FCC TEST REPORT

FCC ID	: 2AA7PDF-S600
Applicant	: DigiFi.,Co.LTD.
Address	: GS 3F Changynyong-daero 151 beon-gil, Jangan-gu, Suwon-si, Gyeonggi-do, South Korea
Manufacturer	: Trends Glory Technology Co., Ltd
Address	: Block B, 5th floor, Building B, XinRui logistics park, HouRui, XiXiang, BaoAn, ShenZhen

Equipment Under Test (EUT) :

Product Name	: Dongle(WiFi Audio Video transmitter)
Model No.	: DF-S600, SS-S300, NH-K600, OPERA-S600，KWD-APC311，KWD-APC312，KWD-APC313
Rules	: FCC CFR47 Part 15 C Section 15.247:2012
Date of Test	: September 04~06, 2013
Date of Issue	: October 24, 2013
Test Result	: PASS*

Remark:

* The sample detailed above has been tested to the requirements of FCC rules mentioned above.

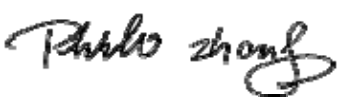
The test results have been reviewed against the directives above and found to meet their essential requirements.

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.

PERPARED BY:
Waltek Services (Shenzhen) Co., Ltd.
1/F, Fukangtai Building, West of Baima Road., Songgang Street, Bao'an District, Shenzhen, China
Tel: +86-755-83551033 Fax: +86-755-83552400

Compiled by: Approved by:



Maikou Zhang / Project Engineer Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
Radiated Emissions	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
Emissions from out of band	15.247(d)	PASS
Emissions from the restricted bands	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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4 General Information

4.1 General Description of E.U.T.

Product Name	: Dongle(WiFi Audio Video transmitter)
Model No.	: DF-S600, SS-S300, NH-K600, OPERA-S600,， KWD-APC311， KWD-APC312，KWD-APC313
Model Difference	: All the models are identical product. Only the appearance screen printing and color are different. The model DF-S600 is the tested sample.
Operation Frequency	: 2412MHz ~ 2462MHz
Antenna Gain	: 0dBi
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.)
Note	: All the modulation modes were tested, all the test data deeply conform to the rules and the data of the worst mode are recorded in the following pages.

4.2 Details of E.U.T.

Technical Data	: DC 5V, 1000mA Powered from adapter (Adapter Input: 100-240VAC, 50/60Hz,1.0A)
Adapter	: Manufacturer: N/A M/N: SWPP-05001000-US

4.3 Description of Support Units

No.	Equipment	Manufacturer	Model No.	Serial No.
1.	LCD TV	caihong	L2019AD	-

4.4 Test Mode

Table 1 Tests Carried Out Under FCC part 15.247

Test Items	Test 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	72 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	72 Mbps	1/6/11	TX
	802.11n HT40	150 Mbps	3/6/9	TX
6 dB Bandwidth	802.11b	11 Mbps	1/11	TX
	802.11g	54 Mbps	1/11	TX
	802.11n HT20	72 Mbps	1/11	TX
	802.11n HT40	150 Mbps	3/9	TX
Band Emissions	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	72 Mbps	1/6/11	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	72 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 .

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

Test Item	Test Mode
Radiation Emission, 30MHz ~ 1GHz	Wifi linking
Conduction Emission, 0.15MHz to 30MHz	Wifi linking

4.5 Test Facility

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

- **IC – Registration No.: 7760A**

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, July 12, 2012.

- **FCC – 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, May 26, 2011.

4.6 Test Location

Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd.,Songgang Street, Baoan District, Shenzhen, China

5 Equipment Used during Test

5.1 Equipments List

Conducted Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	Spe.21,2012	Spe.20,2013
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Spe.21,2012	Spe.20,2013
3.	Cable	LARGE	RF300	EW02014-3	Spe.21,2012	Spe.20,2013
3m Semi-anechoic Chamber for Radiation Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer	Agilent	E7405A	MY45114943	Spe.21,2012	Spe.20,2013
2.	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Spe.21,2012	Spe.20,2013
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Spe.21,2012	Spe.20,2013
4.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Spe.21,2012	Spe.20,2013
5.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	399	Spe.21,2012	Spe.20,2013
6.	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Spe.21,2012	Spe.20,2013
7.	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Spe.21,2012	Spe.20,2013
8.	Cable	Top	EWO2014-7	-	Spe.21,2012	Spe.20,2013
9.	Cable	Top	TYPE16(13M)	-	Spe.21,2012	Spe.20,2013
10.	DC POWER SUPPLY	LWDQGS	PS-303D		Spe.21,2012	Spe.20,2013
11.	Humidity Chamber	GTH-225-40-1P	IAA061213		Spe.21,2012	Spe.20,2013
12.	Spectrum Analyzer	ROHDE & SCHWARZ	FSL6		Spe.21,2012	Spe.20,2013

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)
	± 4.74 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 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

6.1 E.U.T. Operation

Operating Environment:

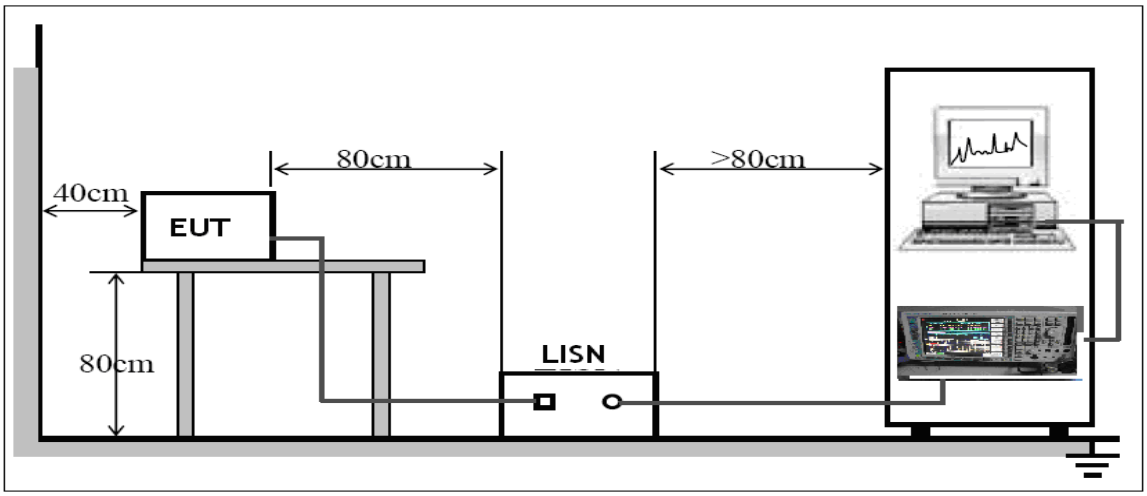
Temperature: 25.5 °C
Humidity: 50 % RH
Atmospheric Pressure: 1010 mbar

EUT Operation:

The pre-test was performed in wifi linking, the test 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.

6.2 EUT Setup

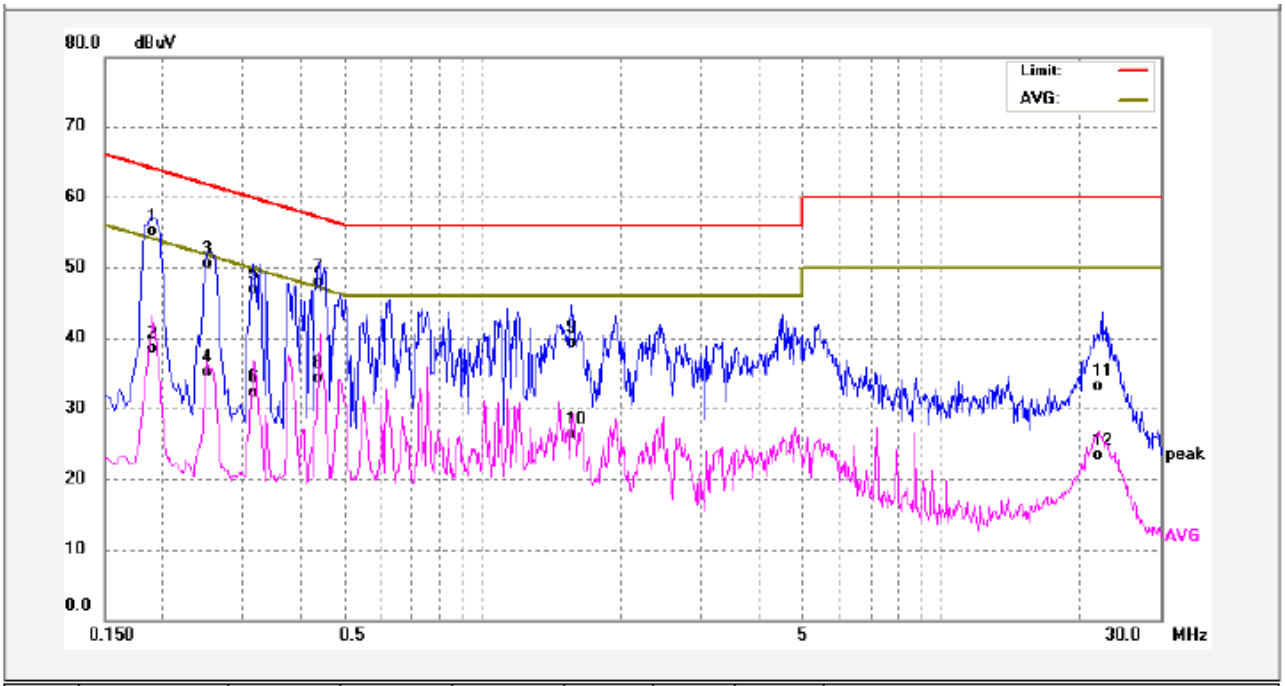
The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003.



6.3 Conducted Emission Test Result

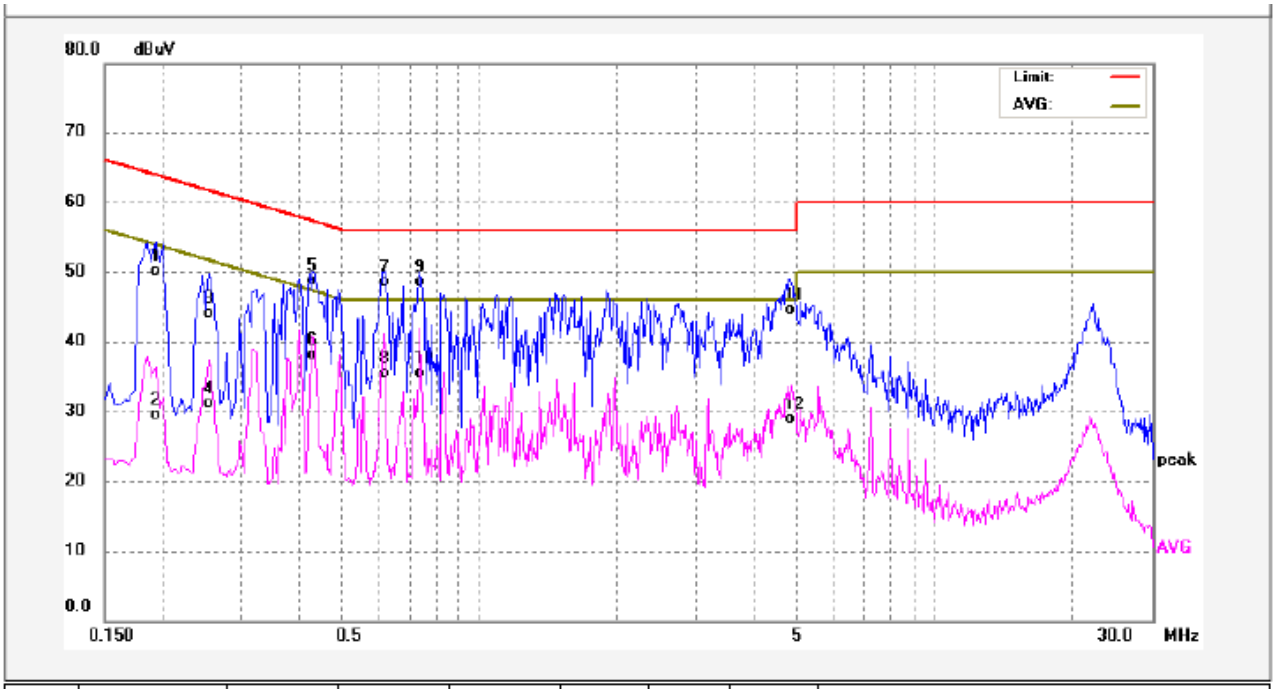
An initial pre-scan was performed on the live and neutral lines.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1883	43.78	11.27	55.05	64.11	-9.06	QP	
2	0.1883	27.27	11.27	38.54	54.11	-15.57	AVG	
3	0.2500	39.30	11.30	50.60	61.75	-11.15	QP	
4	0.2500	23.81	11.30	35.11	51.75	-16.64	AVG	
5	0.3140	35.53	11.30	46.83	59.86	-13.03	QP	
6	0.3140	21.08	11.30	32.38	49.86	-17.48	AVG	
7	0.4380	36.66	11.31	47.97	57.10	-9.13	QP	
8	0.4380	23.09	11.31	34.40	47.10	-12.70	AVG	
9	1.5660	28.18	11.19	39.37	56.00	-16.63	QP	
10	1.5660	15.06	11.19	26.25	46.00	-19.75	AVG	
11	22.3580	21.57	11.53	33.10	60.00	-26.90	QP	
12	22.3580	11.81	11.53	23.34	50.00	-26.66	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1940	38.77	11.28	50.05	63.86	-13.81	QP	
2	0.1940	18.14	11.28	29.42	53.86	-24.44	AVG	
3	0.2540	32.78	11.30	44.08	61.62	-17.54	QP	
4	0.2540	19.89	11.30	31.19	51.62	-20.43	AVG	
5	0.4300	37.46	11.31	48.77	57.25	-8.48	QP	
6	0.4300	26.89	11.31	38.20	47.25	-9.05	AVG	
7	0.6180	37.27	11.33	48.60	56.00	-7.40	QP	
8	0.6180	24.26	11.33	35.59	46.00	-10.41	AVG	
9	0.7420	37.27	11.32	48.59	56.00	-7.41	QP	
10	0.7420	24.23	11.32	35.55	46.00	-10.45	AVG	
11	4.8060	33.22	11.24	44.46	56.00	-11.54	QP	
12	4.8060	17.61	11.24	28.85	46.00	-17.15	AVG	

7 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: ANSI C63.4:2003

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	$20\log^{(500)}$

7.1 EUT Operation :

Operating Environment:

Temperature: 25.5 °C

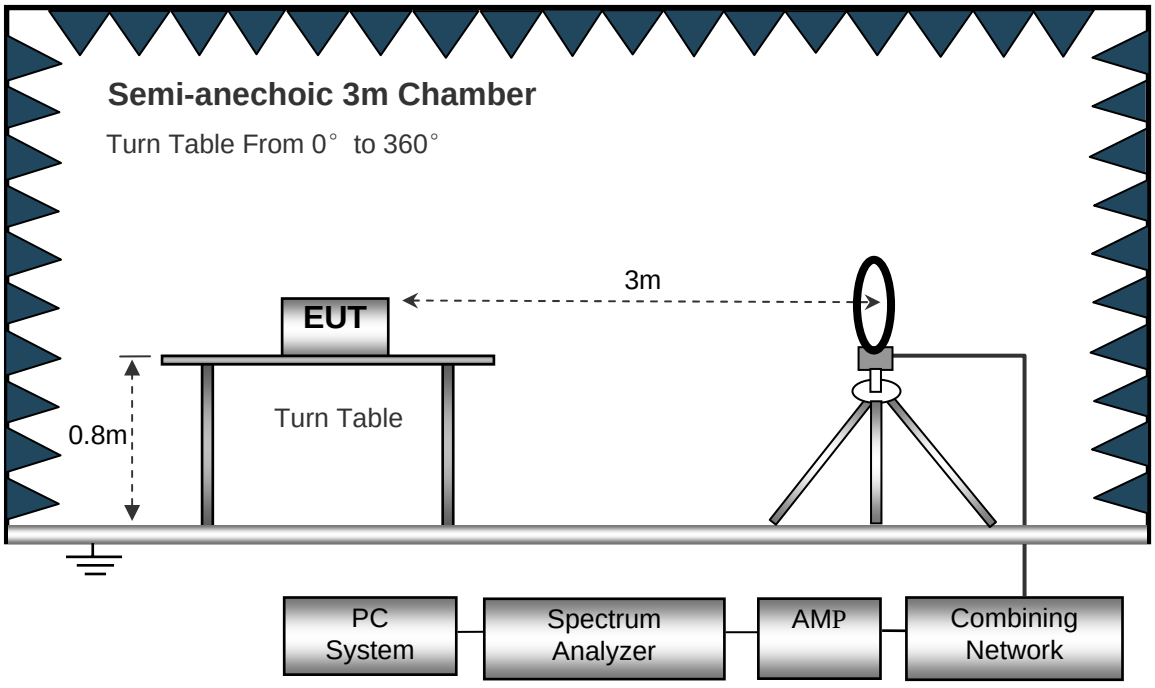
Humidity: 51 % RH

Atmospheric Pressure:1002mbar

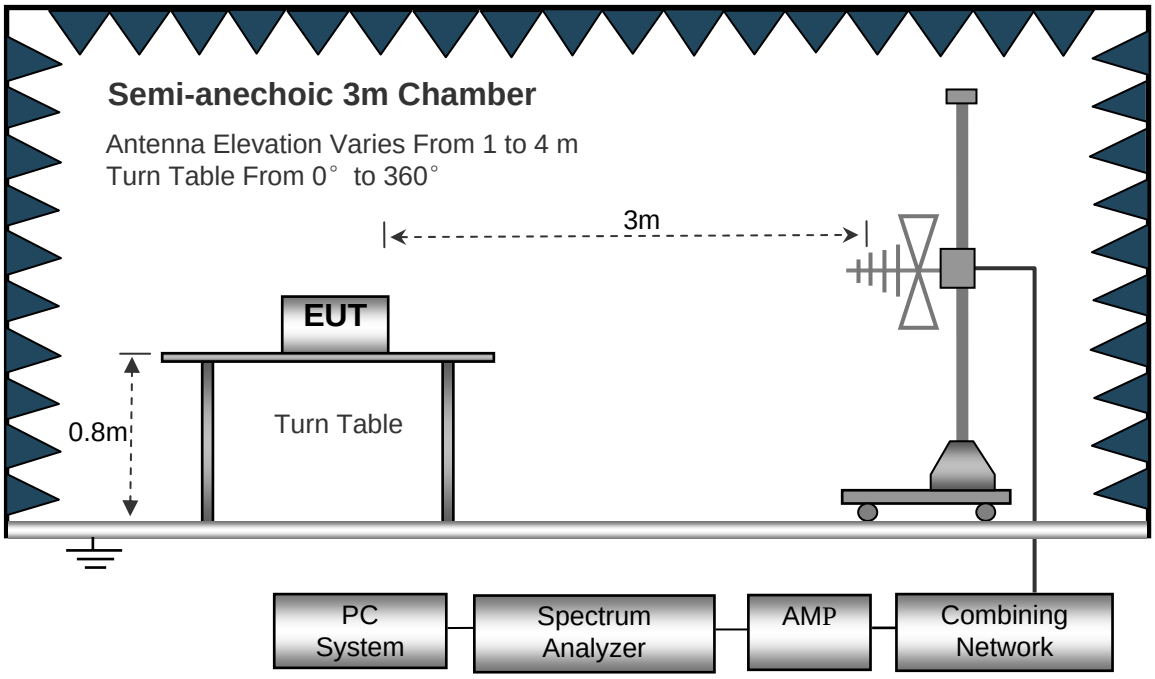
7.2 Test Setup

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

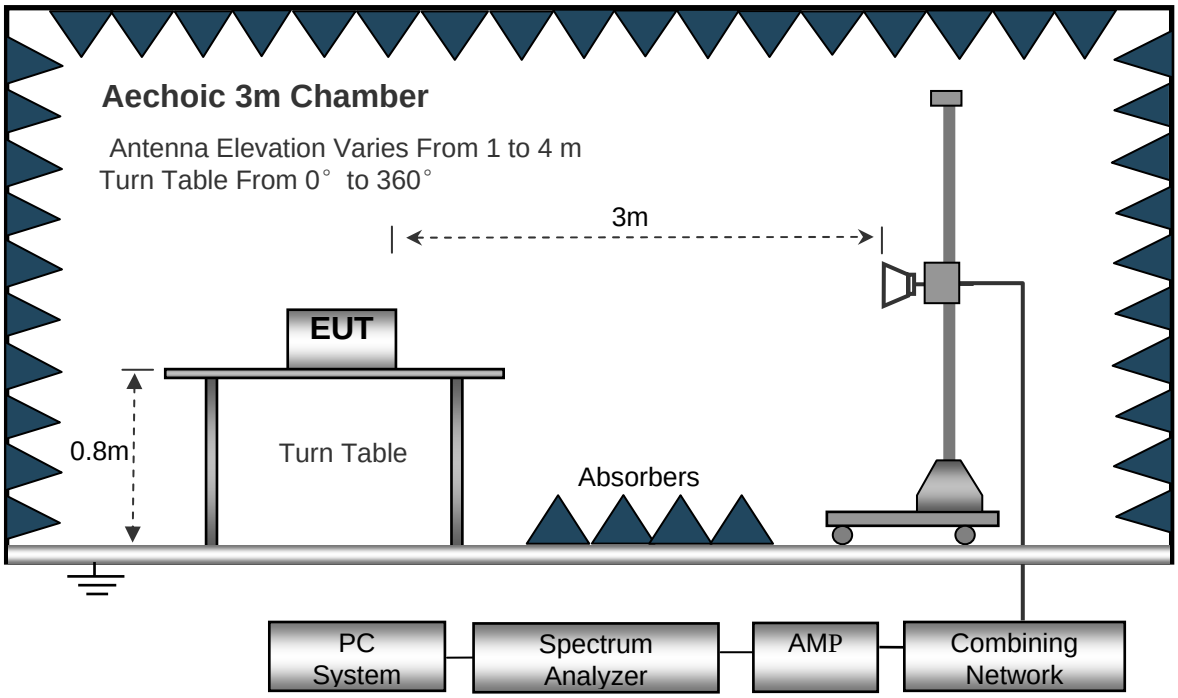
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

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

Below 30MHz

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

30MHz ~ 1GHz

Sweep Speed .....Auto
IF Bandwidth.....120 KHz
Video Bandwidth.....100KHz
Quasi-Peak Adapter Bandwidth .....120 KHz
Quasi-Peak Adapter Mode .....Normal
Resolution Bandwidth.....100KHz

Above 1GHz

Sweep Speed .....Auto
IF Bandwidth.....120 KHz
Video Bandwidth.....3MHz
Quasi-Peak Adapter Bandwidth .....120 KHz
Quasi-Peak Adapter Mode .....Normal
Resolution Bandwidth.....1MHz

7.4 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.

7.5 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

7.6 Summary of Test Results

Test Frequency : Below 30MHz

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

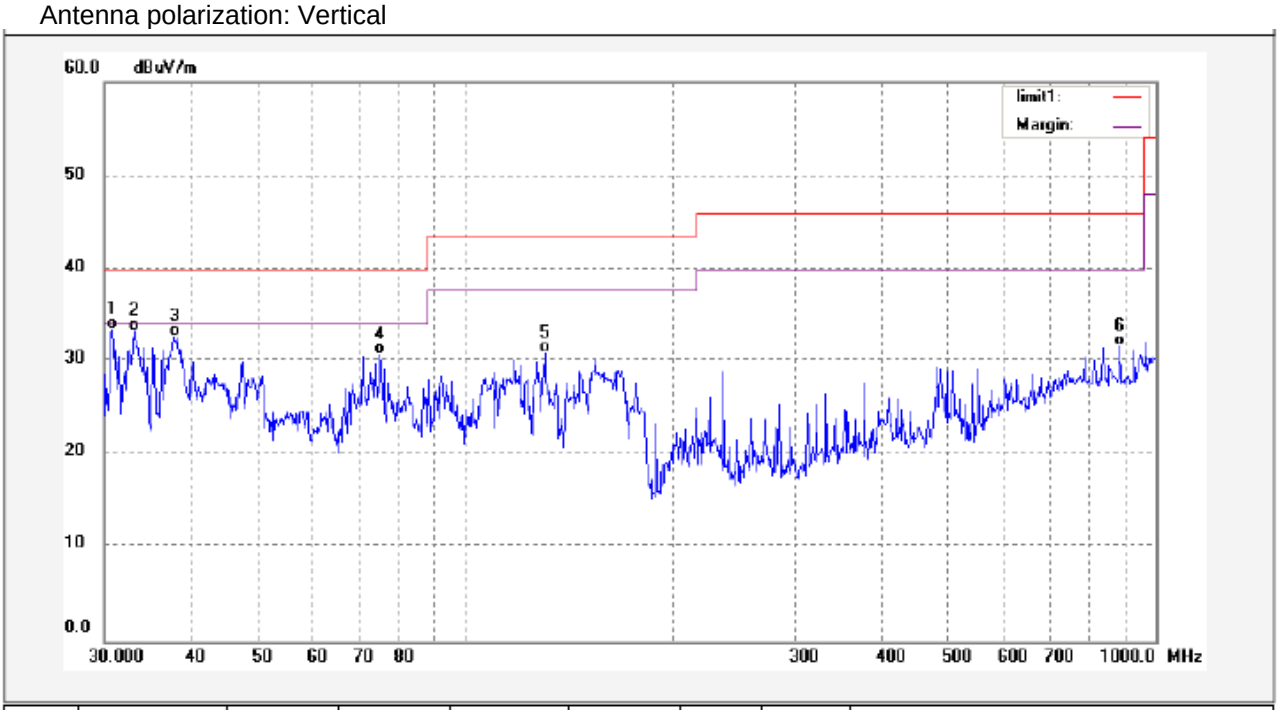
Test Frequency : 30MHz ~ 1000MHz

Remark: The pre-test was performed at TX 11b(2412MHz/2437MHz/2462MHz), TX 11g(2412MHz/2437MHz/2462MHz), TX 11n HT20(2412MHz/2437MHz/2462MHz) and TX 11n HT40(2422MHz/2437MHz/2452MHz) mode, and the worst is TX 11b(2412MHz) mode, so the data shown is that mode's only.

Test mode: Continuously Transmit

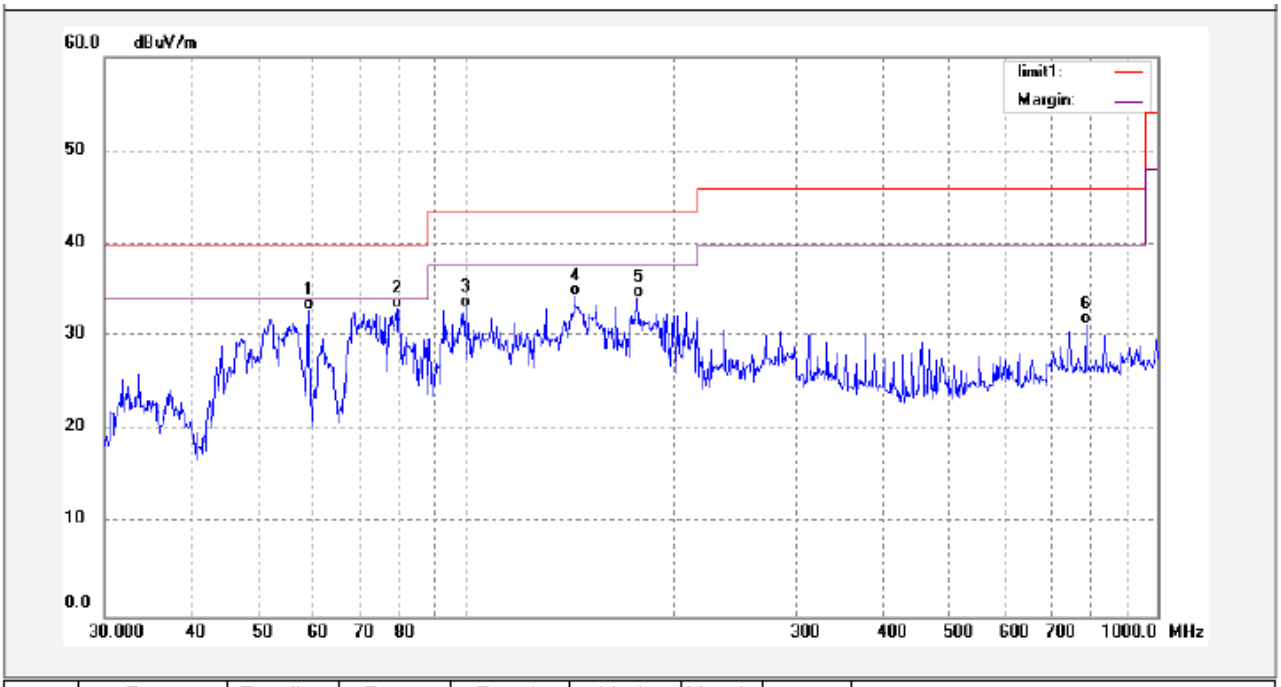
Test Channel: 2412MHz

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.7470	16.99	16.36	33.35	40.00	-6.65	QP	
2	33.1015	16.57	16.60	33.17	40.00	-6.83	QP	
3	37.8297	15.93	16.71	32.64	40.00	-7.36	QP	
4	75.3208	21.41	9.22	30.63	40.00	-9.37	QP	
5	130.3048	18.93	11.90	30.83	43.50	-12.67	QP	
6	887.3978	1.57	30.07	31.64	46.00	-14.36	QP	

Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	59.1052	19.98	12.83	32.81	40.00	-7.19	QP	
2	79.3970	23.77	9.20	32.97	40.00	-7.03	QP	
3	99.7676	19.00	14.01	33.01	43.50	-10.49	QP	
4	143.7760	22.87	11.33	34.20	43.50	-9.30	QP	
5	176.8953	21.72	12.44	34.16	43.50	-9.34	QP	
6	790.2466	2.66	28.68	31.34	46.00	-14.66	QP	

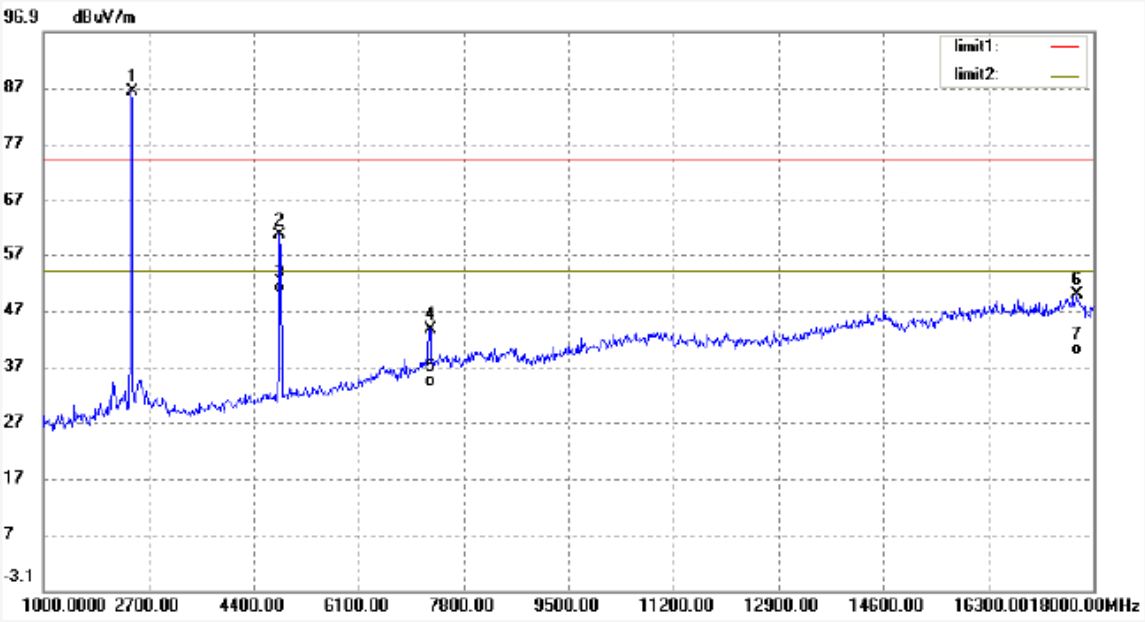
Test Frequency: From 1GHz -18GHz

Remark: The pre-test was performed at TX 11b, TX 11g, TX 11n HT20 and TX 11n HT40 mode, and the worst is TX 11b mode, so the data shown is that mode's only.

Test mode: Continuously Transmit

Modulation:TX 11b, Test Channel: 2412MHz

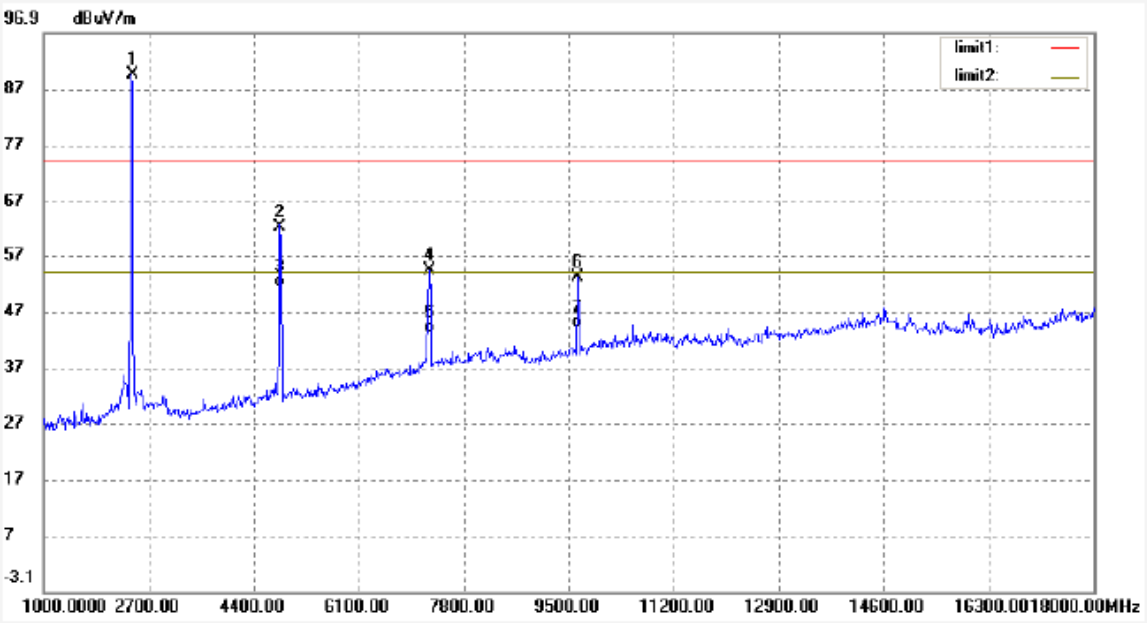
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2412.000	101.82	-15.61	86.21	74.00	12.21	peak	
2	4824.000	72.58	-11.96	60.62	74.00	-13.38	peak	
3	4824.000	62.01	-11.96	50.05	54.00	-3.95	AVG	
4	7256.000	50.70	-7.15	43.55	74.00	-30.45	peak	
5	7256.000	40.36	-7.15	33.21	54.00	-20.79	AVG	
6	17728.000	45.94	3.83	49.77	74.00	-24.23	peak	
7	17728.000	35.14	3.83	38.97	54.00	-15.03	AVG	

Remark: the marker 1 is the fundamental

Antenna polarization: Horizontal

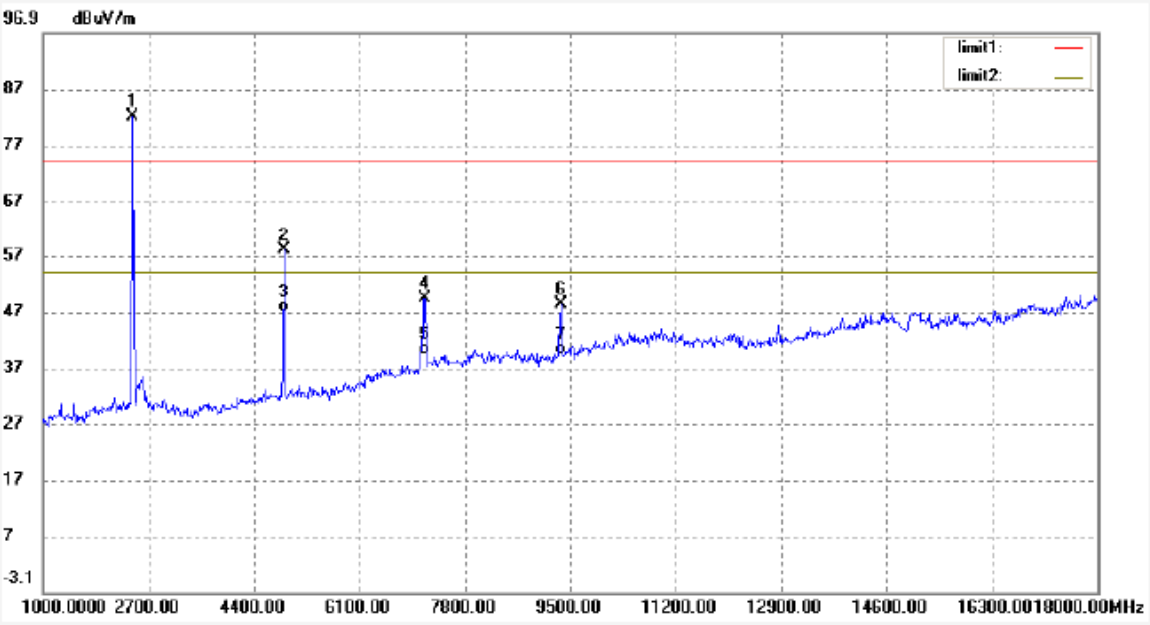


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2412.000	105.05	-15.61	89.44	74.00	15.44	peak	
2	4824.000	74.26	-11.96	62.30	74.00	-11.70	peak	
3	4824.000	63.12	-11.96	51.16	54.00	-2.84	AVG	
4	7239.000	61.47	-7.17	54.30	74.00	-19.70	peak	
5	7239.000	50.26	-7.17	43.09	54.00	-10.91	AVG	
6	9653.000	58.57	-5.65	52.92	74.00	-21.08	peak	
7	9653.000	49.74	-5.65	44.09	54.00	-9.91	AVG	

Remark: the marker 1 is the fundamental

Modulation:TX 11b, Test Channel: 2437MHz

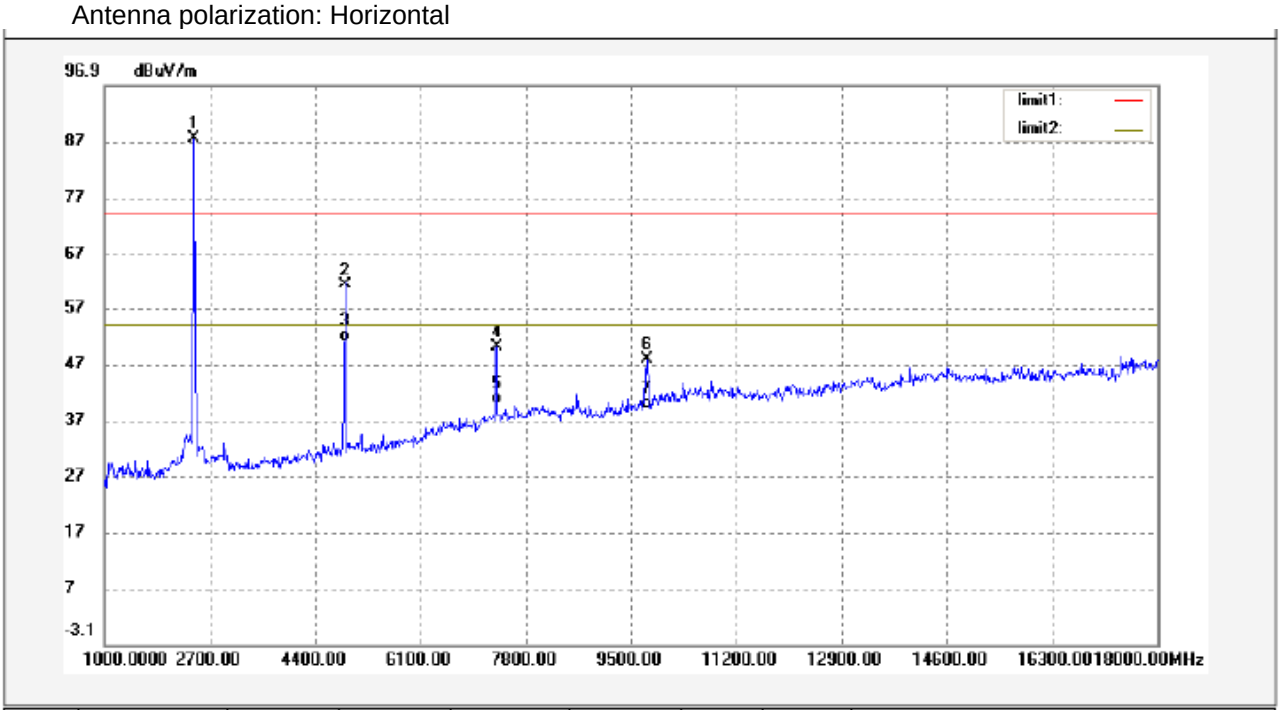
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2437.000	97.59	-15.68	81.91	74.00	7.91	peak	
2	4874.000	69.87	-11.93	57.94	74.00	-16.06	peak	
3	4874.000	58.76	-11.93	46.83	54.00	-7.17	AVG	
4	7154.000	56.78	-7.38	49.40	74.00	-24.60	peak	
5	7154.000	46.54	-7.38	39.16	54.00	-14.84	AVG	
6	9347.000	54.03	-5.83	48.20	74.00	-25.80	peak	
7	9347.000	45.01	-5.83	39.18	54.00	-14.82	AVG	

Remark: the marker 1 is the fundamental

Antenna polarization: Horizontal

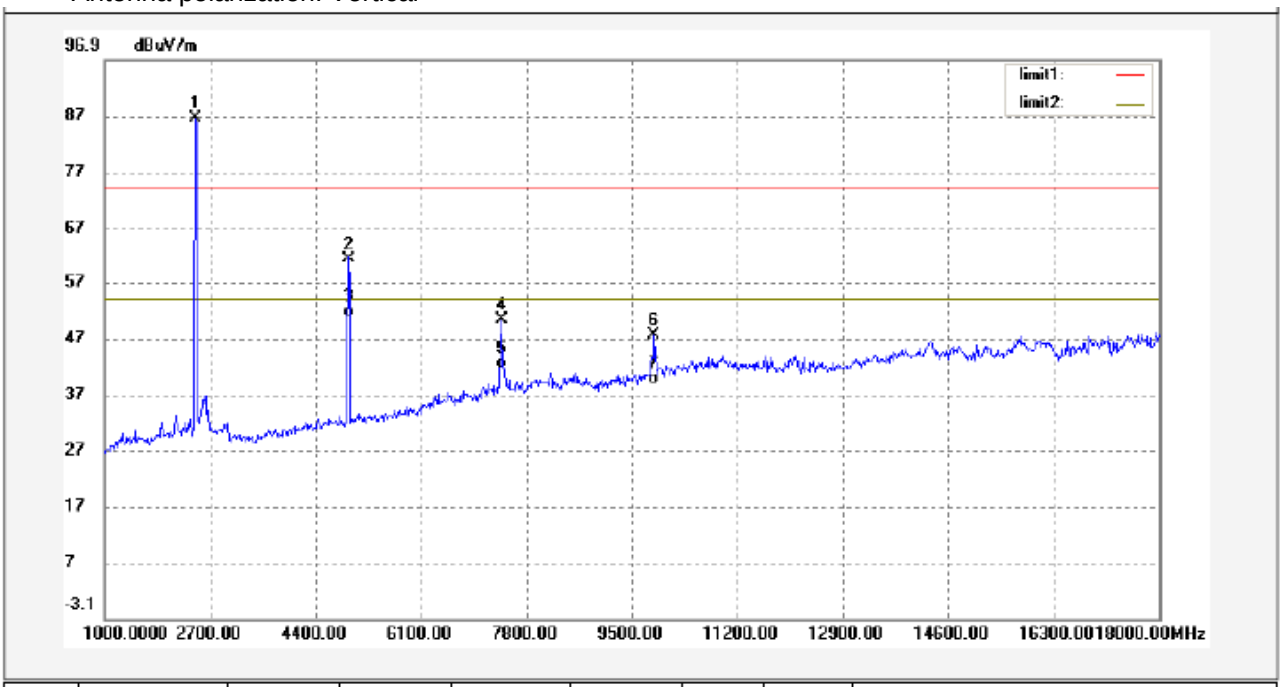


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2437.000	103.28	-15.68	87.60	74.00	13.60	peak	
2	4874.000	73.10	-11.93	61.17	74.00	-12.83	peak	
3	4874.000	62.88	-11.93	50.95	54.00	-3.05	AVG	
4	7324.000	57.08	-7.13	49.95	74.00	-24.05	peak	
5	7324.000	47.01	-7.13	39.88	54.00	-14.12	AVG	
6	9755.000	53.07	-5.33	47.74	74.00	-26.26	peak	
7	9755.000	44.26	-5.33	38.93	54.00	-15.07	AVG	

Remark: the marker 1 is the fundamental

Modulation:TX 11b, Test Channel: 2462MHz

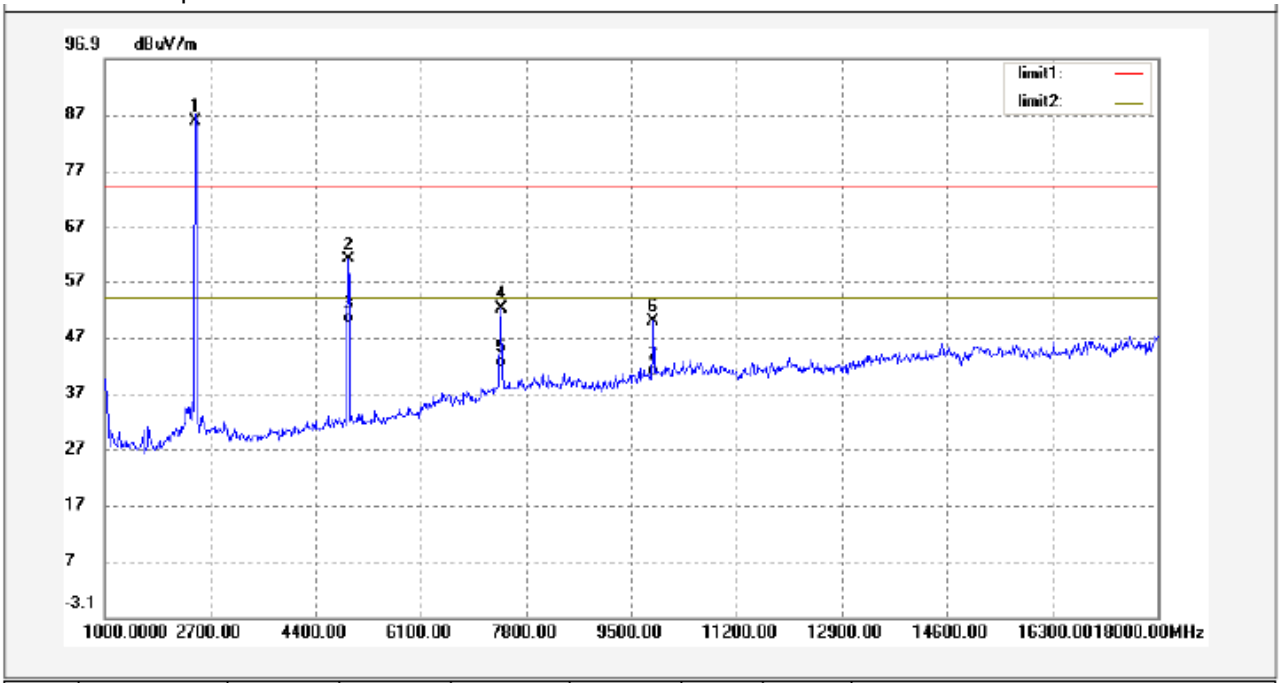
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2462.000	102.33	-15.70	86.63	74.00	12.63	peak	
2	4924.000	73.01	-11.83	61.18	74.00	-12.82	peak	
3	4924.000	62.55	-11.83	50.72	54.00	-3.28	AVG	
4	7392.000	57.35	-7.03	50.32	74.00	-23.68	peak	
5	7392.000	48.65	-7.03	41.62	54.00	-12.38	AVG	
6	9857.000	52.57	-5.10	47.47	74.00	-26.53	peak	
7	9857.000	43.87	-5.10	38.77	54.00	-15.23	AVG	

Remark: the marker 1 is the fundamental

Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2462.000	101.51	-15.70	85.81	74.00	11.81	peak	
2	4924.000	72.80	-11.83	60.97	74.00	-13.03	peak	
3	4924.000	61.05	-11.83	49.22	54.00	-4.78	AVG	
4	7392.000	59.05	-7.03	52.02	74.00	-21.98	peak	
5	7392.000	48.57	-7.03	41.54	54.00	-12.46	AVG	
6	9857.000	54.83	-5.10	49.73	74.00	-24.27	peak	
7	9857.000	45.07	-5.10	39.97	54.00	-14.03	AVG	

Remark: the marker 1 is the fundamental

Test Frequency: Above 18GHz

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

8 Band Edge Measurement

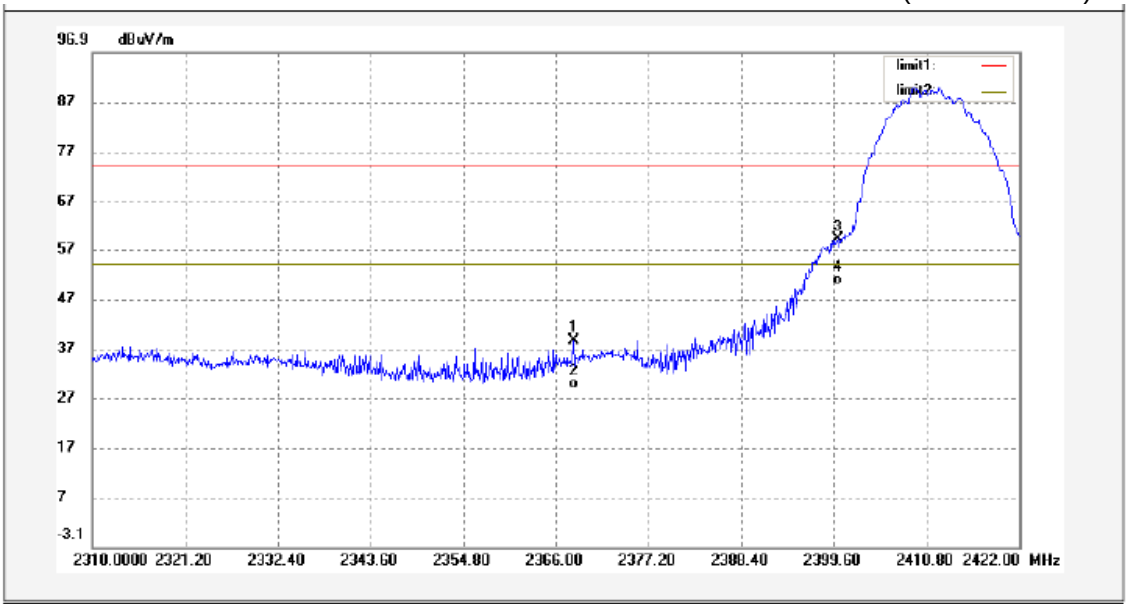
Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) and 15.205(c).
Test Method:	KDB558074 D01 V02 10/04/2012
Measurement Distance:	3m
Detector:	For Peak value: RBW = 1MHz VBW =3MHz; Sweep = auto Detector function = peak Trace = max hold For Average value: RBW = 1MHz VBW=10Hz; Sweep = auto Detector function = Average Trace = max hold

8.1 Test Produce

1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. continuous transmitting

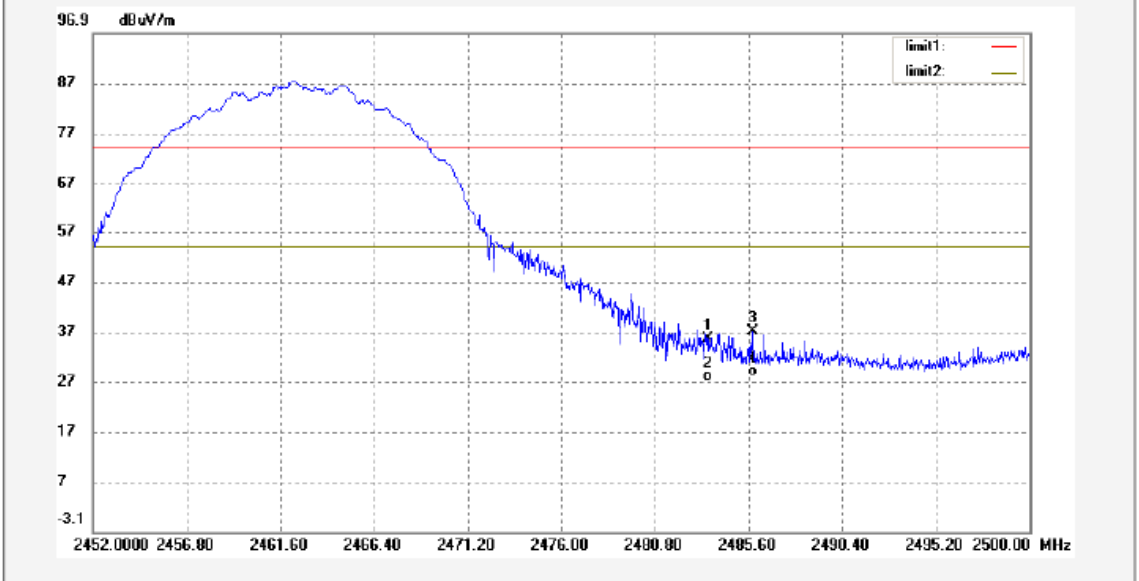
8.2 Test Result

Mode: TX 11b channel 1 Antenna Polarization: Horizontal (the worst case)



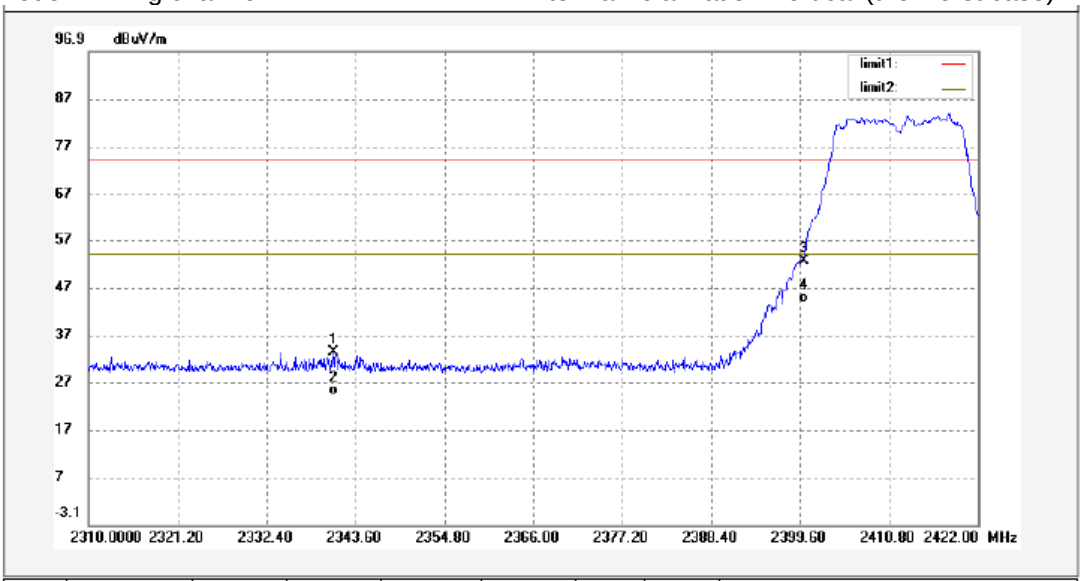
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2368.128	53.92	-15.49	38.43	74.00	-35.57	peak	
2	2368.128	44.26	-15.49	28.77	54.00	-25.23	AVG	
3	2400.000	74.62	-15.58	59.04	74.00	-14.96	peak	
4	2400.000	65.24	-15.58	49.66	54.00	-4.34	AVG	

Mode: TX 11b channel 11 Antenna Polarization:Vertical (the worst case)



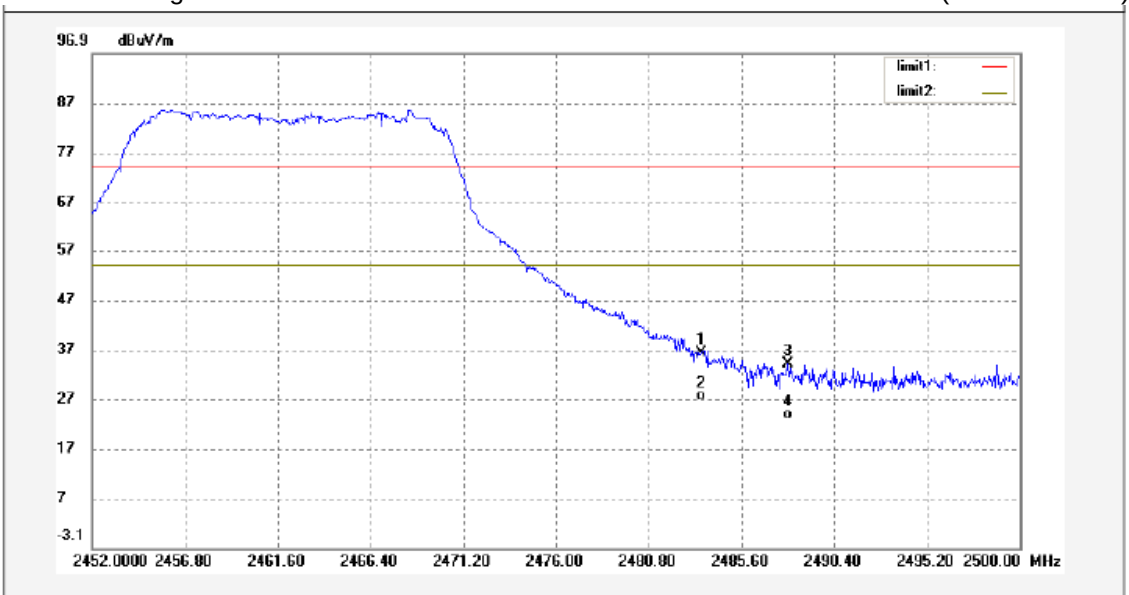
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2483.500	51.32	-15.67	35.65	74.00	-38.35	peak	
2	2483.500	42.65	-15.67	26.98	54.00	-27.02	AVG	
3	2485.792	52.78	-15.67	37.11	74.00	-36.89	peak	
4	2485.792	43.77	-15.67	28.10	54.00	-25.90	AVG	

Mode: TX 11g channel 1 Antenna Polarization:Vertical (the worst case)



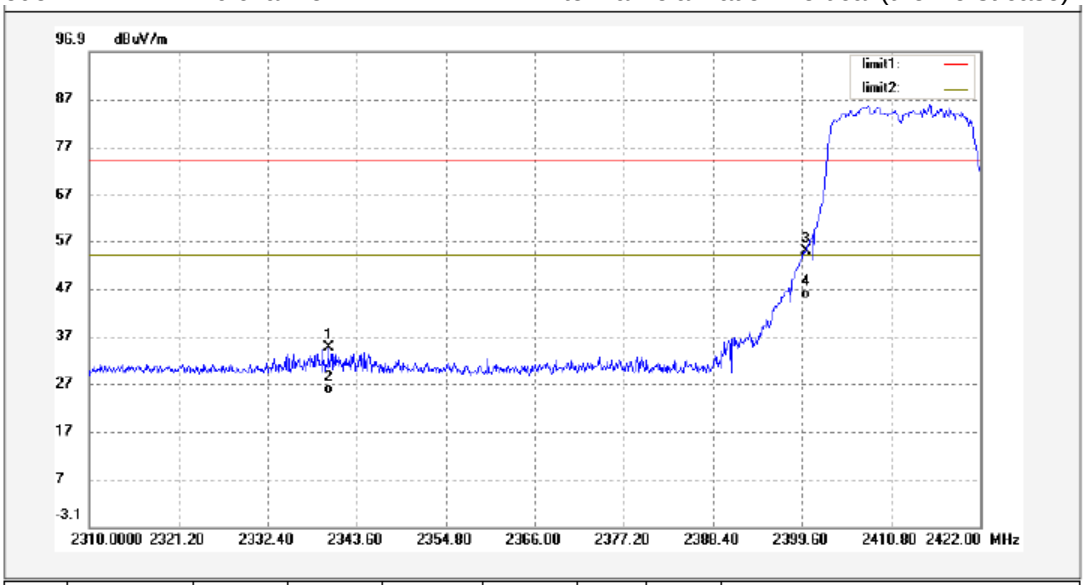
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2340.800	48.55	-15.38	33.17	74.00	-40.83	peak	
2	2340.800	39.74	-15.38	24.36	54.00	-29.64	AVG	
3	2400.000	68.13	-15.58	52.55	74.00	-21.45	peak	
4	2400.000	59.24	-15.58	43.66	54.00	-10.34	AVG	

Mode: TX 11g channel 11 Antenna Polarization:Horizontal(the worst case)



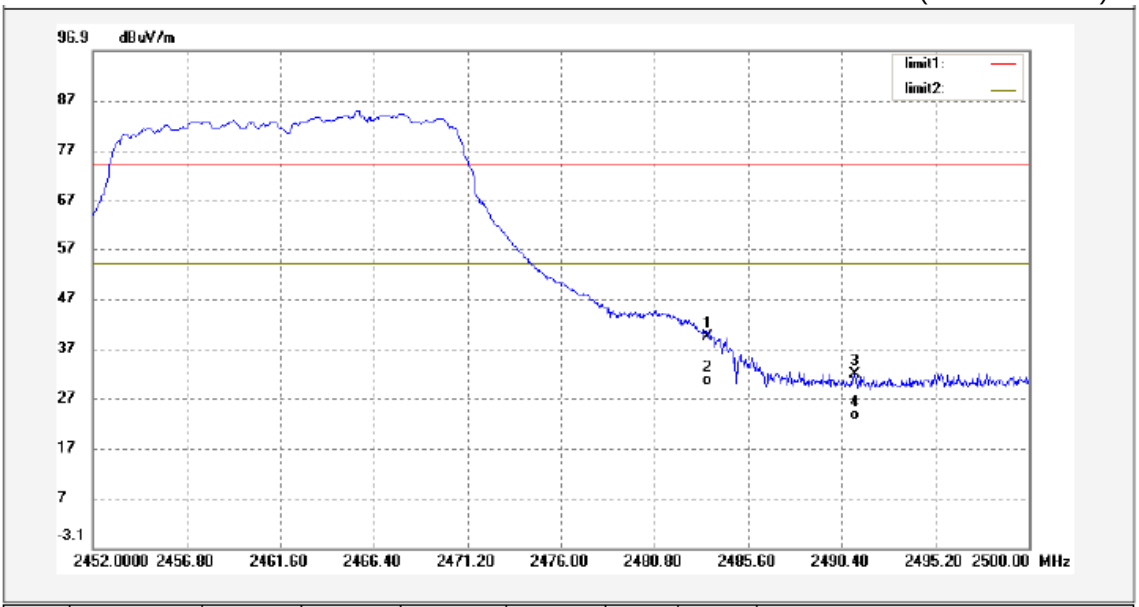
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2483.500	51.95	-15.67	36.28	74.00	-37.72	peak	
2	2483.500	42.12	-15.67	26.45	54.00	-27.55	AVG	
3	2488.000	49.70	-15.67	34.03	74.00	-39.97	peak	
4	2488.000	38.56	-15.67	22.89	54.00	-31.11	AVG	

Mode: TX 11n HT 20 channel 1 Antenna Polarization:Vertical (the worst case)



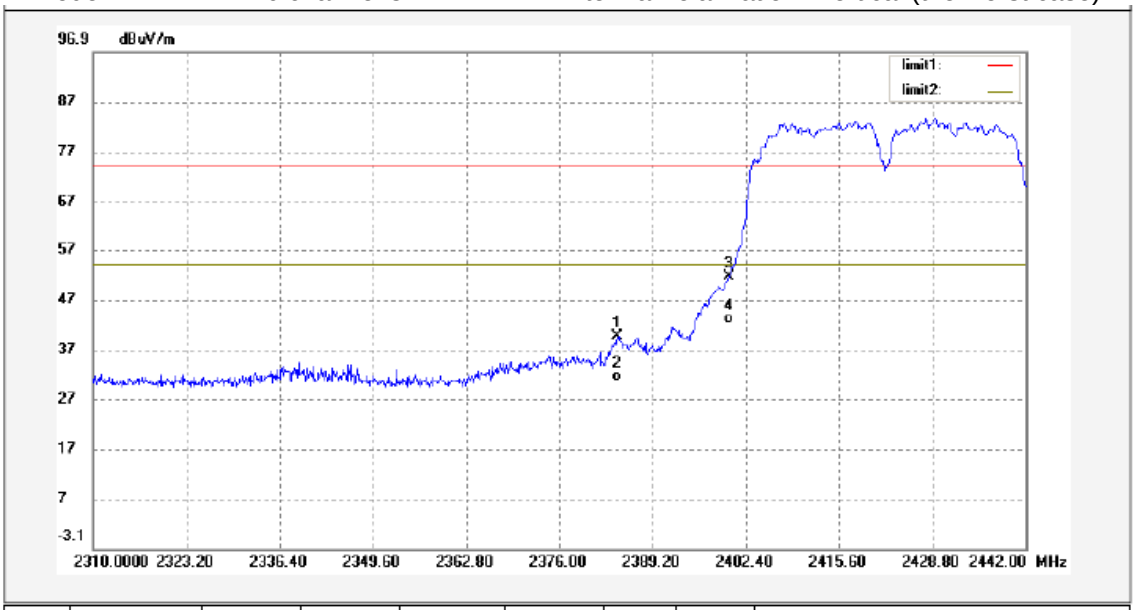
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2340.016	49.98	-15.38	34.60	74.00	-39.40	peak	
2	2340.016	40.14	-15.38	24.76	54.00	-29.24	AVG	
3	2400.000	70.39	-15.58	54.81	74.00	-19.19	peak	
4	2400.000	60.25	-15.58	44.67	54.00	-9.33	AVG	

Mode: TX 11n HT 20 channel 11 Antenna Polarization: Vertical (the worst case)



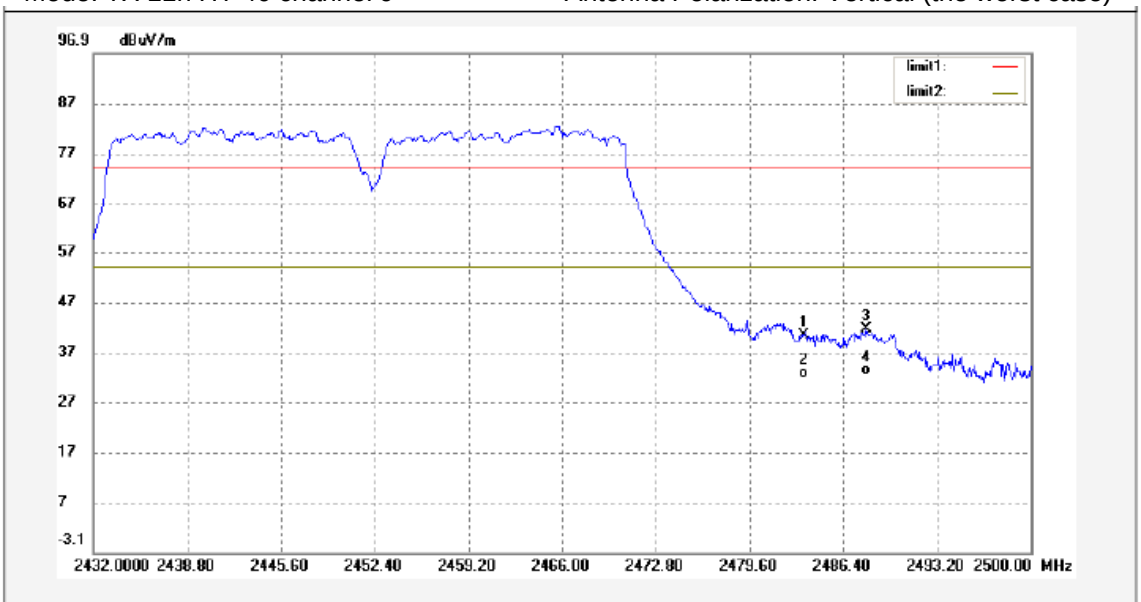
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2483.500	54.94	-15.67	39.27	74.00	-34.73	peak	
2	2483.500	45.12	-15.67	29.45	54.00	-24.55	AVG	
3	2491.072	47.45	-15.67	31.78	74.00	-42.22	peak	
4	2491.072	38.26	-15.67	22.59	54.00	-31.41	AVG	

Mode: TX 11n HT 40 channel 3 Antenna Polarization: Vertical (the worst case)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2384.184	55.02	-15.53	39.49	74.00	-34.51	peak	
2	2384.184	46.01	-15.53	30.48	54.00	-23.52	AVG	
3	2400.000	67.12	-15.58	51.54	74.00	-22.46	peak	
4	2400.000	57.56	-15.58	41.98	54.00	-12.02	AVG	

Mode: TX 11n HT 40 channel 9 Antenna Polarization: Vertical (the worst case)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2483.500	56.03	-15.67	40.36	74.00	-33.64	peak	
2	2483.500	47.56	-15.67	31.89	54.00	-22.11	AVG	
3	2488.032	57.27	-15.67	41.60	74.00	-32.40	peak	
4	2488.032	48.06	-15.67	32.39	54.00	-21.61	AVG	

9 6 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01 V02 10/04/2012

9.1 Test Procedure:

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

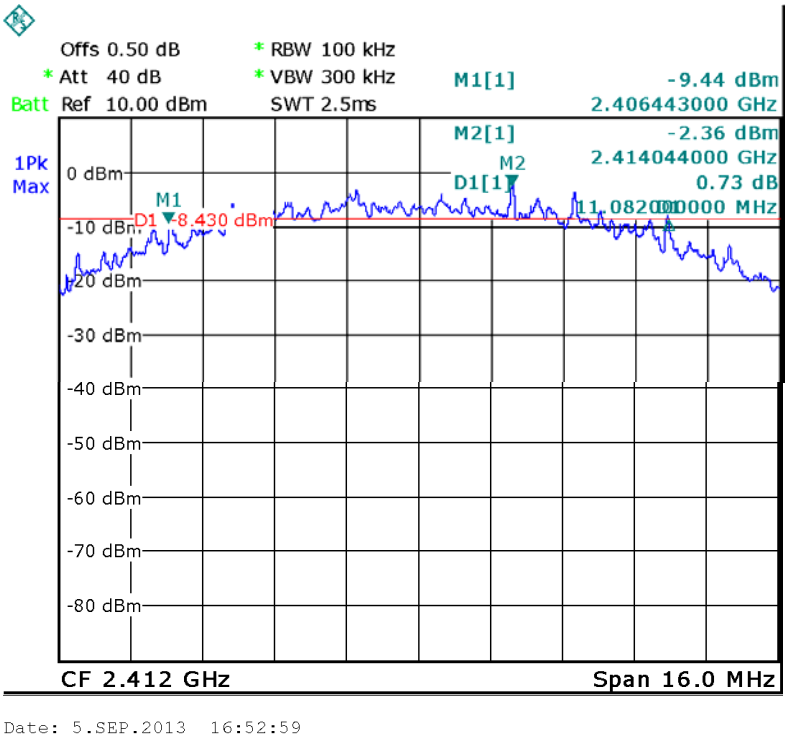
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

9.2 Test Result:

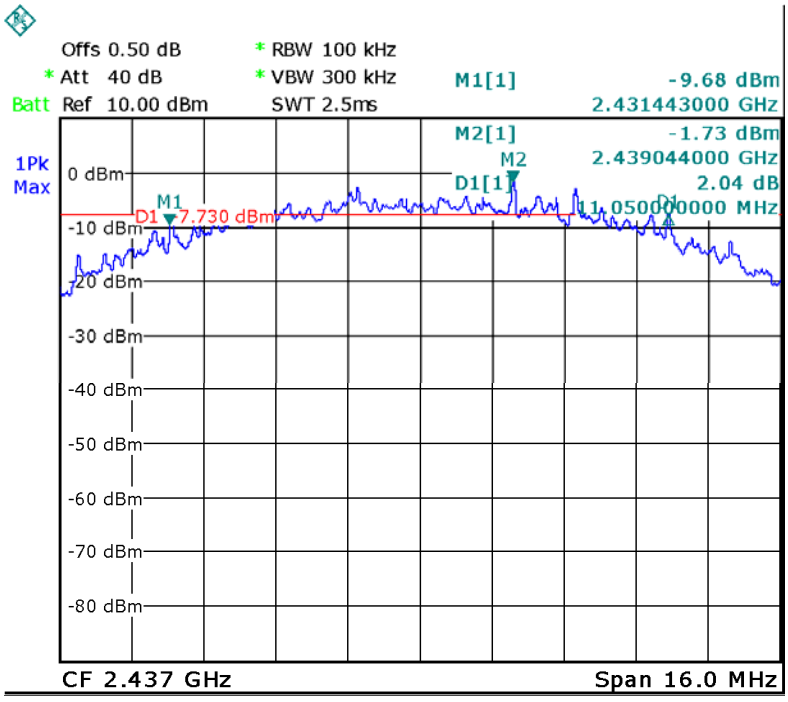
Operation mode	Bandwidth (MHz)		
TX 11b	**Channel 1**	**Channel 6**	**Channel 11**
	11.082	11.050	11.050
TX 11g	**Channel 1**	**Channel 6**	**Channel 11**
	16.495	16.479	16.479
TX 11n HT 20	**Channel 1**	**Channel 6**	**Channel 11**
	17.645	17.697	17.385
TX 11n HT 40	**Channel 3**	**Channel 6**	**Channel 9**
	36.430	36.050	35.920

Test result plot as follows:

Mode: TX 11b channel 1

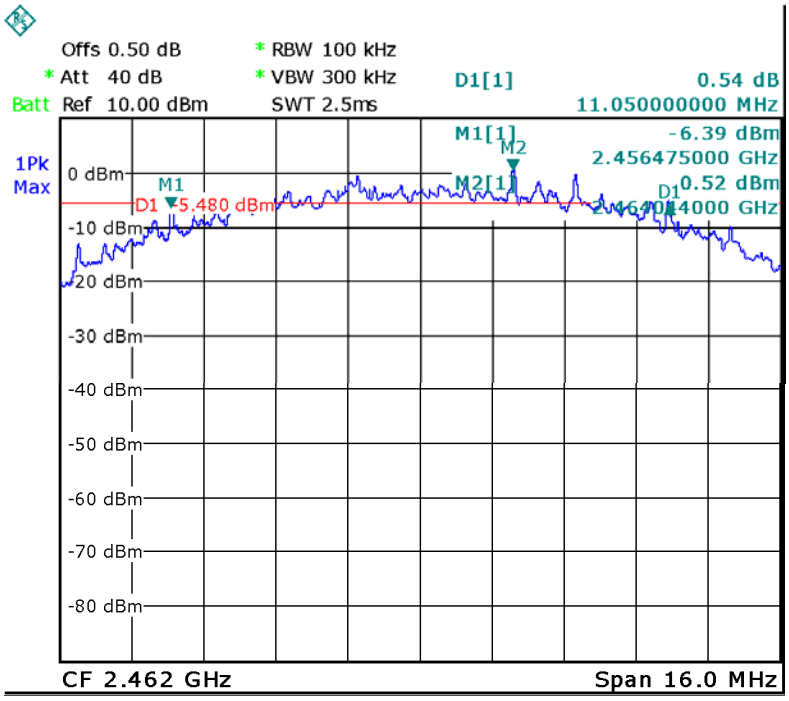


Mode: TX 11b channel 6



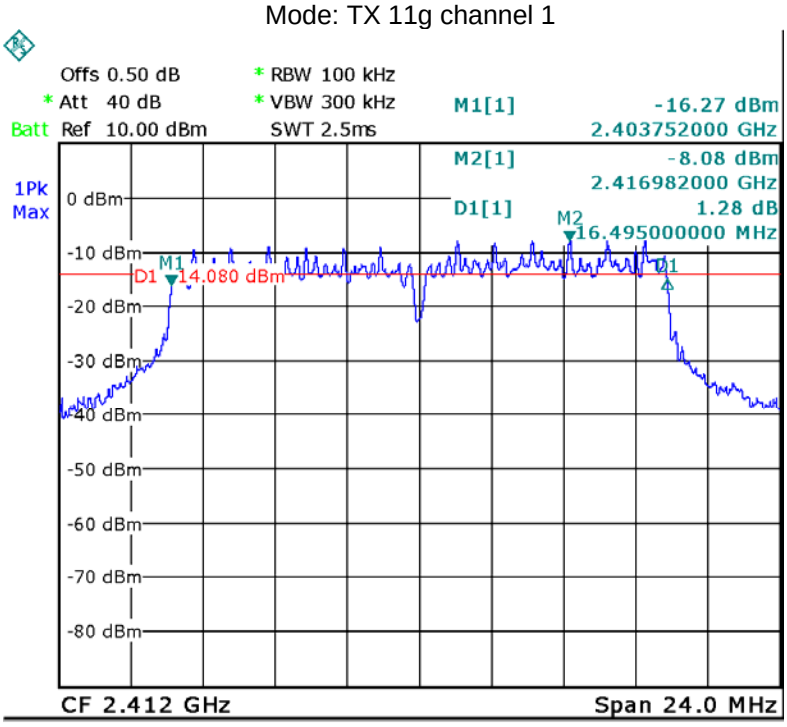
Date: 5.SEP.2013 16:54:19

Mode: TX 11b channel 11



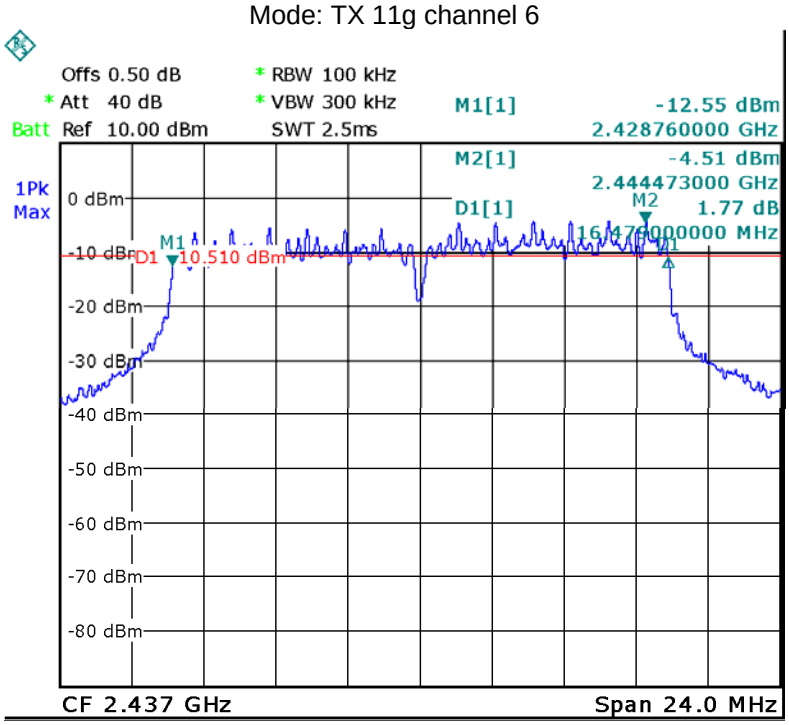
Date: 5.SEP.2013 16:55:58

Mode: TX 11g channel 1



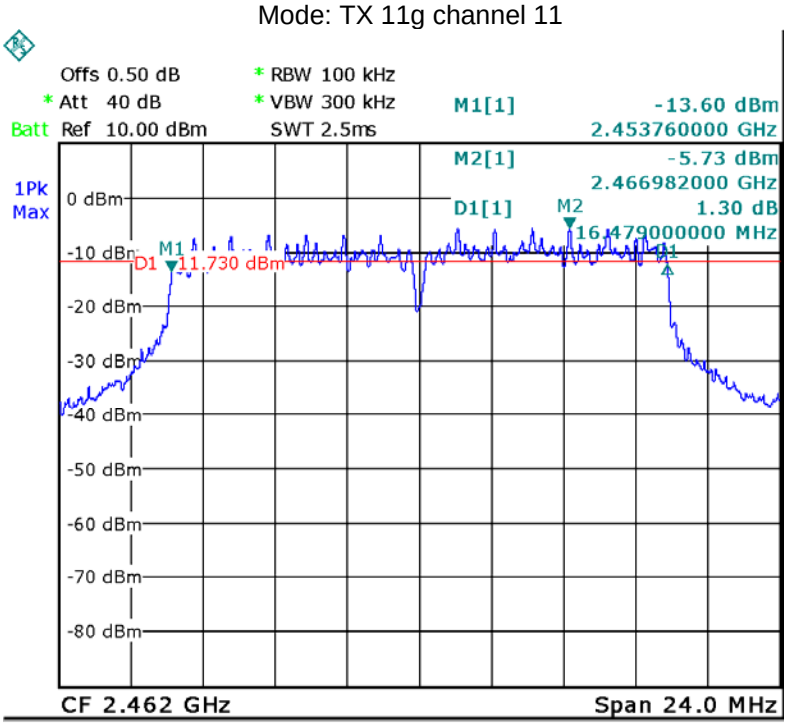
Date: 6.SEP.2013 09:24:52

Mode: TX 11g channel 6



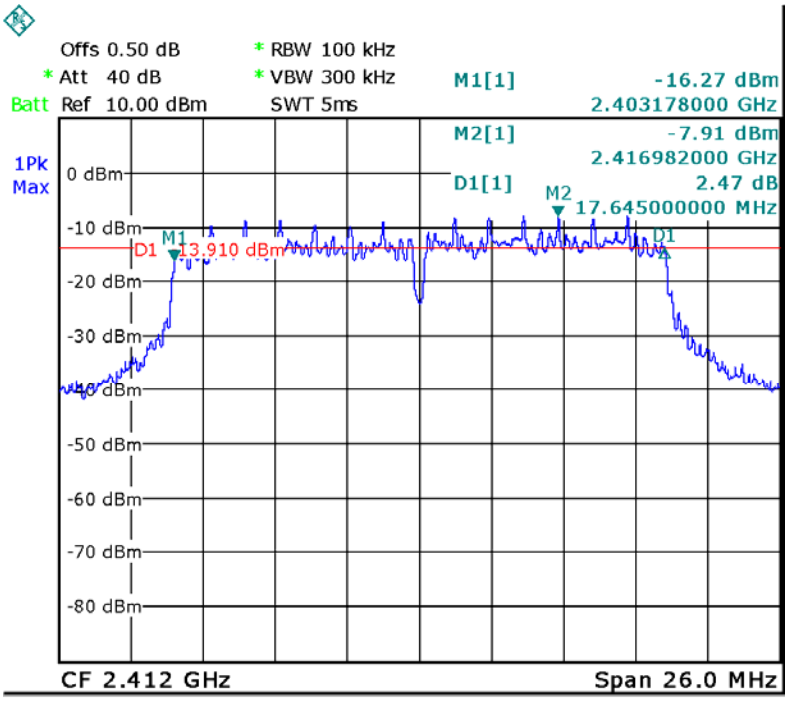
Date: 6.SEP.2013 09:27:51

Mode: TX 11g channel 11



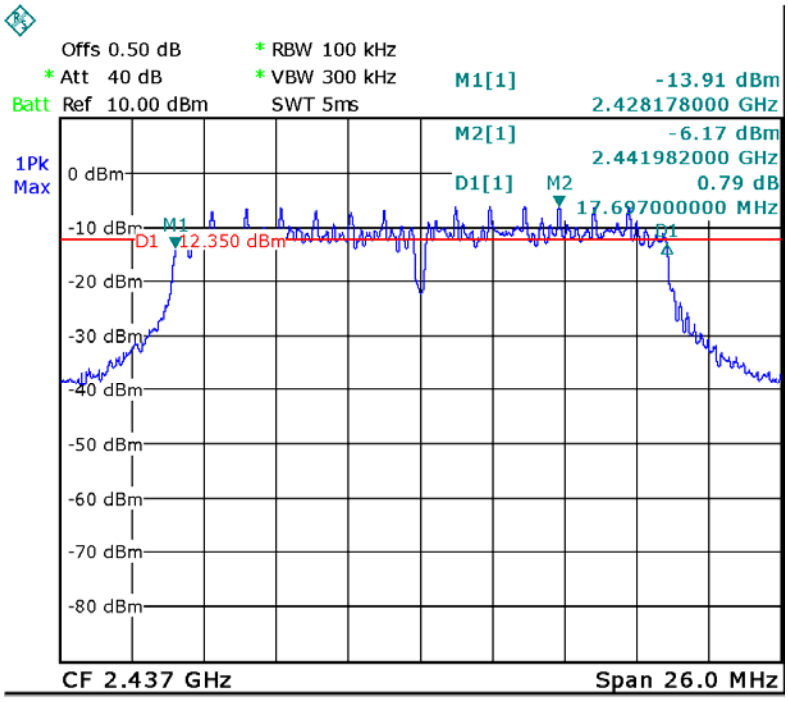
Date: 6.SEP.2013 09:29:48

Mode: TX 11n HT 20 channel 1



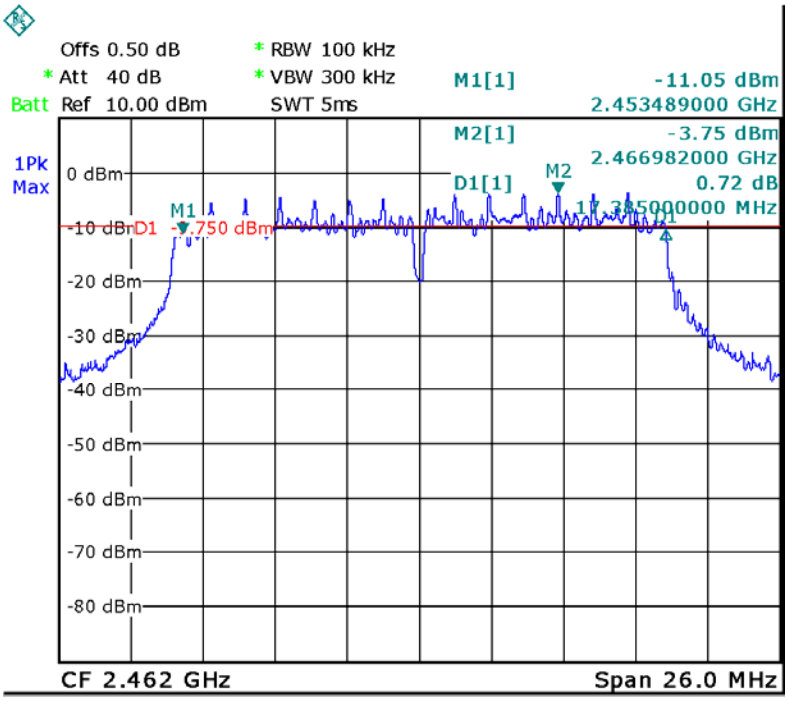
Date: 6.SEP.2013 09:17:31

Mode: TX 11n HT 20 channel 6



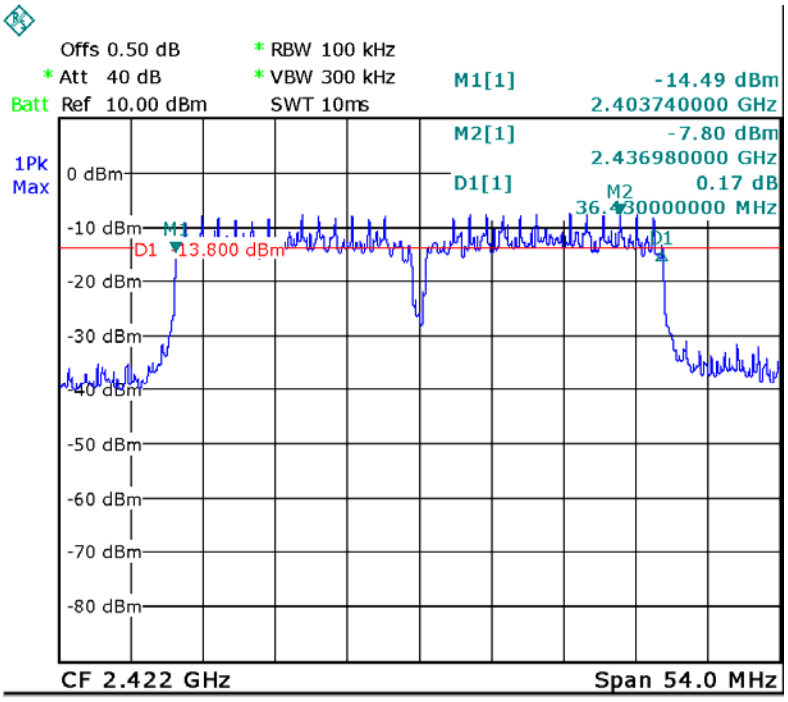
Date: 5.SEP.2013 17:33:11

Mode: TX 11n HT 20 channel 11



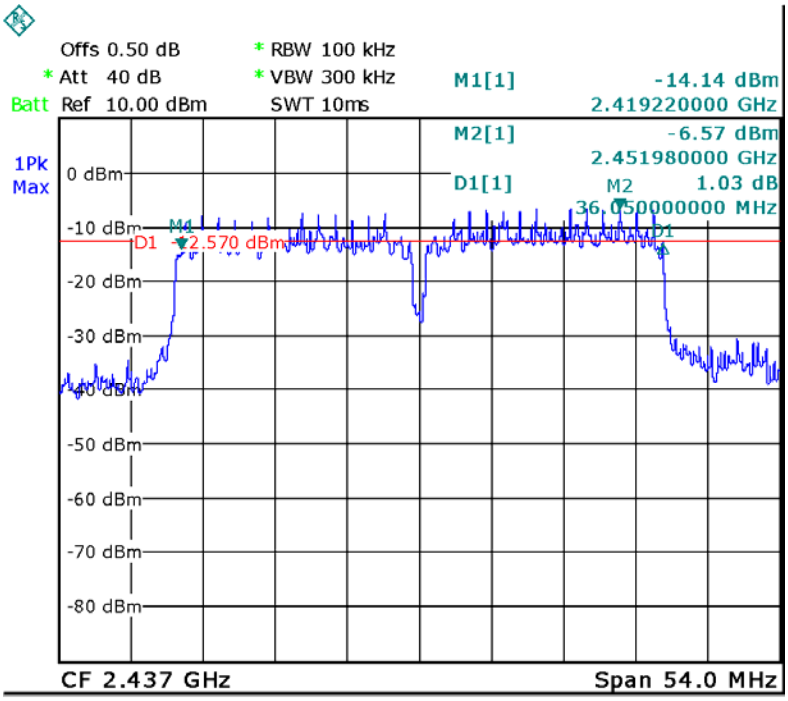
Date: 5.SEP.2013 17:35:43

Mode: TX 11n HT 40 channel 3



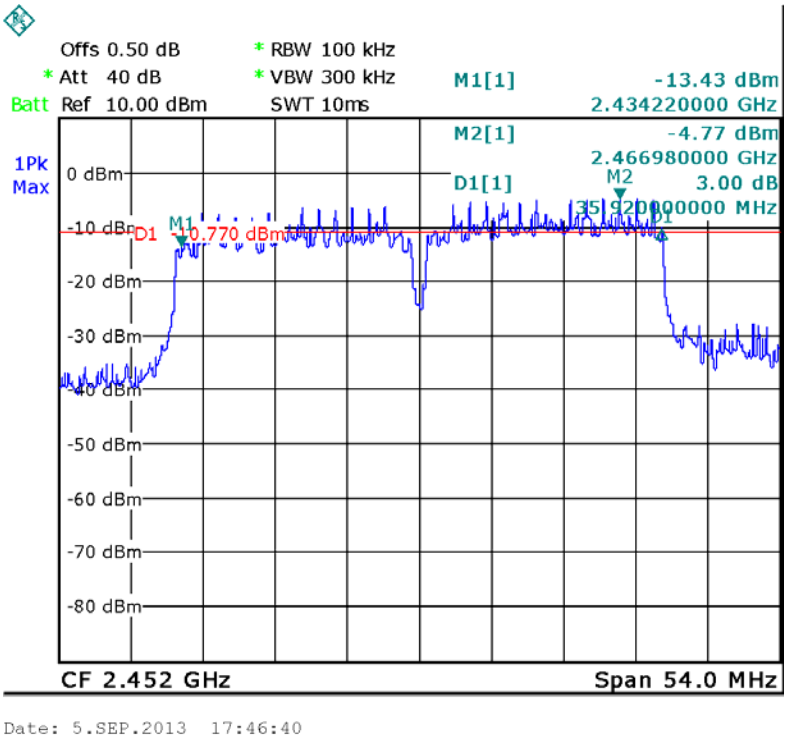
Date: 5.SEP.2013 17:43:13

Mode: TX 11n HT 40 channel 7



Date: 5.SEP.2013 17:44:57

Mode: TX 11n HT 40 channel 9



10 Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01 V02 10/04/2012

10.1 Test Procedure:

KDB558074 D01 V02 10/04/2012 section 8.1.2 Option 2

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.

10.2 Test Result:

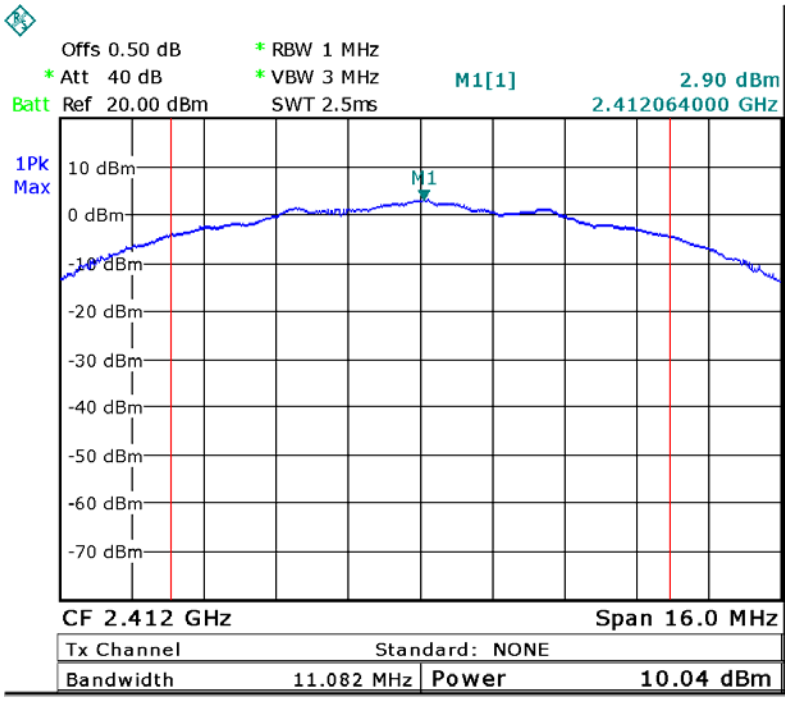
Test mode :TX 11b		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
10.04	10.50	11.54
Limit		
1W/30dBm		

Test mode :TX 11g		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
10.13	11.58	12.71
Limit		
1W/30dBm		

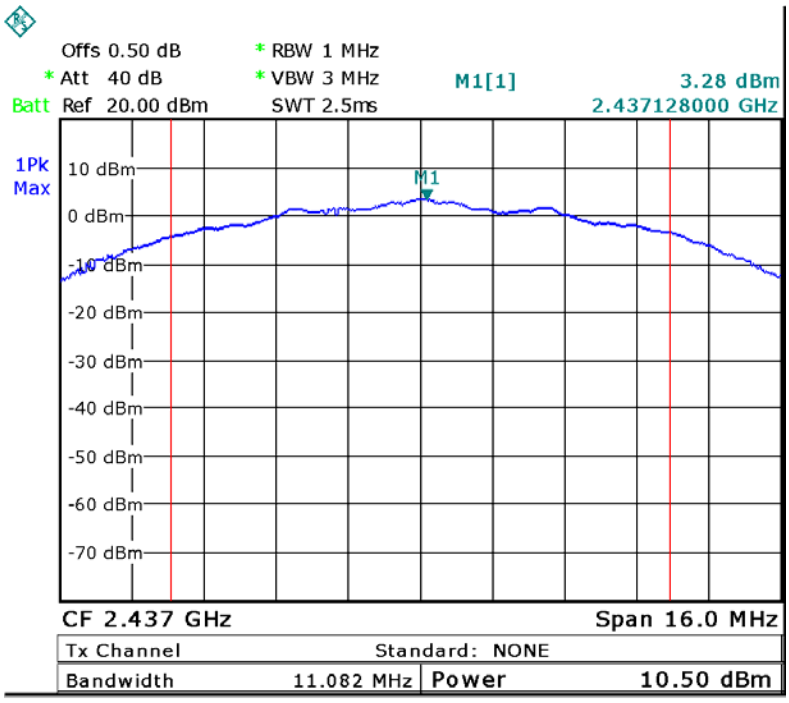
Test mode :TX 11n HT 20		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
10.04	10.91	11.42
Limit		
1W/30dBm		

Test mode :TX 11n HT 40		
10 Maximum Peak Output Power (dBm)		
2422MHz	2437MHz	2452MHz
7.16	7.53	8.78
Limit		
1W/30dBm		

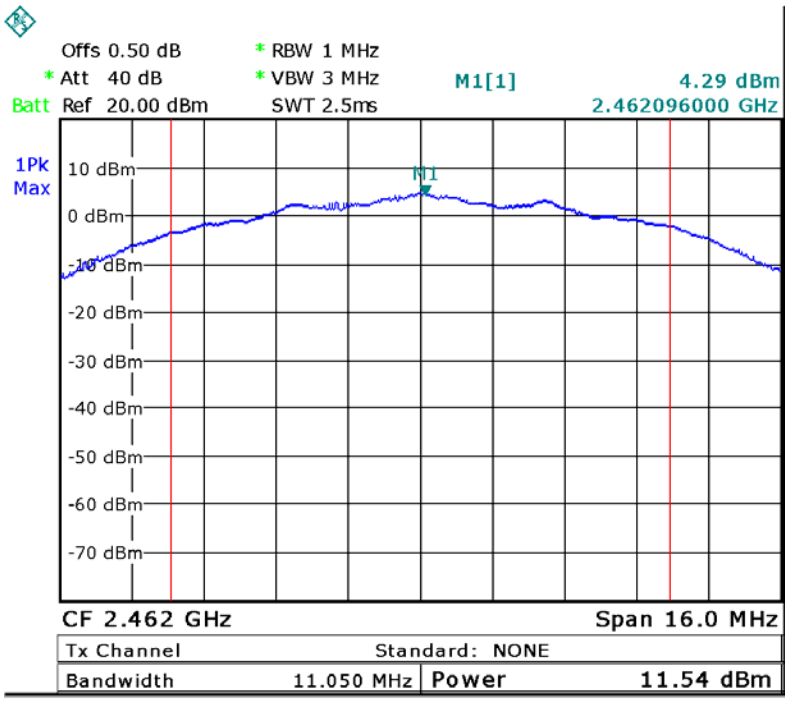
Test mode :TX 11b



Date: 5.SEP.2013 18:03:36

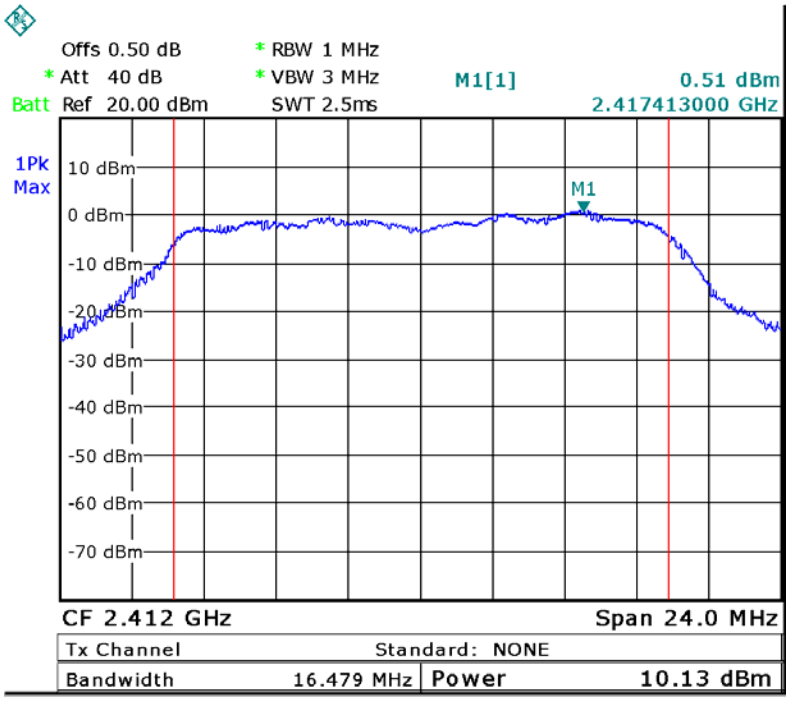


Date: 5.SEP.2013 18:08:31

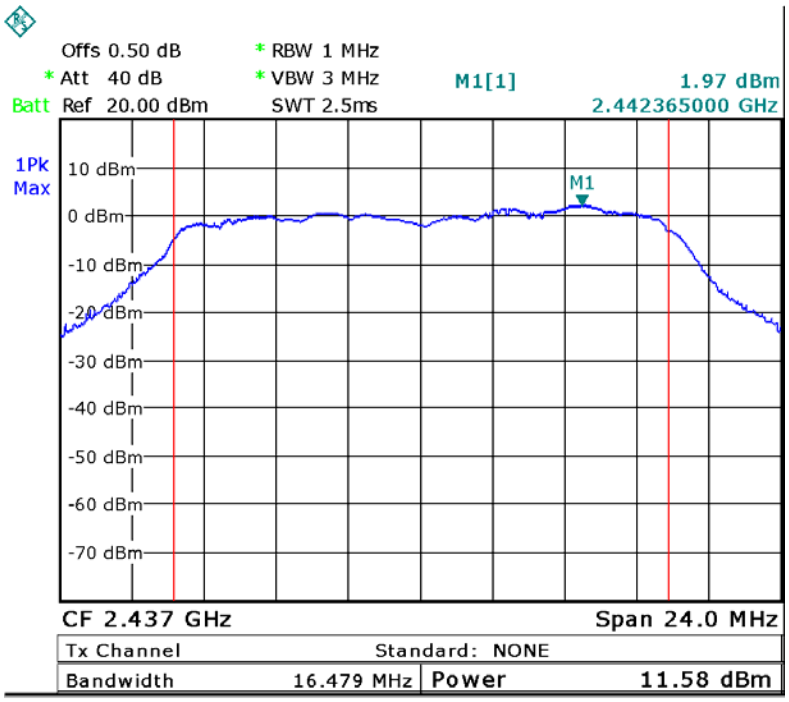


Date: 5.SEP.2013 18:10:24

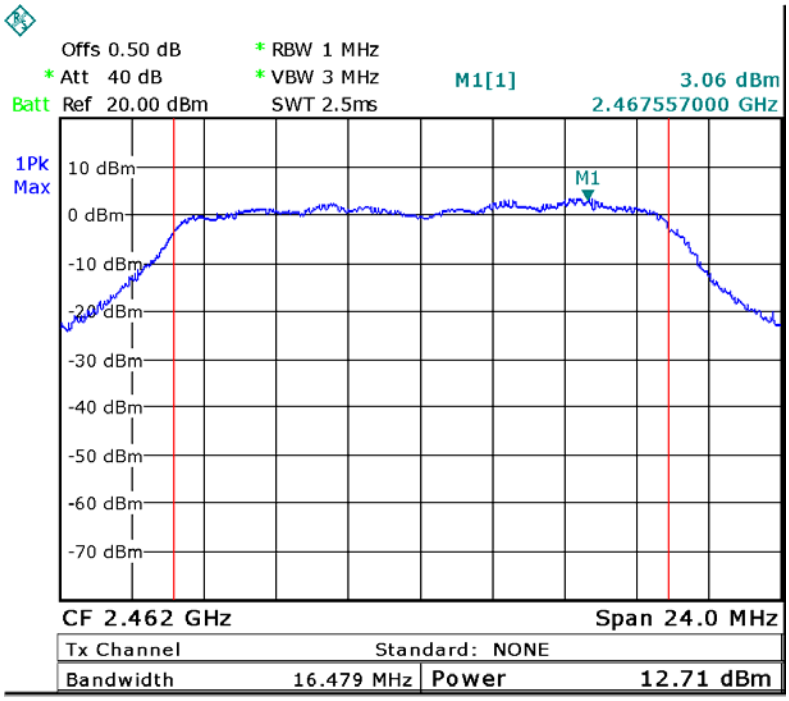
Test mode :TX 11g



Date: 6.SEP.2013 09:36:04

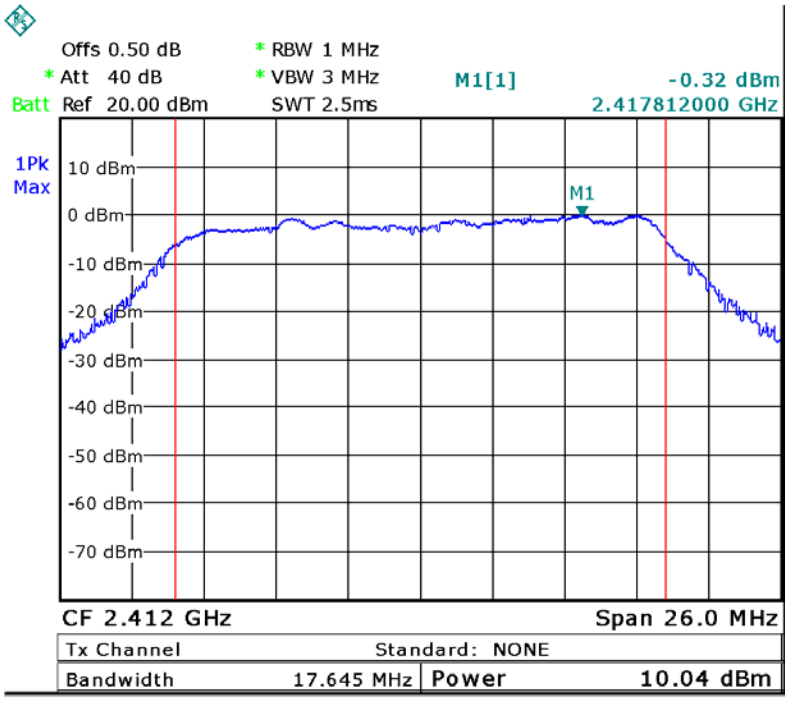


Date: 6.SEP.2013 09:33:58

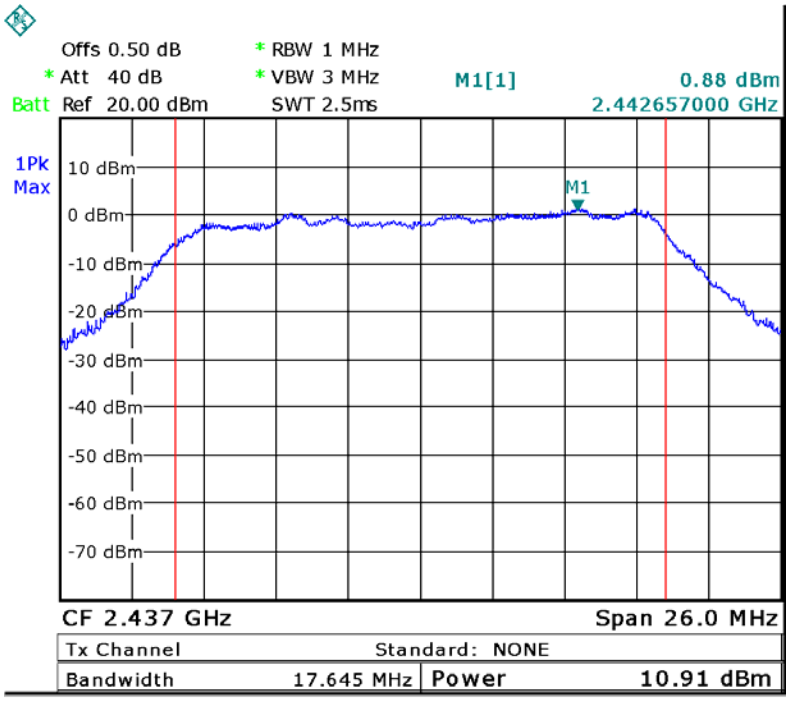


Date: 6.SEP.2013 09:31:47

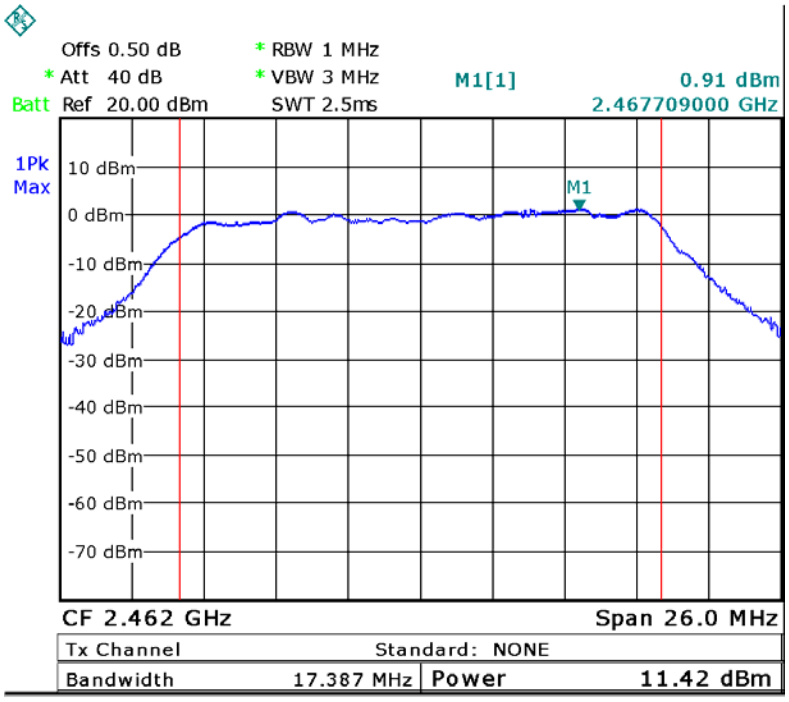
Test mode :TX 11n HT 20



Date: 6.SEP.2013 09:43:56

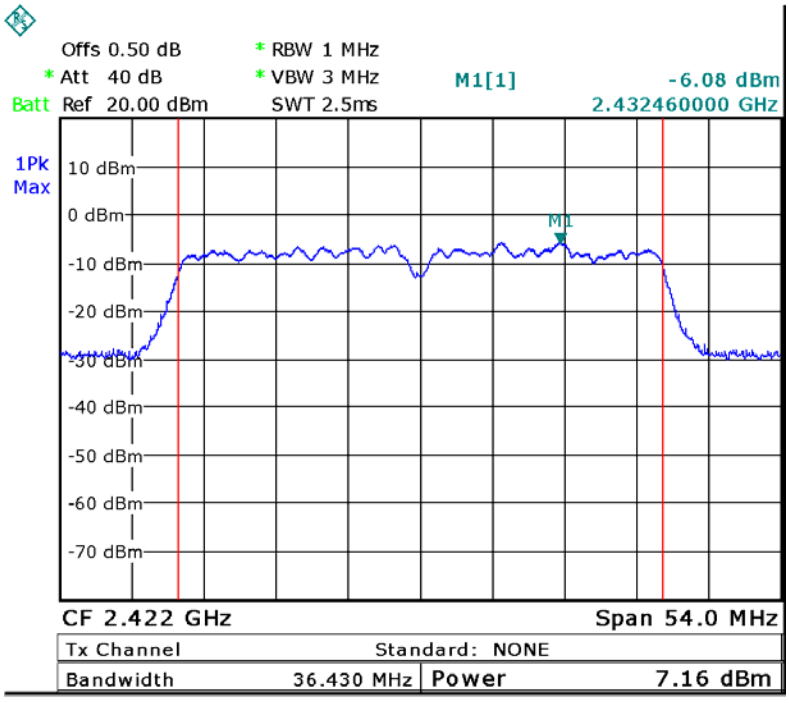


Date: 6.SEP.2013 09:48:05

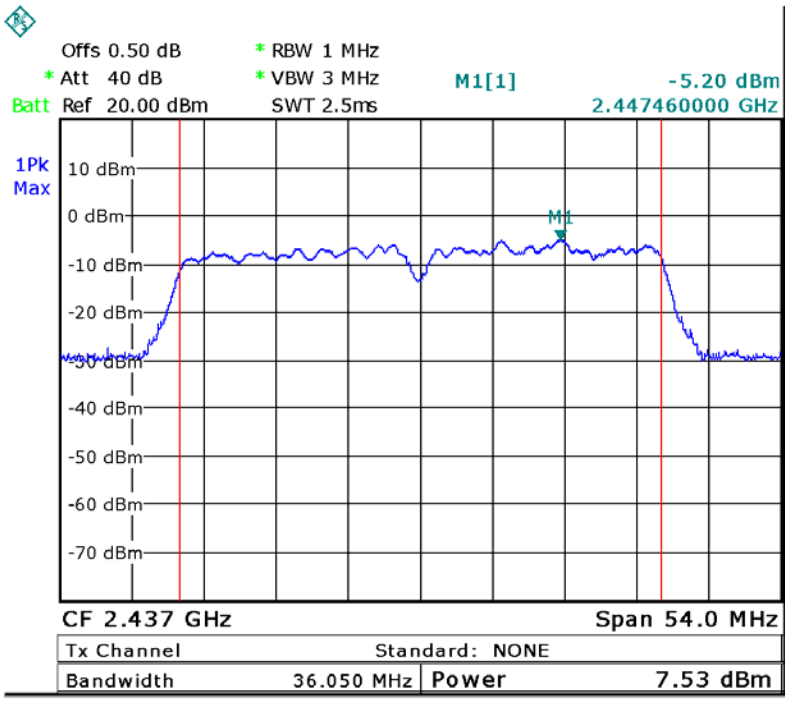


Date: 6.SEP.2013 09:50:39

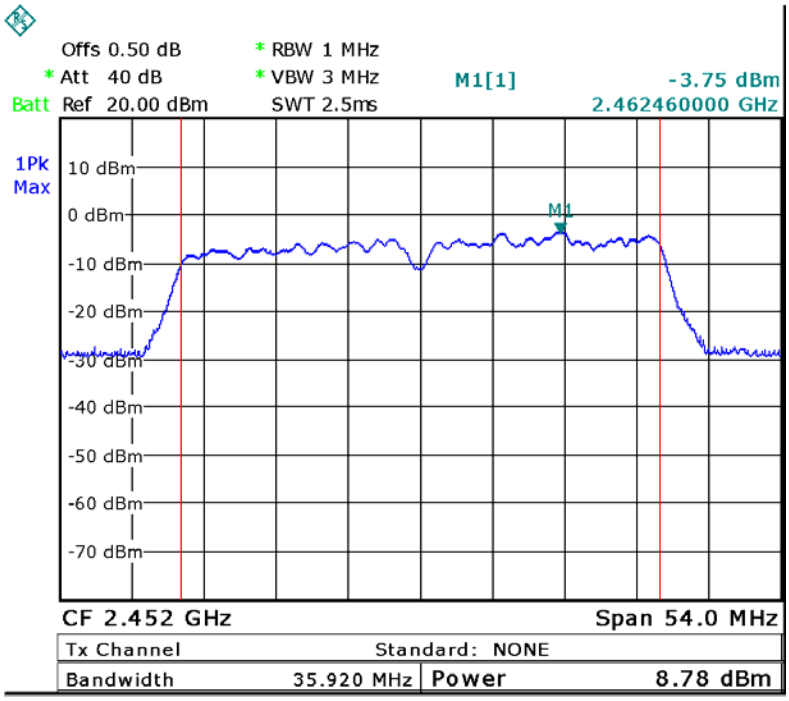
Test mode :TX 11n HT 40



Date: 5.SEP.2013 17:56:19



Date: 5.SEP.2013 17:54:21



Date: 5.SEP.2013 17:50:20

11 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01 V02 10/04/2012

11.1 Test Procedure:

KDB558074 D01 V02 10/04/2012 section 9.1 Option 1

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 = 1kHz. VBW = 3kHz , 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.

11.2 Test Result:

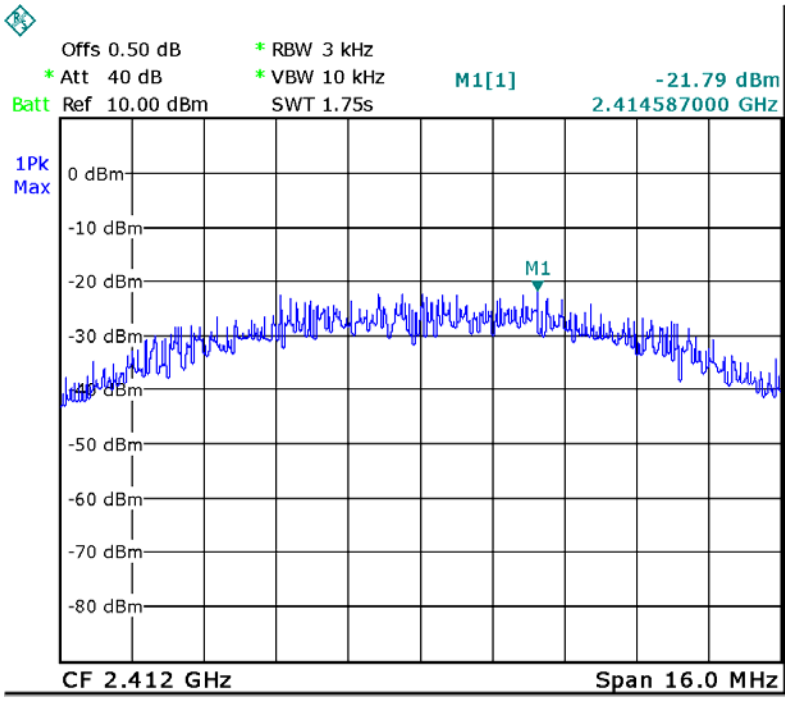
Test mode :TX 11b		
10 Maximum Peak Output Power (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-21.79	-19.22	-17.38
Limit		
8dBm per 3kHz		

Test mode :TX 11g		
10 Maximum Peak Output Power (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-23.68	-23.93	-22.11
Limit		
8dBm per 3kHz		

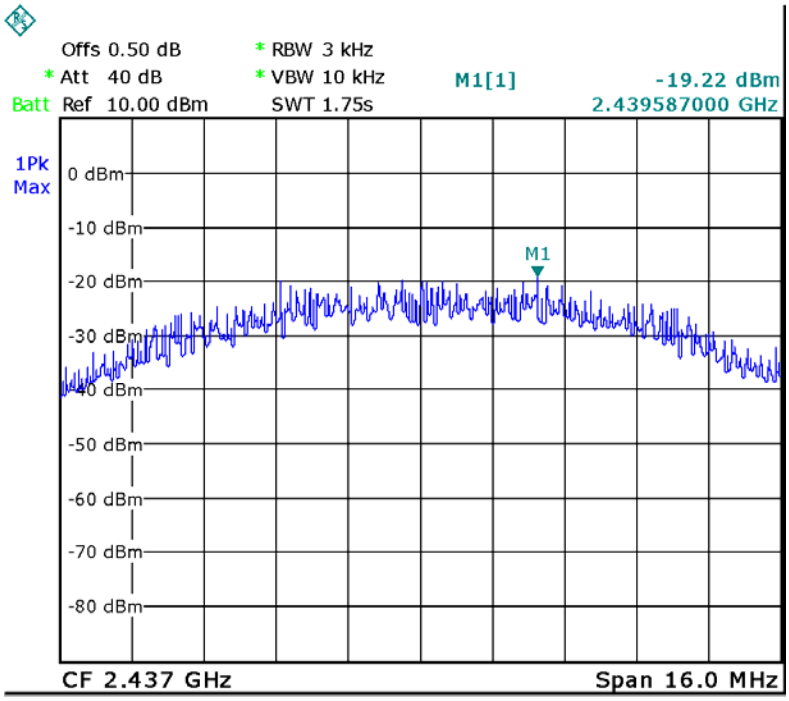
Test mode :TX 11n HT 20		
10 Maximum Peak Output Power (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-24.78	-23.30	-21.81
Limit		
8dBm per 3kHz		

Test mode :TX 11n HT 40		
10 Maximum Peak Output Power (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-20.06	-19.35	-19.95
Limit		
8dBm per 3kHz		

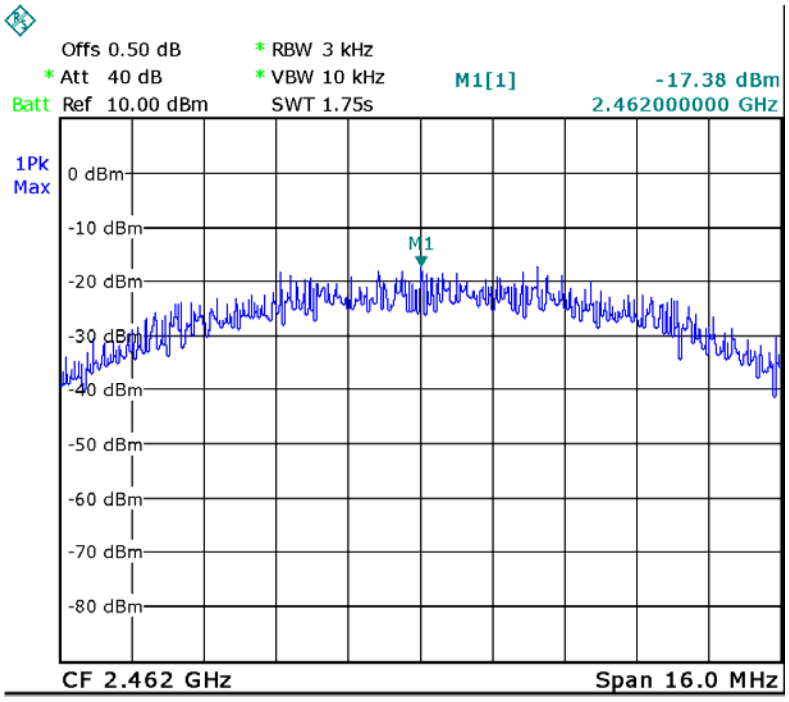
Test mode :TX 11b



Date: 6.SEP.2013 10:32:18

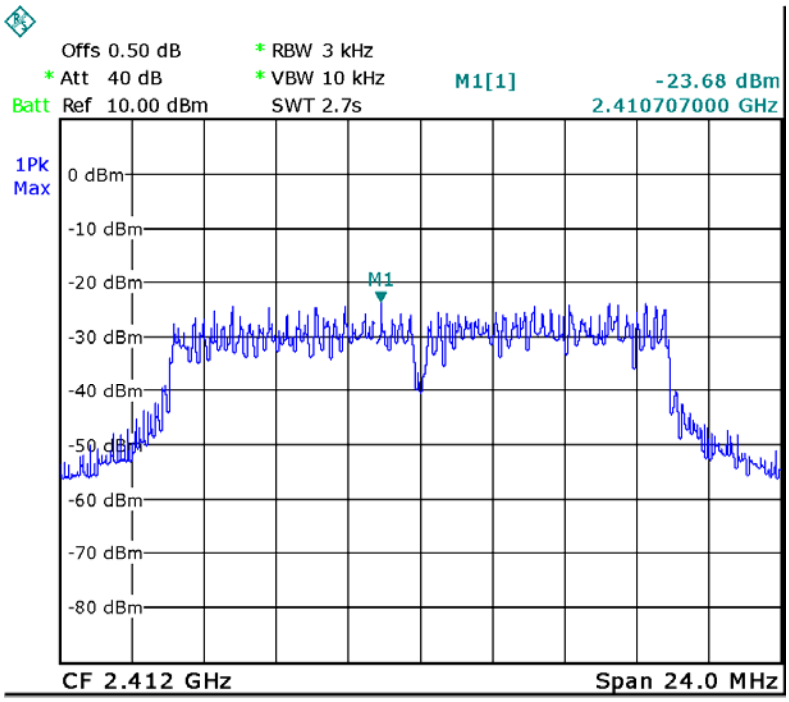


Date: 6.SEP.2013 10:54:07

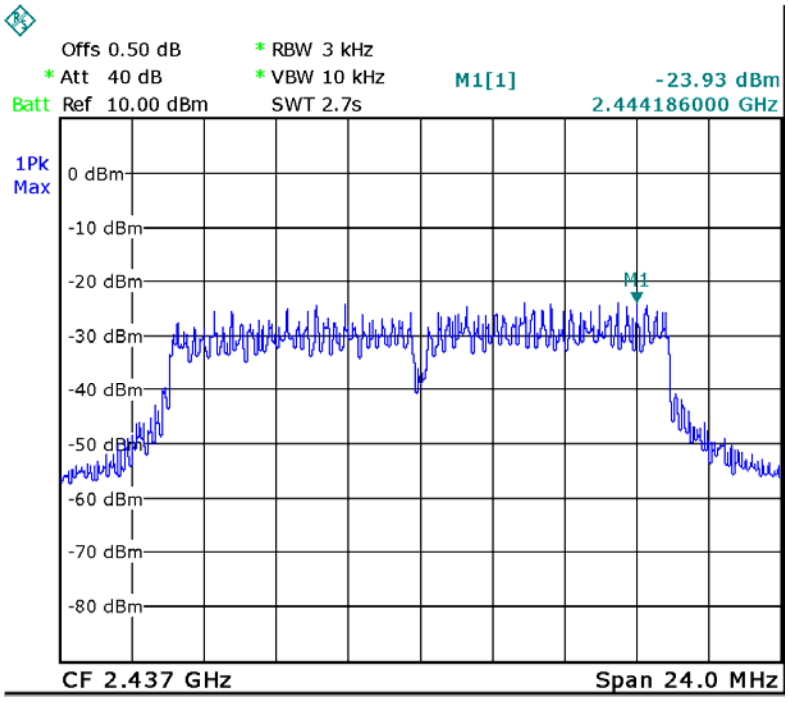


Date: 6.SEP.2013 11:03:22

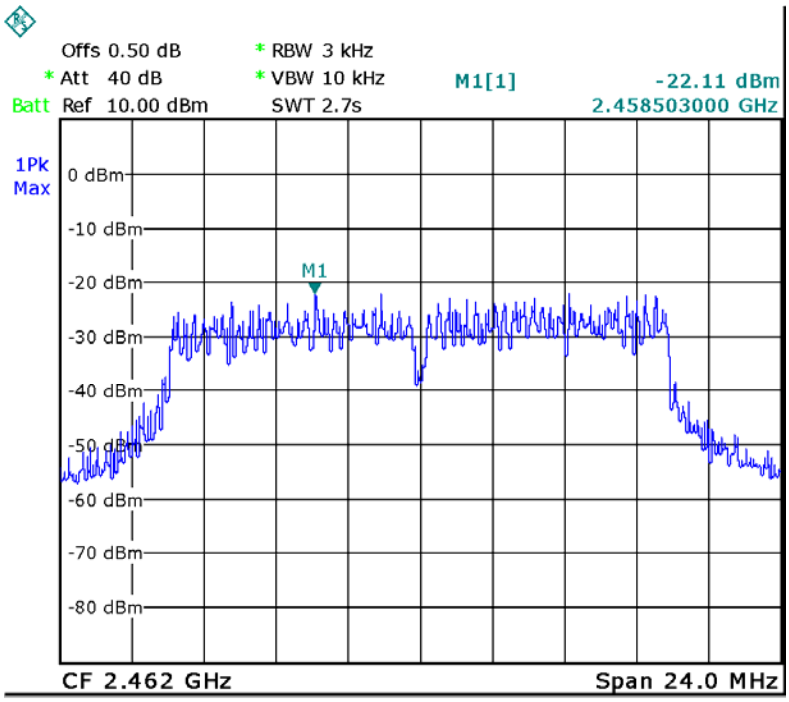
Test mode :TX 11g



Date: 6.SEP.2013 10:24:43

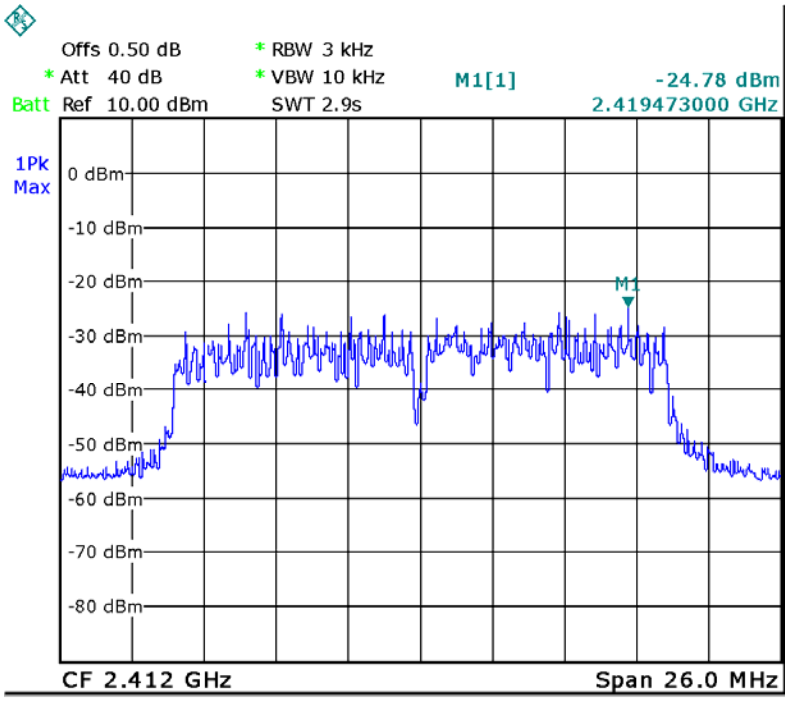


Date: 6.SEP.2013 10:27:56

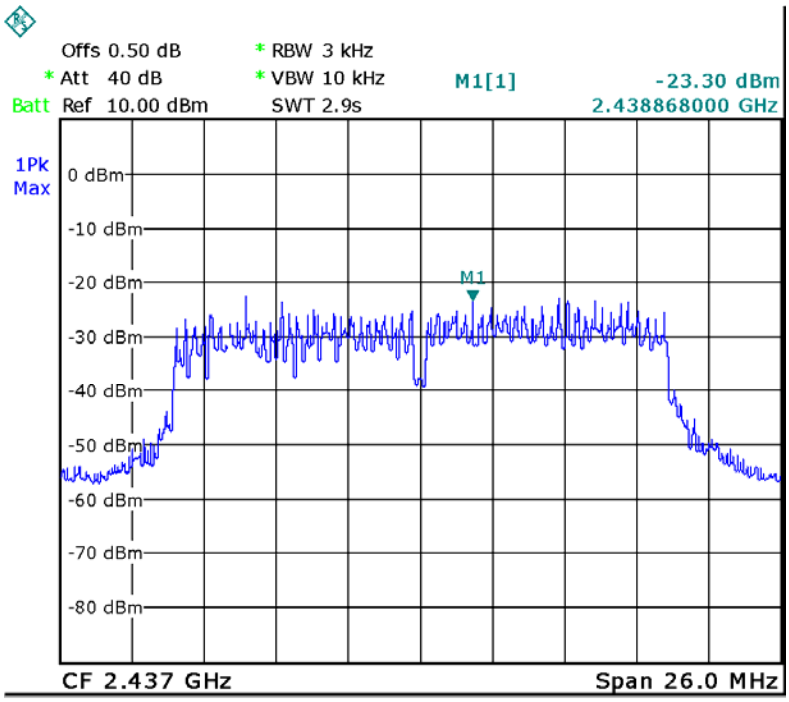


Date: 6.SEP.2013 10:29:57

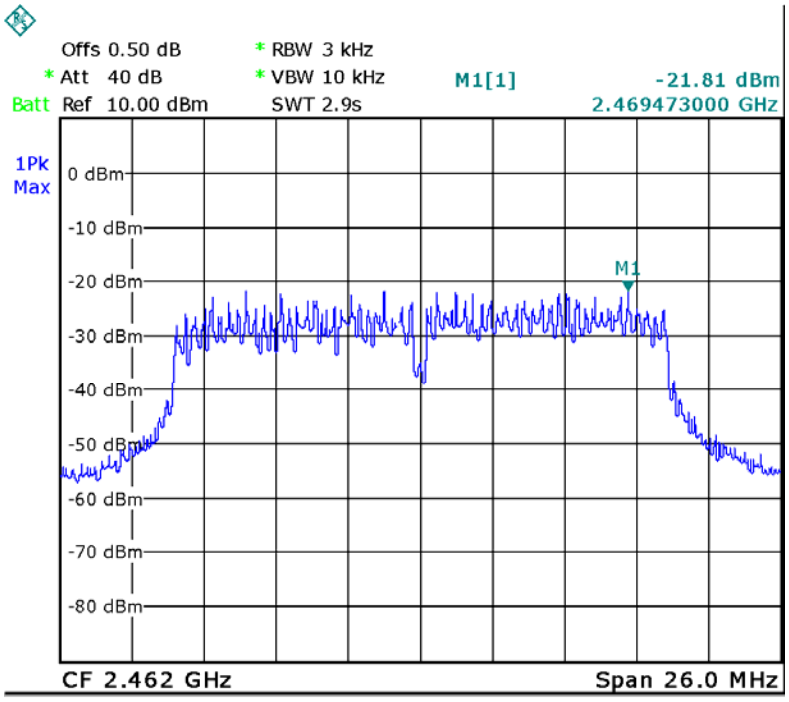
Test mode :TX 11n HT 20



Date: 6.SEP.2013 10:16:04

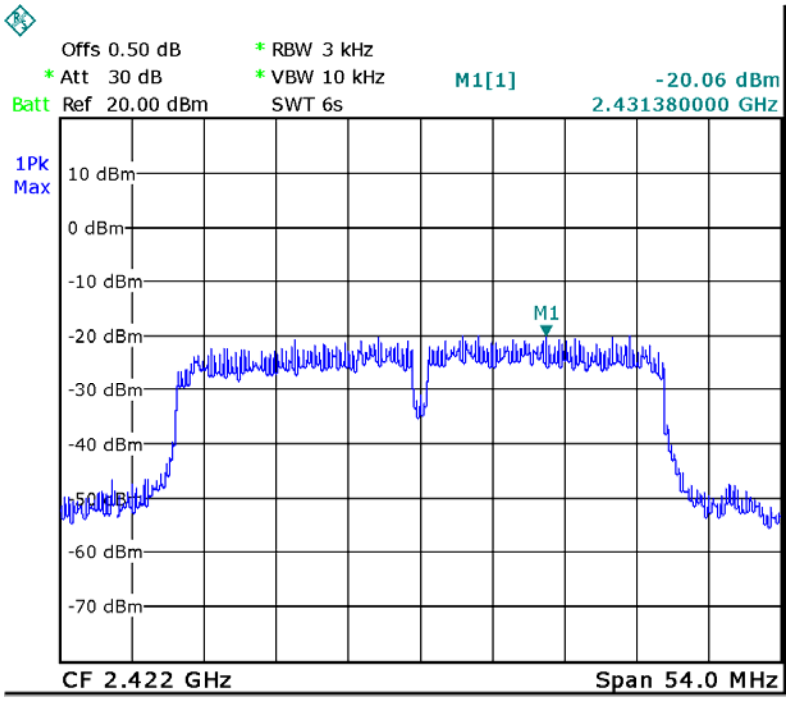


Date: 6.SEP.2013 10:09:51

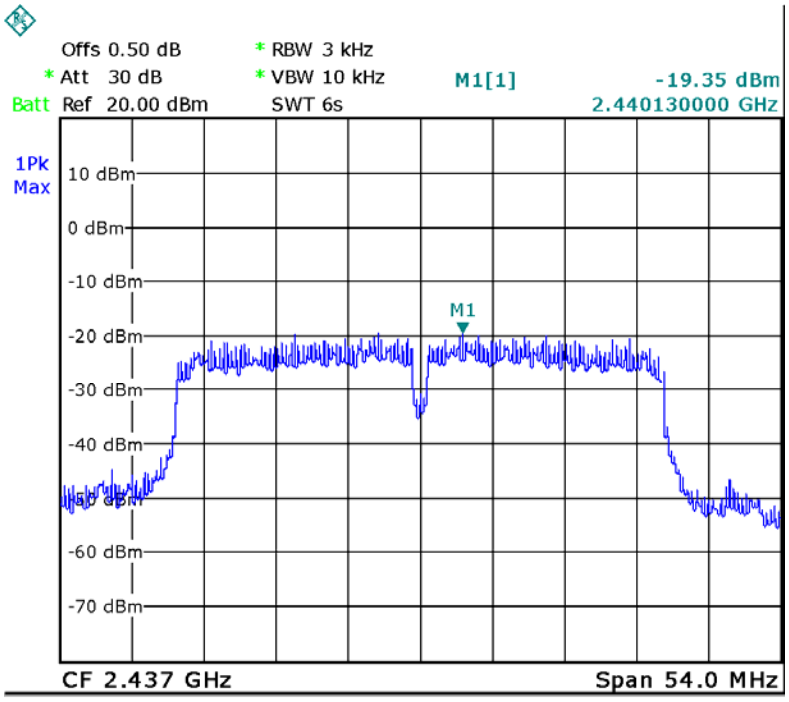


Date: 6.SEP.2013 09:57:53

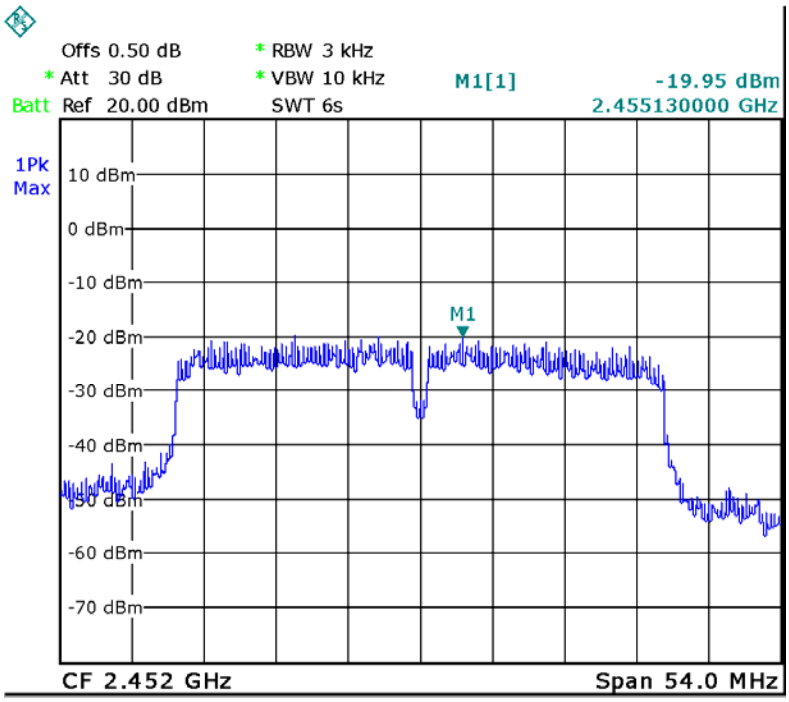
Test mode :TX 11n HT 40



Date: 26.SEP.2013 11:48:12



Date: 26.SEP.2013 11:46:36



Date: 26.SEP.2013 11:44:32

12 Emissions from out of band

Test Requirement:	FCC CFR47 Part 15 Section 15.247(d)
Test Method:	DA 00-705
Test Limit:	Emissions produced by the device outside the authorized frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the fundamental.
Test Mode:	Test in fixing operating frequency at lower, middle, upper channel.

12.1 Test Procedure:

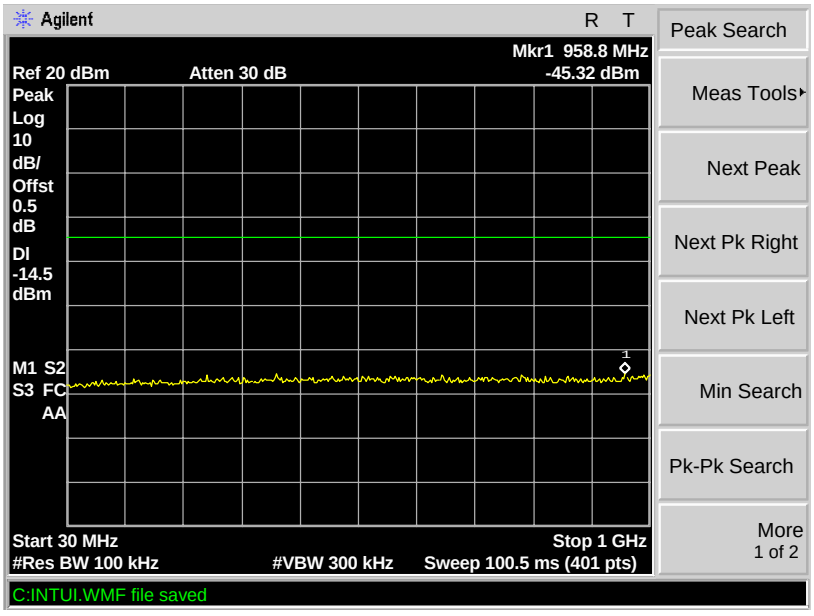
KDB558074 D01 V02 10/04/2012 section 10.1 clause1
The maximum peak conducted output power procedure was used to demonstrate compliance to 15.247(b)(3) requirements, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz. This measurement was performed over a frequency range that spans from the lowest frequency generated in the device up to and including the tenth harmonic of the highest fundamental frequency.

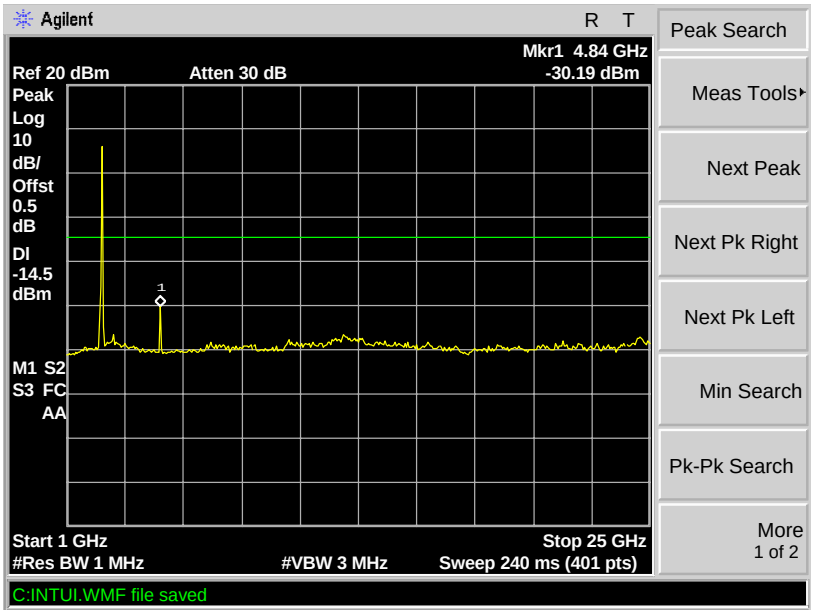
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set to span from the lowest frequency generated in the device up to and including the tenth harmonic of the highest fundamental frequency
3. For below 1GHz,Set RBW = 100kHz and VBW = 100kHz.Sweep =auto. For above1GHz,Set RBW = 100kHz and VBW = 100kHz.Sweep =auto.
4. mark the worst point and record.

12.2 Test Result:

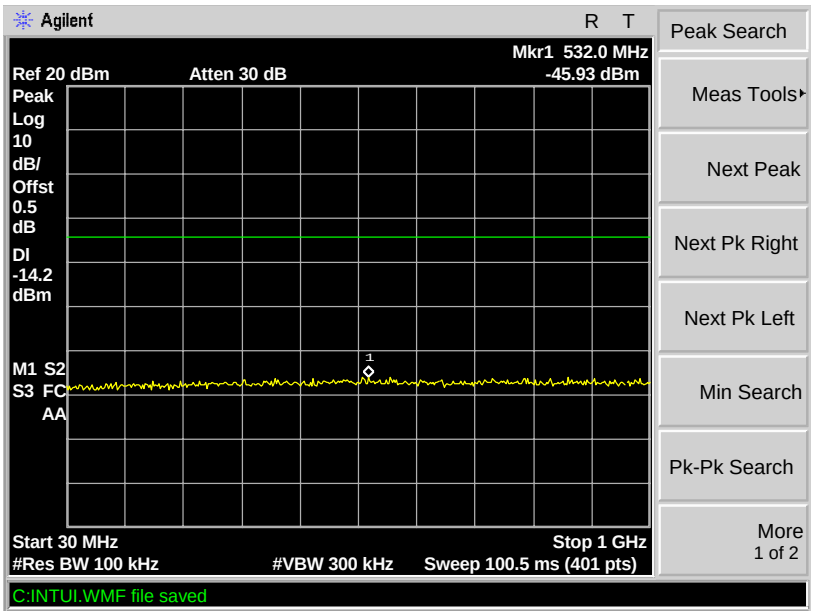
Remark:For emissions below 30MHz,no emission higher than background level,so the data does not show in the report.

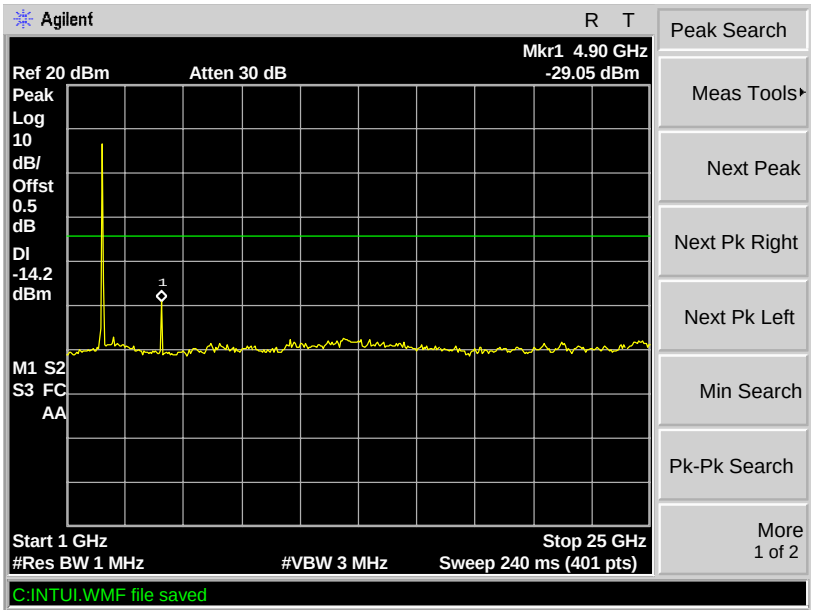
Test mode :TX 11b Lower channel



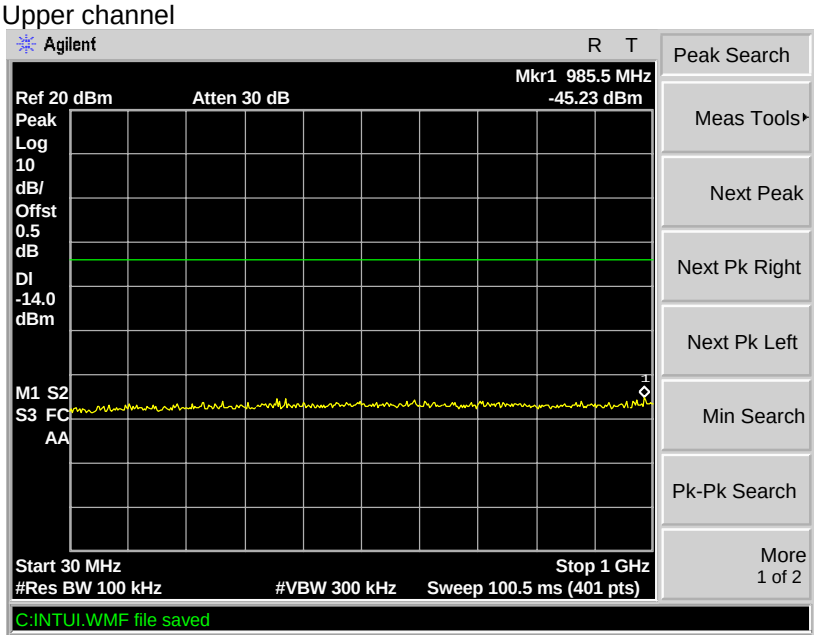


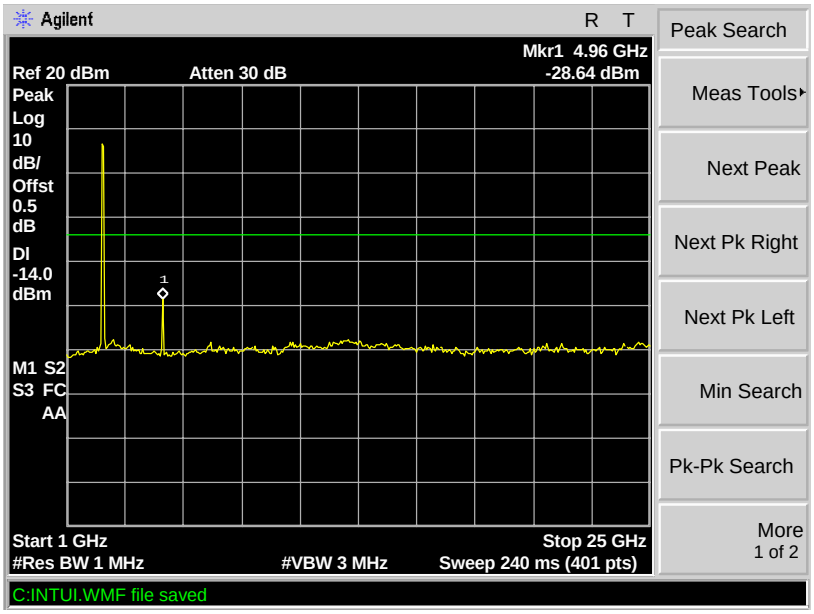
Test mode :TX 11b Middle channel



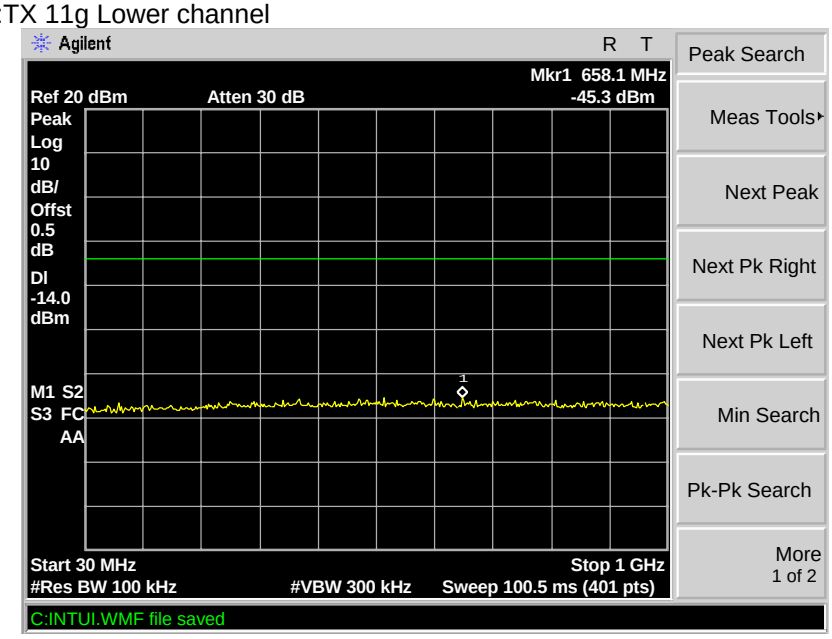


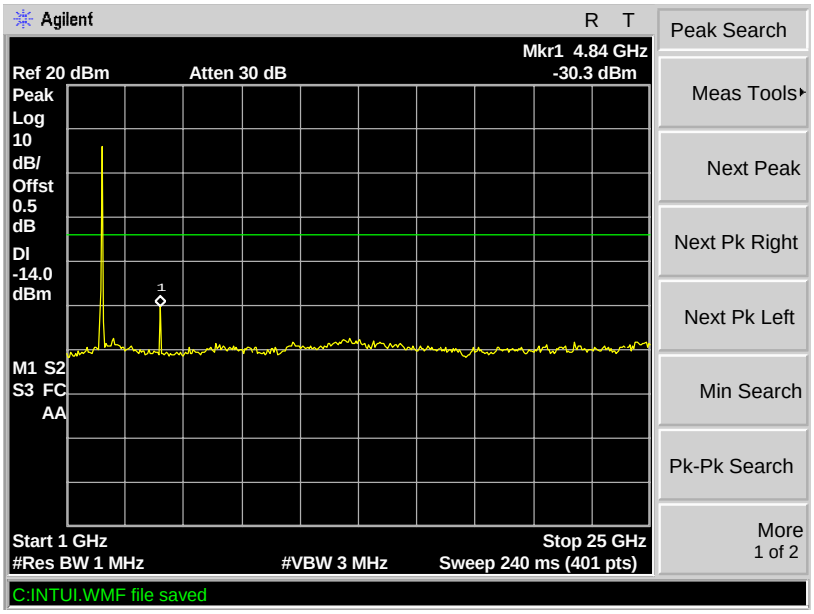
Test mode :TX 11b Upper channel



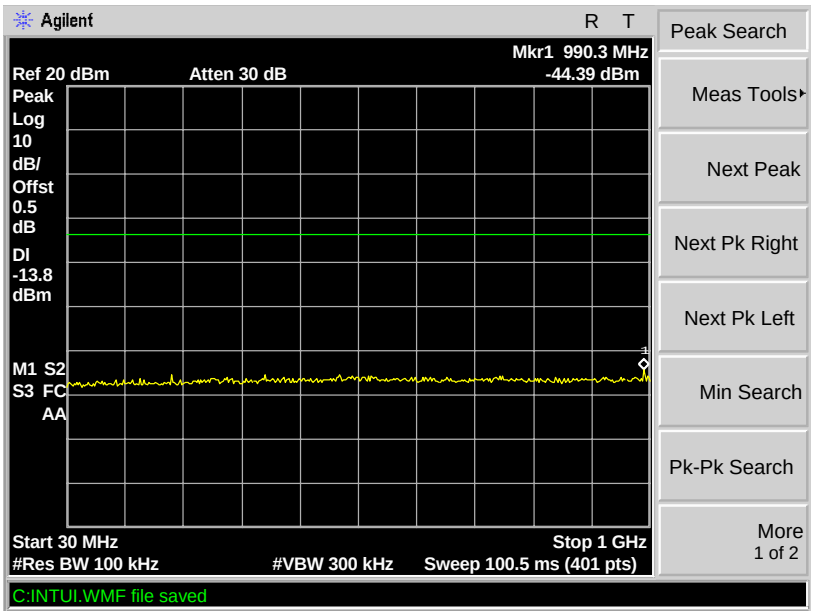


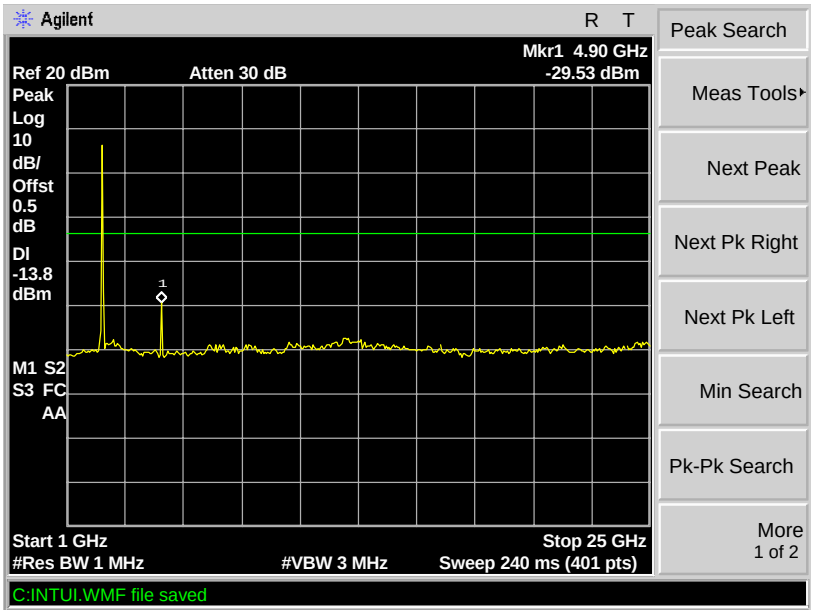
Test mode :TX 11g Lower channel



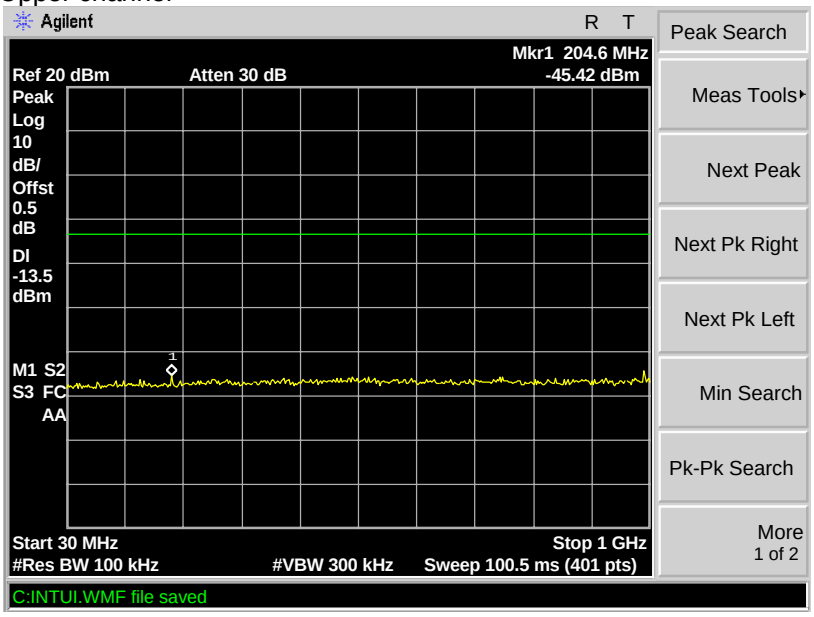


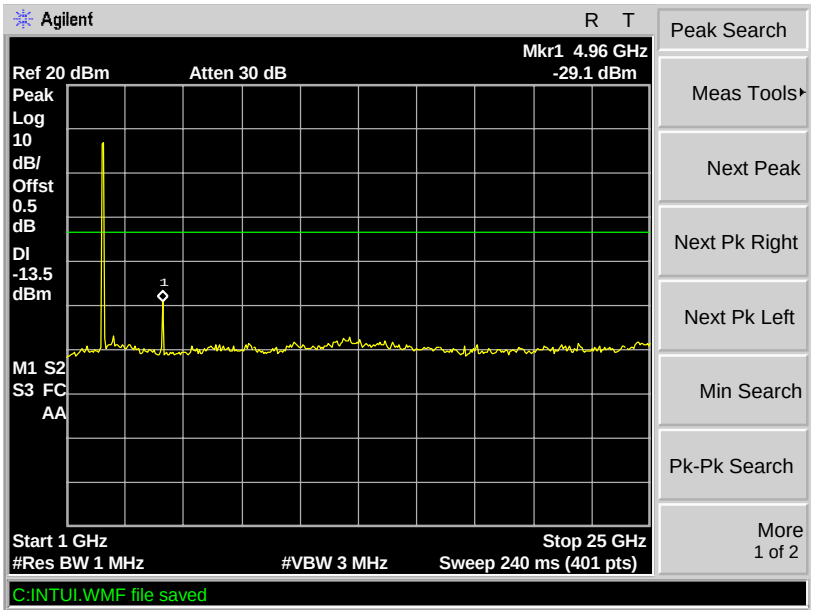
Test mode :TX 11g Middle channel



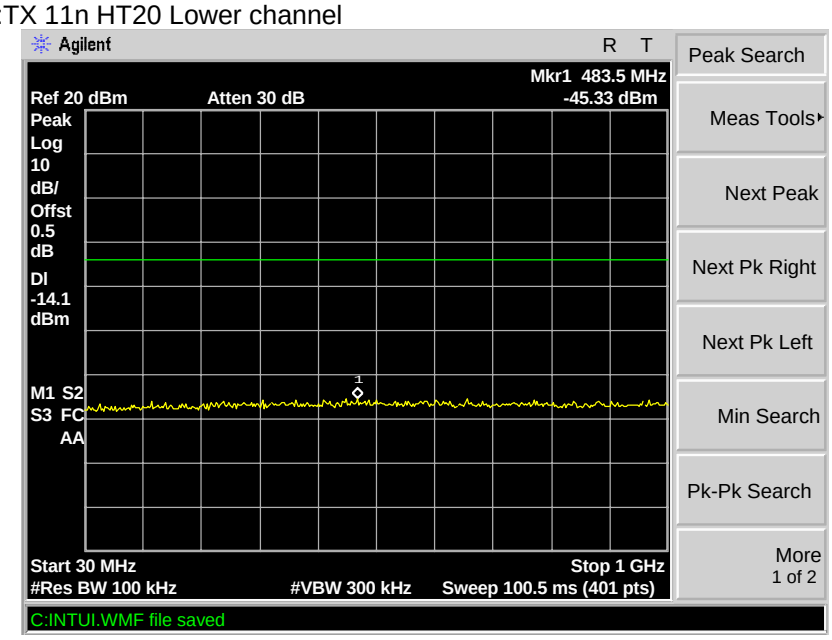


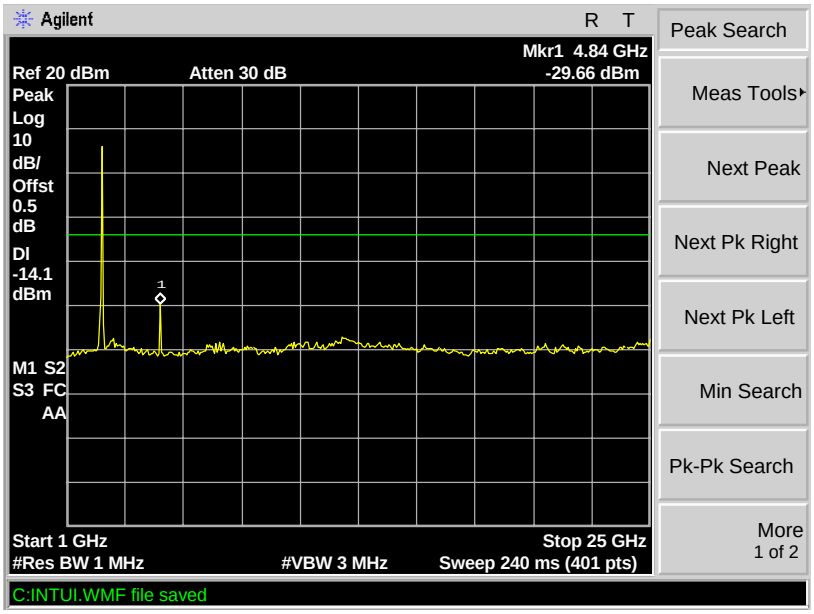
Test mode :TX 11g Upper channel



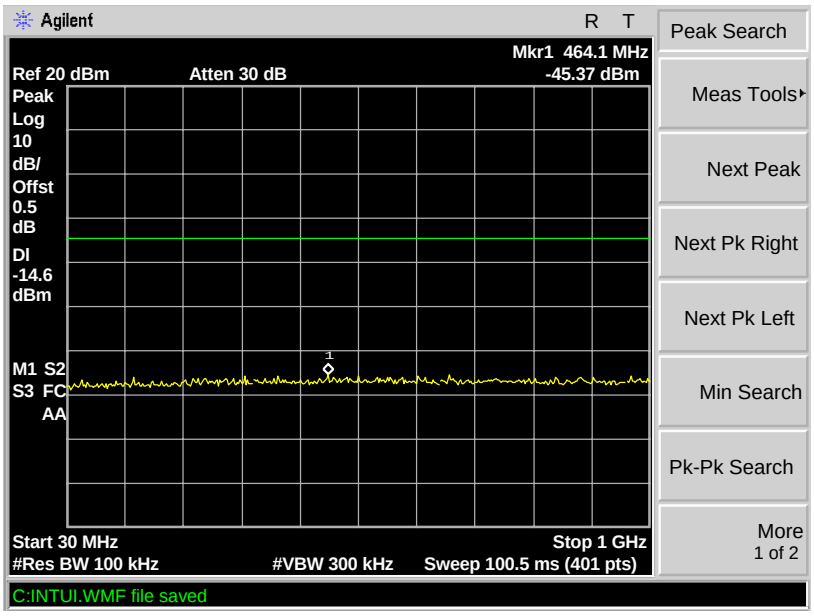


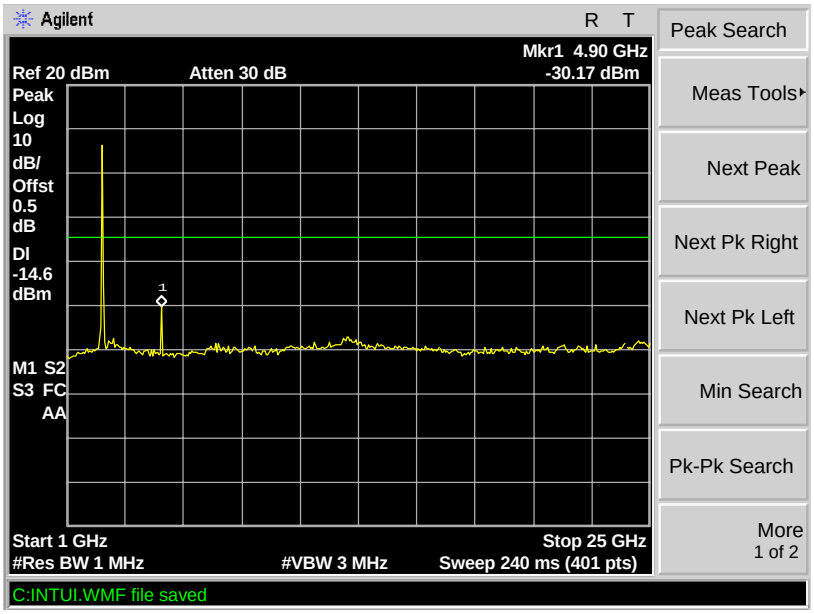
Test mode :TX 11n HT20 Lower channel



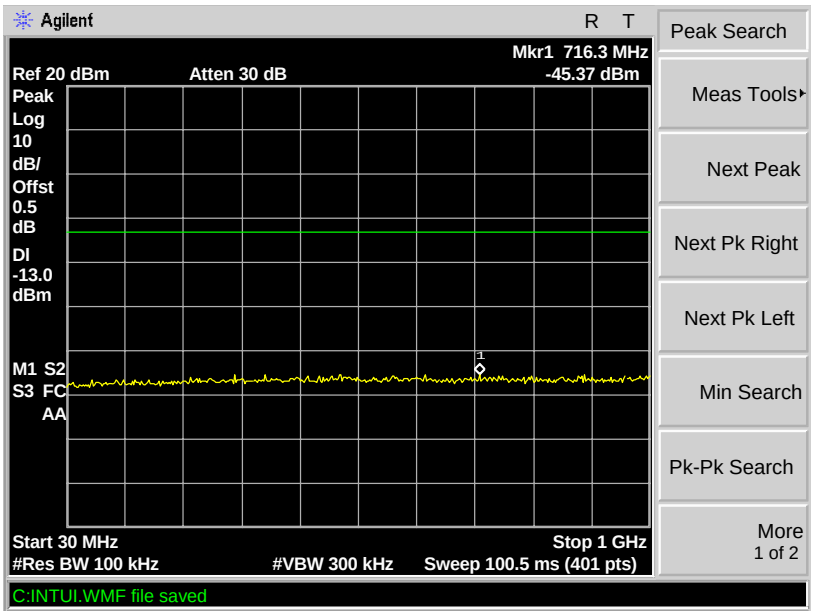


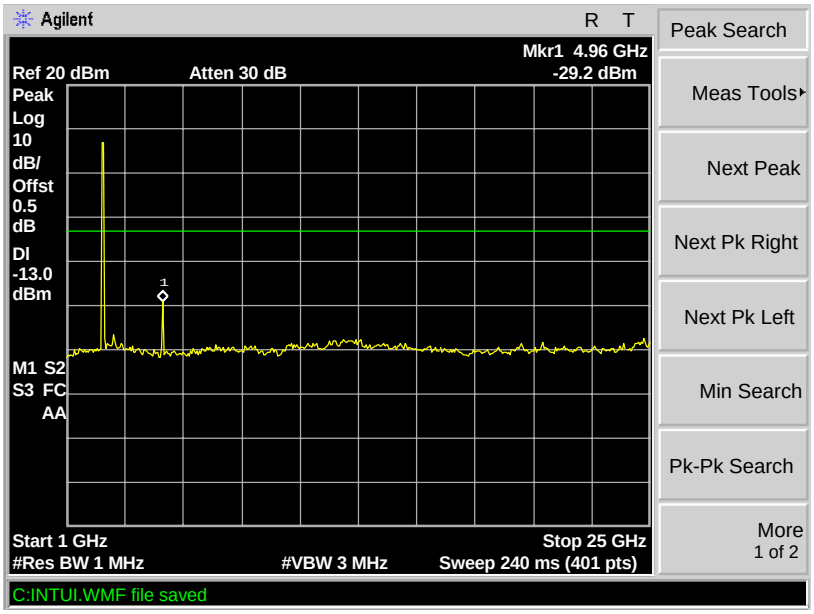
Test mode :TX 11n HT20 Middle channel



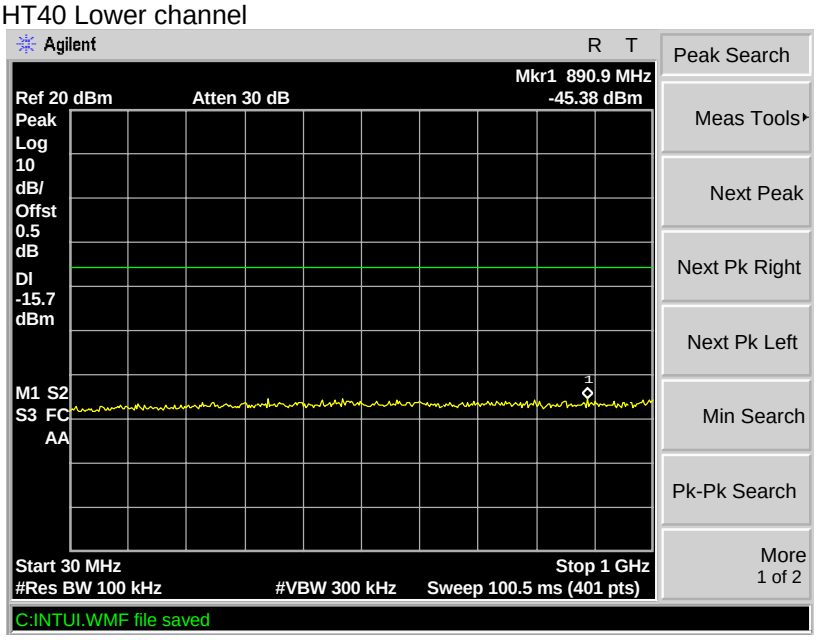


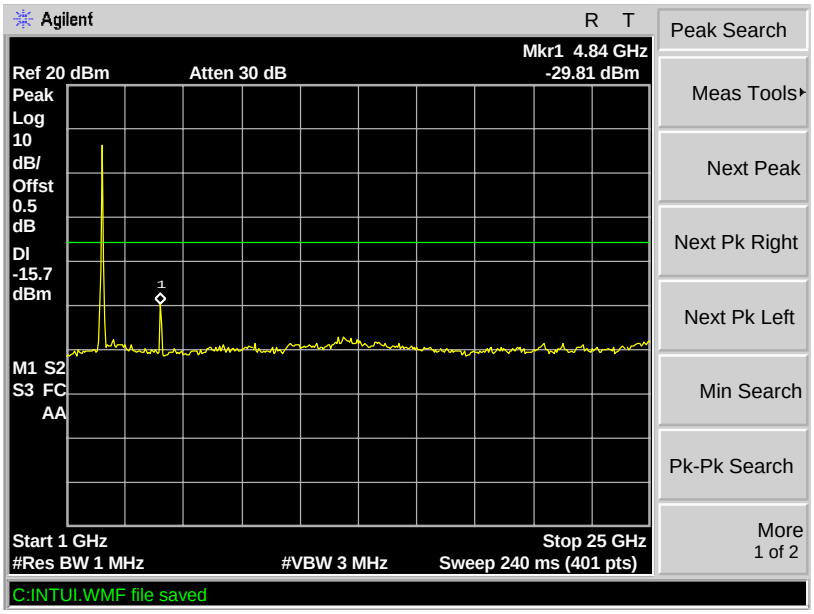
Test mode :TX 11n HT20 Upper channel



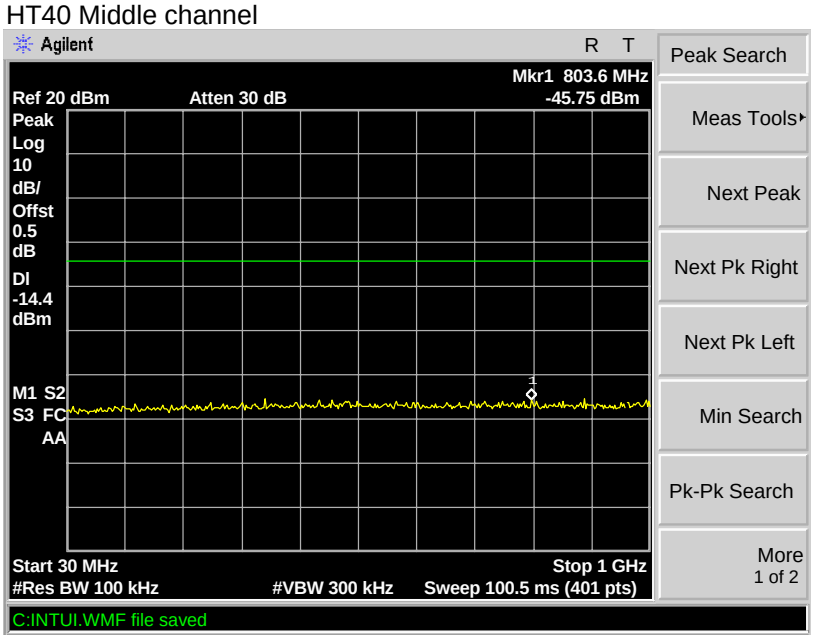


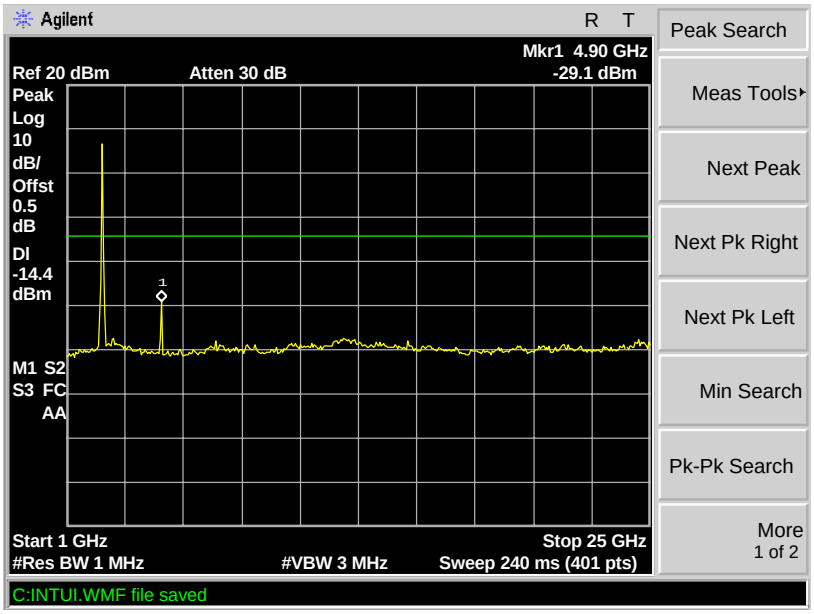
Test mode :TX 11n HT40 Lower channel



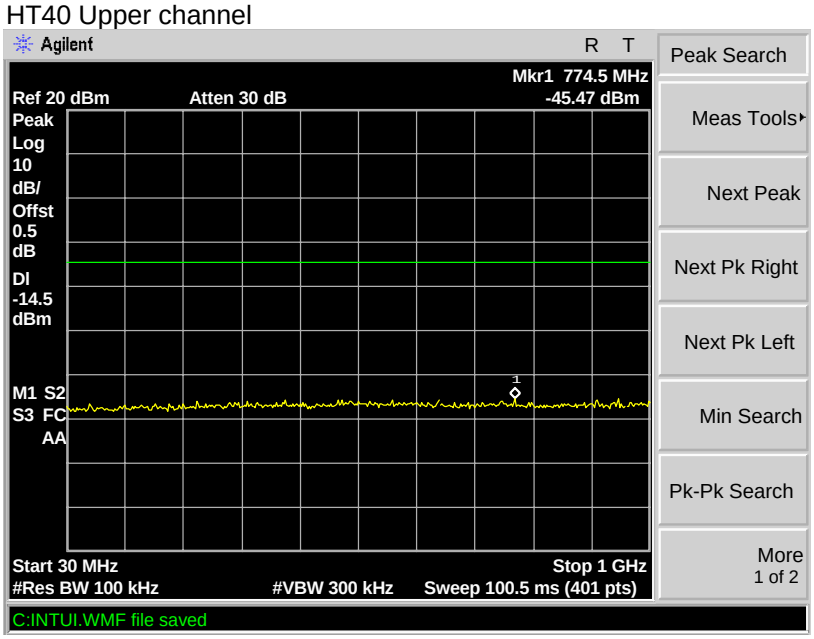


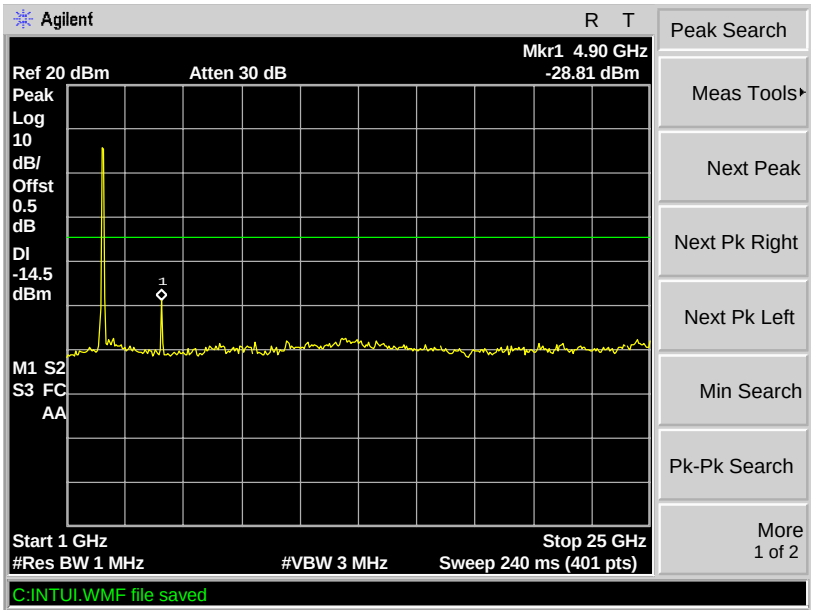
Test mode : TX 11n HT40 Middle channel





Test mode : TX 11n HT40 Upper channel




Agilent
R T
Mkr1 4.90 GHz
-28.81 dBm
Ref 20 dBm
Atten 30 dB
Peak
Log
10
dB/
Offst
0.5
dB
Dl
-14.5
dBm
M1 S2
S3 FC
AA
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 25 GHz
Sweep 240 ms (401 pts)
C:INTUI.WMF file saved
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

13 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 internal antenna, fulfill the requirement of this section.

14 RF Exposure

Test Requirement: **FCC Part 1.1307**

Test Mode: **The EUT work in test mode(Tx).**

14.1 Requiments:

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

14.2 The procedures / limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

14.3 MPE Calculation Method

$$\text{E (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)
P = Peak RF output power (W)
G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)
The formula can be changed to

$$\boldsymbol{Pd} = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

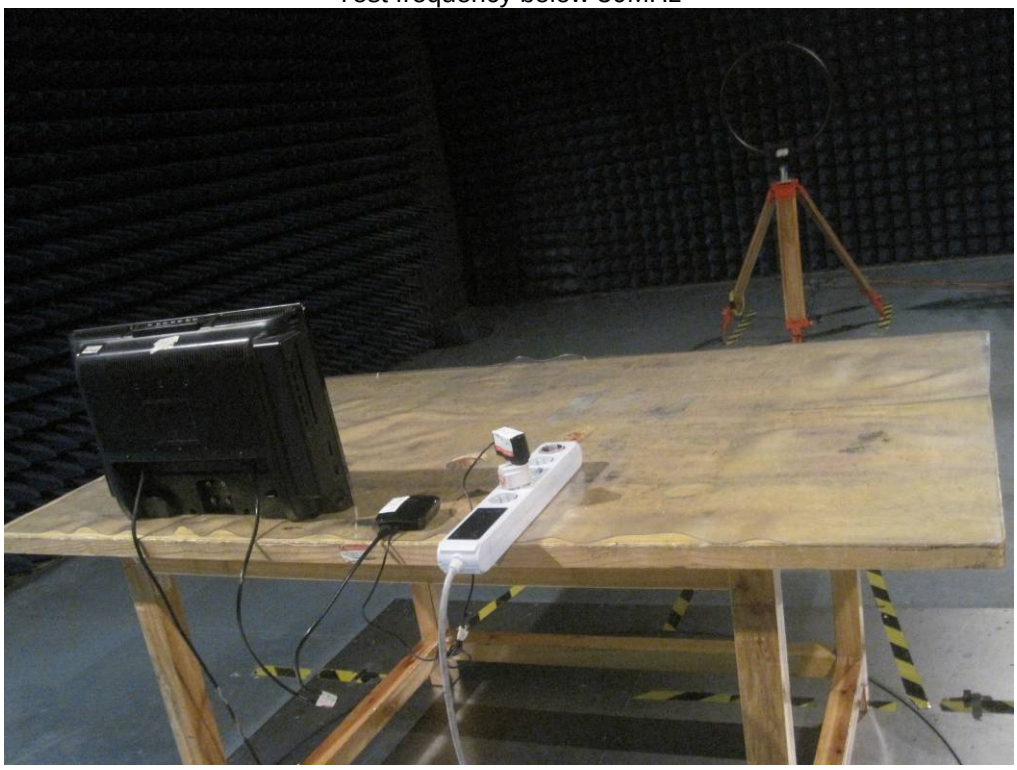
Operation Mode	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)
802.11b	1	11.54	14.25607594	0.002836089	1
802.11g	1	12.71	18.66379691	0.003712957	1
802.11n HT 20	1	11.42	13.86755829	0.002758798	1
802.11n HT 40	1	8.78	7.550922277	0.001502173	1

15 Photographs – Test Setup

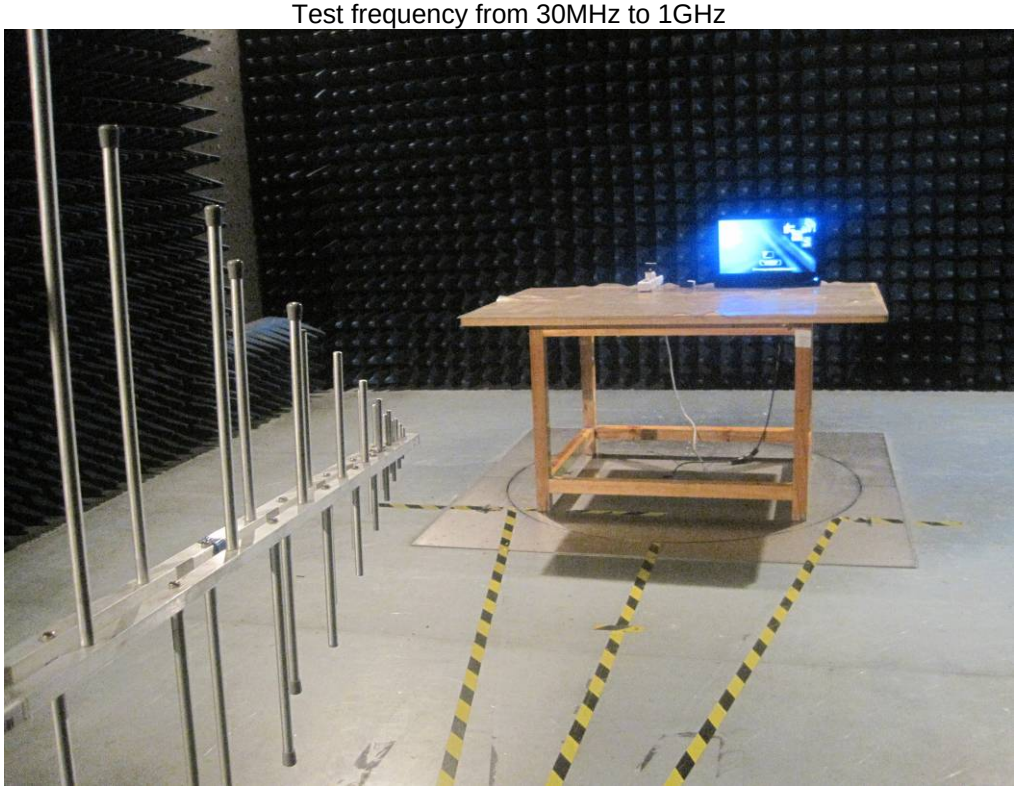
15.1 Conducted Emission

15.2 Radiated Emission

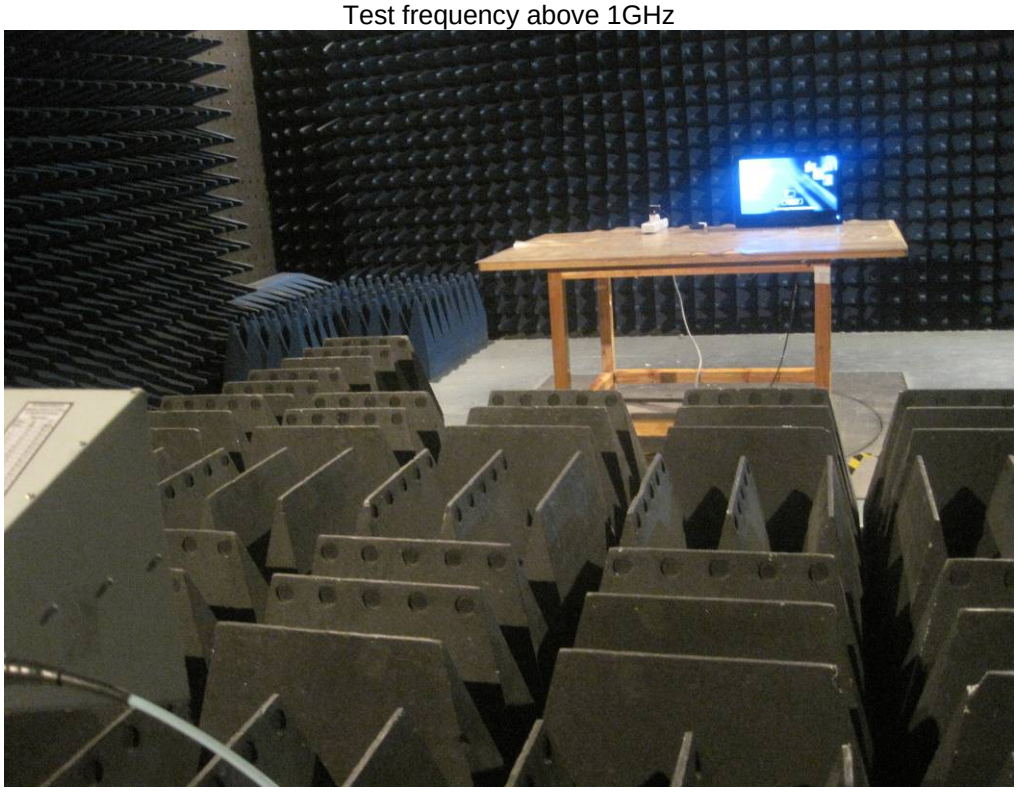
Test frequency below 30MHz



Test frequency from 30MHz to 1GHz



Test frequency above 1GHz

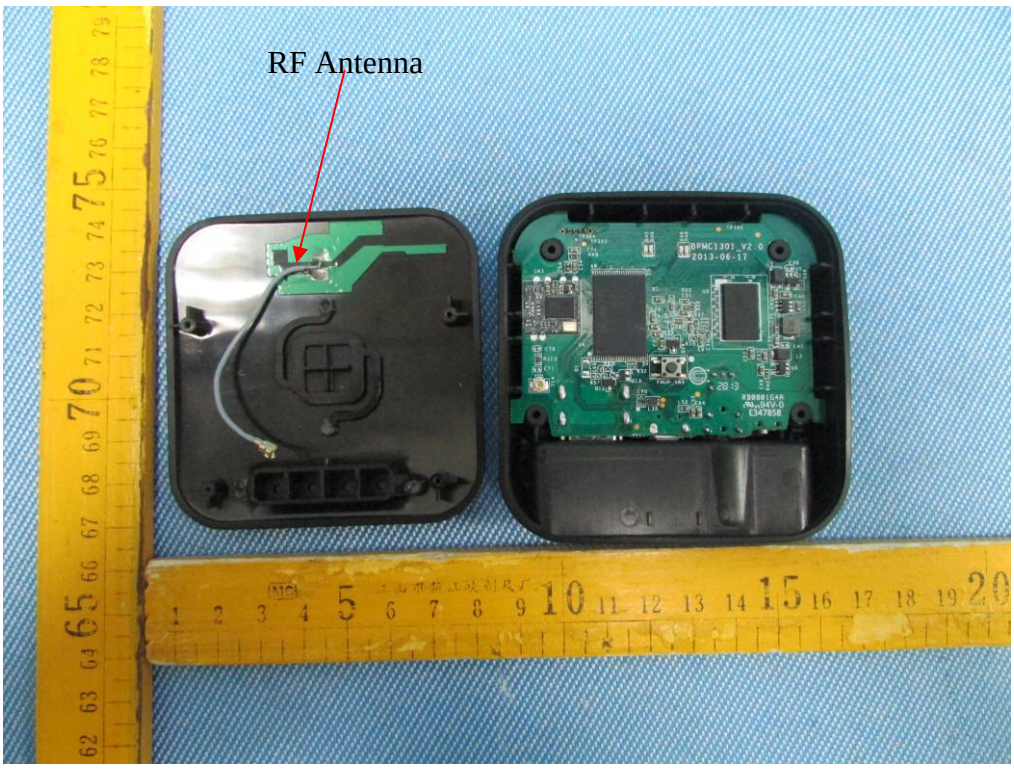


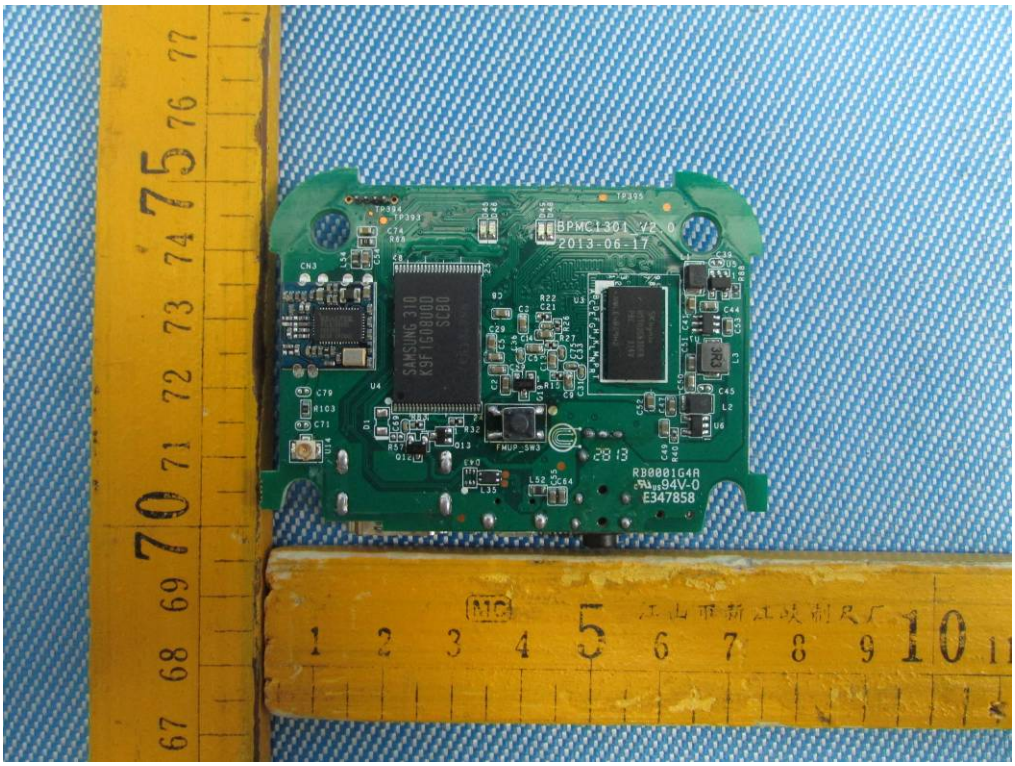
16 Photographs - Constructional Details

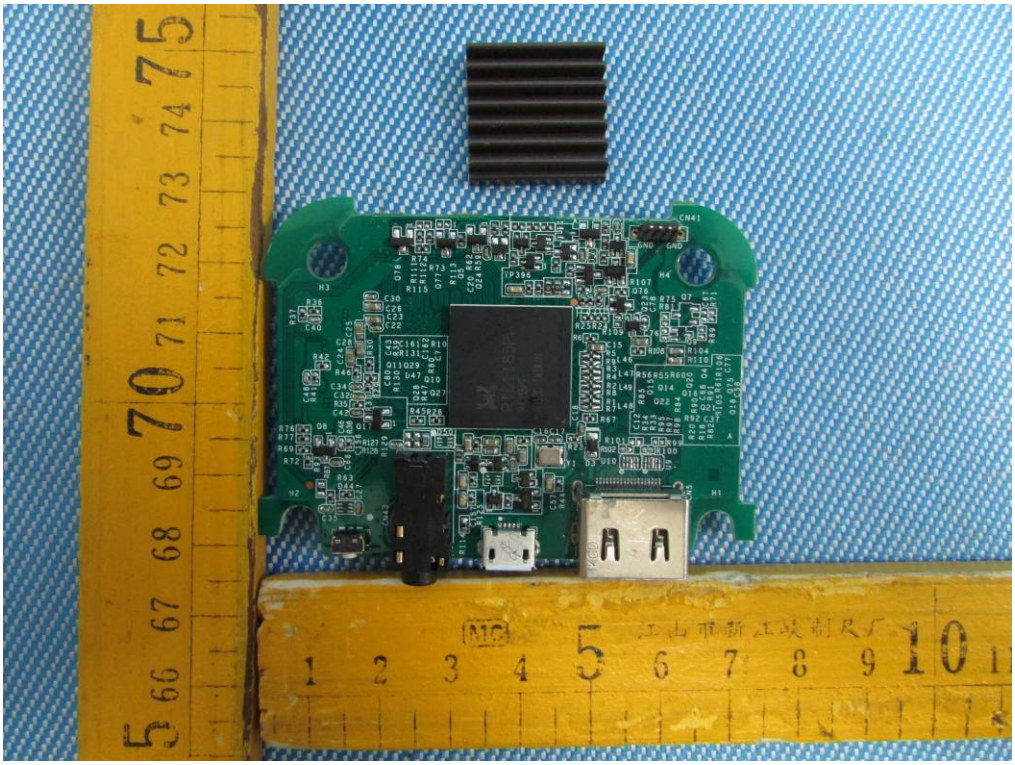
16.1 EUT – External View

16.2 EUT – Adapter View

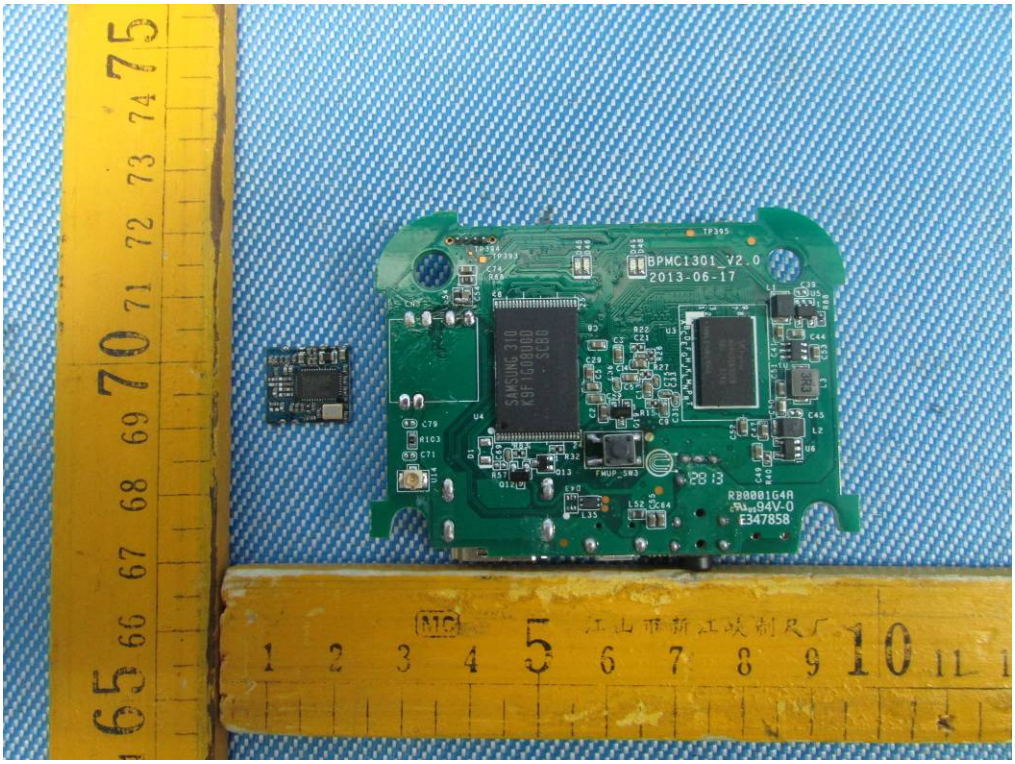
16.3 EUT – Internal View

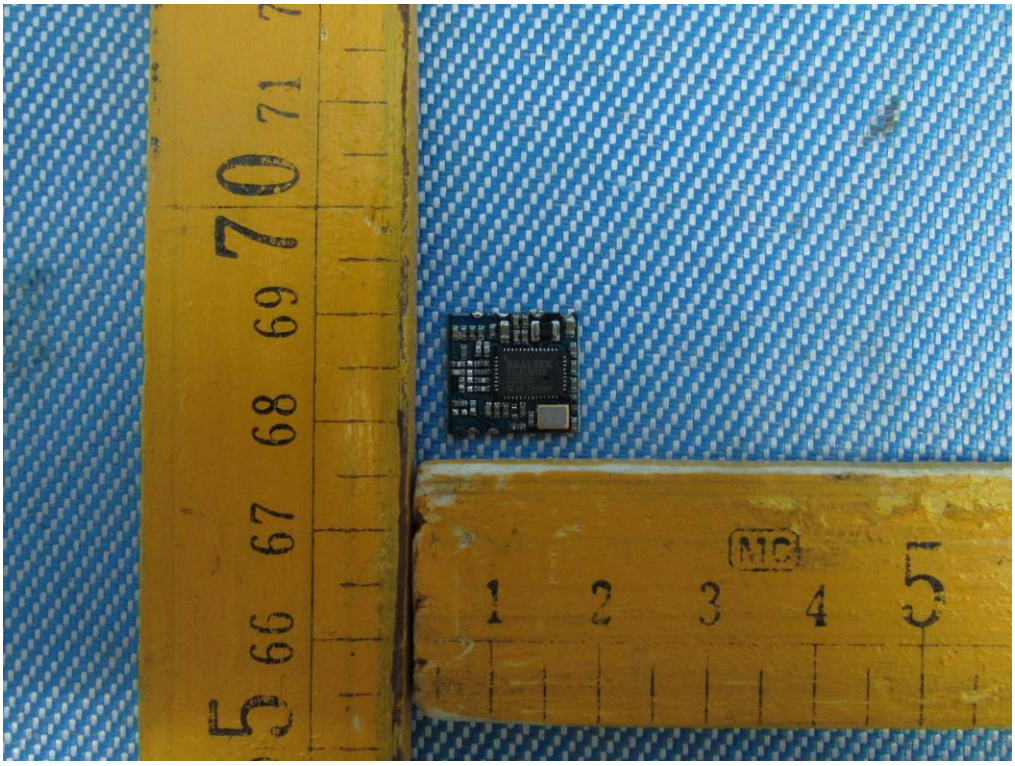


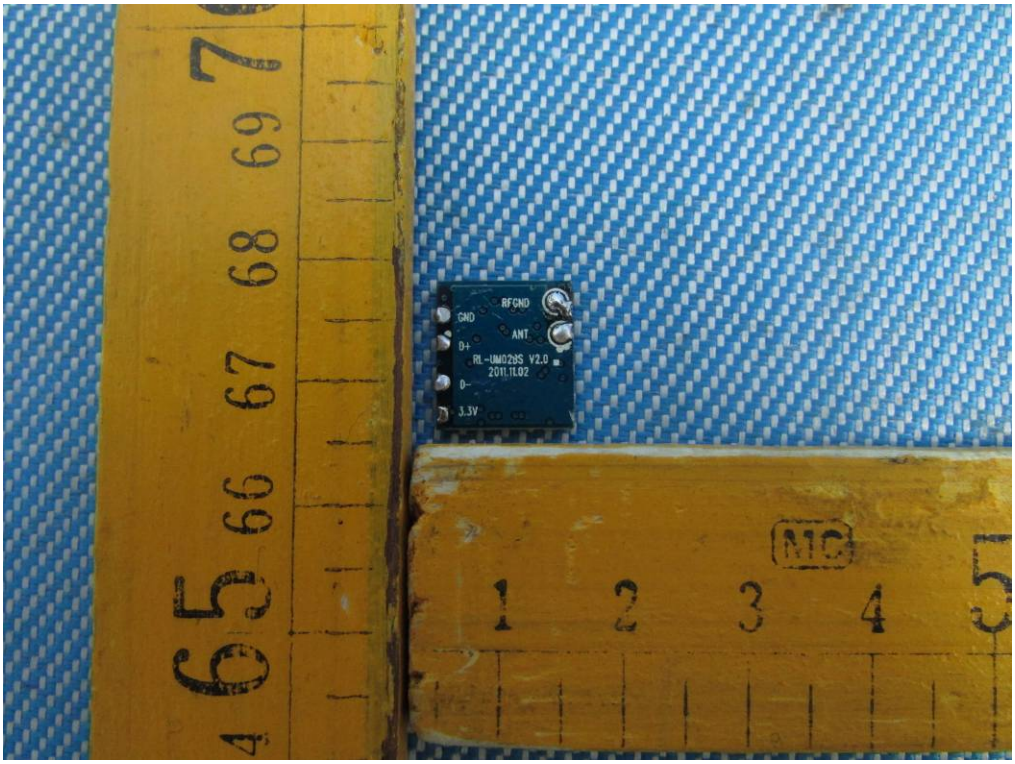




16.4 EUT – RF Module View







==End of test report==