



TEST REPORT

Reference No. : WTS13S1210528E
FCC ID : OGXA71A
Applicant : Guangzhou Shiyuan Electronics Co., Ltd.
Address : No.192,Kezhu Road,Science Park,Guangzhou,Guangdong,China
Manufacturer : the same as above
Address : the same as above
Product Name : Android Box
Model No. : A71A
Standards : FCC CFR47 Part 15 C Section 15.247:2012
Date of Receive sample : January 01,2014
Date of Test : January 02~13,2014
Date of Issue : January 14,2014
Test Result : **Pass ***

***Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.
The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China

Testing location: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China

Tel :+86-755-83551033

Fax:+86-755-83552400

Compiled by:

Zero Zhou / Project Engineer

Approved by:

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

WALTEK



3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY.....	2
3 CONTENTS.....	3
4 GENERAL INFORMATION	5
4.1 GENERAL DESCRIPTION OF E.U.T.....	5
4.2 DETAILS OF E.U.T.....	5
4.3 DESCRIPTION OF SUPPORT UNITS.....	6
4.4 TEST FACILITY	7
4.5 TEST LOCATION.....	7
5 EQUIPMENT USED DURING TEST.....	8
5.1 EQUIPMENTS LIST	8
5.2 MEASUREMENT UNCERTAINTY.....	8
5.3 TEST EQUIPMENT CALIBRATION	8
6 CONDUCTED EMISSION.....	9
6.1 E.U.T. OPERATION.....	9
6.2 EUT SETUP	9
6.3 CONDUCTED EMISSION TEST RESULT.....	10
7 RADIATED EMISSIONS.....	12
7.1 EUT OPERATION :	12
7.2 TEST SETUP	13
7.3 SPECTRUM ANALYZER SETUP	14
7.4 TEST PROCEDURE.....	15
7.5 CORRECTED AMPLITUDE & MARGIN CALCULATION	15
7.6 SUMMARY OF TEST RESULTS	16
8 BAND EDGE MEASUREMENT	28
8.1 TEST PRODUCE	28
8.2 TEST RESULT	29
9 6 DB BANDWIDTH MEASUREMENT.....	45
9.1 TEST PROCEDURE:.....	45
9.2 TEST RESULT:	45
10 MAXIMUM PEAK OUTPUT POWER	52
10.1 TEST PROCEDURE:	52
10.2 TEST RESULT:.....	52
11 POWER SPECTRAL DENSITY	59
11.1 TEST PROCEDURE:	59
11.2 TEST RESULT:.....	59
12 EMISSIONS FROM OUT OF BAND.....	66
12.1 TEST PROCEDURE:	66
12.2 TEST RESULT:.....	66
13 EMISSIONS FROM THE RESTRICTED BANDS.....	79
13.1 TEST PROCEDURE:	79
13.2 TEST RESULT:.....	79
14 ANTENNA REQUIREMENT.....	88
15 RF EXPOSURE	89



15.1	REQUIEMTS:	89
15.2	THE PROCEDURES / LIMIT	89
15.3	MPE CALCULATION METHOD.....	90
16	PHOTOGRAPHS – TEST SETUP	91
16.1	CONDUCTED EMISSION	91
16.2	RADIATED EMISSION.....	92
17	PHOTOGRAPHS - CONSTRUCTIONAL DETAILS.....	94
17.1	EUT – EXTERNAL VIEW	94
17.2	EUT- INTERNAL VIEW.....	97
17.3	EUT- RF MODULE	100



WALTEK



4 General Information

4.1 General Description of E.U.T.

Product Name	: Android Box
Model No.	: A71A
Model Difference	: N/A
Operation Frequency	: 2412MHz ~ 2462MHz
Oscillator	: Crystal 32.768KHz/24MHz for CPU,40MHz for RF module
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	: DC12V, 1.5A powered from adapter (INPUT:100-240V~50/60Hz 500mA)
Adapter	: FLYPOWER Model:PS18K1201500UE

WALTEK



4.3 Description of Support Units

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	72 Mbps	1/6/11	TX
	802.11n HT40	150 Mbps	3/7/9	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	3/7/9	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	3/7/9	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	3/7/9	TX
Receiver Spurious Emissions	802.11b	11 Mbps	1/6/11	RX
	802.11g	54 Mbps	1/6/11	RX
	802.11n HT20	72 Mbps	1/6/11	RX
	802.11n HT40	150 Mbps	3/7/9	RX

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 Meod
Radiation Emission, 30MHz ~ 1GHz	Normal link
Conduction Emission, 0.15MHz to 30MHz	Normal link



4.4 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, 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.

4.5 Test Location

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



WALTEK



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	101178	Aug. 13,2013	Aug. 13,2014
2.	LISN	R&S	ENV216	101215	Aug. 13,2013	Aug. 13,2014
3.	Cable	HUBER+SUHNER	CBL2-NN-3M	2230300	Aug. 13,2013	Aug. 13,2014
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	Aug. 13,2013	Aug. 13,2014
2.	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Aug. 13,2013	Aug. 13,2014
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Aug. 13,2013	Aug. 13,2014
4.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Aug. 13,2013	Aug. 13,2014
5.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	399	Aug. 13,2013	Aug. 13,2014
6.	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Aug. 13,2013	Aug. 13,2014
7.	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Aug. 13,2013	Aug. 13,2014
8.	10m Coaxial Cable with N- plug	SCHWARZBECK	AK 9515 H	-	Aug. 13,2013	Aug. 13,2014
9.	10m 50 Ohm Coaxial Cable with N-plug	SCHWARZBECK	AK 9513	-	Aug. 13,2013	Aug. 13,2014
Associated Equipment						
1	LCD TV	Skyworth	22S11HR	-	-	-

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 4.74 dB (Horn antenna 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.

Waltek Services (Shenzhen) Co.,Ltd.

<http://www.waltek.com.cn>



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 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V 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:	51 % RH
Atmospheric Pressure:	1012 mbar

EUT Operation:

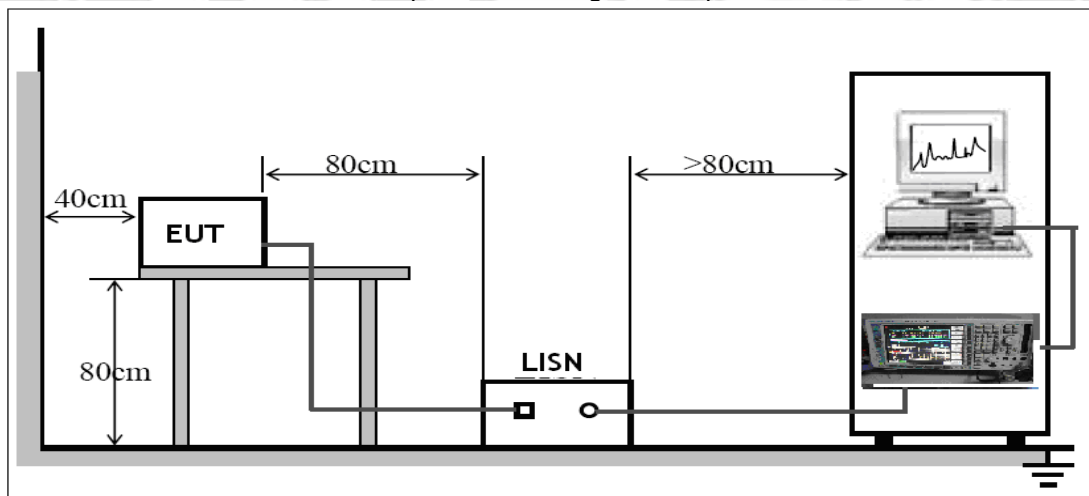
The pre-test was performed in Normal linking(Wifi) mode, the test data were shown as follow.

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.



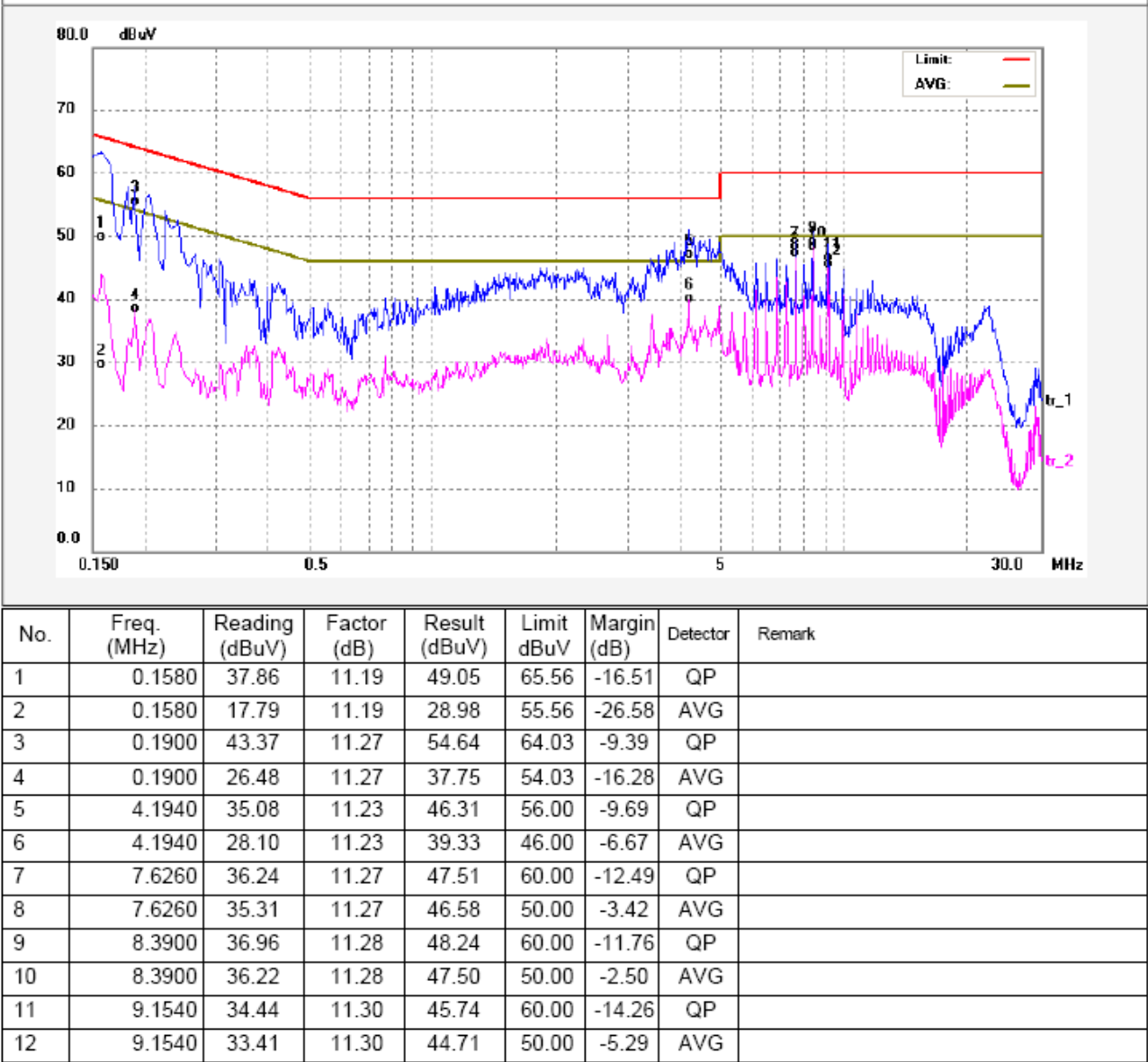


6.3 Conducted Emission Test Result

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

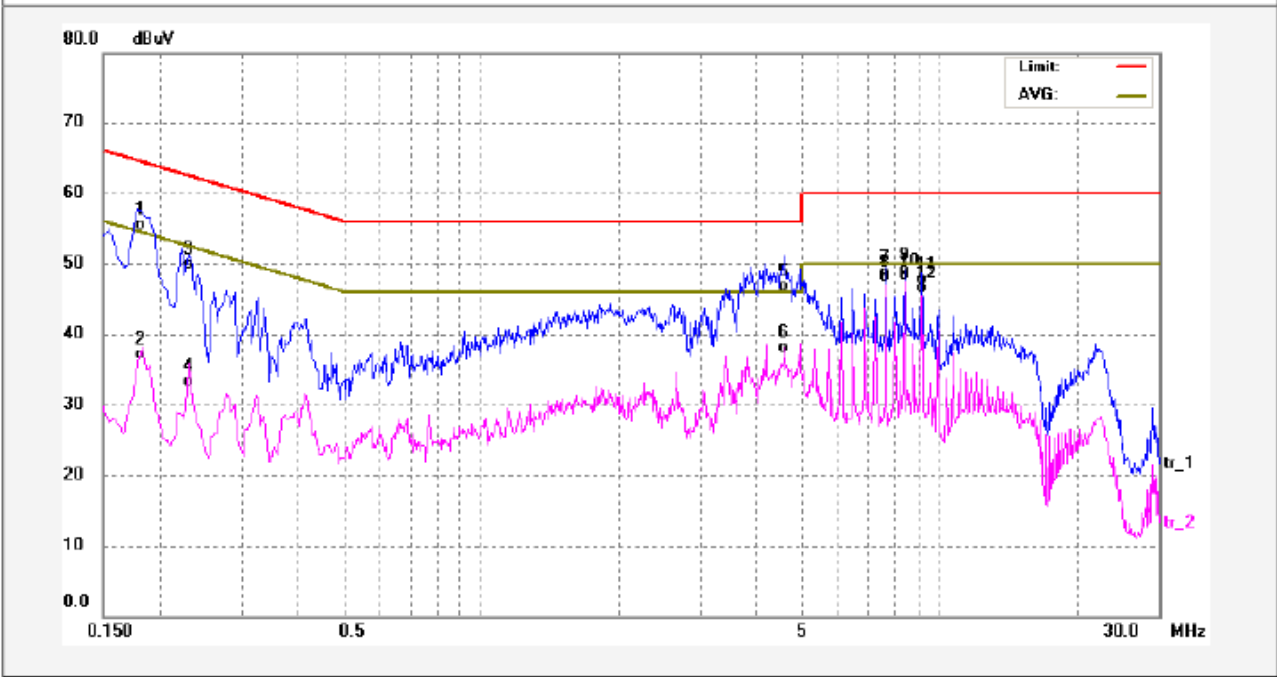
Test Mode: Normal linking(Wifi)

Live line:





Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1806	43.53	11.25	54.78	64.45	-9.67	QP	
2	0.1806	25.11	11.25	36.36	54.45	-18.09	AVG	
3	0.2300	37.90	11.30	49.20	62.45	-13.25	QP	
4	0.2300	21.26	11.30	32.56	52.45	-19.89	AVG	
5	4.5739	34.65	11.23	45.88	56.00	-10.12	QP	
6	4.5739	26.00	11.23	37.23	46.00	-8.77	AVG	
7	7.6260	36.72	11.27	47.99	60.00	-12.01	QP	
8	7.6260	35.98	11.27	47.25	50.00	-2.75	AVG	
9	8.3900	36.97	11.28	48.25	60.00	-11.75	QP	
10	8.3900	36.21	11.28	47.49	50.00	-2.51	AVG	
11	9.1500	35.57	11.30	46.87	60.00	-13.13	QP	
12	9.1500	34.34	11.30	45.64	50.00	-4.36	AVG	



7 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209
& 15.247

Test Method: ANSI C63.4:2003

Test Result: PASS

Frequency Range: 32.768kHz to 25GHz

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	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
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	$20\log^{(500)}$

Test mode: see section 4.3

7.1 EUT Operation :

Operating Environment:

Temperature: 25.5 °C

Humidity: 51 % RH

Atmospheric Pressure: 1012 mbar

EUT Operation:

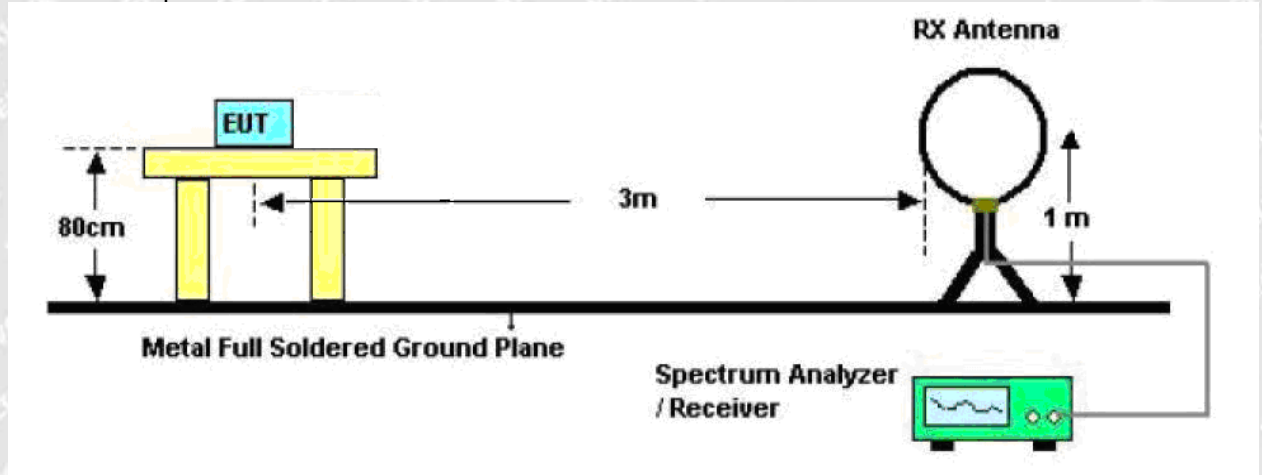
The pre-test was performed in Normal linking(Wifi) mode, the test data were shown as follow.



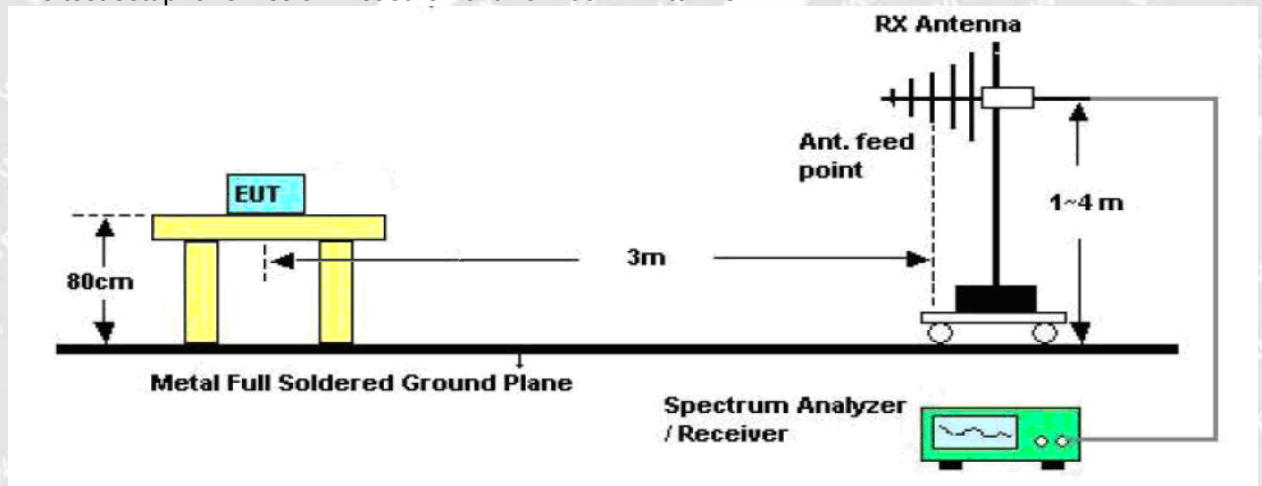
7.2 Test Setup

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

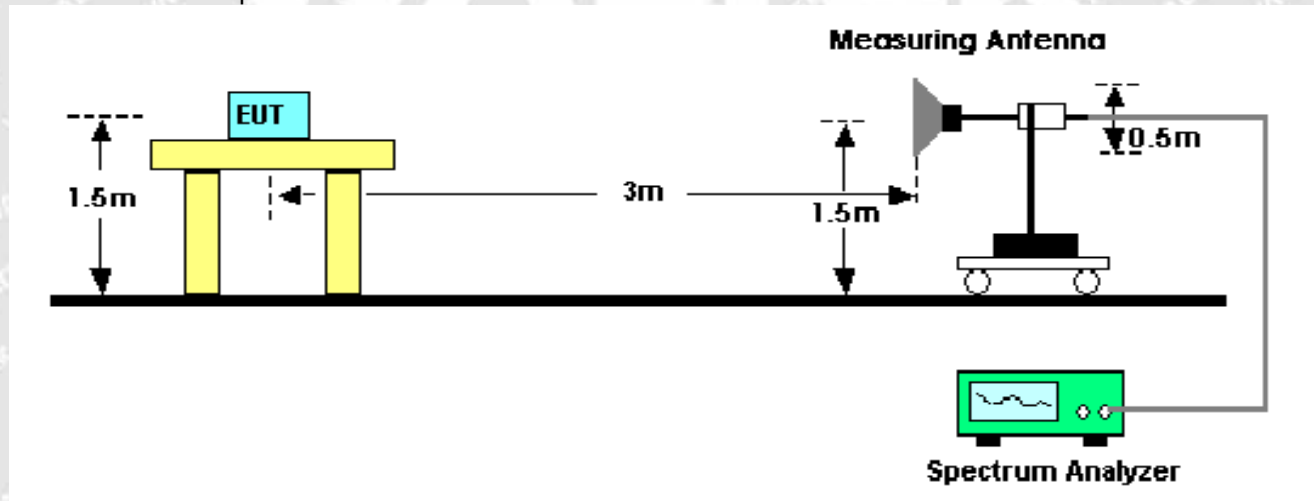
The test setup for emission measurement below 30MHz.



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 32.768kHz to 25000MHz.

Below 30MHz

Sweep SpeedAuto
IF Bandwidth10kHz
Video Bandwidth10kHz
Resolution Bandwidth10kHz

30MHz ~ 1GHz

Sweep SpeedAuto
DetectorPK
Resolution Bandwidth100kHz
Video Bandwidth300kHz

Above 1GHz

Sweep SpeedAuto
DetectorPK
Resolution Bandwidth1MHz
Video Bandwidth3MHz
DetectorAve.
Resolution Bandwidth1MHz
Video Bandwidth10Hz





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.

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:

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

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

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



7.6 Summary of Test Results

Test Frequency : Below 30MHz

After pretested, no higher emissions than the background, the data do not show in the report.

Test Frequency : 30MHz~18GHz

802.11b low channel 2412MHz									
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)
324.50	10.56	PK	27	1.6	H	17.01	27.57	40.00	-12.43
324.50	9.42	PK	353	1.4	V	17.01	26.43	40.00	-13.57
4824.00	53.74	PK	102	1.6	V	-1.06	52.68	74.00	-21.32
4824.00	43.92	Ave	102	1.6	V	-1.06	42.86	54.00	-11.14
7236.00	41.77	PK	94	1.0	H	1.33	43.10	74.00	-30.90
7236.00	39.34	Ave	94	1.0	H	1.33	40.67	54.00	-13.33
2347.74	45.33	PK	290	1.3	V	-13.19	32.14	74.00	-41.86
2347.74	37.33	Ave	290	1.3	V	-13.19	24.14	54.00	-29.86
2379.93	43.10	PK	218	2.0	H	-13.14	29.96	74.00	-44.04
2379.93	38.48	Ave	218	2.0	H	-13.14	25.34	54.00	-28.66
2484.24	44.66	PK	132	1.1	V	-13.08	31.58	74.00	-42.42
2484.24	36.18	Ave	132	1.1	V	-13.08	23.10	54.00	-30.90



802.11b middle channel 2437MHz									
Frequency (MHz)	Receiver Reading (dBμV)	Detector (PK/QP/Ave)	Turn table Angle Degree	RX Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/209/205	
				Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
324.50	10.40	PK	85	1.1	H	17.01	27.41	40.00	-12.59
324.50	9.57	PK	156	1.2	V	17.01	26.58	40.00	-13.42
4874.00	49.53	PK	194	1.1	V	-0.62	48.91	74.00	-25.09
4874.00	41.65	Ave	194	1.1	V	-0.62	41.03	54.00	-12.97
7311.00	46.05	PK	262	1.5	H	2.21	48.26	74.00	-25.74
7311.00	38.26	Ave	262	1.5	H	2.21	40.47	54.00	-13.53
2328.99	46.66	PK	12	1.7	V	-13.19	33.47	74.00	-40.53
2328.99	39.31	Ave	12	1.7	V	-13.19	26.12	54.00	-27.88
2375.43	44.90	PK	238	1.2	H	-13.14	31.76	74.00	-42.24
2375.43	38.72	Ave	238	1.2	H	-13.14	25.58	54.00	-28.42
2486.34	44.25	PK	108	1.5	V	-13.08	31.17	74.00	-42.83
2486.34	36.32	Ave	108	1.5	V	-13.08	23.24	54.00	-30.76

WALTEK



802.11b high channel 2462MHz									
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)
324.50	10.76	PK	344	1.5	H	17.01	27.77	40.00	-12.23
324.50	12.24	PK	115	1.4	V	17.01	29.25	40.00	-10.75
4924.00	51.35	PK	174	1.8	V	-0.24	51.11	74.00	-22.89
4924.00	42.31	Ave	174	1.8	V	-0.24	42.07	54.00	-11.93
7386.00	48.33	PK	323	1.4	H	2.84	51.17	74.00	-22.83
7386.00	39.25	Ave	323	1.4	H	2.84	42.09	54.00	-11.91
2329.91	46.74	PK	212	1.4	V	-13.19	33.55	74.00	-40.45
2329.91	39.34	Ave	212	1.4	V	-13.19	26.15	54.00	-27.85
2359.19	42.42	PK	168	1.9	H	-13.14	29.28	74.00	-44.72
2359.19	38.80	Ave	168	1.9	H	-13.14	25.66	54.00	-28.34
2488.29	44.21	PK	339	1.3	V	-13.08	31.13	74.00	-42.87
2488.29	38.73	Ave	339	1.3	V	-13.08	25.65	54.00	-28.35

WALTEK



802.11g low channel 2412MHz									
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)
324.50	10.74	PK	165	1.4	H	17.01	27.75	40.00	-12.25
324.50	11.61	PK	105	2.0	V	17.01	28.62	40.00	-11.38
4824.00	51.99	PK	123	1.5	V	-1.06	50.93	74.00	-23.07
4824.00	43.75	Ave	123	1.5	V	-1.06	42.69	54.00	-11.31
7236.00	42.29	PK	58	1.8	H	1.33	43.62	74.00	-30.38
7236.00	38.69	Ave	58	1.8	H	1.33	40.02	54.00	-13.98
2319.98	46.44	PK	103	1.8	V	-13.19	33.25	74.00	-40.75
2319.98	37.32	Ave	103	1.8	V	-13.19	24.13	54.00	-29.87
2369.36	43.88	PK	195	2.0	H	-13.14	30.74	74.00	-43.26
2369.36	36.38	Ave	195	2.0	H	-13.14	23.24	54.00	-30.76
2498.92	44.12	PK	311	2.0	V	-13.08	31.04	74.00	-42.96
2498.92	36.37	Ave	311	2.0	V	-13.08	23.29	54.00	-30.71

WALTEK



802.11g middle channel 2437MHz									
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)
324.50	11.49	PK	23	1.9	H	17.01	28.50	40.00	-11.50
324.50	9.25	PK	112	1.5	V	17.01	26.26	40.00	-13.74
4874.00	50.13	PK	251	1.2	V	-0.62	49.51	74.00	-24.49
4874.00	41.04	Ave	251	1.2	V	-0.62	40.42	54.00	-13.58
7311.00	44.52	PK	276	1.1	H	2.21	46.73	74.00	-27.27
7311.00	38.15	Ave	276	1.1	H	2.21	40.36	54.00	-13.64
2344.09	46.76	PK	50	1.8	V	-13.19	33.57	74.00	-40.43
2344.09	38.41	Ave	50	1.8	V	-13.19	25.22	54.00	-28.78
2363.70	42.38	PK	43	2.0	H	-13.14	29.24	74.00	-44.76
2363.70	38.89	Ave	43	2.0	H	-13.14	25.75	54.00	-28.25
2486.34	42.66	PK	116	1.2	V	-13.08	29.58	74.00	-44.42
2486.34	38.32	Ave	116	1.2	V	-13.08	25.24	54.00	-28.76

WALTEK



802.11g high channel 2462MHz									
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)
324.50	9.64	PK	355	1.2	H	17.01	26.65	40.00	-13.35
324.50	10.95	PK	137	1.3	V	17.01	27.96	40.00	-12.04
4924.00	51.21	PK	185	1.8	V	-0.24	50.97	74.00	-23.03
4924.00	44.44	Ave	185	1.8	V	-0.24	44.20	54.00	-9.80
7386.00	47.53	PK	319	1.7	H	2.84	50.37	74.00	-23.63
7386.00	40.35	Ave	319	1.7	H	2.84	43.19	54.00	-10.81
2316.28	46.45	PK	273	1.6	V	-13.19	33.26	74.00	-40.74
2316.28	38.07	Ave	273	1.6	V	-13.19	24.88	54.00	-29.12
2378.24	44.67	PK	37	1.5	H	-13.14	31.53	74.00	-42.47
2378.24	36.86	Ave	37	1.5	H	-13.14	23.72	54.00	-30.28
2498.04	43.06	PK	56	1.6	V	-13.08	29.98	74.00	-44.02
2498.04	37.32	Ave	56	1.6	V	-13.08	24.24	54.00	-29.76

WALTEK



802.11n(HT20) low channel 2412MHz									
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)
324.50	8.59	PK	49	1.4	H	17.01	25.60	40.00	-14.40
324.50	9.41	PK	353	1.0	V	17.01	26.42	40.00	-13.58
4824.00	52.12	PK	181	1.5	V	-1.06	51.06	74.00	-22.94
4824.00	42.95	Ave	181	1.5	V	-1.06	41.89	54.00	-12.11
7236.00	40.73	PK	215	1.7	H	1.33	42.06	74.00	-31.94
7236.00	39.49	Ave	215	1.7	H	1.33	40.82	54.00	-13.18
2316.54	46.95	PK	57	1.7	V	-13.19	33.76	74.00	-40.24
2316.54	37.89	Ave	57	1.7	V	-13.19	24.70	54.00	-29.30
2363.31	44.42	PK	323	2.0	H	-13.14	31.28	74.00	-42.72
2363.31	38.82	Ave	323	2.0	H	-13.14	25.68	54.00	-28.32
2489.07	43.88	PK	59	1.1	V	-13.08	30.80	74.00	-43.20
2489.07	37.10	Ave	59	1.1	V	-13.08	24.02	54.00	-29.98

WALTEK



802.11n(HT20) middle channel 2437MHz									
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)
324.50	11.45	PK	1	1.4	H	17.01	28.46	40.00	-11.54
324.50	9.45	PK	17	1.1	V	17.01	26.46	40.00	-13.54
4874.00	49.44	PK	71	1.8	V	-0.62	48.82	74.00	-25.18
4874.00	42.16	Ave	71	1.8	V	-0.62	41.54	54.00	-12.46
7311.00	44.04	PK	299	1.7	H	2.21	46.25	74.00	-27.75
7311.00	39.18	Ave	299	1.7	H	2.21	41.39	54.00	-12.61
2310.45	46.88	PK	244	1.6	V	-13.19	33.69	74.00	-40.31
2310.45	39.27	Ave	244	1.6	V	-13.19	26.08	54.00	-27.92
2382.56	43.52	PK	22	1.4	H	-13.14	30.38	74.00	-43.62
2382.56	36.59	Ave	22	1.4	H	-13.14	23.45	54.00	-30.55
2489.42	44.09	PK	74	1.8	V	-13.08	31.01	74.00	-42.99
2489.42	38.38	Ave	74	1.8	V	-13.08	25.30	54.00	-28.70

WALTEK



802.11n(HT20) high channel 2462MHz									
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)
324.50	10.91	PK	80	1.6	H	17.01	27.92	40.00	-12.08
324.50	12.77	PK	23	1.0	V	17.01	29.78	40.00	-10.22
4924.00	52.26	PK	13	1.1	V	-0.24	52.02	74.00	-21.98
4924.00	43.02	Ave	13	1.1	V	-0.24	42.78	54.00	-11.22
7386.00	47.60	PK	14	1.3	H	2.84	50.44	74.00	-23.56
7386.00	38.63	Ave	14	1.3	H	2.84	41.47	54.00	-12.53
2321.01	46.25	PK	7	1.7	V	-13.19	33.06	74.00	-40.94
2321.01	39.02	Ave	7	1.7	V	-13.19	25.83	54.00	-28.17
2388.26	43.96	PK	337	1.5	H	-13.14	30.82	74.00	-43.18
2388.26	38.08	Ave	337	1.5	H	-13.14	24.94	54.00	-29.06
2485.65	44.16	PK	235	1.6	V	-13.08	31.08	74.00	-42.92
2485.65	38.56	Ave	235	1.6	V	-13.08	25.48	54.00	-28.52

WALTEK



802.11n(HT40) low channel 2422MHz									
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)
324.50	8.79	PK	164	1.2	H	17.01	25.80	40.00	-14.20
324.50	11.08	PK	199	1.8	V	17.01	28.09	40.00	-11.91
4844.00	53.74	PK	149	1.2	V	-1.06	52.68	74.00	-21.32
4844.00	43.96	Ave	149	1.2	V	-1.06	42.90	54.00	-11.10
7266.00	40.78	PK	342	1.5	H	1.33	42.11	74.00	-31.89
7266.00	38.92	Ave	342	1.5	H	1.33	40.25	54.00	-13.75
2344.18	45.47	PK	280	1.1	V	-13.19	32.28	74.00	-41.72
2344.18	37.75	Ave	280	1.1	V	-13.19	24.56	54.00	-29.44
2389.07	44.89	PK	192	1.8	H	-13.14	31.75	74.00	-42.25
2389.07	38.86	Ave	192	1.8	H	-13.14	25.72	54.00	-28.28
2492.46	42.37	PK	41	1.5	V	-13.08	29.29	74.00	-44.71
2492.46	38.69	Ave	41	1.5	V	-13.08	25.61	54.00	-28.39

WALTEK



802.11n(HT40) middle channel 2437MHz									
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)
324.50	11.74	PK	240	1.4	H	17.01	28.75	40.00	-11.25
324.50	11.32	PK	91	1.4	V	17.01	28.33	40.00	-11.67
4874.00	49.12	PK	179	1.9	V	-0.62	48.50	74.00	-25.50
4874.00	42.31	Ave	179	1.9	V	-0.62	41.69	54.00	-12.31
7311.00	45.14	PK	111	1.9	H	2.21	47.35	74.00	-26.65
7311.00	39.16	Ave	111	1.9	H	2.21	41.37	54.00	-12.63
2325.52	46.18	PK	352	1.9	V	-13.19	32.99	74.00	-41.01
2325.52	37.28	Ave	352	1.9	V	-13.19	24.09	54.00	-29.91
2372.35	42.63	PK	358	1.1	H	-13.14	29.49	74.00	-44.51
2372.35	37.63	Ave	358	1.1	H	-13.14	24.49	54.00	-29.51
2483.82	43.10	PK	206	1.4	V	-13.08	30.02	74.00	-43.98
2483.82	38.53	Ave	206	1.4	V	-13.08	25.45	54.00	-28.55

WALTEK



802.11n(HT40) high channel 2452MHz									
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)
324.50	9.23	PK	235	1.4	H	17.01	26.24	40.00	-13.76
324.50	13.37	PK	49	1.7	V	17.01	30.38	40.00	-9.62
4904.00	51.62	PK	146	1.9	V	-0.24	51.38	74.00	-22.62
4904.00	42.22	Ave	146	1.9	V	-0.24	41.98	54.00	-12.02
7356.00	48.34	PK	83	1.2	H	2.84	51.18	74.00	-22.82
7356.00	39.05	Ave	83	1.2	H	2.84	41.89	54.00	-12.11
2329.57	45.29	PK	350	1.1	V	-13.19	32.10	74.00	-41.90
2329.57	38.08	Ave	350	1.1	V	-13.19	24.89	54.00	-29.11
2372.42	44.09	PK	39	1.7	H	-13.14	30.95	74.00	-43.05
2372.42	38.33	Ave	39	1.7	H	-13.14	25.19	54.00	-28.81
2495.04	43.13	PK	132	1.5	V	-13.08	30.05	74.00	-43.95
2495.04	37.29	Ave	132	1.5	V	-13.08	24.21	54.00	-29.79

Test Frequency :From 18GHz to 25GHz

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 V03 April 9,2013
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

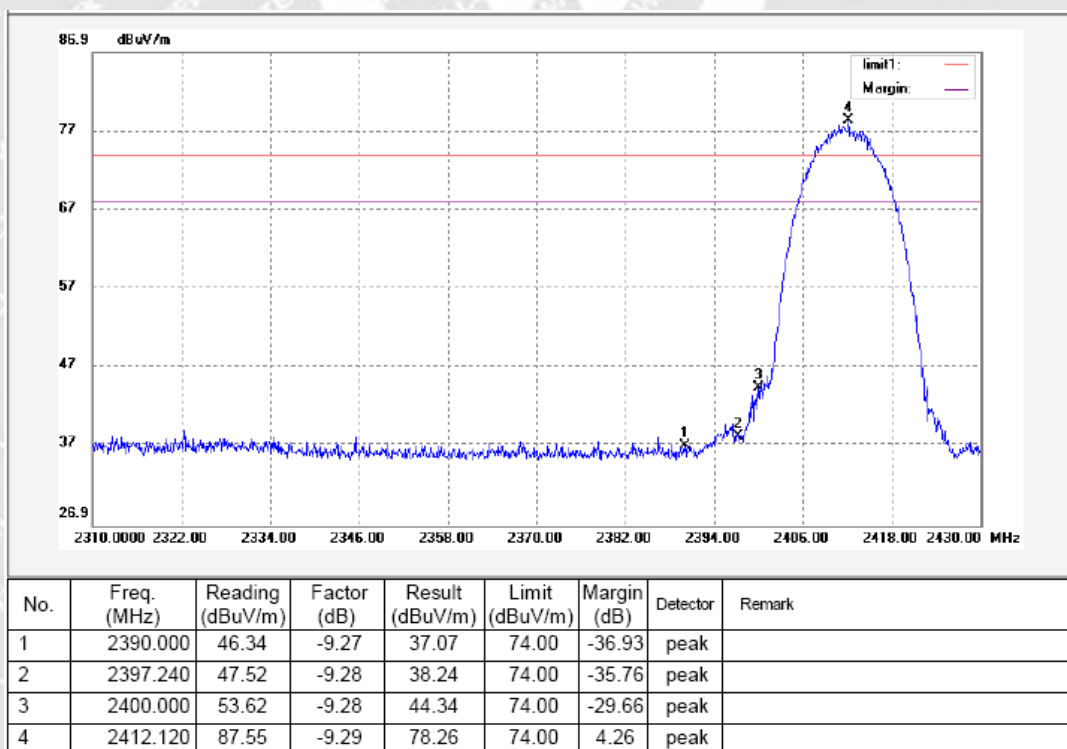
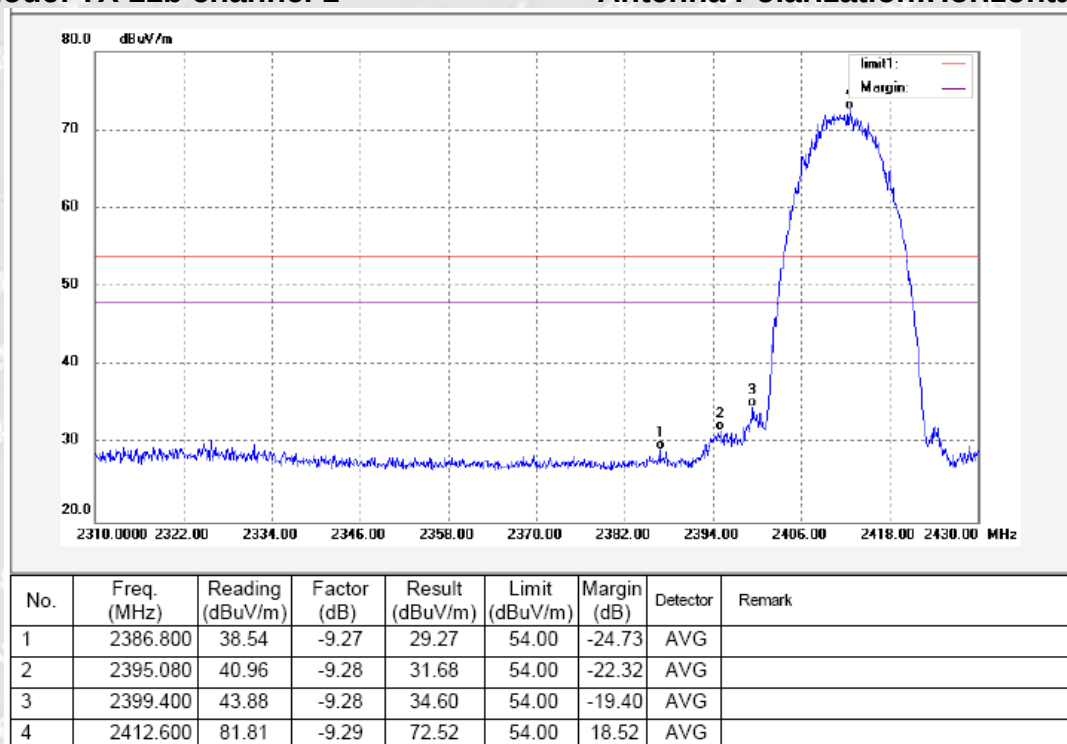
1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out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



8.2 Test Result

Mode: TX 11b channel 1

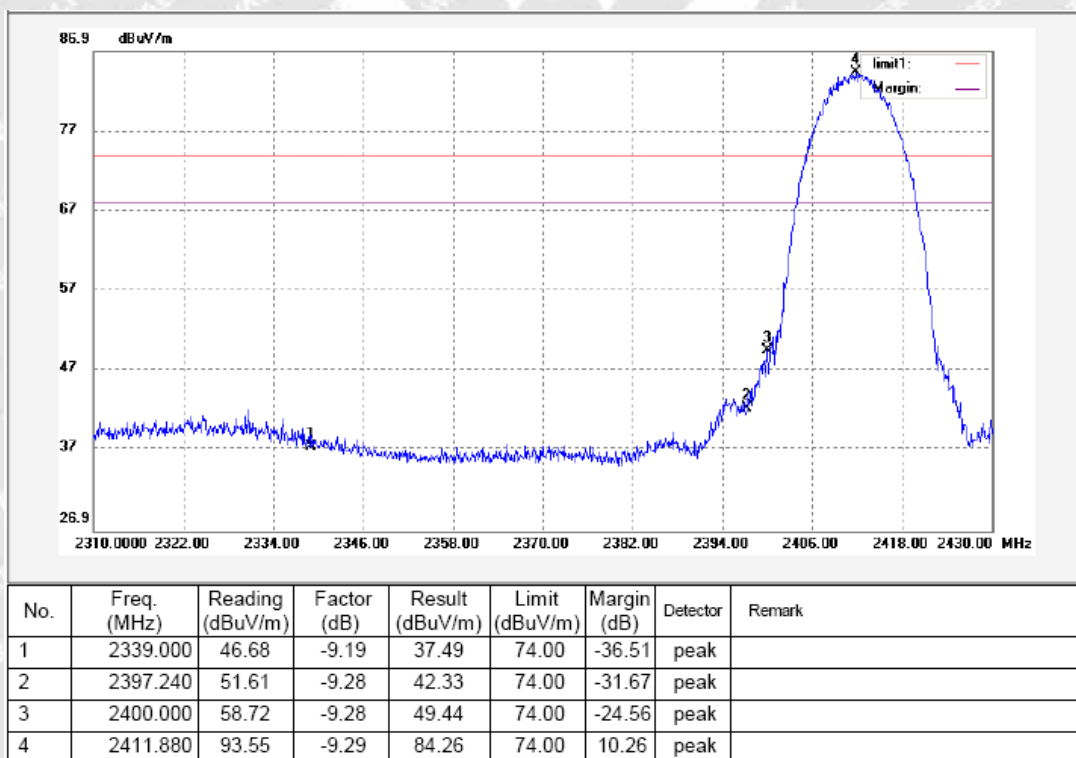
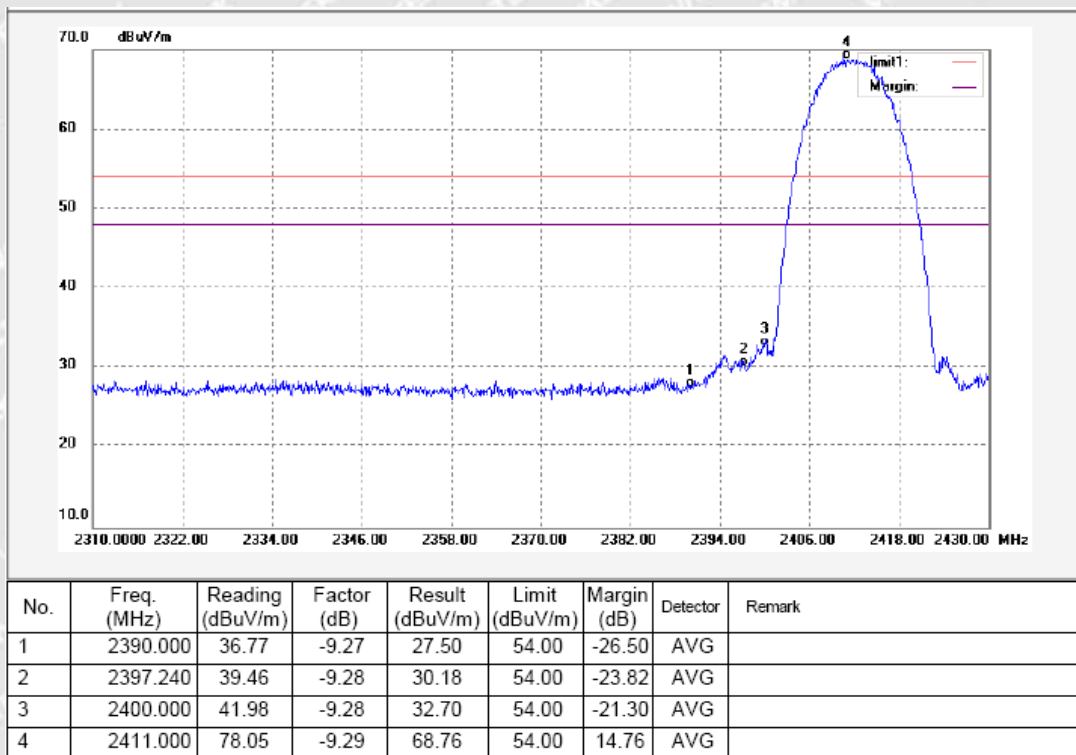
Antenna Polarization:Horizontal





Mode: TX 11b channel 1

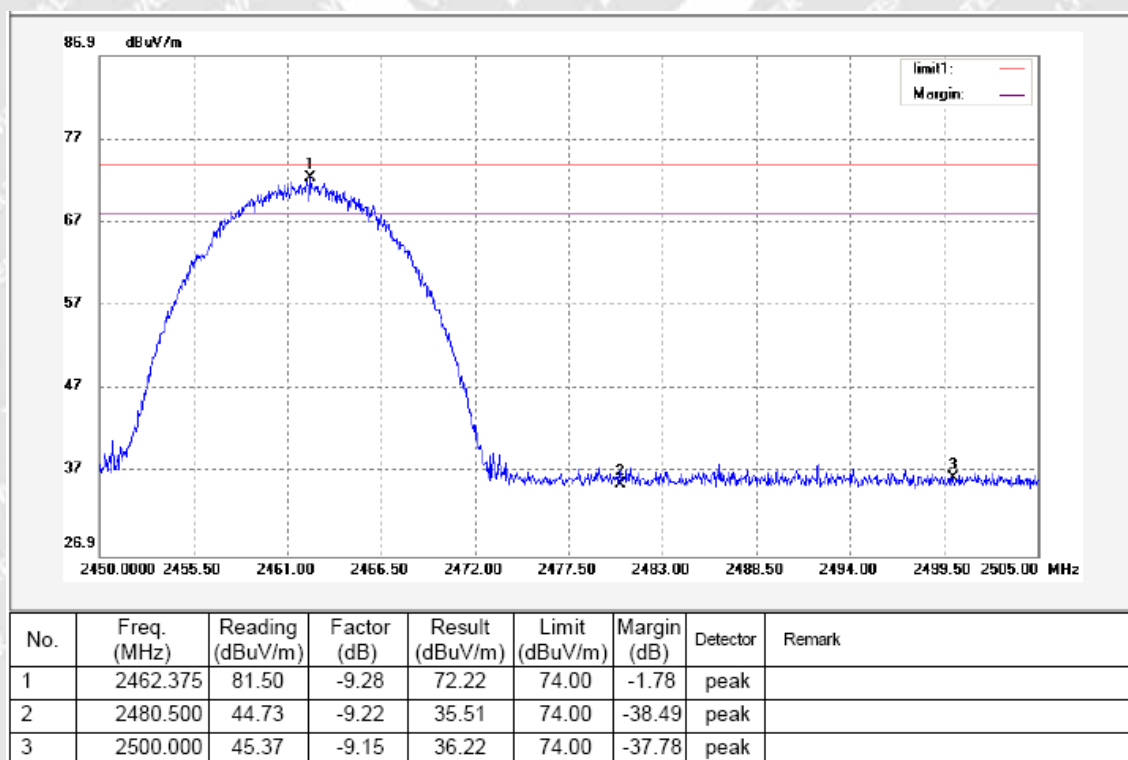
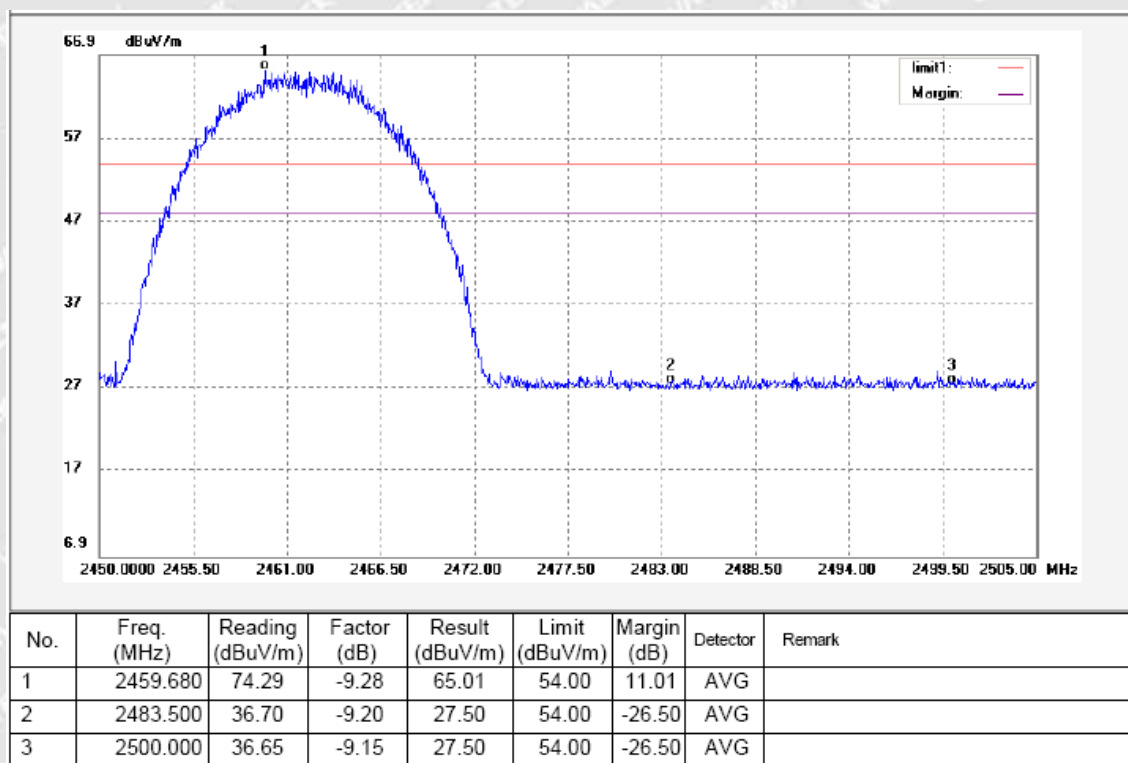
Antenna Polarization:Vertical





Mode: TX 11b channel 11

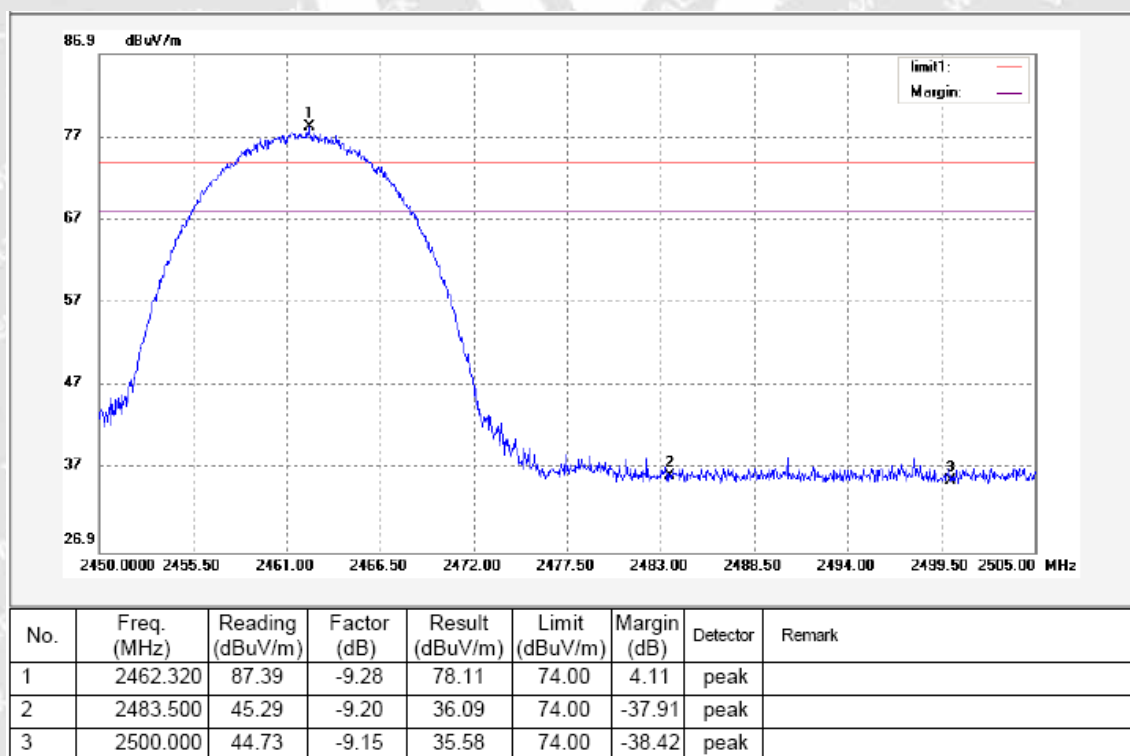
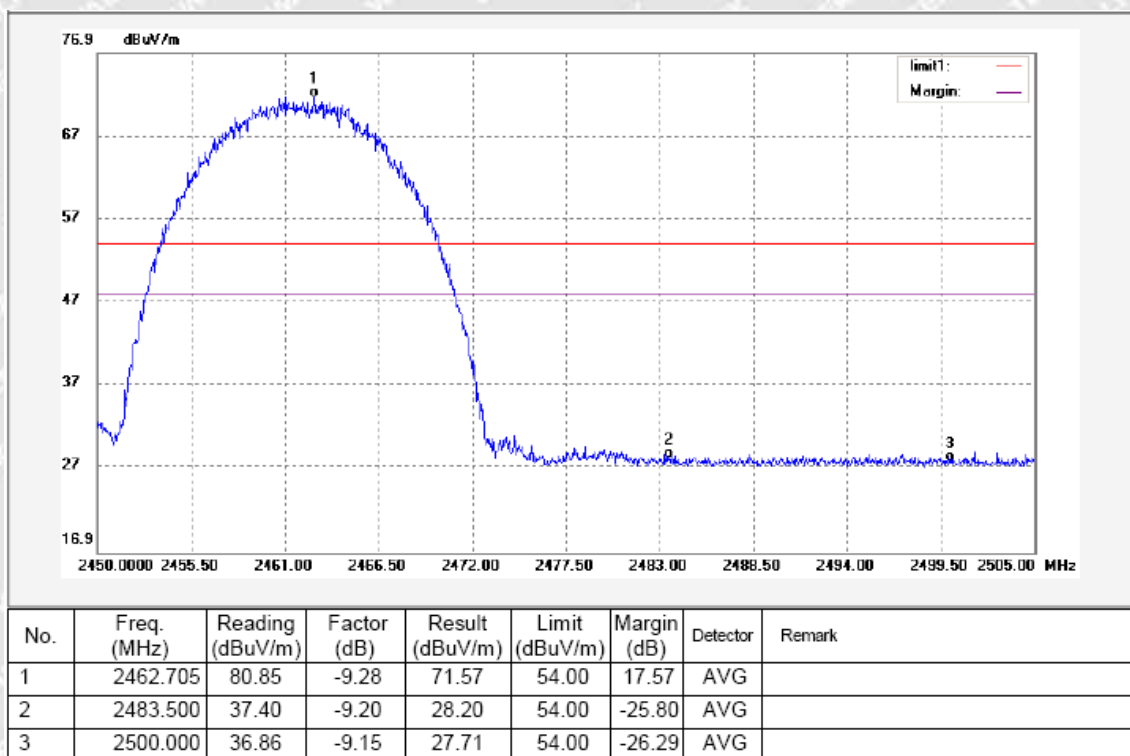
Antenna Polarization:Horizontal





Mode: TX 11b channel 11

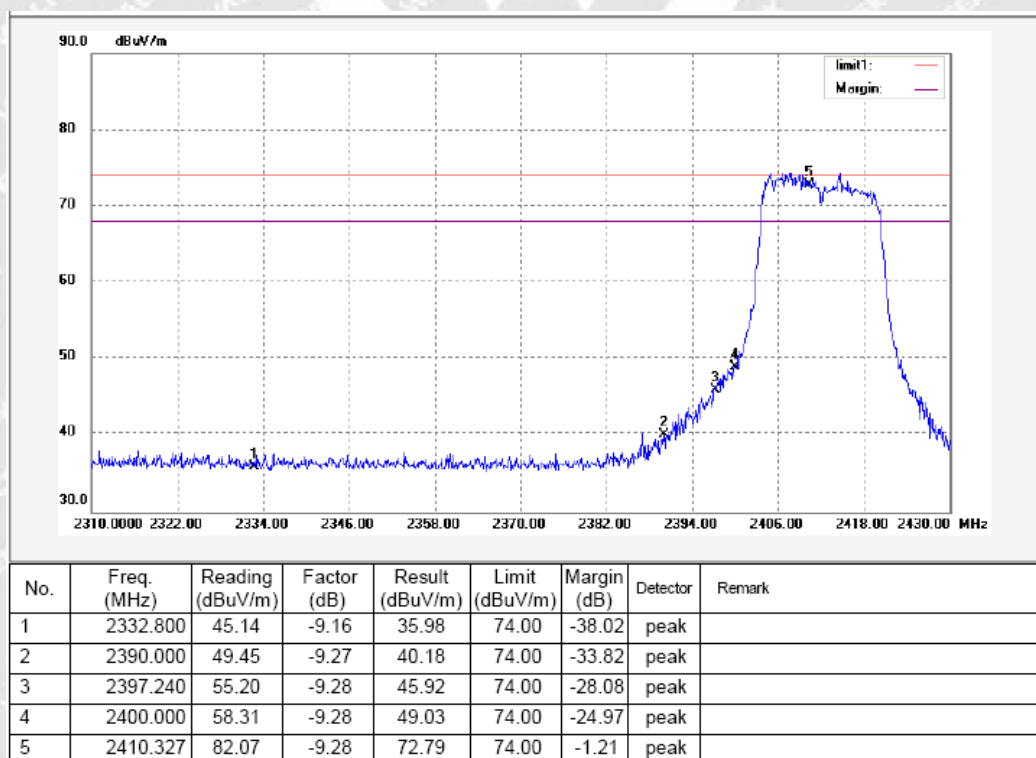
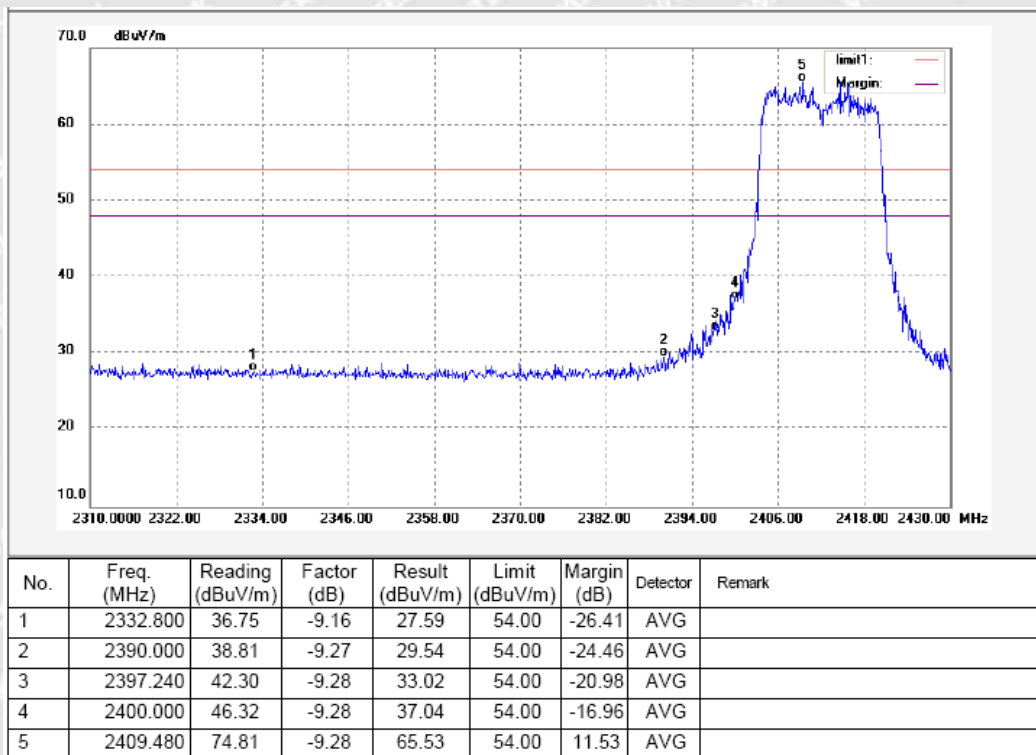
Antenna Polarization:Vertical





Mode: TX 11g channel 1

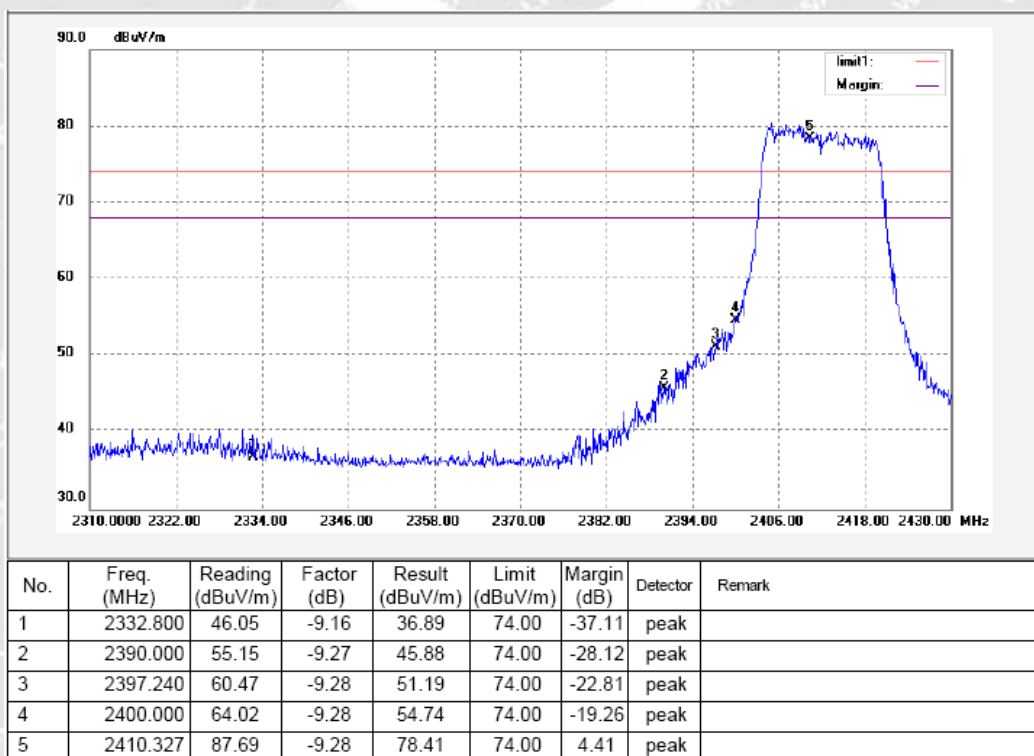
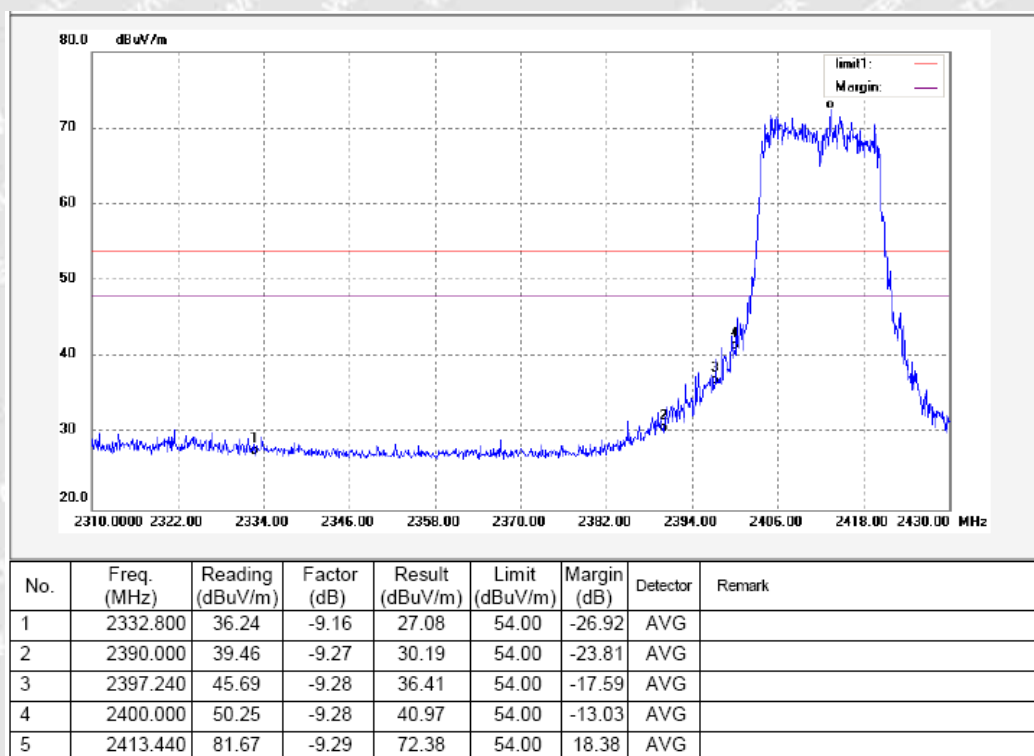
Antenna Polarization:Horizontal





Mode: TX 11g channel 1

Antenna Polarization:Vertical



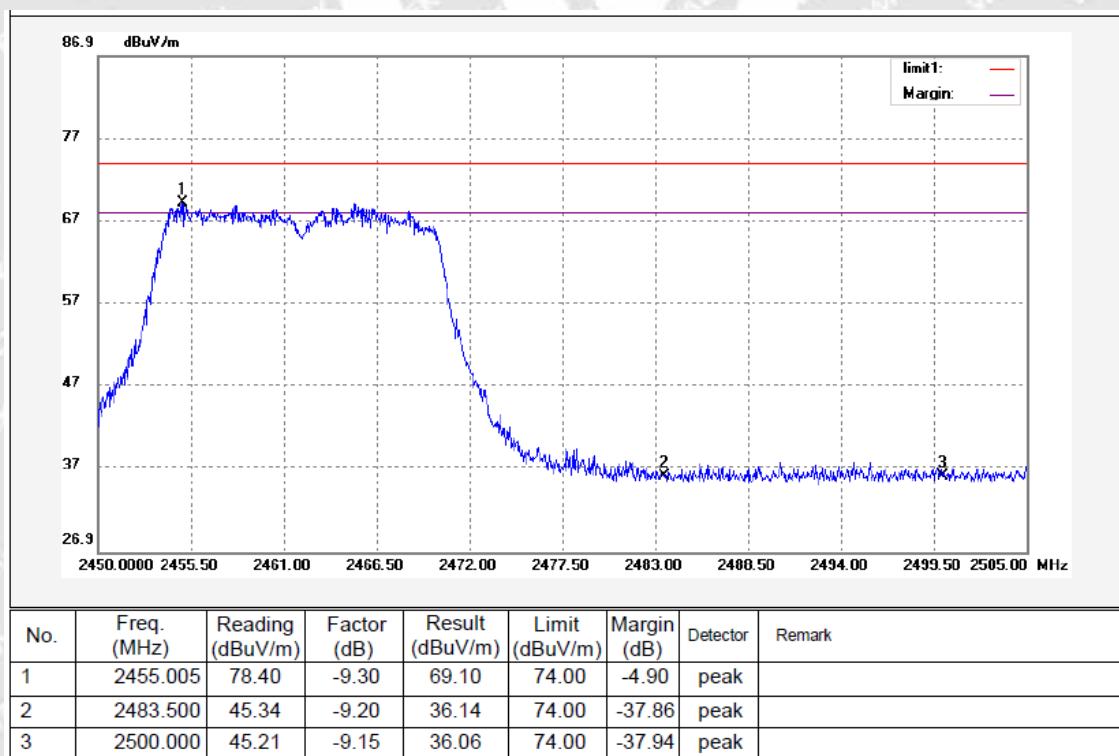
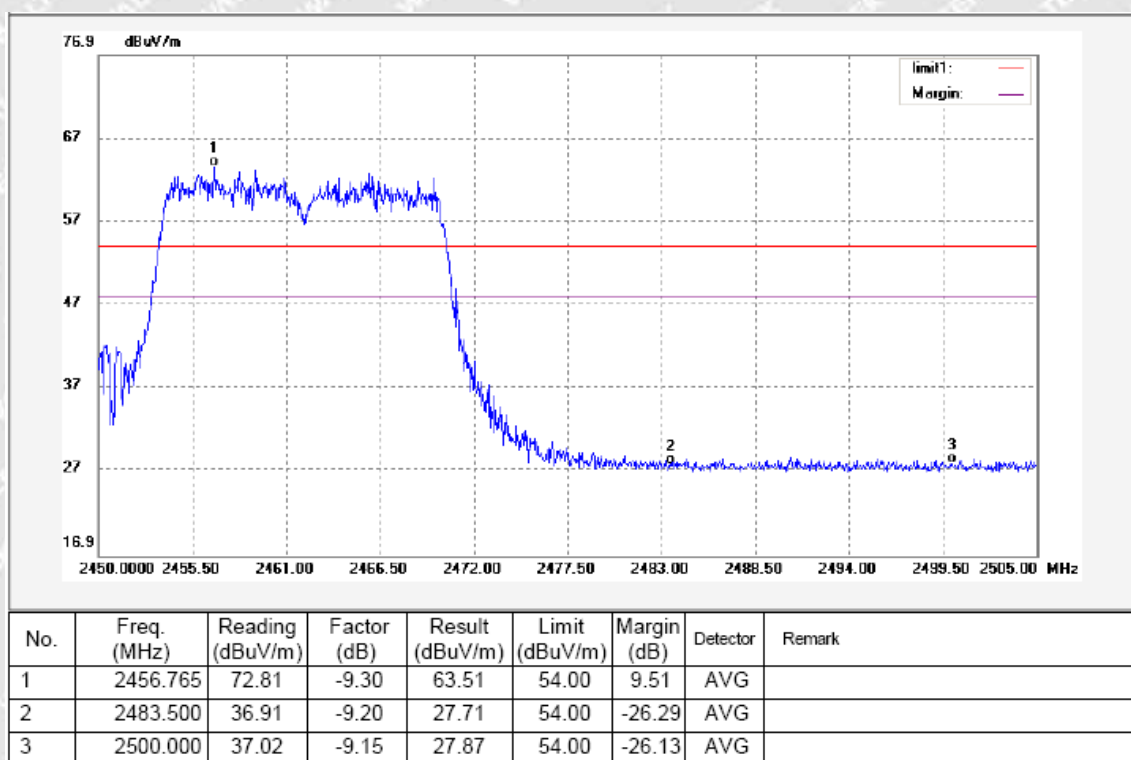
Waltek Services (Shenzhen) Co.,Ltd.

<http://www.waltek.com.cn>



Mode: TX 11g channel 11

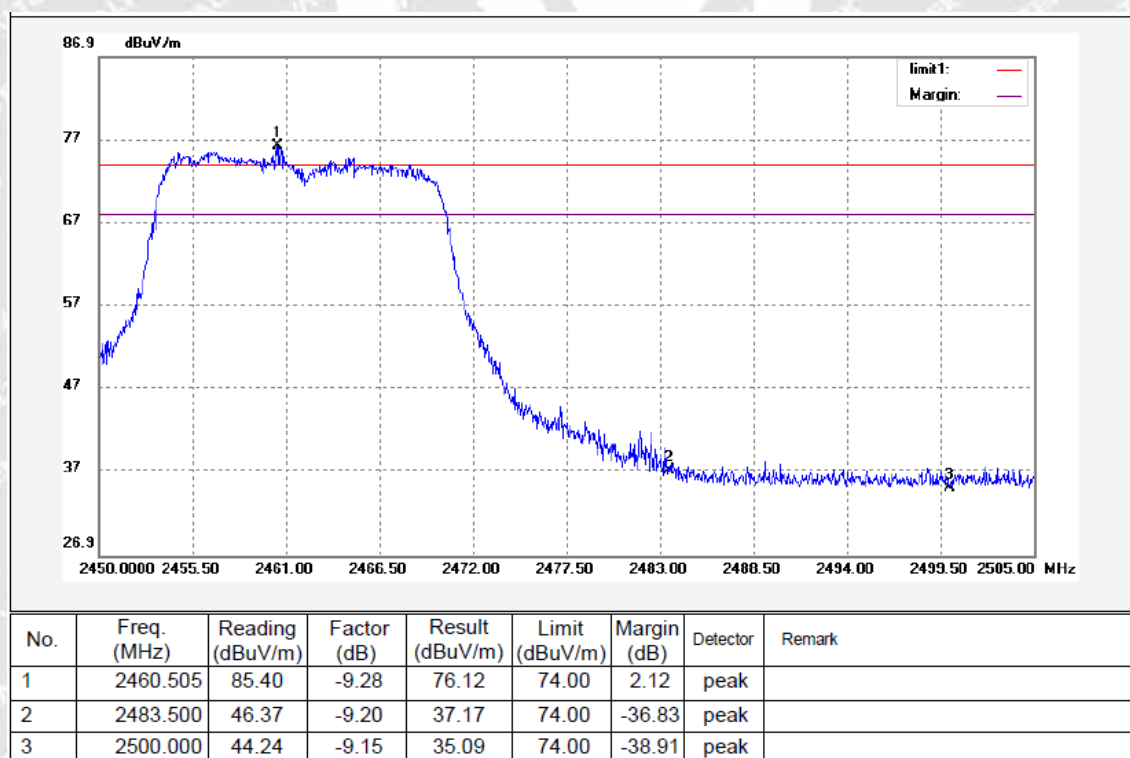
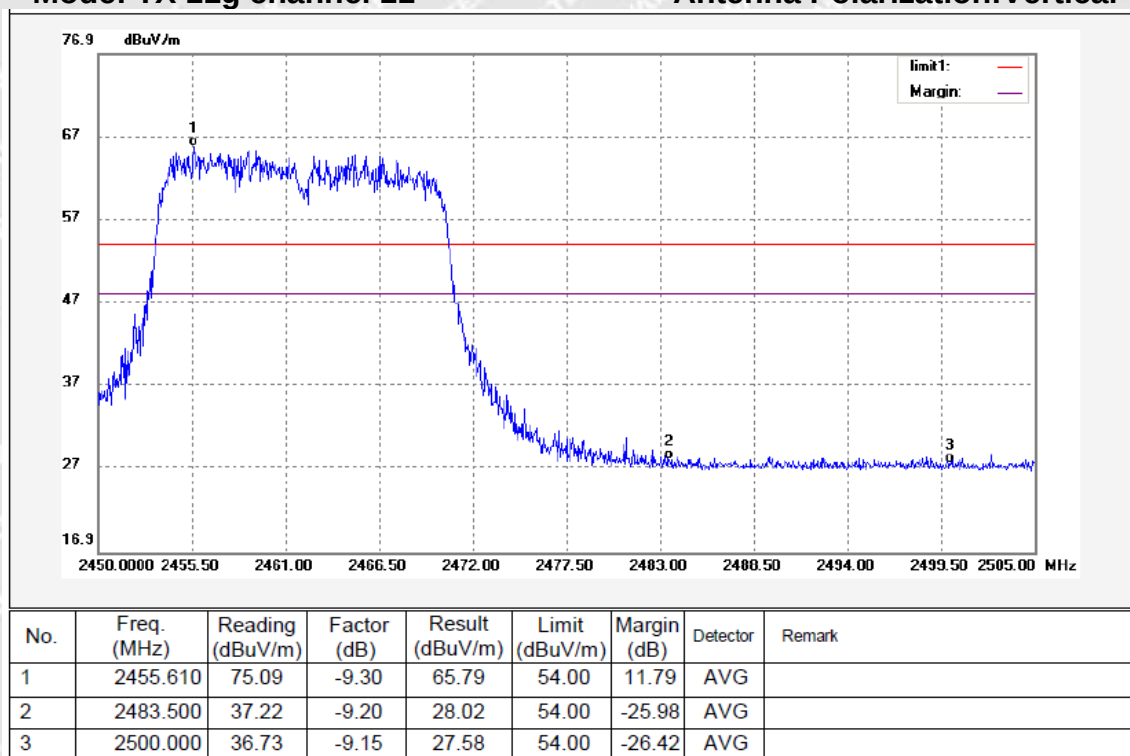
Antenna Polarization:Horizontal





Mode: TX 11g channel 11

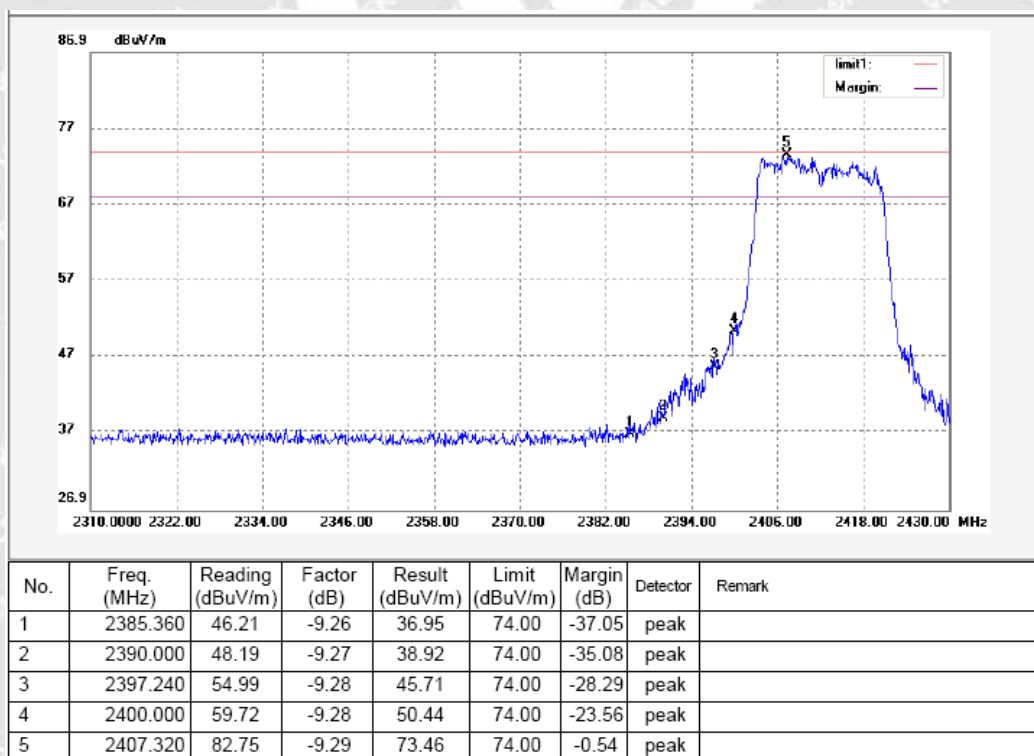
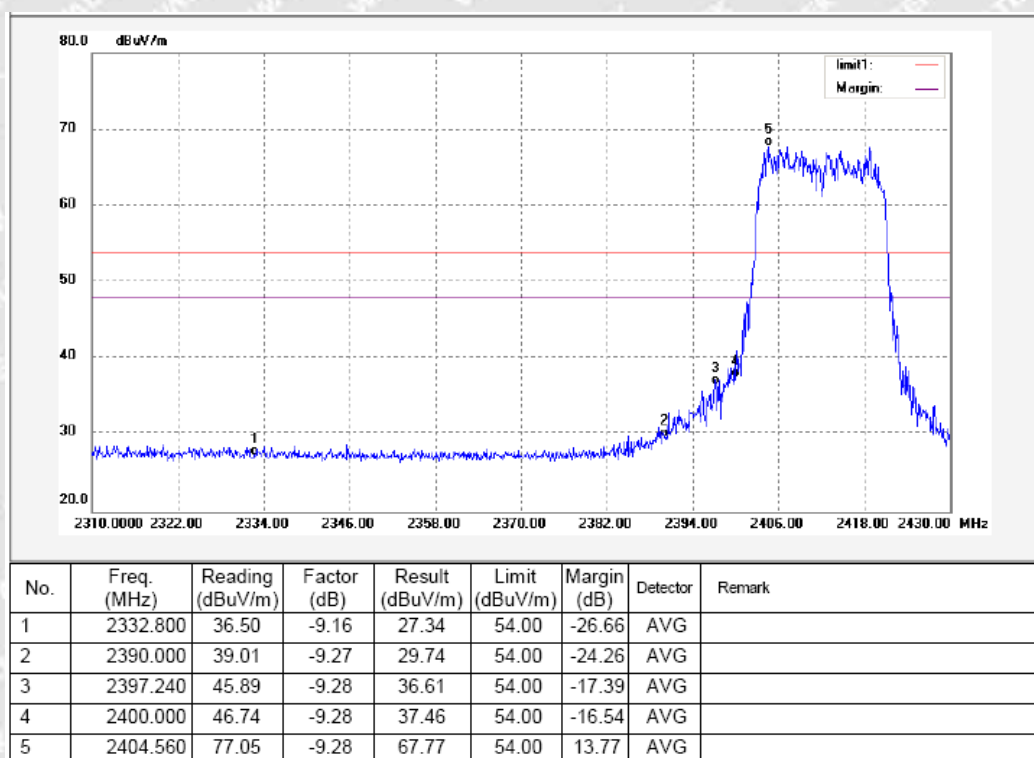
Antenna Polarization:Vertical





Mode: TX 11n HT 20 channel 1

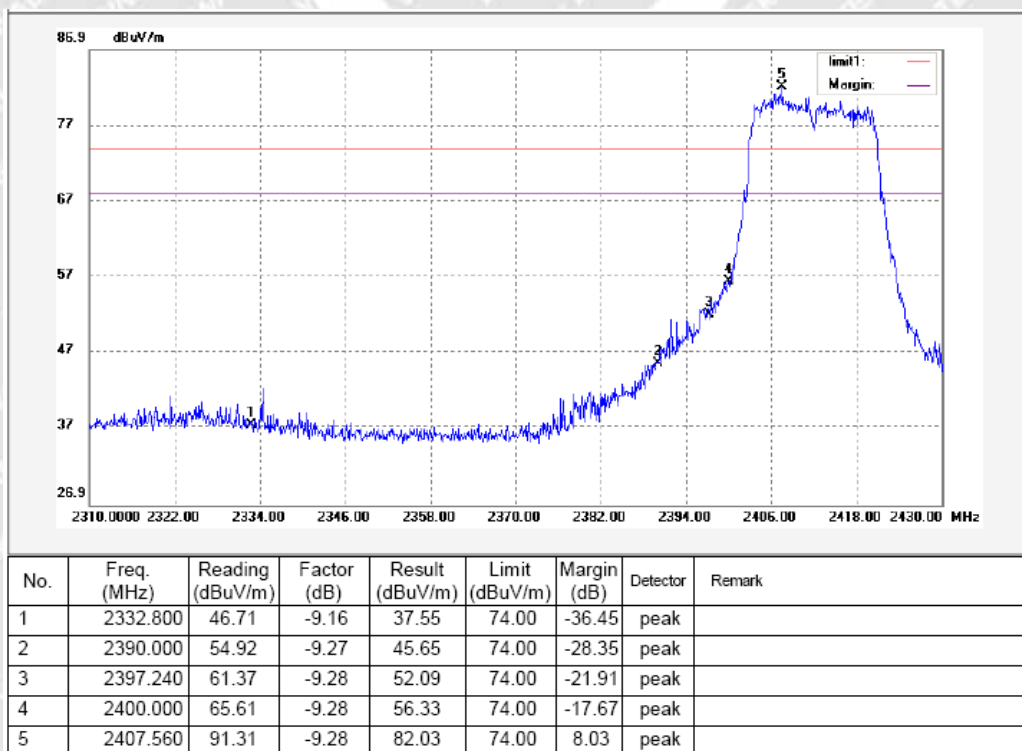
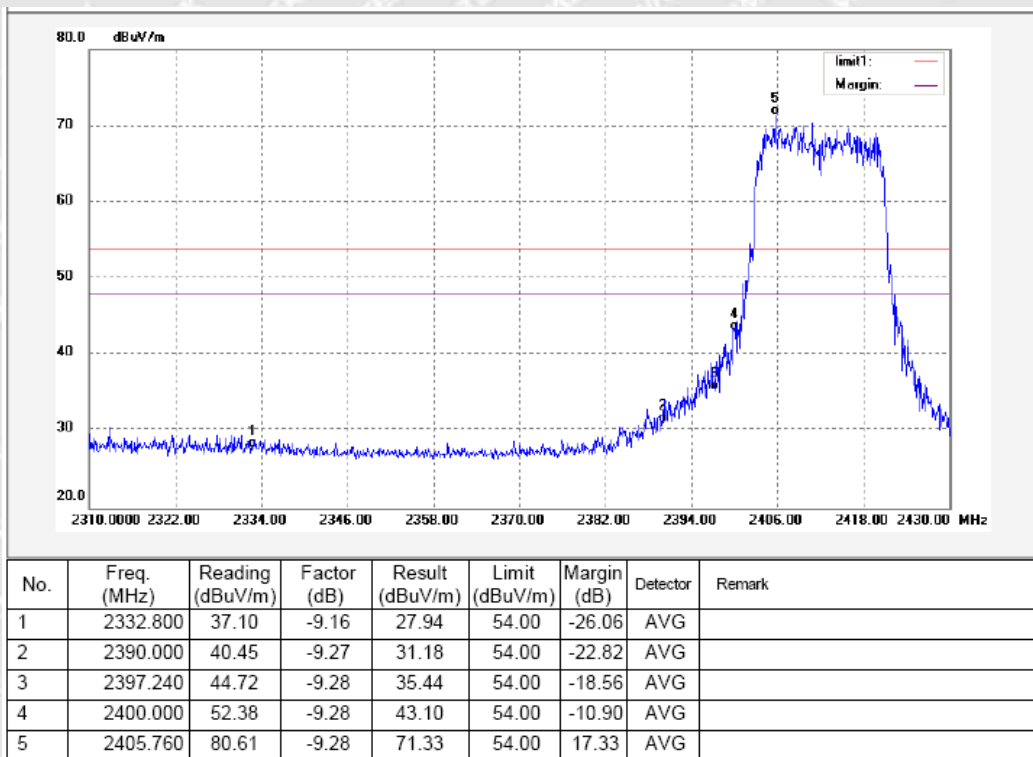
Antenna Polarization:Horizontal





Mode: TX 11n HT 20 channel 1

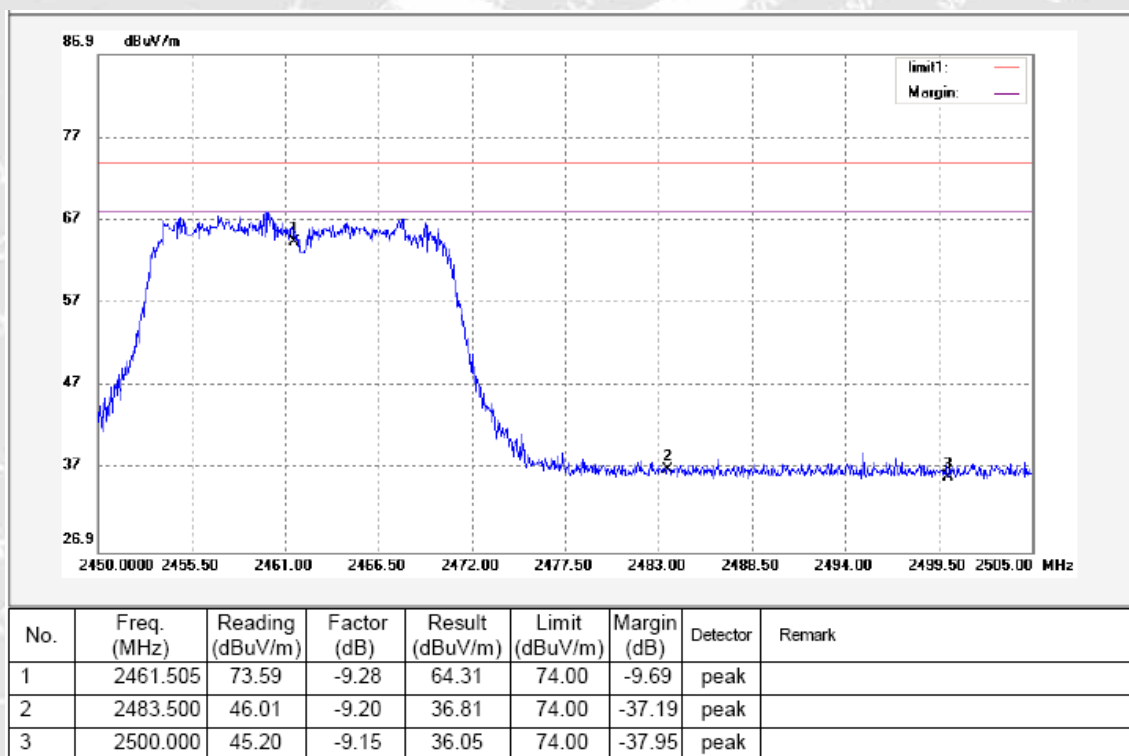
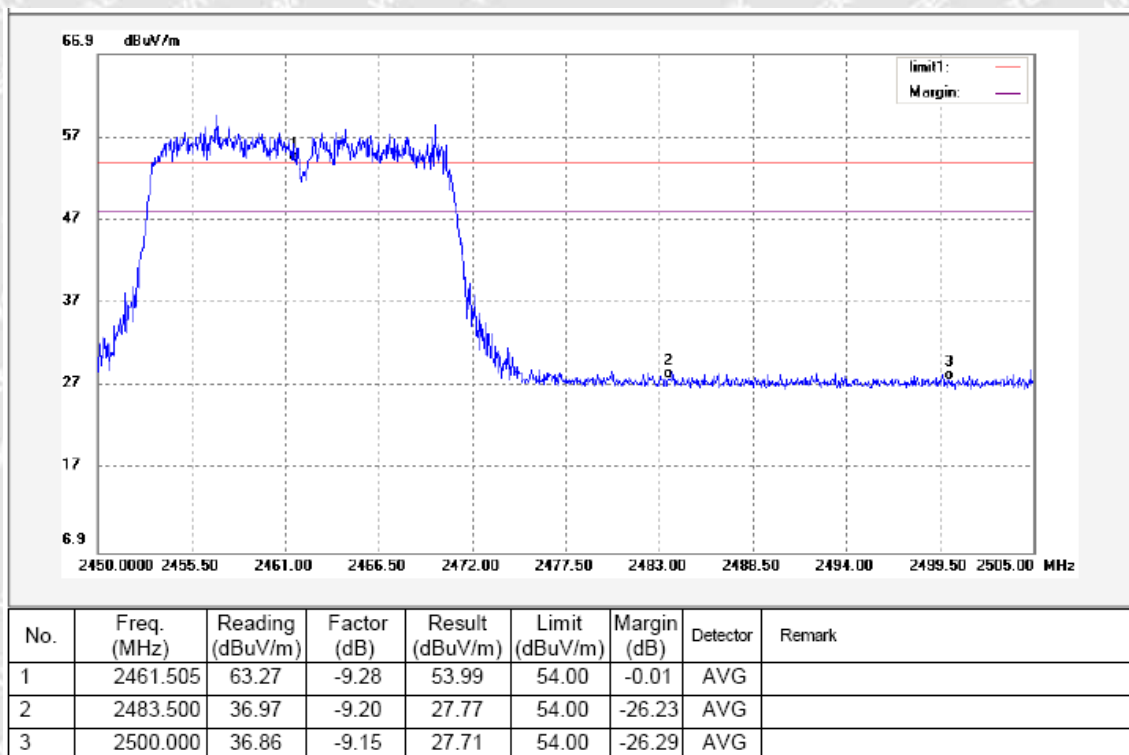
Antenna Polarization:Vertical





Mode: TX 11n HT 20 channel 11

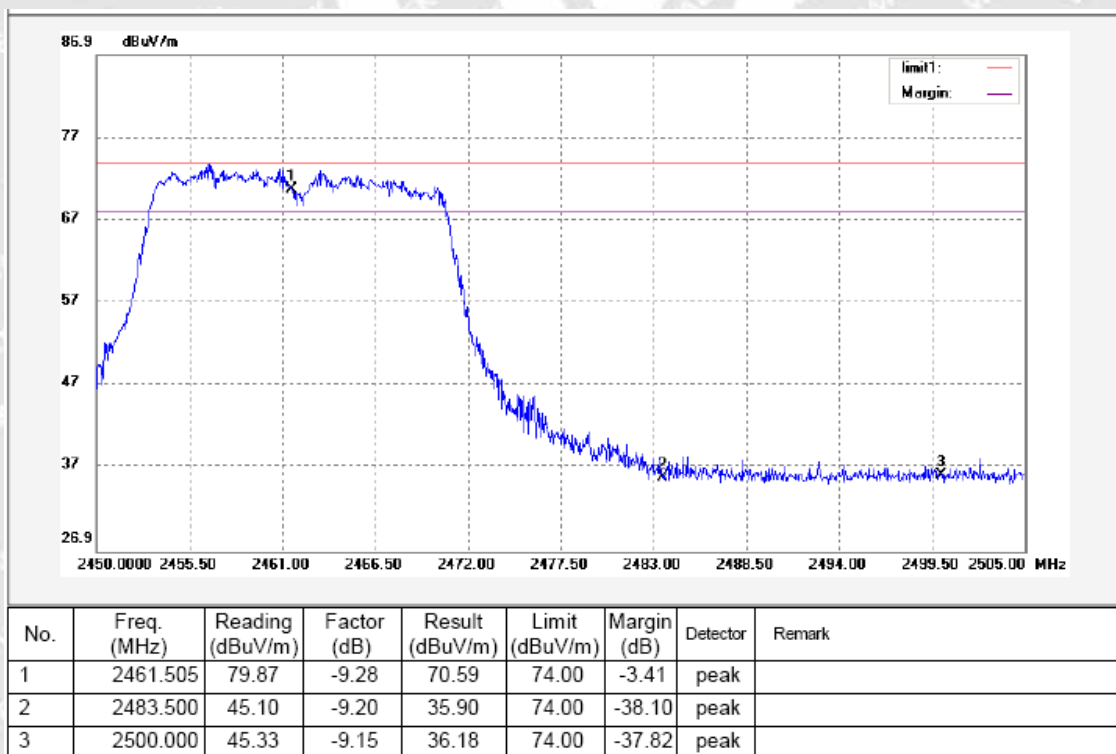
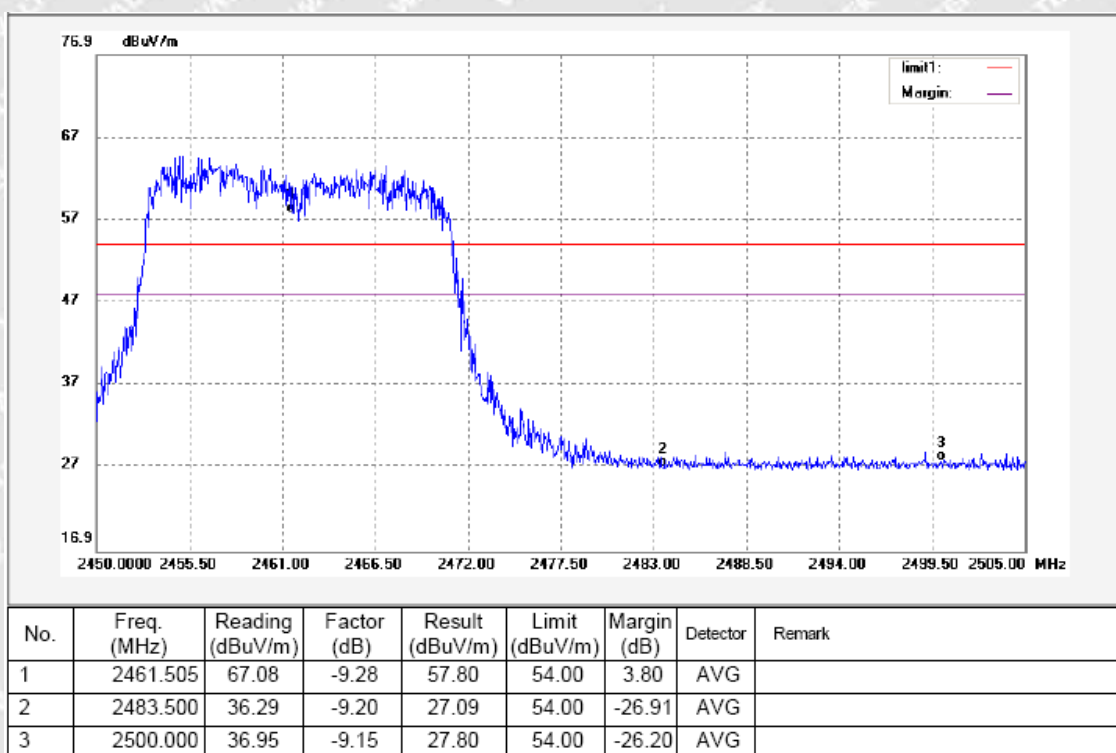
Antenna Polarization:Horizontal





Mode: TX 11n HT 20 channel 11

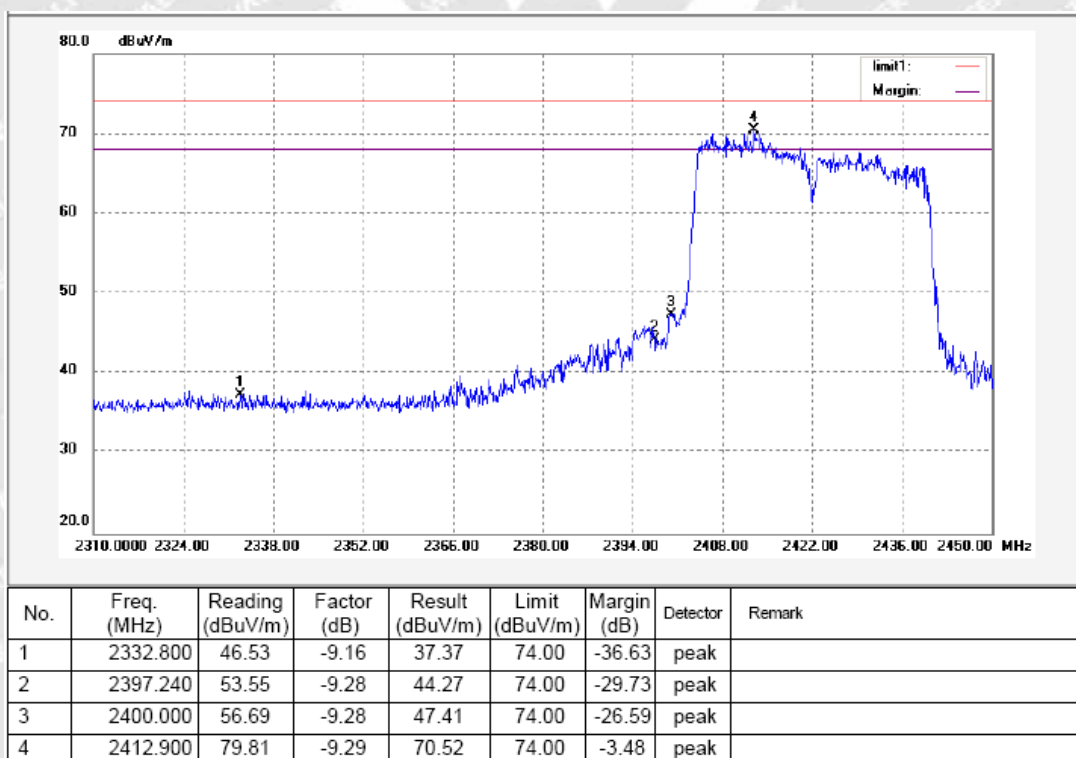
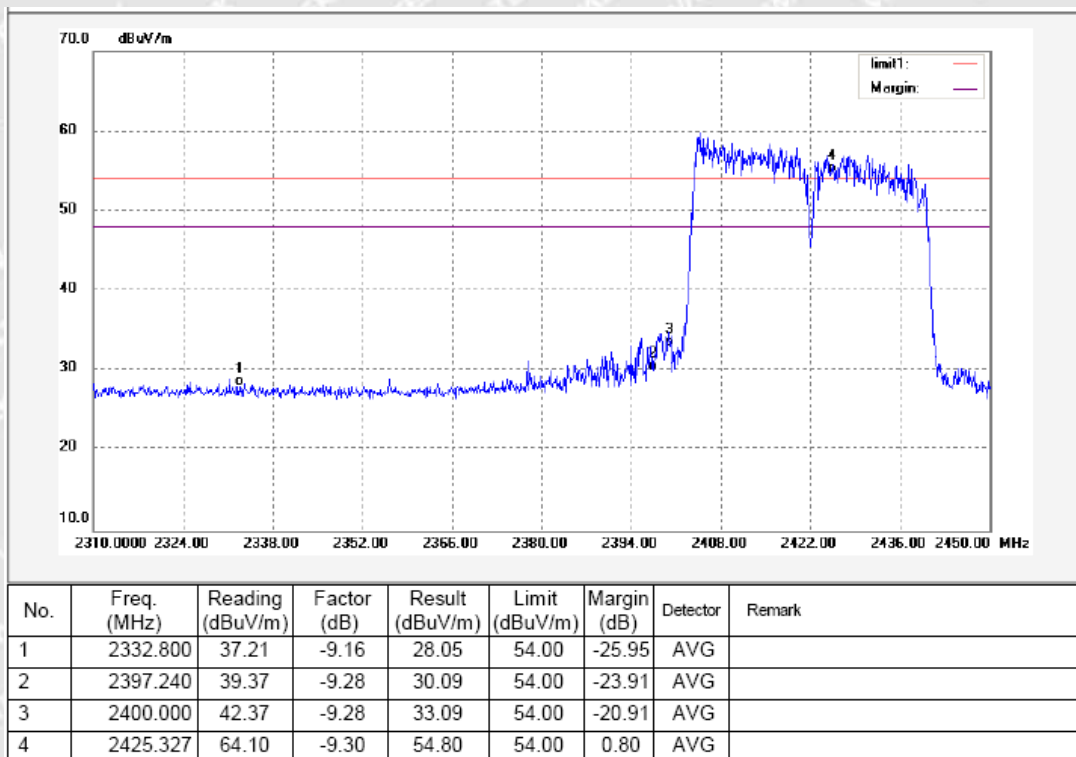
Antenna Polarization:Vertical





Mode: TX 11n HT 40 channel 3

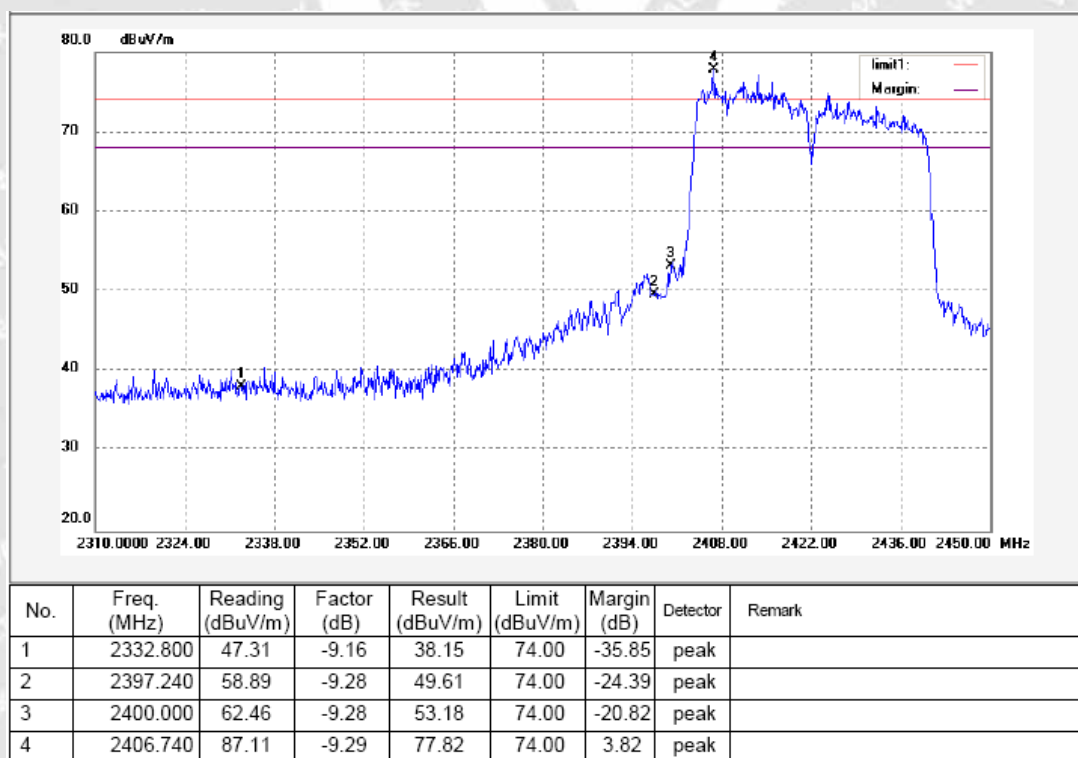
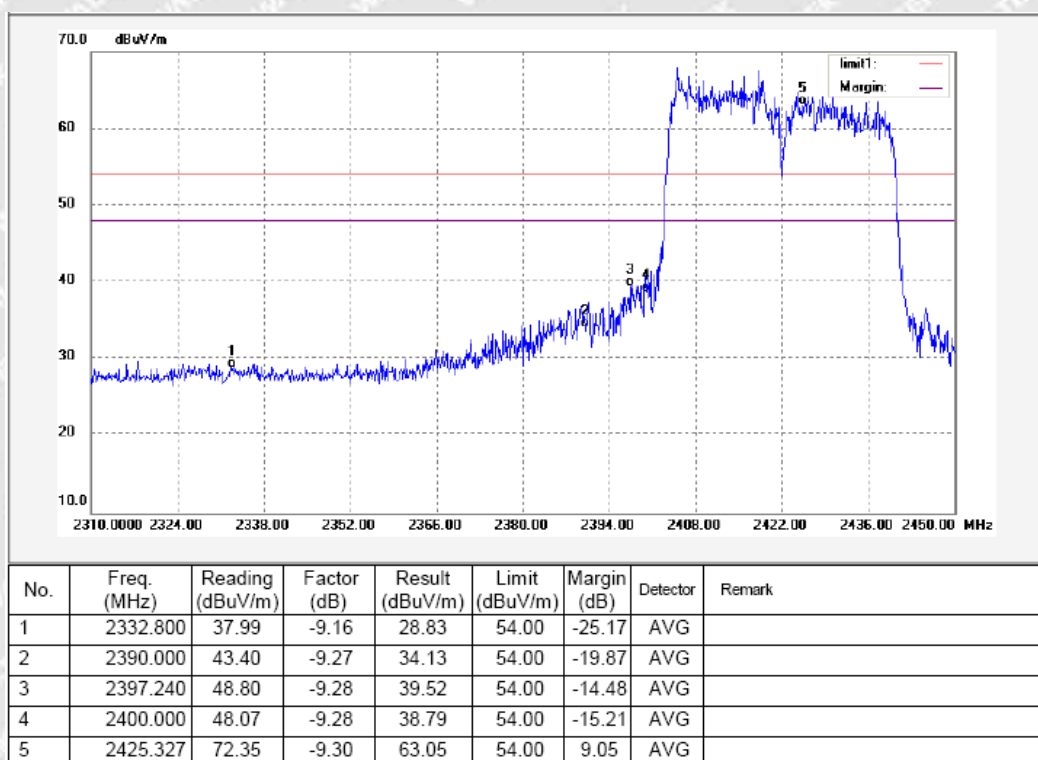
Antenna Polarization:Horizontal





Mode: TX 11n HT 40 channel 3

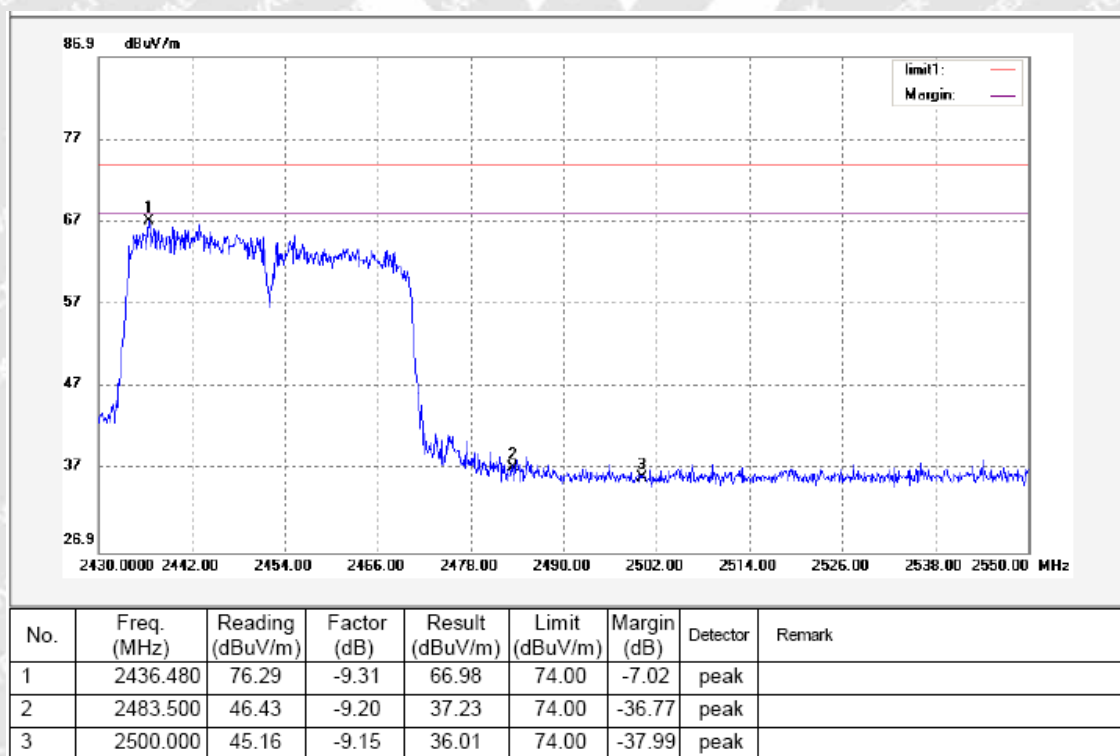
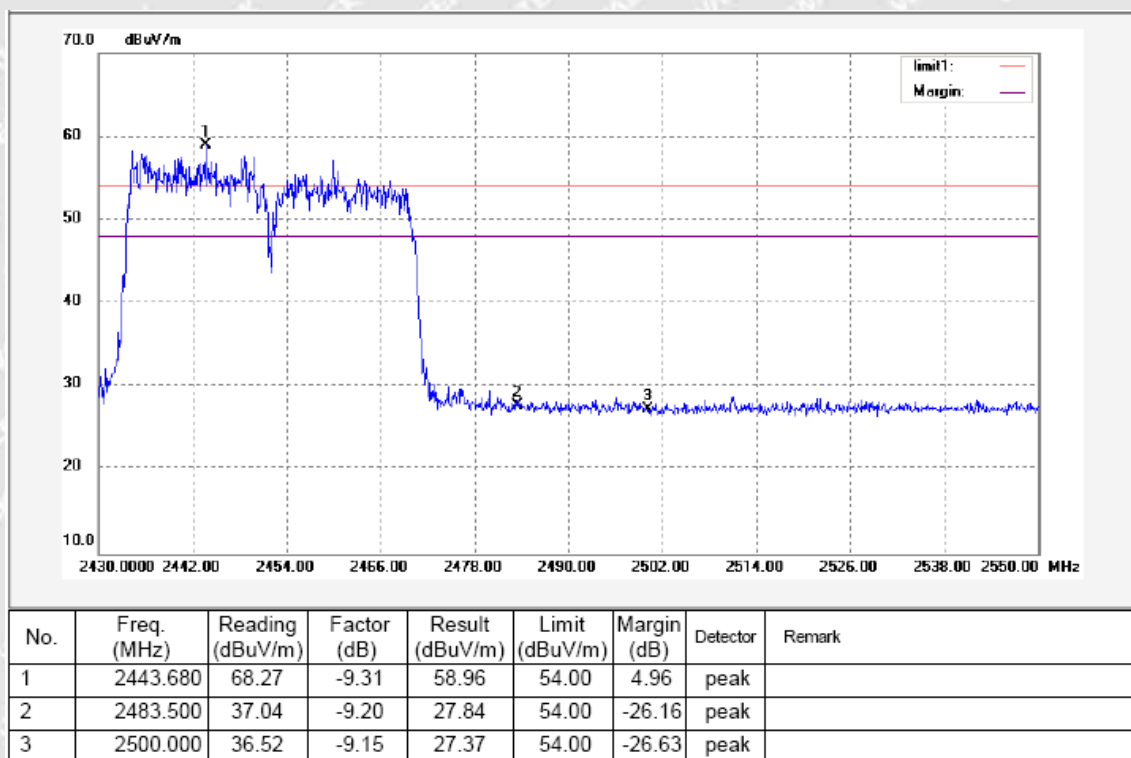
Antenna Polarization:Vertical





Mode: TX 11n HT 40 channel 9

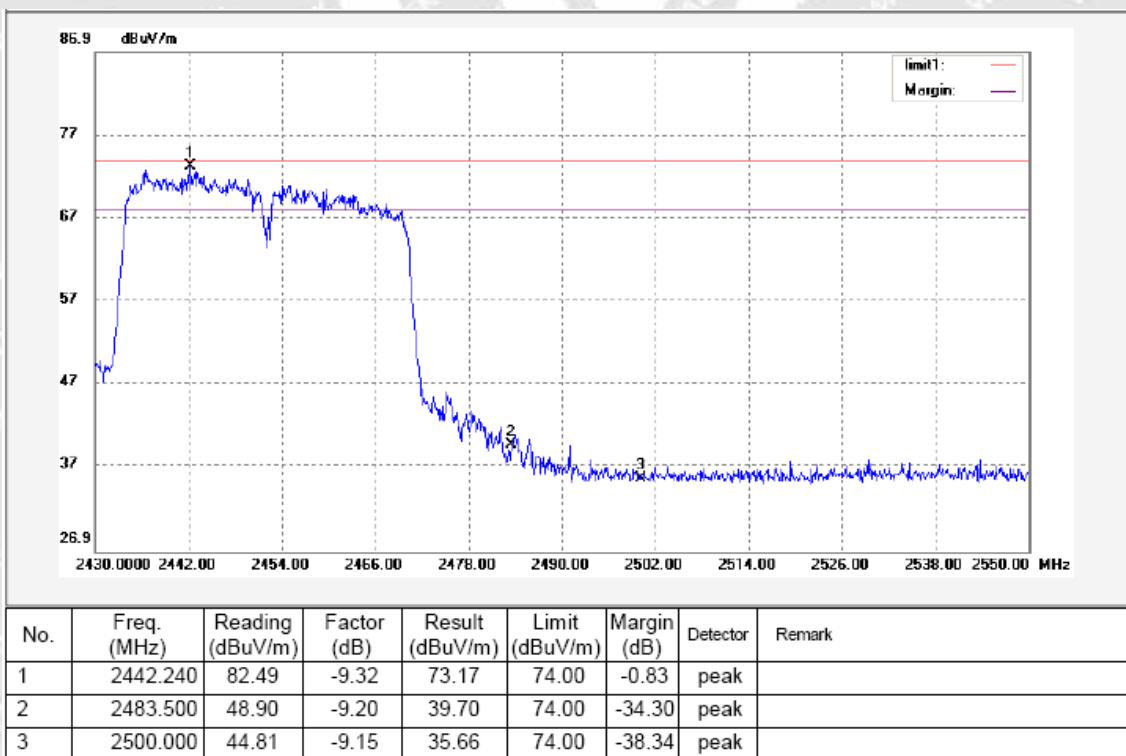
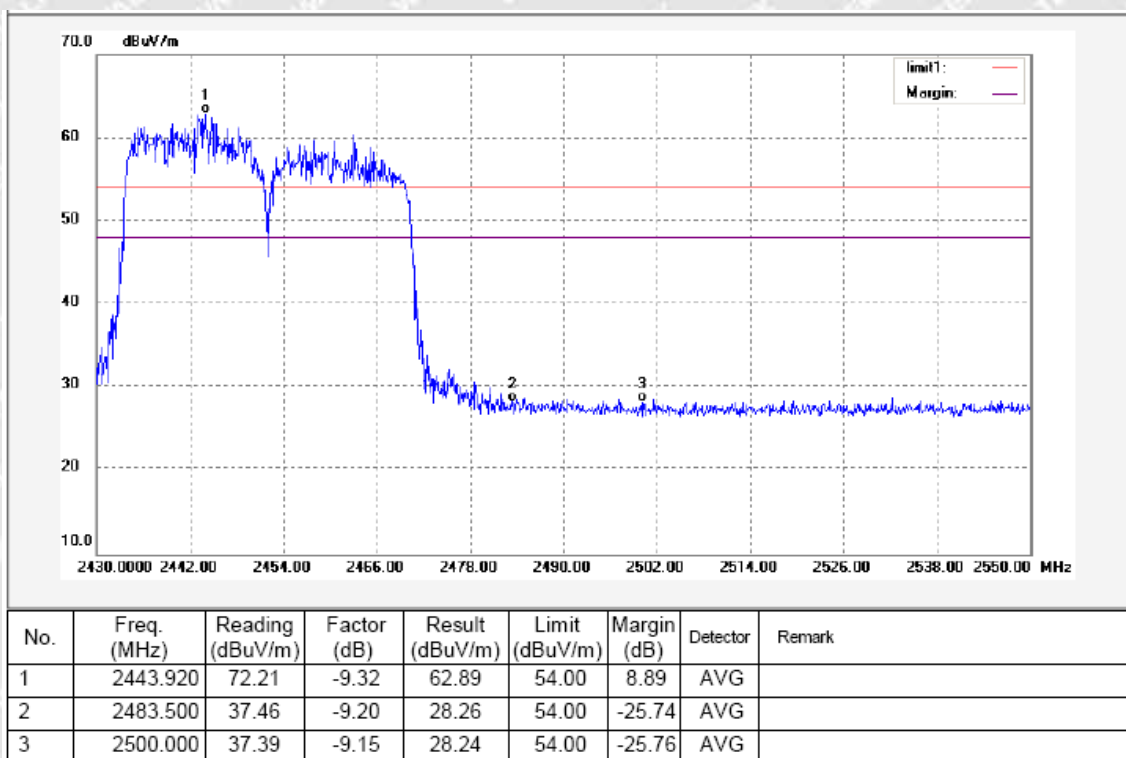
Antenna Polarization:Horizontal





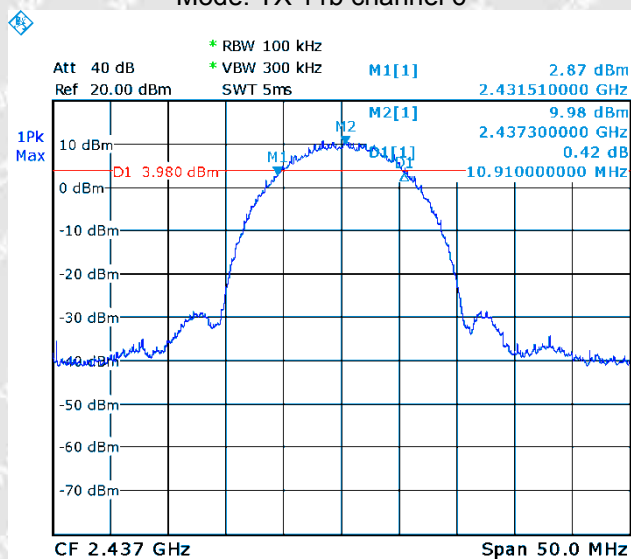
Mode: TX 11n HT 40 channel 9

Antenna Polarization:Vertical

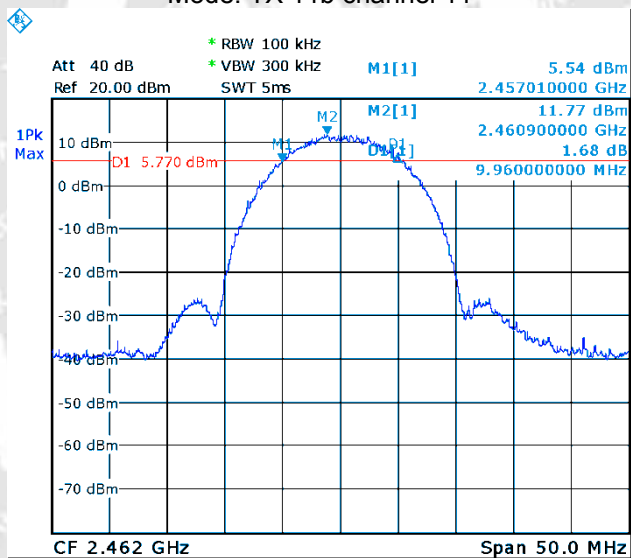




Mode: TX 11b channel 6

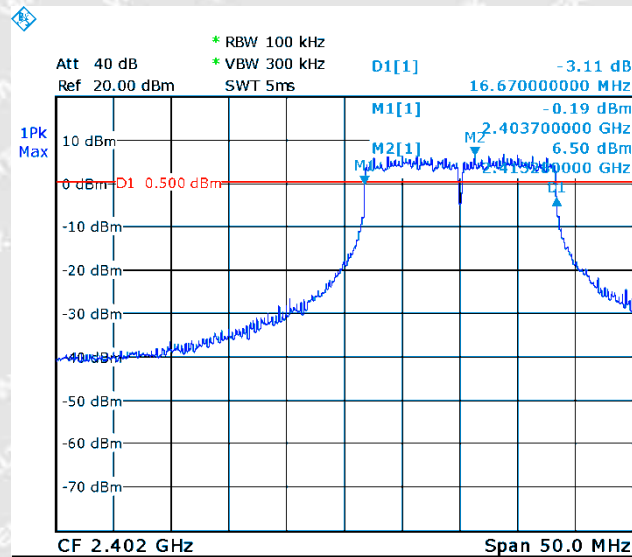


Mode: TX 11b channel 11

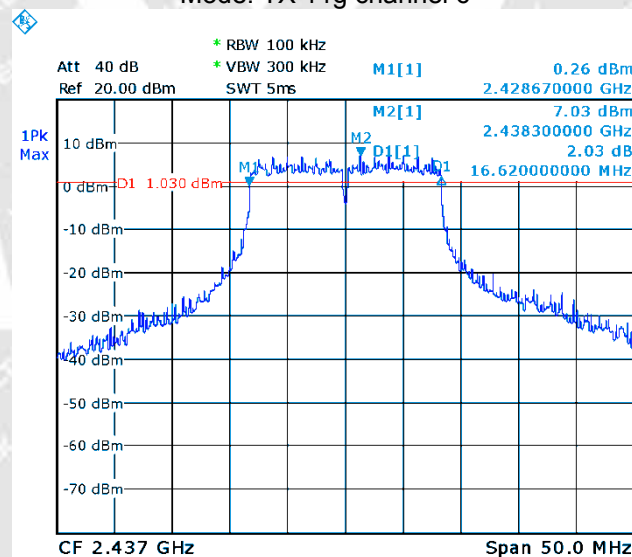




Mode: TX 11g channel 1

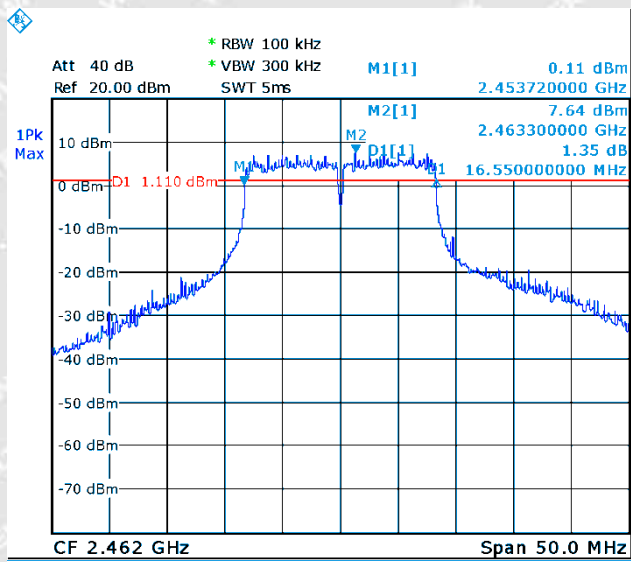


Mode: TX 11g channel 6

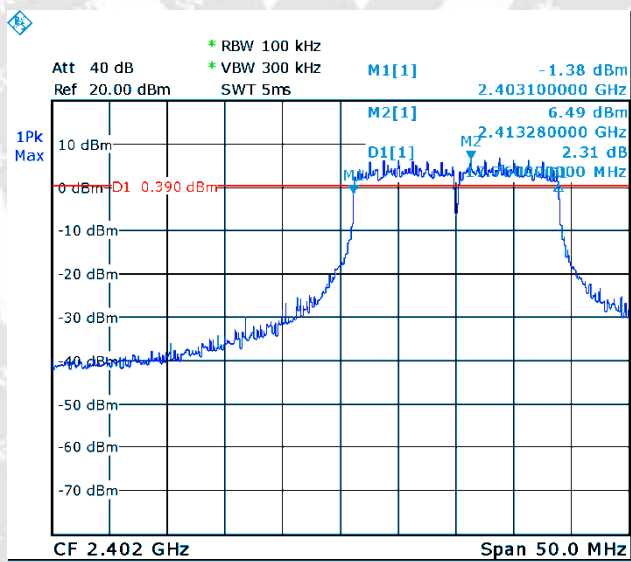




Mode: TX 11g channel 11

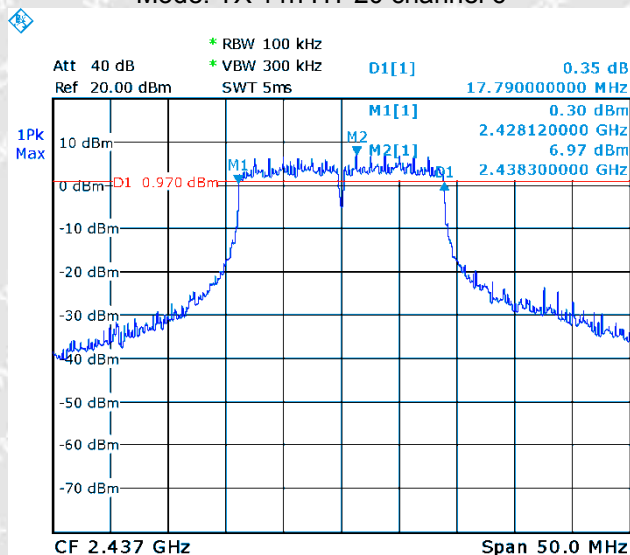


Mode: TX 11n HT 20 channel 1

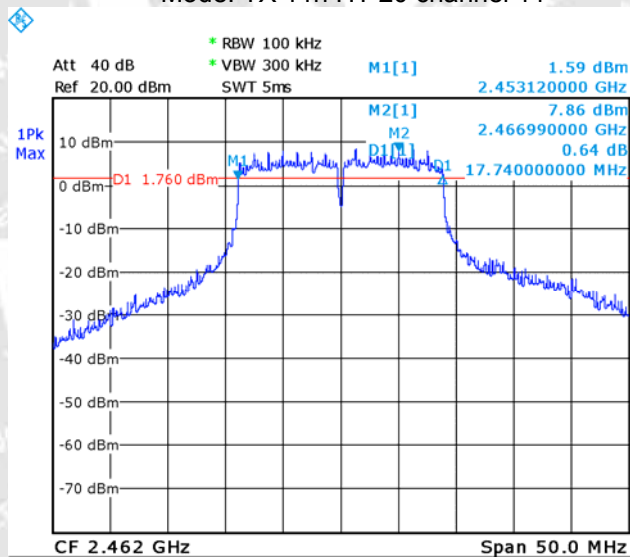




Mode: TX 11n HT 20 channel 6

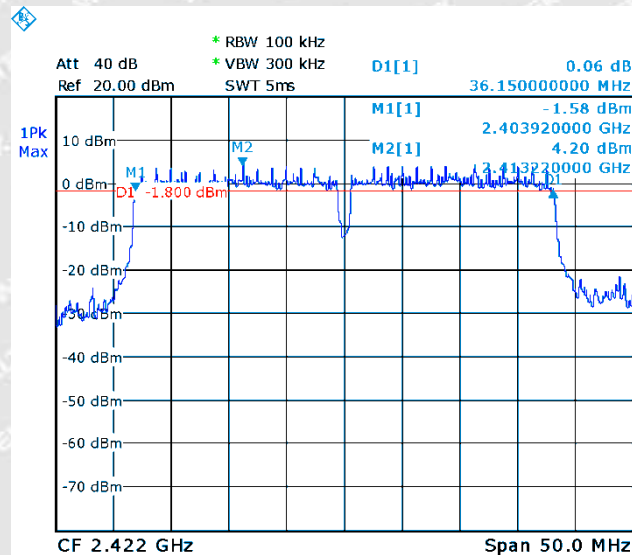


Mode: TX 11n HT 20 channel 11

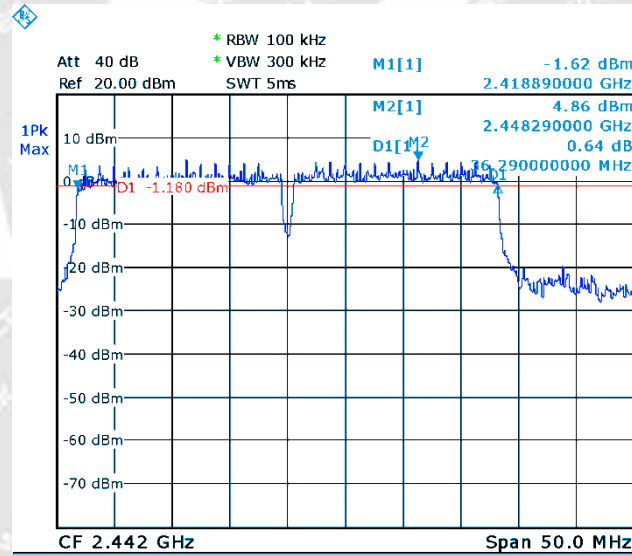




Mode: TX 11n HT 40 channel 3

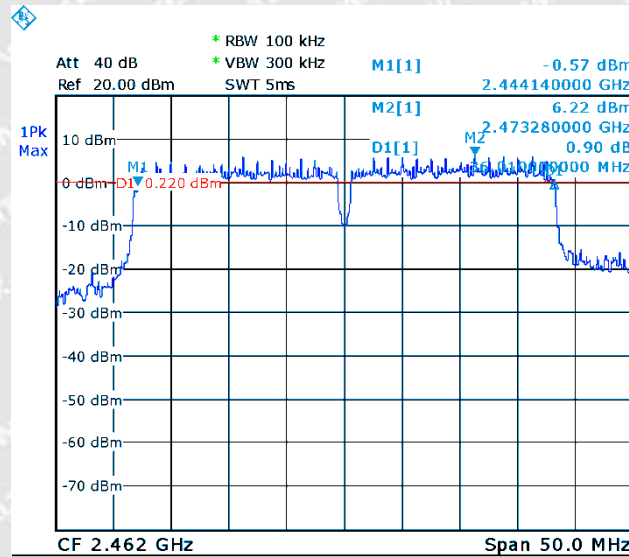


Mode: TX 11n HT 40 channel 7





Mode: TX 11n HT 40 channel 9



WALTEK



10 Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01 V03 April 9,2013

10.1 Test Procedure:

KDB558074 D01 V03 April 9,2013

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 = 10 MHz. VBW = 10 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
15.60	17.50	17.91
Limit		
1W/30dBm		

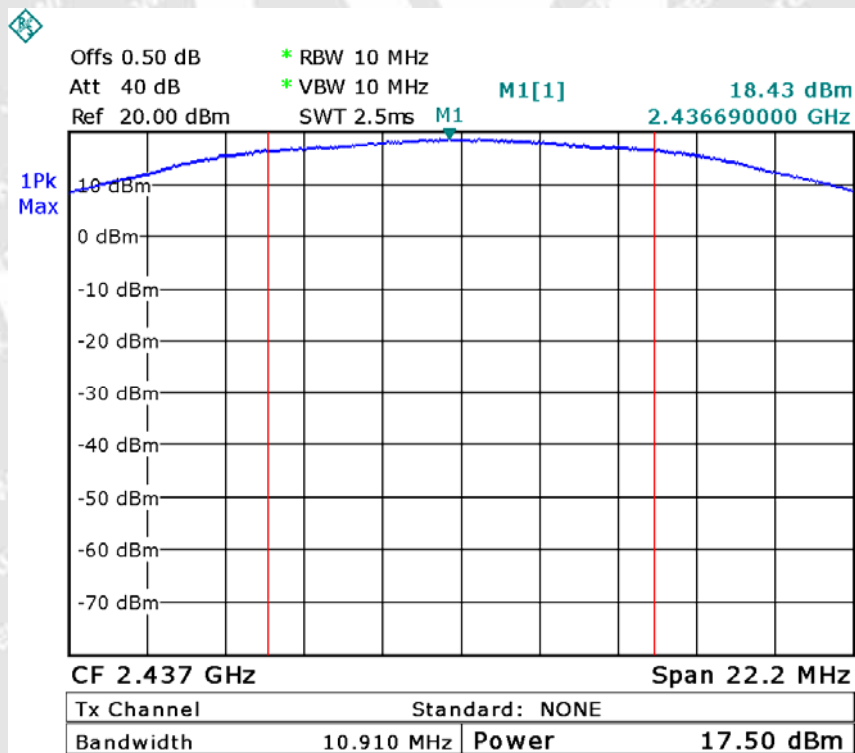
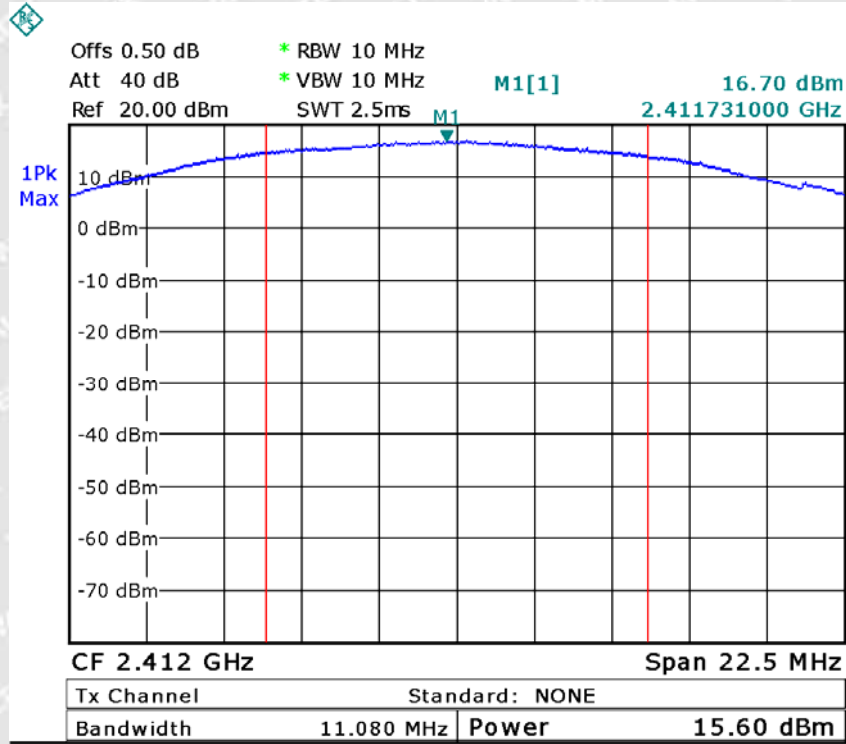
Test mode :TX 11g		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
22.56	22.61	23.20
Limit		
1W/30dBm		

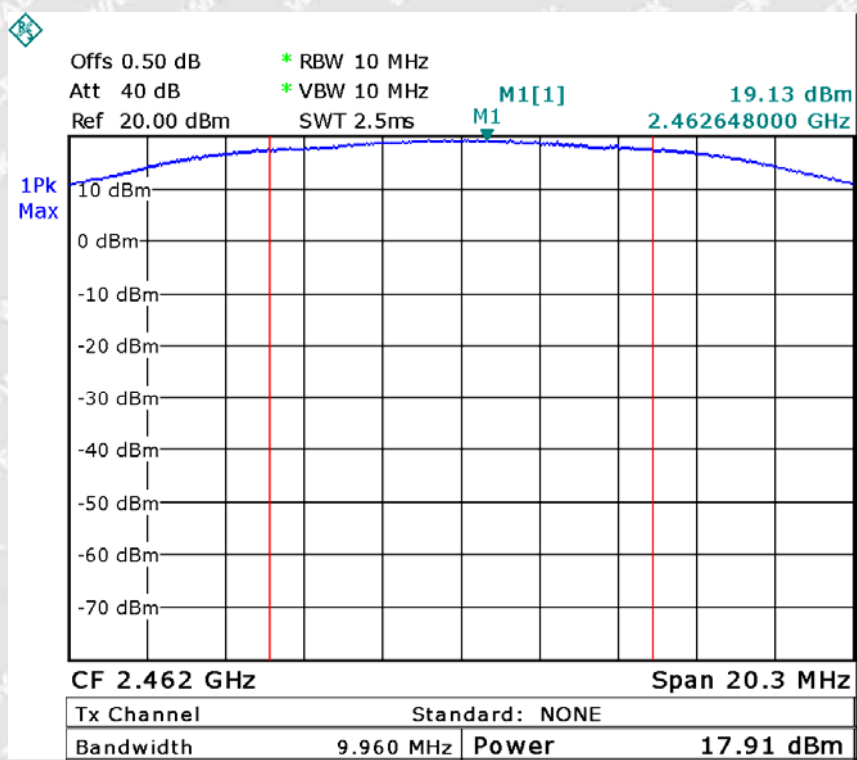
Test mode :TX 11n HT 20		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
21.22	21.93	21.97
Limit		
1W/30dBm		

Test mode :TX 11n HT 40		
10 Maximum Peak Output Power (dBm)		
2422MHz	2442MHz	2452MHz
20.60	21.68	22.23
Limit		
1W/30dBm		

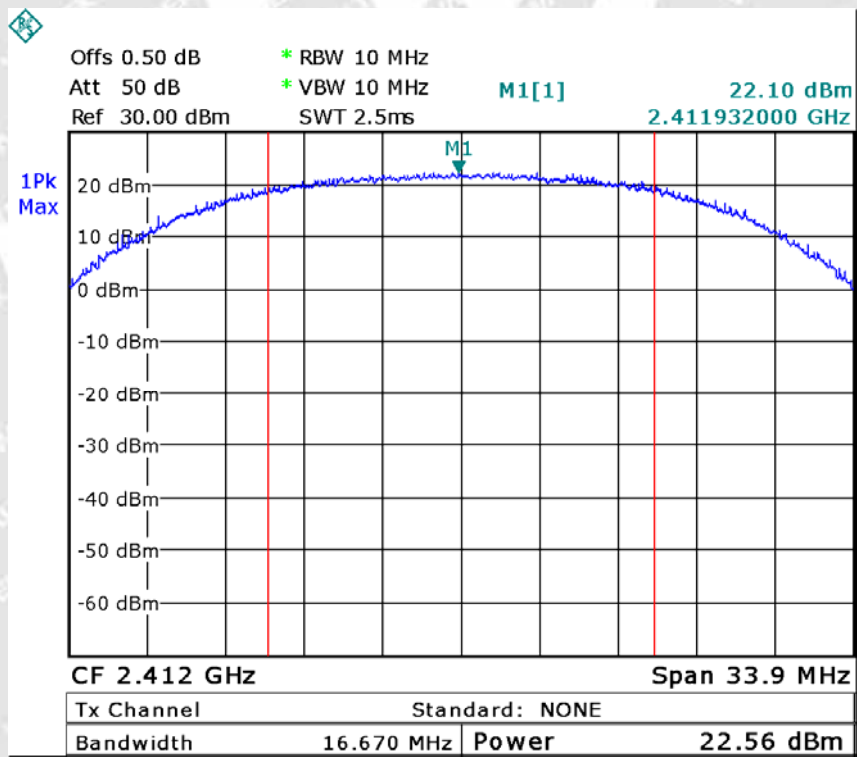


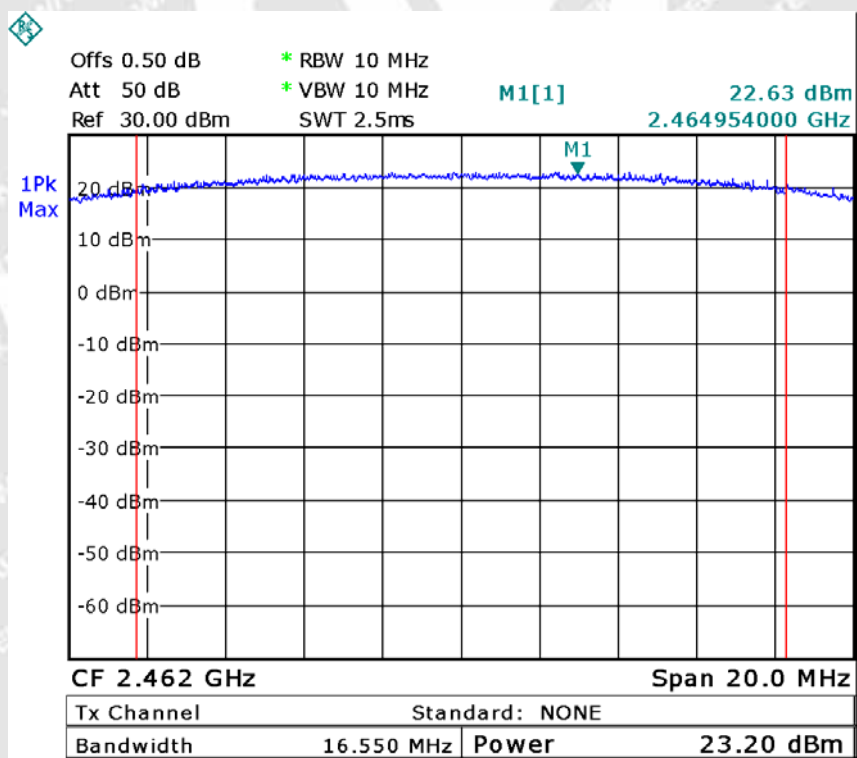
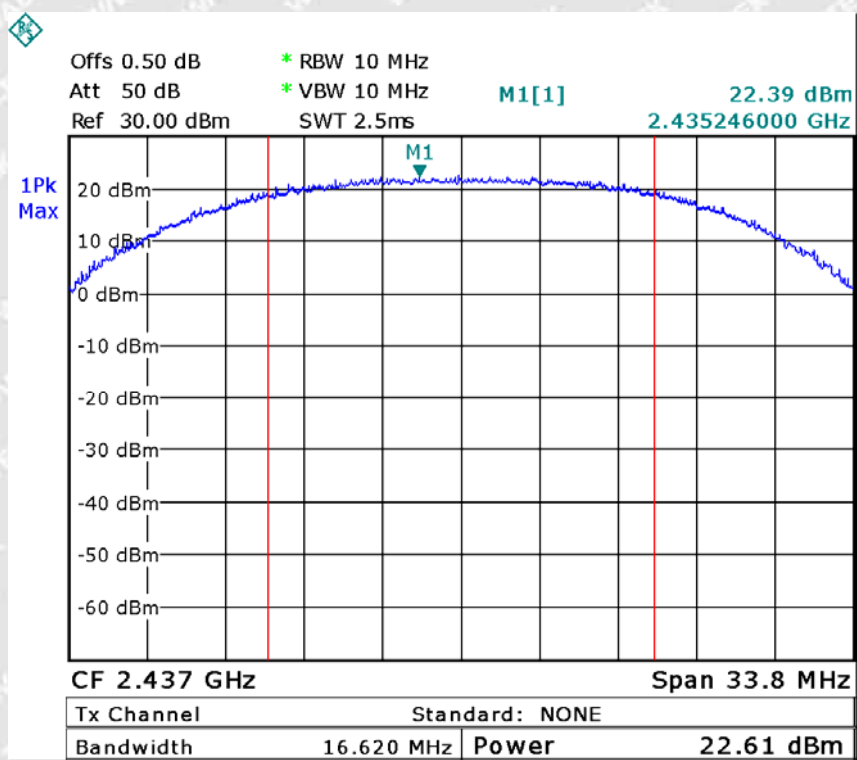
Test mode :TX 11b





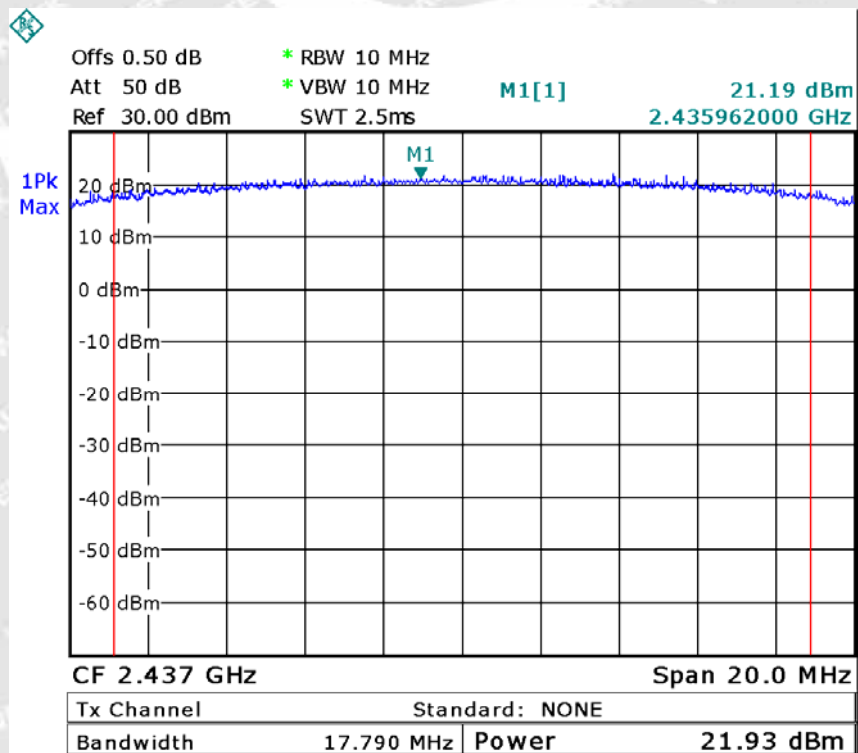
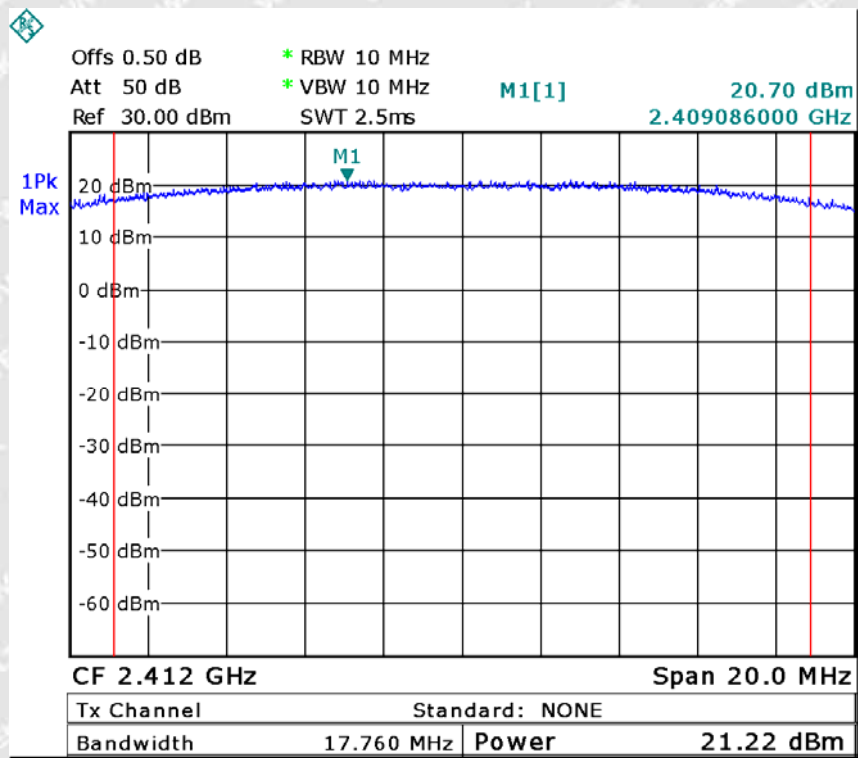
Test mode :TX 11g

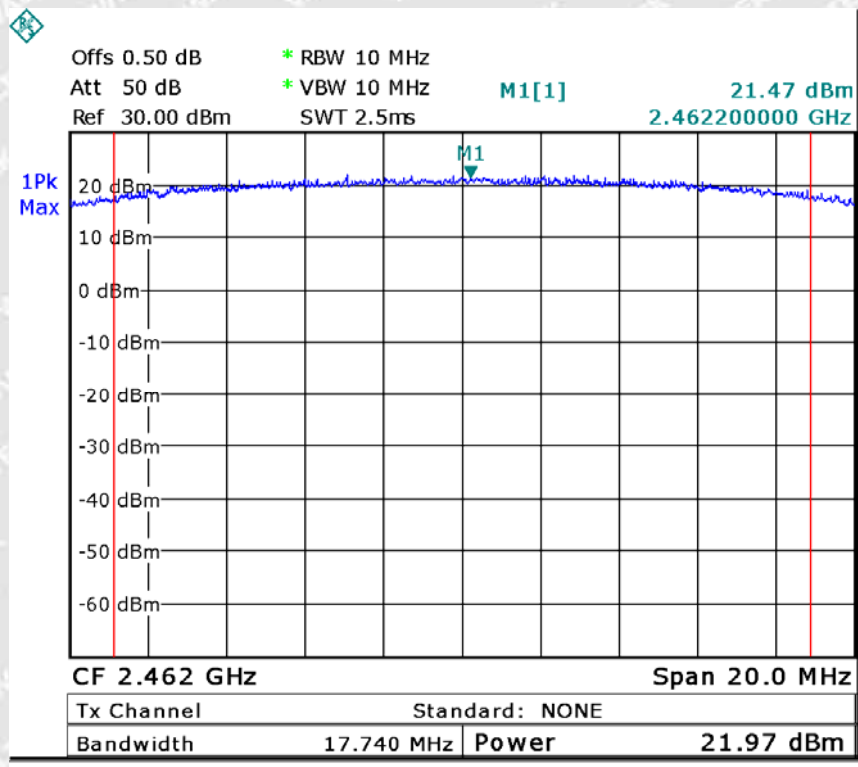




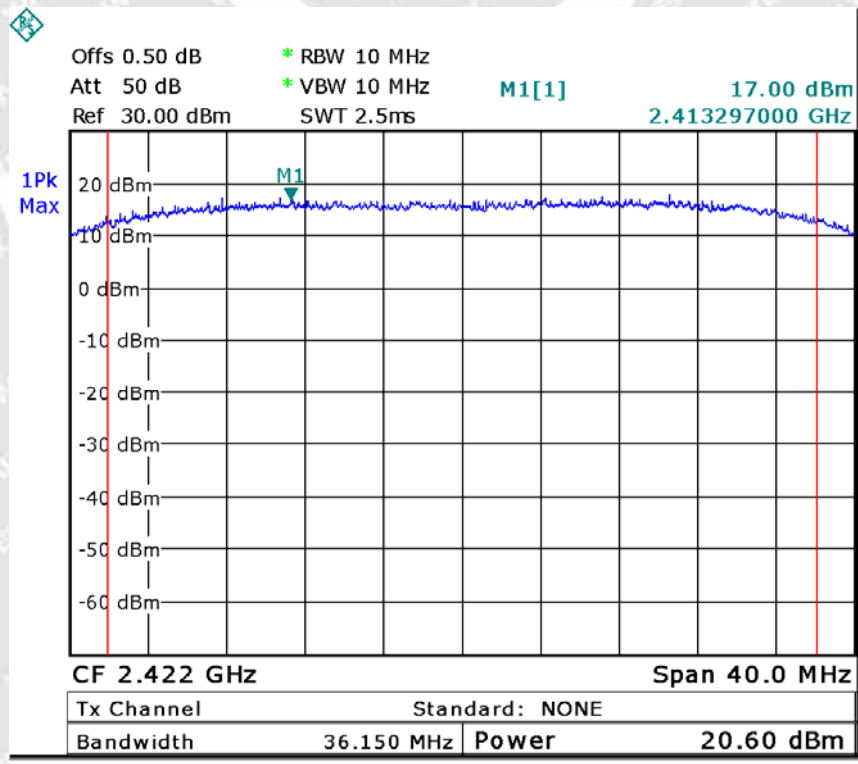


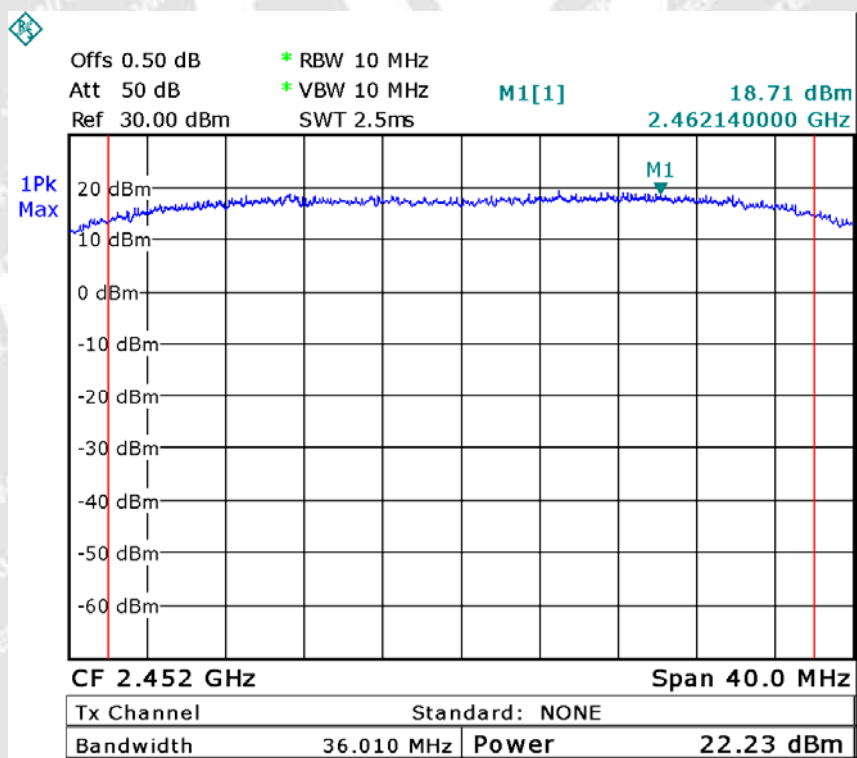
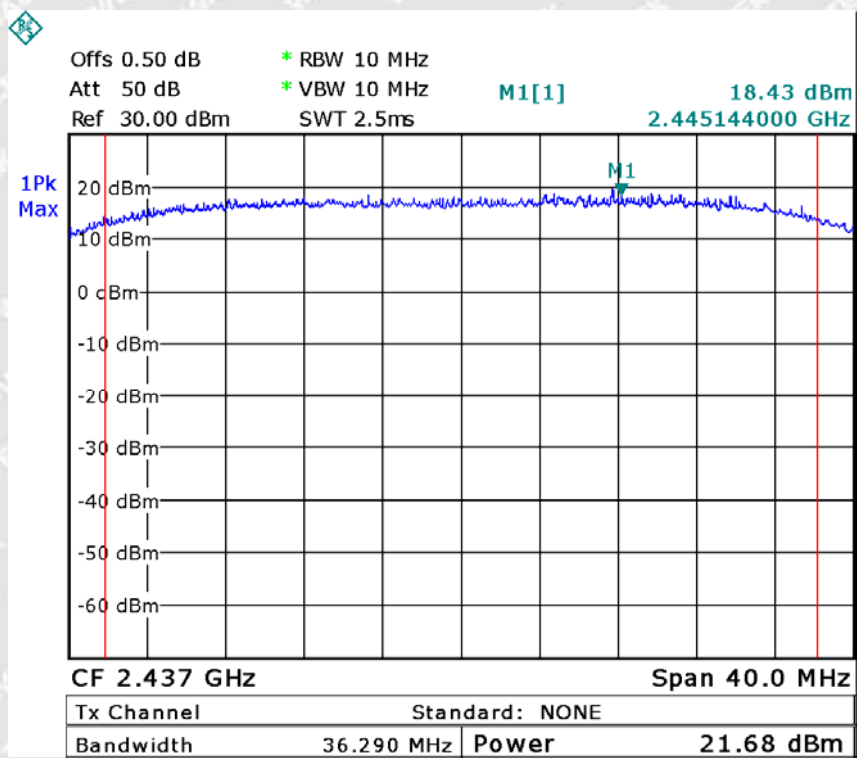
Test mode :TX 11n HT 20





Test mode :TX 11n HT 40







11 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01 V03 April 9,2013

11.1 Test Procedure:

KDB558074 D01 V03 April 9,2013

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 = 300kHz , 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
-10.50	-8.02	-5.85
Limit		
8dBm per 3kHz		

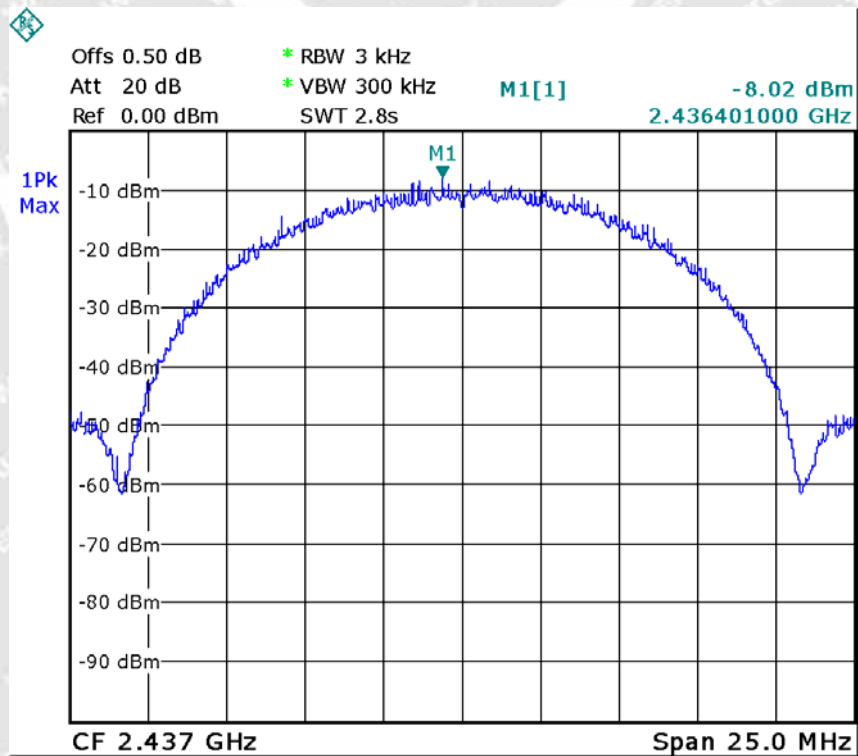
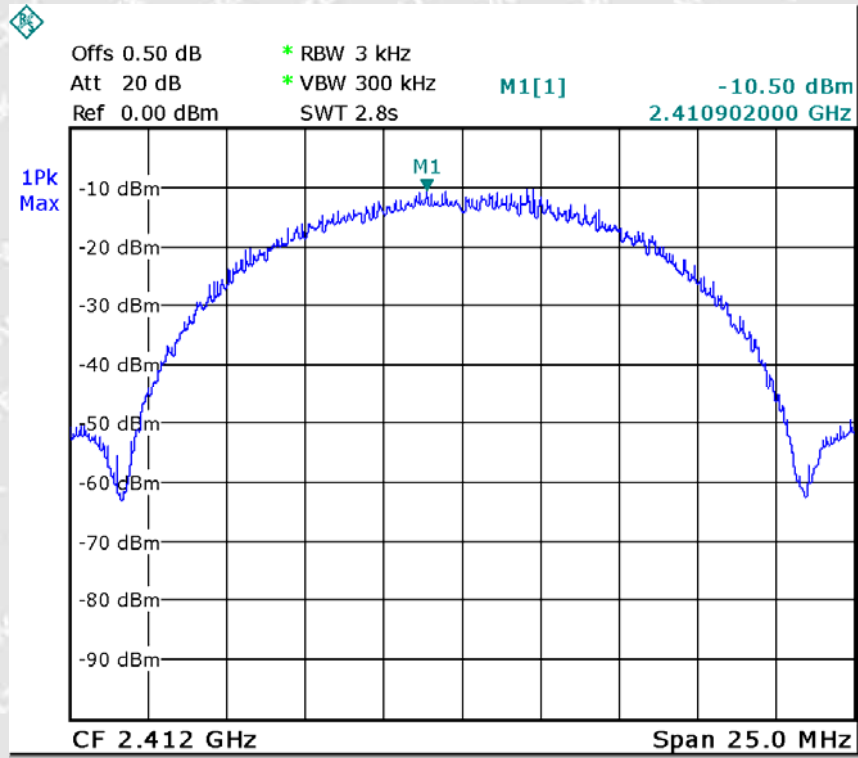
Test mode :TX 11g		
10 Maximum Peak Output Power (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-13.89	-13.30	-13.06
Limit		
8dBm per 3kHz		

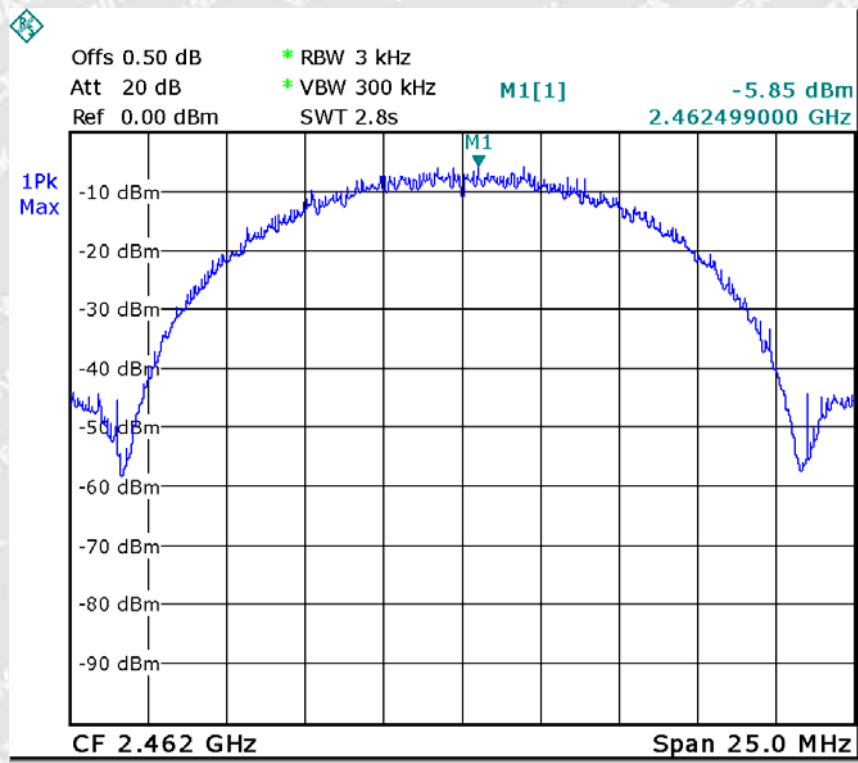
Test mode :TX 11n HT 20		
10 Maximum Peak Output Power (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-15.86	-14.04	-11.22
Limit		
8dBm per 3kHz		

Test mode :TX 11n HT 40		
10 Maximum Peak Output Power (dBm per 3kHz)		
2422MHz	2442MHz	2452MHz
-19.25	-16.21	-17.15
Limit		
8dBm per 3kHz		

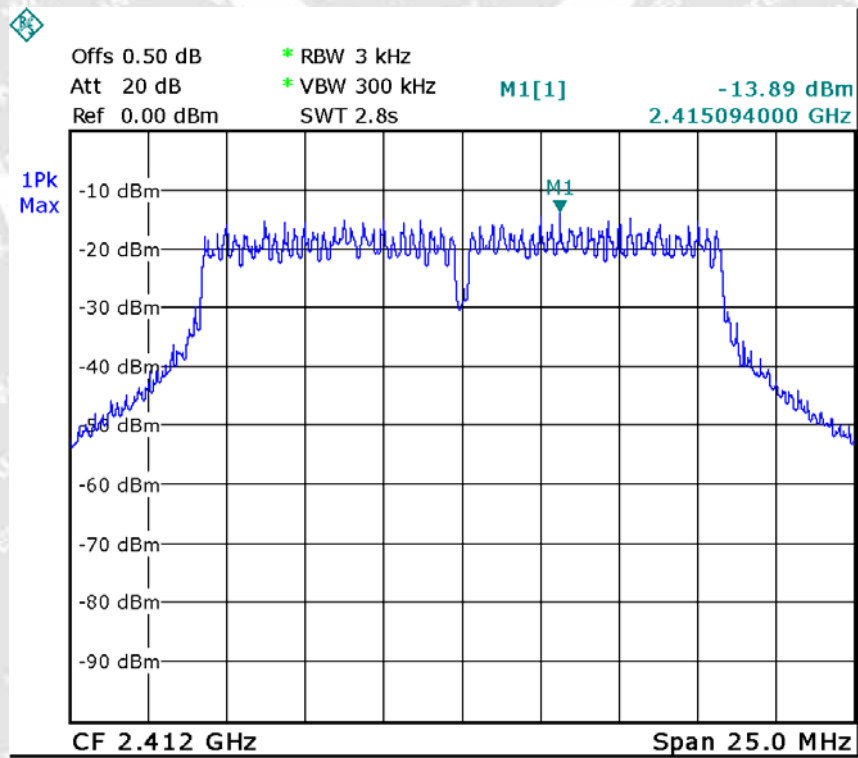


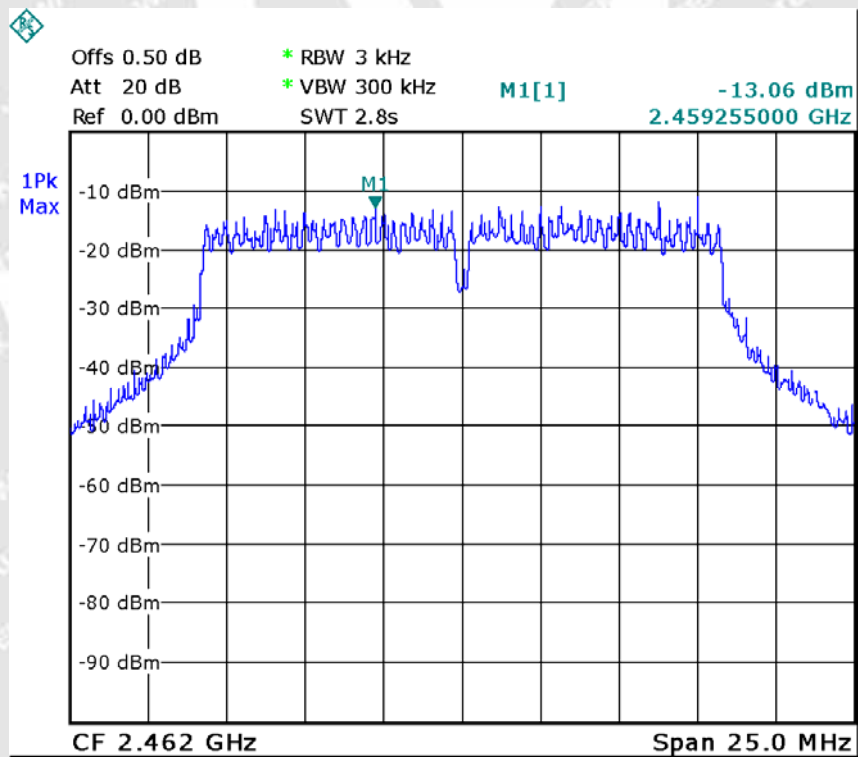
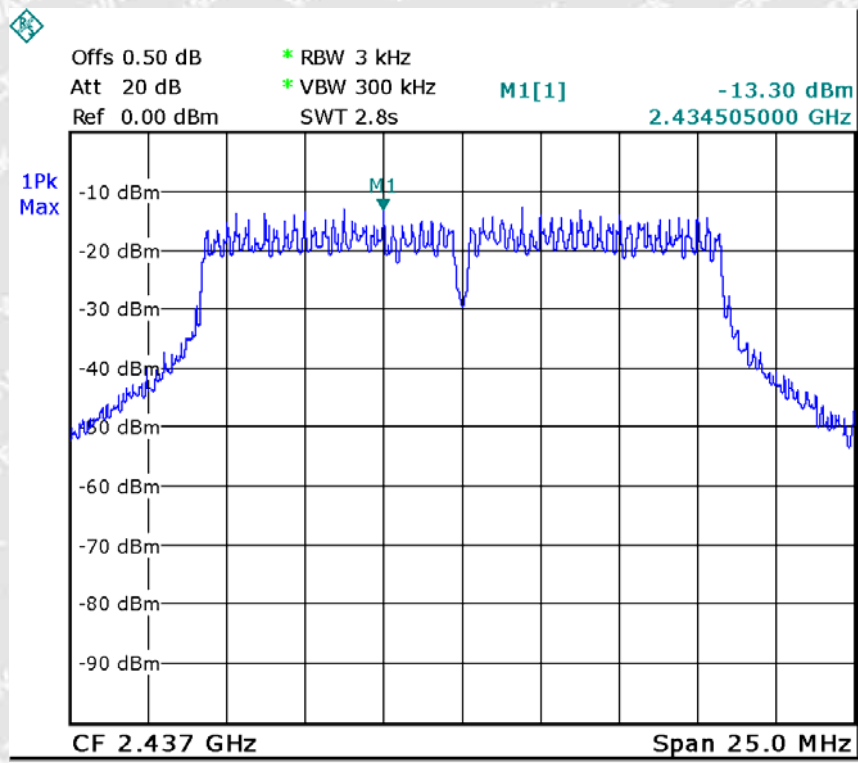
Test mode :TX 11b





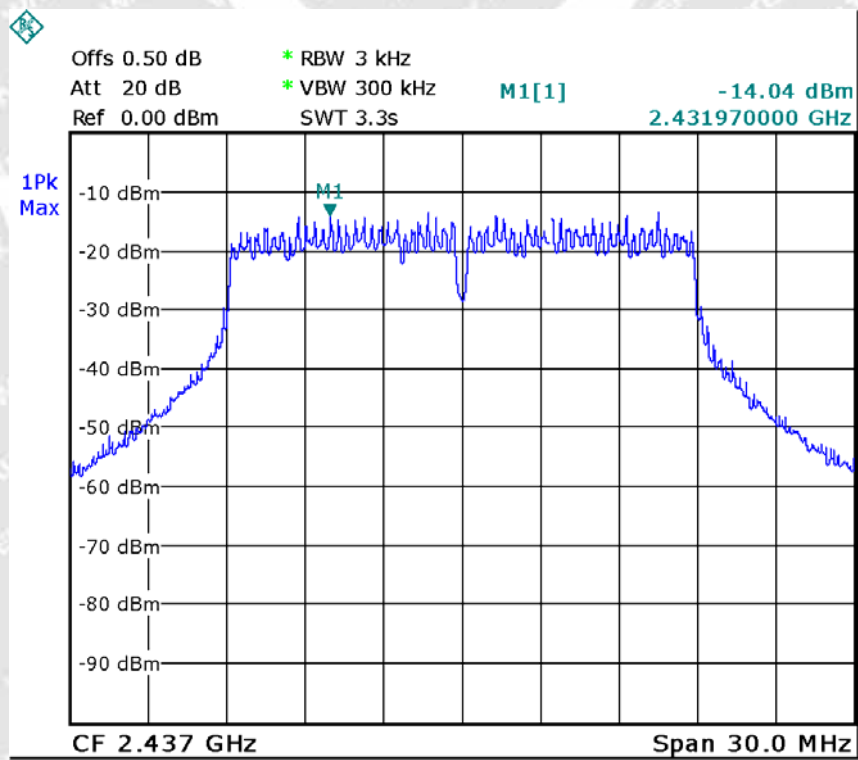
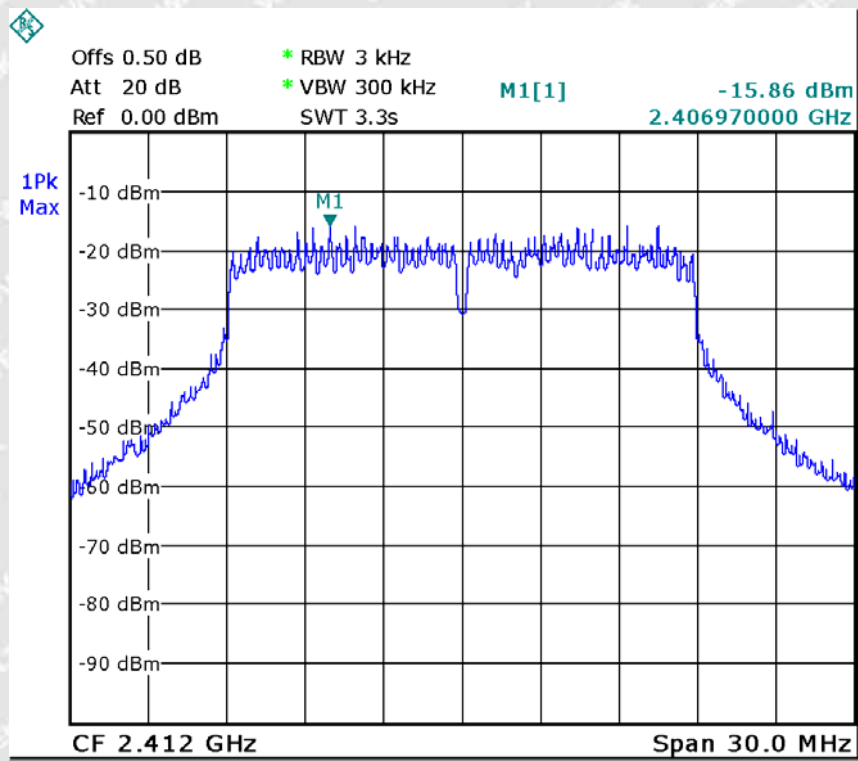
Test mode :TX 11g

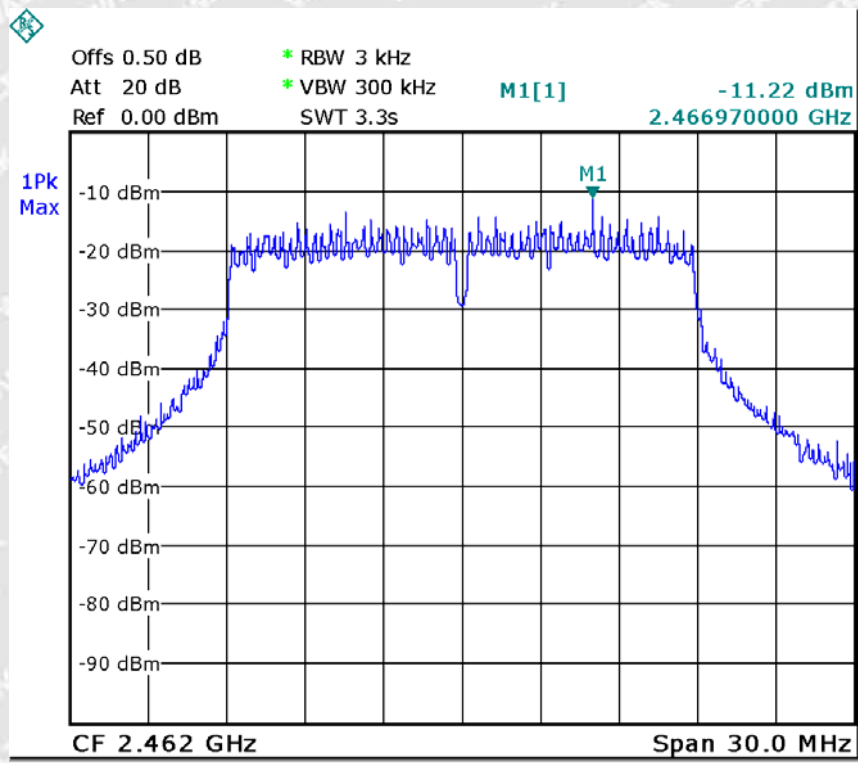




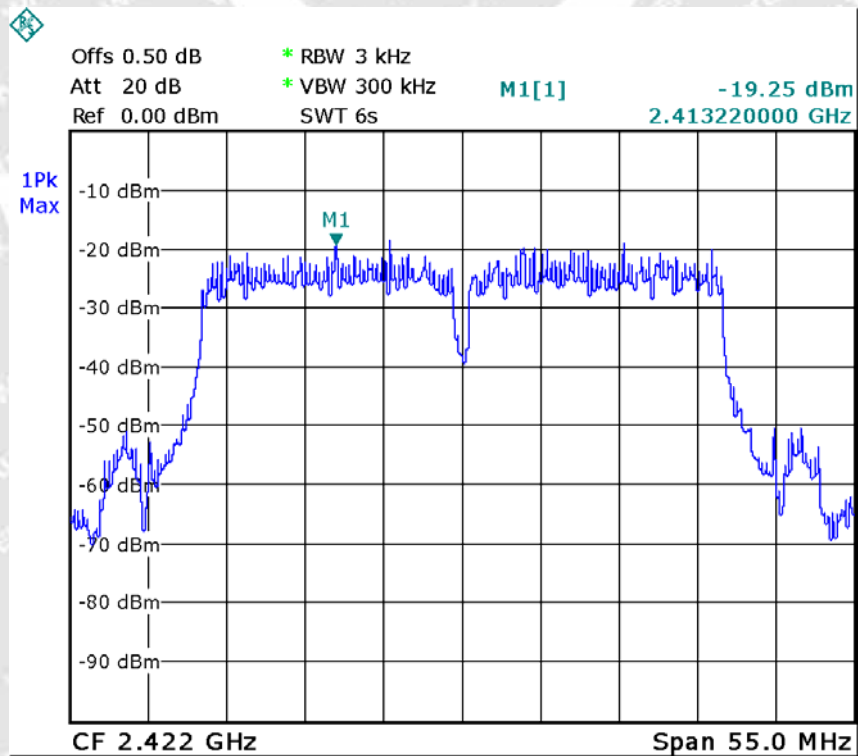


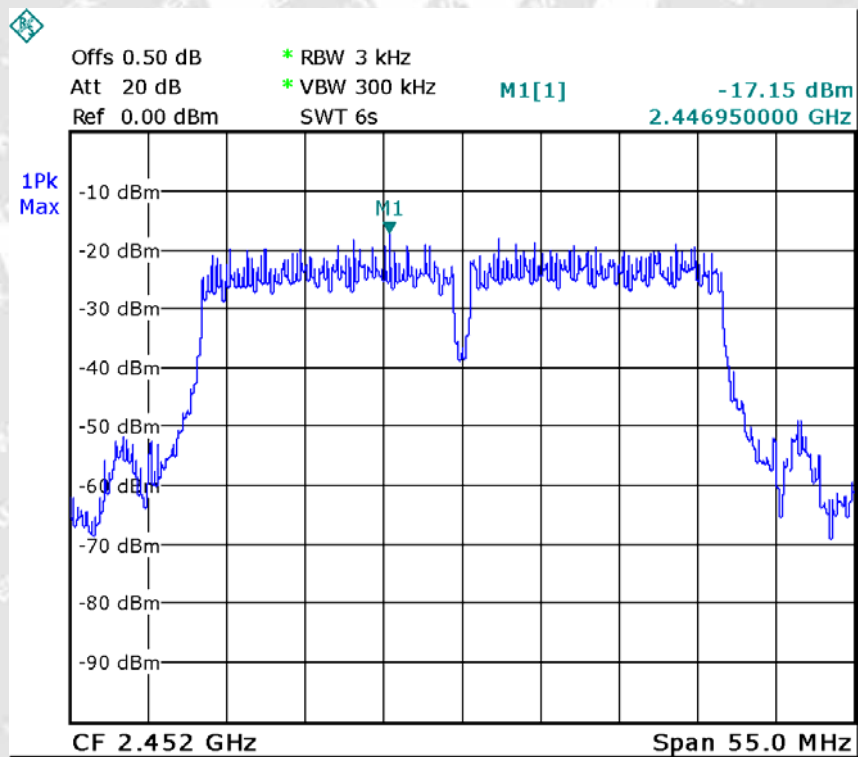
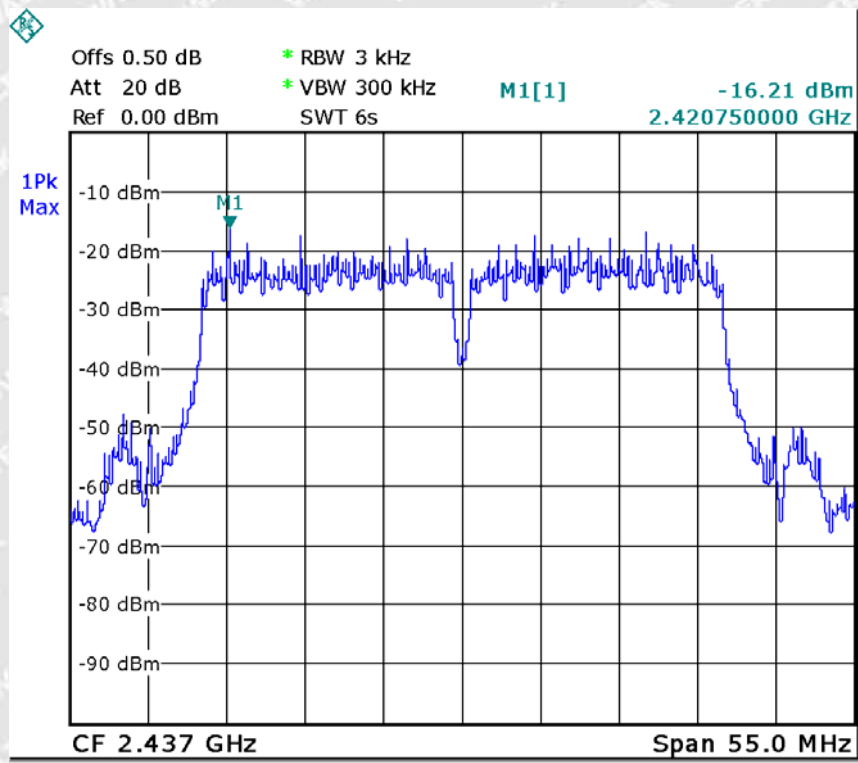
Test mode :TX 11n HT 20





Test mode :TX 11n HT 40







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 V03 April 9,2013

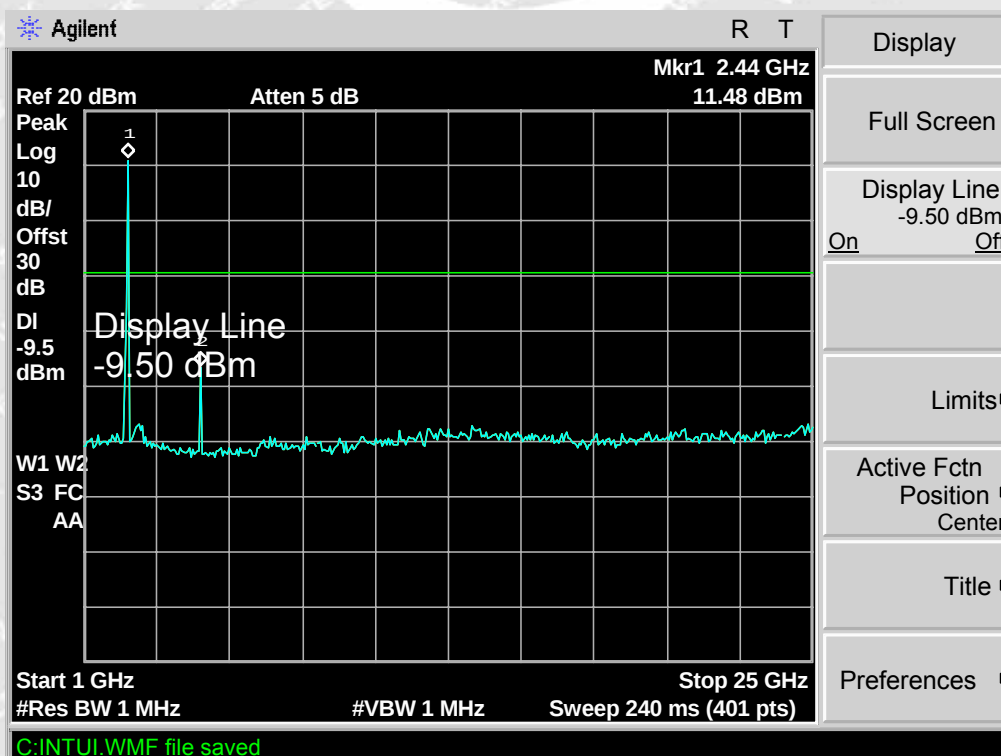
The maximum peak conducted output power procedure was used to demonstrate compliance to 15.247(b)(3) requirements, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level 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.

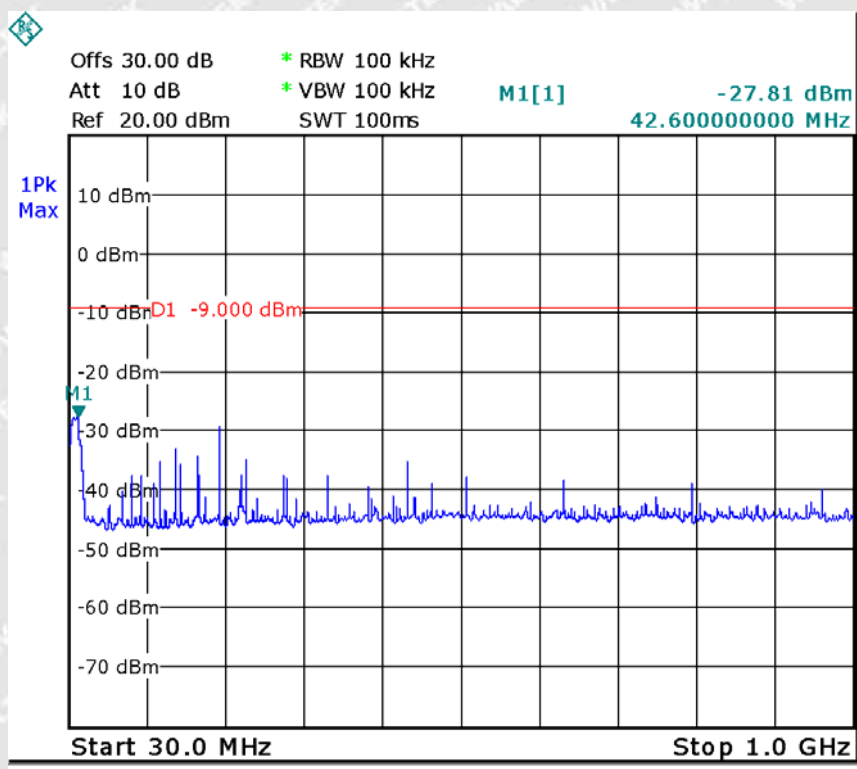
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set to span from the lowest frequency generated in the device up to and including the tenth harmonic of the highest fundamental frequency
3. For below 1GHz, Set RBW = 100kHz and VBW = 100kHz.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

12.2 Test Result:

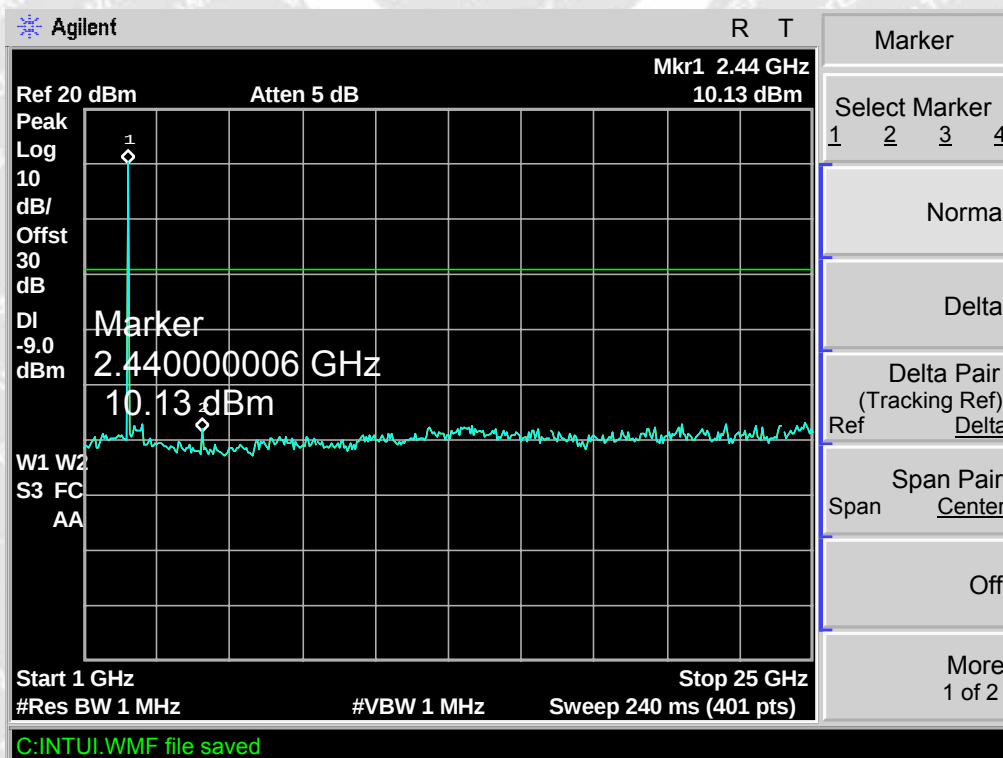
Remark: For emissions below 30MHz, no emission higher than background level, so the data does not show in the report.

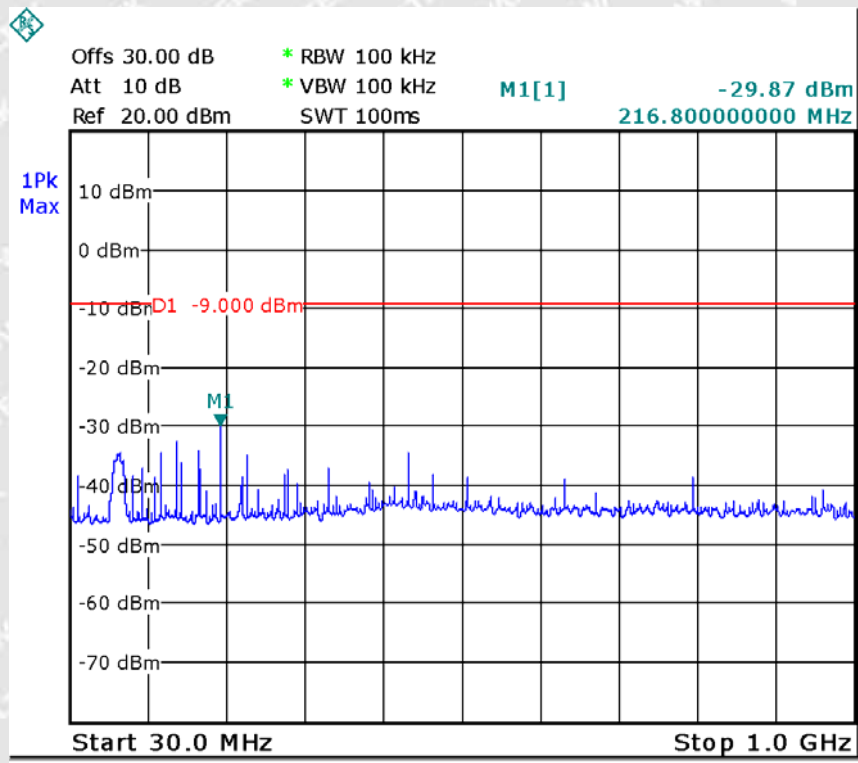
Test mode :TX 11b Lower channel



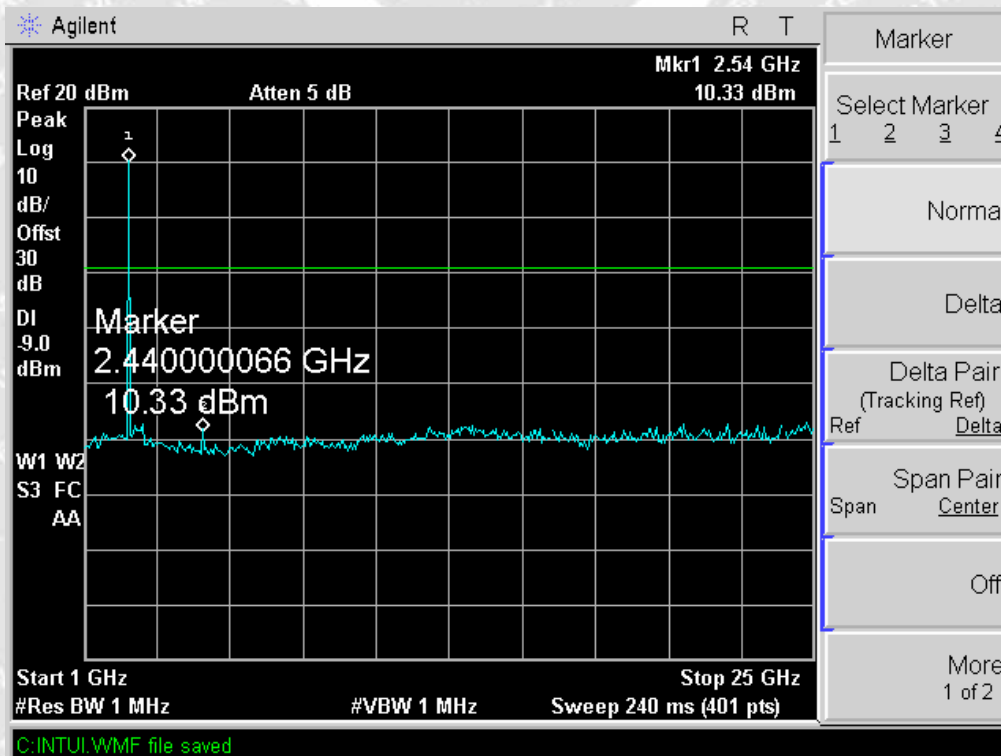


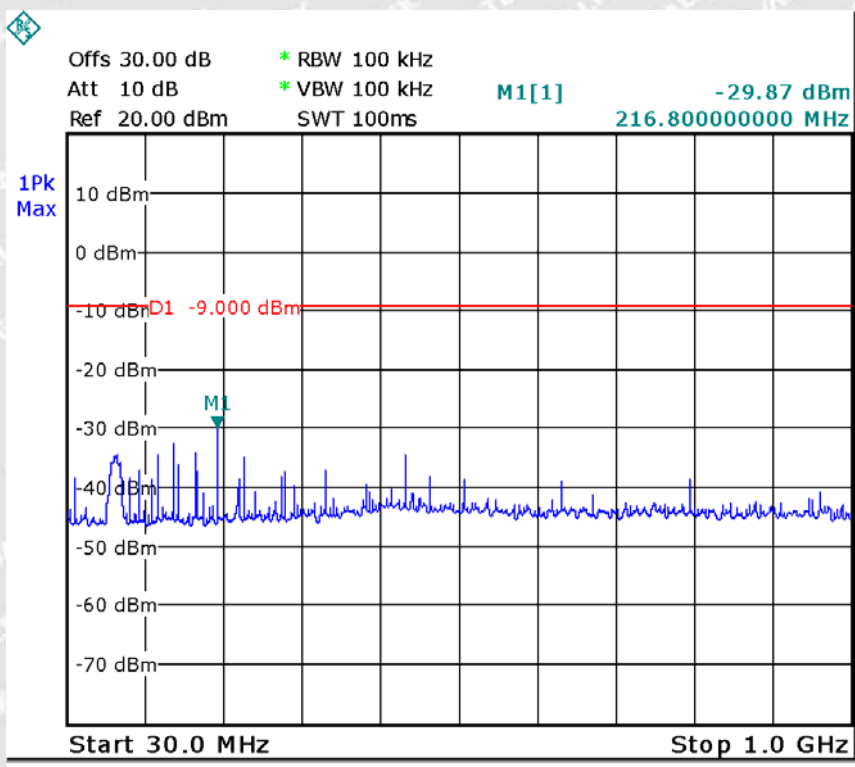
Test mode :TX 11b Middle channel



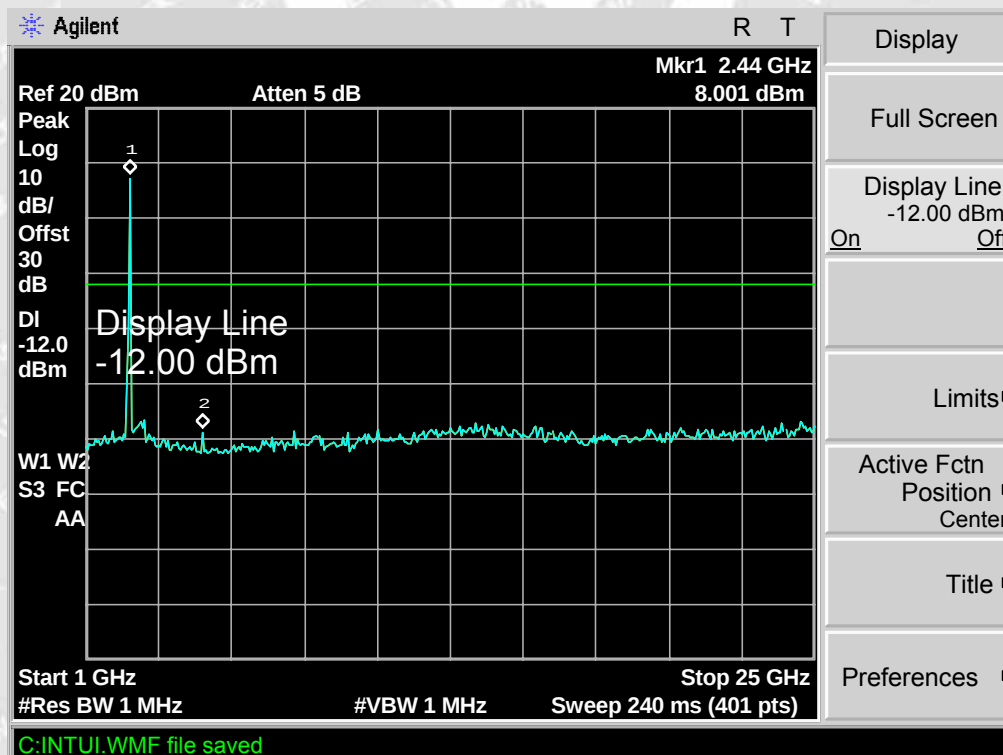


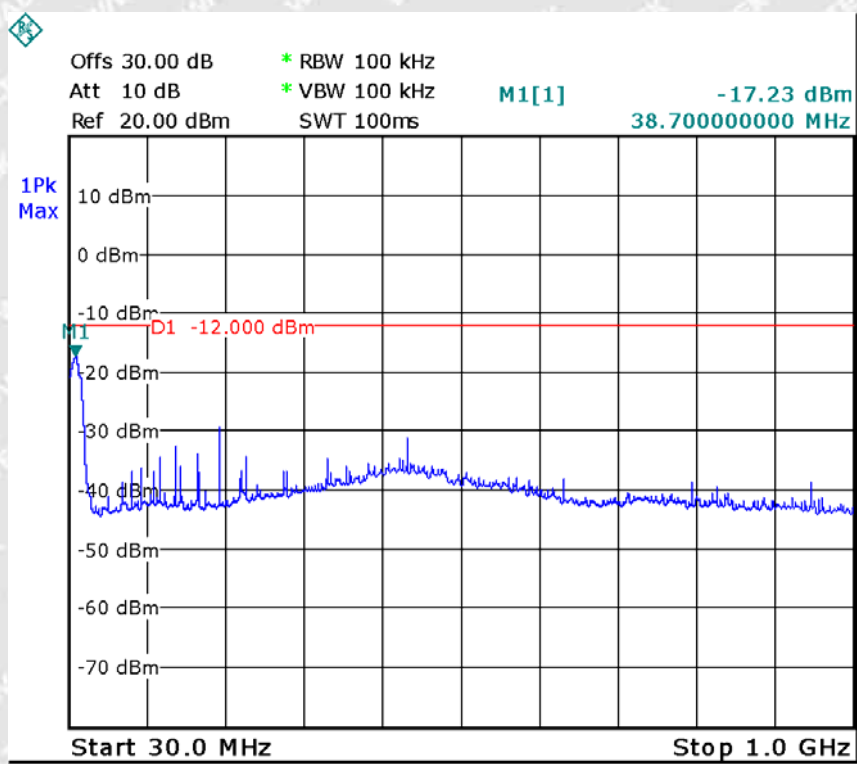
Test mode :TX 11b Upper channel



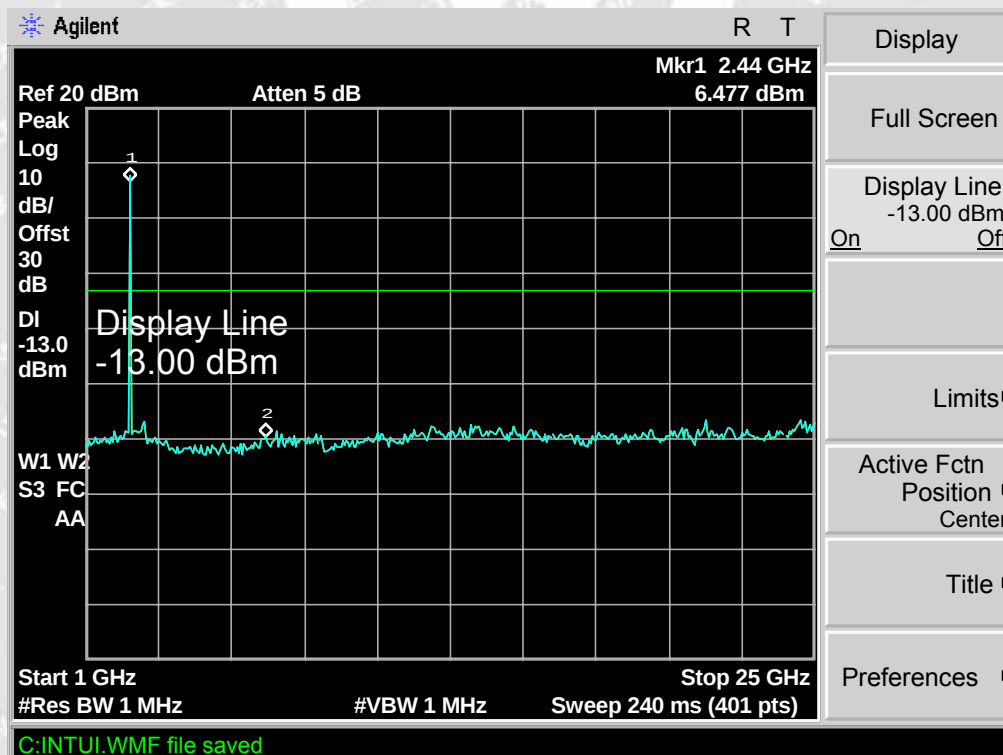


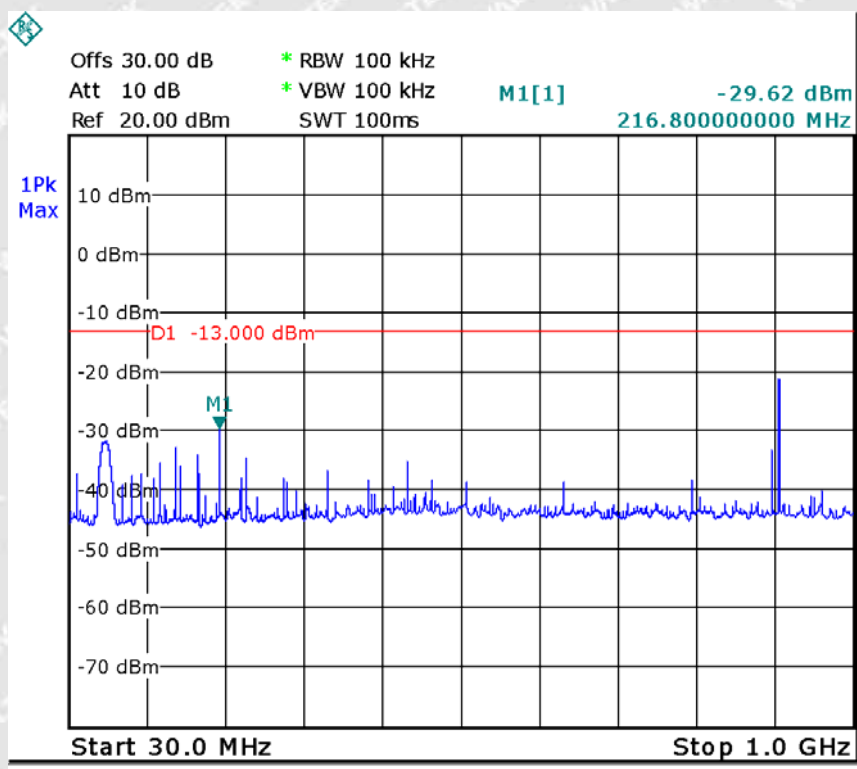
Test mode :TX 11g Lower channel



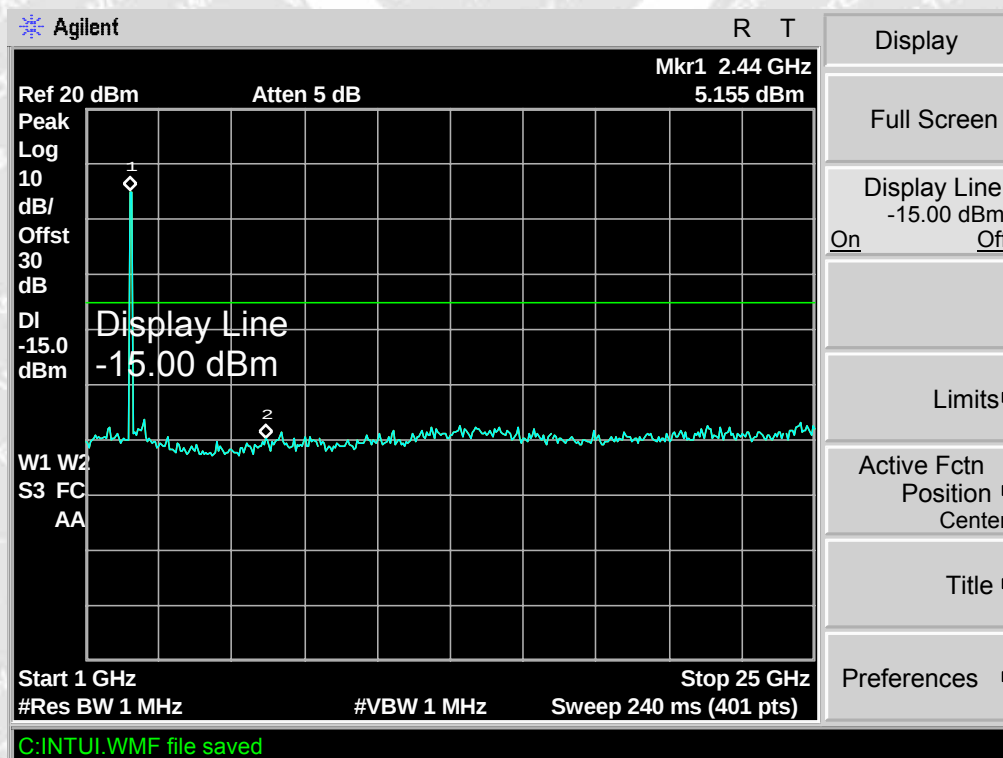


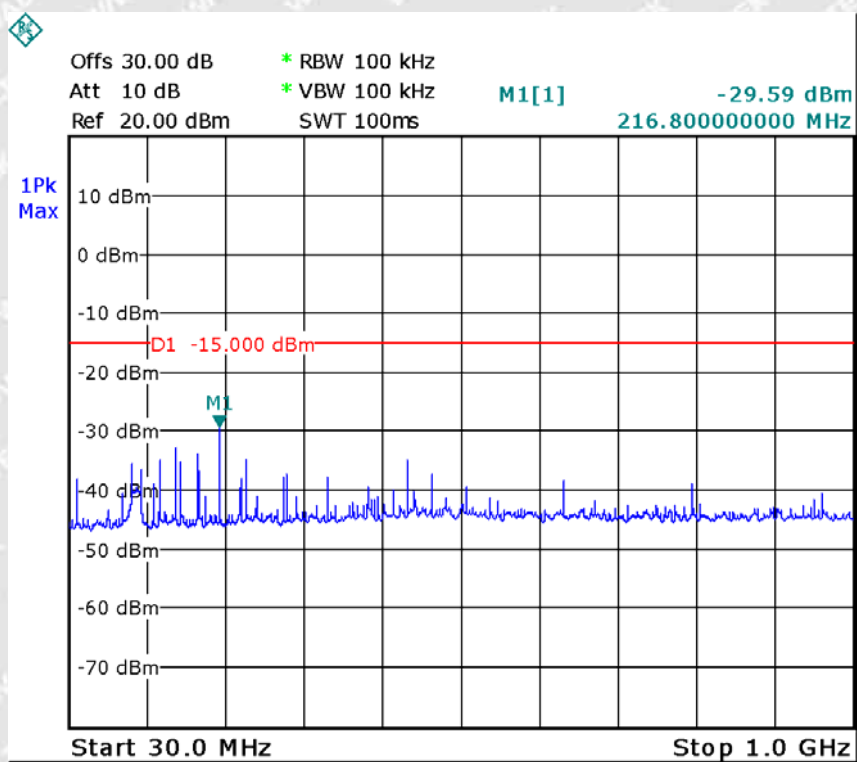
Test mode :TX 11g Middle channel



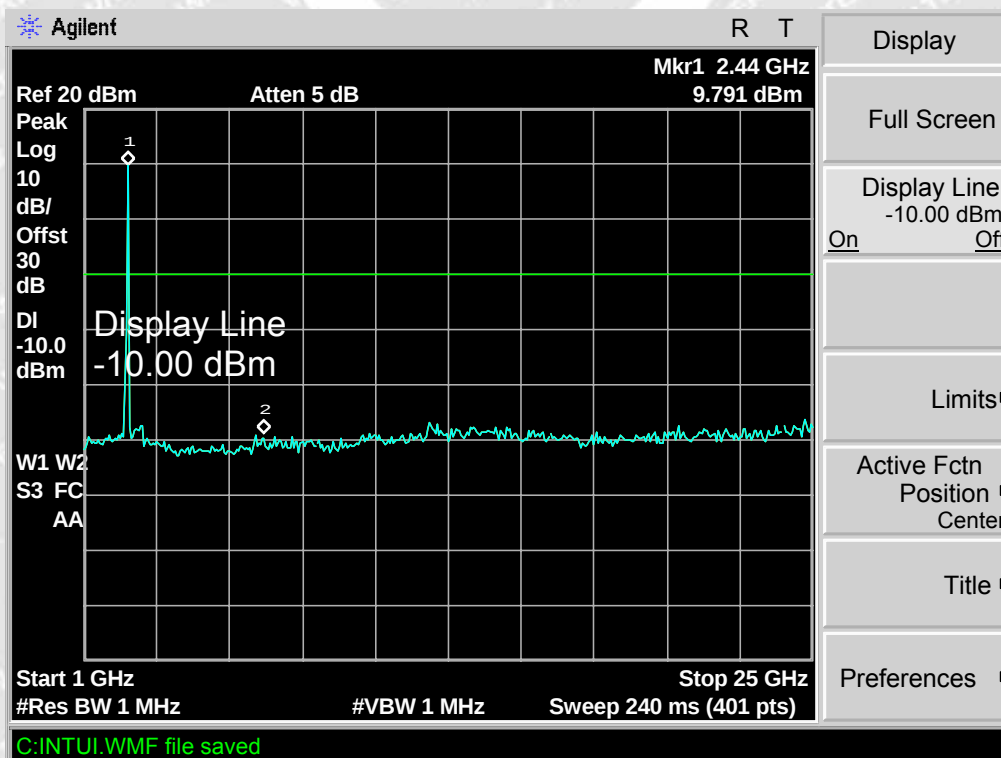


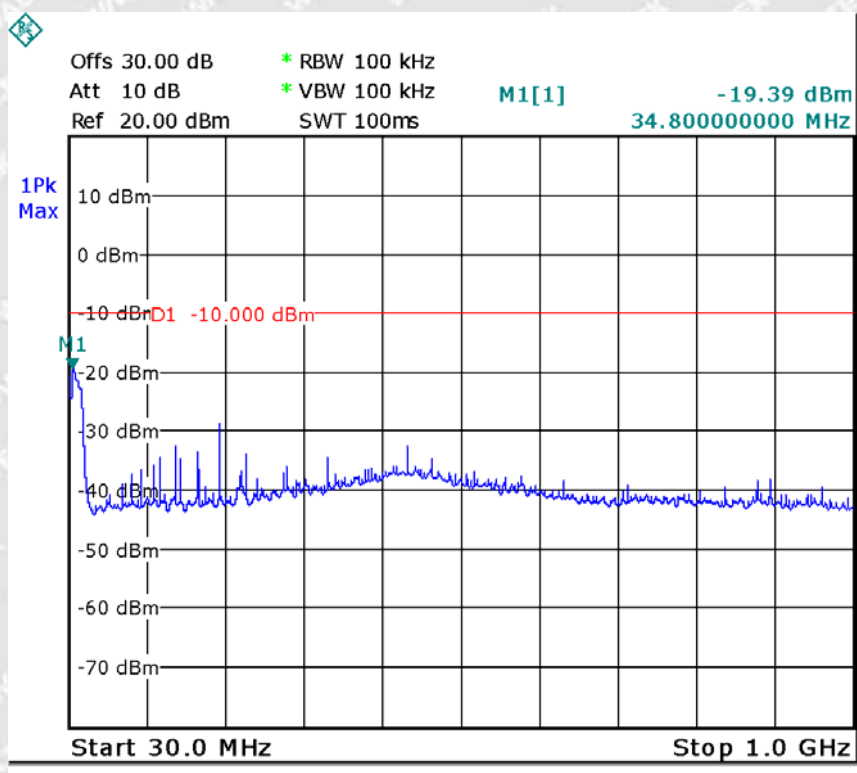
Test mode :TX 11g Upper channel



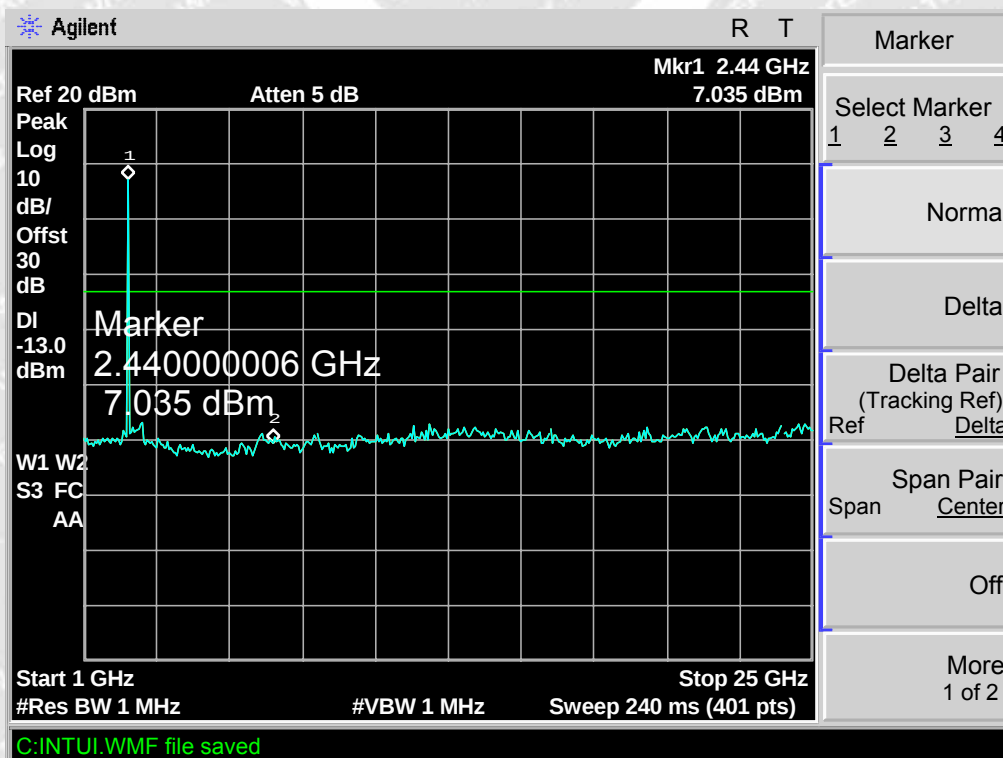


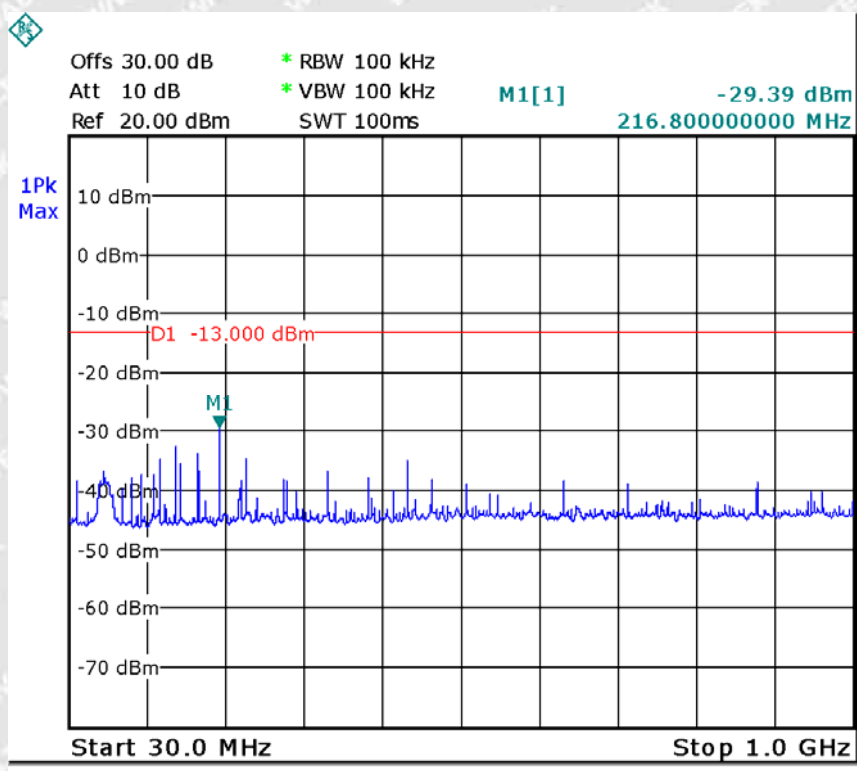
Test mode :TX 11n HT20 Lower channel



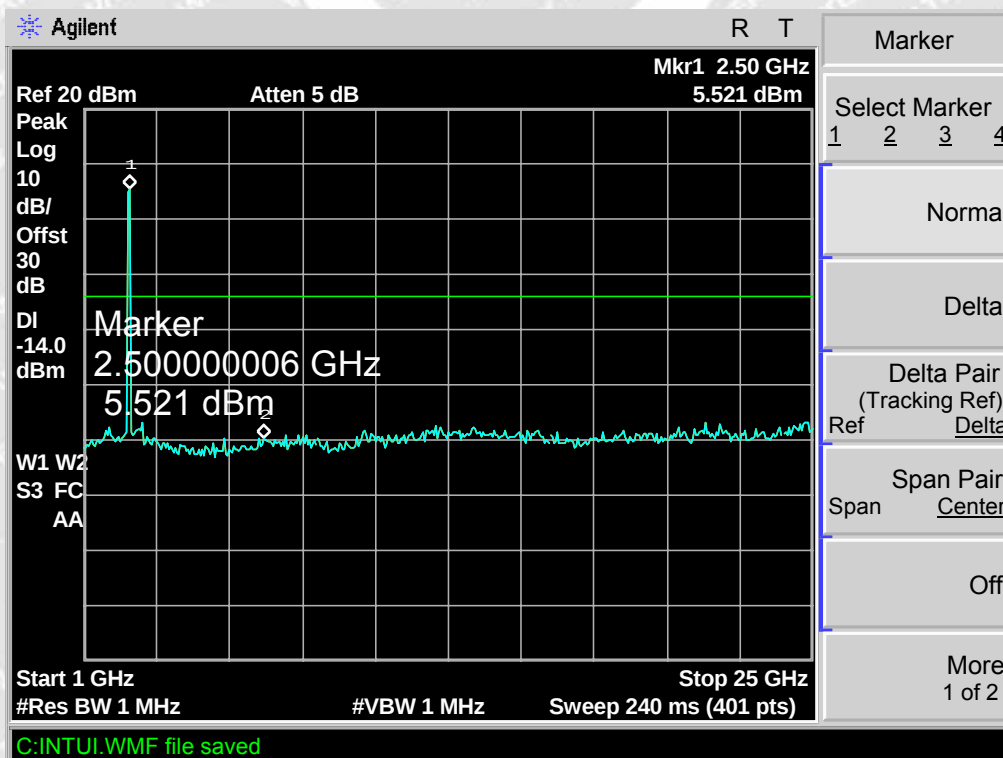


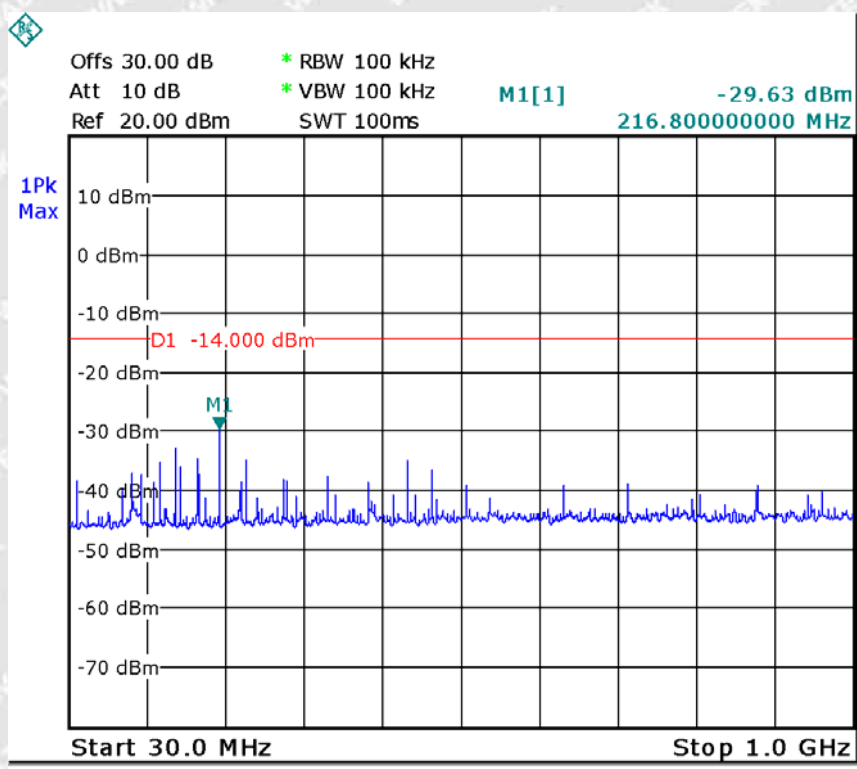
Test mode :TX 11n HT20 Middle channel



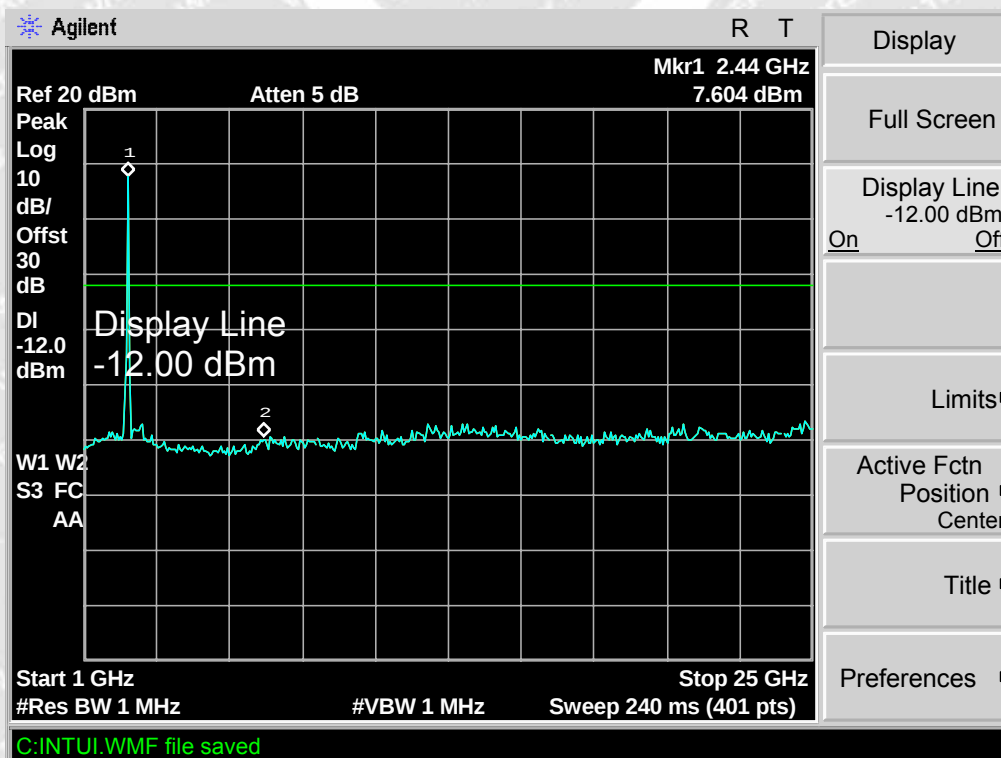


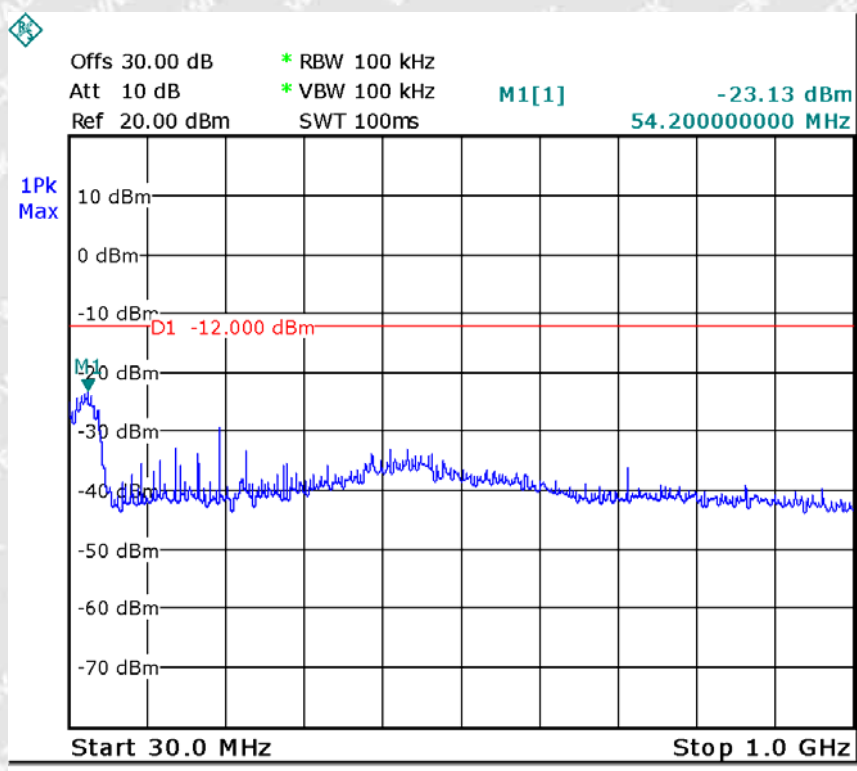
Test mode :TX 11n HT20 Upper channel



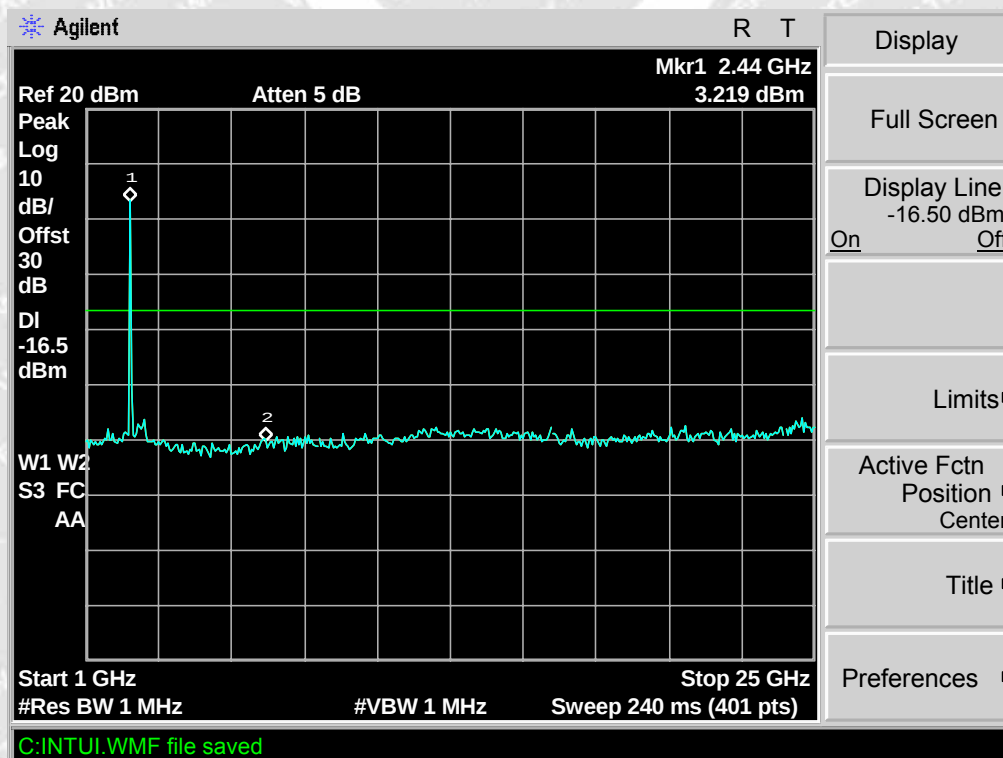


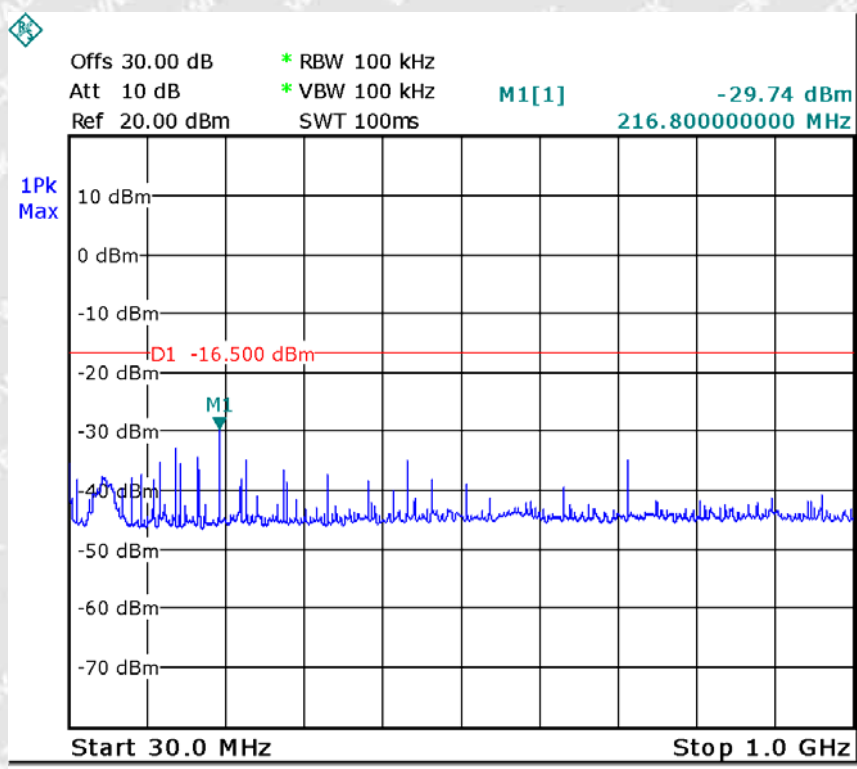
Test mode :TX 11n HT40 Lower channel



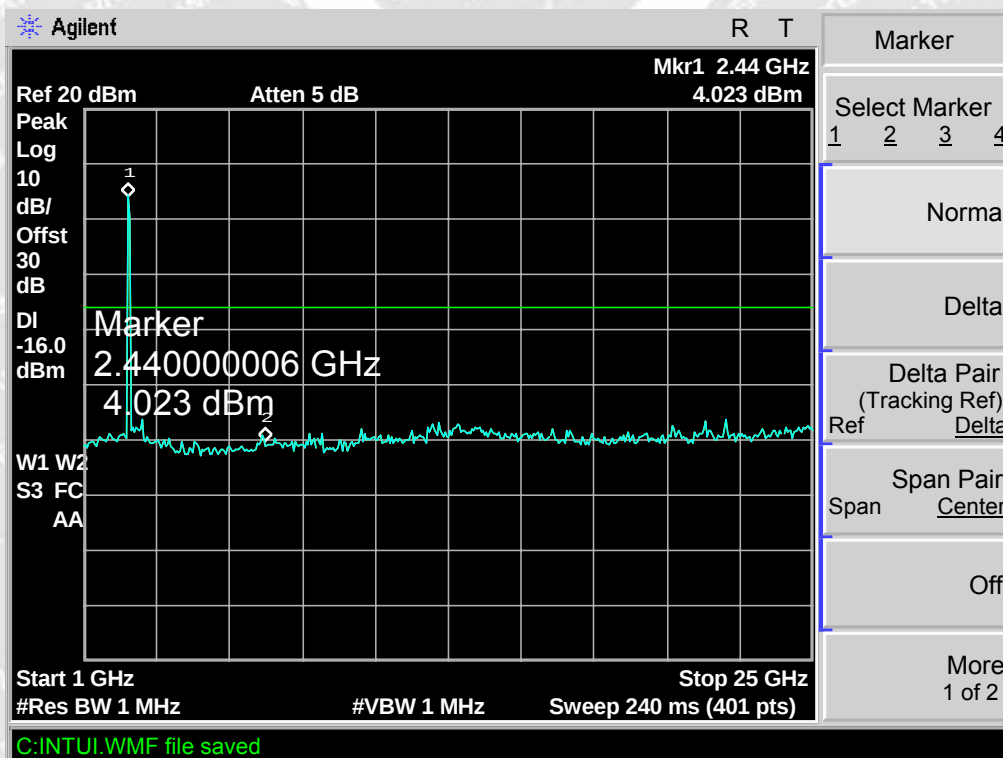


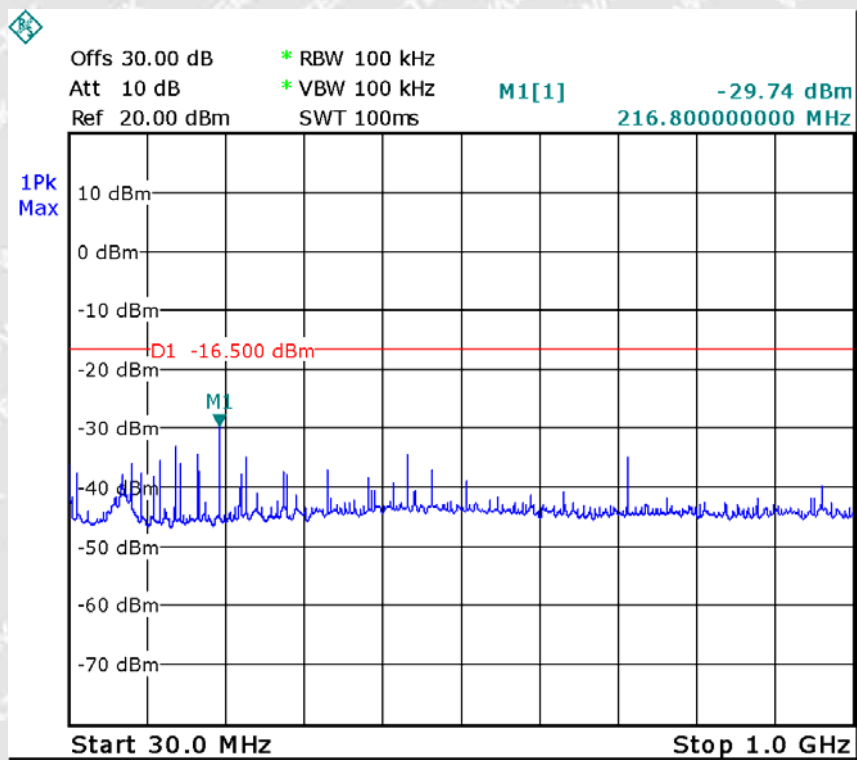
Test mode : TX 11n HT40 Middle channel





Test mode : TX 11n HT40 Upper channel





WALTEK



13 Emissions from the restricted bands

Test Requirement:

FCC CFR47 Part 15 Section 15.247(d)

Test Method:

DA 00-705

Test Limit:

15.205&15.209

Converting the above equation to the logarithmic equivalent yields:

$EIRP = E + 20\log(d) - 104.8$, for example: $E=74\text{dBuV/m(PK)}$, then the calculated EIRP is -21.26dBm(PK) . If $E=54\text{dBuV/m(AV)}$, then the calculated EIRP is -41.26dBm(AV) . This relationship can be used to determine correspondent field strength levels from EIRP levels measured at the distances specified in §15.209(a).

Test Mode:

Test in fixing operating frequency at lower, middle, upper channel.

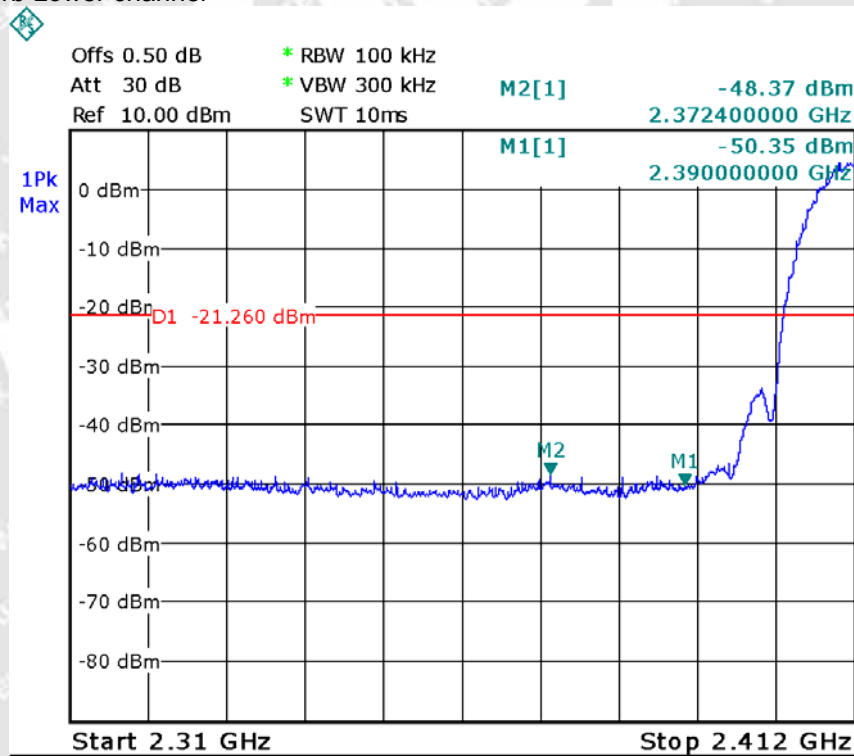
13.1 Test Procedure:

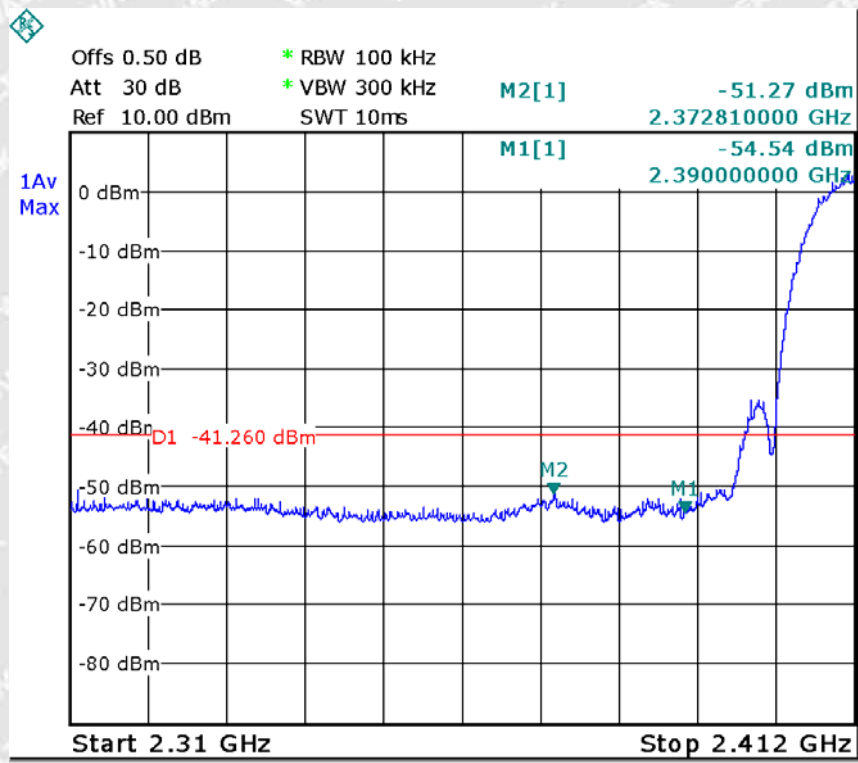
KDB558074 D01 V03 April 9,2013

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. Set RBW = 100kHz and VBW = 300kHz. Sweep = auto.
4. mark the worst point and record.

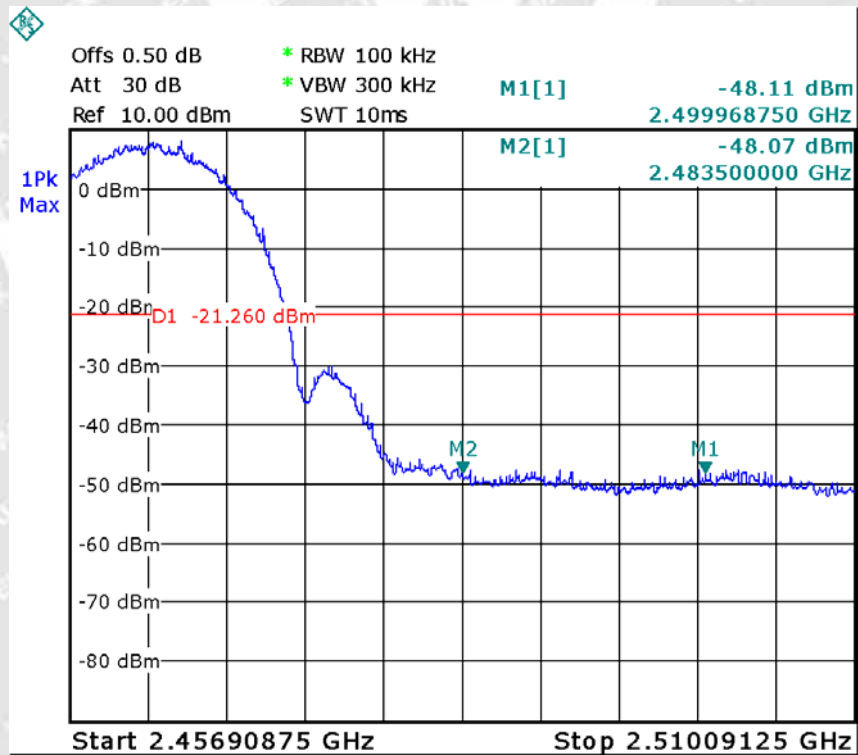
13.2 Test Result:

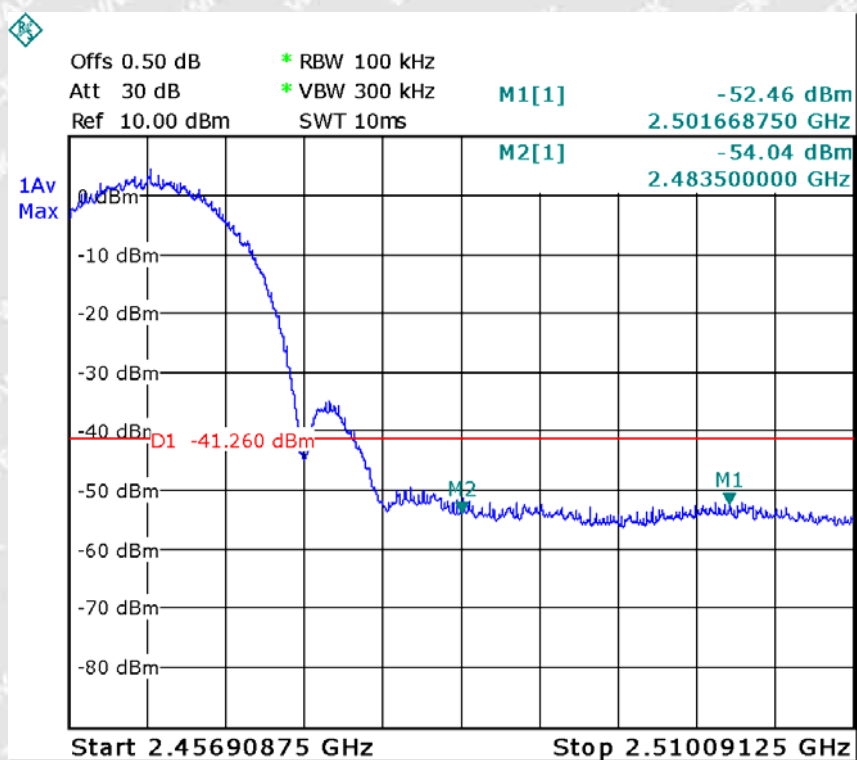
Test mode : TX 11b Lower channel



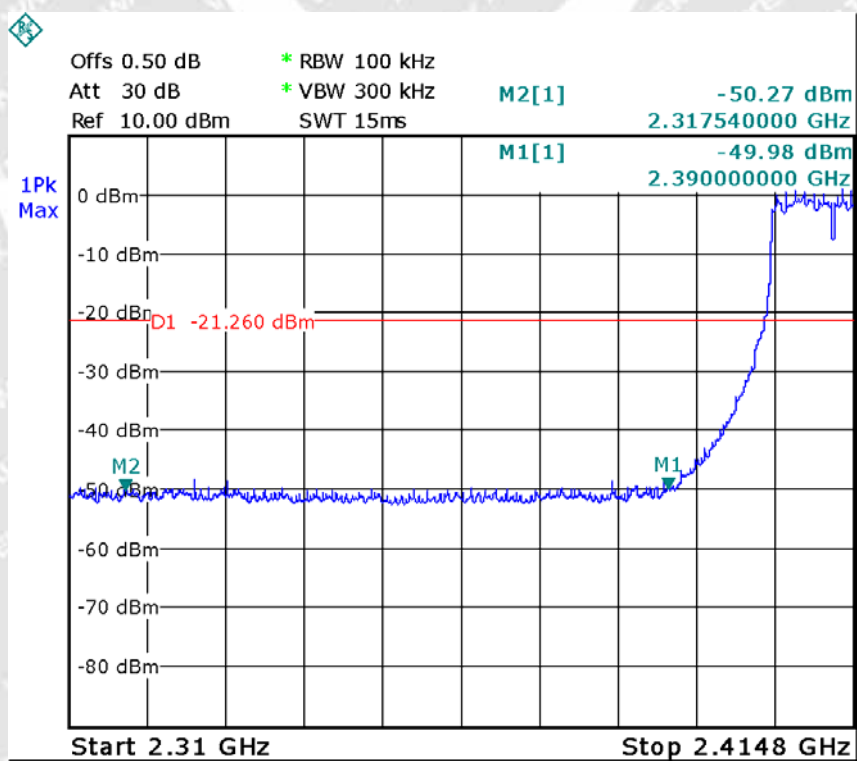


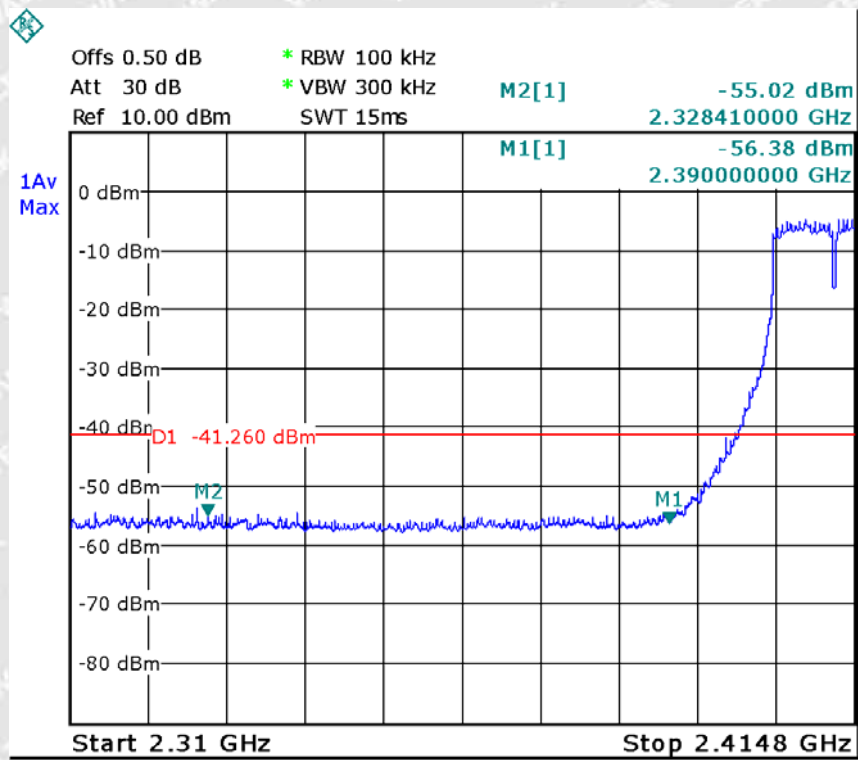
Test mode : TX 11b Upper channel



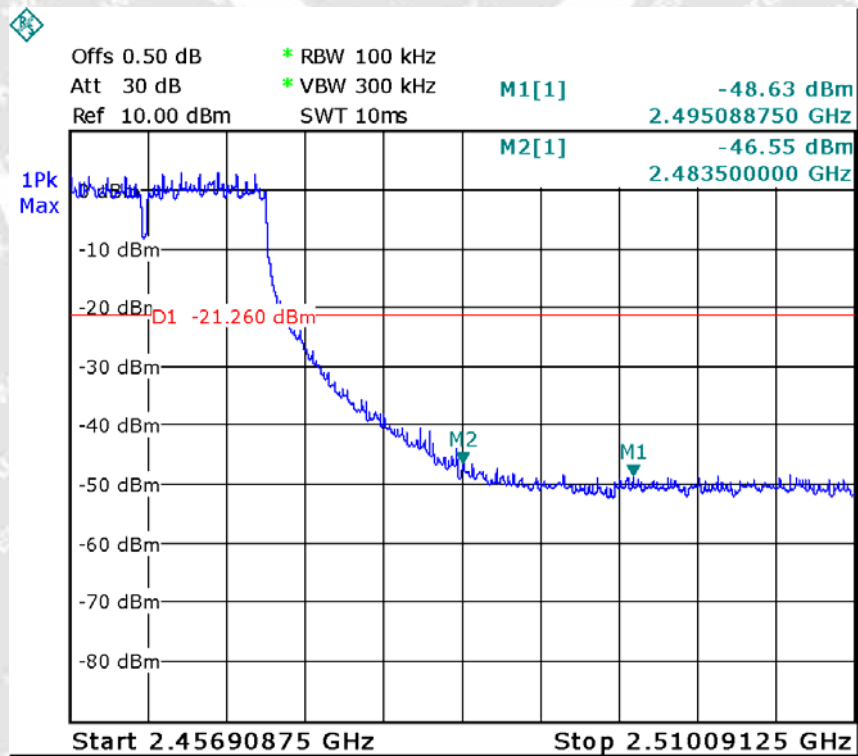


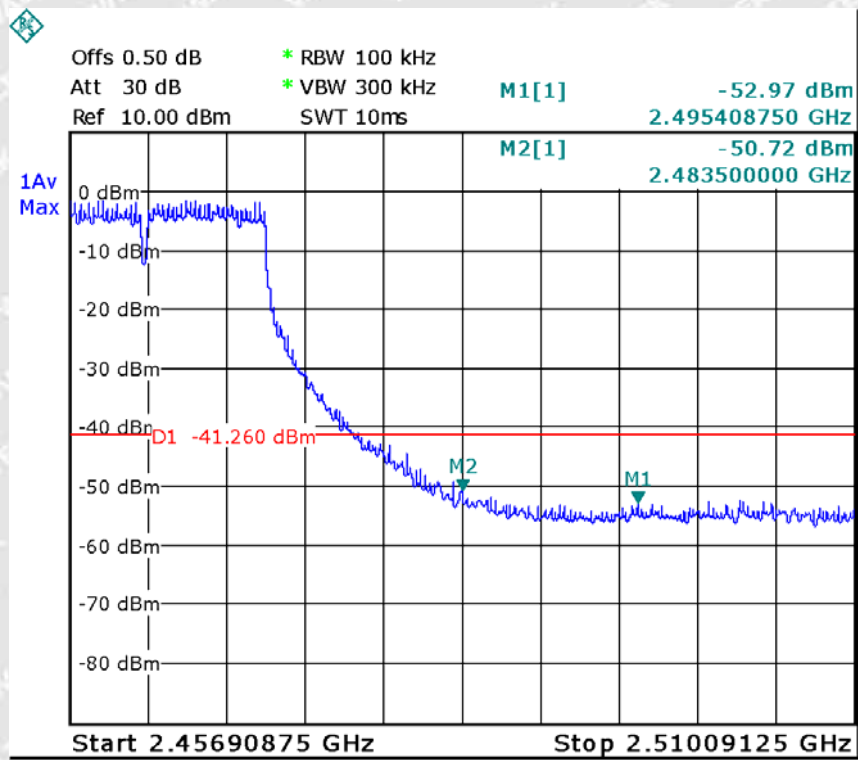
Test mode : TX 11g Lower channel



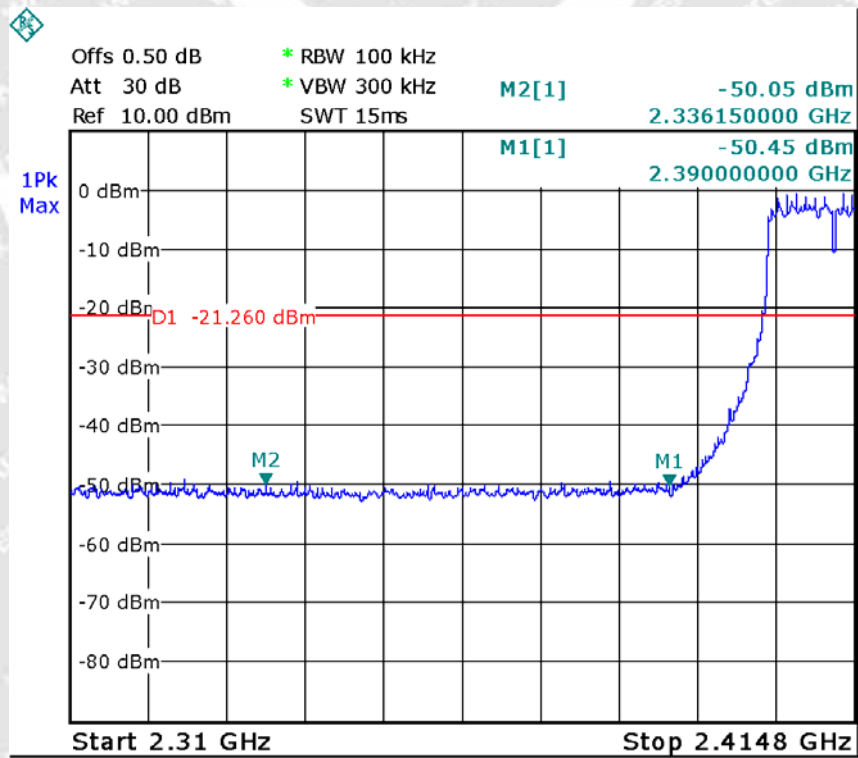


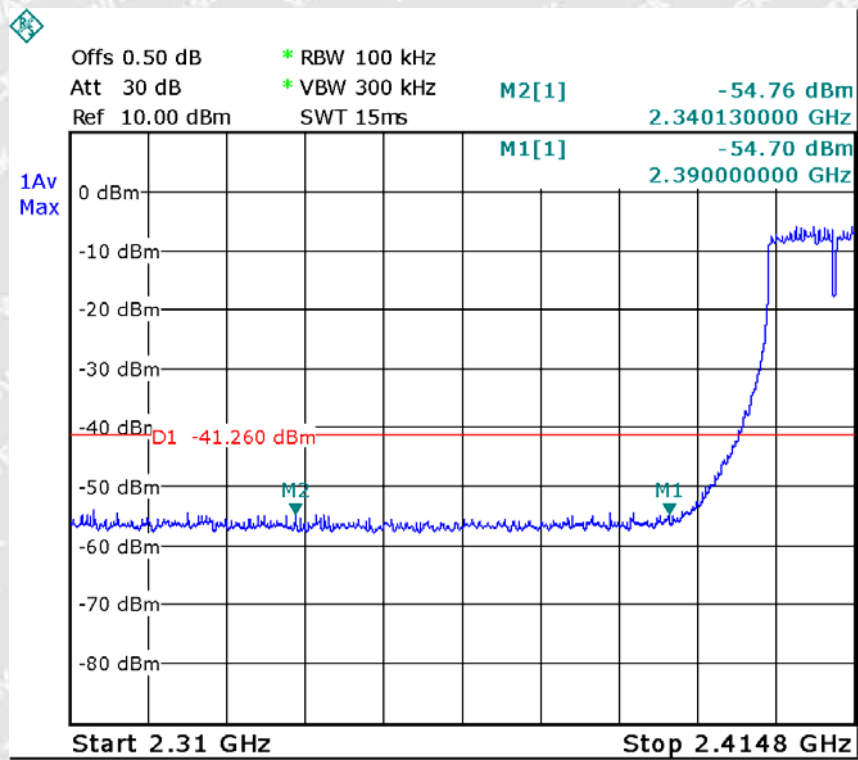
Test mode : TX 11g Upper channel



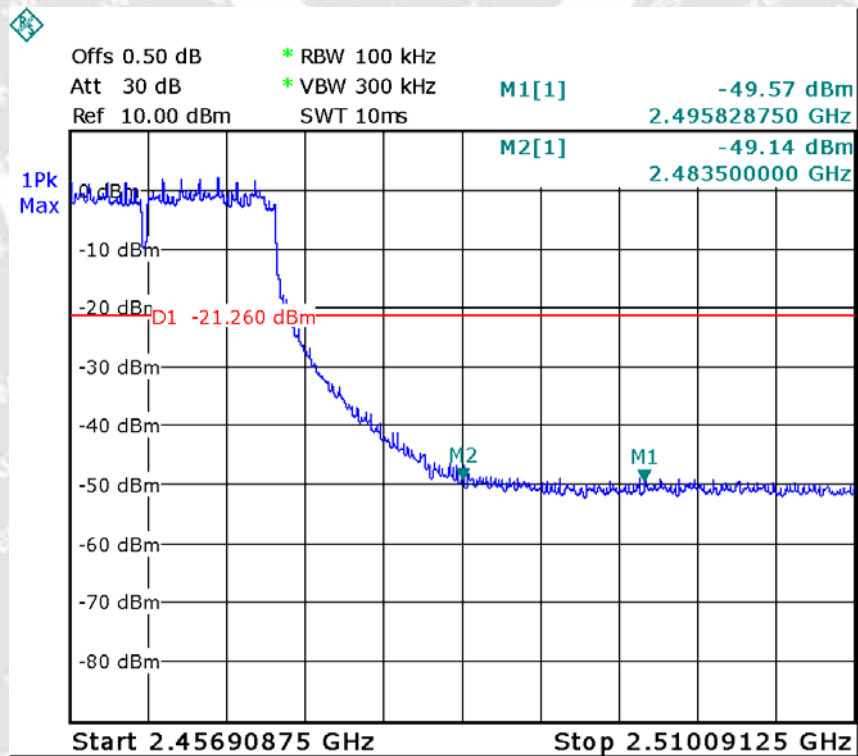


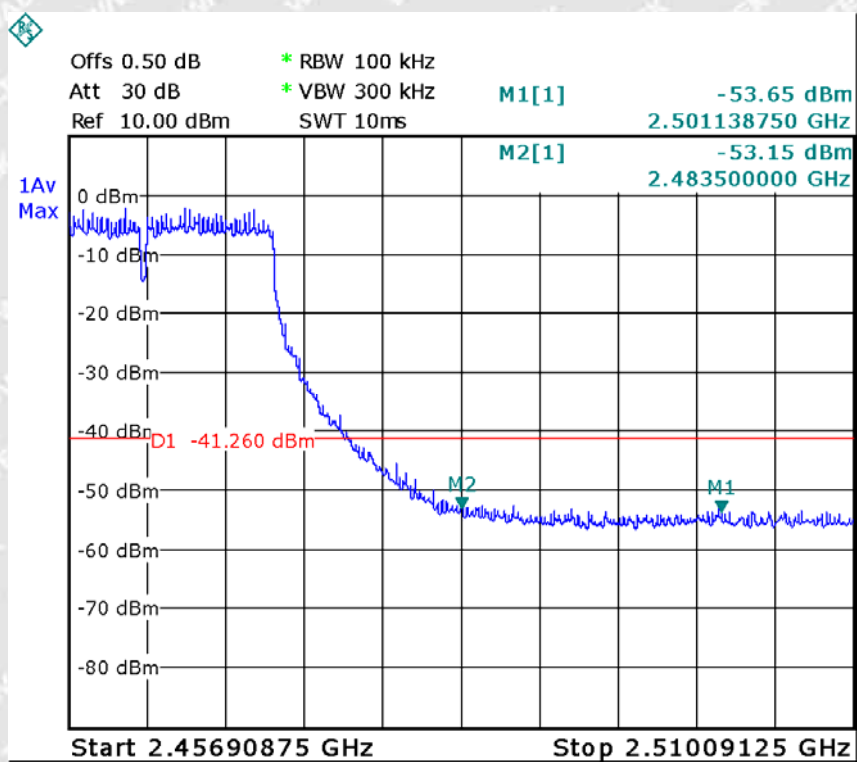
Test mode : TX 11n HT20 Lower channel



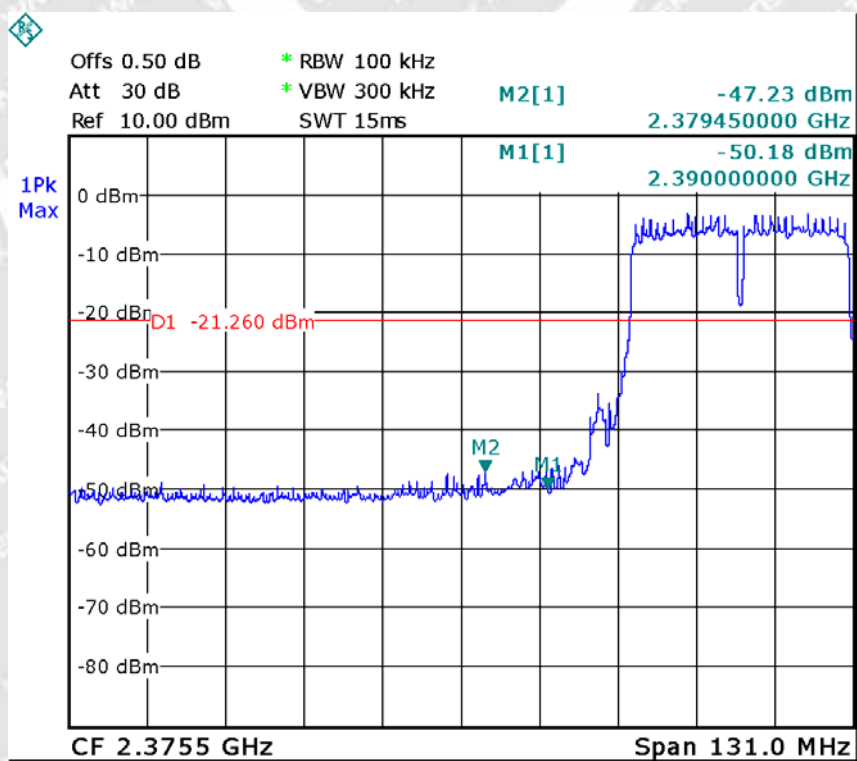


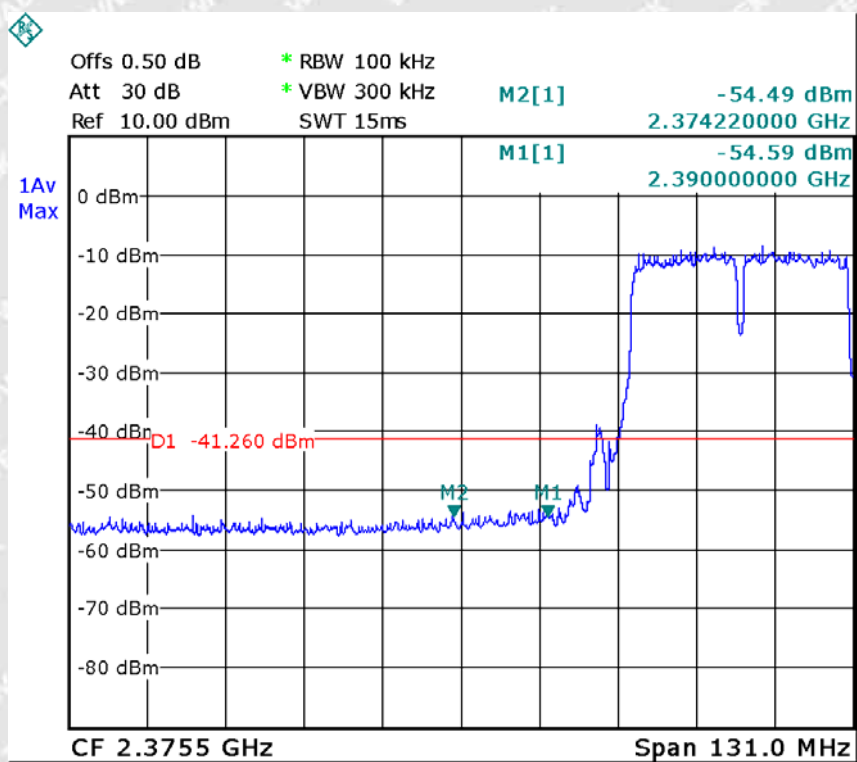
Test mode : TX 11n HT20 Upper channel



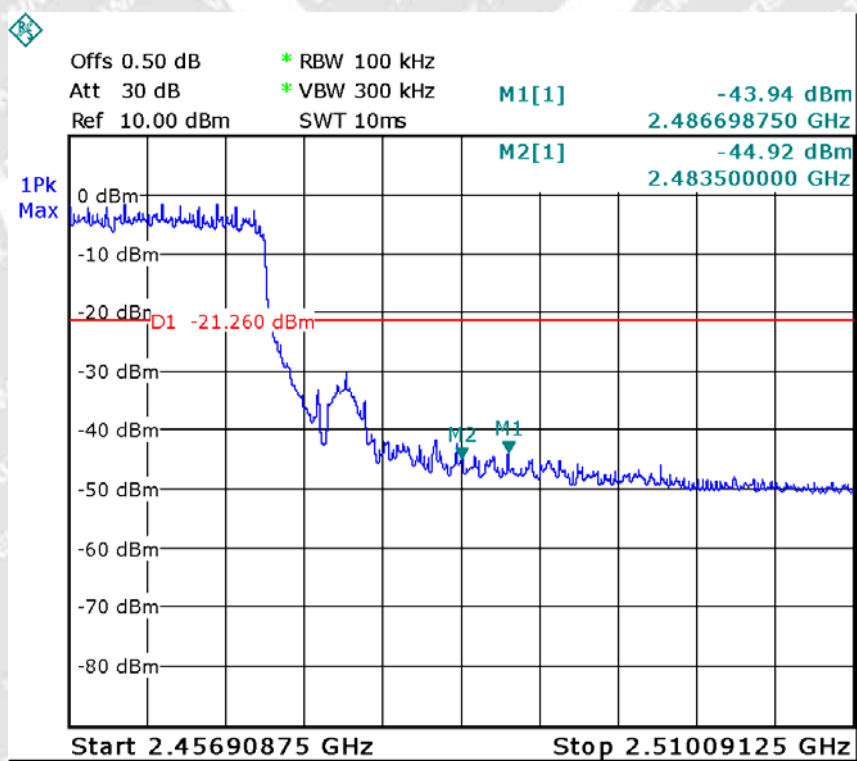


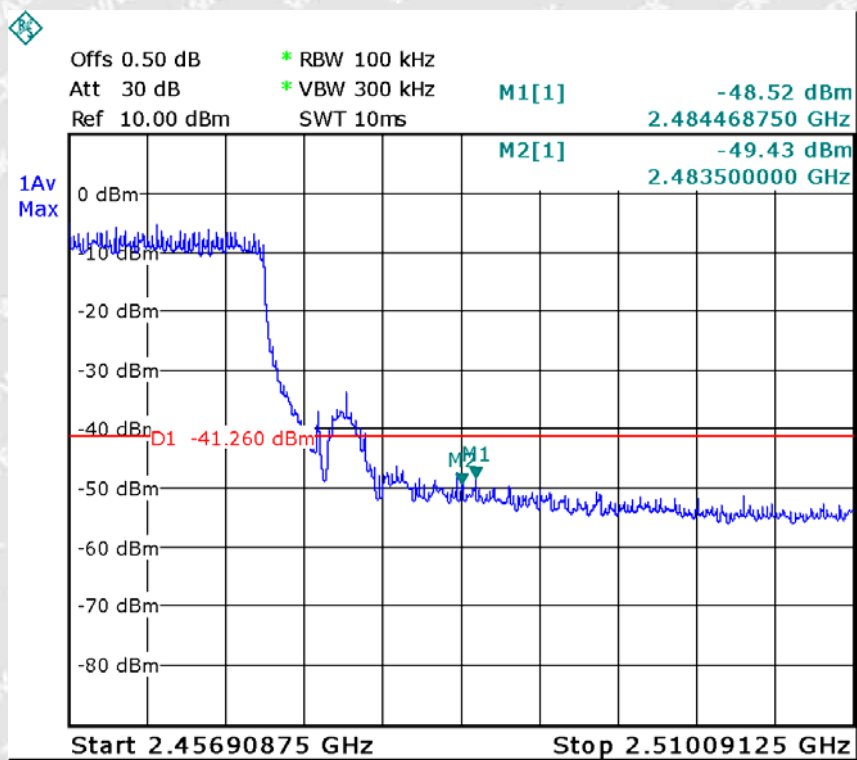
Test mode : TX 11n HT40 Lower channel





Test mode : TX 11n TH40 Upper channel





WALTEK



14 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.



WALTEK



15 RF Exposure

Test Requirement:

FCC Part 1.1307

Test Mode:

The EUT work in test mode(Tx).

15.1 Requirments:

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.

15.2 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



15.3 MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

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

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

From the peak EUT RF output power, the minimum mobile separation distance, $d=0.2\text{m}$, 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/cm ²)	Limit of Power Density (mW/cm ²)
802.11b	1.585	17.91	61.80	0.019	1
802.11g	1.585	23.20	208.93	0.066	1
802.11n HT 20	1.585	21.97	157.40	0.050	1
802.11n HT 40	1.585	22.23	167.11	0.053	1

WALTEK



16 Photographs – Test Setup

16.1 Conducted Emission





16.2 Radiated Emission

Test frequency below 30MHz



Test frequency from 30MHz to 1GHz





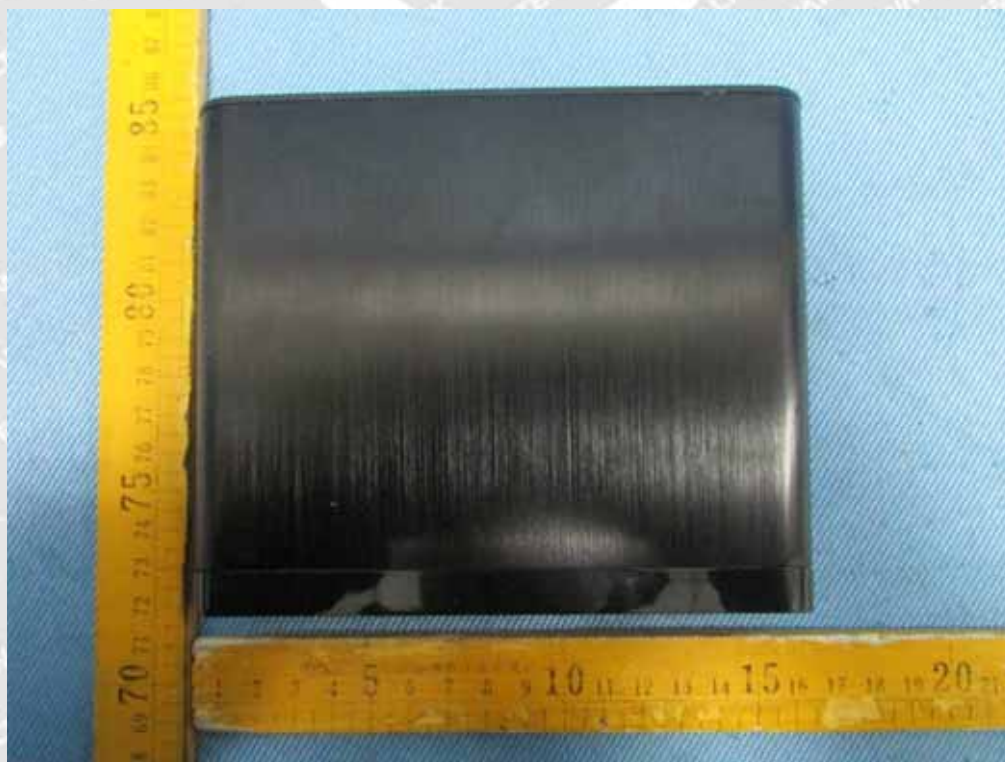
Test frequency above 1GHz





17 Photographs - Constructional Details

17.1 EUT – External View



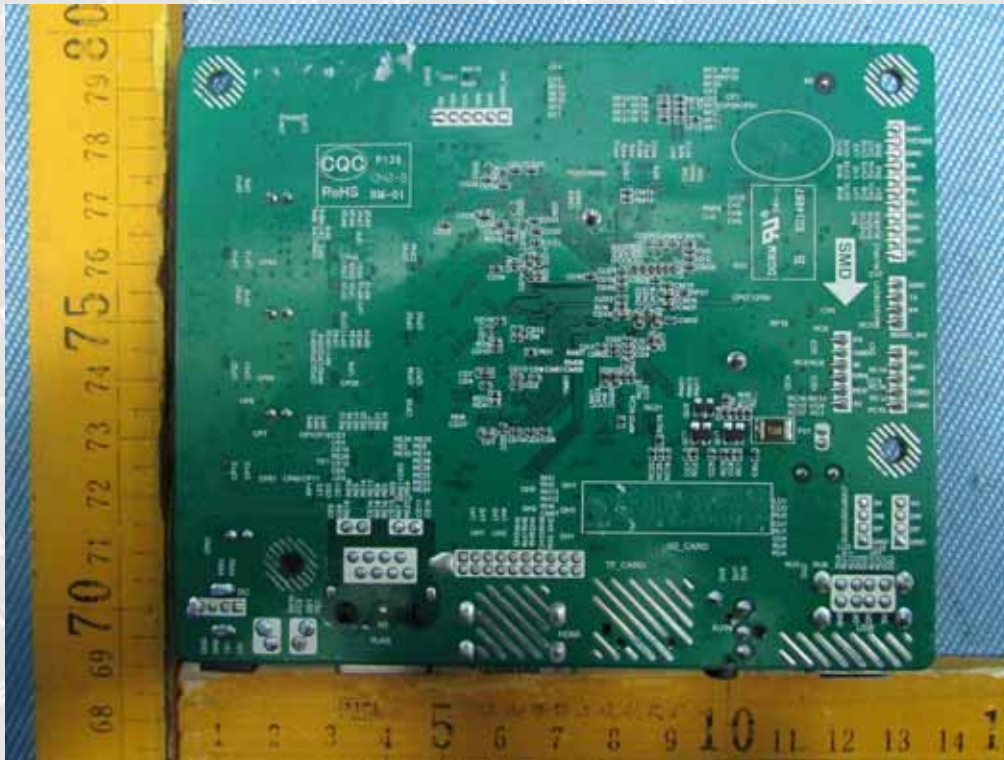






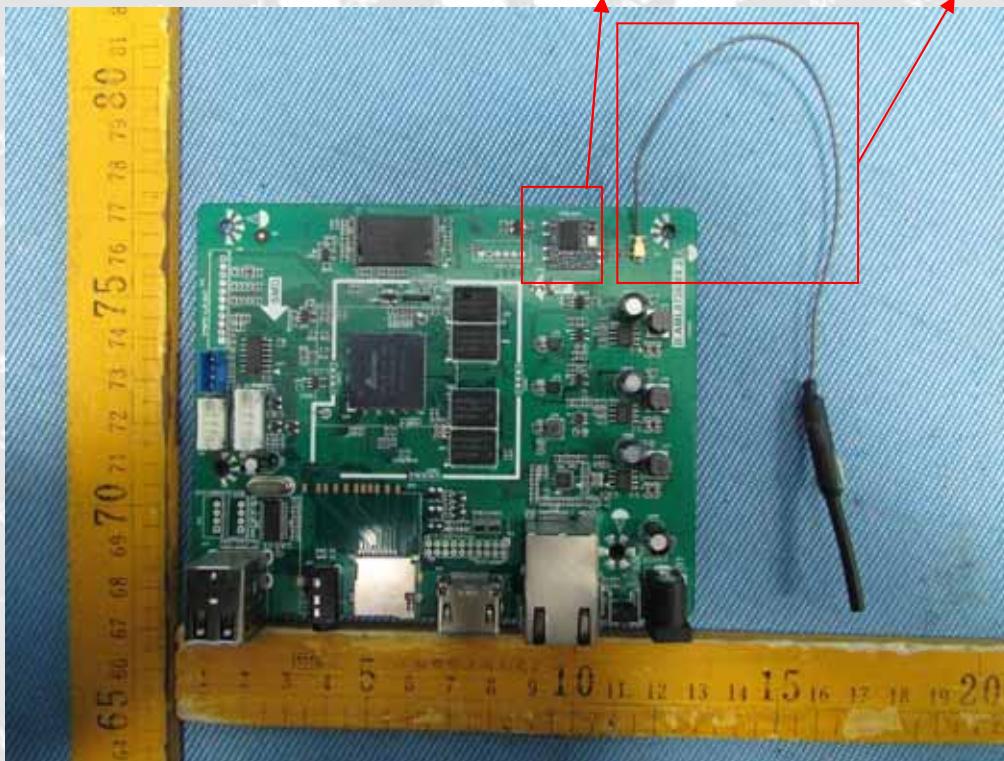
17.2 EUT- Internal View

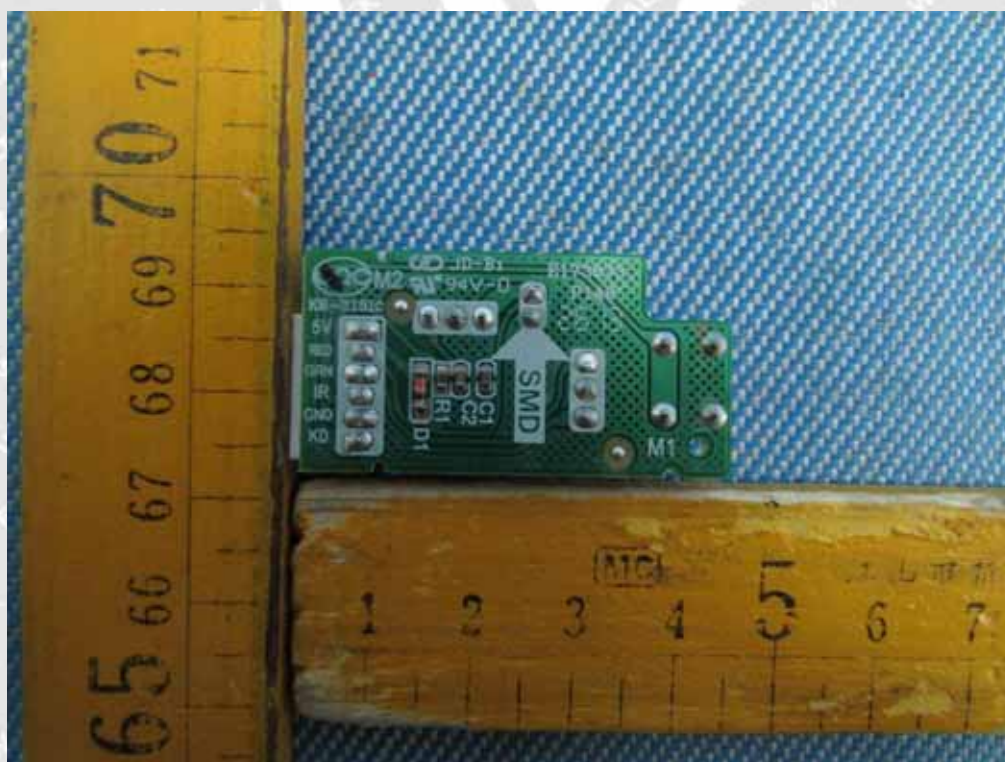
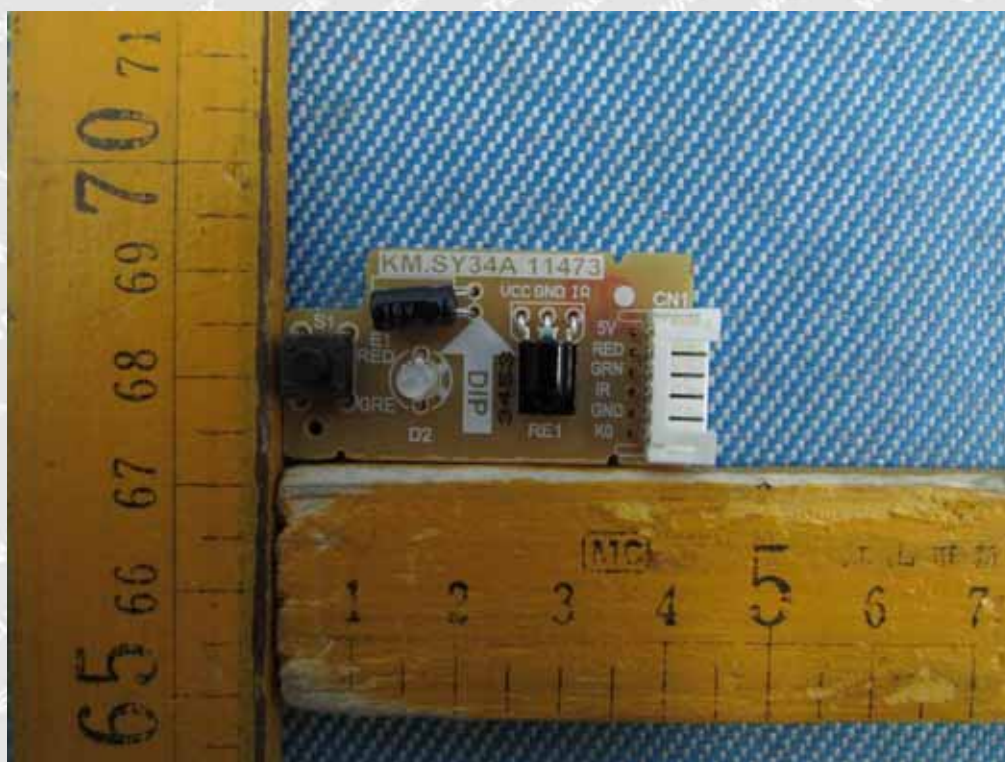




Wifi module

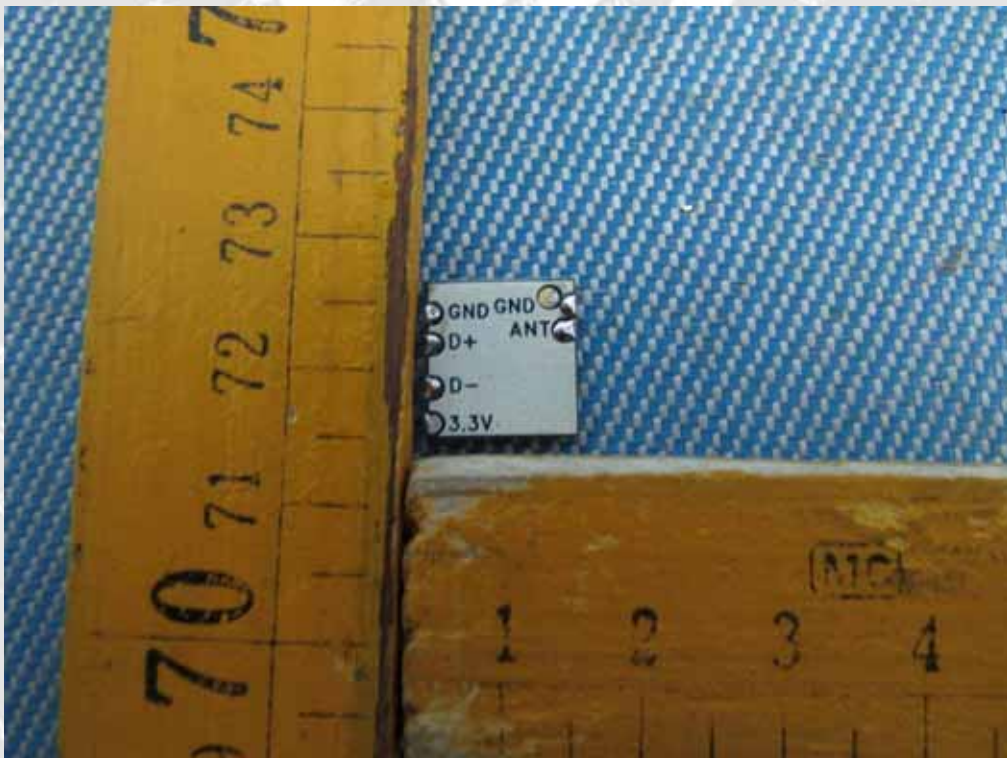
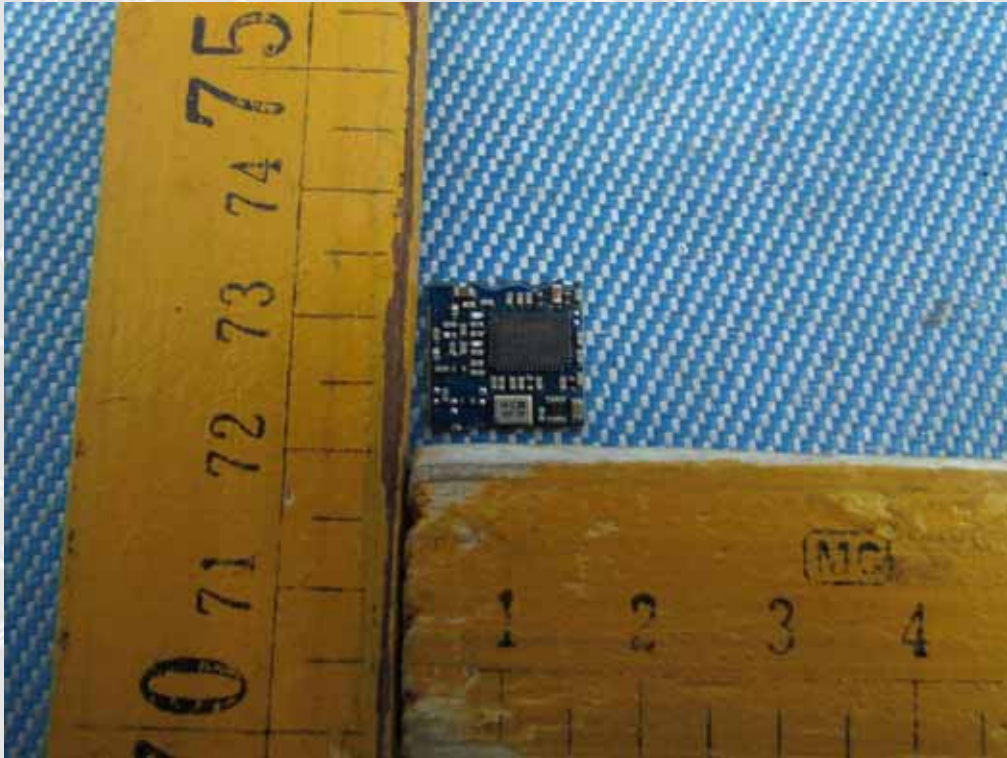
ANT







17.3 EUT- RF module



=====End of test report=====