

FCC TEST REPORT

FCC ID : AZQKC096-08
Applicant : Shenzhen KOHO Technology Co., Ltd
Address : Building3, Jin Yuda Industrial Park, ShangLiao,Shajin, Baoan, Shenzhen, China
Manufacturer : Shenzhen Kanghai Electronics CO.,LTD
Address : Shenzhen Baoan District Shajing Street 107 State Road jinyudaindustrial park(I,II,3)3 2 nd Floor,3rd Floor,A
Equipment Under Test (EUT) :
Product Name : MID
Model No. : KC096-08
Rules : FCC CFR47 Part 15 C Section 15.247:2010
Date of Test : May 28~ June 24, 2013
Date of Issue : June 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:

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Shenzhen, China

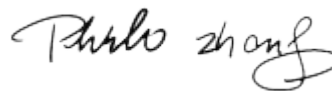
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Philo Zhong / Manager

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	: MID
Model No.	: KC096-08
Model Difference	: N/A
Operation Frequency	: 2412MHz ~ 2462MHz
Oscillator	: Crystal 24MHz and 32.768KHz for CPU,40MHz for RF module
Antenna Gain	: 2dBi
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	: (1)DC 3.7V, 4000mAh powered from lithium battery (2)DC 5V, 2A powered from adapter
Adapter	: SOY Techonolgy Model:SUN-0500200 INPUT:100-240V~50/60Hz 0.3A

4.3 Description of Support Units

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 Meod
Radiation Emission, 30MHz ~ 1GHz	Wifi link(adapter/battery operation)
Conduction Emission, 0.15MHz to 30MHz	Wifi link (adapte operation)

4.4 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.

4.5 Test Location

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

4.6 General condition

Ambient Condition: 25.5 °C 58 %RH

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

The follow condition is not applicable for adapter:

Test Voltage	Input voltage
Rated voltage-15%	AC V
normal	AC V
Rated voltage+15%	AC V

The follow condition is applicable.

Test voltage	Test Voltage (Battery)
Rated voltage	DC 3.7V

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	Aug. 13,2012	Aug. 12,2013
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Aug. 13,2012	Aug. 12,2013
3.	Cable	LARGE	RF300	EW02014-3	Aug.14,2012	Aug. 13,2013
3m Semi-anechoic Chamber for Radiation Emissions (Test Frequency:Above 1GHz)						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer	Agilent	E7405A	MY45114943	Aug. 13,2012	Aug. 12,2013
2.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Aug. 13,2012	Aug. 12,2013
3.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	399	Aug. 13,2012	Aug. 12,2013
4.	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Apr.07,2013	Apr.06,2014
5.	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Aug. 13,2012	Aug. 12,2013
6.	10m Coaxial Cable with N- plug	SCHWARZBECK	AK 9515 H	-	Aug. 13,2012	Aug. 12,2013
7.	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-3325	Aug.11,2012	Aug.11,2013

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 (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 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:	50 % RH
Atmospheric Pressure:	1010 mbar

EUT Operation:

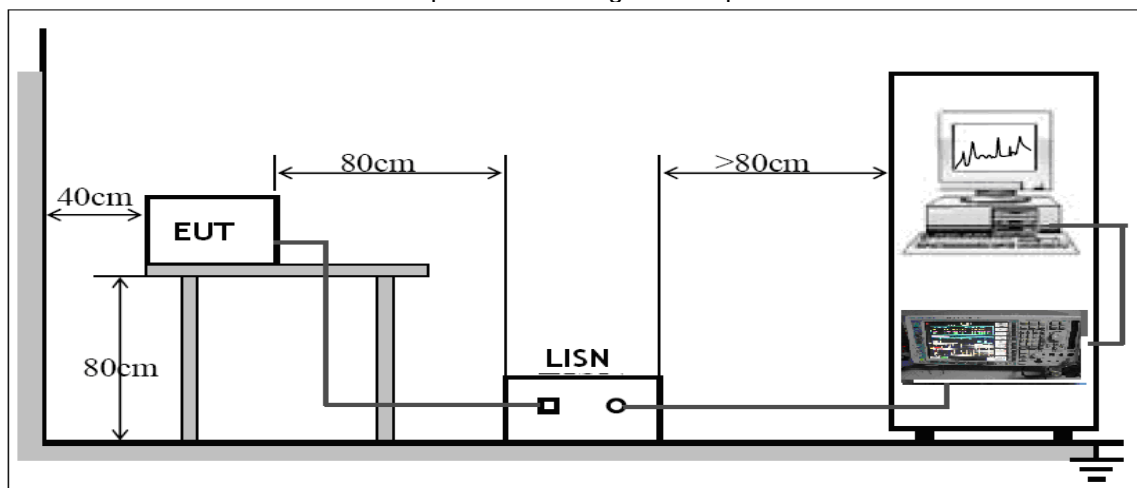
The pre-test was performed in wifi linking mode(adapter operation), so the test data were shown as follow.

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.

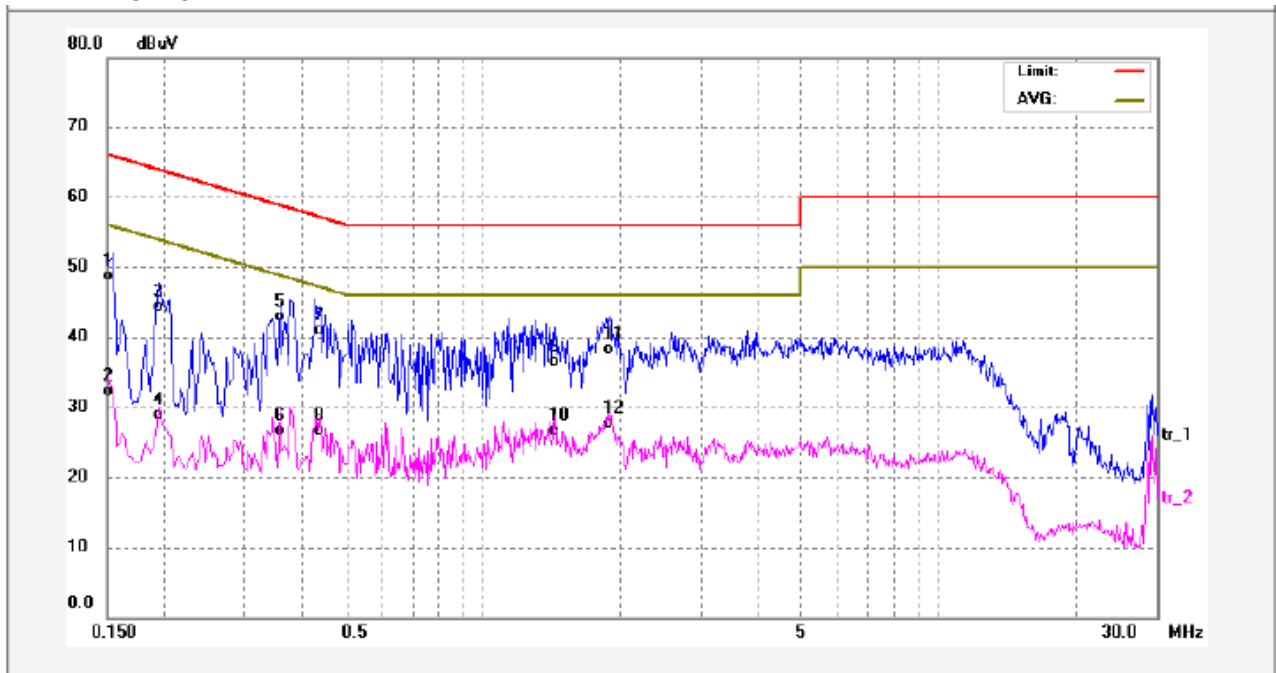


6.3 Conducted Emission Test Result

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

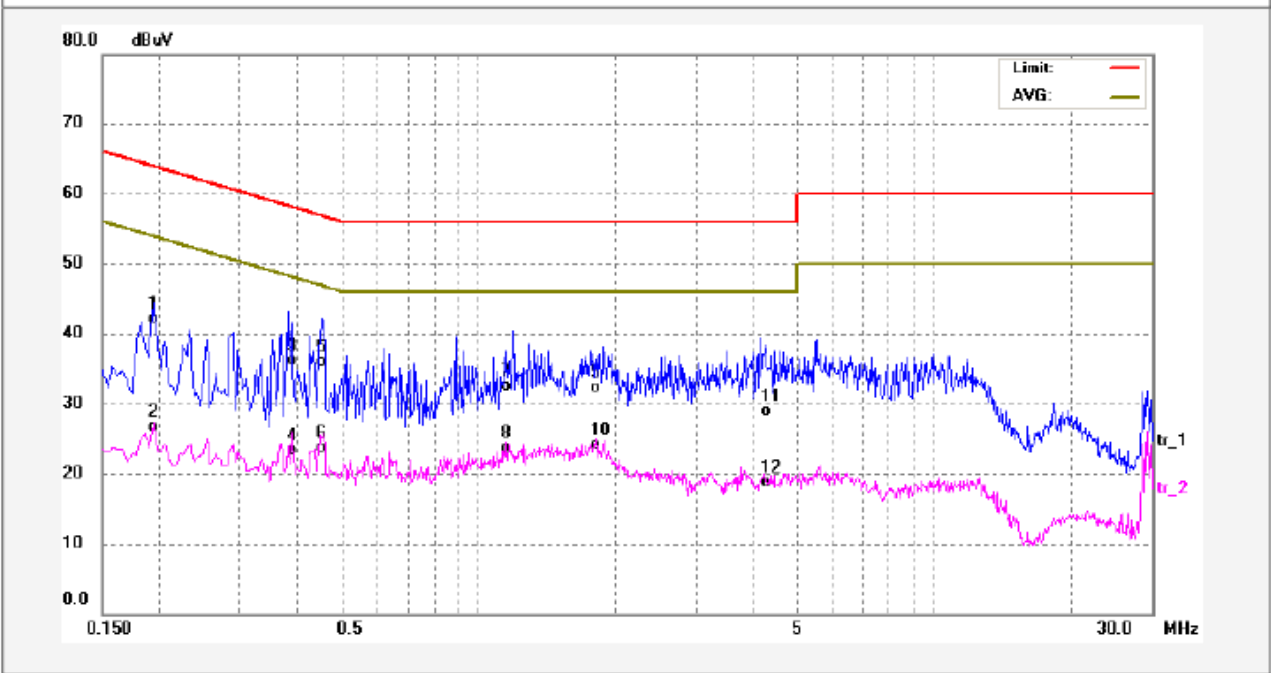
Test Mode: wifi linking mode(adapter operation) ,the worst data

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	36.71	11.17	47.88	65.99	-18.11	QP	
2	0.1500	20.28	11.17	31.45	55.99	-24.54	AVG	
3	0.1940	32.29	11.28	43.57	63.86	-20.29	QP	
4	0.1940	16.84	11.28	28.12	53.86	-25.74	AVG	
5	0.3580	30.79	11.31	42.10	58.77	-16.67	QP	
6	0.3580	14.64	11.31	25.95	48.77	-22.82	AVG	
7	0.4380	28.74	11.31	40.05	57.10	-17.05	QP	
8	0.4380	14.56	11.31	25.87	47.10	-21.23	AVG	
9	1.4380	24.49	11.19	35.68	56.00	-20.32	QP	
10	1.4380	14.62	11.19	25.81	46.00	-20.19	AVG	
11	1.9020	26.27	11.20	37.47	56.00	-18.53	QP	
12	1.9020	15.78	11.20	26.98	46.00	-19.02	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1940	30.04	11.28	41.32	63.86	-22.54	QP	
2	0.1940	14.53	11.28	25.81	53.86	-28.05	AVG	
3	0.3899	24.01	11.31	35.32	58.06	-22.74	QP	
4	0.3899	11.27	11.31	22.58	48.06	-25.48	AVG	
5	0.4580	23.70	11.31	35.01	56.73	-21.72	QP	
6	0.4580	11.63	11.31	22.94	46.73	-23.79	AVG	
7	1.1500	20.53	11.18	31.71	56.00	-24.29	QP	
8	1.1500	11.63	11.18	22.81	46.00	-23.19	AVG	
9	1.8180	20.32	11.20	31.52	56.00	-24.48	QP	
10	1.8180	12.12	11.20	23.32	46.00	-22.68	AVG	
11	4.3100	16.85	11.23	28.08	56.00	-27.92	QP	
12	4.3100	6.70	11.23	17.93	46.00	-28.07	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	$2400/F(\text{kHz})$	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: 1009 mbar

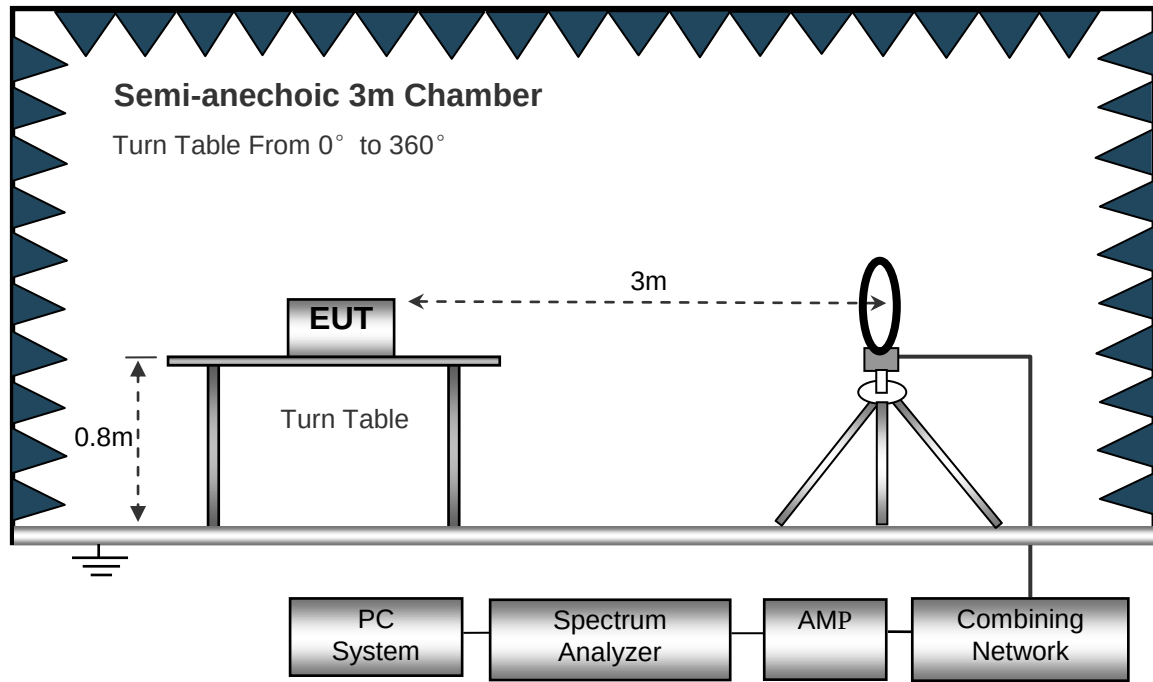
EUT Operation:

The pre-test was performed in wifi linking mode(adapter/battery operation), so the worst data were shown as follow.

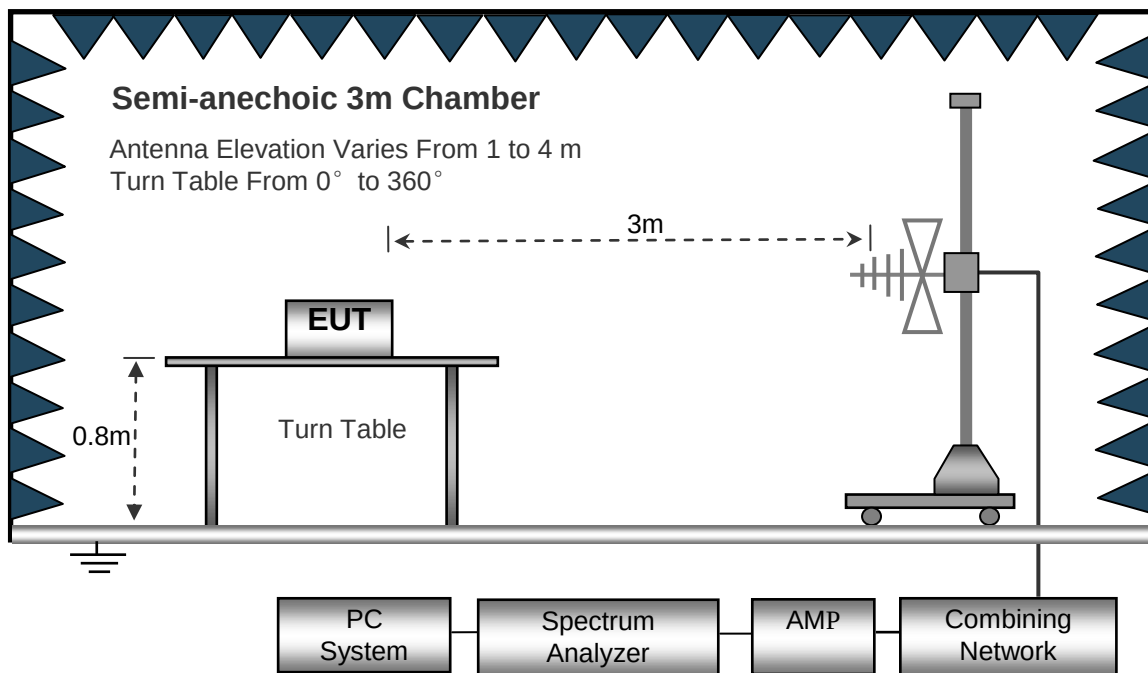
7.2 Test Setup

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

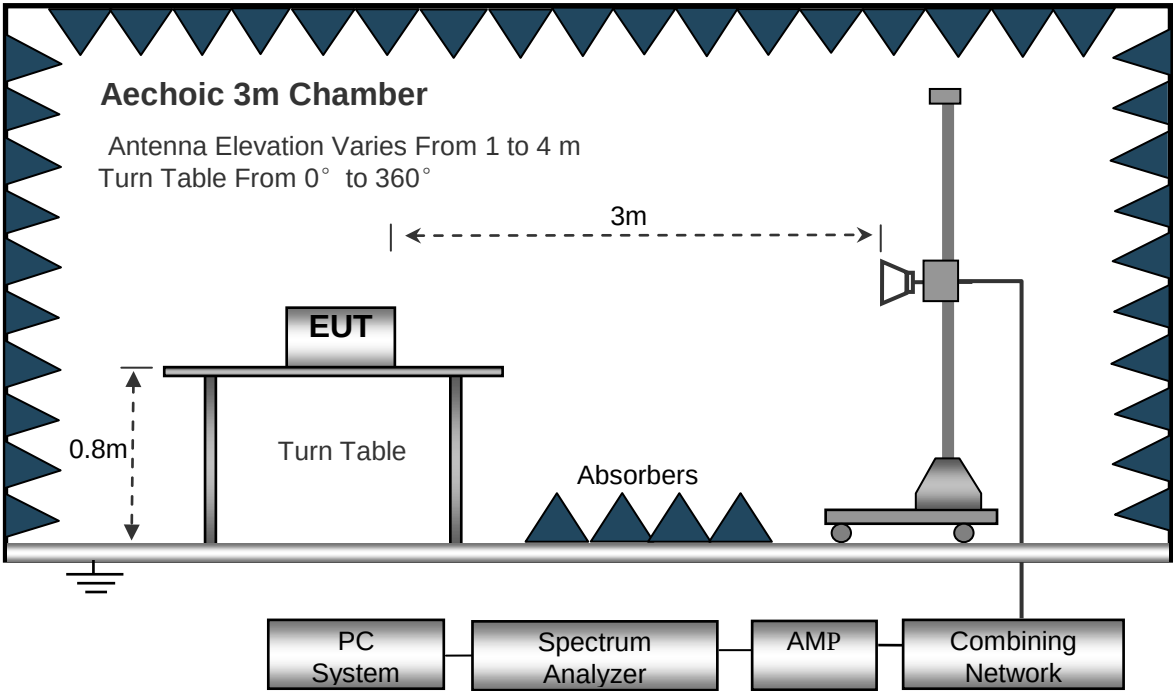
The test setup for emission measurement below 30MHz.



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
IF Bandwidth120 KHz
Video Bandwidth100KHz
Quasi-Peak Adapter Bandwidth120 KHz
Quasi-Peak Adapter ModeNormal
Resolution Bandwidth100KHz

Above 1GHz

Sweep SpeedAuto
IF Bandwidth120 KHz
Video Bandwidth3MHz
Quasi-Peak Adapter Bandwidth120 KHz
Quasi-Peak Adapter ModeNormal
Resolution Bandwidth1MHz

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 during 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:

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

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

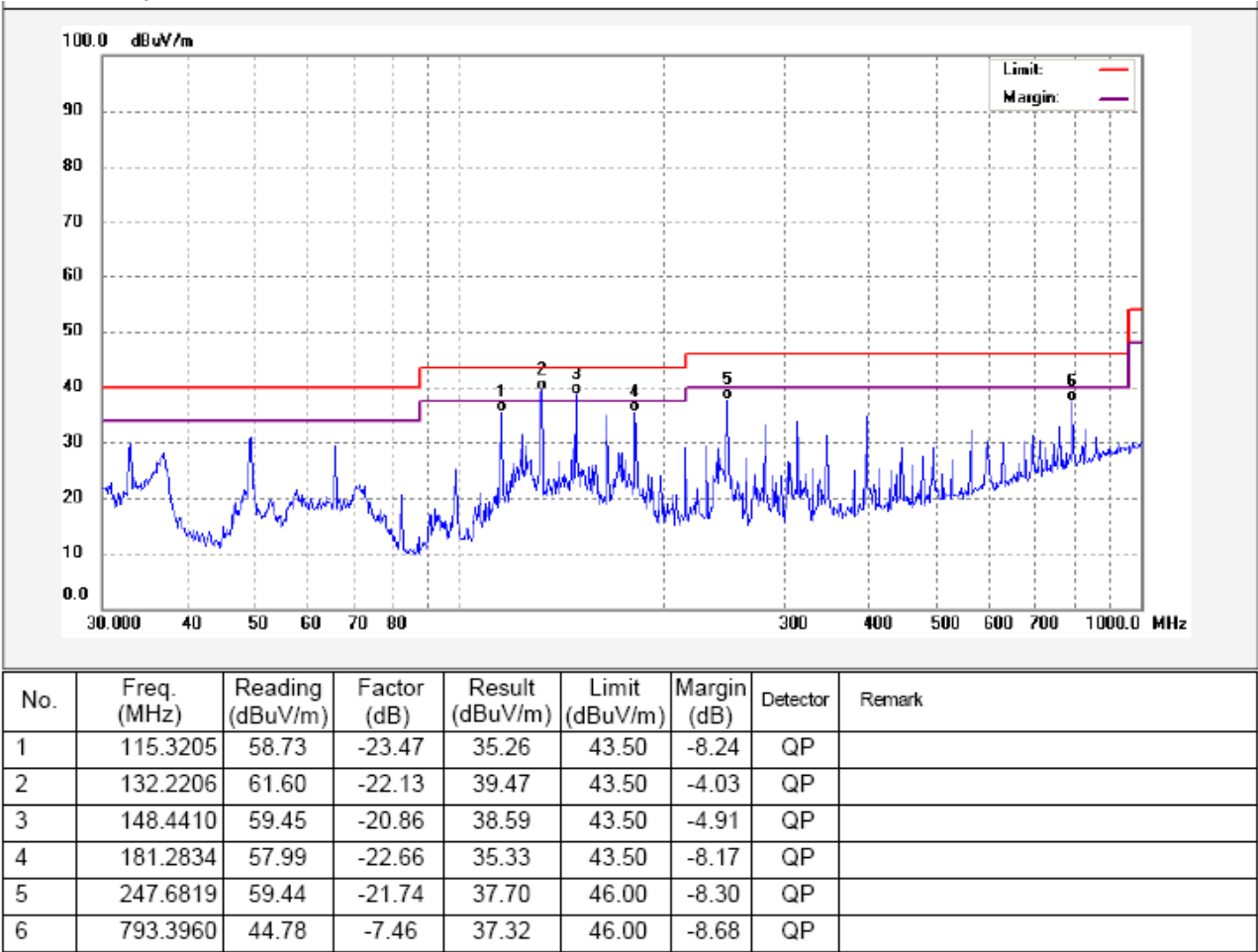
Test Frequency : Below 30MHz

All emissions were more than 20 dB below the limit and therefore not reported.

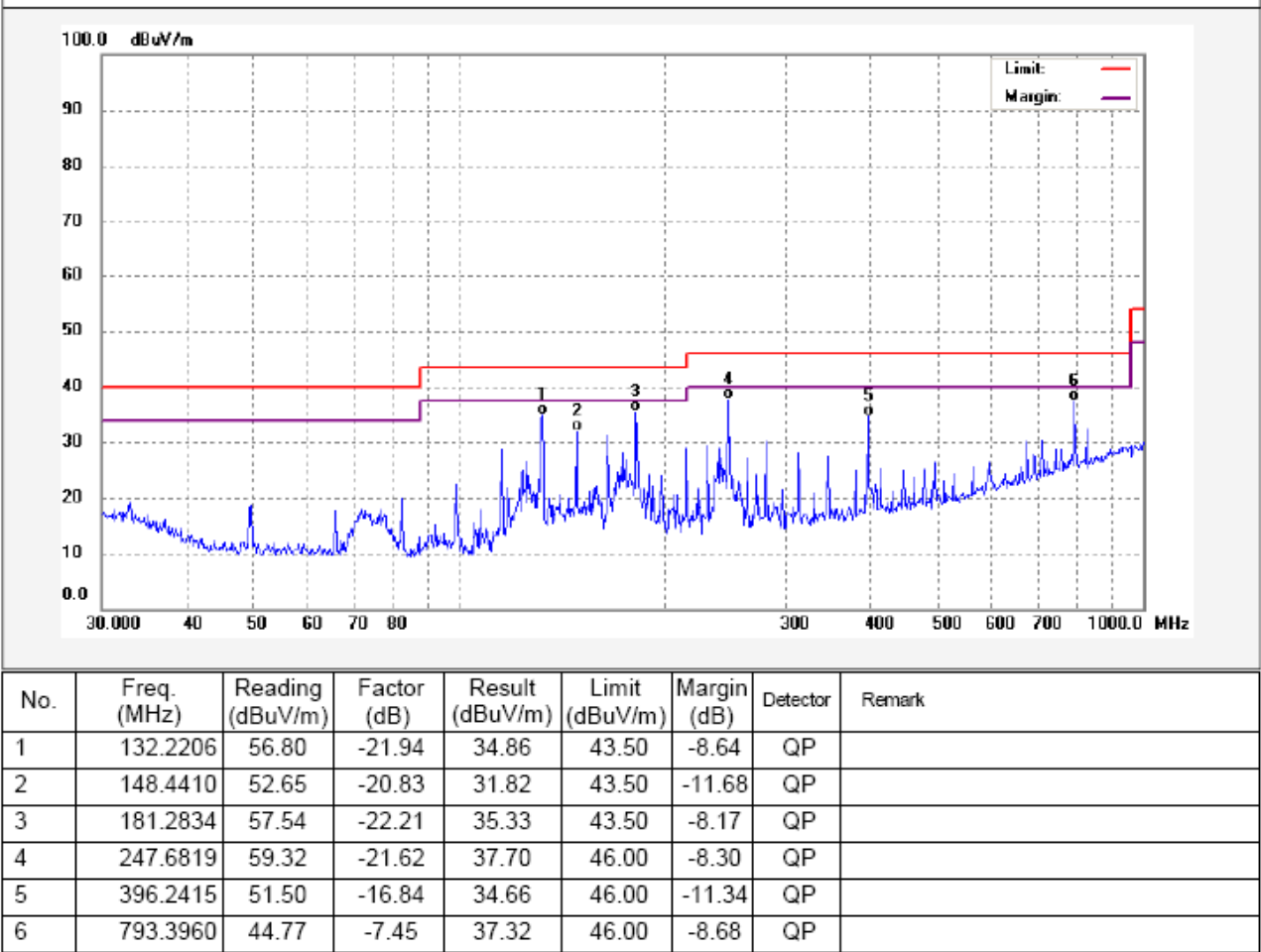
Test Frequency : 30MHz ~ 1000MHz

Test worst mode: Wifi linking(adapter operation) ,the worst data

Antenna polarization: Vertical



Antenna polarization: Horizontal



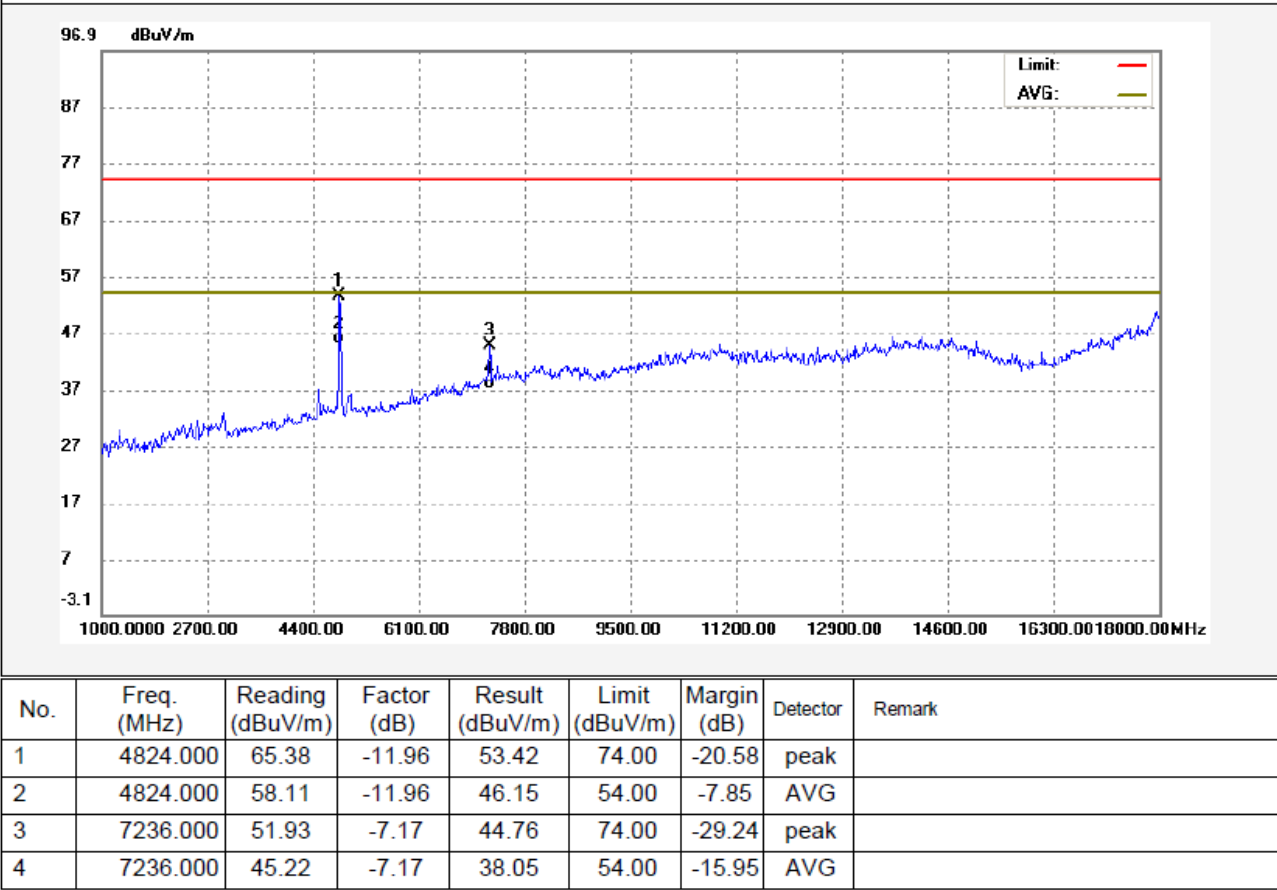
Test Frequency: From 1GHz -18GHz

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.

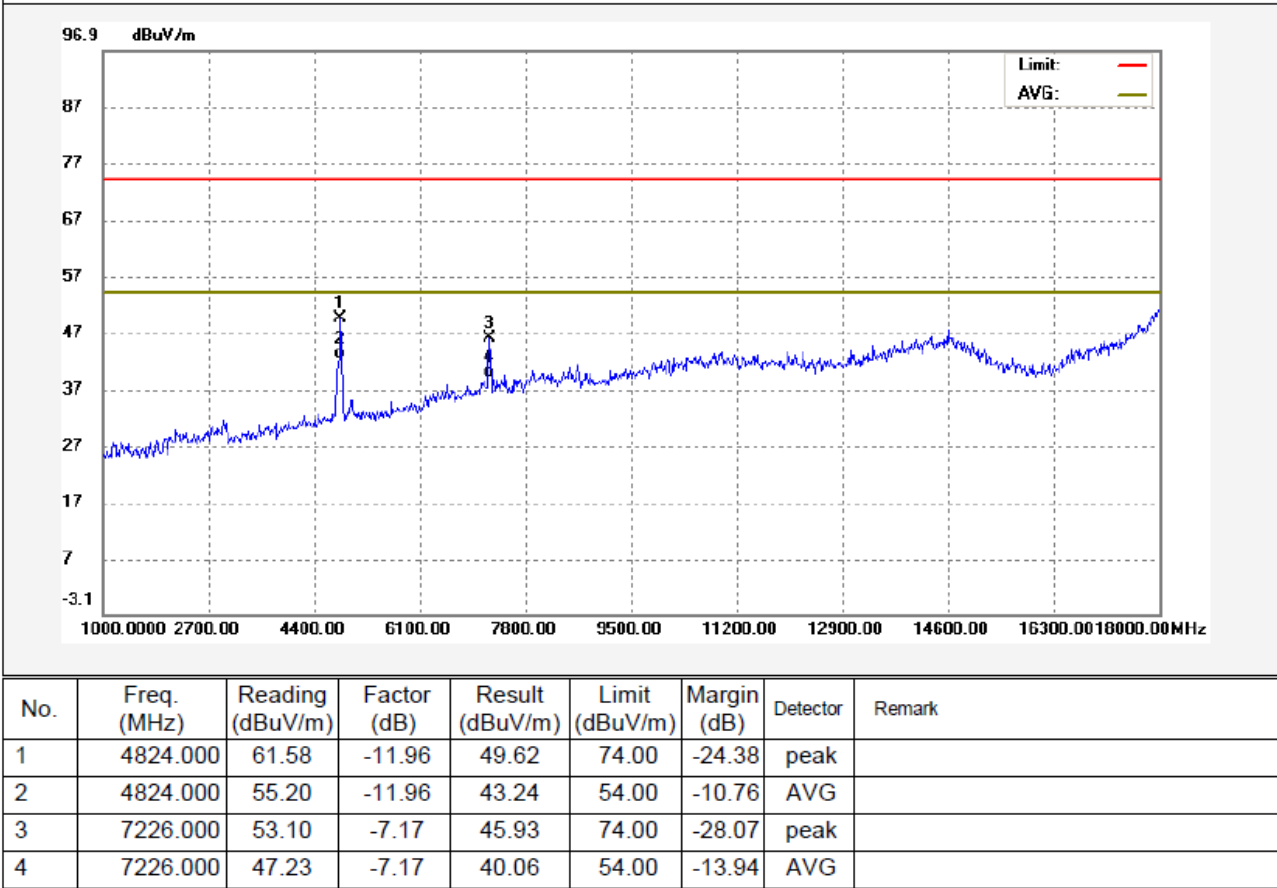
Test mode: Continuously Transmit

Modulation:TX 11b, Test Channel: 2412MHz

Antenna polarization: Vertical

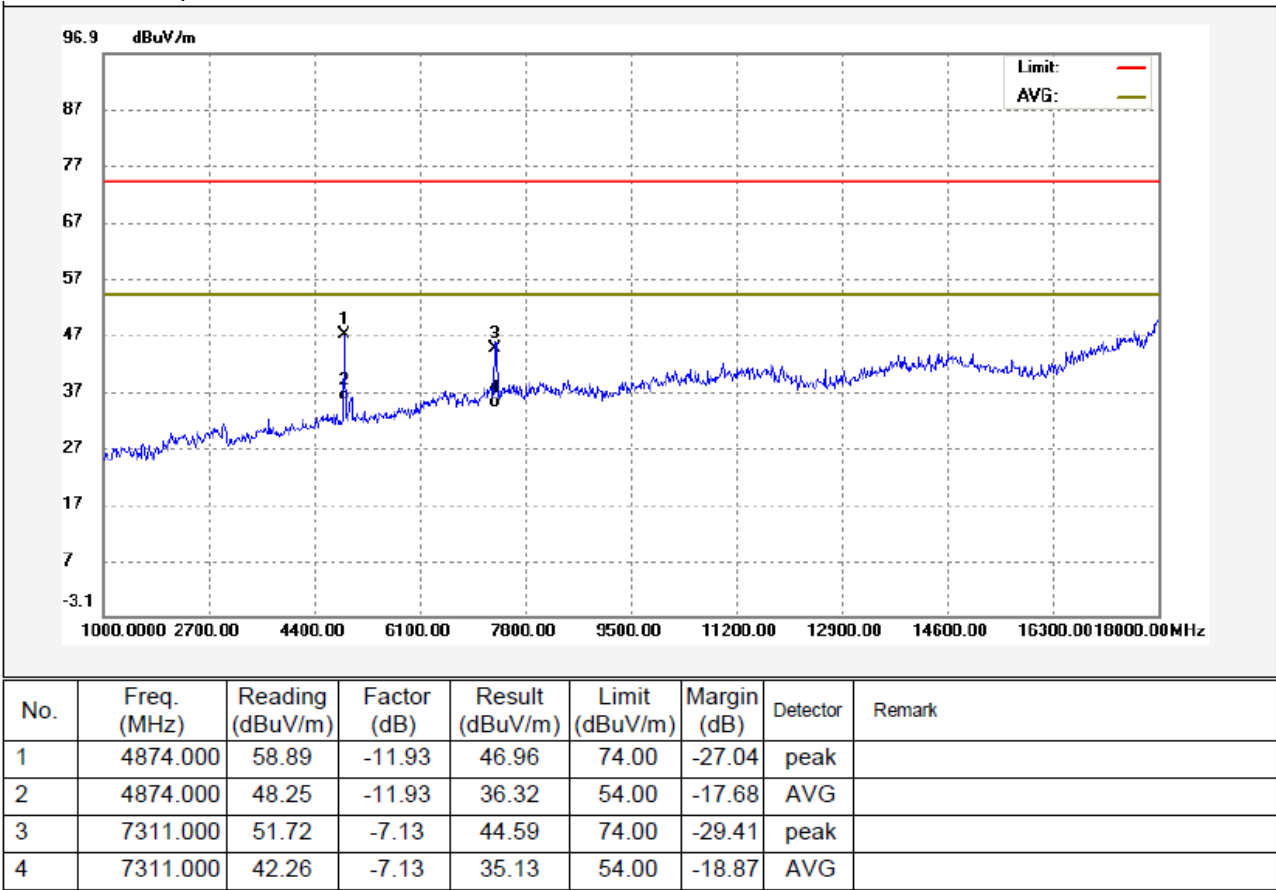


Antenna polarization: Horizontal

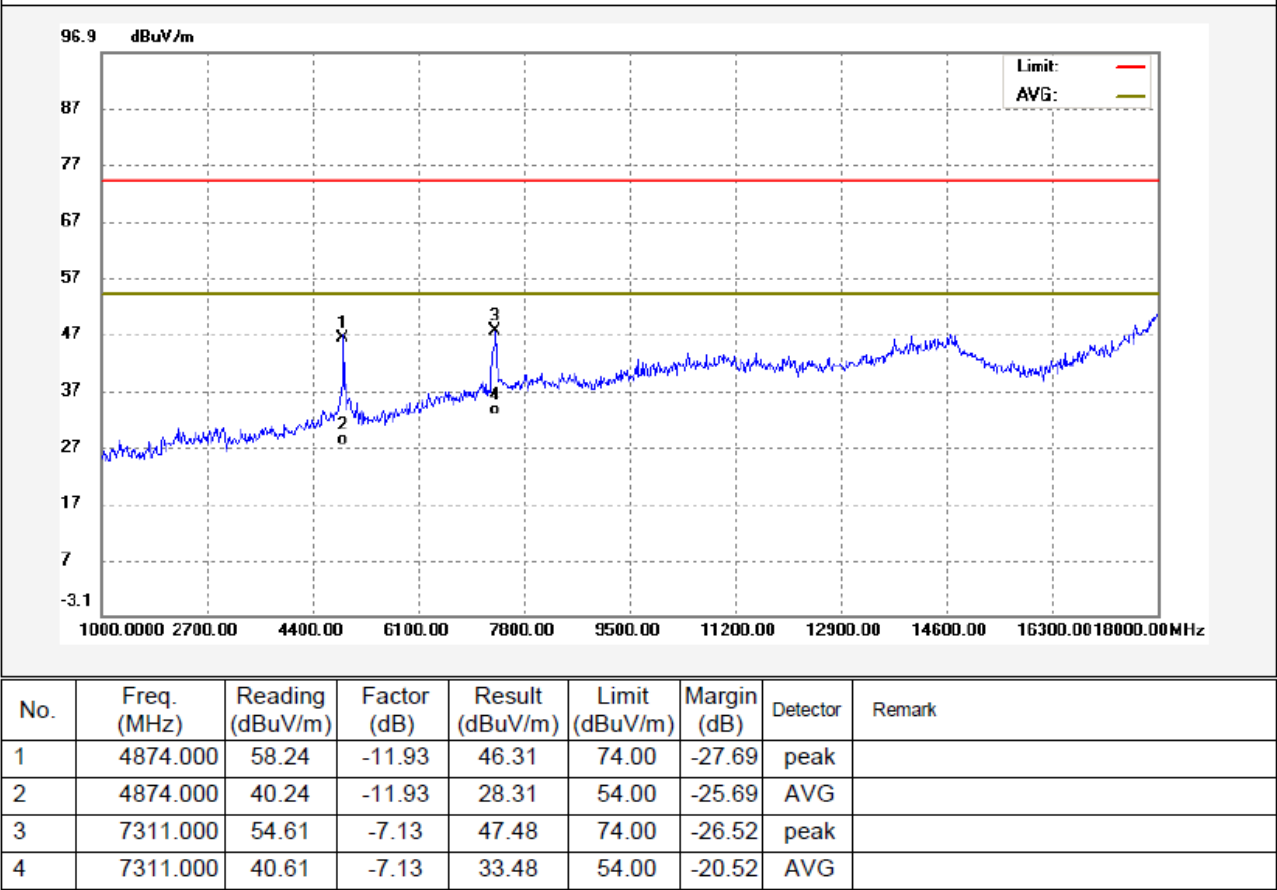


Modulation:TX 11b, Test Channel: 2437MHz

Antenna polarization: Vertical

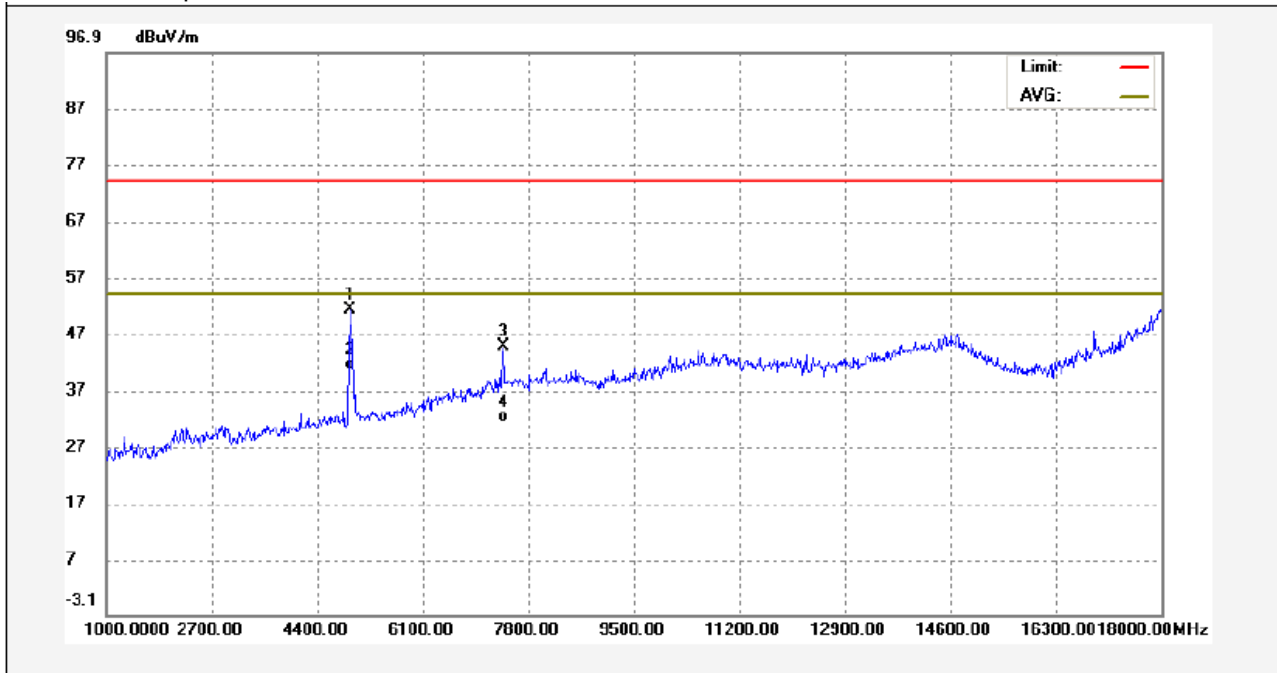


Antenna polarization: Horizontal



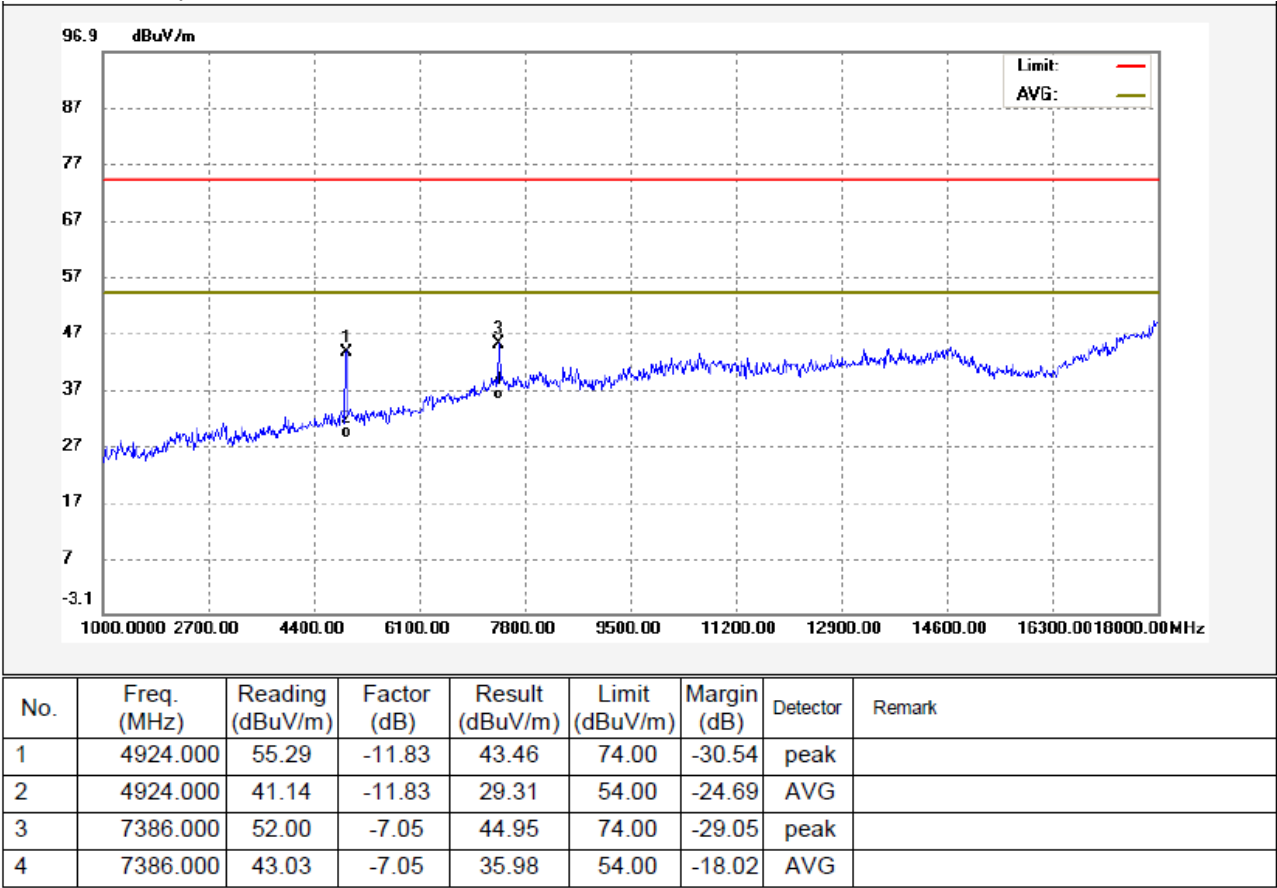
Modulation:TX 11b, Test Channel: 2462MHz

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	4924.000	63.22	-11.83	51.39	74.00	-22.61	peak	
2	4924.000	53.26	-11.83	41.43	54.00	-12.57	AVG	
3	7386.000	51.77	-7.05	44.72	74.00	-29.28	peak	
4	7386.000	39.22	-7.05	32.17	54.00	-21.83	AVG	

Antenna polarization: Horizontal



Test Frequency: Above 18GHz

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

Modulation:TX 11b, Test Channel: 2437MHz(the worst data)

Frequency (MHz)	Detector	Antenna Polarization	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
TX 11b, Test Channel: 2437MHz							
19496.00	AV	Vertical	50.65	54.00	-3.35	1.4	142
21993.00	AV	Vertical	49.64	54.00	-4.36	1.4	35
24370.00	AV	Vertical	49.00	54.00	-5.00	1.1	147
19496.00	AV	Horizontal	52.05	54.00	-1.95	1.6	179
21993.00	AV	Horizontal	51.51	54.00	-2.49	1.4	163
24370.00	AV	Horizontal	50.05	54.00	-3.95	1.4	93

8 Band Edge Measurement

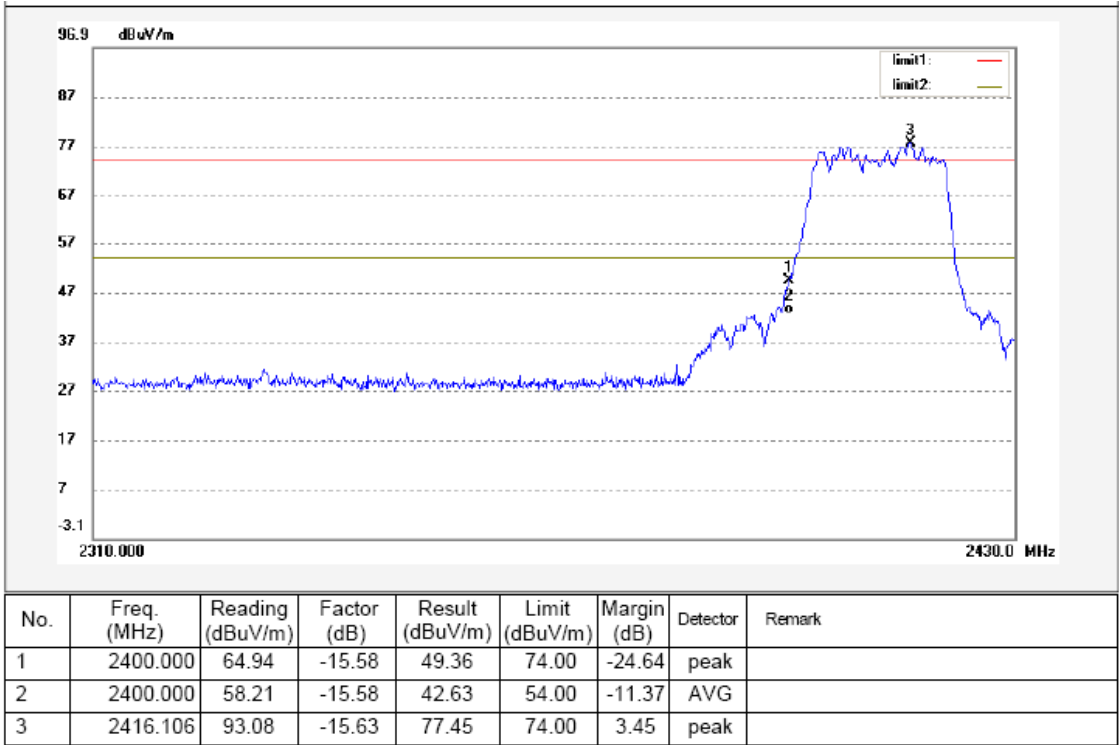
Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) and 15.205(c).
Test Method:	KDB 558074 D01 V03R01
Measurement Distance:	3m
Detector:	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

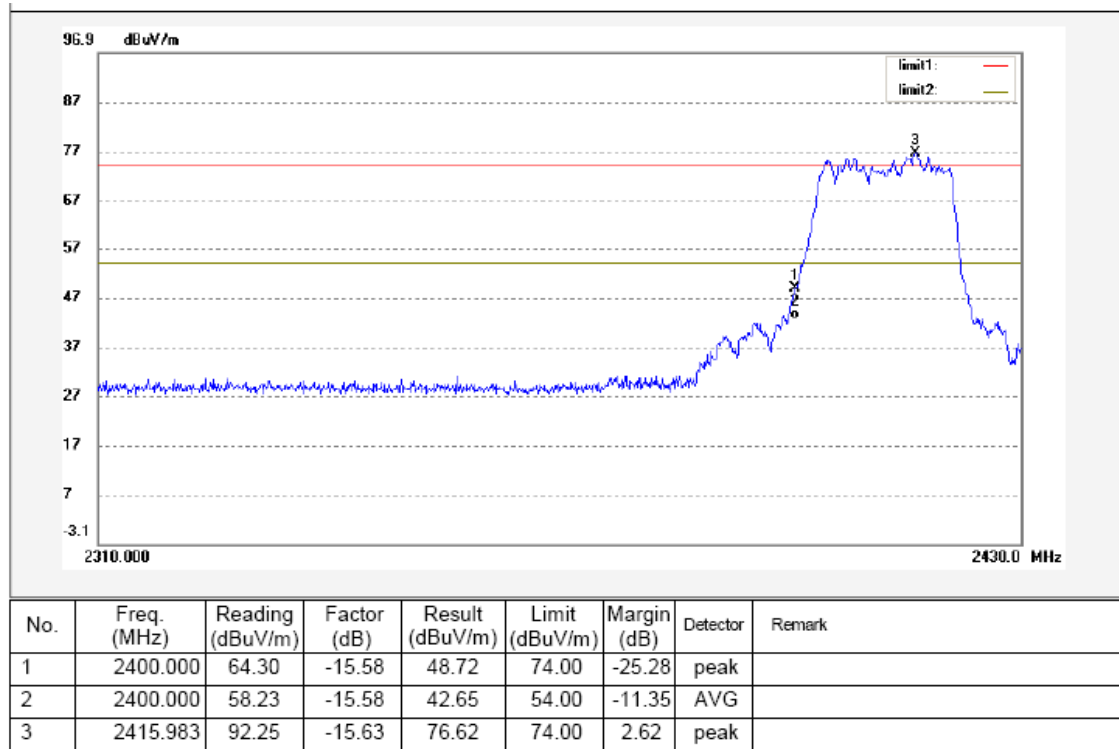
1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out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

8.2 Test Result

Mode: TX 11b channel 1 Antenna Polarization:Horizontal

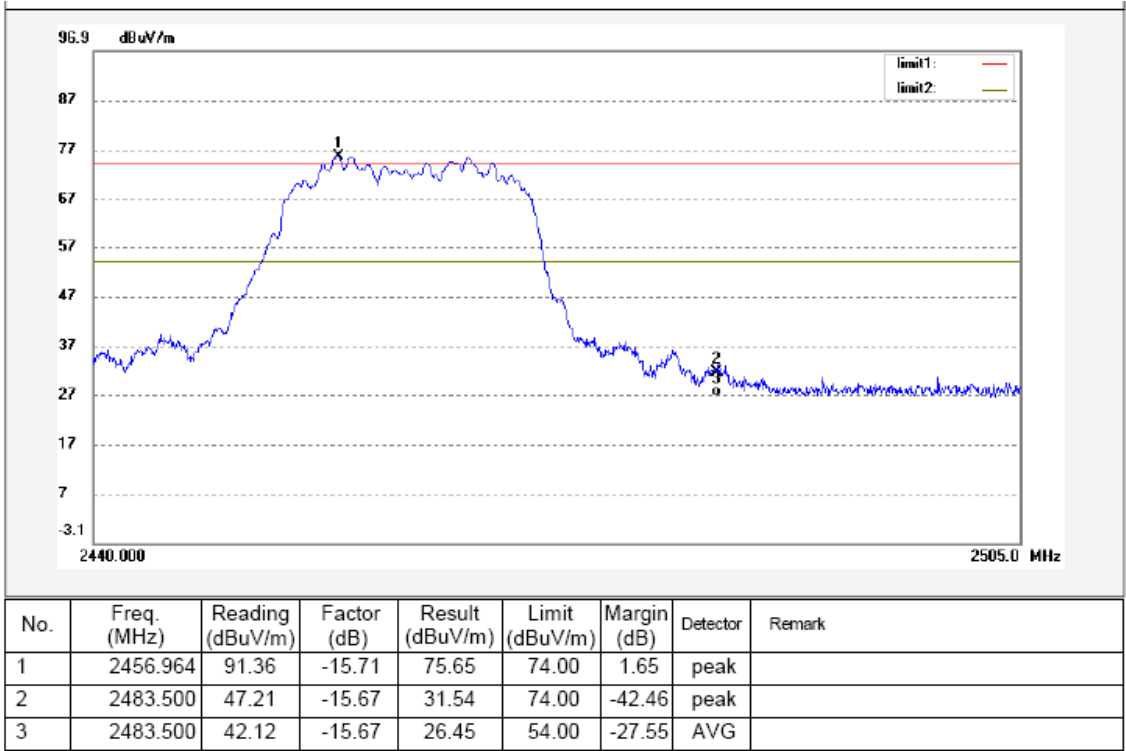


Mode: TX 11b channel 1 Antenna Polarization:Vertical



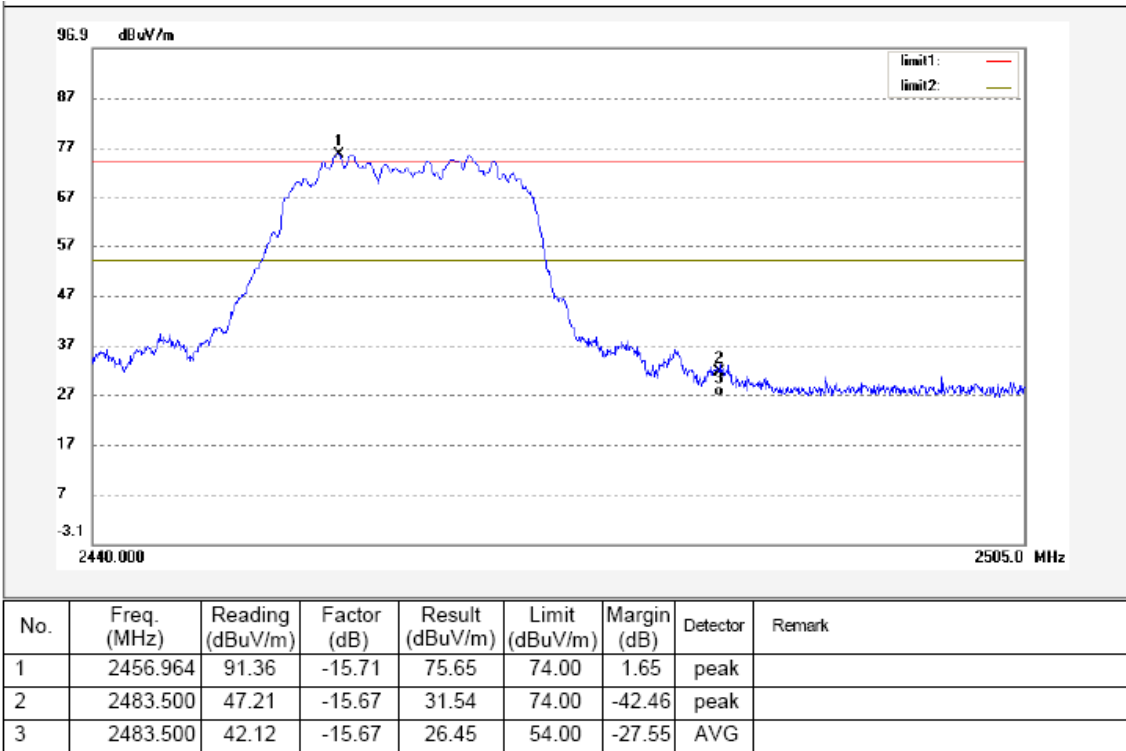
Mode: TX 11b channel 11

Antenna Polarization:Horizontal



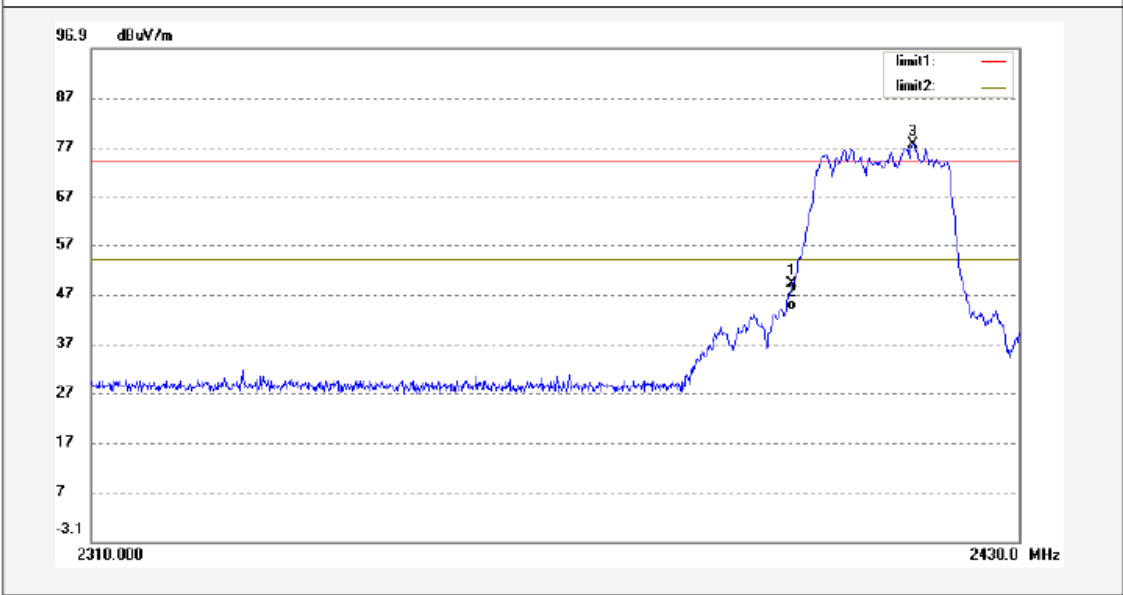
Mode: TX 11b channel 11

Antenna Polarization:Vertical



Mode: TX 11g channel 1

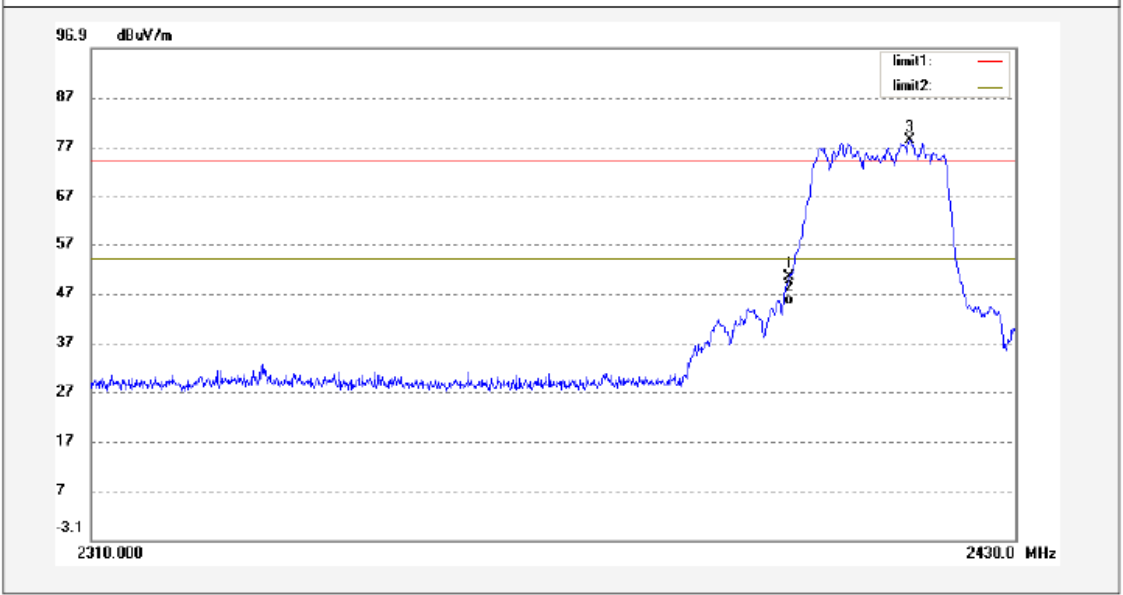
Antenna Polarization:Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	64.64	-15.58	49.06	74.00	-24.94	peak	
2	2400.000	59.24	-15.58	43.66	54.00	-10.34	AVG	
3	2415.983	93.05	-15.63	77.42	74.00	3.42	peak	

Mode: TX 11g channel 1

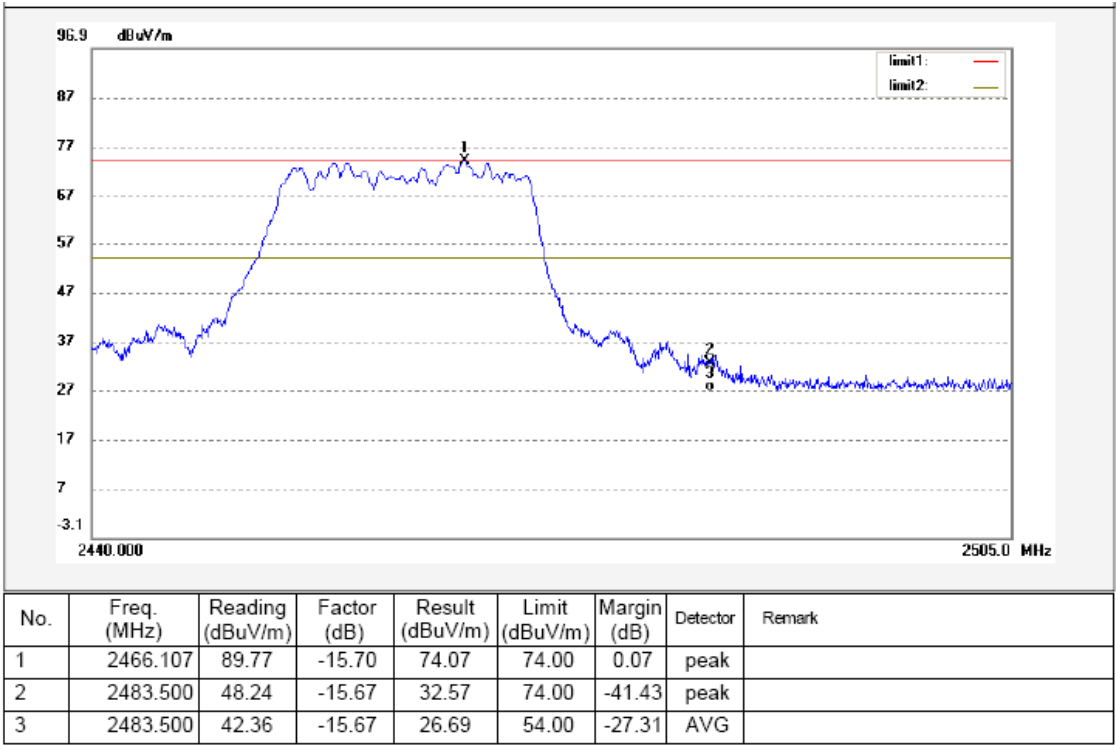
Antenna Polarization:Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	65.76	-15.58	50.18	74.00	-23.82	peak	
2	2400.000	60.12	-15.58	44.54	54.00	-9.46	AVG	
3	2415.983	94.02	-15.63	78.39	74.00	4.39	peak	

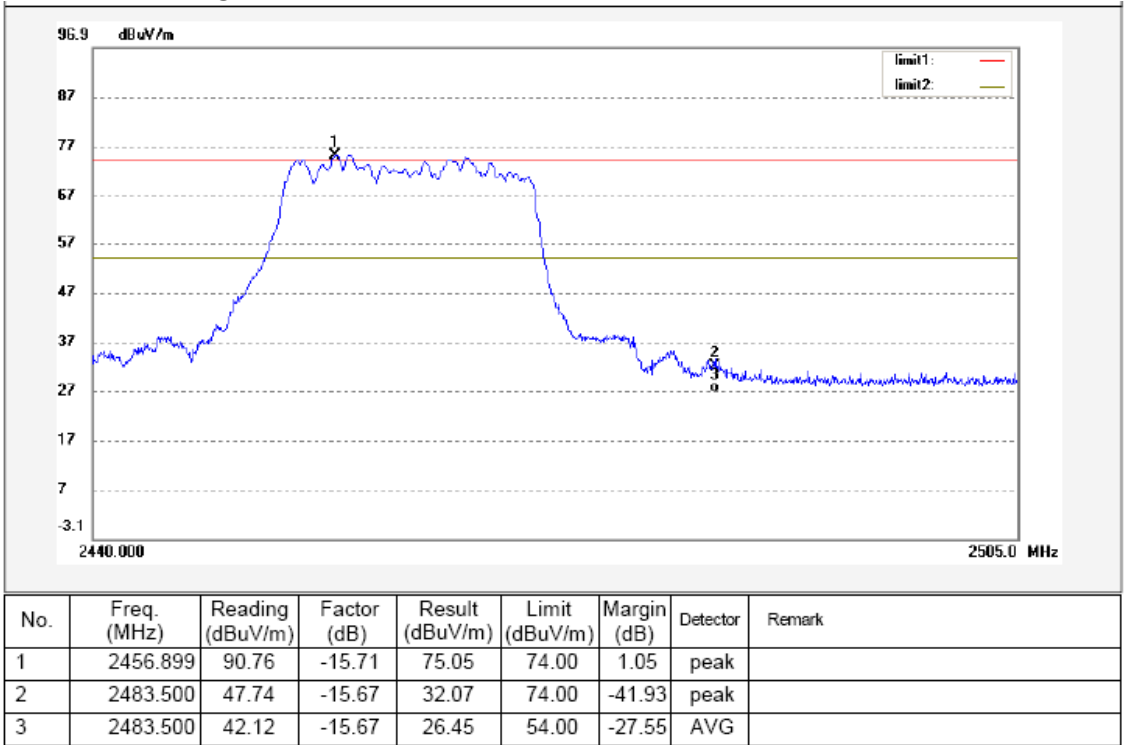
Mode: TX 11g channel 11

Antenna Polarization:Horizontal



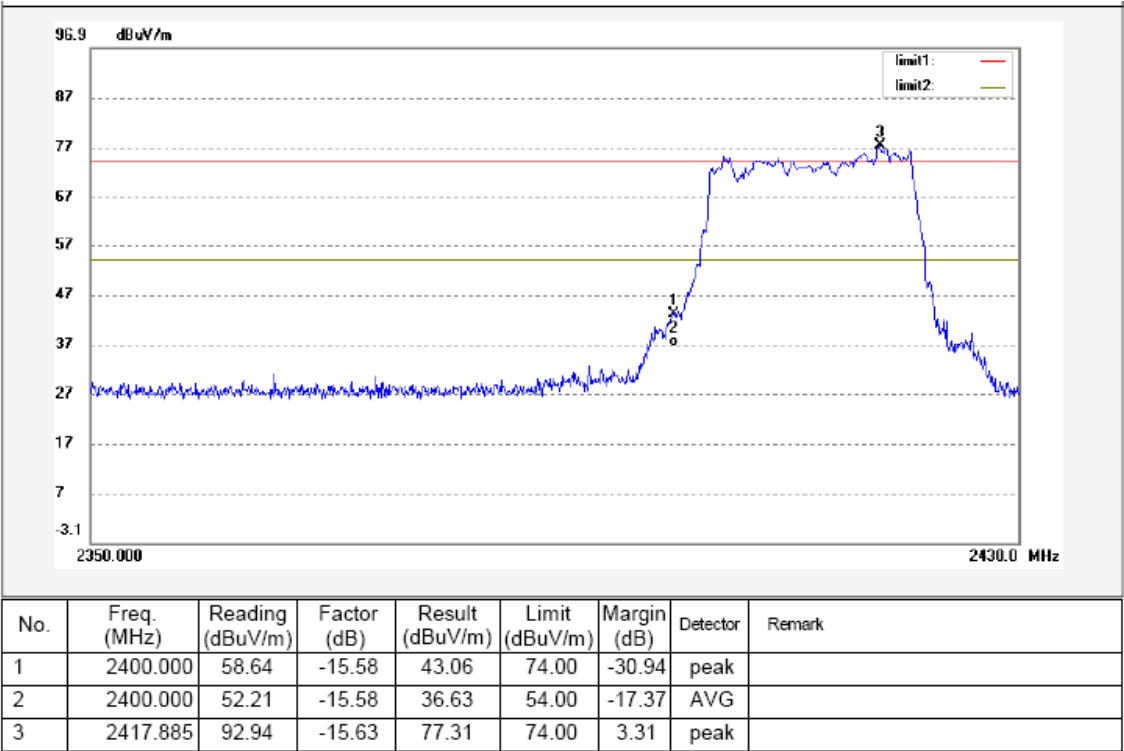
Mode: TX 11g channel 11

Antenna Polarization:Vertical



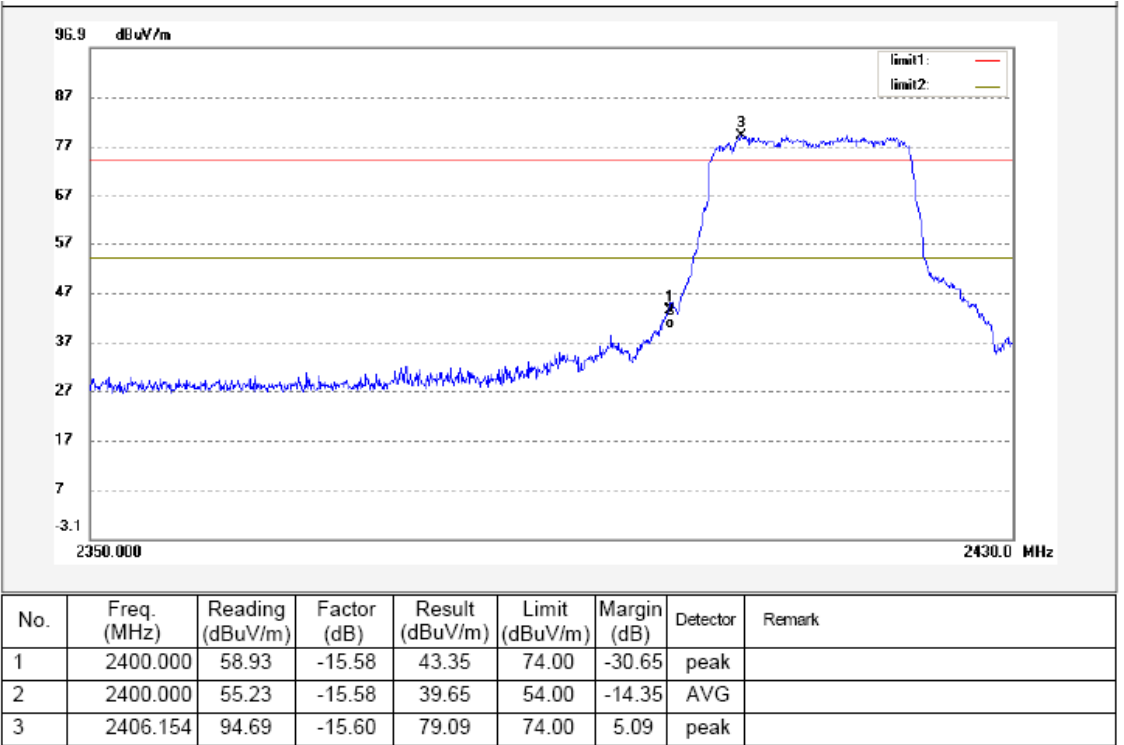
Mode: TX 11n HT 20 channel 1

Antenna Polarization:Horizontal



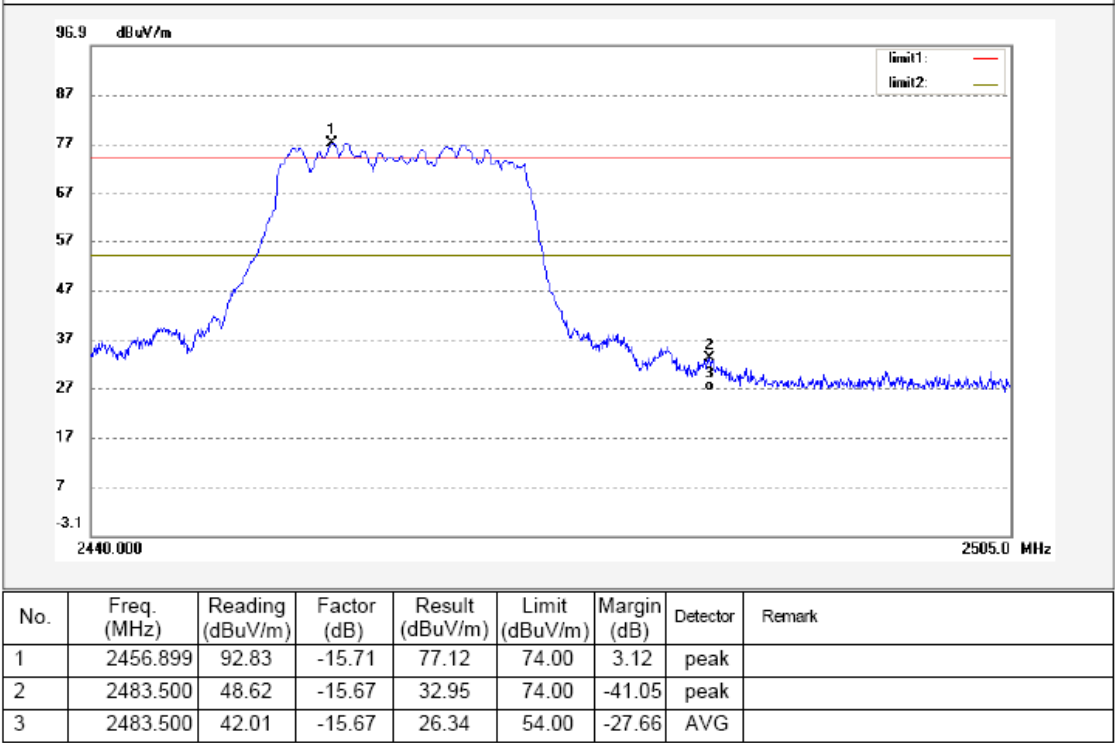
Mode: TX 11n HT 20 channel 1

Antenna Polarization:Vertical



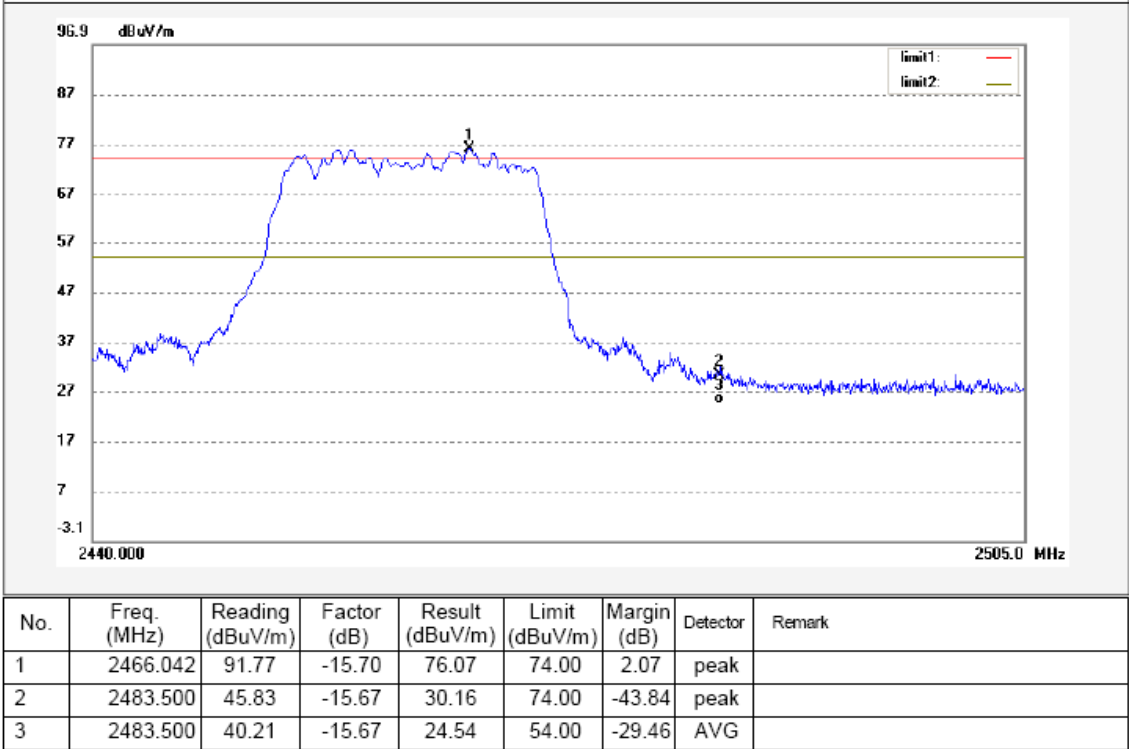
Mode: TX 11n HT 20 channel 11

Antenna Polarization:Horizontal



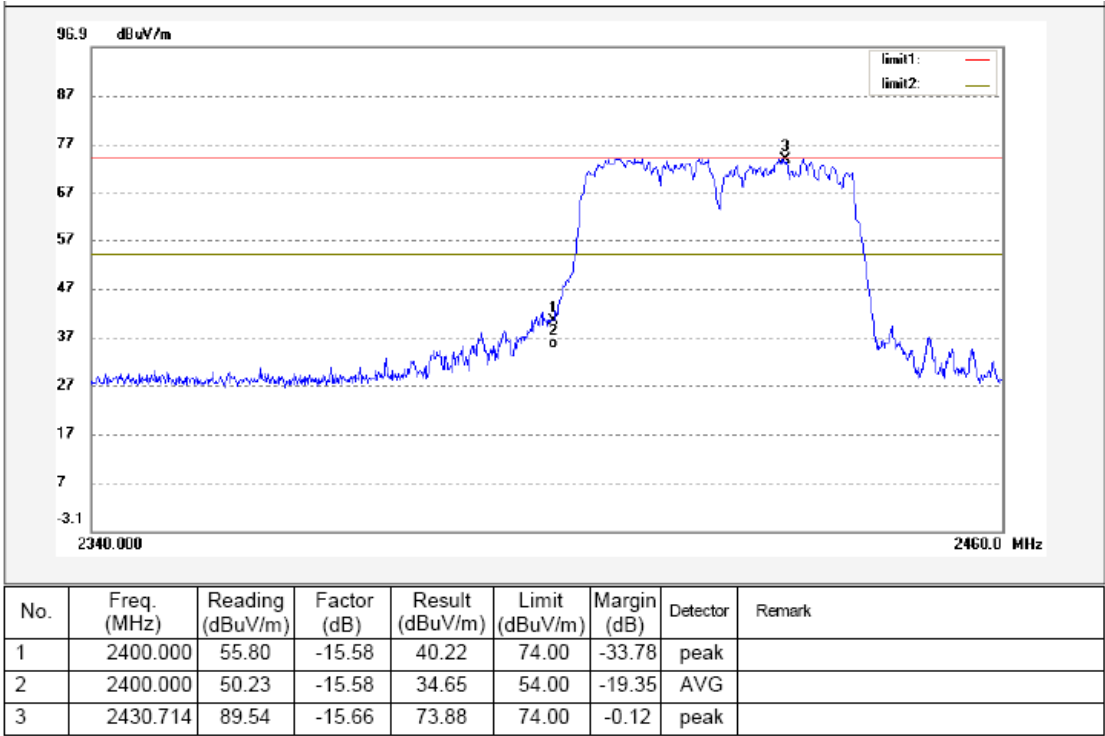
Mode: TX 11n HT 20 channel 11

Antenna Polarization:Vertical



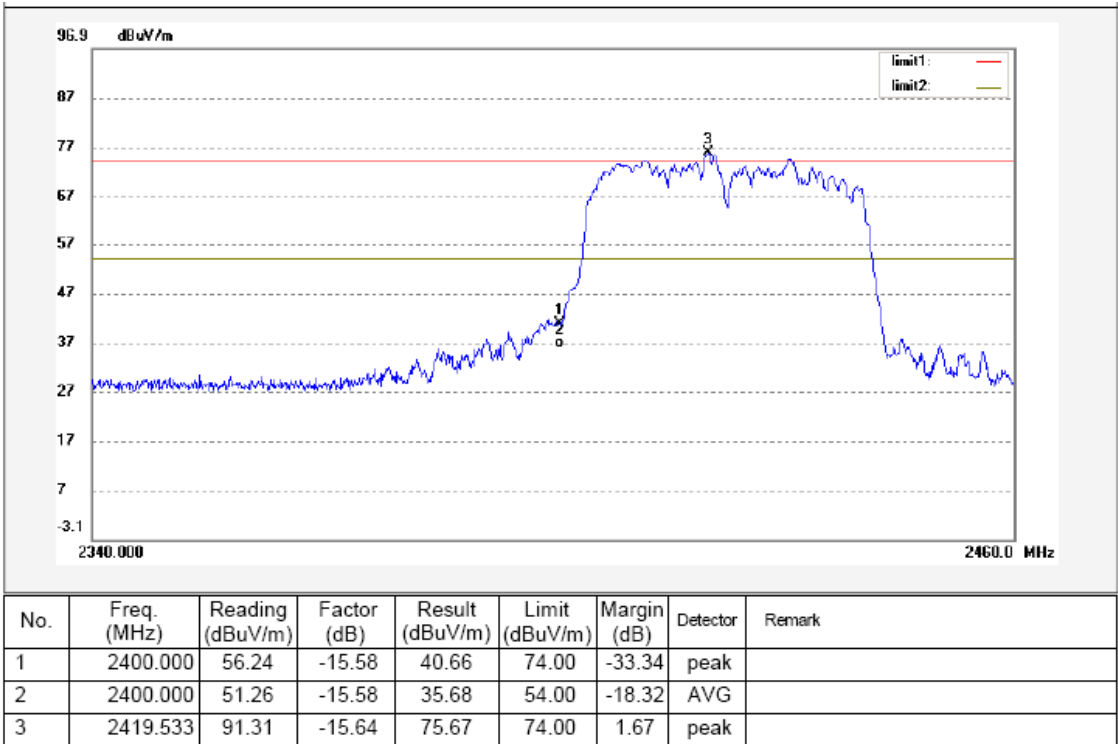
Mode: TX 11n HT 40 channel 3

Antenna Polarization:Horizontal



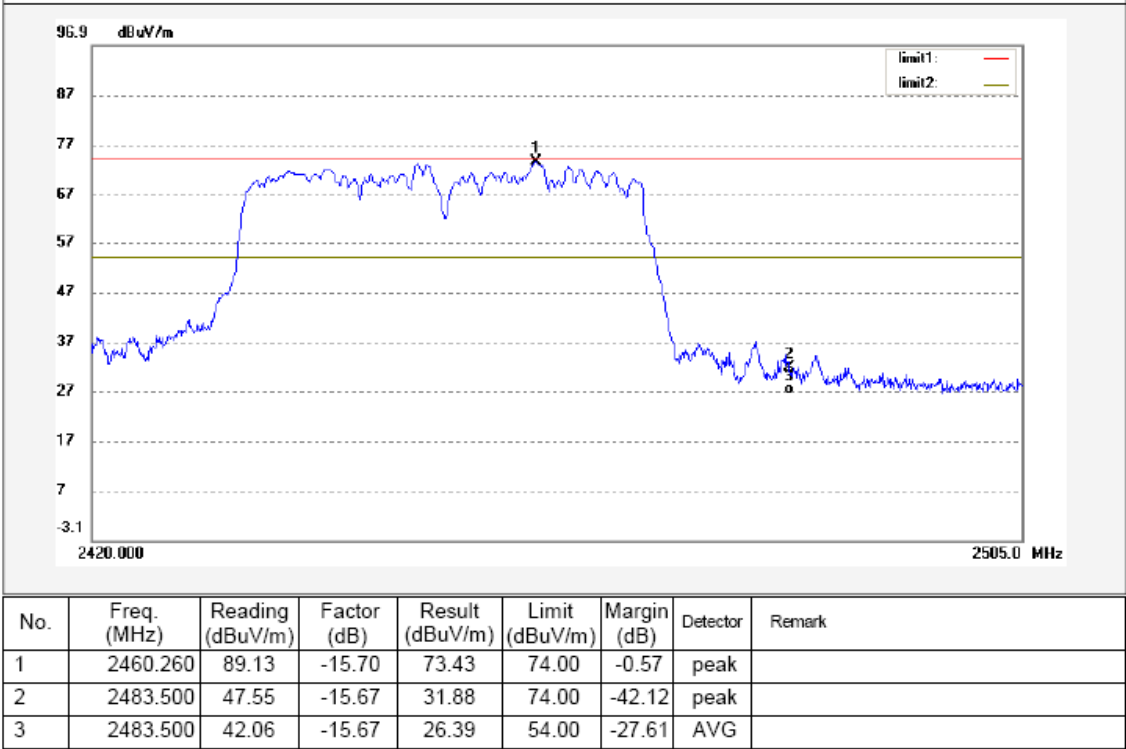
Mode: TX 11n HT 40 channel 3

Antenna Polarization:Vertical



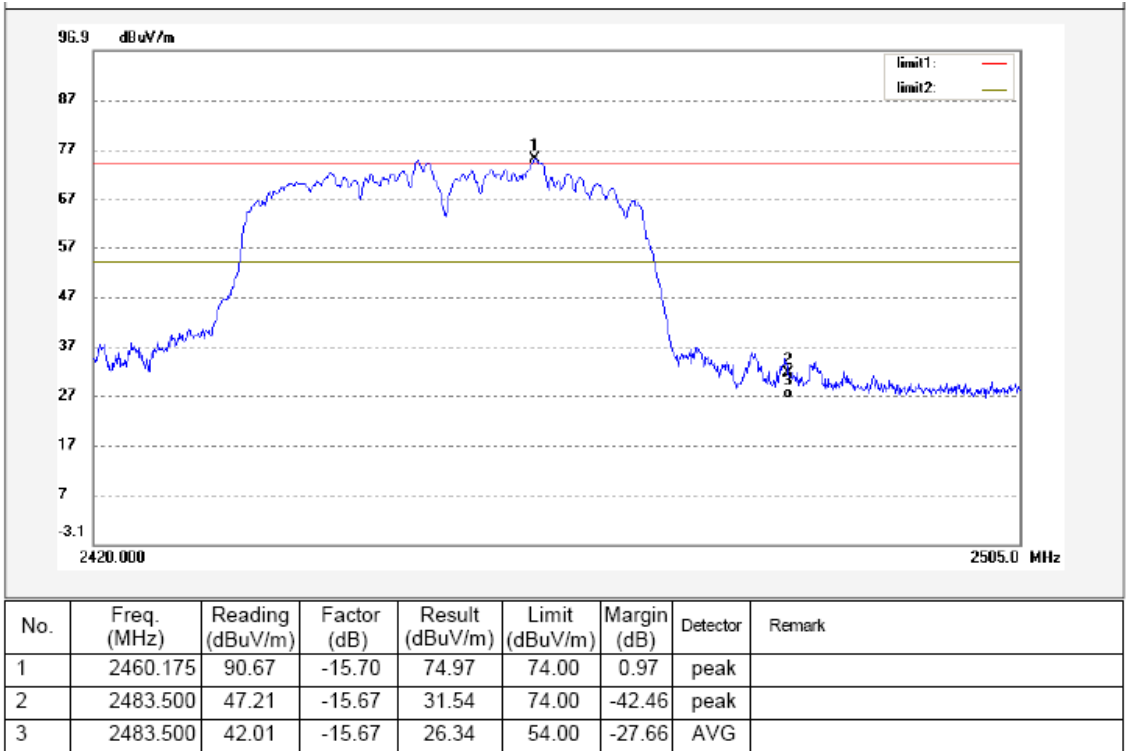
Mode: TX 11n HT 40 channel 9

Antenna Polarization:Horizontal



Mode: TX 11n HT 40 channel 9

Antenna Polarization:Vertical



9 6 dB Bandwidth Measurement

Test Requirement:

FCC CFR47 Part 15 Section 15.247

Test Method:

KDB 558074 D01 V03R01

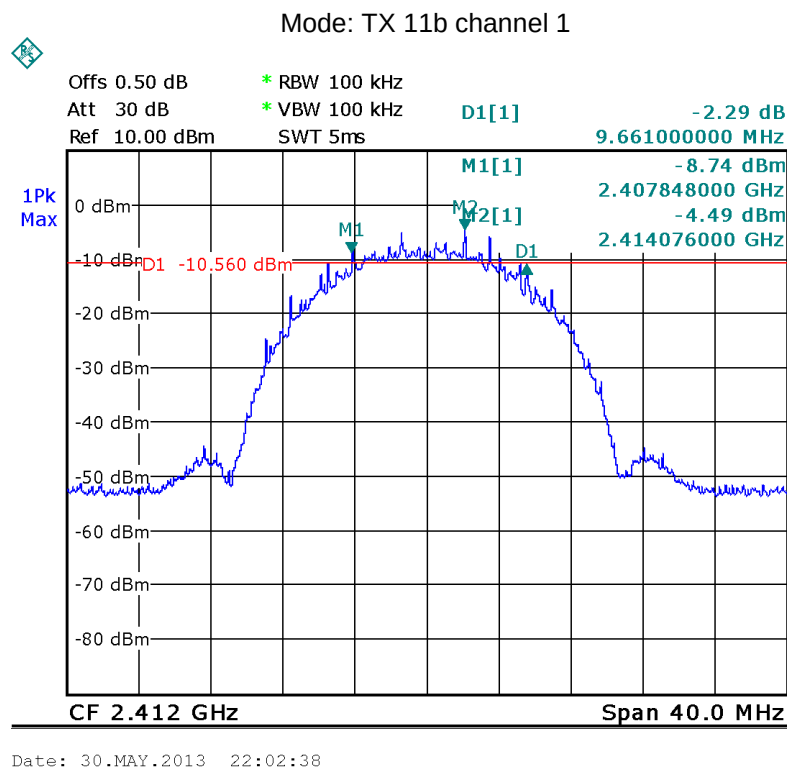
9.1 Test Procedure:

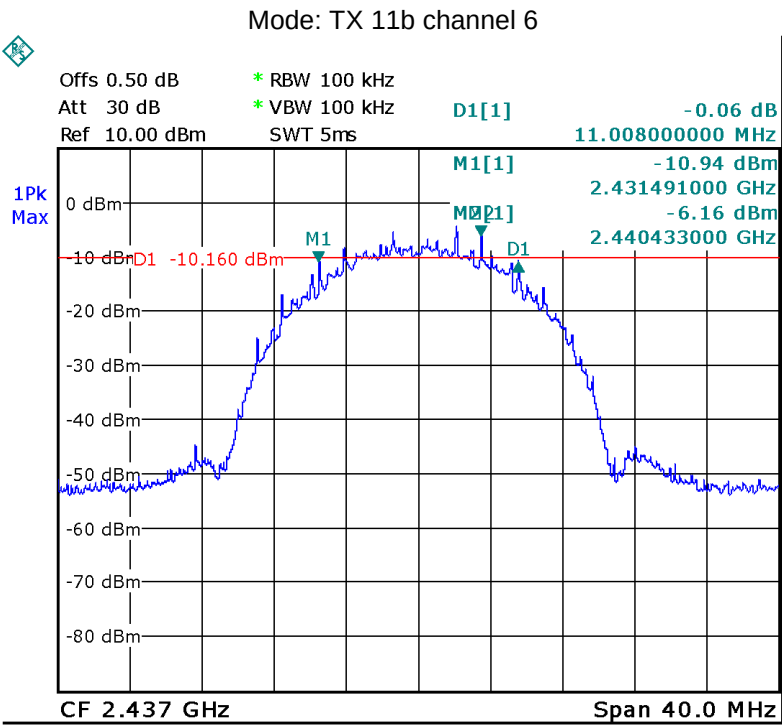
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 100kHz

9.2 Test Result:

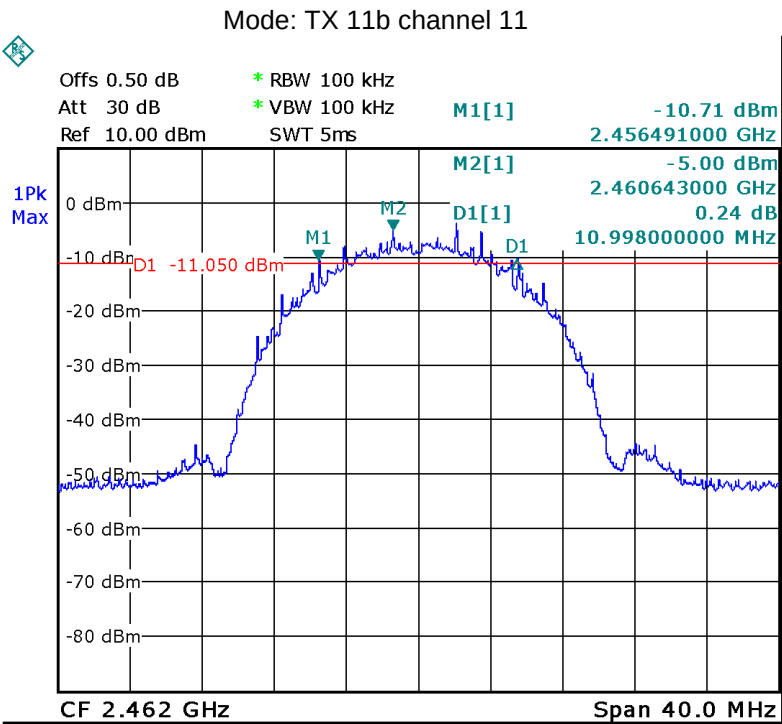
Operation mode	Bandwidth (MHz)		
TX 11b	Channel 1	Channel 6	Channel 11
	9.661	11.008	10.998
TX 11g	Channel 1	Channel 6	Channel 11
	16.607	16.597	16.587
TX 11n HT 20	Channel 1	Channel 6	Channel 11
	17.725	17.794	17.705
TX 11n HT 40	Channel 3	Channel 6	Channel 9
	36.330	36.400	36.370

Test result plot as follows:

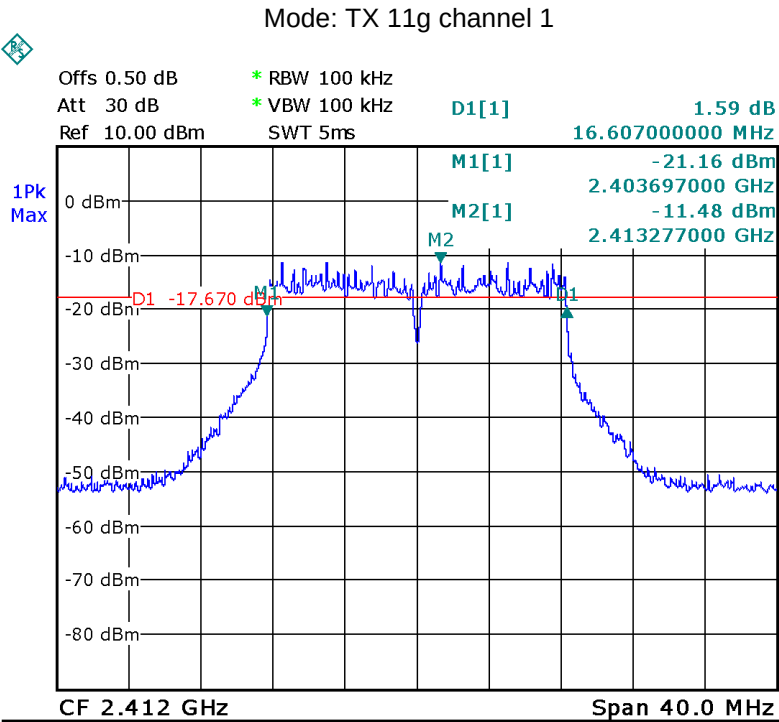




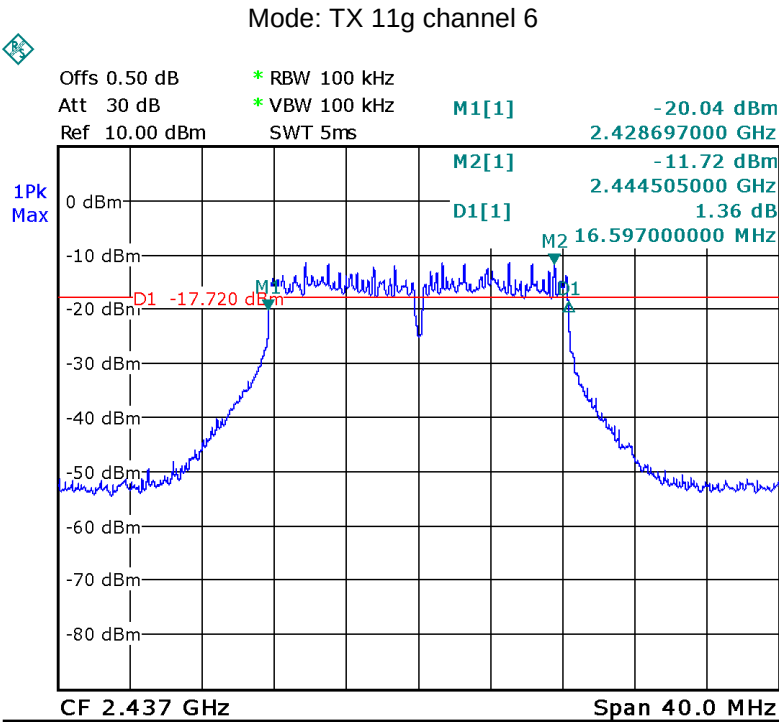
Date: 30.MAY.2013 22:04:26



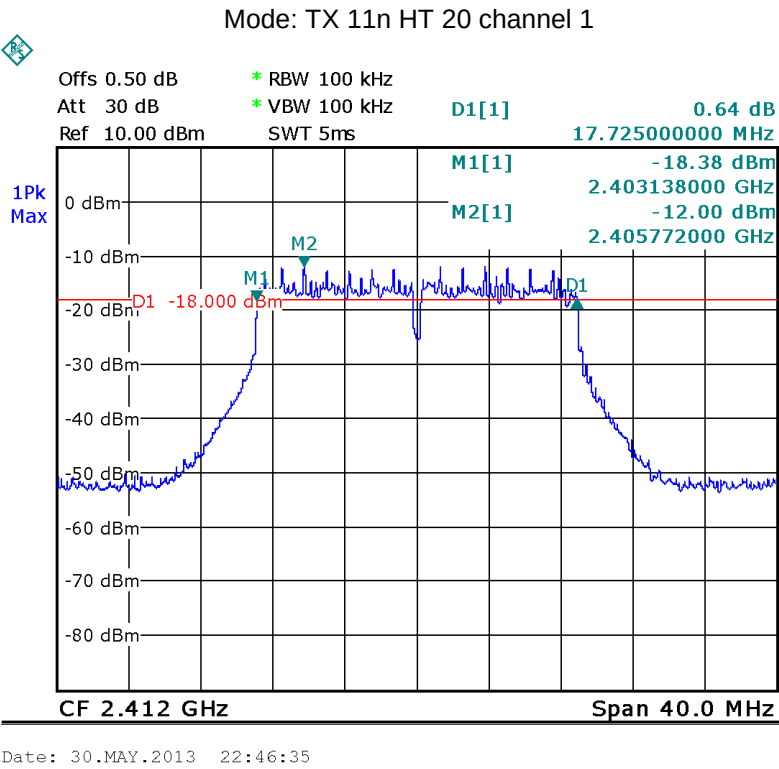
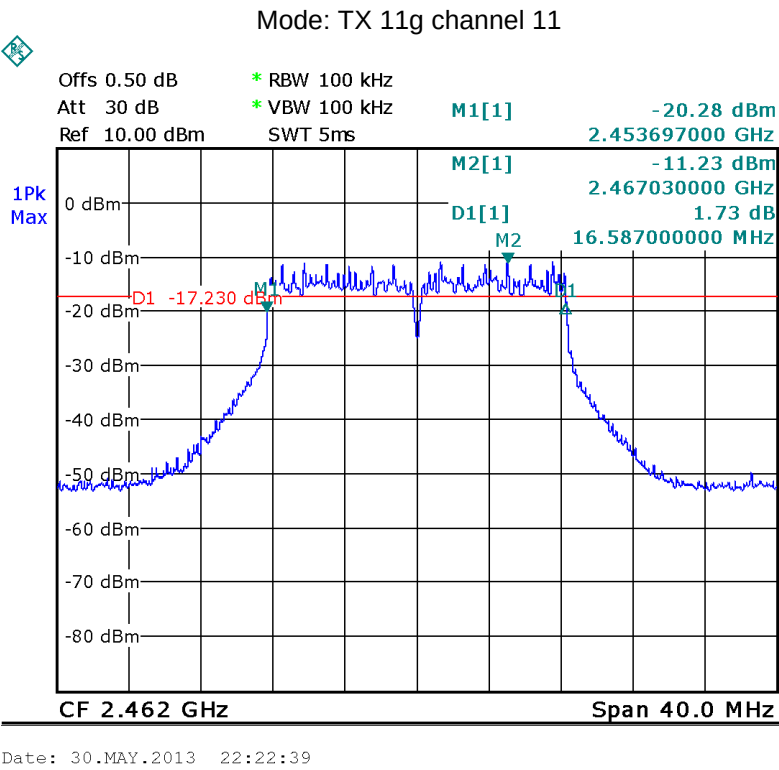
Date: 30.MAY.2013 22:05:30

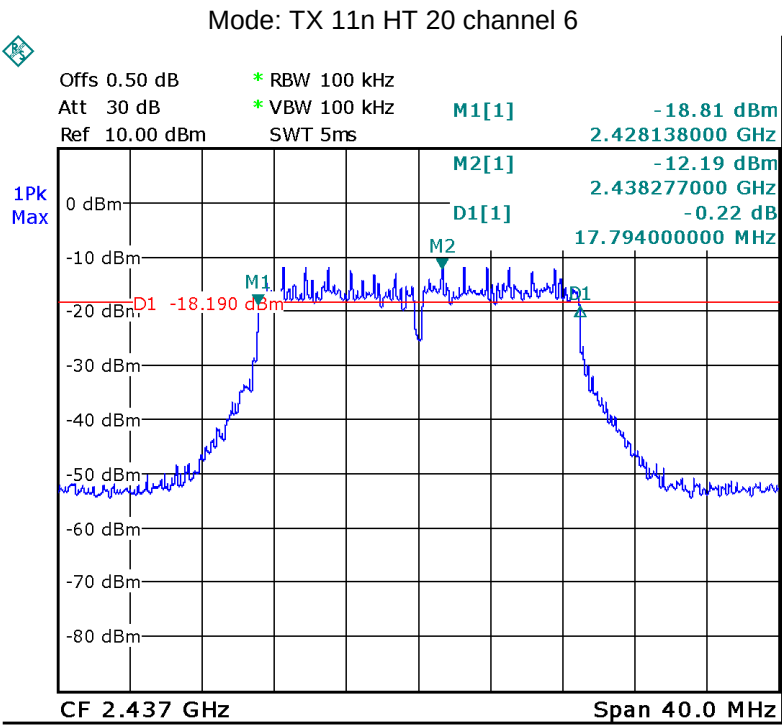


Date: 30.MAY.2013 22:19:54

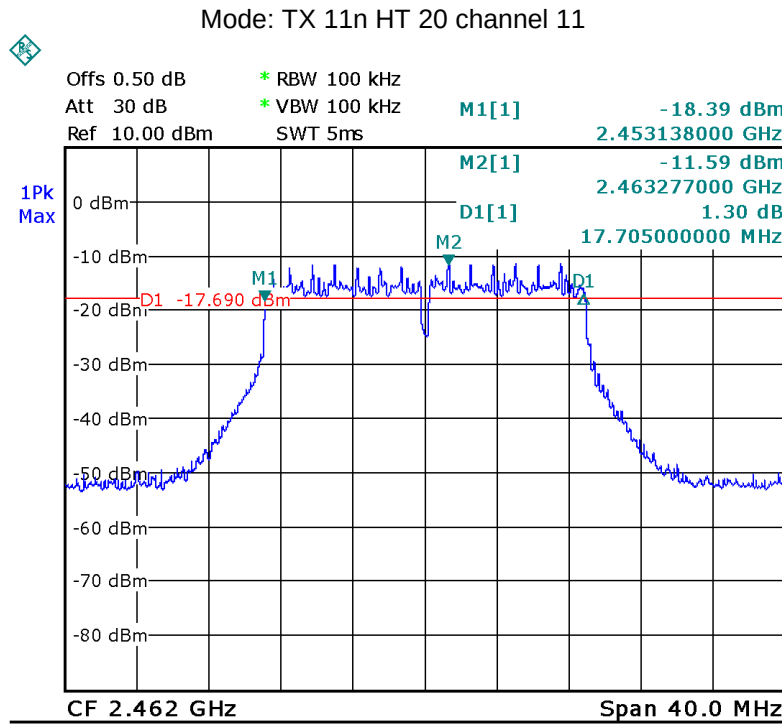


Date: 30.MAY.2013 22:21:17

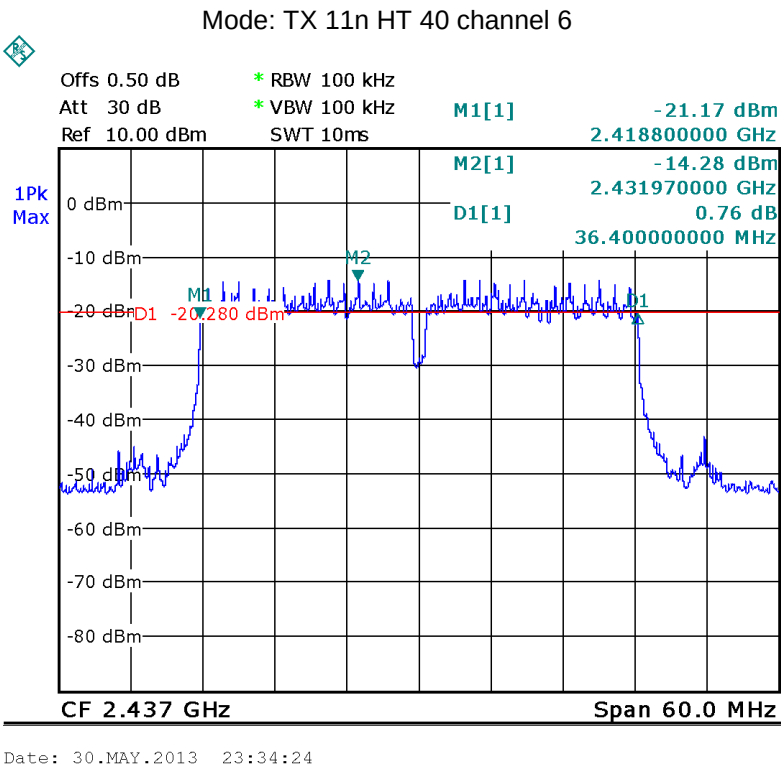
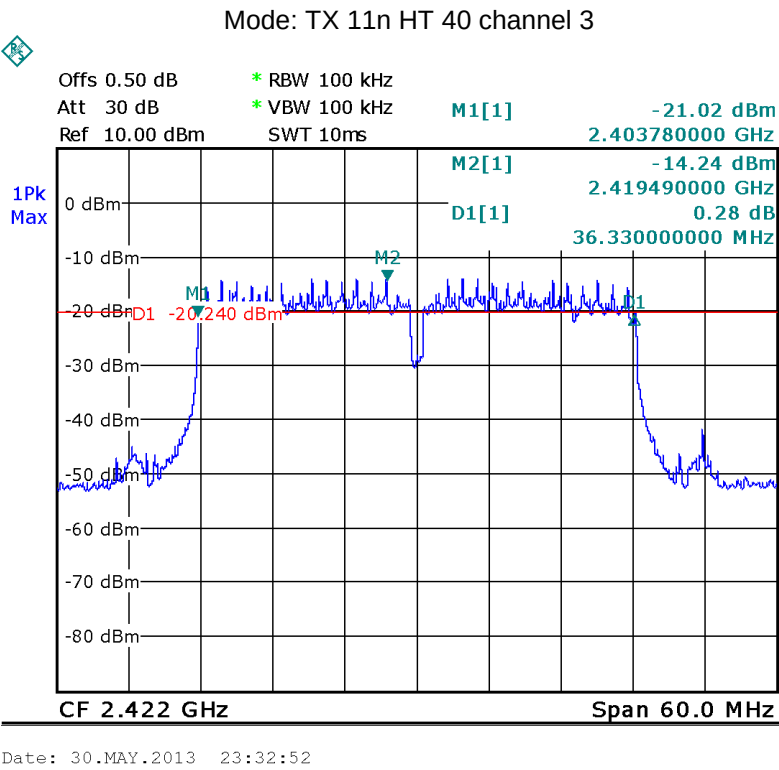




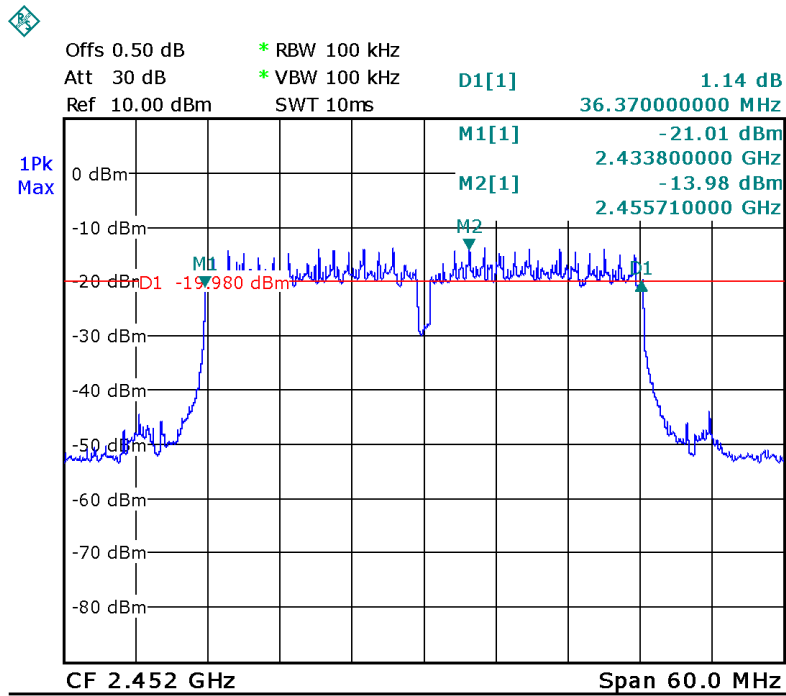
Date: 30.MAY.2013 22:48:43



Date: 30.MAY.2013 22:50:12



Mode: TX 11n HT 40 channel 9



Date: 30.MAY.2013 23:35:37

10 Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 V03R01

10.1 Test Procedure:

KDB 558074 D01 v03r01 section 9.1.2.

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:

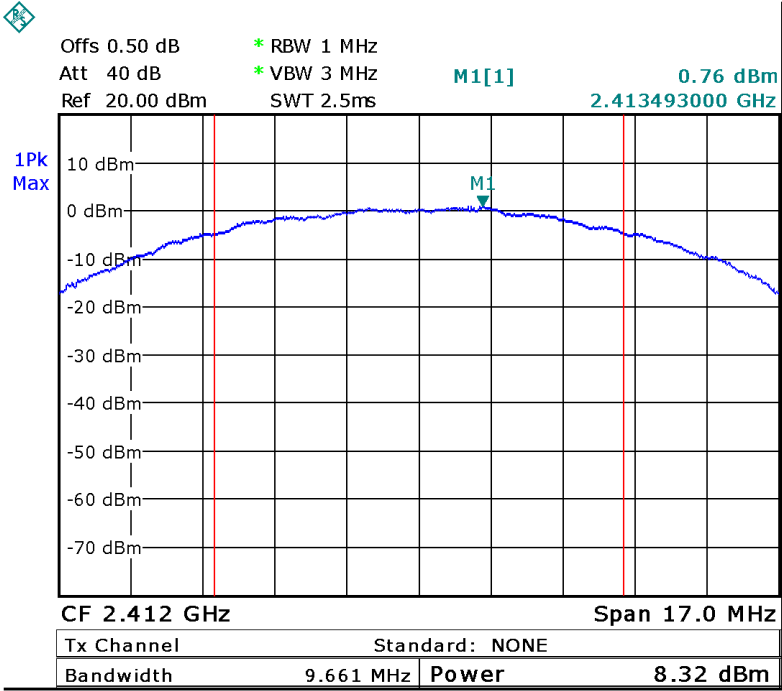
Test mode :TX 11b		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
8.32	9.98	9.58
Limit		
1W/30dBm		

Test mode :TX 11g		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
6.44	8.16	8.88
Limit		
1W/30dBm		

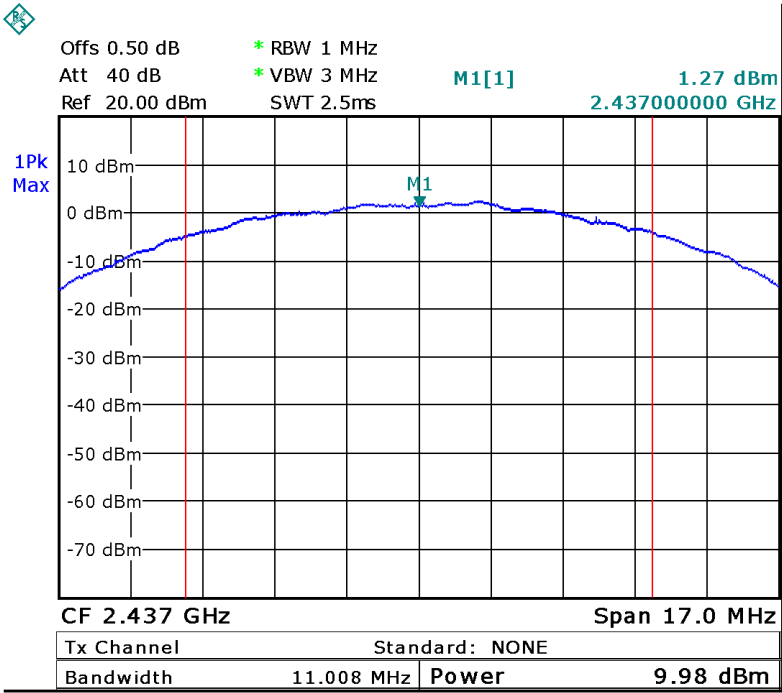
Test mode :TX 11n HT 20		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
6.02	7.58	8.28
Limit		
1W/30dBm		

Test mode :TX 11n HT 40		
10 Maximum Peak Output Power (dBm)		
2422MHz	2437MHz	2452MHz
6.44	7.21	7.71
Limit		
1W/30dBm		

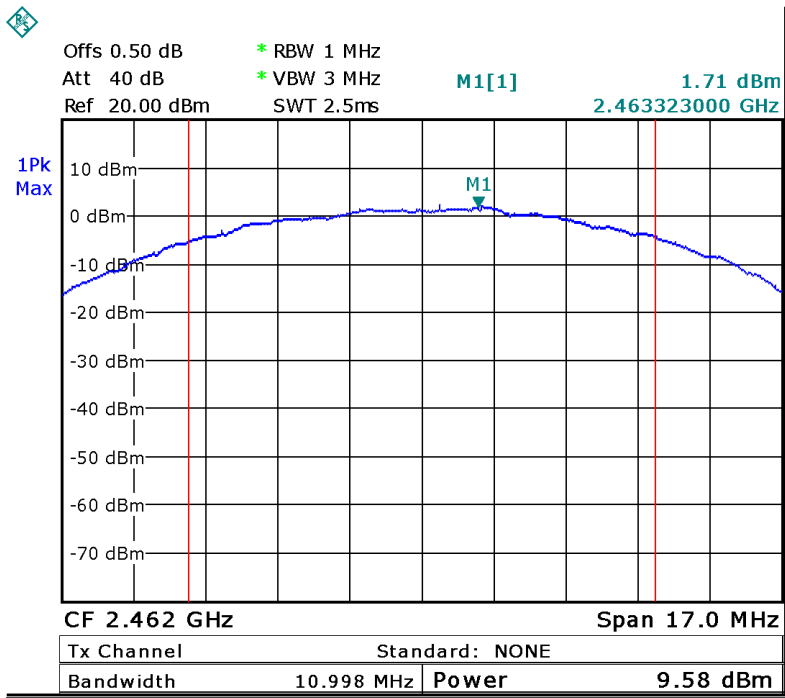
Test mode :TX 11b



Date: 21.JUN.2013 19:04:04

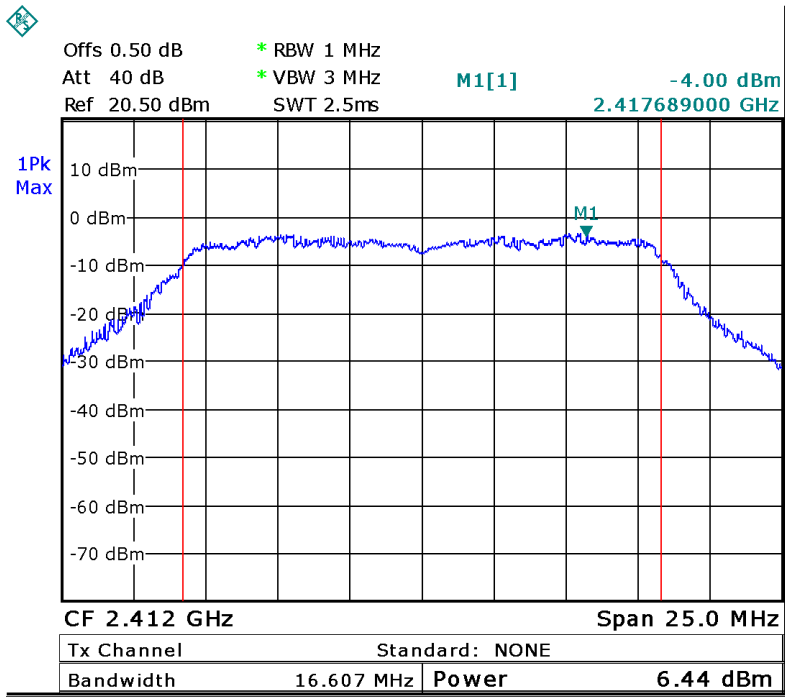


Date: 21.JUN.2013 19:00:39

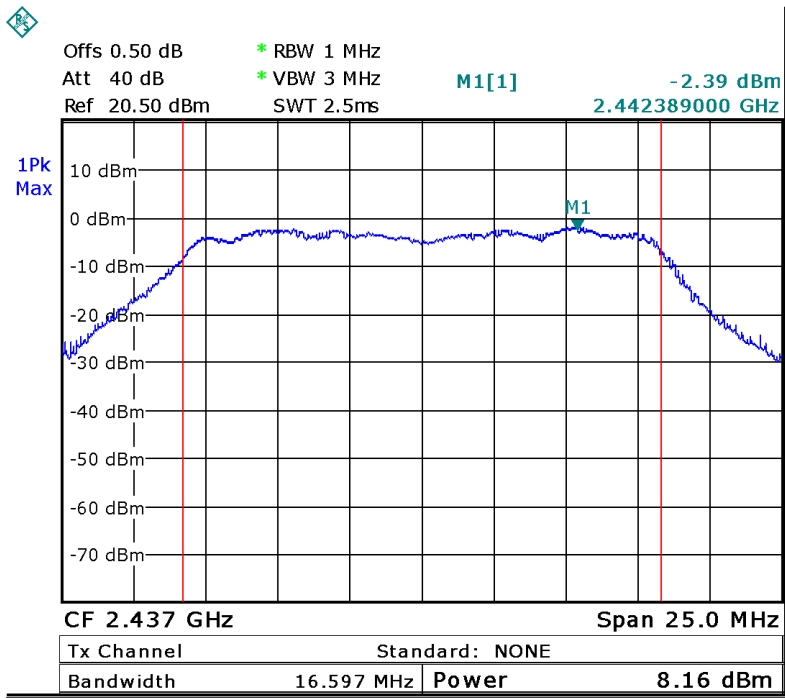


Date: 21.JUN.2013 19:02:49

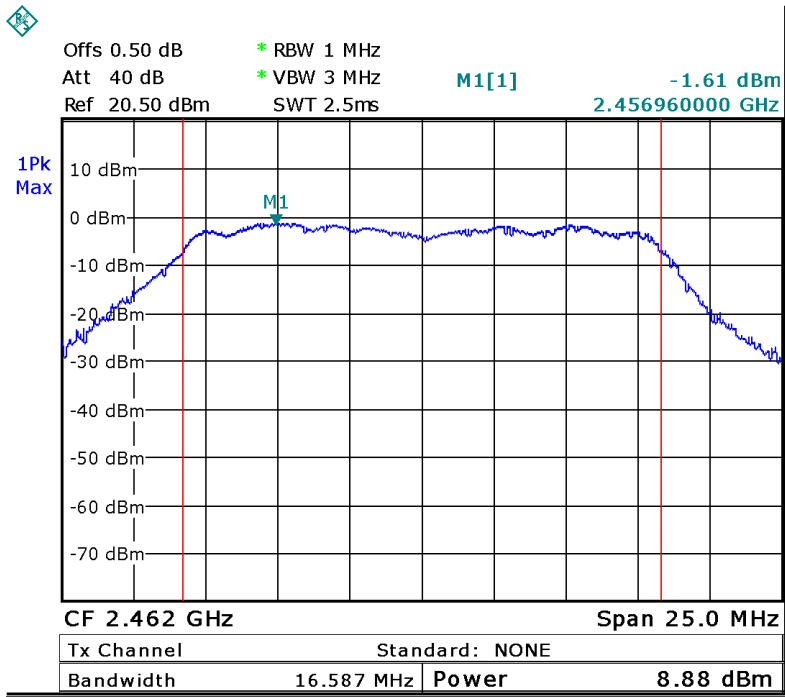
Test mode :TX 11g



Date: 21.JUN.2013 01:15:38

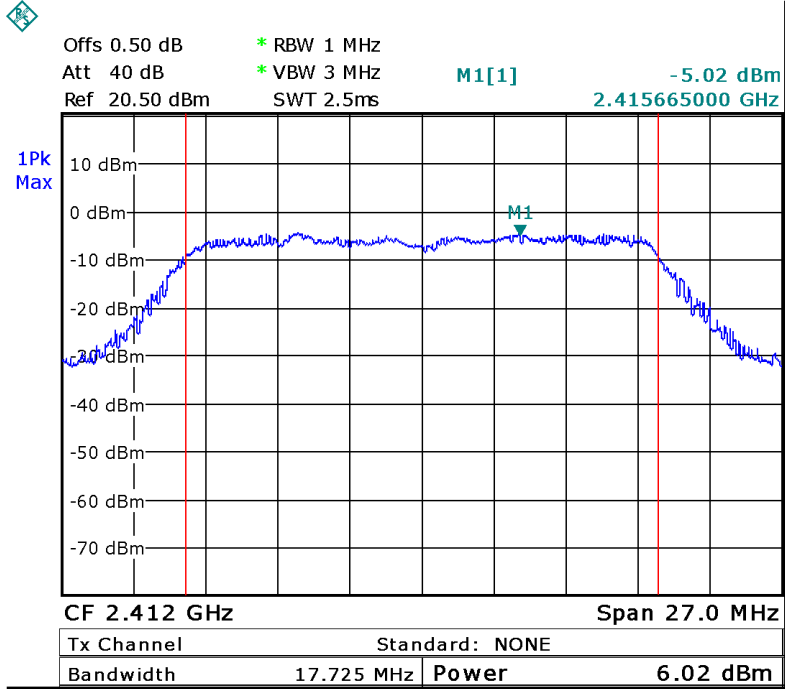


Date: 21.JUN.2013 01:16:25

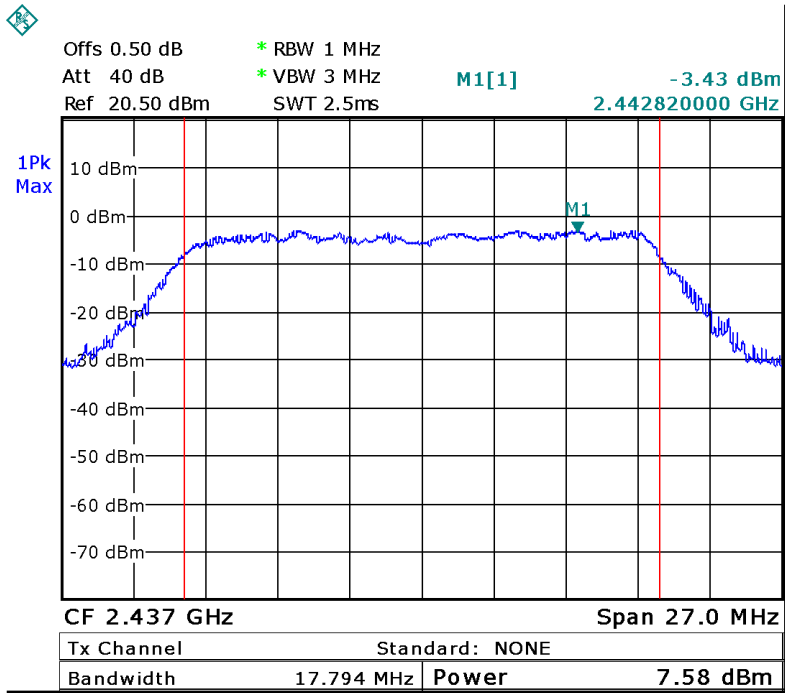


Date: 21.JUN.2013 01:17:03

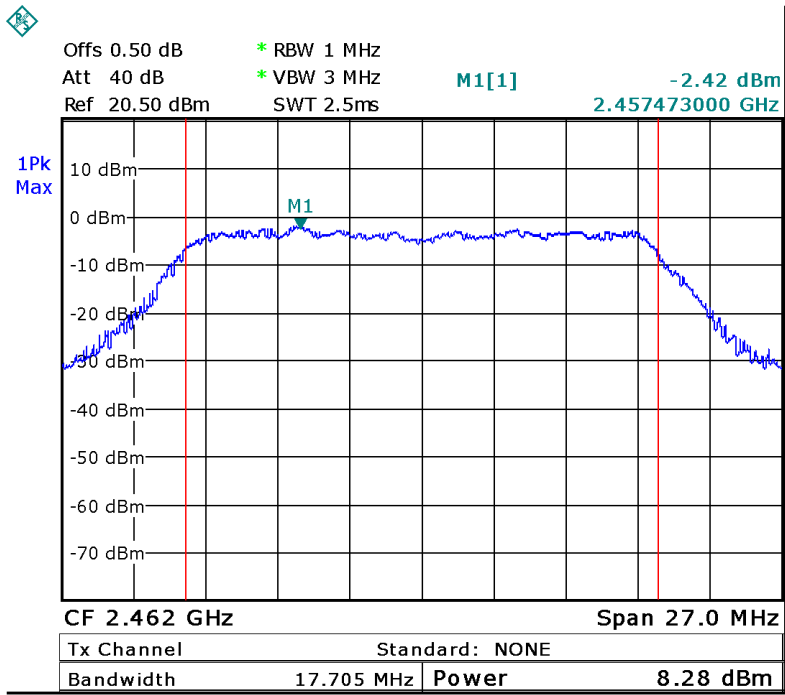
Test mode :TX 11n HT 20



Date: 21.JUN.2013 01:11:33

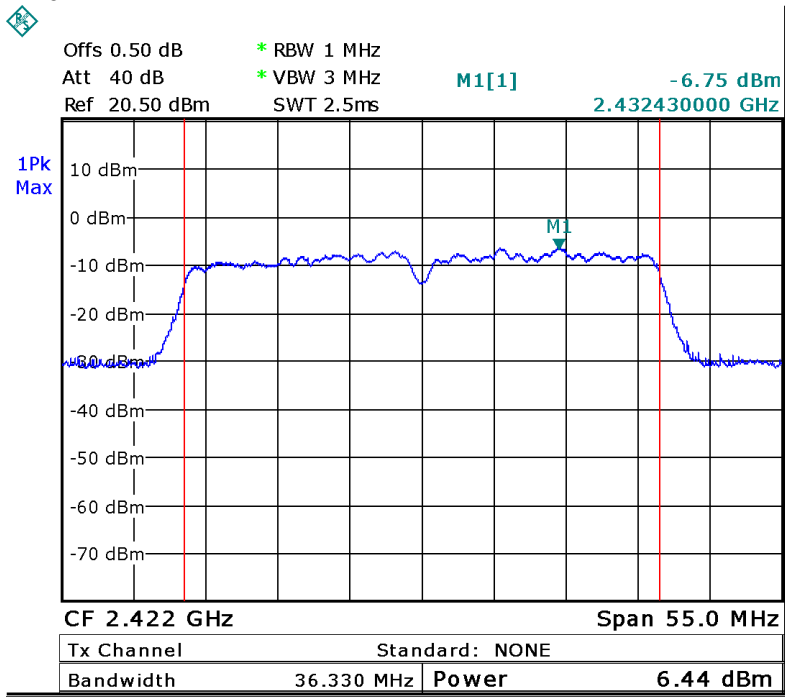


Date: 21.JUN.2013 01:12:21

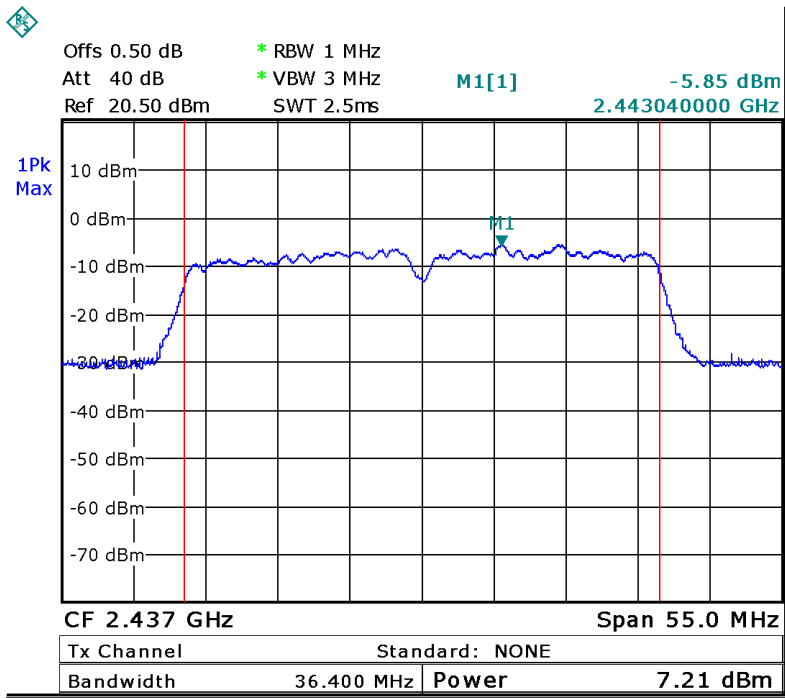


Date: 21.JUN.2013 01:13:08

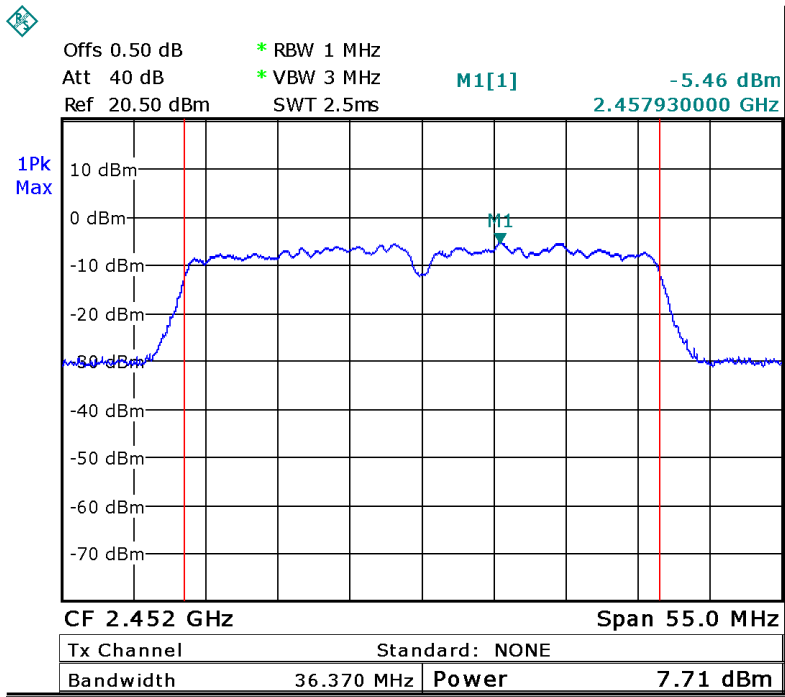
Test mode :TX 11n HT 40



Date: 21.JUN.2013 01:10:06



Date: 21.JUN.2013 01:09:15



Date: 21.JUN.2013 01:08:04

11 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 V03R01

11.1 Test Procedure:

KDB 558074 D01 V03R01

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section
Submit this plot.

11.2 Test Result:

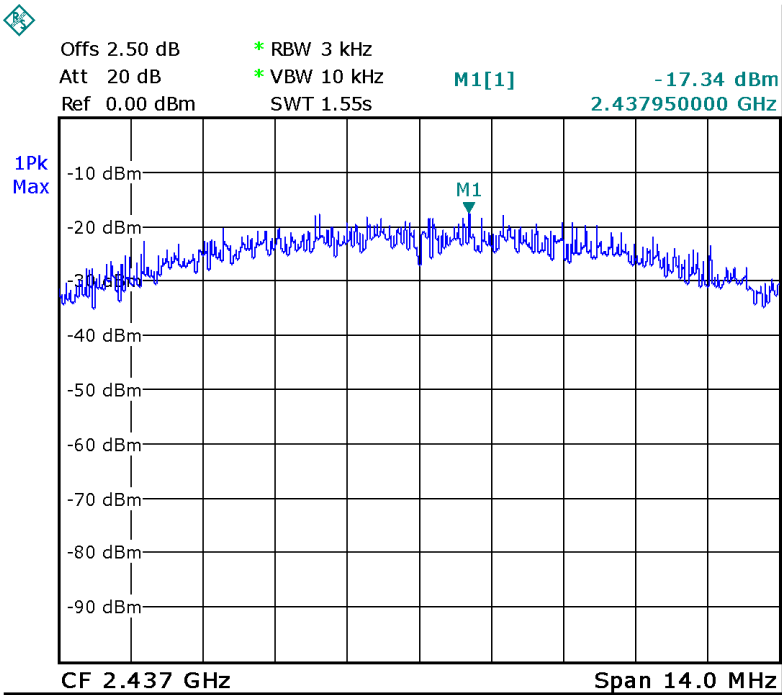
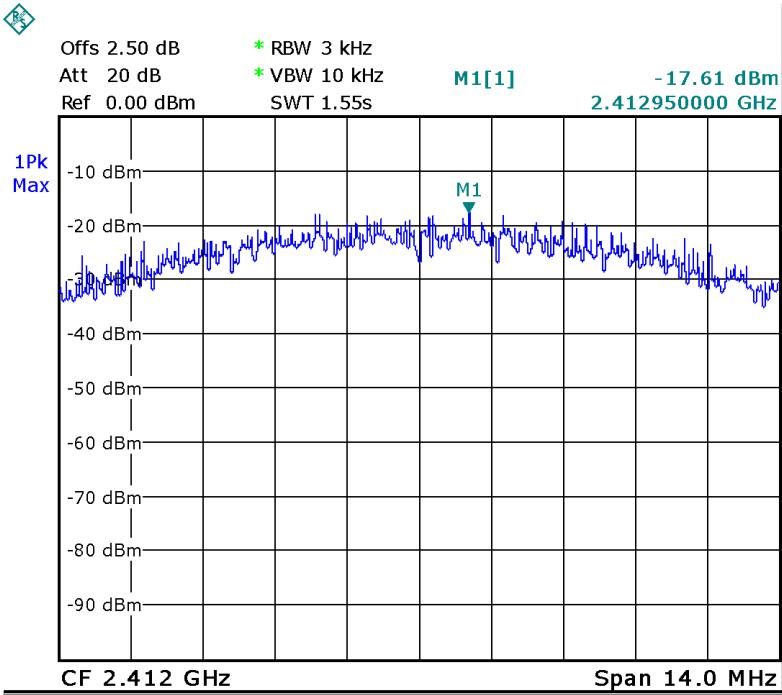
Test mode :TX 11b		
10 Maximum Peak Output Power (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-17.61	-17.34	-17.27
Limit		
8dBm per 3kHz		

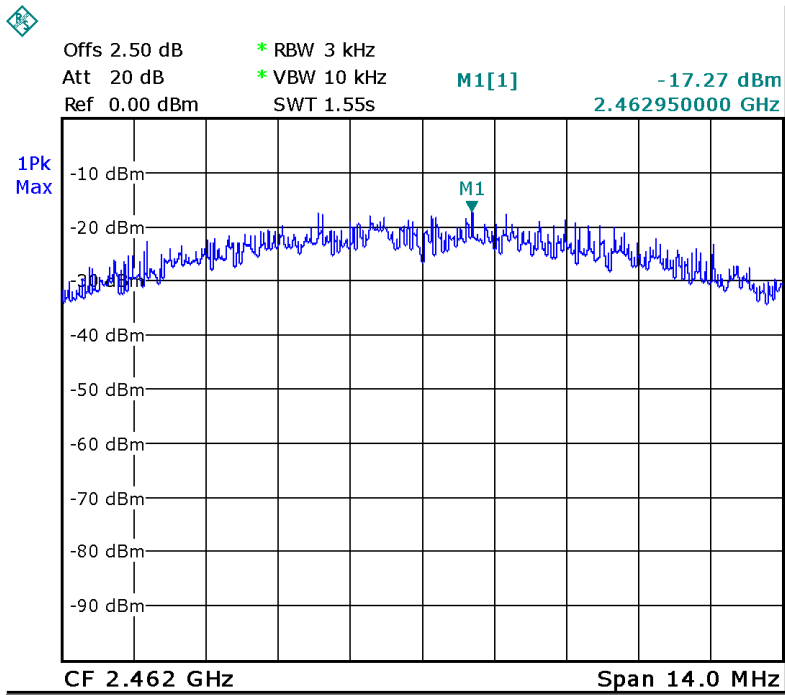
Test mode :TX 11g		
10 Maximum Peak Output Power (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-26.34	-26.86	-25.59
Limit		
8dBm per 3kHz		

Test mode :TX 11n HT 20		
10 Maximum Peak Output Power (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-25.35	-26.04	-25.06
Limit		
8dBm per 3kHz		

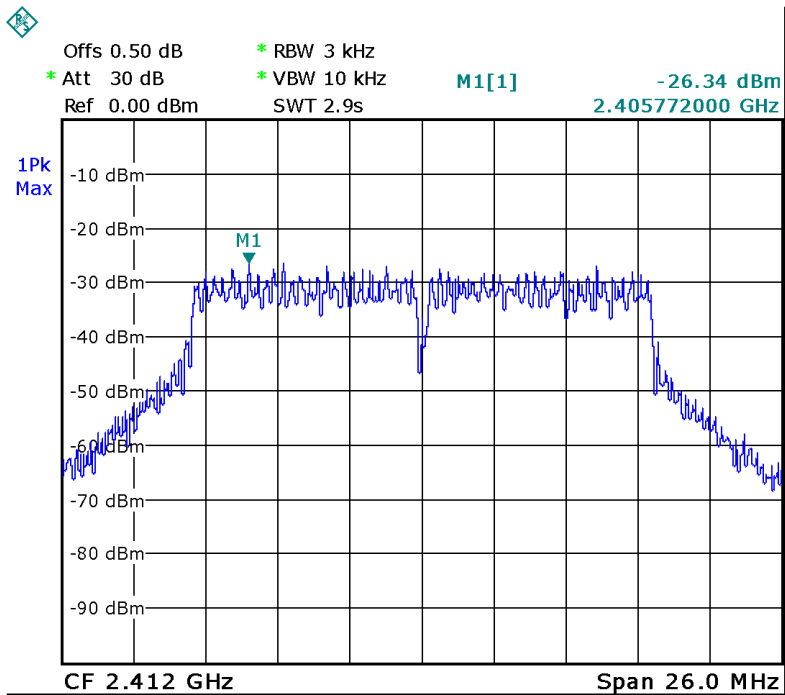
Test mode :TX 11n HT 40		
10 Maximum Peak Output Power (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-26.55	-26.26	-28.06
Limit		
8dBm per 3kHz		

Test mode :TX 11b

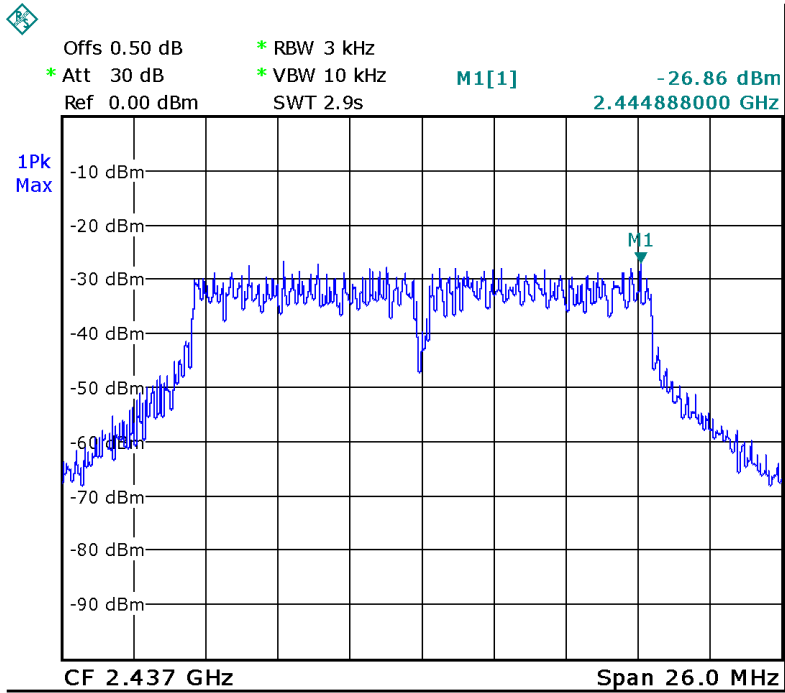




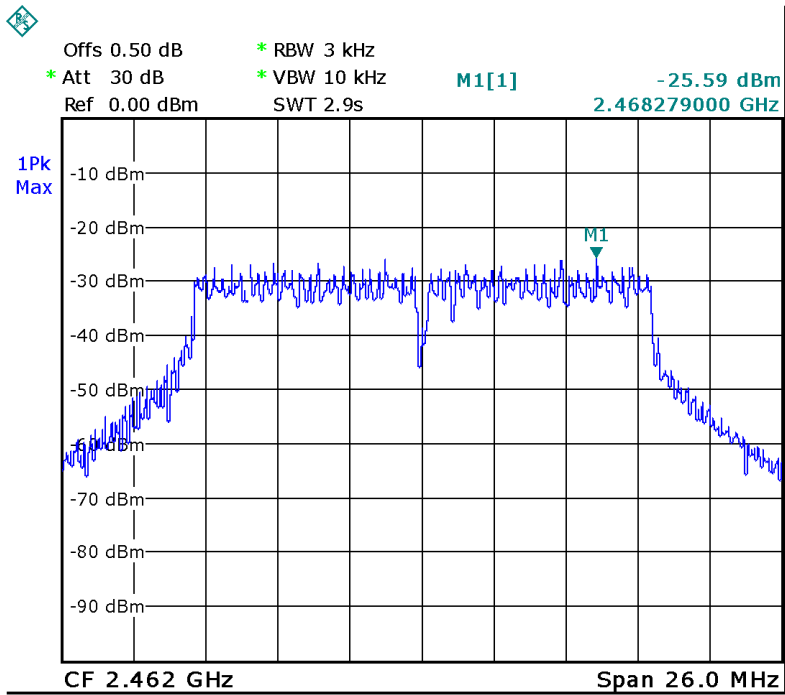
Test mode :TX 11g



Date: 30.MAY.2013 22:28:57

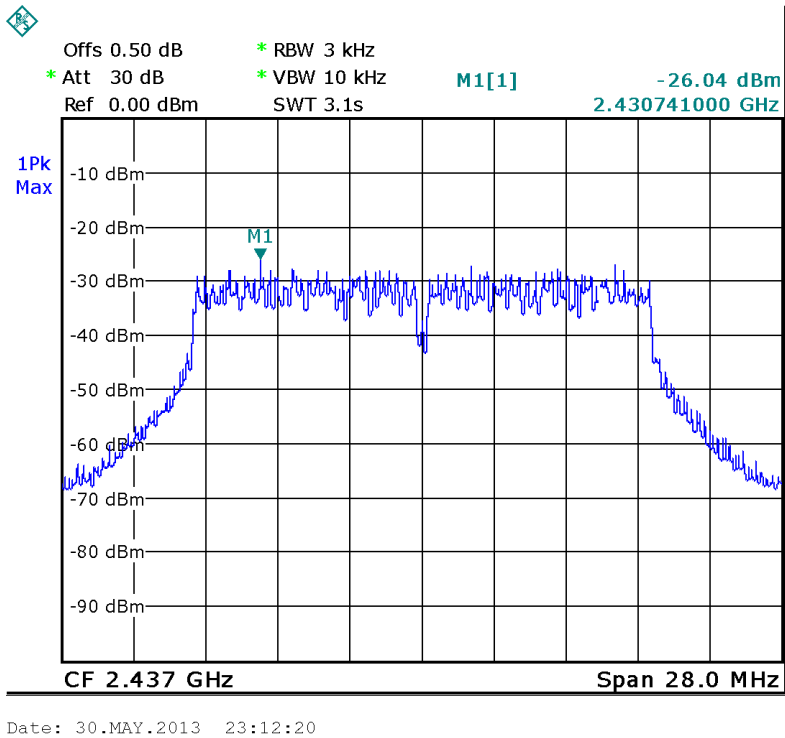
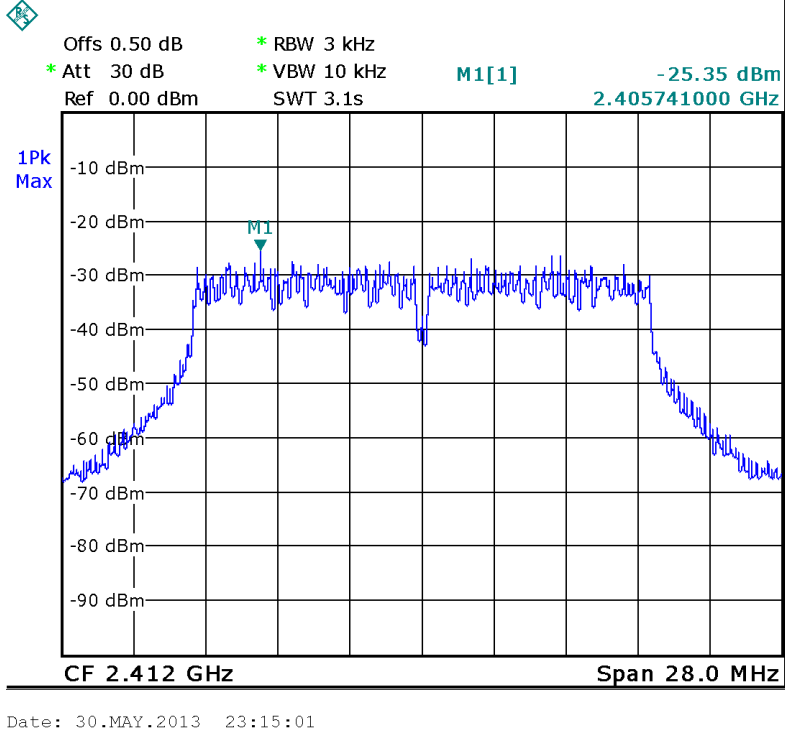


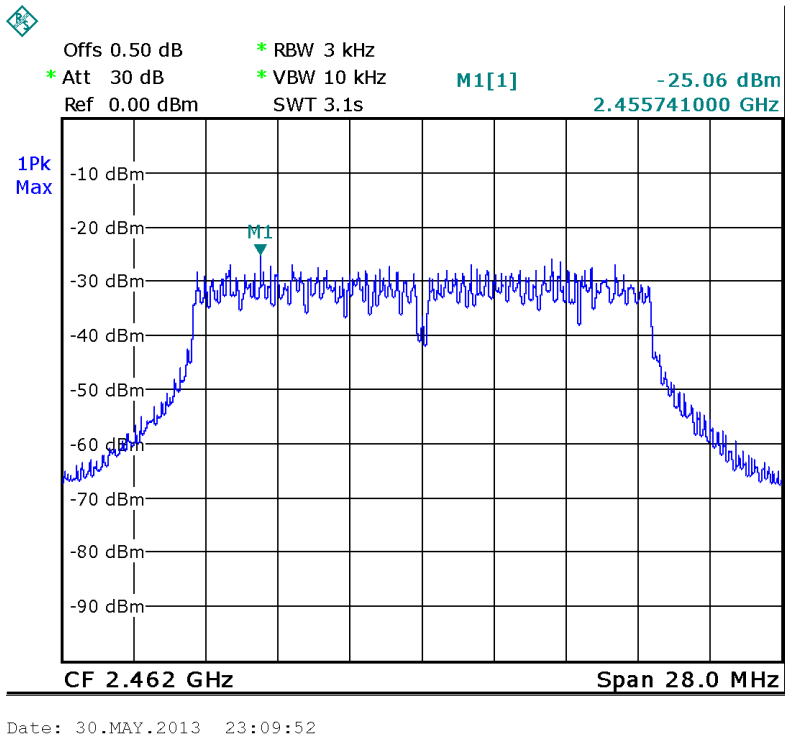
Date: 30.MAY.2013 22:29:44



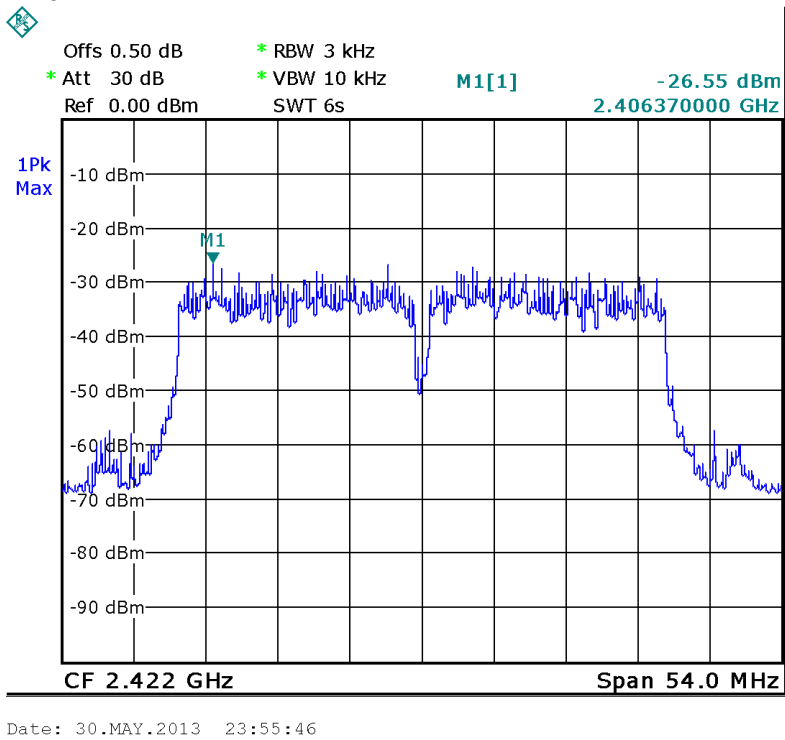
Date: 30.MAY.2013 22:37:00

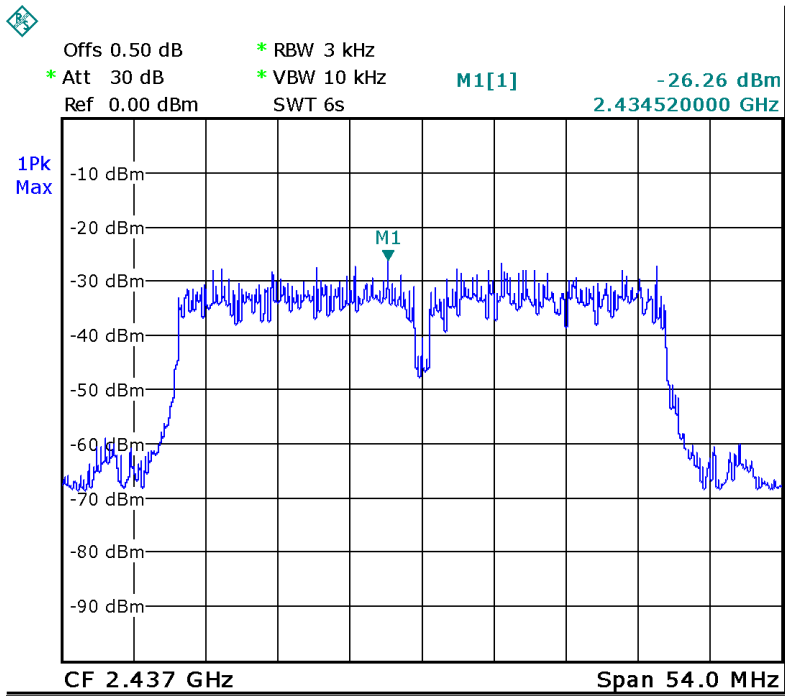
Test mode :TX 11n HT 20



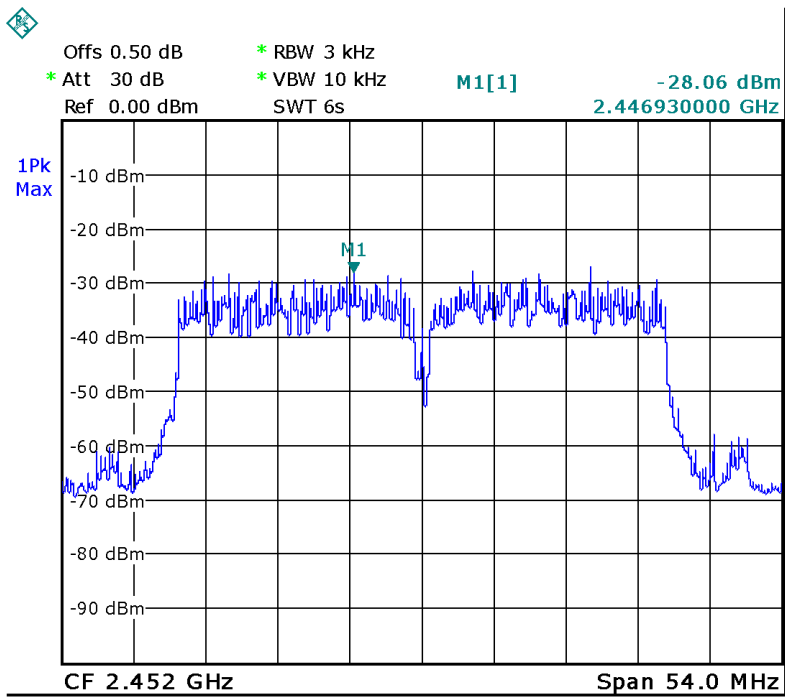


Test mode :TX 11n HT 40





Date: 30.MAY.2013 23:53:37



Date: 30.MAY.2013 23:57:06

12 Emissions from out of band

Test Requirement:	FCC CFR47 Part 15 Section 15.247(d)
Test Method:	KDB558074 D01 v03r01
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:

KDB 558074 D01 V03R01

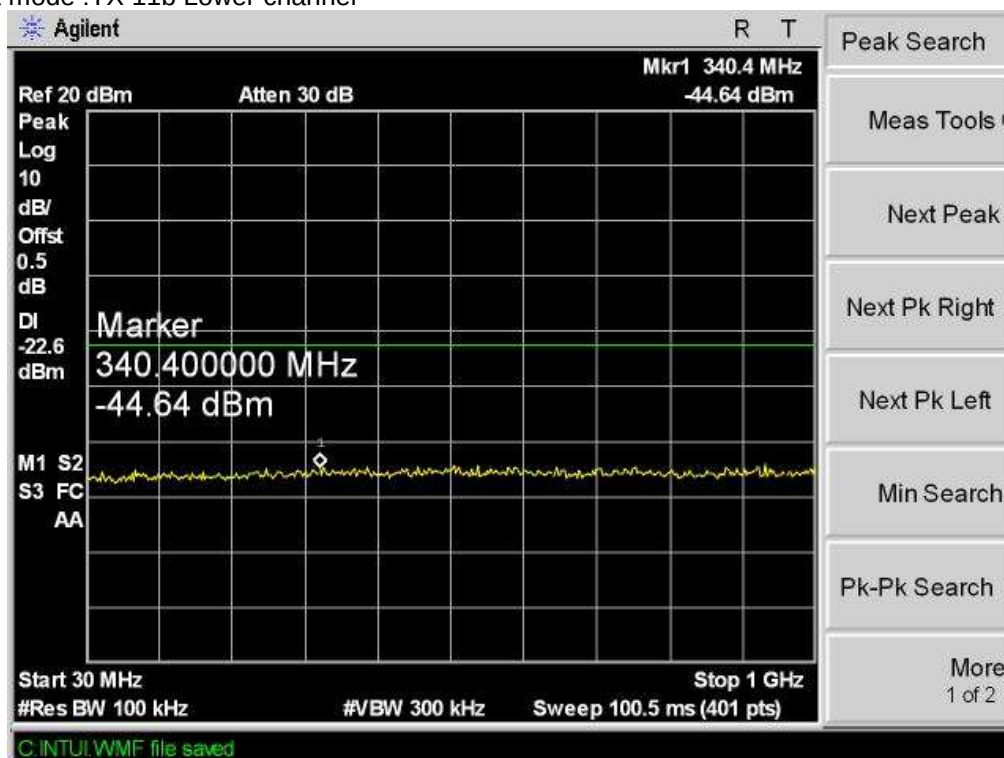
The maximum peak conducted output power procedure was used to demonstrate compliance to 15.247(b)(3) requirements, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level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

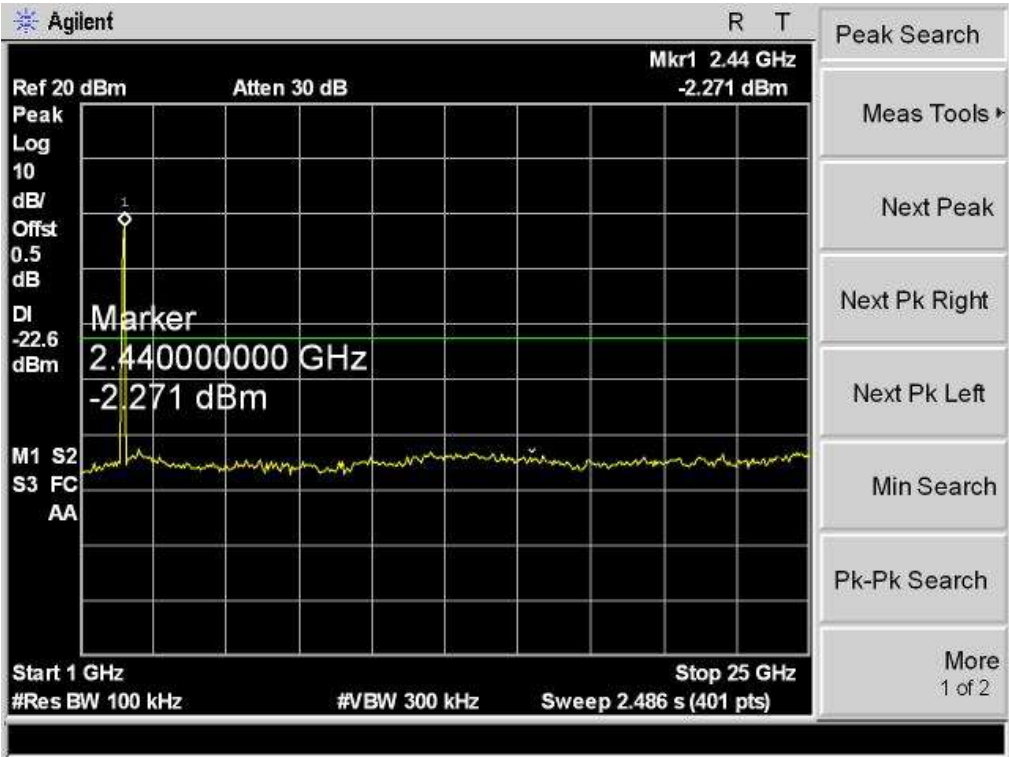
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set to span from the lowest frequency generated in the device up to and including the tenth harmonic of the highest fundamental frequency
3. For below 1GHz, Set RBW = 100kHz and VBW = 300kHz. Sweep = auto. For above 1GHz, Set RBW = 1MHz and VBW = 1MHz. Sweep = auto.
4. mark the worst point and record.

12.2 Test Result:

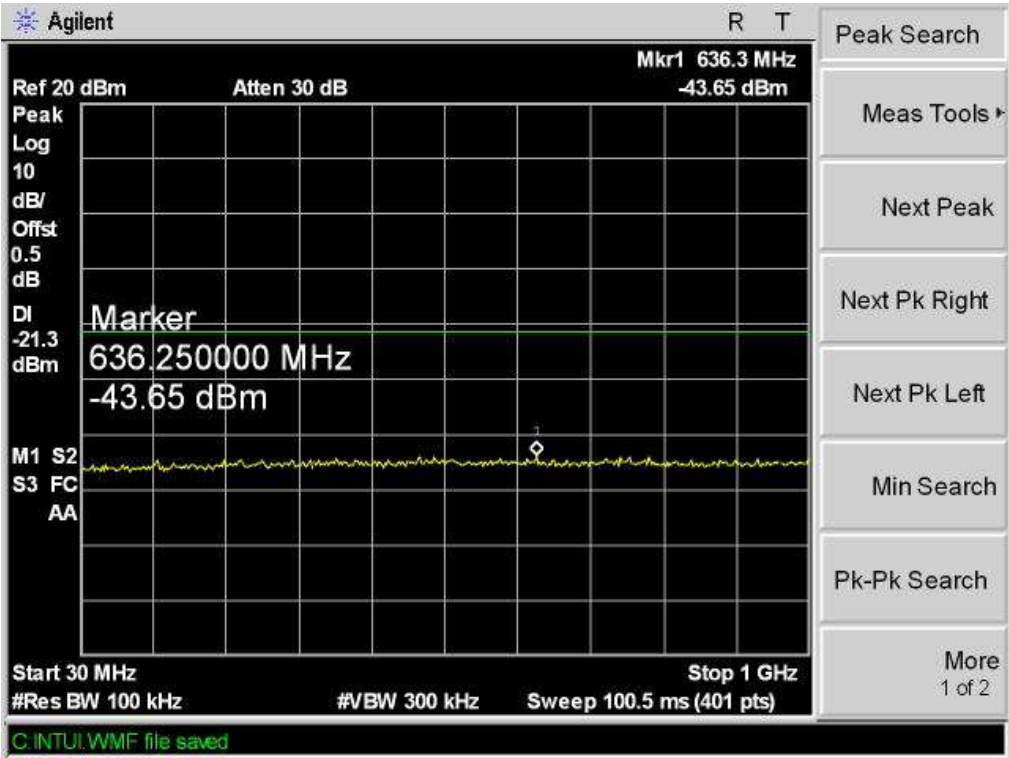
Remark: For emissions below 30MHz, no emission higher than background level, so the data does not show in the report.

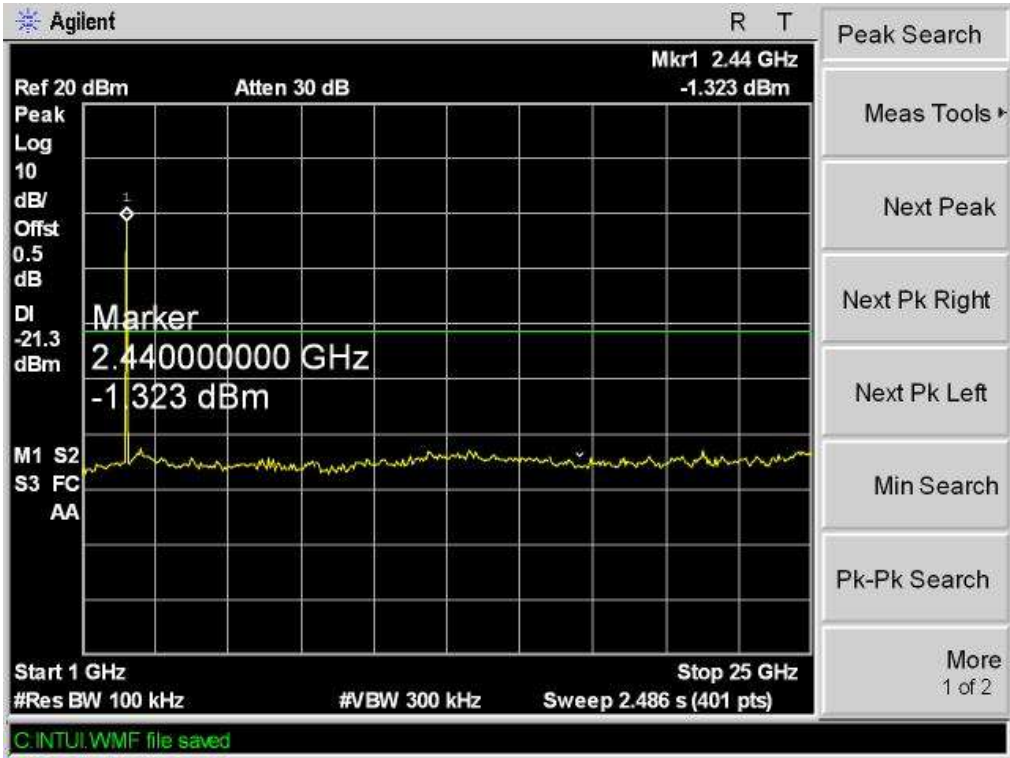
Test mode :TX 11b Lower channel



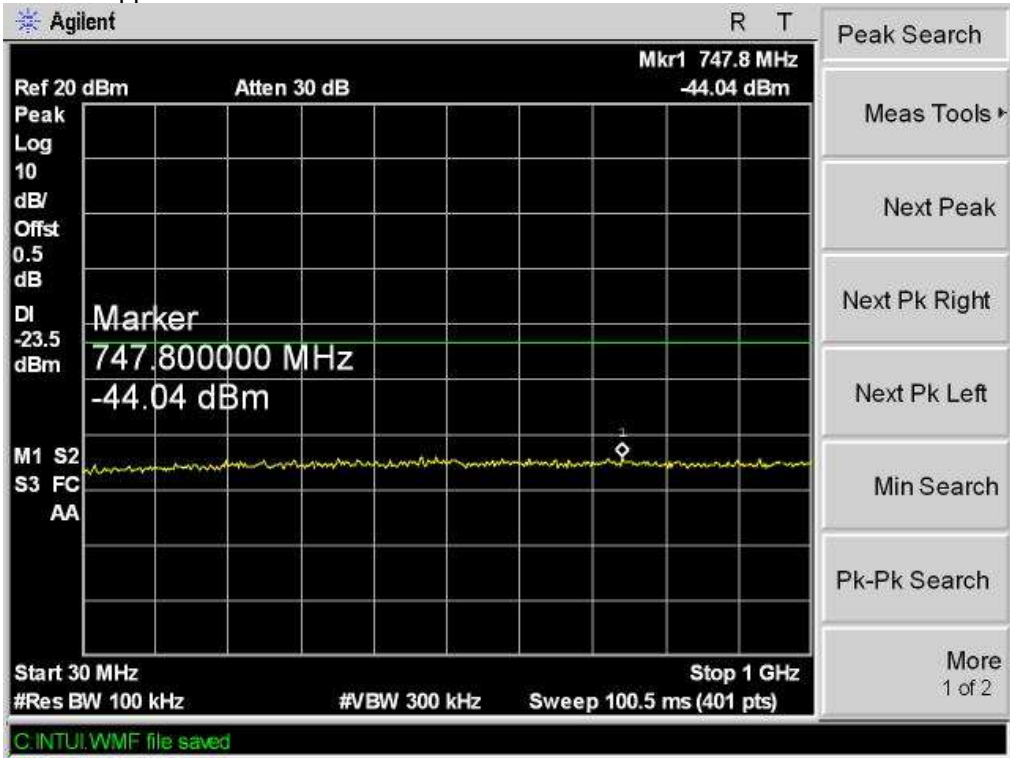


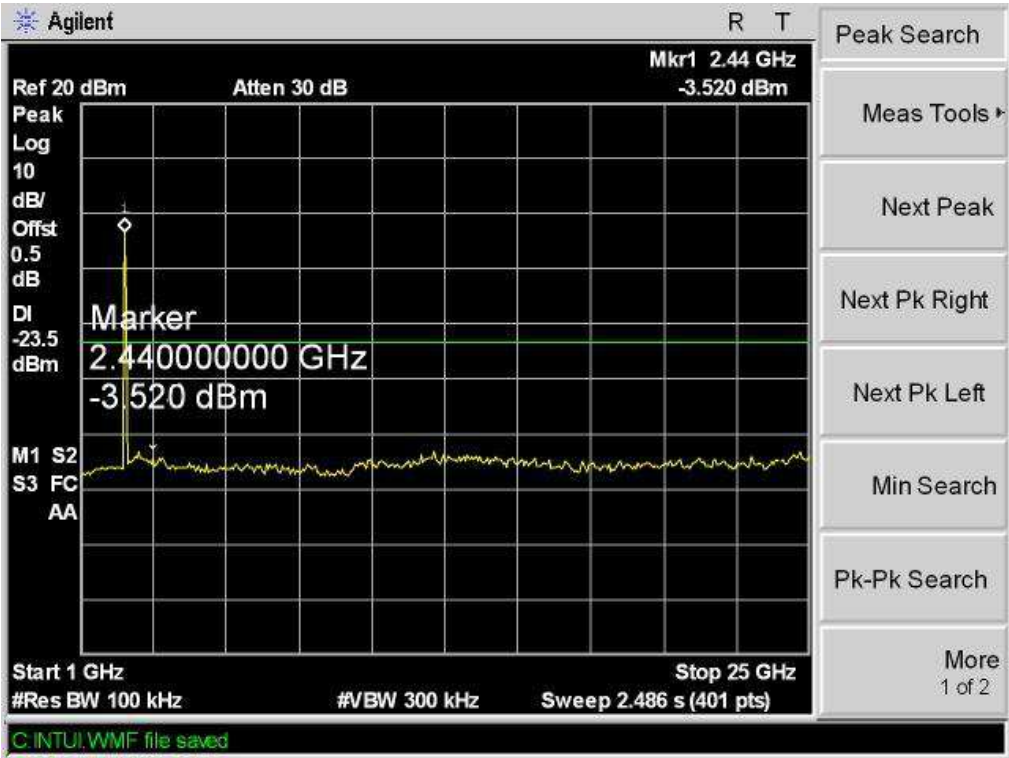
Test mode :TX 11b Middle channel



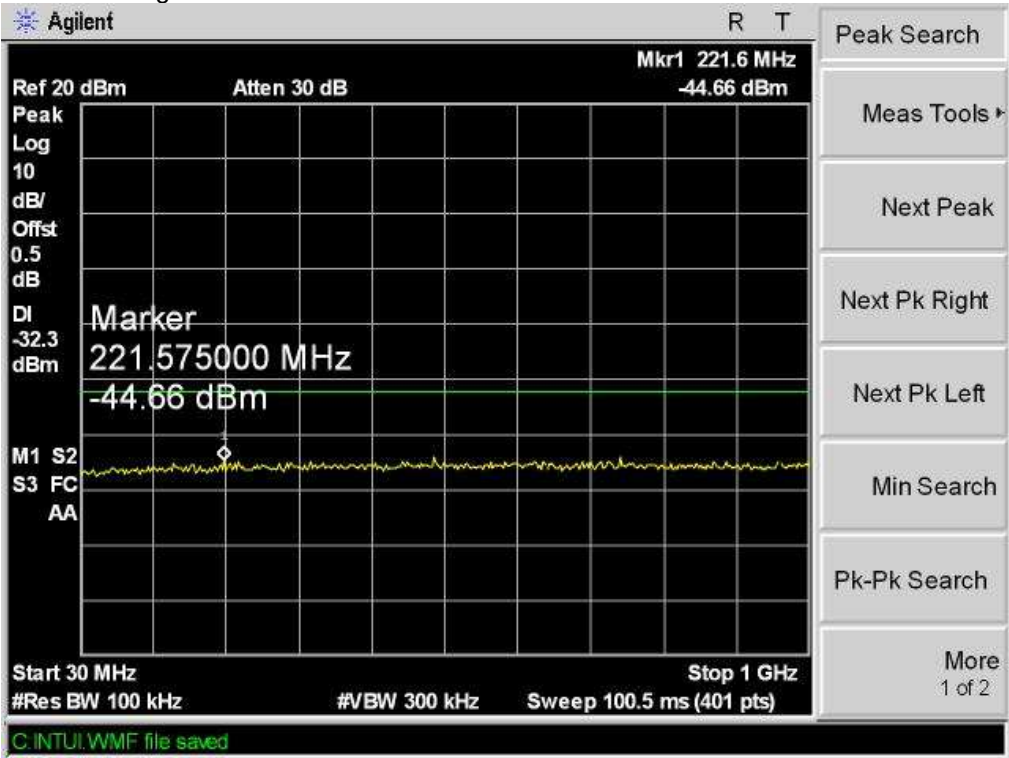


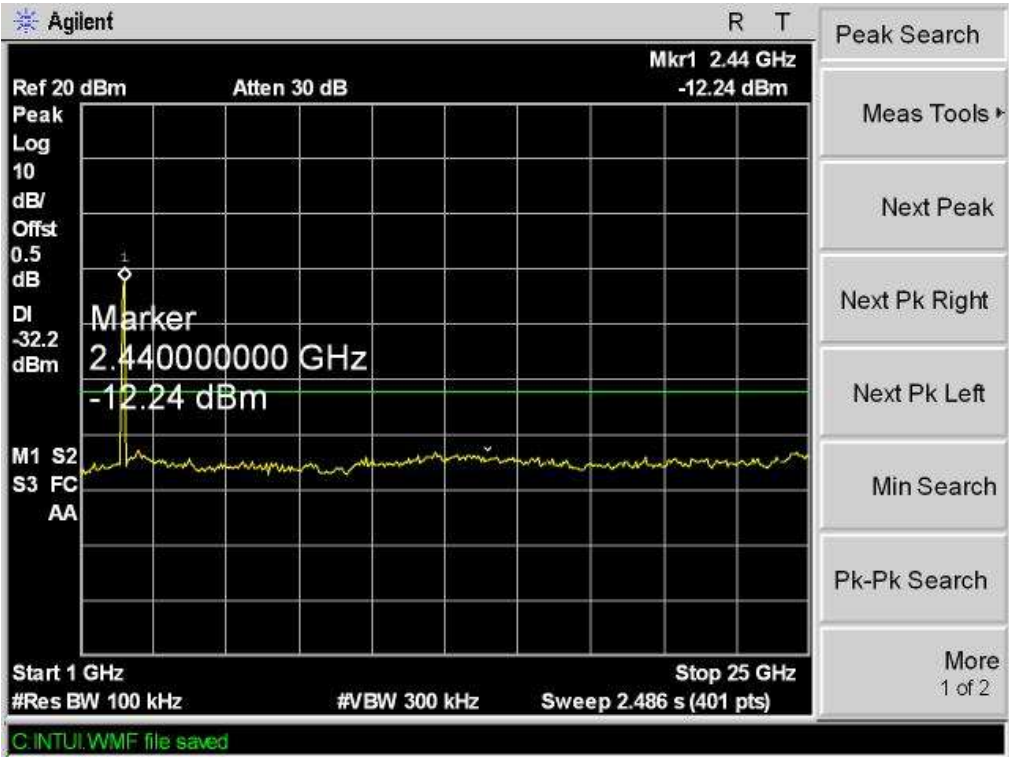
Test mode :TX 11b Upper channel



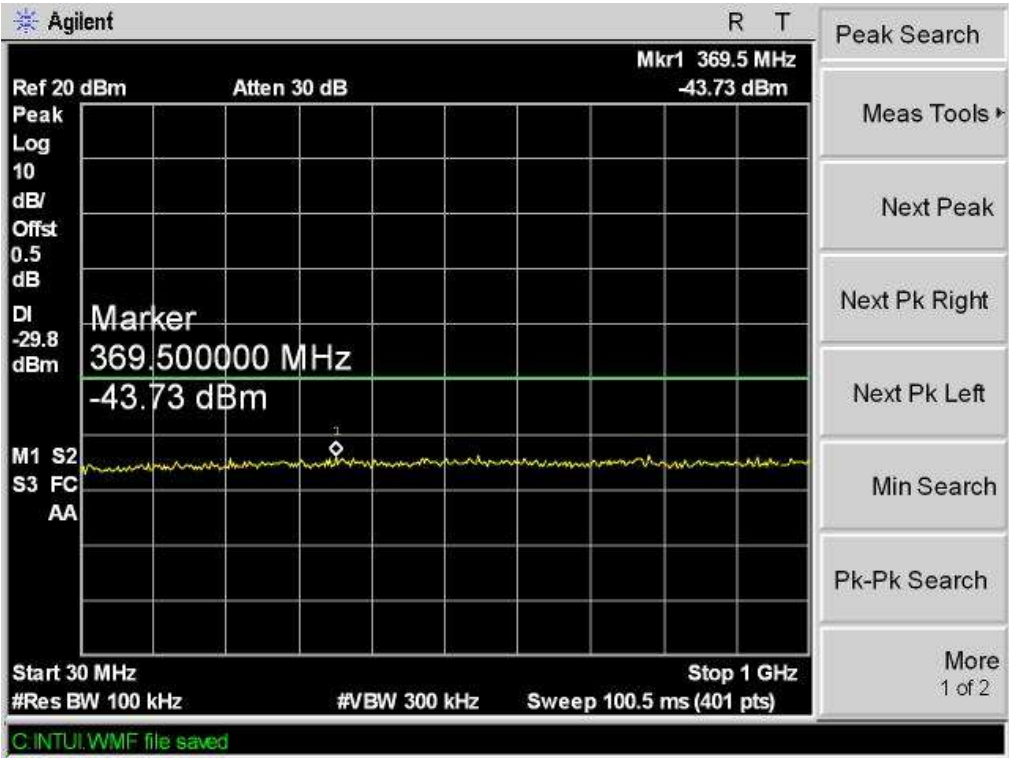


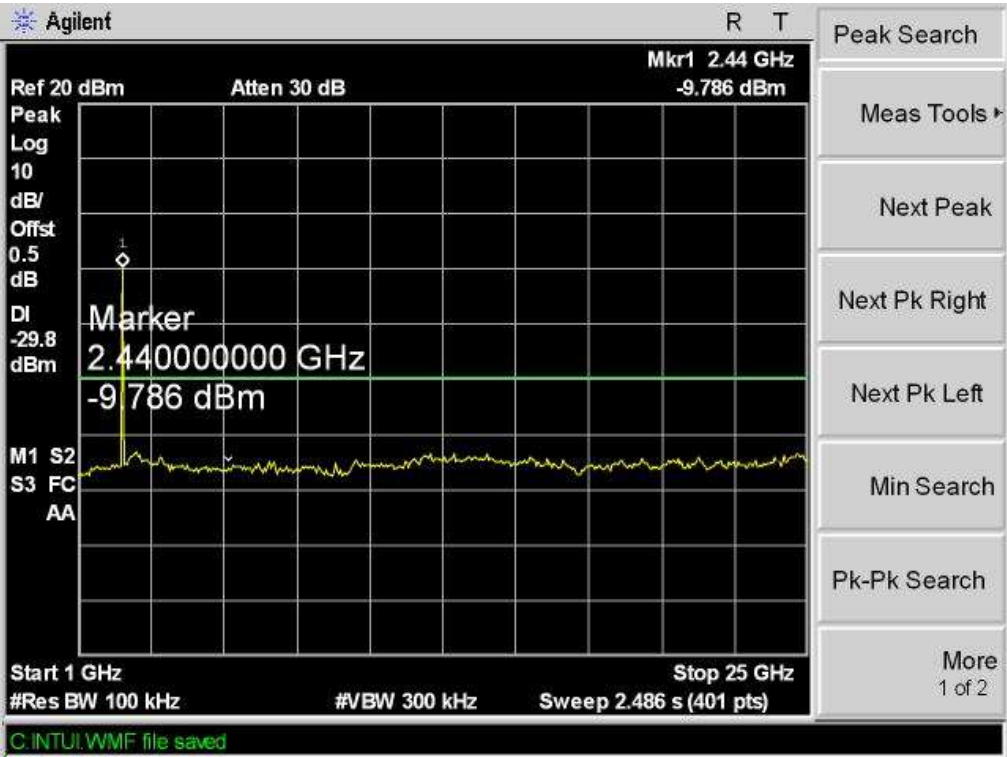
Test mode :TX 11g Lower channel



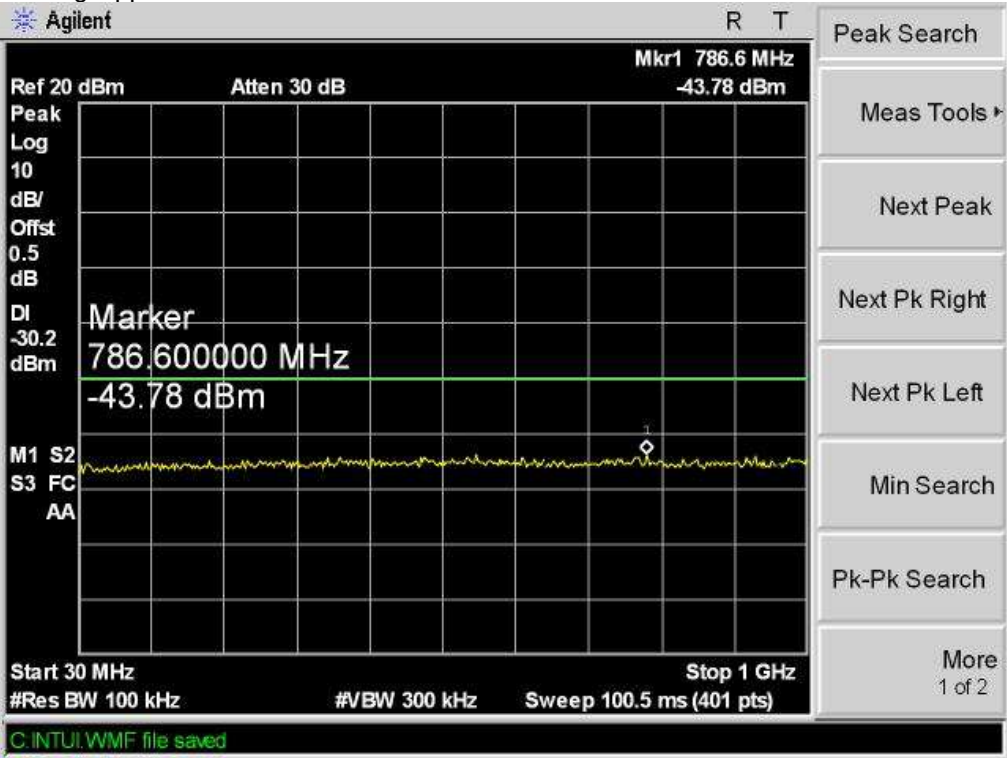


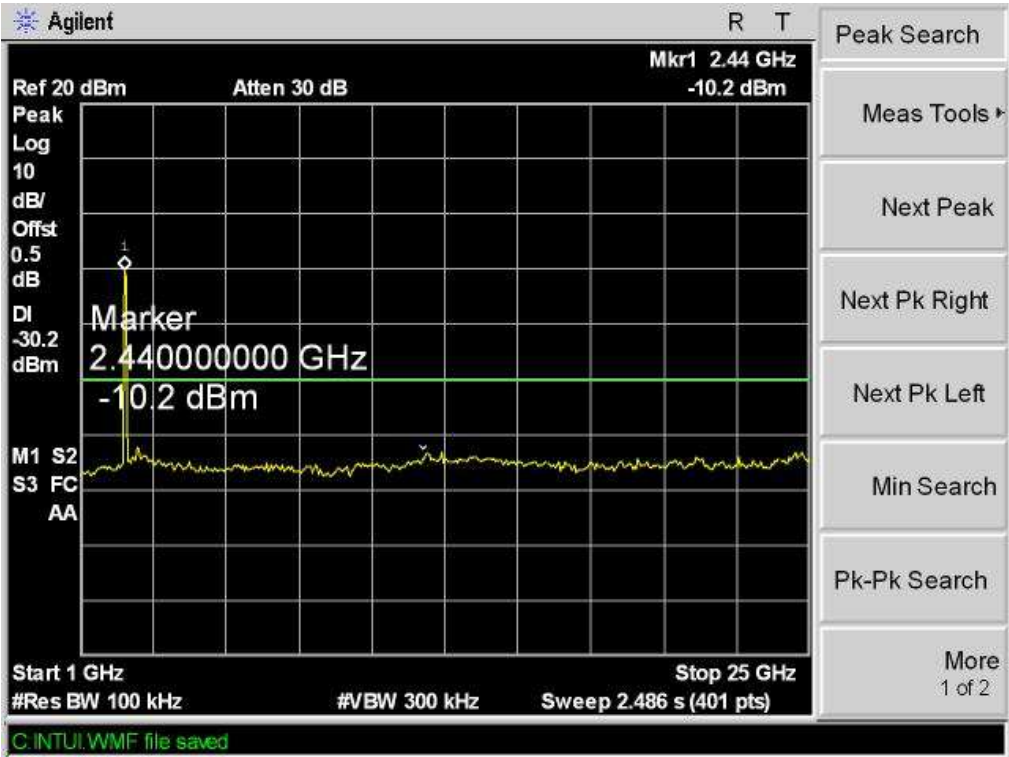
Test mode :TX 11g Middle channel



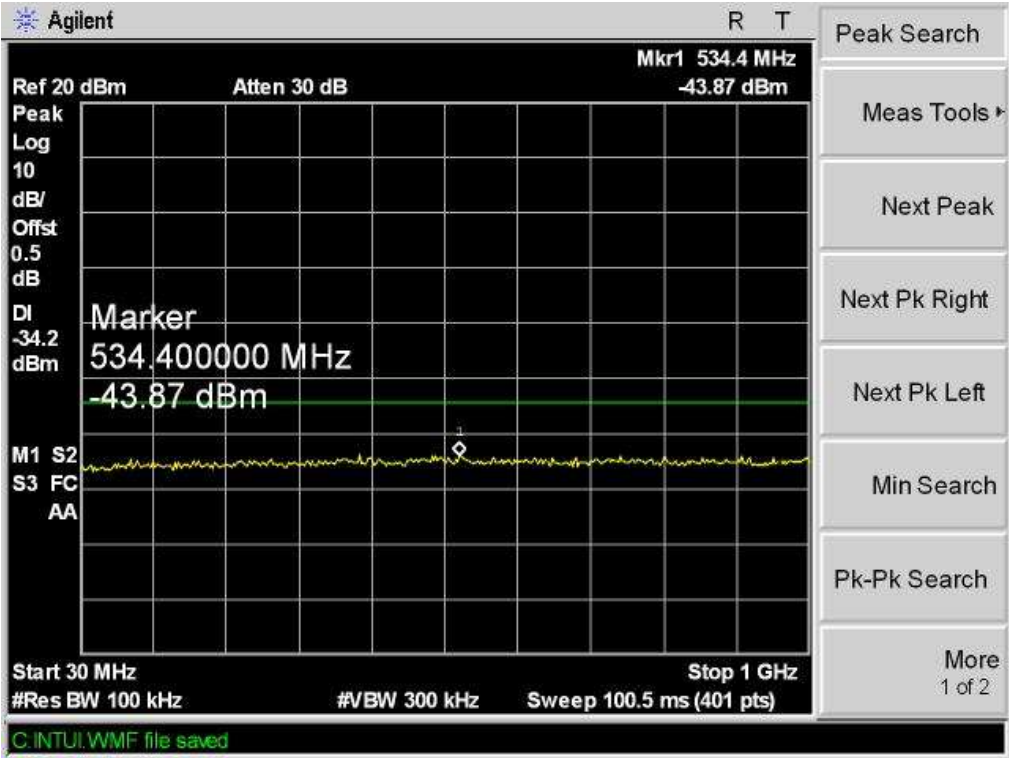


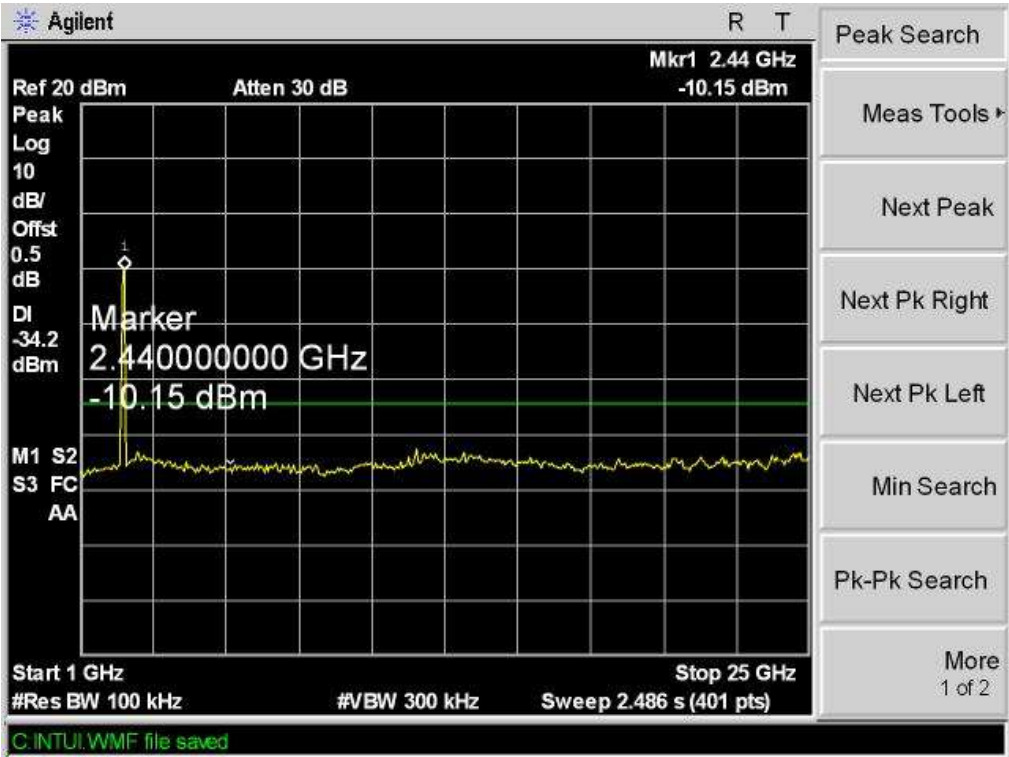
Test mode :TX 11g Upper channel



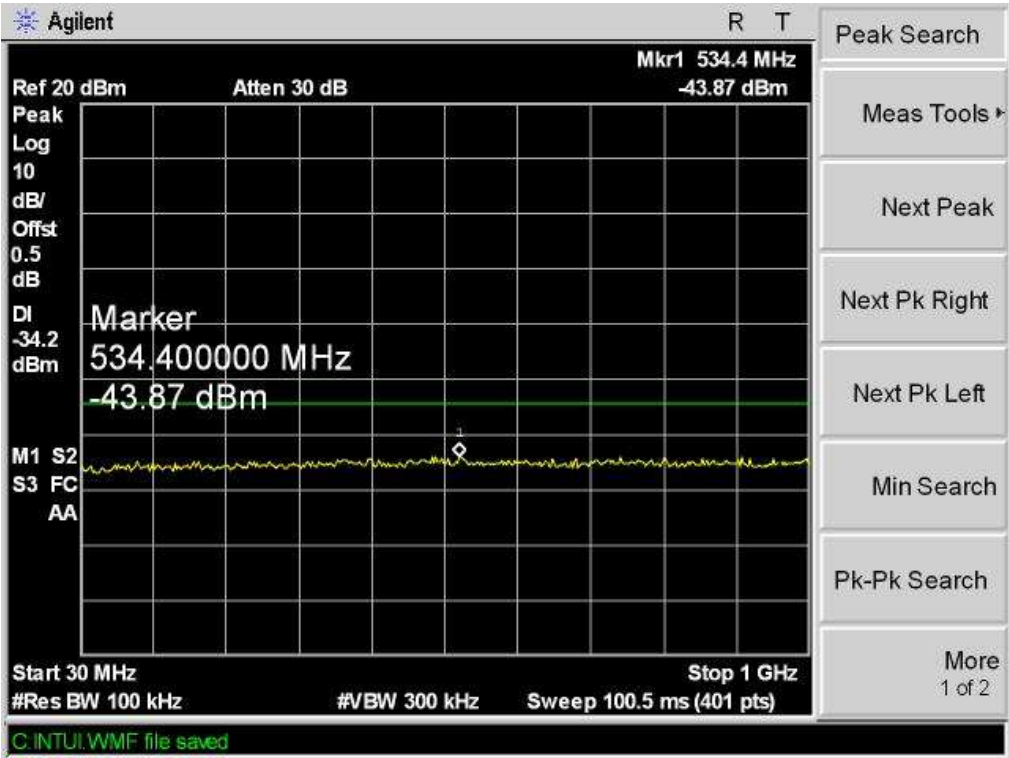


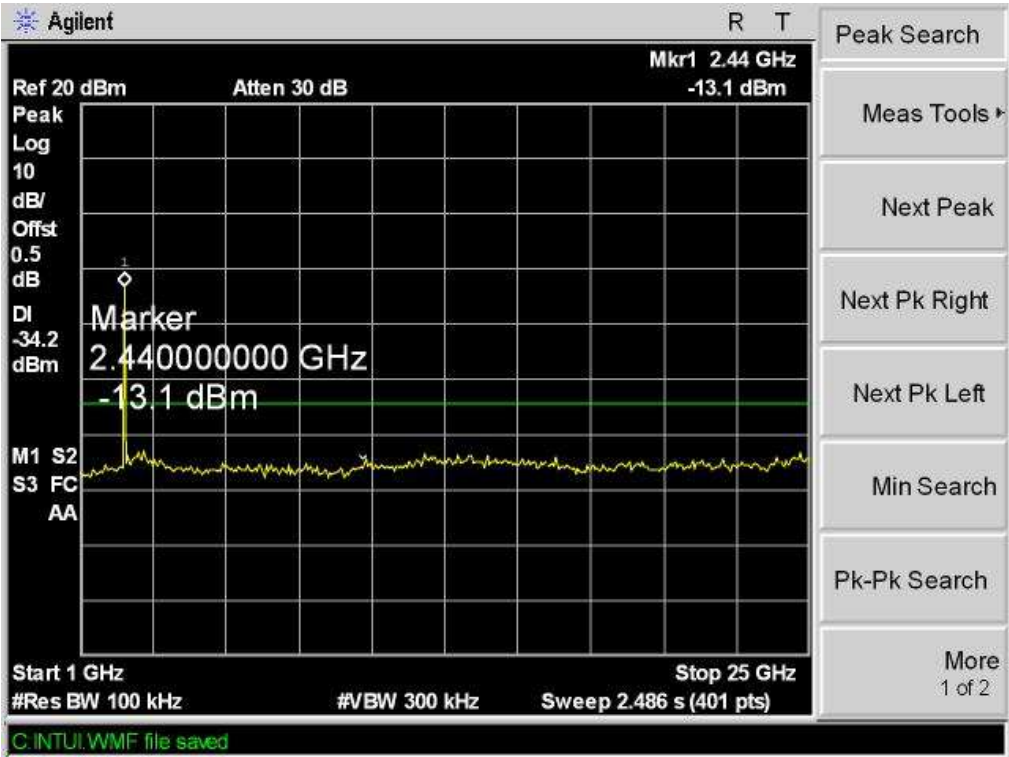
Test mode :TX 11n HT20 Lower channel



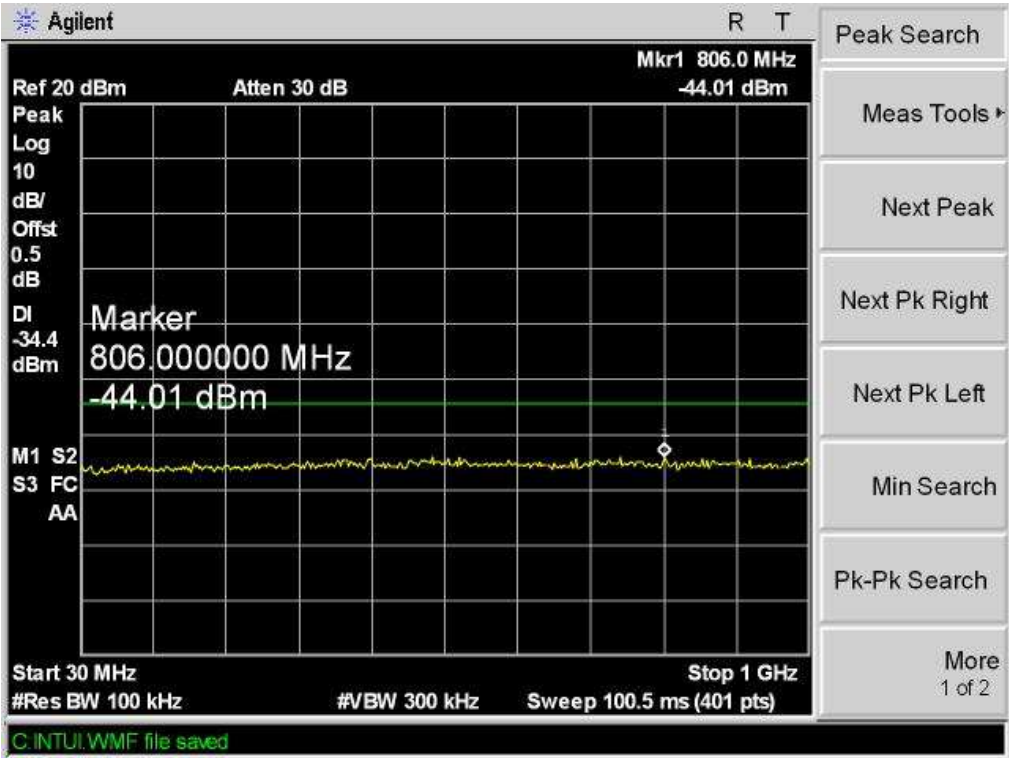


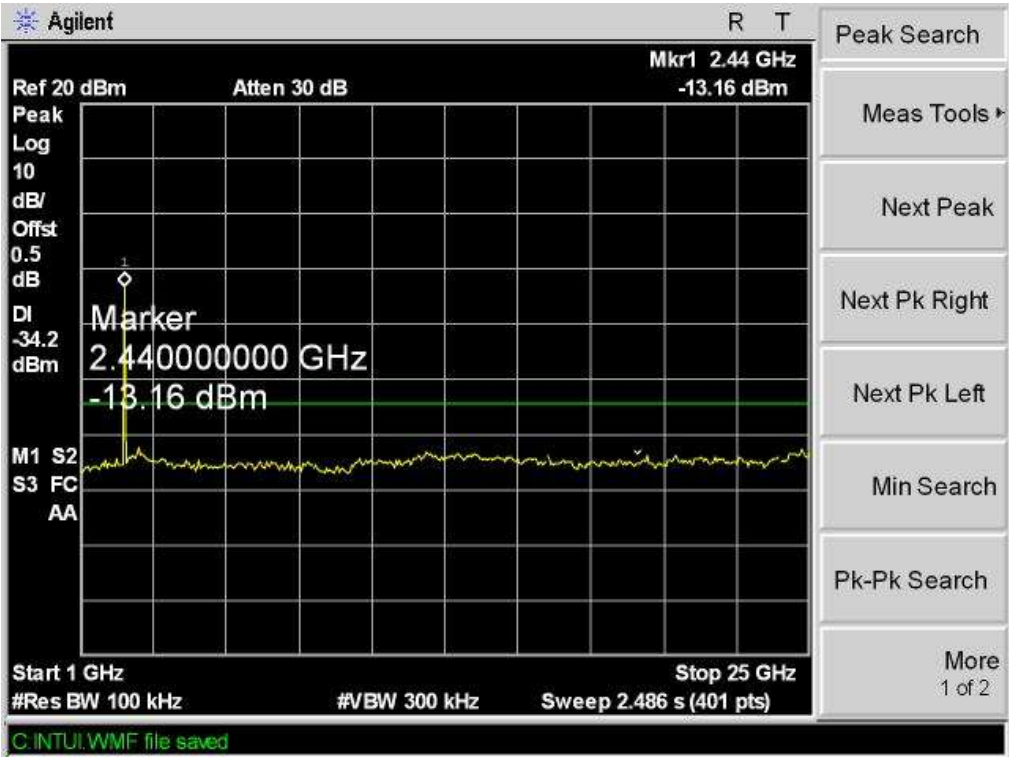
Test mode :TX 11n HT20 Middle channel



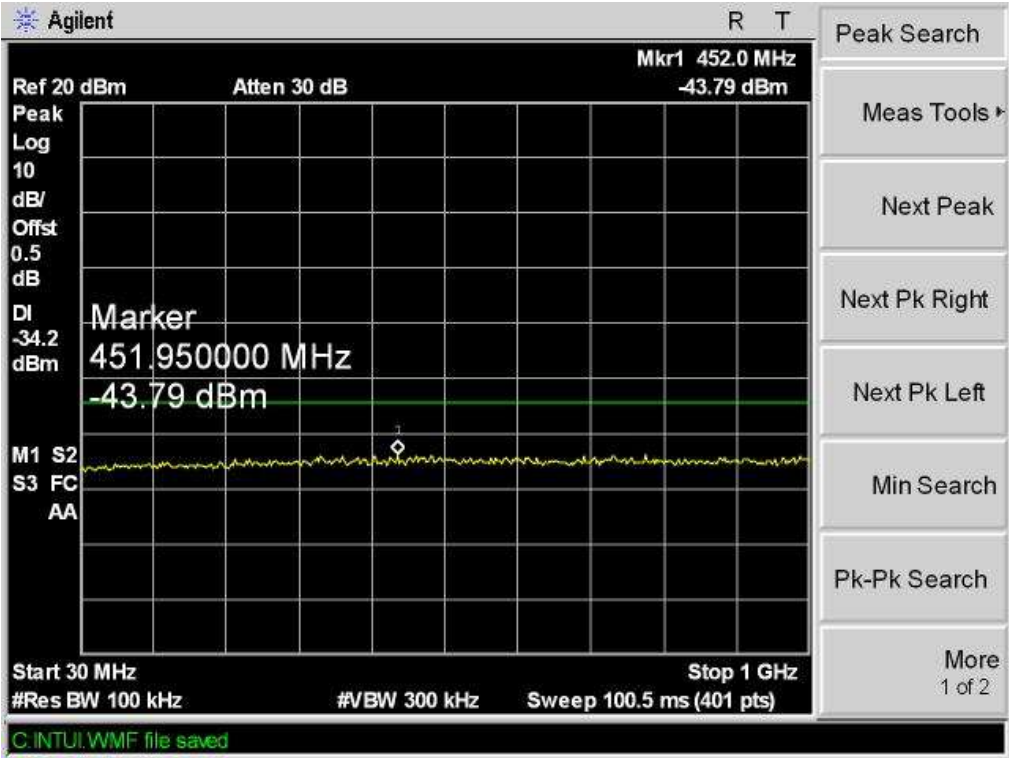


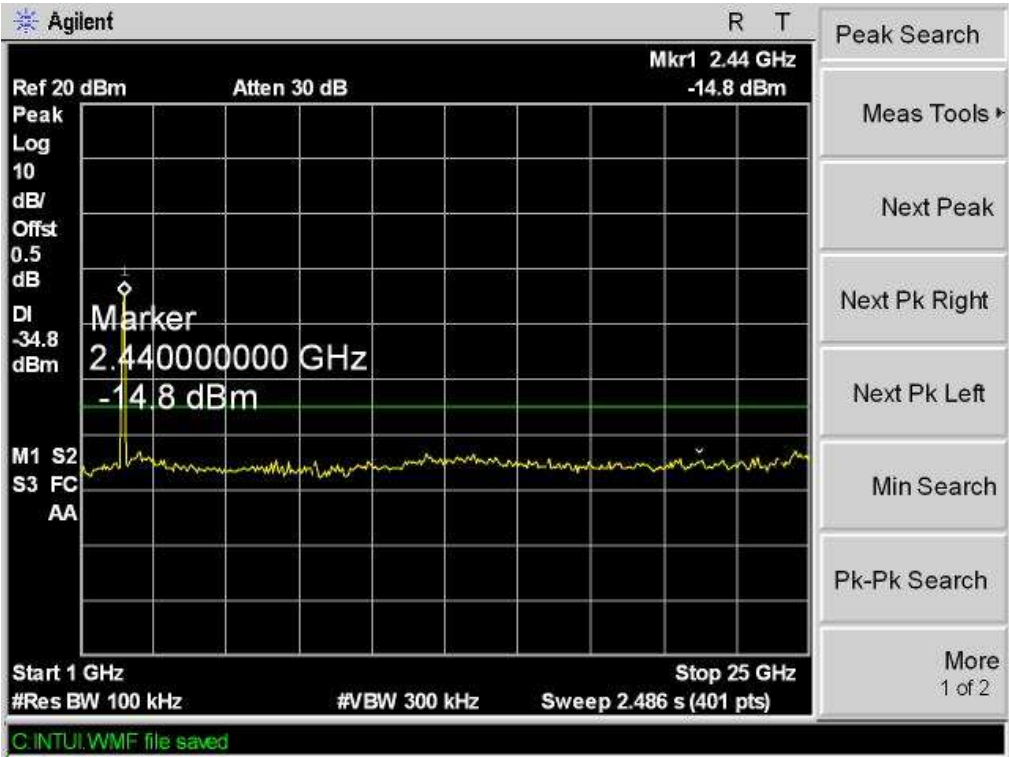
Test mode :TX 11n HT20 Upper channel



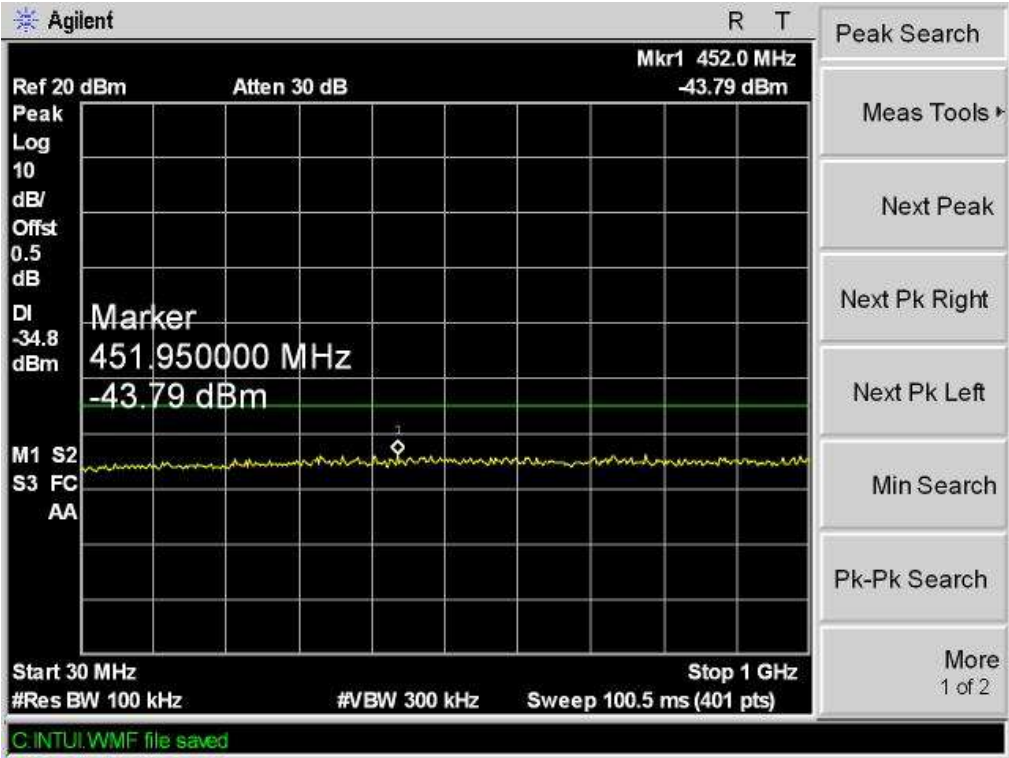


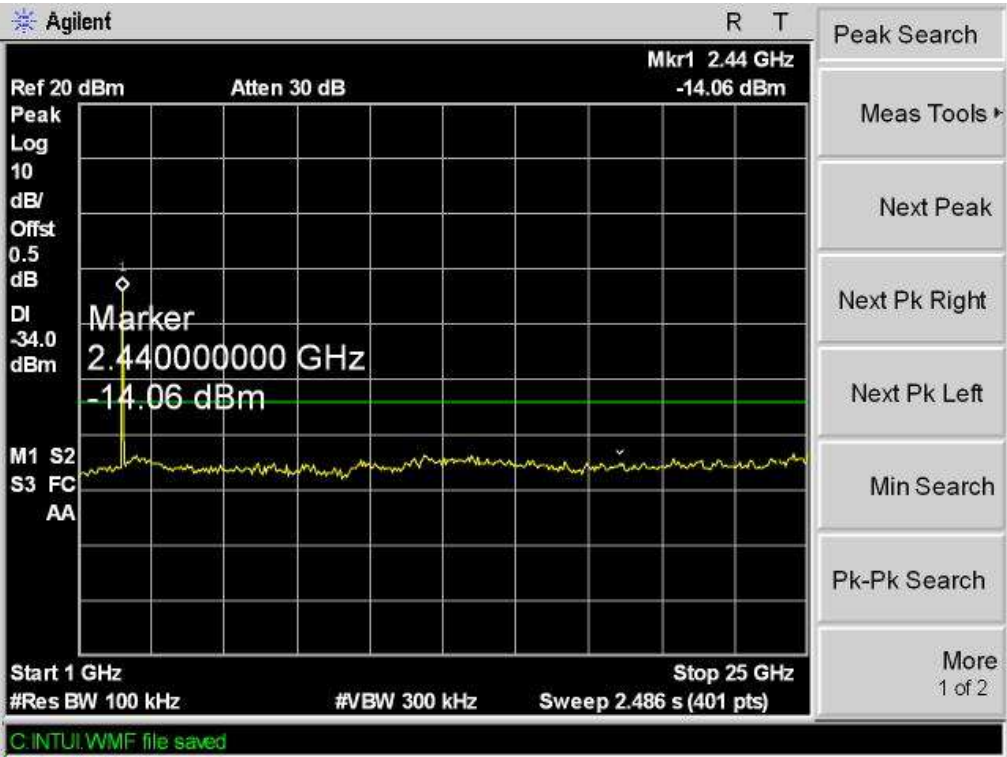
Test mode :TX 11n HT40 Lower channel



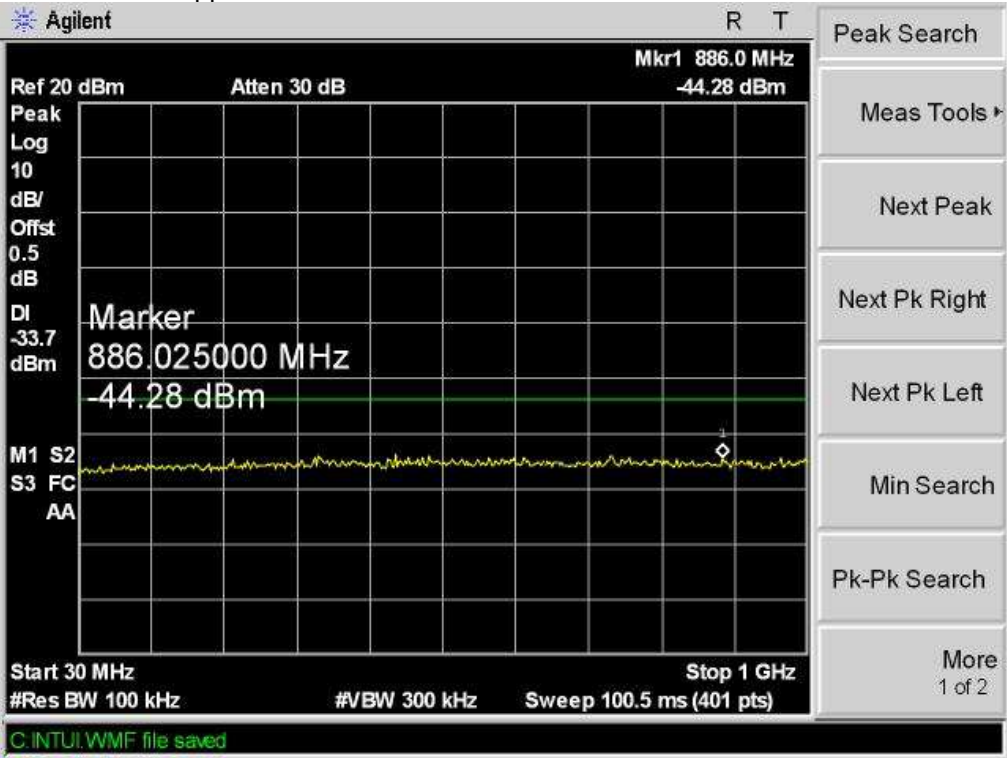


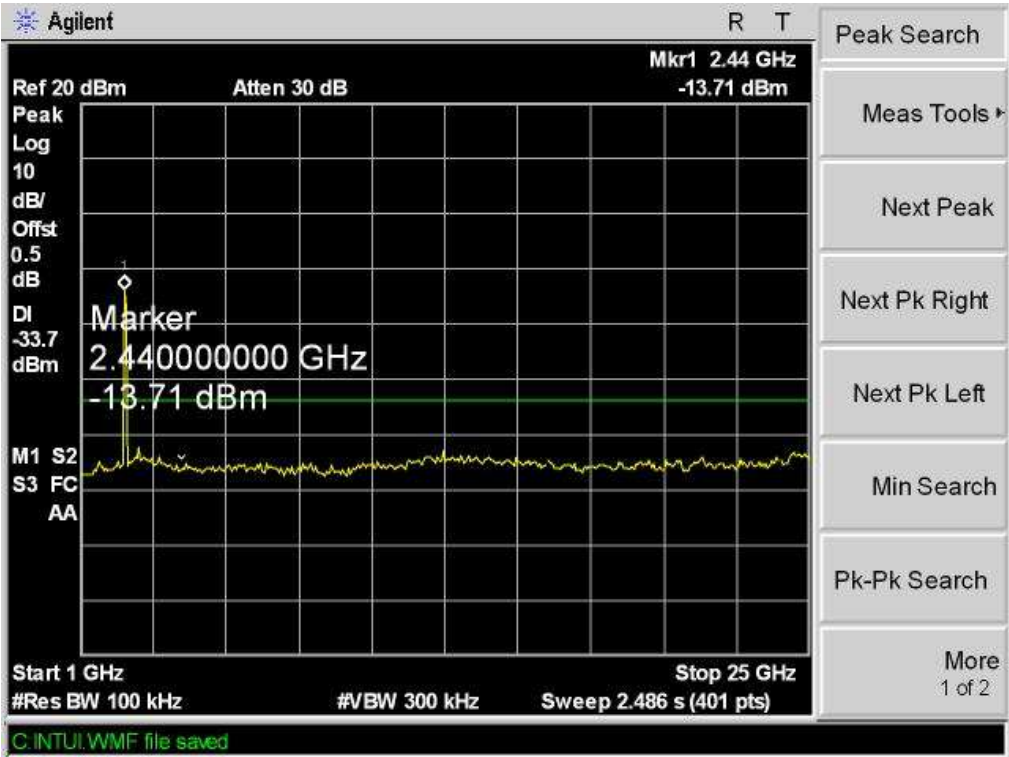
Test mode : TX 11n HT40 Middle channel





Test mode : TX 11n HT40 Upper channel





13 Emissions from the restricted bands

Test Requirement:

FCC CFR47 Part 15 Section 15.247(d)

Test Method:

KDB558074 D01 v03r01

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.

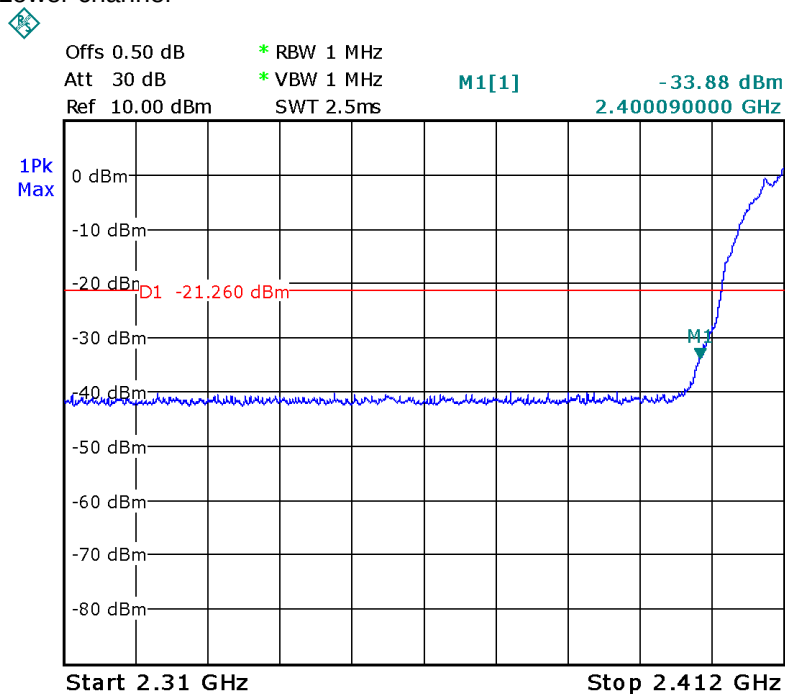
13.1 Test Procedure:

KDB 558074 D01 V03R01

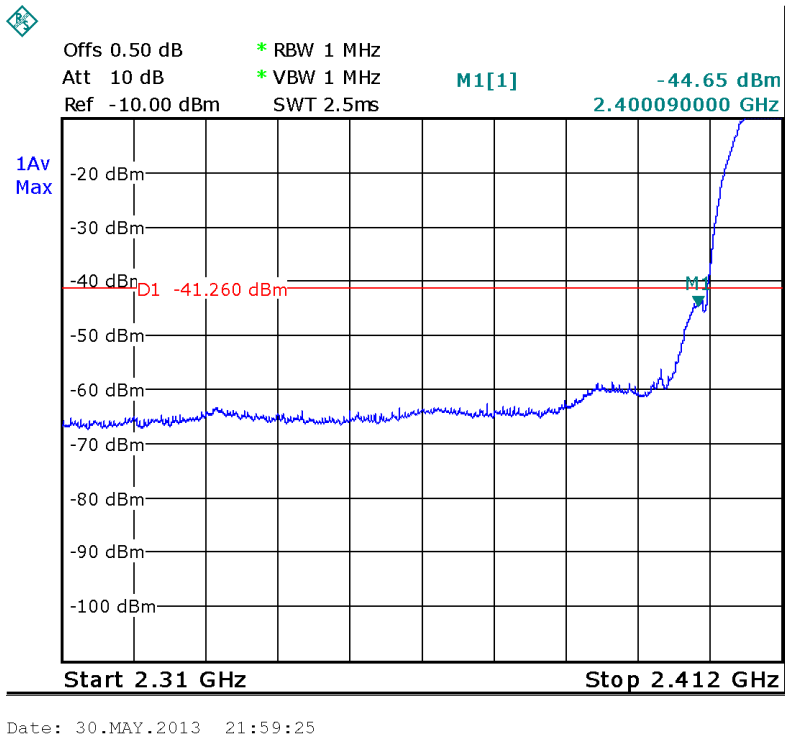
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set to span from the lowest frequency generated in the device up to and including the tenth harmonic of the highest fundamental frequency
3. Set RBW = 100kHz and VBW = 300kHz. Sweep = auto.
4. mark the worst point and record.

13.2 Test Result:

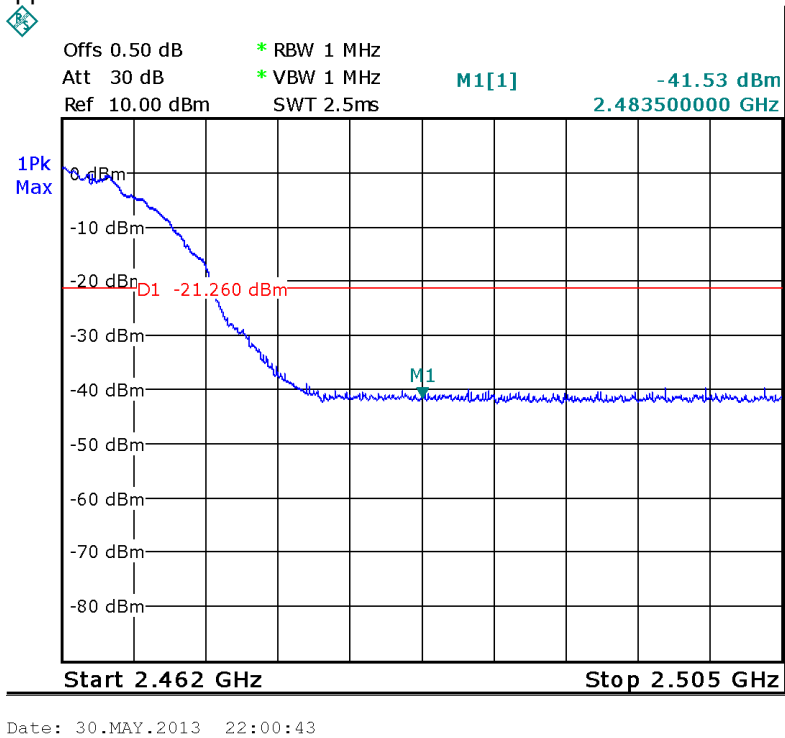
Test mode : TX 11b Lower channel

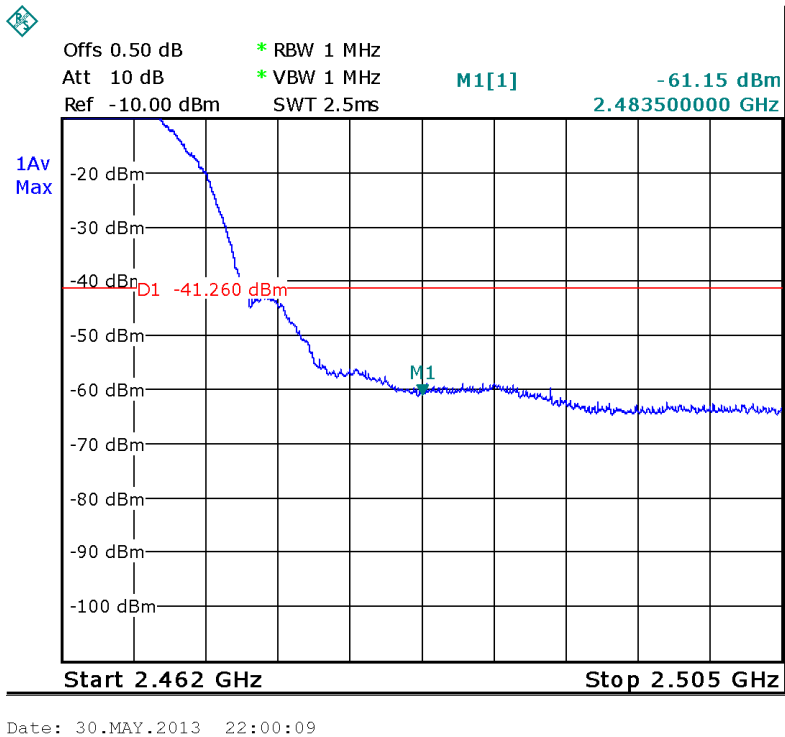


Date: 30.MAY.2013 21:58:38

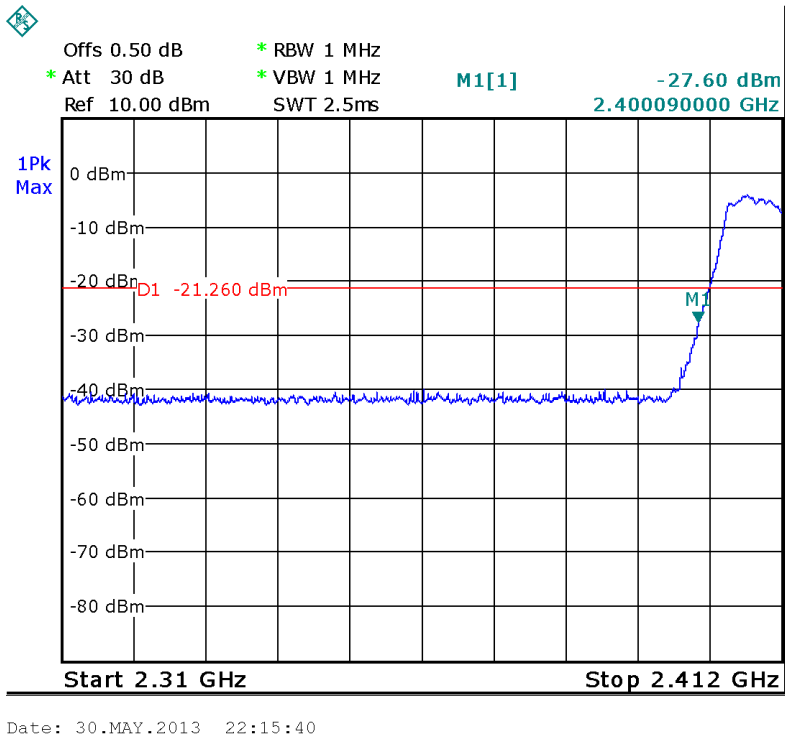


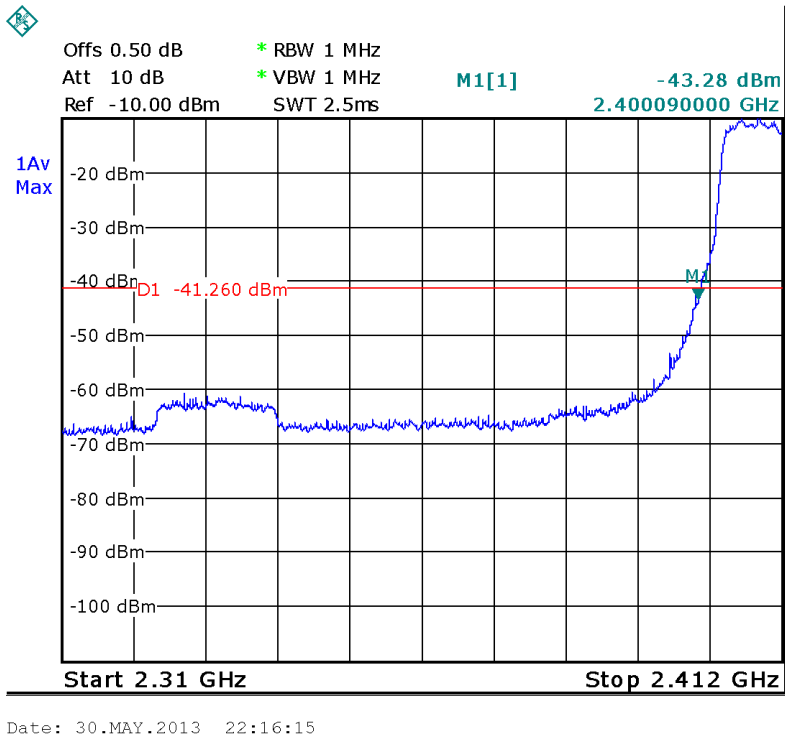
Test mode : TX 11b Upper channel



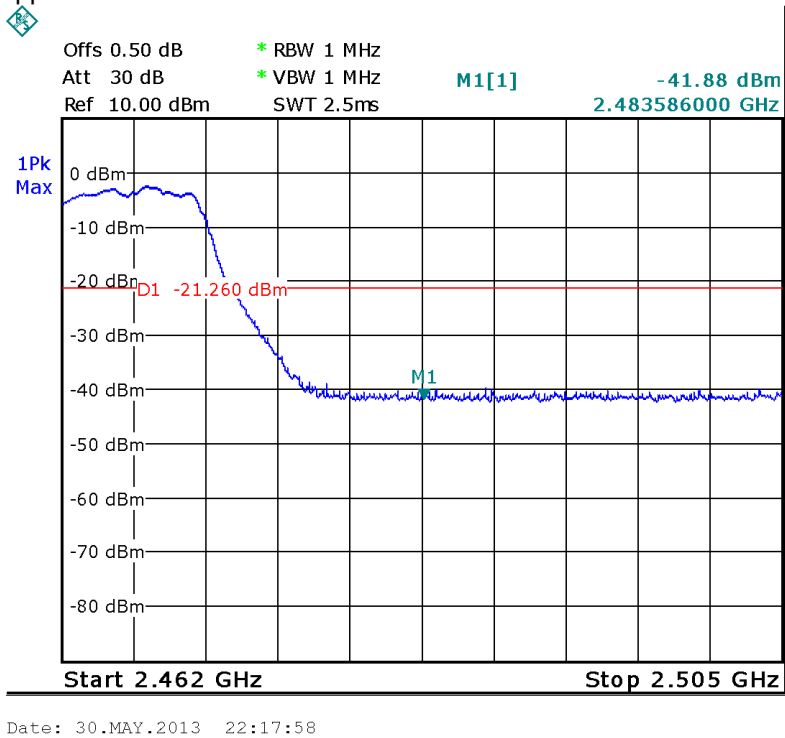


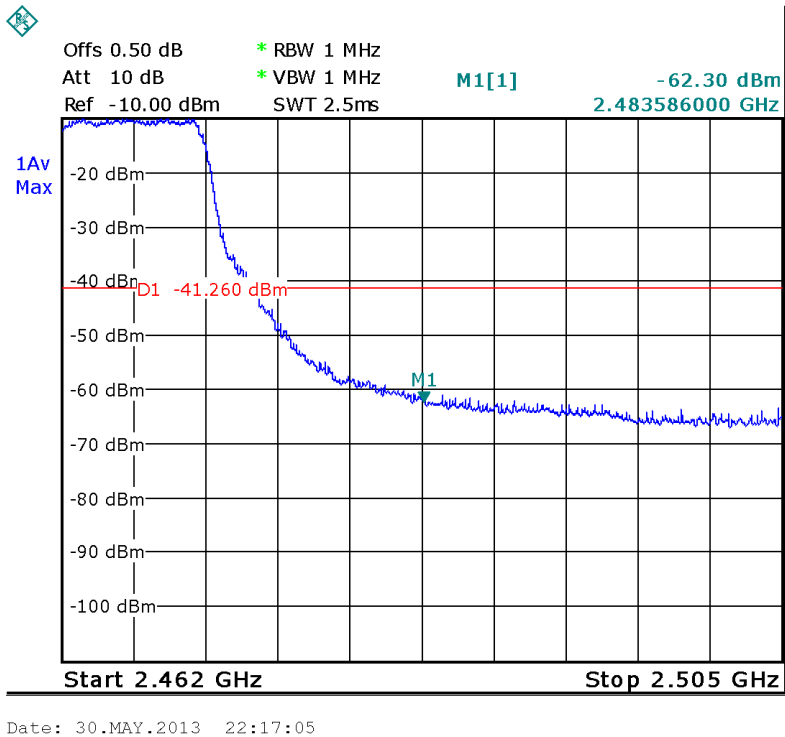
Test mode : TX 11g Lower channel



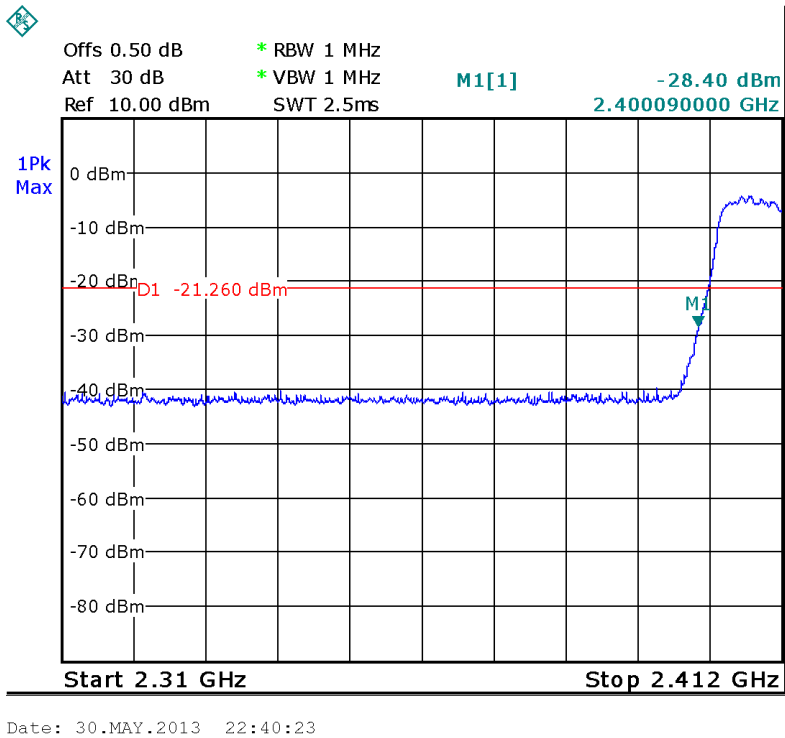


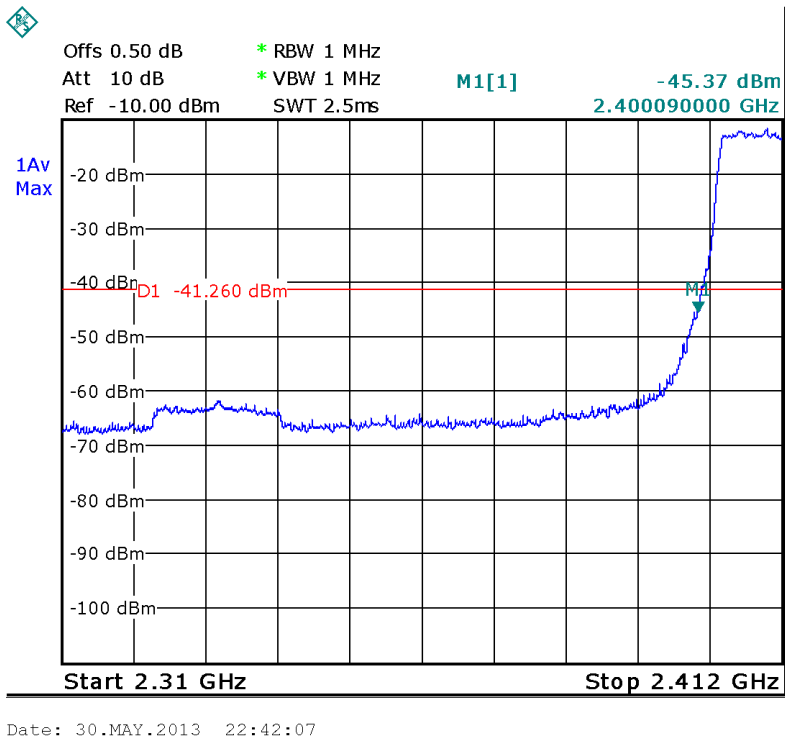
Test mode : TX 11g Upper channel



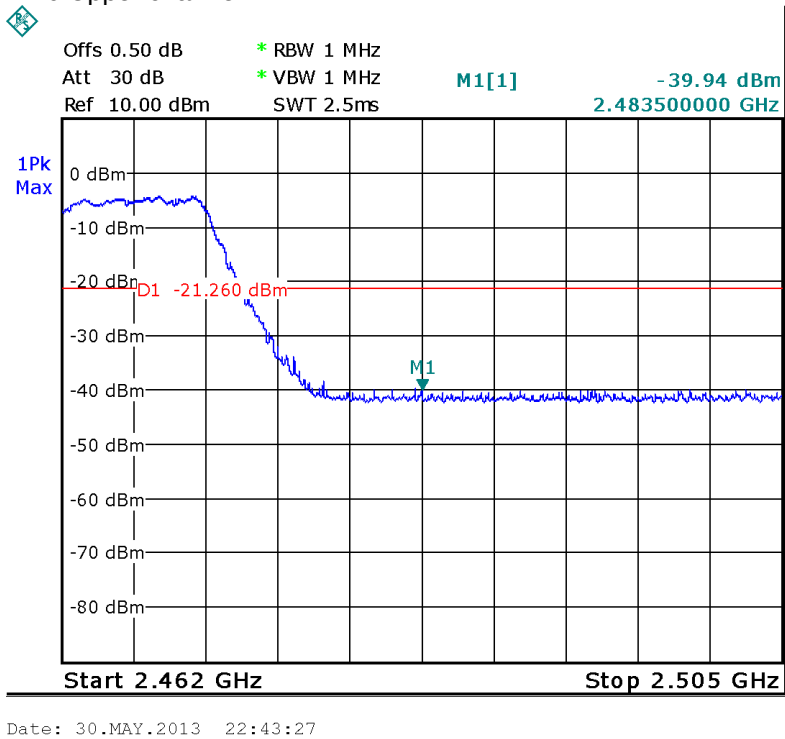


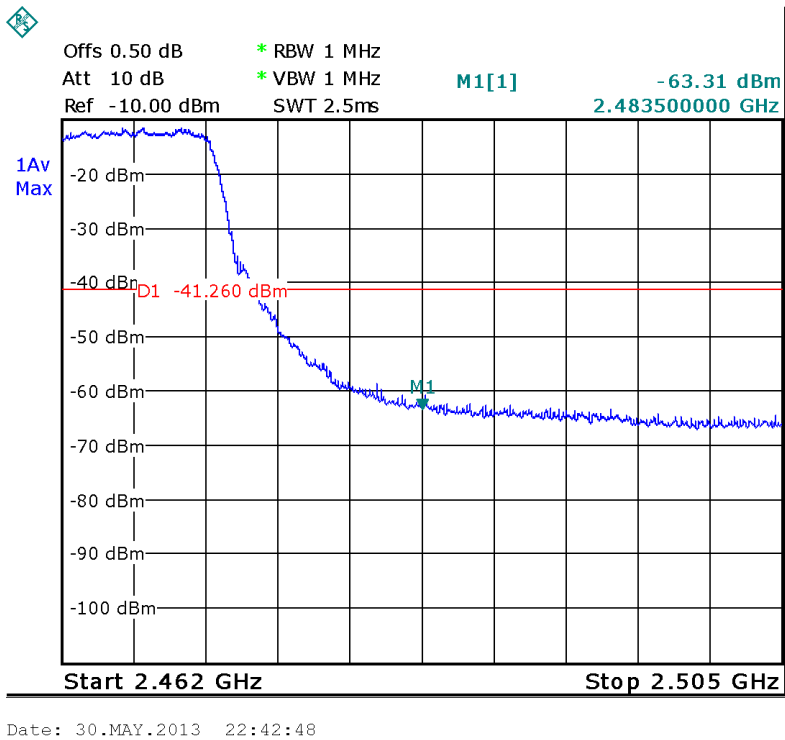
Test mode : TX 11n HT20 Lower channel



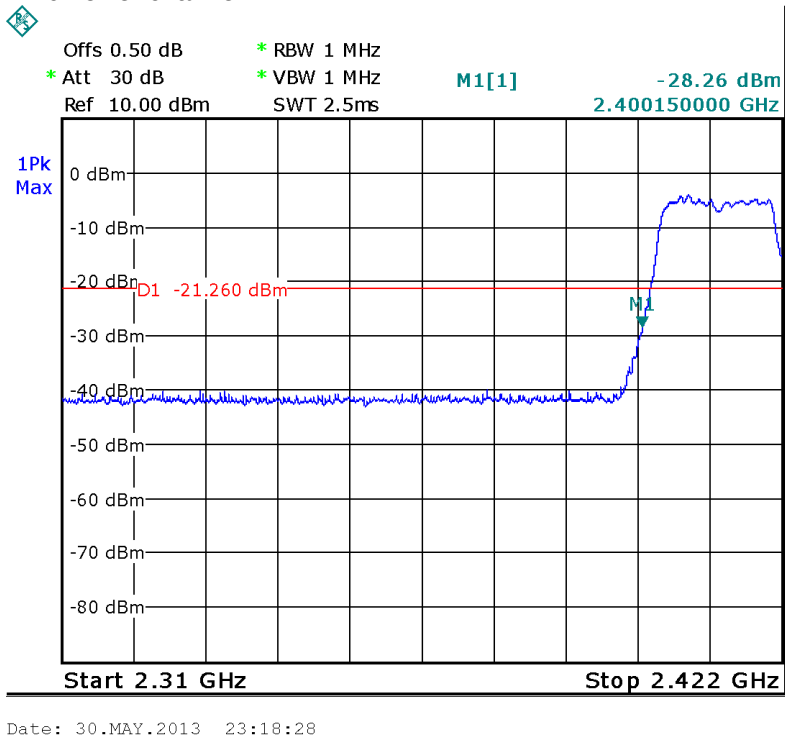


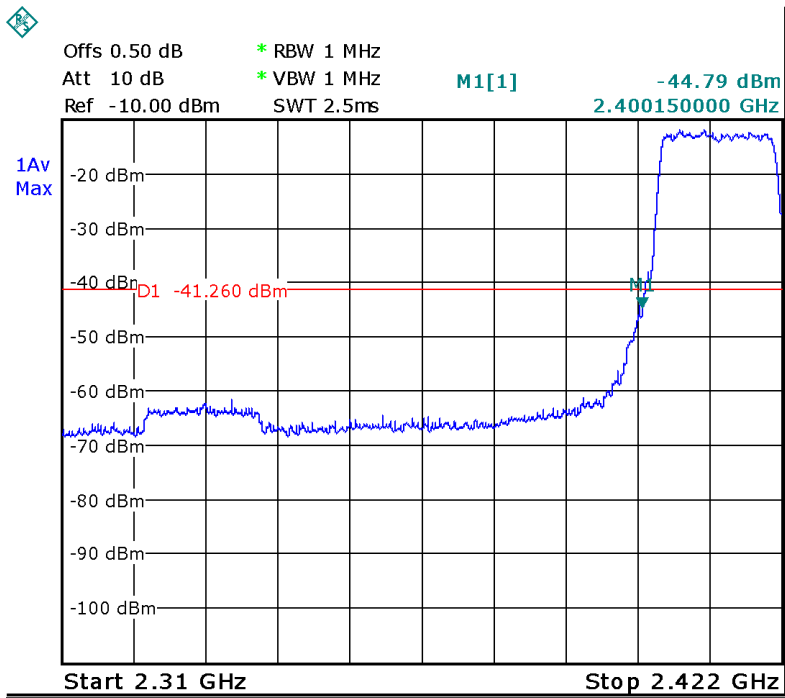
Test mode : TX 11n HT20 Upper channel





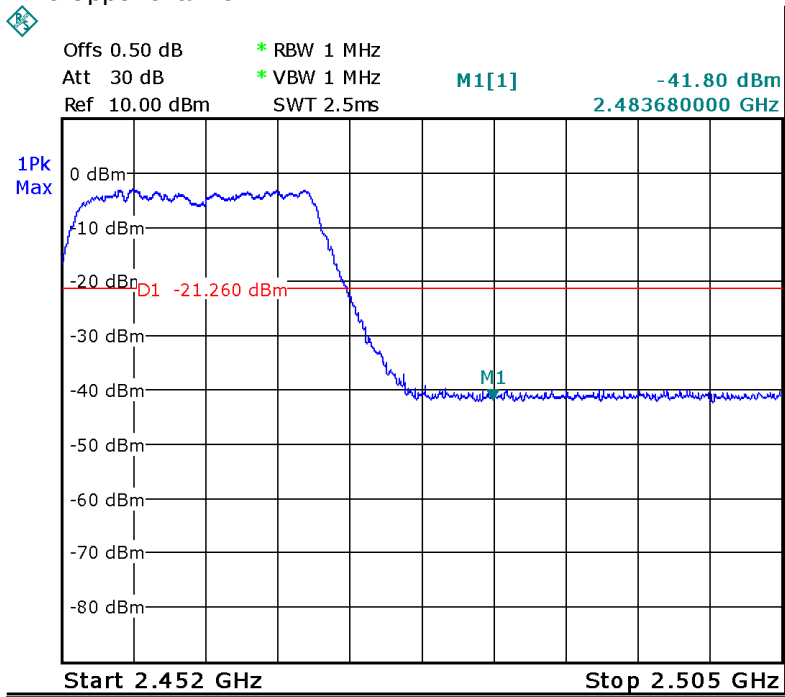
Test mode : TX 11n HT40 Lower channel



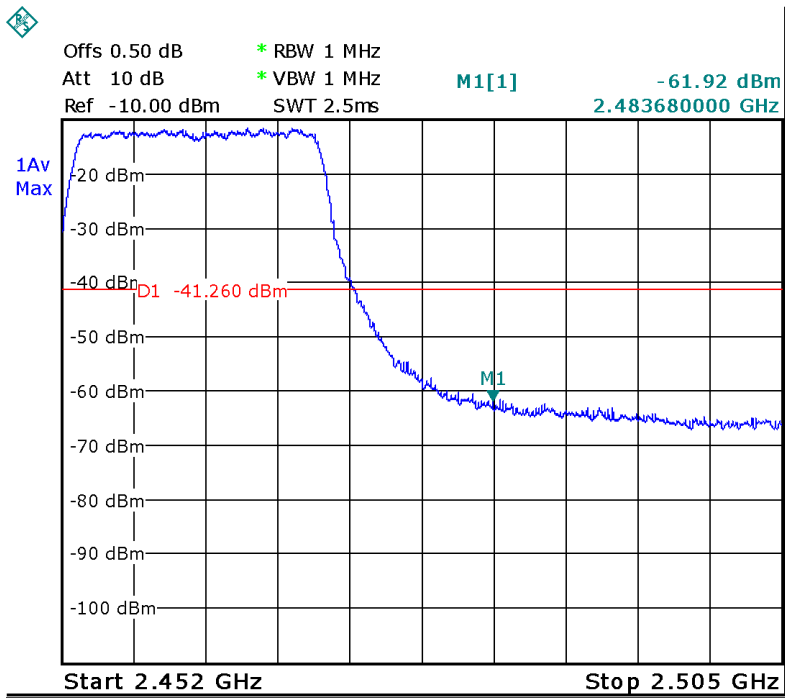


Date: 30.MAY.2013 23:19:28

Test mode : TX 11n TH40 Upper channel



Date: 30.MAY.2013 23:21:35



Date: 30.MAY.2013 23:20:10

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 permanent antenna, fulfill the requirement of this section.

15 RF Exposure

Test Requirement: FCC Part 1.1307

Test Method KDB 447498 D01 General RF Exposure Guidance v05

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

15.1 Requirments:

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR where}$$

1. $f(\text{GHz})$ is the RF channel transmit frequency in GHz
2. Power and distance are rounded to the nearest mW and mm before calculation
3. The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

15.2 Test Result

Modulation	Conducted Peak power(mW)	Source-based time-averaged maximum conducted output power(mW)	Minimum test separation distance required for the exposure conditions (mm)	SAR Test Exclusion Thresholds(mW)
802.11b	9.954	9.954	5	10
802.11g	7.727	7.727	5	10
802.11n HT 20	6.730	6.730	5	10
802.11n HT 40	5.902	5.902	5	10

Remark:Duty factor is 100%.

Calculation formula: Source-based time-averaged maximum conducted output power(mW) =Conducted peak power(mW)*Duty factor

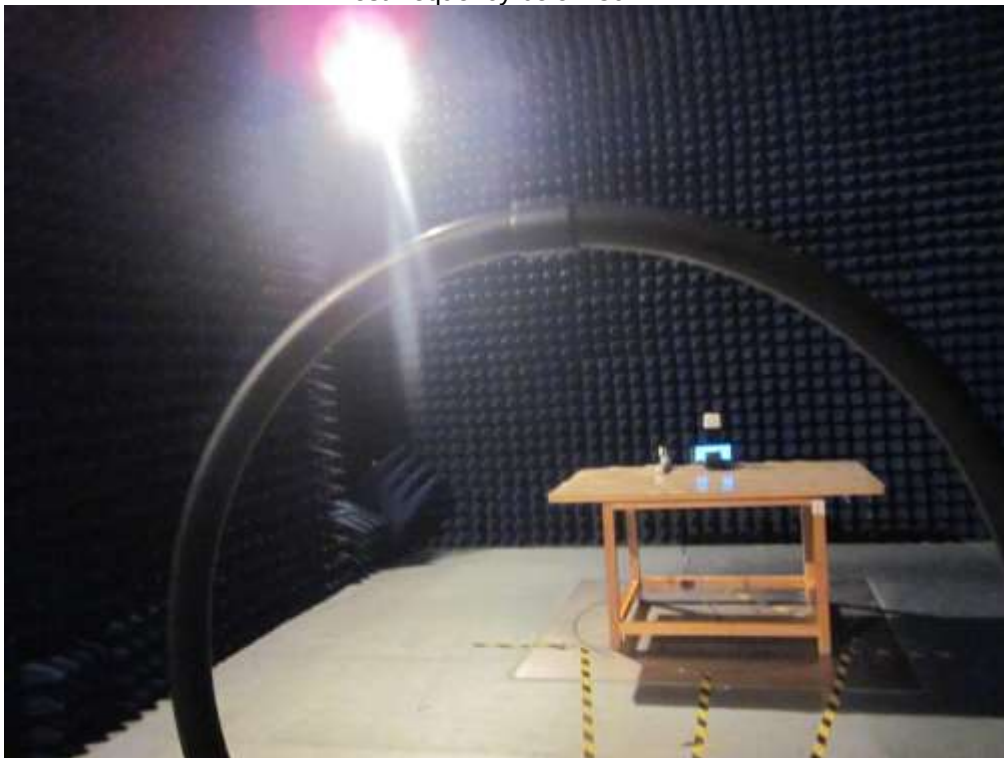
16 Photographs – Test Setup

16.1 Conducted Emission



16.2 Radiated Emission

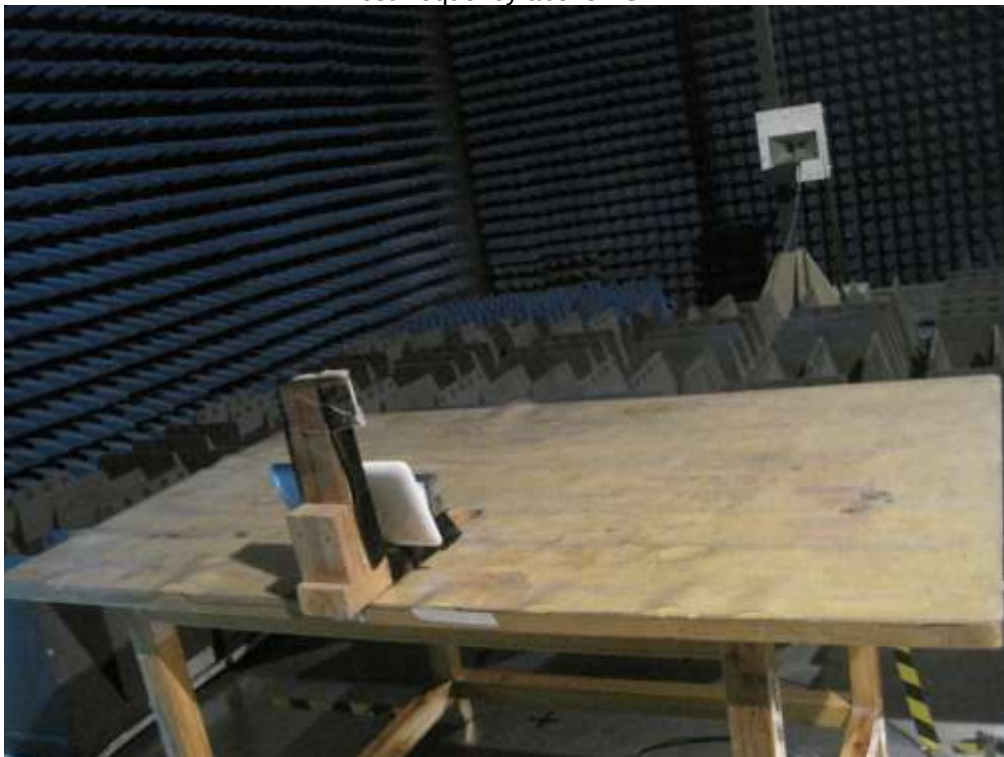
Test frequency below 30MHz



Test frequency from 30MHz to 1GHz



Test frequency above 1GHz

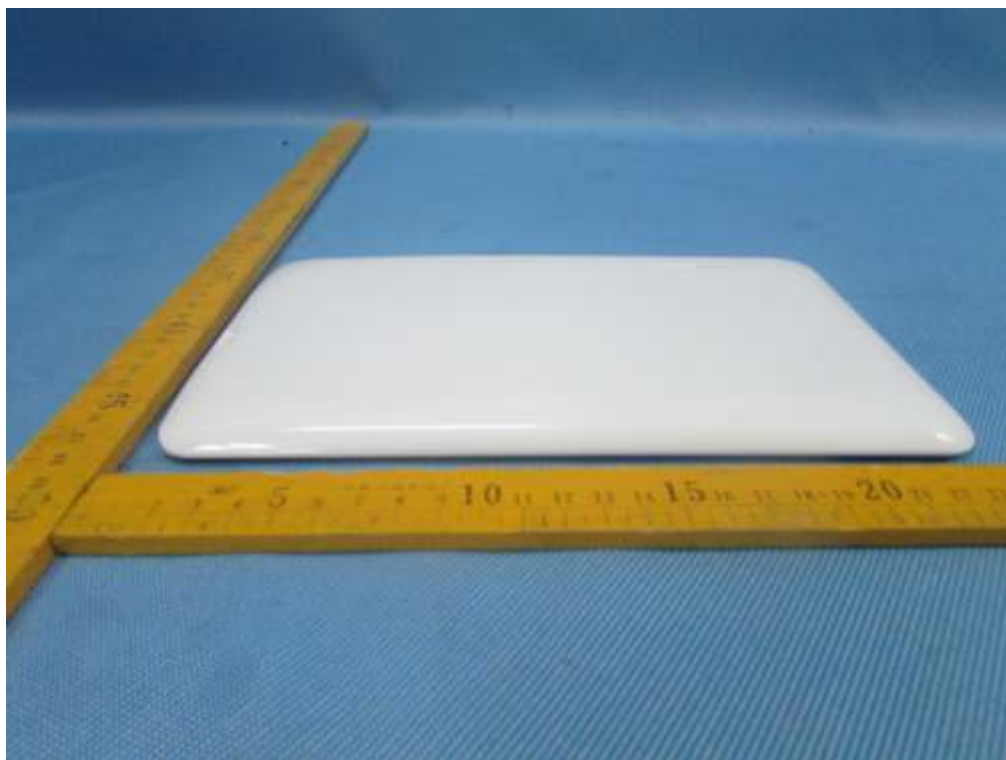


17 Photographs - Constructional Details

17.1 EUT – External View



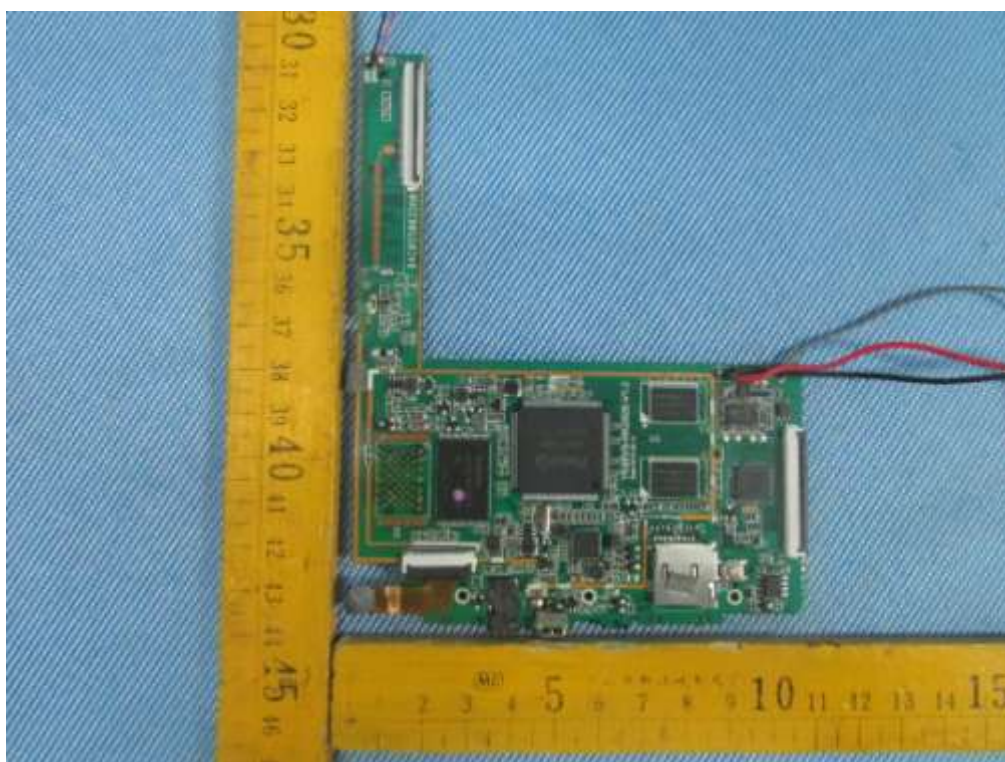


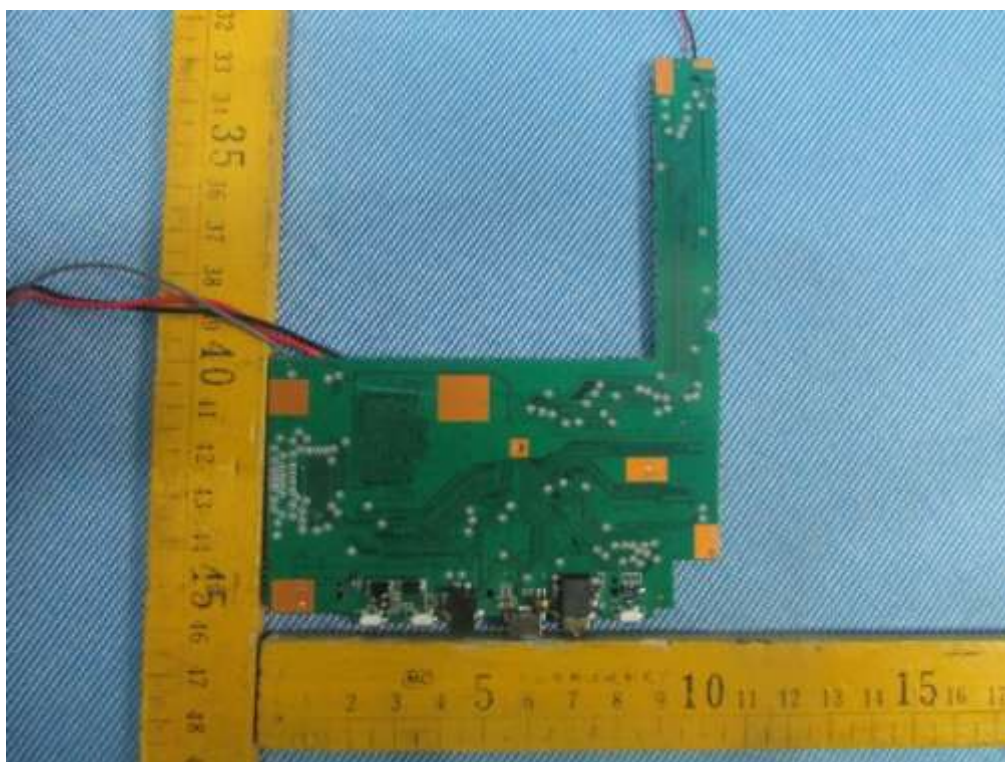




17.2 EUT –Internal View









17.3 Adapter- External View





==End of test report==