

FCC TEST REPORT
for
Wiimu Information Technology Inc.

Wiimu WiFi Audio Module
Model No.:A02

Prepared for : Wiimu Information Technology Inc.
Address : YingCui Rd., No. 7, Jiangning Economic and Technological
Development Zone, Nanjing, Jiangsu Province, China

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Report Number : 201306878F
Date of Test : Jun. 28~ Jul. 20, 2013
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TEST REPORT

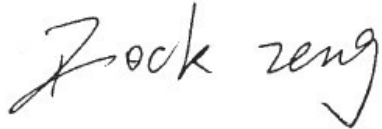
Applicant : Wiimu Information Technology Inc.
Manufacturer : Wiimu Information Technology Inc.
EUT : Wiimu WiFi Audio Module
Model No. : A02
Serial No. : N/A
Trade Mark : Wiimu
Rating : DC 5V, 2A Via adapter (AC 100-240V)


Measurement Procedure Used:
FCC Part15 Subpart C, Paragraph 15.247: 2011

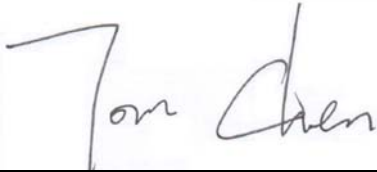
The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Test : Jun. 28~ Jul. 20, 2013

Prepared by : 
(Engineer / Rock Zeng)

Reviewer : 
(Project Manager / Sally Zhang)

Approved & Authorized Signer : 
(Manager / Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : Wiimu WiFi Audio Module

Model Number : A02

Test Power Supply : AC 120V/60Hz for adapter

Adapter : Manufacturer: Wiimu
Model: LY-008-5
Input: AC 100-240V, 50/60Hz
Output: DC 5V, 2A

RF Transmission Frequency : 2412MHz~2462MHz (802.11b/802.11g/802.11n(HT20))
2422MHz~2452MHz (802.11n(HT40))

Channels : 11 For (802.11b/802.11g/802.11n(HT20))
7 For (802.11n(HT40))

Modulation : 802.11b CCK
802.11g OFDM
802.11n MCS

Antenna Type : Integral

Antenna Gain : 0 dBi

Applicant : Wiimu Information Technology Inc.
Address : YingCui Rd., No. 7, Jiangning Economic and Technological
Development Zone, Nanjing, Jiangsu Province, China

Manufacturer : LinkSprite (Wuhan) Electronics Technologies Co., Ltd.
Address : Building E3, Suite 1101, Optics Valley Software Park, Wuhan,
Hubei, 430074.

Date of receiver : Jun. 28, 2013

Date of Test : Jun. 28~ Jul. 20, 2013

1.2. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS - LAB Code: L3503

Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021

Shenzhen Anbotek Compliance Laboratory Limited, 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 752021, July 10, 2013.

IC-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A, February 22, 2013.

Test Location

All Emissions tests were performed at Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.3. Measurement Uncertainty

Radiation Uncertainty : $U_r = 4.3\text{dB}$

Conduction Uncertainty : $U_c = 3.4\text{dB}$

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4: 2009 and FCC Part 15, Paragraph 15.247.

3.1. Summary of Test Results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107, 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15, Paragraph 15.247(b)(1)	Peak Output Power	PASS	Complies
FCC Part 15, Paragraph 15.247(a)(2)	6dB Bandwidth	PASS	Complies
FCC Part 15, Paragraph 15.247(c)	100kHz Bandwidth of Frequency Band Edges	PASS	Complies
FCC Part 15, Paragraph 15.209(a)(f)	Spurious Emission	PASS	Complies
FCC Part 15, Paragraph 15.247(a)(1)	Frequency Separation	-	N/A
FCC Part 15, Paragraph 15.247(a)(1)(iii)	Number of Hopping Frequency	-	N/A
FCC Part 15, Paragraph 15.247(a)(1)(iii)	Time of Occupancy	-	N/A
FCC Part 15, Paragraph 15.247(c)	Peak Power Density	PASS	Complies

3.2. Description of Test Modes

The EUT has been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

IEEE802.11b: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 1 Mbps lowest data rate (worst case) are chosen for the final testing.

IEEE802.11g: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 6 Mbps lowest data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT20): Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 6.5 Mbps lowest data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT40): Channel 3(2422MHz), Channel 6(2437MHz) and Channel 9(2452MHz) with 13.5 Mbps lowest data rate (the worst case) are chosen for the final testing.

3.3. List of channels:

√ - available

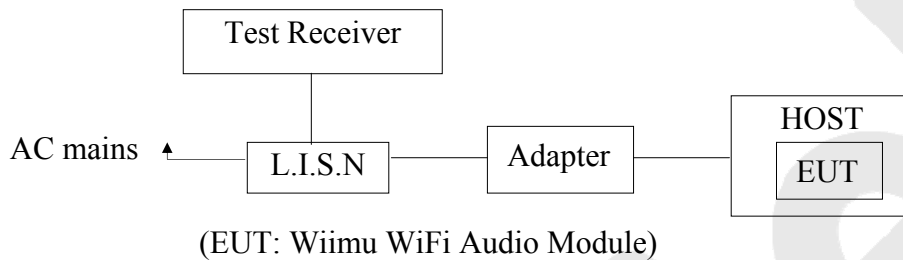
X - tested

Number	Frequency(MHz)		802.11 b/g/n (HT20)	802.11 b/g/n (HT40)
1	2412	√	X	
2	2417	√		
3	2422	√		X
4	2427	√		
5	2432	√		
6	2437	√	X	X
7	2442	√		
8	2447	√		
9	2452	√		X
10	2457	√		
11	2462	√	X	

4. Conducted Emission Test

4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



4.2. Power Line Conducted Emission Measurement Limits (15.207)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

- Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

4.3. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

EUT : Wiimu WiFi Audio Module
Model Number : A02
Applicant : Wiimu Information Technology Inc.

4.4. Operating Condition of EUT

4.4.1. Setup the EUT and simulator as shown as Section 4.1.

4.4.2. Turn on the power of all equipment.

4.4.3. Let the EUT work in test mode (ON) and measure it.

4.5. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.4-2003 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test results are reported on Section 4.6.

4.6. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	10055	Apr. 23, 2013	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 23, 2013	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 23, 2013	1 Year

Conduction Uncertainty : U_c = 3.4dB

4.7. Power Line Conducted Emission Measurement Results

PASS.

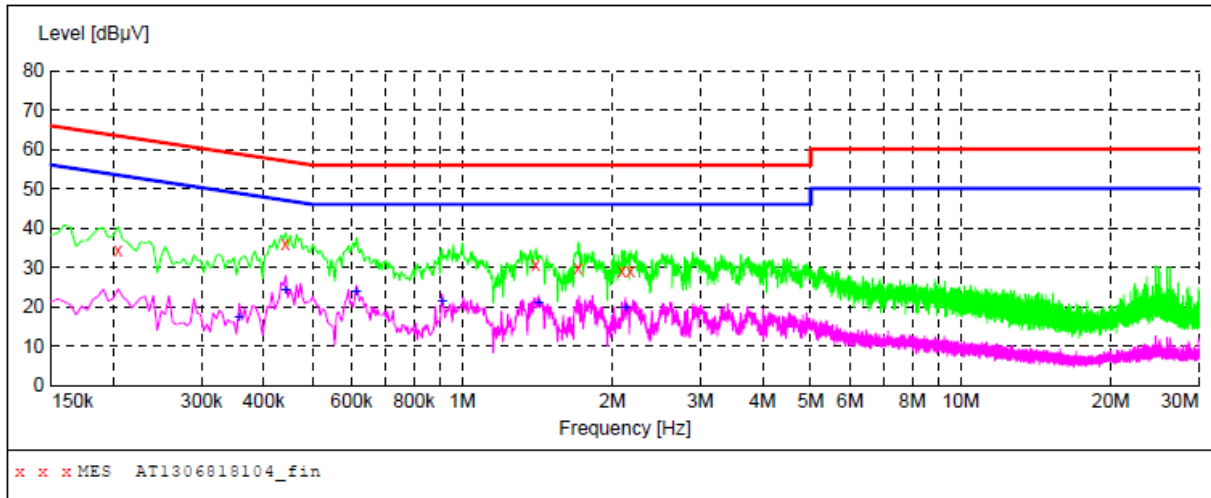
The frequency range from 150KHz to 30 MHz is investigated.

Please refer the following pages.

CONDUCTED EMISSION TEST DATA

EUT: Wiimu WiFi Audio Module M/N:A02
 Operating Condition: ON
 Test Site: 1# Shielded Room
 Operator: Rock Zeng
 Test Specification: AC 120V/60Hz for Adapter
 Comment: Live Line
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage (150K~30M) FIN"
 Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "AT1306818104_fin"

6/25/2013 9:54AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.204000	34.40	20.1	63	29.0	QP	L1	GND
0.442500	36.00	20.1	57	21.0	QP	L1	GND
1.405000	30.70	20.2	56	25.3	QP	L1	GND
1.706500	29.90	20.3	56	26.1	QP	L1	GND
2.093500	29.20	20.3	56	26.8	QP	L1	GND
2.174500	28.90	20.3	56	27.1	QP	L1	GND

MEASUREMENT RESULT: "AT1306818104_fin2"

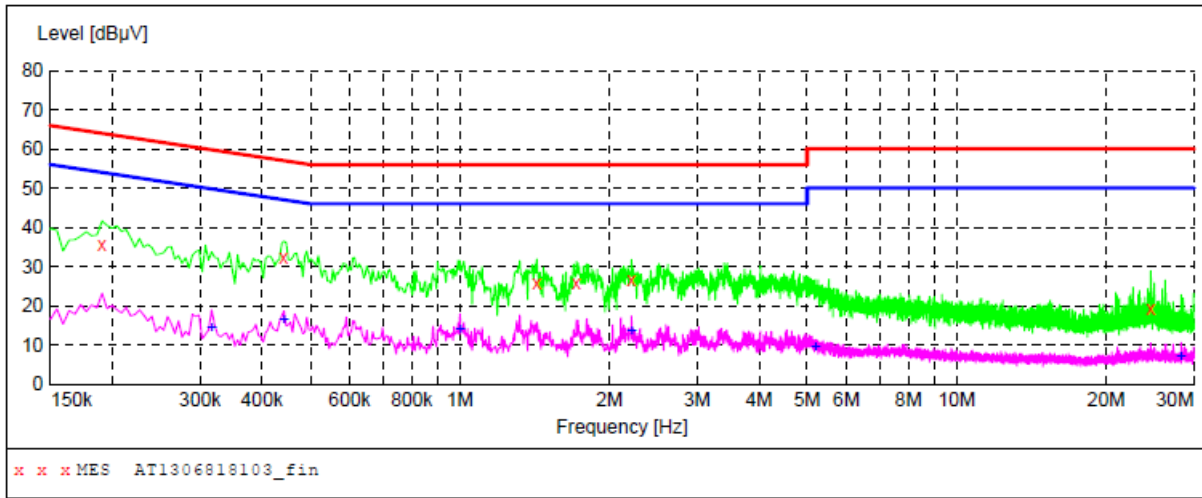
6/25/2013 9:54AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.357000	17.40	20.1	49	31.4	AV	L1	GND
0.442500	24.10	20.1	47	22.9	AV	L1	GND
0.613500	23.60	20.1	46	22.4	AV	L1	GND
0.910500	21.50	20.1	46	24.5	AV	L1	GND
1.423000	20.80	20.3	46	25.2	AV	L1	GND
2.125000	19.80	20.3	46	26.2	AV	L1	GND

CONDUCTED EMISSION TEST DATA

EUT: Wiimu WiFi Audio Module M/N:A02
 Operating Condition: ON
 Test Site: 1# Shielded Room
 Operator: Rock Zeng
 Test Specification: AC 120V/60Hz for Adapter
 Comment: Neutral Line
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage(150K~30M)FIN"
 Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "AT1306818103_fin"

6/25/2013 9:52AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.190500	35.70	20.1	64	28.3	QP	N	GND
0.442500	32.30	20.1	57	24.7	QP	N	GND
1.427500	26.00	20.3	56	30.0	QP	N	GND
1.715500	25.80	20.3	56	30.2	QP	N	GND
2.215000	26.40	20.3	56	29.6	QP	N	GND
24.580000	19.30	20.9	60	40.7	QP	N	GND

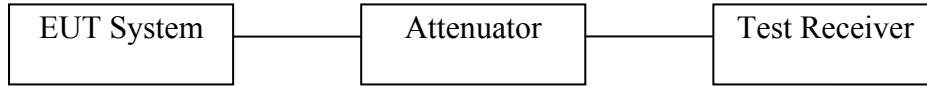
MEASUREMENT RESULT: "AT1306818103_fin2"

6/25/2013 9:52AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.316500	14.30	20.1	50	35.5	AV	N	GND
0.442500	16.50	20.1	47	30.5	AV	N	GND
1.000000	14.00	20.2	46	32.0	AV	N	GND
2.215000	13.50	20.3	46	32.5	AV	N	GND
5.189500	9.50	20.5	50	40.5	AV	N	GND
28.270000	7.20	20.9	50	42.8	AV	N	GND

5. FCC Part 15.247 Requirements for DSSS & OFDM Modulation

5.1 Test Setup



5.2 6dB Bandwidth

a. Limit

For the direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

b. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100kHz (802.11b/802.11g/802.11n(HT20)), RBW=300kHz, VBW = 3*RBW, Span = 50MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

c. Test Setup See 5.1

d. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 23, 2013	1 Year
2	EMI Receiver	Rohde & Schwarz	ESCI	100627	Apr. 23, 2013	1 Year
3.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 23, 2013	1 Year
4	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 23, 2013	1 Year
5	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

e. Test Results

Pass.

f. Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	12.08		Pass
Mid	2437	12.08	>500	Pass
High	2462	12.40		Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	16.48		Pass
Mid	2437	16.32	>500	Pass
High	2462	16.48		Pass

Test mode: IEEE 802.11n (HT20)

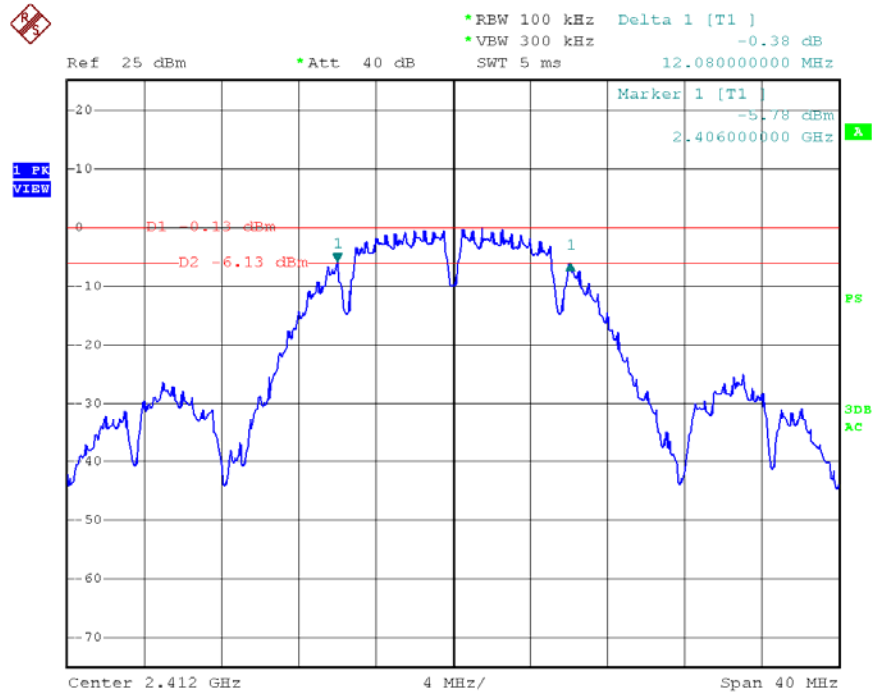
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	17.60		Pass
Mid	2437	17.60	>500	Pass
High	2462	17.60		Pass

Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2422	35.40		Pass
Mid	2437	35.40	>500	Pass
High	2452	35.40		Pass

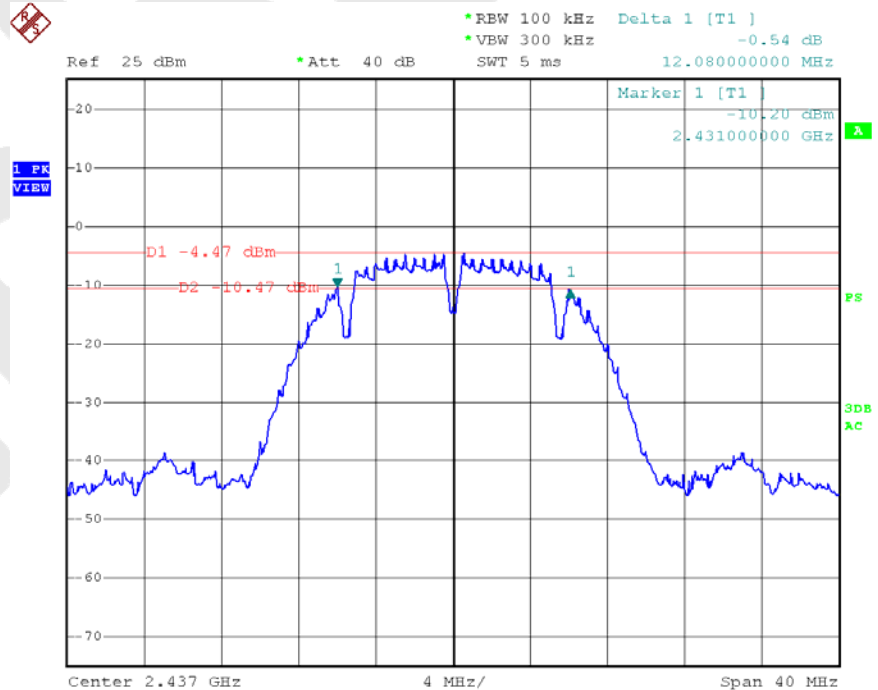
Test Plots See the following page.

Test Mode: 802.11b---Low



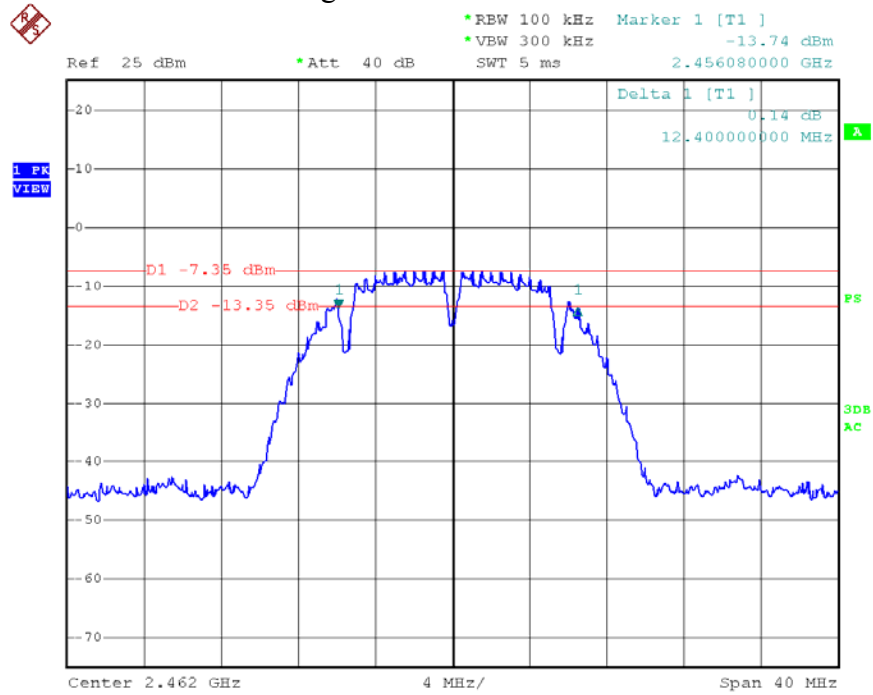
Date: 11.JUL.2013 20:30:12

Test Mode: 802.11b---Mid



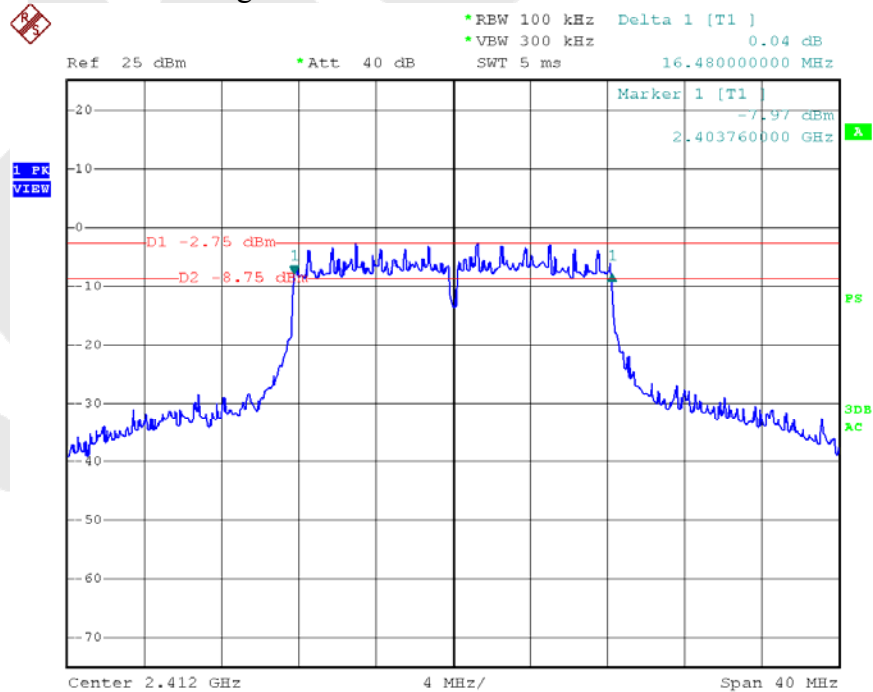
Date: 11.JUL.2013 20:31:17

Test Mode: 802.11b---High



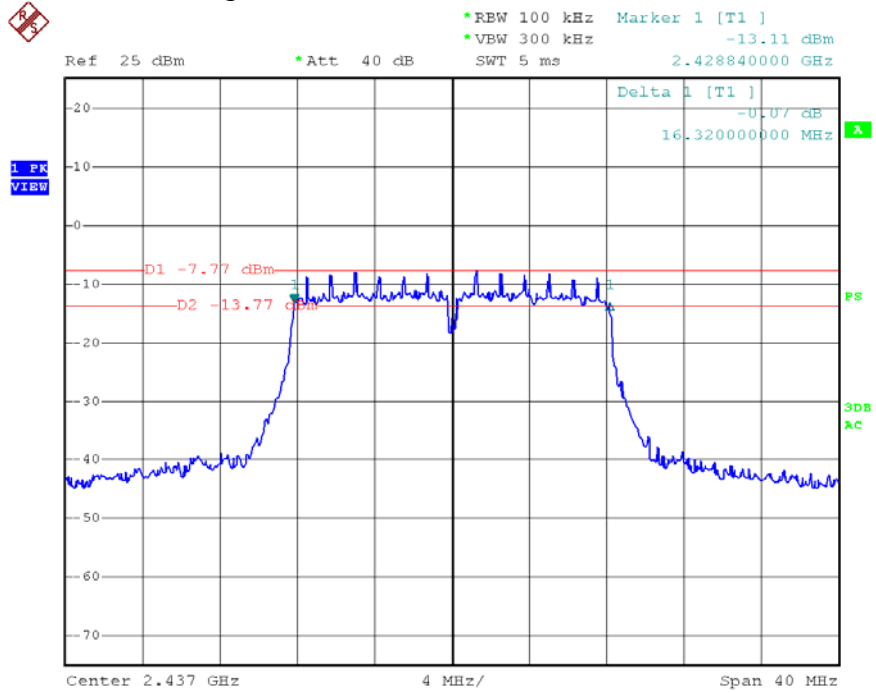
Date: 11.JUL.2013 20:32:37

Test Mode: 802.11g---Low



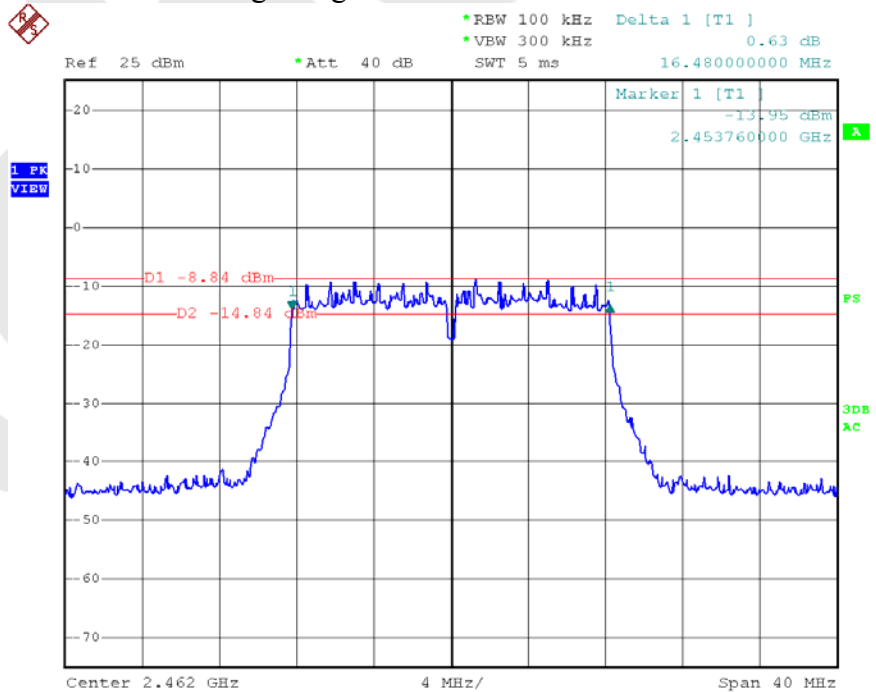
Date: 11.JUL.2013 20:33:51

Test Mode: 802.11g---Mid



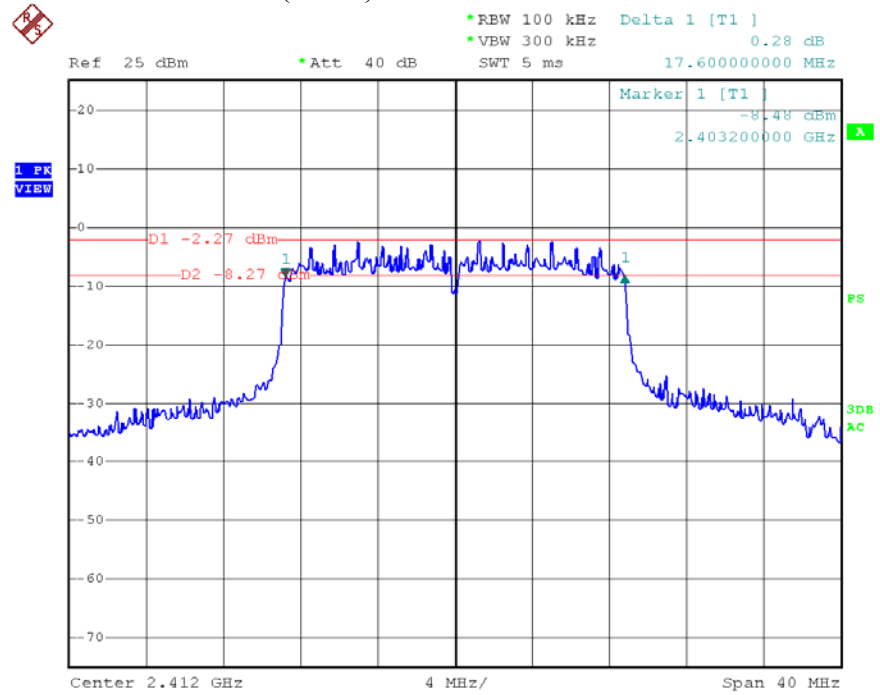
Date: 11.JUL.2013 20:59:50

Test Mode: 802.11g---High



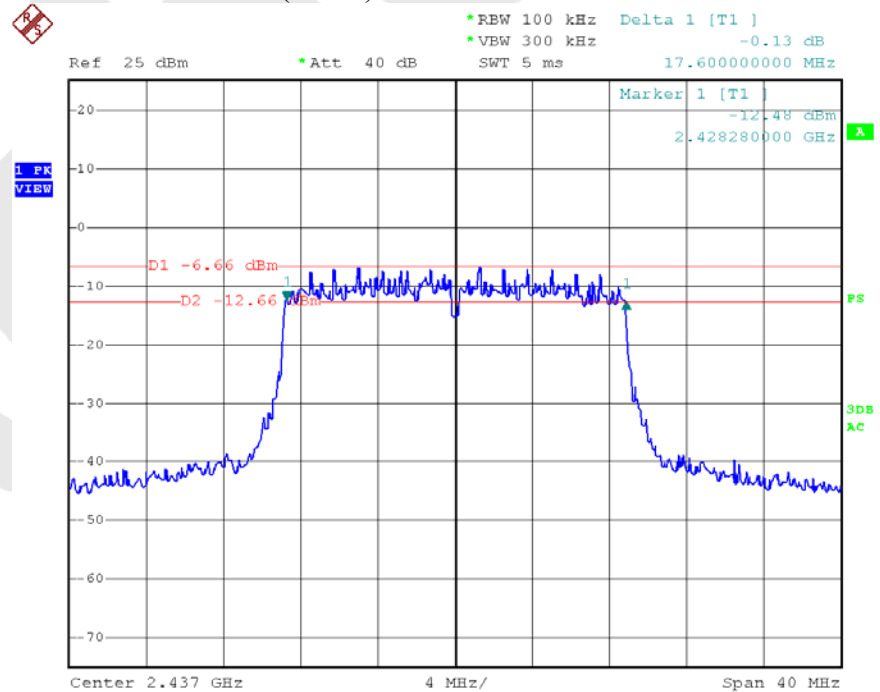
Date: 11.JUL.2013 20:35:56

Test Mode: 802.11n (HT20)---Low



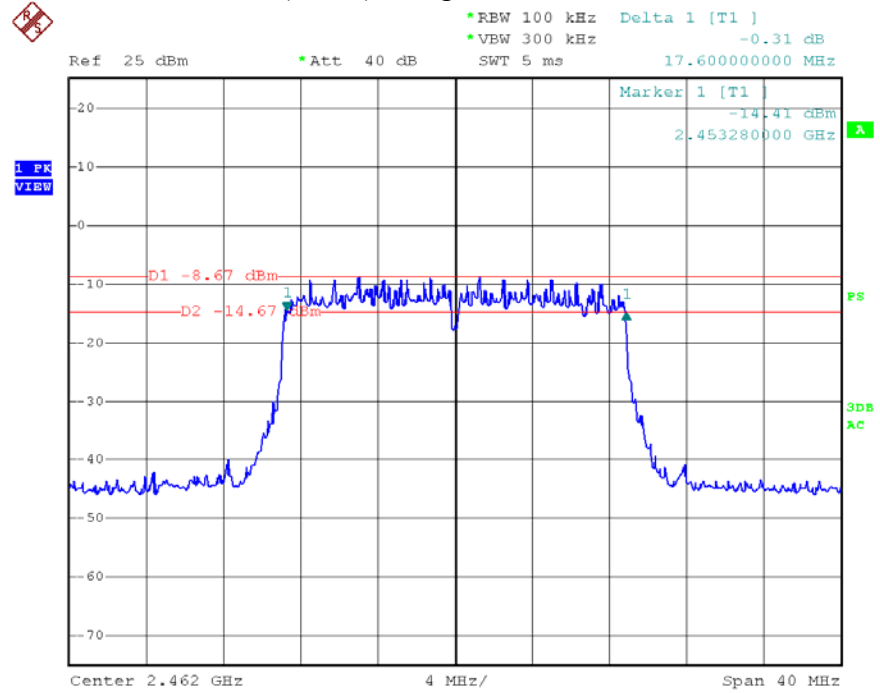
Date: 11.JUL.2013 20:37:17

Test Mode: 802.11n (HT20)---Mid



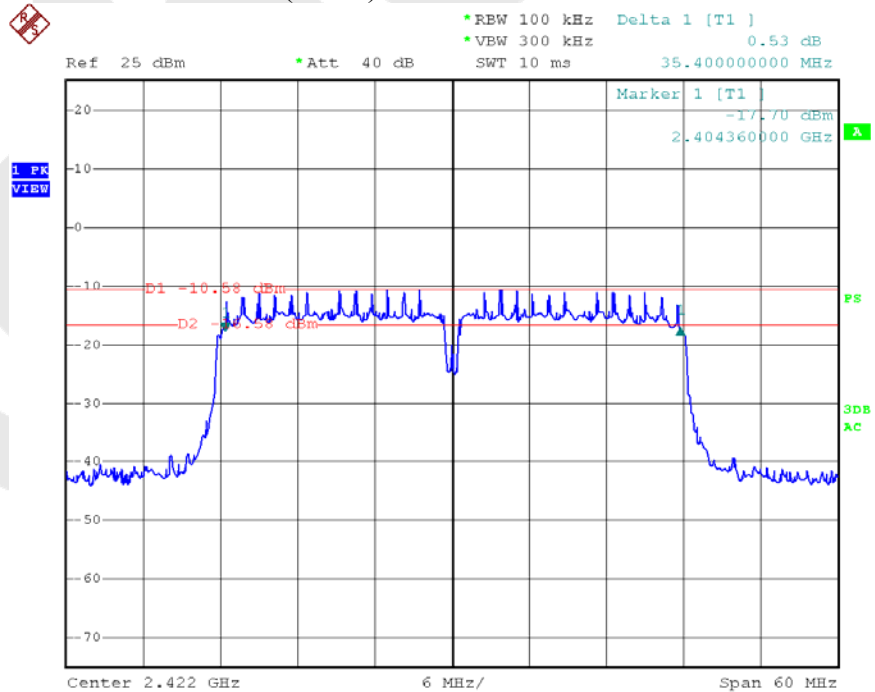
Date: 11.JUL.2013 20:38:09

Test Mode: 802.11n (HT20)---High



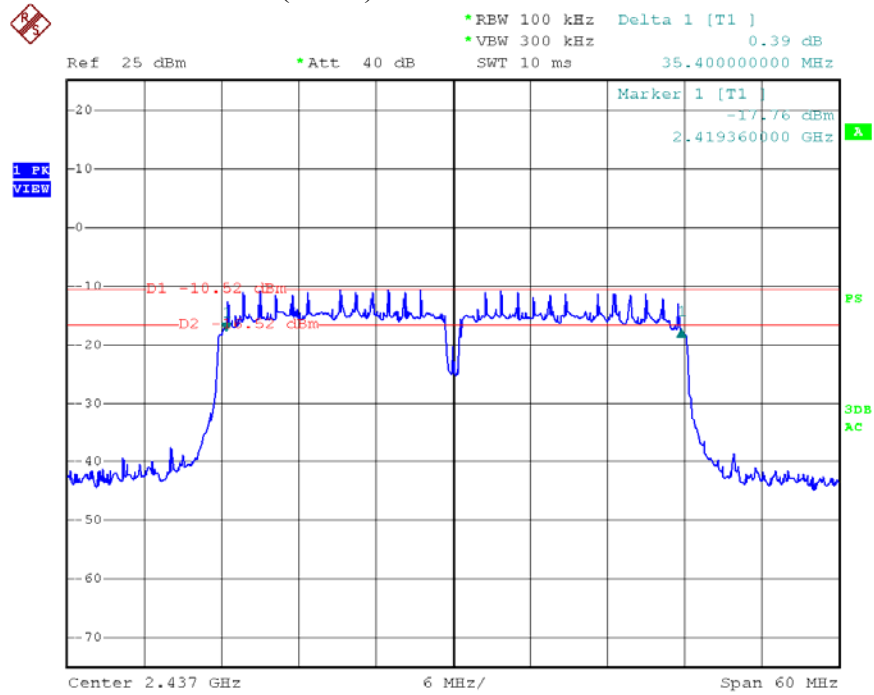
Date: 11.JUL.2013 20:39:08

Test Mode: 802.11n (HT40)---Low



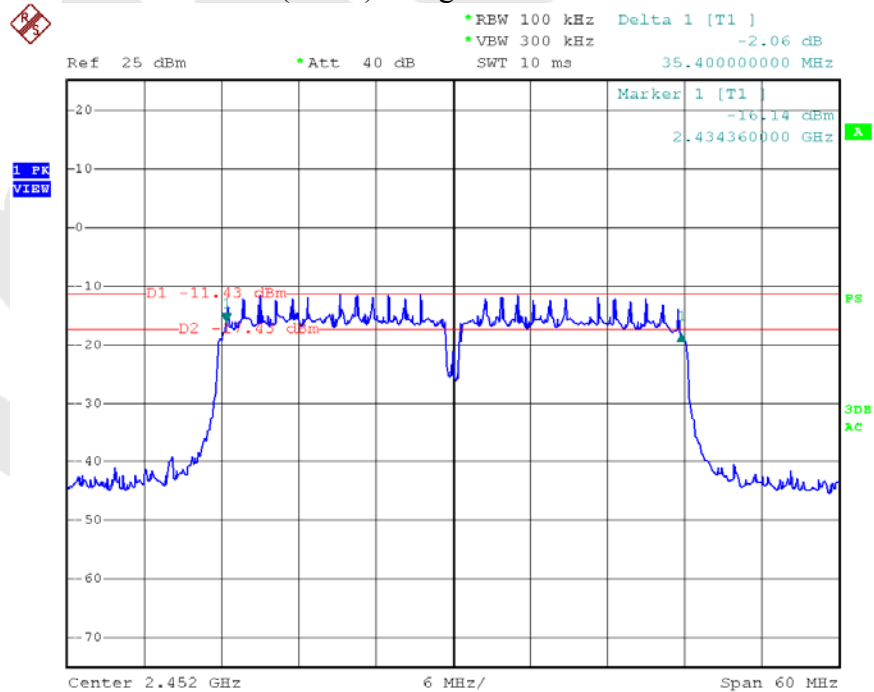
Date: 11.JUL.2013 20:40:36

Test Mode: 802.11n (HT40)---Mid



Date: 11.JUL.2013 20:41:32

Test Mode: 802.11n (HT40)---High



Date: 11.JUL.2013 20:42:33

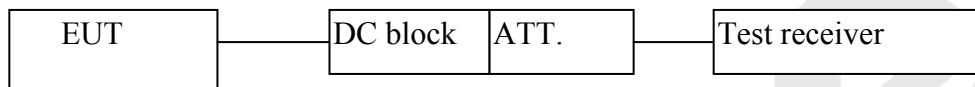
5.3 Maximum Peak output power test

a. Limit

The maximum peak output power of the intentional radiator shall not exceed the following:

1. For systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 watt (30dBm).
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antenna of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

b. Configuration of Measurement



c. Data Rates

IEEE802.11b: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 1 Mbps data rate (worst case) are chosen for the final testing.

IEEE802.11g: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 6 Mbps data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT20: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 6.5Mbps data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT40: Channel 3(2422MHz), Channel 6(2437MHz) and Channel 9(2452MHz) with 13.5Mbps data rate (the worst case) are chosen for the final testing.

d. Test Procedure

This test was according the kdb 58074 5.2.1.2 Measurement Procedure PK2:

1. This procedure provides an integrated measurement alternative when the maximum available RBW < EBW.
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Set the span to a value that is 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges (for some analyzers, this may require a manual override to ensure use of peak detector). If the spectrum analyzer does not have a band power function, sum the spectrum levels (in linear power units) at 1 MHz intervals extending across the EBW of the spectrum.

Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 23, 2013	1 Year
2	EMI Receiver	Rohde & Schwarz	ESCI	100627	Apr. 23, 2013	1 Year
3.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 23, 2013	1 Year
4	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 23, 2013	1 Year
5	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

e. Test Results

Pass.

f. Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Maximum transmit power (dBm)	Limit		Result
			(dBm)	(watts)	
Low	2412	14.00	30	1	Pass
Mid	2437	9.54			Pass
High	2462	7.25			Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Maximum transmit power (dBm)	Limit		Result
			(dBm)	(watts)	
Low	2412	15.60	30	1	Pass
Mid	2437	11.36			Pass
High	2462	9.35			Pass

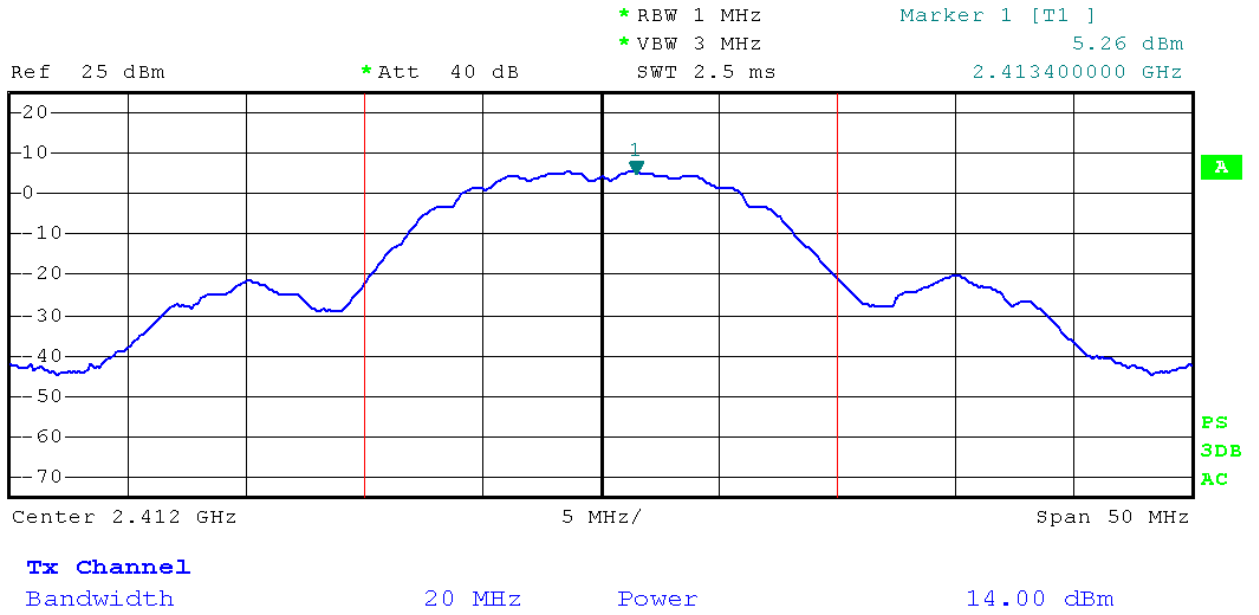
Test mode: IEEE 802.11n (HT20)

Channel	Frequency (MHz)	Maximum transmit power (dBm)	Limit		Result
			(dBm)	(watts)	
Low	2412	15.55	30	1	Pass
Mid	2437	11.37			Pass
High	2462	9.36			Pass

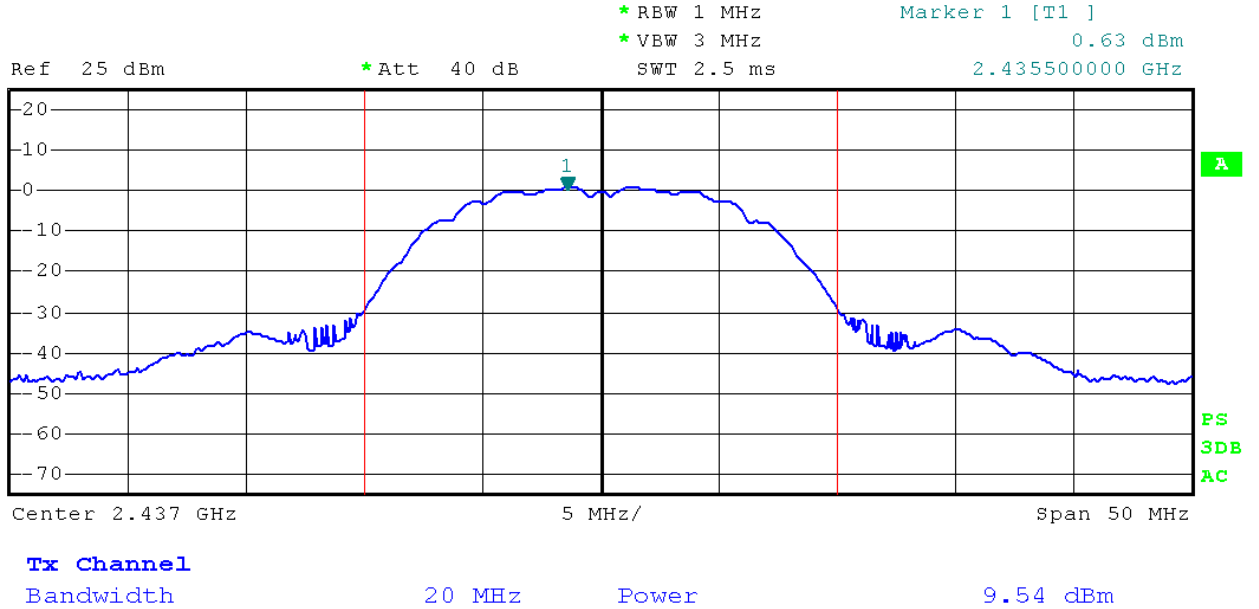
Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	Maximum transmit power (dBm)	Limit		Result
			(dBm)	(watts)	
Low	2422	13.49	30	1	Pass
Mid	2437	13.35			Pass
High	2452	12.50			Pass

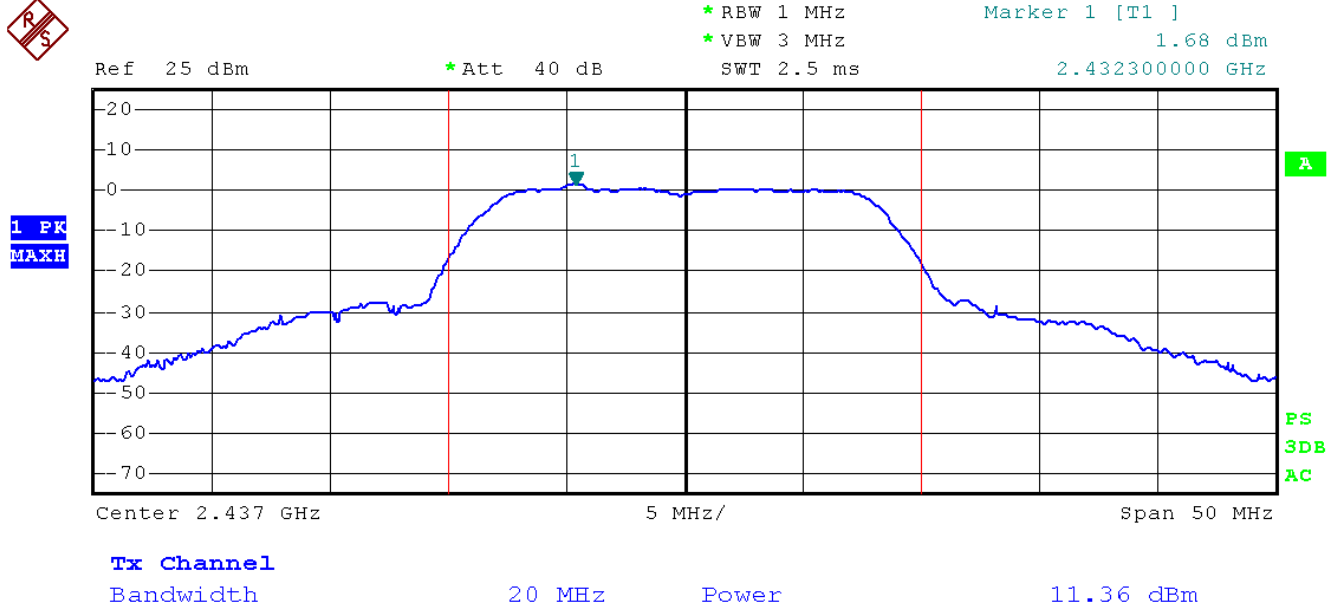
Test Mode: 802.11b ---Low



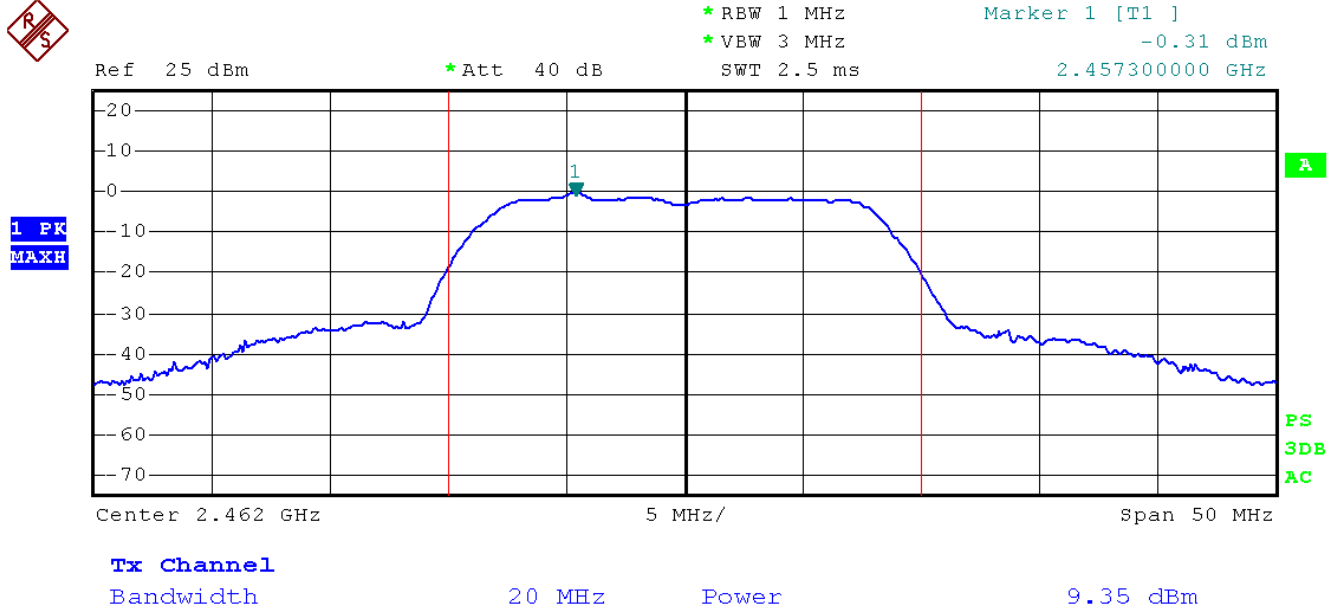
Test Mode: 802.11b---Mid



Test Mode: 802.11g---Mid



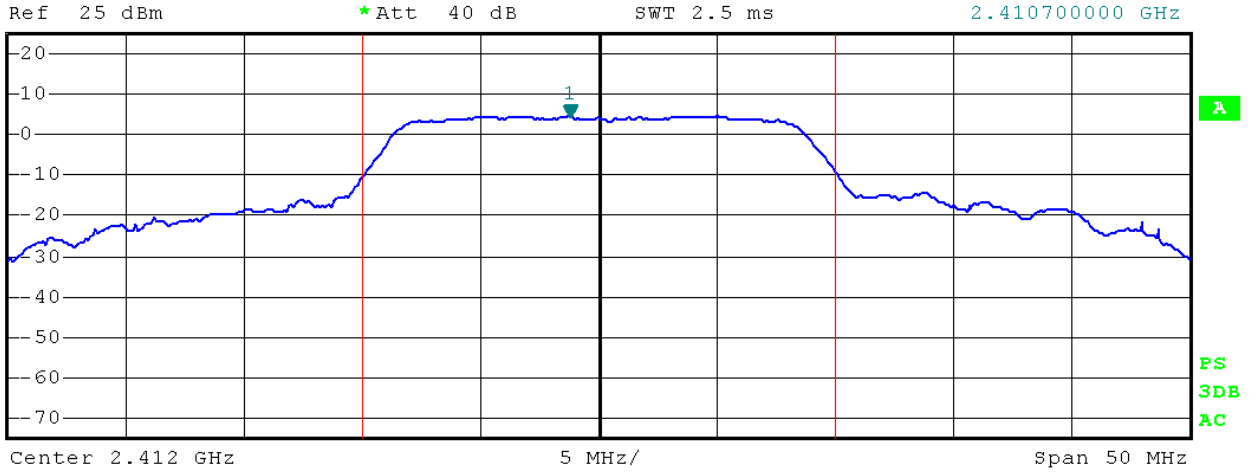
Test Mode: 802.11g---High



Test Mode: 802.11n (HT20) ---Low



* RBW 1 MHz
* VBW 3 MHz
SWT 2.5 ms
Marker 1 [T1]
4.75 dBm
2.410700000 GHz

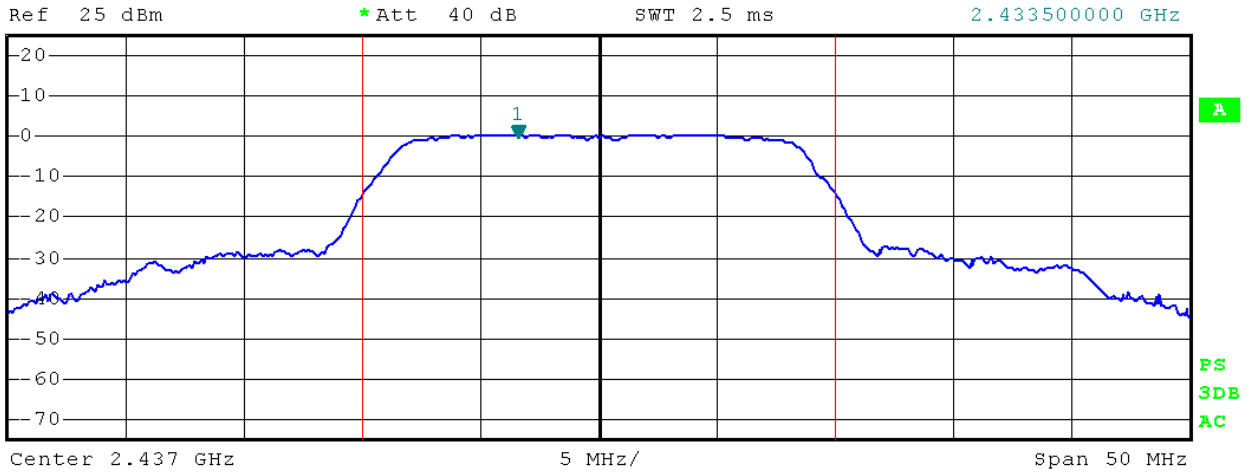


Tx Channel1
Bandwidth 20 MHz Power 15.55 dBm

Test Mode: 802.11n (HT20)---Mid

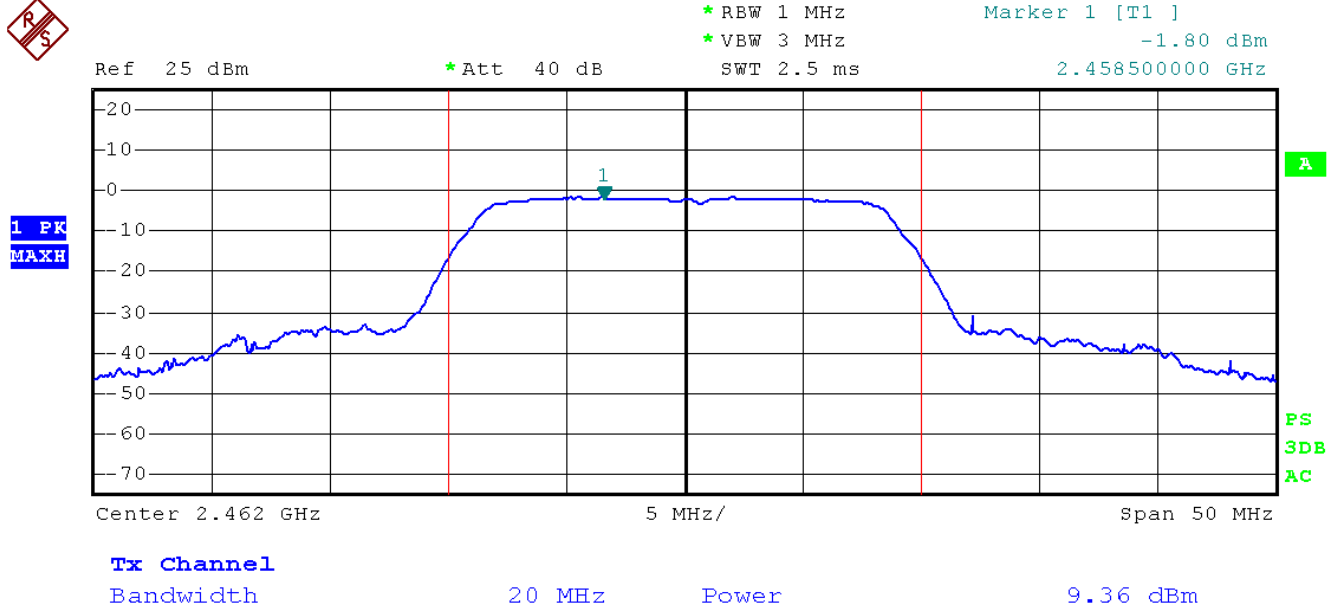


* RBW 1 MHz
* VBW 3 MHz
SWT 2.5 ms
Marker 1 [T1]
0.14 dBm
2.433500000 GHz

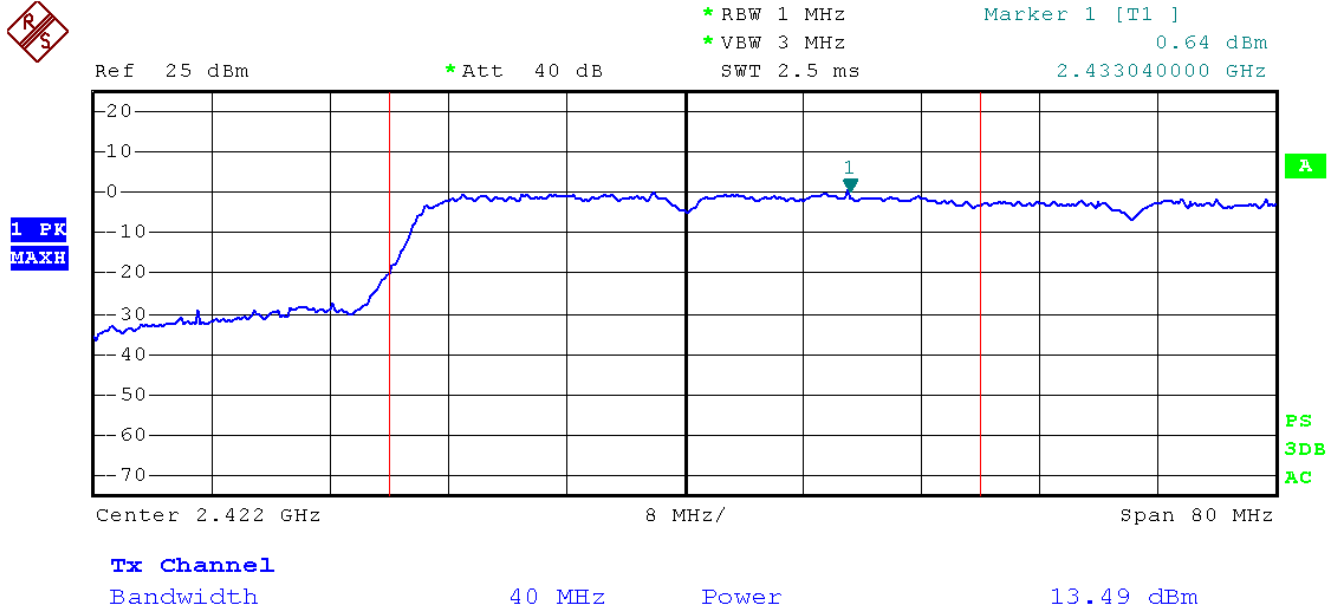


Tx Channel1
Bandwidth 20 MHz Power 11.37 dBm

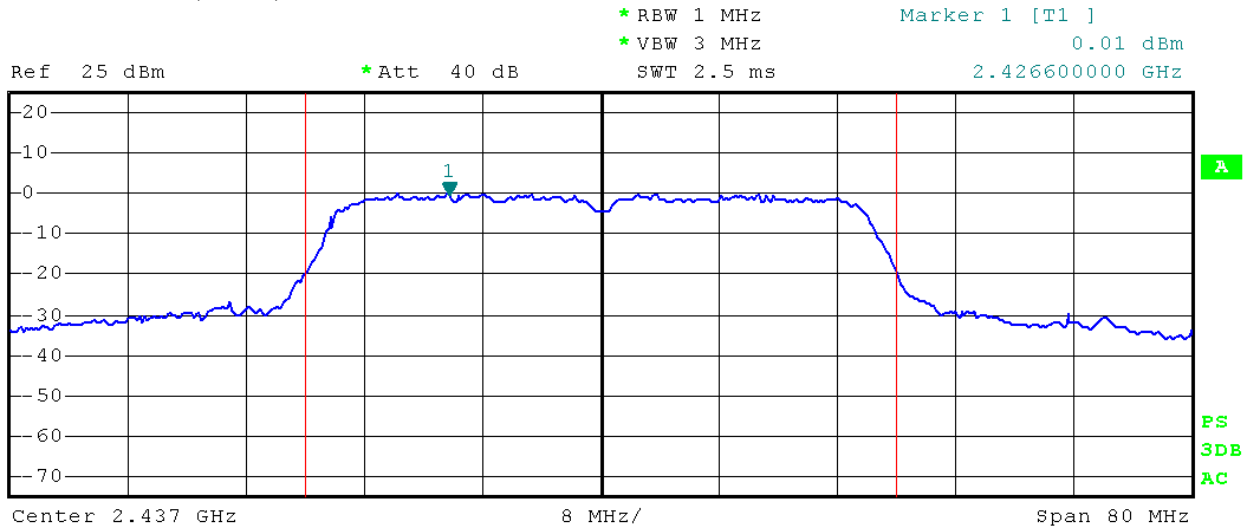
Test Mode: 802.11n (HT20) ---High



Test Mode: 802.11n (HT40) ---Low

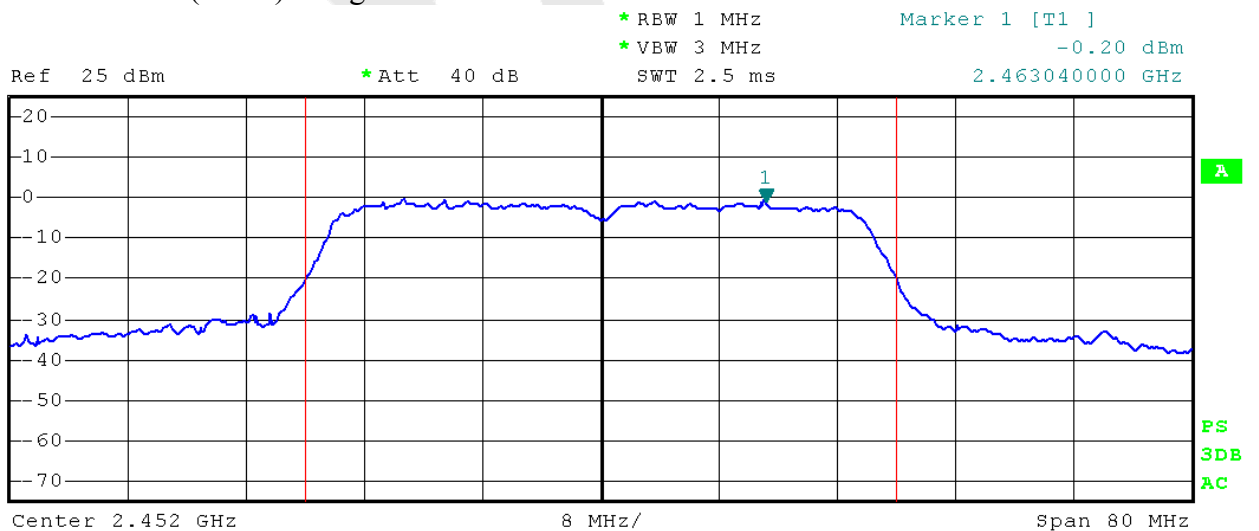


Test Mode: 802.11n (HT40) --- Mid



Tx Channel
 Bandwidth 40 MHz Power 13.35 dBm

Test Mode: 802.11n (HT40)---High



Tx Channel
 Bandwidth 40 MHz Power 12.50 dBm

5.4 Band Edges Measurement

a. Limit

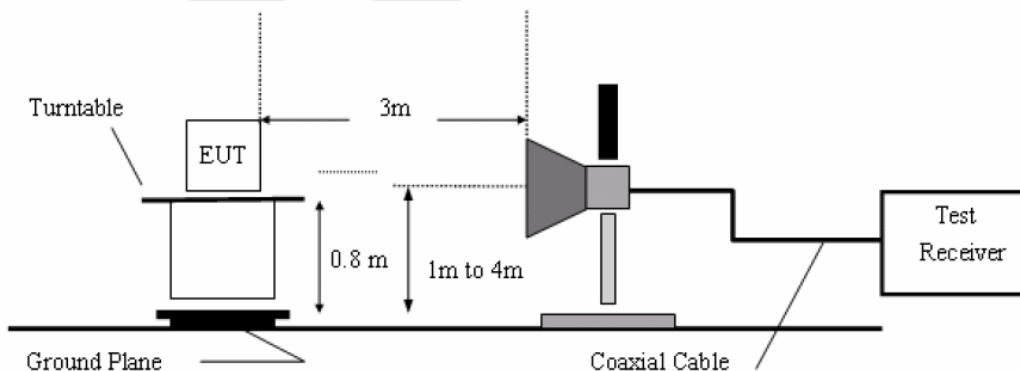
According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

b. Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above the 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 varied from 1m to 4m to find out the highest emission.
4. Peak detector: RBW=100KHz, VBW=100KHz, SWT=AUTO
Average detector: RBW=1MHz, VBW=10Hz, SWT=AUTO
The EUT is tested in 9*6*6 Chamber.
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 23, 2013	1 Year
2	EMI Receiver	Rohde & Schwarz	ESCI	100627	Apr. 23, 2013	1 Year
3.	Preamplifier	Instruments corporation	EMC01183 0	980100	Apr. 23, 2013	1 Year
4	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 23, 2013	1 Year
5	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A



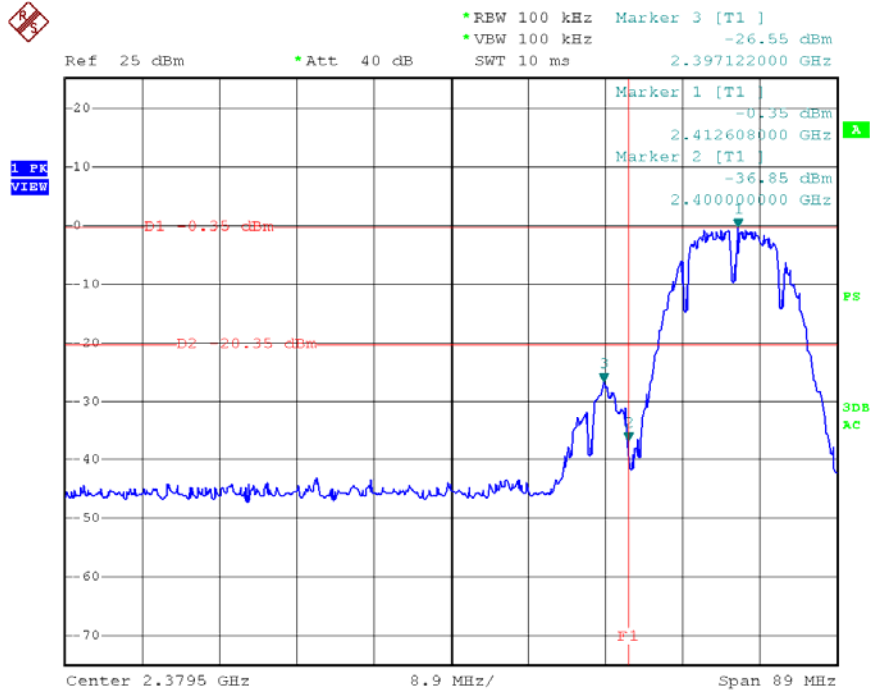
c. Test Results

Pass

d. Test Plots

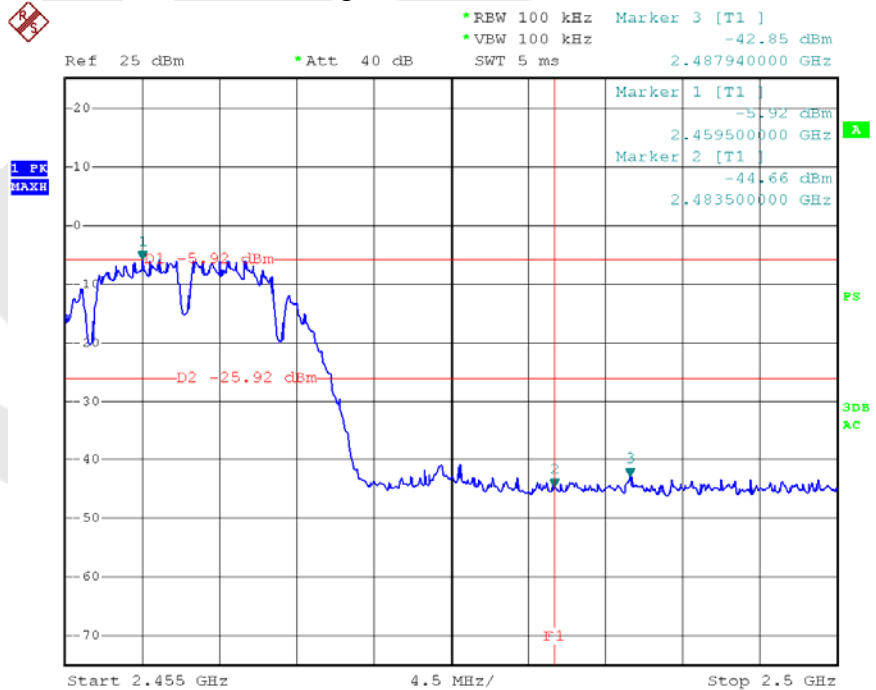
See the following page.

Test Mode: 802.11b ---Low



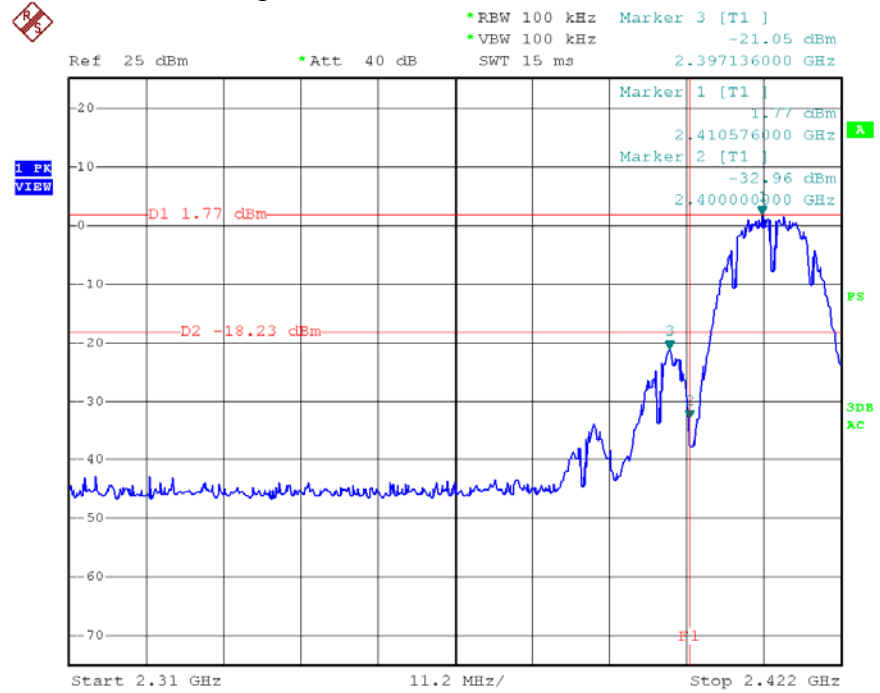
Date: 11.JUL.2013 20:15:11

Test Mode: 802.11b ---High



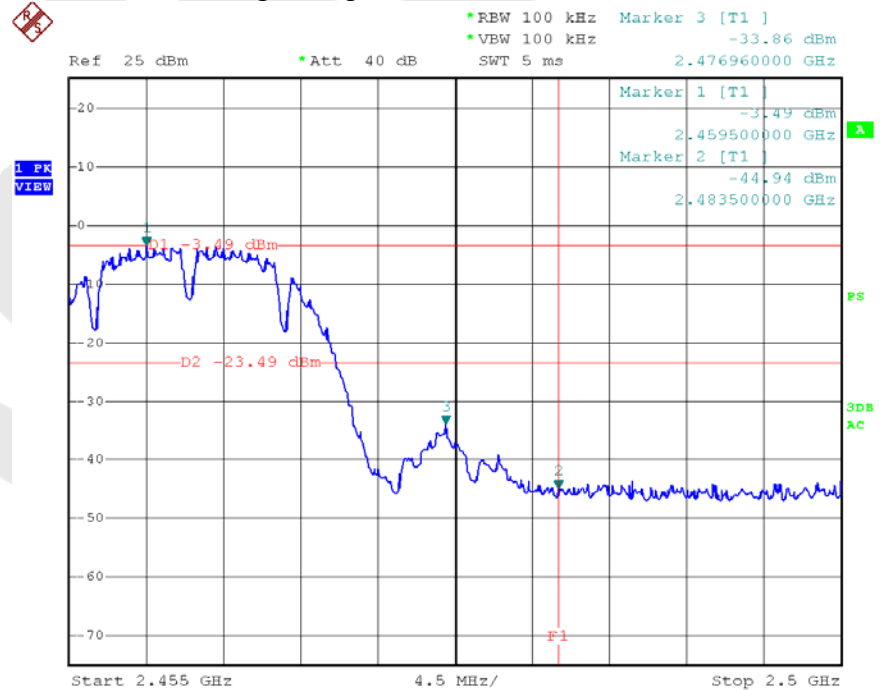
Date: 11.JUL.2013 20:16:35

Test Mode: 802.11g ---Low



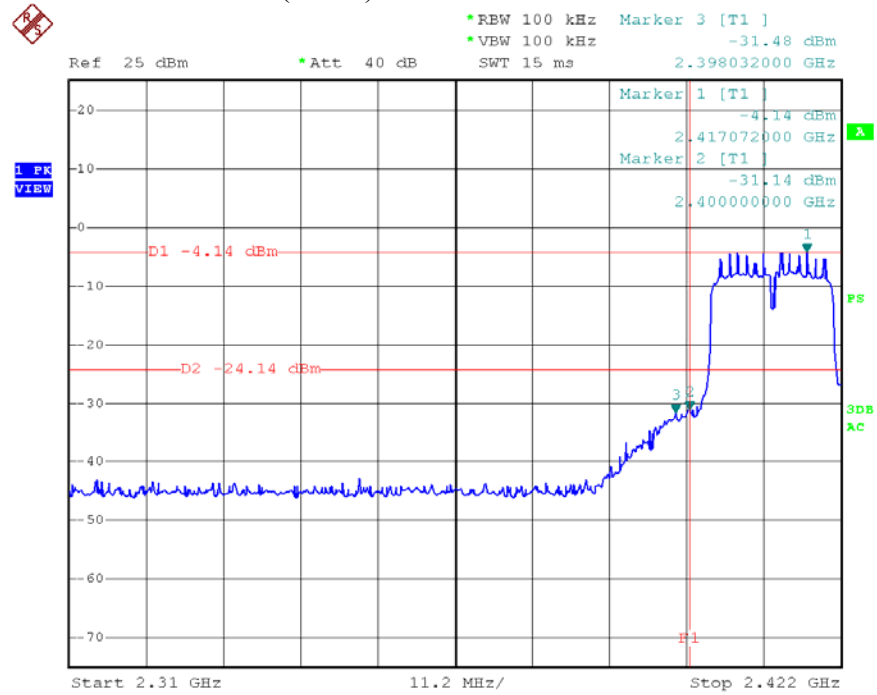
Date: 11.JUL.2013 20:18:38

Test Mode: 802.11g ---High



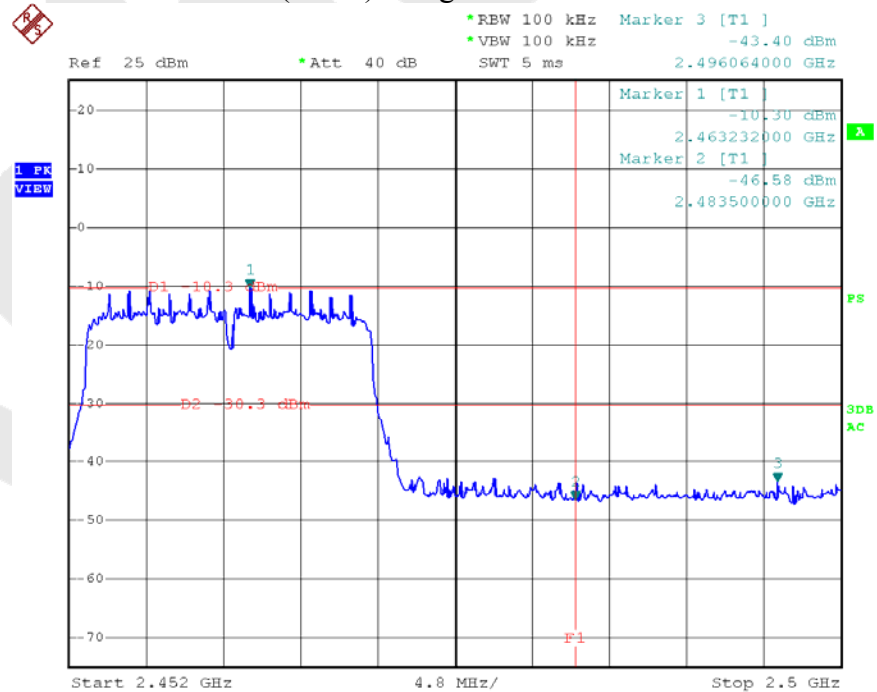
Date: 11.JUL.2013 20:17:33

Test Mode: 802.11n (HT20) ---Low



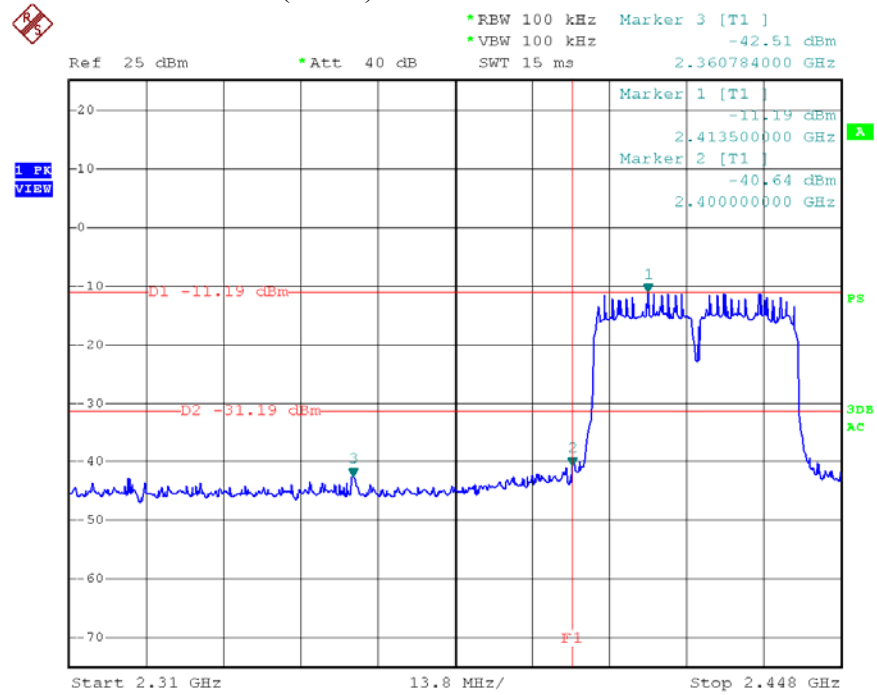
Date: 11.JUL.2013 20:19:46

Test Mode: 802.11n (HT20)---High



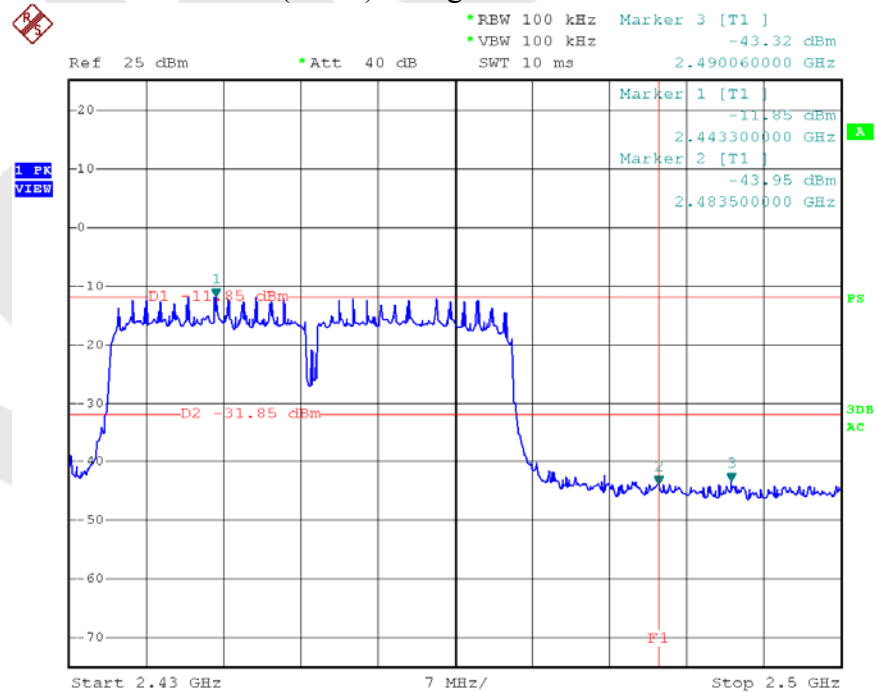
Date: 11.JUL.2013 20:21:05

Test Mode: 802.11n (HT40) ---Low



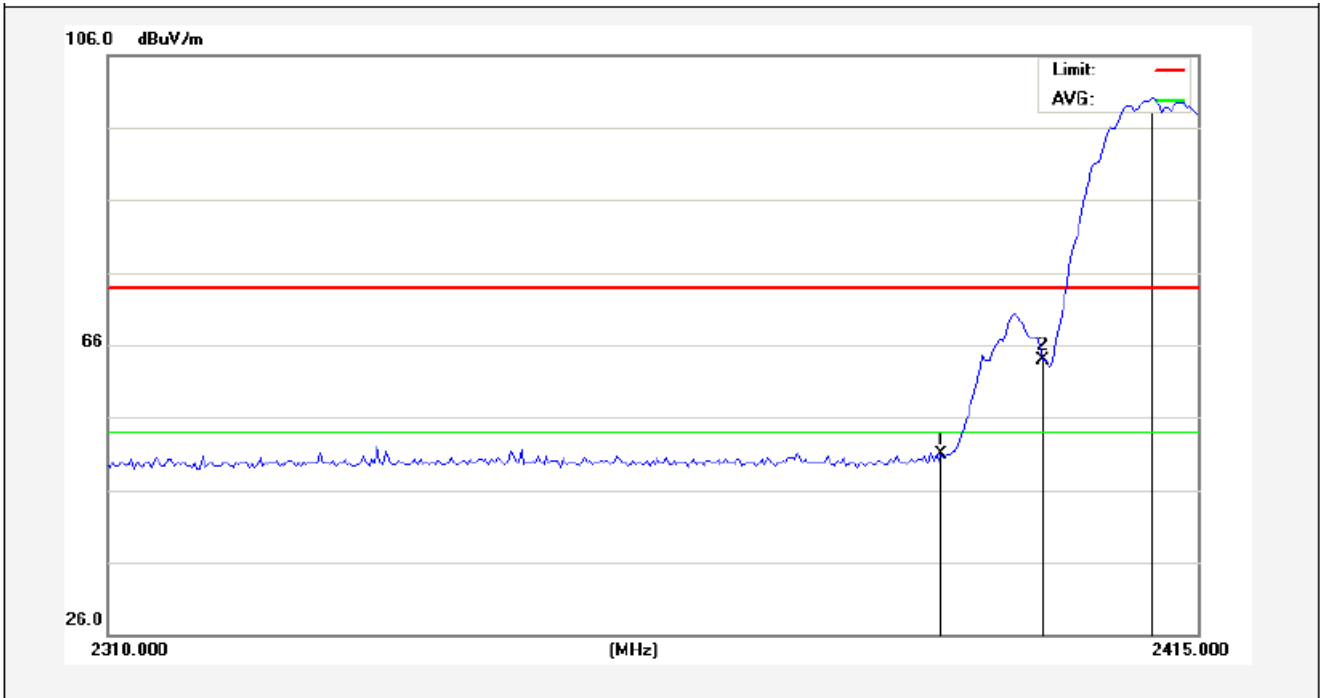
Date: 11.JUL.2013 20:24:42

Test Mode: 802.11n (HT40) ---High



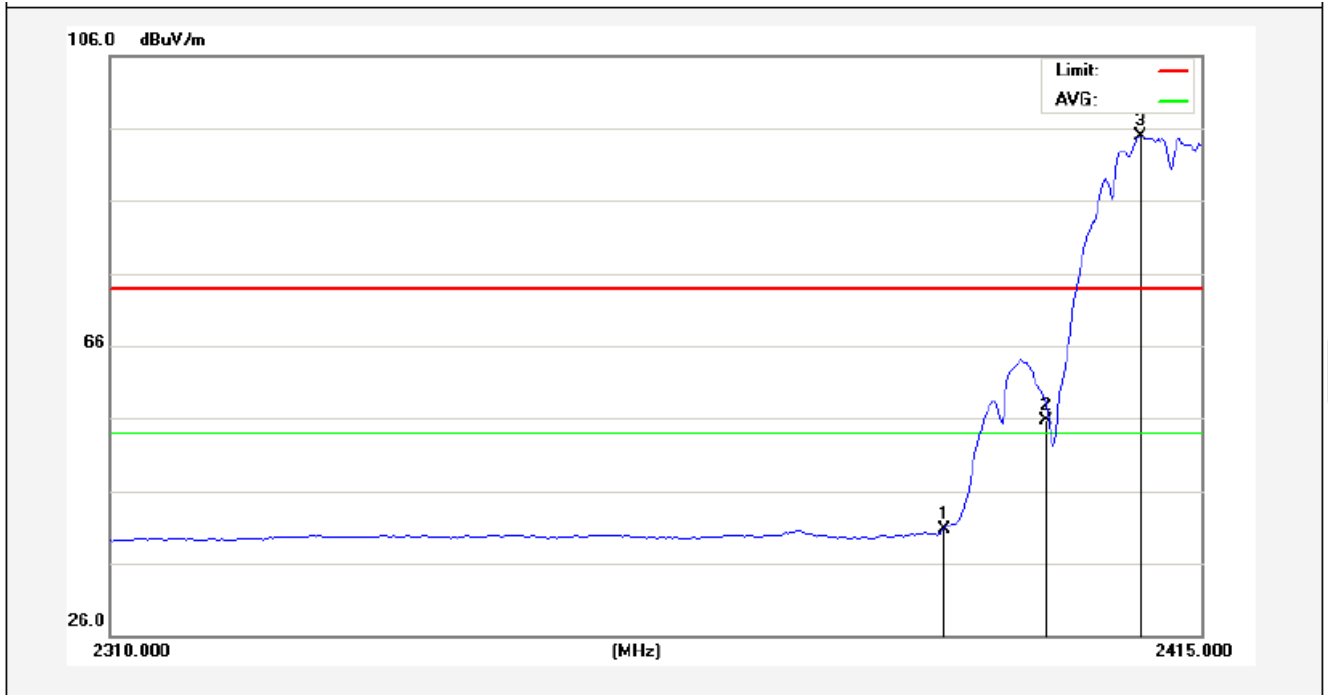
Date: 11.JUL.2013 20:26:24

The worst Mode: 802.11g
Horizontal-PEAK:



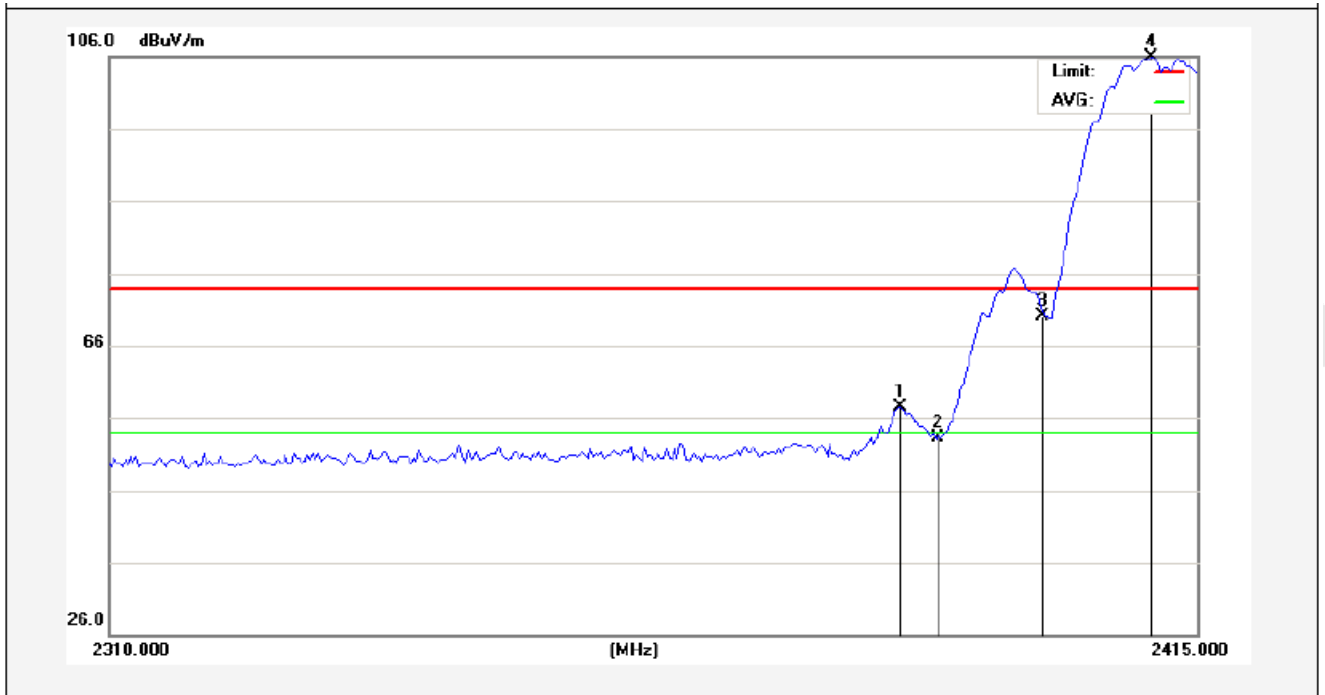
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2390.000	53.41	-2.51	50.90	74.00	-23.10	peak			
2	2400.000	66.38	-2.49	63.89	74.00	-10.11	peak			
3	2410.537	102.53	-2.47	100.06	74.00	26.06	peak			

Horizontal-AV:



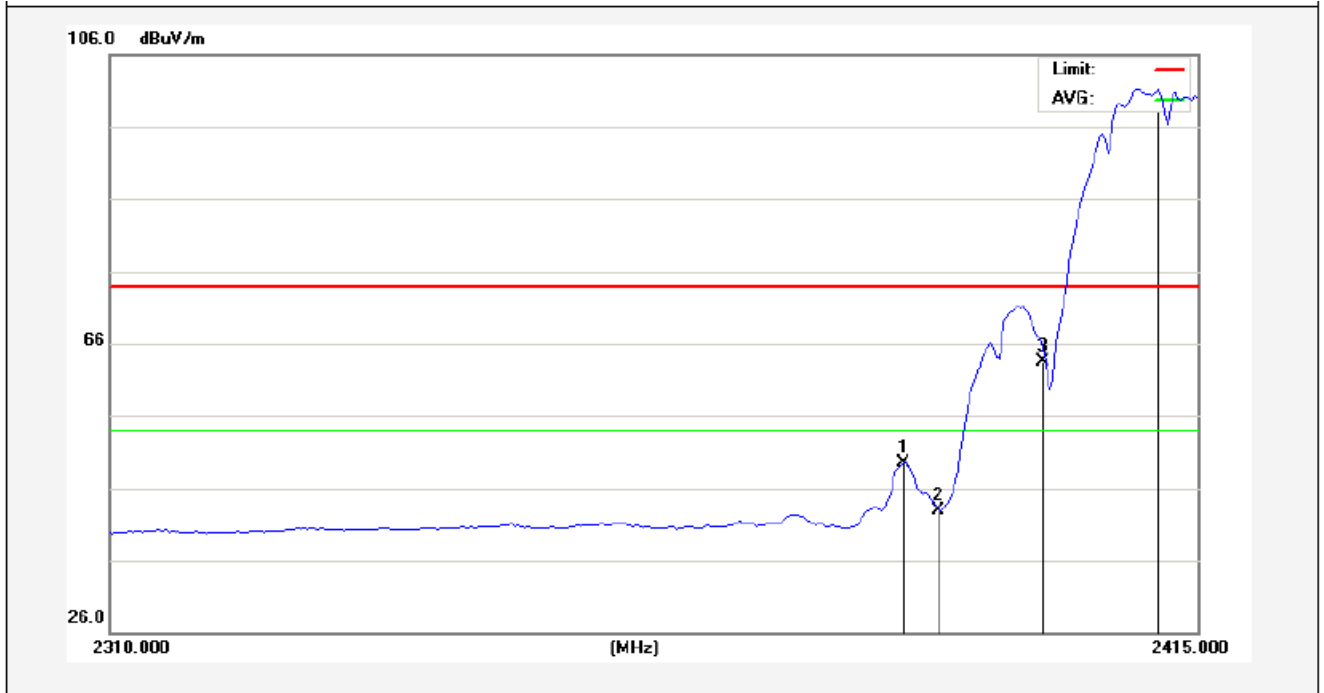
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2390.000	43.31	-2.51	40.80	54.00	-13.20	AVG			
2	2400.000	58.27	-2.49	55.78	54.00	1.78	AVG			
3	2409.225	97.39	-2.47	94.92	54.00	40.92	AVG			

Vertical-PEAK:



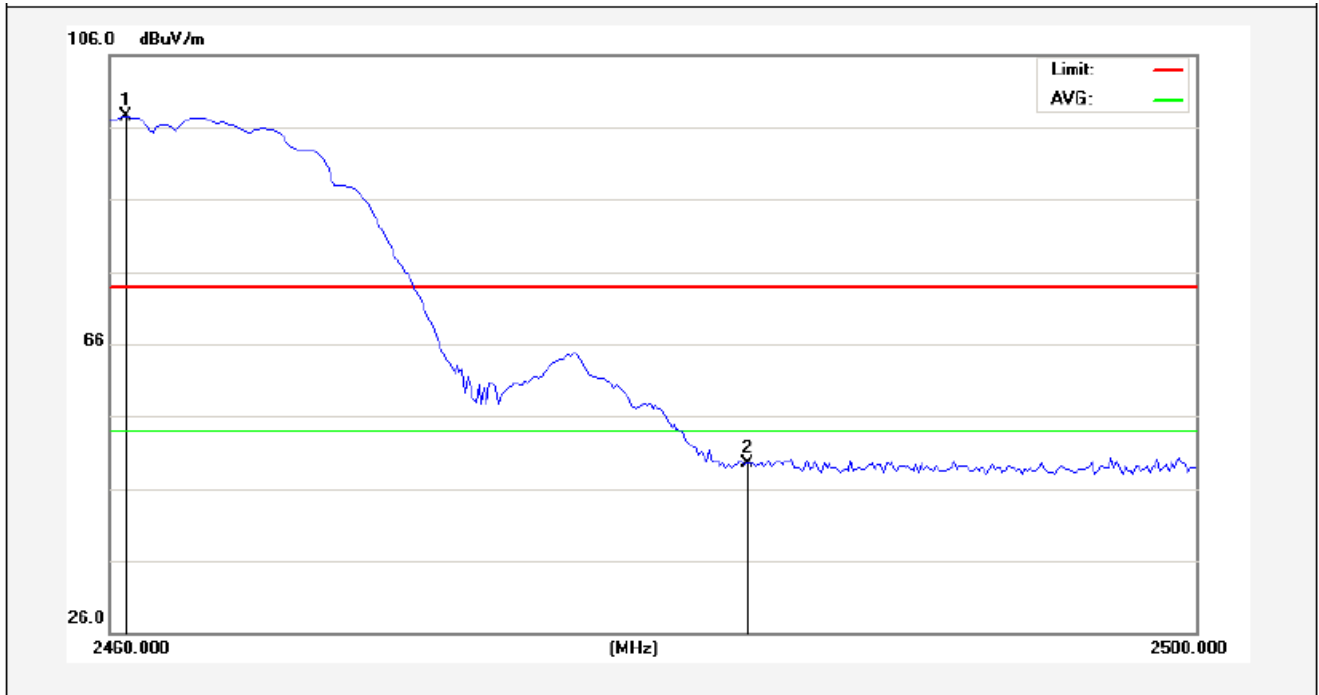
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2386.125	60.08	-2.52	57.56	74.00	-16.44	peak			
2	2390.000	55.91	-2.51	53.40	74.00	-20.60	peak			
3	2400.000	72.68	-2.49	70.19	74.00	-3.81	peak			
4	2410.537	108.30	-2.47	105.83	74.00	31.83	peak			

Vertical -AV:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2386.387	51.99	-2.52	49.47	54.00	-4.53	AVG			
2	2390.000	45.46	-2.51	42.95	54.00	-11.05	AVG			
3	2400.000	66.01	-2.49	63.52	54.00	9.52	AVG			
4	2411.325	103.58	-2.47	101.11	54.00	47.11	AVG			

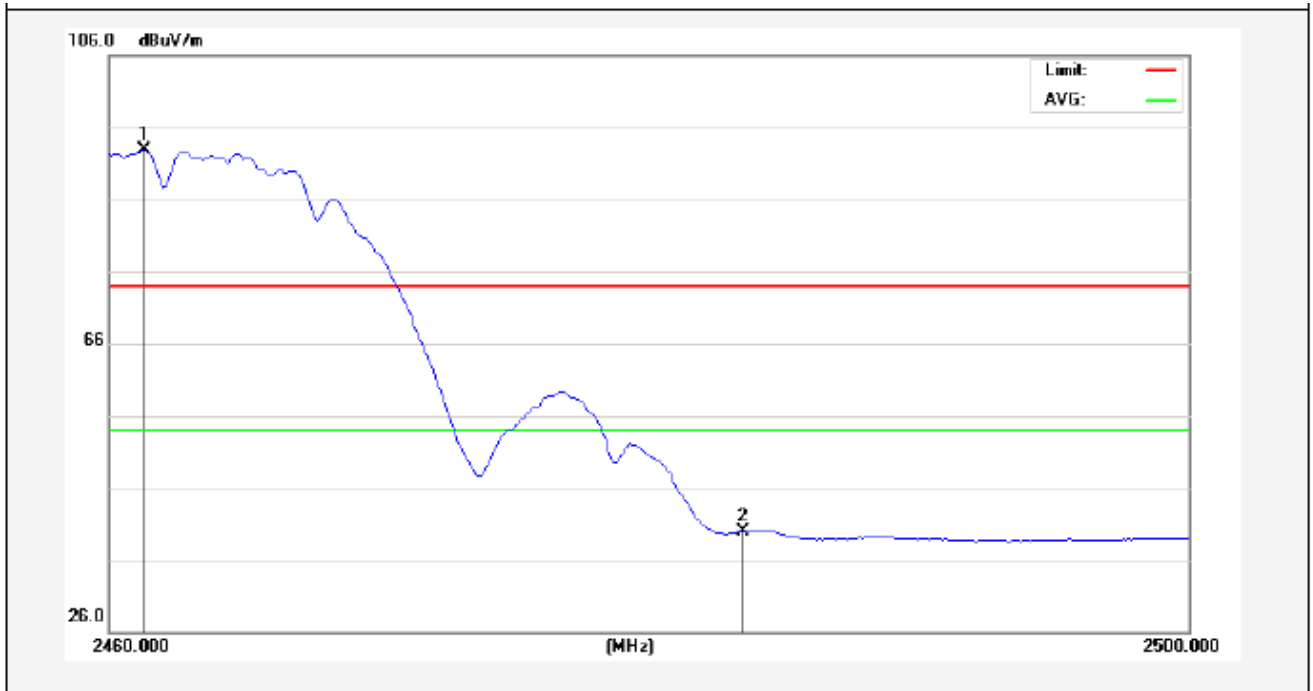
Horizontal -PEAK:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2460.600	99.88	-2.36	97.52	74.00	23.52	peak			
2	2483.500	51.74	-2.31	49.43	74.00	-24.57	peak			

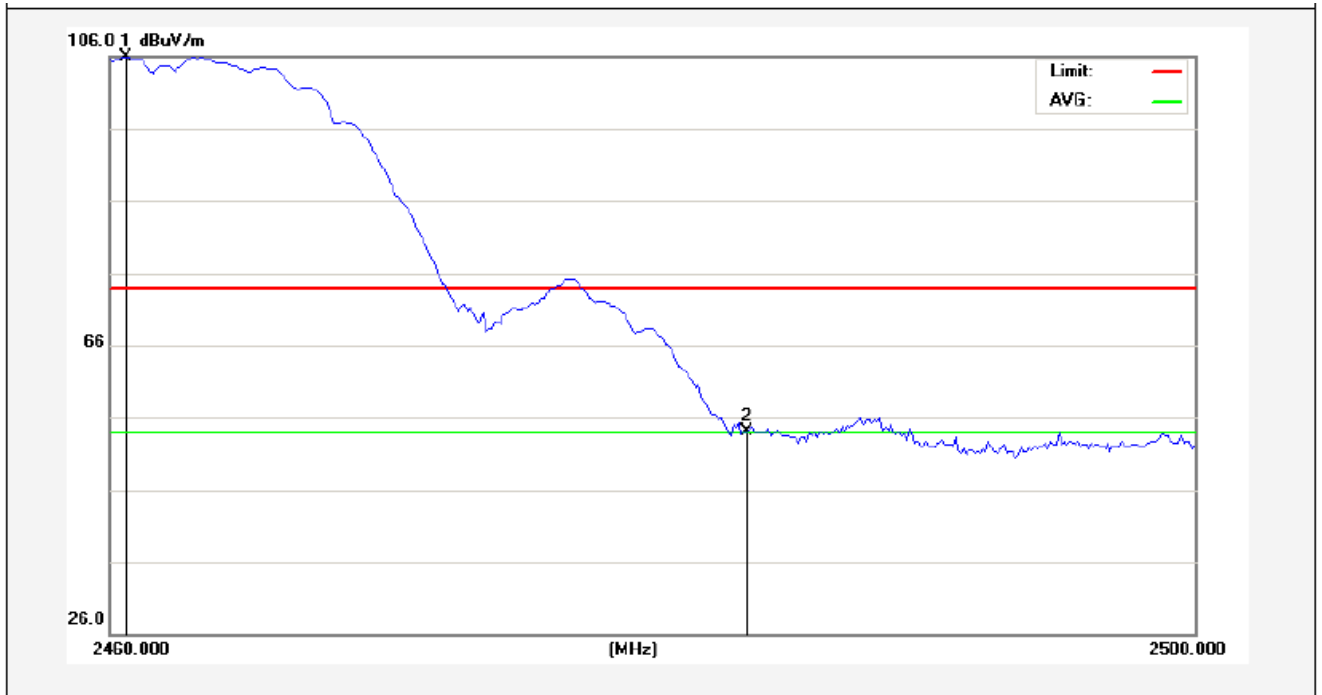
AMB

Horizontal -AV:



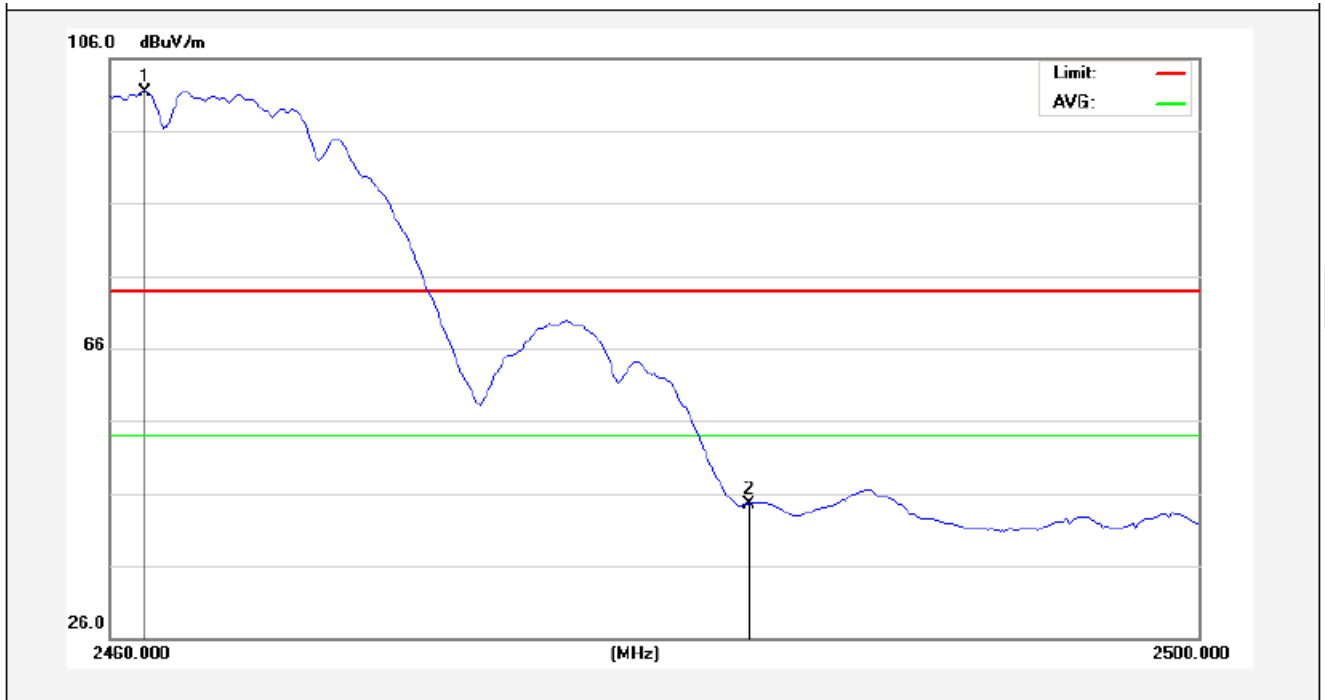
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2461.300	95.25	-2.36	92.89	54.00	38.89	AVG			
2	2483.500	42.16	-2.31	39.85	54.00	-14.15	AVG			

Vertical -PEAK:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2460.600	108.26	-2.36	105.90	74.00	31.90	peak			
2	2483.500	56.44	-2.31	54.13	74.00	-19.87	peak			

Vertical -AV:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2461.300	103.74	-2.36	101.38	54.00	47.38	AVG			
2	2483.500	46.85	-2.31	44.54	54.00	-9.46	AVG			

Anbotek

5.5 Peak Power Spectral Density

a. Limit

1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

b. Test Procedure

1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 1.5MHz, Sweep=500s
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 23, 2013	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 23, 2013	1 Year
3.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 23, 2013	1 Year
4.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

c. Test Setup

See 5.1

d. Test Results

Pass

e. Test Data

Please refer to the following data.

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	Σ PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2412	-4.23	-	8.00	Pass
Mid	2437	-7.38	-		Pass
High	2462	-9.53	-		Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	PPSD (dBm)	Σ PPSD (dBm)	Limit (dBm)	Result
Low	2412	-19.57	-	8.00	Pass
Mid	2437	-24.56	-		Pass
High	2462	-25.47	-		Pass

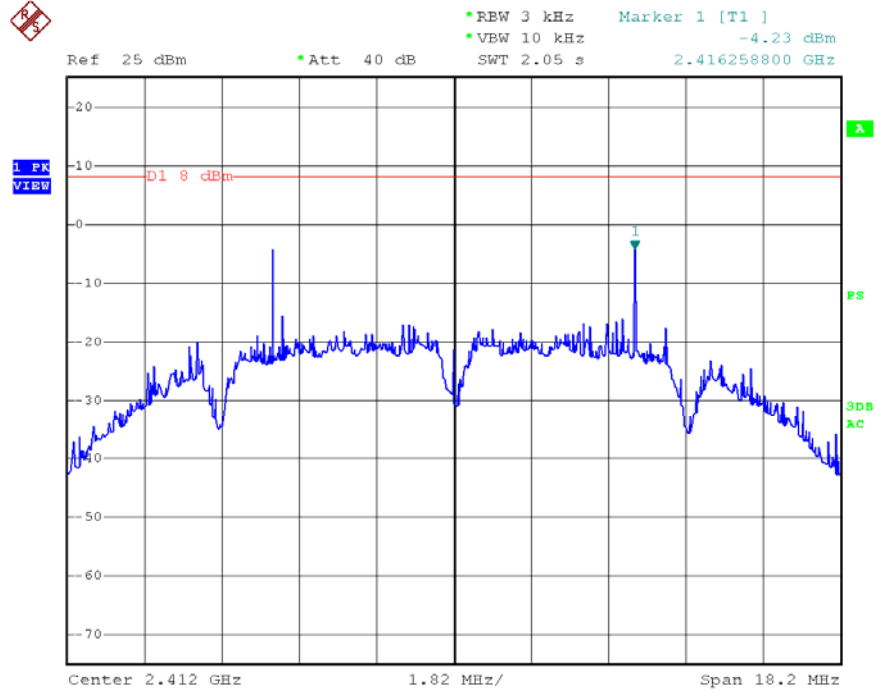
Test mode: IEEE 802.11n (HT20)

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	Σ PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2412	-17.85	-	8.00	Pass
Mid	2437	-17.85	-		Pass
High	2462	-24.87	-		Pass

Test mode: IEEE 802.11n (HT40)

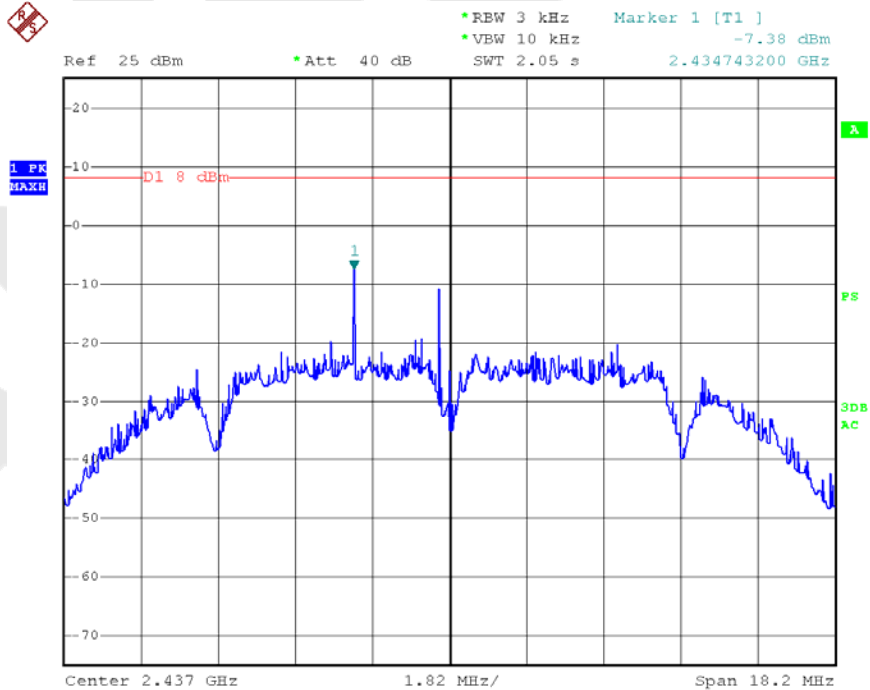
Channel	Frequency (MHz)	PPSD (dBm/3KHz)	Σ PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2422	-23.93	-	8.00	Pass
Mid	2437	-26.04	-		Pass
High	2452	-25.24	-		Pass

f. Test Plot See the following pages
802.11 b CH--Low



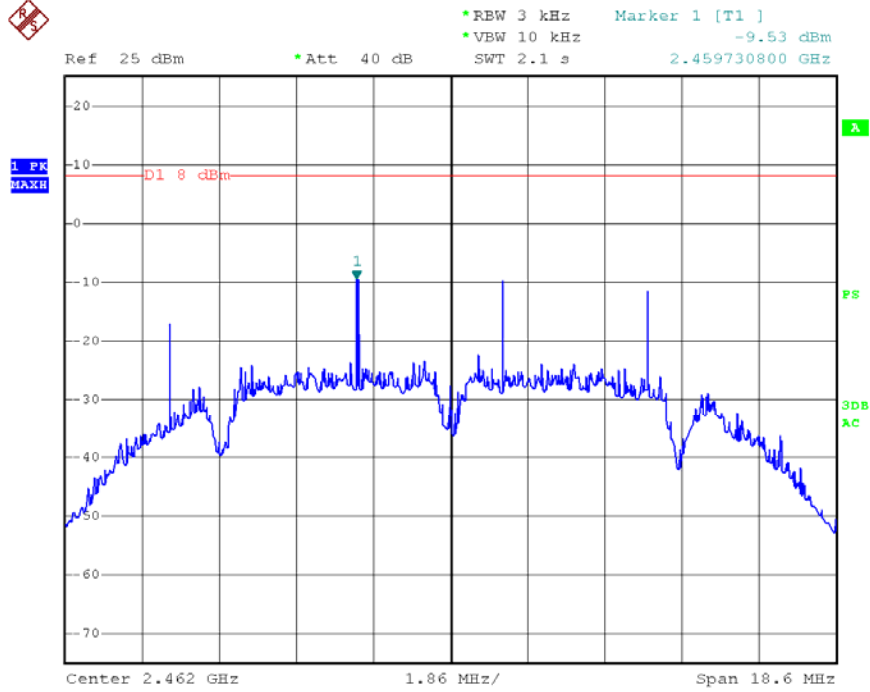
Date: 11.JUL.2013 20:46:08

802.11 b CH--Mid



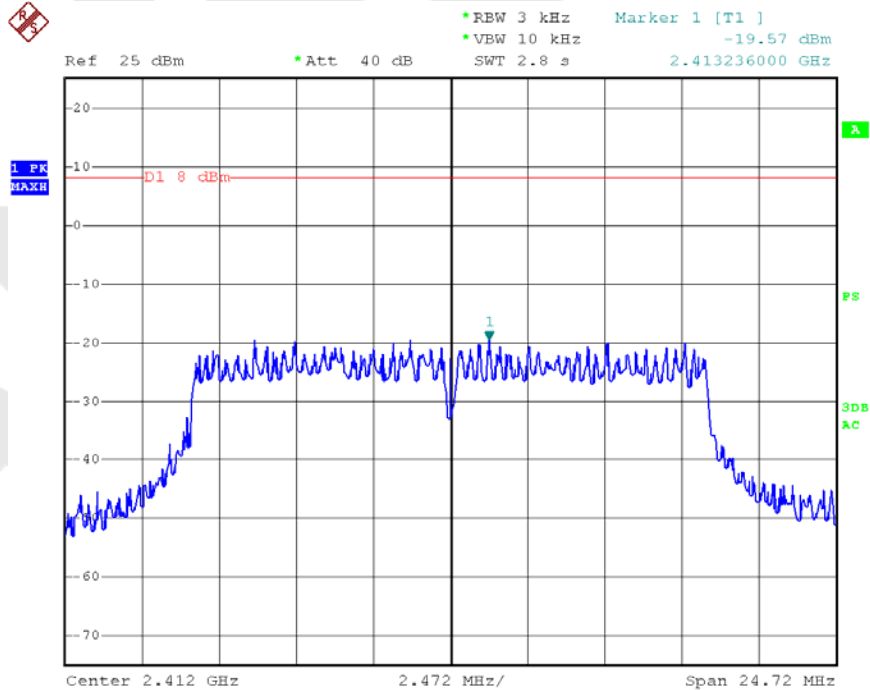
Date: 11.JUL.2013 20:46:43

802.11 b CH--High



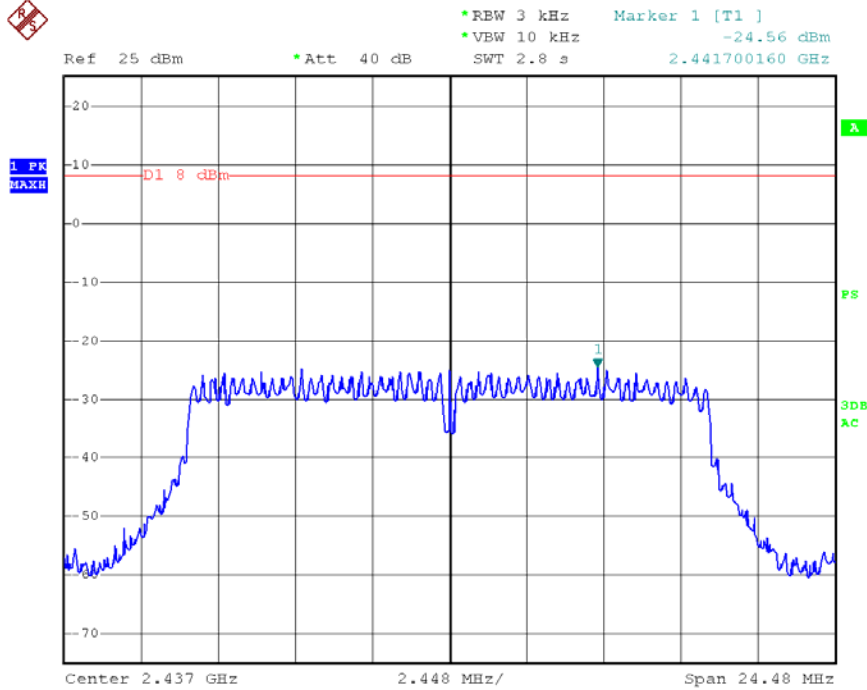
Date: 11.JUL.2013 20:47:23

802.11g CH--Low



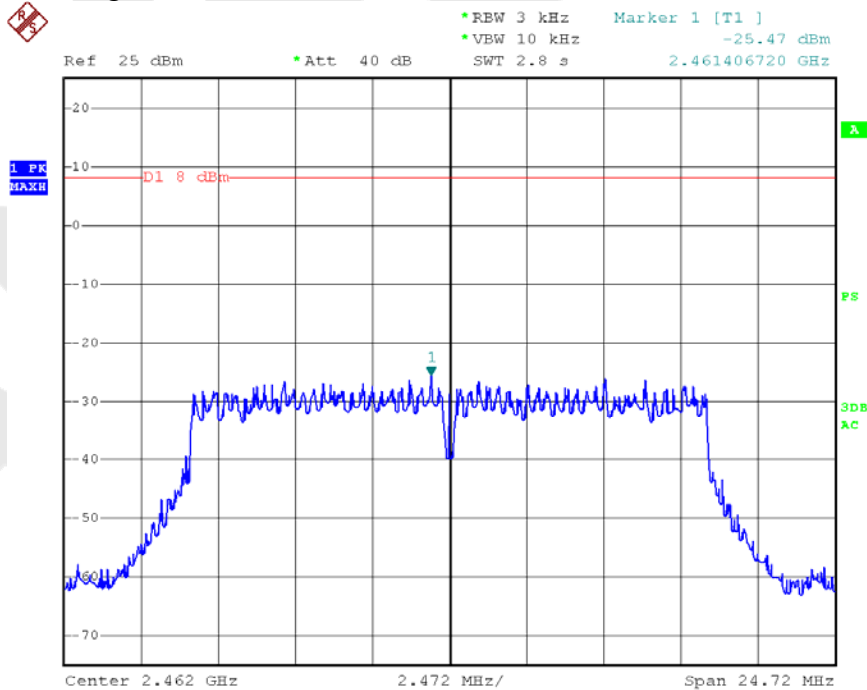
Date: 11.JUL.2013 20:48:07

802.11g CH--Mid



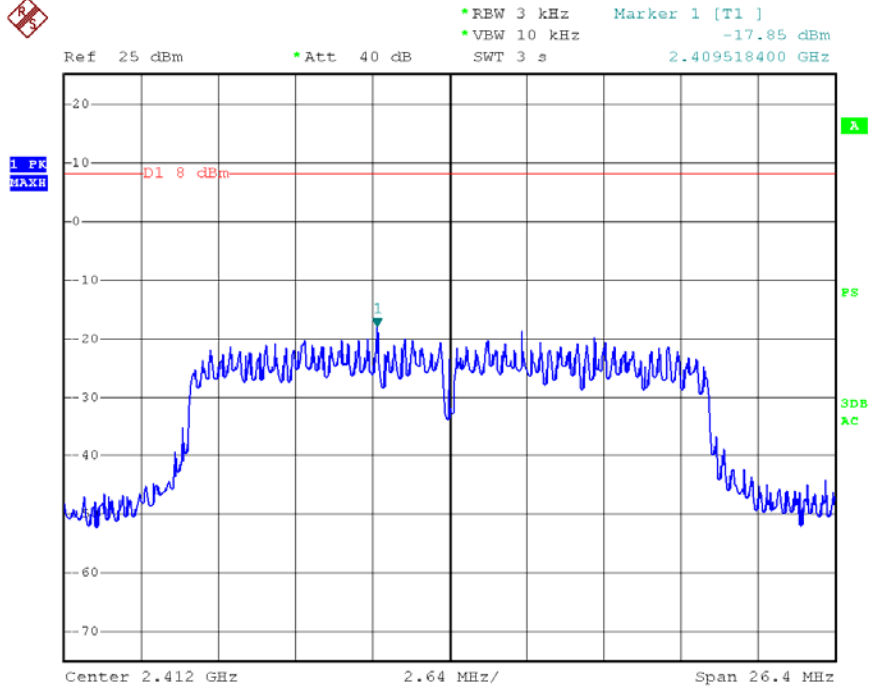
Date: 11.JUL.2013 21:01:33

802.11g CH--High



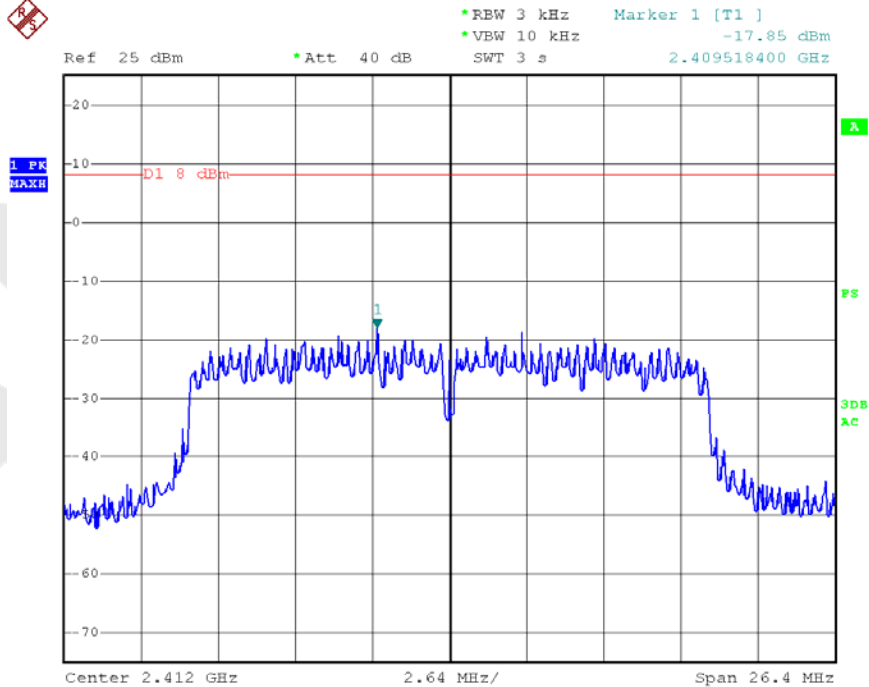
Date: 11.JUL.2013 20:48:47

802.11n (HT20) CH—Low



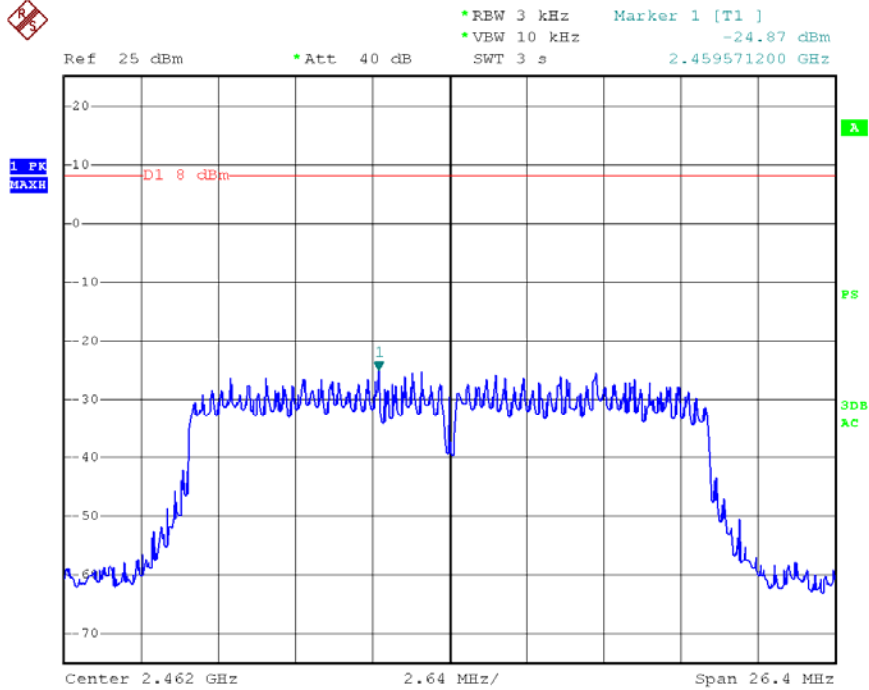
Date: 11.JUL.2013 20:49:24

802.11n (HT20) CH—Mid



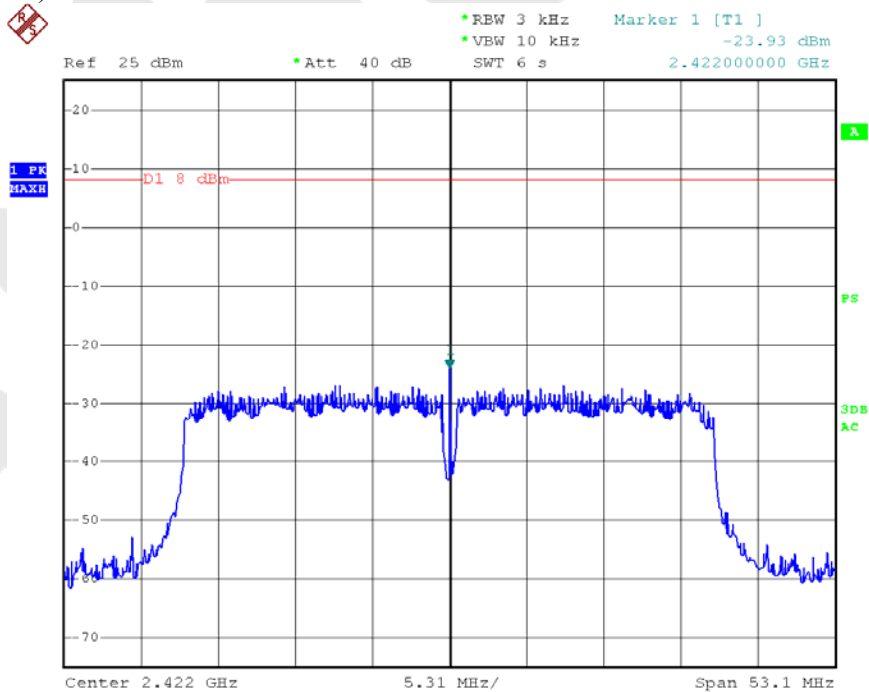
Date: 11.JUL.2013 20:49:44

802.11n (HT20) CH—High



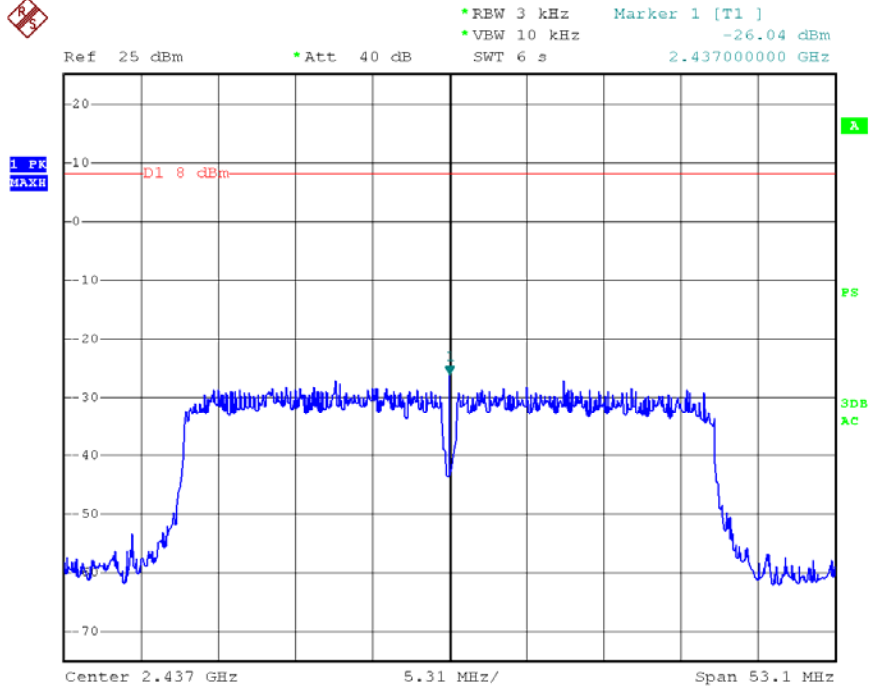
Date: 11.JUL.2013 20:50:13

802.11n (HT40) CH—Low



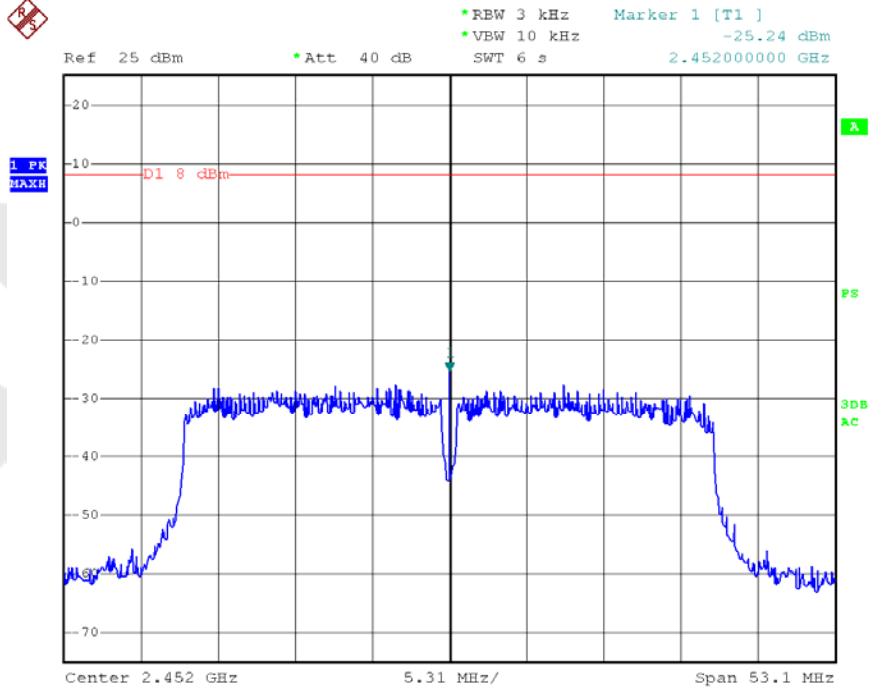
Date: 11.JUL.2013 20:51:18

802.11n (HT40) CH—Mid



Date: 11.JUL.2013 20:51:37

802.11n (HT40) CH—High



Date: 11.JUL.2013 20:52:01

5.6 Radiated Emissions

5.6.1.1. Test Limits (< 30 MHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

5.6.1.2. Test Limits (\geq 30 MHz)

FIELD STRENGTH of Fundamental: @3M	FIELD STRENGTH of Harmonics	S15.209 30 - 88 MHz	40 dBuV/m
902-928 MHz		88 - 216 MHz	43.5
2.4-2.4835 GHz		216 - 960 MHz	46
94 dBuV/m @3m	54 dBuV/m @3m	ABOVE 960 MHz	54dBuV/m

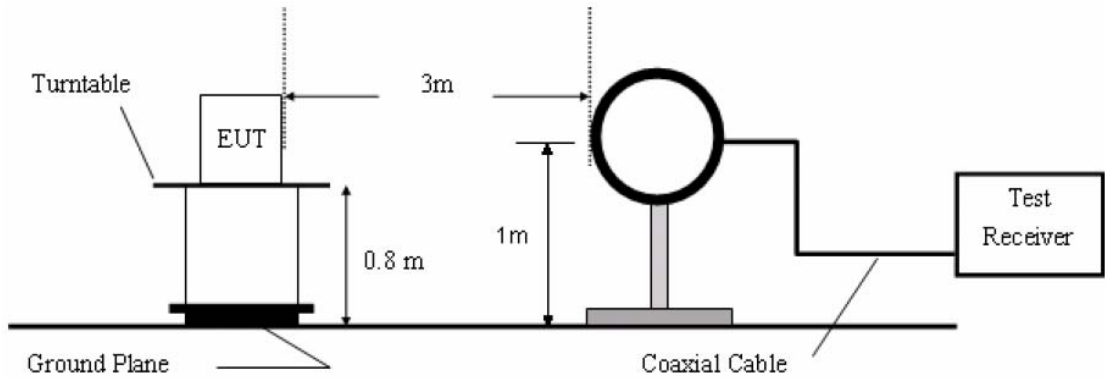
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. 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) (see Section 15.205(c)).

Test Equipment

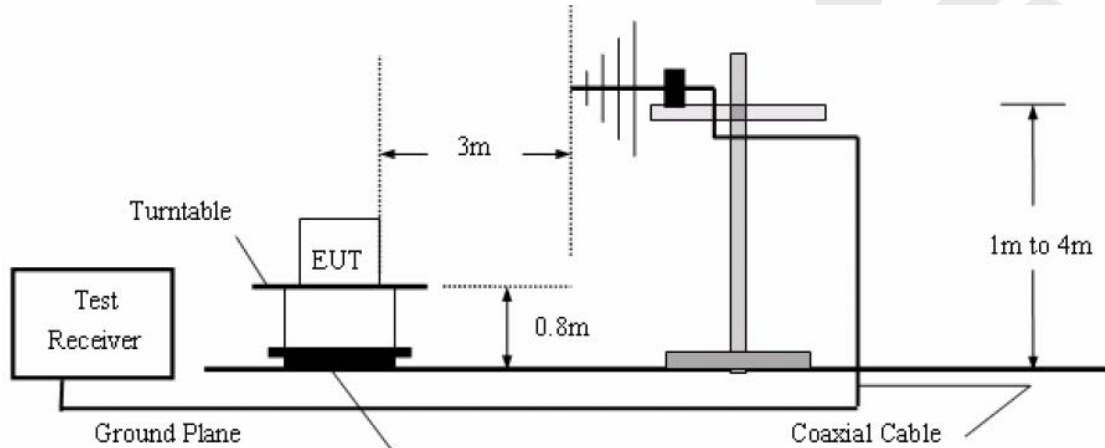
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 23, 2013	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 23, 2013	1 Year
3.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 23, 2013	1 Year
4.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

5.6.2. Test Configuration:

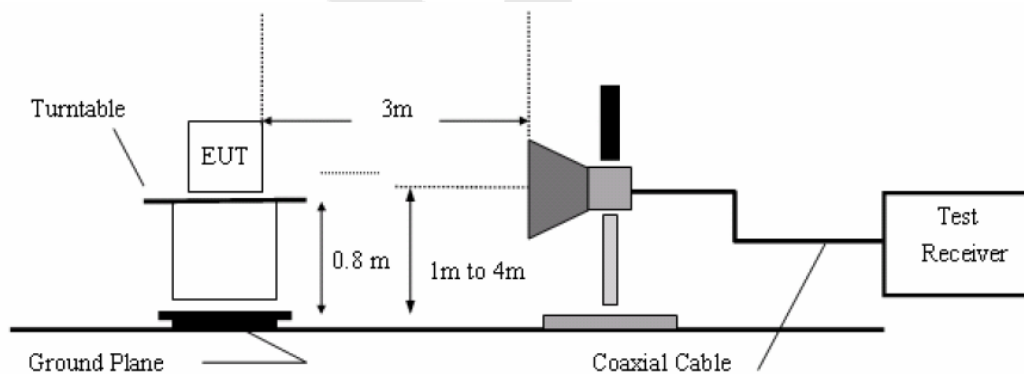
5.6.2.1. 9k to 30MHz emissions:



5.6.2.2. 30M to 1G emissions:



5.6.2.3. 1G to 40G emissions:



5.6.3. Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

Measurements are made on 9KHz to 30MHz and 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

All readings from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All reading are above 1GHz, peak & average values with a resolution bandwidth of 1MHz.

The EUT is tested in 9*6*6 Chamber.

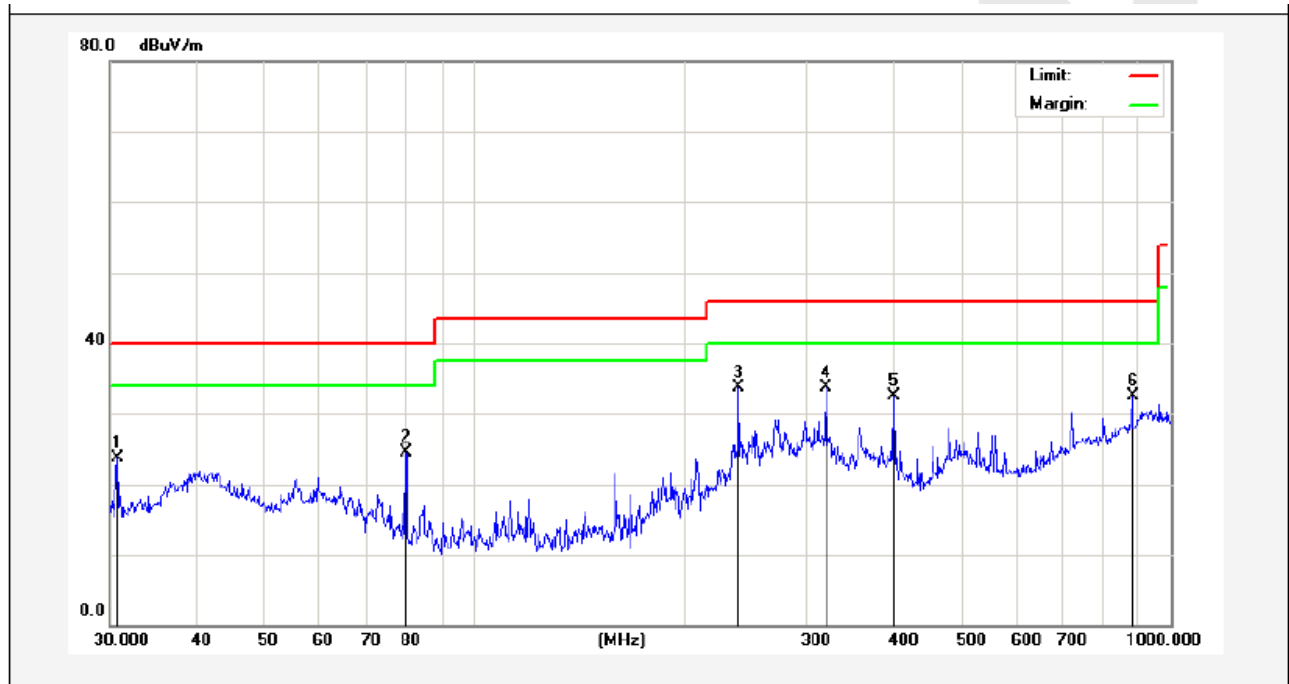
The test results are listed in Section 5.6.4.

g. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 23, 2013	1 Year
2.	Preamplifier	Instruments corporation	EMC01183 0	980100	Apr. 23, 2013	1 Year
3.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 23, 2013	1 Year
4.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

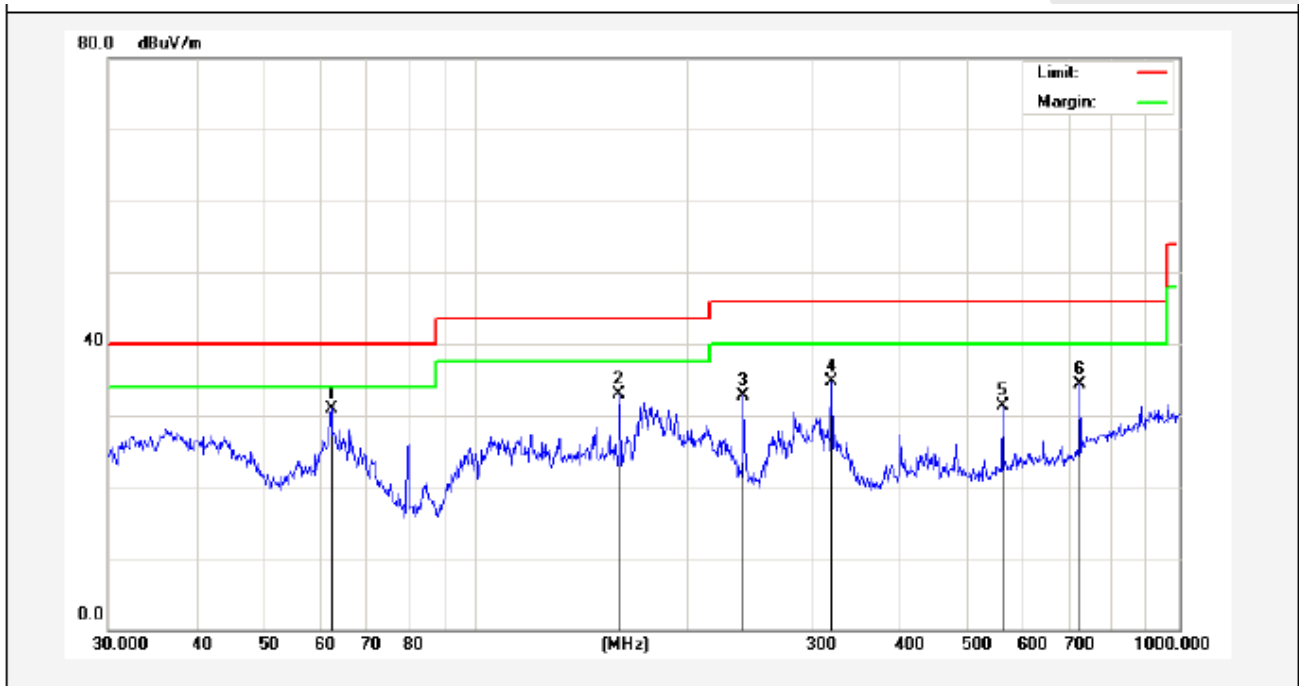
5.6.4. Test Results

Job No.:	AT1306818F	Polarziation:	Horizontal
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 5V
Test item:	Radiation Test	Date:	2013/06/26
Temp.(C)/Hum.(%RH):	24.3(C)/55%RH	Time:	9:20:24
EUT:	Wiimu WiFi Audio Module	Test By:	Rock Zeng
Model:	A02	Distance:	3m
Mode:	On		
Note:	30-1000MHz		



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	30.7454	40.26	-16.55	23.71	40.00	-16.29	peak			
2	79.8002	46.40	-21.92	24.48	40.00	-15.52	peak			
3	239.9874	51.72	-18.09	33.63	46.00	-12.37	peak			
4	319.9370	49.06	-15.27	33.79	46.00	-12.21	peak			
5	400.4318	45.29	-12.86	32.43	46.00	-13.57	peak			
6	881.4067	37.51	-5.06	32.45	46.00	-13.55	peak			

Job No.:	AT1306818F	Polarziation:	Vertical
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 5V
Test item:	Radiation Test	Date:	2013/06/26
Temp.(C)/Hum.(%RH):	24.3(C)/55%RH	Time:	9:22:39
EUT:	Wiimu WiFi Audio Module	Test By:	Rock Zeng
Model:	A02	Distance:	3m
Mode:	On		
Note:	30-1000MHz		



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	62.2128	47.20	-16.32	30.88	40.00	-9.12	peak			
2	159.7844	50.87	-17.88	32.99	43.50	-10.51	peak			
3	239.9874	46.84	-14.09	32.75	46.00	-13.25	peak			
4	319.9370	49.00	-14.26	34.74	46.00	-11.26	peak			
5	560.6928	41.23	-9.92	31.31	46.00	-14.69	peak			
6	721.7259	42.04	-7.82	34.22	46.00	-11.78	peak			

Above 1 GHz (The worst Mode)

Operation Mode: TX / IEEE 802.11g / CH Low

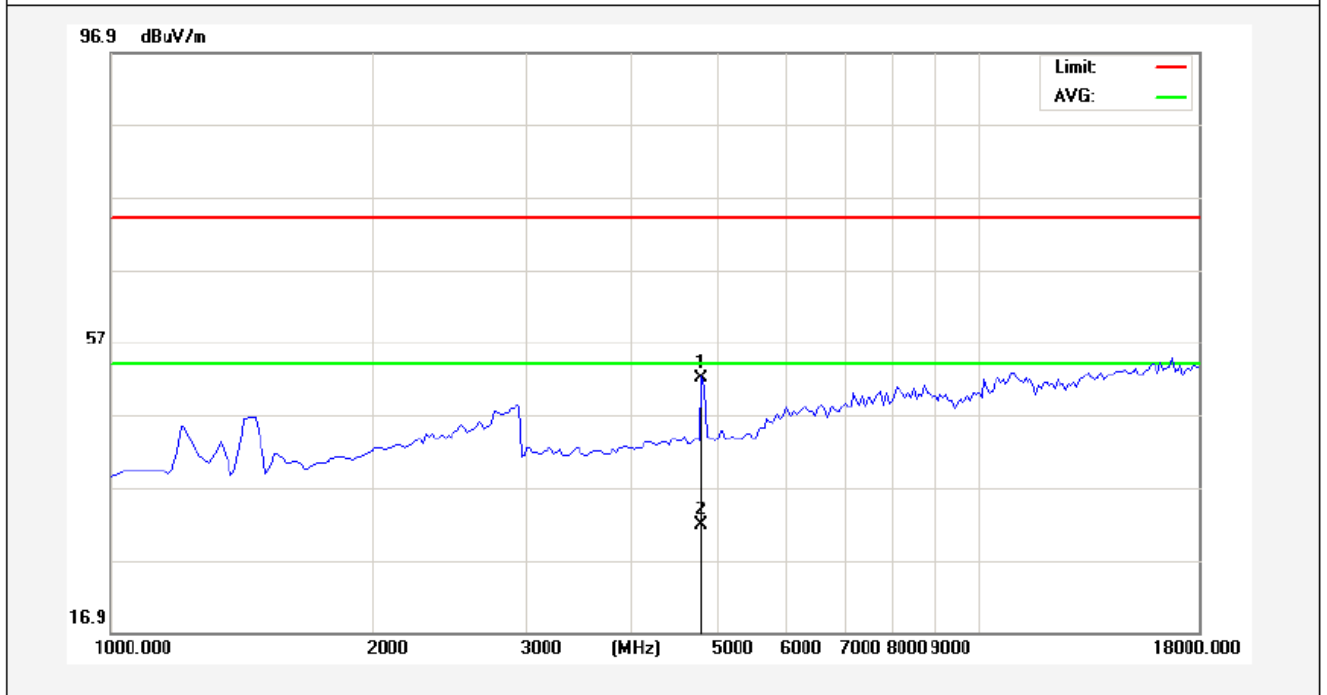
Temperature: 25°C

Humidity: 50 % RH

Test Date: Jul.10, 2013

Tested by: Rock Zeng

Polarity: Horizontal

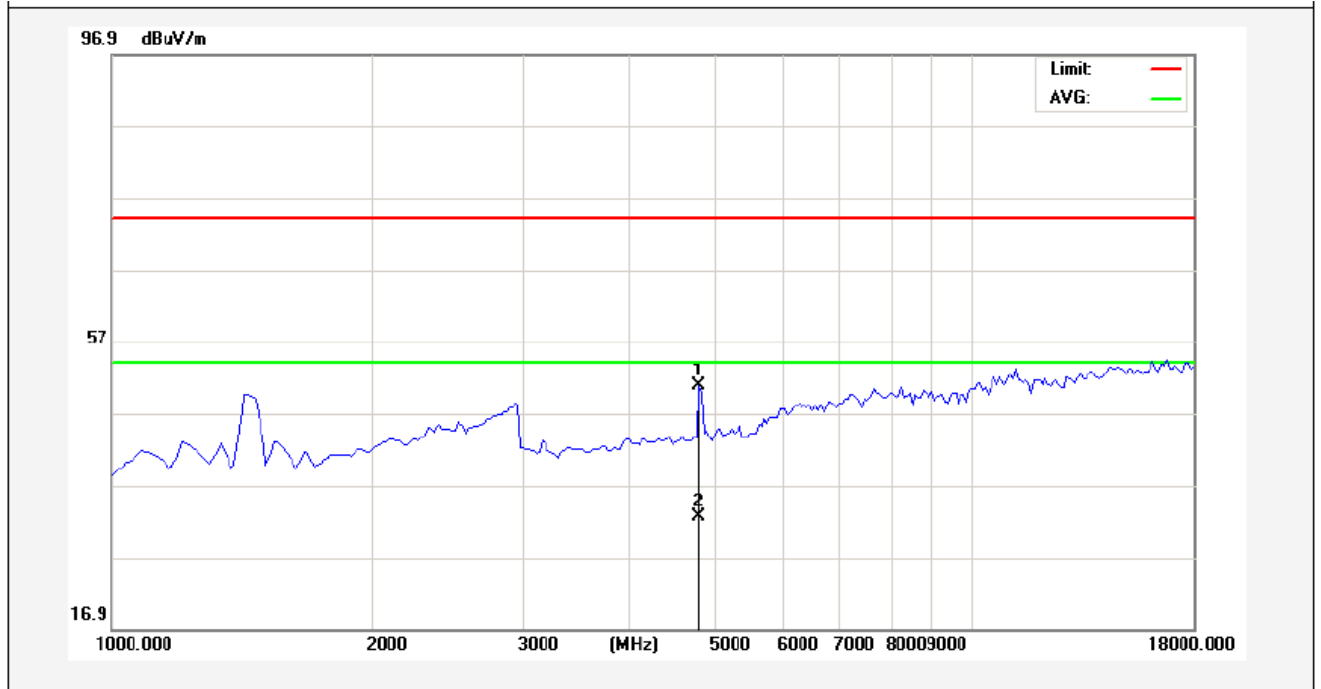


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4825.000	48.76	3.34	52.10	74.00	-21.90	peak			
2	4825.000	28.38	3.34	31.72	54.00	-22.28	AVG			

SAMPLE

Operation Mode: TX / IEEE 802.11g / CH Low
Temperature: 25°C
Humidity: 50 % RH

Test Date: Jul.10, 2013
Tested by: Rock Zeng
Polarity: Vertical

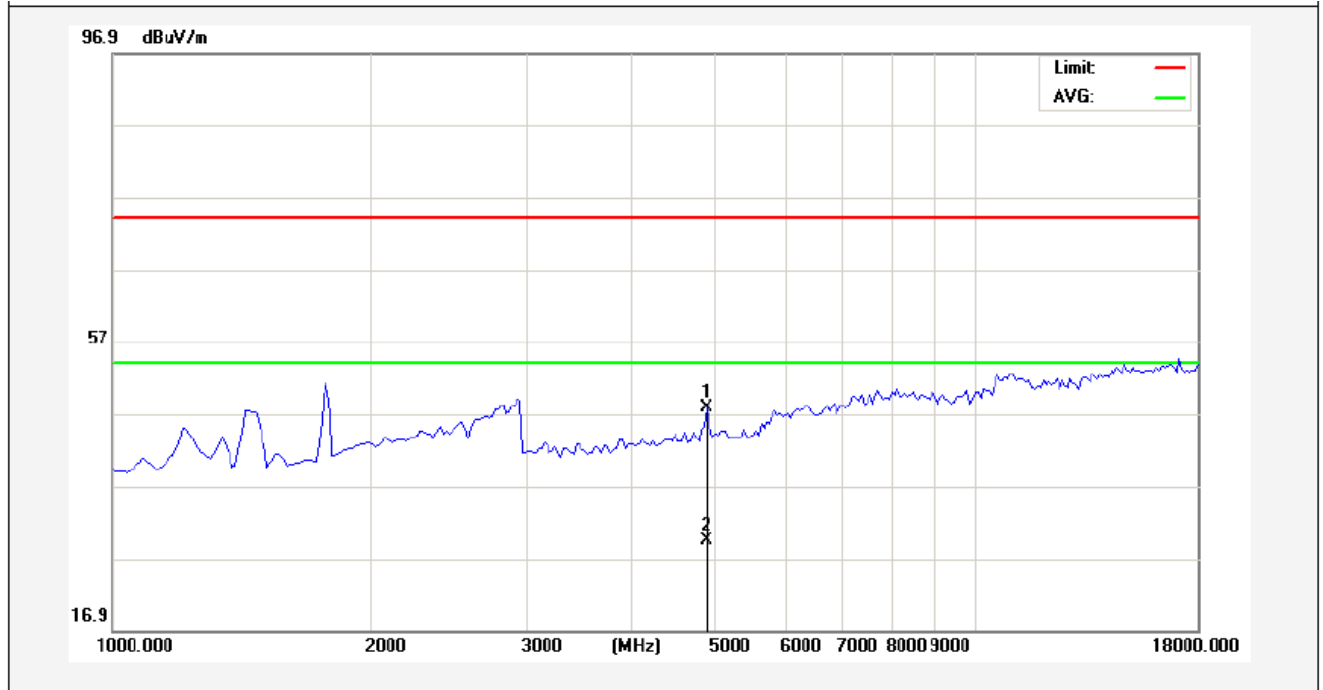


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4825.000	47.43	3.34	50.77	74.00	-23.23	peak			
2	4825.000	29.29	3.34	32.63	54.00	-21.37	AVG			

AMB

Operation Mode: TX / IEEE 802.11g / CH Mid
Temperature: 25°C
Humidity: 50 % RH

Test Date: Jul.10, 2013
Tested by: Rock Zeng
Polarity: Horizontal

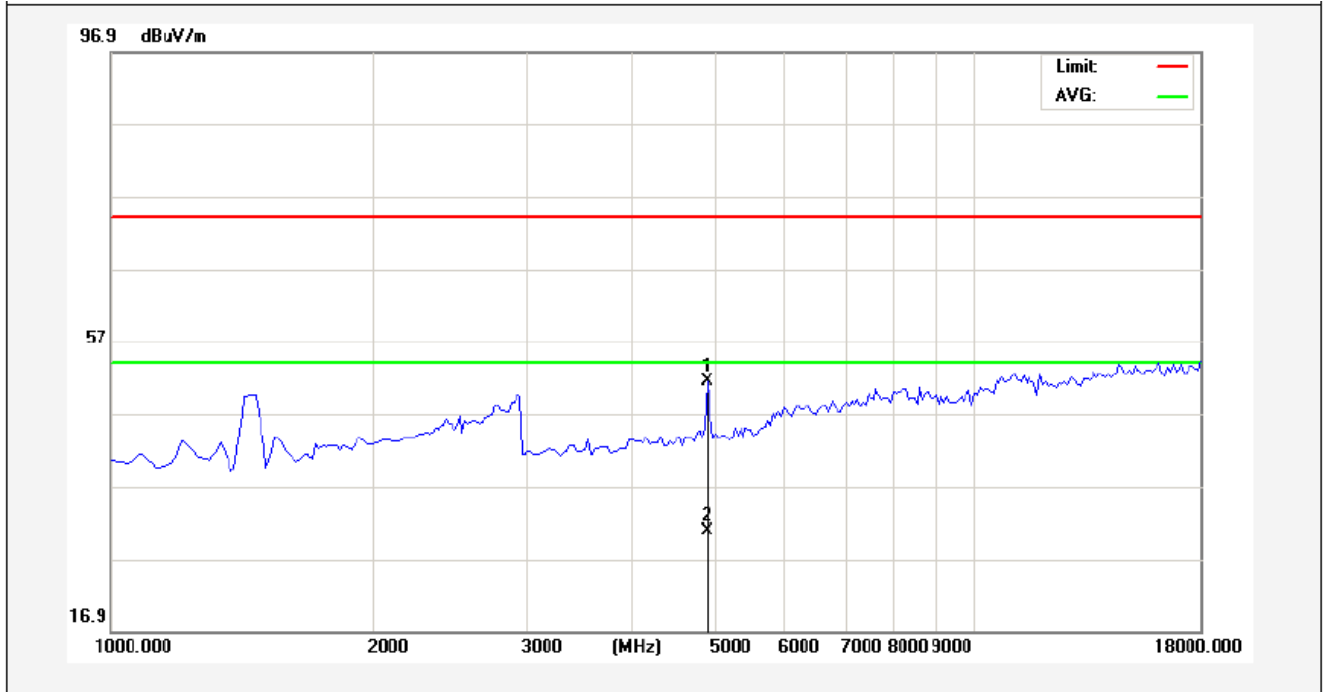


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4867.500	44.33	3.41	47.74	74.00	-26.26	peak			
2	4867.500	25.95	3.41	29.36	54.00	-24.64	AVG			

A.M.R.

Operation Mode: TX / IEEE 802.11g / CH Mid
Temperature: 25°C
Humidity: 50 % RH

Test Date: Jul.10, 2013
Tested by: Rock Zeng
Polarity: Vertical

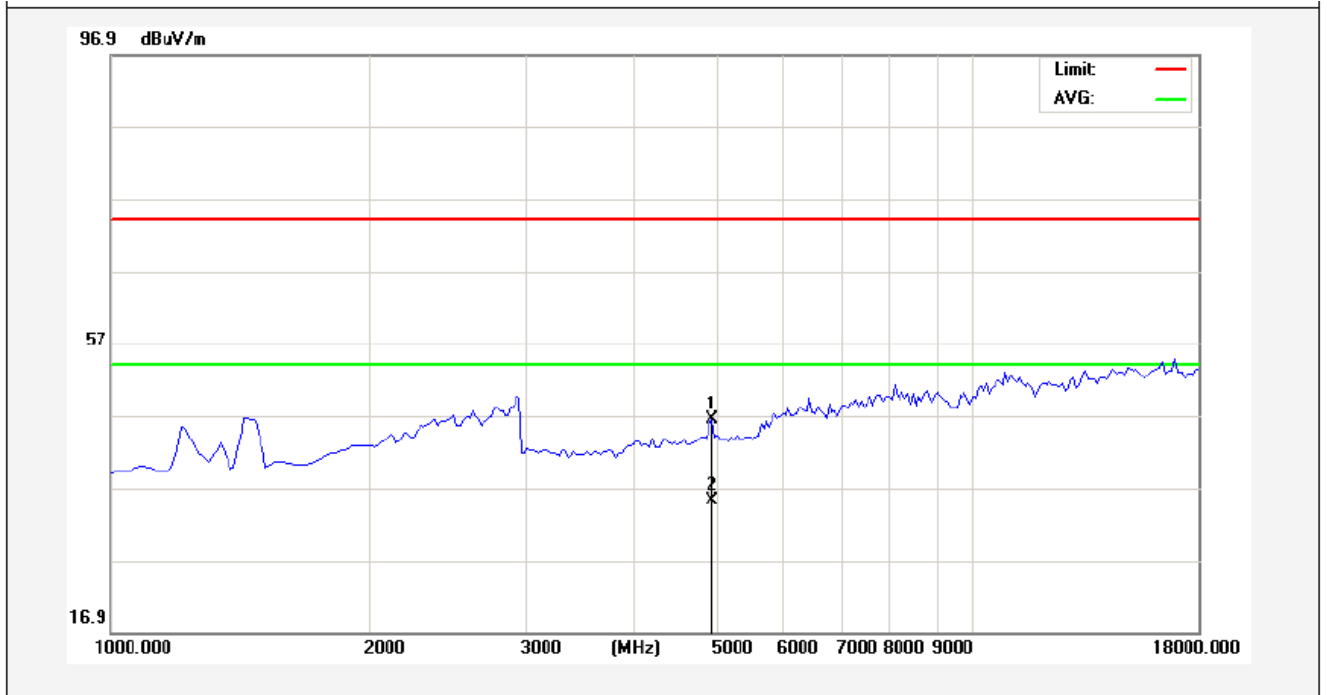


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4867.500	47.91	3.41	51.32	74.00	-22.68	peak			
2	4867.500	27.45	3.41	30.86	54.00	-23.14	AVG			

A M R

Operation Mode: TX / IEEE 802.11g / CH High
Temperature: 25°C
Humidity: 50 % RH

Test Date: Jul.10, 2013
Tested by: Rock Zeng
Polarity: Horizontal

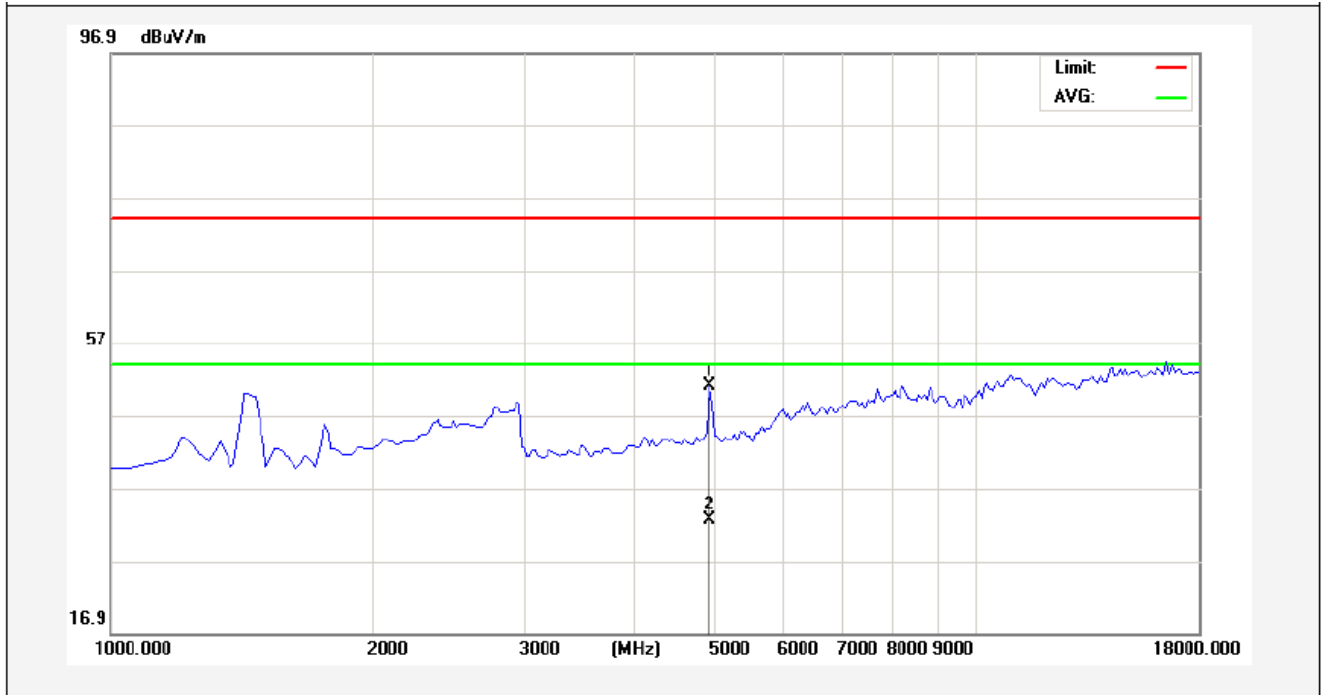


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4952.500	42.88	3.57	46.45	74.00	-27.55	peak			
2	4952.500	31.72	3.57	35.29	54.00	-18.71	AVG			

A.M.R.

Operation Mode: TX / IEEE 802.11g / CH High
Temperature: 25°C
Humidity: 50 % RH

Test Date: Jul.10, 2013
Tested by: Rock Zeng
Polarity: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4910.000	47.53	3.49	51.02	74.00	-22.98	peak			
2	4910.000	29.04	3.49	32.53	54.00	-21.47	AVG			

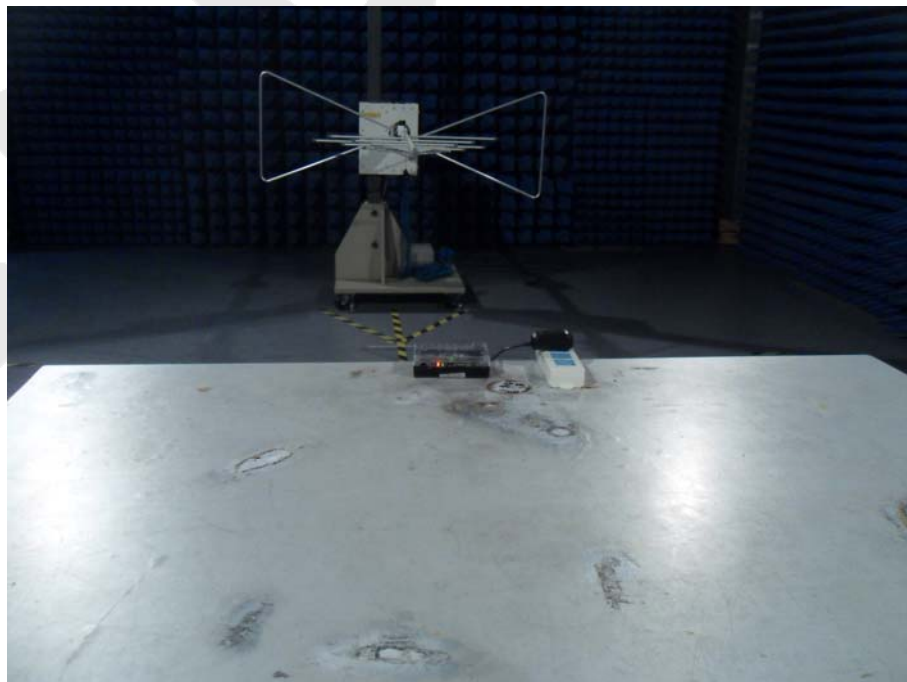
AEM

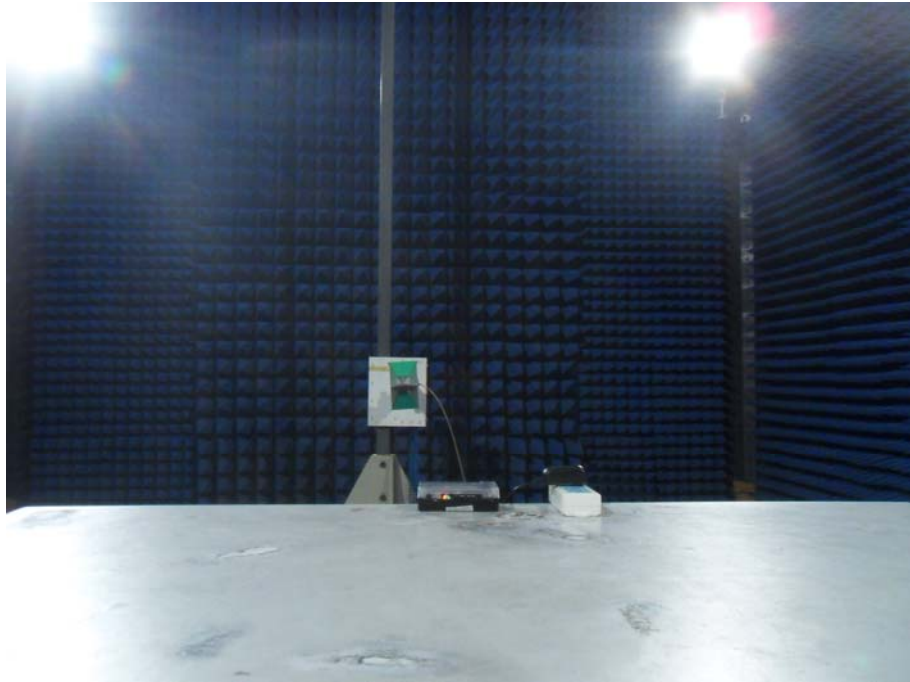
6. PHOTOGRAPH

6.1. Photo of Conducted Emission Measurement



6.2. Photo of Radiation Emission Test





Anbotek

Appendix I (External Photos)

Figure 1
The EUT-Overall View

EUT is placed
inside the host



Appendix II (Internal Photos)

Figure 2
The EUT-Inside View



The EUT:
WIFI Module

Figure 3
The EUT-Inside View

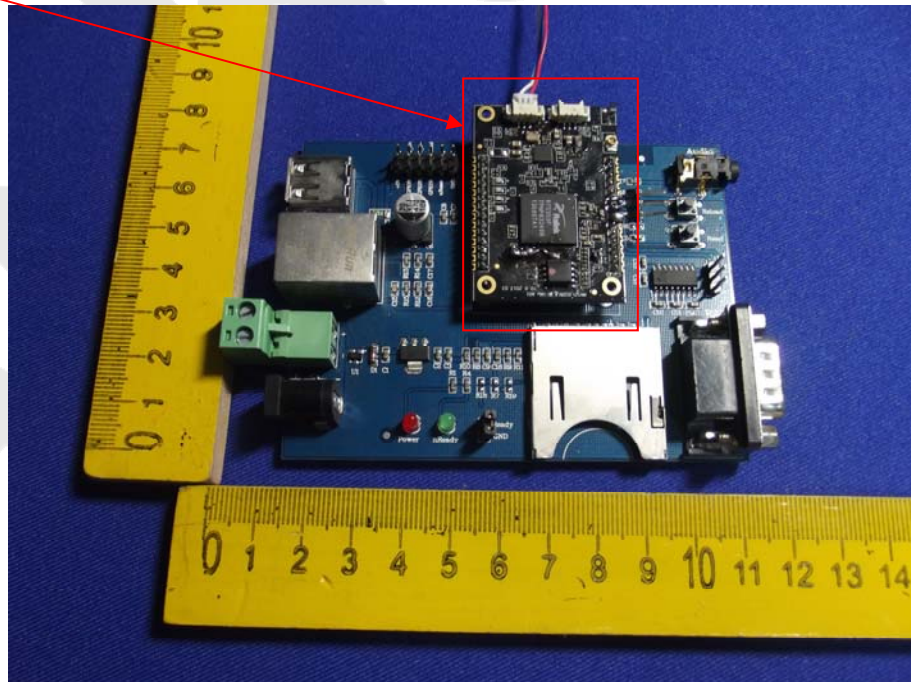
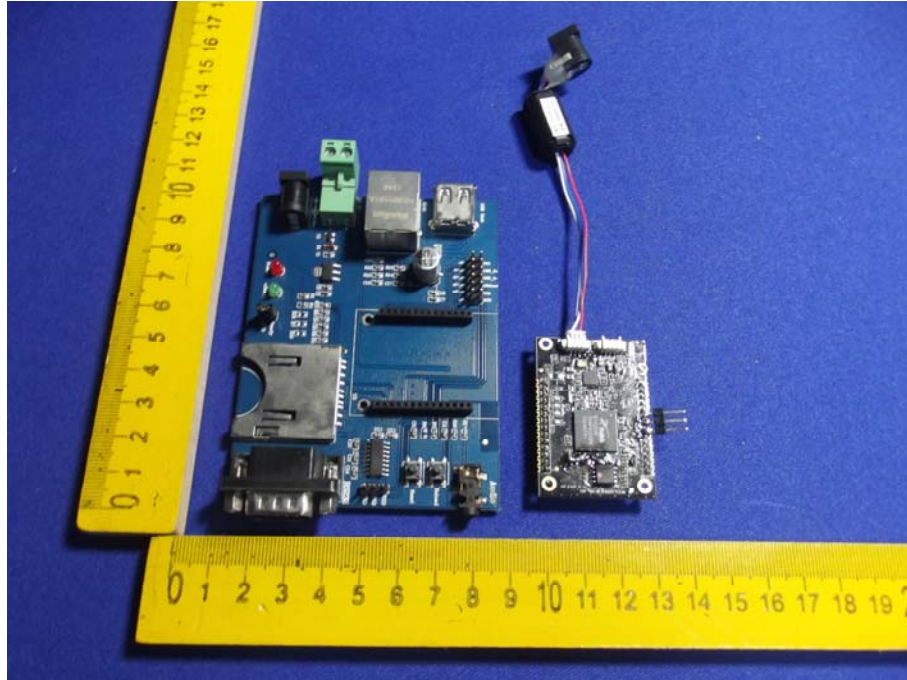


Figure 4
The PCB View



The EUT:
WIFI Module

Figure 5
PCB of the EUT-Front View

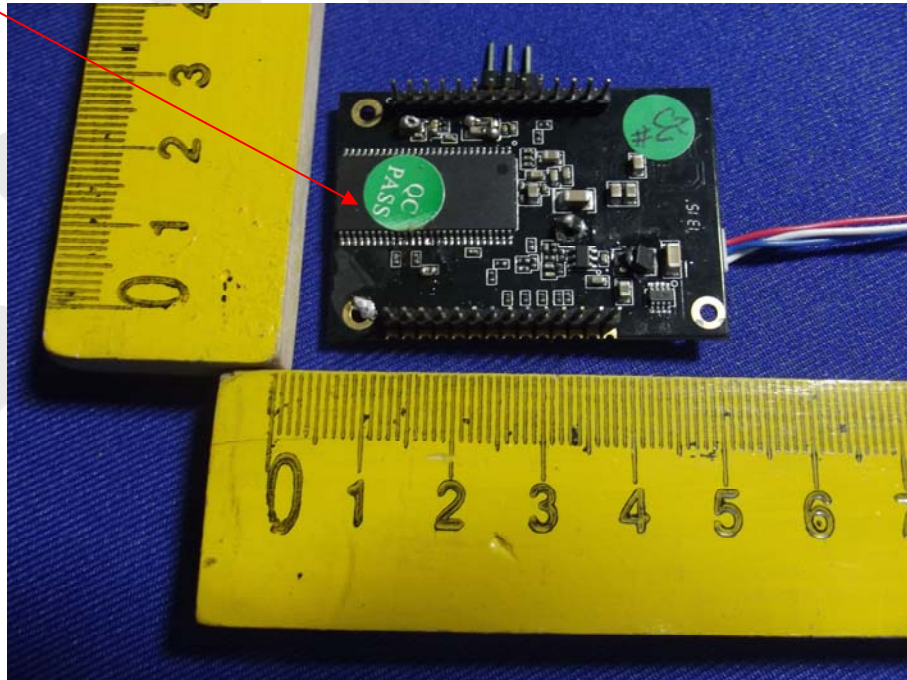


Figure 6
PCB of the EUT-Back View

