

FCC TEST REPORT
for
SHENZHEN BNR INDUSTRY CO,LIMITED

Tablet PC
Model No.: BNR-7063, BNR-9010, BNR-1015

Prepared for : SHENZHEN BNR INDUSTRY CO,LIMITED
Address : Shunda Industry Park, No.28 pingkui Road, PingShan Street,
Longang District, Shenzhen, China

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited
Address : 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road,
Nanshan District, Shenzhen, Guangdong, China
Tel: (86) 755-26066544
Fax: (86) 755-26014772

Report Number : 201402824F
Date of Test : Feb. 27~ Mar. 11, 2014
Date of Report : Mar. 12, 2014

TABLE OF CONTENT

Description	Page
Test Report	
1. GENERAL INFORMATION.....	4
1.1. Description of Device (EUT).....	4
1.2. Auxiliary Equipment Used during Test.....	5
1.3. Description of Test Facility.....	6
1.4. Measurement Uncertainty.....	6
2. TEST METHODOLOGY.....	7
2.1. Summary of Test Results.....	7
2.2. Description of Test Modes.....	7
2.3. List of channels:.....	8
3. CONDUCTED EMISSION TEST.....	9
3.1. Block Diagram of Test Setup.....	9
3.2. Power Line Conducted Emission Measurement Limits (15.207).....	9
3.3. Configuration of EUT on Measurement.....	9
3.4. Operating Condition of EUT.....	9
3.5. Test Procedure.....	10
3.6. Test equipment.....	10
3.7. Power Line Conducted Emission Measurement Results.....	10
4. FCC PART 15.247 REQUIREMENTS FOR DSSS & OFDM MODULATION.....	13
4.1 Test Setup.....	13
4.2 6dB Bandwidth.....	13
4.3. Maximum Peak output power test.....	21
4.4. Band Edges Measurement.....	29
4.5. Peak Power Spectral Density.....	42
4.6. Radiated Emissions.....	50
5. PHOTOGRAPH.....	61
5.1. Photo of Conducted Emission Measurement.....	61
5.2. Photo of Radiation Emission Test.....	61
APPENDIX I (EXTERNAL PHOTOS).....	63
APPENDIX II (INTERNAL PHOTOS).....	65

APPENDIX I (External Photos) (2 Pages)

APPENDIX II (Internal Photos) (4 Pages)

TEST REPORT

Applicant : SHENZHEN BNR INDUSTRY CO,LIMITED
Manufacturer : SHENZHEN BNR INDUSTRY CO,LIMITED
EUT : Tablet PC
Model No. : BNR-7063, BNR-9010, BNR-1015
Serial No. : N/A
Trade Mark : N/A
Rating : DC 5V, 2.0A Max.

Measurement Procedure Used:
FCC Part15 Subpart C, Paragraph 15.247

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 : Feb. 27~ Mar. 11, 2014

Prepared by : Rock zeng
(Tested Engineer / Rock Zeng)

Reviewer : Amy Ding
(Project Manager / Amy Ding)

Approved & Authorized Signer : Tom Chen
(Manager / Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : Tablet PC

Model Number : BNR-7063, BNR-9010, BNR-1015
(Note: All samples are the same except the model number and appearance, so we prepare “BNR-7063” for EMC test only.)

Test Power Supply : AC 120V/60Hz for adapter/
DC 5V(With DC 3.7V battery inside)

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 Gain: : 0dBi

Applicant Address : SHENZHEN BNR INDUSTRY CO,LIMITED
: Shunda Industry Park, No.28 pingkui Road, PingShan Street, Longang District, Shenzhen, China

Manufacturer Address : SHENZHEN BNR INDUSTRY CO,LIMITED
: Shunda Industry Park, No.28 pingkui Road, PingShan Street, Longang District, Shenzhen, China

Factory Address : SHENZHEN BNR INDUSTRY CO,LIMITED
: Shunda Industry Park, No.28 pingkui Road, PingShan Street, Longang District, Shenzhen, China

Date of receiver : Feb. 27, 2014

Date of Test : Feb. 27~ Mar. 11, 2014

1.2. Auxiliary Equipment Used during Test

PC	: Manufacturer: DELL M/N: OPTIPLEX 380 S/N: 1J63X2X CE , FCC: DOC
MONITOR	: Manufacturer: DELL M/N: E170Sc S/N: CN-00V539-64180-055-0UPS CE , FCC: DOC
KEYBOARD	: Manufacturer: DELL M/N: SK-8115 S/N: CN-0DJ313-71616-06C-02XN CE , FCC: DOC Cable: 1m, unshielded
MOUSE	: Manufacturer: DELL M/N: M-UARDEL7 S/N: N/A CE , FCC: DOC Cable: 1m, unshielded
Printer	: Manufacturer:Brother M/N: MFC-3360C S/N: N/A CE, FCC:DOC
Adapter	: Power Supply Model:MX12L3-0502000V Input: AC 100-240V, 50-60Hz, 0.35A Output: DC 3.7V, 2A CE , FCC
Power Cord of Printer	: Non-shielded, Detachable, 0.8m, w/o core
USB Cable for Printer	: Non-Shielded , 1.5m
Power Line	Non-Shielded, 1.5m
VGA Cable	: Non-Shielded, 1.5m
Network Cable	: Non-Shielded, 1.5m
USB Cable for EUT	: Non-Shielded, 1.2m

1.3. Description of Test Facility

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

FCC-Registration No.: 463622

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 463622, June 14, 2011.

IC-Registration No.: 46405-9469

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 46405-9469, May 02, 2011.

Test Location

All Emissions tests were performed at
NINGBO EMTEK CO., LTD. at 1F Building 4, 1177#, Lingyun Road, Ningbo
National Hi-Tech Zone, Ningbo, Zhejiang, China

1.4. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.3dB

Conduction Uncertainty : Uc = 3.4dB

2. TEST METHODOLOGY

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

2.1. 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

2.2. 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 MCS 0 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 MCS 0 Mbps lowest data rate (the worst case) are chosen for the final testing.

2.3. List of channels:

✓ - available

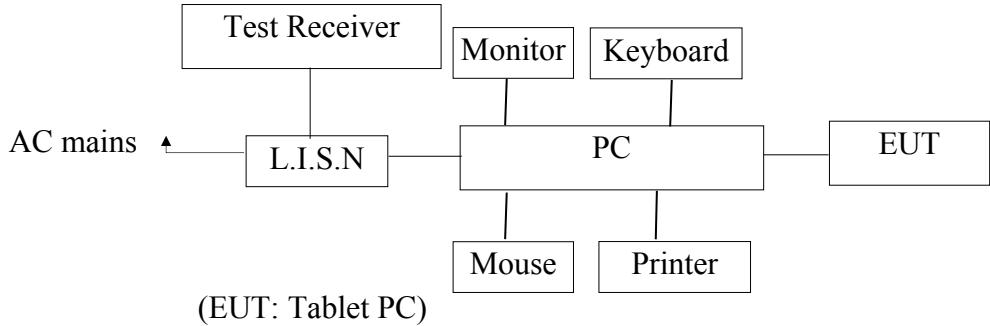
X - tested

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	

3. Conducted Emission Test

3.1. Block Diagram of Test Setup

3.1.1. Block diagram of connection between the EUT and simulators



3.2. Power Line Conducted Emission Measurement Limits (15.207)

Frequency MHz	Limits dB(μ V)	
	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.

3.3. 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 : Tablet PC
 Model Number : BNR-7063
 Applicant : SHENZHEN BNR INDUSTRY CO,LIMITED

3.4. Operating Condition of EUT

- 3.4.1. Setup the EUT and simulator as shown as Section 3.1.
- 3.4.2. Turn on the power of all equipment.
- 3.4.3. Let the EUT work in test mode (Charging to adapter, Communication) and measure it.

3.5. 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 3.6.

3.6. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	100055	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

3.7. Power Line Conducted Emission Measurement Results

PASS.

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

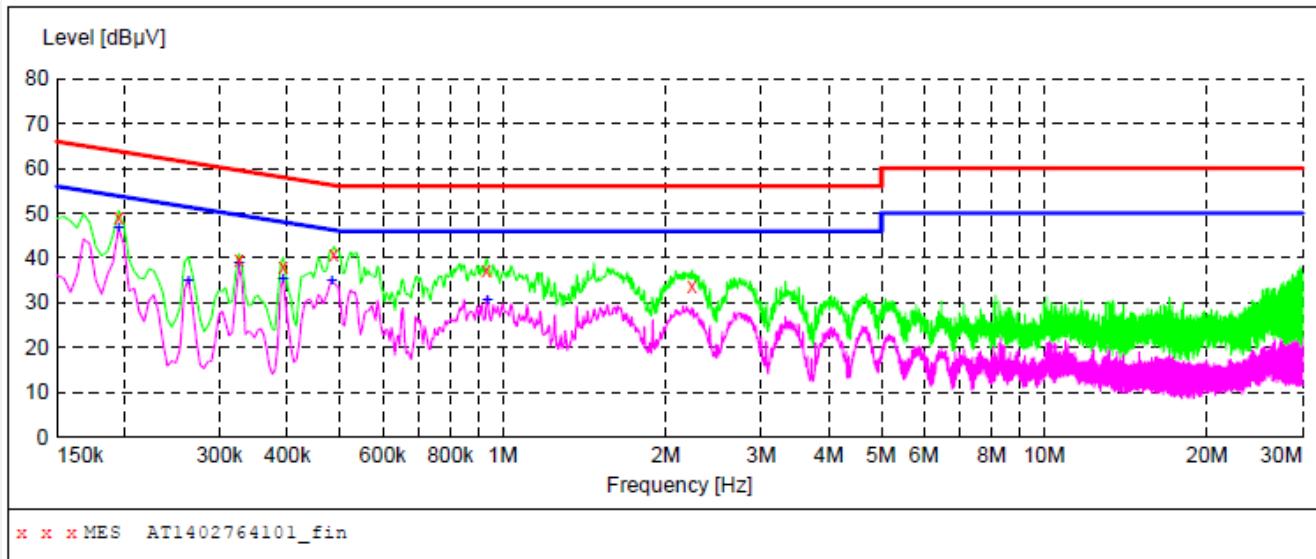
The EUT was tested on (Charging to adapter, Communication) modes, only the worst data of (Communication) are attached in the following pages.

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: Communication
 Test Specification: DC 5V
 Comment: Live Line
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages

**MEASUREMENT RESULT: "AT1402764101_fin"**

2/27/2014 11:25AM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.195000	49.00	20.1	64	14.8	QP	L1	GND
0.325500	39.50	20.1	60	20.1	QP	L1	GND
0.393000	38.20	20.1	58	19.8	QP	L1	GND
0.487500	40.90	20.1	56	15.3	QP	L1	GND
0.933000	37.10	20.1	56	18.9	QP	L1	GND
2.237500	33.50	20.3	56	22.5	QP	L1	GND

MEASUREMENT RESULT: "AT1402764101_fin2"

2/27/2014 11:25AM

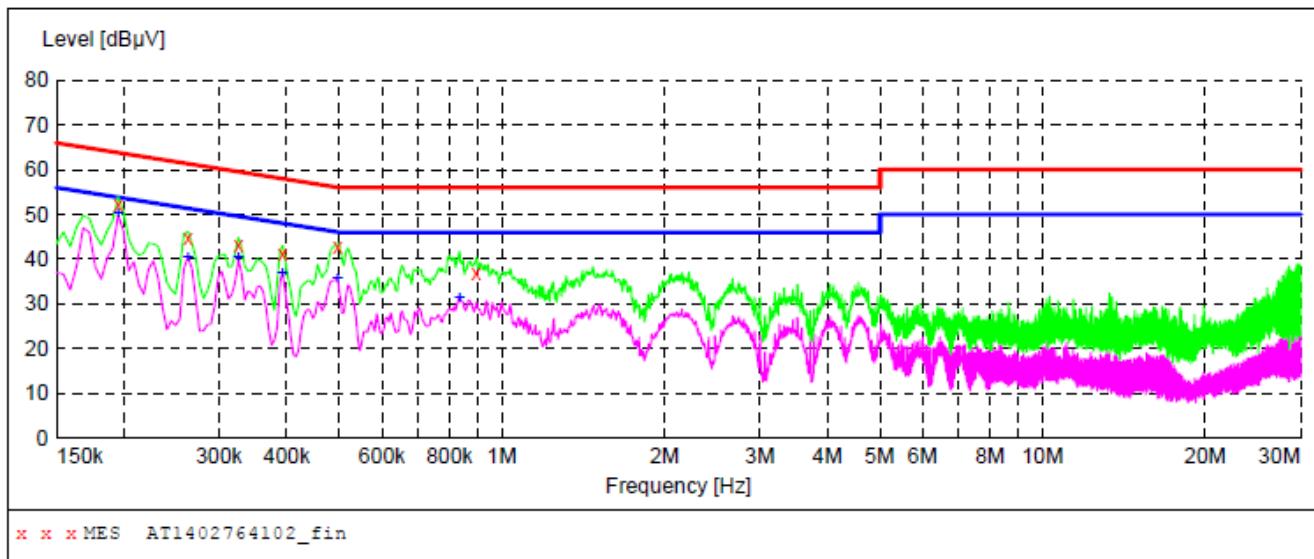
Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.195000	46.70	20.1	54	7.1	AV	L1	GND
0.262500	35.00	20.1	51	16.4	AV	L1	GND
0.325500	38.70	20.1	50	10.9	AV	L1	GND
0.393000	35.30	20.1	48	12.7	AV	L1	GND
0.483000	34.80	20.1	46	11.5	AV	L1	GND
0.937500	30.70	20.1	46	15.3	AV	L1	GND

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: Communication
 Test Specification: DC 5V
 Comment: Neutral Line
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages

**MEASUREMENT RESULT: "AT1402764102_fin"**

2/27/2014 11:28AM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.195000	52.00	20.1	64	11.8	QP	N	GND
0.262500	44.90	20.1	61	16.5	QP	N	GND
0.325500	43.20	20.1	60	16.4	QP	N	GND
0.393000	41.30	20.1	58	16.7	QP	N	GND
0.496500	42.80	20.1	56	13.3	QP	N	GND
0.897000	36.90	20.1	56	19.1	QP	N	GND

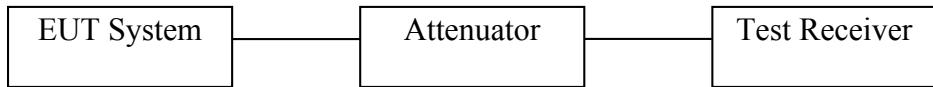
MEASUREMENT RESULT: "AT1402764102_fin2"

2/27/2014 11:28AM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.195000	50.20	20.1	54	3.6	AV	N	GND
0.262500	40.40	20.1	51	11.0	AV	N	GND
0.325500	40.40	20.1	50	9.2	AV	N	GND
0.393000	36.90	20.1	48	11.1	AV	N	GND
0.496500	35.50	20.1	46	10.6	AV	N	GND
0.834000	31.20	20.1	46	14.8	AV	N	GND

4. FCC Part 15.247 Requirements for DSSS & OFDM Modulation

4.1 Test Setup



4.2 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, VBW $\geq 3 \times$ RBW = 300kHz,
 Detector = Peak
 Trace mode = Max hold.
 Sweep - auto couple.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

c. Test Setup See 4.1

d. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Aug. 09, 2013	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Aug. 09, 2013	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 23, 2013	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Aug. 09, 2013	3 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	12.06		Pass
Mid	2437	12.06	>500	Pass
High	2462	12.06		Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	16.56		Pass
Mid	2437	16.56	>500	Pass
High	2462	16.56		Pass

Test mode: IEEE 802.11n (HT20)

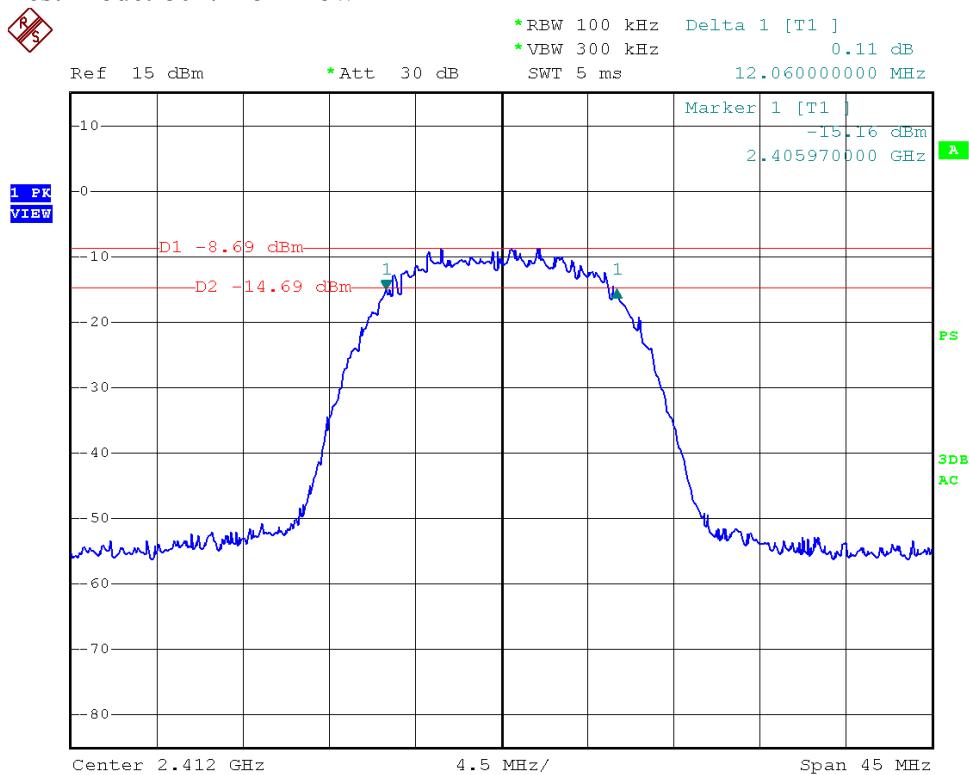
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	17.73		Pass
Mid	2437	17.73	>500	Pass
High	2462	17.73		Pass

Test mode: IEEE 802.11n (HT40)

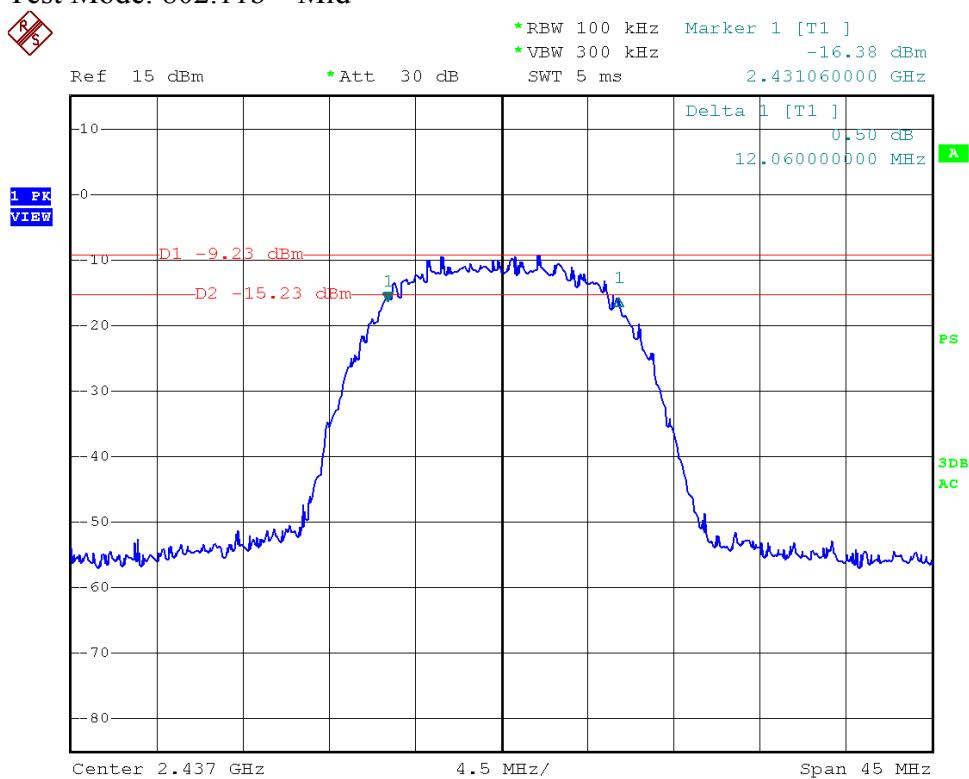
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2422	36.32		Pass
Mid	2437	36.32	>500	Pass
High	2452	36.32		Pass

Test Plots See the following page.

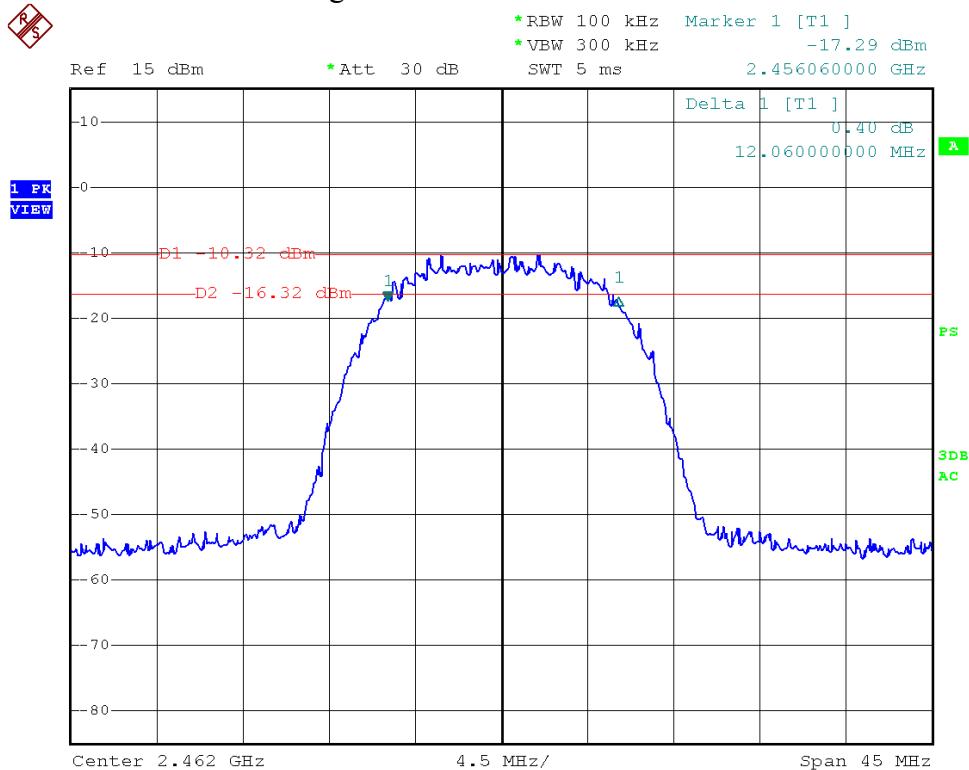
Test Mode: 802.11b---Low



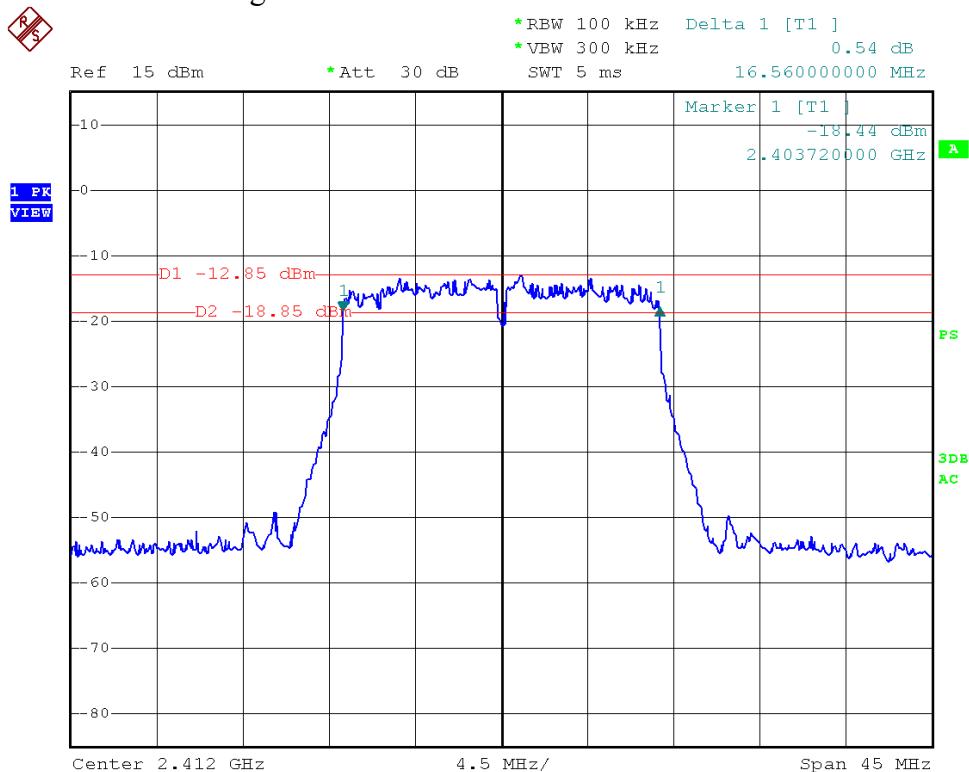
Test Mode: 802.11b---Mid



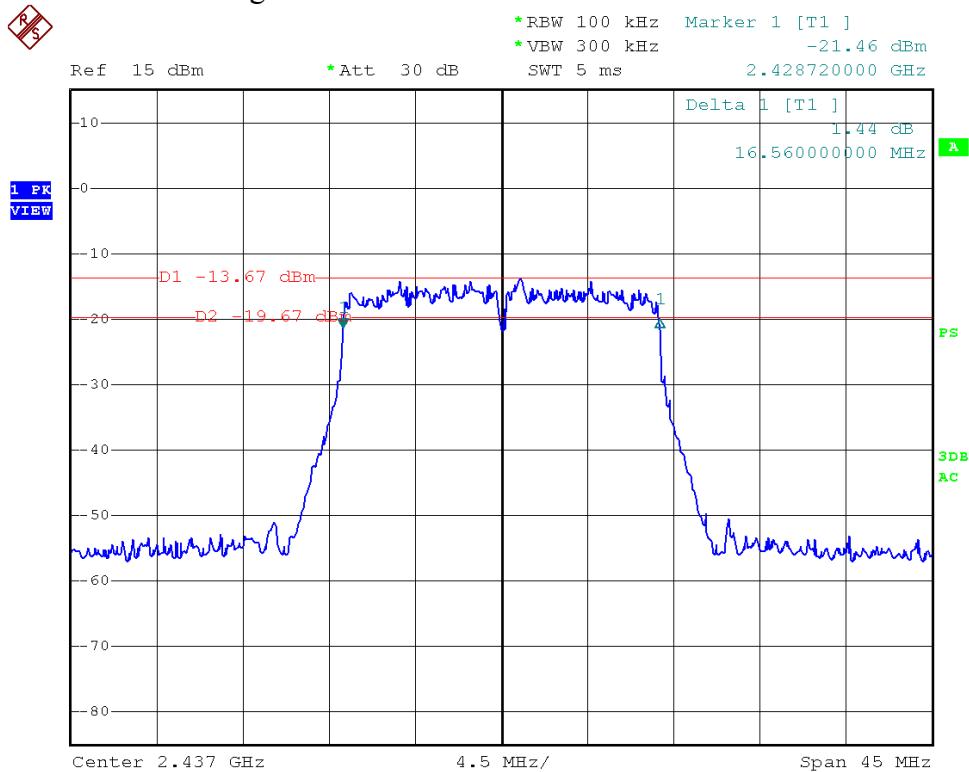
Test Mode: 802.11b---High



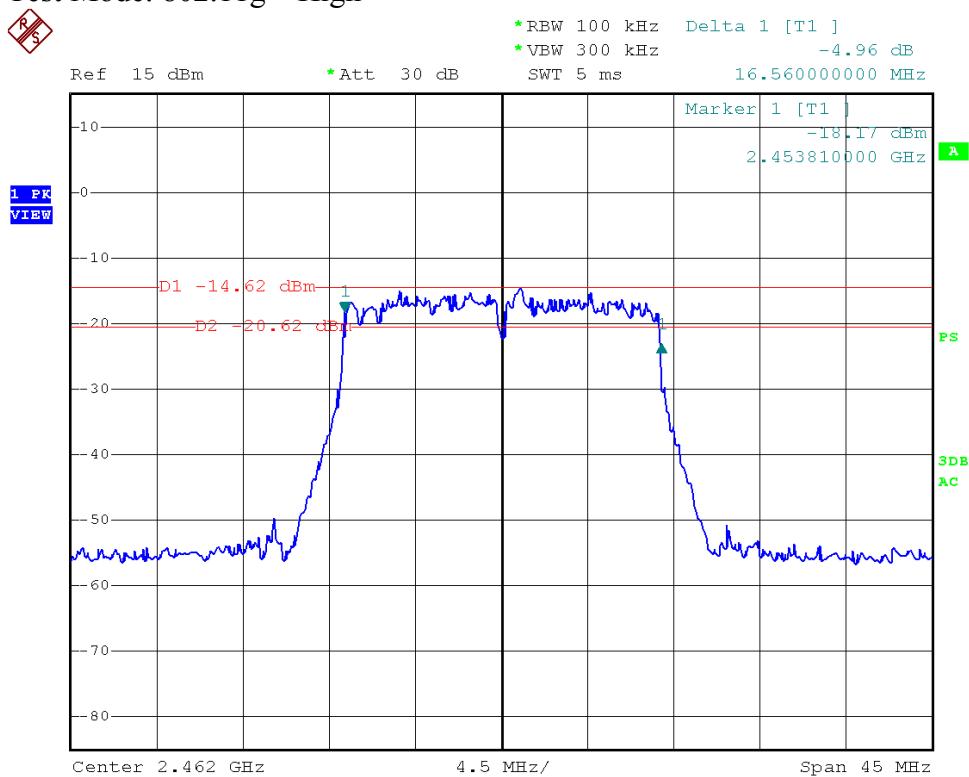
Test Mode: 802.11g---Low



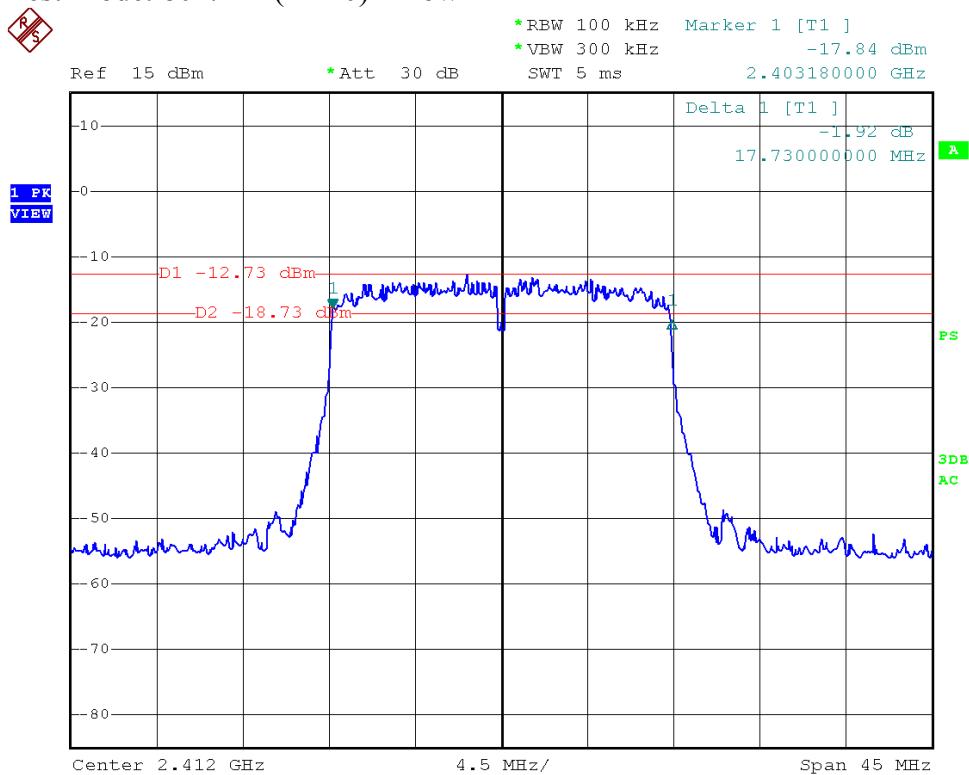
Test Mode: 802.11g---Mid



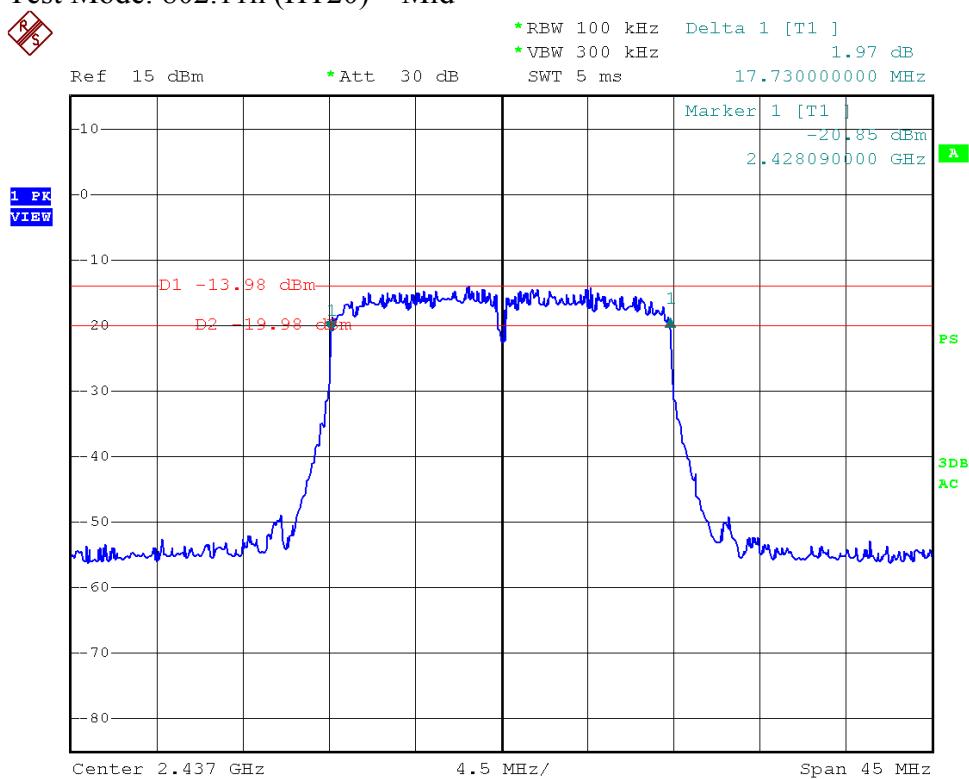
Test Mode: 802.11g---High



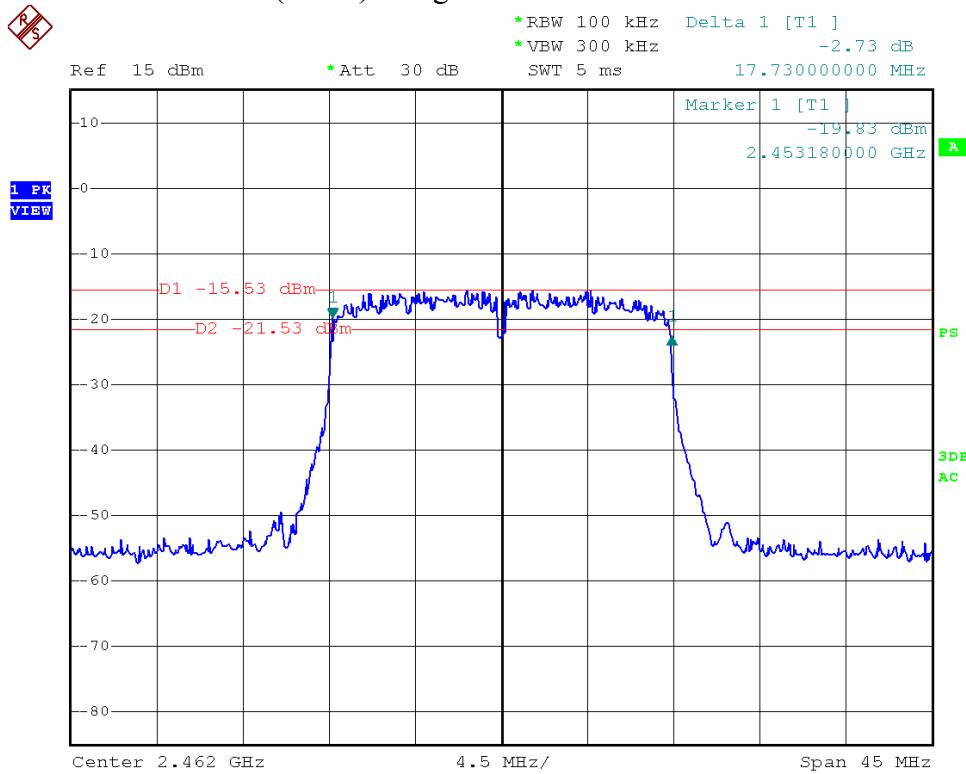
Test Mode: 802.11n (HT20)---Low



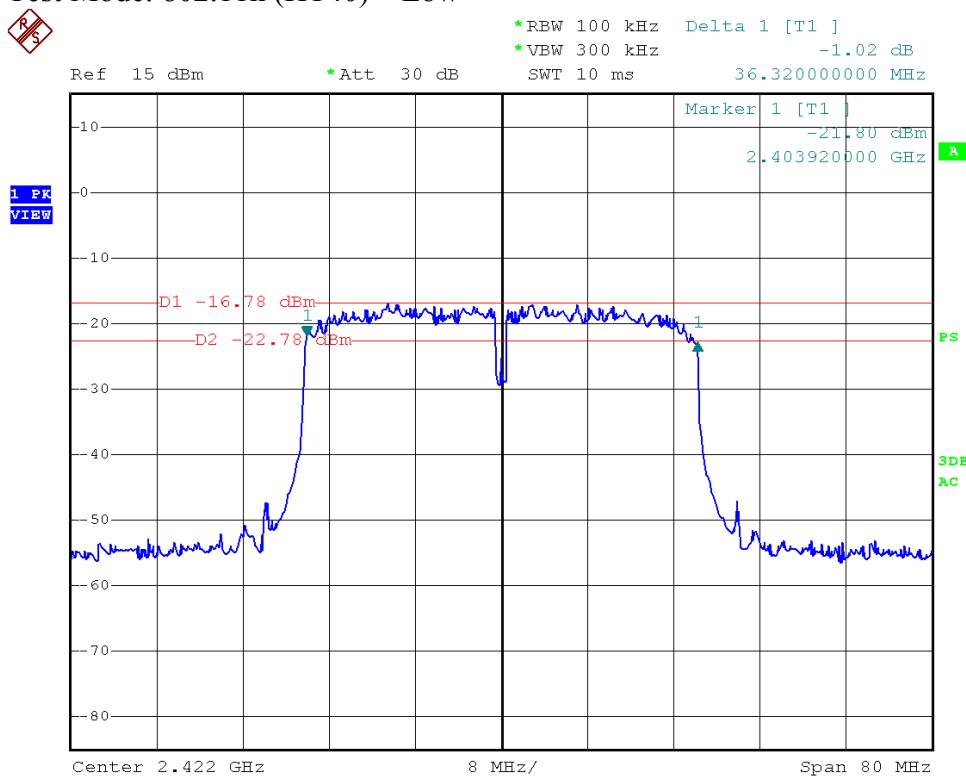
Test Mode: 802.11n (HT20)---Mid



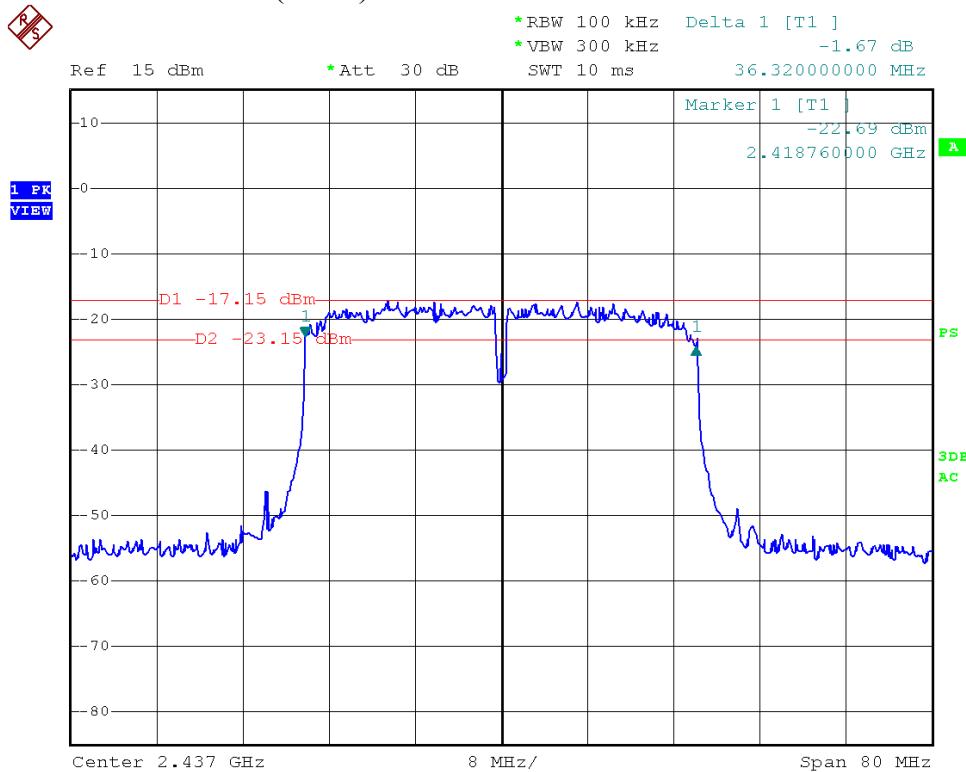
Test Mode: 802.11n (HT20)---High



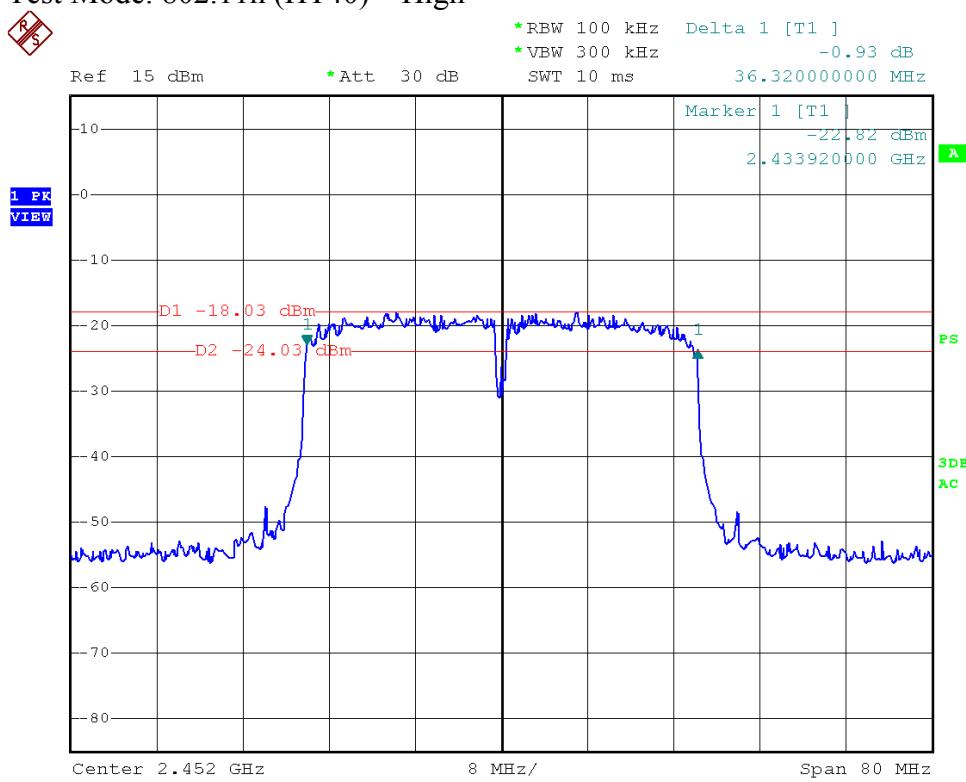
Test Mode: 802.11n (HT40)---Low



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



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



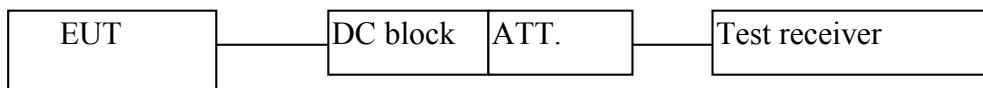
4.3. Maximum Peak output power test

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 558074 9.1.2:

1. This procedure may be used when the maximum available RBW of the measurement instrument is less than the DTS bandwidth.
2. Set the RBW = 1 MHz.
3. Set the VBW $\geq 3 \times \text{RBW} = 3 \text{ MHz}$.
4. Set the span $\geq 1.5 \times \text{DTS bandwidth}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select peak detector). If the instrument does not have a band power function, sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS bandwidth.

e. Test Equipment

Same as the equipment listed in 4.2.

f. Test Results

Pass.

g. Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2412	8.80	30	1	Pass
Mid	2437	7.54			Pass
High	2462	6.59			Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2412	7.39	30	1	Pass
Mid	2437	6.81			Pass
High	2462	6.10			Pass

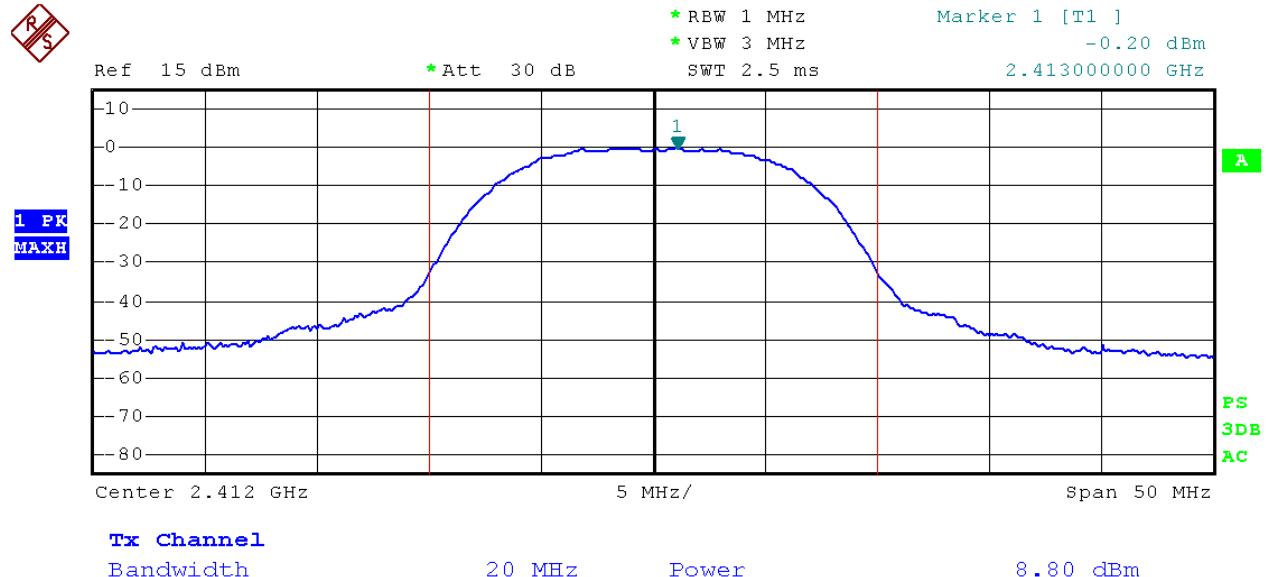
Test mode: IEEE 802.11n (HT20)

Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2412	7.30	30	1	Pass
Mid	2437	6.80			Pass
High	2462	6.03			Pass

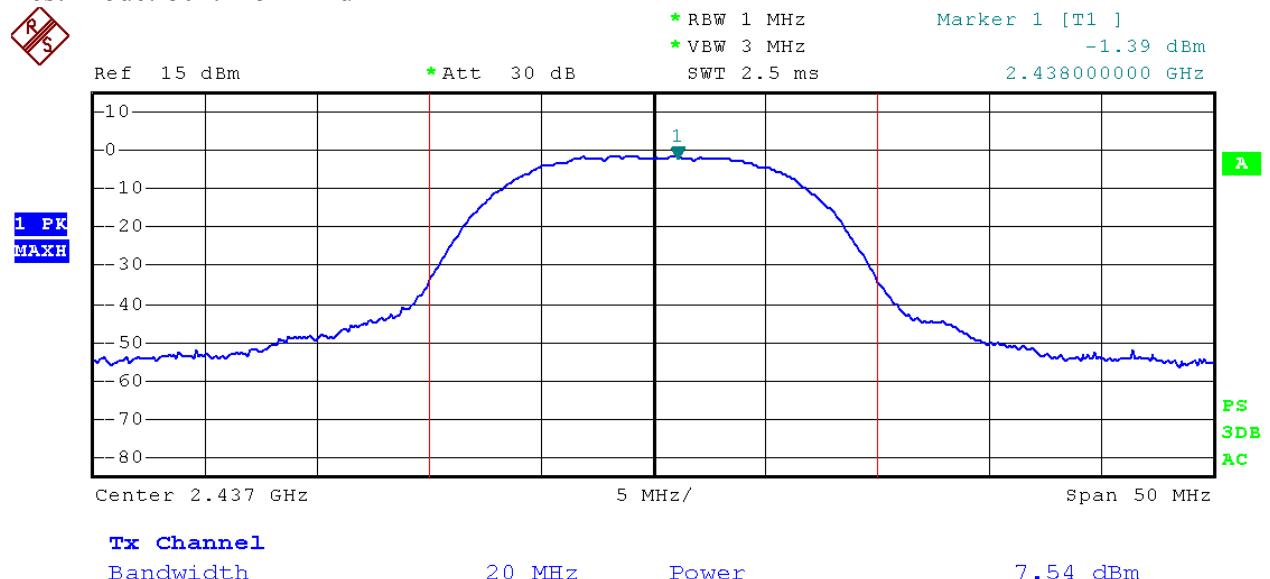
Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2422	6.96	30	1	Pass
Mid	2437	6.41			Pass
High	2452	5.93			Pass

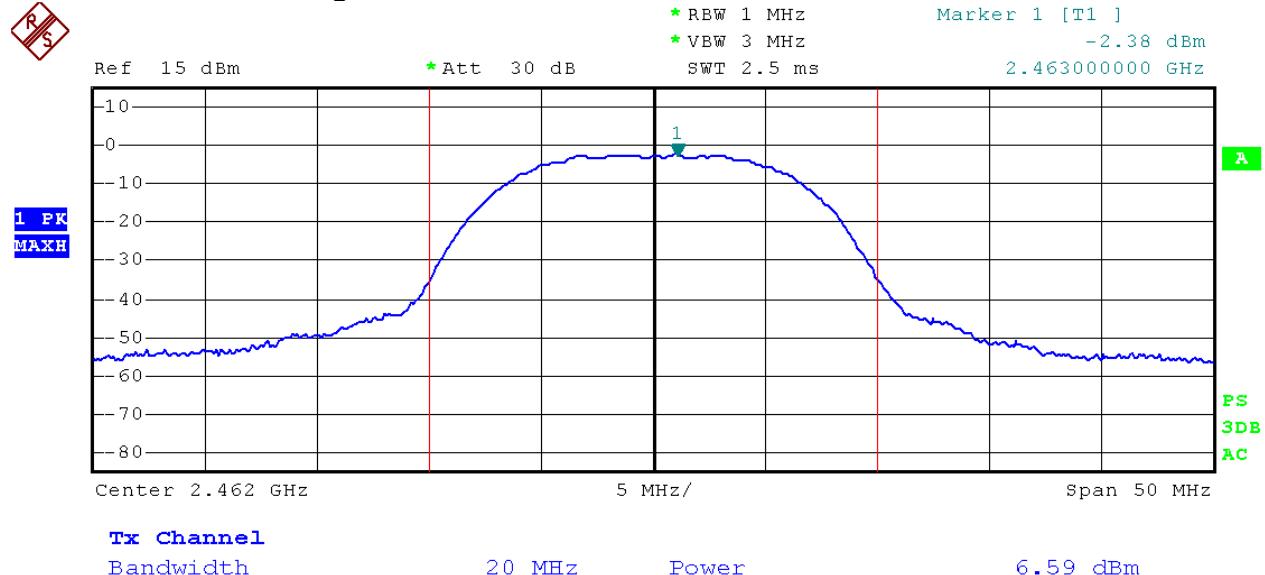
Test Mode: 802.11b---Low



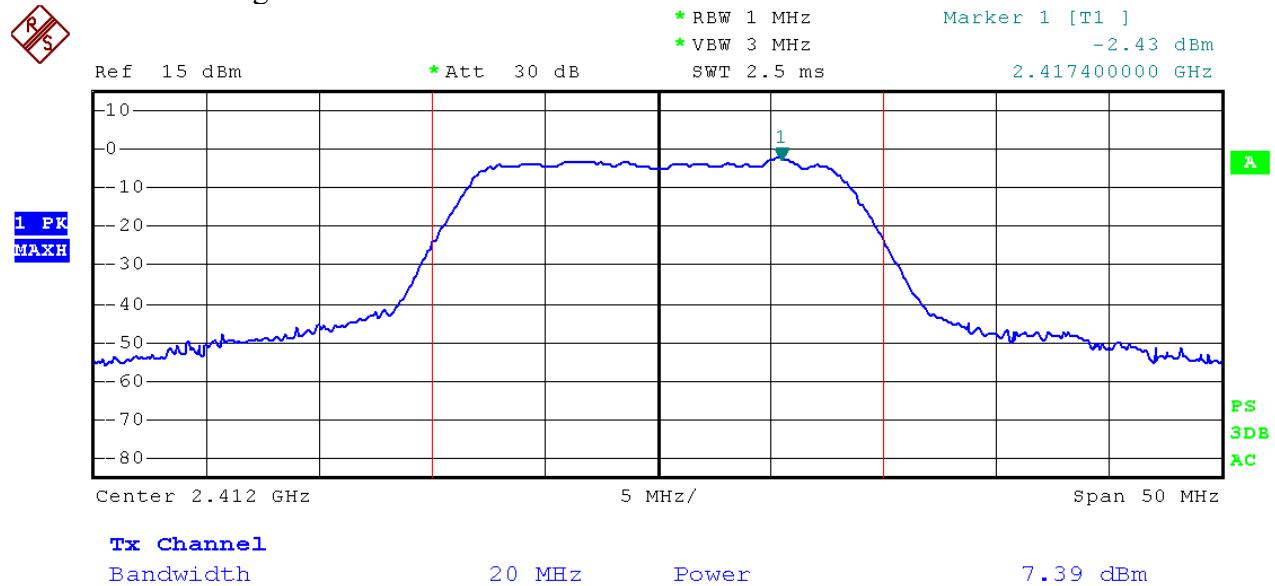
Test Mode: 802.11b---Mid



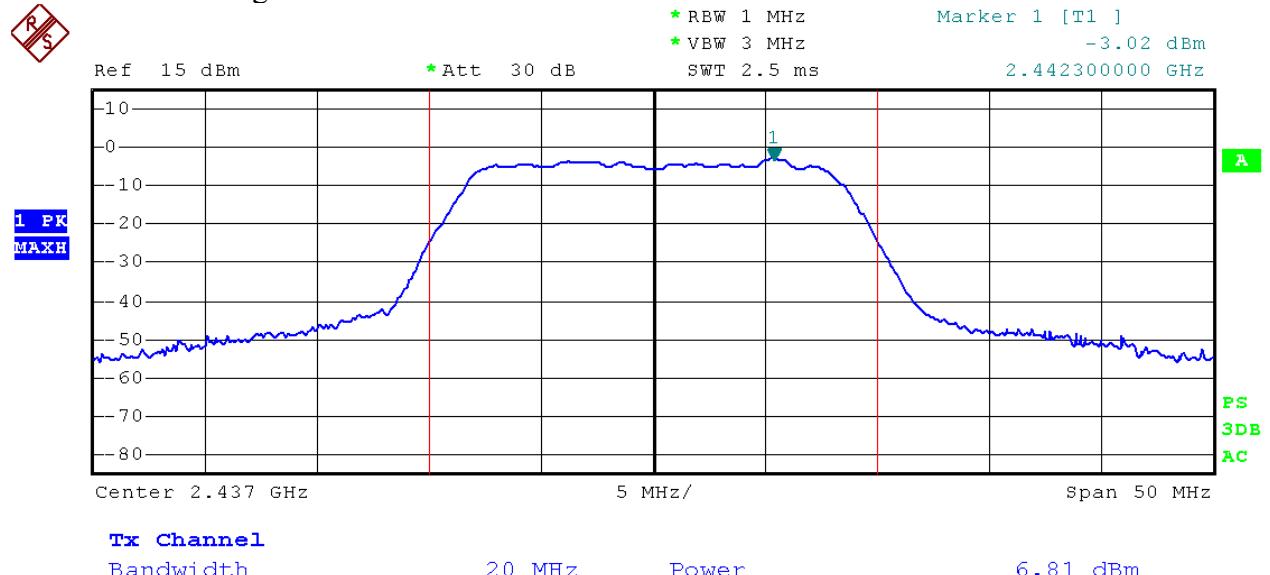
Test Mode: 802.11b---High



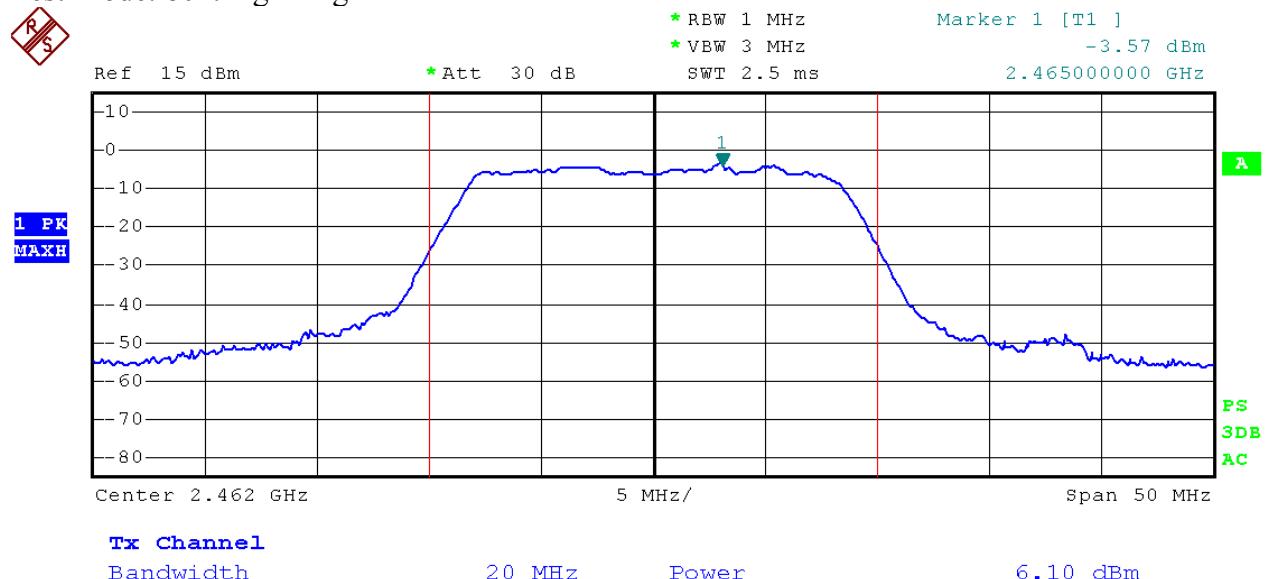
Test Mode: 802.11g---Low



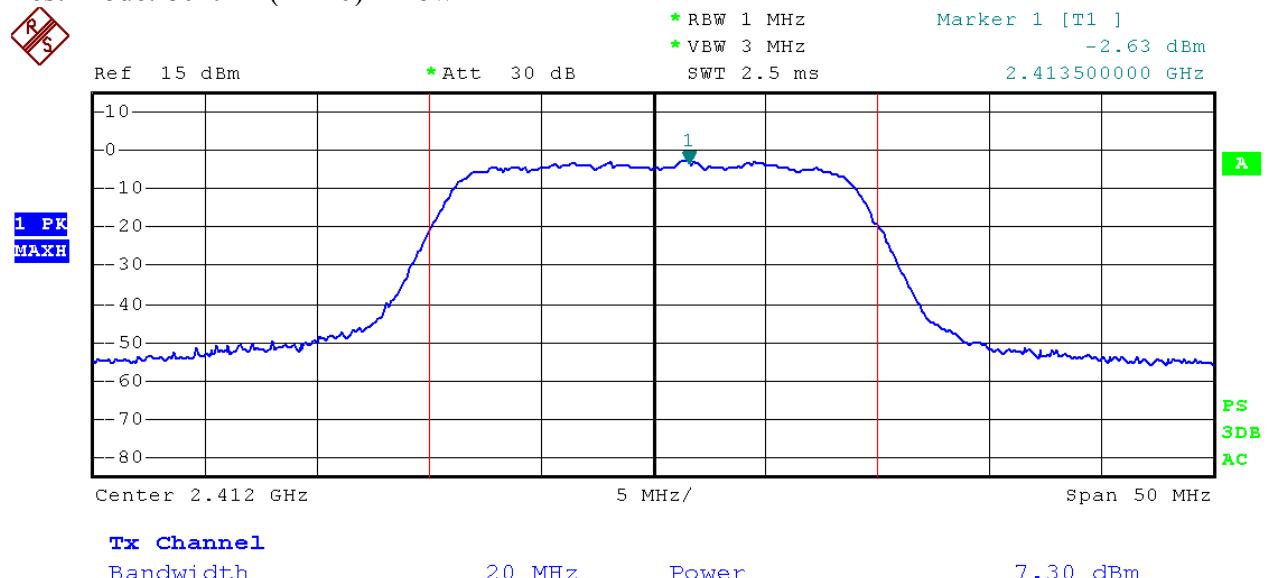
Test Mode: 802.11g---Mid



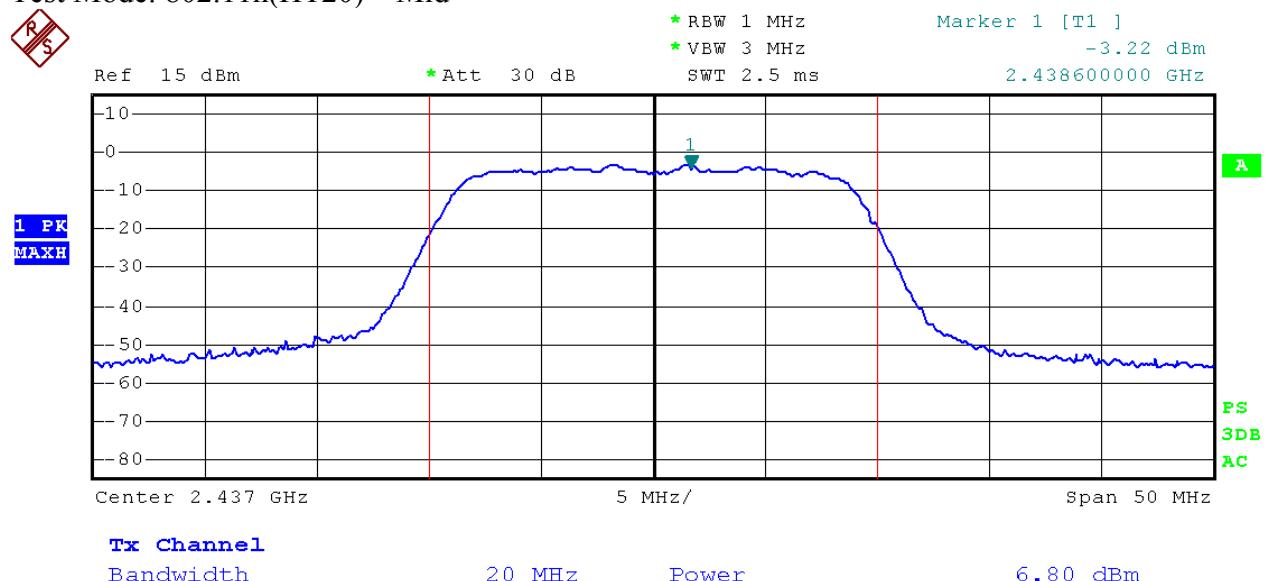
Test Mode: 802.11g---High



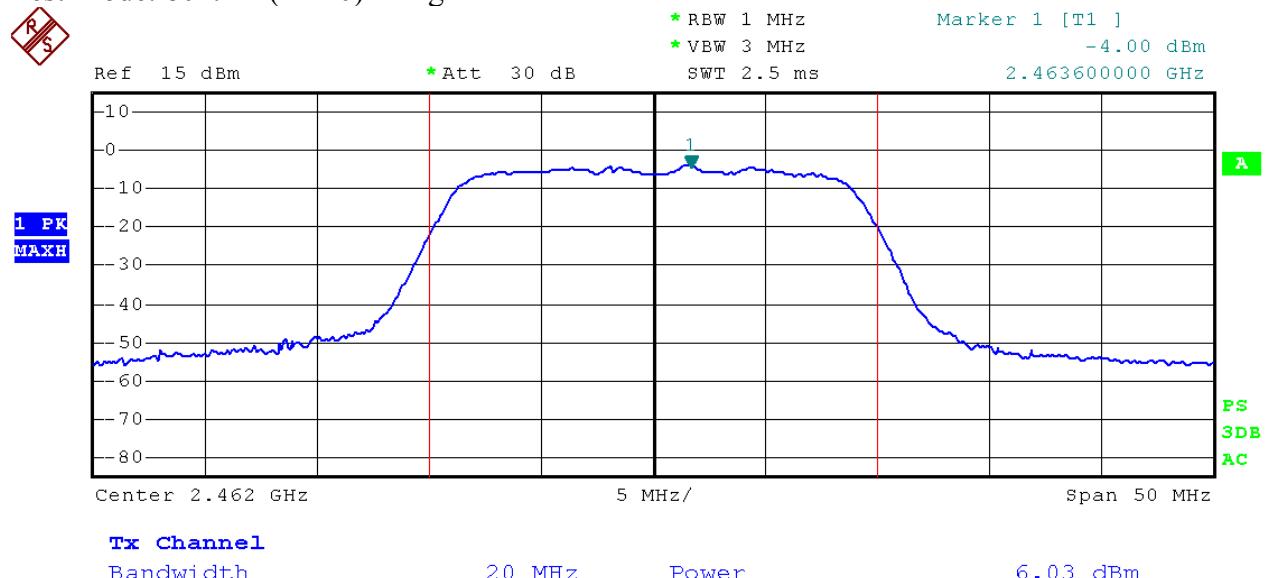
Test Mode: 802.11n(HT20)---Low



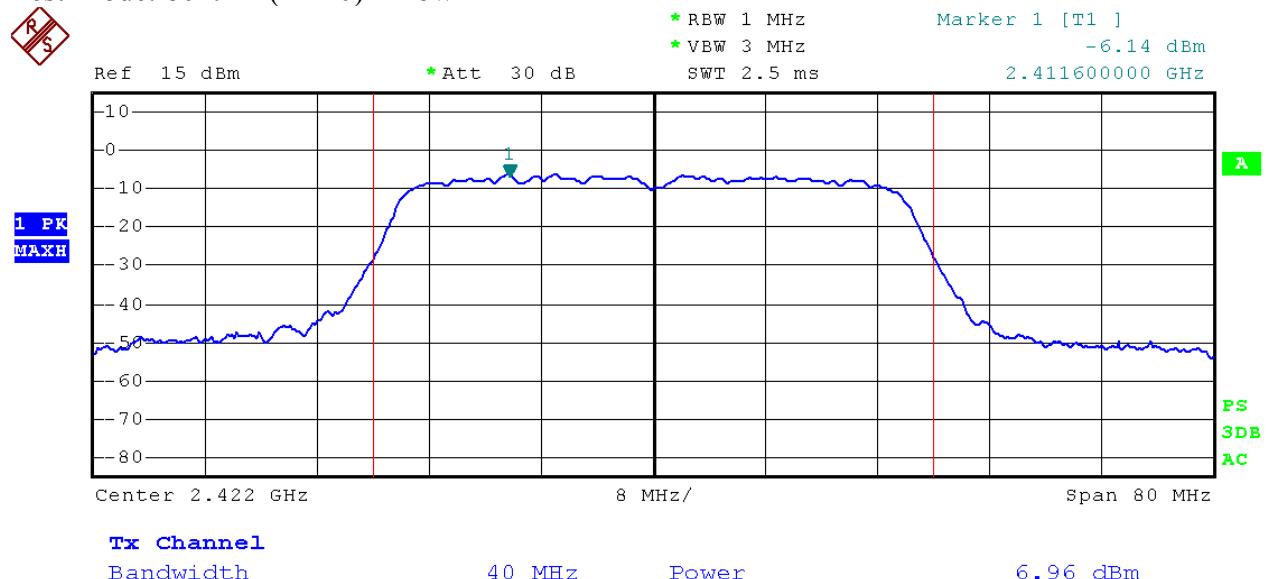
Test Mode: 802.11n(HT20)---Mid



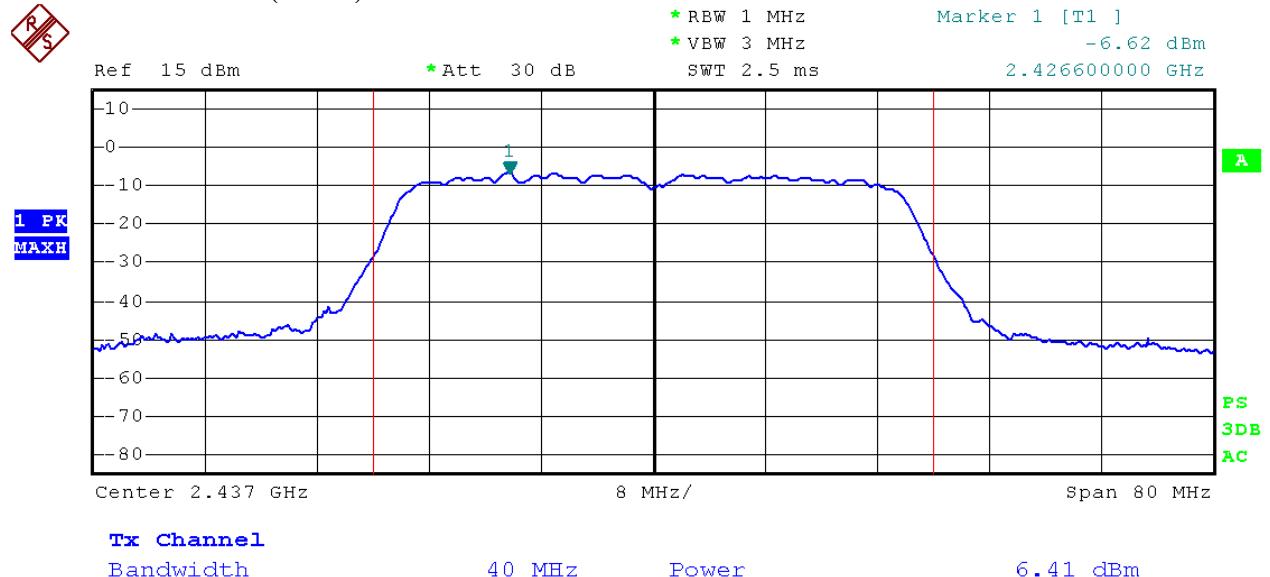
Test Mode: 802.11n(HT20)---High



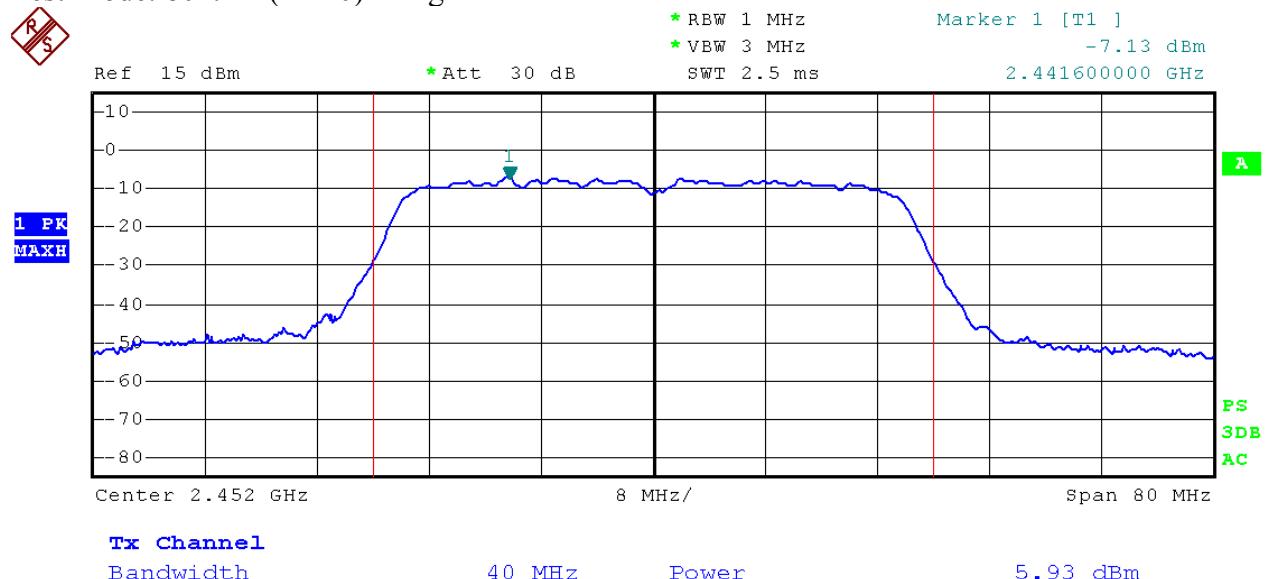
Test Mode: 802.11n(HT40)---Low



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



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



4.4. 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).

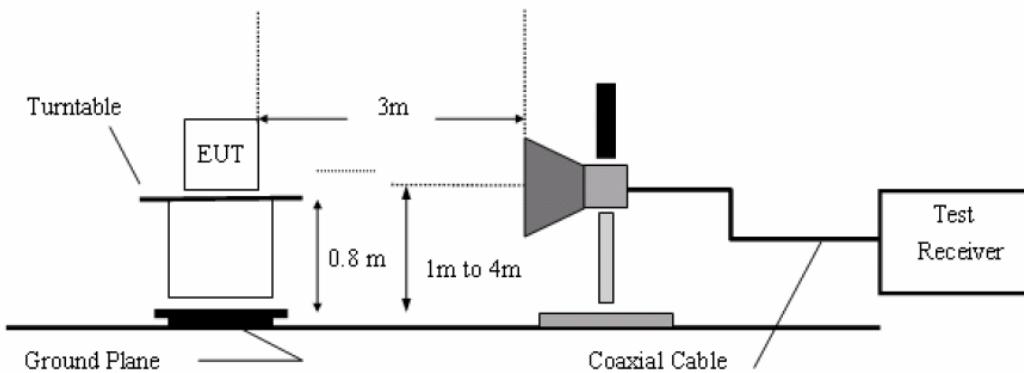
b. Test Procedure

1. Conducted Method:

- 1) Set RBW=100KHz, VBW=300KHz
- 2) Detector=peak
- 3) Sweep time= auto
- 4) Trace mode=max hold.

2. Radiated Method:

- 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=1MHz, VBW=3MHz, 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.



c. Test Equipment

Same as the equipment listed in 4.2.

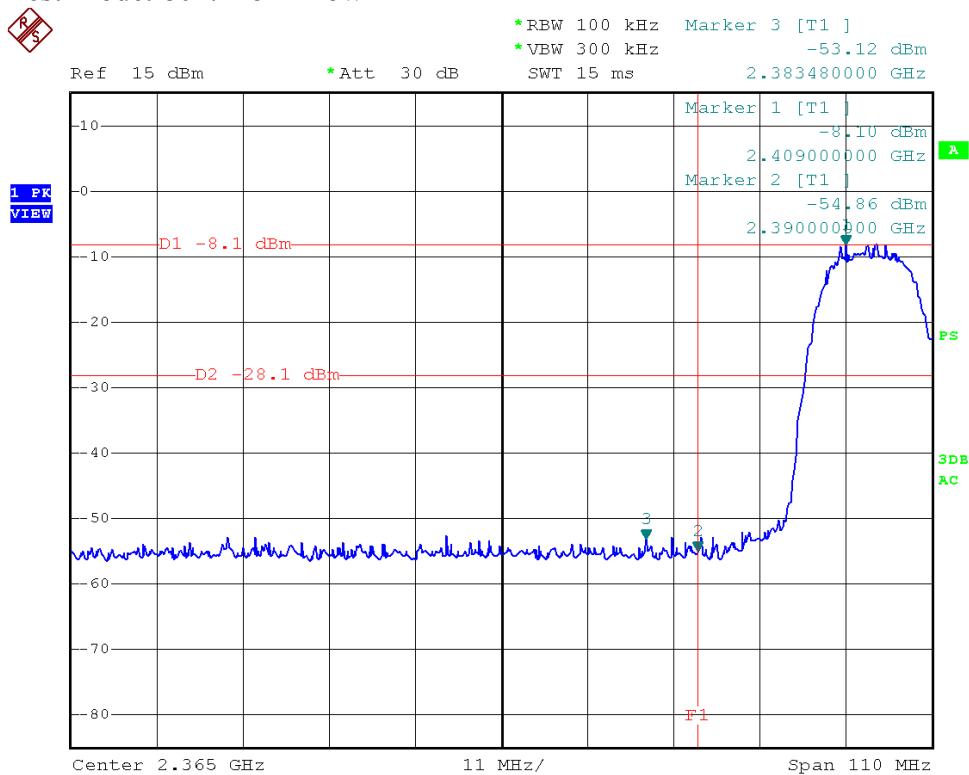
d. Test Results

Pass.

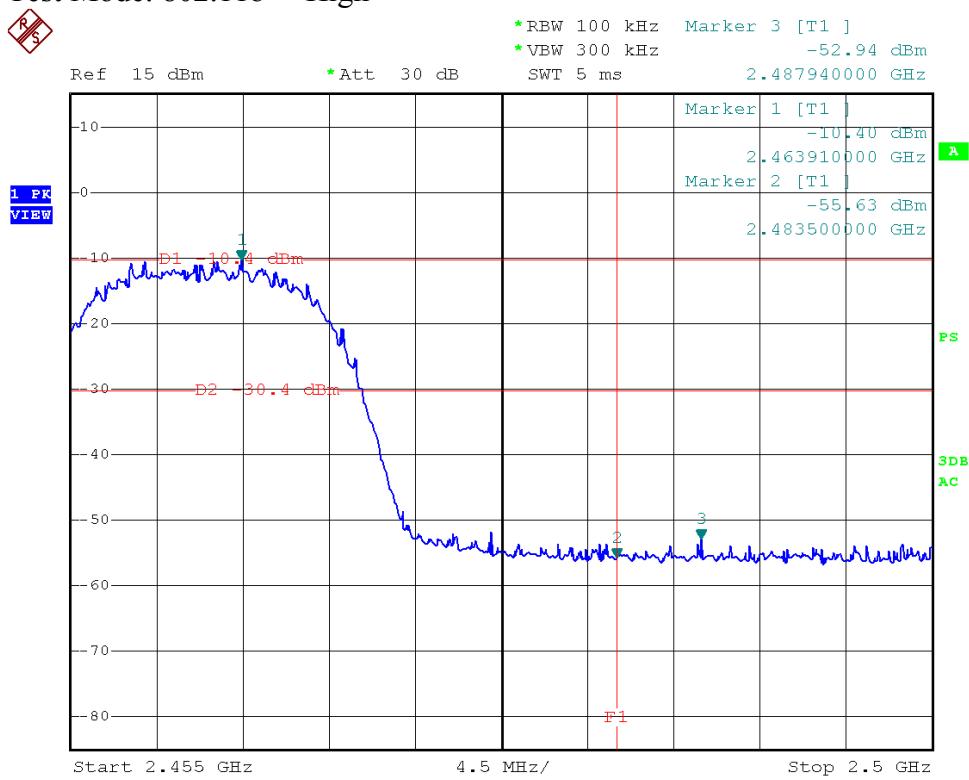
e. Test Plots

See the following page.

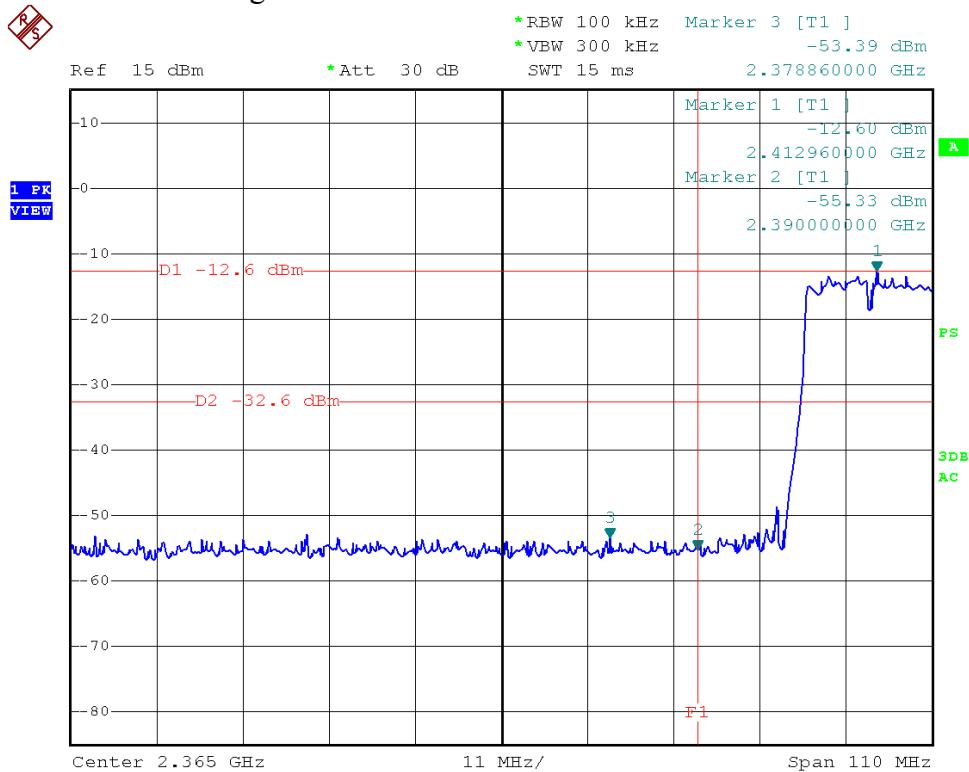
Test Mode: 802.11b ---Low



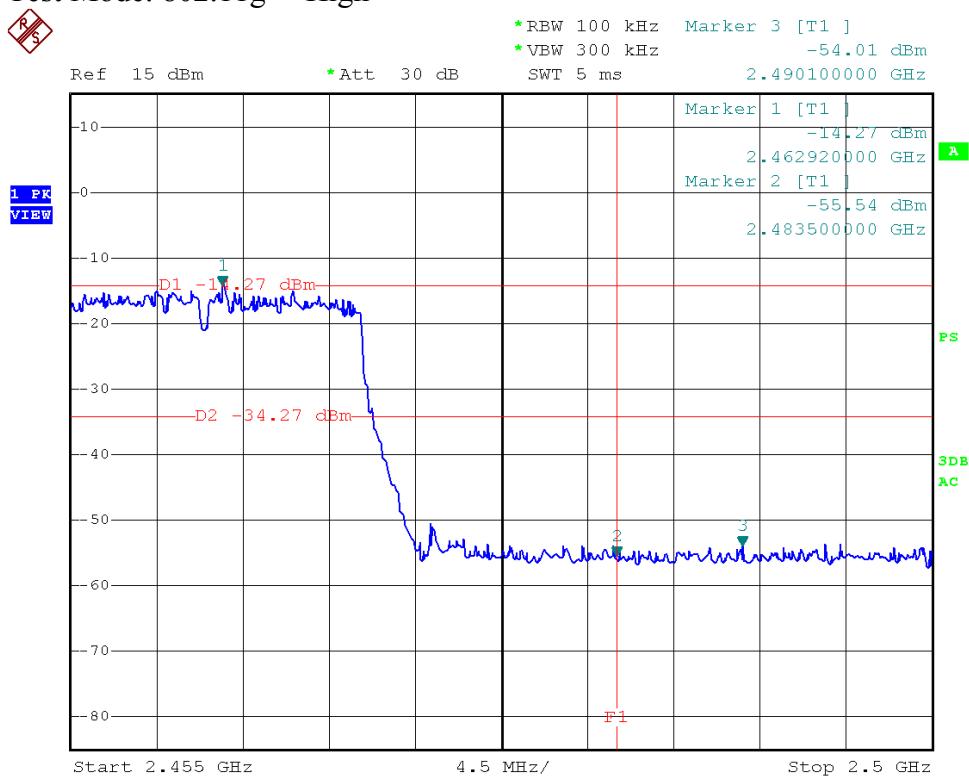
Test Mode: 802.11b ---High



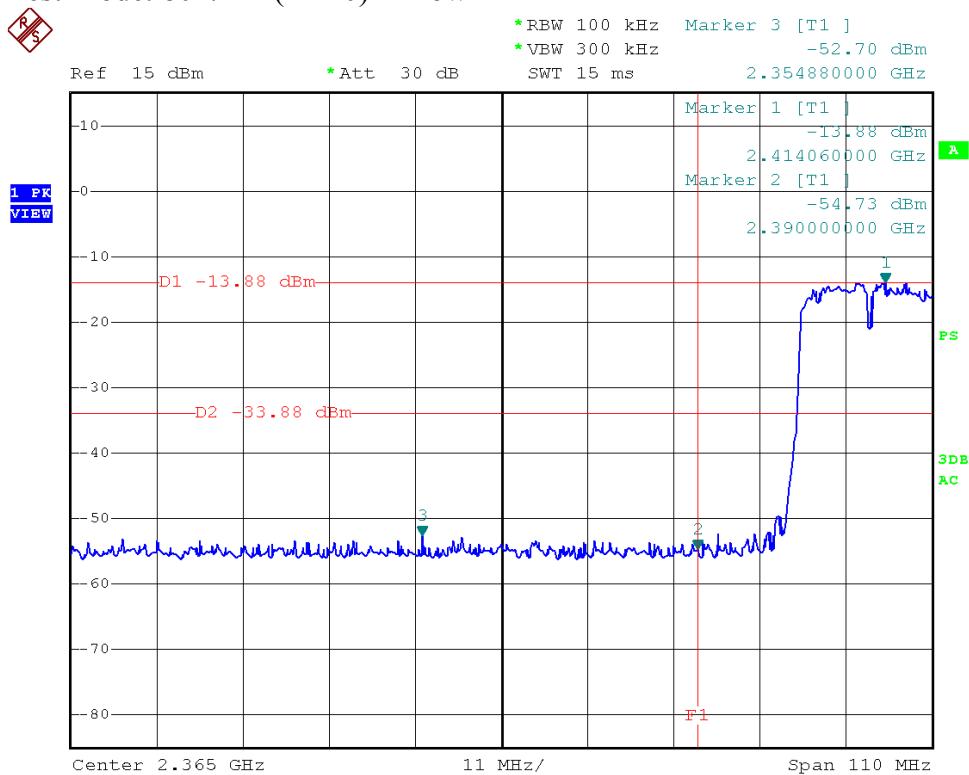
Test Mode: 802.11g ---Low



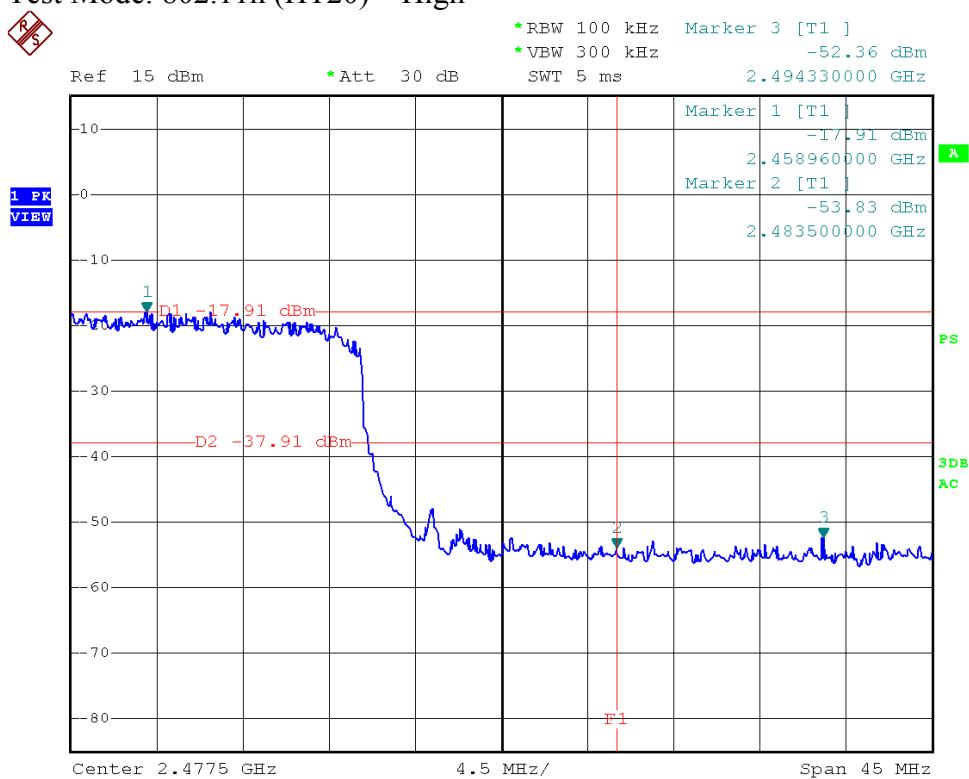
Test Mode: 802.11g ---High



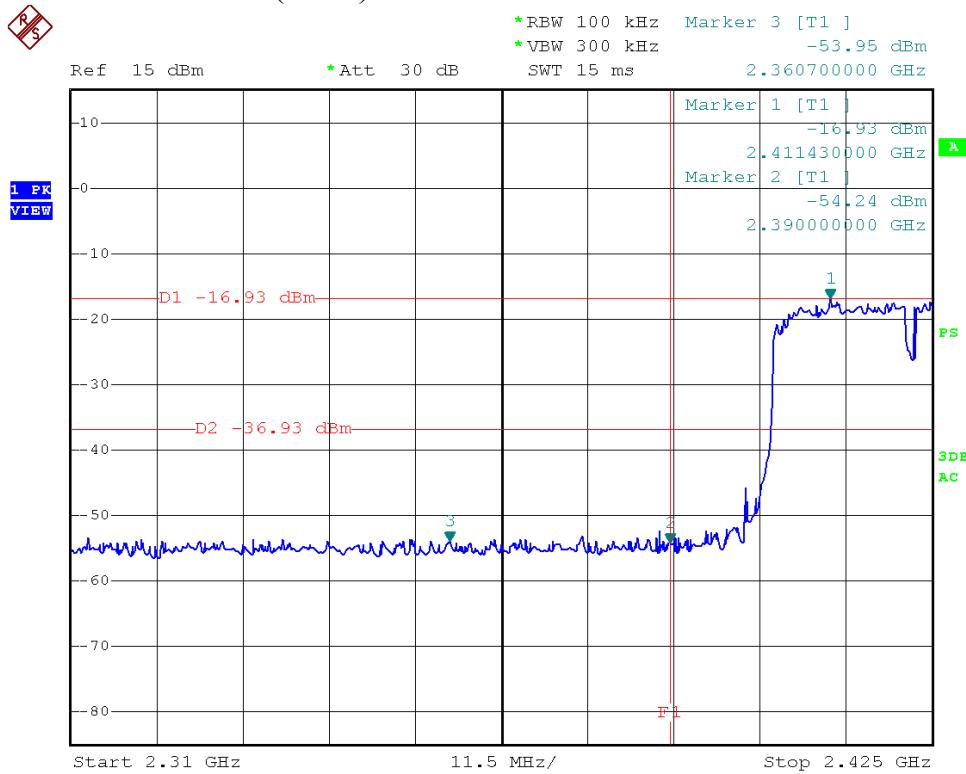
Test Mode: 802.11n (HT20) ---Low



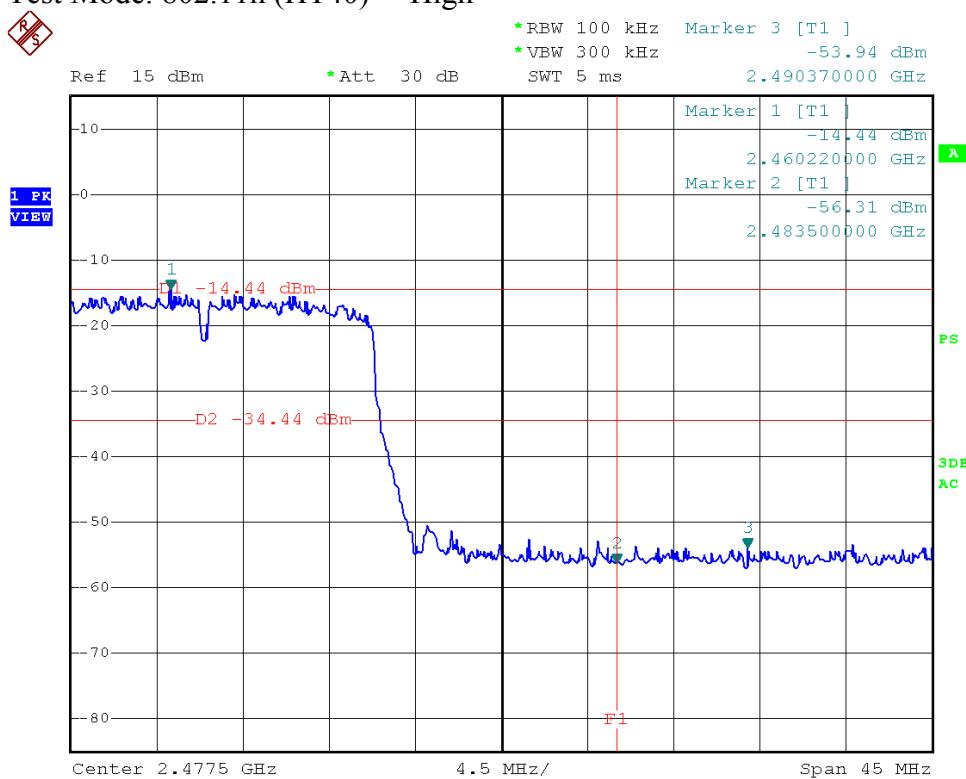
Test Mode: 802.11n (HT20)---High



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



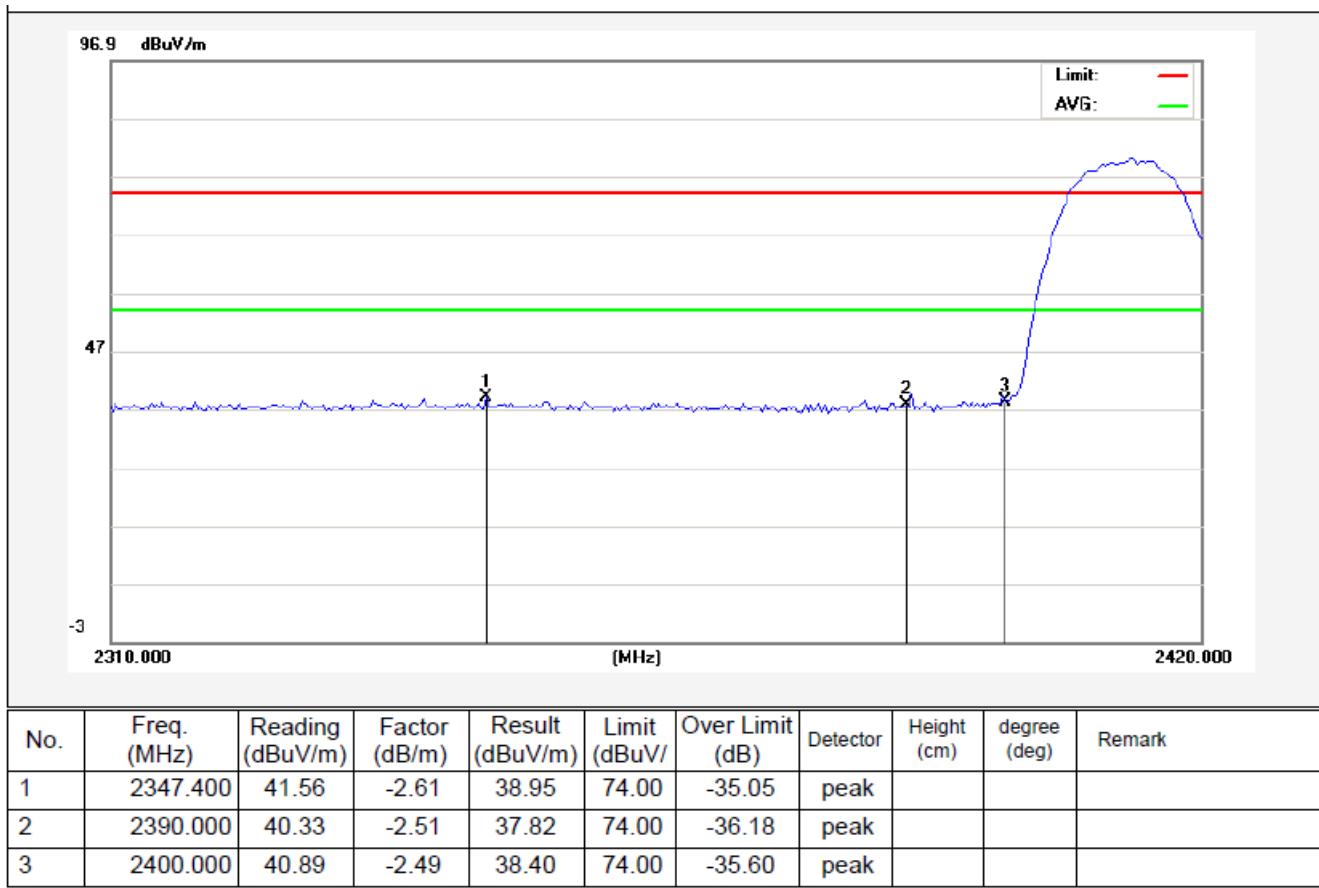
Test Mode: 802.11n (HT40) ---High



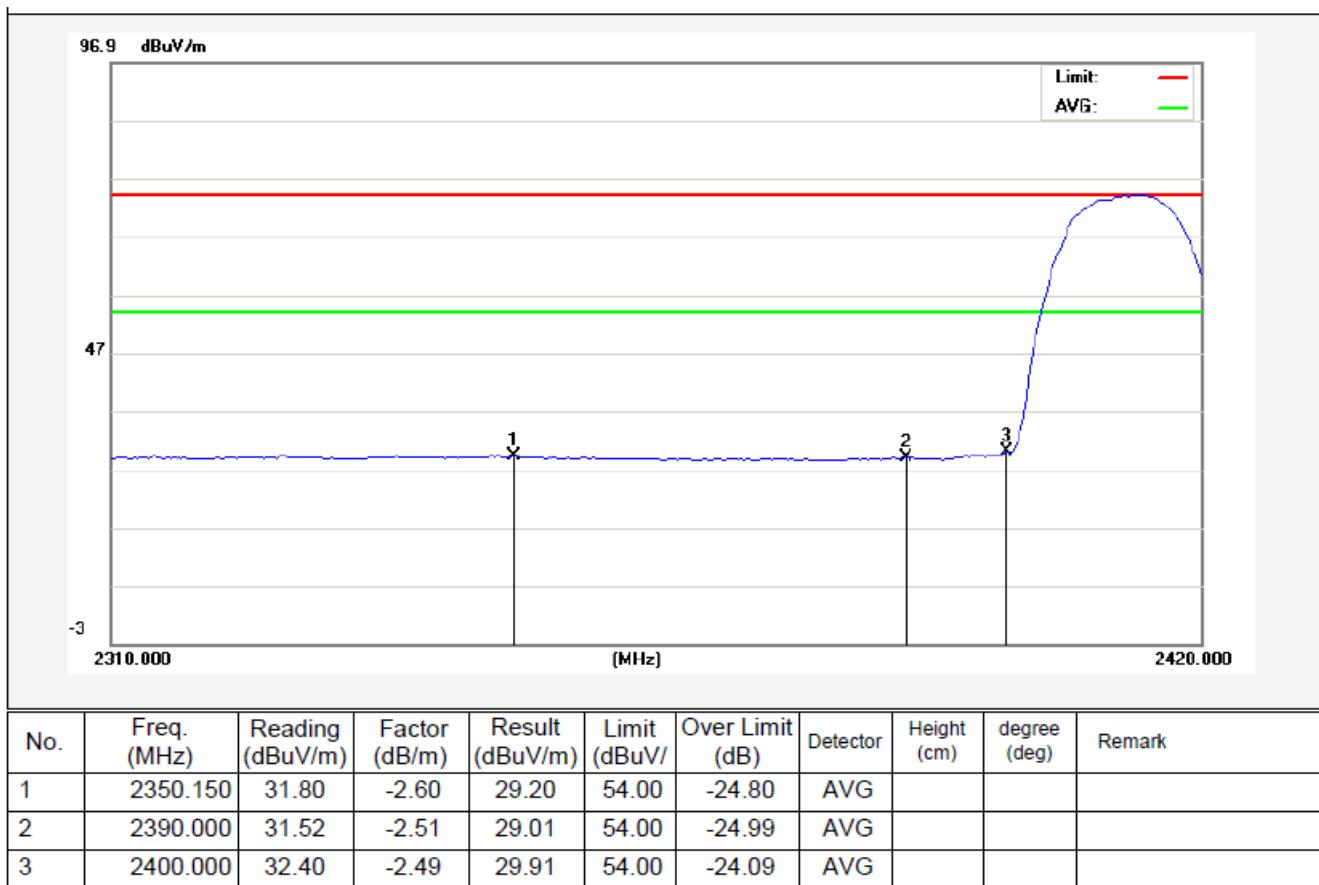
The Worst Mode: 802.11b

2412MHz

Horizontal-PEAK:



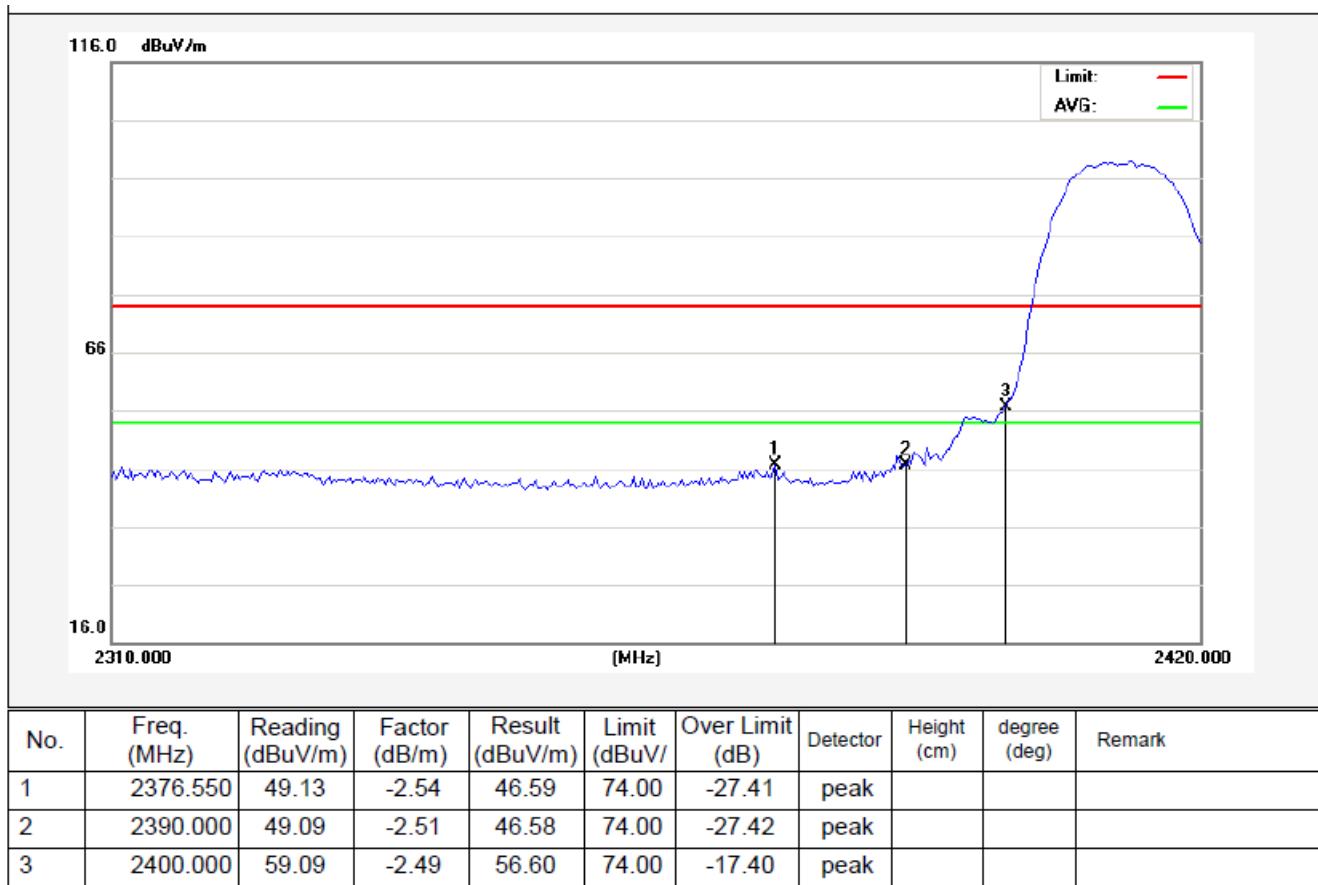
Horizontal-AV:



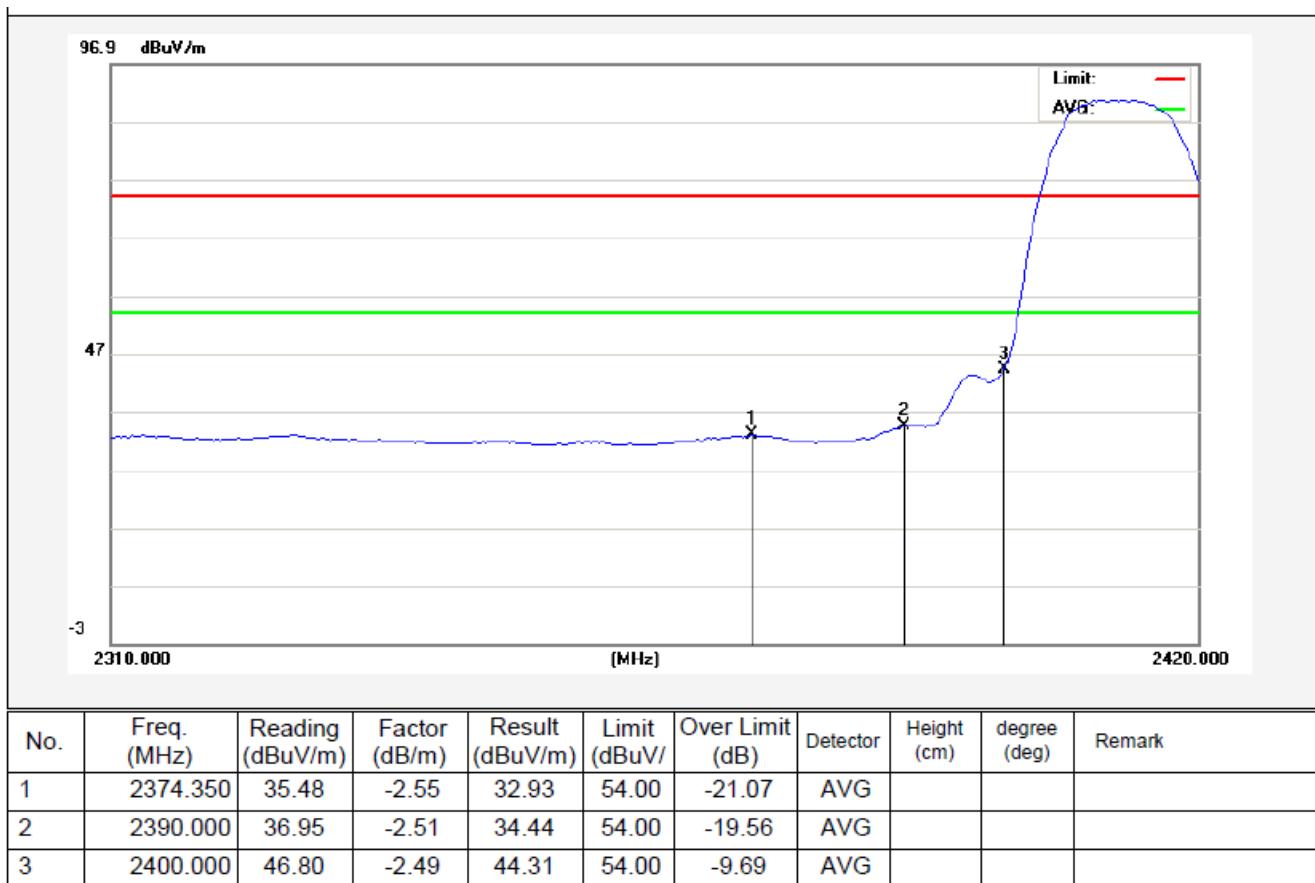
The Worst Mode: 802.11b

2412MHz

Vertical-PEAK:



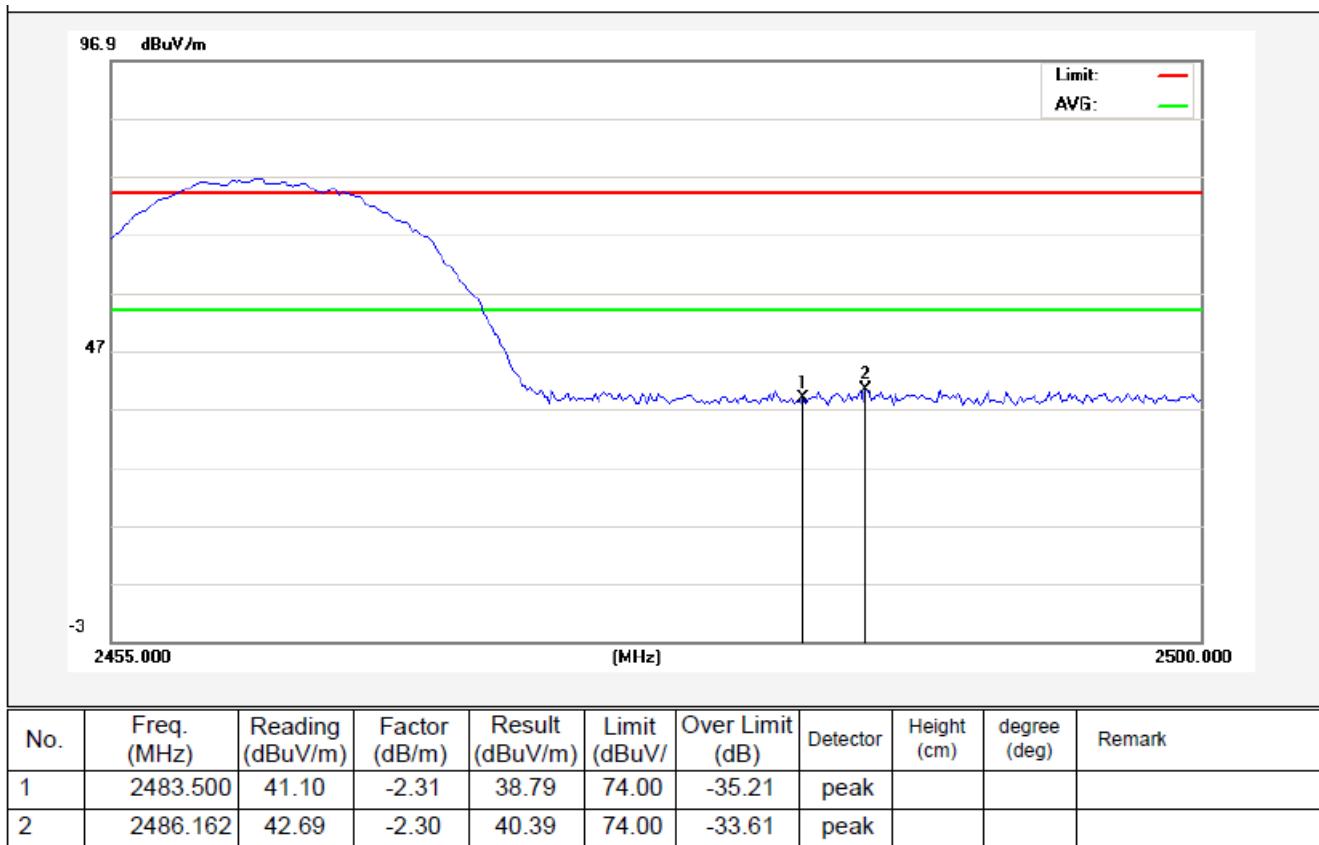
Vertical-AV:



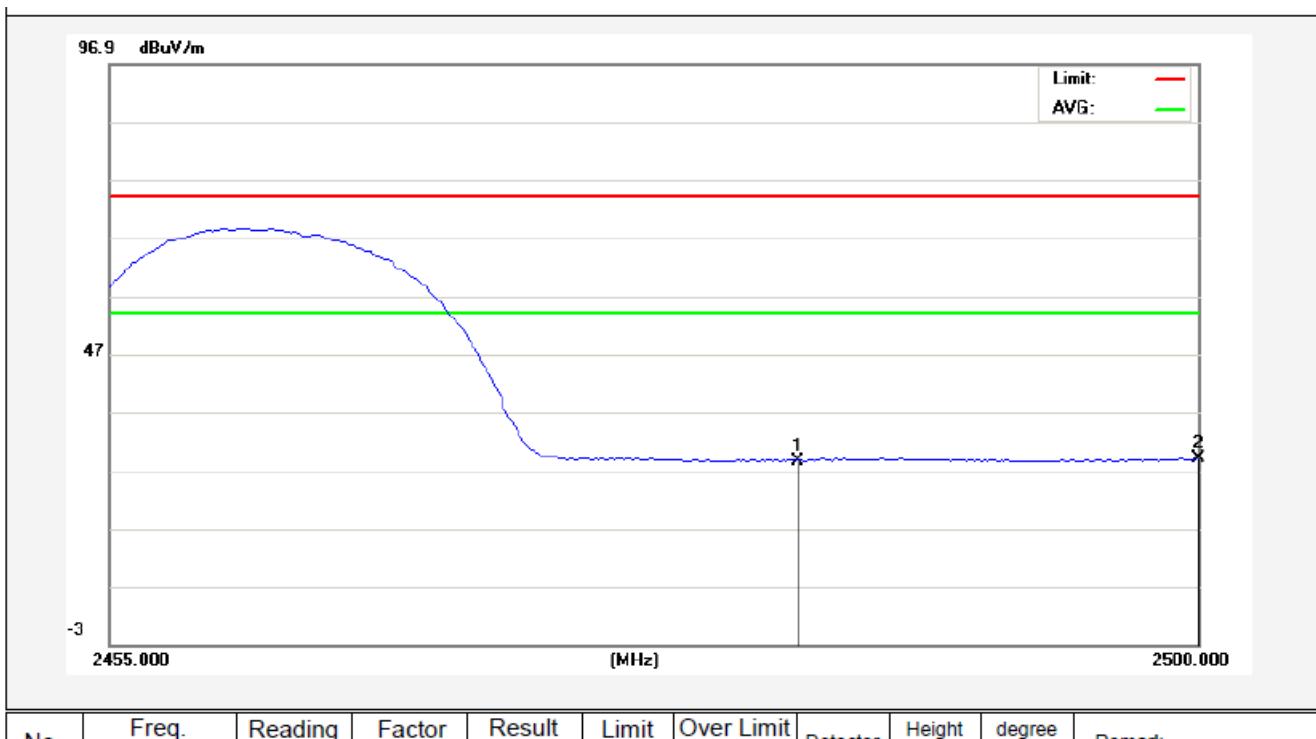
The Worst Mode: 802.11b

2462MHz

Horizontal-PEAK:



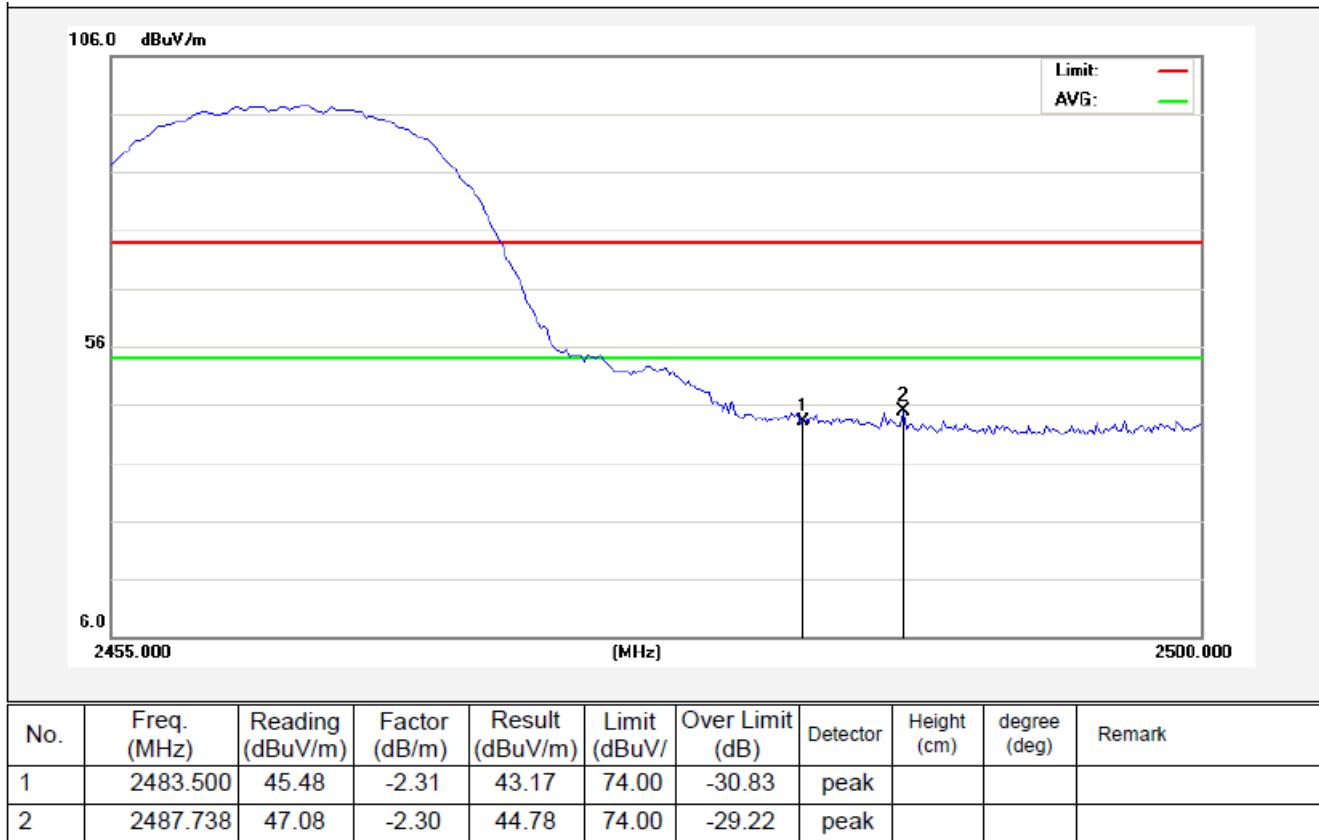
Horizontal-AV:



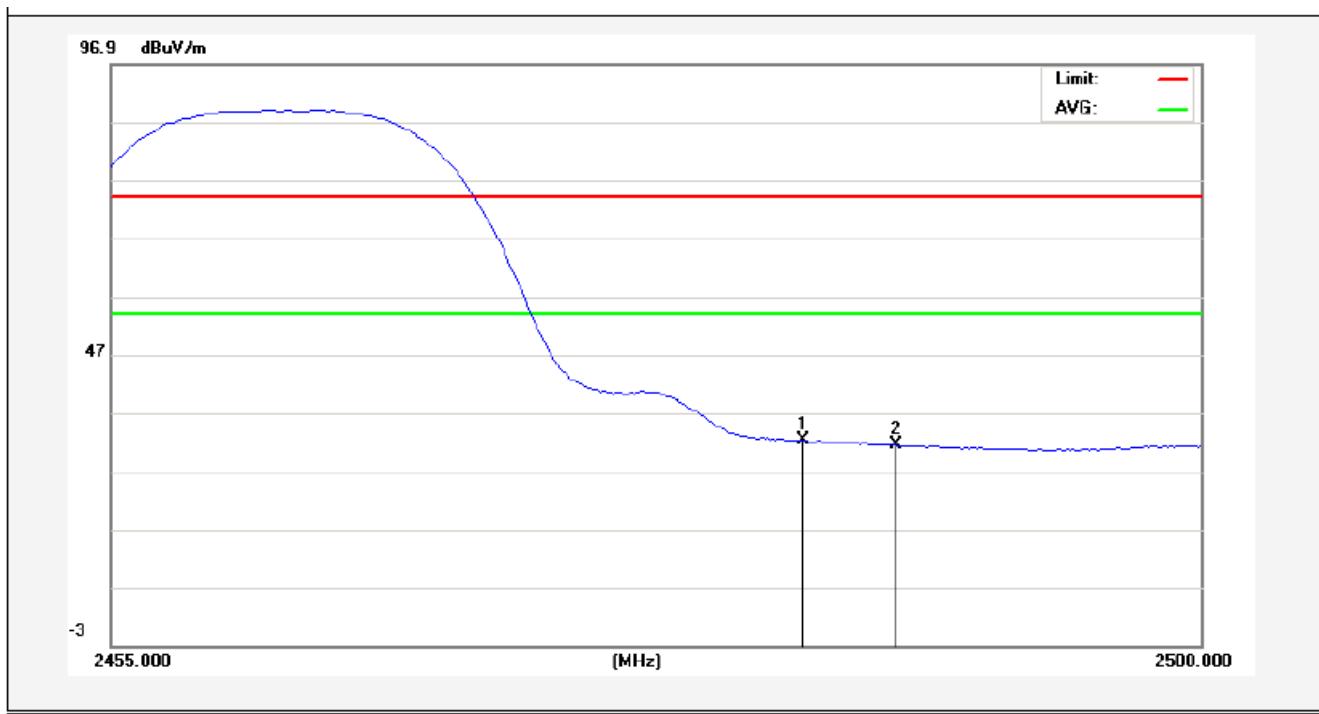
The Worst Mode: 802.11b

2462MHz

Vertical-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	2483.500	34.64	-2.31	32.33	54.00	-21.67	AVG			
2	2487.400	33.78	-2.30	31.48	54.00	-22.52	AVG			

4.5. 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.

c. Test Equipment

Same as the equipment listed in 4.2.

d. Test Setup

See 4.1

e. Test Results

Pass

f. Test Data

Please refer to the following data.

g. Test Plot See the following pages

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	Σ PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2412	-21.17	-		Pass
Mid	2437	-22.12	-	8.00	Pass
High	2462	-23.06	-		Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	PPSD (dBm)	Σ PPSD (dBm)	Limit (dBm)	Result
Low	2412	-26.68	-		Pass
Mid	2437	-26.44	-	8.00	Pass
High	2462	-27.47	-		Pass

Test mode: IEEE 802.11n (HT20)

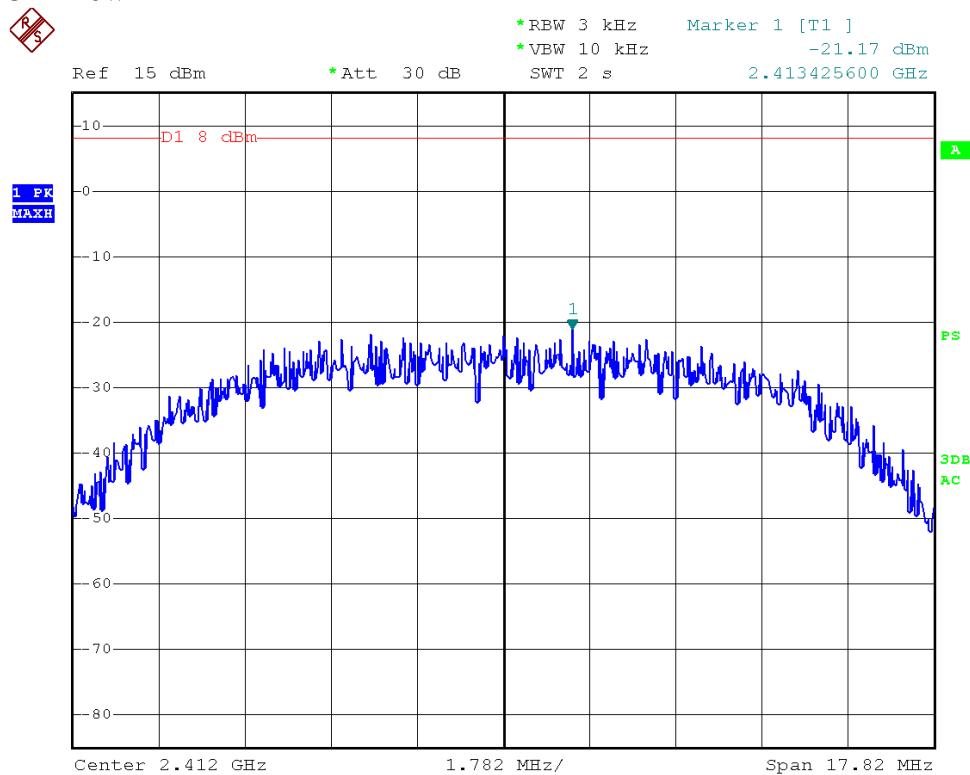
Channel	Frequency (MHz)	PPSD (dBm/3KHz)	Σ PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2412	-27.15	-		Pass
Mid	2437	-27.64	-	8.00	Pass
High	2462	-28.15	-		Pass

Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	Σ PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2422	-28.11	-		Pass
Mid	2437	-28.98	-	8.00	Pass
High	2452	-29.47	-		Pass

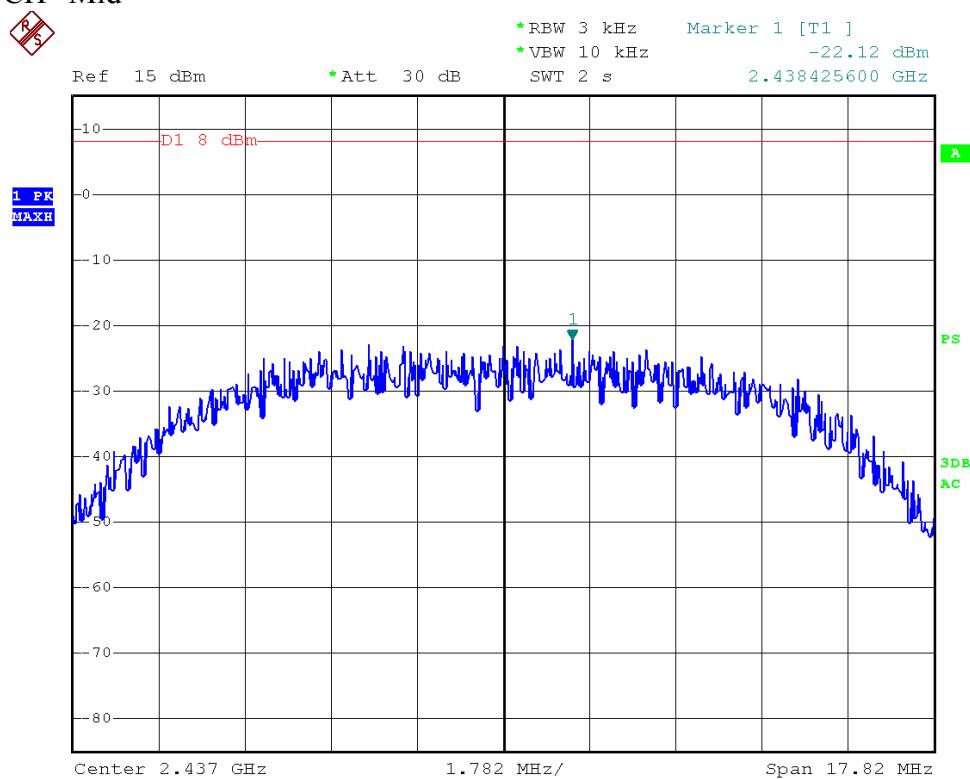
802.11 b

CH--Low

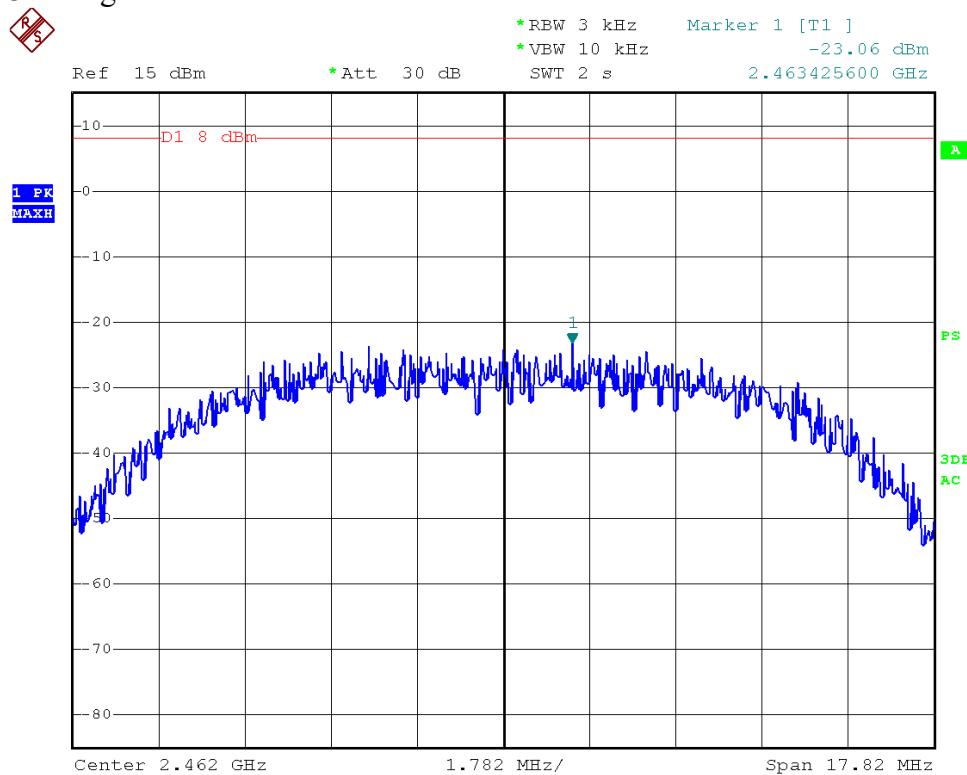


802.11 b

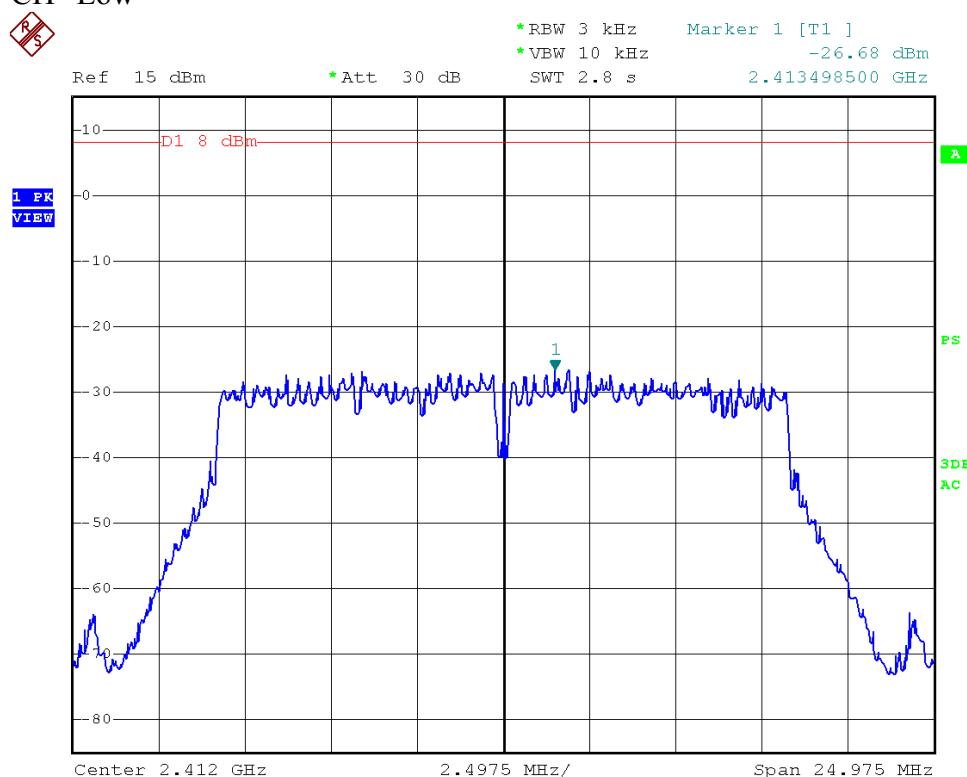
CH--Mid



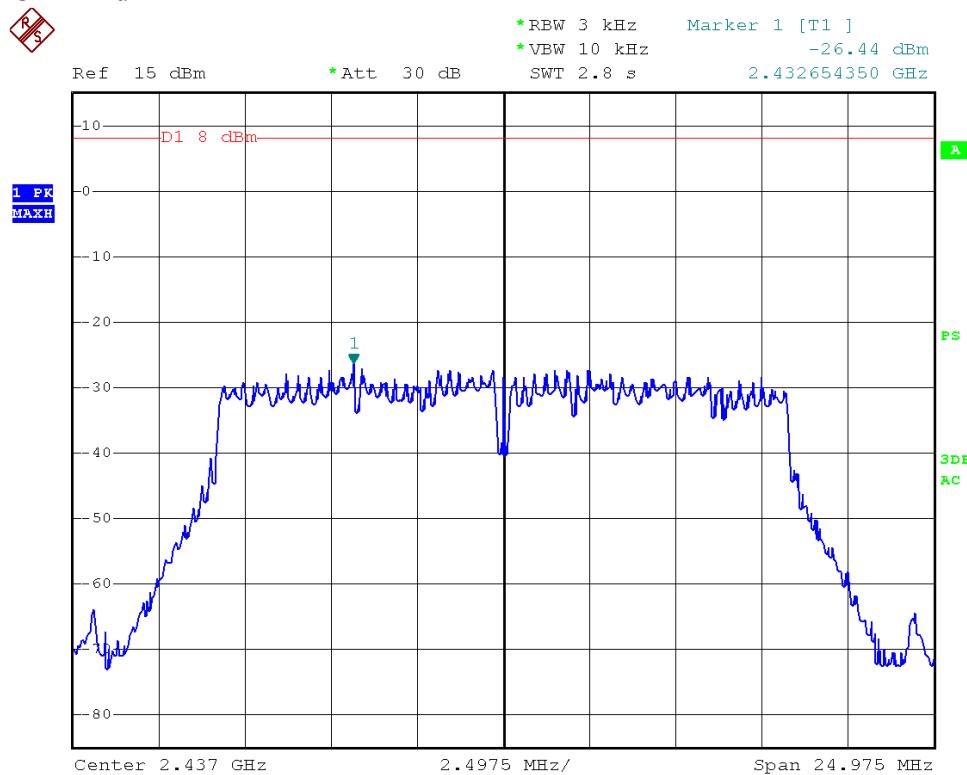
802.11 b CH--High



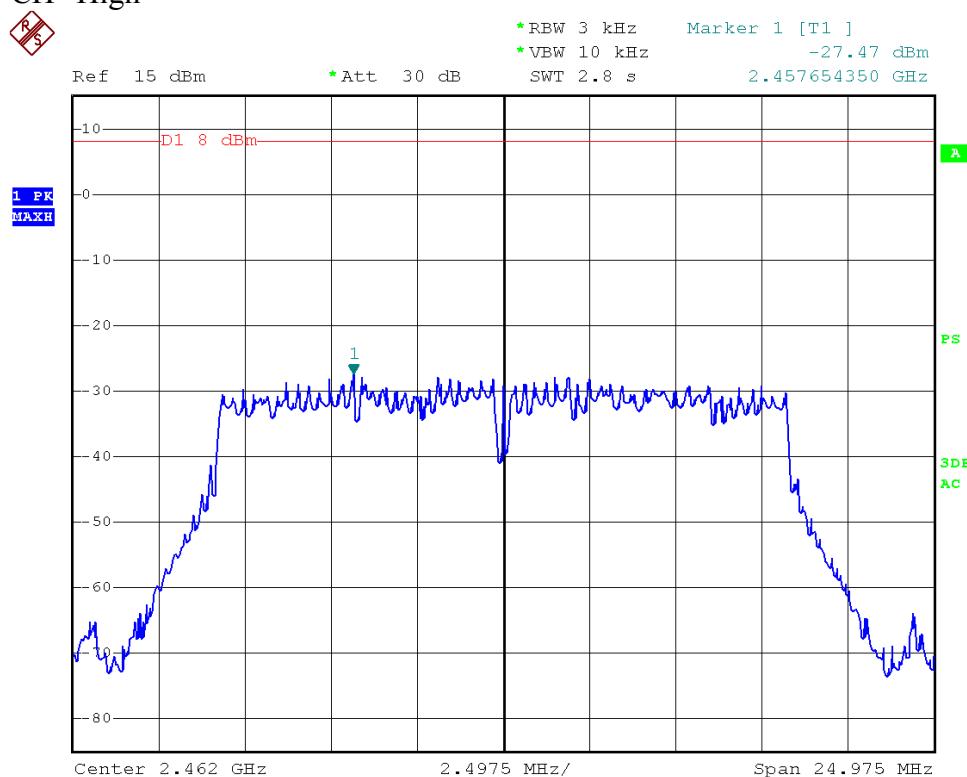
802.11g CH--Low



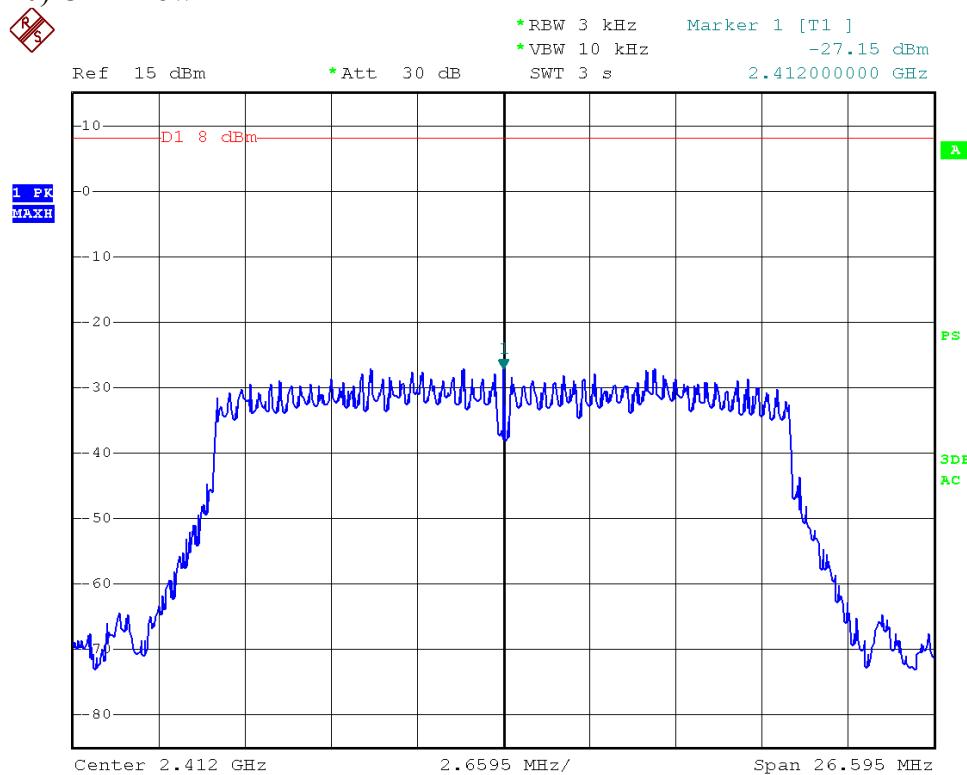
802.11g CH--Mid



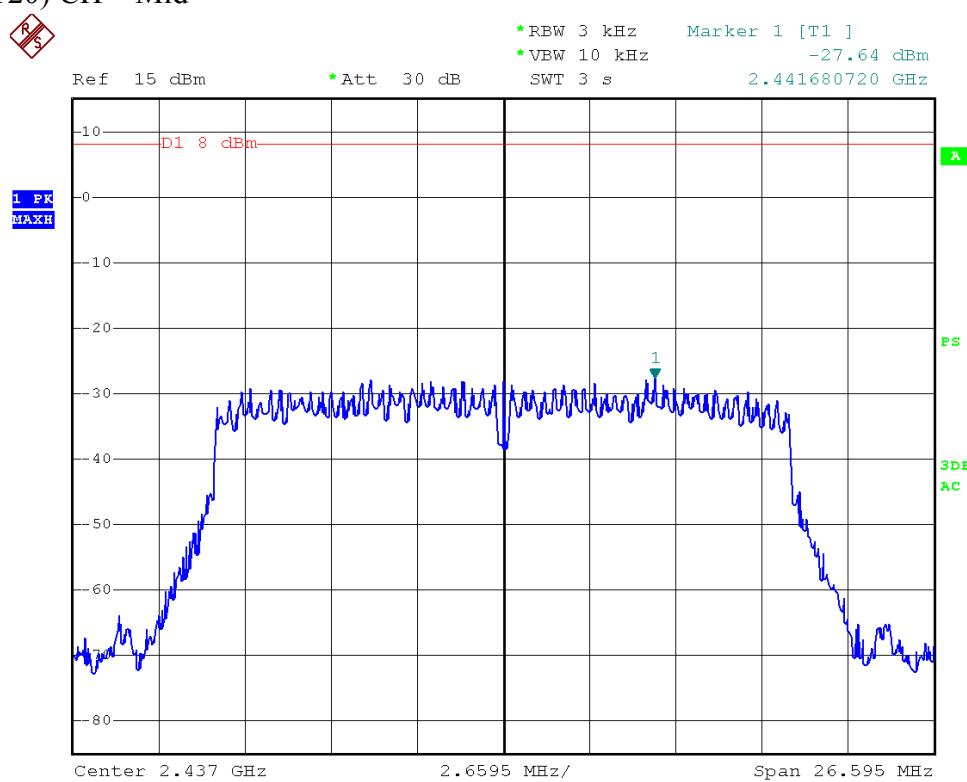
802.11g CH--High



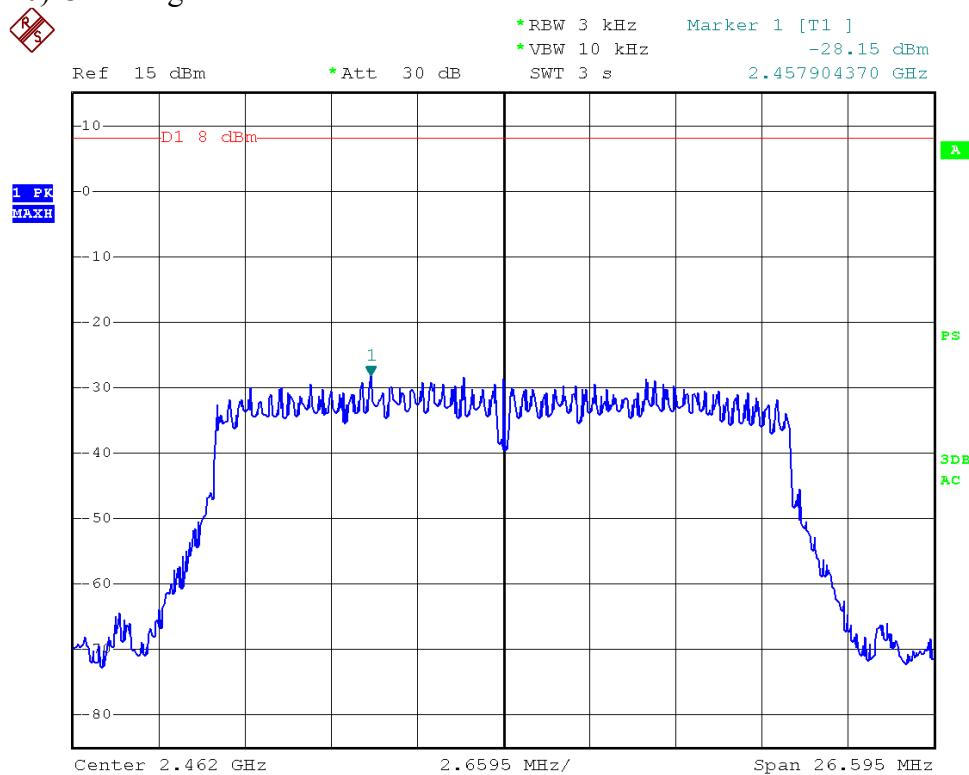
802.11n (HT20) CH—Low



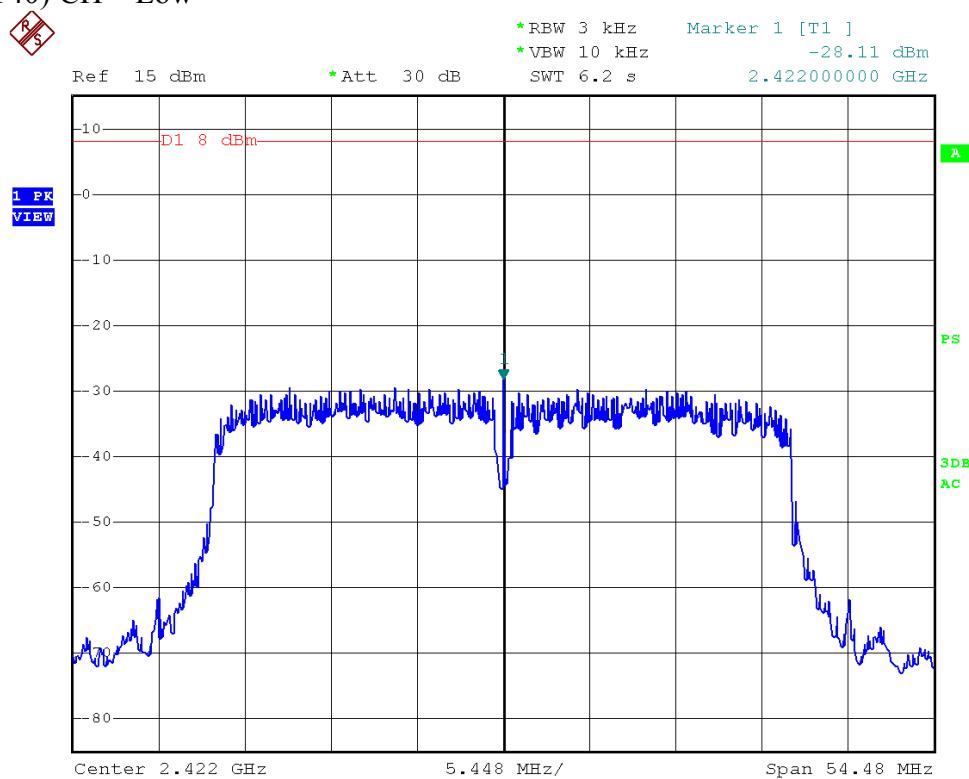
802.11n (HT20) CH—Mid



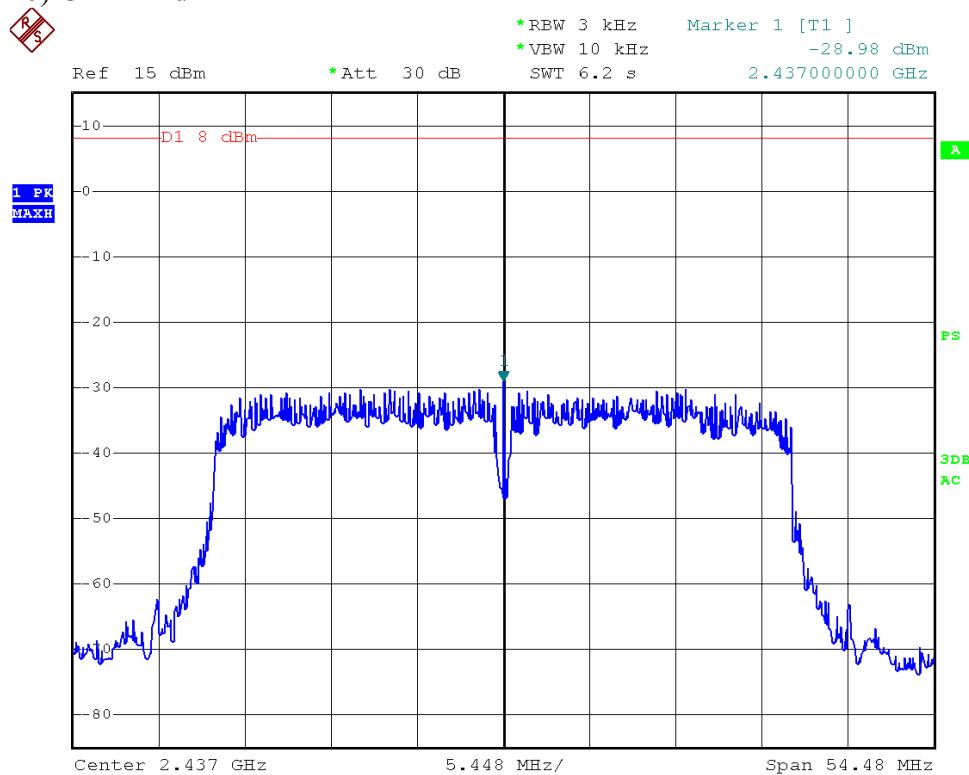
802.11n (HT20) CH—High



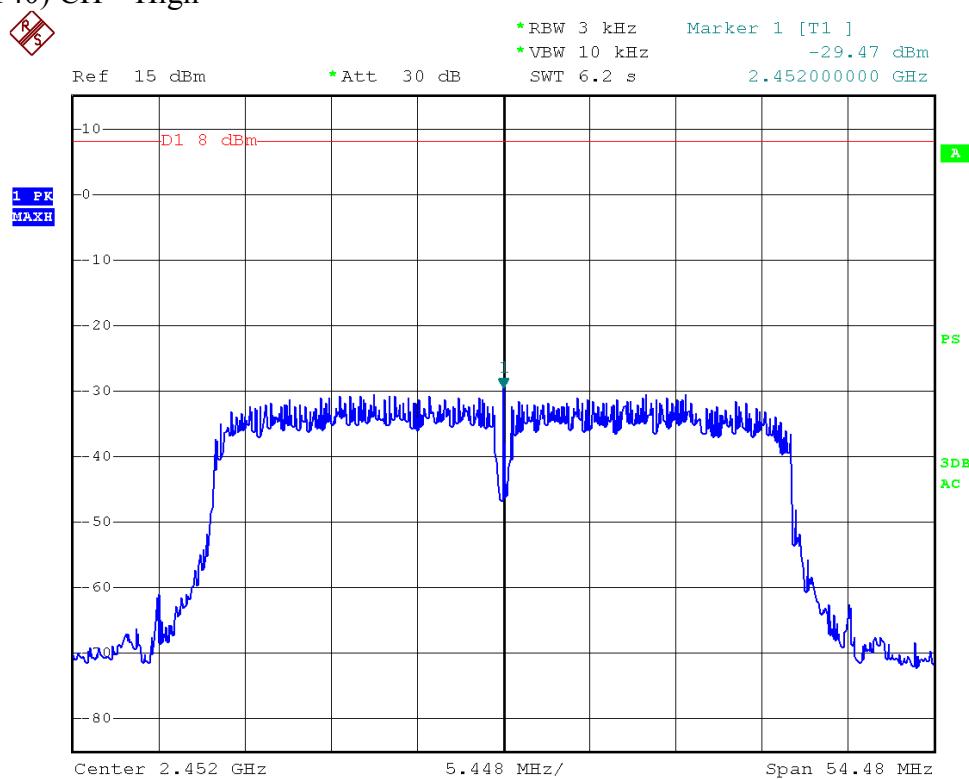
802.11n (HT40) CH—Low



802.11n (HT40) CH—Mid



802.11n (HT40) CH—High



4.6. Radiated Emissions

4.6.1.1. 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

4.6.1.2. Test Limits (\geq 30 MHZ)

FIELD STRENGTH of Fundamental: @3M	FIELD STRENGTH of Harmonics	30 - 88 MHz	40 dB μ V/m
902-928 MHZ		88 - 216 MHz	43.5
2.4-2.4835 GHz		216 - 960 MHz	46
94 dB μ V/m @3m	54 dB μ V/m @3m	ABOVE 960 MHz	54dB μ V/m

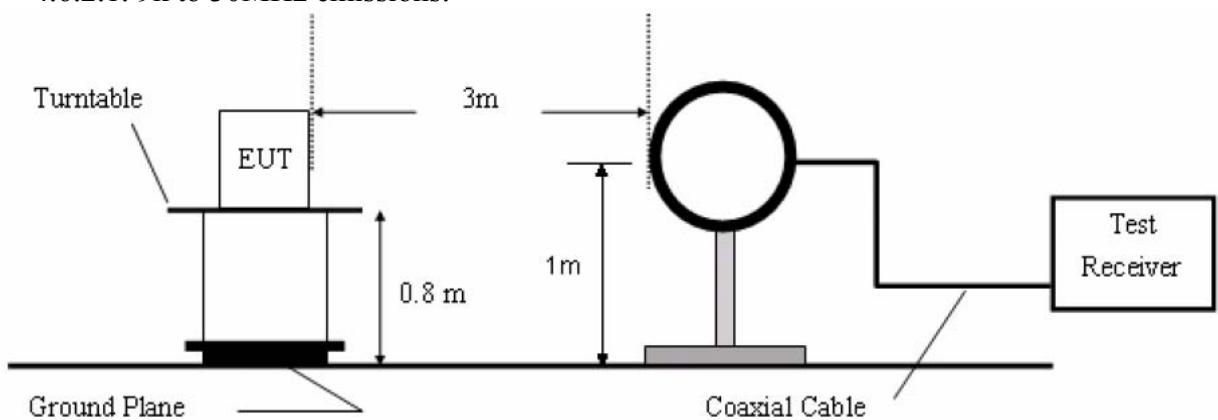
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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

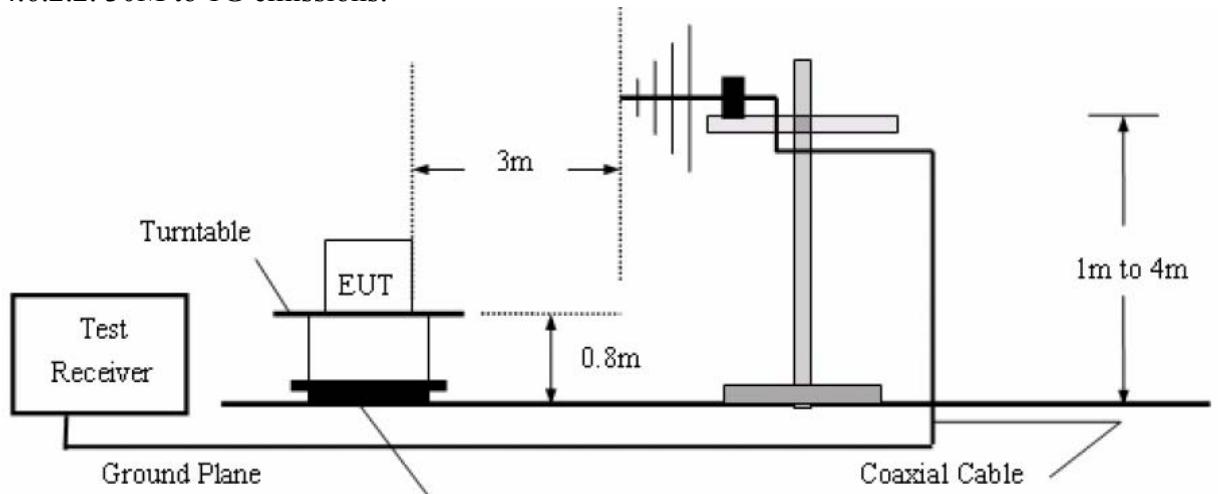
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Preamplifier	Instruments corporation	EMC011830	980100	Aug. 09, 2013	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 23, 2013	1 Year
3.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Aug. 09, 2013	3 Year
4.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 23, 2013	3 Year
5.	Pre-amplifier	SONOMA	310N	186860	Apr. 23, 2013	1 Year
6.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

4.6.2. Test Configuration:

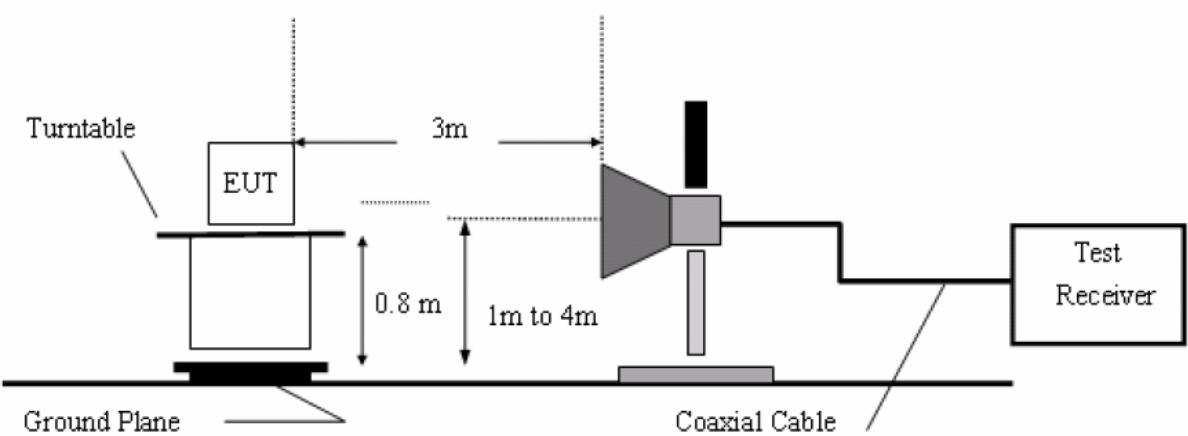
4.6.2.1. 9k to 30MHz emissions:



4.6.2.2. 30M to 1G emissions:



4.6.2.3. 1G to 40G emissions:



4.6.3. 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.

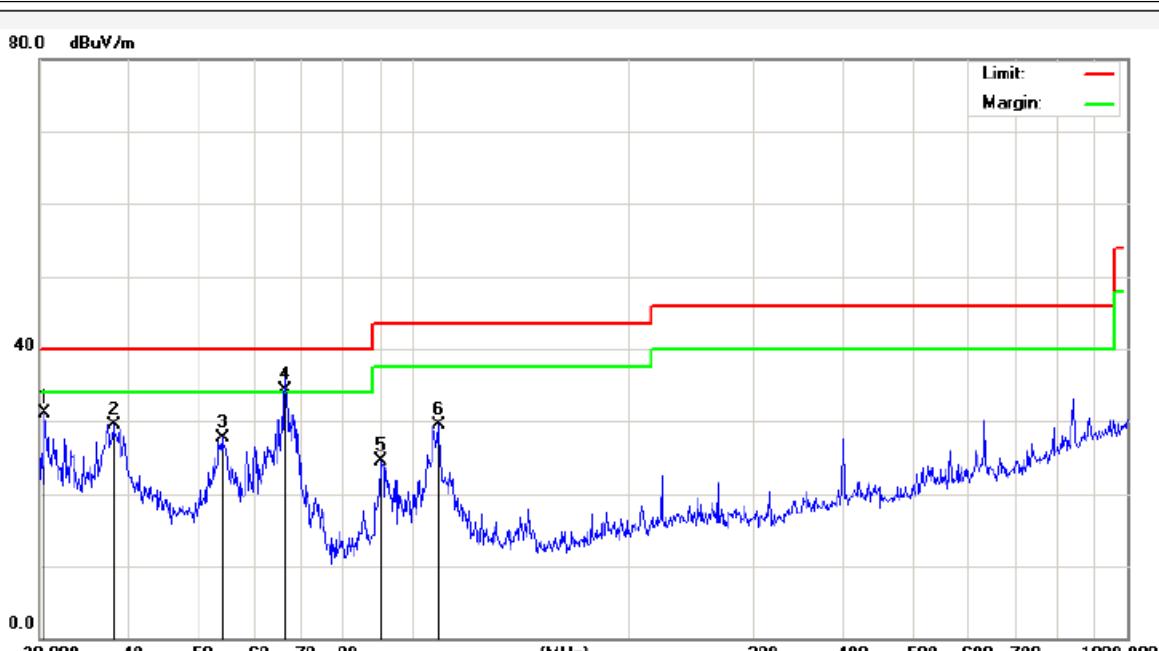
The EUT is tested in 9*6*6 Chamber.

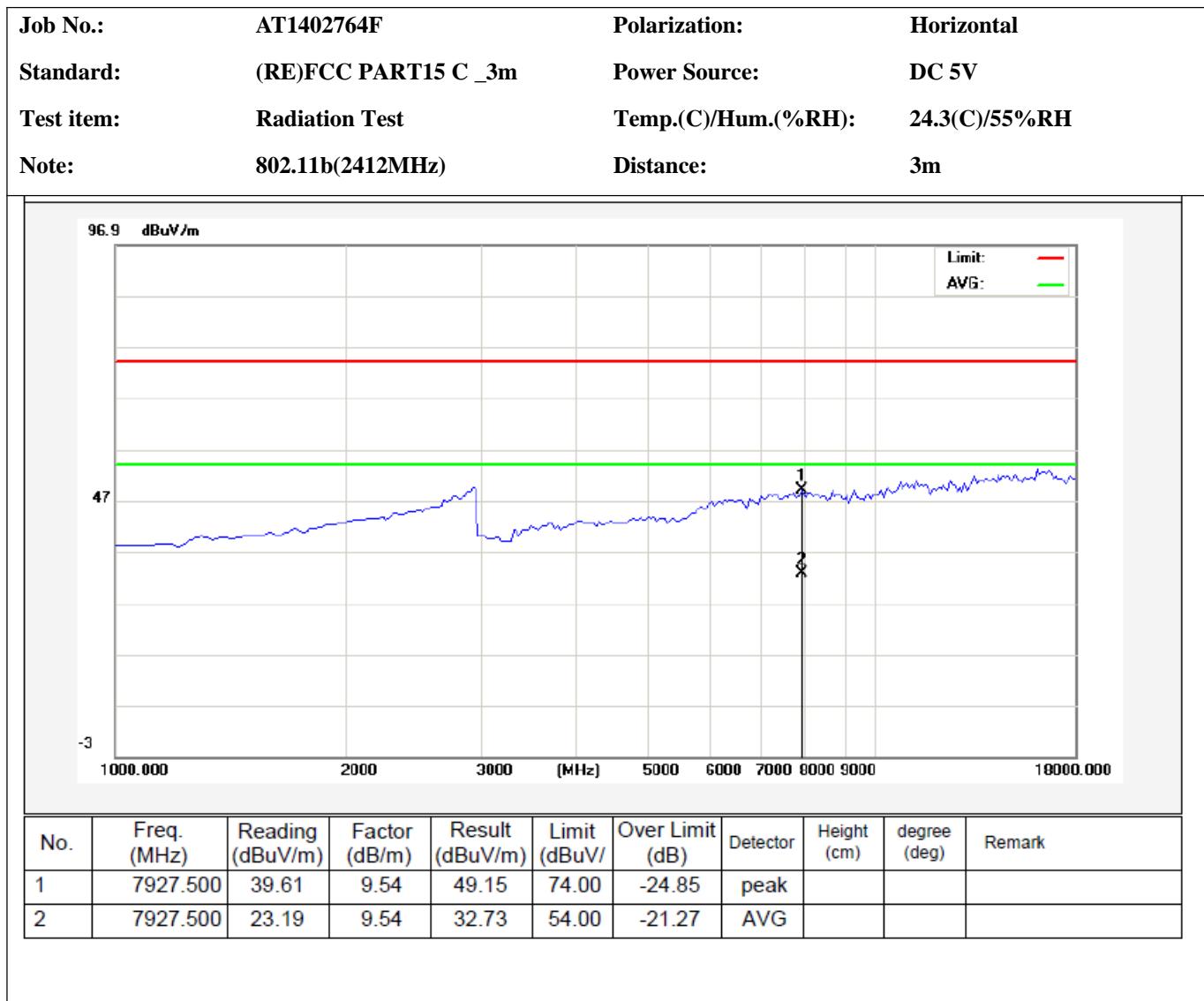
The test results are listed in Section 4.6.4.

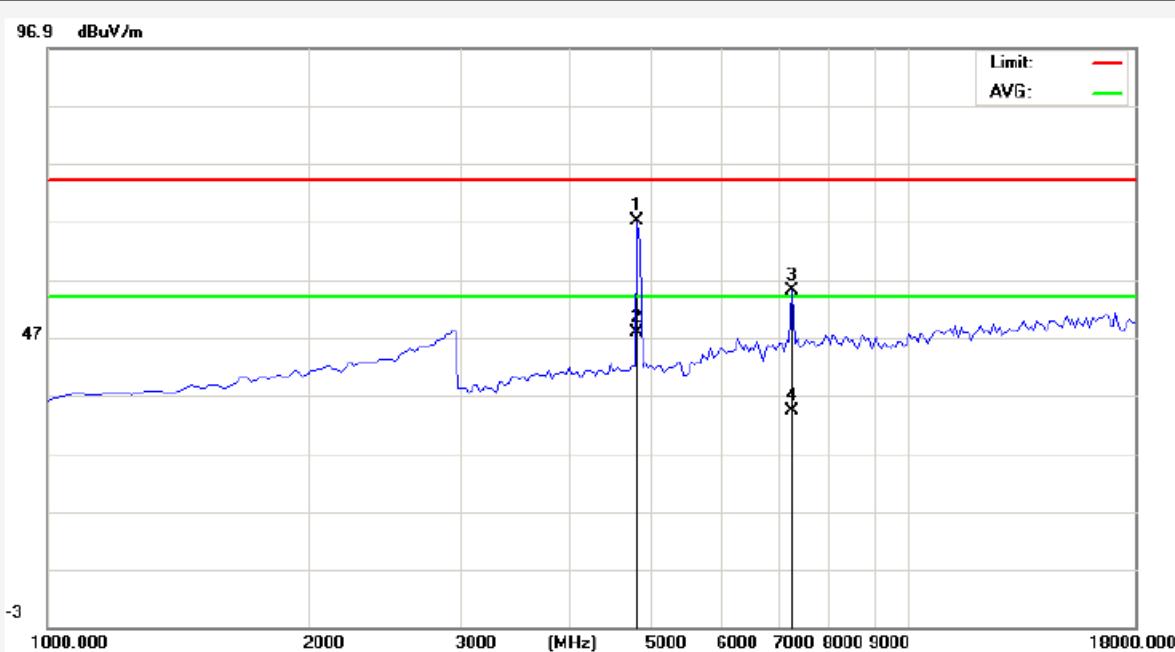
4.6.4. Test Results

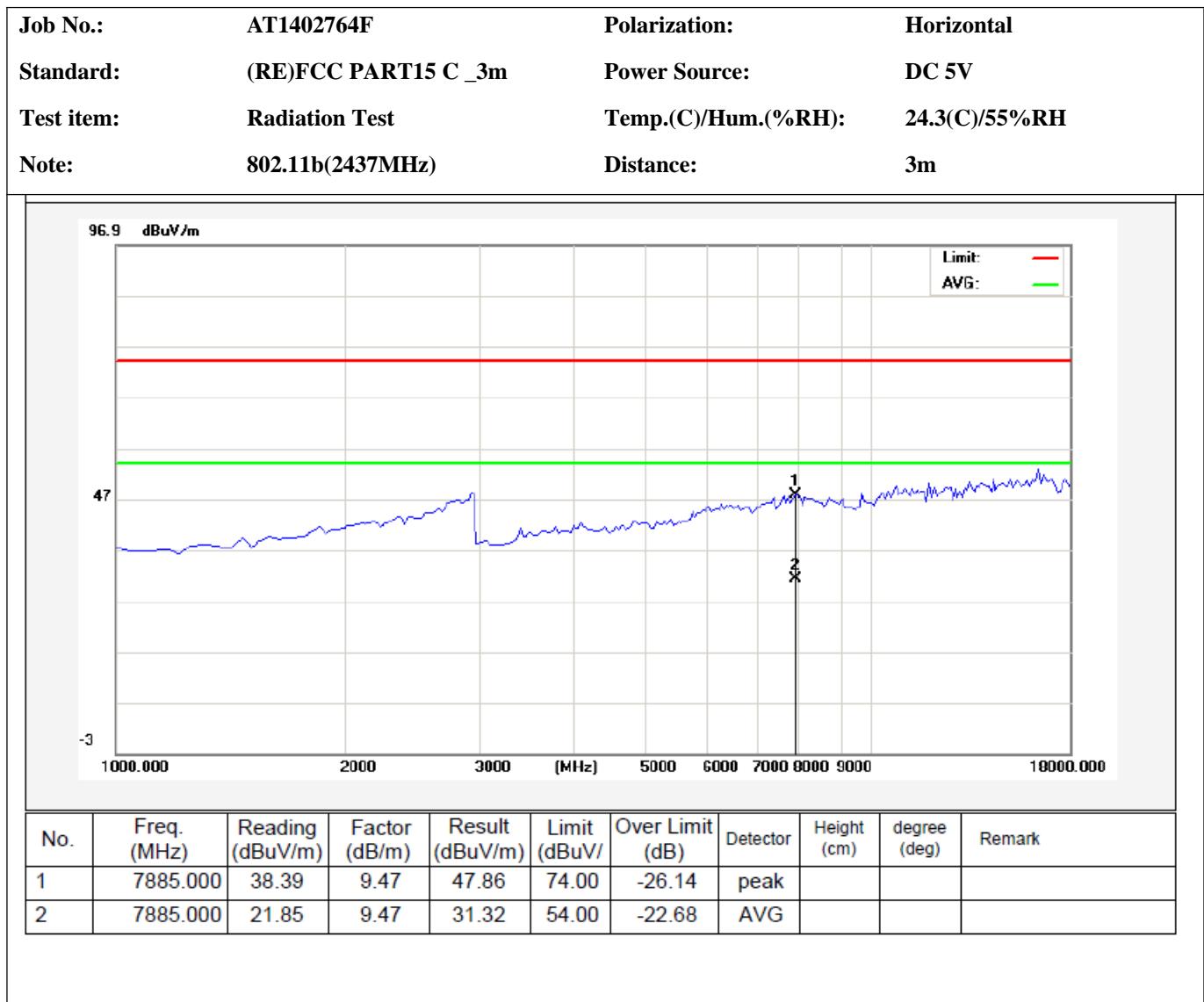
The EUT was tested on (Charging to adapter, Communication, Camera Mode, WIFI Mode) modes, only the worst data of (WIFI Mode) are attached in the following pages.

Job No.:	AT1402764F	Polarization:	Horizontal							
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 5V							
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH							
Test Mode:	WIFI Mode	Distance:	3m							
										
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	38.2120	47.82	-15.05	32.77	40.00	-7.23	peak			
2	54.4516	41.39	-14.88	26.51	40.00	-13.49	peak			
3	74.6569	52.33	-20.53	31.80	40.00	-8.20	peak			
4	106.7587	44.97	-20.68	24.29	43.50	-19.21	peak			
5	267.5455	45.28	-18.71	26.57	46.00	-19.43	peak			
6	420.5803	42.54	-12.38	30.16	46.00	-15.84	peak			

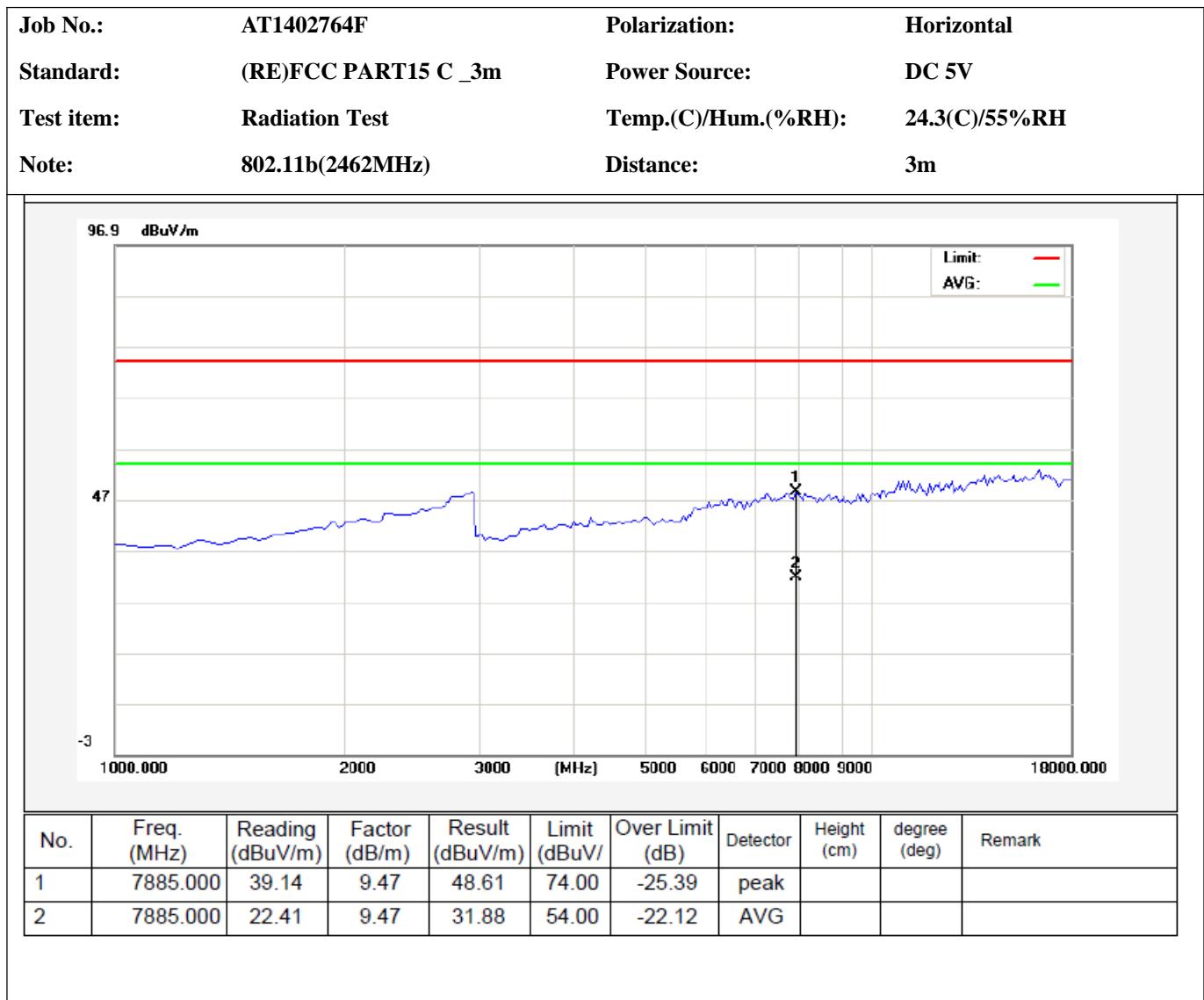
Job No.:	AT1402764F	Polarization:	Vertical							
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 5V							
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH							
Test Mode:	WIFI Mode	Distance:	3m							
										
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	30.5306	48.00	-16.88	31.12	40.00	-8.88	peak			
2	38.0783	44.70	-15.11	29.59	40.00	-10.41	peak			
3	54.0711	42.55	-14.87	27.68	40.00	-12.32	peak			
4	66.2662	52.32	-18.01	34.31	40.00	-5.69	QP	100	0	
5	90.2205	42.33	-17.80	24.53	43.50	-18.97	peak			
6	108.6470	45.13	-15.64	29.49	43.50	-14.01	peak			



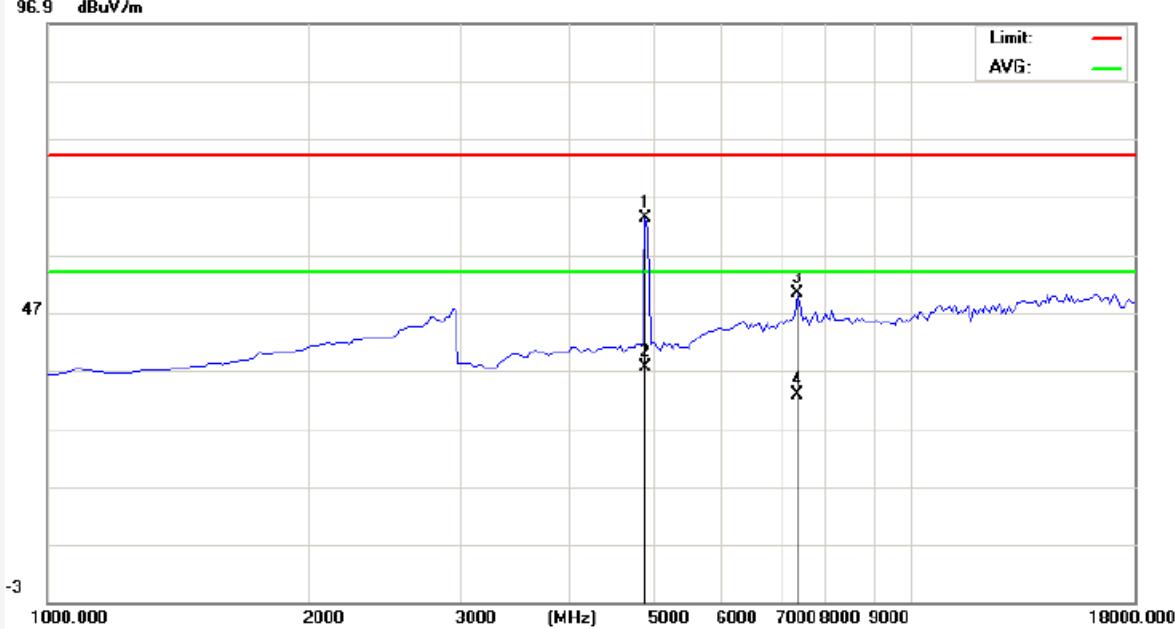
Job No.:	AT1402764F	Polarization:	Vertical							
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 5V							
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH							
Note:	802.11b(2412MHz)	Distance:	3m							
										
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4825.000	63.58	3.34	66.92	74.00	-7.08	peak			
2	4825.000	44.32	3.34	47.66	54.00	-6.34	Avg			
3	7247.500	46.48	8.48	54.96	74.00	-19.04	peak			
4	7247.500	25.87	8.48	34.35	54.00	-19.65	Avg			



Job No.:	AT1402764F	Polarization:	Vertical							
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 5V							
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH							
Note:	802.11b(2437MHz)	Distance:	3m							
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	62.09	3.41	65.50	74.00	-8.50	peak			
2	4867.500	43.92	3.41	47.33	54.00	-6.67	Avg			
3	7332.500	46.11	8.58	54.69	74.00	-19.31	peak			
4	7332.500	27.54	8.58	36.12	54.00	-17.88	Avg			



Job No.:	AT1402764F	Polarization:	Vertical
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 5V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Note:	802.11b(2462MHz)	Distance:	3m

96.9 dBuV/m									
									
Limit:									
AVG:									
96.9									
47									
-3									
1000.000	2000	3000	4000	5000	6000	7000	8000	9000	10000.000

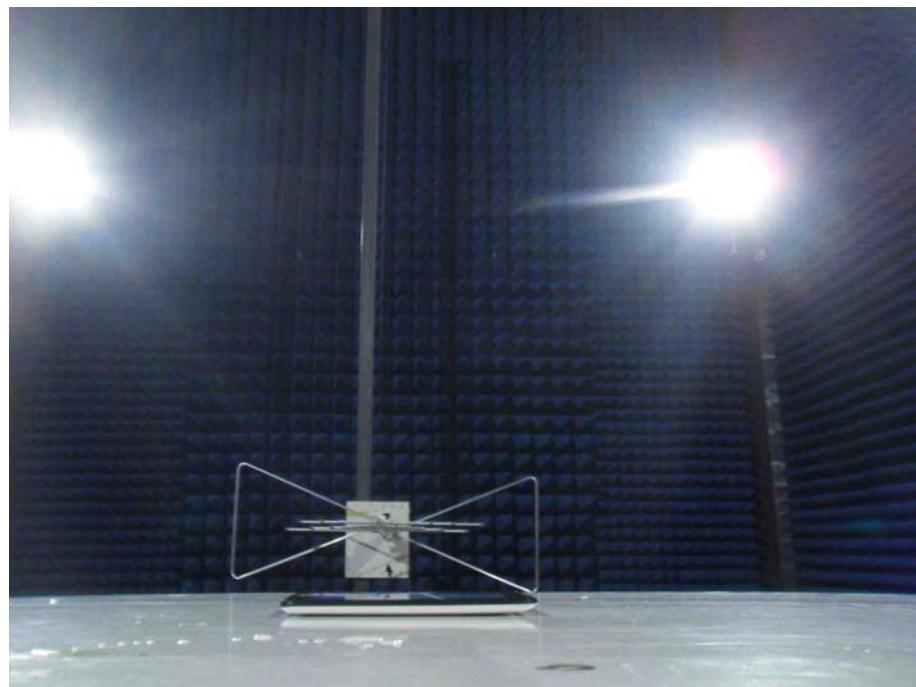
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4910.000	59.88	3.49	63.37	74.00	-10.63	peak			
2	4910.000	34.06	3.49	37.55	54.00	-16.45	AVG			
3	7375.000	41.70	8.63	50.33	74.00	-23.67	peak			
4	7375.000	24.15	8.63	32.78	54.00	-21.22	AVG			

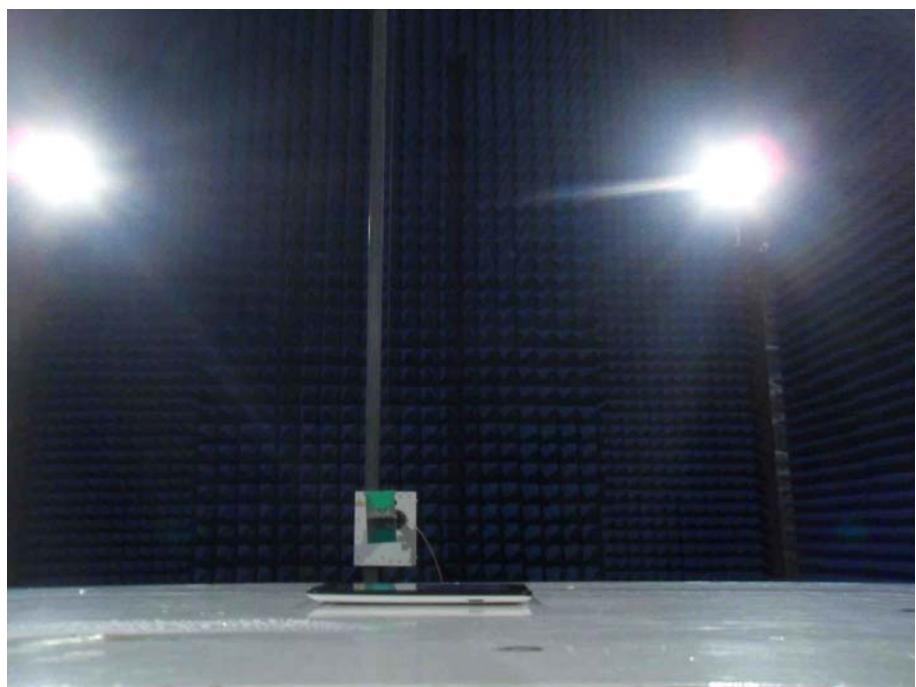
5. PHOTOGRAPH

5.1. Photo of Conducted Emission Measurement



5.2. Photo of Radiation Emission Test





APPENDIX I (EXTERNAL PHOTOS)

Figure 1
The EUT-Overall View



Figure 2
The EUT- Front View



Figure 3
The EUT- Back View



Figure 4
The EUT- Side View



APPENDIX II (INTERNAL PHOTOS)

Figure 5
The EUT-Inside View



Figure 6
The EUT-Inside View



Figure 7
PCB of the EUT-Front View

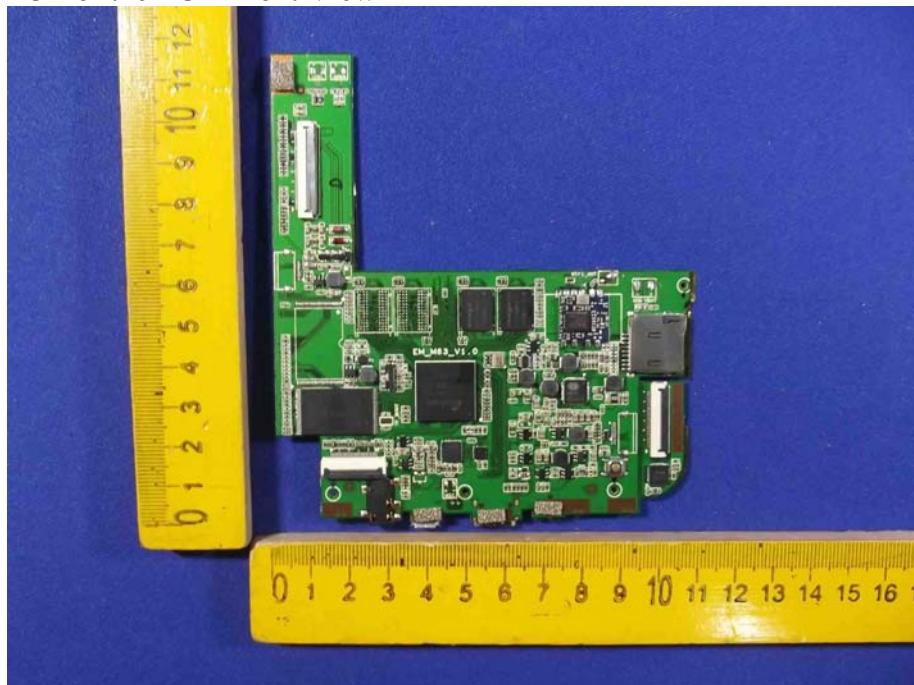


Figure 8
PCB of the EUT-Back View

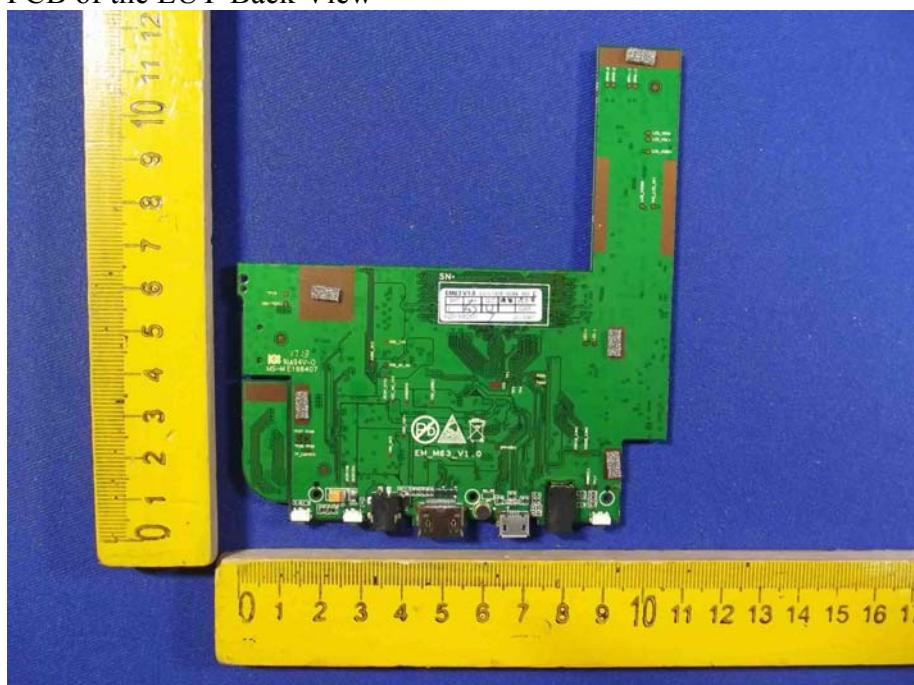


Figure 9
PCB of the EUT-Front View



Figure 10
PCB of the EUT-Back View

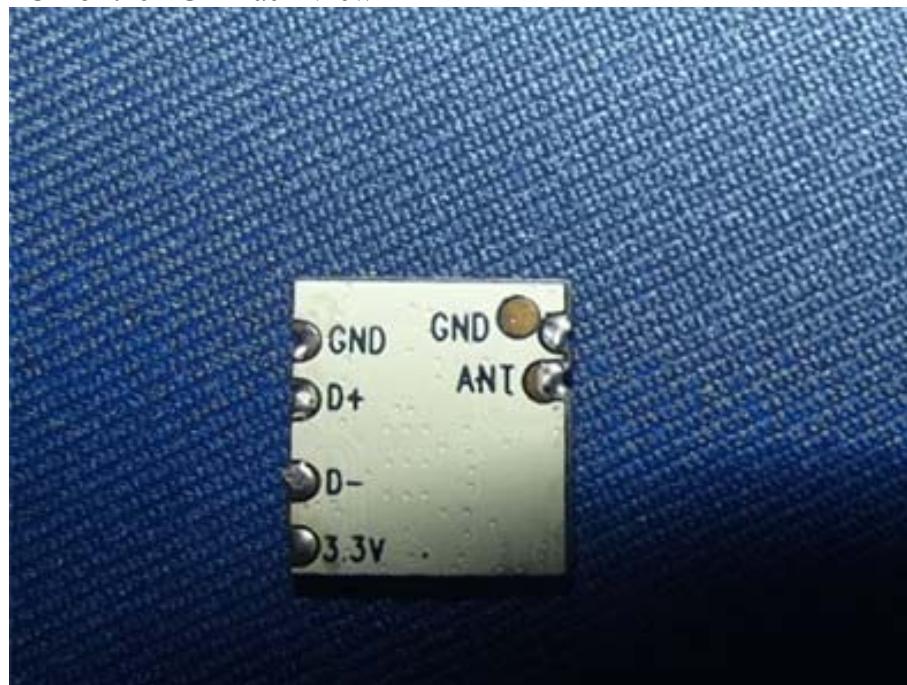


Figure 11
Photos of Antenna Location

