FCC TEST REPORT

Test report
On Behalf of
Shenzhen Zidoo Technology Co., Ltd.
For
SMART TV BOX
Model No.: X6 PRO, X6
FCC ID: 2AGN7-X6PRO

Prepared for :	**Shenzhen Zidoo Technology Co., Ltd.** **Central Avenue Building A m, Unit 12D Xixiang Ave, BaoAn District, Shenzhen.**
Prepared By :	**WST Certification & Testing (HK) Limited** **12/F., San Toi Building,137-139 Connaught Road Central,Hong Kong**
Date of Test:	**Nov. 12, 2015 ~ Nov. 19, 2015**
Date of Report:	**Nov. 20, 2015**
Report Number:	**WST15101103-E**

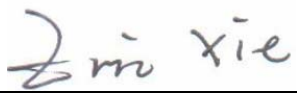
TEST RESULT CERTIFICATION

Applicant's name	:	Shenzhen Zidoo Technology Co., Ltd.
Address	:	Central Avenue Building A m, Unit 12D Xixiang Ave, BaoAn District, Shenzhen.
Manufacture's Name	:	Shenzhen Zidoo Technology Co., Ltd.
Address	:	Central Avenue Building A m, Unit 12D Xixiang Ave, BaoAn District, Shenzhen.

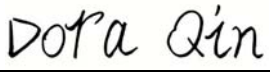
Product description

Trade Mark:		ZIDOO
Product name	:	SMART TV BOX
Model and/or type reference	:	X6 PRO, X6
Standards	:	FCC Rules and Regulations Part 15 Subpart C Section 15.247 ANSI C63.4: 2014

Date of Test	:	
Date (s) of performance of tests	:	Nov. 12, 2015 ~ Nov. 19, 2015
Date of Issue	:	Nov. 20, 2015
Test Result	:	**Pass**

Testing Engineer : 

(Eric Xie)

Technical Manager : 

(Dora Qin)

Authorized Signatory : 

(Kait Chen)

Table of Contents **Page**

Table of Contents **Page**

1.. TEST SUMMARY

FCC Rules	Description of Test	Result
Section 15.247(a)2)	6dB Bandwidth Test	Compliant
Section 15.247(e)	Power Spectral Density Test	Compliant
Section 15.247(b)(3)	Maximum Peak Output Power Test	Compliant
Section 15.247(d)	Band Edge Compliance Tes	Compliant
Section 15.247(d) Section 15.209)	Radiated Spurious Emission Test	Compliant
Section 15.247(d)	Conducted Spurious Emission Test	Compliant
Section 15.207	AC Power Line Conducted Emission Test	Compliant
Section 15.203	Antenna Requirement	Compliant

1.1. TEST FACILITY

Test Firm	:	Shenzhen WST Testing Technology Co., Ltd. Certificated by FCC, Registration No.: 939433
Address	:	1F,No.9 Building,TGK Science & Technology Park,Yangtian Rd., NO.72 Bao'an Dist., Shenzhen,Guangdong,China. 518101
Tel	:	(86)755-33916437
Fax	:	(86)755-27822175

1.2. MEASUREMENT UNCERTAINTY

Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	=	4.06dB, k=2

2.. GENERAL INFORMATION

2.1. GENERAL DESCRIPTION OF EUT

Equipment	SMART TV BOX
Model Name	X6 PRO
Serial Model	X6
FCC ID	2AGN7-X6PRO
Model Difference	All the model are the same circuit and RF module, except the appearance colour, this report only test mode name: X6 PRO.
Modulation Type	WIFI:DBPSK,DQPSK,CCK,BPSK,QPSK,16QAM,64QAM
Antenna Type	Internal Antenna
WLAN Operation frequency	802.11b: 2412-2462MHz 802.11g: 2412-2462MHz 802.11n(20M): 2412-2462MHz 802.11n(40M): 2422-2452MHz
Number of Channels	802.11b/g/n(20M):11 802.11n(40M):7
Data Rate	802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: up to 150Mbps
Modulation Type	CCK, OFDM
Power Source	DC Voltage
Power Rating	DC 5V, 2A, with AC Adapter :Input 100-240V, 50/60Hz,0.35A; Output DC 5V,2A
Adapter Model	KA23-0502000DES

2.2. Carrier Frequency of Channels

802.11b, 802.11g, 802.11n (20MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437	---	---

802.11n (40MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
---	---	07	2442
---	---	08	2447
03	2422	09	2452
04	2427	---	---
05	2432	---	---
06	2437	---	---

Operation of EUT during testing

Operating Mode

The mode is used: **802.11b Transmitting mode**

Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

802.11g Transmitting mode

Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

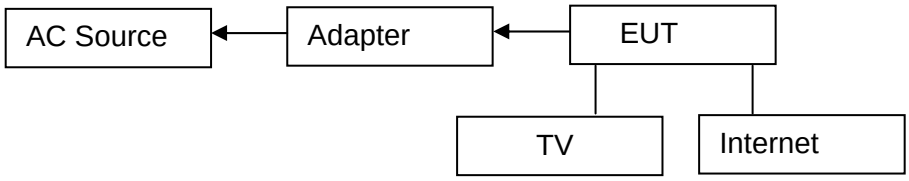
802.11n(20M) Transmitting mode

Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

802.11n(40M) Transmitting mode

Low Channel: 2422MHz
Middle Channel: 2437MHz
High Channel: 2452MHz

2.3. DESCRIPTION OF TEST SETUP



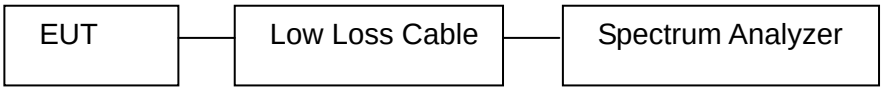
2.4. MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Receiver	Rohde & Schwarz	ESCI	100627	May 19, 2015	1 Year
2.	LISN	SchwarzBeck	NSLK 8126	8126377	May 19, 2015	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 19, 2015	1 Year
4.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
5.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	May 19, 2015	1 Year
6.	Trilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	May 17, 2015	1 Year
7.	Pre-amplifier	Compliance Direction	PAP-0203	22008	May 19, 2015	1 Year
8.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
9.	EMI Receiver	Rohde & Schwarz	ESCI	100627	May 19, 2015	1 Year
10.	LISN	SchwarzBeck	NSLK 8126	8126377	May 19, 2015	1 Year
11.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 19, 2015	1 Year
12.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
13.	EMI Receiver	Rohde & Schwarz	ESCI	100627	May 19, 2015	1 Year
14.	EMI Receiver	Rohde & Schwarz	ESCI	100627	May 19, 2015	1 Year
15.	LISN	SchwarzBeck	NSLK 8126	8126377	May 19, 2015	1 Year
16.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 19, 2015	1 Year
17.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
18.	Programmable AC Power source	SOPH POWER	PAG-1050	630250	May 26, 2015	1 Year
19.	Harmonic and Flicker Analyzer	LAPLACE	AC2000A	272629	May 26, 2015	1 Year
20.	Harmonic and Flicker Test Software AC 2000A	LAPLACE	N/A	N/A	N/A	N/A
21.	ESD Simulators	KIKUSUI	KES4021	LJ003477	May 25, 2015	1 Year
22.	EFT Generator	EMPEK	EFT-4040B	0430928N	May 19, 2015	1 Year
23.	Shielding Room	ChangZhou ZhongYu	JB88	SEL0166	May 19, 2015	1 Year
24.	Signal Generator 9KHz~2.2GHz	R&S	SML02	SEL0143	May 19, 2015	1 Year
25.	Signal Generator 9KHz~1.1GHz	R&S	SML01	SEL0135	May 19, 2015	1 Year
26.	Power Meter	R&S	NRVS	SEL0144	May 19, 2015	1 Year
27.	RF Level Meter		URV35	SEL0137	May 19, 2015	1 Year
28.	Audio Analyzer	R&S	UPL	SEL0136	May 19, 2015	1 Year

29.	RF-Amplifier 150KHz~150MHz	BONN Elektronik	BSA1515-25	SEL0157	May 19, 2015	1 Year
30.	Stripline Test Cell	Erika Fiedler	VDE0872	SEL0167	N/A	N/A
31.	TV Test Transmitter	R&S	SFM	SEL0159	May 17, 2015	1 Year
32.	TV Generator PAL	R&S	SGPF	SEL0138	May 19, 2015	1 Year
33.	TV Generator Ntsc	R&S	SGMF	SEL0140	May 19, 2015	1 Year
34.	TV Generator Secam	R&S	SGSF	SEL0139	May 19, 2015	1 Year
35.	TV Test Transmitter 0.3MHz~3300MHz	R&S	SFQ	SEL0142	May 19, 2015	1 Year
36.	MPEG2 Measurement Generator	R&S	DVG	SEL0141	May 19, 2015	1 Year
37.	Spectrum Analyzer	R&S	FSP	SEL0177	May 19, 2015	1 Year
38.	Matching	R&S	RAM	SEL0146	N/A	N/A
39.	Matching	R&S	RAM	SEL0148	N/A	N/A
40.	Absorbing Clamp	R&S	MDS21	SEL0158	May 17, 2015	1 Year
41.	Coupling Set	Erika Fiedler	Rco, Rci, MC, AC, LC	SEL0149	N/A	N/A
42.	Filters	Erika Fiedler	Sr, LBS	SEL0150	N/A	N/A
43.	Matching Network	Erika Fiedler	MN, T1	SEL0151	N/A	N/A
44.	Fully Anechoic Room	ChangZhou ZhongYu	854	SEL0169	Jun. 10, 2015	1 Year
45.	Signal Generator	R&S	SML03	SEL0068	May 17, 2015	1 Year
46.	RF-Amplifier 30M~1GHz	Amplifier Reasearch	250W1000A	SEL0066	Oct. 24, 2015	1 Year
47.	RF-Amplifier 0.8~3.0GHz	Amplifier Reasearch	60S1G3	SEL0065	Oct. 24, 2015	1 Year
48.	Power Meter	R&S	NRVD	SEL0069	May 17, 2015	1 Year
49.	Power Sensor	R&S	URV5-Z2	SEL0071	May 17, 2015	1 Year
50.	Power Sensor	R&S	URV5-Z2	SEL0072	May 17, 2015	1 Year
51.	Software EMC32	R&S	EMC32-S	SEL0082	N/A	N/A
52.	Log-periodic Antenna	Amplifier Reasearch	AT1080	SEL0073	N/A	N/A
53.	Antenna Tripod	Amplifier Reasearch	TP1000A	SEL0074	N/A	N/A
54.	High Gain Horn Antenna(0.8-5GHz)	Amplifier Reasearch	AT4002A	SEL0075	N/A	N/A

3.. 6DB BANDWIDTH MEASUREMENT

3.1. Block Diagram of Test Setup



3.2. Limits

Section 15.247(a)(2): Systems using digital modulation techniques may operate in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz

3.3. Test Procedure

3.3.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

3.3.2. Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz

3.3.3. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

3.4. Test Result

802.11b			
Channel	**Frequency (MHz)**	**6DB Bandwidth(MHz)**	**Limit(MHz)**
Low	2412	10.16	>0.5MHz
Middle	2437	10.20	>0.5MHz
High	2462	10.16	>0.5MHz

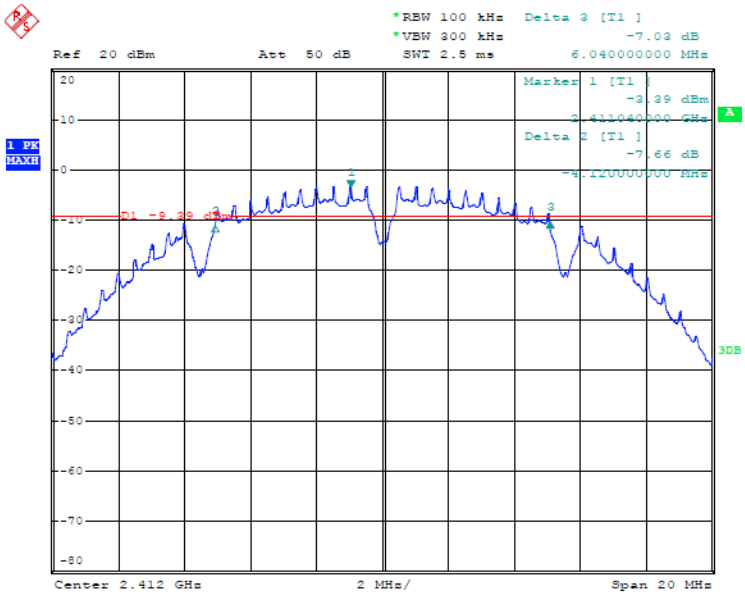
802.11g			
Channel	**Frequency (MHz)**	**6DB Bandwidth(MHz)**	**Limit(MHz)**
Low	2412	16.60	>0.5MHz
Middle	2437	16.64	>0.5MHz
High	2462	16.60	>0.5MHz

802.11n(20M)			
Channel	**Frequency (MHz)**	**6DB Bandwidth(MHz)**	**Limit(MHz)**
Low	2412	17.72	>0.5MHz
Middle	2437	17.76	>0.5MHz
High	2462	17.78	>0.5MHz

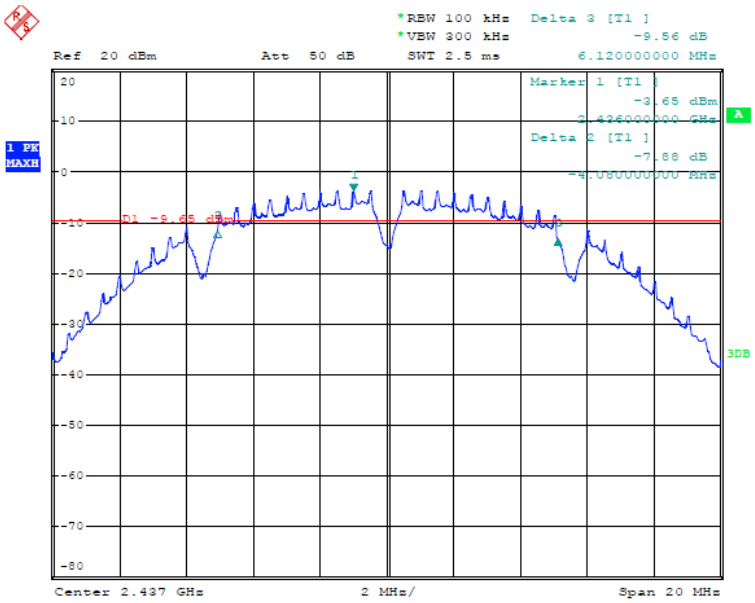
802.11n(40M)			
Channel	**Frequency (MHz)**	**6DB Bandwidth(MHz)**	**Limit(MHz)**
Low	2422	36.56	>0.5MHz
Middle	2437	36.56	>0.5MHz
High	2452	36.56	>0.5MHz

The spectrum analyzer plots are attached as below.

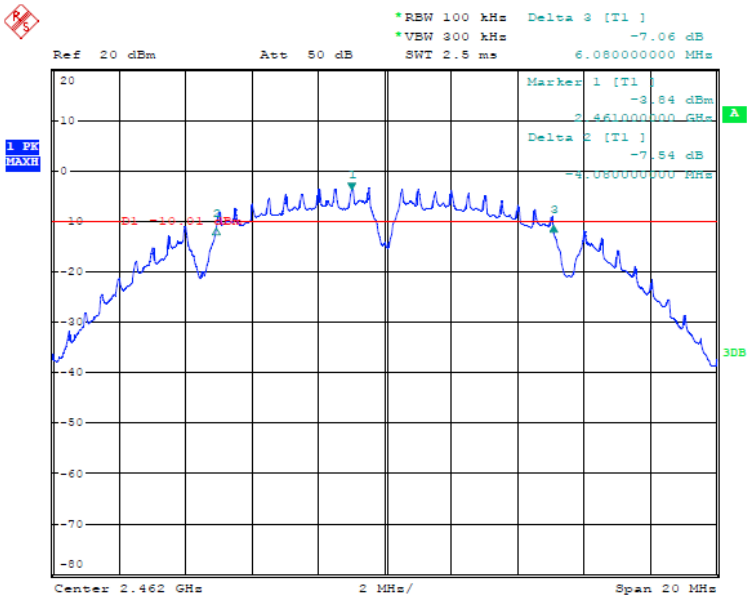
802.11b Channel Low 2412MHz



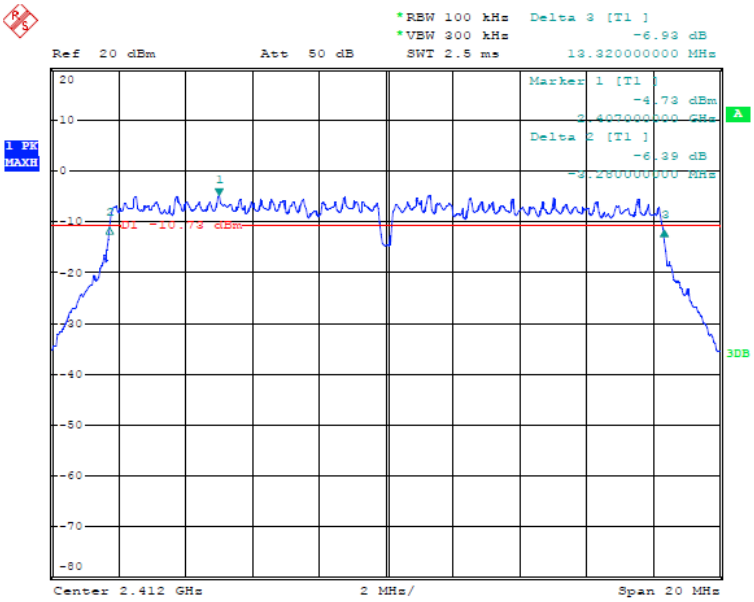
802.11b Channel Middle 2437MHz



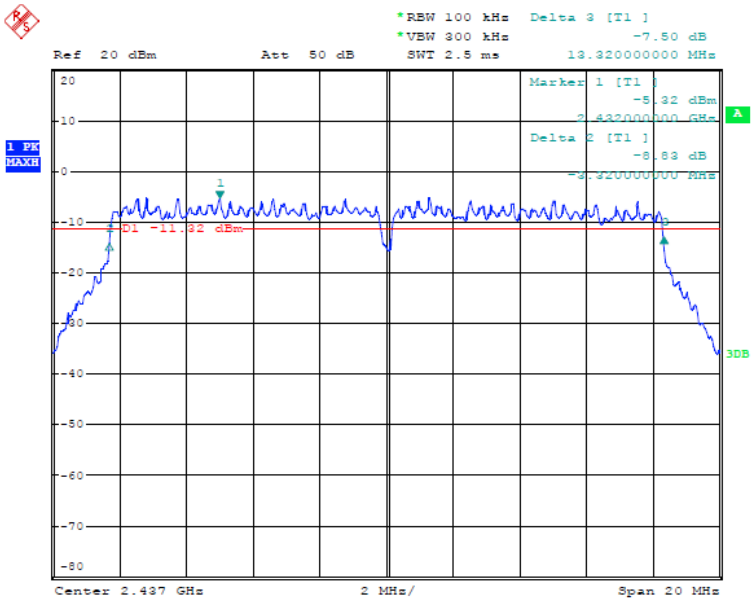
802.11b Channel High 2462MHz



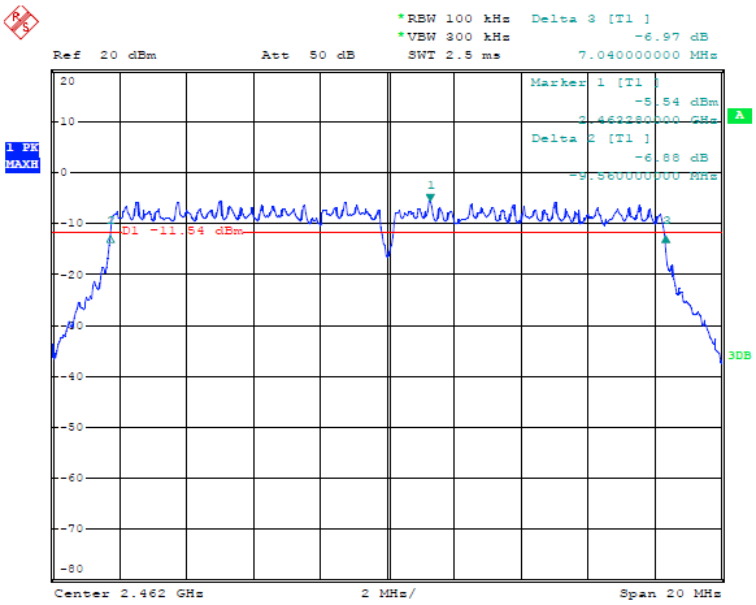
802.11g Channel Low 2412MHz



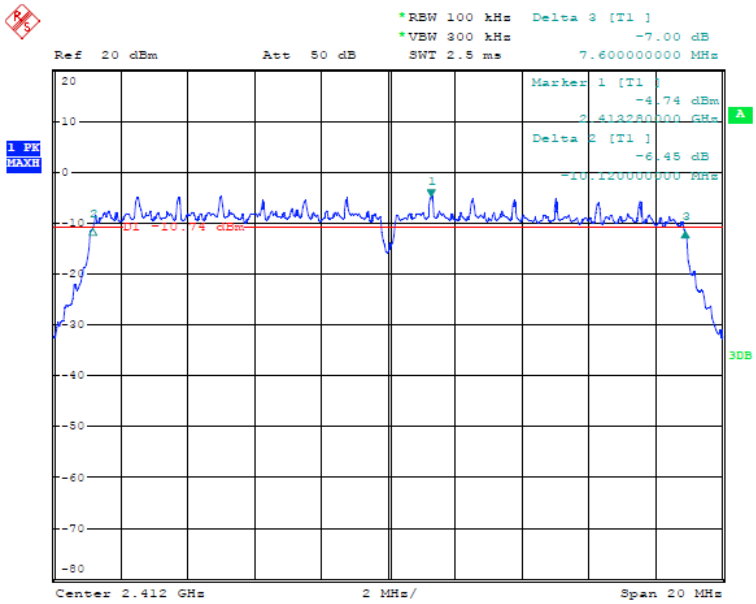
802.11g Channel Middle 2437MHz



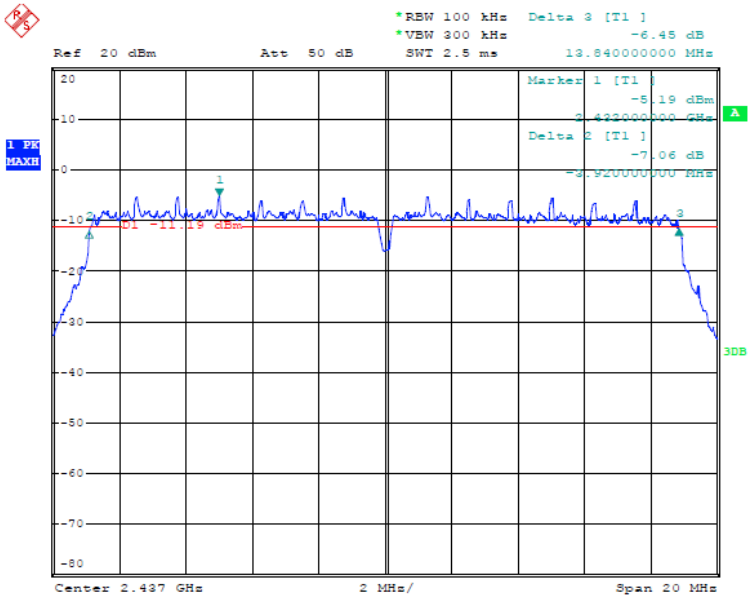
802.11g Channel High 2462MHz



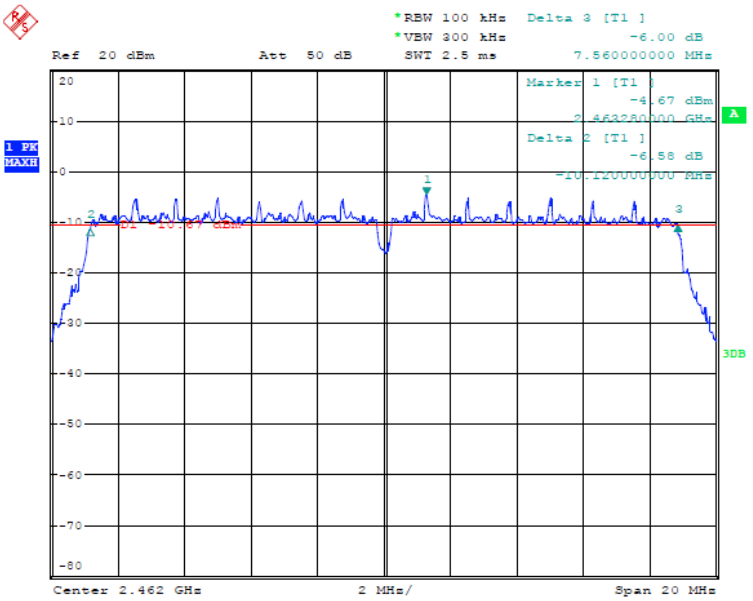
802.11n(20M) Channel Low 2412MHz



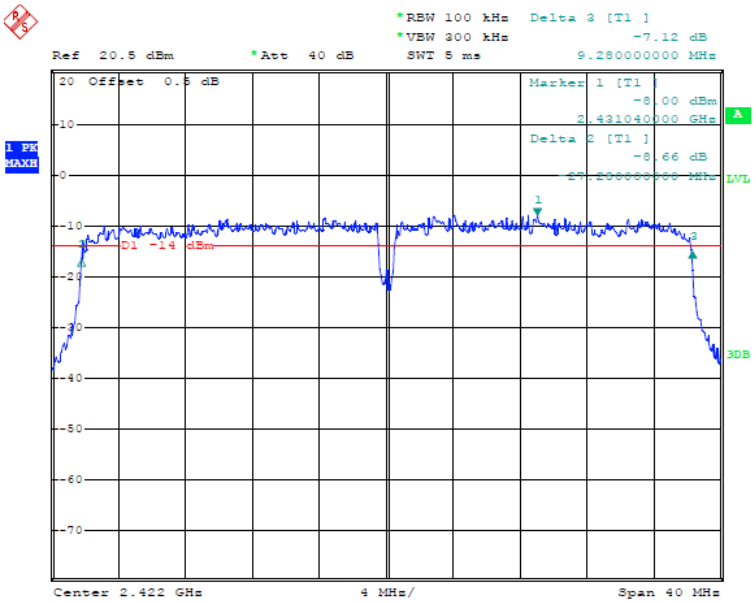
802.11n(20M) Channel Middle 2437MHz



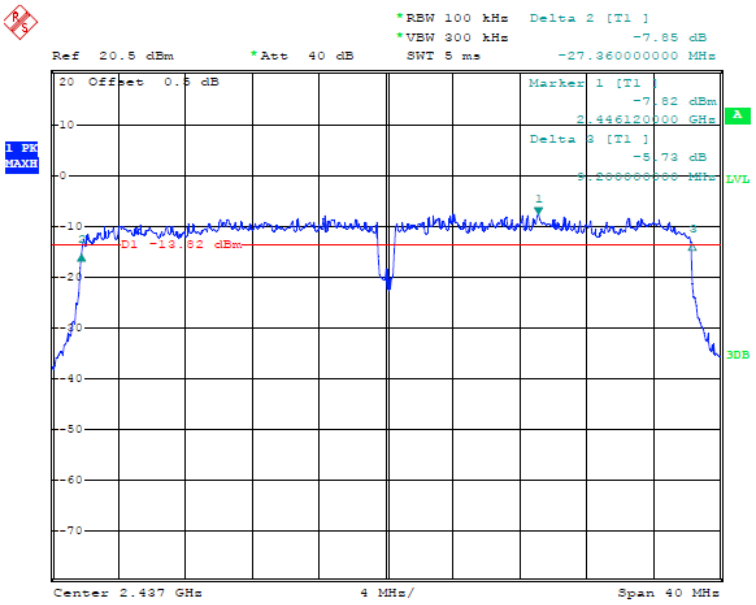
802.11n(20M) Channel High 2462MHz



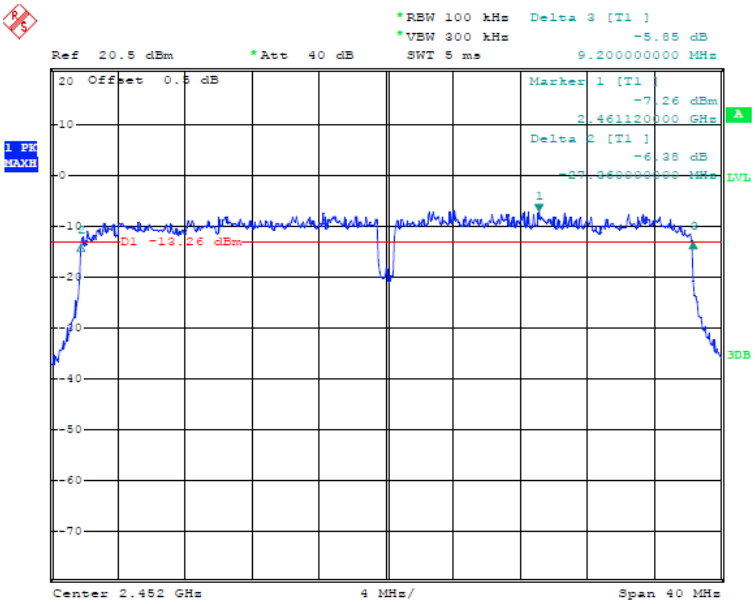
802.11n(40M) Channel Low 2422MHz



802.11n(40M) Channel Middle 2437MHz

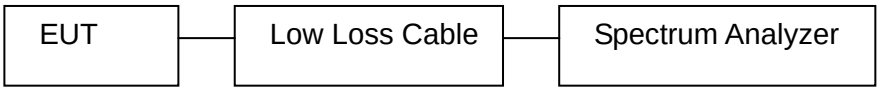


802.11n(40M) Channel High 2452MHz



4 Maximum Peak Output Power

4.1 Block Diagram of Test Setup



4.2 Limits

Section 15.247(b)(3): For systems using digital modulation in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands: 1 Watt.

4.3 Test Procedure

a. The transmitter output was connected to the spectrum analyzer through a low
b. Set RBW of spectrum analyzer to 1MHz and VBW to 3MHz
c. Measurement the maximum peak output power.

4.4 Test Result

PASS

802.11b

Channel	Frequency (MHz)	Peak output power (dBm)	Limit (dBm)
Low	2412	9.20	30
Middle	2437	9.14	30
High	2462	9.26	30

802.11g

Channel	Frequency (MHz)	Peak output power (dBm)	Limit (dBm)
Low	2412	7.23	30
Middle	2437	7.12	30
High	2462	7.46	30

802.11n (20M)

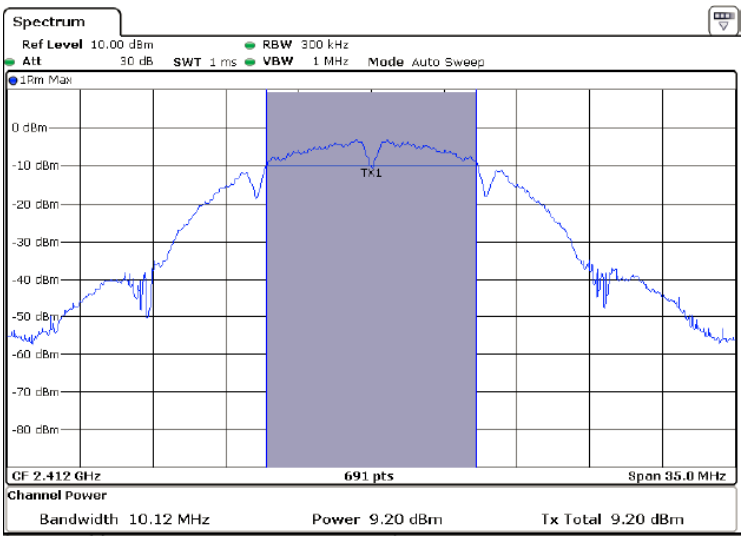
Channel	Frequency (MHz)	Peak output power (dBm)	Limit (dBm)
Low	2412	7.26	30
Middle	2437	6.92	30
High	2462	6.63	30

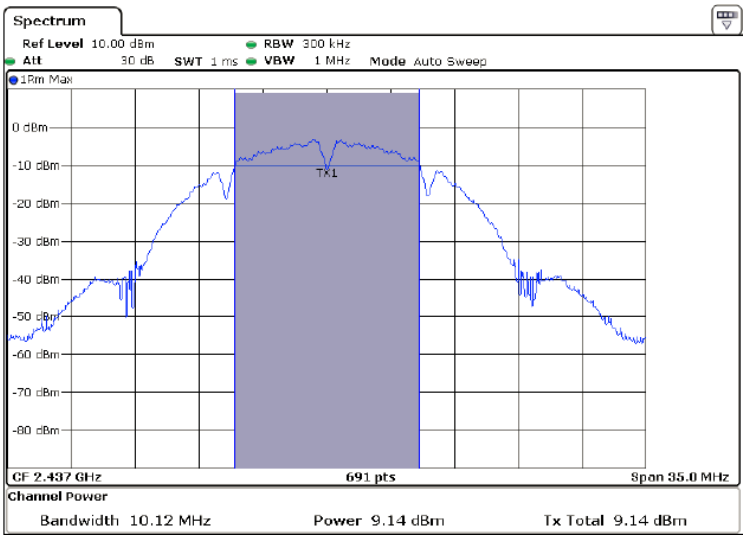
802.11n (40M)

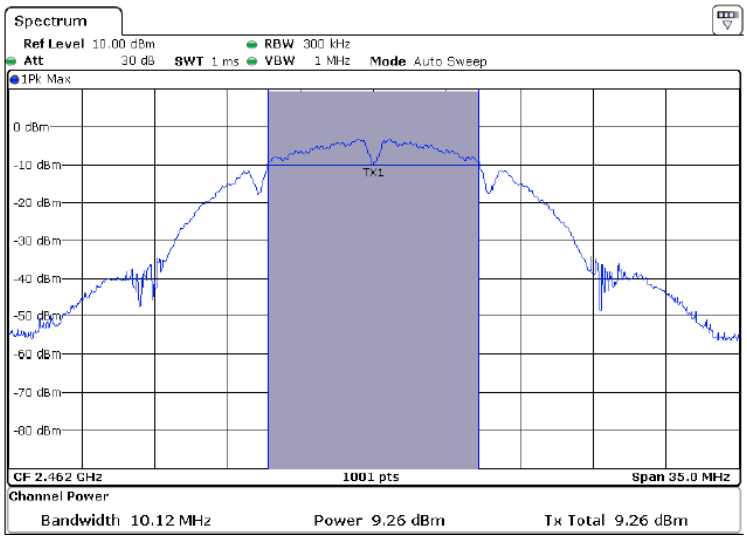
Channel	Frequency (MHz)	Peak output power (dBm)	Limit (dBm)
Low	2422	5.07	30
Middle	2437	5.11	30
High	2452	5.15	30

Pls. refer to the following test plots:

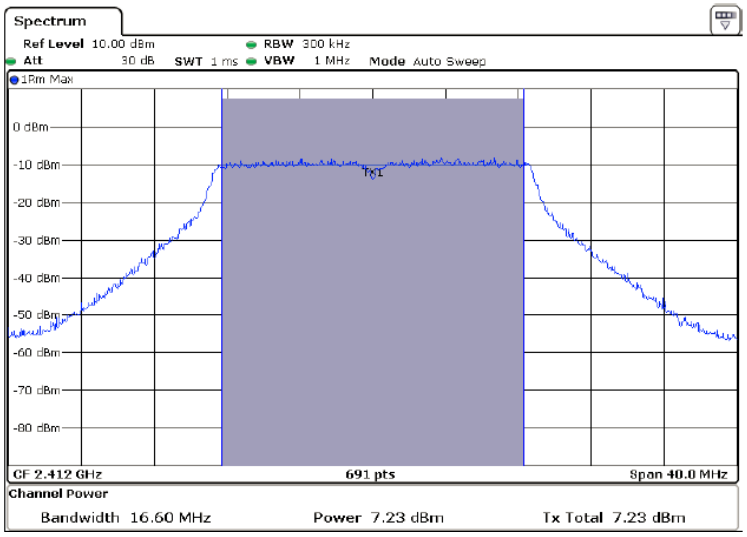
802.11b

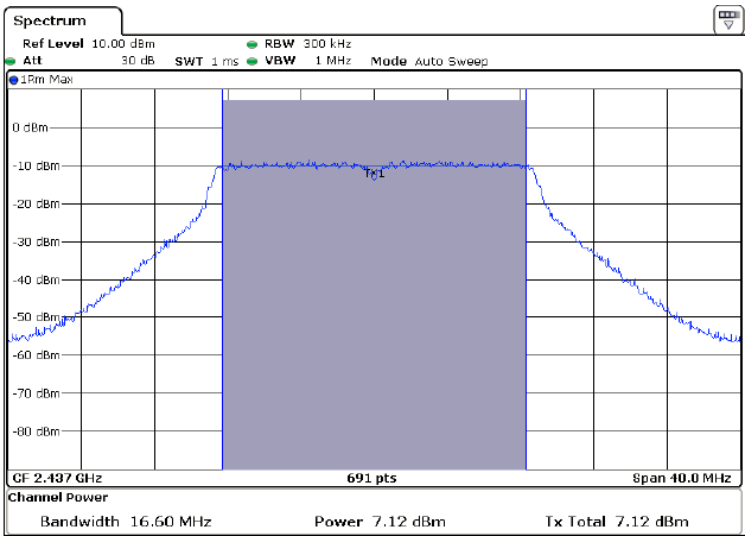


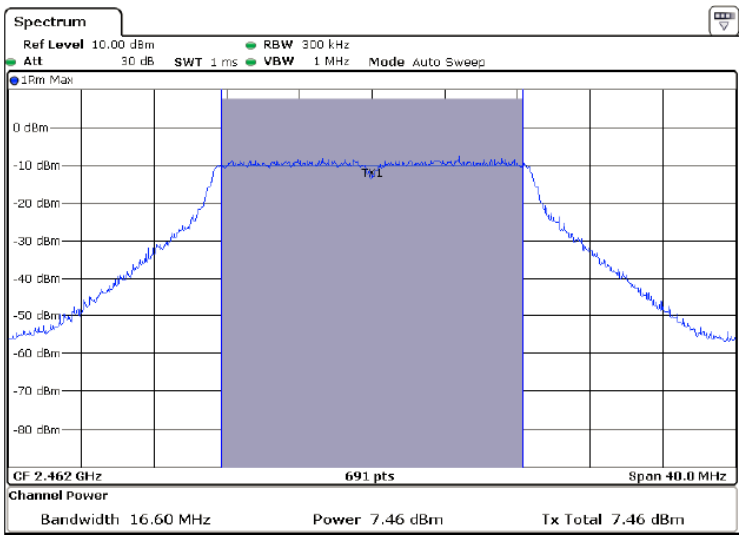




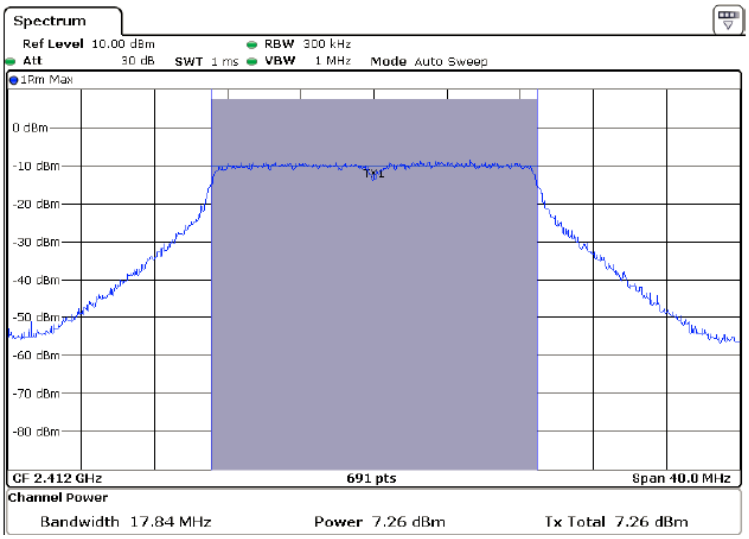
802.11g

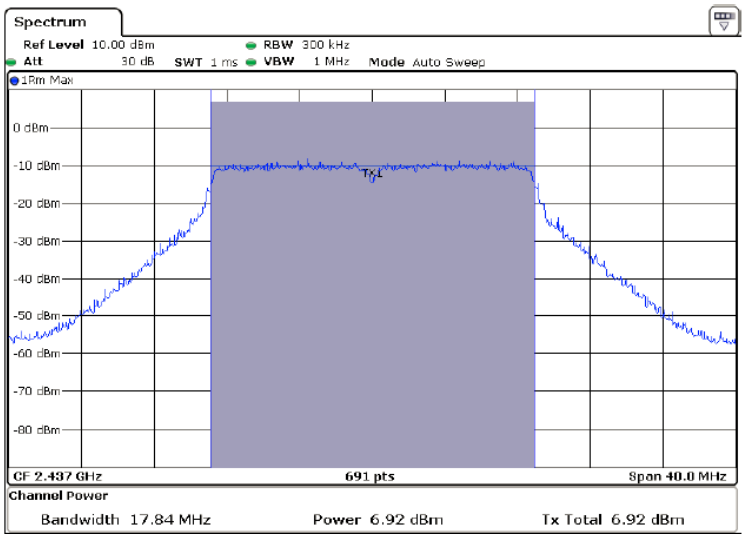

Spectrum
Ref Level 10.00 dBm
RBW 300 kHz
Att 30 dB SWT 1 ms VBW 1 MHz Mode Auto Sweep
1Rm Max
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Tx1
CF 2.412 GHz
691 pts
Span 40.0 MHz
Channel Power
Bandwidth 16.60 MHz
Power 7.23 dBm
Tx Total 7.23 dBm

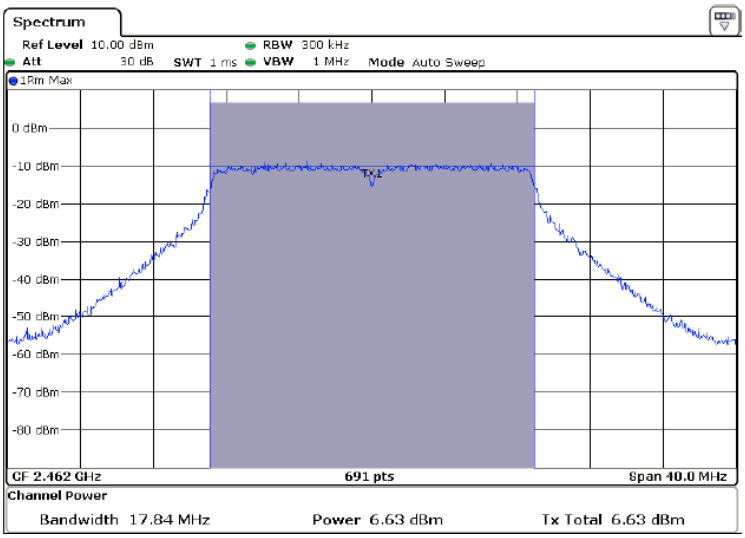

Spectrum
Ref Level 10.00 dBm
RBW 300 kHz
Att 30 dB SWT 1 ms VBW 1 MHz Mode Auto Sweep
1Rm Max
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Tx1
CF 2.437 GHz
691 pts
Span 40.0 MHz
Channel Power
Bandwidth 16.60 MHz
Power 7.12 dBm
Tx Total 7.12 dBm


Spectrum
Ref Level 10.00 dBm
RBW 300 kHz
Att 30 dB SWT 1 ms VBW 1 MHz Mode Auto Sweep
1Rm Max
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Tx1
CF 2.462 GHz
691 pts
Span 40.0 MHz
Channel Power
Bandwidth 16.60 MHz
Power 7.46 dBm
Tx Total 7.46 dBm

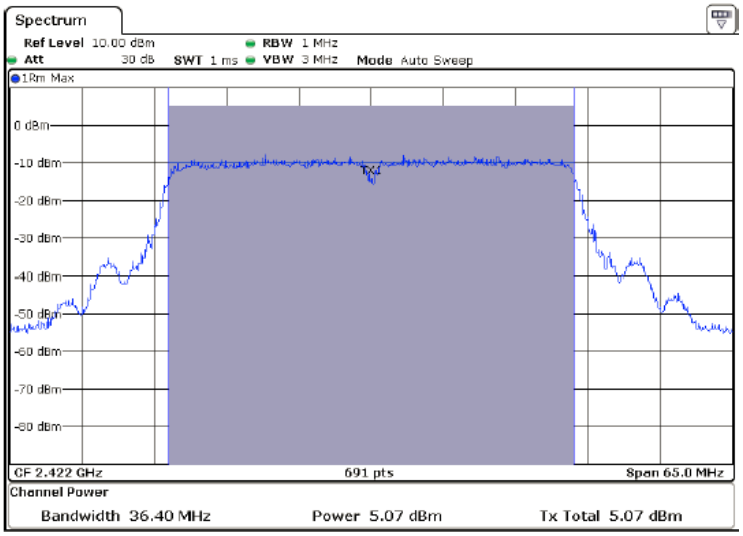
802.11n(20M)

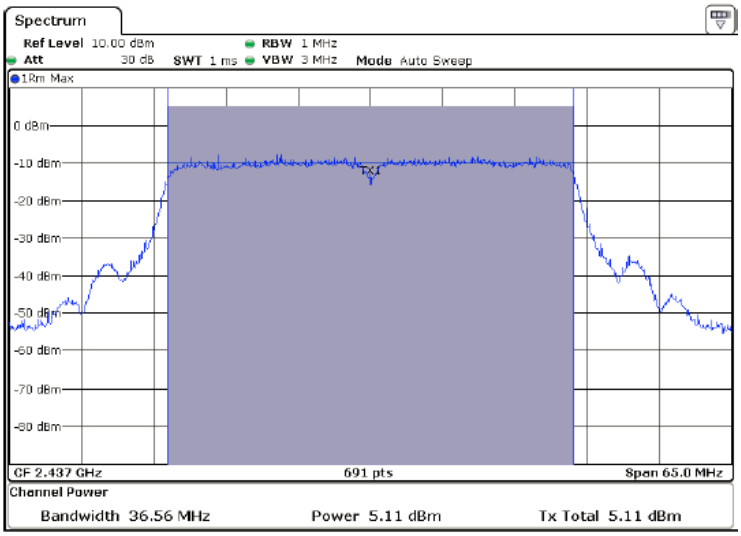

Spectrum
Ref Level 10.00 dBm
RBW 300 kHz
Att 30 dB
SWT 1 ms
VBW 1 MHz
Mode Auto Sweep
1Rm Max
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Tx1
CF 2.412 GHz
691 pts
Span 40.0 MHz
Channel Power
Bandwidth 17.84 MHz
Power 7.26 dBm
Tx Total 7.26 dBm

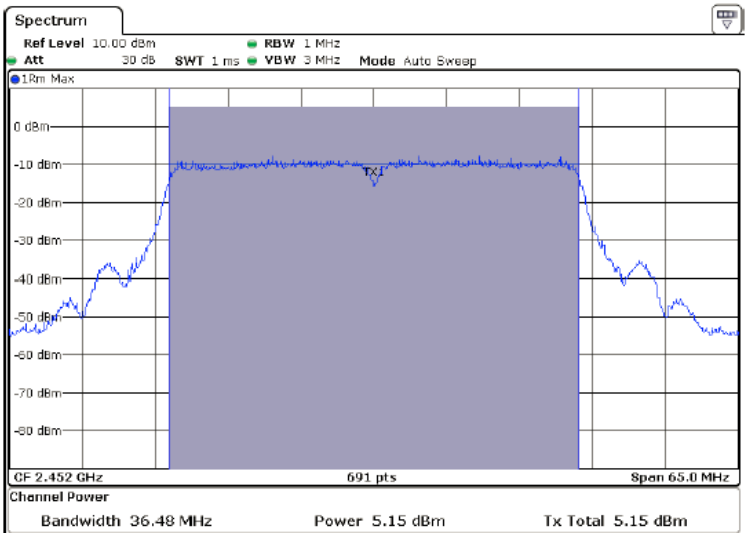

Spectrum
Ref Level 10.00 dBm
RBW 300 kHz
Att 30 dB
SWT 1 ms
VBW 1 MHz
Mode Auto Sweep
1Rm Max
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Tx1
CF 2.437 GHz
691 pts
Span 40.0 MHz
Channel Power
Bandwidth 17.84 MHz
Power 6.92 dBm
Tx Total 6.92 dBm


Spectrum
Ref Level 10.00 dBm
RBW 300 kHz
Att 30 dB
SWT 1 ms
VBW 1 MHz
Mode Auto Sweep
1Rm Max
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Tx1
CF 2.462 GHz
691 pts
Span 40.0 MHz
Channel Power
Bandwidth 17.84 MHz
Power 6.63 dBm
Tx Total 6.63 dBm

802.11n(40M)

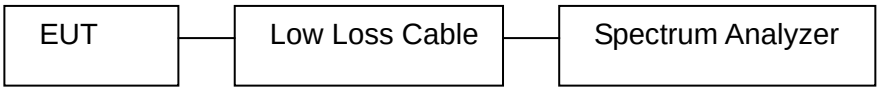

Spectrum
Ref Level 10.00 dBm
RBW 1 MHz
Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
1Rm Max
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
TX1
CF 2.422 GHz
691 pts
Span 65.0 MHz
Channel Power
Bandwidth 36.40 MHz
Power 5.07 dBm
Tx Total 5.07 dBm


Spectrum
Ref Level 10.00 dBm
RBW 1 MHz
Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
1Rm Max
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
TX1
CF 2.437 GHz
691 pts
Span 65.0 MHz
Channel Power
Bandwidth 36.56 MHz
Power 5.11 dBm
Tx Total 5.11 dBm


Spectrum
Ref Level 10.00 dBm
RBW 1 MHz
Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
1Rm Max
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
TX1
CF 2.452 GHz
691 pts
Span 65.0 MHz
Channel Power
Bandwidth 36.48 MHz
Power 5.15 dBm
Tx Total 5.15 dBm

6 Power Spectral Density Measurement

6.1 Block Diagram of Test Setup



6.2 Limits

According to 15.247(a)(1)(iii), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

6.3 Test Procedure

According to the KDB 558074 D01 V03r02, such specifications require that the same method as used to determine the conducted output power shall also be used to determine the power spectral density. The test method of power spectral density as below:

a. Set instrument center frequency to DTS channel center frequency.
b. Set span to at least 1.5 times the OBW.
c. Set RBW to: 3 kHz $\leqslant$ RBW $\leqslant$ 100 kHz.
d. Set VBW $\geqslant$3 x RBW.
e. Detector = power averaging (RMS) or sample detector (when RMS not available)
f. Ensure that the number of measurement points in the sweep $\geqslant$ 2 x span/RBW.
g. Sweep time = auto couple.
h. Employ trace averaging (RMS) mode over a minimum of 100 traces.
i. Use the peak marker function to determine the maximum amplitude level.
j. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat (note that this may require
zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

6.4 Test Result

PASS

802.11b			
Channel	**Frequency (MHz)**	**Power Spectral Density (dBm)**	**Limit (dBm)**
Low	2412	-19.36	8
Middle	2437	-19.20	8
High	2462	-20.11	8

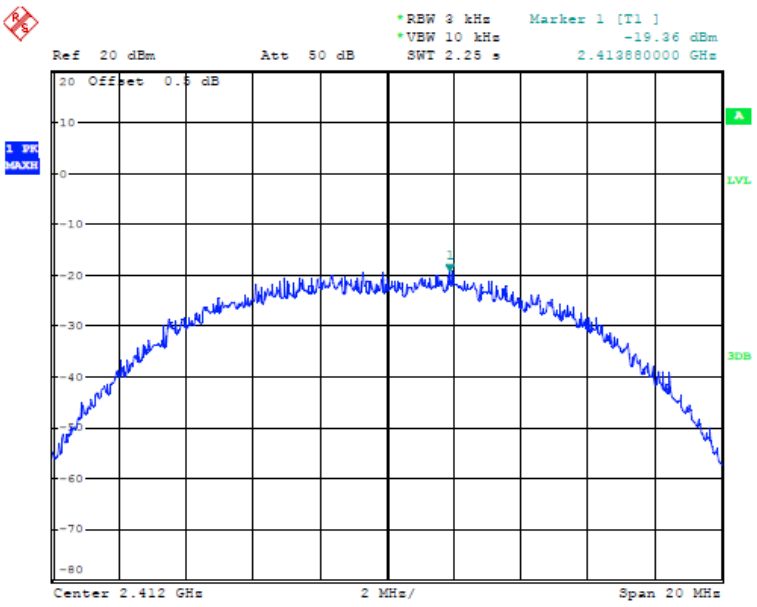
802.11g			
Channel	**Frequency (MHz)**	**Power Spectral Density (dBm)**	**Limit (dBm)**
Low	2412	-23.88	8
Middle	2437	-24.52	8
High	2462	-23.79	8

802.11n(20M)			
Channel	**Frequency (MHz)**	**Power Spectral Density (dBm)**	**Limit (dBm)**
Low	2412	-24.54	8
Middle	2437	-25.50	8
High	2462	-24.74	8

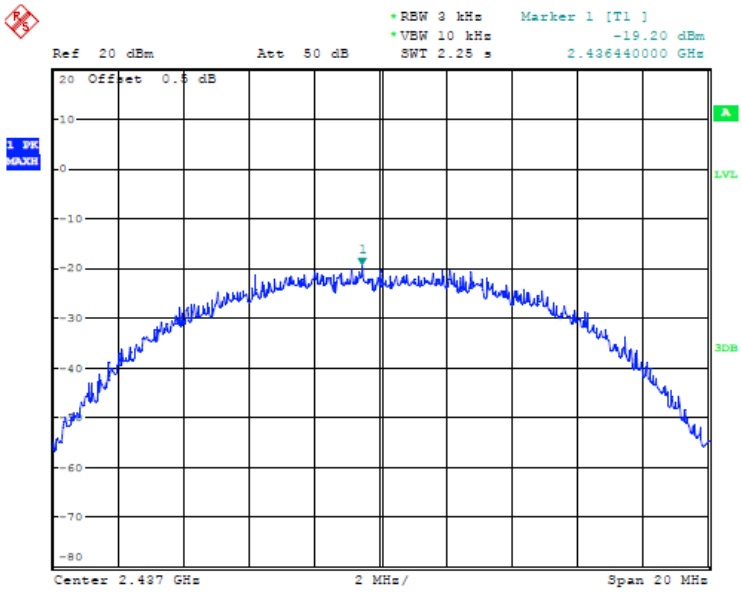
802.11n(40M)			
Channel	**Frequency (MHz)**	**Power Spectral Density (dBm)**	**Limit (dBm)**
Low	2422	-31.31	8
Middle	2437	-33.02	8
High	2452	-31.22	8

The spectrum analyzer plots are attached as below.

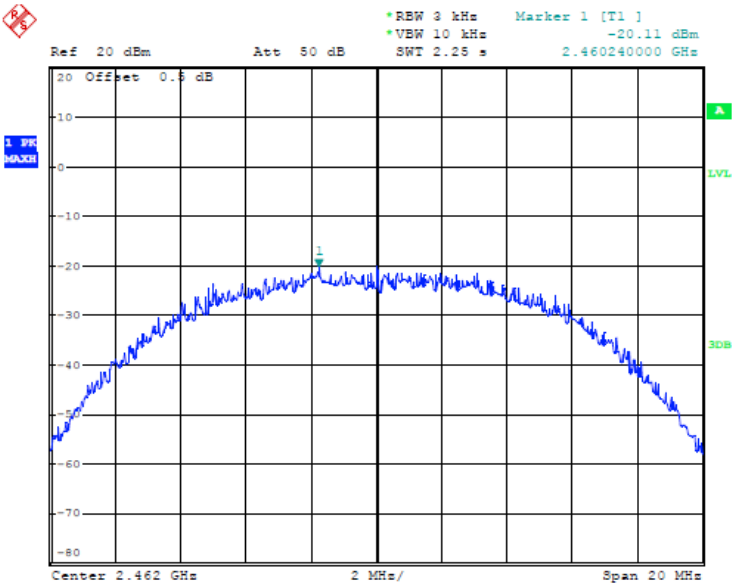
802.11b Channel Low 2412MHz



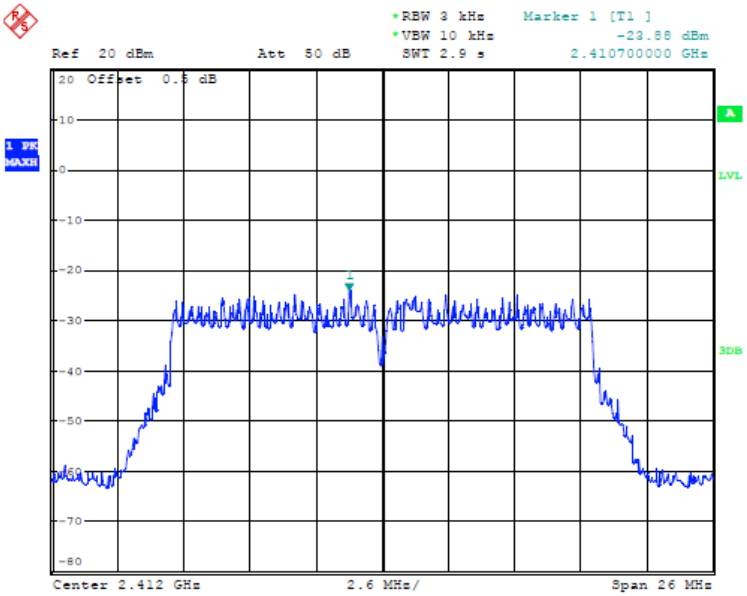
802.11b Channel Middle 2437MHz



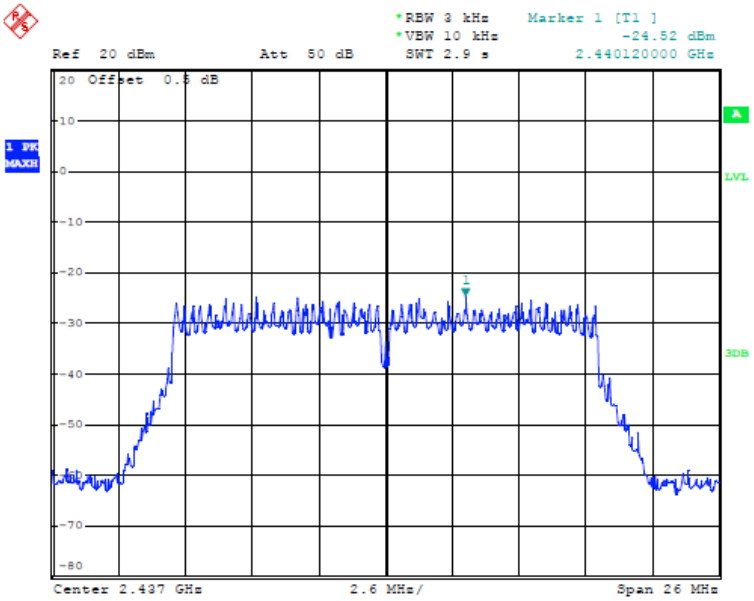
802.11b Channel High 2462MHz



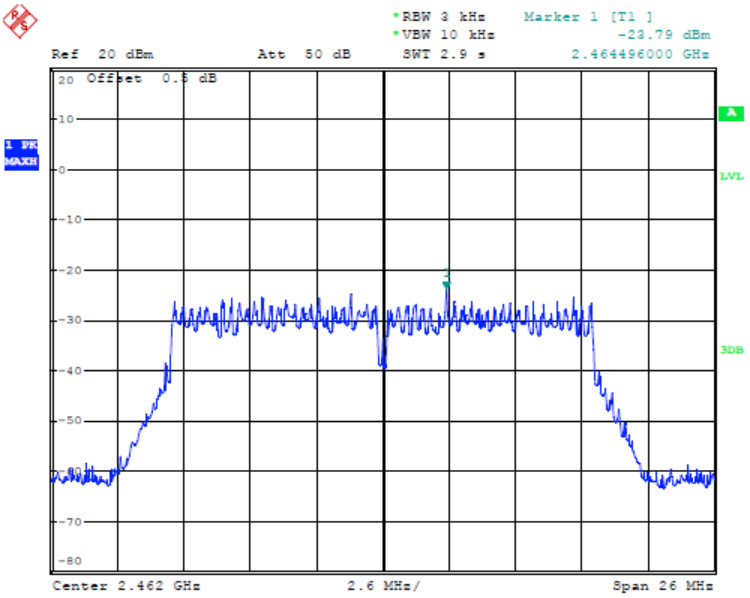
802.11g Channel Low 2412MHz



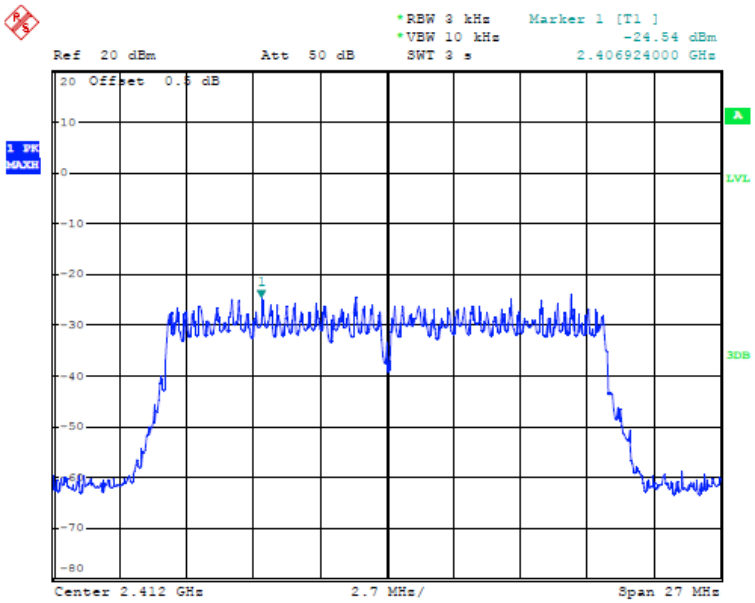
802.11g Channel Middle 2437MHz



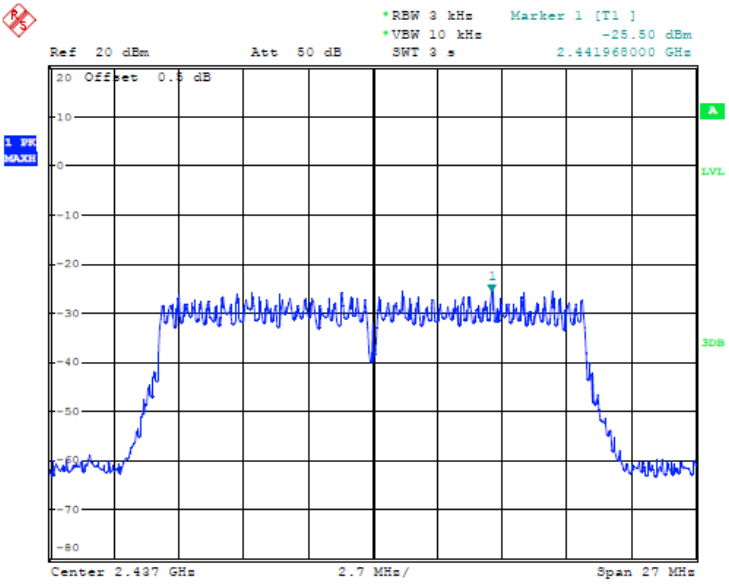
802.11g Channel High 2462MHz



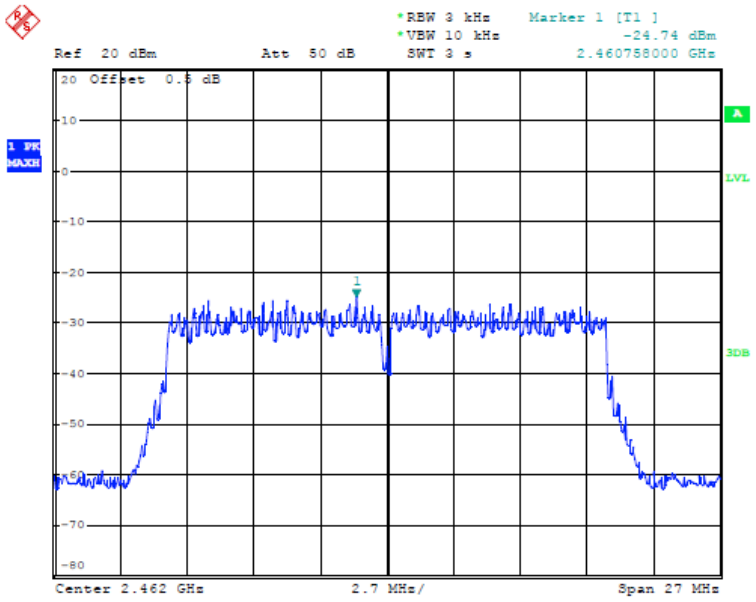
802.11n(20M) Channel Low 2412MHz



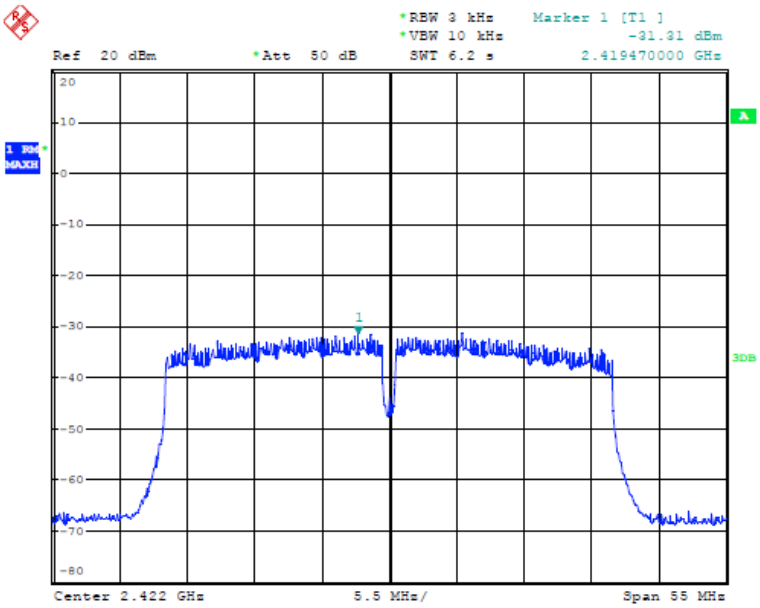
802.11n(20M) Channel High 2437MHz



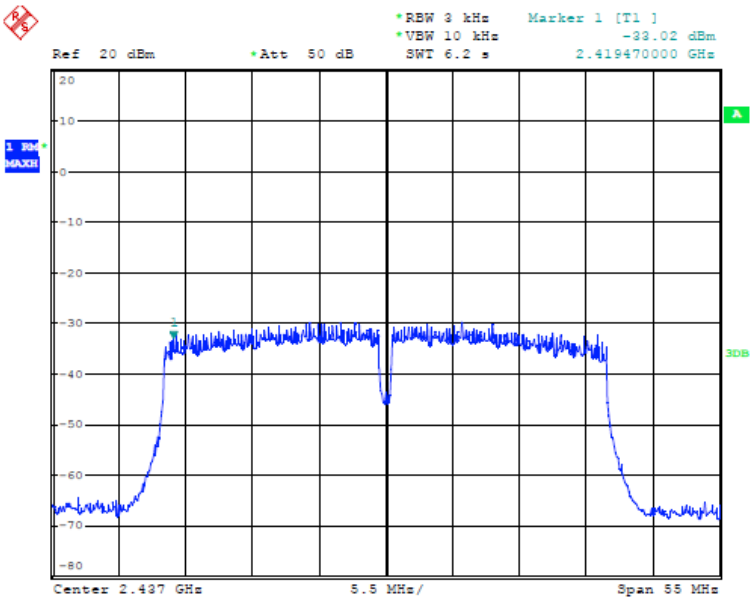
802.11n(20M) Channel High 2462MHz



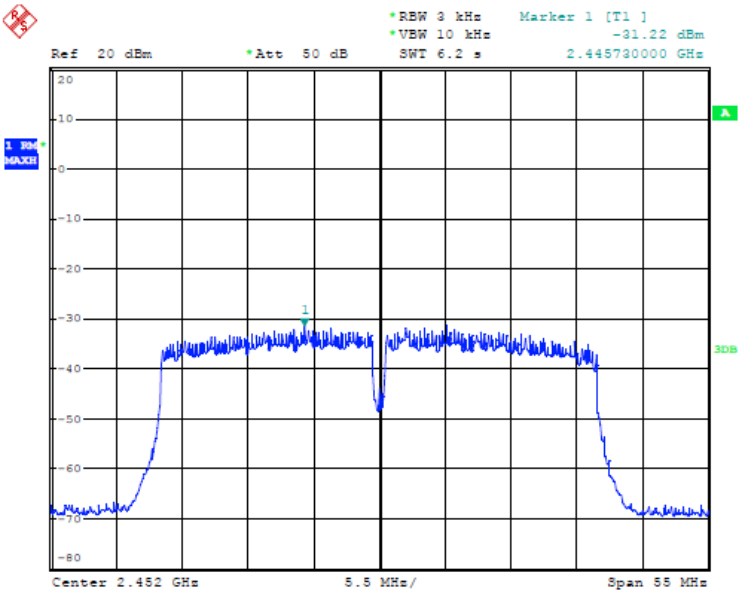
802.11n(40M) Channel Low 2422MHz



802.11n(40M) Channel High 2437MHz

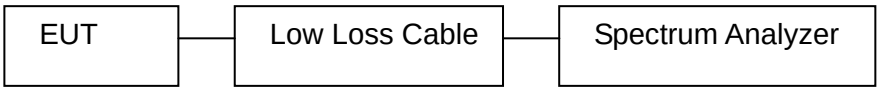


802.11n(40M) Channel High 2452MHz



7 Band Edge Compliance Test

7.1 Block Diagram of Test Setup



7.2 Limits

Section 15.247(d): 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. 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).

7.3 Test Procedure

Conducted Band Edge:

a. The transmitter output was connected to the spectrum analyzer via a low loss cable.
b. Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz.

Radiate Band Edge:

a. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
b. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
c. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
d. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: RBW=1MHz, VBW=1MHz
e. The band edges was measured and recorded.

7.4 Test Result

PASS

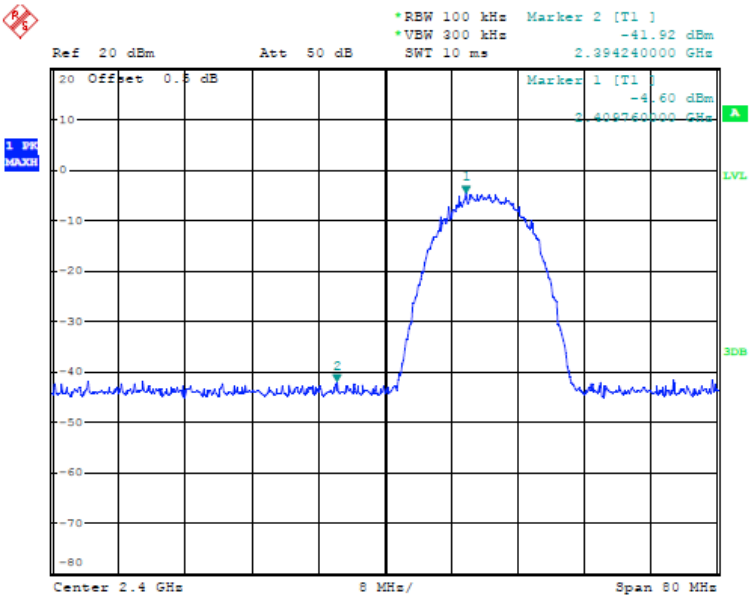
802.11b			
Channel	Frequency (MHz)	Result of Band Edge (dBc)	Limit (dBc)
Low	2412	37.32	>20dBc
High	2462	36.98	> 20dBc

802.11g			
Channel	Frequency (MHz)	Result of Band Edge (dBc)	Limit (dBc)
Low	2412	33.63	>20dBc
High	2462	33.11	> 20dBc

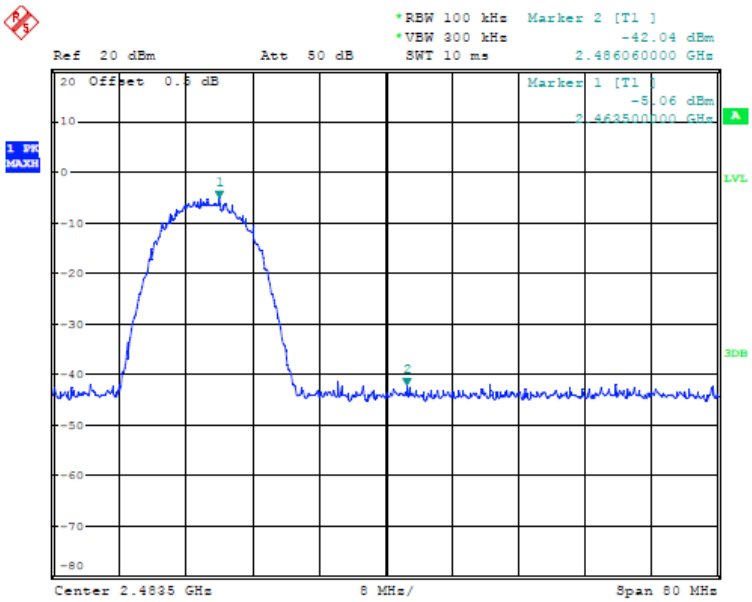
802.11n (20MHz)			
Channel	Frequency (MHz)	Result of Band Edge (dBc)	Limit (dBc)
Low	2412	34.39	>20dBc
High	2462	33.21	> 20dBc

802.11n (40MHz)			
Channel	Frequency (MHz)	Result of Band Edge (dBc)	Limit (dBc)
Low	2422	32.75	>20dBc
High	2452	34.60	> 20dBc

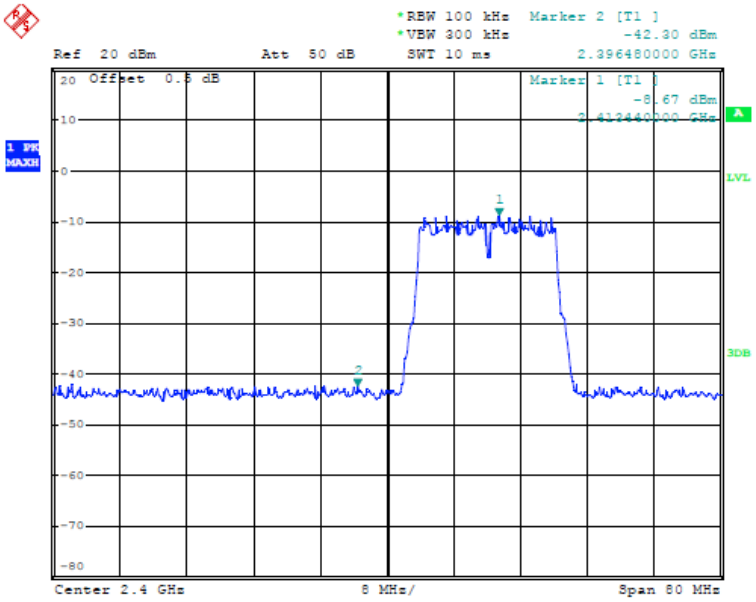
802.11b Channel Low 2412MHz



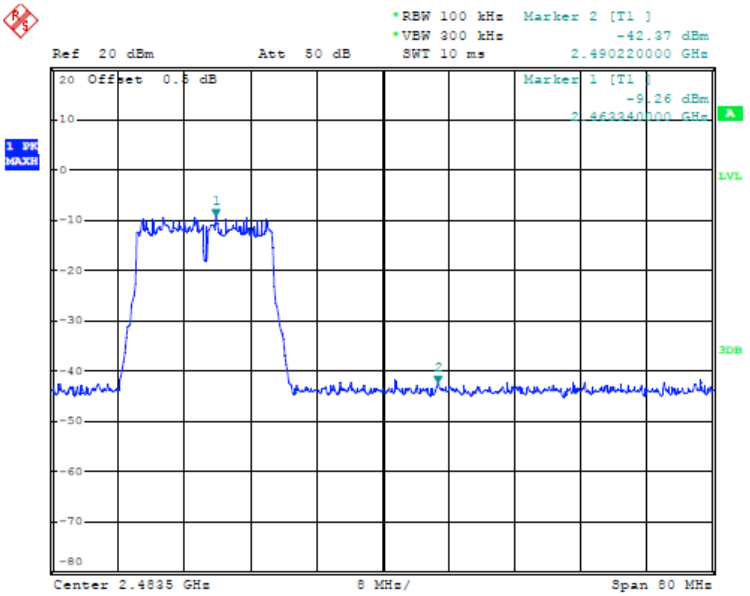
802.11b Channel High 2462MHz



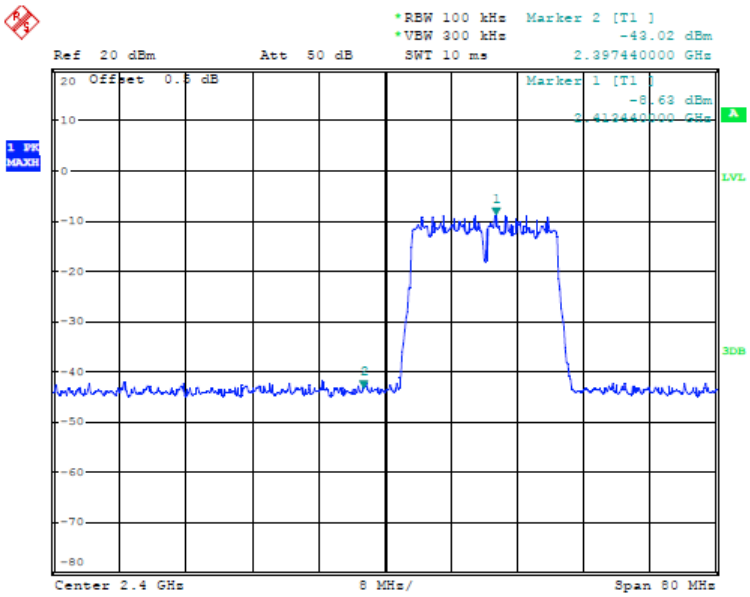
802.11g Channel Low 2412MHz



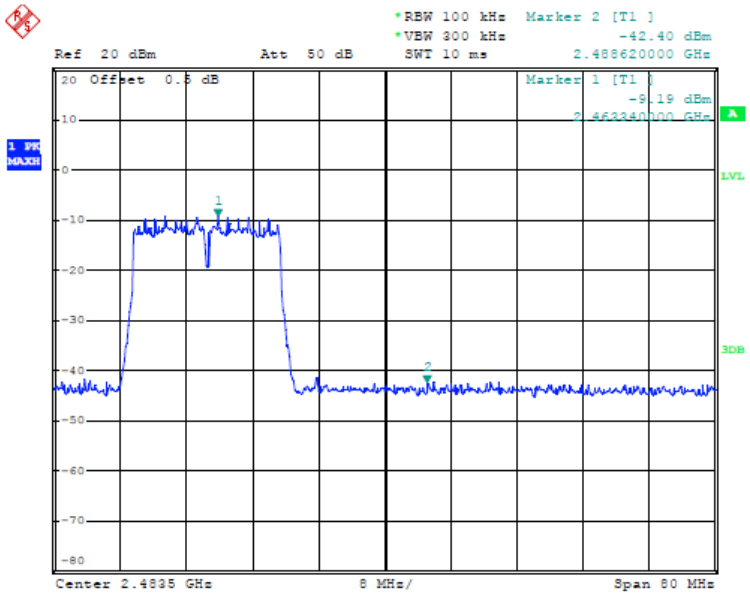
802.11g Channel High 2462MHz



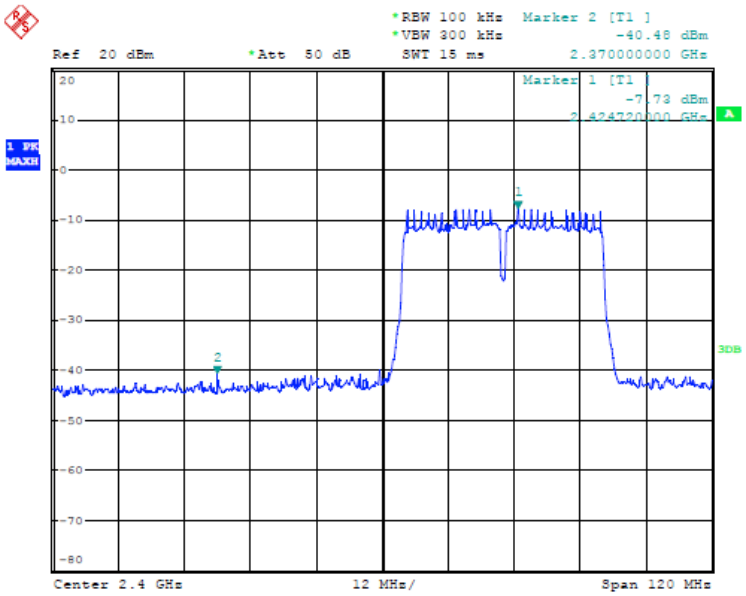
802.11n(20M) Channel Low 2412MHz



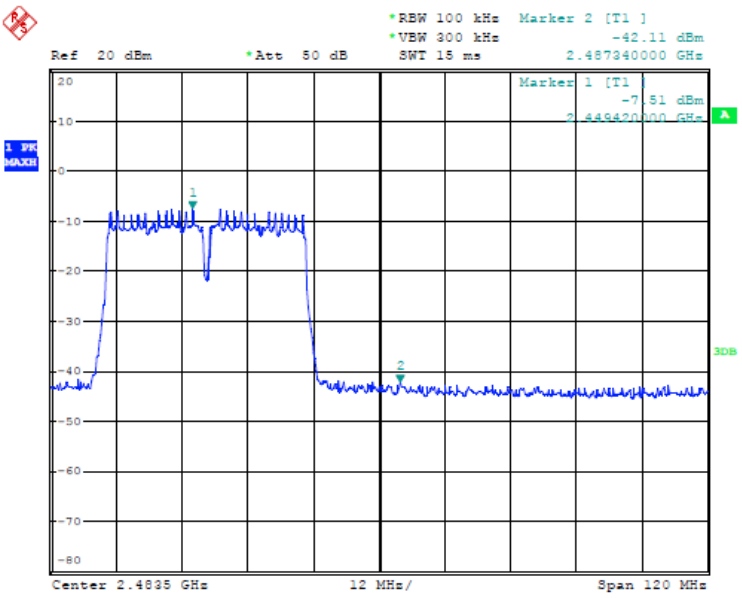
802.11n(20M) Channel High 2462MHz



802.11n(40M) Channel Low 2422MHz

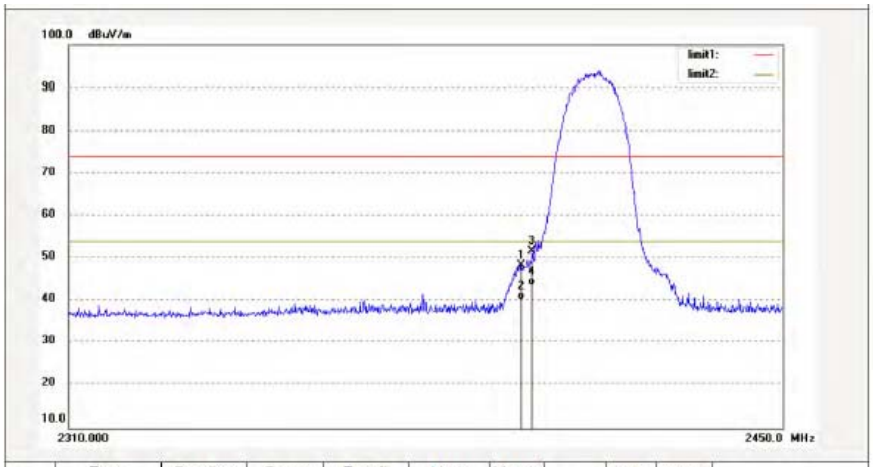


802.11n(40M) Channel High 2452MHz



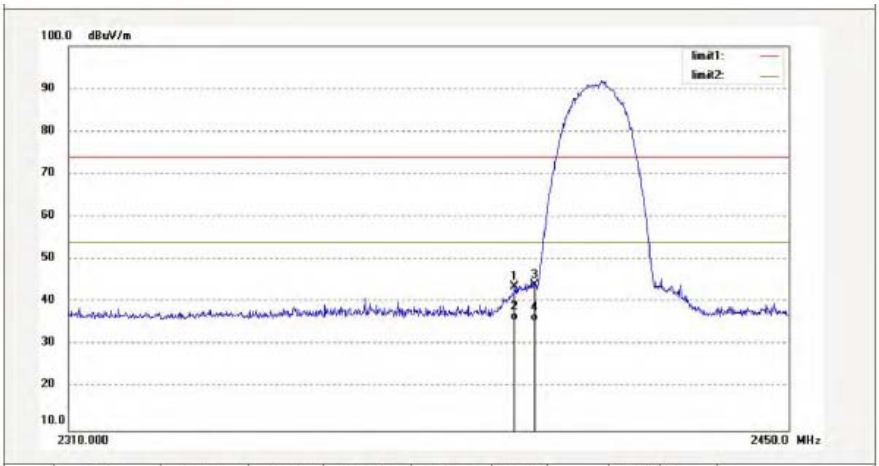
Radiated Band Edge Result

802.11b Channel Low 2412MHz
Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2397.920	55.02	-6.76	48.26	74.00	-25.74	peak			
2	2397.920	47.01	-6.76	40.25	54.00	-13.75	AVG			
3	2400.020	58.43	-6.76	51.67	74.00	-22.33	peak			
4	2400.020	50.37	-6.76	43.61	54.00	-10.39	AVG			

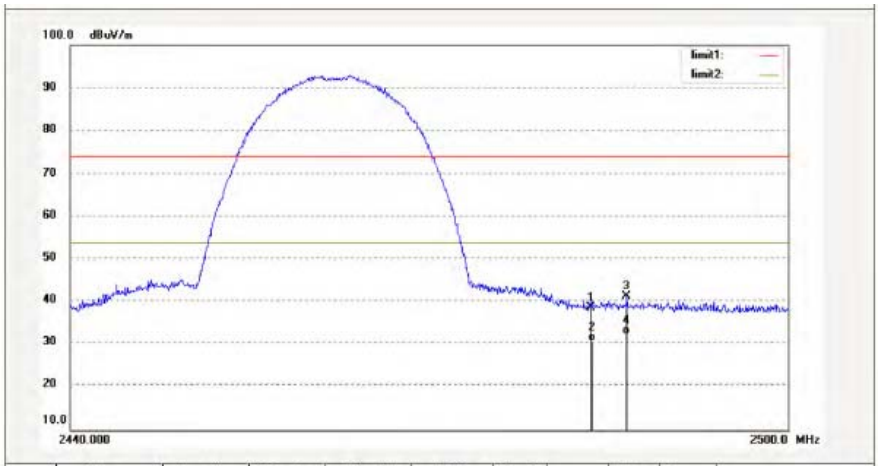
Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2396.100	50.41	-6.76	43.65	74.00	-30.35	peak			
2	2396.100	42.48	-6.76	35.72	54.00	-18.28	AVG			
3	2400.020	50.74	-6.76	43.98	74.00	-30.02	peak			
4	2400.020	42.38	-6.76	35.62	54.00	-18.38	AVG			

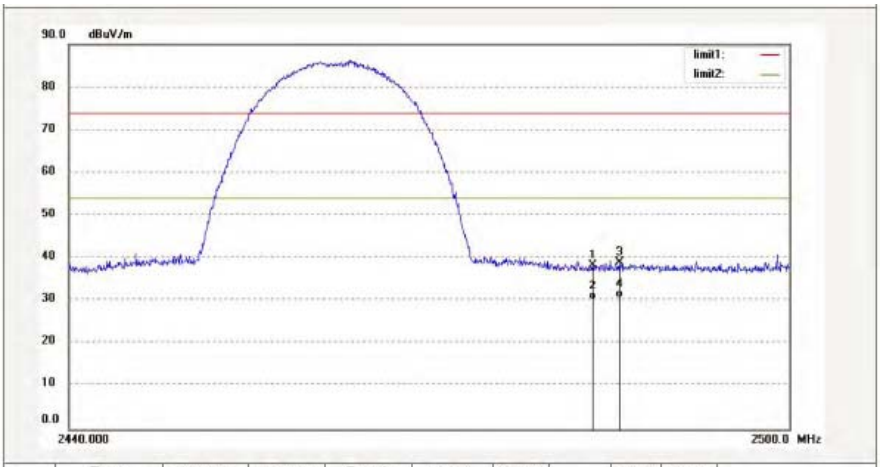
Note:
1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and
subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
3. Display the measurement of peak values.

802.11b Channel High 2462MHz
Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	45.22	-6.54	38.68	74.00	-35.32	peak			
2	2483.500	37.35	-6.54	30.81	54.00	-23.19	AVG			
3	2486.500	47.98	-6.54	41.44	74.00	-32.56	peak			
4	2486.500	38.98	-6.54	32.44	54.00	-21.56	AVG			

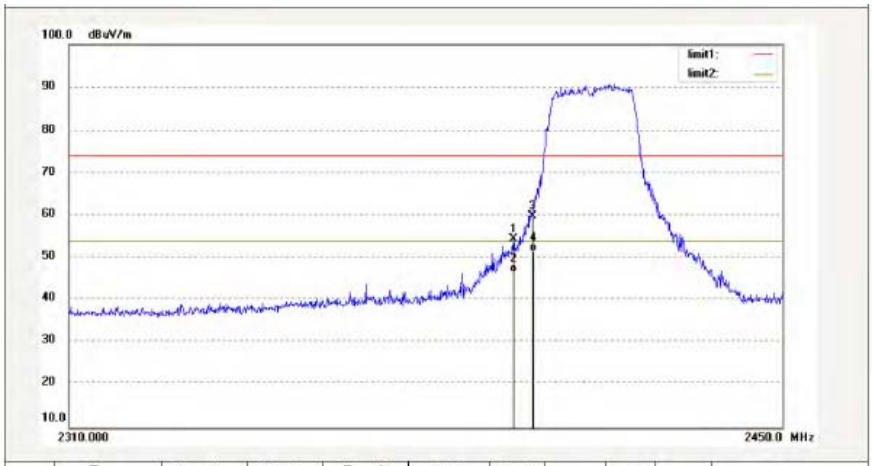
Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	44.83	-6.54	38.29	74.00	-35.71	peak			
2	2483.500	36.78	-6.54	30.24	54.00	-23.76	AVG			
3	2485.720	45.47	-6.54	38.93	74.00	-35.07	peak			
4	2485.720	37.35	-6.54	30.81	54.00	-23.19	AVG			

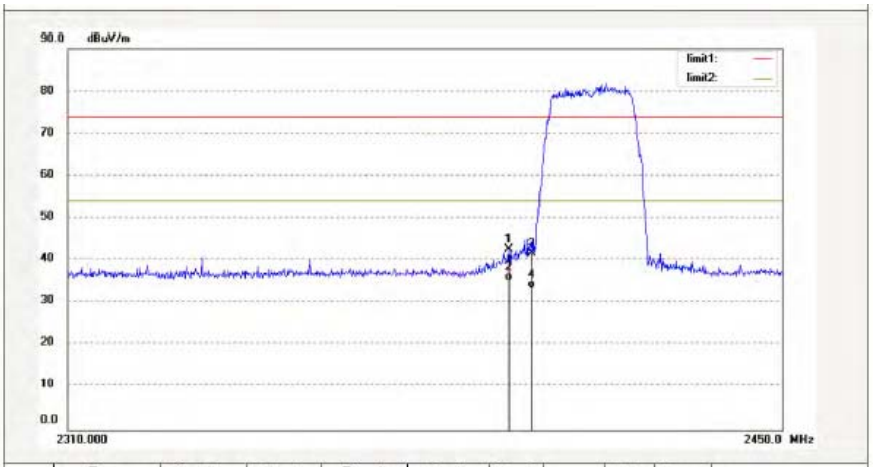
Note:
1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and
subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
3. Display the measurement of peak values.

802.11g Channel Low 2412MHz
Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2396.380	61.12	-6.76	54.36	74.00	-19.64	peak			
2	2396.380	53.24	-6.76	46.48	54.00	-7.52	AVG			
3	2400.020	66.59	-6.76	59.83	74.00	-14.17	peak			
4	2400.020	58.23	-6.76	51.47	54.00	-2.53	AVG			

Vertical



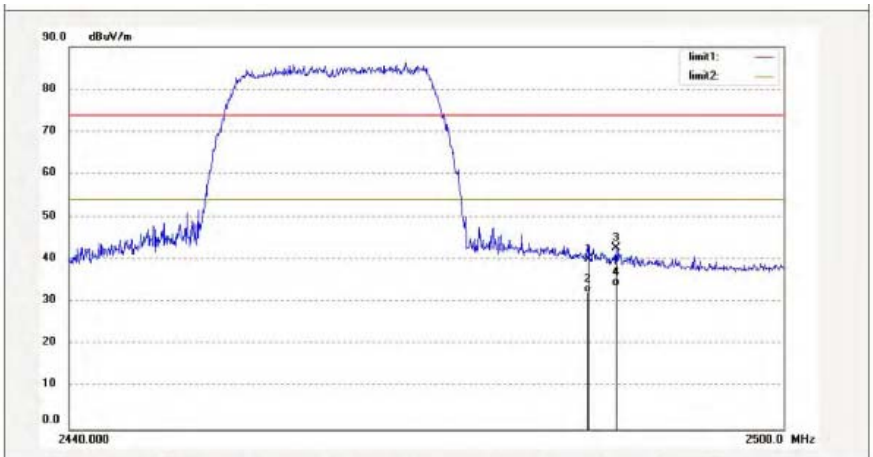
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2395.680	49.44	-6.76	42.68	74.00	-31.32	peak			
2	2395.680	42.03	-6.76	35.27	54.00	-18.73	AVG			
3	2400.020	48.43	-6.76	41.67	74.00	-32.33	peak			
4	2400.020	40.21	-6.76	33.45	54.00	-20.55	AVG			

Note:
1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and
subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
3. Display the measurement of peak values.

802.11g Channel High 2462MHz
Horizontal

No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	59.74	-6.54	53.20	74.00	-20.80	peak			
2	2483.500	51.36	-6.54	44.82	54.00	-9.18	AVG			
3	2484.520	58.78	-6.54	52.24	74.00	-21.76	peak			
4	2484.520	51.23	-6.54	44.69	54.00	-9.31	AVG			

Vertical



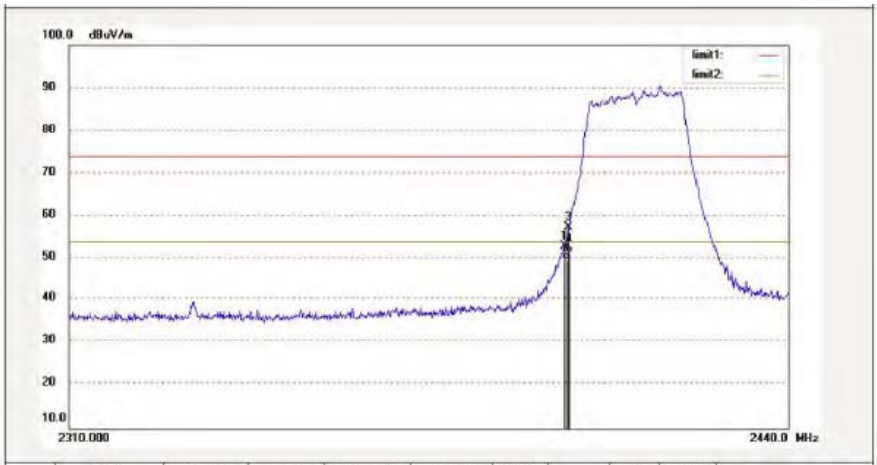
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	46.73	-6.54	40.19	74.00	-33.81	peak			
2	2483.500	38.86	-6.54	32.32	54.00	-21.68	AVG			
3	2485.840	49.37	-6.54	42.83	74.00	-31.17	peak			
4	2485.840	40.35	-6.54	33.81	54.00	-20.19	AVG			

Note:
1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and
subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
3. Display the measurement of peak values.

802.11n(20M) Channel Low 2412MHz
Horizontal

No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2398.400	57.64	-6.75	50.89	74.00	-23.11	peak			
2	2398.400	51.57	-6.75	44.82	54.00	-9.18	AVG			
3	2399.700	61.77	-6.76	55.01	74.00	-18.99	peak			
4	2399.700	55.81	-6.76	49.05	54.00	-4.95	AVG			

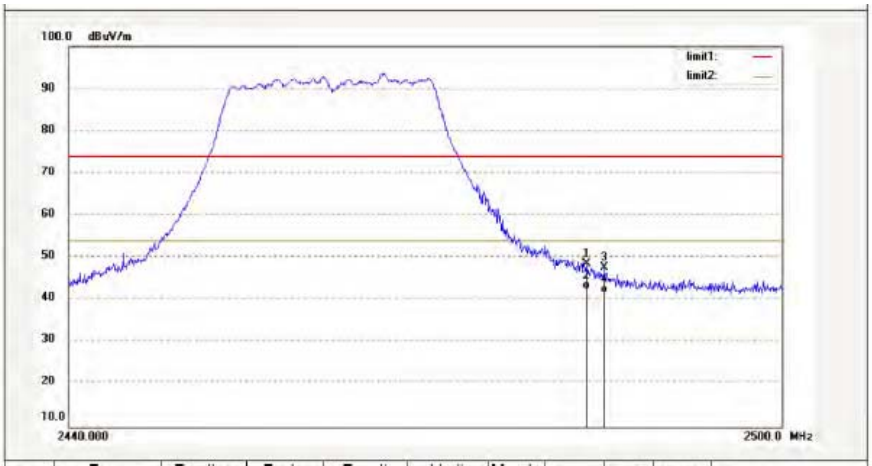
Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2399.050	59.73	-6.76	52.97	74.00	-21.03	peak			
2	2399.050	56.38	-6.76	49.62	54.00	-4.38	AVG			
3	2399.700	64.11	-6.76	57.35	74.00	-16.65	peak			
4	2399.700	58.04	-6.76	51.28	54.00	-2.72	AVG			

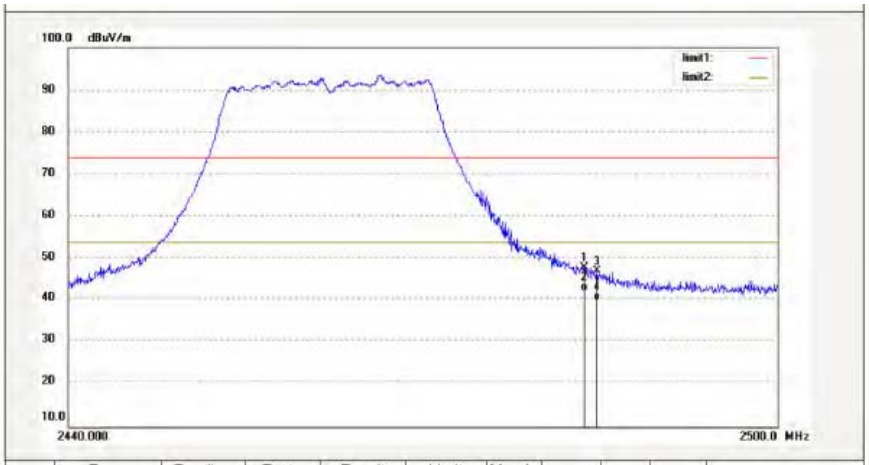
Note:
1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and
subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
3. Display the measurement of peak values.

802.11n(20M) Channel High 2462MHz
Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.440	55.08	-6.54	48.54	74.00	-25.46	peak			
2	2483.440	49.02	-6.54	42.48	54.00	-11.52	AVG			
3	2485.060	54.15	-6.54	47.61	74.00	-26.39	peak			
4	2485.060	48.13	-6.54	41.59	54.00	-12.41	AVG			

Vertical



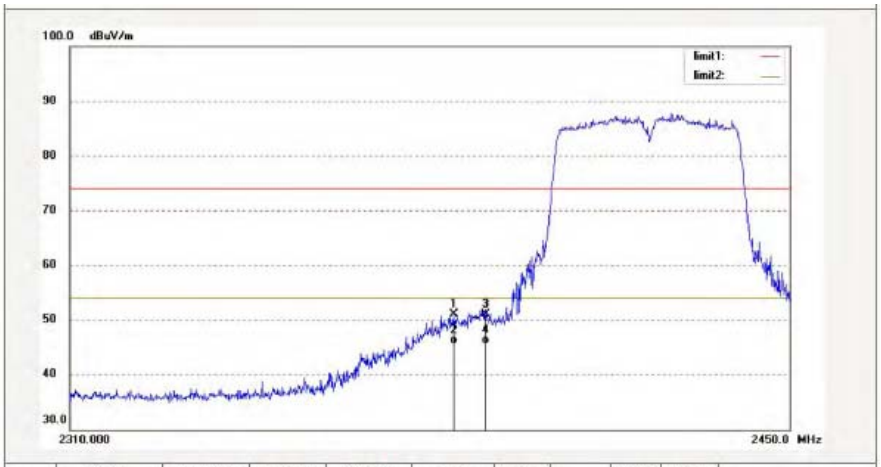
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	54.54	-6.54	48.00	74.00	-26.00	peak			
2	2483.500	48.57	-6.54	42.03	54.00	-11.97	AVG			
3	2484.640	53.48	-6.54	46.94	74.00	-27.06	peak			
4	2484.640	46.42	-6.54	39.88	54.00	-14.12	AVG			

Note:
1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and
subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
3. Display the measurement of peak values.

802.11n(40M) Channel Low 2422MHz
Horizontal

No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2380.420	58.00	-7.64	50.36	74.00	-23.64	peak			
2	2380.420	52.81	-7.64	45.17	54.00	-8.83	AVG			
3	2390.000	57.35	-7.57	49.78	74.00	-24.22	peak			
4	2390.000	52.10	-7.57	44.53	54.00	-9.47	AVG			

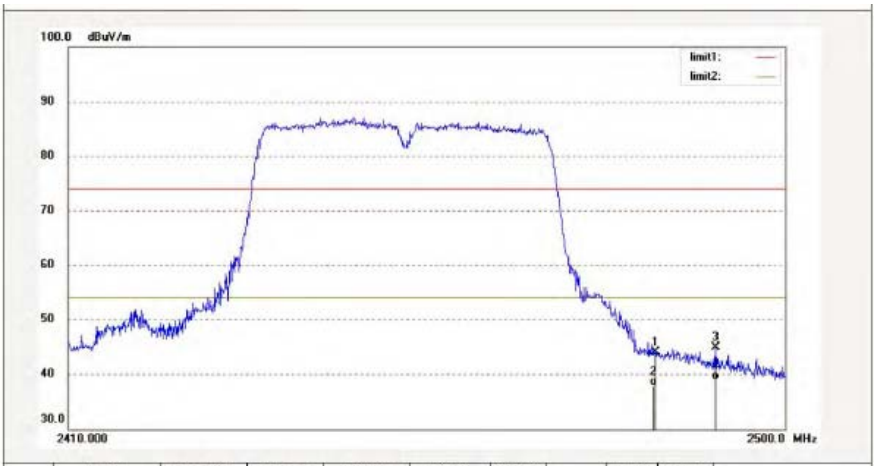
Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2383.780	58.70	-7.61	51.09	74.00	-22.91	peak			
2	2383.780	53.21	-7.61	45.60	54.00	-8.40	AVG			
3	2390.000	58.72	-7.57	51.15	74.00	-22.85	peak			
4	2390.000	53.29	-7.57	45.72	54.00	-8.28	AVG			

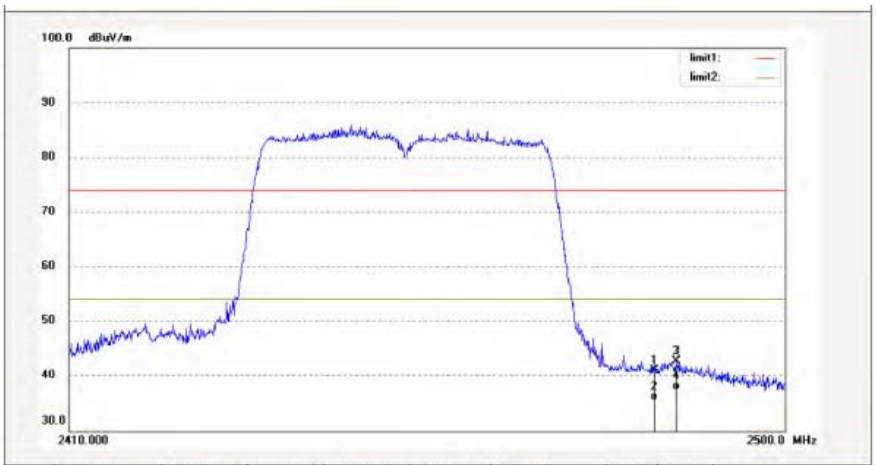
Note:
1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and
subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
3. Display the measurement of peak values.

802.11n(40M) Channel High 2452MHz
Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	51.46	-7.38	44.08	74.00	-29.92	peak			
2	2483.500	45.37	-7.38	37.99	54.00	-16.01	AVG			
3	2491.180	52.34	-7.38	44.96	74.00	-29.04	peak			
4	2491.180	46.32	-7.38	38.94	54.00	-15.06	AVG			

Vertical



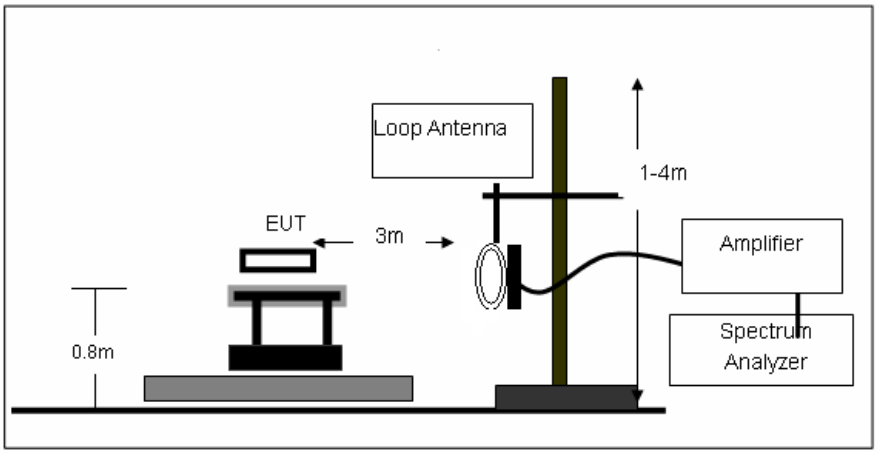
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	48.33	-7.38	40.95	74.00	-33.05	peak			
2	2483.500	42.97	-7.38	35.59	54.00	-18.41	AVG			
3	2486.140	50.11	-7.39	42.72	74.00	-31.28	peak			
4	2486.140	44.87	-7.39	37.48	54.00	-16.52	AVG			

Note:
1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and
subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
3. Display the measurement of peak values.

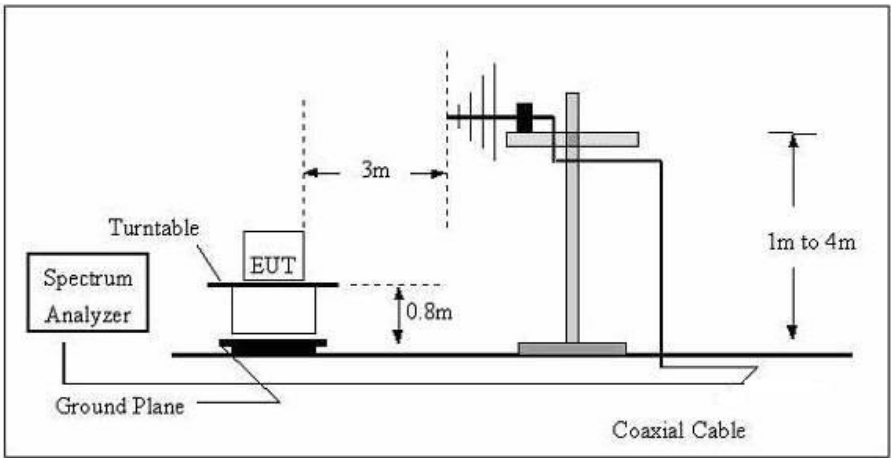
8 Radiated Spurious Emission Test

8.1 Block Diagram of Test Setup

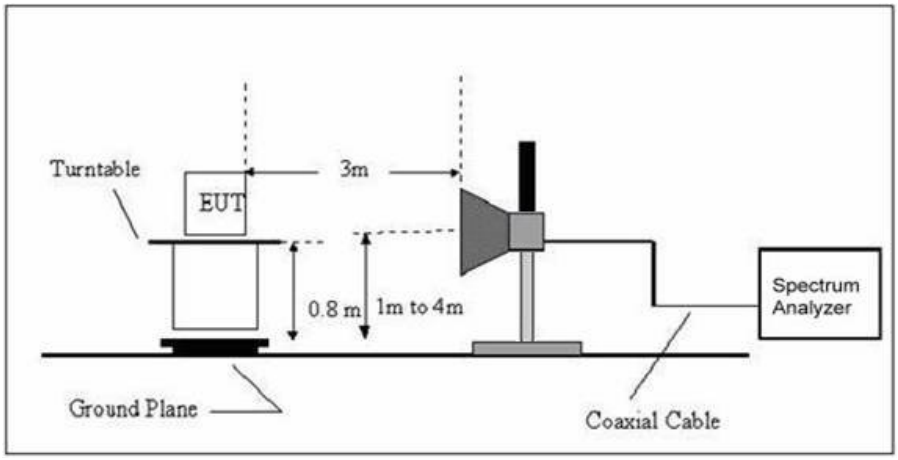
（1）Radiated Emission Test-Up Frequency Below 30MHz



（2）Radiated Emission Test-Up Frequency 30MHz~1GHz



（3）Radiated Emission Test-Up Frequency Above 1GHz



8.2 Limits

Section 15.247(d): 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. 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).

8.3 Restricted bands of operation

9.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

8.3 Test Procedure

a. The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The worst-case data rate for this channel to be 1Mbps for 802.11b mode and 6Mbps for 802.11g mode and 300Mbps for 802.11n mode, based on previous with 802.11 WLAN product design architectures.

The bandwidth of test receiver is set at 9kHz in below 30MHz. and set at 120kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The frequency range from 9kHz to 25GHz is checked.

The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

8.4 Test Result

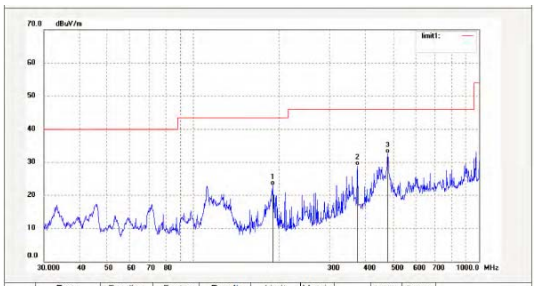
PASS

802.11b Channel Low 2412MHz
For Below 30MHz

Freq.(MHz)	Reading (dBuV/m) (QP)	Factor(dB) Corr.	Result (dBuV/m)	Limit (dBuV/m)	Margin(dB)
/	/	/	/	/	/
/	/	/	/	/	/

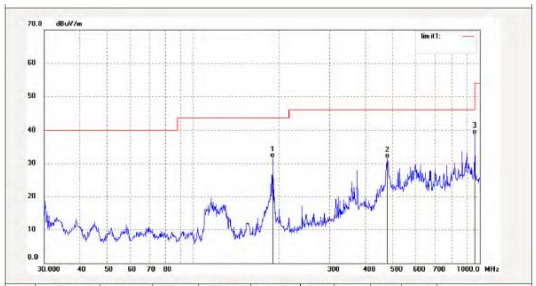
For 30MHz-1000MHz

Polarization: H



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	189.7385	43.92	-20.99	22.93	43.50	-20.57	QP			
2	374.6225	44.82	-15.82	29.00	46.00	-17.00	QP			
3	478.8456	46.84	-14.17	32.67	46.00	-13.33	QP			

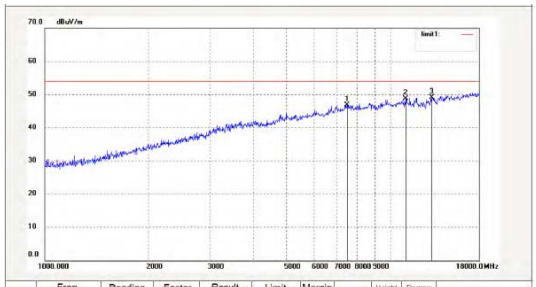
Polarization: V



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	189.7385	52.75	-20.99	31.76	43.50	-11.74	QP			
2	478.8456	45.81	-14.17	31.64	46.00	-14.36	QP			
3	962.1623	43.97	-5.23	38.74	54.00	-15.26	QP			

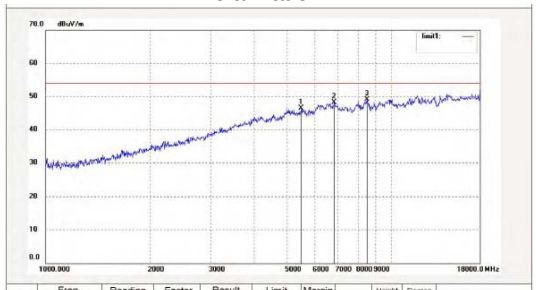
For 1GHz-18GHz

Polarization: H



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	7476.006	41.69	5.07	46.76	54.00	-7.24	peak			
2	11044.129	37.99	10.68	48.67	54.00	-5.33	peak			
3	13135.536	2.64	46.40	49.04	54.00	-4.96	peak			

Polarization: V



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	5487.260	44.29	2.09	46.38	54.00	-7.62	peak			
2	6835.279	43.01	5.29	48.30	54.00	-5.70	peak			
3	8514.456	40.23	8.87	49.10	54.00	-4.90	peak			

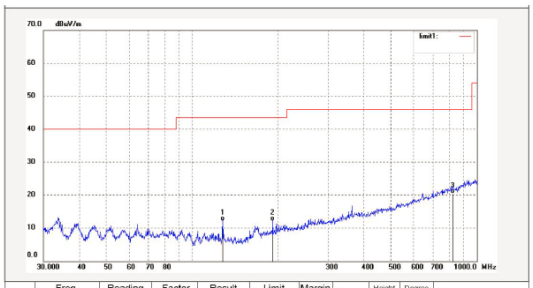
Note:
Emissions attenuated more than 20dB below the permissible value not reported.
The average measurement was not performed when peak measured data under the limit of average detection
The fundamental radiated emissions were reduced by band reject filter in the attached plots
The EUT is tested radiated emissions at each test mode (802.11 b/g/n 20M/n 40M) in three axes, "802.11b" mode is worst mode
The 18-25GHz emissions are not reported, because the levels are too low against the limit.

802.11b Channel Middle 2437MHz
For Below 30MHz

Freq.(MHz)	Reading (dBuV/m) (QP)	Factor(dB) Corr.	Result (dBuV/m)	Limit (dBuV/m)	Margin(dB)
/	/	/	/	/	/
/	/	/	/	/	/

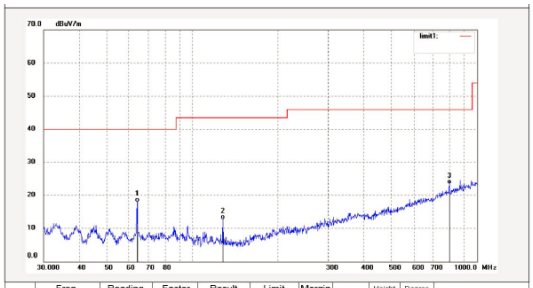
For 30MHz-1000MHz

Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	128.1129	35.18	-22.94	12.24	43.50	-31.26	QP			
2	191.7450	33.03	-20.80	12.23	43.50	-31.27	QP			
3	824.5968	27.85	-7.39	20.46	46.00	-25.54	QP			

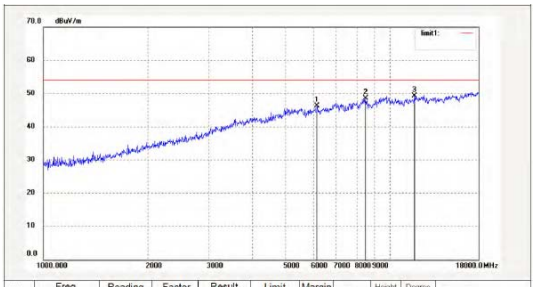
Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	63.9827	39.07	-21.17	17.90	40.00	-22.10	QP			
2	128.1129	35.68	-22.94	12.74	43.50	-30.76	QP			
3	798.9796	31.12	-7.80	23.32	46.00	-22.68	QP			

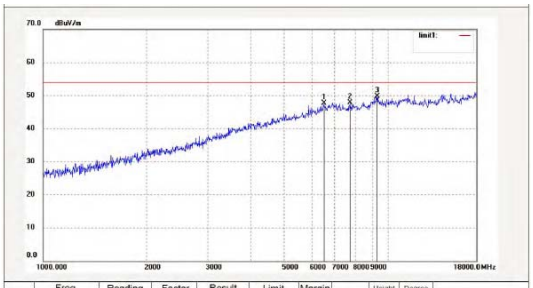
For 1GHz-18GHz

Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	6159.797	42.85	3.56	46.21	54.00	-7.79	peak			
2	8514.456	39.70	8.87	48.57	54.00	-5.43	peak			
3	11769.214	36.19	13.14	49.33	54.00	-4.67	peak			

Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	6507.536	43.18	4.45	47.63	54.00	-6.37	peak			
2	7738.857	41.50	6.36	47.86	54.00	-6.14	peak			
3	9285.710	39.96	9.77	49.73	54.00	-4.27	peak			

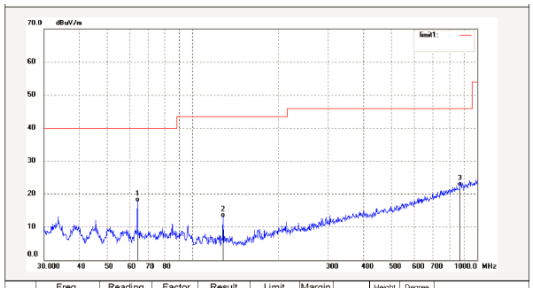
Note:
Emissions attenuated more than 20dB below the permissible value not reported.
The average measurement was not performed when peak measured data under the limit of average detection
The fundamental radiated emissions were reduced by band reject filter in the attached plots
The EUT is tested radiated emissions at each test mode (802.11 b/g/n 20M/n 40M) in three axes,
“802.11b” mode is worst mode
The 18-25GHz emissions are not reported, because the levels are too low against the limit.

802.11b Channel High 2462MHz
For Below 30MHz

Freq.(MHz)	Reading (dBuV/m) (QP)	Factor(dB) Corr.	Result (dBuV/m)	Limit (dBuV/m)	Margin(dB)
/	/	/	/	/	/
/	/	/	/	/	/

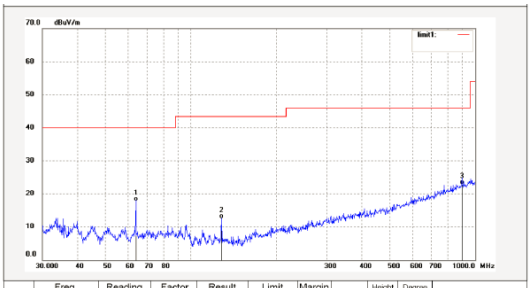
For 30MHz-1000MHz

Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	63.9827	38.69	-21.17	17.52	40.00	-22.48	QP			
2	128.1128	35.74	-22.94	12.80	43.50	-30.70	QP			
3	872.1832	28.87	-6.59	22.28	46.00	-23.72	QP			

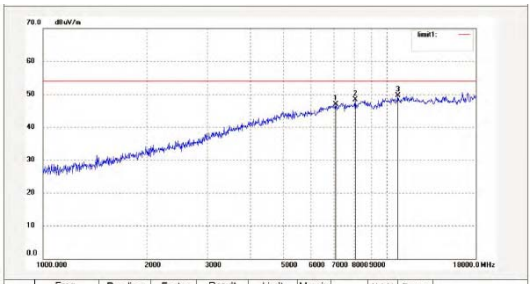
Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	63.9828	38.87	-21.17	17.70	40.00	-22.30	QP			
2	128.1130	35.41	-22.94	12.47	43.50	-31.03	QP			
3	900.1474	28.89	-6.11	22.78	46.00	-23.22	QP			

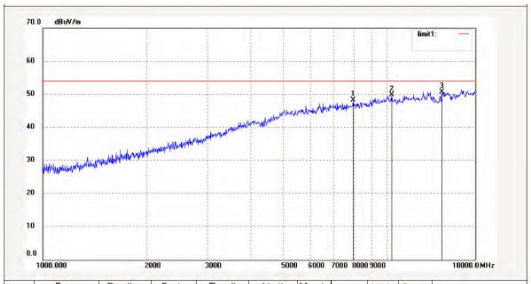
For 1GHz-18GHz

Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	7096.999	42.04	4.99	47.03	54.00	-6.97	peak			
2	8082.803	39.89	8.47	48.36	54.00	-5.64	peak			
3	10760.538	39.46	10.20	49.66	54.00	-4.34	peak			

Polarization: Horizontal

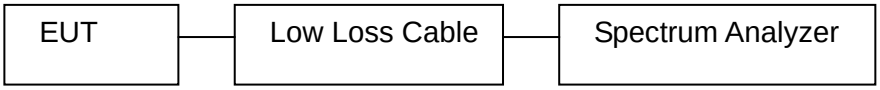


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	7966.832	40.10	8.03	48.13	54.00	-5.87	peak			
2	10303.978	39.53	10.27	49.80	54.00	-4.20	peak			
3	14408.425	0.76	49.99	50.75	54.00	-3.25	peak			

Note:
Emissions attenuated more than 20dB below the permissible value not reported.
The average measurement was not performed when peak measured data under the limit of average detection
The fundamental radiated emissions were reduced by band reject filter in the attached plots
The EUT is tested radiated emissions at each test mode (802.11 b/g/n 20M/n 40M) in three axes, "802.11b" mode is worst mode
The 18-25GHz emissions are not reported, because the levels are too low against the limit.

9 Conducted Spurious Emission Compliance Test

9.1 Block Diagram of Test Setup



9.2 Limits

Se Section 15.247(d): 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. 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).

9.3 Test Procedure

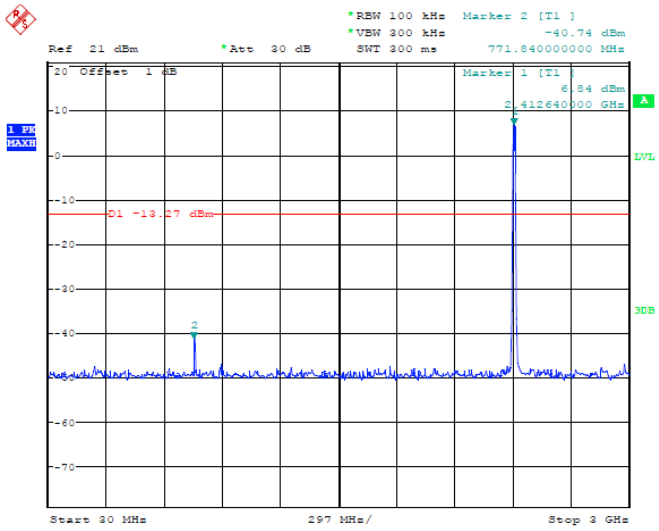
a. The transmitter output was connected to the spectrum analyzer via a low loss cable.
b. Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz.
c. The Conducted Spurious Emission was measured and recorded.

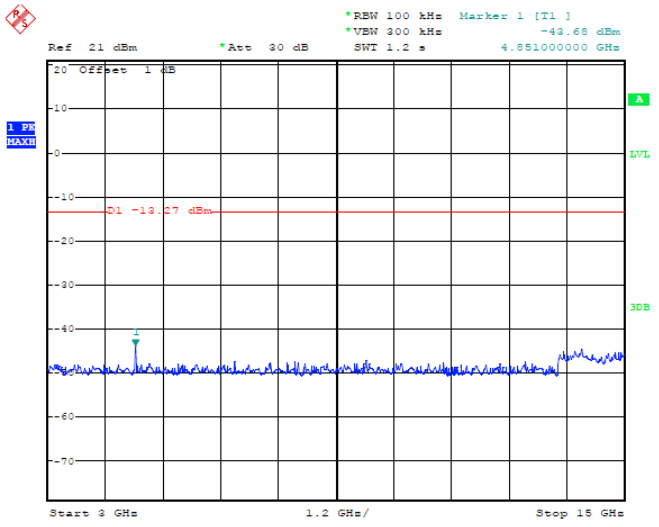
9.4 Test Result

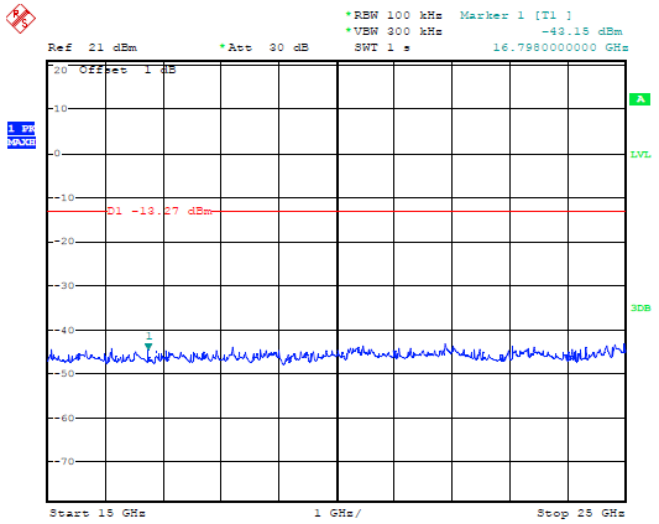
PASS

The spectrum analyzer plots are attached as below.

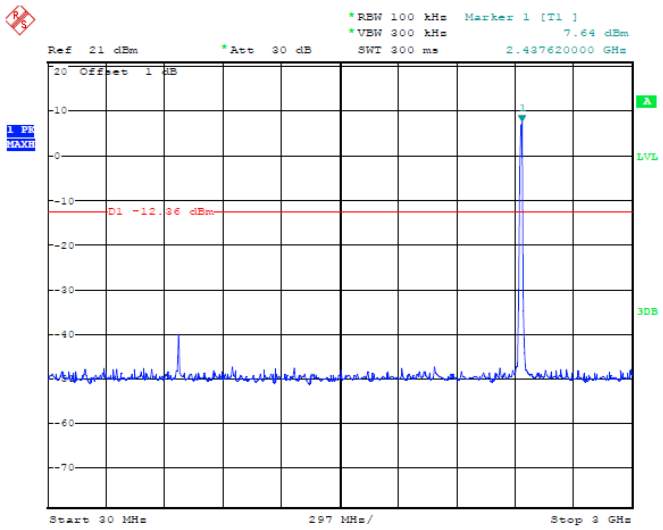
TX 802.11b Channel Low 2412MHz

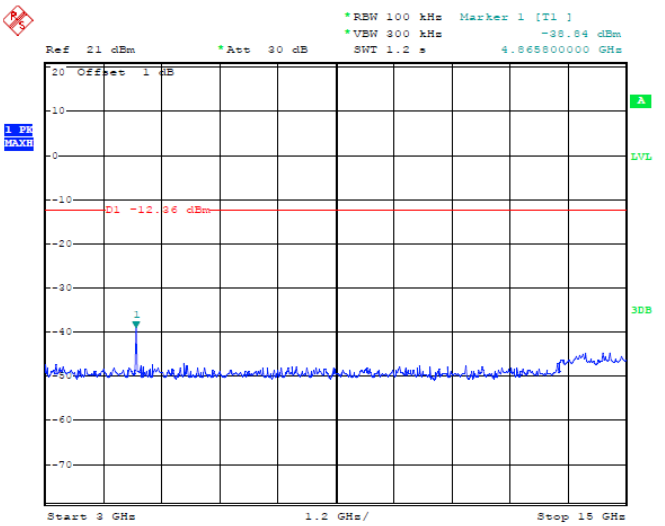


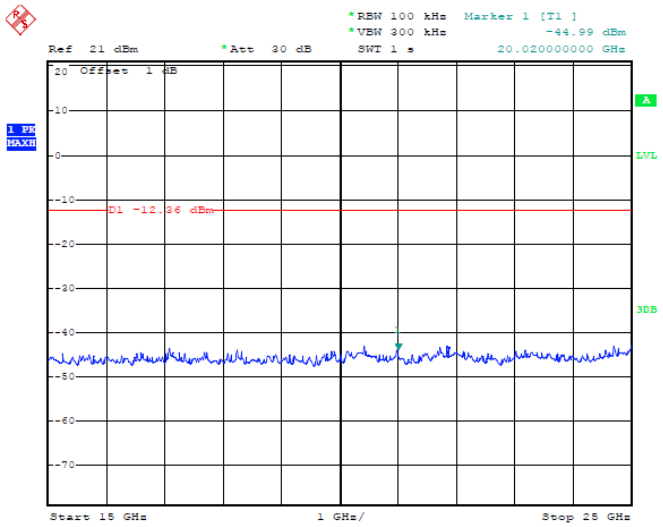




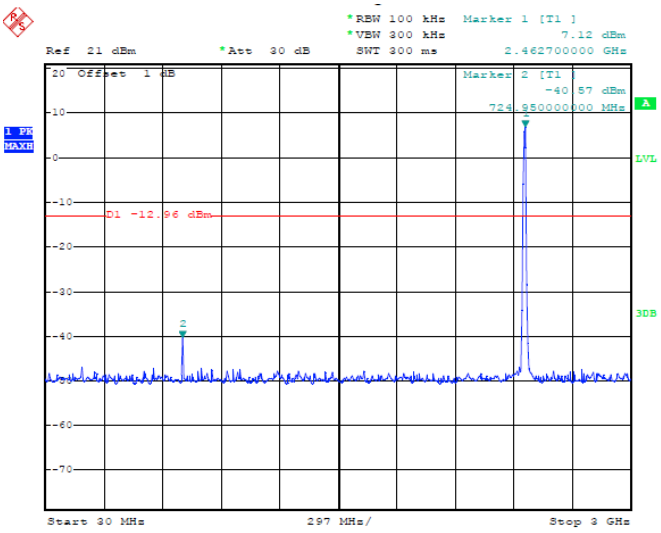
TX 802.11b Channel Middle 2437MHz

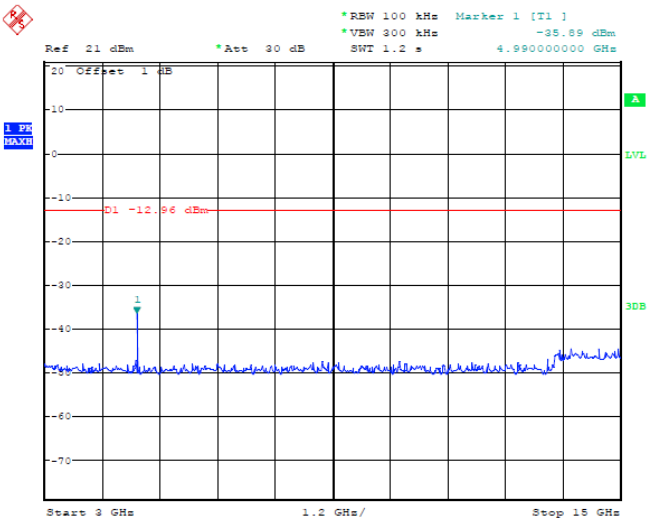


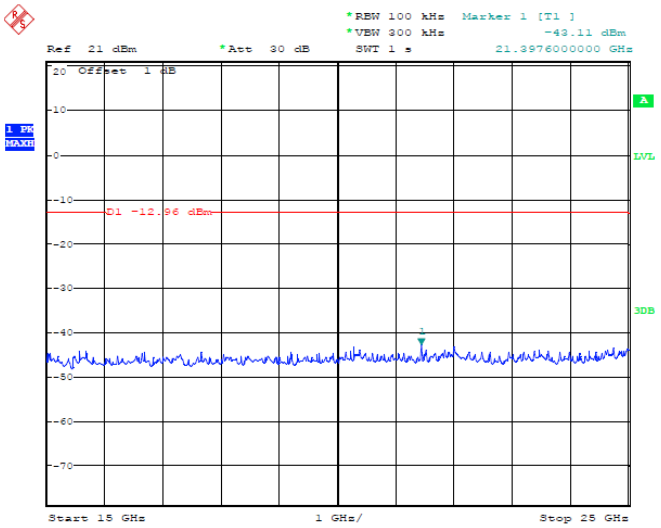




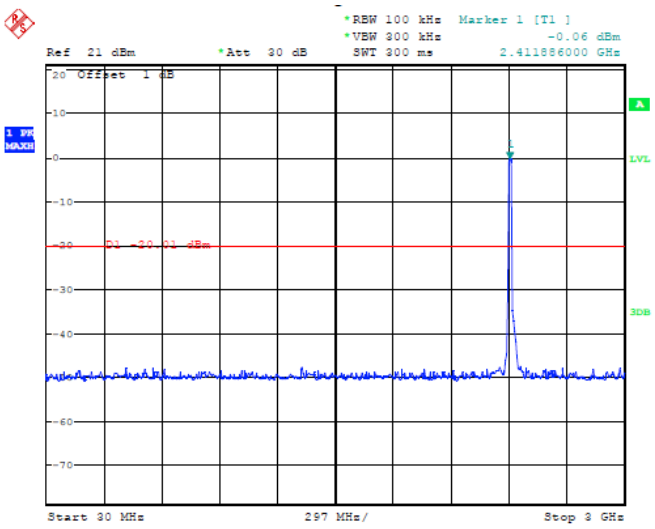
TX 802.11b Channel High 2462MHz

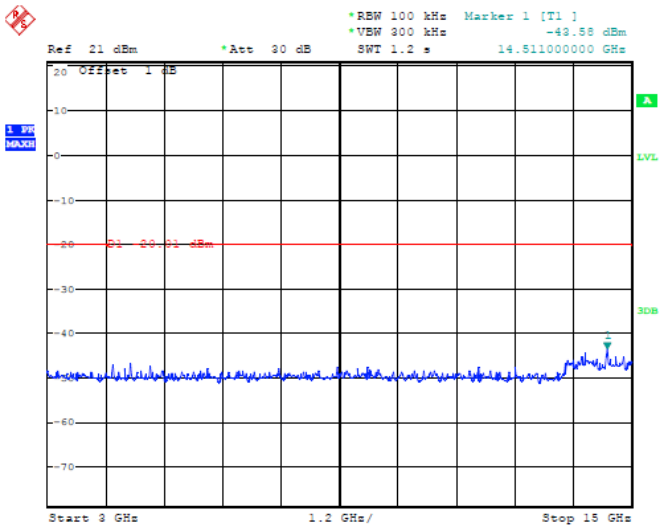


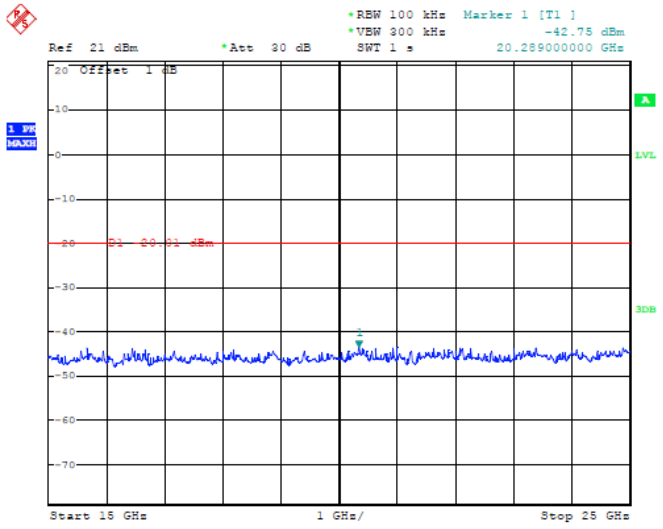




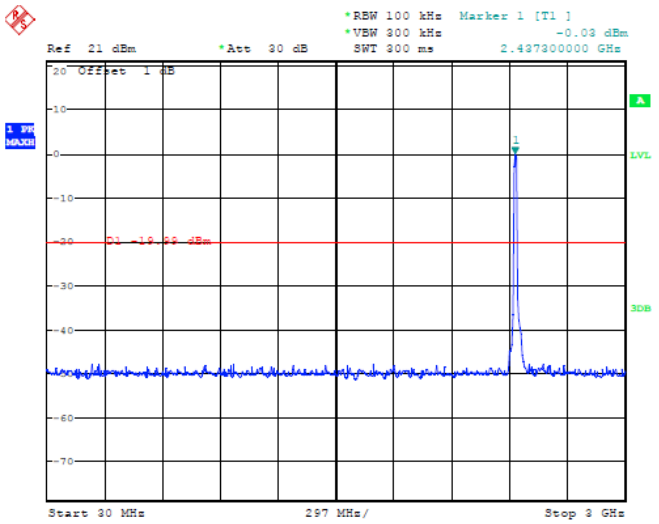
TX 802.11g Channel Low 2412MHz

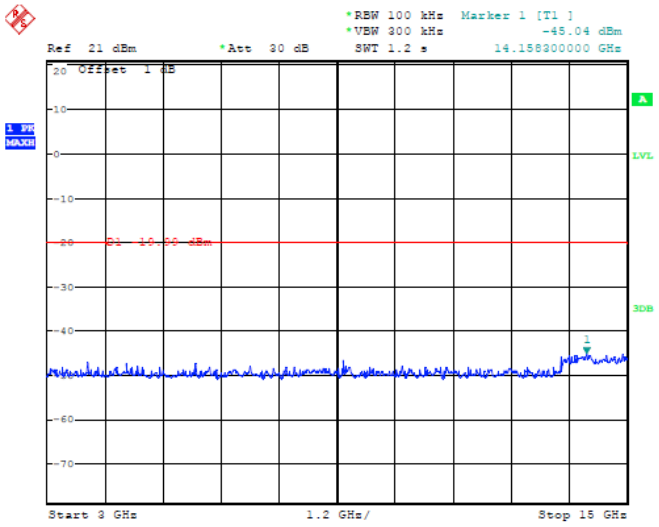


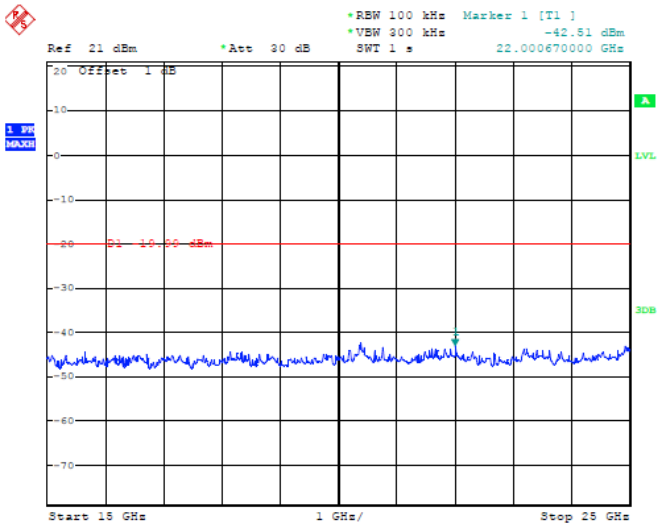




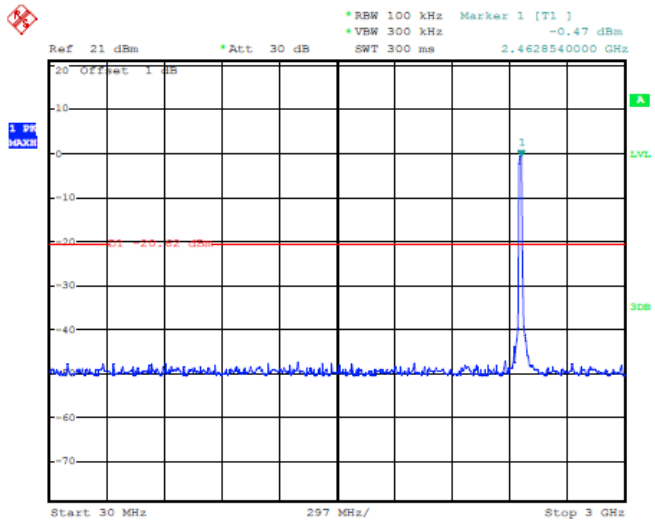
TX 802.11g Channel Middle 2437MHz

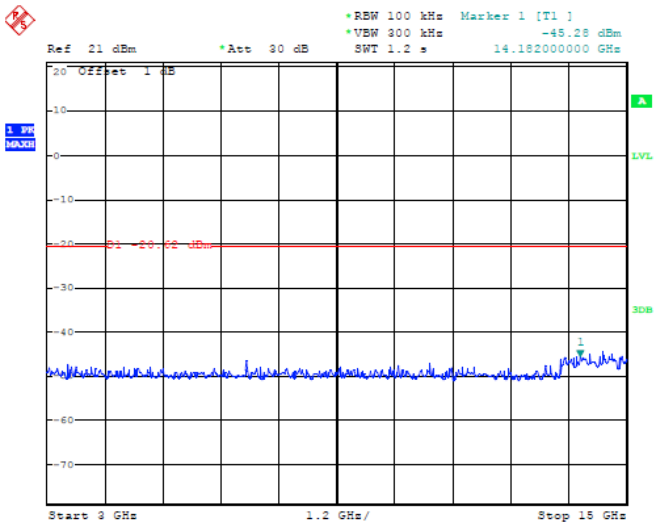


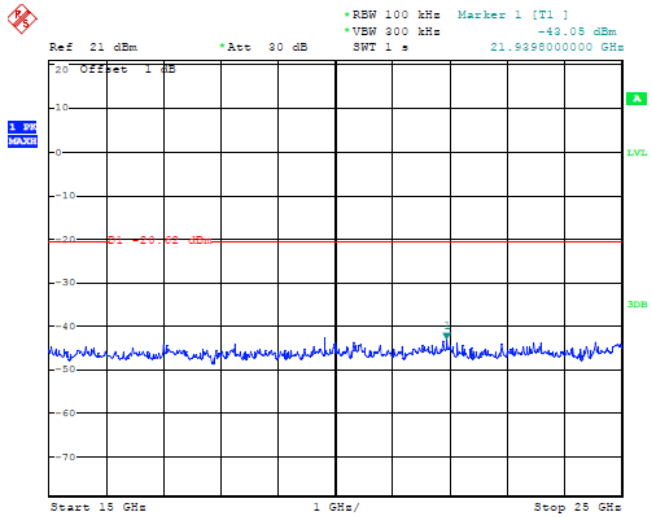




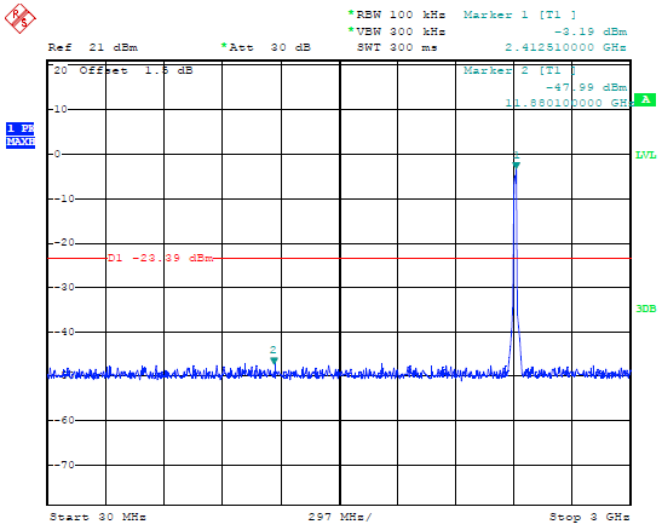
TX 802.11g Channel High 2462MHz

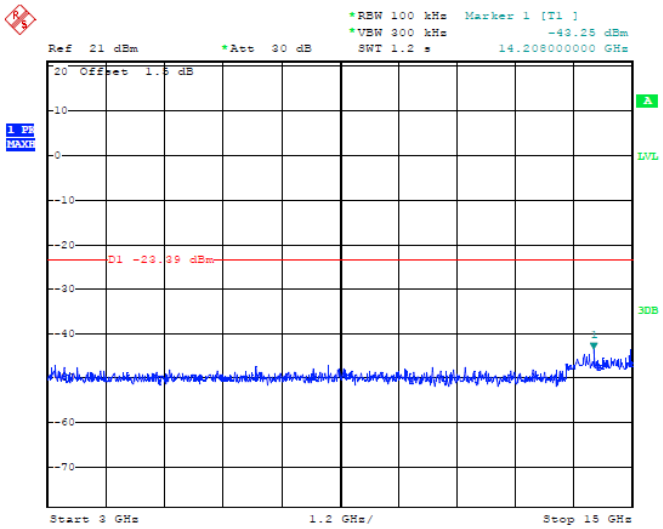


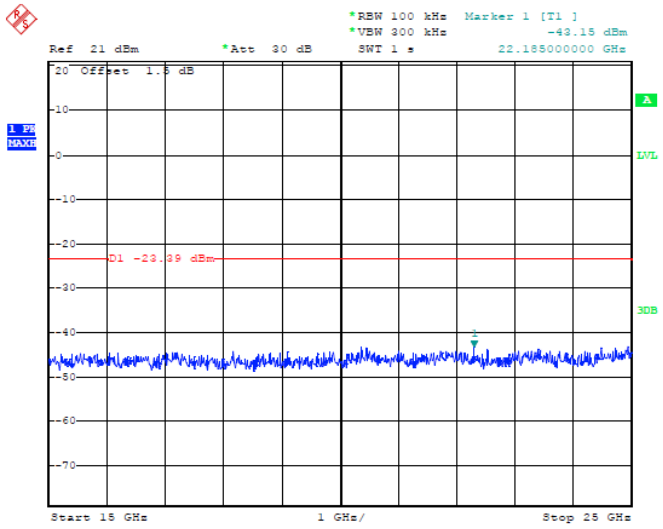




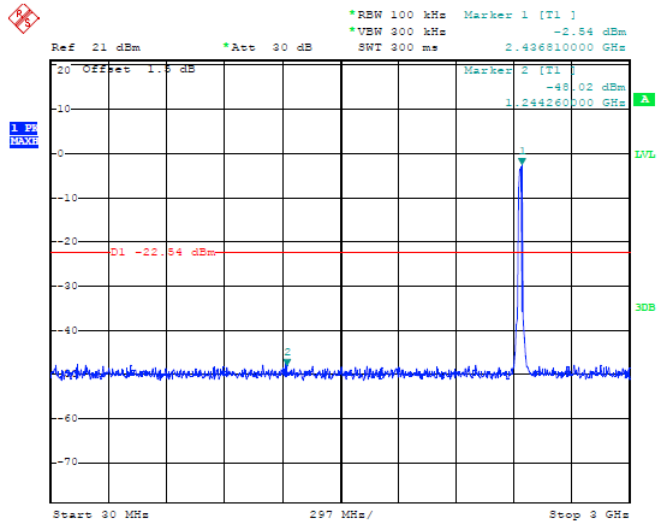
TX 802.11n Channel Low 2412MHz (20MHz)

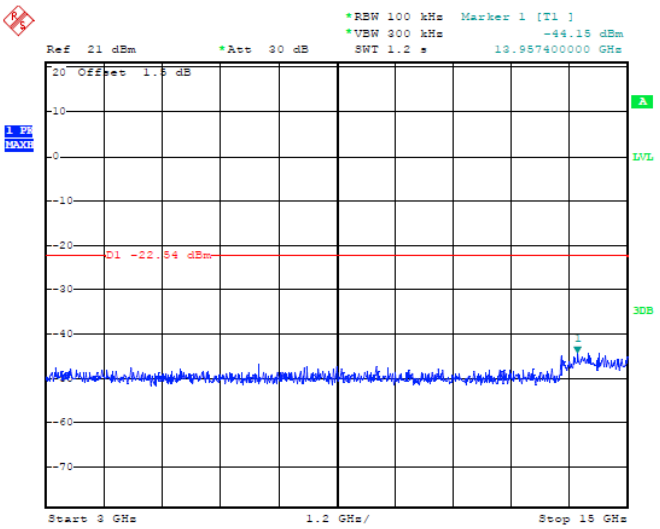


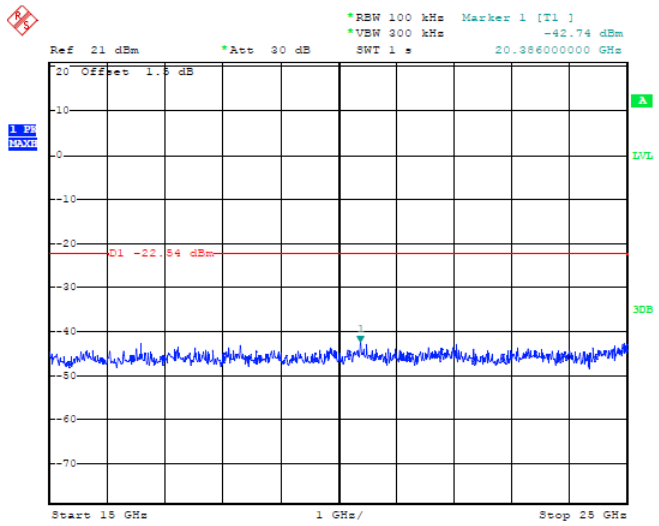




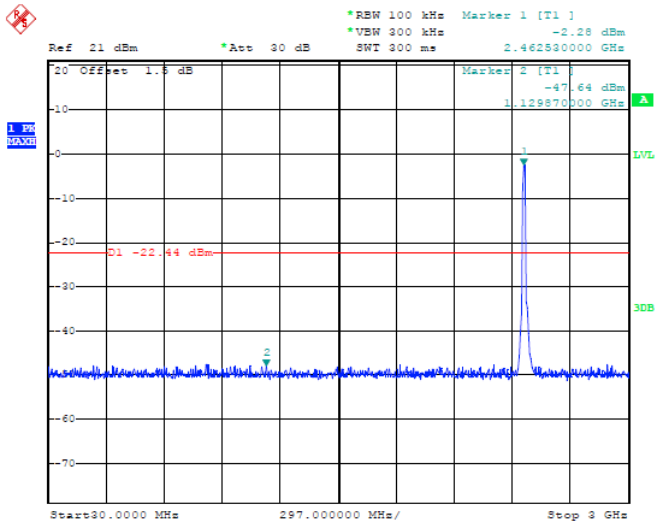
TX 802.11n Channel Middle 2437MHz (20MHz)

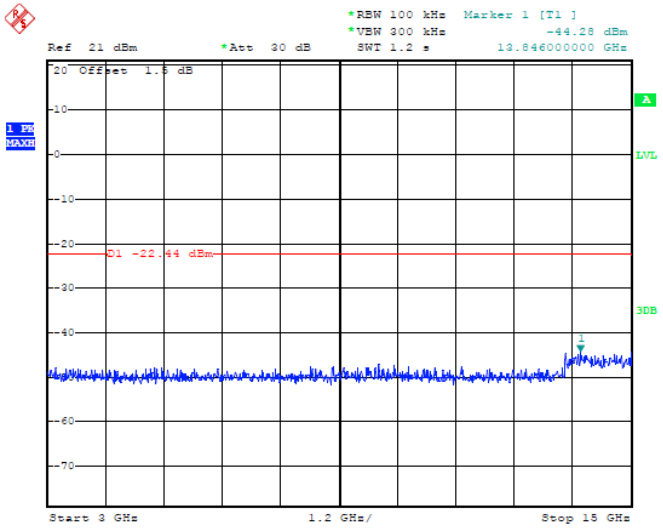


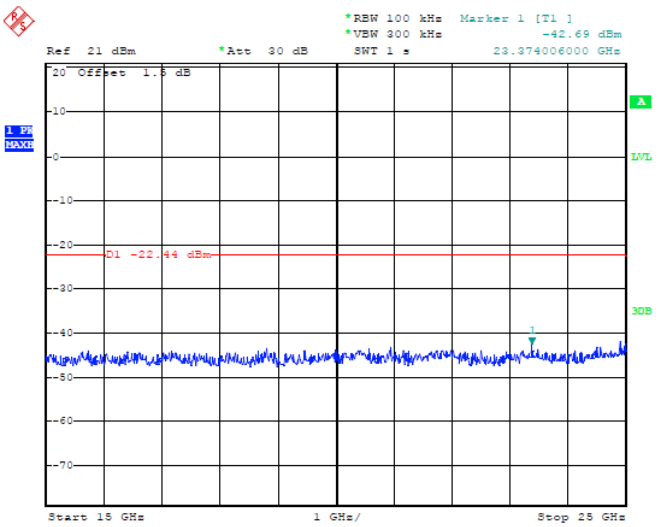




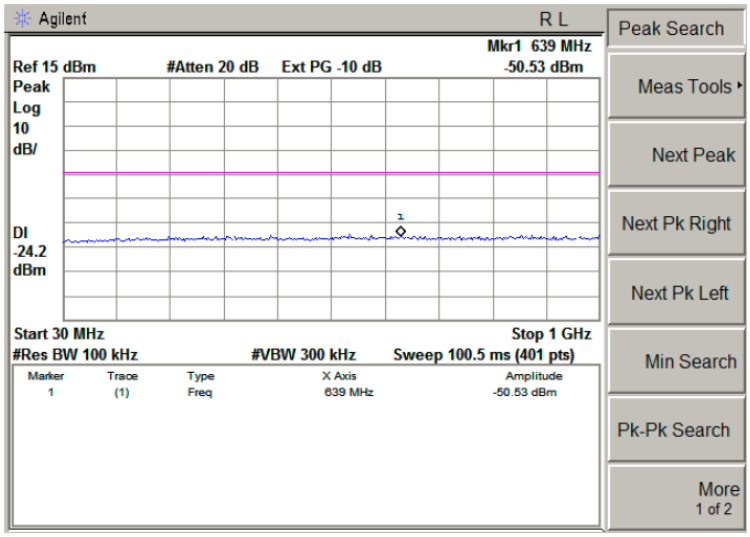
TX 802.11n Channel High 2462MHz (20MHz)

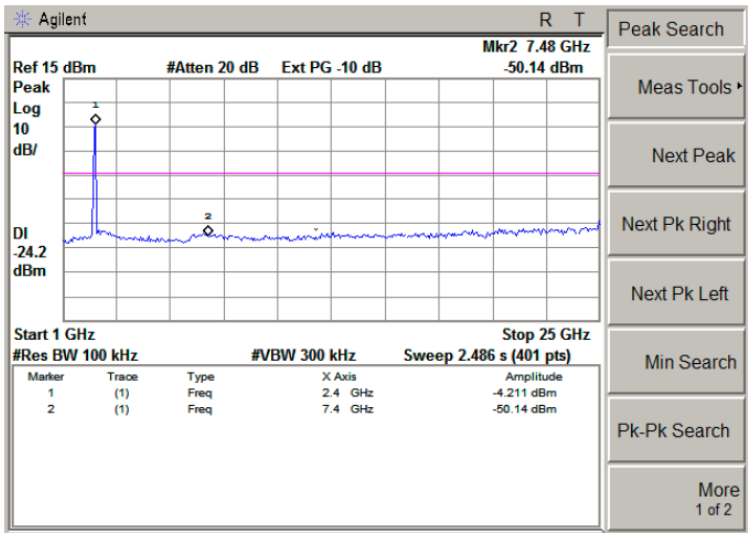




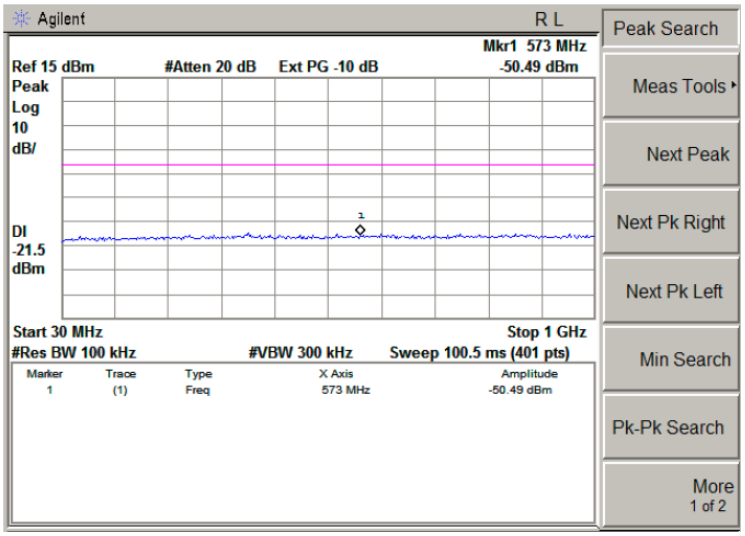


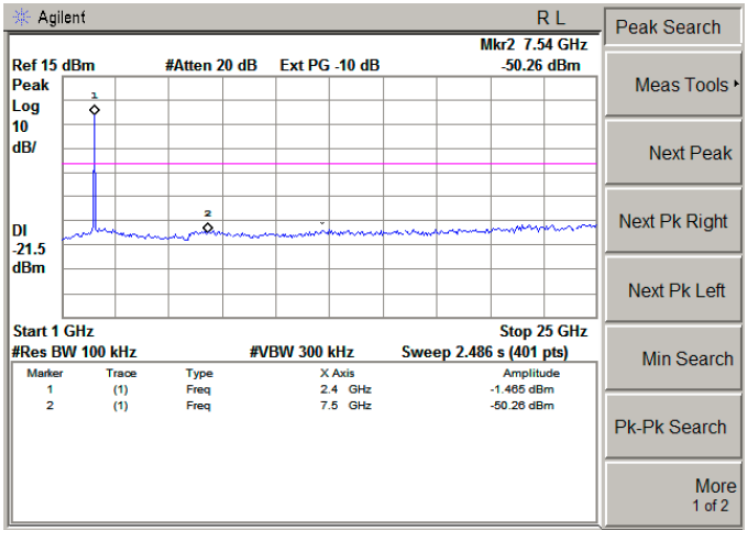
TX 802.11n Channel Low 2422MHz (40MHz)



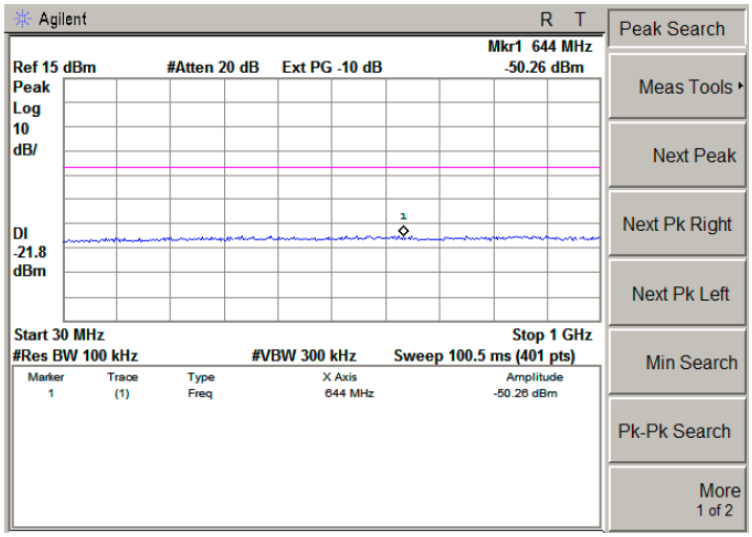


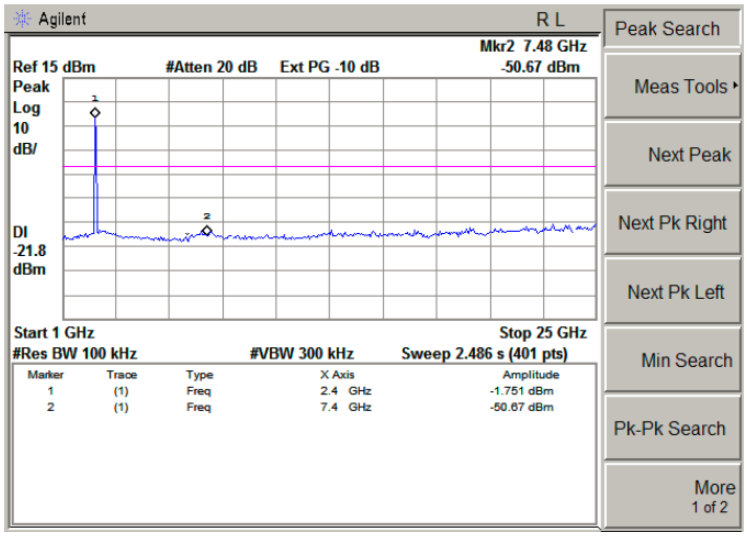
TX 802.11n Channel Middle 2437MHz (40MHz)





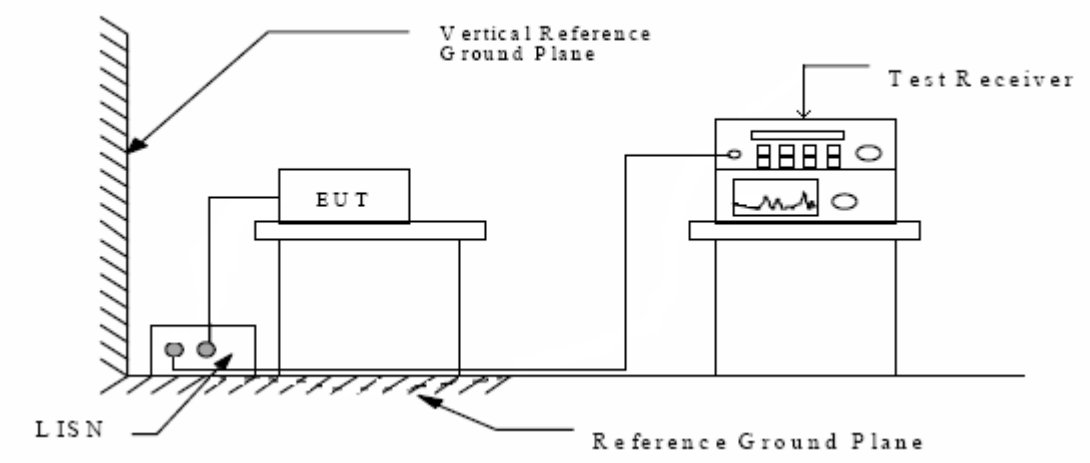
TX 802.11n Channel High 2452MHz (40MHz)





10 AC Power Line Conducted Emission For Part 15 Section 15.207(A)

10.1 Block Diagram of Test Setup



10.2 Limits

Conducted Emission Measurement Limits According to Section 15.207(a)

Frequency MHz	Limits (dBμV)	
	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

* Decreases with the logarithm of the frequency.

10.3 Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and 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 lines 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 ANSI C63.4: 2003 on Conducted Emission Measurement.

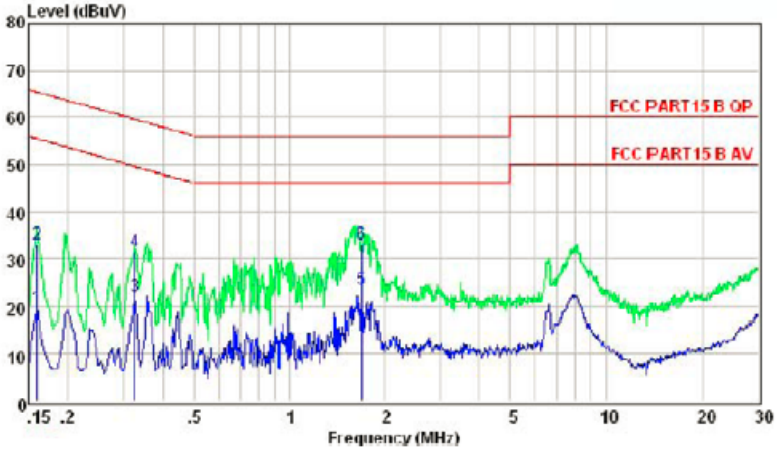
The bandwidth of test receiver (R & S ESPI) is set at 9kHz.

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

10.4 Test Result

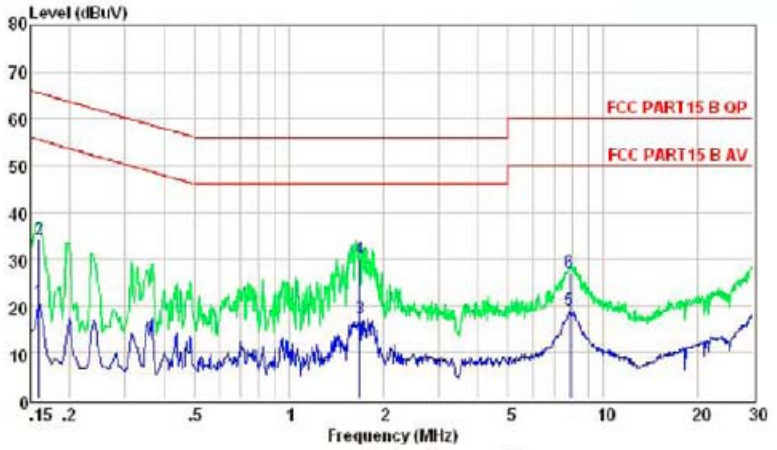
PASS

N



	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.160	19.56	55.47	-35.91	Average
2	0.160	33.06	65.47	-32.41	QP
3	0.325	22.09	49.57	-27.48	Average
4	0.325	31.40	59.57	-28.17	QP
5	1.689	23.44	46.00	-22.56	Average
6	1.689	33.12	56.00	-22.88	QP

L

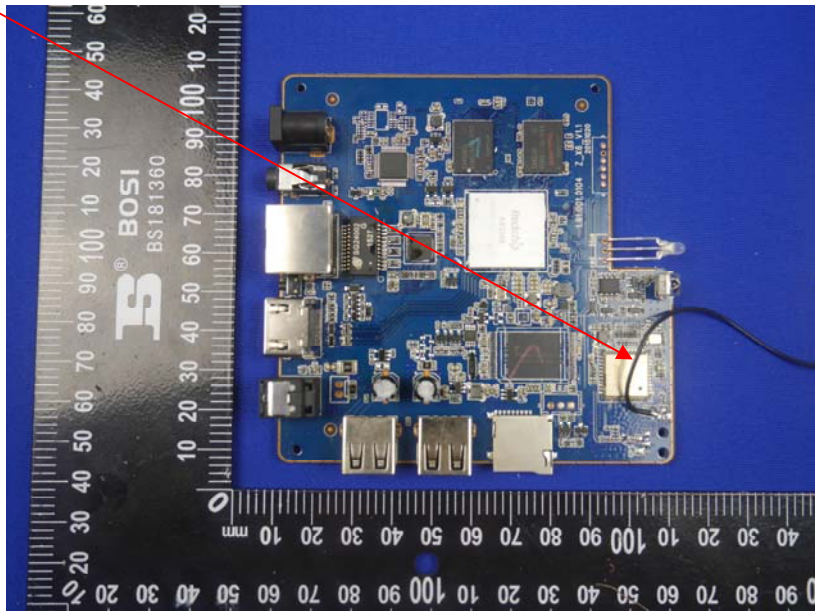


	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.160	20.70	55.47	-34.77	Average
2	0.160	34.12	65.47	-31.35	QP
3	1.680	17.29	46.00	-28.71	Average
4	1.680	30.11	56.00	-25.89	QP
5	7.852	18.98	50.00	-31.02	Average
6	7.852	27.12	60.00	-32.88	QP

11 Antenna Requirement

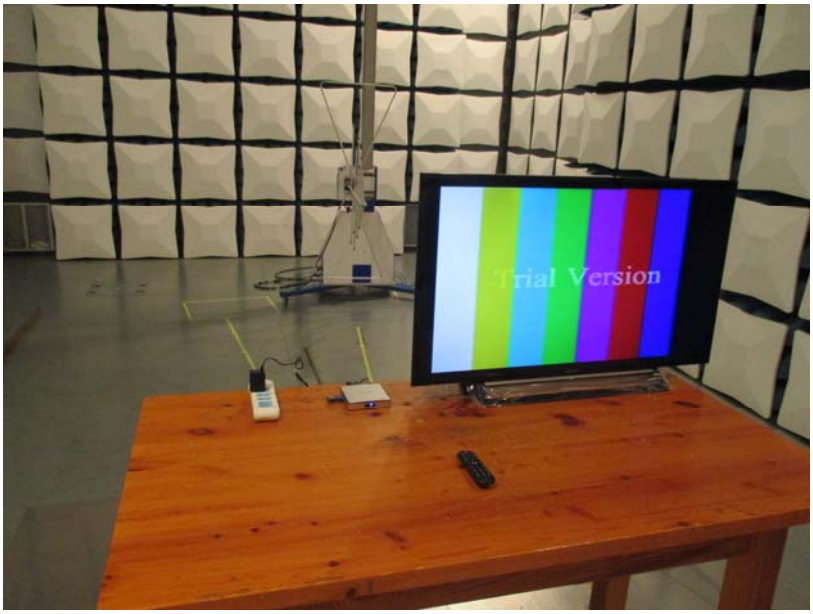
According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. Antenna is fixed by enclosure, can not be changed except take apart the product.

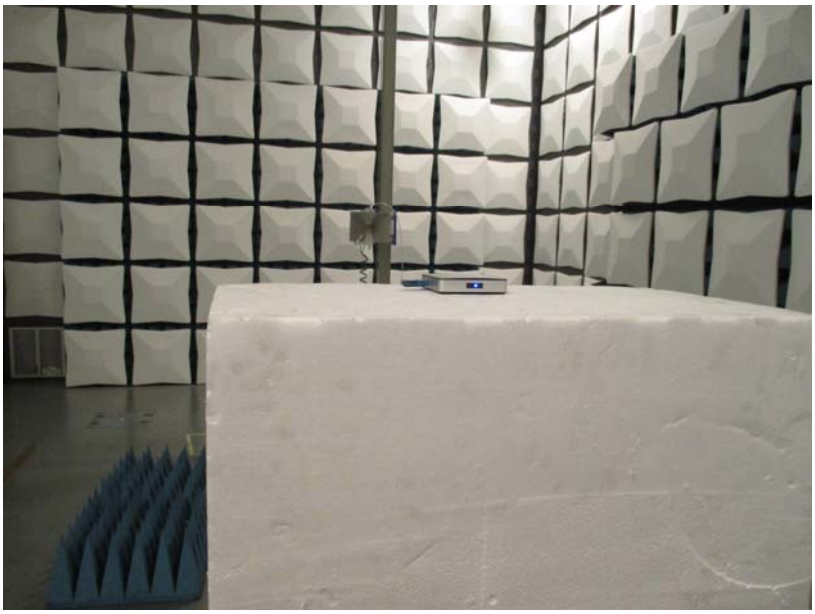
Antenna



12 Photograph of Test

12.1 Radiated Emission





12.2 AC Power Line Conducted Emission