



FCC TEST REPORT

According to

FCC CFR Title 47 Part 15 Subpart C

Applicant	: ZyXEL Communications Corporation
Address	: No. 6, Innovation Road II, Science Park, Hsinchu 300, Taiwan
Manufacturer	: WuXi MitraStar Technology Co.,Ltd
Address	: Wuxi New District Minshan road 60#-E Jiangsu PRC
Equipment	: 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway
Model No.	: P-873HNUP-51B, DSL-491HNUP-B1D
Brand Name	: ZyXEL
FCC ID	: I88P873HNUP51B

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Document history

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I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 – 2003** and the energy emitted by this equipment was **passed** **CISPR PUB. 22 and FCC Part 15** in both radiated and conducted emission class B limits. Testing was carried out on Apr 28, 2011 at **Cerpass Technology Corp.**

Documented By:

Jeff Fang/ Administration

Approved By:

Clinton Kao / Technical director



1. Report of Measurements and Examinations

FCC CFR Title 47 Part 15 Subpart C: 2007			
ANSI C63.4: 2003			
Clause	Test Parameter	Test Performed	Remark
15.207	Conducted Emission	YES	PASS
15.209	Radiated Emission	YES	PASS
15.247(a) 15.215(c)	Occupied Bandwidth	YES	PASS
15.247(b)	Maximum Peak Output Power	YES	PASS
15.247(c)	Band Edges	YES	PASS
15.247(c)	RF antenna conducted	YES	PASS
15.247(d)	Power Spectral Density	YES	PASS



2. Test Configuration of Equipment under Test

2.1. Feature of Equipment under Test

802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Model No:	P-873HNUP-51B, DSL-491HNUP-B1D
Power Adapter	Manufacturer:	LEI
	Model No.:	MU18-D120150-A1
	Input:	100-240V~50-60Hz, 0.6A
	Output:	12V $\overline{\text{---}}$ 1.5A
Power supply cable	Non-Shielded, 1.5m	
Remark	They are identical except for the model name. This is only to satisfy the different requirements of the client. P-873HNUP-51B was selected as the test model and its data have been recorded in this report.	

WLAN	Ralink/RT3062F
Spreading	802.11b: CCK, DQPSK, DBPSK 802.11g: 64 QAM, 16 QAM, QPSK, BPSK 802.11n: BPSK, QPSK, 16-QAM, 64-QAM
Frequency Range	802.11b/g/n(20MHz): 2412-2462MHz 802.11n(40MHz): 2422-2452MHz
Number of Channels	802.11b/g/n (20MHz): 11 802.11n (40MHz): 7
Data Rate	802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0~MCS15
Antenna	Antenna 1 Dipole Chain0 (3.00dBi) Antenna 2 PIFA Chain1 (2.83dBi)



2.2. Carrier Frequency of Channels

For 2.4G 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	---	---

For 2.4G 802.11n (40MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	---	08	2447
02	---	09	2452
03	2422	---	---
04	2427	---	---
05	2432	---	---
06	2437	---	---
07	2442	---	---



2.3. Test Manner

Test Manner	
a	During testing, the interface cables and equipment positions were varied according to 47 CFR, Part 2, Part 15
b	Adjust the EUT at the test mode and the test channel. Then test.
The test modes:	
The EUT transmitting and receiving with one (chain 0) antenna working at b/g mode, so one antenna working configuration was used for b/g mode testing in this report. The EUT transmitting and receiving with two antennas simultaneously working at N mode (Chain 0+Chain 1). The chip set RT3062F supports 802.11 b/g + MIMO 2x2 configuration was finally used in this report. The worst-case data rates are determined to be as follows for each mode based on investigation by measuring the average power, peak power and PPSD across all data rates, bandwidths, and modulations. The worst-case data rates: IEEE802.11b mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing. IEEE802.11g mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 54Mbps data rate were chosen for full testing. IEEE 802.11gn Standard-20 MHz Channel mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with MCS0 data rate were chosen for full testing. IEEE 802.11gn Wide-40 MHz Channel mode: Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with MCS0 data rate were chosen for full testing. Then, the EUT configuration and cable configuration of the above highest emission mode was recorded for all final test items.	



2.4. Description of Test System

No	Device	Manufacturer	Model No.	Description
1	Notebook	ASUS	W6A	Power by adaptor



2.5. General Information of Test

Test Site:	CerpPASS Technology Corp.
Performand Location :	No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China
NVLAP LAB Code :	200814-0
FCC Registration Number :	916572, 331395
IC Registration Number :	7290A-1, 7290A-2
VCCI Registration Number :	T-343 for Telecommunication Test C-2919 for Conducted emission test R-2670 for Radiated emission test below 1GHz G-227 for Radiated emission test above 1GHz

Laboratory accreditation



2.6. Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE/NEUTRAL	±2.71 dB
Radiated Emission	30 MHz ~ 25GHz	Vertical	±4.11 dB
		Horizontal	±4.10 dB
Occupied Bandwidth	---	---	±7500 Hz
Maximum Peak Output Power	---	---	±1.4 dB
Band Edges	---	---	±2.2 dB
Power Spectral Density	---	---	±2.2 dB



3. Test of Conducted Emission

3.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2003 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

3.2. Test Procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

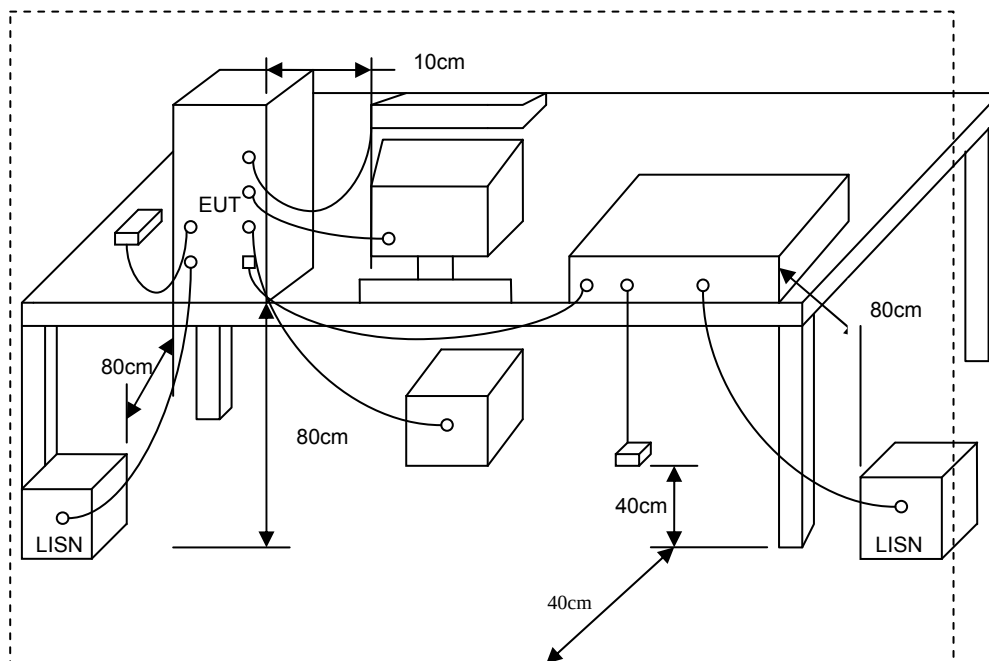
Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.



3.3. Typical Test Setup



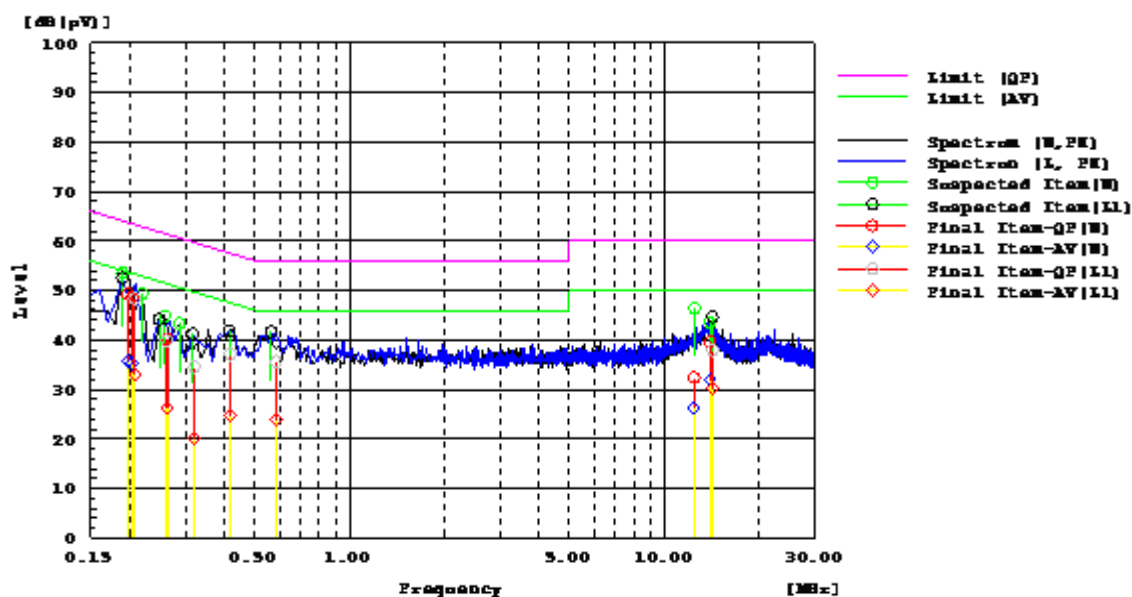
3.4. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date
Test Receiver	R&S	ESCI	100565	2011.01.15
AMN	R&S	ESH2-Z5	100182	2010.06.23
Two-Line V-Network	R&S	ENV216	100325	2011.04.18
ISN	FCC	FCC-TLISN-T2-02	20379	2010.06.23
ISN	FCC	FCC-TLISN-T4-02	20380	2010.06.23
ISN	FCC	FCC-TLISN-T8-02	20381	2010.06.23
Attenuator	R&S	ESH3-Z2	100529	2011.01.11
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-004	2010.08.14



3.5. Test Result and Data

Test Mode :	Mode : Normal Link		
AC Power :	AC 120V/60Hz	Phase :	L&N
Temperature :	22°C	Humidity :	51%
Pressur(mbar) :	1002	Date :	2011/04/25



Frequency MHz	Line Phase	Reading dB(uV) QP	Reading dB(uV) AV	Factor dB	Level dB(uV) QP	Level dB(uV) AV	Limit dB(uV) QP	Limit dB(uV) AV	Margin dB QP	Margin dB AV	Pass/Fail
0.20665	L1	28.5	13.1	19.9	48.4	33.0	63.3	53.3	14.9	20.3	Pass
0.26145	L1	19.9	6.3	19.9	39.8	26.2	61.4	51.4	21.6	25.2	Pass
0.32072	L1	14.7	0.3	19.9	34.6	20.2	59.7	49.7	25.1	29.5	Pass
0.41714	L1	17.2	5.0	19.9	37.1	24.9	57.5	47.5	20.4	22.6	Pass
0.58349	L1	15.9	4.3	19.8	35.7	24.1	56.0	46.0	20.3	21.9	Pass
14.2612	L1	18.2	10.5	19.8	38.0	30.3	60.0	50.0	22.0	19.7	Pass
0.19685	N	29.7	16.1	19.5	49.2	35.6	63.7	53.7	14.5	18.1	Pass
0.20345	N	29.1	15.8	19.5	48.6	35.3	63.5	53.5	14.9	18.2	Pass
0.26165	N	20.7	6.8	19.5	40.2	26.3	61.4	51.4	21.2	25.1	Pass
0.26291	N	20.6	6.7	19.5	40.1	26.2	61.3	51.3	21.2	25.1	Pass
12.4466	N	12.5	6.3	19.9	32.4	26.2	60.0	50.0	27.6	23.8	Pass
13.9918	N	19.8	12.1	19.9	39.7	32.0	60.0	50.0	20.3	18.0	Pass

Note: Measurement Level = Reading Level + Correct Factor



4. Test of Radiated Emission

4.1. Test Limit

Radiated emissions from 30 MHz to 25 GHz were measured according to the methods defines in ANSI C63.4-2003. The EUT was placed, 0.8 meter above the ground plane, as shown in section 5.6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions for unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Field Strength (μ V/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

4.2. Test Procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless



otherwise noted as quasi-peak.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, then the video bandwidth is set to 1MHz for peak measurements and 10Hz for average measurements.

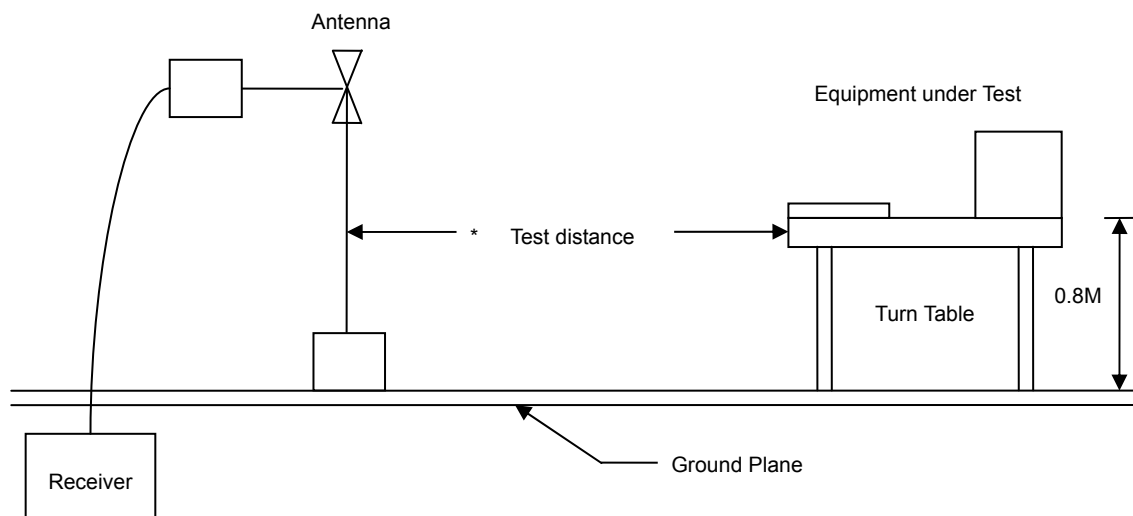
The spectrum from 30MHz to 26GHz is investigated with the transmitter set to the lowest, middle and highest channels in the 2.4GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are

Made with the antenna polarized in both the vertical and the horizontal positions.

When performing radiated measurements >1 GHz, the EUT always remains within the 3dB beam-width of the measuring antenna.

4.3. Typical Test Setup





4.4. Measurement Equipment

Instrument	Model No.	Manufacturer	Serial No.	Calibration Date
EMI Test Receiver	R&S	ESCI	100563	2010.06.23
H64 Amplifier	HP	8447F	3113A05582	2010.08.14
Preamplifier	Agilent	8449B	ED-HE-EMI-077	2011.02.10
Preamplifier	Agilent	8449B	3008A02342	2011.02.10
Ultra Broadband Antenna	R&S	HL562	100362	2010.11.25
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-619	2010.11.10
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	9170-347	2010.10.15
Spectrum Analyzer	R&S	FSP40	100324	2010.08.14
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-002	2010.08.17



4.5. Test Result and Data

Under 1G:

Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_CLASS_B_03M_QP	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Normal Link

Freq. (MHz)	Ant.Pol. H/V	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
75.62	V	50.15	-18.759	31.391	40.00	-8.609	Peak
249.52	V	51.84	-15.266	36.574	46.00	-9.426	Peak
375.89	V	45.74	-11.285	34.455	46.00	-11.545	Peak
499.65	V	47.58	-8.883	38.697	46.00	-7.303	Peak
748.98	V	40.51	-4.392	36.118	46.00	-9.882	Peak
960.24	V	36.84	-0.894	35.946	54.00	-18.054	Peak
125.02	H	45.01	-16.309	28.701	43.50	-14.799	Peak
249.98	H	50.19	-15.239	34.951	46.00	-11.049	Peak
375.21	H	48.52	-11.289	37.231	46.00	-8.769	Peak
499.96	H	44.57	-8.876	35.694	46.00	-10.306	Peak
749.51	H	41.54	-4.397	37.143	46.00	-8.857	Peak
999.51	H	36.857	-0.057	36.8	54.00	-17.2	Peak

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Above 1G:

Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11b (2412MHz)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1318.98	V	56.88	45.21	-4.77	52.11	40.44	74.00	54.00	-13.56	average
4825.00	V	44.06	36.34	6.53	50.59	42.87	74.00	54.00	-11.13	average
7233.66	V	36.89	25.97	15.48	52.37	41.45	74.00	54.00	-12.55	average
1222.51	H	58.76	47.02	-5.72	53.04	41.30	74.00	54.00	-12.70	average
4825.00	H	43.01	33.89	6.53	49.54	40.42	74.00	54.00	-13.58	average
7234.33	H	35.47	25.01	15.48	50.95	40.49	74.00	54.00	-13.51	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Mode1: Transmit by 802.11b (2437MHz)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1317.98	V	58.77	46.52	-4.77	54.00	41.75	74.00	54.00	-12.25	average
4874.67	V	47.45	36.22	6.85	54.30	43.07	74.00	54.00	-10.93	average
7314.45	V	40.33	28.86	15.52	55.85	44.38	74.00	54.00	-9.62	average
1318.06	H	58.04	45.99	-4.77	53.27	41.22	74.00	54.00	-12.78	average
4875.02	H	46.76	35.05	6.85	53.61	41.90	74.00	54.00	-12.10	average
7313.66	H	38.61	26.75	15.52	54.13	42.27	74.00	54.00	-11.73	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Mode1: Transmit by 802.11b (2462MHz)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1318.66	V	59.43	48.32	-4.77	54.66	43.55	74.00	54.00	-10.45	average
4925.00	V	47.06	35.77	6.99	54.05	42.76	74.00	54.00	-11.24	average
7385.01	V	36.25	25.61	15.60	51.85	41.21	74.00	54.00	-12.79	average
1223.03	H	57.88	45.97	-5.72	52.16	40.25	74.00	54.00	-13.75	average
4925.24	H	46.32	35.01	6.99	53.31	42.00	74.00	54.00	-12.00	average
7384.46	H	35.24	24.89	15.60	50.84	40.49	74.00	54.00	-13.51	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11g (2412MHz)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1317.89	V	58.12	47.31	-4.77	53.35	42.54	74.00	54.00	-11.46	average
4825.00	V	45.67	34.22	6.53	52.20	40.75	74.00	54.00	-13.25	average
7233.46	V	39.11	28.02	15.48	54.59	43.50	74.00	54.00	-10.50	average
1318.22	H	57.89	46.56	-4.77	53.12	41.79	74.00	54.00	-12.21	average
4825.00	H	44.77	32.87	6.53	51.30	39.40	74.00	54.00	-14.60	average
7234.31	H	37.28	27.12	15.48	52.76	42.60	74.00	54.00	-11.40	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11g (2437MHz)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1318.67	V	59.02	48.77	-4.77	54.25	44.00	74.00	54.00	-10.00	average
4874.45	V	44.56	35.07	6.85	51.41	41.92	74.00	54.00	-12.08	average
7312.34	V	35.46	26.01	15.52	50.98	41.53	74.00	54.00	-12.47	average
1222.34	H	56.37	45.03	-5.72	50.65	39.31	74.00	54.00	-14.69	average
4875.04	H	43.68	34.67	6.85	50.53	41.52	74.00	54.00	-12.48	average
7313.33	H	34.89	25.66	15.52	50.41	41.18	74.00	54.00	-12.82	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11g (2462MHz)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1223.13	V	58.11	47.03	-5.72	52.39	41.31	74.00	54.00	-12.69	average
4925.00	V	46.13	35.28	6.99	53.12	42.27	74.00	54.00	-11.73	average
7384.45	V	36.78	25.42	15.60	52.38	41.02	74.00	54.00	-12.98	average
1318.14	H	56.47	46.01	-4.77	51.70	41.24	74.00	54.00	-12.76	average
4924.67	H	45.02	34.77	6.99	52.01	41.76	74.00	54.00	-12.24	average
7385.00	H	35.73	24.79	15.60	51.33	40.39	74.00	54.00	-13.61	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (20MHz) (2412MHz)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1318.67	V	60.12	49.77	-4.77	55.35	45.00	74.00	54.00	-9.00	average
4825.00	V	47.34	35.97	6.53	53.87	42.50	74.00	54.00	-11.50	average
7234.33	V	38.22	27.09	15.48	53.70	42.57	74.00	54.00	-11.43	average
1317.87	H	58.58	46.73	-4.77	53.81	41.96	74.00	54.00	-12.04	average
4825.00	H	46.21	34.08	6.53	52.74	40.61	74.00	54.00	-13.39	average
7233.46	H	35.78	26.57	15.48	51.26	42.05	74.00	54.00	-11.95	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (20MHz) (2437MHz)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1318.66	V	60.11	48.05	-4.77	55.34	43.28	74.00	54.00	-10.72	average
4875.00	V	47.89	36.54	6.85	54.74	43.39	74.00	54.00	-10.61	average
7313.33	V	36.47	26.03	15.52	51.99	41.55	74.00	54.00	-12.45	average
1318.02	H	59.44	48.56	-4.77	54.67	43.79	74.00	54.00	-10.21	average
4875.24	H	46.13	35.27	6.85	52.98	42.12	74.00	54.00	-11.88	average
7313.23	H	36.01	25.64	15.52	51.53	41.16	74.00	54.00	-12.84	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (20MHz) (2462MHz)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1602.54	V	59.32	49.21	-5.75	53.57	43.46	74.00	54.00	-10.54	average
4926.32	V	45.12	36.55	6.99	52.11	43.54	74.00	54.00	-10.46	average
7385.41	V	38.21	28.14	15.61	53.82	43.75	74.00	54.00	-10.25	average
1600.02	H	58.62	49.32	-5.76	52.86	43.56	74.00	54.00	-10.44	average
4925.36	H	45.32	35.63	6.99	52.31	42.62	74.00	54.00	-11.38	average
7385.16	H	36.33	27.11	15.61	51.94	42.72	74.00	54.00	-11.28	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (40MHz) (2422MHz)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1318.79	V	60.13	48.77	-4.77	55.36	44.00	74.00	54.00	-10.00	average
4845.12	V	46.25	35.14	6.61	52.86	41.75	74.00	54.00	-12.25	average
7265.45	V	36.54	25.09	15.50	52.04	40.59	74.00	54.00	-13.41	average
1223.34	H	58.79	46.86	-5.72	53.07	41.14	74.00	54.00	-12.86	average
4845.00	H	43.15	33.89	6.61	49.76	40.50	74.00	54.00	-13.50	average
7266.33	H	36.13	24.69	15.50	51.63	40.19	74.00	54.00	-13.81	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (40MHz) (2437MHz)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1317.67	V	60.33	49.75	-5.72	54.61	44.03	74.00	54.00	-9.97	average
4875.24	V	45.46	36.21	6.85	52.31	43.06	74.00	54.00	-10.94	average
7313.33	V	38.54	26.89	15.52	54.06	42.41	74.00	54.00	-11.59	average
1318.44	H	58.49	46.33	-5.72	52.77	40.61	74.00	54.00	-13.39	average
4875.25	H	43.54	33.01	6.85	50.39	39.86	74.00	54.00	-14.14	average
7312.28	H	35.78	24.35	15.52	51.30	39.87	74.00	54.00	-14.13	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011/04/28
Limit : FCC_15_03M_PK	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL/ HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (40MHz) (2452MH)

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
					Peak (dBuV/m)	AV (dBuV/m)				
1318.66	V	58.79	47.86	-4.77	54.02	43.09	74.00	54.00	-10.91	average
4904.34	V	45.03	33.89	6.92	51.95	40.81	74.00	54.00	-13.19	average
7356.21	V	36.46	27.91	15.57	52.03	43.48	74.00	54.00	-10.52	average
1222.32	H	57.86	46.11	-5.72	52.14	40.39	74.00	54.00	-13.61	average
4905.55	H	44.78	33.62	6.92	51.70	40.54	74.00	54.00	-13.46	average
7355.67	H	35.71	26.54	15.57	51.28	42.11	74.00	54.00	-11.89	average

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



5. Occupied Bandwidth

5.1. Test Limit

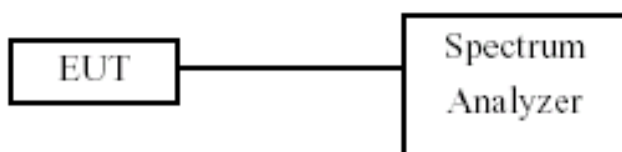
Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725- 5850 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.2. Test Procedures

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

5.3. Test Setup Layout



5.4. Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date
Spectrum Analyzer	R&S	FSP40	100324	2010.08.14
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-002	2010.08.17

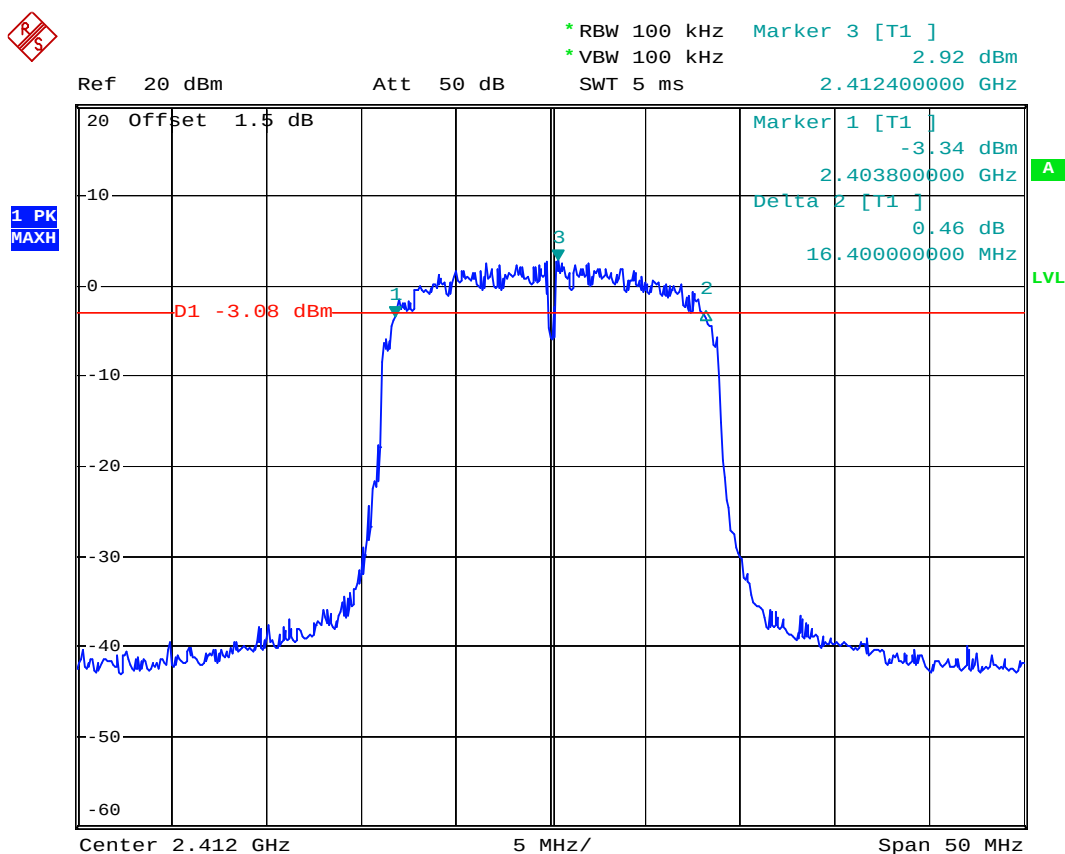


5.5. Test Result and Data

Test Item	Occupied Bandwidth
Test Mode	Transmit by 802.11b
Test Date	2011-04-28

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	16400	500	Pass
06	2437	16400	500	Pass
11	2462	16400	500	Pass

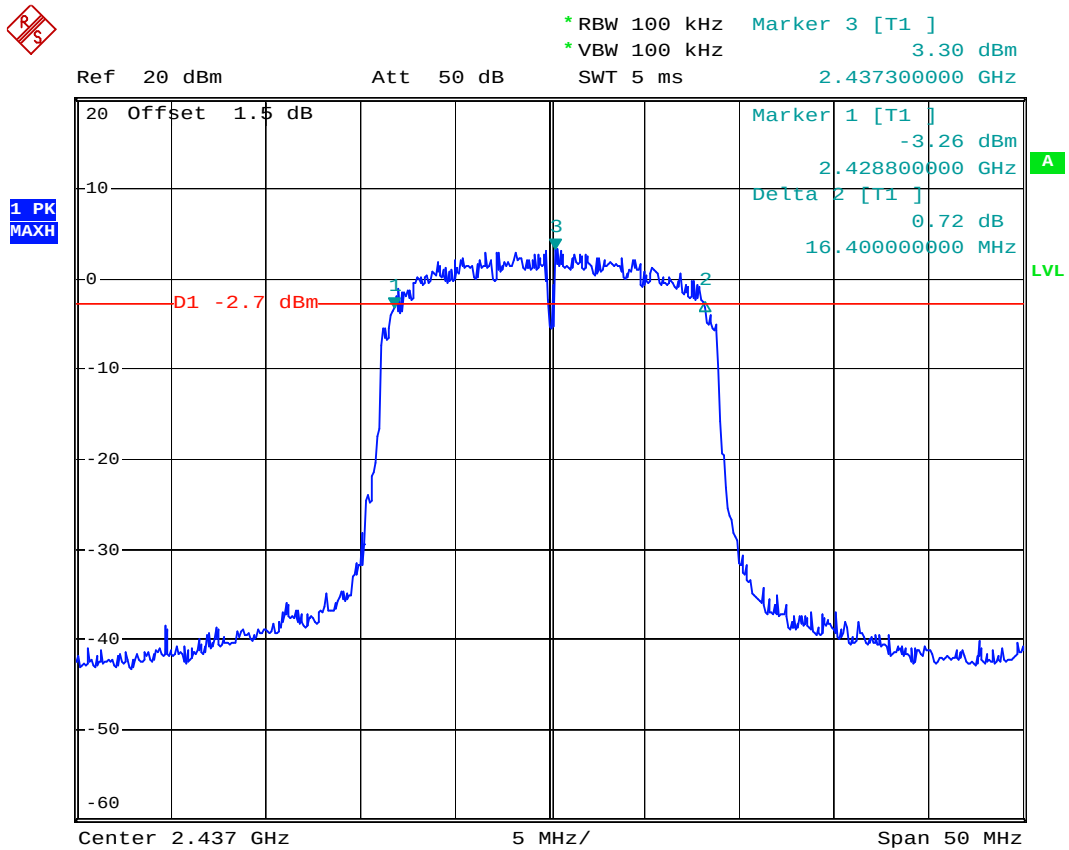
Channel 01 (2412MHz)



Date: 28.APR.2011 17:28:17



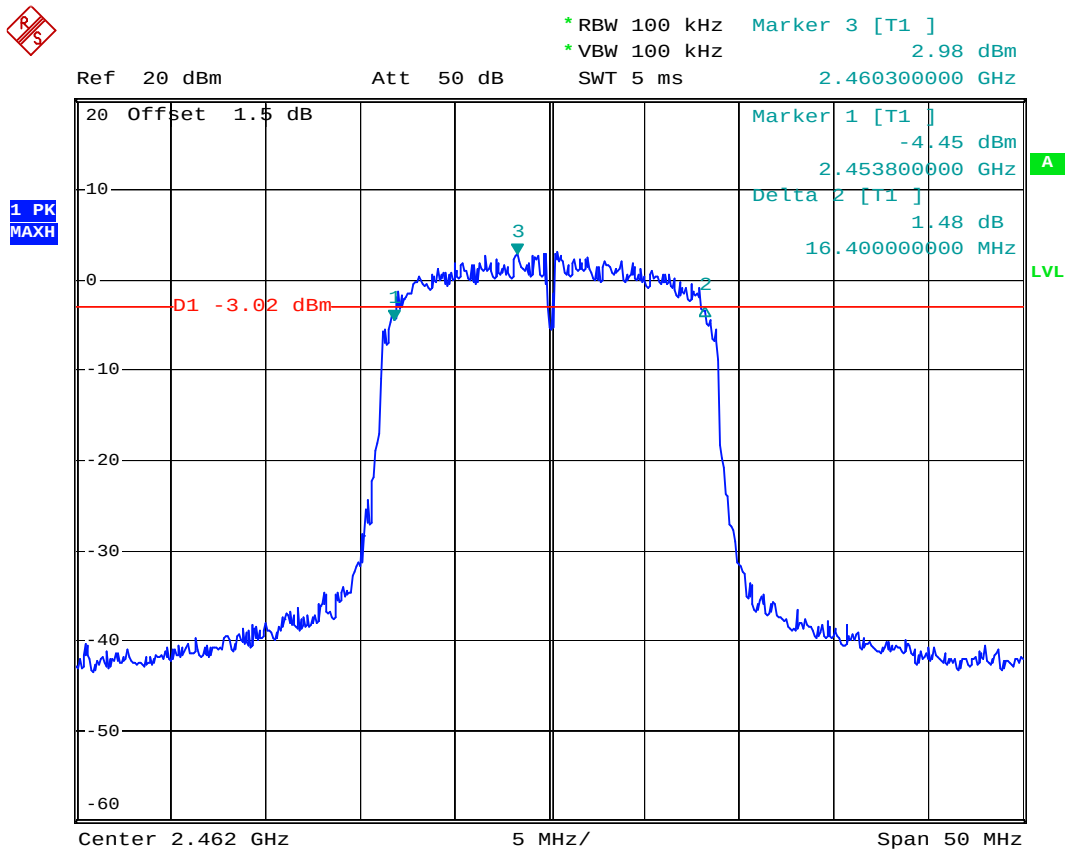
Channel 06 (2437MHz)



Date: 28.APR.2011 17:29:44



Channel11(2462MHz)



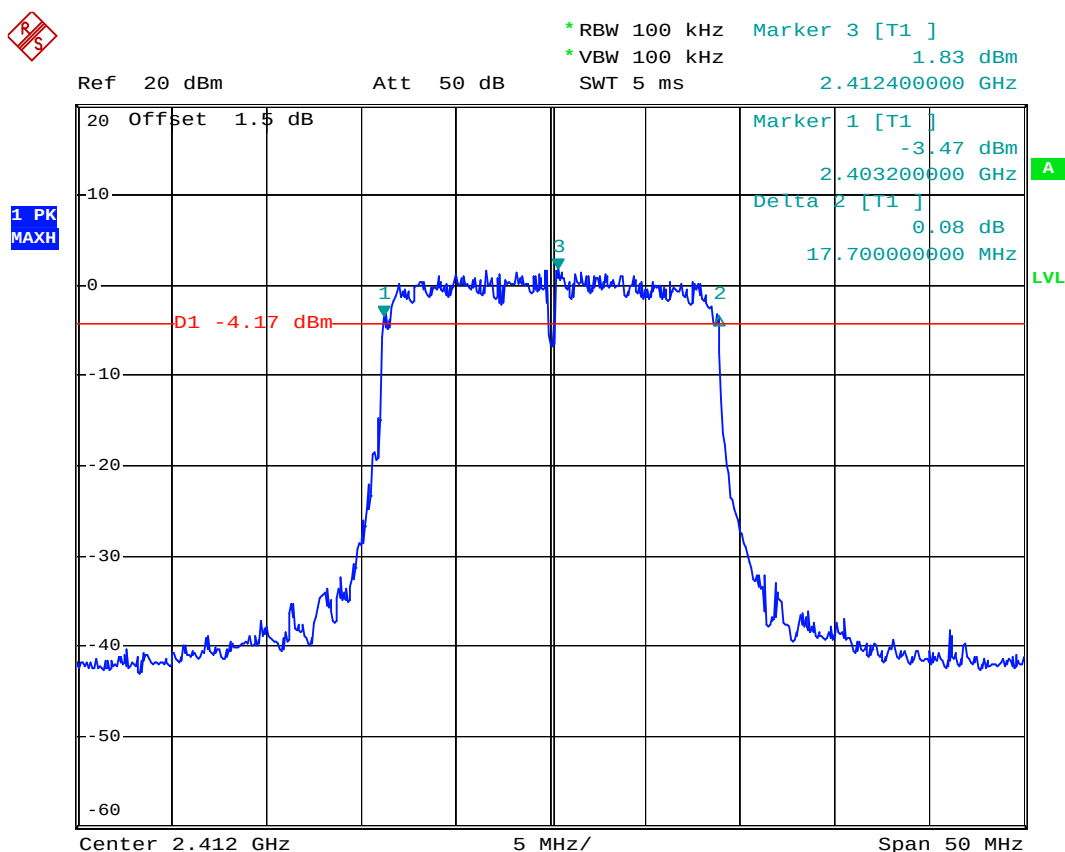
Date: 28.APR.2011 17:30:59



Test Item	Occupied Bandwidth
Test Mode	Transmit by 802.11g
Test Date	2011-04-28

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	17700	500	Pass
06	2437	17800	500	Pass
11	2462	17700	500	Pass

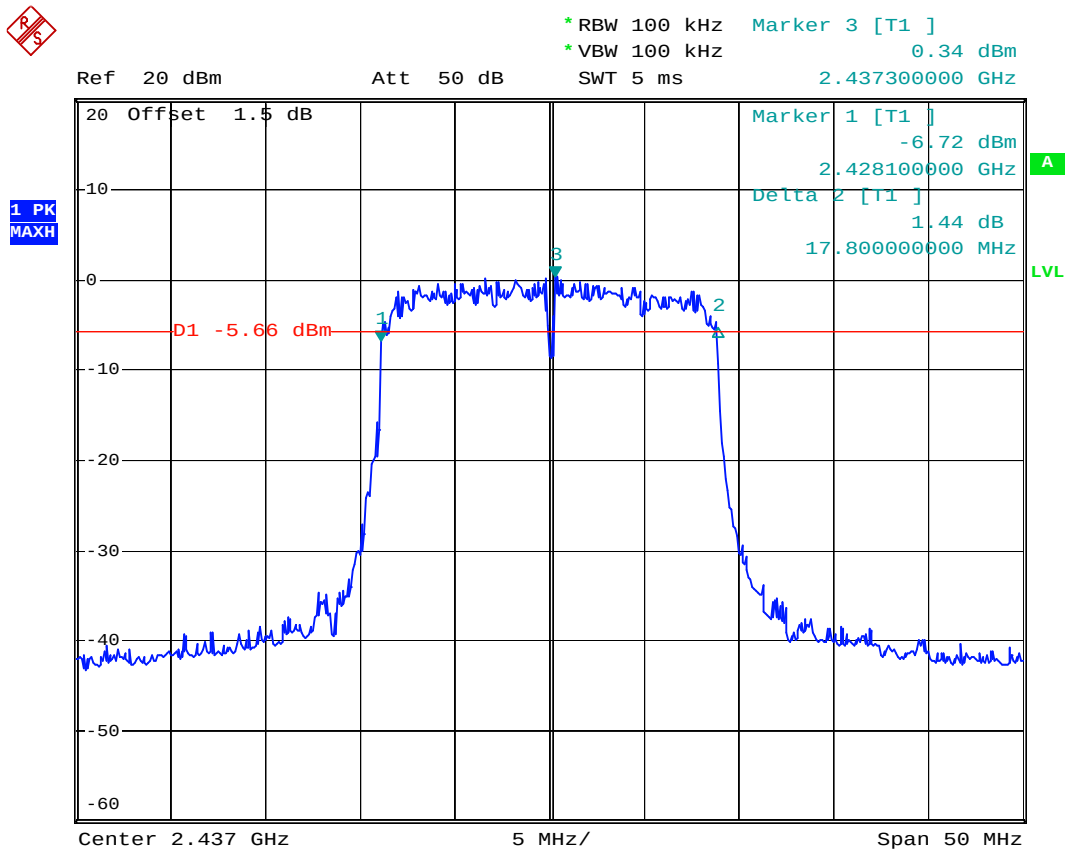
Channel 01 (2412MHz)



Date: 28.APR.2011 17:23:16



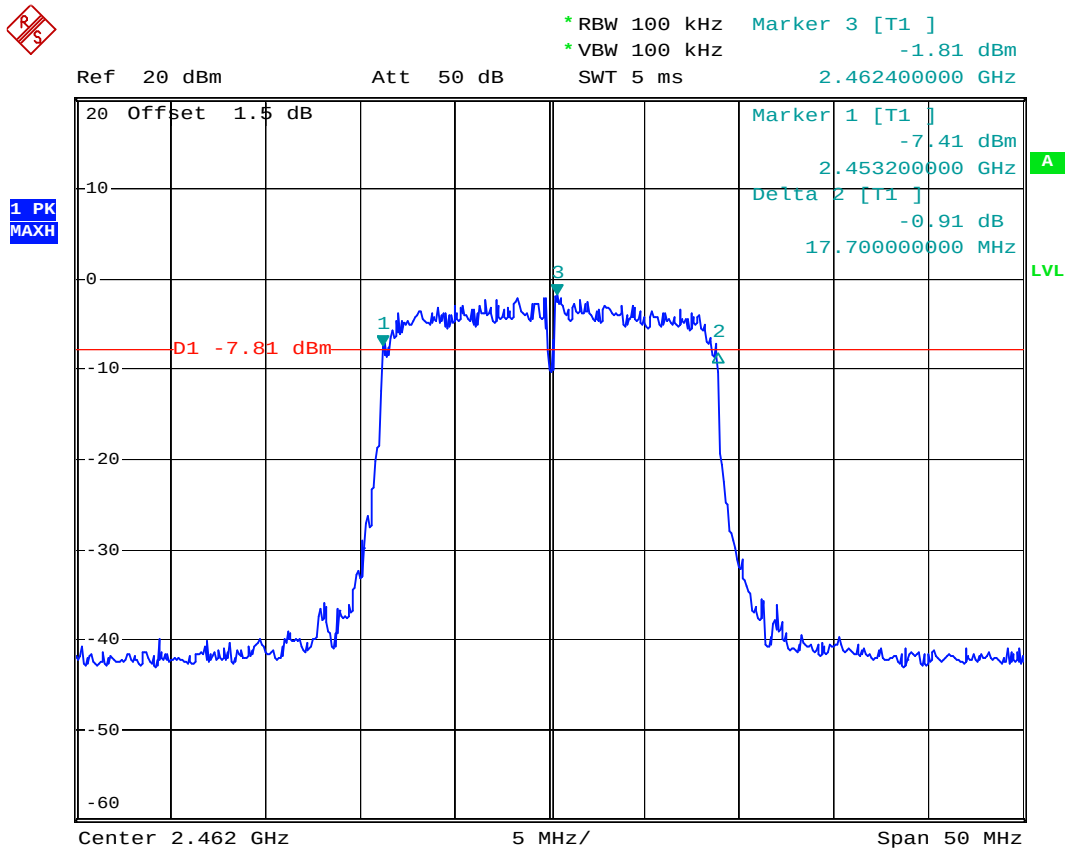
Channel 06 (2437MHz)



Date: 28.APR.2011 17:24:52



Channel 11 (2462MHz)



Date: 28.APR.2011 17:26:30

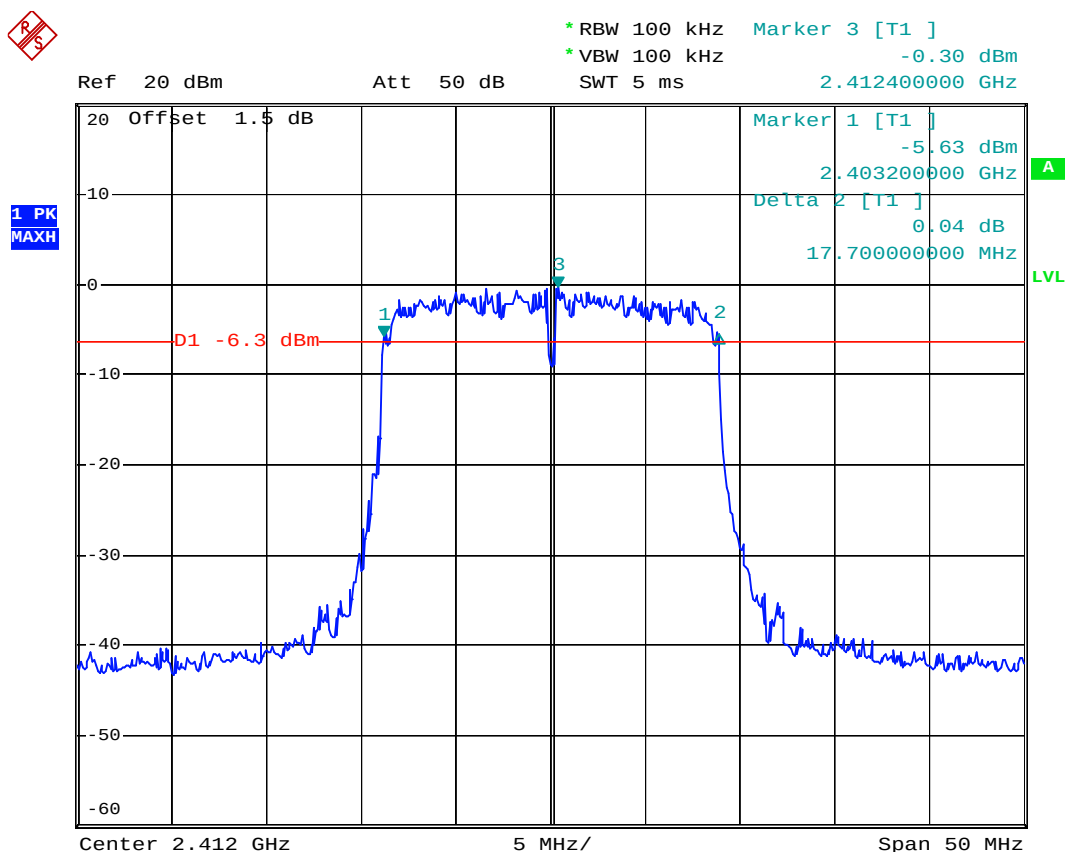


Test Item	Occupied Bandwidth
Test Mode	Transmit by 802.11n (20MHz)
Test Date	2011-04-28

Chain 0

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	17700	500	Pass
06	2437	17800	500	Pass
11	2462	17700	500	Pass

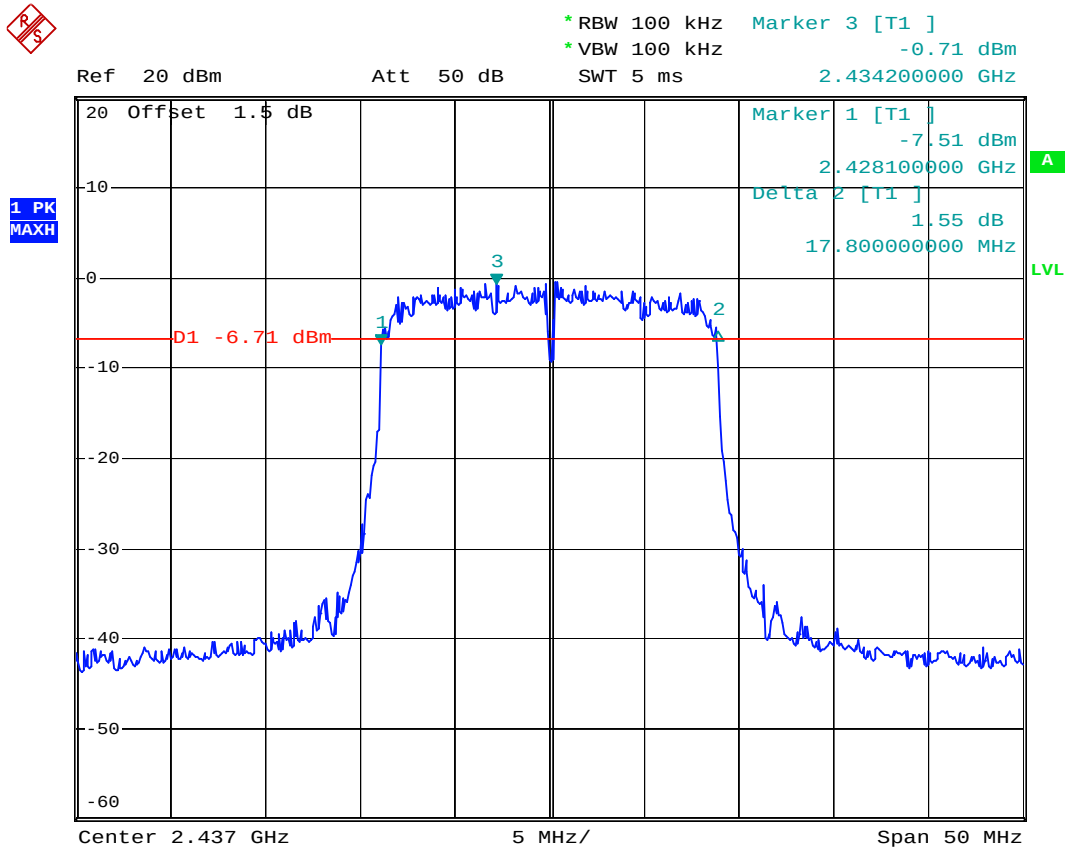
Channel 01 (2412MHz)



Date: 28.APR.2011 17:10:56



Channel 06 (2437MHz)



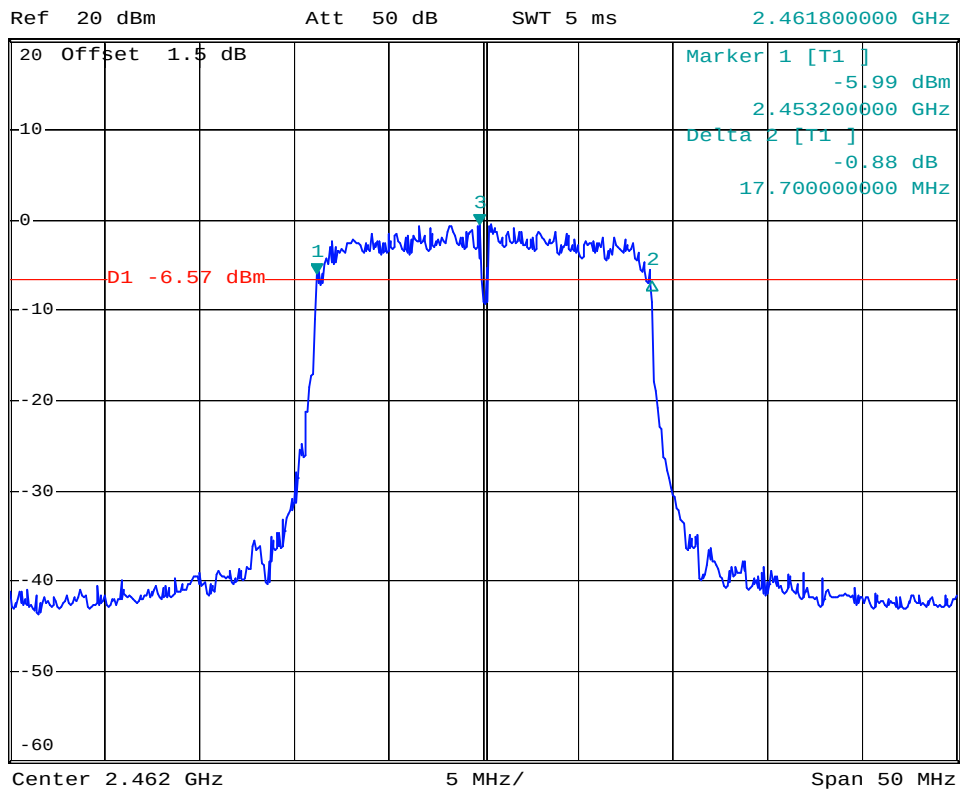
Date: 28.APR.2011 17:18:13



Channel 11 (2462MHz)



*RBW 100 kHz Marker 3 [T1]
*VBW 100 kHz -0.57 dBm
SWT 5 ms 2.461800000 GHz



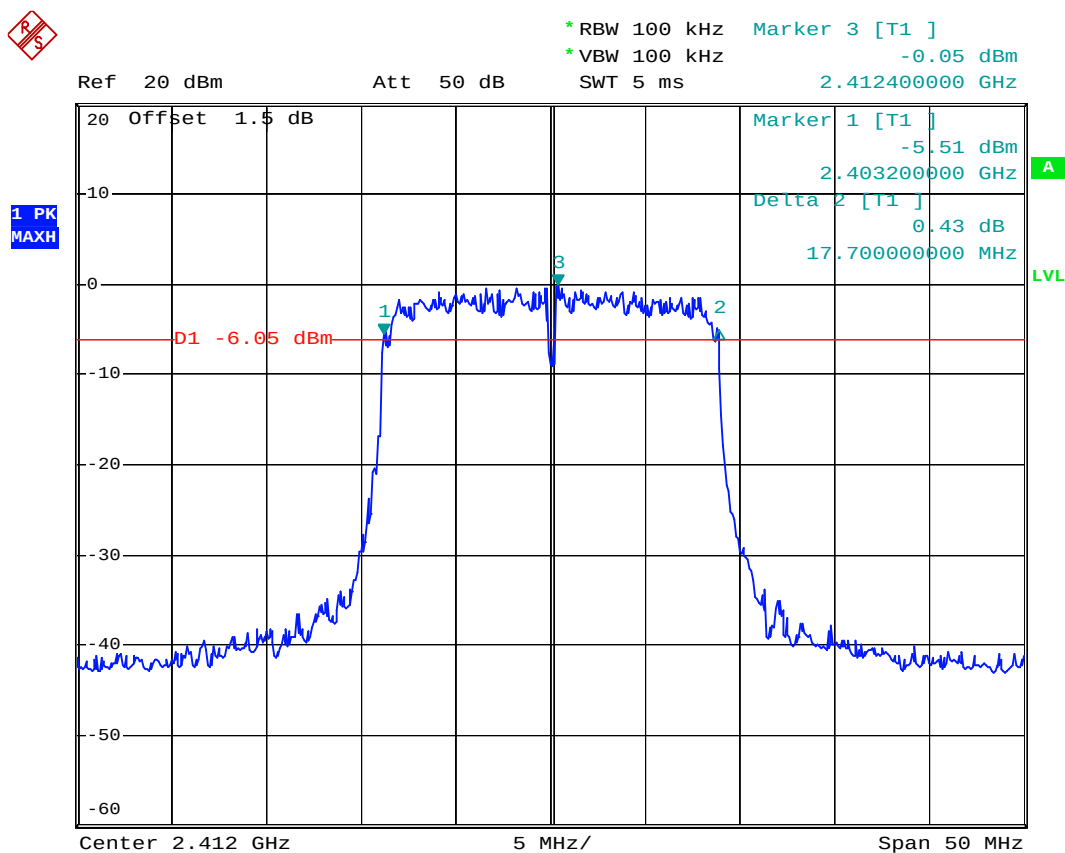
Date: 28.APR.2011 17:19:32



Chain 1

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	17700	500	Pass
06	2437	17800	500	Pass
11	2462	17700	500	Pass

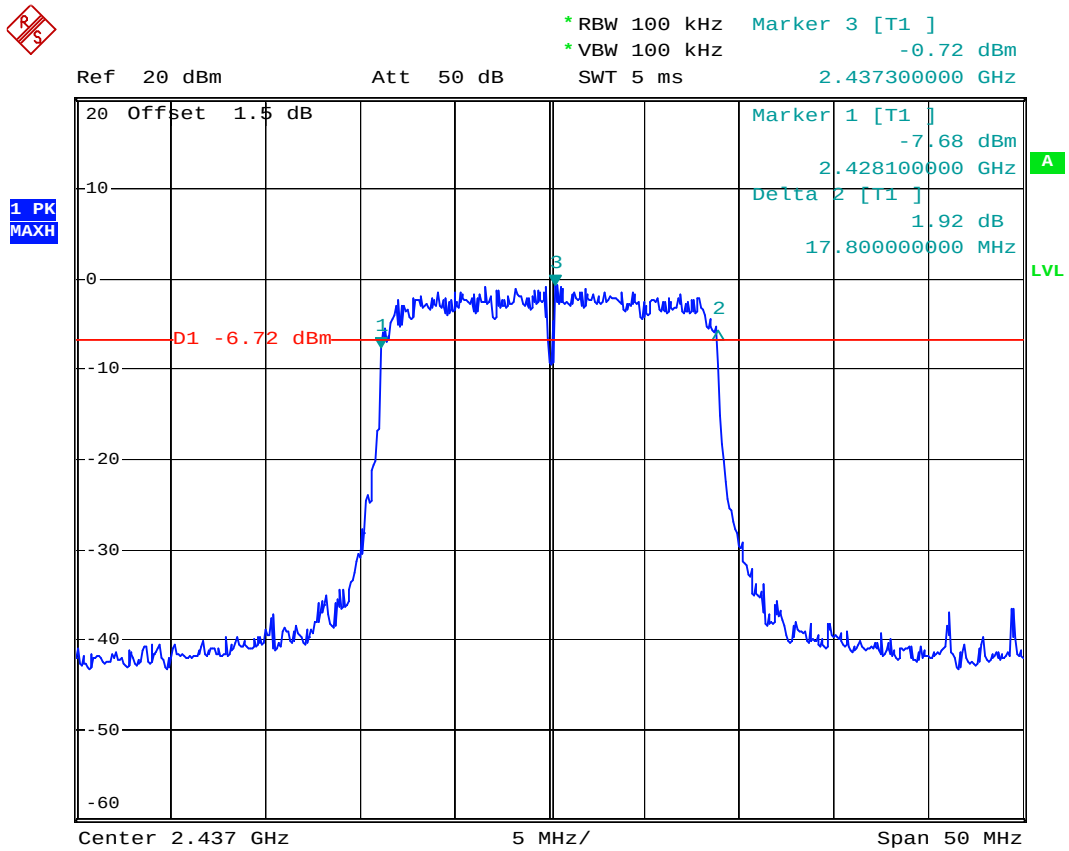
Channel 01 (2412MHz)



Date: 28.APR.2011 17:15:30



Channel 06 (2437MHz)



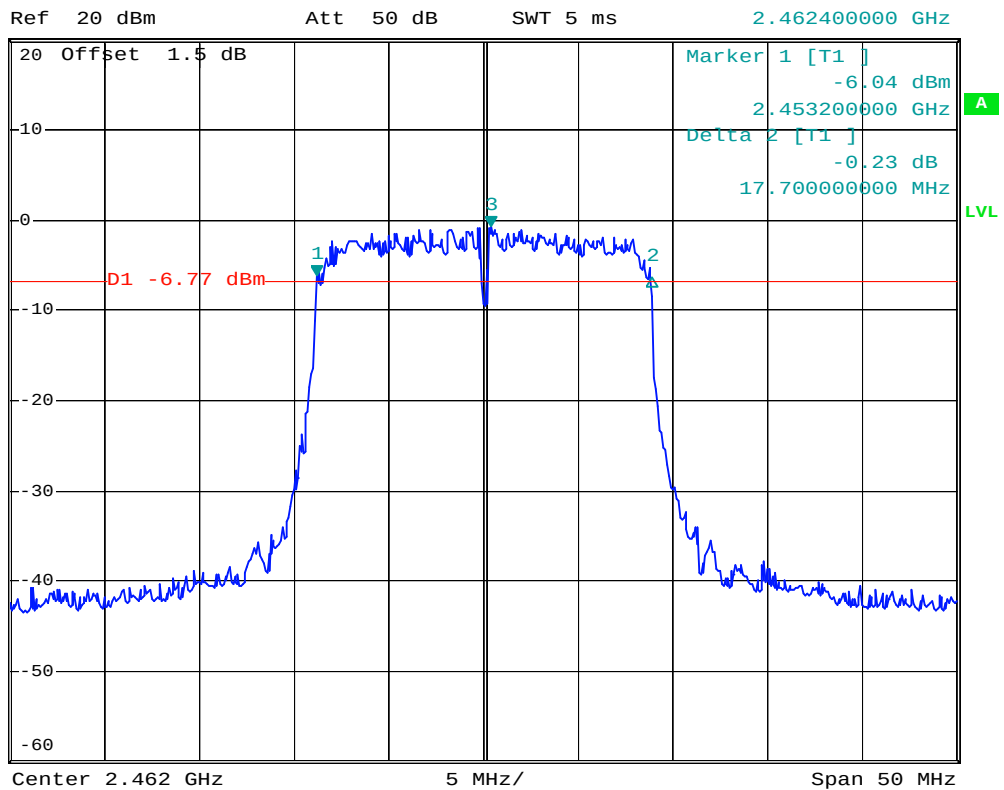
Date: 28.APR.2011 17:17:20



Channel 11 (2462MHz)



*RBW 100 kHz Marker 3 [T1]
*VBW 100 kHz -0.77 dBm
SWT 5 ms 2.462400000 GHz



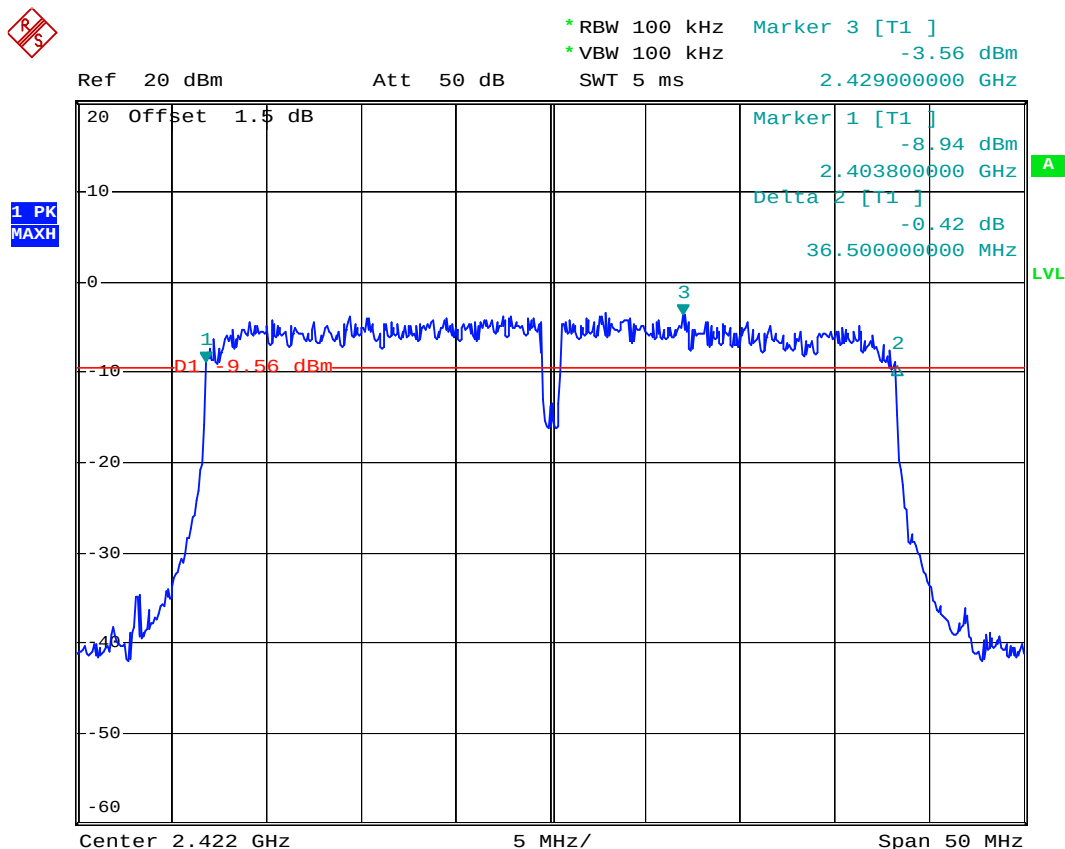
Date: 28.APR.2011 17:21:06

Test Item	Occupied Bandwidth
Test Mode	Transmit by 802.11n (40MHz)
Test Date	2011-04-28

Chain 0

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
03	2422	36500	500	Pass
06	2437	36400	500	Pass
09	2452	36500	500	Pass

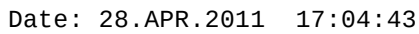
Channel 03 (2422MHz)



Date: 28.APR.2011 17:08:50

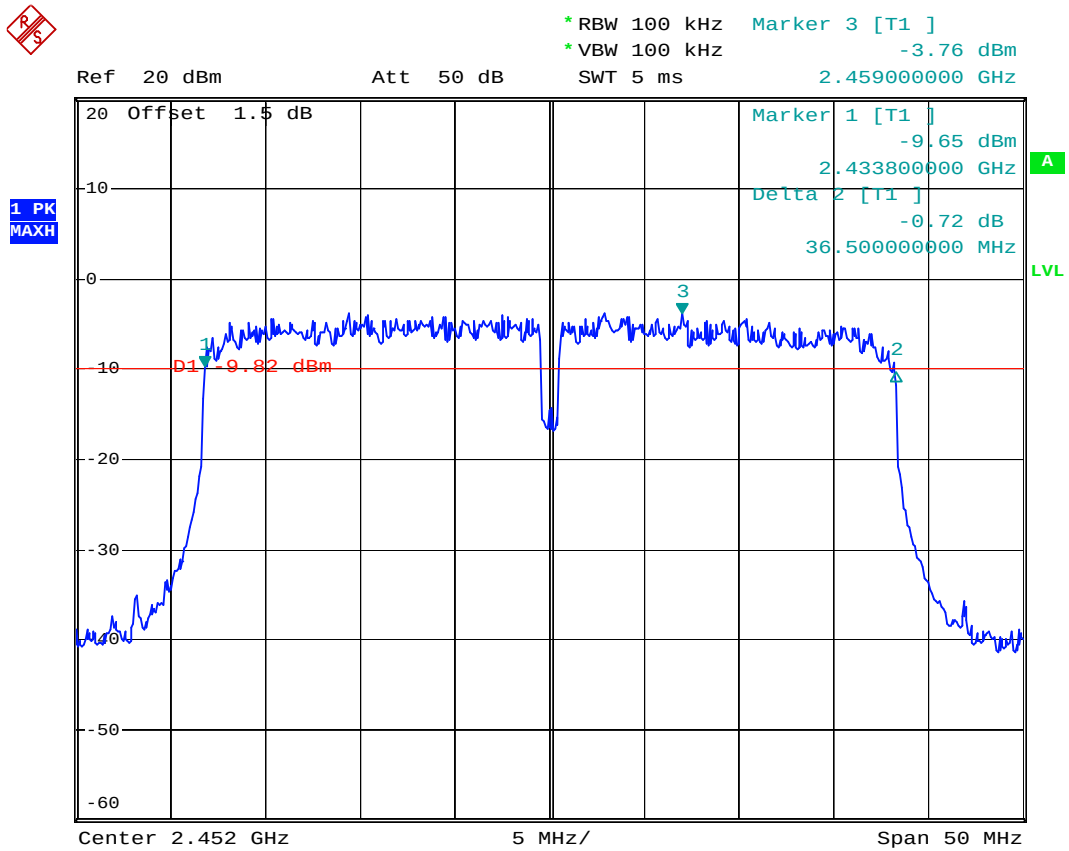


Channel 06 (2437MHz)





Channel 9 (2452MHz)

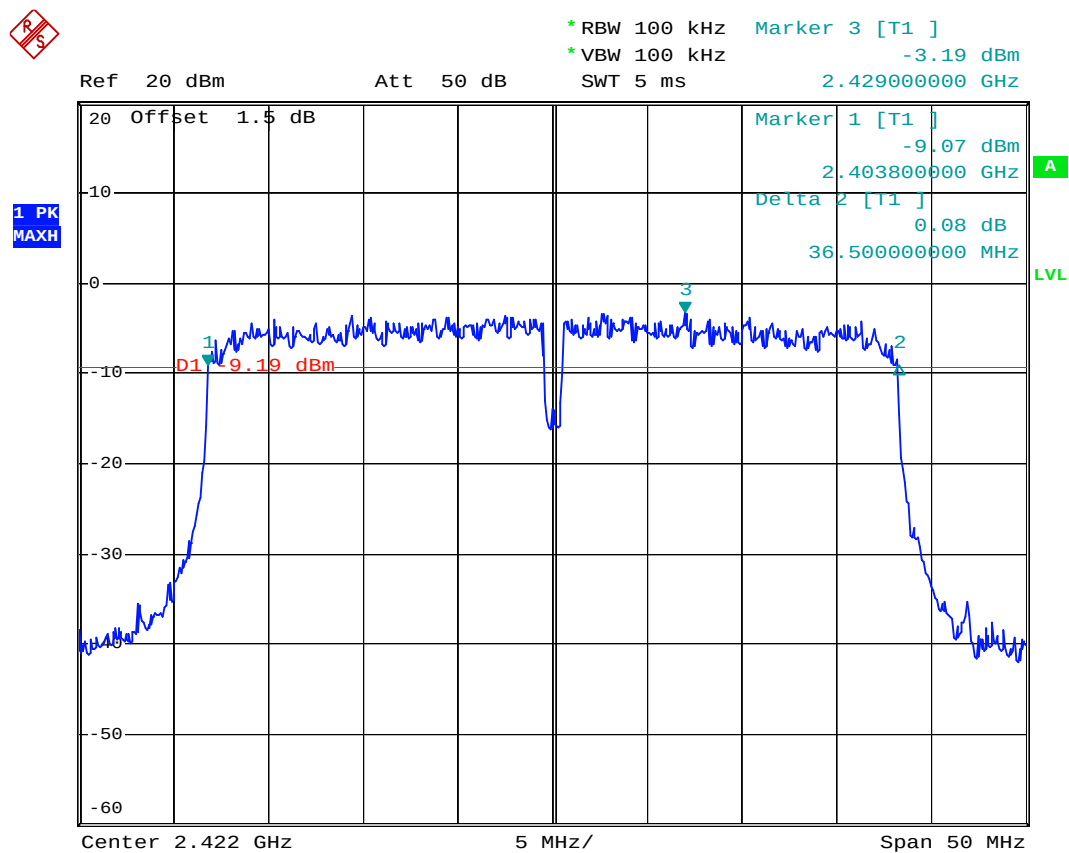


Date: 28.APR.2011 17:02:53

Chain 1

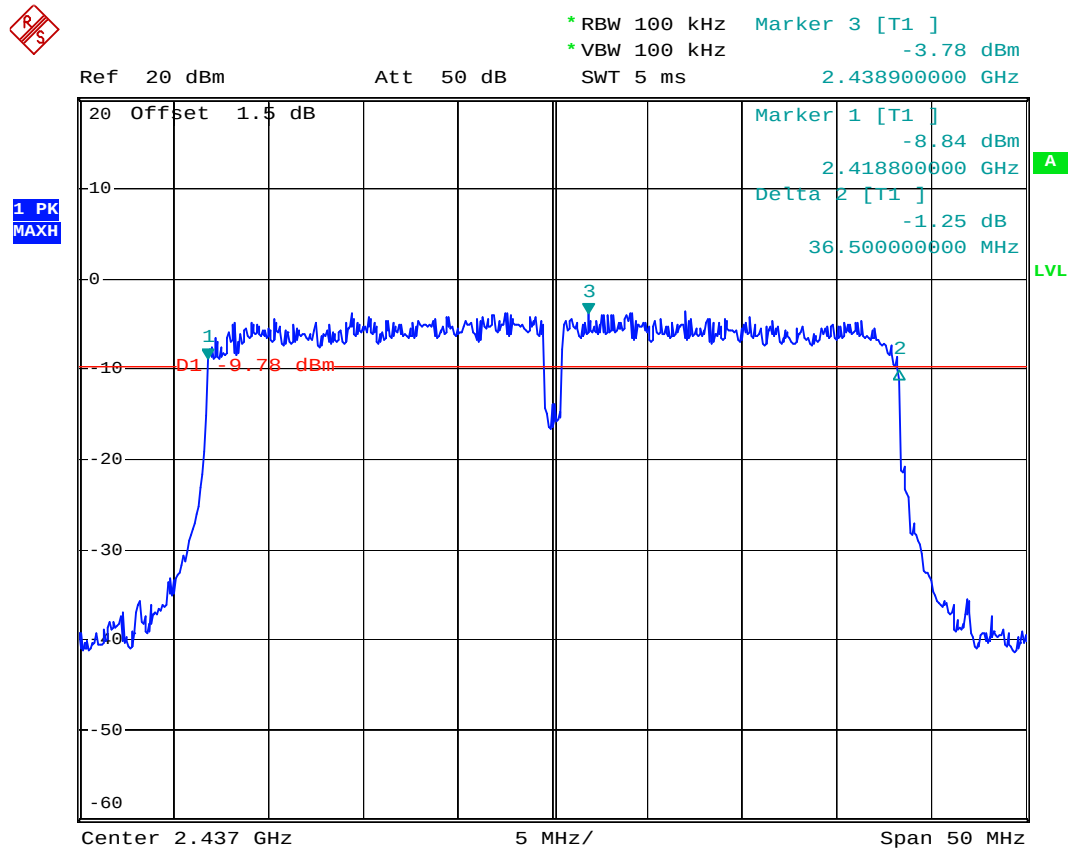
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
03	2422	36500	500	Pass
06	2437	36500	500	Pass
09	2452	36500	500	Pass

Channel 03 (2422MHz)



Date: 28.APR.2011 17:07:41

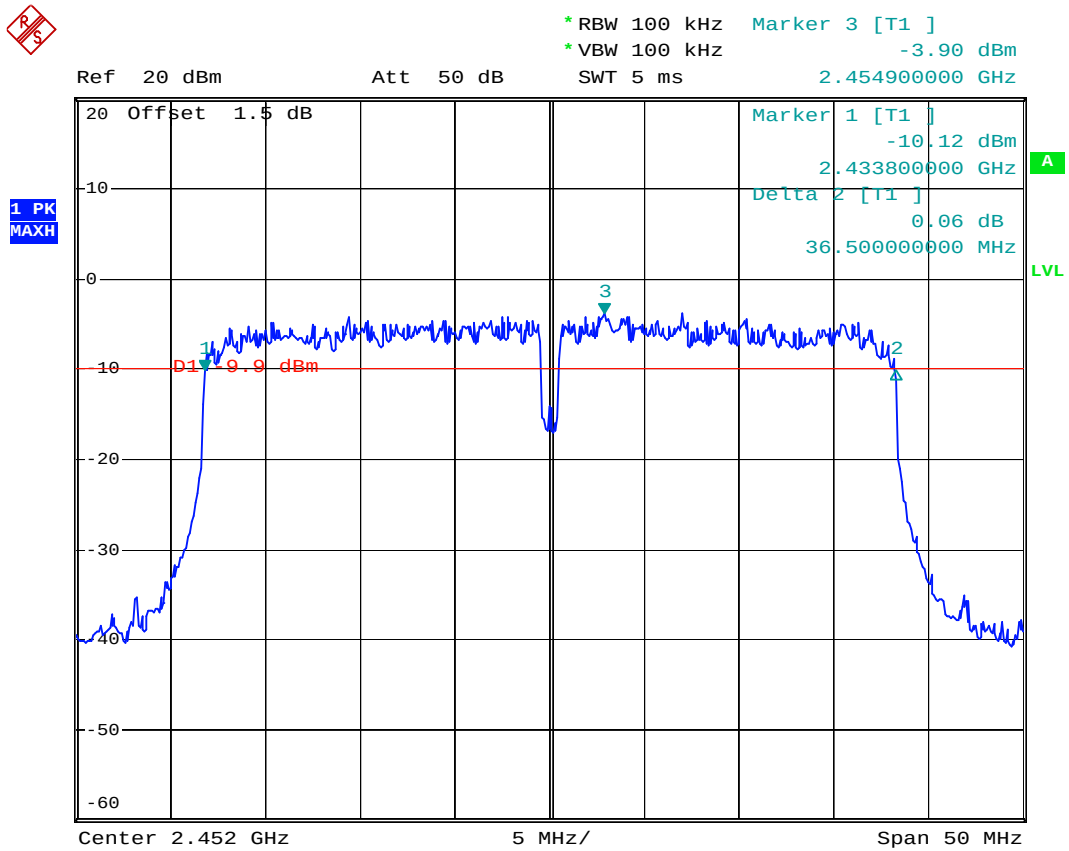
Channel 06 (2437MHz)



Date: 28.APR.2011 17:05:45



Channel 9 (2452MHz)



Date: 28.APR.2011 17:00:44



6. Maximum Peak Output Power

6.1. Test Limit

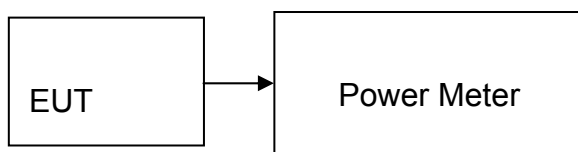
The maximum peak power shall be less 1Watt (30dBm).

The conducted output power limit is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of standard FCC part 15.247, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6 dBi.

6.2. Test Procedure

The transmitter output is connected to the Power Meter.

6.3. Test Setup Layout



6.4. Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date
Power Meter	NRP	R&S	CCE013	2011.01.15
Power Sensor	NRP-Z91	R&S	100385	2011.01.15
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-002	2010.08.17



6.5. Test Result and Data

Test Item	Maximum Peak Output Power
Test Mode	Transmit by 802.11b
Test Date	2011-04-28

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit (dBm)	Result
01	2412	24.13	30	Pass
06	2437	24.24	30	Pass
11	2462	24.18	30	Pass

Test Item	Maximum Peak Output Power
Test Mode	Transmit by 802.11g
Test Date	2011-04-28

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit (dBm)	Result
01	2412	21.95	30	Pass
06	2437	22.07	30	Pass
11	2462	22.03	30	Pass



Test Item	Maximum Peak Output Power
Test Mode	Transmit by 802.11n (20MHz)
Test Date	2011-04-28

Chain 0

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit(dBm)	Result
01	2412	19.83	30	Pass
06	2437	19.95	30	Pass
11	2462	19.89	30	Pass

Chain 1

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit(dBm)	Result
01	2412	19.70	30	Pass
06	2437	19.81	30	Pass
11	2462	19.75	30	Pass

Chain 0+ Chain 1

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit(dBm)	Result
01	2412	22.78	30	Pass
06	2437	22.89	30	Pass
11	2462	22.83	30	Pass

Note: Measurement Level= $10 \times \log_{10}(10^{\text{Chain 0/10}} + 10^{\text{Chain 1/10}})$



Test Item	Maximum Peak Output Power
Test Mode	Transmit by 802.11n (40MHz)
Test Date	2011-04-28

Chain 0

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit(dBm)	Result
03	2422	18.69	30	Pass
06	2437	18.98	30	Pass
09	2452	18.77	30	Pass

Chain 1

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit(dBm)	Result
03	2422	18.58	30	Pass
06	2437	18.74	30	Pass
09	2452	18.62	30	Pass

Chain 0+ Chain 1

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit(dBm)	Result
03	2422	21.65	30	Pass
06	2437	21.87	30	Pass
09	2452	21.71	30	Pass

Note: Measurement Level= $10 \cdot \log_{10}(10^{\text{Chain 0/10}} + 10^{\text{Chain 1/10}})$



7. Band Edges

7.1. Test Limit

For RF Conducted requirement:

20 dB bandwidth of the emission is contained within the operation frequency band.

For RF Radiated requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

7.2. Test Procedure

For RF Conducted Measurement:

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

For RF Radiated Measurement:

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

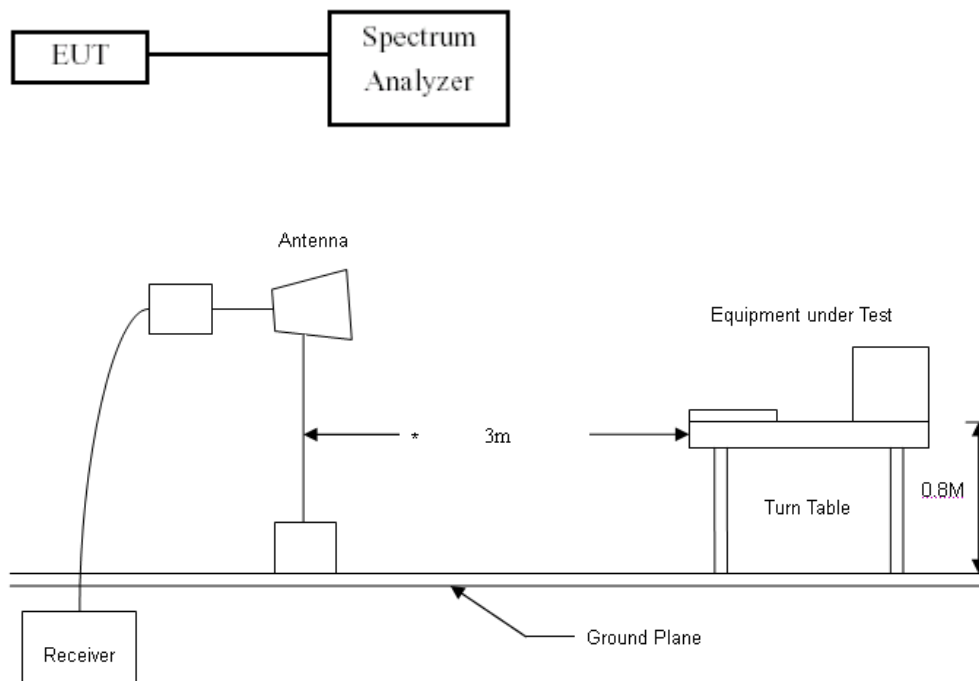
For measurements above 1GHz the resolution bandwidth is set to 1MHz, then the video bandwidth is set to 1MHz for peak measurements and 10Hz for average measurements.

The spectrum from 30MHz to 26GHz is investigated with the transmitter set to the lowest, middle and highest channels in the 2.4GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are Made with the antenna polarized in both the vertical and the horizontal positions.



7.3. Test Setup Layout



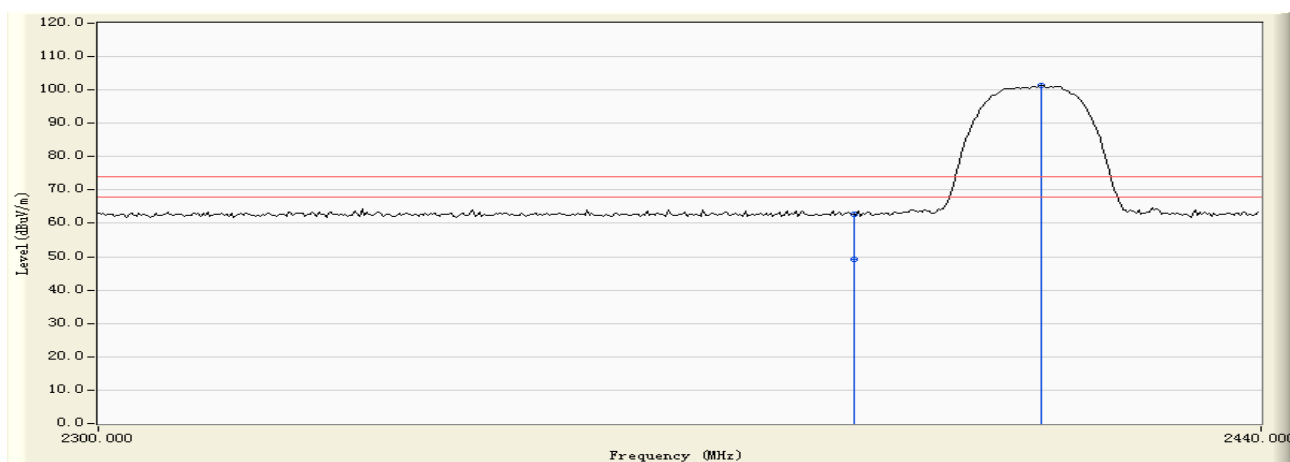
7.4. Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date
Spectrum Analyzer	R&S	FSP40	100324	2010.08.14
H64 Amplifier	HP	8447F	3113A05582	2010.08.14
Preamplifier	Agilent	8449B	ED-HE-EMI-077	2011.02.10
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-619	2010.11.10
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-002	2010.08.17



7.5. Test Result and Data

Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11b (2412MHz)



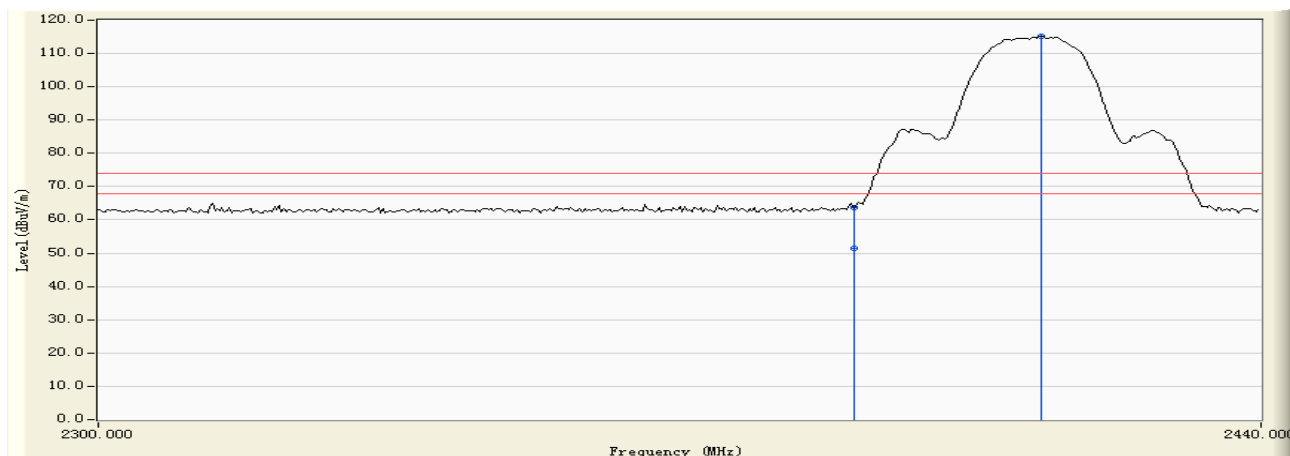
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	0.112	62.623	62.735	-11.265	74.000	PEAK
2		2390.000	0.112	49.240	49.352	-4.648	54.000	AVERAGE
3	*	2412.894	0.136	101.236	101.372	N/A	N/A	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL
Power : AC 120V/60Hz	Note : Transmit by 802.11b (2412MHz)



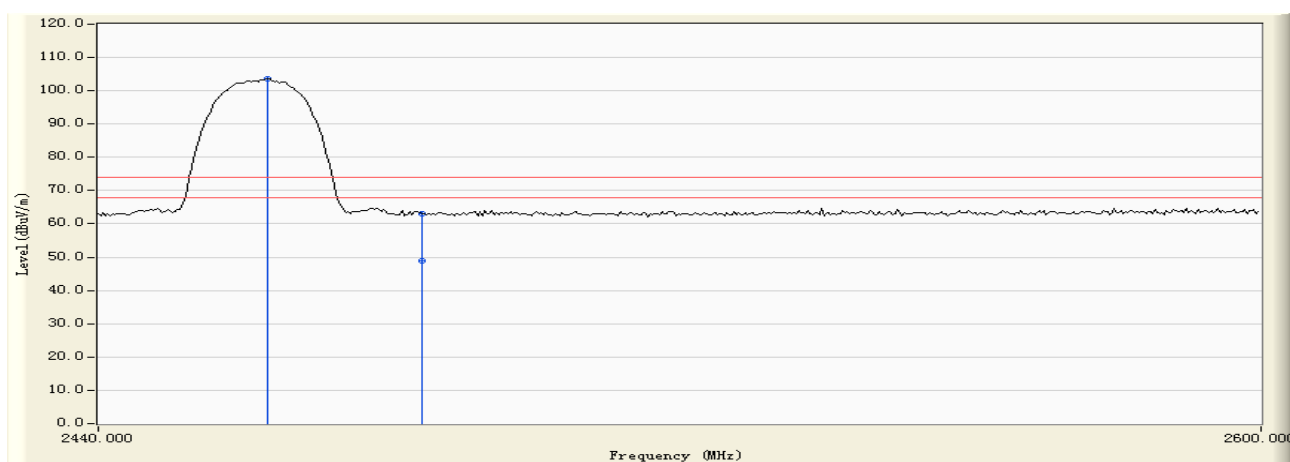
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	0.112	63.458	63.570	-10.430	74.000	PEAK
2		2390.000	0.112	51.300	51.412	-2.588	54.000	AVERAGE
3	*	2412.894	0.136	115.144	115.280	N/A	N/A	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : HORIZONTAL
Power : AC 120V/60Hz	Note :Transmit by 802.11b (2462MHz)



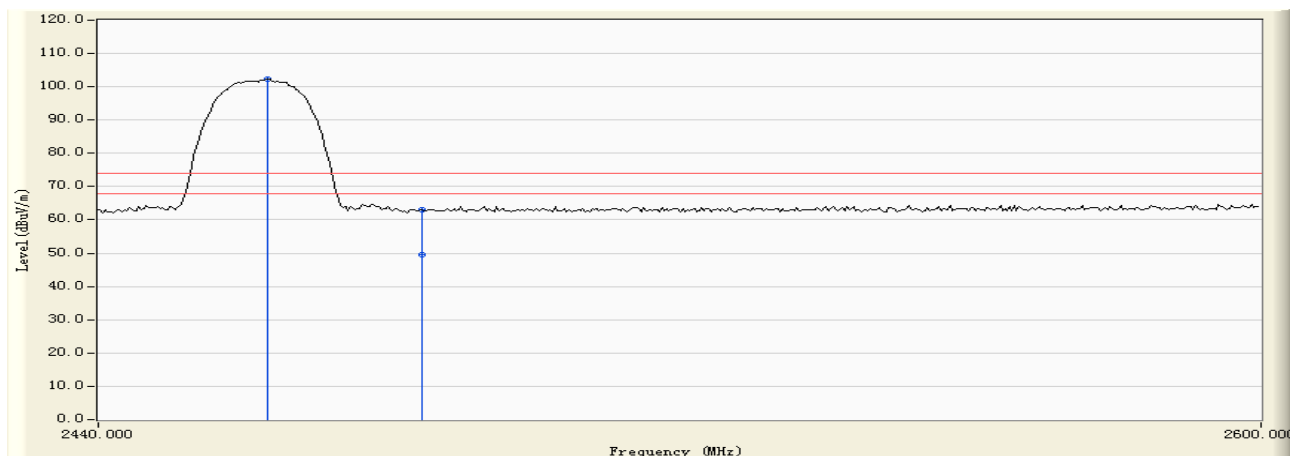
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2462.675	0.257	103.272	103.529	N/A	N/A	PEAK
2		2483.500	0.306	62.749	63.055	-10.945	74.000	PEAK
3		2483.500	0.306	48.730	49.036	-4.964	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL
Power : AC 120V/60Hz	Note : Transmit by 802.11b (2462MHz)



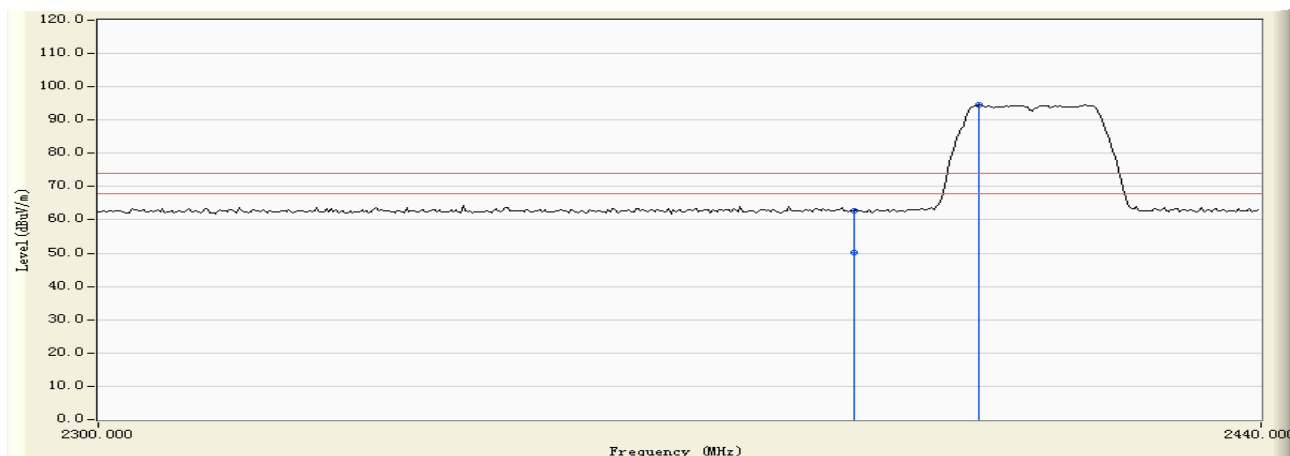
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2462.675	0.257	101.929	102.186	N/A	N/A	PEAK
2		2483.500	0.306	62.793	63.099	-10.901	74.000	PEAK
3		2483.500	0.306	49.310	49.616	-4.384	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11g (2412MHz)



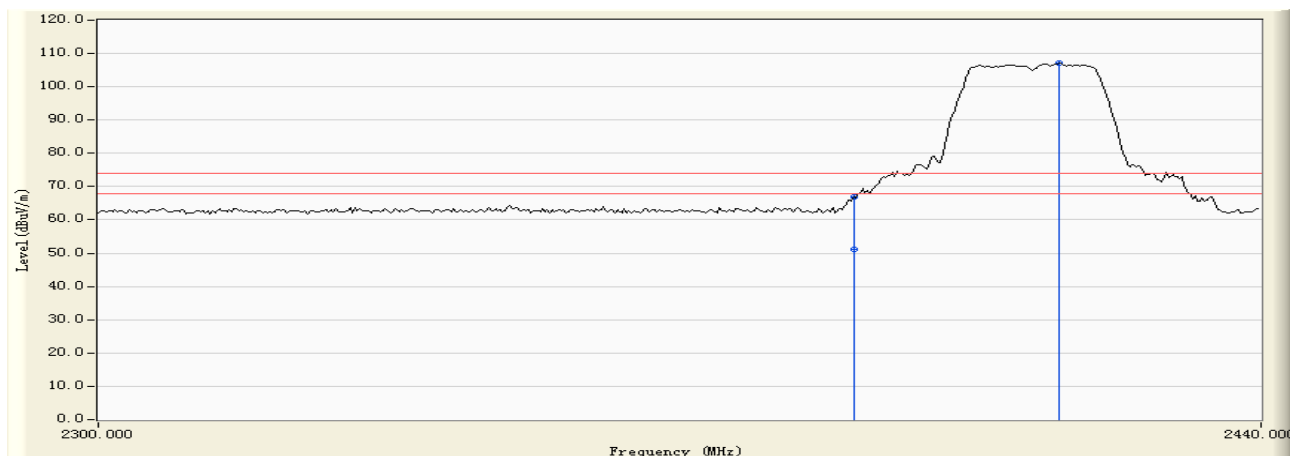
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	0.112	62.604	62.716	-11.284	74.000	PEAK
2		2390.000	0.112	50.120	50.232	-3.768	54.000	AVERAGE
3	*	2405.349	0.125	94.337	94.462	N/A	N/A	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL
Power : AC 120V/60Hz	Note : Transmit by 802.11g (2412MHz)



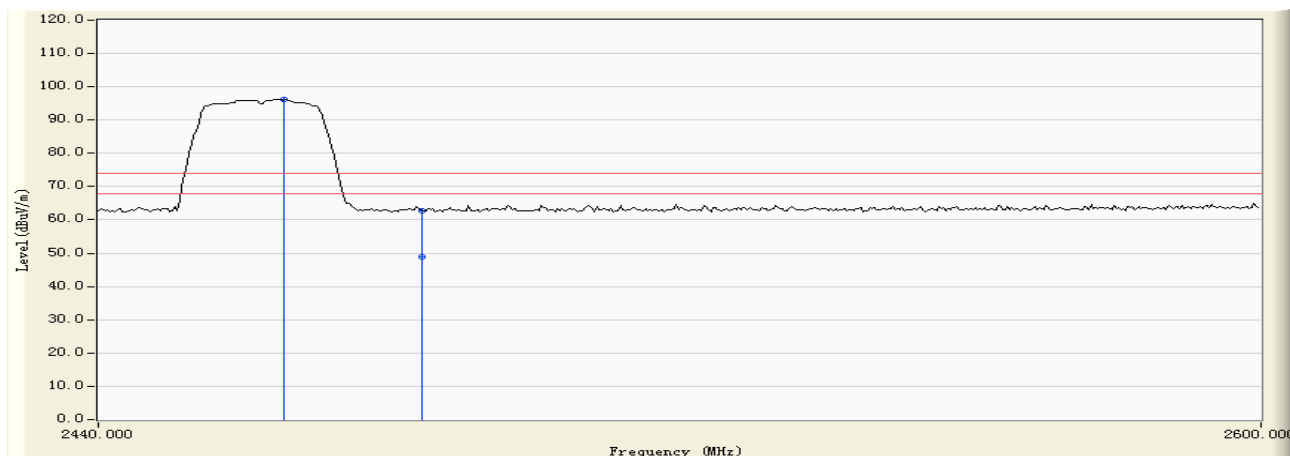
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	0.112	66.807	66.919	-7.081	74.000	PEAK
2		2390.000	0.112	51.140	51.252	-2.748	54.000	AVERAGE
3	*	2415.130	0.139	106.865	107.004	N/A	N/A	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11g (2462MHz)



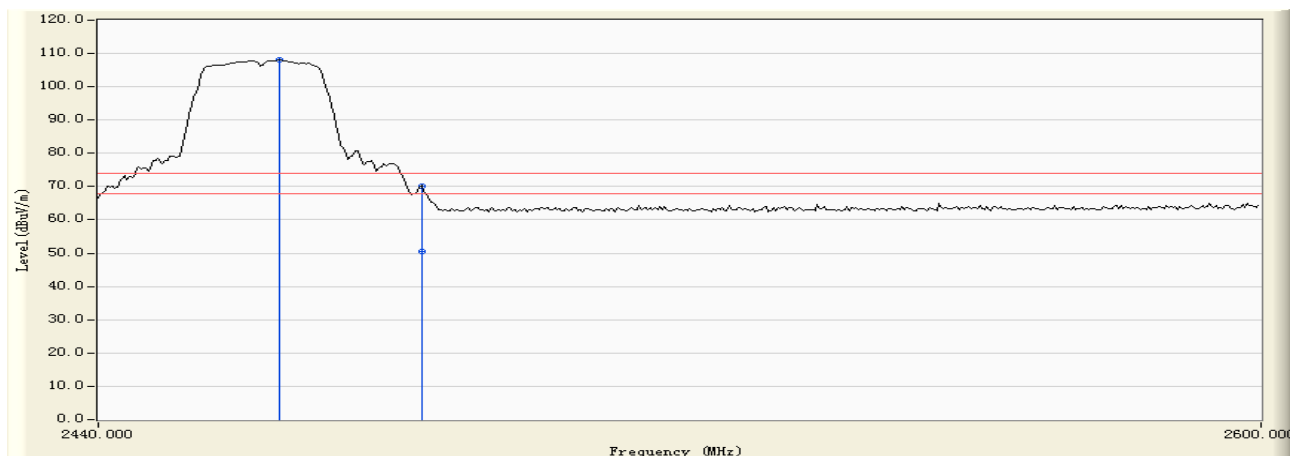
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2464.910	0.262	96.018	96.280	N/A	N/A	PEAK
2		2483.500	0.306	62.410	62.716	-11.284	74.000	PEAK
3		2483.500	0.306	48.560	48.866	-5.134	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL
Power : AC 120V/60Hz	Note : Transmit by 802.11g (2462MHz)



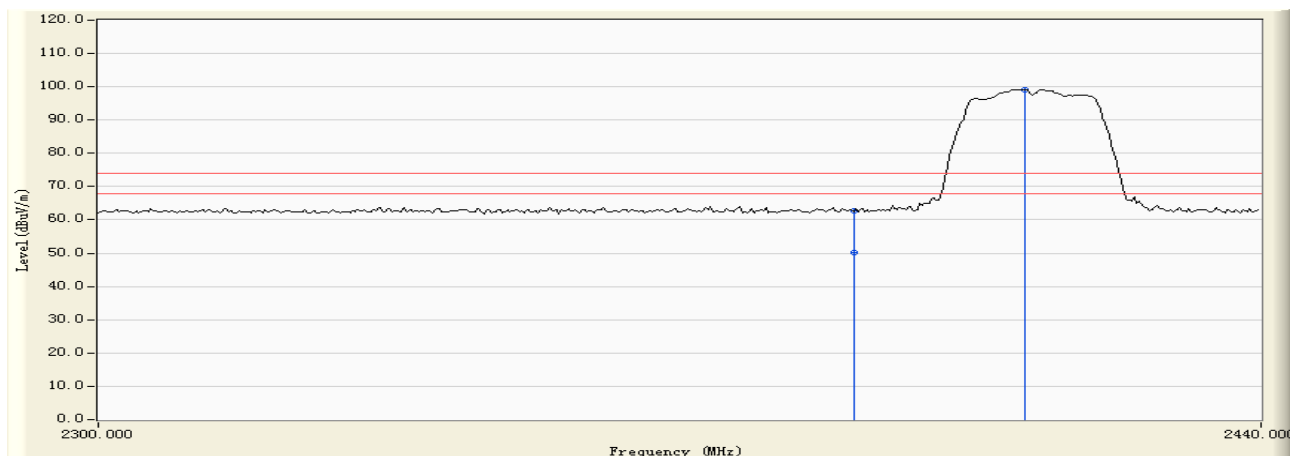
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2462.271	0.261	107.679	107.939	N/A	N/A	PEAK
2		2483.500	0.306	69.702	70.008	-3.992	74.000	PEAK
3		2483.500	0.306	50.320	50.626	-3.374	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (20MHz) (2412MHz)



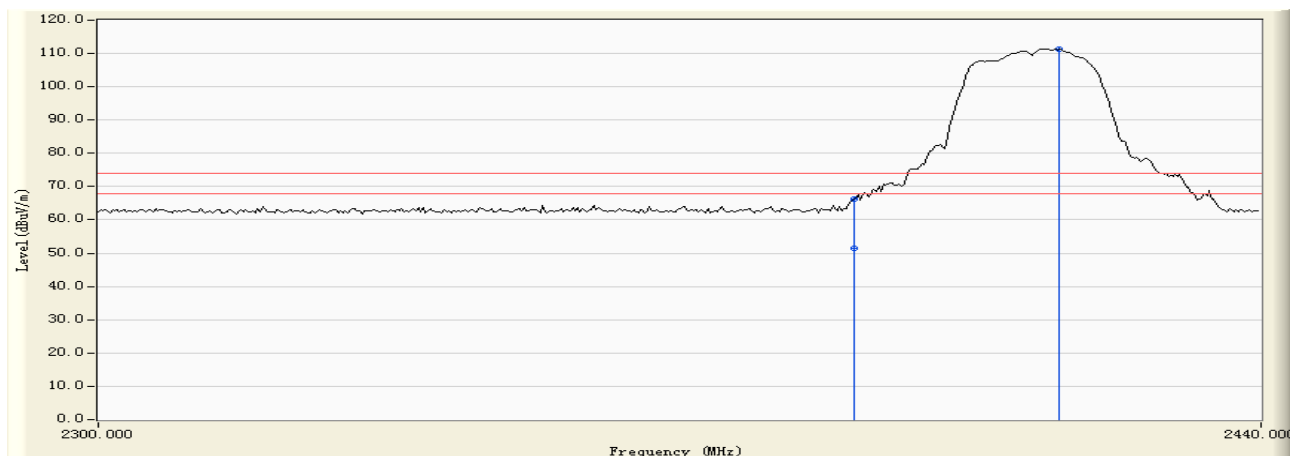
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	0.112	62.499	62.611	-11.389	74.000	PEAK
2		2390.000	0.112	50.020	50.132	-3.868	54.000	AVERAGE
3	*	2410.938	0.133	98.912	99.045	N/A	N/A	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (20MHz) (2412MHz)



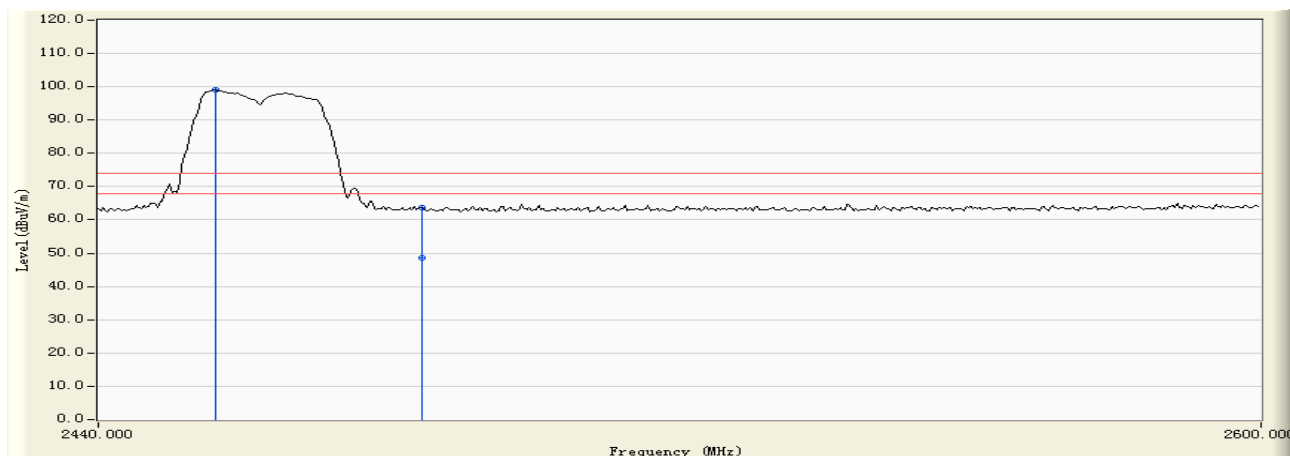
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	0.112	66.124	66.236	-7.764	74.000	PEAK
2		2390.000	0.112	51.240	51.352	-2.648	54.000	AVERAGE
3	*	2415.130	0.139	111.310	111.449	N/A	N/A	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeson	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (20MHz) (2462MHz)



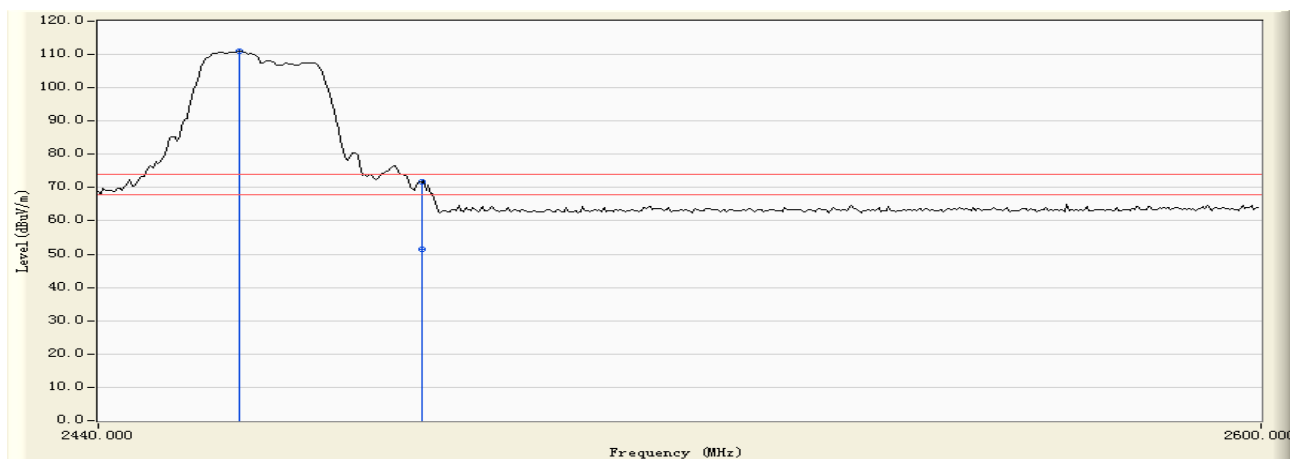
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2455.649	0.237	98.776	99.013	N/A	N/A	PEAK
2		2483.500	0.306	63.357	63.663	-10.337	74.000	PEAK
3		2483.500	0.306	48.250	48.556	-5.444	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (20MHz) (2462MHz)



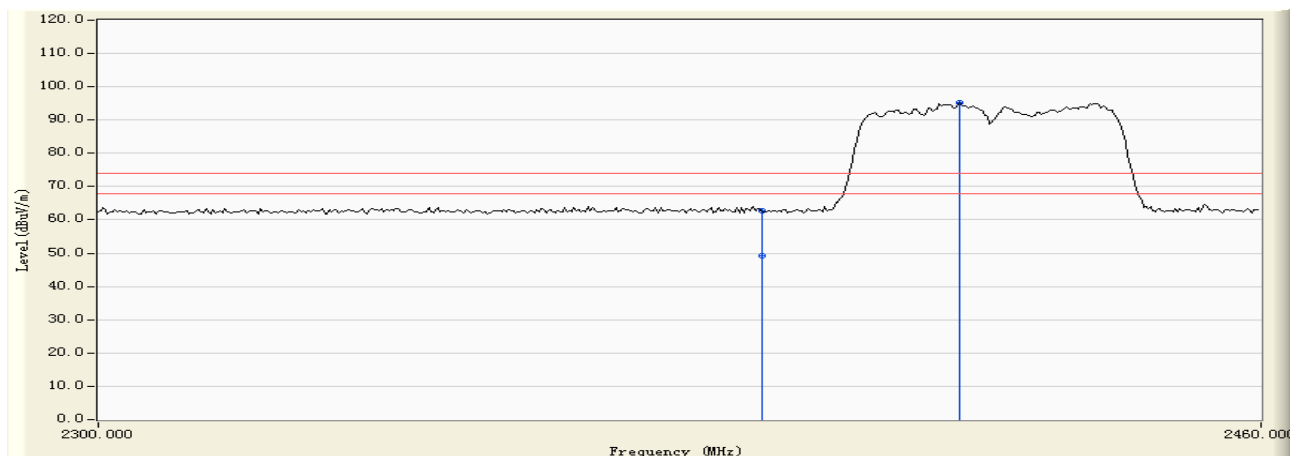
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2458.842	0.246	110.694	110.940	N/A	N/A	PEAK
2		2483.500	0.306	71.348	71.654	-2.346	74.000	PEAK
3		2483.500	0.306	52.240	52.546	-1.454	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (40MHz) (2422MHz)



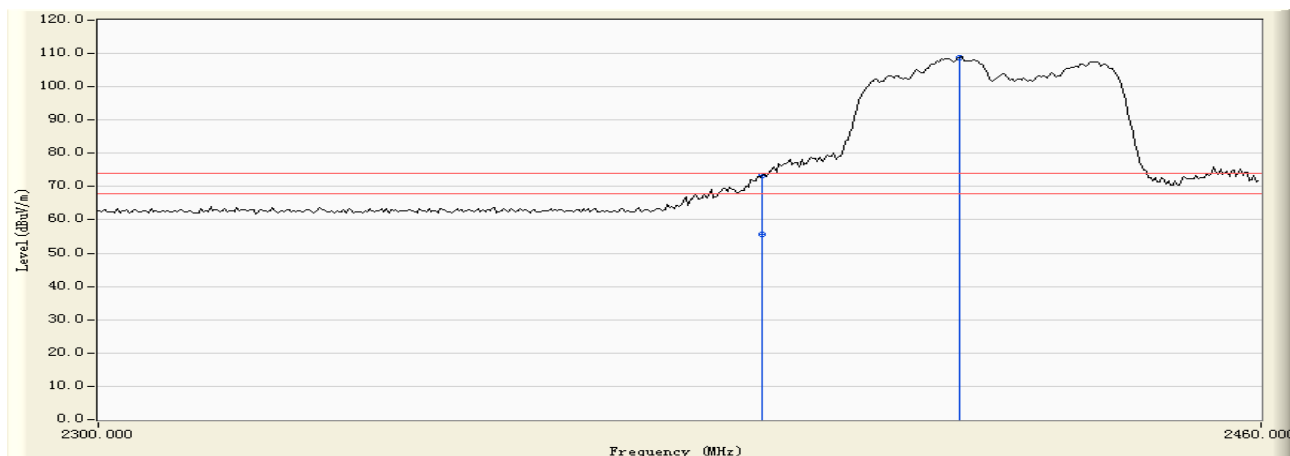
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	0.112	62.485	62.597	-11.403	74.000	PEAK
2		2390.000	0.112	49.250	49.362	-4.638	54.000	AVERAGE
3	*	2417.525	0.142	95.060	95.202	N/A	N/A	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (40MHz) (2422MHz)



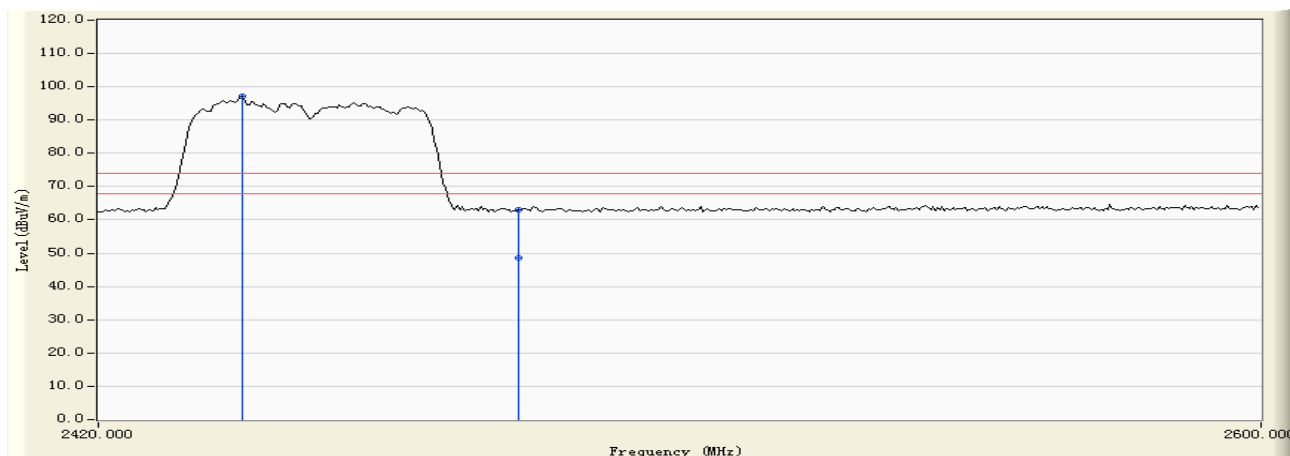
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	0.112	73.123	73.235	-0.765	74.000	PEAK
2		2390.000	0.112	53.520	53.632	-0.368	54.000	AVERAGE
3	*	2417.525	0.142	108.530	108.672	N/A	N/A	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : HORIZONTAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (40MHz) (2452MHz)



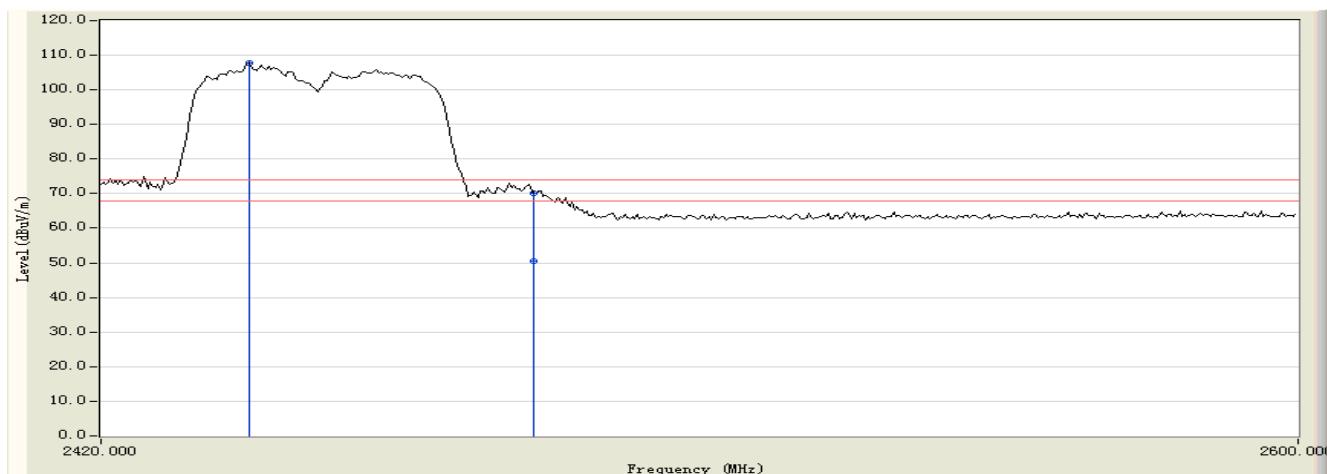
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2441.557	0.197	96.907	97.103	N/A	N/A	PEAK
2		2483.500	0.306	62.667	62.973	-11.027	74.000	PEAK
3		2483.500	0.306	48.240	48.546	-5.454	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Engineer : Jeff	
Site : EMC Lab AC 102	Time : 2011-04-28
Limit : FCC_15_03M	Margin : 6
EUT : 802.11n VDSL2 Bonded 4-port Wi-Fi Gateway	Probe : VERTICAL
Power : AC 120V/60Hz	Note : Transmit by 802.11n (40MHz) (2452MHz)



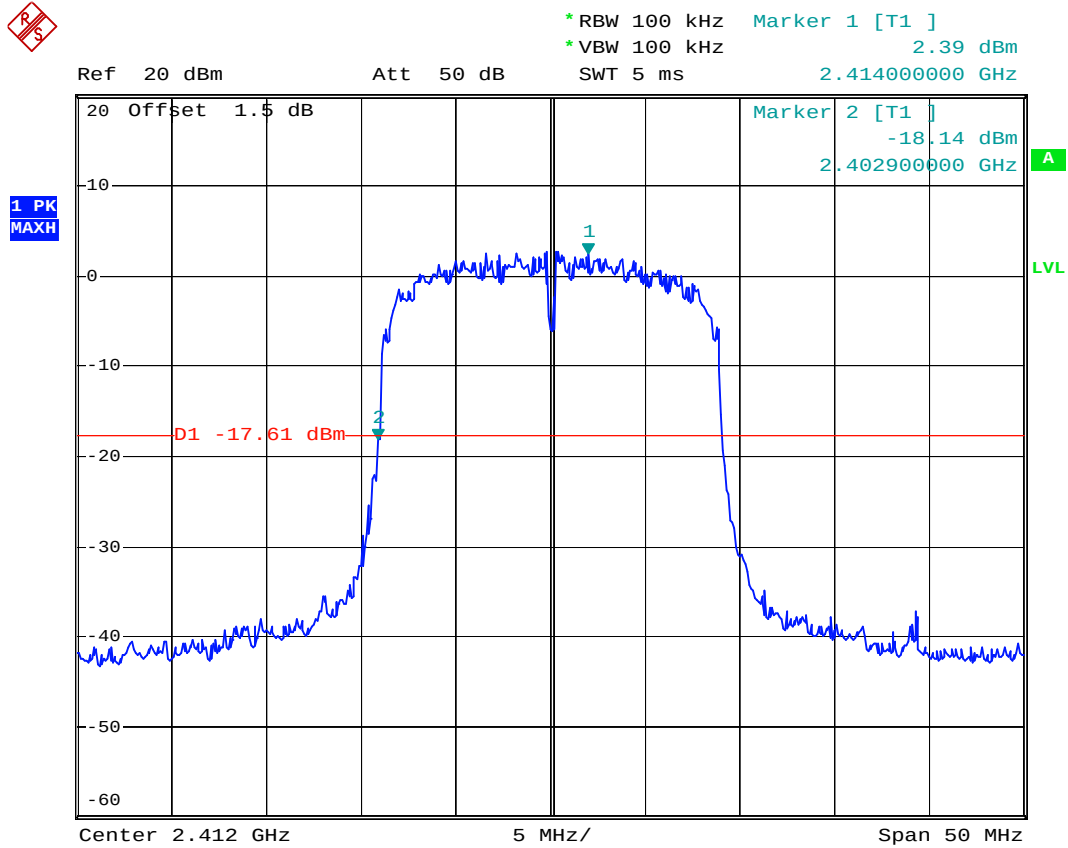
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2441.557	0.197	107.532	107.728	N/A	N/A	PEAK
2		2483.500	0.306	69.896	70.202	-3.798	74.000	PEAK
3		2483.500	0.306	51.250	51.556	-2.444	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



Band Edge (20dBc RF Conducted Measurement)
Mode: Transmit by 802.11b (2412MHz)

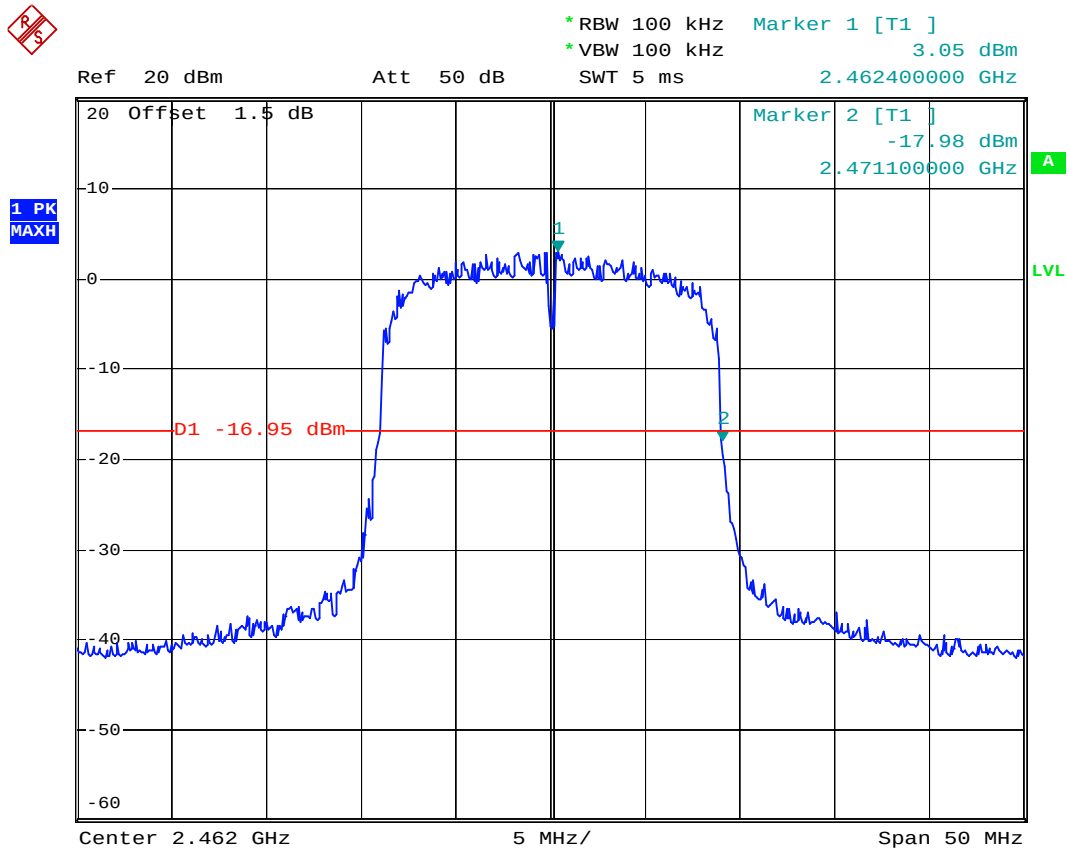


Date: 28.APR.2011 17:36:50



Band Edge (20dBc RF Conducted Measurement)

Mode: Transmit by 802.11b (2462MHz)

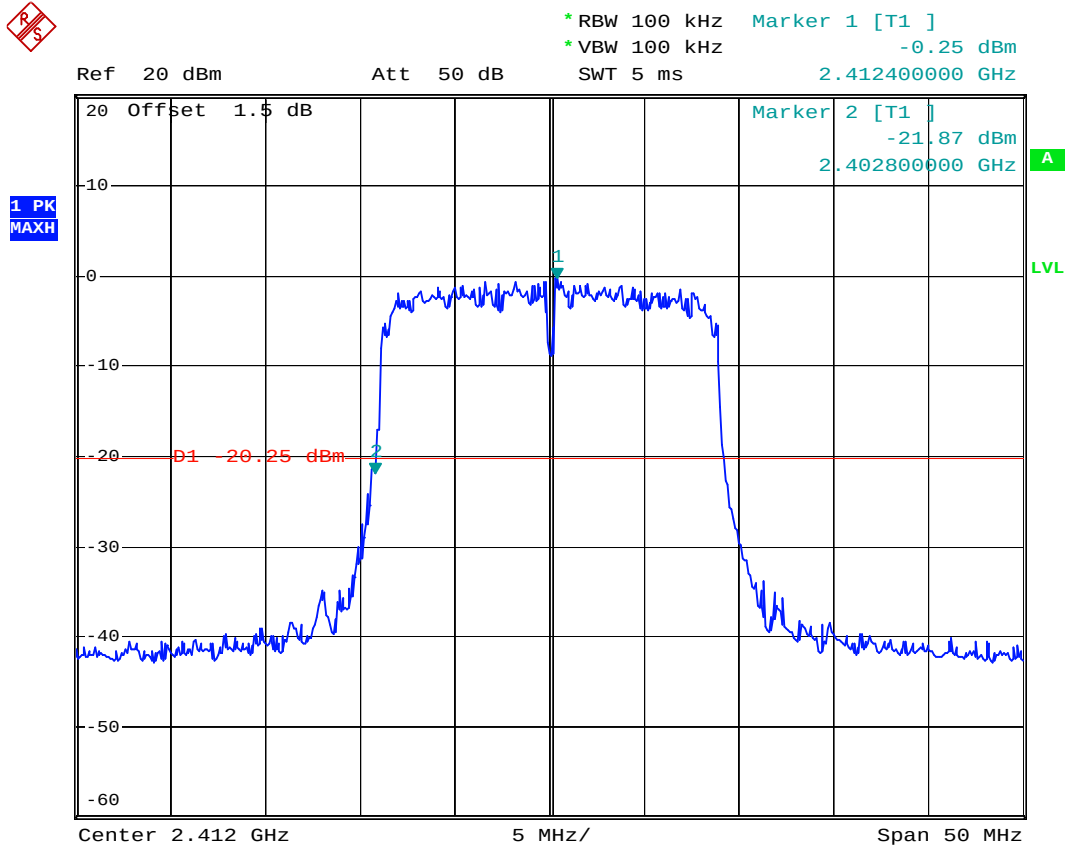


Date: 28.APR.2011 17:35:19



Band Edge (20dBc RF Conducted Measurement)

Mode: Transmit by 802.11g (2412MHz)

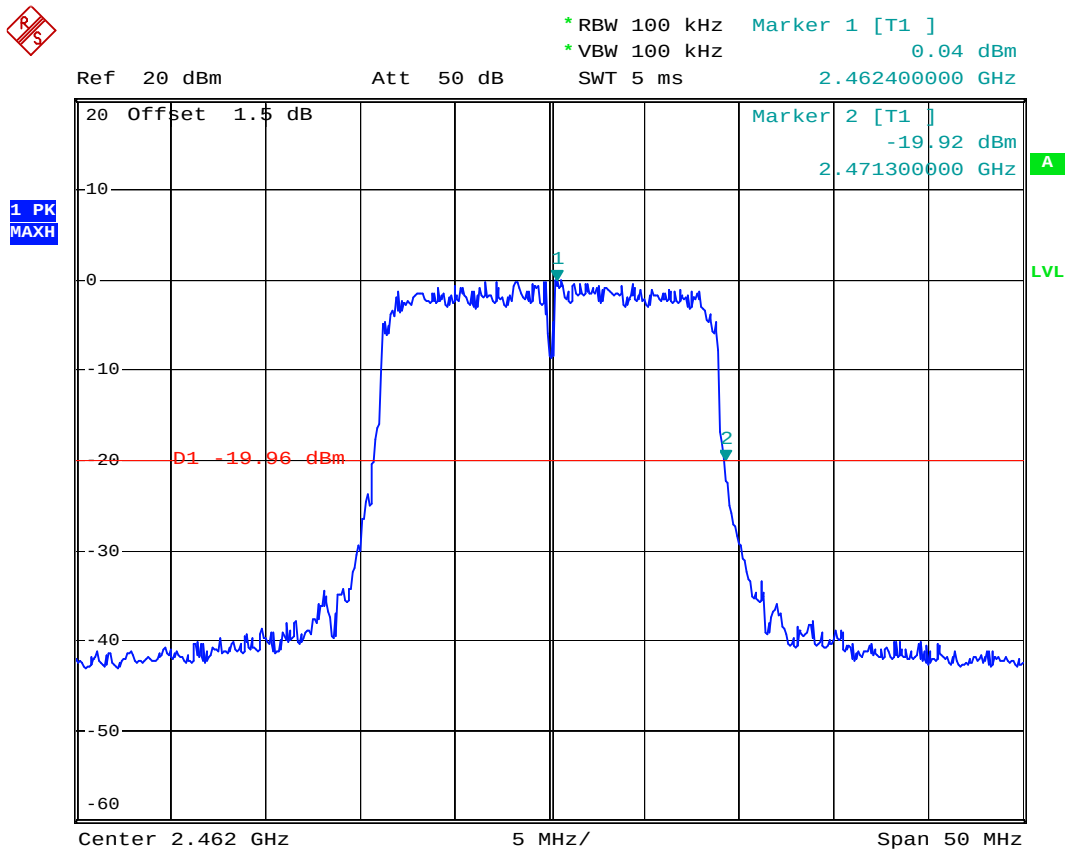


Date: 28.APR.2011 17:39:10



Band Edge (20dBc RF Conducted Measurement)

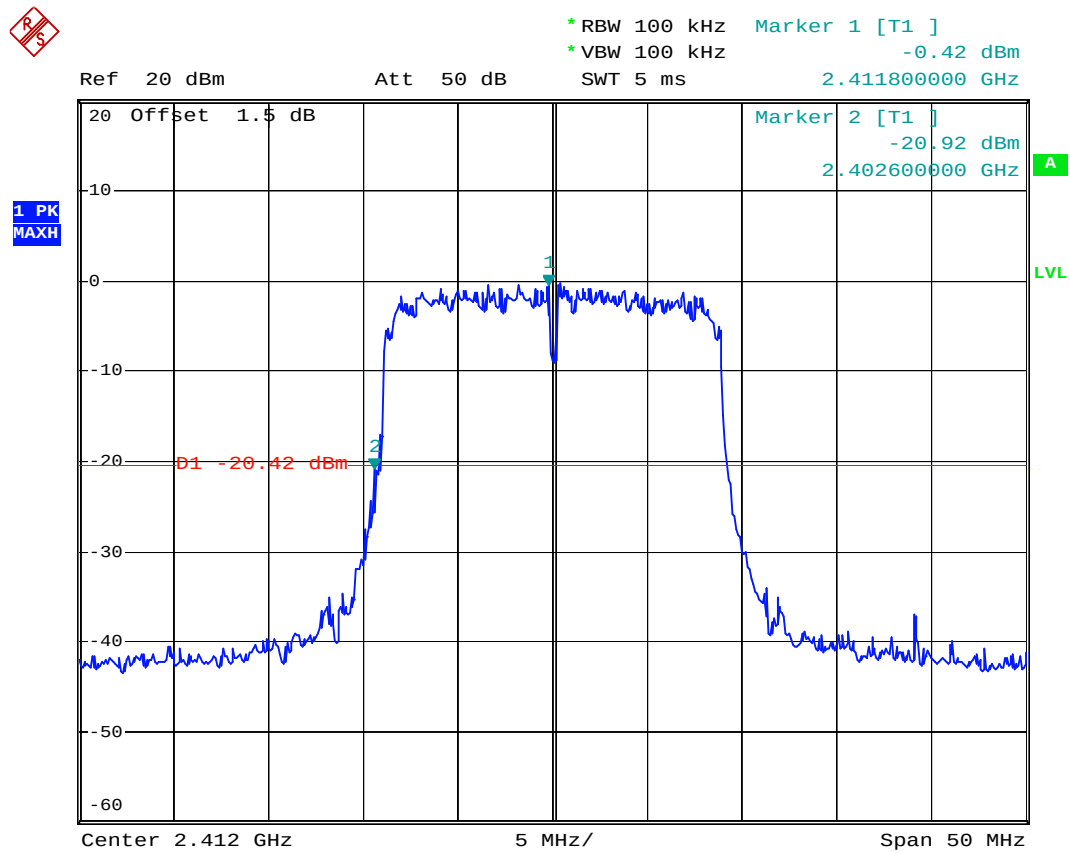
Mode: Transmit by 802.11g (2462MHz)



Date: 28.APR.2011 17:40:28



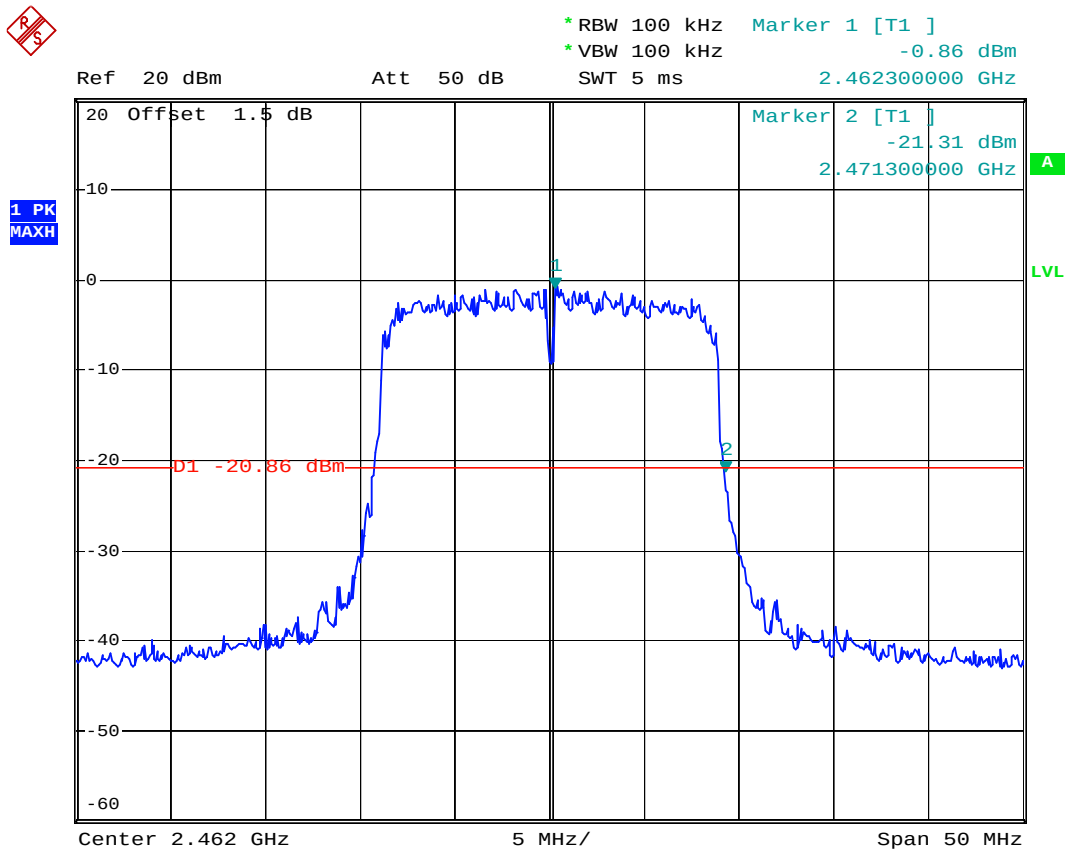
Band Edge (20dBc RF Conducted Measurement)
Mode: Transmit by 802.11n (20MHz) (2412MHz)
Chain 0



Date: 28.APR.2011 17:41:57



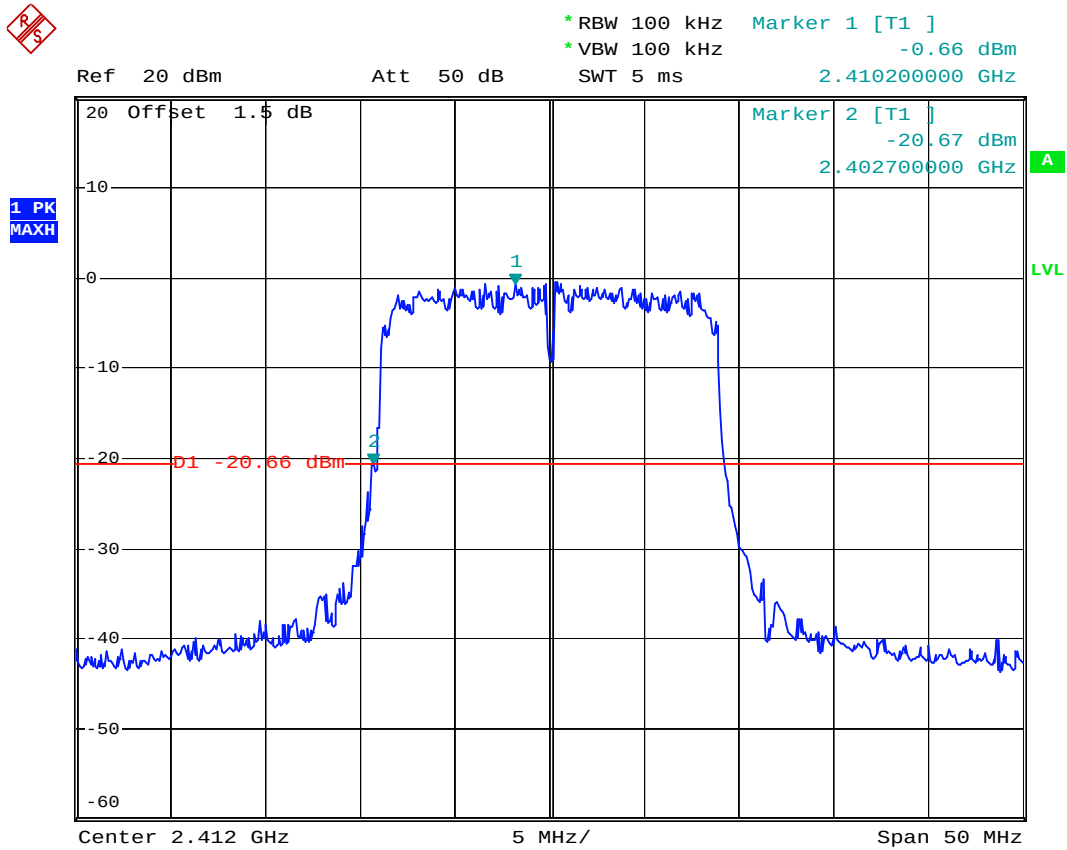
Band Edge (20dBc RF Conducted Measurement)
Mode: Transmit by 802.11n (20MHz) 2462MHz



Date: 28.APR.2011 17:45:24



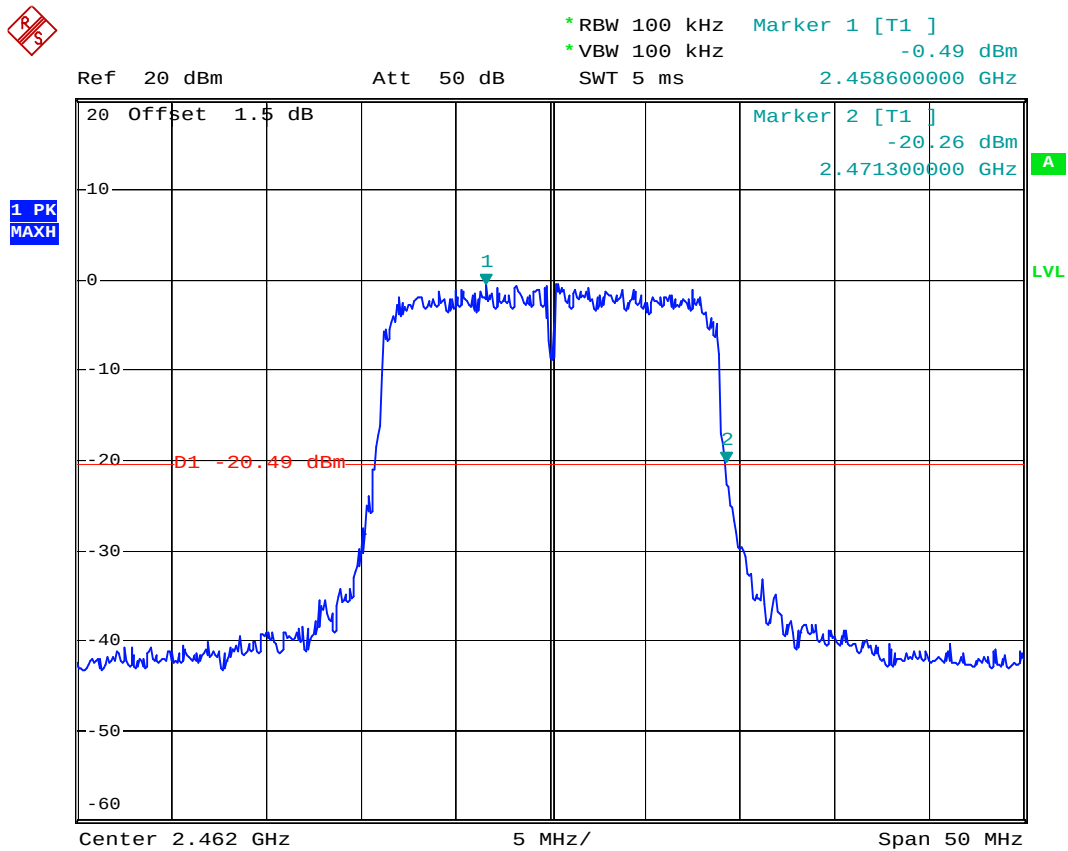
Band Edge (20dBc RF Conducted Measurement)
Mode: Transmit by 802.11n (20MHz) (2412MHz)
Chain 1



Date: 28.APR.2011 17:43:00

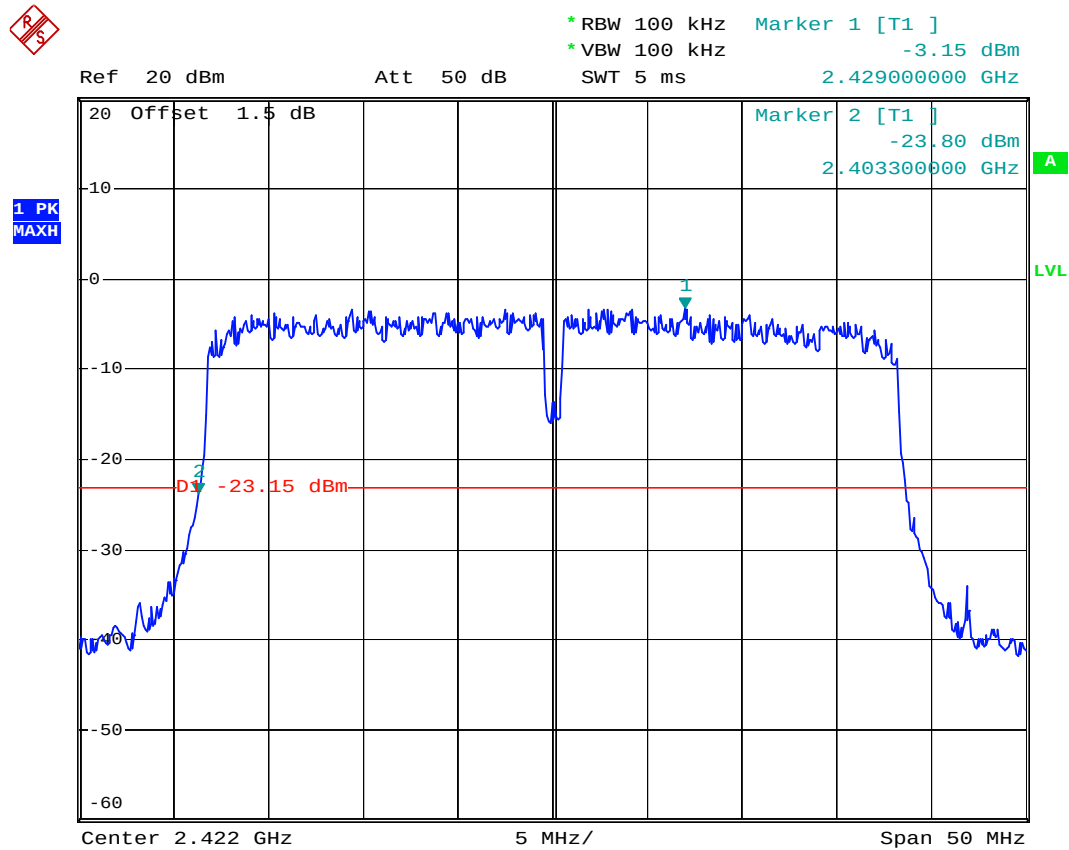


Band Edge (20dBc RF Conducted Measurement)
Mode: Transmit by 802.11n (20MHz) 2462MHz)



Date: 28.APR.2011 17:44:06

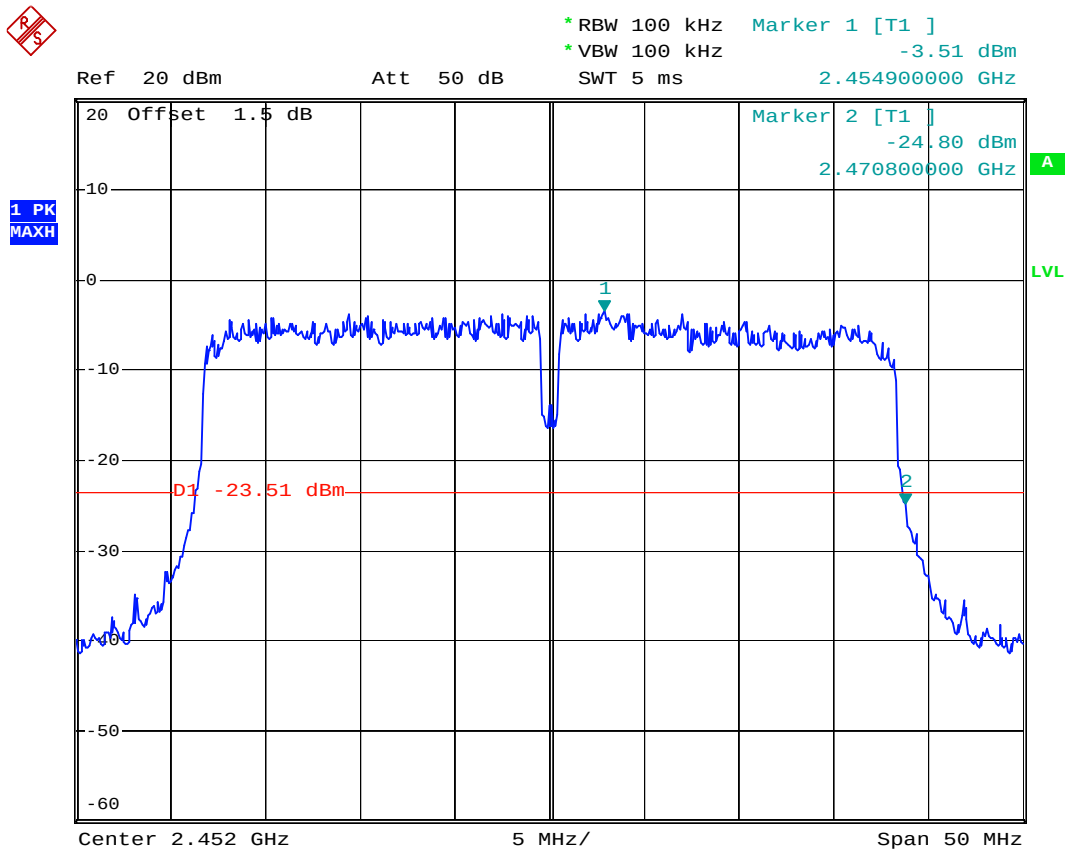
Band Edge (20dBc RF Conducted Measurement)
Mode: Transmit by 802.11n (40MHz) (2422MHz)
Chain 0



Date: 28.APR.2011 17:46:56



Band Edge (20dBc RF Conducted Measurement)
Mode: Transmit by 802.11n (40MHz) 2452MHz)

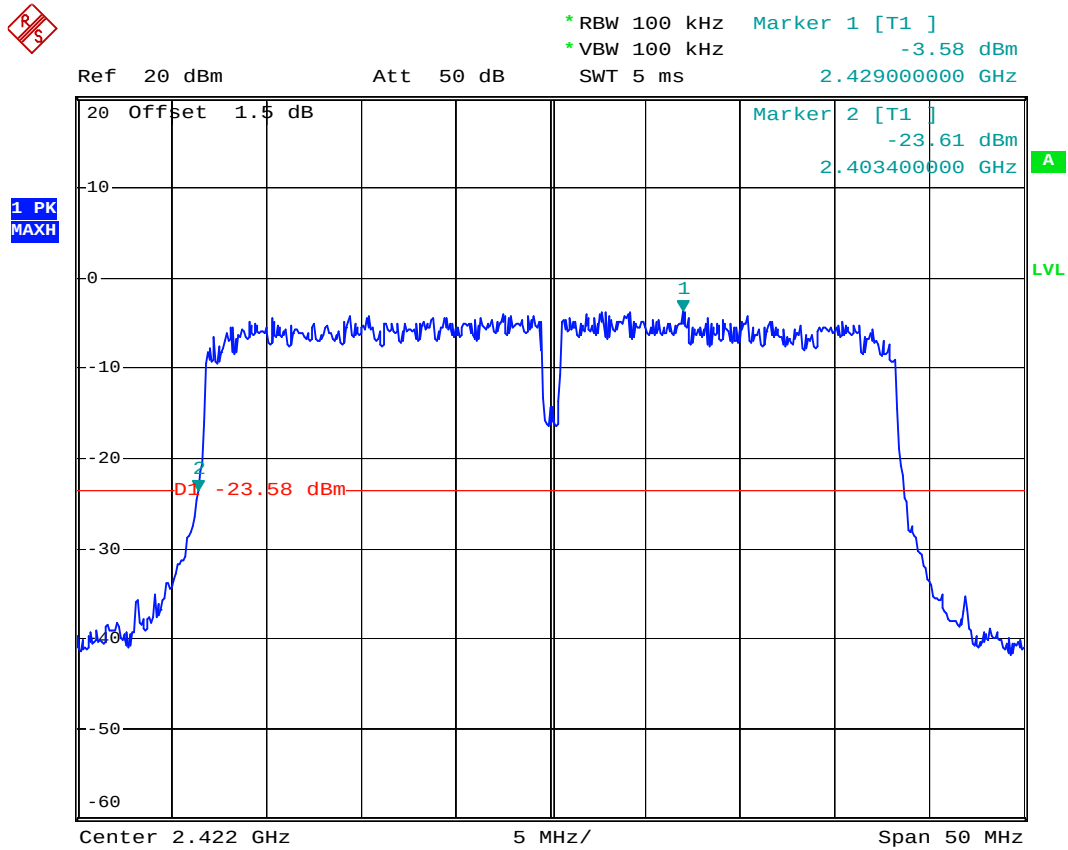


Date: 28.APR.2011 17:51:06

Band Edge (20dBc RF Conducted Measurement)

Mode: Transmit by 802.11n (40MHz) (2422MHz)

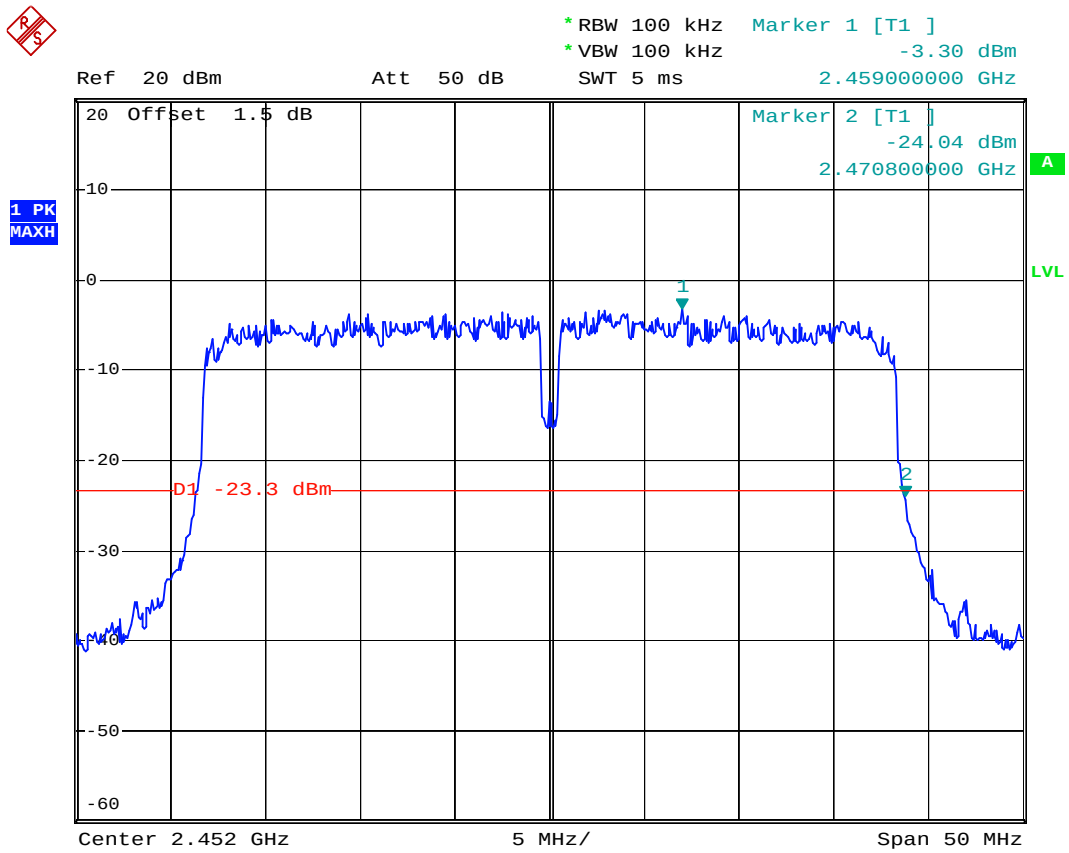
Chain 1



Date: 28.APR.2011 17:48:09



Band Edge (20dBc RF Conducted Measurement)
Mode: Transmit by 802.11n (40MHz) 2452MHz)



Date: 28.APR.2011 17:49:43



8. RF Antenna Conducted Spurious

8.1. Test Limit

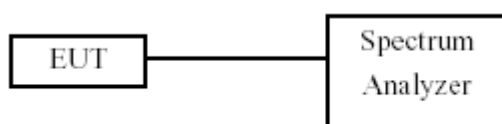
In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional Radiator is operating, the radio frequency power that is produced by the intentional radiator shall Be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

8.2. Test Procedure

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW= 100 kHz, Set VBW>RBW, Sweep time=Auto, set up through 10 th harmonic.

8.3. Test Setup Layout



8.4. Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date
Spectrum Analyzer	R&S	FSP40	100324	2010.08.14
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-002	2010.08.17

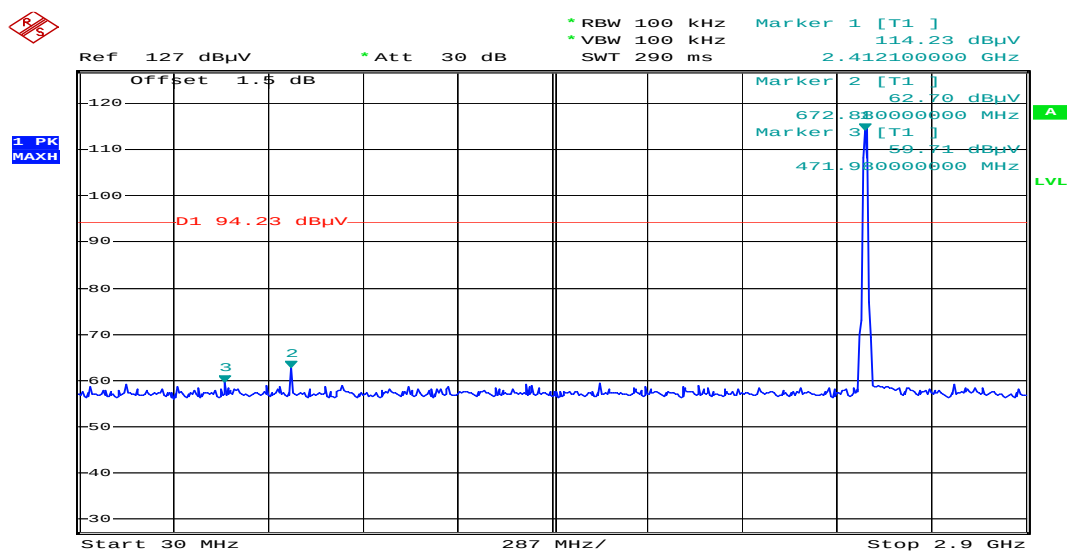


8.5. Test Result and Data

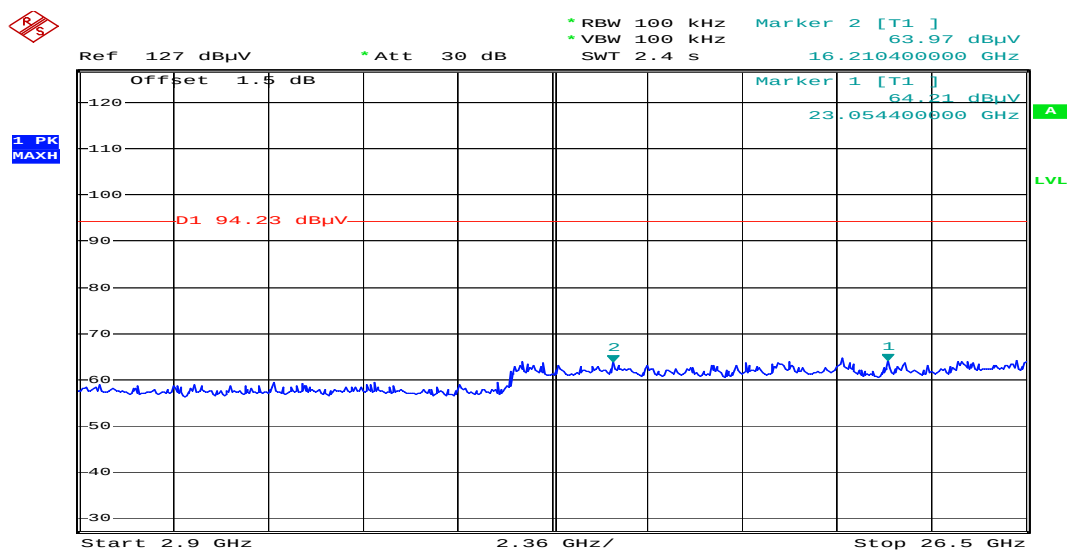
Test Item	RF Antenna Conducted Spurious
Test Mode	Transmit by 802.11b
Test Date	2011-04-28

Channel 01 (2412MHz)

30M---2.9G



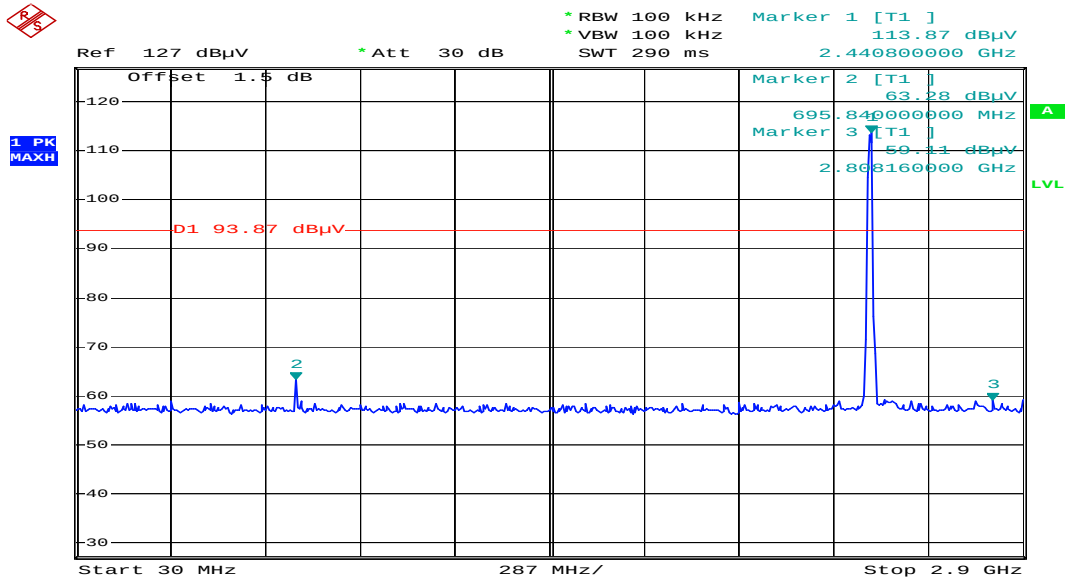
2.9---26.5G



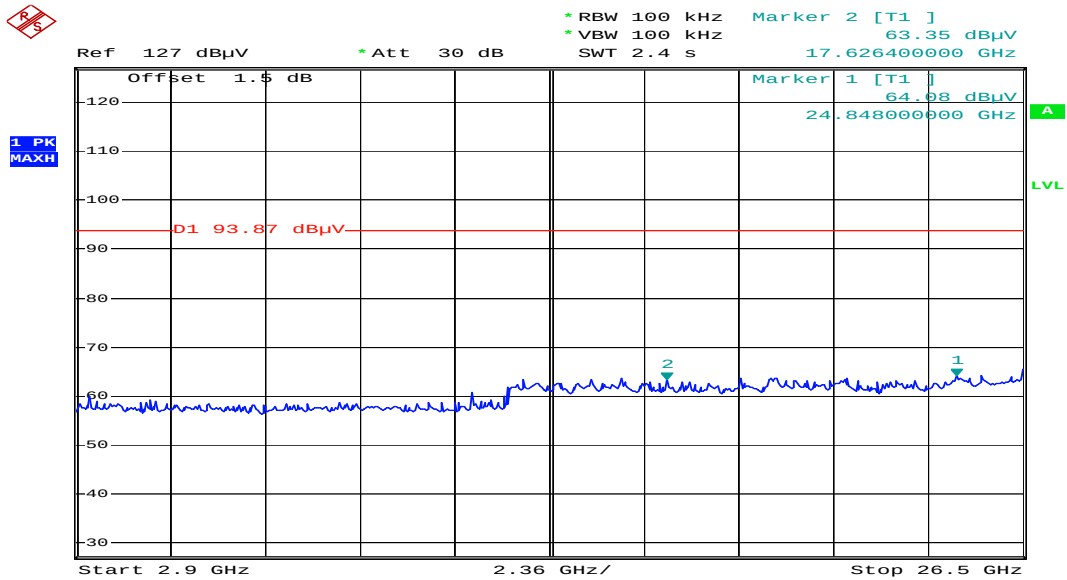


Channel 06 (2437MHz)

30M---2.9G



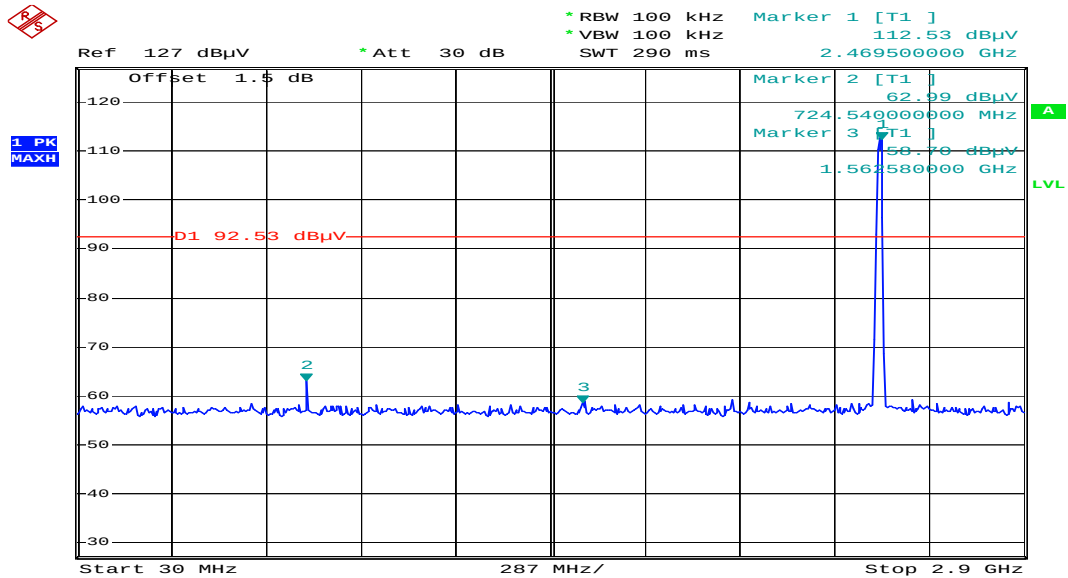
2.9---26.5G



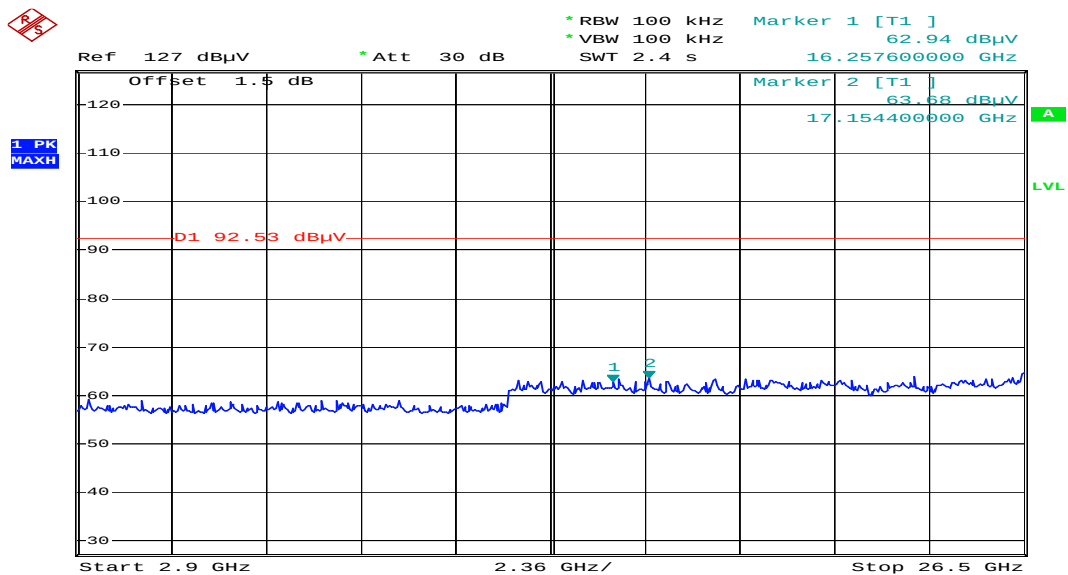


Channel 11 (2462MHz)

30M---2.9G



2.9---26.5G

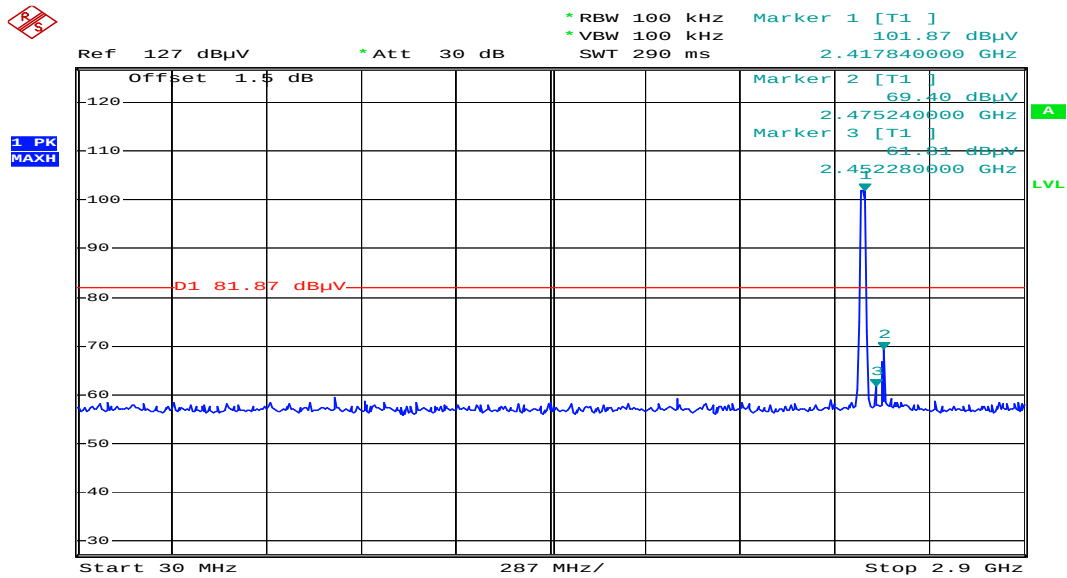




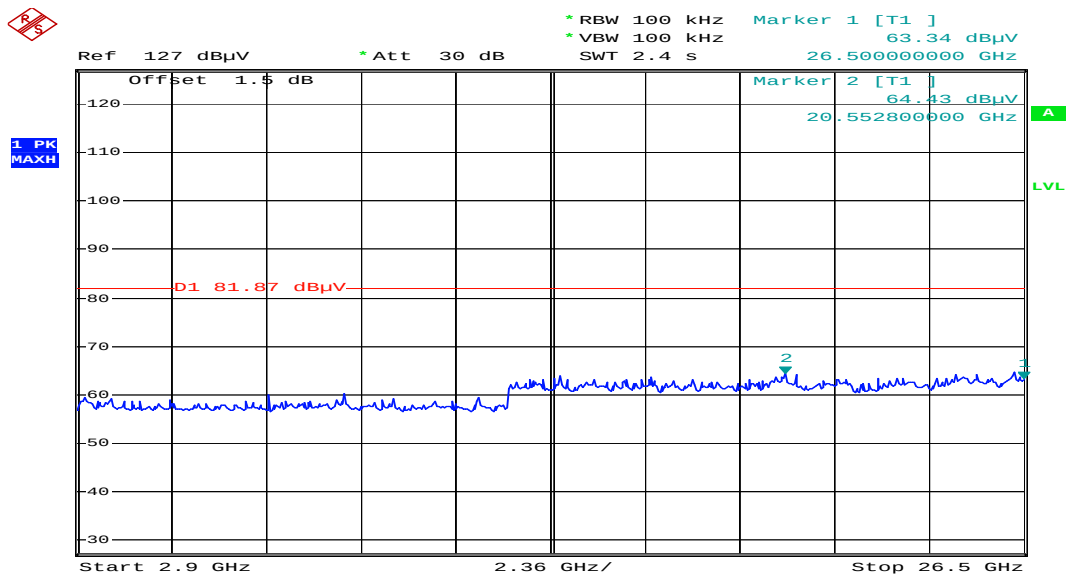
Test Item	RF Antenna Conducted Spurious
Test Mode	Transmit by 802.11g
Test Date	2011-04-28

Channel 01 (2412MHz)

30M---2.9G



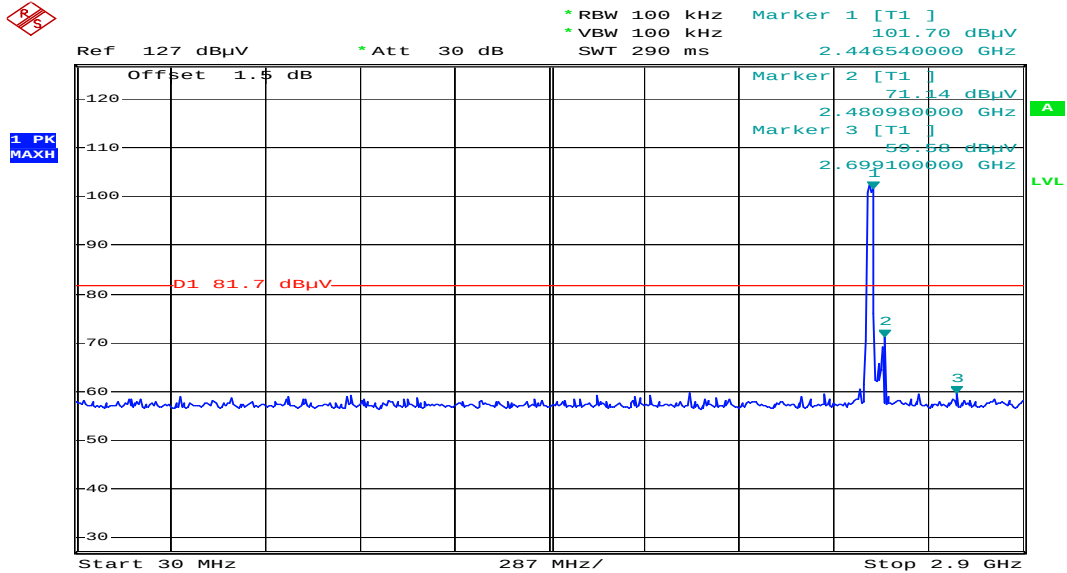
2.9---26.5G



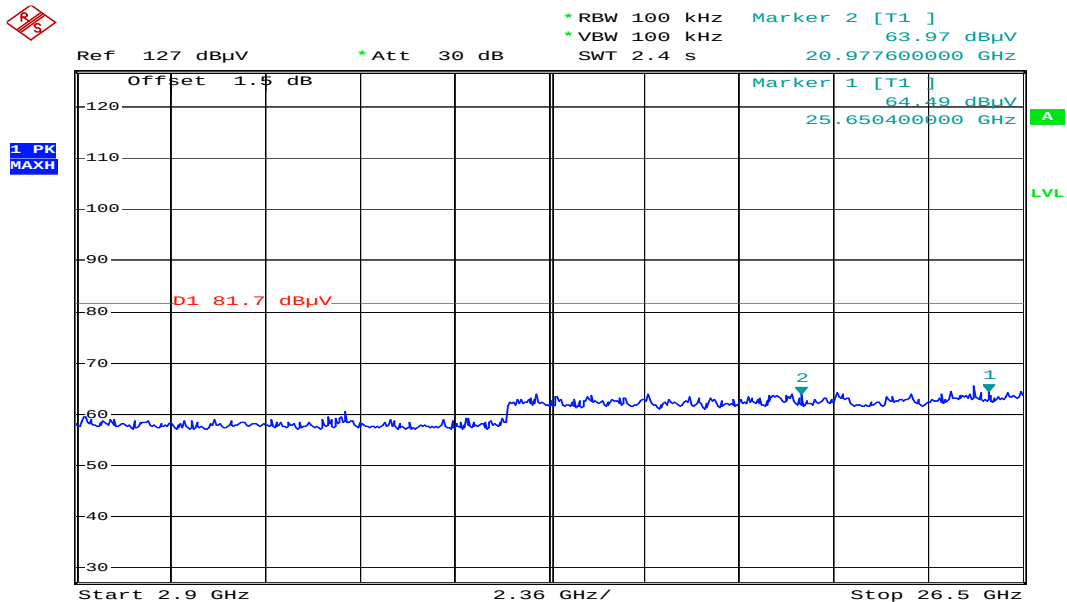


Channel 06 (2437MHz)

30M---2.9G



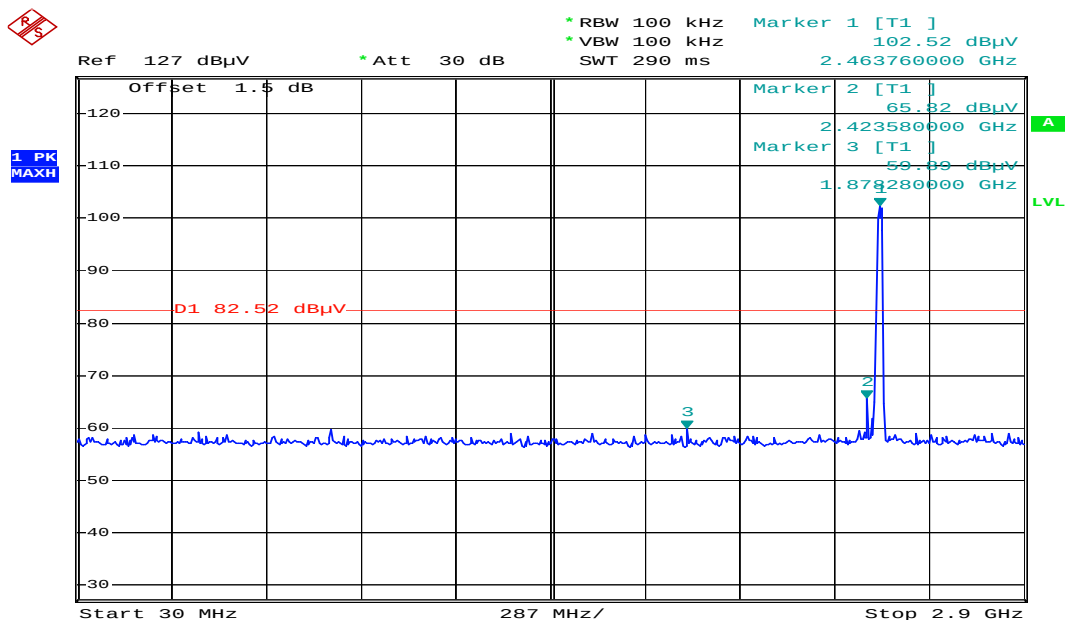
2.9---26.5G



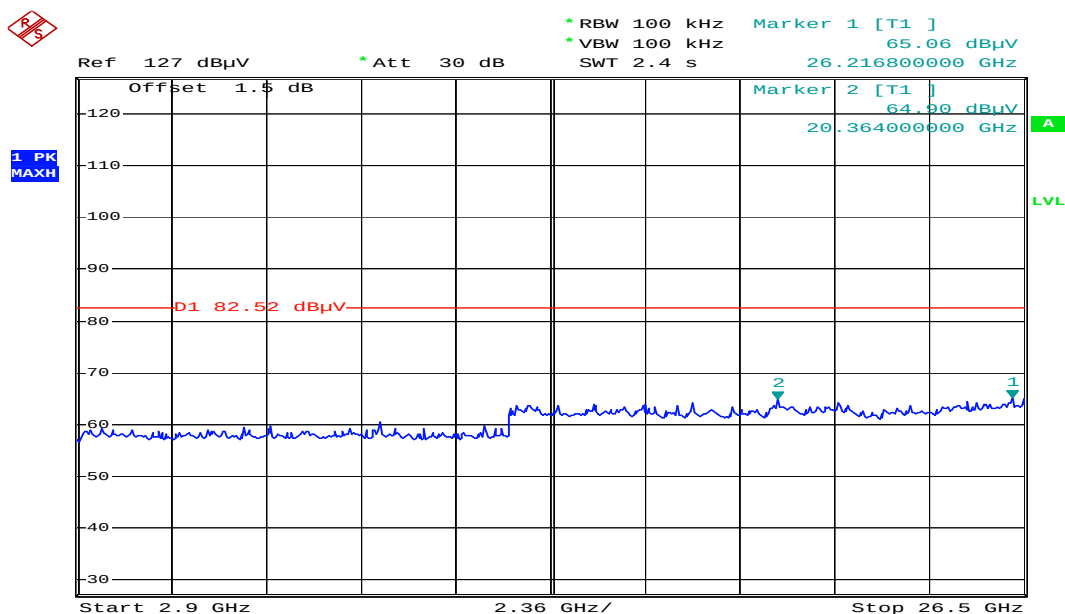


Channel 11 (2462MHz)

30M---2.9G



2.9---26.5G



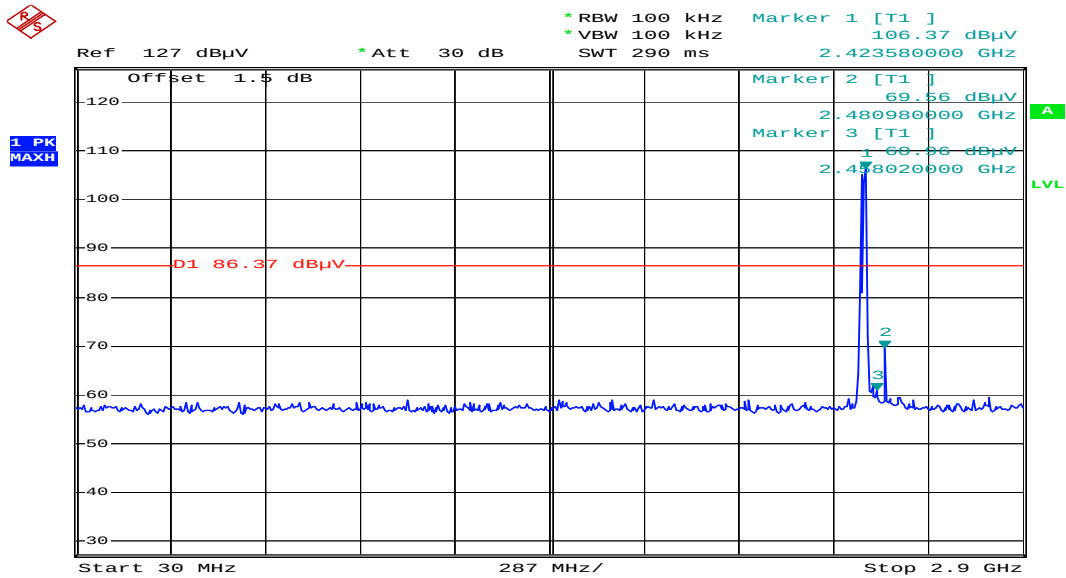


Test Item	RF Antenna Conducted Spurious
Test Mode	Transmit by 802.11n (20MHz)
Test Date	2011-04-28

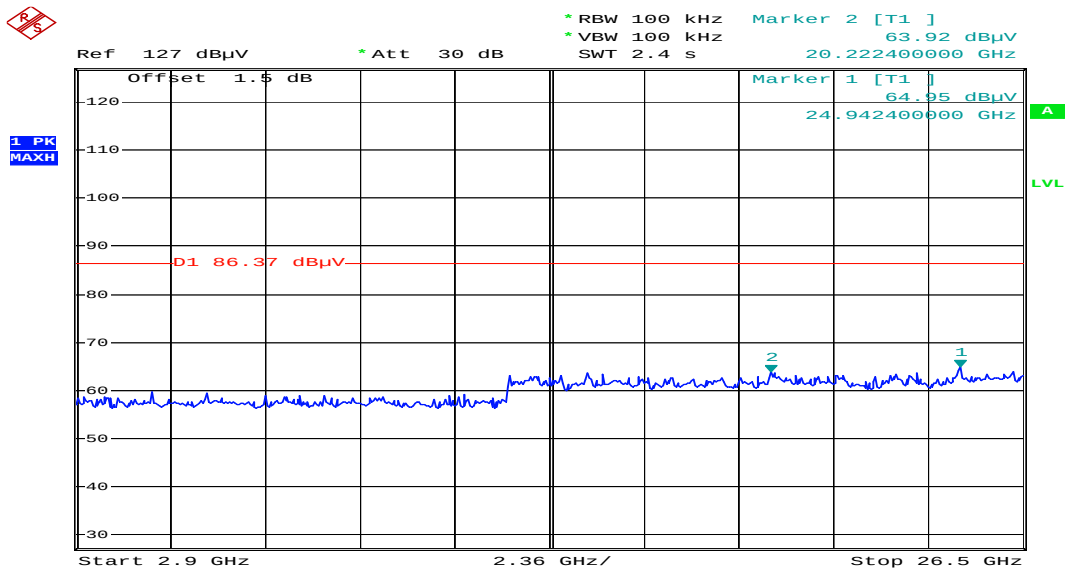
Chain 0

Channel 01 (2412MHz)

30M---2.9G



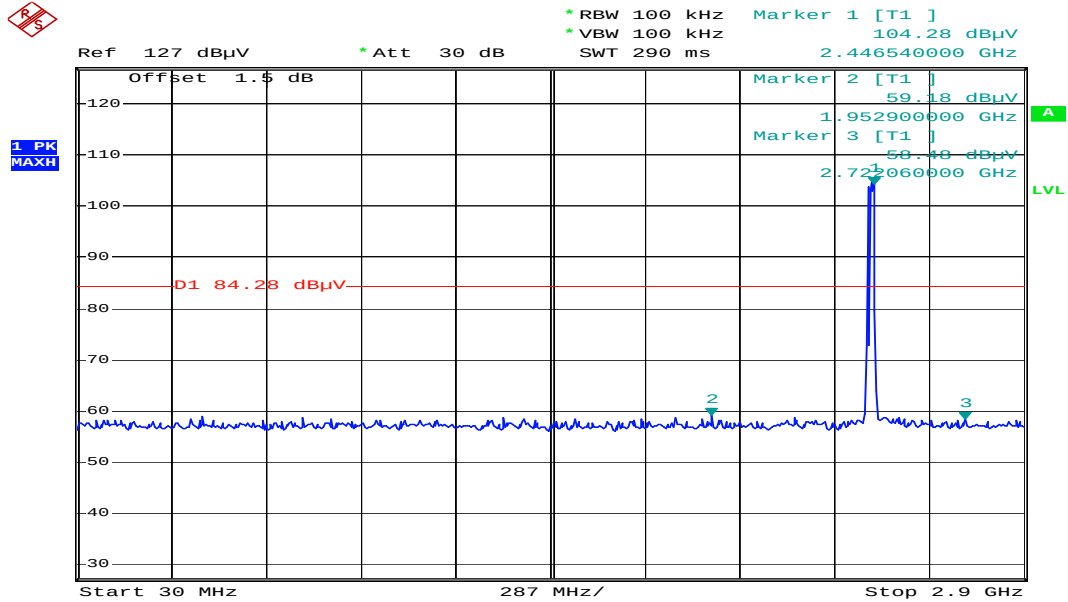
2.9---26.5G



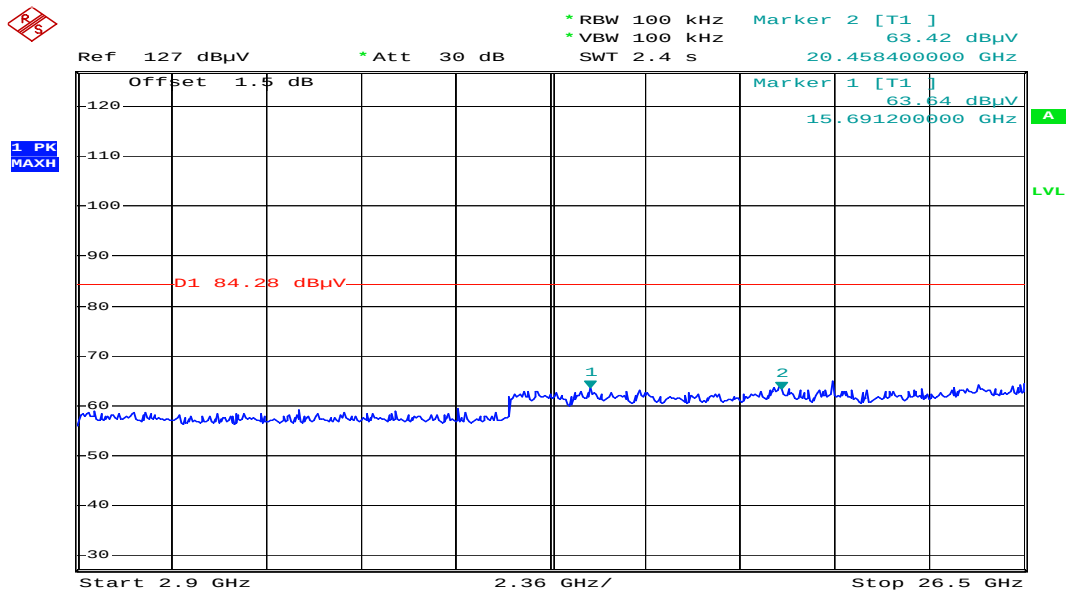


Channel 06 (2437MHz)

30M---2.9G



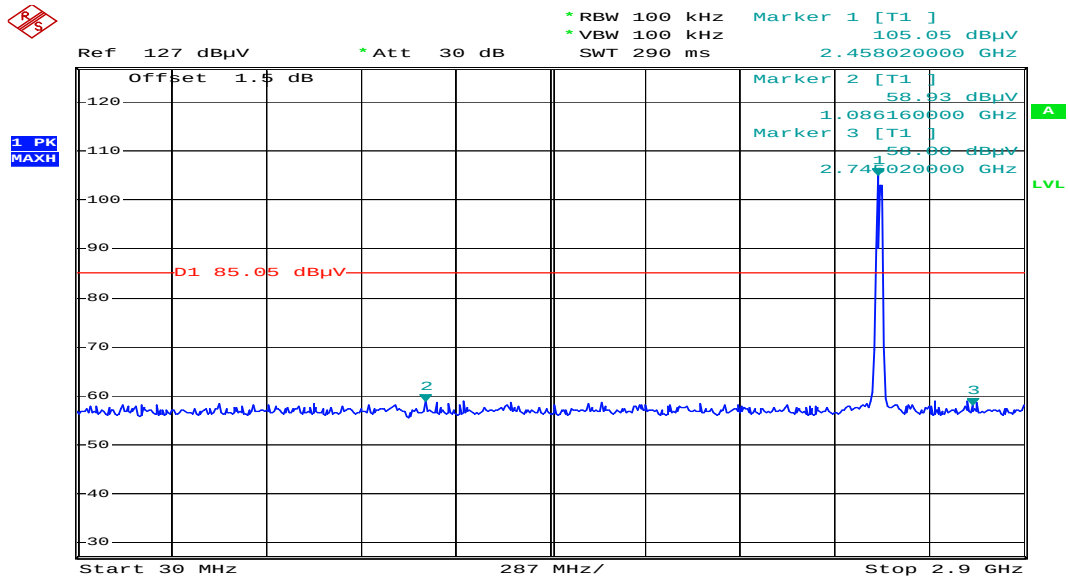
2.9---26.5G



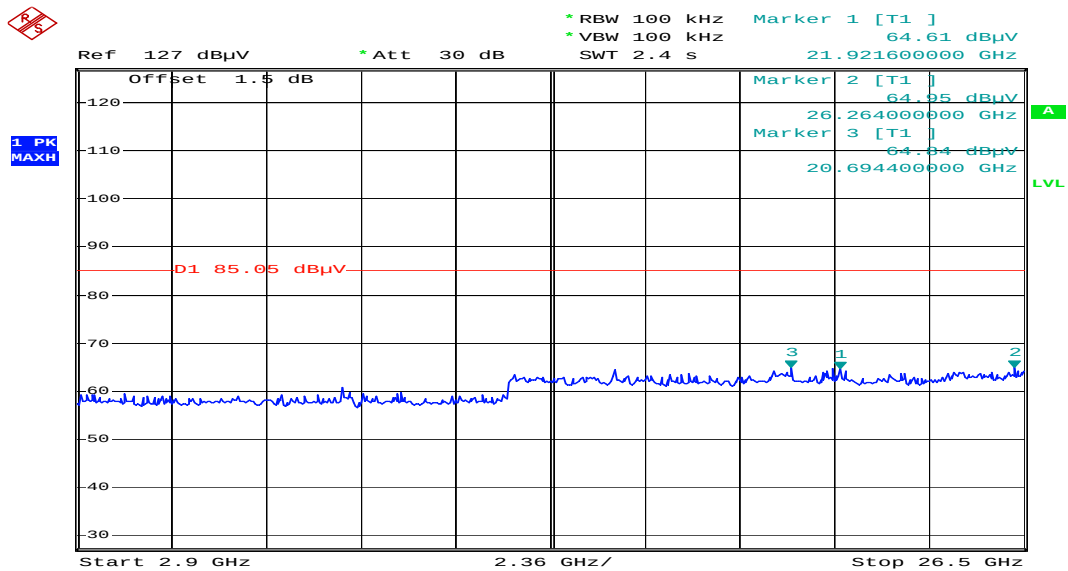


Channel 11 (2462MHz)

30M---2.9G



2.9---26.5G



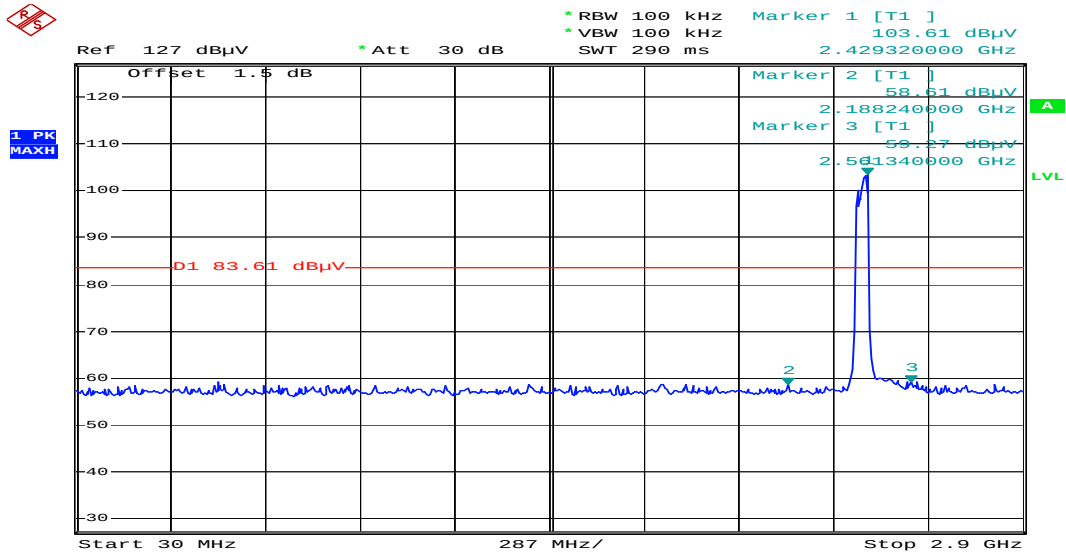


Test Item	RF Antenna Conducted Spurious
Test Mode	Transmit by 802.11n (40MHz)
Test Date	2011-04-28

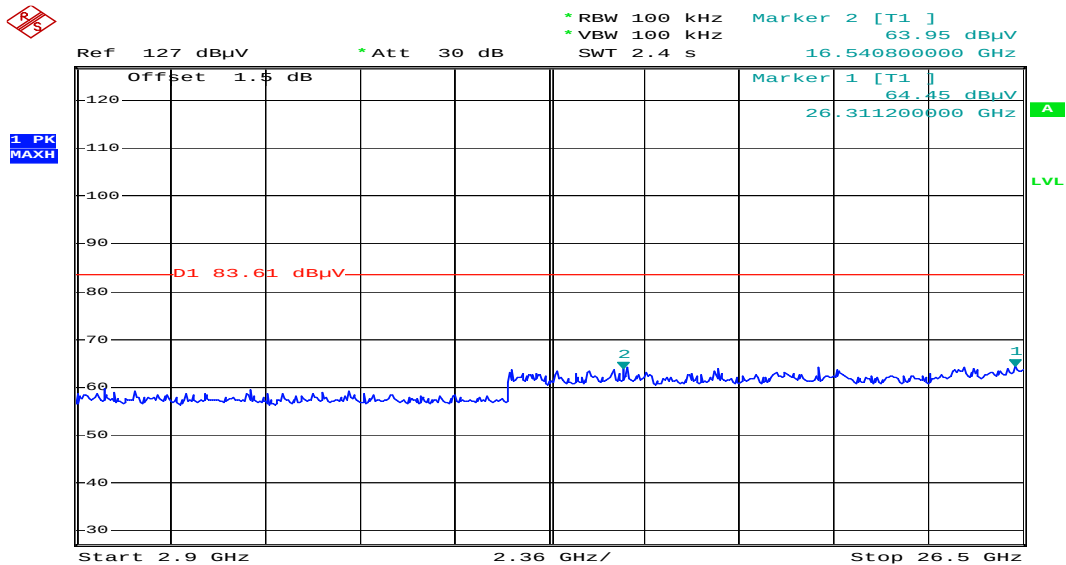
Chain 0

Channel 01 (2422MHz)

30M---2.9G



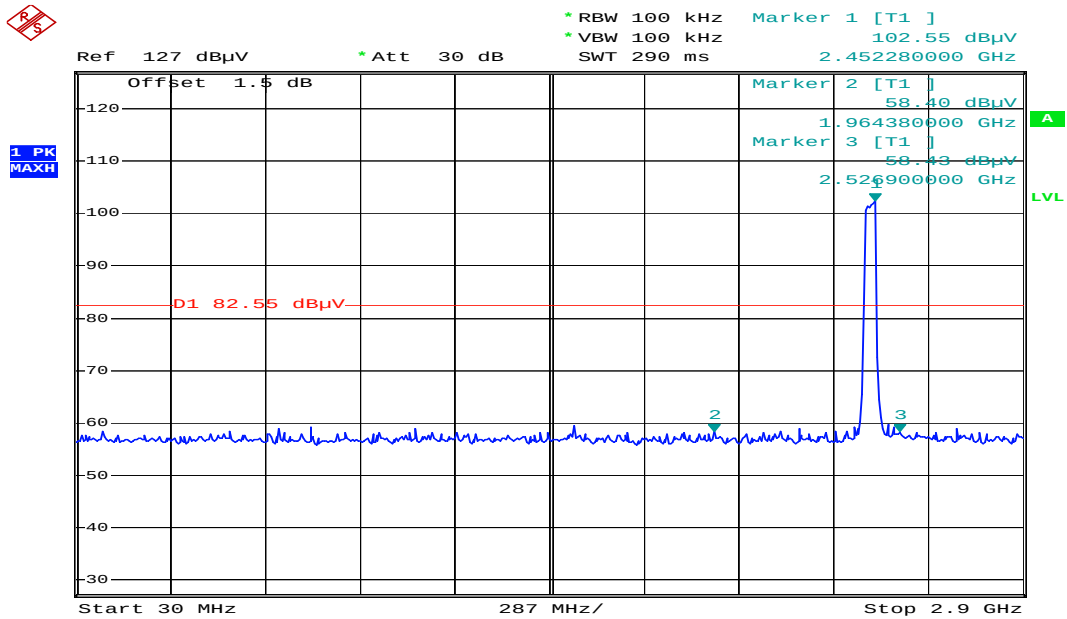
2.9---26.5G



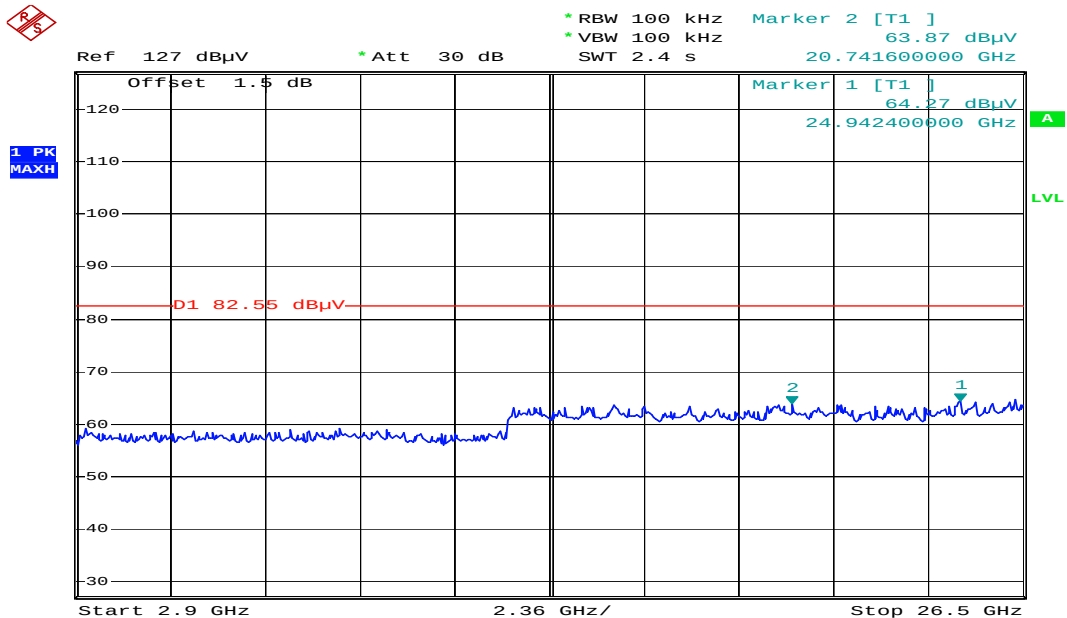


Channel 06 (2437MHz)

30M---2.9G



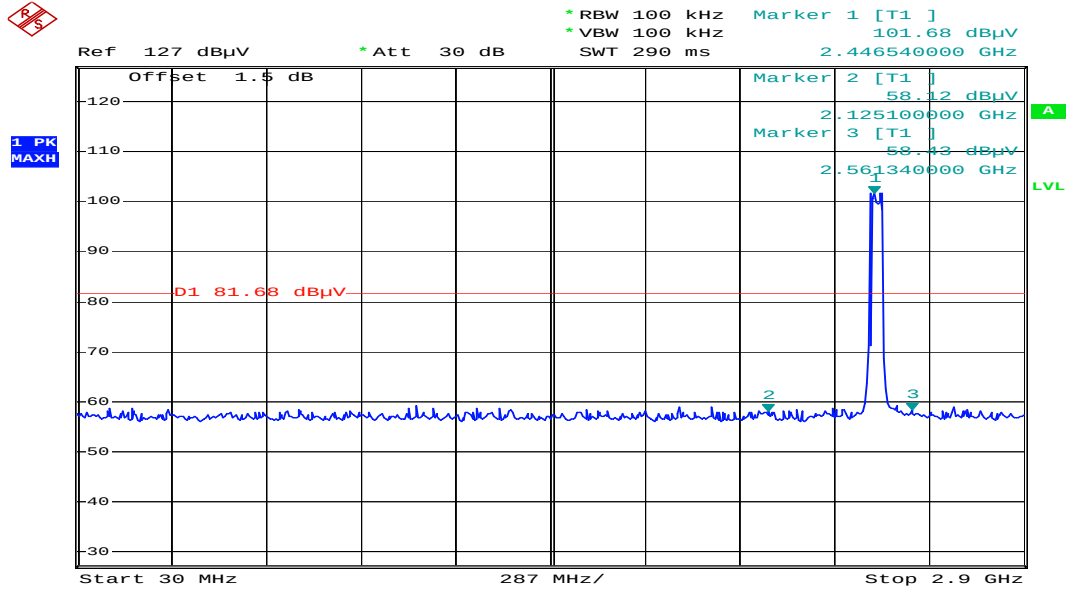
2.9---26.5G



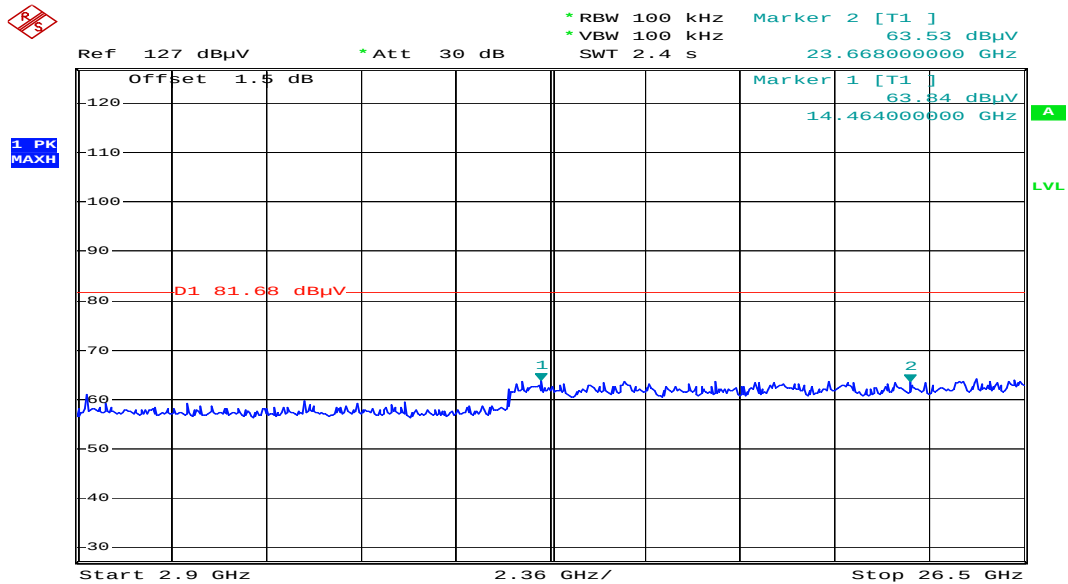


Channel 09 (2452MHz)

30M---2.9G



2.9---26.5G





9. Power Spectral Density

9.1. Test Limit

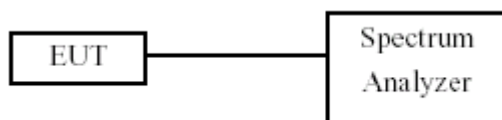
For digitally modulated systems, the power spectral density conducted from the intentional radiated to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

9.2. Test Procedure

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW= 3 kHz, Set VBW $\geq$ RBW, Sweep time=SPAN/3kHz, Set detector=Peak detector.

9.3. Test Setup Layout



9.4. Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date
Spectrum Analyzer	R&S	FSP40	100324	2010.08.14
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-002	2010.08.17

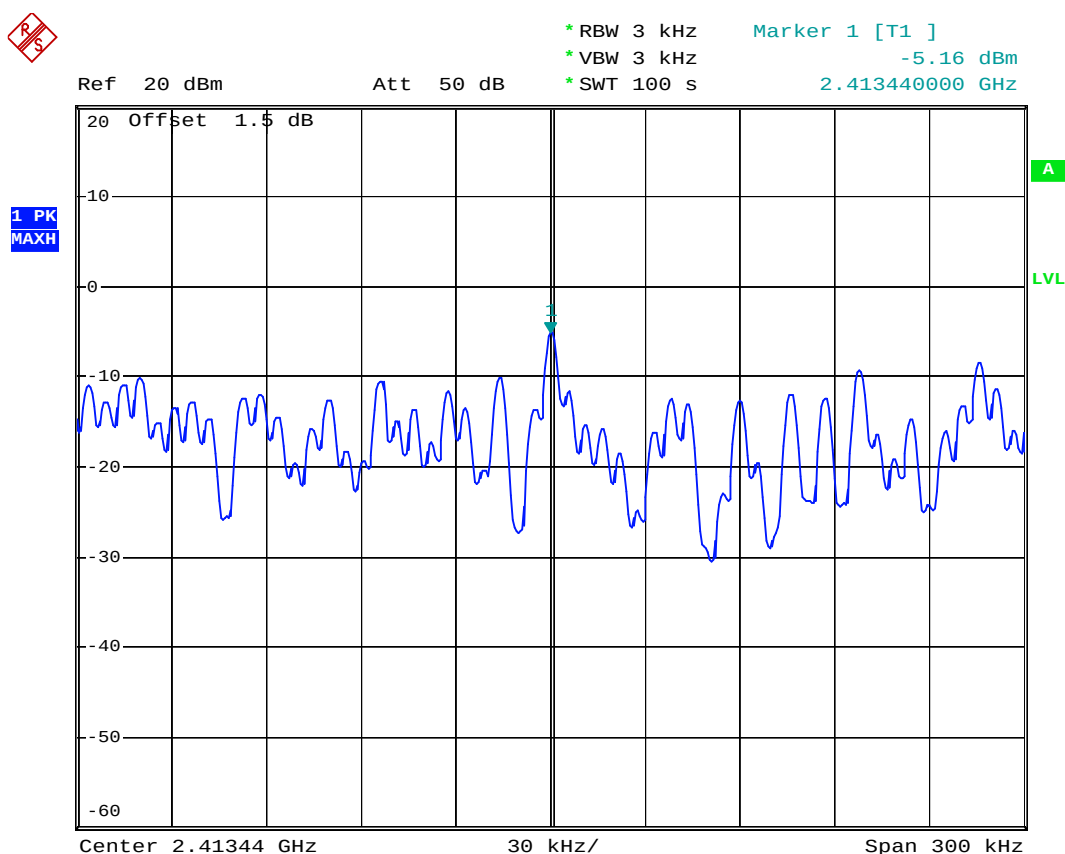


9.5. Test Result and Data

Test Item	Power Spectral Density
Test Mode	Transmit by 802.11b
Test Date	2011-04-28

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
01	2412	-5.16	8	Pass
06	2437	-4.00	8	Pass
11	2462	-4.76	8	Pass

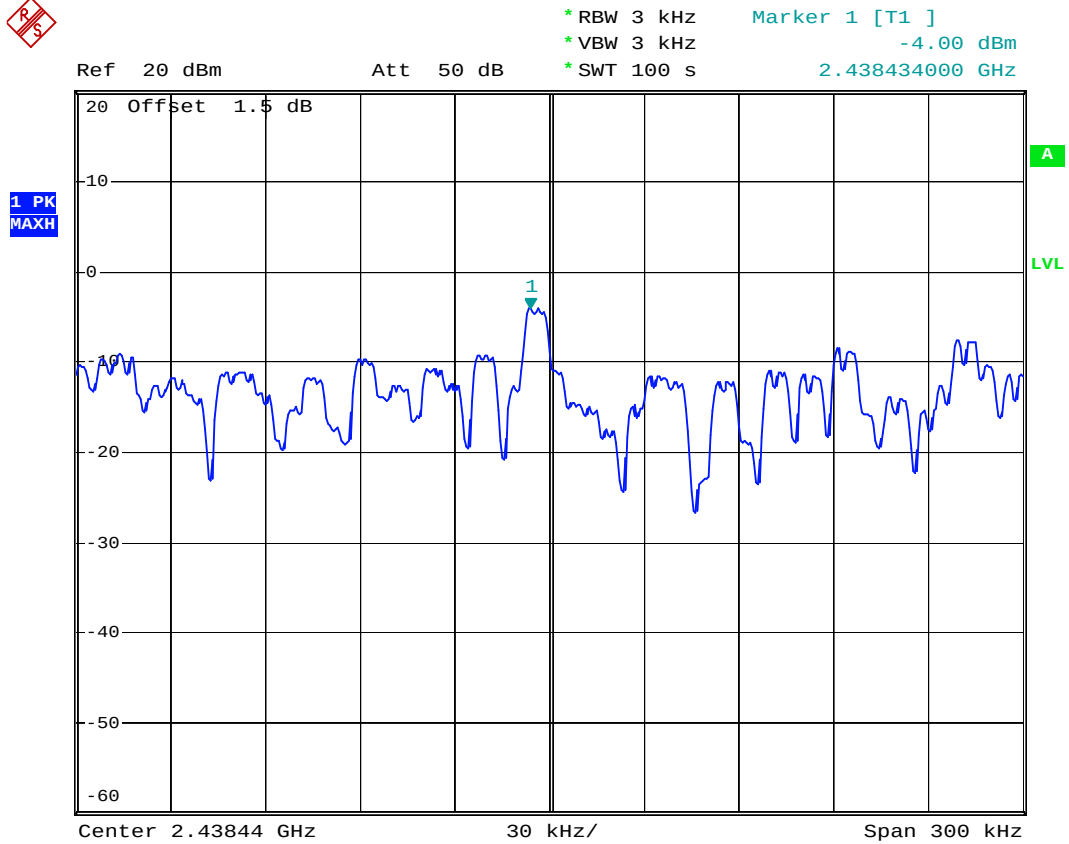
Channel 01 (2412MHz)



Date: 28.APR.2011 14:45:11



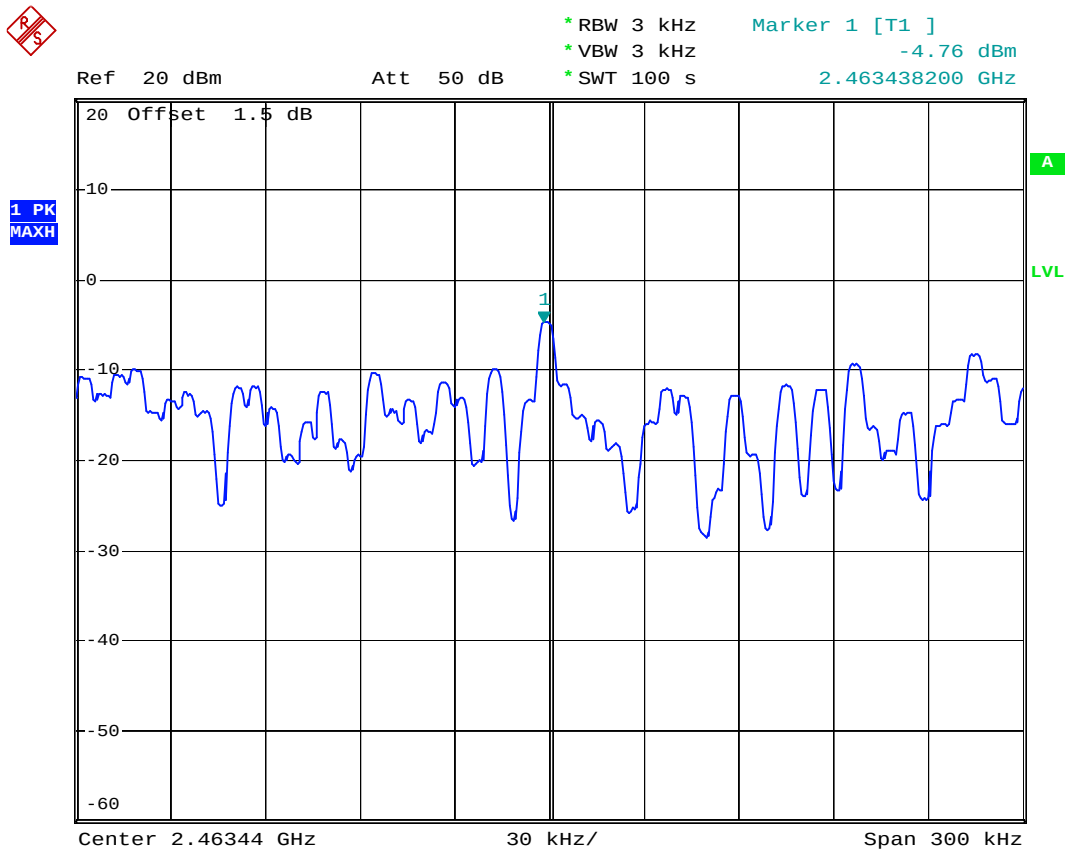
Channel 06 (2437MHz)



Date: 28.APR.2011 14:35:08



Channel 11 (2462MHz)



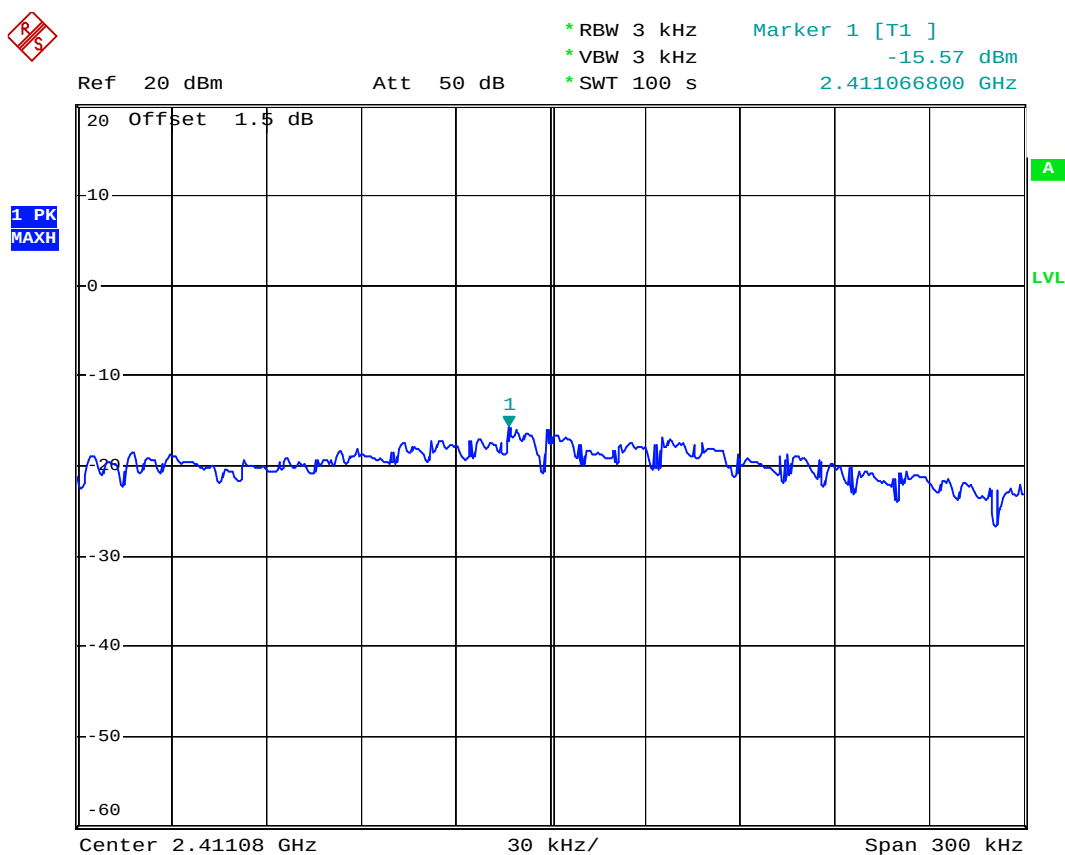
Date: 28.APR.2011 14:40:15



Test Item	Power Spectral Density
Test Mode	Transmit by 802.11g
Test Date	2011-04-28

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
01	2412	-15.57	8	Pass
06	2437	-15.78	8	Pass
11	2462	-16.02	8	Pass

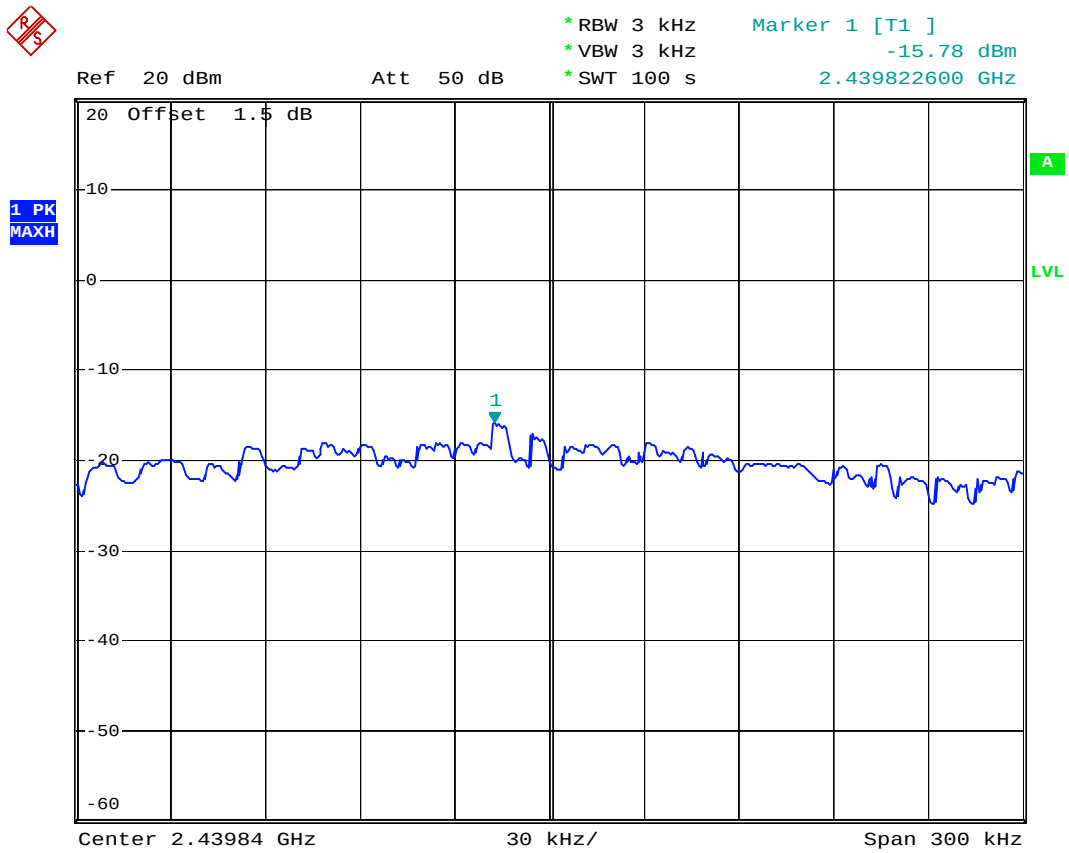
Channel 01 (2412MHz)



Date: 28.APR.2011 14:56:36



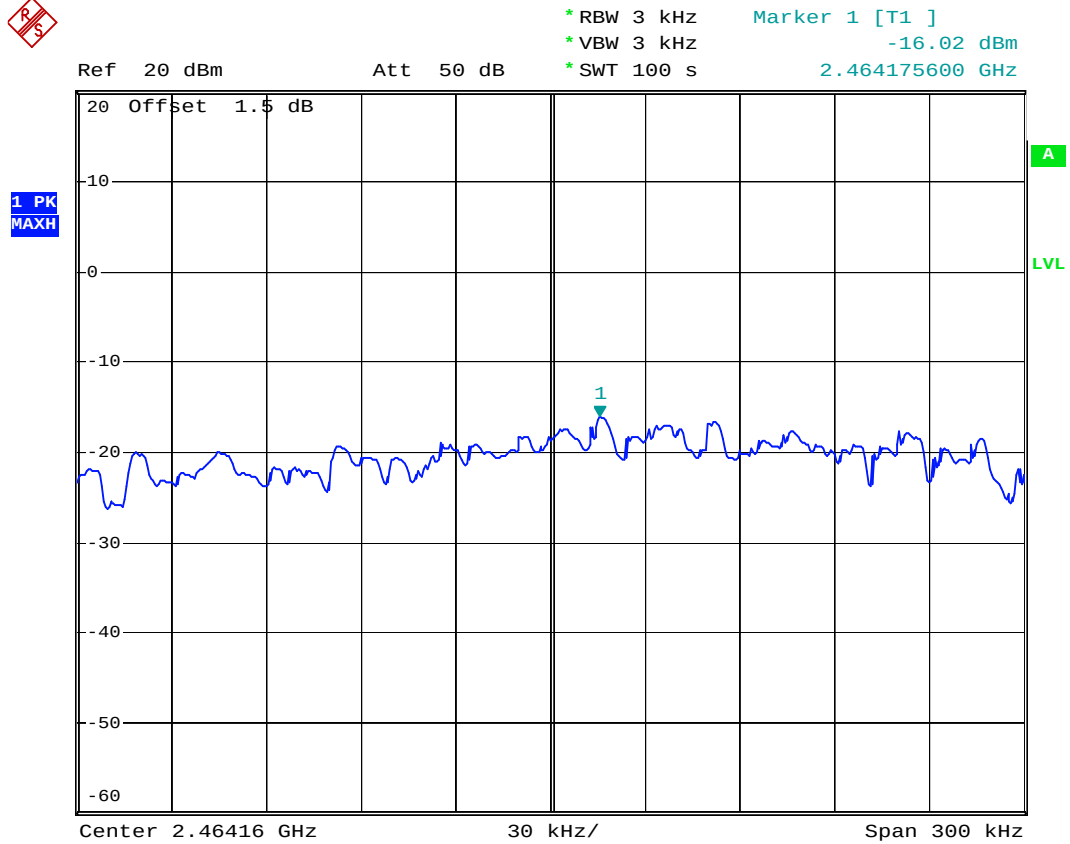
Channel 06 (2437MHz)



Date: 28.APR.2011 15:01:46



Channel 11 (2462MHz)



Date: 28.APR.2011 15:06:58

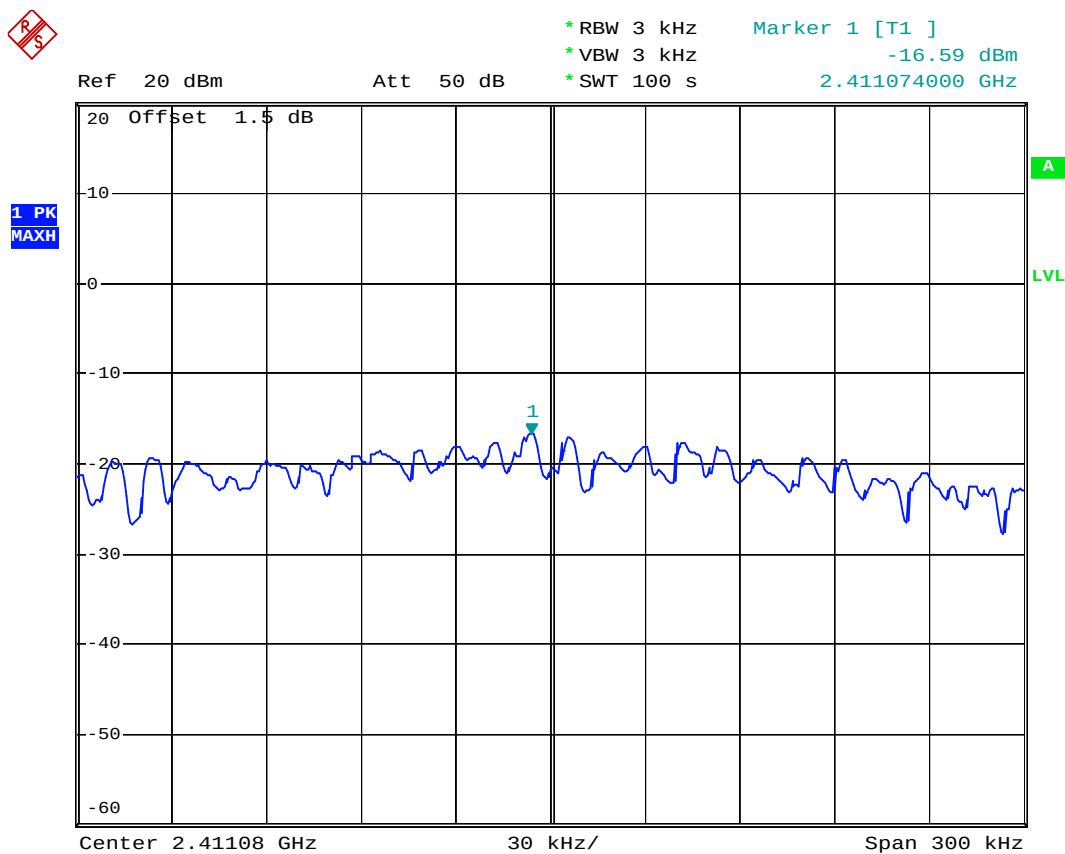


Test Item	Power Spectral Density
Test Mode	Transmit by 802.11n (20MHz)
Test Date	2011-04-28

Chain 0

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
01	2412	-16.59	8	Pass
06	2437	-14.69	8	Pass
11	2462	-14.97	8	Pass

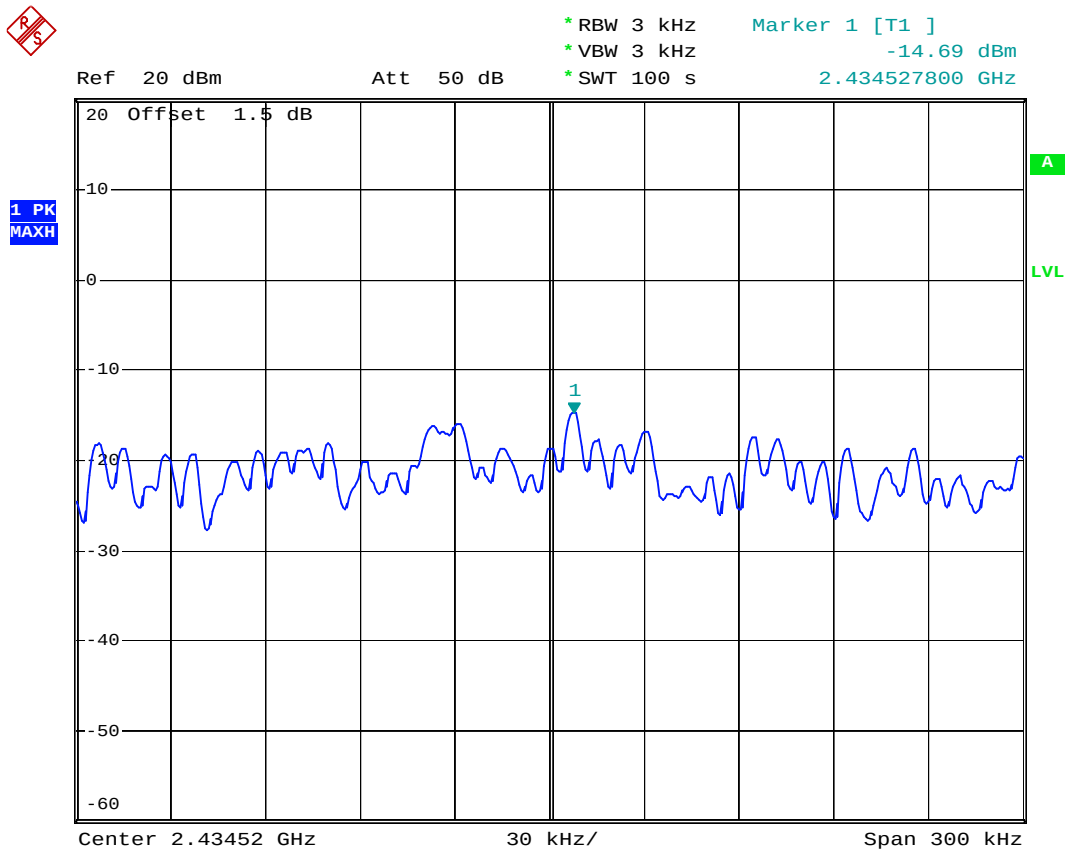
Channel 01 (2412MHz)



Date: 28.APR.2011 15:12:33



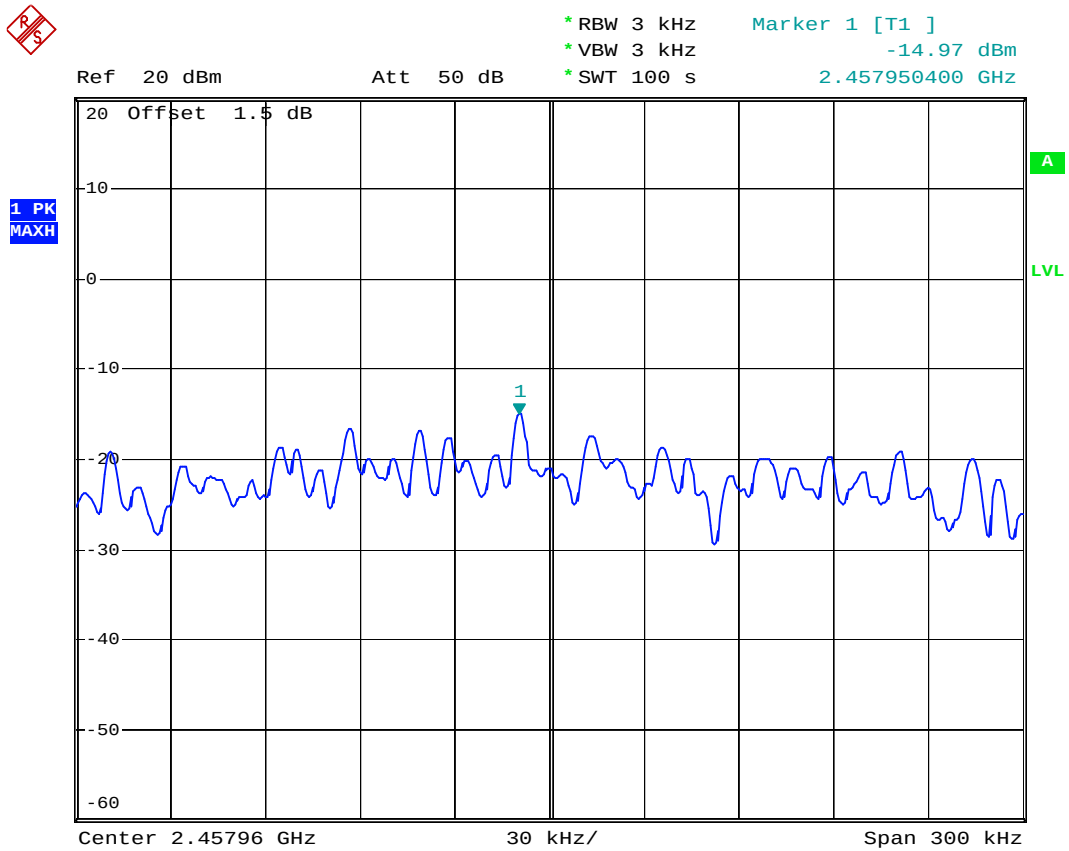
Channel 06 (2437MHz)



Date: 28.APR.2011 15:46:40



Channel 11 (2462MHz)



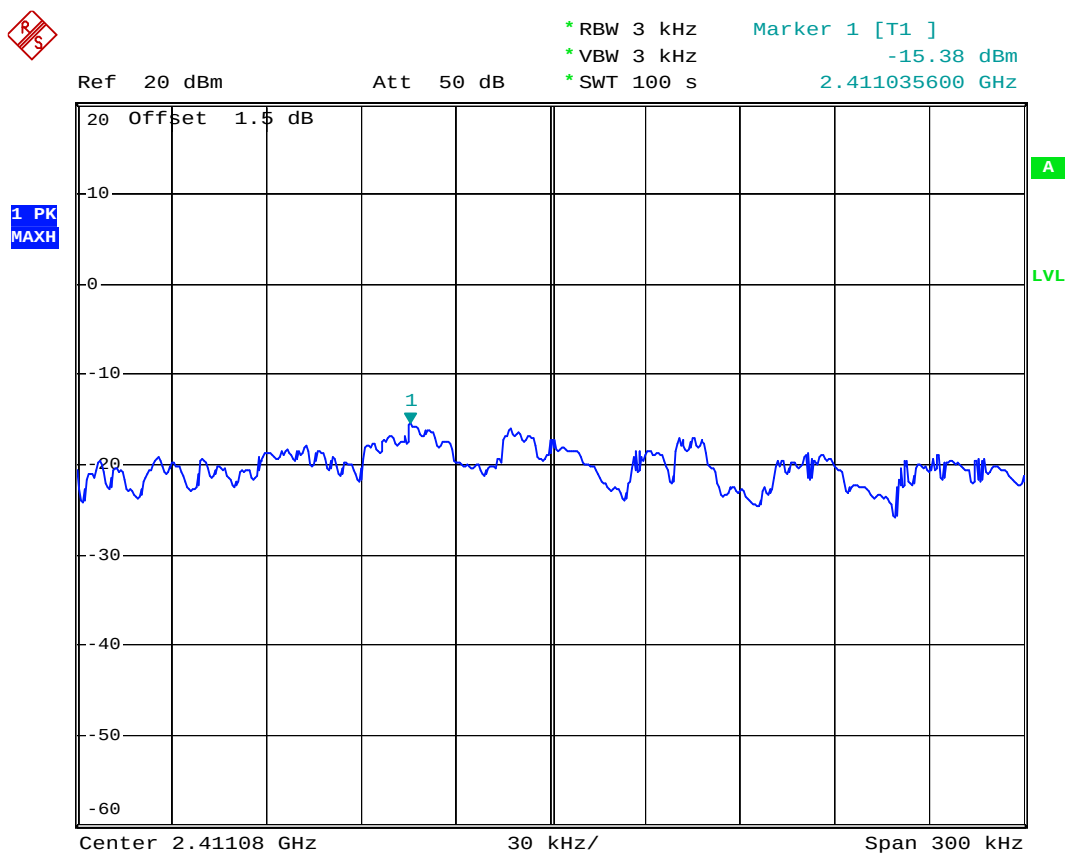
Date: 28.APR.2011 16:01:15



Chain 1

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
01	2412	-15.38	8	Pass
06	2437	-15.25	8	Pass
11	2462	-14.83	8	Pass

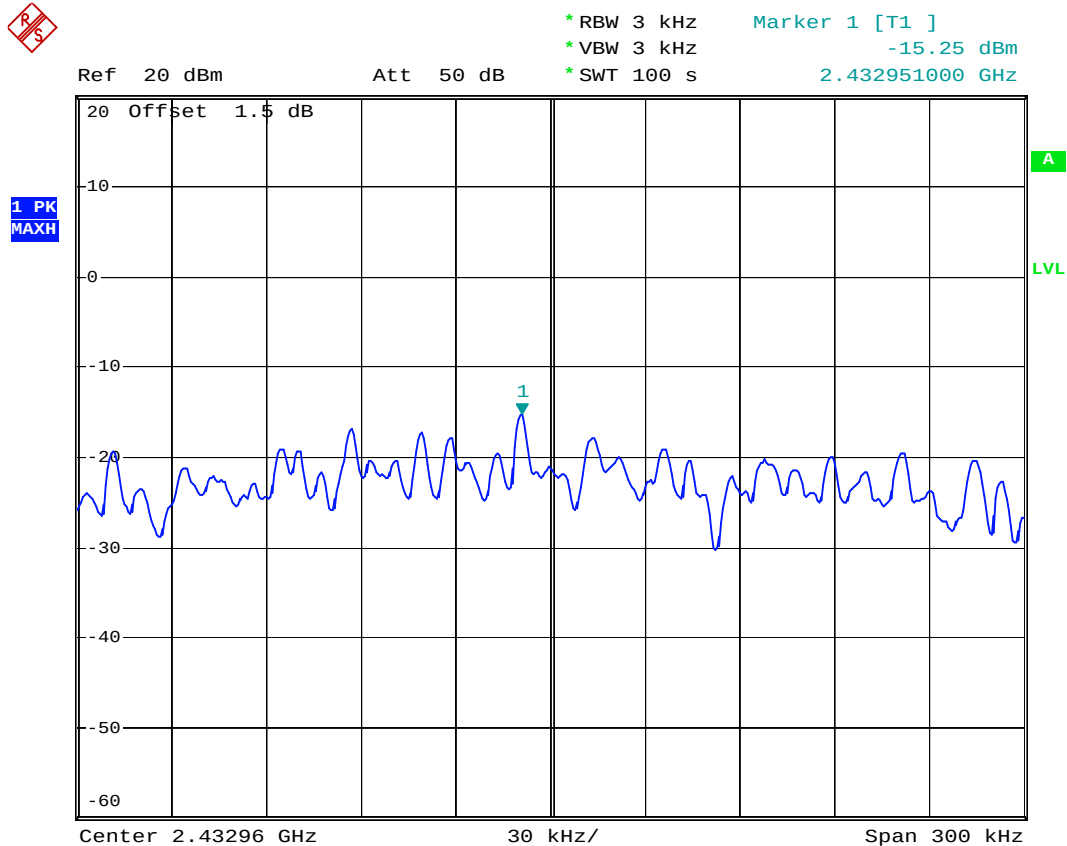
Channel 01 (2412MHz)



Date: 28.APR.2011 15:21:46



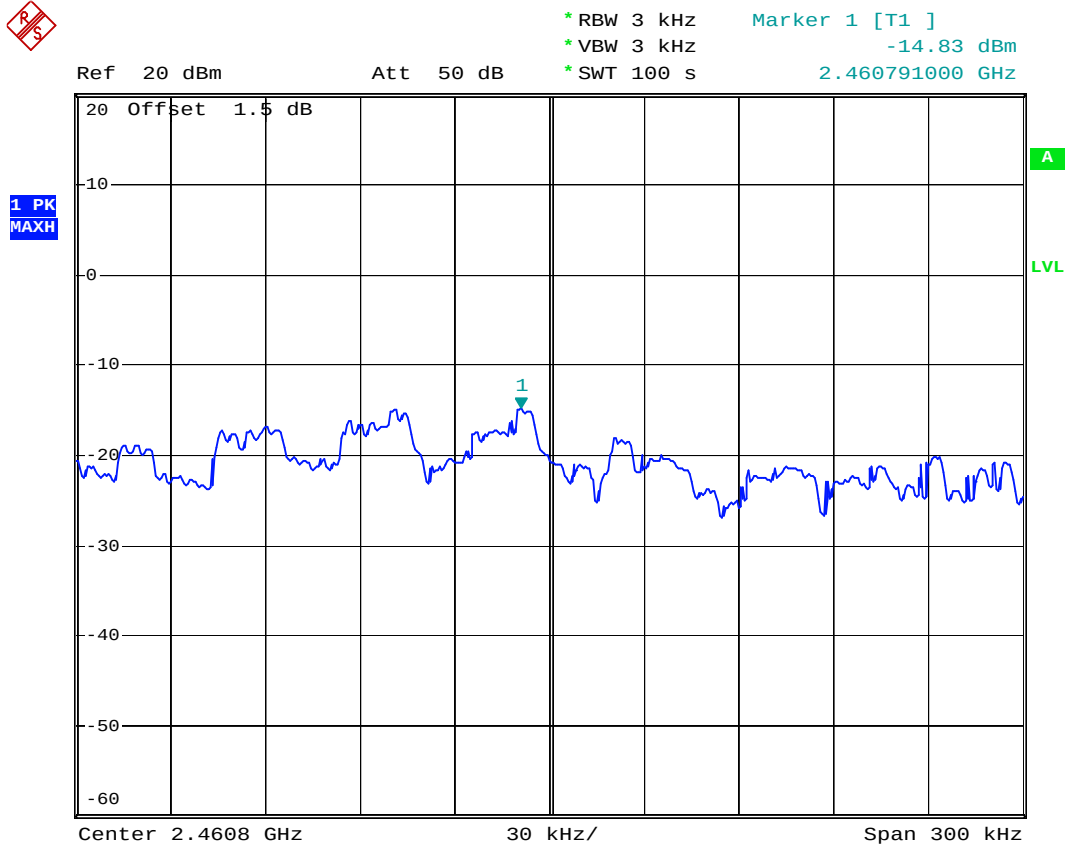
Channel 06 (2437MHz)



Date: 28.APR.2011 15:51:02



Channel 11 (2462MHz)



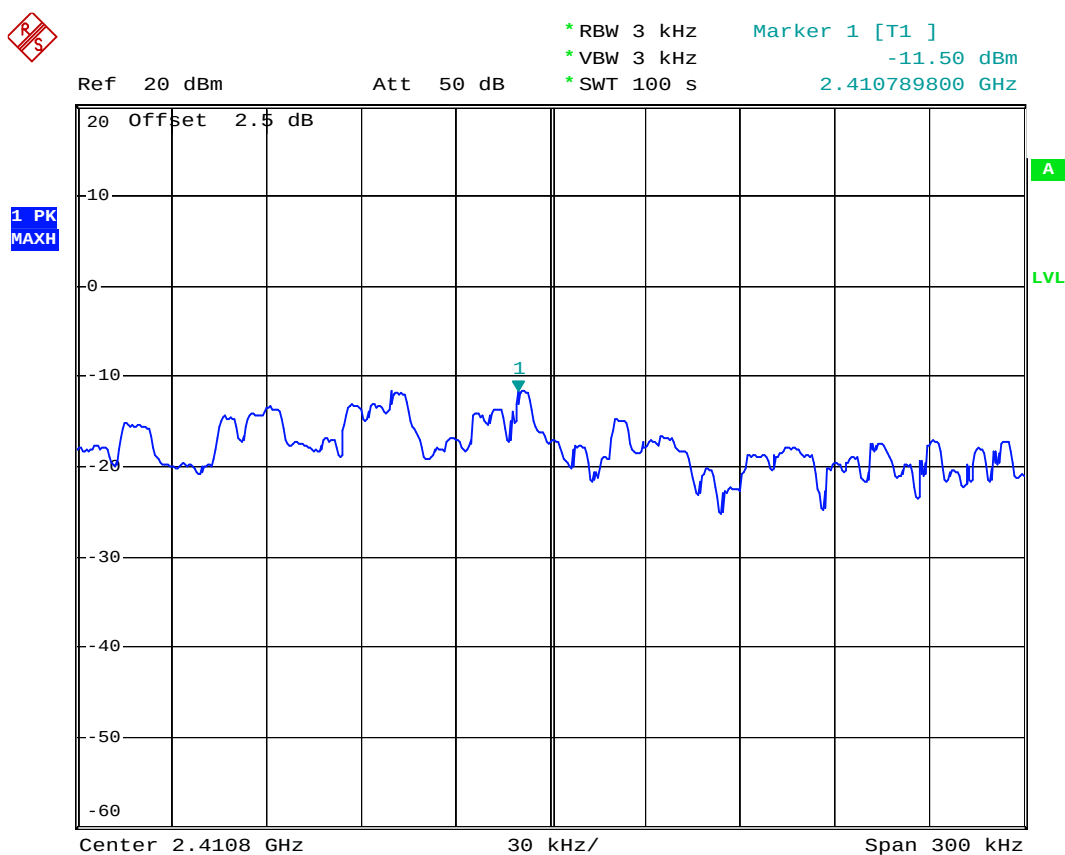
Date: 28.APR.2011 15:56:47



Chain 0+Chain 1

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
03	2412	-11.50	8	Pass
06	2437	-12.59	8	Pass
09	2462	-11.60	8	Pass

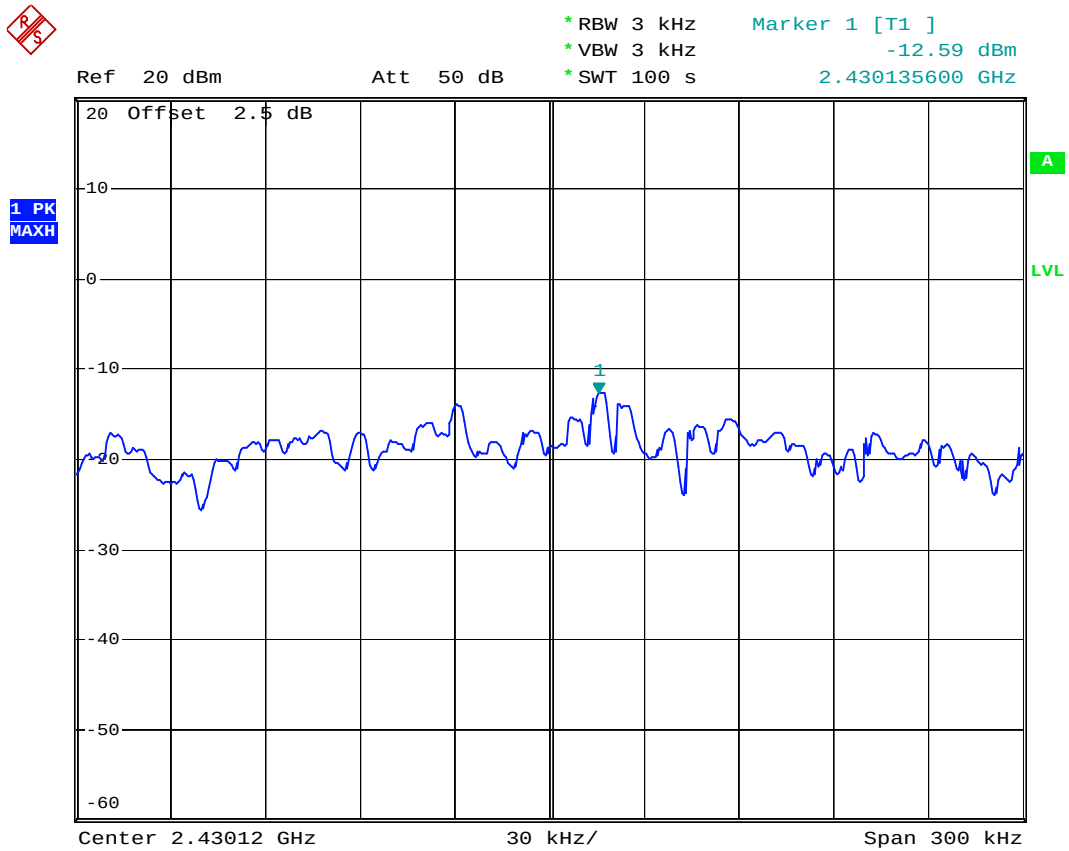
Channel 01 (2412MHz)



Date: 28.APR.2011 15:35:28



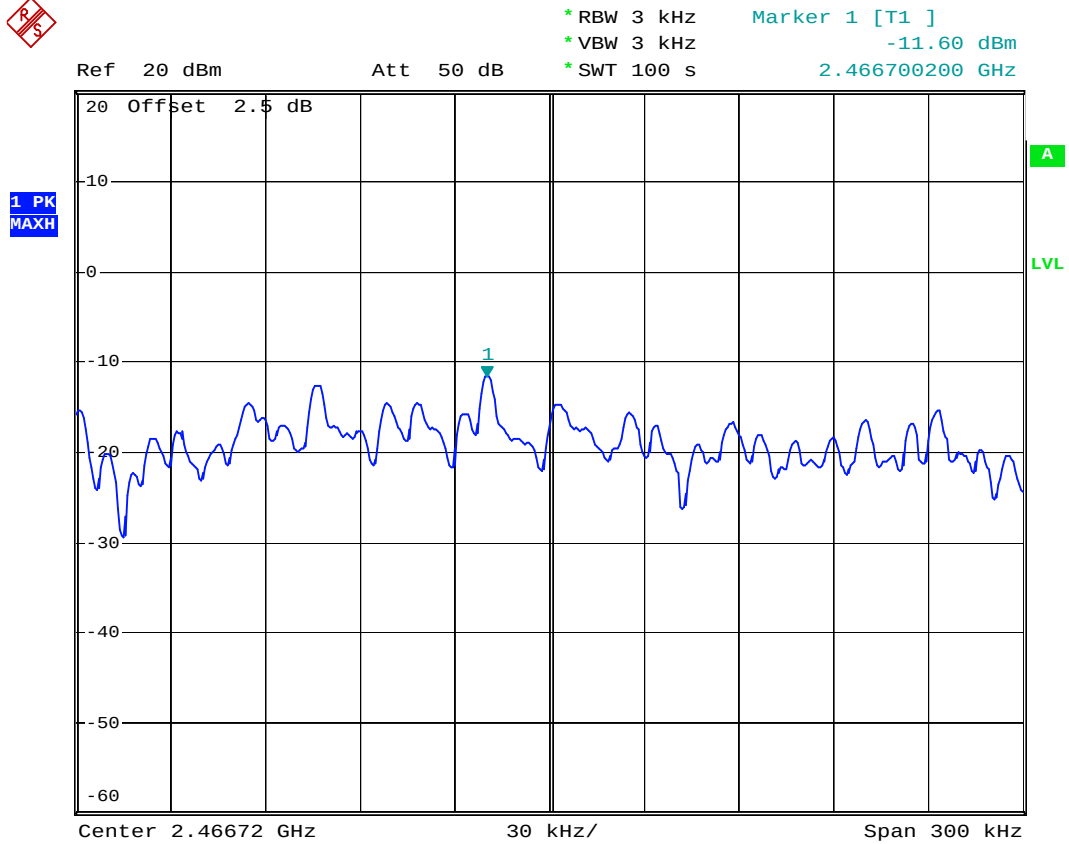
Channel 06 (2437MHz)



Date: 28.APR.2011 15:40:31



Channel 11 (2462MHz)



Date: 28.APR.2011 16:07:28

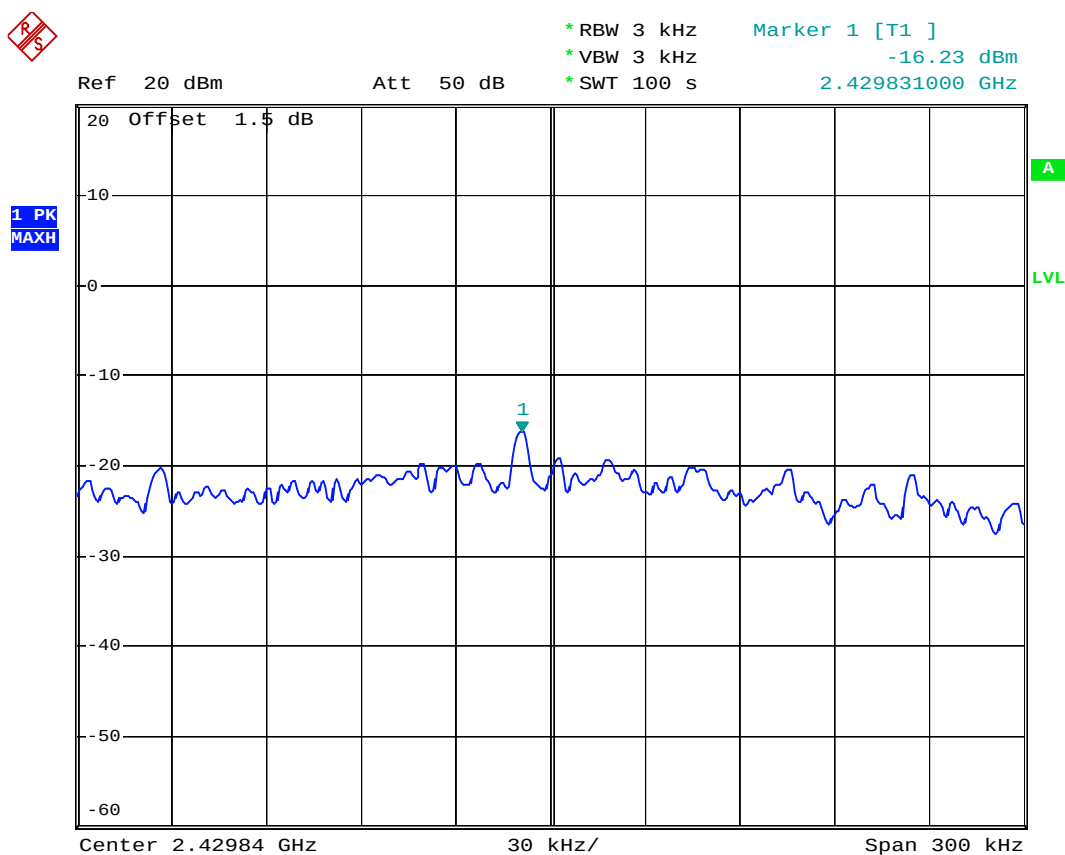


Test Item	Power Spectral Density
Test Mode	Transmit by 802.11n (40MHz)
Test Date	2011-04-28

Chain 0

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
03	2422	-16.23	8	Pass
06	2437	-17.28	8	Pass
09	2452	-16.47	8	Pass

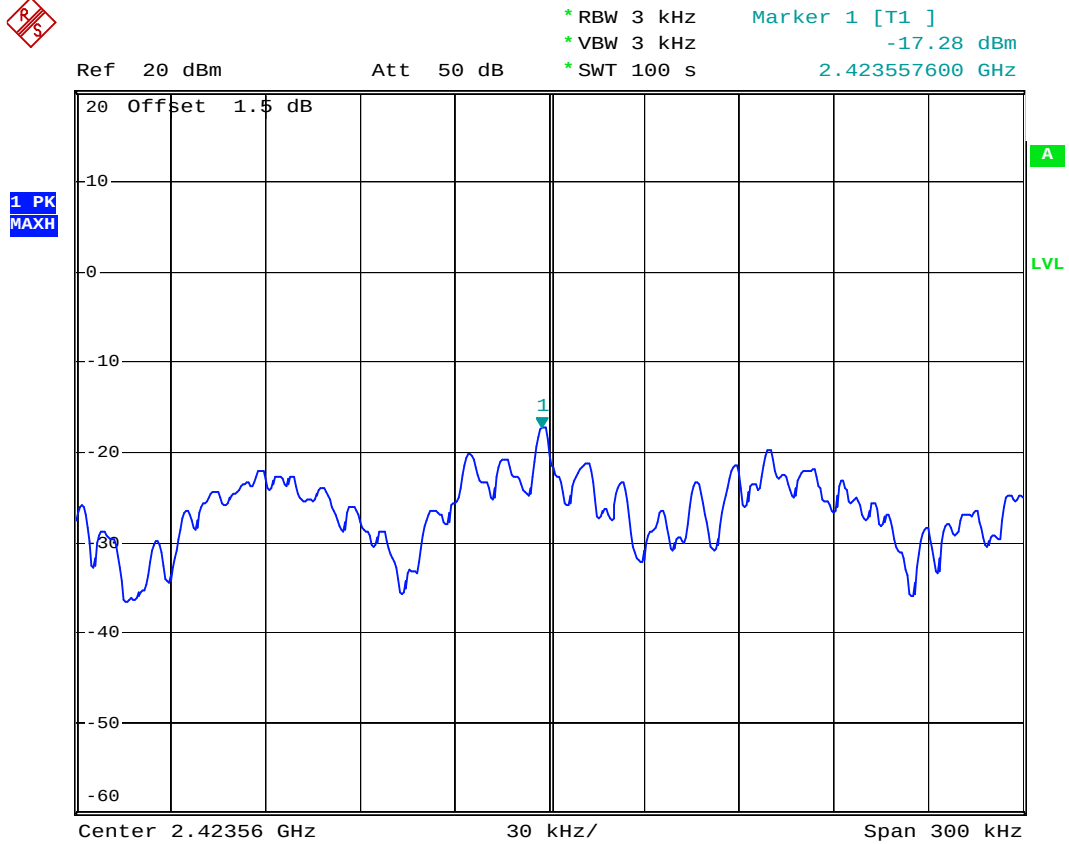
Channel 03 (2422MHz)



Date: 28.APR.2011 16:22:37



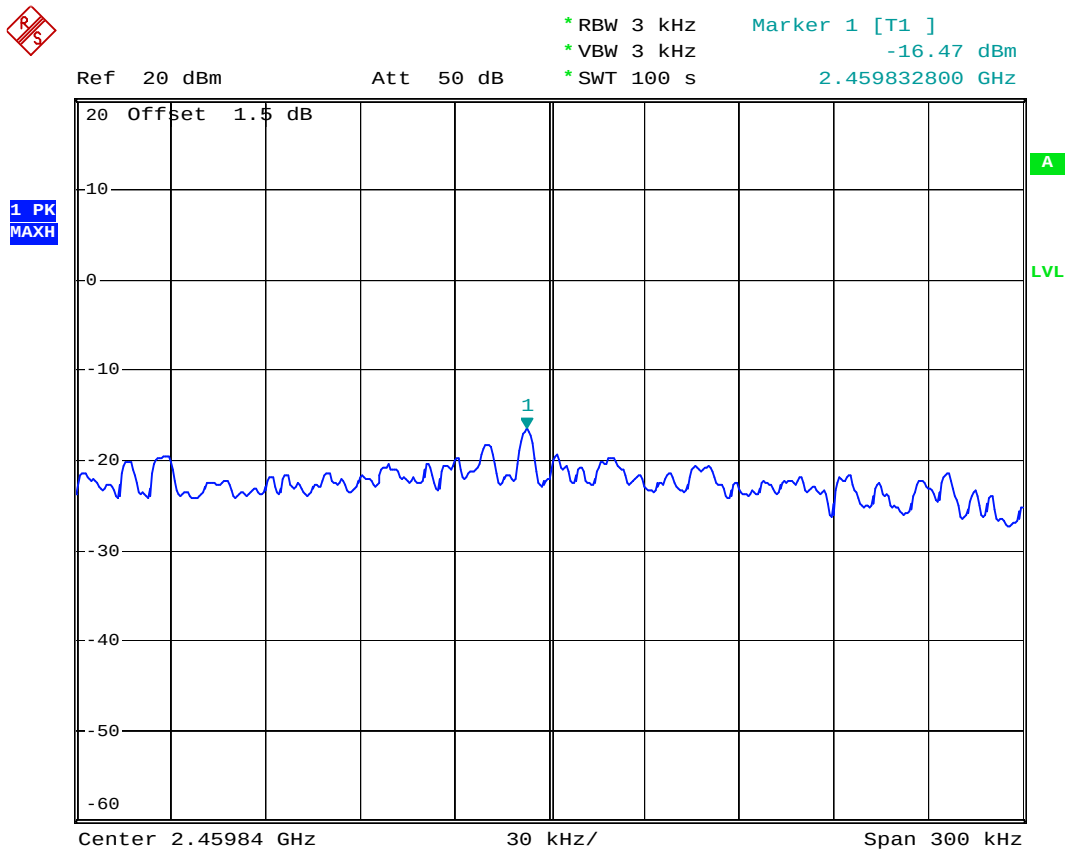
Channel 06 (2437MHz)



Date: 28.APR.2011 16:37:14



Channel 09 (2452MHz)



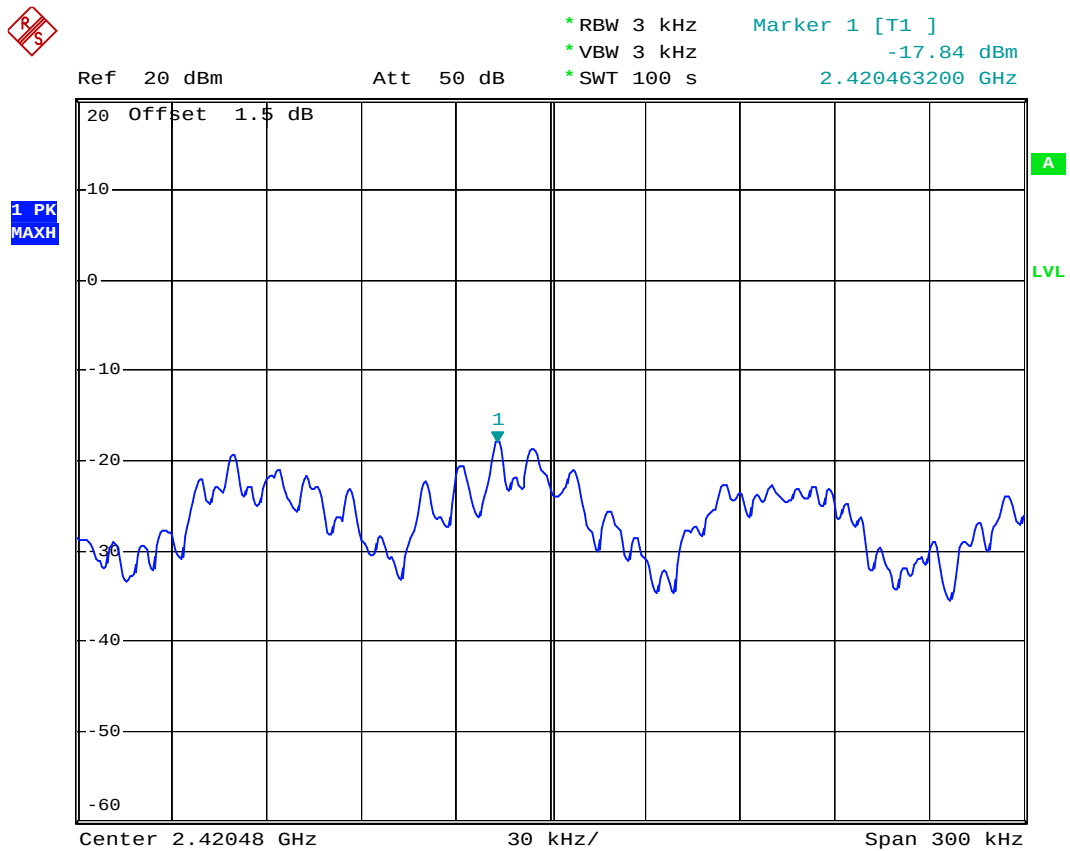
Date: 28.APR.2011 16:52:06



Chain 1

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
03	2422	-17.84	8	Pass
06	2437	-17.56	8	Pass
09	2452	-17.87	8	Pass

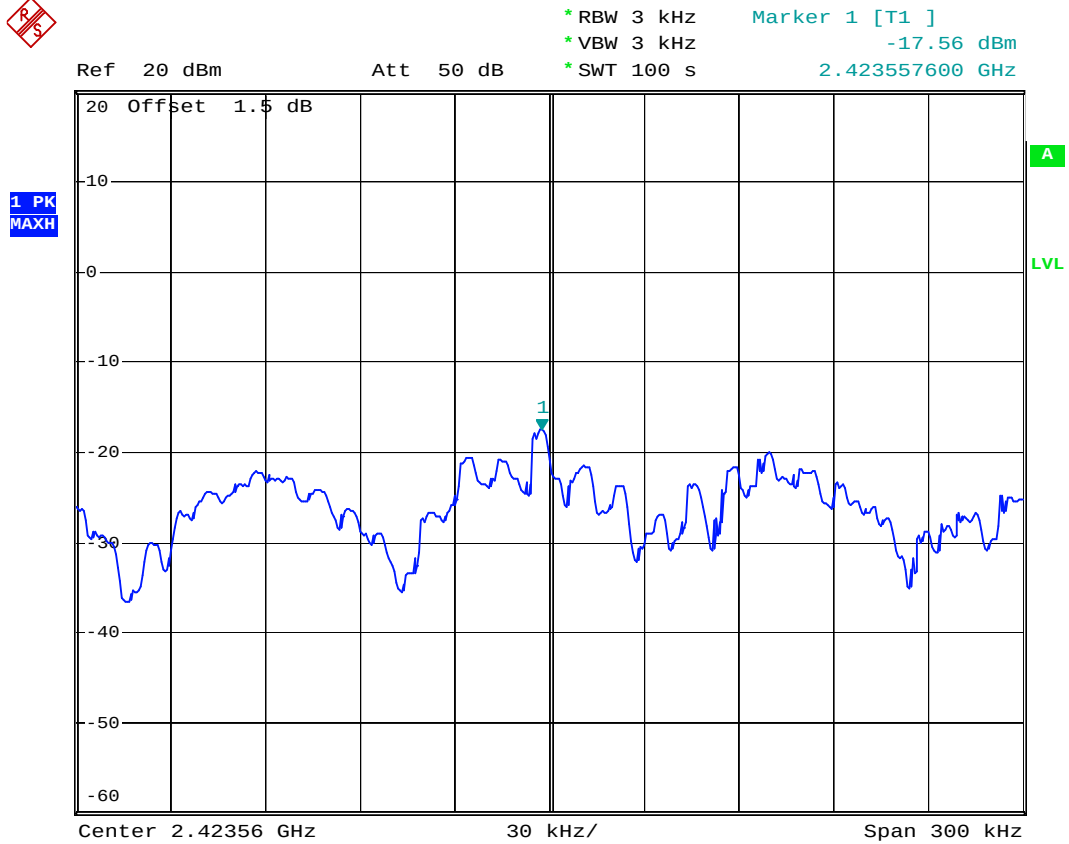
Channel 03 (2422MHz)



Date: 28.APR.2011 16:27:14



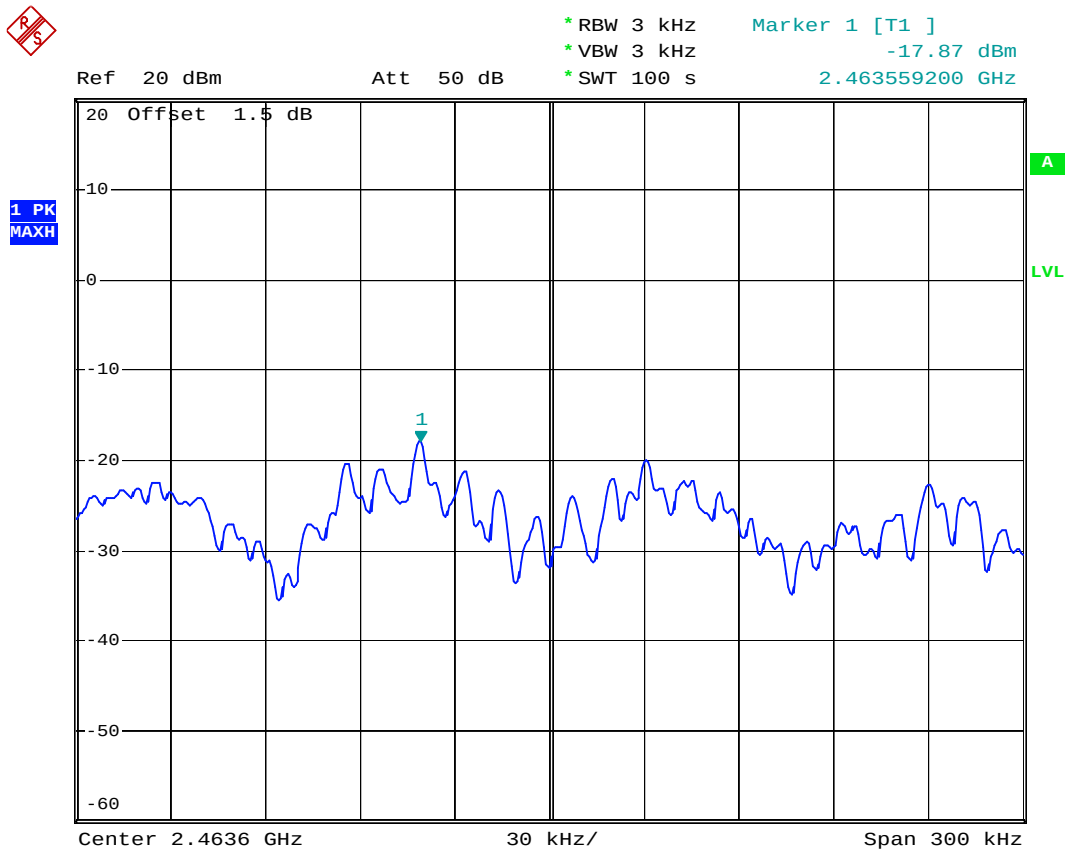
Channel 06 (2437MHz)



Date: 28.APR.2011 16:32:51



Channel 09 (2452MHz)



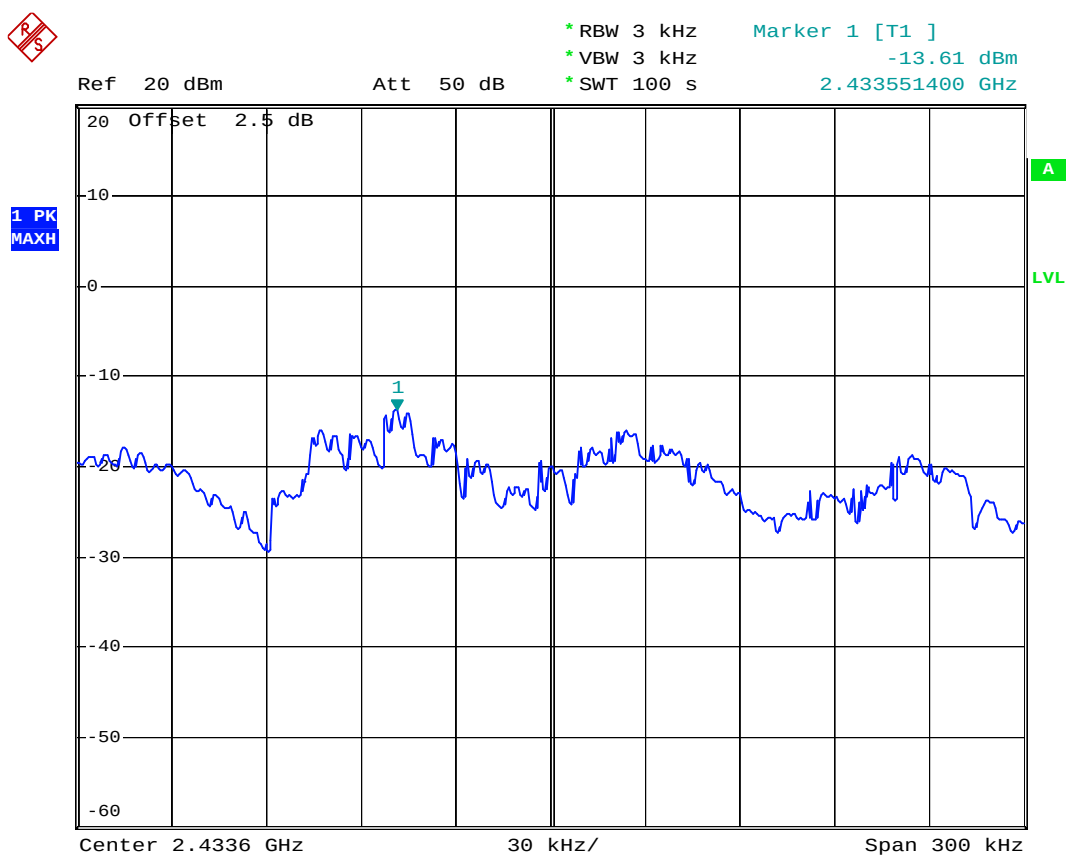
Date: 28.APR.2011 16:56:38



Chain 0+Chain 1

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
03	2422	-13.61	8	Pass
06	2437	-14.52	8	Pass
09	2452	-14.33	8	Pass

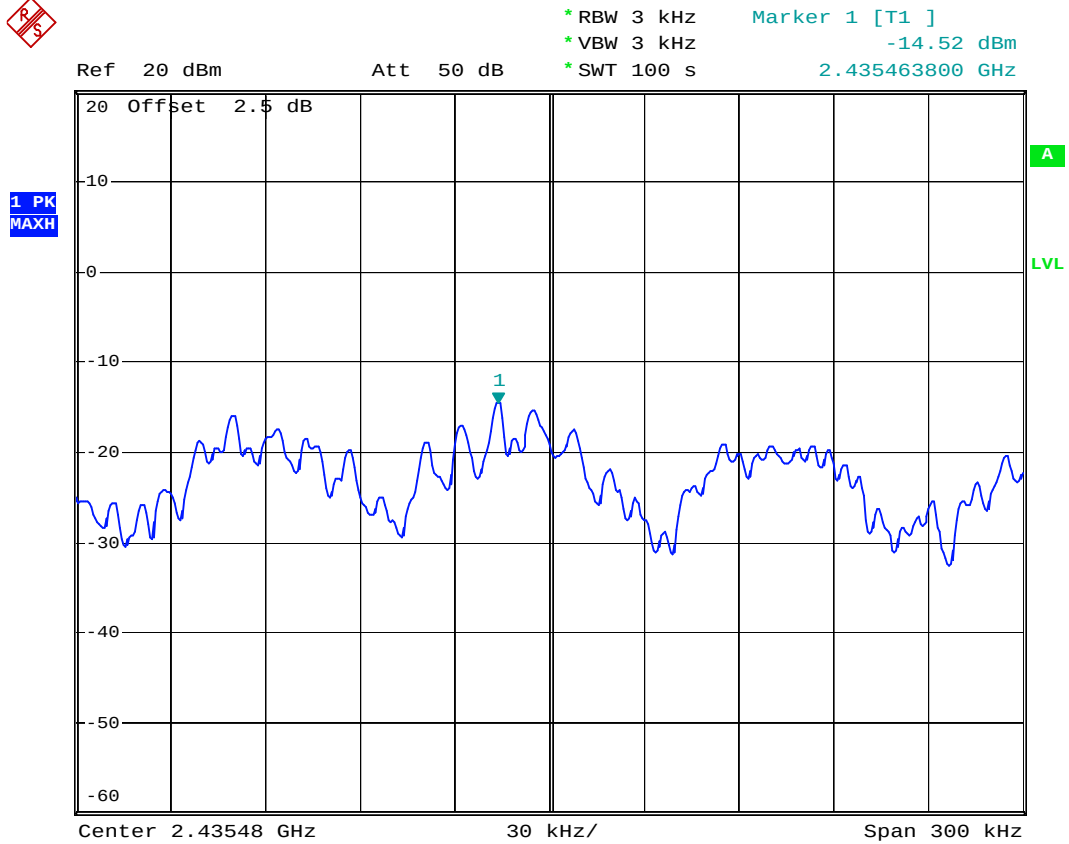
Channel 01 (2412MHz)



Date: 28.APR.2011 16:17:21



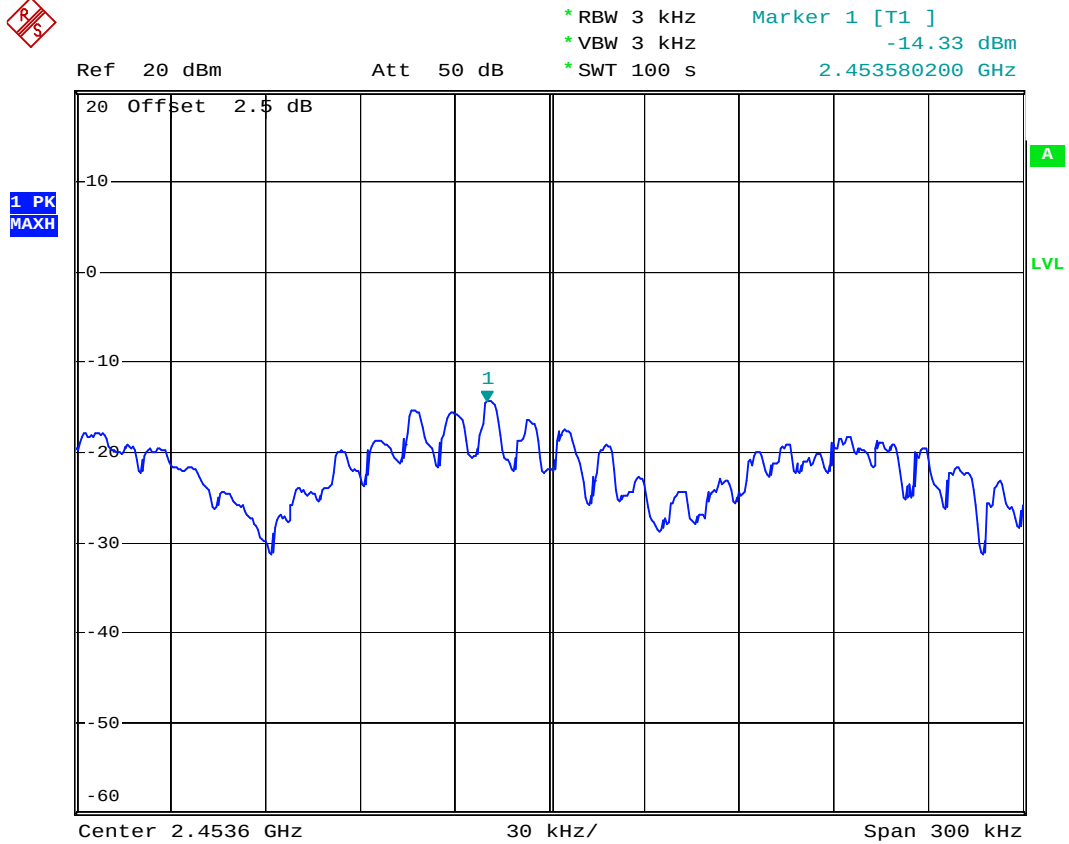
Channel 06 (2437MHz)



Date: 28.APR.2011 16:42:24



Channel 11 (2462MHz)



Date: 28.APR.2011 16:47:07