FCC 47 CFR PART 15 SUBPART C: 2012 AND ANSI C63.4: 2009

TEST REPORT

For

HSPA+ 3G VPN Router

Model: DWR-755

Brand: D-Link

Issued for

D-Link Corporation

No.289 , Sinhu 3rd Rd. , Neihu District , Taipei City 114 , Taiwan R.O.C.

Issued by

Compliance Certification Services Inc.
Tainan Lab.
No.8,Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)

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Date of Issue: February 17, 2014

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REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	February 17, 2014	Initial Issue	ALL	Sunny Chang

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1. TEST REPORT CERTIFICATION

Applicant	:	**D-Link Corporation** No.289 , Sinhu 3rd Rd. , Neihu District , Taipei City 114 , Taiwan R.O.C.
Manufacturer	:	**Advance Multimedia Internet Technology Inc.** No.28, Lane 31 , Sec. 1 , Huandong Rd. , Sinshih District , Tainan City 74146 , Taiwan
Equipment Under Test	:	HSPA+ 3G VPN Router
Model	:	DWR-755
Brand	:	D-Link
Date of Test	:	January 15, 2014 ~ February 06, 2014

APPLICABLE STANDARD	
STANDARD	**TEST RESULT**
FCC Part 15 Subpart C: 2012 AND ANSI C63.4 : 2009	No non-compliance noted

Approved by:

Jeter Wu
Assistant Manager

Reviewed by:

Eric Huang
Assistant Section Manager

2. EUT DESCRIPTION

Product Name	HSPA+ 3G VPN Router
Model	DWR-755
Brand	D-Link
Received Date	January 11, 2014
Frequency Range	IEEE 802.11b/g, 802.11n HT20 (DTS Band):2412MHz~2462MHz IEEE 802.11n HT40 (DTS Band):2422MHz~2452MHz
Transmit Power	IEEE 802.11b Mode : 17.94dBm (DTS Band) (62.23mW) IEEE 802.11g Mode : 18.66dBm (DTS Band) (73.451mW) IEEE 802.11n HT20 Mode : 20.12dBm (DTS Band) (102.86mW) IEEE 802.11n HT40 Mode : 17.82dBm (DTS Band) (60.53mW)
Channel Spacing	IEEE 802.11b/g, 802.11n HT20/HT40: 5MHz
Channel Number	IEEE 802.11b/g, 802.11n HT20:11 Channels IEEE 802.11n HT40 :7 Channels
Transmit Data Rate	IEEE 802.11 b：11, 5.5, 2, 1 Mbps IEEE 802.11g：54, 48 ,36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT20：13, 26, 39, 52, 78, 104, 117, 144.4 Mbps IEEE 802.11n HT40：27, 54, 81, 108, 162, 216, 243, 300 Mbps
Type of Modulation	IEEE 802.11b：DSSS (CCK, DQPSK, DBPSK)
	IEEE 802.11g：OFDM (64QAM, 16QAM, QPSK, BPSK)
	IEEE 802.11n HT20/HT40：OFDM (64QAM, 16QAM, QPSK, BPSK)
Frequency Selection	By software / firmware
Antenna Type	**Antenna*2pcs (2TX2RX)** Manufacture: Wha Yu Group. Type: PIFA Antenna 1 Model / Gain：C381-510146-A Gain：4.74dBi Antenna 2 Model / Gain：C381-510208-A Gain：2.97dBi
Temperature Range	0 ~ +40°C

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	D-Link	AMS9-1201000FU2	100-240Vac, 50/60Hz, 0.5A	12Vdc, 1.0A

REMARK:

1. *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*
2. *This submittal(s) (test report) is intended for FCC ID: **KA2WR755A1** filing to comply with Section 15.207,15.209 and 15.247 of the FCC Part 15, Subpart C Rules.*
3. *For more details, please refer to the User's manual of the EUT.*

3. DESCRIPTION OF TEST MODES

The EUT is a 11n router. It has two transmitter chains and two receive chains (2x2 configurations). The 2x2 configuration is implemented with two outside chains (Chain 0 and Chain 1).

The RF chipset is manufactured by MediaTek Inc.

The antenna peak gain 4.74dBi (highest gain) were chosen for full testing.

IEEE 802.11 b ,802.11g ,802.11n HT20 mode (DTS Band)

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b mode: 1Mbps long data rate (worst case) were chosen for full testing.

IEEE 802.11g mode: 6Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11n HT20 mode: 13Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11n HT40 mode (DTS Band)

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2422
Middle	2437
High	2452

IEEE 802.11n HT40 mode: 27Mbps data rate (worst case) were chosen for full testing.

The worst-case data rates are determined according to the description above, based on the investigations by measuring the PSD, peak power and average power across all the data rates, bandwidths, modulations and spatial stream modes.

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 15.207, 15.209 and 15.247.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No.8,Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 1109 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: TW-1037 and 455173).

5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

Taiwan	TAF

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Germany	TUV NORD
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccsrf.com

6. CALIBRATION AND UNCERTAINTY

6.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

6.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

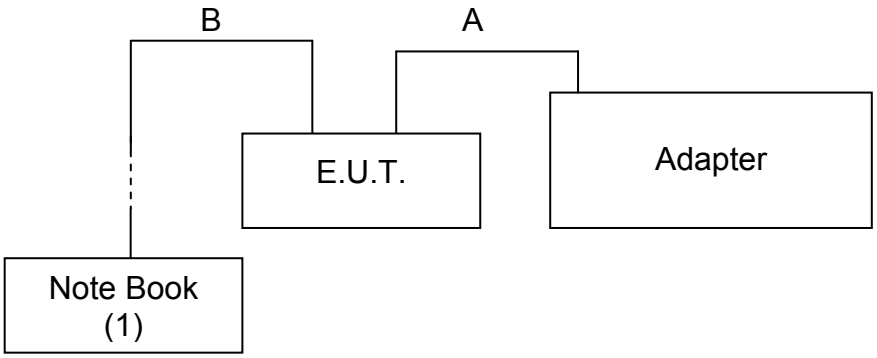
PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz Test Site : OATS-6	±3.59dB
Radiated Emission, 200 to 1000 MHz Test Site : OATS-6	±3.27dB
Radiated Emission, 1 to 26.5 GHz	± 3.20dB
Power Line Conducted Emission	± 2.90dB

Uncertainty figures are valid to a confidence level of 95%, K=2

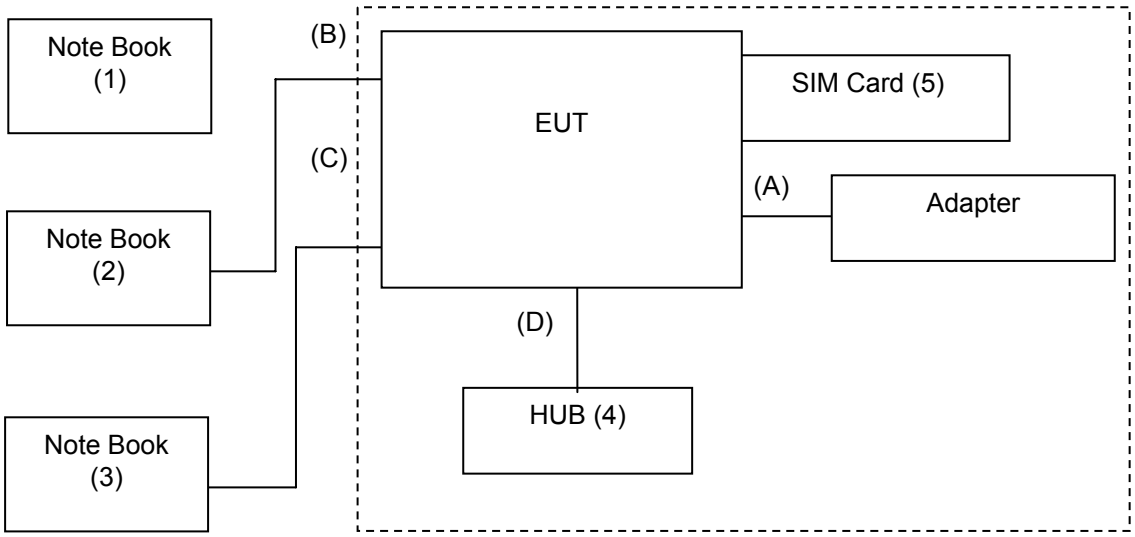
7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

For RF test



For EMI test



7.2 SUPPORT EQUIPMENT

RF test

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1.	Note Book	IBM	T43	DOC	Power cable, unshd, 1.6m

No.	Signal cable description	
A	DC Power	Unshielded, 1.2m, 1pcs
B	LAN	Unshielded, 10m, 1pcs.

EMI test

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	Notebook	IBM	R51	DOC	Power cable, unshd, 1.6m
2	Notebook	Acer	AS 3830TG	DOC	Power cable, unshd, 1.6m
3	Notebook	TOSHIBA	Satellite L730	DOC	Power cable, unshd, 1.6m
4	HUB	BARRICAD	SMC7008BR	DOC	Power cable, unshd, 1.6m
5	SIM Card	Vibo	T1731	N/A	N/A

No.	Signal cable description	
A	Power	Unshielded, 1.2m, 1pcs.
B	LAN	Unshielded, 10m, 1pcs.
C	LAN	Unshielded, 10m, 1pcs.
D	LAN	Unshielded, 2m, 3pcs.
A	Power	Unshielded, 1.2m, 1pcs.

REMARK:

1. All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.
2. Grounding was established in accordance with the manufacturer’s requirements and conditions for the intended use.

7.3 EUT OPERATING CONDITION

RF Setup

1. Set up all computers like the setup diagram.
2. The “MediaTek QA Test Program for “MT7620 V1.0.6.0 AP” software was used for testing. The EUT driver software installed in the host support equipment during testing was MediaTek QA Test Program for “MT7620 V1.0.6.0 AP” Drive

TX Mode:

⇨ **Tx Mode:CCK 、OFDM、 HT MixMode** (Bandwidth: 20、40)

⇨ **Tx Data Rate: 1Mbps long** (IEEE 802.11b mode ,chain 0 TX)
6Mbps (IEEE 802.11g mode ,chain 0 TX)
13Mbps (IEEE 802.11n HT20 mode ,chain 0, chain 1 TX)
27Mbps (IEEE 802.11n HT40 mode, chain 0, chain 1 TX)

Power control mode

Target Power: IEEE 802.11b Channel Low (2412MHz) =0E **(Chain 0)**
IEEE 802.11b Channel Middle (2437MHz) =0C **(Chain 0)**
IEEE 802.11b Channel High (2462MHz) = 0F **(Chain 0)**
Target Power: IEEE 802.11g Channel Low (2412MHz) = 06 **(Chain 0)**
IEEE 802.11g Channel Middle (2437MHz) = 06 **(Chain 0)**
IEEE 802.11g Channel High (2462MHz) = 08 **(Chain 0)**
Target Power: IEEE 802.11n HT20 Channel Low (2412MHz) = 04 **(Chain 0)**
IEEE 802.11 n HT20 Channel Middle (2437MHz) =03 **(Chain 0)**
IEEE 802.11 n HT20 Channel High (2462MHz) = 06 **(Chain 0)**
IEEE 802.11n HT20 Channel Low (2412MHz) = 07 **(Chain 1)**
IEEE 802.11 n HT20 Channel Middle (2437MHz) = 07 **(Chain 1)**
IEEE 802.11 n HT20 Channel High (2462MHz) = 0C **(Chain 1)**
Target Power: IEEE 802.11n HT40 Channel Low (2422MHz) = 00 **(Chain 0)**
IEEE 802.11 n HT40 Channel Middle (2437MHz) = 00 **(Chain 0)**
IEEE 802.11 n HT40 Channel High (2452MHz) = 00 **(Chain 0)**
IEEE 802.11n HT40 Channel Low (2422MHz) = 03 **(Chain 1)**
IEEE 802.11 n HT40 Channel Middle (2437MHz) = 03**(Chain 1)**
IEEE 802.11 n HT40 Channel High (2452MHz) = 04 **(Chain 1)**

RX Mode：

Start RX

3. All of the function are under run.
4. Start test.

Normal Link Setup

1. Setup a whole system for test as shown on setup diagram.
2. Turn on power and check function.
3. Start to test.

8. APPLICABLE LIMITS AND TEST RESULTS

8.1 6DB BANDWIDTH

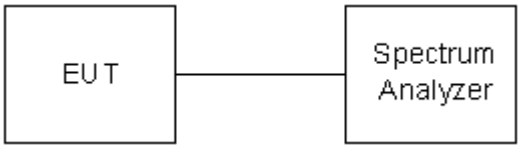
LIMIT

§ 15.247(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP. 28, 2014

TEST SETUP



TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 1-5 % of the emission bandwidth (EBW).
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is 1-5 %.

TEST RESULTS

No non-compliance noted.

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	11.06	500	PASS
Middle	2437	10.19	500	PASS
High	2462	10.19	500	PASS

NOTE : 1. At finial test to get the worst-case emission at 1Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g mode

Channel	Channel Frequency (MHz)	66dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.59	500	PASS
Middle	2437	16.54	500	PASS
High	2462	16.59	500	PASS

NOTE : 1. At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Pass / Fail
		Chain 0	Chain1		
Low	2412	17.69	17.69	500	PASS
Middle	2437	17.69	17.40	500	PASS
High	2462	17.69	17.69	500	PASS

NOTE : 1. At finial test to get the worst-case emission at 13Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

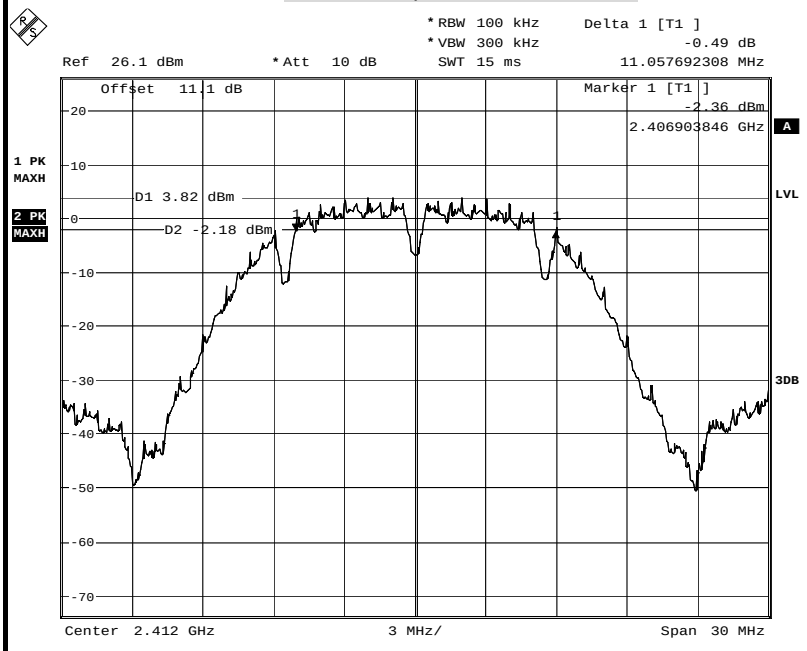
IEEE 802.11n HT40 mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Pass / Fail
		Chain 0	Chain1		
Low	2422	36.54	36.44	500	PASS
Middle	2437	36.44	35.87	500	PASS
High	2452	36.35	36.15	500	PASS

NOTE : 1. At finial test to get the worst-case emission at 27Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

6dB BANDWIDTH (802.11b MODE)

CH Low (802.11b MODE)



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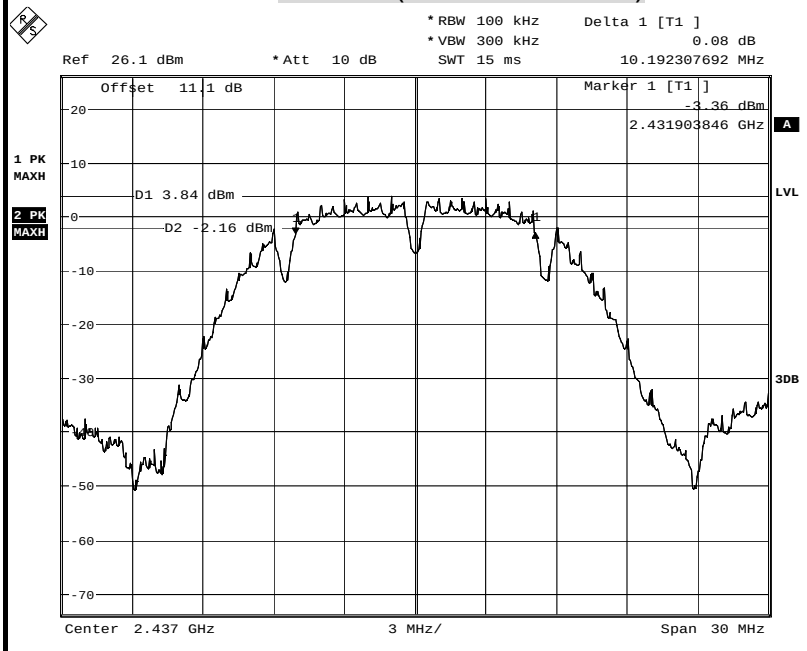
CH Mid (802.11b MODE)



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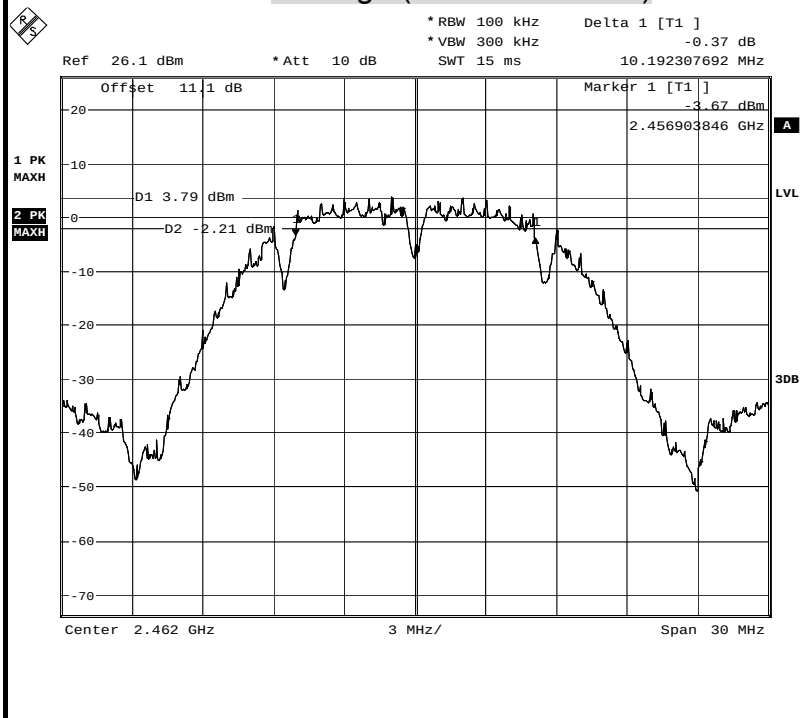
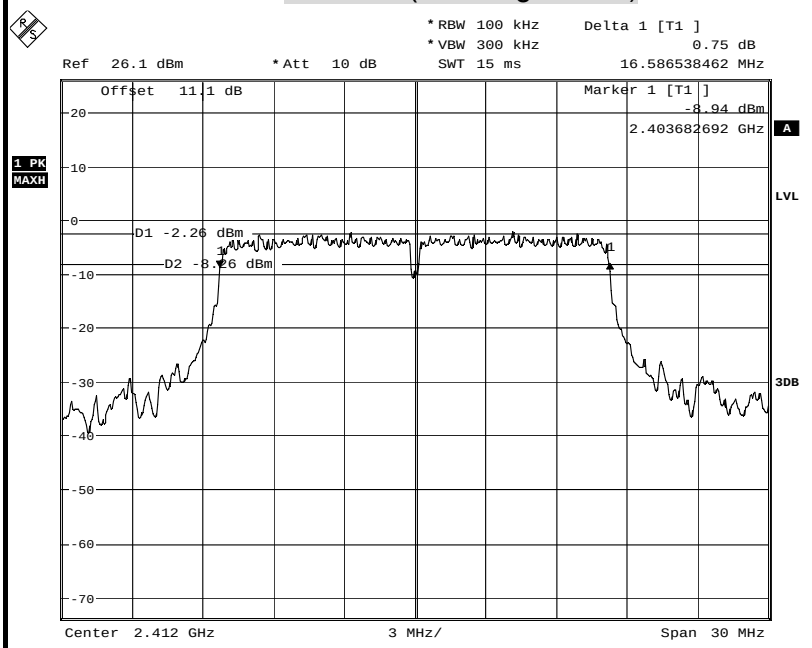
CH High (802.11b MODE)



6dB BANDWIDTH (802.11g MODE)

CH Low (802.11g MODE)



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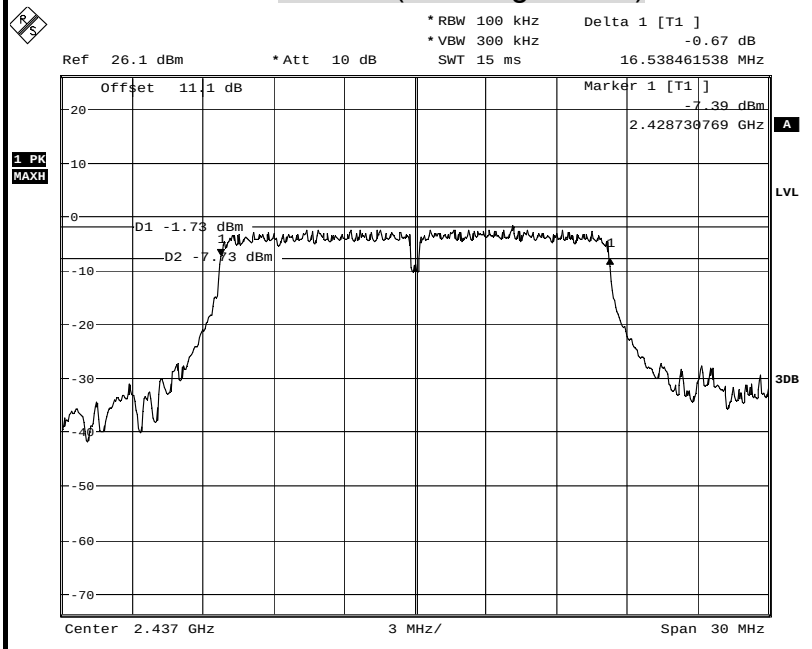

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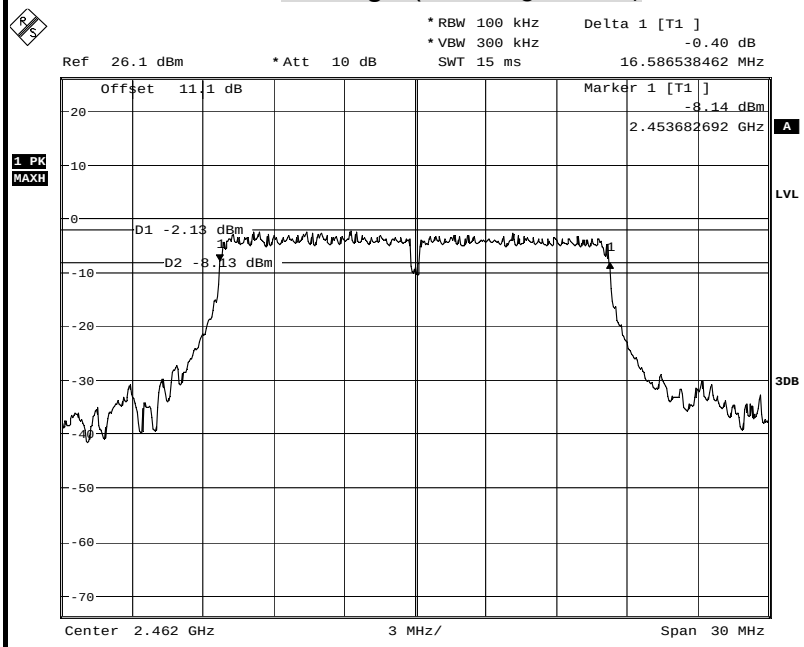
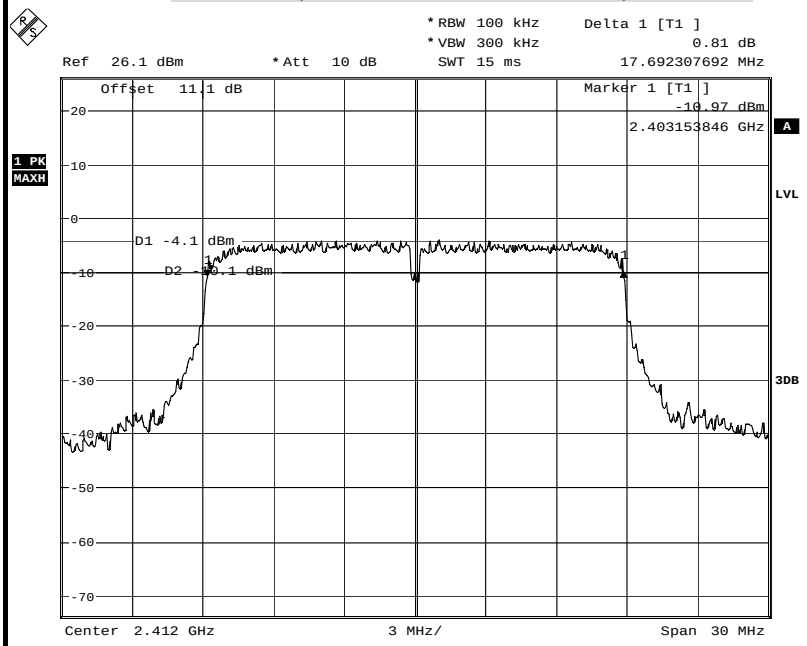
CH High (802.11g MODE)



6dB BANDWIDTH (802.11n HT20 MODE) Chain 0

CH Low (802.11n HT20 MODE)-Chain 0



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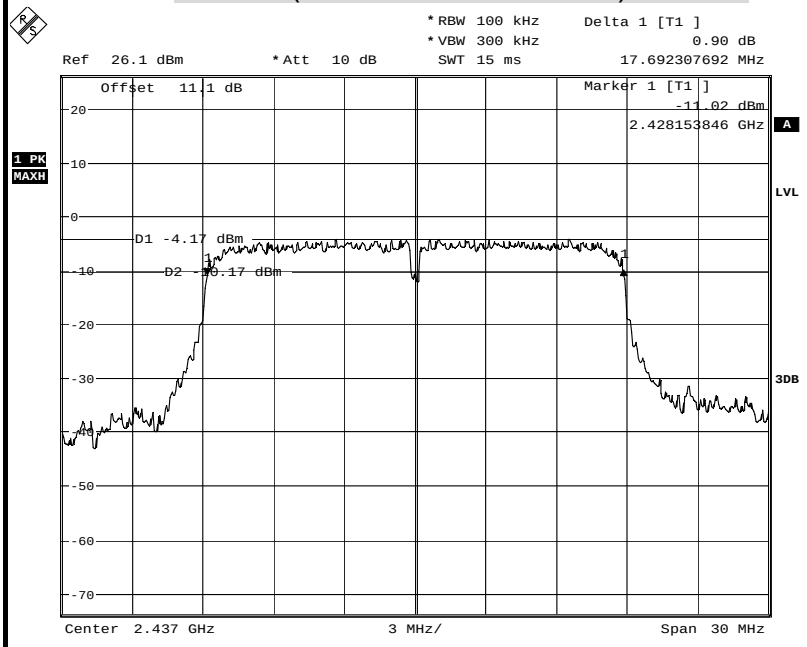

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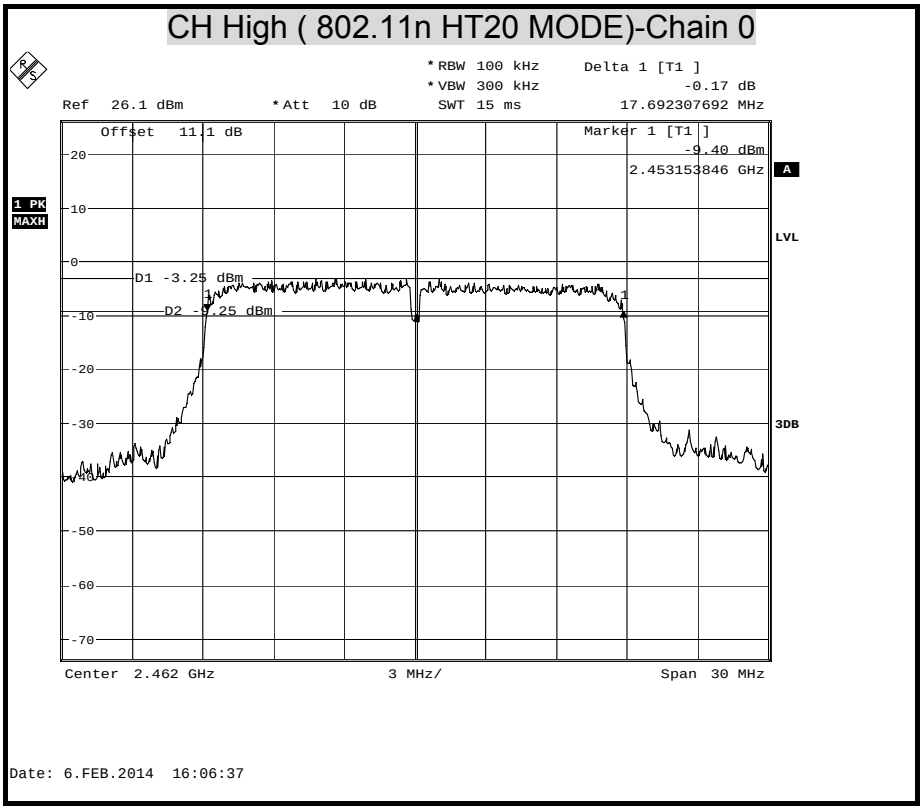
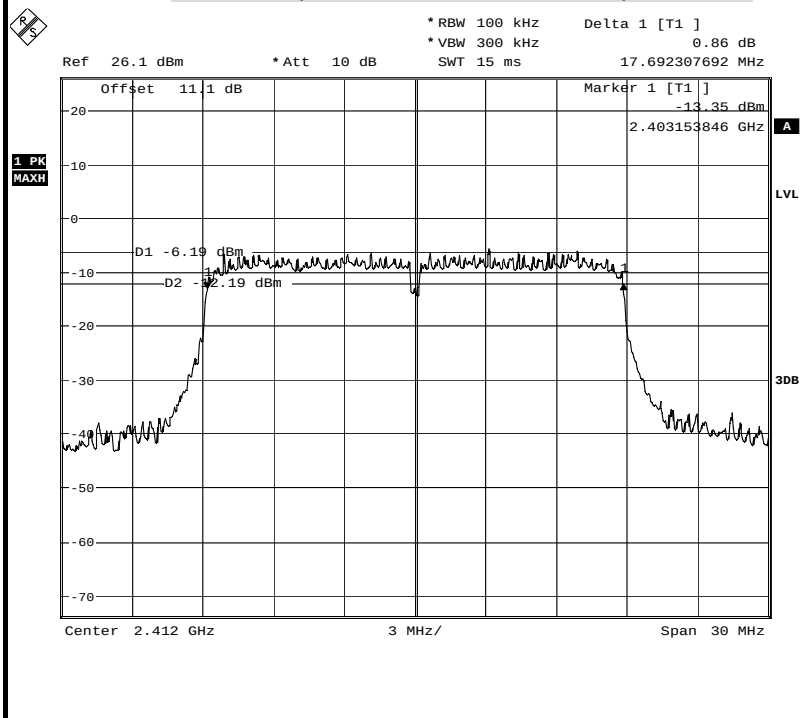


6dB BANDWIDTH (802.11n HT20 MODE) Chain 1

CH Low (802.11n HT20 MODE)-Chain 1



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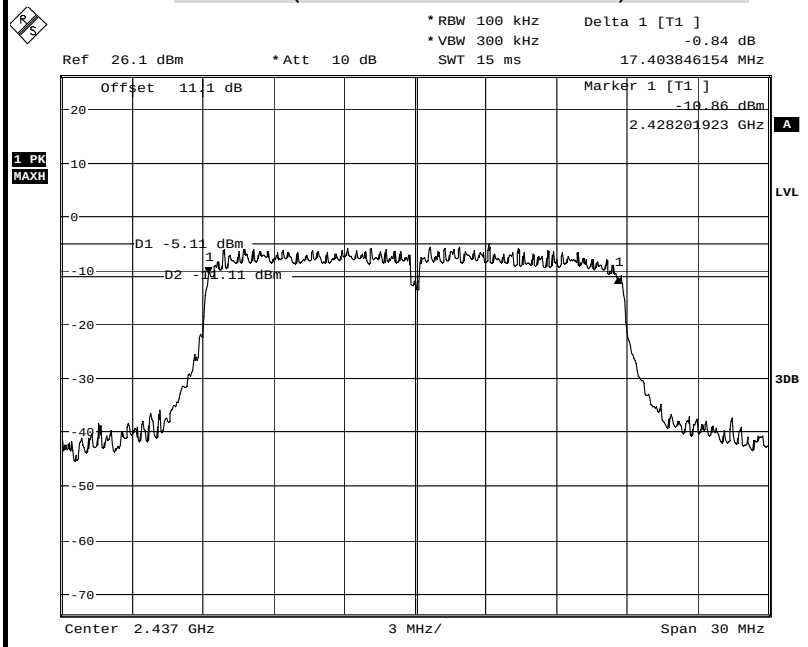

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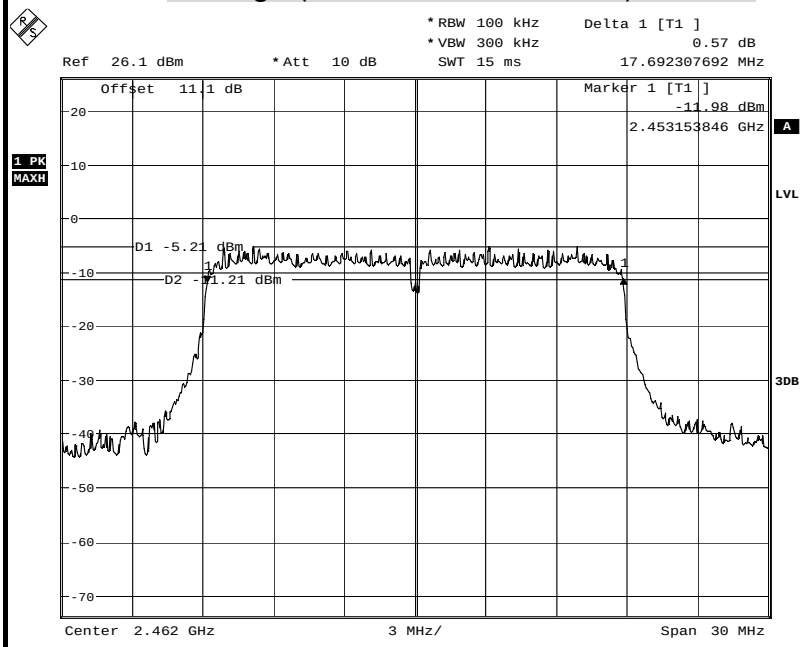
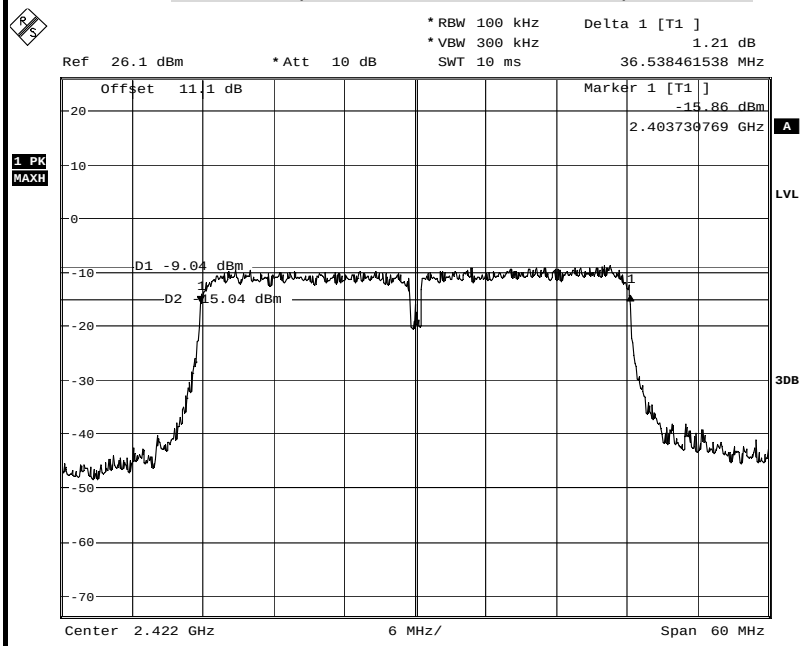
CH High (802.11n HT20 MODE)-Chain 1



6dB BANDWIDTH (802.11n HT40 MODE) Chain 0

CH Low (802.11n HT40 MODE)-Chain 0



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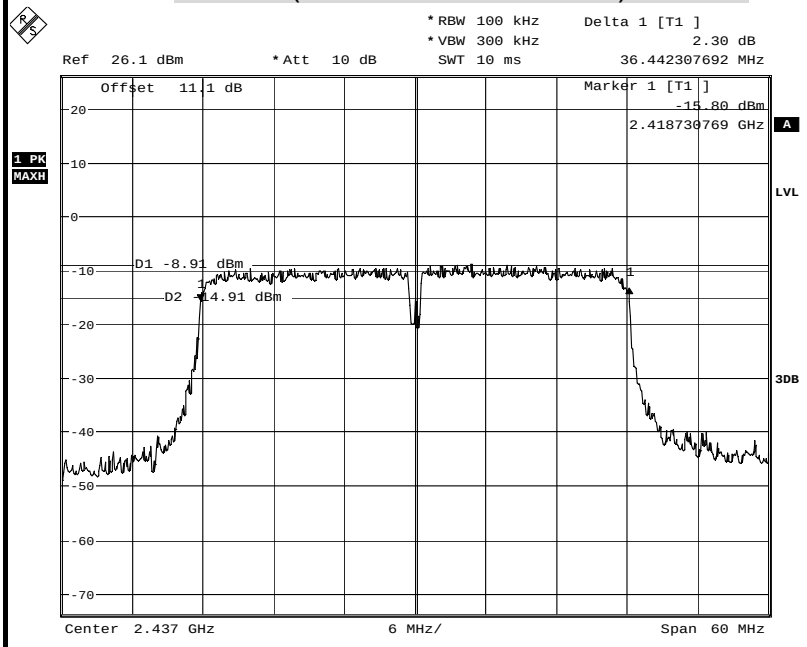

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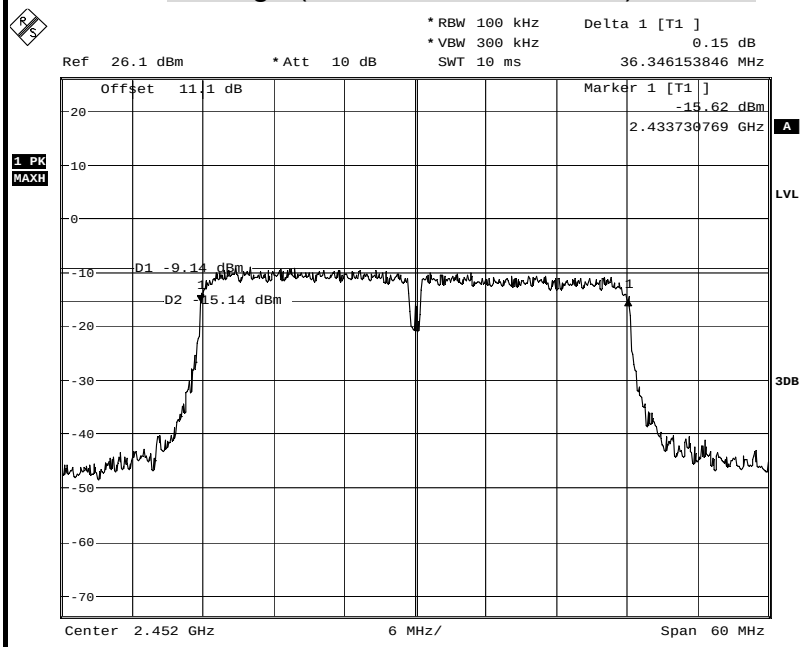
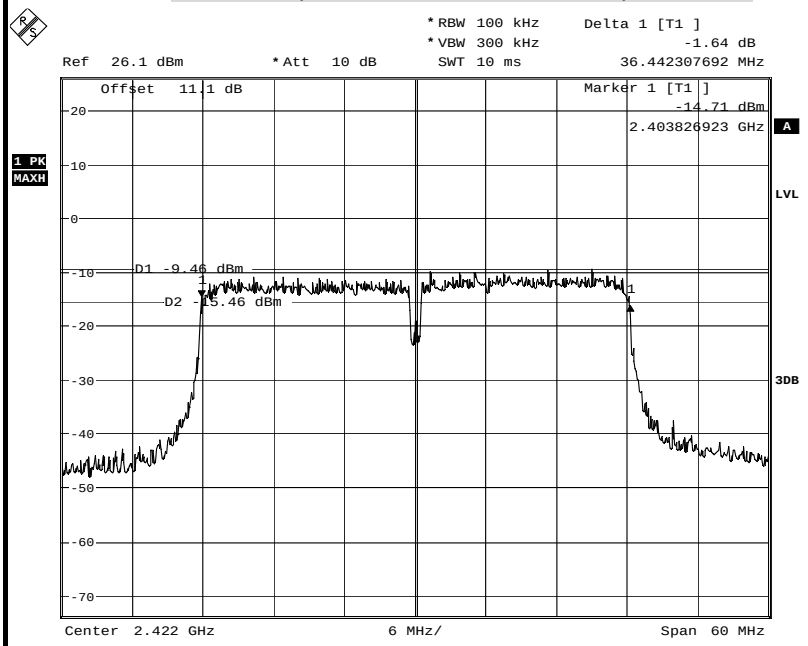


6dB BANDWIDTH (802.11n HT40 MODE) Chain 1

CH Low (802.11n HT40 MODE)-Chain 1



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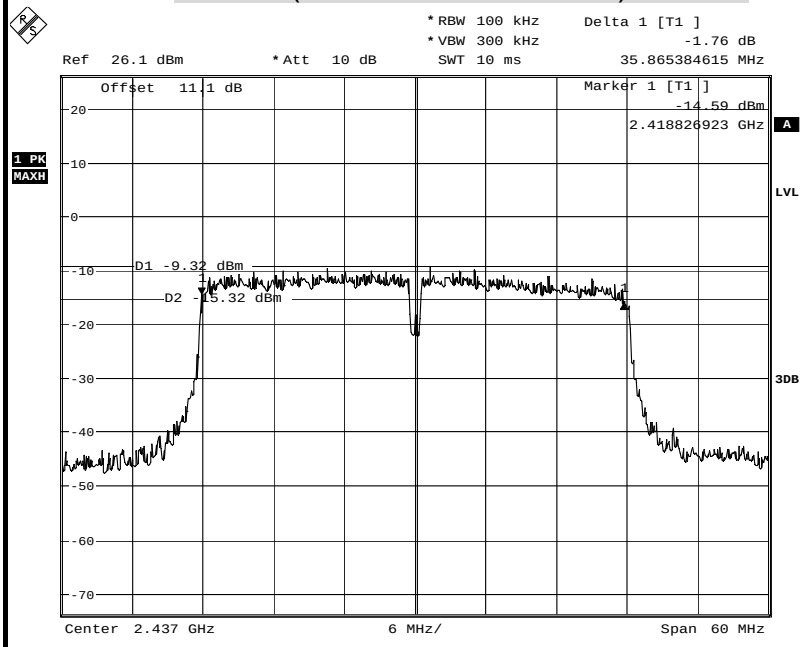

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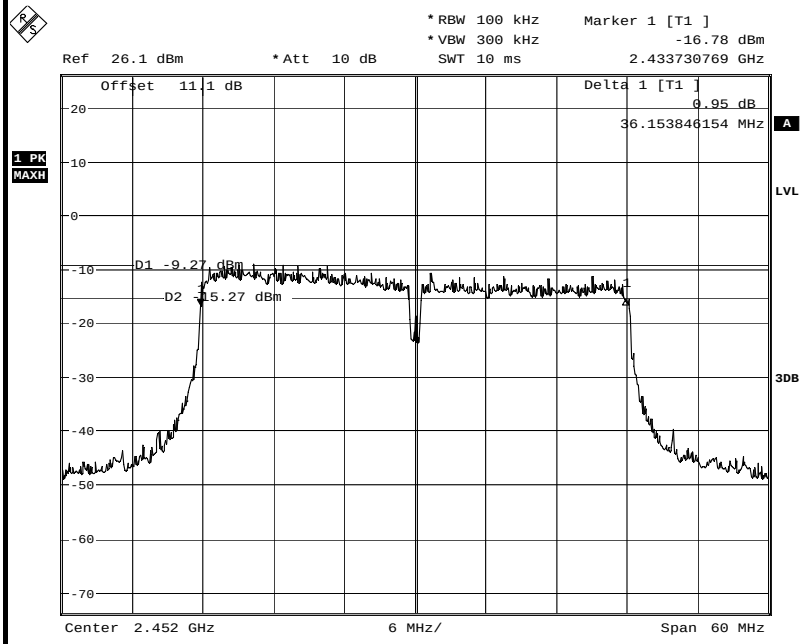


8.2 MAXIMUM PEAK OUTPUT POWER

LIMIT

§ 15.247(b) The maximum peak output power of the intentional radiator shall not exceed the following :

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

§ 15.247(b) (4) Except as shown in paragraphs (c) of this section , if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section , as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP. 28, 2014
Power Meter	Anritsu	ML2487A	6K00003888	JUN. 24, 2014

TEST SETUP

For Peak Power

For Average Power

TEST PROCEDURE

The tests were performed in accordance with KDB 558074 5.2.1.2 and 5.2.2.1.

5.2.1.2 Measurement Procedure PK2:

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

Average Power

Connect the EUT to power meter, set the center frequency of the power meter to the channel center frequency.

TEST RESULTS

No non-compliance noted

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	17.94	30.00	PASS
Middle	2437	17.89	30.00	PASS
High	2462	17.72	30.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 1Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	17.87	30.00	PASS
Middle	2437	18.66	30.00	PASS
High	2462	18.50	30.00	PASS

NOTE : 1.At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total (dBm)	Peak Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
Low	2412	16.94	15.56	19.31	28.59	PASS
Middle	2437	17.17	16.11	19.68	28.59	PASS
High	2462	17.61	16.55	20.12	28.59	PASS

NOTE : 1. At finial test to get the worst-case emission at 13Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total (dBm)	Peak Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
Low	2422	15.47	14.03	17.82	28.59	PASS
Middle	2437	15.61	13.78	17.80	28.59	PASS
High	2452	15.15	13.50	17.41	28.59	PASS

NOTE : 1. At finial test to get the worst-case emission at 27Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

Average Power Data

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2412	16.58
Middle	2437	16.43
High	2462	15.96

IEEE 802.11g mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2412	12.84
Middle	2437	13.62
High	2462	13.58

IEEE 802.11n HT20 mode

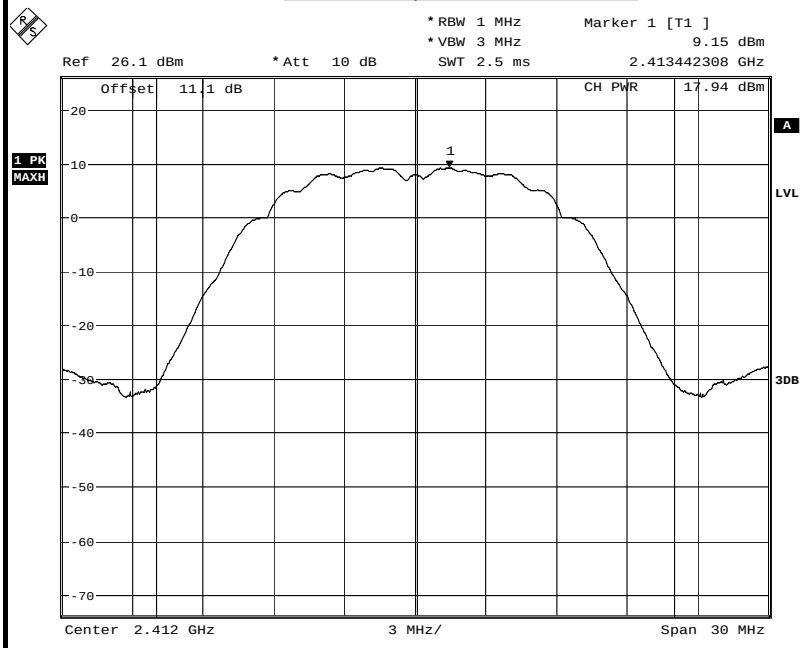
Channel	Channel Frequency (MHz)	Average Power (dBm)	Average Power (dBm)	Average Power (dBm)
		Chain 0	Chain 1	Total
Low	2412	11.42	9.08	13.42
Middle	2437	11.32	9.71	13.60
High	2462	11.65	10.08	13.95

IEEE 802.11n HT40 mode

Channel	Channel Frequency (MHz)	Average Power (dBm)	Average Power (dBm)	Average Power (dBm)
		Chain 0	Chain 1	Total
Low	2422	9.74	7.02	11.60
Middle	2437	10.04	7.22	11.87
High	2452	9.63	6.82	11.46

MAXIMUM PEAK OUTPUT POWER (802.11b MODE)

CH Low (802.11b MODE)



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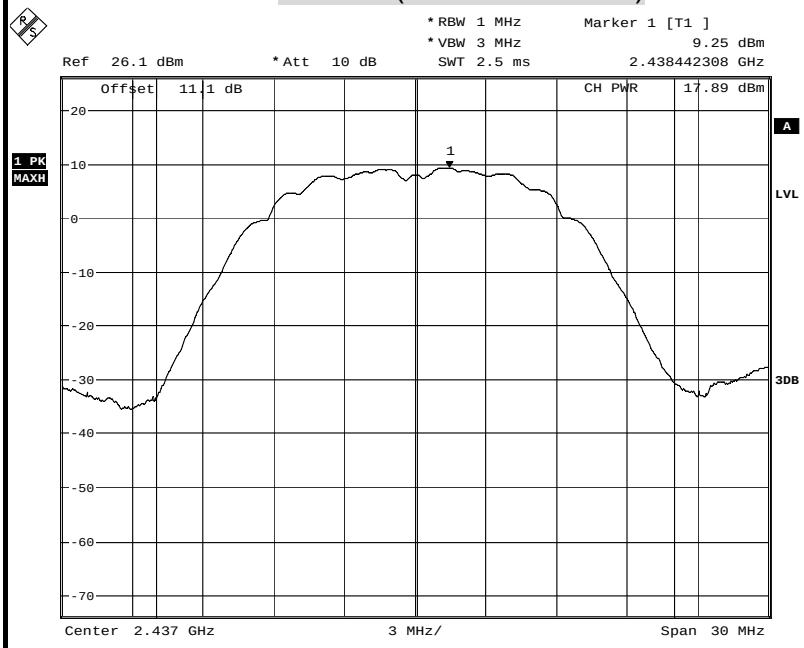

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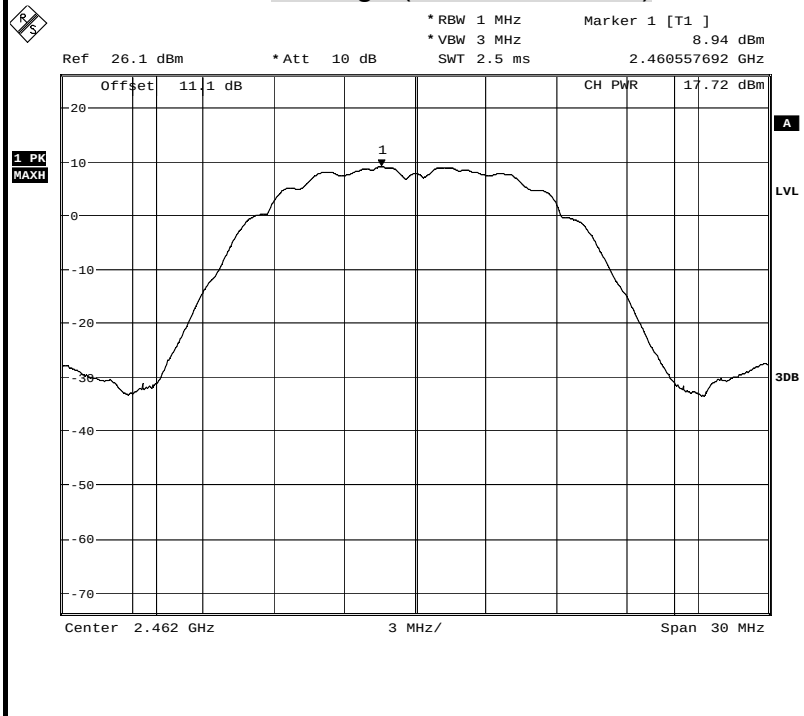
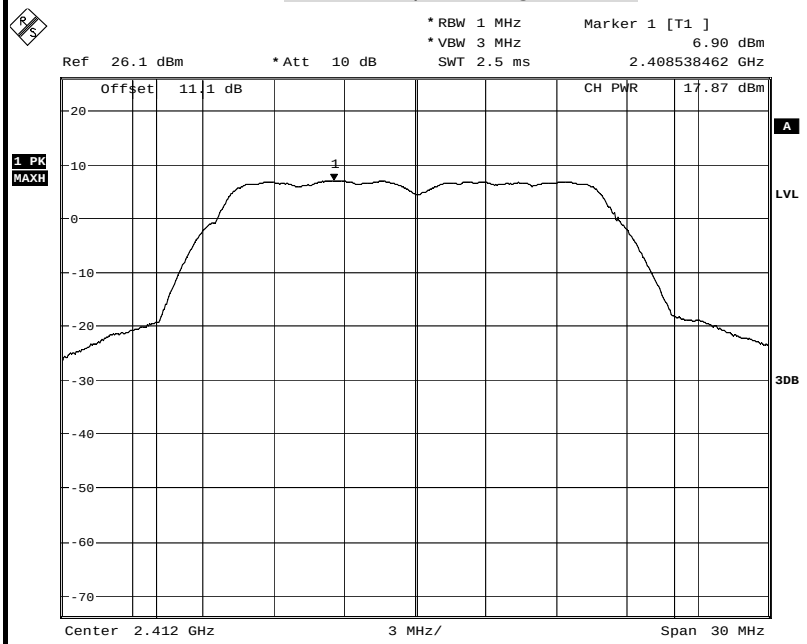


MAXIMUM PEAK OUTPUT POWER (802.11g MODE)

CH Low (802.11g MODE)



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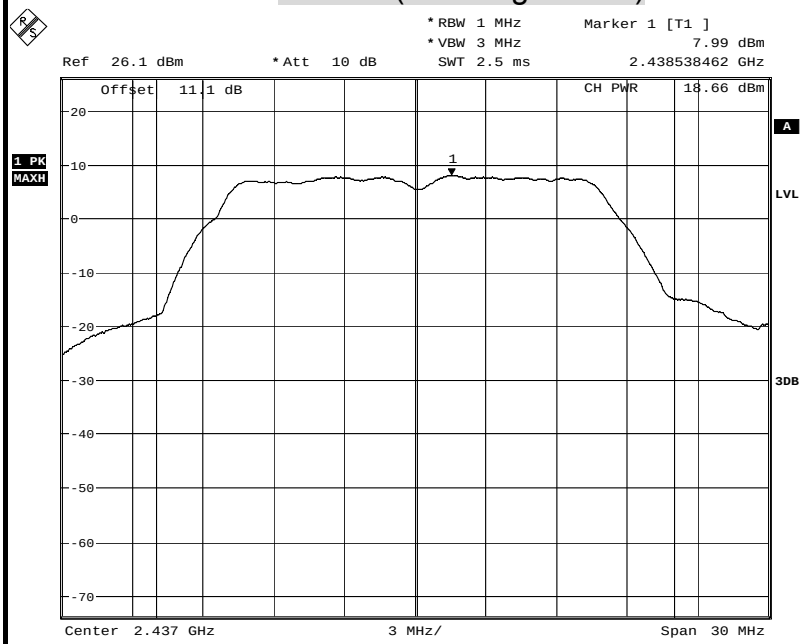

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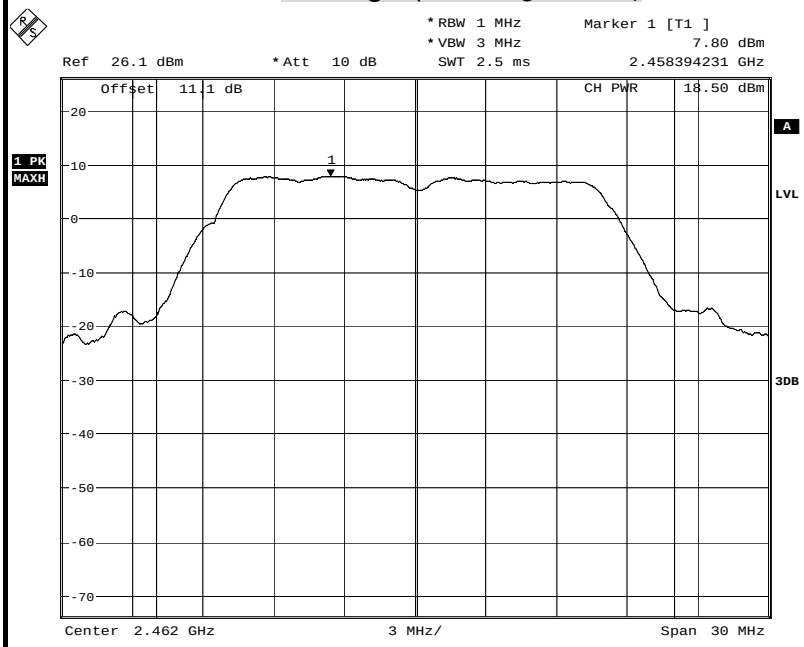
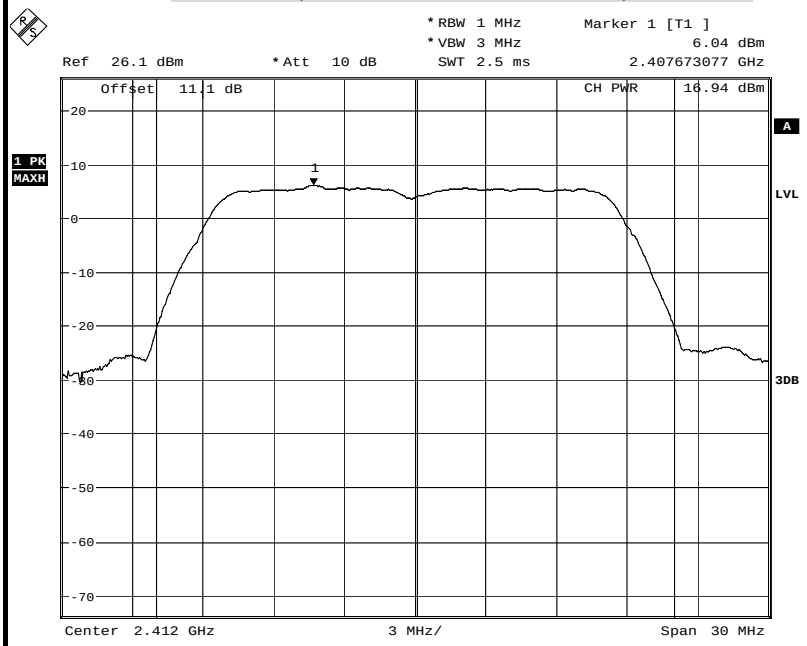


MAXIMUM PEAK OUTPUT POWER (802.11n HT20 MODE) Chain 0

CH Low (802.11n HT20 MODE)-Chain 0



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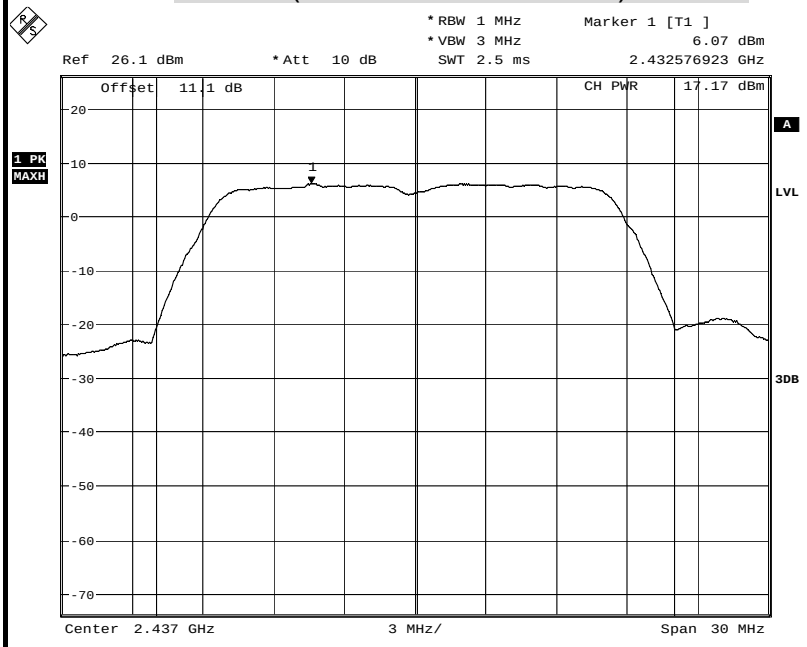
CH Mid (802.11n HT20 MODE)-Chain 0



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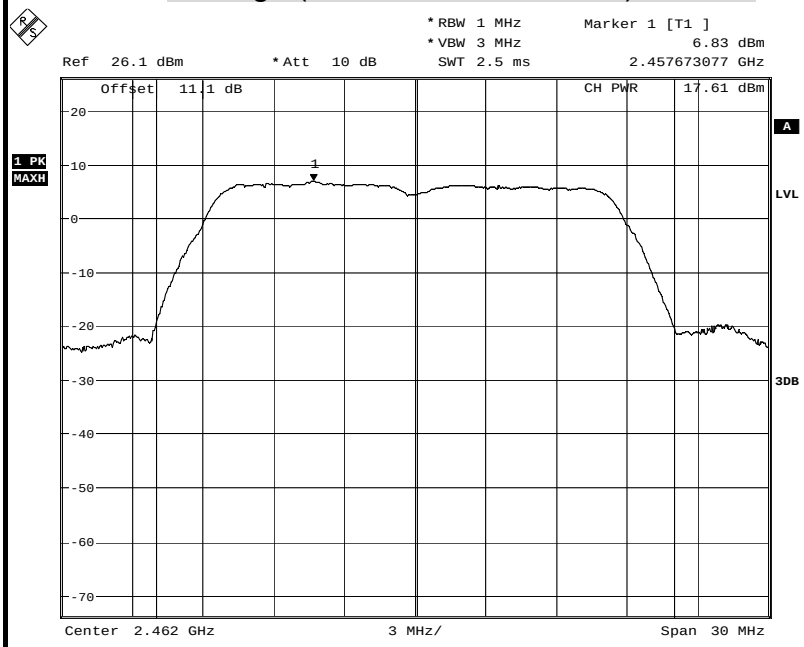
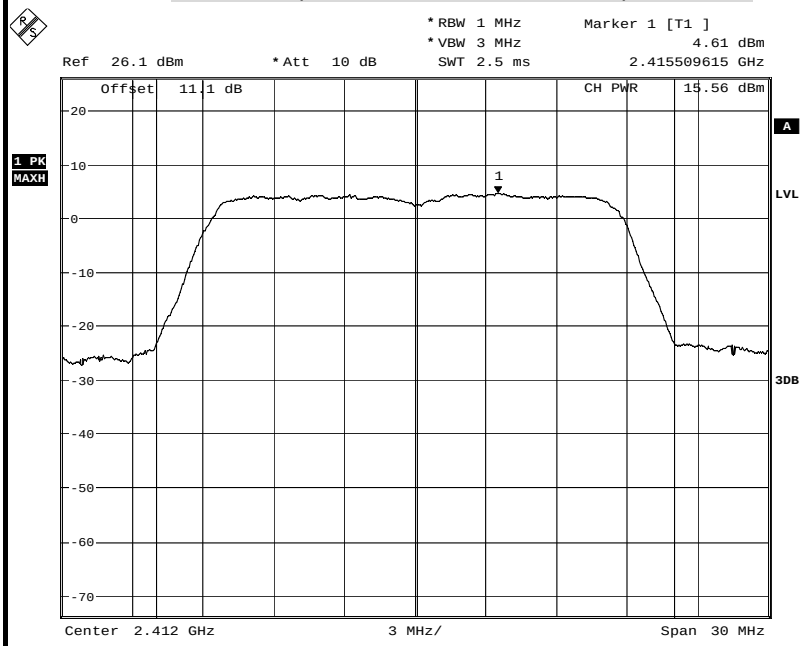
CH High (802.11n HT20 MODE)-Chain 0



MAXIMUM PEAK OUTPUT POWER (802.11n HT20 MODE) Chain 1

CH Low (802.11n HT20 MODE)-Chain 1



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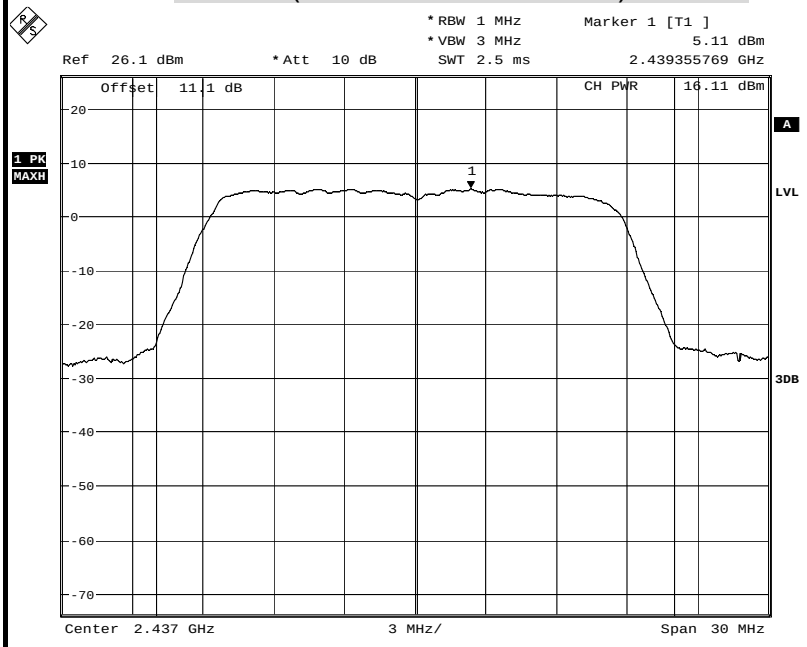
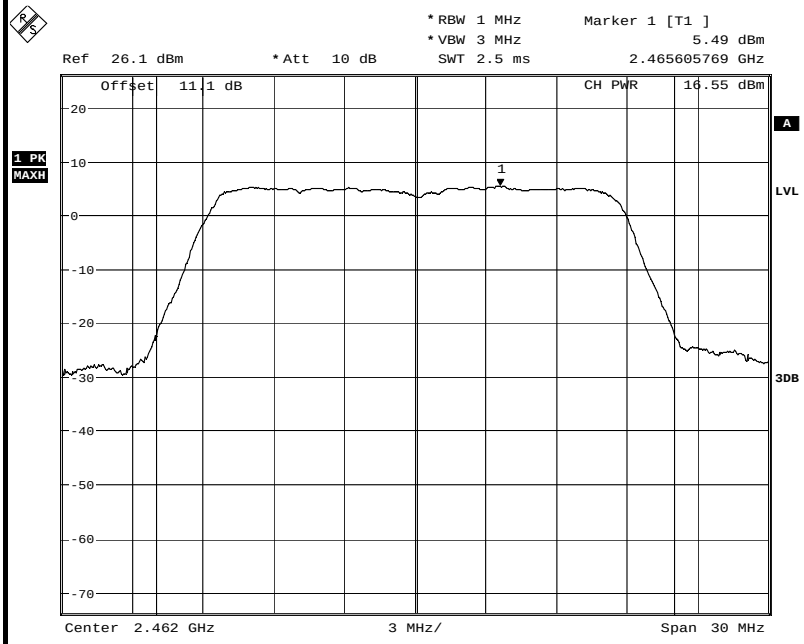
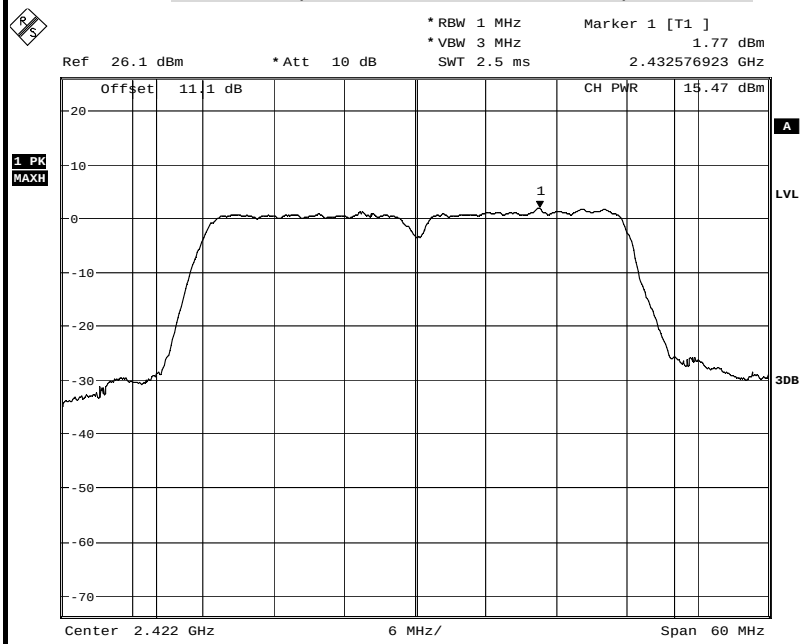


CH High (802.11n HT20 MODE)-Chain 1



MAXIMUM PEAK OUTPUT POWER (802.11n HT40 MODE) Chain 0

CH Low (802.11n HT40 MODE)-Chain 0



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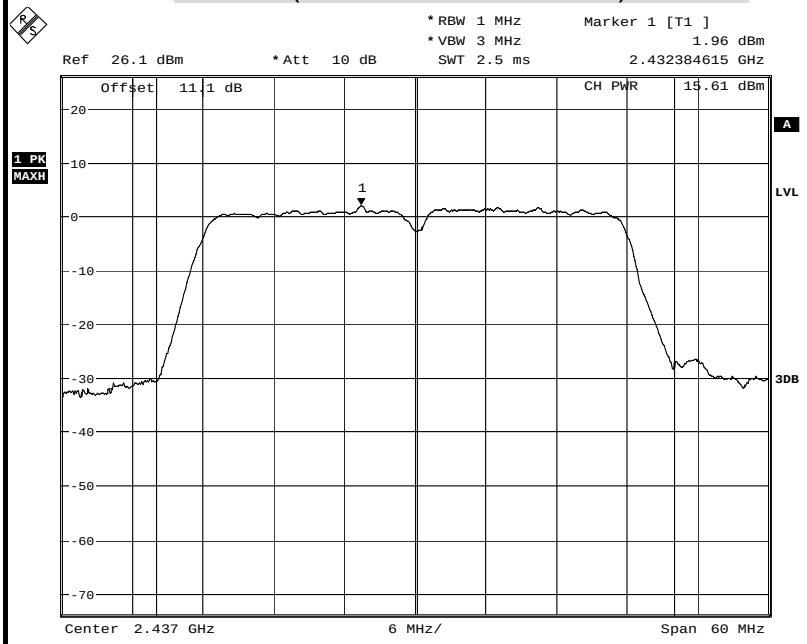
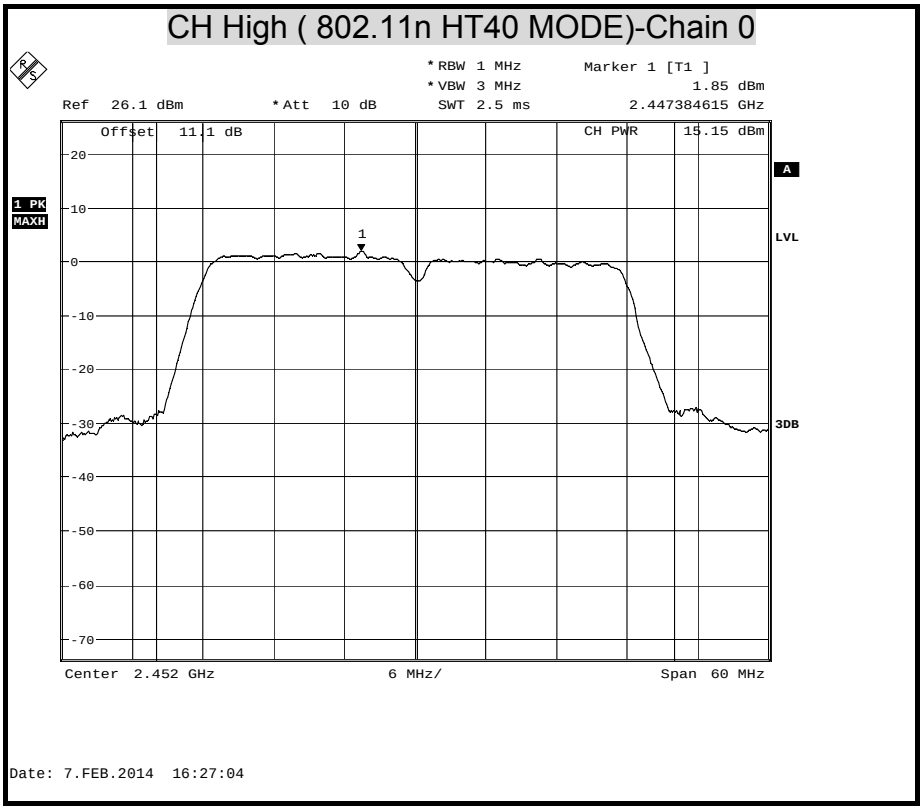
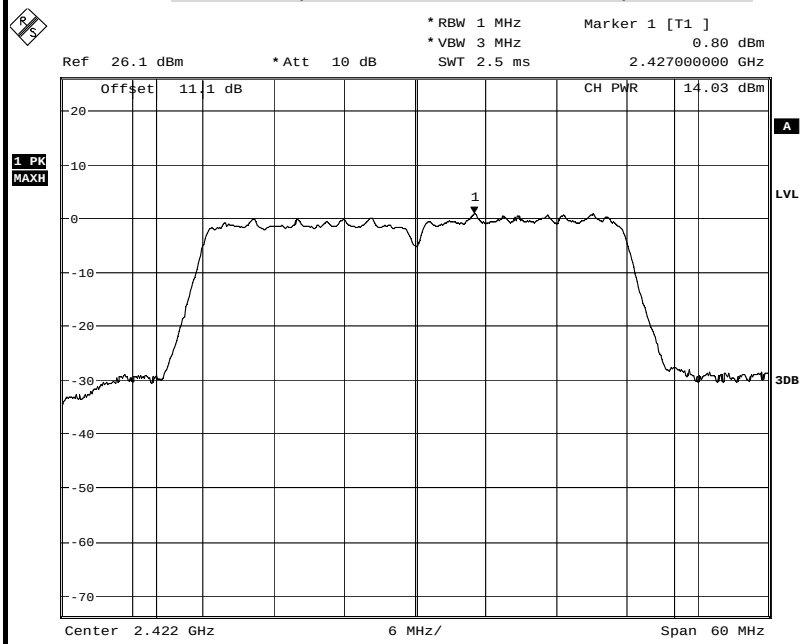


CH High (802.11n HT40 MODE)-Chain 0



MAXIMUM PEAK OUTPUT POWER (802.11n HT40 MODE) Chain 1

CH Low (802.11n HT40 MODE)-Chain 1



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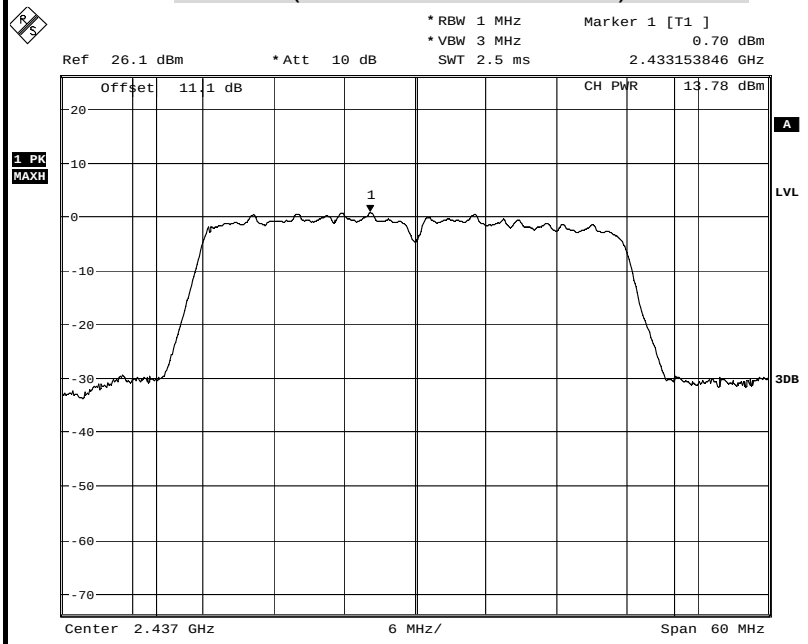
CH Mid (802.11n HT40 MODE)-Chain 1



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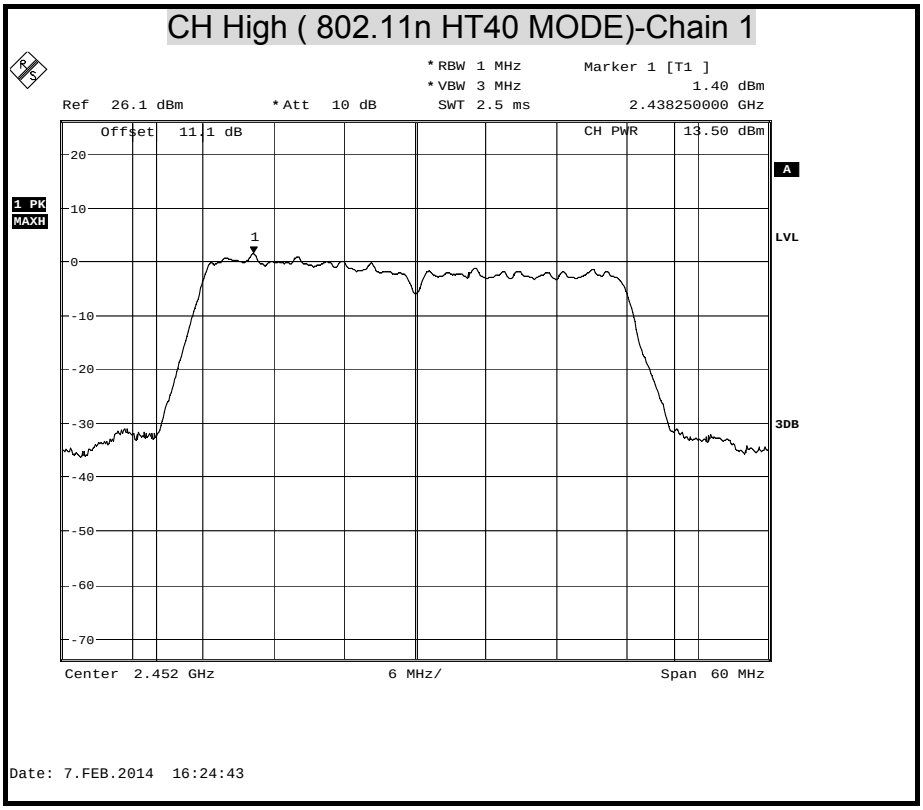


8.3 MAXIMUM PERMISSIBLE EXPOSURE

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time
(A) Limits for Occupational / Control Exposures				
300-1,500	--	--	F/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300-1,500	--	--	F/1500	6
1,500-100,000	--	--	1	30

CALCULATIONS

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm^2

LIMIT

Power Density Limit, S=1.0mW/cm^2

TEST RESULTS

No non-compliance noted.

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$

Antenna Gain 1=4.74dBi = 2.97851643 mW
Antenna Gain 2=2.97dBi = 1.981527 mW
Total Gain=7.41dBi = 4.960043 mW

IEEE 802.11b	=	0.0796 *	62.2300	*	2.97851643	÷ 400 =	0.03689
IEEE 802.11g	=	0.0796 *	73.4514	*	2.97851643	÷ 400 =	0.04354
IEEE 802.11n HT20	=	0.0796 *	102.8622	*	4.96004346	÷ 400 =	0.10153
IEEE 802.11n HT40	=	0.0796 *	60.5301	*	4.96004346	÷ 400 =	0.05975

Mode	Minimum separation distance (cm)	Output Power (dBm)	Output Power (mw)	Antenna Gain (dBi)	Power Density Limit (mW/cm^2)	Power Density at 20cm (mW/cm^2)
IEEE 802.11b	20	17.94	62.23	4.74	1.00	0.036885
IEEE 802.11g	20	18.66	73.45	4.74	1.00	0.043536
IEEE 802.11n HT20	20	20.12	102.86	6.95	1.00	0.101530
IEEE 802.11n HT40	20	17.82	60.53	6.95	1.00	0.059746

REMARK: For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.

8.4 POWER SPECTRAL DENSITY

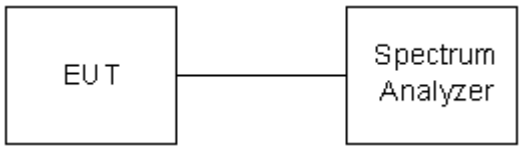
LIMIT

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

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP. 28, 2014

TEST SETUP



TEST PROCEDURE

The tests were performed in accordance with KDB 558074 5.3.1.

5.3.1 Measurement Procedure PKPSD:

1.Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2.Set the RBW = 100 kHz.
3.Set the VBW ≥ 300 kHz.
4.Set the span to 5-30 % greater than the EBW.
5.Detector = peak.
6.Sweep time = auto couple.
7.Trace mode = max hold.
8.Allow trace to fully stabilize.
9.Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
10.Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(3 kHz/100 kHz= -15.2 dB).11.The resulting peak PSD level must be ≤ 8 dBm.

TEST RESULTS

IEEE 802.11b mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	2412	3.82	8.00	-4.18	PASS
Middle	2437	3.81	8.00	-4.19	PASS
High	2462	3.39	8.00	-4.61	PASS

NOTE : 1. At finial test to get the worst-case emission at 1long Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	2412	-2.79	8.00	-10.79	PASS
Middle	2437	-1.40	8.00	-9.40	PASS
High	2462	-1.99	8.00	-9.99	PASS

NOTE : 1. At finial test to get the worst-case emission at 6Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	PPSD Chain0 (dBm)	PPSD Chain1 (dBm)	PPSD Total (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	2412	-6.97	-5.96	-3.43	7.05	-10.47	PASS
Middle	2437	-4.40	-5.07	-1.71	7.05	-8.76	PASS
High	2462	-3.46	-4.55	-0.96	7.05	-8.01	PASS

NOTE : 1. At finial test to get the worst-case emission at 13Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

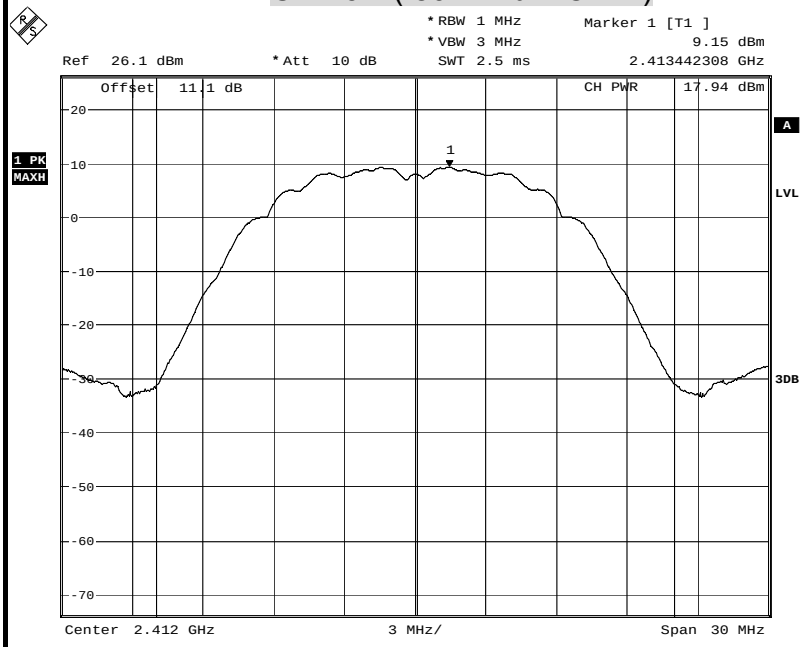
IEEE 802.11n HT40 mode

Channel	Frequency (MHz)	PPSD Chain0 (dBm)	PPSD Chain1 (dBm)	PPSD Total (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	2422	-9.65	-8.93	-6.26	7.05	-13.31	PASS
Middle	2437	-9.19	-9.42	-6.29	7.05	-13.34	PASS
High	2452	-9.35	-9.81	-6.56	7.05	-13.61	PASS

NOTE : 1. At finial test to get the worst-case emission at 27Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

POWER SPECTRAL DENSITY (IEEE 802.11b MODE)

CH Low (802.11b MODE)



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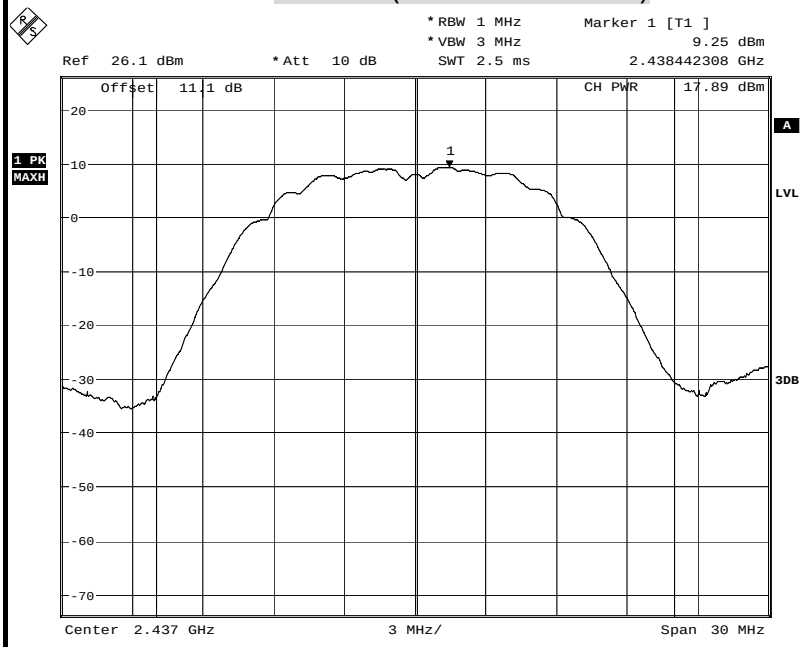
CH Mid (802.11b MODE)



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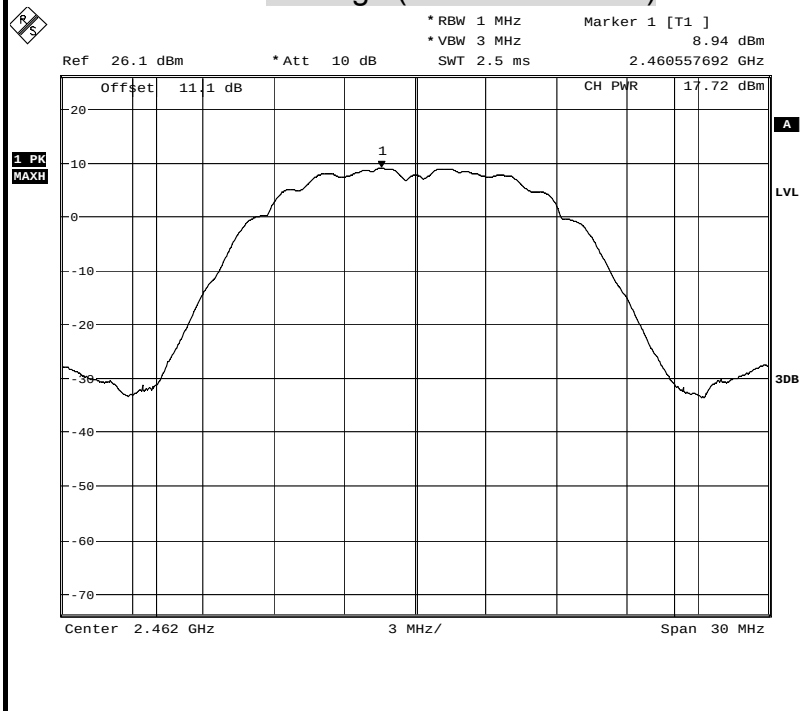
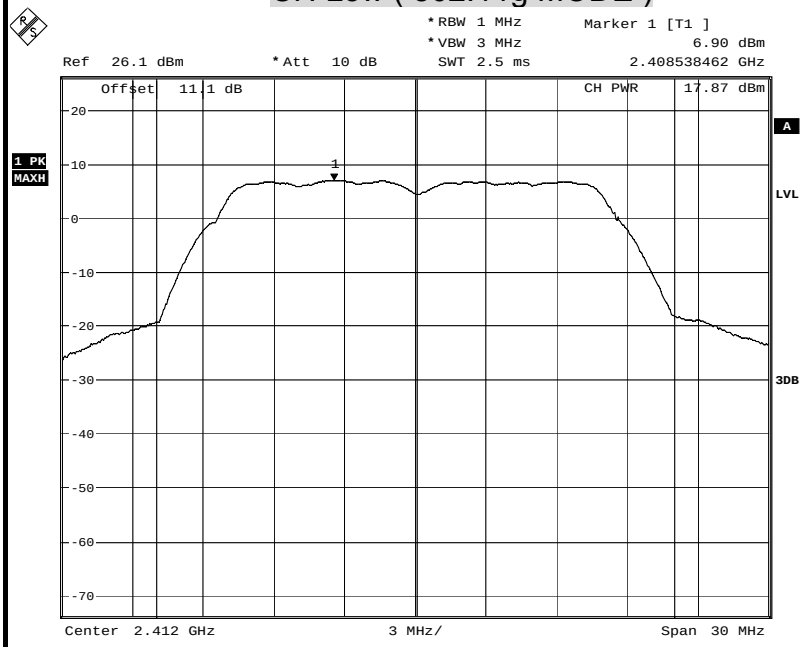
CH High (802.11b MODE)



POWER SPECTRAL DENSITY (IEEE 802.11g MODE)

CH Low (802.11g MODE)



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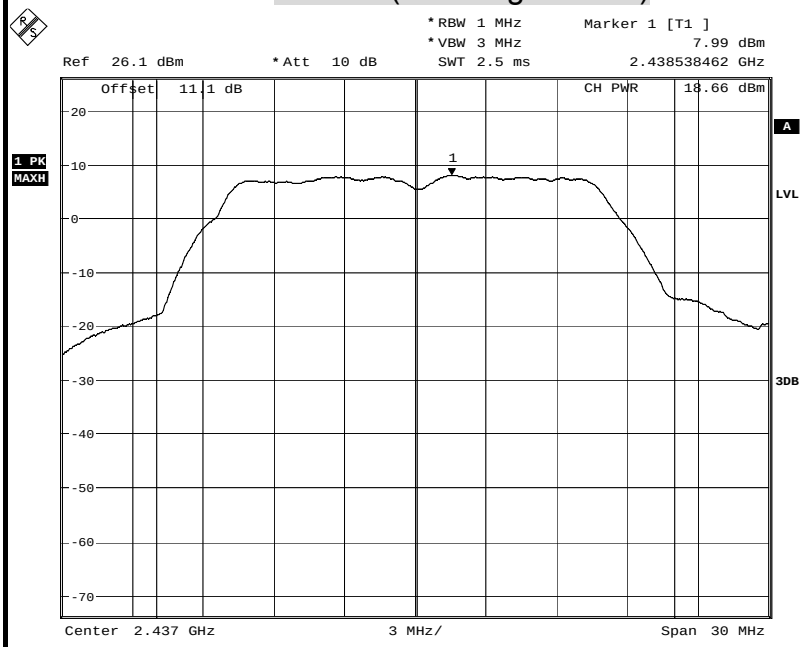
CH Mid (802.11g MODE)



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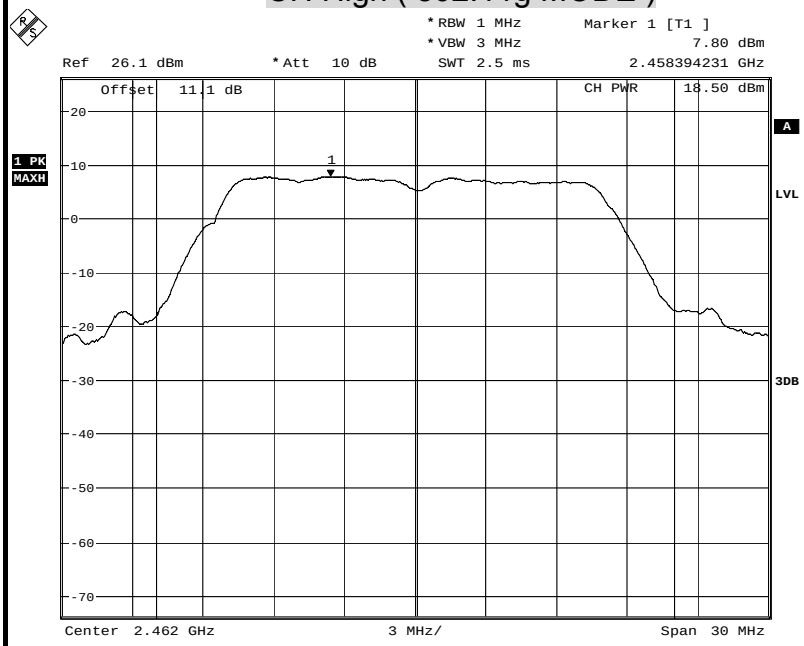
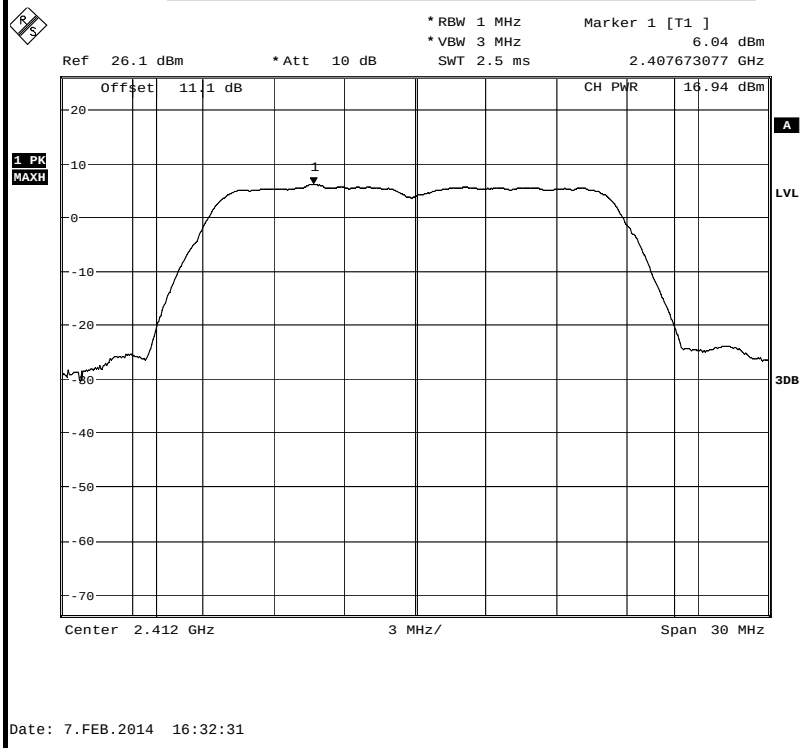
CH High (802.11g MODE)

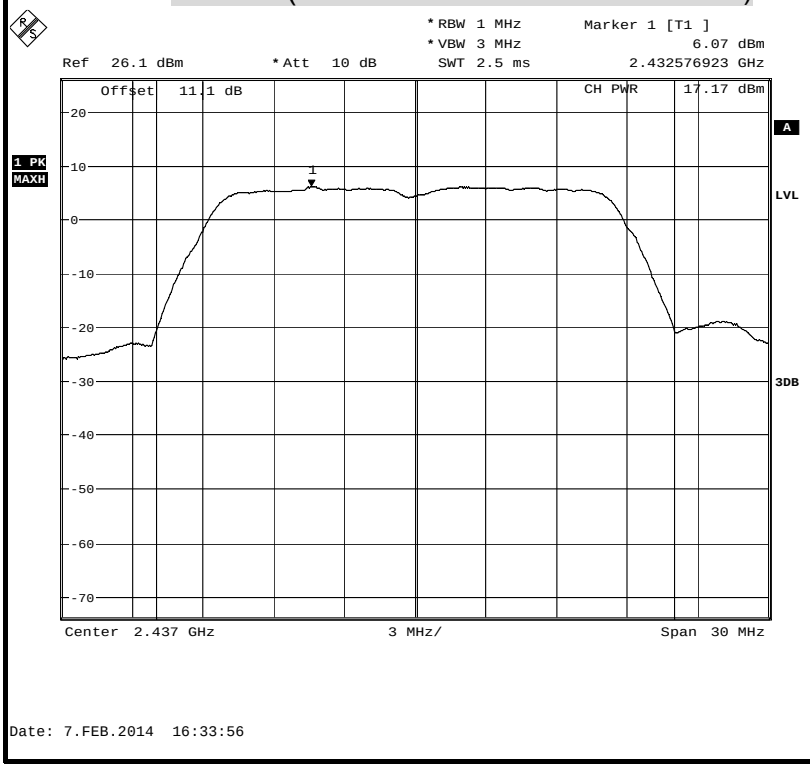


POWER SPECTRAL DENSITY (802.11n HT20 MODE)

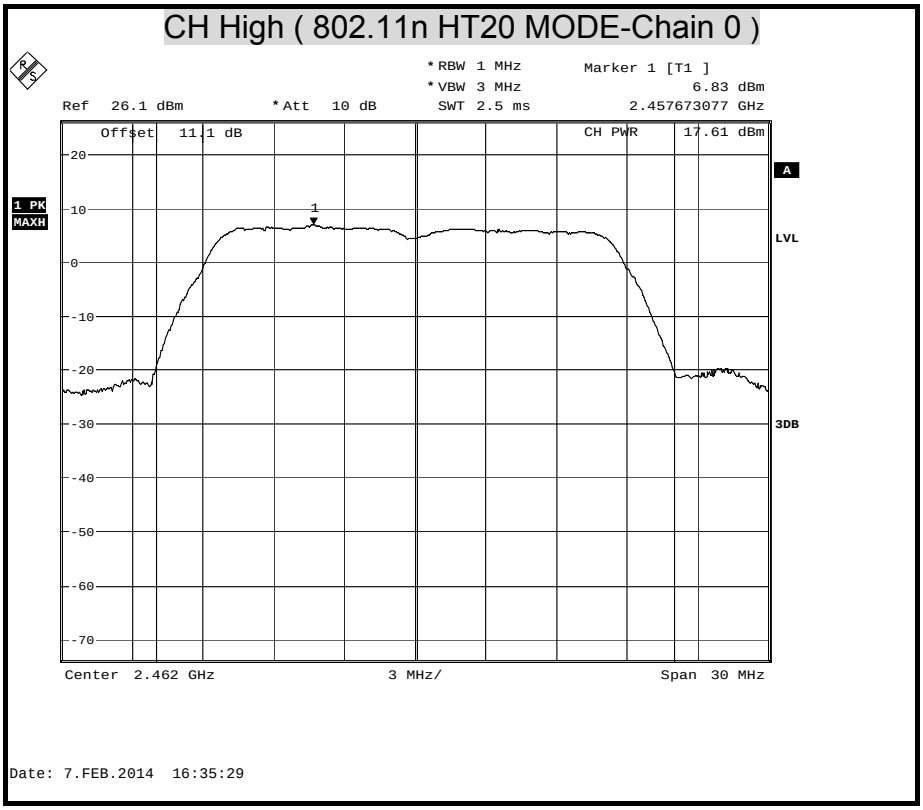
CH Low (802.11n HT20 MODE-Chain 0)



CH Mid (802.11n HT20 MODE-Chain 0)

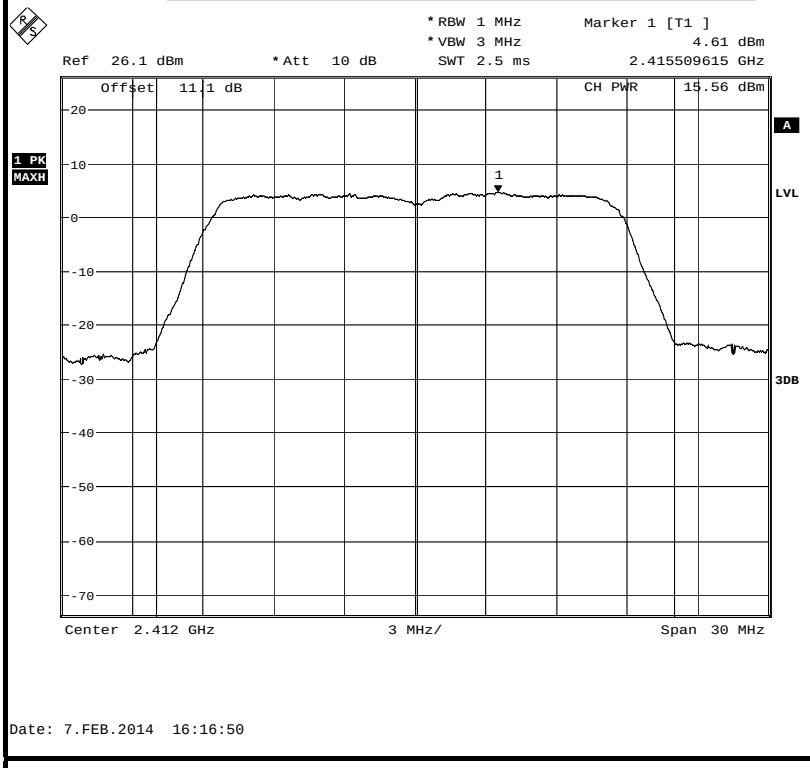


CH High (802.11n HT20 MODE-Chain 0)

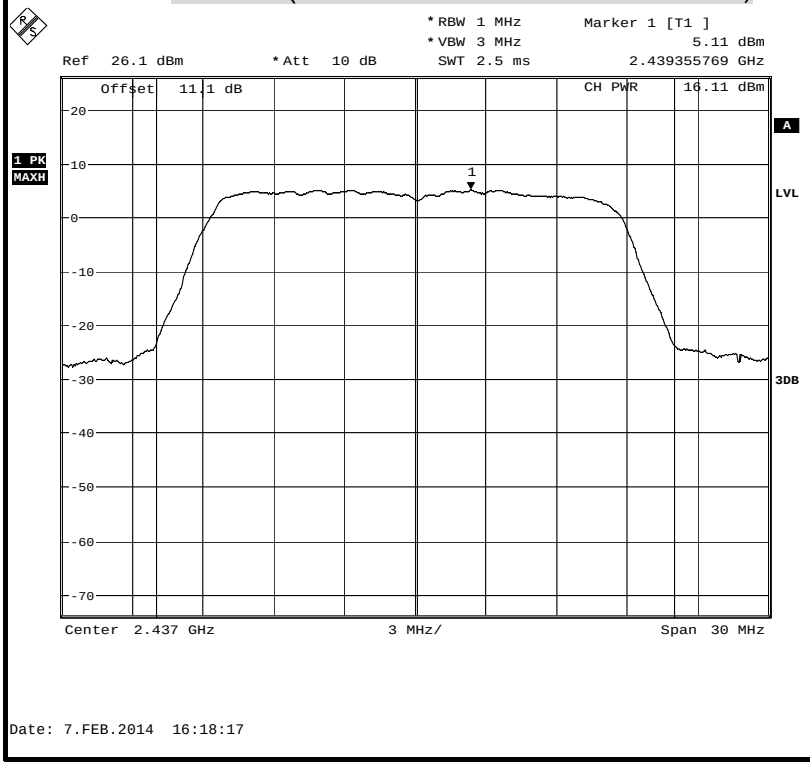


POWER SPECTRAL DENSITY (802.11n HT20 MODE)

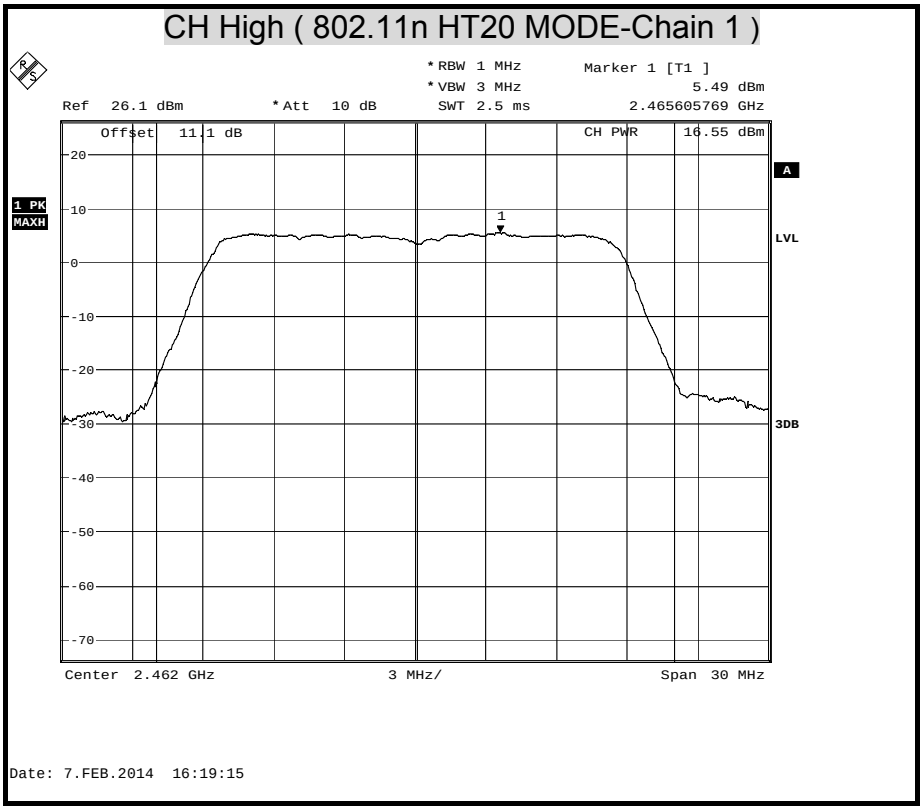
CH Low (802.11n HT20 MODE-Chain 1)



CH Mid (802.11n HT20 MODE-Chain 1)

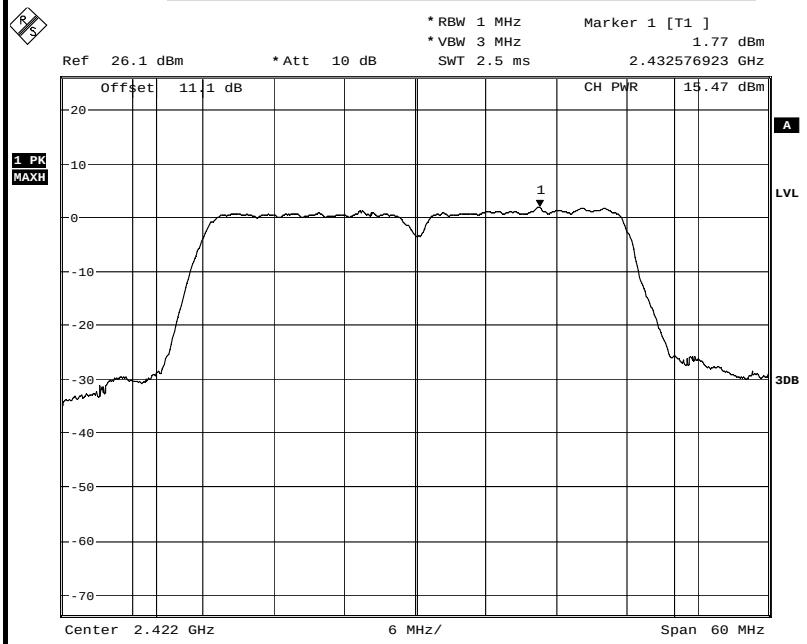


CH High (802.11n HT20 MODE-Chain 1)

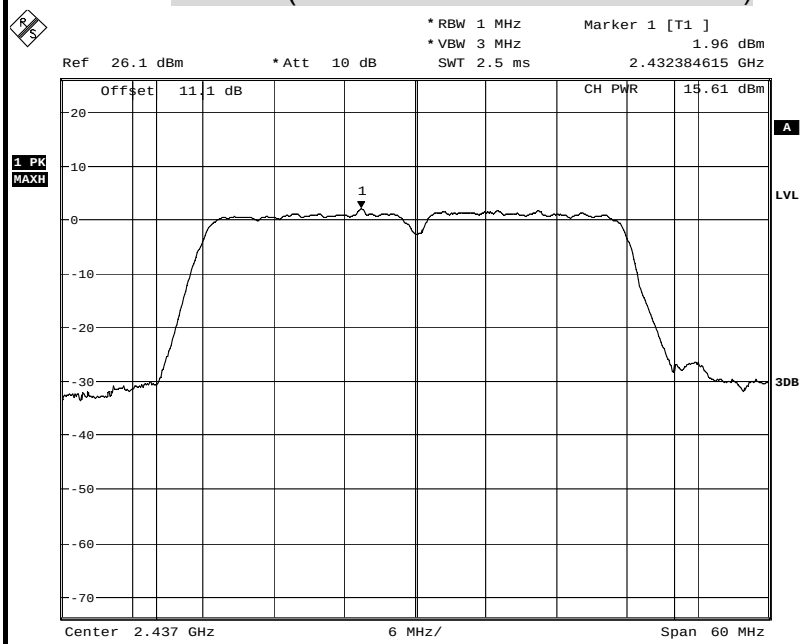


POWER SPECTRAL DENSITY (802.11n HT40 MODE)

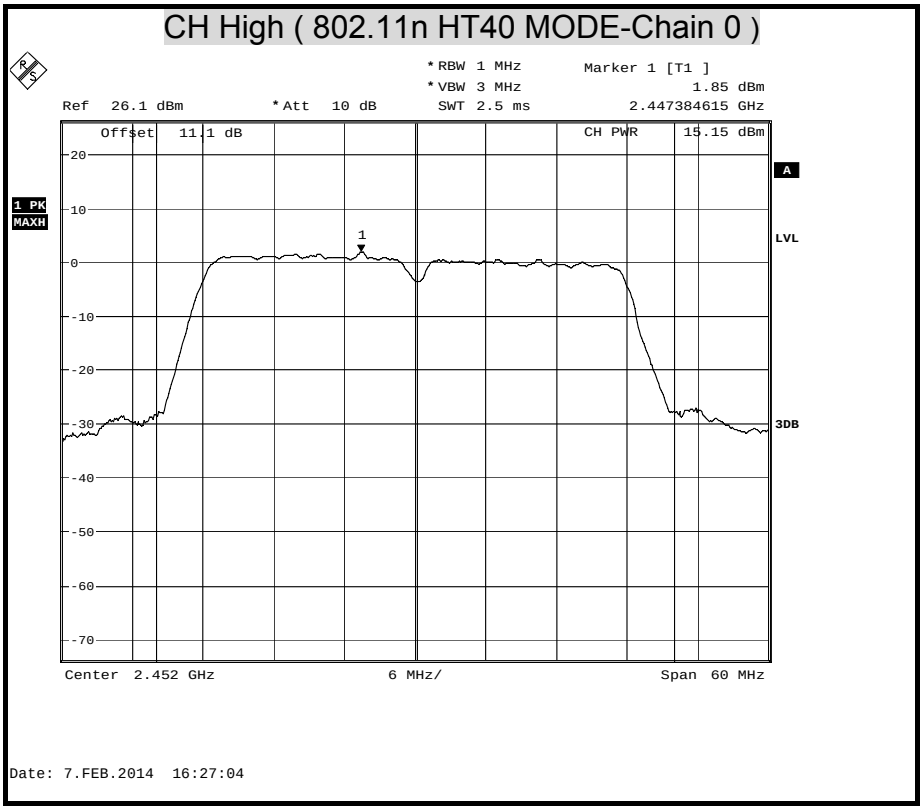
CH Low (802.11n HT40 MODE-Chain 0)



CH Mid (802.11n HT40 MODE-Chain 0)

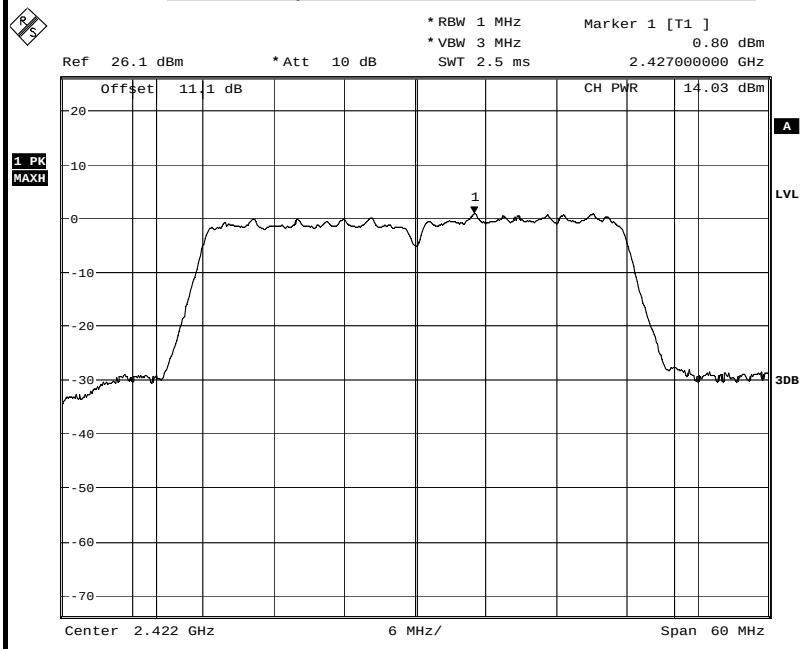


CH High (802.11n HT40 MODE-Chain 0)



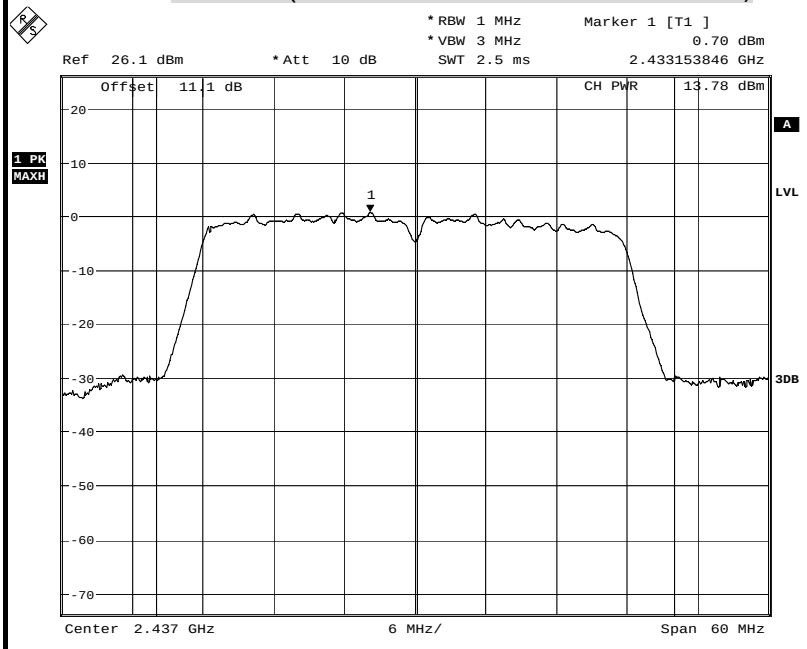
POWER SPECTRAL DENSITY (802.11n HT40 MODE)

CH Low (802.11n HT40 MODE-Chain 1)



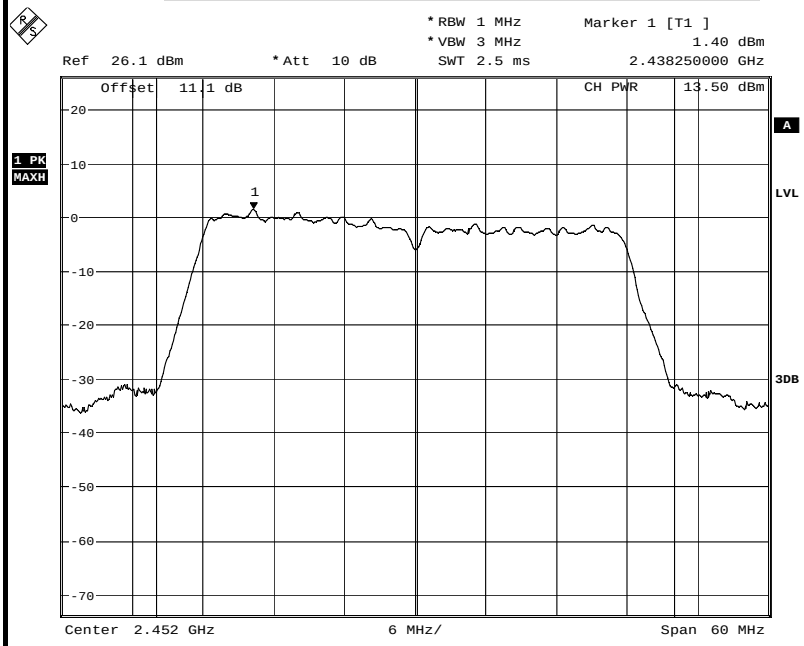
Date: 7.FEB.2014 16:21:42

CH Mid (802.11n HT40 MODE-Chain 1)



Date: 7.FEB.2014 16:23:07

CH High (802.11n HT40 MODE-Chain 1)



8.5 CONDUCTED SPURIOUS EMISSION

LIMITS

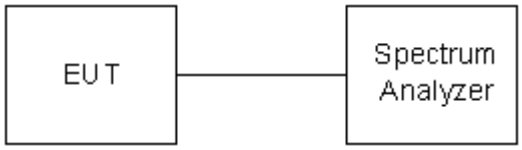
§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the and that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP. 28, 2014

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP



TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

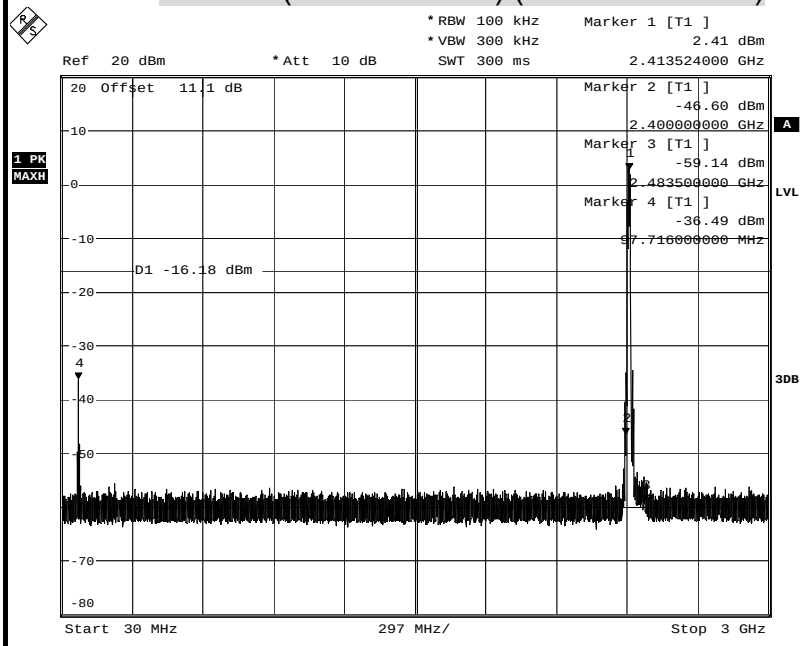
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

TEST RESULTS

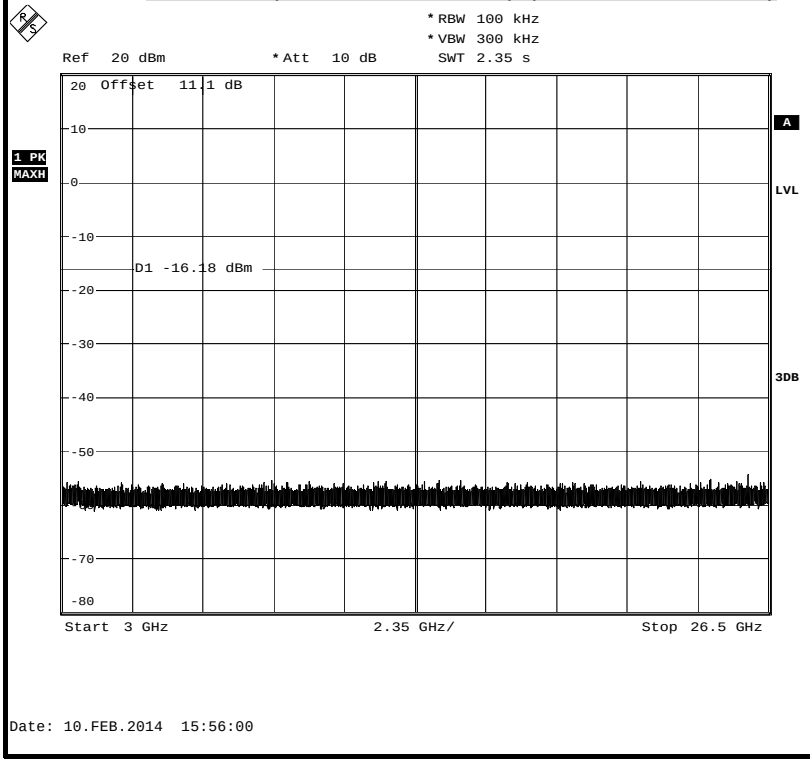
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(IEEE 802.11b MODE)

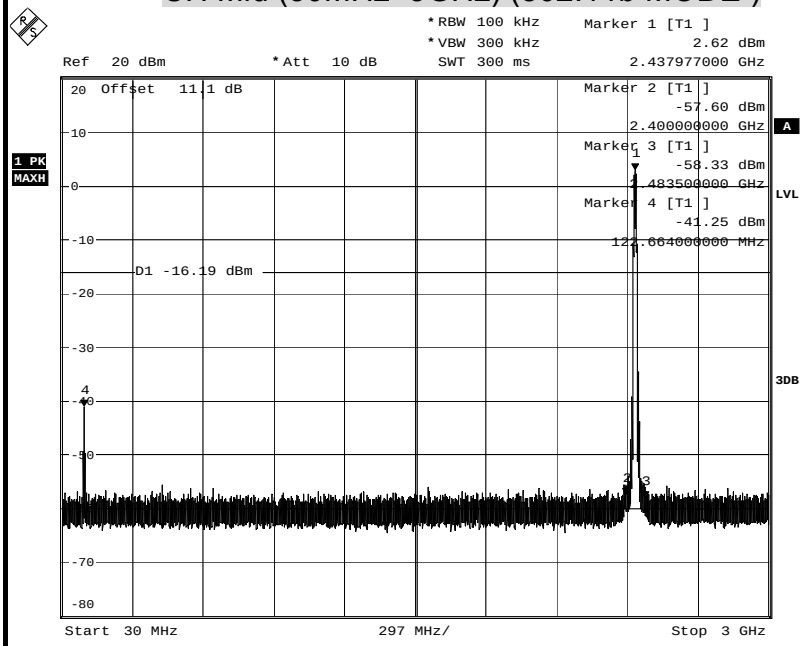
CH Low (30MHz~3GHz) (802.11b MODE)



CH Low (3GHz~26.5GHz) (802.11b MODE)

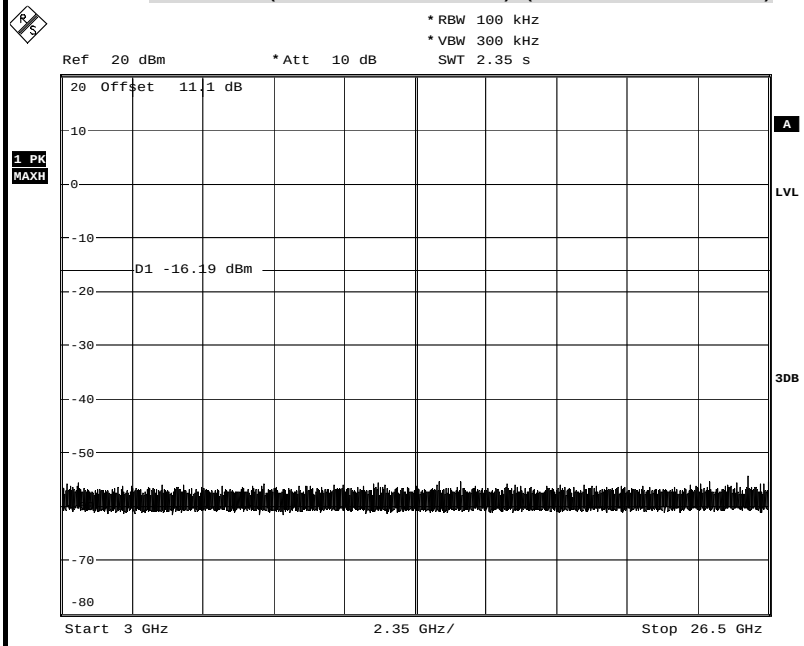


CH Mid (30MHz~3GHz) (802.11b MODE)



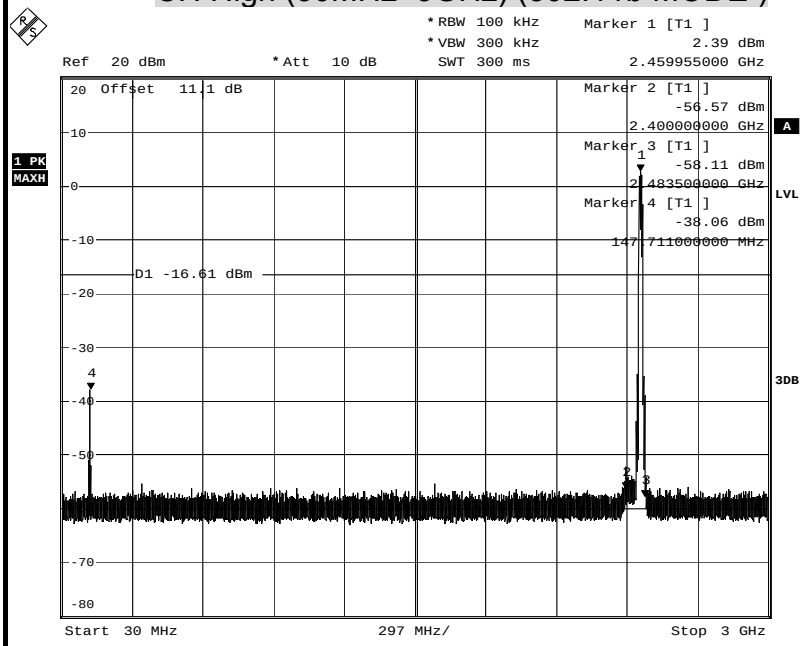
Date: 10.FEB.2014 15:51:53

CH Mid (3GHz~26.5GHz) (802.11b MODE)



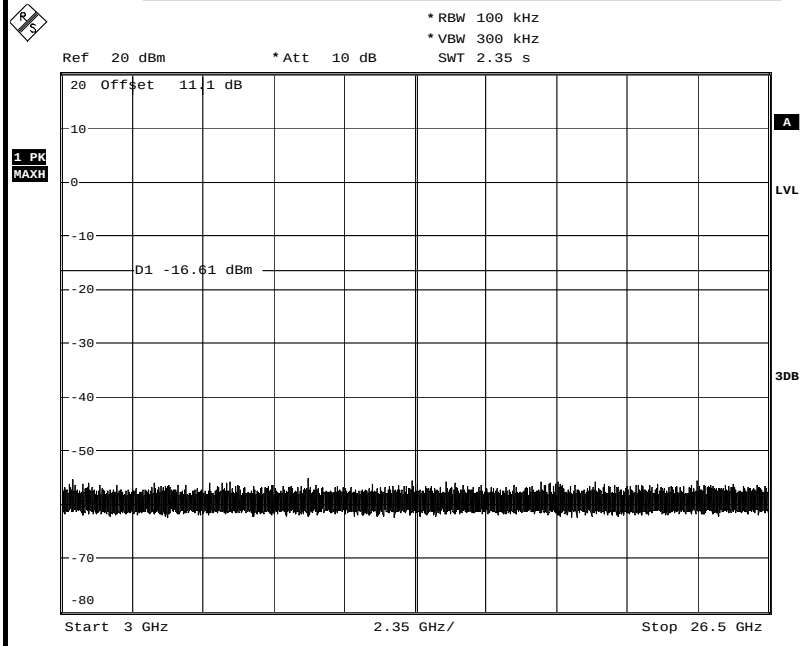
Date: 10.FEB.2014 15:55:08

CH High (30MHz~3GHz) (802.11b MODE)



Date: 10.FEB.2014 15:50:41

CH High (3GHz~26.5GHz) (802.11b MODE)

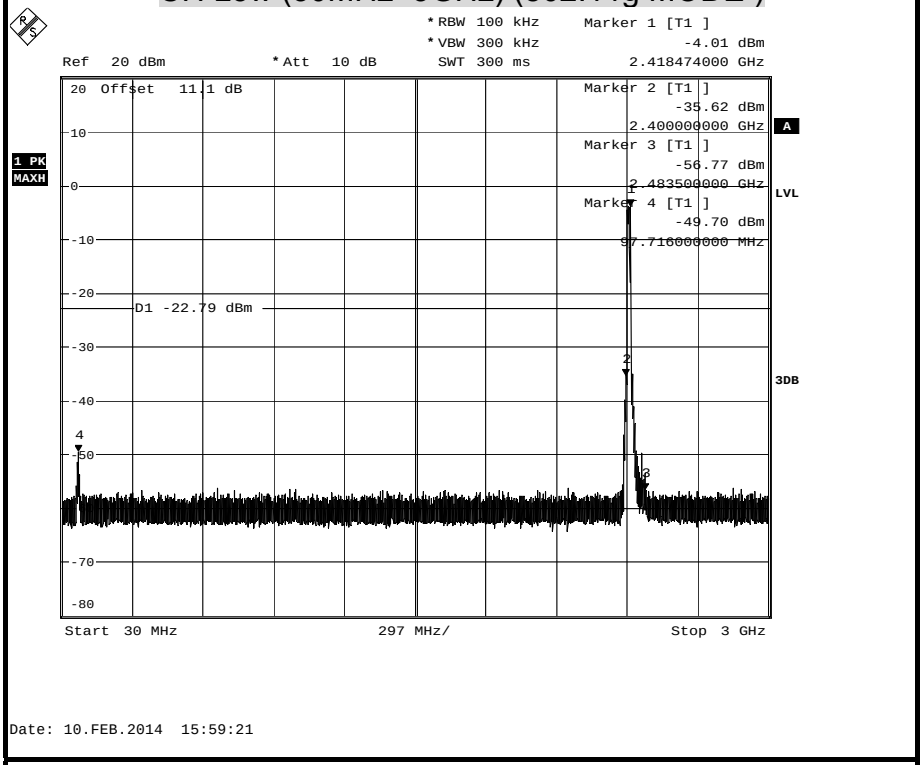


Date: 10.FEB.2014 15:47:57

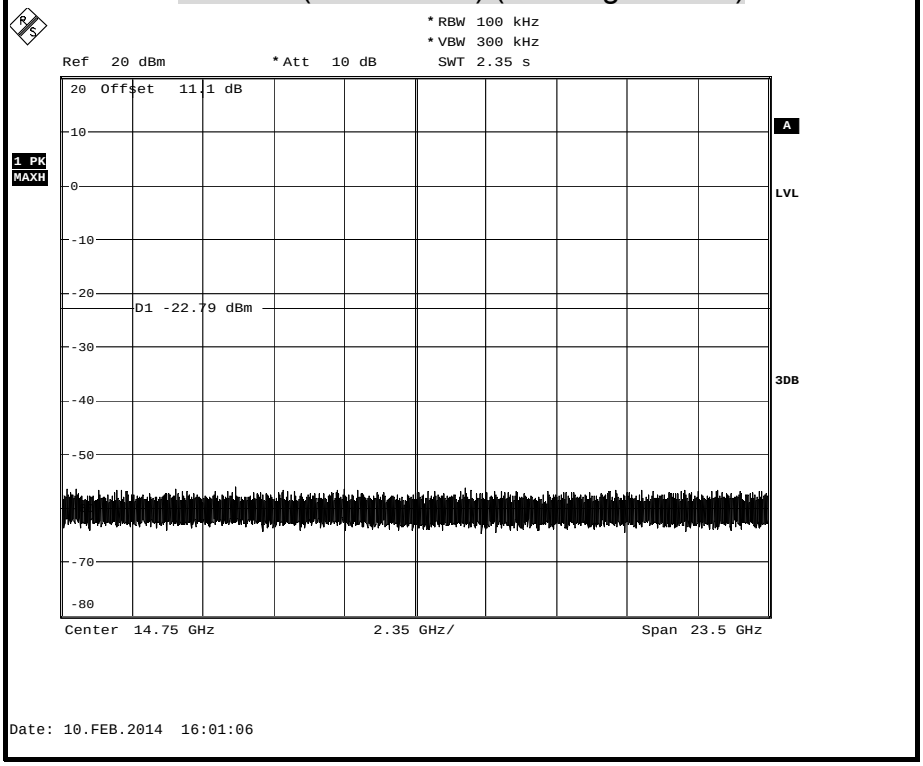
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(802.11g MODE)

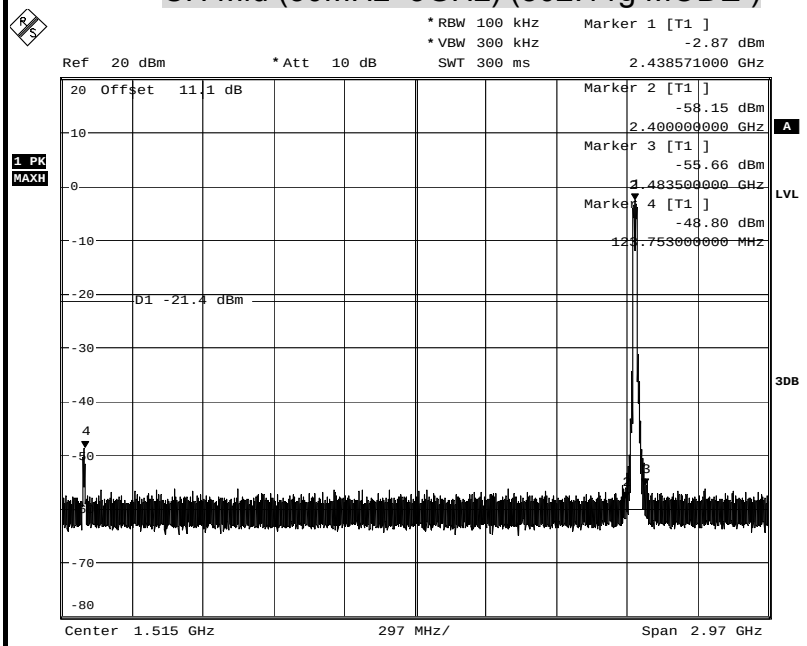
CH Low (30MHz~3GHz) (802.11g MODE)



CH Low (3~26.5GHz) (802.11g MODE)

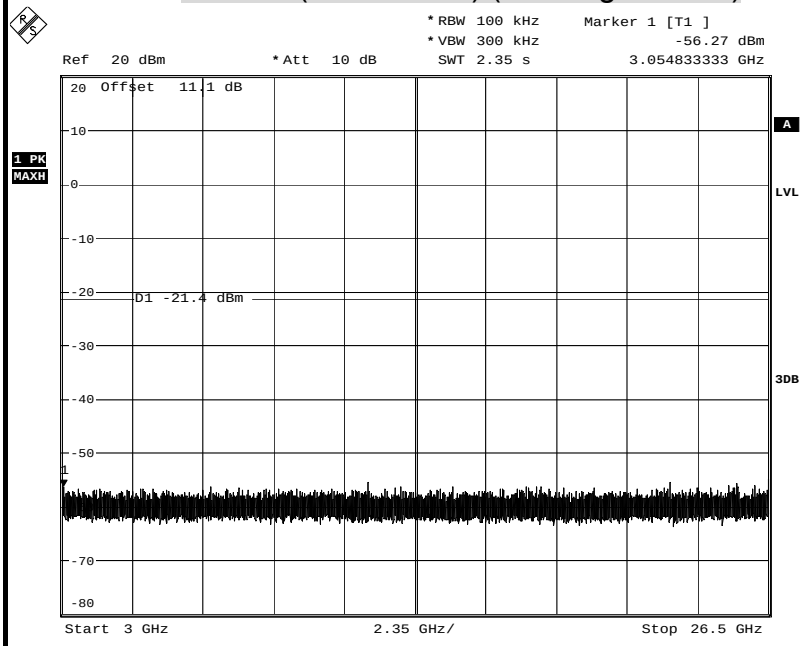


CH Mid (30MHz~3GHz) (802.11g MODE)



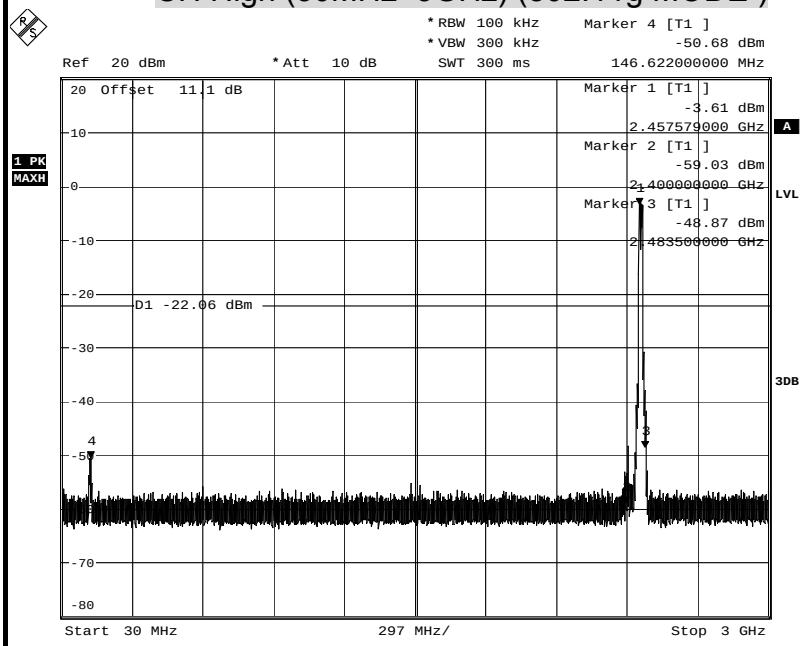
Date: 10.FEB.2014 16:03:04

CH Mid (3~26.5GHz) (802.11g MODE)



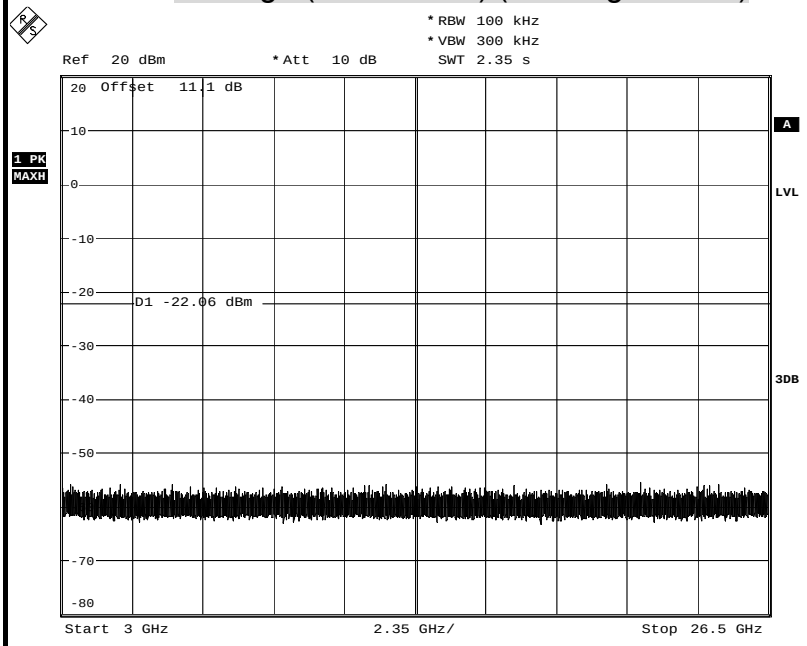
Date: 10.FEB.2014 16:01:58

CH High (30MHz~3GHz) (802.11g MODE)



Date: 10.FEB.2014 16:04:44

CH High (3~26.5GHz) (802.11g MODE)

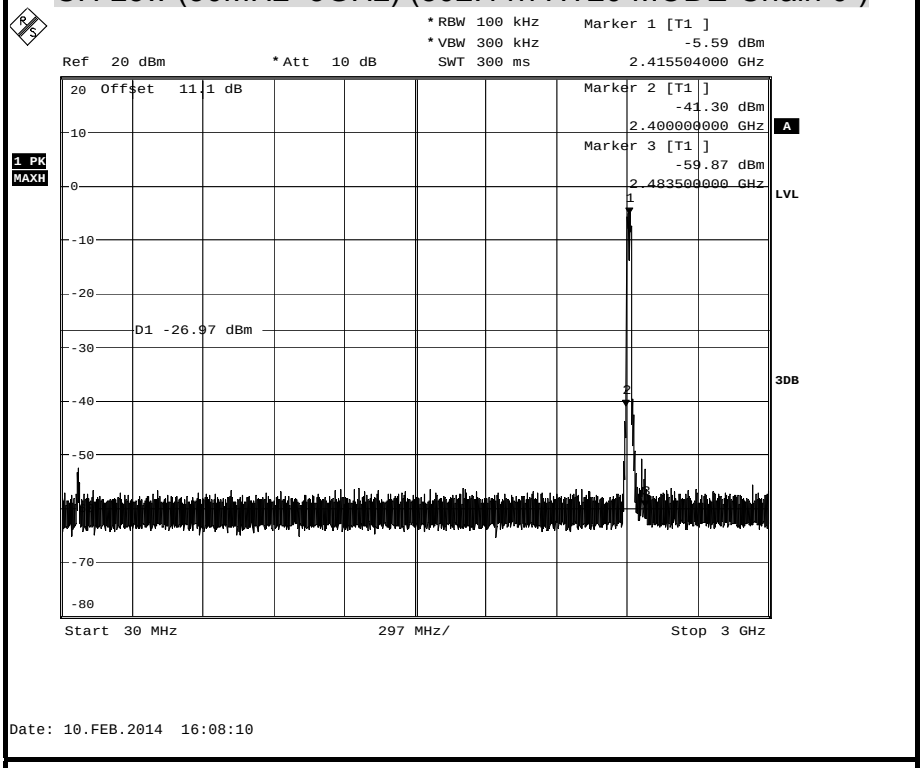


Date: 10.FEB.2014 16:05:36

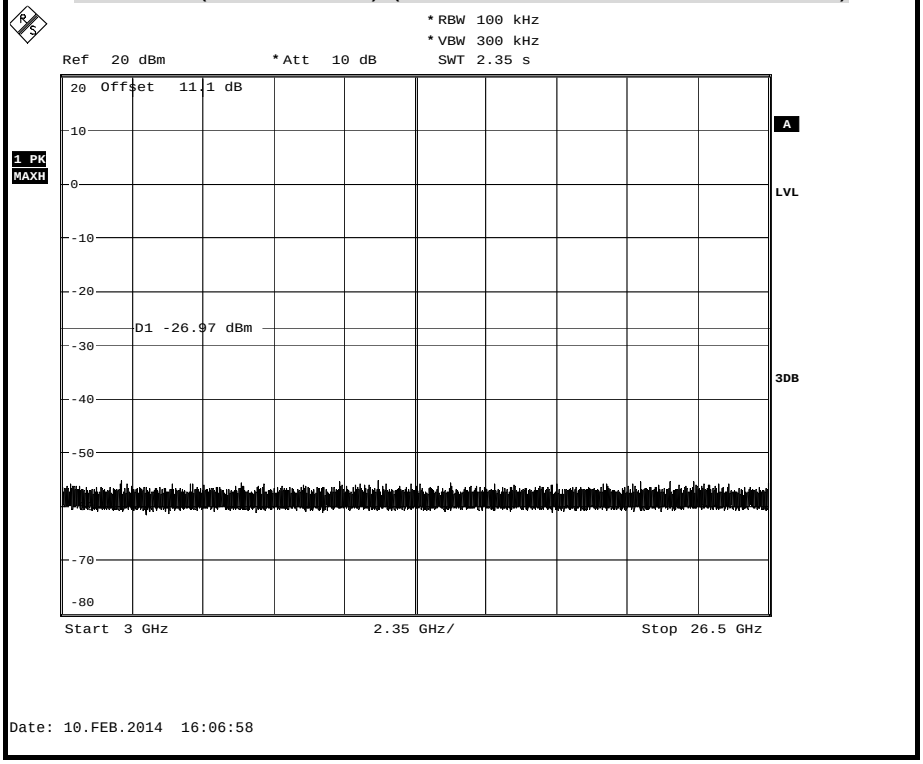
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(802.11n HT20 MODE)

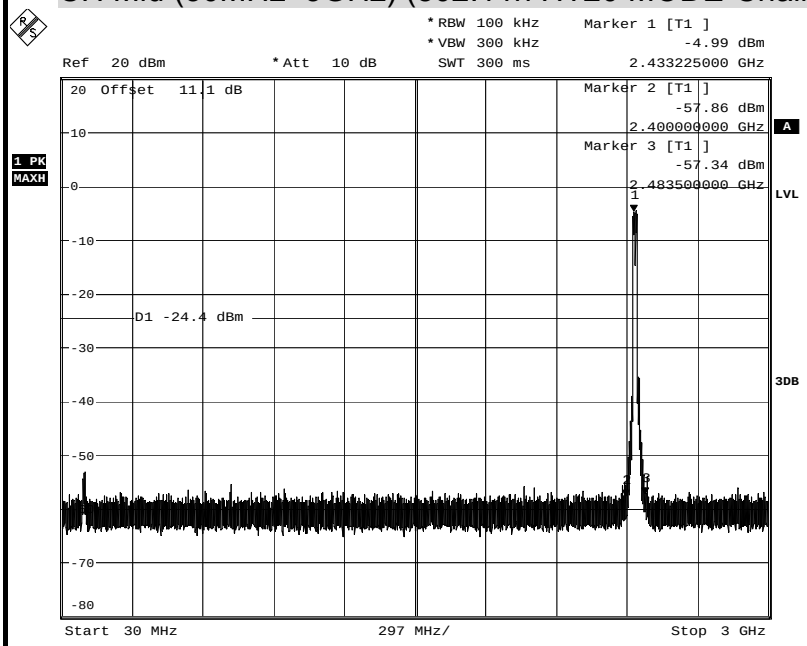
CH Low (30MHz~3GHz) (802.11n HT20 MODE-Chain 0)



CH Low (3~26.5GHz) (802.11n HT20 MODE-Chain 0)

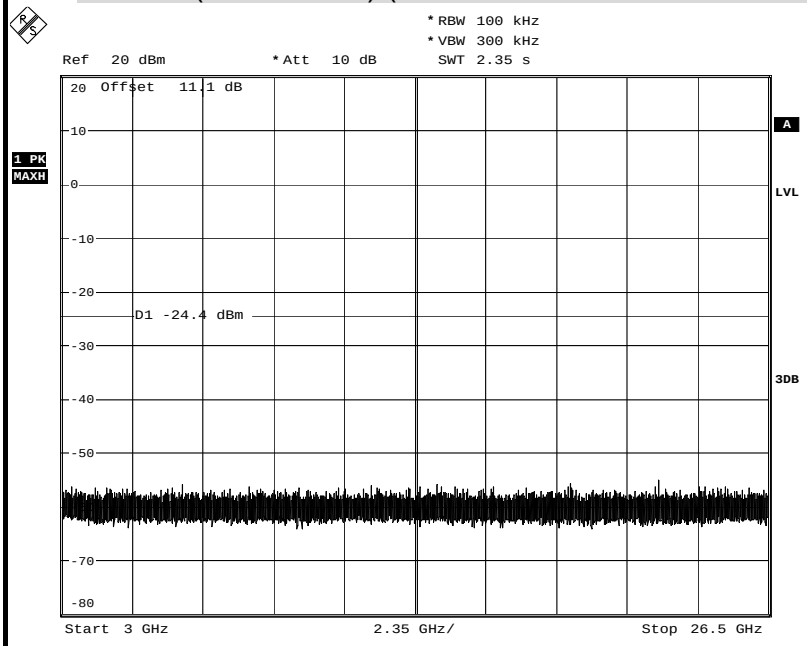


CH Mid (30MHz~3GHz) (802.11n HT20 MODE-Chain 0)



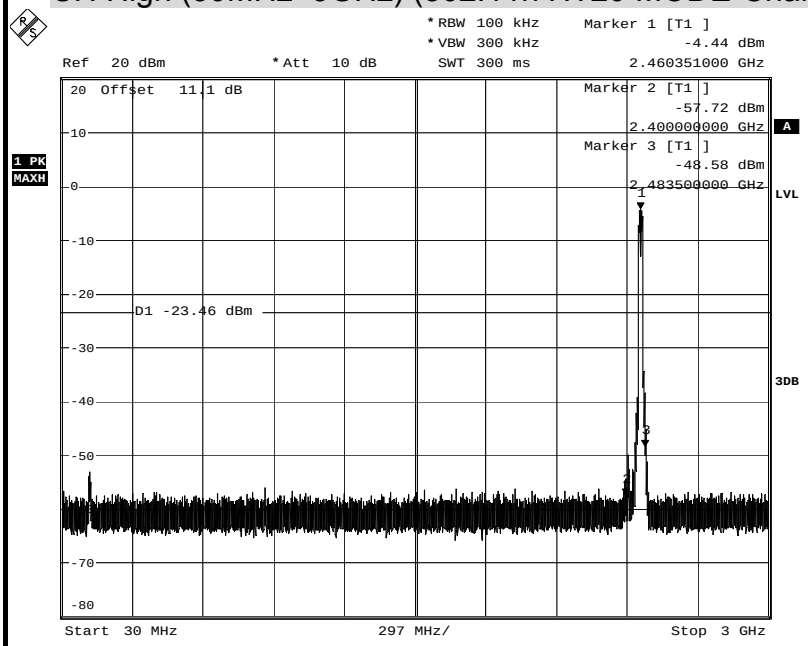
Date: 10.FEB.2014 16:09:12

CH Mid (3~26.5GHz) (802.11n HT20 MODE-Chain 0)



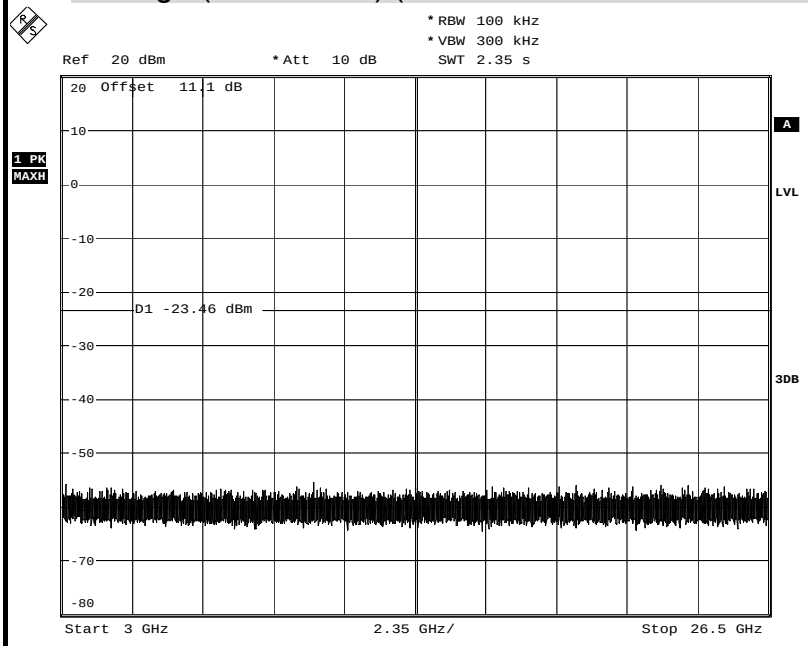
Date: 10.FEB.2014 16:09:53

CH High (30MHz~3GHz) (802.11n HT20 MODE-Chain 0)



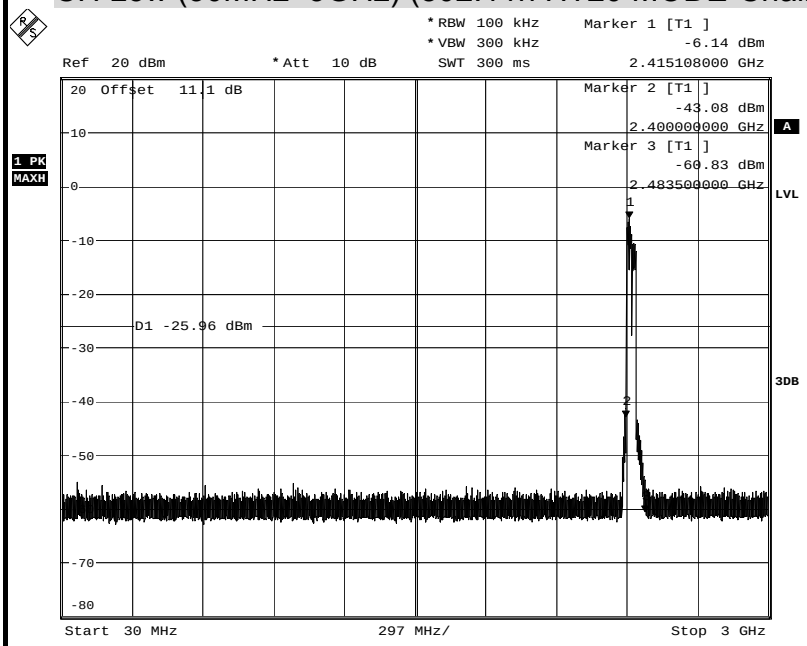
Date: 10.FEB.2014 16:11:38

CH High (3~26.5GHz) (802.11n HT20 MODE-Chain 0)

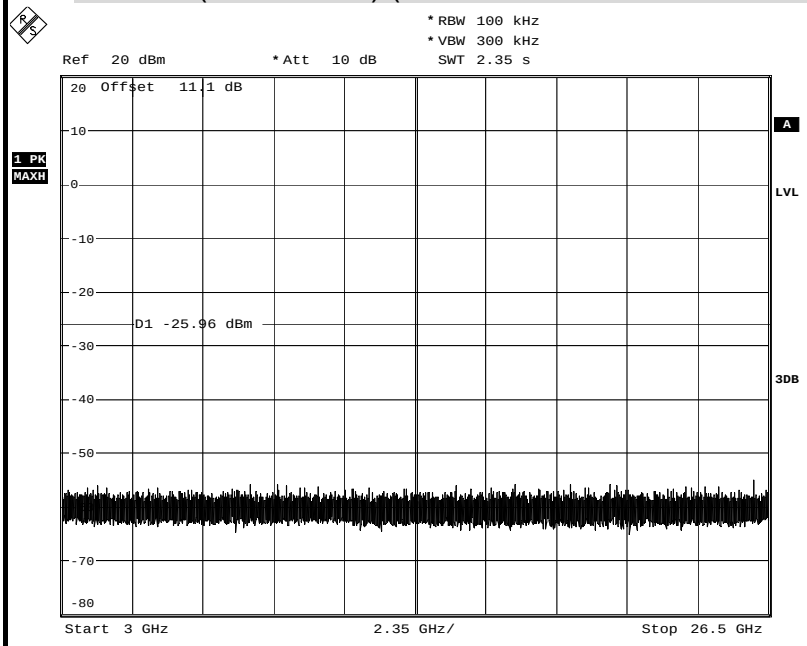


Date: 10.FEB.2014 16:10:46

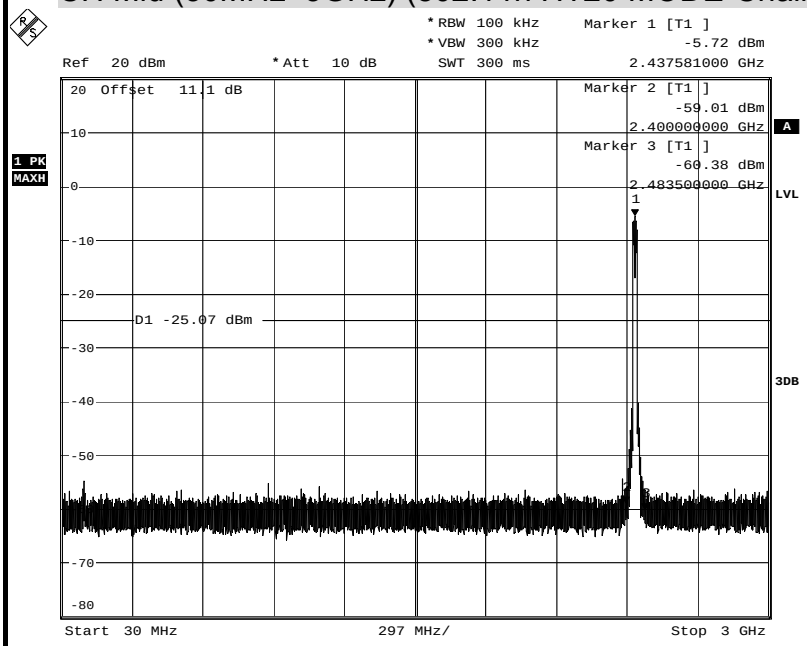
CH Low (30MHz~3GHz) (802.11n HT20 MODE-Chain 1)



CH Low (3~26.5GHz) (802.11n HT20 MODE-Chain 1)

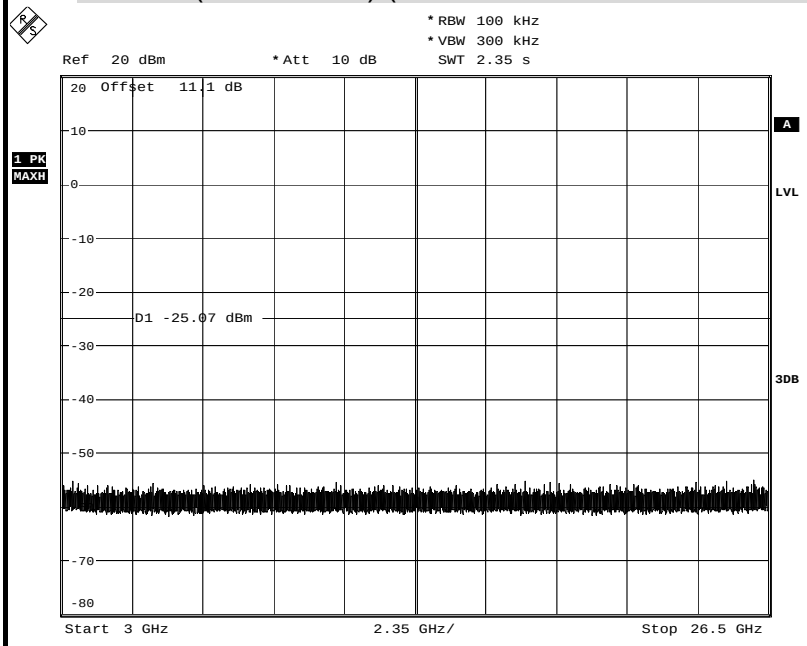


CH Mid (30MHz~3GHz) (802.11n HT20 MODE-Chain 1)



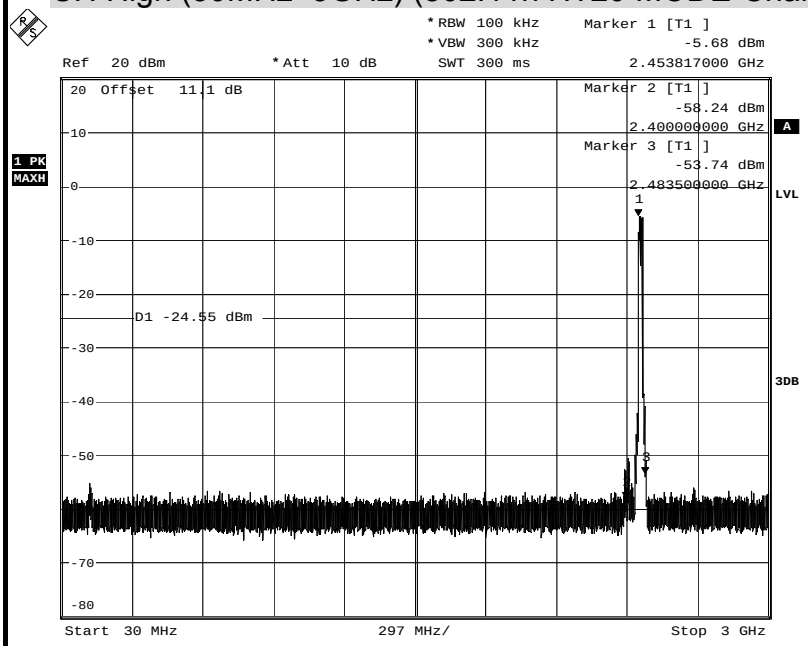
Date: 10.FEB.2014 16:30:22

CH Mid (3~26.5GHz) (802.11n HT20 MODE-Chain 1)



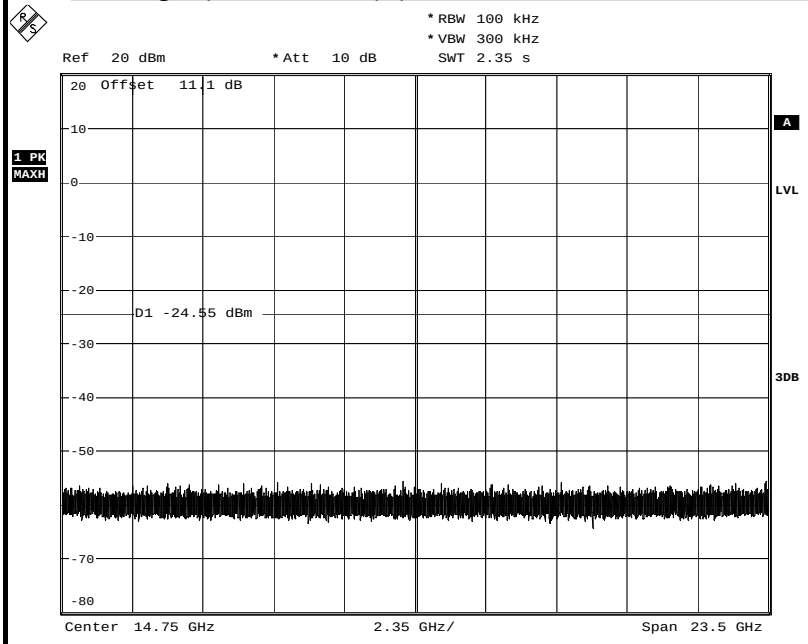
Date: 10.FEB.2014 16:29:22

CH High (30MHz~3GHz) (802.11n HT20 MODE-Chain 1)



Date: 10.FEB.2014 16:31:49

CH High (3~26.5GHz) (802.11n HT20 MODE-Chain 1)

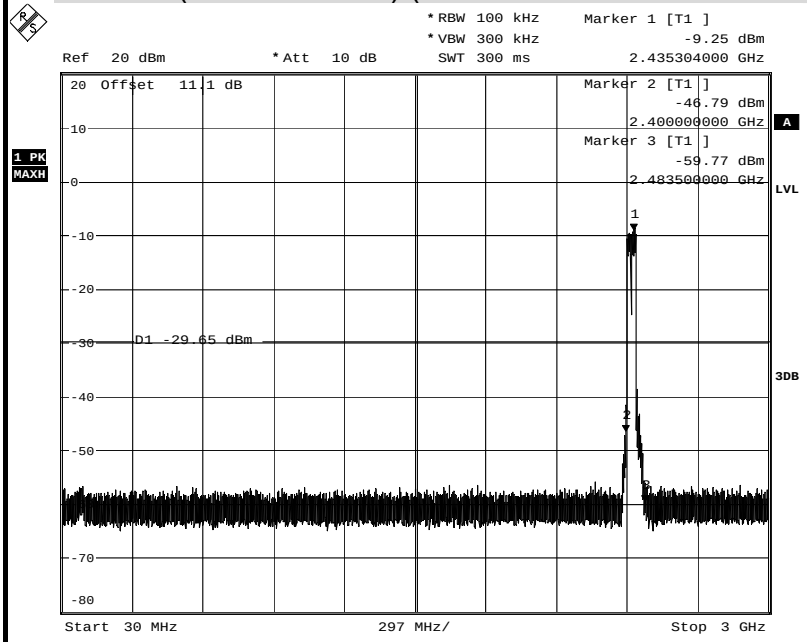


Date: 10.FEB.2014 16:32:43

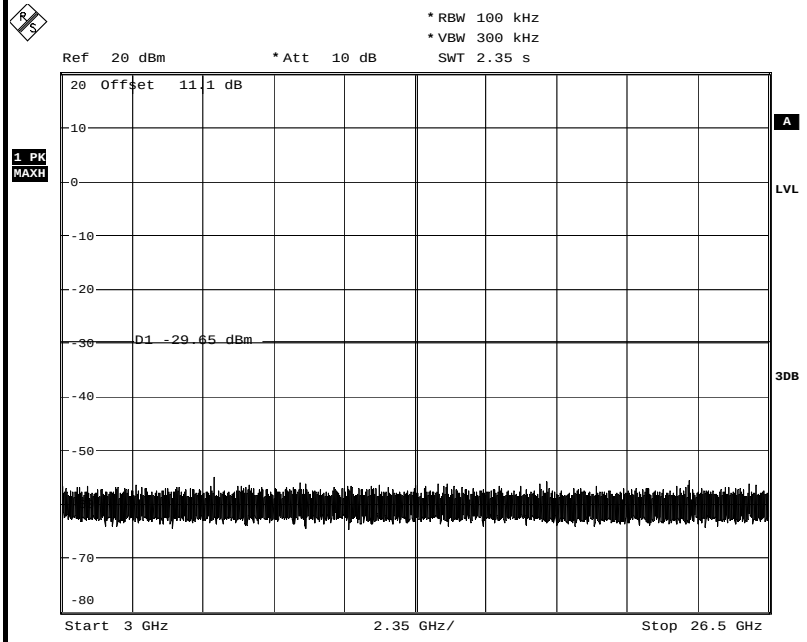
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(802.11n HT40 MODE)

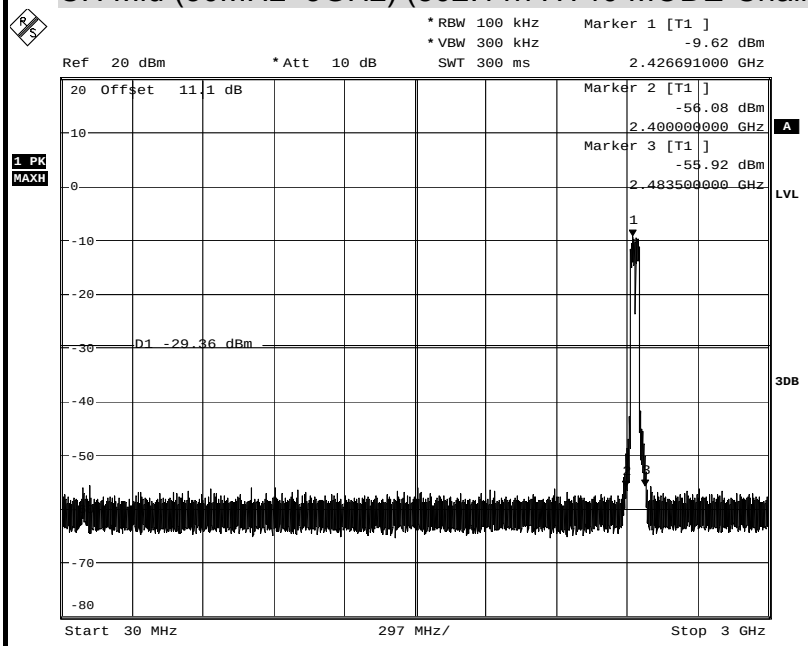
CH Low (30MHz~3GHz) (802.11n HT40 MODE-Chain 0)



CH Low (3~26.5GHz) (802.11n HT40 MODE-Chain 0)

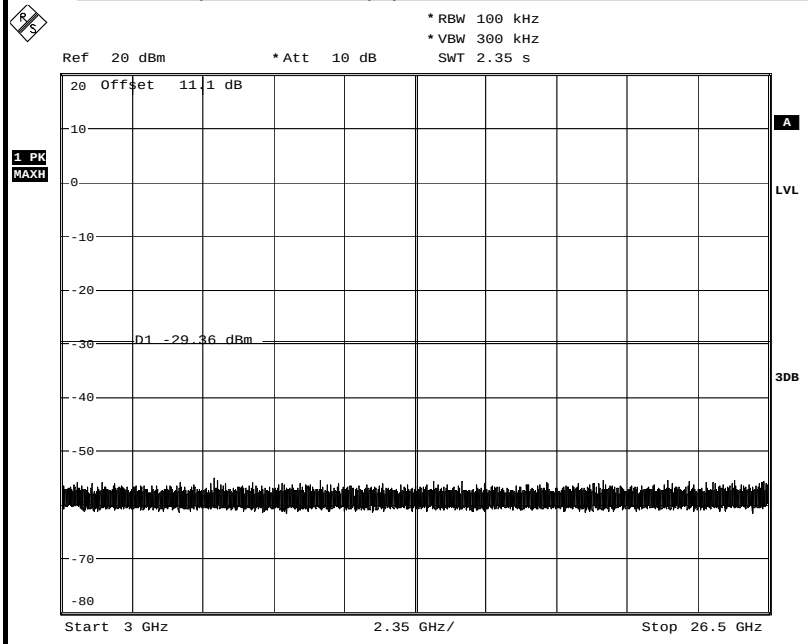


CH Mid (30MHz~3GHz) (802.11n HT40 MODE-Chain 0)



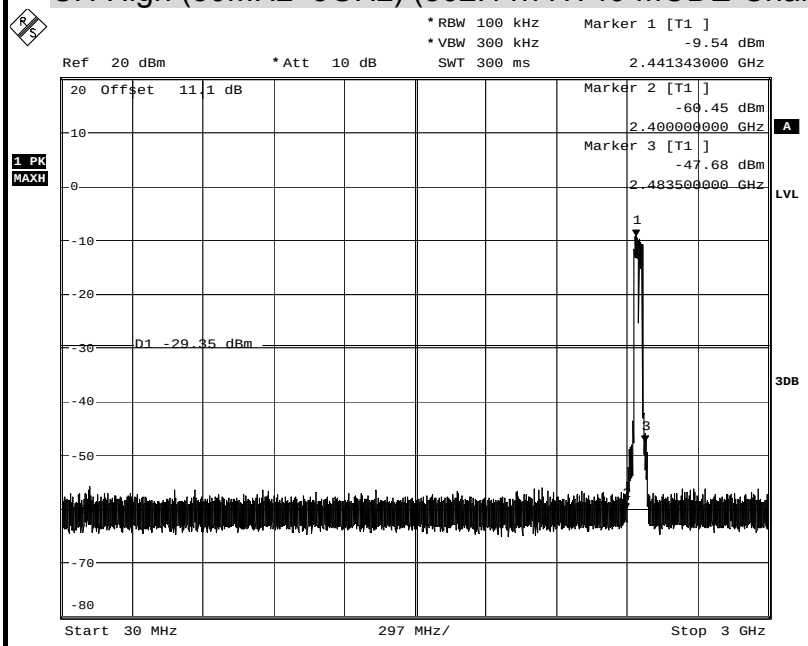
Date: 10.FEB.2014 16:16:17

CH Mid (3~26.5GHz) (802.11n HT40 MODE-Chain 0)



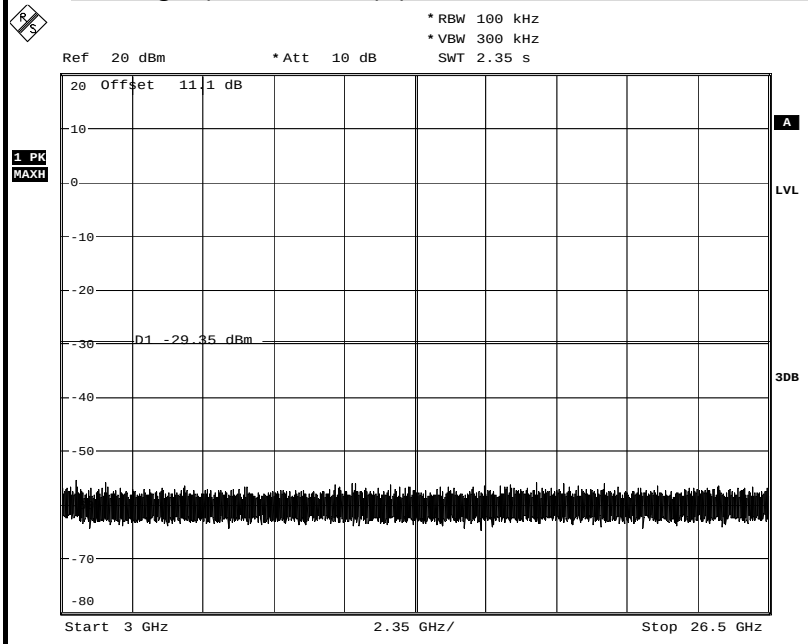
Date: 10.FEB.2014 16:15:14

CH High (30MHz~3GHz) (802.11n HT40 MODE-Chain 0)



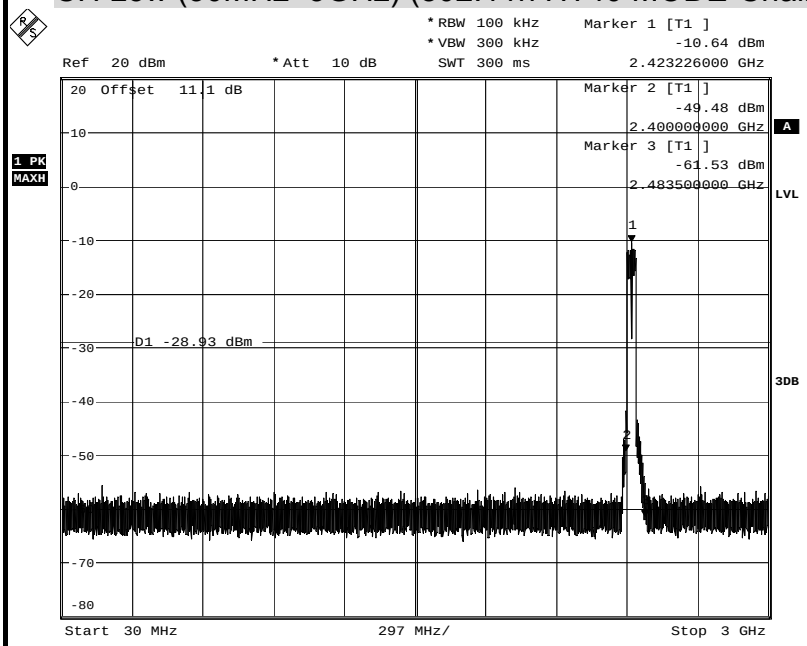
Date: 10.FEB.2014 16:17:22

CH High (3~26.5GHz) (802.11n HT40 MODE-Chain 0)



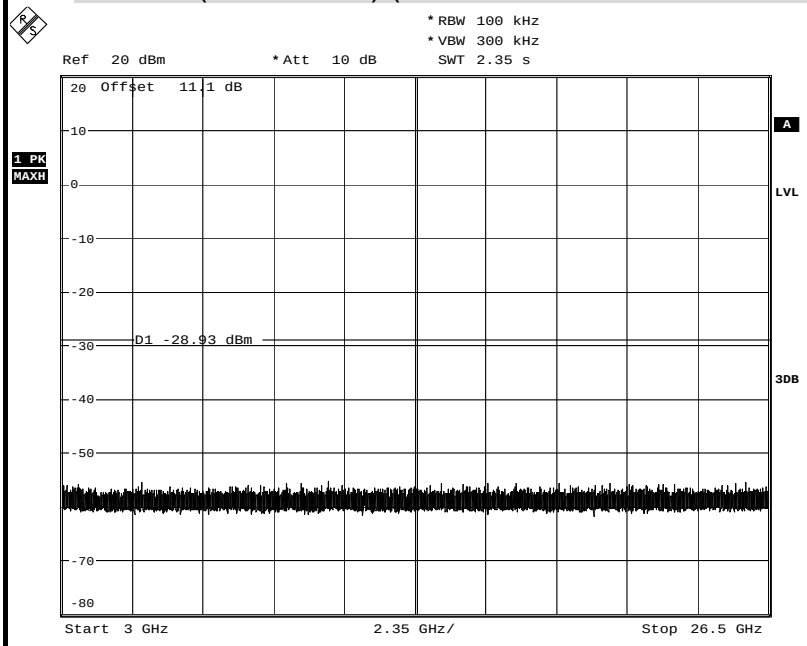
Date: 10.FEB.2014 16:18:05

CH Low (30MHz~3GHz) (802.11n HT40 MODE-Chain 1)



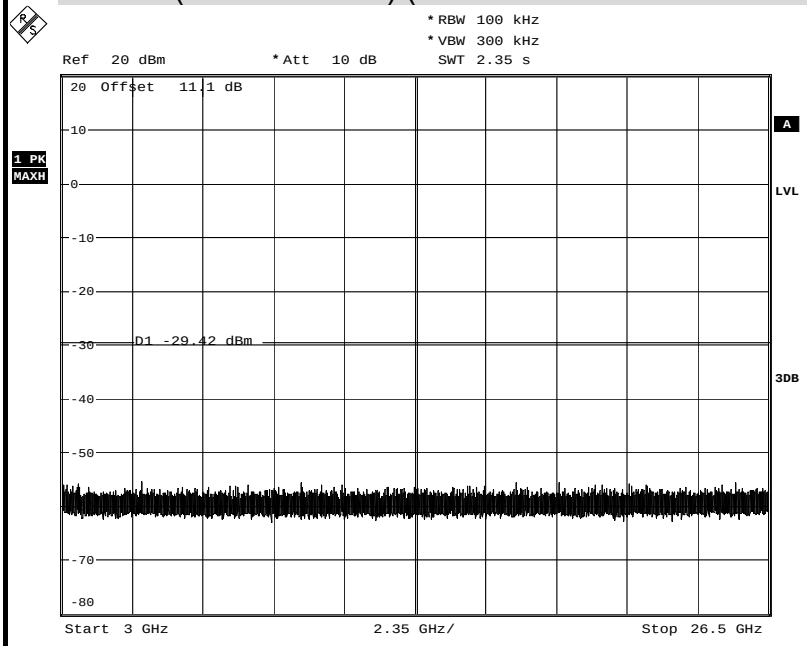
Date: 10.FEB.2014 16:25:57

CH Low (3~26.5GHz) (802.11n HT40 MODE-Chain 1)

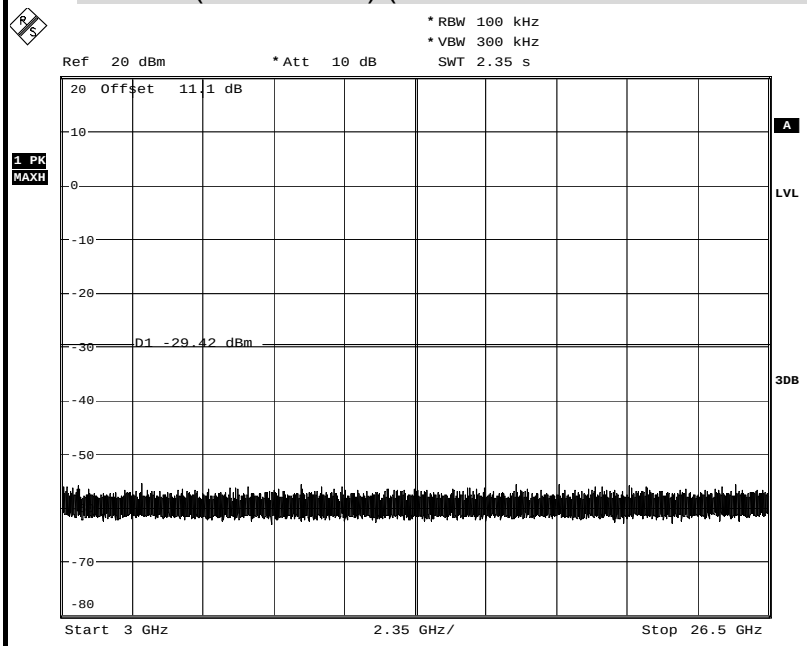


Date: 10.FEB.2014 16:24:49

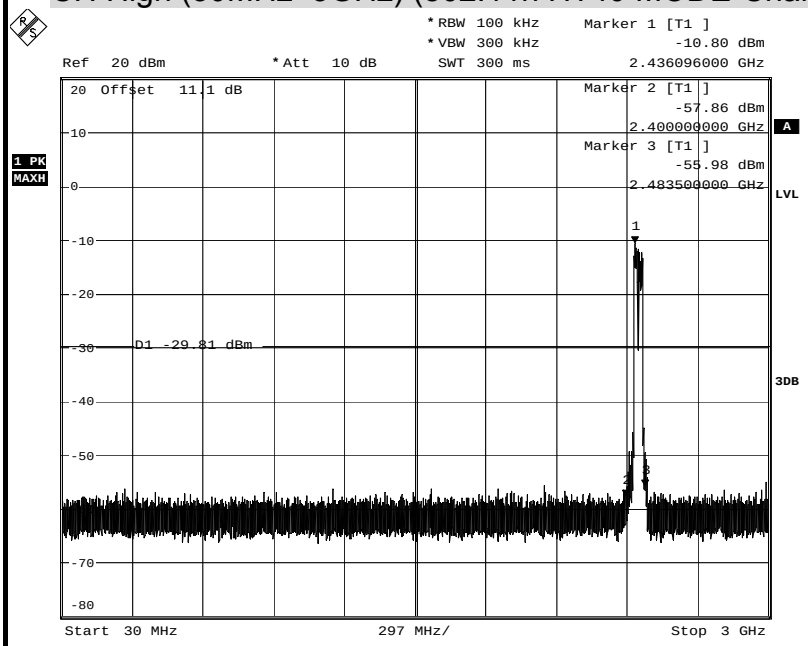
CH Mid (30MHz~3GHz) (802.11n HT40 MODE-Chain 1)



CH Mid (3~26.5GHz) (802.11n HT40 MODE-Chain 1)

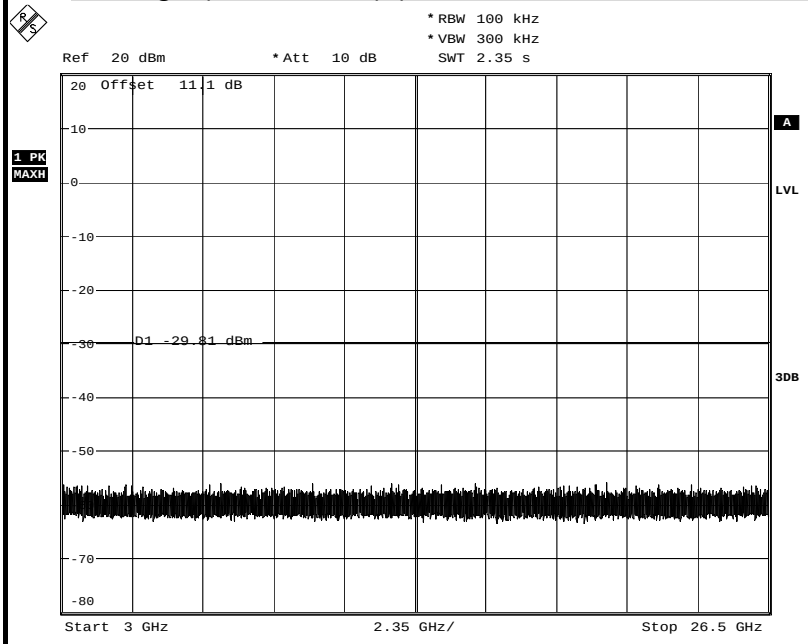


CH High (30MHz~3GHz) (802.11n HT40 MODE-Chain 1)



Date: 10.FEB.2014 16:21:05

CH High (3~26.5GHz) (802.11n HT40 MODE-Chain 1)



Date: 10.FEB.2014 16:19:55

8.6 RADIATED EMISSIONS

8.6.1 TRANSMITTER RADIATED SUPURIOUS EMSSIONS

LIMITS

§ 15.205 (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	2655 - 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 - 3338	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 MHz.

[2] Above 38.6

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

§ 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** 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.

§ 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

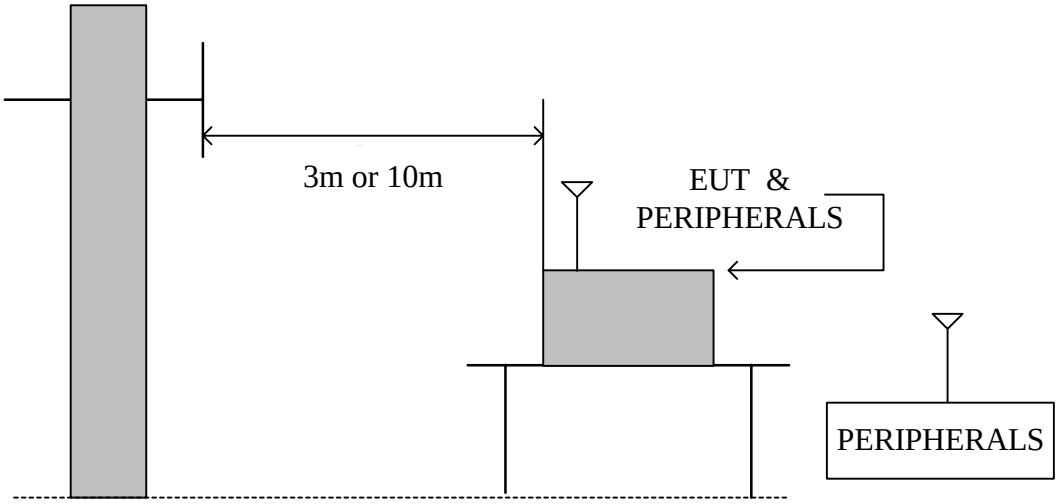
TEST EQUIPMENTS

The following test equipments are utilized in making the measurements contained in this report.

Open Area Test Site # 6				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
TYPE N COAXIAL CABLE	SUHNER	CHA9513	6	DEC. 18, 2014
BI-LOG Antenna	Sunol	JB1	A070506-2	SEP. 09, 2014
LOOP ANTENNA	EMCO	6502	8905-2356	JUN. 10, 2014
Pre-Amplifier	HP	8447F	2944A03817	DEC. 18, 2014
Pre-Amplifier	EMCI	EMC 012645	980097	DEC. 20, 2014
EMI Receiver	R&S	ESVS10	833206/012	JUN. 26, 2014
Horn Antenna	Com-Power	AH-118	071032	DEC. 05, 2014
3116 Double Ridge Antenna (40G)	ETS-LINDGREN	3116	00078900	DEC. 27, 2014
Turn Table	Yo Chen	001	----------	N.C.R.
Antenna Tower	AR	TP1000A	309874	N.C.R.
Controller	CT	SC101	----------	N.C.R.
RF Swicth	E-INSTRUMENT TELH LTD	ERS-180A	EC1204141	N.C.R
Power Meter	Anritsu	ML2487A	6K00003888	JUN. 24, 2014
Power Sensor	Anritsu	MA2491A	33265	JUN. 24, 2014
Temp./Humidity Chamber	K.SON	THS-M1	242	AUG. 08, 2014
DC Power Source	LOKO	DSP-5050	L1507009282	N.C.R
Spectrum Analyzer	R&S	FSU	200789	JUL. 01, 2014
Spectrum Analyzer	R&S	FSEM	830270/015	NCR
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP. 28, 2014
Signal Analyzer	ROHDE&SCHWARZ	FSV 40	101073	APR. 25, 2014

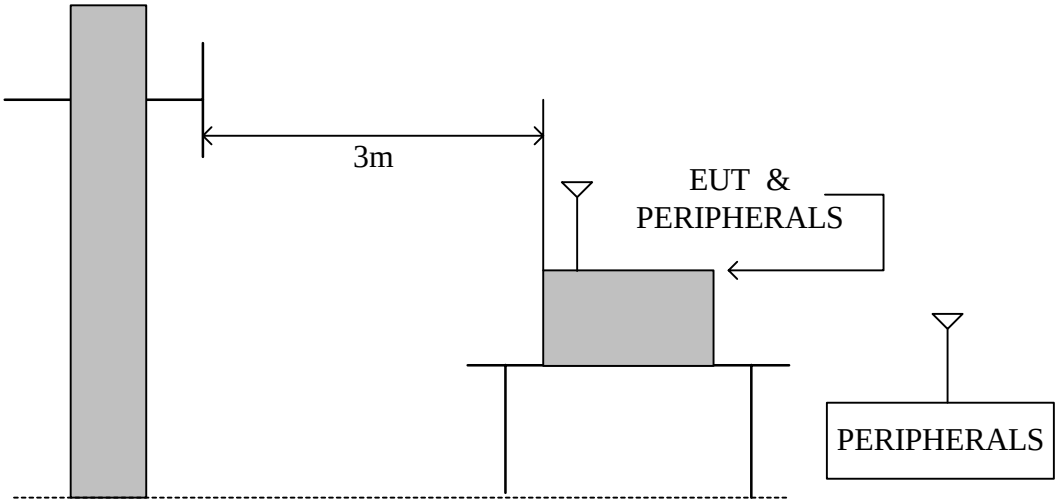
TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 to 1GHz.



Antenna Elevation Variable

The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



Antenna Elevation Variable

TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. White measuring the radiated emission below 1GHz, the EUT was set 3/10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. White measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. The tests were performed in accordance with KDB 558074 5.4 .

NOTE：

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.

3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4. No emission is found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)

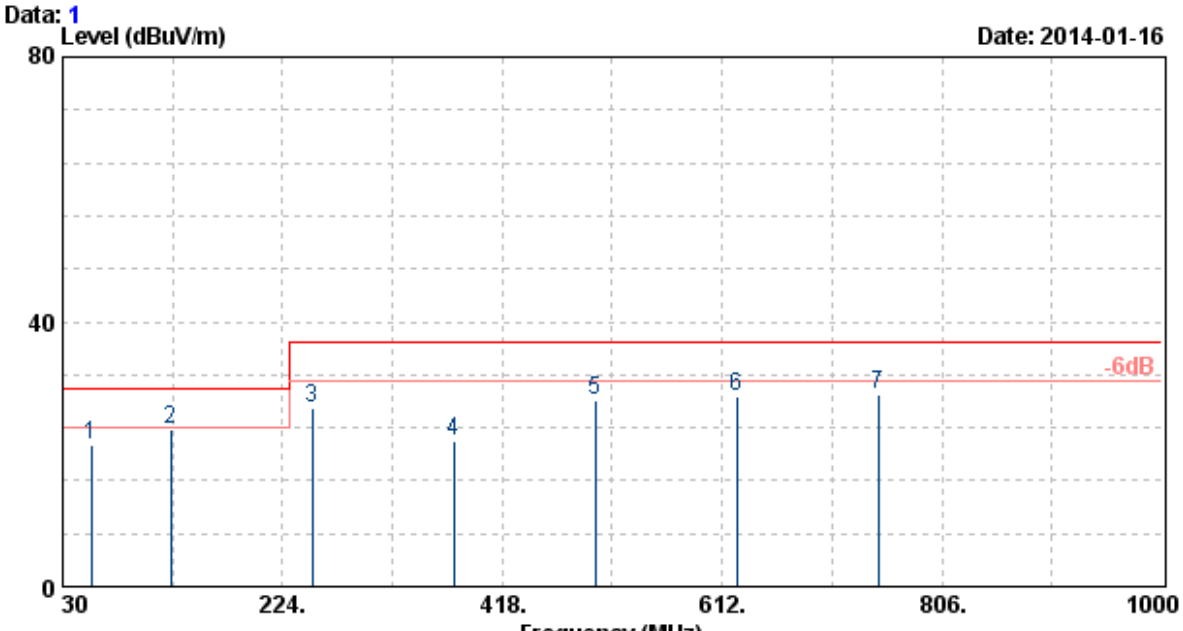
TEST RESULTS

No non-compliance noted.

8.6.2 WORST-CASE RADIATED EMISSION BELOW 1 GHz

Model No.	DWR-755	**Test Mode**	WAN mode
Environmental Conditions	23.5℃, 44% RH	**Resolution Bandwidth**	120 kHz
Antenna Pole	Vertical	**Antenna Distance**	10m
Detector Function:	Quasi-peak.	**Tested By**	Ted Huang
Test Site	OATS 5		

(The chart below shows the highest readings taken from the final data.)



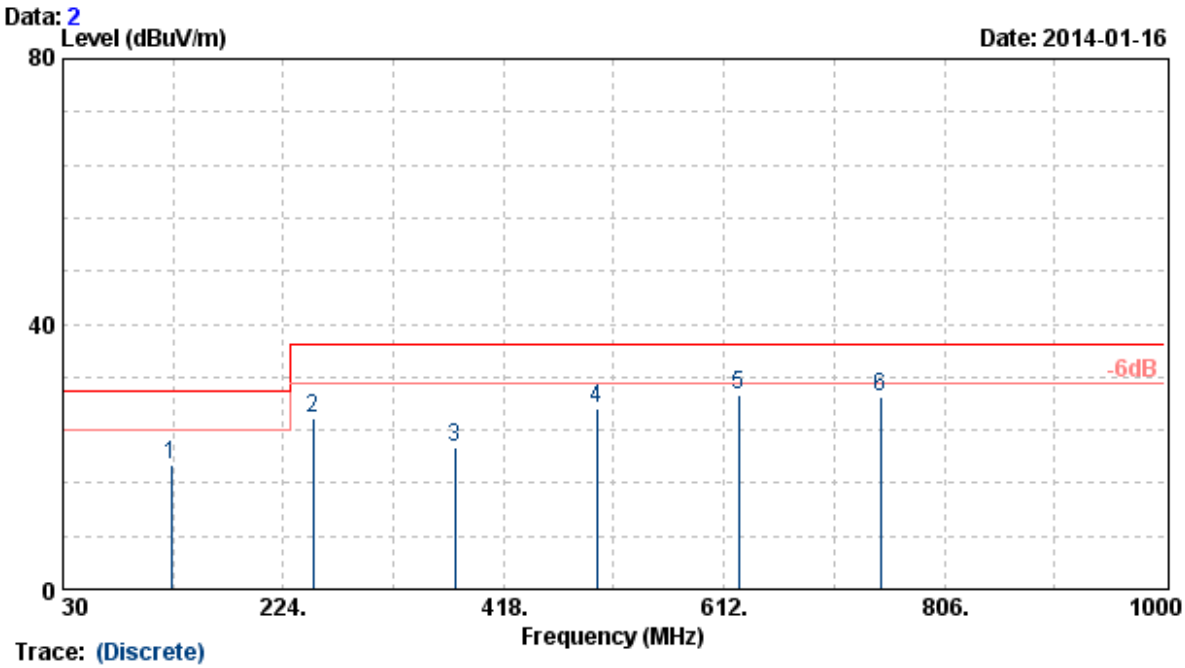
Trace: (Discrete)

Freq. MHz	Reading Level dBuV	Antenna Factor dB/m	Cable Loss dB	Measure Level dBuV/m	Limit dBuV/m	Over Limit dBuV/m	Detector
55.26	11.49	7.94	2.07	21.49	30.00	-8.51	QP
125.00	6.64	13.94	3.20	23.78	30.00	-6.22	QP
250.00	10.30	11.91	4.65	26.86	37.00	-10.14	QP
375.00	1.25	14.98	5.74	21.97	37.00	-15.03	QP
500.00	3.71	17.79	6.75	28.25	37.00	-8.75	QP
625.00	2.13	19.06	7.56	28.75	37.00	-8.25	QP
750.00	0.36	20.68	8.06	29.10	37.00	-7.90	QP

Note: 1. QP= Quasi-peak Reading.
2. The other emission levels were very low against the limit

Model No.	DWR-755	**Test Mode**	WAN mode
Environmental Conditions	23.5℃, 44% RH	**Resolution Bandwidth**	120 kHz
Antenna Pole	Horizontal	**Antenna Distance**	10m
Detector Function	Quasi-peak.	**Tested By**	Ted Huang
Test Site	OATS 5		

(The chart below shows the highest readings taken from the final data.)



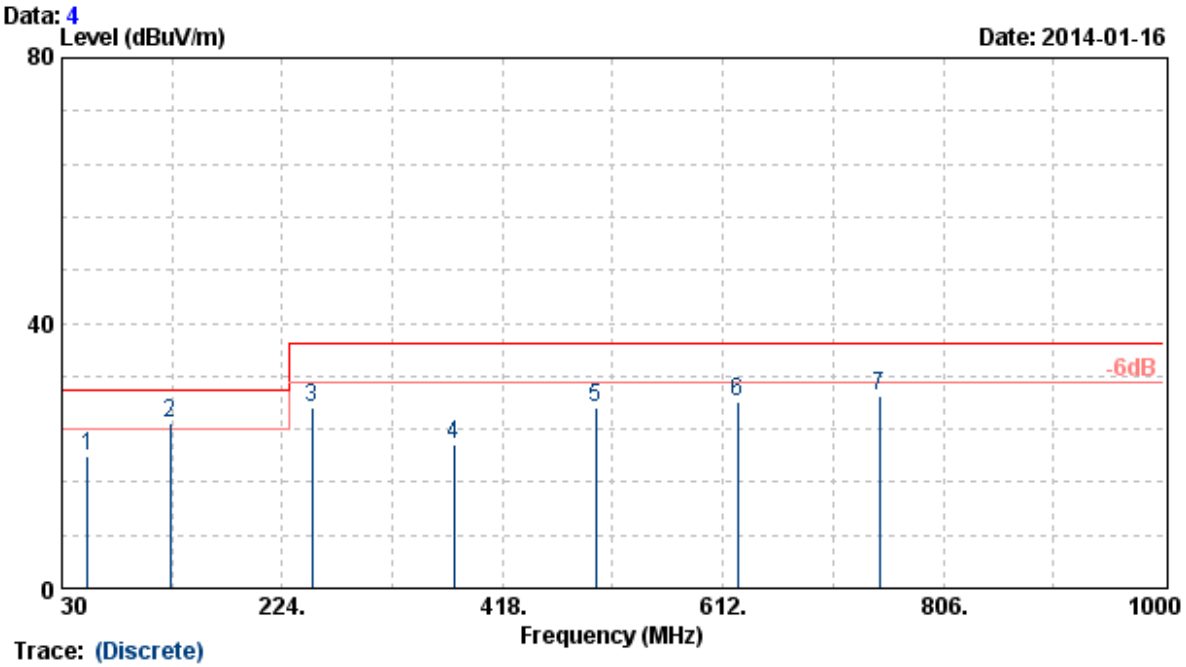
Trace: (Discrete)

Freq. MHz	Reading Level dBuV	Antenna Factor dB/m	Cable Loss dB	Measure Level dBuV/m	Limit dBuV/m	Over Limit dBuV/m	Detector
125.00	1.66	13.94	3.20	18.80	30.00	-11.20	QP
250.00	9.20	11.91	4.65	25.76	37.00	-11.24	QP
375.00	0.76	14.98	5.74	21.48	37.00	-15.52	QP
500.00	2.80	17.79	6.75	27.34	37.00	-9.66	QP
625.00	2.73	19.06	7.56	29.35	37.00	-7.65	QP
750.00	0.21	20.68	8.06	28.95	37.00	-8.05	QP

Note: 1. QP= Quasi-peak Reading.
2. The other emission levels were very low against the limit

Model No.	DWR-755	**Test Mode**	3G mode
Environmental Conditions	23.5℃, 44% RH	**Resolution Bandwidth**	120 kHz
Antenna Pole	Vertical	**Antenna Distance**	10m
Detector Function:	Quasi-peak.	**Tested By**	Ted Huang
Test Site	OATS 5		

(The chart below shows the highest readings taken from the final data.)



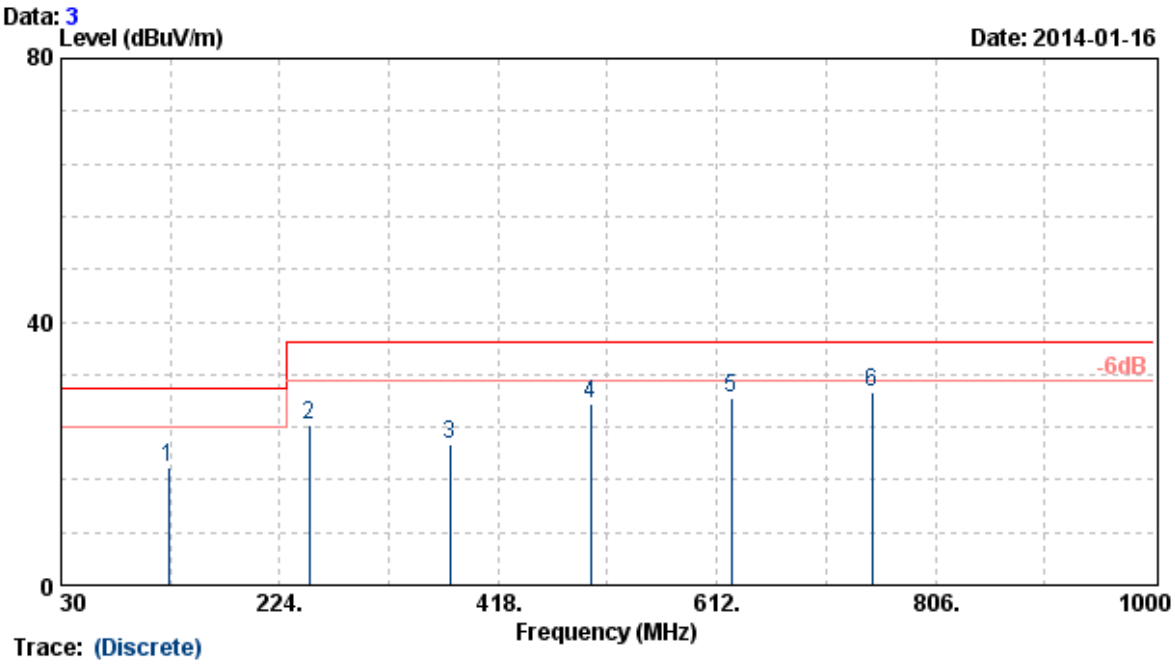
Trace: (Discrete)

Freq. MHz	Reading Level dBuV	Antenna Factor dB/m	Cable Loss dB	Measure Level dBuV/m	Limit dBuV/m	Over Limit dBuV/m	Detector
53.00	9.81	7.95	2.04	19.80	30.00	-10.20	QP
125.00	7.76	13.94	3.20	24.90	30.00	-5.10	QP
250.00	10.70	11.91	4.65	27.26	37.00	-9.74	QP
375.00	0.98	14.98	5.74	21.70	37.00	-15.30	QP
500.00	2.83	17.79	6.75	27.37	37.00	-9.63	QP
625.00	1.56	19.06	7.56	28.18	37.00	-8.82	QP
750.00	0.36	20.68	8.06	29.10	37.00	-7.90	QP

Note: 1. QP= Quasi-peak Reading.
2. The other emission levels were very low against the limit

Model No.	DWR-755	**Test Mode**	3G mode
Environmental Conditions	23.5℃, 44% RH	**Resolution Bandwidth**	120 kHz
Antenna Pole	Horizontal	**Antenna Distance**	10m
Detector Function	Quasi-peak.	**Tested By**	Ted Huang
Test Site	OATS 5		

(The chart below shows the highest readings taken from the final data.)



Trace: (Discrete)

Freq. MHz	Reading Level dBuV	Antenna Factor dB/m	Cable Loss dB	Measure Level dBuV/m	Limit dBuV/m	Over Limit dBuV/m	Detector
125.00	0.78	13.94	3.20	17.92	30.00	-12.08	QP
250.00	7.70	11.91	4.65	24.26	37.00	-12.74	QP
375.00	0.75	14.98	5.74	21.47	37.00	-15.53	QP
500.00	3.04	17.79	6.75	27.58	37.00	-9.42	QP
625.00	1.93	19.06	7.56	28.55	37.00	-8.45	QP
750.00	0.57	20.68	8.06	29.31	37.00	-7.69	QP

Note: 1. QP= Quasi-peak Reading.
2. The other emission levels were very low against the limit

8.6.3 TRANSMITTER RADIATED EMISSION ABOVE 1 GHz

Product Name	HSPA+ 3G VPN Routerr	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11b TX (CH Low)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11b mode / CH Low				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1626.19	62.56	27.63	2.36	44.71	0.30	48.15	74.00	-25.85	P
*	1626.19	56.79	27.63	2.36	44.71	0.30	42.38	54.00	-11.62	A
*	4823.97	59.77	33.47	3.84	45.07	0.40	52.40	74.00	-21.60	P
*	4823.97	48.78	33.47	3.84	45.07	0.40	41.41	54.00	-12.59	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

	TX / IEEE 802.11b mode / CH Low				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1534.15	62.35	26.95	2.29	44.67	0.30	47.22	74.00	-26.78	P
*	1534.15	52.53	26.95	2.29	44.67	0.30	37.40	54.00	-16.60	A
*	4824.12	60.93	33.47	3.84	45.07	0.40	53.56	74.00	-20.44	P
*	4824.12	50.70	33.47	3.84	45.07	0.40	43.33	54.00	-10.67	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	HSPA+ 3G VPN Router	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11b TX (CH Middle)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11b mode / CH Middle				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1625.17	66.72	27.63	2.36	44.71	0.30	52.30	74.00	-21.70	P
*	1625.17	61.28	27.63	2.36	44.71	0.30	46.86	54.00	-7.14	A
*	4874.08	58.47	33.65	3.85	45.13	0.40	51.24	74.00	-22.76	P
*	4874.08	48.93	33.65	3.85	45.13	0.40	41.70	54.00	-12.30	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

I

	TX / IEEE 802.11b mode / CH Middle				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1534.93	60.42	26.96	2.29	44.67	0.30	45.29	74.00	-28.71	P
*	1534.93	51.63	26.96	2.29	44.67	0.30	36.50	54.00	-17.50	A
*	4874.00	59.93	33.65	3.85	45.13	0.40	52.70	74.00	-21.30	P
*	4874.00	48.72	33.65	3.85	45.13	0.40	41.49	54.00	-12.51	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	HSPA+ 3G VPN Router	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11b TX (CH High)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11b mode / CH High				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1625.84	66.53	27.63	2.36	44.71	0.30	52.11	74.00	-21.89	P
*	1625.84	62.53	27.63	2.36	44.71	0.30	48.11	54.00	-5.89	A
*	4923.73	58.72	33.83	3.86	45.18	0.40	51.63	74.00	-22.37	P
*	4923.73	48.49	33.83	3.86	45.18	0.40	41.40	54.00	-12.60	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

	TX / IEEE 802.11b mode / CH High				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1534.08	59.98	26.95	2.29	44.67	0.30	44.85	74.00	-29.15	P
*	1534.08	49.21	26.95	2.29	44.67	0.30	34.08	54.00	-19.92	A
*	4923.98	58.72	33.83	3.86	45.18	0.40	51.63	74.00	-22.37	P
*	4923.98	48.94	33.83	3.86	45.18	0.40	41.85	54.00	-12.15	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	HSPA+ 3G VPN Router	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11g TX (CH Low)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11g mode / CH Low				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1625.72	63.48	27.63	2.36	44.71	0.30	49.06	74.00	-24.94	P
*	1625.72	57.38	27.63	2.36	44.71	0.30	42.96	54.00	-11.04	A
*	4824.13	59.52	33.47	3.84	45.07	0.40	52.15	74.00	-21.85	P
*	4824.13	48.38	33.47	3.84	45.07	0.40	41.01	54.00	-12.99	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

	TX / IEEE 802.11g mode / CH Low				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1534.13	63.75	26.95	2.29	44.67	0.30	48.62	74.00	-25.38	P
*	1534.13	53.39	26.95	2.29	44.67	0.30	38.26	54.00	-15.74	A
*	4824.20	60.24	33.47	3.84	45.07	0.40	52.87	74.00	-21.13	P
*	4824.20	49.67	33.47	3.84	45.07	0.40	42.30	54.00	-11.70	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	HSPA+ 3G VPN Router	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11g TX (CH Middle)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11g mode / CH Middle				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1625.19	63.52	27.63	2.36	44.71	0.30	49.10	74.00	-24.90	P
*	1625.19	58.72	27.63	2.36	44.71	0.30	44.30	54.00	-9.70	A
*	4874.08	60.08	33.65	3.85	45.13	0.40	52.85	74.00	-21.15	P
*	4874.08	49.67	33.65	3.85	45.13	0.40	42.44	54.00	-11.56	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

	TX / IEEE 802.11g mode / CH Middle				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1534.48	64.52	26.96	2.29	44.67	0.30	49.39	74.00	-24.61	P
*	1534.48	55.72	26.96	2.29	44.67	0.30	40.59	54.00	-13.41	A
*	4874.06	60.19	33.65	3.85	45.13	0.40	52.96	74.00	-21.04	P
*	4874.06	49.89	33.65	3.85	45.13	0.40	42.66	54.00	-11.34	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	HSPA+ 3G VPN Router	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11g TX (CH High)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11g mode / CH High				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1625.57	64.52	27.63	2.36	44.71	0.30	50.10	74.00	-23.90	P
*	1625.57	59.41	27.63	2.36	44.71	0.30	44.99	54.00	-9.01	A
*	4923.96	59.78	33.83	3.86	45.18	0.40	52.69	74.00	-21.31	P
*	4923.96	48.36	33.83	3.86	45.18	0.40	41.27	54.00	-12.73	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

	TX / IEEE 802.11g mode / CH High				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1534.60	63.47	26.96	2.29	44.67	0.30	48.34	74.00	-25.66	P
	1534.60	54.29	26.96	2.29	44.67	0.30	39.16	54.00	-14.84	A
*	4924.02	60.11	33.83	3.86	45.18	0.40	53.02	74.00	-20.98	P
*	4924.02	49.72	33.83	3.86	45.18	0.40	42.63	54.00	-11.37	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	HSPA+ 3G VPN Router	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11n HT20 TX (CH Low)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11n HT20 mode / CH Low				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1626.27	63.48	27.63	2.36	44.71	0.30	49.07	74.00	-24.93	P
*	1626.27	57.28	27.63	2.36	44.71	0.30	42.87	54.00	-11.13	A
*	4824.24	58.93	33.47	3.84	45.07	0.40	51.56	74.00	-22.44	P
*	4824.24	48.35	33.47	3.84	45.07	0.40	40.98	54.00	-13.02	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

	TX / IEEE 802.11n HT20 mode / CH Low				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1533.92	64.25	26.95	2.29	44.67	0.30	49.12	74.00	-24.88	P
*	1533.92	54.93	26.95	2.29	44.67	0.30	39.80	54.00	-14.20	A
*	4824.08	60.58	33.47	3.84	45.07	0.40	53.21	74.00	-20.79	P
*	4824.08	49.38	33.47	3.84	45.07	0.40	42.01	54.00	-11.99	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	HSPA+ 3G VPN Router	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11n HT20 TX (CH Middle)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11n HT20 mode / CH Middle				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1625.14	64.52	27.63	2.36	44.71	0.30	50.10	74.00	-23.90	P
*	1625.14	58.71	27.63	2.36	44.71	0.30	44.29	54.00	-9.71	A
*	4874.28	59.01	33.65	3.85	45.13	0.40	51.78	74.00	-22.22	P
*	4874.28	48.69	33.65	3.85	45.13	0.40	41.46	54.00	-12.54	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

	TX / IEEE 802.11n HT20 mode / CH Middle				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1533.59	65.13	26.95	2.29	44.67	0.30	49.99	74.00	-24.01	P
*	1533.59	57.62	26.95	2.29	44.67	0.30	42.48	54.00	-11.52	A
*	4874.13	60.48	33.65	3.85	45.13	0.40	53.25	74.00	-20.75	P
*	4874.13	49.47	33.65	3.85	45.13	0.40	42.24	54.00	-11.76	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	HSPA+ 3G VPN Router	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11n HT20 TX (CH High)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11n HT20 mode / CH High				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1626.24	65.02	27.63	2.36	44.71	0.30	50.61	74.00	-23.39	P
*	1626.24	60.71	27.63	2.36	44.71	0.30	46.30	54.00	-7.70	A
*	4924.37	59.46	33.83	3.86	45.18	0.40	52.37	74.00	-21.63	P
*	4924.37	47.93	33.83	3.86	45.18	0.40	40.84	54.00	-13.16	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

	TX / IEEE 802.11n HT20 mode / CH High				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1534.08	65.28	26.95	2.29	44.67	0.30	50.15	74.00	-23.85	P
*	1534.08	57.63	26.95	2.29	44.67	0.30	42.50	54.00	-11.50	A
*	4924.11	60.81	33.83	3.86	45.18	0.40	53.72	74.00	-20.28	P
*	4924.11	50.10	33.83	3.86	45.18	0.40	43.01	54.00	-10.99	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	HSPA+ 3G VPN Router	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11n HT40 TX (CH Low)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11n HT40 mode / CH Low				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1625.83	63.48	27.63	2.36	44.71	0.30	49.06	74.00	-24.94	P
*	1625.83	57.63	27.63	2.36	44.71	0.30	43.21	54.00	-10.79	A
*	4843.59	59.47	33.54	3.84	45.09	0.40	52.16	74.00	-21.84	P
*	4843.59	48.60	33.54	3.84	45.09	0.40	41.29	54.00	-12.71	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

	TX / IEEE 802.11n HT40 mode / CH Low				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1534.39	63.47	26.95	2.29	44.67	0.30	48.34	74.00	-25.66	P
*	1534.39	54.81	26.95	2.29	44.67	0.30	39.68	54.00	-14.32	A
*	4843.28	60.49	33.54	3.84	45.09	0.40	53.17	74.00	-20.83	P
*	4843.28	50.15	33.54	3.84	45.09	0.40	42.83	54.00	-11.17	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	HSPA+ 3G VPN Router	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11n HT40 TX (CH Middle)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11n HT40 mode / CH Middle				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1625.15	65.12	27.63	2.36	44.71	0.30	50.70	74.00	-23.30	P
*	1625.15	57.66	27.63	2.36	44.71	0.30	43.24	54.00	-10.76	A
*	4873.91	59.72	33.65	3.85	45.13	0.40	52.49	74.00	-21.51	P
*	4873.91	49.30	33.65	3.85	45.13	0.40	42.07	54.00	-11.93	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

	TX / IEEE 802.11n HT40 mode / CH Middle				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1534.67	64.08	26.96	2.29	44.67	0.30	48.95	74.00	-25.05	P
*	1534.67	56.72	26.96	2.29	44.67	0.30	41.59	54.00	-12.41	A
*	4874.08	61.39	33.65	3.85	45.13	0.40	54.16	74.00	-19.84	P
*	4874.08	52.19	33.65	3.85	45.13	0.40	44.96	54.00	-9.04	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	HSPA+ 3G VPN Router	Test Date	2014/02/06
Model	DWR-755	Test By	John Chen
Test Mode	IEEE 802.11n HT40 TX (CH High)	TEMP& Humidity	20.4℃, 61%

	TX / IEEE 802.11n HT40 mode / CH High				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1624.52	62.18	27.62	2.36	44.71	0.30	47.75	74.00	-26.25	P
*	1624.52	58.03	27.62	2.36	44.71	0.30	43.60	54.00	-10.40	A
*	4904.38	60.25	33.76	3.86	45.16	0.40	53.10	74.00	-20.90	P
*	4904.38	49.49	33.76	3.86	45.16	0.40	42.34	54.00	-11.66	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

	TX / IEEE 802.11n HT40 mode / CH High				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1533.82	63.42	26.95	2.29	44.67	0.30	48.28	74.00	-25.72	P
*	1533.82	55.75	26.95	2.29	44.67	0.30	40.61	54.00	-13.39	A
*	4904.28	60.93	33.76	3.86	45.16	0.40	53.78	74.00	-20.22	P
*	4904.28	50.26	33.76	3.86	45.16	0.40	43.11	54.00	-10.89	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*