FCC 47 CFR PART 15 SUBPART C AND ANSI C63.4: 2003

TEST REPORT

For

3G Mobile Wireless Router

Model Number: TEW-716BRG

Brand Name: TRENDnet

Issued for

TRENDnet , Inc.

20675 Manhattan Place , Torrance , CA 90501 , U.S.A.

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: December 22, 2012

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REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	December 22, 2012	Initial Issue	ALL	Sunny Chang

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1. TEST REPORT CERTIFICATION

Applicant ：TRENDnet , Inc.

Address ：20675 Manhattan Place , Torrance , CA 90501 , U.S.A.

Equipment Under Test ：3G Mobile Wireless Router

Model Number ：TEW-716BRG

Brand Name ：TRENDnet

Date of Test ：February 04, 2010 ~ December 20, 2012

APPLICABLE STANDARD	
STANDARD	**TEST RESULT**
FCC Part 15 Subpart C AND ANSI C63.4 : 2003	No non-compliance noted

Approved by:

Jeter Wu
Assistant Manager

Reviewed by:

Eric Huang
Assistant Section Manager

2. EUT DESCRIPTION

2.1 DESCRIPTION OF EUT & POWER

Product Name	3G Mobile Wireless Router
Model Number	TEW-716BRG
Brand Name	TRENDnet
Received Date	May 09, 2011
Frequency Range	IEEE 802.11b/g, 802.11n HT20 (DTS Band):2412MHz~2462MHz IEEE 802.11n HT40 (DTS Band):2422MHz~2452MHz
Transmit Power (ERP)	IEEE 802.11b Mode : 16.24dBm (DTS Band) (42.0727 mW) IEEE 802.11g Mode : 16.56dBm (DTS Band) (45.2898 mW) IEEE 802.11n HT20 Mode : 14.42dBm (DTS Band) (27.6694 mW) IEEE 802.11n HT40 Mode : 13.27dBm (DTS Band) (21.2324 mW)
Average Power	IEEE 802.11b Mode : 13.49dBm IEEE 802.11g Mode : 10.56dBm IEEE 802.11n HT20 Mode : 9.62dBm IEEE 802.11n HT40 Mode : 9.17dBm
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 802.11b :11, 5.5, 2, 1Mbps
	IEEE 802.11g : 54, 48 ,36, 24, 18, 12, 11, 9, 6Mbps
	IEEE 802.11n HT20 : 65, 58.5, 52, 39, 26, 19.5, 13, 6.5 Mbps
	IEEE 802.11n HT40 : 135, 121.5, 108, 81, 54, 40.5, 27, 13.5 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	**One PIFA antenna** Model: C381-510152-A Gain: 2.31 dBi Brand: M.gear Manufacture: Wha Yu Group
Power Source	Powered from battery & adapter **Adapter Spec:** Brand: AMIGO Model: AMS1-0501200FU Input: 100-240Vac, 50/60Hz, Max 0.2A Output: 5Vdc, 1.2A
Temperature Range	0 ~ +55°C

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: **XU8TEW716BRG** 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.

2.2. DESCRIPTION OF TEST MODES

The EUT is a 11n router. It has one transmitter chain and one receive chain (1x1 configurations). The 1x1 configuration is implemented with one outside chain (Chain 0).

The RF chipset is manufactured by Ralink Technology, Corp.

The antenna peak gain 2.31dBi (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: 11Mbps 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: 6.5Mbps 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: 13.5Mbps 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.

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 2462 MHz.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

4. FACILITIES AND ACCREDITATIONS

4.1 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.

4.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors 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.”

4.3 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).

4.4 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

5. CALIBRATION AND UNCERTAINTY

5.1 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.

5.2 MEASUREMENT UNCERTAINTY

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

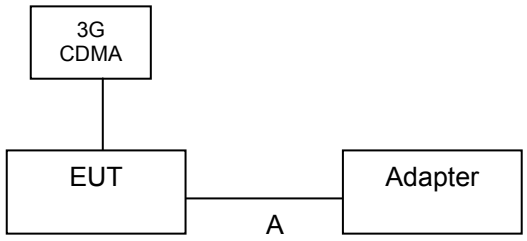
PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz Test Site : OATS-6	±3.59dB
Radiated Emission, 200 to 1000 MHz Test Site : OATS-6	±3.52dB
Radiated Emission, 1 to 40 GHz	± 2.38 dB
Power Line Conducted Emission	±2.01dB

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

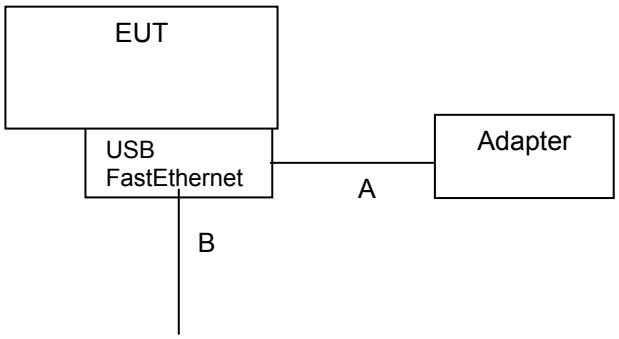
6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.2 SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1.	Cellular/PCS CDMA Wireless USB Modem with EvDO	Novatel	MC727	PKRNVWMC727	N/A
2.	USB FastEthernet	billionton	USBKR2-100B	DOC S/N:070601003000	N/A

No.	Signal cable description	
A	DC Power cable	Unshielded, 1.5m, 1pcs.
B	LAN cable	Unshielded, 6m, 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.

6.3 EUT OPERATING CONDITION

RF Setup

1. Set up all computers like the setup diagram.
2. The “Ralink QA Test Program for RT3052” software was used for testing

The EUT driver software installed in the host support equipment during testing was Ralink QA Test Program for RT3052 Drive

TX Mode:

- ⇨ **Tx Mode:CCK 、OFDM、 HT MixMode** (Bandwidth: 20、40)
- ⇨ **Tx Data Rate: 11Mbps long** (IEEE 802.11b mode ,TX)
  6Mbps (IEEE 802.11g mode ,TX)
  6.5Mbps (IEEE 802.11n HT20 mode ,chain 0 TX)
  13.5Mbps (IEEE 802.11n HT40 mode, chain 0 TX)

Power control mode

Target Power: IEEE 802.11b Channel Low (2412MHz) = **7**
IEEE 802.11b Channel Middle (2437MHz) = **8**
IEEE 802.11b Channel High (2462MHz) = **8**
Target Power: IEEE 802.11g Channel Low (2412MHz) = **7**
IEEE 802.11g Channel Middle (2437MHz) = **8**
IEEE 802.11g Channel High (2462MHz) = **8**
Target Power: IEEE 802.11n HT20 Channel Low (2412MHz) = **7 (Chain 0)**
IEEE 802.11 n HT20 Channel Middle (2437MHz) = **8 (Chain 0)**
IEEE 802.11 n HT20 Channel High (2462MHz) = **8 (Chain 0)**
Target Power: IEEE 802.11n HT40 Channel Low (2422MHz) = **7 (Chain 0)**
IEEE 802.11 n HT40 Channel Middle (2437MHz) = **8 (Chain 0)**
IEEE 802.11 n HT40 Channel High (2452MHz) = **8 (Chain 0)**

RX Mode：

Start RX

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

Normal Link Setup

1. Set up all computers like the setup diagram.
2. All of the function are under run.
3. Notebook PC (2) ping 192.168.0.10 –t to Notebook PC (1).
4. Notebook PC (1) ping 192.168.0.20 –t to Notebook PC (2).
5. Notebook PC (1) ping 192.168.0.50 –t to Wireless Access Point (3).

Start test.

7. APPLICABLE LIMITS AND TEST RESULTS

7.1 6DB BANDWIDTH

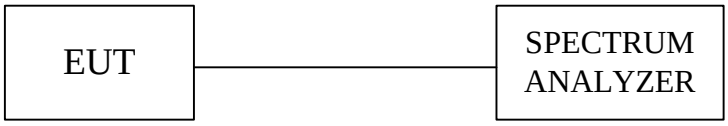
LIMIT

§ 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. 29, 2013

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 (One TX)

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	12585.17	500	PASS
Middle	2437	11222.44	500	PASS
High	2462	10340.68	500	PASS

NOTE : 1. At finial test to get the worst-case emission at11Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g mode (One TX)

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16593.19	500	PASS
Middle	2437	16032.06	500	PASS
High	2462	16112.22	500	PASS

NOTE : 1. At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 mode (One TX)

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	17074.15	500	PASS
Middle	2437	16993.99	500	PASS
High	2462	16993.99	500	PASS

NOTE : 1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

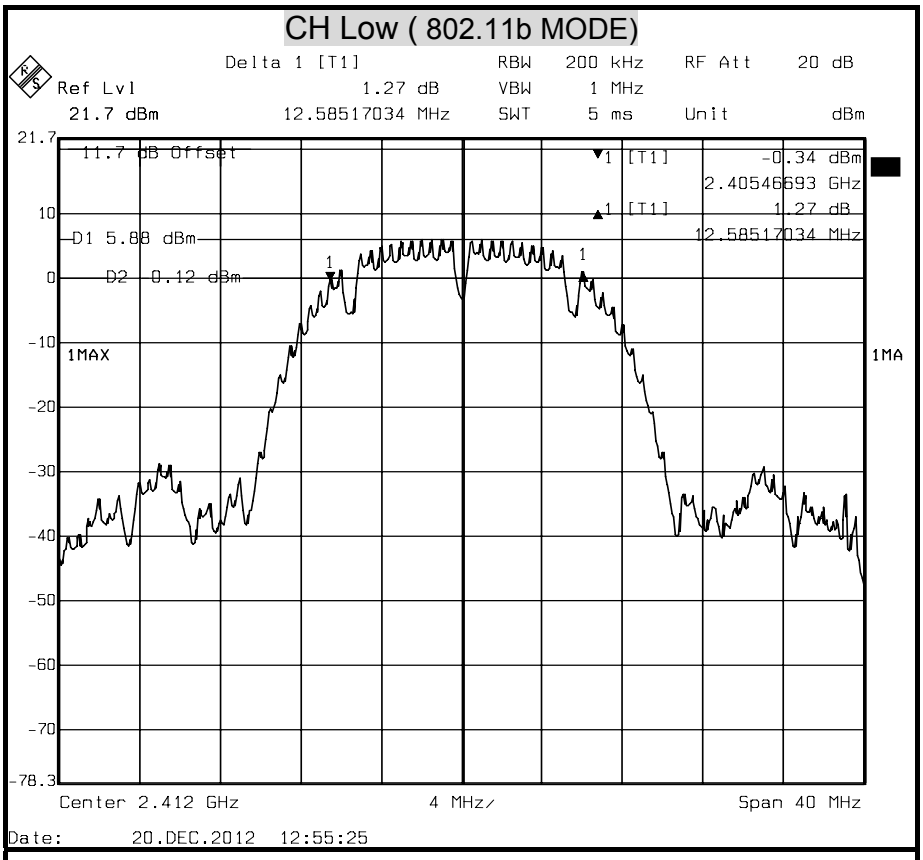
IEEE 802.11n HT40 mode (One TX)

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass / Fail
Low	2422	34789.58	500	PASS
Middle	2437	34308.62	500	PASS
High	2452	35430.86	500	PASS

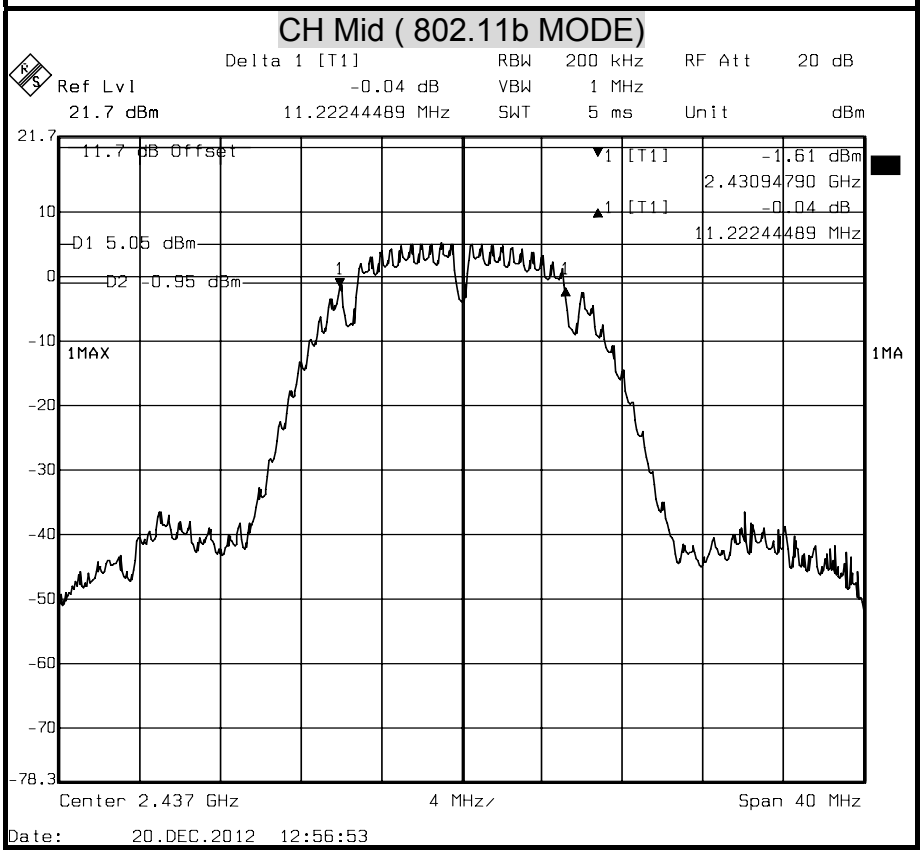
NOTE : 1. At finial test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

6dB BANDWIDTH (802.11b MODE)

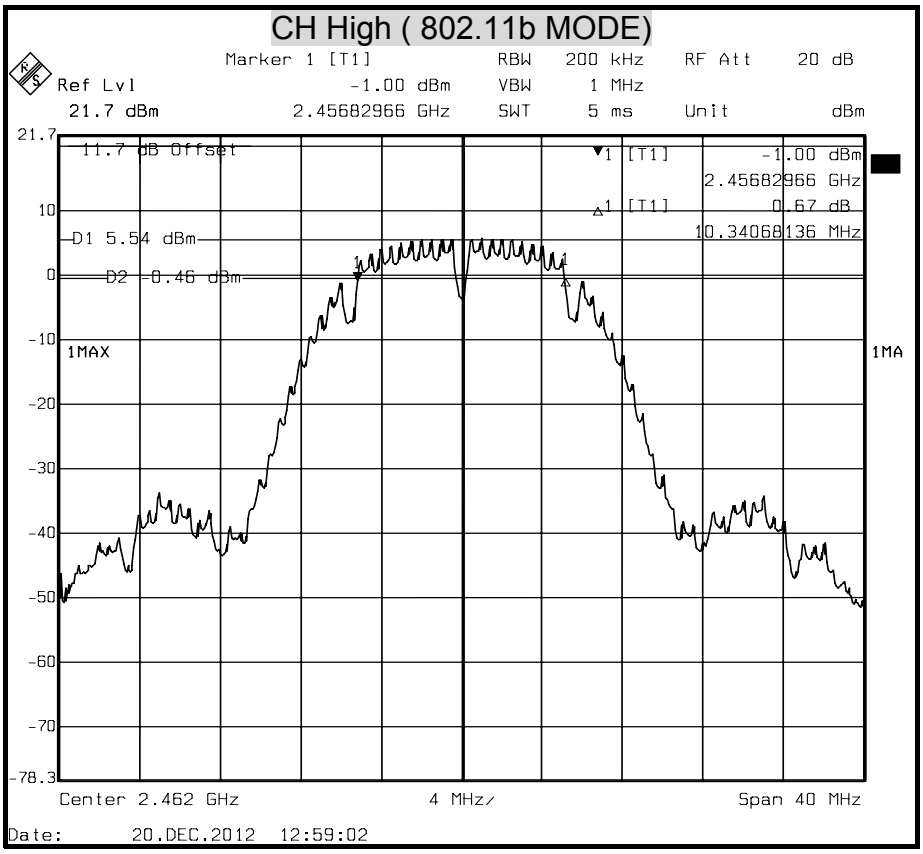
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

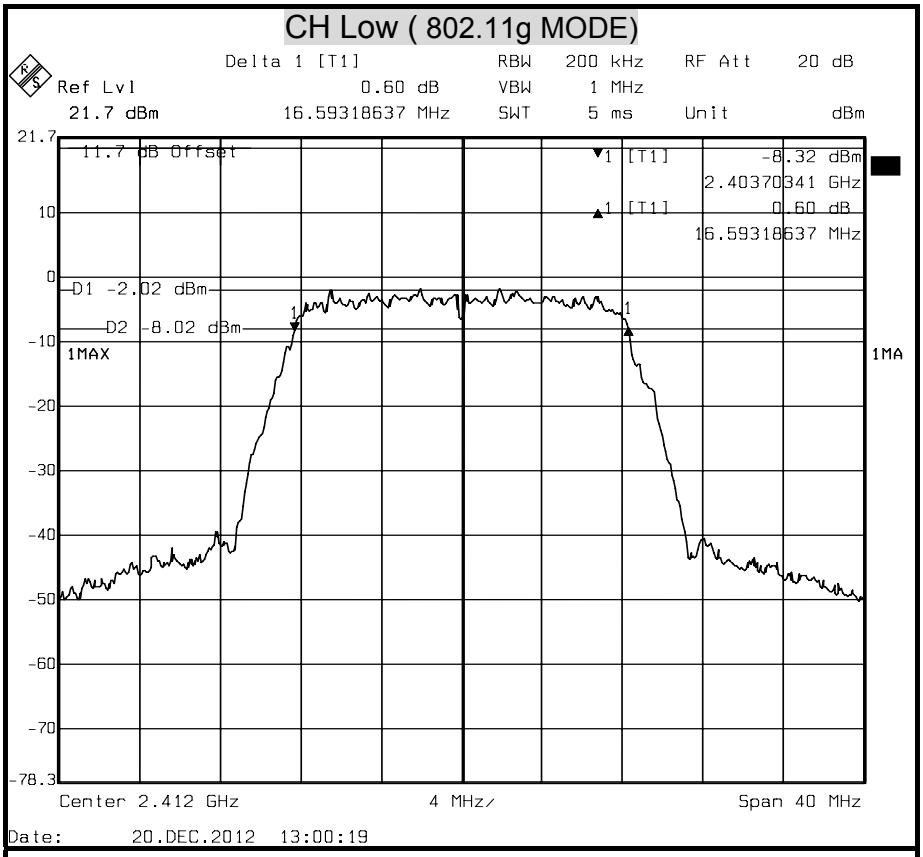


CH High (802.11b MODE)

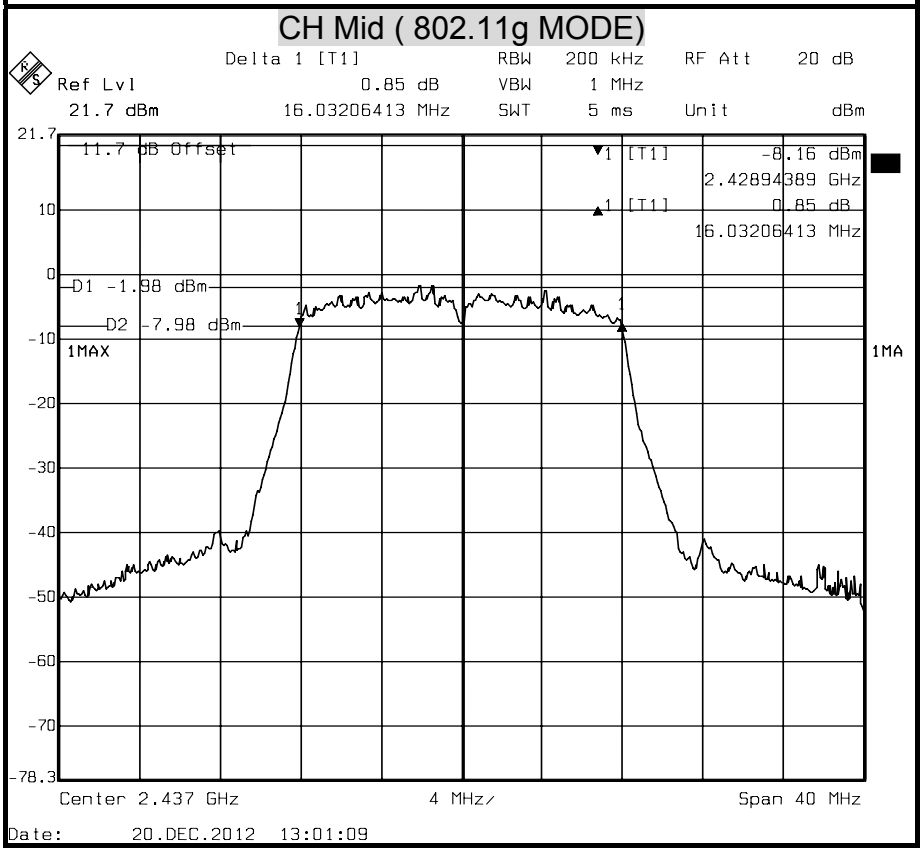


6dB BANDWIDTH (802.11g MODE)

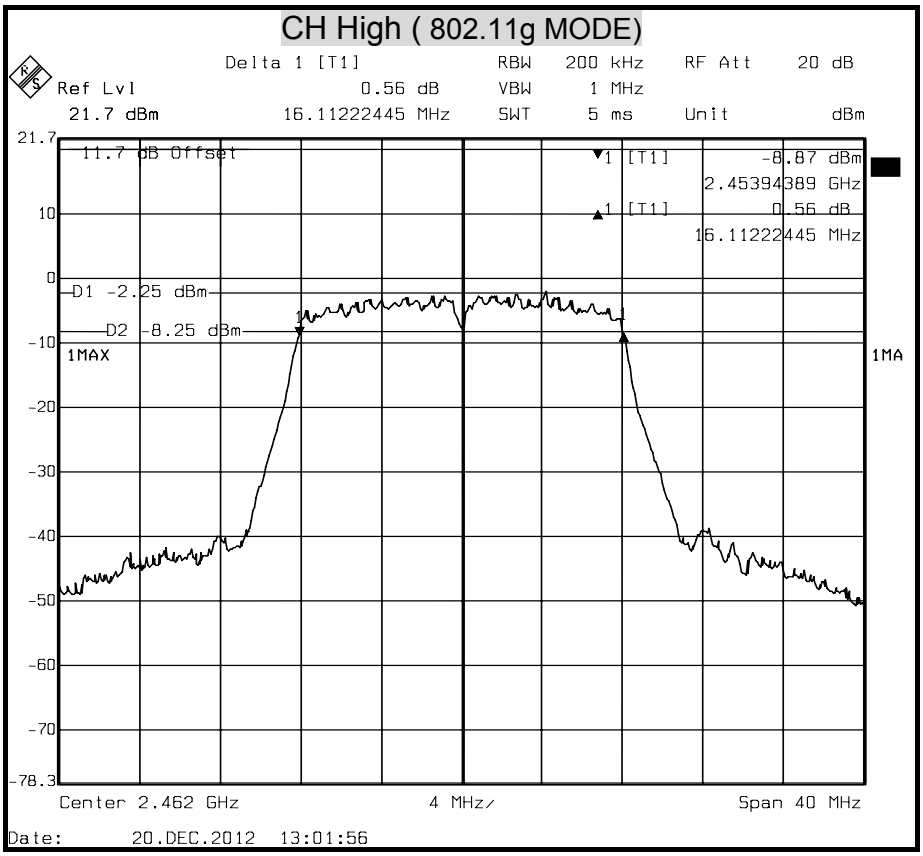
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

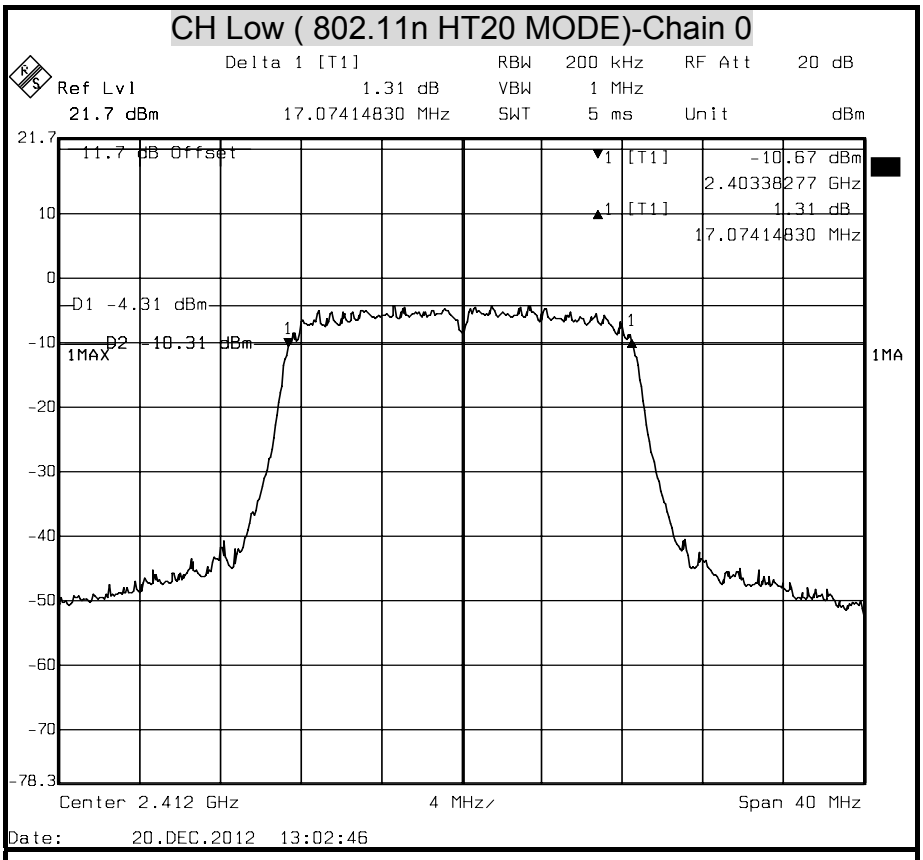


CH High (802.11g MODE)

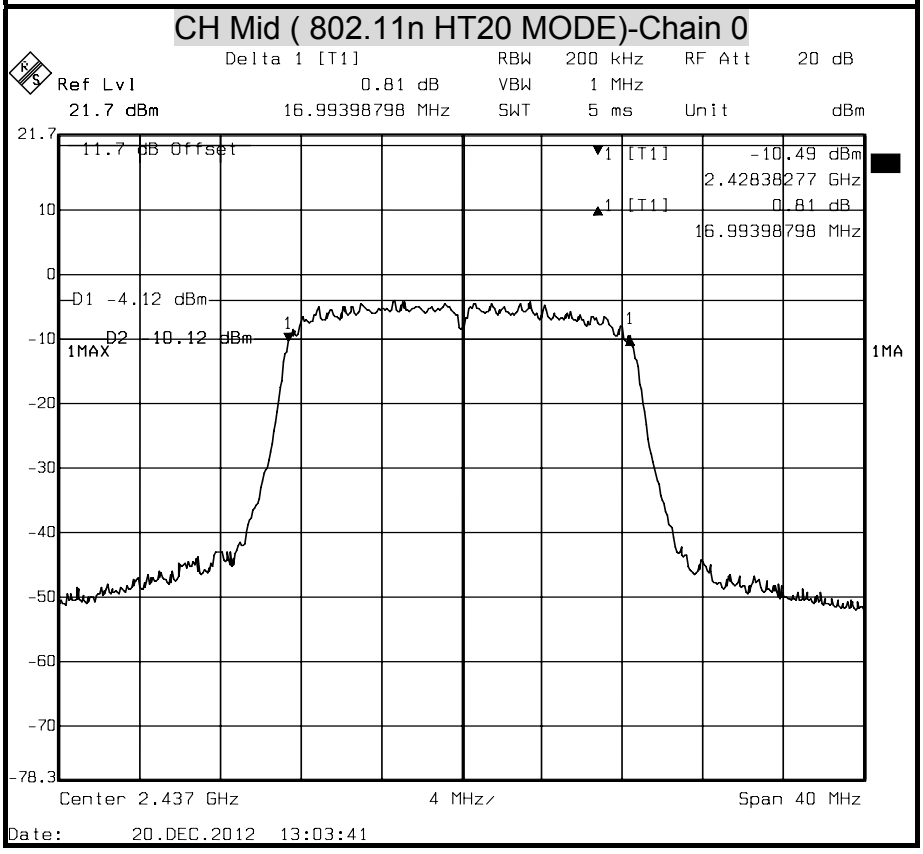


6dB BANDWIDTH (802.11n HT20 MODE)

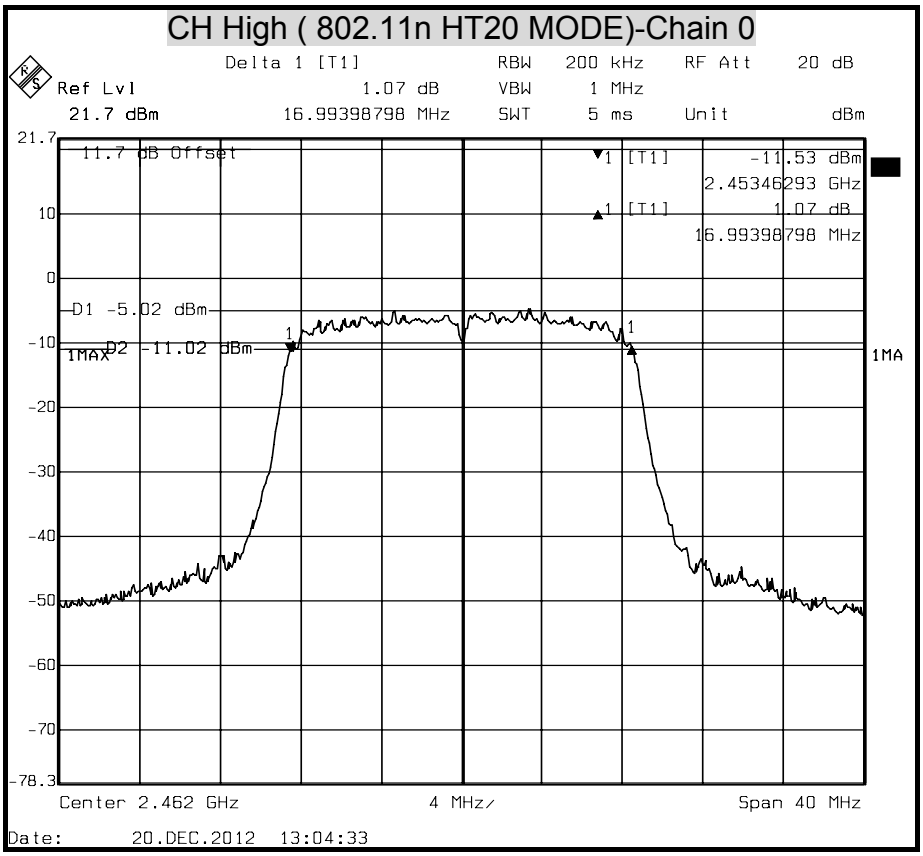
CH Low (802.11n HT20 MODE)-Chain 0



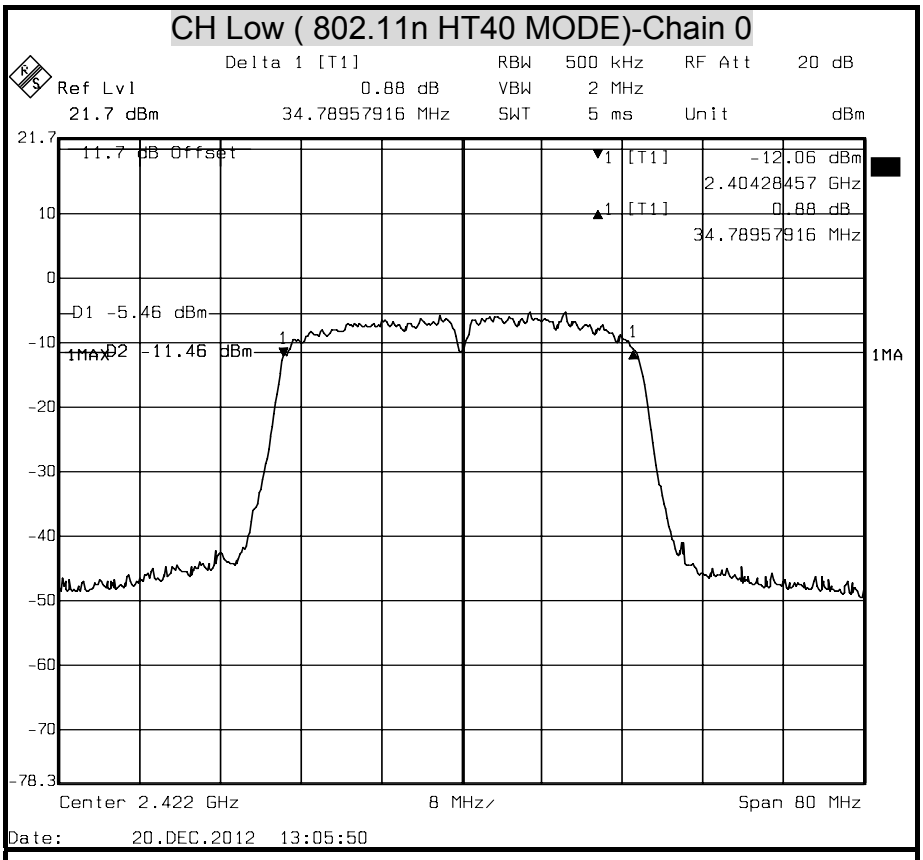
CH Mid (802.11n HT20 MODE)-Chain 0

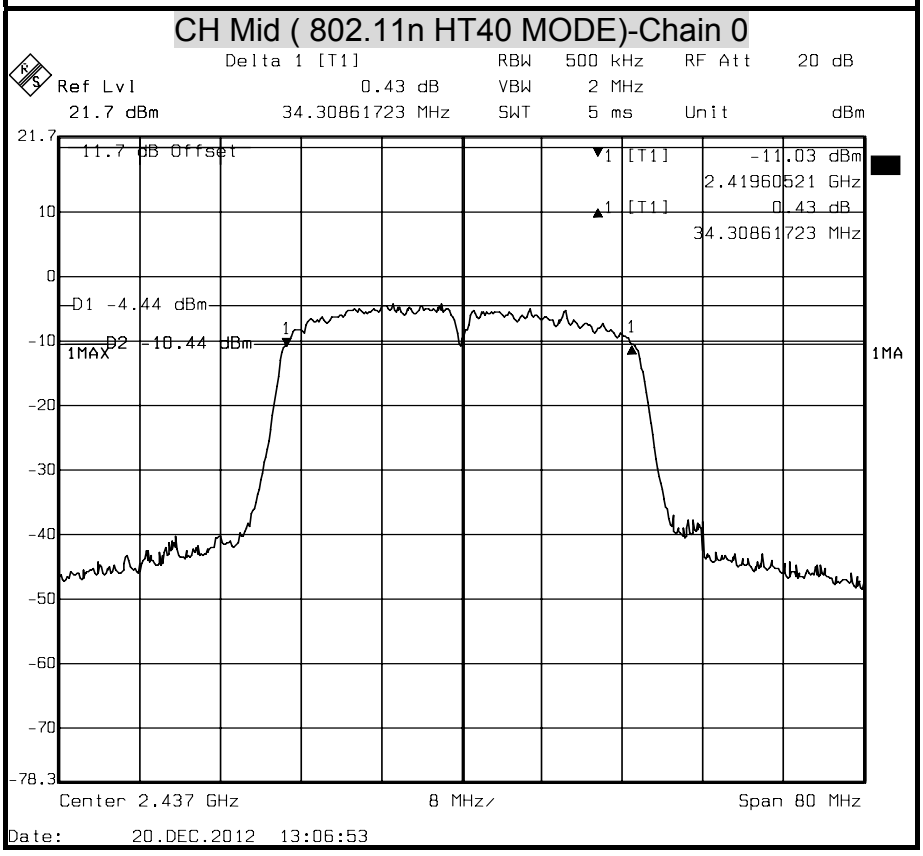


CH High (802.11n HT20 MODE)-Chain 0

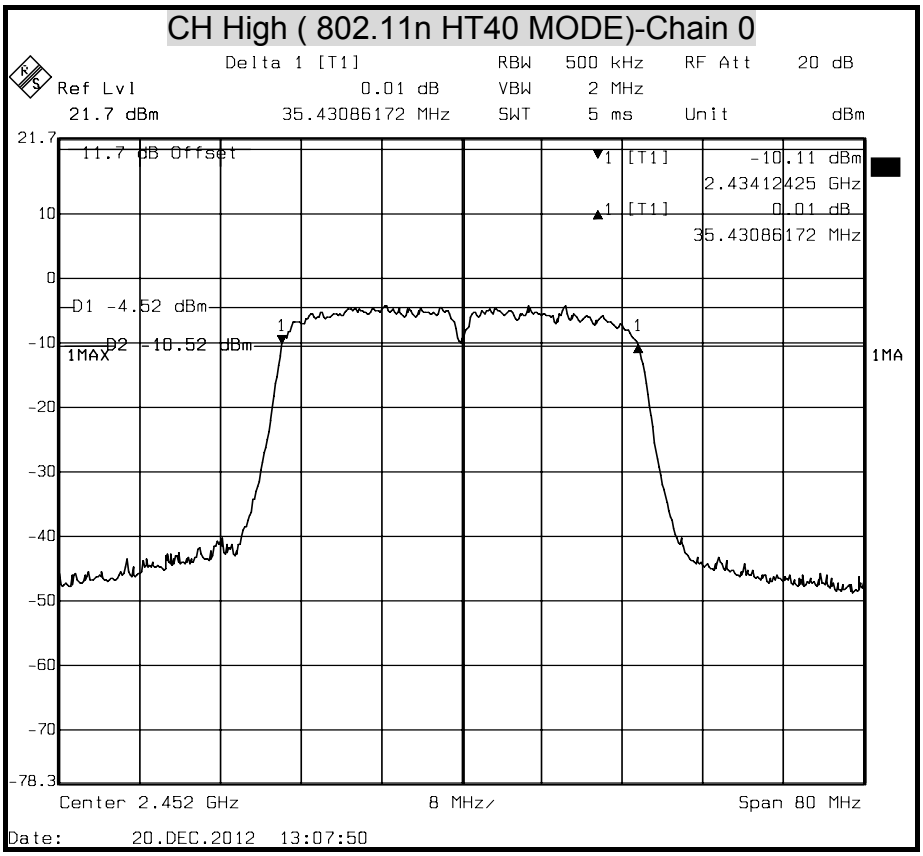


6dB BANDWIDTH (802.11n HT40 MODE)





CH High (802.11n HT40 MODE)-Chain 0



7.2 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 EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	FSU	FSEK 30	835253/002	SEP. 29, 2013

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

TEST SETUP

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.

5.2.2.1 Measurement Procedure AVG1(power averaging over the EBW with slow sweep speed):

1. Set the analyzer span to 5-30% greater than the EBW.
2. Set the RBW = 1 MHz.
3. Set the VBW ≥ 3 MHz.
4. Detector = power average (RMS).
5. Ensure that the number of measurement points in the sweep ≥ 2 x (span/RBW).
6. Manually set the sweep time to: ≥10 x (number of measurement points in sweep) x (transmission symbol period).
7. Perform the measurement over a single sweep.
8. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges to determine the maximum conducted output power of the EUTover the EBW. Note: If the analyzer does not have a band power function, sum the spectral levels (in linear power units) at 1 MHz intervals extending across the entire EBW.

IEEE 802.11b mode (One TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	18.35	30	PASS
Middle	2437	17.80	30	PASS
High	2462	18.50	30	PASS

NOTE : 1. At finial test to get the worst-case emission at 11Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g mode (One TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	15.79	30	PASS
Middle	2437	15.26	30	PASS
High	2462	15.43	30	PASS

NOTE : 1. At finial test to get the worst-case emission at 11Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 mode(One TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	14.40	30	PASS
Middle	2437	14.34	30	PASS
High	2462	13.44	30	PASS

NOTE : 1. At finial test to get the worst-case emission at 11Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

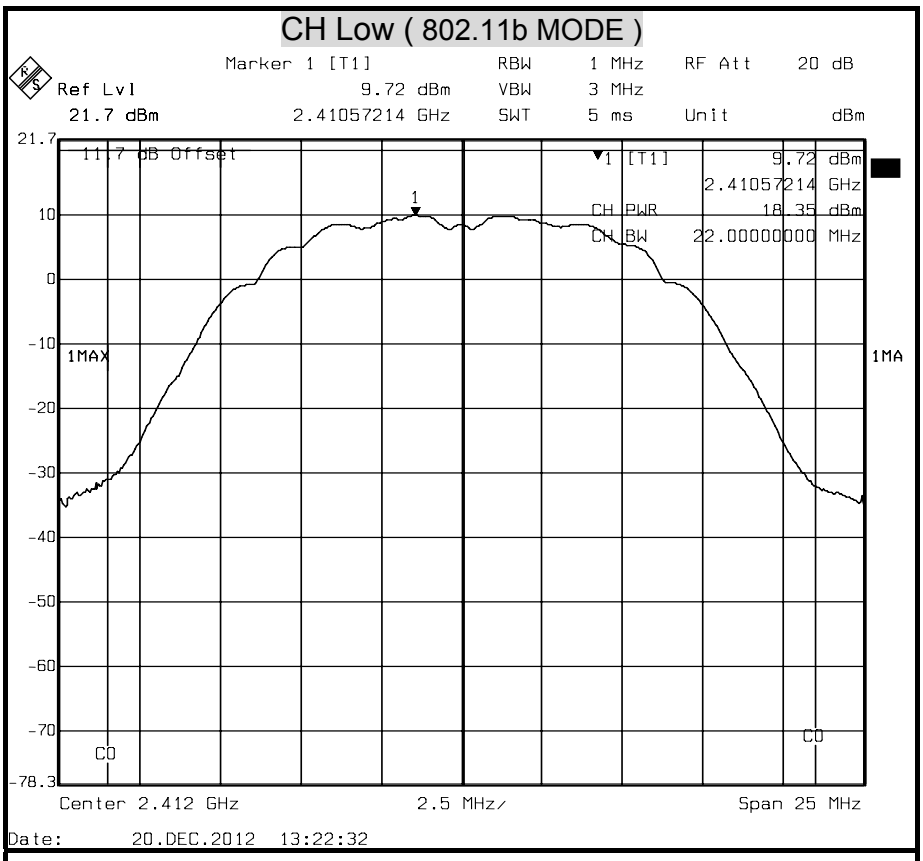
IEEE 802.11n HT40 mode (One TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2422	11.39	30	PASS
Middle	2437	12.46	30	PASS
High	2452	13.11	30	PASS

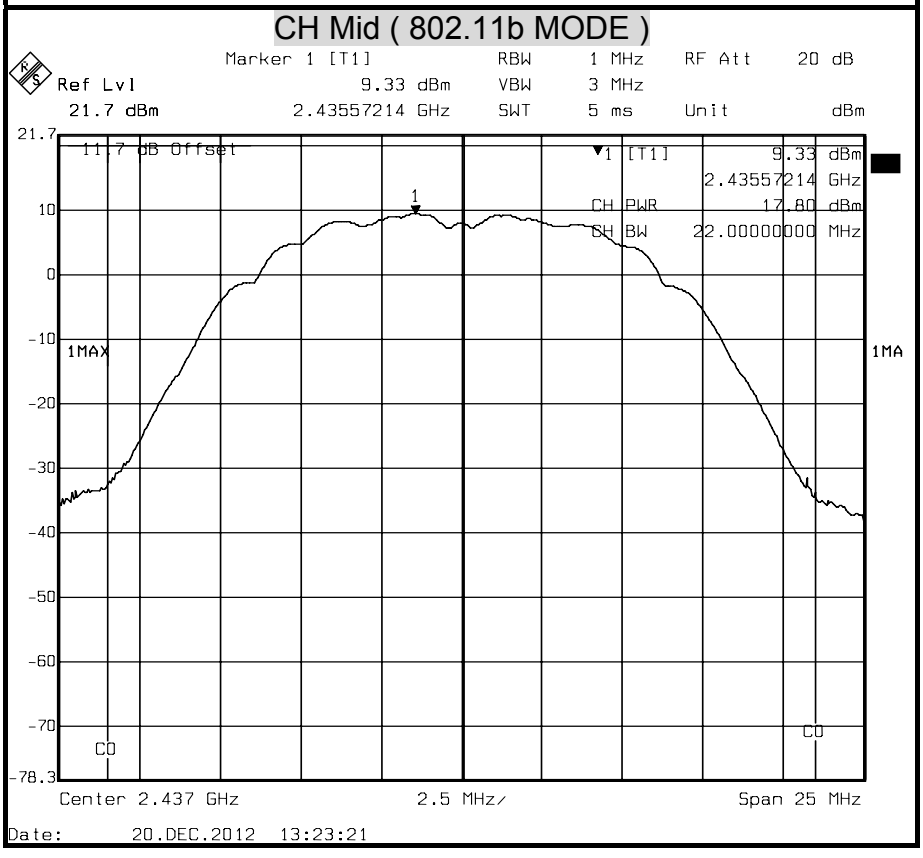
NOTE : 1. At finial test to get the worst-case emission at 11Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

MAXIMUM PEAK OUTPUT POWER (802.11b MODE)

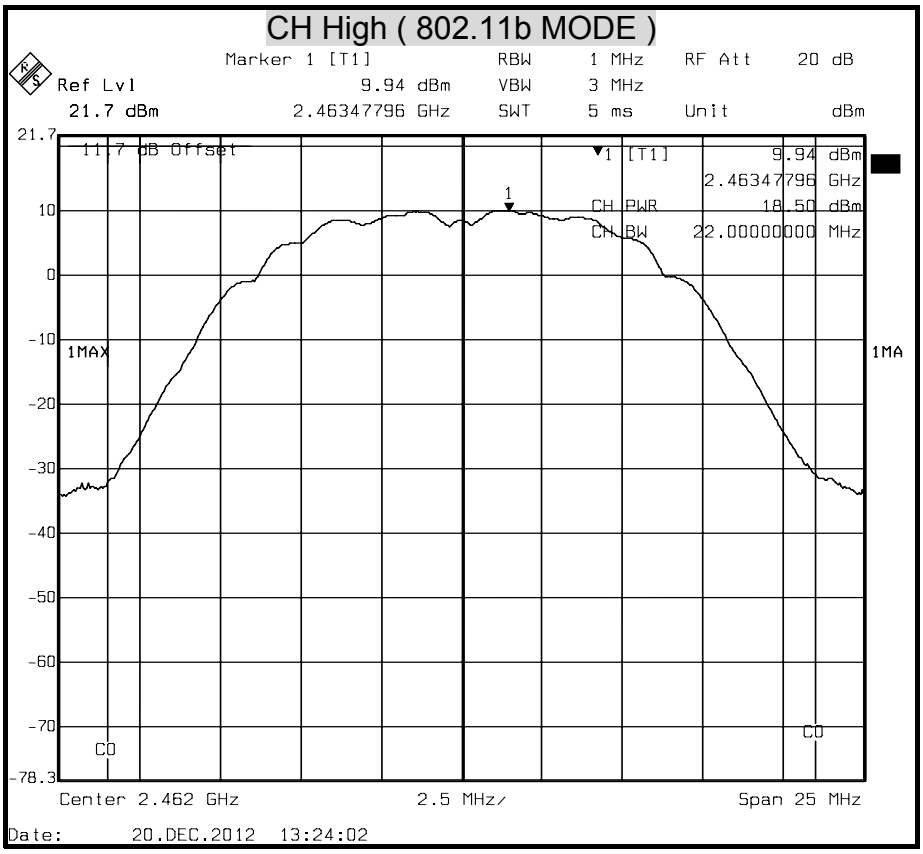
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

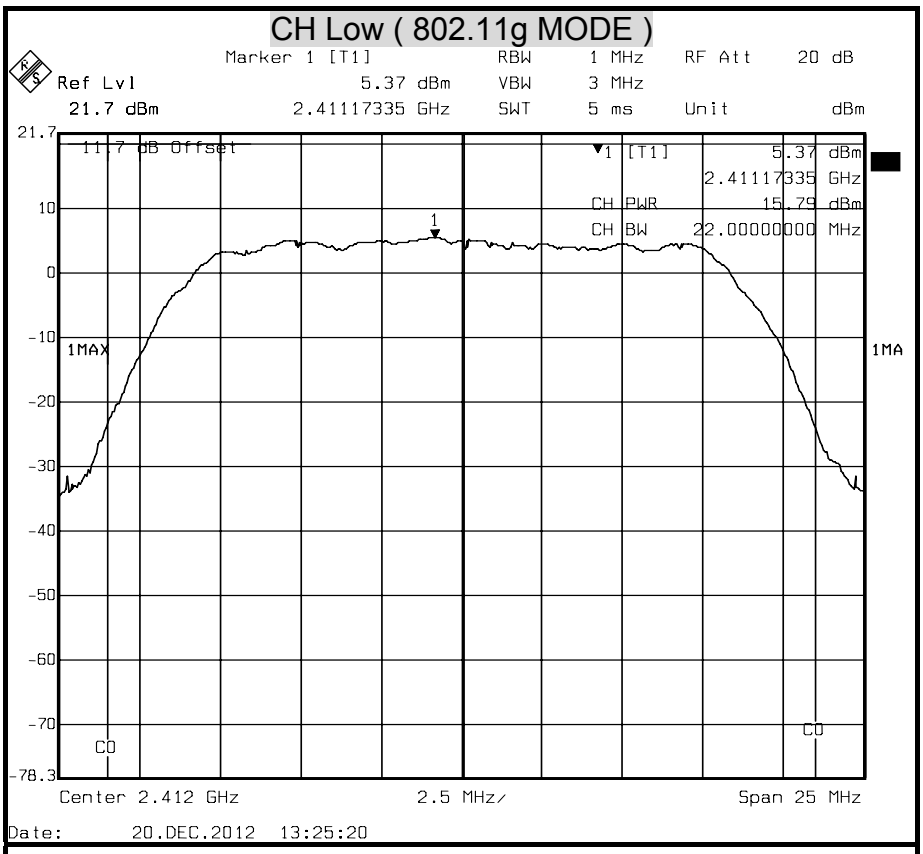


CH High (802.11b MODE)

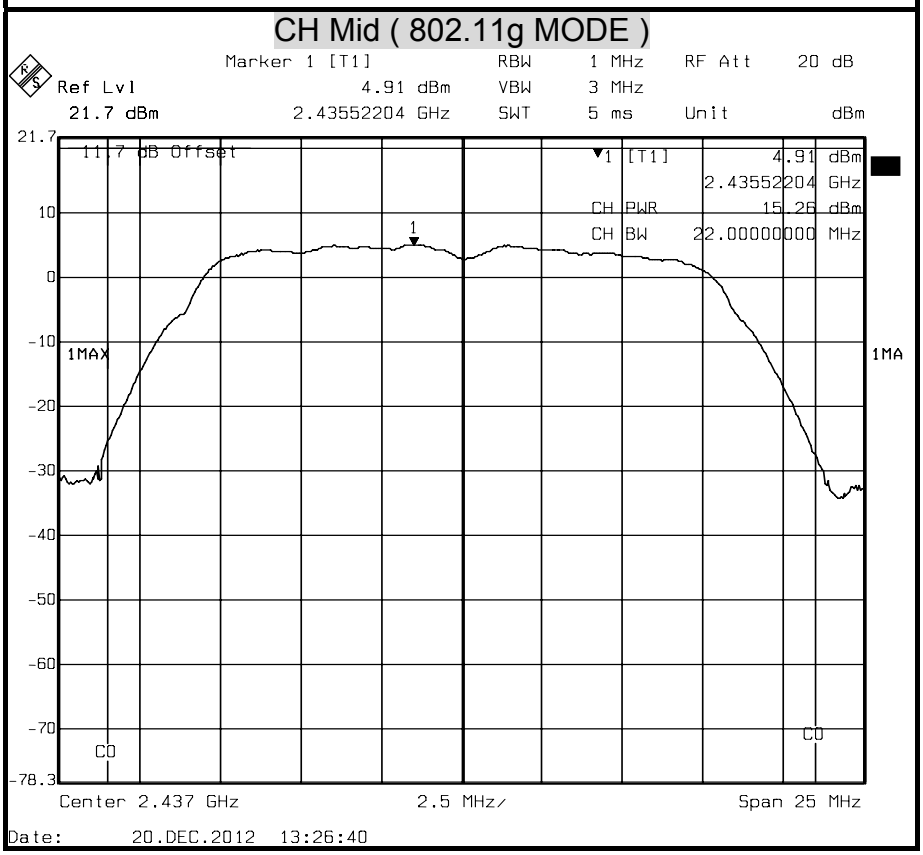


MAXIMUM PEAK OUTPUT POWER (802.11g MODE)

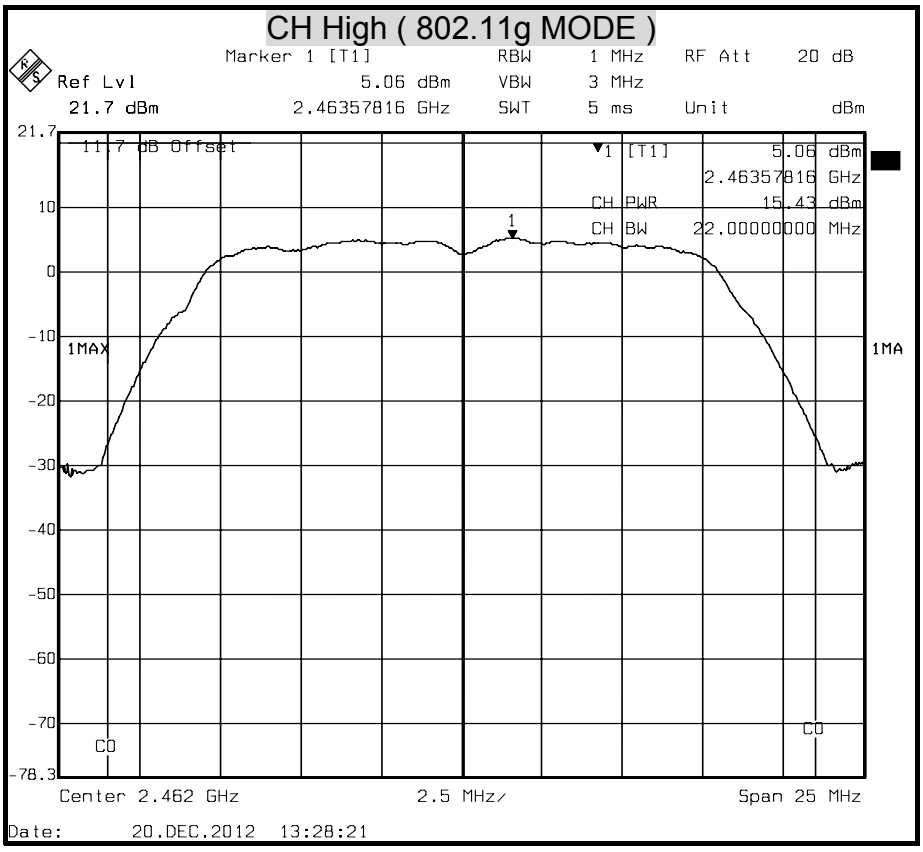
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

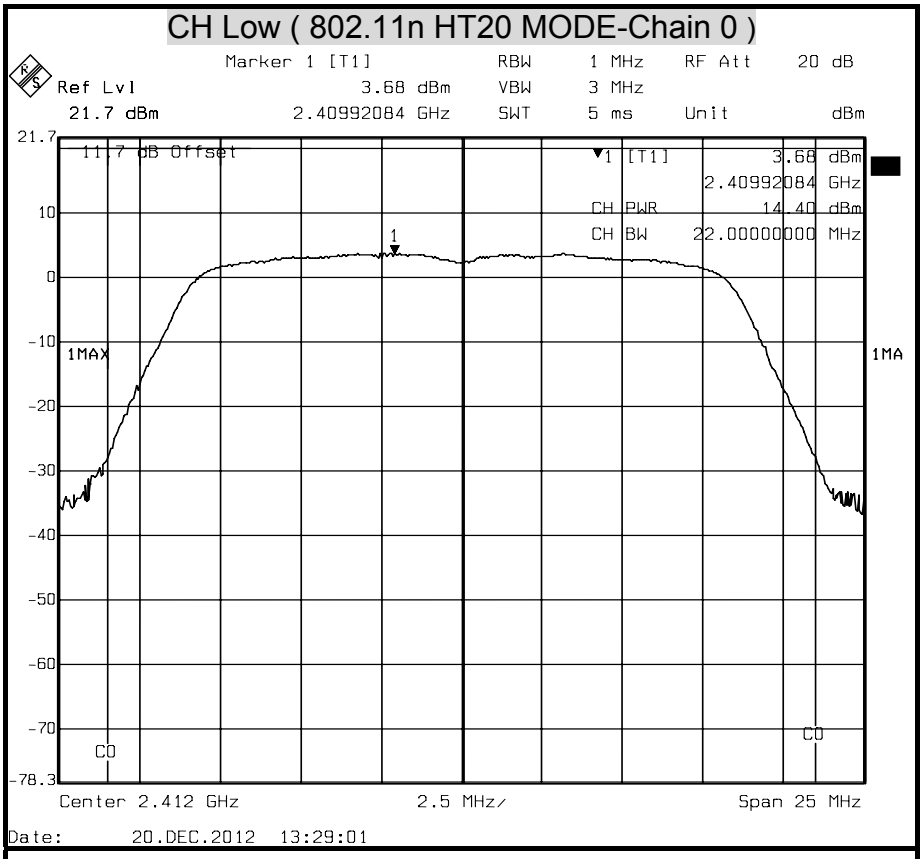


CH High (802.11g MODE)

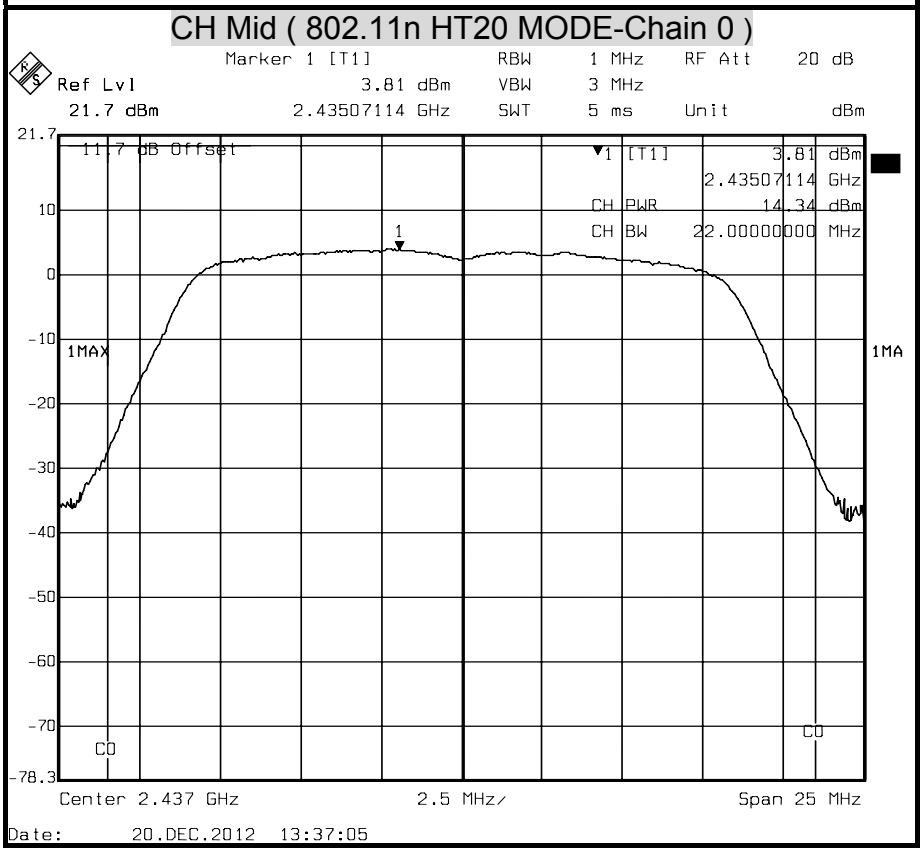


MAXIMUM PEAK OUTPUT POWER (802.11n HT20 MODE)

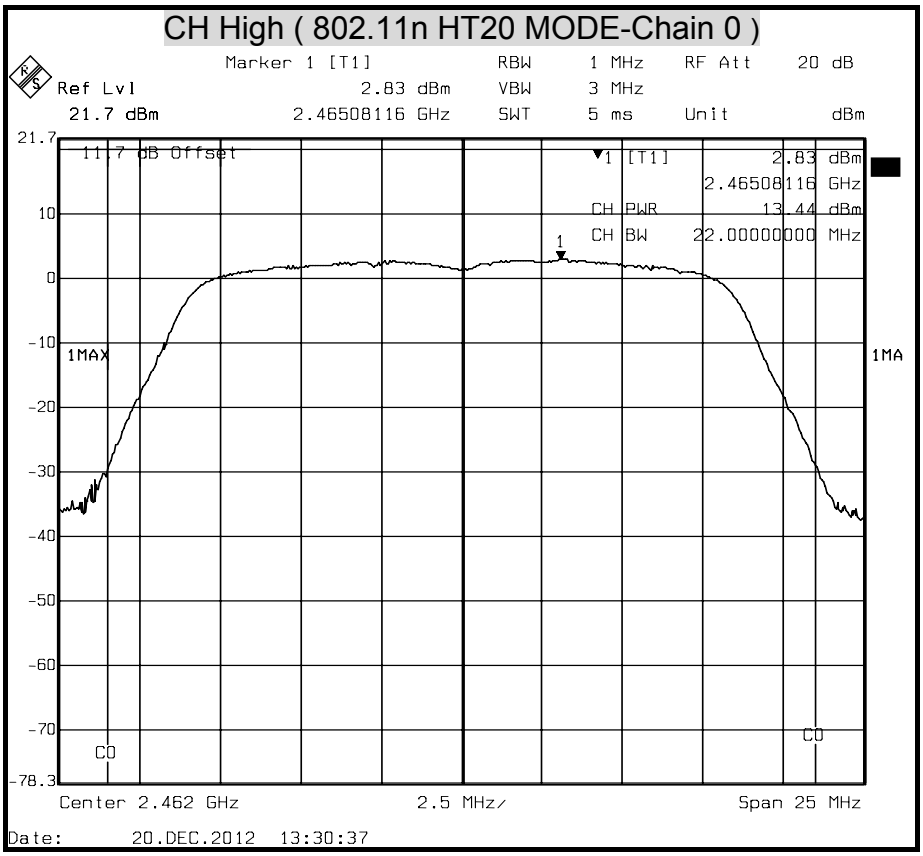
CH Low (802.11n HT20 MODE-Chain 0)



CH Mid (802.11n HT20 MODE-Chain 0)

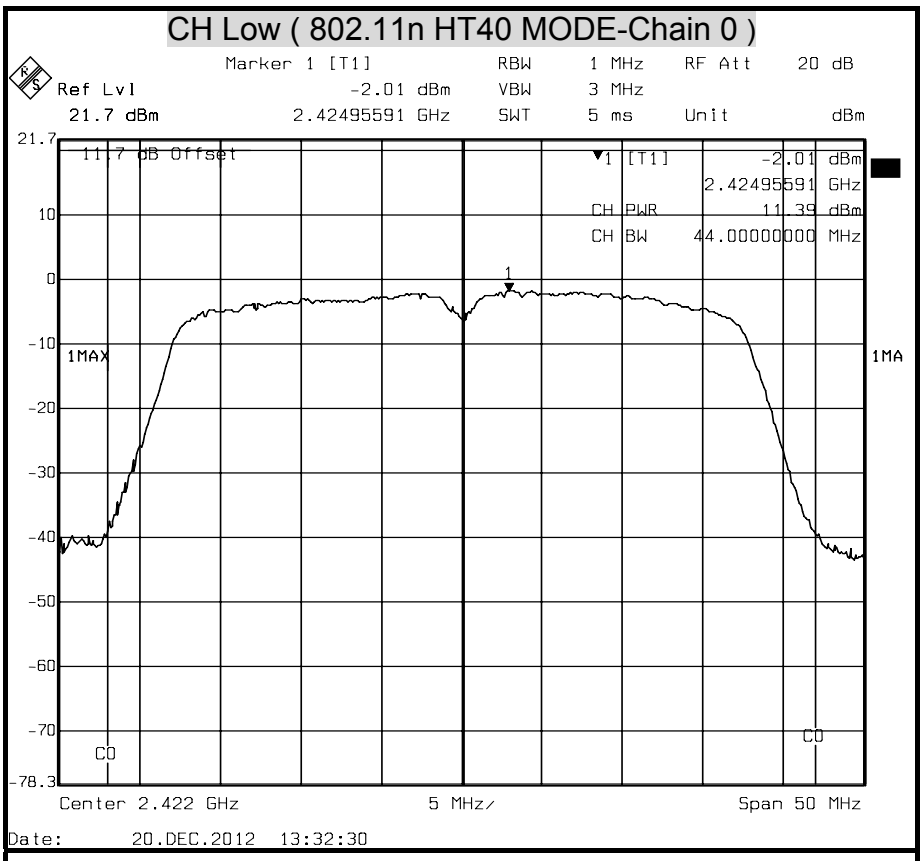


CH High (802.11n HT20 MODE-Chain 0)

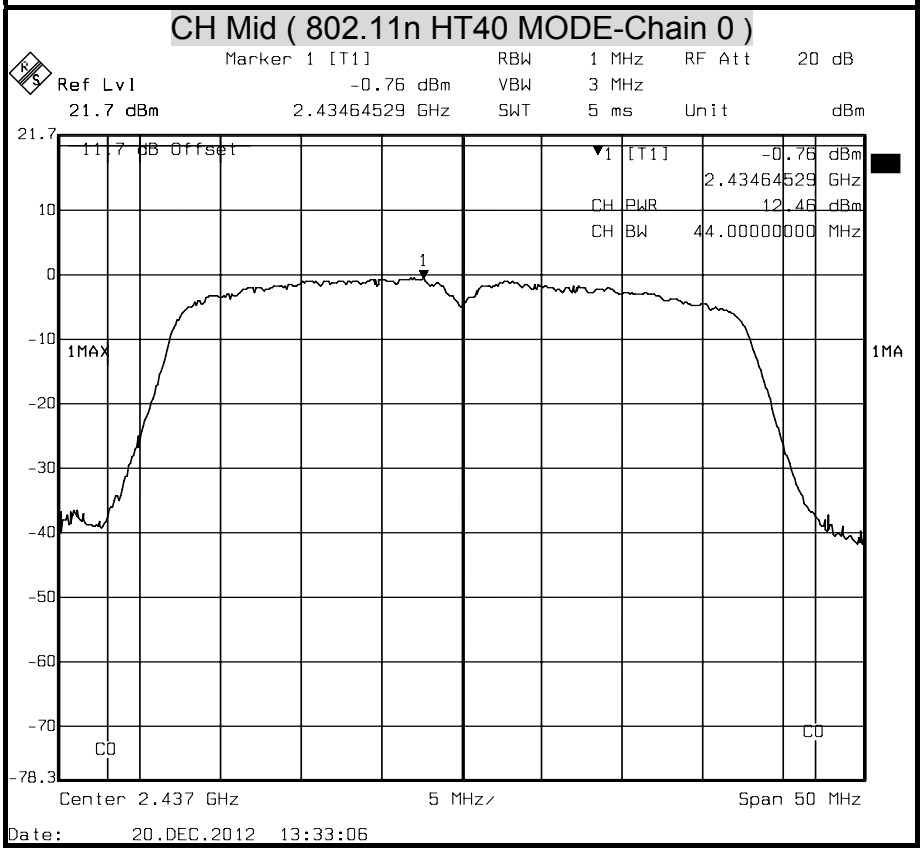


MAXIMUM PEAK OUTPUT POWER (802.11n HT40 MODE)

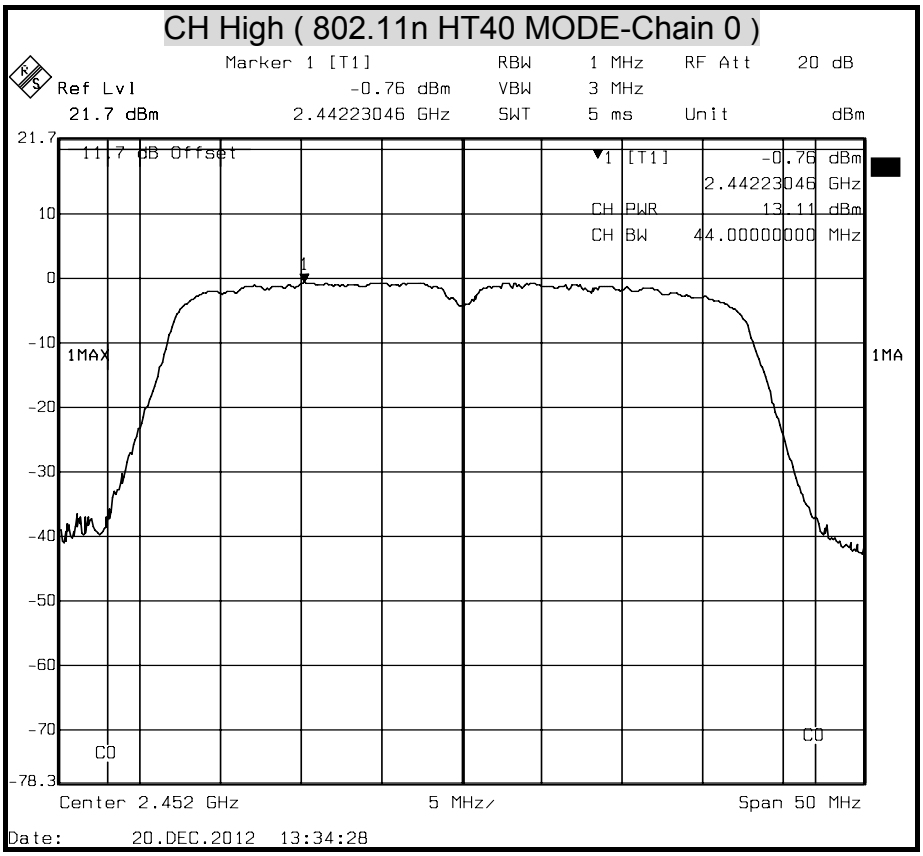
CH Low (802.11n HT40 MODE-Chain 0)



CH Mid (802.11n HT40 MODE-Chain 0)



CH High (802.11n HT40 MODE-Chain 0)



7.3 AVERAGE POWER

TEST DATA

Test mode: IEEE 802.11b Mode

Channel	Frequency (MHz)	Average Power Chain0 (dBm)
Low	2412	15.25
Middle	2437	14.76
High	2462	15.42

Test mode: IEEE 802.11g Mode

Channel	Frequency (MHz)	Average Power Chain0 (dBm)
Low	2412	8.86
Middle	2437	8.21
High	2462	8.51

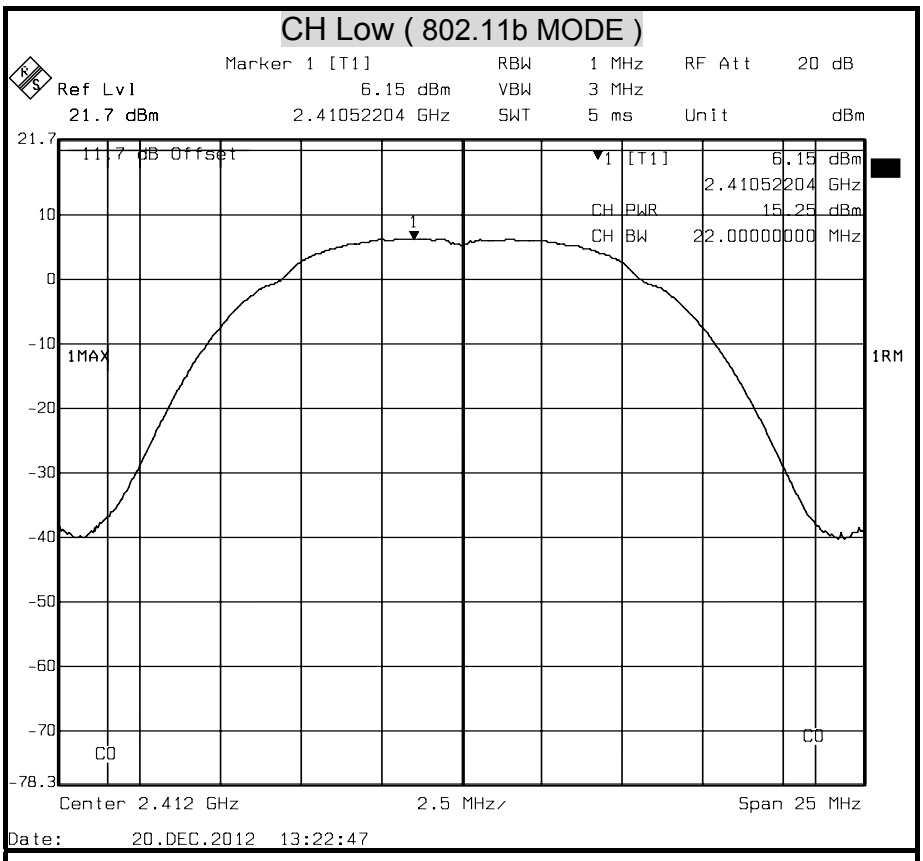
Test mode: IEEE 802.11n HT-20 Mode

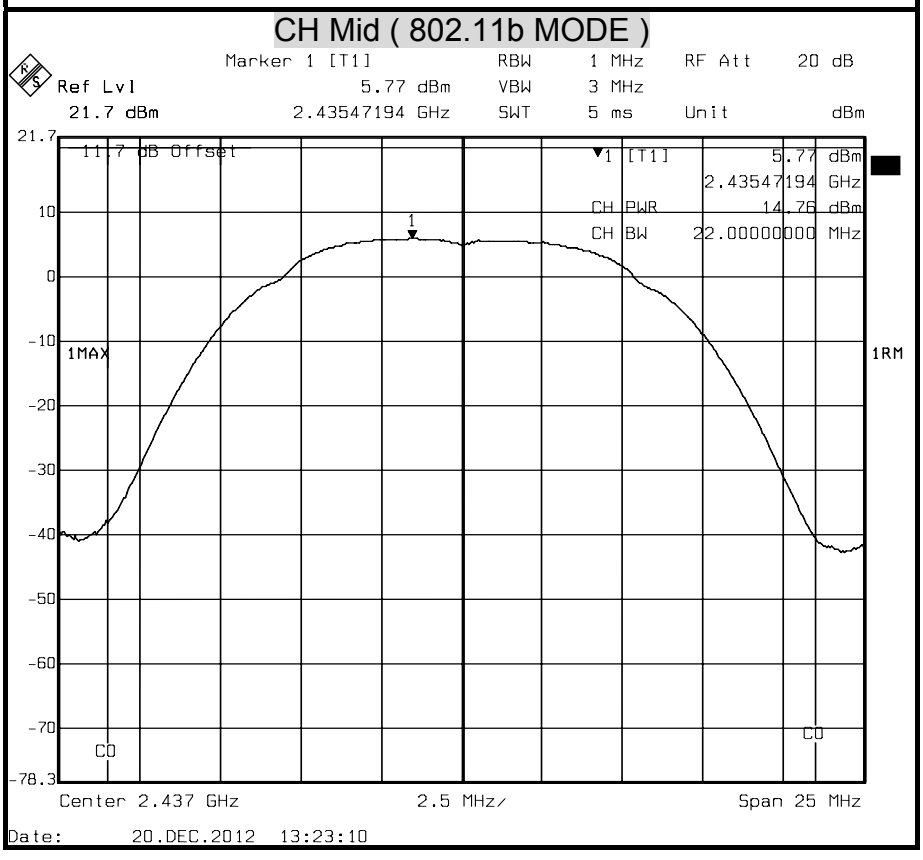
Channel	Frequency (MHz)	Average Power Chain0 (dBm)
Low	2412	7.47
Middle	2437	6.97
High	2462	6.15

Test mode: IEEE 802.11n HT-40 Mode

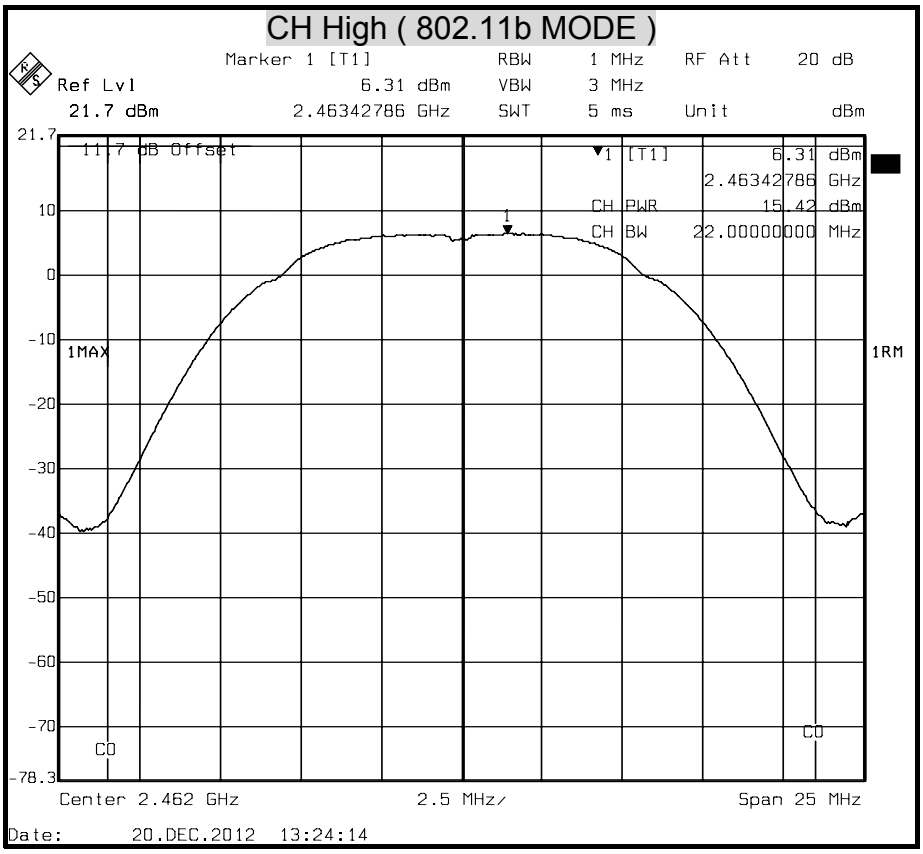
Channel	Frequency (MHz)	Average Power Chain0 (dBm)
Low	2422	4.33
Middle	2437	5.27
High	2452	5.92

AVERAGE POWER (802.11b MODE)



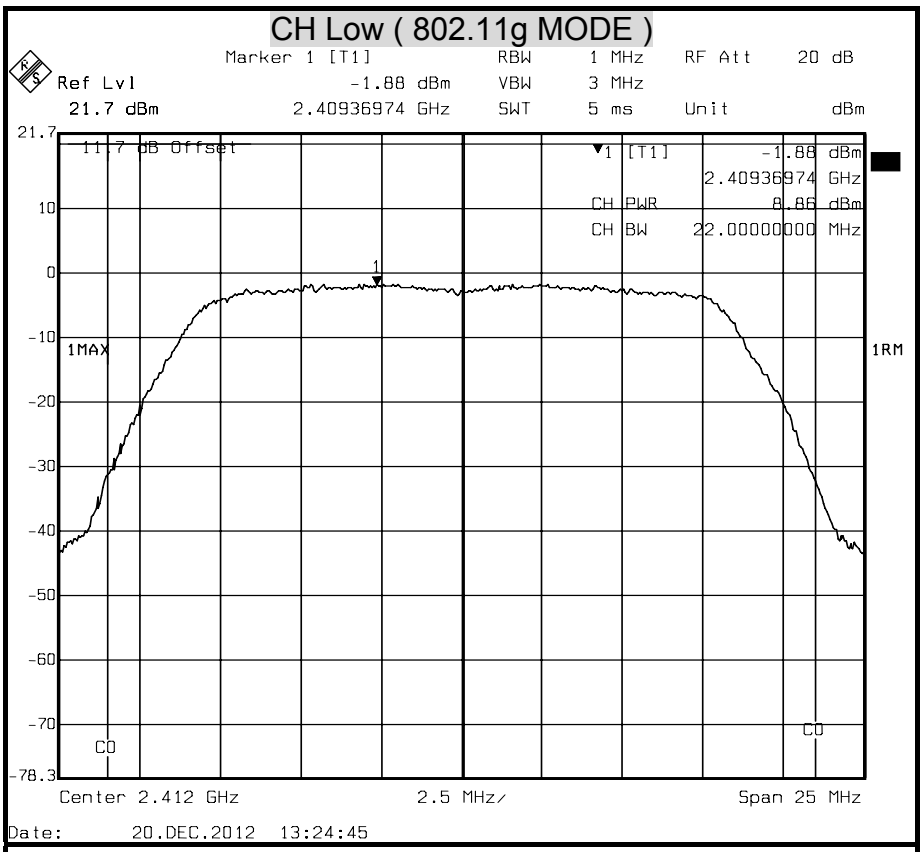


CH High (802.11b MODE)

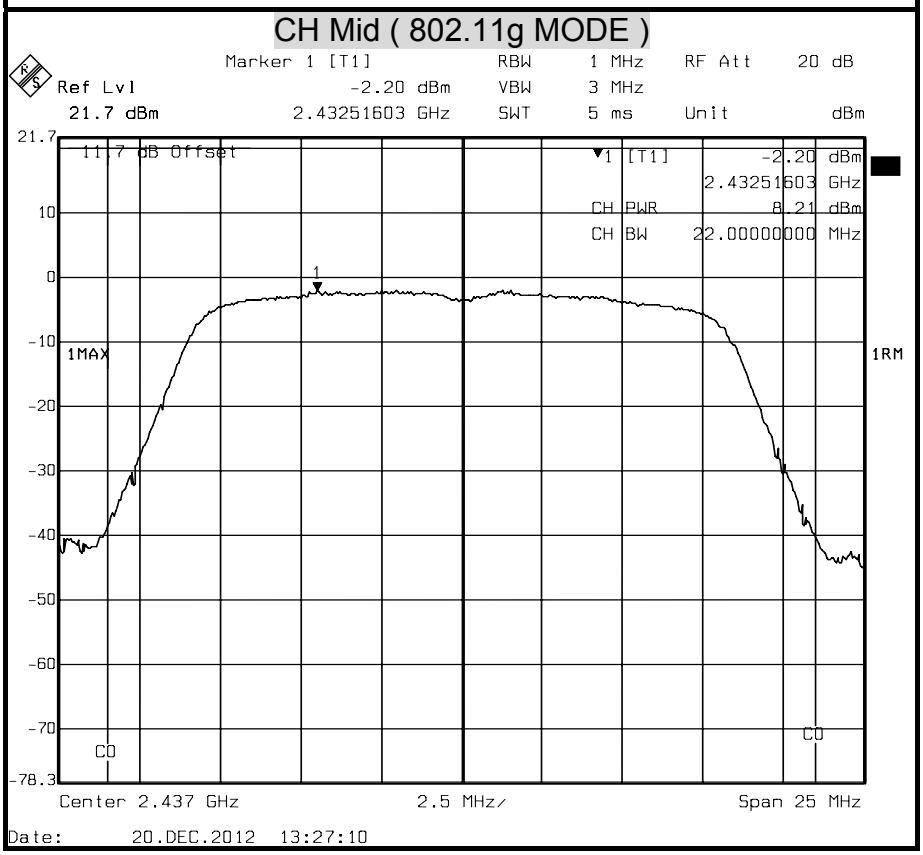


AVERAGE POWER (802.11g MODE)

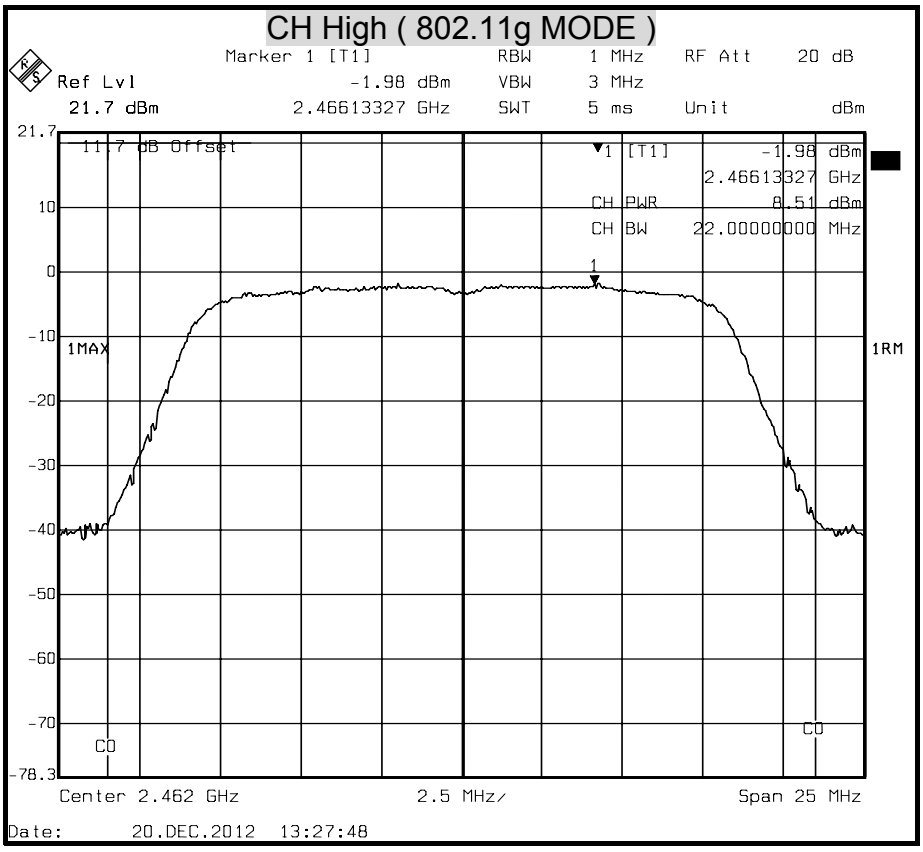
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

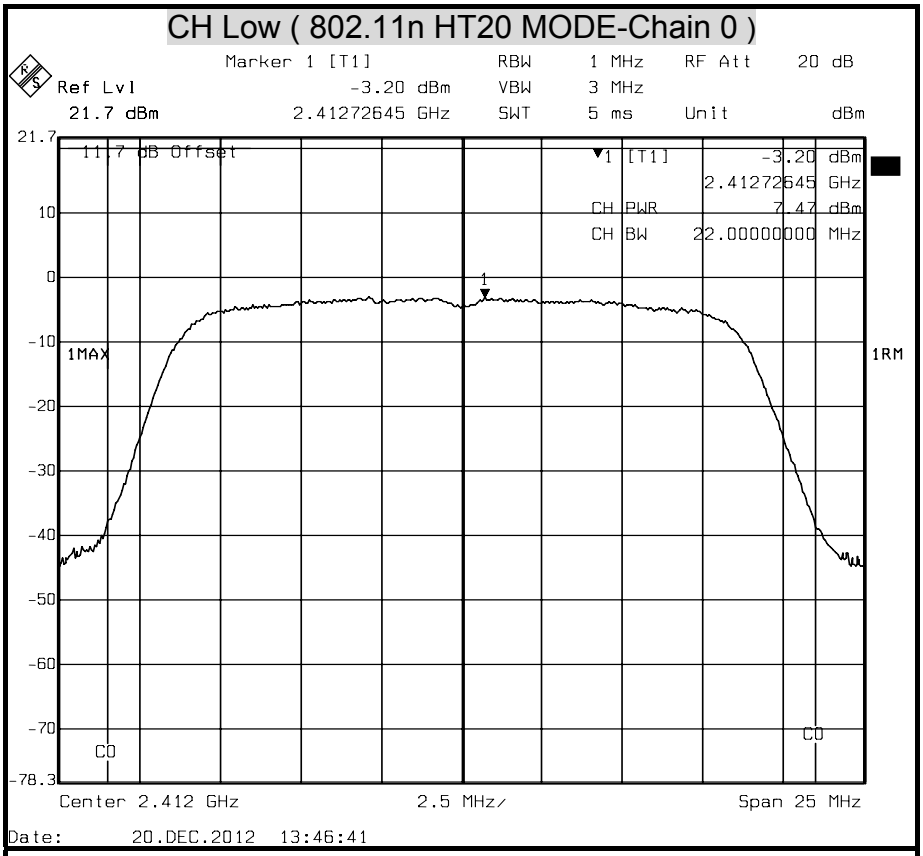


CH High (802.11g MODE)

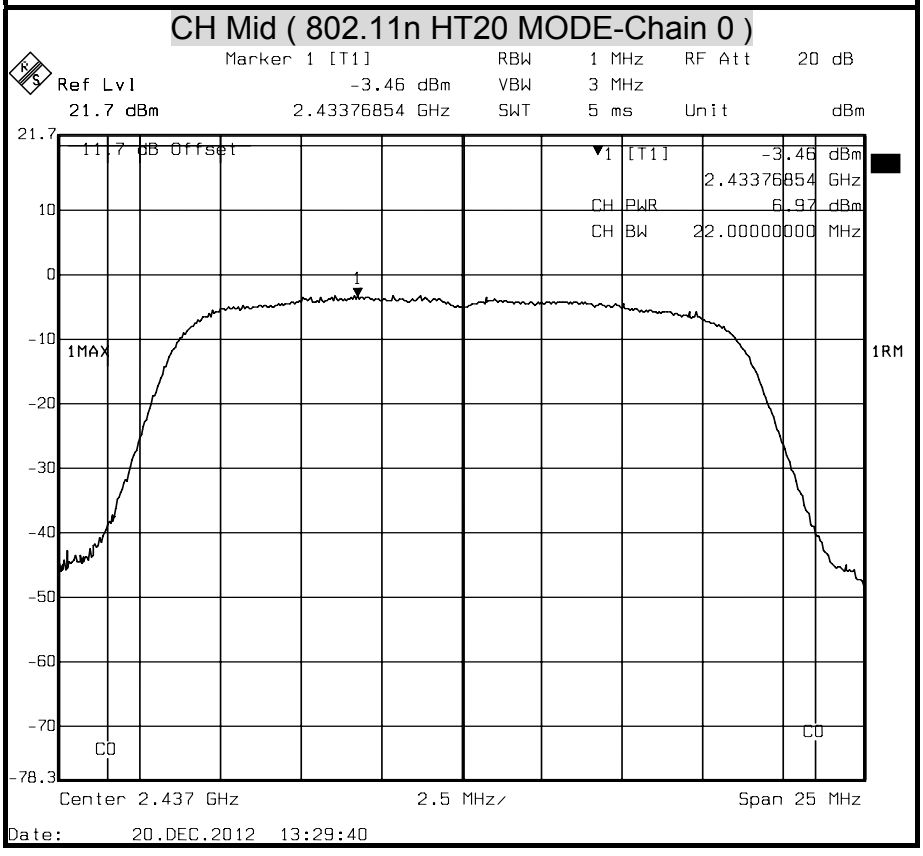


AVERAGE POWER (802.11n HT20 MODE)

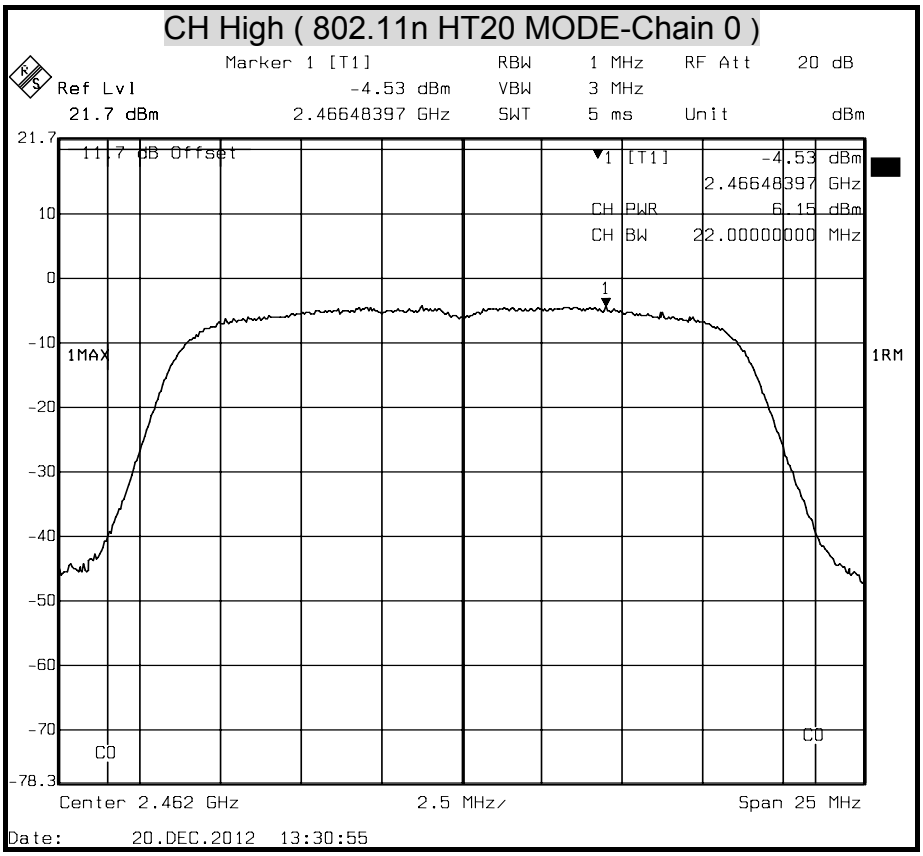
CH Low (802.11n HT20 MODE-Chain 0)



CH Mid (802.11n HT20 MODE-Chain 0)

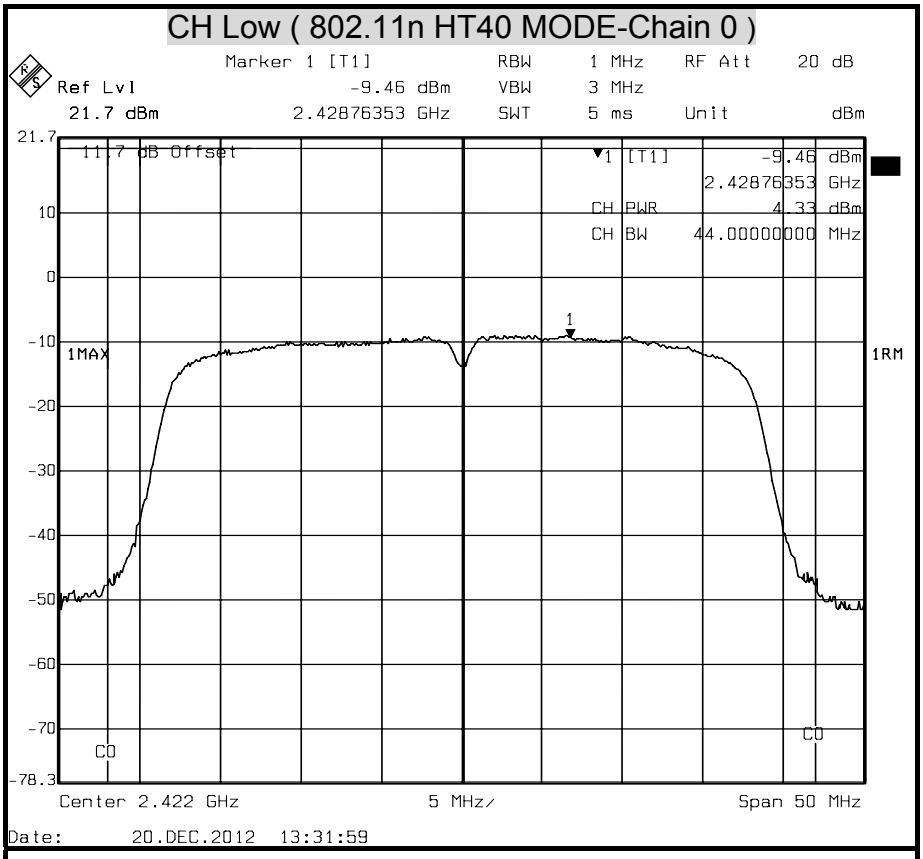


CH High (802.11n HT20 MODE-Chain 0)

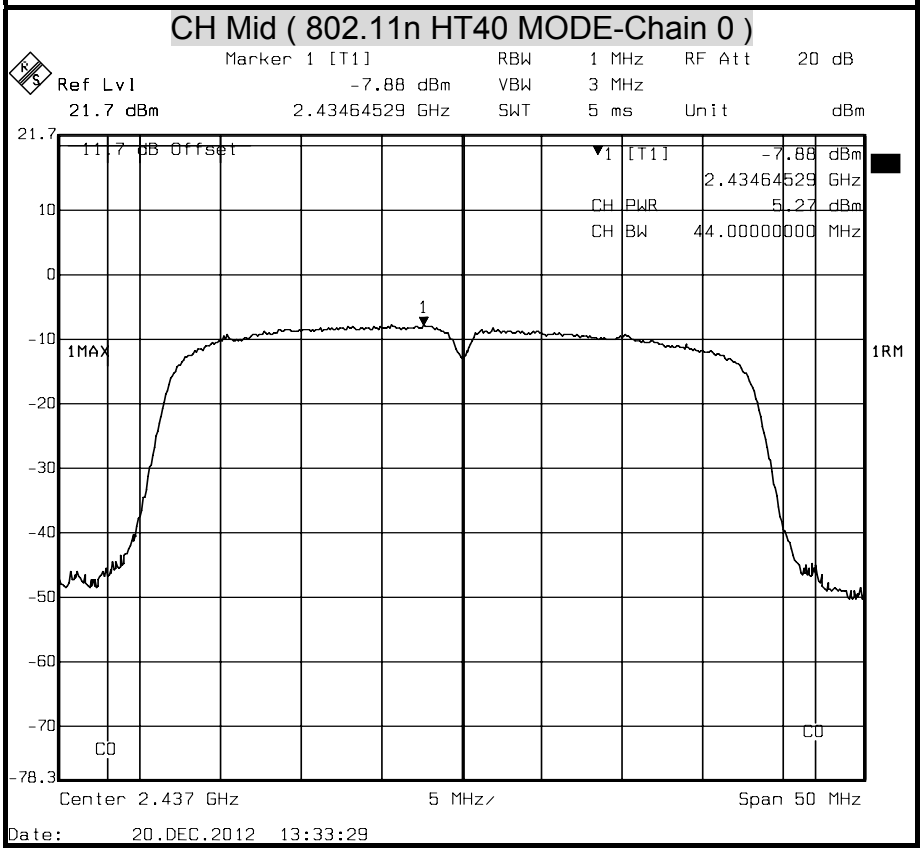


AVERAGE POWER (802.11n HT40 MODE)

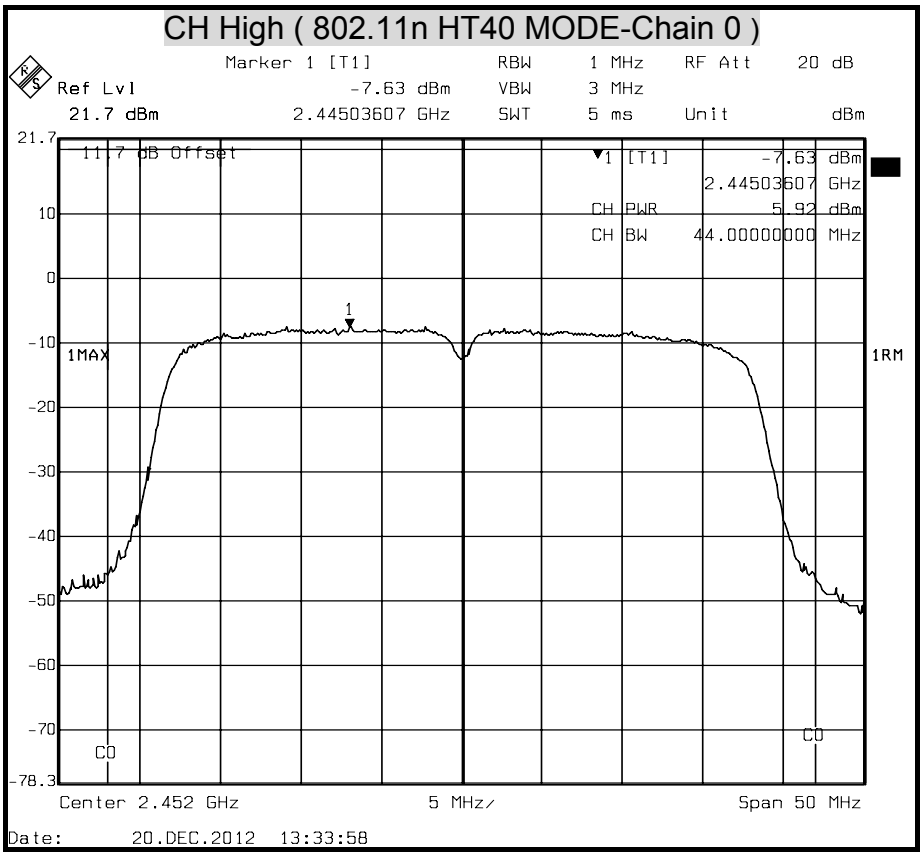
CH Low (802.11n HT40 MODE-Chain 0)



CH Mid (802.11n HT40 MODE-Chain 0)



CH High (802.11n HT40 MODE-Chain 0)



7.4 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 (2.4G): 2.31 dBi = 1.70215851 mW

IEEE 802.11b	=	0.0796 *	70.7946	*	1.70215851	÷ 400 =	0.02398
IEEE 802.11g	=	0.0796 *	37.9315	*	1.70215851	÷ 400 =	0.01285
IEEE 802.11n HT20	=	0.0796 *	27.5423	*	1.70215851	÷ 400 =	0.00933
IEEE 802.11n HT40	=	0.0796 *	20.4644	*	1.70215851	÷ 400 =	0.00693

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	20.0	18.50	70.79	2.31	1	0.023980
IEEE 802.11g	20.0	15.79	37.93	2.31	1	0.012849
IEEE 802.11n HT20	20.0	14.40	27.54	2.31	1	0.009329
IEEE 802.11n HT40	20.0	13.11	20.46	2.31	1	0.006932

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.

7.5 POWER SPECTRAL DENSITY

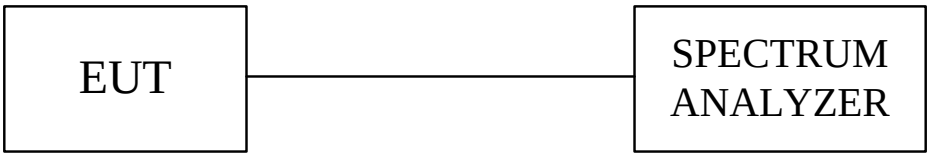
LIMIT

§ 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. 29, 2013

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.

IEEE 802.11b mode

Channel	Frequency (MHz)	Reading (dBm)	BWCF (dB)	PPSD (dBm)	Limit (dBm)	Margin (dB)	Result
Low	2412	4.25	-15.2	-10.95	8.00	-18.95	PASS
Middle	2437	3.69	-15.2	-11.51	8.00	-19.51	PASS
High	2462	4.26	-15.2	-10.94	8.00	-18.94	PASS

NOTE : 1. At finial test to get the worst-case emission at 11Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 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)	Reading (dBm)	BWCF (dB)	PPSD (dBm)	Limit (dBm)	Margin (dB)	Result
Low	2412	-6.22	-15.2	-21.42	8.00	-29.42	PASS
Middle	2437	-6.07	-15.2	-21.27	8.00	-29.27	PASS
High	2462	-5.68	-15.2	-20.88	8.00	-28.88	PASS

NOTE : 1. At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 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)	Reading (dBm)	BWCF (dB)	PPSD (dBm)	Limit (dBm)	Margin (dB)	Result
Low	2412	-7.18	-15.2	-22.38	8.00	-30.38	PASS
Middle	2437	-7.68	-15.2	-22.88	8.00	-30.88	PASS
High	2462	-8.86	-15.2	-24.06	8.00	-32.06	PASS

NOTE : 1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

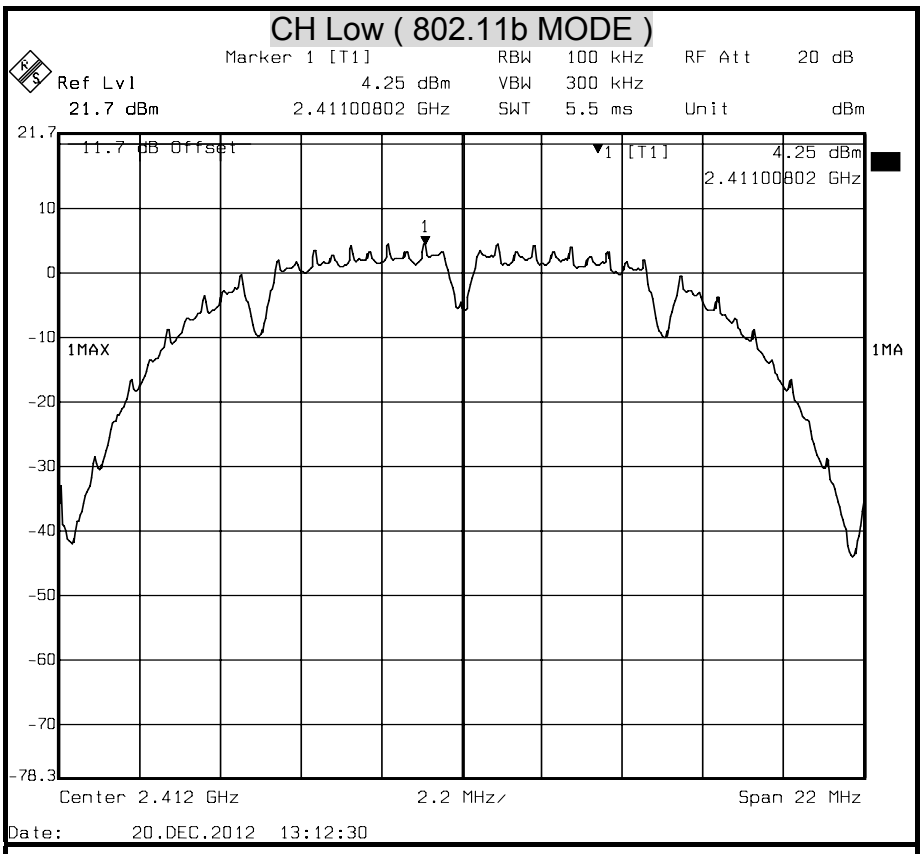
IEEE 802.11n HT40 mode

Channel	Frequency (MHz)	Reading (dBm)	BWCF (dB)	PPSD (dBm)	Limit (dBm)	Margin (dB)	Result
Low	2422	-12.73	-15.2	-27.93	8.00	-35.93	PASS
Middle	2437	-11.98	-15.2	-27.18	8.00	-35.18	PASS
High	2452	-11.78	-15.2	-26.98	8.00	-34.98	PASS

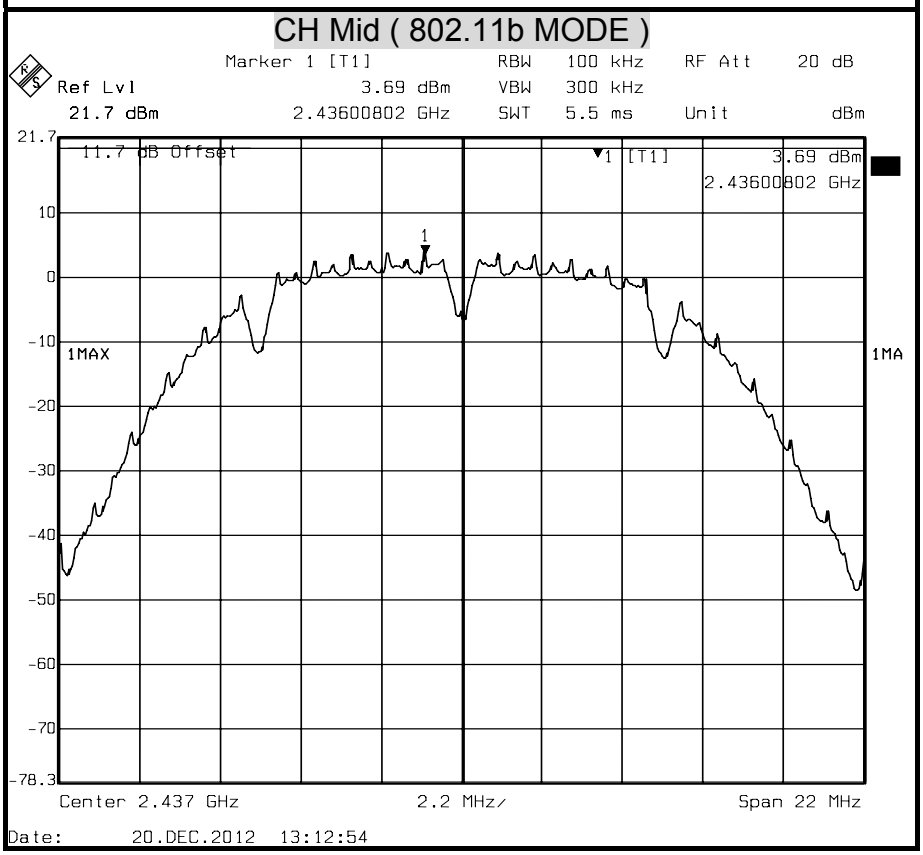
NOTE : 1. At finial test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

POWER SPECTRAL DENSITY (IEEE 802.11b MODE)

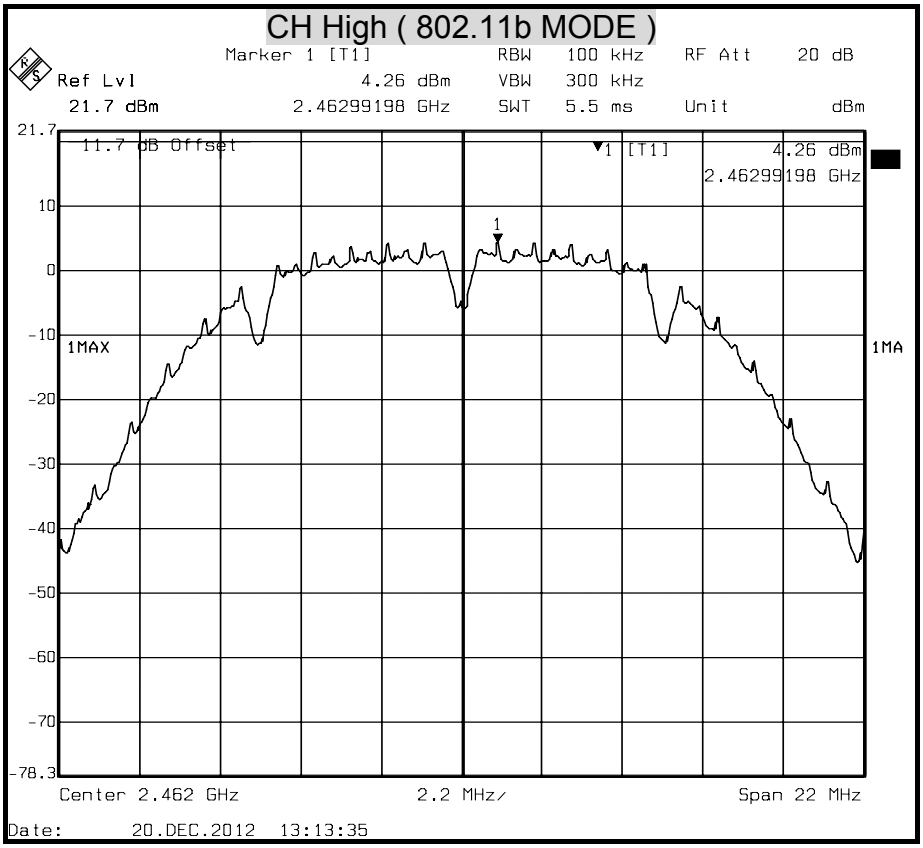
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

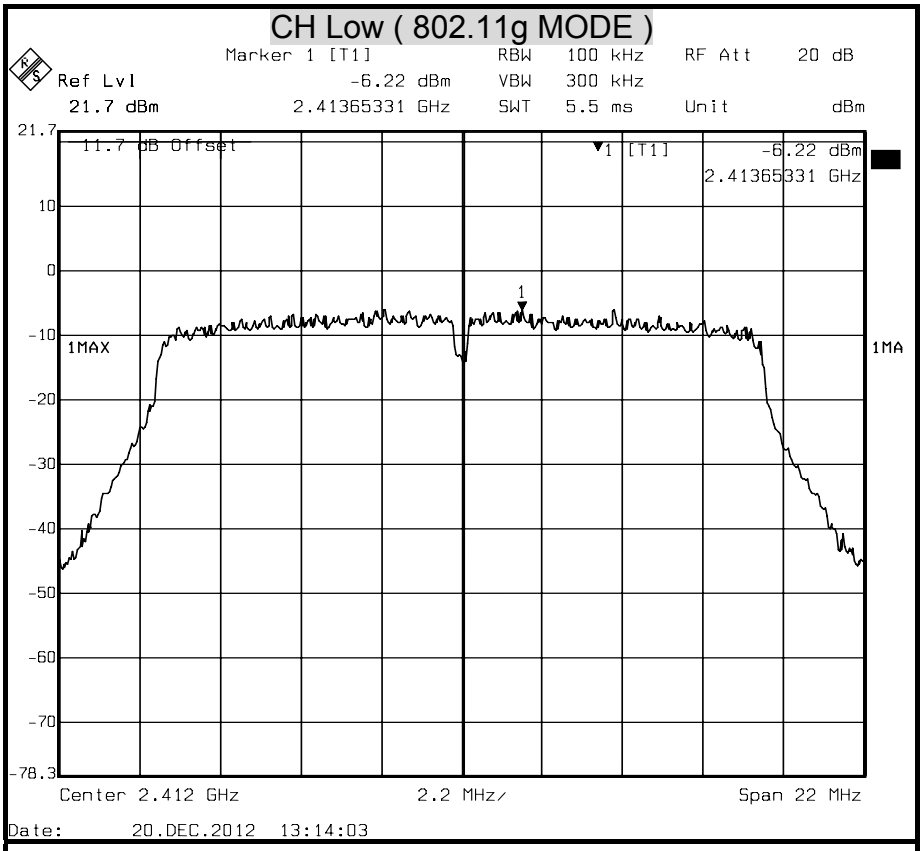


CH High (802.11b MODE)

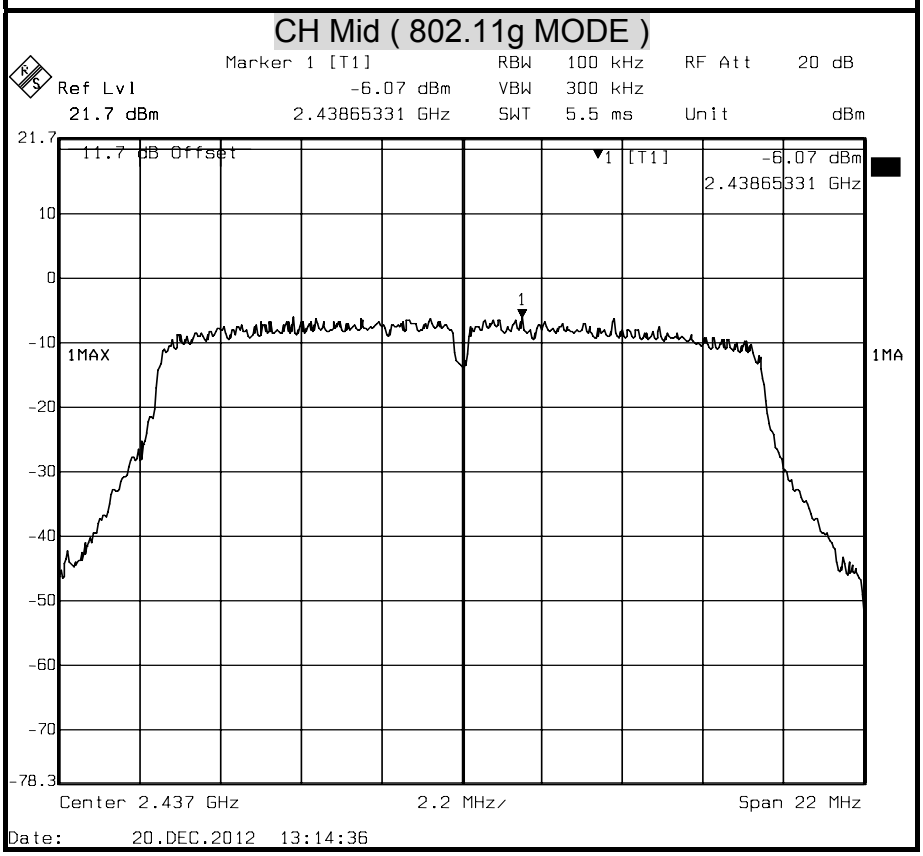


POWER SPECTRAL DENSITY (IEEE 802.11g MODE)

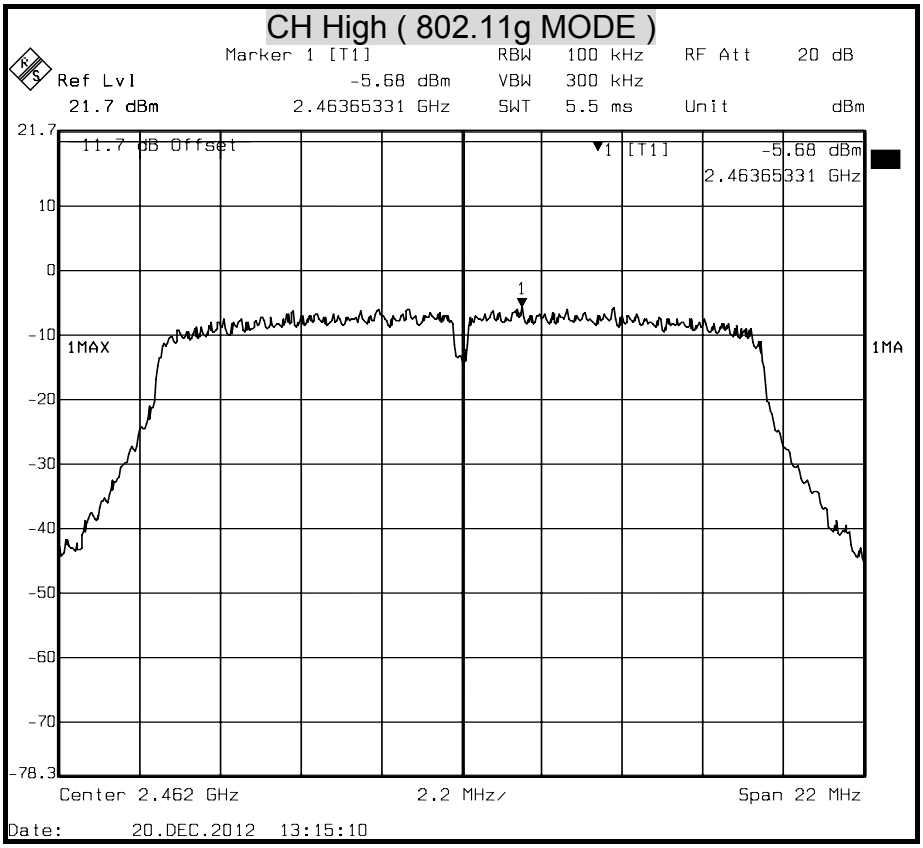
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

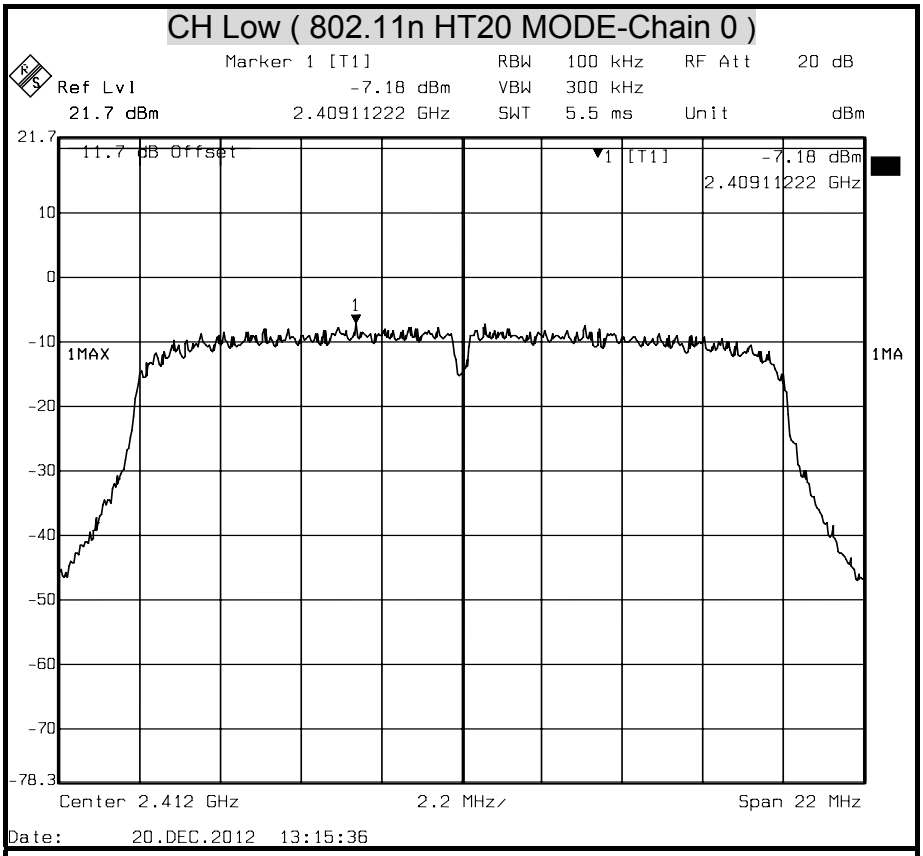


CH High (802.11g MODE)

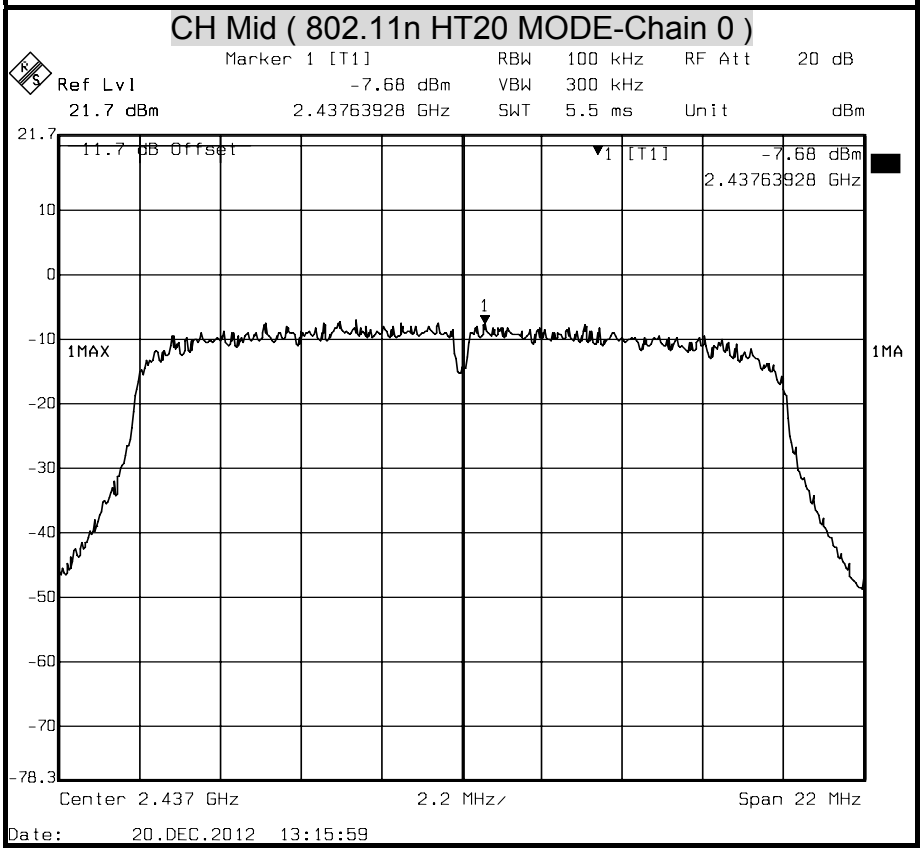


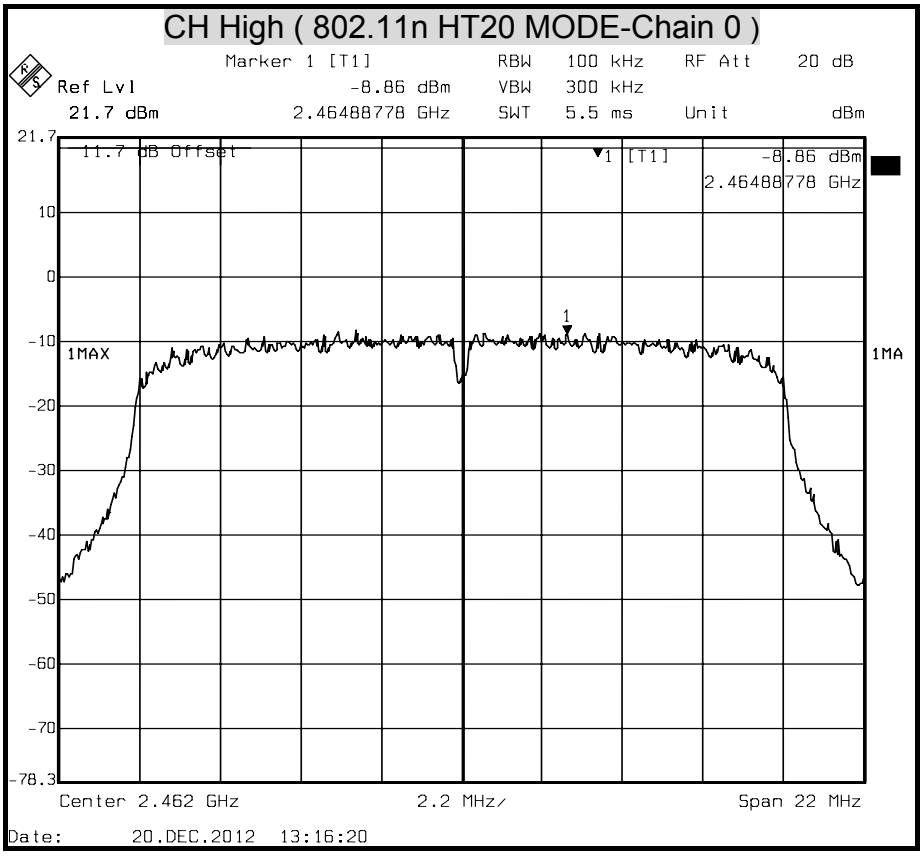
POWER SPECTRAL DENSITY (802.11n HT20 MODE)

CH Low (802.11n HT20 MODE-Chain 0)



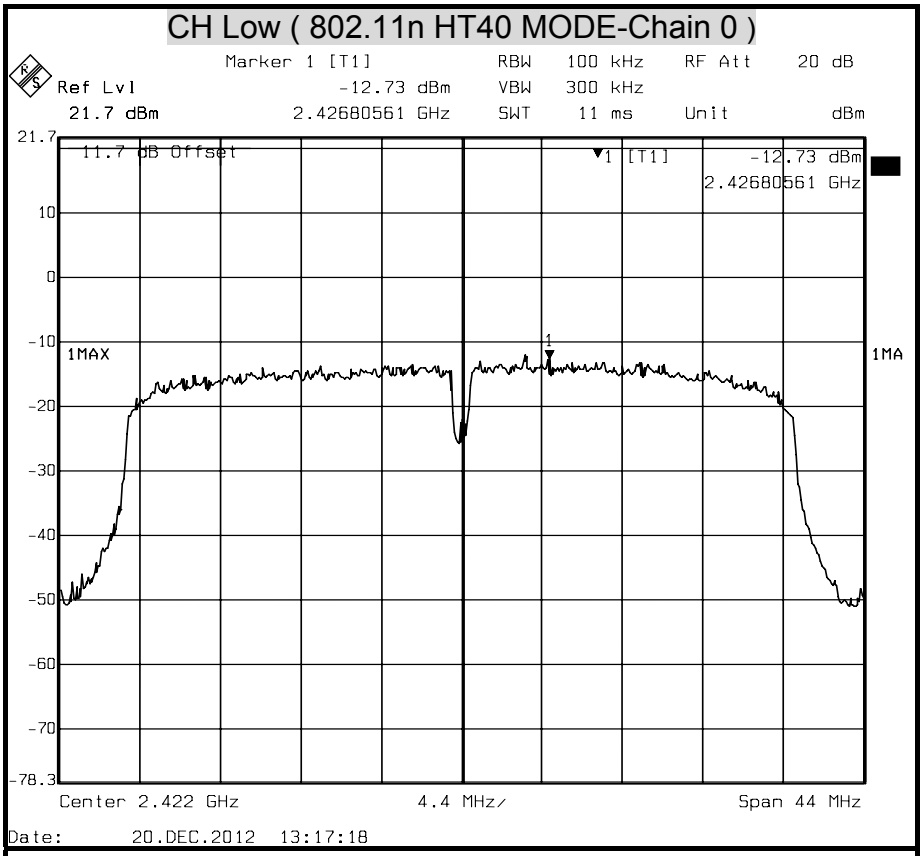
CH Mid (802.11n HT20 MODE-Chain 0)



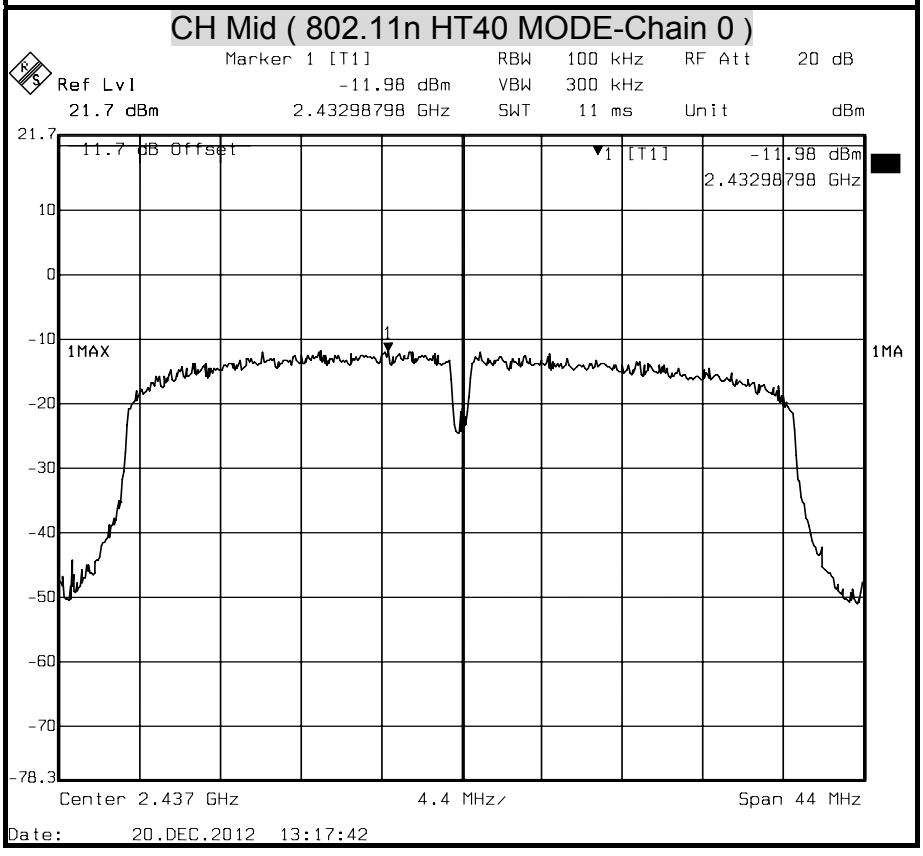

CH High (802.11n HT20 MODE-Chain 0)
Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-8.86 dBm
VBW 300 kHz
21.7 dBm
2.46488778 GHz
SWT 5.5 ms
Unit dBm
11.7 dB Offset
1 [T1]
-8.86 dBm
2.46488778 GHz
1MAX
1MA
Center 2.462 GHz
2.2 MHz/
Span 22 MHz
Date: 20.DEC.2012 13:16:20

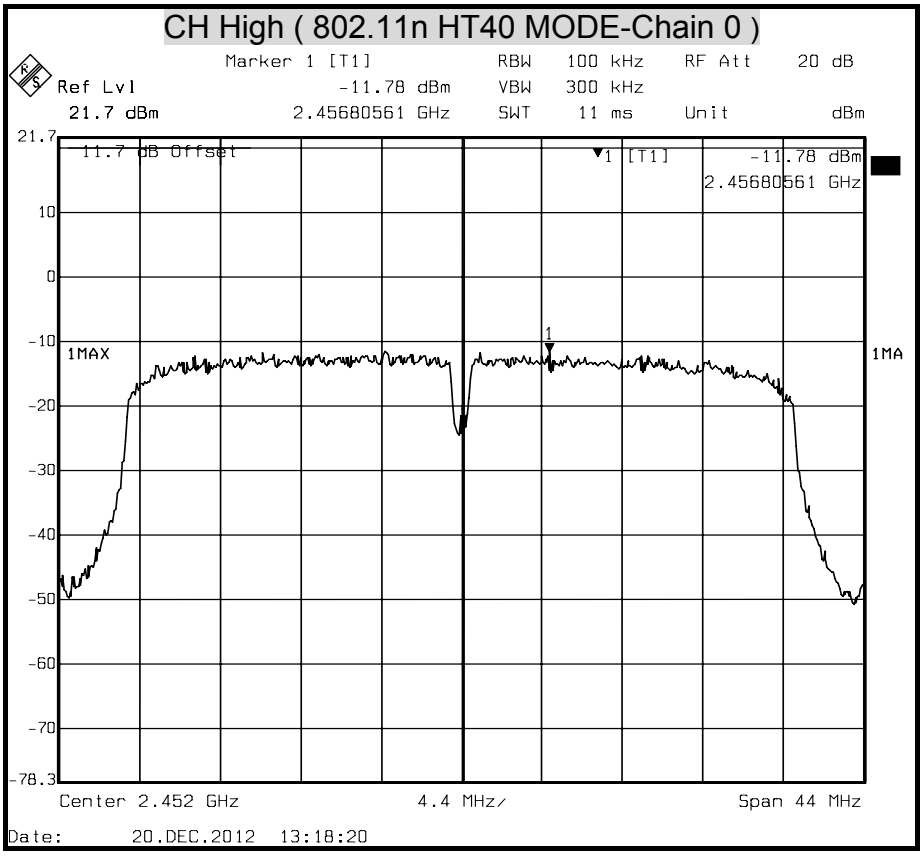
POWER SPECTRAL DENSITY (802.11n HT40 MODE)

CH Low (802.11n HT40 MODE-Chain 0)



CH Mid (802.11n HT40 MODE-Chain 0)




CH High (802.11n HT40 MODE-Chain 0)
Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-11.78 dBm
VBW 300 kHz
21.7 dBm
2.45680561 GHz
SWT 11 ms
Unit dBm
11.7 dB Offset
1 [T1]
-11.78 dBm
2.45680561 GHz
21.7
10
0
-10
-20
-30
-40
-50
-60
-70
-78.3
1MAX
1MA
Center 2.452 GHz
4.4 MHz/
Span 44 MHz
Date: 20.DEC.2012 13:18:20

7.6 CONDUCTED SPURIOUS EMISSION

LIMITS

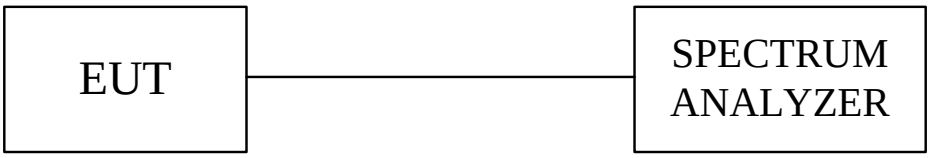
§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the and that contains the highest level 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 PROCEDURE

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

The spectrum from 30 MHz to 26.5 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

TEST SETUP



TEST RESULTS

No non-compliance noted.

802.11b Mode

CH Low

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2413.5402	11.7	95.09	106.79	N/A	N/A
6925.9919	11.7	34.69	46.39	86.79	-40.40
13821.9839	11.7	33.79	45.49	86.79	-41.30
21566.7134	11.7	34.87	46.57	86.79	-40.22

CH Mid

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2437.5101	11.7	95.28	106.98	N/A	N/A
6872.9458	11.7	34.26	45.96	86.98	-41.02
13768.9378	11.7	35.12	46.82	86.98	-40.16
22044.1282	11.7	34.16	45.86	86.98	-41.12

CH High

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2461.5201	11.7	93.78	105.48	N/A	N/A
6713.8076	11.7	34.27	45.97	85.48	-39.51
13238.4769	11.7	33.86	45.56	85.48	-39.92
21778.8978	11.7	34.43	46.13	85.48	-39.35

802.11g Mode

CH Low

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2411.3562	11.7	89.29	100.99	N/A	N/A
6925.9919	11.7	34.09	45.79	80.99	-35.20
13768.9378	11.7	33.15	44.85	80.99	-36.14
22309.3587	11.7	34.61	46.31	80.99	-34.68

CH Mid

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2436.5104	11.7	89.17	100.87	N/A	N/A
6660.7615	11.7	34.24	45.94	80.87	-34.93
13715.8917	11.7	33.91	45.61	80.87	-35.26
22415.4509	11.7	34.08	45.78	80.87	-35.09

CH High

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2462.5384	11.7	89.90	101.6	N/A	N/A
6925.9919	11.7	33.93	45.63	81.60	-35.97
14087.2144	11.7	33.27	44.97	81.60	-36.63
22044.1282	11.7	34.32	46.02	81.60	-35.58

802.11n HT20 Mode

CH Low

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2413.5136	11.7	86.43	98.13	N/A	N/A
6979.038	11.7	34.82	46.52	78.13	-31.61
13609.7996	11.7	32.85	44.55	78.13	-33.58
21991.0821	11.7	34.54	46.24	78.13	-31.89

CH Mid

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2435.8215	11.7	86.14	97.84	N/A	N/A
6979.038	11.7	35.67	47.37	77.84	-30.47
13609.7996	11.7	33.19	44.89	77.84	-32.95
21991.0821	11.7	34.75	46.45	77.84	-31.39

CH High

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2462.5366	11.7	85.15	96.85	N/A	N/A
6819.8998	11.7	34.30	46	76.85	-30.85
15042.044	11.7	33.64	45.34	76.85	-31.51
22150.2204	11.7	33.77	45.47	76.85	-31.38

802.11n HT40 Mode

CH Low

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2421.5365	11.7	83.49	95.19	N/A	N/A
6979.038	11.7	34.18	45.88	75.19	-29.31
12761.0621	11.7	34.10	45.8	75.19	-29.39
21566.7134	11.7	33.56	45.26	75.19	-29.93

CH Mid

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2435.6536	11.7	84.92	96.62	N/A	N/A
6979.038	11.7	34.68	46.38	76.62	-30.24
13715.8917	11.7	33.63	45.33	76.62	-31.29
21725.8517	11.7	34.35	46.05	76.62	-30.57

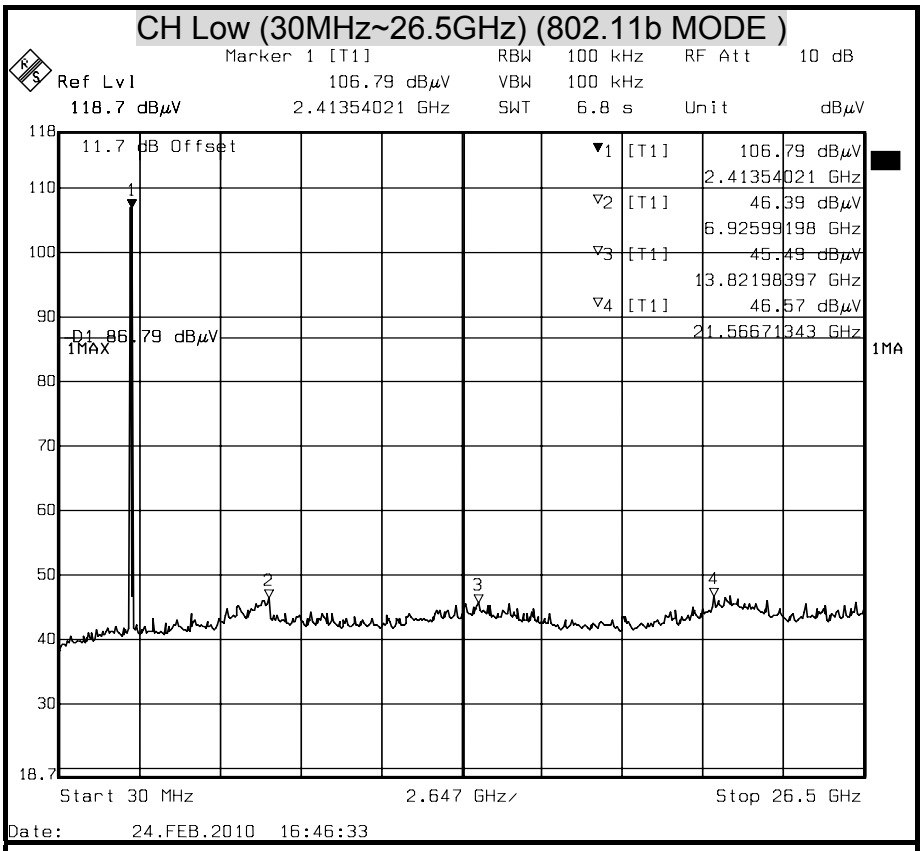
CH High

Frequency (MHz)	Offset (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)
2451.5317	11.7	82.51	94.21	N/A	N/A
6979.038	11.7	34.40	46.1	74.21	-28.11
13928.0761	11.7	33.49	45.19	74.21	-29.02
22044.1282	11.7	34.53	46.23	74.21	-27.98

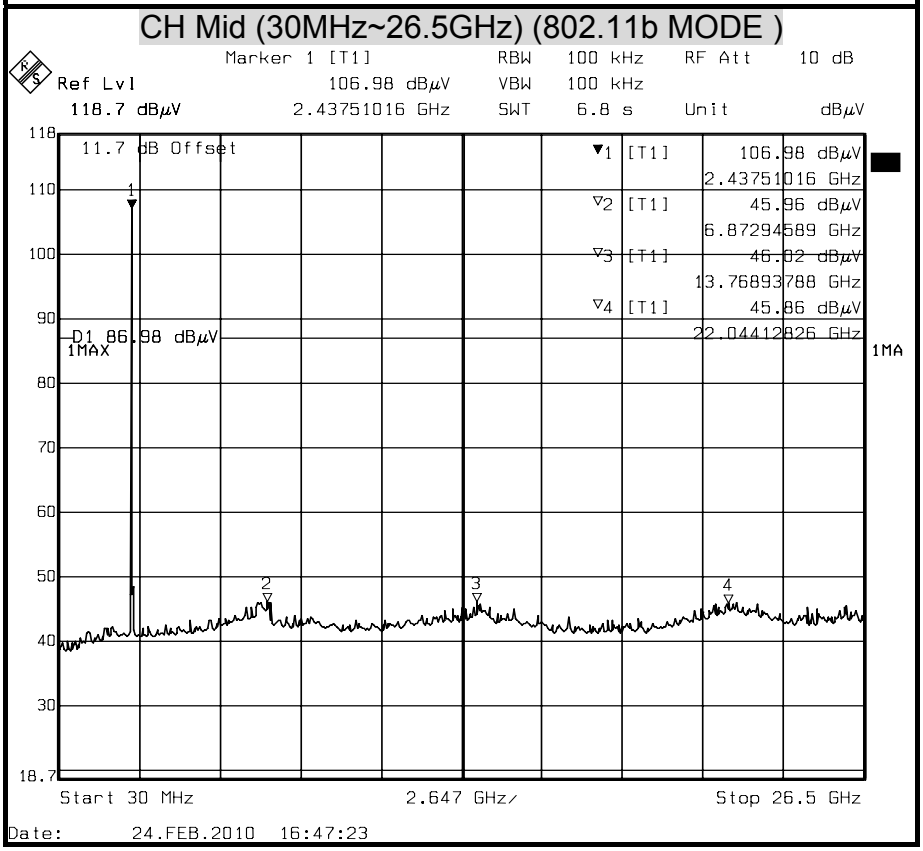
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(IEEE 802.11b MODE)

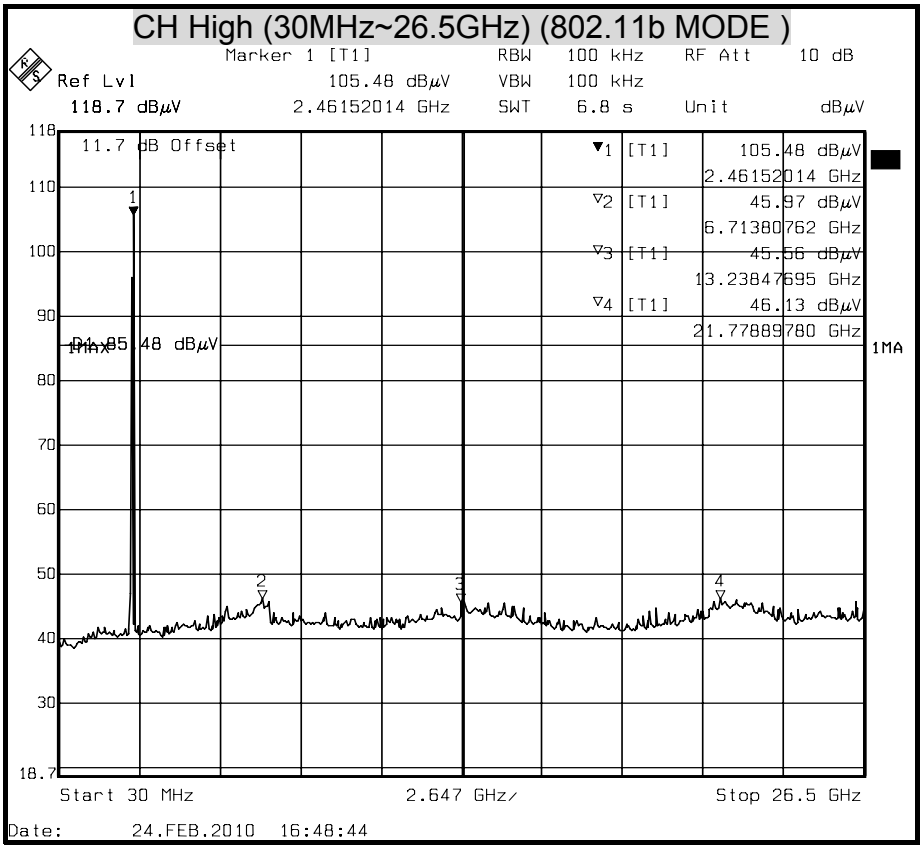
CH Low (30MHz~26.5GHz) (802.11b MODE)



CH Mid (30MHz~26.5GHz) (802.11b MODE)



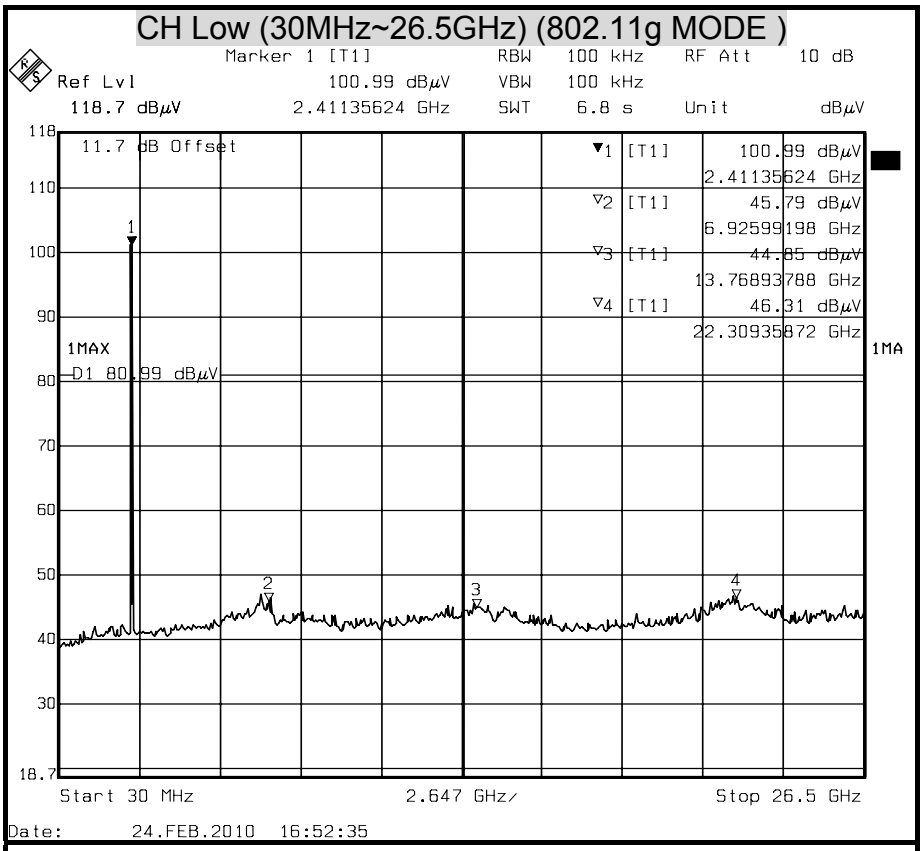
CH High (30MHz~26.5GHz) (802.11b MODE)



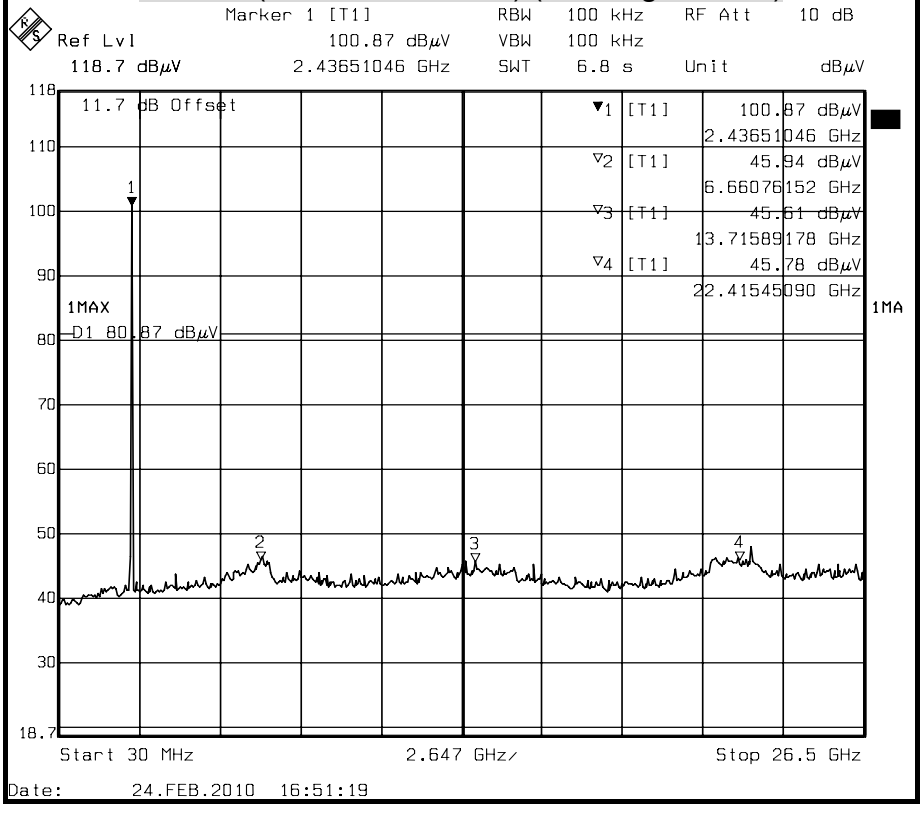
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(802.11g MODE)

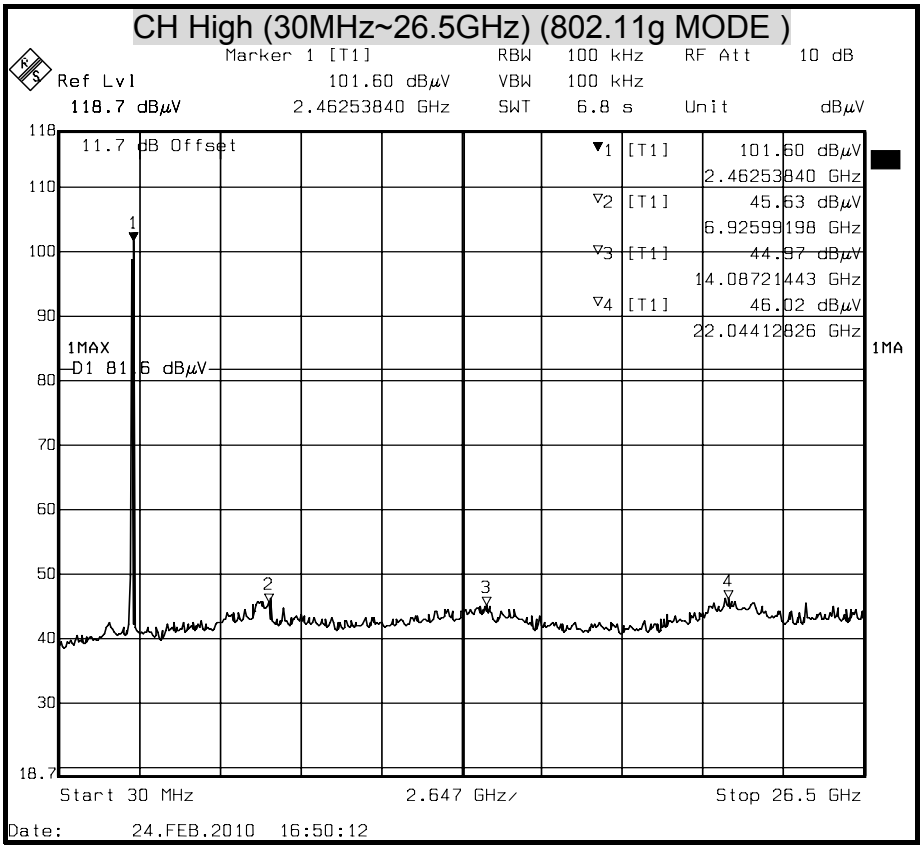
CH Low (30MHz~26.5GHz) (802.11g MODE)



CH Mid (30MHz~26.5GHz) (802.11g MODE)



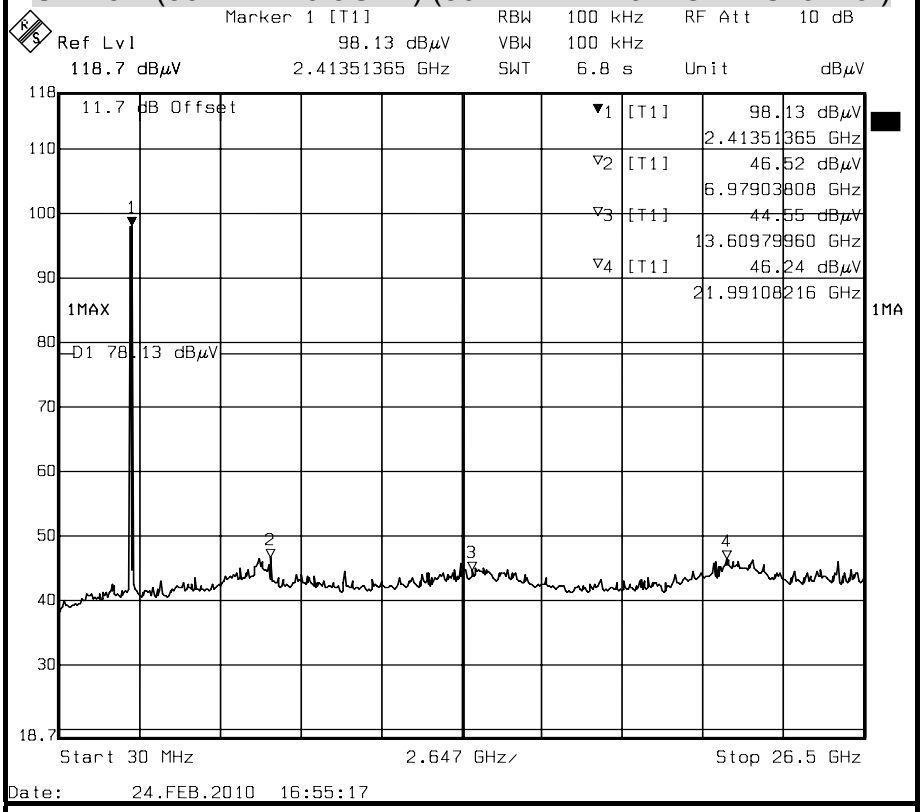
CH High (30MHz~26.5GHz) (802.11g MODE)



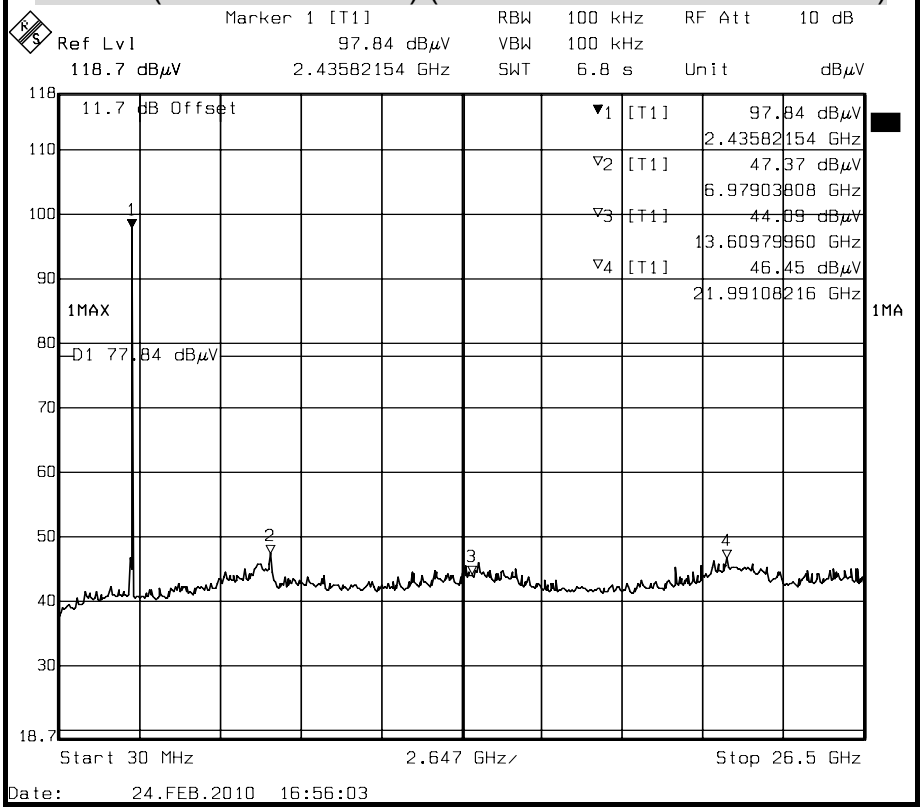
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(802.11n HT20 MODE)

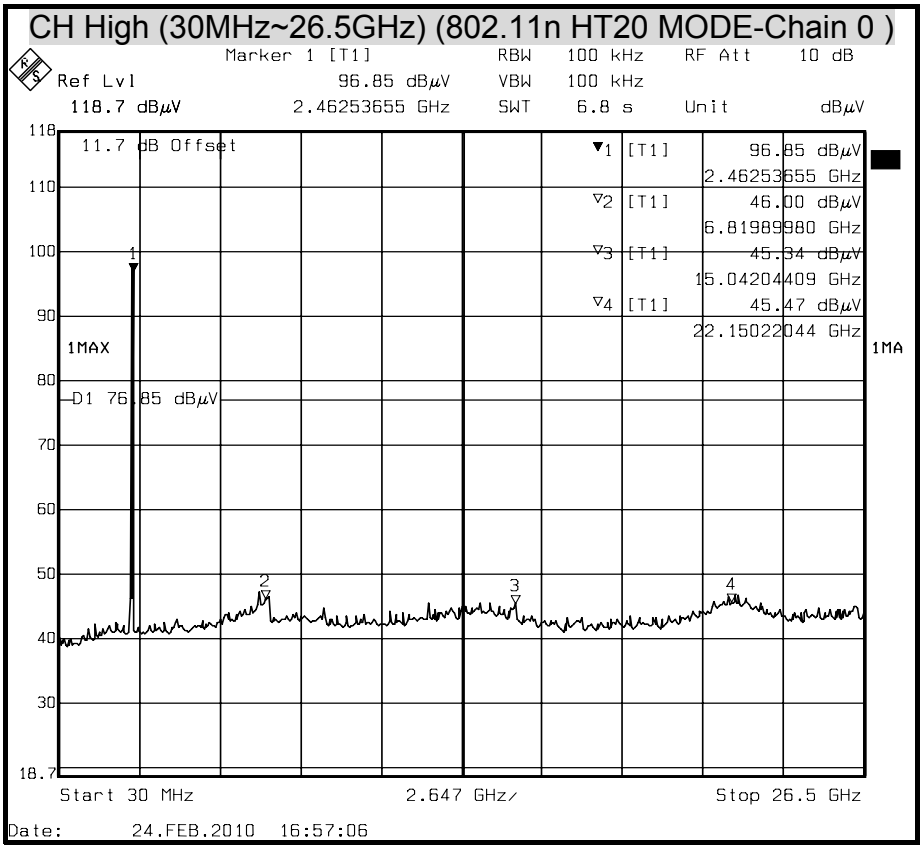
CH Low (30MHz~26.5GHz) (802.11n HT20 MODE-Chain 0)



CH Mid (30MHz~26.5GHz) (802.11n HT20 MODE-Chain 0)



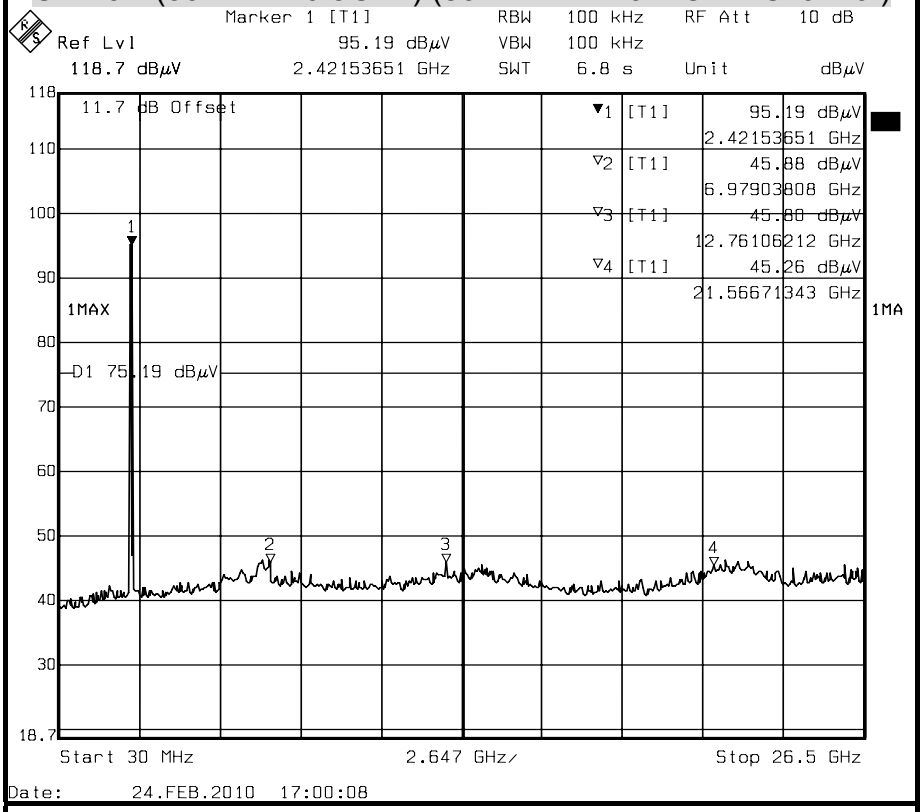
CH High (30MHz~26.5GHz) (802.11n HT20 MODE-Chain 0)



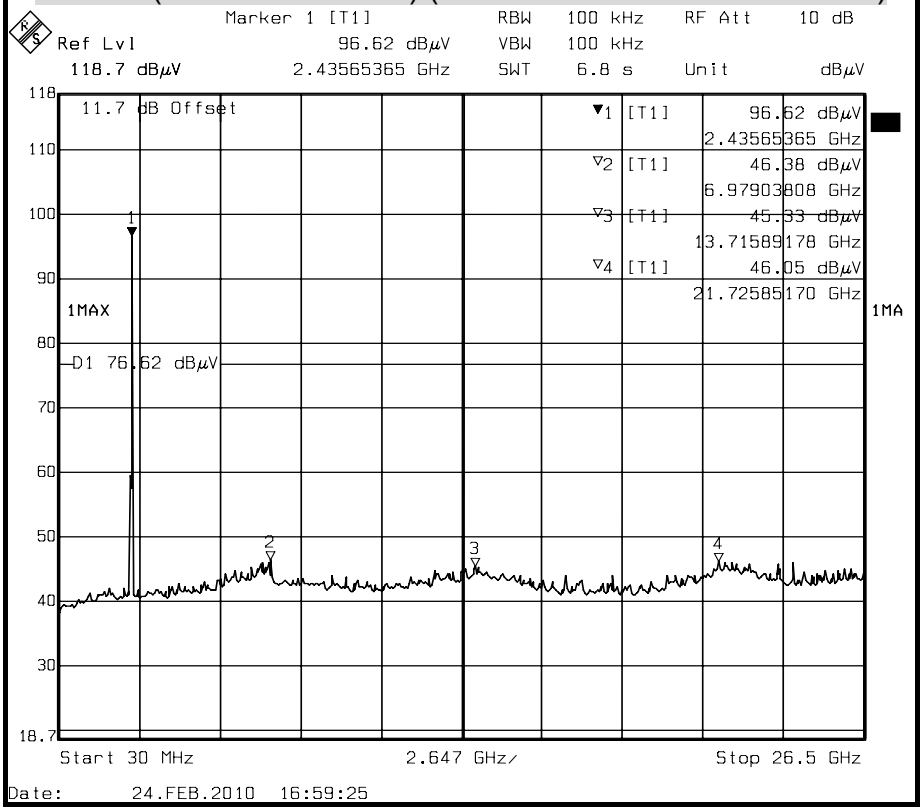
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(802.11n HT40 MODE)

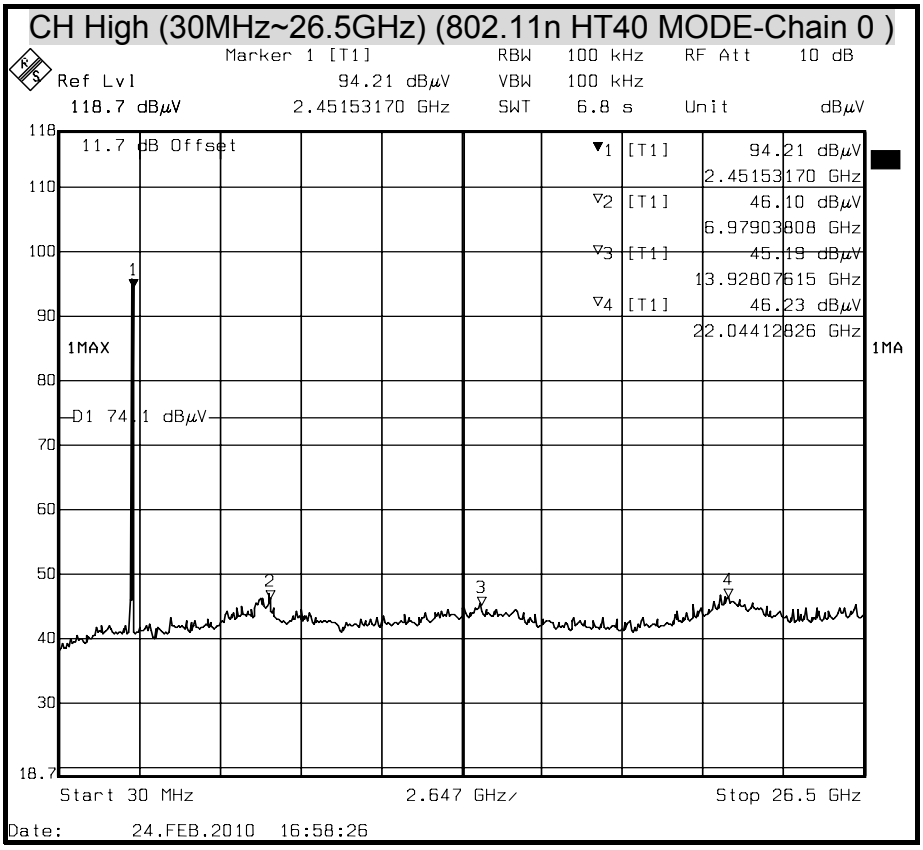
CH Low (30MHz~26.5GHz) (802.11n HT40 MODE-Chain 0)



CH Mid (30MHz~26.5GHz) (802.11n HT40 MODE-Chain 0)



CH High (30MHz~26.5GHz) (802.11n HT40 MODE-Chain 0)



7.7 RADIATED EMISSIONS

7.7.1 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.

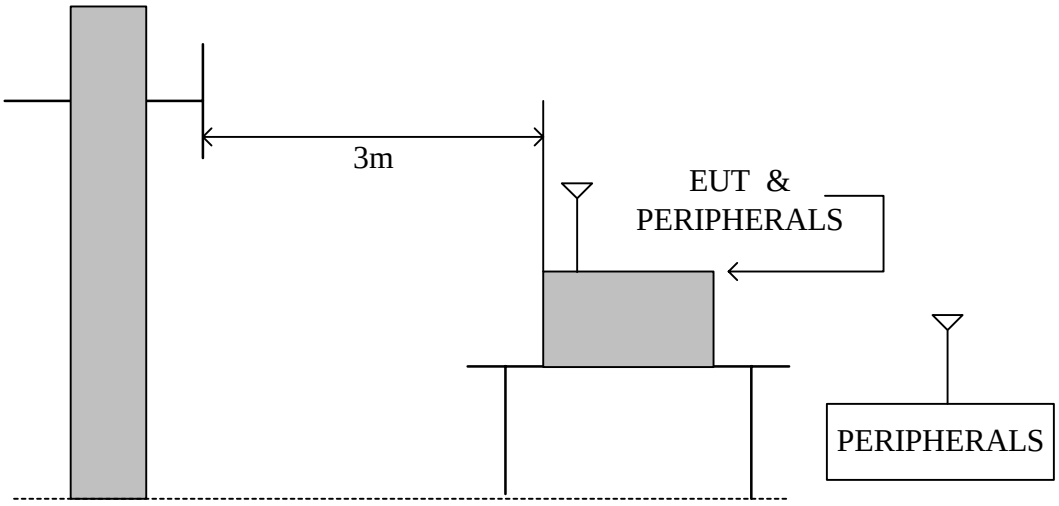
TEST EQUIPMENTS

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	AUG. 31, 2010
BI-LOG Antenna	Sunol	JB1	A070506-2	NOV. 12, 2010
LOOP ANTENNA	EMCO	6502	2356	MAY 28, 2010
Pre-Amplifier	HP	8447F	2944A03817	AUG. 31, 2010
EMI Receiver	R&S	ESVS10	833206/012	APR. 28, 2010
RF Cable	SUHNER	SUCOFLEX104PEA	20520/4PEA	NOV. 10, 2010
Horn Antenna	Com-Power	AH-118	071032	DEC. 29, 2010
Spectrum Analyzer	R&S	FSEK 30	835253/002	JAN. 03, 2011
Pre-Amplifier	MITEQ	AFS44-00108650-42-10P-44	1205908	NOV. 10, 2010
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
Test S/W	e-3 (5.04303e)			

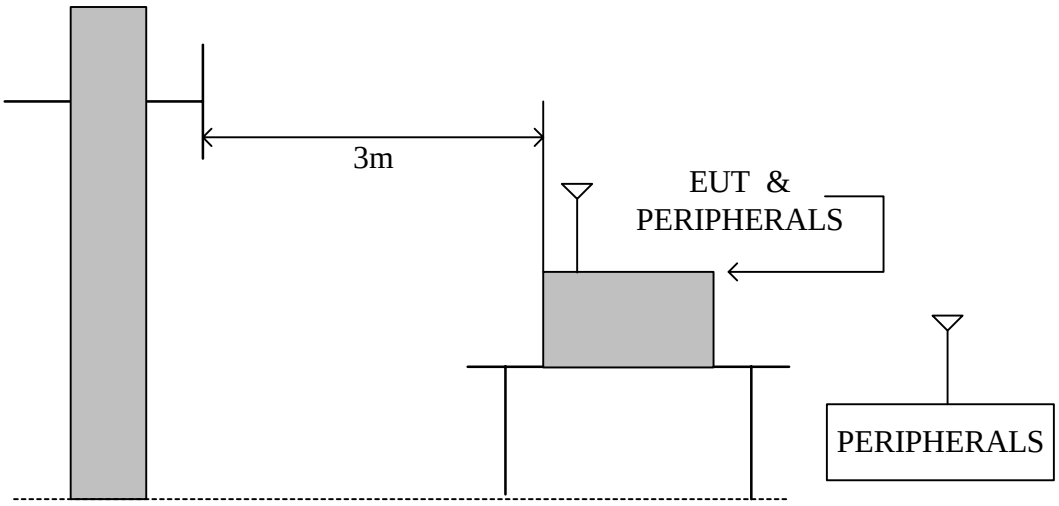
TEST SETUP

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 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.

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.

7.7.2 WORST-CASE RADIATED EMISSION BELOW 1 GHz

Product Name	3G Mobile Wireless Router	Test Date	2010/02/10
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	Normal operating (worst case)	TEMP& Humidity	27.8℃, 54%

Horizontal

Frequency	Meter Reading	Antenna Factor	Cable Loss	Emission Level	Limits	Margin	Detector Mode
(MHz)	(dBμV)	(dB/M)	(dB)	(dBμV/M)	(dBμV/M)	(dB)	PK/QP
55.33	18.50	12.49	1.16	32.16	40.00	-7.84	QP
158.14	21.57	13.36	2.17	37.10	43.50	-6.40	QP
213.32	24.20	13.06	2.59	39.86	43.50	-3.64	QP
320.00	22.20	14.61	3.46	40.27	46.00	-5.73	QP
426.63	15.80	16.83	4.14	36.77	46.00	-9.23	QP
640.00	14.30	19.86	5.49	39.65	46.00	-6.35	QP
853.31	13.30	22.46	6.30	42.05	46.00	-3.95	QP
N/A	-----	-----	-----	-----	-----	-----	-----

Vertical

Frequency	Meter Reading	Antenna Factor	Cable Loss	Emission Level	Limits	Margin	Detector Mode
(MHz)	(dBμV)	(dB/M)	(dB)	(dBμV/M)	(dBμV/M)	(dB)	PK/QP
55.33	22.16	12.49	1.16	35.82	40.00	-4.18	QP
158.35	16.80	13.36	2.17	32.33	43.50	-11.17	QP
213.33	18.40	13.06	2.59	34.06	43.50	-9.44	QP
320.00	21.60	14.61	3.46	39.67	46.00	-6.33	QP
426.63	14.90	16.83	4.14	35.87	46.00	-10.13	QP
640.00	12.60	19.86	5.49	37.95	46.00	-8.05	QP
853.32	11.80	22.46	6.30	40.55	46.00	-5.45	QP
N/A	-----	-----	-----	-----	-----	-----	-----

REMARK: Emission level (dBμV/m) =Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).

7.7.3 TRANSMITTER RADIATED EMISSION ABOVE 1 GHz

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11b TX (CH Low)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3216.03	54.62	30.14	3.00	41.19	1.26	47.83	74.00	-26.17	P
	3216.03	43.25	30.14	3.00	41.19	1.26	36.46	54.00	-17.54	A
*	4823.65	53.26	33.17	3.73	42.38	0.69	48.47	74.00	-25.53	P
*	4823.65	42.85	33.17	3.73	42.38	0.69	38.06	54.00	-15.94	A
	6432.03	53.62	35.09	4.32	42.78	0.77	51.02	74.00	-22.98	P
	6432.03	42.85	35.09	4.32	42.78	0.77	40.25	54.00	-13.75	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	**Test By**	Eric Yang
Test Mode	IEEE 802.11b TX (CH Low)	**TEMP& Humidity**	25.3℃, 44%

Vertical

	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)
	3216.05	52.41	30.14	3.00	41.19	1.26	45.62	74.00	-28.38	P
	3216.05	41.33	30.14	3.00	41.19	1.26	34.54	54.00	-19.46	A
*	4824.81	51.42	33.17	3.73	42.38	0.69	46.63	74.00	-27.37	P
*	4824.81	40.85	33.17	3.73	42.38	0.69	36.06	54.00	-17.94	A
	6431.86	51.42	35.09	4.32	42.78	0.77	48.82	74.00	-25.18	P
	6431.86	41.36	35.09	4.32	42.78	0.77	38.76	54.00	-15.24	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11b TX (CH Middle)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3249.32	54.87	30.15	3.02	41.20	1.22	48.06	74.00	-25.94	P
	3249.32	43.62	30.15	3.02	41.20	1.22	36.81	54.00	-17.19	A
*	4874.16	53.26	33.32	3.74	42.43	0.71	48.61	74.00	-25.39	P
*	4874.16	42.85	33.32	3.74	42.43	0.71	38.20	54.00	-15.80	A
	6498.62	53.62	35.20	4.34	42.69	0.78	51.25	74.00	-22.75	P
	6498.62	42.81	35.20	4.34	42.69	0.78	40.44	54.00	-13.56	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11b TX (CH Middle)	TEMP& Humidity	25.3℃, 44%

Vertical

	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)
	3249.27	52.16	30.15	3.02	41.20	1.22	45.35	74.00	-28.65	P
	3249.27	40.28	30.15	3.02	41.20	1.22	33.47	54.00	-20.53	A
*	4873.95	51.42	33.32	3.74	42.43	0.71	46.76	74.00	-27.24	P
*	4873.95	40.26	33.32	3.74	42.43	0.71	35.60	54.00	-18.40	A
	6498.59	51.42	35.20	4.34	42.69	0.78	49.05	74.00	-24.95	P
	6498.59	39.85	35.20	4.34	42.69	0.78	37.48	54.00	-16.52	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11b TX (CH High)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3282.61	54.62	30.16	3.05	41.21	1.17	47.79	74.00	-26.21	P
	3282.61	43.81	30.16	3.05	41.21	1.17	36.98	54.00	-17.02	A
*	4924.27	53.27	33.47	3.76	42.48	0.73	48.75	74.00	-25.25	P
*	4924.27	41.65	33.47	3.76	42.48	0.73	37.13	54.00	-16.87	A
	6565.34	54.87	35.55	4.37	42.63	0.80	52.96	74.00	-21.04	P
	6565.34	44.62	35.55	4.37	42.63	0.80	42.71	54.00	-11.29	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11b TX (CH High)	TEMP& Humidity	25.3℃, 44%

Vertical

	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)
	3282.59	52.41	30.16	3.05	41.21	1.17	45.58	74.00	-28.42	P
	3282.59	41.33	30.16	3.05	41.21	1.17	34.50	54.00	-19.50	A
*	4924.23	51.42	33.47	3.76	42.48	0.73	46.90	74.00	-27.10	P
*	4924.23	39.87	33.47	3.76	42.48	0.73	35.35	54.00	-18.65	A
	6565.38	52.64	35.55	4.37	42.63	0.80	50.73	74.00	-23.27	P
	6565.38	42.03	35.55	4.37	42.63	0.80	40.12	54.00	-13.88	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11g TX (CH Low)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3216.03	54.62	30.14	3.00	41.19	1.26	47.83	74.00	-26.17	P
	3216.03	43.82	30.14	3.00	41.19	1.26	37.03	54.00	-16.97	A
*	4823.65	53.26	33.17	3.73	42.38	0.69	48.47	74.00	-25.53	P
*	4823.65	42.81	33.17	3.73	42.38	0.69	38.02	54.00	-15.98	A
	6431.97	54.35	35.09	4.32	42.78	0.77	51.75	74.00	-22.25	P
	6431.97	43.22	35.09	4.32	42.78	0.77	40.62	54.00	-13.38	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11g TX (CH Low)	TEMP& Humidity	25.3℃, 44%

Vertical

	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)
	3215.98	52.41	30.14	3.00	41.19	1.26	45.62	74.00	-28.38	P
	3215.98	41.36	30.14	3.00	41.19	1.26	34.57	54.00	-19.43	A
*	4824.13	51.42	33.17	3.73	42.38	0.69	46.63	74.00	-27.37	P
*	4824.13	39.87	33.17	3.73	42.38	0.69	35.08	54.00	-18.92	A
	6432.03	52.02	35.09	4.32	42.78	0.77	49.42	74.00	-24.58	P
	6432.03	41.37	35.09	4.32	42.78	0.77	38.77	54.00	-15.23	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11g TX (CH Middle)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3249.32	53.26	30.15	3.02	41.20	1.22	46.45	74.00	-27.55	P
	3249.32	42.81	30.15	3.02	41.20	1.22	36.00	54.00	-18.00	A
*	4874.69	54.67	33.32	3.74	42.43	0.71	50.02	74.00	-23.98	P
*	4874.69	42.17	33.32	3.74	42.43	0.71	37.52	54.00	-16.48	A
	6498.59	53.68	35.20	4.34	42.69	0.78	51.31	74.00	-22.69	P
	6498.59	41.75	35.20	4.34	42.69	0.78	39.38	54.00	-14.62	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11g TX (CH Middle)	TEMP& Humidity	25.3℃, 44%

Vertical

	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)
	3249.34	52.14	30.15	3.02	41.20	1.22	45.33	74.00	-28.67	P
	3249.34	41.38	30.15	3.02	41.20	1.22	34.57	54.00	-19.43	A
*	4875.26	52.24	33.33	3.75	42.44	0.71	47.59	74.00	-26.41	P
*	4875.26	41.36	33.33	3.75	42.44	0.71	36.71	54.00	-17.29	A
	6498.53	51.24	35.20	4.34	42.69	0.78	48.87	74.00	-25.13	P
	6498.53	40.68	35.20	4.34	42.69	0.78	38.31	54.00	-15.69	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11g TX (CH High)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3282.59	55.85	30.16	3.05	41.21	1.17	49.02	74.00	-24.98	P
	3282.59	45.62	30.16	3.05	41.21	1.17	38.79	54.00	-15.21	A
*	4924.51	54.73	33.47	3.76	42.48	0.73	50.21	74.00	-23.79	P
*	4924.51	43.65	33.47	3.76	42.48	0.73	39.13	54.00	-14.87	A
	6565.33	52.18	35.55	4.37	42.63	0.80	50.27	74.00	-23.73	P
	6565.33	42.65	35.55	4.37	42.63	0.80	40.74	54.00	-13.26	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11g TX (CH High)	TEMP& Humidity	25.3℃, 44%

Vertical

	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)
	3282.63	52.64	30.16	3.05	41.21	1.17	45.81	74.00	-28.19	P
	3282.63	43.26	30.16	3.05	41.21	1.17	36.43	54.00	-17.57	A
*	4923.86	53.24	33.47	3.76	42.48	0.73	48.72	74.00	-25.28	P
*	4923.86	41.62	33.47	3.76	42.48	0.73	37.10	54.00	-16.90	A
	6565.34	52.55	35.55	4.37	42.63	0.80	50.64	74.00	-23.36	P
	6565.34	39.87	35.55	4.37	42.63	0.80	37.96	54.00	-16.04	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT20 TX (CH Low)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3215.97	53.64	30.14	3.00	41.19	1.26	46.85	74.00	-27.15	P
	3215.97	42.55	30.14	3.00	41.19	1.26	35.76	54.00	-18.24	A
*	4823.67	54.81	33.17	3.73	42.38	0.69	50.02	74.00	-23.98	P
*	4823.67	43.67	33.17	3.73	42.38	0.69	38.88	54.00	-15.12	A
	6432.05	53.28	35.09	4.32	42.78	0.77	50.68	74.00	-23.32	P
	6432.05	42.61	35.09	4.32	42.78	0.77	40.01	54.00	-13.99	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT20 TX (CH Low)	TEMP& Humidity	25.3℃, 44%

Vertical

	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)
	3216.03	52.65	30.14	3.00	41.19	1.26	45.86	74.00	-28.14	P
	3216.03	41.72	30.14	3.00	41.19	1.26	34.93	54.00	-19.07	A
*	4821.98	52.54	33.17	3.73	42.38	0.69	47.75	74.00	-26.25	P
*	4821.98	41.33	33.17	3.73	42.38	0.69	36.54	54.00	-17.46	A
	6431.96	51.42	35.09	4.32	42.78	0.77	48.82	74.00	-25.18	P
	6431.96	39.87	35.09	4.32	42.78	0.77	37.27	54.00	-16.73	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT20 TX (CH Middle)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3249.41	53.24	30.15	3.02	41.20	1.22	46.43	74.00	-27.57	P
	3249.41	43.62	30.15	3.02	41.20	1.22	36.81	54.00	-17.19	A
*	4873.26	52.87	33.32	3.74	42.43	0.71	48.21	74.00	-25.79	P
*	4873.26	41.33	33.32	3.74	42.43	0.71	36.67	54.00	-17.33	A
	6498.37	54.65	35.20	4.34	42.69	0.78	52.27	74.00	-21.73	P
	6498.37	43.82	35.20	4.34	42.69	0.78	41.44	54.00	-12.56	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT20 TX (CH Middle)	TEMP& Humidity	25.3℃, 44%

Vertical

	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)
	3249.37	51.42	30.15	3.02	41.20	1.22	44.61	74.00	-29.39	P
	3249.37	41.33	30.15	3.02	41.20	1.22	34.52	54.00	-19.48	A
*	4874.16	51.22	33.32	3.74	42.43	0.71	46.57	74.00	-27.43	P
*	4874.16	40.39	33.32	3.74	42.43	0.71	35.74	54.00	-18.26	A
	6498.36	52.64	35.20	4.34	42.69	0.78	50.26	74.00	-23.74	P
	6498.36	41.37	35.20	4.34	42.69	0.78	38.99	54.00	-15.01	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT20 TX (CH High)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3282.51	54.62	30.16	3.05	41.21	1.17	47.79	74.00	-26.21	P
	3282.51	44.73	30.16	3.05	41.21	1.17	37.90	54.00	-16.10	A
*	4923.61	53.26	33.47	3.76	42.48	0.73	48.74	74.00	-25.26	P
*	4923.61	41.75	33.47	3.76	42.48	0.73	37.23	54.00	-16.77	A
	6565.49	52.84	35.55	4.37	42.63	0.80	50.93	74.00	-23.07	P
	6565.49	42.33	35.55	4.37	42.63	0.80	40.42	54.00	-13.58	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT20 TX (CH High)	TEMP& Humidity	25.3℃, 44%

Vertical

	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)
	3282.49	52.41	30.16	3.05	41.21	1.17	45.58	74.00	-28.42	P
	3282.49	41.67	30.16	3.05	41.21	1.17	34.84	54.00	-19.16	A
*	4924.15	51.42	33.47	3.76	42.48	0.73	46.90	74.00	-27.10	P
*	4924.15	40.36	33.47	3.76	42.48	0.73	35.84	54.00	-18.16	A
	6565.43	51.84	35.55	4.37	42.63	0.80	49.93	74.00	-24.07	P
	6565.43	40.26	35.55	4.37	42.63	0.80	38.35	54.00	-15.65	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT40 TX (CH Low)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3229.41	54.62	30.15	3.01	41.19	1.24	47.82	74.00	-26.18	P
	3229.41	43.81	30.15	3.01	41.19	1.24	37.01	54.00	-16.99	A
*	4843.65	52.65	33.23	3.74	42.40	0.70	47.91	74.00	-26.09	P
*	4843.65	43.22	33.23	3.74	42.40	0.70	38.48	54.00	-15.52	A
	6458.81	53.94	35.13	4.33	42.74	0.78	51.43	74.00	-22.57	P
	6458.81	42.67	35.13	4.33	42.74	0.78	40.16	54.00	-13.84	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT40 TX (CH Low)	TEMP& Humidity	25.3℃, 44%

Vertical

	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)
	3229.38	52.41	30.15	3.01	41.19	1.24	45.61	74.00	-28.39	P
	3229.38	41.33	30.15	3.01	41.19	1.24	34.53	54.00	-19.47	A
*	4844.21	51.68	33.23	3.74	42.40	0.70	46.95	74.00	-27.05	P
*	4844.21	41.67	33.23	3.74	42.40	0.70	36.94	54.00	-17.06	A
	6458.79	51.42	35.13	4.33	42.74	0.78	48.91	74.00	-25.09	P
	6458.79	39.85	35.13	4.33	42.74	0.78	37.34	54.00	-16.66	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT40 TX (CH Middle)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3249.38	52.41	30.15	3.02	41.20	1.22	45.60	74.00	-28.40	P
	3249.38	42.36	30.15	3.02	41.20	1.22	35.55	54.00	-18.45	A
*	4874.16	53.41	33.32	3.74	42.43	0.71	48.76	74.00	-25.24	P
*	4874.16	42.57	33.32	3.74	42.43	0.71	37.92	54.00	-16.08	A
	6498.72	52.65	35.20	4.34	42.69	0.78	50.28	74.00	-23.72	P
	6498.72	41.87	35.20	4.34	42.69	0.78	39.50	54.00	-14.50	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT40 TX (CH Middle)	TEMP& Humidity	25.3℃, 44%

Vertical

	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)
	3249.37	51.42	30.15	3.02	41.20	1.22	44.61	74.00	-29.39	P
	3249.37	41.33	30.15	3.02	41.20	1.22	34.52	54.00	-19.48	A
*	4873.65	51.42	33.32	3.74	42.43	0.71	46.76	74.00	-27.24	P
*	4873.65	41.37	33.32	3.74	42.43	0.71	36.71	54.00	-17.29	A
	6498.68	51.42	35.20	4.34	42.69	0.78	49.05	74.00	-24.95	P
	6498.68	40.38	35.20	4.34	42.69	0.78	38.01	54.00	-15.99	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT40 TX (CH High)	TEMP& Humidity	25.3℃, 44%

Horizontal

	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)
	3269.41	52.41	30.15	3.04	41.21	1.19	45.59	74.00	-28.41	P
	3269.41	41.33	30.15	3.04	41.21	1.19	34.51	54.00	-19.49	A
*	4902.34	53.26	33.41	3.75	42.46	0.72	48.68	74.00	-25.32	P
*	4902.34	44.81	33.41	3.75	42.46	0.72	40.23	54.00	-13.77	A
	6538.86	53.24	35.41	4.36	42.65	0.79	51.15	74.00	-22.85	P
	6538.86	42.67	35.41	4.36	42.65	0.79	40.58	54.00	-13.42	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	3G Mobile Wireless Router	Test Date	2010/2/9
Model	TEW-716BRG	Test By	Eric Yang
Test Mode	IEEE 802.11n HT40 TX (CH High)	TEMP& Humidity	25.3℃, 44%

Vertical

	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)
	3269.39	51.11	30.15	3.04	41.21	1.19	44.29	74.00	-29.71	P
	3269.39	40.36	30.15	3.04	41.21	1.19	33.54	54.00	-20.46	A
*	4902.32	51.44	33.41	3.75	42.46	0.72	46.86	74.00	-27.14	P
*	4902.32	39.85	33.41	3.75	42.46	0.72	35.27	54.00	-18.73	A
	6538.89	52.64	35.41	4.36	42.65	0.79	50.55	74.00	-23.45	P
	6538.89	41.37	35.41	4.36	42.65	0.79	39.28	54.00	-14.72	A
	N/A	------	------	------	------	------	------	------	------	P
	N/A	------	------	------	------	------	------	------	------	A

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
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 – Dist, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

7.7.4 RESTRICTED BAND EDGES

802.11b Mode

Channel	Polarity	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	H	2390.00	61.17	74	-12.83	Peak
	H	2390.00	49.04	54	-4.96	Average
	V	2390.00	57.69	74	-16.31	Peak
LOW	V	2390.00	46.34	54	-7.66	Average
	H	2483.50	59.07	74	-14.93	Peak
	H	2483.50	47.15	54	-6.85	Average
	V	2483.50	57.65	74	-16.35	Peak
HIGH	V	2483.50	45.76	54	-8.24	Average

802.11g Mode

Channel	Polarity	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	H	2390.00	61.94	74	-12.06	Peak
	H	2390.00	47.87	54	-6.13	Average
	V	2390.00	59.46	74	-14.54	Peak
LOW	V	2390.00	45.63	54	-8.37	Average
	H	2483.50	60.31	74	-13.69	Peak
	H	2483.50	45.98	54	-8.02	Average
	V	2483.50	57.07	74	-16.93	Peak
HIGH	V	2483.50	45.24	54	-8.76	Average

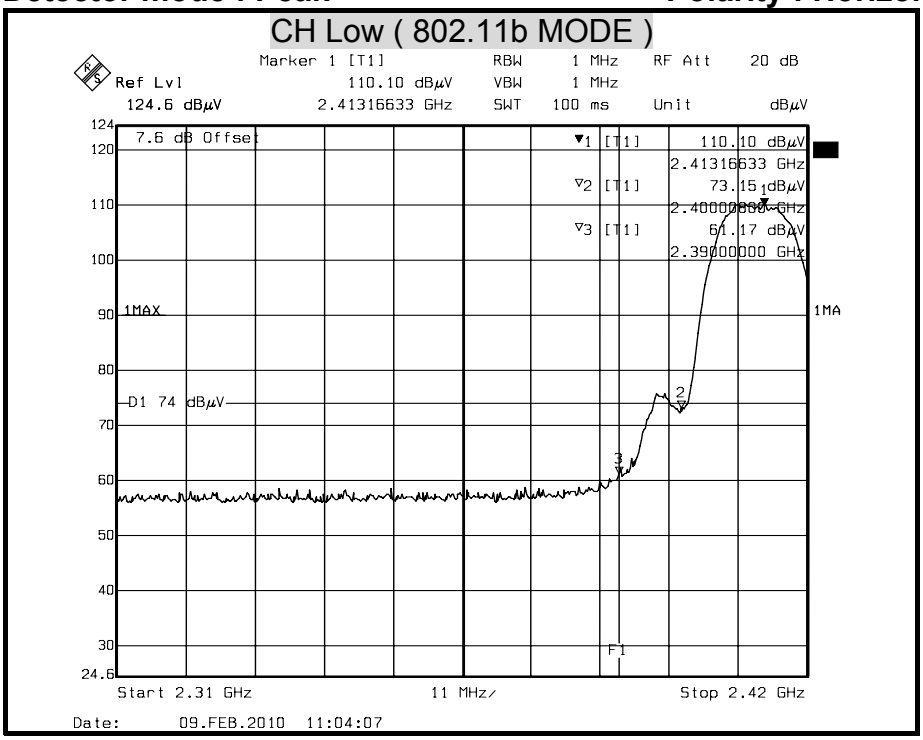
802.11n HT-20 Mode

Channel	Polarity	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	H	2390.00	66.41	74	-7.59	Peak
	H	2390.00	47.94	54	-6.06	Average
	V	2390.00	57.38	74	-16.62	Peak
LOW	V	2390.00	45.54	54	-8.46	Average
	H	2483.50	59.58	74	-14.42	Peak
	H	2483.50	45.85	54	-8.15	Average
	V	2483.50	57.98	74	-16.02	Peak
HIGH	V	2483.50	44.93	54	-9.07	Average

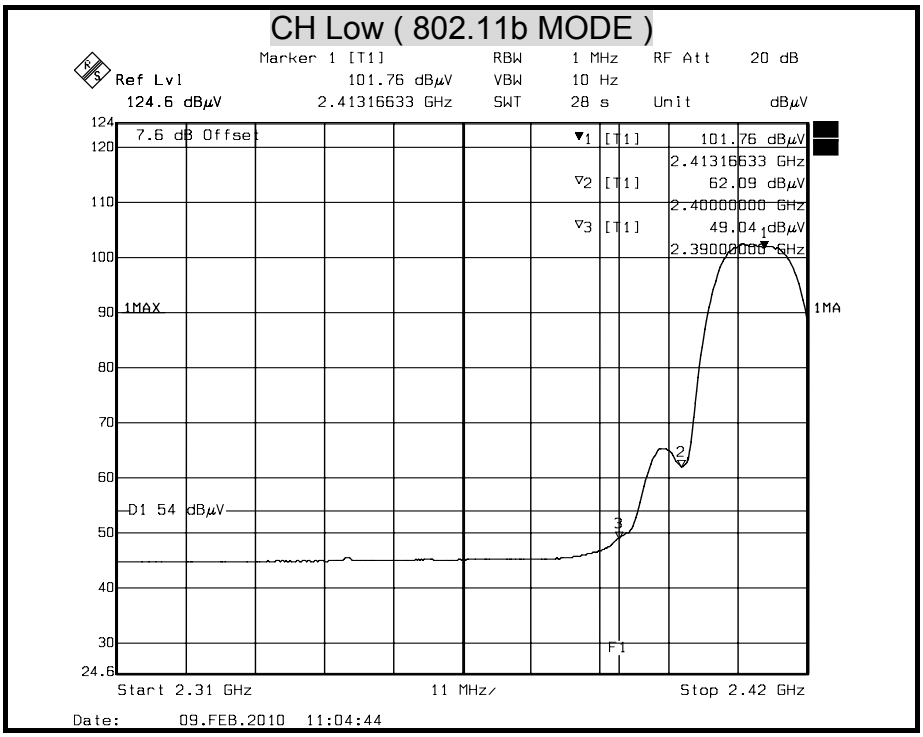
802.11n HT-40 Mode

Channel	Polarity	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	H	2390.00	61.39	74	-12.61	Peak
	H	2390.00	49.29	54	-4.71	Average
	V	2390.00	58.19	74	-15.81	Peak
LOW	V	2390.00	45.67	54	-8.33	Average
	H	2483.50	61.77	74	-12.23	Peak
	H	2483.50	48.03	54	-5.97	Average
	V	2483.50	57.77	74	-16.23	Peak
HIGH	V	2483.50	45.5	54	-8.50	Average

Detector mode : Peak **Polarity : Horizontal**



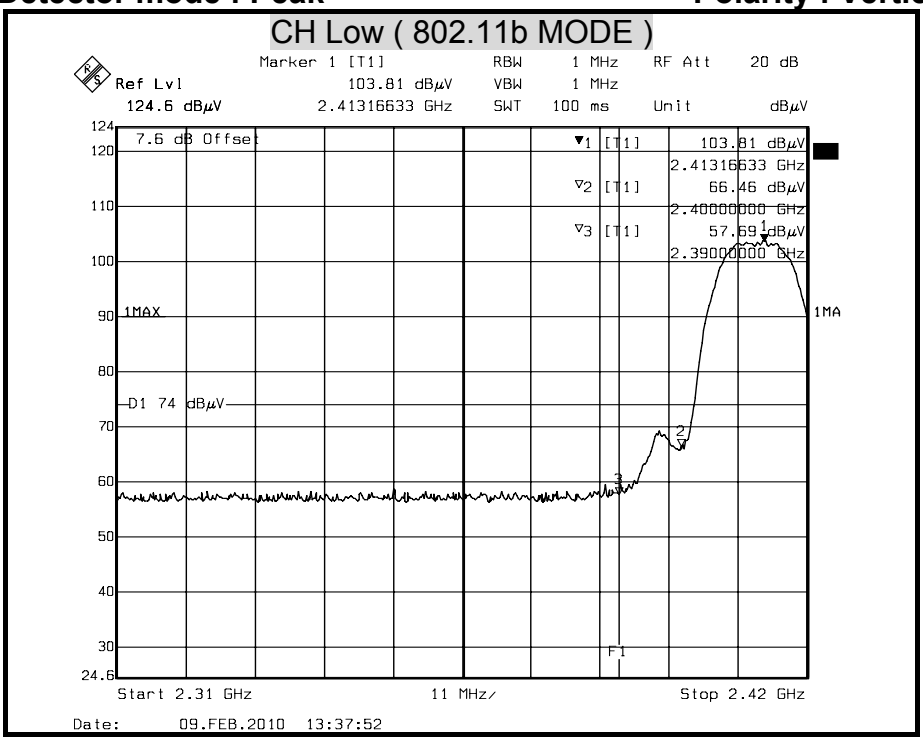
Detector mode : Average **Polarity : Horizontal**



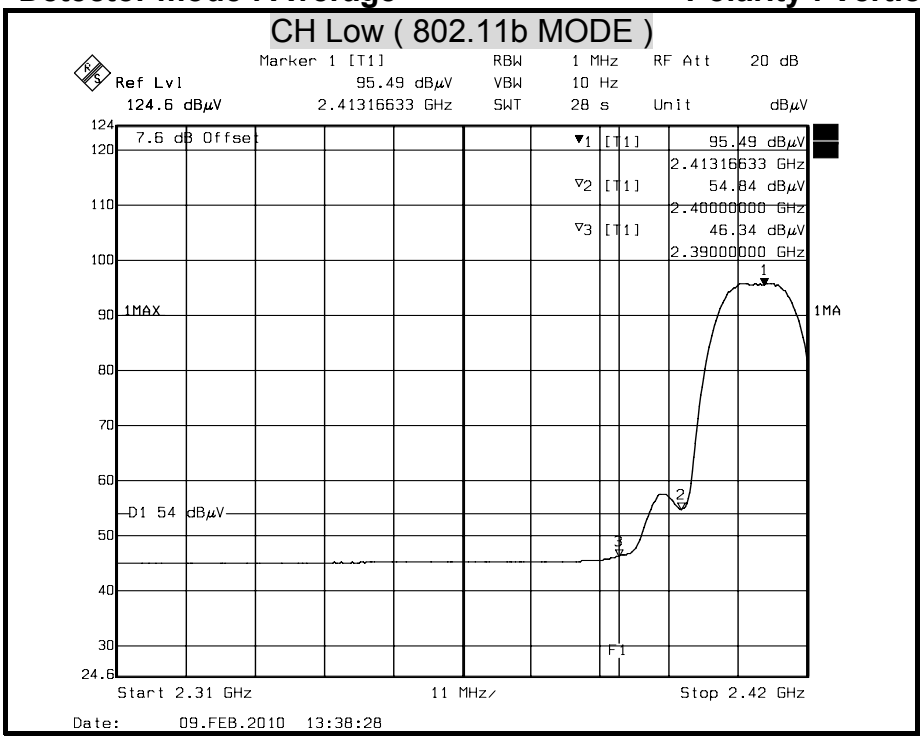
Remark:

1. Display Line = 54/74 dBµV/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Vertical**



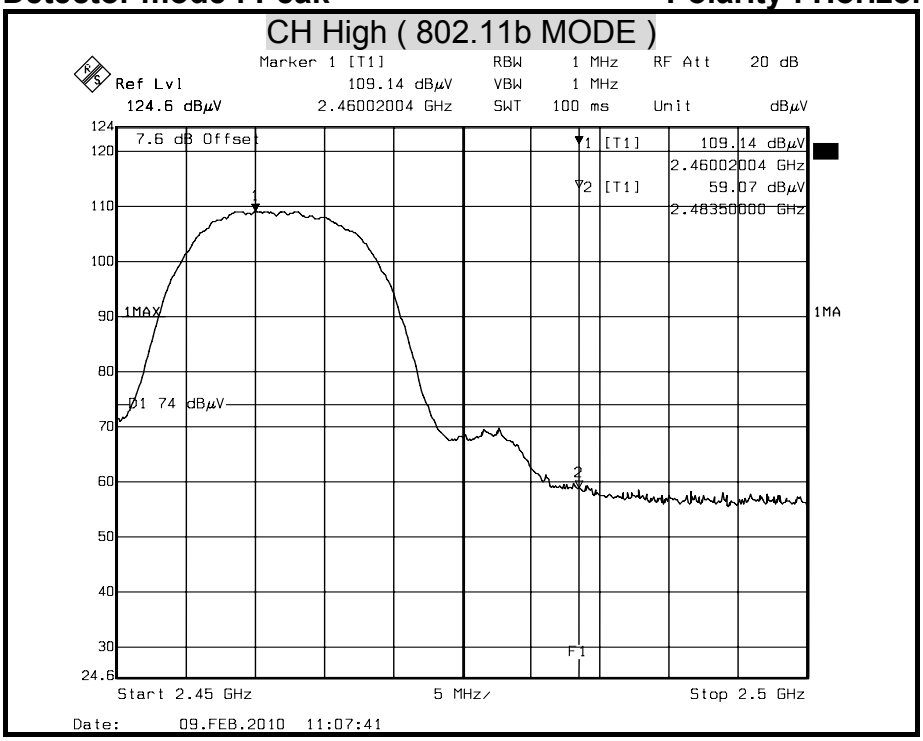
Detector mode : Average **Polarity : Vertical**



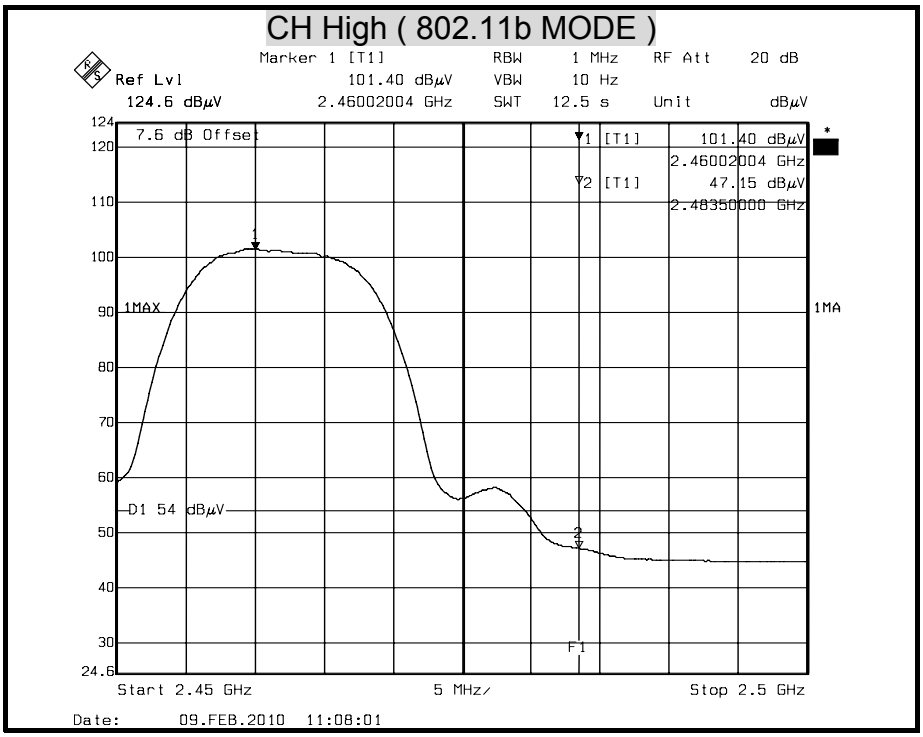
Remark:

1. Display Line = 54/74 dBµV/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Horizontal**



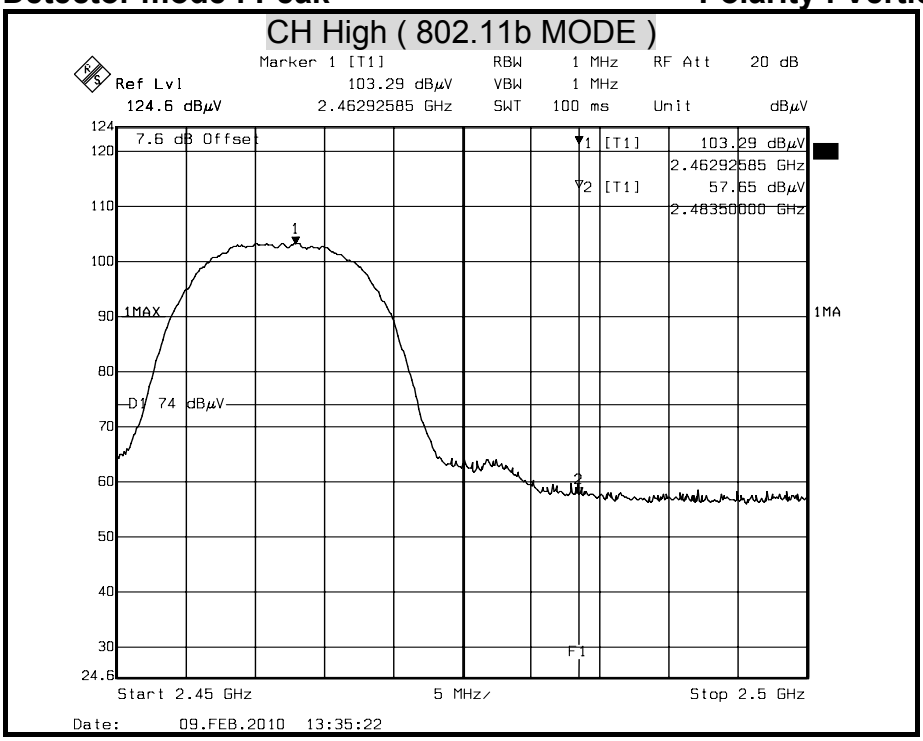
Detector mode : Average **Polarity : Horizontal**



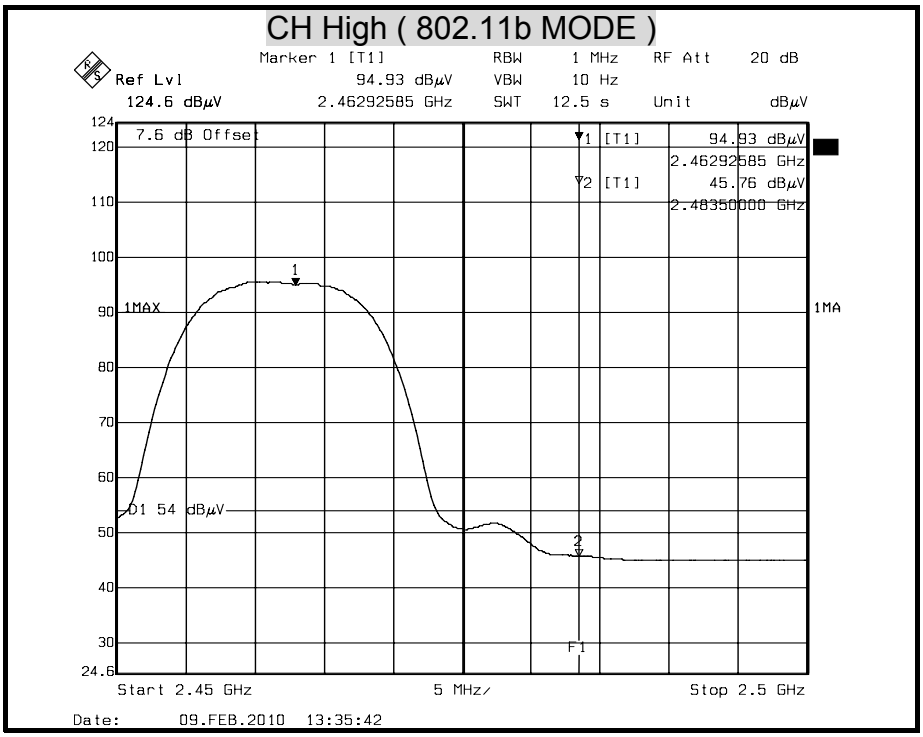
Remark:

1. Display Line = 54/74 dBµV/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Vertical**



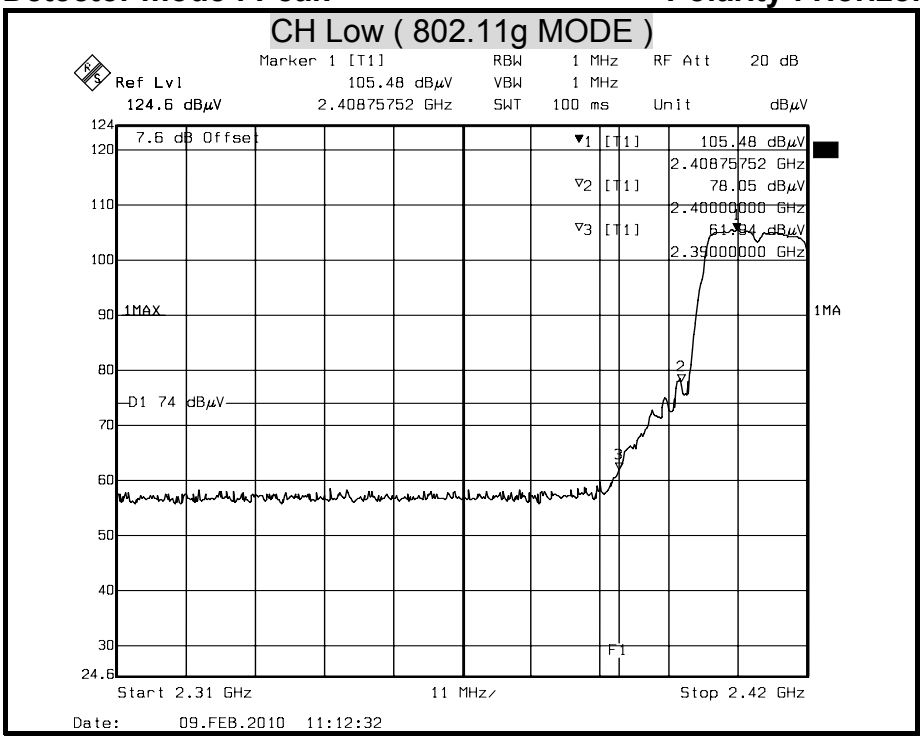
Detector mode : Average **Polarity : Vertical**



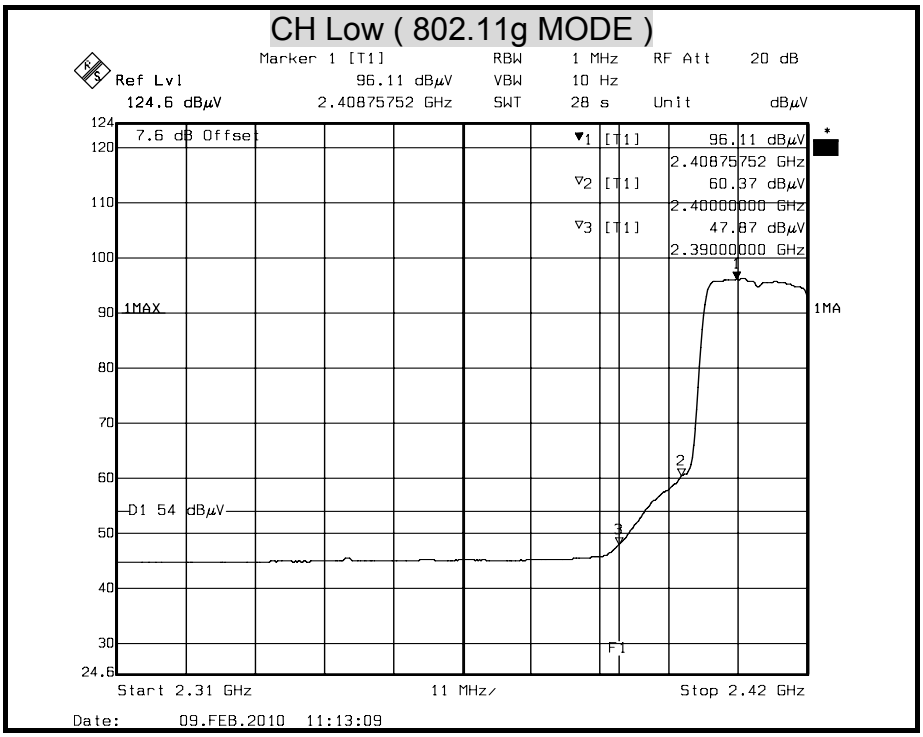
Remark:

1. Display Line = 54/74 dBµV/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak Polarity : Horizontal



Detector mode : Average Polarity : Horizontal



Remark:

1. Display Line = 54/74 dBµV/m.
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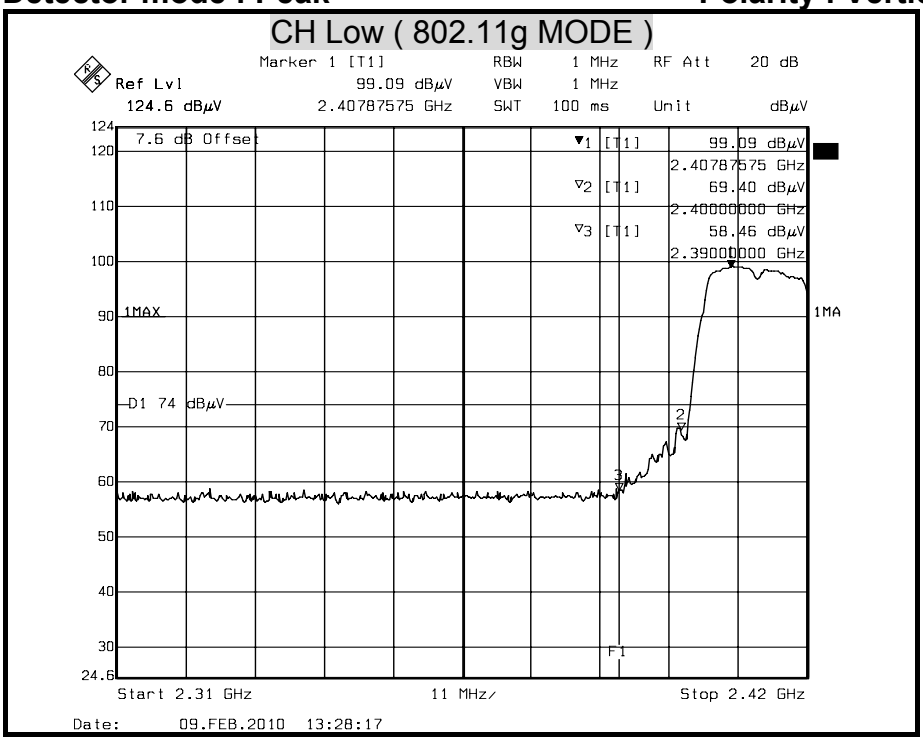
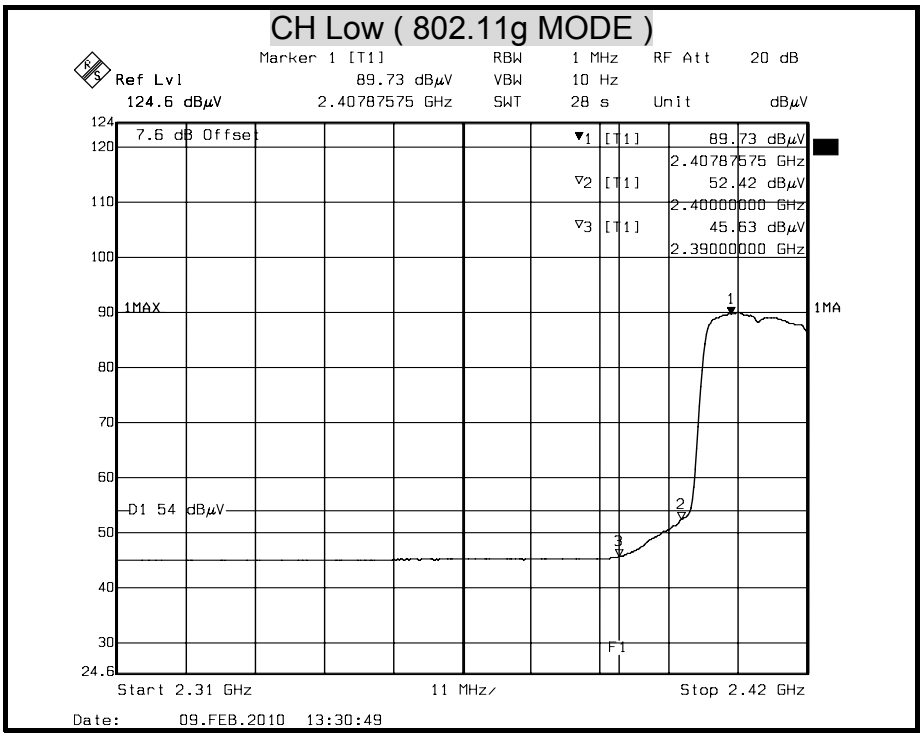
Detector mode : Peak **Polarity : Vertical**



Detector mode : Average **Polarity : Vertical**



Remark:

1. Display Line = 54/74 dBµV/m.
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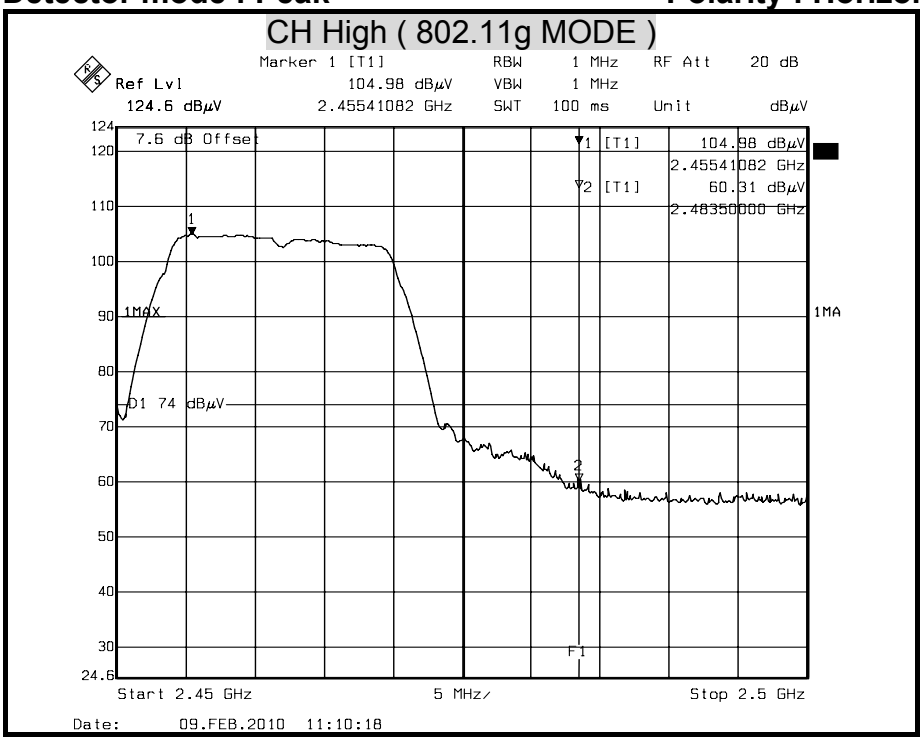
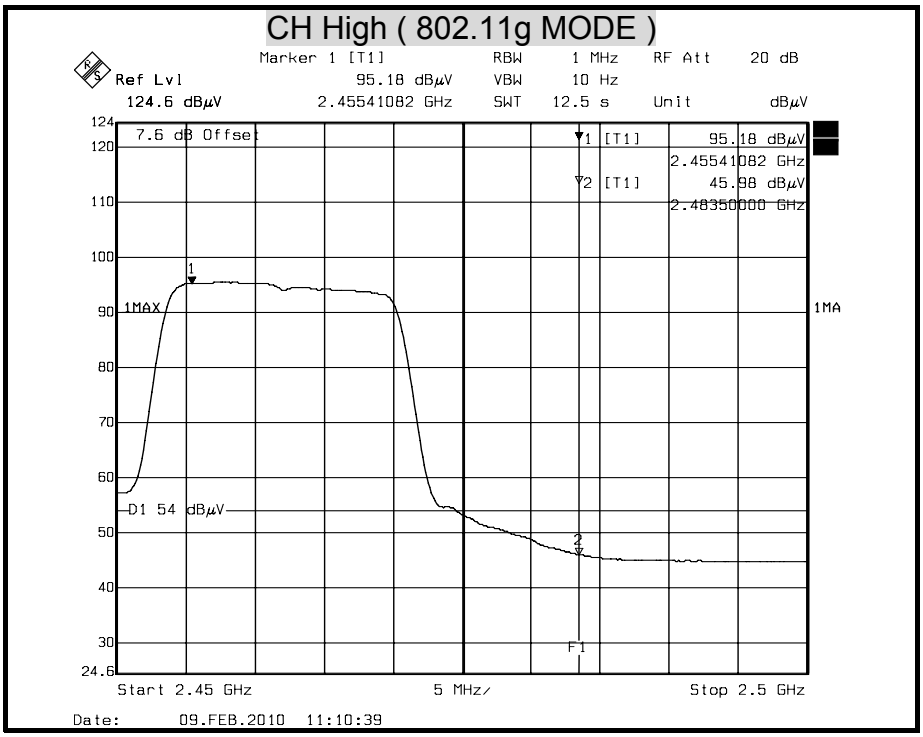
Detector mode : Peak **Polarity : Horizontal**



Detector mode : Average **Polarity : Horizontal**



Remark:

1. Display Line = 54/74 dBµV/m.
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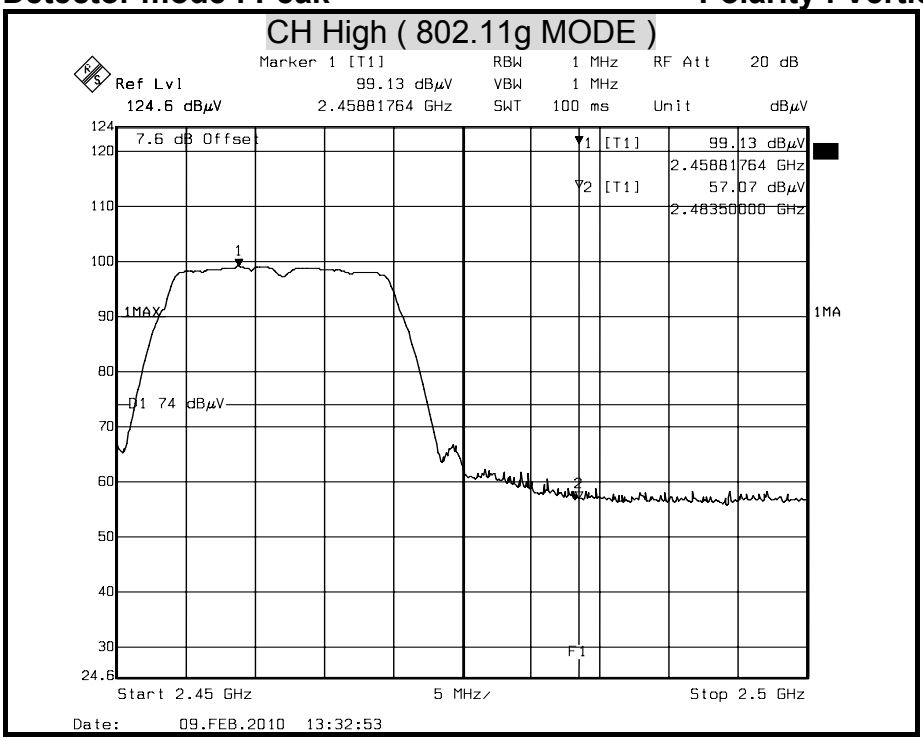
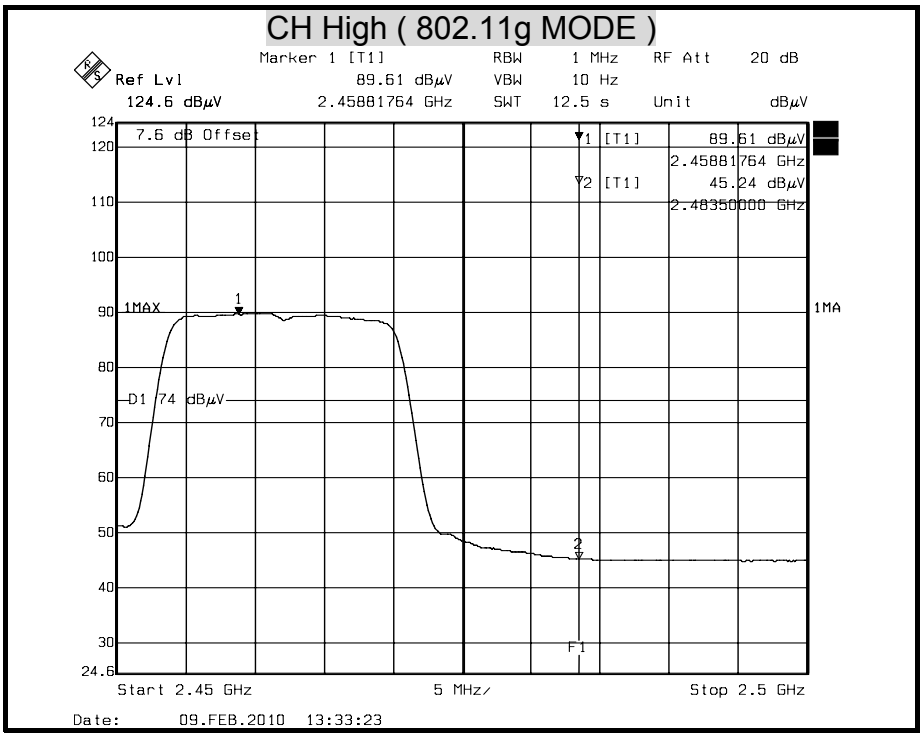
Detector mode : Peak **Polarity : Vertical**



Detector mode : Average **Polarity : Vertical**



Remark:

1. Display Line = 54/74 dBµV/m.
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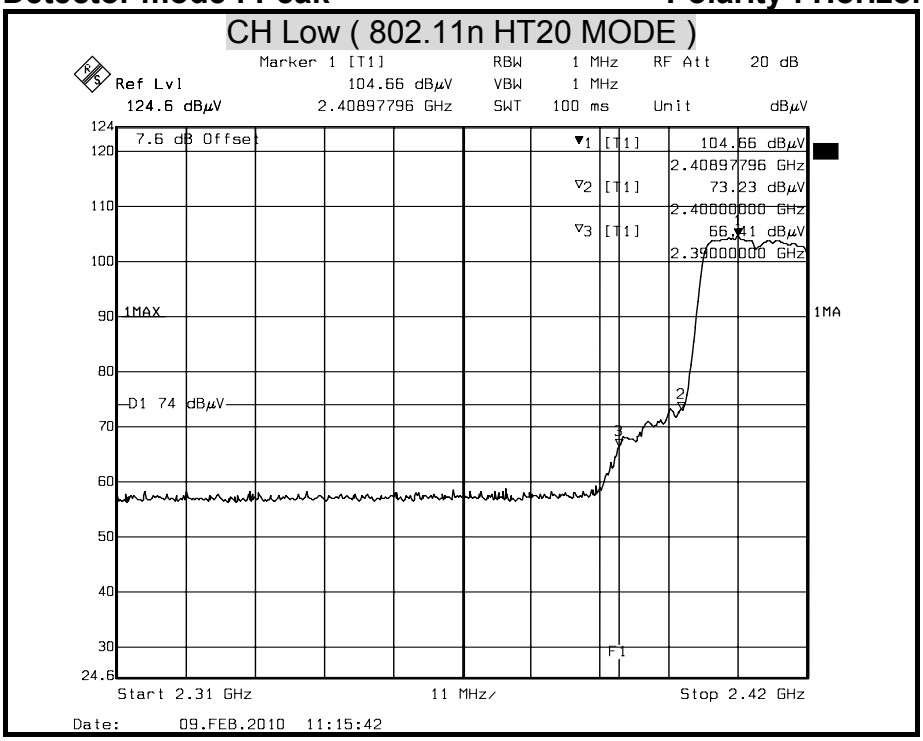
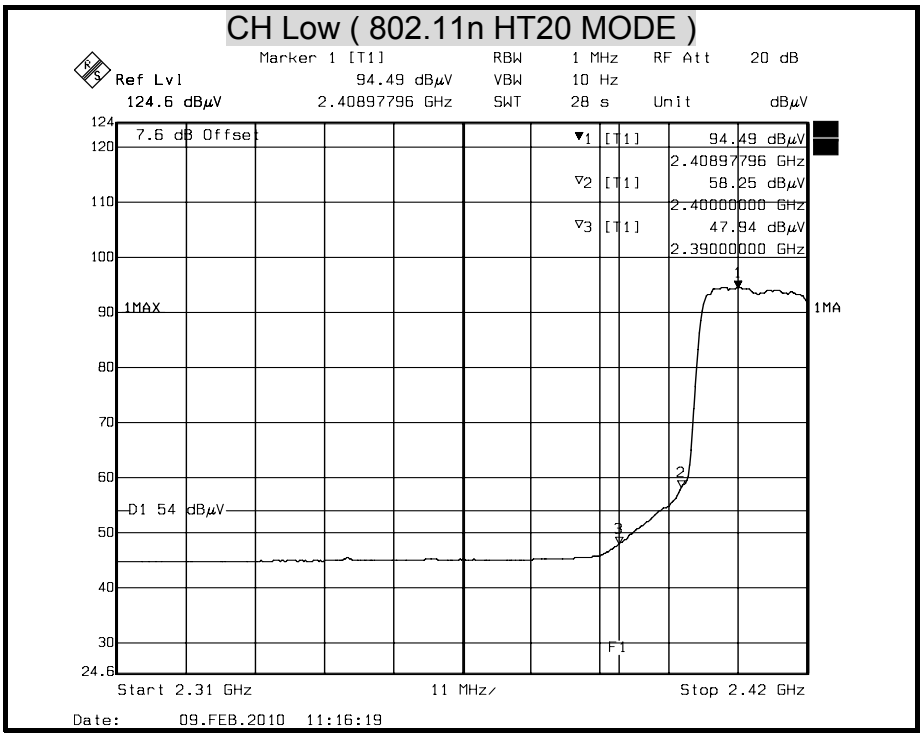
Detector mode : Peak **Polarity : Horizontal**



Detector mode : Average **Polarity : Horizontal**



Remark:

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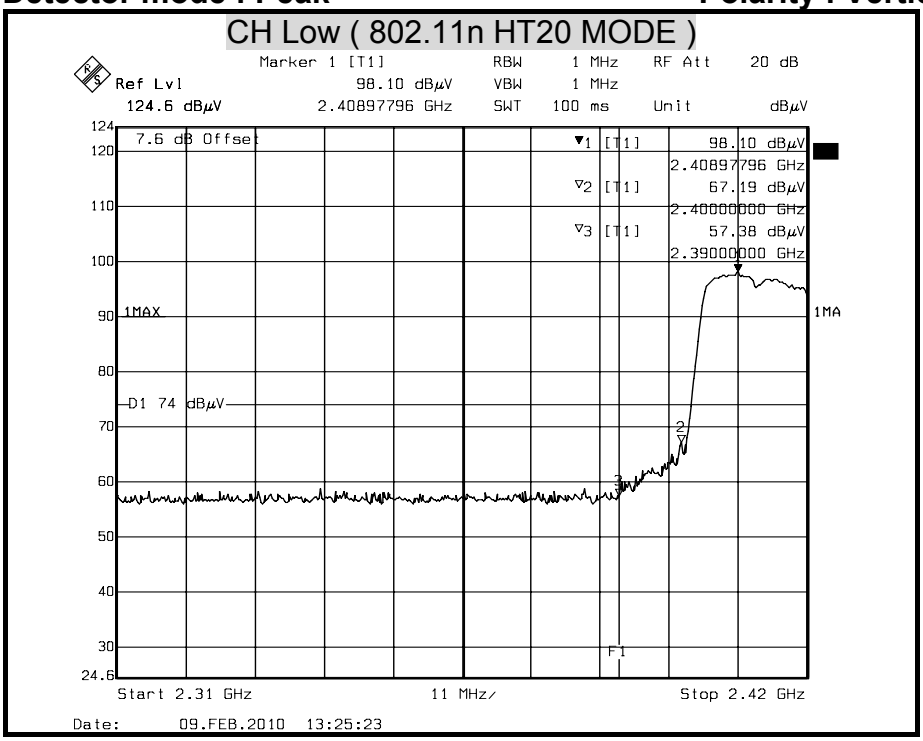
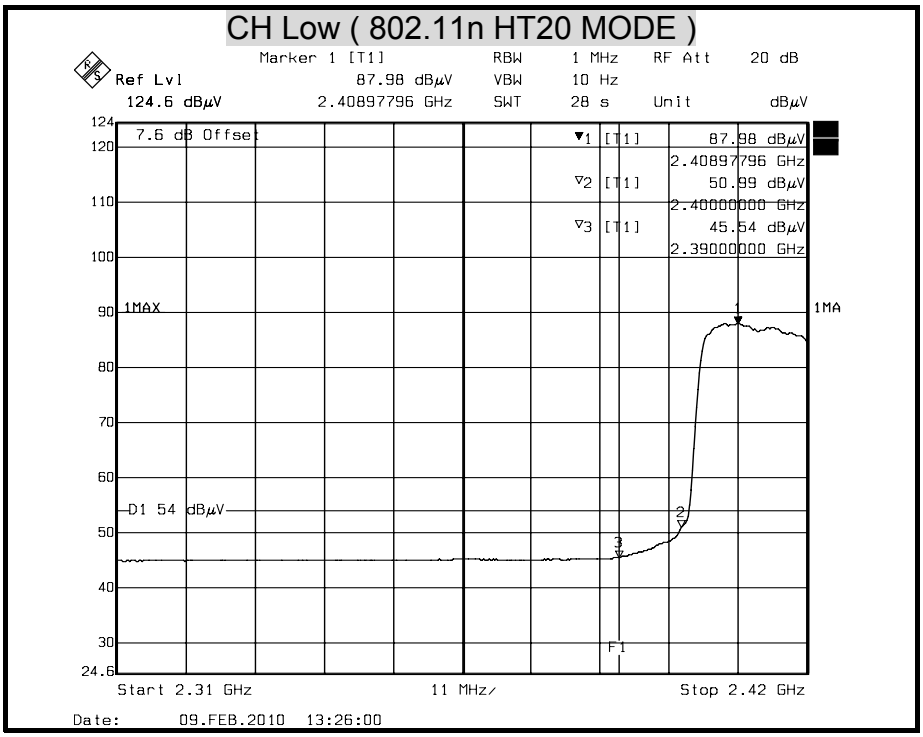
Detector mode : Peak **Polarity : Vertical**



Detector mode : Average **Polarity : Vertical**



Remark:

1. Display Line = 54/74 dBµV/m.
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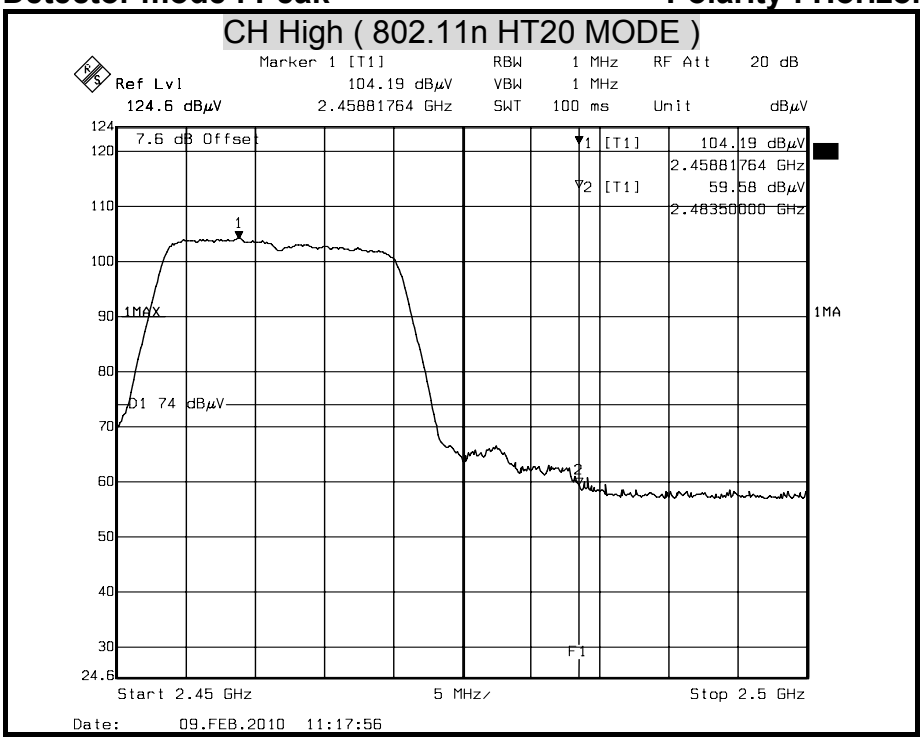
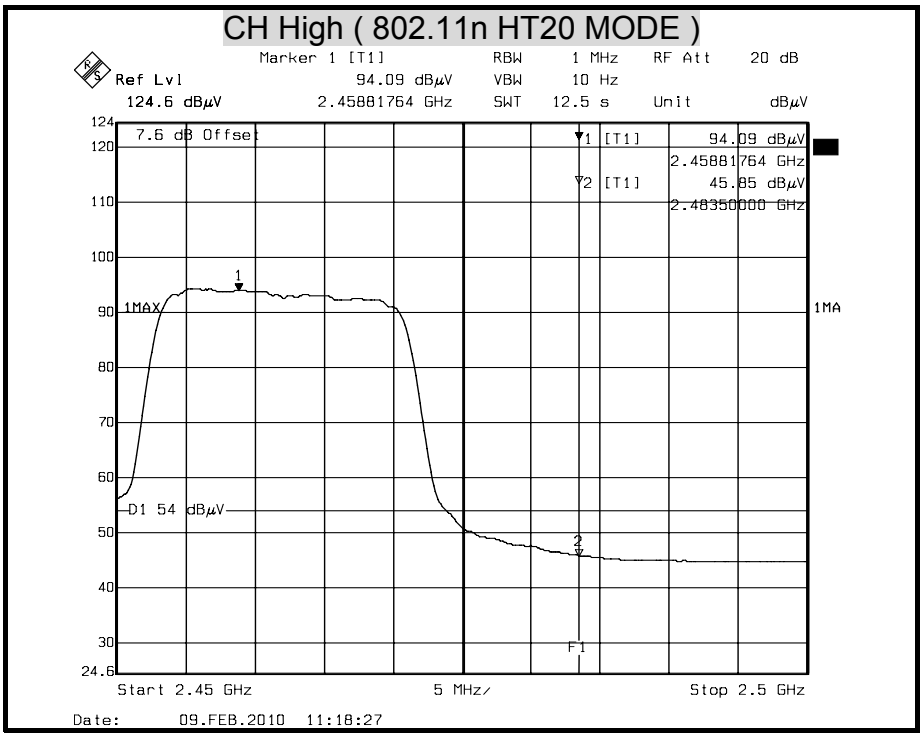
Detector mode : Peak **Polarity : Horizontal**



Detector mode : Average **Polarity : Horizontal**



Remark:

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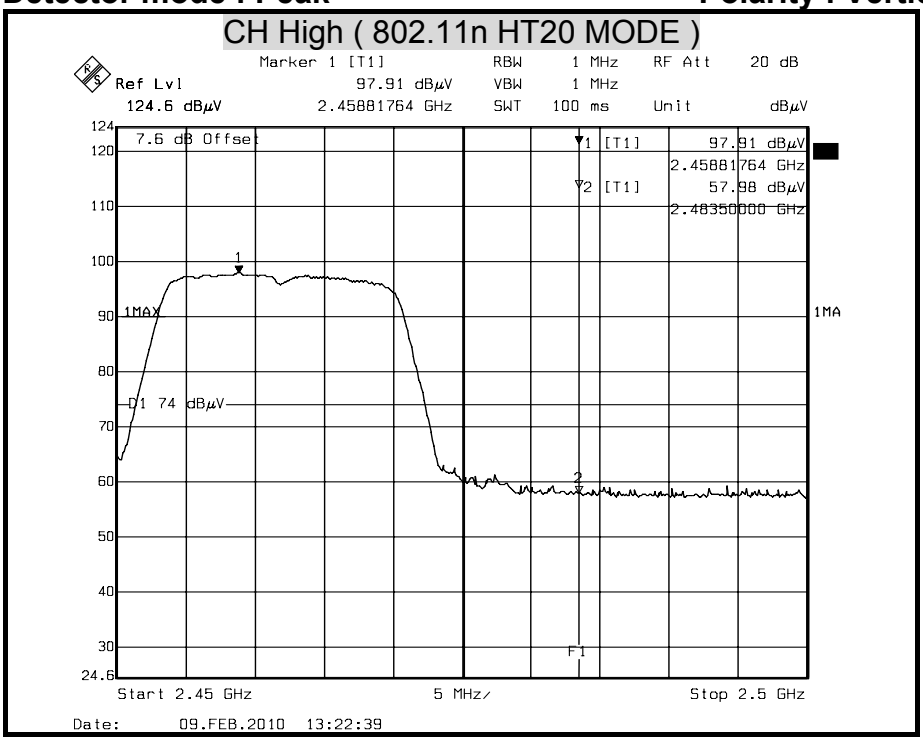
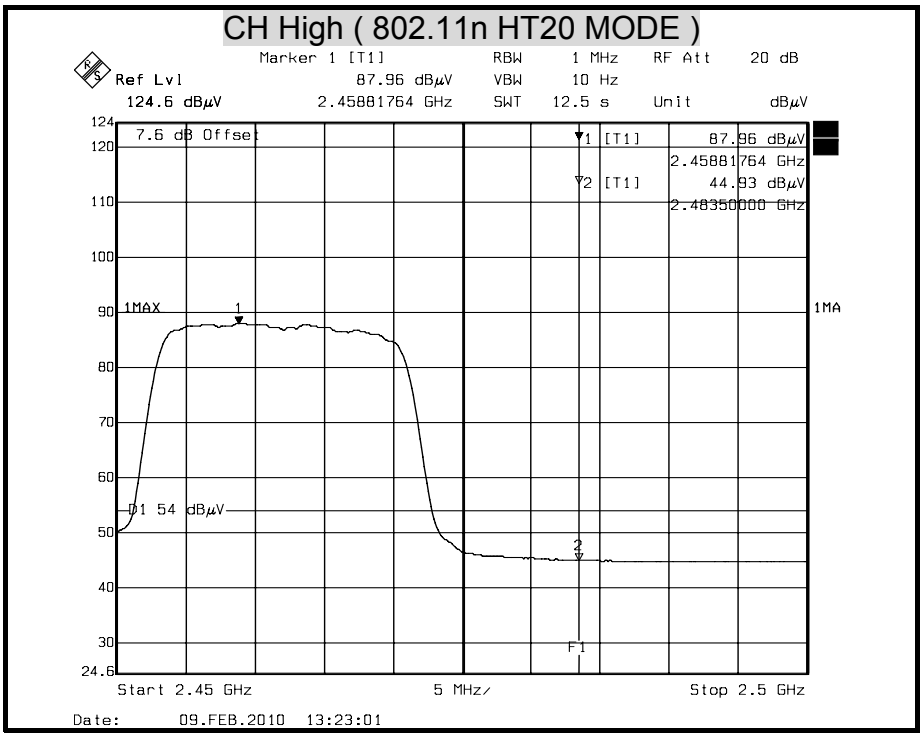
Detector mode : Peak **Polarity : Vertical**



Detector mode : Average **Polarity : Vertical**



Remark:

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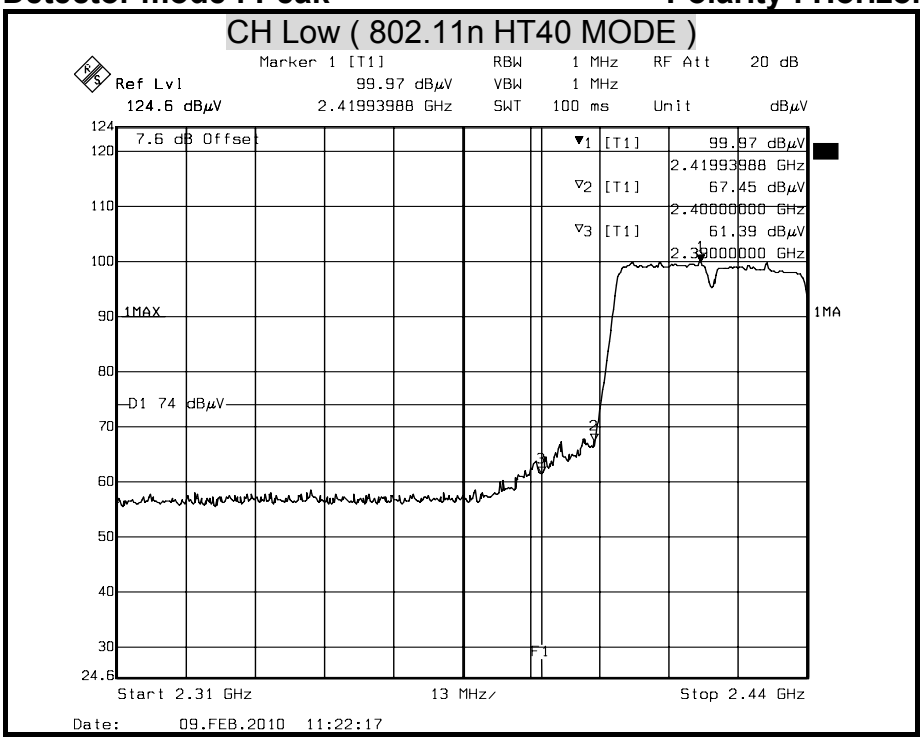
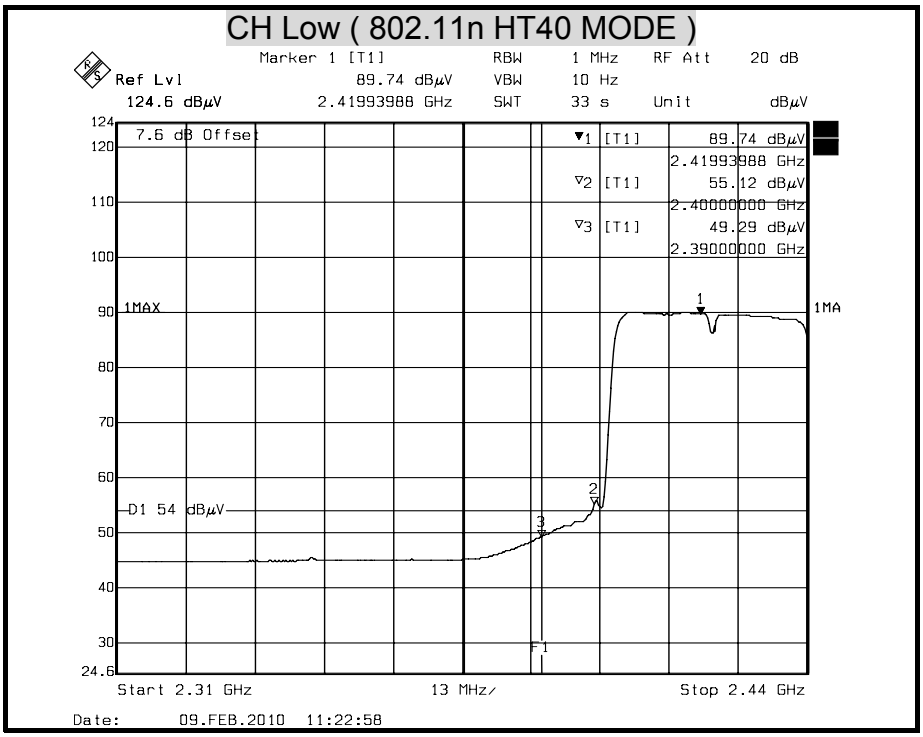
Detector mode : Peak **Polarity : Horizontal**



Detector mode : Average **Polarity : Horizontal**



Remark:

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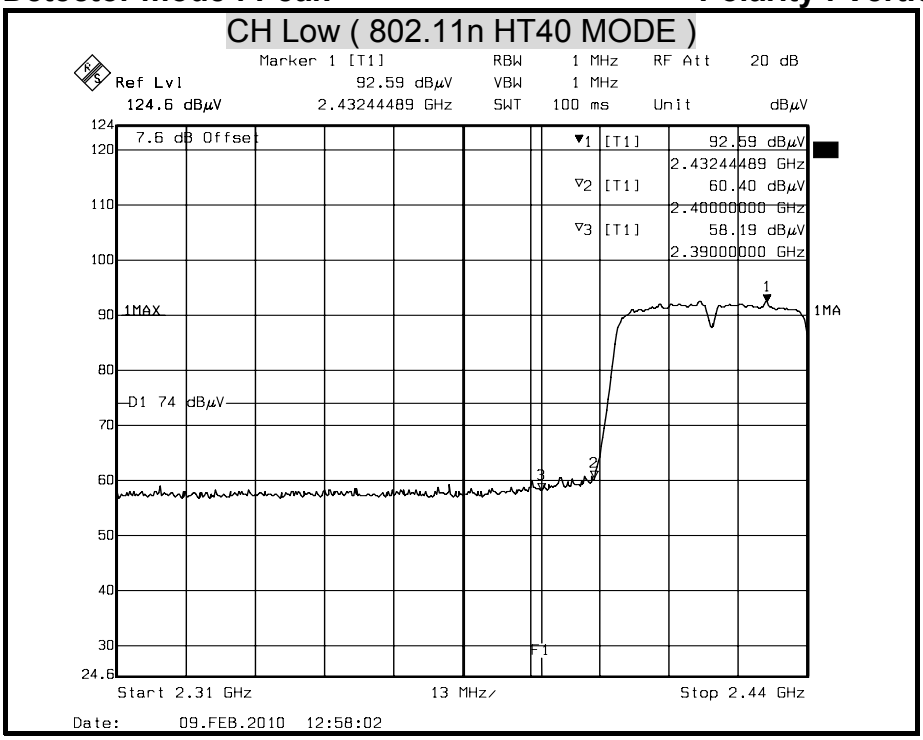
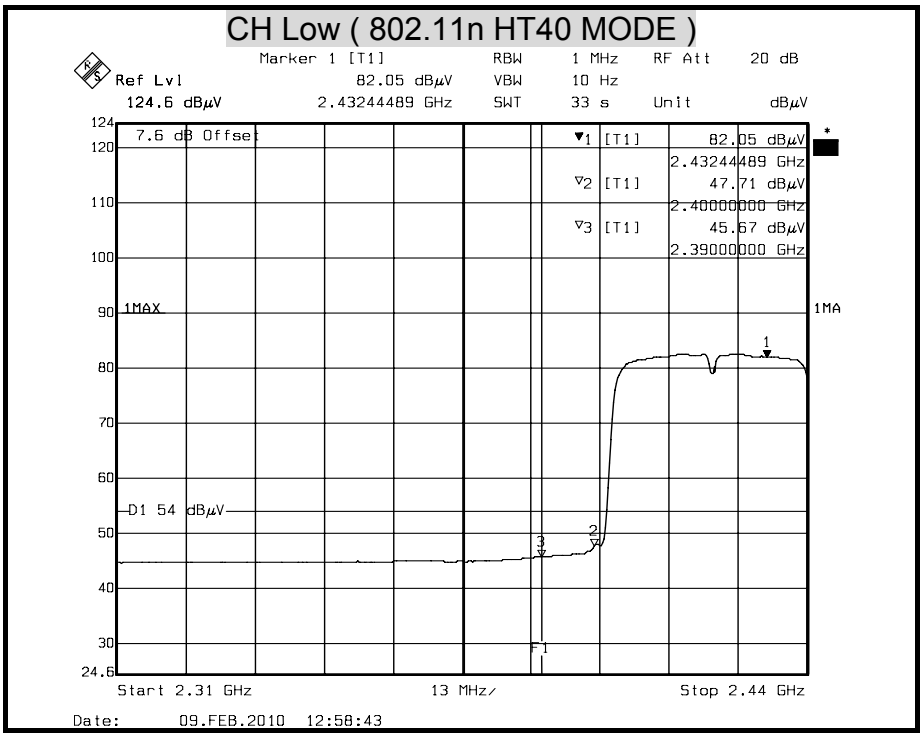
Detector mode : Peak **Polarity : Vertical**



Detector mode : Average **Polarity : Vertical**



Remark:

1. Display Line = 54/74 dBµV/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
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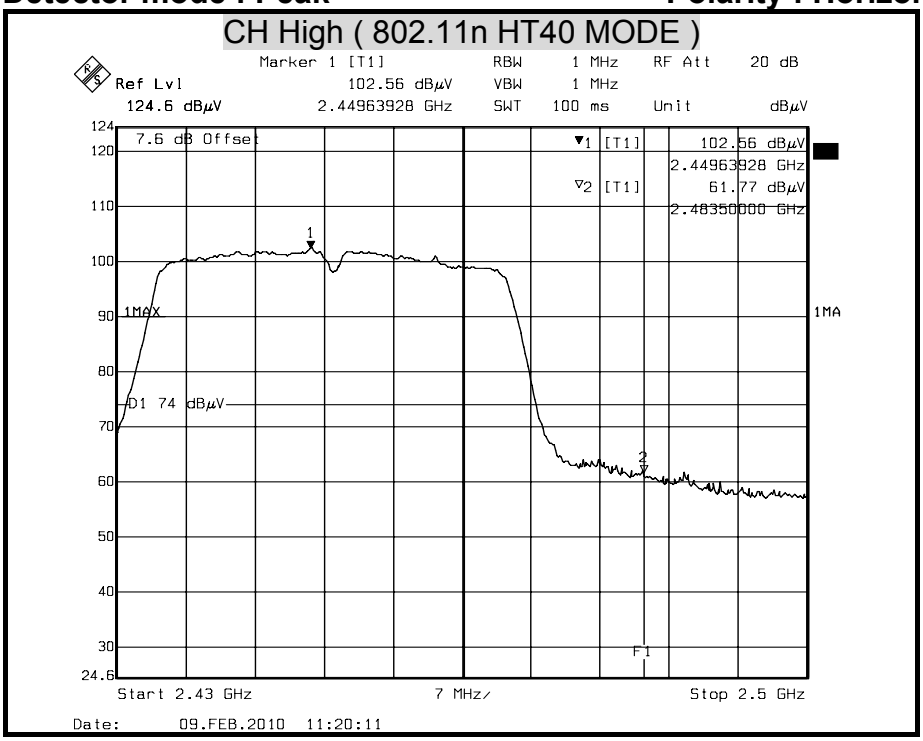
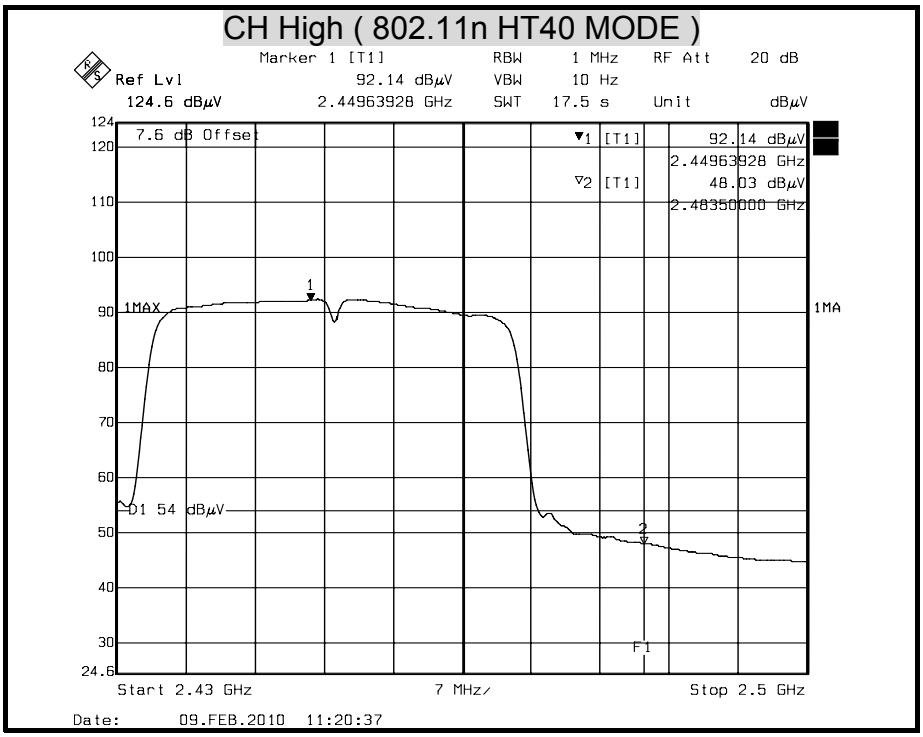
Detector mode : Peak **Polarity : Horizontal**



Detector mode : Average **Polarity : Horizontal**



Remark:

1. Display Line = 54/74 dBµV/m.
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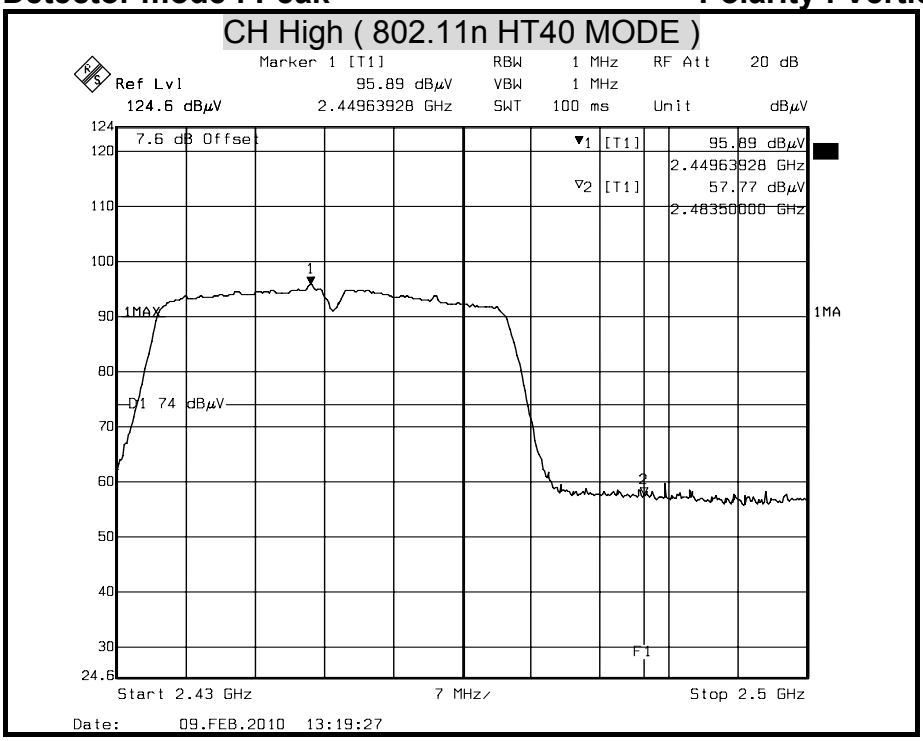
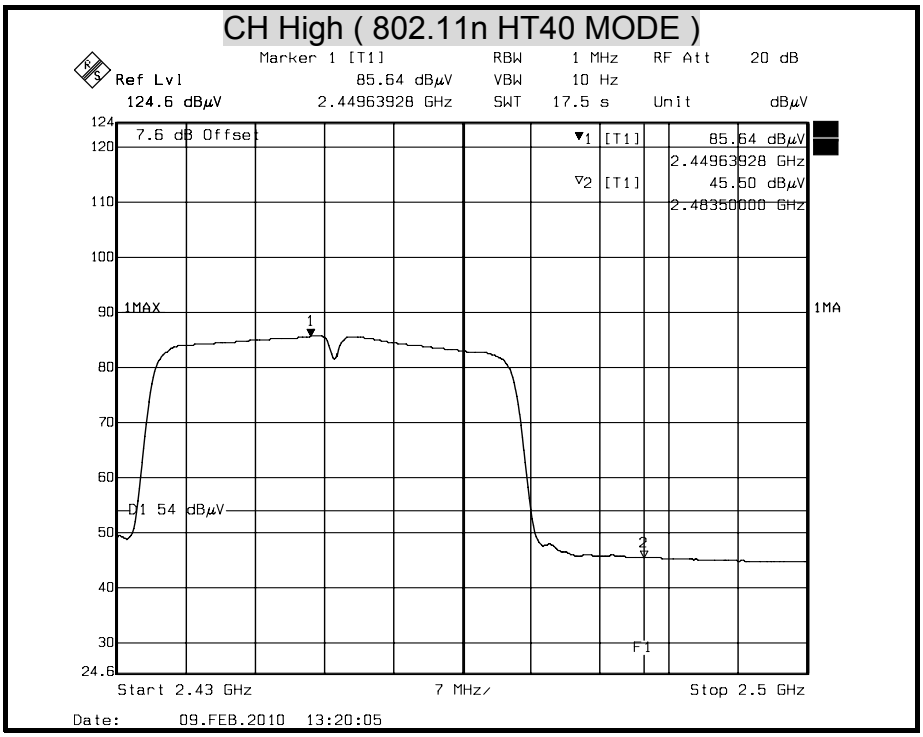
Detector mode : Peak **Polarity : Vertical**



Detector mode : Average **Polarity : Vertical**



Remark:

1. Display Line = 54/74 dBµV/m.
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7.8 POWERLINE CONDUCTED EMISSIONS

LIMITS

§ 15.207 (a) Except as shown in paragraph (b) and (c) this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

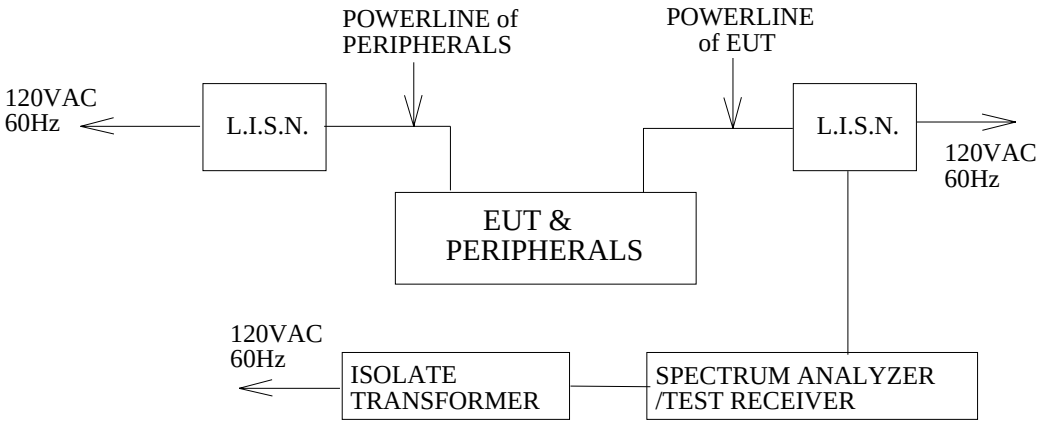
Frequency of Emission (MHz)	Conducted limit (dBμv)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.5 - 5	56	46
5 - 30	60	50

TEST EQUIPMENTS

The following test equipments are used during the conducted power line tests：

Conducted Emission room #1				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
L.I.S.N.	SCHWARZBECK	NNLK 8121	8121-308	MAR. 9, 2011
	Rohde & Schwarz	ESH 3-Z5	840062/021	NOV. 29, 2010
TEST RECEIVER	Rohde & Schwarz	ESCS 30	100348	JUL. 16, 2010
TYPE N COAXIAL CABLE	CCS	BNC50	11	AUG. 26, 2010
Test S/W	e-3 (5.04211c) R&S (2.27)			

TEST SETUP



TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80cm above the horizontal ground plane. The EUT IS CONFIGURED IN ACCORDANCE WITH ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both quasi-peak detection and average detection measurements.

Line conducted data is recorded for both NEUTRAL and LINE.

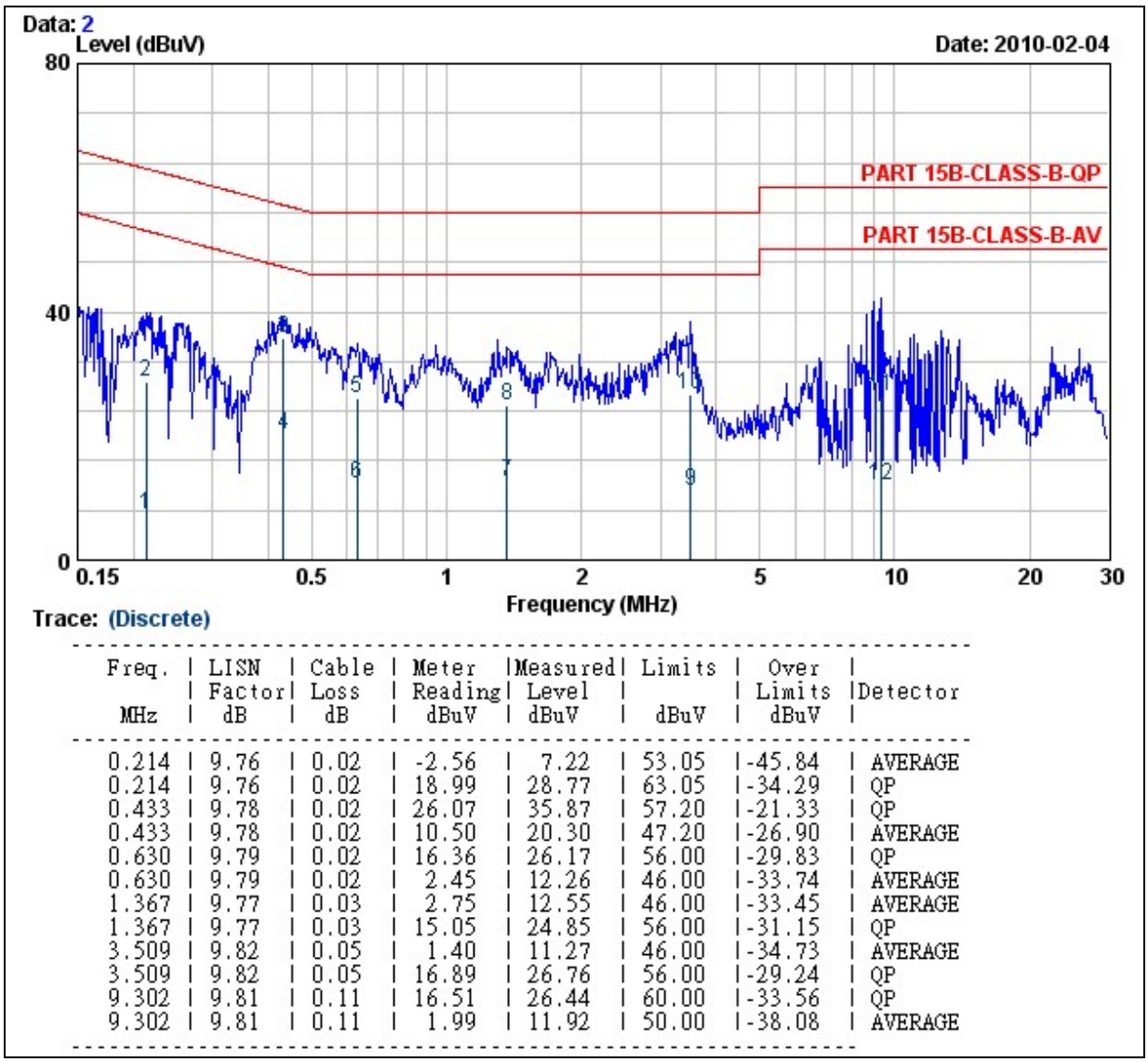
TEST RESULTS

No non-compliance noted.

CONDUCTED RF VOLTAGE MEASUREMENT

Model No.	TEW-716BRG	**Resolution Bandwidth**	9 kHz
Environmental Conditions	24.4°C, 51%	**Test Mode**	3G mode
Tested by	Mick Sue		

LINE



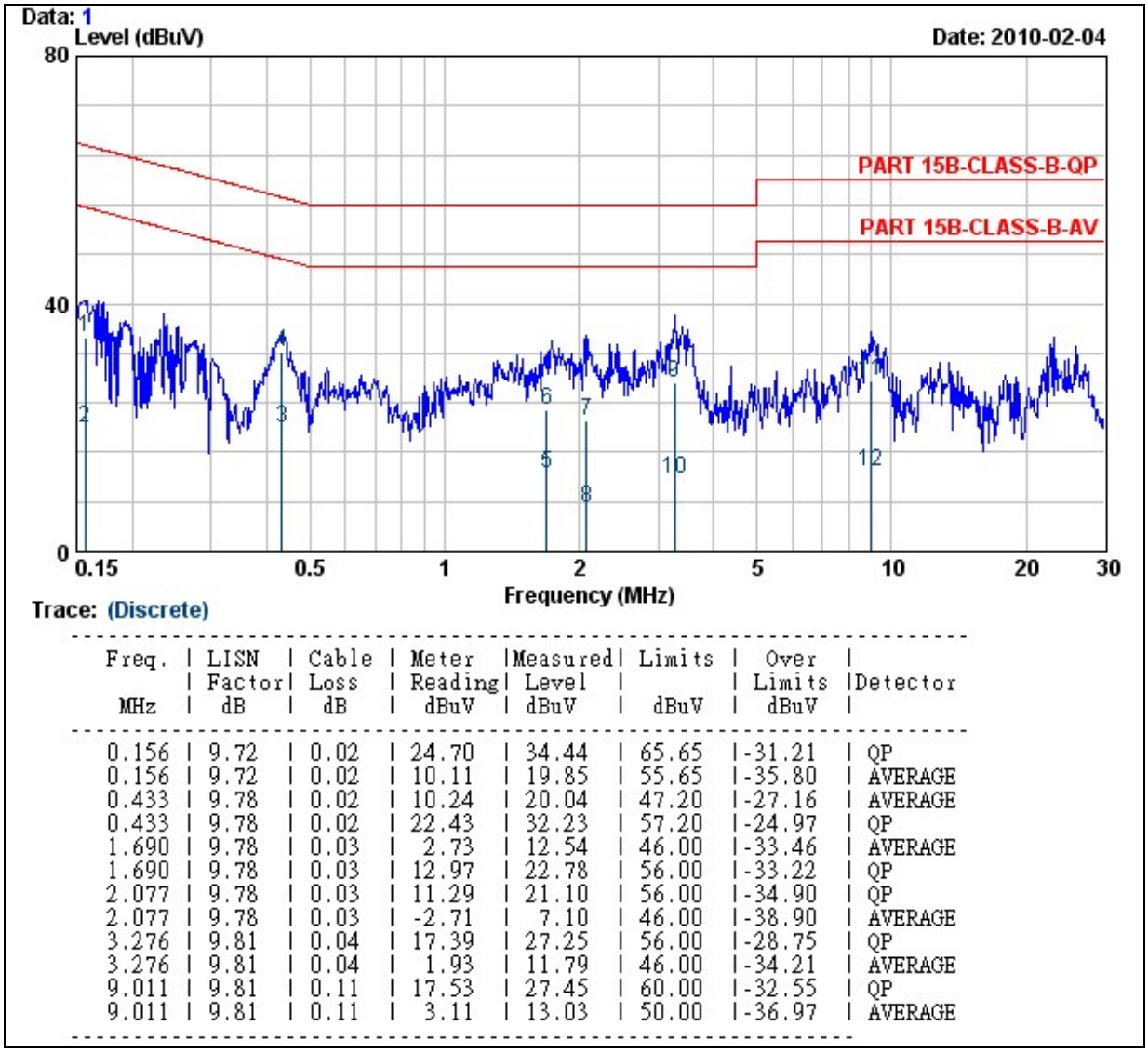
Trace: (Discrete)

Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
0.214	9.76	0.02	-2.56	7.22	53.05	-45.84	AVERAGE
0.214	9.76	0.02	18.99	28.77	63.05	-34.29	QP
0.433	9.78	0.02	26.07	35.87	57.20	-21.33	QP
0.433	9.78	0.02	10.50	20.30	47.20	-26.90	AVERAGE
0.630	9.79	0.02	16.36	26.17	56.00	-29.83	QP
0.630	9.79	0.02	2.45	12.26	46.00	-33.74	AVERAGE
1.367	9.77	0.03	2.75	12.55	46.00	-33.45	AVERAGE
1.367	9.77	0.03	15.05	24.85	56.00	-31.15	QP
3.509	9.82	0.05	1.40	11.27	46.00	-34.73	AVERAGE
3.509	9.82	0.05	16.89	26.76	56.00	-29.24	QP
9.302	9.81	0.11	16.51	26.44	60.00	-33.56	QP
9.302	9.81	0.11	1.99	11.92	50.00	-38.08	AVERAGE

REMARKS： 1. Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB)
2. Over Limit value (dB) = Level (dBuV) – Limit Line (dBuV)

Model No.	TEW-716BRG	**Resolution Bandwidth**	9 kHz
Environmental Conditions	24.4°C, 51%	**Test Mode**	3G mode
Tested by	Mick Sue		

NEUTRAL



Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
0.156	9.72	0.02	24.70	34.44	65.65	-31.21	QP
0.156	9.72	0.02	10.11	19.85	55.65	-35.80	AVERAGE
0.433	9.78	0.02	10.24	20.04	47.20	-27.16	AVERAGE
0.433	9.78	0.02	22.43	32.23	57.20	-24.97	QP
1.690	9.78	0.03	2.73	12.54	46.00	-33.46	AVERAGE
1.690	9.78	0.03	12.97	22.78	56.00	-33.22	QP
2.077	9.78	0.03	11.29	21.10	56.00	-34.90	QP
2.077	9.78	0.03	-2.71	7.10	46.00	-38.90	AVERAGE
3.276	9.81	0.04	17.39	27.25	56.00	-28.75	QP
3.276	9.81	0.04	1.93	11.79	46.00	-34.21	AVERAGE
9.011	9.81	0.11	17.53	27.45	60.00	-32.55	QP
9.011	9.81	0.11	3.11	13.03	50.00	-36.97	AVERAGE

REMARKS： 1. Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB)
2. Over Limit value (dB) = Level (dBuV) – Limit Line (dBuV)

9. ANTENNA REQUIREMENT

9.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used for this product is a PIFA antenna.

The peak Gain of this antennas is 2.31dBi at 2.4GHz.

The antenna spec. As below:

One PIFA antenna

Model: C381-510152-A Gain: 2.31 dBi

Brand: M.gear Manufacture: Wha Yu Group