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

TEST REPORT

For

Smart Cloud HD Surveillance Camera with Audio Wireless Router

Model: IPJC1n

Brand: Sapido

Issued for

Sapido Technology Inc.

1F, No. 383, Sec. 2, Minsheng Rd.,West Central District, Tainan City 700, Taiwan R.O.C .

Issued by

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

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Date of Issue: February 21, 2014

Testing Laboratory
1109

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REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	February 21, 2014	Initial Issue	ALL	Eva Lin

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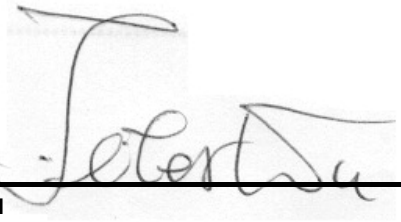
1. TEST REPORT CERTIFICATION

Applicant	：Sapido Technology Inc.
Address	：1F, No. 383, Sec. 2, Minsheng Rd.,West Central District, Tainan City 700, Taiwan R.O.C.
Manufacturer	：E-TOP Navigator Technology Inc.
Address	：No.82, Gongye 2nd Rd., Annan Dist., Tainan City 709, Taiwan (R.O.C.)
Equipment Under Test	：Smart Cloud HD Surveillance Camera with Audio Wireless Router
Model	：IPJC1n
Brand	：Sapido
Date of Test	：November 22, 2013 – December 10, 2013

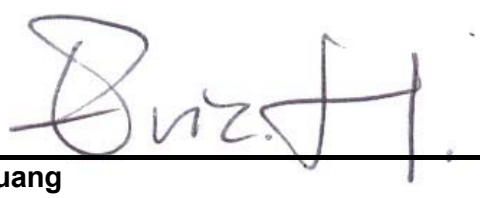
APPLICABLE STANDARD	
STANDARD	**TEST RESULT**
FCC Part 15 Subpart C AND ANSI C63.4 : 2009	No non-compliance noted

Approved by:



Jeter Wu
Assistant Manager

Reviewed by:



Eric Huang
Assistant Section Manager

2. EUT DESCRIPTION

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router
Model	IPJC1n
Brand	Sapido
Received Date	November 22, 2013
Frequency Range	IEEE 802.11b/g, 802.11n HT20 (DTS Band):2412MHz~2462MHz IEEE 802.11n HT40 (DTS Band):2422MHz~2452MHz
Transmit Power	IEEE 802.11b Mode : 21.69dBm (DTS Band) (147.571mW) IEEE 802.11g Mode : 19.79dBm (DTS Band) (95.2796mW) IEEE 802.11n HT20 Mode : 19.43dBm (DTS Band) (87.7001mW) IEEE 802.11n HT40 Mode : 18.88dBm (DTS Band) (77.2681mW)
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, 1 Mbps IEEE 802.11g：54, 48 ,36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT20 : 65, 58.5, 52, 39, 26, 19.5, 13, 6.5 Mbps IEEE 802.11n HT40 : 150 ,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 HT20/40：OFDM (64QAM, 16QAM, QPSK, BPSK)
Frequency Selection	By software / firmware
Antenna Type	**Antenna (1T1R)** Type: Dipole Antenna Model: 112011020 Gain: 4 dBi Manufacturer: WAVERAR TECHNOLGY CO., LTD
Power Source	**5Vdc, 2A (powered from Adapter)**
Adapter Specification	Model: AD520p Input: AC 100-240Vac, 50/60Hz, 0.5A Output: 5Vdc, 2A Brand: AMIGO
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: **2ABUQ-IPJC1N** 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.*
4. *This report is transferred from T131106N02-RD.*

Multiple Listing:

Company Address	Brand Name	Model name	Product Name
1F , No. 383., Sec. 2, Minsheng Rd., West Central District, Tainan 700, Taiwan, R.O.C.	Sapido	IPJC1n IPJC2n	Smart Cloud HD Surveillance Camera with Audio Wireless Router Smart Cloud Night Vision Camera with Audio Wireless Router
5F., No.63, Lane 77, Xing-Ai Road, Neihu Dist., Taipei City 114, Taiwan (R.O.C.)	Amigo	IPJC1n IPJC2n	Smart Cloud HD Surveillance Camera with Audio Wireless Router Smart Cloud Night Vision Camera with Audio Wireless Router

3. DESCRIPTION OF TEST MODES

The EUT is a Smart Cloud HD Surveillance Camera with Audio Wireless Router. It has one transmitter chains and one receive chains (1x1 configurations). The 1x1 configuration is implemented with one outside chains (Chain 0).

The RF chipset is manufactured by Realtek Technology, Corp.

The antenna peak gain 4 dBi (highest gain) were chosen for full testing.

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

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

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

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

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

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

4. TEST METHODOLOGY

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

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

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

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

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

5.2 EQUIPMENT

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

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

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

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

5.3 LABORATORY ACCREDITATIONS LISTINGS

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

5.4 TABLE OF ACCREDITATIONS AND LISTINGS

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

Taiwan	TAF

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

Canada	Industry Canada
Germany	TUV NORD
Taiwan	BSMI
USA	FCC

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

6. CALIBRATION AND UNCERTAINTY

6.1 MEASURING INSTRUMENT CALIBRATION

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

6.2 MEASUREMENT UNCERTAINTY

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

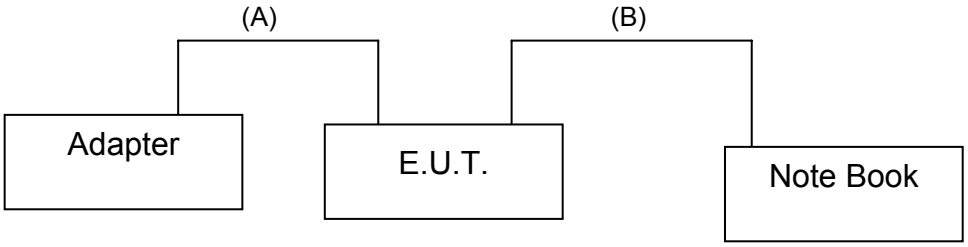
PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz Test Site : OATS-6	±3.59dB
Radiated Emission, 200 to 1000 MHz Test Site : OATS-6	±3.27dB
Radiated Emission, 1 to 26.5 GHz	± 3.20dB
Power Line Conducted Emission	± 2.90dB

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

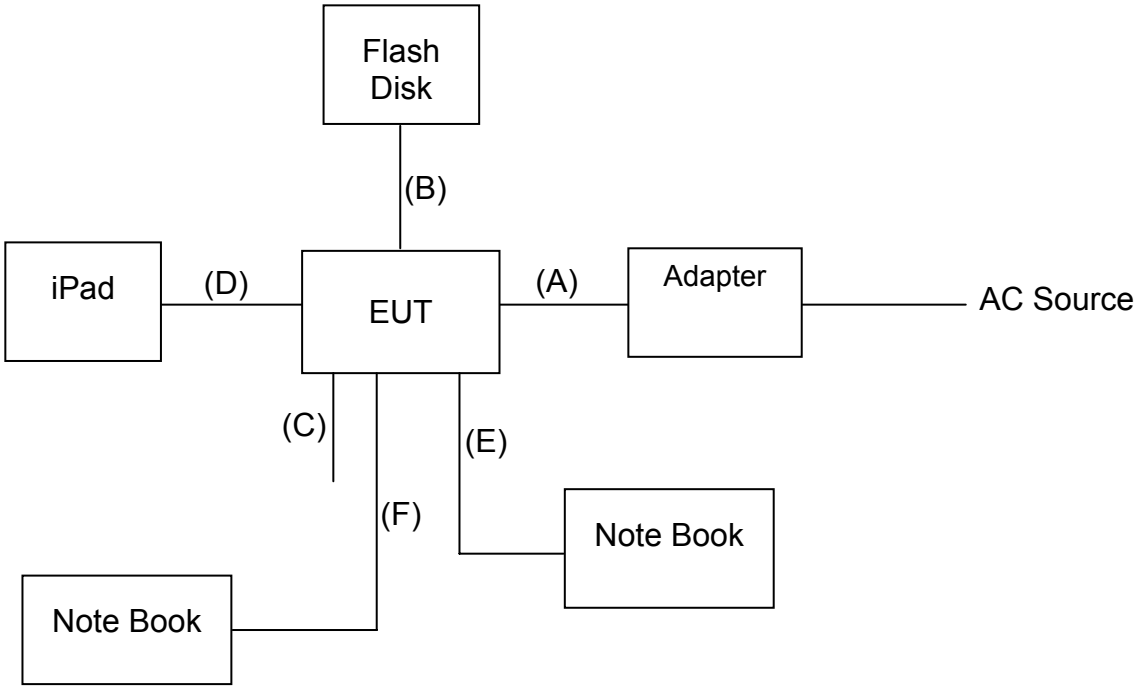
7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

For RF test



For EMI test



7.2 SUPPORT EQUIPMENT

RF test

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

No.	Signal cable description	
A	DC Power	Shielded, 1.0m, 1pcs.
B	LAN	Unshielded, 10m, 1pcs.

EMI test

	Product	Manufacturer	Model No.	Certify No.	Signal cable
1.	Note Book	Acer	AS 3830TG	DOC	Power cable, unshd, 1.6m
2.	Note Book	TOSHIBA	Satellite L730	DOC	Power cable, unshd, 1.6m
3.	Flash Disk	Kingston	DTIG3/8GB	DOC	N/A
4.	iPad	APPLE	A1219	DOC	N/A

No.	Signal cable description	
A	DC Power	Unshielded, 1m, 1pcs. with one core
B	USB	Shielded, 0.2m, 1pcs.
C	Micro USB	Shielded, 0.2m, 1pcs.
D	Audio	Unshielded, 1.6m, 1pcs.
E	LAN	Unshielded, 10m, 1pcs.
F	LAN	Unshielded, 10m, 1pcs.

REMARK:

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

7.3 EUT OPERATING CONDITION

RF Setup

1. Set up all computers like the setup diagram.
2. The “MP_TEST” software was used for testing

TX Mode:

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

⇨ **Tx Data Rate: 1Mbps long** (IEEE 802.11b mode ,chain A TX)

6Mbps (IEEE 802.11g mode ,chain 0 TX)

6.5Mbps (IEEE 802.11n HT20 mode ,chain 0 TX)

13 Mbps (IEEE 802.11n HT40 mode, chain 0 TX**)**

Power control mode

Target Power: IEEE 802.11b Channel Low (2412MHz) = **51 (Chain 0)**
IEEE 802.11b Channel Middle (2437MHz) = **50 (Chain 0)**
IEEE 802.11b Channel High (2462MHz) = **50 (Chain 0)**
Target Power: IEEE 802.11g Channel Low (2412MHz) = **47 (Chain 0)**
IEEE 802.11g Channel Middle (2437MHz) = **47 (Chain 0)**
IEEE 802.11g Channel High (2462MHz) = **45 (Chain 0)**
Target Power: IEEE 802.11n HT20 Channel Low (2412MHz) = **43 (Chain 0)**
IEEE 802.11 n HT20 Channel Middle (2437MHz) = **45 (Chain 0)**
IEEE 802.11 n HT20 Channel High (2462MHz) = **45 (Chain 0)**
Target Power: IEEE 802.11n HT40 Channel Low (2422MHz) = **43 (Chain 0)**
IEEE 802.11 n HT40 Channel Middle (2437MHz) = **45 (Chain 0)**
IEEE 802.11 n HT40 Channel High (2452MHz) = **45 (Chain 0)**

(2) **RX Mode：**

Start RX

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

RX Mode：

Test Item packets RX
Start RX

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.

8. APPLICABLE LIMITS AND TEST RESULTS

8.1 6DB BANDWIDTH

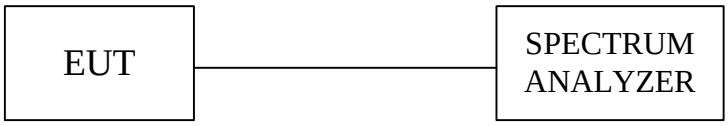
LIMIT

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

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSV	101073	APR. 26, 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

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	10.12	500	PASS
Middle	2437	10.12	500	PASS
High	2462	10.12	500	PASS

NOTE : 1. At finial test to get the worst-case emission at 1Mbps long.
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	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.59	500	PASS
Middle	2437	16.59	500	PASS
High	2462	16.59	500	PASS

NOTE : 1. At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.7dB (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	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
		Chain 0		
Low	2412	17.80	500	PASS
Middle	2437	17.80	500	PASS
High	2462	17.80	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.

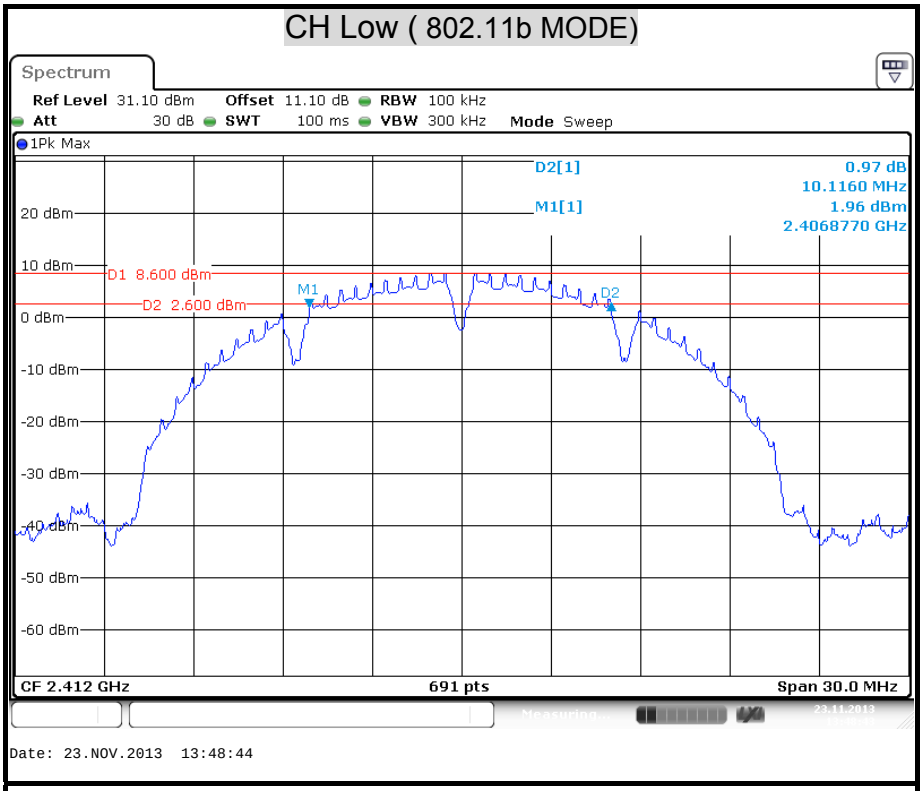
IEEE 802.11n HT40 mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
		Chain 0		
Low	2422	36.38	500	PASS
Middle	2437	36.30	500	PASS
High	2452	36.38	500	PASS

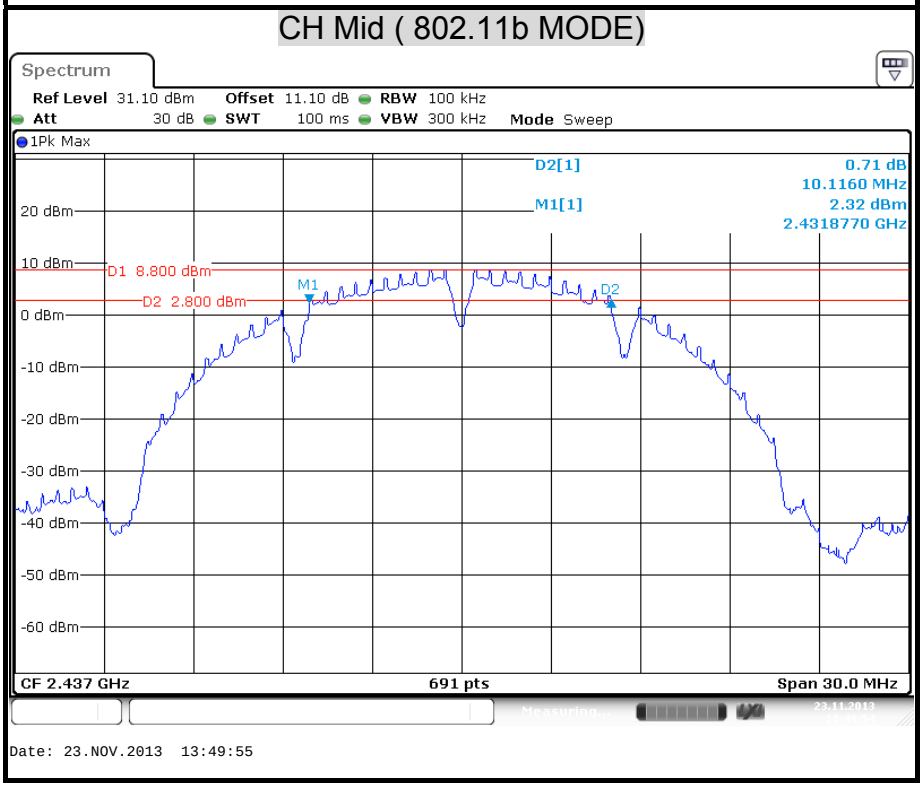
NOTE : 1. At finial test to get the worst-case emission at 13Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

6dB BANDWIDTH (802.11b MODE)

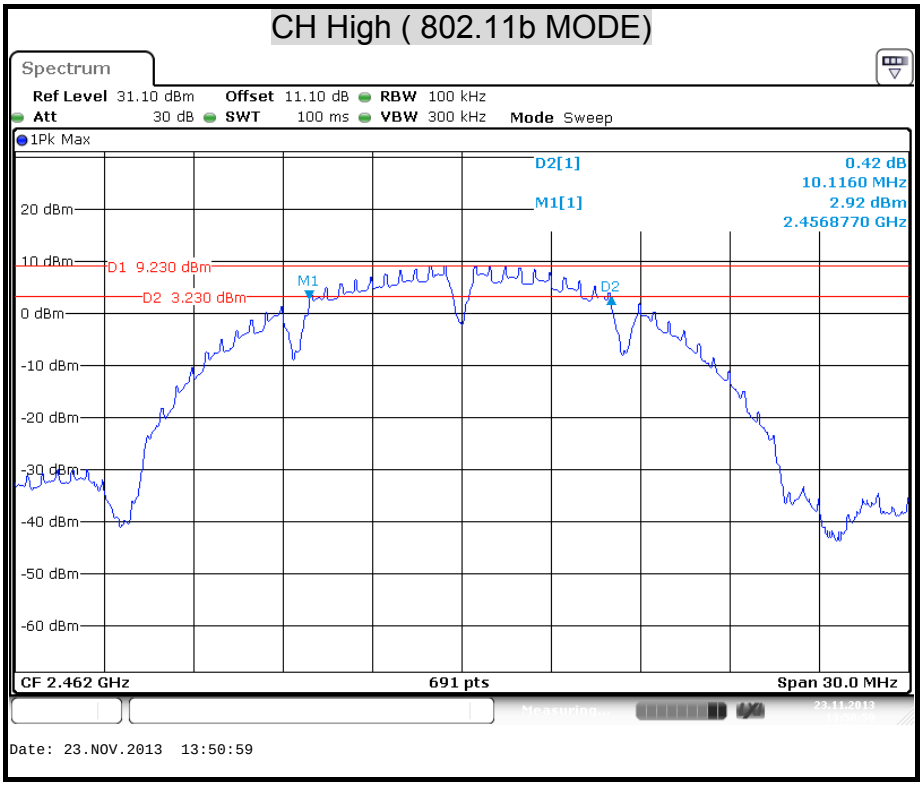
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

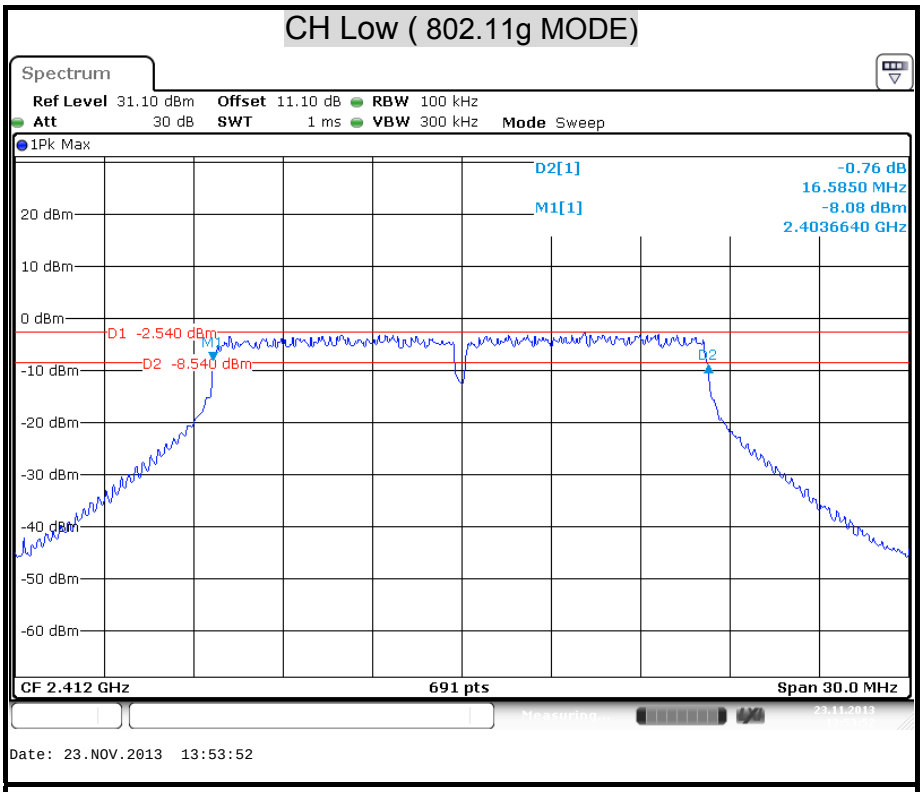


CH High (802.11b MODE)

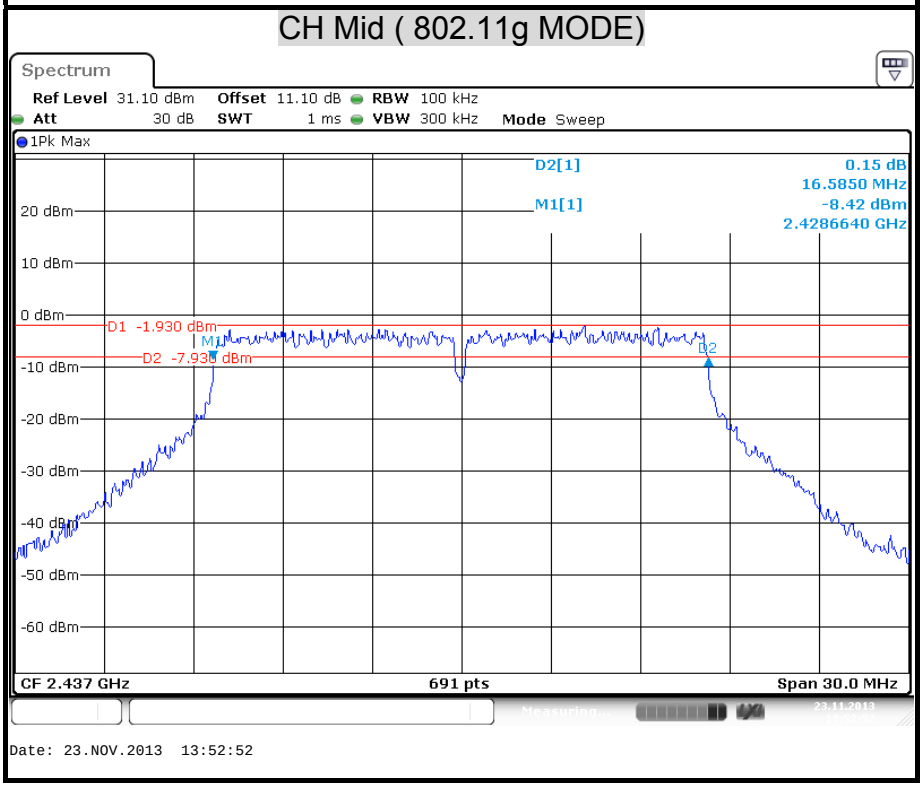


6dB BANDWIDTH (802.11g MODE)

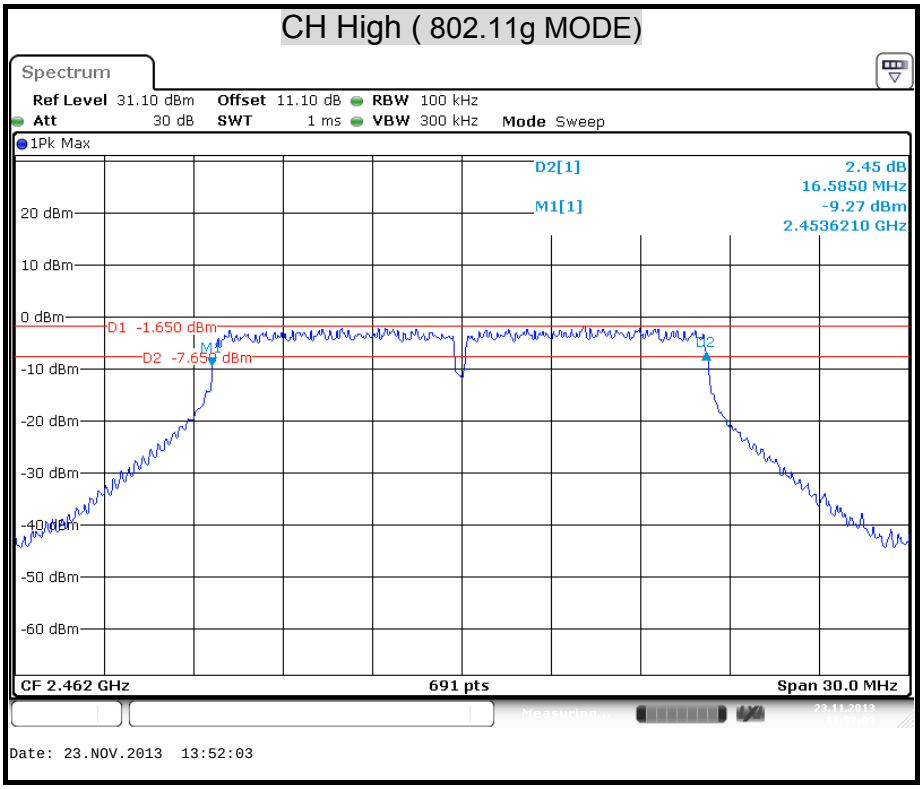
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

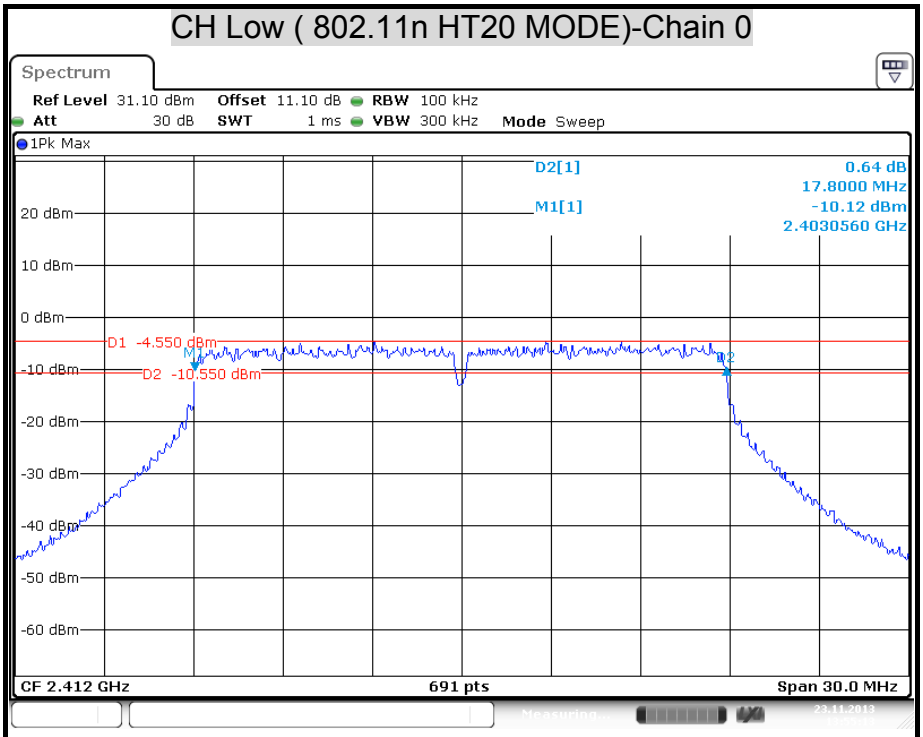


CH High (802.11g MODE)

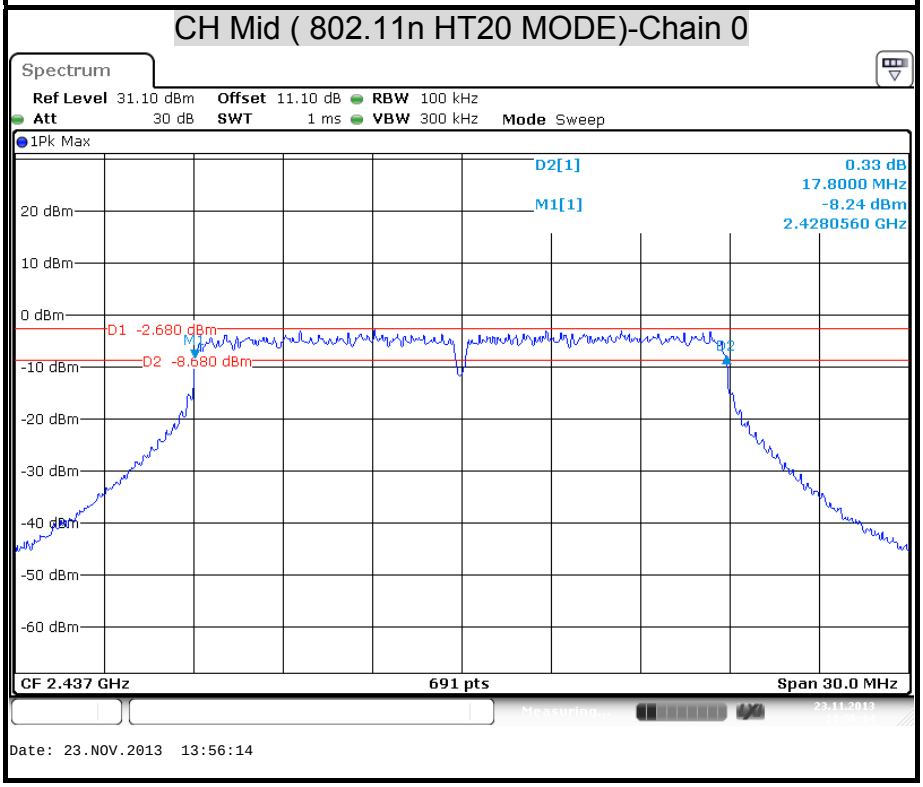


6dB BANDWIDTH (802.11n HT20 MODE) Chain 0

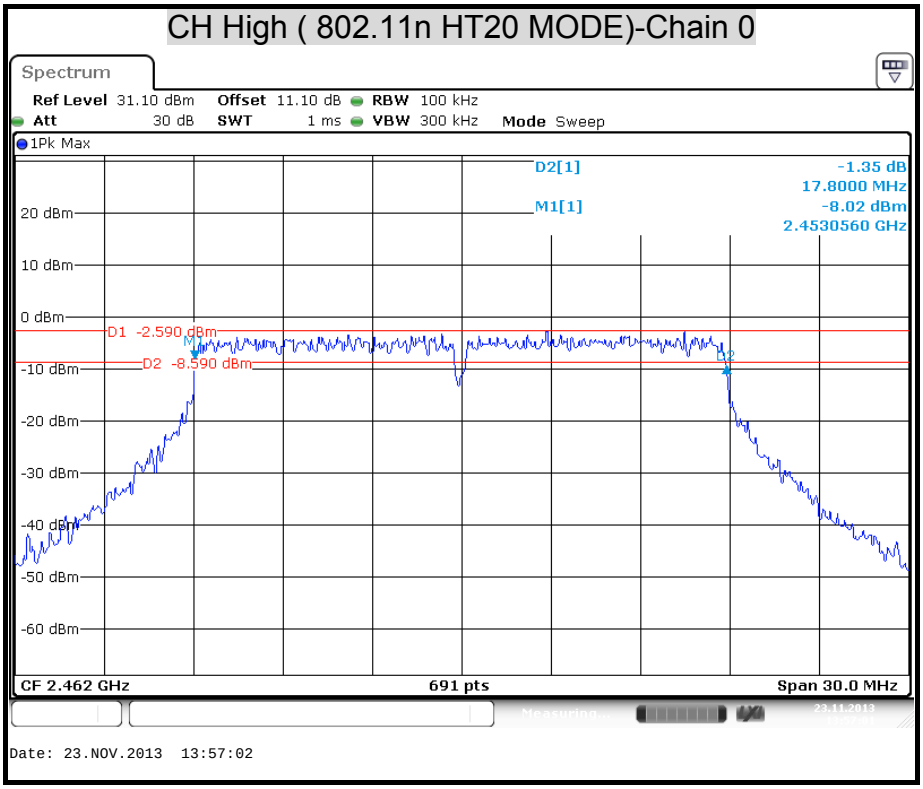
CH Low (802.11n HT20 MODE)-Chain 0



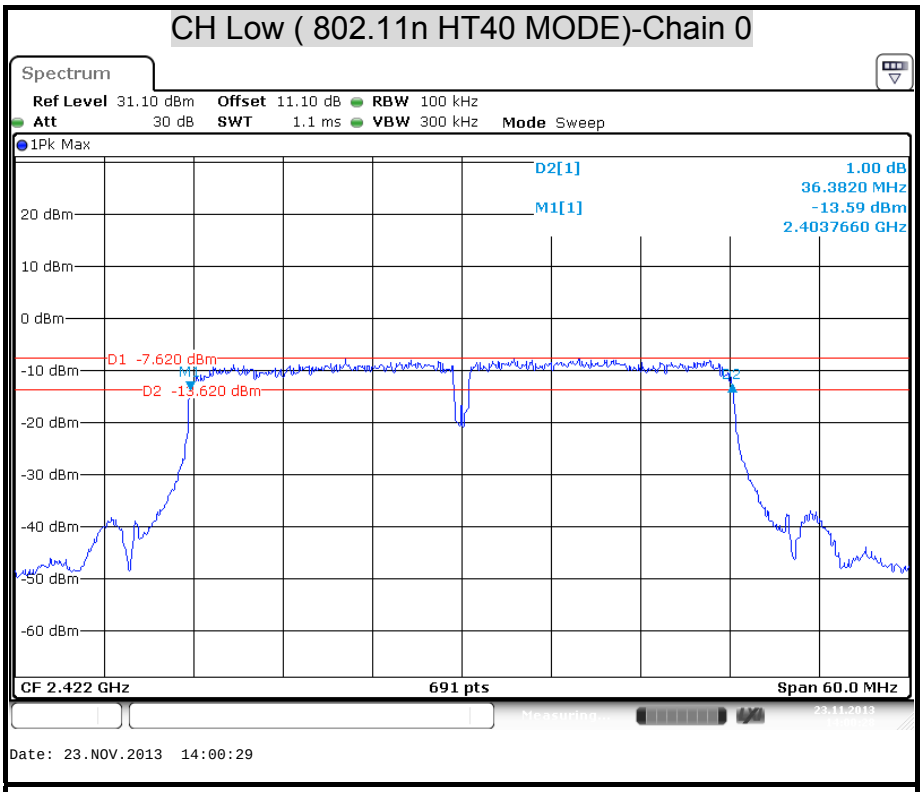
CH Mid (802.11n HT20 MODE)-Chain 0

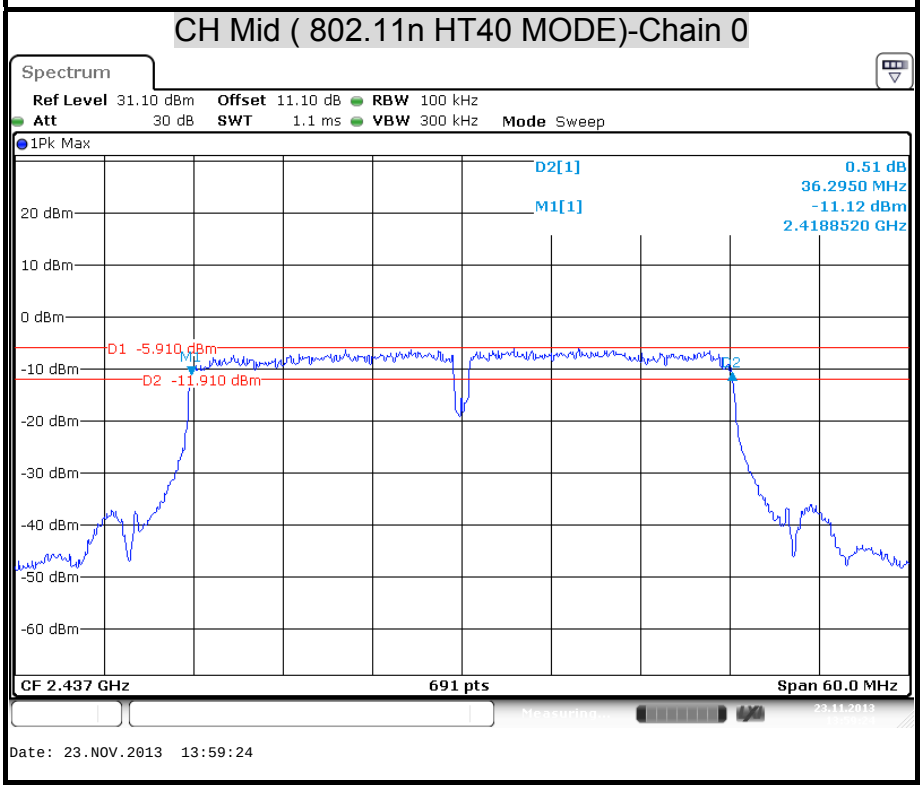


CH High (802.11n HT20 MODE)-Chain 0

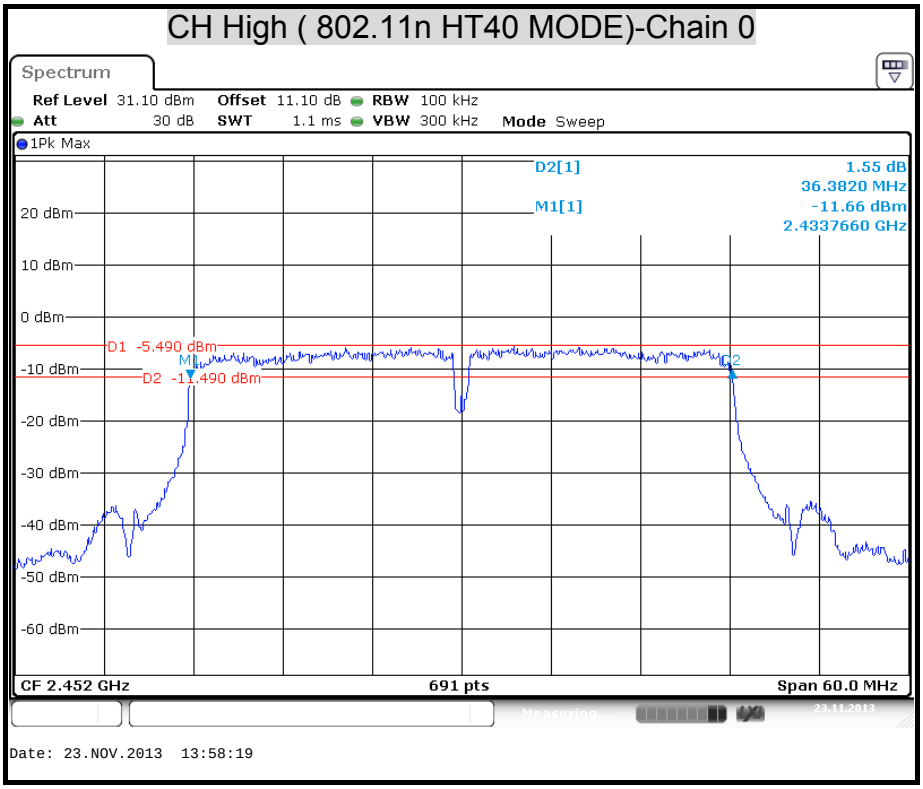


6dB BANDWIDTH (802.11n HT40 MODE) Chain 0





CH High (802.11n HT40 MODE)-Chain 0



8.2 MAXIMUM PEAK OUTPUT POWER

LIMIT

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

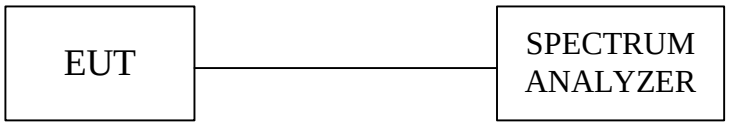
§ 15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands : 1 watt.

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

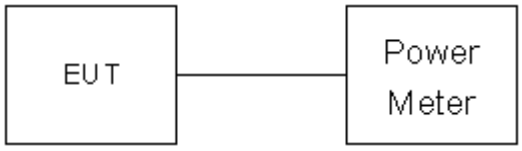
TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	FSV	101073	APR. 26, 2013	APR. 25, 2014
Power Meter	Anritsu	ML2487A	6K00003888	JUN. 25, 2013

TEST SETUP



For Average Power



TEST PROCEDURE

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

5.2.1.2 Measurement Procedure PK2:

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

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 EUT over 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.

TEST RESULTS

No non-compliance noted

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	20.98	30.00	PASS
Middle	2437	21.15	30.00	PASS
High	2462	21.69	30.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 1Mbps long.
2. The cable assembly insertion loss of 11.7dB (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	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	19.07	30.00	PASS
Middle	2437	19.79	30.00	PASS
High	2462	19.55	30.00	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	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
		Chain 0		
Low	2412	17.26	30.00	PASS
Middle	2437	19.11	30.00	PASS
High	2462	19.43	30.00	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	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
		Chain 0		
Low	2422	17.01	30.00	PASS
Middle	2437	18.56	30.00	PASS
High	2452	18.88	30.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 13Mbps.
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.

Average Power Data

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2412	19.16
Middle	2437	19.38
High	2462	19.87

IEEE 802.11g mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2412	12.52
Middle	2437	13.36
High	2462	12.96

IEEE 802.11n HT20 mode

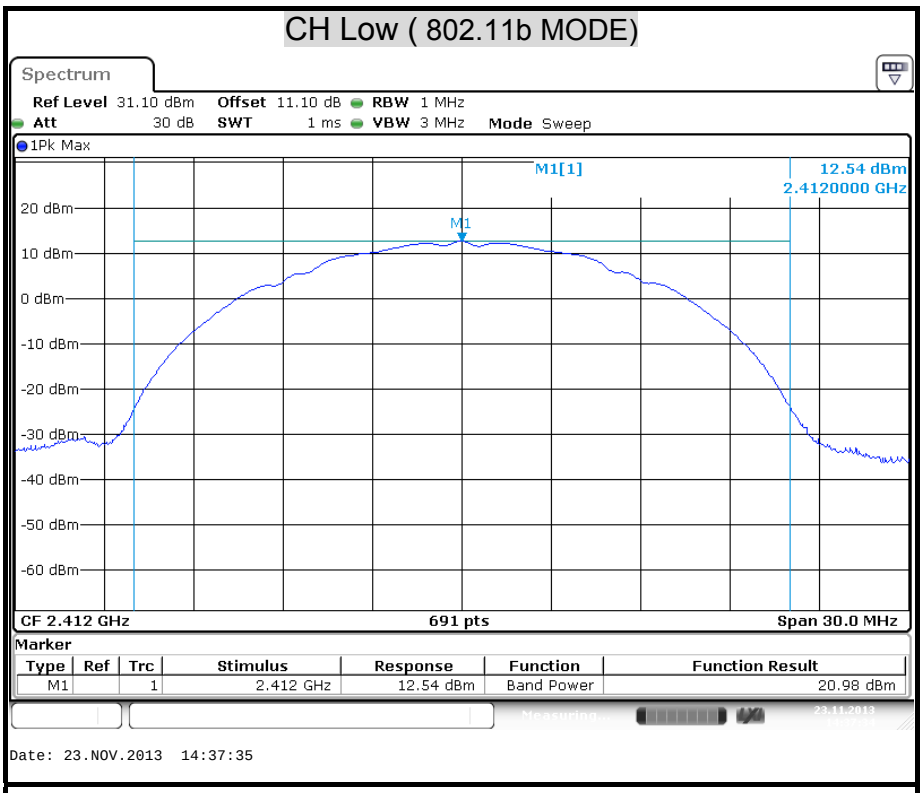
Channel	Channel Frequency (MHz)	Average Power (dBm)
		Chain 0
Low	2412	10.52
Middle	2437	12.36
High	2462	12.91

IEEE 802.11n HT40 mode

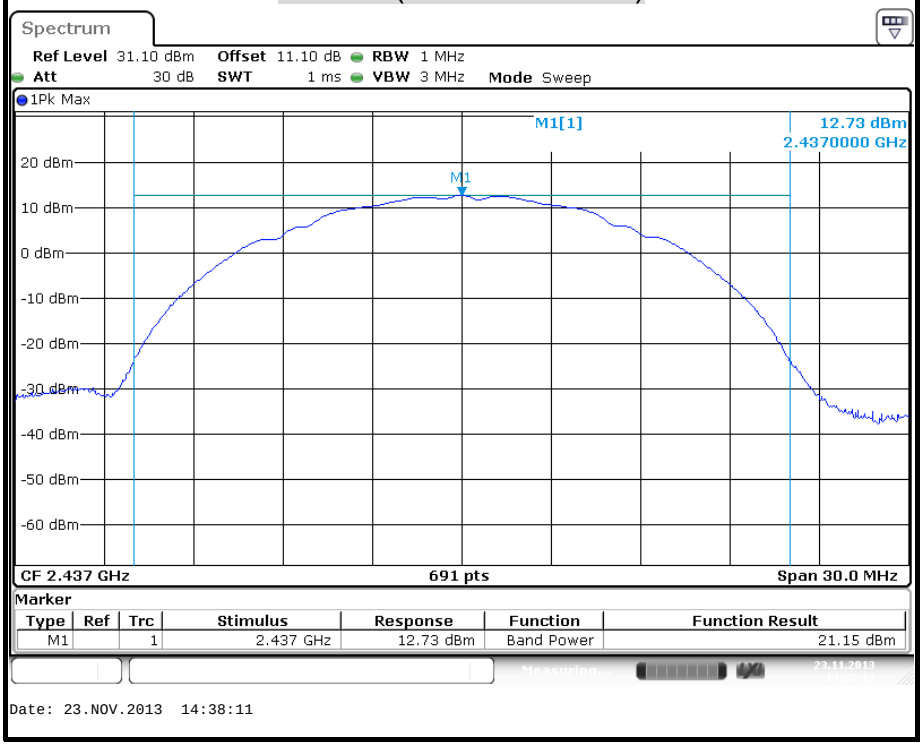
Channel	Channel Frequency (MHz)	Average Power (dBm)
		Chain 0
Low	2422	10.36
Middle	2437	11.95
High	2452	12.28

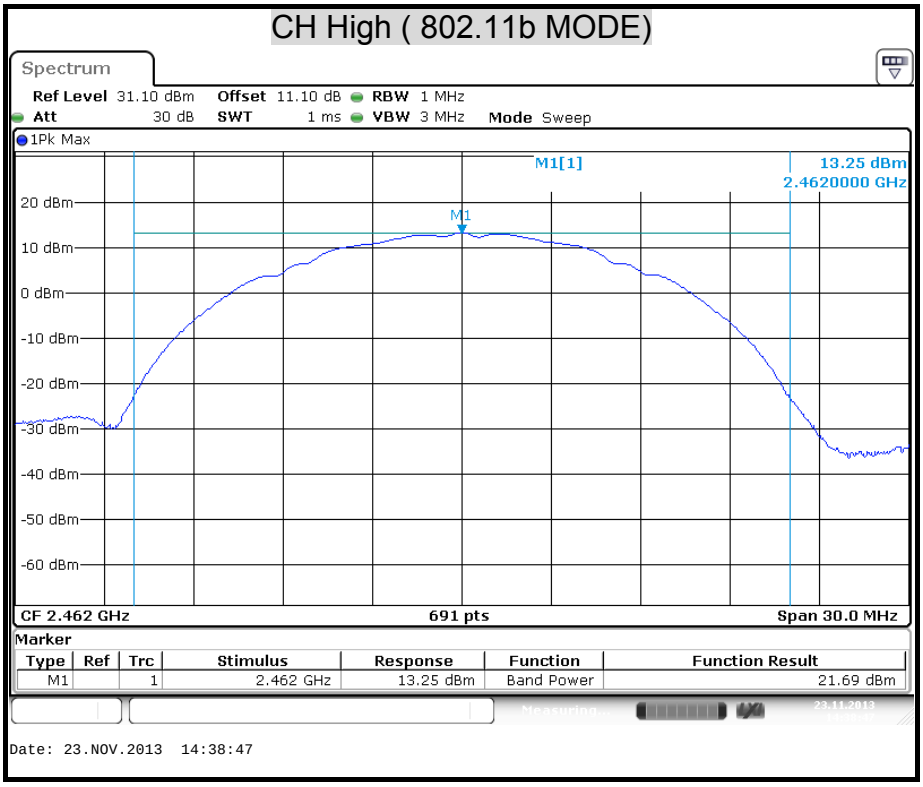
MAXIMUM PEAK OUTPUT POWER (802.11b MODE)

CH Low (802.11b MODE)



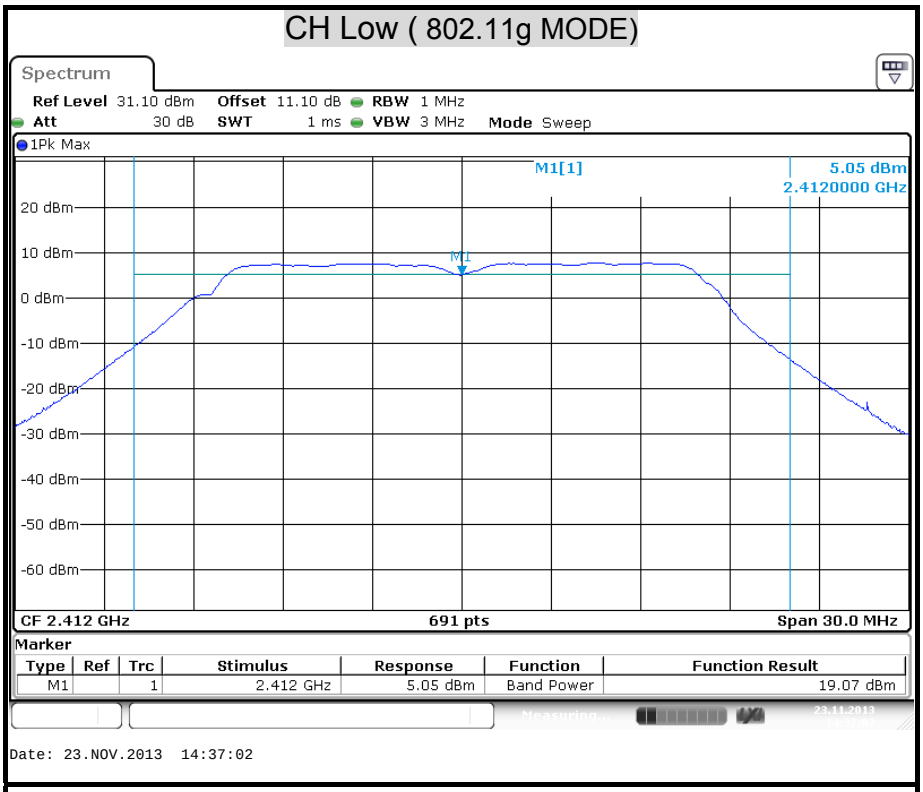
CH Mid (802.11b MODE)



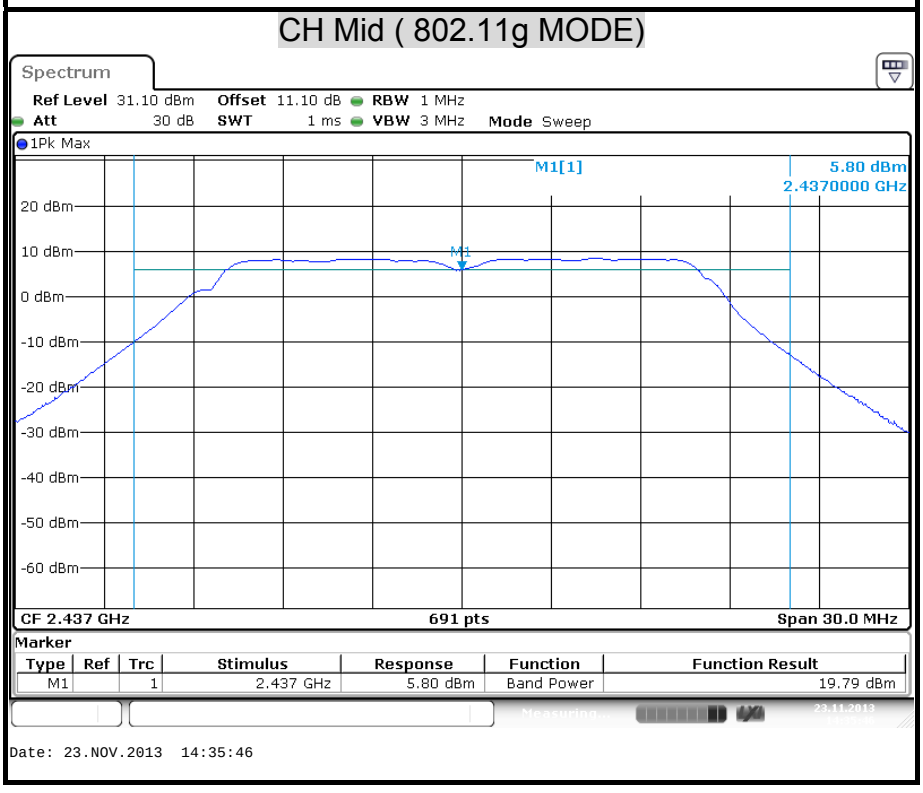

CH High (802.11b MODE)
Spectrum
Ref Level 31.10 dBm Offset 11.10 dB RBW 1 MHz
Att 30 dB SWT 1 ms VBW 3 MHz Mode Sweep
1Pk Max
M1[1]
13.25 dBm
2.4620000 GHz
M1
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.462 GHz 13.25 dBm Band Power 21.69 dBm
Date: 23.NOV.2013 14:38:47

MAXIMUM PEAK OUTPUT POWER (802.11g MODE)

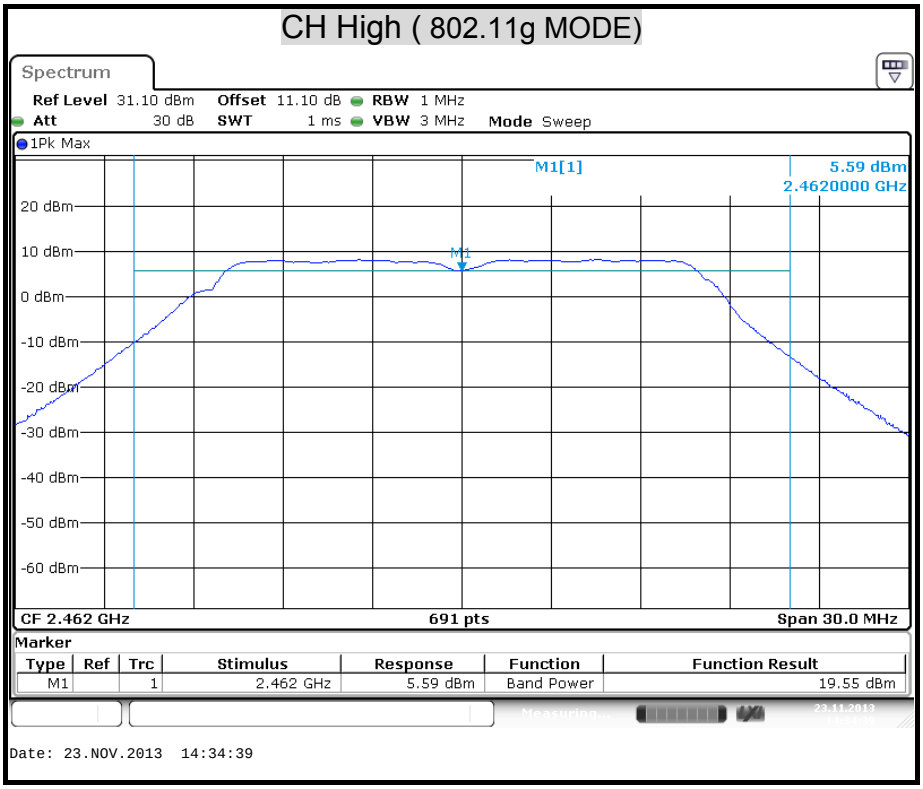
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

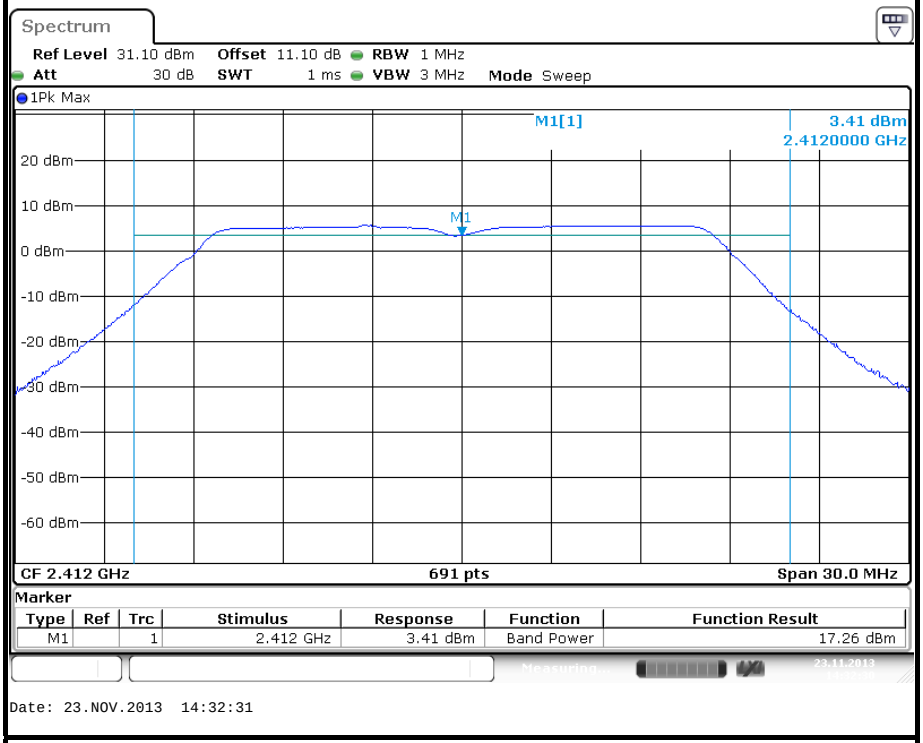


CH High (802.11g MODE)

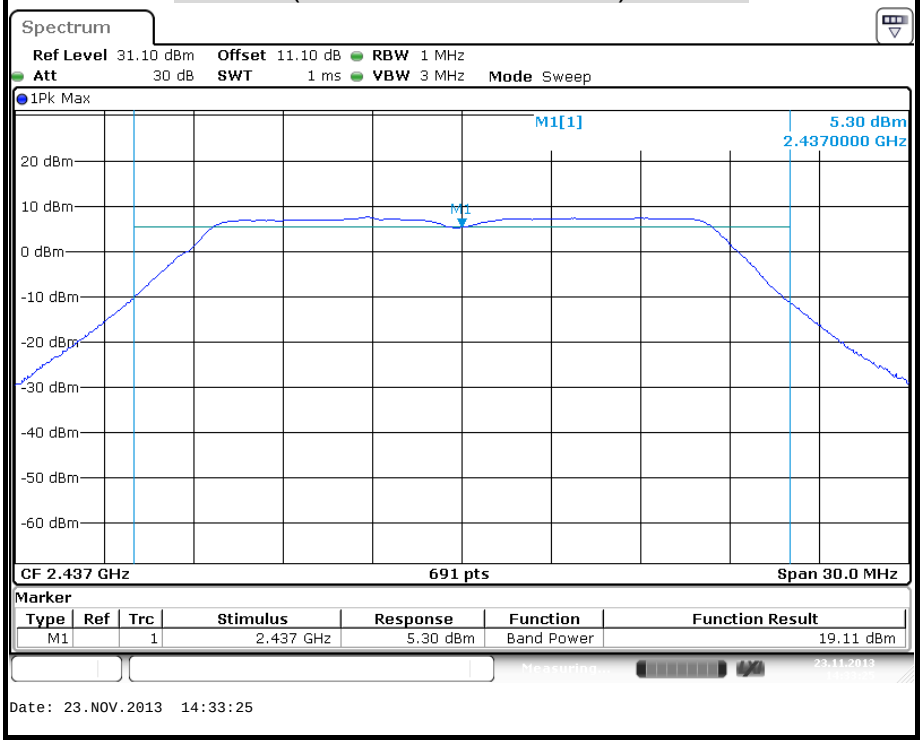


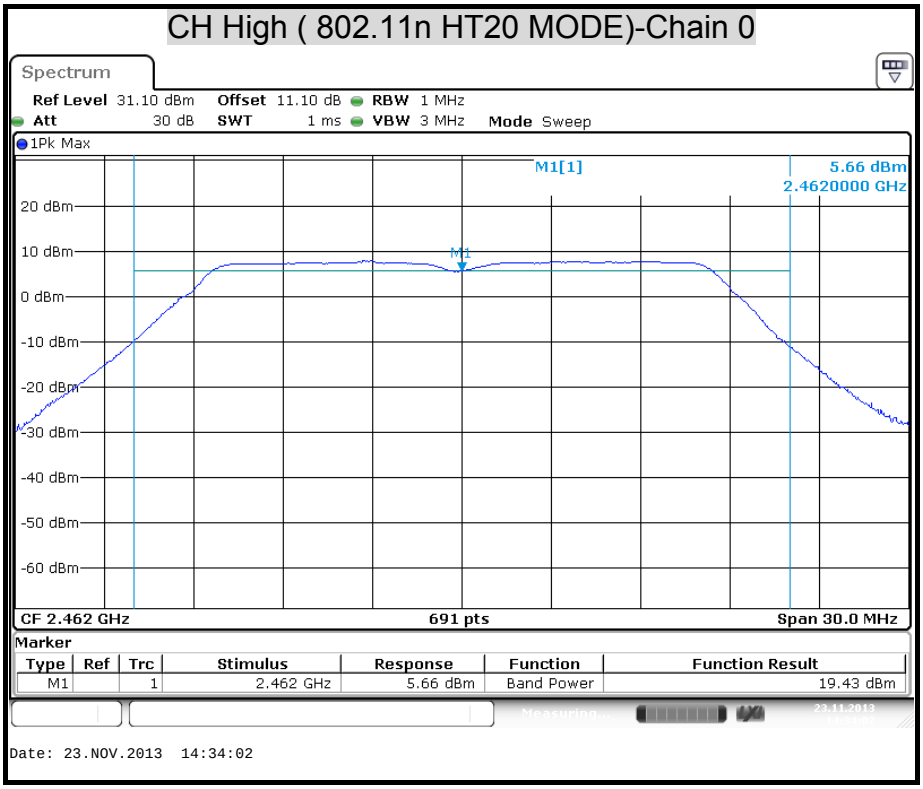
MAXIMUM PEAK OUTPUT POWER (802.11n HT20 MODE) Chain 0

CH Low (802.11n HT20 MODE)-Chain 0



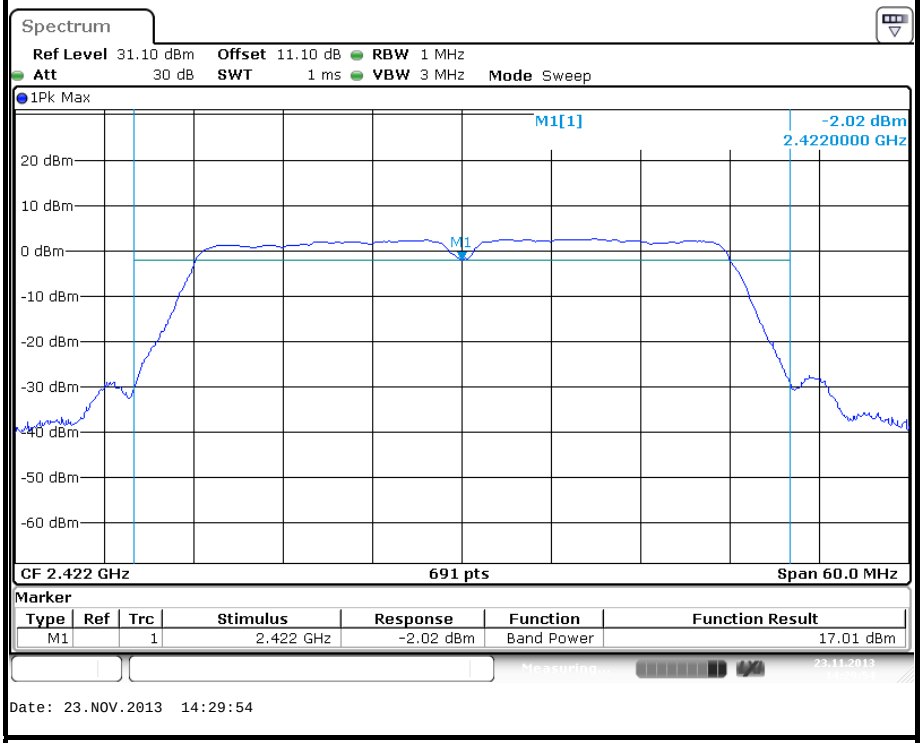
CH Mid (802.11n HT20 MODE)-Chain 0



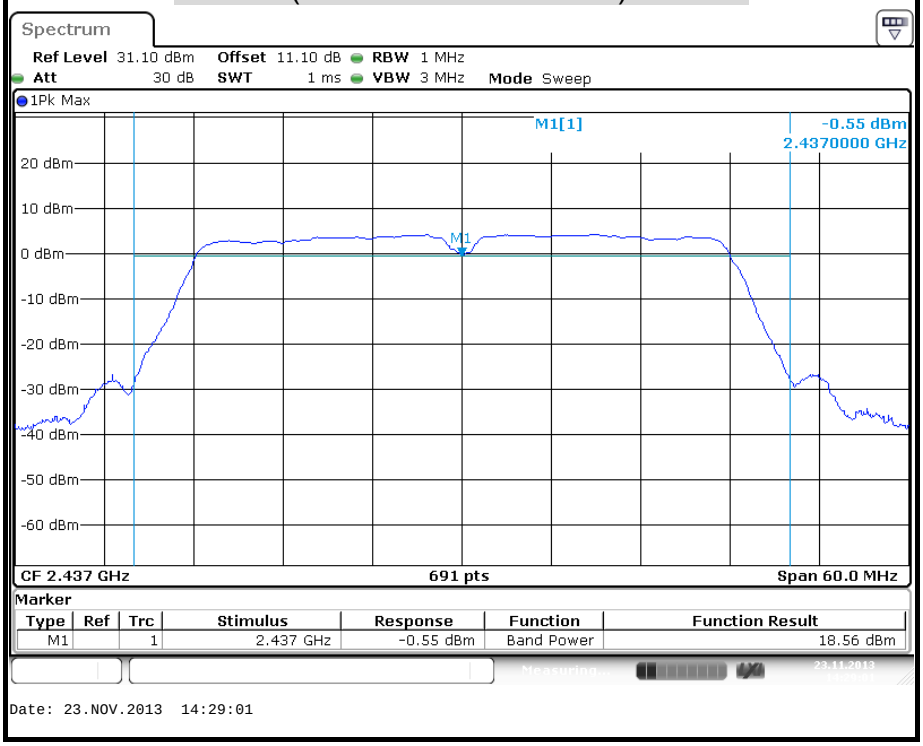

CH High (802.11n HT20 MODE)-Chain 0
Spectrum
Ref Level 31.10 dBm Offset 11.10 dB RBW 1 MHz
Att 30 dB SWT 1 ms VBW 3 MHz Mode Sweep
1Pk Max
M1[1]
5.66 dBm
2.4620000 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.462 GHz 5.66 dBm Band Power 19.43 dBm
Date: 23.NOV.2013 14:34:02

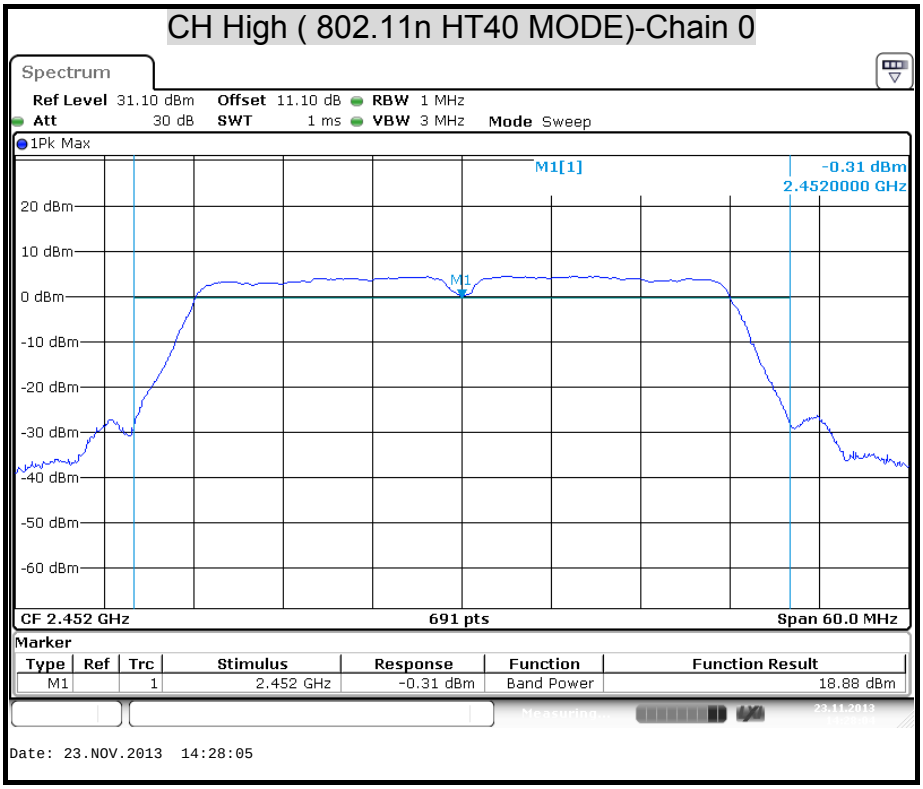
MAXIMUM PEAK OUTPUT POWER (802.11n HT40 MODE) Chain 0

CH Low (802.11n HT40 MODE)-Chain 0



CH Mid (802.11n HT40 MODE)-Chain 0




CH High (802.11n HT40 MODE)-Chain 0
Spectrum
Ref Level 31.10 dBm Offset 11.10 dB RBW 1 MHz
Att 30 dB SWT 1 ms VBW 3 MHz Mode Sweep
1Pk Max
M1[1]
-0.31 dBm
2.4520000 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.452 GHz
691 pts
Span 60.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.452 GHz -0.31 dBm Band Power 18.88 dBm
Date: 23.NOV.2013 14:28:05

8.3 MAXIMUM PERMISSIBLE EXPOSURE

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

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

CALCULATIONS

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

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

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

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

Changing to units of mW and cm, using:

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

d (cm) = d(m) / 100

Yields

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

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm^2

LIMIT

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

TEST RESULTS

No non-compliance noted.

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

Once Antenna Gain=4 dBi=2.51188643mW

IEEE 802.11b	=	0.0796 *	147.5707	*	2.51188643	÷ 400 =	0.073765
IEEE 802.11g	=	0.0796 *	95.2796	*	2.51188643	÷ 400 =	0.047627
IEEE 802.11n HT20	=	0.0796 *	87.7001	*	2.51188643	÷ 400 =	0.043838
IEEE 802.11n HT40	=	0.0796 *	77.2681	*	2.51188643	÷ 400 =	0.038624

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	21.69	147.57	4.00	1.00	0.073765
IEEE 802.11g	20	19.79	95.28	4.00	1.00	0.047627
IEEE 802.11n HT20	20	19.43	87.70	4.00	1.00	0.043838
IEEE 802.11n HT40	20	18.88	77.27	4.00	1.00	0.038624

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

8.4 POWER SPECTRAL DENSITY

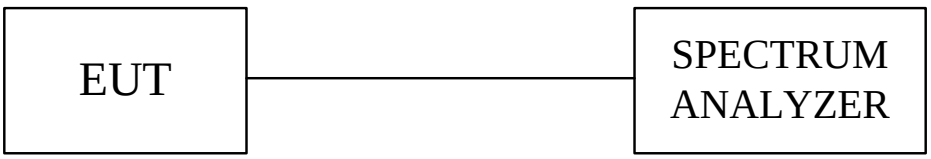
LIMIT

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

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSV	101073	APR. 26, 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.

TEST RESULTS

IEEE 802.11b mode

Channel	Frequency (MHz)	PPSD ChainA (dBm)	Limit (dBm)	Result
Low	2412	-11.36	8.00	PASS
Middle	2437	-11.13	8.00	PASS
High	2462	-10.59	8.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 1Mbps long.
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)	PPSD ChainA (dBm)	Limit (dBm)	Result
Low	2412	-2.98	8.00	PASS
Middle	2437	-2.13	8.00	PASS
High	2462	-2.54	8.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 6Mbps long.
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)	PPSD ChainA (dBm)	Limit (dBm)	Result
Low	2412	-5.00	8.00	PASS
Middle	2437	-3.07	8.00	PASS
High	2462	-2.55	8.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 6.5Mbps long.
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.

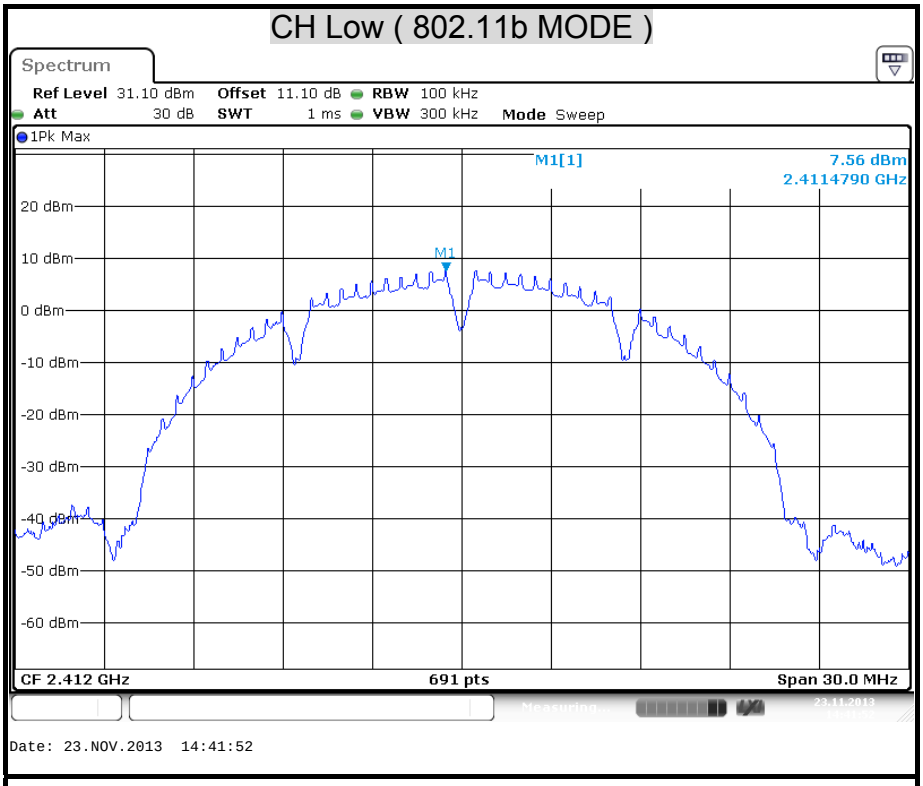
IEEE 802.11n HT40 mode

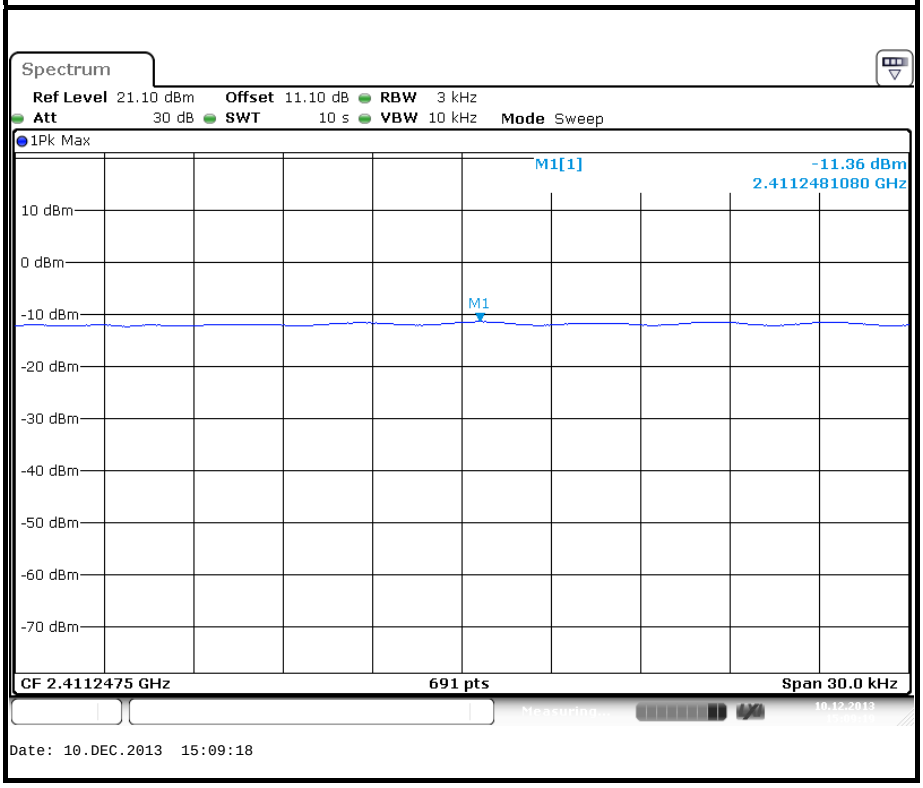
Channel	Frequency (MHz)	PPSD ChainA (dBm)	Limit (dBm)	Result
Low	2412	-7.99	8.00	PASS
Middle	2437	-6.23	8.00	PASS
High	2462	-5.92	8.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 13Mbps long.
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.

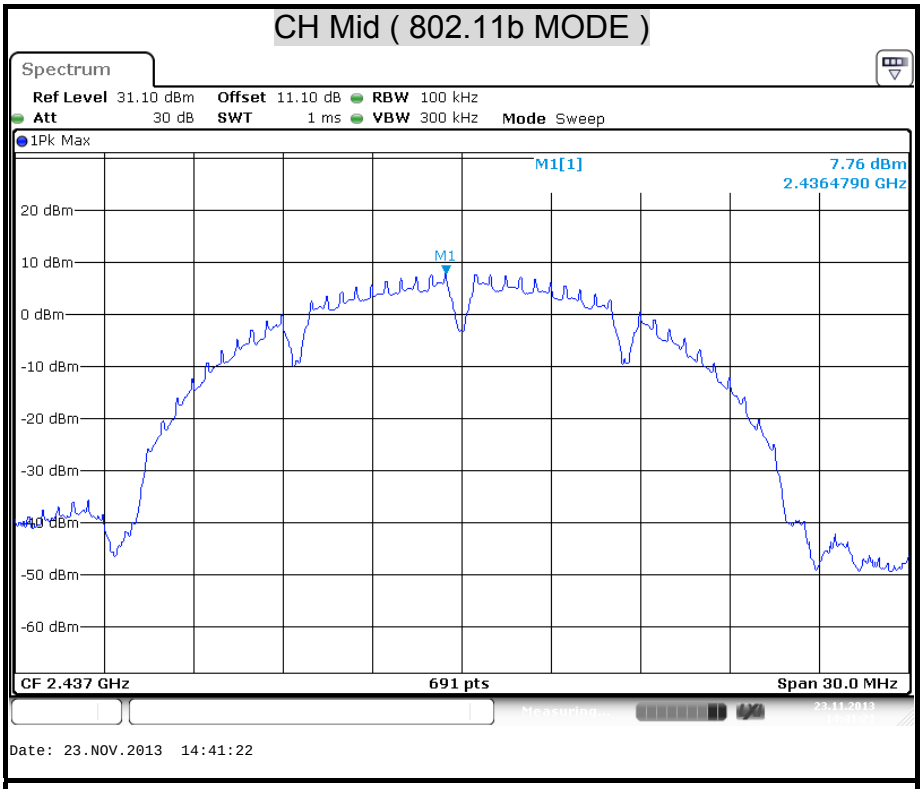
POWER SPECTRAL DENSITY (IEEE 802.11b MODE)

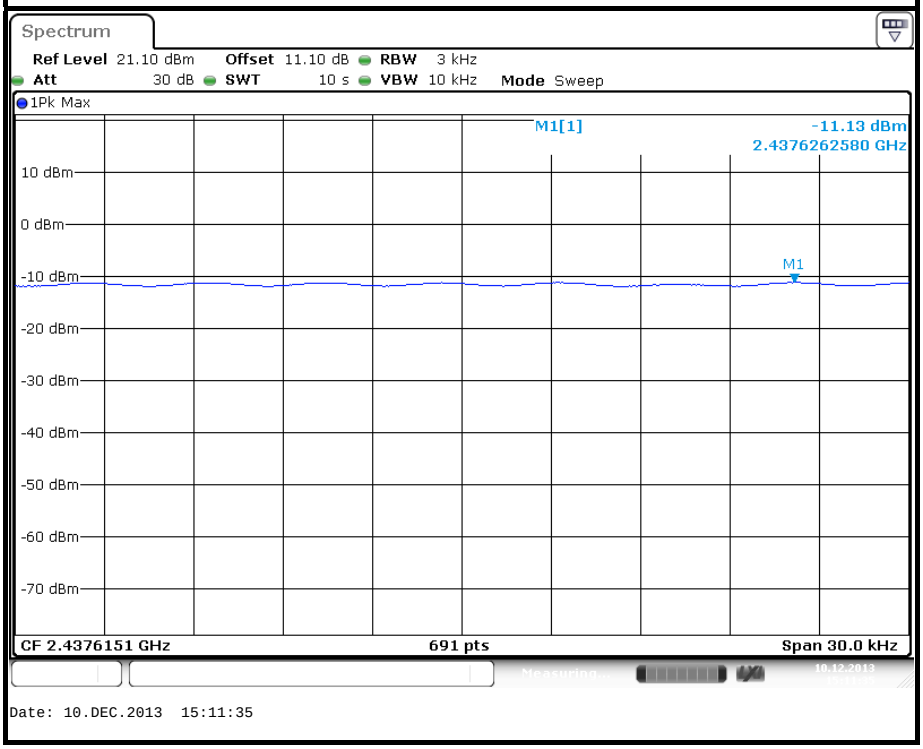
CH Low (802.11b MODE)



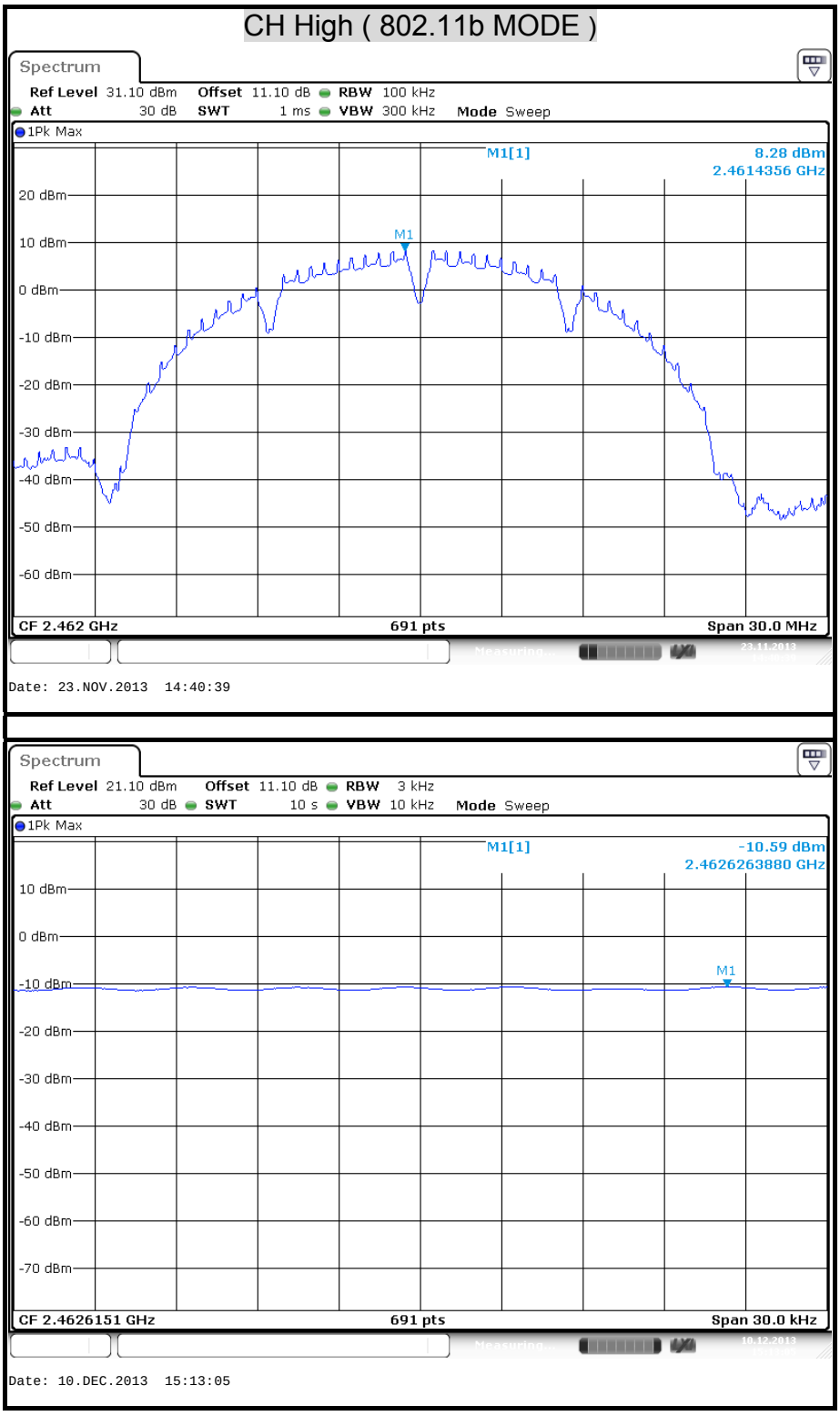


CH Mid (802.11b MODE)



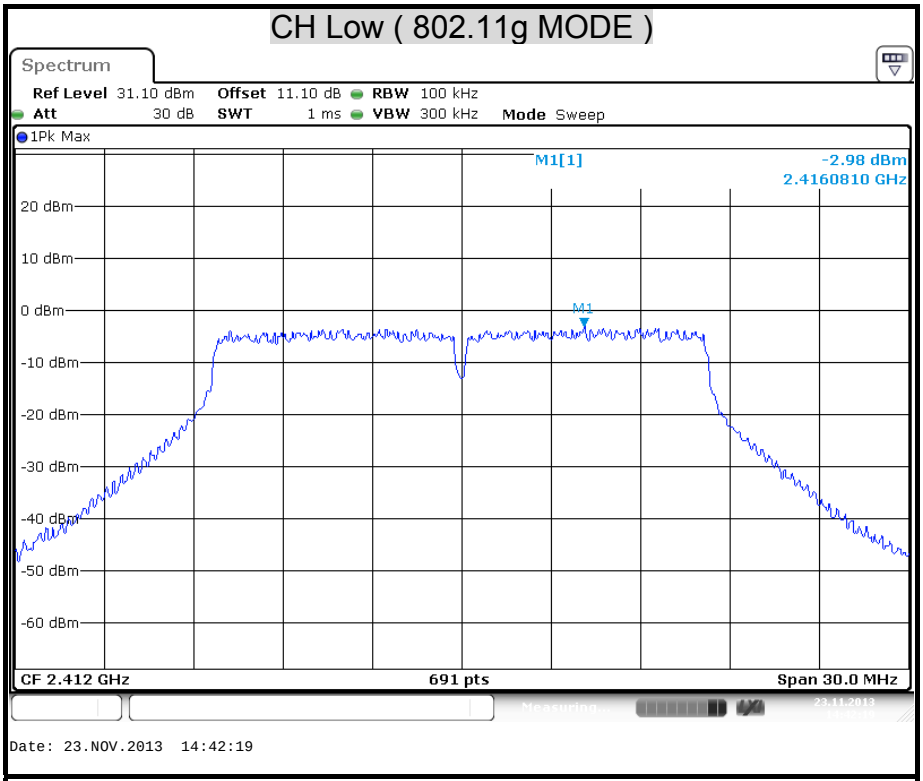


CH High (802.11b MODE)

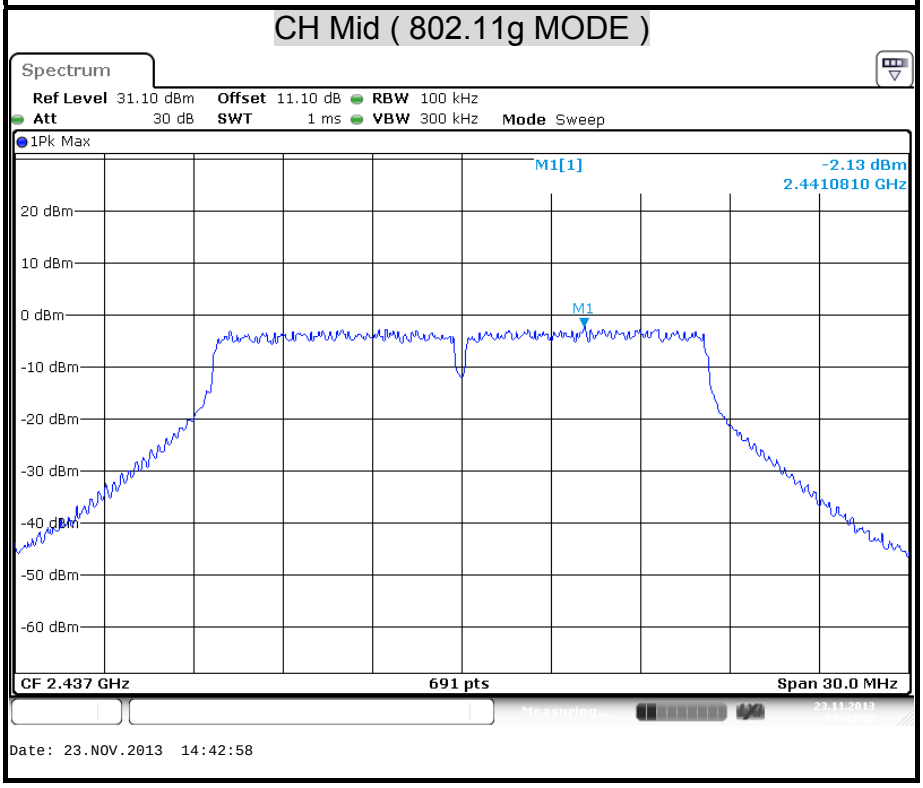


POWER SPECTRAL DENSITY (IEEE 802.11g MODE)

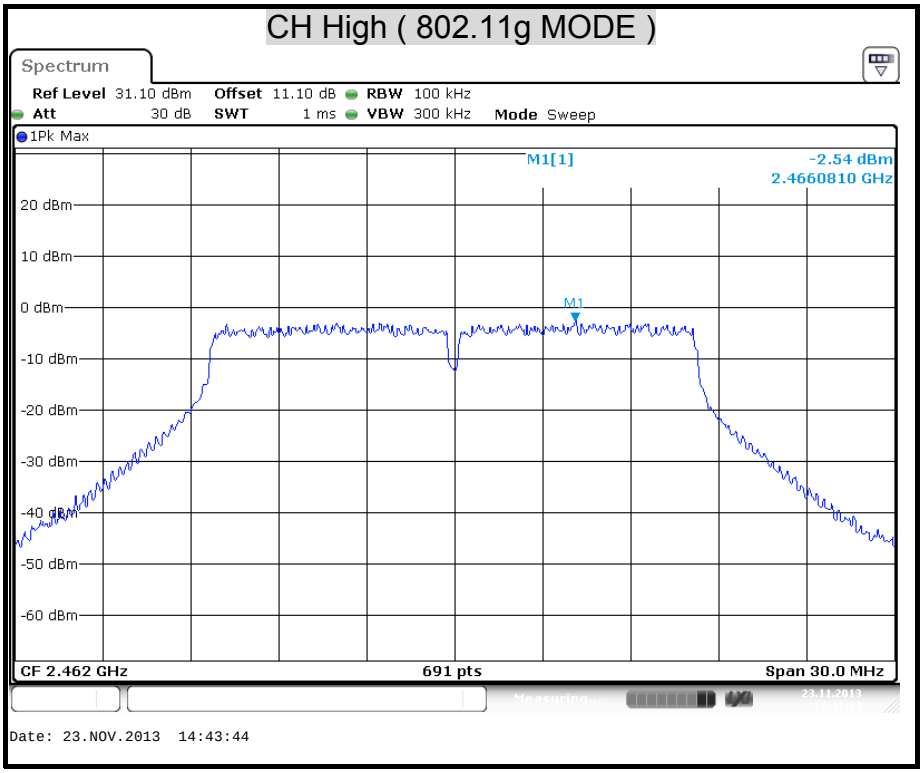
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

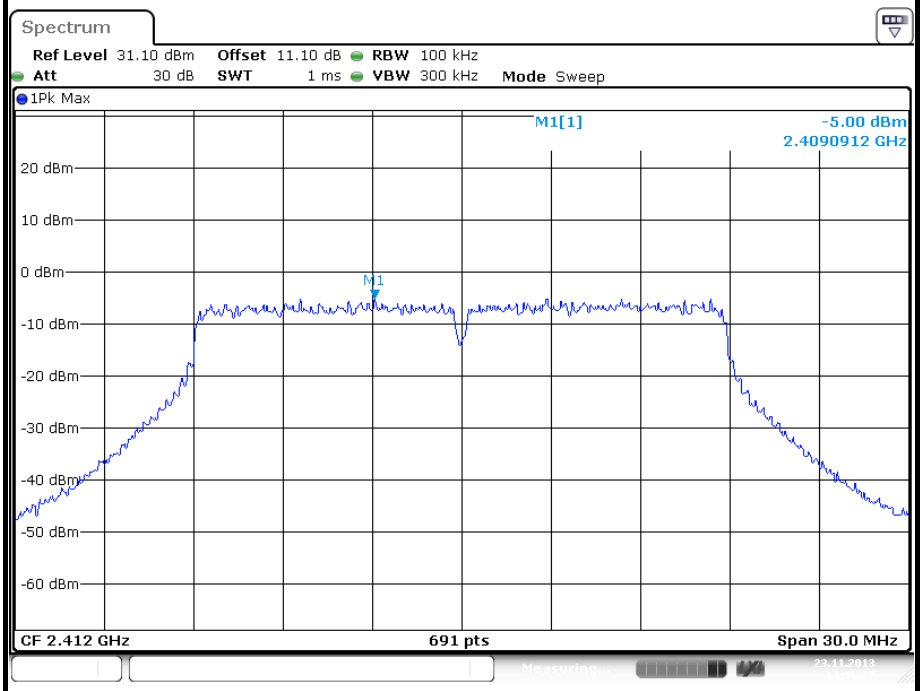


CH High (802.11g MODE)

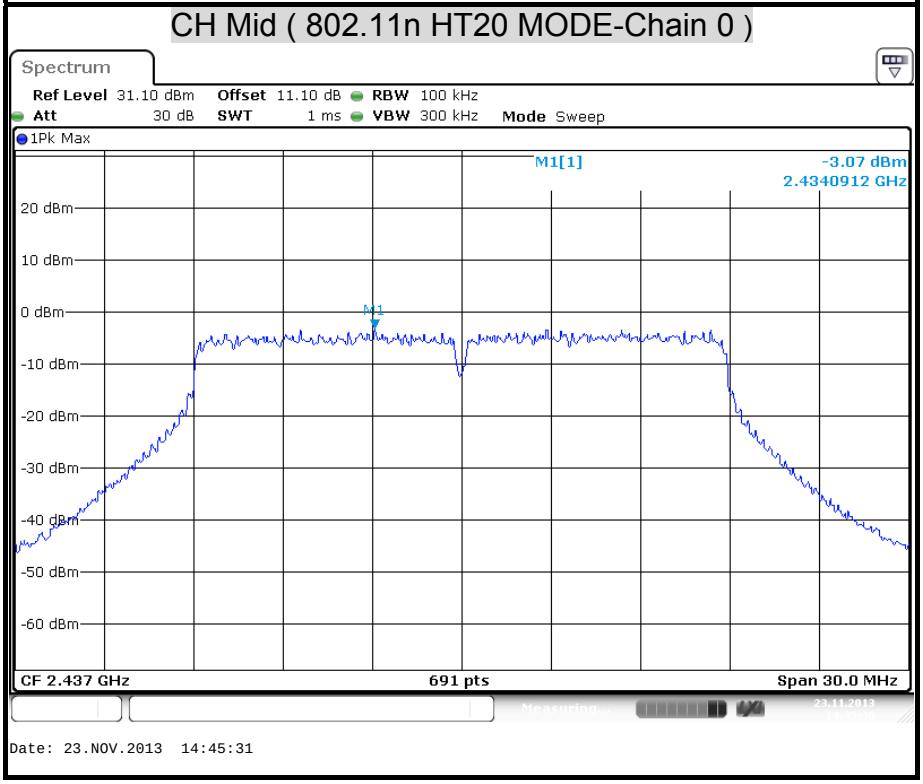


POWER SPECTRAL DENSITY (802.11n HT20 MODE)

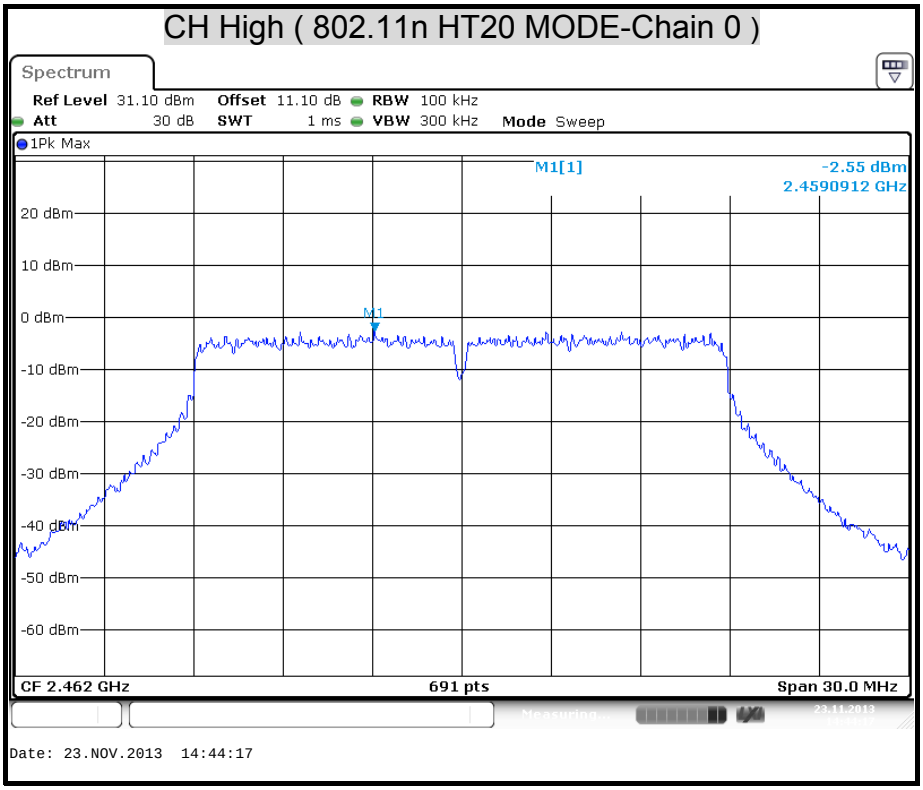
CH Low (802.11n HT20 MODE-Chain 0)



CH Mid (802.11n HT20 MODE-Chain 0)

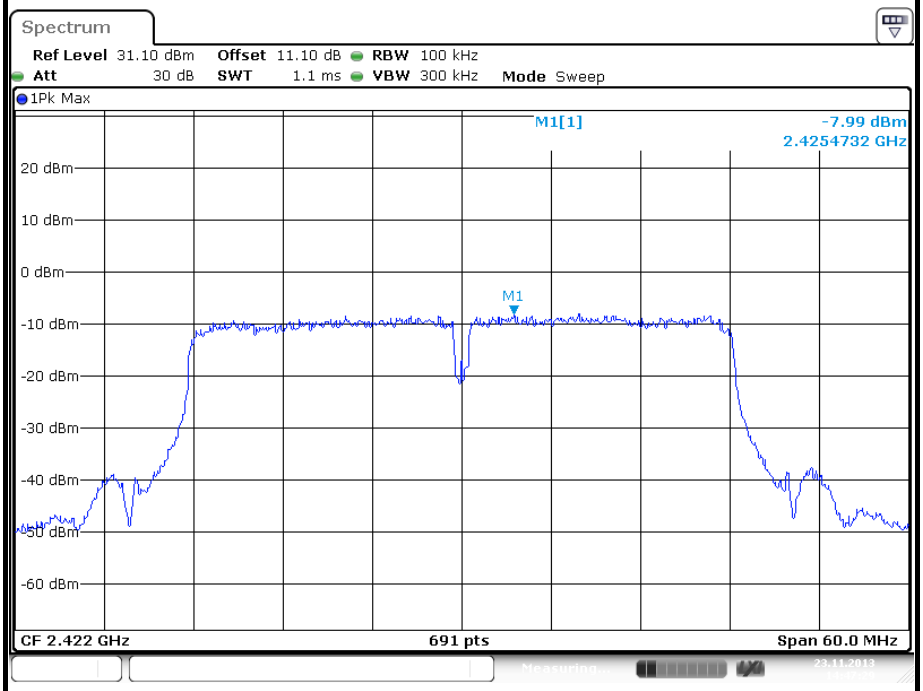


CH High (802.11n HT20 MODE-Chain 0)

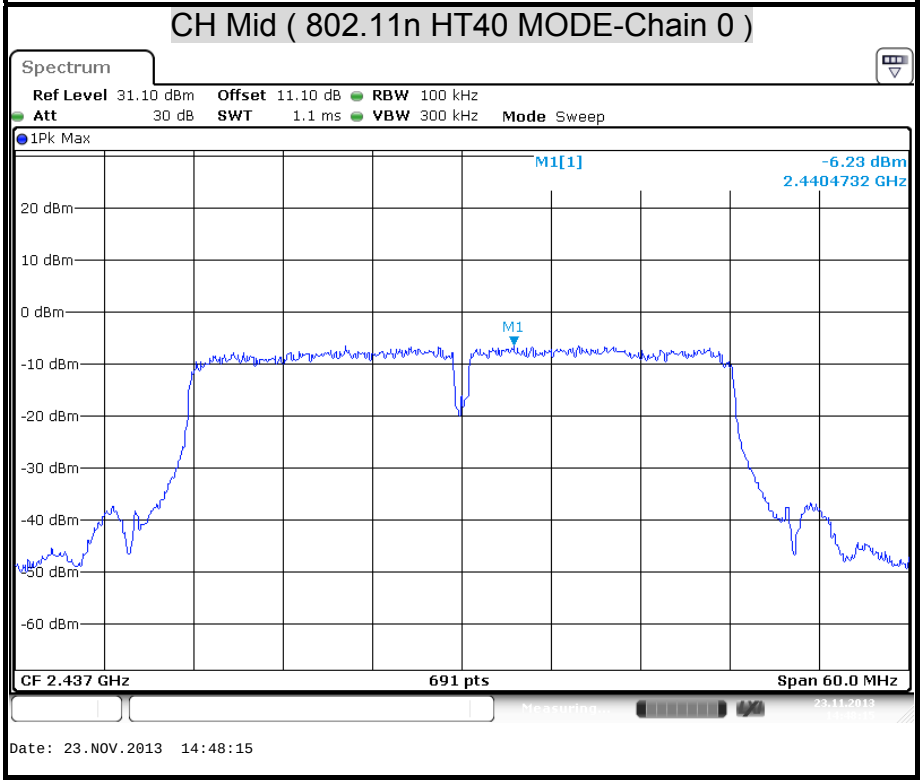


POWER SPECTRAL DENSITY (802.11n HT40 MODE)

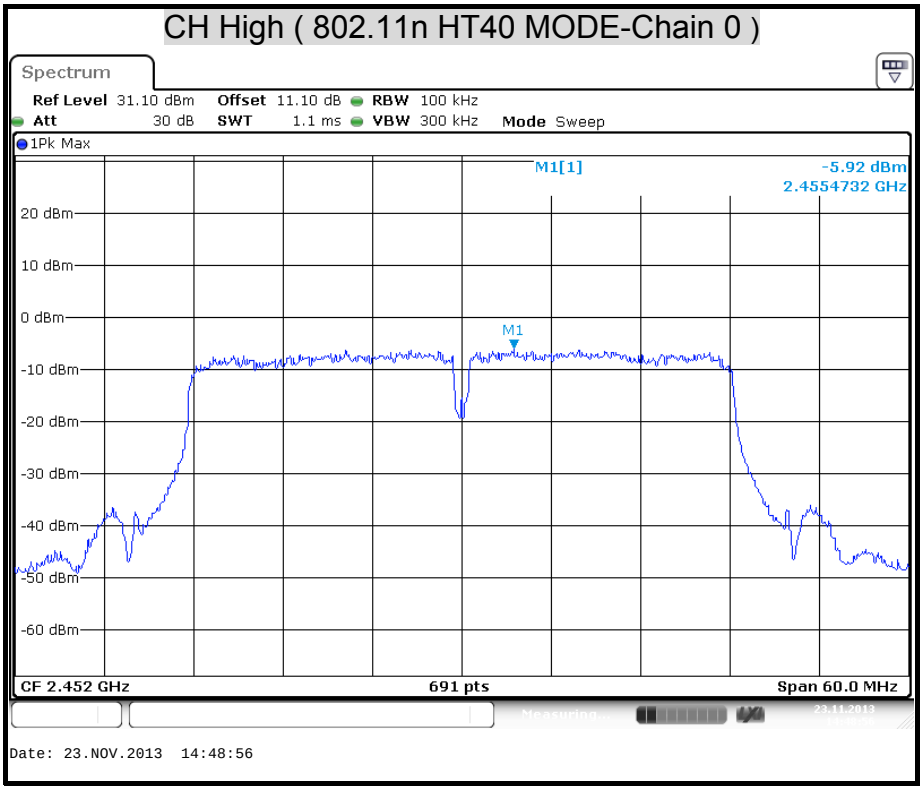
CH Low (802.11n HT40 MODE-Chain 0)



CH Mid (802.11n HT40 MODE-Chain 0)



CH High (802.11n HT40 MODE-Chain 0)



8.5 CONDUCTED SPURIOUS EMISSION

LIMITS

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

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	FSV	101073	APR. 26, 2013	APR. 25, 2014

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

TEST SETUP

TEST PROCEDURE

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

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

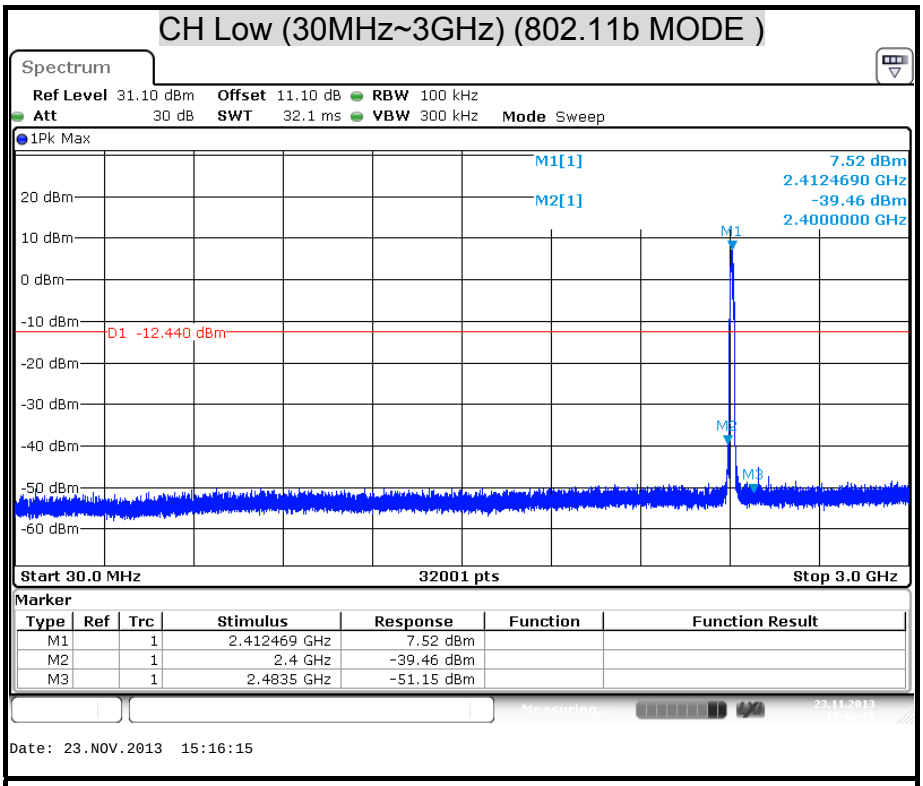
TEST RESULTS

No non-compliance noted.

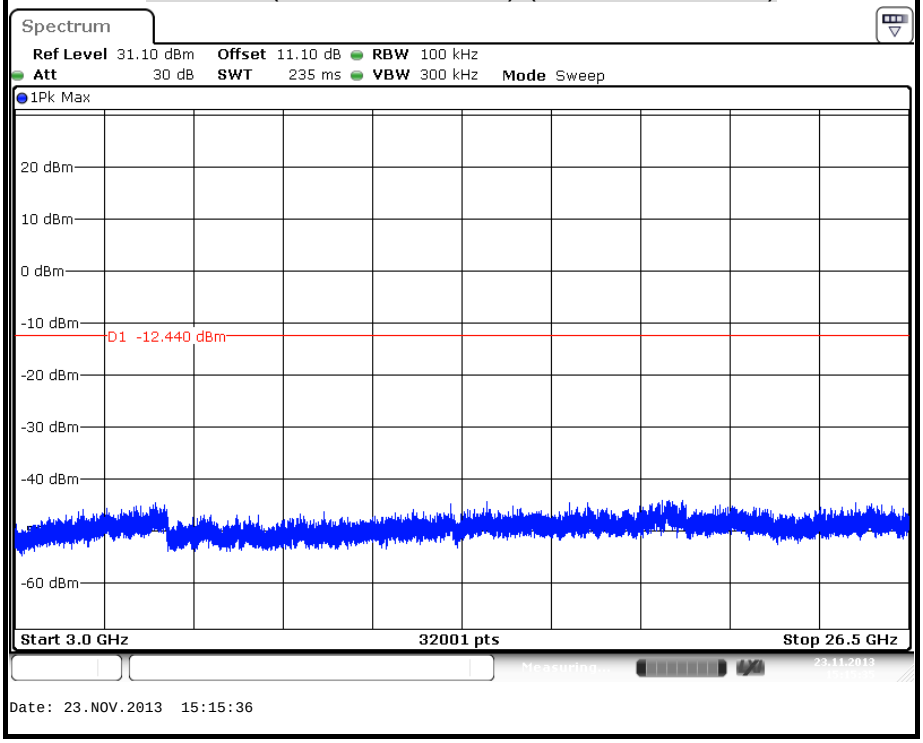
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(IEEE 802.11b MODE)

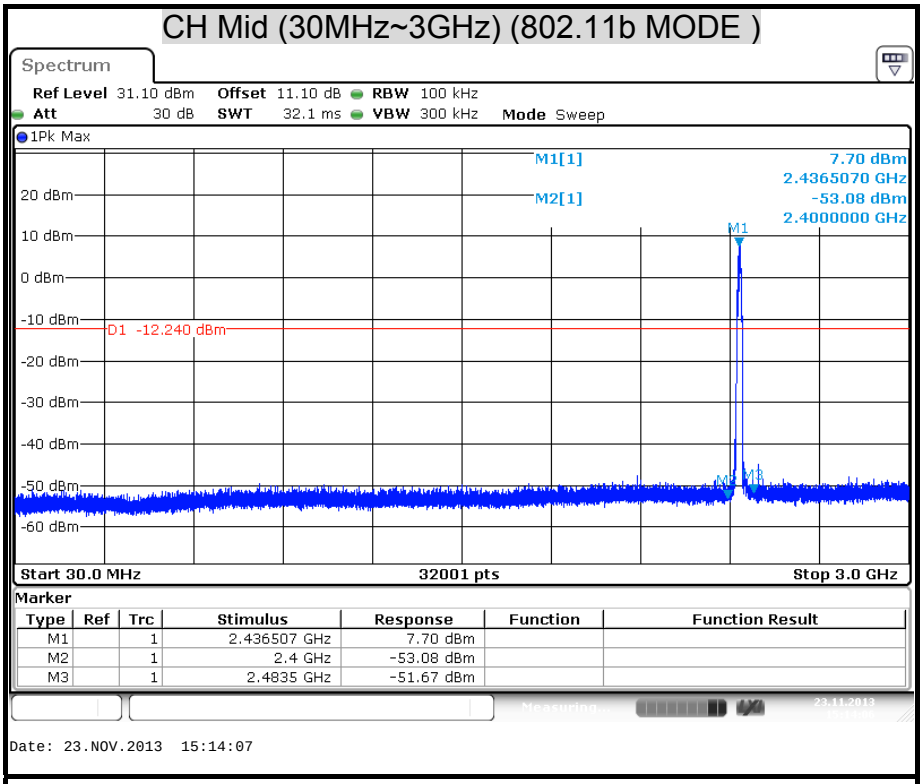
CH Low (30MHz~3GHz) (802.11b MODE)



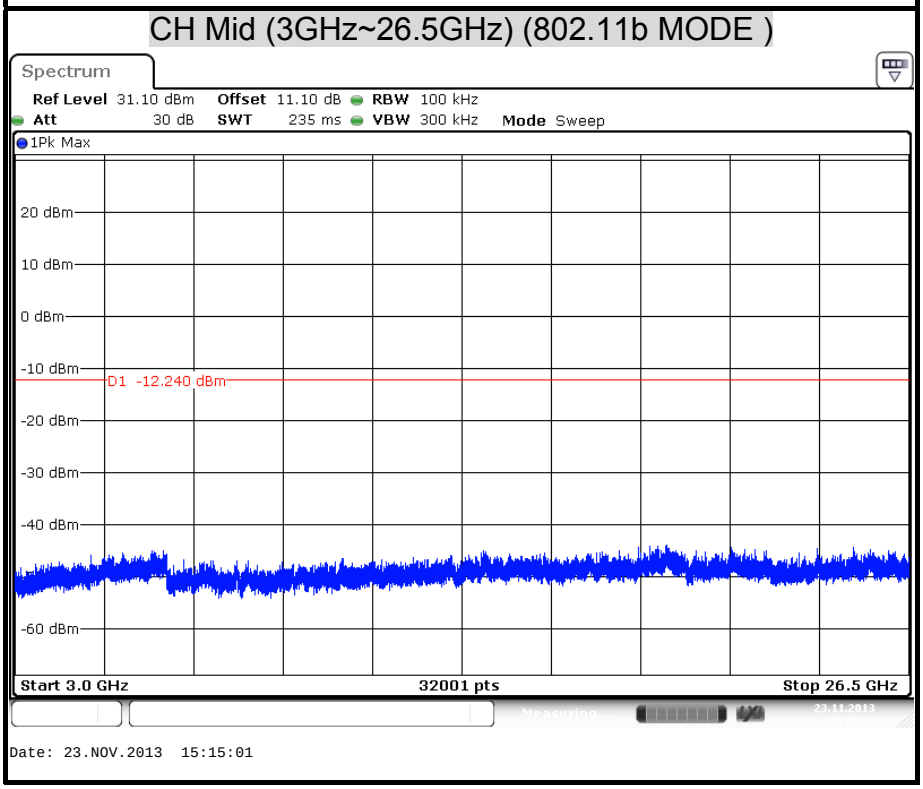
CH Low (3GHz~26.5GHz) (802.11b MODE)



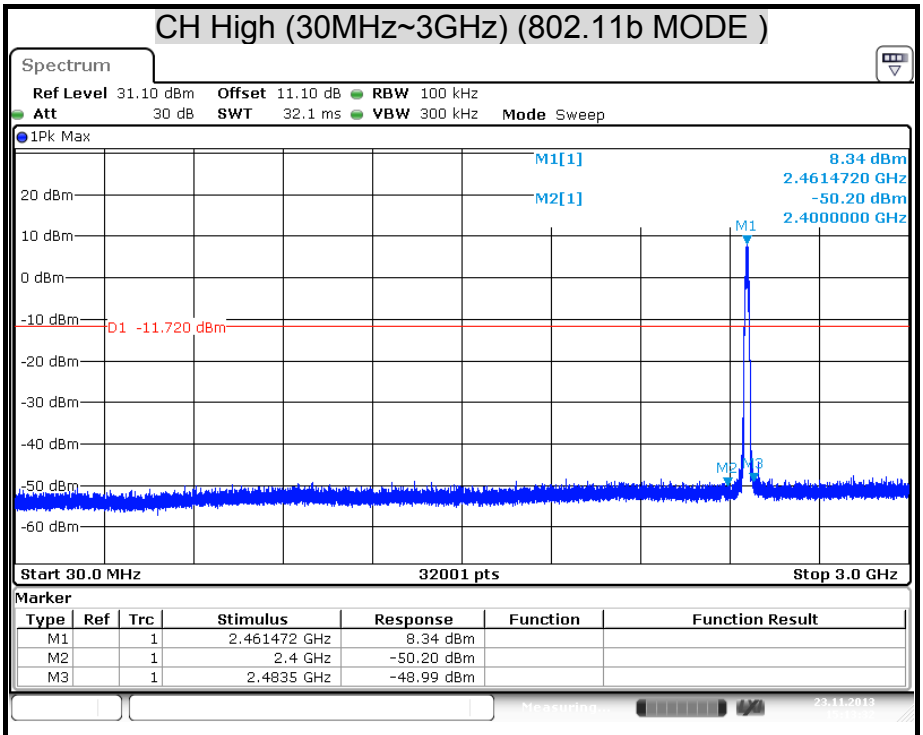
CH Mid (30MHz~3GHz) (802.11b MODE)



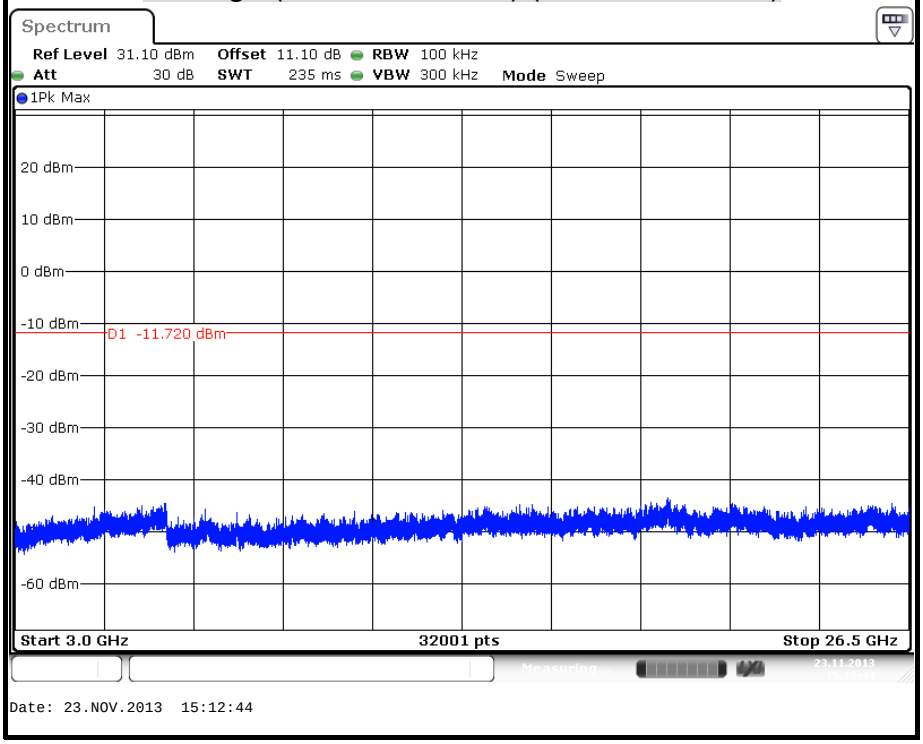
CH Mid (3GHz~26.5GHz) (802.11b MODE)



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



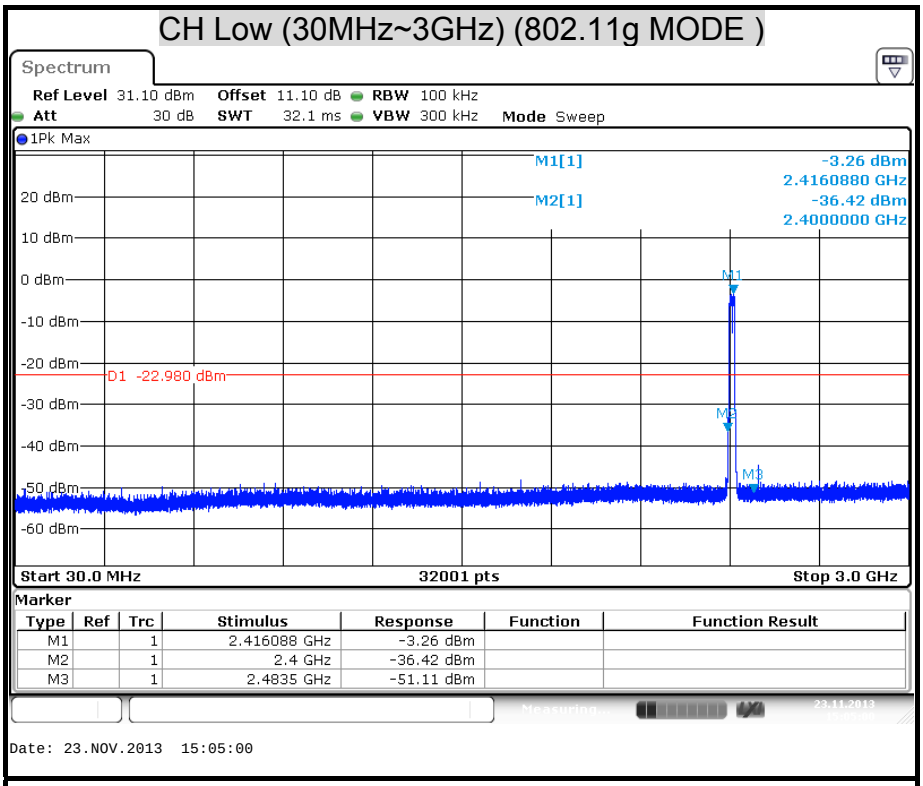
CH High (3GHz~26.5GHz) (802.11b MODE)



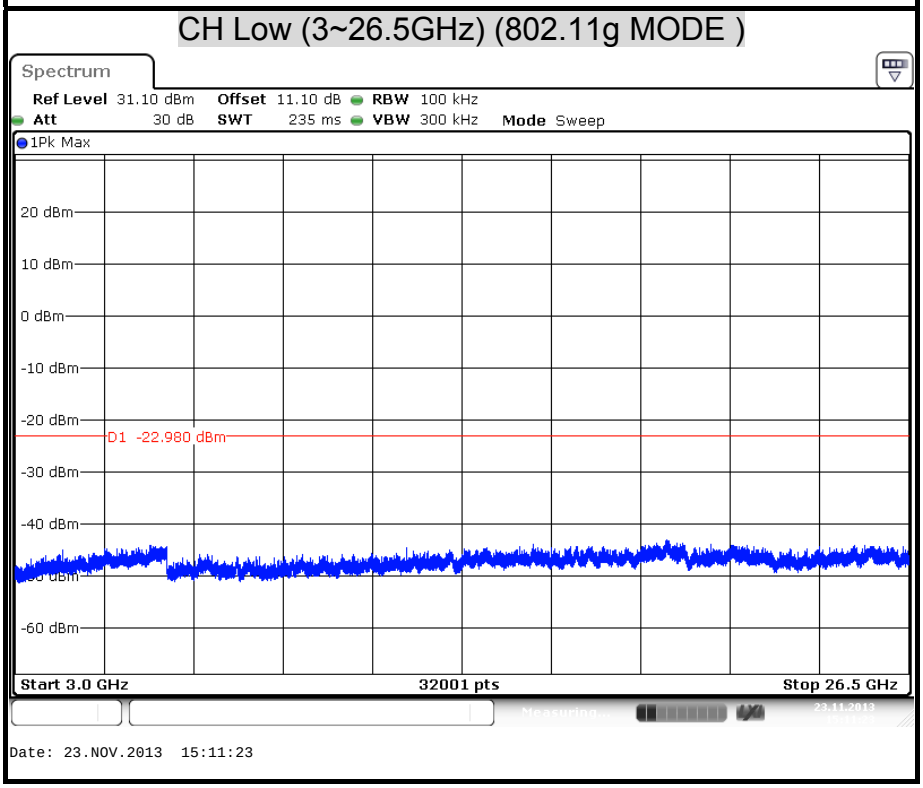
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(802.11g MODE)

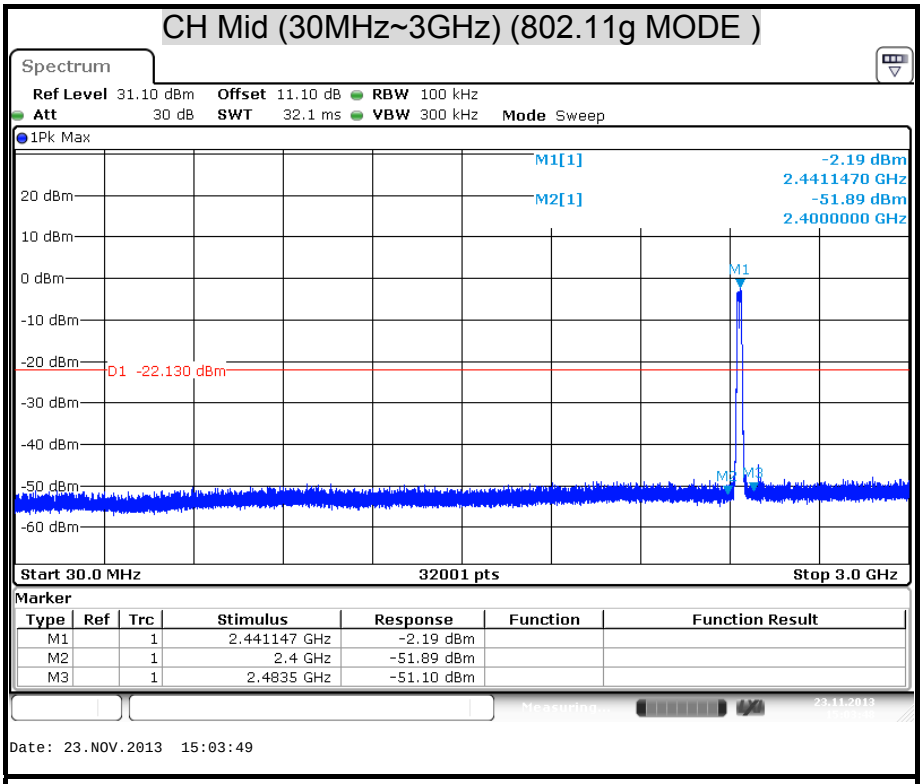
CH Low (30MHz~3GHz) (802.11g MODE)



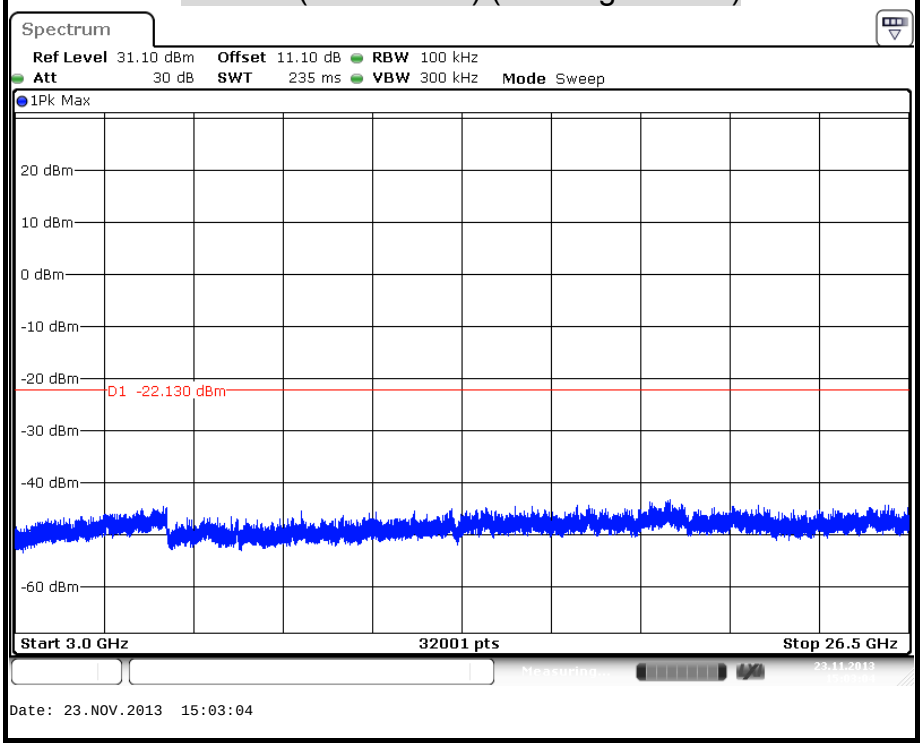
CH Low (3~26.5GHz) (802.11g MODE)



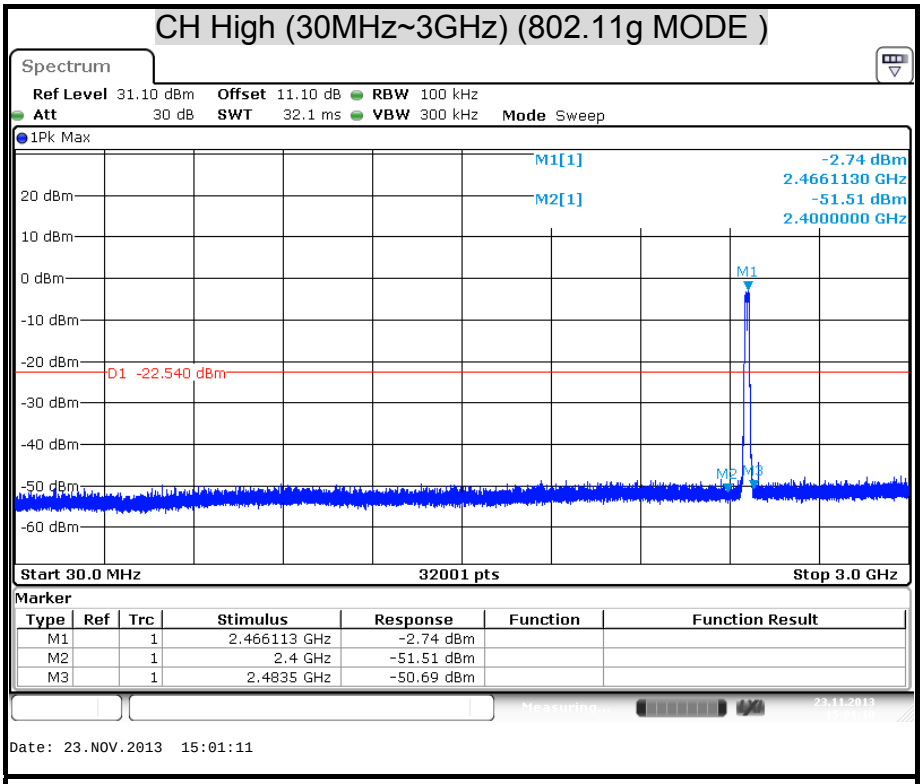
CH Mid (30MHz~3GHz) (802.11g MODE)



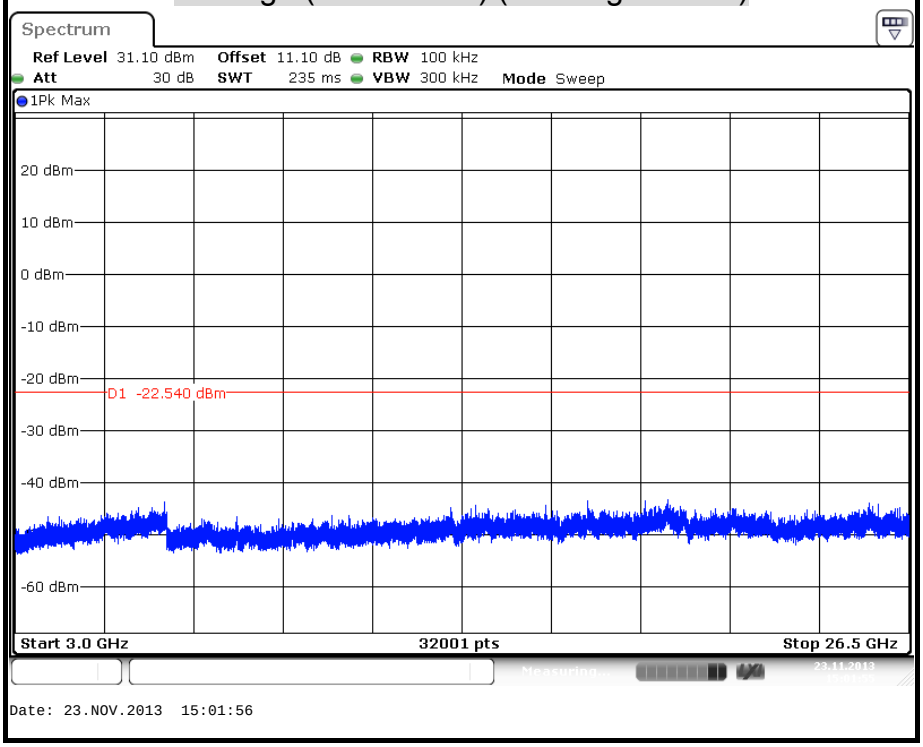
CH Mid (3~26.5GHz) (802.11g MODE)



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



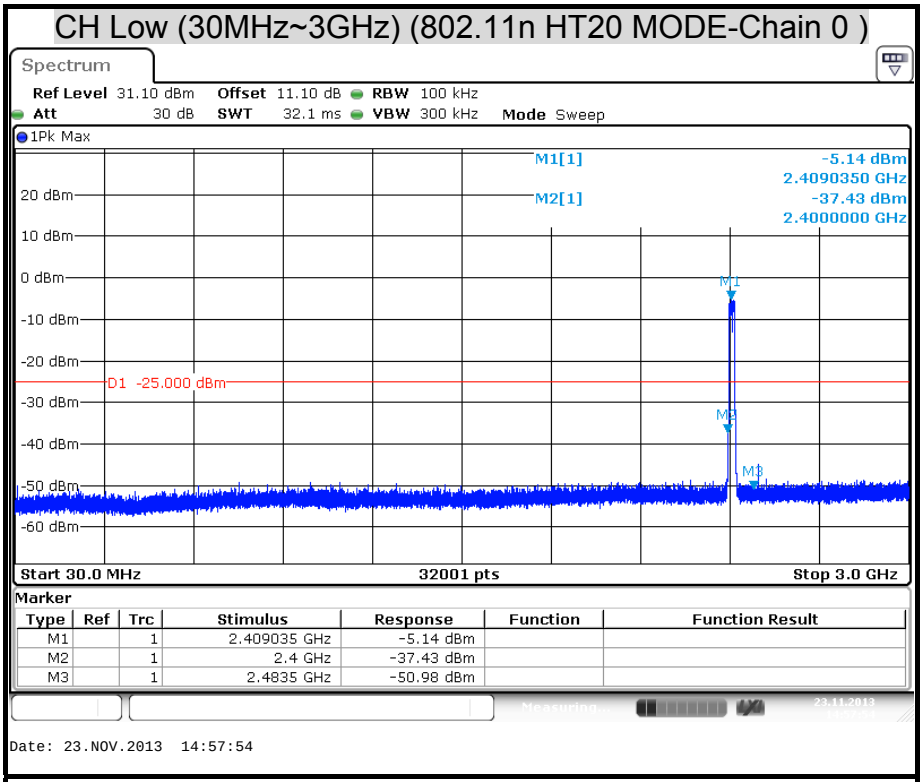
CH High (3~26.5GHz) (802.11g MODE)



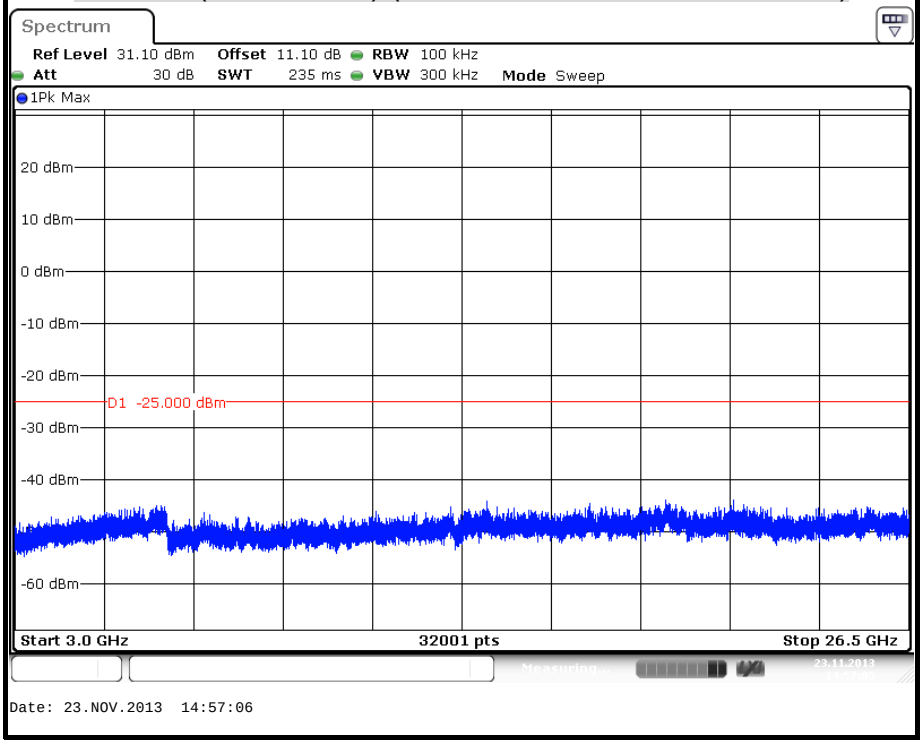
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(802.11n HT20 MODE)

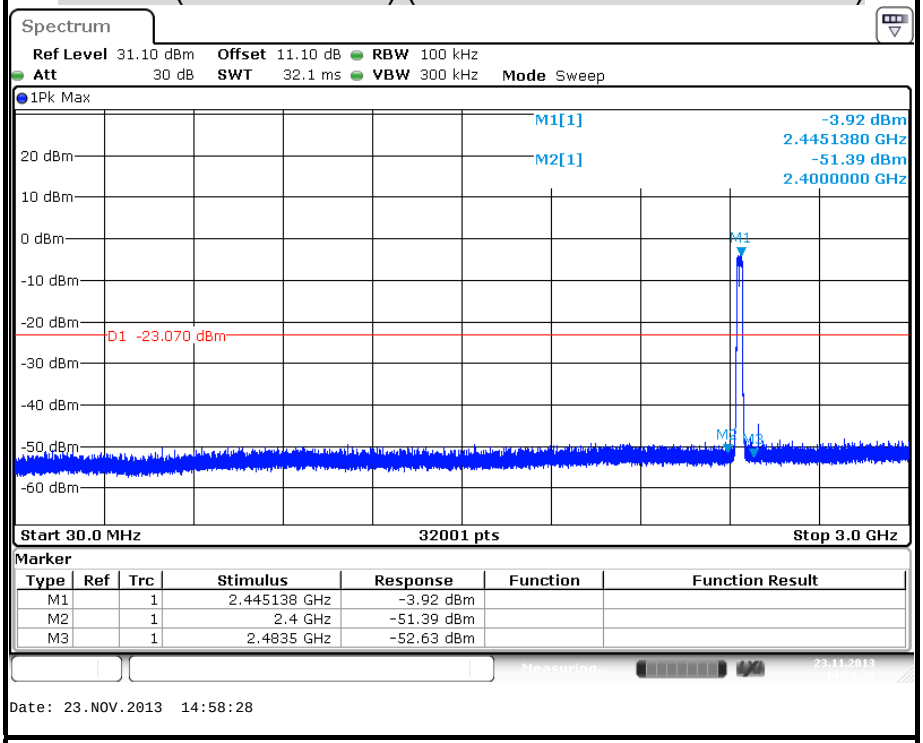
CH Low (30MHz~3GHz) (802.11n HT20 MODE-Chain 0)



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



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

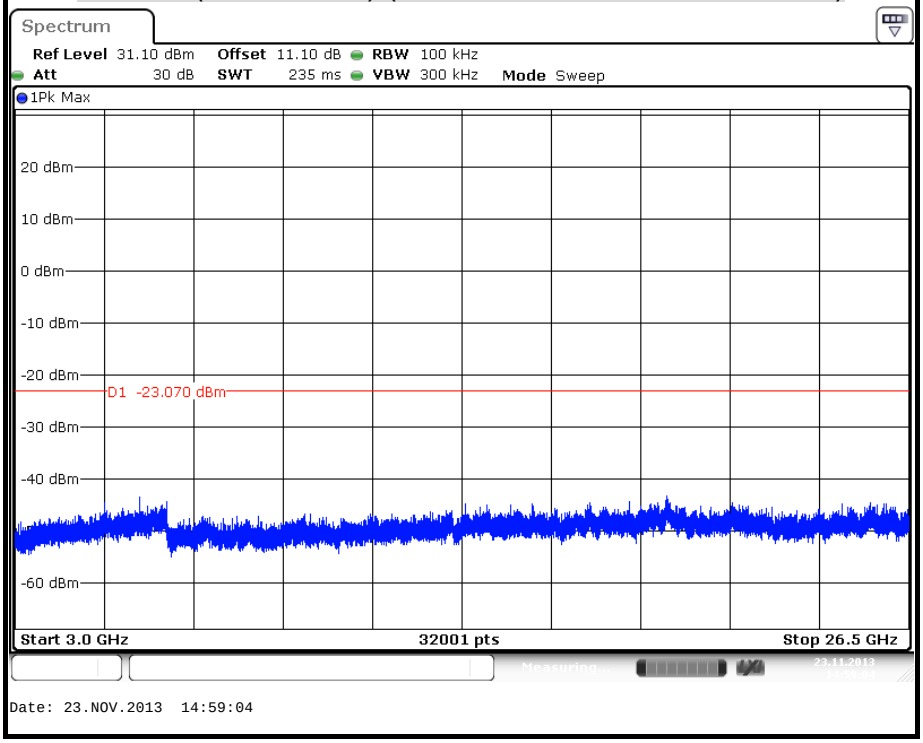


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	2.445138 GHz	-3.92 dBm		
M2		1	2.4 GHz	-51.39 dBm		
M3		1	2.4835 GHz	-52.63 dBm		

Date: 23.NOV.2013 14:58:28

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



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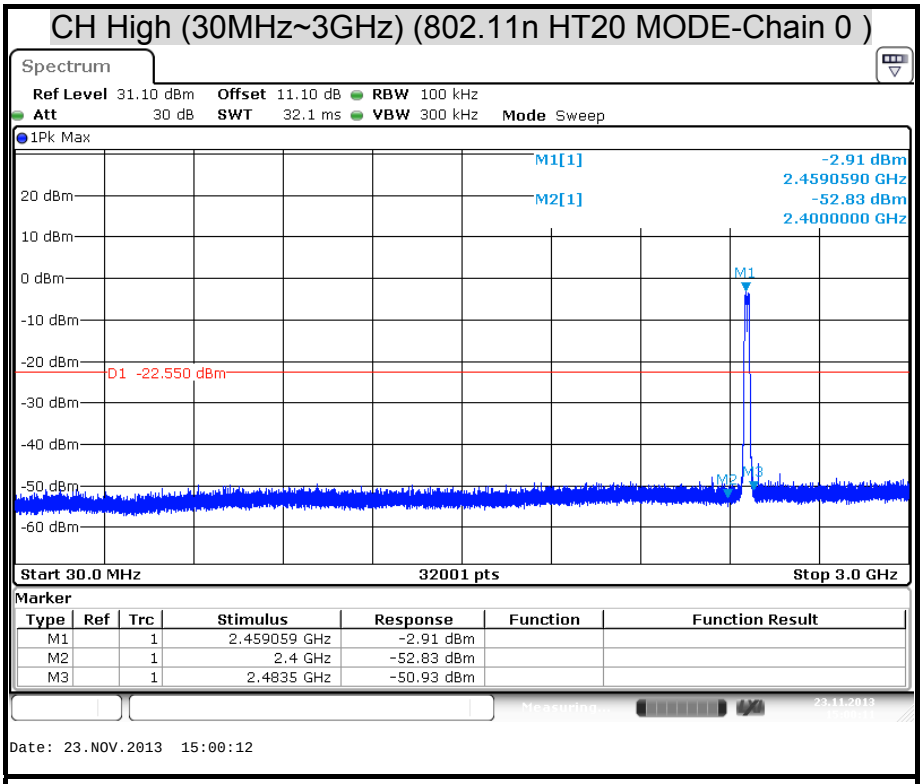
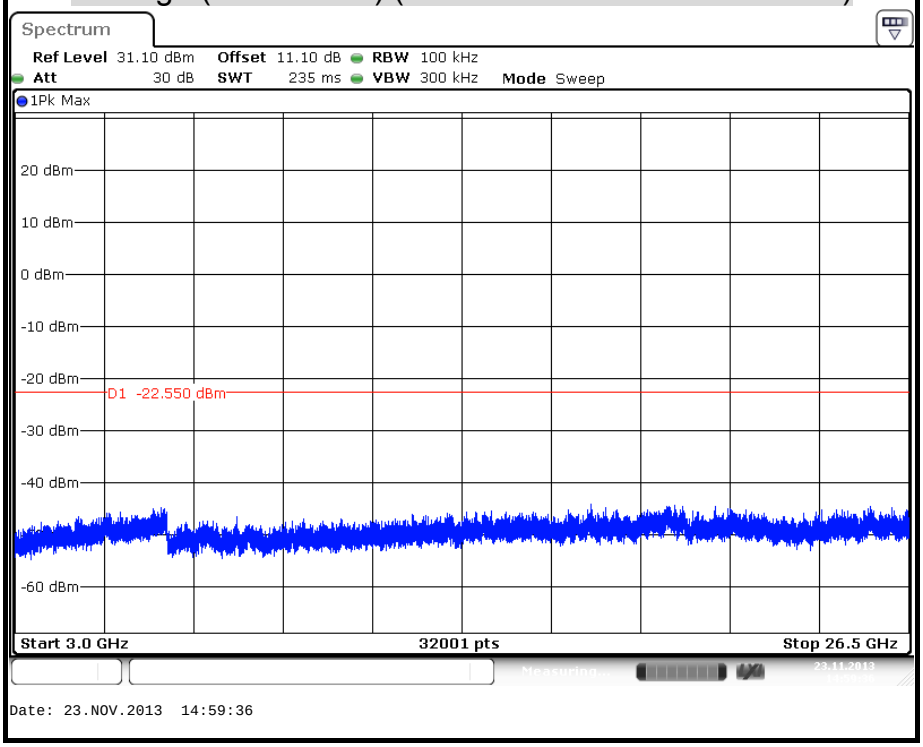
CH High (30MHz~3GHz) (802.11n HT20 MODE-Chain 0)



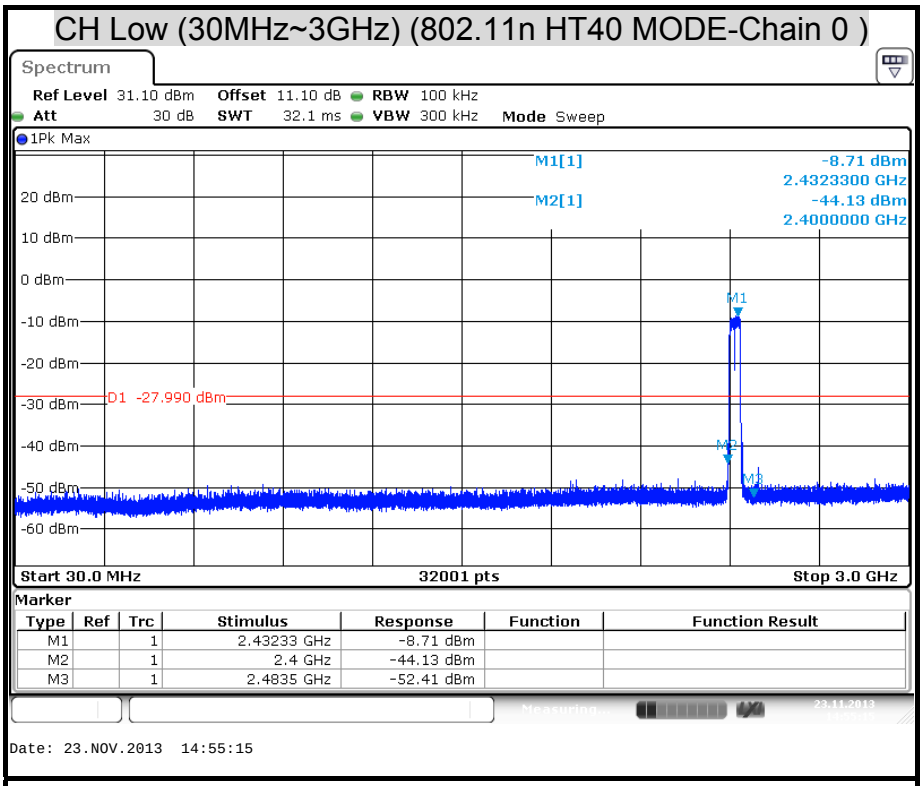
CH High (3~26.5GHz) (802.11n HT20 MODE-Chain 0)



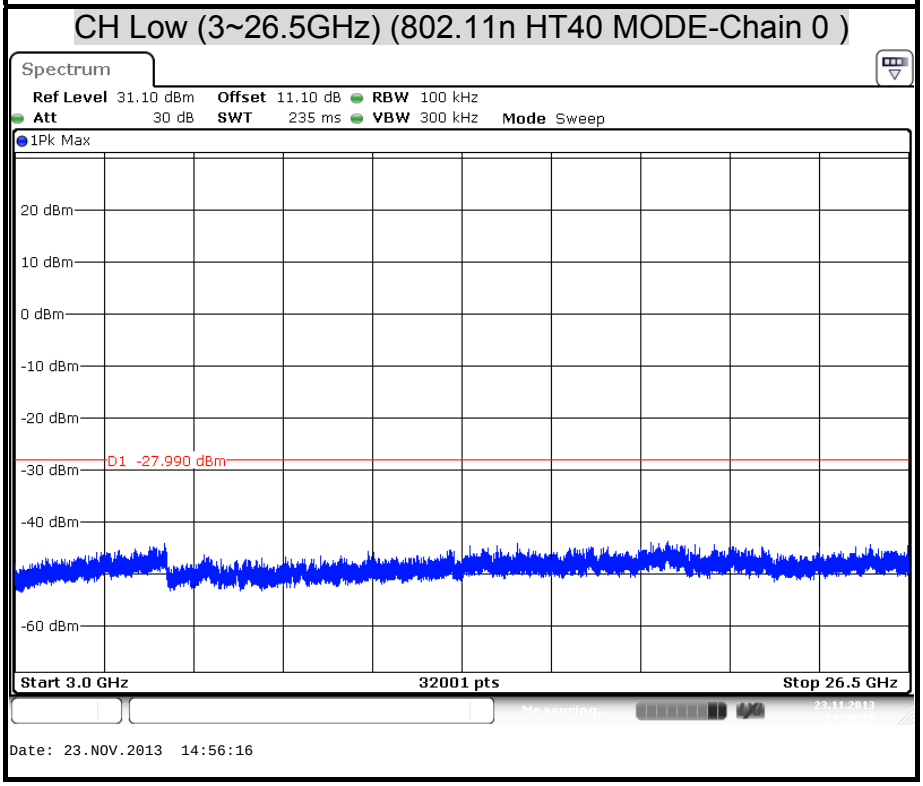
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(802.11n HT40 MODE)

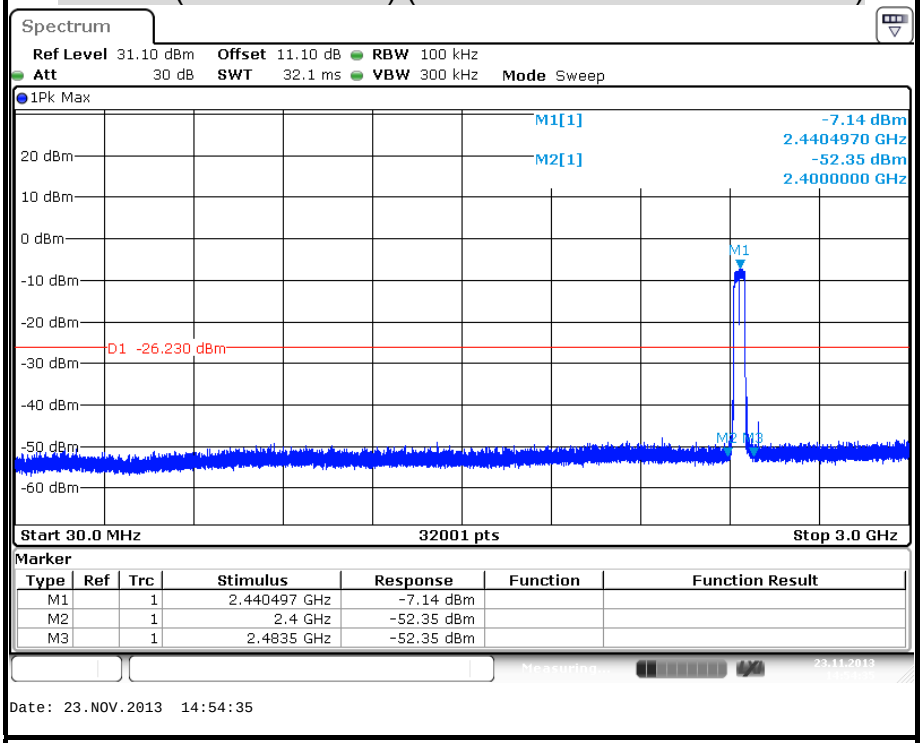
CH Low (30MHz~3GHz) (802.11n HT40 MODE-Chain 0)



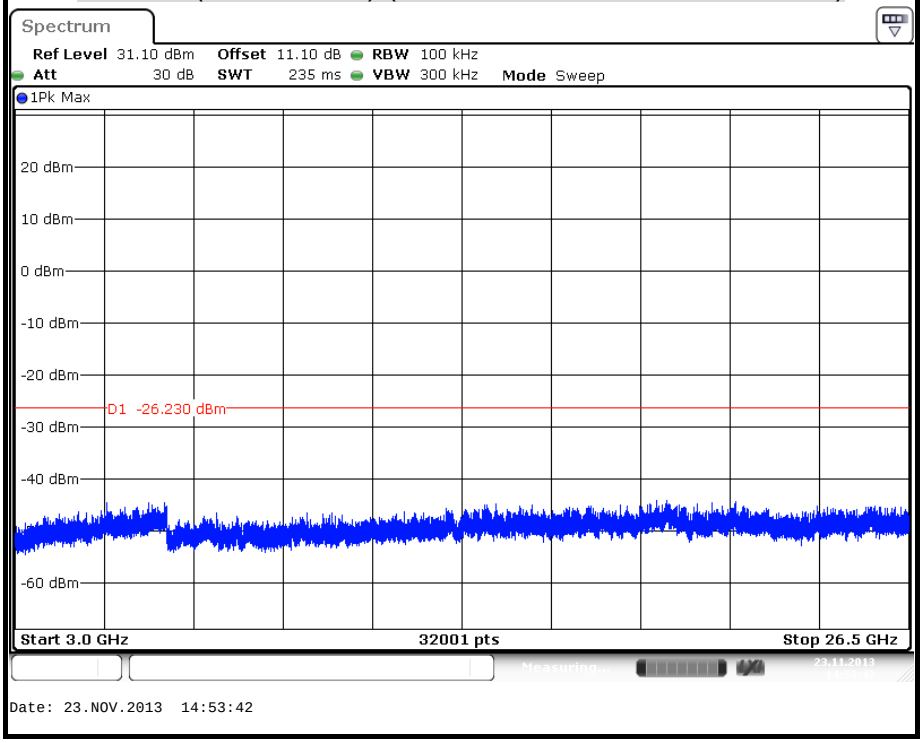
CH Low (3~26.5GHz) (802.11n HT40 MODE-Chain 0)



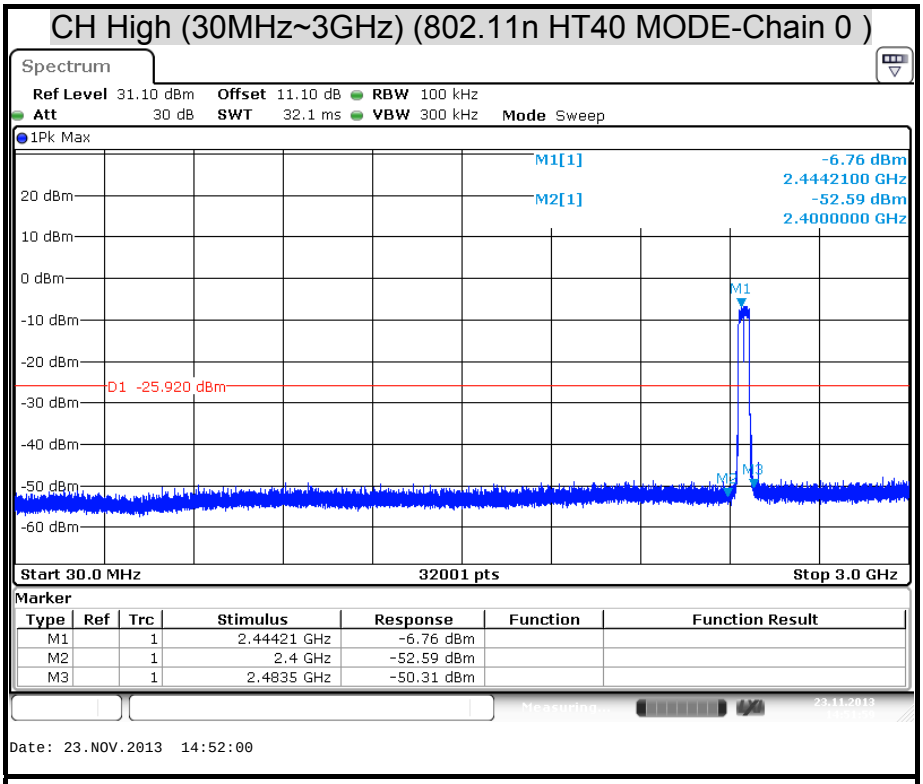
CH Mid (30MHz~3GHz) (802.11n HT40 MODE-Chain 0)



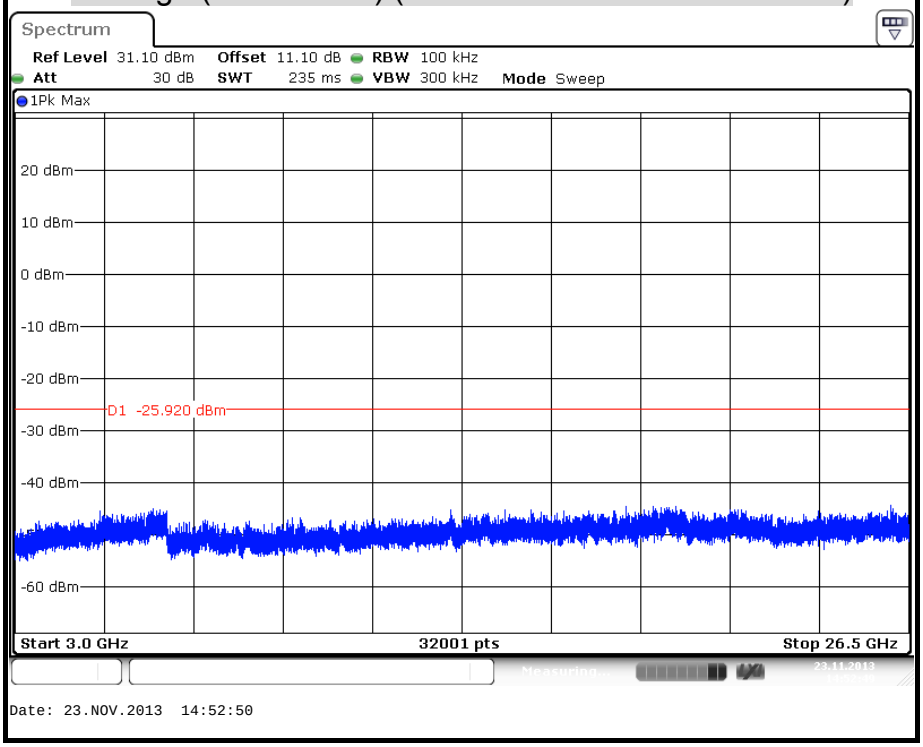
CH Mid (3~26.5GHz) (802.11n HT40 MODE-Chain 0)



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



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



8.6 RADIATED EMISSIONS

8.6.1 TRANSMITTER RADIATED SUPURIOUS EMSSIONS

LIMITS

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

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 -1710	10.6 -12.7
6.26775 - 6.26825	108 -121.94	1718.8 - 1722.2	13.25 -13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 – 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 -16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 -335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

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

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

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

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

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

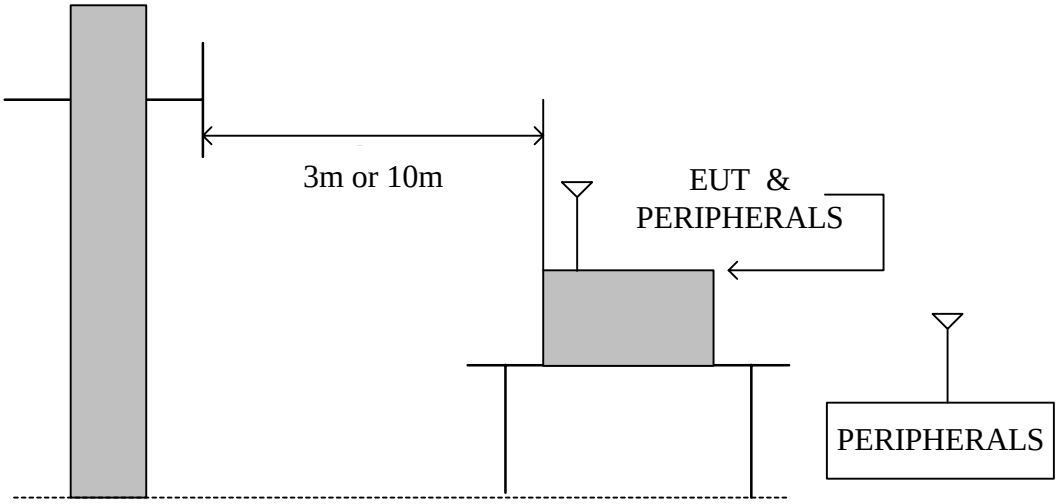
TEST EQUIPMENTS

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

Open Area Test Site # 6				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
TYPE N COAXIAL CABLE	SUHNER	CHA9513	6	DEC. 18, 2013
BI-LOG Antenna	Sunol	JB1	A070506-2	SEP. 09, 2014
LOOP ANTENNA	EMCO	6502	8905-2356	JUN. 10, 2014
Pre-Amplifier	HP	8447F	NCR	NCR
EMI Receiver	R&S	ESVS10	833206/012	JUN. 26, 2014
RF Cable	SUHNER	SUCOFLEX104PEA	20520/4PEA	NOV. 10, 2014
Horn Antenna	Com-Power	AH-118	071032	DEC. 05, 2014
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP. 28, 2014
Spectrum Analyzer	R&S	FSU	200789	APR. 25, 2014
Spectrum Analyzer	R&S	FSV	101073	APR. 25, 2014
Pre-Amplifier	MITEQ	AFS44-00108650-42-10P-44	1205908	DEC. 27, 2013
3116 Double Ridge Antenna (40G)	ETS-LINDGREN	EMCO-003	00078	DEC. 18, 2013
Turn Table	Yo Chen	001	----------	N.C.R.
Antenna Tower	AR	TP1000A	309874	N.C.R.
Controller	CT	SC101	----------	N.C.R.
RF Swicth	E-INSTRUMENT TELH LTD	ERS-180A	EC1204141	N.C.R
Power Meter	Anritsu	ML2487A	6K00003888	MAY 20, 2014
Power Sensor	Anritsu	MA2491A	33265	MAY 20, 2014
Temp./Humidity Chamber	K.SON	THS-M1	242	AUG. 08, 2014
Signal Generator	HP	8673C	2938A00663	SEP. 12, 2014
DC Power Source	LOKO	DSP-5050	L1507009282	N.C.R

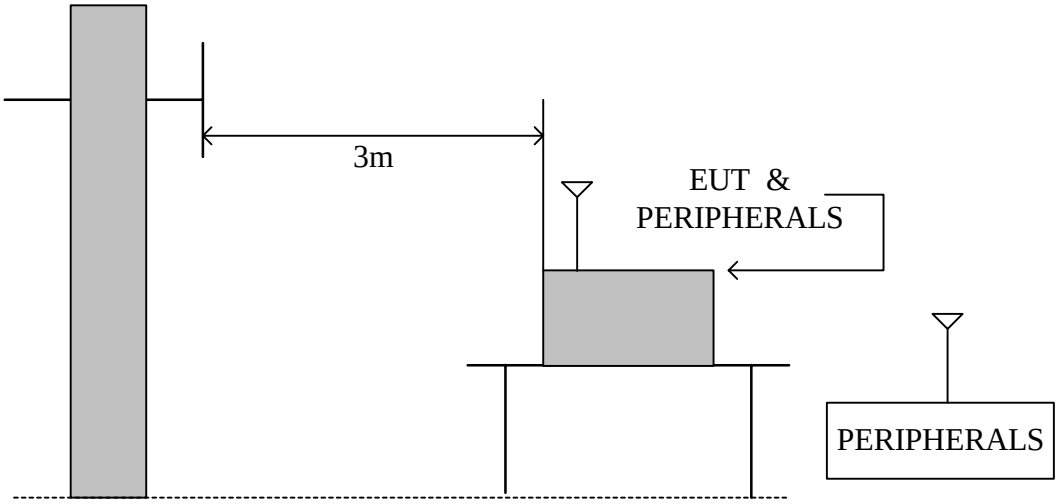
TEST SETUP

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



Antenna Elevation Variable

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



Antenna Elevation Variable

TEST PROCEDURE

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

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

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

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

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

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

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

NOTE：

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

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

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

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

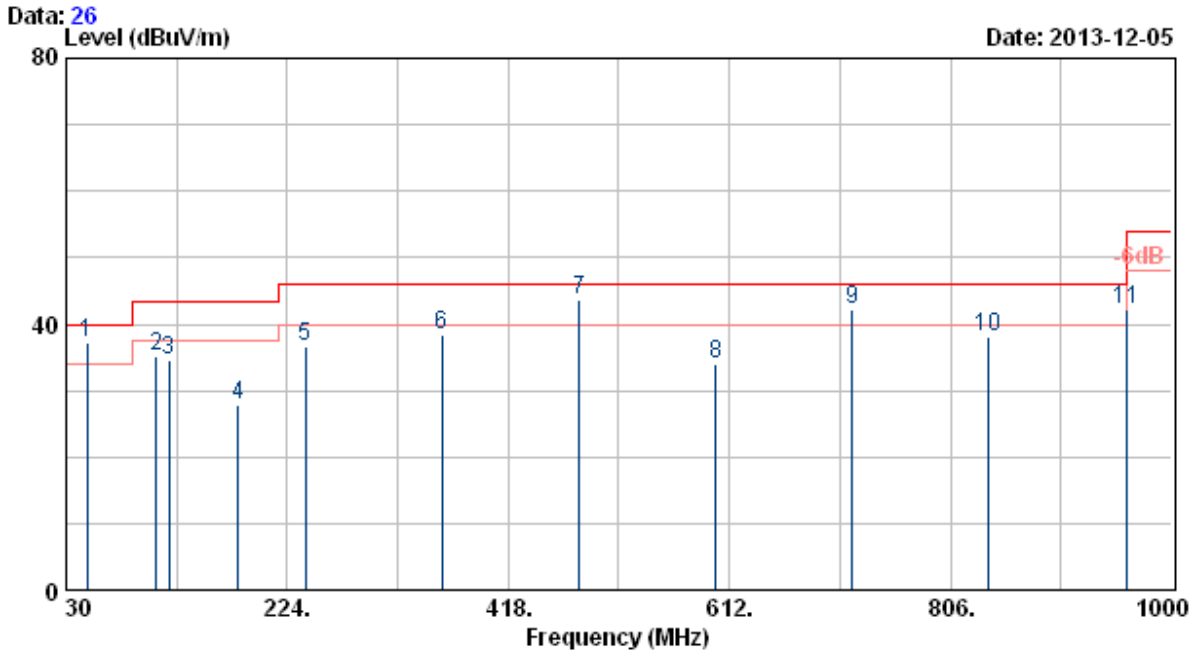
TEST RESULTS

No non-compliance noted.

8.6.2 WORST-CASE RADIATED EMISSION BELOW 1 GHz

Model No.	IPJC1n	Test Mode	Normal Operation
Environmental Conditions	25.9 ℃, 57 % RH	Resolution Bandwidth	120 kHz
Antenna Pole	Vertical	Antenna Distance	3m
Detector Function:	Quasi-peak.	Tested By	Vision Chang
Test Site	OATS 7		

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

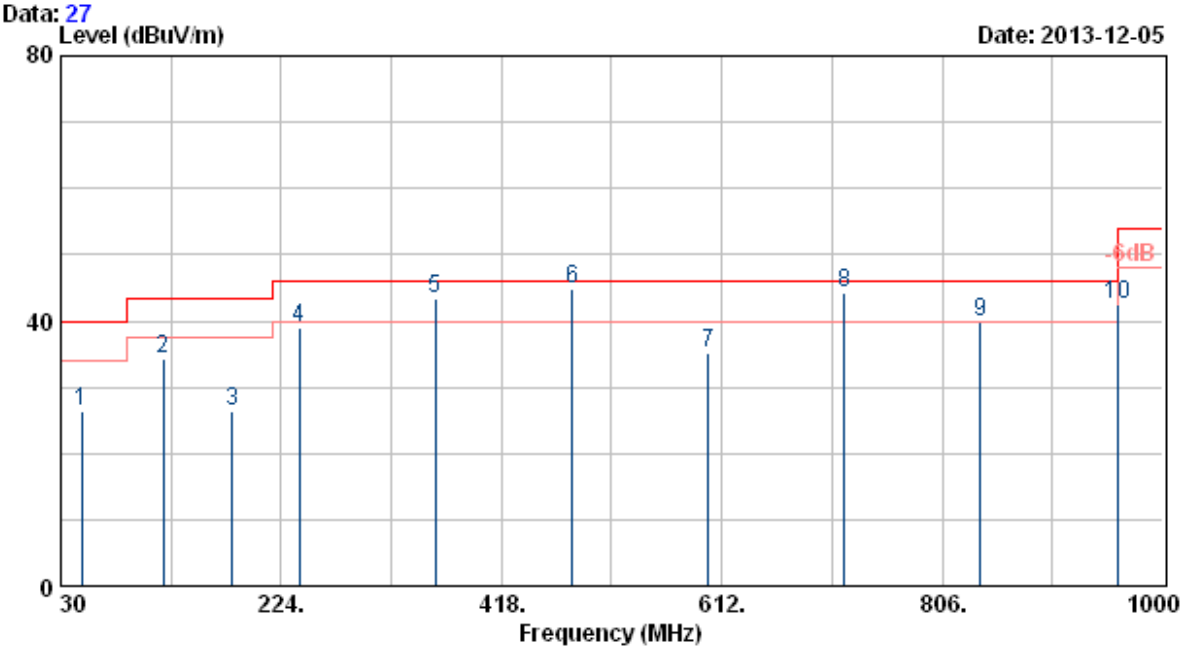


Freq. MHz	Reading Level dBuV	Antenna Factor dB/m	Cable Loss dB	Measure Level dBuV/m	Limit dBuV/m	Over Limit dBuV/m	Detector
48.00	26.24	9.09	2.03	37.36	40.00	-2.64	QP
109.00	20.01	11.96	3.08	35.05	43.50	-8.45	QP
120.00	17.22	14.05	3.27	34.54	43.50	-8.96	QP
181.32	12.36	11.50	4.04	27.91	43.50	-15.59	QP
240.00	19.47	12.22	4.80	36.49	46.00	-9.51	QP
360.00	16.86	15.32	6.24	38.42	46.00	-7.58	QP
480.00	18.40	17.79	7.39	43.58	46.00	-2.42	QP
600.00	6.21	19.33	8.51	34.05	46.00	-11.95	QP
720.00	12.05	20.85	9.29	42.20	46.00	-3.80	QP
840.00	6.09	22.11	10.01	38.22	46.00	-7.78	QP
960.00	7.94	23.06	11.15	42.15	46.00	-3.85	QP

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

Model No.	IPJC1n	Test Mode	Normal Operation
Environmental Conditions	25.9 ℃, 57 % RH	Resolution Bandwidth	120 kHz
Antenna Pole	Horizontal	Antenna Distance	3m
Detector Function	Quasi-peak.	Tested By	Vision Chang
Test Site	OATS 7		

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



Freq. MHz	Reading Level dBuV	Antenna Factor dB/m	Cable Loss dB	Measure Level dBuV/m	Limit dBuV/m	Over Limit dBuV/m	Detector
48.00	15.31	9.09	2.03	26.42	40.00	-13.58	QP
120.00	16.97	14.05	3.27	34.29	43.50	-9.21	QP
181.40	10.92	11.50	4.04	26.46	43.50	-17.04	QP
240.00	21.82	12.22	4.80	38.84	46.00	-7.16	QP
360.00	21.71	15.32	6.24	43.26	46.00	-2.74	QP
480.00	19.54	17.79	7.39	44.72	46.00	-1.28	QP
600.00	7.43	19.33	8.51	35.27	46.00	-10.73	QP
720.00	13.99	20.85	9.29	44.14	46.00	-1.86	QP
840.00	7.67	22.11	10.01	39.79	46.00	-6.21	QP
960.00	8.27	23.06	11.15	42.48	46.00	-3.52	QP

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

8.6.3 TRANSMITTER RADIATED EMISSION ABOVE 1 GHz

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Routerr	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11b TX (CH Low)	TEMP& Humidity	25.4℃, 51%

	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)
*	1440.01	66.19	26.47	2.20	44.71	0.30	50.44	74.00	-23.56	P
*	1440.01	58.07	26.47	2.20	44.71	0.30	42.32	54.00	-11.68	A
	1980.02	64.71	30.25	2.64	44.84	0.30	53.06	74.00	-20.94	P
	1980.02	57.78	30.25	2.64	44.84	0.30	46.13	54.00	-7.87	A
*	4823.98	63.44	33.47	3.84	45.07	0.40	56.07	74.00	-17.93	P
*	4823.98	57.61	33.47	3.84	45.07	0.40	50.24	54.00	-3.76	A

	TX / IEEE 802.11b mode / CH Low				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1080.01	66.87	25.10	1.81	45.03	0.30	49.05	74.00	-24.95	P
*	1080.01	55.90	25.10	1.81	45.03	0.30	38.08	54.00	-15.92	A
*	1440.00	66.85	26.47	2.20	44.71	0.30	51.10	74.00	-22.90	P
*	1440.00	60.04	26.47	2.20	44.71	0.30	44.29	54.00	-9.71	A
*	4823.91	63.12	33.47	3.84	45.07	0.40	55.75	74.00	-18.25	P
*	4823.91	58.55	33.47	3.84	45.07	0.40	51.18	54.00	-2.82	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11b TX (CH Middle)	TEMP& Humidity	25.4℃, 51%

	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)
*	1440.01	66.83	26.47	2.20	44.71	0.30	51.08	74.00	-22.92	P
*	1440.01	58.20	26.47	2.20	44.71	0.30	42.45	54.00	-11.55	A
	1980.01	64.29	30.25	2.64	44.84	0.30	52.64	74.00	-21.36	P
	1980.01	57.46	30.25	2.64	44.84	0.30	45.81	54.00	-8.19	A
*	4873.91	64.25	33.65	3.85	45.13	0.40	57.02	74.00	-16.98	P
*	4873.91	58.77	33.65	3.85	45.13	0.40	51.54	54.00	-2.46	A

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	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)
*	1080.00	66.14	25.10	1.81	45.03	0.30	48.32	74.00	-25.68	P
*	1080.00	55.72	25.10	1.81	45.03	0.30	37.90	54.00	-16.10	A
*	1440.02	66.28	26.47	2.20	44.71	0.30	50.53	74.00	-23.47	P
*	1440.02	59.87	26.47	2.20	44.71	0.30	44.12	54.00	-9.88	A
*	4873.86	65.14	33.65	3.85	45.13	0.40	57.91	74.00	-16.09	P
*	4873.86	59.84	33.65	3.85	45.13	0.40	52.61	54.00	-1.39	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11b TX (CH High)	TEMP& Humidity	25.4℃, 51%

	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)
*	1440.00	65.97	26.47	2.20	44.71	0.30	50.22	74.00	-23.78	P
*	1440.00	57.84	26.47	2.20	44.71	0.30	42.09	54.00	-11.91	A
	1980.02	64.24	30.25	2.64	44.84	0.30	52.59	74.00	-21.41	P
	1980.02	57.50	30.25	2.64	44.84	0.30	45.85	54.00	-8.15	A
*	4923.88	64.94	33.83	3.86	45.18	0.40	57.85	74.00	-16.15	P
*	4923.88	59.11	33.83	3.86	45.18	0.40	52.02	54.00	-1.98	A

	TX / IEEE 802.11b mode / CH High				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1080.02	65.19	25.10	1.81	45.03	0.30	47.37	74.00	-26.63	P
*	1080.02	55.20	25.10	1.81	45.03	0.30	37.38	54.00	-16.62	A
*	1440.02	66.82	26.47	2.20	44.71	0.30	51.07	74.00	-22.93	P
*	1440.02	59.94	26.47	2.20	44.71	0.30	44.19	54.00	-9.81	A
*	4923.92	64.35	33.83	3.86	45.18	0.40	57.26	74.00	-16.74	P
*	4923.92	59.85	33.83	3.86	45.18	0.40	52.76	54.00	-1.24	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11g TX (CH Low)	TEMP& Humidity	25.4℃, 51%

	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)
*	1440.01	65.82	26.47	2.20	44.71	0.30	50.07	74.00	-23.93	P
*	1440.01	57.90	26.47	2.20	44.71	0.30	42.15	54.00	-11.85	A
	1980.03	65.18	30.25	2.64	44.84	0.30	53.53	74.00	-20.47	P
	1980.03	58.02	30.25	2.64	44.84	0.30	46.37	54.00	-7.63	A
*	4823.95	60.91	33.47	3.84	45.07	0.40	53.54	74.00	-20.46	P
*	4823.95	50.52	33.47	3.84	45.07	0.40	43.15	54.00	-10.85	A

	TX / IEEE 802.11g mode / CH Low				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1080.00	66.52	25.10	1.81	45.03	0.30	48.70	74.00	-25.30	P
*	1080.00	55.79	25.10	1.81	45.03	0.30	37.97	54.00	-16.03	A
*	1440.02	66.82	26.47	2.20	44.71	0.30	51.07	74.00	-22.93	P
*	1440.02	59.63	26.47	2.20	44.71	0.30	43.88	54.00	-10.12	A
*	4823.99	61.54	33.47	3.84	45.07	0.40	54.17	74.00	-19.83	P
*	4823.99	54.28	33.47	3.84	45.07	0.40	46.91	54.00	-7.09	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11g TX (CH Middle)	TEMP& Humidity	25.4℃, 51%

	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)
*	1440.00	64.82	26.47	2.20	44.71	0.30	49.07	74.00	-24.93	P
*	1440.00	57.54	26.47	2.20	44.71	0.30	41.79	54.00	-12.21	A
	1980.03	65.81	30.25	2.64	44.84	0.30	54.16	74.00	-19.84	P
	1980.03	58.33	30.25	2.64	44.84	0.30	46.68	54.00	-7.32	A
*	4872.81	59.74	33.64	3.85	45.13	0.40	52.51	74.00	-21.49	P
*	4872.81	50.35	33.64	3.85	45.13	0.40	43.12	54.00	-10.88	A

	TX / IEEE 802.11g mode / CH Middle				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1079.99	66.72	25.10	1.81	45.03	0.30	48.90	74.00	-25.10	P
*	1079.99	55.80	25.10	1.81	45.03	0.30	37.98	54.00	-16.02	A
*	1440.00	66.18	26.47	2.20	44.71	0.30	50.43	74.00	-23.57	P
*	1440.00	59.09	26.47	2.20	44.71	0.30	43.34	54.00	-10.66	A
*	4876.63	62.73	33.66	3.85	45.13	0.40	55.51	74.00	-18.49	P
*	4876.63	51.98	33.66	3.85	45.13	0.40	44.76	54.00	-9.24	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11g TX (CH High)	TEMP& Humidity	25.4℃, 51%

	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)
*	1440.00	64.82	26.47	2.20	44.71	0.30	49.07	74.00	-24.93	P
*	1440.00	57.20	26.47	2.20	44.71	0.30	41.45	54.00	-12.55	A
	1980.02	65.59	30.25	2.64	44.84	0.30	53.94	74.00	-20.06	P
	1980.02	58.43	30.25	2.64	44.84	0.30	46.78	54.00	-7.22	A
*	4924.27	59.71	33.83	3.86	45.18	0.40	52.62	74.00	-21.38	P
*	4924.27	50.73	33.83	3.86	45.18	0.40	43.64	54.00	-10.36	A

	TX / IEEE 802.11g mode / CH High				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1080.00	66.19	25.10	1.81	45.03	0.30	48.37	74.00	-25.63	P
*	1080.00	55.12	25.10	1.81	45.03	0.30	37.30	54.00	-16.70	A
*	1440.02	65.82	26.47	2.20	44.71	0.30	50.07	74.00	-23.93	P
*	1440.02	58.65	26.47	2.20	44.71	0.30	42.90	54.00	-11.10	A
*	4924.04	61.62	33.83	3.86	45.18	0.40	54.53	74.00	-19.47	P
*	4924.04	53.44	33.83	3.86	45.18	0.40	46.35	54.00	-7.65	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11n HT20 TX (CH Low)	TEMP& Humidity	25.4℃, 51%

	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)
*	1440.03	66.27	26.47	2.20	44.71	0.30	50.52	74.00	-23.48	P
*	1440.03	58.46	26.47	2.20	44.71	0.30	42.71	54.00	-11.29	A
	1980.03	64.76	30.25	2.64	44.84	0.30	53.11	74.00	-20.89	P
	1980.03	57.59	30.25	2.64	44.84	0.30	45.94	54.00	-8.06	A
*	4823.95	58.62	33.47	3.84	45.07	0.40	51.25	74.00	-22.75	P
*	4823.95	50.14	33.47	3.84	45.07	0.40	42.77	54.00	-11.23	A

	TX / IEEE 802.11n HT20 mode / CH Low				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1080.03	66.72	25.10	1.81	45.03	0.30	48.90	74.00	-25.10	P
*	1080.03	55.75	25.10	1.81	45.03	0.30	37.93	54.00	-16.07	A
*	1439.98	65.42	26.47	2.20	44.71	0.30	49.67	74.00	-24.33	P
*	1439.98	58.99	26.47	2.20	44.71	0.30	43.24	54.00	-10.76	A
*	4822.89	61.35	33.46	3.84	45.07	0.40	53.98	74.00	-20.02	P
*	4822.89	53.74	33.46	3.84	45.07	0.40	46.37	54.00	-7.63	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11n HT20 TX (CH Middle)	TEMP& Humidity	25.4℃, 51%

	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)
*	1440.00	65.82	26.47	2.20	44.71	0.30	50.07	74.00	-23.93	P
*	1440.00	57.99	26.47	2.20	44.71	0.30	42.24	54.00	-11.76	A
	1980.00	65.01	30.25	2.64	44.84	0.30	53.36	74.00	-20.64	P
	1980.00	59.80	30.25	2.64	44.84	0.30	48.15	54.00	-5.85	A
*	4875.62	59.41	33.65	3.85	45.13	0.40	52.18	74.00	-21.82	P
*	4875.62	51.22	33.65	3.85	45.13	0.40	43.99	54.00	-10.01	A

	TX / IEEE 802.11n HT20 mode / CH Middle				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1080.00	65.92	25.10	1.81	45.03	0.30	48.10	74.00	-25.90	P
*	1080.00	55.17	25.10	1.81	45.03	0.30	37.35	54.00	-16.65	A
*	1440.03	65.08	26.47	2.20	44.71	0.30	49.33	74.00	-24.67	P
*	1440.03	58.47	26.47	2.20	44.71	0.30	42.72	54.00	-11.28	A
*	4875.44	62.18	33.65	3.85	45.13	0.40	54.95	74.00	-19.05	P
*	4875.44	52.99	33.65	3.85	45.13	0.40	45.76	54.00	-8.24	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11n HT20 TX (CH High)	TEMP& Humidity	25.4℃, 51%

	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)
*	1440.01	66.82	26.47	2.20	44.71	0.30	51.07	74.00	-22.93	P
*	1440.01	58.50	26.47	2.20	44.71	0.30	42.75	54.00	-11.25	A
	1980.00	64.72	30.25	2.64	44.84	0.30	53.07	74.00	-20.93	P
	1980.00	57.31	30.25	2.64	44.84	0.30	45.66	54.00	-8.34	A
*	4924.97	58.77	33.83	3.86	45.18	0.40	51.68	74.00	-22.32	P
*	4924.97	51.06	33.83	3.86	45.18	0.40	43.97	54.00	-10.03	A

	TX / IEEE 802.11n HT20 mode / CH High				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1080.01	66.82	25.10	1.81	45.03	0.30	49.00	74.00	-25.00	P
*	1080.01	55.91	25.10	1.81	45.03	0.30	38.09	54.00	-15.91	A
*	1440.00	65.92	26.47	2.20	44.71	0.30	50.17	74.00	-23.83	P
*	1440.00	59.40	26.47	2.20	44.71	0.30	43.65	54.00	-10.35	A
*	4923.84	61.11	33.83	3.86	45.18	0.40	54.02	74.00	-19.98	P
*	4923.84	53.44	33.83	3.86	45.18	0.40	46.35	54.00	-7.65	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11n HT40 TX (CH Low)	TEMP& Humidity	25.4℃, 51%

	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)
*	1439.99	65.72	26.47	2.20	44.71	0.30	49.97	74.00	-24.03	P
*	1439.99	57.59	26.47	2.20	44.71	0.30	41.84	54.00	-12.16	A
	1980.01	64.28	30.25	2.64	44.84	0.30	52.63	74.00	-21.37	P
	1980.01	57.04	30.25	2.64	44.84	0.30	45.39	54.00	-8.61	A
*	4843.79	60.46	33.54	3.84	45.09	0.40	53.15	74.00	-20.85	P
*	4843.79	50.42	33.54	3.84	45.09	0.40	43.11	54.00	-10.89	A

	TX / IEEE 802.11n HT40 mode / CH Low				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1079.97	66.80	25.10	1.81	45.03	0.30	48.98	74.00	-25.02	P
*	1079.97	55.24	25.10	1.81	45.03	0.30	37.42	54.00	-16.58	A
*	1439.99	65.76	26.47	2.20	44.71	0.30	50.01	74.00	-23.99	P
*	1439.99	59.13	26.47	2.20	44.71	0.30	43.38	54.00	-10.62	A
*	4844.00	61.80	33.54	3.84	45.09	0.40	54.49	74.00	-19.51	P
*	4844.00	53.90	33.54	3.84	45.09	0.40	46.59	54.00	-7.41	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11n HT40 TX (CH Middle)	TEMP& Humidity	25.4℃, 51%

	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)
*	1440.00	64.25	26.47	2.20	44.71	0.30	48.50	74.00	-25.50	P
*	1440.00	56.92	26.47	2.20	44.71	0.30	41.17	54.00	-12.83	A
	1980.01	65.29	30.25	2.64	44.84	0.30	53.64	74.00	-20.36	P
	1980.01	57.88	30.25	2.64	44.84	0.30	46.23	54.00	-7.77	A
*	4872.41	58.41	33.64	3.85	45.12	0.40	51.18	74.00	-22.82	P
*	4872.41	50.87	33.64	3.85	45.12	0.40	43.64	54.00	-10.36	A

	TX / IEEE 802.11n HT40 mode / CH Middle				Measurement Distance at 3m				Vertical polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1080.01	66.74	25.10	1.81	45.03	0.30	48.92	74.00	-25.08	P
*	1080.01	55.15	25.10	1.81	45.03	0.30	37.33	54.00	-16.67	A
*	1440.00	65.08	26.47	2.20	44.71	0.30	49.33	74.00	-24.67	P
*	1440.00	59.14	26.47	2.20	44.71	0.30	43.39	54.00	-10.61	A
*	4878.41	61.48	33.66	3.85	45.13	0.40	54.26	74.00	-19.74	P
*	4878.41	52.79	33.66	3.85	45.13	0.40	45.57	54.00	-8.43	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

Product Name	Smart Cloud HD Surveillance Camera with Audio Wireless Router	Test Date	2013/11/23
Model	IPJC1n	Test By	John Chen
Test Mode	IEEE 802.11n HT40 TX (CH High)	TEMP& Humidity	25.4℃, 51%

	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)
*	1439.98	65.01	26.47	2.20	44.71	0.30	49.26	74.00	-24.74	P
*	1439.98	57.35	26.47	2.20	44.71	0.30	41.60	54.00	-12.40	A
	1980.01	65.57	30.25	2.64	44.84	0.30	53.92	74.00	-20.08	P
	1980.01	58.22	30.25	2.64	44.84	0.30	46.57	54.00	-7.43	A
*	4902.71	59.71	33.75	3.86	45.16	0.40	52.56	74.00	-21.44	P
*	4902.71	50.14	33.75	3.86	45.16	0.40	42.99	54.00	-11.01	A

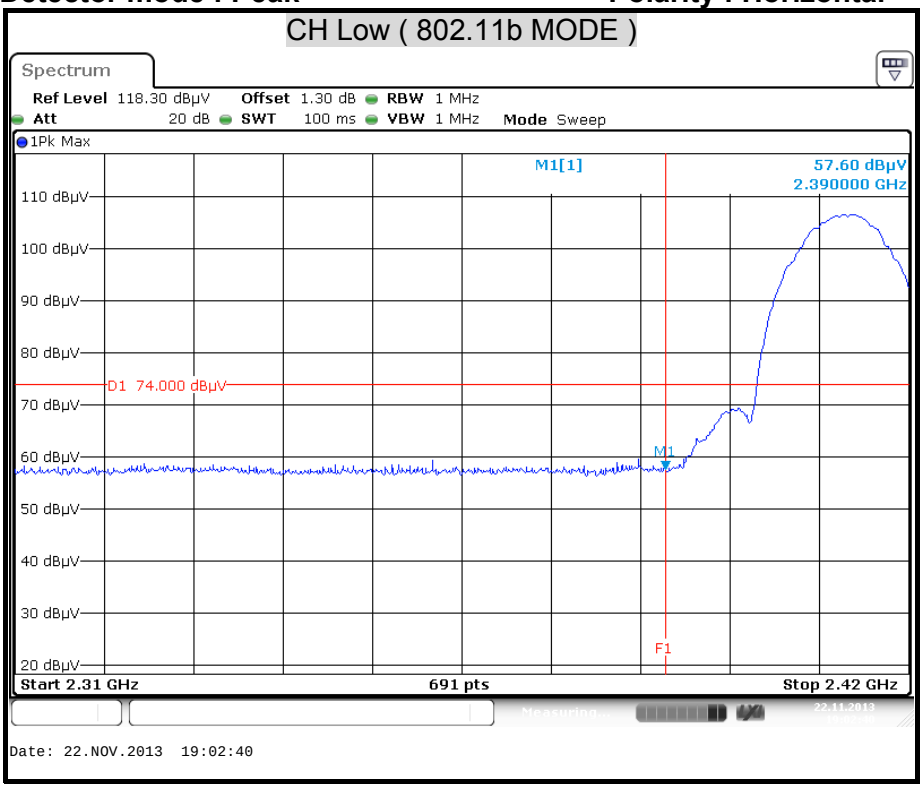
	TX / IEEE 802.11n HT40 mode / CH High				Measurement Distance at 3m				Vertical	polarity
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1080.02	66.27	25.10	1.81	45.03	0.30	48.45	74.00	-25.55	P
*	1080.02	55.60	25.10	1.81	45.03	0.30	37.78	54.00	-16.22	A
*	1440.02	65.89	26.47	2.20	44.71	0.30	50.14	74.00	-23.86	P
*	1440.02	59.42	26.47	2.20	44.71	0.30	43.67	54.00	-10.33	A
*	4903.92	61.57	33.75	3.86	45.16	0.40	54.42	74.00	-19.58	P
*	4903.92	52.76	33.75	3.86	45.16	0.40	45.61	54.00	-8.39	A

REMARK:

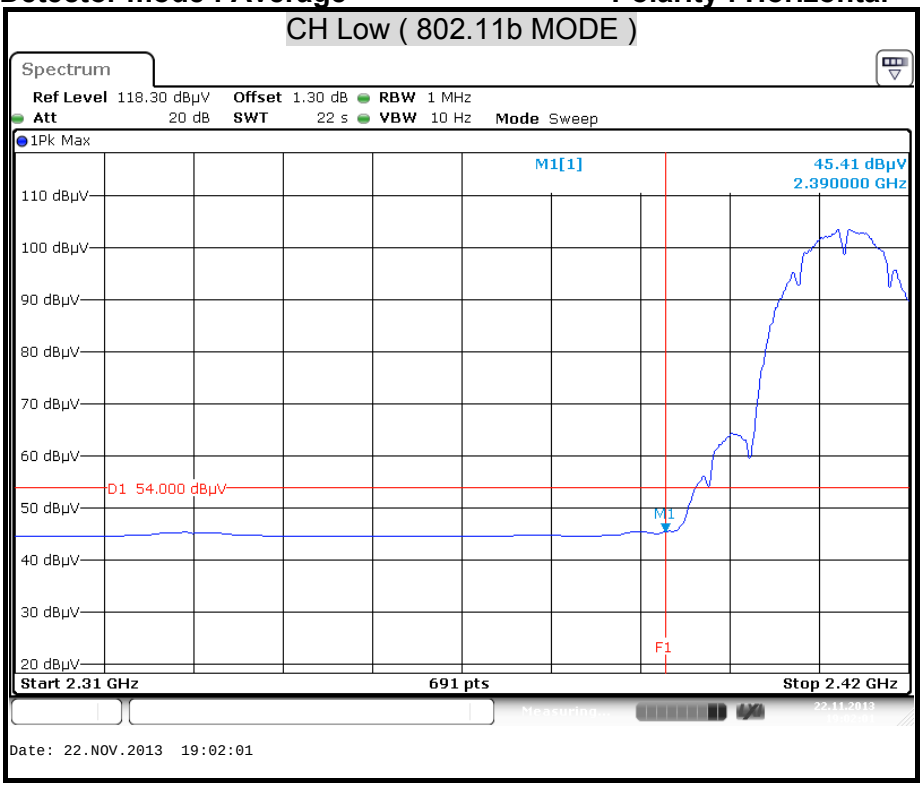
1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: 2.4GHz~2.5GHz Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*
6. ** means: the frequency is under 15.205 restricted bands.*

8.6.4 RESTRICTED BAND EDGES

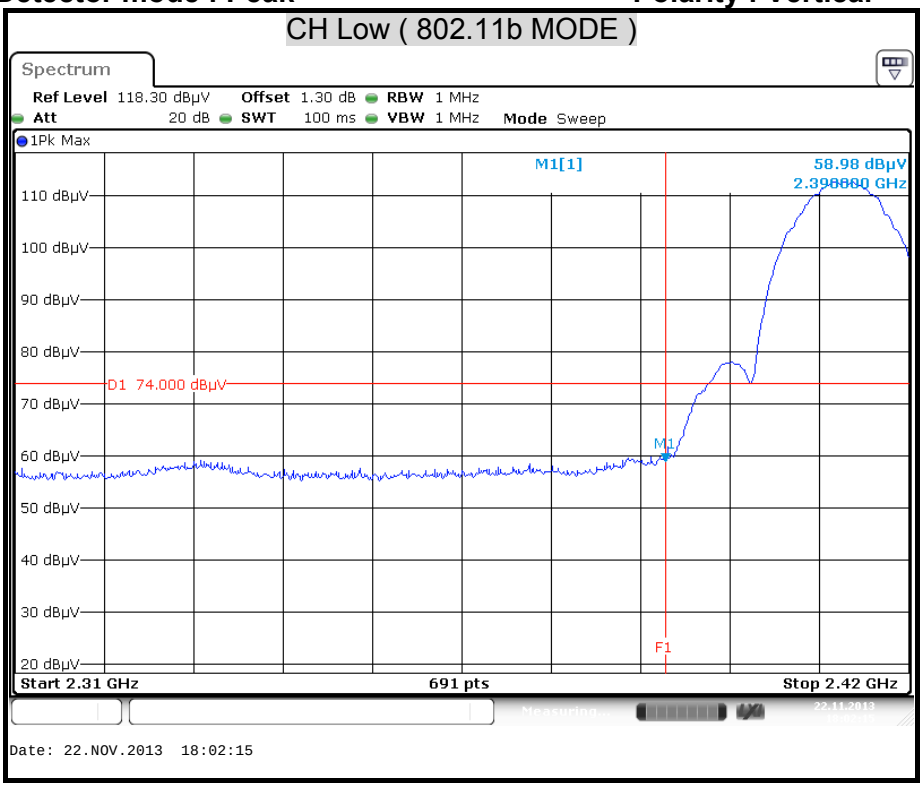
Detector mode : Peak **Polarity : Horizontal**



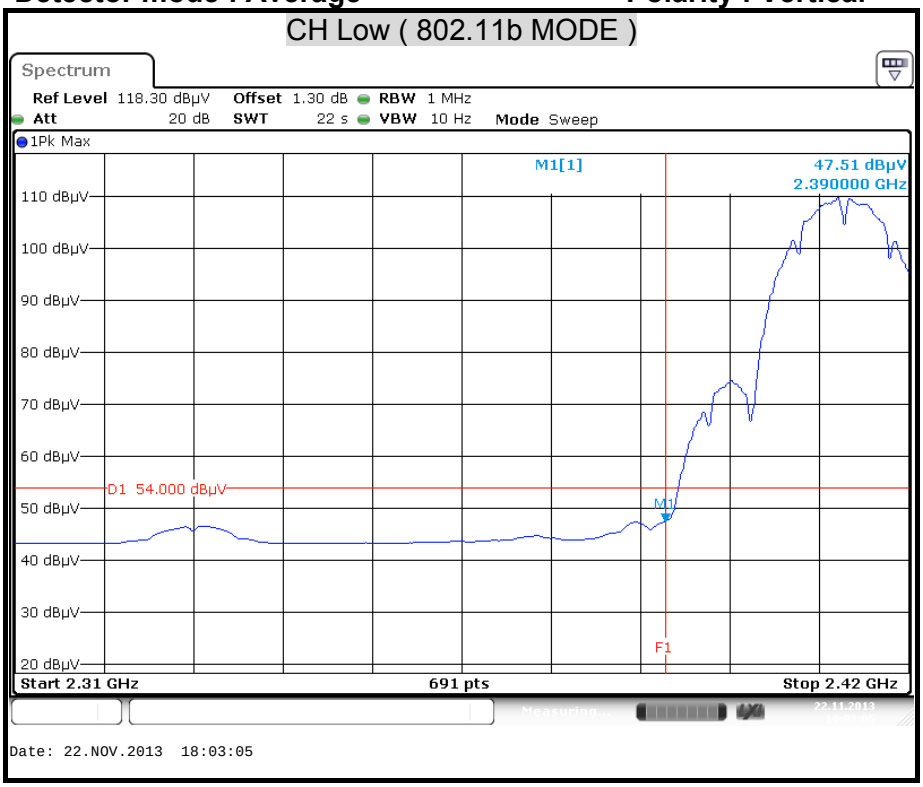
Detector mode : Average **Polarity : Horizontal**



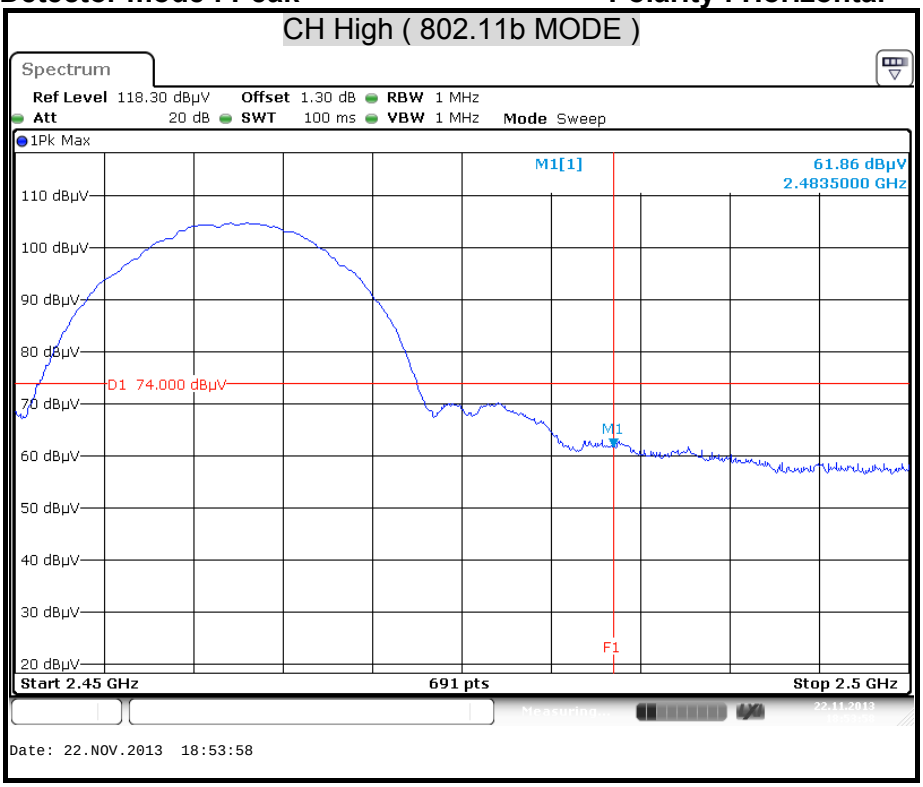
Detector mode : Peak **Polarity : Vertical**



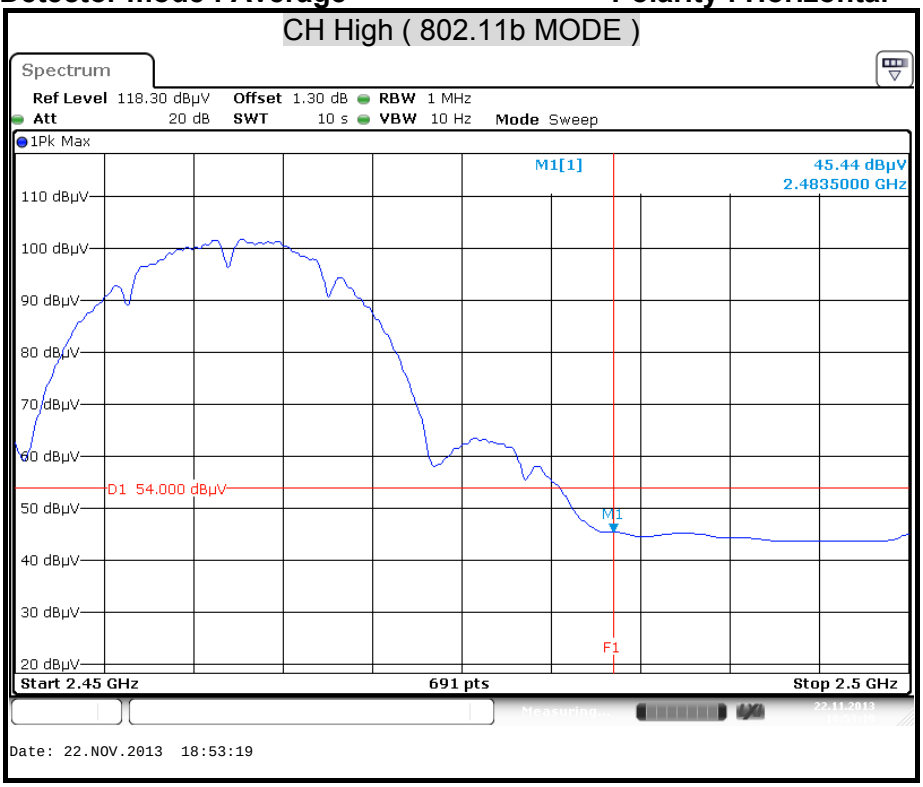
Detector mode : Average **Polarity : Vertical**



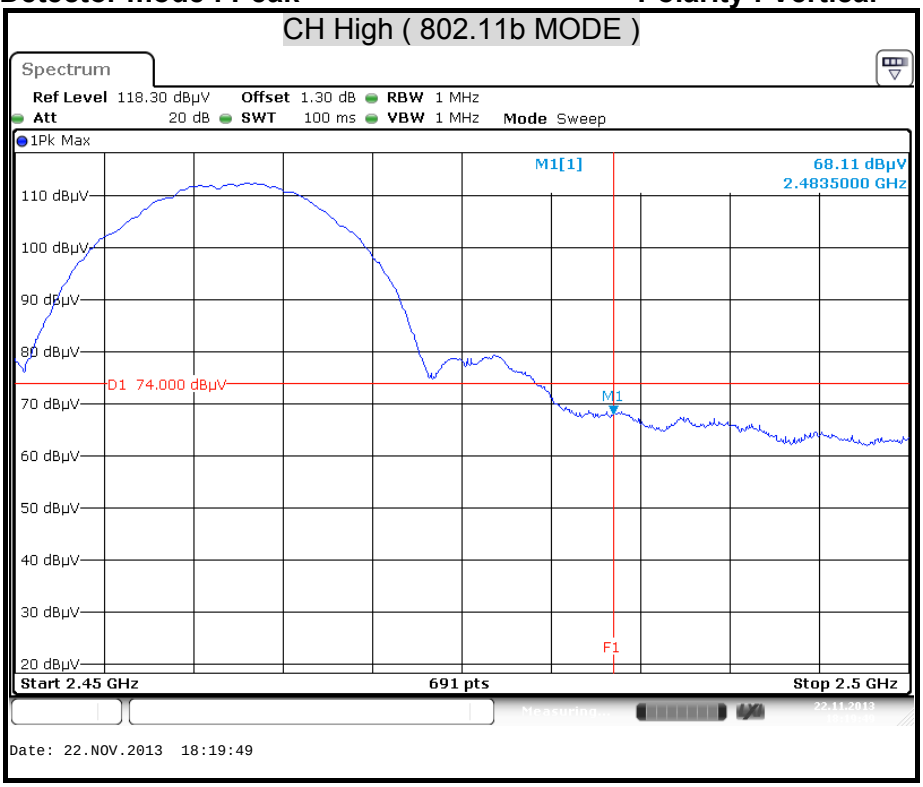
Detector mode : Peak **Polarity : Horizontal**



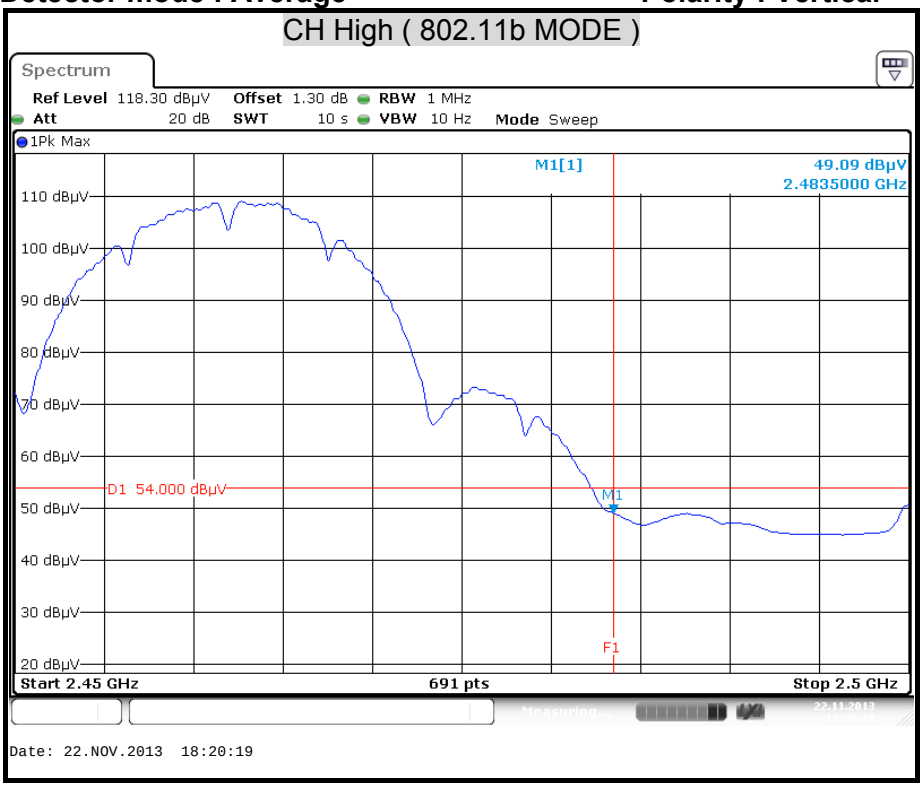
Detector mode : Average **Polarity : Horizontal**



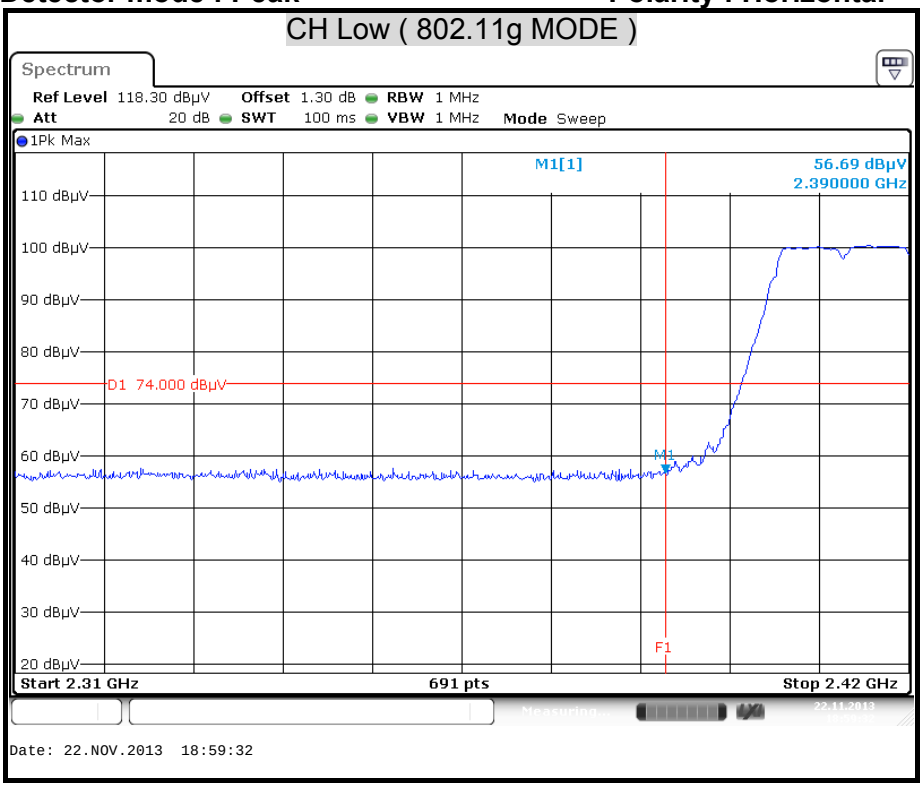
Detector mode : Peak **Polarity : Vertical**



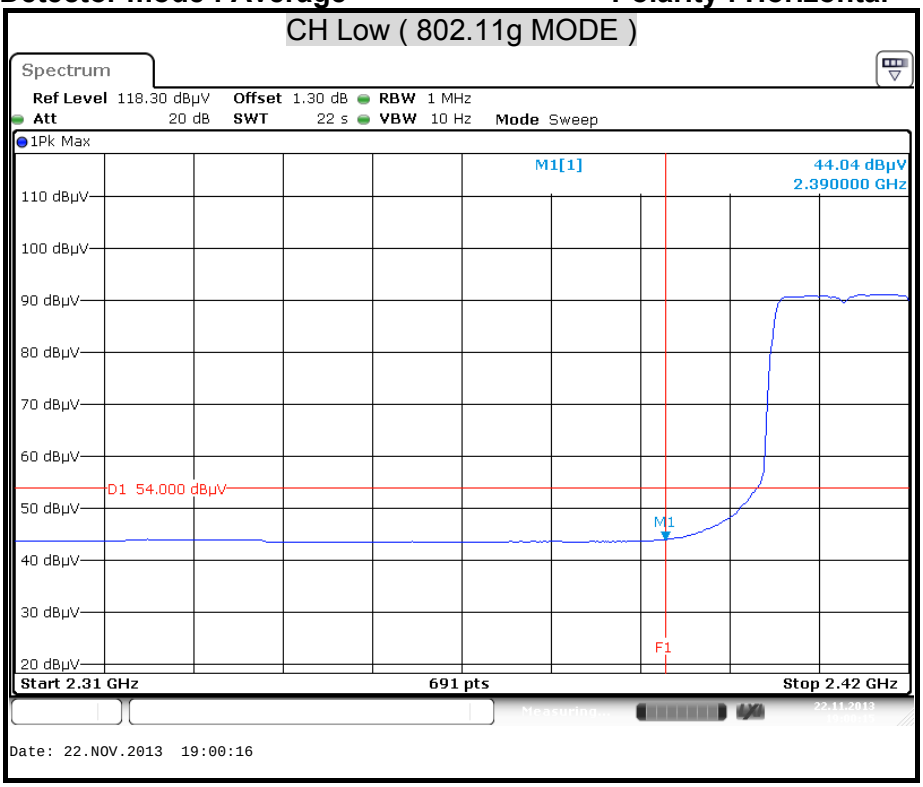
Detector mode : Average **Polarity : Vertical**



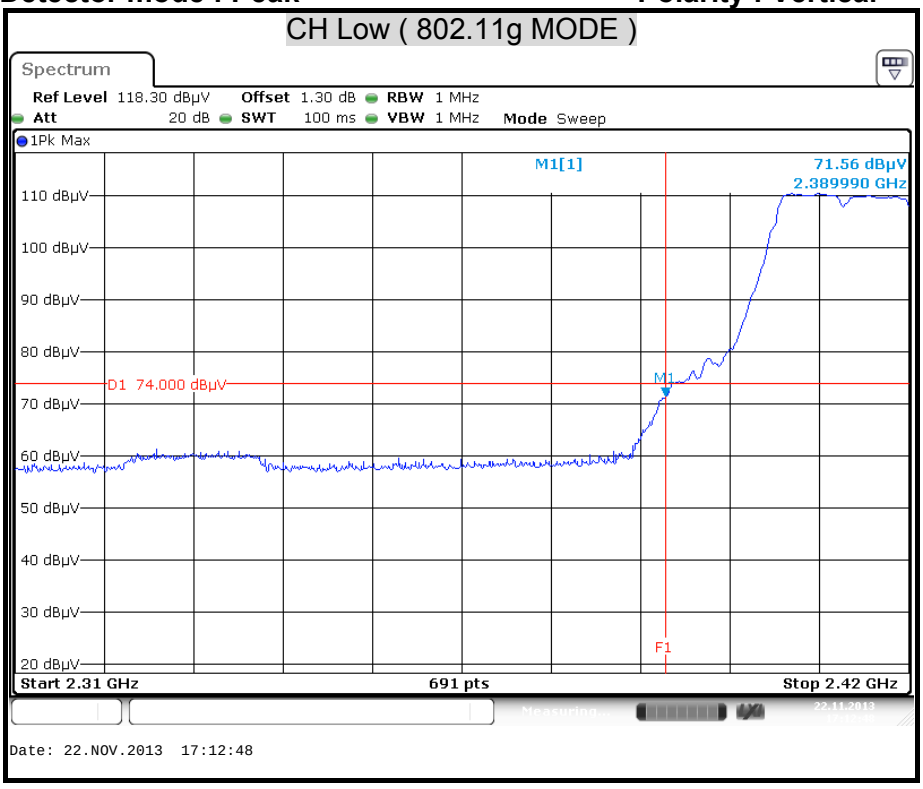
Detector mode : Peak **Polarity : Horizontal**



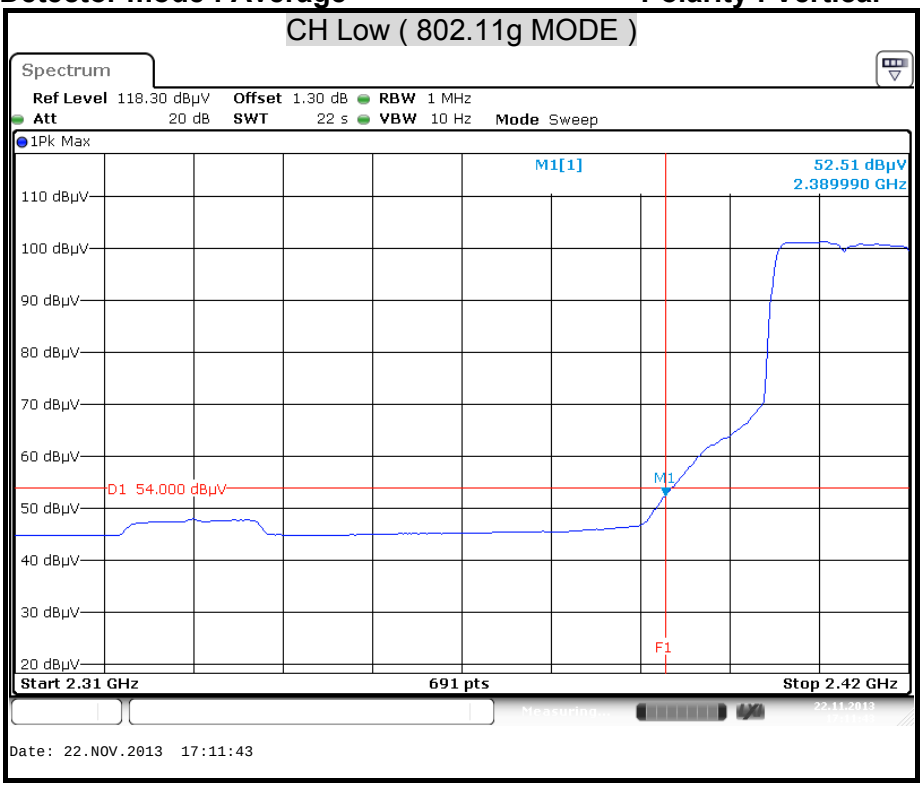
Detector mode : Average **Polarity : Horizontal**



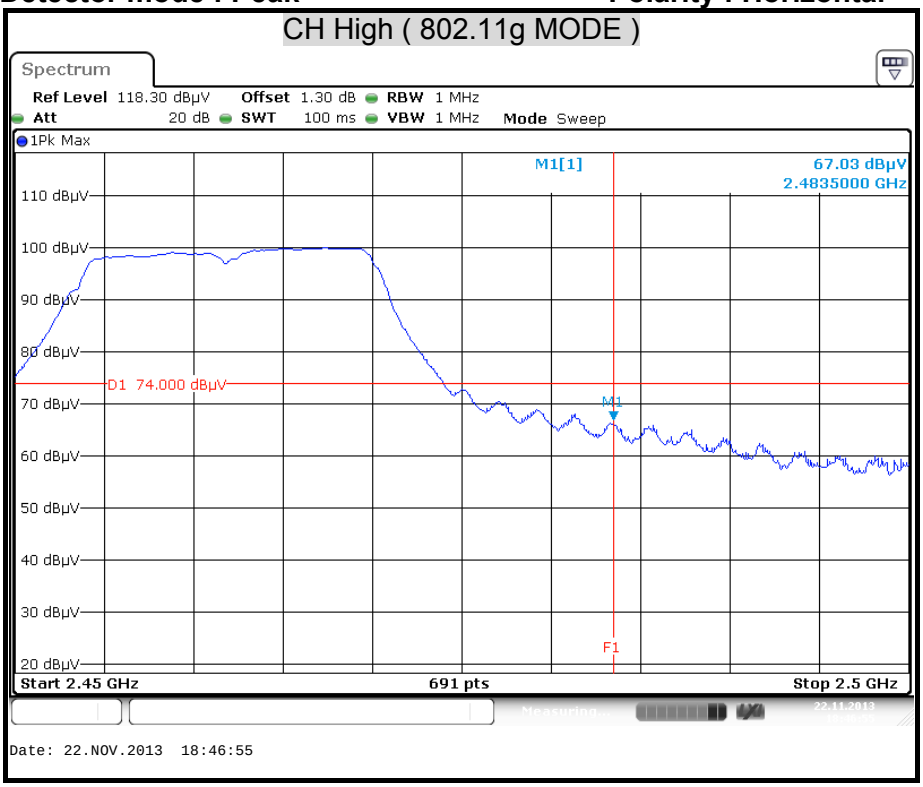
Detector mode : Peak **Polarity : Vertical**



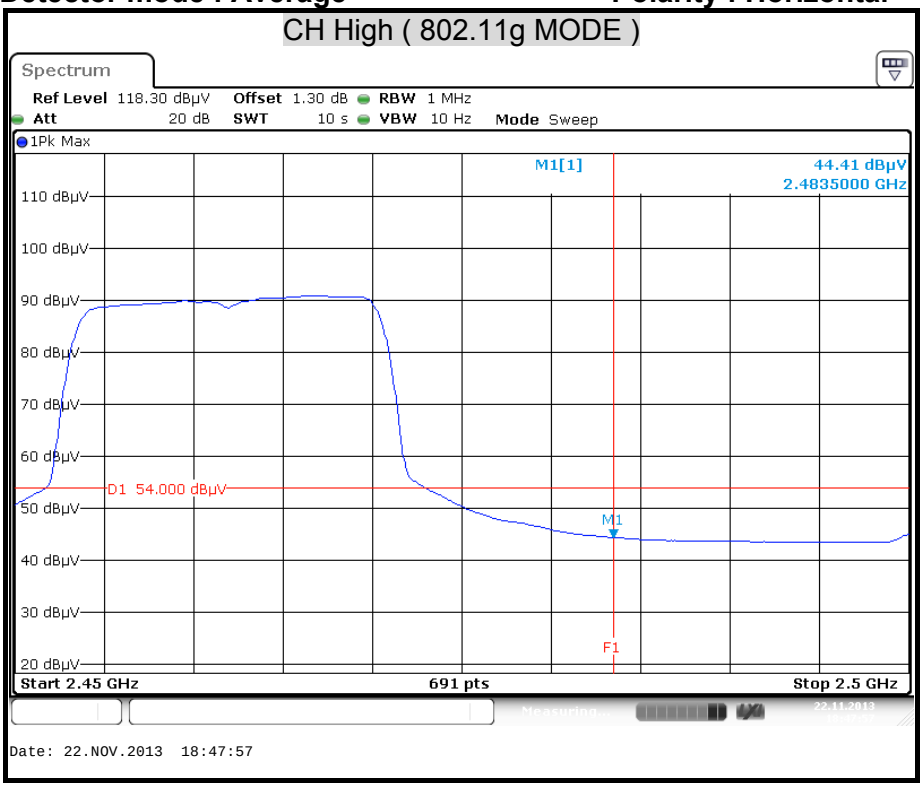
Detector mode : Average **Polarity : Vertical**



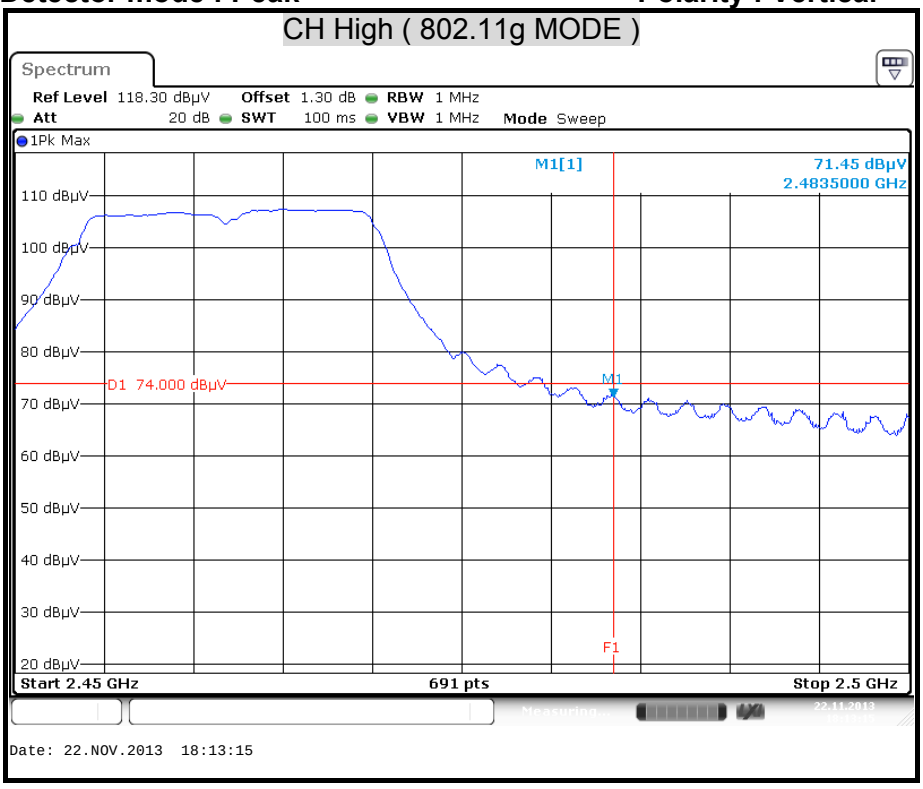
Detector mode : Peak **Polarity : Horizontal**



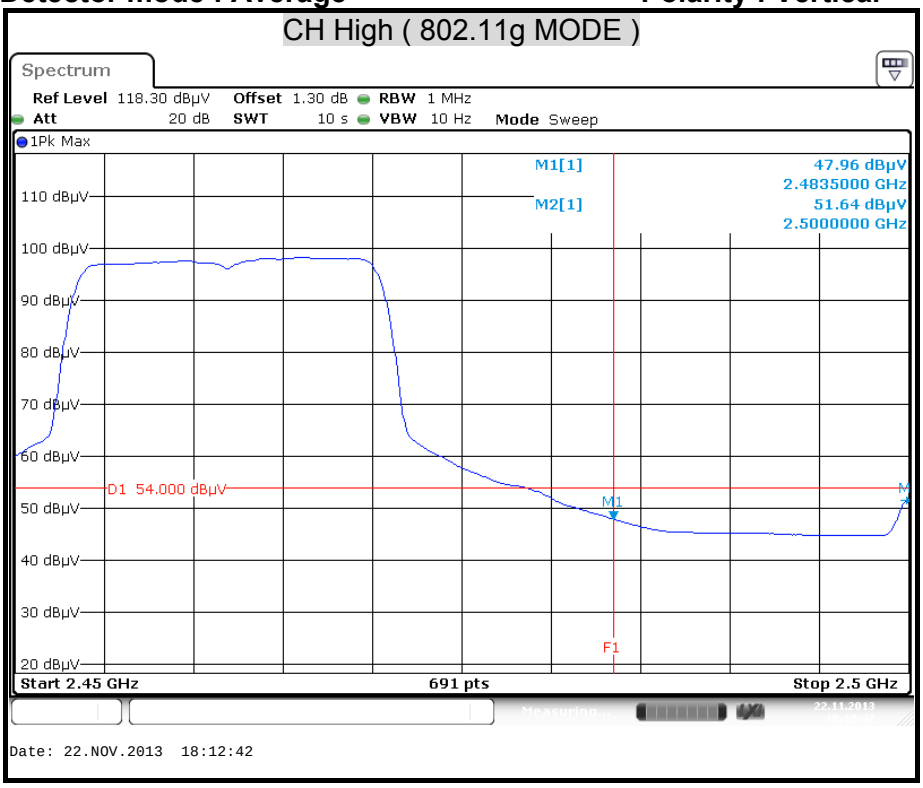
Detector mode : Average **Polarity : Horizontal**



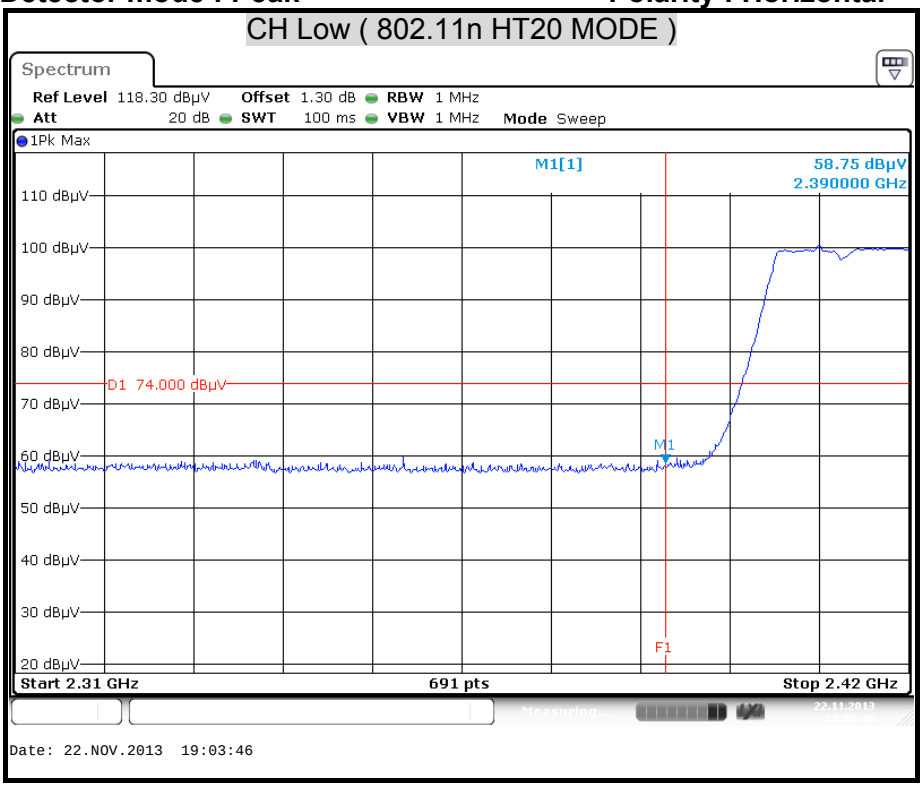
Detector mode : Peak **Polarity : Vertical**



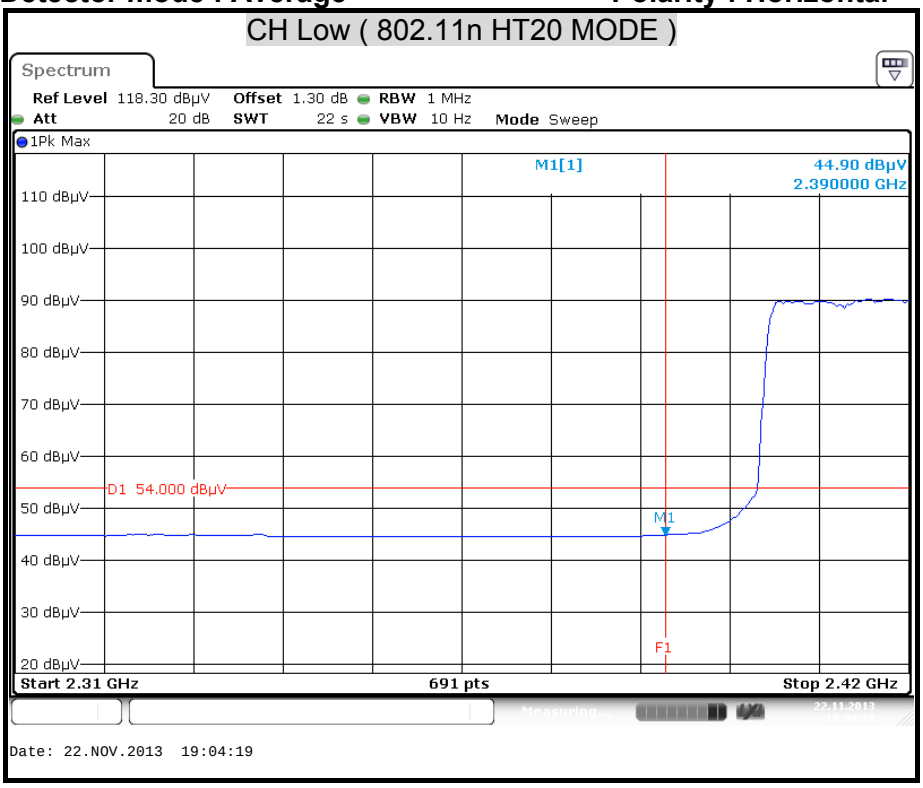
Detector mode : Average **Polarity : Vertical**



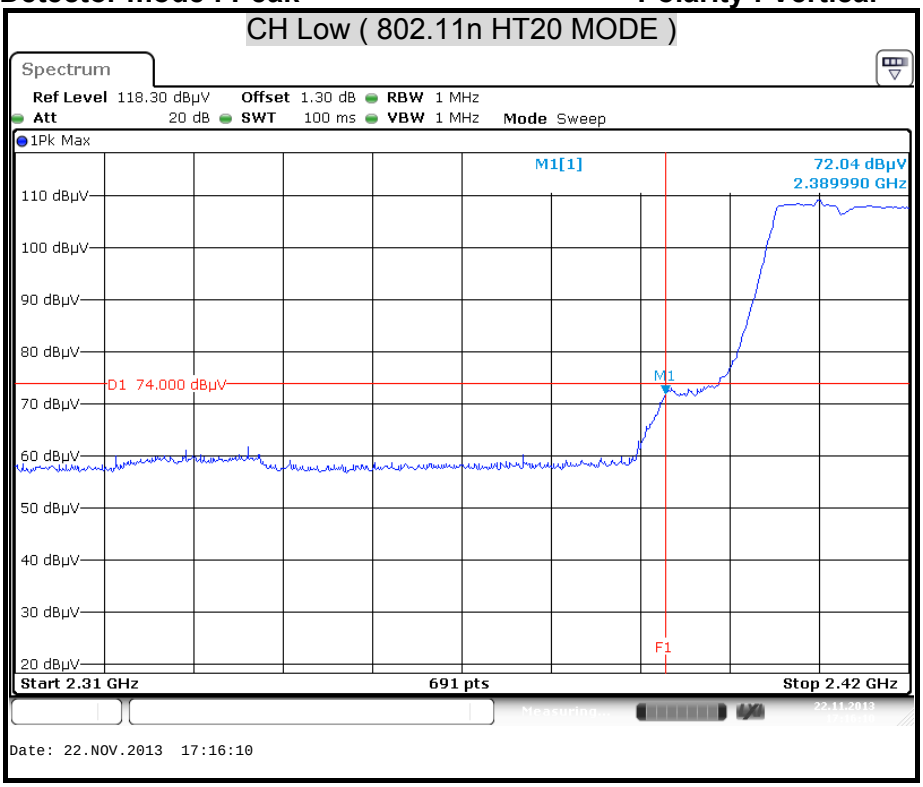
Detector mode : Peak **Polarity : Horizontal**



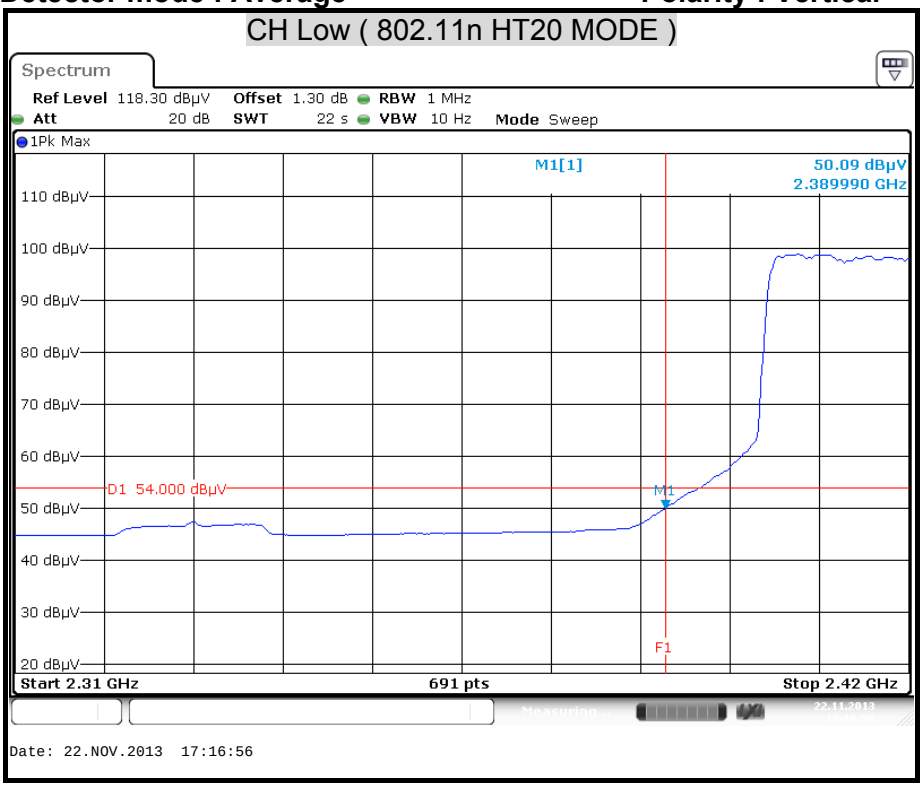
Detector mode : Average **Polarity : Horizontal**



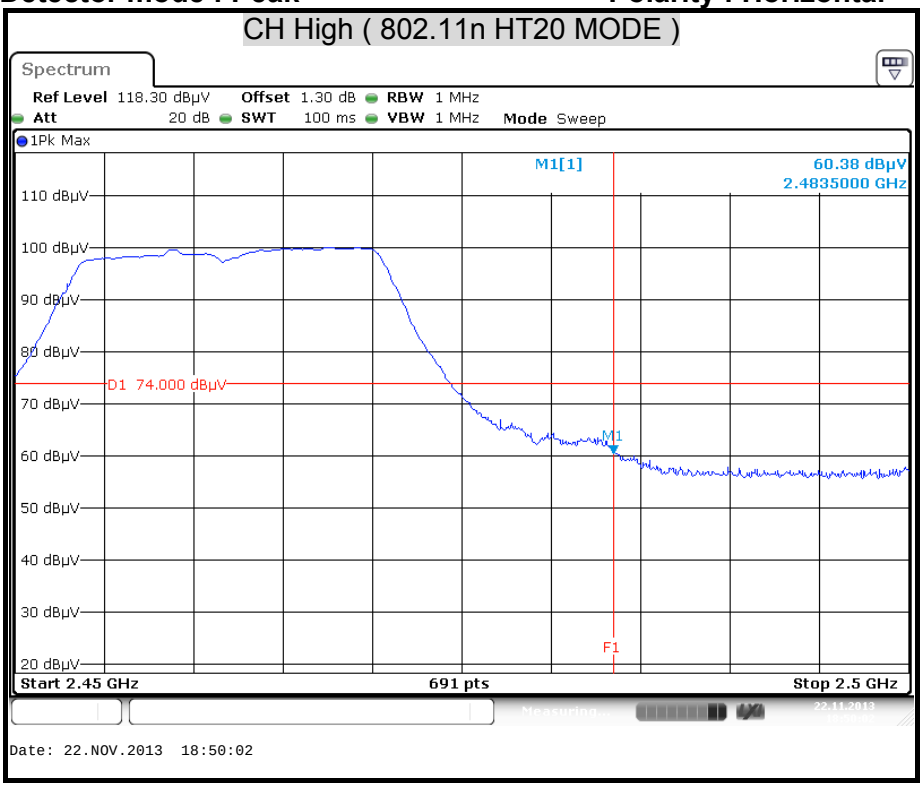
Detector mode : Peak **Polarity : Vertical**



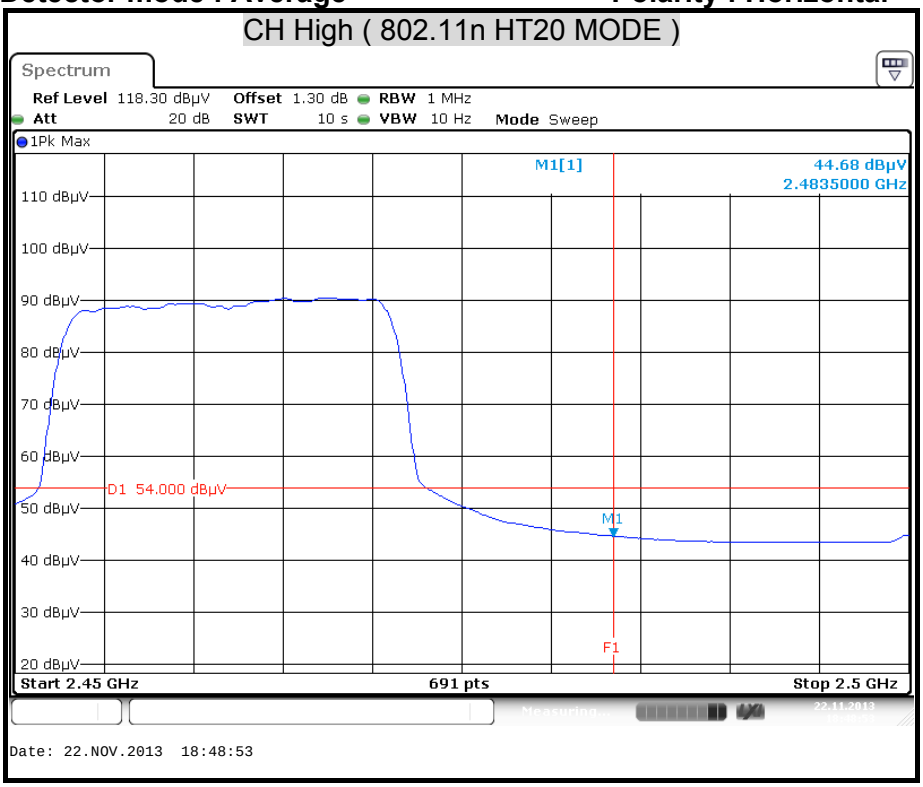
Detector mode : Average **Polarity : Vertical**



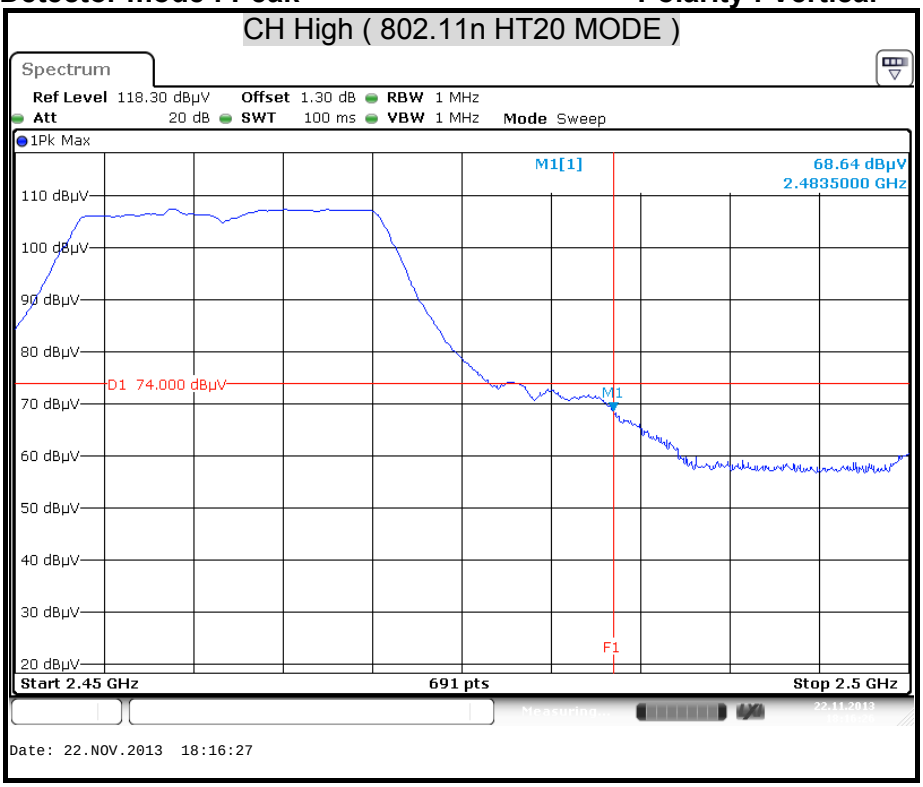
Detector mode : Peak **Polarity : Horizontal**



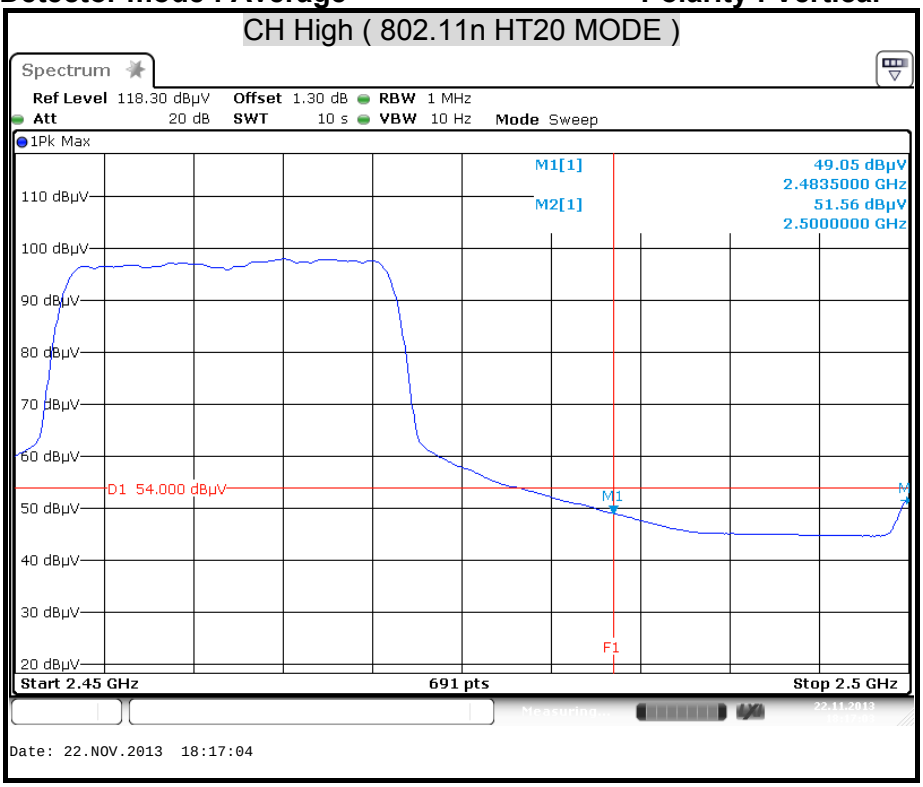
Detector mode : Average **Polarity : Horizontal**



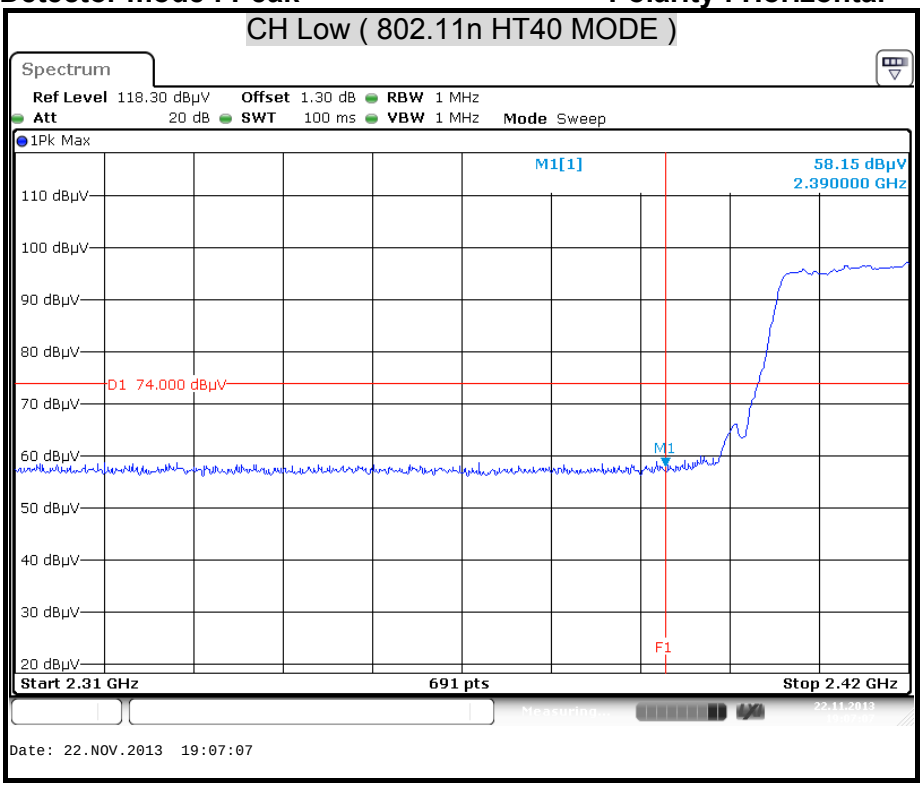
Detector mode : Peak **Polarity : Vertical**



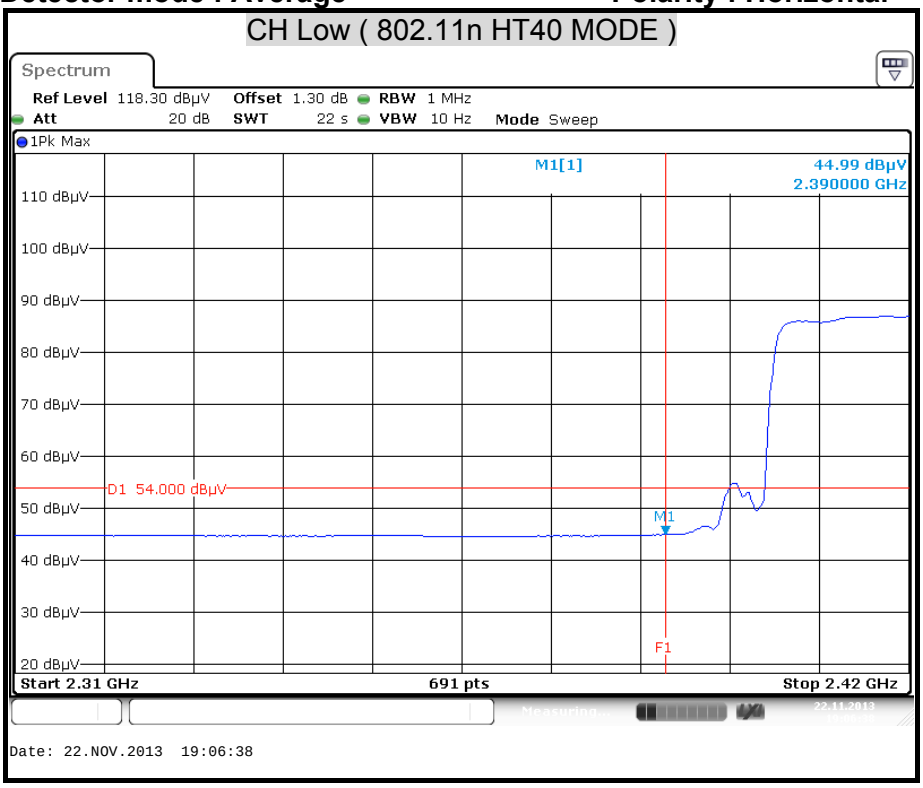
Detector mode : Average **Polarity : Vertical**



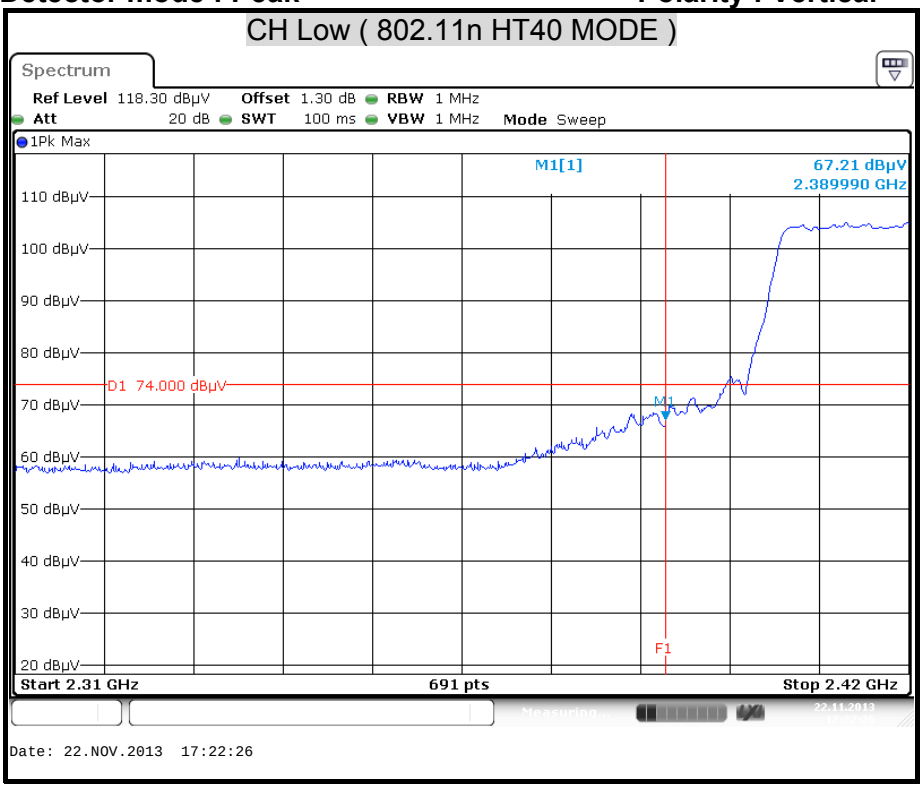
Detector mode : Peak **Polarity : Horizontal**



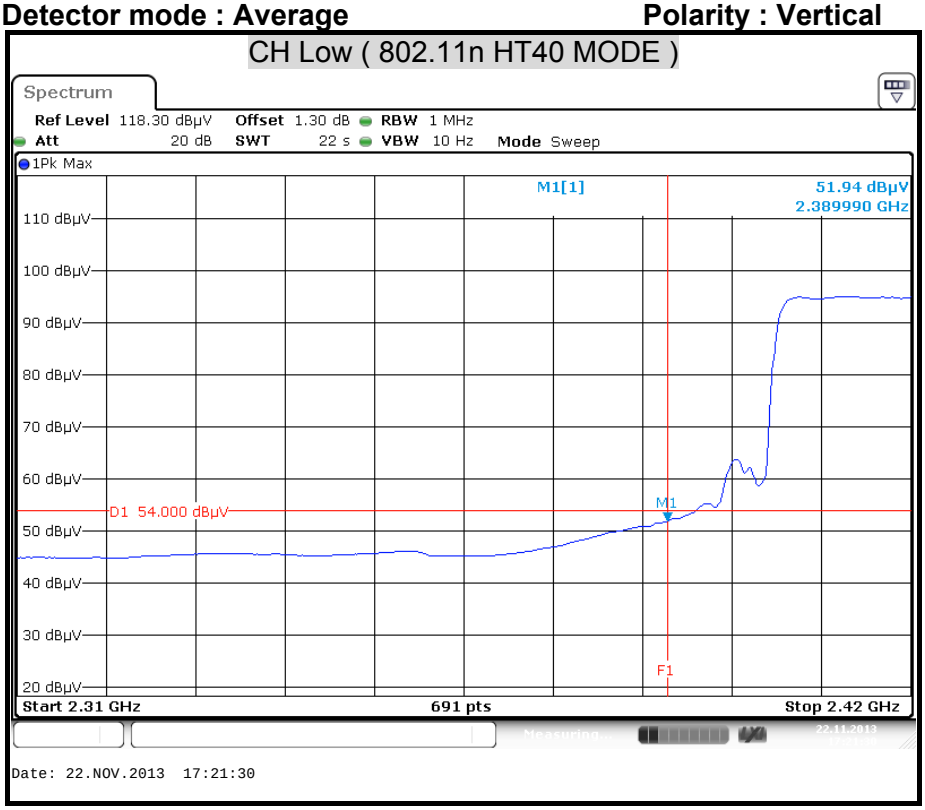
Detector mode : Average **Polarity : Horizontal**



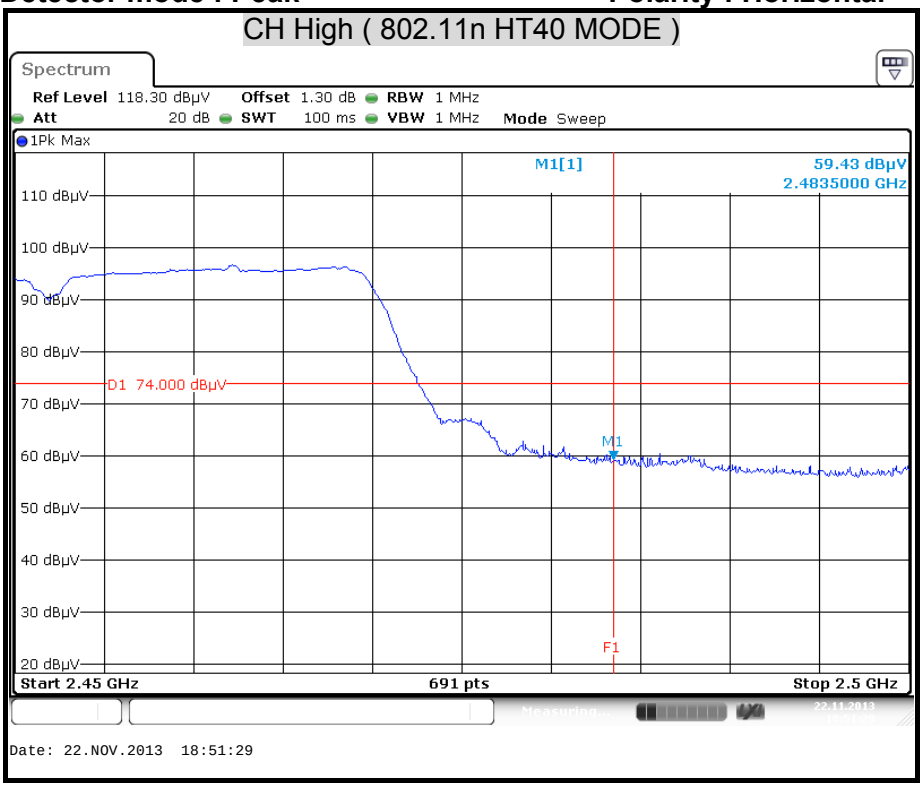
Detector mode : Peak **Polarity : Vertical**



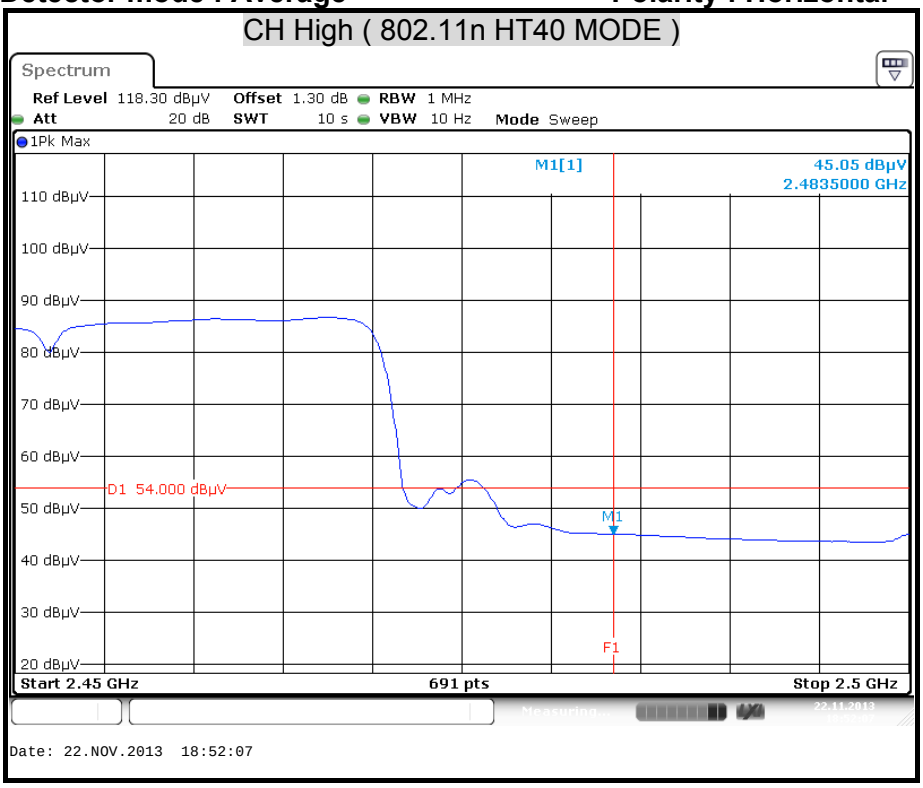
Detector mode : Average **Polarity : Vertical**



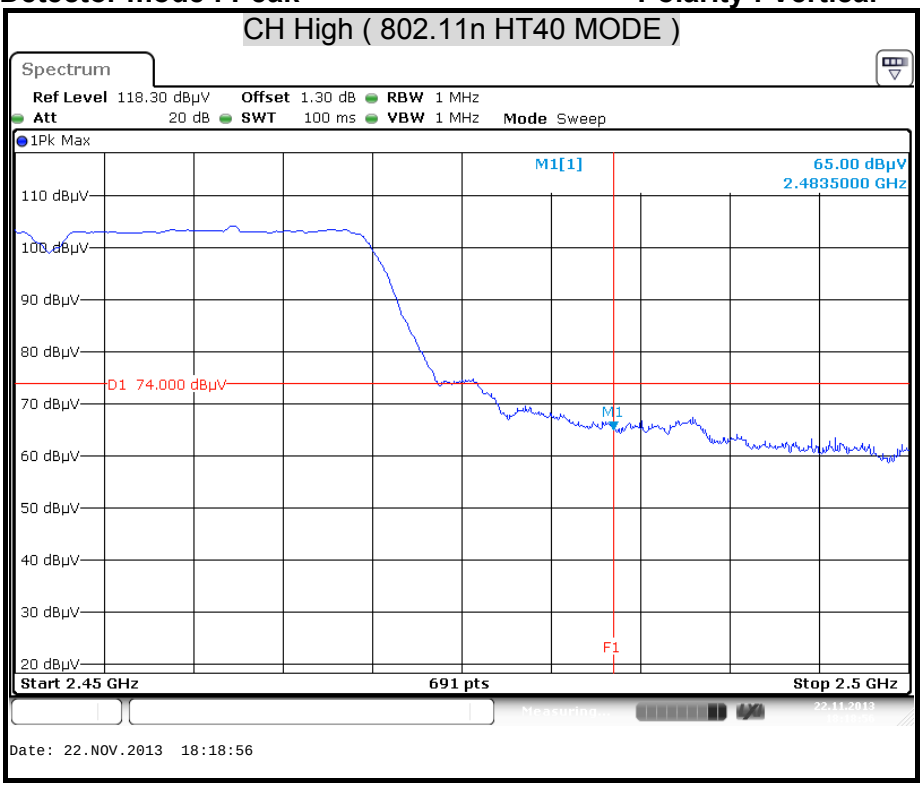
Detector mode : Peak **Polarity : Horizontal**



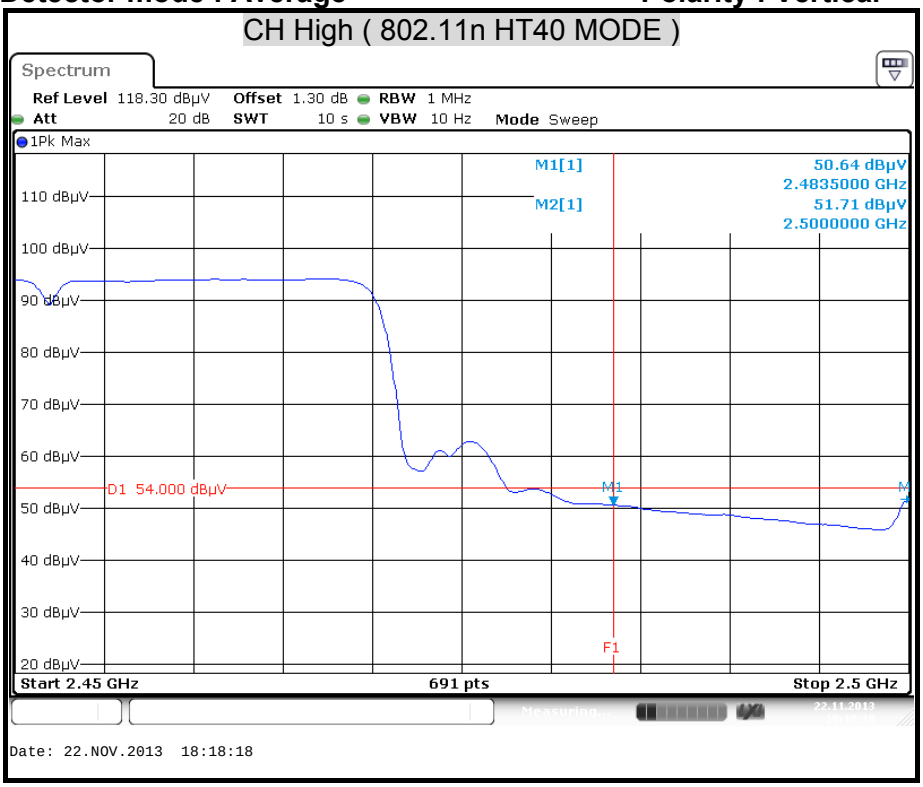
Detector mode : Average **Polarity : Horizontal**



Detector mode : Peak **Polarity : Vertical**



Detector mode : Average **Polarity : Vertical**



8.7 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.

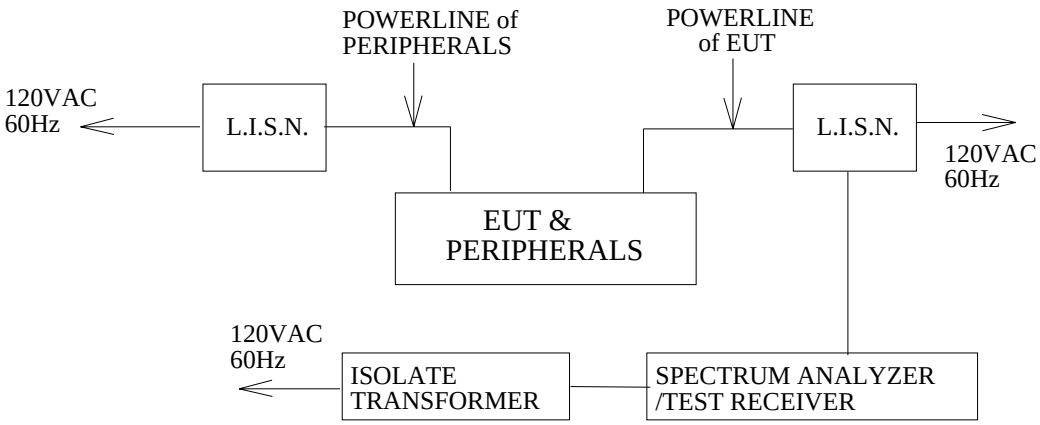
Frequency of Emission (MHz)	Conducted limit (dBμv)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.5 - 5	56	46
5 - 30	60	50

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 8130	8130124	AUG. 12, 2014
	Rohde & Schwarz	ESH 3-Z5	840062/021	SEP. 09, 2014
TEST RECEIVER	Rohde & Schwarz	ESCS 30	100348	AUG. 09, 2014
TYPE N COAXIAL CABLE	CCS	BNC50	11	NOV. 19, 2014
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.

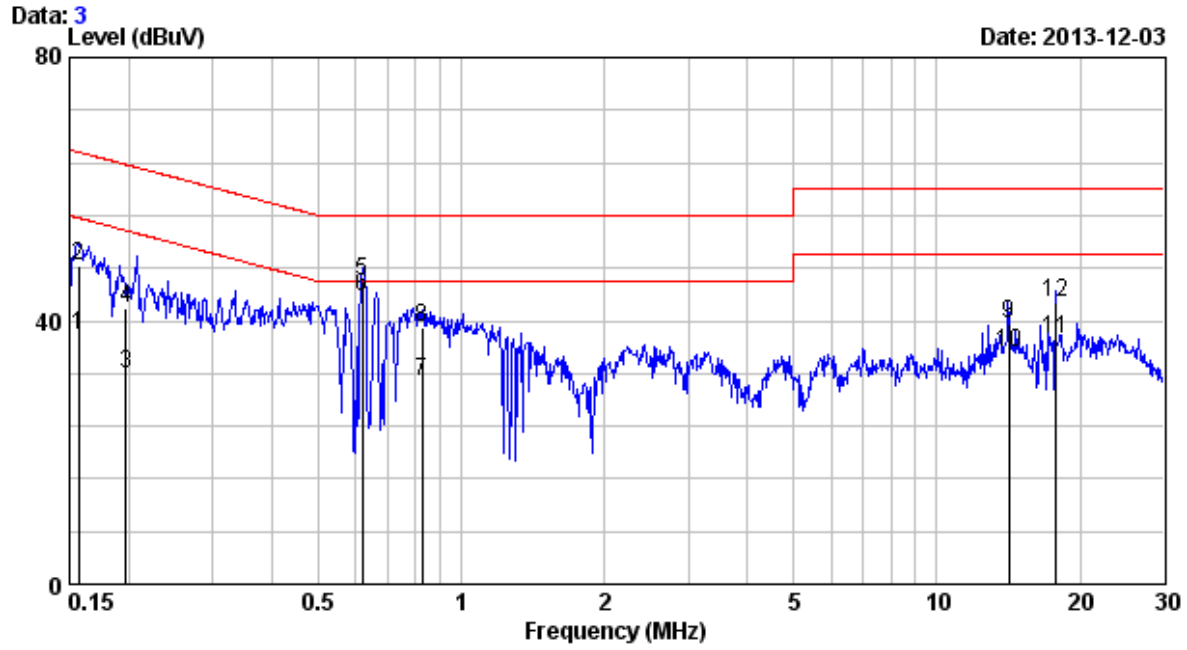
TEST RESULTS

No non-compliance noted.

CONDUCTED RF VOLTAGE MEASUREMENT

Model	IPJC1n	Test Date	2013/12/03
TEMP& Humidity	24.5°C, 52%	Test By	Shiang Su
Test Mode	Normal Operation		

LINE

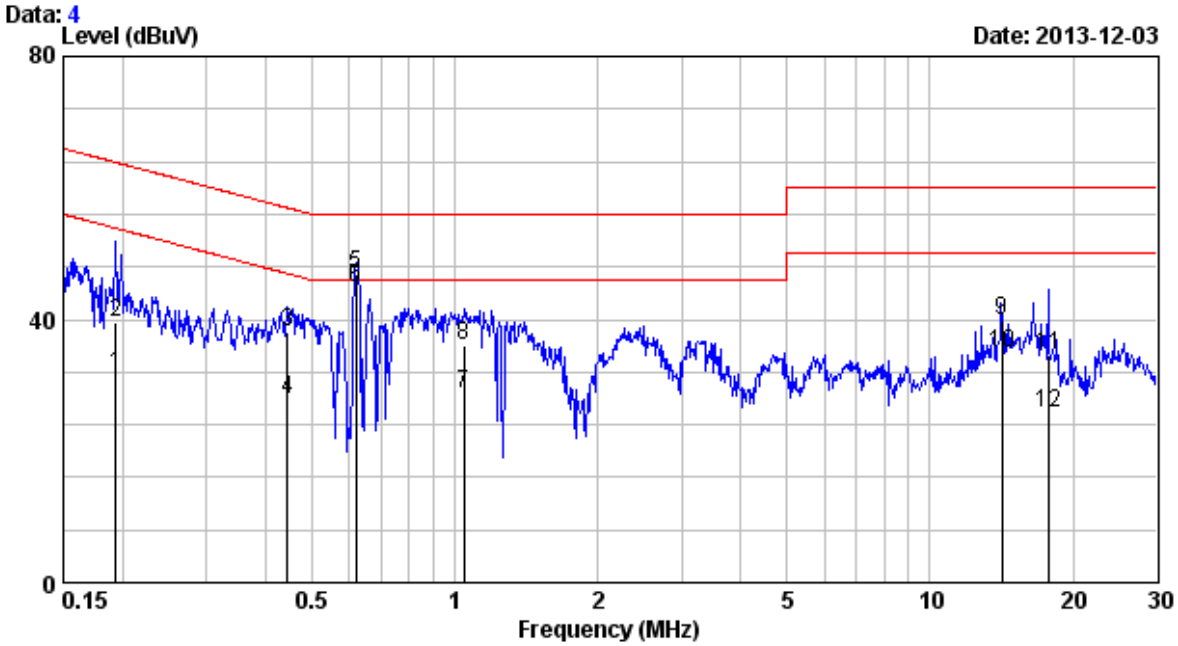


Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
0.16	7.42	0.09	30.30	37.80	55.65	-17.84	AVERAGE
0.16	7.42	0.09	40.75	48.25	65.65	-17.39	QP
0.20	7.63	0.13	24.30	32.06	53.71	-21.65	AVERAGE
0.20	7.63	0.13	34.24	42.00	63.71	-21.71	QP
0.62	7.30	0.25	38.51	46.06	56.00	-9.94	QP
0.62	7.30	0.25	36.09	43.64	46.00	-2.36	AVERAGE
0.83	7.51	0.28	23.12	30.91	46.00	-15.09	AVERAGE
0.83	7.51	0.28	31.19	38.98	56.00	-17.02	QP
14.15	8.62	0.34	30.55	39.51	60.00	-20.49	QP
14.15	8.62	0.34	26.33	35.29	50.00	-14.71	AVERAGE
17.69	8.68	0.36	28.21	37.25	50.00	-12.75	AVERAGE
17.69	8.68	0.36	33.86	42.90	60.00	-17.10	QP

REMARK:
1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value

Model	IPJC1n	Test Date	2013/12/03
TEMP& Humidity	24.5°C, 52%	Test By	Shiang Su
Test Mode	Normal Operation		

NEUTRAL



Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
0.19	7.61	0.12	24.06	31.79	53.89	-22.09	AVERAGE
0.19	7.61	0.12	31.76	39.49	63.89	-24.39	QP
0.44	7.74	0.22	30.26	38.22	56.98	-18.76	QP
0.44	7.74	0.22	19.89	27.85	46.98	-19.13	AVERAGE
0.62	7.30	0.25	39.23	46.78	56.00	-9.22	QP
0.62	7.30	0.25	37.32	44.87	46.00	-1.13	AVERAGE
1.04	7.77	0.24	20.58	28.59	46.00	-17.41	AVERAGE
1.04	7.77	0.24	28.15	36.16	56.00	-19.84	QP
14.15	8.62	0.34	30.85	39.81	60.00	-20.19	QP
14.15	8.62	0.34	26.03	34.99	50.00	-15.01	AVERAGE
17.76	8.68	0.36	25.51	34.55	60.00	-25.45	QP
17.76	8.68	0.36	16.85	25.89	50.00	-24.11	AVERAGE

REMARK:
1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value

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 spec. As below:

Antenna (1T1R)
Type: Dipole Antenna
Model: 112011020
Gain: 4 dBi
Manufacturer: WAVERAR TECHNOLGY CO., LTD