FCC 47 CFR PART 15 SUBPART E AND ANSI C63.4:2003 TEST REPORT

For

Smart 300N Broadband Router

Model : BR485d

Trade Name : E-TOP

Issued for

E-Top Network Technology Inc.

No. 82 , Gongye 2nd Rd., Tainan City 70955, 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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Issued Date: January 07, 2012

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	January 07, 2012	Initial Issue	ALL	Sunny Chang

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TITLE PAGE NO.

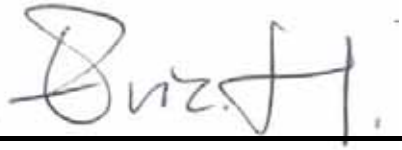
1. TEST REPORT CERTIFICATION

Applicant	：	E-Top Network Technology Inc.
Address	：	No. 82 , Gongye 2nd Rd., Tainan City 70955, Taiwan, R.O.C.
Manufacturer	：	E-Top Network Technology Inc.
Address	：	No. 82 , Gongye 2nd Rd., Tainan City 70955, Taiwan, R.O.C.
Equipment Under Test	：	Smart 300N Broadband Router
Model	：	BR485d
Trade Name	：	E-TOP
Tested Date	：	November 23, 2011 ~ December 24, 2011

APPLICABLE STANDARD	
Standard	**Test Result**
FCC Part 15 Subpart E AND ANSI C63.4:2003	PASS

WE HEREBY CERTIFY THAT: The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by: ***Reviewed by:***



Jeter Wu
Assistant Manager

Eric Huang
Assistant Section Manager

2. EUT DESCRIPTION

Product Name	Smart 300N Broadband Router
Model Number	BR485d
Brand Name	E-TOP
Identify Number	T11112830801
Received Date	December 28, 2011
Frequency Range	IEEE 802.11a, 802.11n HT20 : 5180MHz ~ 5240MHz,
	IEEE 802.11n HT40 : 5190MHz ~ 5230MHz,
Transmit Power	IEEE 802.11a : 8.86dBm (7.6913mW)
	IEEE 802.11n HT20 : 11.77dBm (15.0357mW)
	IEEE 802.11n HT40 : 11.25dBm (13.3209W)
Channel Spacing	IEEE 802.11a, 802.11n HT20 : 20MHz
	IEEE 802.11n HT40 : 20MHz
Channel Number	IEEE 802.11a, 802.11n HT20 : 4 Channels
	IEEE 802.11n HT40 : 3 Channels
Transmit Data Rate	IEEE 802.11a : 54, 48 ,36, 24, 18, 12, 9, 6 Mbps
	IEEE 802.11n HT20：130,117,104,78, 65, 58.5, 52, 39, 26, 19.5, 13, 6.5 Mbps
	IEEE 802.11n HT40：300, 270,243, 216,162 ,135, 121.5, 108, 81, 54, 40.5, 27, 13.5 Mbps
Type of Modulation	IEEE 802.11a : OFDM (64QAM, 16QAM, QPSK, BPSK)
	IEEE 802.11n HT20/40 : OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Type	**Two antennas (2TX2RX)** Manufacture: YONG-SHUN TECH. CO., LTD. Type: Co-linear dipole structure Model: AN-152RRSU00 Gain: 3dBi for 2.4GHz, 4dBi for 5GHz Connector: Reverse SMA PLUG
Power Rating	12Vdc; 1A(Powered from Adapter)
Power Source	**Powered from adapter** Model: JKY36-SP1201000 Input: 100-240Vac, 50/60Hz, 0.5A Output: 12Vdc, 1000mA
Test Voltage	120Vac, 60Hz

Operation Frequency:

IEEE 802.11a, 802.11n HT20

UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII)			
CHANNEL	**MHz**	**CHANNEL**	**MHz**
36	5180	44	5220
40	5200	48	5240

IEEE 802.11n HT40

UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII)			
CHANNEL	**MHz**	**CHANNEL**	**MHz**
38	5190	46	5230
42	5210		

Remark :

1. *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*
2. *For more details, please refer to the User's manual of the EUT.*
3. *This submittal(s) (test report) is intended for FCC ID: **U6A-BR485D** filing to comply with Section 15.407, of the FCC Part 15, Subpart E Rules.*
4. *To add a series model is for business necessary. The different of the each model is shown as bellows:*

Multiple listing:

Company Name/Address	Brand name	Model	Product Name
E-Top Network Technology Inc. No. 82, Gongye 2nd Rd., Tainan City 70955, Taiwan, R.O.C.	E-TOP	BR485d	Smart 300N Broadband Router
Amigo Technology Inc. 5F., No.63, Lane 77, Xing-Ai Road, Neihu Dist., Taipei City 114, Taiwan (R.O.C.)	Amigo	BR485d	Smart 300N Broadband Router
Sapido Technology Inc. No. 383., Sec. 2, Minsheng Rd., West Central District, Tainan 700, Taiwan, R.O.C.	SAPIDO	RB-1830	Smart 300Mbps Dualband Router - All Broadbands

3. DESCRIPTION OF TEST MODES

Conducted Emission / Radiated Emission Test (Below 1 GHz)

1. The following test modes were scanned during the preliminary test:

No.	Pre-Test Mode
1	TX Mode

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode		
Emission	Radiated Emission	TX Mode
	Conducted Emission	TX Mode

Remark : *Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.*

Conducted / Radiated Emission Test (Above 1 GHz)

IEEE 802.11a, 802.11n HT20 mode

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	5180
Middle	5220
High	5240

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

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

IEEE 802.11n HT40 mode

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	5190
Middle	5210
High	5230

IEEE 802.11n HT40 mode : 13.5Mbps data rate (worst case) were chosen for full testing.

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4: 2003 and FCC CFR 47, 15.207, 15.209 and 15.407.

5. FACILITIES AND ACCREDITATION

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 ACCREDITATIONS

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

Taiwan	TAF

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

Canada	Industry Canada
Germany	TUV NORD
Taiwan	BSMI
USA	FCC

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

5.3 MEASUREMENT UNCERTAINTY

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2.

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz Test Site : OATS-6	±3.38dB
Radiated Emission, 200 to 1000 MHz Test Site : OATS-6	±3.04dB
Radiated Emission, 1 to 26.5 GHz	± 3.20dB
Power Line Conducted Emission	± 2.01dB

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

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

For RF test

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

No.	Signal cable description	
A	DC Power	Unshielded, 1.2m, 1pcs
B	LAN Cable	Unshielded, 1.0m, 1pcs

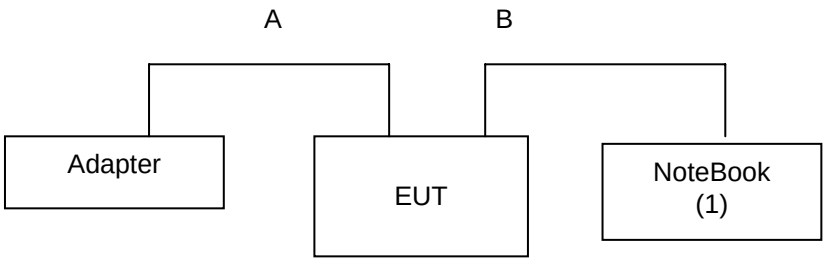
For EMI test

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	Note Book	IBM	R51	R33026	Power cable, unshd, 1.6m
2	Note Book	IBM	T43	DoC	Power cable, unshd, 1.6m
3	Note Book	IBM	R50E	DoC	Power cable, unshd, 1.6m
4	3G Modem	NOVATEL	Qualcomm 3G CDMA	PKRNVWMC727	N/A
5	HUB	BARRICAD	SMC7008BR	DoC	Power cable, unshd, 1.6m

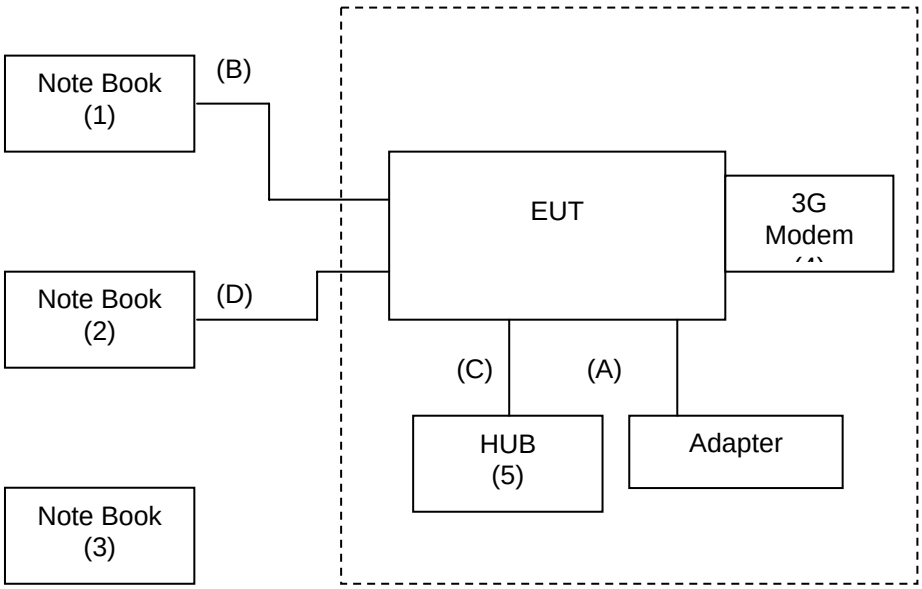
No.	Signal cable description	
A	DC Power	Unshielded, 1.8m, 1pcs
B	LAN	Unshielded, 10m, 1pcs
C	LAN	Unshielded, 2.0m, 3pcs
D	LAN	Unshielded, 10m, 1pcs

SETUP DIAGRAM FOR TESTS

For RF test



For EMI test



EUT OPERATING CONDITION

RF Setup

1. Set up all computers like the setup diagram.
2. Reset equipment and burn in the test program “MP_Test”.
3. The “Realtek Test Program for “RTL819x ” software was used for testing
   The EUT driver software installed in the host support equipment during testing was Realtek Test Program for RTL819x Drive
   1. **TX Mode:**

⇨ **IC Type: RTL_8192D**
⇨ **Mode:5G/SingleMac**
⇨ **Dev:WLAN0**
⇨ **Test Item :Continuous TX**
⇨ **TX POWER: follow “Power Control”**
⇨ **Antenna: A Mode A, HT20、HT40 Mode AB**
⇨ **Tx Data : 6Mbps** (IEEE 802.11a mode , TX)
13Mbps (IEEE 802.11n HT20 mode ,chain 0, chain 1 TX)
27Mbps (IEEE 802.11n HT40 mode, chain 0, chain 1 TX)
⇨ **Bandwith: A、HT20 20MHz, HT40 40MHz**
⇨ **Start**

Target Power: IEEE 802.11a Channel Low (5180MHz) = **40**
IEEE 802.11a Channel Middle (5220MHz) = **40**
IEEE 802.11a Channel High (5240MHz) = **40**
Target Power: IEEE 802.11n HT20 Channel Low (5180MHz) = **40 (Chain 0)**
IEEE 802.11 n HT20 Channel Middle (5220MHz) = **40 (Chain 0)**
IEEE 802.11 n HT20 Channel High (5240MHz) = **40 (Chain 0)**
IEEE 802.11n HT20 Channel Low (5180MHz) = **40 (Chain 1)**
IEEE 802.11 n HT20 Channel Middle (5220MHz) = **40 (Chain 1)**
IEEE 802.11 n HT20 Channel High (5240MHz) = **40 (Chain 1)**
Target Power: IEEE 802.11n HT40 Channel Low (5190MHz) = **40 (Chain 0)**
IEEE 802.11 n HT40 Channel Middle (5210MHz) = **40 (Chain 0)**
IEEE 802.11n HT40 Channel High (5230MHz) = **40 (Chain 0)**
IEEE 802.11 n HT40 Channel Low (5190MHz) = **40 (Chain 1)**
IEEE 802.11n HT40 Channel Middle (5210MHz) = **40 (Chain 1)**
IEEE 802.11 n HT40 Channel High (5230MHz) = **40 (Chain 1)**

   2. **RX Mode：**

Test Item packets RX
Start RX

(3).Normal Link Setup

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

Start test.

7. FCC PART 15.407 REQUIREMENTS

7.1 26dB BANDWIDTH

LIMITS

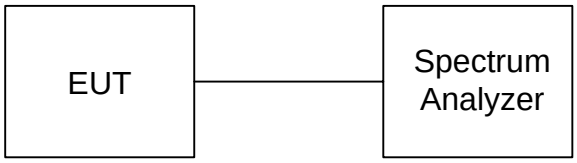
§ 15.303 © (2), For purposes of this subpart, the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP. 29, 2012

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

TEST SETUP



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW > 1%EBW, VBW > RBW, Span = 50MHz and Sweep = auto.
4. Mark the –26dBc (upper and lower) frequency of the peak value.
5. Repeat until all the rest channels were investigated.

TEST RESULTS

IEEE 802.11a Mode

Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)	Pass / Fail
Low	5180	25.651	PASS
Middle	5220	25.651	PASS
High	5240	25.591	PASS

IEEE 802.11 n HT20 Mode

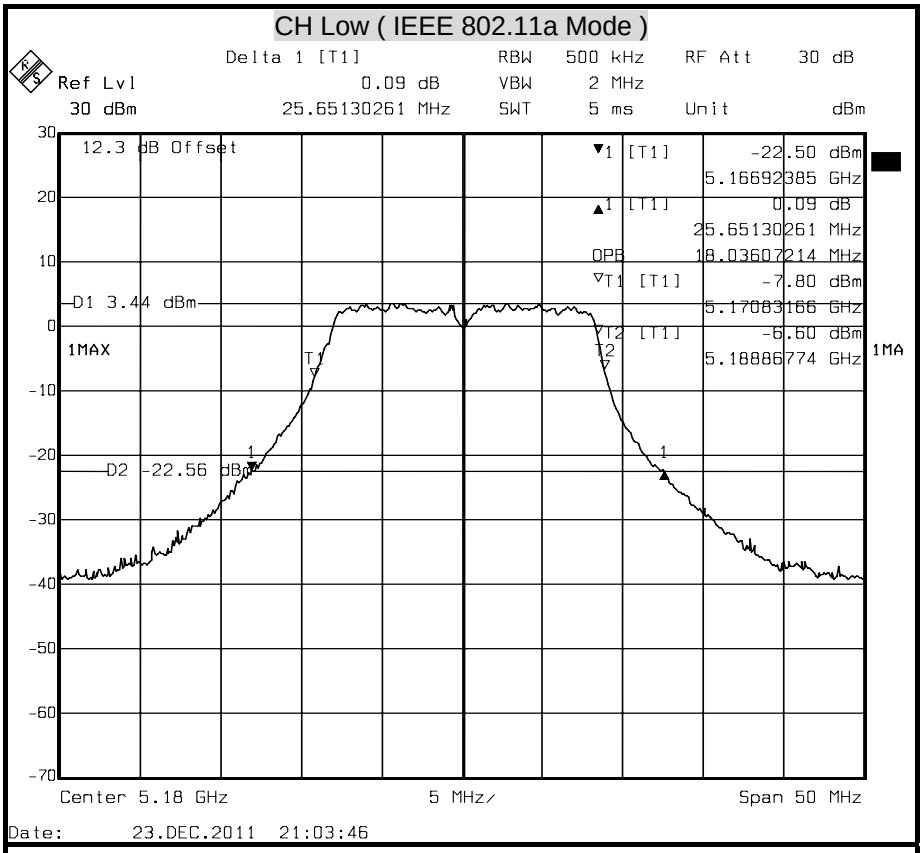
Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
Low	5180	25.050	24.349	PASS
Middle	5220	25.952	24.148	PASS
High	5240	25.591	24.589	PASS

IEEE 802.11 n HT40 Mode

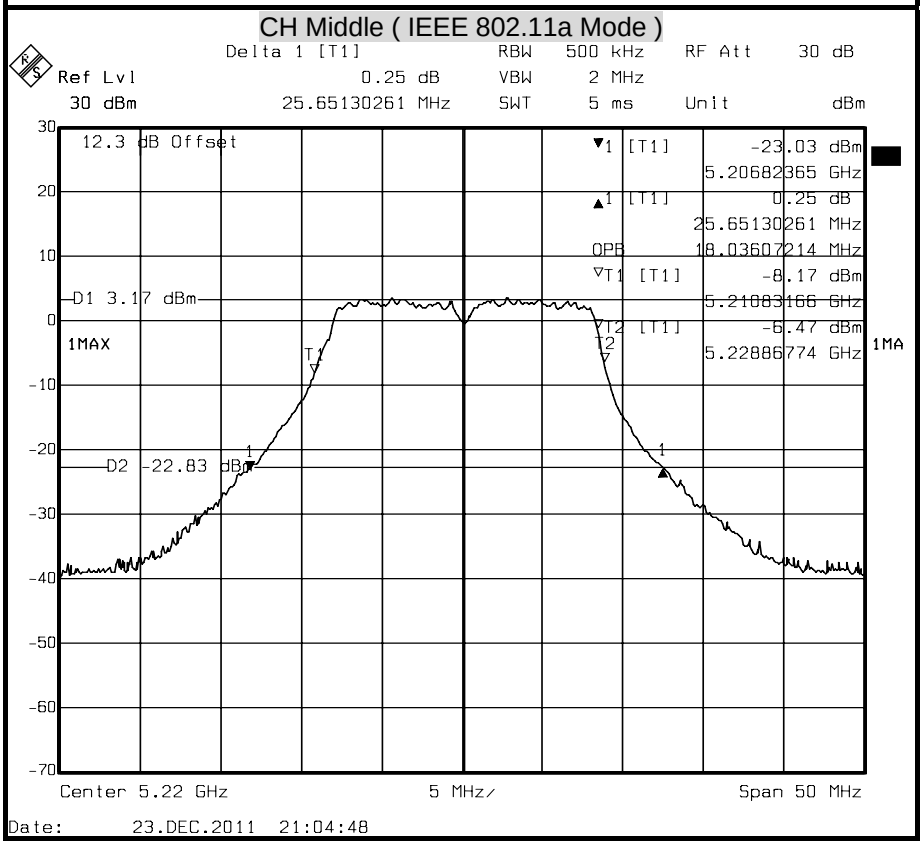
Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
Low	5190	43.337	42.936	PASS
Middle	5210	43.176	43.176	PASS
High	5230	43.217	43.016	PASS

26dB BANDWIDTH

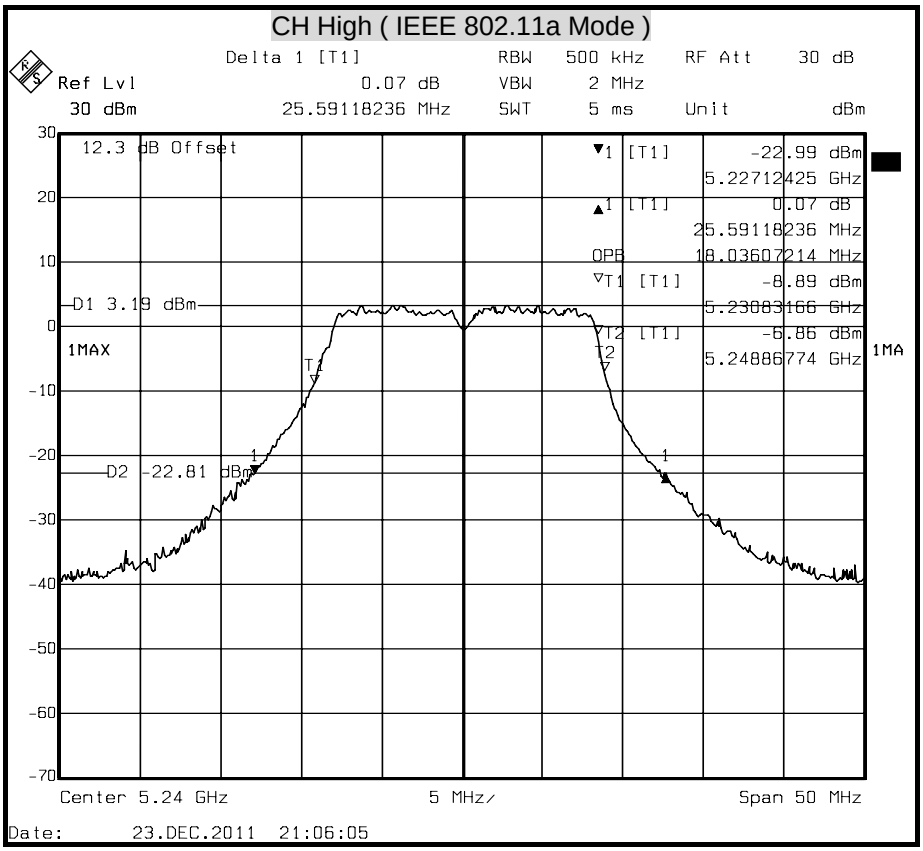
CH Low (IEEE 802.11a Mode)



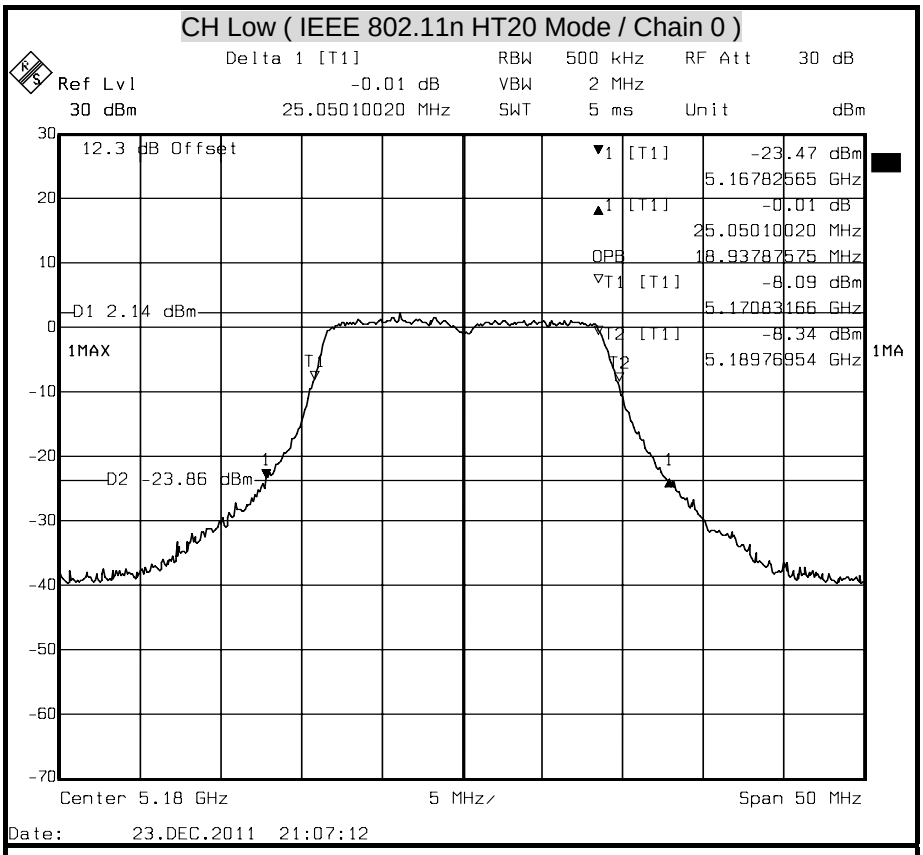
CH Middle (IEEE 802.11a Mode)



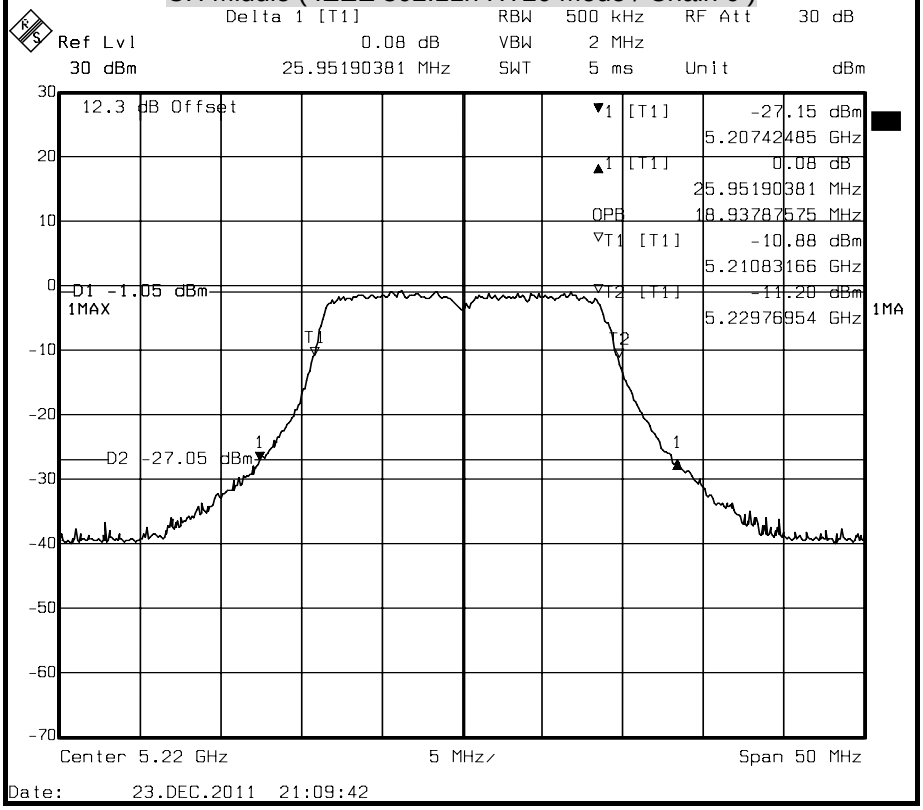
CH High (IEEE 802.11a Mode)

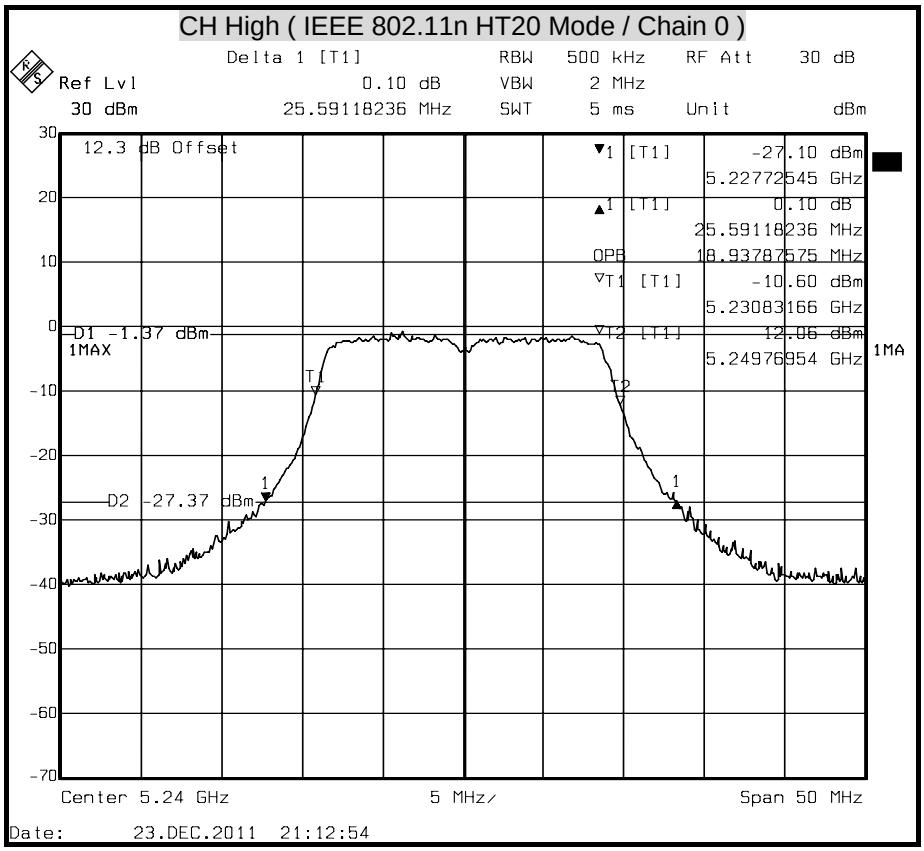


CH Low (IEEE 802.11n HT20 Mode / Chain 0)

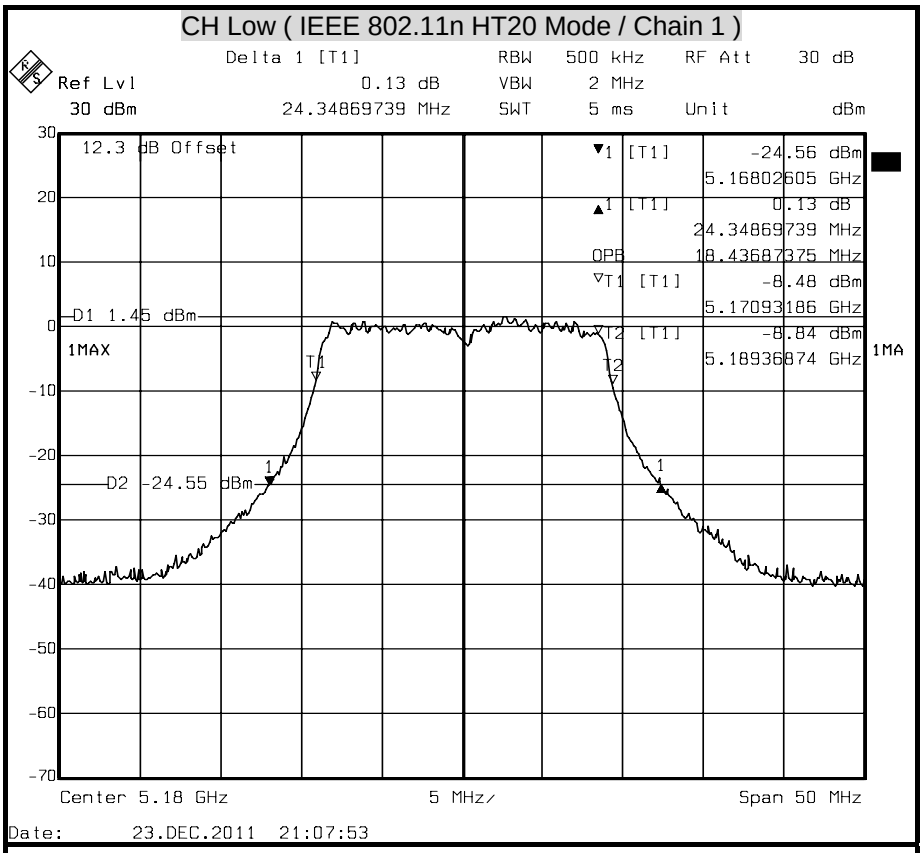


CH Middle (IEEE 802.11n HT20 Mode / Chain 0)

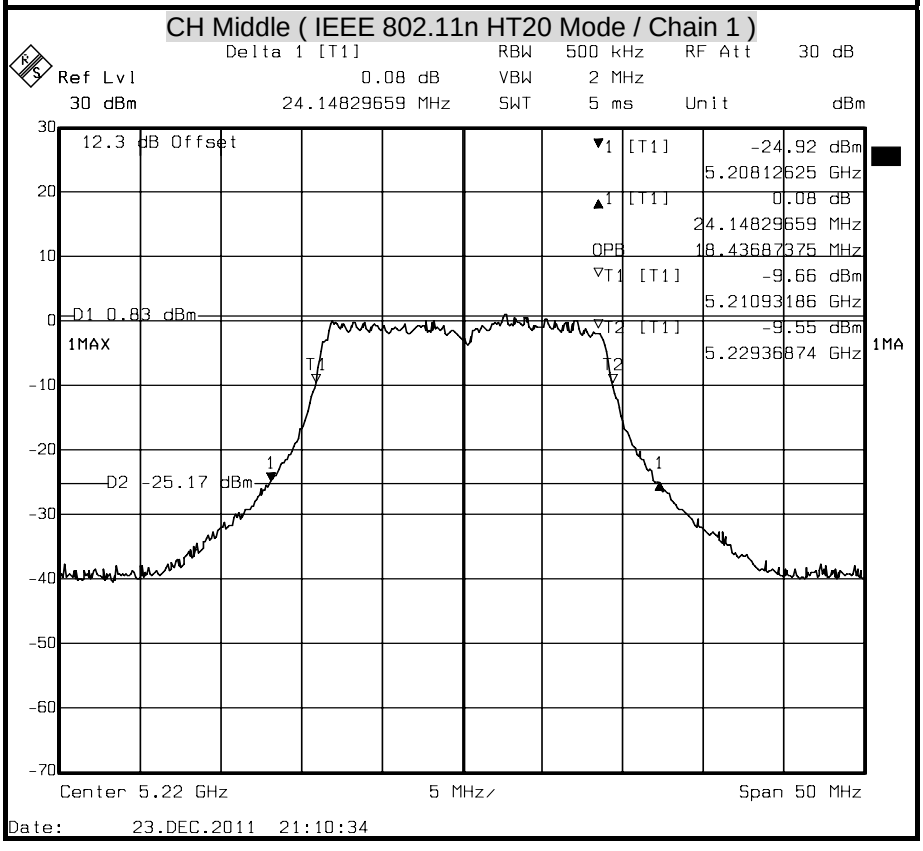




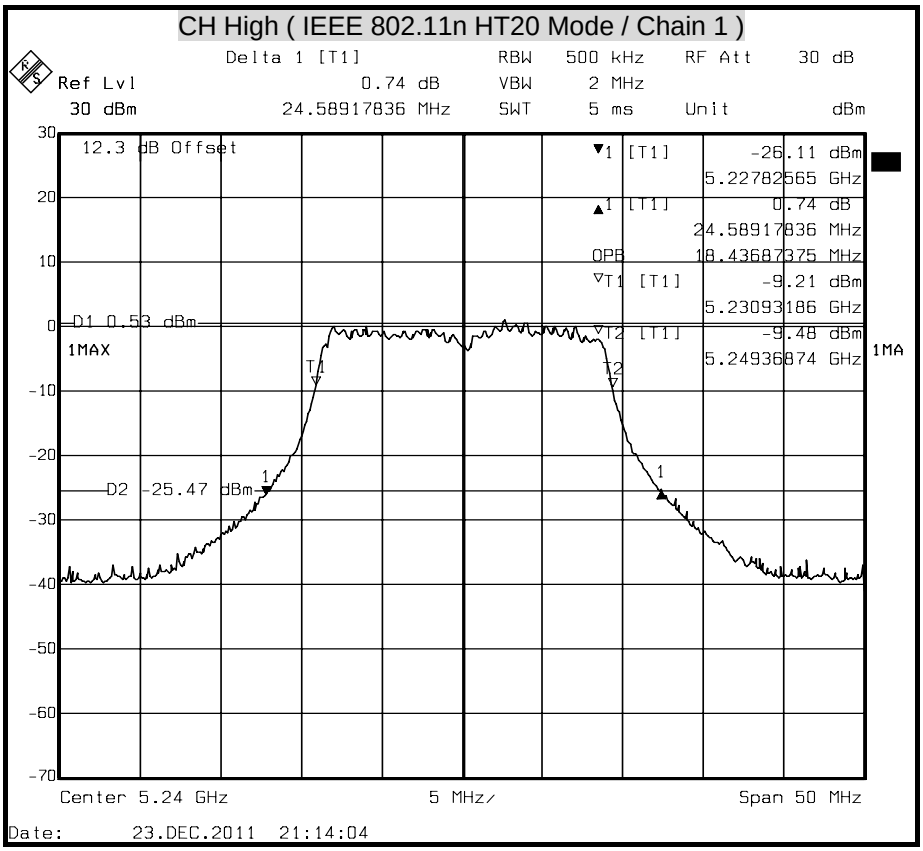
CH Low (IEEE 802.11n HT20 Mode / Chain 1)



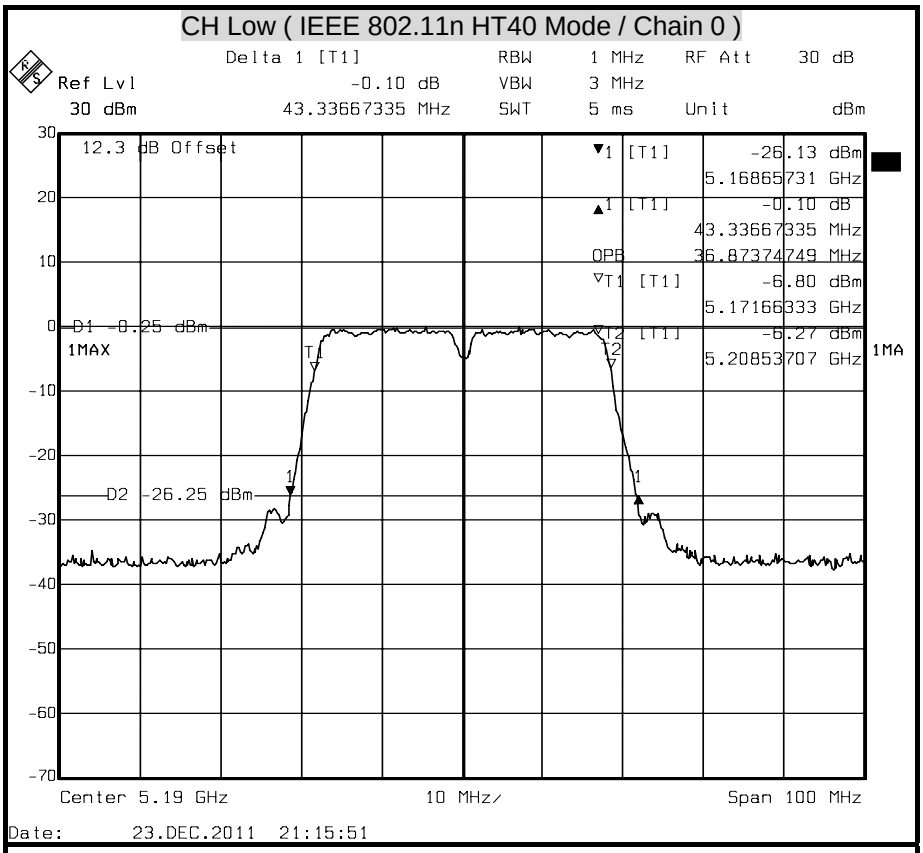
CH Middle (IEEE 802.11n HT20 Mode / Chain 1)



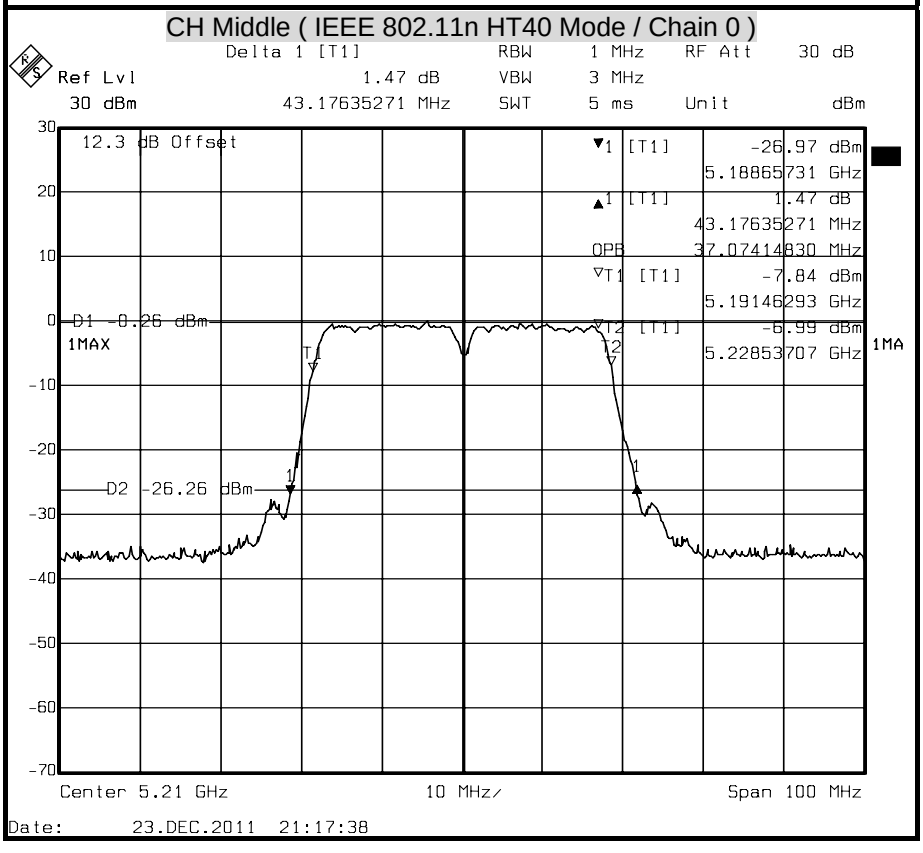
CH High (IEEE 802.11n HT20 Mode / Chain 1)



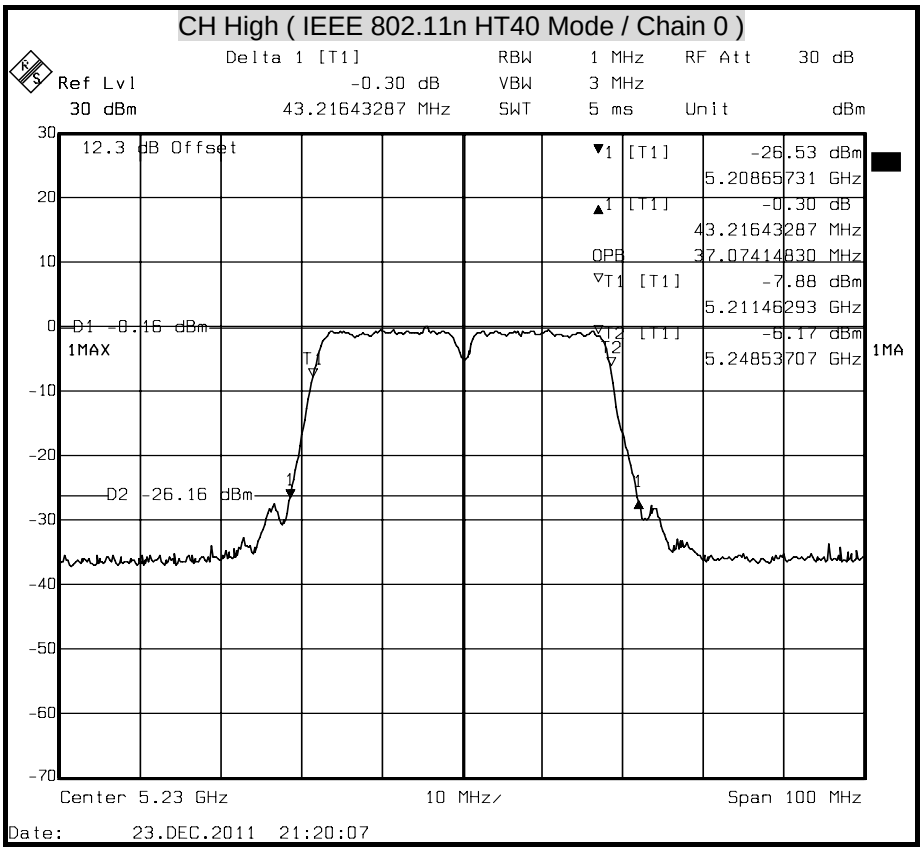
CH Low (IEEE 802.11n HT40 Mode / Chain 0)



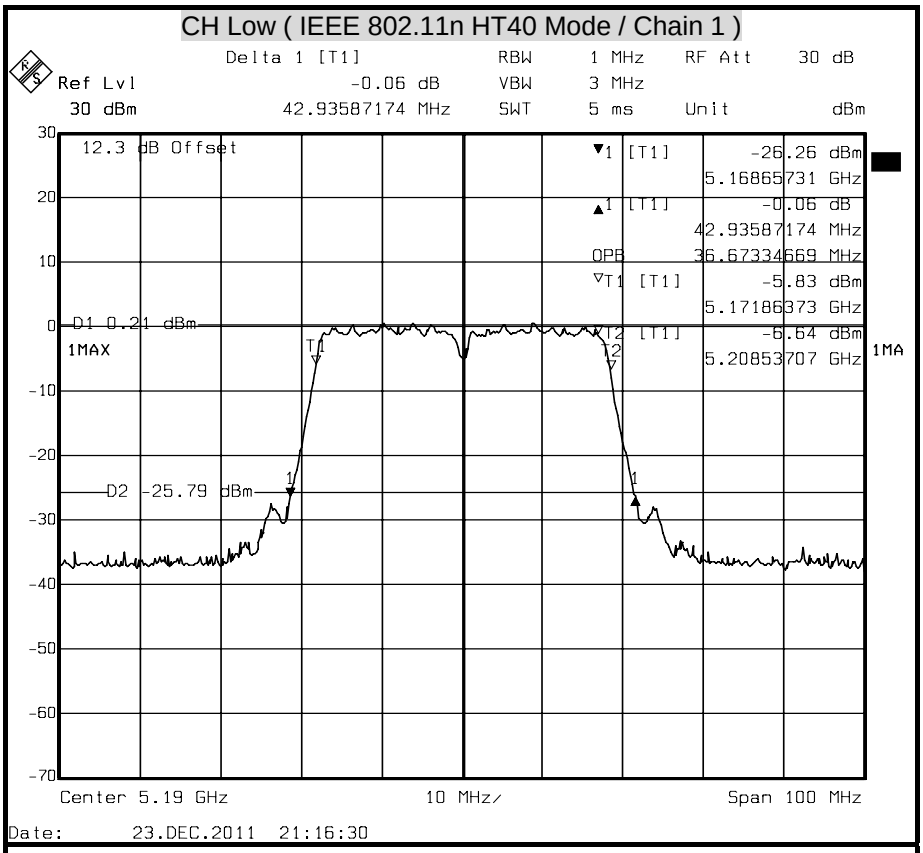
CH Middle (IEEE 802.11n HT40 Mode / Chain 0)



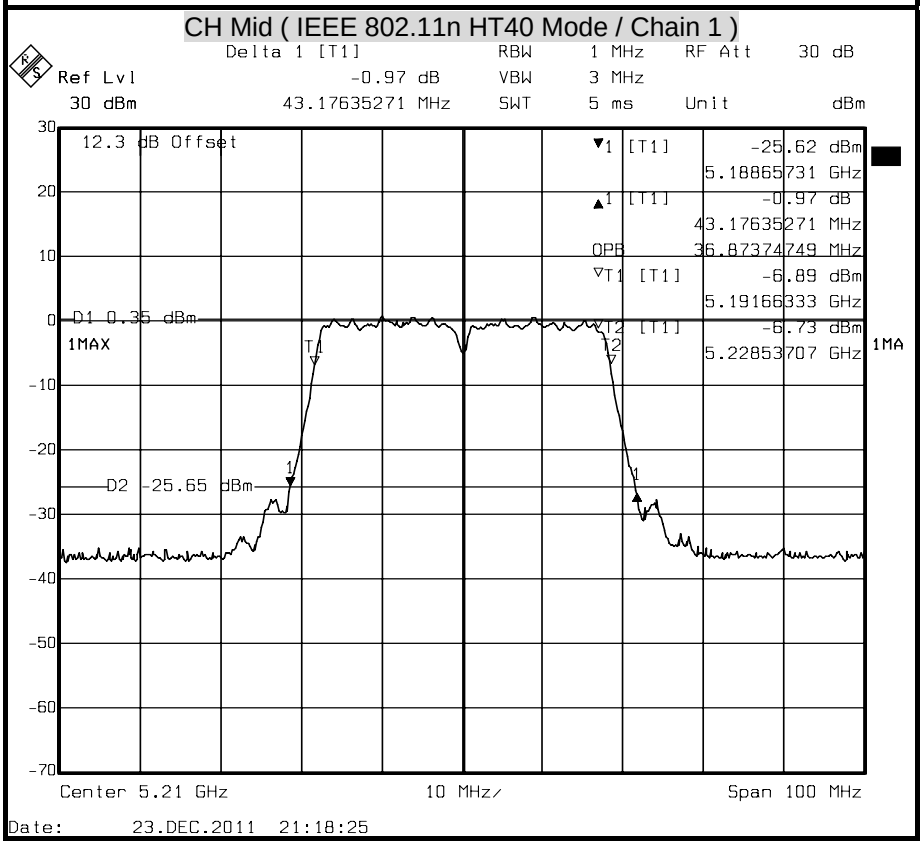
CH High (IEEE 802.11n HT40 Mode / Chain 0)



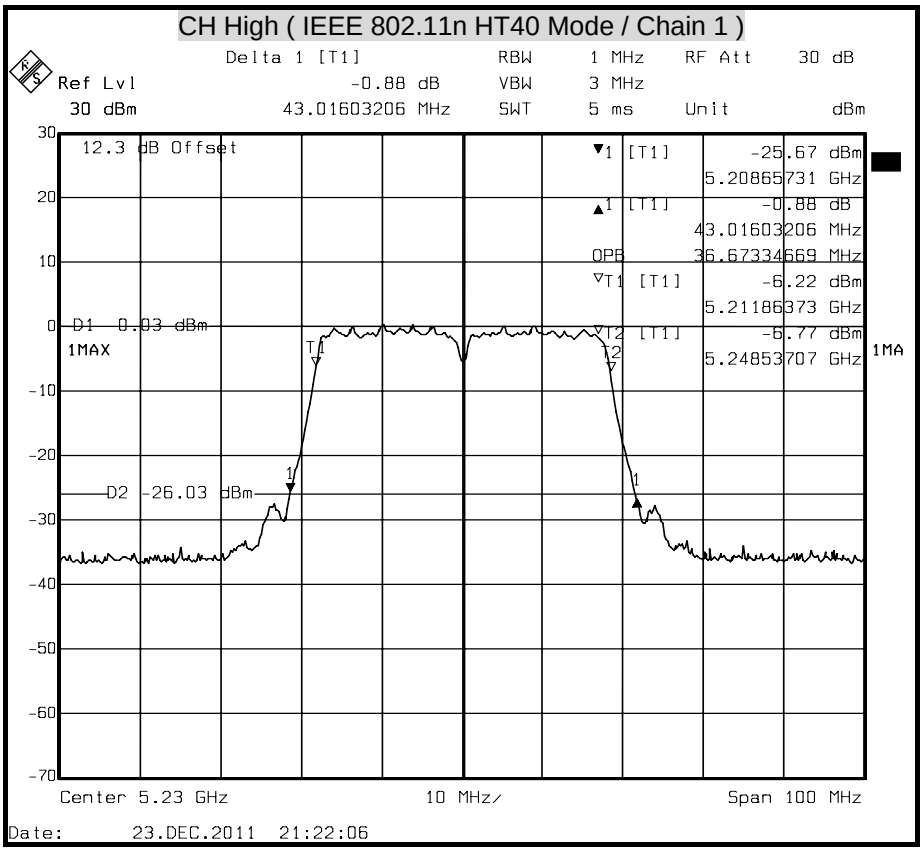
CH Low (IEEE 802.11n HT40 Mode / Chain 1)



CH Mid (IEEE 802.11n HT40 Mode / Chain 1)



CH High (IEEE 802.11n HT40 Mode / Chain 1)



7.2 MAXIMUM CONDUCTED OUTPUT POWER

LIMITS

§ 15.407(a)

(1) For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50mW (17dBm) or 4dBm + 10log B, where B is the 26dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4dBm in any 1 MHz band.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the 26 dB emission bandwidth in MHz.

If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

The peak power shall not exceeded the limit as follows:

IEEE 802.11a mode

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5180	25.651	14.09	18.09	17.00
Middle	5220	25.651	14.09	18.09	17.00
High	5240	25.591	14.08	18.08	17.00

IEEE 802.11n HT20 mode

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)		10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 0	Chain 1			
Low	5180	25.050	24.349	13.99	17.99	17.00
Middle	5220	25.952	24.148	14.14	18.14	17.00
High	5240	25.591	24.589	14.08	18.08	17.00

IEEE 802.11n HT40 mode

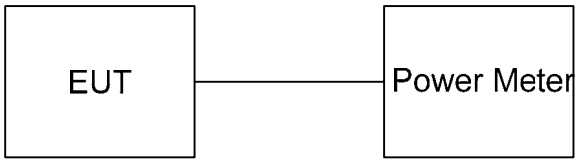
Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)		10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 0	Chain 1			
Low	5190	43.337	42.936	16.37	20.37	17.00
Middle	5210	43.176	43.176	16.35	20.35	17.00
High	5230	43.217	43.016	16.36	20.36	17.00

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Anritsu	ML2487A	6K00003888	MAY 30, 2012

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

TEST SETUP



TEST PROCEDURE

Set span to encompass the entire emission bandwidth (EBW) of the signal.

Set RBW = 1 MHz / Set VBW = 3 MHz.

Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”. Trace average 100 traces in power averaging mode. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

TEST RESULTS

IEEE 802.11a Mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	5180	8.86	17	PASS
Middle	5220	8.71	17	PASS
High	5240	8.31	17	PASS

Remark:

1. At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 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			Peak Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Total		
Low	5180	7.16	6.74	9.97	15.99	PASS
Middle	5220	9.21	8.26	11.77	15.99	PASS
High	5240	7.52	8.01	10.78	15.99	PASS

Remark:

1. At finial test to get the worst-case emission at 13Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 Mode

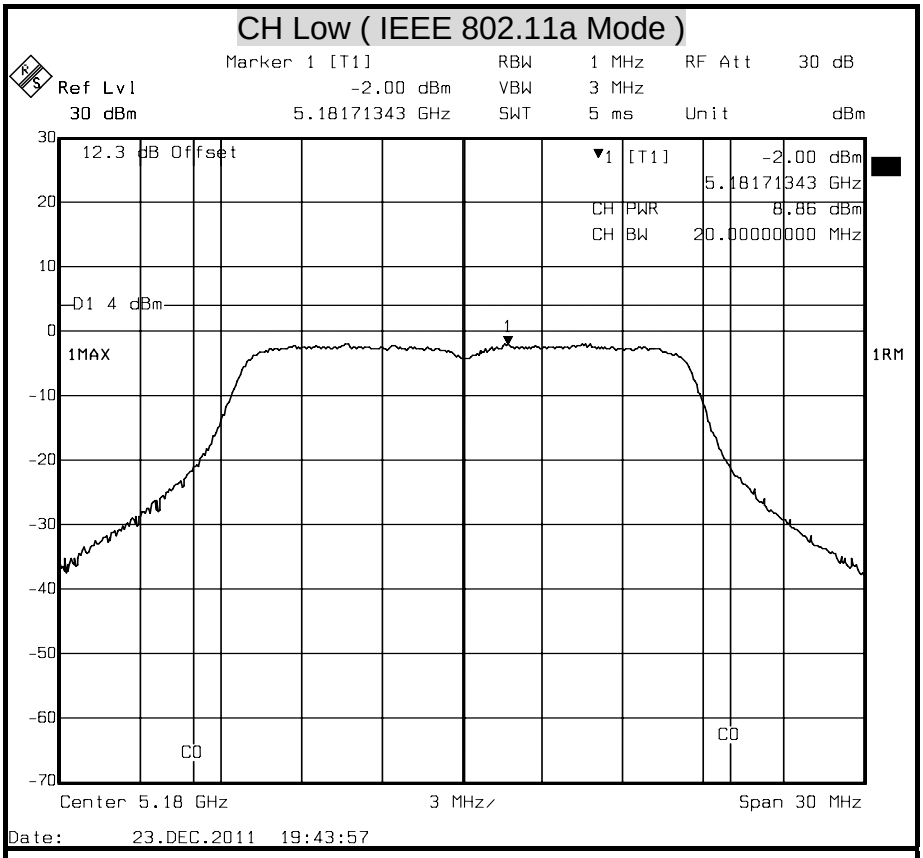
Channel	Channel Frequency (MHz)	Peak Power			Peak Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Total		
Low	5190	8.08	7.84	10.97	15.99	PASS
Middle	5210	8.22	8.25	11.25	15.99	PASS
High	5230	7.90	8.48	11.21	15.99	PASS

Remark:

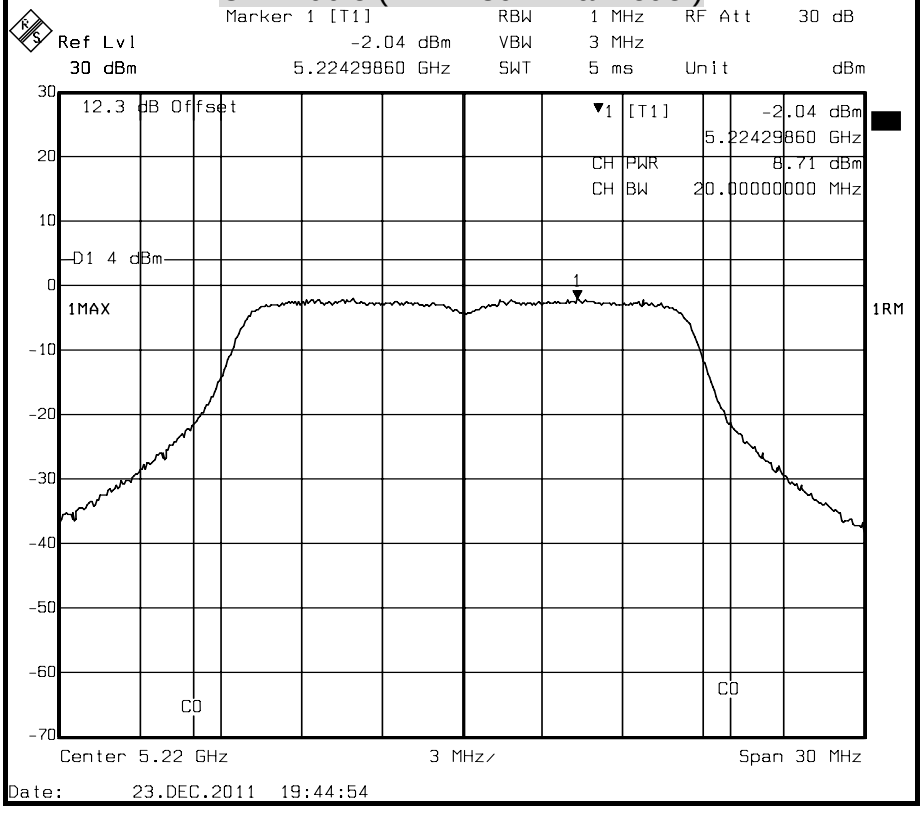
1. At finial test to get the worst-case emission at 27Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

MAXIMUM CONDUCTED OUTPUT POWER

CH Low (IEEE 802.11a Mode)



CH Middle (IEEE 802.11a Mode)



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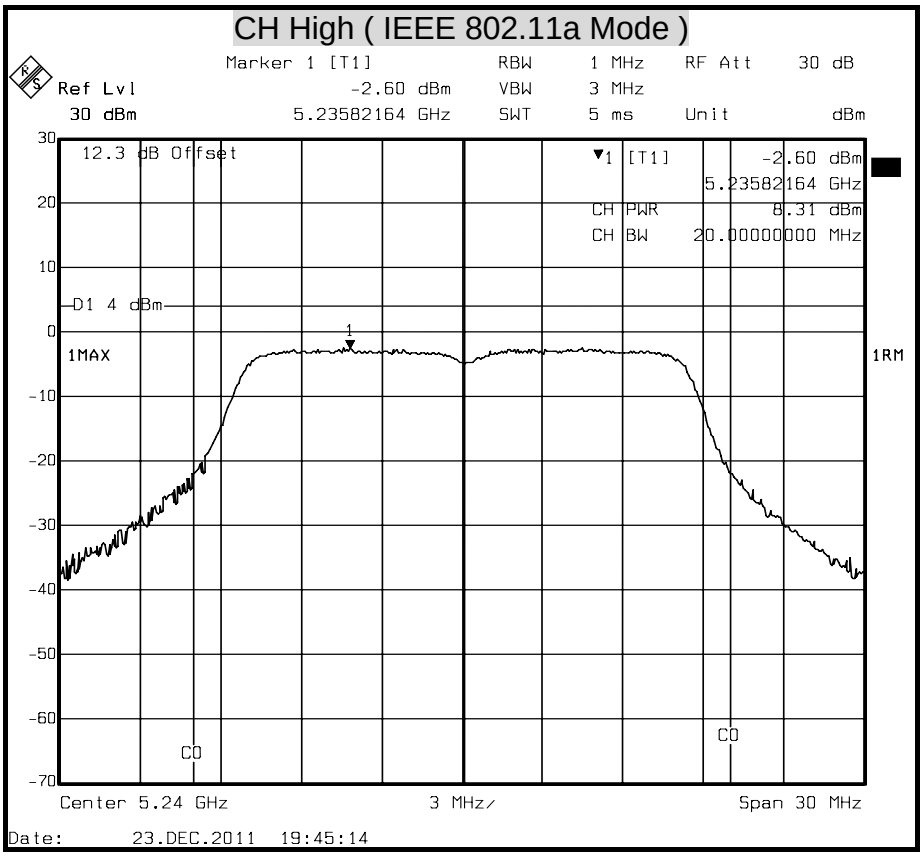
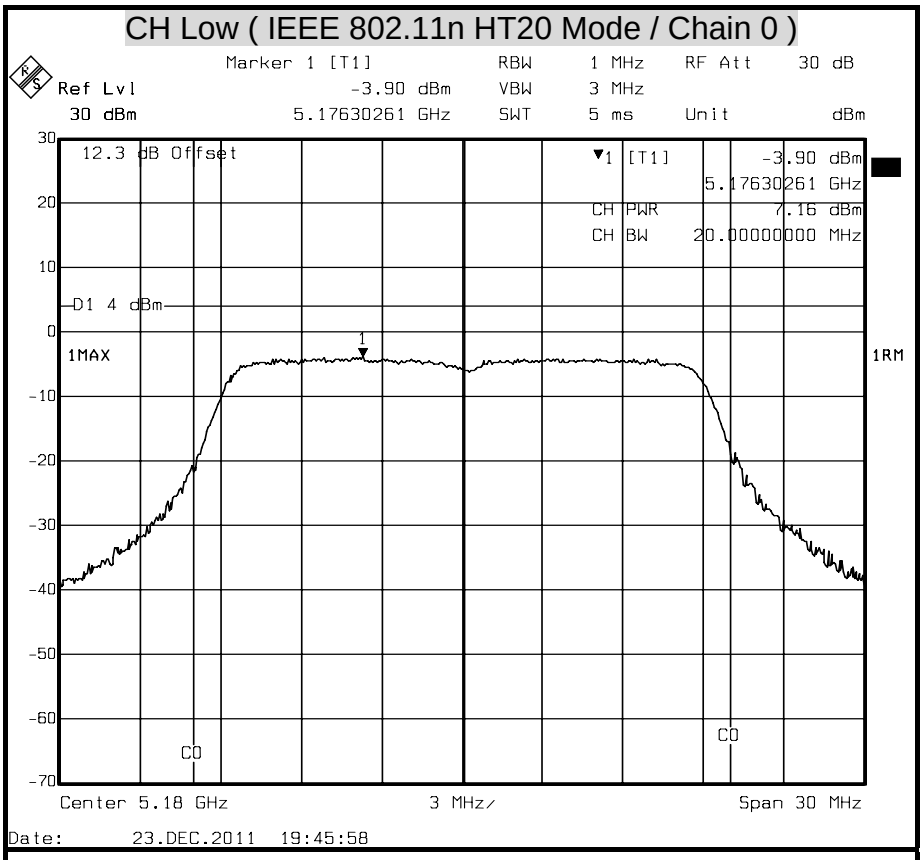
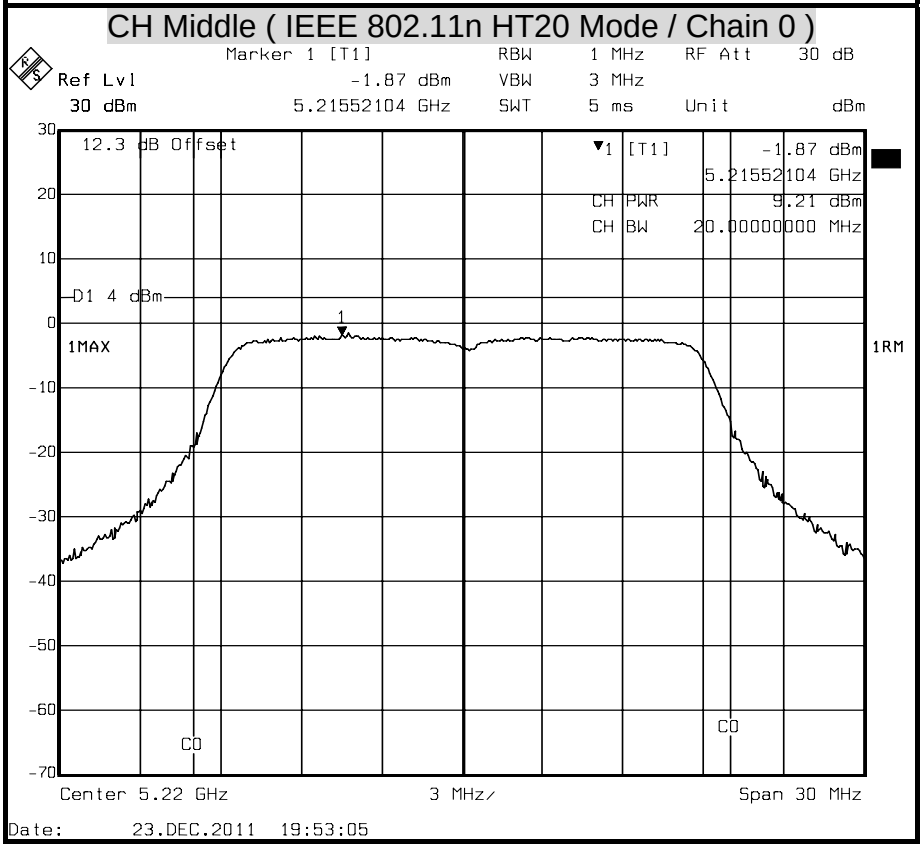


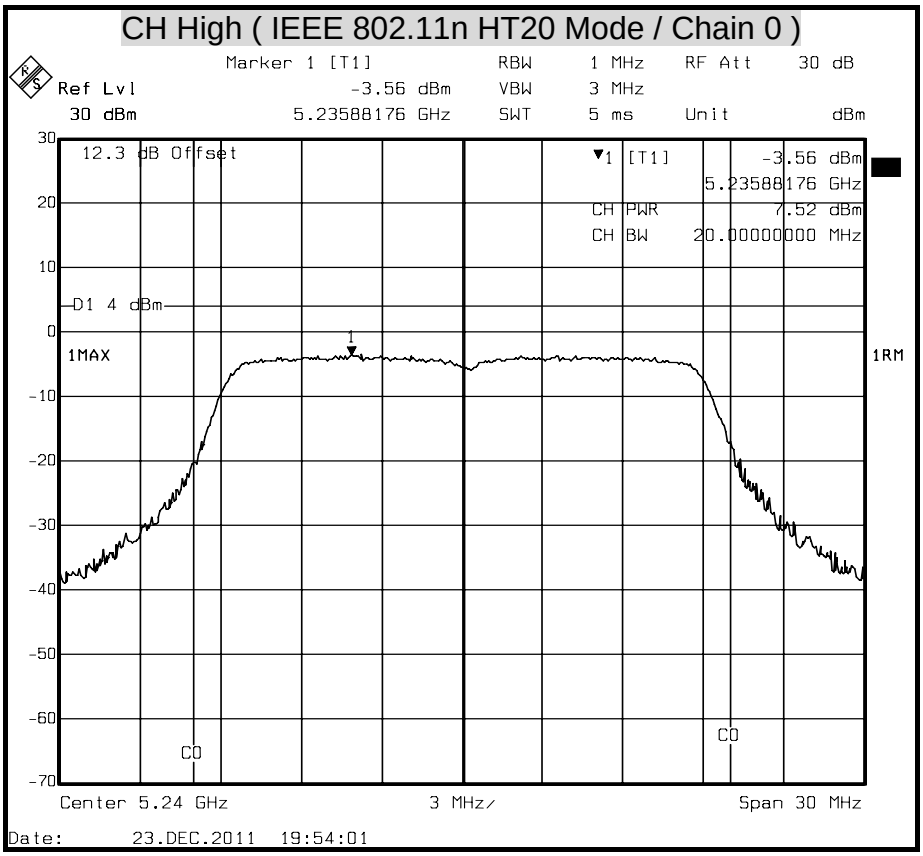
CH Low (IEEE 802.11n HT20 Mode / Chain 0)



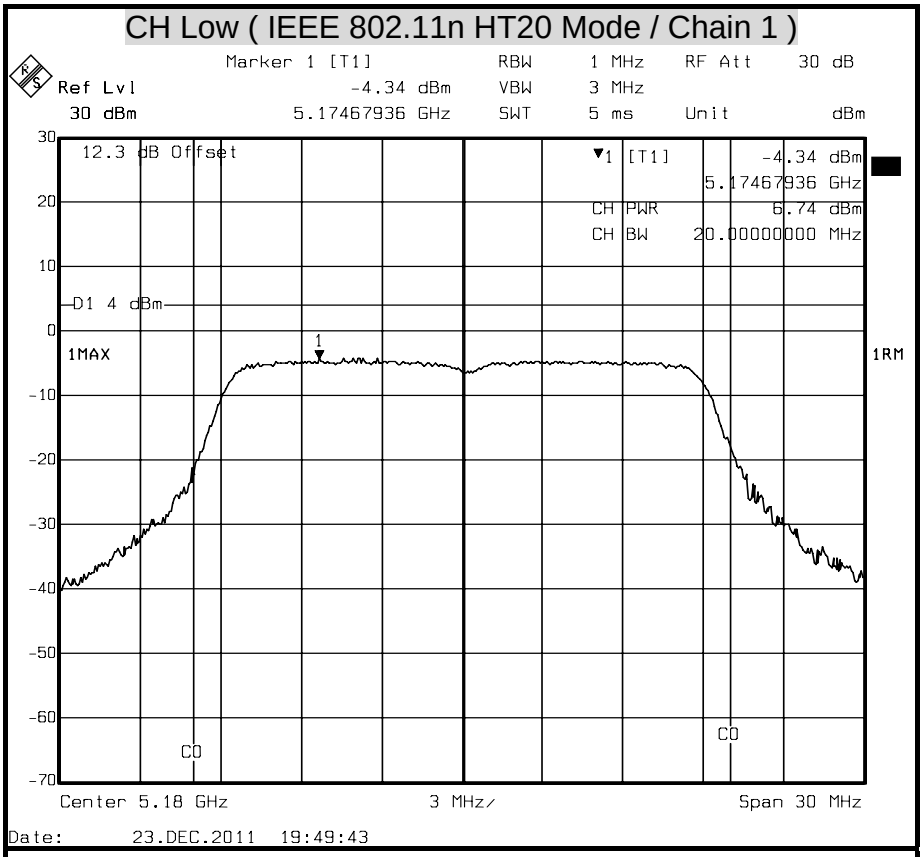
CH Middle (IEEE 802.11n HT20 Mode / Chain 0)



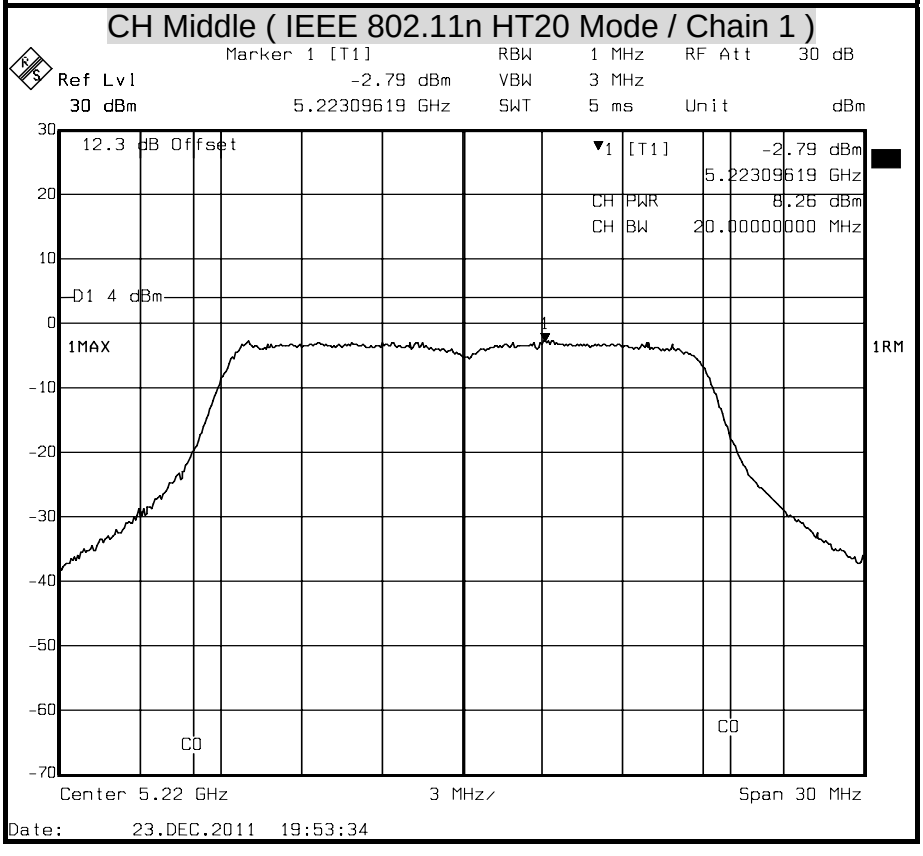
CH High (IEEE 802.11n HT20 Mode / Chain 0)



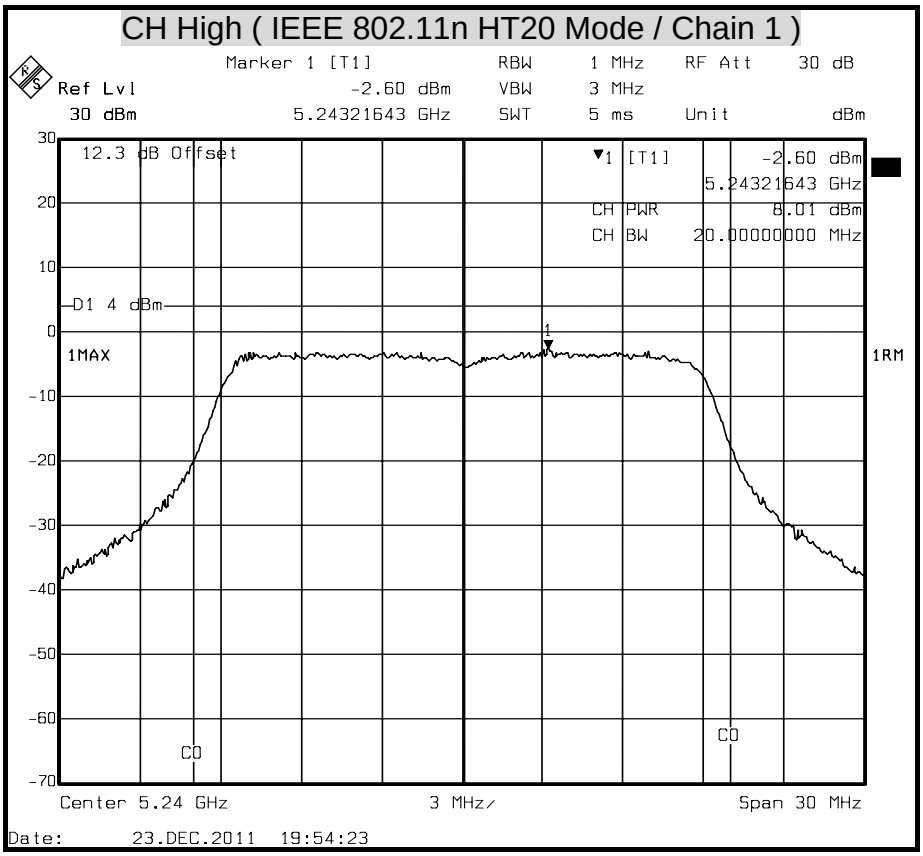
CH Low (IEEE 802.11n HT20 Mode / Chain 1)



CH Middle (IEEE 802.11n HT20 Mode / Chain 1)



CH High (IEEE 802.11n HT20 Mode / Chain 1)



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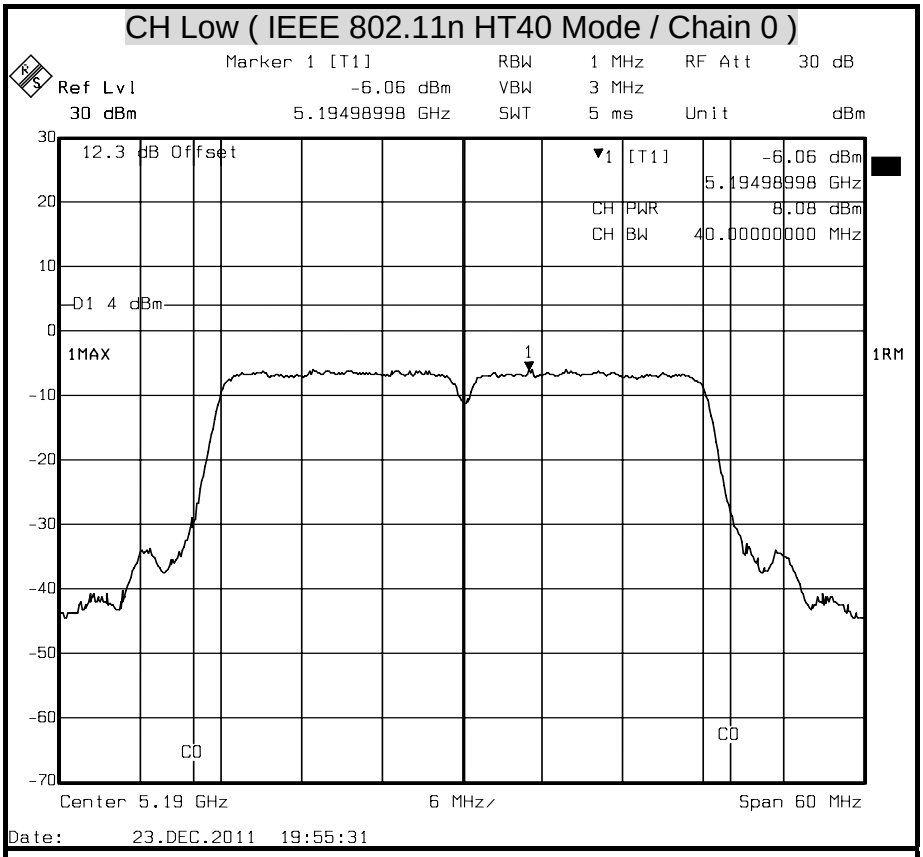

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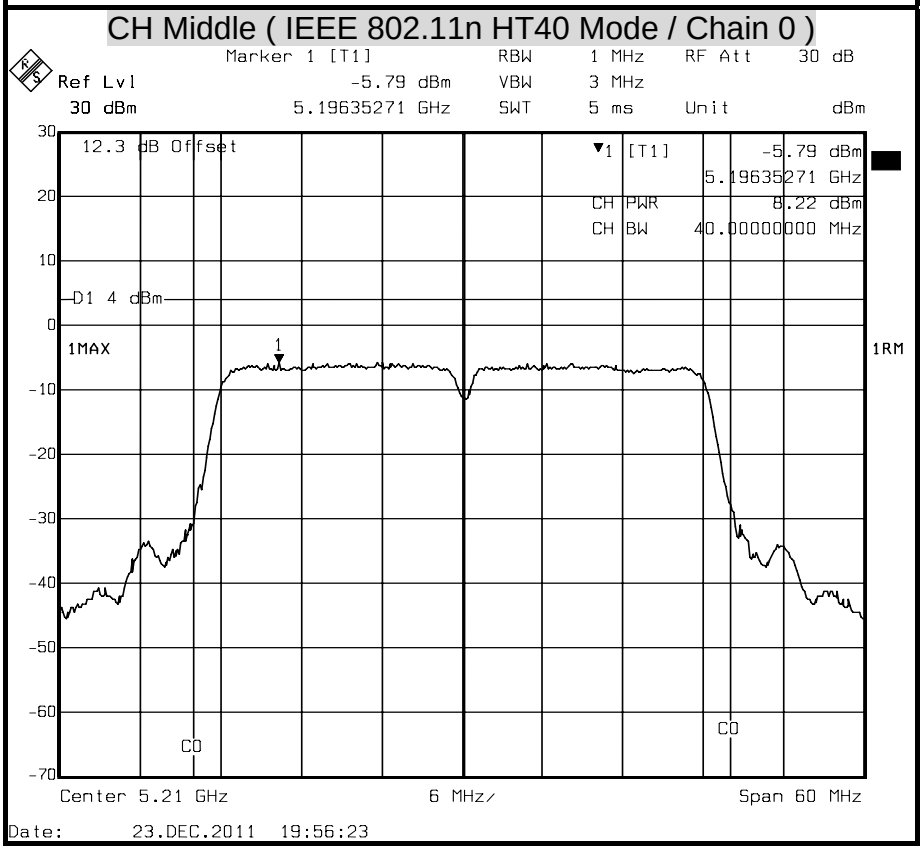
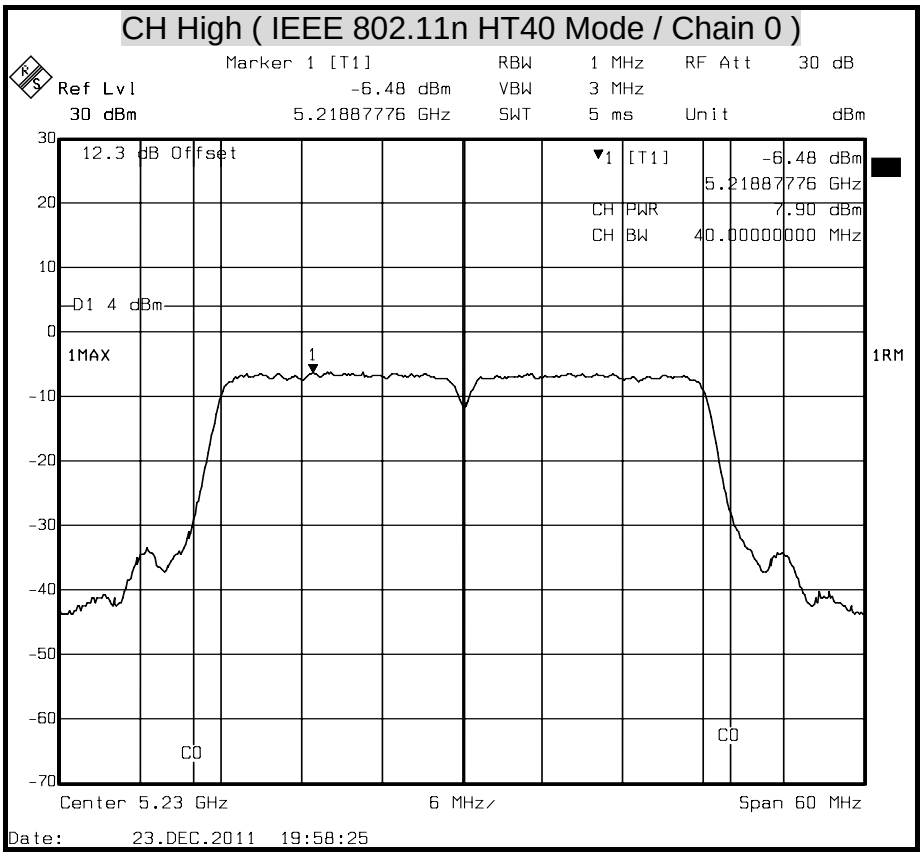
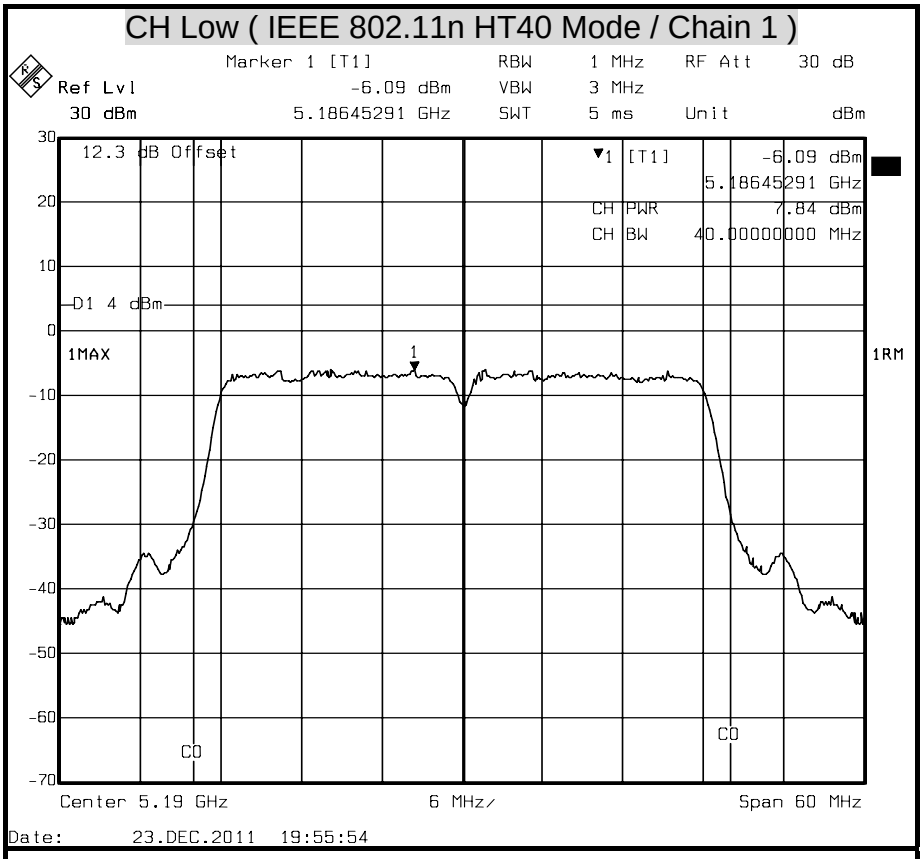


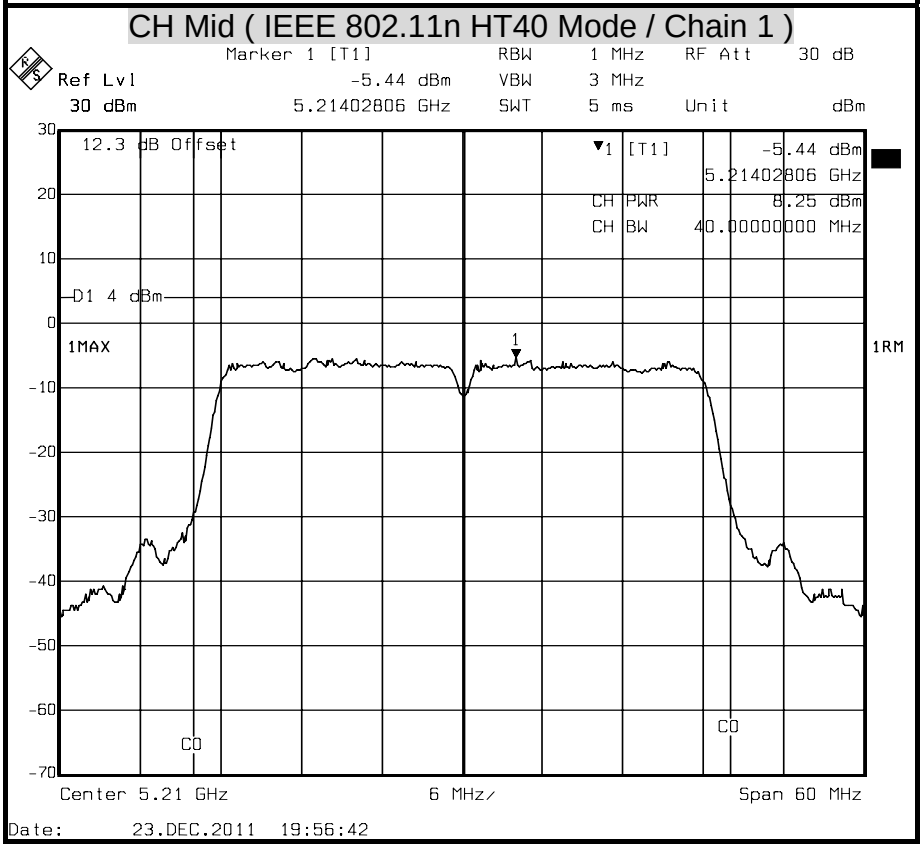
CH High (IEEE 802.11n HT40 Mode / Chain 0)



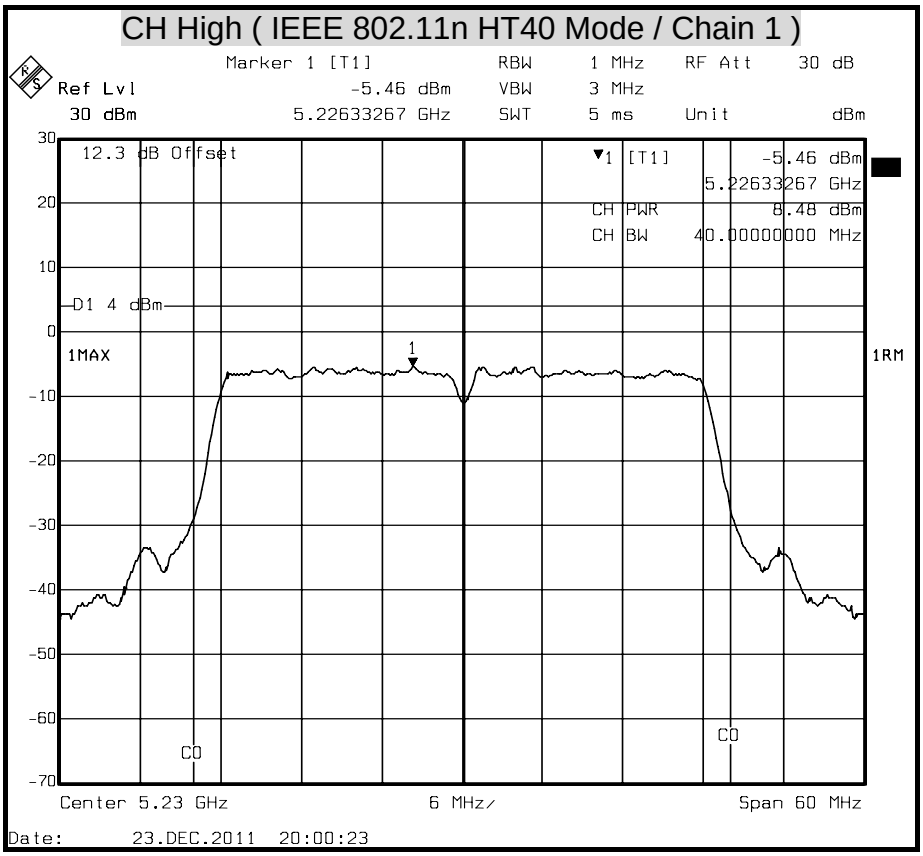
CH Low (IEEE 802.11n HT40 Mode / Chain 1)



CH Mid (IEEE 802.11n HT40 Mode / Chain 1)



CH High (IEEE 802.11n HT40 Mode / Chain 1)



7.3 PEAK POWER SPECTRAL DENSITY

LIMITS

§ 15.407 (a)

(1) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4dBm in any 1MHz band.

(2) For the band 5.25-5.35 GHz and 5.47-5725 GHz, the peak power spectral density shall not exceed 11dBm in any 1MHz band.

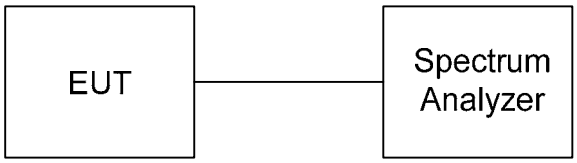
If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP. 29, 2012

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

TEST SETUP



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
   Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz, Span = Sweep= AUTO
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

TEST RESULTS

IEEE 802.11a Mode

Channel	Channel Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	5180	-2.000	4.00	-6.00	PASS
Middle	5220	-2.040		-6.04	PASS
High	5240	-2.600		-6.60	PASS

Remark:

1. At finial test to get the worst-case emission at 6Mbps.

2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 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)	PPSD (dBm)			Limit (dBm)	Margin (dB)	Pass / Fail
		Chain 0	Chain 1	Tatol			
Low	5180	-3.900	-4.340	-1.10	2.99	-4.09	PASS
Middle	5220	-1.870	-2.790	0.70		-2.29	PASS
High	5240	-3.560	-2.600	-0.04		-3.03	PASS

Remark:

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

2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 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)	PPSD (dBm)			Limit (dBm)	Margin (dB)	Pass / Fail
		Chain 0	Chain 1	Tatol			
Low	5190	-6.060	-6.090	-3.06	2.99	-6.05	PASS
Middle	5210	-5.790	-5.440	-2.60		-5.59	PASS
High	5230	-6.480	-5.460	-2.93		-5.92	PASS

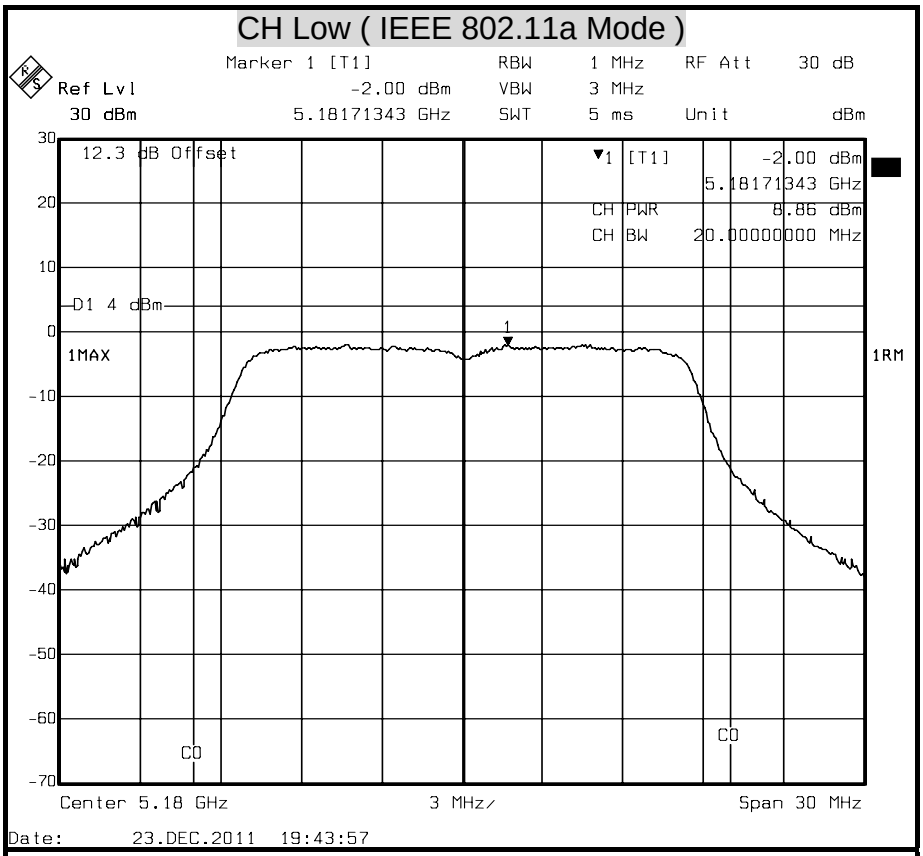
Remark:

1. At finial test to get the worst-case emission at 27Mbps

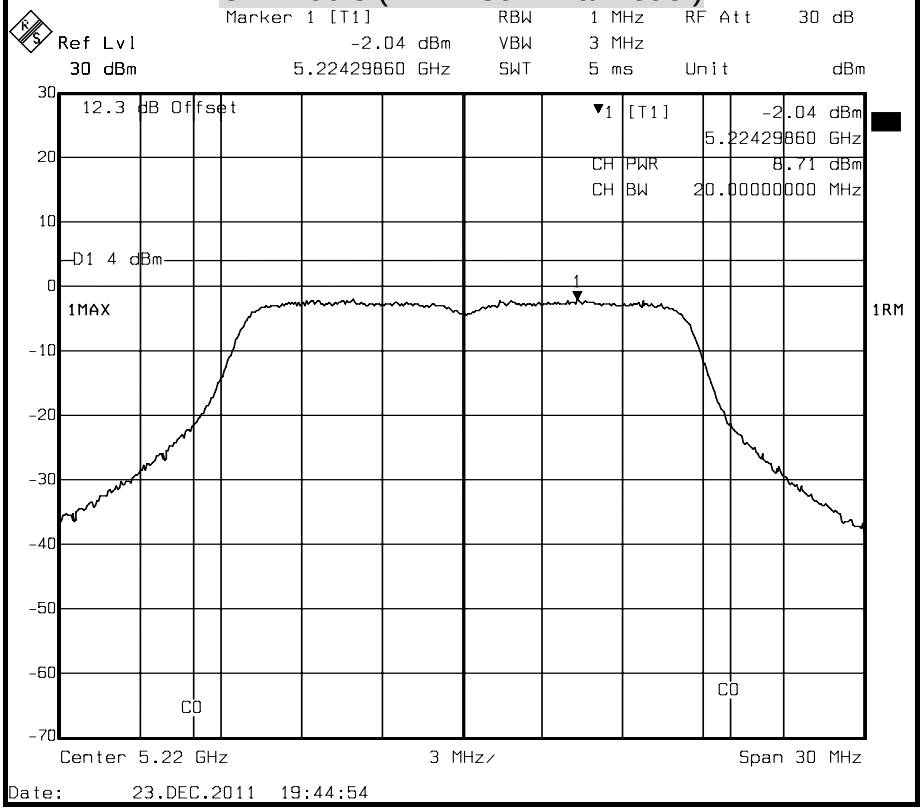
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

PEAK POWER SPECTRAL DENSITY

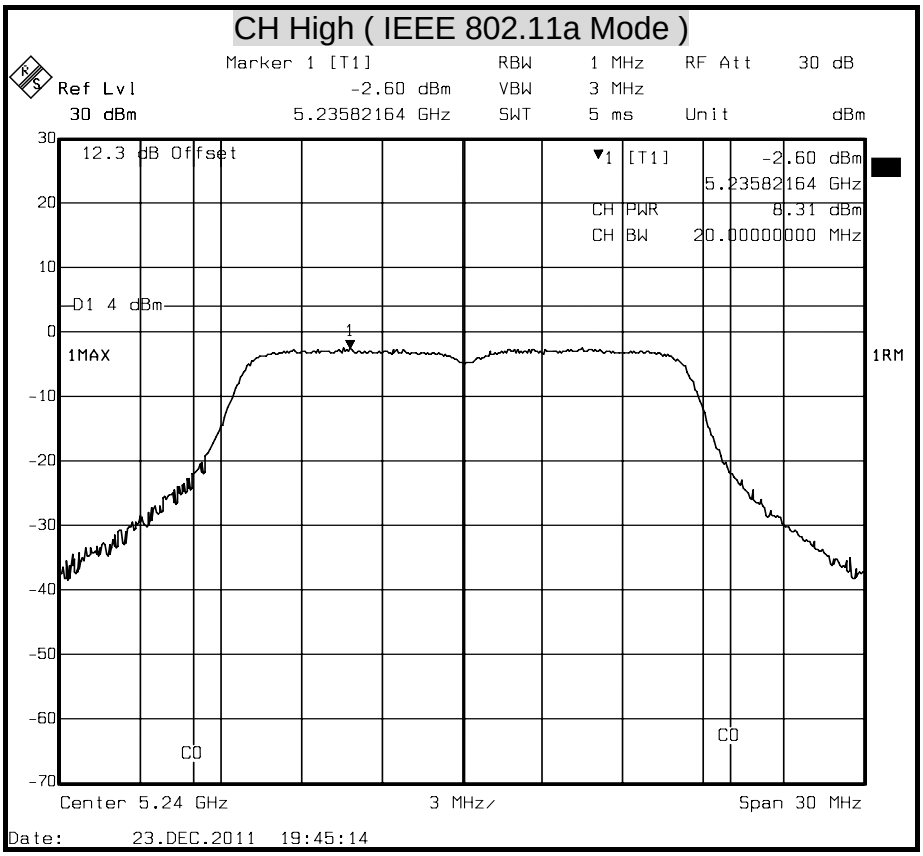
CH Low (IEEE 802.11a Mode)



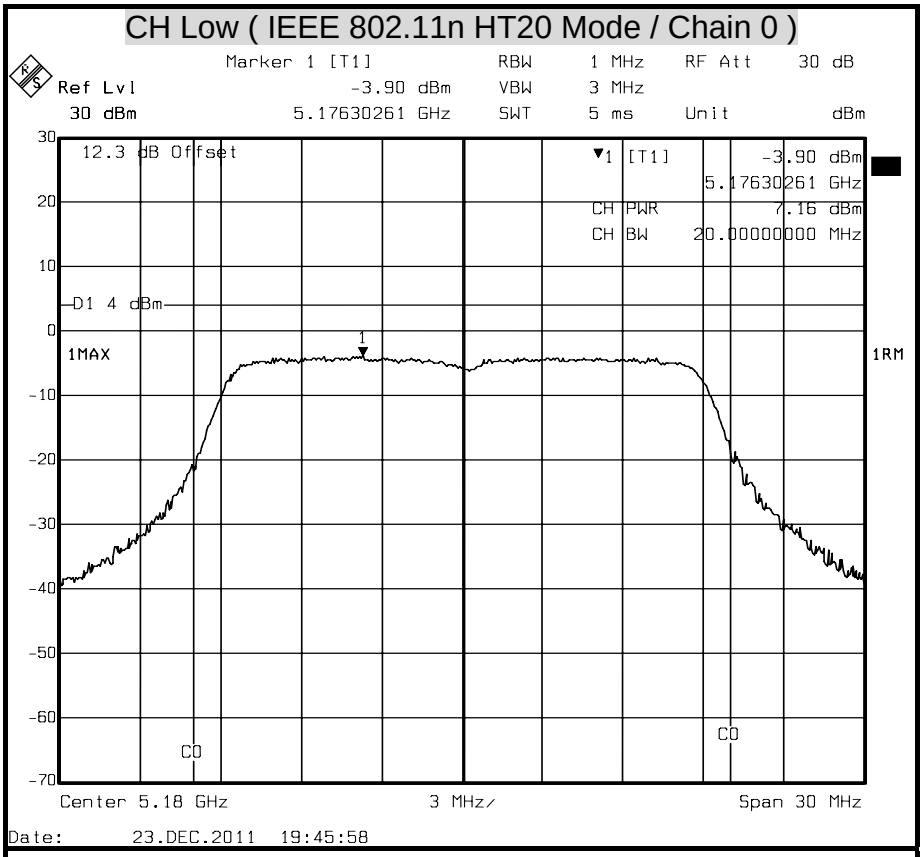
CH Middle (IEEE 802.11a Mode)



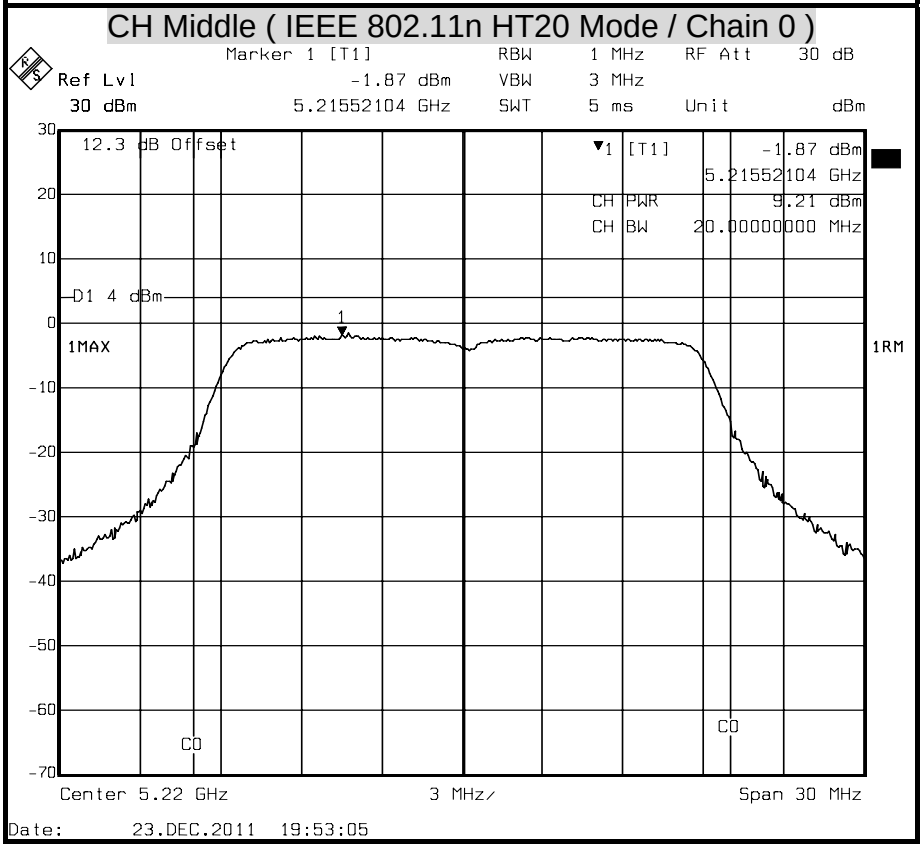
CH High (IEEE 802.11a Mode)



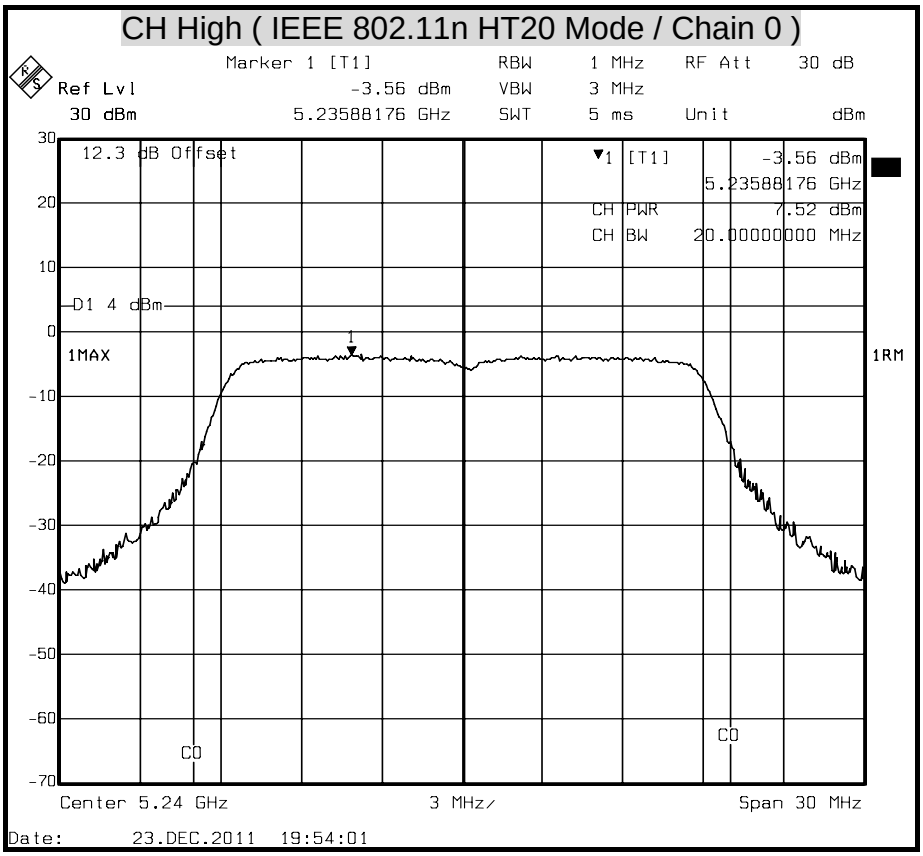
CH Low (IEEE 802.11n HT20 Mode / Chain 0)



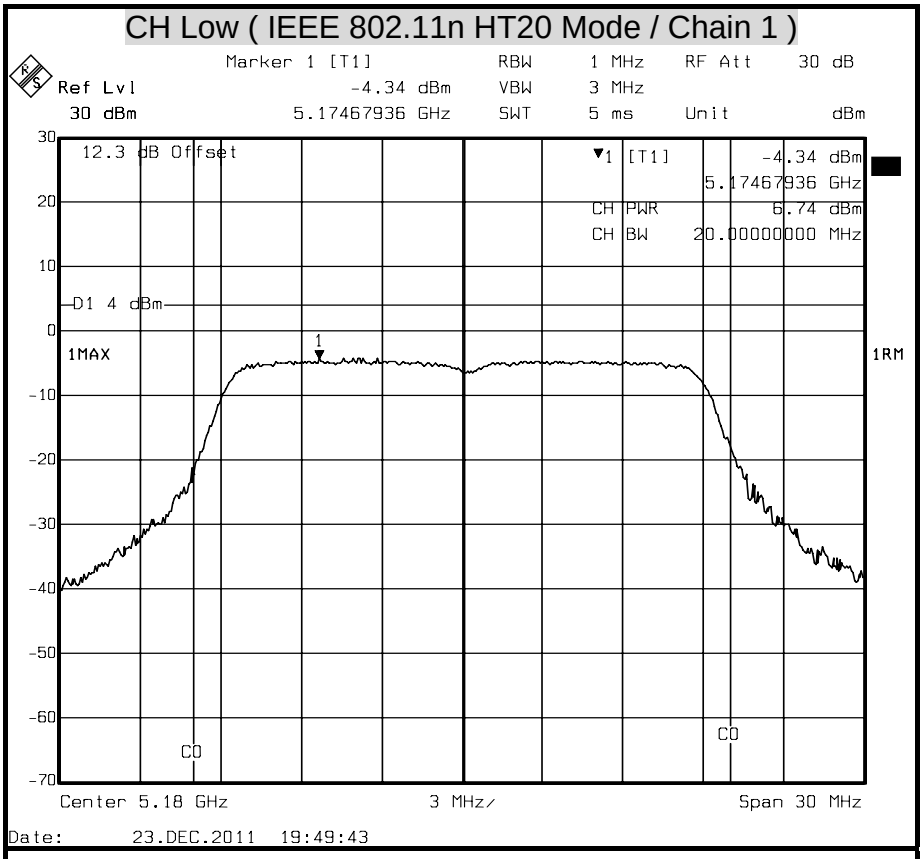
CH Middle (IEEE 802.11n HT20 Mode / Chain 0)



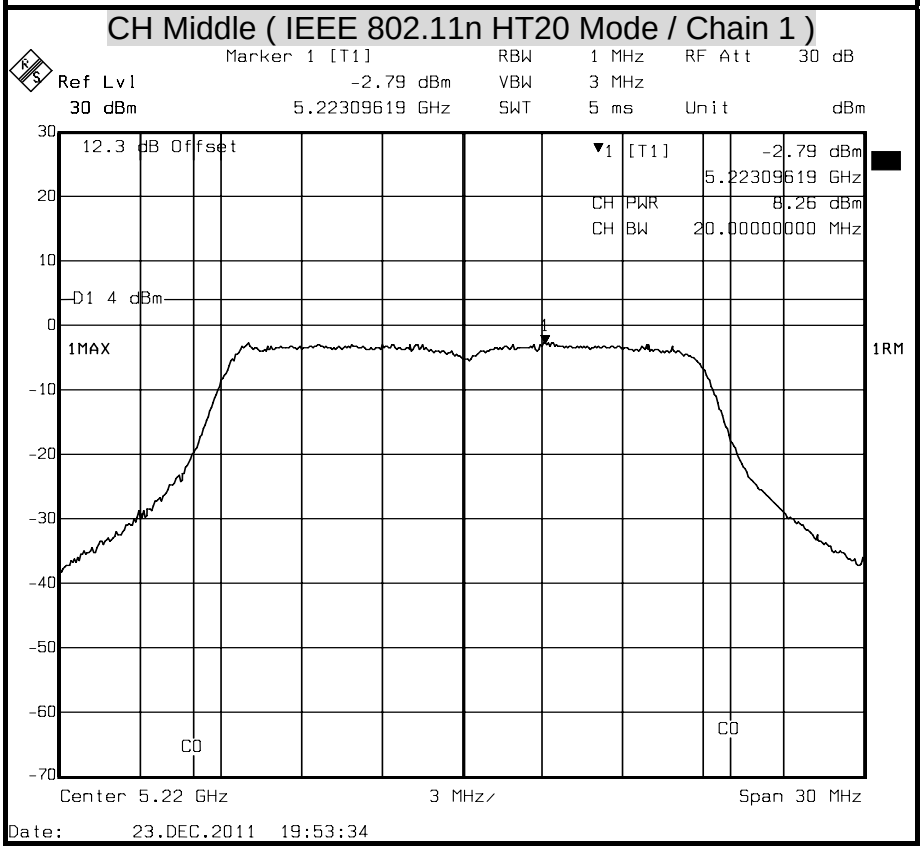
CH High (IEEE 802.11n HT20 Mode / Chain 0)



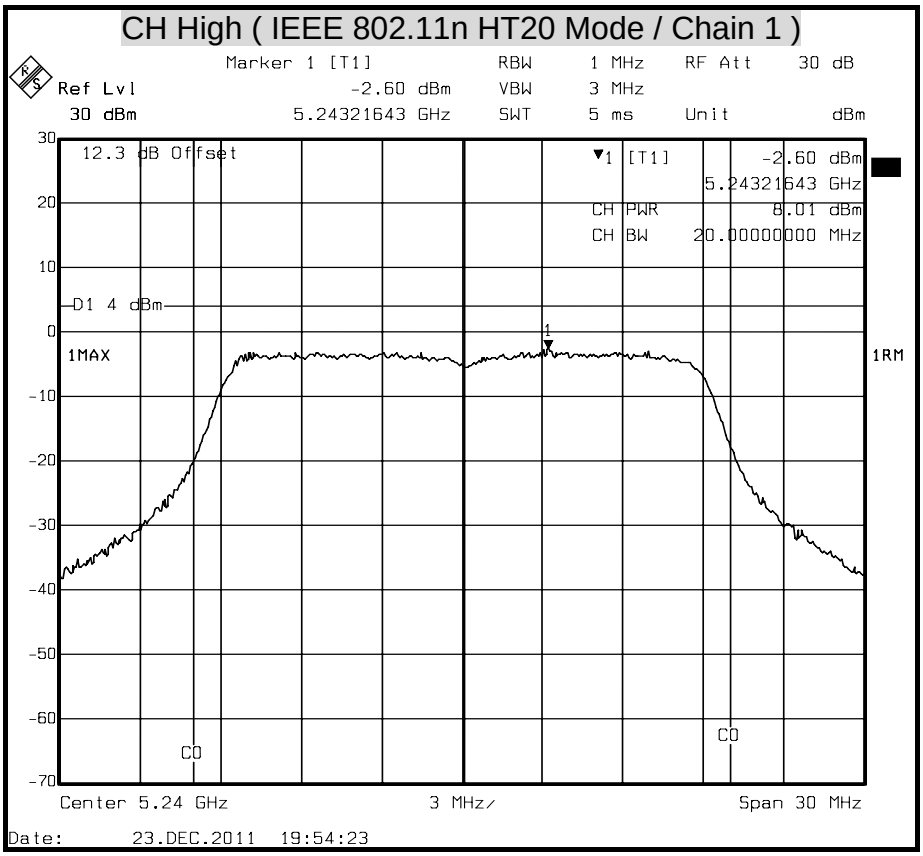
CH Low (IEEE 802.11n HT20 Mode / Chain 1)



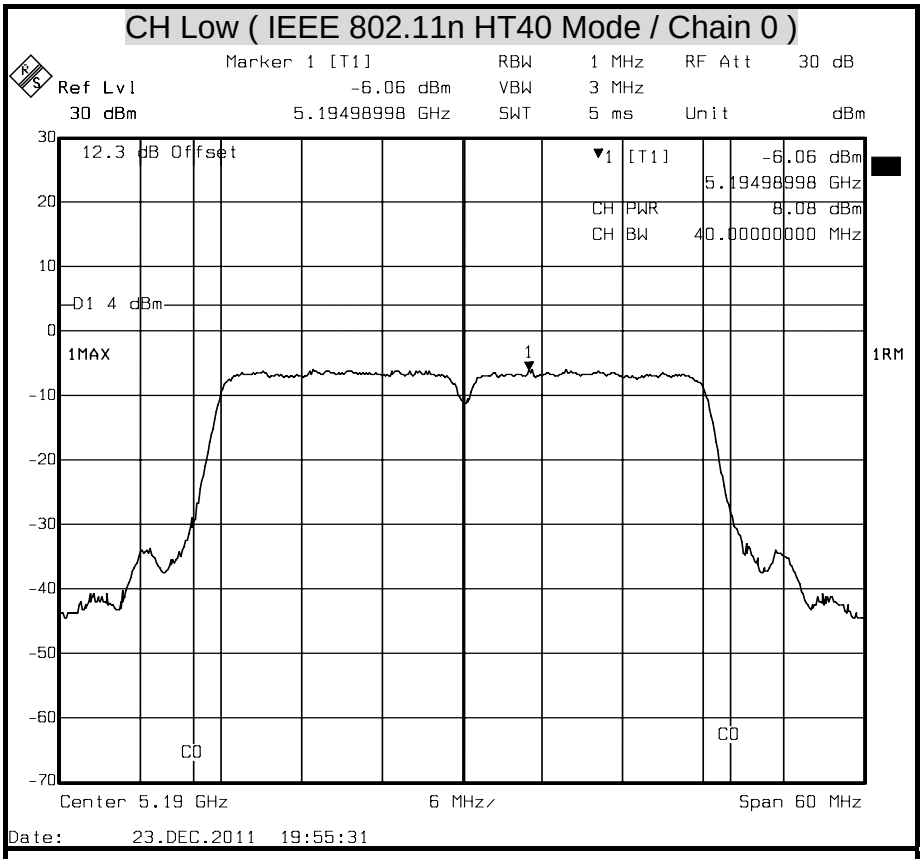
CH Middle (IEEE 802.11n HT20 Mode / Chain 1)



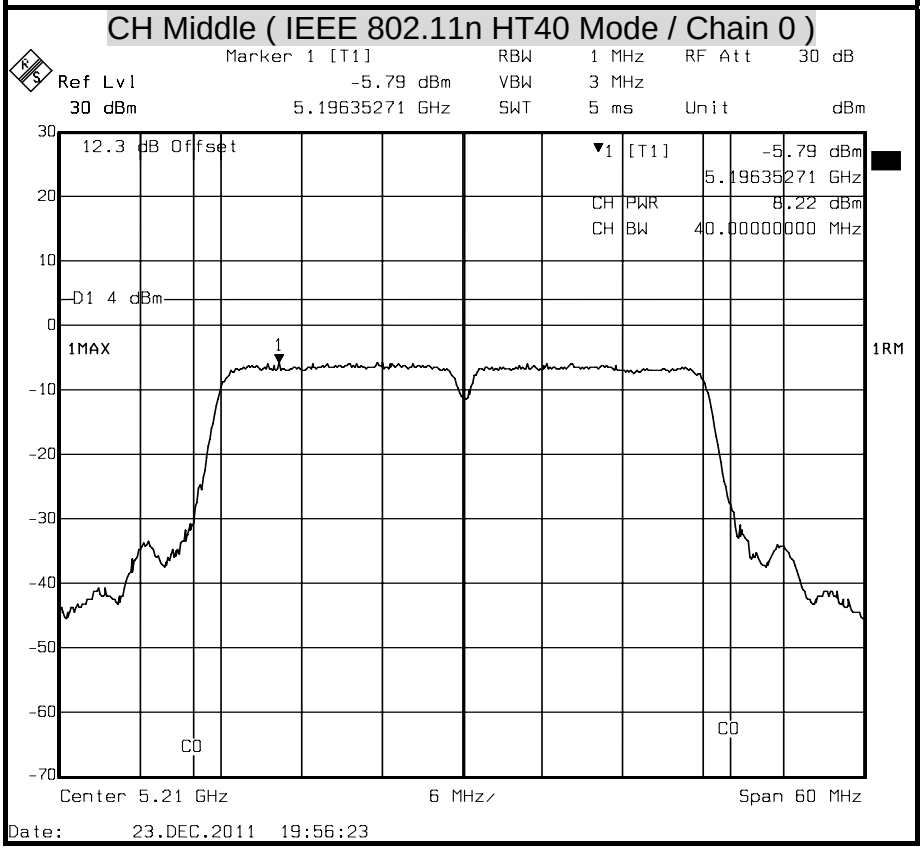
CH High (IEEE 802.11n HT20 Mode / Chain 1)



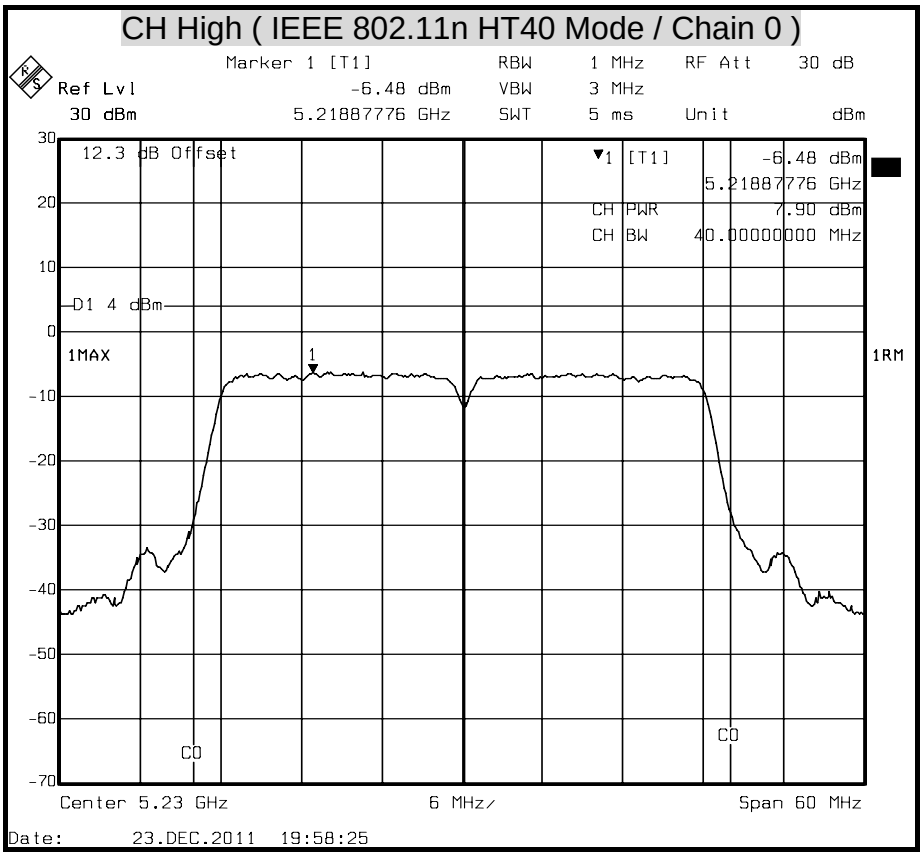
CH Low (IEEE 802.11n HT40 Mode / Chain 0)



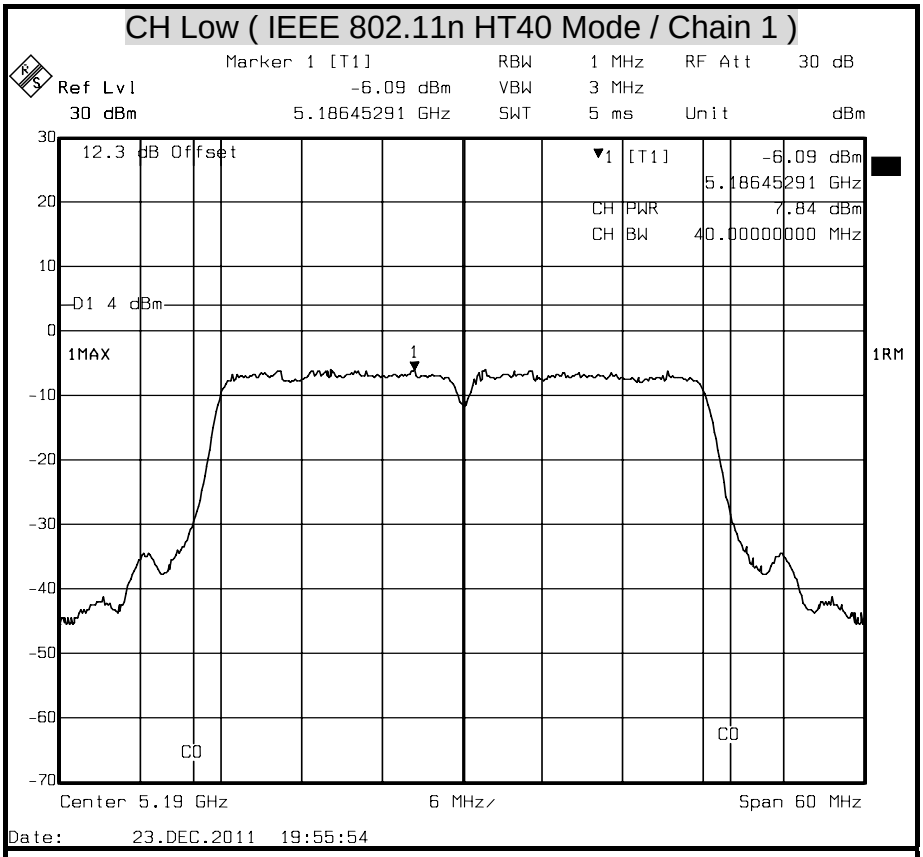
CH Middle (IEEE 802.11n HT40 Mode / Chain 0)



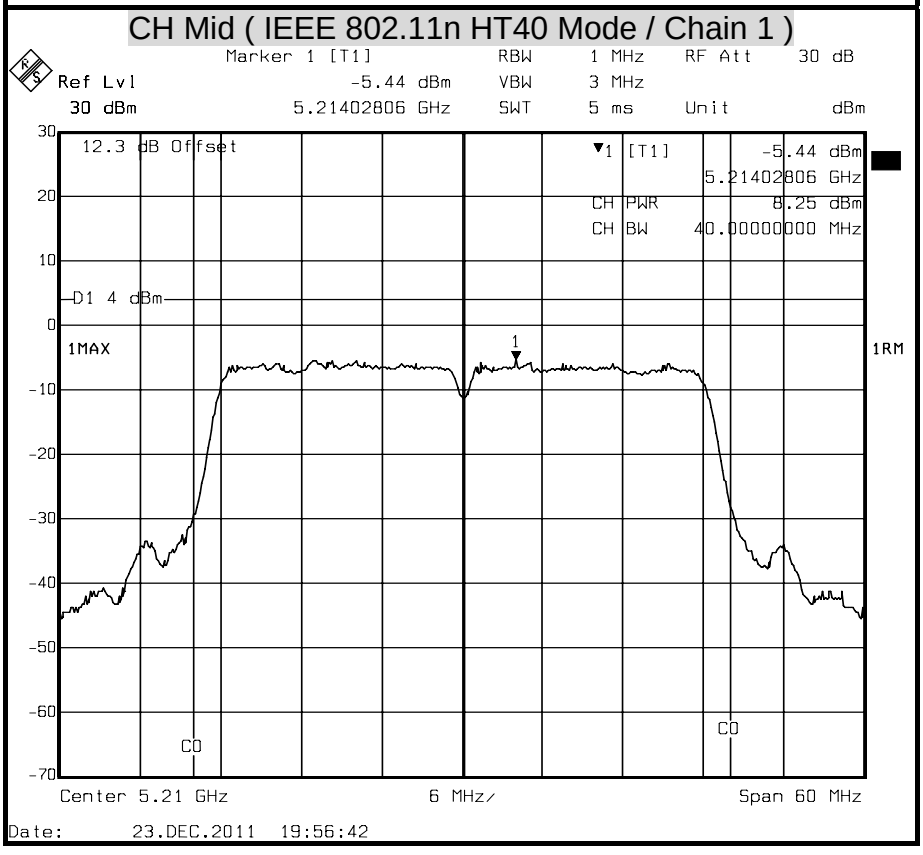
CH High (IEEE 802.11n HT40 Mode / Chain 0)



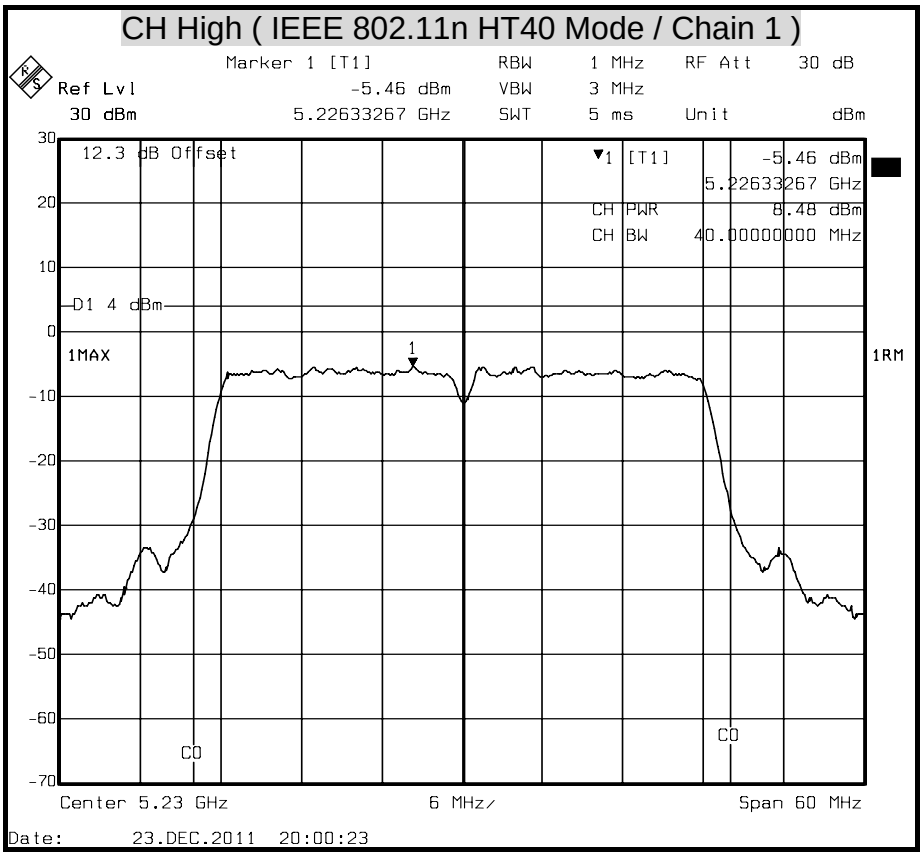
CH Low (IEEE 802.11n HT40 Mode / Chain 1)



CH Mid (IEEE 802.11n HT40 Mode / Chain 1)



CH High (IEEE 802.11n HT40 Mode / Chain 1)



7.4 PEAK EXCURSION

LIMITS

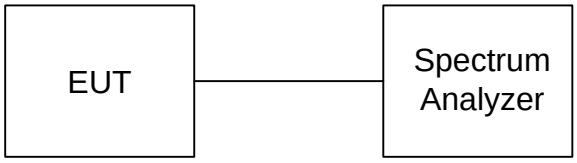
§ 15.407 (a) (6), the ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP. 29, 2012

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

TEST SETUP



TEST PROCEDURE

The test is performed in accordance with <FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices> – Part 15, Subpart E, August 2002.

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
3. Trace A, Set RBW =1MHz, VBW = 3MHz, Span > 26dB Bandwidth, Max. hold.
   Trace B, Set RBW =1MHz, VBW = 3MHz, Span > 26dB Bandwidth, Setup sample detector and power average mode, to scan 100 times with average.
4. Delta Mark trace A Maximum frequency and trace B same frequency.
5. Repeat the above procedure until measurements for all frequencies were complete.

TEST RESULTS

IEEE 802.11a Mode

Channel	Channel Frequency (MHz)	Peak Excursion (dB)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	5180	6.85	13	-6.15	PASS
Middle	5220	7.09		-5.91	PASS
High	5240	7.06		-5.94	PASS

Remark:

1. At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 Mode Chain 0

Channel	Channel Frequency (MHz)	Peak Excursion (dB)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	5180	7.46	13	-5.54	PASS
Middle	5220	7.30		-5.70	PASS
High	5240	7.56		-5.44	PASS

Remark:

1. At finial test to get the worst-case emission at 13Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 Mode Chain 1

Channel	Channel Frequency (MHz)	Peak Excursion (dB)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	5180	6.70	13.00	-6.30	PASS
Middle	5220	6.68		-6.32	PASS
High	5240	6.84		-6.16	PASS

Remark:

1. At finial test to get the worst-case emission at 13Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 Mode Chain 0

Channel	Channel Frequency (MHz)	Peak Excursion (dB)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	5190	7.28	13.00	-5.72	PASS
Middle	5210	7.20		-5.80	PASS
High	5230	7.24		-5.76	PASS

Remark:

1. At finial test to get the worst-case emission at 27Mbps.

2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 Mode Chain 1

Channel	Channel Frequency (MHz)	Peak Excursion (dB)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	5190	7.28	13.00	-5.72	PASS
Middle	5210	7.20		-5.80	PASS
High	5230	7.24		-5.76	PASS

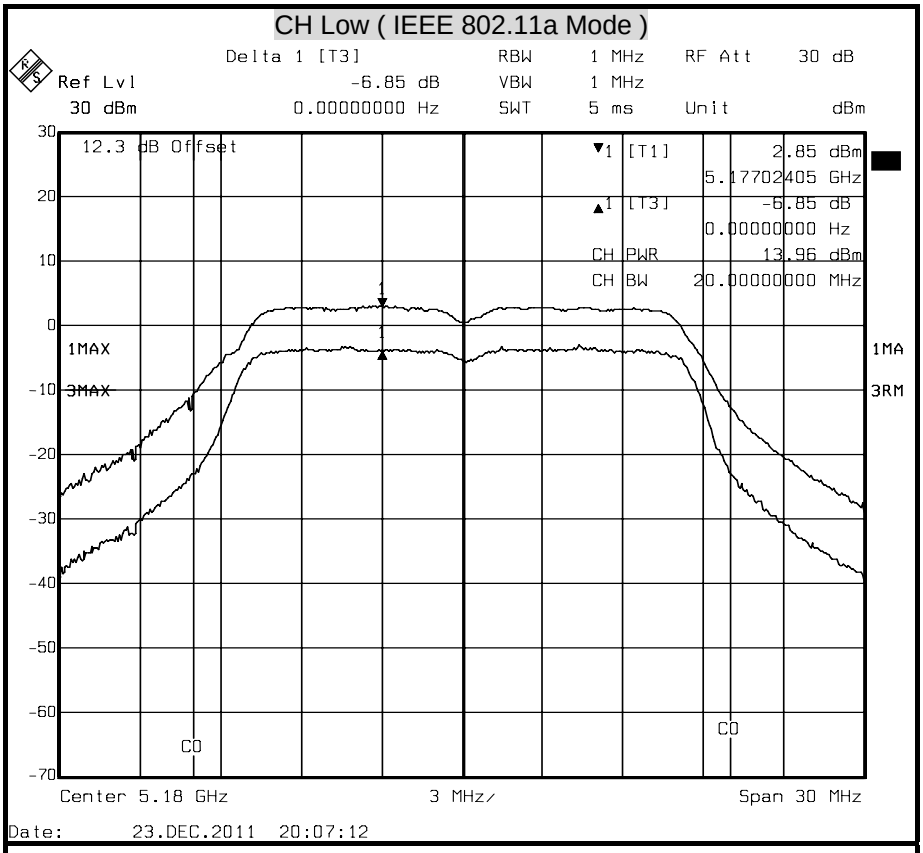
Remark:

1. At finial test to get the worst-case emission at 27Mbps.

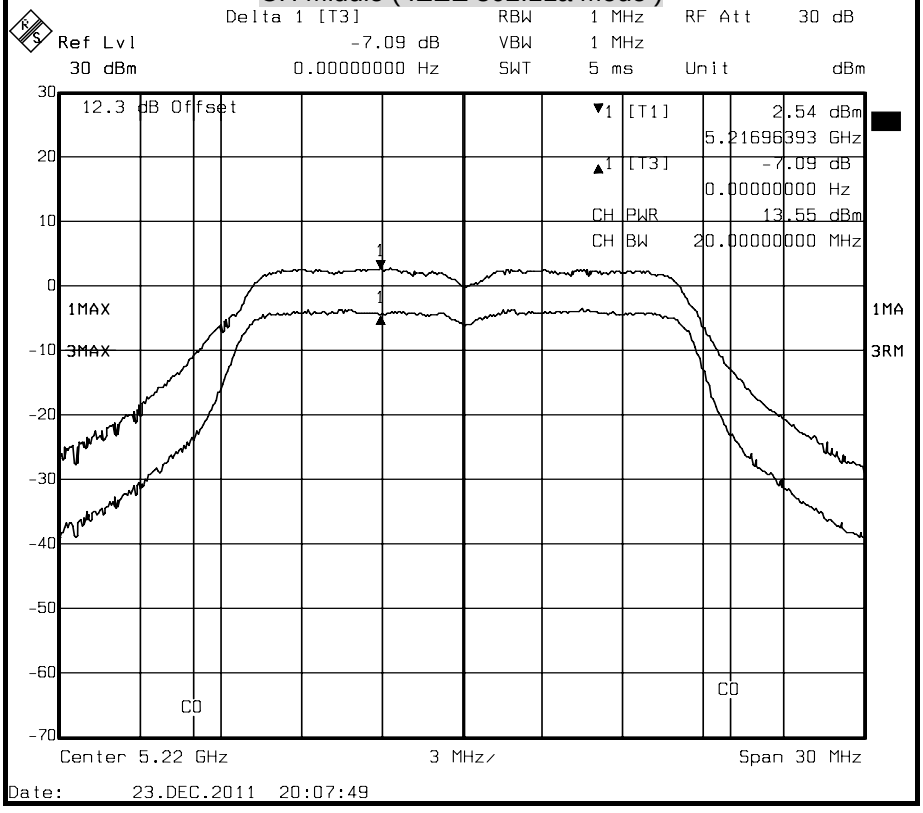
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

PEAK EXCURSION

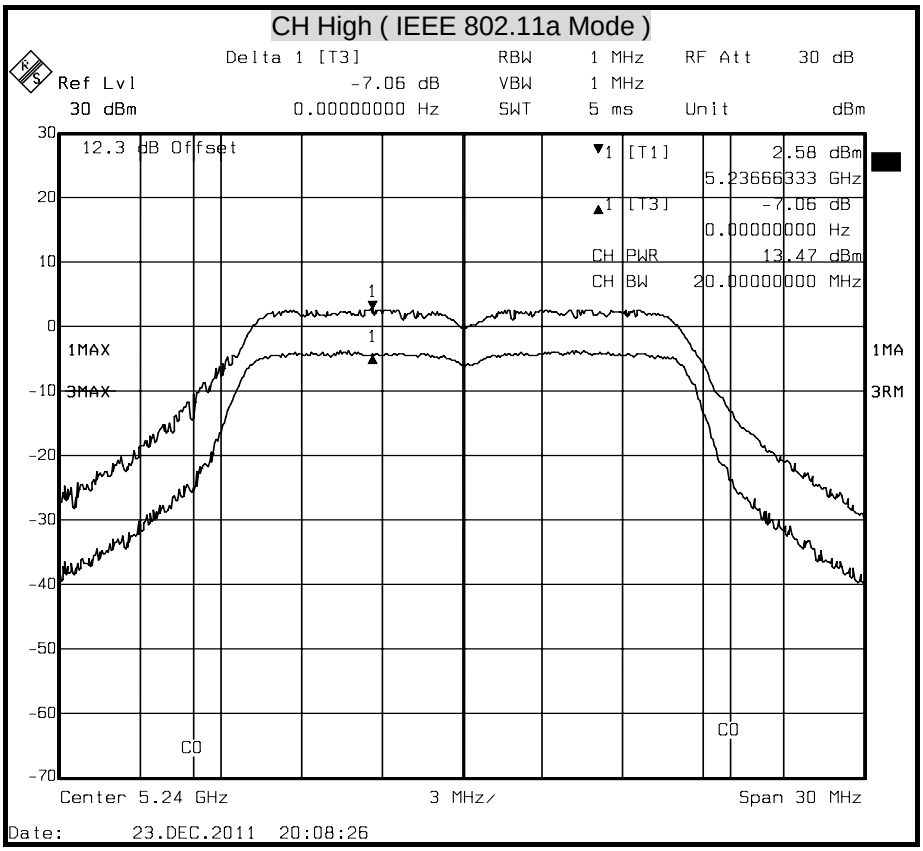
CH Low (IEEE 802.11a Mode)



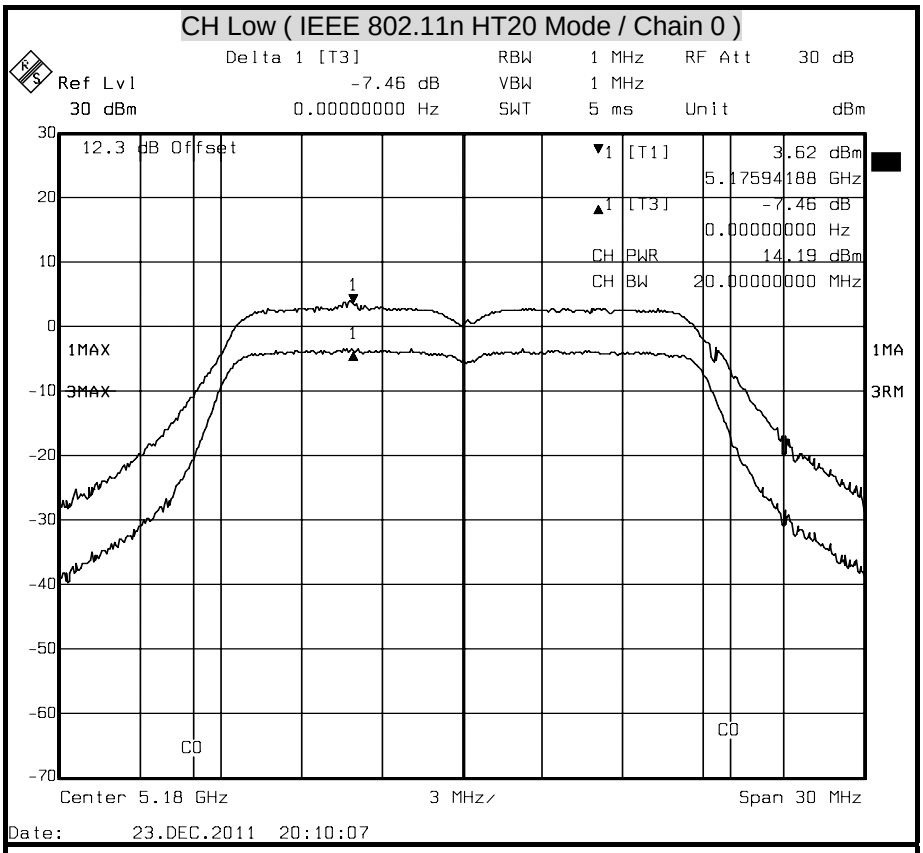
CH Middle (IEEE 802.11a Mode)



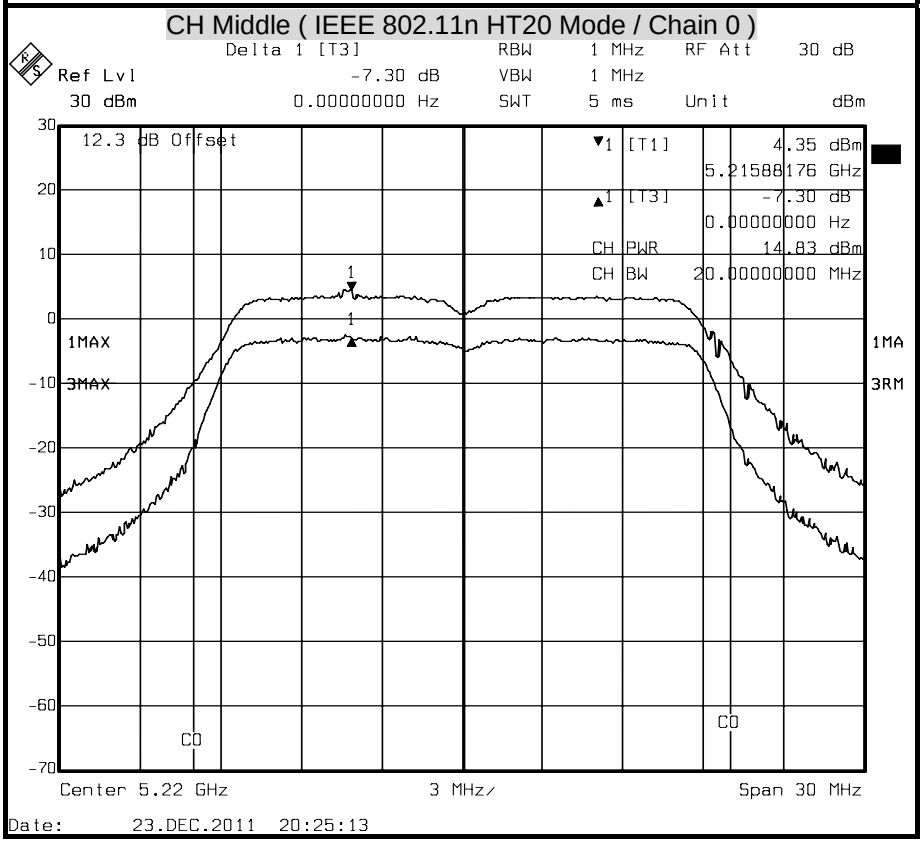
CH High (IEEE 802.11a Mode)

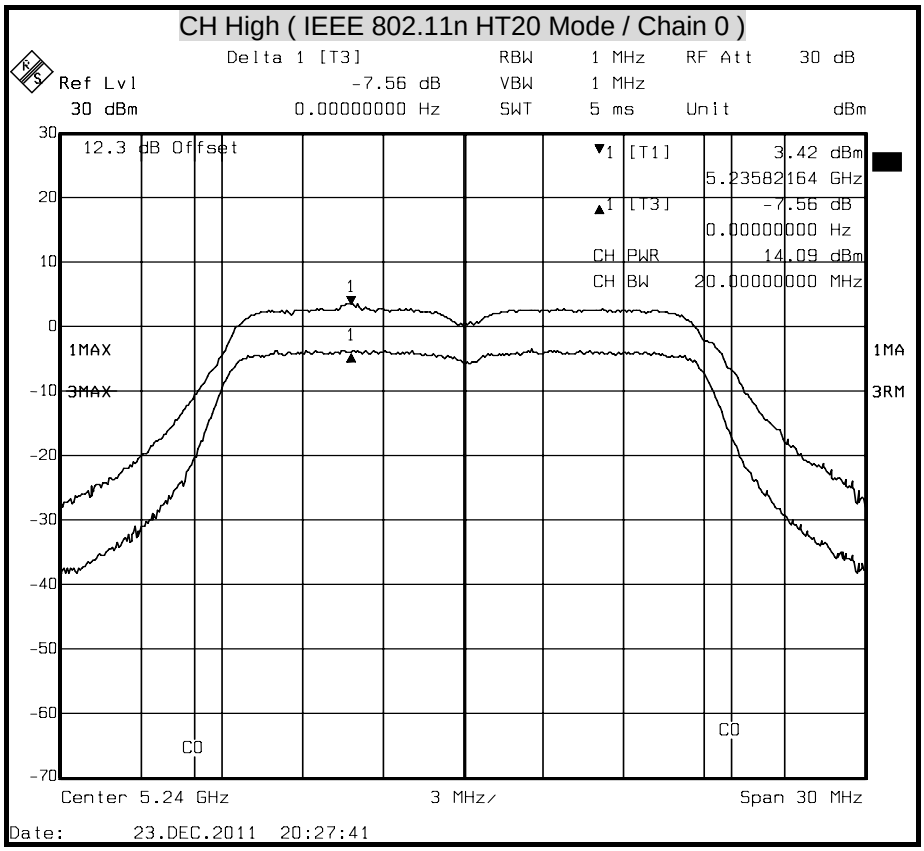


CH Low (IEEE 802.11n HT20 Mode / Chain 0)

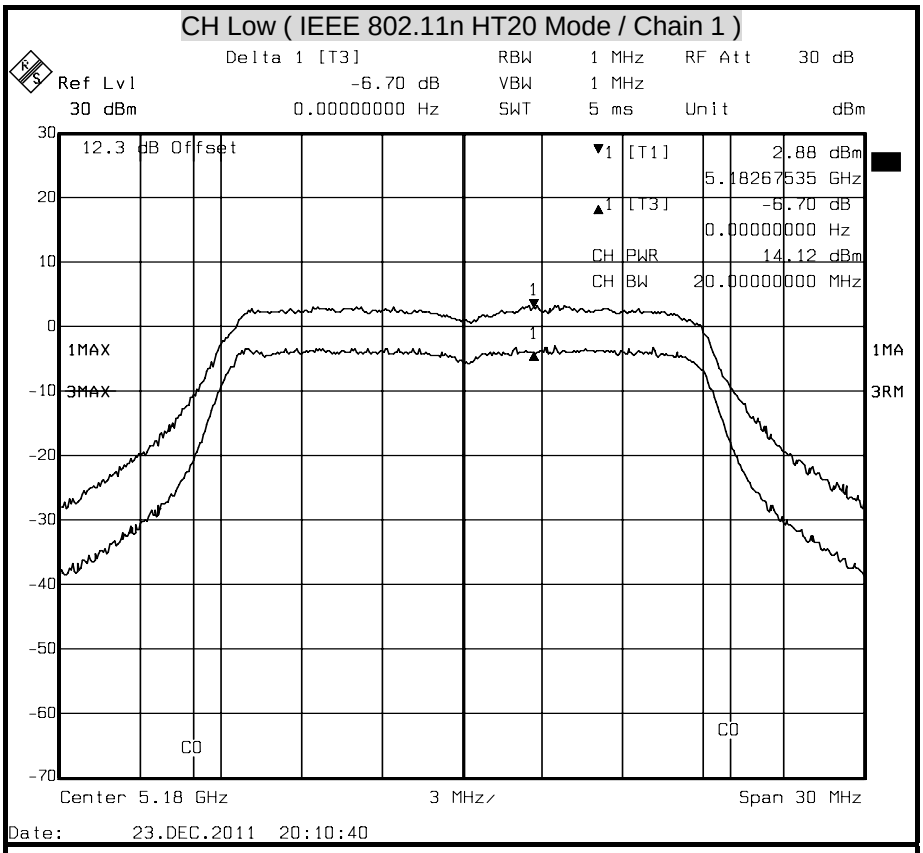


CH Middle (IEEE 802.11n HT20 Mode / Chain 0)

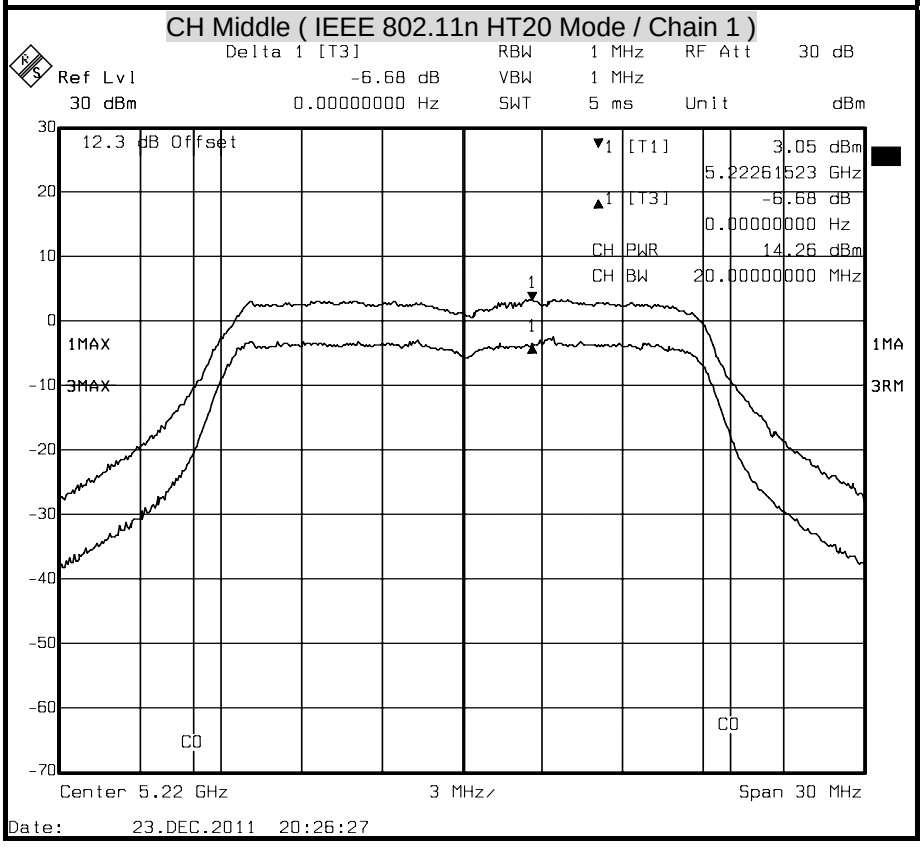


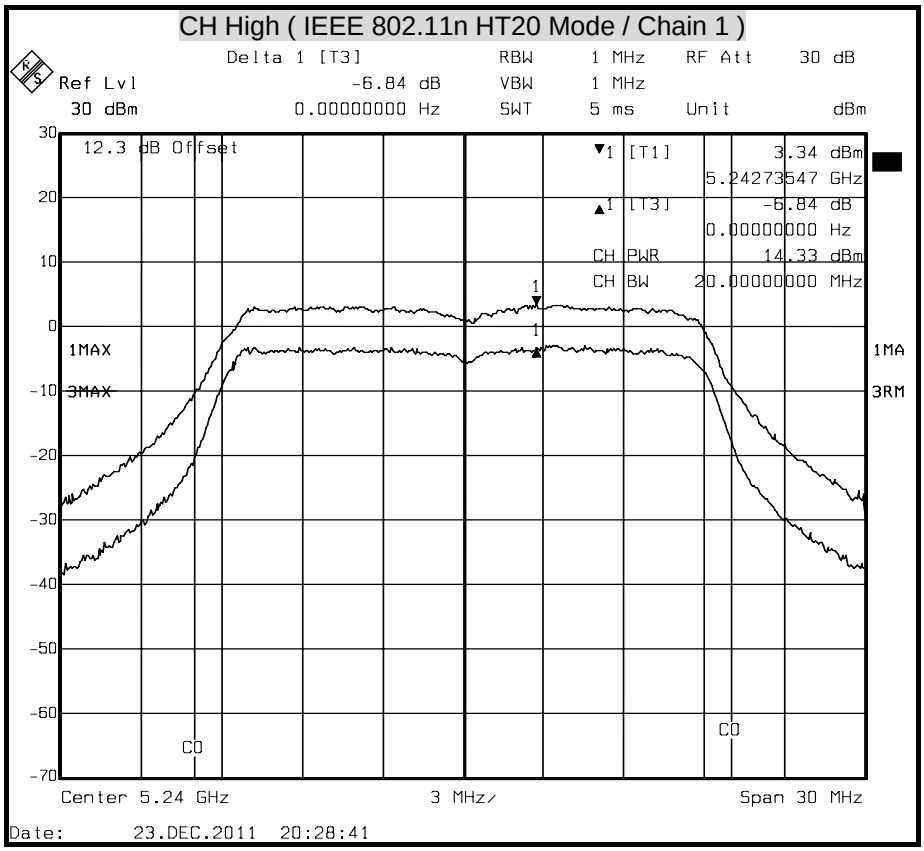


CH Low (IEEE 802.11n HT20 Mode / Chain 1)

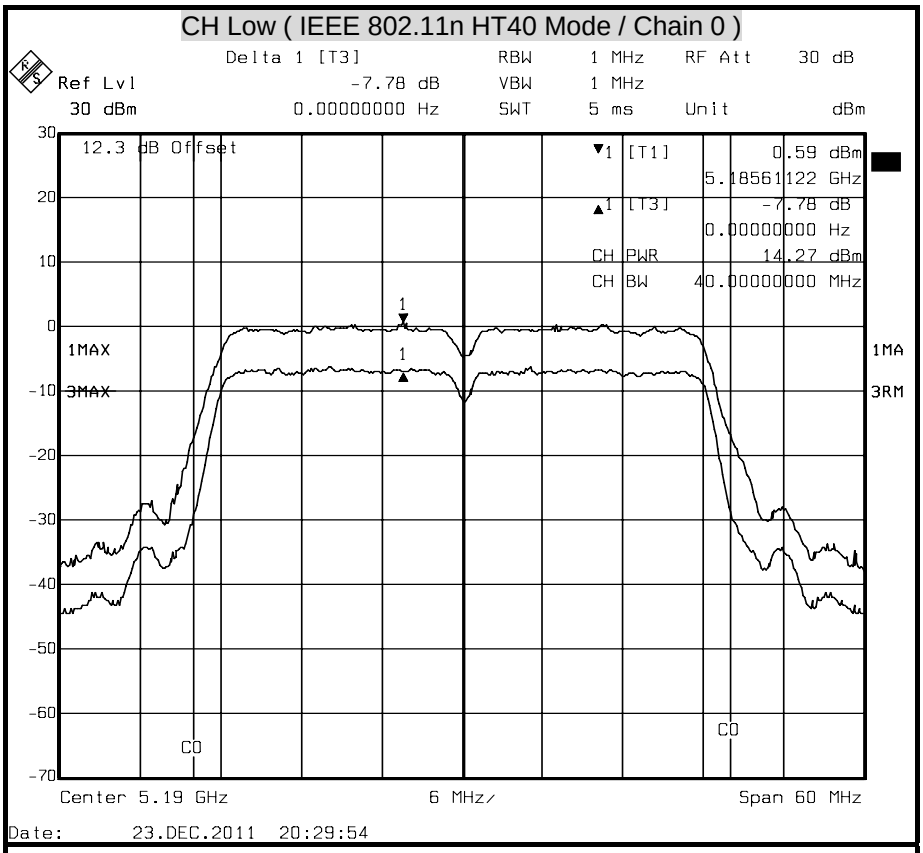


CH Middle (IEEE 802.11n HT20 Mode / Chain 1)

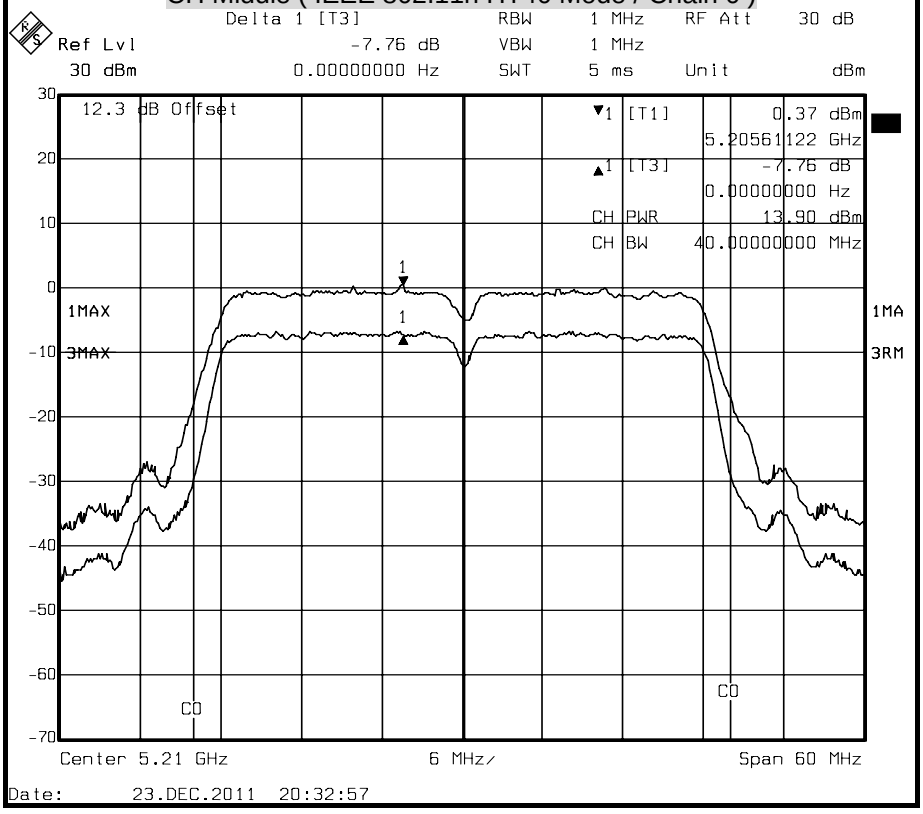


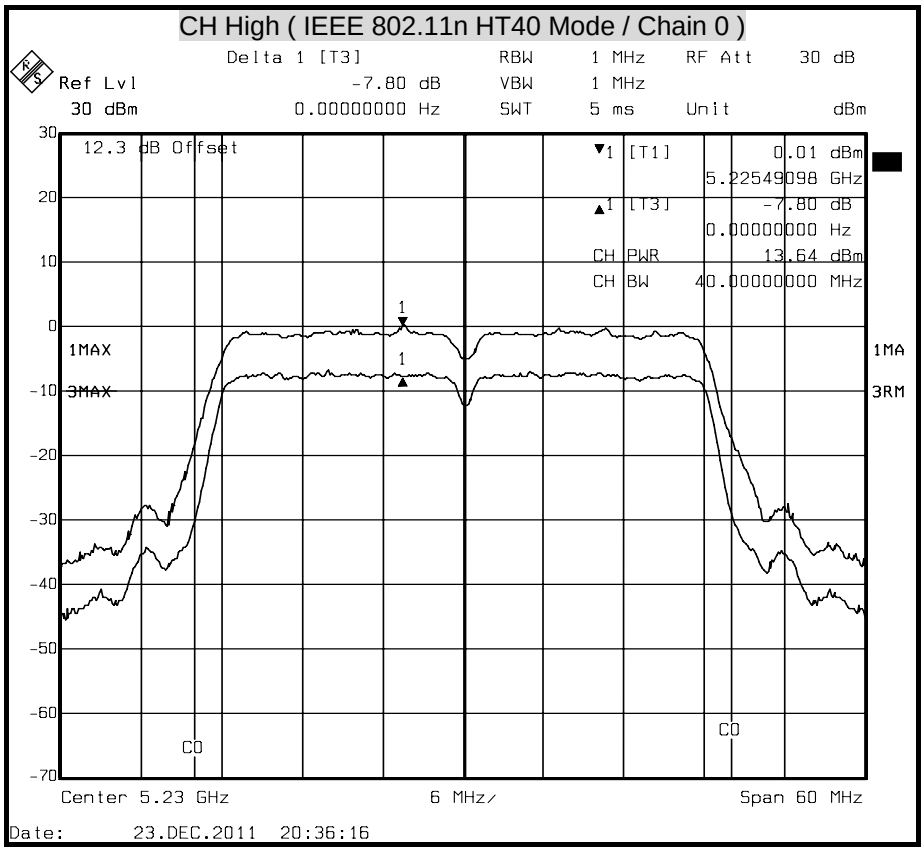


CH Low (IEEE 802.11n HT40 Mode / Chain 0)

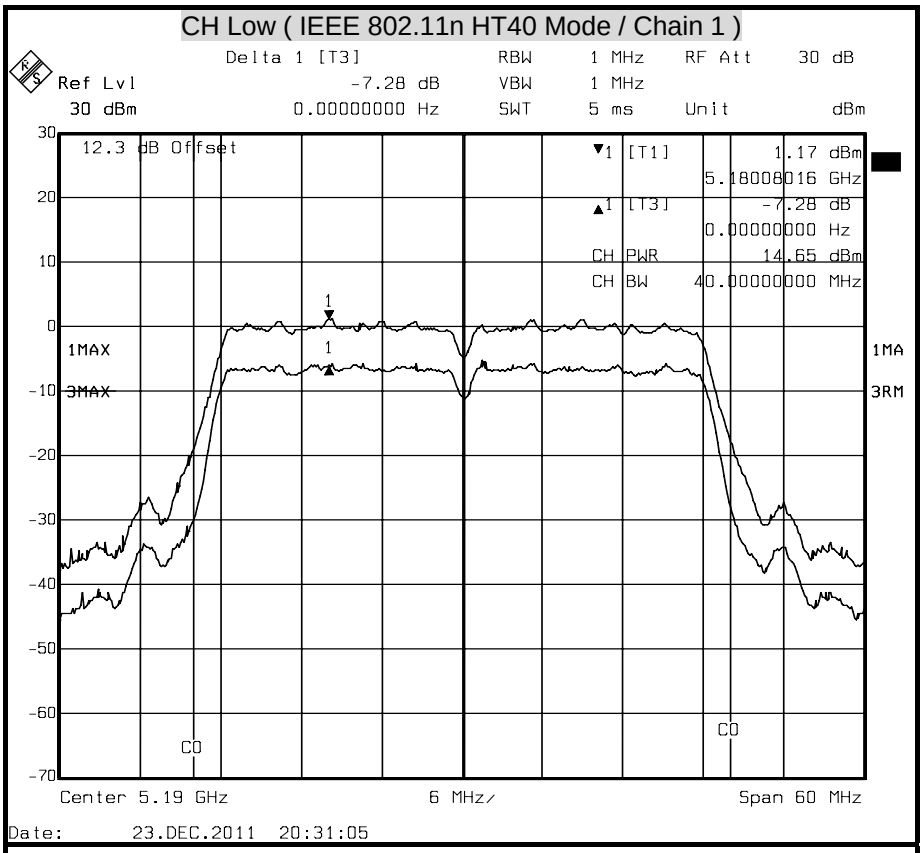


CH Middle (IEEE 802.11n HT40 Mode / Chain 0)





CH Low (IEEE 802.11n HT40 Mode / Chain 1)



CH Mid (IEEE 802.11n HT40 Mode / Chain 1)