TEST REPORT

of

FCC Part 15 Subpart E §15.407 / RSS-210 Issue 8, RSS-Gen Issue 3

FCC ID/IC Certification : A3LNX30 / 649E-NX30

Equipment Under Test	:	Digital Camera
Model Name	:	NX30
Applicant	:	SAMSUNG ELECTRONICS Co., Ltd.
Manufacturer	:	SAMSUNG ELECTRONICS Co., Ltd.
Date of Test(s)	:	2013.12.07 ~ 2014.02.05
Date of Issue	:	2014.02.07

In the configuration tested, the EUT complied with the standards specified above.

Tested By: Jungmin Yang **Date** 2014.02.07

Approved By: Feel Jeong **Date** 2014.02.07

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1. General information

1.1 Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
- Wireless Div. 3FL, 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 435-040

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx.

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1.2 Details of applicant

Applicant : SAMSUNG ELECTRONICS Co., Ltd.
Address : 129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do, 443-742 Korea, Republic of
Contact Person : Kim, Jung-Hwan
Phone No. : + 82 31 277 3308

1.3. Description of EUT

Kind of Product	Digital Camera
Model Name	NX30
Power Supply	DC 7.6 V
Frequency Range	2 412 ㎒ ~ 2 462 ㎒ (11b/g/n_HT20), 5 745 ㎒ ~ 5 825 ㎒ (11a/n_HT20), 5 755 ㎒ ~ 5 795 ㎒ (11n_HT40), 5 180 ㎒ ~ 5 240 ㎒ (11a/n_ HT20 – Non DFS), 5 190 ㎒ ~ 5 230 ㎒ (11n_ HT40 – Non DFS), 5 260 ㎒ ~ 5 320 ㎒ (11a/n_ HT20 – DFS), 5 270 ㎒ ~ 5 310 ㎒ (11n_ HT40 – DFS), 5 500 ㎒ ~ 5 700 ㎒ (11a/n_ HT20 – DFS), 5 510 ㎒ ~ 5 670 ㎒ (11n_ HT40 – DFS)
Modulation Technique	DSSS, OFDM
Number of Channels	11 channel (11b/g/n_HT20), 5 channel (11a/n_HT20), 2 channel (11n_HT40), 4 channel (11a/n_HT20–Non DFS), 2 channel (11n_HT40 – Non DFS), 15 channel (11a/n_HT20 – DFS), 7 channel (11n_HT40 – DFS)
Antenna Type	Internal type (SISO)
Antenna Gain	2 412 ㎒ ~ 2 462 ㎒: -2.63 ㏈i, 5 180 ㎒ ~ 5 320 ㎒: -2.82 ㏈i, 5 500 ㎒ ~ 5 700 ㎒: 0.03 ㏈i, 5 745 ㎒ ~ 5 825 ㎒: 0.68 ㏈i
H/W version	PV2 2013.12.06
S/W version	NX30GLUANA4

1.4. Declaration by the manufacturer

- N/A

1.5. Test equipment list

Equipment	Manufacturer	Model	S/N	Cal Date	Cal Interval	Cal Due.
Signal Generator	R&S	SMR40	100272	Aug. 10, 2013	Annual	Aug. 10, 2014
Signal Generator	R&S	8648D	3847M00534	Mar. 28, 2013	Annual	Mar. 28, 2014
Spectrum Analyzer	Agilent	N9030A	US51350132	Oct. 08, 2013	Annual	Oct. 08, 2014
Attenuator	AEROFLEX / INMET	18N-20dB	3	Apr. 01, 2013	Annual	Apr. 01, 2014
High Pass Filter	Wainwright	WHK3.0/18G-10SS	344	Jun. 08, 2013	Annual	Jun. 08, 2014
High Pass Filter	Wainwright	WHK7.5/26.5G-6SS	11	Jun. 08, 2013	Annual	Jun. 08, 2014
Low Pass Filter	Mini circuits	NLP-1200+	V8979400903-2	Mar. 30, 2013	Annual	Mar. 30, 2014
Power Meter	Anritsu	ML2495	1223004	Jun. 13, 2013	Annual	Jun. 13, 2014
Power Sensor	Anritsu	MA2411B	1207272	Jun. 13, 2013	Annual	Jun. 13, 2014
DC Power Supply	Agilent	U8002A	MY50060028	Mar. 28, 2013	Annual	Mar. 28, 2014
Preamplifier	H.P.	8447F	2944A03909	Jun. 28, 2013	Annual	Jun. 28, 2014
Preamplifier	R&S	SCU 18	1391123	Sep. 30, 2013	Annual	Sep. 30, 2014
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	Jun. 13, 2013	Annual	Jun. 13, 2014
Test Receiver	R&S	ESU26	100109	Feb. 28, 2013	Annual	Feb. 28, 2014
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	396	Jun. 07, 2013	Biennial	Jun. 07, 2015
Loop Antenna	R&S	HFH2-Z2	100118	Jul. 12, 2013	Biennial	Jul. 12, 2015
Horn Antenna	R&S	HF906	100326	Dec. 10, 2013	Biennial	Dec. 10, 2015
Horn Antenna	SCHWARZBECK MESSELEKTRONIK	BBHA9170	BBHA9170431	May. 15, 2012	Biennial	May 15, 2014
Band Reject Filter	Wainwright Instrument GmbH	WRCJV5150/5350-5130/ 5370-50/16SS	1	Sep. 28, 2013	Annual	Sep. 28, 2014
Band Reject Filter	Wainwright Instrument GmbH	WRCJV5470/5725-5450/ 5745-50/20SS	1	Sep. 28, 2013	Annual	Sep. 28, 2014
Antenna Master	INNCO	MM4000	N/A	N.C.R.	N/A	N.C.R.
Turn Table	INNCO	DS 1200S	N/A	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L × W × H (6.5 m × 3.5 m × 3.5 m)	N/A	N.C.R.	N/A	N.C.R.
EMI Test Receiver	R&S	ESHSI0	863365/018	Jun, 27. 2013	Annual	Jun, 27. 2014
Two-Line V-Network	R&S	ENV216	100190	Jan. 02, 2014	Annual	Jan. 02, 2015
Anechoic Chamber	SY Corporation	L × W × H (9.6 m × 6.4 m × 6.4 m)	N/A	N.C.R.	N/A	N.C.R.

▶ **Support equipment**

Description	Manufacturer	Model	Serial Number / FCC ID
N/A	-	-	-

1.6. Summary of test result

The EUT has been tested according to the following specifications:

APPLIED STANDARD:FCC Part15, RSS-210,RSS-Gen			
Section in FCC 15	**Section in RSS-210 RSS-Gen**	**Test Item**	**Result**
15.205(a) 15.209(a) 15.407(b)(1) 15.407(b)(2) 15.407(b)(3)	RSS-Gen 7 RSS-210 A9.2(1) RSS-210 A9.2(2) RSS-210 A9.2(3)	Transmitter radiated spurious emissions	Complied
15.407(a)(1) 15.407(a)(2)	RSS-210 A9.2(1) RSS-210 A9.2(2) RSS-210 A9.2(3)	Output power	Complied
15.407(a)(1) 15.407(a)(2)	RSS-210 A9.2(1) RSS-210 A9.2(2) RSS-210 A9.2(3)	Peak power spectral density	Complied
15.407(a)(6)	-	Peak excursion	Complied
15.207	RSS-Gen 7.2.4	Transmitter AC Power Line Conducted Emission	Complied

1.7. Test Procedure(s)

The measurement procedures described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 ㎑ to 40 ㎓ (ANSI C63.4-2003) and the guidance provided in KDB 789033_v01r03 were used in the measurement of the DUT.

1.8. Sample calculation

Where relevant, the following sample calculation is provided:

1.8.1. Conducted test

offset value (dB) = Attenuator (dB) + Cable loss (dB)

1.8.2. Radiation test

Field strength level (dBμV/m) = Measured level (dBμV) + Antenna factor (dB) + Cable loss (dB) - amplifier (dB)

1.9. Test report revision

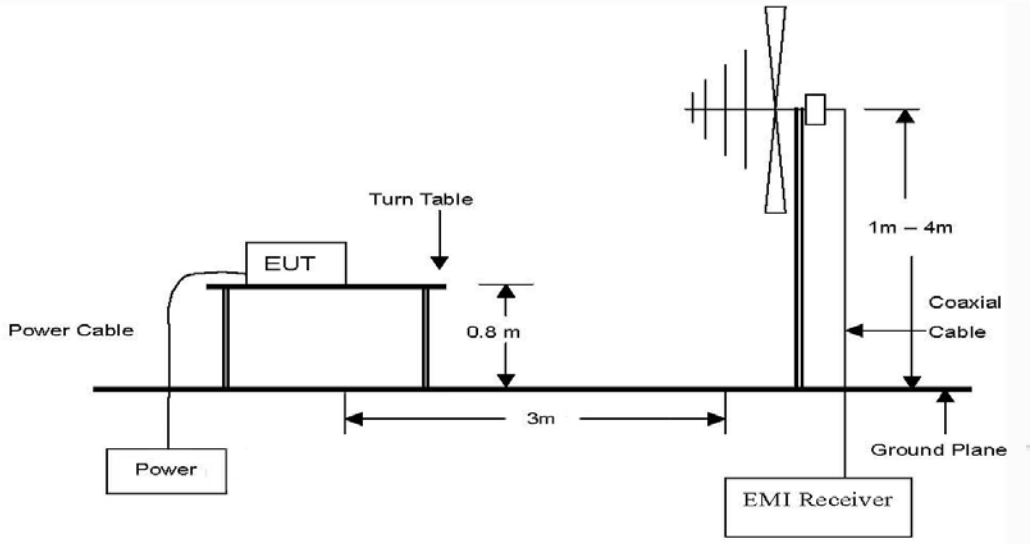
Revision	Report number	Description
0	F690501/RF-RTL007236	Initial
1	F690501/RF-RTL007236-1	Add component around antenna

2. Transmitter radiated spurious emissions

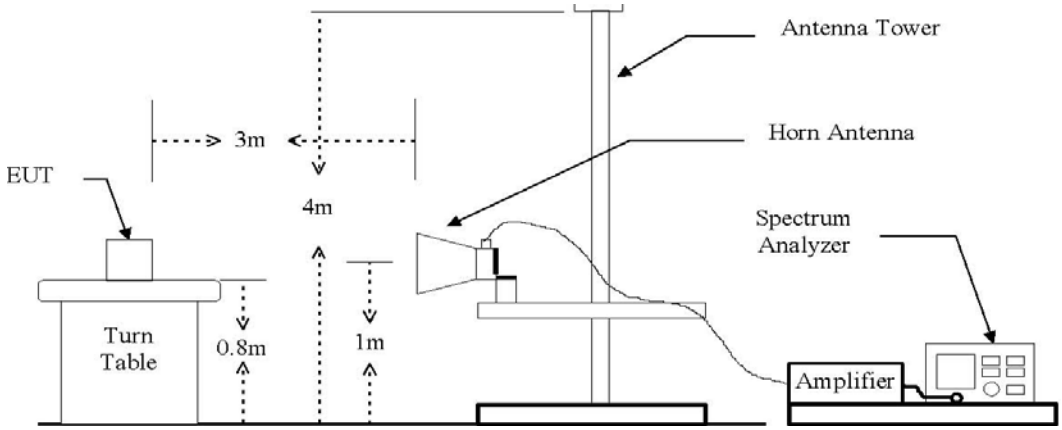
2.1. Test setup

2.1.1. Transmitter radiated spurious emissions

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



The diagram below shows the test setup that is utilized to make the measurements for emission .The spurious emissions were investigated form 1 ㎓ to the 10th harmonic of the highest fundamental frequency or 40 ㎓, whichever is lower.



2.2. Limit

15.407(b)(1) For transmitters operating in the 5.15 ~ 5.25 ㎓ band: all emissions outside of the 5.15 ~ 5.35 ㎓ band shall not exceed an EIRP of -27 ㏈m/㎒.
15.407(b)(2) For transmitters operating in the 5.25 ~ 5.35 ㎓ band: all emissions outside of the 5.15 ~ 5.35 ㎓ band shall not exceed an EIRP of -27 ㏈m/㎒. Devices operating in the 5.25 ~ 5.35 ㎓ band that generate emissions in the 5.15 ~ 5.25 ㎓ band must meet all applicable technical requirements for operation in the 5.15 ~ 5.25 ㎓ band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 ㏈m/㎒ in the 5.15 ~ 5.25 ㎓ band.
15.407(b)(3) For transmitters operating in the 5.47 ~ 5.725 ㎓ band: all emissions outside of the 5.47 ~ 5.725 ㎓ band shall not exceed an EIRP of −27 ㏈m/㎒.

According to § 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 (㎒)	Distance (Meters)	Field Strength (㏈㎶/m)	Field Strength (㎶/m)
30 - 88	3	40.0	100
88 – 216	3	43.5	150
216 – 960	3	46.0	200
Above 960	3	54.0	500

2.3. Test procedures

Conducted and Radiated emissions from the EUT were measured according to the dictates in section H of KDB 789033_v01r03.
All data rates and modes were investigated for conducted spurious emissions. The emissions of the configuration that produced the worst case emissions are reported in this section.

2.3.1. Test procedures for radiated spurious emissions

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 ㎓, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 ㎓, the EUT was set 3 meter away from the interference-receiving antenna.
3. 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 polarizations of the antenna are set to make the measurement.
4. 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.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10 ㏈ 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 ㏈ margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE;

- The measurements for below 1 ㎓
  Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

- The measurements for above 1 ㎓
  Peak emission levels are measured by setting the analyzer as follows:
  Set to RBW = 1 ㎒, VBW ≥ 3 ㎒, Detector = Peak, Sweep time = auto, Trace mode= Max hold.
  Average emission levels are measured by setting the analyzer as follows:
  Set to RBW = 1 ㎒, VBW ≥ 3 ㎒, Detector = RMS, Averaging type = power(i.e., RMS), Sweep time = auto, Trace mode= trace average of at least 100 traces. If the transmission is not continuous, the number of traces shall be increased by a factor of 1/x, where x is the duty cycle.
  If duty cycle < 98 percent, a correction factor shell be added to the measurement results.

- Power averaging(RMS) mode was used above, the correction factor is 10 log(1/x), where x is the duty cycle.

To get a maximum emission level from the EUT, the EUT is manipulated through three orthogonal planes.

2.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

2.4.1. Spurious radiated emission (Worst case configuration_11a mode_6Mbps_Middle channel)

The frequency spectrum from 30 ㎒ to 1 000 ㎒ was investigated. Emission levels are not reported much lower than the limits by over 30 ㏈. All reading values are peak values.

Radiated emissions			Ant	Correction factors		Total	Limit	
Frequency (㎒)	Reading (㏈㎶)	Detect Mode	Pol.	AF (㏈/m)	Amp gain+CL (㏈)	Actual (㏈ uV/m)	Limit (㏈ uV/m)	Margin (㏈)
81.01	37.02	Peak	H	9.58	-26.40	20.20	40.00	19.80
81.01	35.43	Peak	V	9.77	-26.40	18.80	40.00	21.20
296.99	43.18	Peak	V	13.96	-24.74	32.40	46.00	13.60
459.02	44.57	Peak	V	17.78	-25.35	37.00	46.00	9.00
512.98	39.57	Peak	V	18.59	-25.36	32.80	46.00	13.20
567.02	40.85	Peak	V	19.18	-25.33	34.70	46.00	11.30
760.01	37.84	Peak	H	22.44	-24.68	35.60	46.00	10.40
Above 800.00	Not detected	-	-	-	-	-	-	-

Remark:

1. All spurious emission at channels are almost the same below 1 ㎓, So that the Middle channel was chose at representative in final test.
2. Actual = Reading + AF + AMP + CL

2.4.2. Spurious radiated emission for above 1 ㎓

802.11a (Non-DFS) _6 Mbps

A. Low Channel (5 180 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 150.00	13.46	Peak	V	33.51	9.32	56.29	74.00	17.71
*5 150.00	5.42	Average	V	33.51	9.32	48.25	54.00	5.75
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**Amp Gain+CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
10 365.42	30.22	Peak	H	37.75	-24.52	43.45	68.23	24.78
Above 10 400.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 220 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 436.20	30.11	Peak	H	37.66	-24.71	43.06	68.23	25.17
Above 10 500.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 240 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 481.12	31.18	Peak	H	37.66	-24.85	43.99	68.23	24.24
Above 10 500.00	Not detected	-	-	-	-	-	-	-

802.11a (DFS) _6 Mbps

A. Low Channel (5 260 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 523.18	30.43	Peak	H	37.67	-24.94	43.16	68.23	25.07
Above 10 600.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 300 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*10 605.28	30.73	Peak	H	37.79	-25.00	43.52	74.00	30.48
*10 605.28	19.44	Average	H	37.79	-25.00	32.23	54.00	21.77
Above 10 700.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 320 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 350.00	12.28	Peak	V	33.91	9.32	55.51	74.00	18.49
*5 350.00	3.79	Average	V	33.91	9.32	47.02	54.00	6.98
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**Amp Gain+CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
*10 648.06	29.74	Peak	H	37.85	-24.67	42.92	74.00	31.08
*10 648.06	20.36	Average	H	37.85	-24.67	33.54	54.00	20.46
Above 10 700.00	Not detected	-	-	-	-	-	-	-

802.11a (DFS) _6 Mbps

A. Low Channel (5 500 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 460.00	11.51	Peak	V	34.05	9.12	54.68	74.00	19.32
*5 460.00	3.52	Average	V	34.05	9.12	46.69	54.00	7.31
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**Amp Gain+CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
*11 003.22	31.19	Peak	H	38.20	-24.28	45.11	74.00	28.89
*11 003.22	20.92	Average	H	38.20	-24.28	34.84	54.00	19.16
Above 11 100.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 580 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 154.34	30.01	Peak	H	38.19	-24.22	43.98	74.00	30.02
*11 154.34	20.53	Average	H	38.19	-24.22	34.50	54.00	19.50
Above 11 200.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 700 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 394.60	32.18	Peak	H	38.26	-23.82	46.62	74.00	27.39
*11 394.60	21.13	Average	H	38.26	-23.82	35.57	54.00	18.43
Above 11 400.00	Not detected	-	-	-	-	-	-	-

802.11n_HT20 (Non-DFS)_MCS0

A. Low Channel (5 180 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 150.00	14.78	Peak	V	33.51	9.32	57.61	74.00	16.40
*5 150.00	5.18	Average	V	33.51	9.32	48.01	54.00	5.99
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**Amp Gain+CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
10 368.48	30.91	Peak	H	37.76	-24.52	44.15	68.23	24.08
Above 10 400.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 220 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 434.80	30.83	Peak	H	37.67	-24.70	43.80	68.23	24.43
Above 10 500.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 240 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 481.54	30.61	Peak	H	37.66	-24.85	43.42	68.23	24.81
Above 10 500.00	Not detected	-	-	-	-	-	-	-

802.11n_HT20 (DFS)_MCS0

A. Low Channel (5 260 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 514.48	30.11	Peak	H	37.68	-24.93	42.86	68.23	25.37
Above 10 600.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 300 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*10 608.00	30.27	Peak	H	37.79	-24.98	43.08	74.00	30.92
*10 608.00	20.37	Average	H	37.79	-24.98	33.18	54.00	20.83
Above 10 700.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 320 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 350.00	11.48	Peak	V	33.91	9.32	54.71	74.00	19.29
*5 350.00	3.85	Average	V	33.91	9.32	47.08	54.00	6.92
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*10 638.38	30.32	Peak	H	37.83	-24.74	43.41	74.00	30.59
*10 638.38	20.35	Average	H	37.83	-24.74	33.44	54.00	20.56
Above 10 700.00	Not detected	-	-	-	-	-	-	-

802.11n_HT20 (DFS)_MCS0

A. Low Channel (5 500 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 460.00	10.23	Peak	V	34.05	9.12	53.40	74.00	20.60
*5 460.00	3.38	Average	V	34.05	9.12	46.55	54.00	7.45
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**Amp Gain+CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
*11 002.96	30.62	Peak	H	38.20	-24.28	44.54	74.00	29.46
*11 002.96	20.61	Average	H	38.20	-24.28	34.53	54.00	19.48
Above 11 100.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 580 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 163.78	29.79	Peak	H	38.16	-24.23	43.72	74.00	30.28
*11 163.78	20.28	Average	H	38.16	-24.23	34.21	54.00	19.79
Above 11 200.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 700 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 389.72	31.34	Peak	H	38.26	-23.85	45.75	74.00	28.25
*11 389.72	21.29	Average	H	38.26	-23.85	35.70	54.00	18.30
Above 11 400.00	Not detected	-	-	-	-	-	-	-

802.11n_HT40 (Non-DFS) _MCS0

A. Low Channel (5 190 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 150.00	13.02	Peak	V	33.51	9.32	55.85	74.00	18.15
*5 150.00	5.38	Average	V	33.51	9.32	48.21	54.00	5.79
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**Amp Gain+CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
10 377.74	30.32	Peak	H	37.74	-24.55	43.51	68.23	24.72
Above 10 400.00	Not detected	-	-	-	-	-	-	-

B. High Channel (5 230 ㎒)

Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 467.14	30.33	Peak	H	37.68	-24.81	43.20	68.23	25.03
Above 10 500.00	Not detected	-	-	-	-	-	-	-

802. 11n_HT40 (DFS)_MCS0

A. Low Channel (5 270 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 538.32	31.10	Peak	H	37.71	-24.96	43.85	68.23	24.39
Above 10 600.00	Not detected	-	-	-	-	-	-	-

B. High Channel (5 310 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 350.00	12.64	Peak	V	33.91	9.32	55.87	74.00	18.13
*5 350.00	3.67	Average	V	33.91	9.32	46.90	54.00	7.11
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**Amp Gain+CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
*10 613.88	30.12	Peak	H	37.80	-24.93	42.99	74.00	31.01
*10 613.88	20.16	Average	H	37.80	-24.93	33.03	54.00	20.97
Above 10 700.00	Not detected	-	-	-	-	-	-	-

802. 11n_HT40 (DFS)_MCS8

A. Low Channel (5 510 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 460.00	10.20	Peak	V	34.05	9.12	53.37	74.00	20.64
*5 460.00	3.74	Average	V	34.05	9.12	46.91	54.00	7.09
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**Amp Gain+CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
*11 021.82	30.15	Peak	H	38.25	-24.25	44.15	74.00	29.85
*11 021.82	20.71	Average	H	38.25	-24.25	34.71	54.00	19.29
Above 11 100.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 550 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 103.34	30.48	Peak	H	38.18	-24.13	44.53	74.00	29.47
*11 103.34	20.55	Average	H	38.18	-24.13	34.60	54.00	19.40
Above 11 200.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 670 ㎒)

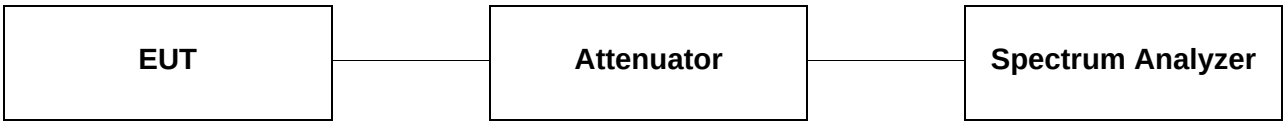
Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 336.72	30.57	Peak	H	38.23	-24.22	44.58	74.00	29.42
*11 336.72	20.92	Average	H	38.23	-24.22	34.93	54.00	19.07
Above 11 400.00	Not detected	-	-	-	-	-	-	-

Remark:

1. "*" means the restricted band.
2. Radiated emissions measured in frequency above 1 000 ㎒ were made with an instrument using Peak / average detector mode if frequency was in restricted band. Otherwise the frequency was in outside of restricted band, only peak detector should be used.
3. Average test would be performed if the peak result was greater than the average limit and frequency was in the restricted band.
4. If frequency was outside of restricted band, the calculation method for peak limit is same as below:
   68.23 dBμV/m = EIRP – 20 log(d) + 104.77 = -27 – 20 log (3) + 104.77
   *distance: 3 m, *EIRP: -27 dB m/㎒

3. 26 dB bandwidth and 99 % occupied bandwidth

3.1. Test setup



3.2. Limit

None; for reporting purpose only

3.3. Test procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

3.3.1. 26 dB Bandwidth

1. This measurement settings are specified in section C of KDB 789033_v01r03.
2. Set RBW: approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %

Note: The automatic bandwidth measurement capability of a spectrum analyzer may be employed if it implements the functionality described above.

3.3.2. 99% bandwidth

1. Set the spectrum analyzer as SPAN = 2 or 3 times necessary bandwidth, RBW = approximately 1 % of the SPAN, VBW is set to 3 times RBW, Detector = Sample, Trace mode = max hold.
2. Measure lowest and highest frequencies are placed in a running sum until 0.5 % and 99.5 % of the total is reached.
3. Record the SPAN between the lowest and the highest frequencies for the 99 % occupied bandwidth.
4. Repeat until all the test channels are investigated.

3.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

802. 11a

Operating mode	Frequency(㎒)	26 ㏈ bandwidth(㎒)	99% bandwidth(㎒)
Non - DFS	5 180	20.19	16.93
	5 220	20.11	16.92
	5 240	20.59	16.88
DFS	5 260	20.54	16.92
	5 300	20.60	16.89
	5 320	20.61	16.92
DFS	5 500	20.64	16.95
	5 580	20.42	17.04
	5 700	20.35	16.99

802.11n_HT20

Operating mode	Frequency(㎒)	26 ㏈ bandwidth(㎒)	99% bandwidth(㎒)
Non - DFS	5 180	21.44	17.99
	5 220	21.39	18.00
	5 240	21.20	18.02
DFS	5 260	21.15	17.97
	5 300	21.43	18.01
	5 320	21.46	17.99
DFS	5 500	21.41	18.06
	5 580	21.21	18.09
	5 700	21.11	18.05

802.11n_HT40

Operating mode	Frequency(㎒)	26 ㏈ bandwidth(㎒)	99% bandwidth(㎒)
Non - DFS	5 190	44.35	36.27
	5 230	43.18	36.41
DFS	5 270	43.38	36.27
	5 310	43.18	36.42
	5 510	44.47	36.39
	5 550	43.80	36.32
	5 670	44.10	36.37

26 dB Bandwidth

802.11a (Non-DFS)

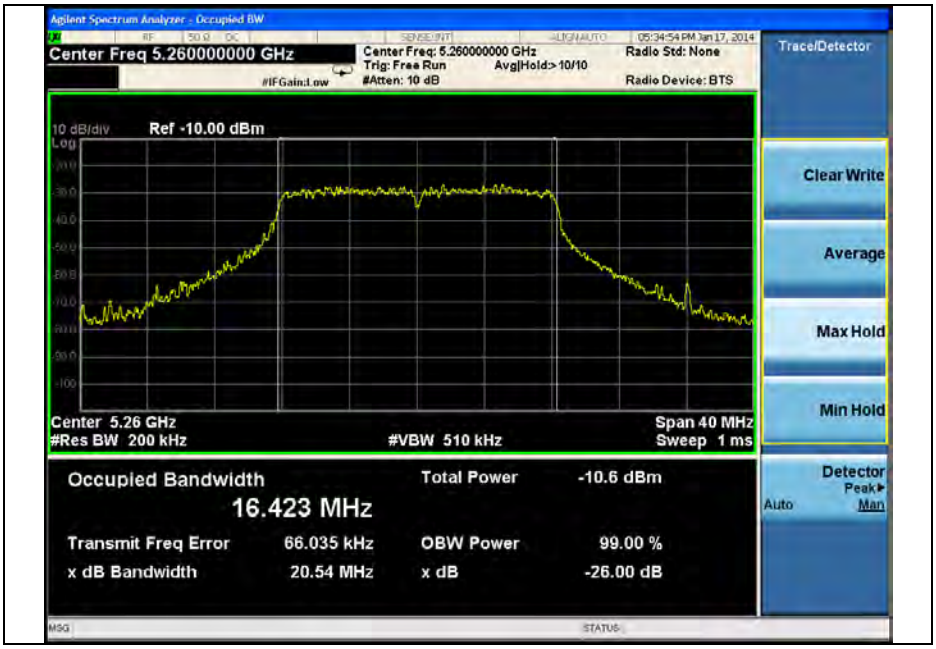
Low Channel (5 180 ㎒)

Middle Channel (5 220 ㎒)

High Channel (5 240 ㎒)

802.11a (DFS)

Low Channel (5 260 ㎒)

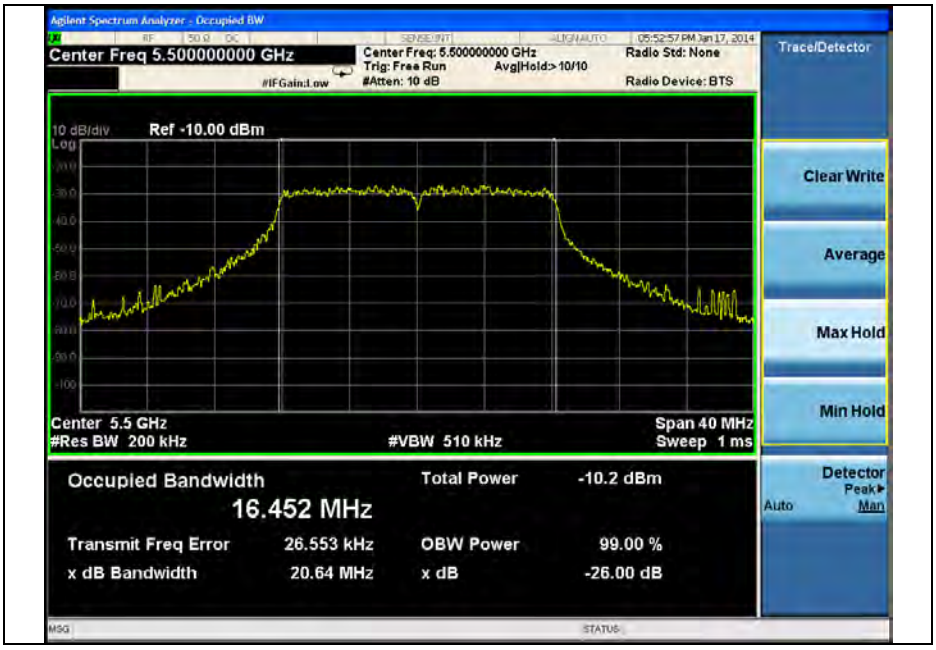


Middle Channel (5 300 ㎒)

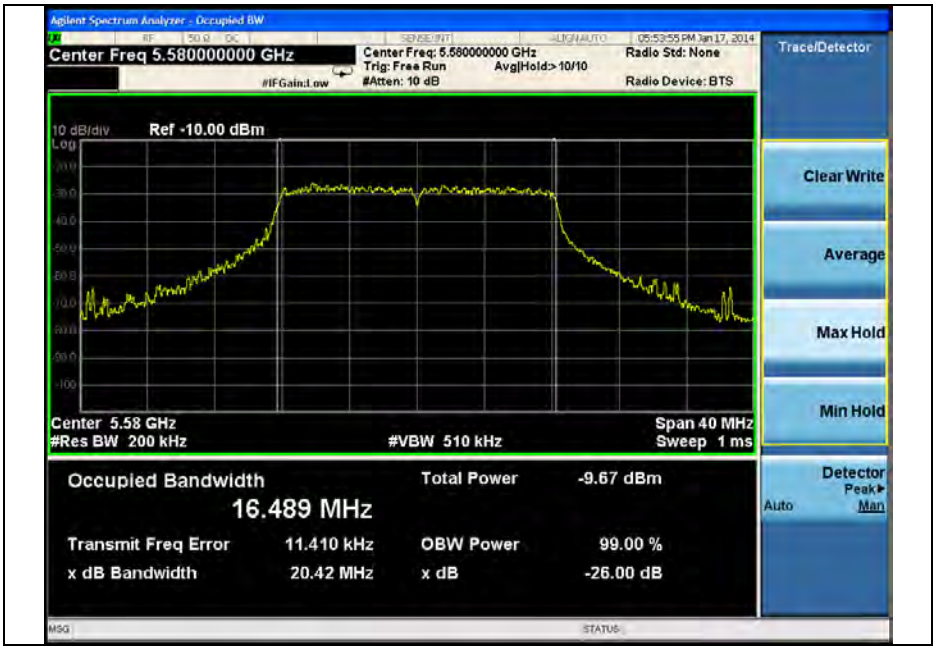
High Channel (5 320 ㎒)

802.11a (DFS)

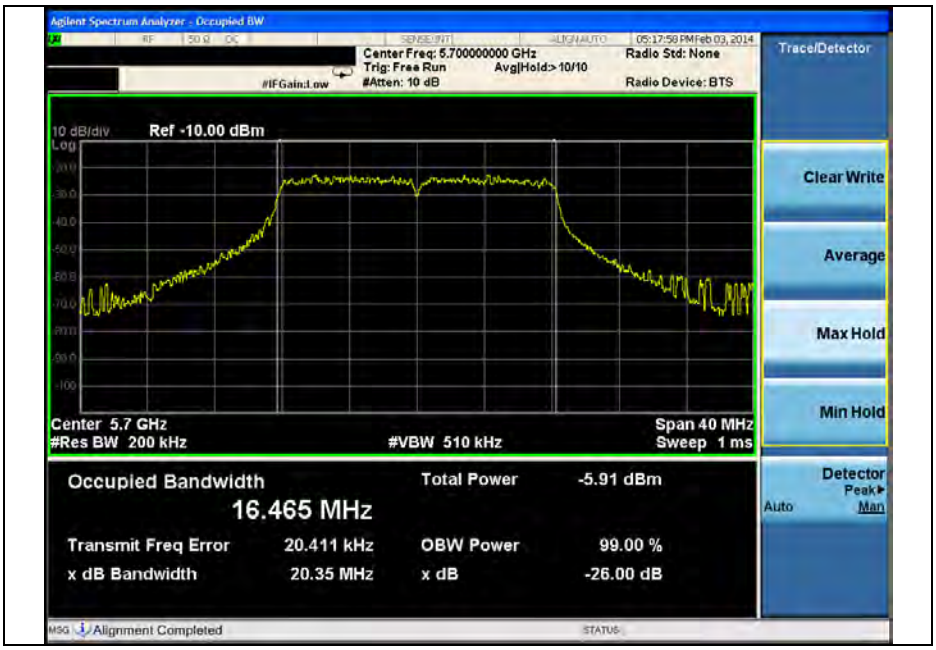
Low Channel (5 500 ㎒)



Middle Channel (5 580 ㎒)

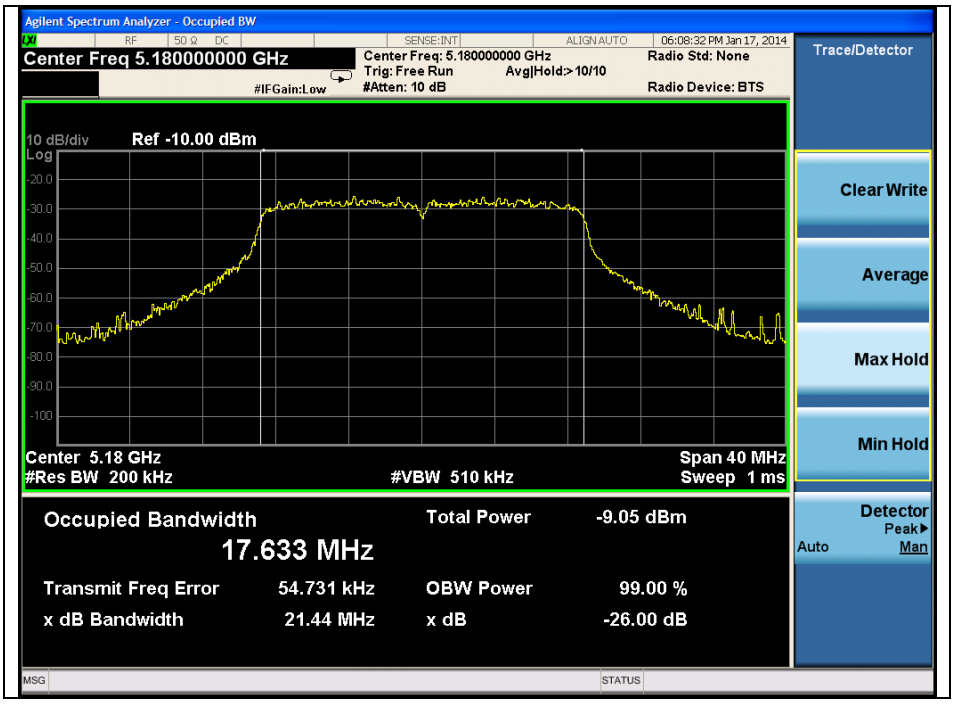


High Channel (5 700 ㎒)

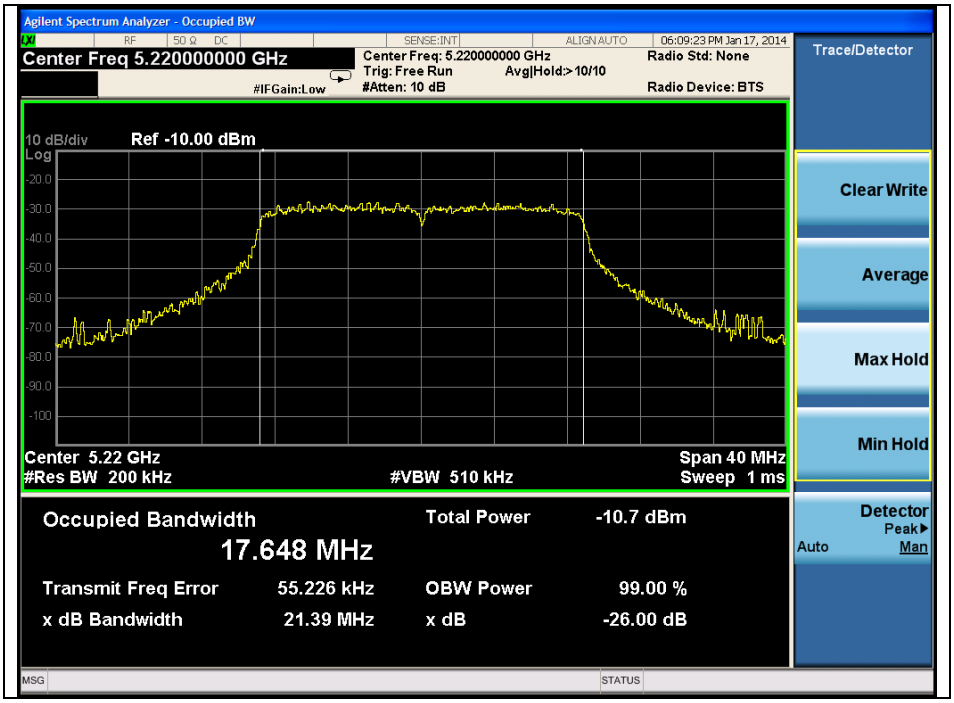


802.11n_HT20 (Non-DFS)

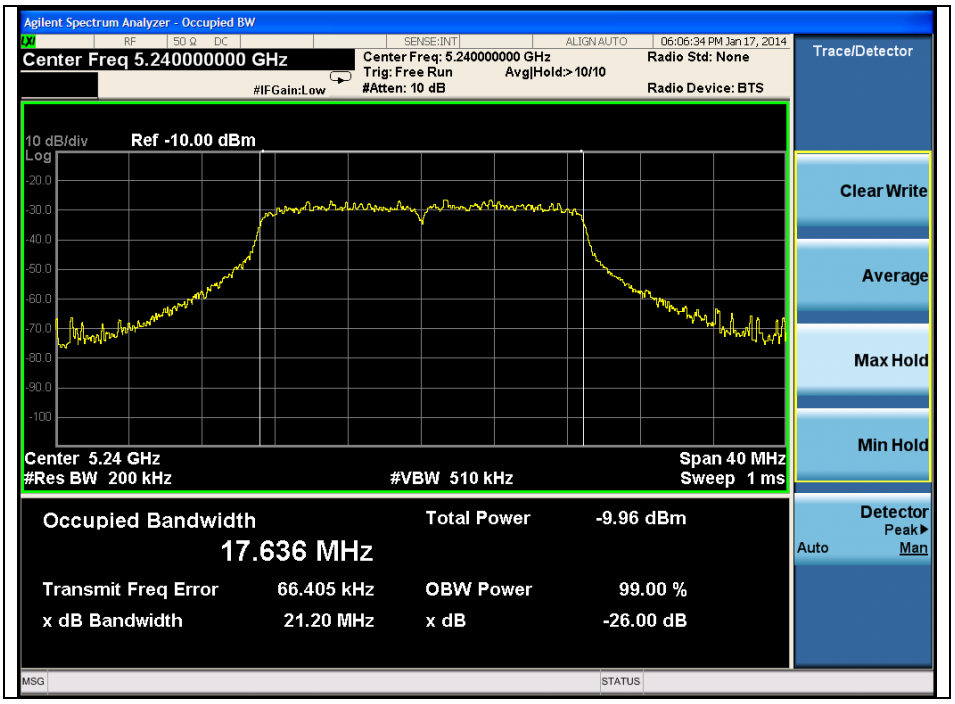
Low Channel (5 180 ㎒)



Middle Channel (5 220 ㎒)

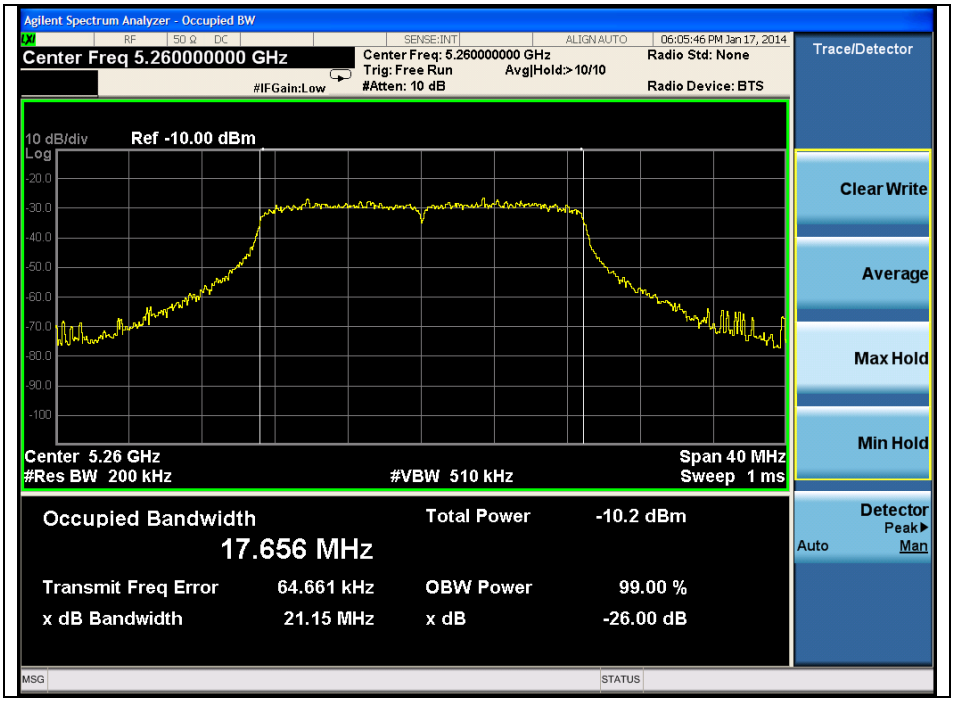


High Channel (5 240 ㎒)

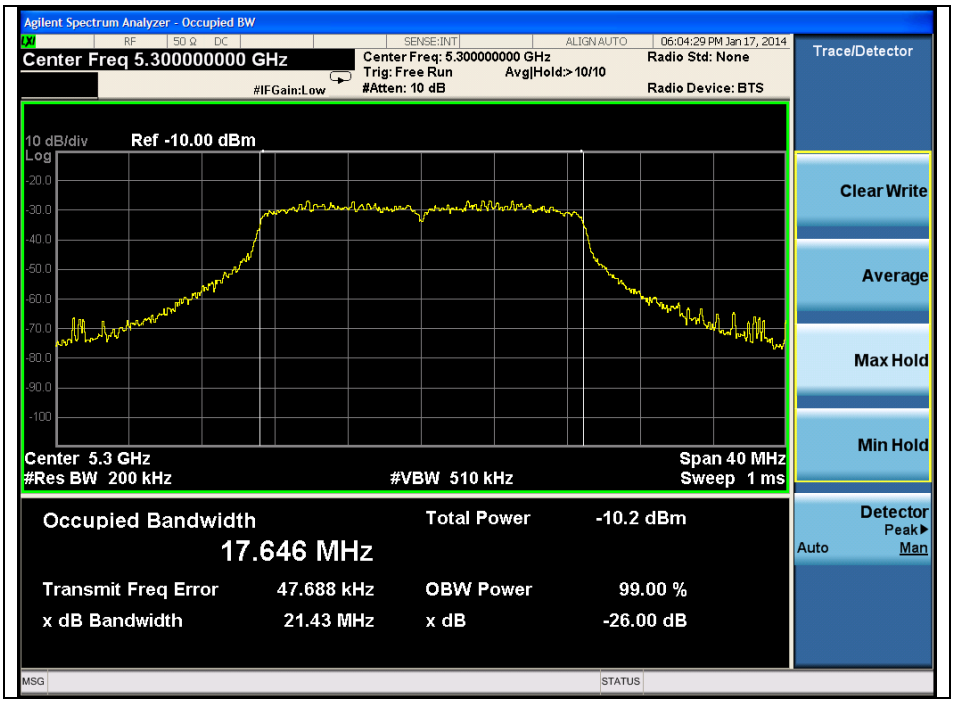


802.11n_HT20 (DFS)

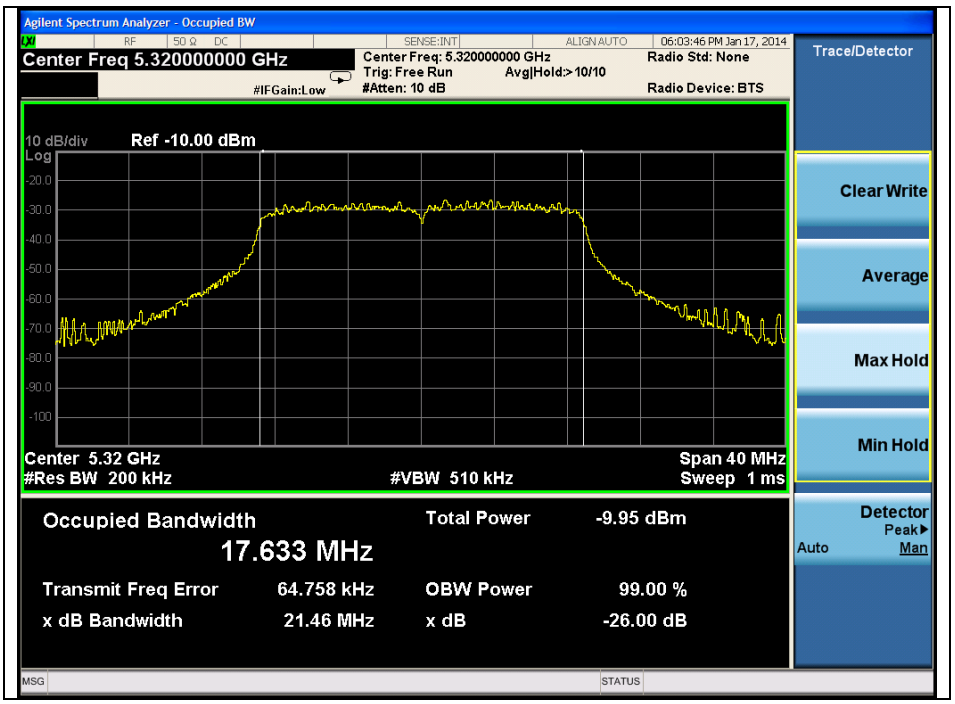
Low Channel (5 260 ㎒)



Middle Channel (5 300 ㎒)

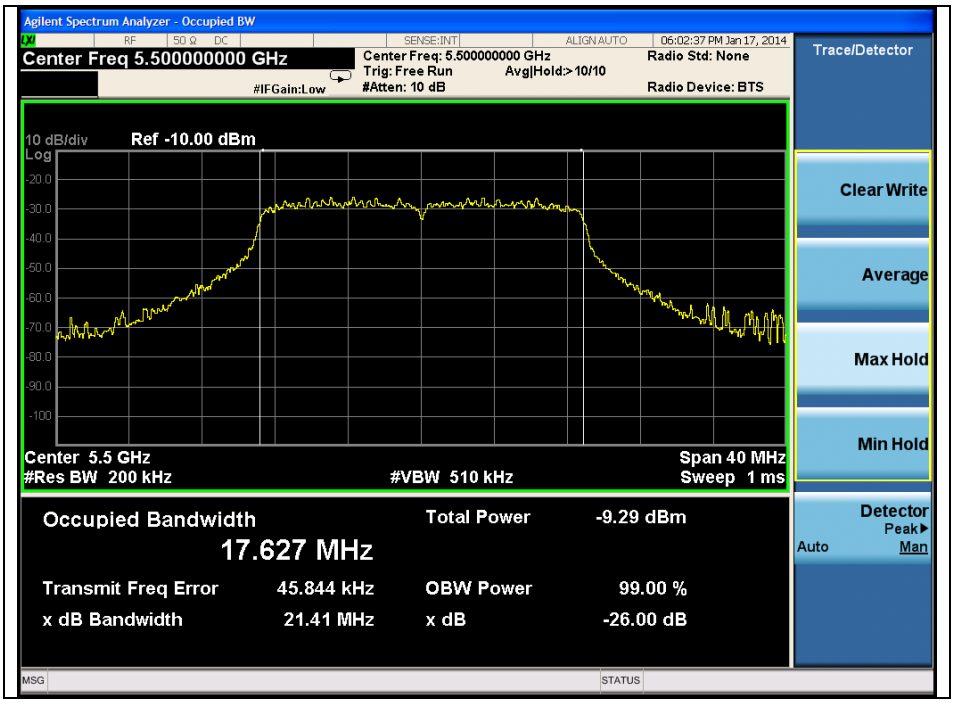


High Channel (5 320 ㎒)

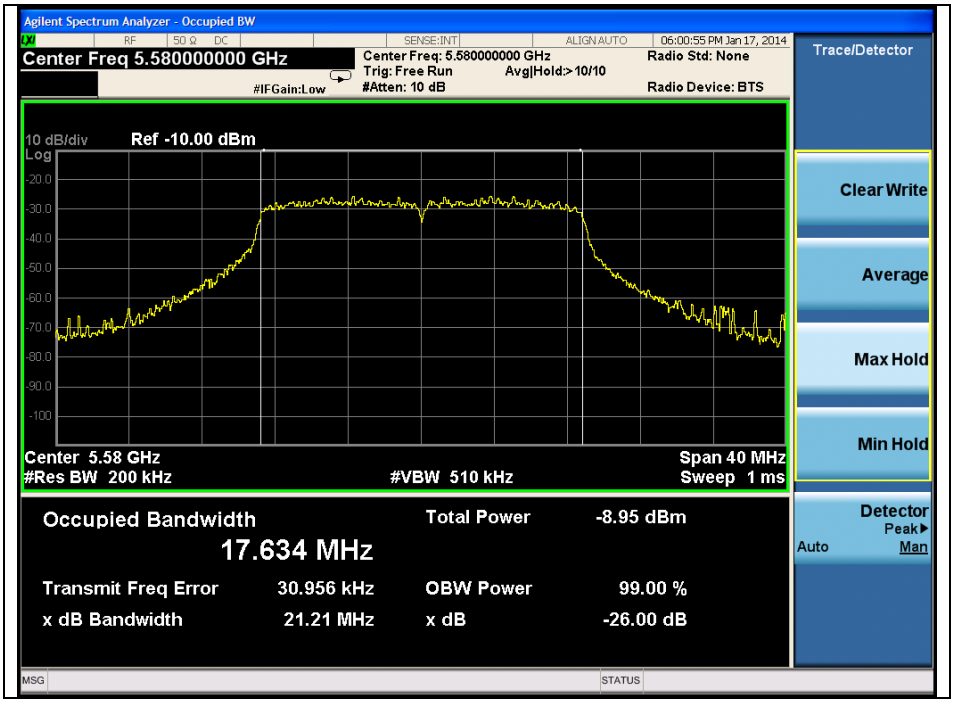


802.11n_HT20 (DFS)

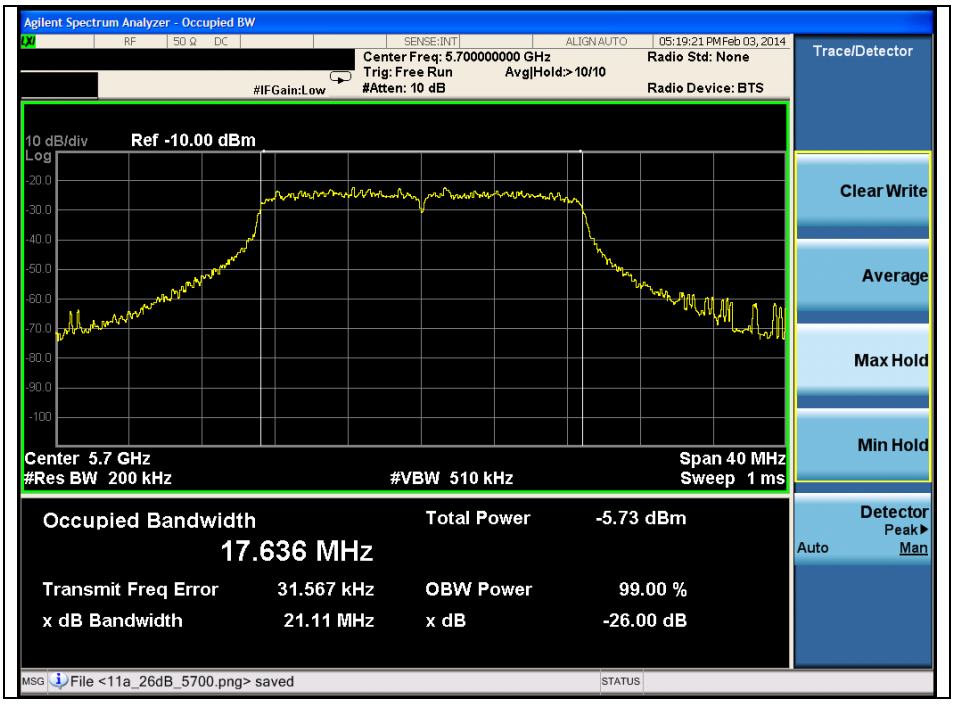
Low Channel (5 500 ㎒)



Middle Channel (5 580 ㎒)



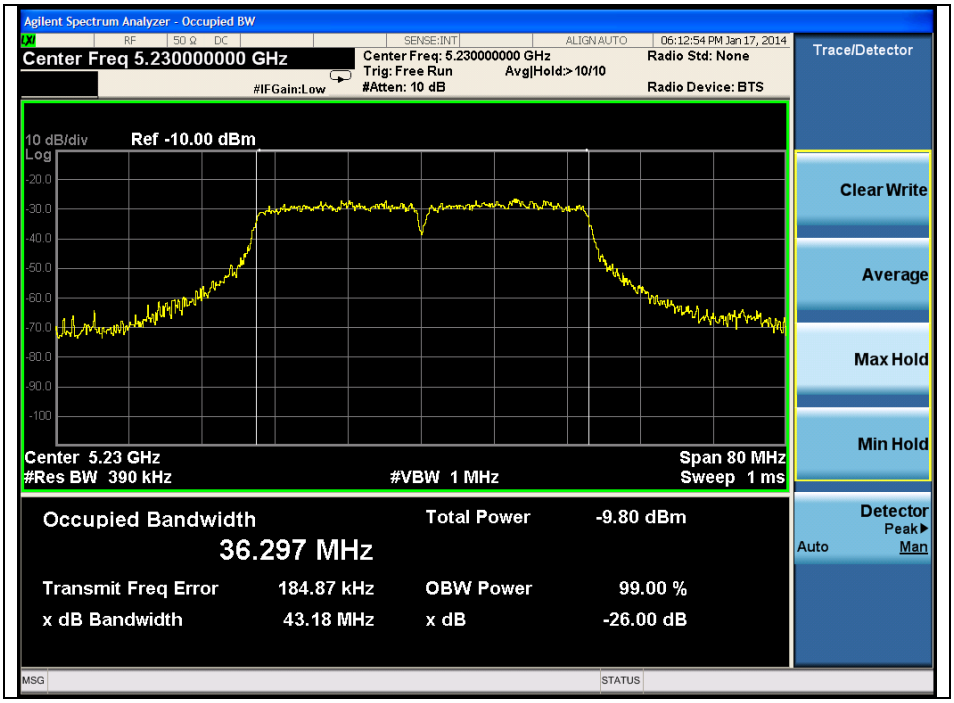
High Channel (5 700 ㎒)



802.11n_HT40 (Non-DFS)

Low Channel (5 190 ㎒)

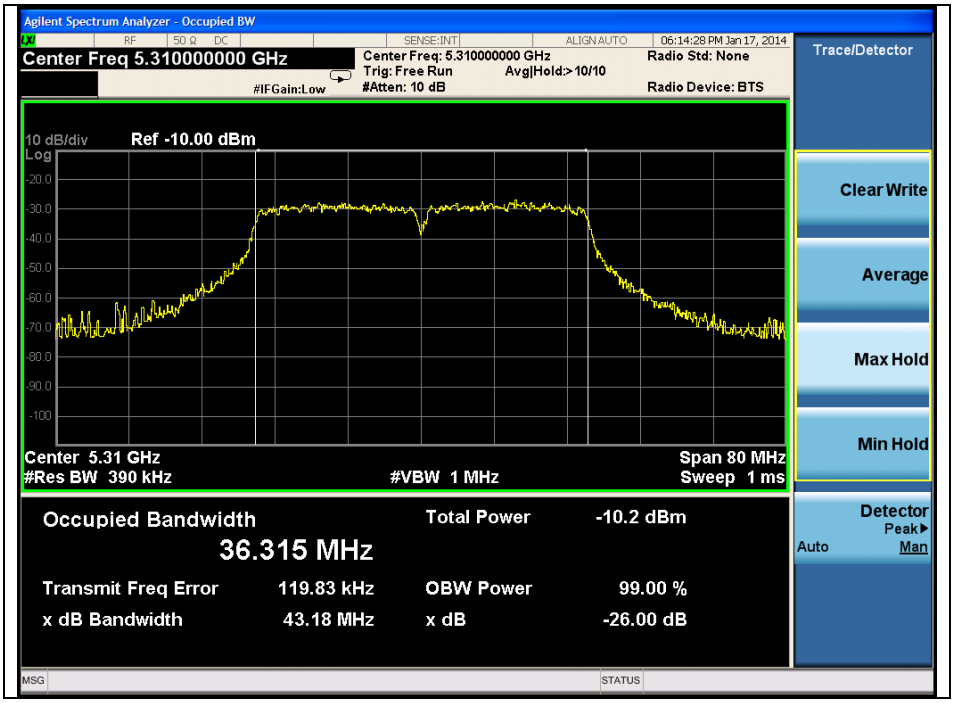
High Channel (5 230 ㎒)



802.11n_HT40 (DFS)

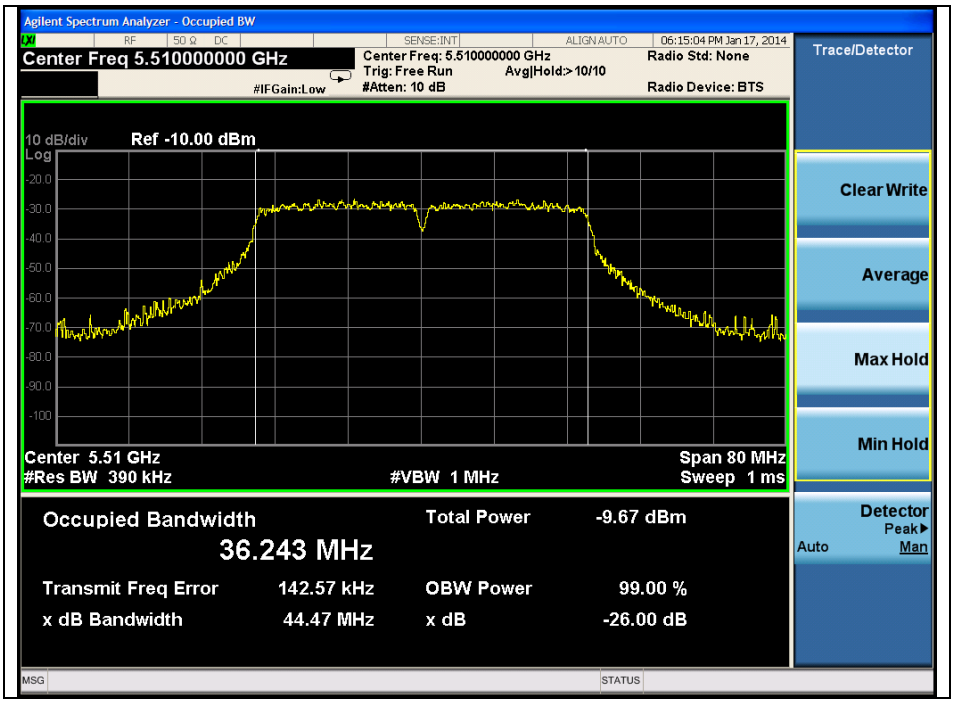
Low Channel (5 270 ㎒)

High Channel (5 310 ㎒)

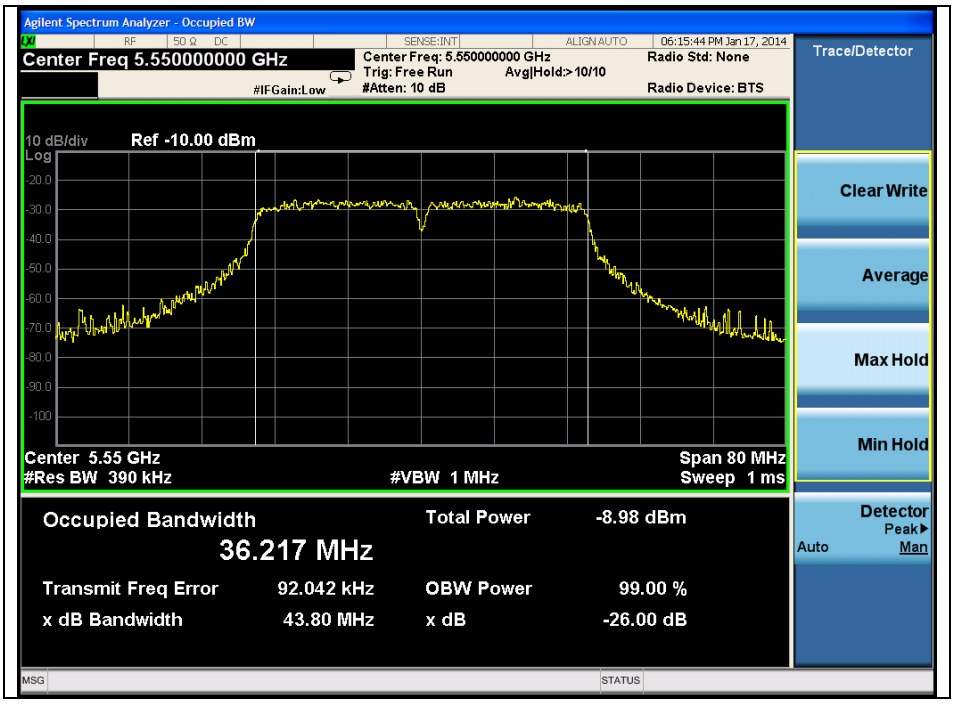


802.11n_HT40 (DFS)

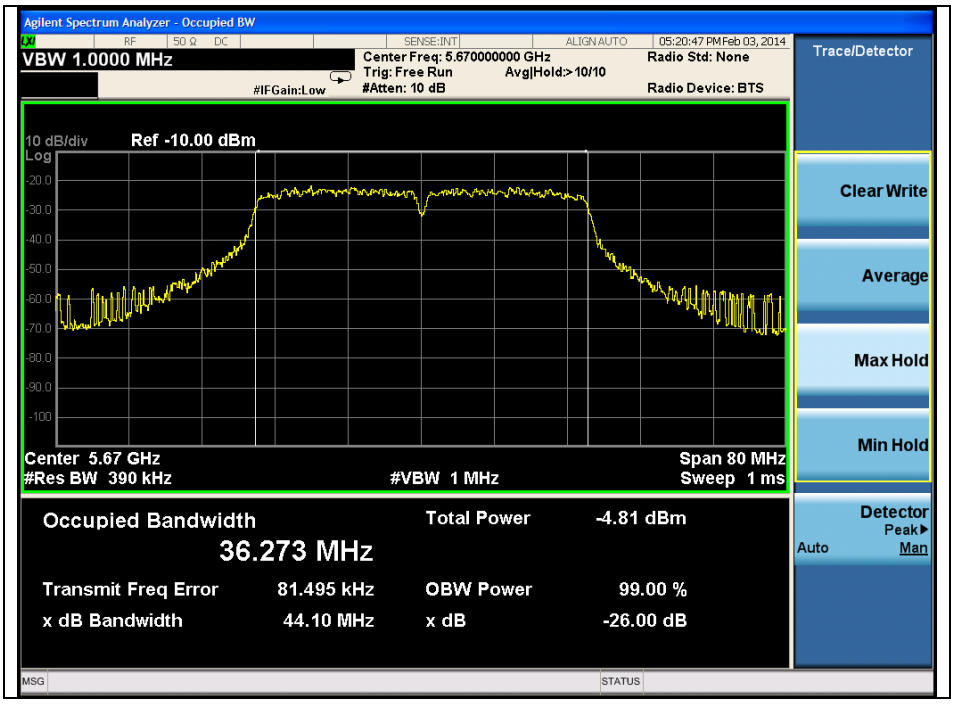
Low Channel (5 510 ㎒)



Low Channel (5 550 ㎒)



High Channel (5 670 ㎒)



99% Bandwidth

802.11a (Non-DFS)

Low Channel (5 180 ㎒)

Middle Channel (5 220 ㎒)

High Channel (5 240 ㎒)

802.11a (DFS)

Low Channel (5 260 ㎒)

Middle Channel (5 300 ㎒)

High Channel (5 320 ㎒)

802.11a (DFS)

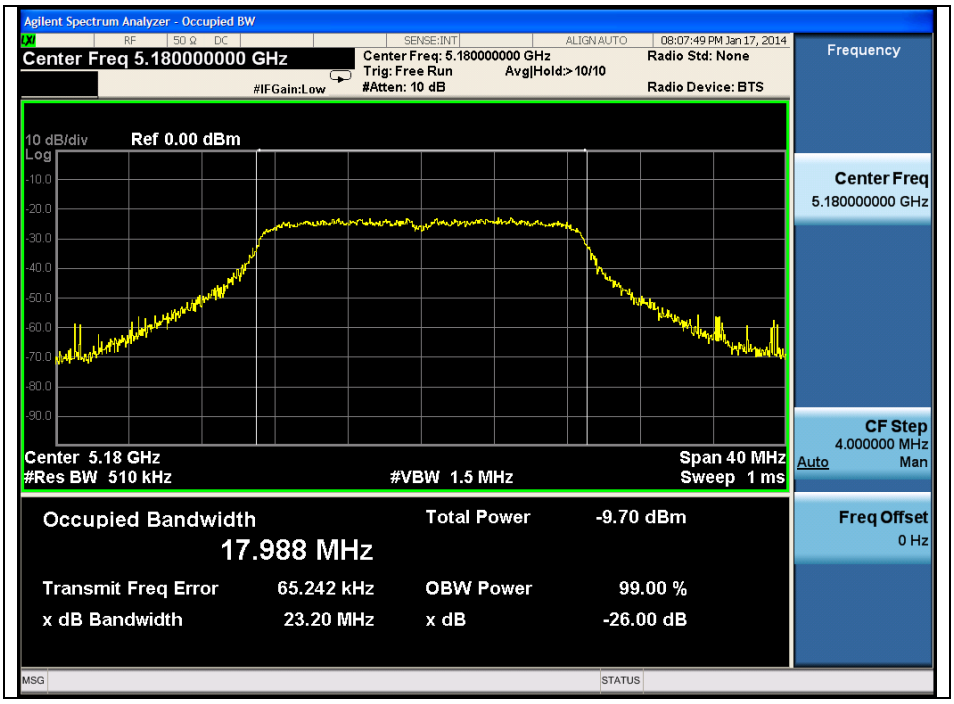
Low Channel (5 500 ㎒)

Middle Channel (5 580 ㎒)

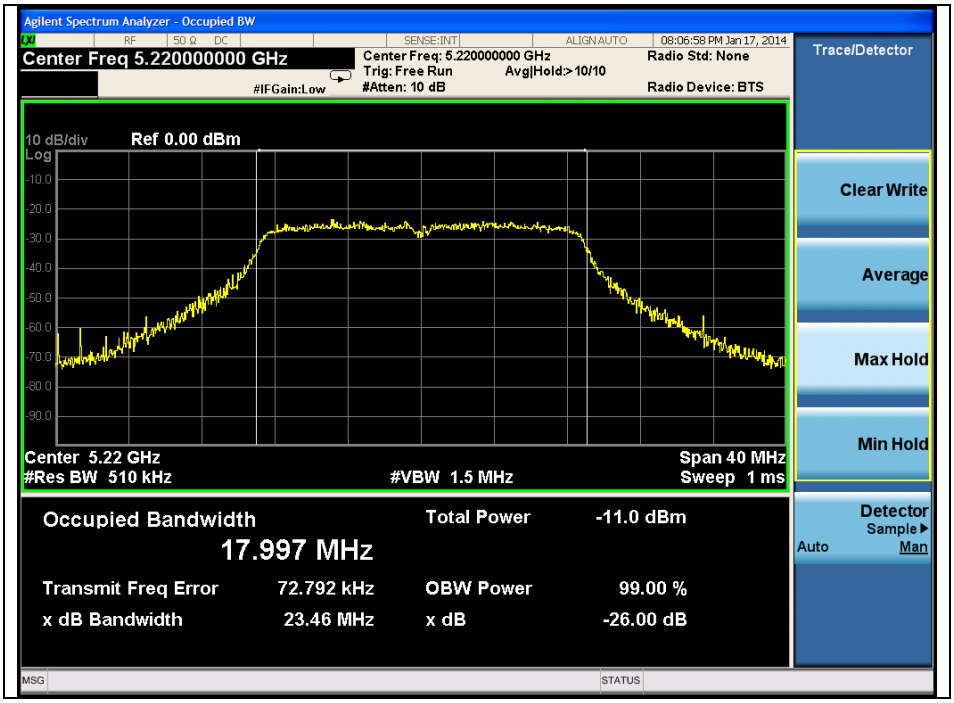
High Channel (5 700 ㎒)

802.11n_HT20 (Non-DFS)

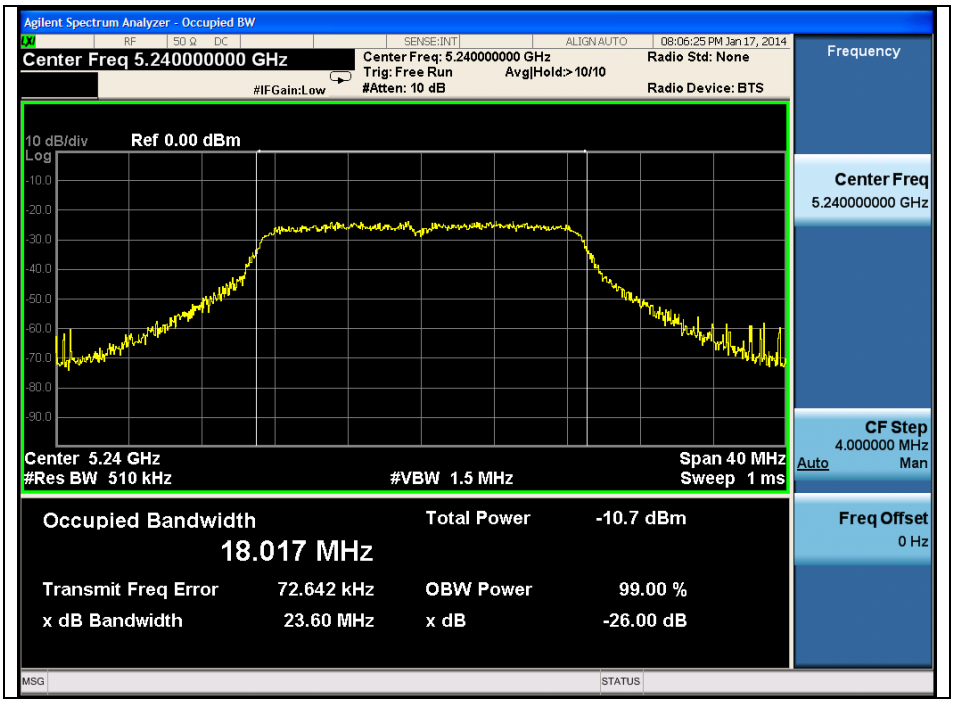
Low Channel (5 180 ㎒)



Middle Channel (5 220 ㎒)

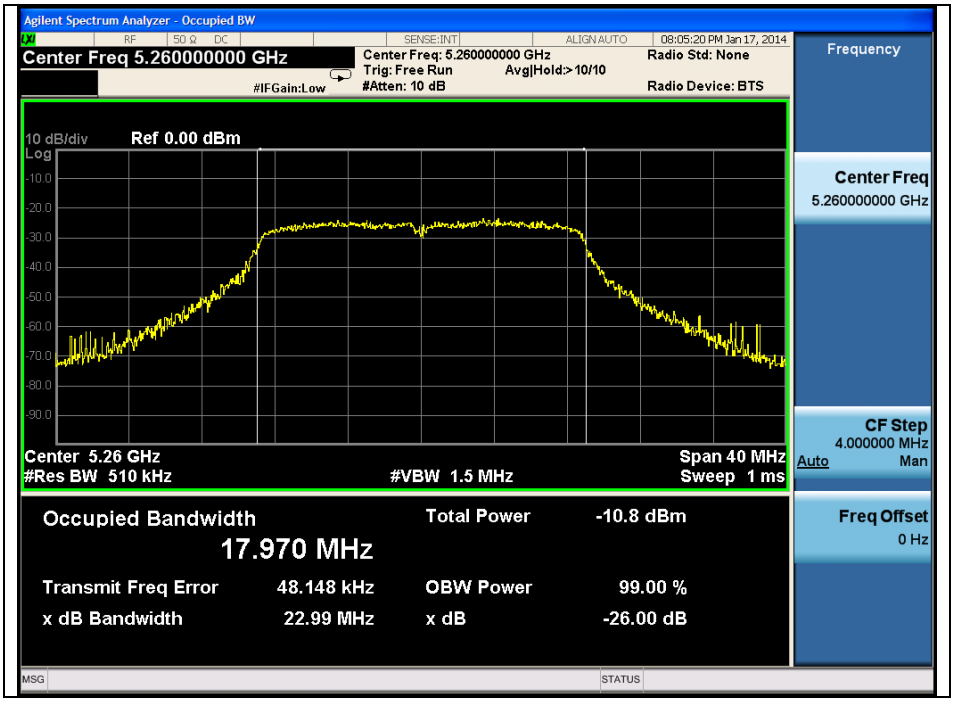


High Channel (5 240 ㎒)

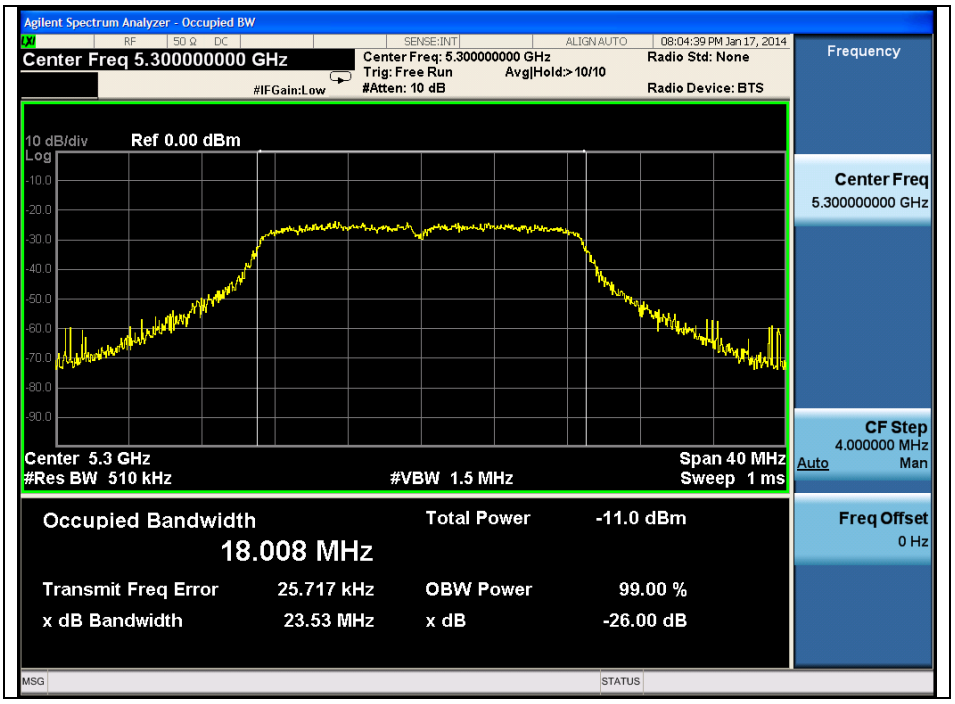


802.11n_HT20 (DFS)

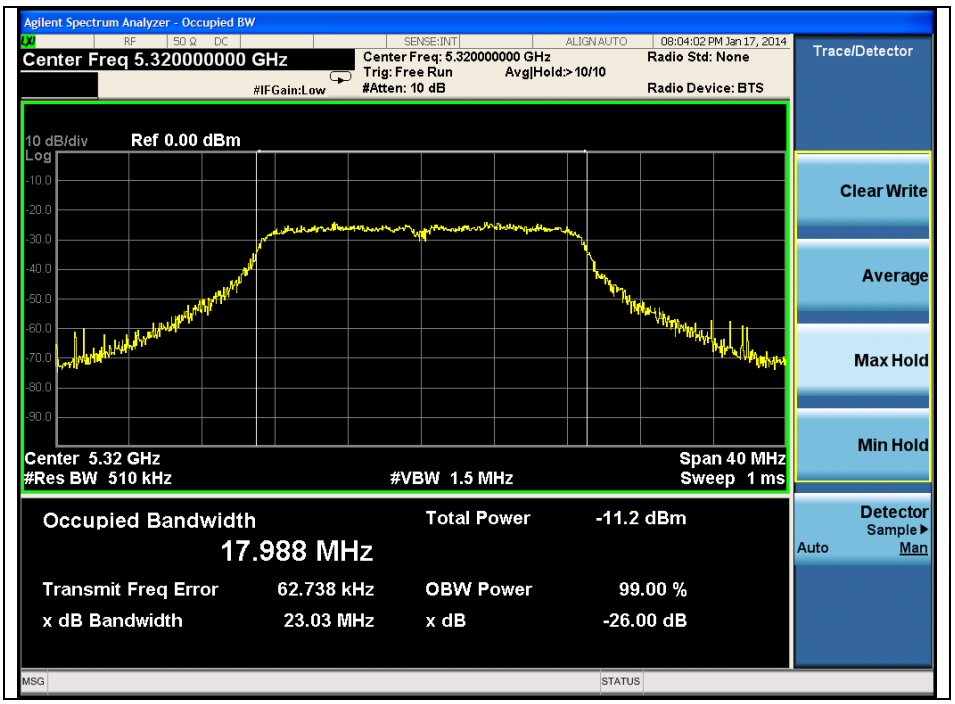
Low Channel (5 260 ㎒)



Middle Channel (5 300 ㎒)

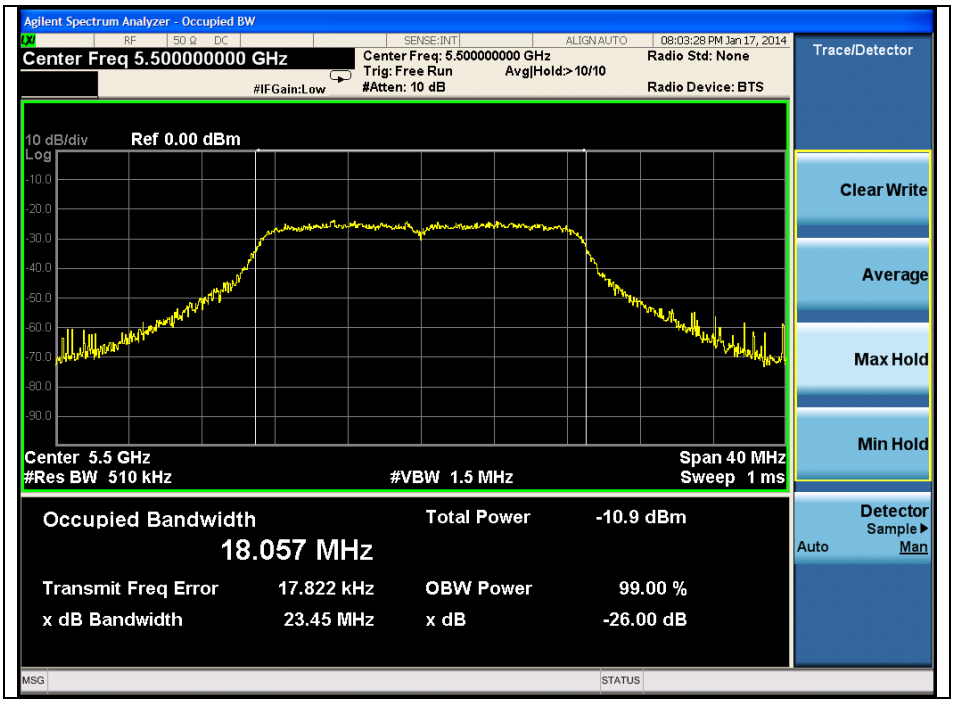


High Channel (5 320 ㎒)

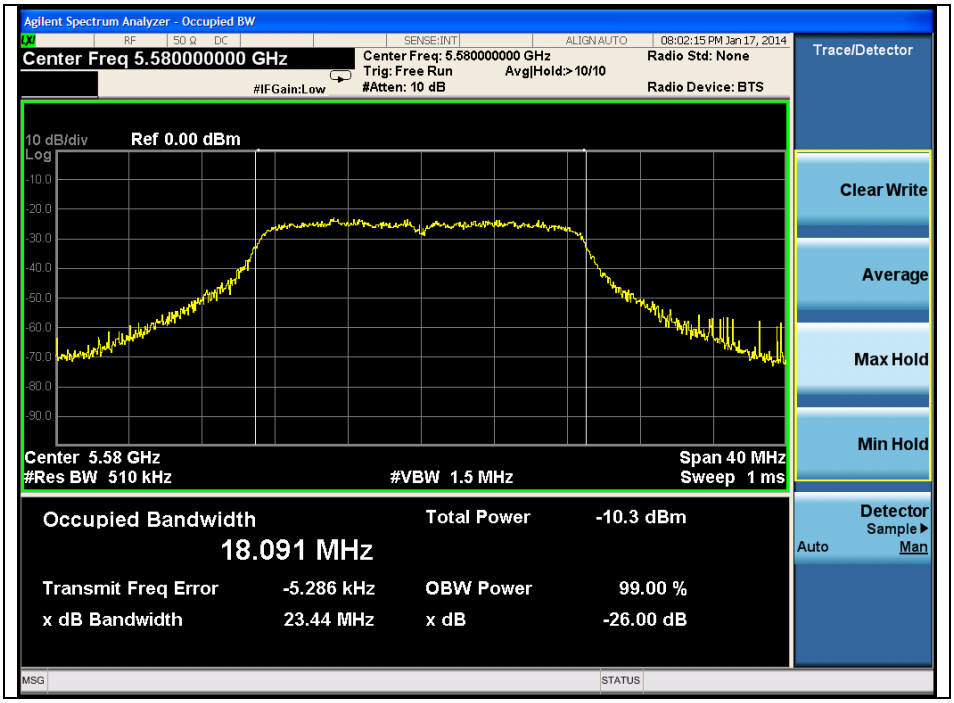


802.11n_HT20 (DFS)

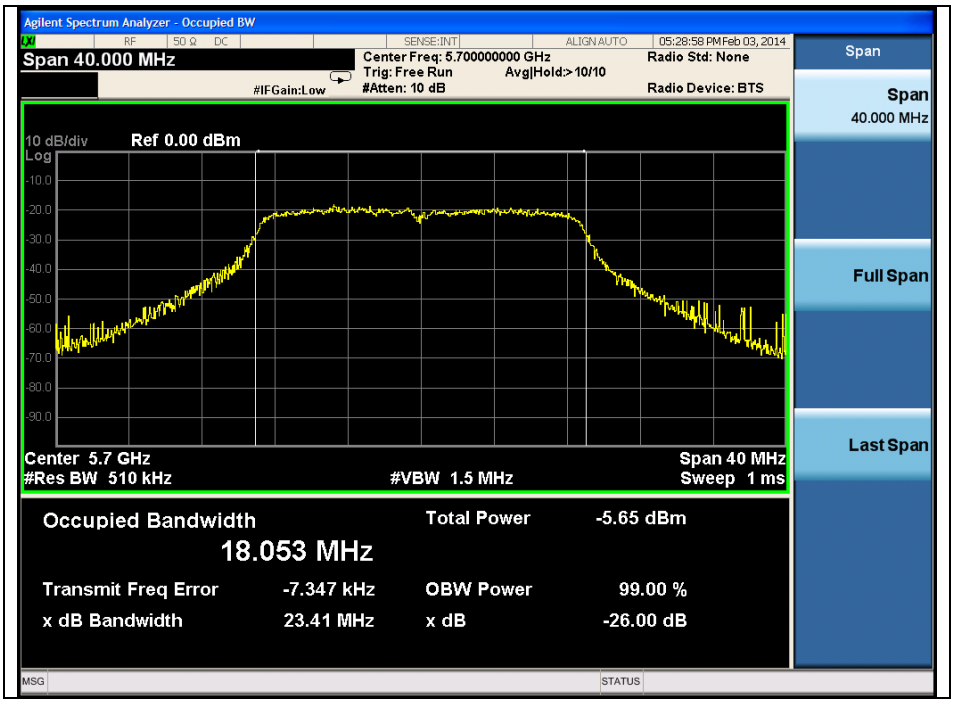
Low Channel (5 500 ㎒)



Middle Channel (5 580 ㎒)



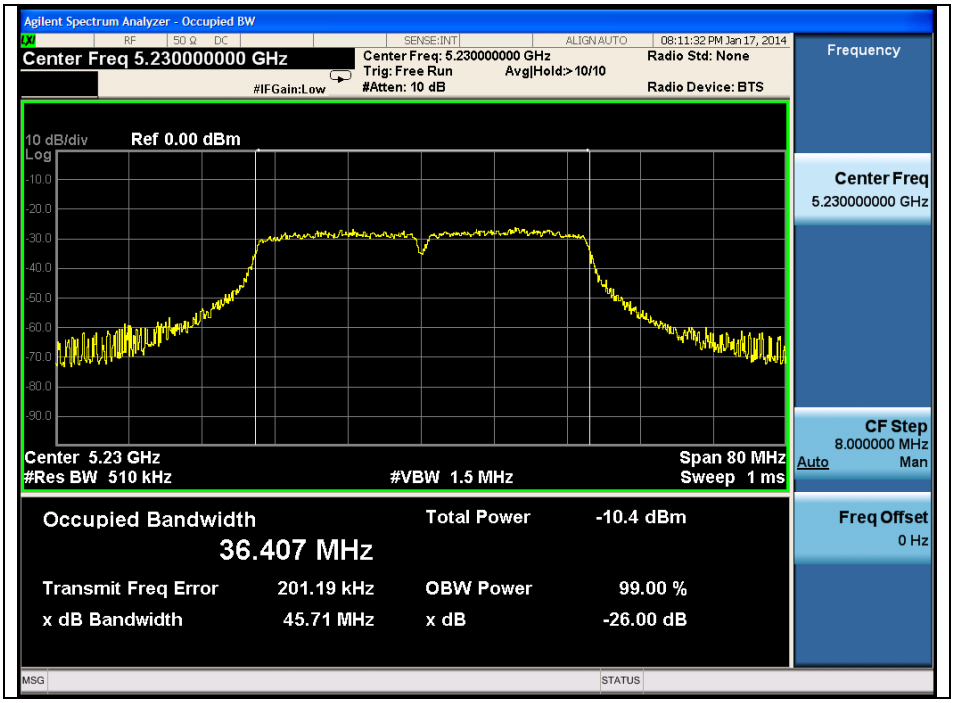
High Channel (5 700 ㎒)



802.11n_HT40 (Non-DFS)

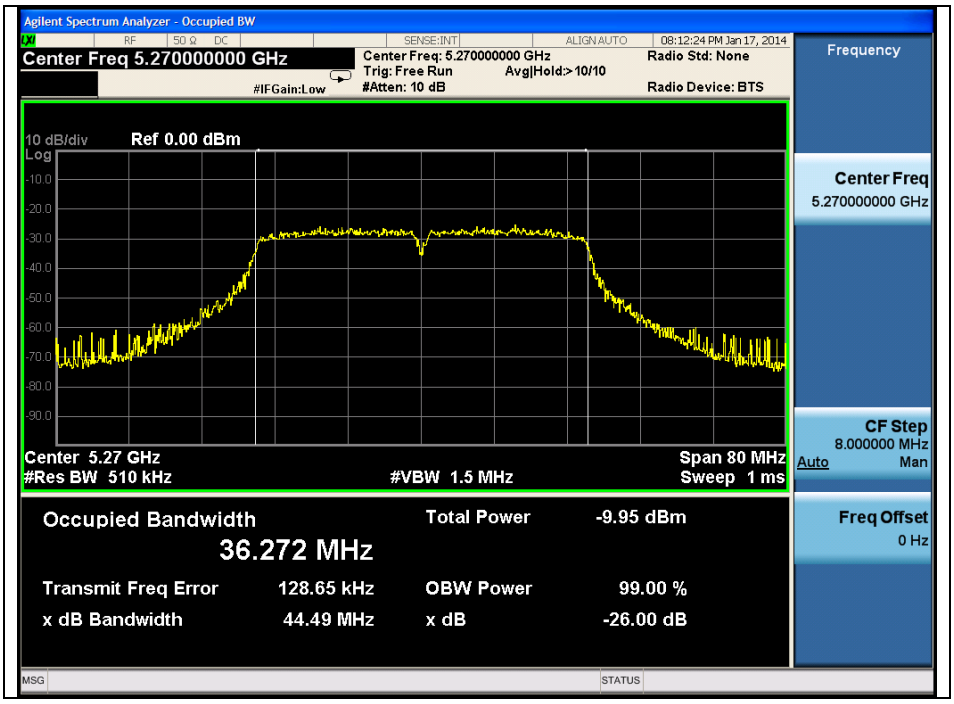
Low Channel (5 190 ㎒)

High Channel (5 230 ㎒)

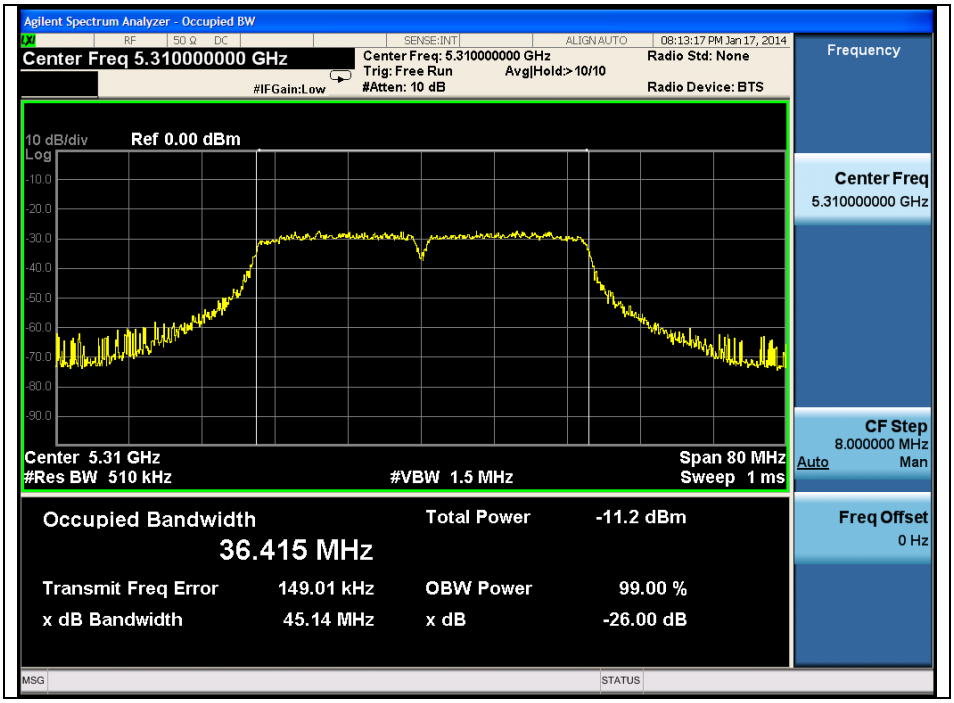


802.11n_HT40 (DFS)

Low Channel (5 270 ㎒)

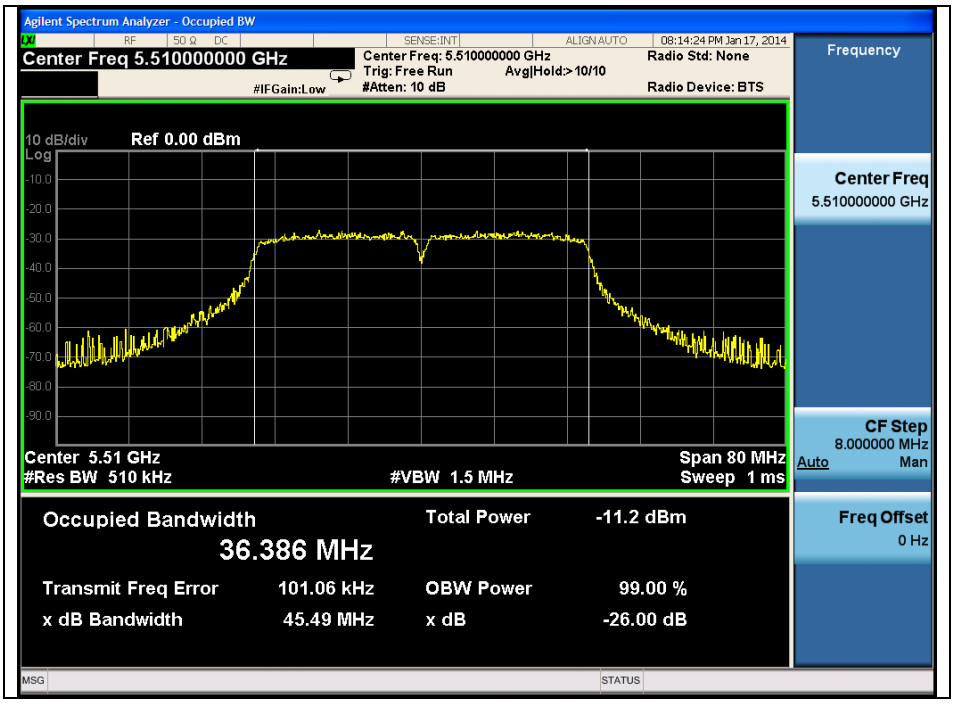


High Channel (5 310 ㎒)

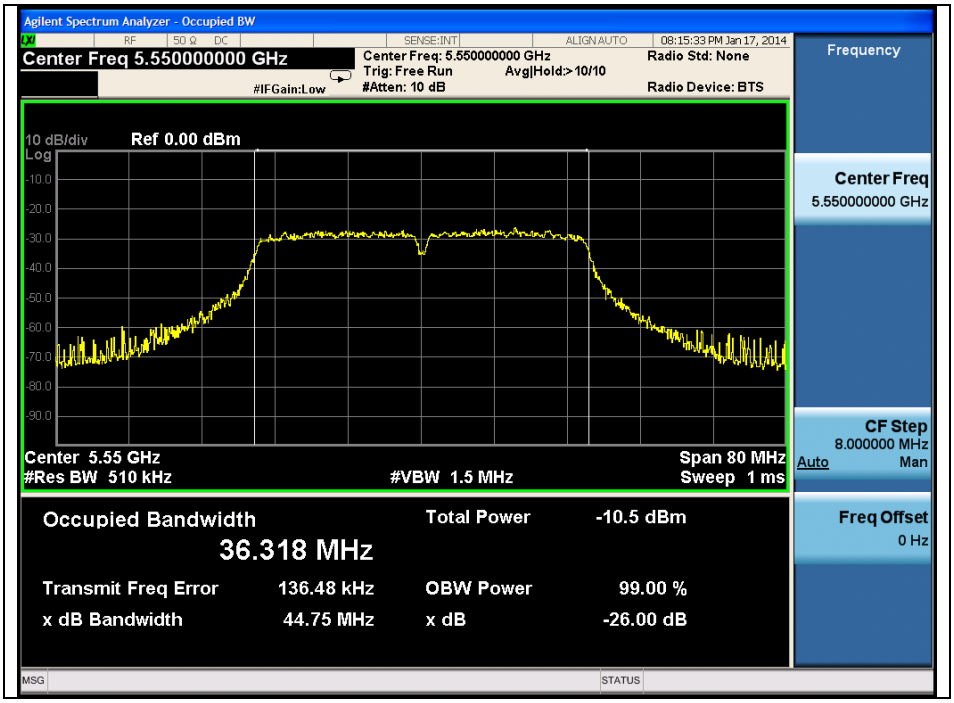


802.11n_HT40 (DFS)

Low Channel (5 510 ㎒)



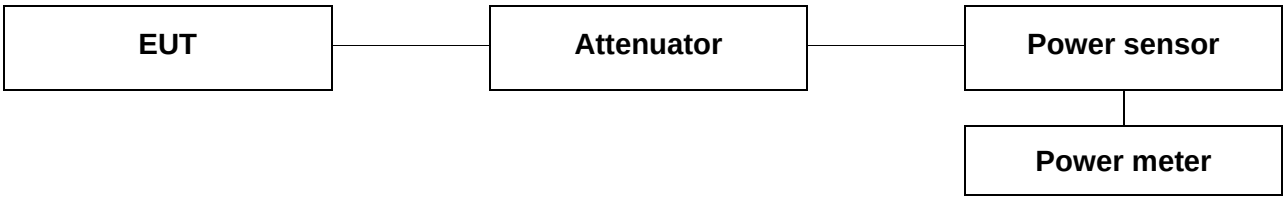
Low Channel (5 550 ㎒)



High Channel (5 670 ㎒)

4. Output power

4.1. Test setup



4.2. Limit

4.2.1. FCC 15.407

(a)(1)

For the 5.15-5.25 ㎓ band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 ㎽ or 4 ㏈m + 10 log B, where B is the 26-㏈ emission bandwidth in ㎒. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

(a)(2)

For the 5.25–5.35 ㎓ and 5.47–5.725 ㎓ bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 ㎽ or 11 ㏈m + 10 log B, where B is the 26 ㏈ emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 ㏈ m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

4.2.2. IC RSS-210

A9.2(1) Band 5 150-5 250 ㎒

The maximum e.i.r.p. shall not exceed 200 ㎽ or 10 + 10 log10 B, ㏈m, whichever power is less. B is the 99% emission bandwidth in ㎒.

A9.2(2) Band 5 250-5 350 ㎒

The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10 log10 B, ㏈m, whichever power is less. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10 B, ㏈m, whichever power is less. B is the 99% emission bandwidth in ㎒. Note that devices with a maximum e.i.r.p. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 ㏈ below the maximum permitted e.i.r.p. of 1 W.

A9.2(3) Band 5 600-5 650 ㎒

The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10 log10 B, ㏈m, whichever power is less. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10 B, ㏈m, whichever power is less. B is the 99% emission bandwidth in ㎒. Note that devices with a maximum e.i.r.p. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 ㏈ below the maximum permitted e.i.r.p. of 1 W.

4.3. Test procedure

1. This measurement settings are specified in clause 3) of section E of KDB 789033_v01r03.
2. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.
- The EUT is configured to transmit continuously or to transmit with a consistent duty cycle.
-At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
-The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
3. If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B).
4. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
5. Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g., 10 log(1/0.25) if the duty cycle is 25 percent).

4.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

4.4.1. FCC Limit

-11a

Mode	Frequency (㎒)	Data Rate (Mbps)	Fixed Limit (dB m)	26 dB BW (㎒)	4+10LogB (dB m)	Antenna gain (dB i)	Limit (dB m)
11a	5 180	6	17	20.19	17.05	-2.82	17
	5 220	6	17	20.11	17.03	-2.82	17
	5 240	6	17	20.59	17.14	-2.82	17
Mode	**Frequency (㎒)**	**Data Rate (Mbps)**	**Fixed Limit (dB m)**	**26 dB BW (㎒)**	**11+10LogB (dB m)**	**Antenna gain (dB i)**	**Limit (dB m)**
11a	5 260	6	24	20.54	24.13	-2.82	24
	5 300	6	24	20.60	24.14	-2.82	24
	5 320	6	24	20.61	24.14	-2.82	24
	5 500	6	24	20.64	24.15	0.03	24
	5 580	6	24	20.42	24.10	0.03	24
	5 700	6	24	20.35	24.09	0.03	24

-11n_HT20

Mode	Frequency (㎒)	Data Rate (Mbps)	Fixed Limit (dB m)	26 dB BW (㎒)	4+10LogB (dB m)	Antenna gain (dB i)	Limit (dB m)
11n_HT20	5 180	MCS0	17	21.44	17.31	-2.82	17
	5 220	MCS0	17	21.39	17.30	-2.82	17
	5 240	MCS0	17	21.20	17.26	-2.82	17
Mode	**Frequency (㎒)**	**Data Rate (Mbps)**	**Fixed Limit (dB m)**	**26 dB BW (㎒)**	**11+10LogB (dB m)**	**Antenna gain (dB i)**	**Limit (dB m)**
11n_HT20	5 260	MCS0	24	21.15	24.25	-2.82	24
	5 300	MCS0	24	21.43	24.31	-2.82	24
	5 320	MCS0	24	21.46	24.32	-2.82	24
	5 500	MCS0	24	21.41	24.31	0.03	24
	5 580	MCS0	24	21.21	24.27	0.03	24
	5 700	MCS0	24	21.11	24.24	0.03	24

-11n_HT40

Mode	Frequency (㎒)	Data Rate (Mbps)	Fixed Limit (dB m)	26 dB BW (㎒)	4+10LogB (dB m)	Antenna gain (dB i)	Limit (dB m)
11n_HT40	5 190	MCS0	17	44.35	20.47	-2.82	17.00
	5 230	MCS0	17	43.18	20.35	-2.82	17.00
Mode	**Frequency (㎒)**	**Data Rate (Mbps)**	**Fixed Limit (dB m)**	**26 dB BW (㎒)**	**11+10LogB (dB m)**	**Antenna gain (dB i)**	**Limit (dB m)**
11n_HT40	5 270	MCS0	24	43.38	27.37	-2.82	24.00
	5 310	MCS0	24	43.18	27.35	-2.82	24.00
	5 510	MCS0	24	44.47	27.48	0.03	24.00
	5 550	MCS0	24	43.80	27.41	0.03	24.00
	5 670	MCS0	24	44.10	27.44	0.03	24.00

4.4.2. IC Limit

-11a

Mode	Frequency (㎒)	Data Rate (Mbps)	Fixed Limit (㏈m)	99% BW (㎒)	10+10LogB (㏈m)	Antenna gain (㏈i)	Limit (㏈m)
11a	5 180	6	23	16.93	22.29	-2.82	22.29
	5 220	6	23	16.92	22.28	-2.82	22.28
	5 240	6	23	16.88	22.27	-2.82	22.27
Mode	**Frequency (㎒)**	**Data Rate (Mbps)**	**Fixed Limit (㏈m)**	**99% BW (㎒)**	**11+10LogB (㏈m)**	**Antenna gain (㏈i)**	**Limit (㏈m)**
11a	5 260	6	24	16.92	23.28	-2.82	23.28
	5 300	6	24	16.89	23.28	-2.82	23.28
	5 320	6	24	16.82	23.26	-2.82	23.26
	5 500	6	24	16.95	23.29	0.03	23.29
	5 580	6	24	17.04	23.31	0.03	23.31
	5 700	6	24	16.99	23.30	0.03	23.30

-11n_HT20

Mode	Frequency (㎒)	Data Rate (Mbps)	Fixed Limit (㏈m)	99% BW (㎒)	10+10LogB (㏈m)	Antenna gain (㏈i)	Limit (㏈m)
11n_HT20	5 180	MCS0	23	17.99	22.55	-2.82	22.55
	5 220	MCS0	23	18.00	22.55	-2.82	22.55
	5 240	MCS0	23	18.02	22.56	-2.82	22.56
Mode	**Frequency (㎒)**	**Data Rate (Mbps)**	**Fixed Limit (㏈m)**	**99% BW (㎒)**	**11+10LogB (㏈m)**	**Antenna gain (㏈i)**	**Limit (㏈m)**
11n_HT20	5 260	MCS0	24	17.97	23.55	-2.82	23.55
	5 300	MCS0	24	18.01	23.56	-2.82	23.56
	5 320	MCS0	24	17.99	23.55	-2.82	23.55
	5 500	MCS0	24	18.06	23.57	0.03	23.57
	5 580	MCS0	24	18.09	23.57	0.03	23.57
	5 700	MCS0	24	18.05	23.56	0.03	23.56

-11n_HT40

Mode	Frequency (㎒)	Data Rate (Mbps)	Fixed Limit (㏈ m)	99% BW (㎒)	10+10LogB (㏈ m)	Antenna gain (㏈ i)	Limit (㏈ m)
11n_HT40	5 190	MCS0	23	36.27	25.60	-2.82	23
	5 230	MCS0	23	36.41	25.61	-2.82	23
Mode	**Frequency (㎒)**	**Data Rate (Mbps)**	**Fixed Limit (㏈ m)**	**99% BW (㎒)**	**11+10LogB (㏈ m)**	**Antenna gain (㏈ i)**	**Limit (㏈ m)**
11n_HT40	5 270	MCS0	24	36.27	26.60	-2.82	24
	5 310	MCS0	24	36.12	26.58	-2.82	24
	5 510	MCS0	24	36.39	26.61	0.03	24
	5 550	MCS0	24	36.32	26.60	0.03	24
	5 670	MCS0	24	36.37	26.61	0.03	24

4.4.3. Result

-11a

Frequncy [MHz]	Rated [Mbps]	Measured Power [dB m]	Limit [dB m]	
			FCC	IC
5 180	6	4.73	17.00	22.29
	9	4.95		
	12	5.13		
	18	5.07		
	24	5.01		
	36	4.95		
	48	4.88		
	54	4.64		
5 220	6	3.61	17.00	22.28
	9	3.93		
	12	4.04		
	18	3.99		
	24	3.84		
	36	3.79		
	48	3.55		
	54	3.56		
5 240	6	4.28	17.00	22.27
	9	4.24		
	12	4.45		
	18	4.40		
	24	4.26		
	36	4.30		
	48	4.05		
	54	3.99		

Frequncy [㎒]	Rated [Mbps]	Measured Power [dB m]	Limit [dB m]	
			FCC	IC
5 260	6	4.40	24.00	23.28
	9	4.32		
	12	4.54		
	18	4.40		
	24	4.34		
	36	4.26		
	48	4.12		
	54	4.06		
5 300	6	4.40	24.00	23.28
	9	4.46		
	12	4.59		
	18	4.44		
	24	4.30		
	36	4.21		
	48	4.22		
	54	4.09		
5 320	6	4.26	24.00	23.26
	9	4.39		
	12	4.48		
	18	4.35		
	24	4.33		
	36	4.05		
	48	4.10		
	54	3.88		

Frequncy [㎒]	Rated [Mbps]	Measured Power [dB m]	Limit [dB m]	
			FCC	IC
5 500	6	4.63	24.00	23.29
	9	4.70		
	12	4.77		
	18	4.65		
	24	4.60		
	36	4.34		
	48	4.26		
	54	4.10		
5 580	6	5.58	24.00	23.31
	9	5.59		
	12	5.62		
	18	5.54		
	24	5.34		
	36	5.44		
	48	5.31		
	54	5.16		
5 700	6	5.15	24.00	23.30
	9	5.22		
	12	5.26		
	18	5.20		
	24	5.17		
	36	5.04		
	48	5.00		
	54	4.96		

-11n_HT20

Frequncy [㎒]	Rated [Mbps]	Measured Power [dB m]	Limit [dB m]	
			FCC	IC
5 180	MCS0	5.10	17.00	22.55
	MCS1	5.56		
	MCS2	5.66		
	MCS3	6.04		
	MCS4	5.89		
	MCS5	5.90		
	MCS6	5.71		
	MCS7	5.55		
5 220	MCS0	4.30	17.00	22.55
	MCS1	4.28		
	MCS2	4.33		
	MCS3	4.73		
	MCS4	4.66		
	MCS5	4.50		
	MCS6	4.26		
	MCS7	4.13		
5 240	MCS0	4.66	17.00	22.56
	MCS1	4.60		
	MCS2	4.69		
	MCS3	5.08		
	MCS4	5.01		
	MCS5	5.00		
	MCS6	4.91		
	MCS7	4.88		

Frequncy [㎒]	Rated [Mbps]	Measured Power [dB m]	Limit [dB m]	
			FCC	IC
5 260	MCS0	4.69	24.00	23.55
	MCS1	4.77		
	MCS2	4.85		
	MCS3	5.21		
	MCS4	5.10		
	MCS5	5.03		
	MCS6	4.94		
	MCS7	4.79		
5 300	MCS0	5.13	24.00	23.56
	MCS1	4.82		
	MCS2	4.85		
	MCS3	4.72		
	MCS4	4.60		
	MCS5	4.51		
	MCS6	4.31		
	MCS7	4.26		
5 320	MCS0	5.00	24.00	23.55
	MCS1	4.70		
	MCS2	4.72		
	MCS3	4.60		
	MCS4	4.44		
	MCS5	4.49		
	MCS6	4.26		
	MCS7	4.10		

Frequncy [㎒]	Rated [Mbps]	Measured Power [dB m]	Limit [dB m]	
			FCC	IC
5 500	MCS0	5.35	24.00	23.57
	MCS1	5.40		
	MCS2	5.44		
	MCS3	5.82		
	MCS4	5.61		
	MCS5	5.55		
	MCS6	5.34		
	MCS7	5.21		
5 580	MCS0	5.70	24.00	23.57
	MCS1	5.87		
	MCS2	5.90		
	MCS3	6.27		
	MCS4	6.20		
	MCS5	6.02		
	MCS6	5.88		
	MCS7	5.76		
5 700	MCS0	5.42	24.00	23.56
	MCS1	5.29		
	MCS2	5.31		
	MCS3	5.20		
	MCS4	5.11		
	MCS5	5.00		
	MCS6	4.88		
	MCS7	4.92		

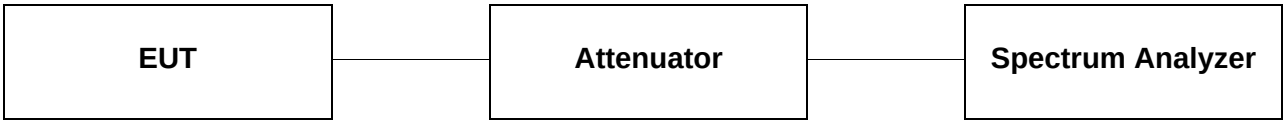
-11n_HT40

Frequncy [㎒]	Rated [Mbps]	Measured Power [dB m]	Limit [dB m]	
			FCC	IC
5 190	MCS0	5.02	17.00	23.00
	MCS1	5.54		
	MCS2	5.10		
	MCS3	5.44		
	MCS4	5.40		
	MCS5	5.31		
	MCS6	5.22		
	MCS7	5.06		
5 230	MCS0	4.13	17.00	23.00
	MCS1	4.35		
	MCS2	3.84		
	MCS3	4.26		
	MCS4	4.11		
	MCS5	4.00		
	MCS6	3.88		
	MCS7	3.90		
5 270	MCS0	5.29	24.00	24.00
	MCS1	5.15		
	MCS2	5.04		
	MCS3	5.00		
	MCS4	4.88		
	MCS5	4.90		
	MCS6	4.71		
	MCS7	4.65		
5 310	MCS0	4.44	24.00	24.00
	MCS1	4.39		
	MCS2	4.57		
	MCS3	4.22		
	MCS4	4.16		
	MCS5	4.20		
	MCS6	4.11		
	MCS7	4.05		

Frequncy [㎒]	Rated [Mbps]	Measured Power [dB m]	Limit [dB m]	
			FCC	IC
5 510	MCS0	4.61	24.00	24.00
	MCS1	5.37		
	MCS2	5.21		
	MCS3	5.14		
	MCS4	5.10		
	MCS5	5.02		
	MCS6	4.88		
	MCS7	4.64		
5 550	MCS0	5.52	24.00	24.00
	MCS1	6.02		
	MCS2	5.73		
	MCS3	5.72		
	MCS4	5.61		
	MCS5	5.43		
	MCS6	5.26		
	MCS7	5.10		
5 670	MCS0	5.30	24.00	24.00
	MCS1	5.15		
	MCS2	5.16		
	MCS3	5.22		
	MCS4	5.02		
	MCS5	4.96		
	MCS6	4.87		
	MCS7	4.80		

5. Peak power spectral density

5.1. Test setup



5.2. Limit

5.2.1. FCC 15.407

(a)(1)

For the band 5.15-5.25 ㎓ band, the peak power spectral density shall not exceed 4 ㏈m in any 1 ㎒ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

(a)(2)

For the band 5.25–5.35 ㎓ and 5.47–5.725 ㎓ bands, the peak power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

5.2.2. IC RSS-210

A9.2(1) Band 5 150-5 250 ㎒

The e.i.r.p. spectral density shall not exceed 10 ㏈m in any 1.0 ㎒ band.

A9.2(2) Band 5 250-5 350 ㎒

The power spectral density shall not exceed 11 ㏈m in any 1.0 ㎒ band.

A9.2(3) Band 5 600-5 650 ㎒

The power spectral density shall not exceed 11 ㏈m in any 1.0 ㎒ band.

5.3. Test procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in clause b) Method SA-1 of section E of KDB 789033_v01r03.
2. Set span to encompass the 26 ㏈ EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
3. Set RBW = 1 ㎒
4. Set VBW ≥ 3 ㎒
5. Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
6. Sweep time = auto.
7. Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
8. Do not use sweep triggering. Allow the sweep to “free run”.
9. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
10. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
11. The result is the PPSD.

5.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

- 802.11a

Frequency (㎒)	Data Rate (Mbps)	Measured PSD (dB m)	Limit (dB m)
5 180	6	-5.663	4
5 220	6	-6.936	4
5 240	6	-6.263	4
5 260	6	-6.464	11
5 300	6	-6.872	11
5 320	6	-6.985	11
5 500	6	-7.591	11
5 580	6	-6.485	11
5 700	6	-6.326	11

- 802.11n_HT20

Frequency (㎒)	Data Rate (Mbps)	Measured PSD (dB m)	Limit (dB m)
5 180	MCS0	-5.123	4
5 220	MCS0	-6.698	4
5 240	MCS0	-6.235	4
5 260	MCS0	-6.241	11
5 300	MCS0	-6.339	11
5 320	MCS0	-6.438	11
5 500	MCS0	-7.116	11
5 580	MCS0	-6.042	11
5 700	MCS0	-5.722	11

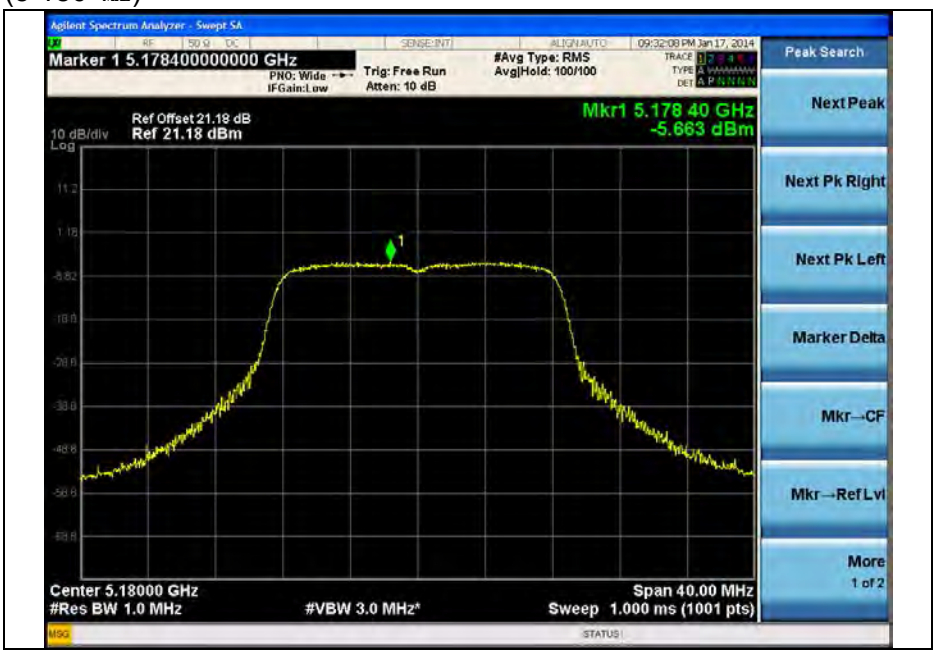
- 802.11n_HT40

Frequency (㎒)	Data Rate (Mbps)	Measured PSD (㏈m)	Limit (㏈m)
5 190	MCS0	-7.574	4
5 230	MCS0	-9.357	4
5 270	MCS0	-9.086	4
5 310	MCS0	-10.292	11
5 510	MCS0	-10.729	11
5 550	MCS0	-9.877	11
5 670	MCS0	-8.441	11

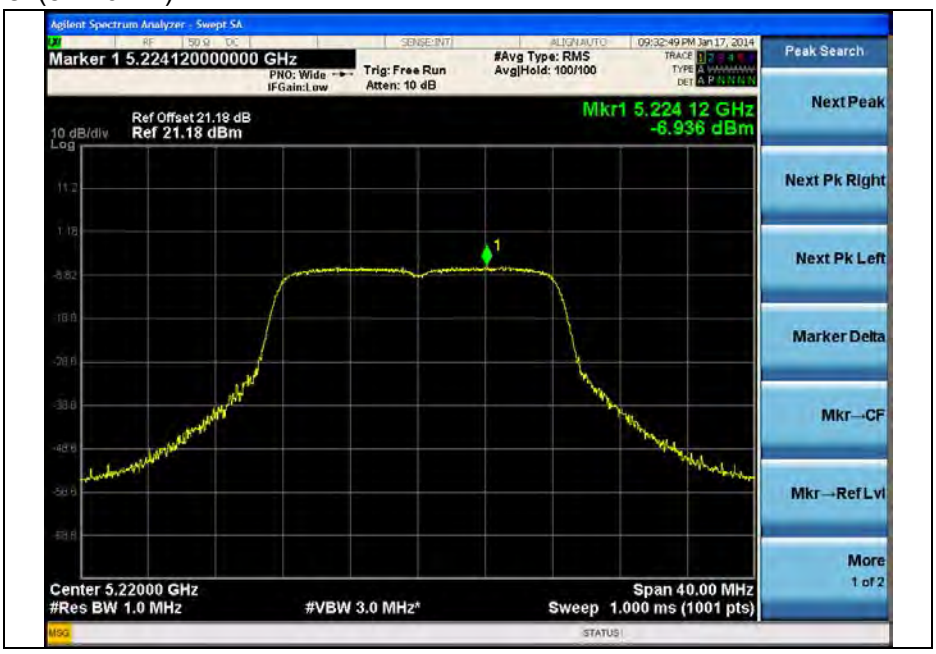
Note;
- In case of the Data Rate, record the Data Rate of the worst case

802.11a (6 Mbps)

Low Channel (5 180 ㎒)

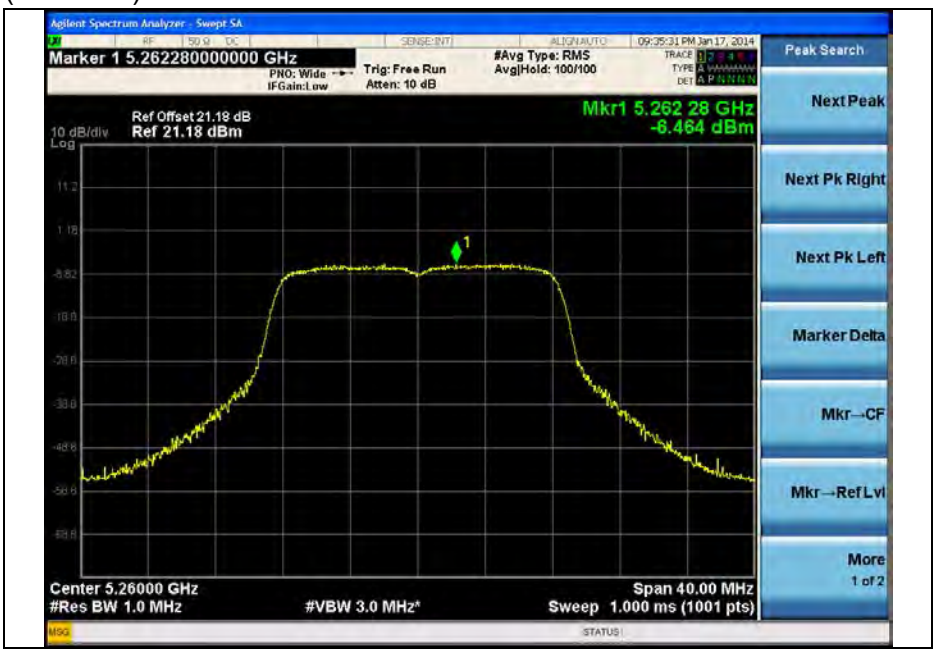


Middle Channel (5 220 ㎒)



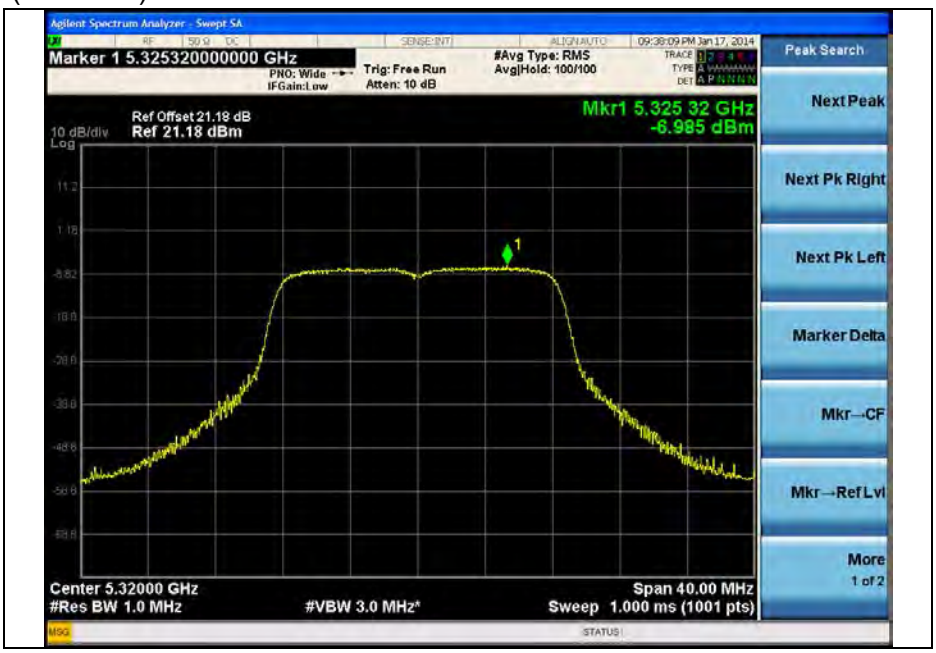
High Channel (5 240 ㎒)

Low Channel (5 260 ㎒)

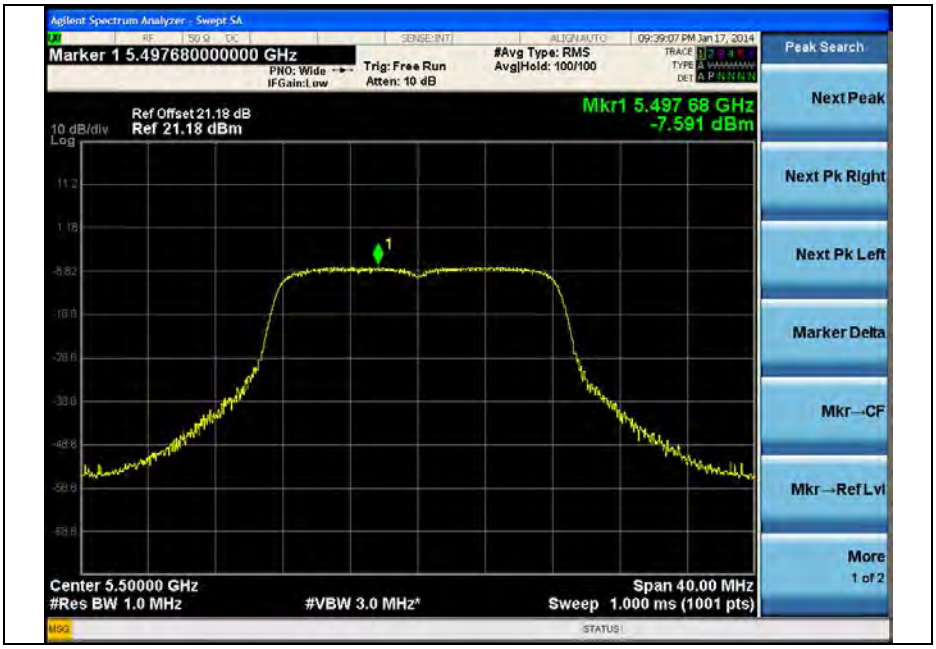


Middle Channel (5 300 ㎒)

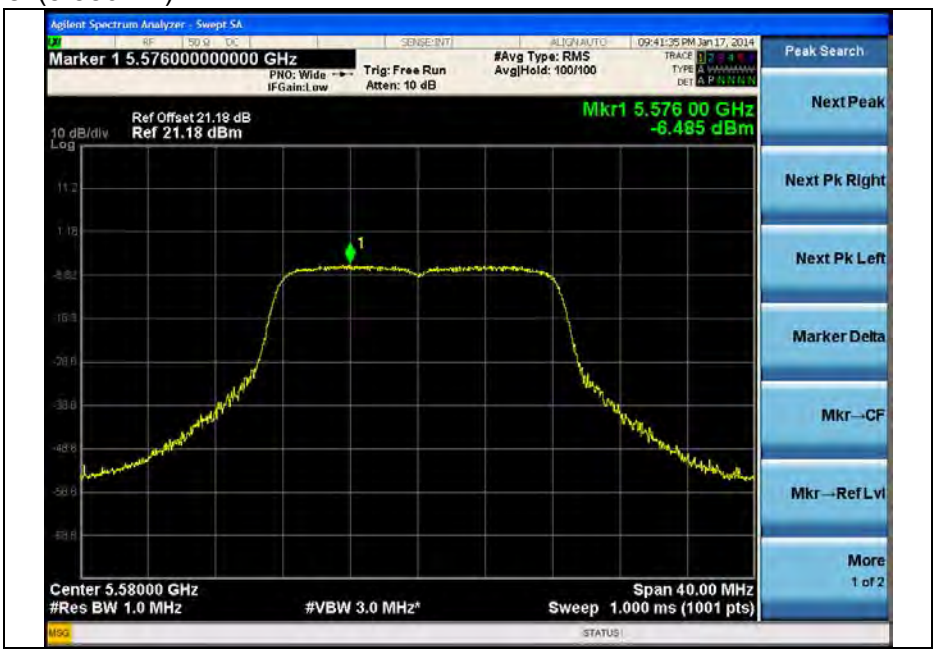
High Channel (5 320 ㎒)



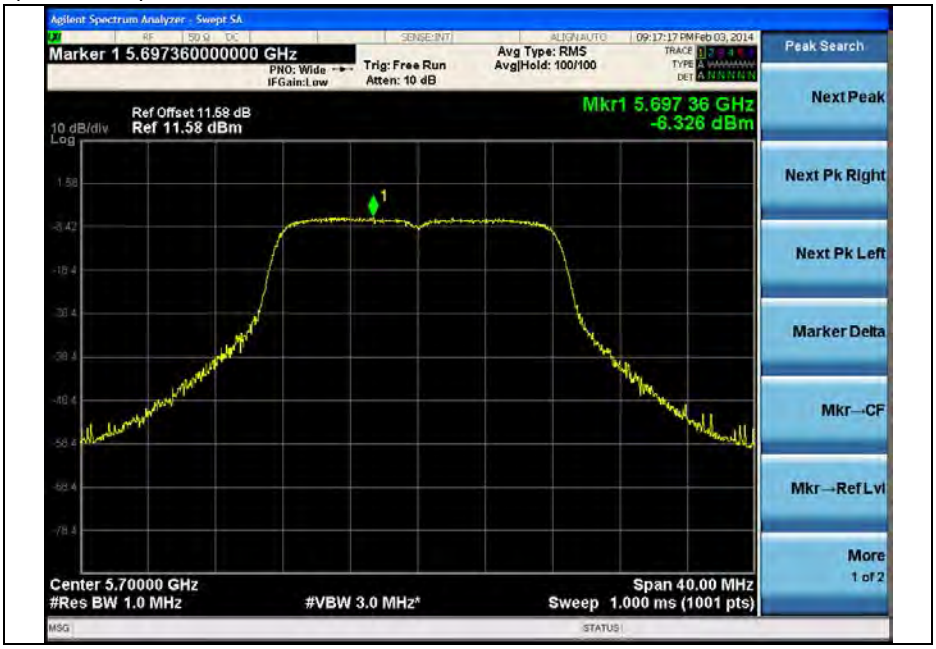
Low Channel (5 500 ㎒)



Middle Channel (5 580 ㎒)

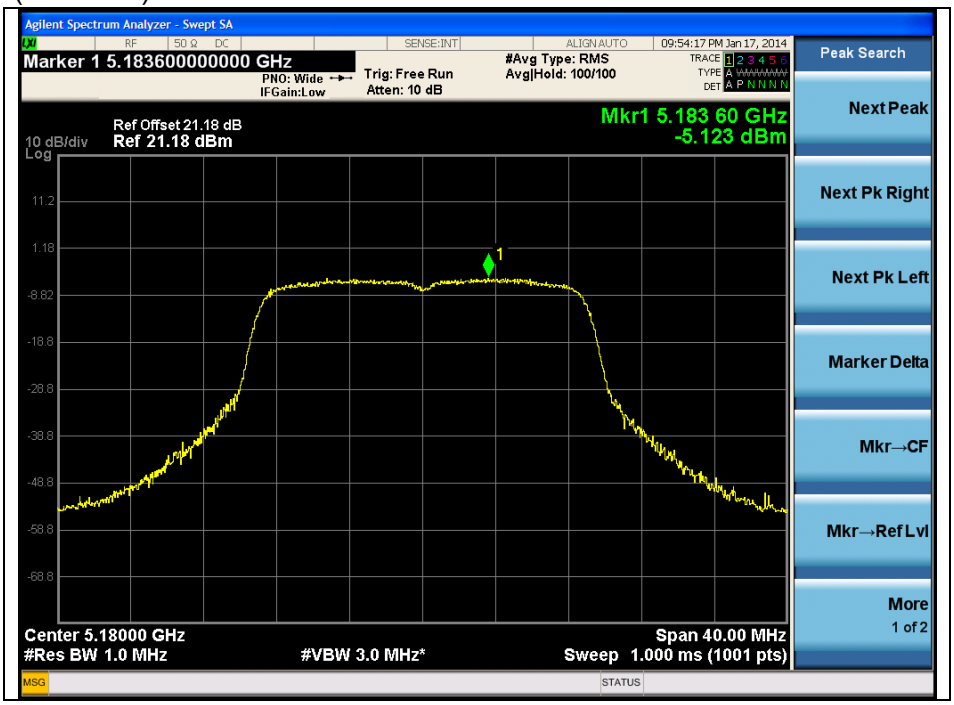


High Channel (5 700 ㎒)

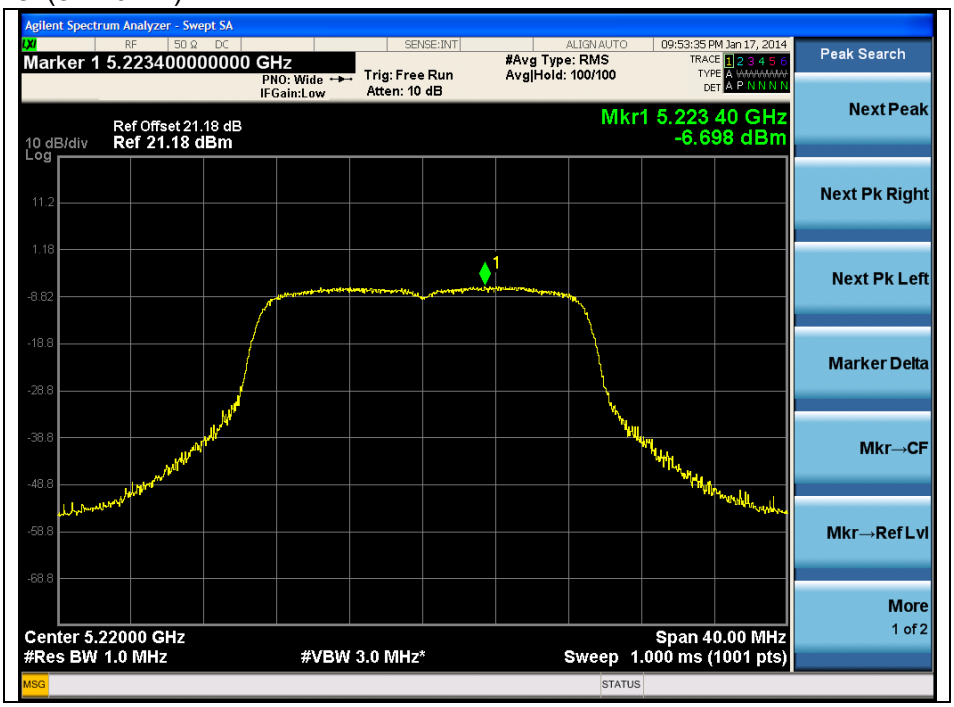


802.11n_HT20 (MCS0)

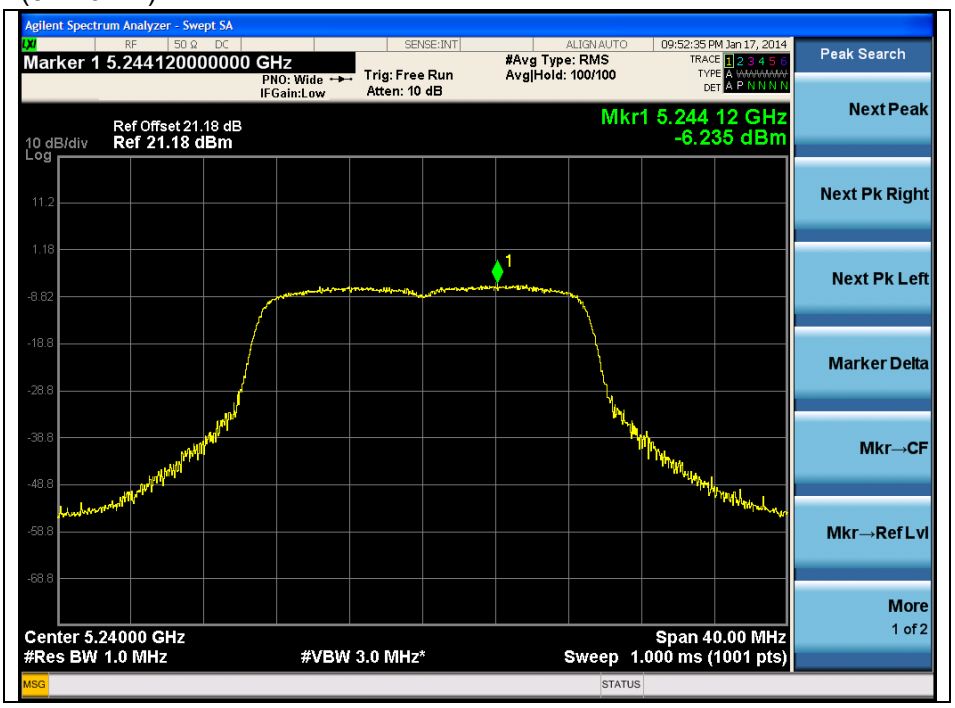
Low Channel (5 180 ㎒)



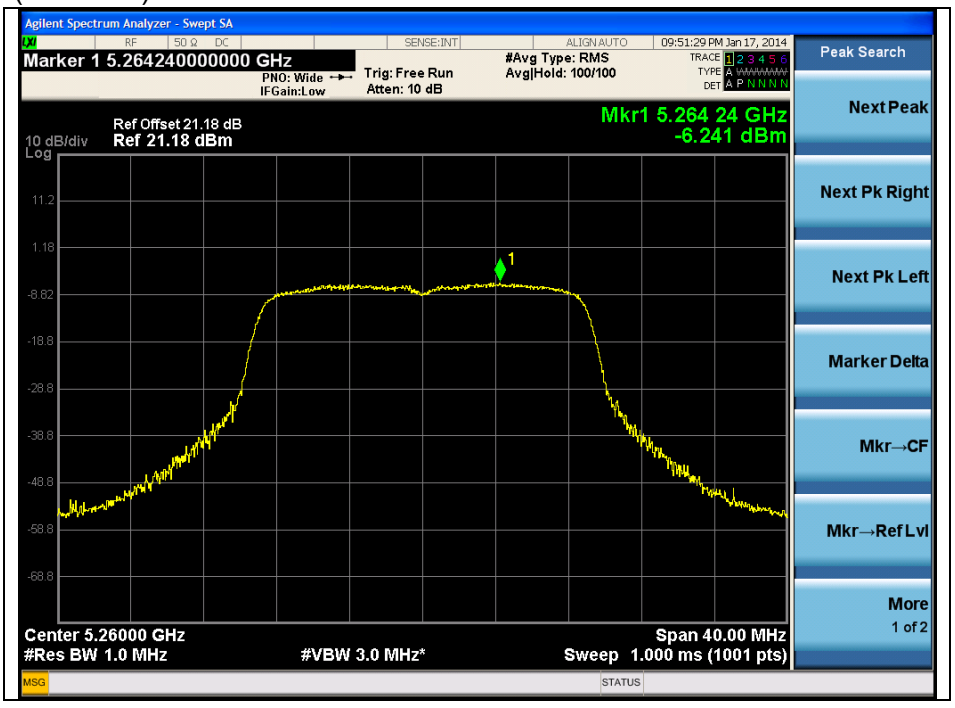
Middle Channel (5 220 ㎒)



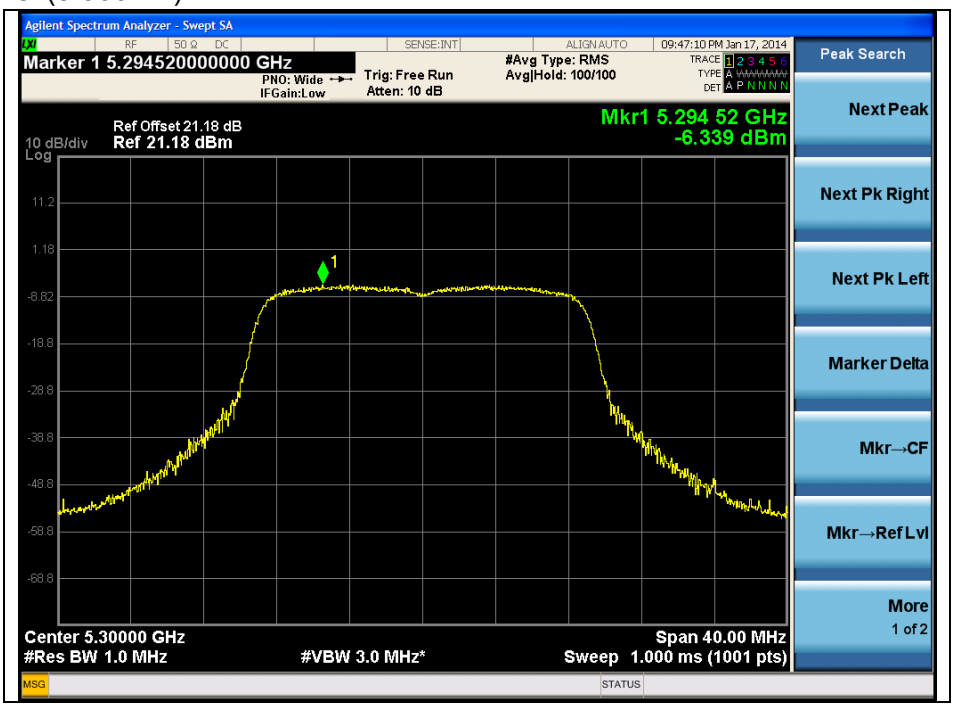
High Channel (5 240 ㎒)



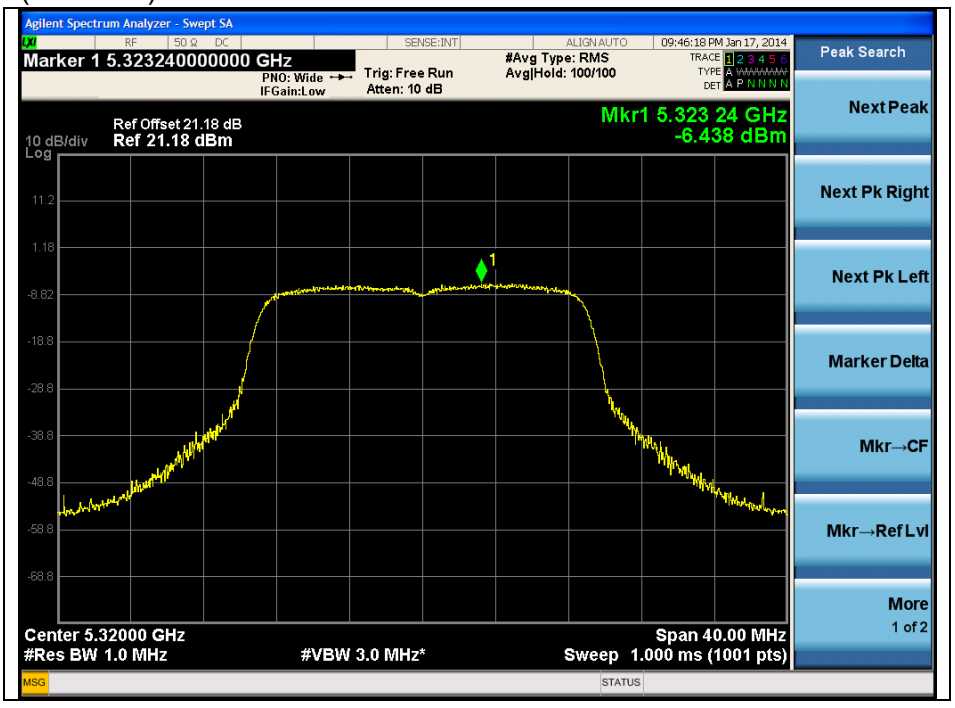
Low Channel (5 260 ㎒)



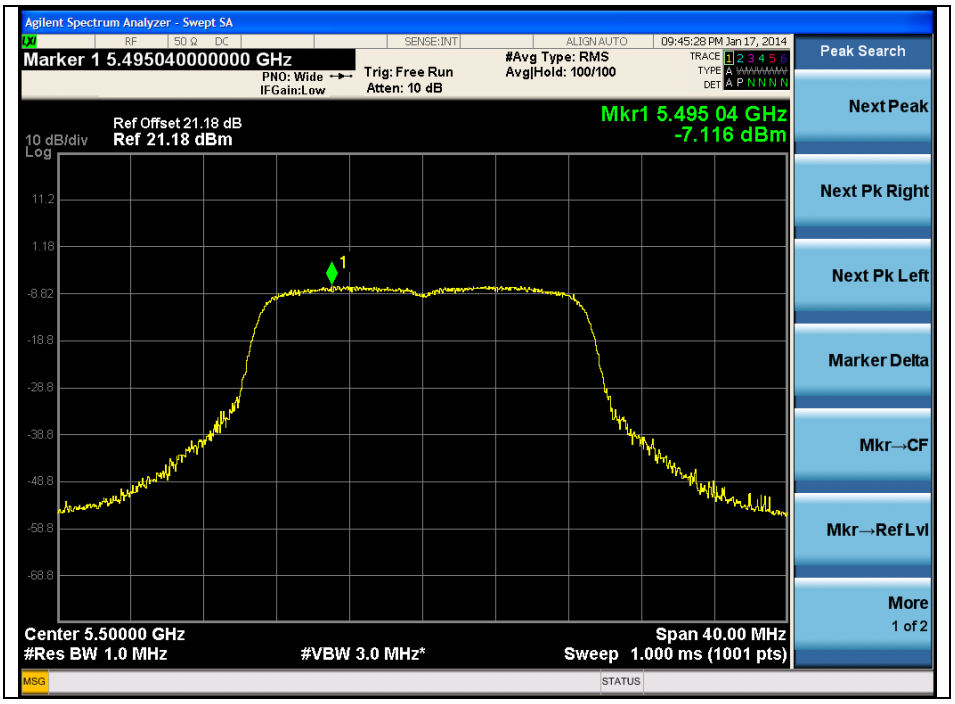
Middle Channel (5 300 ㎒)



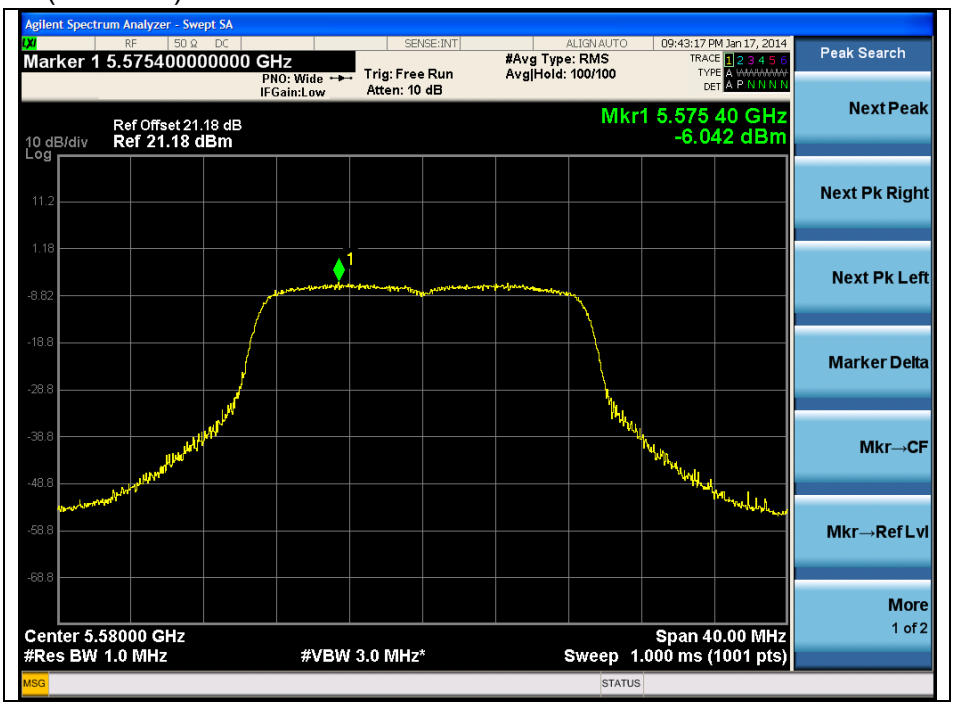
High Channel (5 320 ㎒)



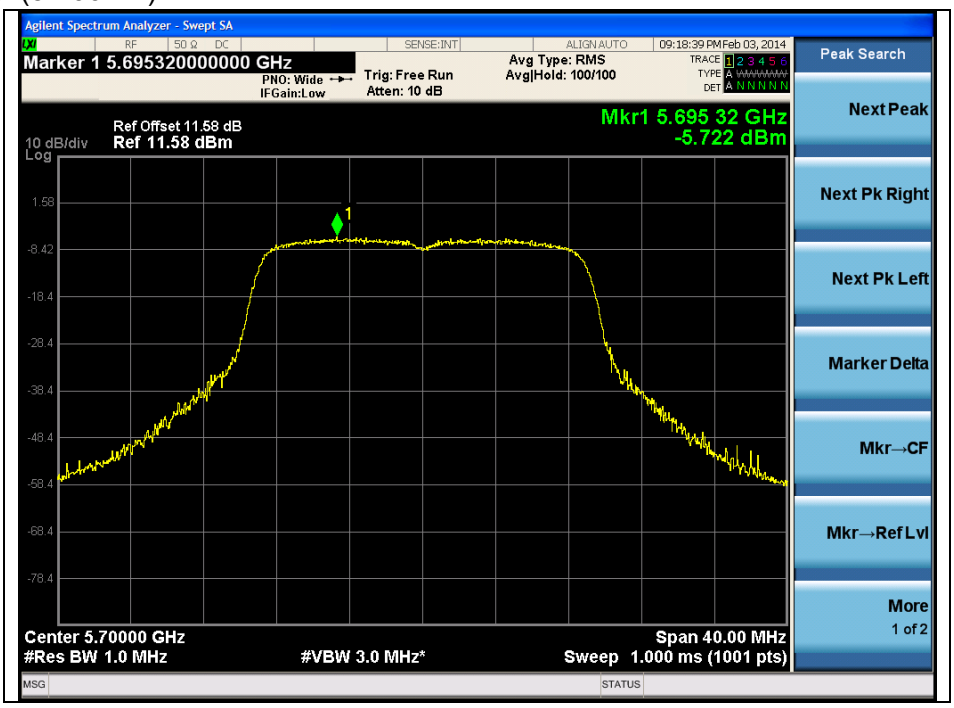
Low Channel (5 500 ㎒)



Middle Channel (5 580 ㎒)

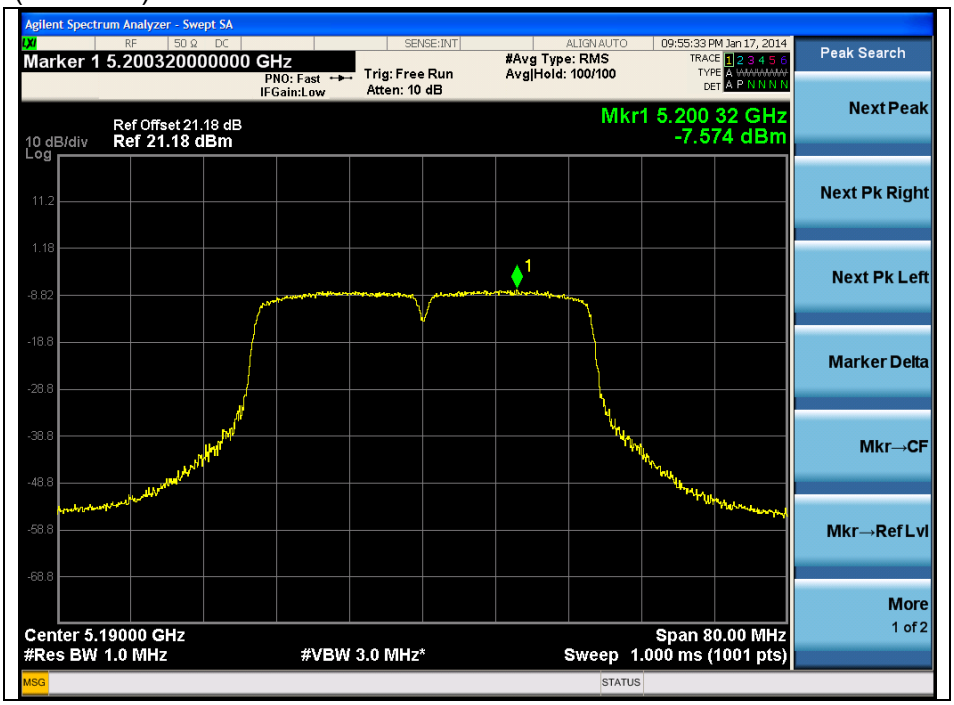


High Channel (5 700 ㎒)

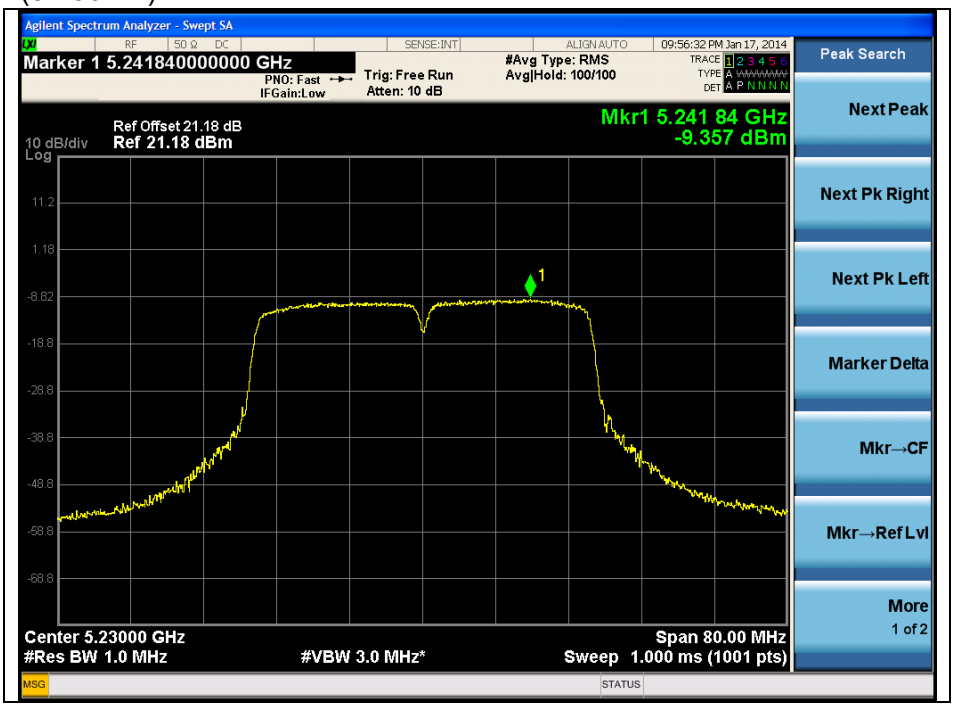


802.11n_HT40 (MCS0)

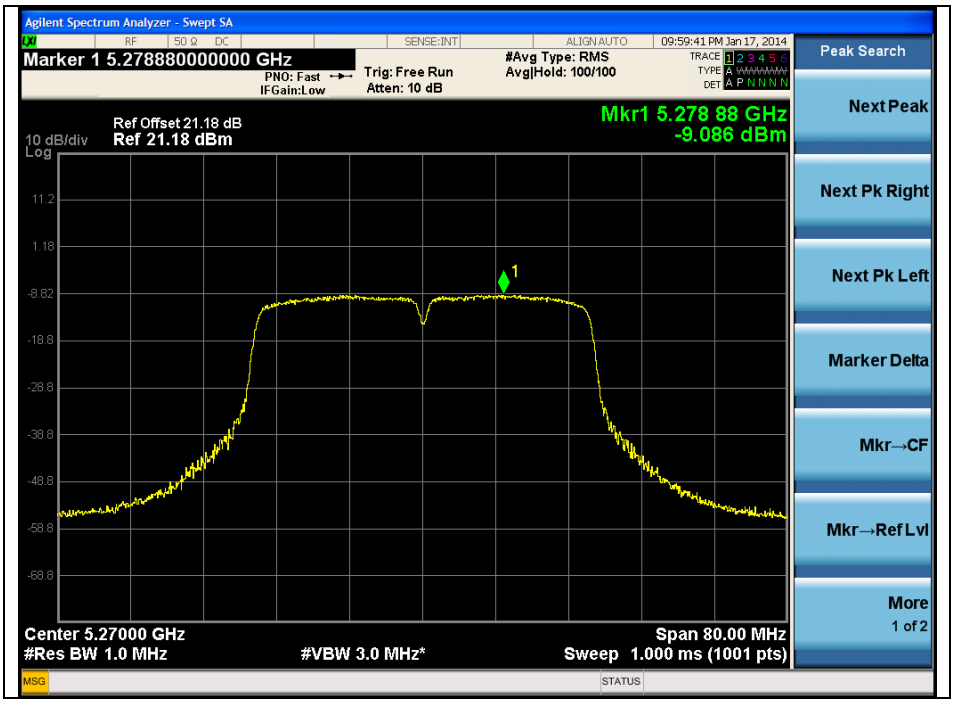
Low Channel (5 190 ㎒)



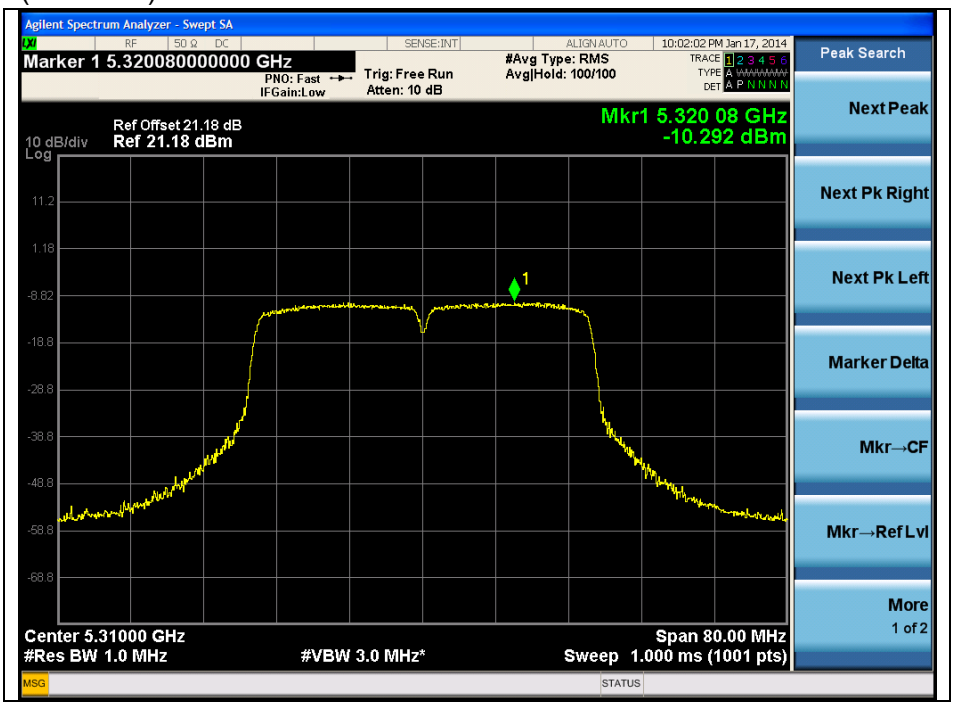
High Channel (5 230 ㎒)



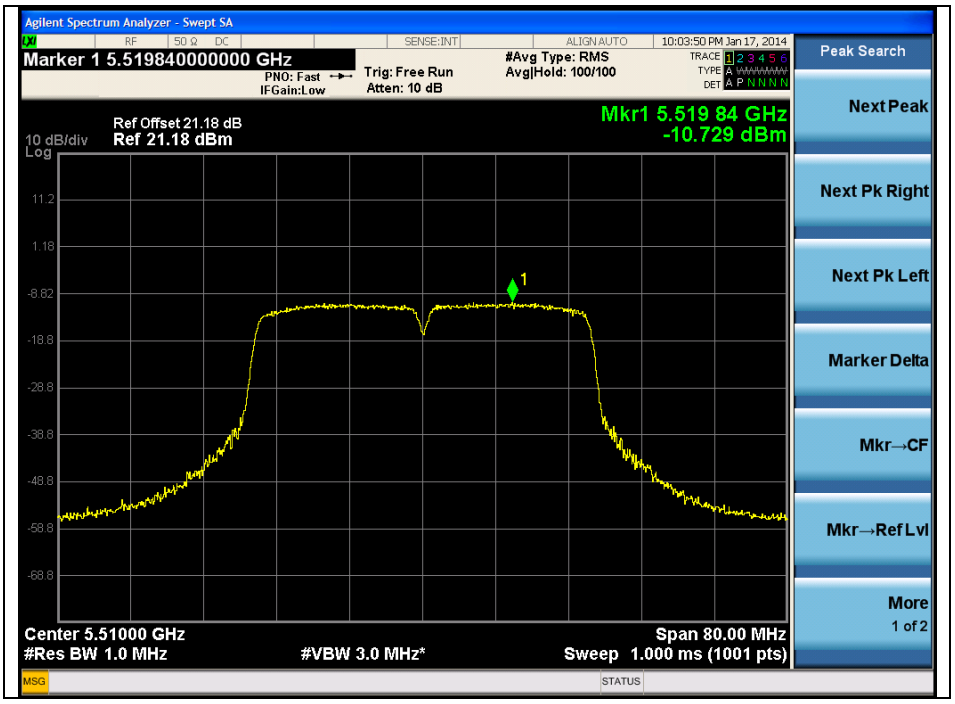
Low Channel (5 270 ㎒)



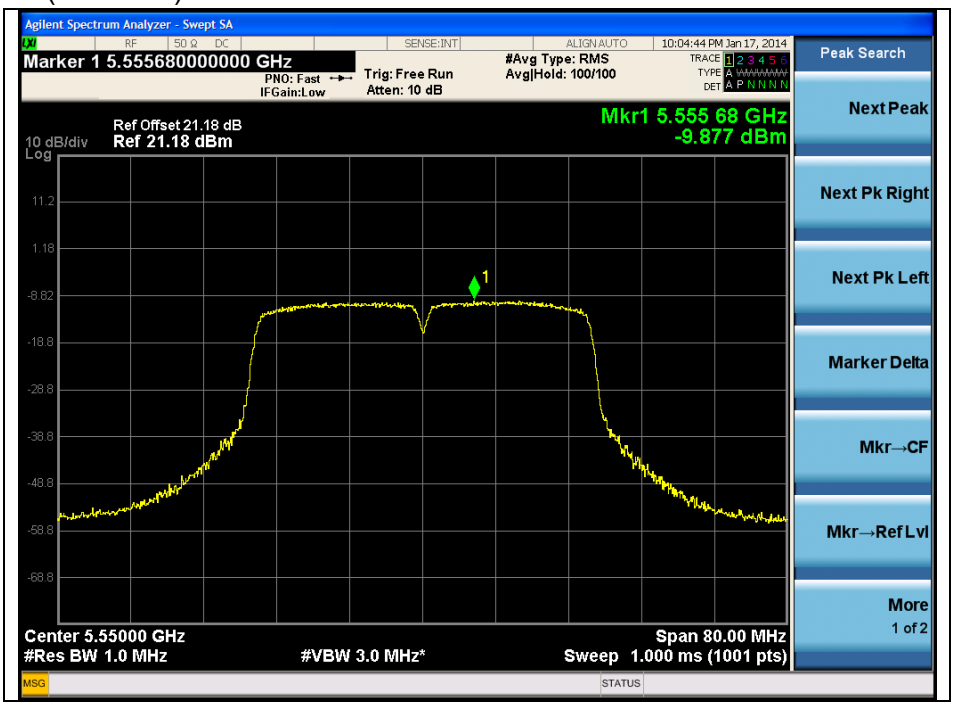
High Channel (5 310 ㎒)



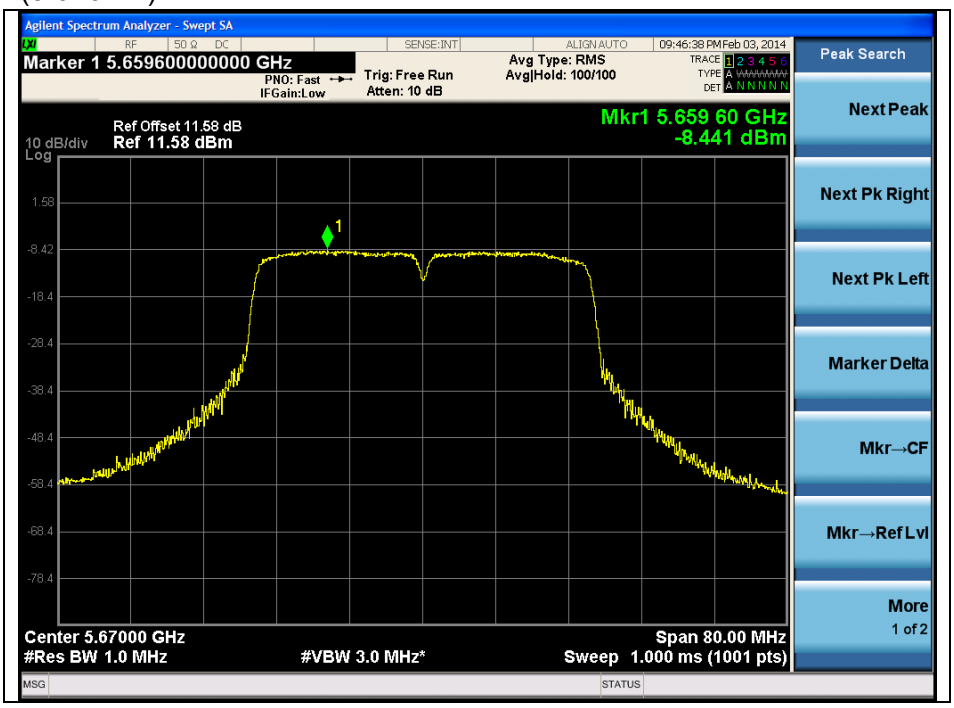
Low Channel (5 510 ㎒)



Middle Channel (5 550 ㎒)

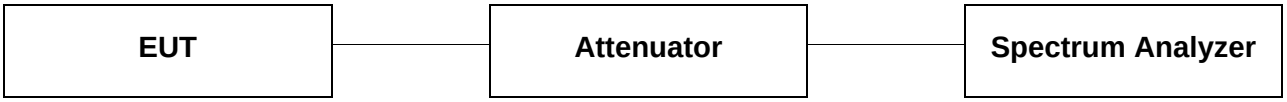


High Channel (5 670 ㎒)



6. Peak excursion

6.1. Test setup



6.2. Limit

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 ㏈ across any 1 ㎒ bandwidth or the emission bandwidth whichever is less.

6.3. Test procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in section G of KDB 789033_v01r03.
2. Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth.
3. Find the maximum of the peak-max-hold spectrum.
4. Set RBW = 1 ㎒.
5. Set VBW ≥ 3 ㎒.
6. Detector = Peak.
7. Trace mode = max-hold.
8. Allow the sweeps to continue until the trace stabilizes.
9. Use the peak search function to find the peak of the spectrum.
10. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.
    - Testing each modulation mode on a single channel in a single operating band is sufficient to demonstrate compliance with the peak excursion requirement.
    - Tests performed all signal types, all modulation types, all bandwidth modes, all variations in signal parameters.

6.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

- 11a

Channel No.	Frequency (㎒)	Data Rate (Mbps)	Peak excursion (dB)	Limit (dB)
36	5 180	6	7.524	13
		9	7.818	
		12	9.141	
		18	8.487	
		24	9.237	
		36	8.655	
		48	9.264	
		54	9.923	

- 11n_HT20

Channel No.	Frequency (㎒)	Data Rate (Mbps)	Peak excursion (dB)	Limit (dB)
36	5 180	MCS0	7.694	13
		MCS1	8.890	
		MCS2	7.995	
		MCS3	8.337	
		MCS4	7.927	
		MCS5	9.137	
		MCS6	8.091	
		MCS7	8.930	

- 11n_HT40

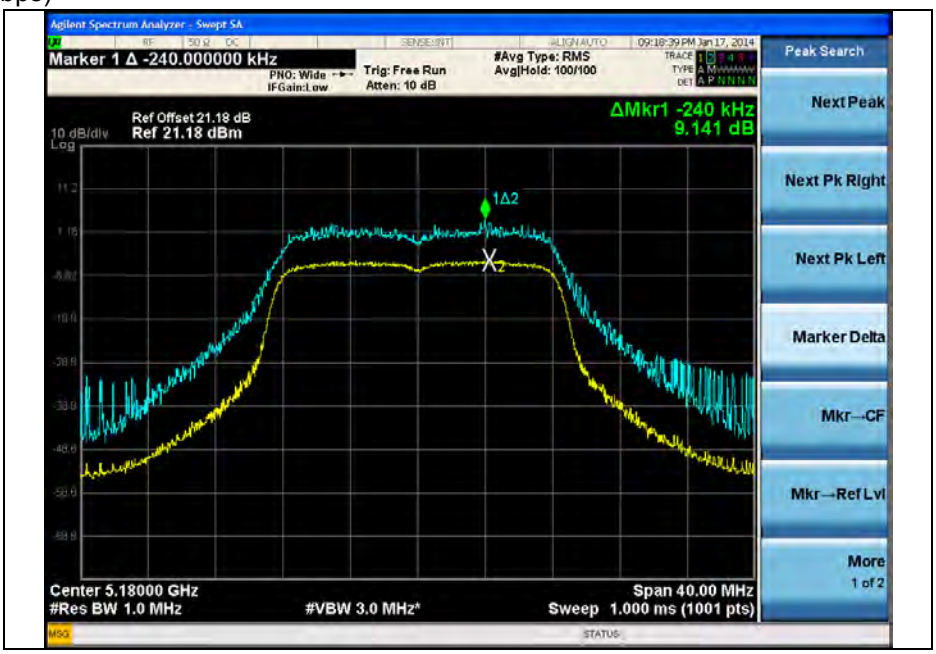
Channel No.	Frequency (㎒)	Data Rate (Mbps)	Peak excursion (dB)	Limit (dB)
38	5 190	MCS0	7.611	13
		MCS1	9.366	
		MCS2	9.752	
		MCS3	7.934	
		MCS4	9.193	
		MCS5	9.409	
		MCS6	10.061	
		MCS7	9.018	

- 11a

5 180 ㎒(6 Mbps)

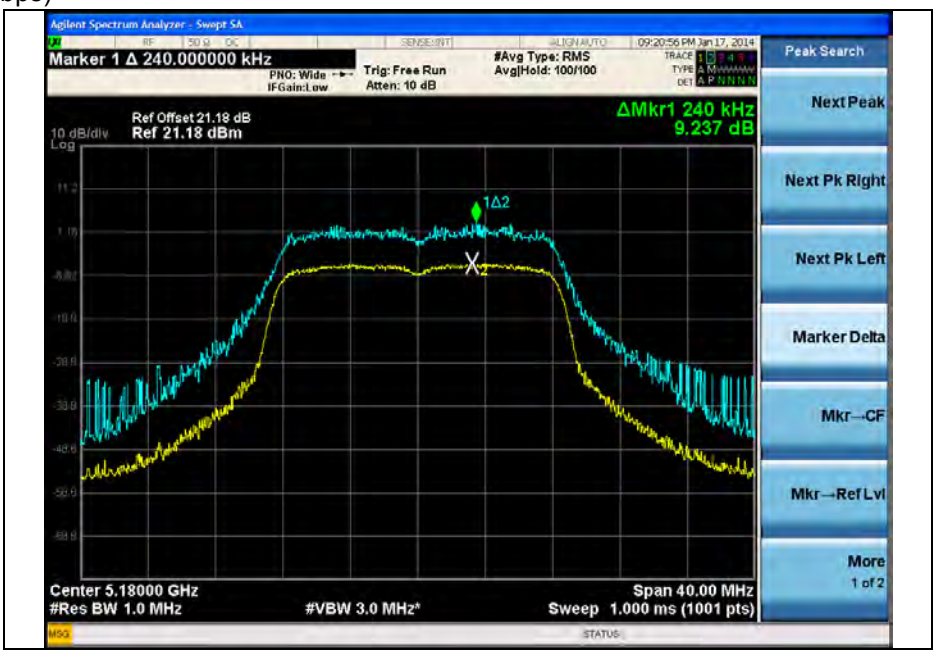
5 180 ㎒(9 Mbps)

5 180 ㎒(12 Mbps)



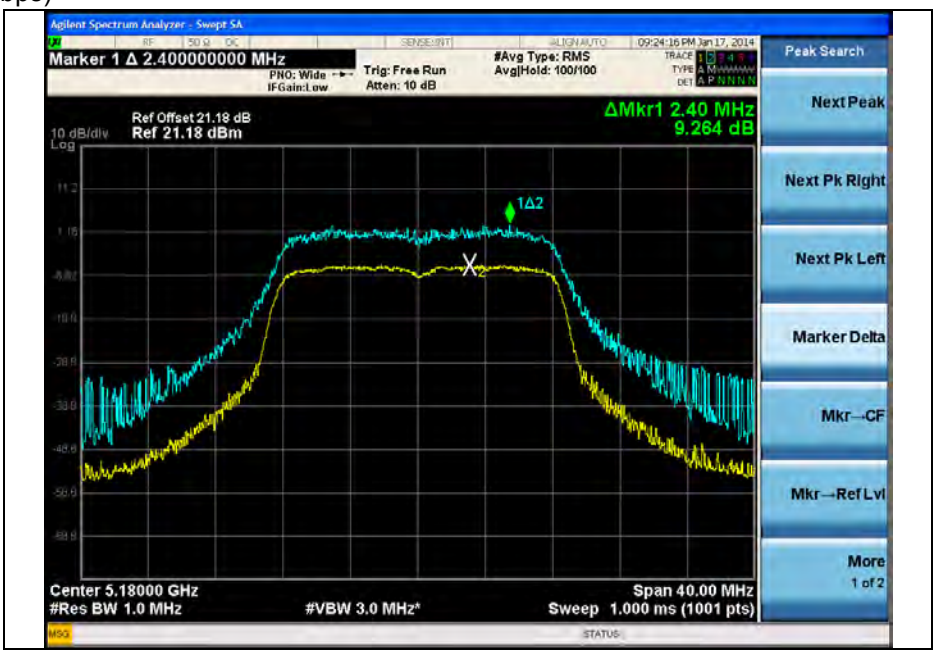
5 180 ㎒(18 Mbps)

5 180 ㎒(24 Mbps)



5 180 ㎒(36 Mbps)

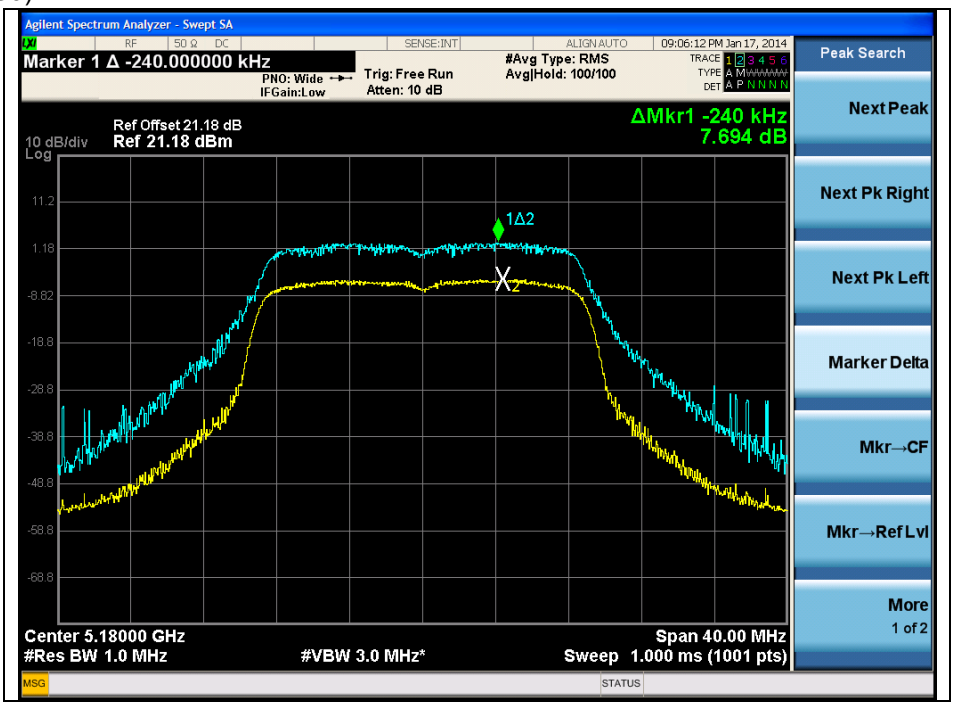
5 180 ㎒(48 Mbps)



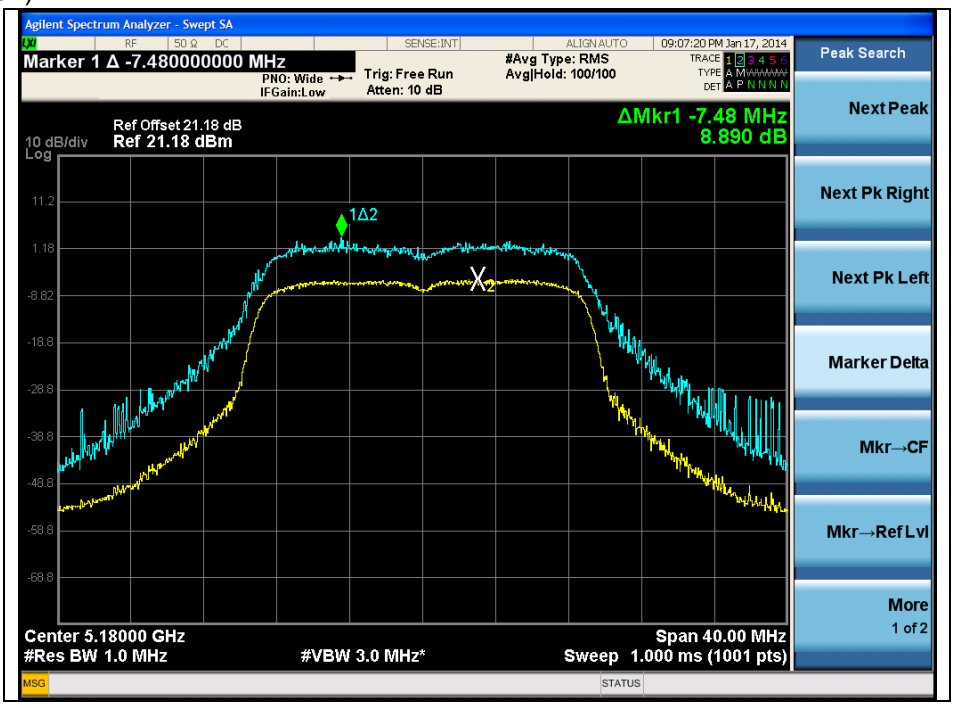
5 180 ㎒(54 Mbps)

- 11n_HT20

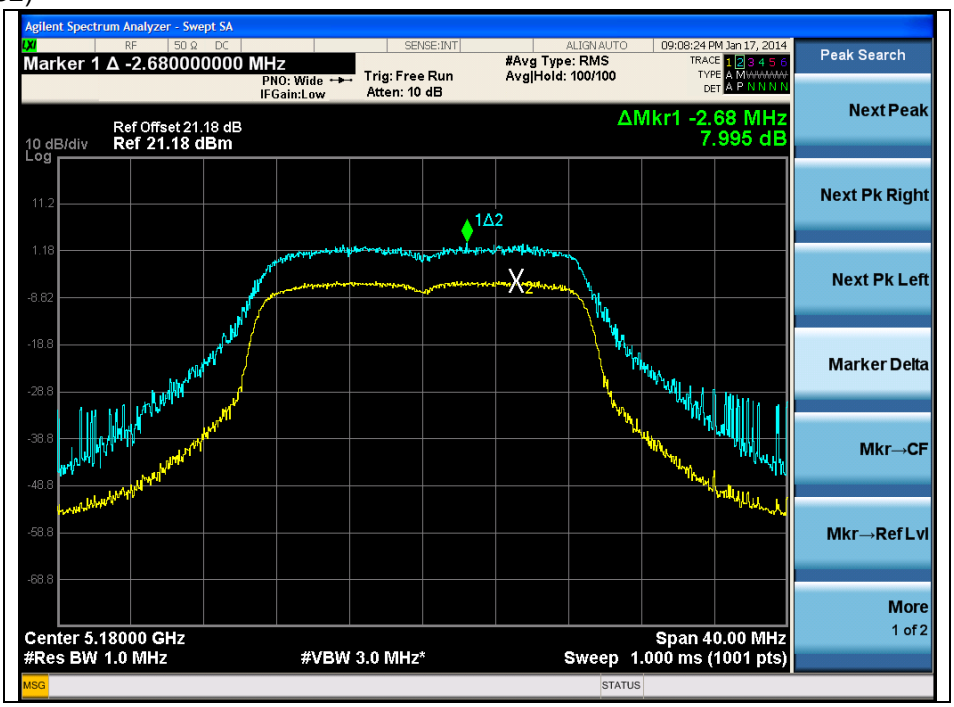
5 180 ㎒(MCS0)



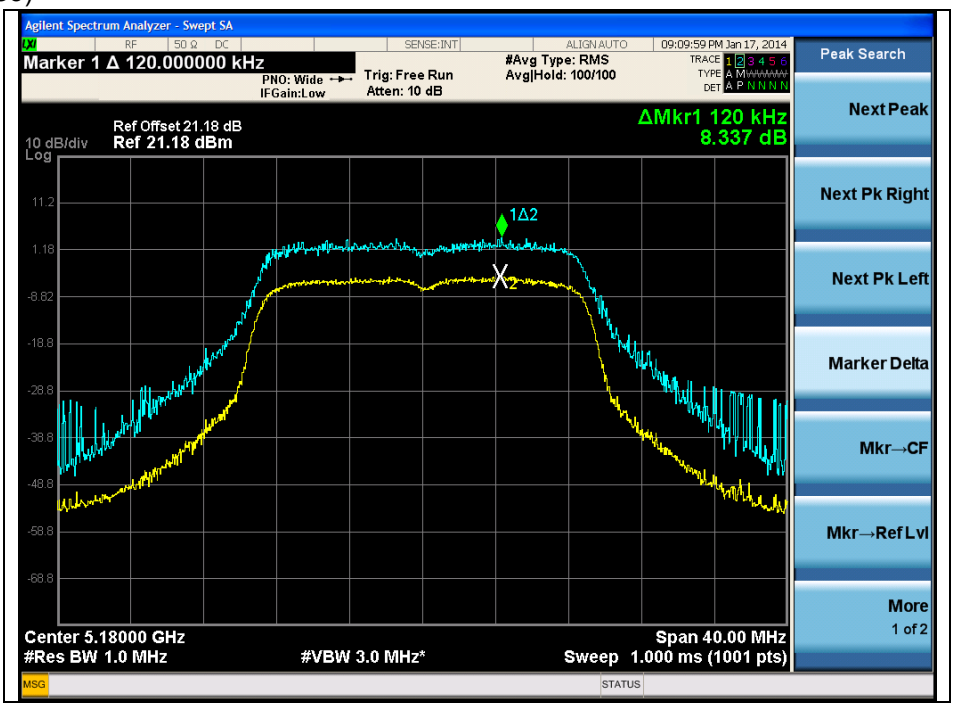
5 180 ㎒(MCS1)



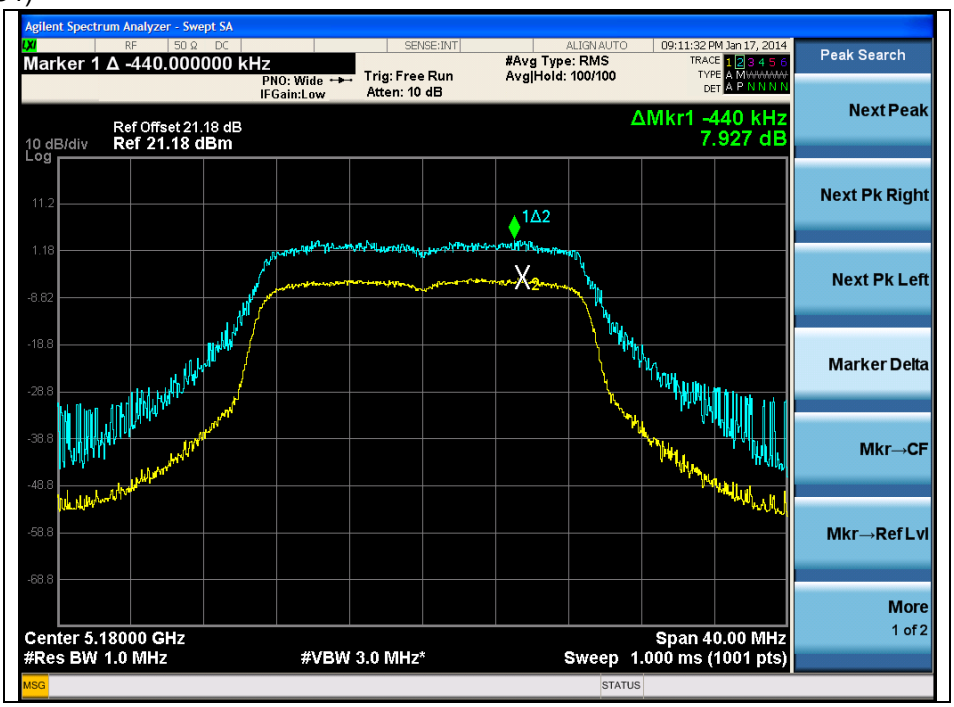
5 180 ㎒(MCS2)



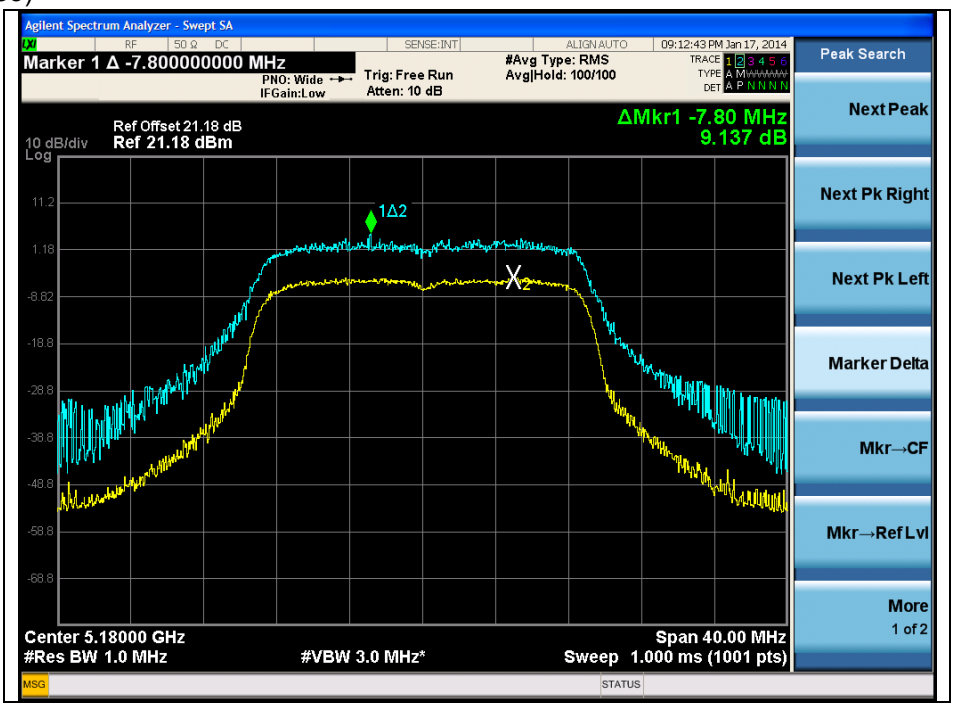
5 180 ㎒(MCS3)



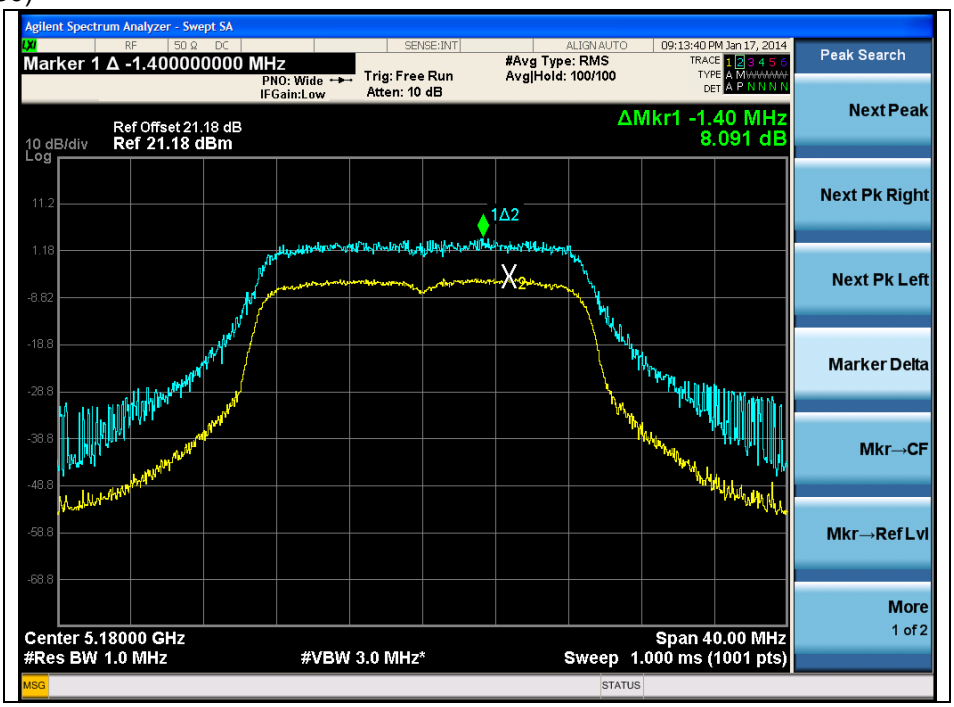
5 180 ㎒(MCS4)



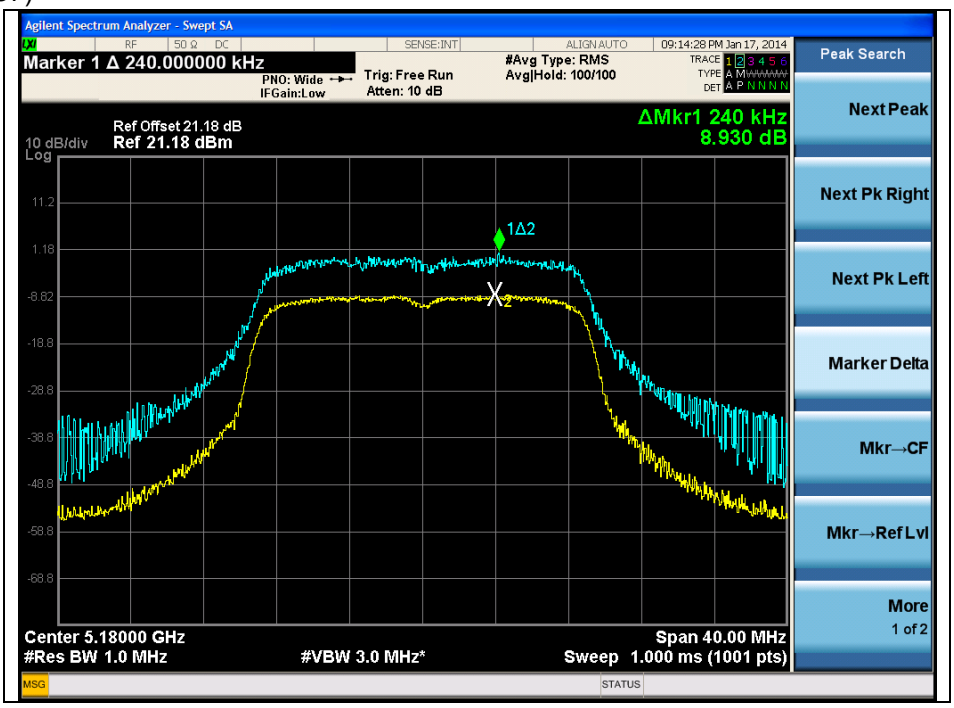
5 180 ㎒(MCS5)



5 180 ㎒(MCS6)

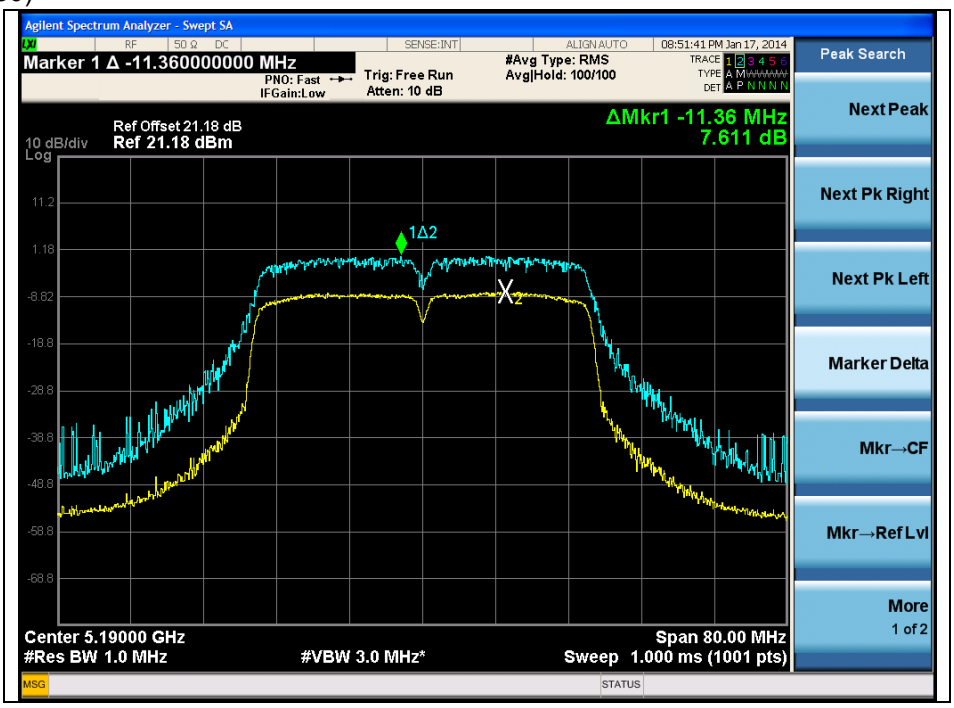


5 180 ㎒(MCS7)

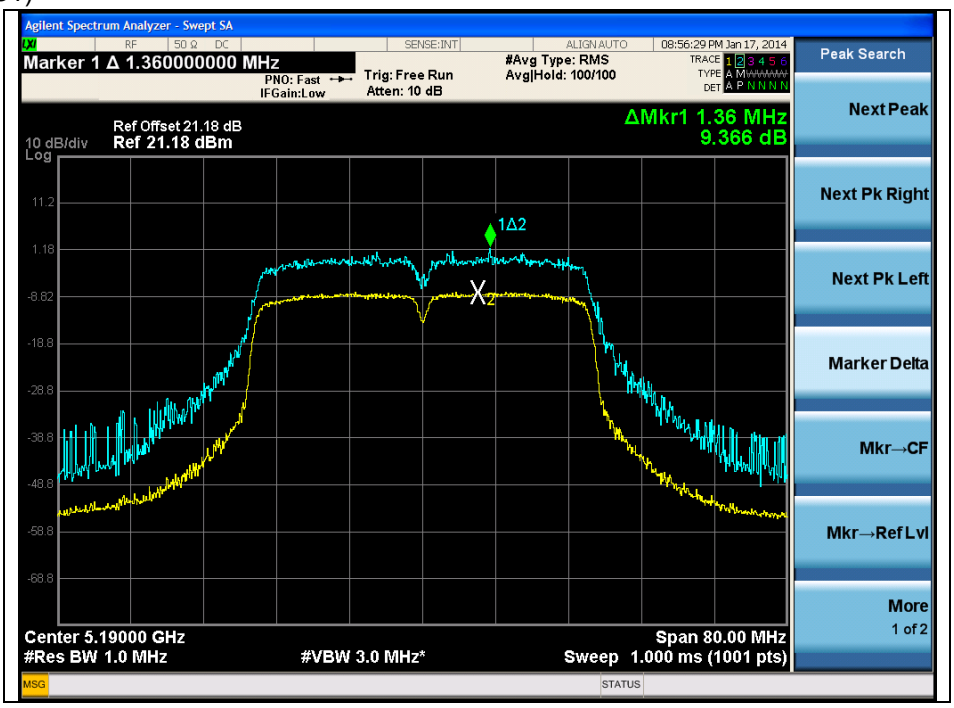


- 11n_HT40

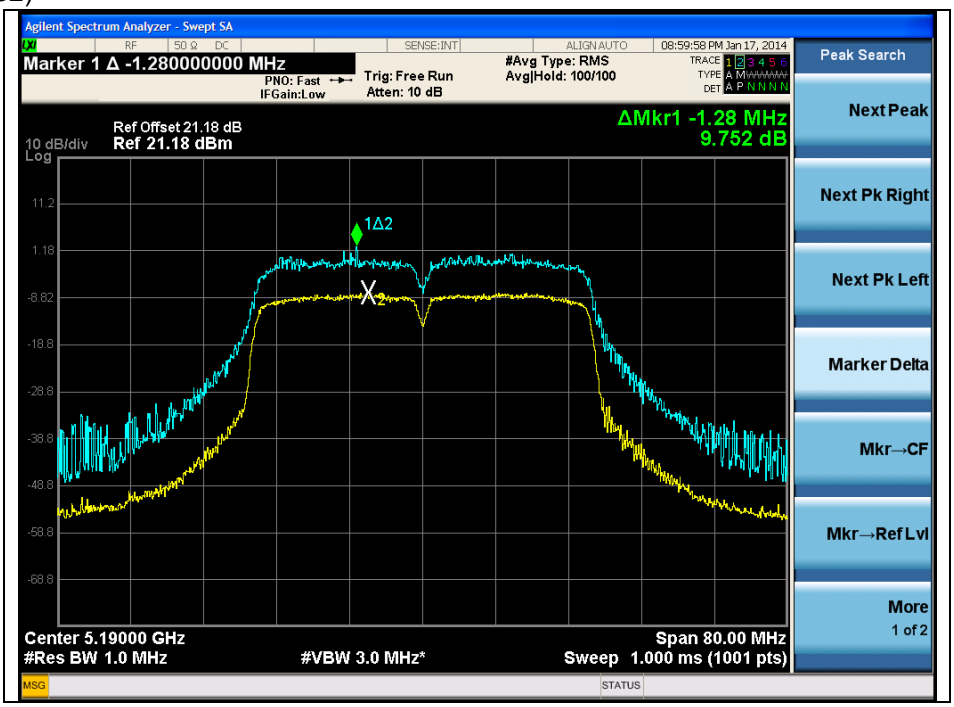
5 190 ㎒(MCS0)



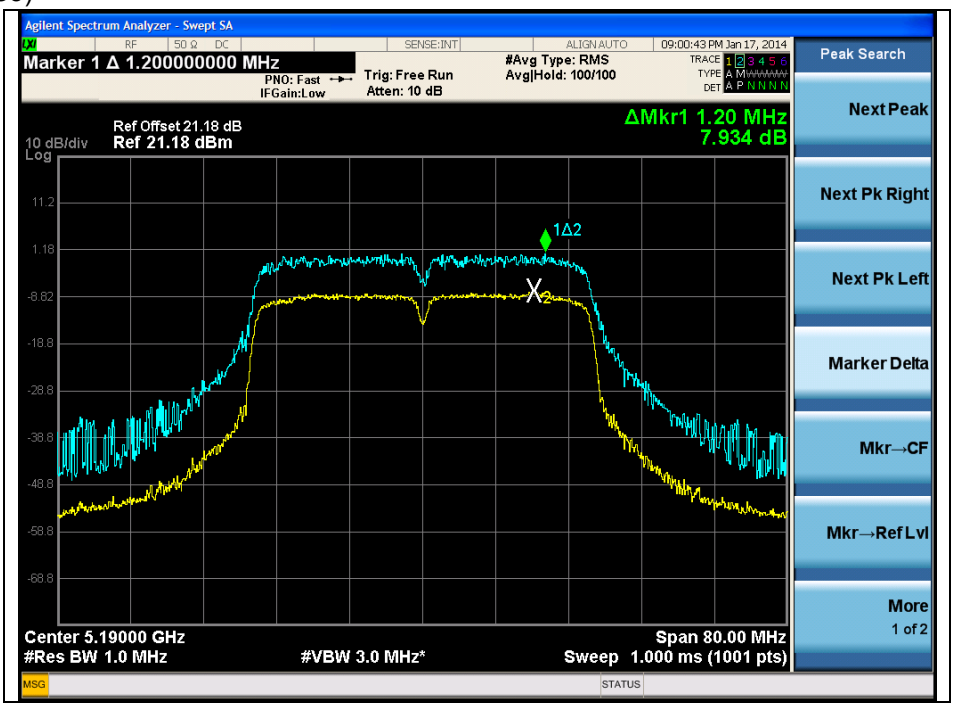
5 190 ㎒(MCS1)



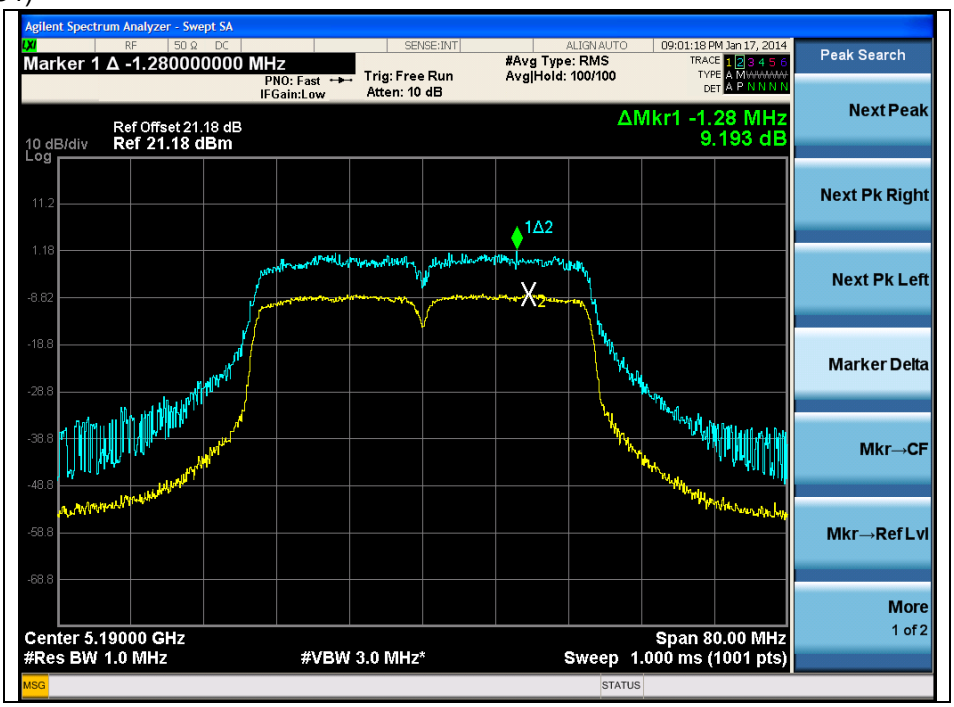
5 190 ㎒(MCS2)



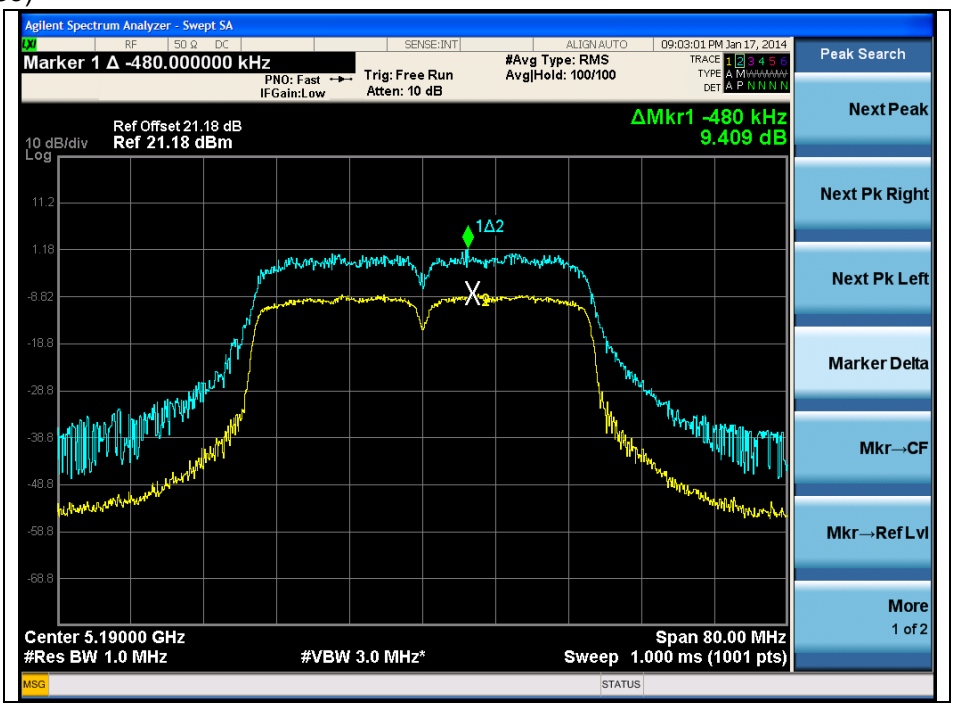
5 190 ㎒(MCS3)



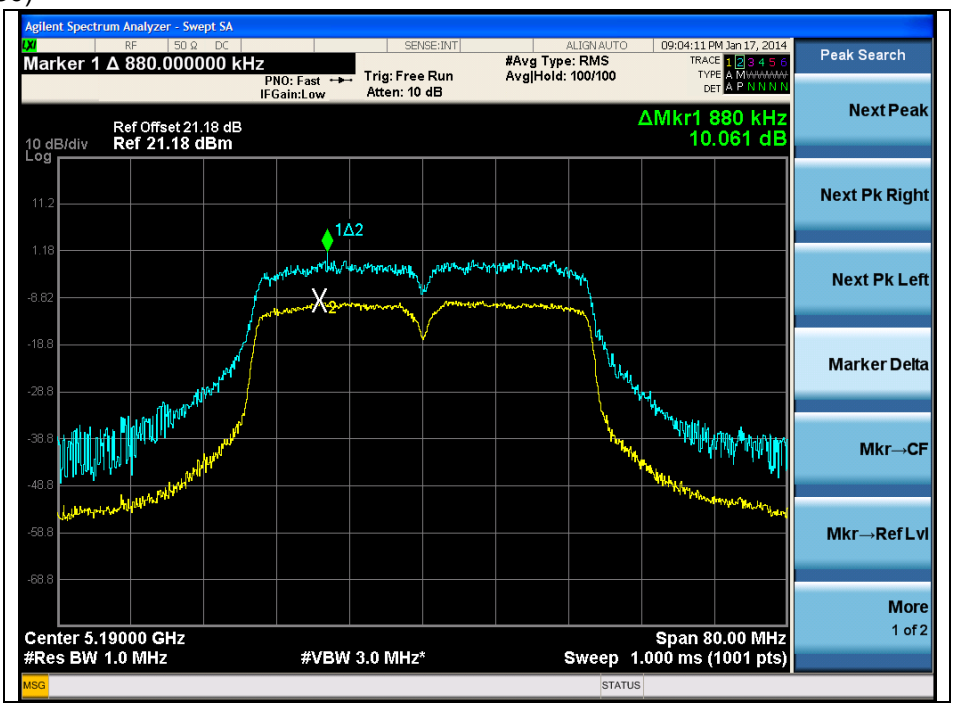
5 190 ㎒(MCS4)



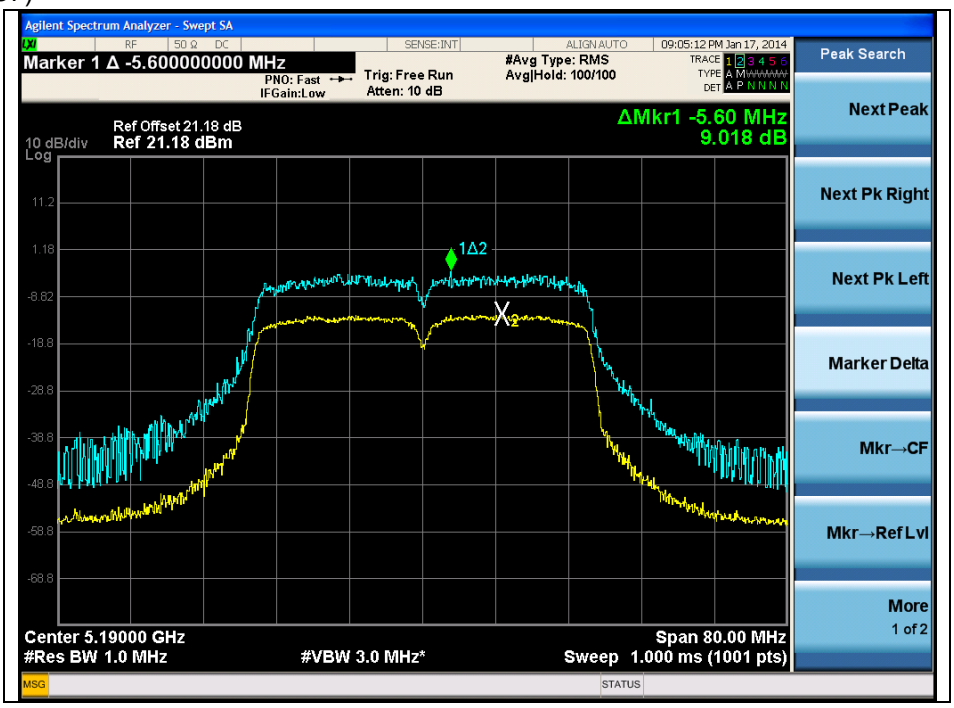
5 190 ㎒(MCS5)



5 190 ㎒(MCS6)

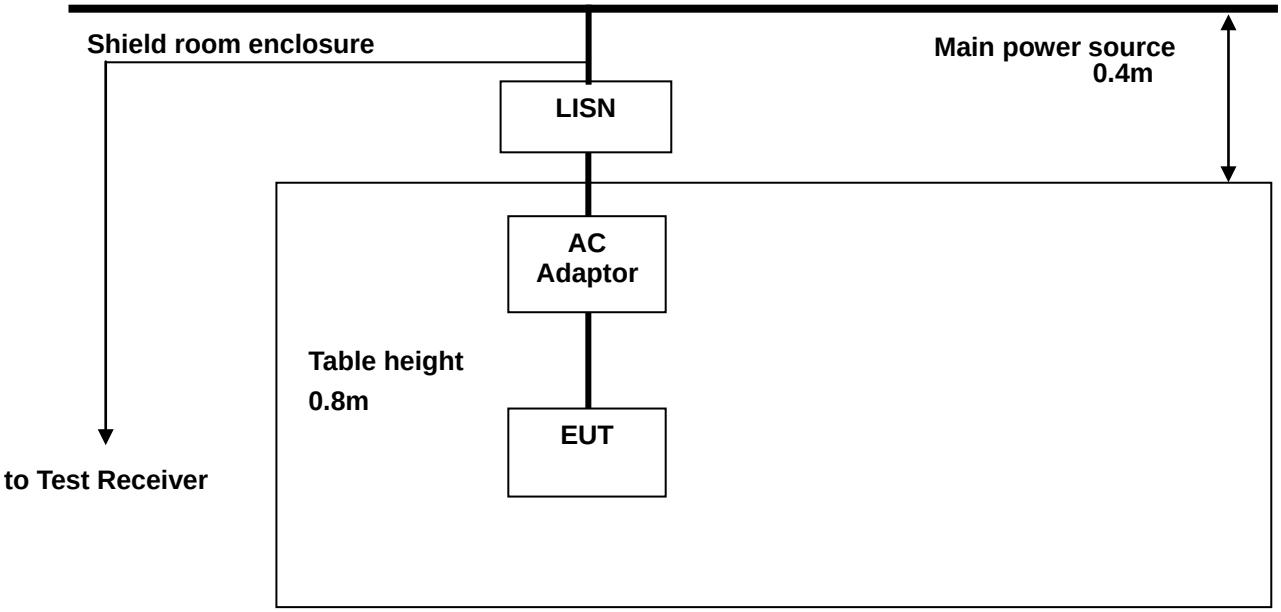


5 190 ㎒(MCS7)



7. Transmitter AC Power Line Conducted Emission

7.1. Test Setup



7.2. Limit

According to §15.207(a) 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 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).
Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

Frequency of Emission (㎒)	Conducted limit (dB㎶)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

* Decreases with the logarithm of the frequency.

7.3. Test Procedures

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.
AC line conducted emissions from the EUT were measured according to the dictates of ANSI C63.4-2003

1. The test procedure is performed in a 6.5m × 3.6m× 3.6m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m(W)× 1.5 m(L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. The excess power cable between the EUT and the LISN was bundled. All connecting cables of EUT were moved to find the maximum emission.

7.4. Test Results (Worst case configuration_ 11a mode_6Mbps)

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line.

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

Frequency range : 0.15 ㎒ – 30 ㎒
Measured Bandwidth : 9 ㎑

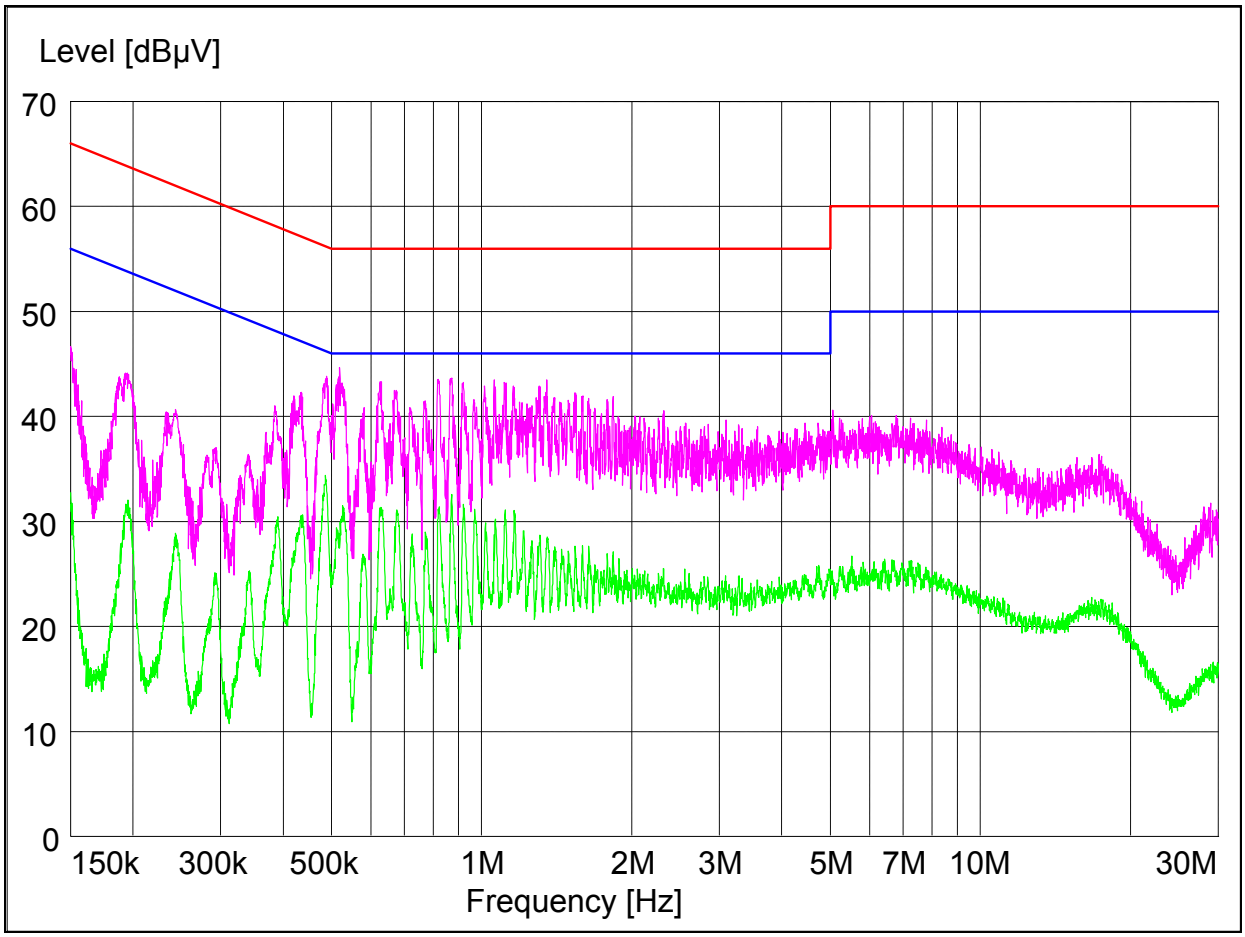
FREQ.	LEVEL(dB㎶)		LINE	LIMIT(dB㎶)		MARGIN(dB)	
(㎒)	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.19	41.82	32.62	H	64.04	54.04	22.22	21.42
0.52	38.22	29.72	H	56.00	46.00	17.78	16.28
0.87	40.28	32.88	H	56.00	46.00	15.72	13.12
2.32	33.86	25.01	H	56.00	46.00	22.14	20.99
5.07	32.46	24.41	H	60.00	50.00	27.54	25.59
17.30	30.00	22.80	H	60.00	50.00	30.00	27.20
0.20	40.95	31.80	N	63.61	53.61	22.66	21.81
0.52	31.95	23.00	N	56.00	46.00	24.05	23.00
1.03	29.76	21.16	N	56.00	46.00	26.24	24.84
1.42	28.67	19.37	N	56.00	46.00	27.33	26.63
5.51	27.04	20.64	N	60.00	50.00	32.96	29.36
7.73	26.99	20.39	N	60.00	50.00	33.01	29.61

Note ;

1. Line (H): Hot, Line (N): Neutral
2. All modes of operation were investigated and the worst-case emissions are reported using 11a_6Mbps
3. The limit for Class B device(s) from 150 ㎑ to 30 ㎒ are specified in Section of the Title 47 CFR.
4. Traces shown in plot mad using a peak detector and average detector
5. Deviations to the Specifications: None.

Plot of Conducted Power line

Test mode : (Hot)



Test mode : (Neutral)