FCC TEST REPORT

For

Rosewill Inc.

300Mbps 802.11n/a/b/g Wireless Dual Band USB Adapter

Model No.: RNX-N600UBE

Prepared for	:	Rosewill Inc.
Address	:	17708, Rowland Street, City of Industry, CA, 91748, United States
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd., Bao'an District, Shenzhen, Guangdong, China
Date of receipt of test sample	:	January 22, 2013
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	January 22, 2013 - February 28, 2013
Date of Report	:	February 28, 2013

FCC TEST REPORT
FCC CFR 47 PART 15 E(15.407)

Report Reference No.	**:**	**LCS130122283TF**
Date of Issue	:	February 28, 2013
Testing Laboratory Name.....	**:**	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	:	1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd., Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure.....	:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name.....	**:**	**Rosewill Inc.**
Address	:	17708, Rowland Street, City of Industry, CA, 91748, United States
Test Specification		
Standard	:	FCC CFR 47 PART 15 E(15.407)
Test Report Form No.....	**:**	LCSEMC-1.0
TRF Originator	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	:	Dated 2011-03

Test Item Description.	**:**	**300Mbps 802.11n/a/b/g Wireless Dual Band USB Adapter**
Trade Mark	:	Rosewill
Model/ Type reference.....	:	RNX-N600UBE
Ratings	:	DC 5V
Result	:	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Yoyo Wang/ File administrators	Vito Cao/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS130122283TF	February 28, 2013 Date of issue

Type / Model.....	: RNX-N600UBE
EUT.....	: 300Mbps 802.11n/a/b/g Wireless Dual Band USB Adapter
Applicant.....	**: Rosewill Inc.**
Address.....	: 17708, Rowland Street, City of Industry, CA, 91748, United States
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: ZIONCOM ELECTRONICS (SHENZHEN) LTD.**
Address.....	: Building A1~A2, Lantian Science Technology Park, Xinyu Road Xinqiao Henggang Block, Shajing Street, Baoan District, Shenzhen City, China
Telephone.....	: /
Fax.....	: /
Factory.....	**: ZIONCOM ELECTRONICS (SHENZHEN) LTD.**
Address.....	: Building A1~A2, Lantian Science Technology Park, Xinyu Road Xinqiao Henggang Block, Shajing Street, Baoan District, Shenzhen City, China
Telephone.....	: /
Fax.....	: /

Test Result:	**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	300Mbps 802.11n/a/b/g Wireless Dual Band USB Adapter
Model Number	:	RNX-N600UBE
Power Supply	:	DC 5V
Frequency Range	:	5180.00-5240.00MHz
Channel Number	:	4 Channels for 20MHz Bandwidth 2 Channels for 40MHz Bandwidth
Modulation Technology	:	IEEE 802.11n: OFDM (64QAM, 16QAM,QPSK,BPSK) IEEE 802.11a: OFDM (64QAM, 16QAM,QPSK,BPSK)
Data Rates	:	IEEE 802.11n: MCS0-MCS15 IEEE 802.11a: 6-54Mbps
Antenna Gain	:	Standard SMA connector Antenna(Fixed by Special glue) Antenna 1: 4.0dBi(Max.) Antenna 2: 4.0dBi(Max.)

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
Lenovo	Notebook	B470	--	DoC

1.3. External I/O Port

I/O Port Description	Quantity	Cable
USB Port	1	1.5m,unshielded

1.4. Description of Test Facility

Site Description EMC Lab.	:	Accredited by CNAS, June 04, 2010
		The Certificate Registration Number. is L4595.
		Accredited by FCC, July 14, 2011
		The Certificate Registration Number. is 899208.
		Accredited by Industry Canada, May. 02, 2011
		The Certificate Registration Number. is 9642A-1

1.5. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	±3.10dB	(1)
		30MHz~200MHz	±2.96dB	(1)
		200MHz~1000MHz	±3.10dB	(1)
		1GHz~26.5GHz	±3.80dB	(1)
		26.5GHz~40GHz	±3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±1.63dB	(1)
Power disturbance	:	30MHz~300MHz	±1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.7. Description Of Test Modes

The EUT has been tested under operating condition.

This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.

Worst-case mode and channel used for 150kHz-30 MHz power line conducted emissions was the mode and channel with the highest output power, that was determined to be 802.11n HT20 mode(Low Channel, 5GHz Band).

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be 802.11n HT20 mode(Low Channel, 5GHz Band).

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows:
802.11n Mode HT20:.MCS8, OFDM.
802.11n Mode HT40:.MCS8, OFDM.
802.11a Mode : 6 Mbps, OFDM.

Antenna & Bandwidth

Antenna	Single (Port.1)		Two (Port.1 + Port.2)	
Bandwidth Mode	20MHz	40MHz	20MHz	40MHz
802.11a	☑	☐	☐	☐
802.11n	☐	☐	☑	☑

Channel List & Frequency

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
5180~5240MHz Band 1	36	5180	44	5220
	38	5190	46	5230
	40	5200	48	5240

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd..

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to FCC's request, Test Procedure KDB789033 and KDB 6622911 are required to be used for this kind of FCC 15.407 UII device.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E

2.3. General Test Procedures

2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements of ANSI C63.4

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmit condition.

3.2. EUT Exercise Software

N/A

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart E		
FCC Rules	**Description of Test**	**Result**
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.407(a)	26dB Bandwidth	Compliant
§15.407(a)	99% Occupied Bandwidth	Compliant
§15.407(a)	Peak Excursion	Compliant
§15.407(b)	Radiated Emissions	Compliant
§15.407(b)	Band edge Emissions	Compliant
§15.205	Emissions at Restricted Band	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.207(a)	Line Conducted Emissions	Compliant
§15.203	Antenna Requirements	Compliant
§2.1093	RF Exposure	Compliant

5. TEST RESULT

5.1. Maximum Conducted Output Power Measurement

5.1.1. Standard Applicable

For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B, where B is the 26 dB emissions bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

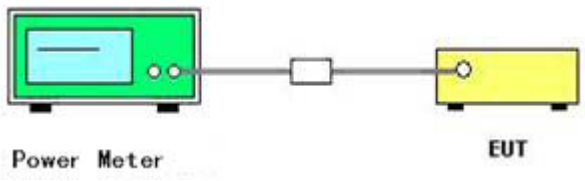
5.1.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of the power meter.

5.1.3. Test Procedures

The transmitter output (antenna port) was connected to the power meter.

5.1.4. Test Setup Layout



5.1.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.1.6. Test Result of Maximum Conducted Output Power

Temperature	25℃	Humidty	60%
Test Engineer	Leo	Configurations	802.11a/n

802.11n HT20

Channel	Frequency (MHz)	AV Conducted Power(dBm)			Max. Limit (dBm)	Result
		Port.1	Port.2	Port.1+Port.2		
36	5180	0.93	0.90	3.93	17	Complies
40	5200	0.91	0.89	3.91	17	Complies
48	5240	0.87	0.86	3.88	17	Complies

802.11n HT40

Channel	Frequency (MHz)	AV Conducted Power(dBm)			Max. Limit (dBm)	Result
		Port.1	Port.2	Port.1+Port.2		
38	5190	0.81	0.79	3.81	17	Complies
46	5230	0.76	0.77	3.78	17	Complies

802.11a/Port.1

Channel	Frequency (MHz)	AV Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180	3.25	17	Complies
40	5200	3.19	17	Complies
48	5240	3.12	17	Complies

5.2. Power Spectral Density Measurement

5.2.1. Standard Applicable

The power spectral density is defined as the highest level of power in dBm per MHz generated by the transmitter within the power envelope. The power spectral density limits as show follow.

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	4

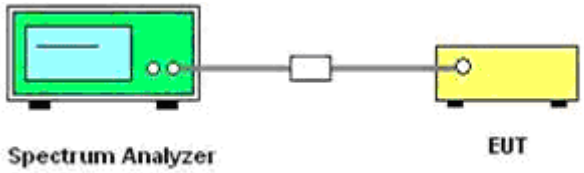
5.2.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of Spectrum Analyzer.

5.2.3. Test Procedures

1. The transmitter was connected directly to a Spectrum Analyzer through a directional couple.
2. The power was monitored at the coupler port with a Spectrum Analyzer. The power level was set to the maximum level.
3. Set the RBW = 1000 kHz.
4. Set the VBW ≥ 3*RBW
5. Span=Encompass the entire emissions bandwidth (EBW) of the signal
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum power level in any 1MHz band segment within the fundamental EBW.

5.2.4. Test Setup Layout



5.2.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.6. Test Result of Power Spectral Density

Temperature	25℃	Humidity	60%
Test Engineer	Leo	Configurations	802.11a/n

802.11n HT20

Channel	Frequency (MHz)	Power *Density* (dBm/MHz)			Max. Limit (dBm/MHz)	Result
		Port.1	Port.2	Port.1+Port.2		
36	5180	-4.216	-4.93	-1.55	4	Complies
40	5200	-5.047	-4.949	-1.99	4	Complies
48	5240	-4.878	-5.346	-2.10	4	Complies

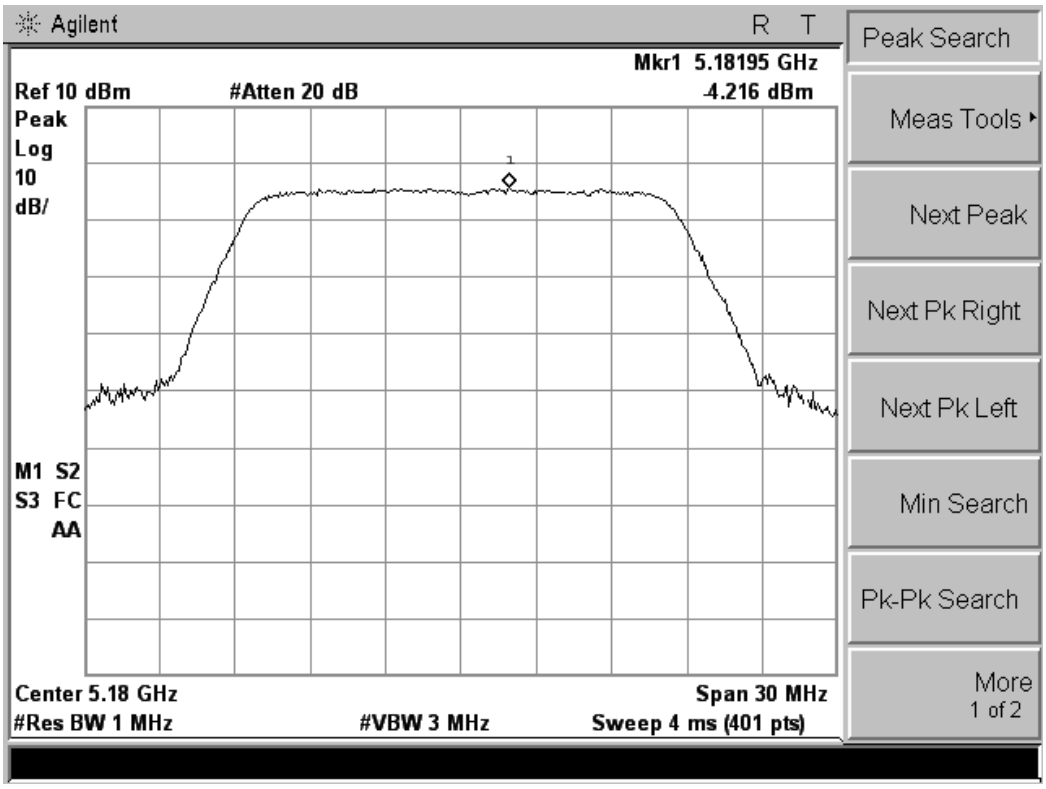
802.11n HT40

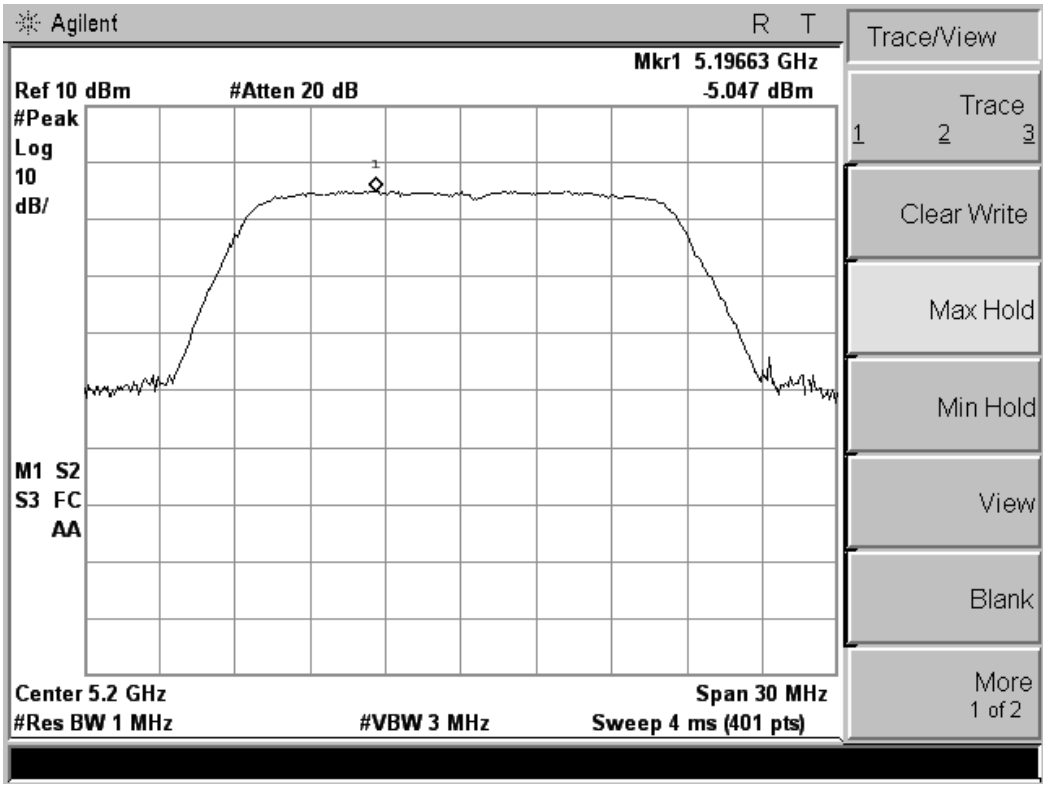
Channel	Frequency (MHz)	Power *Density* (dBm/MHz)			Max. Limit (dBm/MHz)	Result
		Port.1	Port.2	Port.1+Port.2		
38	5190	-4.562	-4.288	-1.41	4	Complies
46	5230	-4.827	-4.728	-1.77	4	Complies

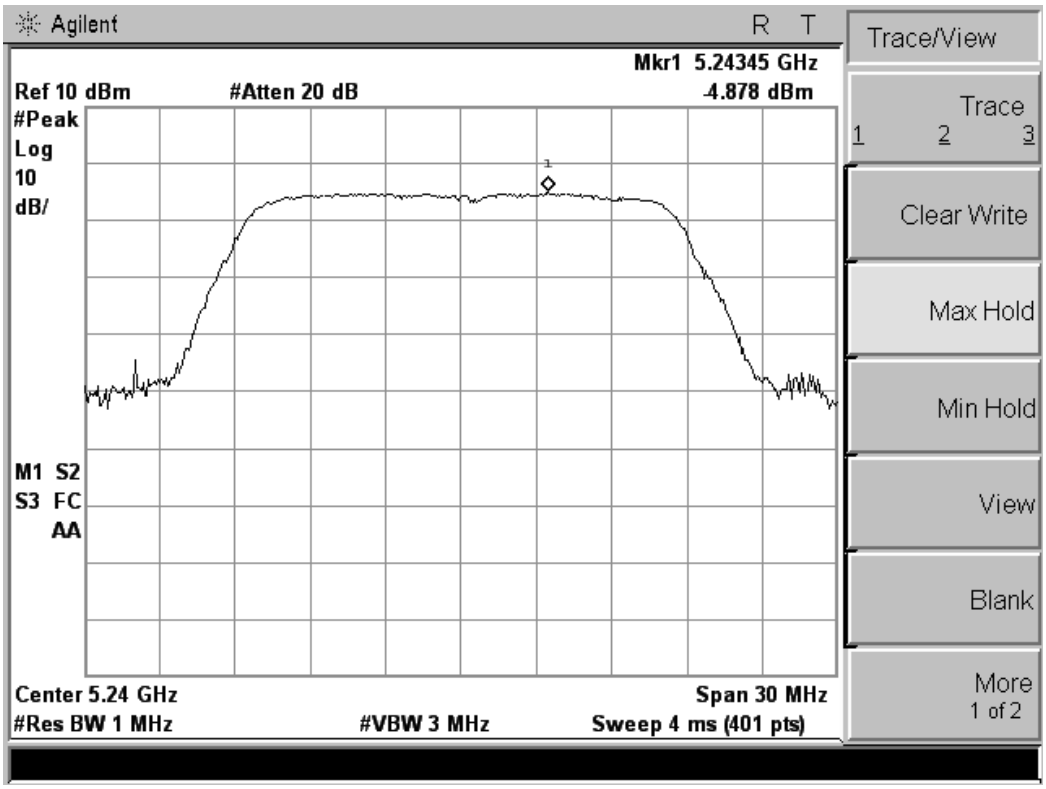
802.11a/Port.1

Channel	Frequency (MHz)	Power *Density* (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180	-2.975	4	Complies
40	5200	-2.936	4	Complies
48	5240	-2.338	4	Complies

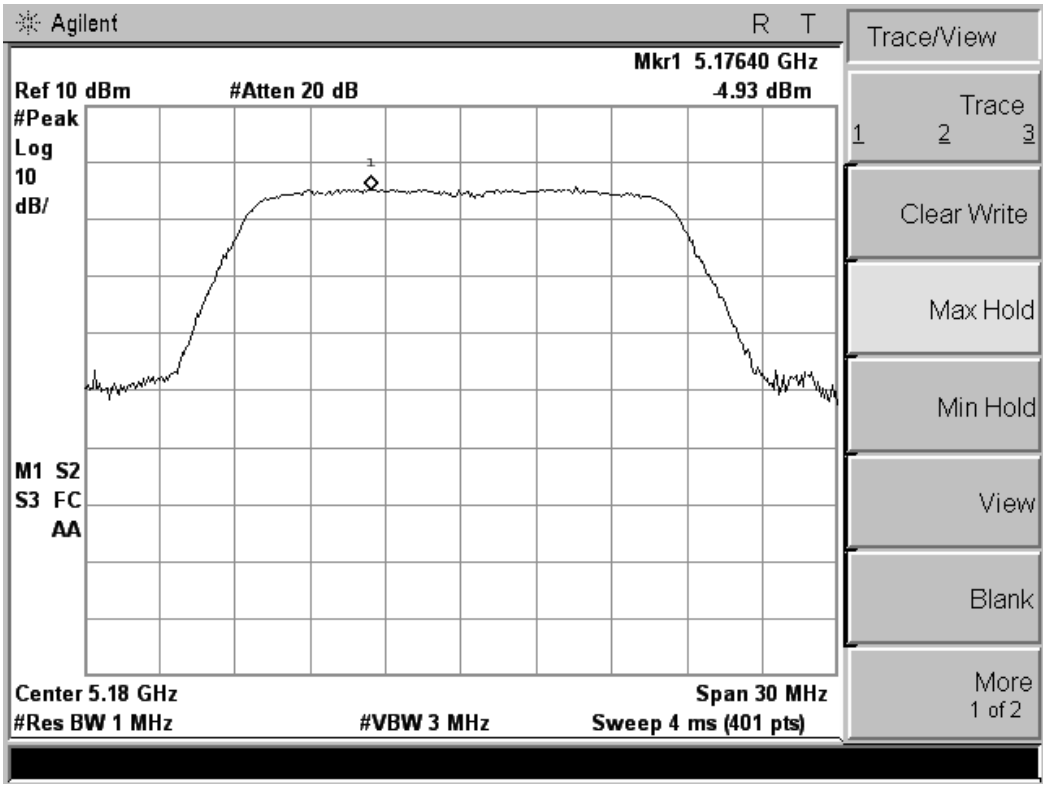
802.11n HT20 channel power density / port.1

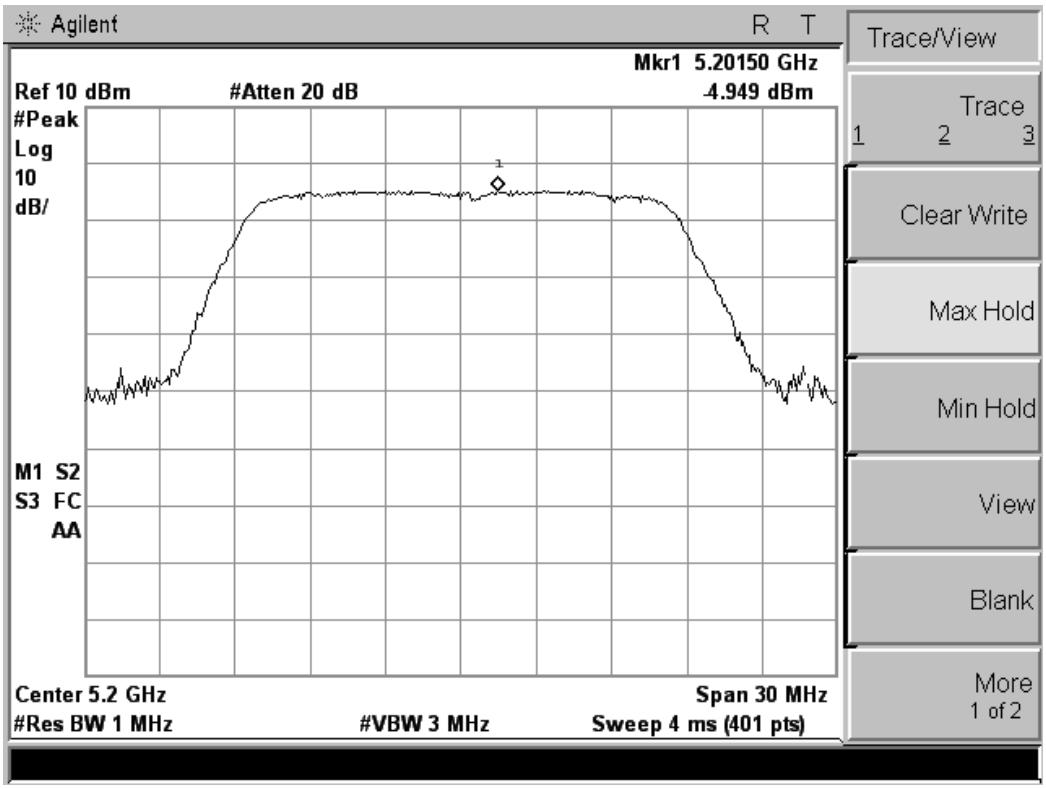


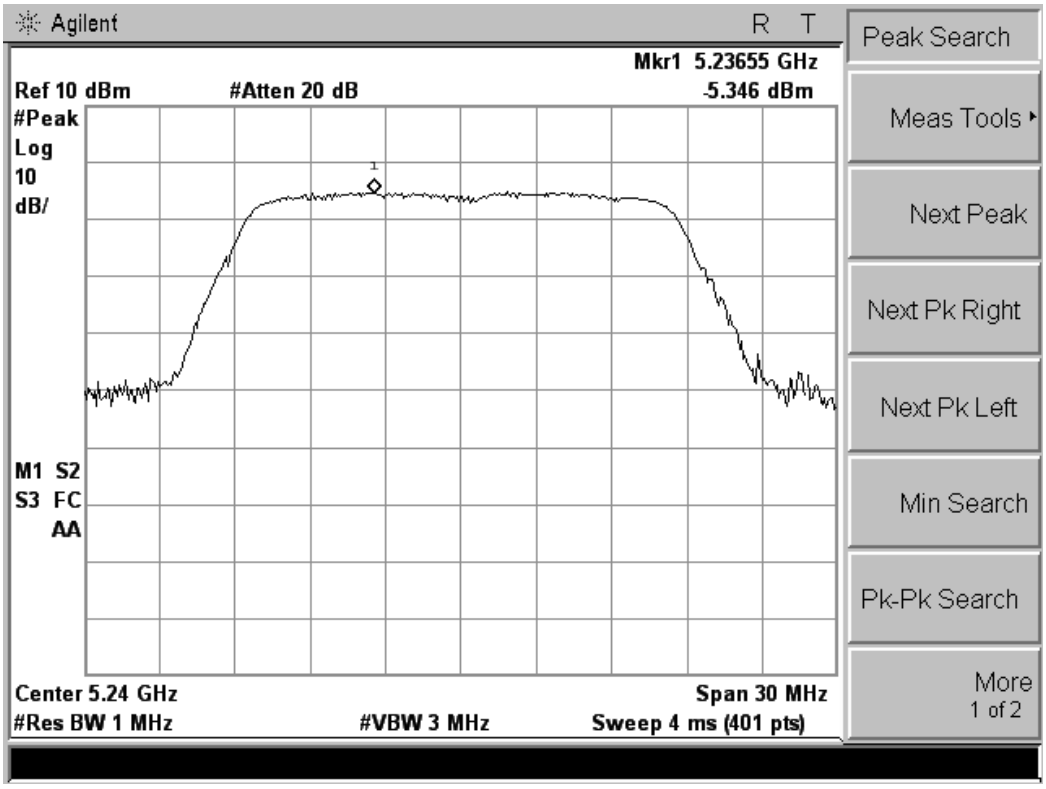




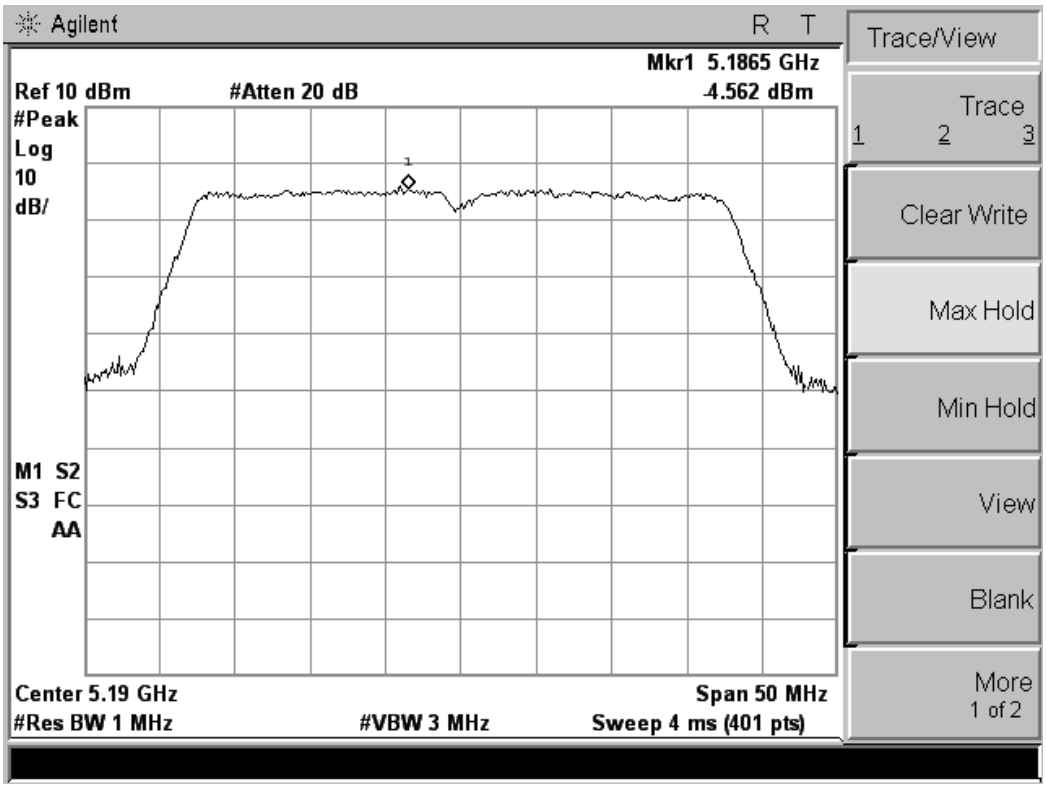
802.11n HT20 channel power density / port.2

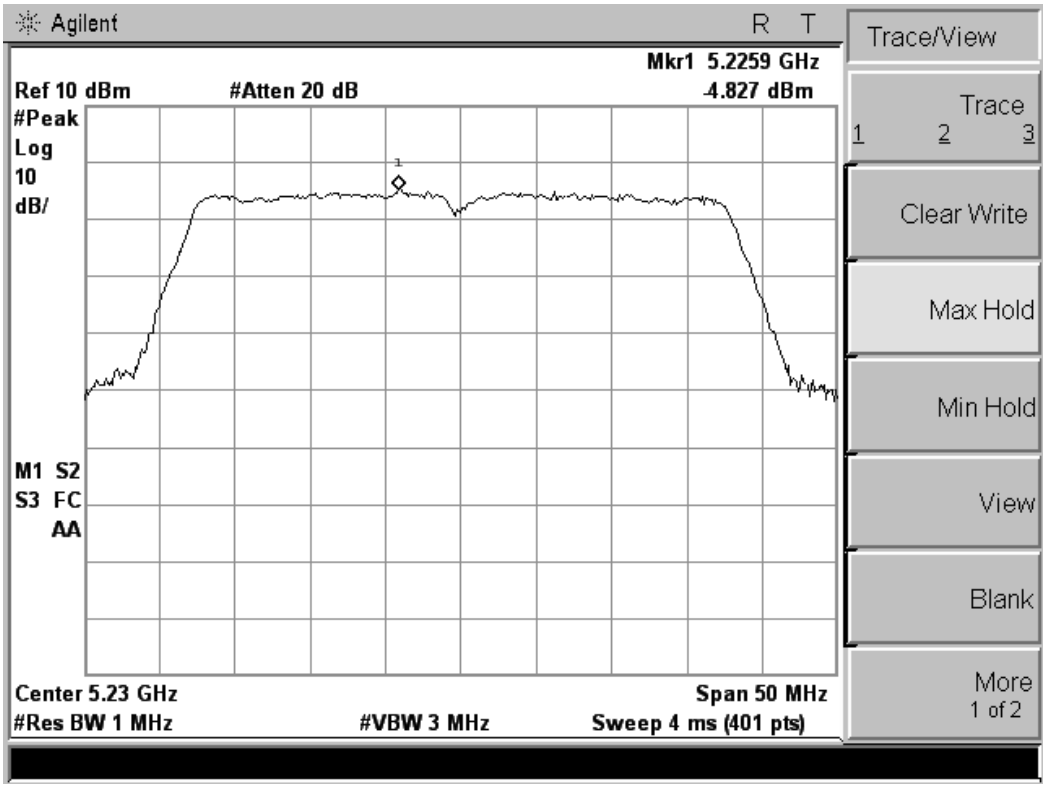




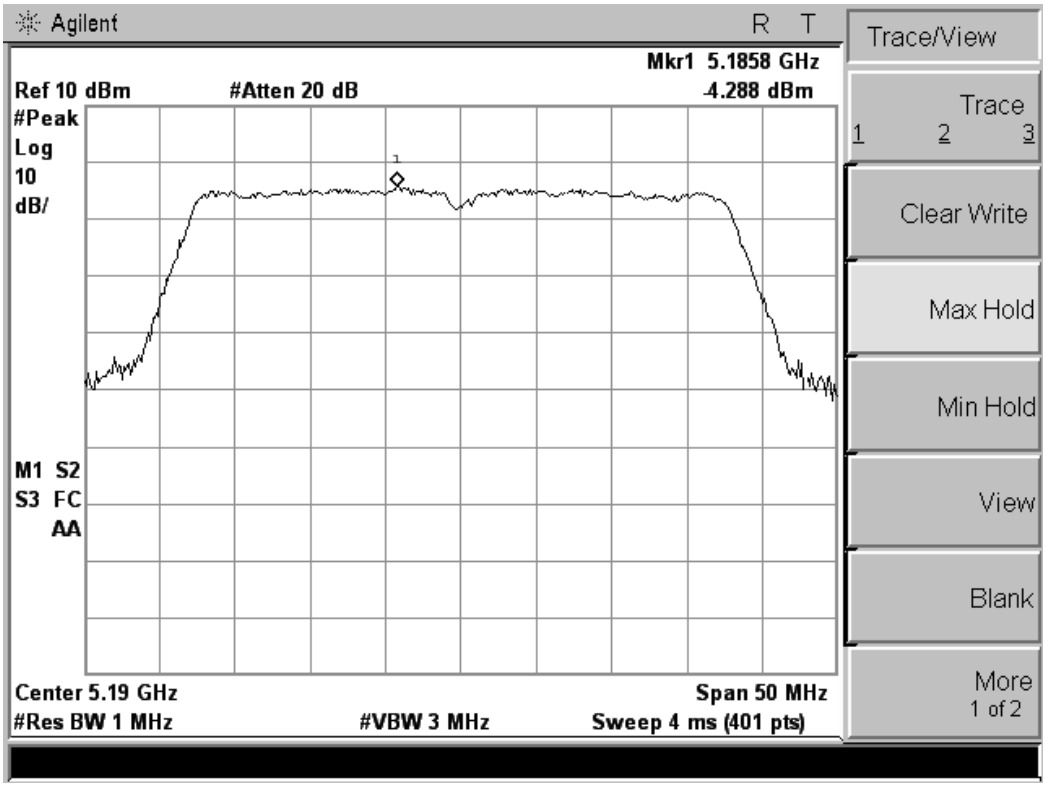


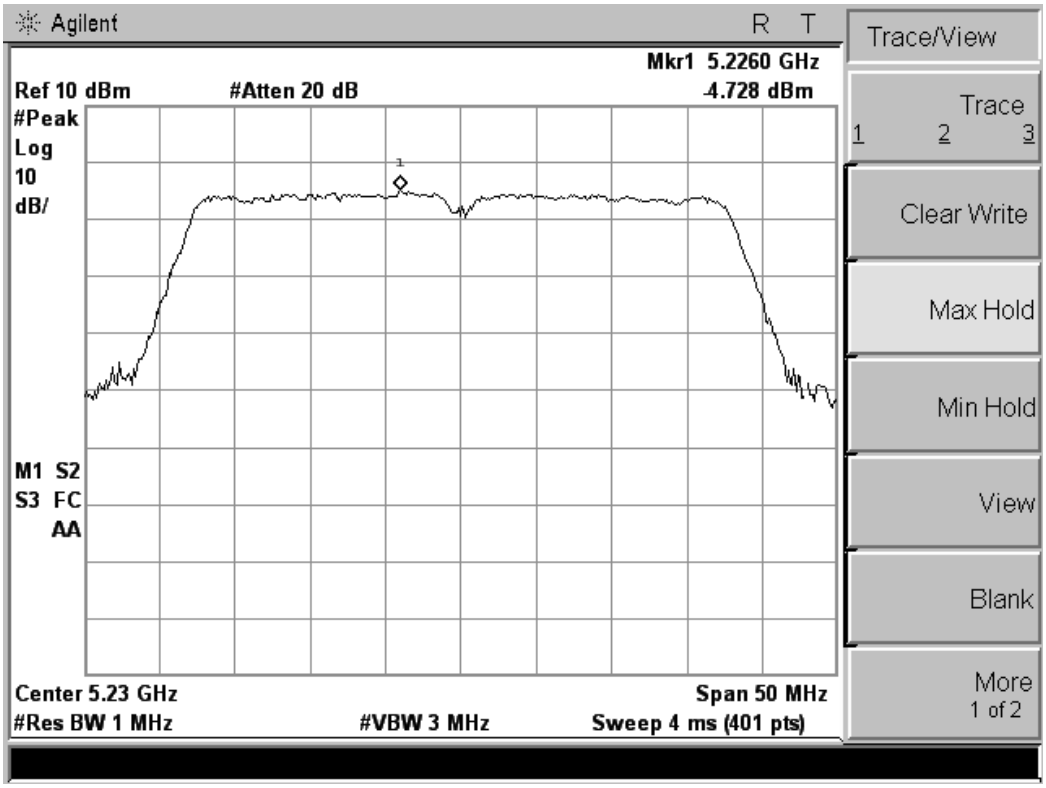
802.11n HT40 channel power density / port.1



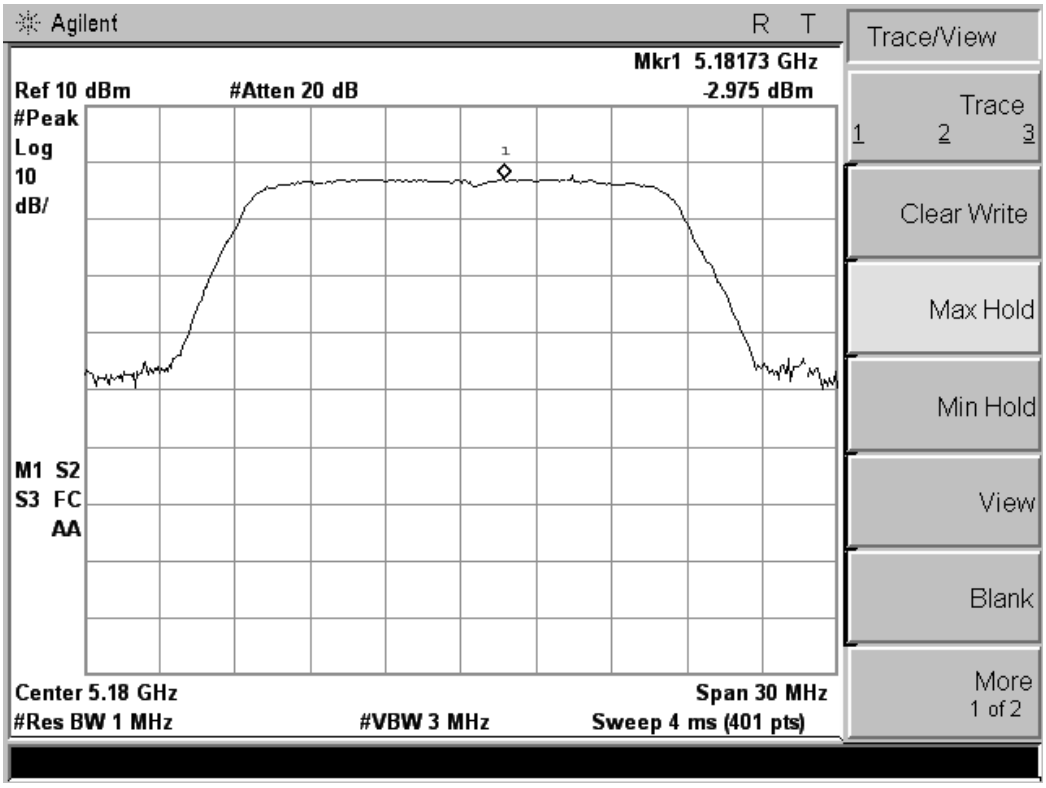


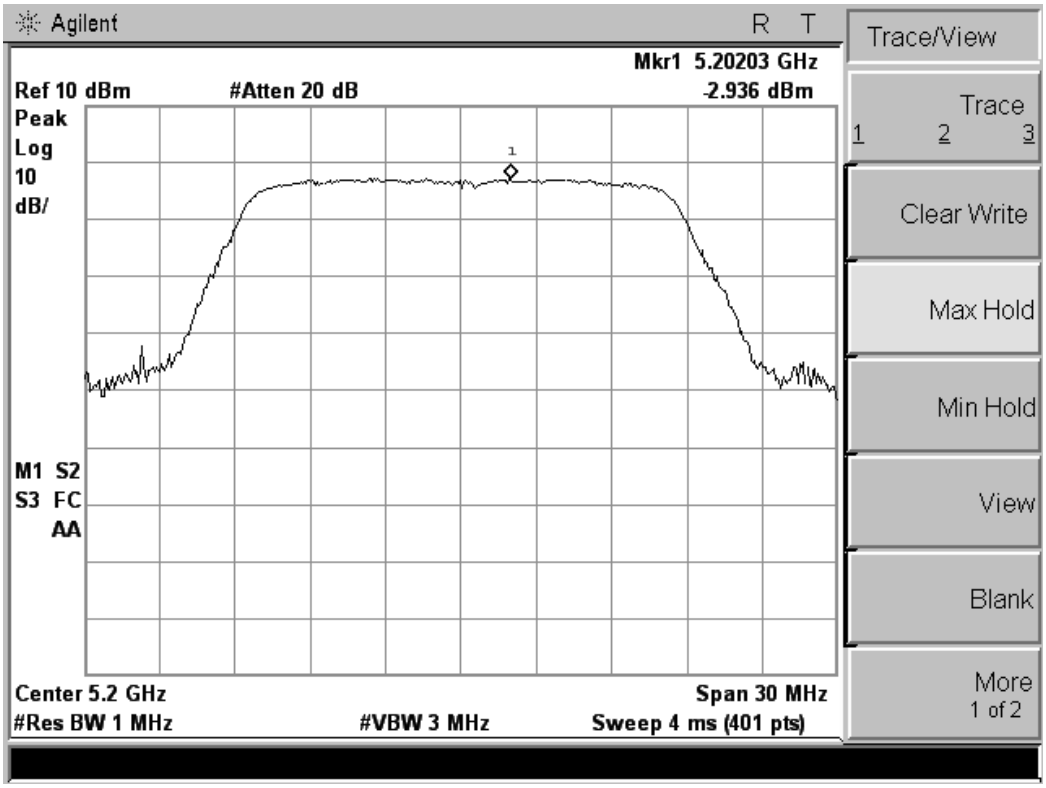
802.11n HT40 channel power density / port.2

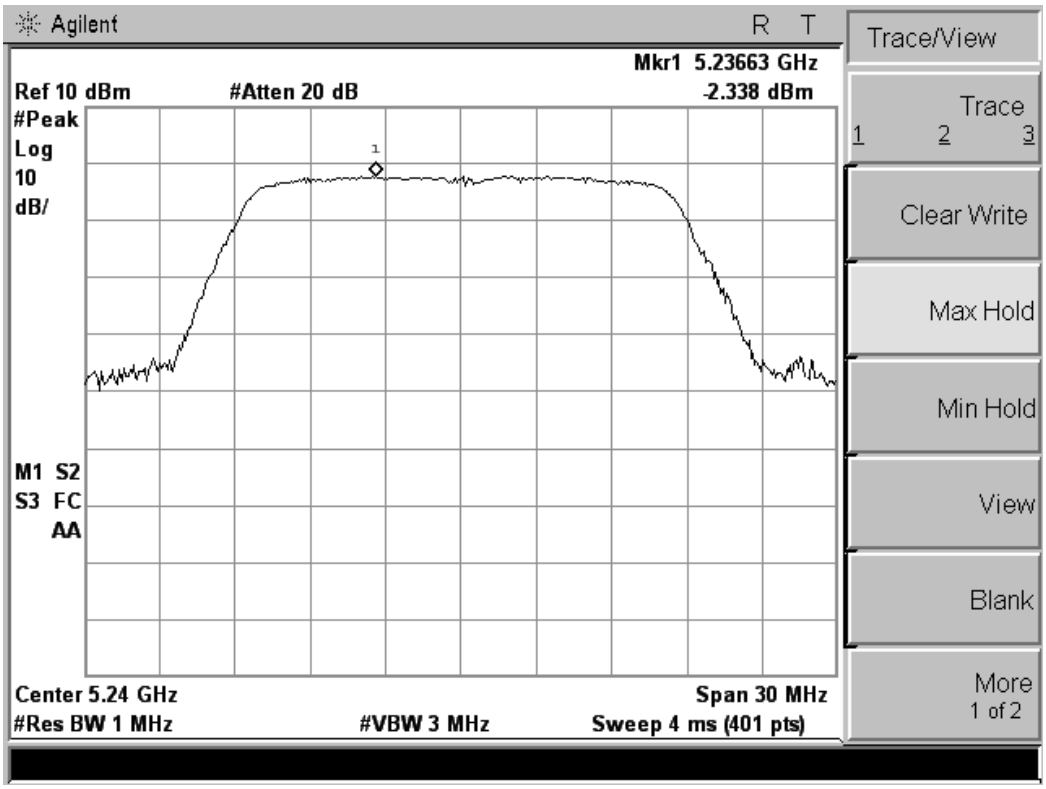




802.11a channel power density / port.1






Agilent
R T
Mkr1 5.23663 GHz
Ref 10 dBm
#Atten 20 dB
-2.338 dBm
#Peak
Log
10
dB/
M1 S2
S3 FC
AA
Center 5.24 GHz
Span 30 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 4 ms (401 pts)
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

5.3. 99% Occupied Bandwidth Measurement

5.3.1. Standard Applicable

No restriction limits. But resolution bandwidth within band edge measurement is 1% of the 99% occupied bandwidth.

5.3.2. Measuring Instruments and Setting

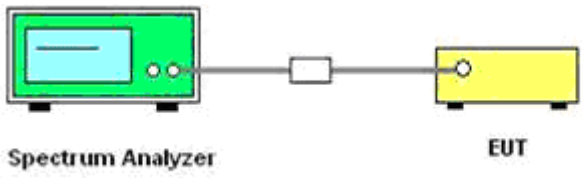
Please refer to section 6 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span	> 26dB Bandwidth
Detector	Peak
Trace	Max Hold
Sweep Time	100ms

5.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 300 kHz and the video bandwidth of 1000 kHz were used.
3. Measured the spectrum width with power higher than 26dB below carrier.

5.3.4. Test Setup Layout



5.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.6. Test Result of 99% Occupied Bandwidth

Temperature	25℃	Humidity	60%
Test Engineer	Leo	Configurations	802.11a/n

802.11n HT20/Port.1+Port.2

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180	20.181	17.468
40	5200	20.361	17.495
48	5240	20.323	17.455

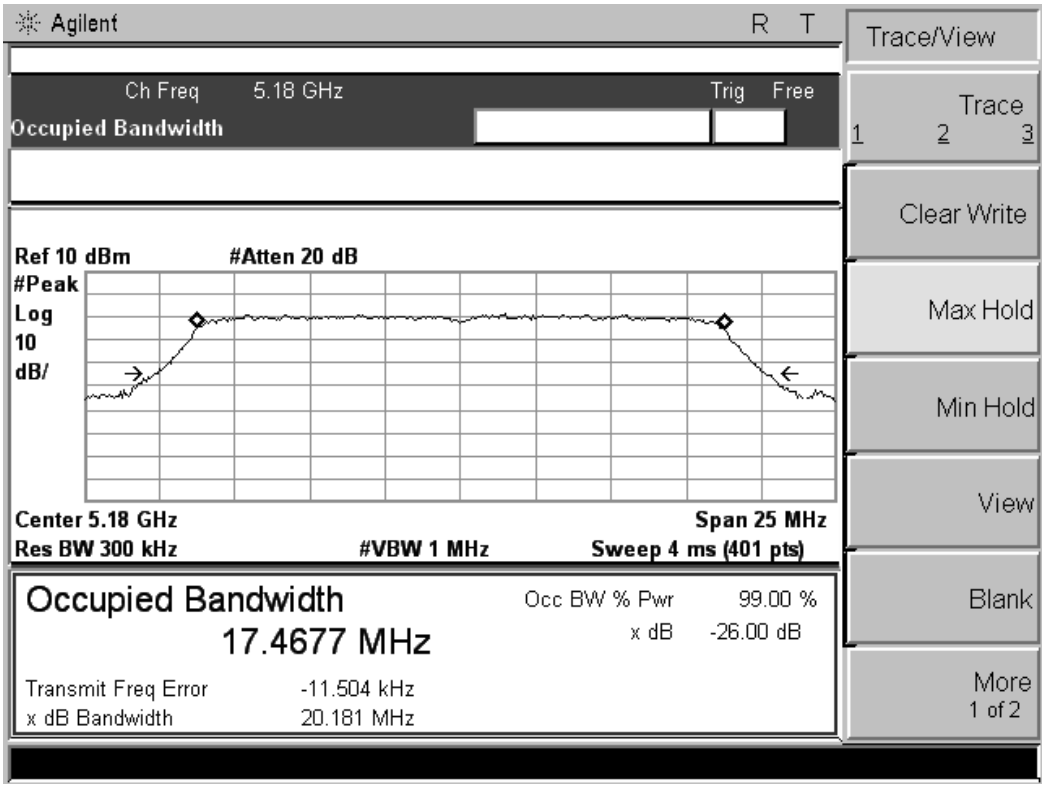
802.11n HT40/Port.1+Port.2

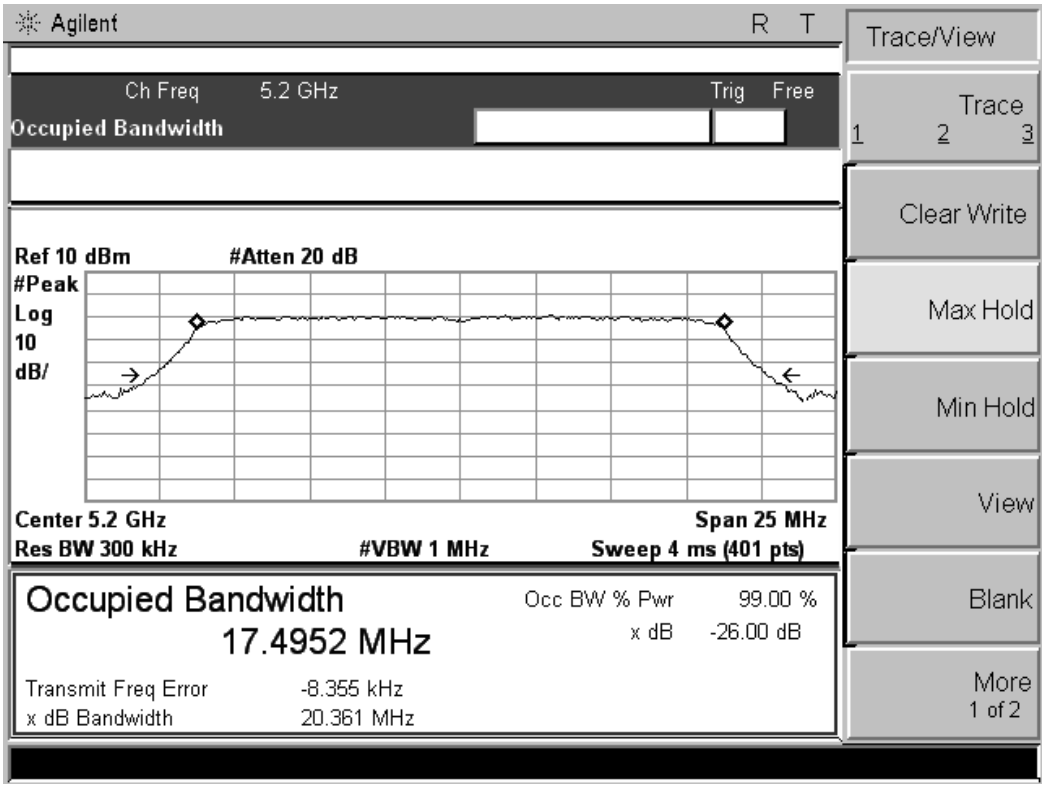
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190	40.148	35.866
46	5230	40.309	35.858

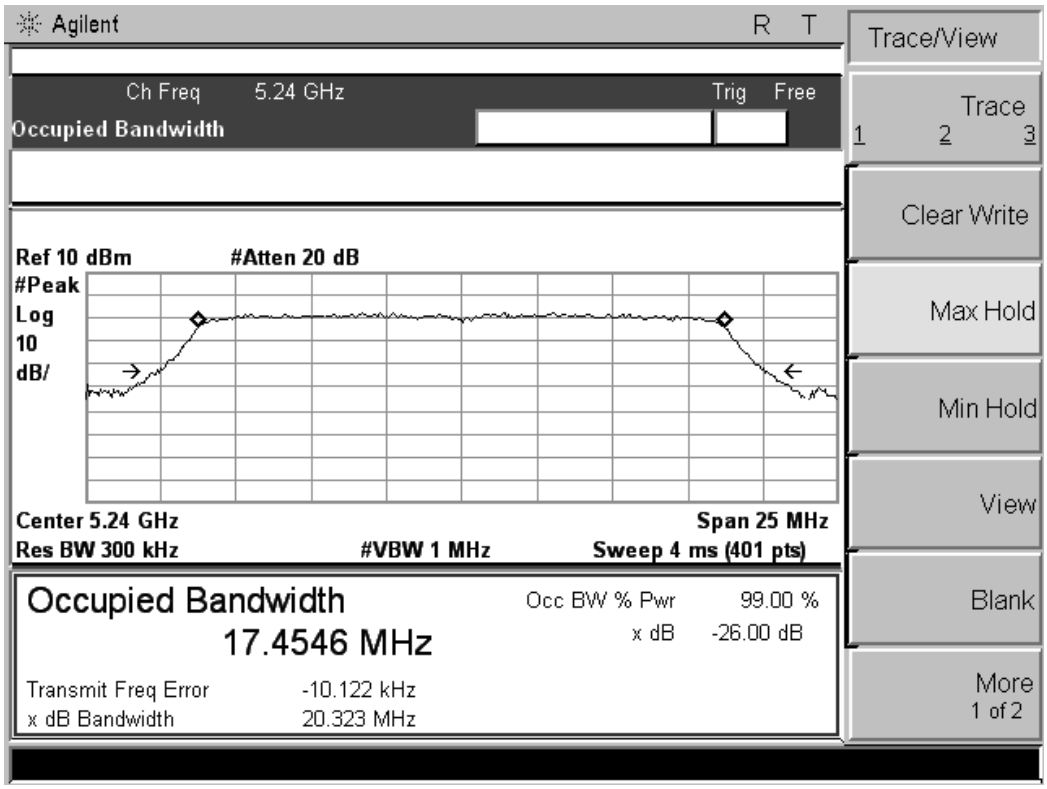
802.11a/Port.1

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180	20.401	17.473
40	5200	20.413	17.469
48	5240	20.352	17.468

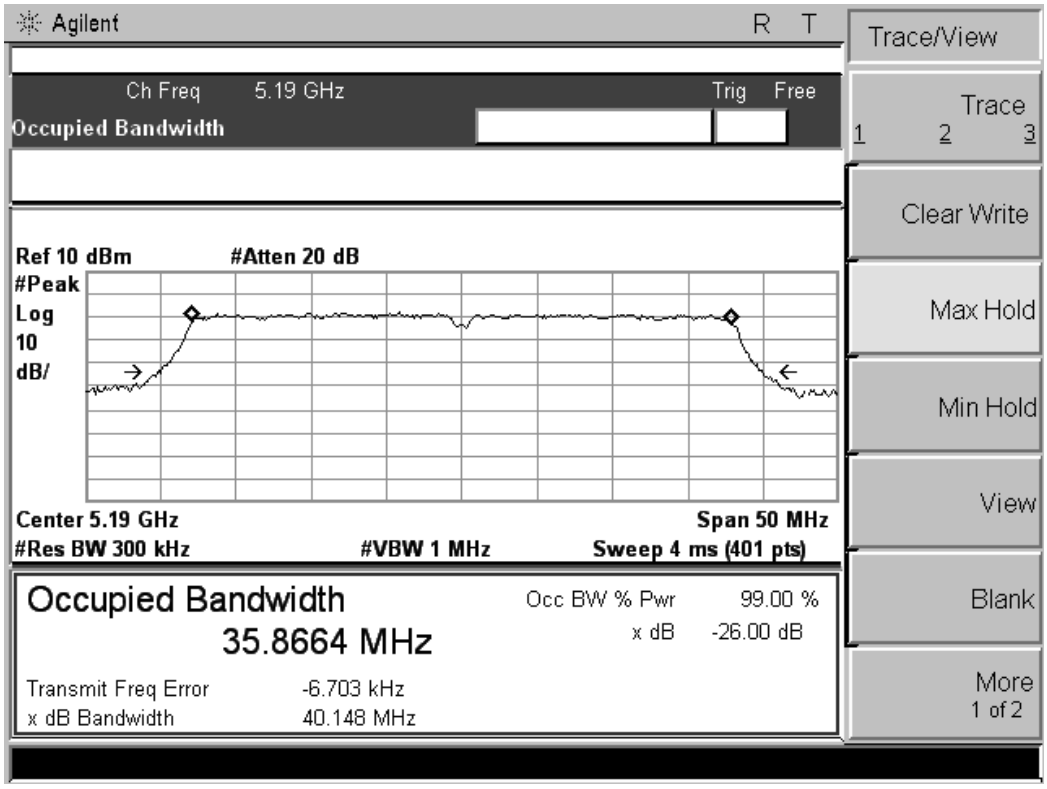
802.11n HT20 channel, 99% Occupied Bandwidth / port.1+port.2

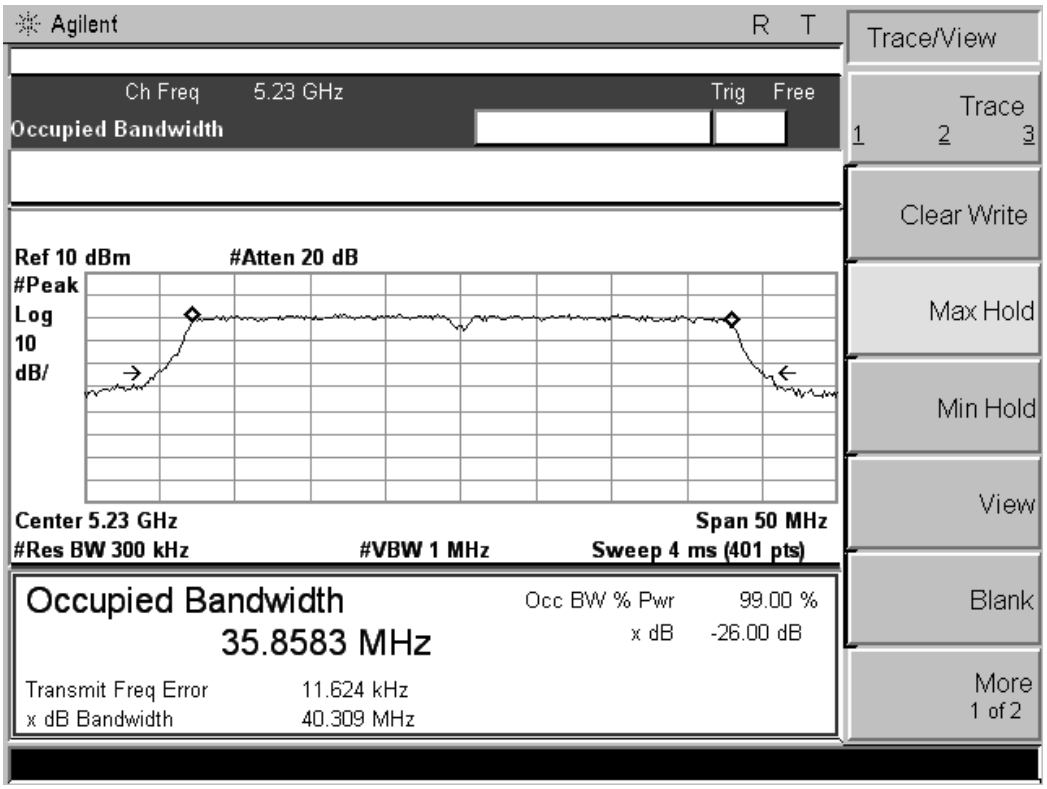




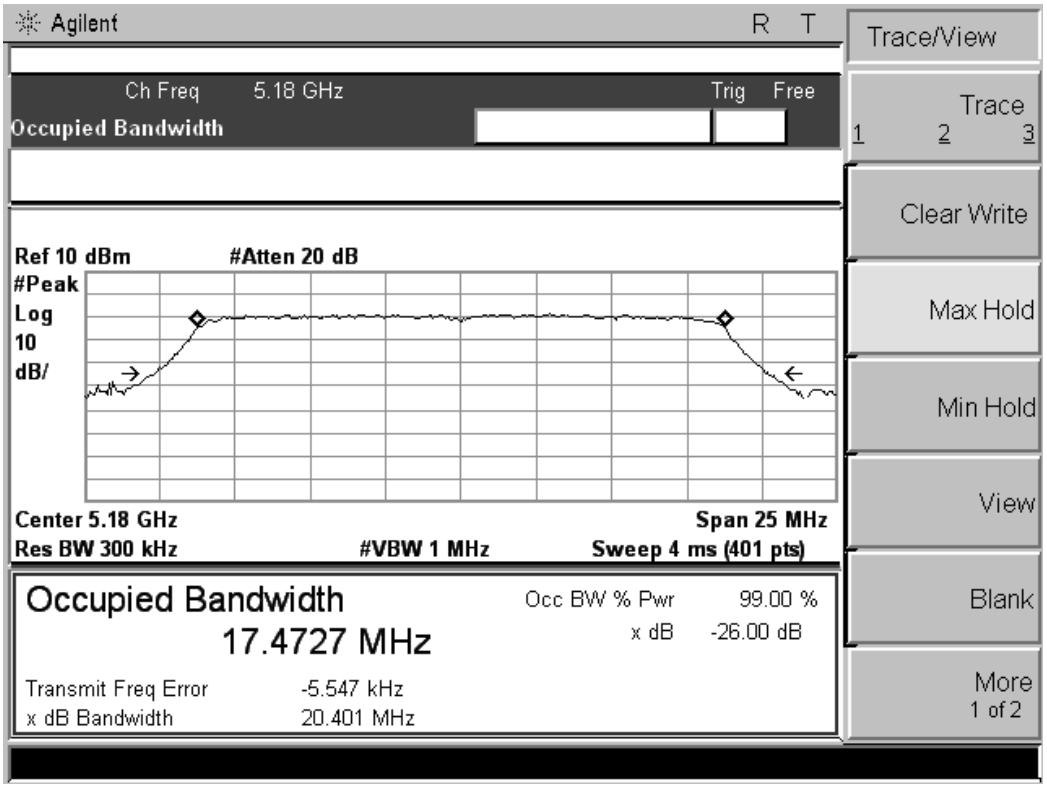


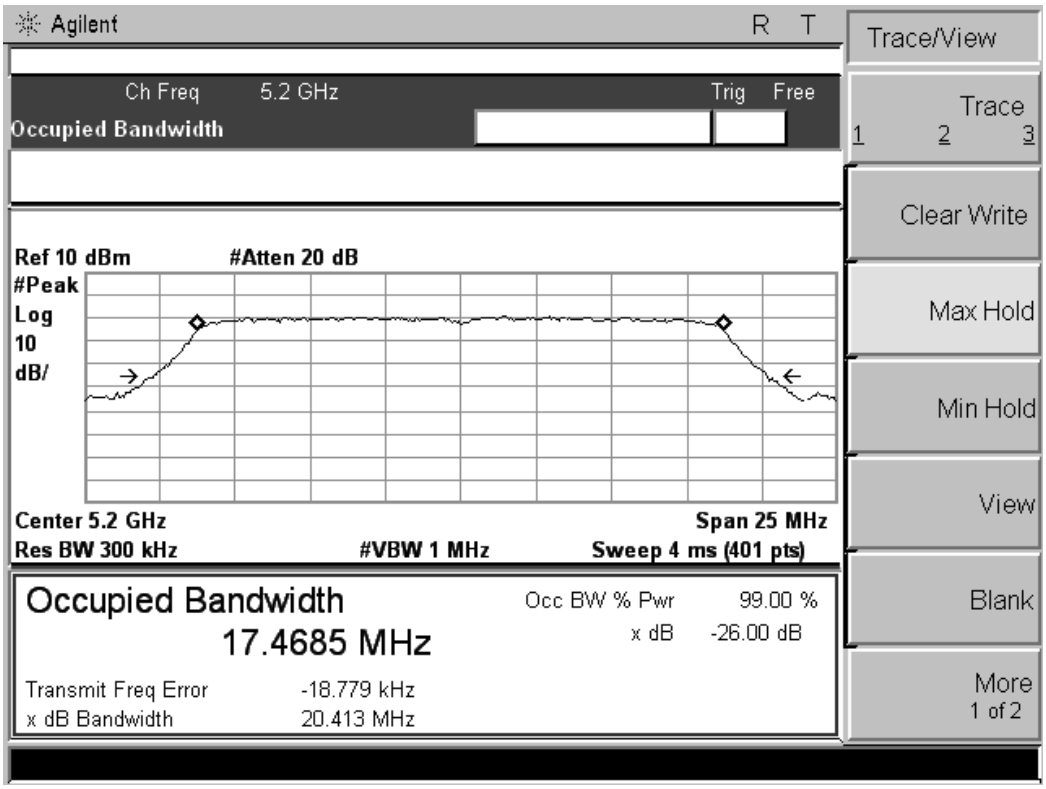
802.11n HT40 channel, 99% Occupied Bandwidth / port.1+port.2

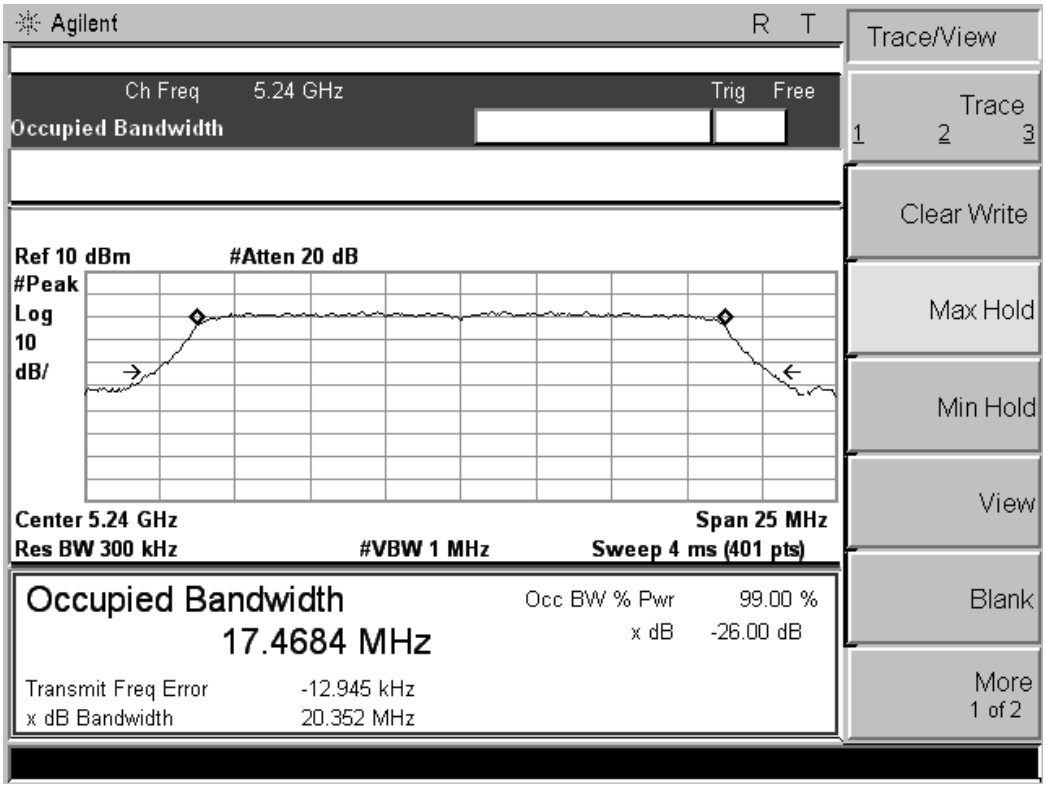




802.11a channel, 99% Occupied Bandwidth / port.1







5.4. Peak Excursion Measurement

5.4.1. Standard Applicable

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emissions bandwidth whichever is less.

5.4.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1000 kHz (Peak Trace) / 1000 kHz (Average Trace)
VBW	3000 kHz (Peak Trace) / 300 kHz (Average Trace)
Detector	Peak (Peak Trace) / Sample (Average Trace)
Trace	Max Hold
Sweep Time	Auto

5.4.3. Test Procedures

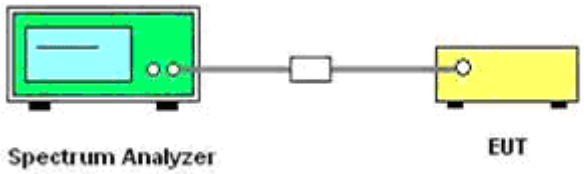
1. The transmitter output is connected to the spectrum analyzer.

2. Trace A, Set RBW =1MHz, VBW = 3MHz, Span >26dB bandwidth, Max. hold.

3. Delta Mark trace A Maximum frequency and trace B same frequency.

4. Repeat the above procedure until measurements for all frequencies were complete.

5.4.4. Test Setup Layout



5.4.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.4.6. Test Result of Peak Excursion

Temperature	25℃	Humidity	60%
Test Engineer	Leo	Configurations	802.11a/n

802.11n HT20/Port.1+Port.2

Channel	Frequency (MHz)	Peak Excursion (dB)	Max. Limit (dB)	Result
36	5180	3.781	13	Complies
40	5200	4.249	13	Complies
48	5240	3.969	13	Complies

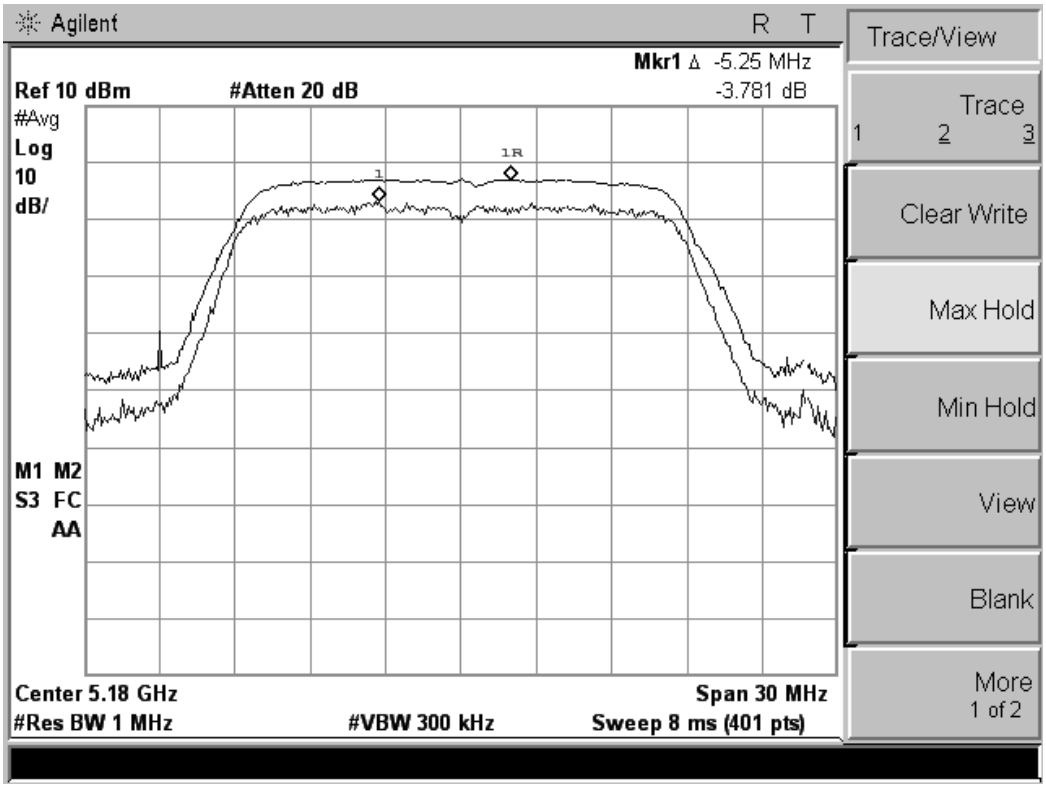
802.11n HT40/Port.1+Port.2

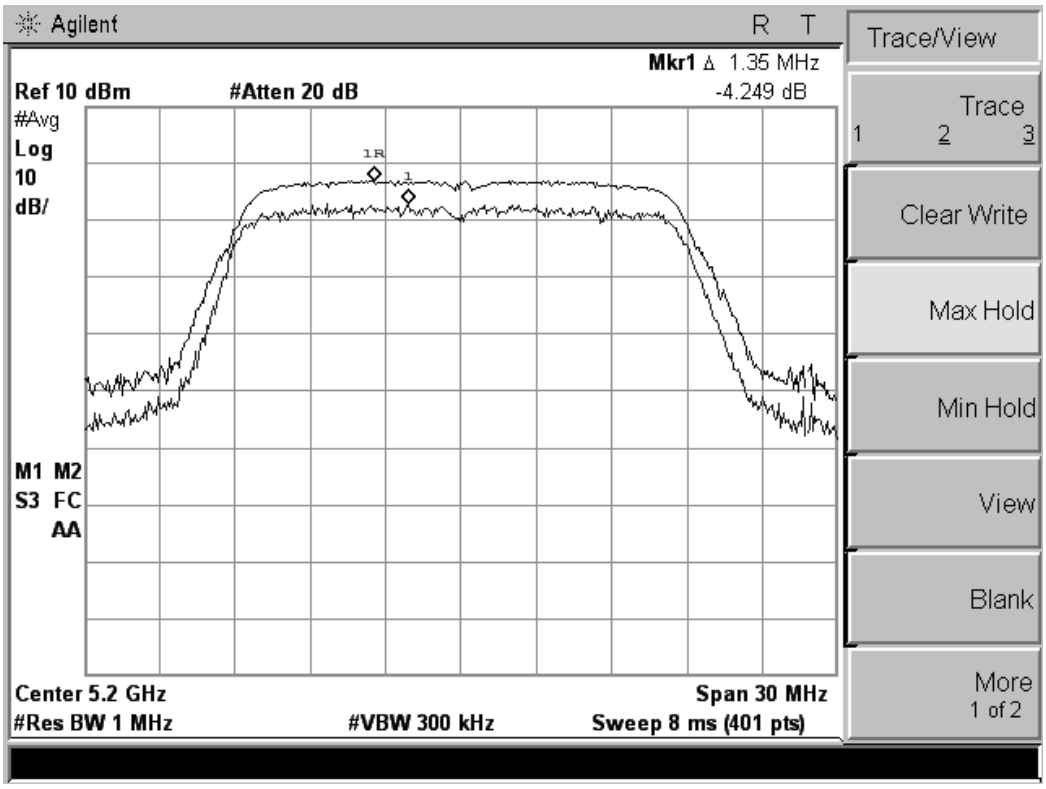
Channel	Frequency (MHz)	Peak Excursion (dB)	Max. Limit (dB)	Result
38	5190	4.537	13	Complies
46	5230	5.176	13	Complies

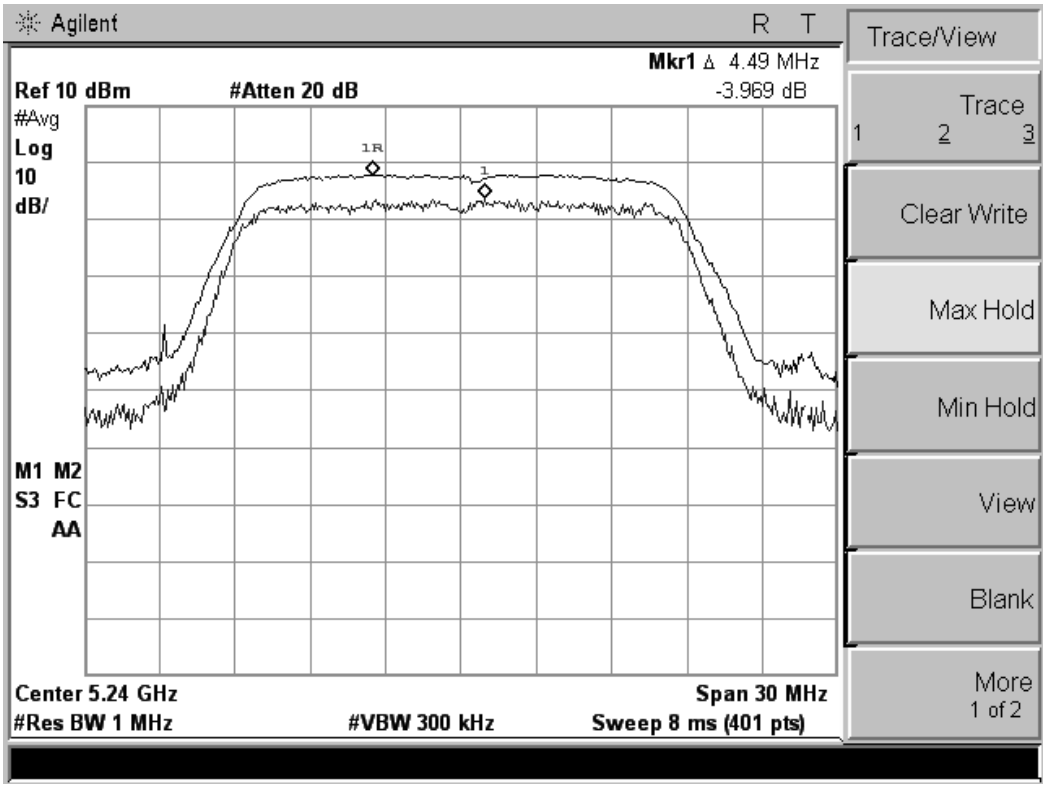
802.11a/Port.1

Channel	Frequency (MHz)	Peak Excursion (dB)	Max. Limit (dB)	Result
36	5180	4.212	13	Complies
40	5200	4.632	13	Complies
48	5240	3.758	13	Complies

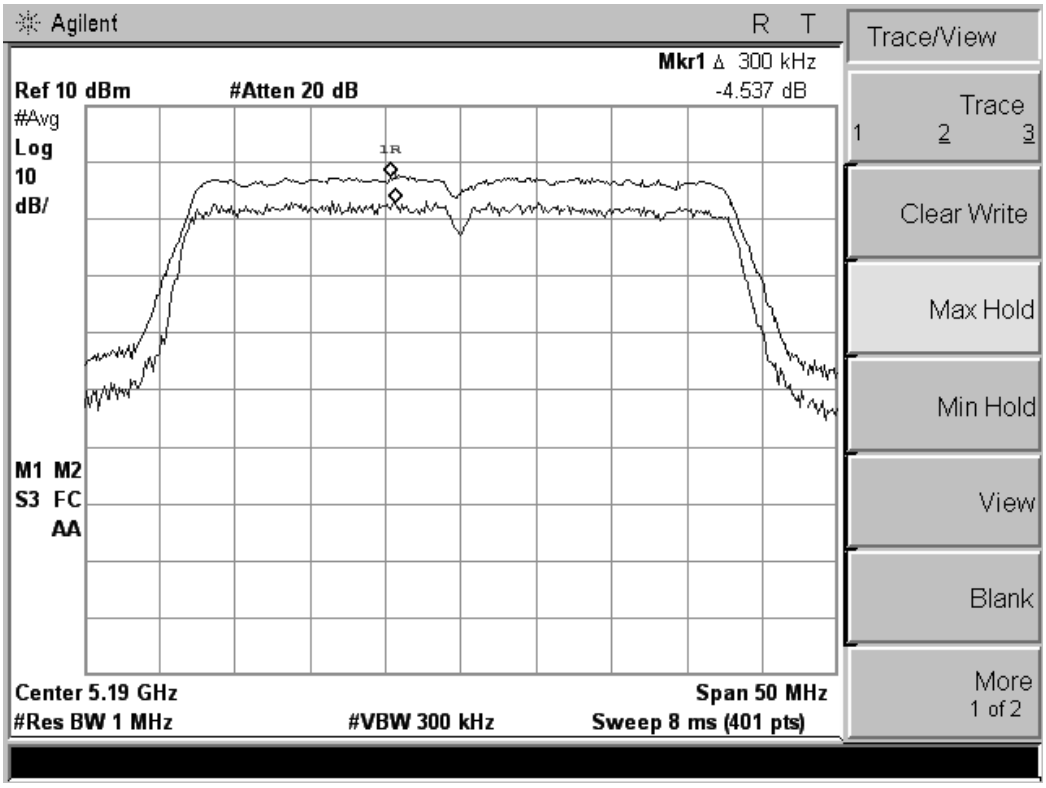
802.11n HT20 channel, Peak Excursion / port.1+ port.2

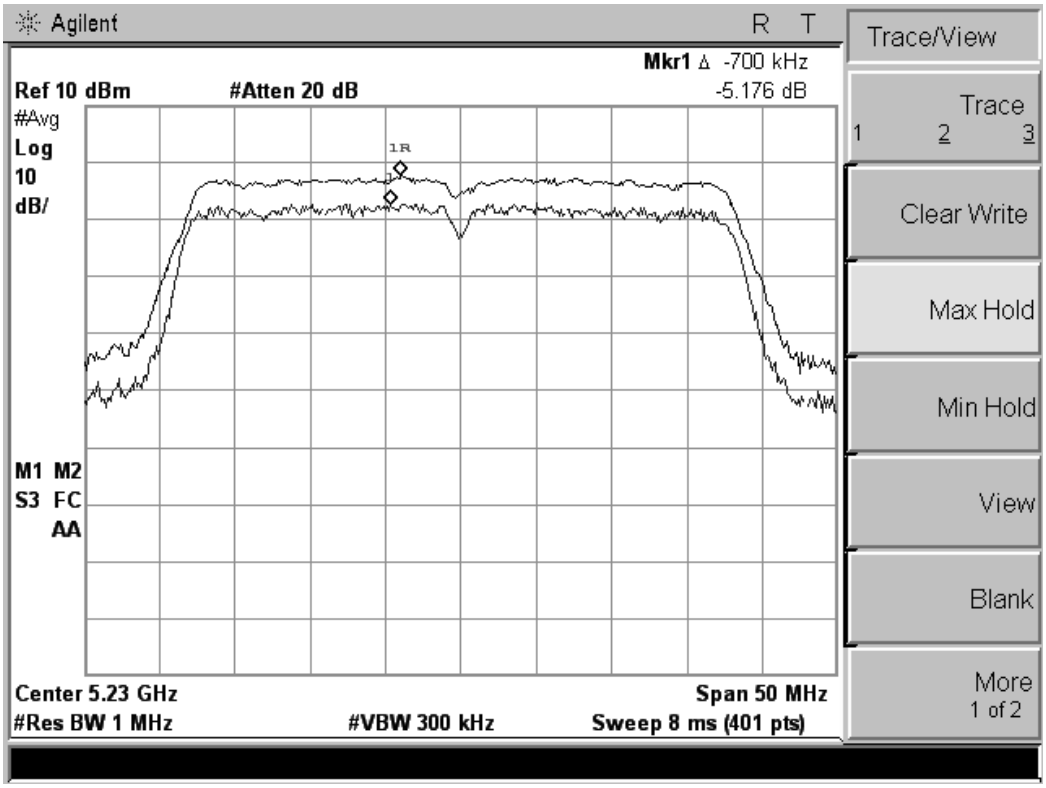




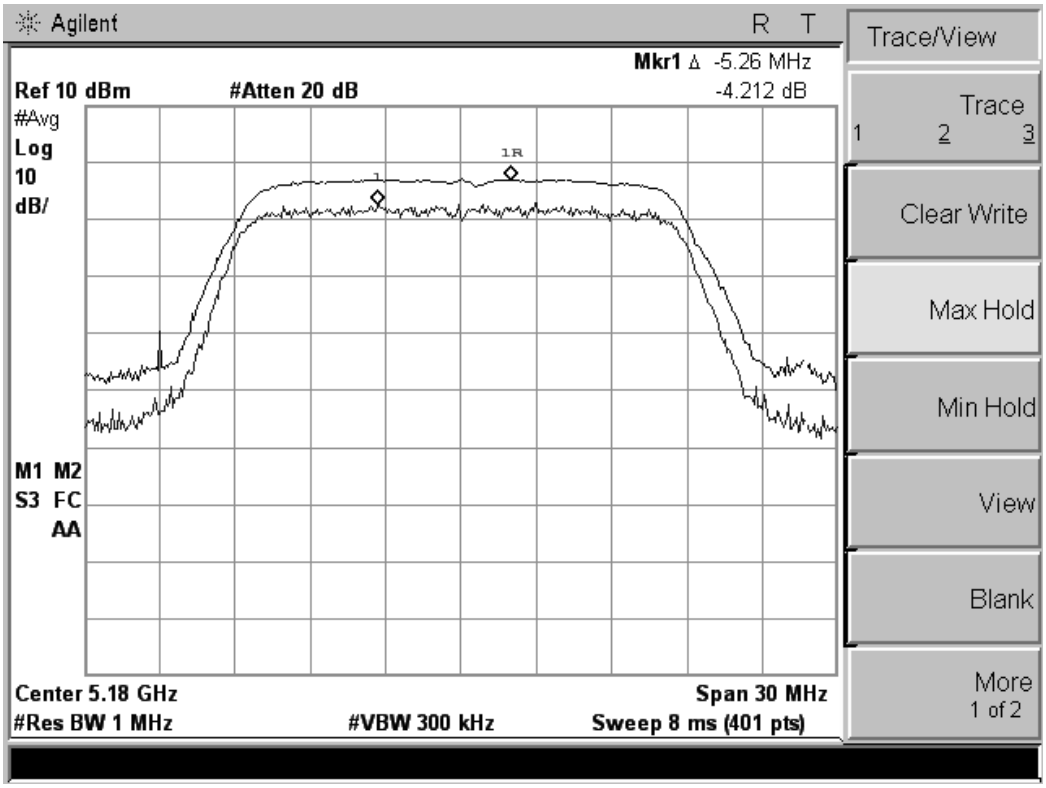


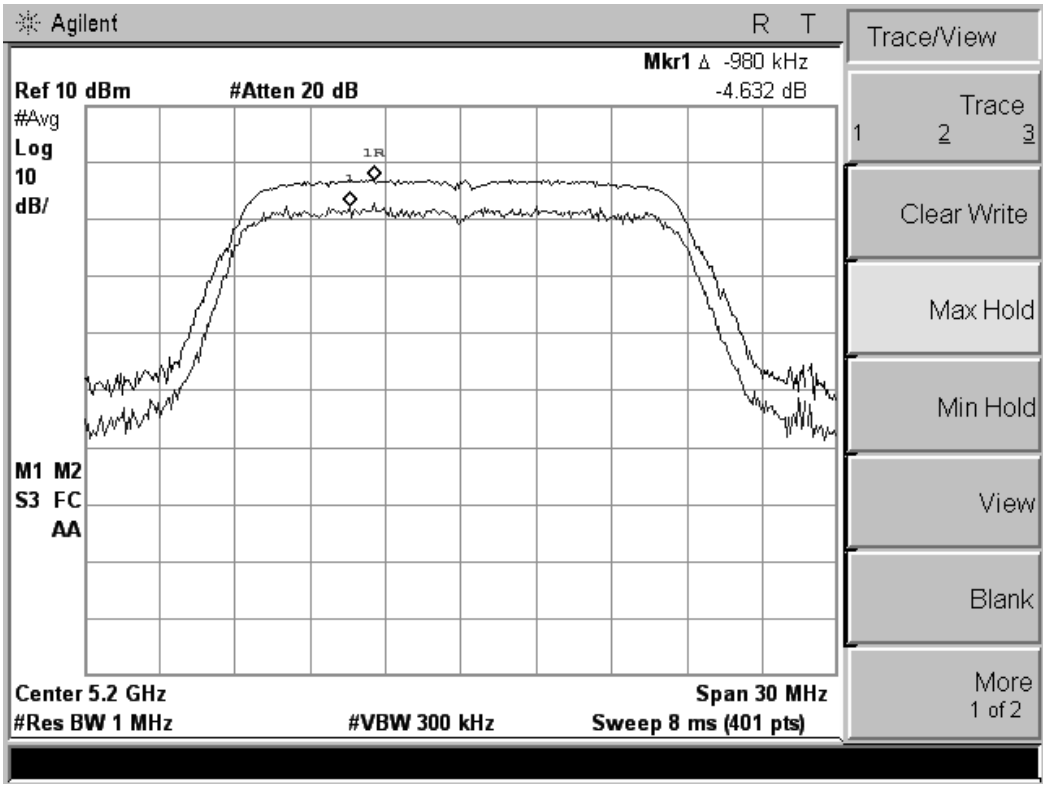
802.11n HT40 channel, Peak Excursion / port.1+ port.2

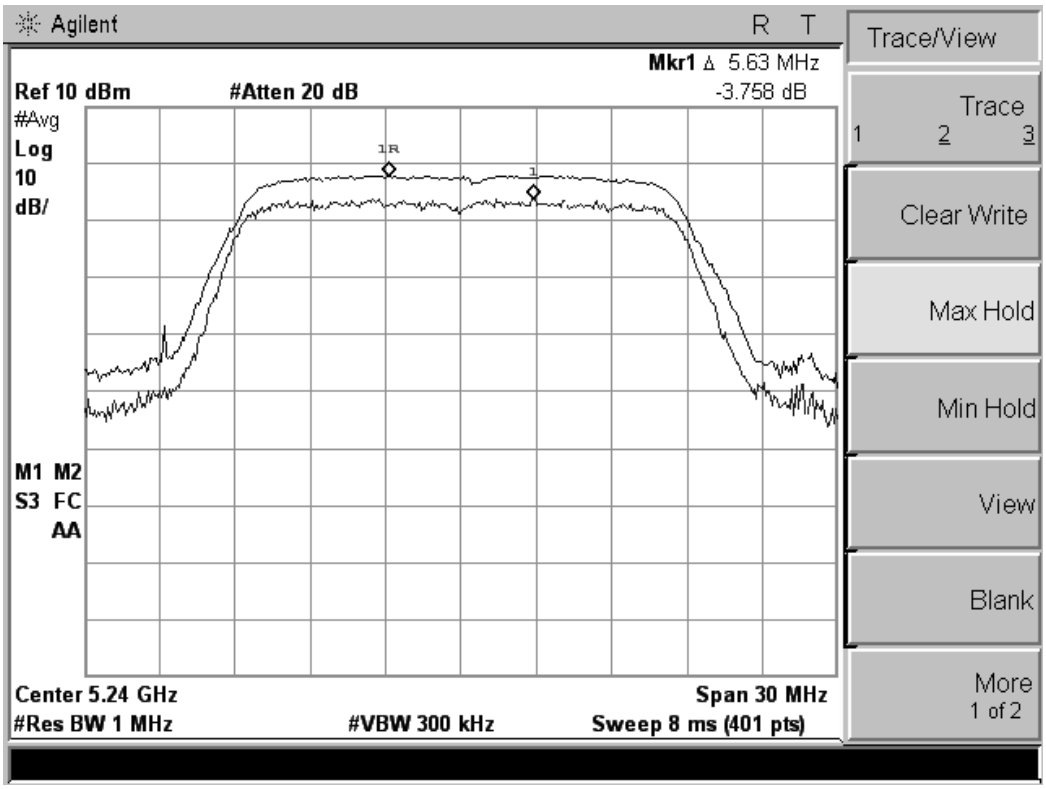




802.11a channel, Peak Excursion / port.1






Agilent
R T
Mkr1 Δ 5.63 MHz
-3.758 dB
Ref 10 dBm
#Atten 20 dB
#Avg
Log
10
dB/
1R
1
M1 M2
S3 FC
AA
Center 5.24 GHz
#Res BW 1 MHz
#VBW 300 kHz
Span 30 MHz
Sweep 8 ms (401 pts)
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

5.5. Radiated Emissions Measurement

5.5.1. Standard Applicable

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.470-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBuV/m at 3m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies(MHz)	Field Strength(microvolts/meter)	Measurement Distance(meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

5.5.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 100kHz for QP

5.5.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.

2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.

3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.

4. For each suspected emissions, the antenna tower was scan (from 1 m to 4 m) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading

5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.

6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.

7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

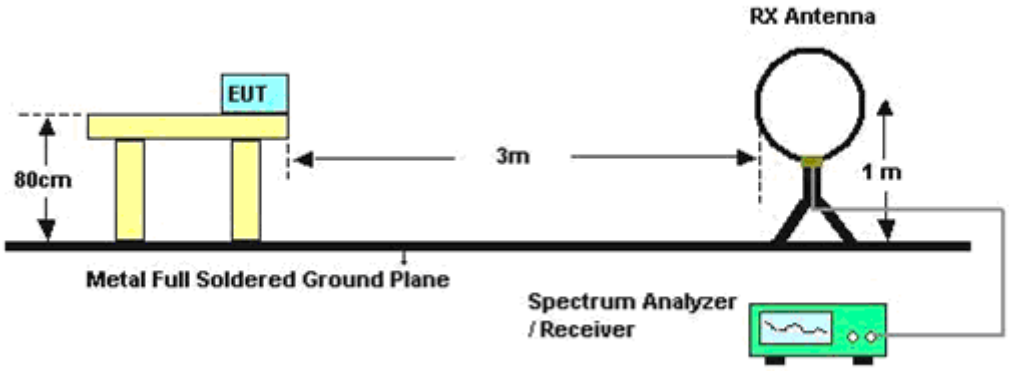
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.

9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

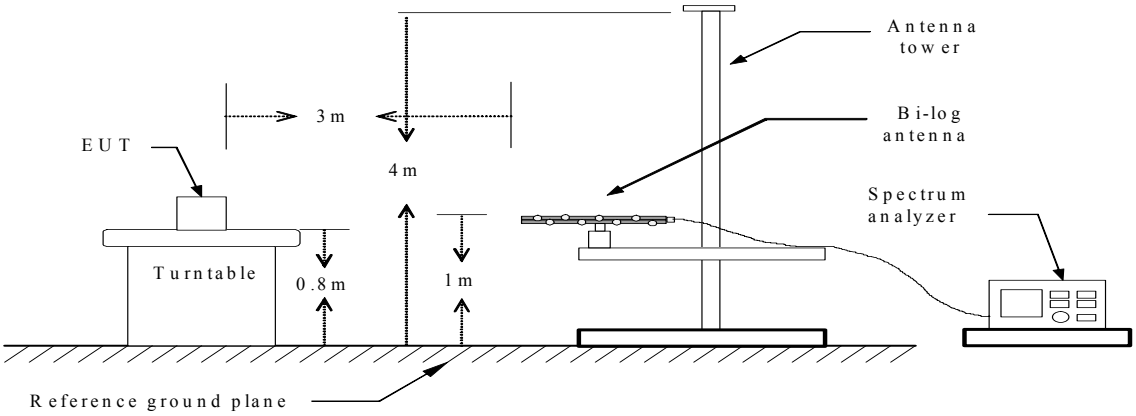
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

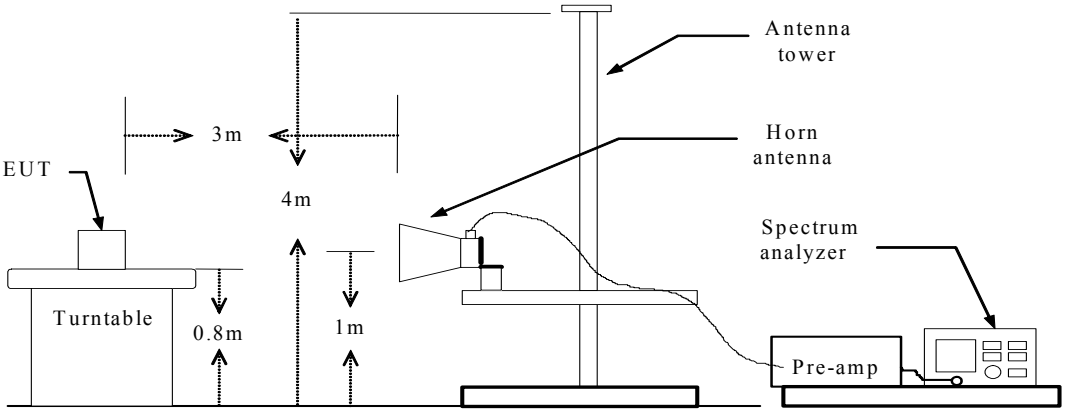
5.5.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz





Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distanc [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

5.5.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.5.6. Results of Radiated Emissions (9kHz~30MHz)

Temperature	25℃	Humidty	60%
Test Engineer	Leo	Configurations	802.11a/n

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

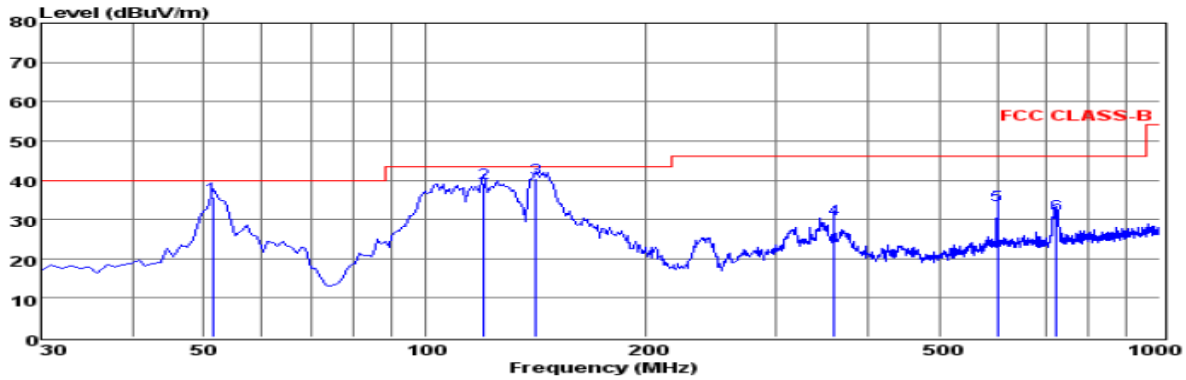
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

5.5.7. Results of Radiated Emissions (30MHz~1GHz)

Temperature	25℃	Humidty	60%
Test Engineer	Leo	Configurations	802.11n HT20, Low Channel

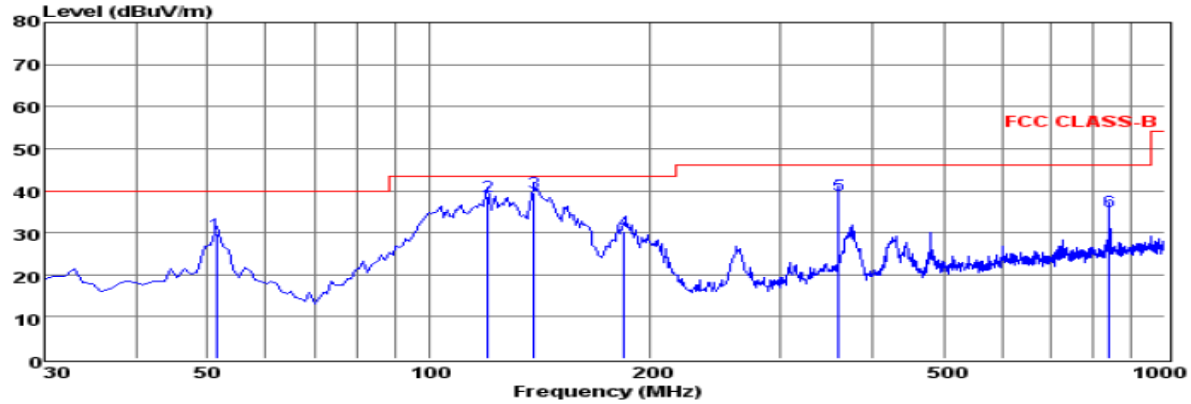
Test result for 802.11n HT20 (Low Channel, 5GHz Band)




```
Env. /Ins:              24℃/56%
EUT:                    300Mbps 802.11n/a/b/g Wireless Dual Band USB Adapter
M/N:                    RNX-N600UBE
Power Rating:           DC 5V
Test Mode:              Tx-5180(802.11n20, 5G)
Operator:               Andy
Memo:
pol:                    HORIZONTAL
```

	Freq	Reading	CabLos	AntFac	PreFac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1	51.34	21.95	0.54	13.19	0.00	35.68	40.00	-4.32	QP
2	120.21	28.23	0.64	10.45	0.00	39.32	43.50	-4.18	QP
3	141.55	31.42	0.71	8.20	0.00	40.33	43.50	-3.17	QP
4	359.80	14.36	1.18	14.43	0.00	29.97	46.00	-16.03	QP
5	600.36	13.72	1.43	18.45	0.00	33.60	46.00	-12.40	QP
6	723.55	10.44	1.72	19.10	0.00	31.26	46.00	-14.74	QP

Note: 1. All readings are Quasi-peak values.
2.Measured = Reading + Antenna Factor + Cable Loss - Amp Factor.
3.The emission levels that ate 20dB below the official limit are not reported.



Env. /Ins: 24℃/56%
EUT: 300Mbps 802.11n/a/b/g Wireless Dual Band USB Adapter
M/N: RNX-N600UBE
Power Rating: DC 5V
Test Mode: Tx-5180(802.11n20, 5G)
Operator: Andy
Memo:
pol: VERTICAL

	Freq	Reading	CabLos	AntFac	PreFac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1	51.34	15.94	0.54	13.19	0.00	29.67	40.00	-10.33	QP
2	120.21	27.56	0.64	10.45	0.00	38.65	43.50	-4.85	QP
3	138.64	30.58	0.75	8.29	0.00	39.62	43.50	-3.88	QP
4	184.23	19.59	0.70	10.05	0.00	30.34	43.50	-13.16	QP
5	359.80	23.46	1.18	14.43	0.00	39.07	46.00	-6.93	QP
6	840.92	12.76	1.88	20.48	0.00	35.12	46.00	-10.88	QP

Note: 1. All readings are Quasi-peak values.
2.Measured = Reading + Antenna Factor + Cable Loss - Amp Factor.
3.The emission levels that ate 20dB below the official limit are not reported.

Note:

Pre-scan all mode and recorded the worst case results in this report (802.11n HT20 (Low Channel, 5GHz Band)).

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

5.5.8. Results for Radiated Emissions (Above 1GHz)

802.11 HT20/Port.1+Port.2

Channel 36

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.52	50.84	33.06	35.04	3.94	74	-21.20	Peak	Horizontal
15.52	37.10	33.06	35.04	3.94	54	-14.94	Average	Horizontal
15.53	50.77	33.06	35.04	3.94	74	-21.27	Peak	Vertical
15.53	37.11	33.06	35.04	3.94	54	-14.93	Average	Vertical

Channel 40

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.58	50.64	33.16	35.15	3.96	74	-21.39	Peak	Horizontal
15.58	36.56	33.16	35.15	3.96	54	-15.47	Average	Horizontal
15.57	49.77	33.16	35.15	3.96	74	-22.26	Peak	Vertical
15.57	36.61	33.16	35.15	3.96	54	-15.42	Average	Vertical

Channel 48

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.71	50.62	33.26	35.14	3.98	74	-21.28	Peak	Horizontal
15.71	36.66	33.26	35.14	3.98	54	-15.24	Average	Horizontal
15.71	50.14	33.26	35.14	3.98	74	-21.76	Peak	Vertical
15.71	36.67	33.26	35.14	3.98	54	-15.23	Average	Vertical

802.11 HT40/Port.1+Port.2

Channel 38

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.55	50.79	33.06	35.04	3.94	74	-21.25	Peak	Horizontal
15.55	37.10	33.06	35.04	3.94	54	-14.94	Average	Horizontal
15.56	50.01	33.06	35.04	3.94	74	-22.03	Peak	Vertical
15.56	37.02	33.06	35.04	3.94	54	-15.02	Average	Vertical

Channel 46

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.67	49.71	33.16	35.15	3.96	74	-22.32	Peak	Horizontal
15.67	36.65	33.16	35.15	3.96	54	-15.38	Average	Horizontal
15.68	49.81	33.16	35.15	3.96	74	-22.22	Peak	Vertical
15.68	36.71	33.16	35.15	3.96	54	-15.32	Average	Vertical

802.11a/Port.1

Channel 36

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.54	50.16	33.06	35.04	3.94	74	-21.88	Peak	Horizontal
15.54	36.97	33.06	35.04	3.94	54	-15.07	Average	Horizontal
15.53	50.08	33.06	35.04	3.94	74	-21.96	Peak	Vertical
15.53	37.12	33.06	35.04	3.94	54	-14.92	Average	Vertical

Channel 40

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.58	51.66	33.16	35.15	3.96	74	-20.37	Peak	Horizontal
15.58	36.64	33.16	35.15	3.96	54	-15.39	Average	Horizontal
15.61	51.09	33.16	35.15	3.96	74	-20.94	Peak	Vertical
15.61	36.58	33.16	35.15	3.96	54	-15.45	Average	Vertical

Channel 48

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.71	49.65	33.26	35.14	3.98	74	-22.25	Peak	Horizontal
15.71	36.27	33.26	35.14	3.98	54	-15.63	Average	Horizontal
15.70	50.33	33.26	35.14	3.98	74	-21.57	Peak	Vertical
15.70	36.23	33.26	35.14	3.98	54	-15.67	Average	Vertical

Notes:

1. *Measuring frequencies from 9k~40GHz, No emission found between lowest internal used/generated frequency to 30MHz.*
2. *Radiated emissions measured in frequency range from 9k~40GHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*

5.5.9. Results for Band Edge Emissions

802.11 HT20/Port.1+Port.2

Channel 36

Freq. MHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4824.11	49.31	33.06	35.04	3.94	74	-22.73	Peak	Horizontal
4824.11	38.67	33.06	35.04	3.94	54	-13.37	Average	Horizontal
5149.80	60.43	33.26	35.14	3.98	74	-11.47	Peak	Horizontal
5150.00	43.17	33.26	35.14	3.98	54	-8.73	Average	Horizontal

802.11 HT40/Port.1+Port.2

Channel 38

Freq MHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
5000.00	50.79	33.06	35.04	3.94	74	-21.25	Peak	Horizontal
5000.00	37.10	33.06	35.04	3.94	54	-14.94	Average	Horizontal
5150.56	50.01	33.06	35.04	3.94	74	-22.03	Peak	Vertical
5150.56	37.02	33.06	35.04	3.94	54	-15.02	Average	Vertical

802.11a/Port.1

Channel 36

Freq MHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
4831.11	50.16	33.06	35.04	3.94	74	-21.88	Peak	Horizontal
4831.09	36.97	33.06	35.04	3.94	54	-15.07	Average	Horizontal
5150.00	49.94	33.26	35.14	3.98	74	-21.96	Peak	Vertical
5150.00	36.98	33.26	35.14	3.98	54	-14.92	Average	Vertical

5.6. Frequency Stability Measurement

5.6.1. Standard Applicable

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emissions is maintained within the band of operation under all conditions of normal operation as specified in the user's manual or ±20ppm (IEEE 802.11nspecification).

5.6.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Detector	Peak
Attenuation	Auto
Span	Entire absence of modulation emissions bandwidth
RBW	10KHz
RBW	10KHz

5.6.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.

2. EUT have transmitted absence of modulation signal and fixed channelize.

3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.

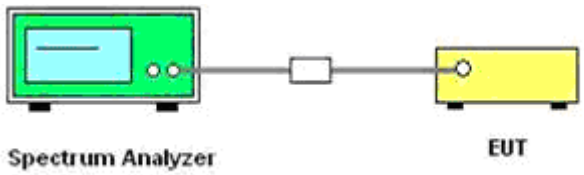
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.

5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).

6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value

7. Extreme temperature rule is -30°C~50°C.

5.6.4. Test Setup Layout



5.6.5. EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

5.6.6. Test Results of Frequency Stability Measurement

Voltage vs. Frequency Stability

Voltage	Measure Frequency (MHz)
(V)	5200
126.50	5199.9950
110.00	5199.9980
93.50	5199.9980
Max. Deviation (MHz)	0.0050
Max. Deviation (ppm)	0.96

Temperature vs. Frequency Stability

Temperature	Measure Frequency (MHz)
(℃)	5200
-30	5199.9915
-20	5199.9930
-10	5199.9960
0	5199.9960
+10	5199.9965
+20	5199.9968
+30	5199.9970
+40	5199.9989
+50	5199.9998
Max. Deviation (MHz)	0.0085
Max. Deviation (ppm)	1.63

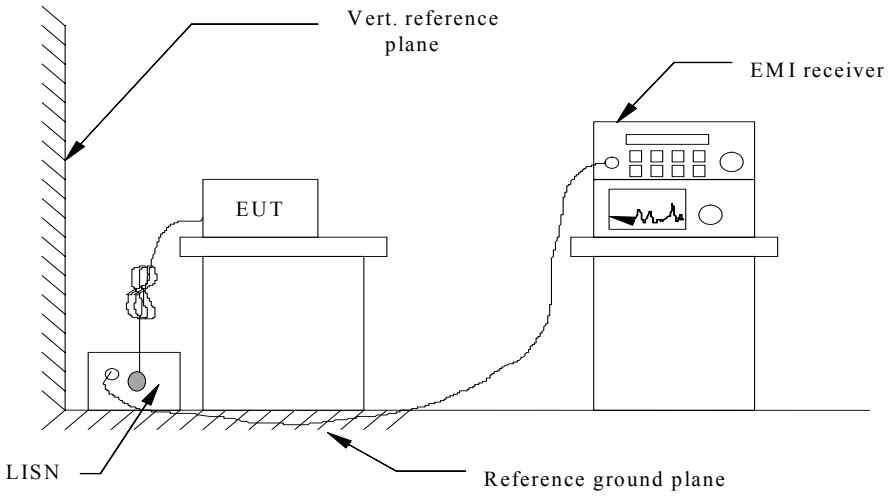
5.7. Power line conducted emissions

5.7.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

5.7.2 Block Diagram of Test Setup

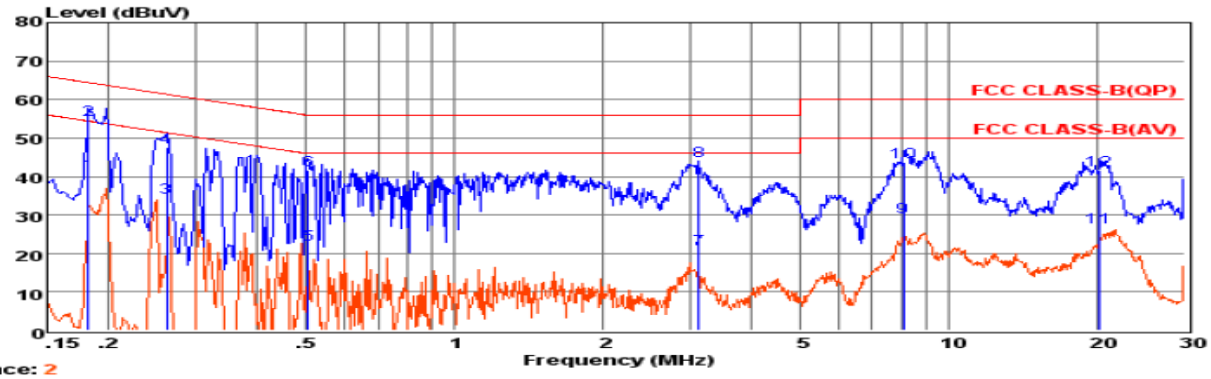


5.7.3 Test Results

PASS.

The test data please refer to following page.

Test result for 802.11n (HT20, Low Channel)

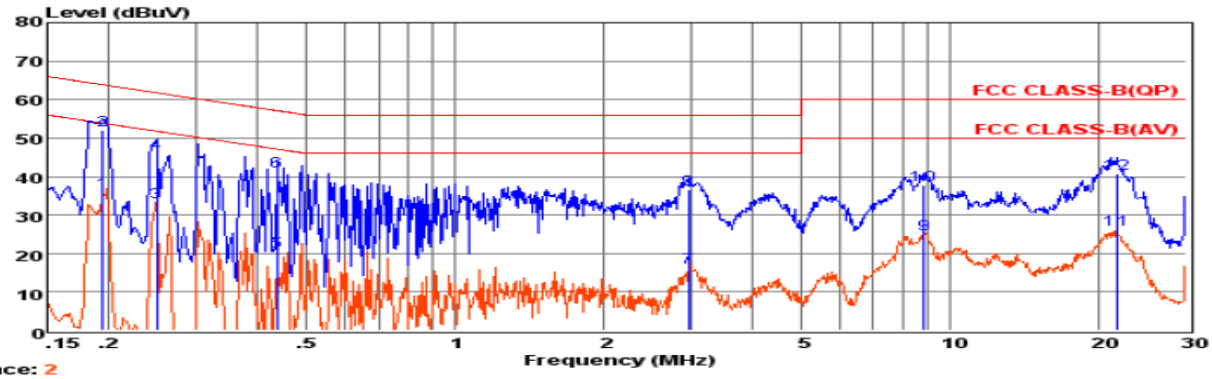


Trace: 2

Env. Ins:	24*/56%
EUT:	300Mbps 802.11n/a/b/g Wireless Dual Band USB Adapter
M/N:	RNX-N600UBE
Power Rating:	AC 120V/60Hz
Test Mode:	Tx-5180(802.11n20,5G)
Operator:	Andy
Memo:	
Pol:	LINE

	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBpW	dB	dB	dBpW	dBpW	dB	
1	0.18	31.17	9.63	0.02	40.82	54.42	-13.60	Average
2	0.18	45.15	9.63	0.02	54.80	64.42	-9.62	QP
3	0.26	24.79	9.60	0.03	34.42	51.38	-16.96	Average
4	0.26	37.94	9.60	0.03	47.57	61.38	-13.81	QP
5	0.50	12.79	9.62	0.04	22.45	46.00	-23.55	Average
6	0.50	31.94	9.62	0.04	41.60	56.00	-14.40	QP
7	3.12	11.31	9.64	0.06	21.01	46.00	-24.99	Average
8	3.12	34.27	9.64	0.06	43.97	56.00	-12.03	QP
9	8.11	19.74	9.70	0.07	29.51	50.00	-20.49	Average
10	8.11	33.83	9.70	0.07	43.60	60.00	-16.40	QP
11	20.16	16.74	9.88	0.12	26.74	50.00	-23.26	Average
12	20.16	31.59	9.88	0.12	41.59	60.00	-18.41	QP

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
2. The emission levels that are 20dB below the official limit are not reported.



Trace: 2

Env. Ins:	24*/56%
EUT:	300Mbps 802.11n/a/b/g Wireless Dual Band USB Adapter
M/N:	RNX-N600UBE
Power Rating:	AC 120V/60Hz
Test Mode:	Tx-5180(802.11n20,5G)
Operator:	Andy
Memo:	
Pol:	NEUTRAL

	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBpW	dB	dB	dBpW	dBpW	dB	
1	0.19	26.30	9.60	0.02	35.92	53.84	-17.92	Average
2	0.19	42.35	9.60	0.02	51.97	63.84	-11.87	QP
3	0.25	23.64	9.60	0.03	33.27	51.78	-18.51	Average
4	0.25	36.57	9.60	0.03	46.20	61.78	-15.58	QP
5	0.44	10.81	9.62	0.04	20.47	47.11	-26.64	Average
6	0.44	31.78	9.62	0.04	41.44	57.11	-15.67	QP
7	2.96	6.77	9.64	0.06	16.47	46.00	-29.53	Average
8	2.96	26.74	9.64	0.06	36.44	56.00	-19.56	QP
9	8.87	15.09	9.71	0.08	24.88	50.00	-25.12	Average
10	8.87	28.02	9.71	0.08	37.81	60.00	-22.19	QP
11	21.71	16.14	9.82	0.12	26.08	50.00	-23.92	Average
12	21.71	30.93	9.82	0.12	40.87	60.00	-19.13	QP

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
2. The emission levels that are 20dB below the official limit are not reported.

****Note: Pre-scan all mode and recorded the worst case results in this report (802.11n (HT20, Low Channel)).*

5.8. Antenna Requirements

5.8.1. Standard Applicable

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

5.8.2. Antenna Connector Construction

The EUT used two standard SMA connectors which permanently attached on PCB. The antenna is permanently attached by special glue. Please see EUT photo for details.

5.8.3. Results: Compliance.

6. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	June 18,2012	June 17,2013
Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	9kHz~40GHz	July 16,2012	July 15,2013
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	June 18,2012	June 17,2013
LISN (Support Unit)	EMCO	3819/2NM	9703-1839	9KHz-30MHz	June 18,2012	June 17,2013
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 18,2012	June 17,2013
ISN	SCHAFFNER	ISN ST08	21653	9KHz-30MHz	June 18,2012	June 17,2013
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-1GHz 3m	June 18,2012	June 17,2013
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHzz	June 18,2012	June 17,2013
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 16,2012	July 15,2013
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	July 16,2012	July 15,2013
Spectrum Analyzer	Agilent	E4407B	MY41440292	9k-26.5GHz	July 16,2012	July 15,2013
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	June 18,2012	June 17,2013
By-log Antenna	SCHAFFNER	CBL 6112D	22237	30MHz-1GHz	June 10,2012	June 09,2013
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 10,2012	June 09,2013
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz-40GHz	June 10,2012	June 09,2013
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18,2012	June 17,2013
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18,2012	June 17,2013
Spectrum Meter	R&S	FSP 30	100023	9kHz-30GHz	July 16,2012	July 15,2013
Power Meter	R&S	NRVS	100444	DC-40GHz	June 18,2012	June 17,2013
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	June 18,2012	June 17,2013
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	June 18,2012	June 17,2013
AC Power Source	HPC	HPA-500E	HPA-9100024	AC 0~300V	June 18,2012	June 17,2013
DC power Soure	GW	GPC-6030D	C671845	DC 1V-60V	June 18,2012	June 17,2013
Temp. and Humidigy	Giant Force	GTH-225-20-S	MAB0103-00	N/A	June 18,2012	June 17,2013
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18,2012	June 17,2013
RF CABLE-2m	JYE Bao	RG142	CB)35-2m	20MHz-1GHz	June 18,2012	June 17,2013
Vector signal Generator	R&S	SMU200A	102098	100kHz~6GHz	June 18,2012	June 17,2013
Signal Generator	R&S	SMR40	10016	10MHz~40GHz	July 16,2012	July 15,2013
Oscilloscope	Tektonix	TDS380	B016197	400MHz/2GRS	July 16,2012	July 15,2013

7. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following series model(s):

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Belong to the tested device:

Product description : 300Mbps 802.11n/a/b/g Wireless Dual Band USB Adapter

Model name : RNX-N600UBE

Remark: No additional models were tested.

----------THE END OF REPORT----------