

Test Report

FCC Part15 Subpart E

Product Name : AC450 Wireless Nano USB Adapter
Model No. : Archer T1U
FCC ID : TE7T1U

Applicant : TP-LINK TECHNOLOGIES CO., LTD.
Address : Building 24 (floors 1,3,4,5) and 28 (floors1-4)
Central Science and Technology Park, Shennan Rd,
Nanshan, Shenzhen, China

Date of Receipt : Jul. 28, 2015
Test Date : Jul. 28, 2015~ Dec. 15, 2015
Issued Date : Jul. 13, 2016
Report No. : 1580053R-RF-US-P09V01
Report Version : V1.3

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF any agency of the government.

The test report shall not be reproduced without the written approval of Quietek Corporation.

Test Report Certification

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Applicant : TP-LINK TECHNOLOGIES CO., LTD.
Address : Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
Manufacturer : TP-LINK TECHNOLOGIES CO., LTD.
Address : Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
Model No. : Archer T1U
FCC ID : TE7T1U
EUT Voltage : DC 5V
Brand Name : TP-LINK
Applicable Standard : FCC CFR Title 47 Part 15 Subpart E: 2015
ANSI C63.4:2014;
ANSI C63.10:2013;
789033 D02 General UNII Test Procedures New Rules v01
Test Result : Complied
Performed Location : Quietek Corporation - Suzhou EMC Laboratory
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TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392

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Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC, TAF
USA	:	FCC
Japan	:	VCCI
China	:	CNAS

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site :<http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :
<http://www.quietek.com/>

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
1580053R-RF-US-P09V01	V1.0	Initial Issued Report	Dec.30, 2015
1580053R-RF-US-P09V01	V1.1	Modify power setting and power output	Mar.18, 2016
1580053R-RF-CE-P03V01	V1.2	Modify power setting and power of 802.11n(40MHz) CH 38, 62	Apr. 29, 2016
1580053R-RF-CE-P03V01	V1.3	Modify power setting and power	Jul. 13, 2016

1. General Information

1.1. EUT Description

Product Name	AC450 Wireless Nano USB Adapter
EUT Category	Mobile Product
Brand Name	TP-LINK
Model No.	Archer T1U
EUT Voltage	AC 120V/60Hz
Frequency Range	For 5GHz Band 802.11a/n/ac(20MHz): 5180~5320MHz, 5500~5580MHz, 5660~5700MHz, 5745~5825MHz 802.11n/ac(40MHz): 5190~5310MHz, 5510~5550MHz, 5670MHz, 5755~5795MHz 802.11ac(80MHz):5210MHz,5290MHz,5530MHz,5775MHz
Channel Number	For 5GHz Band 802.11a/n/ac(20MHz): 21 802.11n/ac(40MHz): 9 802.11ac(80MHz): 4
Type of Modulation	802.11a/n/ac: OFDM
Data Rate	802.11a: 6/9/12/18/24/36/48/54 Mbps 802.11n: up to 150 Mbps 802.11ac: up to 433.3 Mbps
Channel Control	Auto
Antenna Delivery	1*Tx + 1*Rx
Antenna Type	Reference to Antenna List
Peak Antenna Gain	Reference to Antenna List

For 5.0GHz Band

802.11a/n(20MHz) Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz	48	5240 MHz
52	5260MHz	56	5280 MHz	60	5300 MHz	64	5320 MHz
100	5500MHz	104	5520 MHz	108	5540 MHz	112	5550 MHz
116	5580MHz	132	5660 MHz	136	5680 MHz	140	5700 MHz
149	5745 MHz	153	5765 MHz	157	5785 MHz	161	5805 MHz
165	5825MHz	N/A	N/A	N/A	N/A	N/A	N/A

802.11n(40MHz) Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz	62	5310 MHz
102	5510 MHz	110	5550 MHz	134	5670 MHz	151	5755 MHz
159	5795 MHz	N/A	N/A	N/A	N/A	N/A	N/A

802.11n(80MHz) Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	106	5530MHz	155	5775 MHz

Antenna List

Antenna	Type	Model No.	Peak Gain
Internal Antenna	N/A	N/A	5GHz Band: 2 dBi

Power Parameter Value of the test software

Test Mode	Test Channel	Power Setting
802.11a	5180	1B
	5200	1A
	5240	1B
	5260	19
	5300	19
	5320	19
	5500	2A
	5580	1E
	5660	23
	5700	3F
	5745	1F
	5785	3F
	5825	1E
802.11n(20MHz)	5180	15
	5200	20
	5240	1D
	5260	1D
	5300	1D
	5320	1B
	5500	2C
	5580	3F
	5660	3F
	5700	3F
	5745	1F
	5785	3F
	5825	20

802.11ac(20MHz)	5180	12
	5200	1E
	5240	1E
	5260	18
	5300	1C
	5320	1C
	5500	22
	5580	1A
	5660	22
	5700	15
	5745	24
	5785	3F
	5825	3F
	802.11n(40MHz)	5190
5230		1E
5270		1D
5310		1D
5510		22
5550		24
5670		1E
5755		1B
5795		23
802.11ac(40MHz)	5190	11
	5230	1D
	5270	1B
	5310	1B
	5510	22
	5550	23
	5670	23
	5755	1C
	5795	24
802.11ac(80MHz)	5210	11
	5290	1C
	5530	22
	5775	29

The test mode of the test software can support.

Test Mode	Ant 0
802.11a	√
802.11n(20MHz)	√
802.11n(40MHz)	√
802.11ac(20MHz)	√
802.11ac(40MHz)	√
802.11ac(80MHz)	√

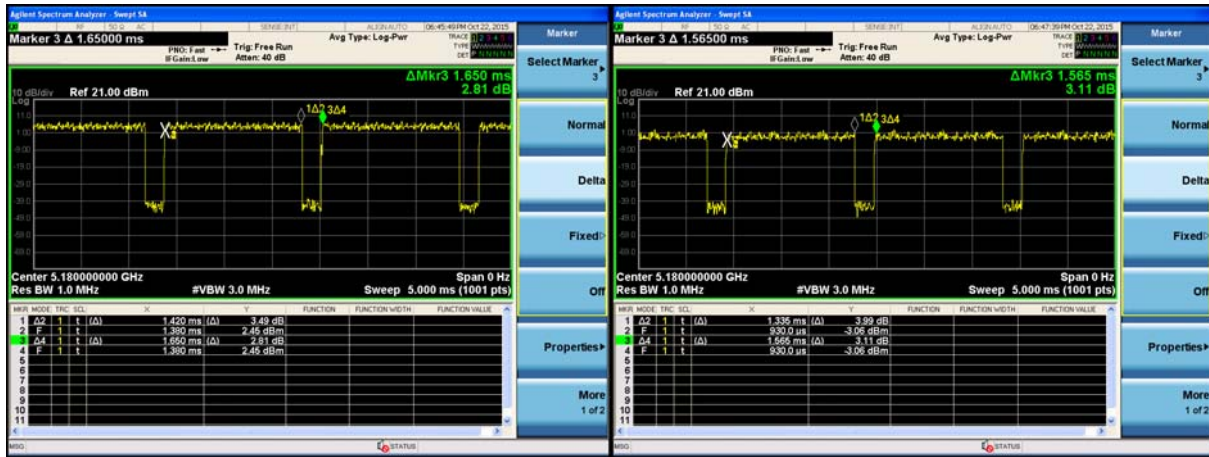
Duty Cycle

5GHz Band

Test Mode	Tx On (ms)	Tx Off (ms)	VBW (Hz)	Tx On + Tx Off (ms)	Duty Cycle
802.11a	1.42	0.23	750	1.65	86.06%
802.11n(20MHz)	1.335	0.23	750	1.565	85.30%
802.11ac(20MHz)	1.335	0.24	750	1.575	84.76%
802.11n(40MHz)	0.636	0.24	1600	0.876	72.60%
802.11ac(40MHz)	0.657	0.222	1600	0.879	74.74%
802.11ac(80MHz)	0.3	0.236	3600	0.536	55.97%

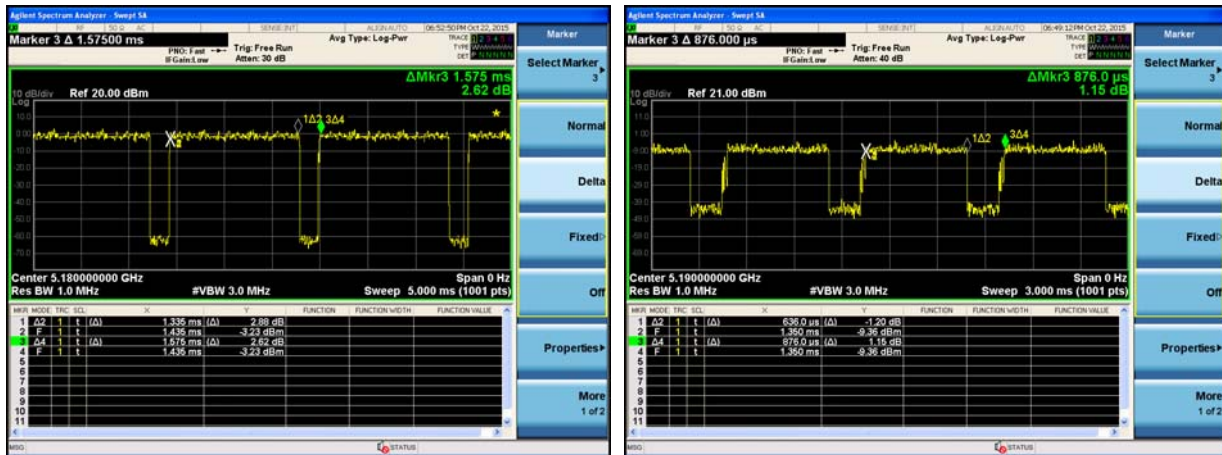
802.11a

802.11n(20MHz)

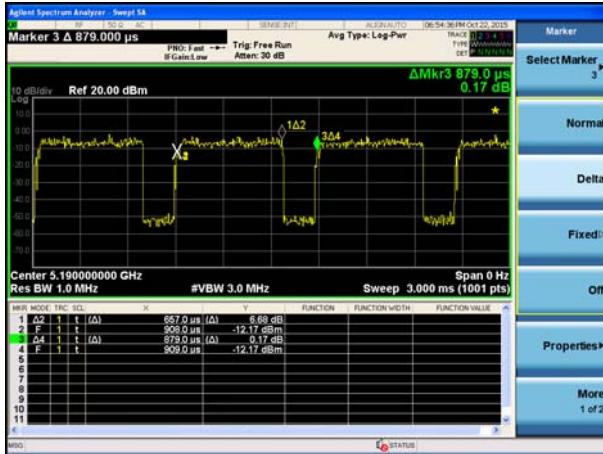


802.11ac(20MHz)

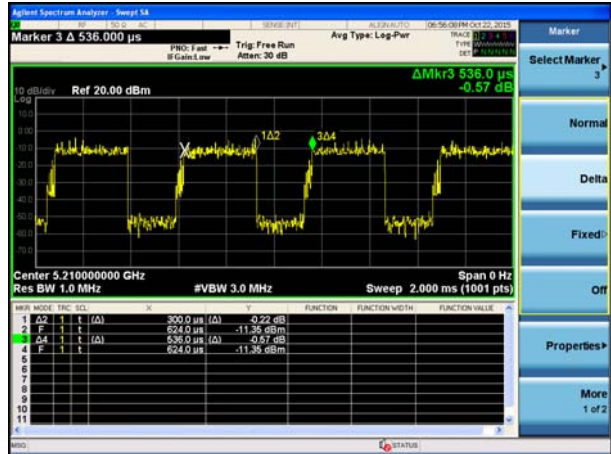
802.11n(40MHz)



802.11ac(40MHz)



802.11ac(80MHz)



1.2. Mode of Operation

Quietek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmit by 802.11a
Mode 2: Transmit by 802.11n(20MHz)
Mode 3: Transmit by 802.11n(40MHz)
Mode 4: Transmit by 802.11ac(20MHz)
Mode 5: Transmit by 802.11ac(40MHz)
Mode 6: Transmit by 802.11ac(80MHz)

Note:

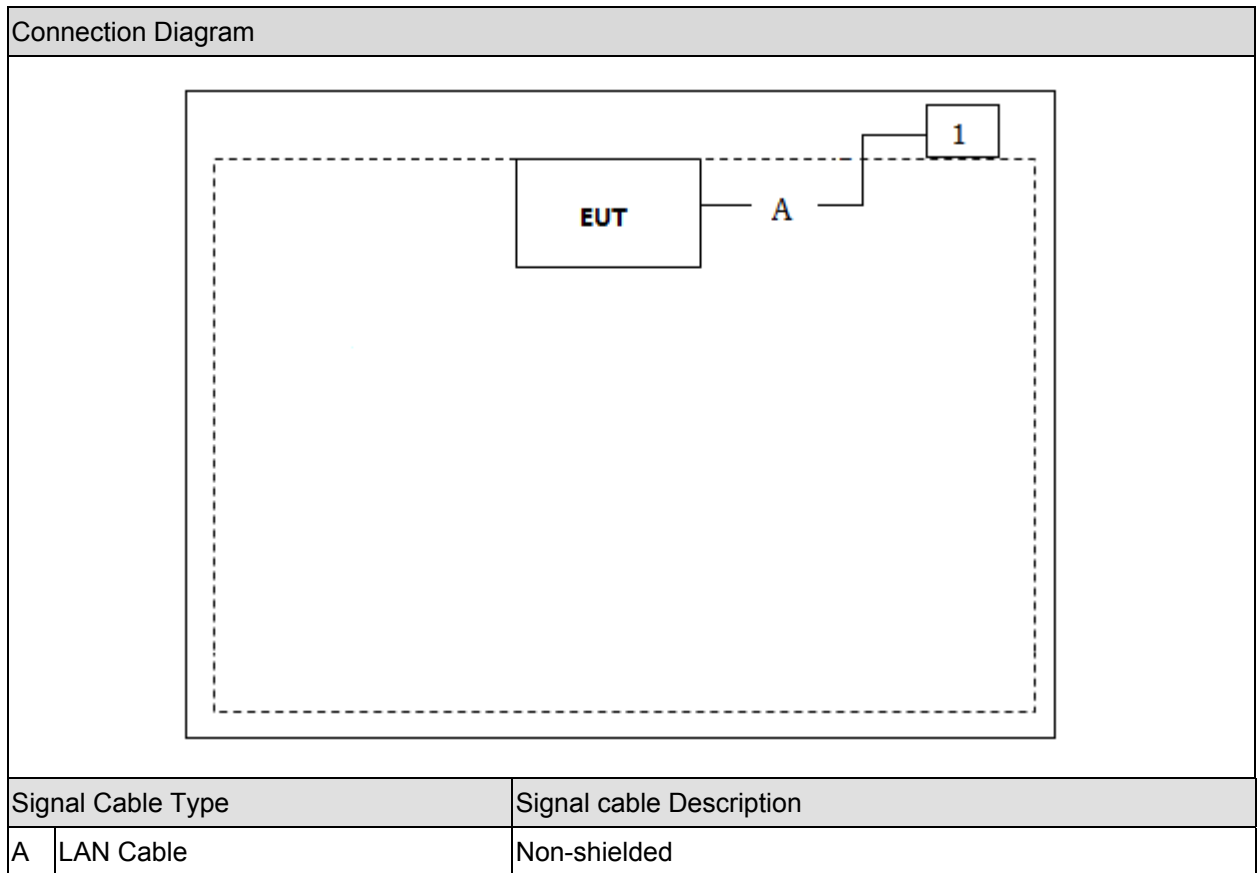
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. The radiation measure measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	Asus	N80V	8BN0AS226971468	None-shielded

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Input RF commands, and set the test mode and channel, then press OK to start to continue transmit or receive.

2. Technical Test

2.1. Summary of Test Result

- No deviations from the test standards
 Deviations from the test standards as below description:

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.207	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.209	Yes	No
26dB Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.407(a)	Yes	No
6dB Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart E:2015 Section 15.407(e)	Yes	No
Power Output	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.407(a)	Yes	No
Peak Power Spectral Density	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.407(a)	Yes	No
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.205, 15.407(b)	Yes	No
Frequency Stability	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.407(g)	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

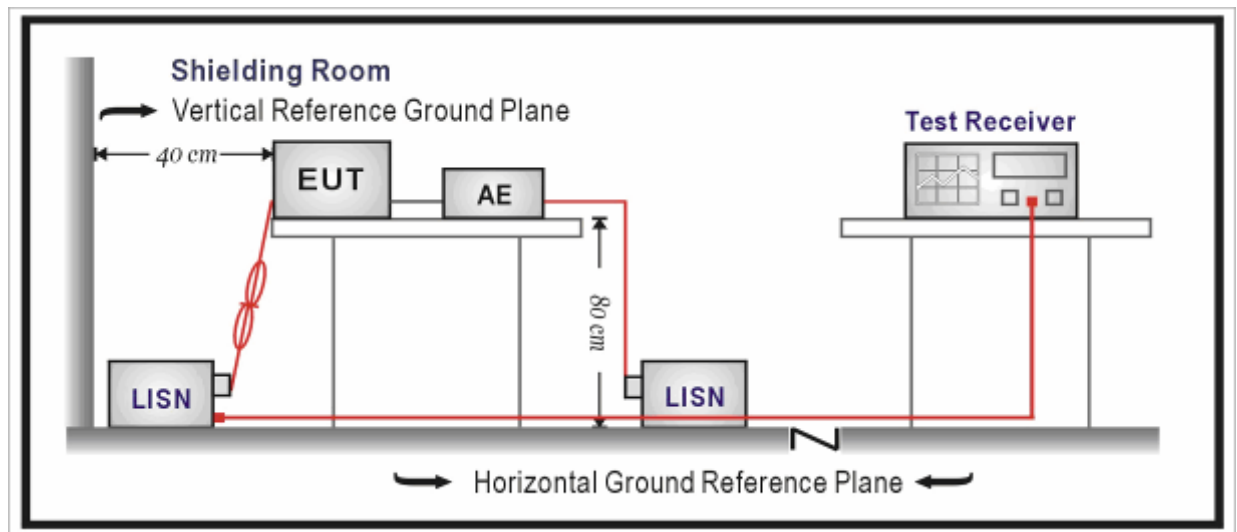
3.1. Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2016.03.28
Two-Line V-Network	R&S	ENV216	100043	2016.03.28
Two-Line V-Network	R&S	ENV216	100044	2016.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2016.03.01
50ohm Termination	SHX	TF2	07081401	2016.09.16
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2017.01.04

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

For FCC

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

according to ANSI C63.4:2014& ANSI C63.10:2013&789033 D02 General UNII Test Procedures New Rules v01& FCC CFR Title 47 Part 15 Subpart E: 2015

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

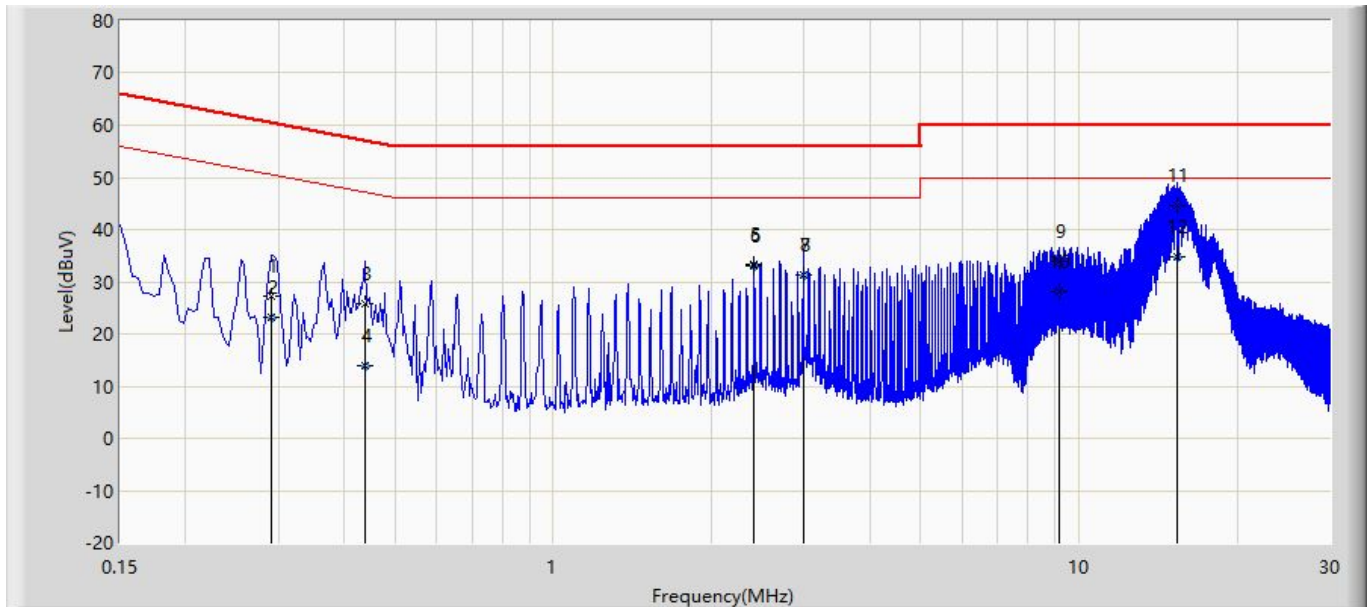
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

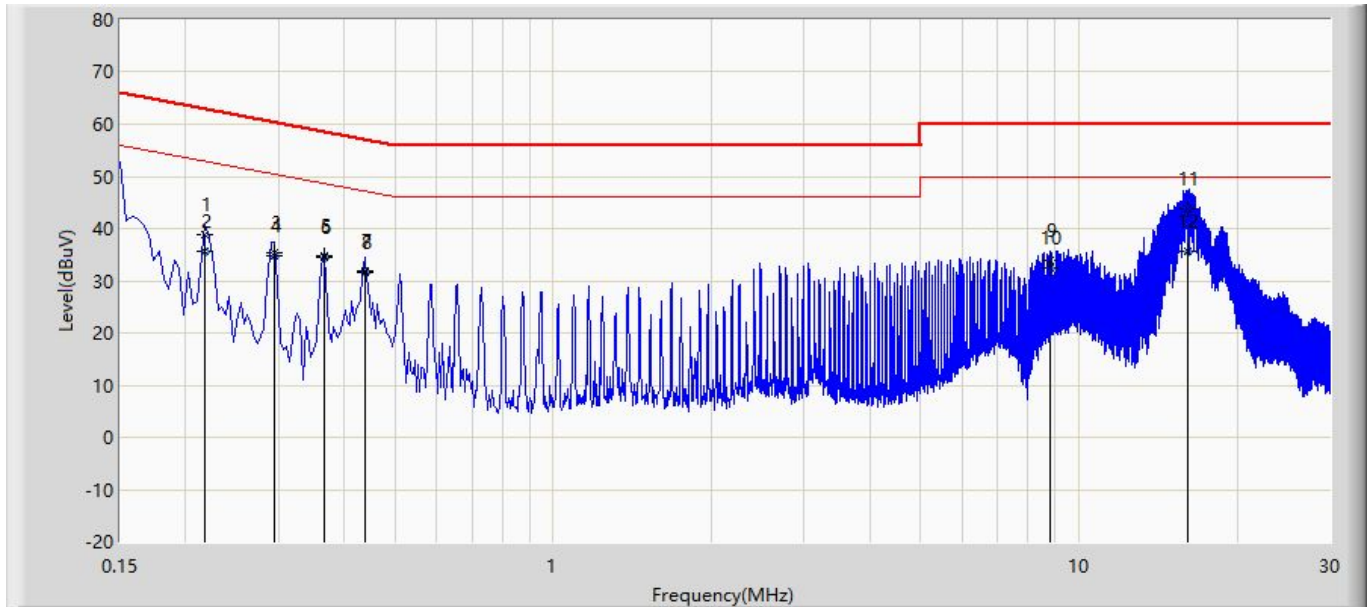
3.6. Test Result

Engineer: Scott	
Site: TR5	Time: 2015/10/16 - 14:02
Limit: FCC_Part15.207_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Line
EUT: AC450 Wireless Nano USB Adapter	Power: AC 120V/60Hz
Note: Mode 1: Transmit by 802.11a	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.290	27.191	17.347	-33.334	60.524	9.844	QP
2		0.290	23.268	13.424	-27.256	50.524	9.844	AV
3		0.438	25.859	15.984	-31.241	57.100	9.875	QP
4		0.438	13.793	3.918	-33.307	47.100	9.875	AV
5		2.406	33.213	23.425	-22.787	56.000	9.788	QP
6	*	2.406	33.188	23.400	-12.812	46.000	9.788	AV
7		2.990	31.210	21.411	-24.790	56.000	9.799	QP
8		2.990	31.328	21.529	-14.672	46.000	9.799	AV
9		9.190	33.786	23.859	-26.214	60.000	9.927	QP
10		9.190	27.973	18.046	-22.027	50.000	9.927	AV
11		15.386	44.683	34.623	-15.317	60.000	10.060	QP
12		15.386	34.748	24.688	-15.252	50.000	10.060	AV

Engineer: Scott	
Site: TR5	Time: 2015/10/16 - 14:05
Limit: FCC_Part15.207_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Neutral
EUT: AC450 Wireless Nano USB Adapter	Power: AC 120V/60Hz
Note: Mode 1: Transmit by 802.11 a	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.158	45.981	35.691	-19.587	65.568	10.290	QP
2		0.158	33.357	23.067	-22.212	55.568	10.290	AV
3		0.194	41.736	31.715	-22.128	63.864	10.021	QP
4		0.194	31.602	21.580	-22.262	53.864	10.022	AV
5		0.350	43.191	33.116	-15.772	58.962	10.075	QP
6	*	0.350	35.841	25.766	-13.121	48.962	10.075	AV
7		4.442	28.106	18.112	-27.894	56.000	9.994	QP
8		4.442	20.762	10.767	-25.238	46.000	9.995	AV
9		8.102	24.294	14.102	-35.706	60.000	10.192	QP
10		8.102	17.230	7.038	-32.770	50.000	10.192	AV
11		16.166	35.991	25.870	-24.009	60.000	10.121	QP
12		16.166	32.798	22.678	-17.202	50.000	10.120	AV

Note: All the test modes are pretested and mode 1 802.11a mode was found to be the worst mode, so the data of this test mode was recorded.

4. Radiated Emission

4.1. Test Equipment

Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2016.03.28
Loop Antenna	R&S	HFH2-Z2	833799/003	2016.11.17
Bilog Chainenna	Teseq GmbH	CBL6112D	27611	2016.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2016.03.01
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2017.01.04

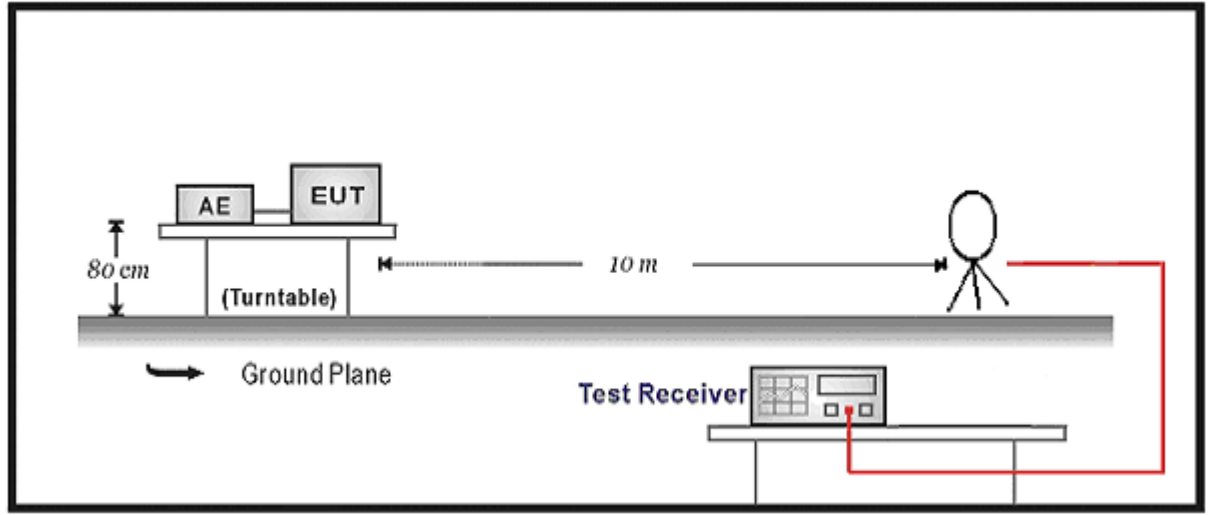
Radiated Emission / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2016.03.28
Spectrum Analyzer	Agilent	E4446A	MY45300103	2017.01.04
Preamplifier	Miteq	NSP1800-25	1364185	2016.05.05
Preamplifier	QuieTek	AP-040G	CHM-0906001	2016.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2016.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2016.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2017.01.04

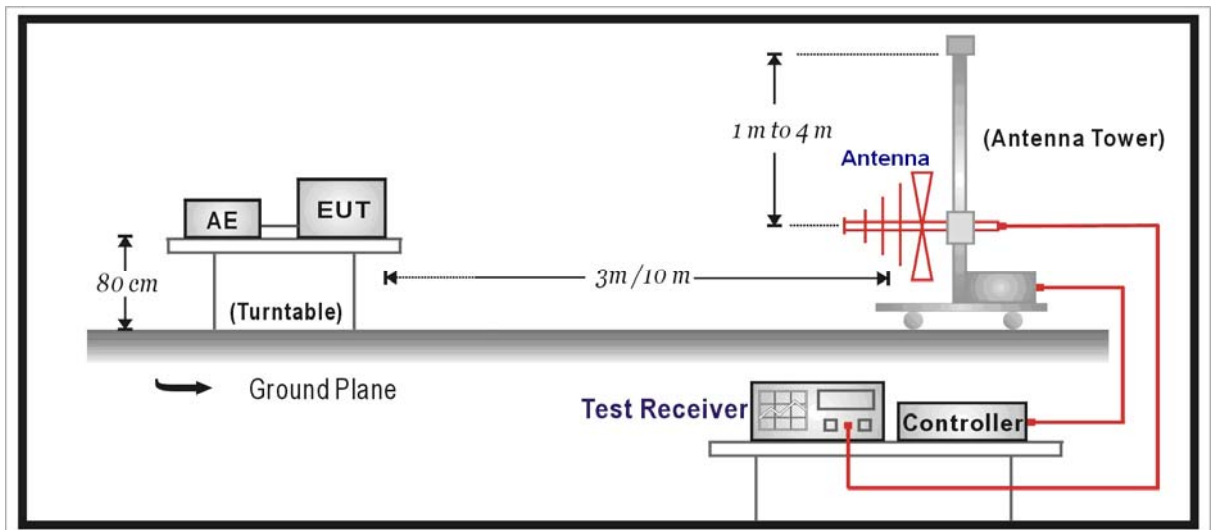
Note : All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

4.2. Test Setup

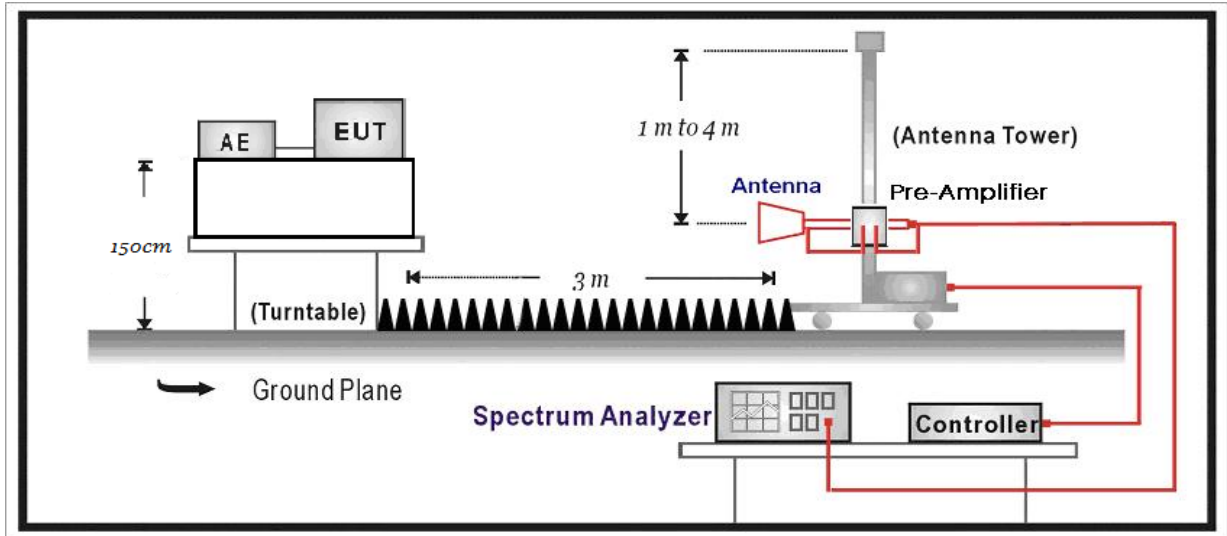
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument Antenna and the closed point of any part of the device or system.

Note 3: E field strength (dBuV/m) = $20 \log E$ field strength (uV/m)

4.4. Test Procedure

According to ANSI C63.4:2014& ANSI C63.10:2013&789033 D02 General UNII Test Procedures New Rules v01& FCC CFR Title 47 Part 15 Subpart E: 2015

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from Chainenna to the EUT was 3 meters.

The Chainenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the Chainenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2014 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

The procedure for peak unwanted emissions measurements above 1000 MHz is as follows:

Peak emission levels are measured by setting the instrument as follows:

- 1) RBW = 1 MHz.
- 2) VBW \geq [3 \times RBW].
- 3) Detector = peak
- 4) Sweep time = auto.
- 5) Trace mode = max hold.
- 6) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, then the time required for the trace to stabilize will increase by a factor of approximately 1 / D, where D is the duty cycle. For example, at 50% duty cycle, the measurement time will increase by a factor of two, relative to measurement time for continuous transmission.

Average emission levels are measured by setting the instrument as follows:

- a) RBW = 1 MHz.
- b) Video bandwidth:
 - 1) If the EUT is configured to transmit with $D \geq 98\%$, then set $VBW \leq RBW / 100$ (i.e., 10 kHz), but not less than 10 Hz.
 - 2) If the EUT D is $< 98\%$, then set $VBW \geq 1 / T$, where T is defined in item a1) of 12.2.
- c) Video bandwidth mode or display mode:
 - 1) The instrument shall be set with video filtering applied in the power domain. Typically, this requires setting the detector mode to RMS (power averaging) and setting the average-VBW type to power (rms).
 - 2) As an alternative, the instrument may be set to linear detector mode. Video filtering shall be applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode to accomplish this. Others have a setting for average-VBW type, which can be set to "voltage" regardless of the display mode.
- d) Detector = peak.
- e) Sweep time = auto.
- f) Trace mode = max hold.
- g) Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at

least 98% duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where D is the duty cycle. For example, use at least 200 traces if the duty cycle is 25%. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 50 traces should be averaged.)

Note: When doing emission measurement above 1GHz, the horn Chainenna will be bended down a little (as horn antenna has the narrow beamwidth) in order to keeping the Chainenna in the “cone of radiation” of EUT. The 3dB beamwidth is 60~10 degrees for H-plane and 90~10 degrees for E-plane.

4.5. Uncertainty

The measurement uncertainty above 1GHz is defined as ± 3.9 dB
below 1GHz is defined as ± 3.8 dB

4.6. Test Result

Mode1: Transmit by 802.11a

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
36	H	10360.0	52.2	-2.7	49.5	54(Note3)	-4.5	PK
	V	10360.0	48.4	-2.7	45.7	54(Note3)	-8.3	PK
	H	15540.0	39.8	3.1	42.9	54(Note3)	-11.1	PK
	V	15540.0	40.1	3.2	43.3	54(Note3)	-10.7	PK
40	H	10392.5	57.4	-2.1	55.4	74	-18.6	PK
	H	10400.7	44.9	-2.0	42.9	54	-11.1	AV
	V	10401.0	56.6	-2.0	54.5	74	-19.5	PK
	V	10400.5	43.5	-2.0	41.5	54	-12.5	AV
	H	15600.0	36.3	7.9	44.2	54(Note3)	-9.8	PK
	V	15600.0	34.2	7.9	42.1	54(Note3)	-11.9	PK
48	H	10480.0	54.6	-2.9	51.7	54(Note3)	-2.3	PK
	V	10480.0	51.2	-2.9	48.3	54(Note3)	-5.7	PK
	H	15720.0	39.3	7.4	46.7	54(Note3)	-7.3	PK
	V	15720.0	38.0	7.4	45.3	54(Note3)	-8.7	PK
52	H	10520.0	55.9	-1.8	54.1	74	-19.9	PK
	H	10519.9	43.2	-1.8	41.4	54	-12.6	AV
	V	10520.0	53.0	-1.8	51.2	54(Note3)	-2.8	PK
	H	15780.0	42.9	8.2	51.1	54(Note3)	-2.9	PK
	V	15780.0	40.3	8.2	48.5	54(Note3)	-5.5	PK
60	H	10600.0	50.7	-2.0	48.7	54(Note3)	-5.3	PK
	V	10600.0	50.4	-2.0	48.4	54(Note3)	-5.6	PK
	H	15900.0	43.2	6.9	50.1	54(Note3)	-3.9	PK
	V	15900.0	40.9	6.9	47.8	54(Note3)	-6.2	PK
64	H	10640.0	50.4	-2.0	48.4	54(Note3)	-5.6	PK
	V	10640.0	48.6	-2.0	46.6	54(Note3)	-7.4	PK
	H	15960.0	43.2	8.9	52.1	54(Note3)	-1.9	PK
	V	15960.0	41.0	8.9	49.9	54(Note3)	-4.1	PK

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
100	H	11000.0	52.3	-1.0	51.3	54(Note3)	-2.7	PK
	V	11000.0	50.2	-1.0	49.2	54(Note3)	-4.8	PK
	H	16500.0	41.1	7.6	48.8	54(Note3)	-5.2	PK
	V	16500.0	40.5	7.6	48.1	54(Note3)	-5.9	PK
116	H	11160.0	53.5	-0.6	52.9	54(Note3)	-1.1	PK
	V	11160.0	52.1	-0.6	51.5	54(Note3)	-2.5	PK
	H	16740.0	43.1	7.4	50.5	54(Note3)	-3.5	PK
	V	16740.0	40.5	7.4	47.9	54(Note3)	-6.1	PK
140	H	11400.0	53.3	-0.2	53.1	54(Note3)	-0.9	PK
	V	11400.0	51.1	-0.2	50.9	54(Note3)	-3.1	PK
	H	17100.0	44.5	5.7	50.2	54(Note3)	-3.8	PK
	V	17100.0	42.3	5.7	48.0	54(Note3)	-6.0	PK
149	H	11490.0	46.5	1.3	47.8	54(Note3)	-6.2	PK
	V	11490.0	44.4	1.3	45.8	54(Note3)	-8.2	PK
	H	17235.0	37.1	7.4	44.5	54(Note3)	-9.5	PK
	V	17235.0	36.6	7.4	44.0	54(Note3)	-10.0	PK
157	H	11570.0	54.1	1.6	55.7	74	1.7	PK
	H	11569.1	42.6	1.6	44.2	54	-9.8	AV
	V	11570.0	52.2	1.6	53.8	54(Note3)	-0.2	PK
	H	17355.0	41.2	6.1	47.2	54(Note3)	-6.8	PK
	V	17355.0	40.8	6.1	46.9	54(Note3)	-7.1	PK
165	H	11650.0	47.5	2.5	50.0	54(Note3)	-4.0	PK
	V	11650.0	43.4	2.5	45.9	54(Note3)	-8.1	PK
	H	17475.0	35.8	6.1	41.9	54(Note3)	-12.1	PK
	V	17475.0	35.1	6.1	41.2	54(Note3)	-12.8	PK

Note: 1. Measure Level = Reading Level + Factor.

2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Mode2: Transmit by 802.11n(20MHz)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
36	H	10360.0	44.0	-2.7	41.3	54(Note3)	-12.7	PK
	V	10360.0	44.5	-2.7	41.8	54(Note3)	-12.2	PK
	H	15540.0	39.6	3.2	42.8	54(Note3)	-11.2	PK
	V	15540.0	39.7	3.2	42.8	54(Note3)	-11.2	PK
40	H	10400.0	55.9	-2.0	53.9	54(Note3)	-0.1	PK
	V	10400.0	54.1	-2.0	52.1	54(Note3)	-1.9	PK
	H	15600.0	37.0	7.9	44.9	54(Note3)	-9.1	PK
	V	15600.0	34.1	7.9	42.0	54(Note3)	-12.0	PK
48	H	10480.0	55.5	-2.9	52.6	54(Note3)	-1.4	PK
	V	10480.0	51.1	-2.9	48.2	54(Note3)	-5.8	PK
	H	15720.0	38.8	7.4	46.2	54(Note3)	-7.8	PK
	V	15720.0	36.4	7.4	43.8	54(Note3)	-10.2	PK
52	H	10520.0	52.6	-1.8	50.8	54(Note3)	-3.2	PK
	V	10520.0	51.1	-1.8	49.3	54(Note3)	-4.7	PK
	H	15780.0	42.0	8.2	50.2	54(Note3)	-3.8	PK
	V	15780.0	39.3	8.2	47.5	54(Note3)	-6.5	PK
60	H	10600.0	46.5	-2.0	44.5	54(Note3)	-9.5	PK
	V	10600.0	44.3	-2.0	42.3	54(Note3)	-11.7	PK
	H	15900.0	39.9	6.9	46.8	54(Note3)	-7.2	PK
	V	15900.0	37.3	6.9	44.2	54(Note3)	-9.8	PK
64	H	10640.0	46.4	-2.0	44.4	54(Note3)	-9.6	PK
	V	10640.0	45.5	-2.0	43.5	54(Note3)	-10.5	PK
	H	15960.0	34.9	8.9	43.9	54(Note3)	-10.1	PK
	V	15960.0	34.1	8.9	43.1	54(Note3)	-10.9	PK
100	H	11000.0	51.1	-1.0	50.1	54(Note3)	-3.9	PK
	V	11000.0	50.5	-1.0	49.5	54(Note3)	-4.5	PK
	H	16500.0	40.2	7.6	47.8	54(Note3)	-6.2	PK
	V	16500.0	39.7	7.6	47.3	54(Note3)	-6.7	PK

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
116	H	11160.0	53.0	-0.6	52.4	54(Note3)	-1.6	PK
	V	11160.0	51.3	-0.6	50.7	54(Note3)	-3.3	PK
	H	16740.0	43.5	7.4	50.9	54(Note3)	-3.1	PK
	V	16740.0	39.7	7.4	47.1	54(Note3)	-6.9	PK
140	H	11400.0	52.8	-0.2	52.6	54(Note3)	-1.4	PK
	V	11400.0	50.9	-0.2	50.7	54(Note3)	-3.3	PK
	H	17100.0	44.2	5.7	49.9	54(Note3)	-4.1	PK
	V	17100.0	40.9	5.7	46.6	54(Note3)	-7.4	PK
149	H	11490.0	45.7	1.3	47.0	54(Note3)	-7.0	PK
	V	11490.0	44.0	1.3	45.4	54(Note3)	-8.6	PK
	H	17235.0	37.3	7.4	44.7	54(Note3)	-9.3	PK
	V	17235.0	37.4	7.4	44.8	54(Note3)	-9.2	PK
157	H	11570.0	53.3	1.6	54.9	74	-19.1	PK
	H	11569.1	40.6	1.6	42.2	54	-11.8	AV
	V	11570.0	50.3	1.6	51.9	54(Note3)	-2.1	PK
	H	17355.0	40.8	6.1	46.9	54(Note3)	-7.1	PK
	V	17355.0	40.9	6.1	46.9	54(Note3)	-7.1	PK
165	H	11650.0	47.4	2.5	49.9	54(Note3)	-4.1	PK
	V	11650.0	44.6	2.5	47.1	54(Note3)	-6.9	PK
	H	17475.0	35.5	6.1	41.6	54(Note3)	-12.4	PK
	V	17475.0	35.8	6.1	41.9	54(Note3)	-12.1	PK

Note: 1. Measure Level = Reading Level + Factor.

2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Mode3: Transmit by 802.11n(40MHz)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
38	H	10380.0	44.4	-2.2	42.2	54(Note3)	-11.8	PK
	V	10380.0	44.1	-2.2	41.9	54(Note3)	-12.1	PK
	H	15570.0	38.9	3.5	42.4	54(Note3)	-11.6	PK
	V	15570.0	40.1	3.2	43.3	54(Note3)	-10.7	PK
46	H	10460.0	50.5	-3.1	47.4	54(Note3)	-6.6	PK
	V	10460.0	46.5	-3.1	43.5	54(Note3)	-10.5	PK
	H	15690.0	36.9	4.4	41.3	54(Note3)	-12.7	PK
	V	15690.0	34.8	4.4	39.2	54(Note3)	-14.8	PK
54	H	10540.0	53.5	-1.9	51.5	54(Note3)	-2.5	PK
	V	10540.0	51.5	-1.9	49.5	54(Note3)	-4.5	PK
	H	15810.0	46.7	8.1	54.8	74	-19.2	PK
	H	15822.0	35.1	9.9	45.0	54	-9.0	AV
	V	15810.0	44.0	8.1	52.1	54(Note3)	-1.9	PK
62	H	10260.0	41.1	-3.1	38.0	54(Note3)	-16.0	PK
	V	10260.0	40.2	-3.1	37.1	54(Note3)	-16.9	PK
	H	15930.0	31.9	8.0	39.9	54(Note3)	-14.1	PK
	V	15930.0	30.6	8.0	38.5	54(Note3)	-15.5	PK
102	H	11021.5	46.5	-1.7	44.8	54(Note3)	-9.2	PK
	V	11020.0	48.7	-1.7	47.0	54(Note3)	-7.0	PK
	H	16530.0	27.9	6.5	34.4	54(Note3)	-19.6	PK
	V	16580.5	36.8	5.6	42.5	54(Note3)	-11.5	PK
110	H	11098.0	49.4	0.2	49.6	54(Note3)	-4.4	PK
	V	11098.0	49.5	0.2	49.6	54(Note3)	-4.4	PK
	H	16590.0	36.2	6.1	42.3	54(Note3)	-11.7	PK
	V	16590.0	37.0	6.1	43.1	54(Note3)	-10.9	PK
134	H	11336.0	47.9	1.0	48.8	54(Note3)	-5.2	PK
	V	11344.5	49.1	0.8	49.9	54(Note3)	-4.1	PK
	H	17010.0	36.2	8.2	44.4	54(Note3)	-9.6	PK
	V	17010.0	35.9	8.2	44.1	54(Note3)	-9.9	PK

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
151	H	11510.0	39.7	1.8	41.6	54(Note3)	-12.4	PK
	V	11510.0	40.0	1.8	41.9	54(Note3)	-12.2	PK
	H	17265.0	36.8	5.9	42.6	54(Note3)	-11.4	PK
	V	17265.0	36.2	5.9	42.1	54(Note3)	-11.9	PK
159	H	11591.0	46.1	1.1	47.2	54(Note3)	-6.8	PK
	V	11591.0	49.1	1.1	50.2	54(Note3)	-3.8	PK
	H	17385.0	34.7	7.4	42.1	54(Note3)	-11.9	PK
	V	17385.0	34.0	7.4	41.4	54(Note3)	-12.6	PK

Note: 1. Measure Level = Reading Level + Factor.

2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.

3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Mode4: Transmit by 802.11ac(20MHz)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
36	H	10360.0	40.2	-2.7	37.4	54(Note3)	-16.6	PK
	V	10360.0	41.4	-2.7	38.7	54(Note3)	-15.3	PK
	H	15824.0	37.2	10.2	47.4	54(Note3)	-6.6	PK
	V	15824.0	35.4	10.2	45.6	54(Note3)	-8.4	PK
40	H	10400.0	41.1	-2.0	39.1	54(Note3)	-14.9	PK
	V	10400.0	43.0	-2.0	40.9	54(Note3)	-13.1	PK
	H	15824.0	35.7	10.2	45.9	54(Note3)	-8.1	PK
	V	15824.0	35.5	10.2	45.7	54(Note3)	-8.3	PK
48	H	10486.0	46.1	-2.8	43.3	54(Note3)	-10.7	PK
	V	10480.0	47.2	-2.9	44.3	54(Note3)	-9.7	PK
	H	15720.0	30.9	7.4	38.3	54(Note3)	-15.7	PK
	V	15720.0	34.6	7.4	41.9	54(Note3)	-12.1	PK
52	H	10520.0	46.2	-1.8	44.3	54(Note3)	-9.7	PK
	V	10511.5	49.0	-2.1	46.9	54(Note3)	-7.1	PK
	H	15780.0	32.9	8.2	41.1	54(Note3)	-12.9	PK
	V	15780.0	36.3	8.2	44.4	54(Note3)	-9.6	PK
60	H	10596.5	49.6	-2.1	47.5	54(Note3)	-6.5	PK
	V	10605.0	48.8	-1.8	47.0	54(Note3)	-7.0	PK
	H	15900.0	34.7	6.9	41.6	54(Note3)	-12.4	PK
	V	15900.0	35.2	6.9	42.1	54(Note3)	-11.9	PK
64	H	10639.0	46.7	-2.0	44.7	54(Note3)	-9.3	PK
	V	10647.5	49.2	-2.1	47.1	54(Note3)	-6.9	PK
	H	15960.0	34.7	8.9	43.6	54(Note3)	-10.4	PK
	V	15960.0	35.4	8.9	44.3	54(Note3)	-9.7	PK
100	H	10996.0	52.0	-0.8	51.2	54(Note3)	-2.8	PK
	V	11004.5	52.3	-1.3	51.0	54(Note3)	-3.0	PK
	H	16500.0	37.5	7.6	45.1	54(Note3)	-8.9	PK
	V	16500.0	36.1	7.6	43.8	54(Note3)	-10.2	PK

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
116	H	11157.5	51.4	-0.8	50.6	54(Note3)	-3.4	PK
	V	11166.0	54.7	-0.8	53.9	54(Note3)	-0.1	PK
	H	16740.0	38.7	5.1	43.8	54(Note3)	-10.2	PK
	V	16740.0	37.1	5.1	42.3	54(Note3)	-11.7	PK
132	H	11319.0	49.4	1.4	50.8	54(Note3)	-3.2	PK
	V	11310.5	51.3	1.4	52.8	54(Note3)	-1.2	PK
	H	16980.0	37.8	6.7	44.5	54(Note3)	-9.5	PK
	V	16980.0	37.2	6.7	43.9	54(Note3)	-10.1	PK
140	H	11395.5	48.2	-0.2	47.9	54(Note3)	-6.1	PK
	V	11404.0	51.8	-0.1	51.7	54(Note3)	-2.3	PK
	H	17100.0	40.4	5.7	46.0	54(Note3)	-8.0	PK
	V	17100.0	37.4	5.7	43.0	54(Note3)	-11.0	PK
149	H	11489.0	46.1	1.3	47.4	54(Note3)	-6.6	PK
	V	11489.0	46.8	1.3	48.1	54(Note3)	-5.9	PK
	H	17235.0	34.5	7.4	41.9	54(Note3)	-12.1	PK
	V	17235.0	35.2	7.4	42.6	54(Note3)	-11.4	PK
157	H	11565.5	48.6	1.6	50.2	54(Note3)	-3.8	PK
	V	11574.0	52.7	1.5	54.2	74	-19.8	PK
	V	11571.6	40.9	1.5	42.5	54	-11.5	AV
	H	17355.0	25.7	6.1	31.7	54(Note3)	-22.3	PK
	V	17355.0	24.8	6.1	30.8	54(Note3)	-23.2	PK
165	H	11650.5	45.5	2.5	48.0	54(Note3)	-6.0	PK
	V	11650.5	49.6	2.5	52.1	54(Note3)	-1.9	PK
	H	17475.0	34.6	6.1	40.7	54(Note3)	-13.3	PK
	V	17475.0	35.1	6.1	41.2	54(Note3)	-12.8	PK

Note: 1. Measure Level = Reading Level + Factor.

2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.

3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Mode5: Transmit by 802.11ac(40MHz)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
38	H	10380.0	40.6	-2.2	38.4	54(Note3)	-15.6	PK
	V	10380.0	40.4	-2.2	38.1	54(Note3)	-15.9	PK
	H	15118.5	37.0	3.9	41.0	54(Note3)	-13.0	PK
	V	15824.0	35.4	10.2	45.6	54(Note3)	-8.4	PK
46	H	10460.0	41.3	-3.1	38.2	54(Note3)	-15.8	PK
	V	10460.0	41.6	-3.1	38.6	54(Note3)	-15.4	PK
	H	15824.0	35.1	10.2	45.3	54(Note3)	-8.7	PK
	V	15824.0	35.5	10.2	45.7	54(Note3)	-8.3	PK
54	H	10540.0	39.9	-1.9	38.0	54(Note3)	-16.0	PK
	V	10540.0	40.8	-1.9	38.8	54(Note3)	-15.2	PK
	H	15810.0	33.9	8.1	42.0	54(Note3)	-12.0	PK
	V	15810.0	34.2	8.1	42.3	54(Note3)	-11.7	PK
62	H	10620.0	40.7	-2.0	38.8	54(Note3)	-15.2	PK
	V	10620.0	40.2	-2.0	38.3	54(Note3)	-15.7	PK
	H	15930.0	30.1	8.0	38.1	54(Note3)	-15.9	PK
	V	15930.0	30.4	8.0	38.3	54(Note3)	-15.7	PK
102	H	11020.0	40.5	-1.7	38.7	54(Note3)	-15.3	PK
	V	11020.0	40.8	-1.7	39.1	54(Note3)	-14.9	PK
	H	16631.5	35.6	7.8	43.4	54(Note3)	-10.6	PK
	V	16657.0	35.3	9.0	44.3	54(Note3)	-9.7	PK
110	H	11098.0	49.1	0.2	49.3	54(Note3)	-4.7	PK
	V	11098.0	50.6	0.2	50.8	54(Note3)	-3.2	PK
	H	16650.0	36.8	8.7	45.5	54(Note3)	-8.5	PK
	V	16650.0	35.9	8.7	44.6	54(Note3)	-9.4	PK
134	H	11344.5	49.6	0.8	50.4	54(Note3)	-3.6	PK
	V	11344.5	50.0	0.8	50.8	54(Note3)	-3.2	PK
	H	17010.0	36.8	8.2	44.9	54(Note3)	-9.1	PK
	V	17010.0	36.3	8.2	44.5	54(Note3)	-9.5	PK

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
151	H	11510.0	39.3	1.8	41.1	54(Note3)	-12.9	PK
	V	11510.0	41.1	1.8	42.9	54(Note3)	-11.1	PK
	H	17265.0	35.5	5.9	41.4	54(Note3)	-12.6	PK
	V	17265.0	36.4	5.9	42.3	54(Note3)	-11.7	PK
159	H	11590.0	40.0	1.2	41.2	54(Note3)	-12.8	PK
	V	11590.0	40.5	1.2	41.7	54(Note3)	-12.3	PK
	H	17385.0	33.9	7.4	41.3	54(Note3)	-12.7	PK
	V	17385.0	34.5	7.4	41.8	54(Note3)	-12.2	PK

Note: 1. Measure Level = Reading Level + Factor.

2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Mode6: Transmit by 802.11ac(80MHz)

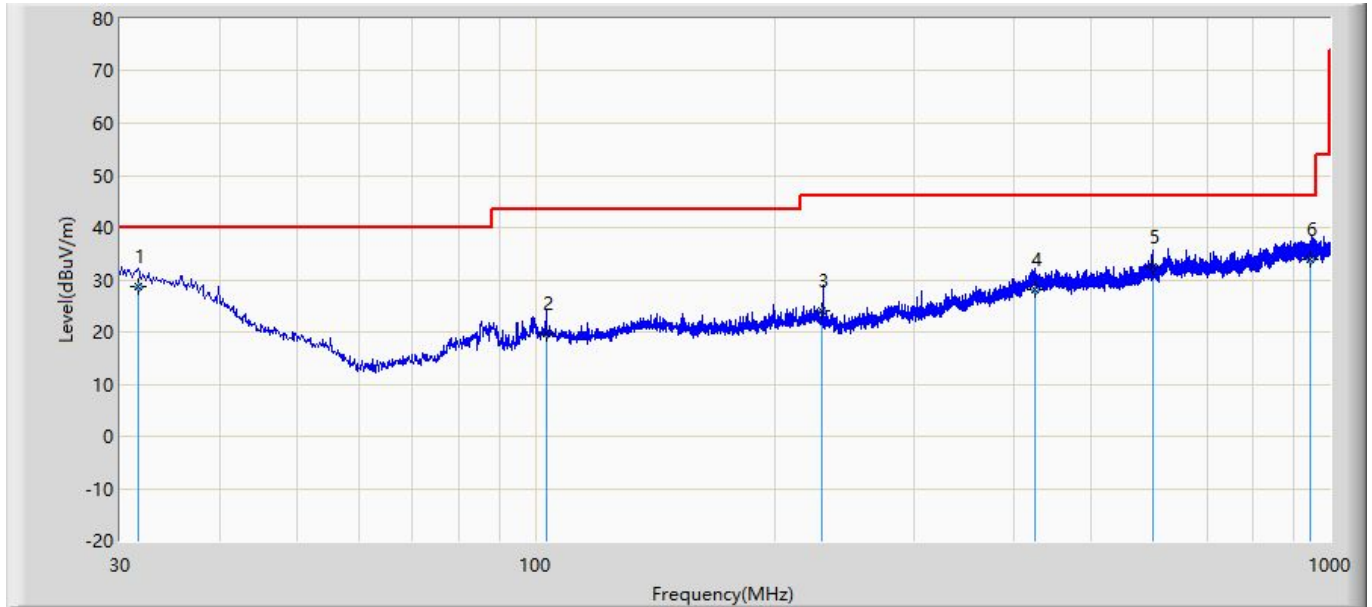
CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
42	H	10420.0	40.3	-2.4	38.0	54(Note3)	-16.0	PK
	V	10420.0	39.9	-2.4	37.5	54(Note3)	-16.5	PK
	H	14965.5	37.2	3.5	40.7	54(Note3)	-13.3	PK
	V	15118.5	36.3	3.9	40.2	54(Note3)	-13.8	PK
58	H	10580.0	40.0	-2.1	37.9	54(Note3)	-16.1	PK
	V	10580.0	40.5	-2.1	38.4	54(Note3)	-15.6	PK
	H	15870.0	31.4	7.7	39.1	54(Note3)	-14.9	PK
	V	15870.0	31.7	7.7	39.4	54(Note3)	-14.6	PK
106	H	11064.0	44.9	-1.1	43.8	54(Note3)	-10.2	PK
	V	11060.0	46.0	-1.2	44.9	54(Note3)	-9.1	PK
	H	16590.0	37.0	6.1	43.1	54(Note3)	-10.9	PK
	V	16590.0	36.2	6.1	42.4	54(Note3)	-11.6	PK
155	H	11259.5	47.4	-0.4	47.0	54(Note3)	-7.0	PK
	V	11240.0	48.3	-0.9	47.4	54(Note3)	-6.6	PK
	H	16860.0	36.6	6.6	43.1	54(Note3)	-10.9	PK
	V	16860.0	35.2	6.6	41.8	54(Note3)	-12.2	PK

Note: 1. Measure Level = Reading Level + Factor.

2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

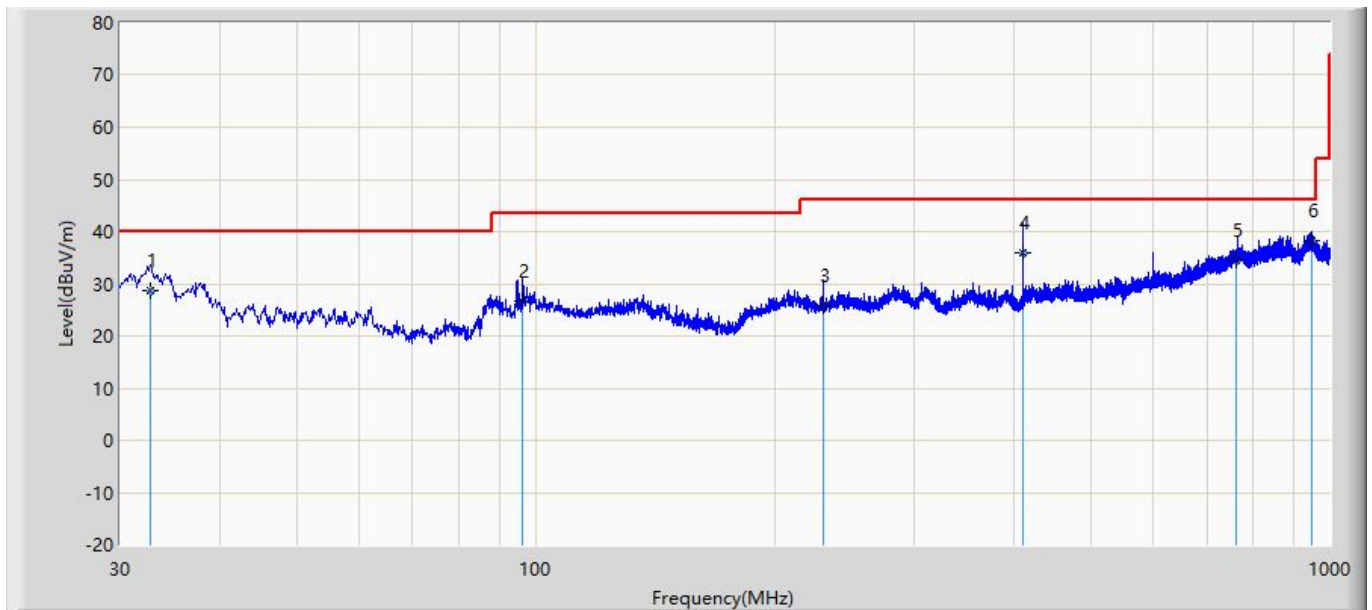
The worst case of Radiated Emission below 1GHz:

Site: AC2	Time: 2015/08/06 - 10:23
Limit: FCC_Part15.209_RE(3m)_ClassB	Margin: 0
Probe: AC2_10M(30-1000M)20150408	Polarity: Horizontal
EUT: AC450 Wireless Nano USB Adapter	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	31.554	28.551	33.148	-11.449	40.000	-4.597	QP
2		103.154	19.663	30.308	-23.837	43.500	-10.645	QP
3		229.264	24.058	35.466	-21.942	46.000	-11.408	QP
4		425.264	28.184	32.314	-17.816	46.000	-4.130	QP
5		598.540	32.365	33.485	-13.635	46.000	-1.120	QP
6		946.578	33.784	31.872	-12.216	46.000	1.912	QP

Site: AC2	Time: 2015/08/06 - 10:23
Limit: FCC_Part15.209_RE(3m)_ClassB	Margin: 0
Probe: AC2_10M(30-1000M)20150408	Polarity: Vertical
EUT: AC450 Wireless Nano USB Adapter	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		32.790	28.702	34.020	-11.298	40.000	-5.318	QP
2		96.236	26.796	38.546	-16.704	43.500	-11.750	QP
3		229.944	25.825	37.167	-20.175	46.000	-11.342	QP
4		410.267	35.982	40.516	-10.018	46.000	-4.534	QP
5		763.355	34.579	34.235	-11.421	46.000	0.344	QP
6	*	948.264	38.199	36.246	-7.801	46.000	1.953	QP

5. Occupied Bandwidth

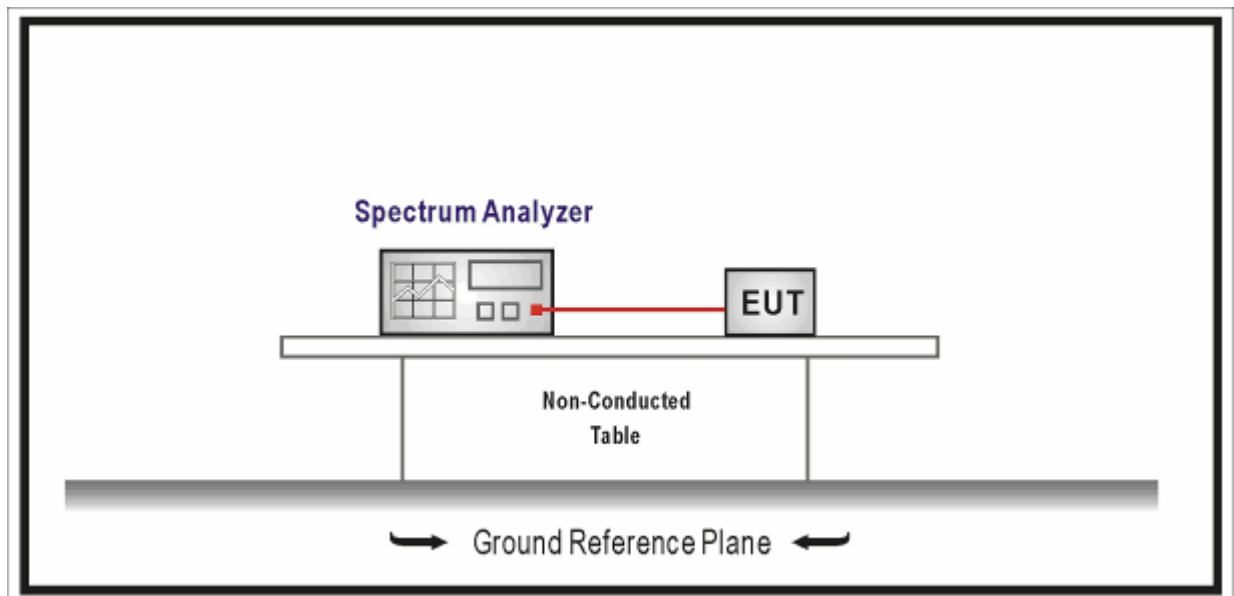
5.1. Test Equipment

Occupied Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup



5.3. Limit

N/A

5.4. Test Procedure

According to ANSI C63.4:2014& ANSI C63.10:2013&789033 D02 General UNII Test Procedures New Rules v01& FCC CFR Title 47 Part 15 Subpart E: 2015

Emission Bandwidth

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum 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%.

5.5. Uncertainty

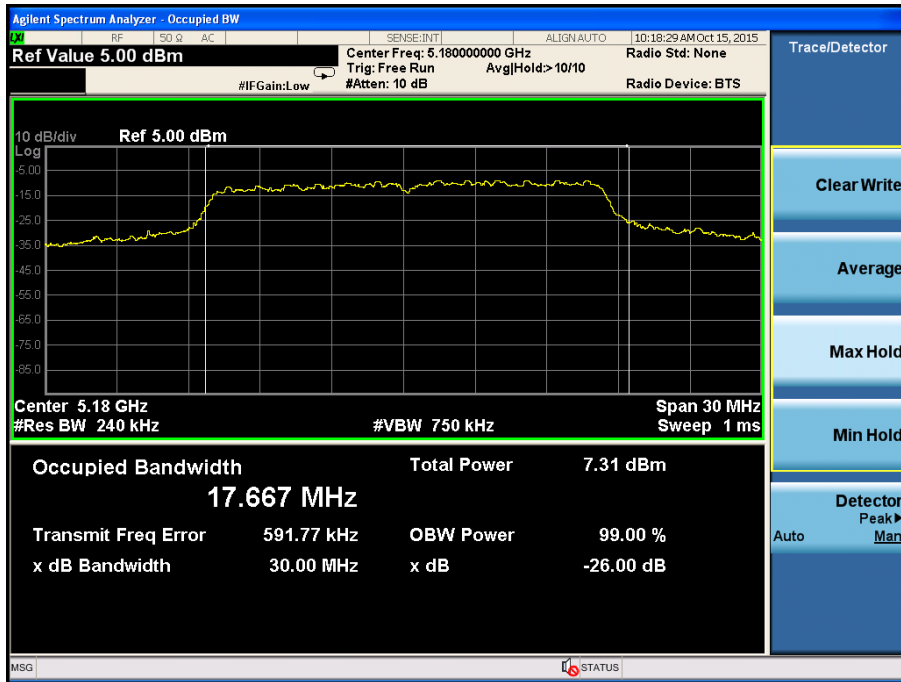
The measurement uncertainty is defined as ± 1 kHz

5.6. Test Result

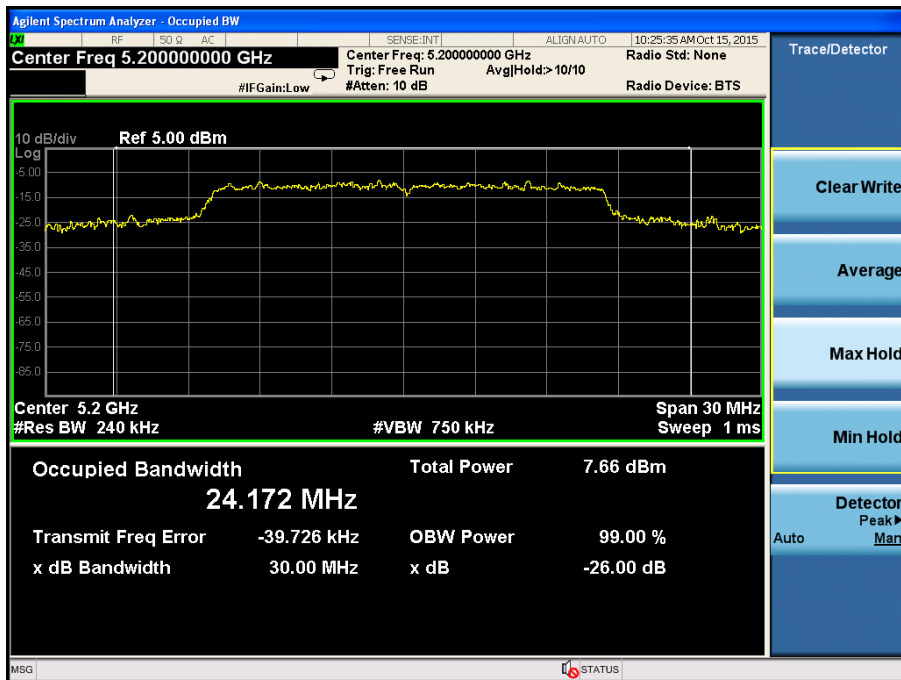
Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180	30.00	17.667
40	5200	30.00	24.172
48	5240	30.00	24.803
52	5260	30.00	24.736
60	5300	30.00	25.029
64	5320	30.00	25.122
100	5500	30.00	25.408
116	5580	30.00	26.288
132	5660	30.00	26.338
140	5700	30.00	26.173
149	5745	28.70	16.762
157	5785	30.00	26.614
165	5825	29.76	16.978

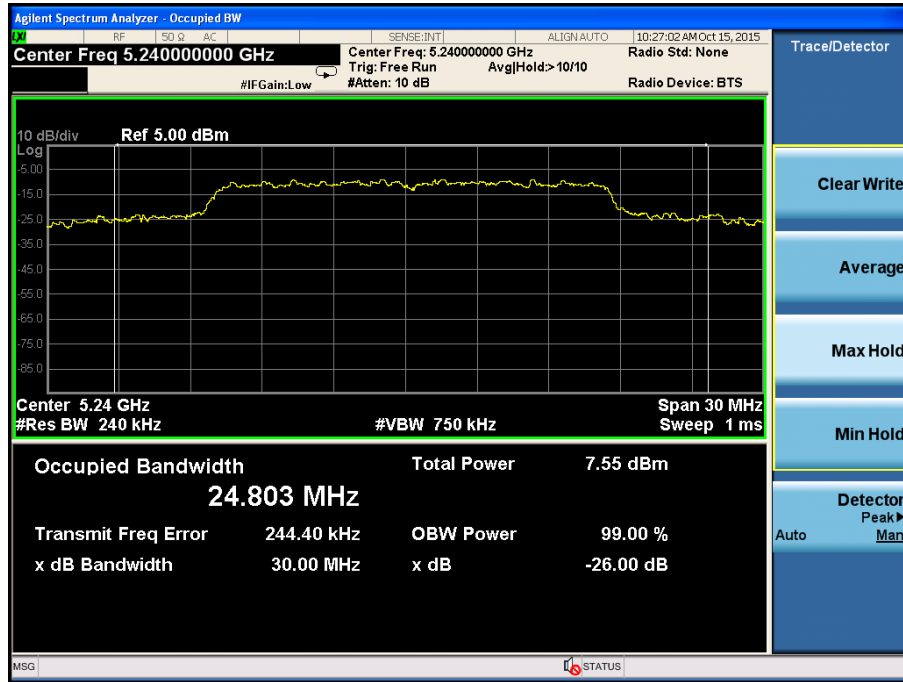
Channel 36



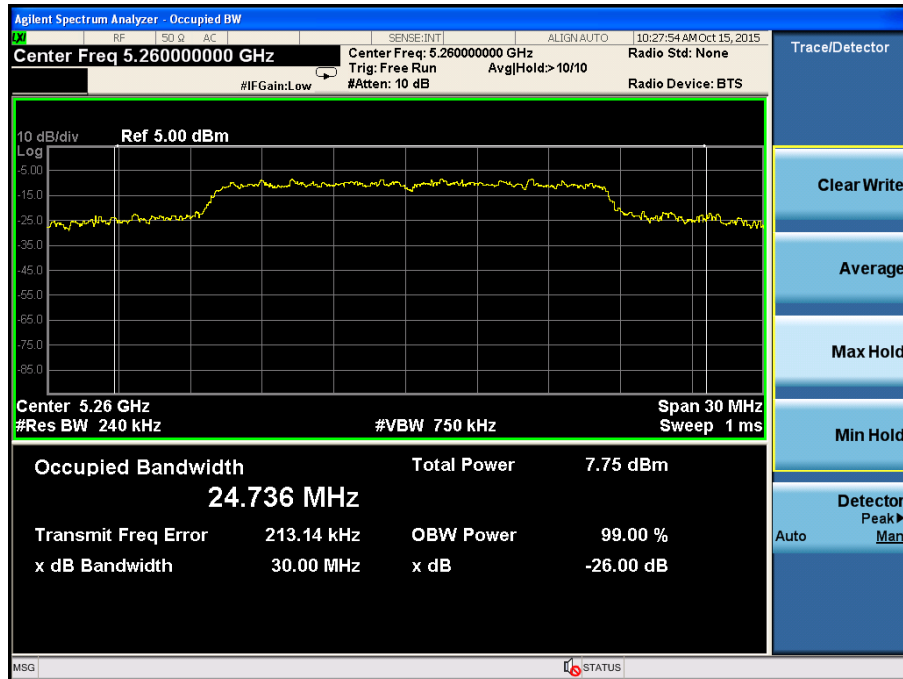
Channel 40



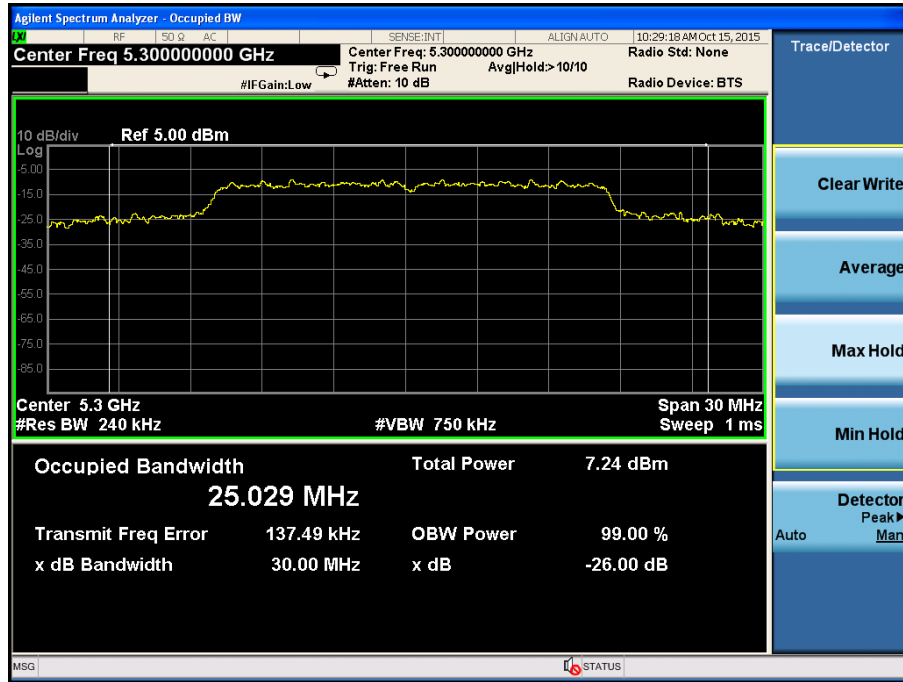
Channel 48



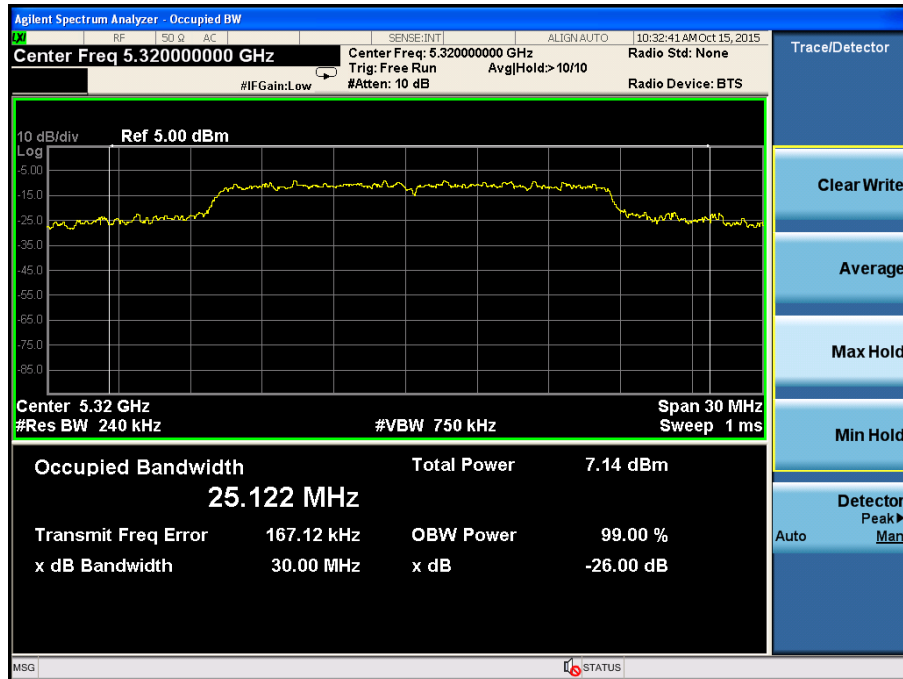
Channel 52



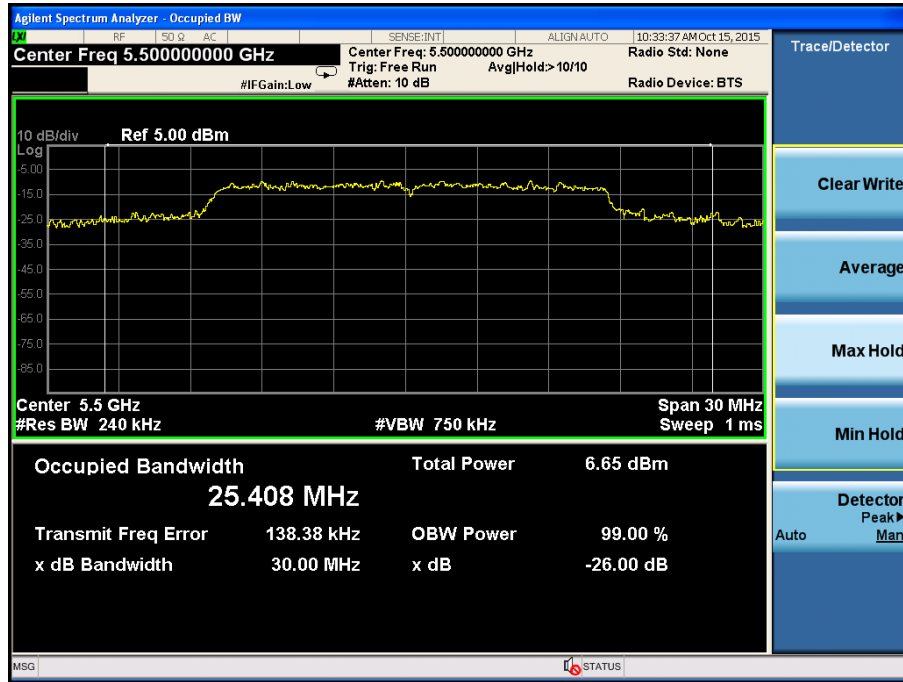
Channel 60



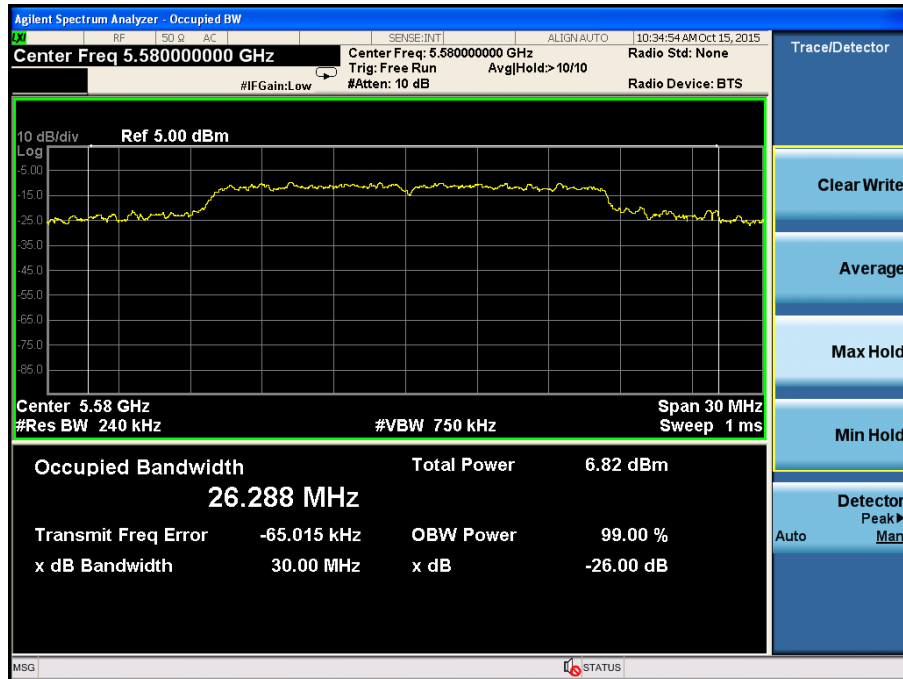
Channel 64



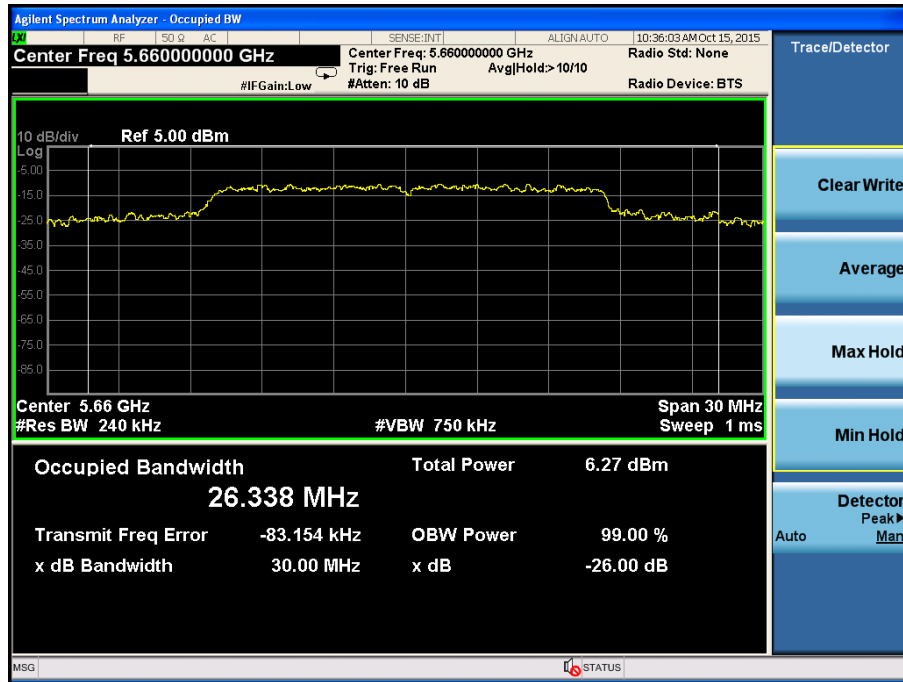
Channel 100



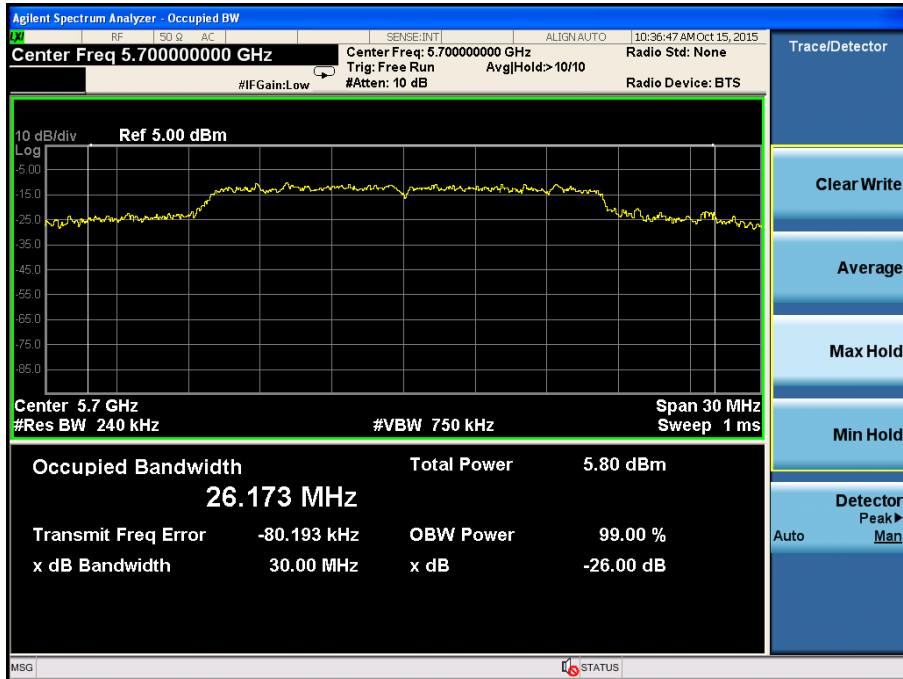
Channel 116



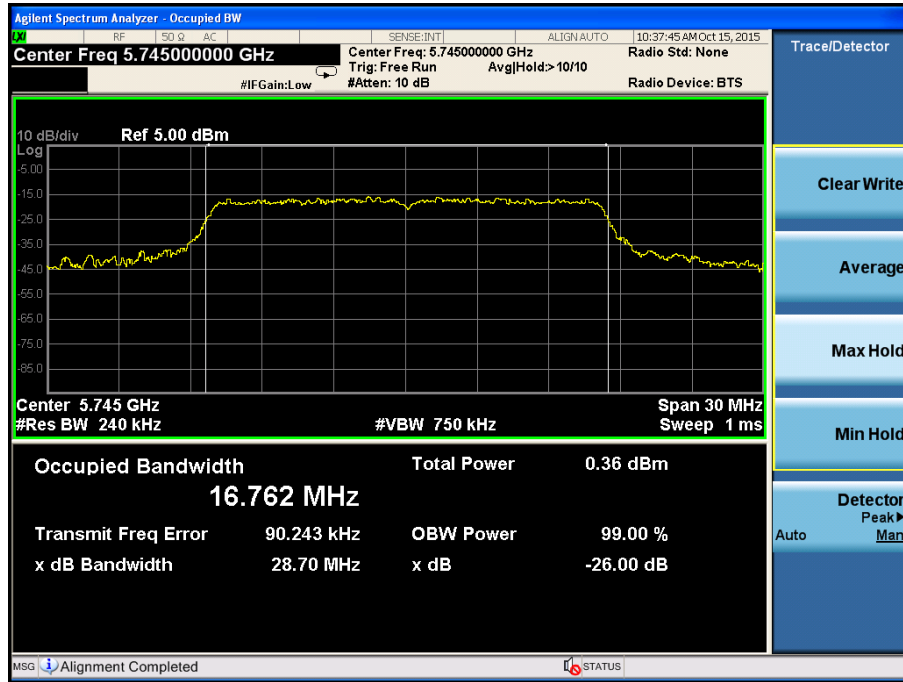
Channel 132



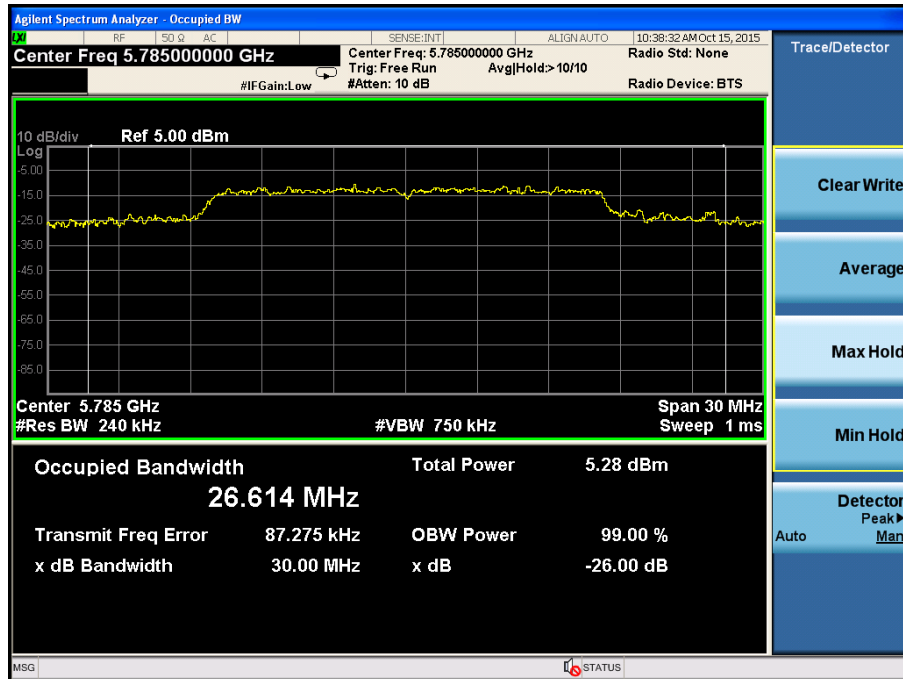
Channel 140



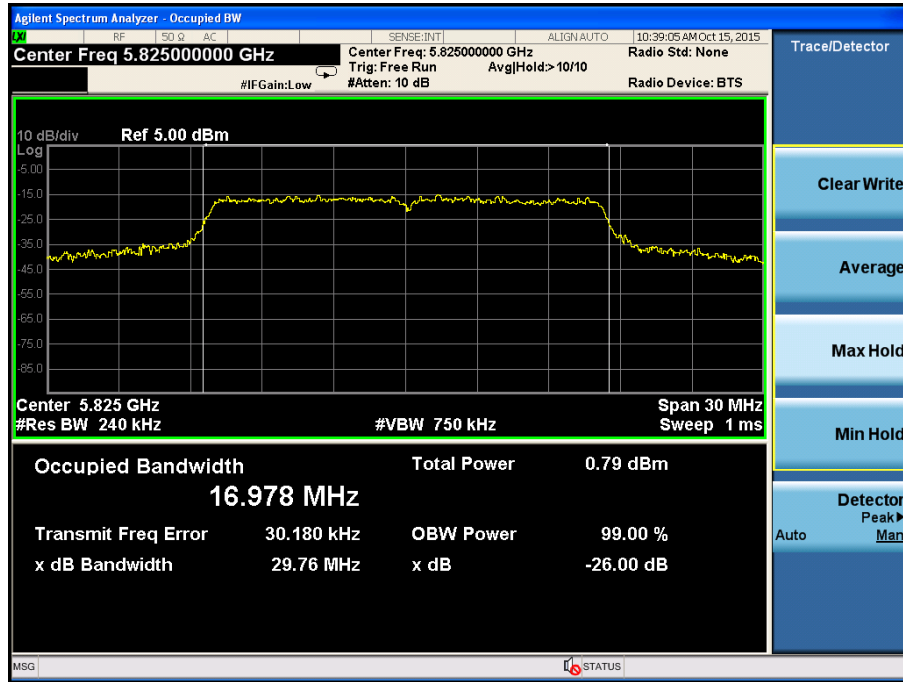
Channel 149



Channel 157



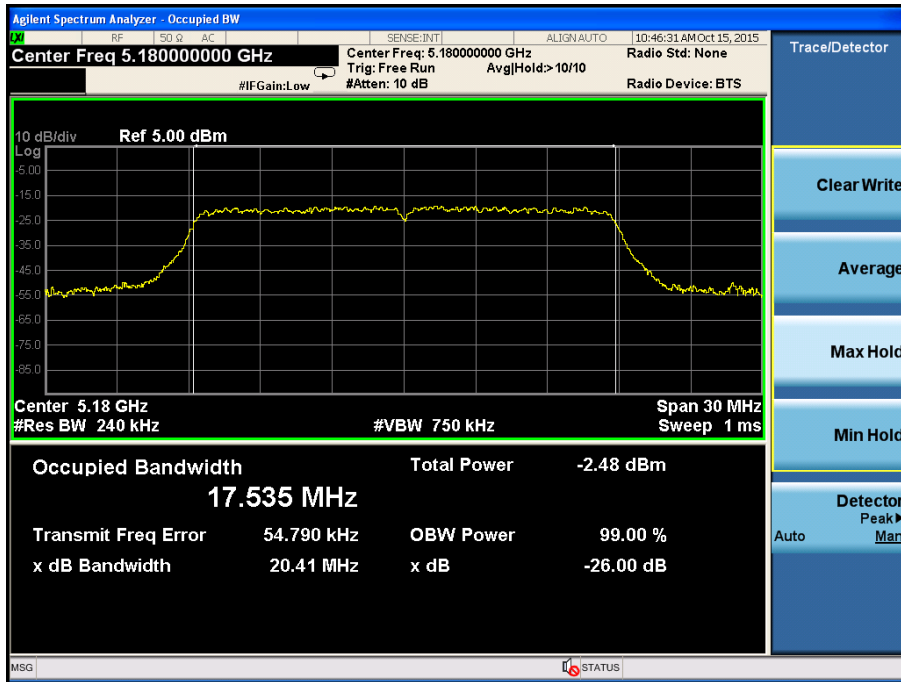
Channel 165



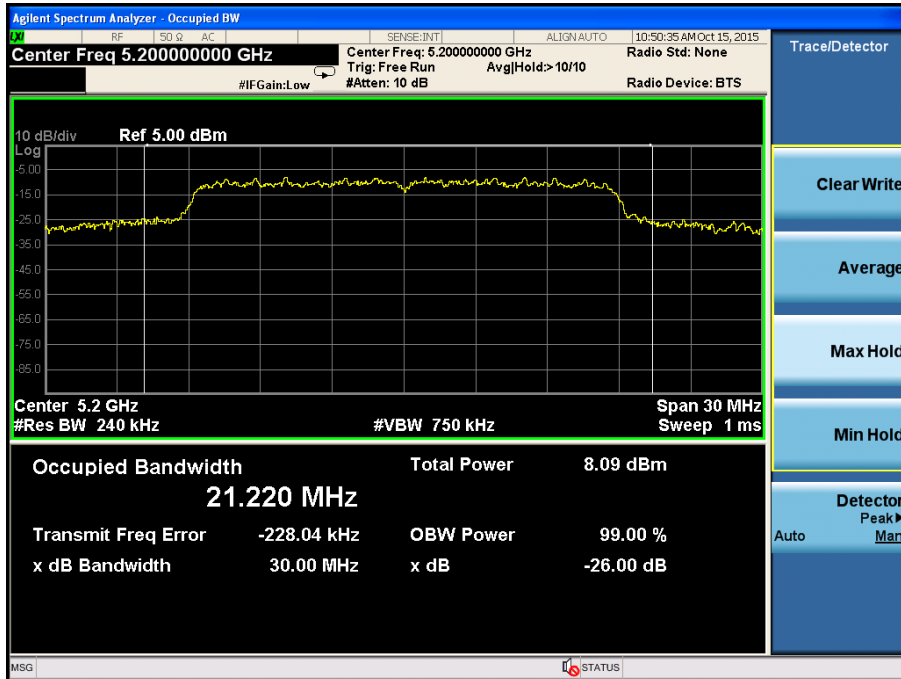
Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180	20.41	17.535
40	5200	30.00	21.220
48	5240	30.00	21.438
52	5260	30.00	21.769
60	5300	29.91	17.751
64	5320	20.00	17.503
100	5500	30.00	22.856
116	5580	30.00	25.140
140	5700	30.00	26.173
149	5745	29.15	16.762
157	5785	30.00	25.727
165	5825	30.00	25.342

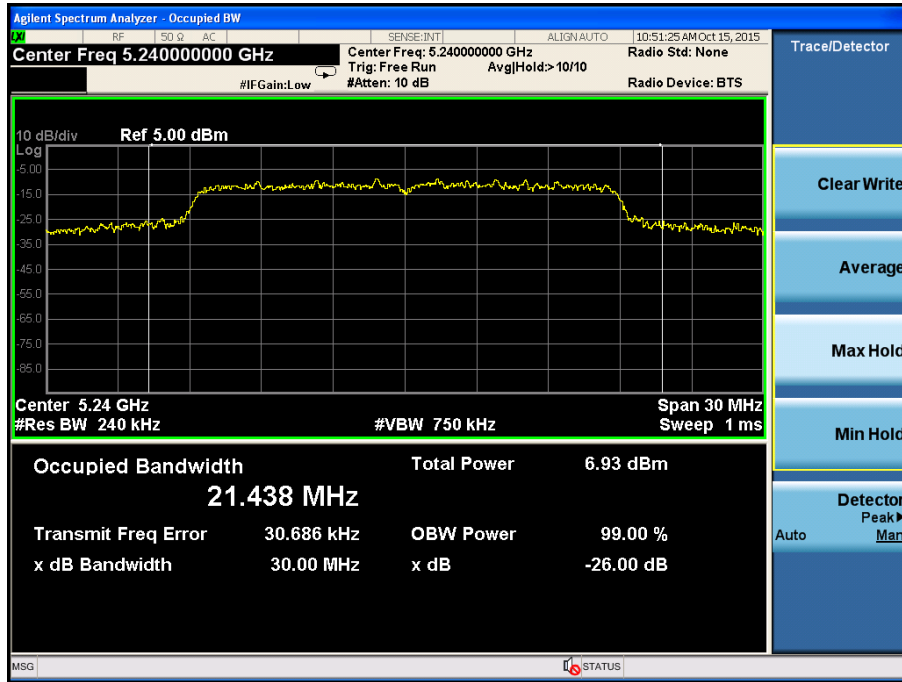
Channel 36 (5180MHz)



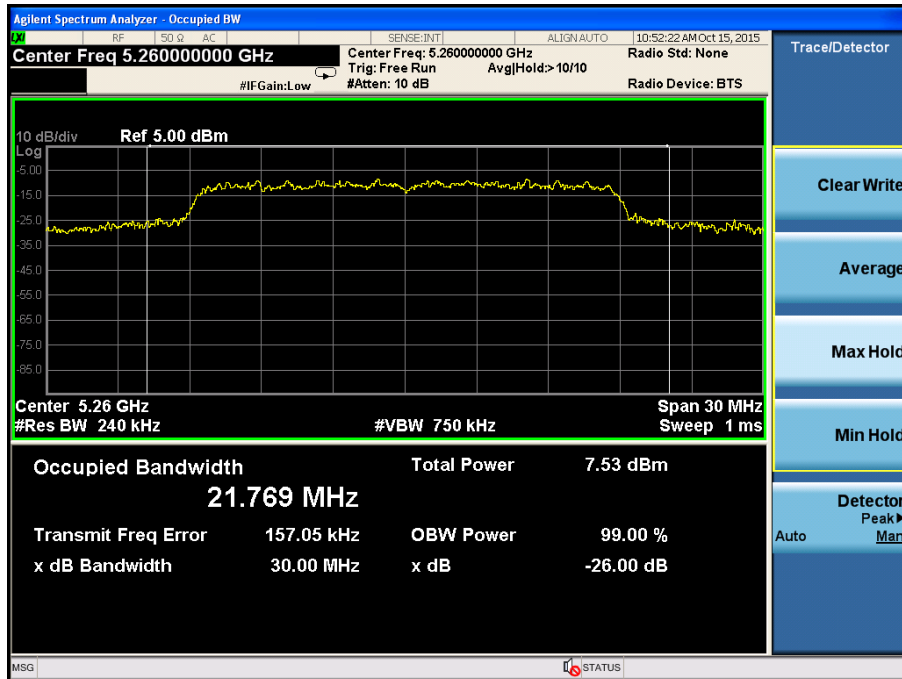
Channel 40 (5200MHz)



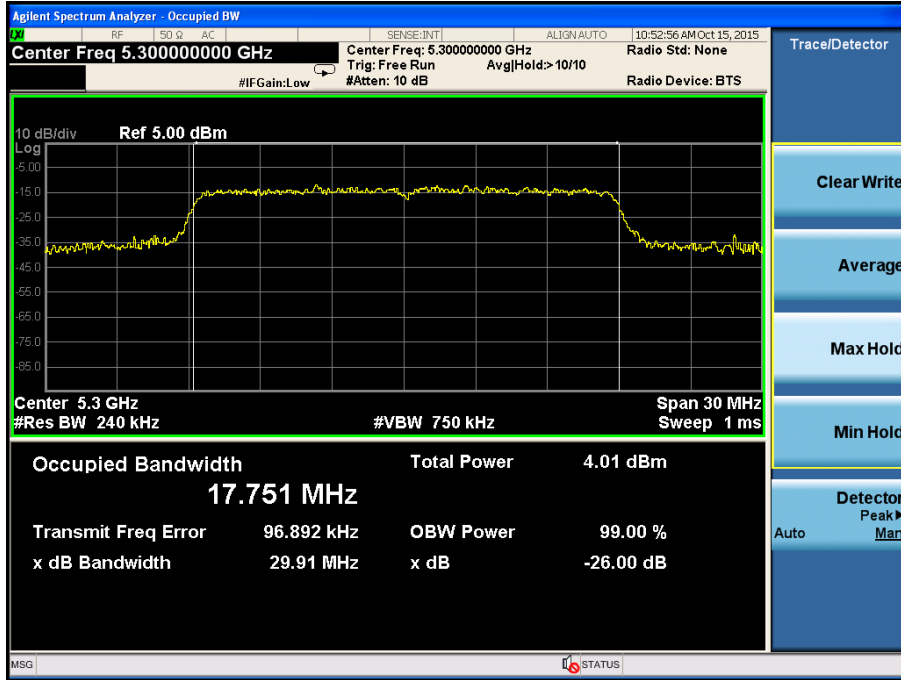
Channel 48 (5240MHz)



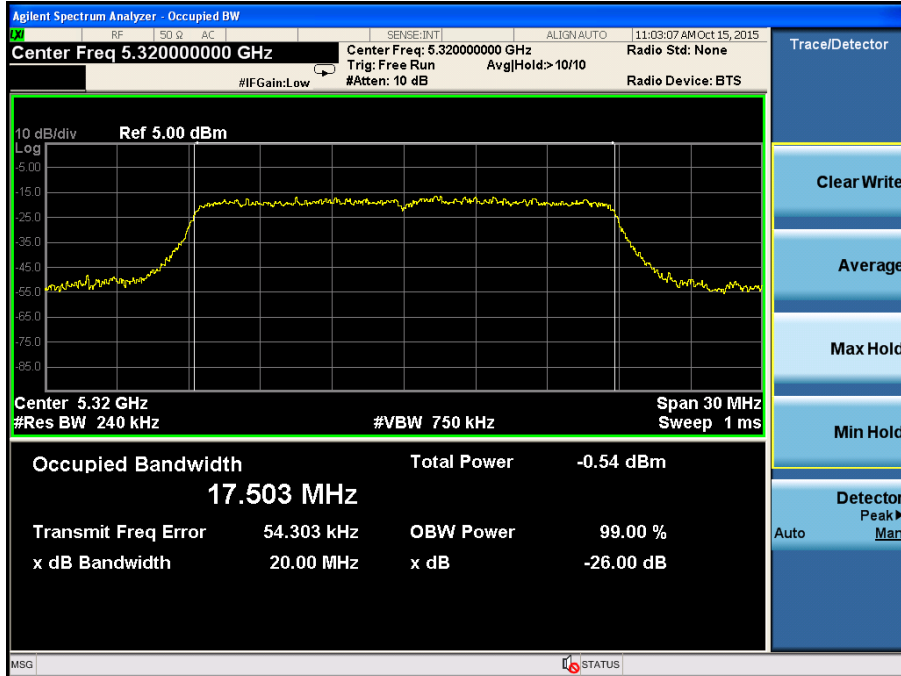
Channel 56 (5260MHz)



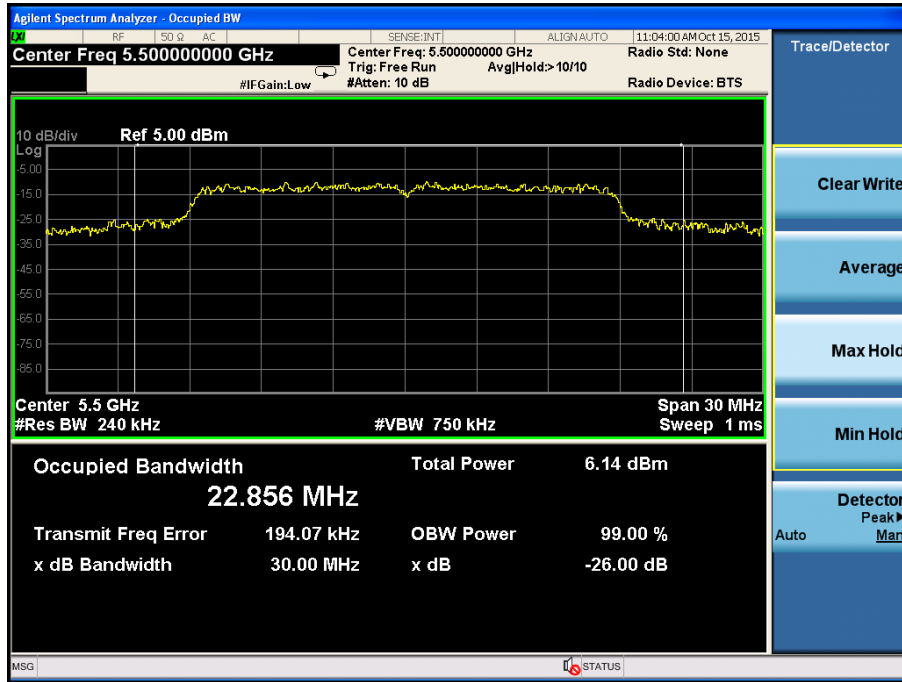
Channel 60 (5300MHz)



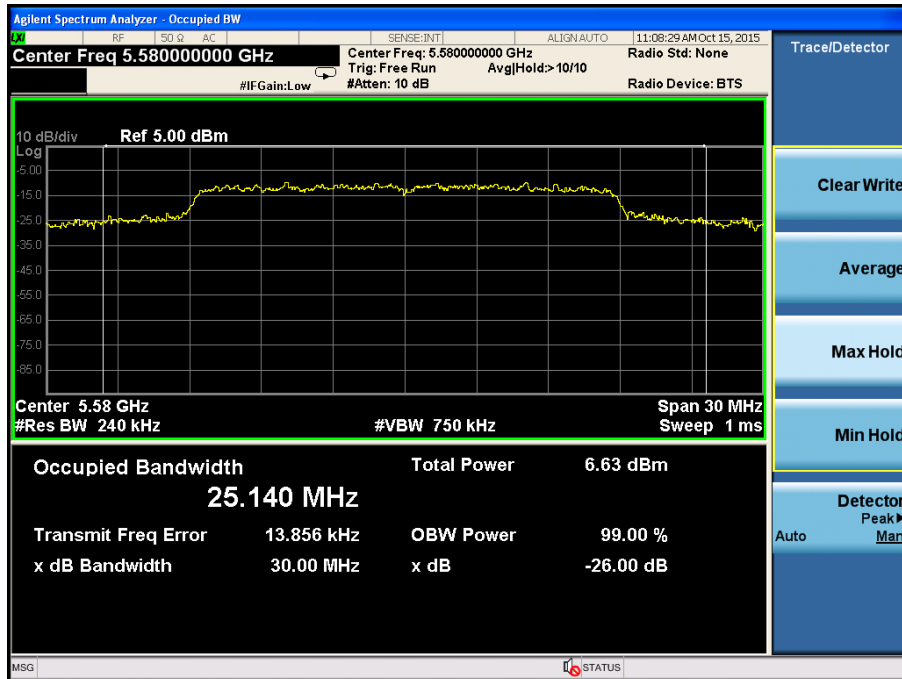
Channel 64 (5320MHz)



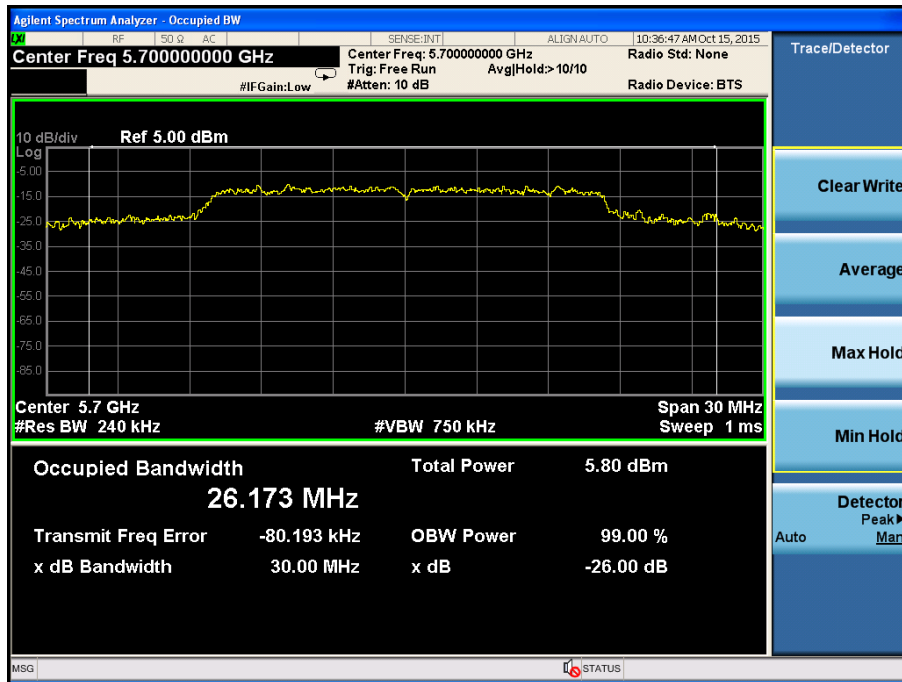
Channel 100 (5500MHz)



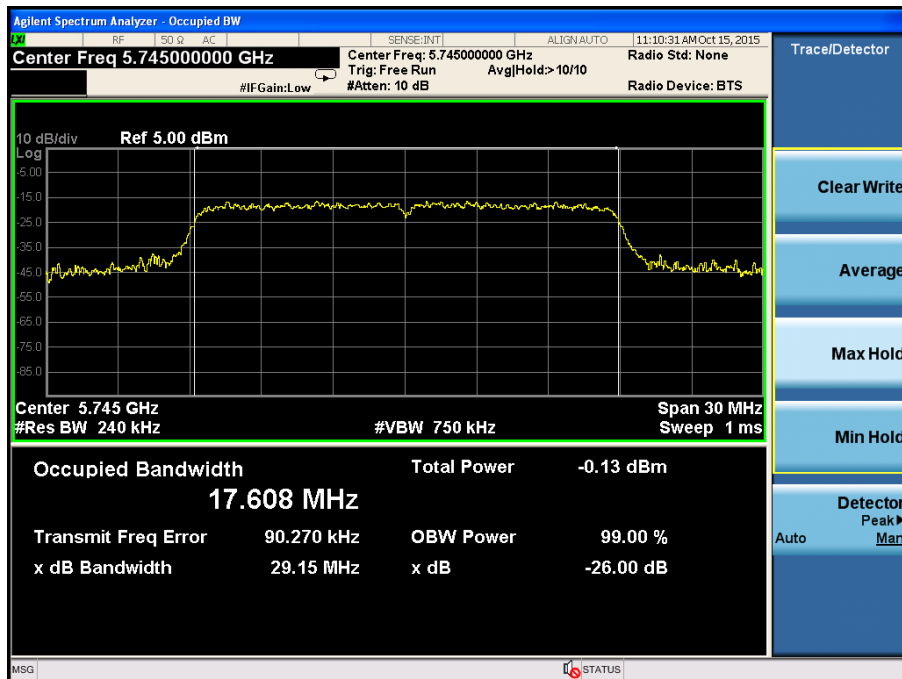
Channel 116 (5580MHz)



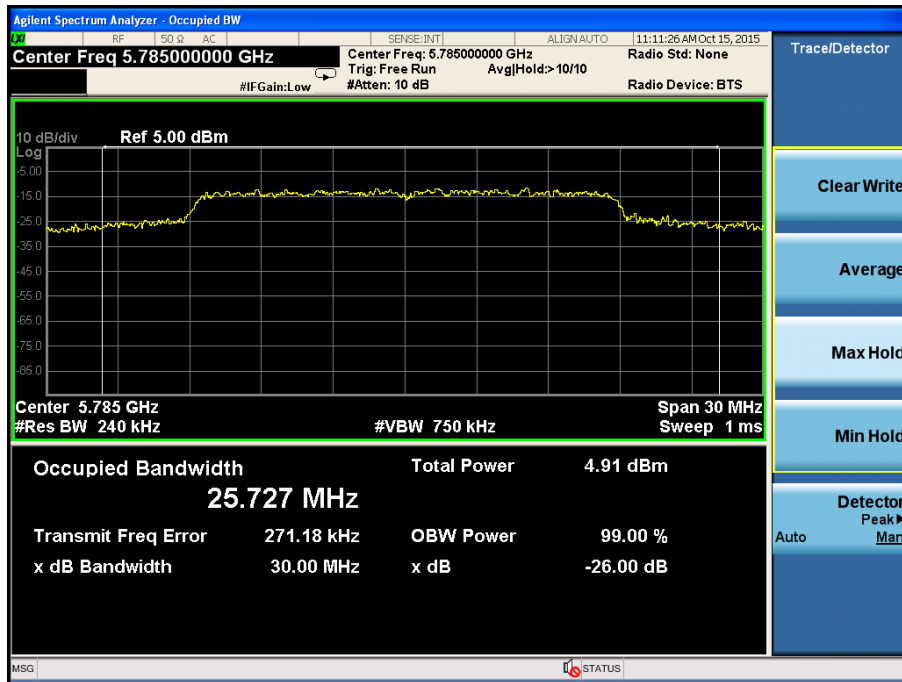
Channel 140 (5700MHz)



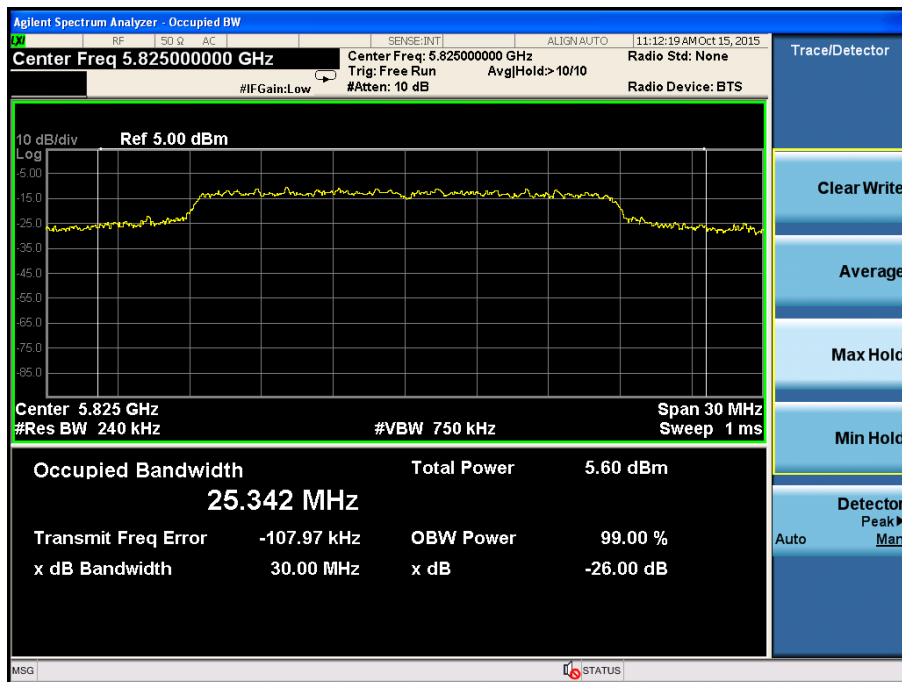
Channel 149 (5745MHz)



Channel 157(5785MHz)



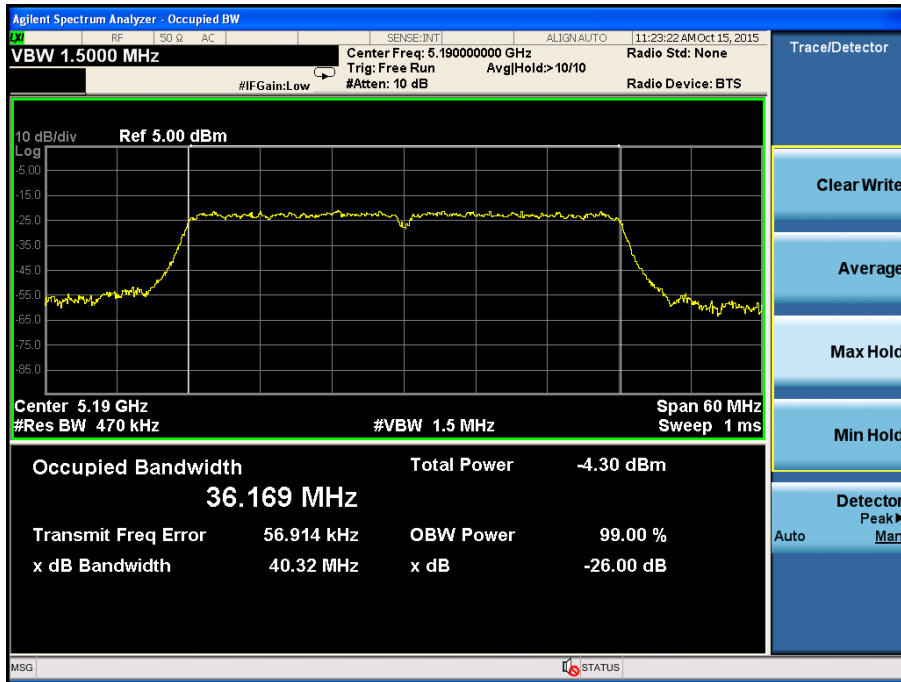
Channel 165 (5825MHz)



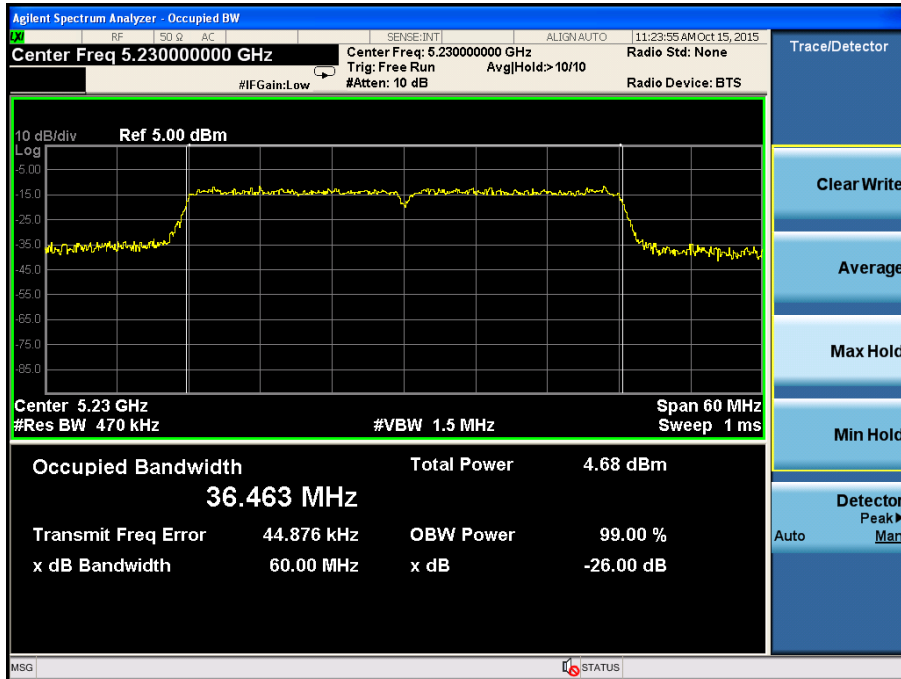
Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz)

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190	40.32	36.169
46	5230	60.00	36.463
54	5270	60.00	42.812
62	5310	40.38	36.237
102	5510	59.37	36.355
110	5550	60.00	50.300
134	5670	60.00	50.111
151	5755	60.00	36.151
159	5795	40.32	37.704

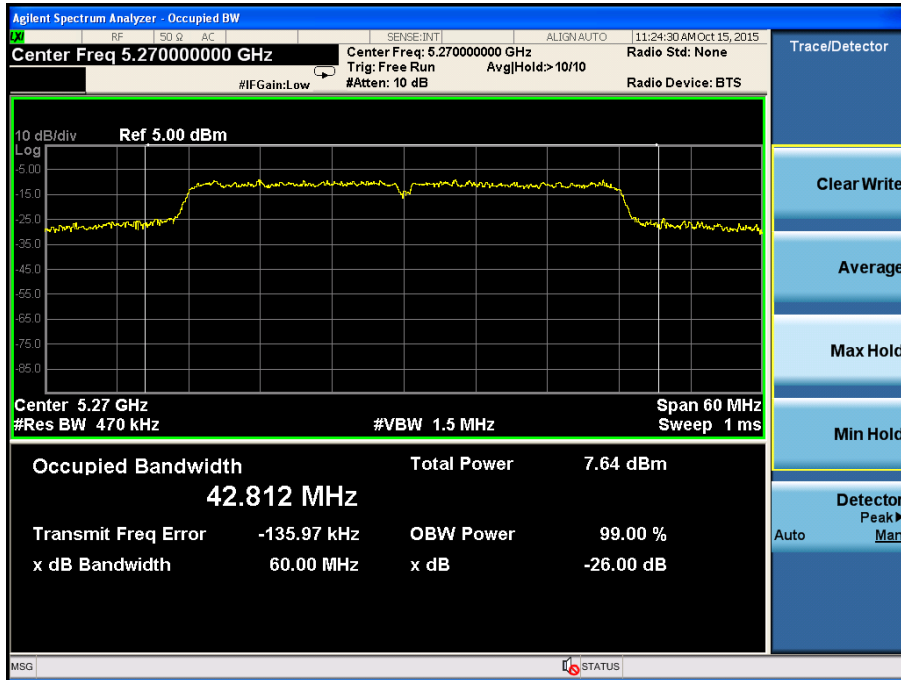
Channel 38 (5190MHz)



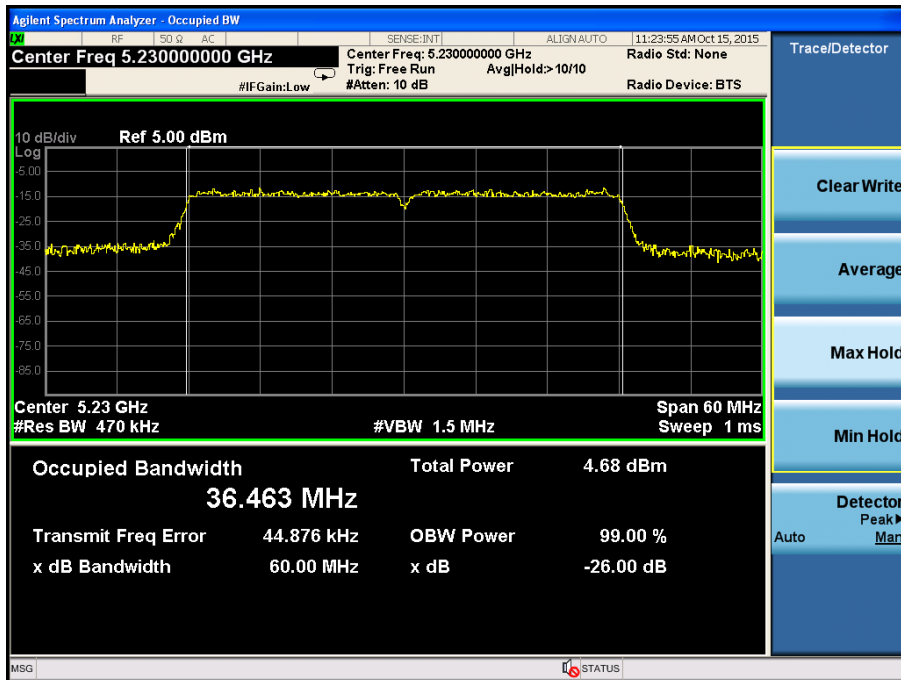
Channel 46 (5230MHz)



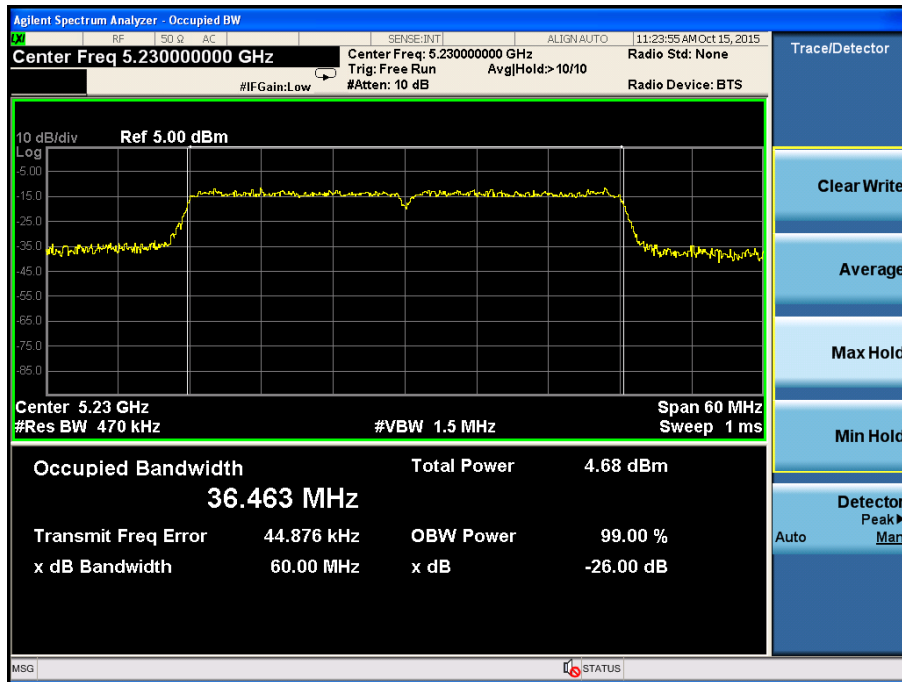
Channel 54 (5270MHz)



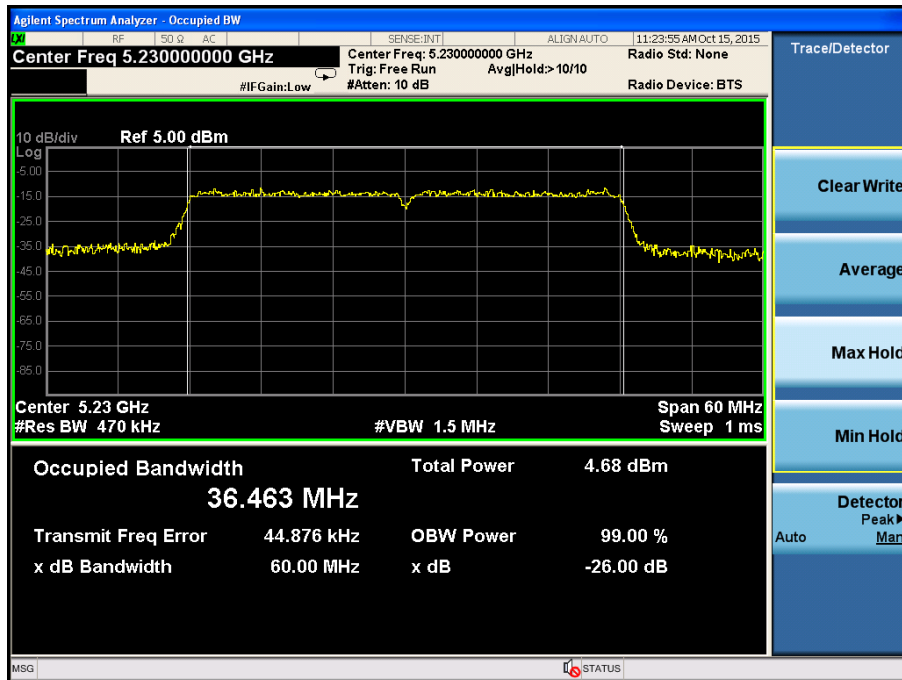
Channel 62 (5310MHz)



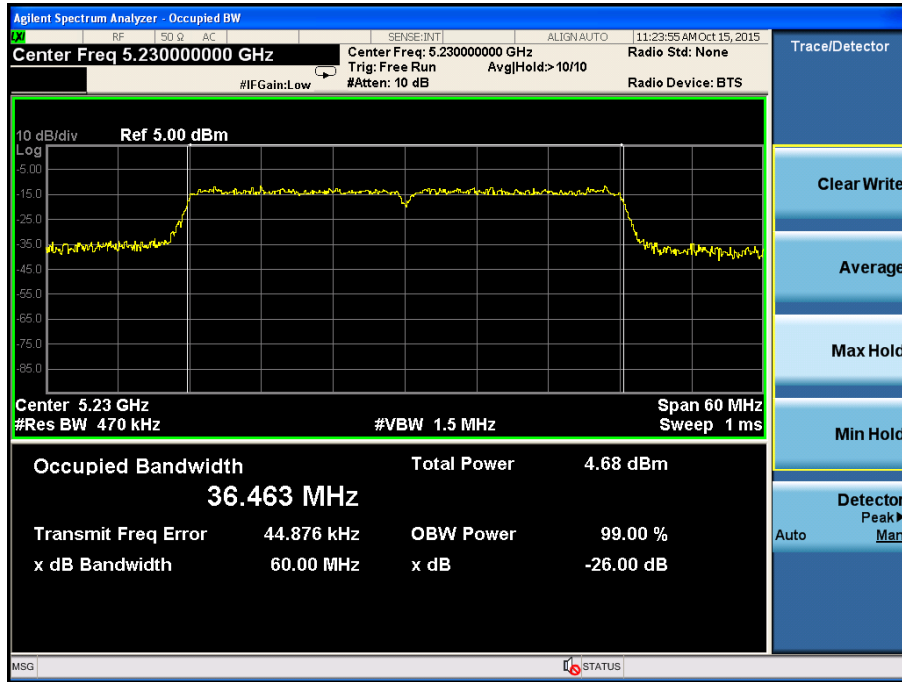
Channel 102 (5510MHz)



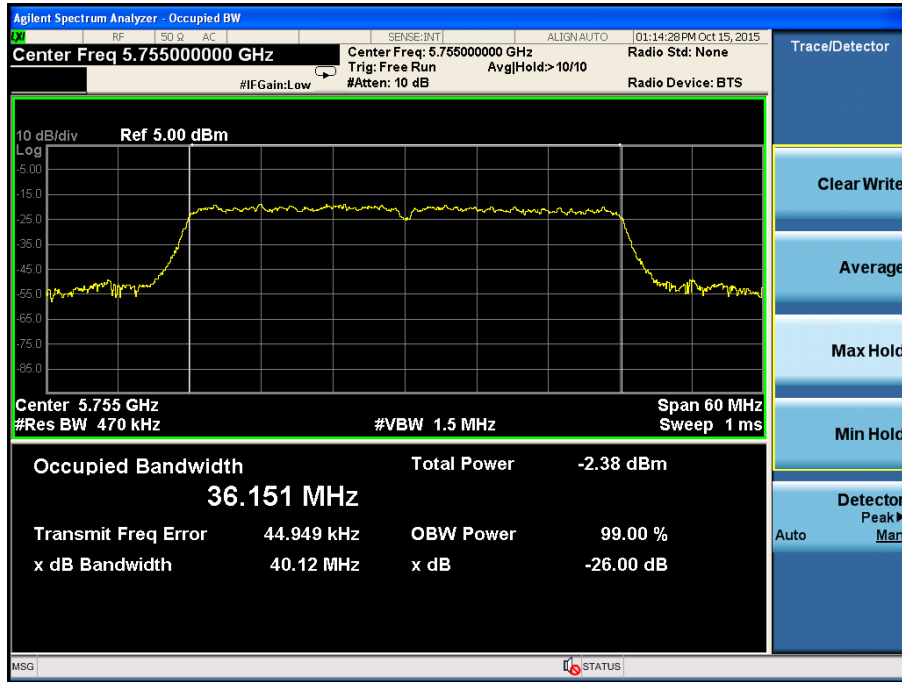
Channel 110 (5550MHz)



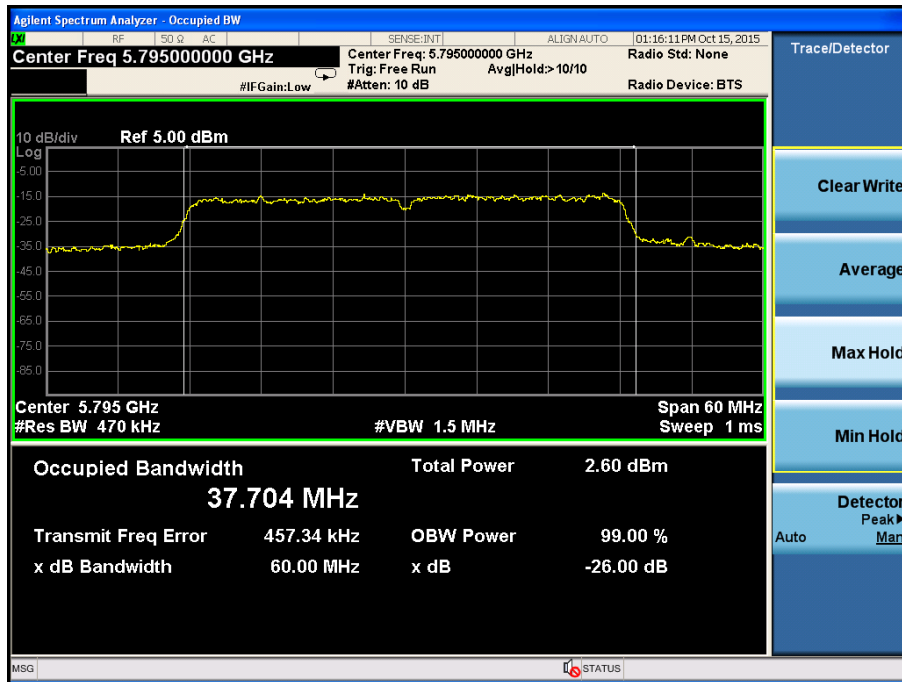
Channel 134 (5670MHz)



Channel 151 (5755MHz)



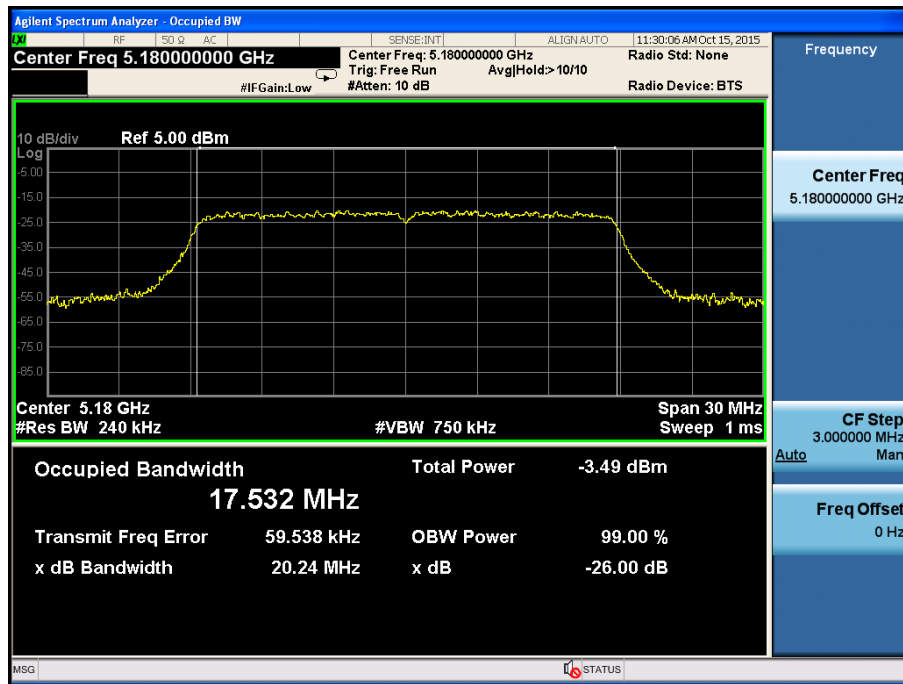
Channel 159(5795MHz)



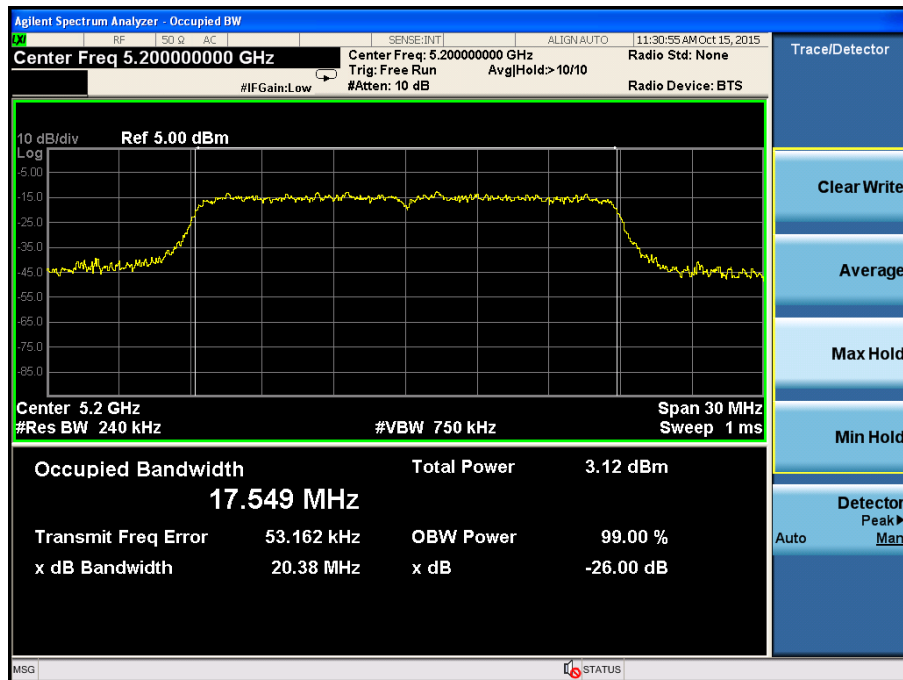
Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 4: Transmit by 802.11ac(20MHz)

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180	20.24	17.532
40	5200	20.38	17.549
48	5240	30.00	21.885
52	5260	30.00	22.507
60	5300	29.91	17.751
64	5320	20.48	17.543
100	5500	30.00	24.902
116	5580	30.00	24.992
132	5660	30.00	25.094
140	5700	30.00	25.154
149	5745	25.62	17.606
157	5785	30.00	25.720
165	5825	30.00	17.850

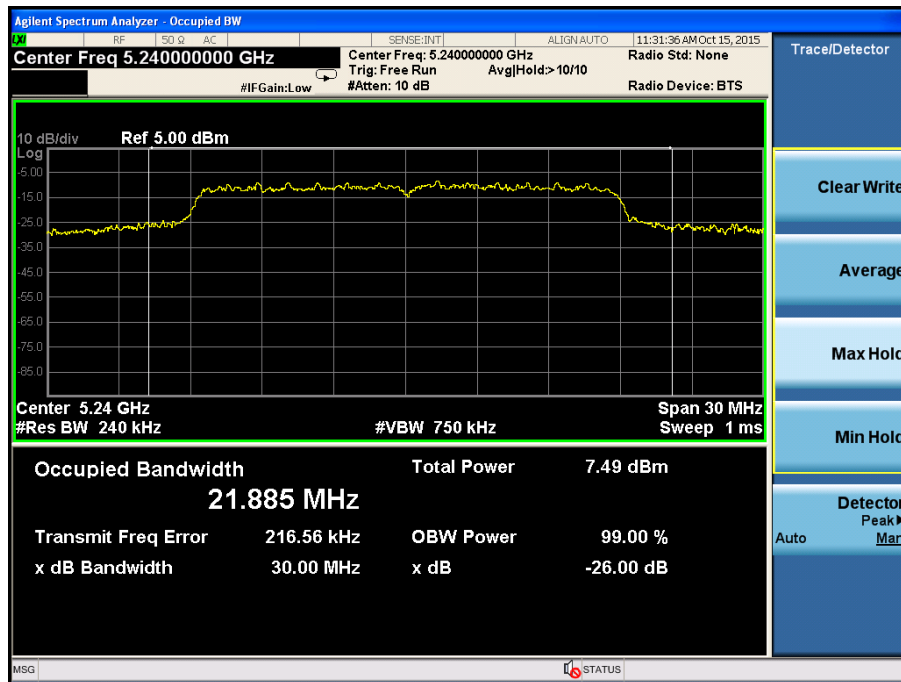
Channel 36



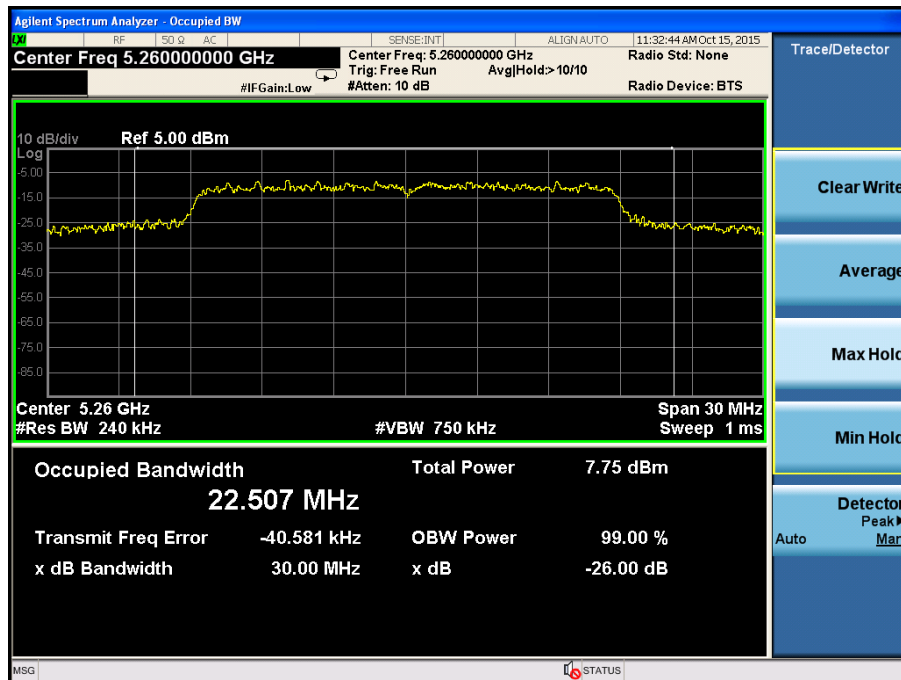
Channel 40



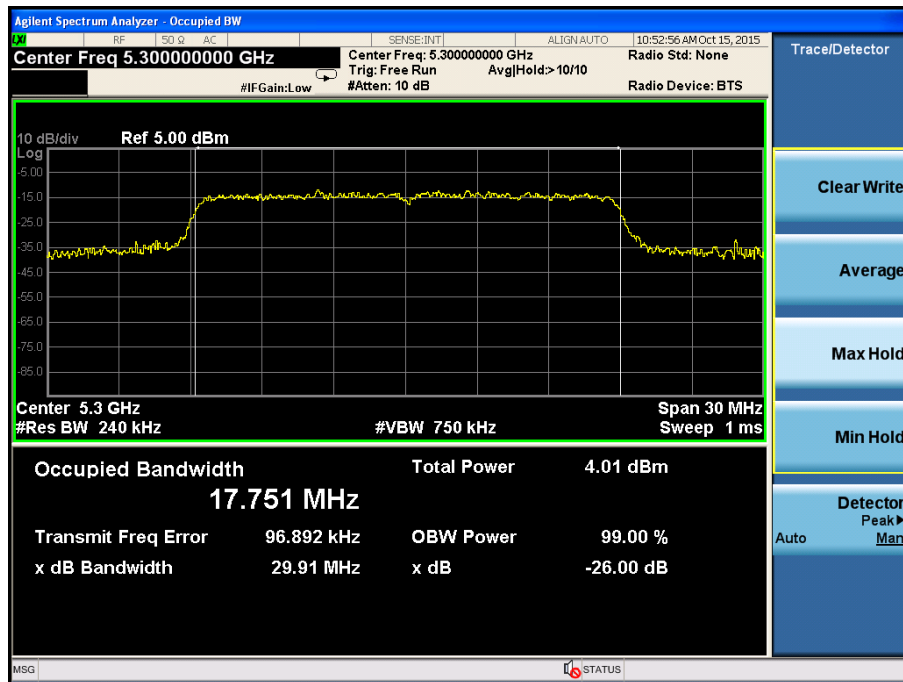
Channel 48



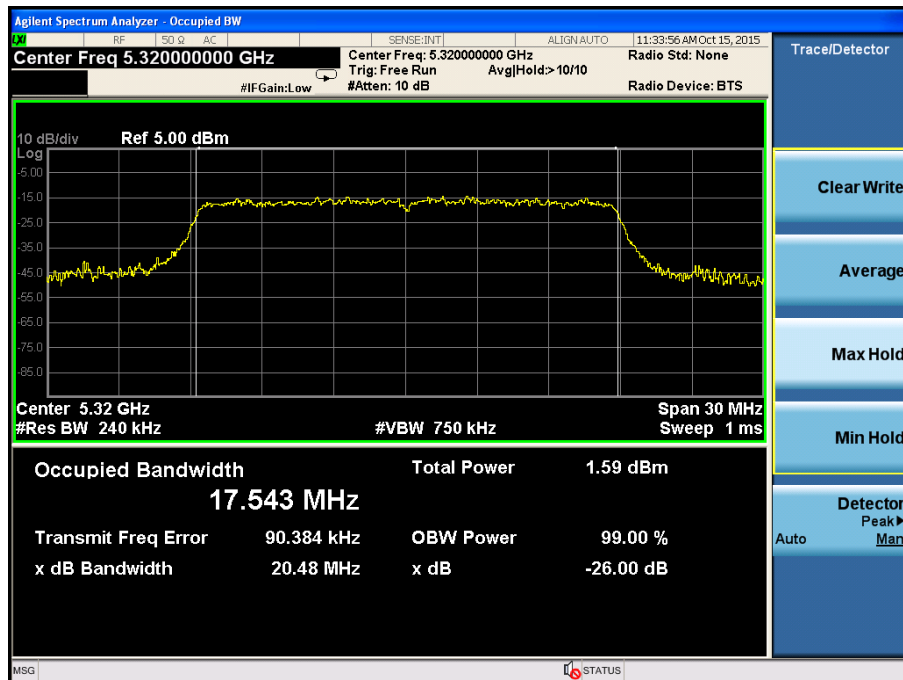
Channel 52



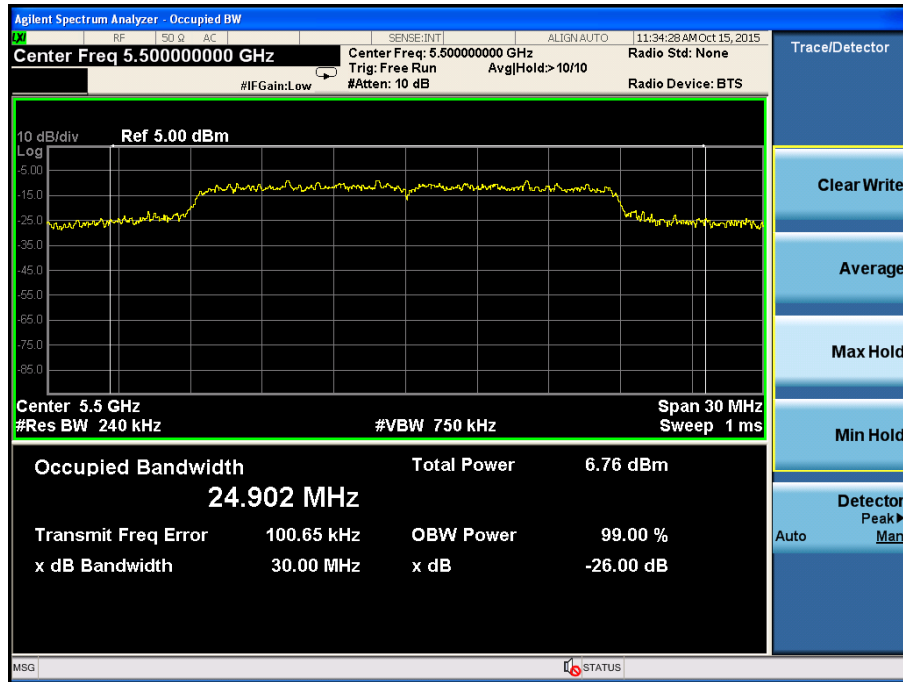
Channel 60



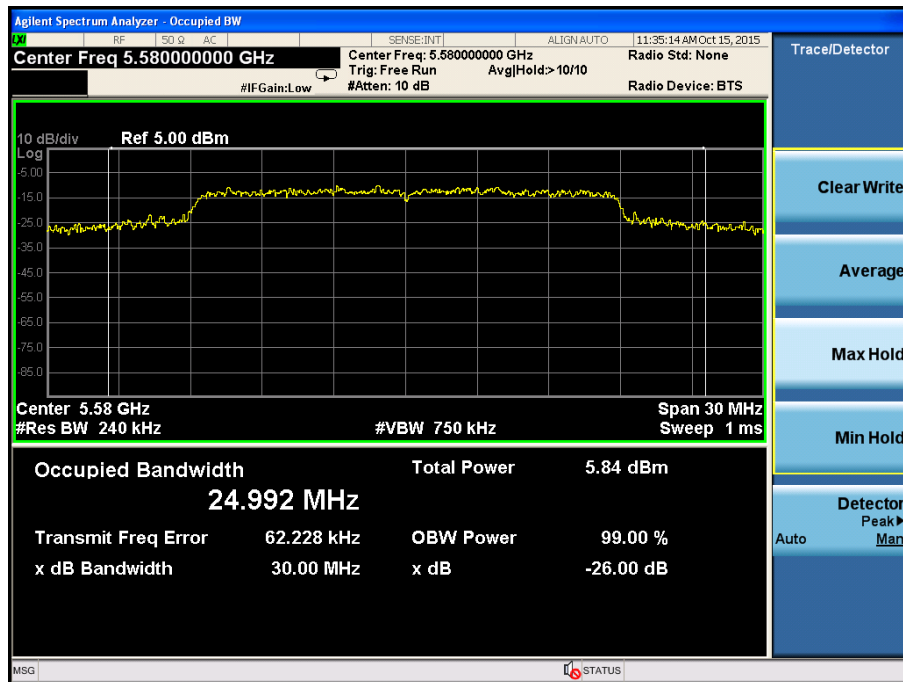
Channel 64



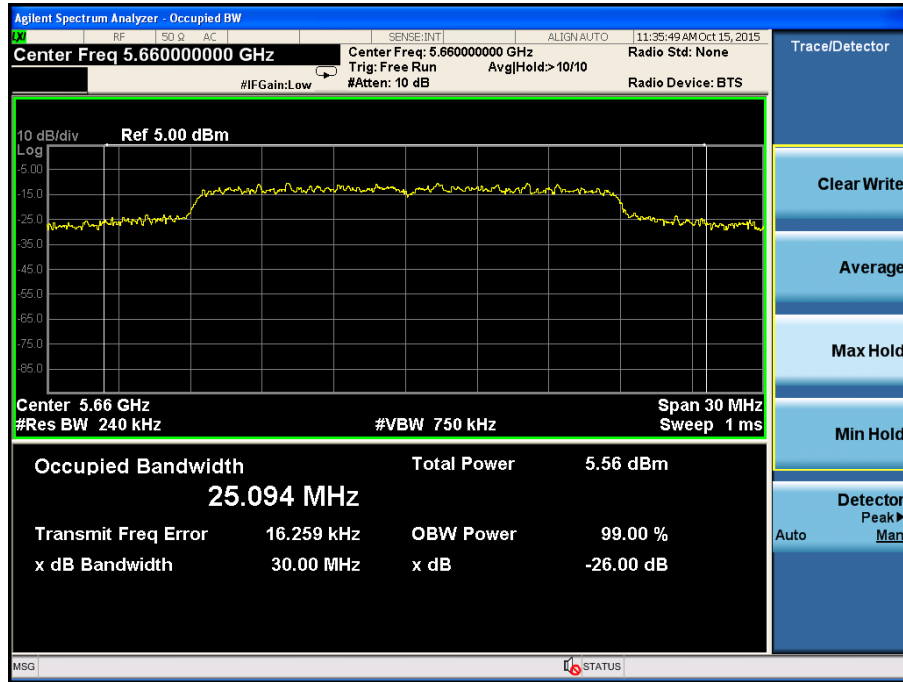
Channel 100



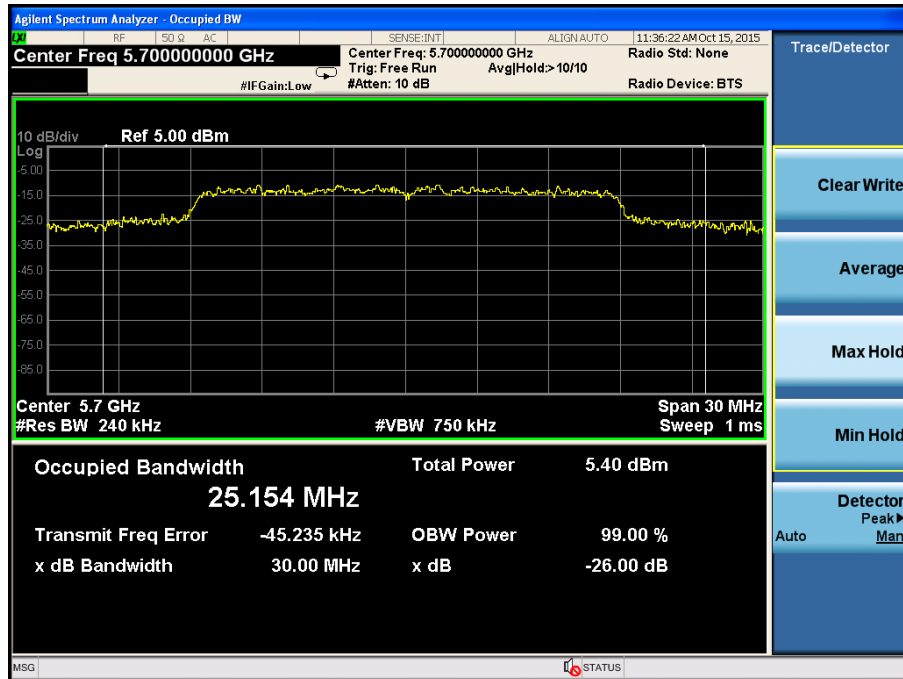
Channel 116



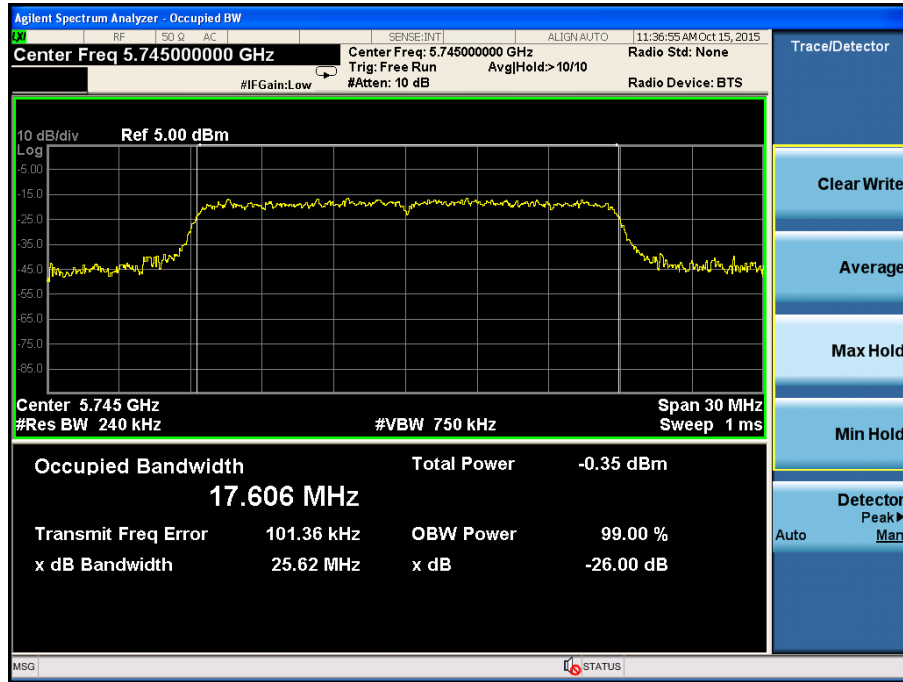
Channel 132



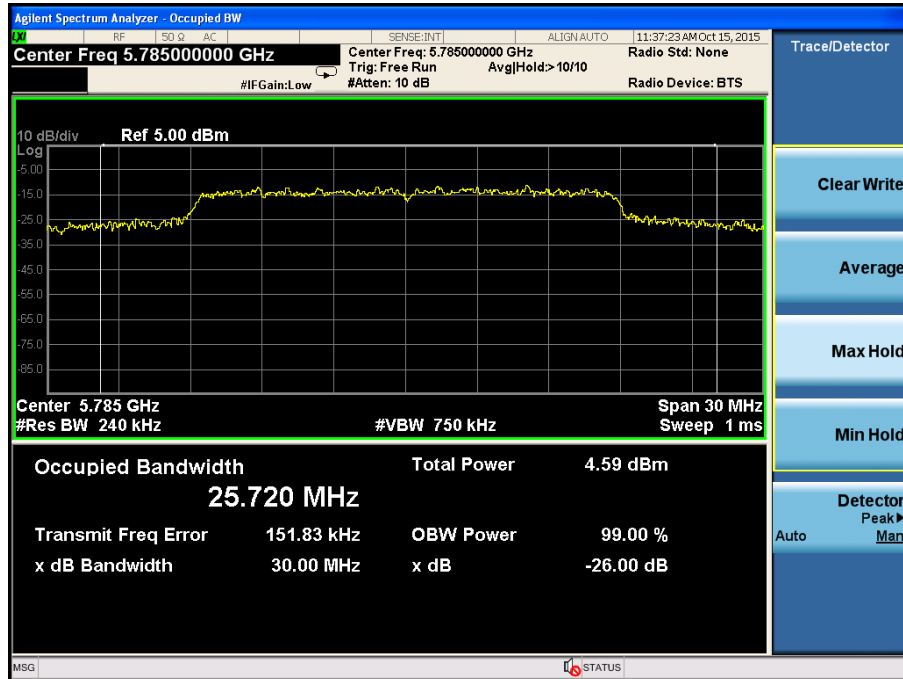
Channel 140



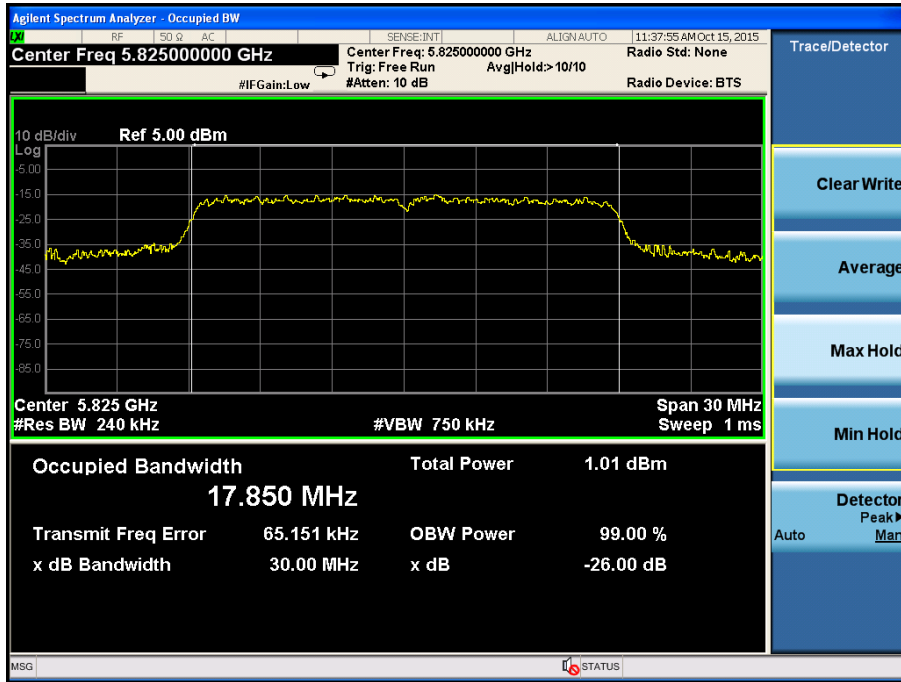
Channel 149



Channel 157



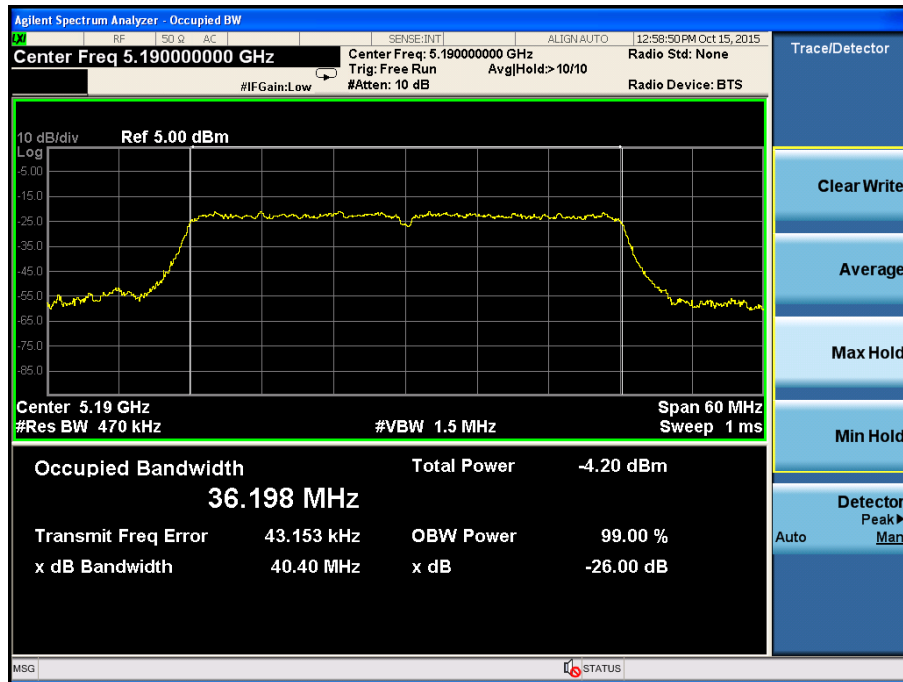
Channel 165



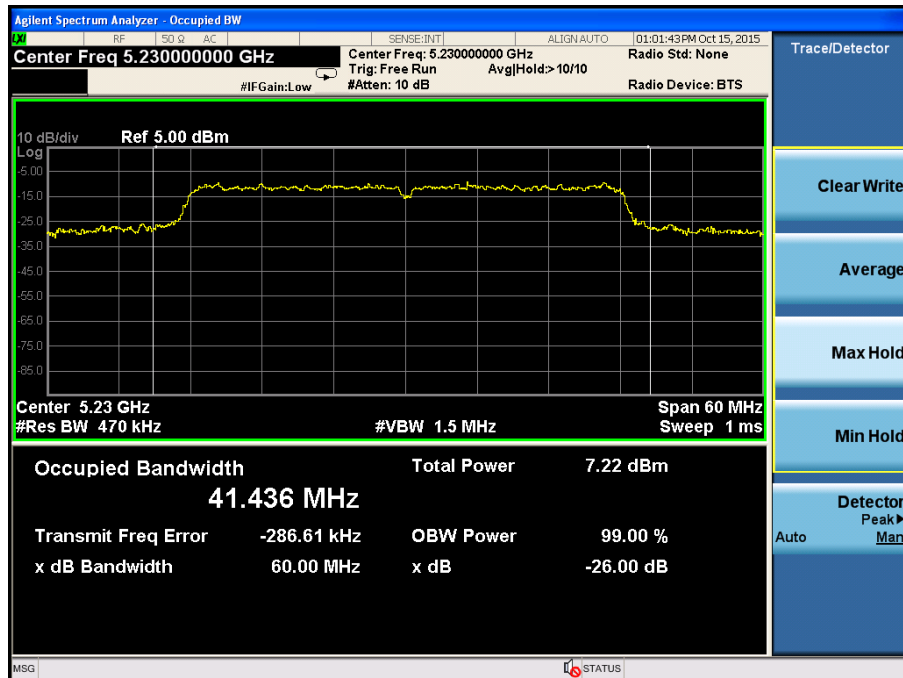
Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 5: Transmit by 802.11ac(40MHz)

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190	40.40	36.198
46	5230	60.00	41.436
54	5270	60.00	42.225
62	5310	40.98	36.227
102	5510	58.93	36.383
110	5550	60.00	50.081
134	5670	60.00	50.104
151	5755	60.00	36.150
159	5795	40.09	60.000

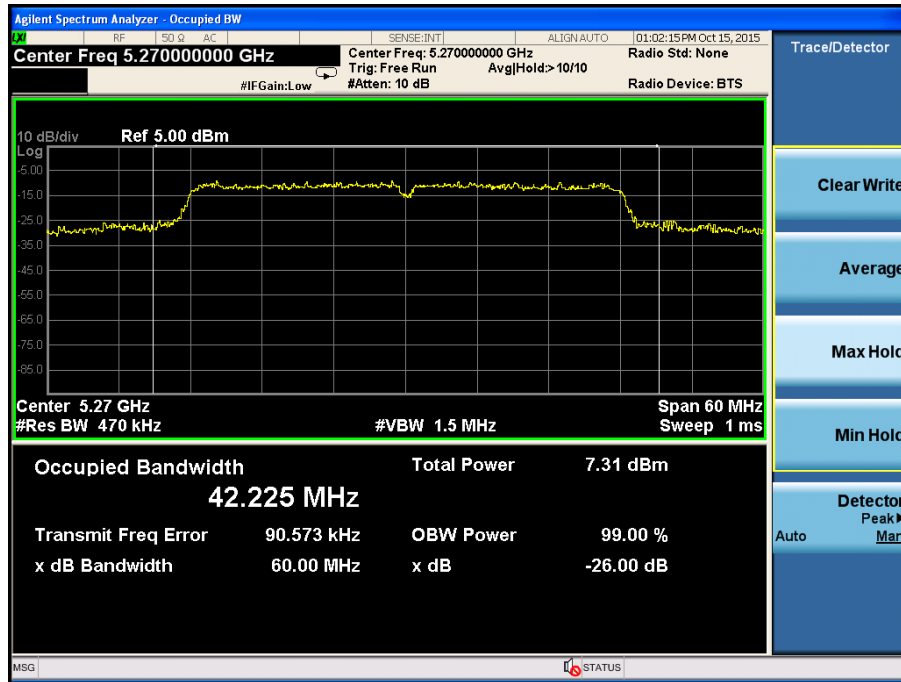
Channel 38



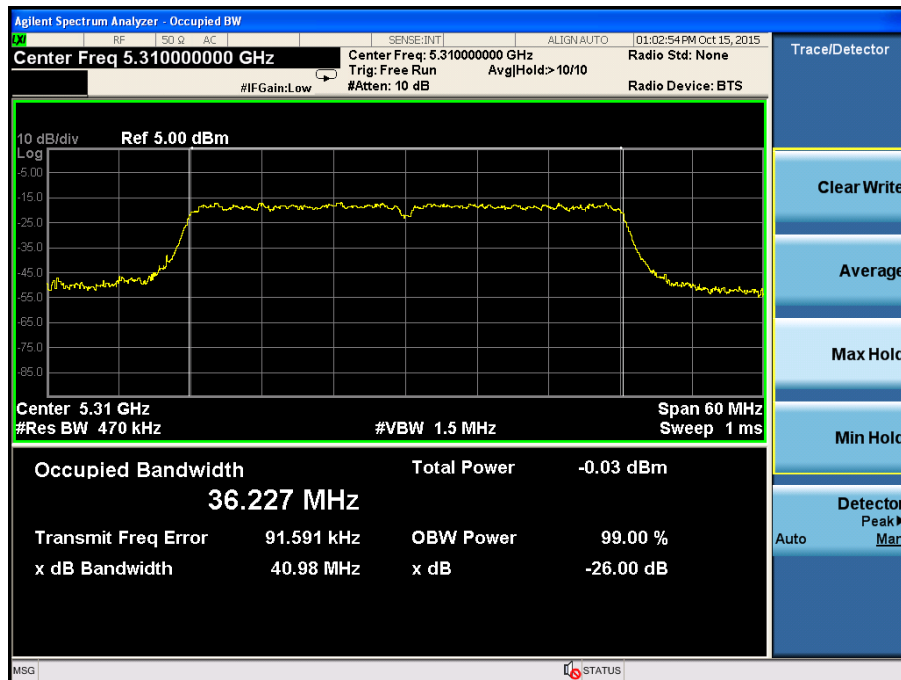
Channel 46



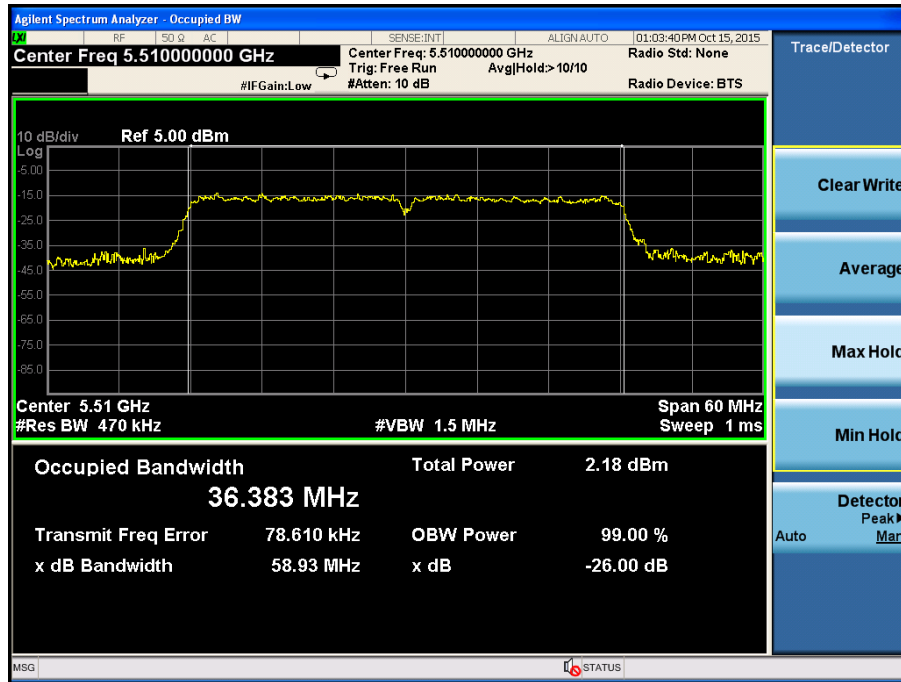
Channel 54



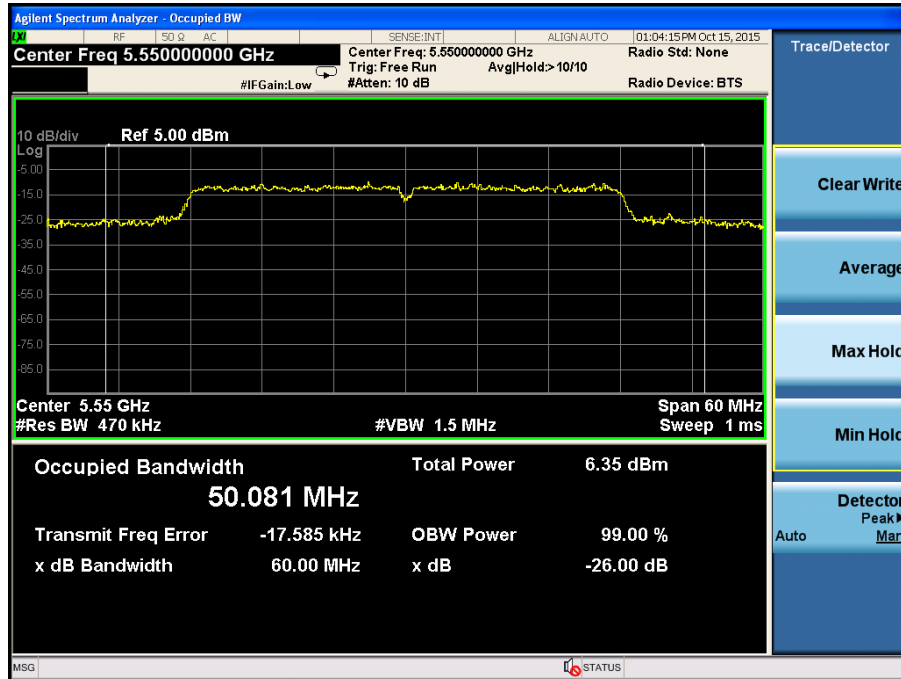
Channel 62



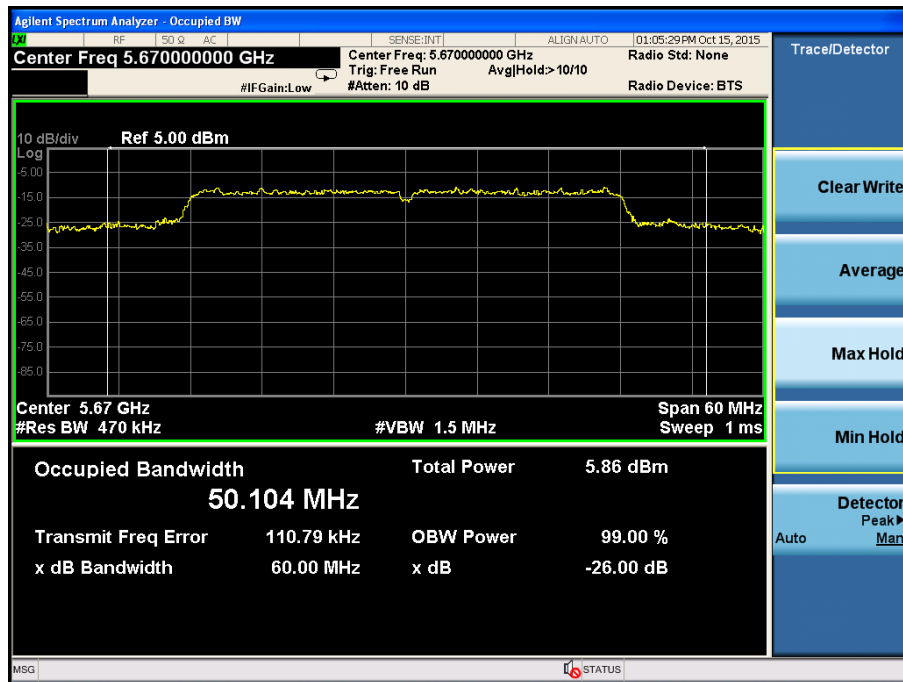
Channel 102



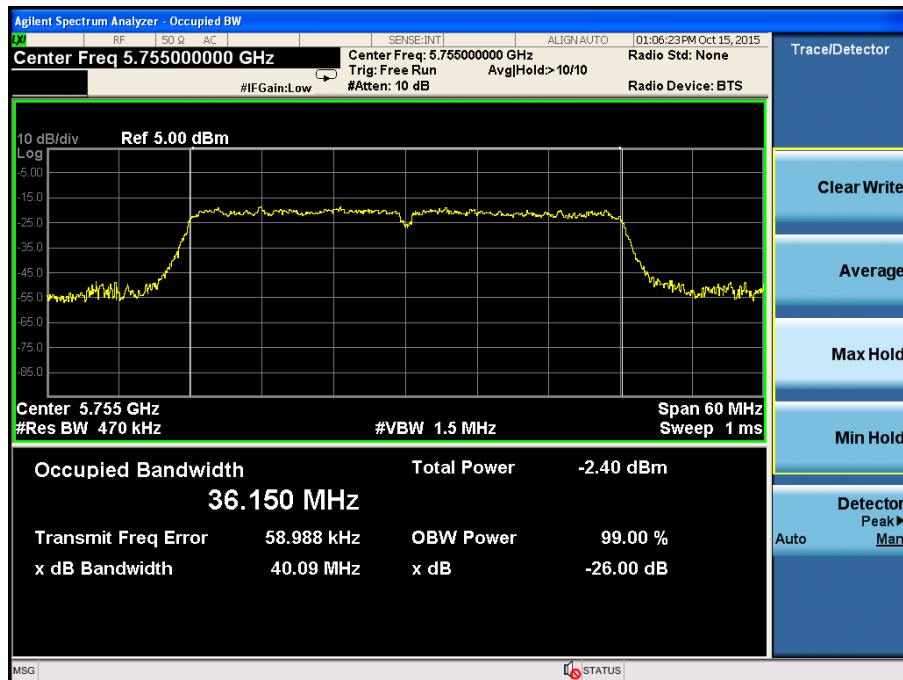
Channel 110



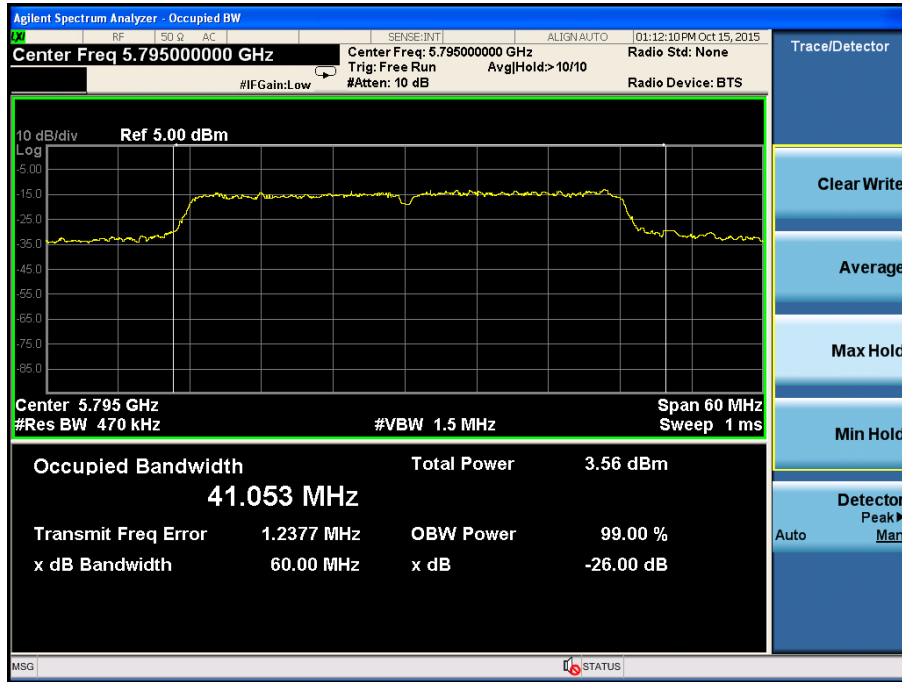
Channel 134



Channel 151



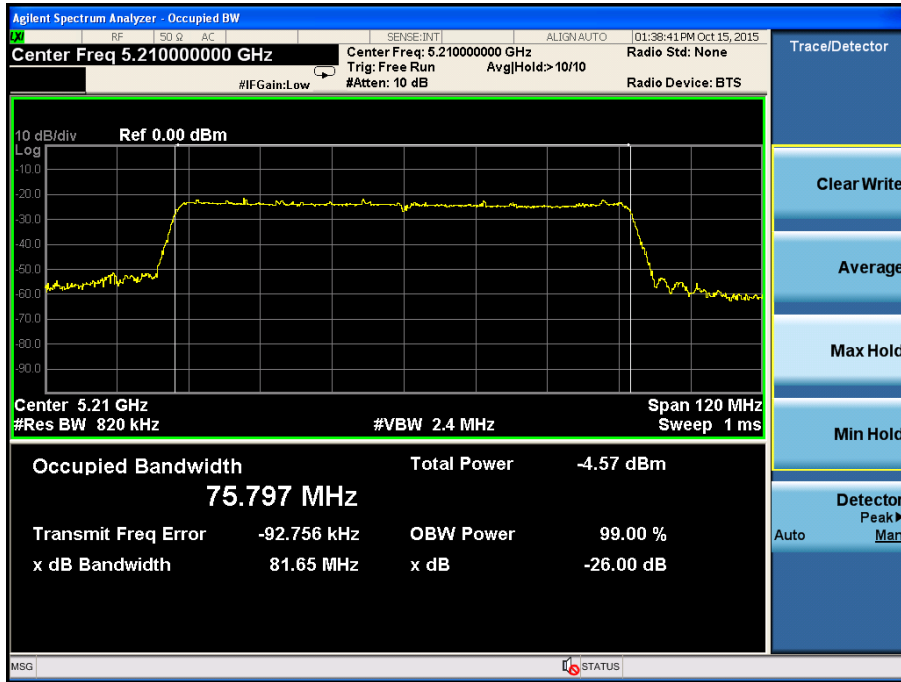
Channel 159



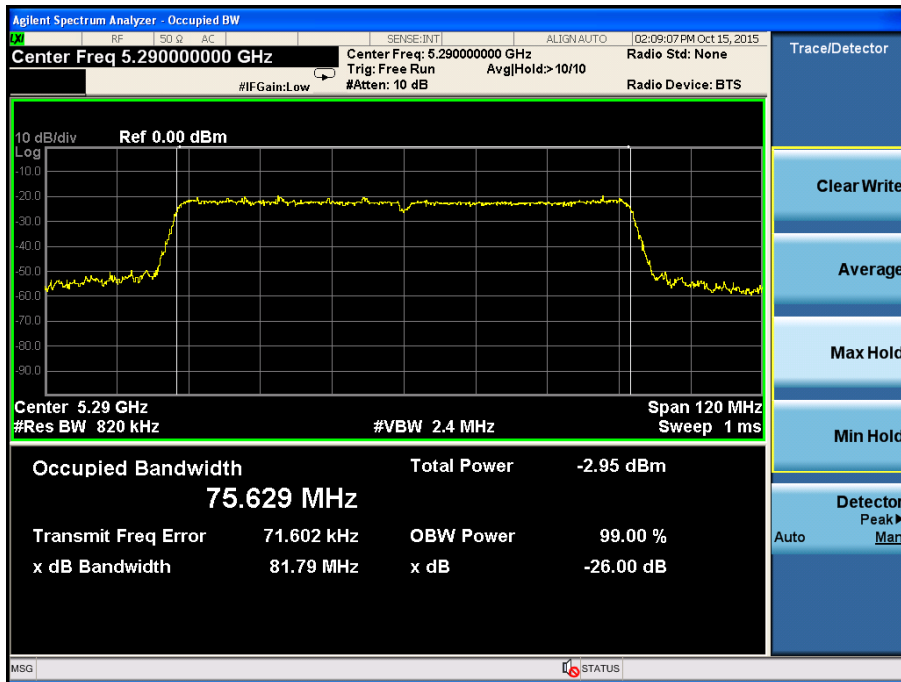
Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 6: Transmit by 802.11ac(80MHz)

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
42	5210	81.65	75.797
58	5290	81.79	75.629
106	5530	118.7	76.153
155	5775	81.37	75.690

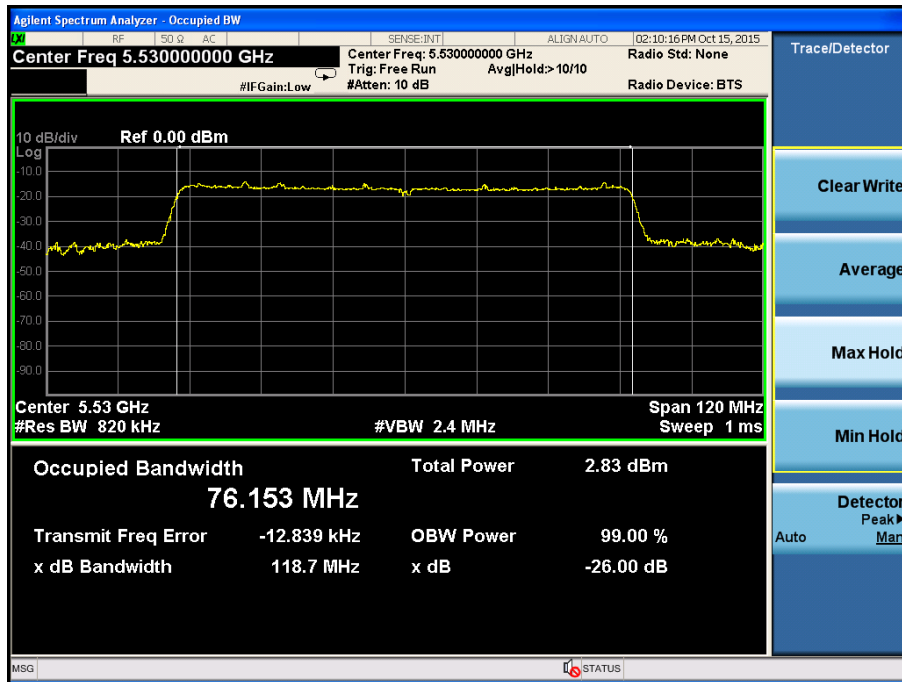
Channel 42 (5210MHz)



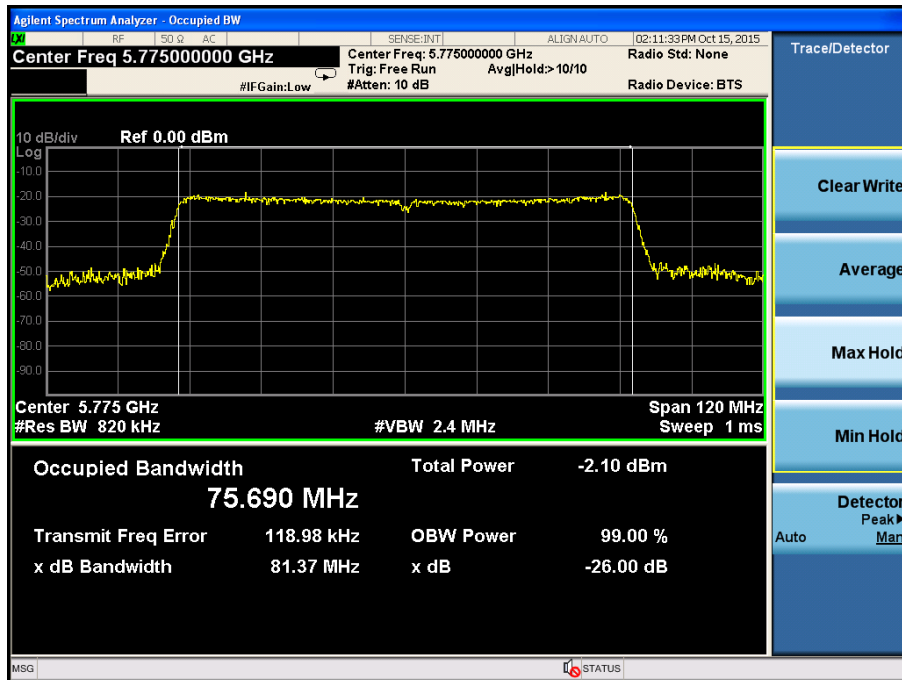
Channel 48 (5290MHz)



Channel 106 (5530MHz)



Channel 155 (5775MHz)



6. 6dB Occupied Bandwidth

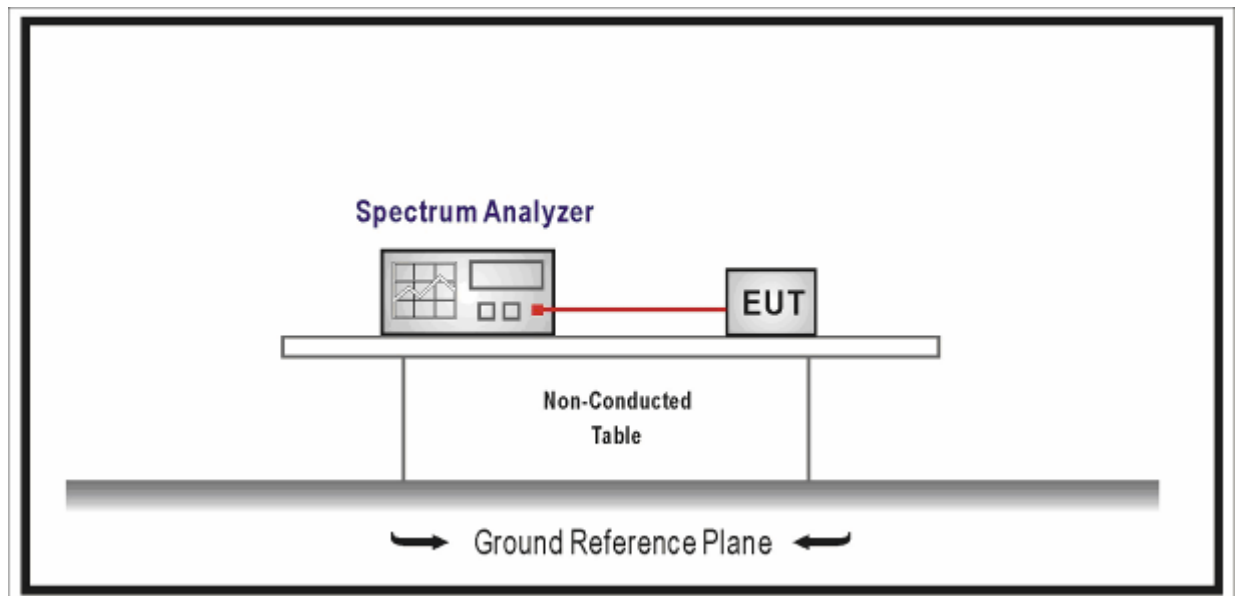
6.1. Test Equipment

Occupied Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

6.2. Test Setup



6.3. Limit

For FCC&IC

The minimum 6 dB bandwidth shall be 500 kHz.

6.4. Test Procedure

According to ANSI C63.4:2014& ANSI C63.10:2013&789033 D02 General UNII Test Procedures New Rules v01& FCC CFR Title 47 Part 15 Subpart E: 2015

- a) Set RBW = in the range of 1% to 5% of the OBW.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Use the -6dBm function of the instrument (if available) and report the measured bandwidth.

6.5. Uncertainty

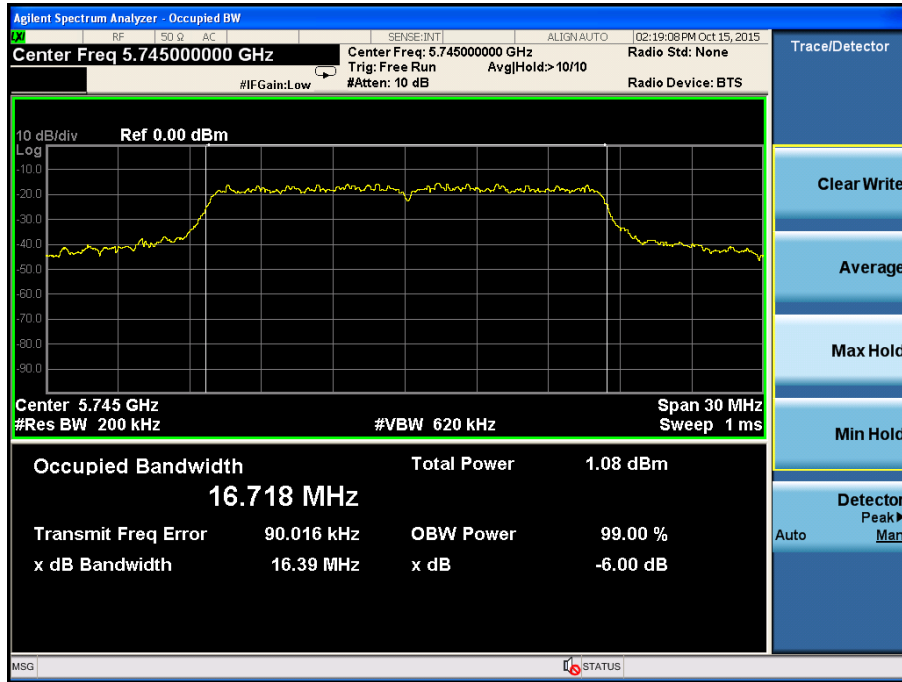
The measurement uncertainty is defined as ± 1 kHz

6.6. Test Result

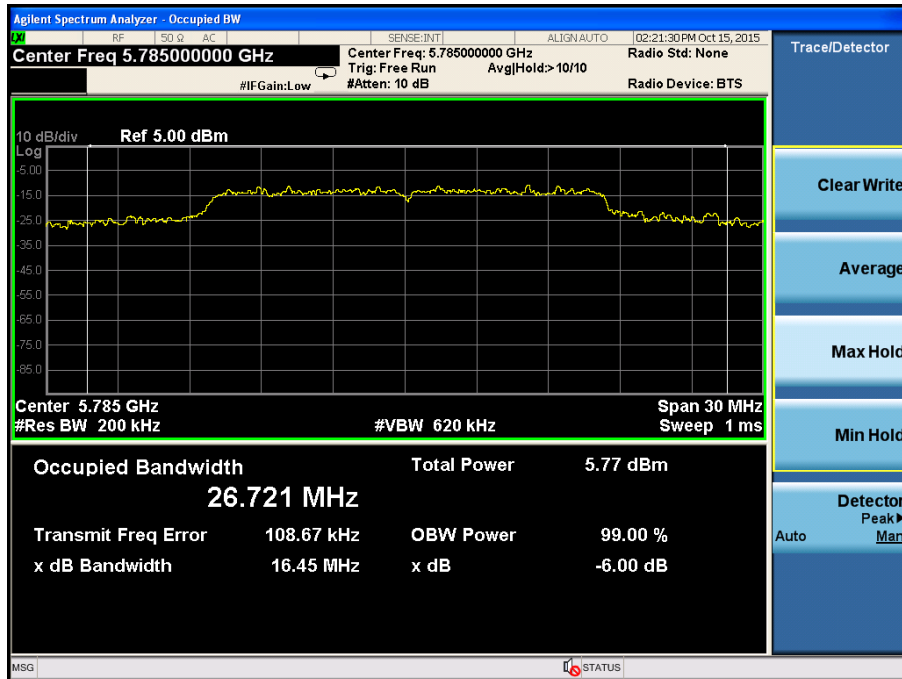
Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a

Channel No.	Frequency (MHz)	6dB Occupied Bandwidth (MHz)
149	5745	16.39
157	5785	16.45
165	5825	16.37

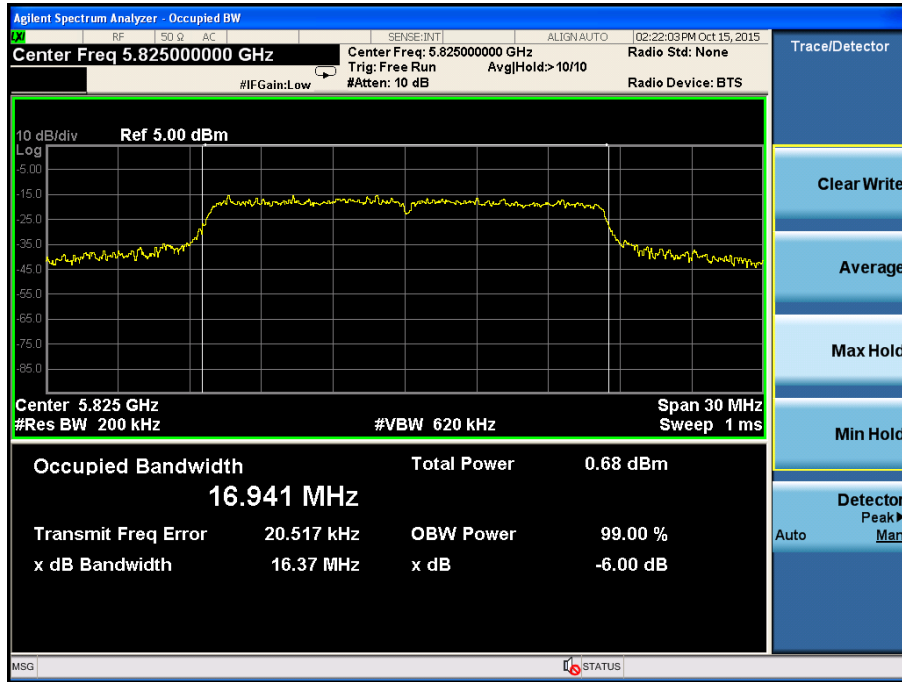
Channel 149 (5745MHz)



Channel 157(5785MHz)



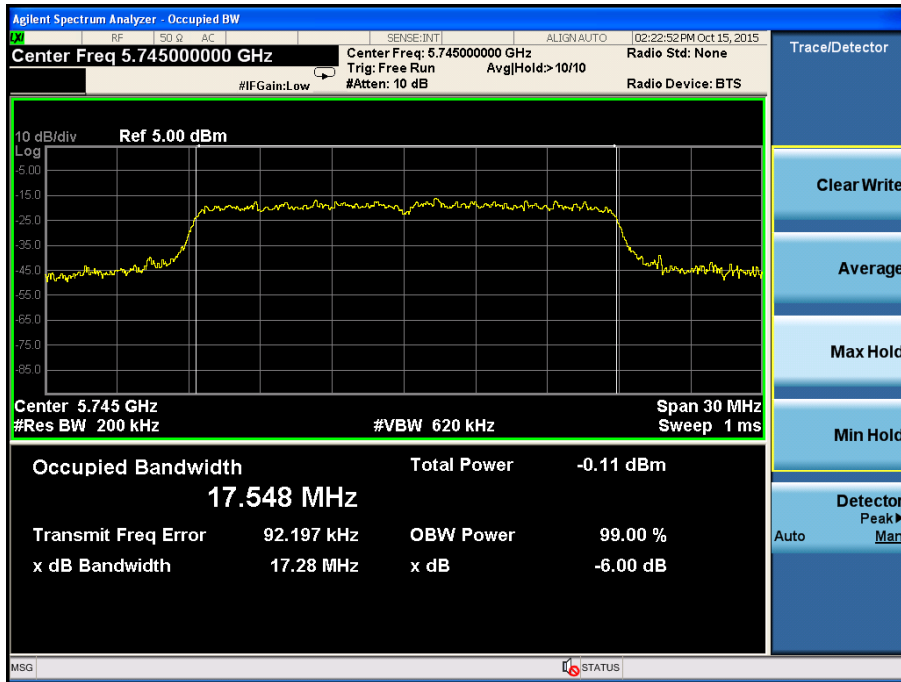
Channel 165 (5825MHz)



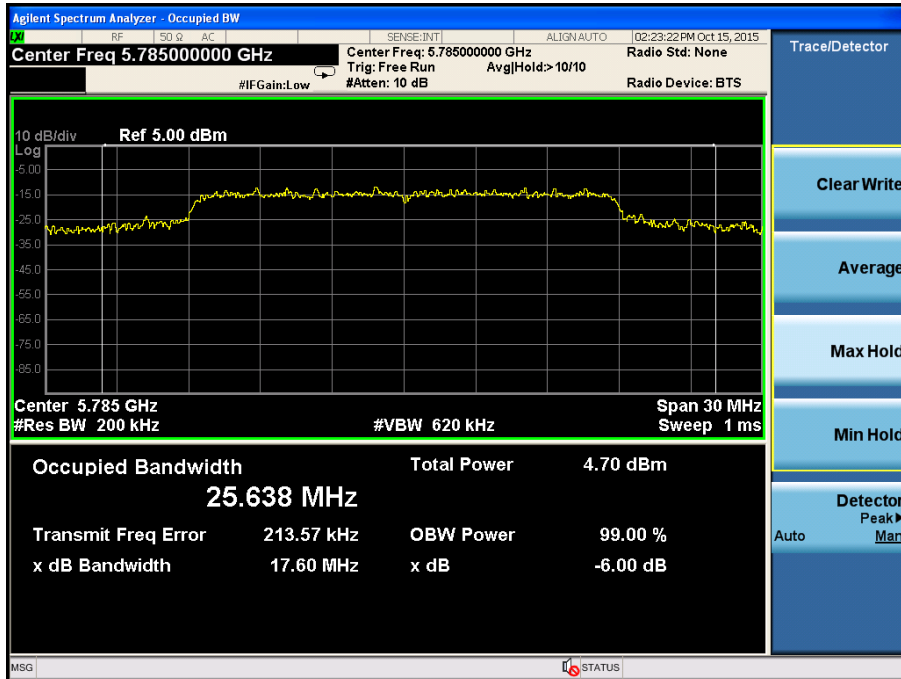
Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	6dB Occupied Bandwidth (MHz)
149	5745	17.28
157	5785	17.60
165	5825	17.36

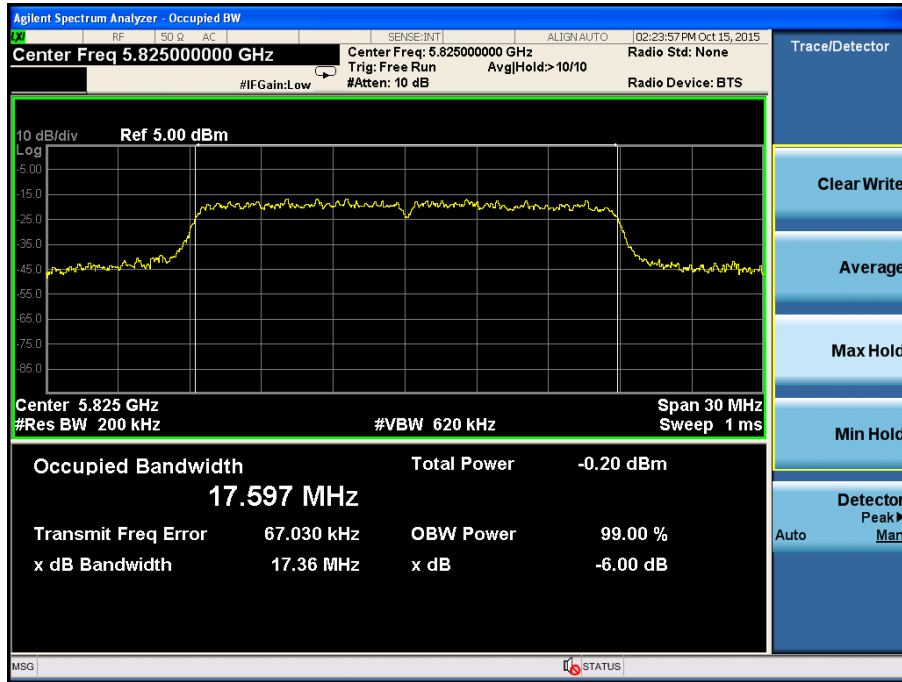
Channel 149 (5745MHz)



Channel 157(5785MHz)



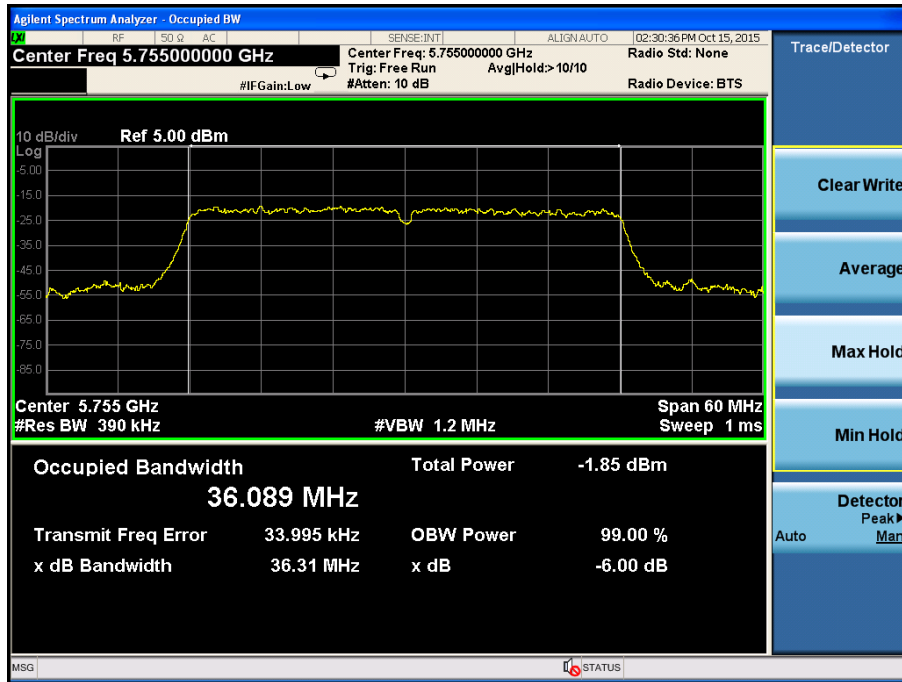
Channel 165 (5825MHz)



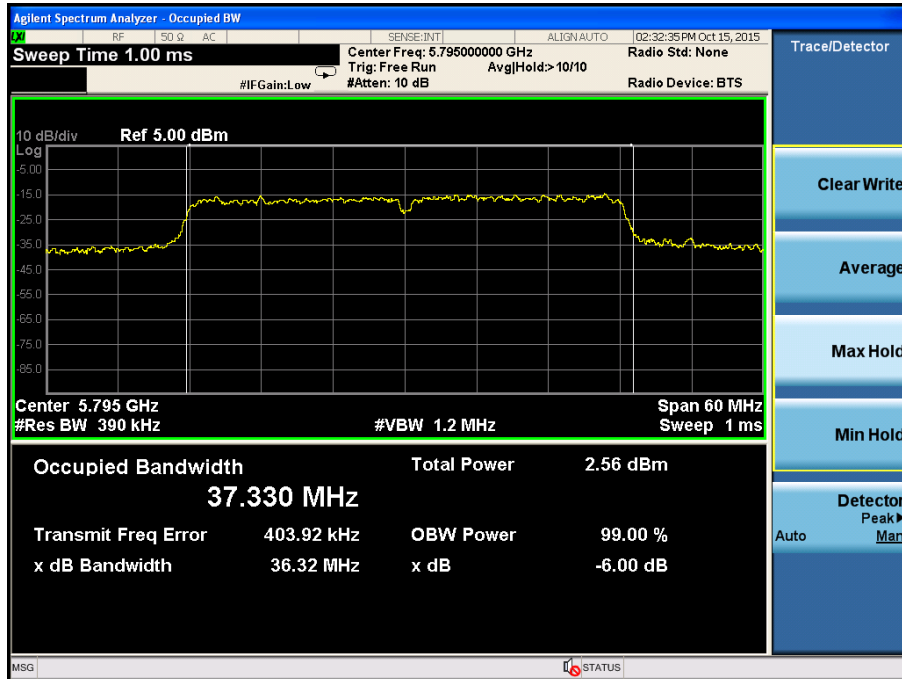
Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz)

Channel No.	Frequency (MHz)	6dB Occupied Bandwidth (MHz)
151	5755	36.31
159	5795	36.32

Channel 151 (5755MHz)



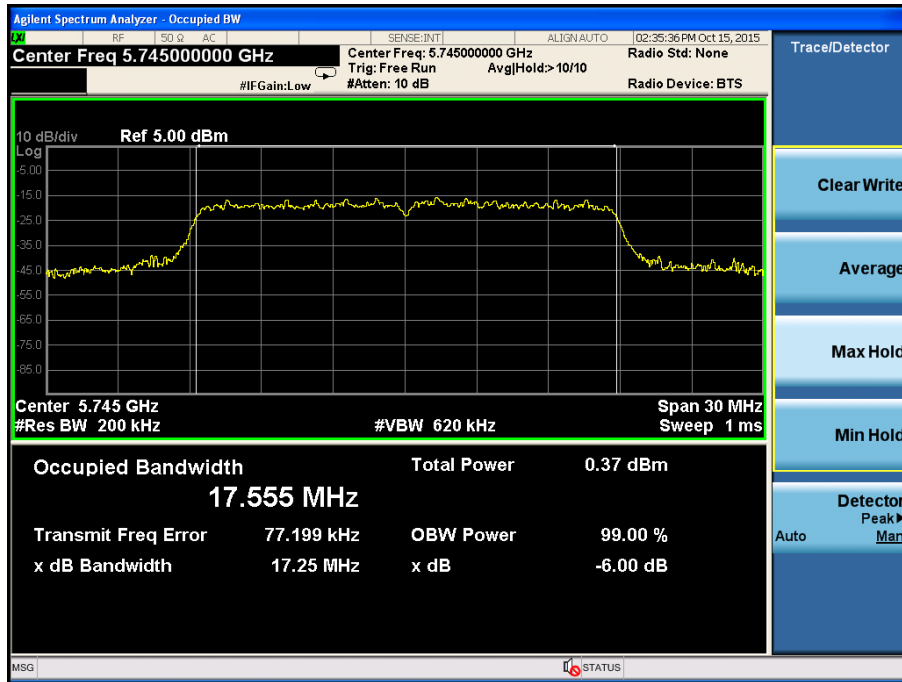
Channel 159(5795MHz)



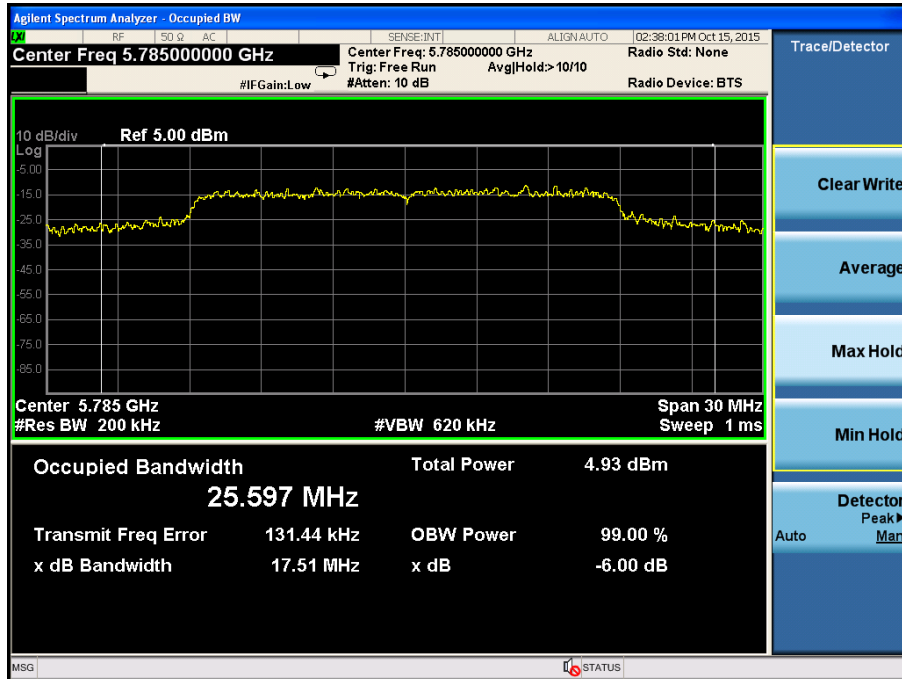
Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 4: Transmit by 802.11ac(20MHz)

Channel No.	Frequency (MHz)	Ant 0 6dB Occupied Bandwidth (MHz)
149	5745	17.25
157	5785	17.51
165	5825	17.42

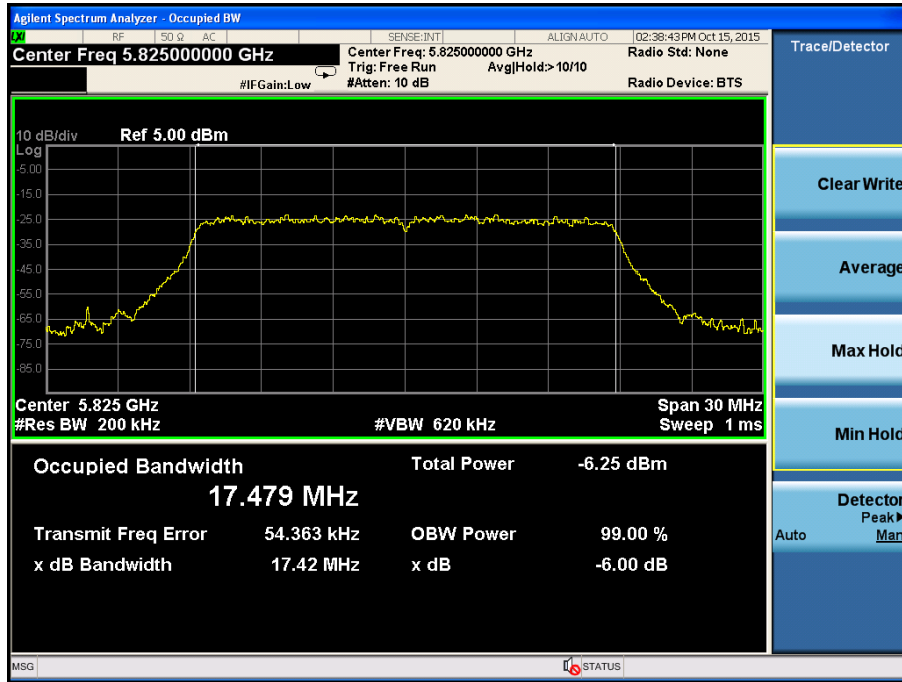
Channel 149 (5745MHz)



Channel 157(5785MHz)



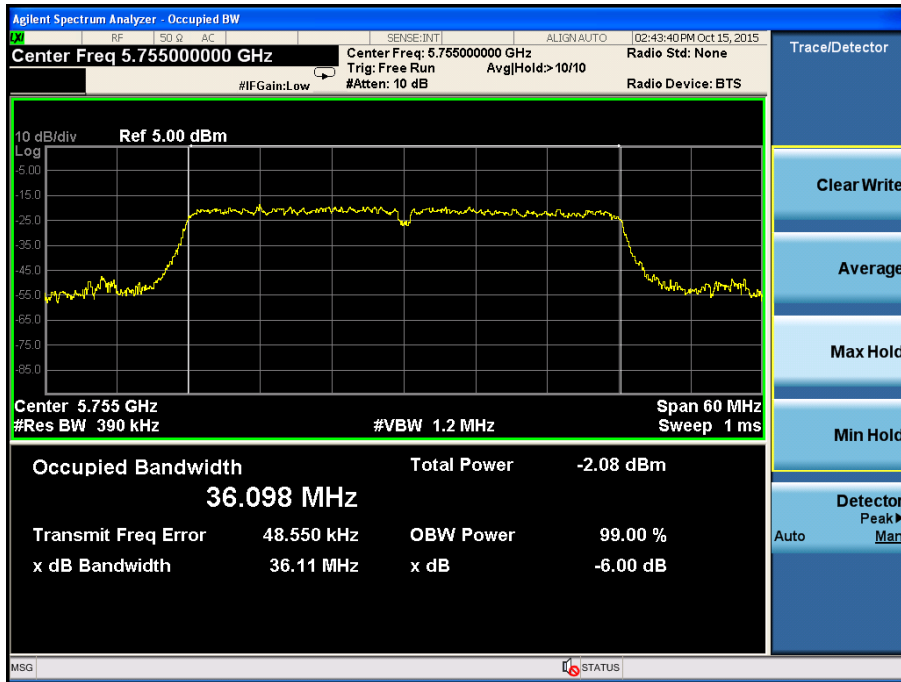
Channel 165 (5825MHz)



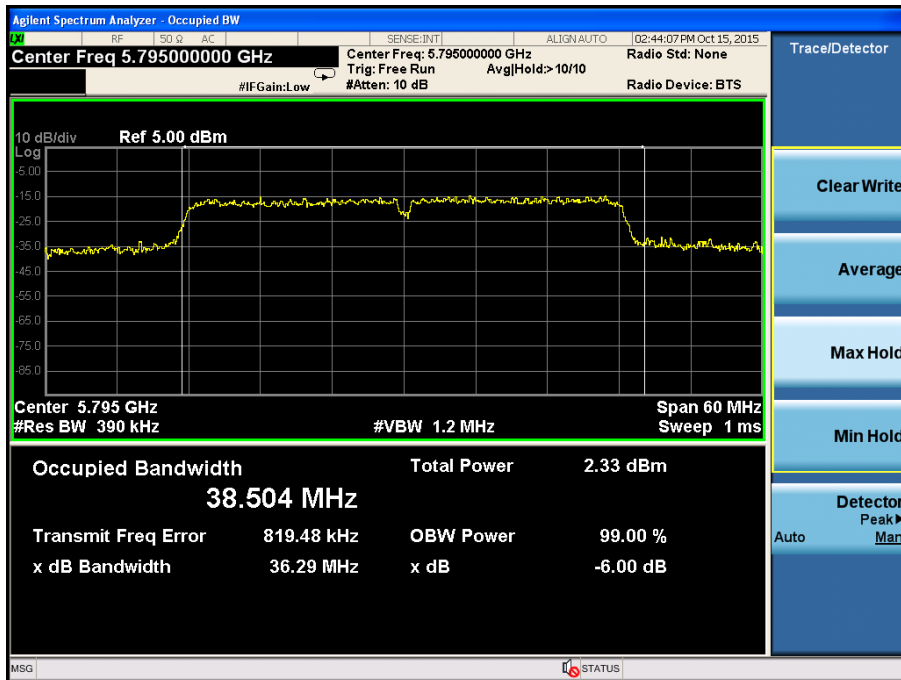
Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 5: Transmit by 802.11ac(40MHz)

Channel No.	Frequency (MHz)	Ant 0 6dB Occupied Bandwidth (MHz)
151	5755	36.11
159	5795	36.29

Channel 151 (5755MHz)



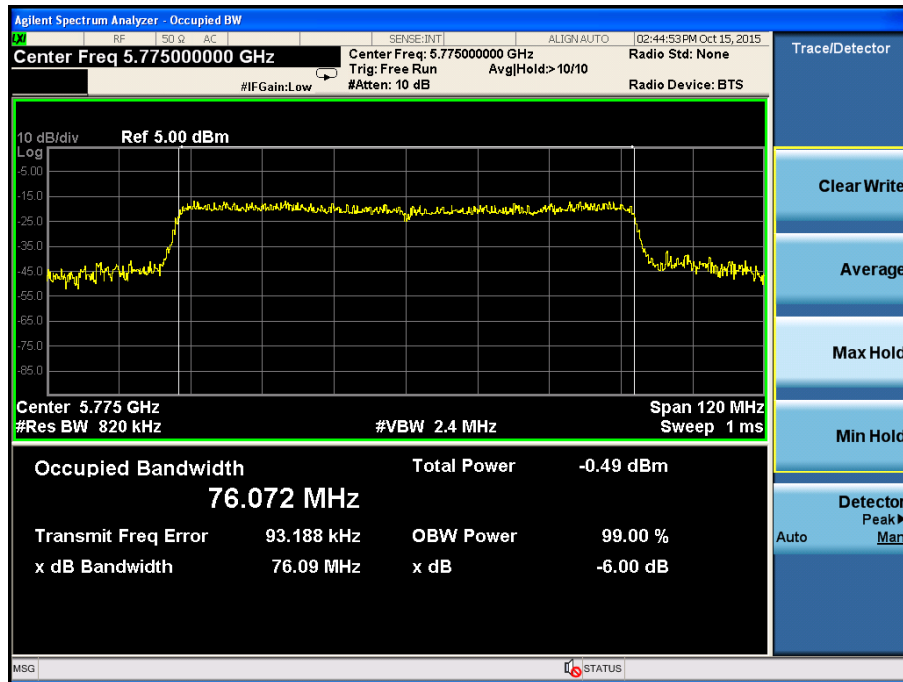
Channel 159(5795MHz)



Product	: AC450 Wireless Nano USB Adapter
Test Item	: Occupied Bandwidth
Test Site	: TR-8
Test Mode	: Mode 6: Transmit by 802.11ac(80MHz)

Channel No.	Frequency (MHz)	Ant 0 6dB Occupied Bandwidth (MHz)
155	5775	76.09

Channel 155(5775MHz)



7. Power Output

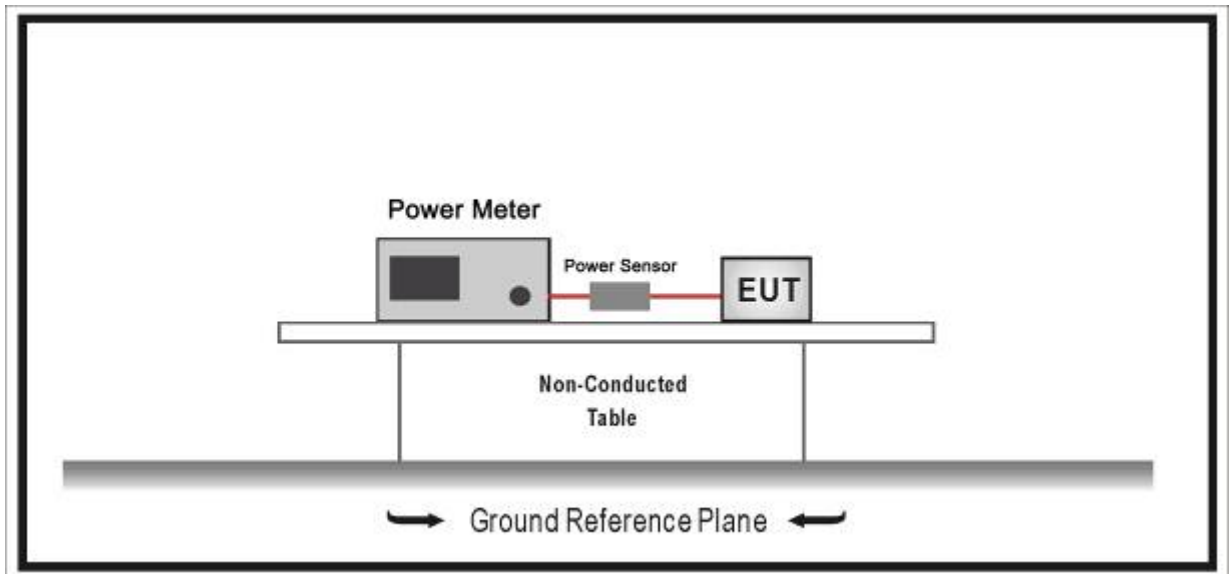
7.1. Test Equipment

Power Output / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
DC Power Supply	IDRC	CD-035-020PR	977272	2016.09.16
Power Meter	Anritsu	ML2495A	0905006	2016.10.29
Power Sensor	Anritsu	MA2411B	0846014	2016.10.29
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

7.2. Test Setup



7.3. Limit

- For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power

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

- For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

7.4. Test Procedure

According to ANSI C63.4:2014& ANSI C63.10:2013&789033 D02 General UNII Test Procedures New Rules v01& FCC CFR Title 47 Part 15 Subpart E: 2015

Use the wideband power meter to test RMS power and record the result.

However, if the bandwidth of the single is higher than 40MHz, use the Spectrum Analyzer and the channel power function to test RMS power and record the result.

Maximum conducted output power using a power meter

Method PM is Measurement using an RF average power meter. The procedure for this method is as follows:

a) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:

1) The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.

2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.

3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

- b) If the transmitter does not transmit continuously, measure the duty cycle D of the transmitter output signal as described in 12.2.
- c) Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
- d) Adjust the measurement in dBm by adding $[10 \log (1 / D)]$, where D is the duty cycle {e.g., $[10 \log (1 / 0.25)]$, if the duty cycle is 25%}

Maximum conducted output power measurement using a spectrum analyzer

Method SA-1

Method SA-1 uses trace averaging with the EUT transmitting at full power throughout each sweep.

The procedure for this method is as follows:

- a) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.
- b) Set RBW = 1 MHz.
- c) Set VBW \geq 3 MHz.
- d) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
- e) Sweep time = auto.
- f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- g) If transmit duty cycle $< 98\%$, use a video trigger with the trigger level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle $\geq 98\%$, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run."
- h) Trace average at least 100 traces in power averaging (rms) mode.
- i) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument's band power measurement function, with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.

Method SA-2

Method SA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction. The procedure for this method is as follows:

- a) Measure the duty cycle D of the transmitter output signal as described in 12.2.
- b) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.
- c) Set RBW = 1 MHz.
- d) Set VBW \geq 3 MHz.
- e) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that

narrowband signals are not lost between frequency bins.)

f) Sweep time = auto.

g) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

h) Do not use sweep triggering. Allow the sweep to “free run.”

i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.

j) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument’s band power measurement function with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.

k) Add $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add $[10 \log (1 / 0.25)] = 6$ dB if the duty cycle is 25%.

Method SA-3

Method SA-3 uses rms detection with max hold. The procedure for this method is as follows:

a) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.

b) Set sweep trigger to “free run.”

c) Set RBW = 1 MHz

d) Set VBW \geq 3 MHz

e) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)

f) Sweep time $\leq [(\text{number of points in sweep}) \times T]$, where T is defined in 12.2. If this gives a sweep time less than the auto sweep time of the instrument, then method SA-3A shall not be used. (The purpose of this step is so that averaging time in each bin is less than or equal to the minimum time of a transmission.)

g) Detector = RMS (power averaging).

h) Trace mode = max hold.

i) Allow max hold to run for at least 60 s or longer as needed to allow the trace to stabilize.

j) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument’s band power measurement function with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW of the spectrum.

7.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

7.6. Test Result

Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)
36	5180	12.23	24
44	5200	11.72	24
48	5240	12.03	24
52	5260	11.61	24
60	5300	11.60	24
64	5320	11.59	24
100	5500	20.72	24
116	5580	13.62	24
132	5660	15.98	24
140	5700	21.38	24
149	5745	15.24	30
157	5785	21.00	30
165	5825	14.92	30

Note1: For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

Note2: For the band 5.725-5.85 GHz, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

Product	: AC450 Wireless Nano USB Adapter
Test Item	: Power Output
Test Site	: TR-8
Test Mode	: Mode 2: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)
36	5180	11.02	24
44	5200	14.73	24
48	5240	13.24	24
52	5260	13.79	24
60	5300	13.92	24
64	5320	13.20	24
100	5500	20.68	24
116	5580	20.93	24
132	5660	20.54	24
140	5700	20.34	24
149	5745	13.59	30
157	5785	20.22	30
165	5825	13.36	30

Note1: For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

Note2: For the band 5.725-5.85 GHz, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

Product	: AC450 Wireless Nano USB Adapter
Test Item	: Power Output
Test Site	: TR-8
Test Mode	: Mode 3: Transmit by 802.11n(40MHz)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)
38	5190	13.12	24
46	5230	13.39	24
54	5270	13.03	24
62	5310	11.59	24
102	5510	15.04	24
110	5550	16.16	24
134	5670	13.23	24
151	5755	13.04	30
159	5795	15.63	30

Note1: For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

Note2: For the band 5.725-5.85 GHz, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

Product	: AC450 Wireless Nano USB Adapter
Test Item	: Power Output
Test Site	: TR-8
Test Mode	: Mode 4: Transmit by 802.11ac(20MHz)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)
36	5180	11.89	24
44	5200	13.56	24
48	5240	13.68	24
52	5260	12.75	24
60	5300	13.18	24
64	5320	13.23	24
100	5500	15.70	24
116	5580	12.36	24
132	5660	14.88	24
140	5700	12.16	24
149	5745	13.56	30
157	5785	20.16	30
165	5825	14.93	30

Note1: For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

Note2: For the band 5.725-5.85 GHz, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

Product	: AC450 Wireless Nano USB Adapter
Test Item	: Power Output
Test Site	: TR-8
Test Mode	: Mode 5: Transmit by 802.11ac(40MHz)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)
38	5190	12.69	24
46	5230	13.08	24
54	5270	12.26	24
62	5310	12.32	24
102	5510	14.53	24
110	5550	15.98	24
134	5670	16.03	24
151	5755	12.79	30
159	5795	15.99	30

Note1: For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

Note2: For the band 5.725-5.85 GHz, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 6: Transmit by 802.11ac(80MHz)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)
42	5210	12.13	24
58	5290	12.24	24
106	5530	14.07	24
155	5775	15.24	30

Note1: For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

Note2: For the band 5.725-5.85 GHz, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

Note3: Measurement Power=Reading Level + 10*Log(1/(Duty Cycle))

8. Peak Power Spectral Density

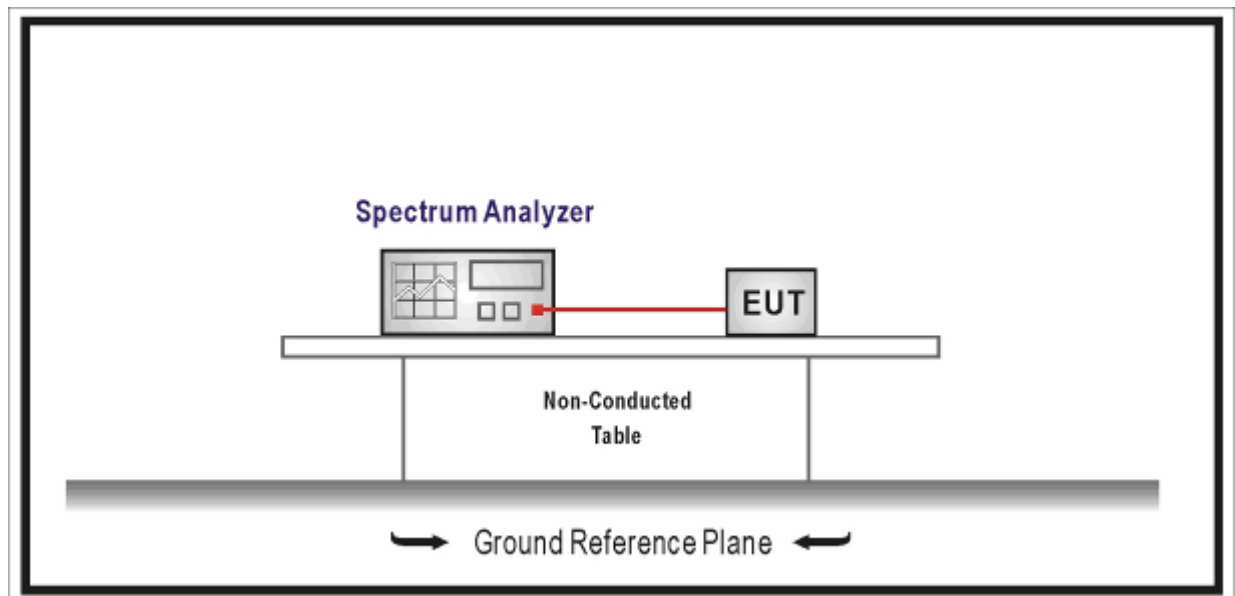
8.1. Test Equipment

Peak Power Spectral Density / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

8.2. Test Setup



8.3. Limit

- For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm +

10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

- For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

8.4. Test Procedure

According to ANSI C63.4:2014& ANSI C63.10:2013&789033 D02 General UNII Test Procedures New Rules v01& FCC CFR Title 47 Part 15 Subpart E: 2015

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

For 5150-5725MHz

- a) Set RBW = 1 MHz.
- b) Set VBW \geq 3 MHz.
- c) Sweep time = auto.
- d) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

For 5725-5875MHz

- e) Set RBW=510KHz
- f) VBW \geq 3RBW
- g) Sweep time=auto
- h) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

8.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

8.6. Test Result

Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a

Channel No.	Frequency (MHz)	Measurement Power Output (dBm/MHz)	Duty Cycle (%)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)
36	5180	-11.472	86.06	-10.820	11.0
40	5220	-10.790	86.06	-10.138	11.0
48	5240	-10.458	86.06	-9.806	11.0
52	5260	-9.870	86.06	-9.218	11.0
60	5300	-10.447	86.06	-9.795	11.0
64	5320	-10.777	86.06	-10.125	11.0
100	5500	-11.226	86.06	-10.574	11.0
116	5580	-11.231	86.06	-10.579	11.0
132	5660	-12.502	86.06	-11.850	11.0
140	5700	-11.985	86.06	-11.333	11.0

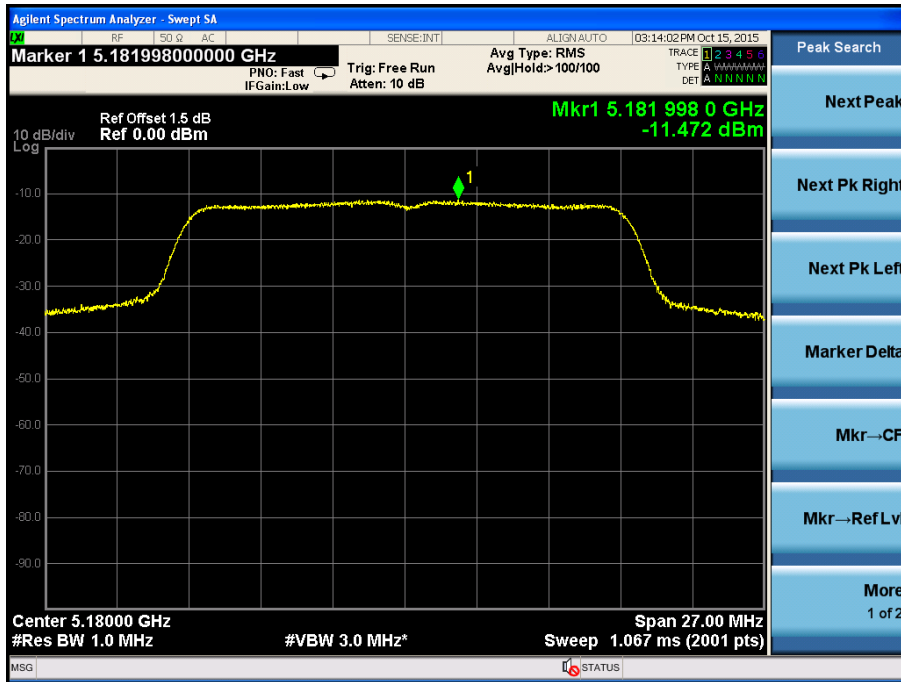
Channel No.	Frequency (MHz)	Measurement Power Output (dBm/500KHz)	Duty Cycle (%)	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)
149	5745	-19.747	86.06	-19.095	30.0
157	5785	-15.550	86.06	-14.898	30.0
165	5825	-18.924	86.06	-18.272	30.0

Note1: When EUT duty cycle < 98%, the total PSD = Reading Level + 10*log(1/duty cycle)

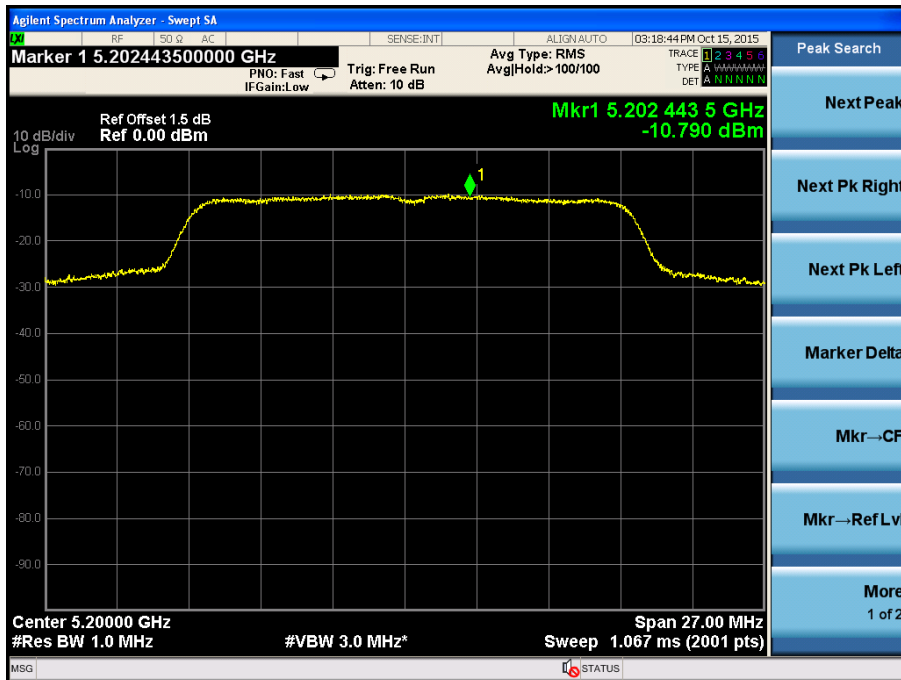
Note2: The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

Note3: For the band 5.725-5.85 GHz, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

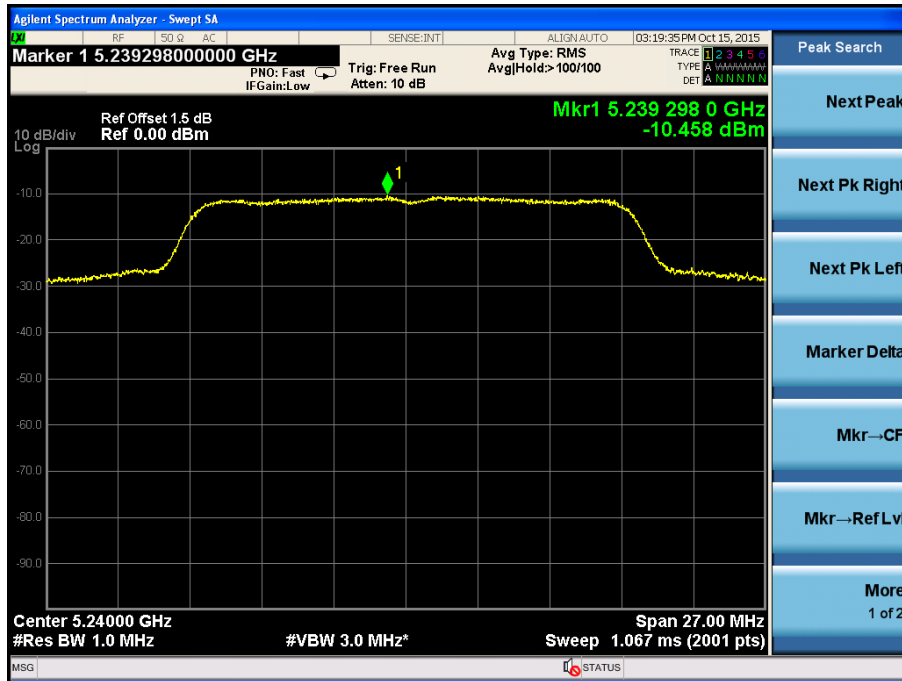
Channel 36



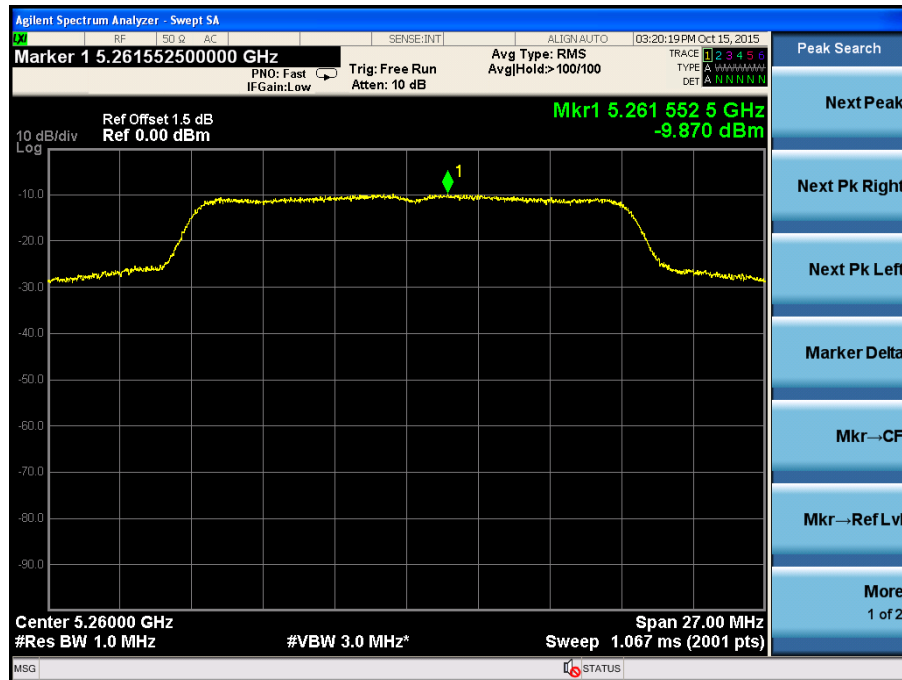
Channel 40



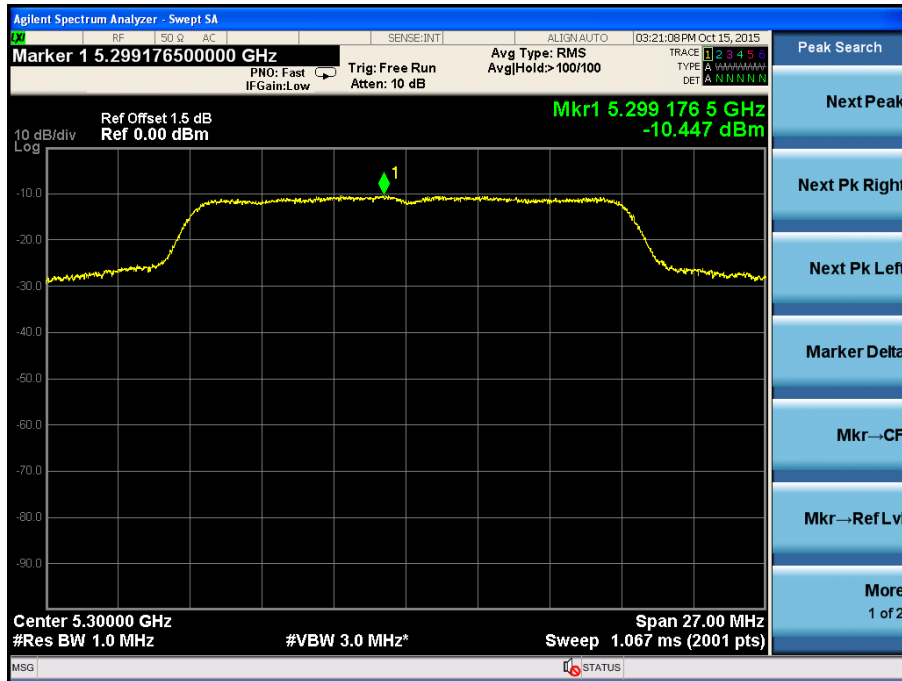
Channel 48



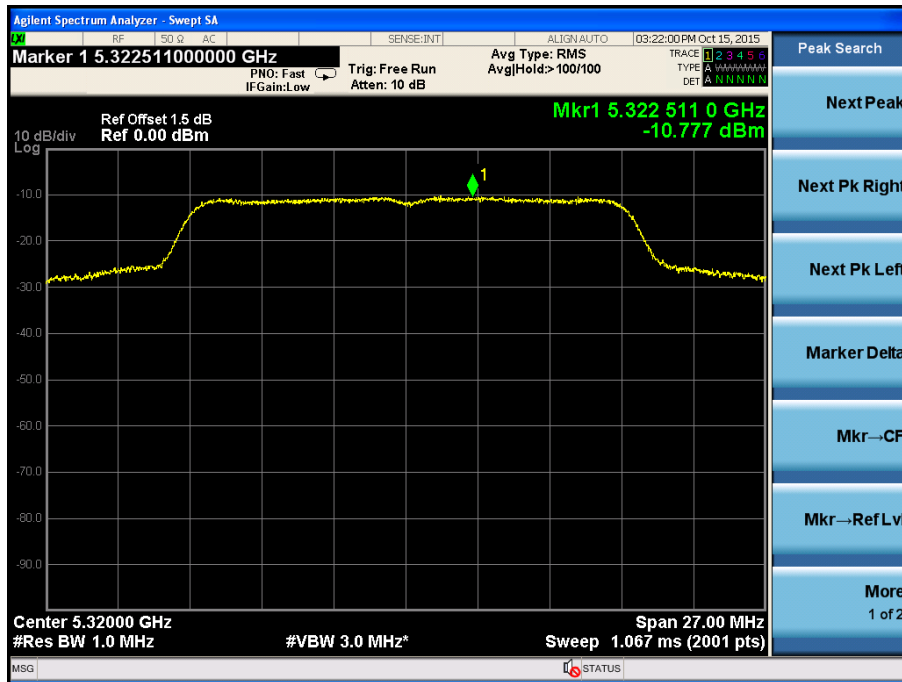
Channel 52



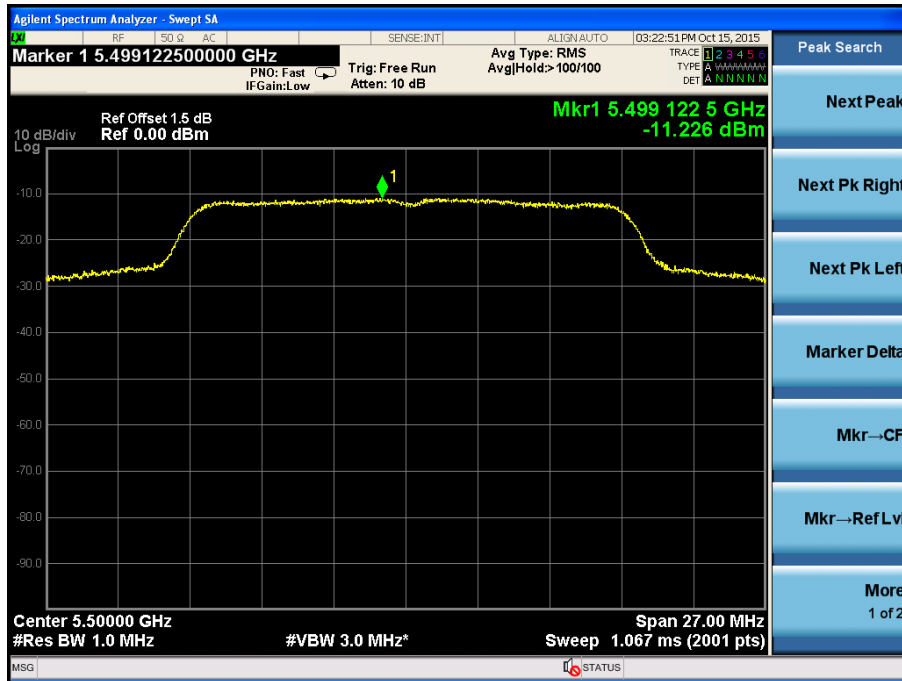
Channel 60



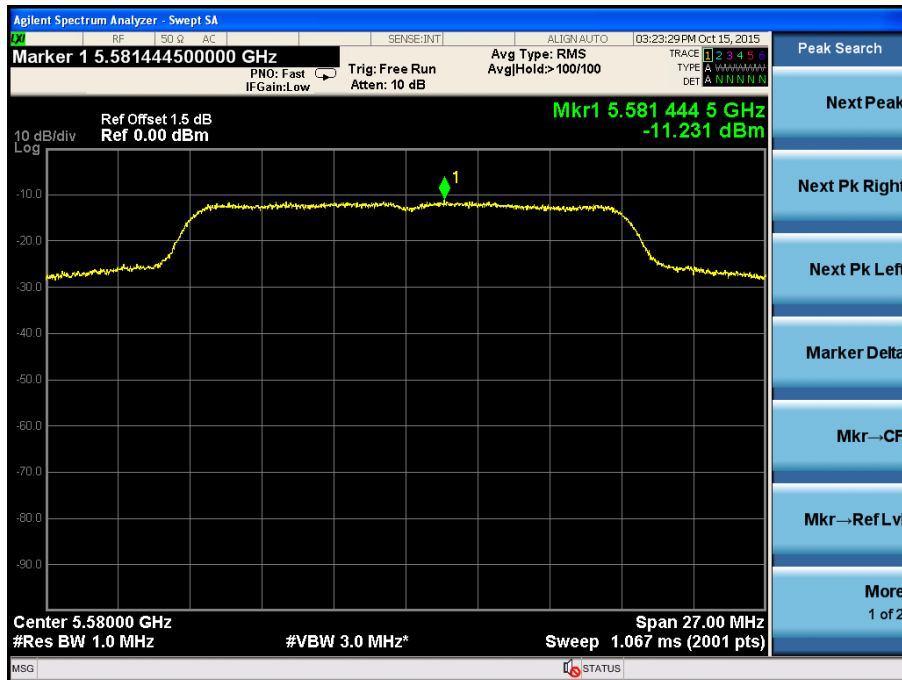
Channel 64



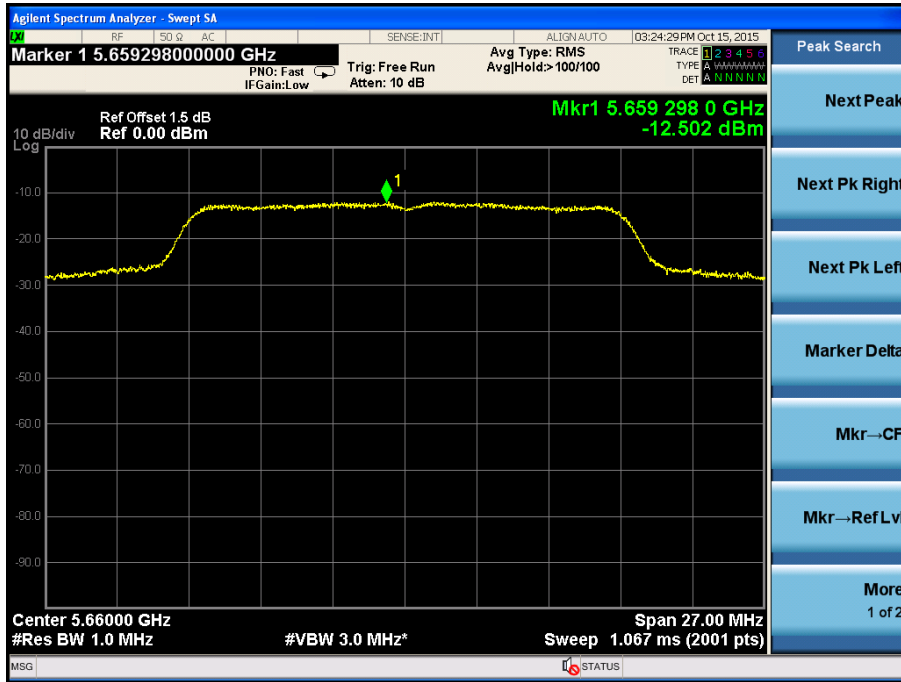
Channel 100



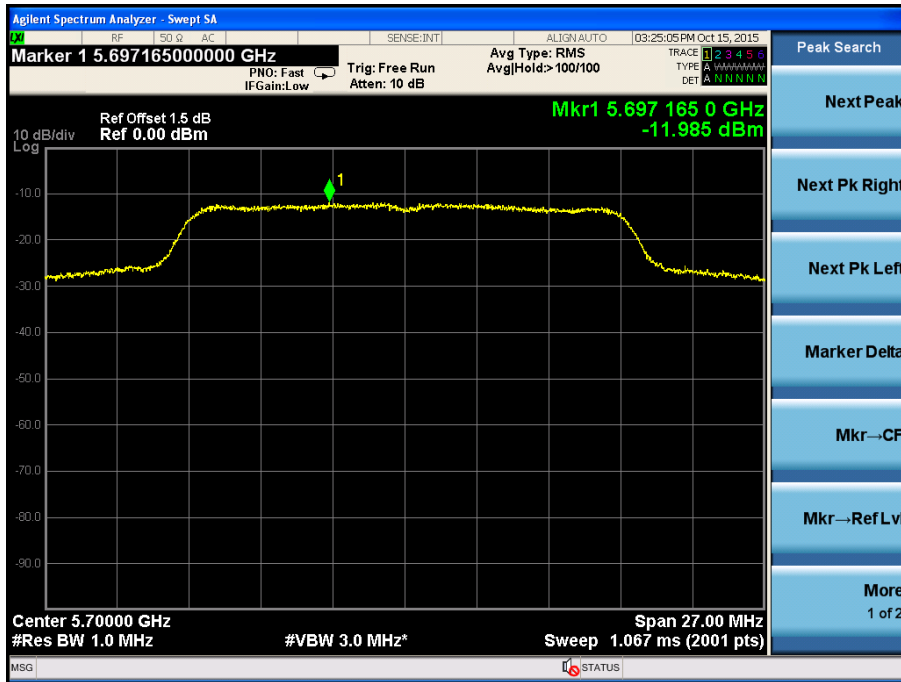
Channel 118



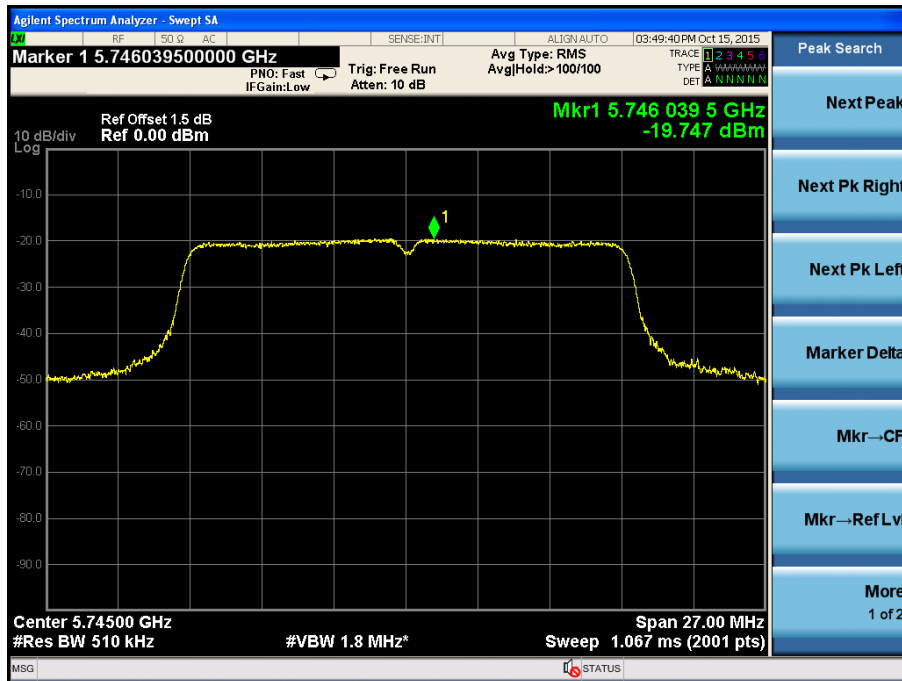
Channel 126



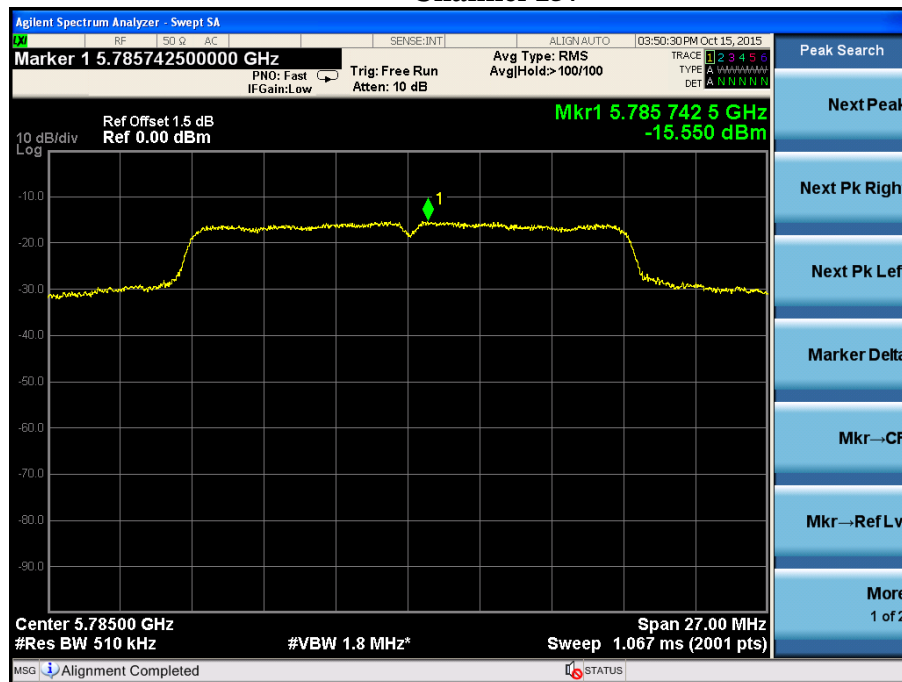
Channel 140



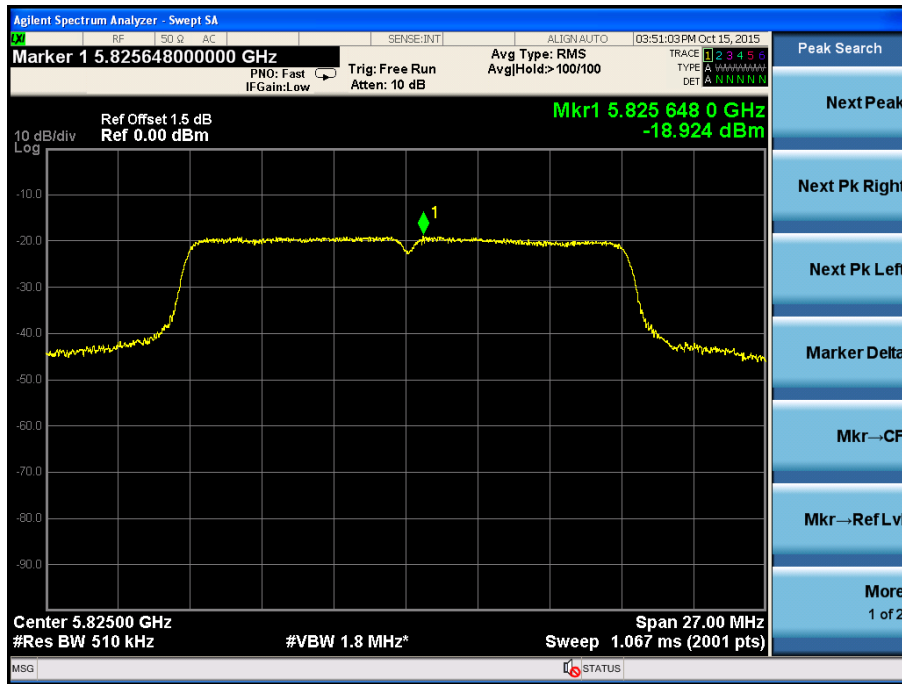
Channel 149



Channel 157



Channel 165



Product	:	AC450 Wireless Nano USB Adapter
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm/MHz)	Duty Cycle (%)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)
36	5180	-20.686	85.30	-19.995	11.0
40	5220	-10.441	85.30	-9.750	11.0
48	5240	-10.828	85.30	-10.137	11.0
52	5260	-10.619	85.30	-9.928	11.0
60	5300	-13.688	85.30	-12.997	11.0
64	5320	-17.958	85.30	-17.267	11.0
100	5500	-12.081	85.30	-11.390	11.0
116	5580	-11.837	85.30	-11.146	11.0
132	5660	-12.408	85.30	-11.717	11.0
140	5700	-12.911	85.30	-12.220	11.0

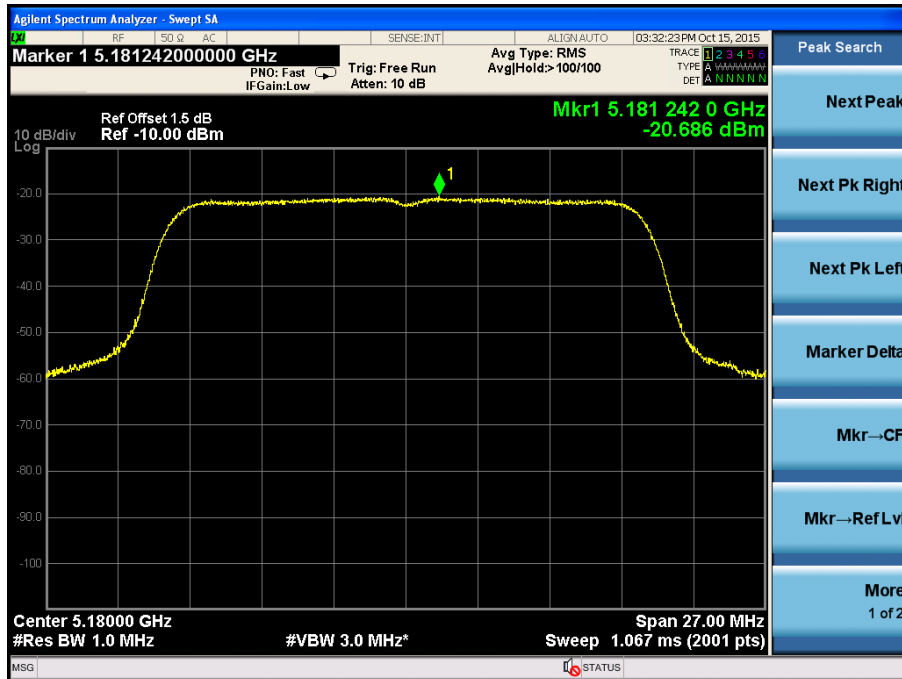
Channel No.	Frequency (MHz)	Measurement Power Output (dBm/500KHz)	Duty Cycle (%)	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)
149	5745	-20.436	85.30	-19.745	30.0
157	5785	-16.479	85.30	-15.788	30.0
165	5825	-20.271	85.30	-19.580	30.0

Note1: When EUT duty cycle < 98%, the total PSD = Reading Level + 10*log(1/duty cycle)

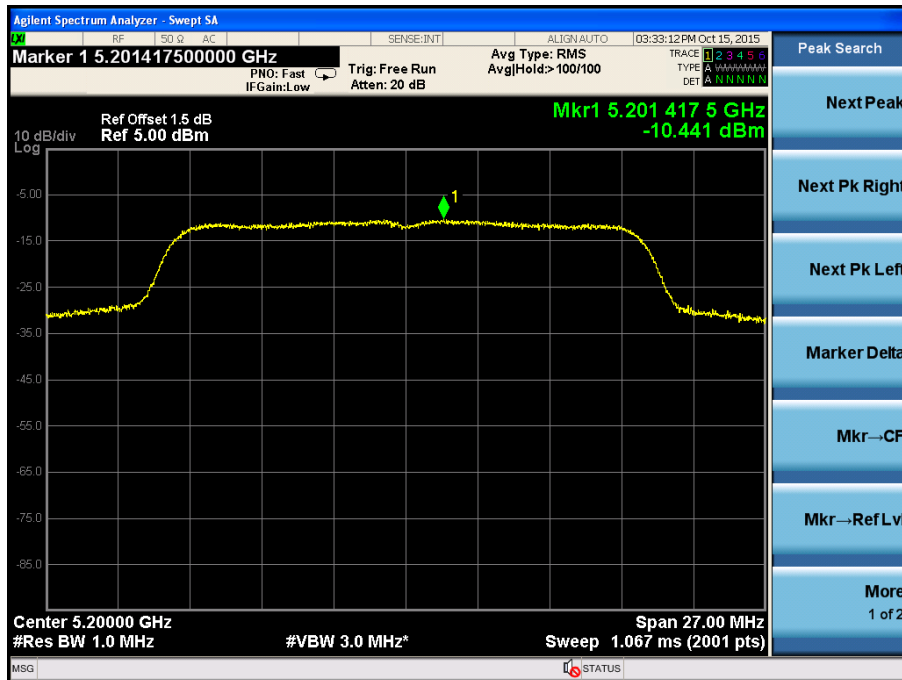
Note2: The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

Note3: For the band 5.725-5.85 GHz, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

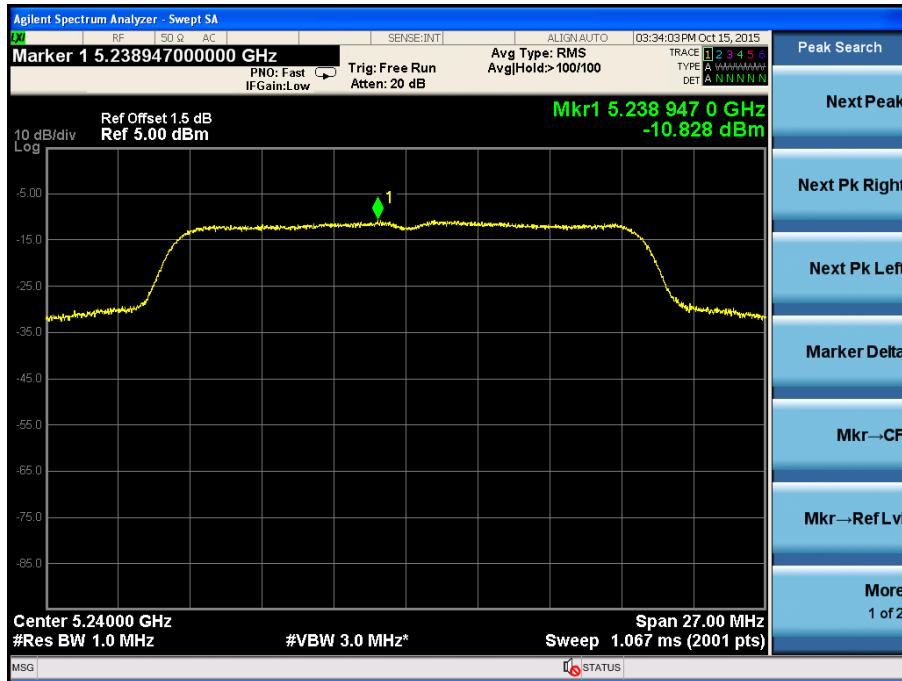
Channel 36



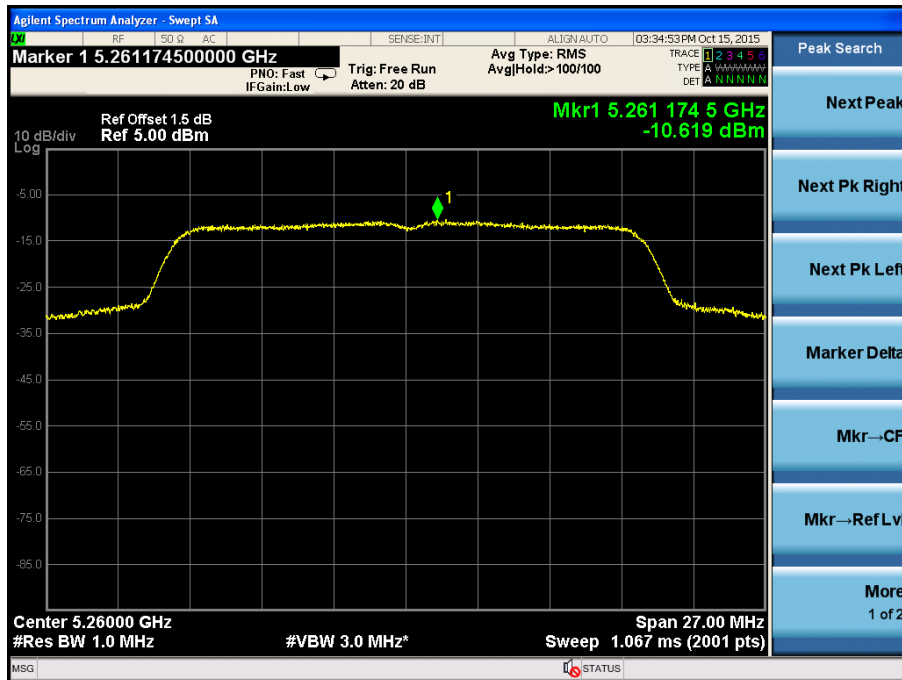
Channel 40



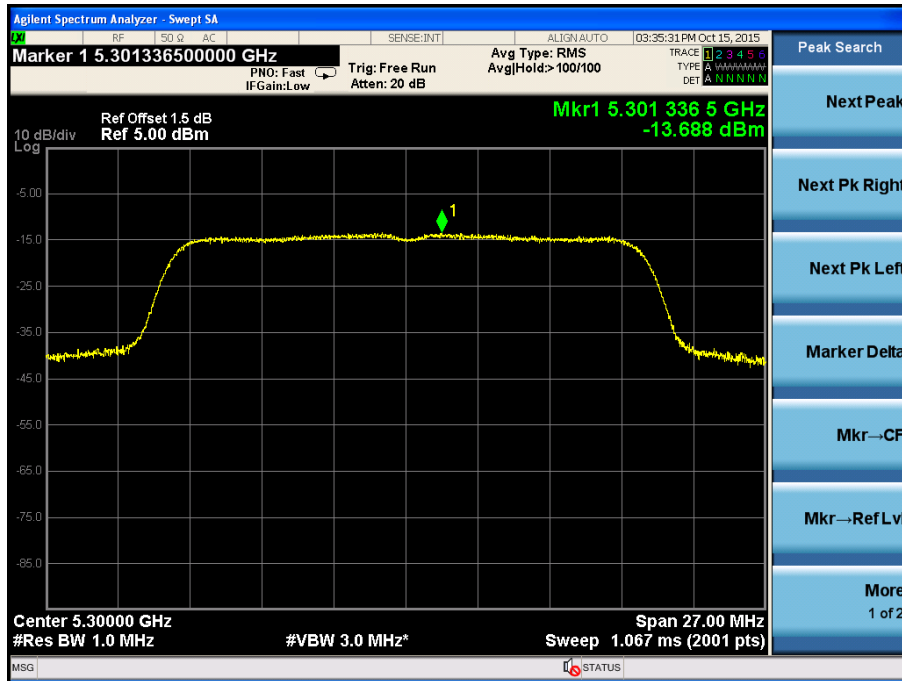
Channel 48



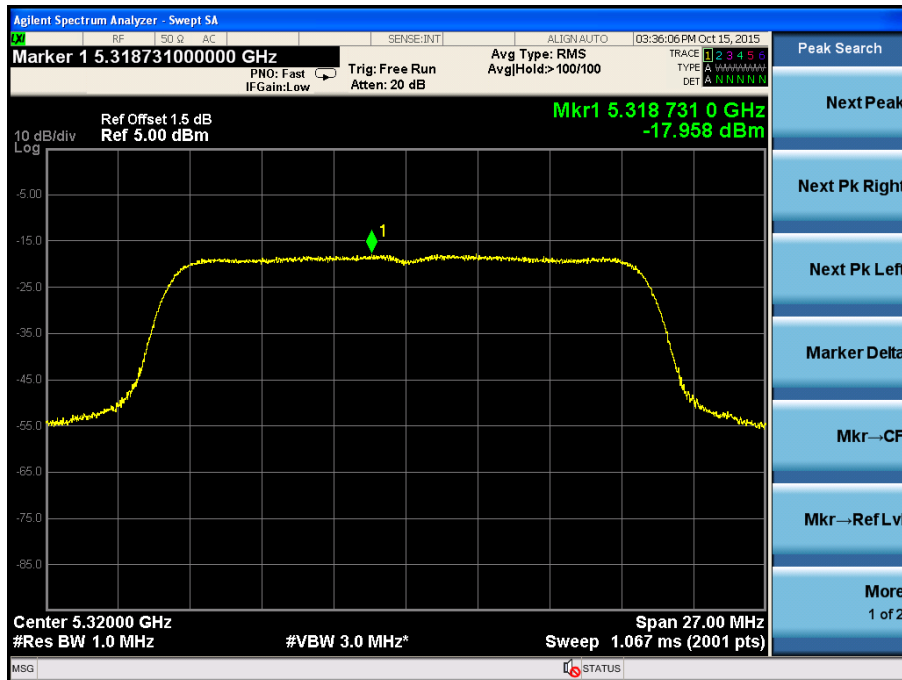
Channel 52



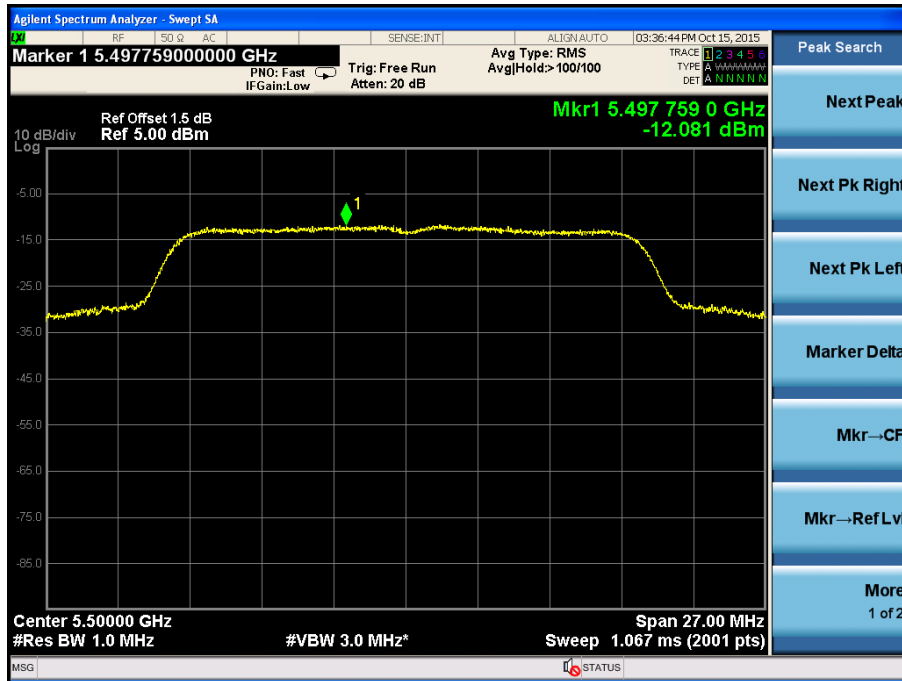
Channel 60



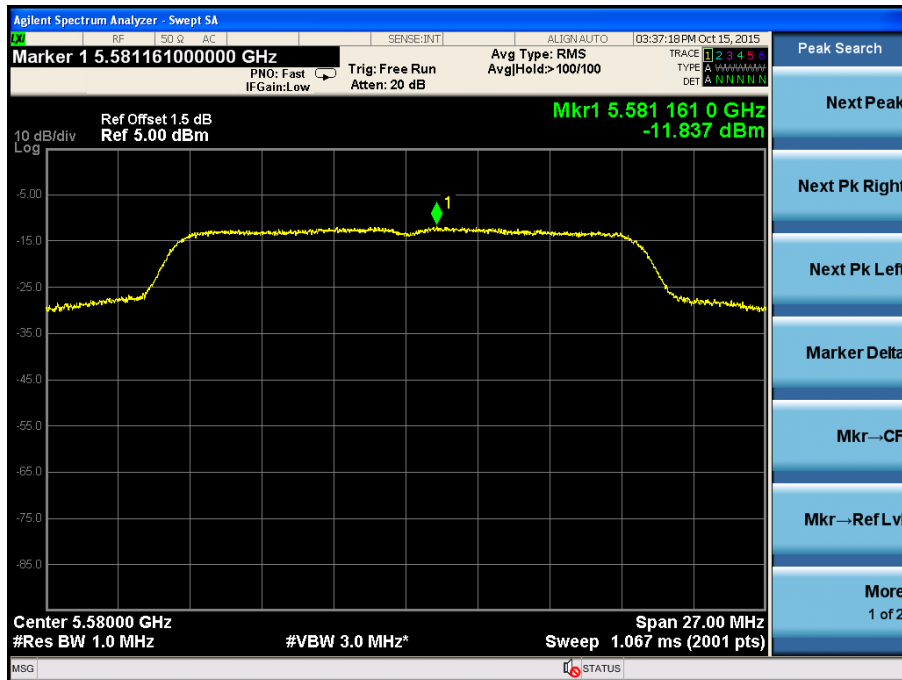
Channel 64



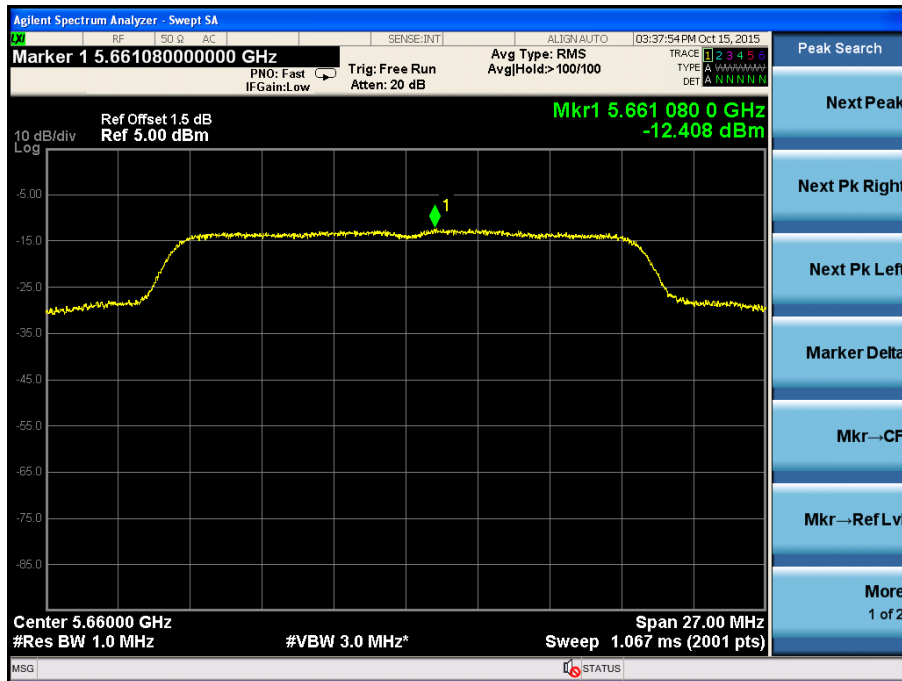
Channel 100



Channel 118



Channel 126



Channel 140

