Test Report

FCC Part15 Subpart E

Product Name	:	AC1750 Wireless Dual Band Gigabit Router
Model No.	:	Archer C8
FCC ID	:	TE7C8V2

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. 10, 2015
Test Date	:	Jul. 10, 2015~ Nov. 28, 2015
Issued Date	:	Nov. 30, 2015
Report No.	:	1570321R-RF-US-P09V01
Report Version	:	V2.1

Test Report Certification

Issued Date : Nov. 30, 2015
Report No. : 1570321R-RF-US-P09V01

Product Name	:	AC1750 Wireless Dual Band Gigabit Router
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 C8
FCC ID	:	TE7C8V2
EUT Voltage	:	DC 12V/3.3A
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 No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,215006, Jiangsu, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 FCC Registration Number: 800392;
Documented By	:	Elaine Yang
Reviewed By	:	Jack zhang
Approved By	:	Harry zhao

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/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

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TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

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No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,215006, Jiangsu, China
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
1570321R-RF-US-P09V01	V1.0	Initial Issued Report	Nov. 26, 2015
1570321R-RF-US-P09V01	V2.0	1. Added the power and PSD data of each chain. 2. Updated the bandedge plots to table form.	Nov. 28, 2015
1570321R-RF-US-P09V01	V2.1	1. Modified the EUT voltage information. 2. Modified some miscalculation.	Nov. 30, 2015

1. General Information

1.1. EUT Description

Product Name	AC1750 Wireless Dual Band Gigabit Router
Brand Name	TP-LINK
Model No.	Archer C8
EUT Voltage	DC 12V/3.3A
Frequency Range	**For 5GHz Band** 802.11a/n/ac(20MHz): 5180~5240MHz, 5745~5825MHz 802.11n/ac(40MHz): 5190~5230MHz, 5755~5795MHz 802.11ac(80MHz):5210MHz, 5775MHz
Channel Number	**For 5GHz Band** 802.11a/n/ac(20MHz): 9 802.11n/ac(40MHz): 4 802.11ac(80MHz): 2
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 450 Mbps
	802.11ac: up to 1.3 Gbps
Channel Control	Auto
Antenna Delivery	3*Tx + 3*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
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	151	5755 MHz	159	5795 MHz
802.11n(80MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	155	5775 MHz	N/A	N/A	N/A	N/A

Antenna List

Antenna	Type	Product Number	Peak Gain	Beamforming Gain	Array gain
Dipole Antenna	Dipole	3101500451	1.7dBi	4.77dBi	4.77dBi

Note: 1. The EUT uses MIMO technology and always operating with the antennas transmitting simultaneously, so we only test the mode which the antennas transmitting simultaneously.

2. The EUT has three antennas, and each port has same gain, they transmit signals are correlated with each other.

(1) 5G Directional gain for Beamforming Calculation is:

Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi≈6.47dBi.

(2) 5G Directional gain for CDD Calculation is:

a. For power measurements

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

Directional gain = G_{ANT} + Array Gain=1.7dBi

b. For power spectral density (PSD) measurements

Directional gain = G_{ANT} + Array Gain≈6.47dBi

Power Parameter Value of the test software

Test Mode	Test Channel	Power Setting (With CDD)	Power Setting (With Beamforming)
802.11a	5180	74	×
	5200	78	×
	5240	76	×
802.11n(20MHz)	5180	73	×
	5200	85	×
	5240	86	×
802.11ac(20MHz)	5180	72	80
	5200	85	87
	5240	85	87
802.11n(40MHz)	5190	48	×
	5230	87	×
802.11ac(40MHz)	5190	46	57
	5230	86	93
802.11ac(80MHz)	5210	39	46

The test mode of the test software can support.

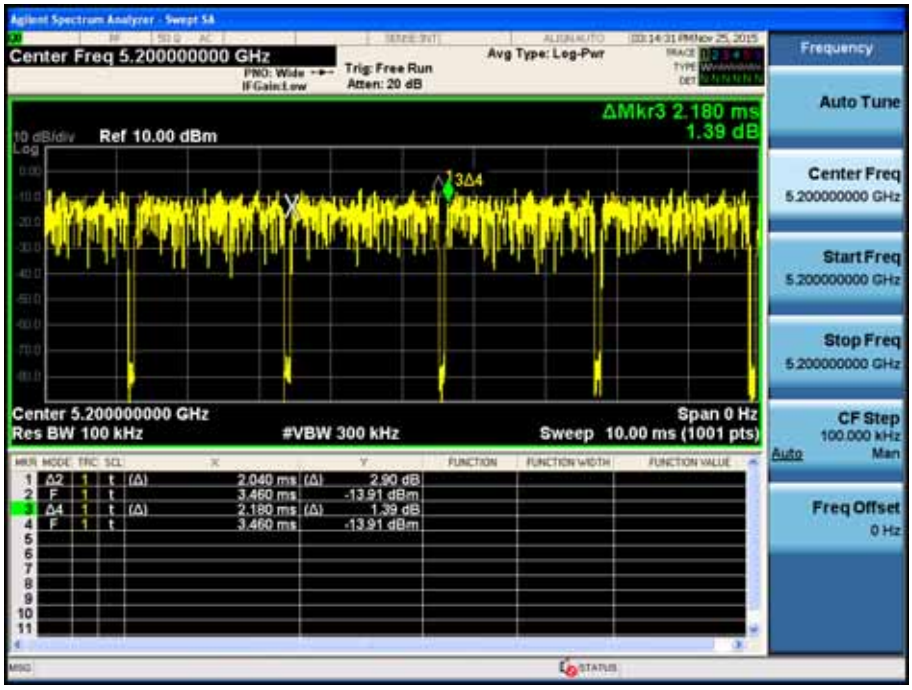
Test Mode	Ant 1+2+3
802.11a	√
802.11n(20MHz)	√
802.11n(40MHz)	√
802.11ac(20MHz)	√
802.11ac(40MHz)	√
802.11ac(80MHz)	√

Note : 1: The EUT uses CDD technology by all modes and beamforming technology by 802.11ac modes. The EUT of all test mode which always operate with the antennas transmitting simultaneously, so we only test the mode when the antennas transmitting simultaneously.

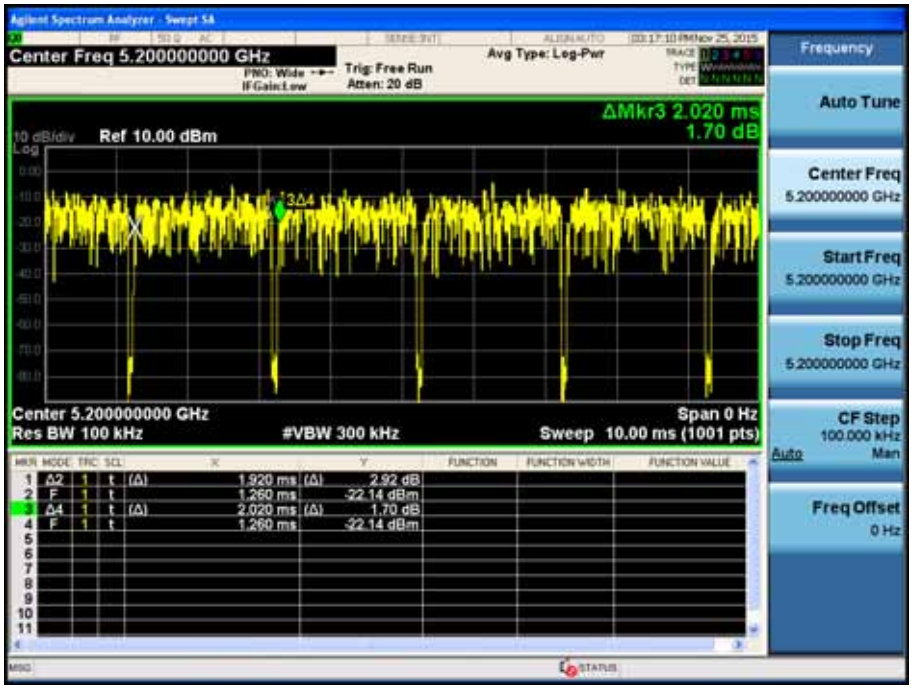
Duty Cycle

Test Mode	Duty Cycle
802.11a with CDD	93.58%
802.11n(20MHz) with CDD	95.05%
802.11n(40MHz) with CDD	88.39%
802.11ac(20MHz) with CDD	97.87%
802.11ac(40MHz) with CDD	96.06%
802.11ac(80MHz) with CDD	95.48%
802.11ac(20MHz) with beamforming	96.65%
802.11ac(40MHz) with beamforming	96.65%
802.11ac(80MHz) with beamforming	94.84%

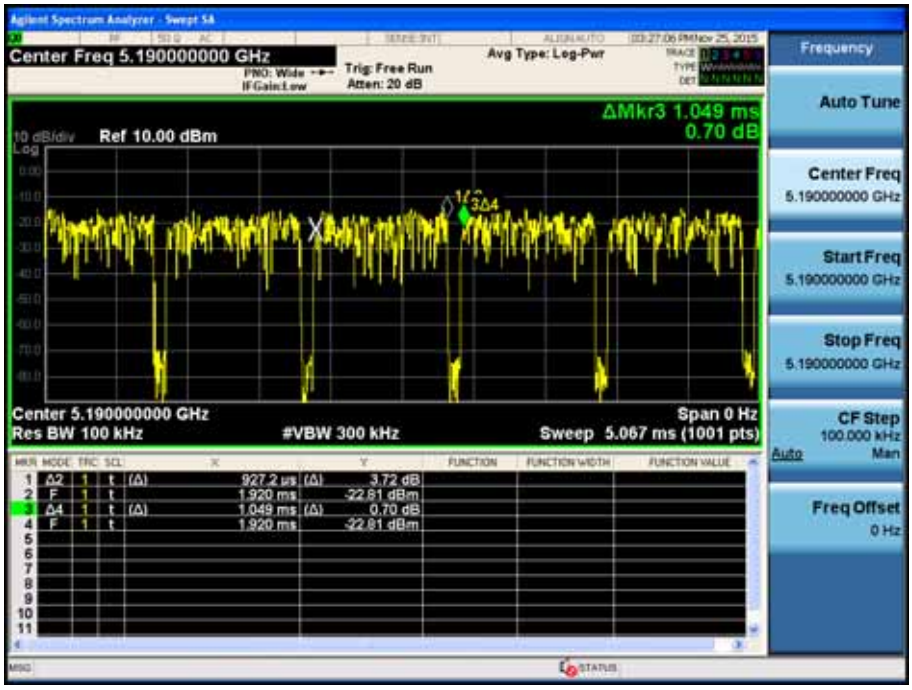
802.11a with CDD



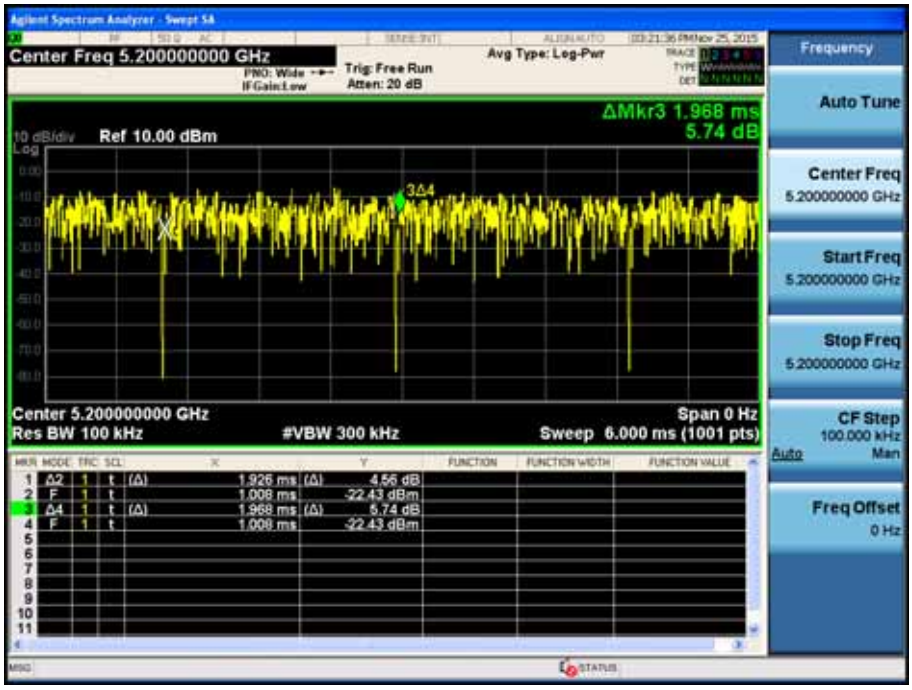
802.11n(20MHz) with CDD



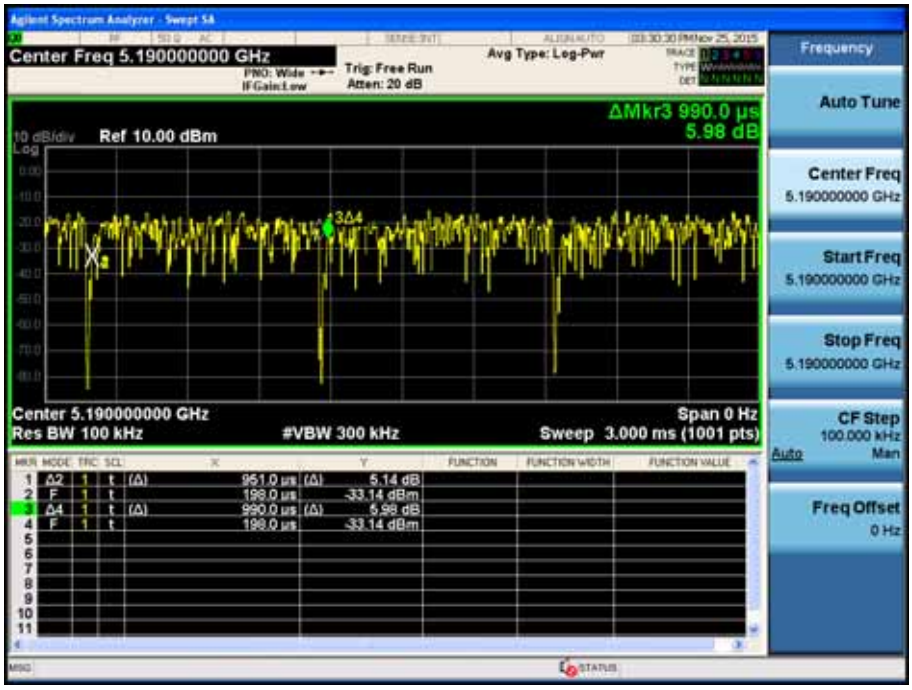
802.11n(40MHz) with CDD



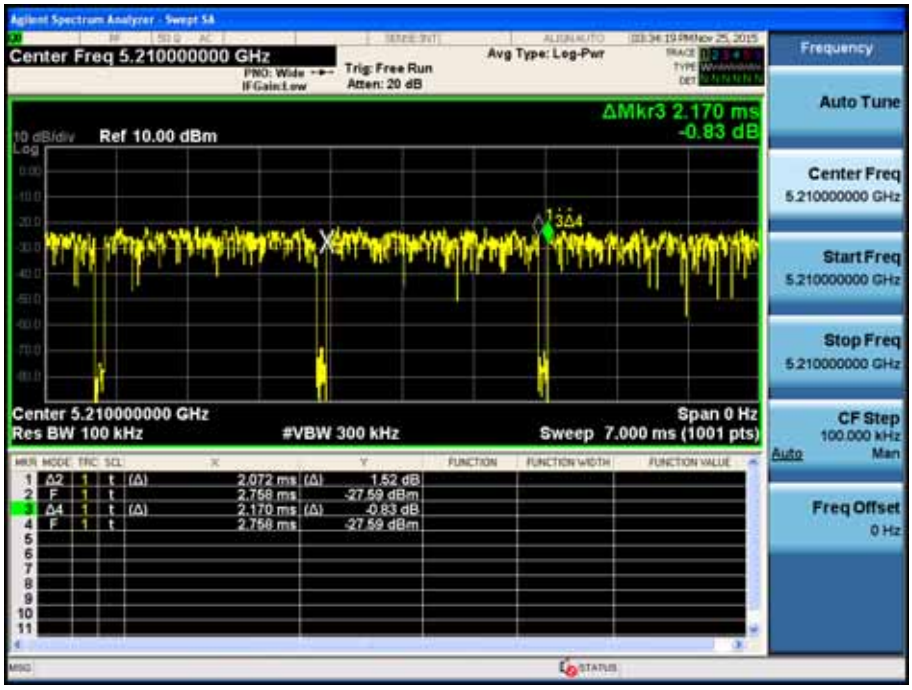
802.11ac(20MHz) with CDD



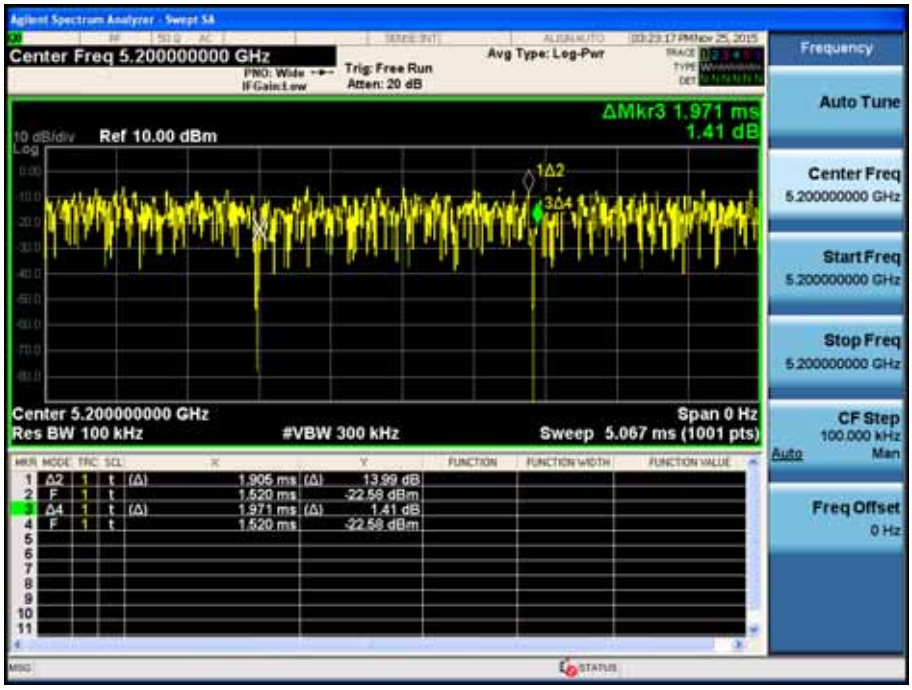
802.11ac(40MHz) with CDD



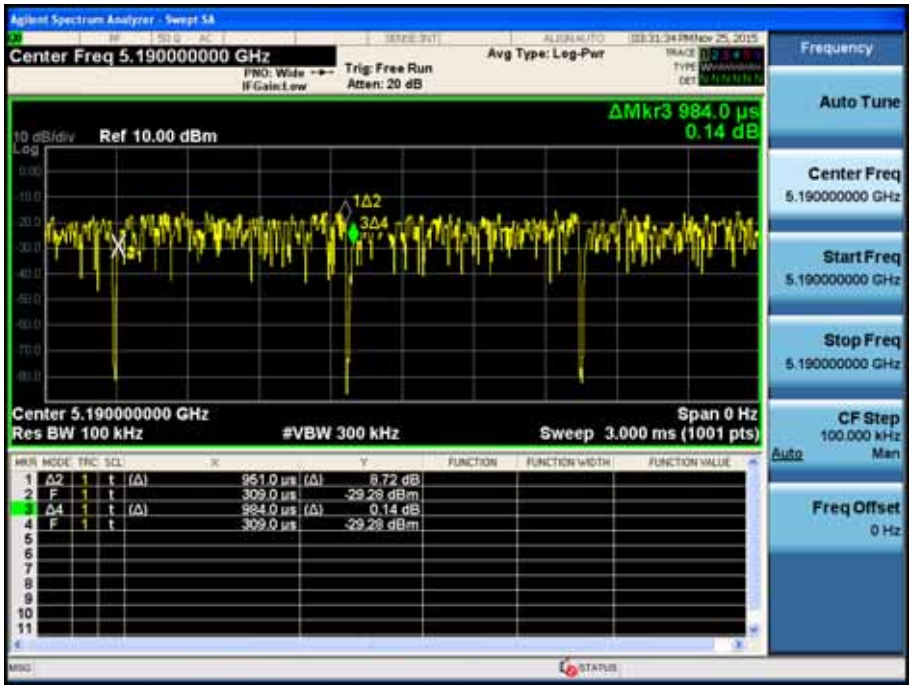
802.11ac(80MHz) with CDD



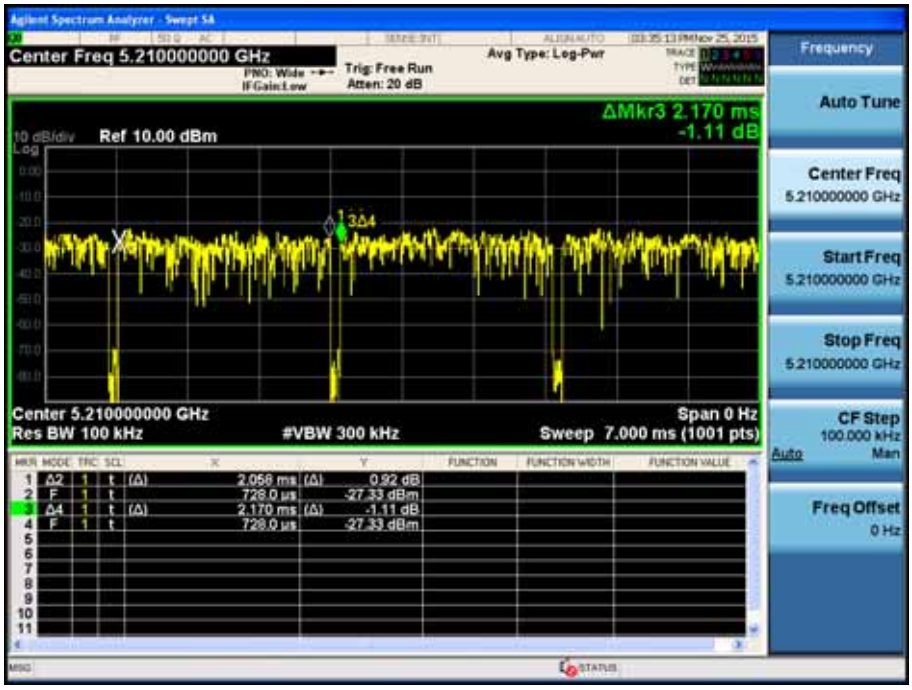
802.11ac(20MHz) with beamforming



802.11ac(40MHz) with beamforming



802.11ac(80MHz) with beamforming



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 with CDD
Mode 2: Transmit by 802.11n(20MHz) with CDD
Mode 3: Transmit by 802.11n(40MHz) with CDD
Mode 4: Transmit by 802.11ac(20MHz) with CDD
Mode 5: Transmit by 802.11ac(40MHz) with CDD
Mode 6: Transmit by 802.11ac(80MHz) with CDD
Mode 7: Transmit by 802.11ac(20MHz) with beamforming
Mode 8: Transmit by 802.11ac(40MHz) with beamforming
Mode 9: Transmit by 802.11ac(80MHz) with beamforming

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: For portable device, radiated tests was verified over X, Y, Z axis, and shown the worst case on this report.

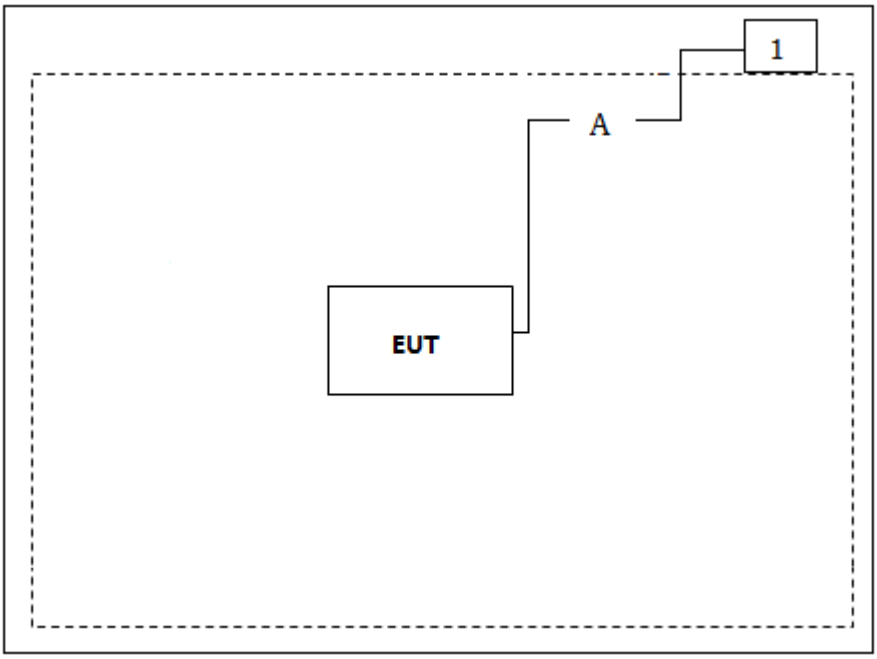
1.3. Tested System Details

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
2	Notebook	Lenovo	Think pad x220	SUA0600195	Non-shielded

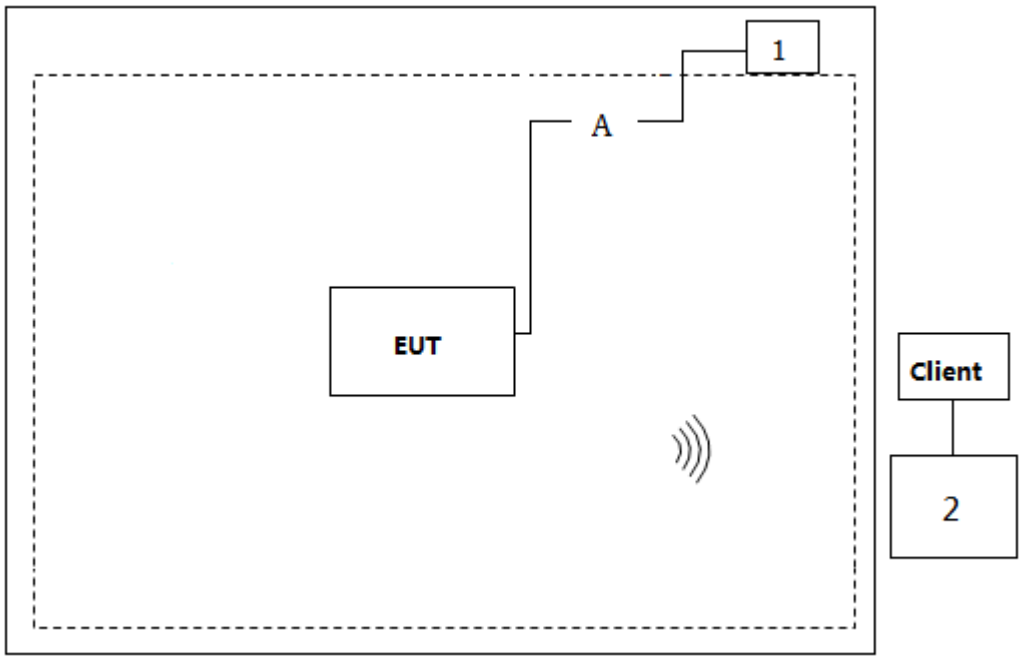
1.4. Configuration of Tested System

With CDD:

Connection Diagram


Signal Cable Type		Signal cable Description
A	LAN Cable	Non-shielded, 15m

With beamforming:

Connection Diagram


Signal Cable Type		Signal cable Description
A	LAN Cable	Non-shielded, 15m
B	LAN Cable	Non-shielded, 15m

1.5. EUT Exercise Software

With CDD:

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.

With Beamforming:

1	Setup the EUT and Client as shown on above.
2	Turn on the power of equipment.
3	Configure the client and connect the EUT.
3	Input RF commands, and set the test mode and channel, then use “Tfgen” to traffic and test.

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 Emission Bandwidth	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.407(a)	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

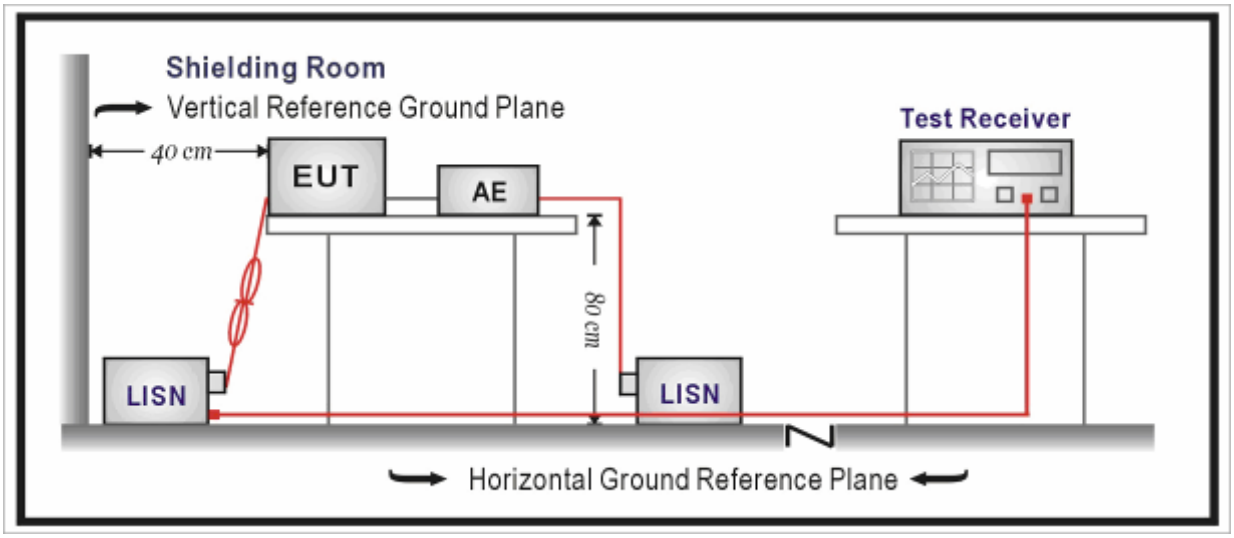
3.1. Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2015.03.29	2016.03.28
Two-Line V-Network	R&S	ENV216	100043	2015.03.29	2016.03.28
Two-Line V-Network	R&S	ENV216	100044	2015.09.17	2016.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2015.03.02	2016.03.01
50ohm Termination	SHX	TF2	07081401	2015.09.17	2016.09.16
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2015.01.09	2016.01.08

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

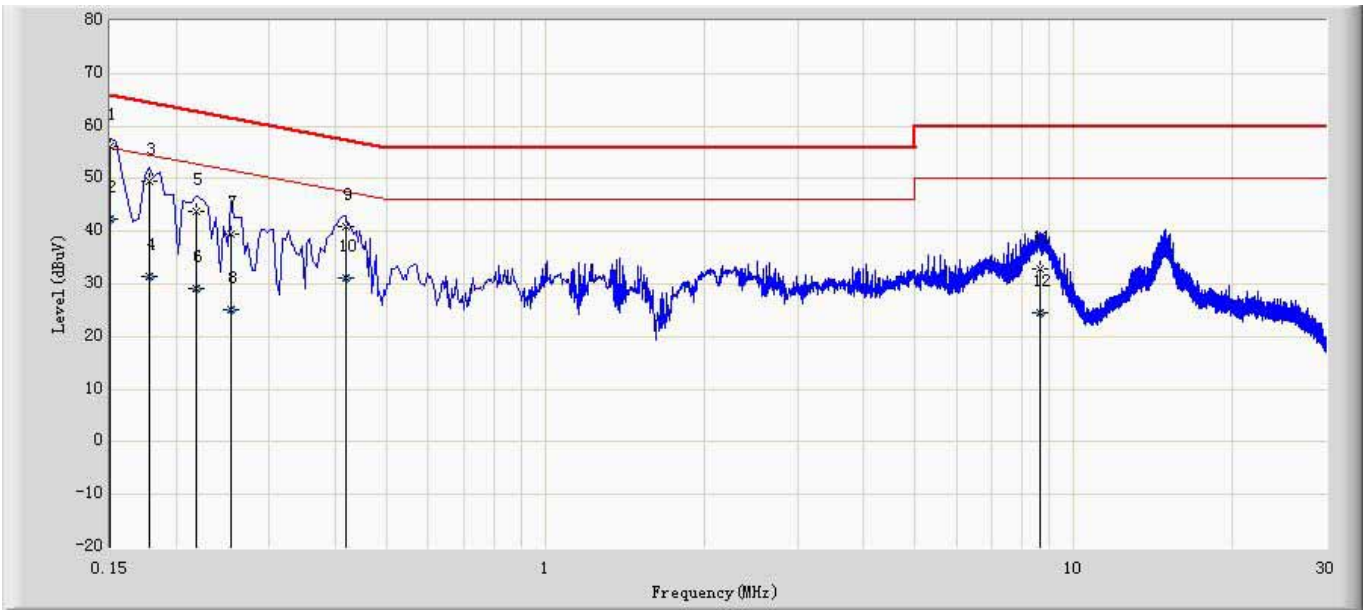
The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are 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

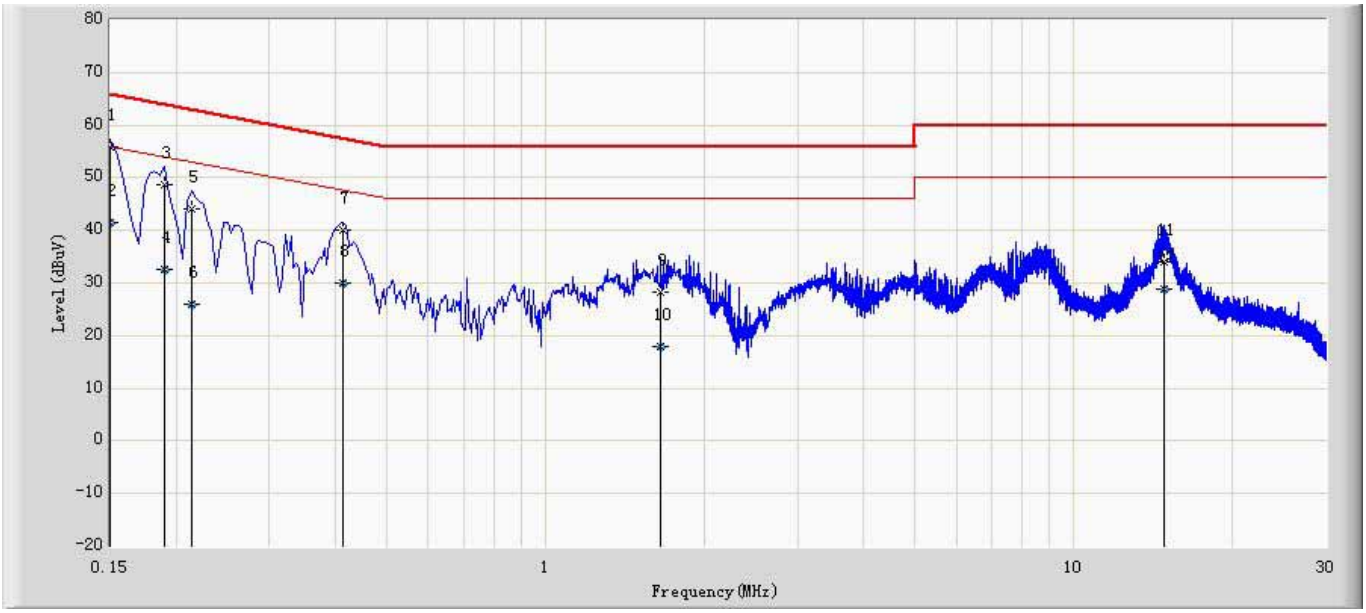
3.6. Test Result

Engineer: Scott	
Site: TR1	Time: 2015/07/20
Limit: FCC_Part15.207_CE_AC Power_ClassB	Margin: 0
Probe: ENV216-L1	Polarity: Line
EUT: AC1750 Wireless Dual Band Gigabit Router	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	*	0.150	56.224	46.348	-9.776	66.000	9.876	QP
2		0.150	42.381	32.505	-13.619	56.000	9.876	AV
3		0.178	49.495	39.638	-15.083	64.578	9.857	QP
4		0.178	31.462	21.605	-23.116	54.578	9.857	AV
5		0.218	43.857	34.007	-19.038	62.895	9.850	QP
6		0.218	29.141	19.291	-23.754	52.895	9.850	AV
7		0.254	39.511	29.663	-22.114	61.625	9.848	QP
8		0.254	25.057	15.209	-26.568	51.625	9.848	AV
9		0.418	40.890	31.056	-16.598	57.488	9.834	QP
10		0.418	31.262	21.428	-16.226	47.488	9.834	AV
11		8.626	32.836	22.916	-27.164	60.000	9.920	QP
12		8.626	24.480	14.560	-25.520	50.000	9.920	AV

Engineer: Scott	
Site: TR1	Time: 2015/07/20
Limit: FCC_Part15.207_CE_AC Power_ClassB	Margin: 0
Probe: ENV216-L1	Polarity: Neutral
EUT: AC1750 Wireless Dual Band Gigabit Router	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	*	0.150	55.997	46.121	-10.003	66.000	9.876	QP
2		0.150	41.577	31.701	-14.423	56.000	9.876	AV
3		0.190	48.749	38.889	-15.288	64.037	9.860	QP
4		0.190	32.716	22.856	-21.321	54.037	9.860	AV
5		0.214	44.202	34.342	-18.847	63.049	9.860	QP
6		0.214	25.916	16.056	-27.133	53.049	9.860	AV
7		0.414	40.090	30.250	-17.478	57.568	9.840	QP
8		0.414	29.950	20.110	-17.618	47.568	9.840	AV
9		1.650	28.245	18.405	-27.755	56.000	9.840	QP
10		1.650	18.022	8.182	-27.978	46.000	9.840	AV
11		14.846	34.143	23.896	-25.857	60.000	10.247	QP
12		14.846	28.956	18.709	-21.044	50.000	10.247	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. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2015.03.29	2016.03.28
Loop Antenna	R&S	HFH2-Z2	833799/003	2015.11.18	2016.11.17
Bilog Chainenna	Teseq GmbH	CBL6112D	27611	2015.10.16	2016.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2015.03.02	2016.03.01
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2015.01.09	2016.01.08

Radiated Emission / AC-5

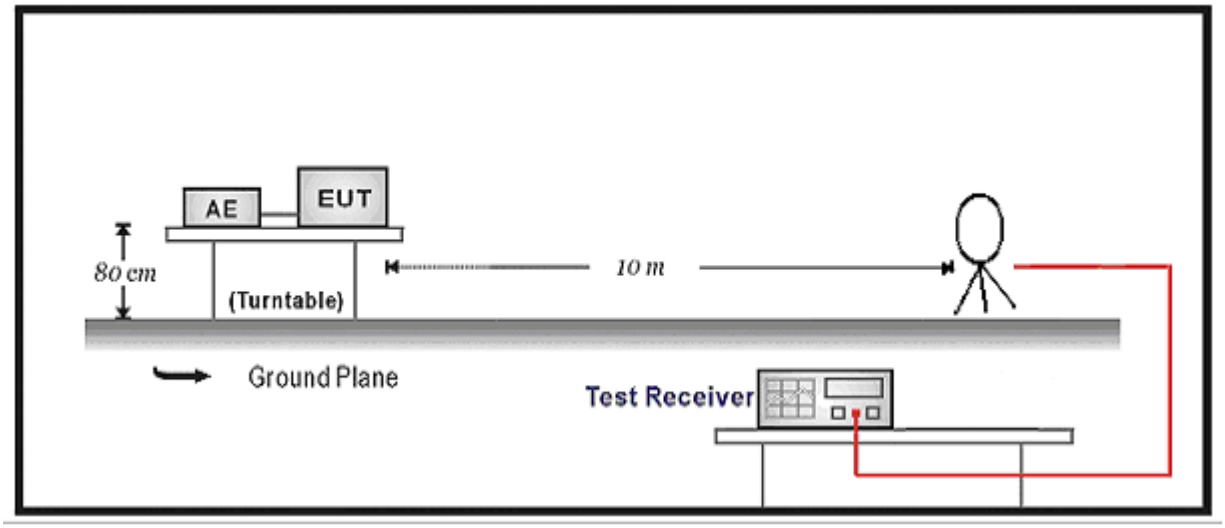
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2015.03.29	2016.03.28
Spectrum Analyzer	Agilent	E4446A	MY45300103	2015.01.08	2016.01.07
Preamplifier	Miteq	NSP1800-25	1364185	2015.05.06	2016.05.05
Preamplifier	QuieTek	AP-040G	CHM-0906001	2015.05.06	2016.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2015.01.22	2016.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2015.11.25	2016.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2015.03.02	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2015.03.02	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2015.03.02	2016.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2015.06.10	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2015.01.09	2016.01.08

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

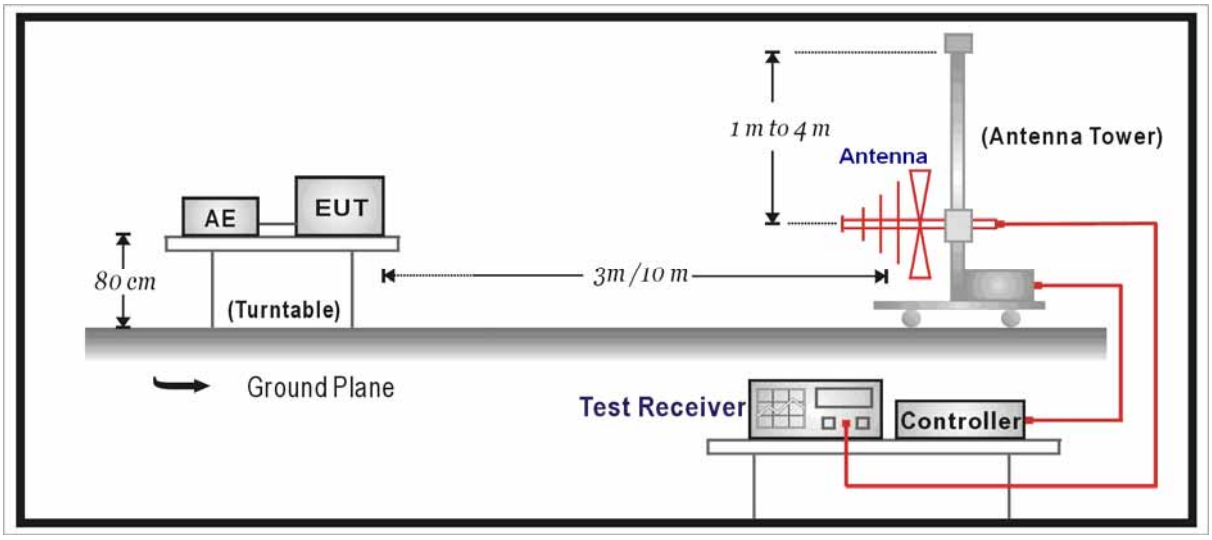
4.2. Test Setup

For FCC

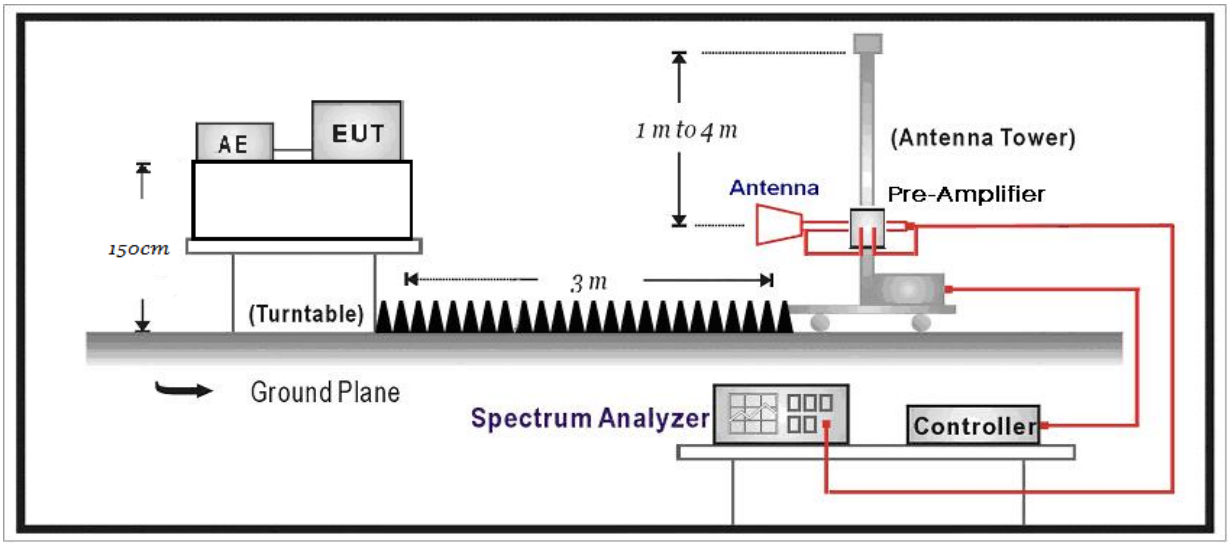
Below 30MHz Test Setup:



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 0.8 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 ≥ [3 × 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 ≥ 98%, then set VBW ≤ RBW / 100 (i.e., 10 kHz), but not less than 10 Hz.
2) If the EUT D is < 98%, then set VBW ≥ 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 with CDD

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
36	H	10360.0	44.2	2.4	46.6	54(Note3)	-7.4	PK
	V	10360.0	44.2	2.4	46.6	54(Note3)	-7.4	PK
	H	15540.0	37.2	11.9	49.1	54(Note3)	-4.9	PK
	V	15540.0	37.2	11.9	49.1	54(Note3)	-4.9	PK
40	H	10400.0	44.2	3.1	47.3	54(Note3)	-6.7	PK
	V	10400.0	44.2	3.1	47.3	54(Note3)	-6.7	PK
	H	15603.0	46.9	13.7	60.6	74	-13.4	PK
	H	15604.0	30.3	13.7	44.0	54	-10.0	AV
	V	15603.0	45.4	13.7	59.1	74	-14.9	PK
	V	15600.6	31.2	13.6	44.8	54	-9.2	AV
48	H	10480.0	44.7	2.3	47.0	54(Note3)	-7.0	PK
	V	10480.0	44.0	2.3	46.3	54(Note3)	-7.7	AV
	H	15720.0	34.8	13.3	48.0	54(Note3)	-6.0	PK
	V	15720.0	34.1	13.3	47.4	54(Note3)	-6.6	PK

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

2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, 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) with CDD

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
36	H	10360.0	43.5	2.4	46.0	54(Note3)	-8.0	PK
	V	10360.0	43.8	2.4	46.2	54(Note3)	-7.8	AV
	H	15540.0	29.2	11.9	41.1	54(Note3)	-12.9	PK
	V	15540.0	29.6	11.9	41.5	54(Note3)	-12.5	PK
40	H	10400.0	44.2	3.1	47.3	54(Note3)	-6.7	PK
	V	10400.0	43.1	3.1	46.2	54(Note3)	-7.8	PK
	H	15600.0	32.7	13.6	46.3	54(Note3)	-7.7	PK
	V	15560.0	29.4	13.7	43.1	54(Note3)	-10.9	PK
48	H	10480.0	46.0	2.3	48.3	54(Note3)	-5.7	PK
	V	10480.0	44.3	2.3	46.6	54(Note3)	-7.4	AV
	H	15720.0	36.2	13.3	49.4	54(Note3)	-4.6	PK
	V	15720.0	34.8	13.3	48.1	54(Note3)	-5.9	PK

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

2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, 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) with CDD

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
38	H	10380.0	43.2	3.1	46.2	54(Note3)	-7.8	PK
	V	10380.0	45.0	3.1	48.1	54(Note3)	-5.9	PK
	H	15570.0	29.2	14.2	43.4	54(Note3)	-10.6	PK
	V	15570.0	29.7	14.2	44.0	54(Note3)	-10.0	PK
46	H	10460.0	44.3	2.2	46.5	54(Note3)	-7.5	PK
	V	10460.0	44.5	2.2	46.7	54(Note3)	-7.3	PK
	H	15690.0	34.0	10.5	44.5	54(Note3)	-9.5	PK
	V	15690.0	32.4	10.5	42.9	54(Note3)	-11.1	PK

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

2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, 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) with CDD

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
36	H	10360.0	43.9	2.4	46.4	54(Note3)	-7.6	PK
	V	10360.0	43.7	2.4	46.1	54(Note3)	-7.9	PK
	H	15540.0	29.9	11.9	41.8	54(Note3)	-12.2	PK
	V	15540.0	29.6	11.9	41.5	54(Note3)	-12.5	PK
40	H	10400.0	44.6	3.1	47.7	54(Note3)	-6.3	PK
	V	10400.0	43.3	3.1	46.4	54(Note3)	-7.6	PK
	H	15600.0	36.0	13.6	49.6	54(Note3)	-4.4	PK
	V	15600.0	32.4	13.6	46.0	54(Note3)	-8.0	PK
48	H	10480.0	46.3	2.3	48.6	54(Note3)	-5.4	PK
	V	10480.0	44.4	2.3	46.7	54(Note3)	-7.3	AV
	H	15720.0	38.2	13.3	51.5	54(Note3)	-2.5	PK
	V	15720.0	34.7	13.3	48.0	54(Note3)	-6.0	PK

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

2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, 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) with CDD

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
38	H	10380.0	43.8	3.1	46.9	54(Note3)	-7.1	PK
	V	10380.0	43.7	3.1	46.8	54(Note3)	-7.2	PK
	H	15570.0	29.6	14.2	43.8	54(Note3)	-10.2	PK
	V	15570.0	29.8	14.2	44.0	54(Note3)	-10.0	PK
46	H	10460.0	44.6	2.2	46.9	54(Note3)	-7.1	PK
	V	10460.0	44.2	2.2	46.5	54(Note3)	-7.5	PK
	H	15690.0	34.0	10.5	44.5	54(Note3)	-9.5	PK
	V	15690.0	34.0	10.5	44.5	54(Note3)	-9.5	PK

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

2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, 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) with CDD

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
42	H	10420.0	43.2	2.4	45.6	54(Note3)	-8.4	PK
	V	10420.0	44.6	2.4	47.0	54(Note3)	-7.0	PK
	H	15630.0	30.8	13.5	44.2	54(Note3)	-9.8	PK
	V	15630.0	30.5	13.5	44.0	54(Note3)	-10.0	PK

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

2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, 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.

Mode7: Transmit by 802.11ac(20MHz) with beamforming

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
36	H	10360.0	42.1	2.4	44.5	54(Note3)	-9.5	PK
	V	10360.0	42.1	2.4	44.5	54(Note3)	-9.5	PK
	H	15540.0	28.5	11.8	40.3	54(Note3)	-13.7	PK
	V	15540.0	28.4	12.1	40.5	54(Note3)	-13.5	PK
40	H	10400.0	43.3	3.3	46.6	54(Note3)	-7.4	PK
	V	10400.0	41.4	3.8	45.2	54(Note3)	-8.8	PK
	H	15600.0	34.7	13.5	48.2	54(Note3)	-5.8	PK
	V	15600.0	31.3	13.2	44.5	54(Note3)	-9.5	PK
48	H	10480.0	44.0	3.1	47.1	54(Note3)	-6.9	PK
	V	10480.0	42.7	2.9	45.6	54(Note3)	-8.4	AV
	H	15720.0	37.2	13.6	50.8	54(Note3)	-3.2	PK
	V	15720.0	33.8	13.6	47.4	54(Note3)	-6.6	PK

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

2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, 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.

Mode8: Transmit by 802.11ac(40MHz) with beamforming

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
38	H	10380.0	42.3	3.7	46.0	54(Note3)	-8.0	PK
	V	10380.0	42.2	3.0	45.2	54(Note3)	-8.8	PK
	H	15570.0	29.1	13.6	42.7	54(Note3)	-11.3	PK
	V	15570.0	29.2	13.9	43.1	54(Note3)	-10.9	PK
46	H	10460.0	43.3	3.0	46.3	54(Note3)	-7.7	PK
	V	10460.0	42.9	2.8	45.7	54(Note3)	-8.3	PK
	H	15690.0	33.0	10.2	43.2	54(Note3)	-10.8	PK
	V	15690.0	33.3	10.5	43.8	54(Note3)	-10.2	PK

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

2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, 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.

Mode9: Transmit by 802.11ac(80MHz) with beamforming

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
42	H	10420.0	41.7	3.2	44.9	54(Note3)	-9.1	PK
	V	10420.0	43.1	2.9	46.0	54(Note3)	-8.0	PK
	H	15630.0	29.5	13.0	42.5	54(Note3)	-11.5	PK
	V	15630.0	30.0	13.0	43.0	54(Note3)	-11.0	PK

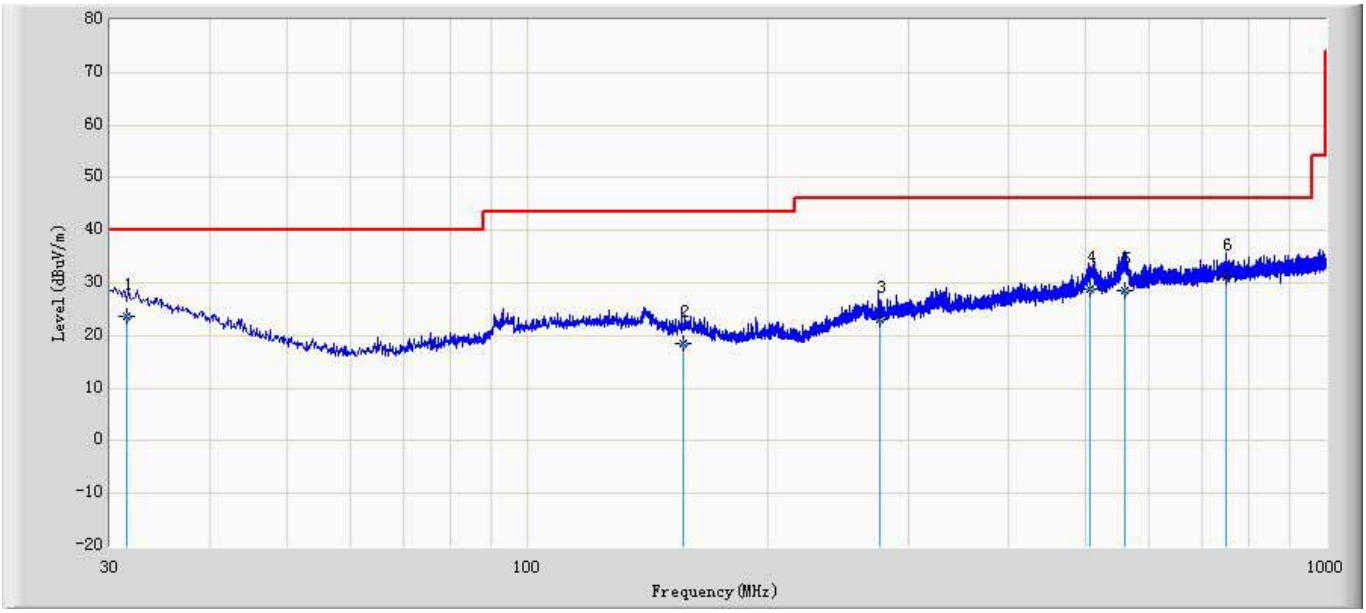
Note: 1. Measure Level = Reading Level + Factor.

2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, 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.

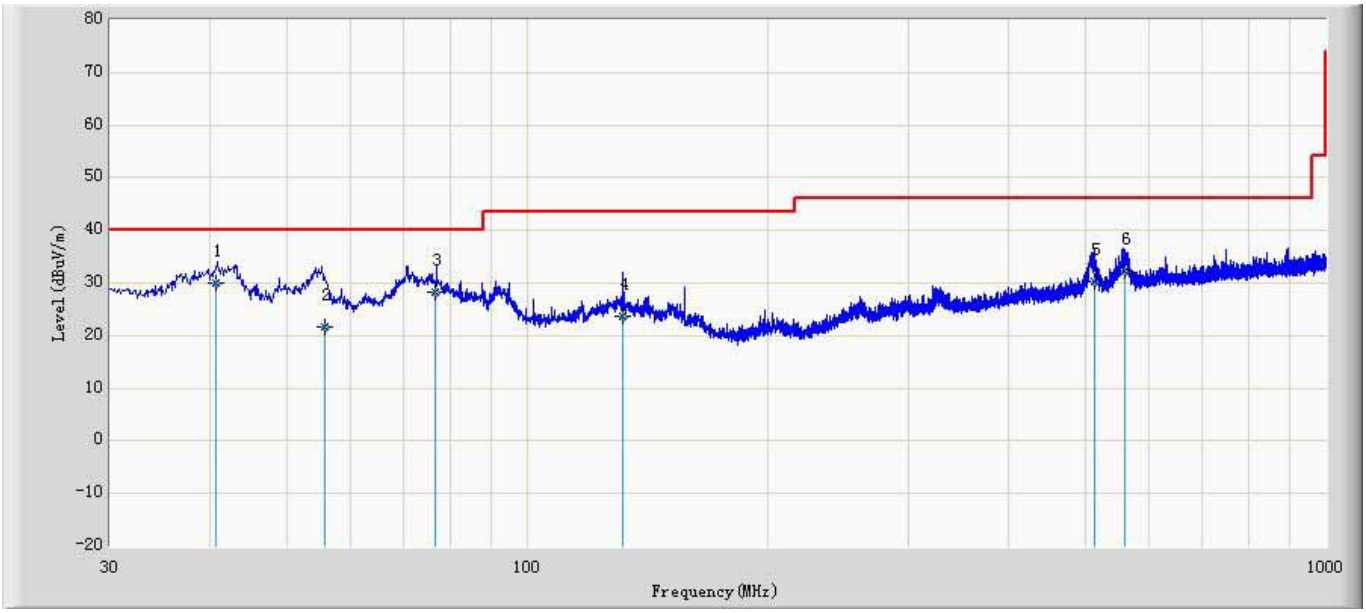
The worst case of Radiated Emission below 1GHz:

Site: AC2	Time: 2015/07/20
Limit: FCC_Part15.209_RE(3m)_ClassB	Margin: 0
Probe: CB7_CBL6112_0726	Polarity: Horizontal
EUT: AC1750 Wireless Dual Band Gigabit Router	Power: AC 120V/60Hz
Note: Mode 1: Transmit at 802.11a	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		31.524	23.583	28.163	-16.417	40.000	-4.580	QP
2		156.636	18.461	30.024	-25.039	43.500	-11.563	QP
3		275.664	23.145	31.643	-22.855	46.000	-8.498	QP
4		505.634	28.957	31.349	-17.043	46.000	-2.392	QP
5		559.966	28.649	29.855	-17.351	46.000	-1.206	QP
6	*	749.665	31.231	31.048	-14.769	46.000	0.183	QP

Site: AC2	Time: 2015/07/20
Limit: FCC_Part15.209_RE(3m)_ClassB	Margin: 0
Probe: CB7_CBL6112_0726	Polarity: Vertical
EUT: AC1750 Wireless Dual Band Gigabit Router	Power: AC 120V/60Hz
Note: Mode 1: Transmit at 802.11a	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	40.634	30.141	40.075	-9.859	40.000	-9.934	QP
2		55.664	21.769	36.746	-18.231	40.000	-14.977	QP
3		76.635	28.312	43.698	-11.688	40.000	-15.386	QP
4		131.634	23.612	33.665	-19.888	43.500	-10.053	QP
5		512.665	30.198	32.404	-15.802	46.000	-2.206	QP
6		558.935	32.368	33.578	-13.632	46.000	-1.210	QP

5. Occupied Bandwidth

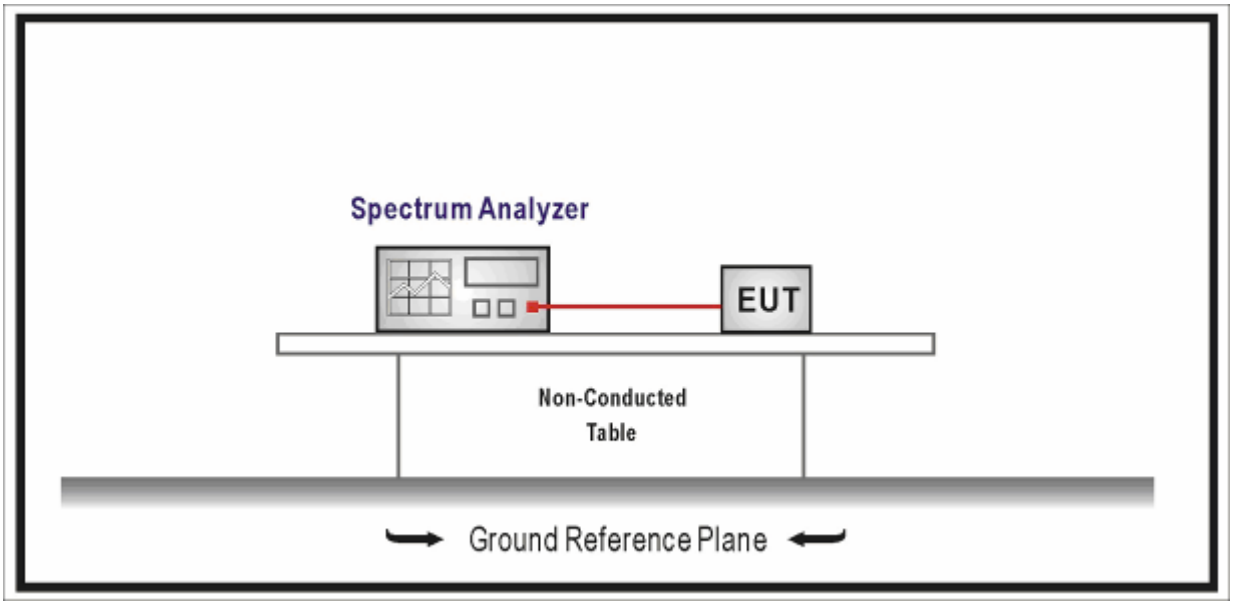
5.1. Test Equipment

Occupied Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2015.03.11	2016.03.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2015.04.10	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

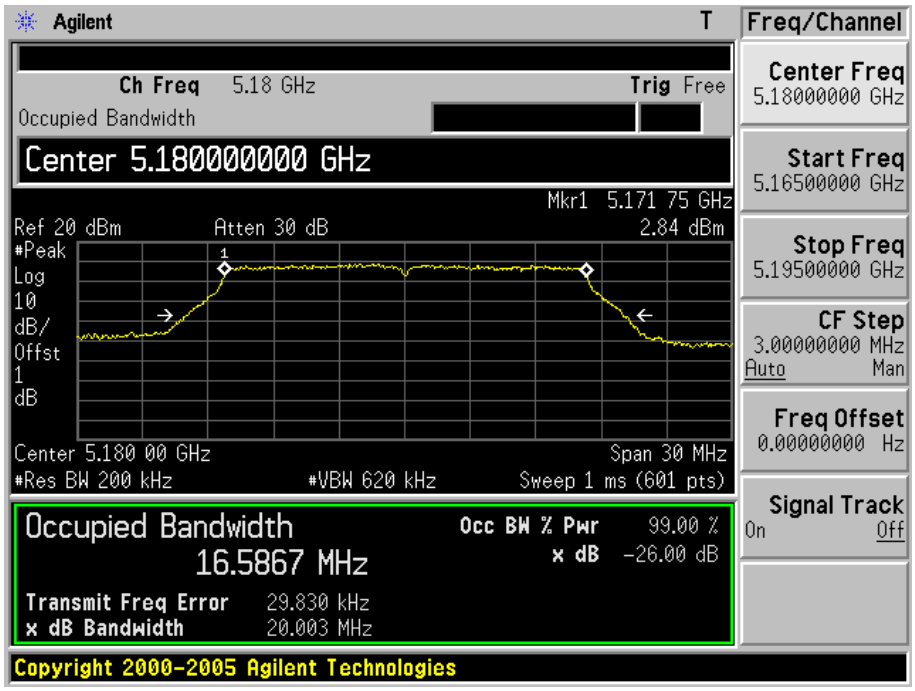
5.6. Test Result

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a with CDD

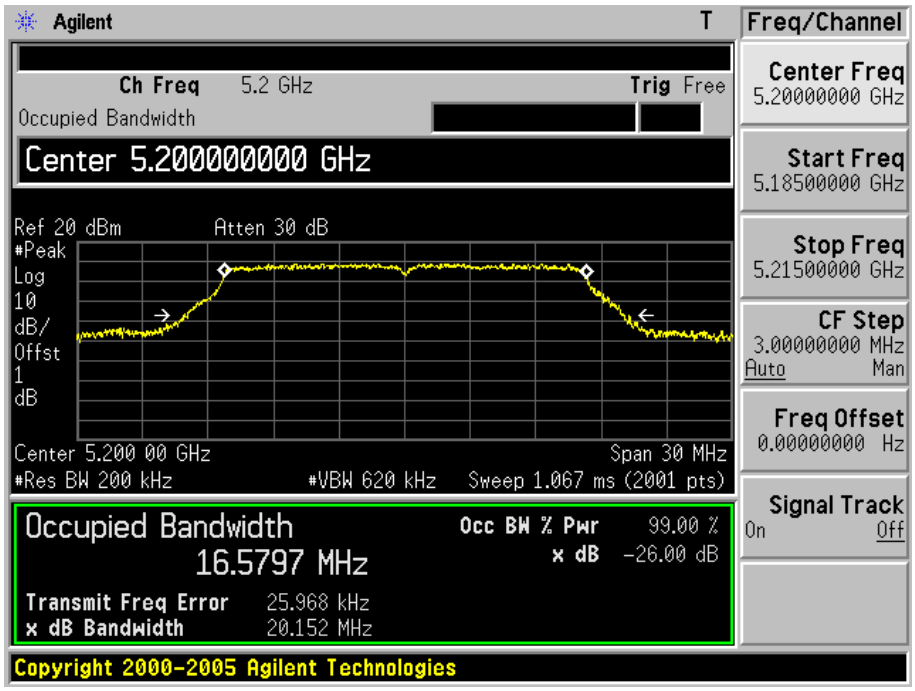
Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)			Lower/Higher Frequency (MHz)		
		Ant1	Ant2	An3	Ant1	Ant2	An3	Ant1	Ant2	An3
36	5180	20.003	20.082	20.008	16.5867	16.5712	16.5398	5171.75	5171.75	5171.75
40	5200	20.152	20.191	20.080	16.5797	16.5666	16.5327	N/A	N/A	N/A
48	5240	20.274	19.964	20.121	16.5650	16.5705	16.5494	5248.28	5248.28	5248.26

Ant 1

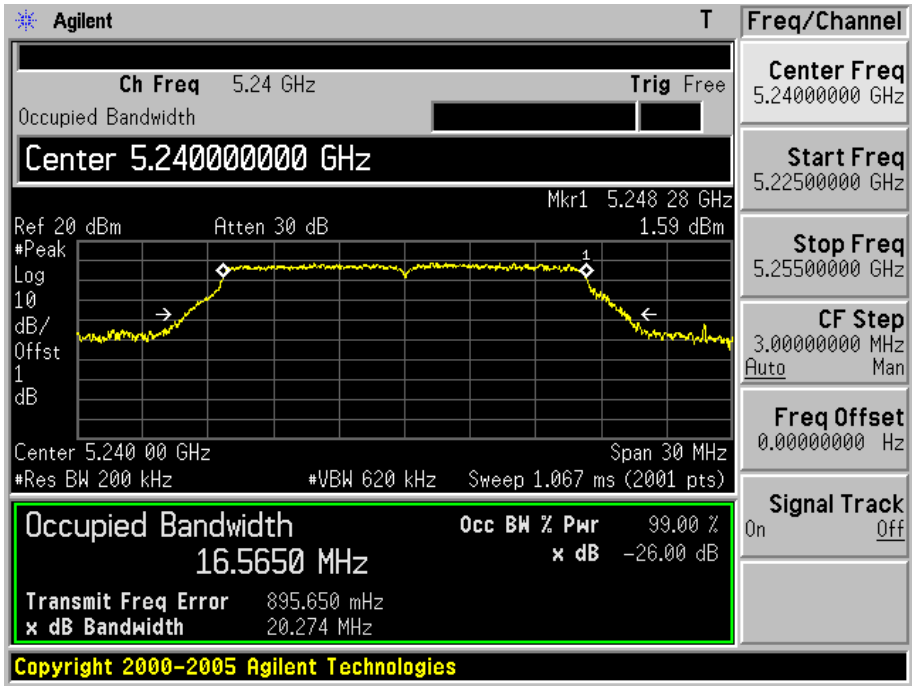
Channel 36 (5180MHz)



Channel 40 (5200MHz)

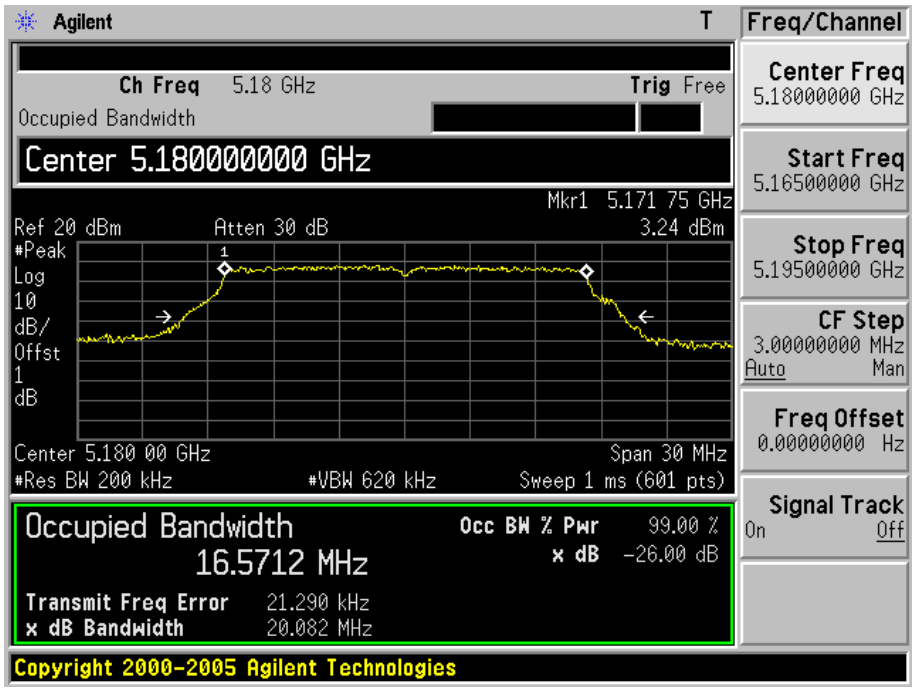


Channel 48 (5240MHz)

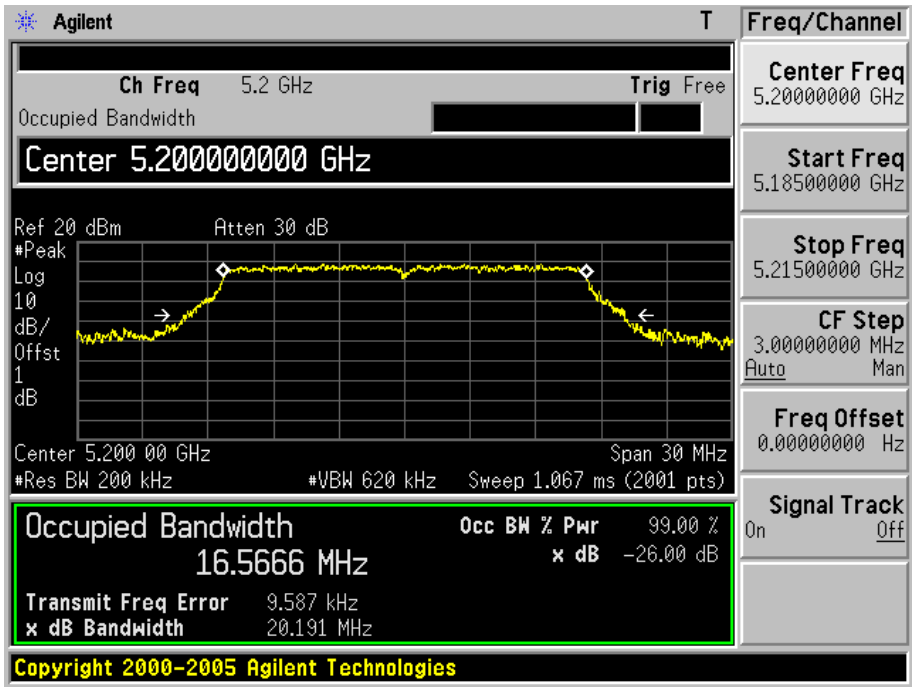


Ant 2

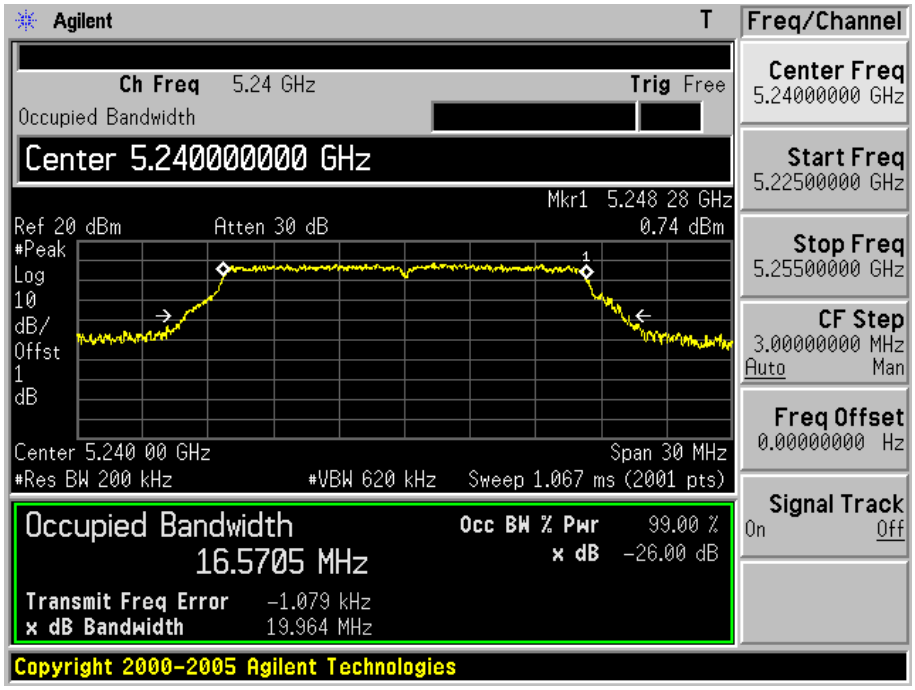
Channel 36 (5180MHz)



Channel 40 (5200MHz)

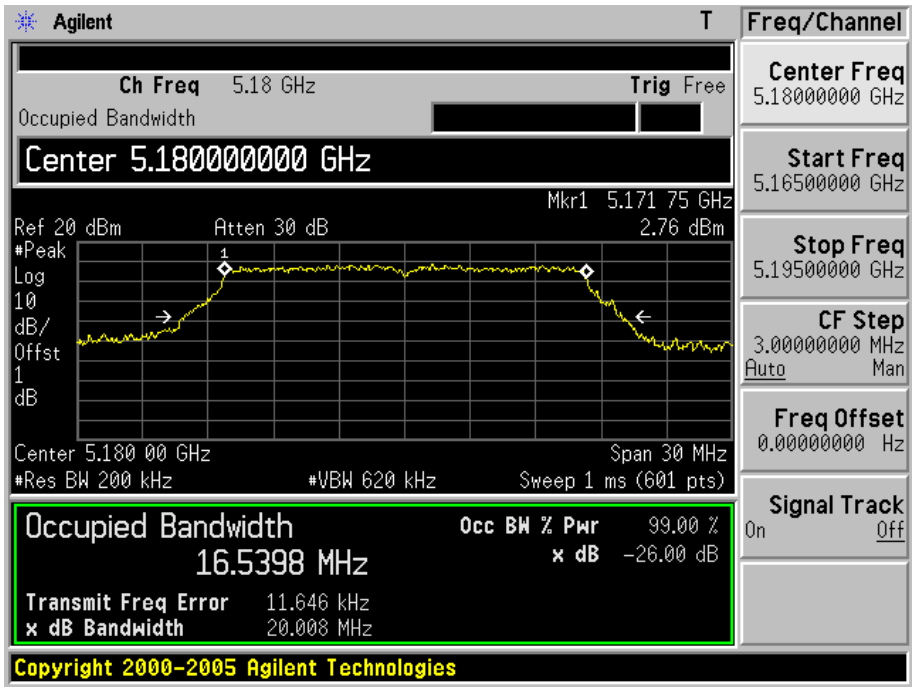


Channel 48 (5240MHz)

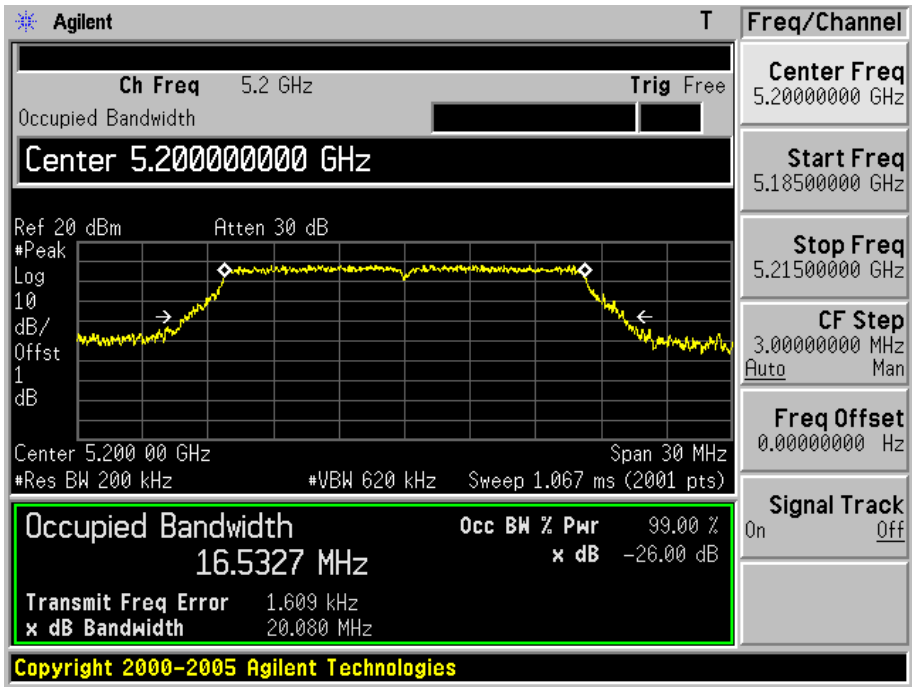


Ant 3

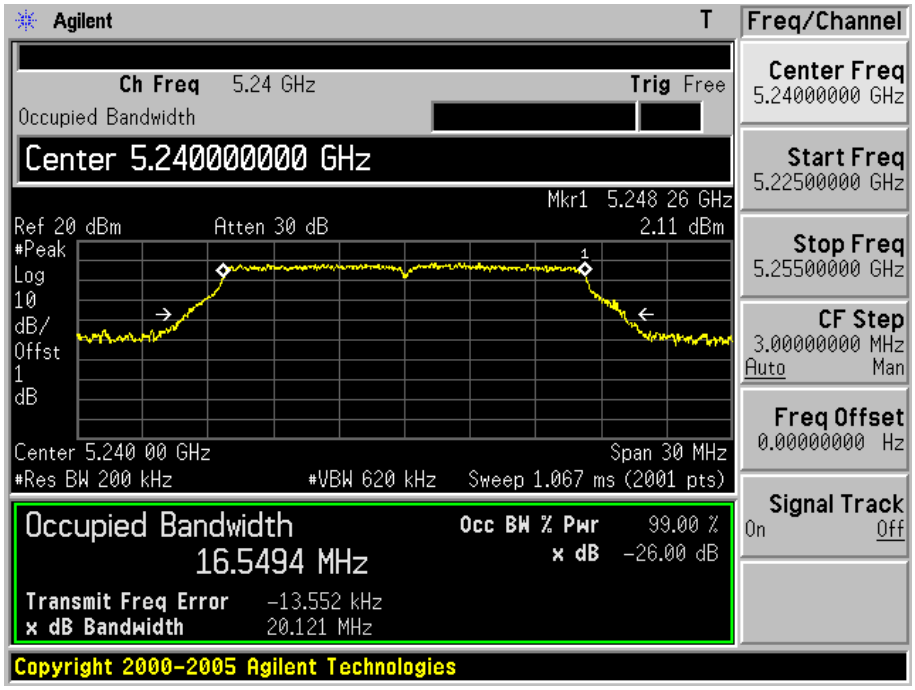
Channel 36 (5180MHz)



Channel 40 (5200MHz)



Channel 48 (5240MHz)

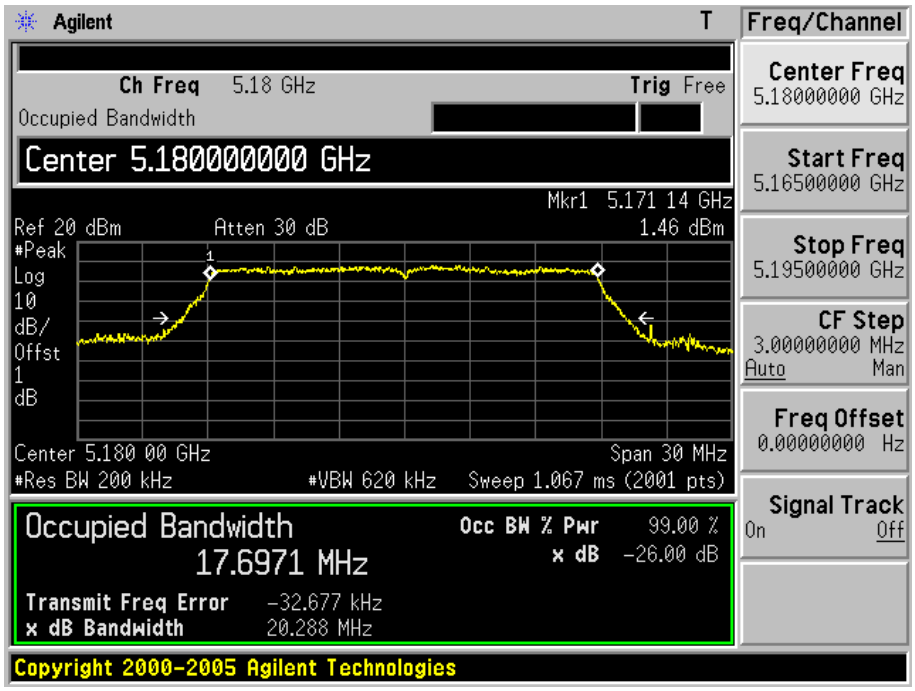


Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) with CDD

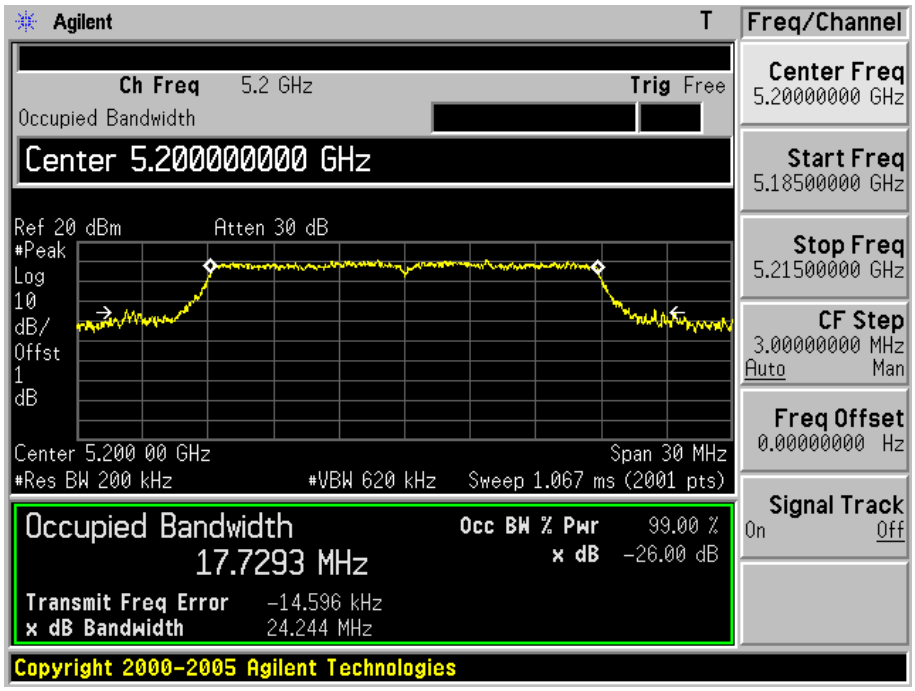
Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)			Lower/Higher Frequency (MHz)		
		Ant1	Ant2	An3	Ant1	Ant2	An3	Ant1	Ant2	An3
36	5180	20.288	20.282	20.143	17.6971	17.6911	17.6760	5171.14	5171.14	5171.14
40	5200	24.244	21.244	23.257	17.7293	17.7371	17.7320	N/A	N/A	N/A
48	5240	27.385	24.143	23.435	17.7512	17.7577	17.7597	5248.86	5248.85	5248.88

Ant 1

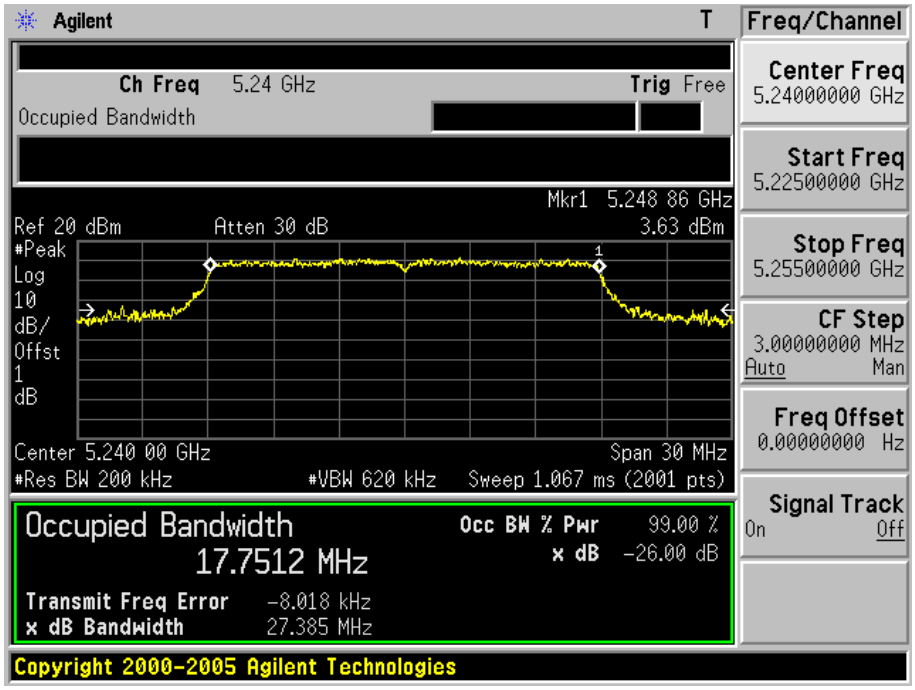
Channel 36 (5180MHz)



Channel 40 (5200MHz)

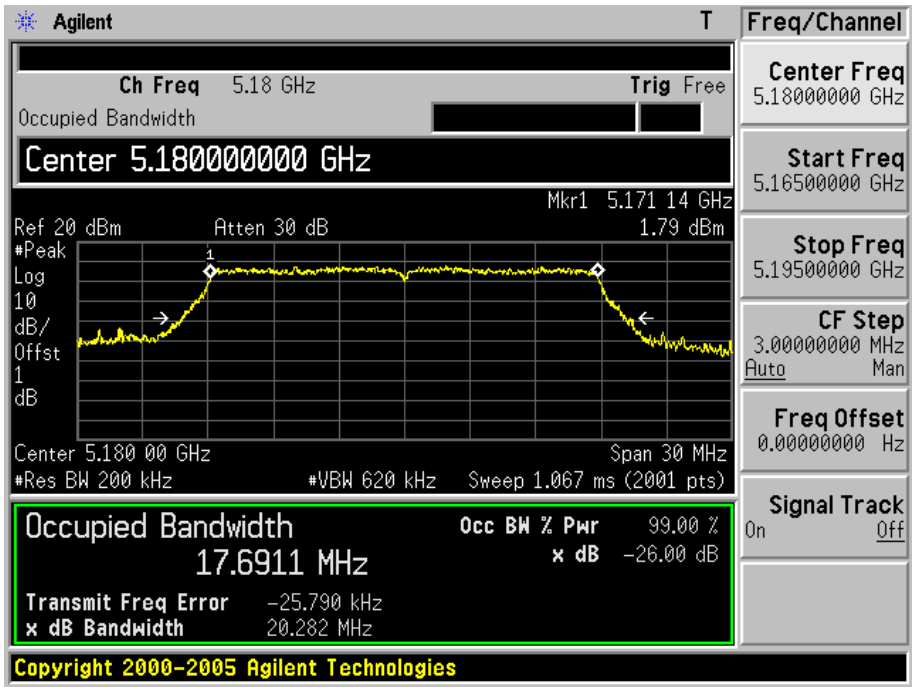


Channel 48 (5240MHz)

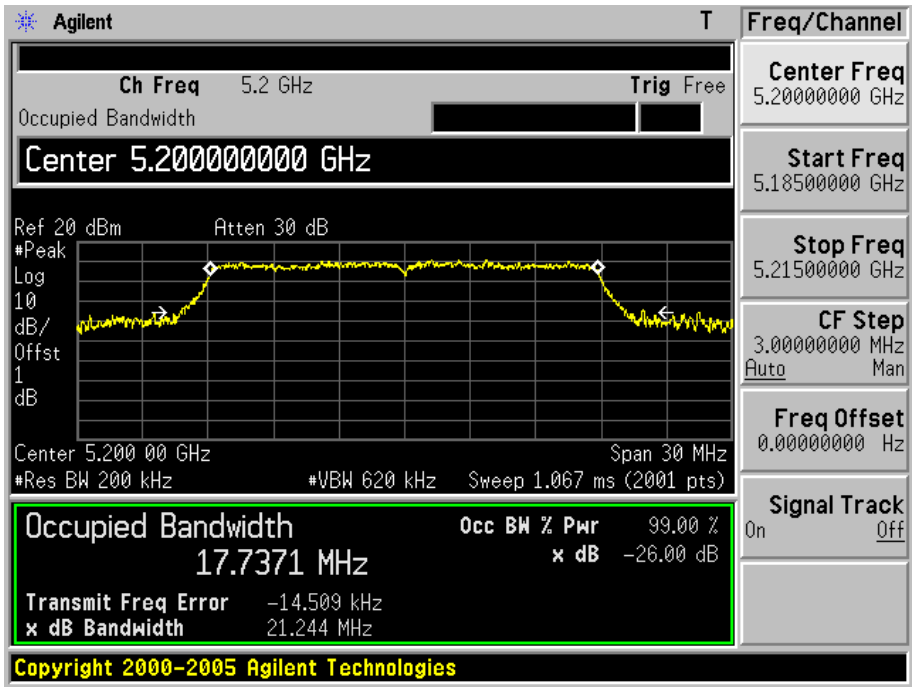


Ant 2

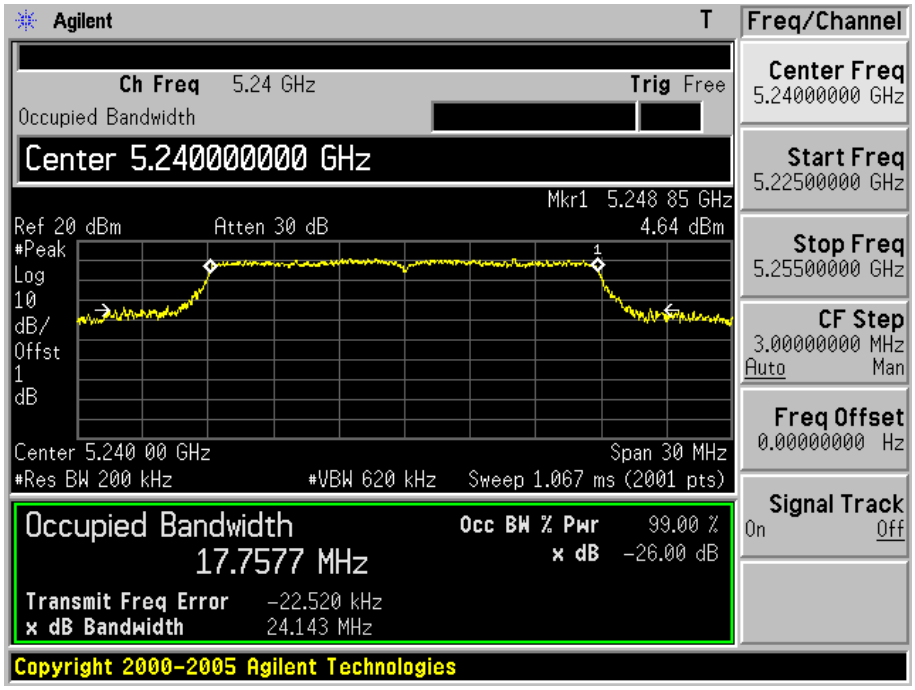
Channel 36 (5180MHz)



Channel 40 (5200MHz)

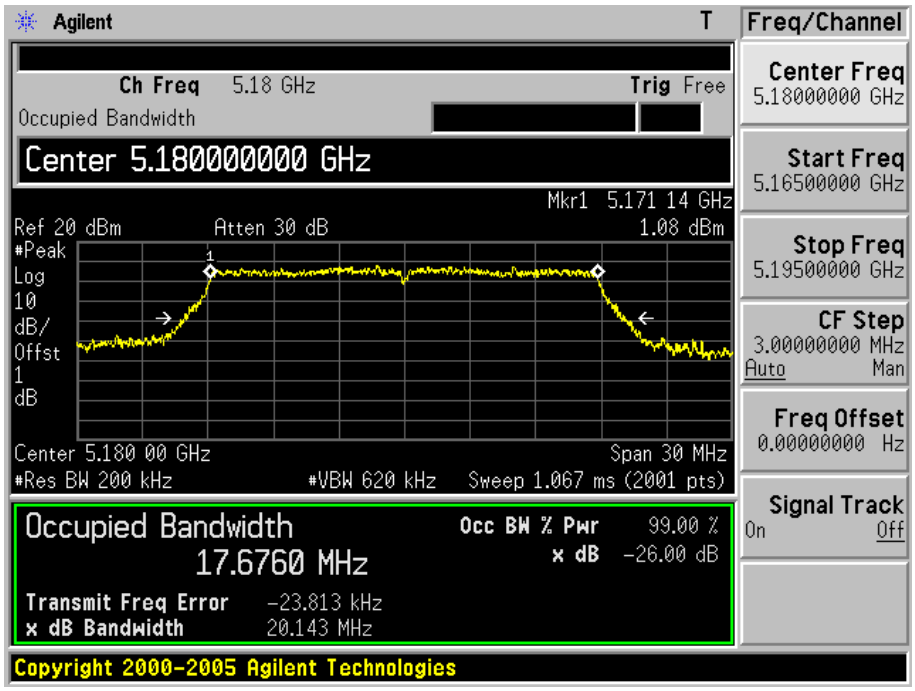


Channel 48 (5240MHz)

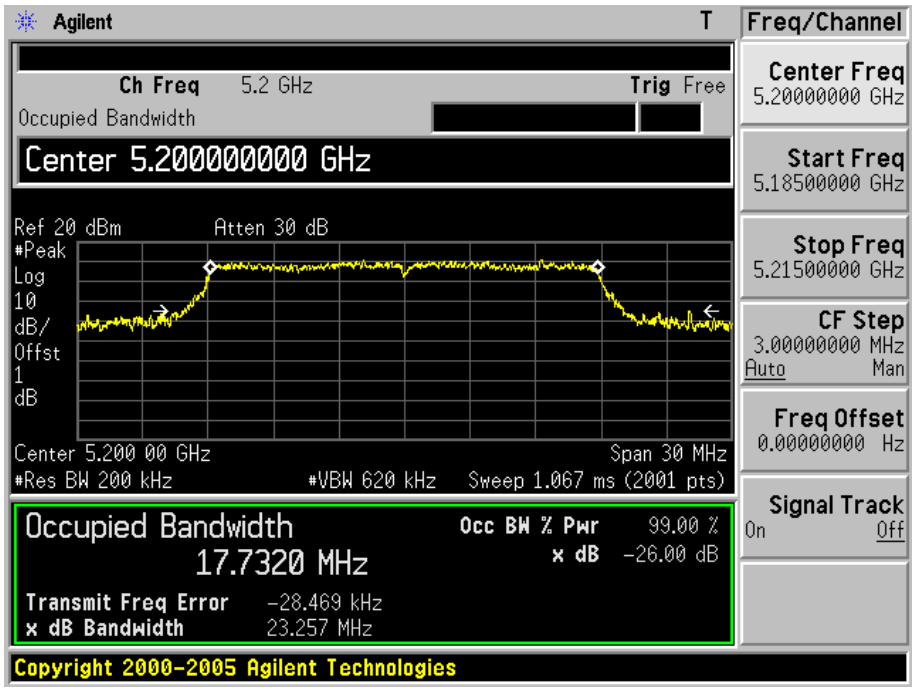


Ant 3

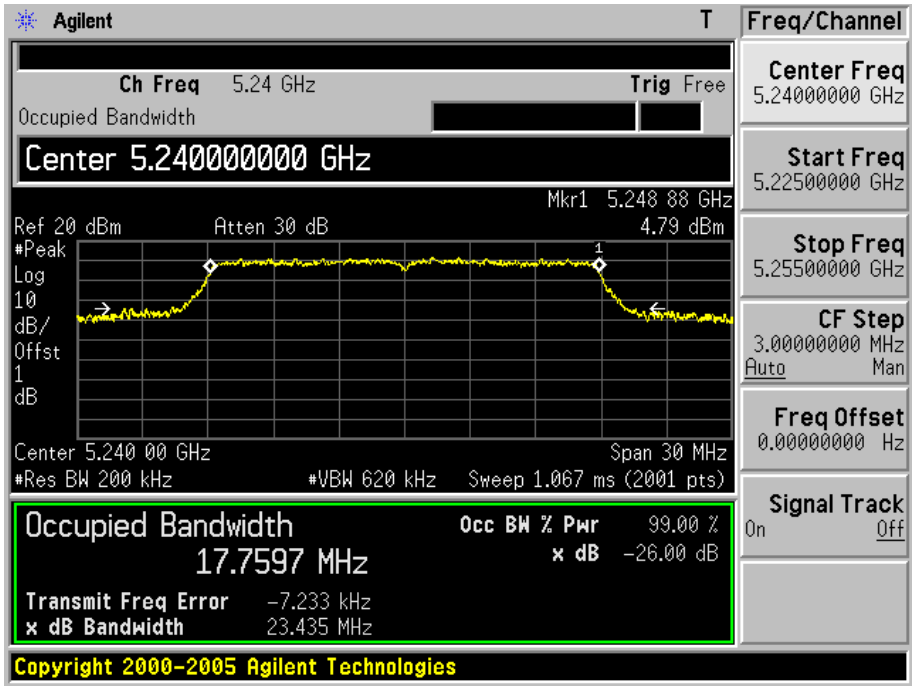
Channel 36 (5180MHz)



Channel 40 (5200MHz)



Channel 48 (5240MHz)

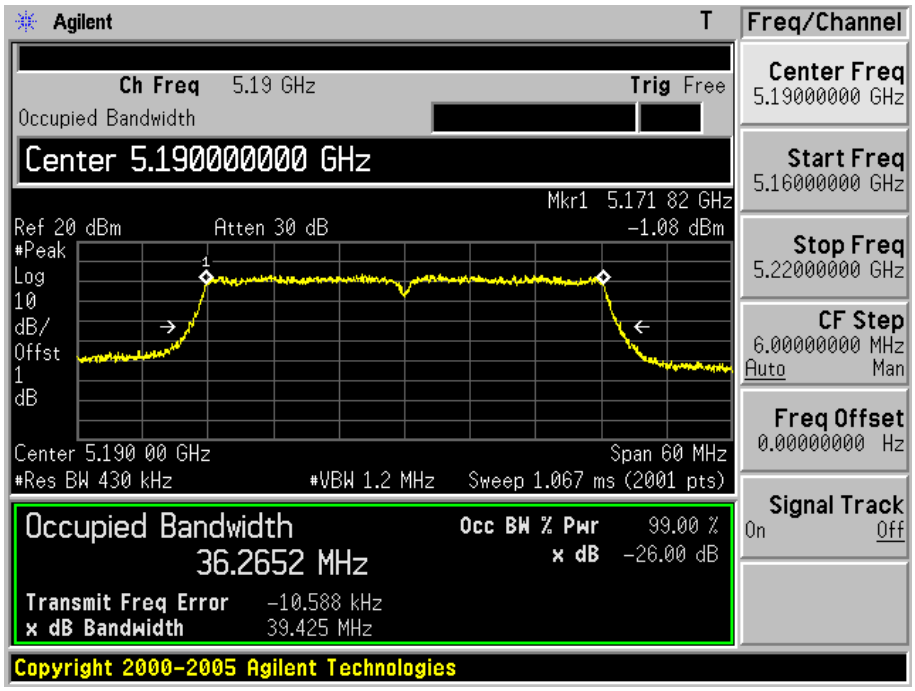


Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz) with CDD

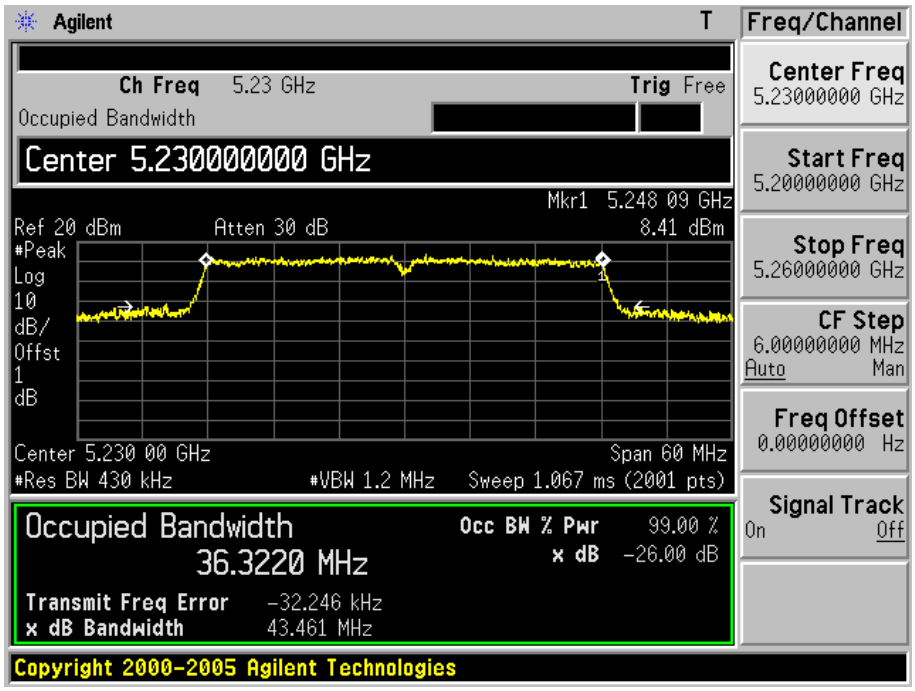
Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)			Lower/Higher Frequency (MHz)		
		Ant1	Ant2	An3	Ant1	Ant2	An3	Ant1	Ant2	An3
38	5190	39.425	38.904	39.469	36.2652	36.2511	36.2218	5171.82	5171.88	5171.85
46	5230	43.461	45.622	45.740	36.3220	36.3176	36.3552	5248.09	5248.12	5248.12

Ant 1

Channel 38 (5190MHz)

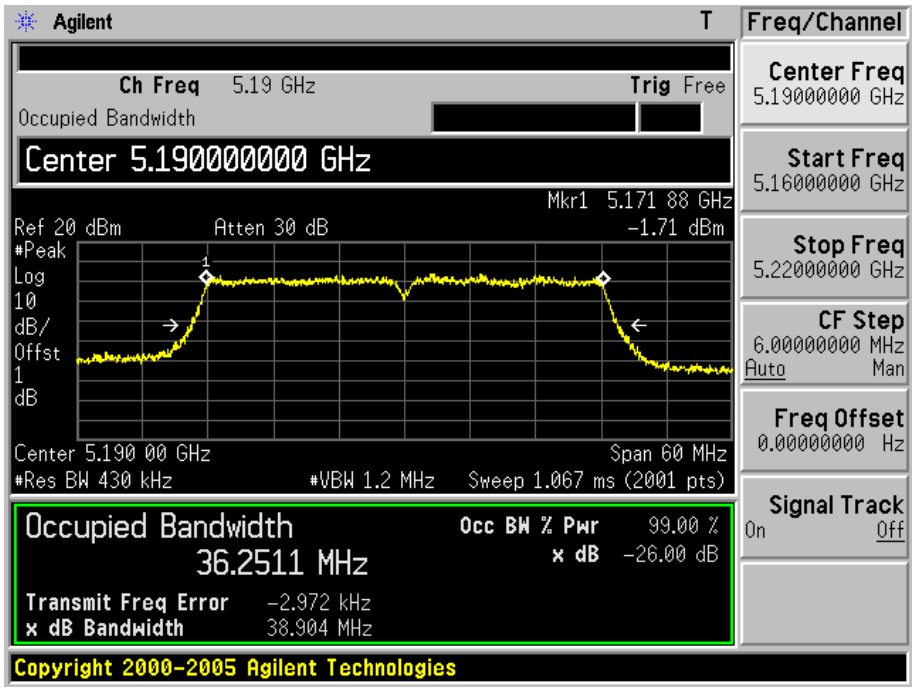


Channel 46 (5230MHz)

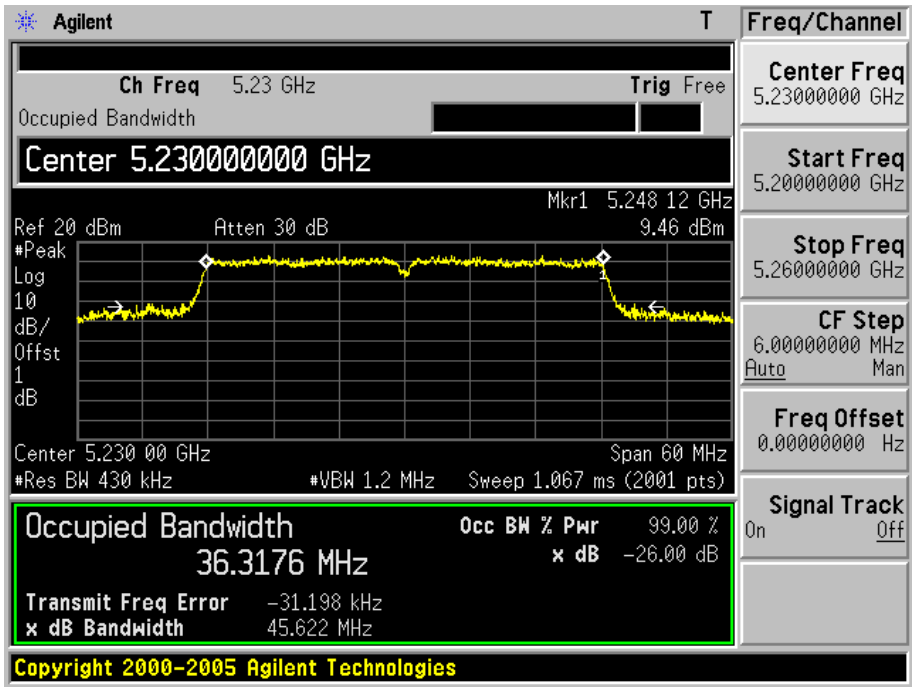


Ant 2

Channel 38 (5190MHz)

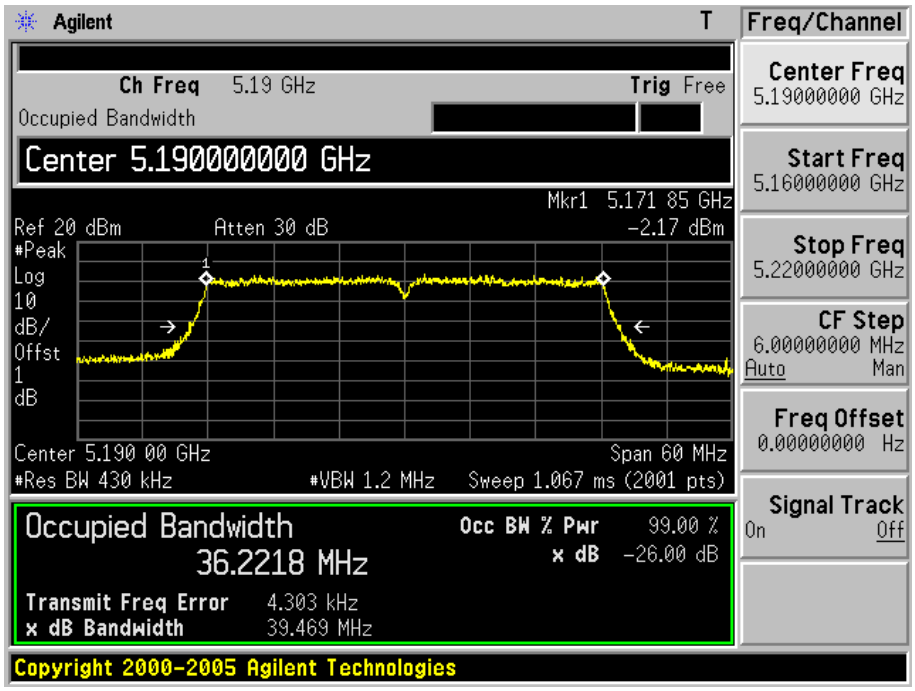


Channel 46 (5230MHz)

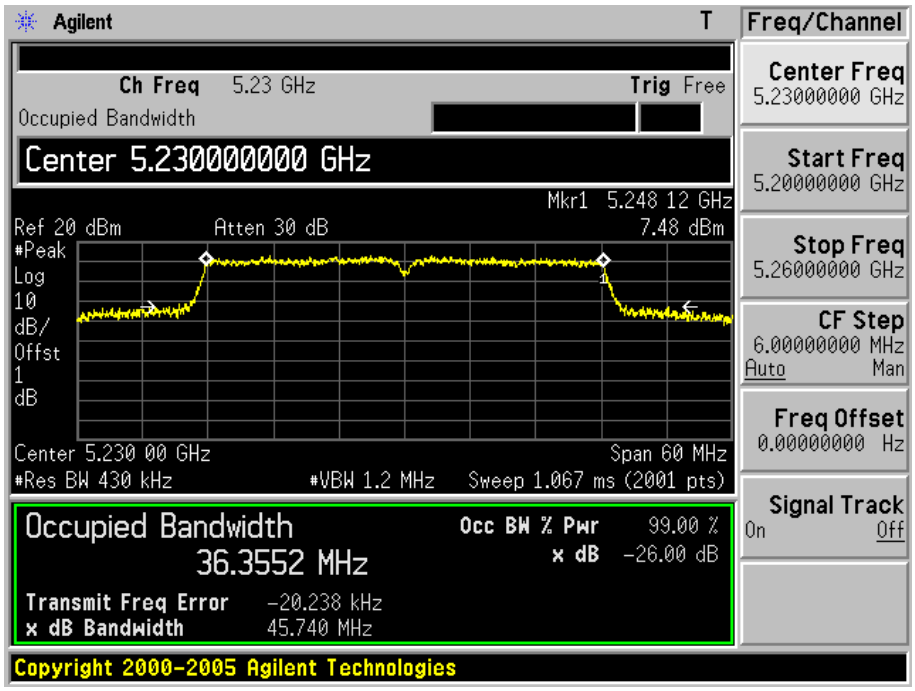


Ant 3

Channel 38 (5190MHz)



Channel 46 (5230MHz)

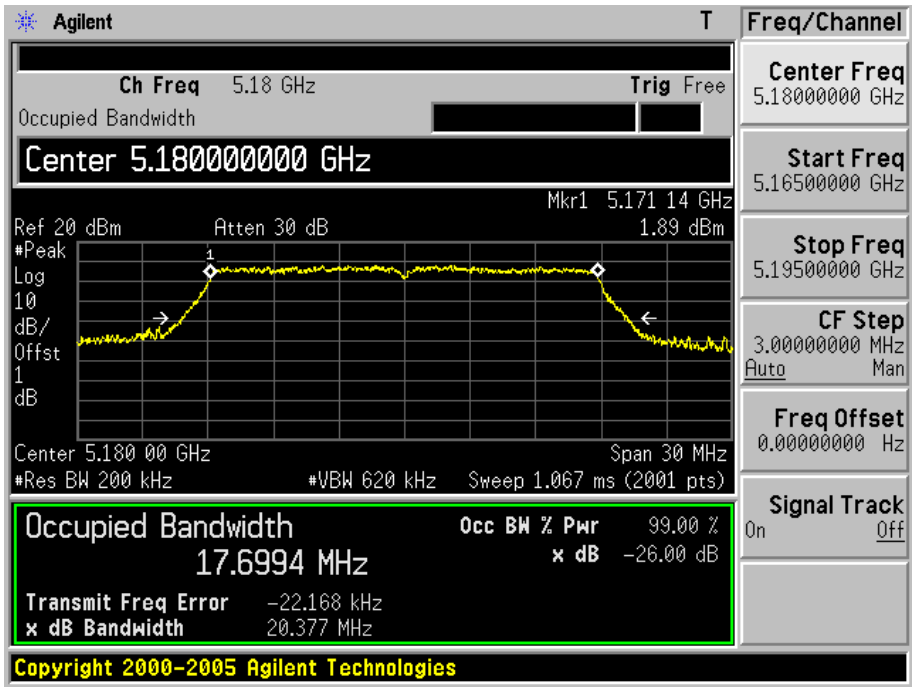


Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 4: Transmit by 802.11ac(20MHz) with CDD

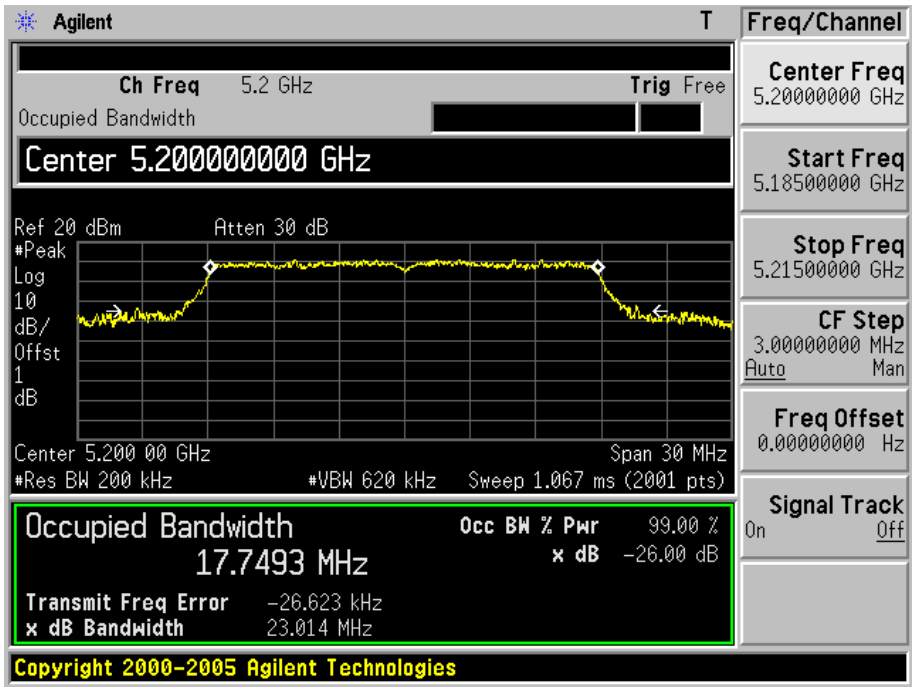
Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)			Lower/Higher Frequency (MHz)		
		Ant1	Ant2	An3	Ant1	Ant2	An3	Ant1	Ant2	An3
36	5180	20.377	20.311	20.369	17.6994	17.6887	17.6856	5171.14	5171.14	5171.14
40	5200	23.014	20.566	23.852	17.7493	17.7239	17.7330	N/A	N/A	N/A
48	5240	24.528	24.083	25.115	17.7582	17.7550	17.7443	5248.86	5248.86	5248.84

Ant 1

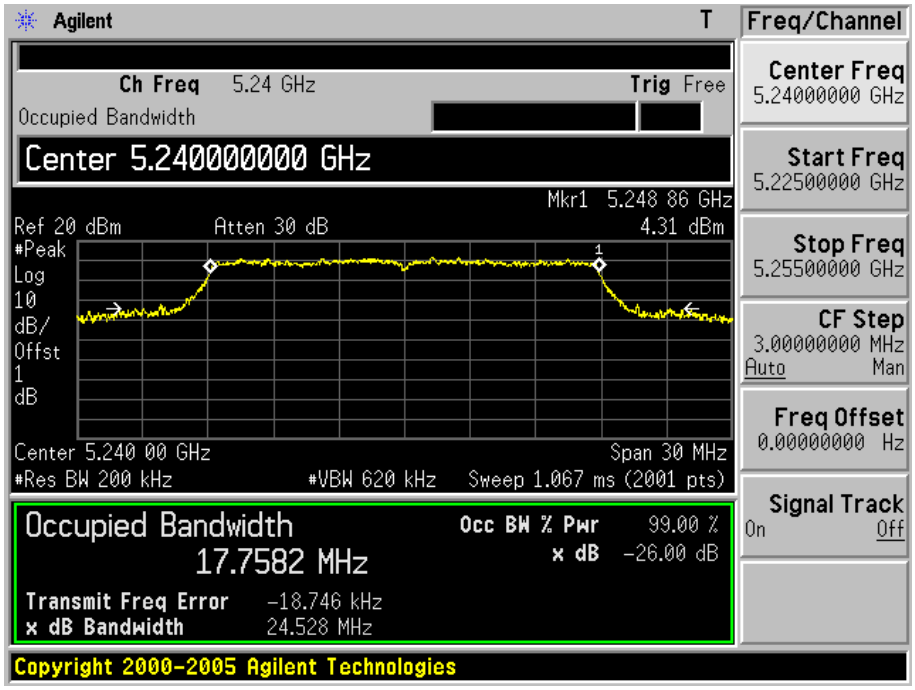
Channel 36 (5180MHz)



Channel 40 (5200MHz)

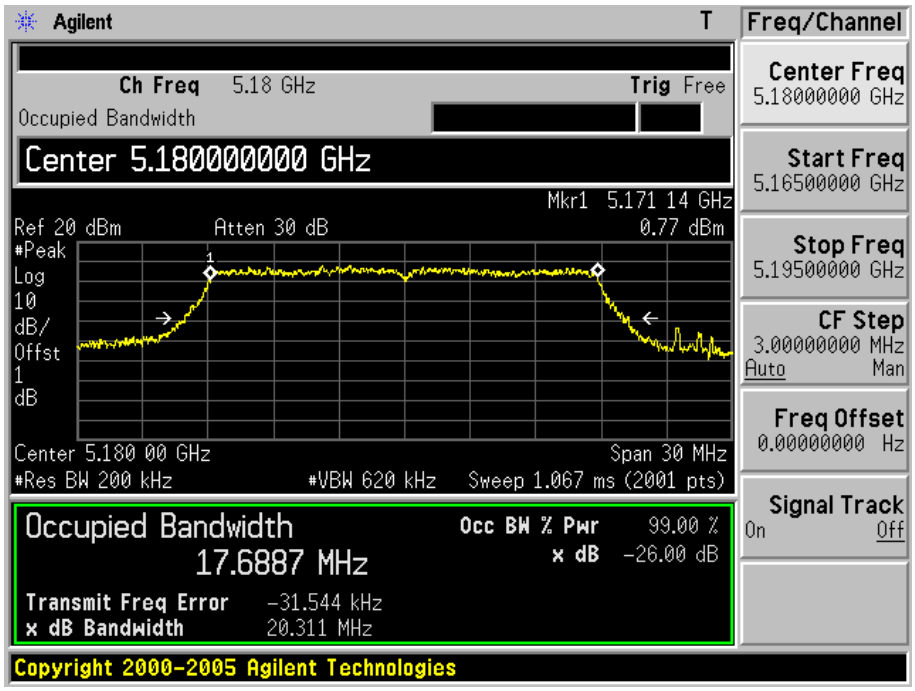


Channel 48 (5240MHz)

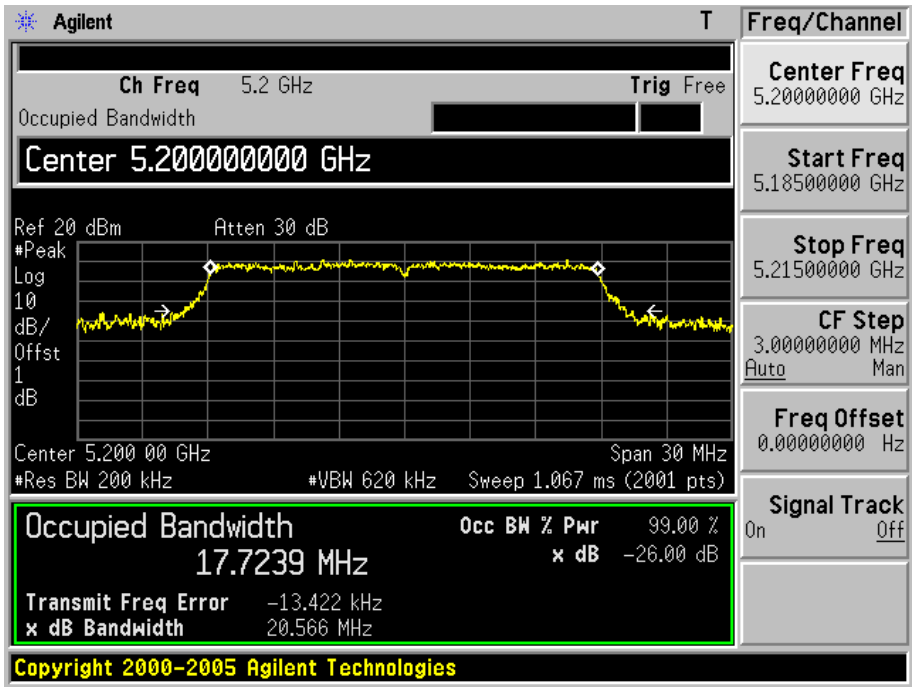


Ant 2

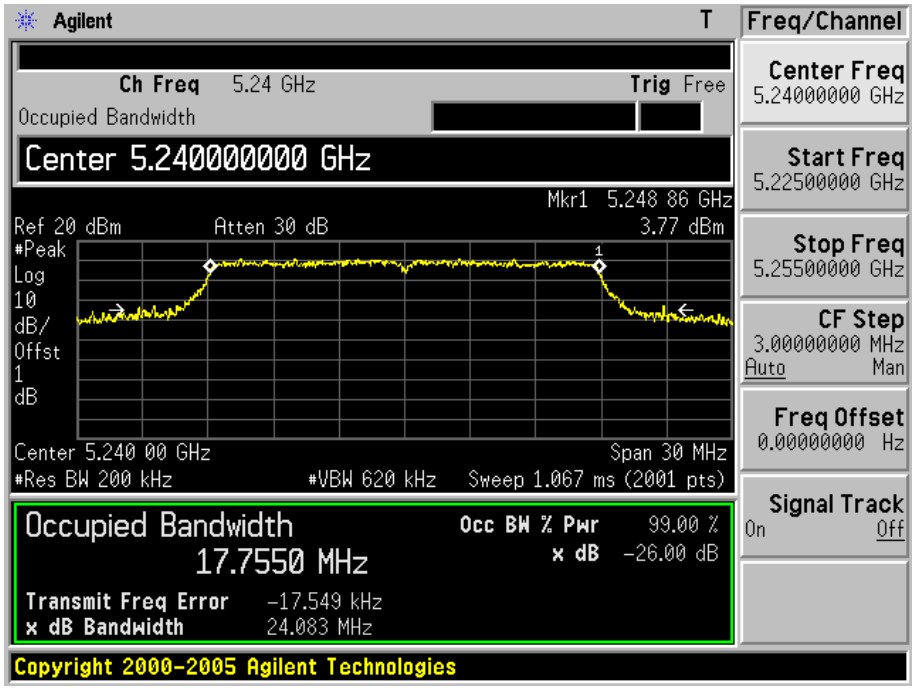
Channel 36 (5180MHz)



Channel 40 (5200MHz)

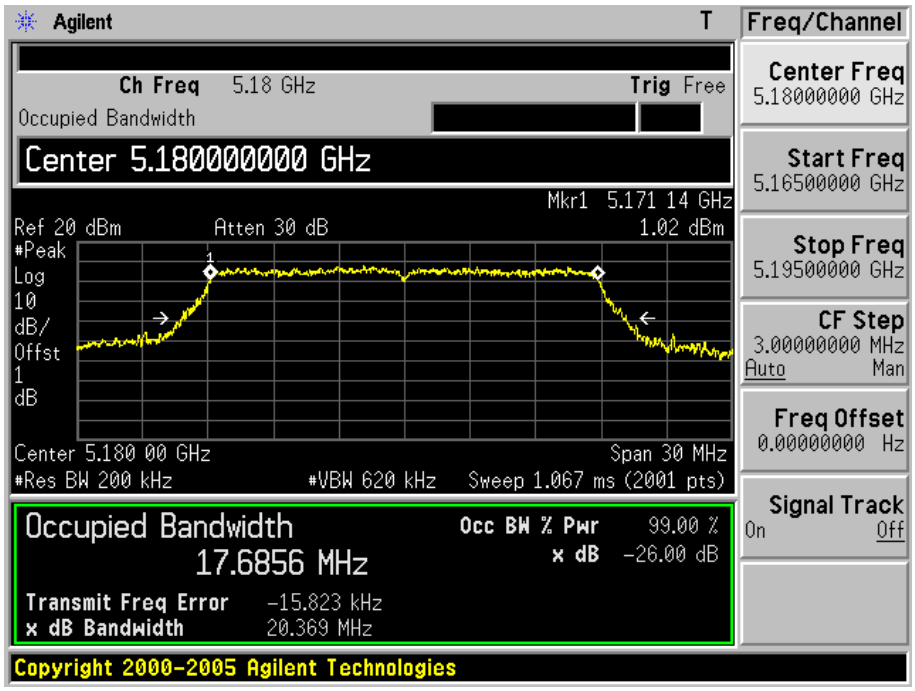


Channel 48 (5240MHz)

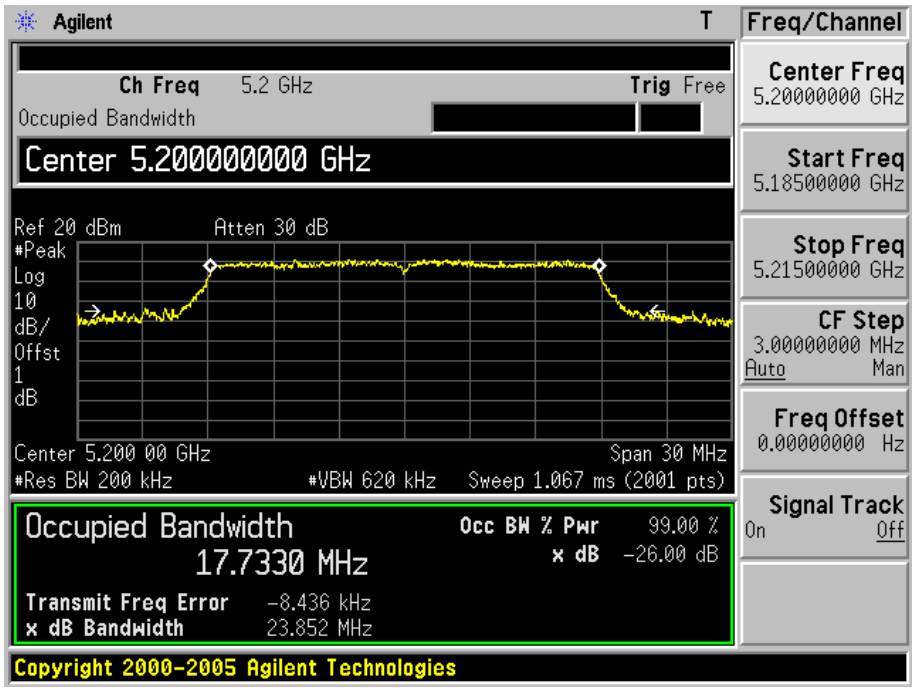


Ant 3

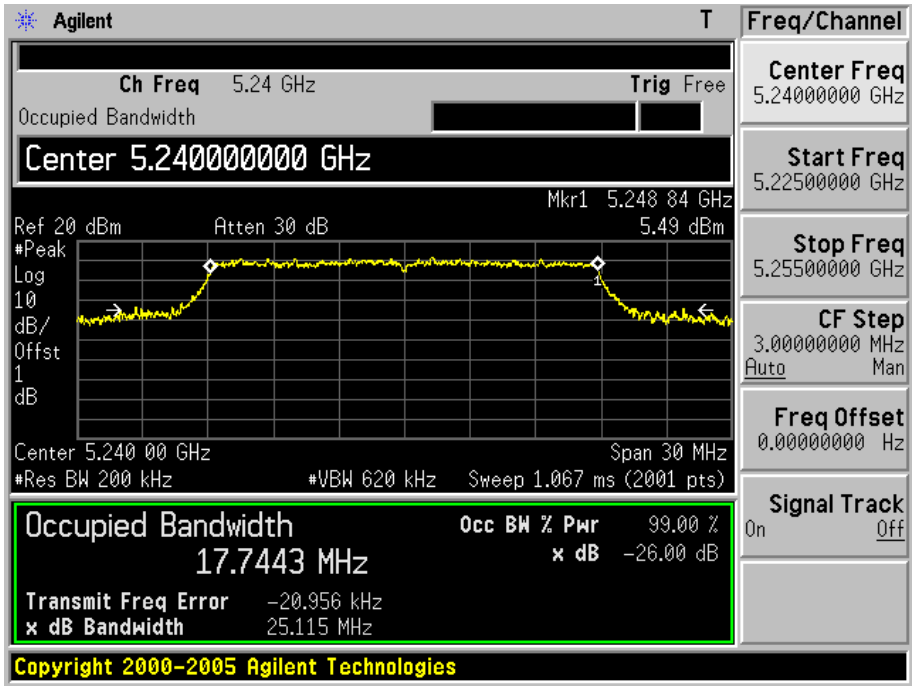
Channel 36 (5180MHz)



Channel 40 (5200MHz)



Channel 48 (5240MHz)

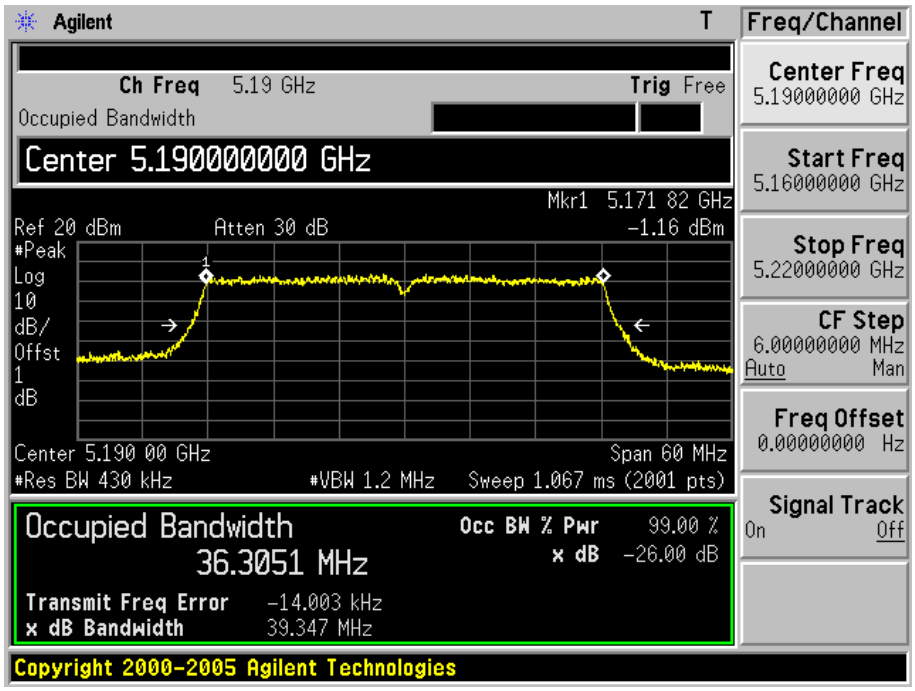


Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 5: Transmit by 802.11ac(40MHz) with CDD

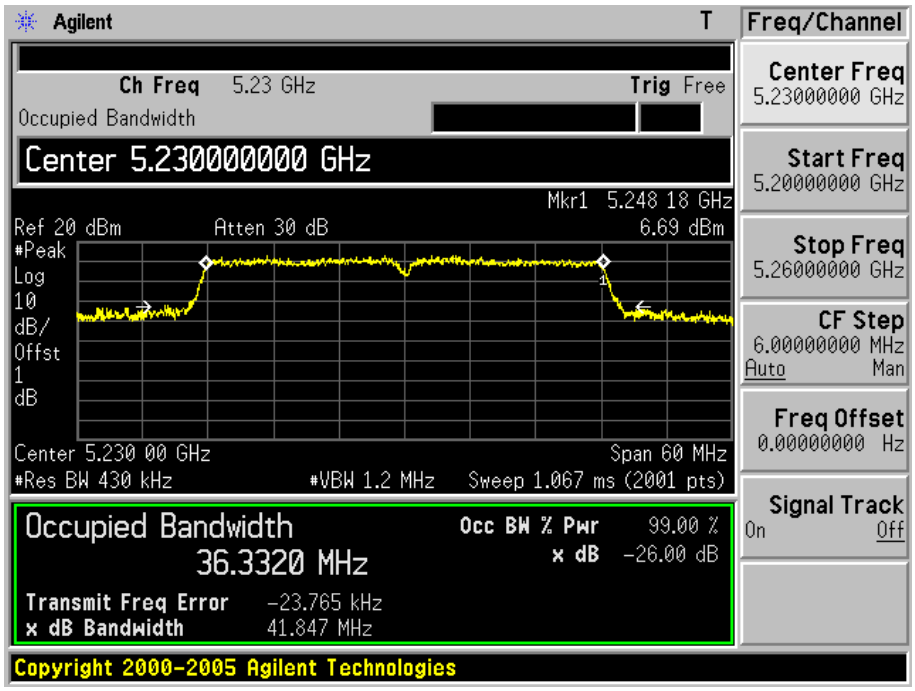
Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)			Lower/Higher Frequency (MHz)		
		Ant1	Ant2	An3	Ant1	Ant2	An3	Ant1	Ant2	An3
38	5190	39.347	39.439	39.355	36.3051	36.2461	36.2777	5171.82	5171.85	5171.85
46	5230	41.847	50.921	52.701	36.3320	36.3339	36.2911	5248.18	5248.12	5248.00

Ant 1

Channel 38 (5190MHz)

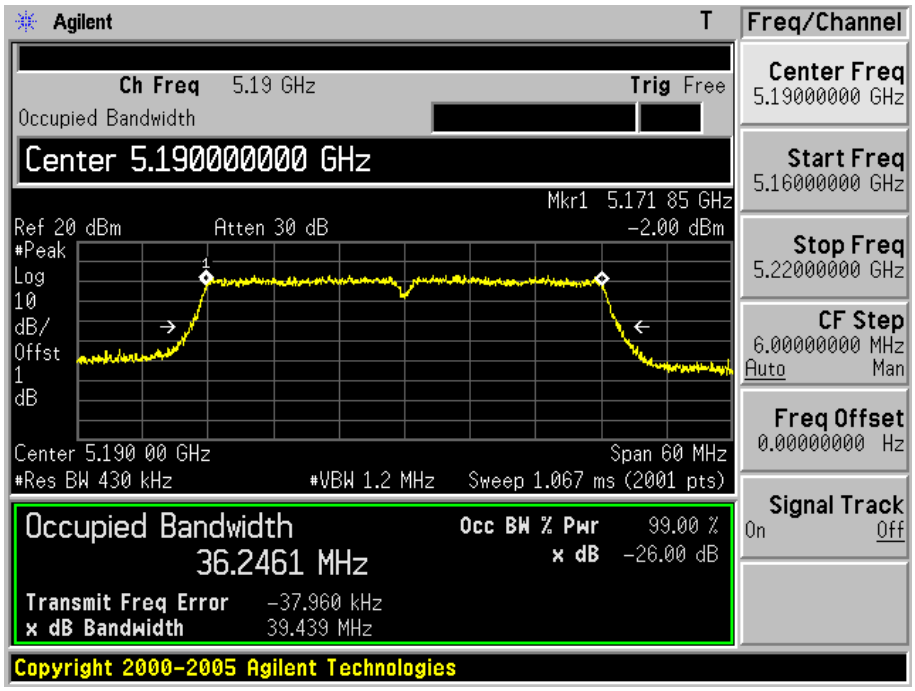


Channel 46 (5230MHz)

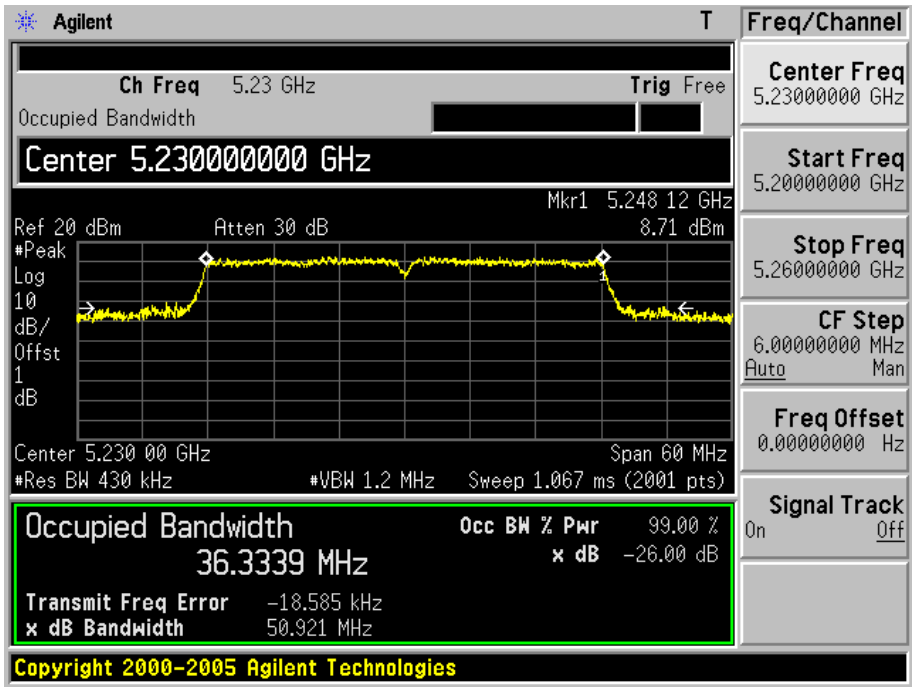


Ant 2

Channel 38 (5190MHz)

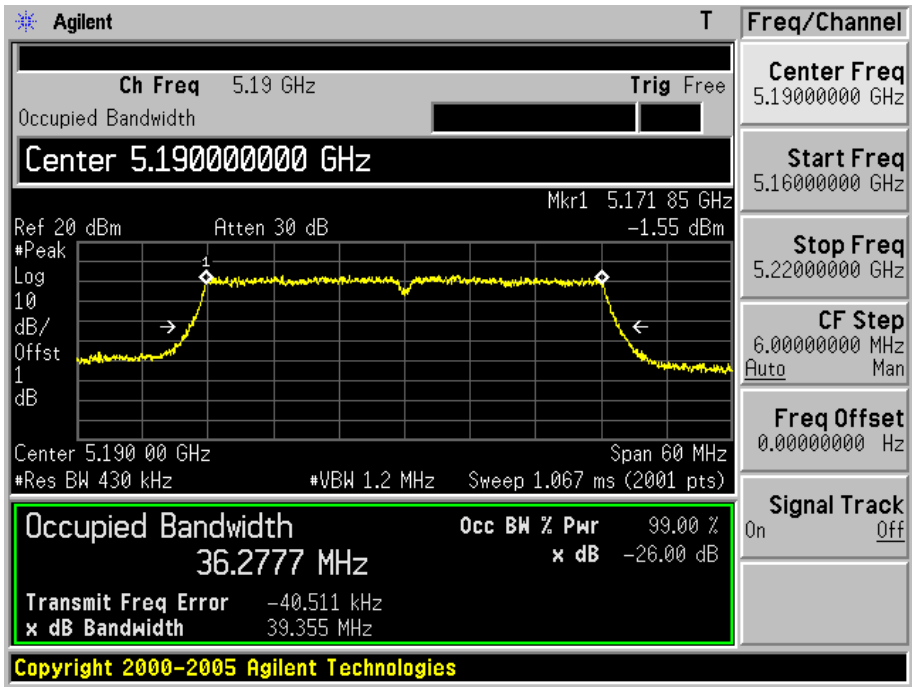


Channel 46 (5230MHz)

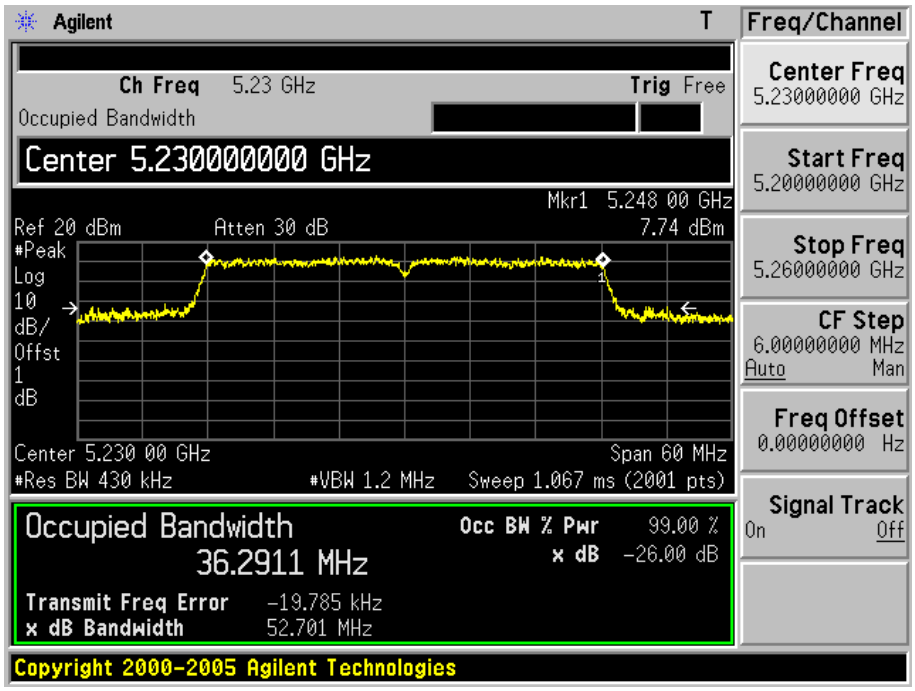


Ant 3

Channel 38 (5190MHz)



Channel 46 (5230MHz)



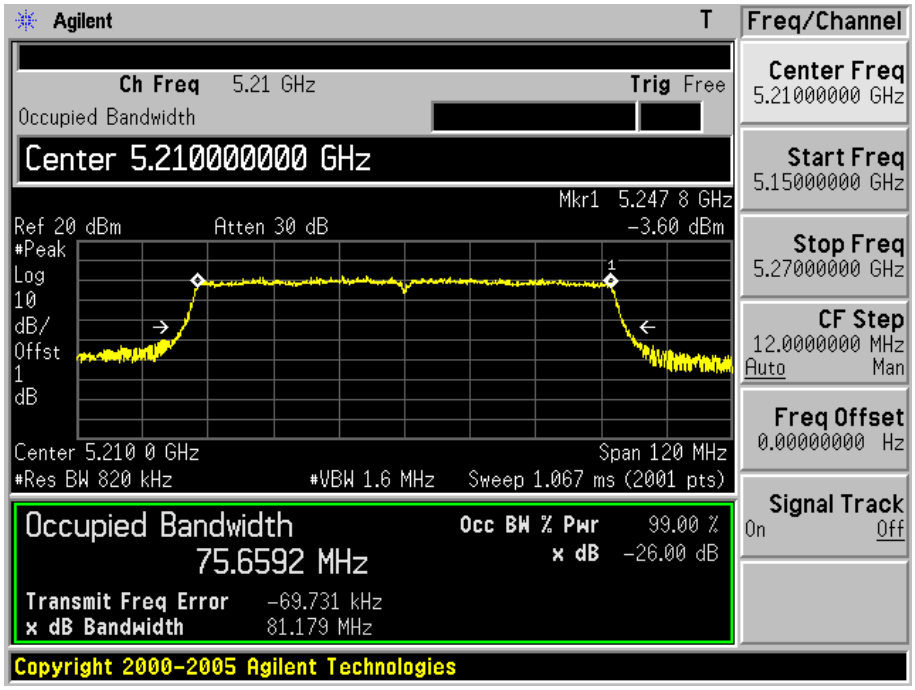
Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 6: Transmit by 802.11ac(80MHz) with CDD

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)			Lower/Higher Frequency (MHz)		
		Ant1	Ant2	An3	Ant1	Ant2	An3	Ant1	Ant2	An3
42	5210	81.179	81.532	81.400	75.6592	75.6655	75.6474	5247.8	5247.7	5247.7

Note: The worsest frequency was showed above.

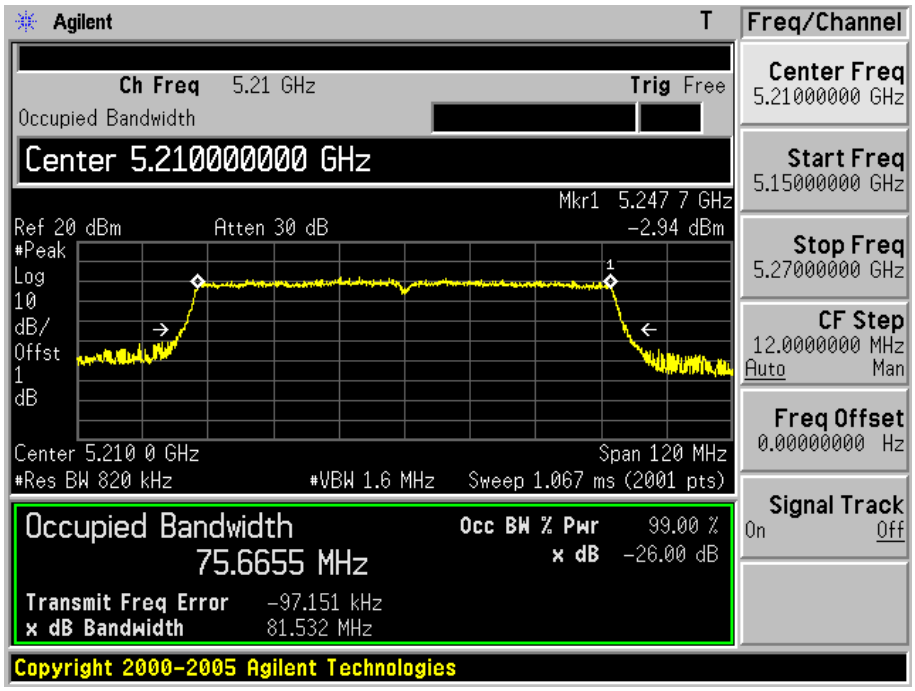
Ant 1

Channel 42 (5210MHz)



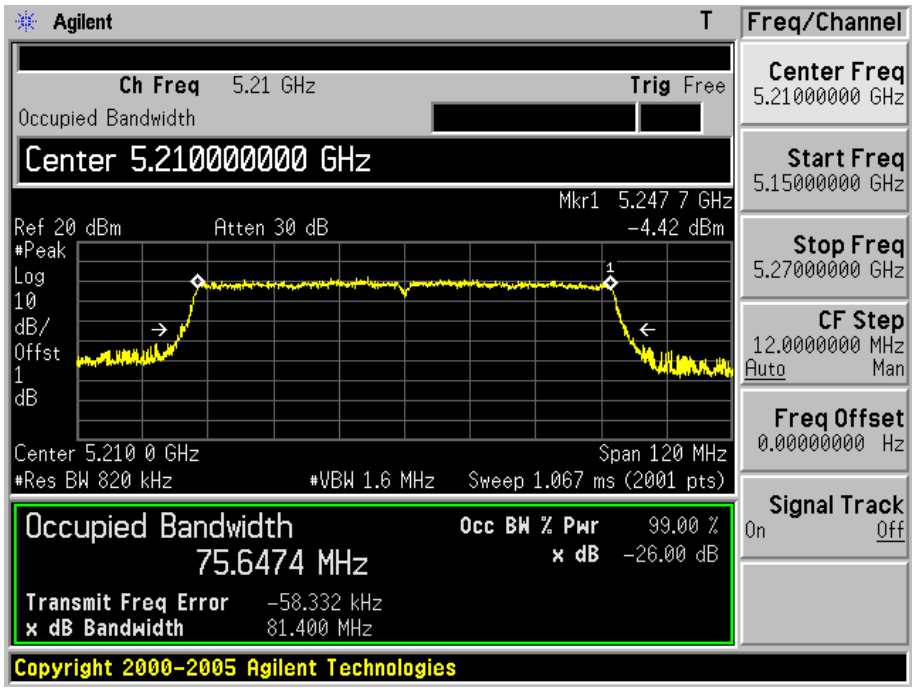
Ant 2

Channel 42 (5210MHz)



Ant 3

Channel 42 (5210MHz)

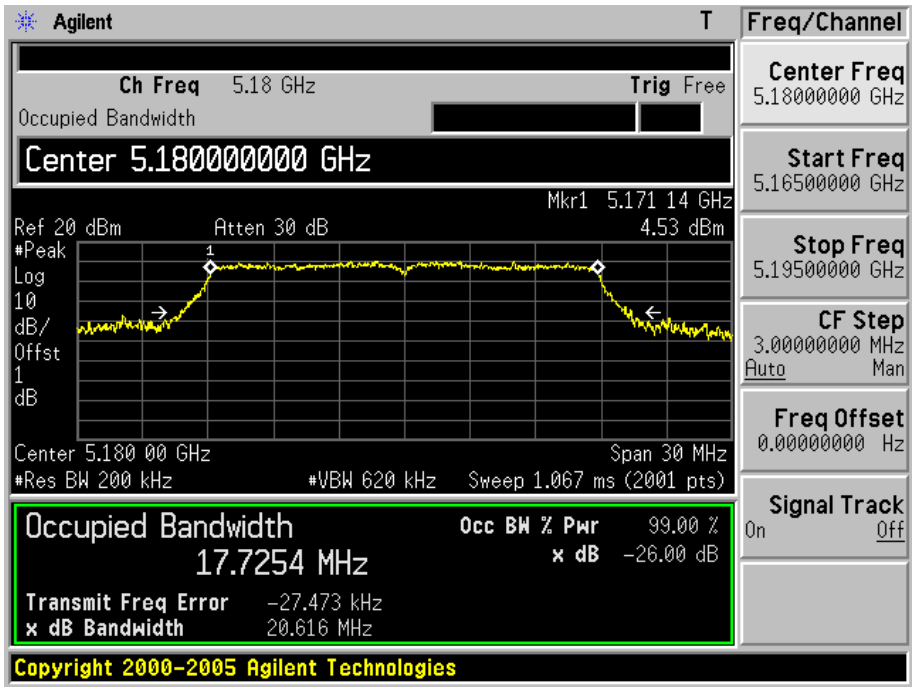


Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 7: Transmit by 802.11ac(20MHz) with beamforming

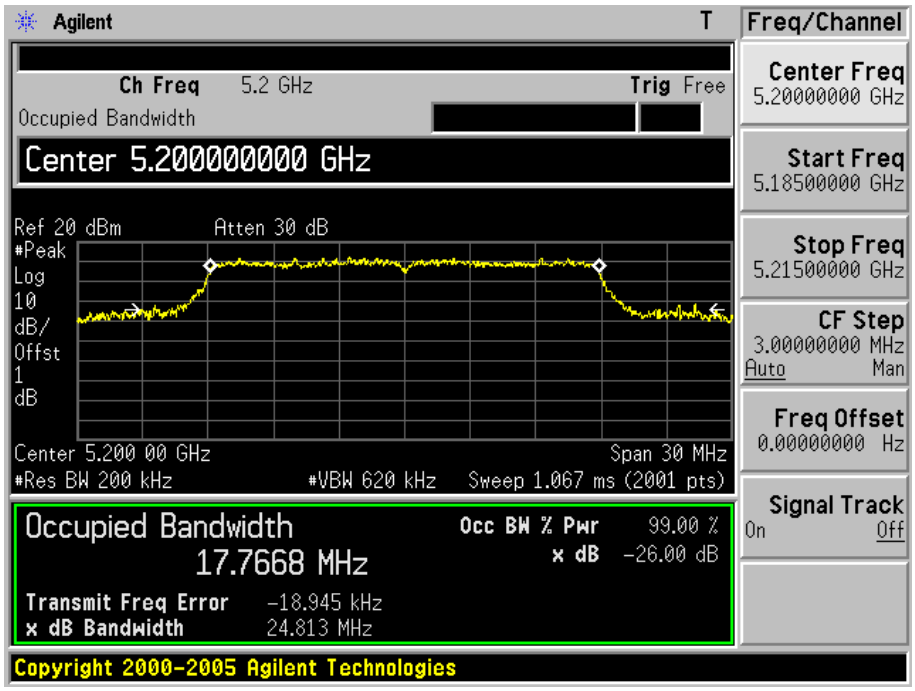
Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)			Lower/Higher Frequency (MHz)		
		Ant1	Ant2	An3	Ant1	Ant2	An3	Ant1	Ant2	An3
36	5180	20.616	20.227	20.297	17.7254	17.7041	17.7165	5171.14	5171.14	5171.12
40	5200	24.813	25.794	23.148	17.7668	17.7611	17.7364	N/A	N/A	N/A
48	5240	24.900	23.720	23.819	17.7664	17.7606	17.7779	5248.86	5248.86	5248.86

Ant 1

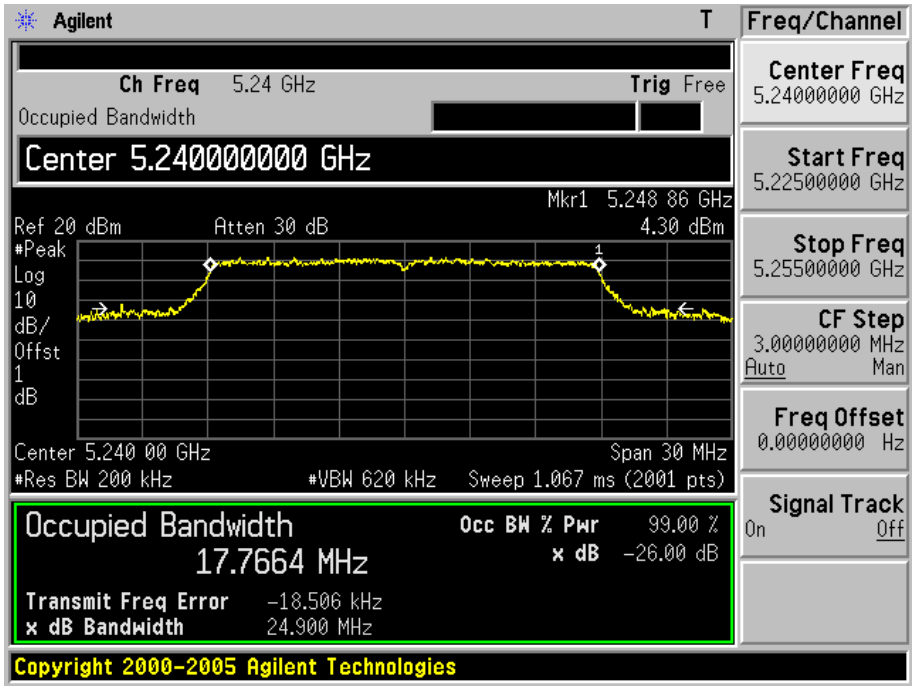
Channel 36 (5180MHz)



Channel 40 (5200MHz)

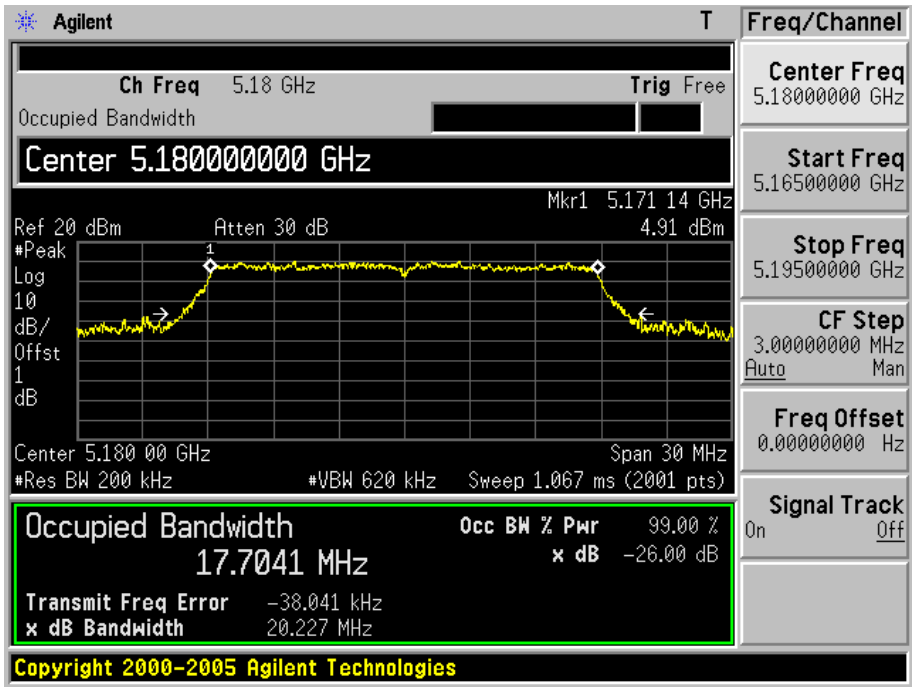


Channel 48 (5240MHz)

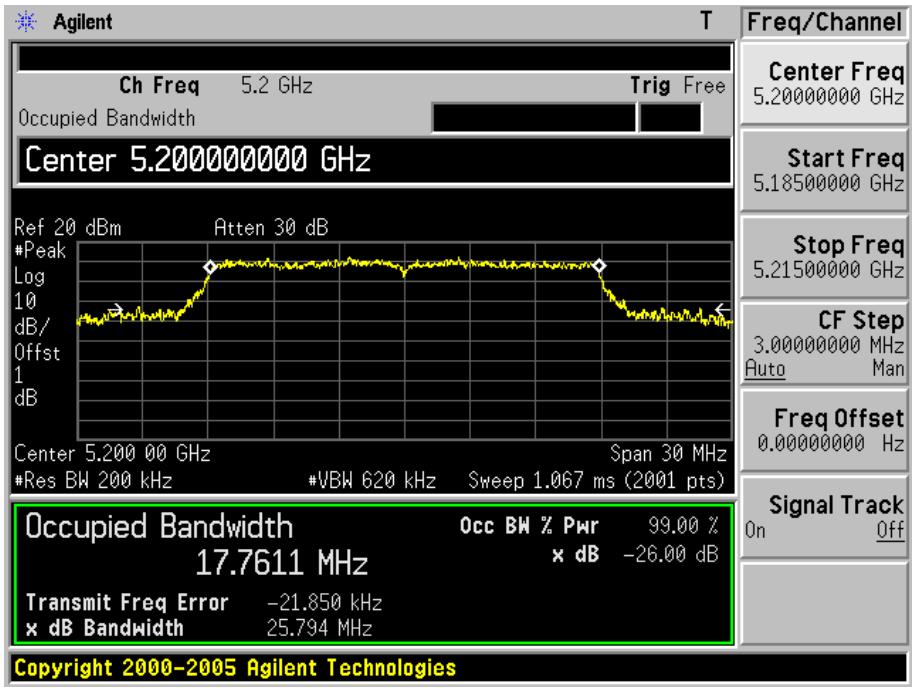


Ant 2

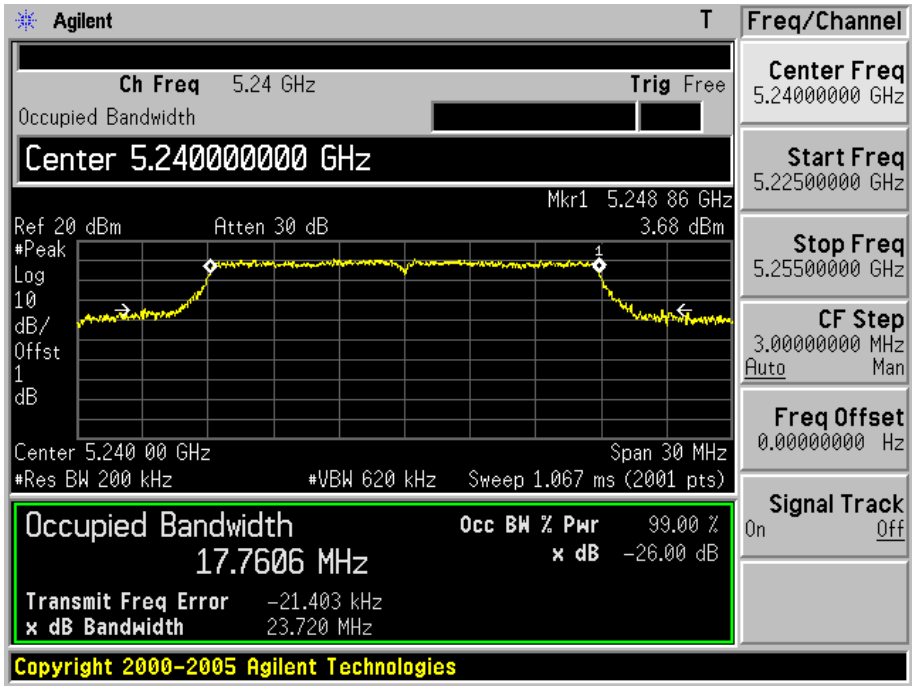
Channel 36 (5180MHz)



Channel 40 (5200MHz)

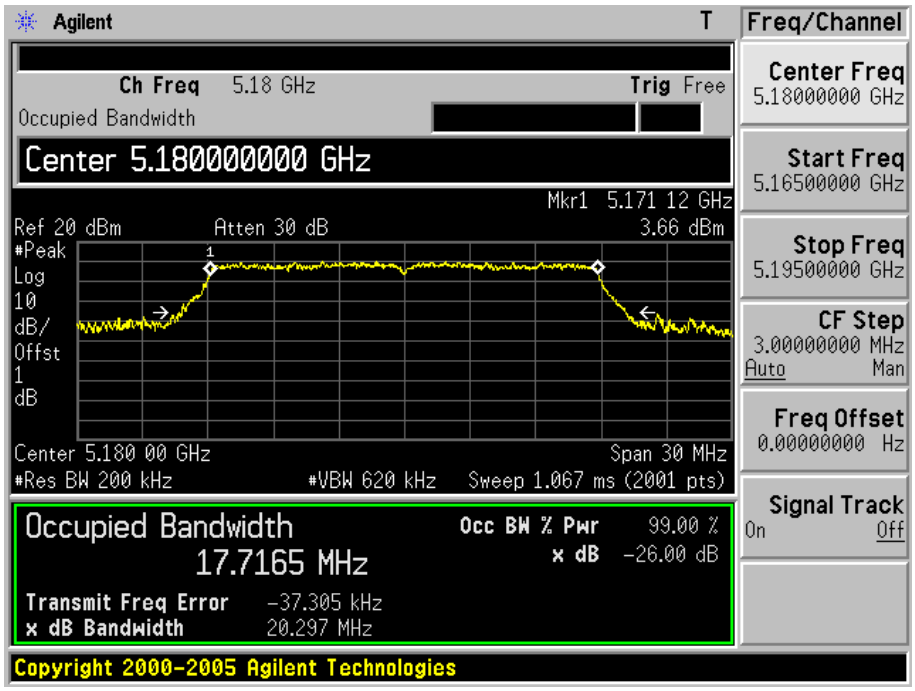


Channel 48 (5240MHz)

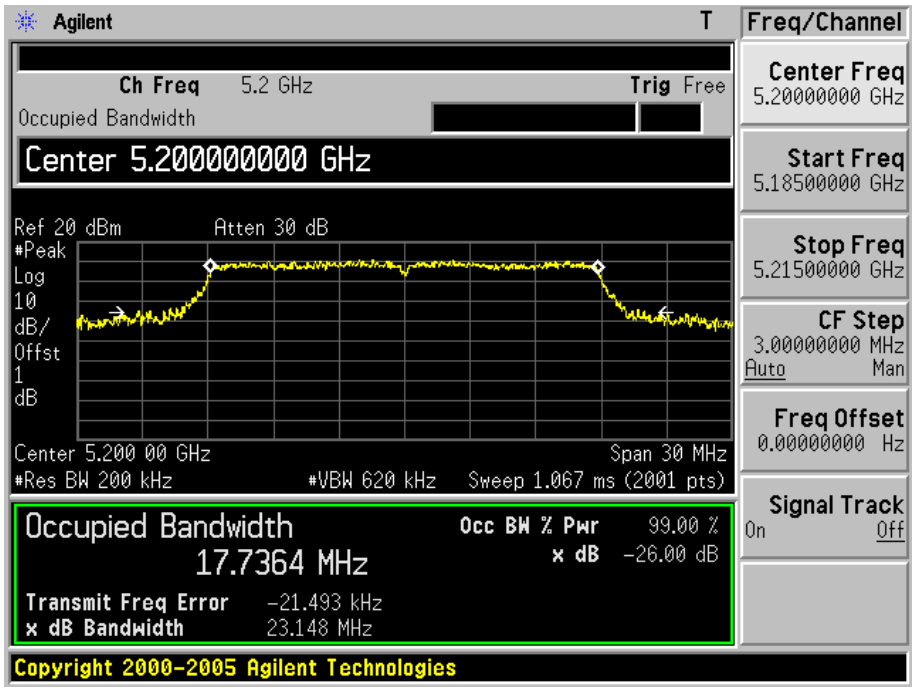


Ant 3

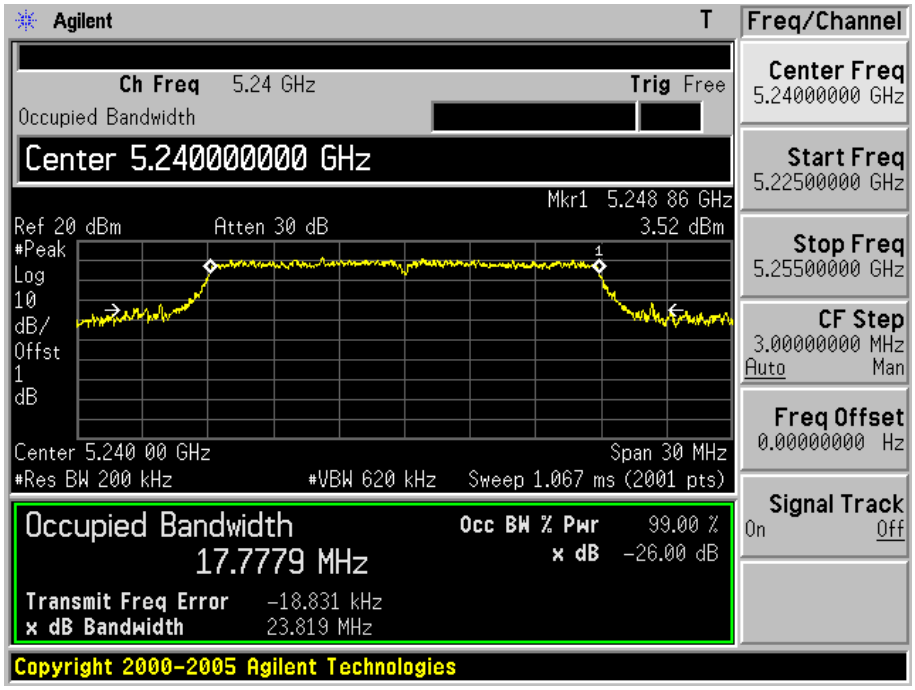
Channel 36 (5180MHz)



Channel 40 (5200MHz)



Channel 48 (5240MHz)

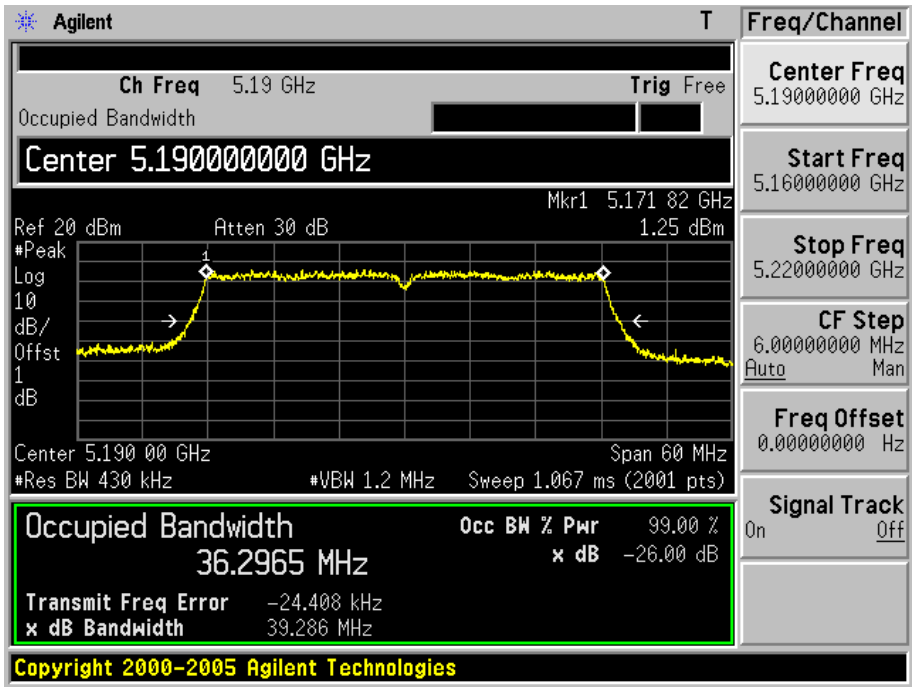


Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 8: Transmit by 802.11ac(40MHz) with beamforming

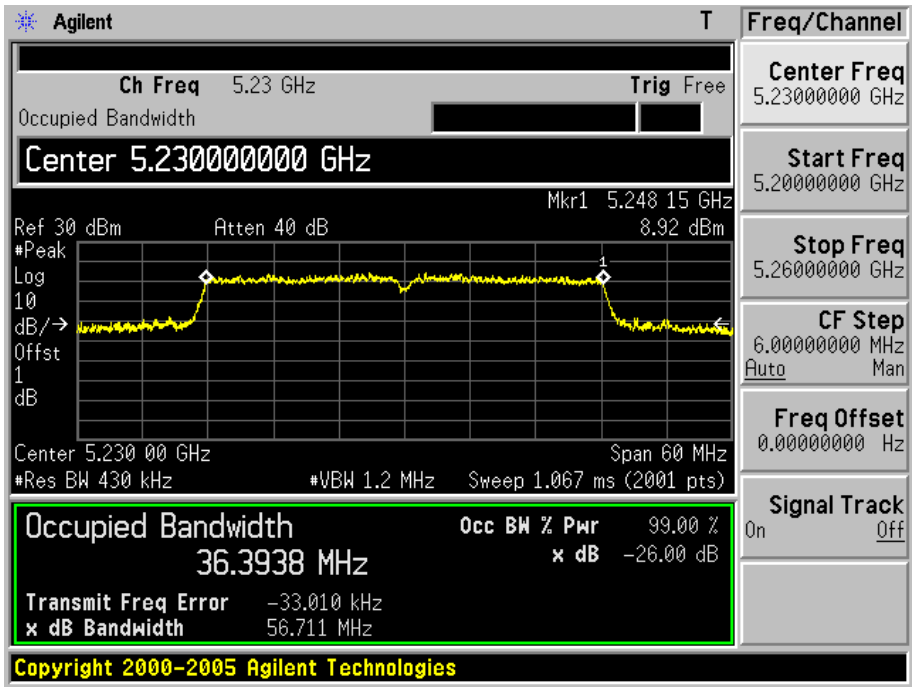
Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)			Lower/Higher Frequency (MHz)		
		Ant1	Ant2	An3	Ant1	Ant2	An3	Ant1	Ant2	An3
38	5190	39.286	39.156	39.268	36.2965	36.2455	36.2749	5171.82	5171.88	5171.76
46	5230	56.711	54.504	55.514	36.3938	36.4133	36.4055	5248.15	5248.15	5248.15

Ant 1

Channel 38 (5190MHz)

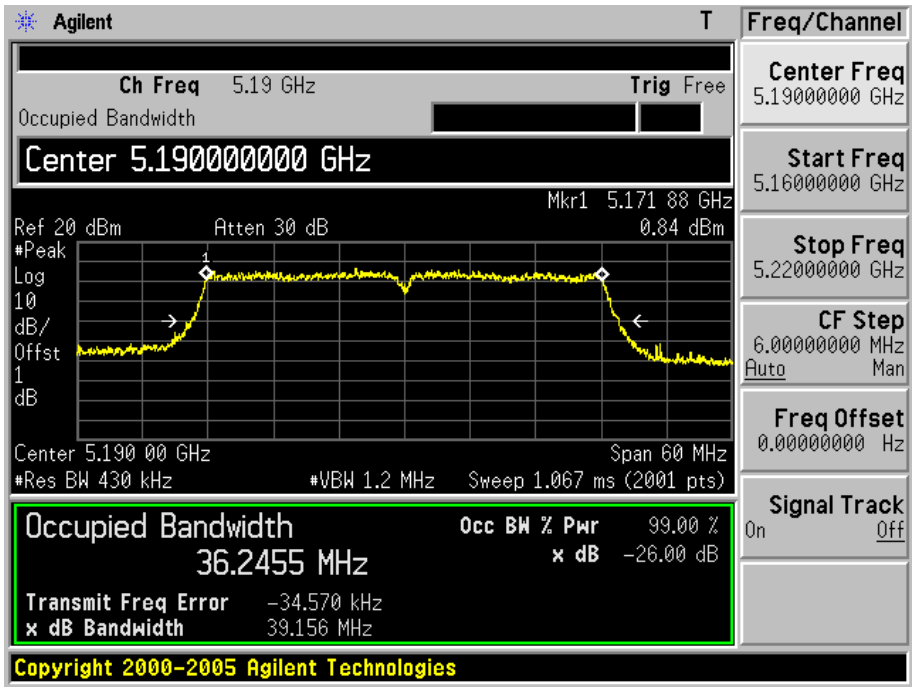


Channel 46 (5230MHz)

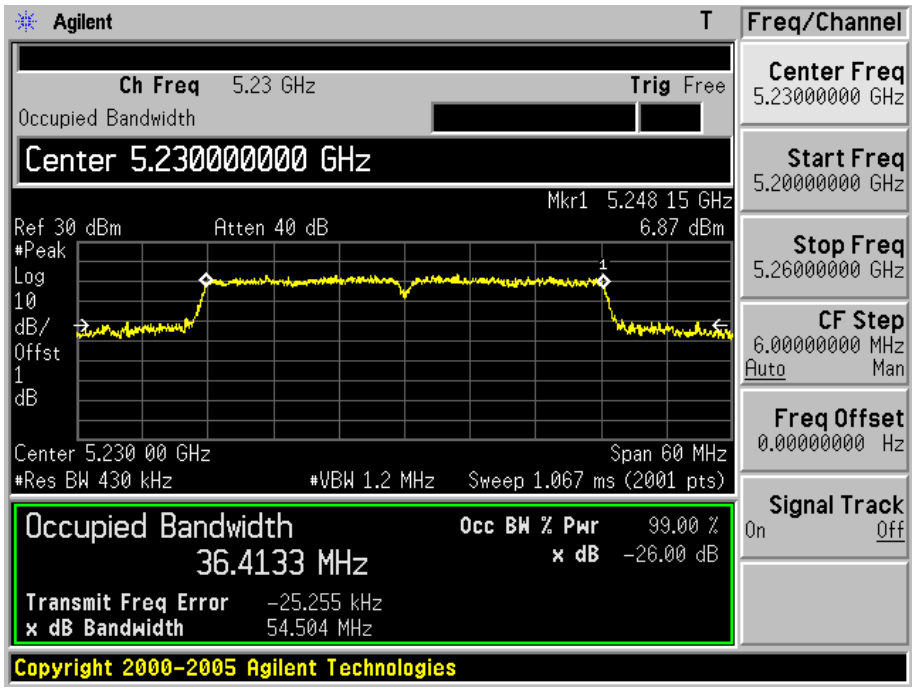


Ant 2

Channel 38 (5190MHz)

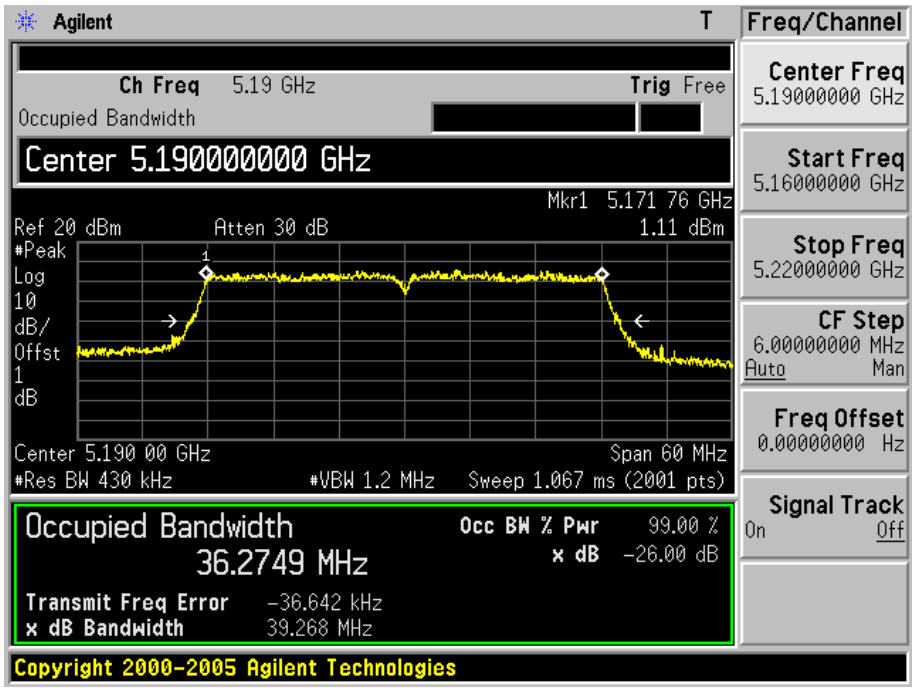


Channel 46 (5230MHz)

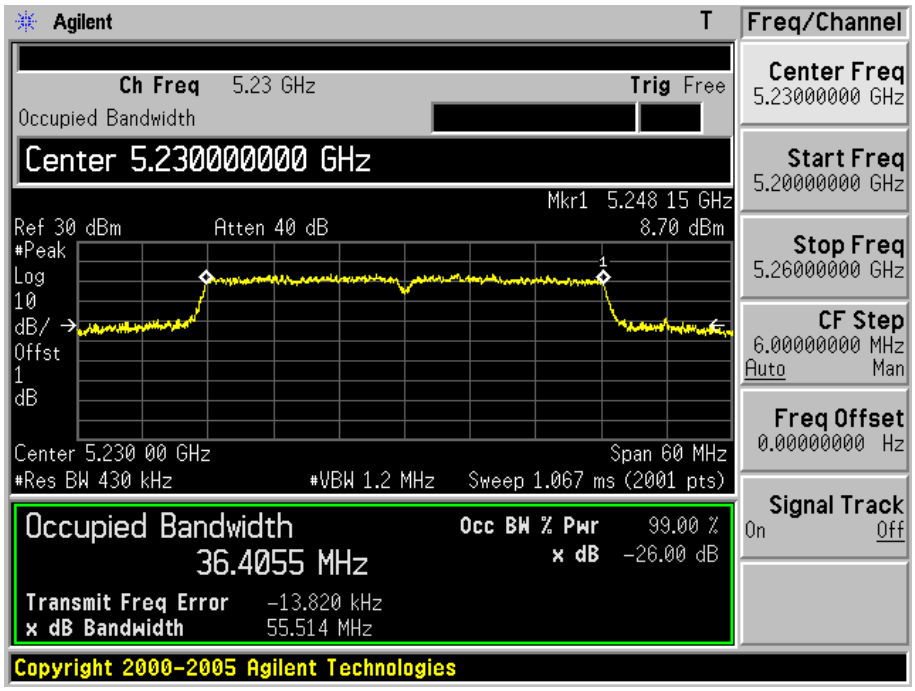


Ant 3

Channel 38 (5190MHz)



Channel 46 (5230MHz)



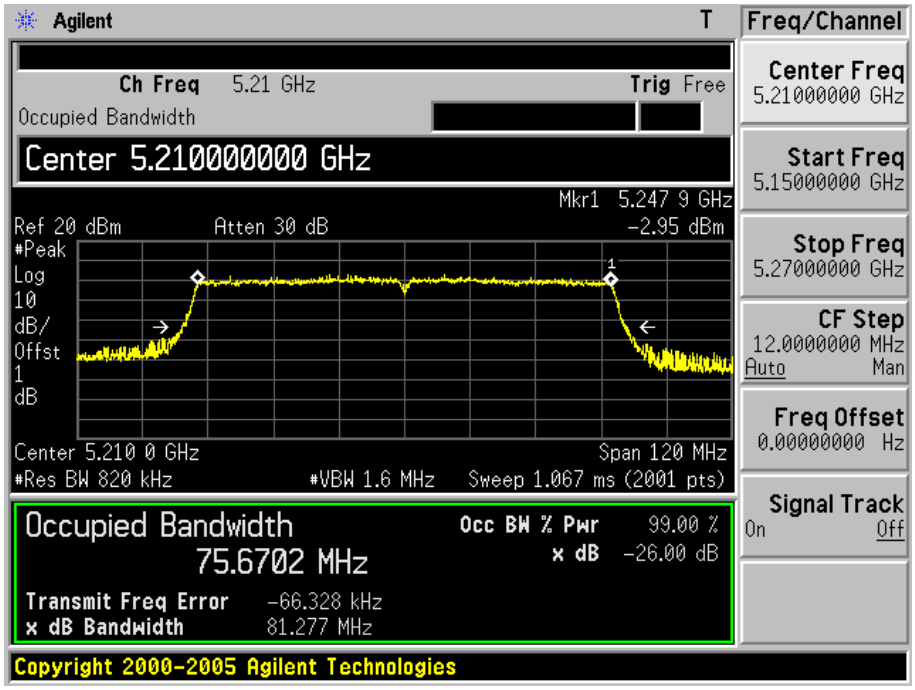
Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 9: Transmit by 802.11ac(80MHz) with beamforming

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)			99% Occupied Bandwidth (MHz)			Lower/Higher Frequency (MHz)		
		Ant1	Ant2	An3	Ant1	Ant2	An3	Ant1	Ant2	An3
42	5210	81.277	81.037	81.216	75.6702	75.6499	75.6426	5247.9	5247.7	5247.7

Note: The worsest frequency was showed above.

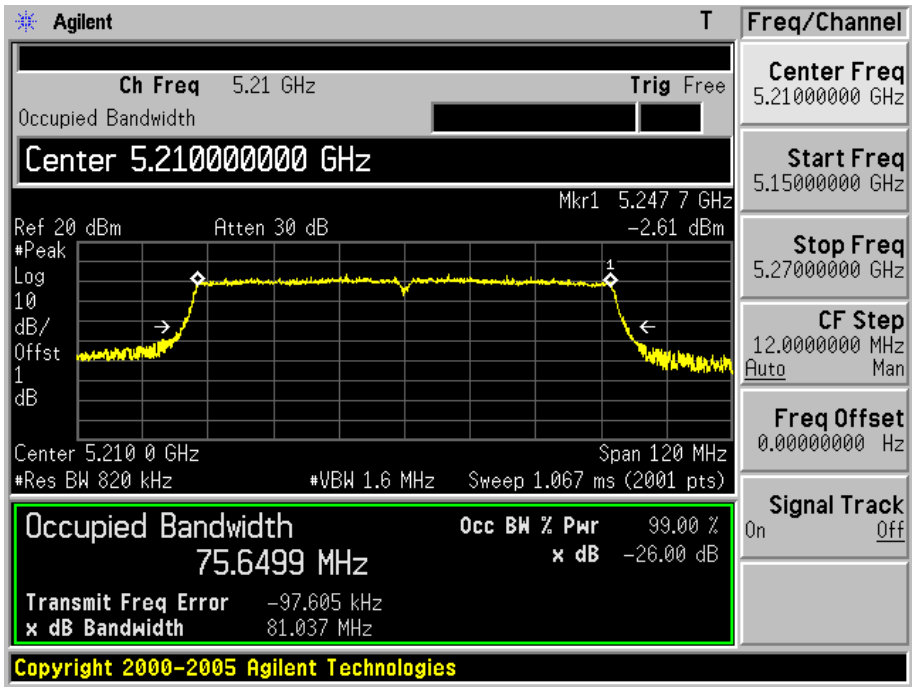
Ant 1

Channel 42 (5210MHz)



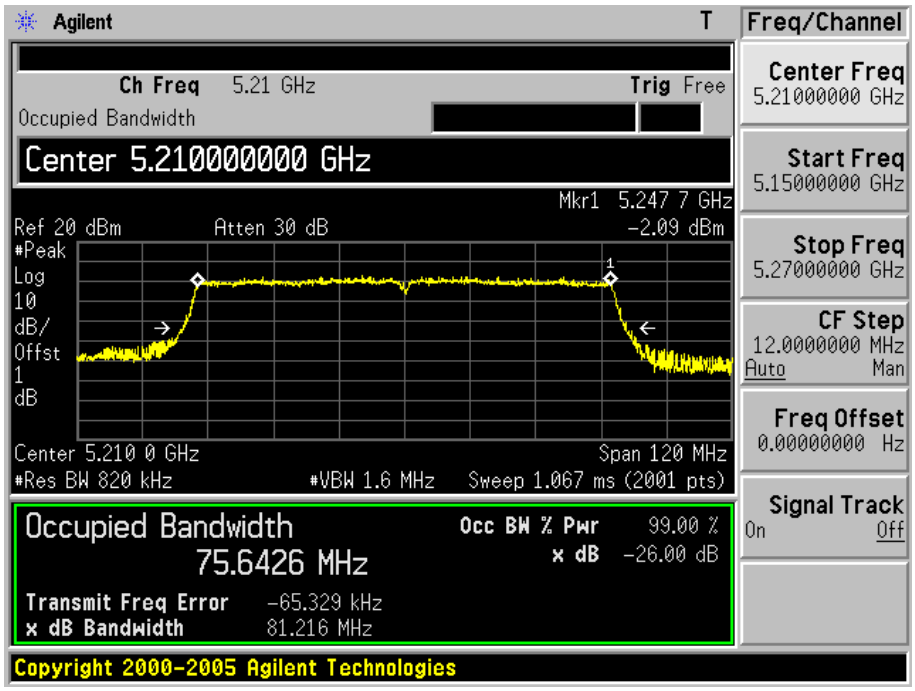
Ant 2

Channel 42 (5210MHz)



Ant 3

Channel 42 (5210MHz)



6. Power Output

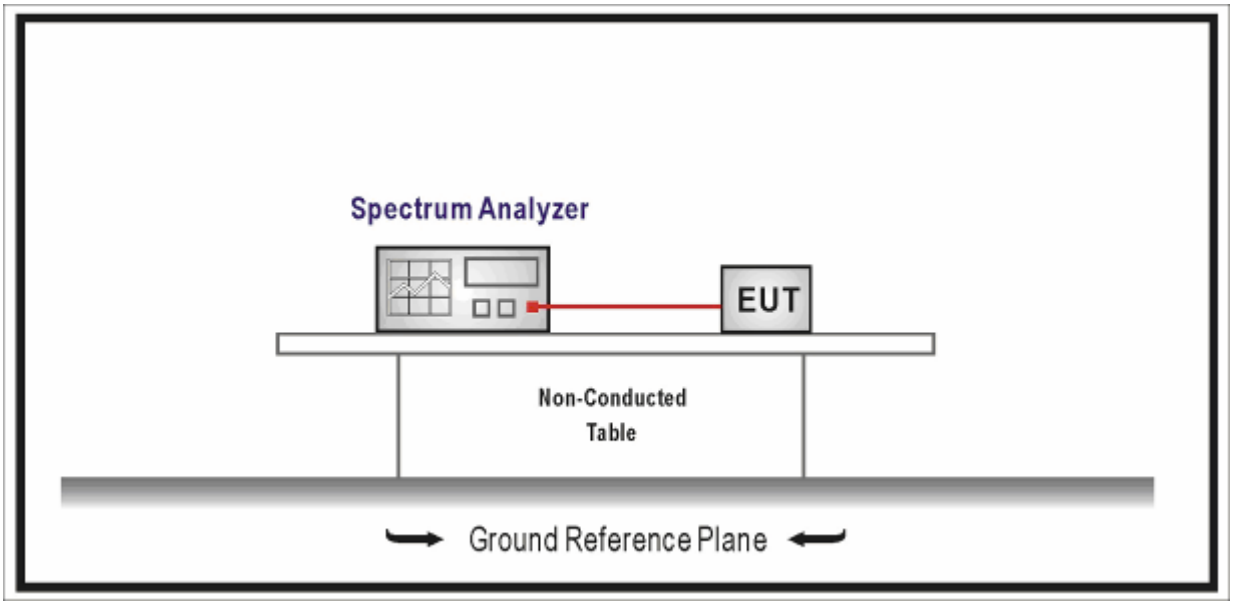
6.1. Test Equipment

Power Output / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2015.03.11	2016.03.10
Power Sensor	Anritsu	MA2411B	0846014	2016.11.11	2016.11.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2015.04.10	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 an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 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.

  According to KDB 662911 D01v02r01, Clause F) 2) f):
  Cyclic Delay Diversity (CDD) [also known as cyclic shift diversity (CSD)]. CDD signals are correlated and create unintended array gain that varies with signal bandwidth, antenna geometry, and cyclic delay values. Consequently, depending on system parameters, it may be appropriate to use different values of array gain for compliance with power limits versus compliance with power spectral density limits.
  CAUTION: The term CDD, as used here, does not apply to any transmission mode in which the cyclic delay values are chosen to optimize performance at a given receiver; such a system shall be classified as an intentional beamforming system. CDD refers only to cases in which the cyclic delay values are selected apriori without regard to the specific communication device pair.
  For CDD transmissions, directional gain is calculated as follows. In all formulas, NANT = number of transmit antennas and NSS = number of spatial streams. (Assume NSS = 1 unless you have specific information to the contrary.)
  CAUTION: Most devices can operate with one spatial stream (NSS = 1) even if they also are capable of more spatial streams. The worst case directional gain will occur when NSS = 1; therefore, it is especially important to ensure that the device complies with all emission

limits for the case of NSS = 1 (or with the lowest possible value of NSS, if the device always uses spatial multiplexing). The application filing must clearly include a proper justification for the lowest value NSS used.
(i) If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain is as follows.
• For power spectral density (PSD) measurements on all devices, Array Gain = 10 log(NANT/NSS) dB.
• For power measurements on IEEE 802.11 devices, 1, 2 Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less, for 20-MHz channel widths with NANT ≥ 5.
• For power measurements on all other devices:
Array Gain = 10 log(NANT/NSS) dB. The FCC may permit a lower array gain value based on analysis involving the specific cyclic delays, signal bandwidths, channelization, and antenna configurations used by the device. Contact the FCC through the Knowledge DataBase (www.fcc.gov/labhelp) for more information.

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

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 ≥ 3 MHz.

d) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ 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 ≥ 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 ≥ 3 MHz.

e) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ 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 ≥ 3 MHz

e) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)

f) Sweep time ≤ [(number of points in sweep) × *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.

6.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

6.6. Test Result

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)			Total Power (dBm)	FCC Limit (dBm)
		Ant 1	Ant 2	Ant 3		
36	5180	19.24	19.07	19.18	24.23	30.0
44	5220	20.24	20.11	20.16	25.23	30.0
48	5240	19.91	19.75	19.83	24.89	30.0

Note1: 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.

Note2: Total Power = Measurement Power Output + 10Log(1/(Duty Cycle))

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain is 0dBi for power measurements on IEEE 802.11 devices if NANT ≤ 4;

Note4 : Directional gain = GANT + Array Gain=1.7dBi＜6dBi, so The Limit is 30dBm

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)			Total Power (dBm)	FCC Limit (dBm)
		Ant 1	Ant 2	Ant 3		
36	5180	18.90	18.78	18.81	23.82	30.0
44	5220	21.91	21.92	21.88	26.89	30.0
48	5240	21.91	21.79	21.84	26.84	30.0

Note1: 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.

Note2: Total Power = Measurement Power Output + 10Log(1/(Duty Cycle))

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain is 0dBi for power measurements on IEEE 802.11 devices if NANT ≤ 4;

Note4 : Directional gain = GANT + Array Gain=1.7dBi＜6dBi, so The Limit is 30dBm

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz) with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)			Total Power (dBm)	FCC Limit (dBm)
		Ant 1	Ant 2	Ant 3		
38	5190	12.89	12.76	12.81	18.13	30.0
46	5230	21.94	21.83	21.89	27.20	30.0

Note1: 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.

Note2: Total Power = Measurement Power Output + 10Log(1/(Duty Cycle))

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain is 0dBi for power measurements on IEEE 802.11 devices if NANT ≤ 4;

Note4 : Directional gain = GANT + Array Gain=1.7dBi＜6dBi, so The Limit is 30dBm

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 4: Transmit by 802.11ac(20MHz) with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)			Total Power (dBm)	FCC Limit (dBm)
		Ant 1	Ant 2	Ant 3		
36	5180	18.98	18.57	18.87	23.67	30.0
44	5220	22.14	22.09	22.01	26.94	30.0
48	5240	22.05	22.01	22.13	26.92	30.0

Note1: 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.

Note2: Total Power = Measurement Power Output + 10Log(1/(Duty Cycle))

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain is 0dBi for power measurements on IEEE 802.11 devices if NANT ≤ 4;

Note4 : Directional gain = GANT + Array Gain=1.7dBi＜6dBi, so The Limit is 30dBm

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 5: Transmit by 802.11ac(40MHz) with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)			Total Power (dBm)	FCC Limit (dBm)
		Ant 1	Ant 2	Ant 3		
38	5190	12.76	12.71	12.72	17.67	30.0
46	5230	22.11	22.09	22.09	27.04	30.0

Note1: 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.

Note2: Total Power = Measurement Power Output + 10Log(1/(Duty Cycle))

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain is 0dBi for power measurements on IEEE 802.11 devices if NANT ≤ 4;

Note4 : Directional gain = GANT + Array Gain=1.7dBi＜6dBi, so The Limit is 30dBm

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 6: Transmit by 802.11ac(80MHz) with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)			Total Power (dBm)	FCC Limit (dBm)
		Ant 1	Ant 2	Ant 3		
42	5210	10.98	10.89	10.87	15.88	30.0

Note1: 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.

Note2: Total Power = Measurement Power Output + 10Log(1/(Duty Cycle))

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain is 0dBi for power measurements on IEEE 802.11 devices if NANT ≤ 4;

Note4 : Directional gain = GANT + Array Gain=1.7dBi＜6dBi, so The Limit is 30dBm

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 7: Transmit by 802.11ac(20MHz) with beamforming

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)			Total Power (dBm)	FCC Limit (dBm)
		Ant 1	Ant 2	Ant 3		
36	5180	21.03	20.93	20.94	25.89	29.53
44	5220	22.63	22.64	22.73	27.59	29.53
48	5240	20.73	20.68	20.71	27.63	29.53

Note1: 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.

Note2: Total Power = Measurement Power Output + 10Log(1/(Duty Cycle))

Note3 : Directional gain = GANT + 10 log(NANT/NSS) = 6.47dBi＞6dBi, so The Limit is 29.53dBm

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 8: Transmit by 802.11ac(40MHz) with beamforming

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)			Total Power (dBm)	FCC Limit (dBm)
		Ant 1	Ant 2	Ant 3		
38	5190	15.55	15.42	15.55	20.43	29.53
46	5230	24.13	23.98	24.21	29.03	29.53

Note1: 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.

Note2: Total Power = Measurement Power Output + 10Log(1/(Duty Cycle))

Note3 : Directional gain = GANT + 10 log(NANT/NSS) = 6.47dBi＞6dBi, so The Limit is 29.53dBm

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 9: Transmit by 802.11ac(80MHz) with beamforming

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)			Total Power (dBm)	FCC Limit (dBm)
		Ant 1	Ant 2	Ant 3		
42	5210	12.06	11.84	11.47	16.81	29.53

Note1: 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.

Note2: Total Power = Measurement Power Output + 10Log(1/(Duty Cycle))

Note3 : Directional gain = GANT + 10 log(NANT/NSS) = 6.47dBi＞6dBi, so The Limit is 29.53dBm

7. Peak Power Spectral Density

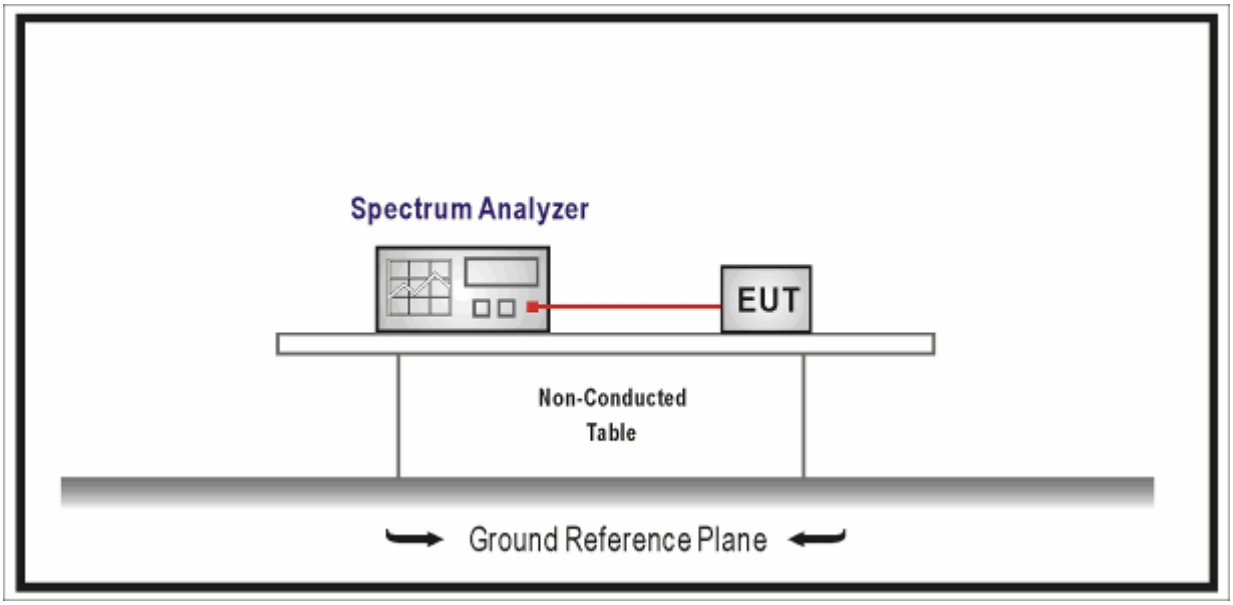
7.1. Test Equipment

Peak Power Spectral Density / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2015.03.11	2016.03.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2015.04.10	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 an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 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.

According to KDB 662911 D01v02r01, Clause F) 2) f):
Cyclic Delay Diversity (CDD) [also known as cyclic shift diversity (CSD)]. CDD signals are correlated and create unintended array gain that varies with signal bandwidth, antenna geometry, and cyclic delay values. Consequently, depending on system parameters, it may be appropriate to use different values of array gain for compliance with power limits versus compliance with power spectral density limits.
CAUTION: The term CDD, as used here, does not apply to any transmission mode in which the cyclic delay values are chosen to optimize performance at a given receiver; such a system shall be classified as an intentional beamforming system. CDD refers only to cases in which the cyclic delay values are selected apriori with out regard to the specific communication device pair.
For CDD transmissions, directional gain is calculated as follows. In all formulas, NANT = number of transmit antennas and NSS = number of spatial streams. (Assume NSS = 1 unless you have specific information to the contrary.)
CAUTION: Most devices can operate with one spatial stream (NSS = 1) even if they also are capable of more spatial streams. The worst case directional gain will occur when NSS = 1; therefore, it is especially important to ensure that the device complies with all emission limits for the case of NSS = 1 (or with the lowest possible value of NSS, if the device always uses spatial multiplexing). The application filing must clearly include a proper justification for the lowest value NSS used.
(i) If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain is as follows.
• For power spectral density (PSD) measurements on all devices, Array Gain = 10 log(NANT/NSS) dB.
• For power measurements on IEEE 802.11 devices, 1, 2 Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less, for 20-MHz channel widths with NANT ≥ 5.

• For power measurements on all other devices:
Array Gain = 10 log(NANT/NSS) dB. The FCC may permit a lower array gain value based on analysis involving the specific cyclic delays, signal bandwidths, channelization, and antenna configurations used by the device. Contact the FCC through the Knowledge DataBase (www.fcc.gov/labhelp) for more information.

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

Set span to encompass the entire emission bandwidth (EBW) of the signal.
For 5150-5725MHz

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

7.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

7.6. Test Result

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm/MHz)			Duty Cycle (%)	Total PPSD (dBm/MHz)	FCC Limit (dBm/MHz)
		Ant1	Ant2	Ant3			
36	5180	9.191	10.371	9.904	93.58%	14.91	16.53
40	5200	7.474	7.527	7.797	93.58%	12.66	16.53
48	5240	10.788	10.287	10.109	93.58%	15.47	16.53

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

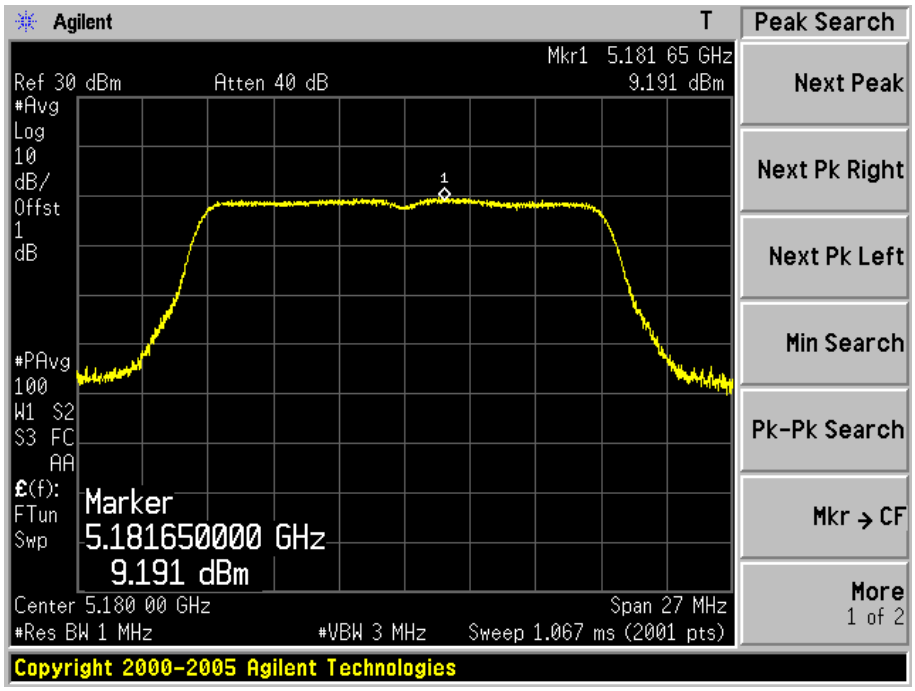
Note2: If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain = 10 log(NANT/NSS) dB for power spectral density measurements on all devices;

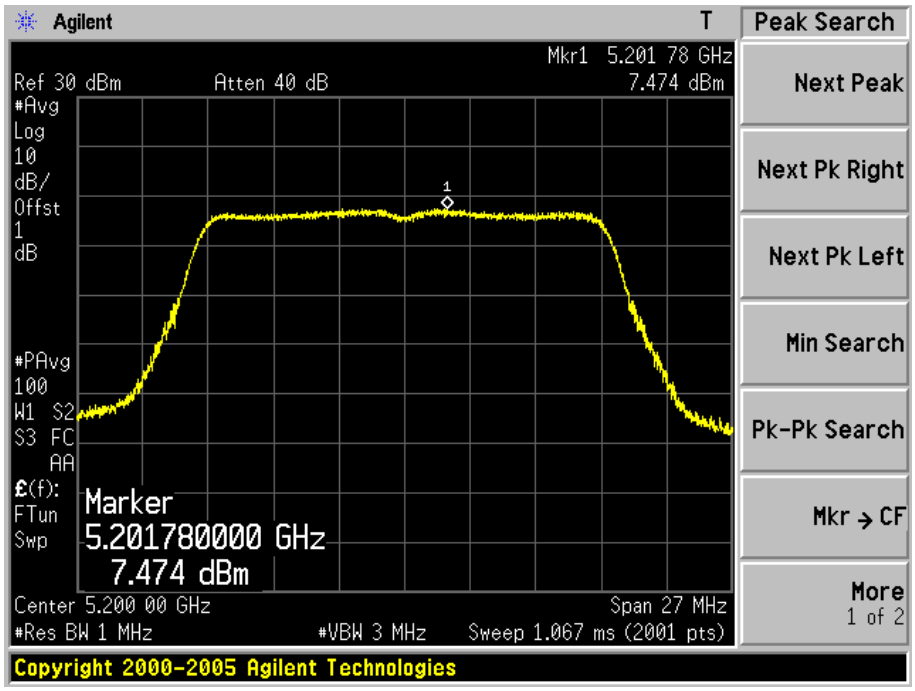
Note4: For power spectral density (PSD) measurements on all devices, Array Gain = 10 log(NANT/NSS) dB. Directional gain = GANT + Array Gain=6.47dBi＞6dBi, so The Limit is 16.53dBm

Ant 1

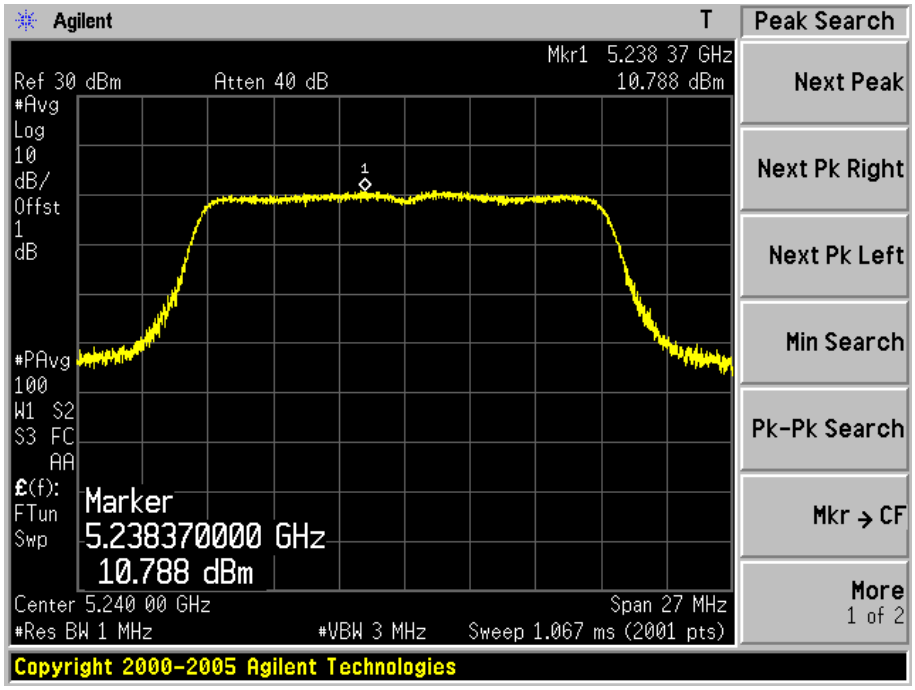
Channel 36 (5180MHz)



Channel 40 (5200MHz)

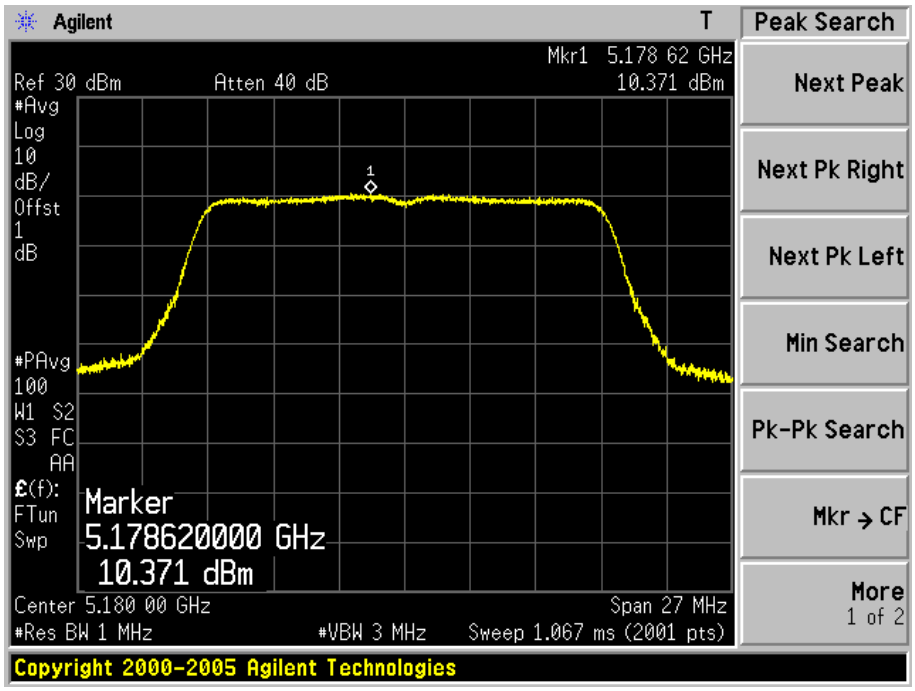


Channel 48 (5240MHz)

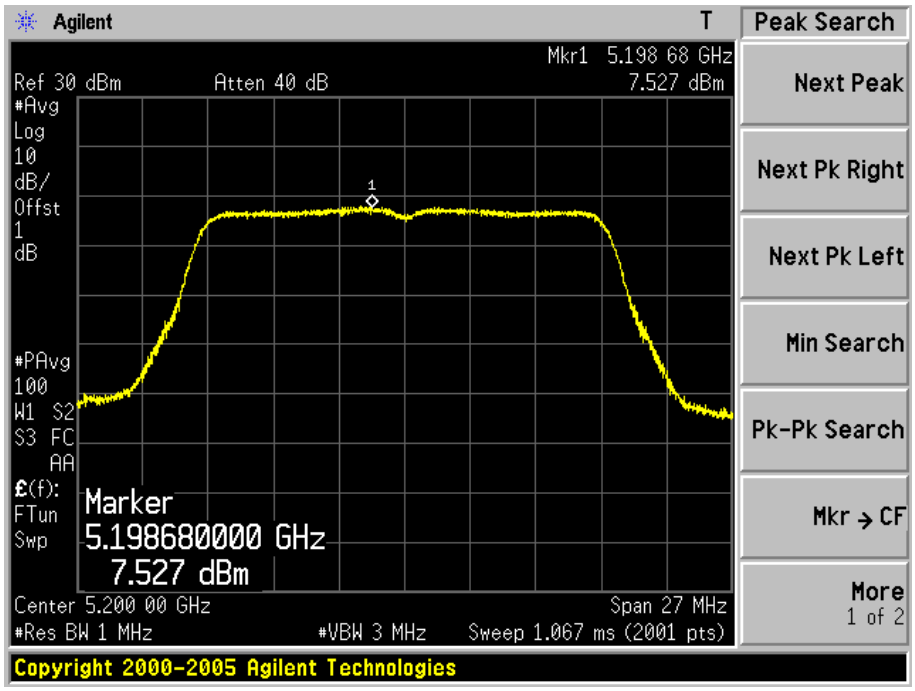


Ant 2

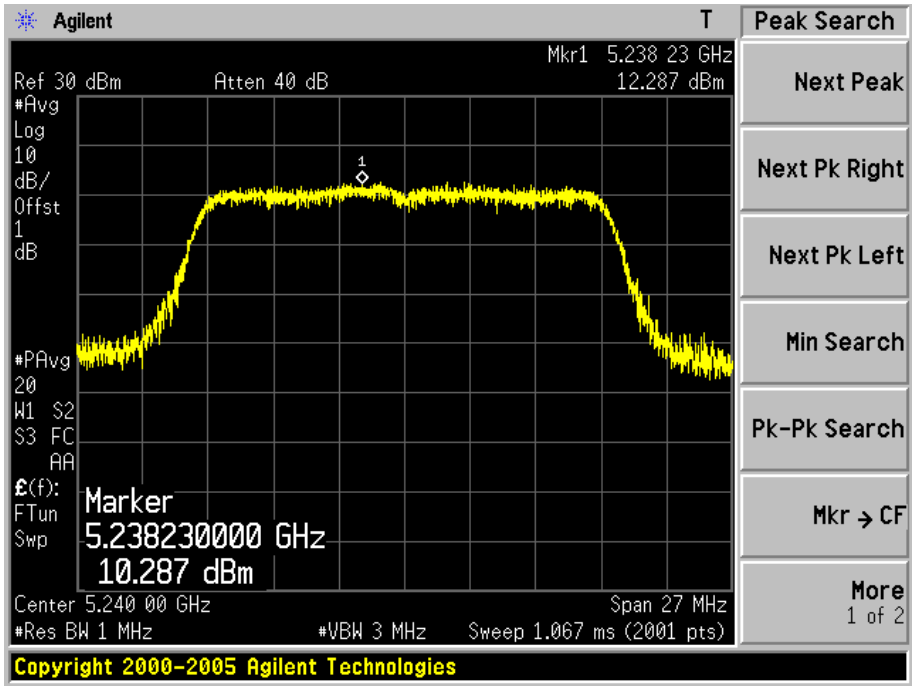
Channel 36 (5180MHz)



Channel 40 (5200MHz)

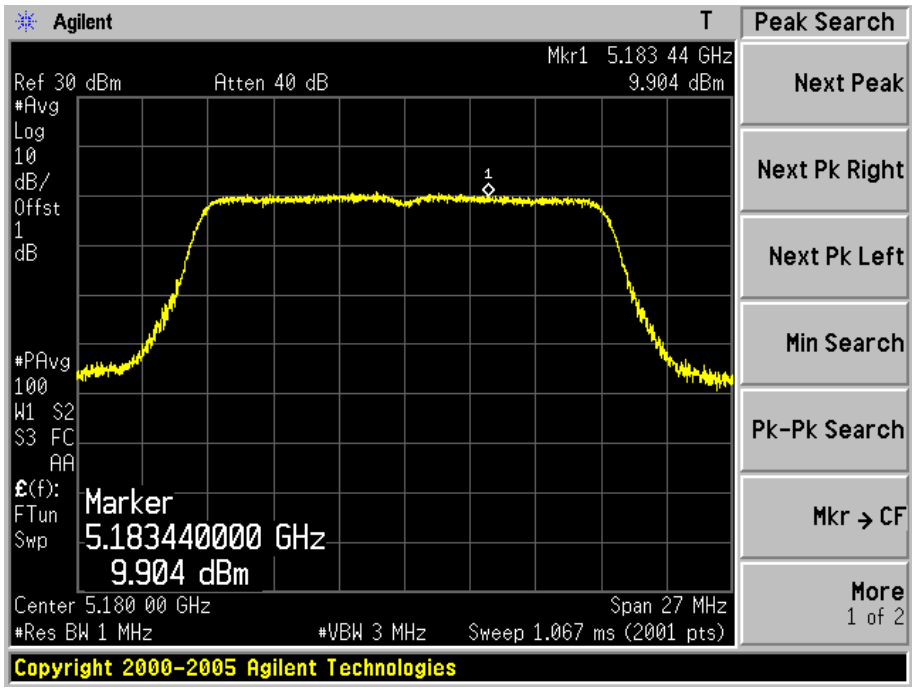


Channel 48 (5240MHz)

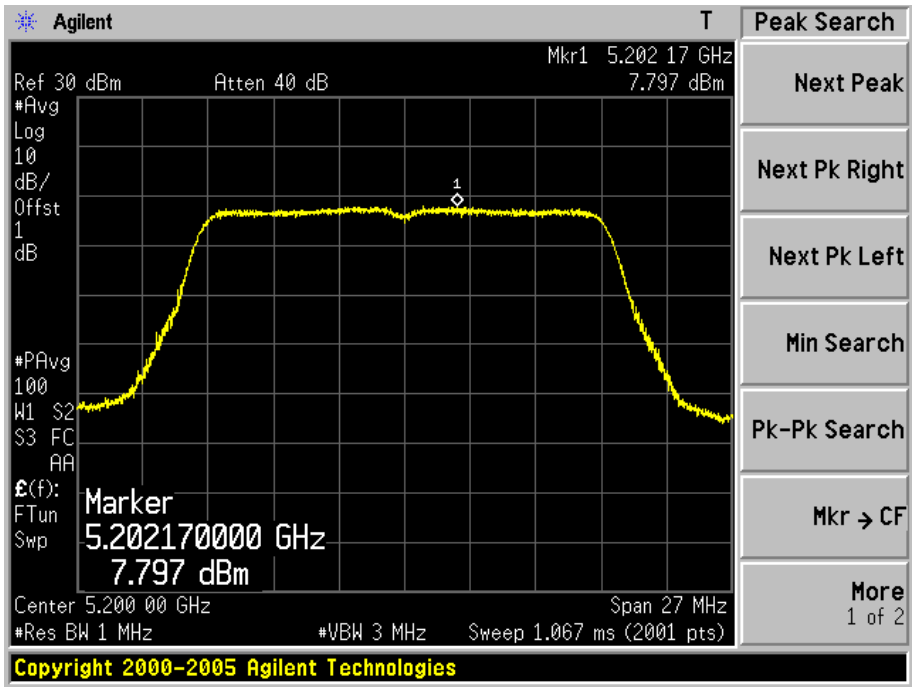


Ant 3

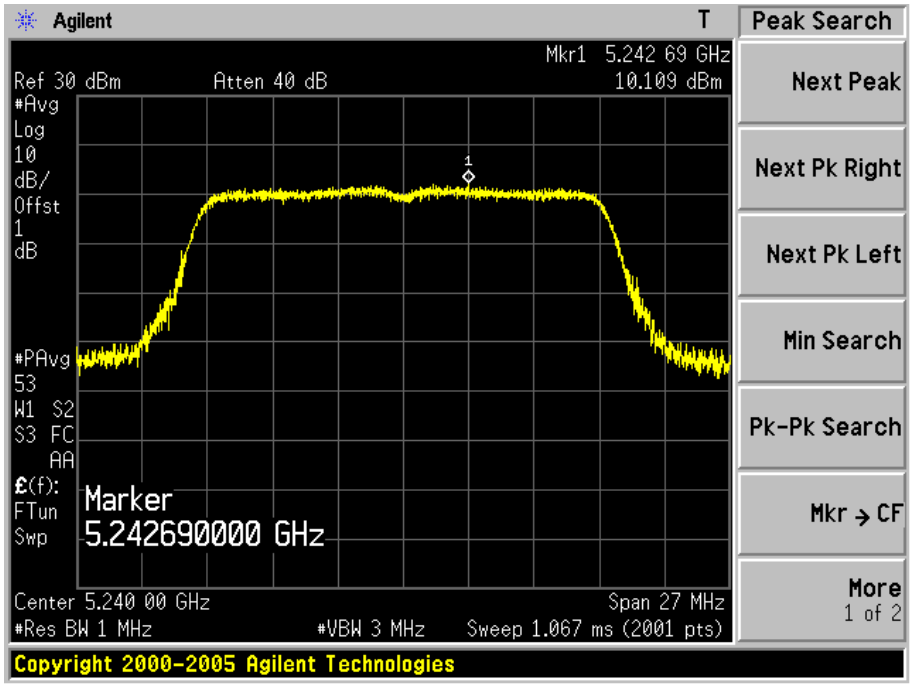
Channel 36 (5180MHz)



Channel 40 (5200MHz)



Channel 48 (5240MHz)



Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm/MHz)			Duty Cycle (%)	Total PPSD (dBm/MHz)	FCC Limit (dBm/MHz)
		Ant1	Ant2	Ant3			
36	5180	7.358	6.918	7.006	95.05%	12.09	16.53
40	5200	10.547	11.050	11.477	95.05%	16.03	16.53
48	5240	10.760	10.557	10.689	95.05%	15.66	16.53

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

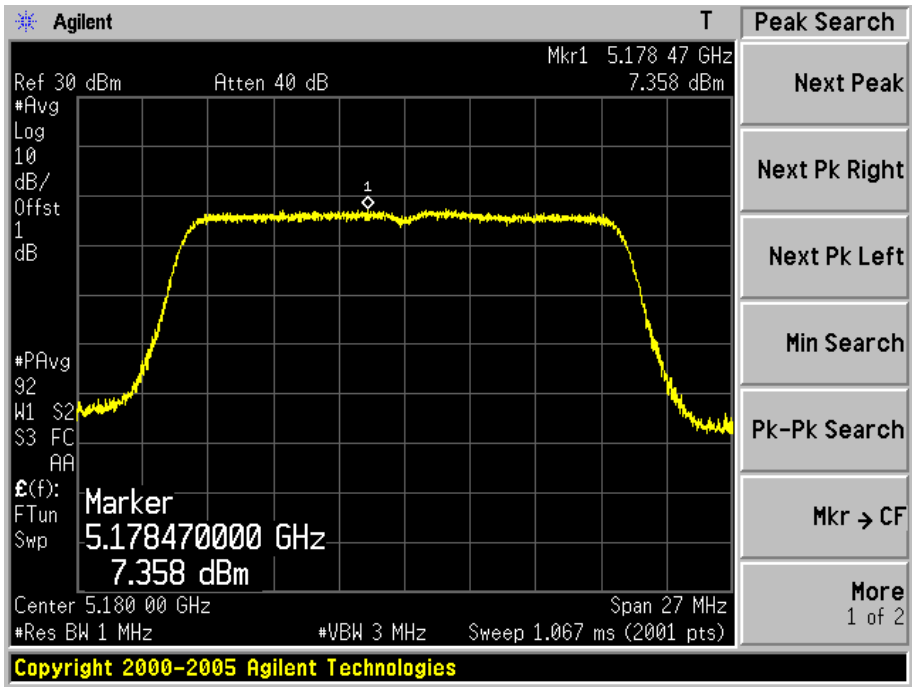
Note2: If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain = 10 log(NANT/NSS) dB for power spectral density measurements on all devices;

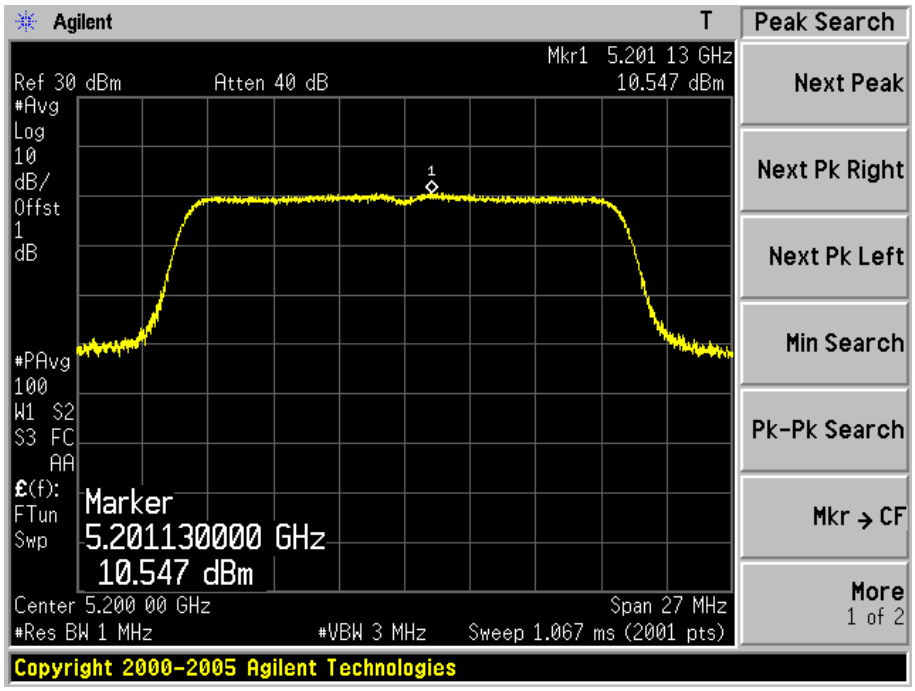
Note4: For power spectral density (PSD) measurements on all devices, Array Gain = 10 log(NANT/NSS) dB. Directional gain = GANT + Array Gain=6.47dBi＞6dBi, so The Limit is 16.53dBm

Ant 1

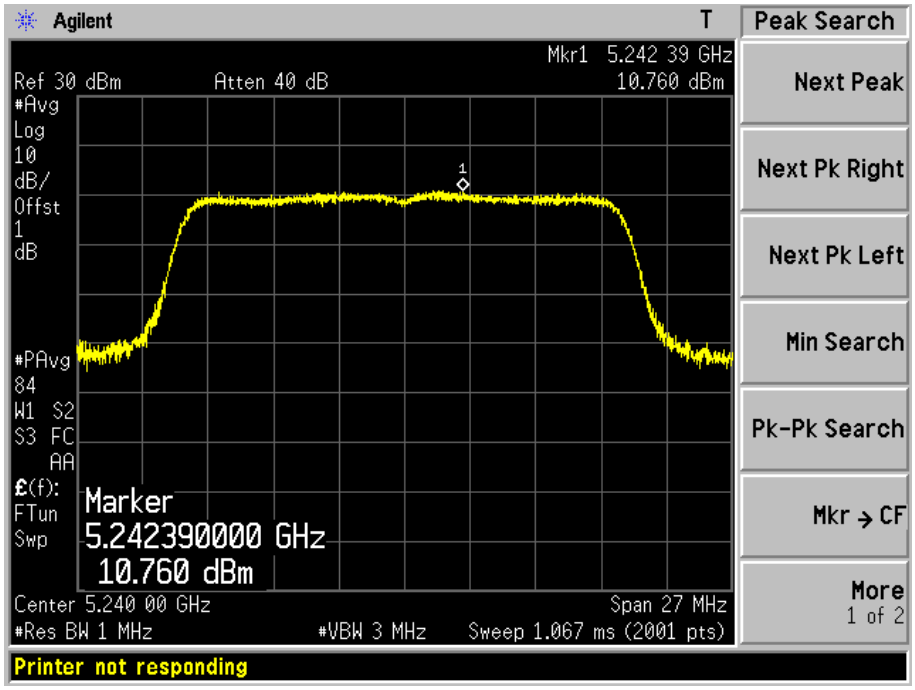
Channel 36 (5180MHz)



Channel 40 (5200MHz)

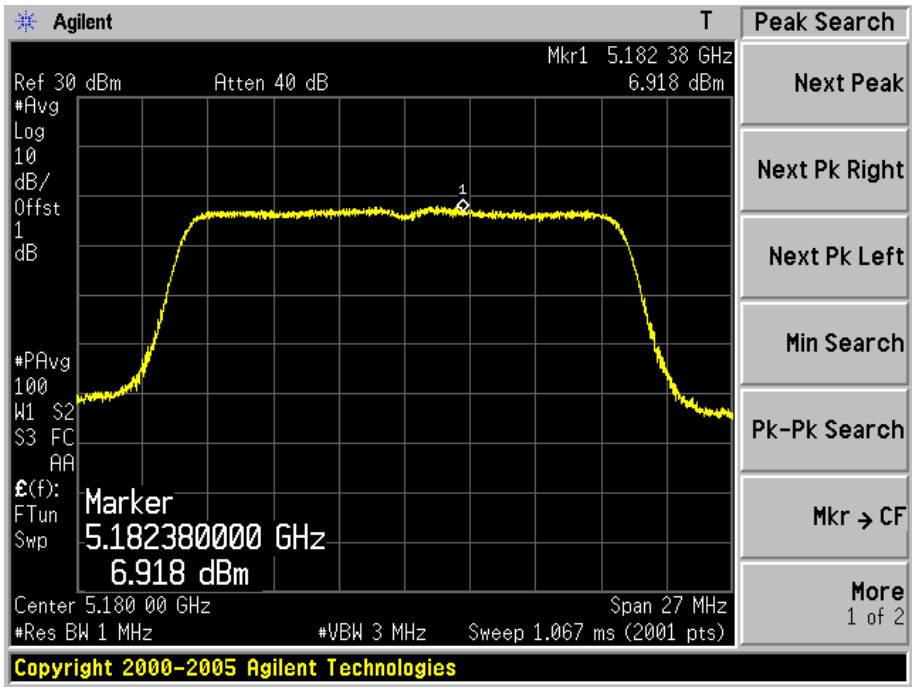


Channel 48 (5240MHz)

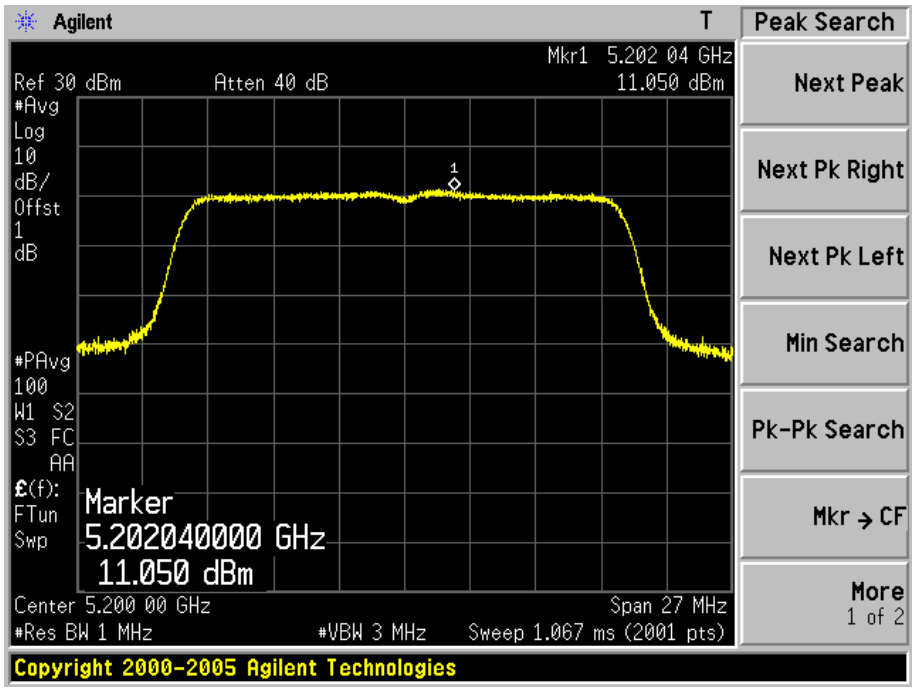


Ant 2

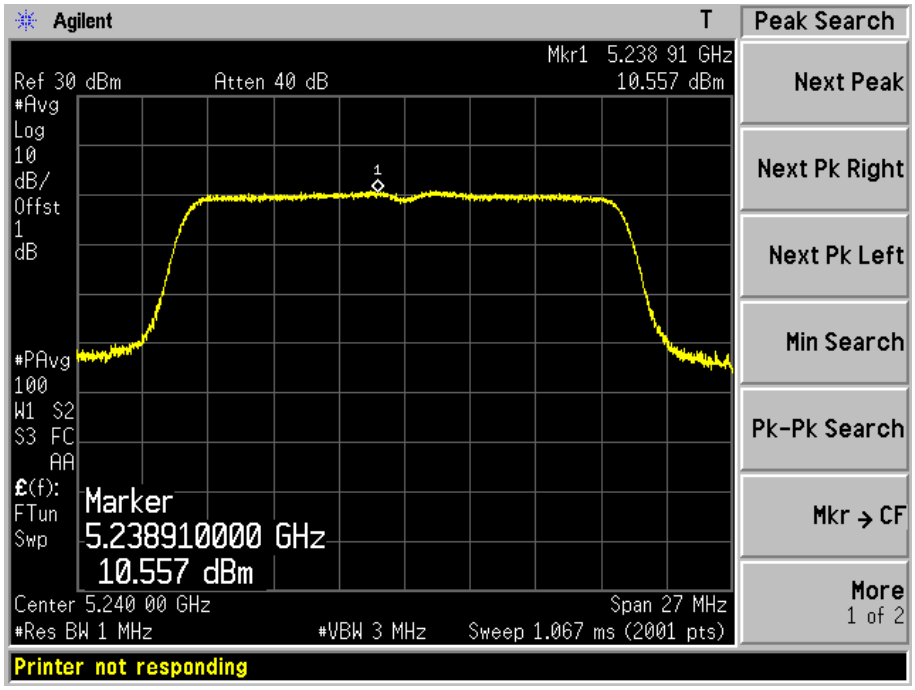
Channel 36 (5180MHz)



Channel 40 (5200MHz)

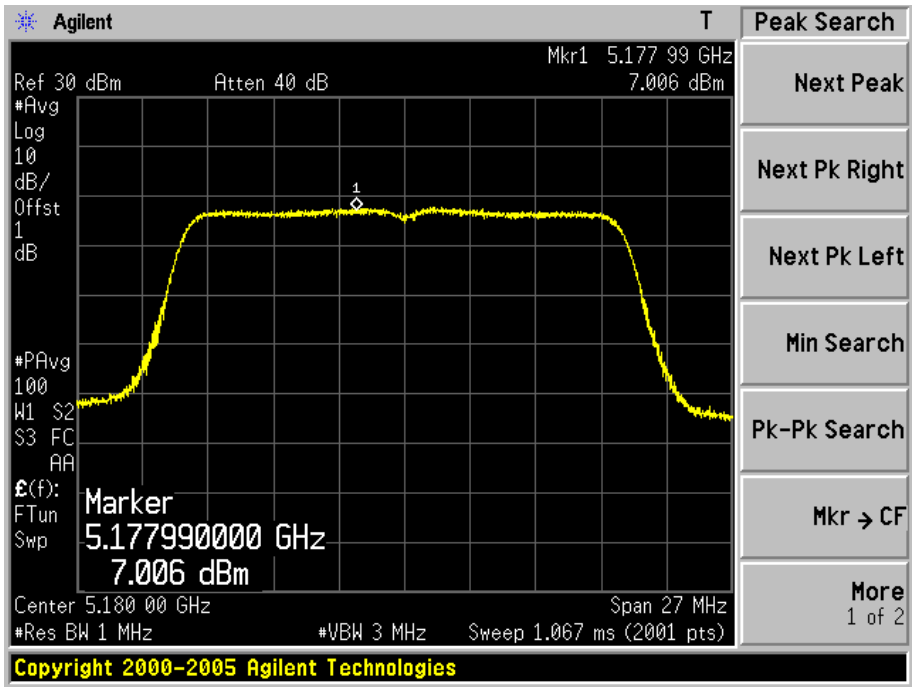


Channel 48 (5240MHz)

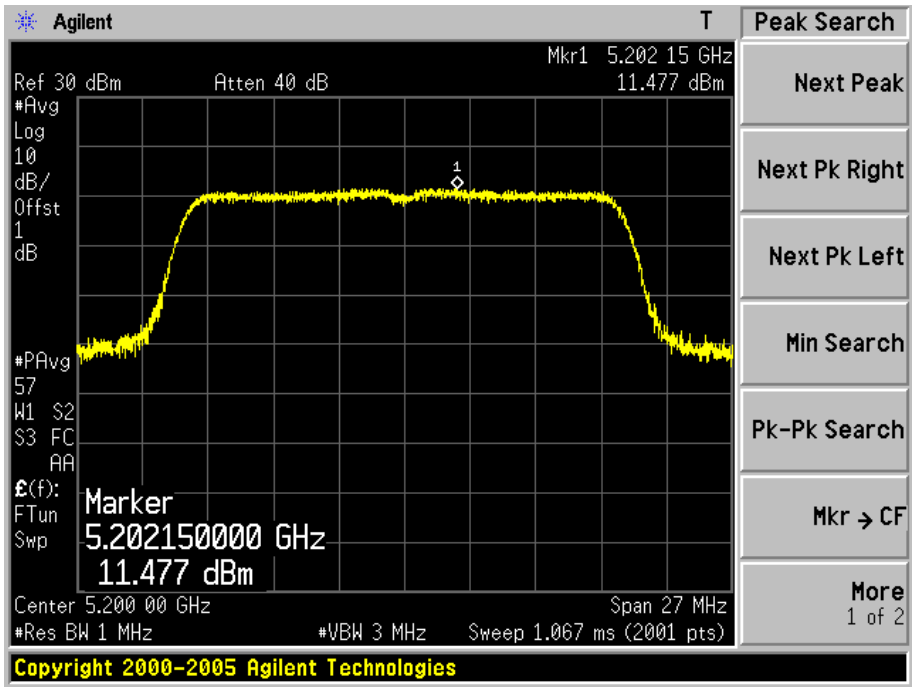


Ant 3

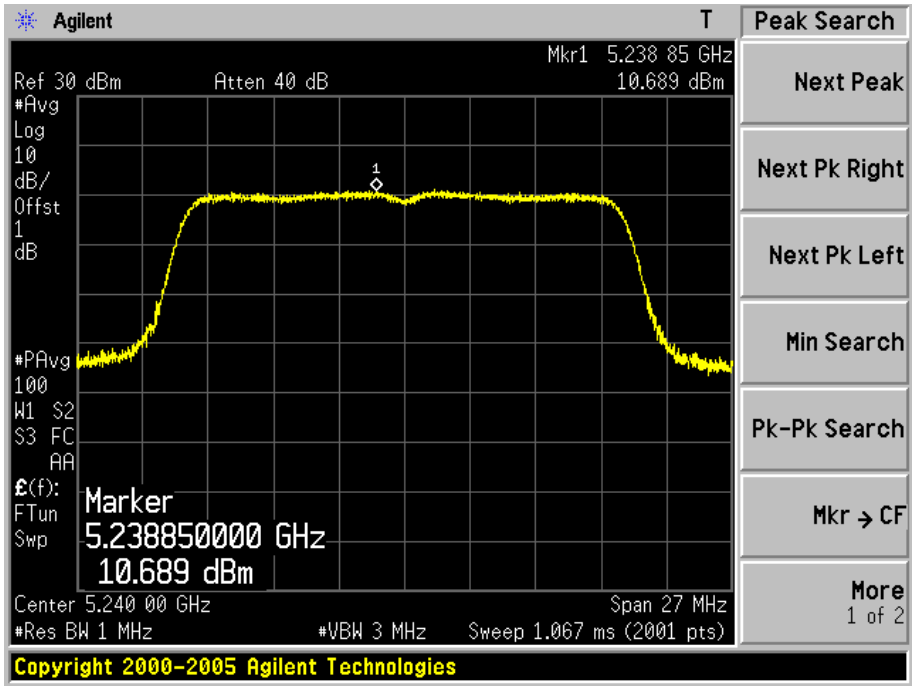
Channel 36 (5180MHz)



Channel 40 (5200MHz)



Channel 48 (5240MHz)



Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz) with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm/MHz)			Duty Cycle (%)	Total PPSD (dBm/MHz)	FCC Limit (dBm/MHz)
		Ant1	Ant2	Ant3			
38	5190	1.699	0.933	0.594	88.39%	6.41	16.53
46	5230	8.343	7.752	8.151	88.39%	13.40	16.53

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

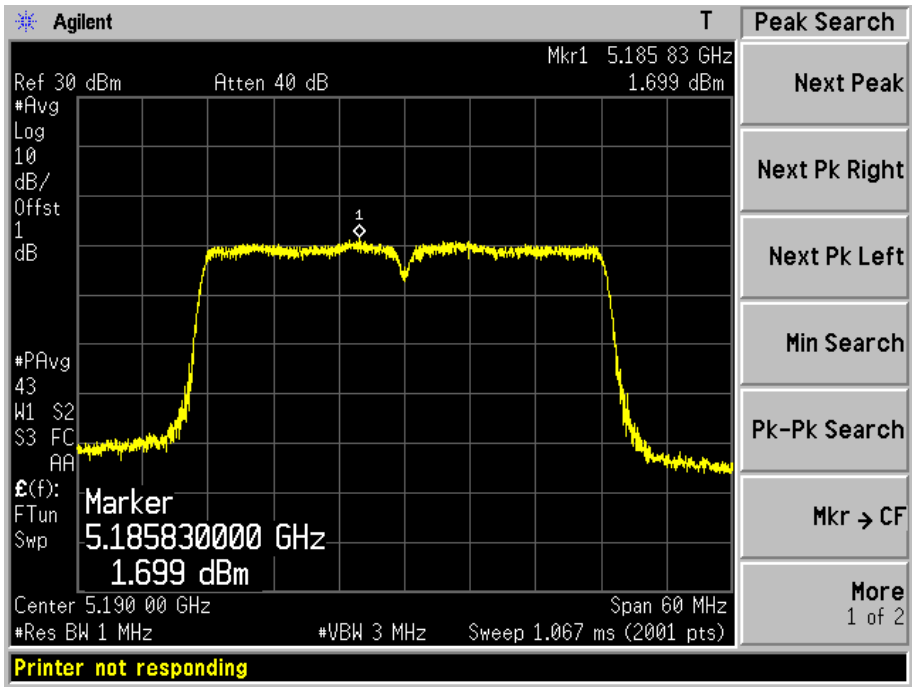
Note2: If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain = 10 log(NANT/NSS) dB for power spectral density measurements on all devices;

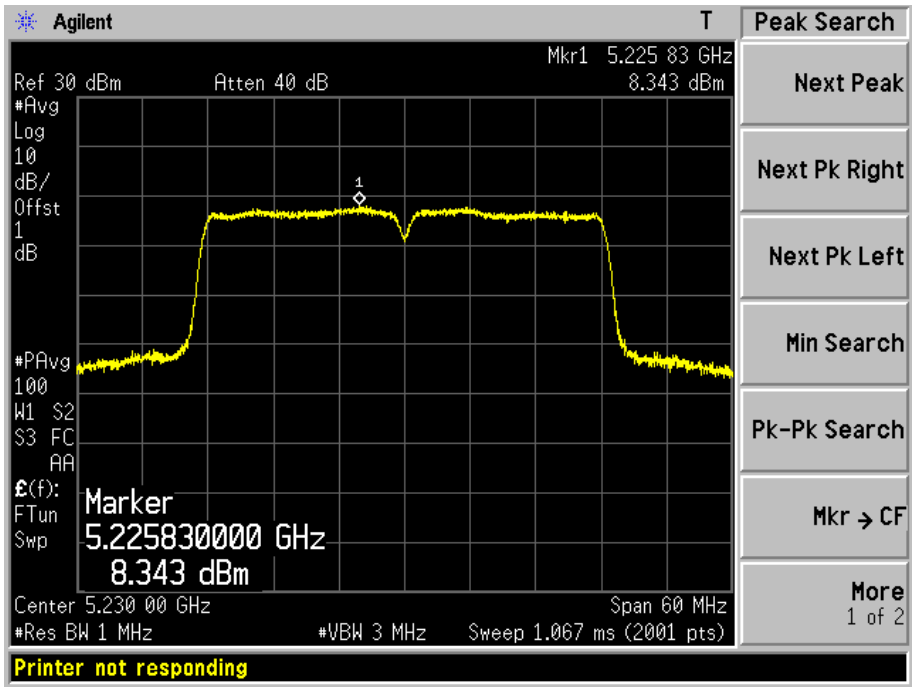
Note4: For power spectral density (PSD) measurements on all devices, Array Gain = 10 log(NANT/NSS) dB. Directional gain = GANT + Array Gain=6.47dBi＞6dBi, so The Limit is 16.53dBm

Ant 1

Channel 38 (5190MHz)

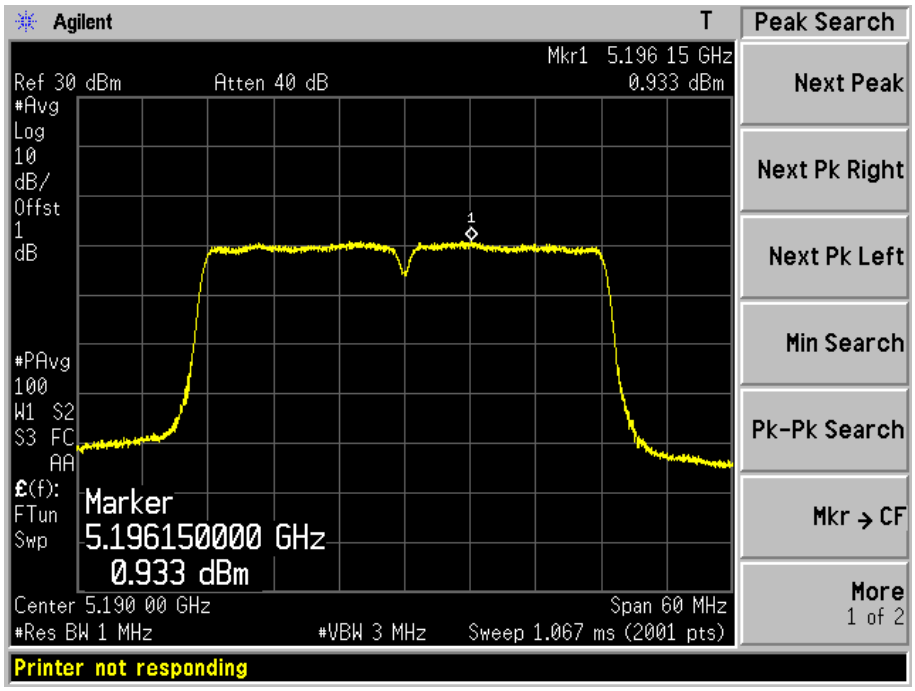


Channel 46 (5230MHz)

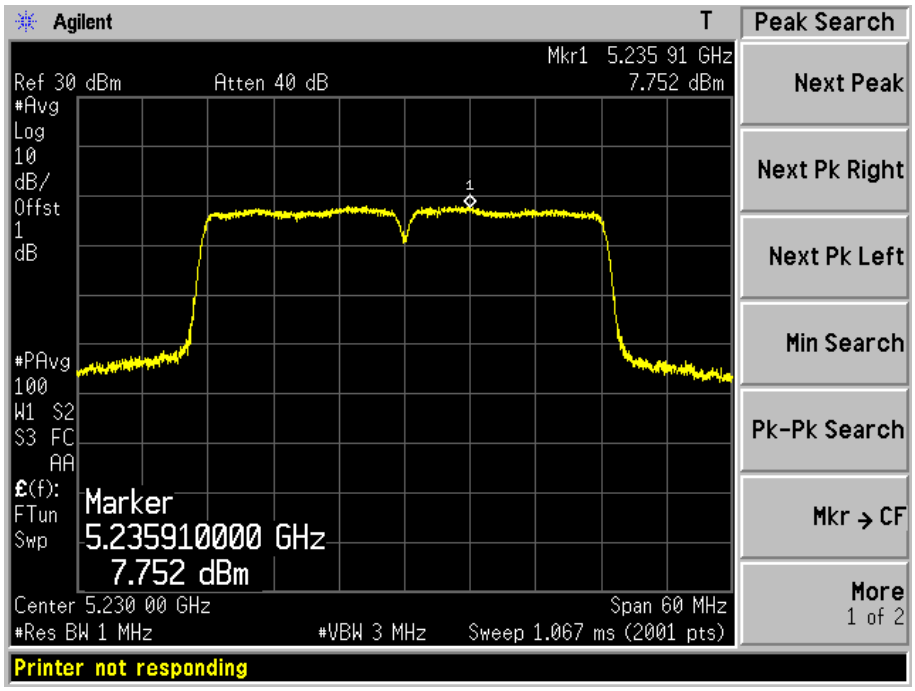


Ant 2

Channel 38 (5190MHz)

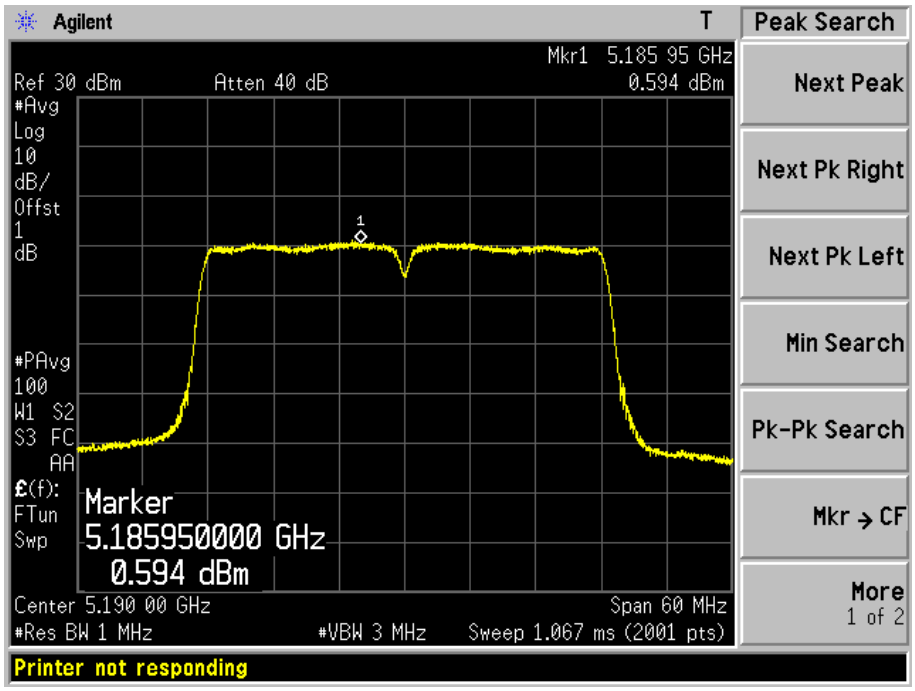


Channel 46 (5230MHz)

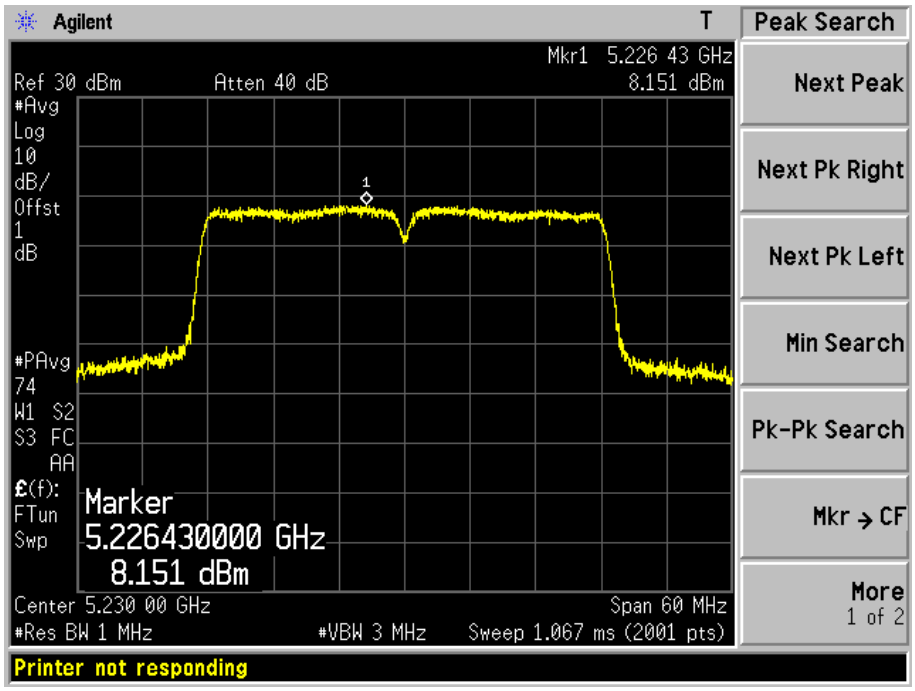


Ant 3

Channel 38 (5190MHz)



Channel 46 (5230MHz)



Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 4: Transmit by 802.11ac(20MHz) with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm/MHz)			Duty Cycle (%)	Total PPSD (dBm/MHz)	FCC Limit (dBm/MHz)
		Ant1	Ant2	Ant3			
36	5180	6.862	8.561	8.078	97.87%	12.75	16.53
40	5200	11.815	11.315	11.071	97.87%	16.27	16.53
48	5240	10.257	11.571	11.129	97.87%	15.88	16.53

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

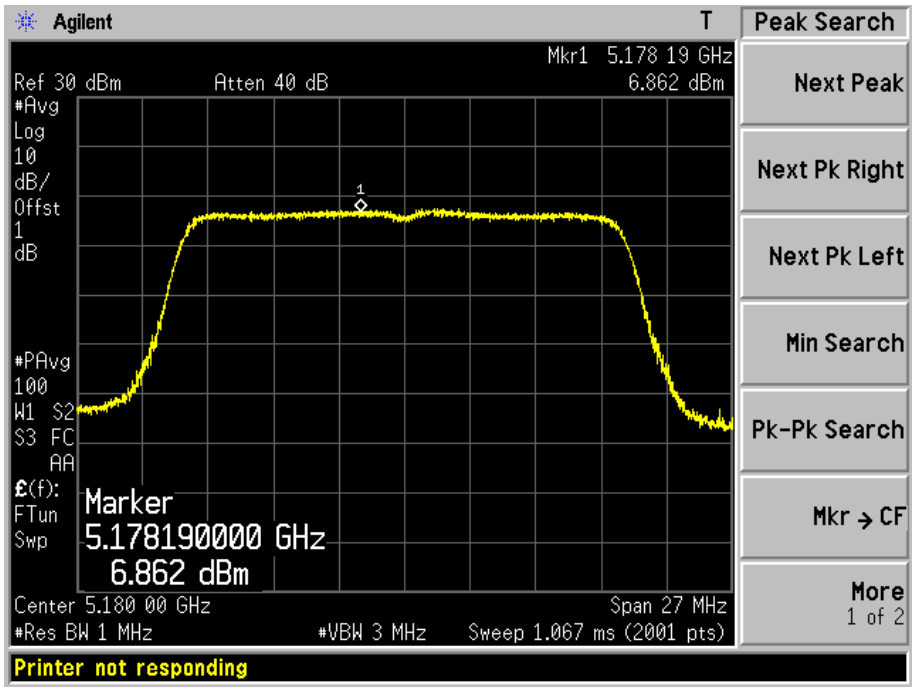
Note2: If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain = 10 log(NANT/NSS) dB for power spectral density measurements on all devices;

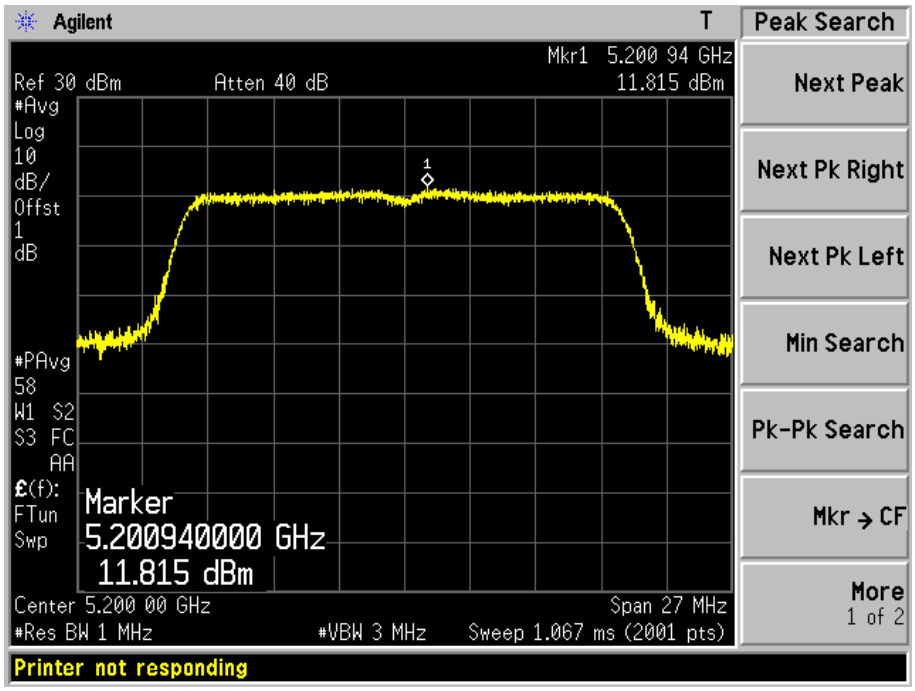
Note4: For power spectral density (PSD) measurements on all devices, Array Gain = 10 log(NANT/NSS) dB. Directional gain = GANT + Array Gain=6.47dBi＞6dBi, so The Limit is 16.53dBm

Ant 1

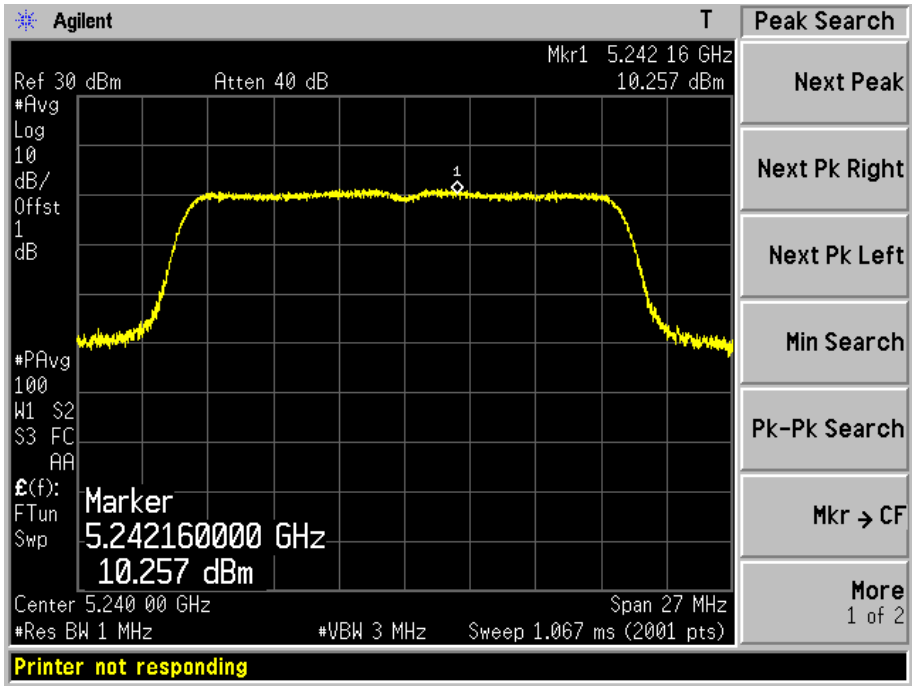
Channel 36 (5180MHz)



Channel 40 (5200MHz)

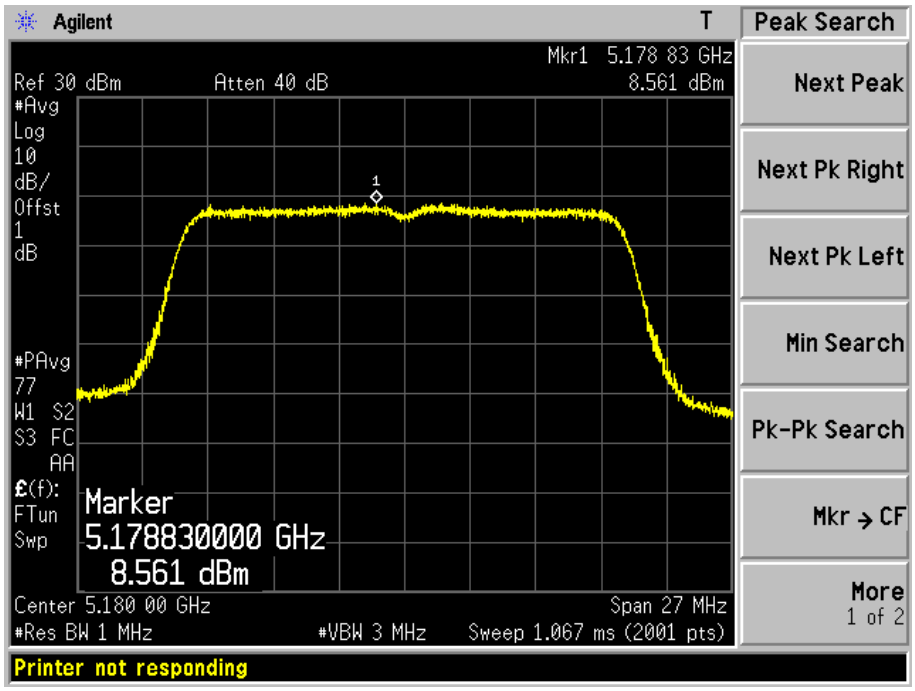


Channel 48 (5240MHz)

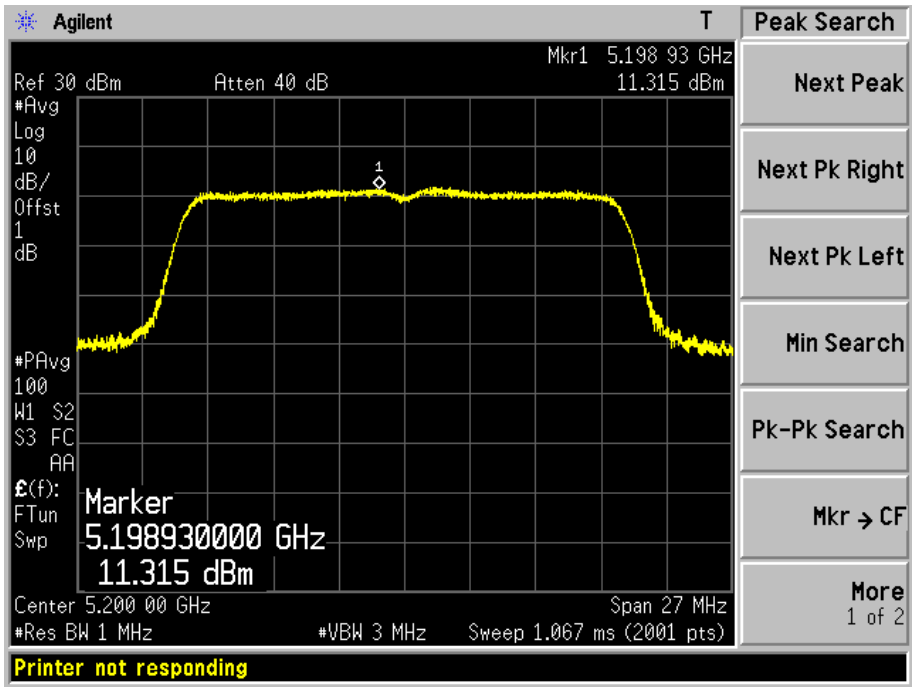


Ant 2

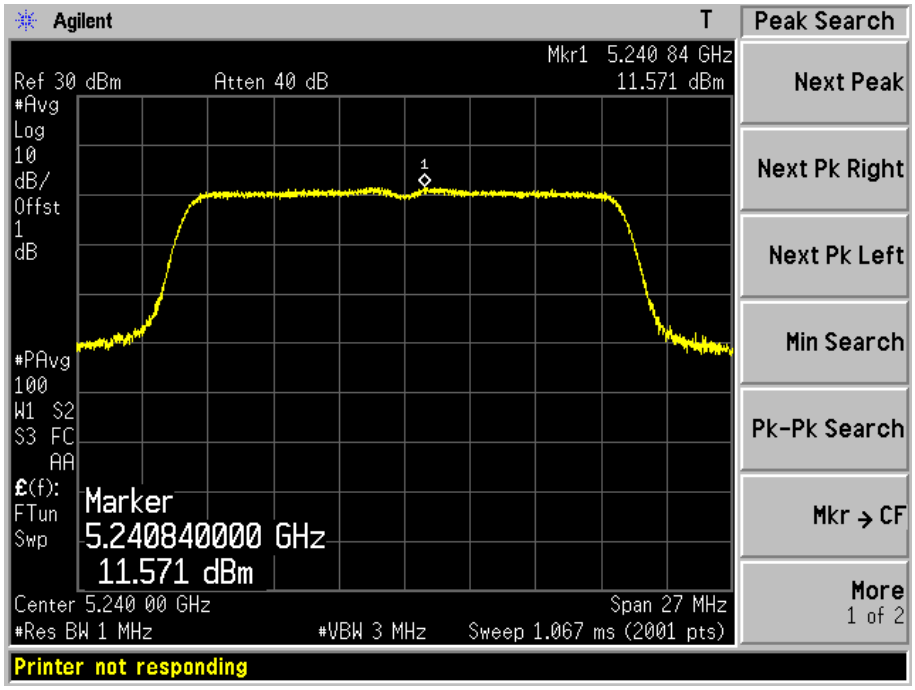
Channel 36 (5180MHz)



Channel 40 (5200MHz)

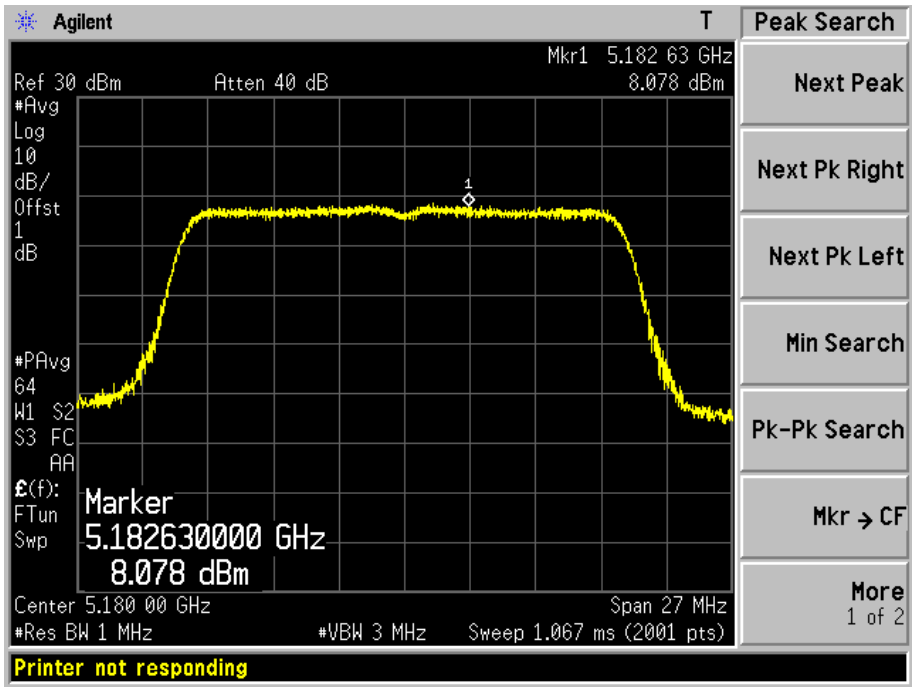


Channel 48 (5240MHz)

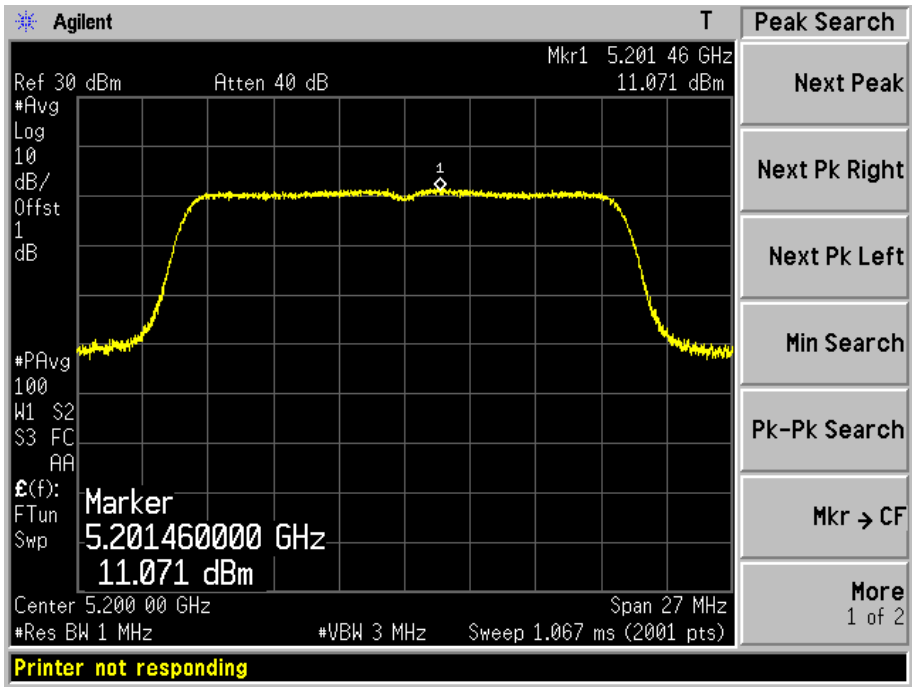


Ant 3

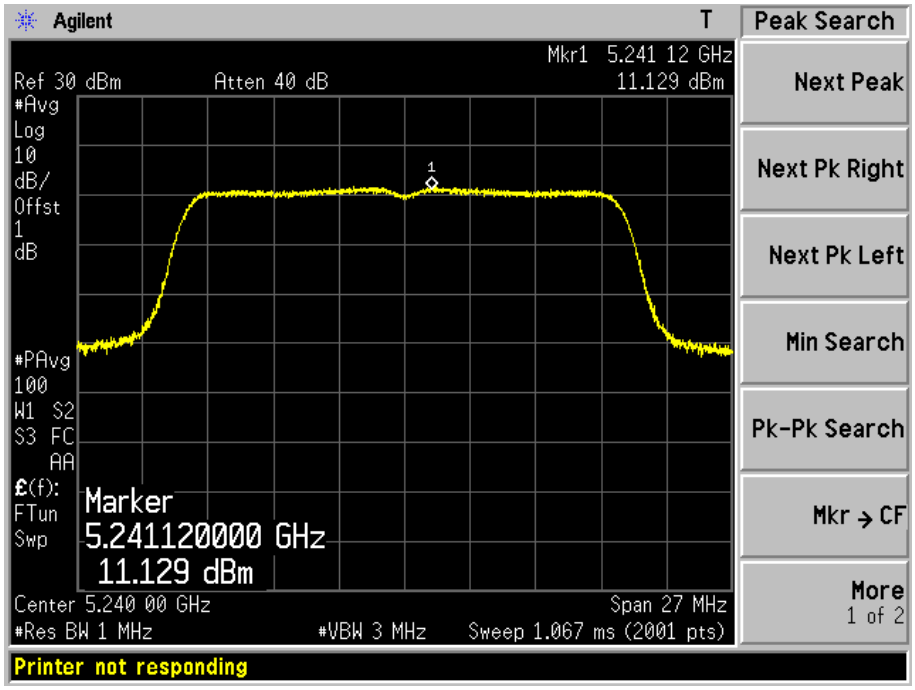
Channel 36 (5180MHz)



Channel 40 (5200MHz)



Channel 48 (5240MHz)



Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 5: Transmit by 802.11ac(40MHz) with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm/MHz)			Duty Cycle (%)	Total PPSD (dBm/MHz)	FCC Limit (dBm/MHz)
		Ant1	Ant2	Ant3			
38	5190	1.699	1.363	0.757	96.06%	6.23	16.53
46	5230	7.835	8.134	8.351	96.06%	13.05	16.53

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

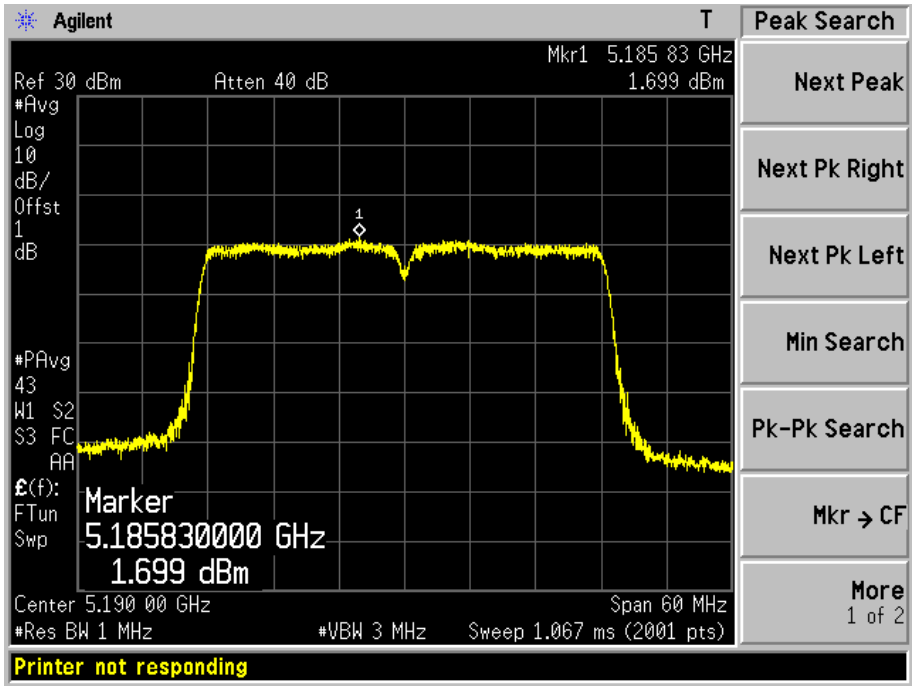
Note2: If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain = 10 log(NANT/NSS) dB for power spectral density measurements on all devices;

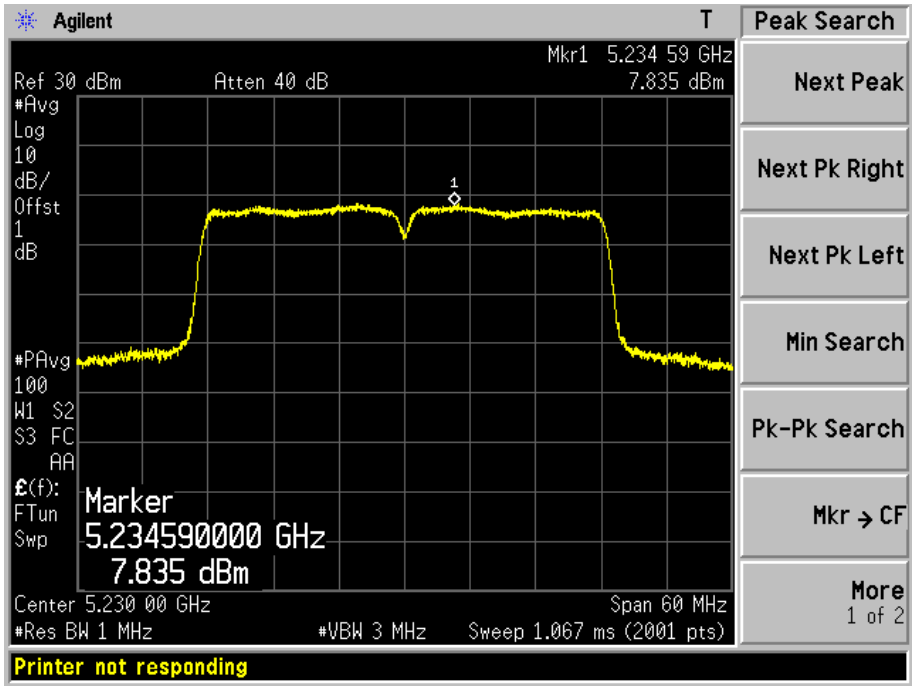
Note4: For power spectral density (PSD) measurements on all devices, Array Gain = 10 log(NANT/NSS) dB. Directional gain = GANT + Array Gain=6.47dBi＞6dBi, so The Limit is 16.53dBm

Ant 1

Channel 38 (5190MHz)

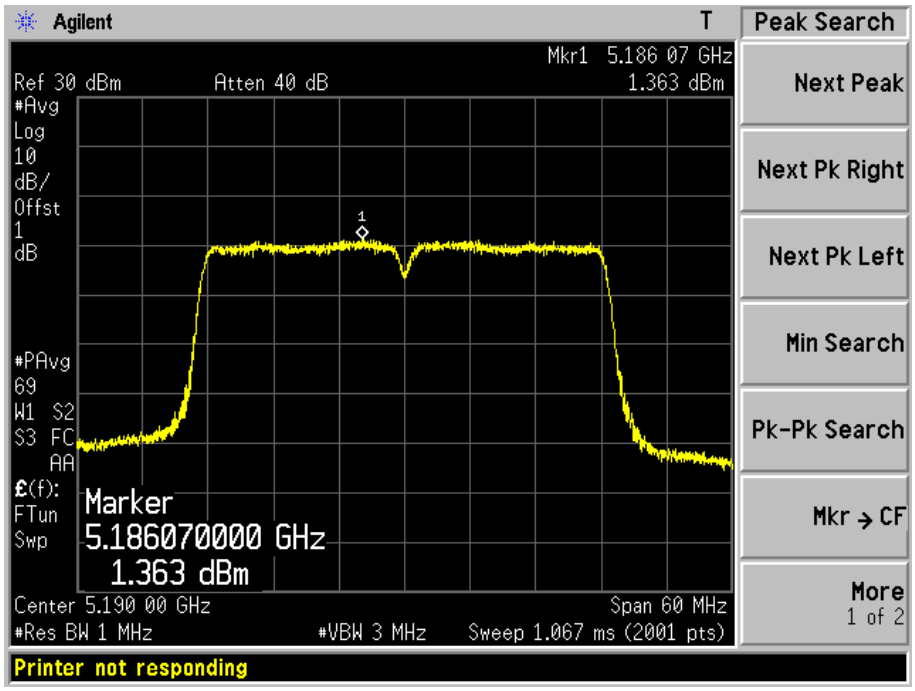


Channel 38 (5230MHz)

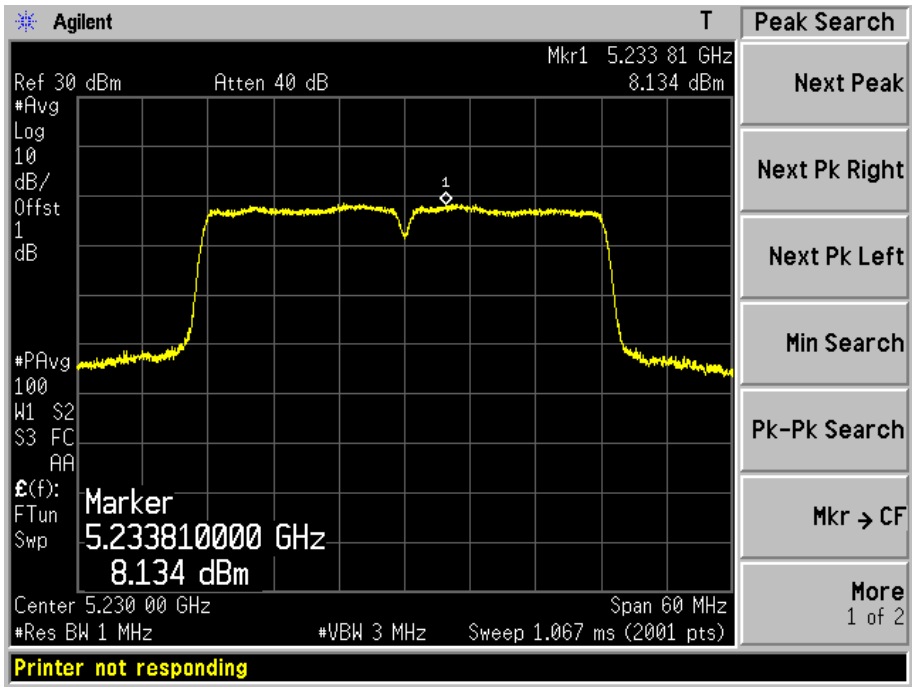


Ant 2

Channel 38 (5190MHz)

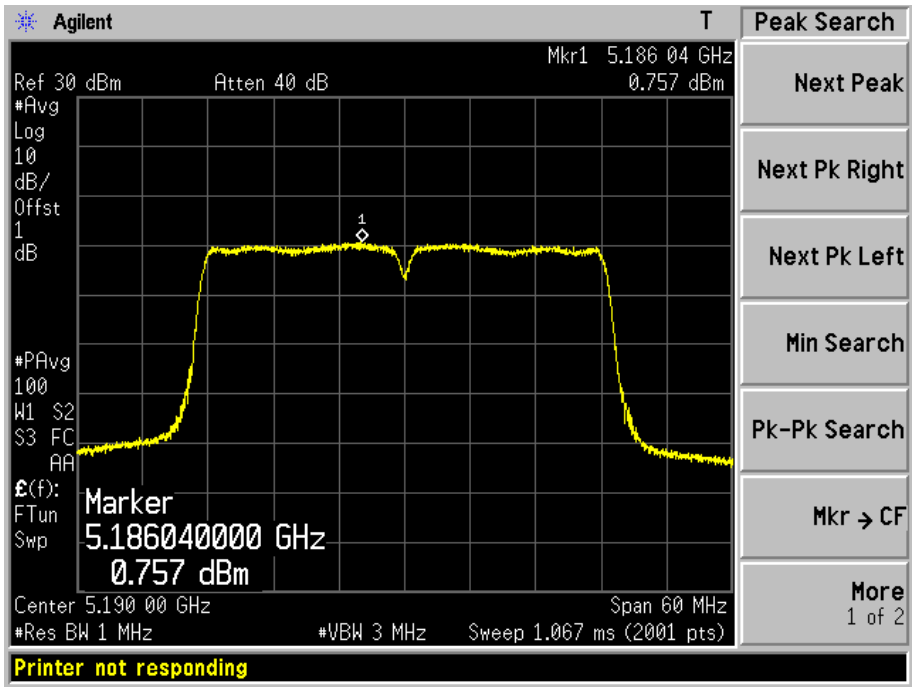


Channel 38 (5230MHz)

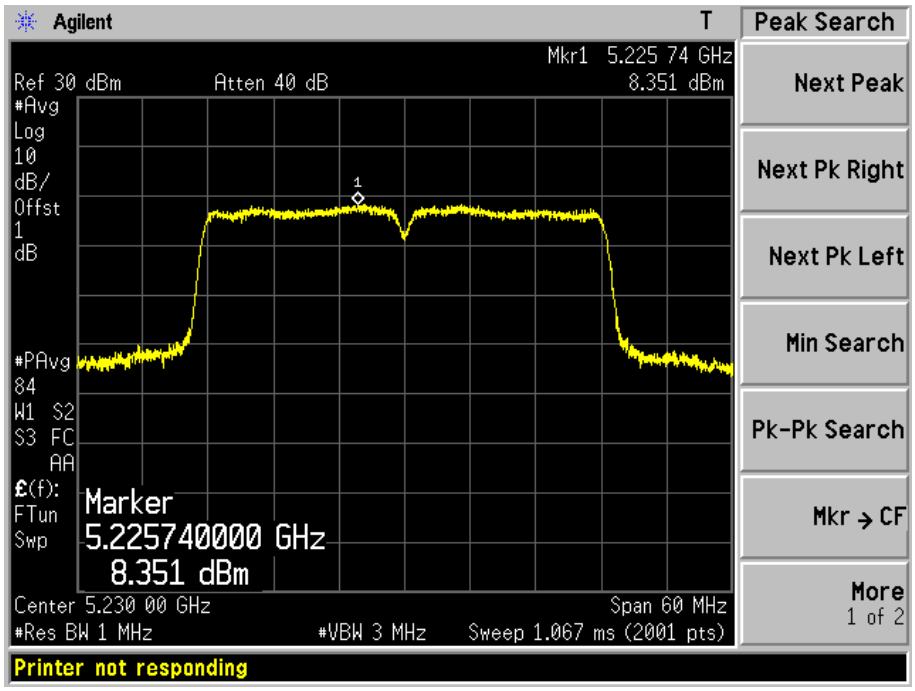


Ant 3

Channel 38 (5190MHz)



Channel 38 (5230MHz)



Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 6: Transmit by 802.11ac(80MHz) with CDD

Channel No.	Frequency (MHz)	Measurement Power Output (dBm/MHz)			Duty Cycle (%)	Total PPSD (dBm/MHz)	FCC Limit (dBm/MHz)
		Ant1	Ant2	Ant3			
42	5210	-5.116	-5.795	-6.081	95.48%	-0.67	16.53

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

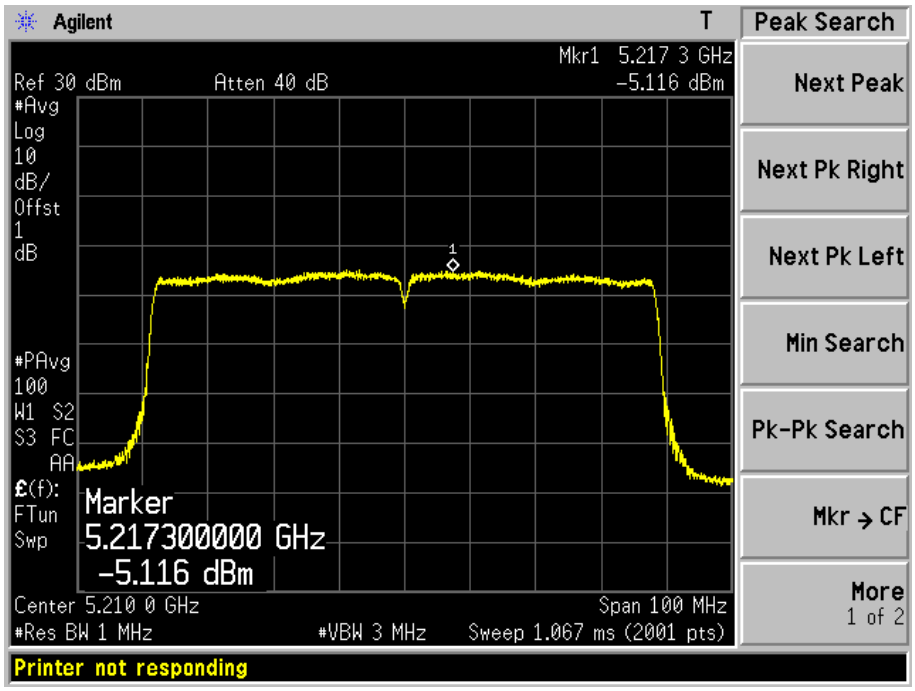
Note2: If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note3: If all antennas have the same gain, GANT, Directional gain = GANT + Array Gain, where Array Gain = 10 log(NANT/NSS) dB for power spectral density measurements on all devices;

Note4: For power spectral density (PSD) measurements on all devices, Array Gain = 10 log(NANT/NSS) dB. Directional gain = GANT + Array Gain=6.47dBi＞6dBi, so The Limit is 16.53dBm

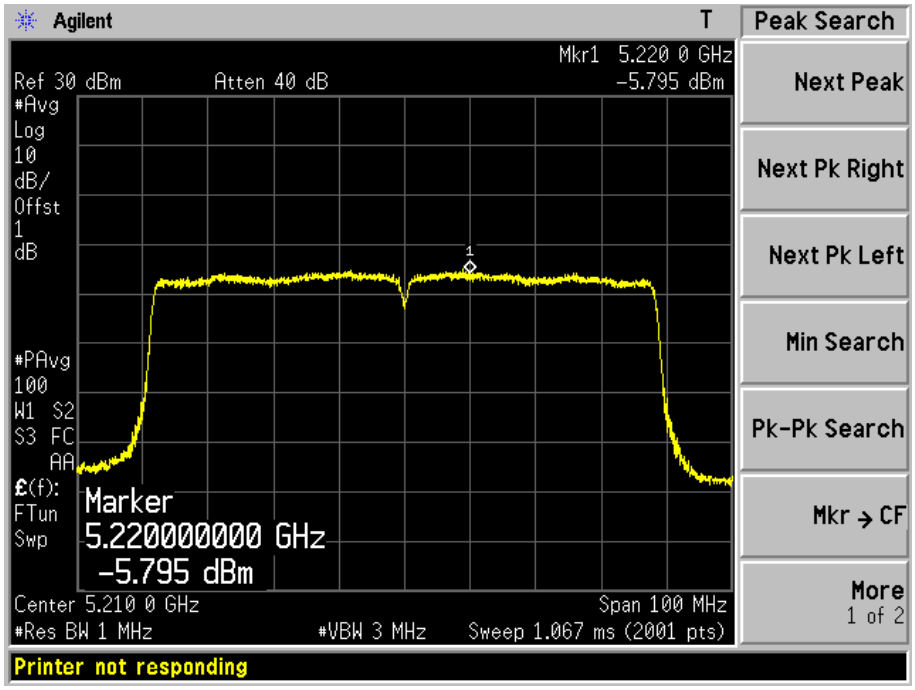
Ant 1

Channel 42 (5210MHz)



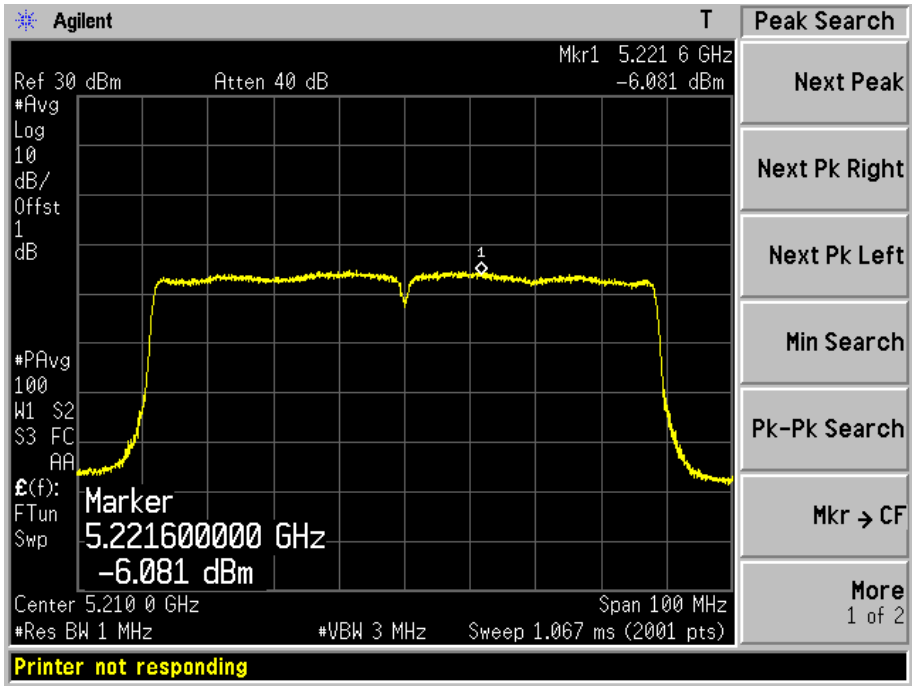
Ant 2

Channel 42 (5210MHz)



Ant 3

Channel 42 (5210MHz)



Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 7: Transmit by 802.11ac(20MHz) with beamforming

Channel No.	Frequency (MHz)	Measurement Power Output (dBm/MHz)			Duty Cycle (%)	Total PPSD (dBm/MHz)	FCC Limit (dBm/MHz)
		Ant1	Ant2	Ant3			
36	5180	9.716	9.354	9.632	96.65%	14.49	16.53
40	5200	11.433	11.394	11.402	96.65%	16.33	16.53
48	5240	11.623	11.491	11.567	96.65%	16.48	16.53

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

Note2: 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.

Note3: For power spectral density (PSD) measurements on all devices, Directional gain = GANT + 10 log(NANT/NSS) =6.47dBi＞6dBi, so The Limit is 16.53dBm

Ant 1

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

Ant 2

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

Ant 3

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 8: Transmit by 802.11ac(40MHz) with beamforming

Channel No.	Frequency (MHz)	Measurement Power Output (dBm/MHz)			Duty Cycle (%)	Total PPSD (dBm/MHz)	FCC Limit (dBm/MHz)
		Ant1	Ant2	Ant3			
38	5190	1.581	1.340	1.606	96.65%	6.43	16.53
46	5230	10.525	9.788	9.866	96.65%	14.99	16.53

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

Note2: 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.

Note3: For power spectral density (PSD) measurements on all devices, Directional gain = GANT + 10 log(NANT/NSS) =6.47dBi＞6dBi, so The Limit is 16.53dBm

Ant 1

Channel 38 (5190MHz)

Channel 38 (5230MHz)

Ant 2

Channel 38 (5190MHz)

Channel 38 (5230MHz)

Ant 3

Channel 38 (5190MHz)

Channel 38 (5230MHz)

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 9: Transmit by 802.11ac(80MHz) with beamforming

Channel No.	Frequency (MHz)	Measurement Power Output (dBm/MHz)			Duty Cycle (%)	Total PPSD (dBm/MHz)	FCC Limit (dBm/MHz)
		Ant1	Ant2	Ant3			
42	5210	-4.826	-5.037	-5.130	94.84%	0.01	16.53

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

Note2: 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.

Note3: For power spectral density (PSD) measurements on all devices, Directional gain = GANT + 10 log(NANT/NSS) =6.47dBi＞6dBi, so The Limit is 16.53dBm

Ant 1

Channel 42 (5210MHz)

Ant 2

Channel 42 (5210MHz)

Ant 3

Channel 42 (5210MHz)

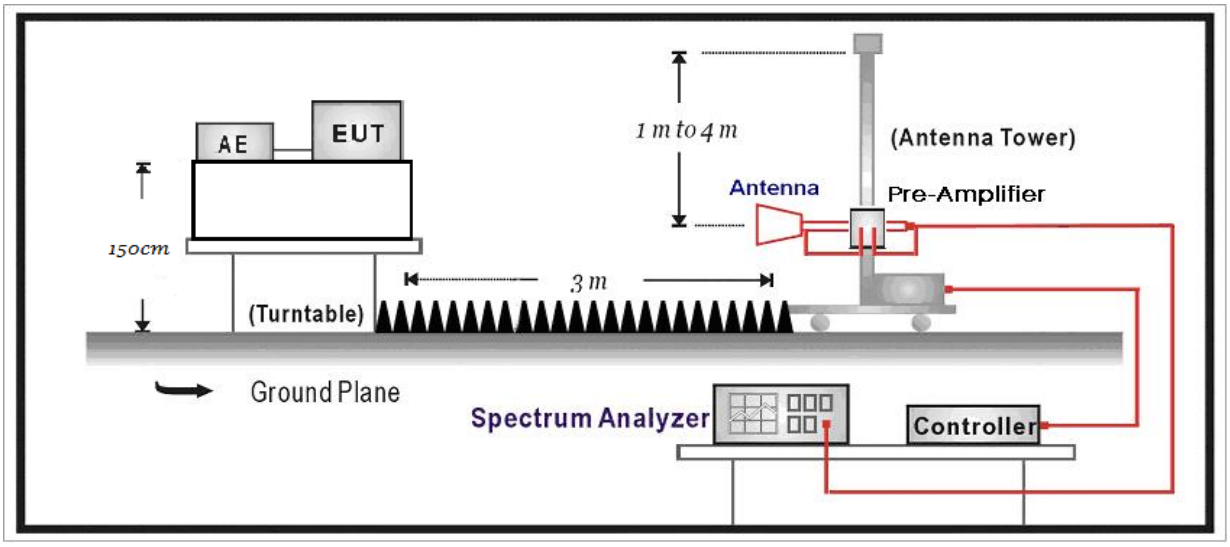
8. Radiated Emission Band Edge

8.1. Test Equipment

☒Radiated Emission Band Edge / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2015.03.11	2016.03.10
Preamplifier	Miteq	NSP1800-25	1364185	2015.05.04	2016.05.03
Preamplifier	QuieTek	AP-040G	CHM-0906001	2015.05.04	2016.05.03
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2015.10.16	2016.10.15
DRG Horn	ETS-Lindgren	3117	00123988	2015.01.08	2016.01.07
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2015.03.02	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2015.03.02	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2015.03.02	2016.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2015.06.10	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2015.01.09	2016.01.08

8.2. Test Setup



8.3. Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

For 15.407(b) requirement:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 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 e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

Operating Frequency Band (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength at 3m (dBuV/m)
5150 - 5250	-27	68.3
5250 - 5350	-27	68.3
5470 - 5725	-27	68.3
5725 - 5825	-27 [Note(1)]	68.3
	-17 [Note(2)]	78.3

Note(1): Outside the frequency range 5715 - 5835MHz.
Note(2): Within the frequency range from the band edge to 10MHz below or above the band edge, 5715 – 5725MHz and 5825 - 5835MHz.

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

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 antenna to the EUT was 3 meters.
The antenna 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 antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2009 on radiated measurement.

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 ≥ [3 × 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 ≥ 98%, then set VBW ≤ RBW / 100 (i.e., 10 kHz), but not less than 10 Hz.
2) If the EUT D is < 98%, then set VBW ≥ 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 Chainenna has the narrow beamwidth) in order to keeping the Chainenna in the “cone of radiation” of EUT. The 3dB beamwidth is 10~60 degrees for H-plane and 10~90 degrees for E-plane.

8.5. Uncertainty

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

8.6. Test Result

Mode 1: Transmit by 802.11a with CDD

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1+2+3	36	V	5150.0	27.4	42.0	69.4	74.0	-4.6	PK
		V	5150.0	11.5	42.0	53.5	54.0	-0.5	AV
		H	5150.0	14.0	42.0	56.1	74.0	-17.9	PK
		H	5150.0	0.2	42.0	42.2	54.0	-11.8	AV

Mode 2: Transmit by 802.11n(20MHz) with CDD

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1+2+3	36	V	5150.0	11.7	42.0	53.7	54.0	-0.3	PK
		V	5150.0	28.5	42.0	70.6	74.0	-3.4	AV
		H	5150.0	15.3	42.0	57.4	74.0	-16.6	PK
		H	5150.0	1.4	42.0	43.4	54.0	-10.6	AV

Mode 3: Transmit by 802.11n(40MHz) with CDD

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1+2+3	38	V	5150.0	25.8	42.0	67.8	74.0	-6.2	PK
		V	5150.0	11.3	42.0	53.4	54.0	-0.6	AV
		H	5150.0	14.3	42.0	56.3	74.0	-17.7	PK
		H	5150.0	2.4	42.0	44.5	54.0	-9.5	AV

Mode 4: Transmit by 802.11ac(20MHz) with CDD

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1+2+3	36	V	5150.0	28.5	42.0	70.5	74.0	-3.5	PK
		V	5150.0	11.5	42.0	53.6	54.0	-0.4	AV
		H	5150.0	14.3	42.0	56.3	74.0	-17.7	PK
		H	5150.0	1.8	42.0	43.8	54.0	-10.2	AV

Mode 5: Transmit by 802.11ac(40MHz) with CDD

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1+2+3	38	V	5150.0	26.4	42.0	68.4	74.0	-5.6	PK
		V	5150.0	11.3	42.0	53.3	54.0	-0.7	AV
		H	5150.0	12.8	42.0	54.8	74.0	-19.2	PK
		H	5150.0	1.8	42.0	43.8	54.0	-10.2	AV

Mode 6: Transmit by 802.11ac(80MHz) with CDD

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1+2+3	42	V	5150.0	23.9	42.0	66.0	74.0	-8.0	PK
		V	5144.6	11.0	42.0	53.0	54.0	-1.0	AV
		V	5150.0	11.2	42.0	53.2	54.0	-0.8	AV
		H	5150.0	13.2	42.0	55.2	74.0	-18.8	PK
		H	5150.0	2.0	42.0	44.1	54.0	-9.9	AV

Mode 7: Transmit by 802.11ac(20MHz) with Beamforming

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1+2+3	36	V	5149.0	31.6	42.0	73.6	74.0	-0.4	PK
		V	5150.0	26.8	42.0	68.8	74.0	-5.2	PK
		V	5150.0	11.5	42.0	53.5	54.0	-0.5	AV
		H	5150.0	15.9	42.0	57.9	74.0	-16.1	PK
		H	5150.0	2.0	42.0	44.1	54.0	-9.9	AV

Mode 8: Transmit by 802.11ac(40MHz) with Beamforming

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1+2+3	38	V	5150.0	27.9	42.0	69.9	74.0	-4.1	PK
		V	5150.0	11.9	42.0	53.9	54.0	-0.1	AV
		H	5150.0	15.5	42.0	57.5	74.0	-16.5	PK
		H	5150.0	2.7	42.0	44.7	54.0	-9.3	AV

Mode 9: Transmit by 802.11ac(80MHz) with Beamforming

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1+2+3	42	V	5122.6	29.9	42.1	72.1	74.0	-1.9	PK
		V	5150.0	27.2	42.0	69.2	74.0	-4.8	PK
		V	5142.7	11.0	42.1	53.0	54.0	-1.0	AV
		V	5150.0	4.6	42.0	46.6	54.0	-7.4	AV
		H	5150.0	21.7	42.0	63.7	74.0	-10.3	PK
		H	5137.0	6.3	42.2	48.5	54.0	-5.5	AV
		H	5150.0	-1.8	42.0	40.2	54.0	-13.8	AV

9. Frequency Stability

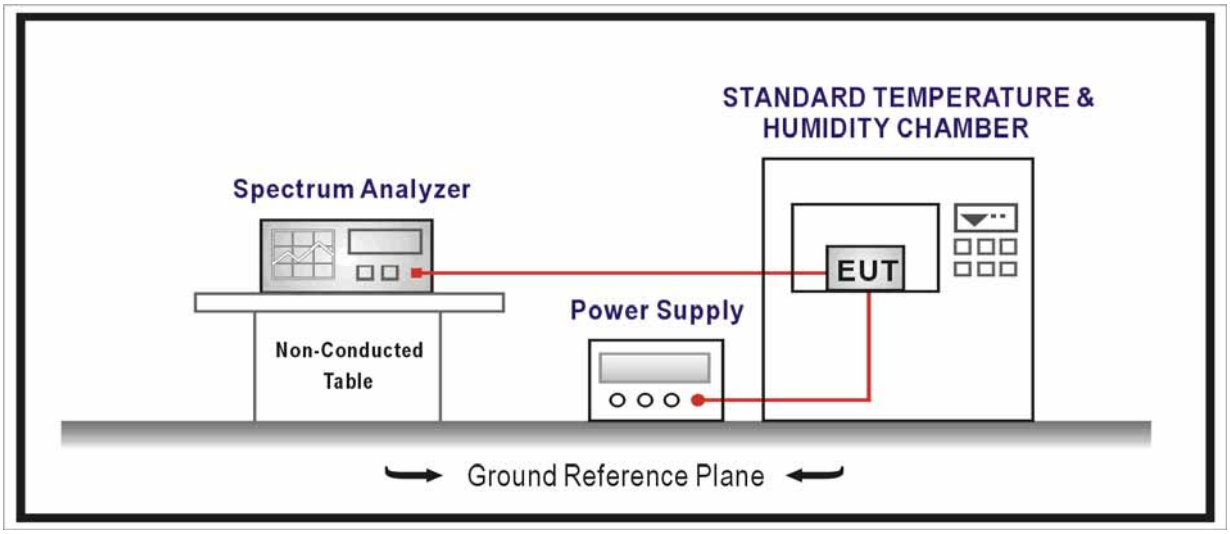
9.1. Test Equipment

Frequency Stability / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2015.01.08	2016.01.07
AC Power Supply	IDRC	CF-500TP	979422	2015.09.17	2016.09.16
DC Power Supply	IDRC	CD-035-020PR	977272	2015.09.17	2016.09.16
Programmable Temperature & Humidity Chamber	Gaoyu	TH-1P-B	WIT-05121302	2015.01.08	2016.01.07
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2015.04.10	2016.04.09

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

9.2. Test Setup



9.3. Limit

For FCC

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

9.4. Test Procedure

Frequency Stability Under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20℃ operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20℃. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.
Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

9.5. Uncertainty

The measurement uncertainty is defined as ± 100 Hz

9.6. Test Result

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Frequency Stability
Test Site	:	TR-8
Test Mode	:	Carrier Transmit

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)
-30	5200.000	171
-20	5200.000	-181
-10	5200.000	-132
0	5200.000	214
10	5200.000	-116
20	5200.000	-88
30	5200.000	118
40	5200.000	100
50	5200.000	-115

Frequency Stability under Voltage

AC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)
102	5200.000	141
120	5200.000	104
138	5200.000	109

The End