

Test Report

Industry Canada RSS-Gen Issue 3/RSS-210 Issue 8
FCC Part15 Subpart E

Product Name : IP-STB
Model No. : 3500X
FCC ID : TC2-R1008
IC : 5959A-R1008

Applicant : Roku Inc.

Address : 12980 Saratoga Ave, Suite D Saratoga, CA 95070

Date of Receipt : Jan. 23, 2014
Test Date : Jan. 23, 2014~ Feb. 14, 2014
Issued Date : Feb. 15, 2014
Report No. : 1410471R-RF-US-P09V01
Report Version : V1.1



The test results relate only to the samples tested.

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

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Test Report Certification

Issued Date : Feb. 15, 2014

Report No. : 1410471R-RF-US-P09V01



Product Name : IP-STB

Applicant : Roku Inc.

Address : 12980 Saratoga Ave, Suite D Saratoga, CA 95070

Manufacturer : Ambit Mircosystems (Shanghai) LTD.

Address : 1925, Nanle Road, Songjiang Export Processing Zone,
Shanghai, China 201613

Model No. : 3500X

FCC ID : TC2-R1008

IC : 5959A-R1008

EUT Voltage : 100-240Vac +/-10%

Brand Name : Roku

Applicable Standard : FCC CFR Title 47 Part 15 Subpart E: 2012
ANSI C63.4: 2009; KDB 789033
Industry Canada RSS-Gen Issue 3/RSS-210 Issue 8

Test Result : Complied

Performed Location : Suzhou EMC Laboratory
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FCC Registration Number: 800392; IC Lab Code: 4075B

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Laboratory Information

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

Taiwan R.O.C.	:	BSMI, NCC, TAF
Germany	:	TUV Rheinland
Norway	:	Nemko, DNV
USA	:	FCC
Japan	:	VCCI
China	:	CNAS

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

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

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TABLE OF CONTENTS

Description	Page
1. General Information	7
1.1. EUT Description	7
1.2. Mode of Operation	10
1.3. Tested System Details.....	11
1.4. Configuration of Tested System	12
1.5. EUT Exercise Software	13
2. Technical Test.....	14
2.1. Summary of Test Result	14
2.2. Test Environment	16
3. Conducted Emission	17
3.1. Test Equipment	17
3.2. Test Setup	17
3.3. Limit.....	18
3.4. Test Procedure	18
3.5. Uncertainty	18
3.6. Test Result	19
4. Radiated Emission	21
4.1. Test Equipment	21
4.2. Test Setup	22
4.3. Limit.....	23
4.4. Test Procedure	23
4.5. Uncertainty	24
4.6. Test Result	25
5. Operation Frequency Range of 20dB Bandwidth.....	31
5.1. Test Equipment	31
5.2. Test Setup	31
5.3. Limit.....	31
5.4. Test Procedure	31
5.5. Uncertainty	31
5.6. Test Result	32
6. Occupied Bandwidth	38
6.1. Test Equipment	38
6.2. Test Setup	38
6.3. Limit.....	38
6.4. Test Procedure	39
6.5. Uncertainty	39
6.6. Test Result	40

7.	Power Output	52
7.1.	Test Equipment	52
7.2.	Test Setup	52
7.3.	Limit.....	52
7.4.	Test Procedure	53
7.5.	Uncertainty	53
7.6.	Test Result	54
8.	Peak Power Spectral Density.....	59
8.1.	Test Equipment	59
8.2.	Test Setup	59
8.3.	Limit.....	59
8.4.	Test Procedure	60
8.5.	Uncertainty	60
8.6.	Test Result	61
9.	Peak Excursion	80
9.1.	Test Equipment	80
9.2.	Test Setup	80
9.3.	Limit.....	80
9.4.	Test Procedure	81
9.5.	Uncertainty	81
9.6.	Test Result	82
10.	Radiated Emission Band Edge	94
10.1.	Test Equipment	94
10.2.	Test Setup	94
10.3.	Limit.....	94
10.4.	Test Procedure	96
10.5.	Uncertainty	96
10.6.	Test Result	97
11.	Frequency Stability.....	161
11.1.	Test Equipment	161
11.2.	Test Setup	161
11.3.	Limit.....	161
11.4.	Test Procedure	162
11.5.	Uncertainty	162
11.6.	Test Result	163
12.	Receiver Spurious Emission for Industry Canada RSS-Gen Requirement.....	164
12.1.	Test Equipment	164
12.2.	Test Setup	165
12.3.	Limit.....	166

12.4. Test Procedure	166
12.5. Uncertainty	167
12.6. Test Result	168

1. General Information

1.1. EUT Description

Product Name	IP-STB
Brand Name	Roku
Model No.	3500X
EUT Voltage	100-240Vac +/-10%
Frequency Range	<p>For 2.4GHz Band</p> <p>802.11b/g/n(20MHz): 2412~2462MHz</p> <p>802.11n(40MHz): 2422~2452MHz</p> <p>For 5.0GHz Band</p> <p>802.11a/n(20MHz):</p> <p>5180~5240MHz, 5745~5825MHz</p> <p>802.11n(40MHz):</p> <p>5190~5230MHz,, 5755~5795MHz</p>
Channel Number	<p>For 2.4GHz Band</p> <p>802.11b/g/n(20MHz): 11 802.11n(40MHz): 7</p> <p>For 5.0GHz Band</p> <p>802.11a /n(20MHz) /ac(20MHz): 9 802.11n(40MHz): 4</p>
Type of Modulation	<p>802.11b: DSSS</p> <p>802.11a/g/n: OFDM</p>
Data Rate	<p>802.11a/g: 6/9/12/18/24/36/48/54 Mbps</p> <p>802.11b: 1/2/5.5/11 Mbps</p> <p>802.11n: up to 300 Mbps</p>
Channel Control	Auto
Antenna Delivery	2*Tx + 2*Rx
Antenna Type	Printed Antenna
Peak Antenna Gain	2dBi for 2.4GHz and 5GHz

For 2.4GHz Band

802.11b/g/n(20MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz	04	2427 MHz
05	2432 MHz	06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	10	2457 MHz	11	2462 MHz	N/A	N/A

802.11n(40MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz	N/A	N/A

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	5825 MHz	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

Power Parameter Value of the test software

Test Mode	Test Channel	Ant 0	Ant 1	Ant 0+1
802.11a	5180	64	64	x
	5200	68	68	x
	5240	66	66	x
802.11n(20MHz)	5180	48	48	48
	5200	52	52	52
	5240	48	48	48
802.11n(40MHz)	5190	48	48	48
	5230	48	48	48

Duty Cycle

Test Mode	Duty Cycle
802.11a	96%
802.11n(20MHz)	95%
802.11n(40MHz)	96%

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 802.11 a
Mode 2: Transmit by 802.11n(20MHz)
Mode 3 Transmit by 802.11n(40MHz)

Note:

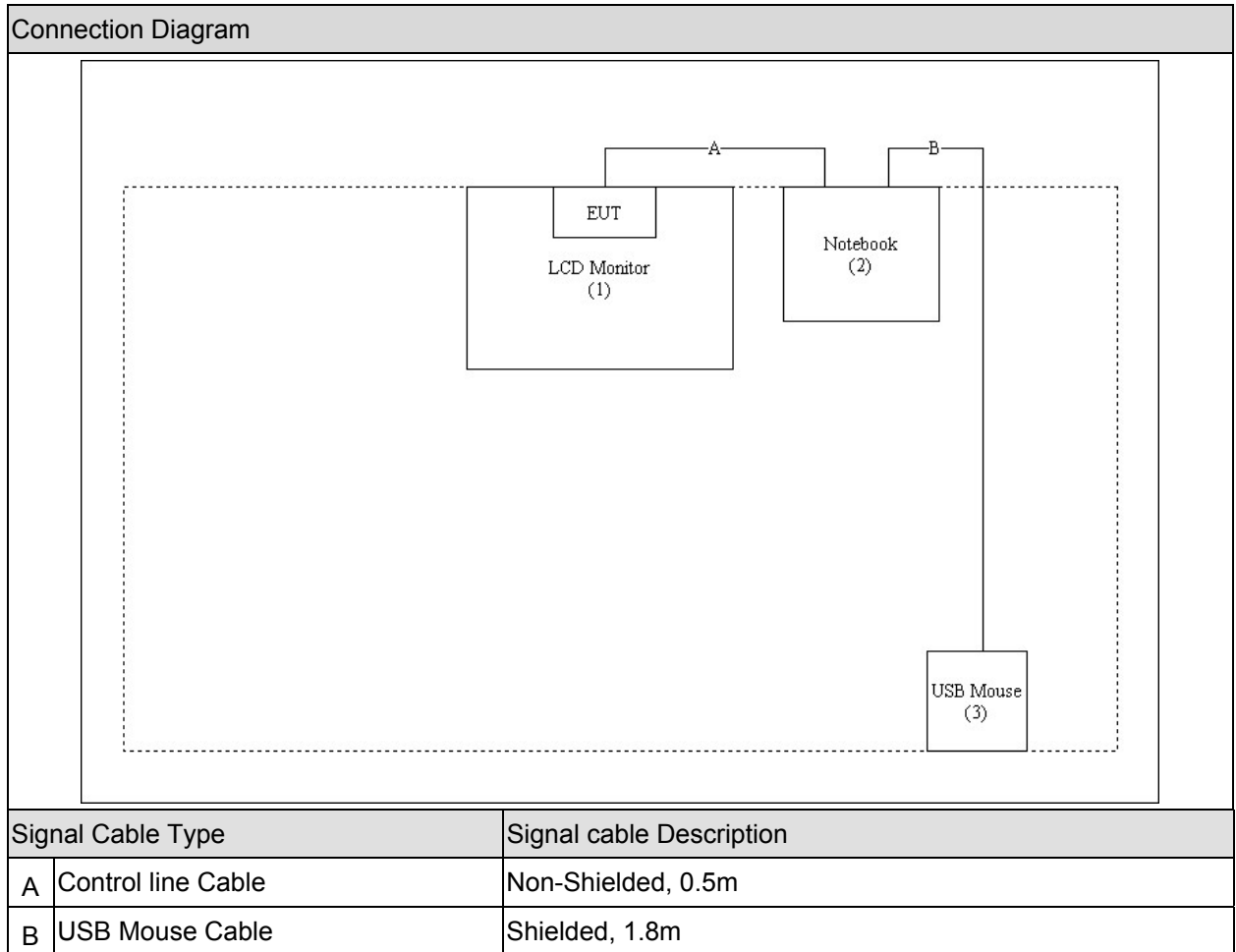
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

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 LCD Monitor	DELL	U2410f	N/A	Non-Shielded, 1.8m
2 Notebook	Think Pad	R400	R8-MTNE5	Power by adapter
3 USB Mouse	DELL	M-UVDEL1	LNAS2162651	Power by Notebook

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Input the play instruction to EUT using "hypertrm" and set the test mode and channel, then press OK to start continue Transmit or receive.

2. Technical Test

2.1. Summary of Test Result

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

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart E: 2012 Section 15.207	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart E: 2012 Section 15.209	Yes	No
Operation Frequency Range of 20dB Bandwidth	FCC CFR Title 47 Part 15 Subpart E: 2012 15.215(c)	Yes	No
26dB Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart E: 2012 Section 15.407(a)	Yes	No
Power Output	FCC CFR Title 47 Part 15 Subpart E: 2012 Section 15.407(a)	Yes	No
Peak Power Spectral Density	FCC CFR Title 47 Part 15 Subpart E: 2012 Section 15.407(a)	Yes	No
Peak Excursion	FCC CFR Title 47 Part 15 Subpart E: 2012 Section 15.407(a)(6)	Yes	No
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart E: 2012 Section 15.205, 15.407(b)	Yes	No
Frequency Stability	FCC CFR Title 47 Part 15 Subpart E: 2012 Section 15.407(g)	Yes	No

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	RSS-Gen Issue 3 December 2010 Table 2	Yes	No
Radiated Emission	RSS-210 Issue 8 December 2010 Section 2.7 Table 2 and Table 3	Yes	No
99% Occupied Bandwidth	RSS-Gen Issue 3 December 2010 Section 4.6.1 and 4.6.2	Yes	No
Power Output	RSS-210 Issue 8 December 2010 A9.2	Yes	No
Peak Power Spectral Density	RSS-210 Issue 8 December 2010 A9.2/A9.5	Yes	No
Radiated Emission Band Edge	RSS-210 Issue 8 December 2010 A9.3	Yes	No
Frequency Stability	RSS-210 Issue 8 December 2010 A9.5(5)	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

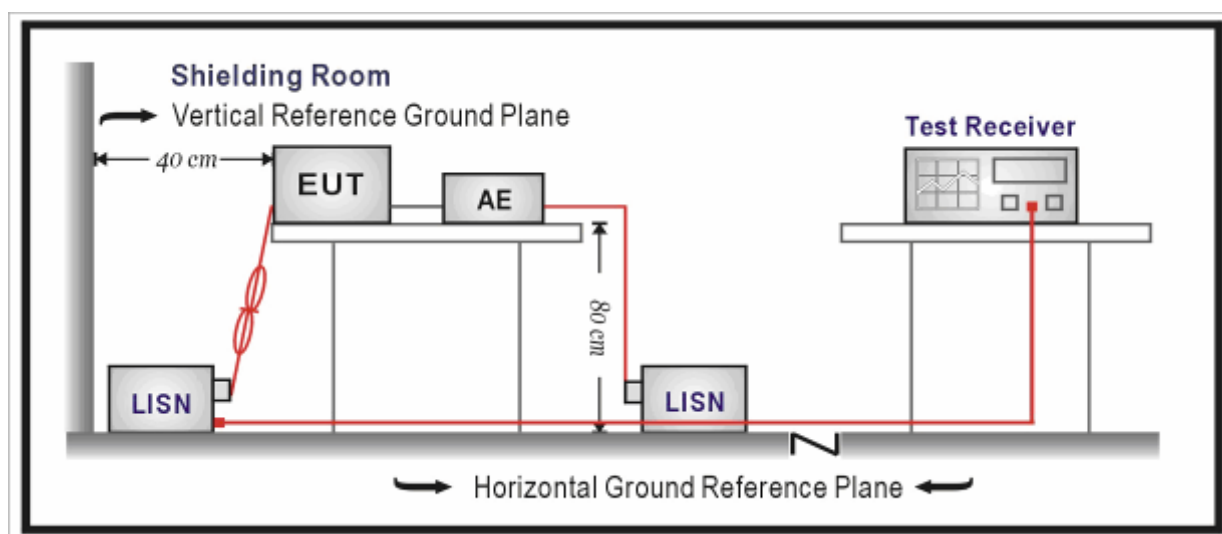
3.1. Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
EMI Test Receiver	R&S	ESCI	100726	2015.01.07
Two-Line V-Network	R&S	ENV216	100043	2014.03.30
Two-Line V-Network	R&S	ENV216	100044	2014.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2014.03.01
50ohm Termination	SHX	TF2	07081401	2014.09.16
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2015.01.08

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

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

The EUT was setup according to ANSI C63.4, 2009.

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.

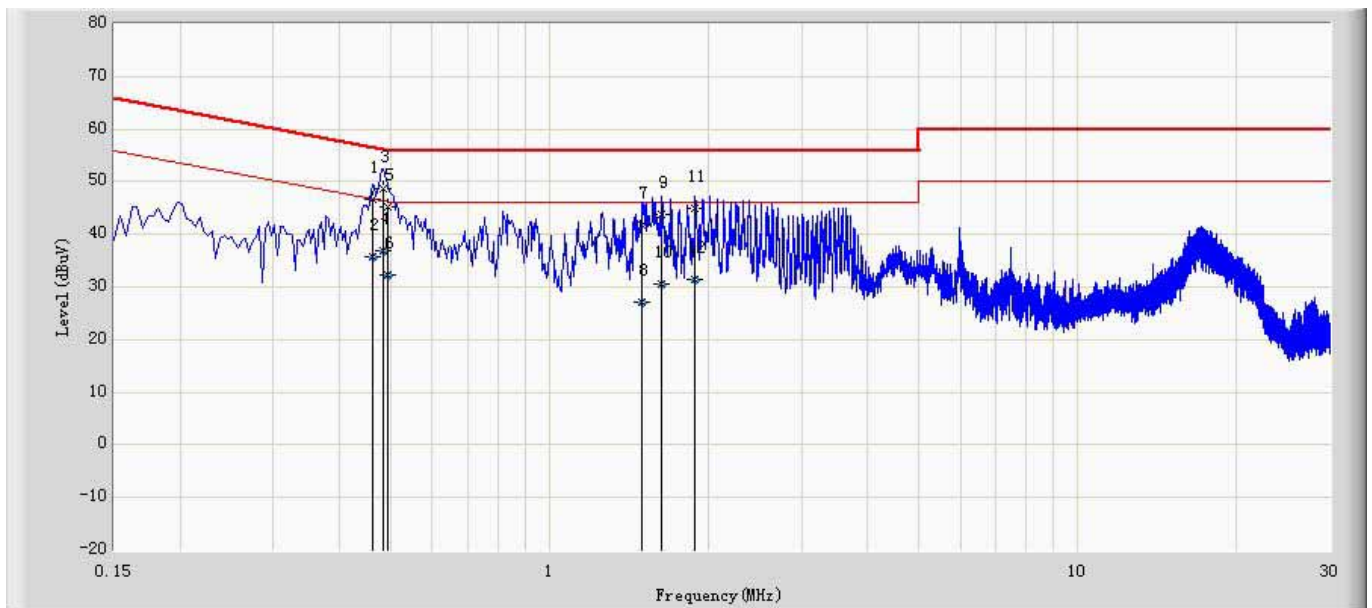
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

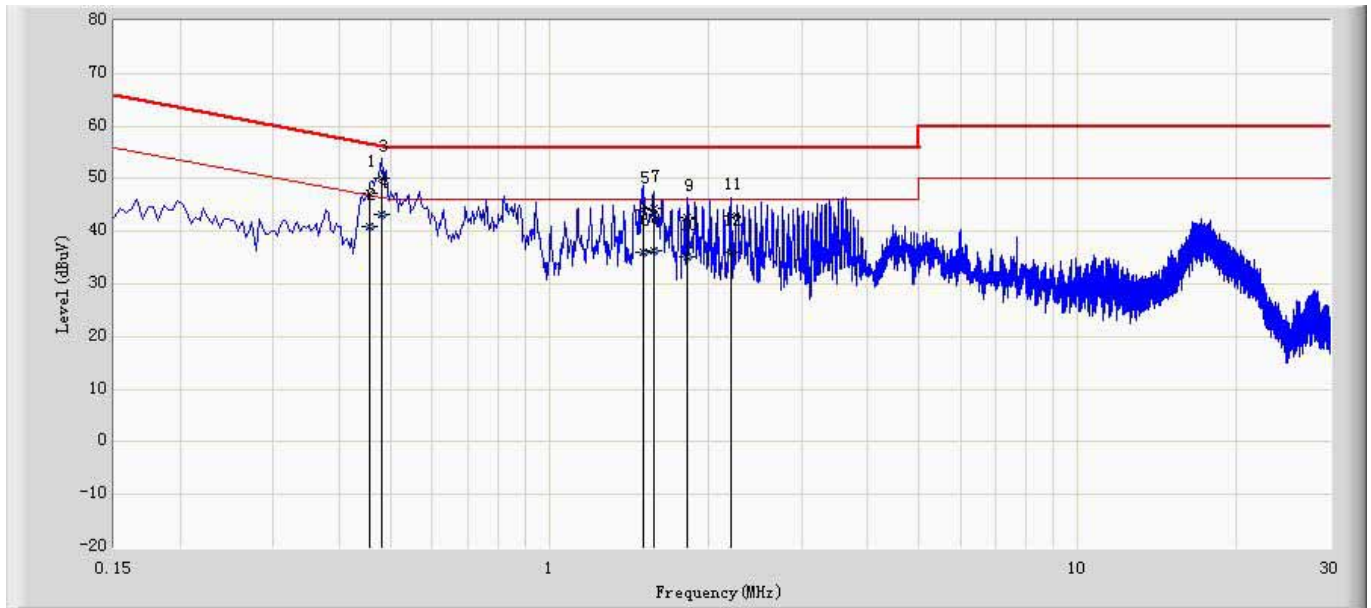
3.6. Test Result

Engineer: Ware	
Site: TR1	Time: 2014/02/10 - 15:52
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Line
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.462	46.627	36.722	-10.029	56.657	9.905	QP
2		0.462	35.633	25.727	-11.024	46.657	9.905	AV
3	*	0.486	48.813	38.905	-7.422	56.236	9.909	QP
4		0.486	36.949	27.040	-9.287	46.236	9.909	AV
5		0.494	45.278	35.370	-10.822	56.100	9.908	QP
6		0.494	32.408	22.500	-13.693	46.100	9.908	AV
7		1.498	41.868	32.068	-14.132	56.000	9.800	QP
8		1.498	27.102	17.302	-18.898	46.000	9.800	AV
9		1.634	43.936	34.141	-12.064	56.000	9.795	QP
10		1.634	30.613	20.818	-15.387	46.000	9.795	AV
11		1.890	44.826	35.032	-11.174	56.000	9.794	QP
12		1.890	31.327	21.533	-14.673	46.000	9.794	AV

Engineer: Ware	
Site: TR1	Time: 2014/02/10 - 15:55
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Line
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.458	47.215	37.310	-9.513	56.729	9.905	QP
2		0.458	40.943	31.038	-5.786	46.729	9.905	AV
3		0.482	50.105	40.197	-6.200	56.305	9.908	QP
4	*	0.482	43.118	33.210	-3.186	46.305	9.908	AV
5		1.510	44.008	34.208	-11.992	56.000	9.800	QP
6		1.510	36.135	26.335	-9.865	46.000	9.800	AV
7		1.574	44.286	34.489	-11.714	56.000	9.797	QP
8		1.574	36.214	26.417	-9.786	46.000	9.797	AV
9		1.822	42.588	32.801	-13.412	56.000	9.787	QP
10		1.822	35.228	25.441	-10.772	46.000	9.787	AV
11		2.202	43.055	33.264	-12.945	56.000	9.791	QP
12		2.202	36.016	26.225	-9.984	46.000	9.791	AV

4. Radiated Emission

4.1. Test Equipment

Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2014.03.30
Loop Antenna	R&S	HFH2-Z2	833799/003	2014.11.17
Bilog Chainenna	Teseq GmbH	CBL6112D	27611	2014.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2014.03.01
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2015.01.08

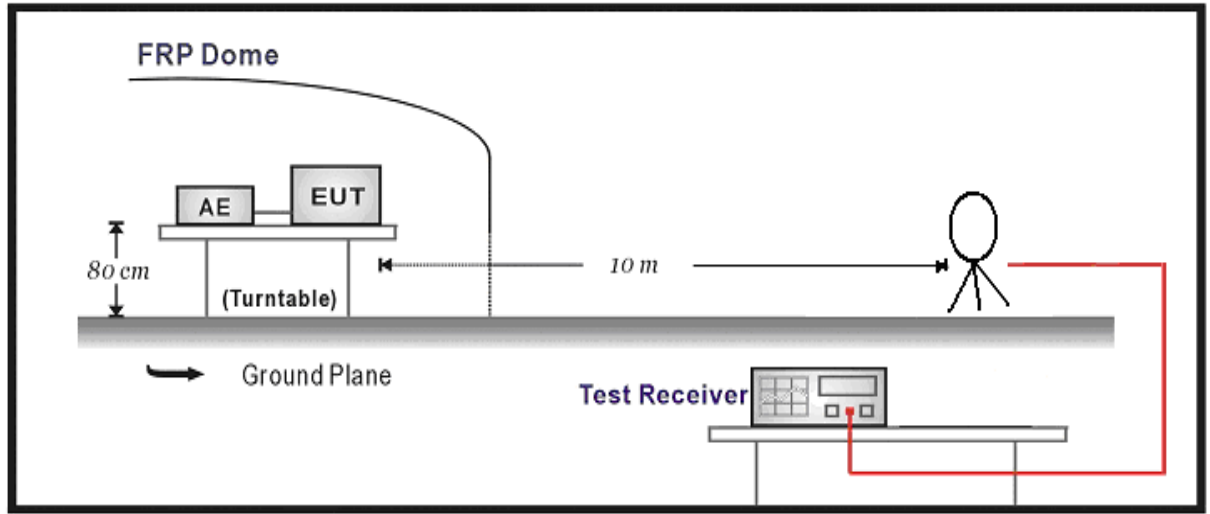
Radiated Emission / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2014.03.30
Spectrum Analyzer	Agilent	E4446A	MY45300103	2014.01.21
Preamplifier	Miteq	NSP1800-25	1364185	2014.05.04
Preamplifier	QuieTek	AP-040G	CHM-0906001	2014.05.04
DRG Horn	ETS-Lindgren	3117	00123988	2014.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2014.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2014.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2014.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2014.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2014.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2015.01.08

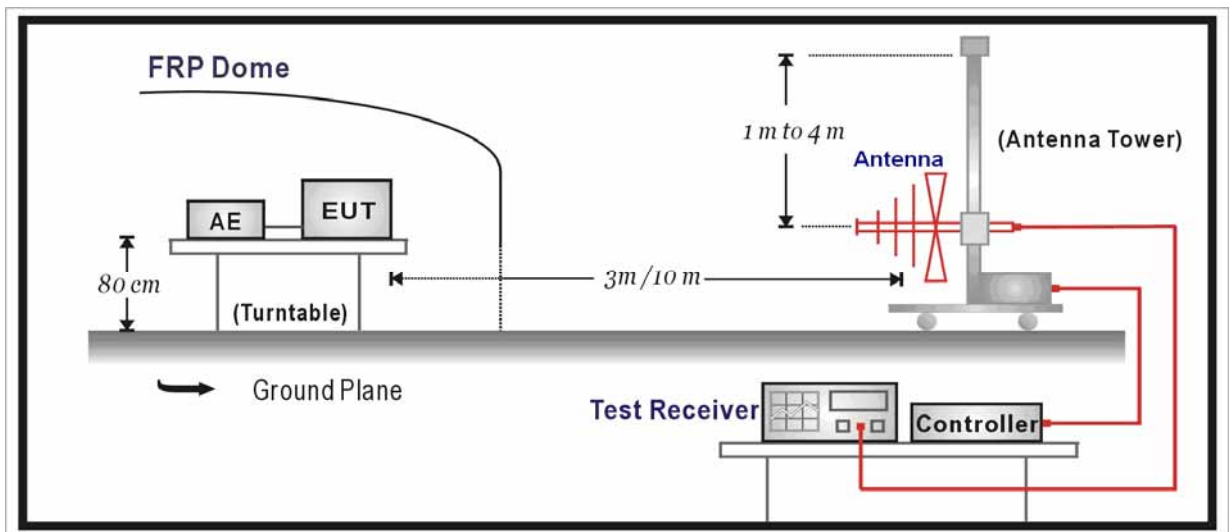
Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

4.2. Test Setup

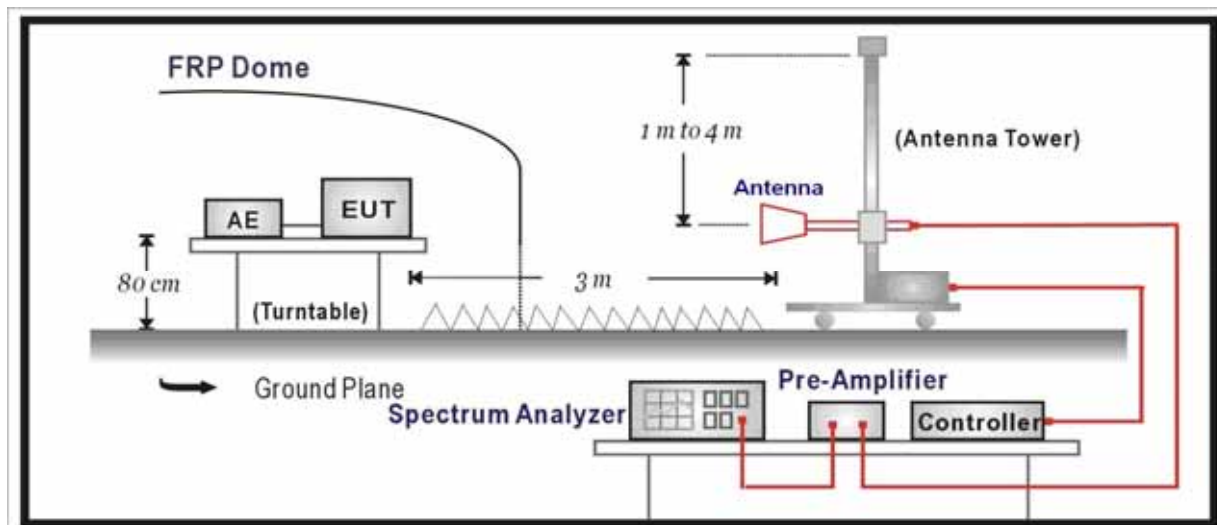
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

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

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

Note 2: Distance refers to the distance in meters between the measuring instrument Chainenna 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

The EUT was setup according to ANSI C63.4 2009 & KDB 789033.

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 C63.4:2009 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.

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 60~10 degrees for H-plane and 90~10 degrees for E-plane.

4.5. Uncertainty

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

4.6. Test Result

All of the test result shown indicates the worst case, and spectrum analyzer parameters setting as shown below:

Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;

Average detector: RBW = 1MHz, VBW = 10Hz, sweep time = auto.

Mode1: Transmit by 802.11a

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 0	36	H	10358.5	35.1	13.7	48.8	54(Note3)	-5.2	PK
		V	10360.0	37.1	13.7	50.8	54(Note3)	-3.2	PK
		H	15540.0	23.6	22	45.6	54(Note3)	-8.4	PK
		V	15540.0	23.6	21.8	45.4	54(Note3)	-8.6	PK
	40	H	10401.0	35.9	13.8	49.7	54(Note3)	-4.3	PK
		V	10401.0	38.8	13.8	52.6	54(Note3)	-1.4	PK
		H	15600.0	22.5	22.9	45.4	54(Note3)	-8.6	AV
		V	15603.0	25.7	22.8	48.5	54(Note3)	-5.5	PK
	48	H	10477.5	37	13.7	50.7	54(Note3)	-3.3	PK
		V	10486.0	38.9	13.7	52.6	54(Note3)	-1.4	PK
		H	15720.0	22.5	22.1	44.6	54(Note3)	-9.4	PK
		V	15720.0	24.1	22	46.1	54(Note3)	-7.9	AV
Ant 1	36	H	10358.0	41.3	13.7	55.0	74.0	-19.0	PK
		H	10358.0	32.7	13.7	46.4	54.0	-7.6	AV
		V	10358.0	44.3	13.7	58.0	74.0	-16.0	PK
		V	10358.0	32.7	13.7	46.4	54.0	-7.6	AV
		H	15543.5	30.5	22.0	52.5	54(Note3)	-1.5	PK
		V	15535.0	31.3	21.8	53.1	54(Note3)	-0.9	PK
	40	H	10409.5	39.2	13.8	53.0	54(Note3)	-1.0	PK
		V	10392.5	39.2	13.8	53.0	54(Note3)	-1.0	PK
		H	15600.0	23.2	22.9	46.1	54(Note3)	-7.9	PK
		V	15600.0	22.7	22.8	45.5	54(Note3)	-8.5	PK
	48	H	10477.5	42.4	13.7	56.1	74.0	-17.9	PK
		H	10477.5	32.9	13.7	46.6	54.0	-7.4	AV
		V	10486.0	47.5	13.7	61.2	74.0	-12.8	PK
		V	10486.0	34.5	13.7	48.2	54.0	-5.8	AV
		H	15722.0	28.0	22.1	50.1	54(Note3)	-3.9	PK

		V	15713.5	29.8	22.1	51.9	54(Note3)	-2.1	PK
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Note: 1. Measure Level = Reading Level + Factor.

2. The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), 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)

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	
Ant 0	36	H	10358.5	36.8	13.7	50.5	54(Note3)	-3.5	PK	
		V	10358.5	39.4	13.7	53.1	54(Note3)	-0.9	PK	
		H	15543.5	25.4	22.0	47.4	54(Note3)	-6.6	PK	
		V	15535.0	25.7	21.8	47.5	54(Note3)	-6.5	PK	
	44	H	10401.0	32.4	13.8	46.2	54(Note3)	-7.8	PK	
		V	10392.5	32.2	13.8	46.0	54(Note3)	-8.0	PK	
		H	15600.0	20.9	22.9	43.8	54(Note3)	-10.2	PK	
		V	15600.0	20.4	22.8	43.2	54(Note3)	-10.8	AV	
	48	H	10486.0	32.5	13.7	46.2	54(Note3)	-7.8	PK	
		V	10477.5	39.4	13.7	53.1	54(Note3)	-0.9	PK	
		H	15720.0	21.5	22.1	43.6	54(Note3)	-10.4	PK	
		V	15730.5	25.0	22.0	47.0	54(Note3)	-7.0	PK	
Ant 1	36	H	10358.5	37.7	13.7	51.4	54(Note3)	-2.6	PK	
		V	10358.5	44.5	13.7	58.2	74.0	-15.8	PK	
		V	10358.5	31.9	13.7	45.6	54.0	-8.4	AV	
		H	15543.5	31.2	22.0	53.2	54(Note3)	-0.8	PK	
		V	15543.5	34.4	21.8	56.2	74.0	-17.8	PK	
		V	15543.5	22.8	21.8	44.6	54.0	-9.4	AV	
	44	H	10401.0	40.0	13.8	53.8	54(Note3)	-0.2	PK	
		V	10401.0	36.0	13.8	49.8	54(Note3)	-4.2	PK	
		H	15600.0	20.1	22.9	43.0	54(Note3)	-11.0	PK	
		V	15603.0	22.5	22.8	45.3	54(Note3)	-8.7	PK	
		48	H	10486.0	43.7	13.7	57.4	74.0	-16.6	PK
			H	10486.0	31.1	13.7	44.8	54.0	-9.2	AV
V	10486.0		46.9	13.7	60.6	74.0	-13.4	PK		

Ant 0+1		V	10486.0	36.5	13.7	50.2	54.0	-3.8	AV
		H	15722.0	25.3	22.1	47.4	54(Note3)	-6.6	PK
		V	15730.5	31.6	22.0	53.6	54(Note3)	-0.4	PK
	36	H	10358.5	38.2	13.7	51.9	54(Note3)	-2.1	PK
		V	10358.5	43.4	13.7	57.1	74.0	-16.9	PK
		V	10358.5	31.9	13.7	45.6	54.0	-8.4	AV
		H	15543.5	31.2	22.0	53.2	54(Note3)	-0.8	PK
		V	15543.5	31.4	21.8	53.2	54(Note3)	-0.8	PK
	44	H	10401.0	39.0	13.8	52.8	54(Note3)	-1.2	PK
		V	10401.0	37.4	13.8	51.2	54(Note3)	-2.8	PK
		H	15600.0	21.2	22.9	44.1	54(Note3)	-9.9	PK
		V	15603.0	22.9	22.8	45.7	54(Note3)	-8.3	PK
	48	H	10477.5	40.1	13.7	53.8	54(Note3)	-0.2	PK
		V	10469.0	39.4	13.7	53.1	54(Note3)	-0.9	PK
		H	15720.0	20.4	22.1	42.5	54(Note3)	-11.5	PK
		V	15720.0	20.3	22.0	42.3	54(Note3)	-11.7	PK

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

2. The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), 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)

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 0	38	H	10380.0	27.8	13.7	41.5	54(Note3)	-12.5	PK
		V	10375.5	31.8	13.7	45.5	54(Note3)	-8.5	PK
		H	15570.0	21.5	22.0	43.5	54(Note3)	-10.5	PK
		V	15570.0	21.5	21.8	43.3	54(Note3)	-10.7	PK
	46	H	10460.0	27.8	13.7	41.5	54(Note3)	-12.5	PK
		V	10452.0	34.2	13.7	47.9	54(Note3)	-6.1	PK
		H	15690.0	21.4	22.1	43.5	54(Note3)	-10.5	PK
		V	15690.0	22.6	22.1	44.7	54(Note3)	-9.3	PK
Ant 1	38	H	10375.5	33.1	13.7	46.8	54(Note3)	-7.2	PK
		V	10375.5	39.3	13.7	53.0	54(Note3)	-1.0	PK

		H	15570.0	21.4	22.0	43.4	54(Note3)	-10.6	PK
		V	15570.0	23.5	21.8	45.3	54(Note3)	-8.7	PK
	46	H	10469.0	34.2	13.7	47.9	54(Note3)	-6.1	PK
		V	10469.0	39.0	13.7	52.7	54(Note3)	-1.3	PK
		H	15690.0	20.9	22.1	43.0	54(Note3)	-11.0	PK
		V	15690.0	23.3	22.1	45.4	54(Note3)	-8.6	PK
Ant 0+1	38	H	10392.5	35.2	13.7	48.9	54(Note3)	-5.1	PK
		V	10375.5	39.4	13.7	53.1	54(Note3)	-0.9	PK
		H	15570.0	23.0	22.0	45.0	54(Note3)	-9.0	PK
		V	15569.0	27.2	21.8	49.0	54(Note3)	-5.0	PK
	46	H	10460.5	37.8	13.7	51.5	54(Note3)	-2.5	PK
		V	10460.5	43.6	13.7	57.3	74.0	-16.7	PK
		V	10460.5	31.4	13.7	45.1	54.0	-8.9	AV
		H	15690.0	24.3	22.1	46.4	54(Note3)	-7.6	PK
		V	15688.0	29.6	22.1	51.7	54(Note3)	-2.3	PK

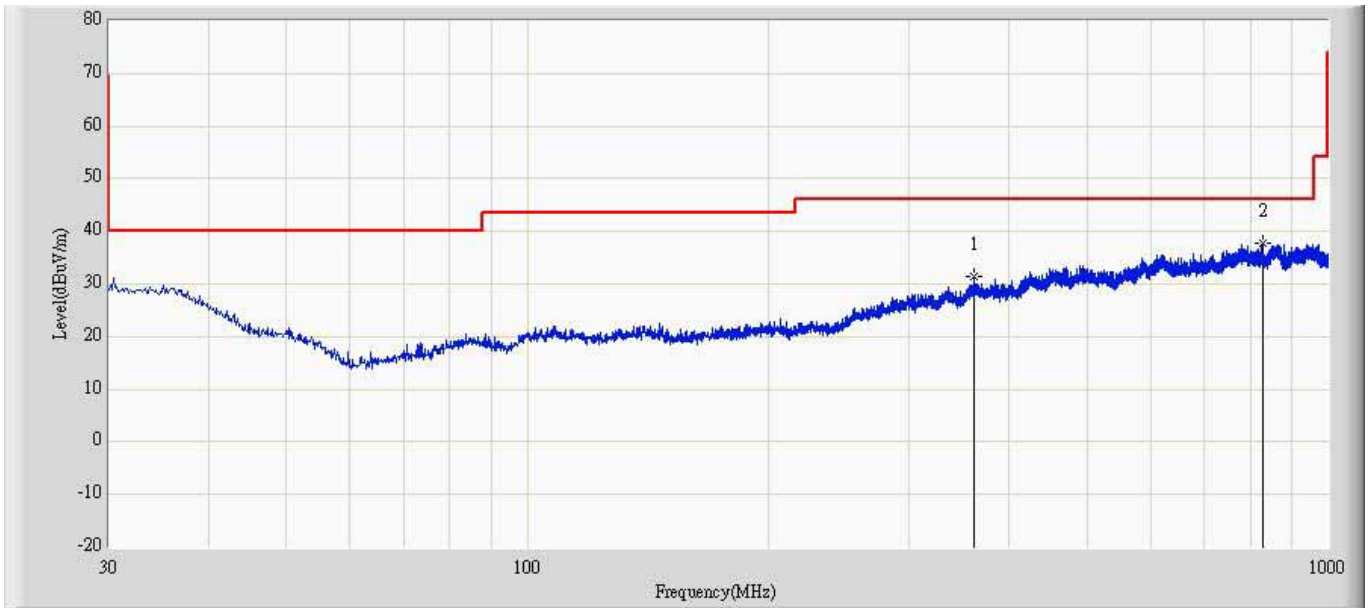
Note: 1. Measure Level = Reading Level + Factor.

2. The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), 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.

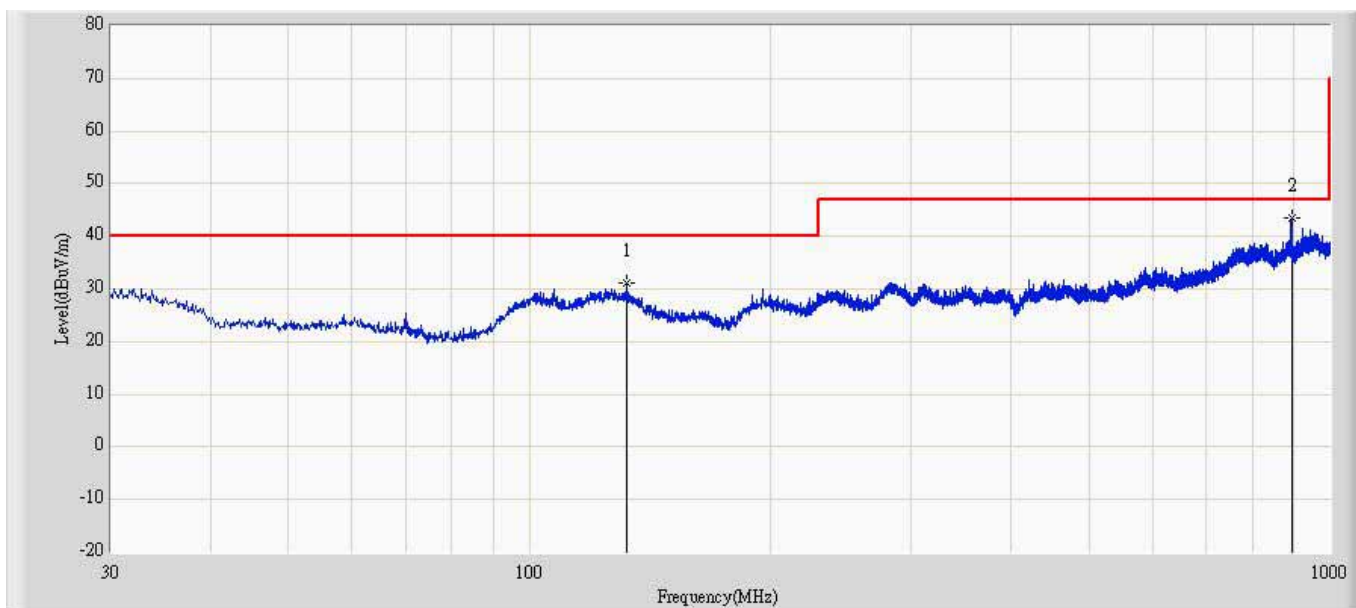
The worst case of Radiated Emission below 1GHz:

Engineer: Pig	
Site: AC3	Time: 2014/01/26 - 15:48
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC3_10m (30-1000MHz)20130511	Polarity: Horizontal
EUT: IP-STB	Power: 120V/60Hz
Note: Mode 2: Transmit at channel 5180MHz by 802.11n20MHz ant0	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		361.497	31.480	5.865	-14.520	46.000	25.616	QP
2	*	828.674	37.635	6.569	-8.365	46.000	31.066	QP

Engineer: Pig	
Site: AC3	Time: 2014/01/26 - 15:58
Limit: EN55022_RE(3m)_ClassB	Margin: 0
Probe: AC3_10m (30-1000MHz)20130511	Polarity: Vertical
EUT: IP-STB	Power: 120V/60Hz
Note: Mode 2: Transmit at channel 5180MHz by 802.11n20MHz ant0	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		132.456	31.067	6.499	-8.933	40.000	24.568	QP
2	*	895.240	43.646	10.114	-3.354	47.000	33.532	QP

5. Operation Frequency Range of 20dB Bandwidth

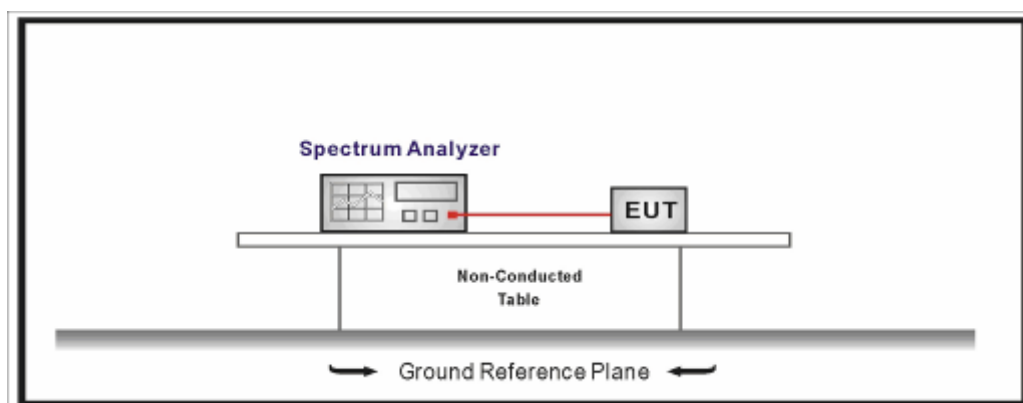
5.1. Test Equipment

Operation Frequency Range of 20dB Bandwidth /TR8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2015.01.07
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2014.05.07

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

20 dB bandwidth of the emission is contained within the operation frequency band. FCC Part15.215(c).

5.4. Test Procedure

The EUT was tested according to UNII test procedure of KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

Set RBW = 100 kHz, Span greater than RBW.

5.5. Uncertainty

The measurement uncertainty is defined as ± 1 kHz

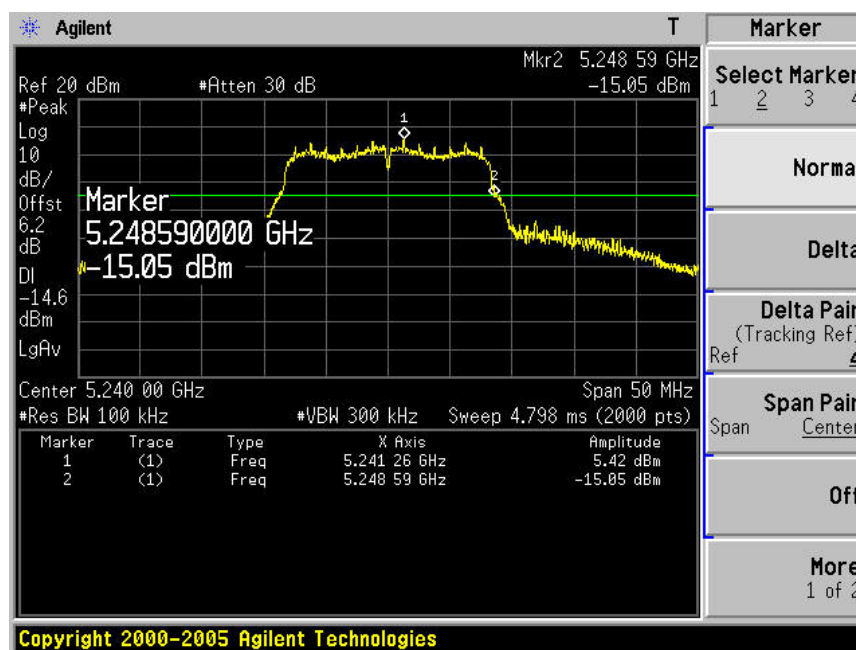
5.6. Test Result

Product	:	IP-STB
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a (ant 0)

Channel 36 (5180MHz)

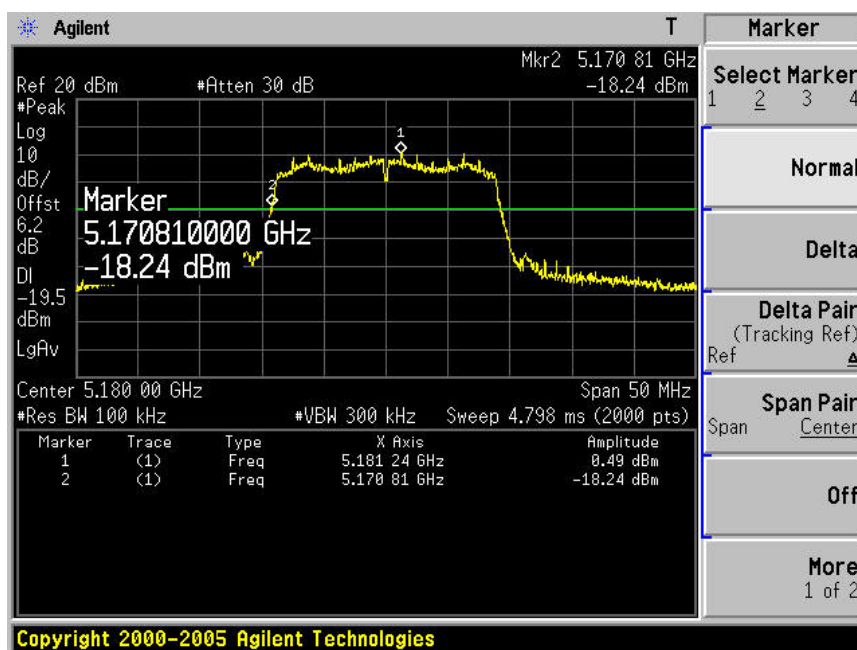


Channel 48 (5240MHz)

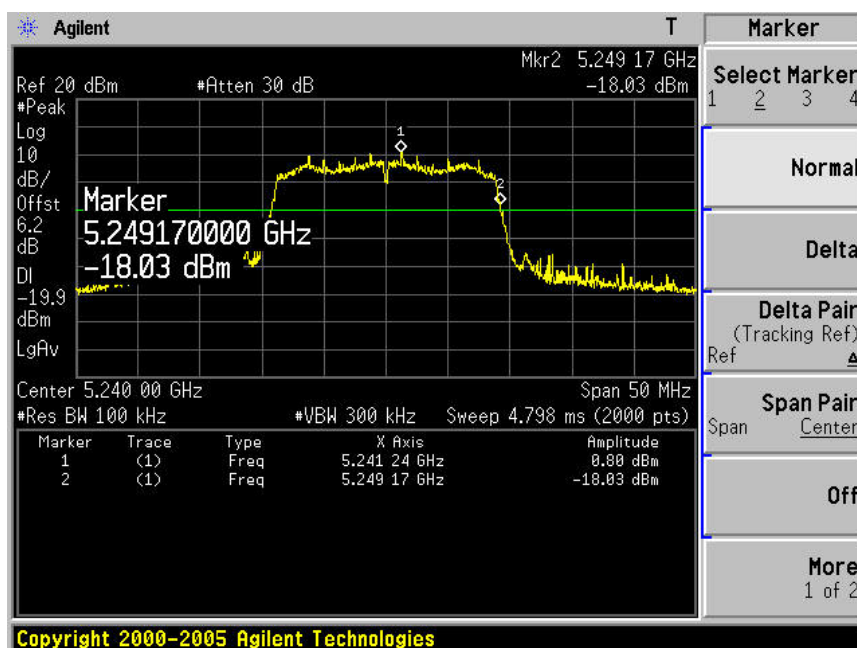


Product	:	IP-STB
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n (20MHz) (ant 0)

Channel 36 (5180MHz)

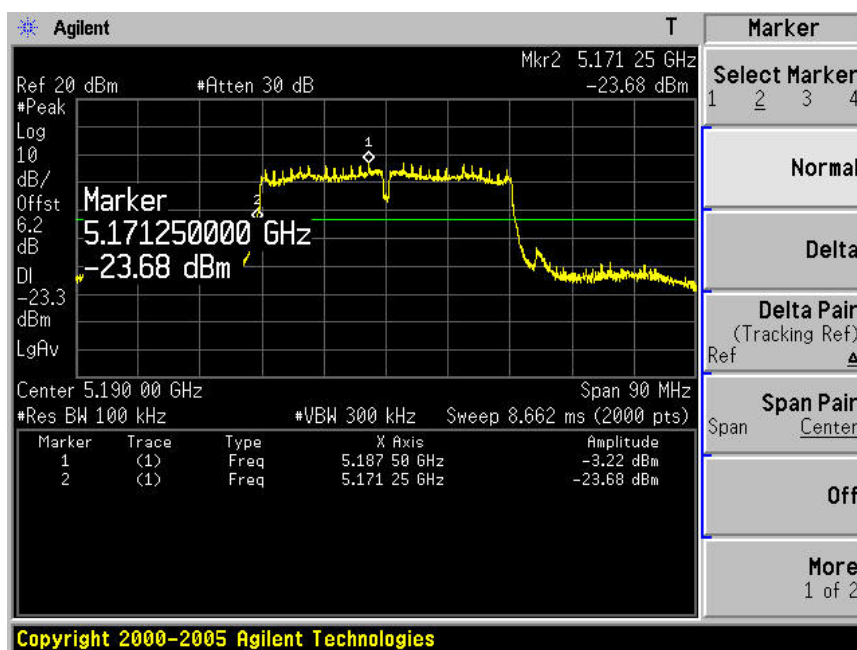


Channel 48 (5240MHz)

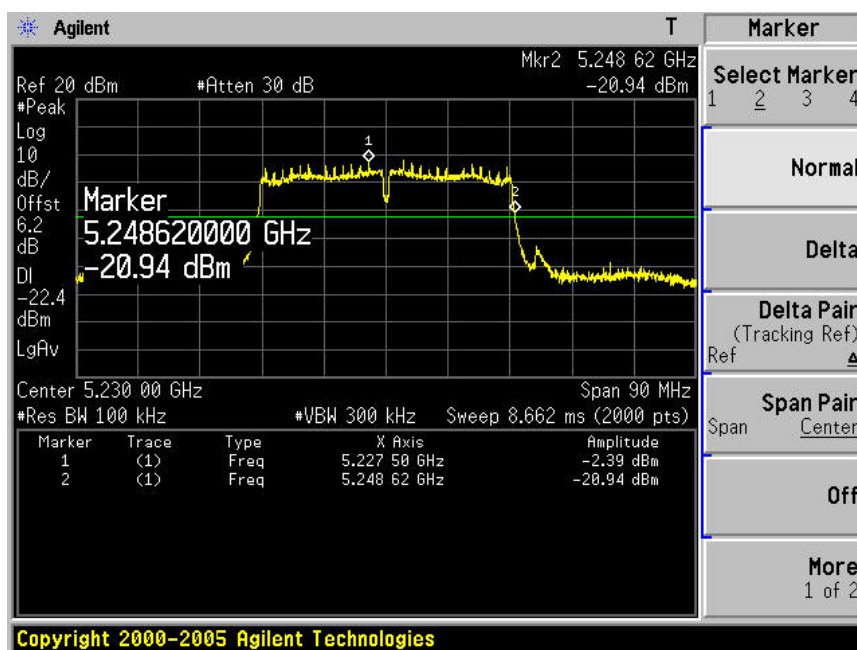


Product	:	IP-STB
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (40MHz) (ant 0)

Channel 38 (5190MHz)

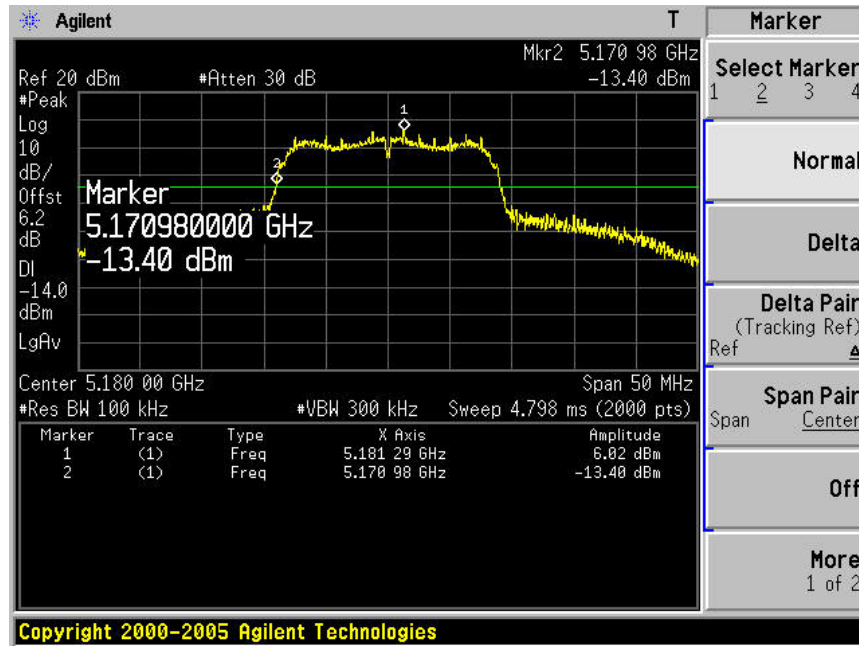


Channel 46 (5230MHz)

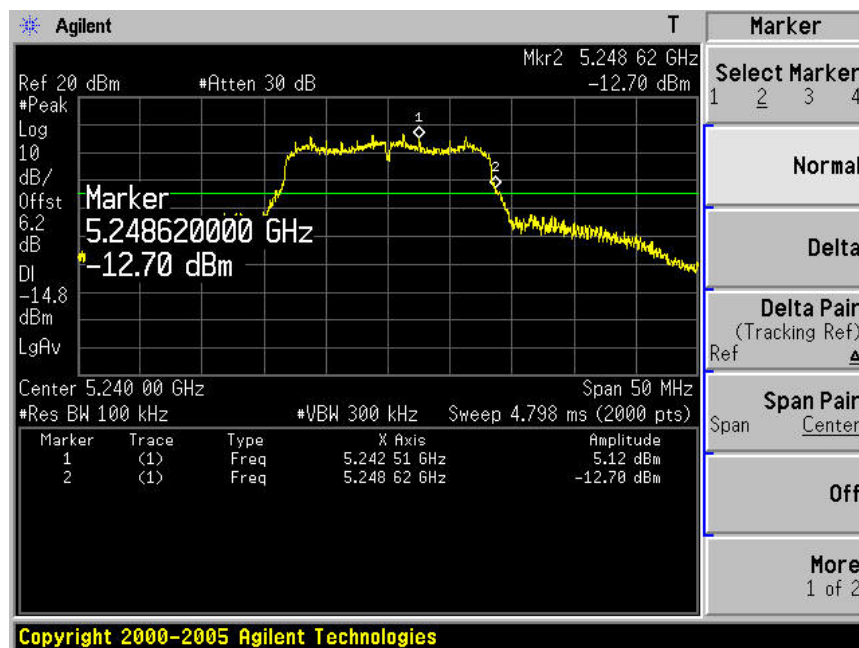


Product	:	IP-STB
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a (ant 1)

Channel 36 (5180MHz)

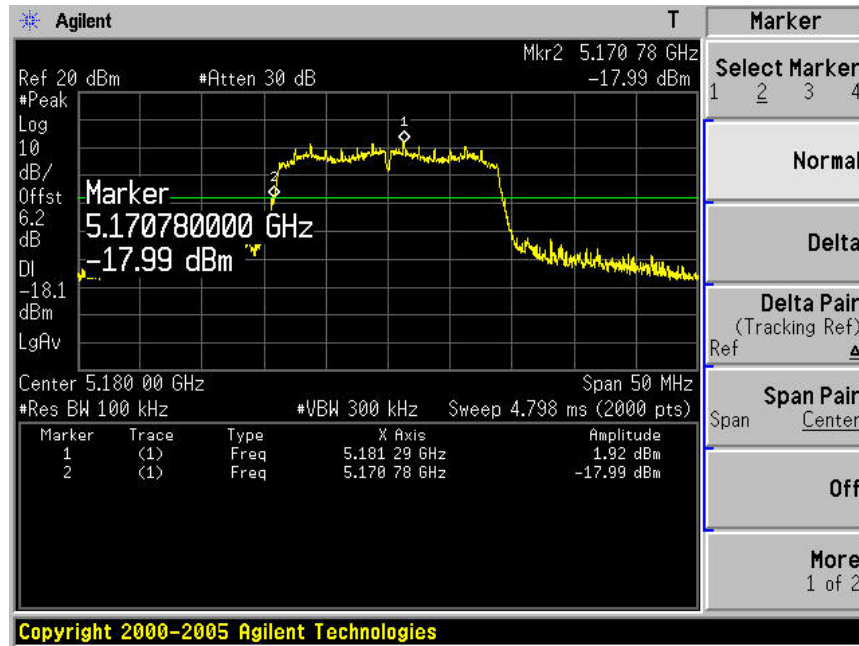


Channel 48 (5240MHz)

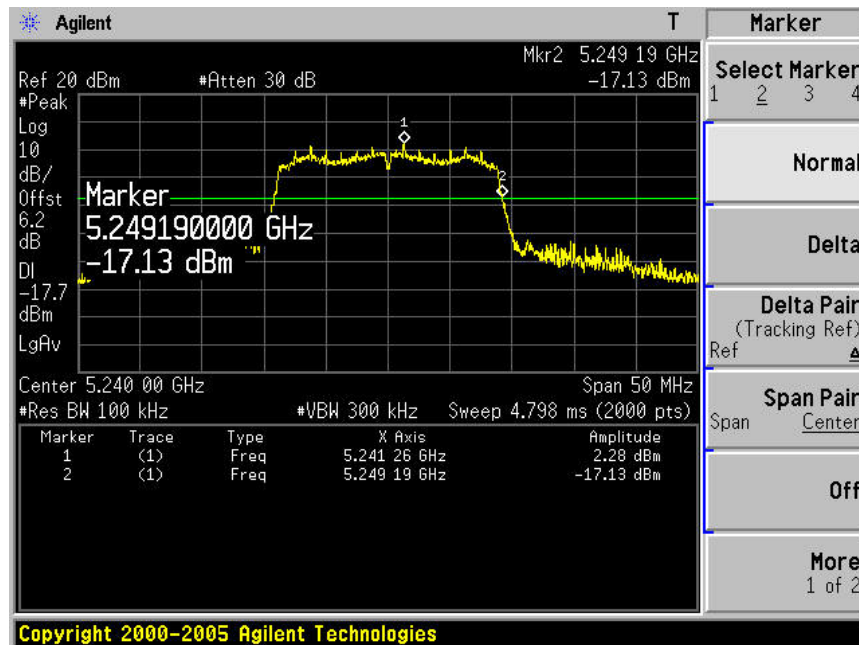


Product	:	IP-STB
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n (20MHz) (ant 1)

Channel 36 (5180MHz)

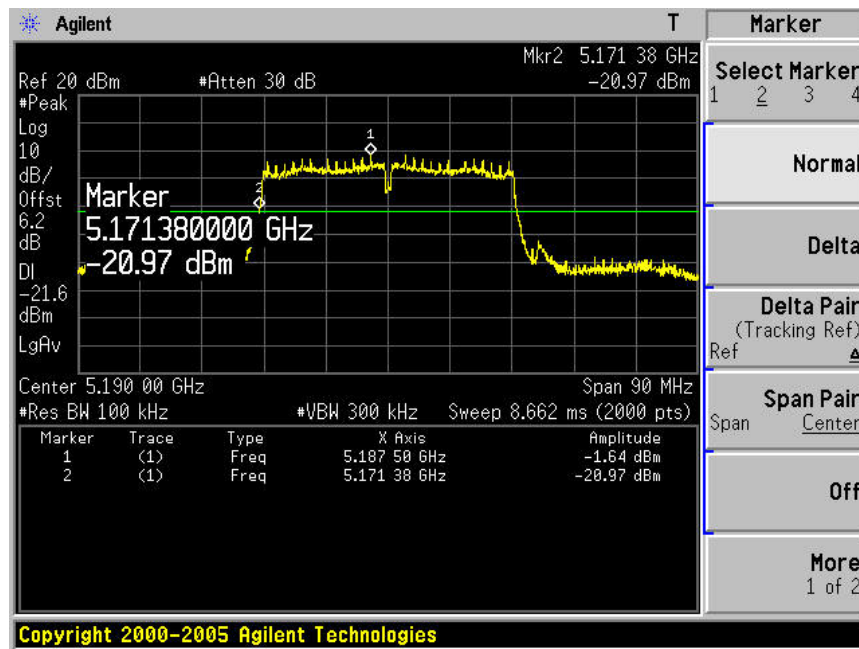


Channel 48 (5240MHz)

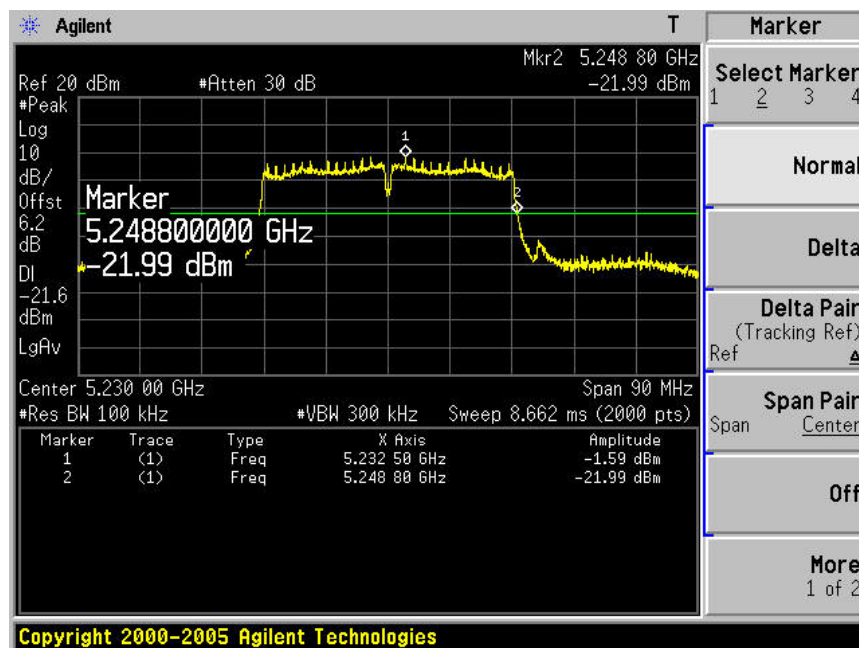


Product	:	IP-STB
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (40MHz) (ant 1)

Channel 38 (5190MHz)



Channel 46 (5230MHz)



6. Occupied Bandwidth

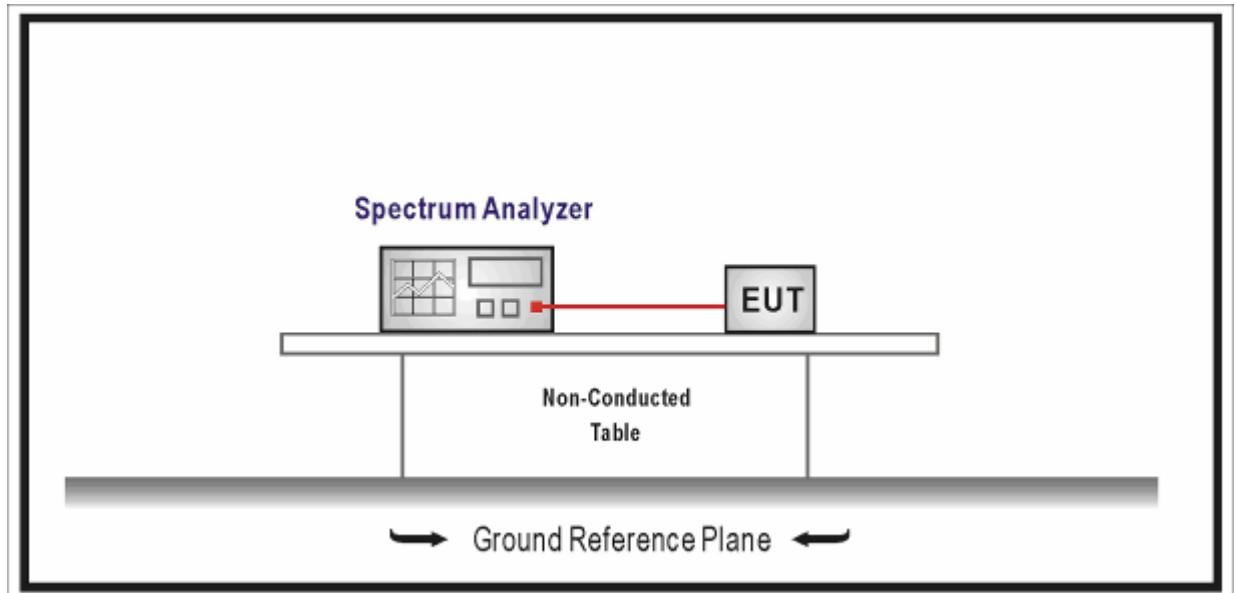
6.1. Test Equipment

Occupied Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2015.01.07
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2014.05.07

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

N/A

6.4. Test Procedure

The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

Emission Bandwidth

- Use a RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

99% Occupied Bandwidth

- Set center frequency to the nominal EUT channel center frequency.
- Set span = 1.5 times to 5.0 times the OBW.
- Set RBW = 1 % to 5 % of the OBW.
- Set VBW $\geq 3 \cdot$ RBW.
- Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- Use the 99 % power bandwidth function of the instrument (if available).
- If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

6.5. Uncertainty

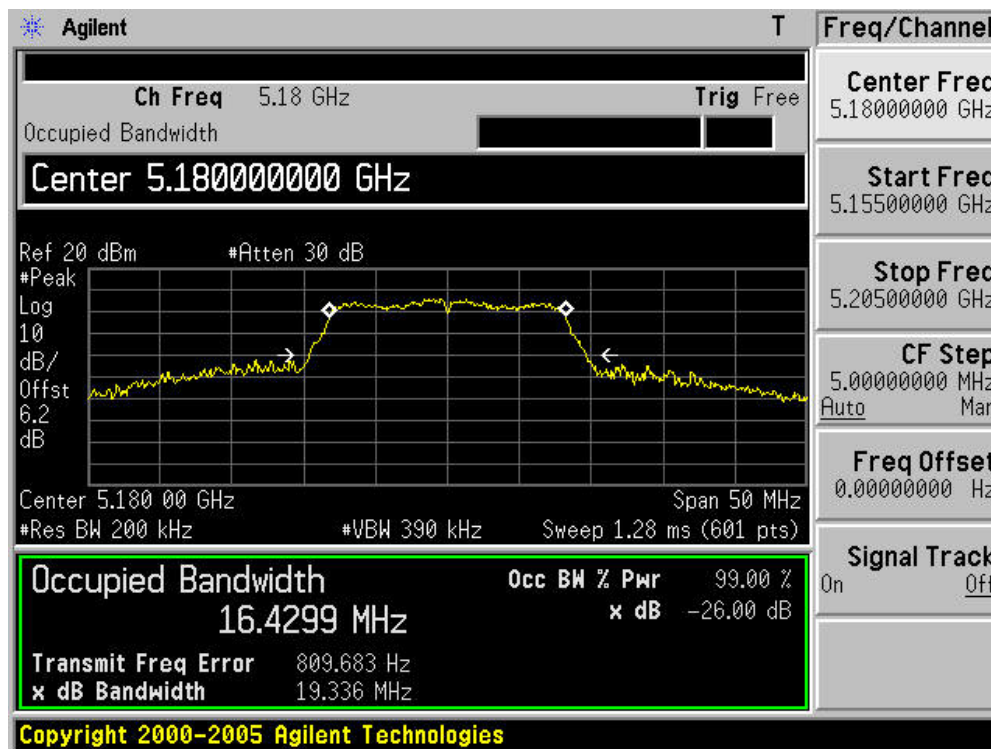
The measurement uncertainty is defined as ± 1 kHz

6.6. Test Result

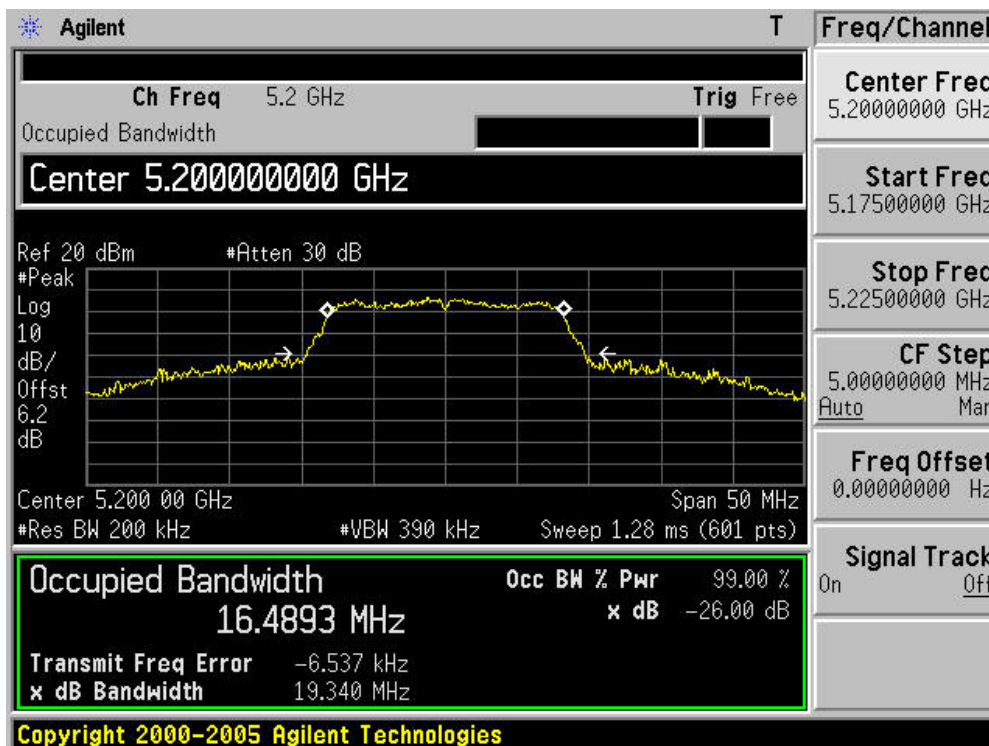
Product	:	IP-STB
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a (ant0)

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180	19.336	16.430
40	5200	19.340	16.489
48	5240	19.398	16.455

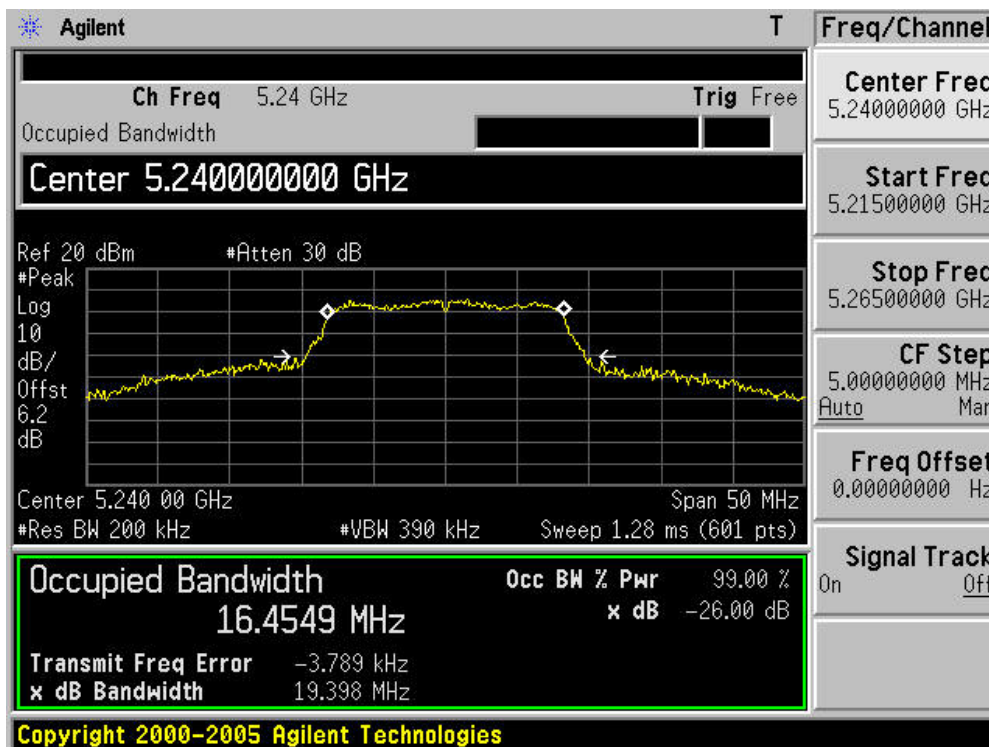
Channel 36 (5180MHz)



Channel 40 (5200MHz)



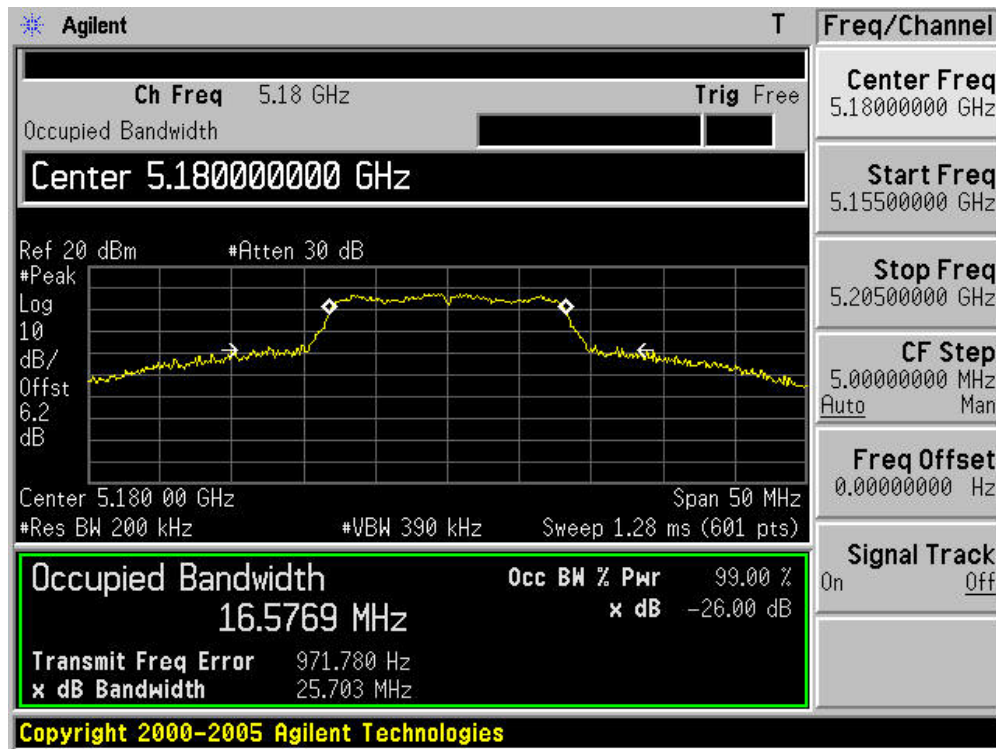
Channel 48 (5240MHz)



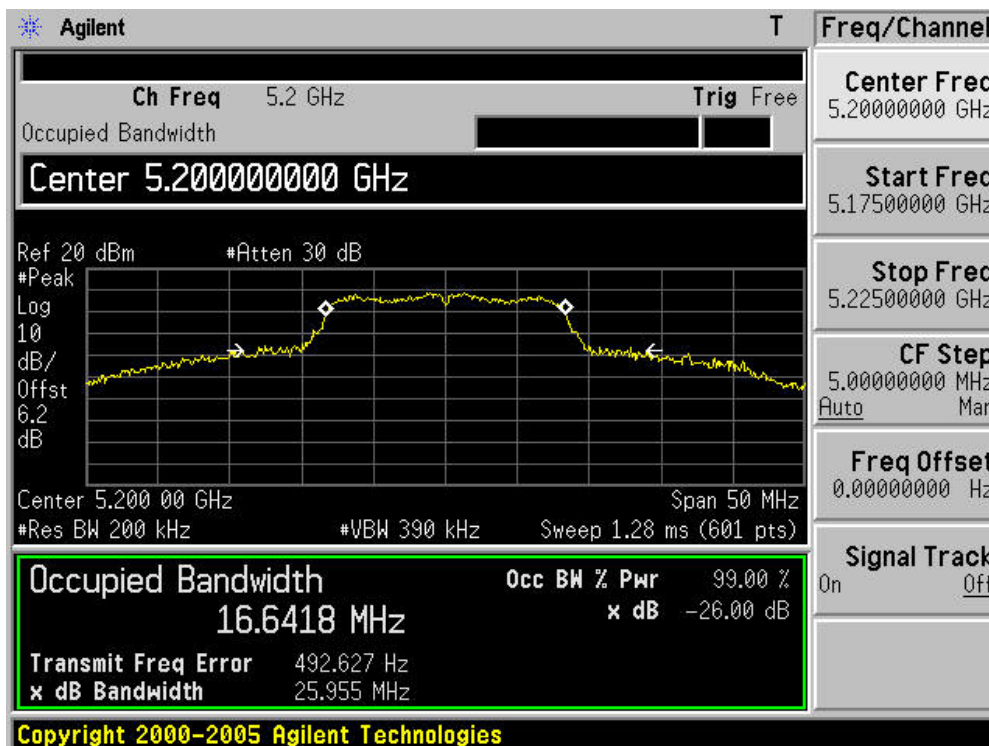
Product	:	IP-STB
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a (ant1)

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180	25.703	16.577
40	5200	25.955	16.642
48	5240	19.451	16.532

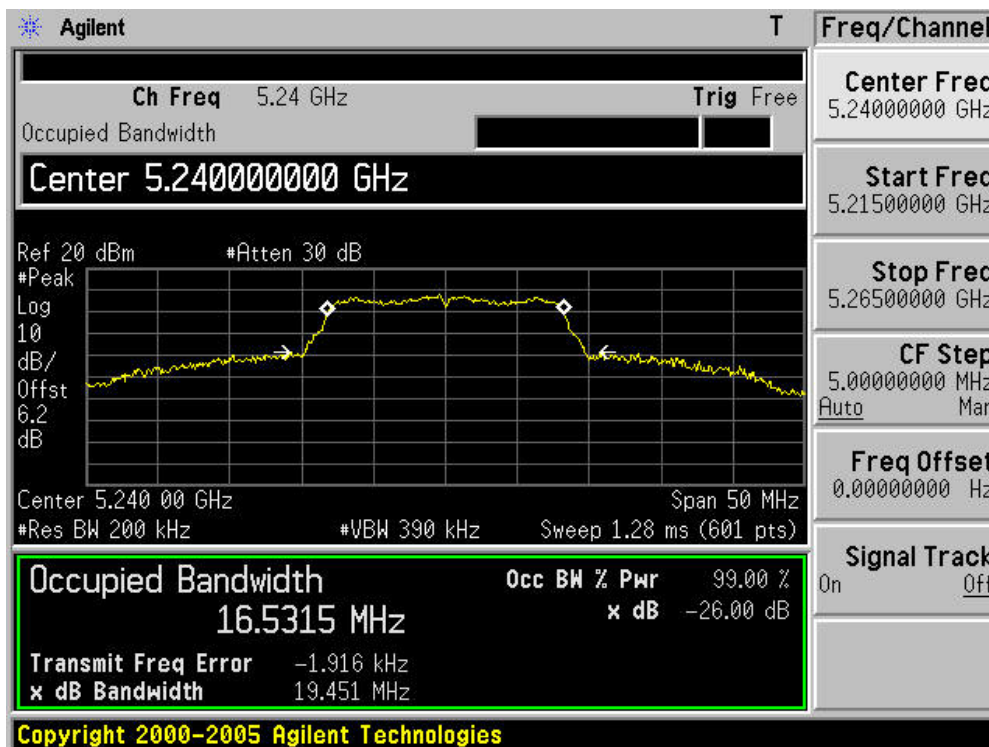
Channel 36 (5180MHz)



Channel 40 (5200MHz)



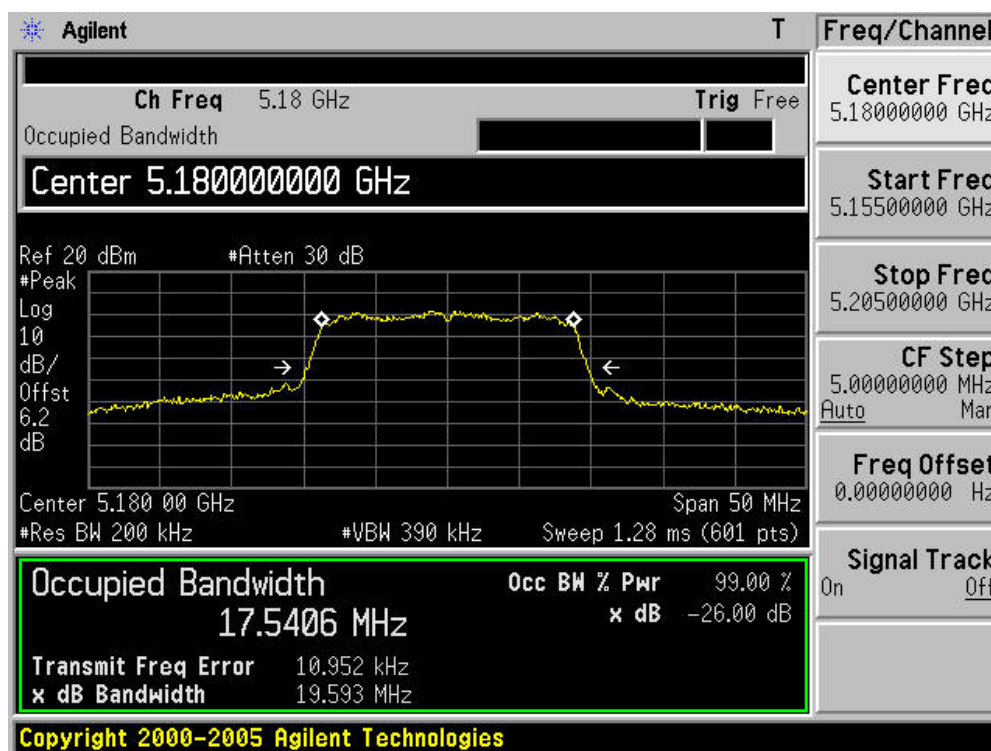
Channel 48 (5240MHz)



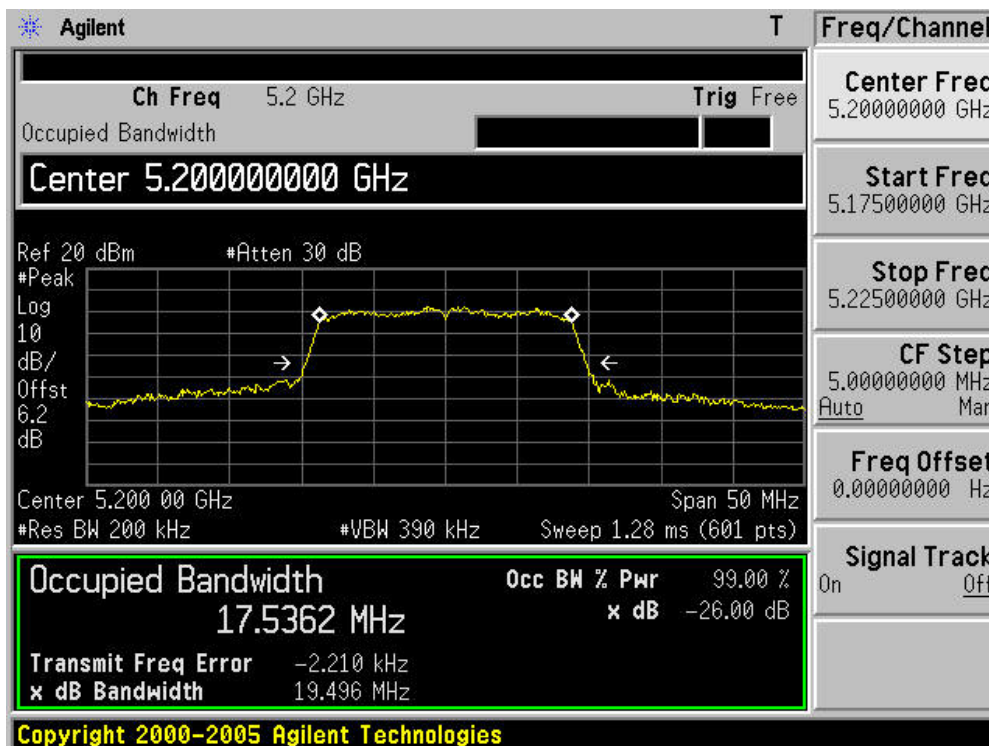
Product	:	IP-STB
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) (ant0)

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180	19.538	17.541
40	5200	19.496	17.536
48	5240	19.499	17.545

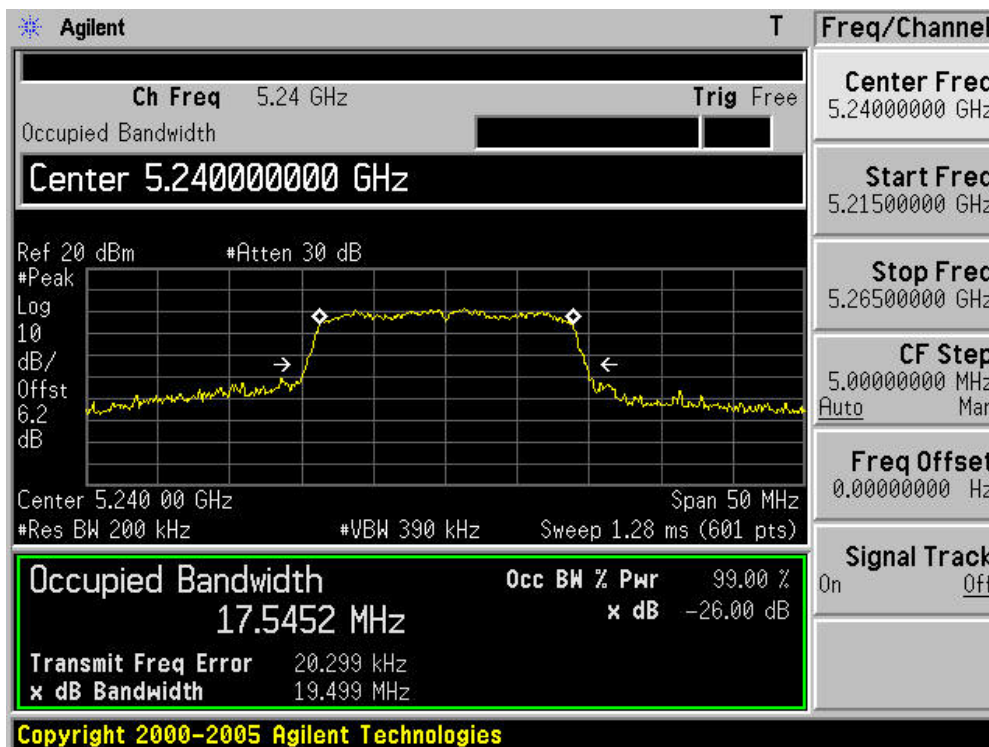
Channel 36 (5180MHz)



Channel 40 (5200MHz)



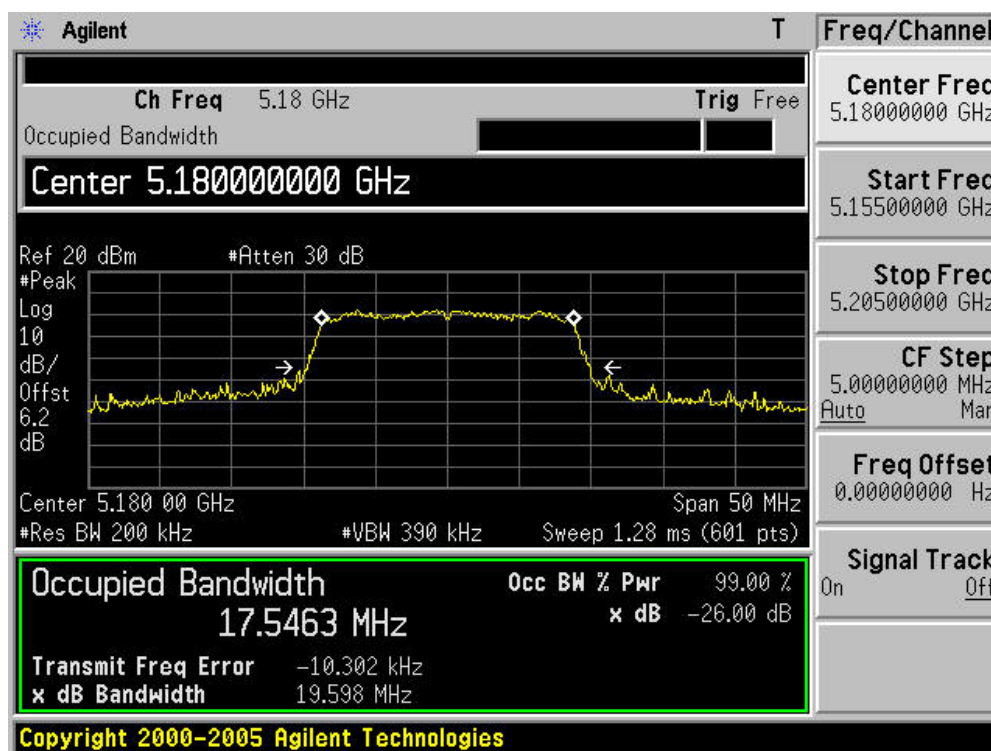
Channel 48 (5240MHz)



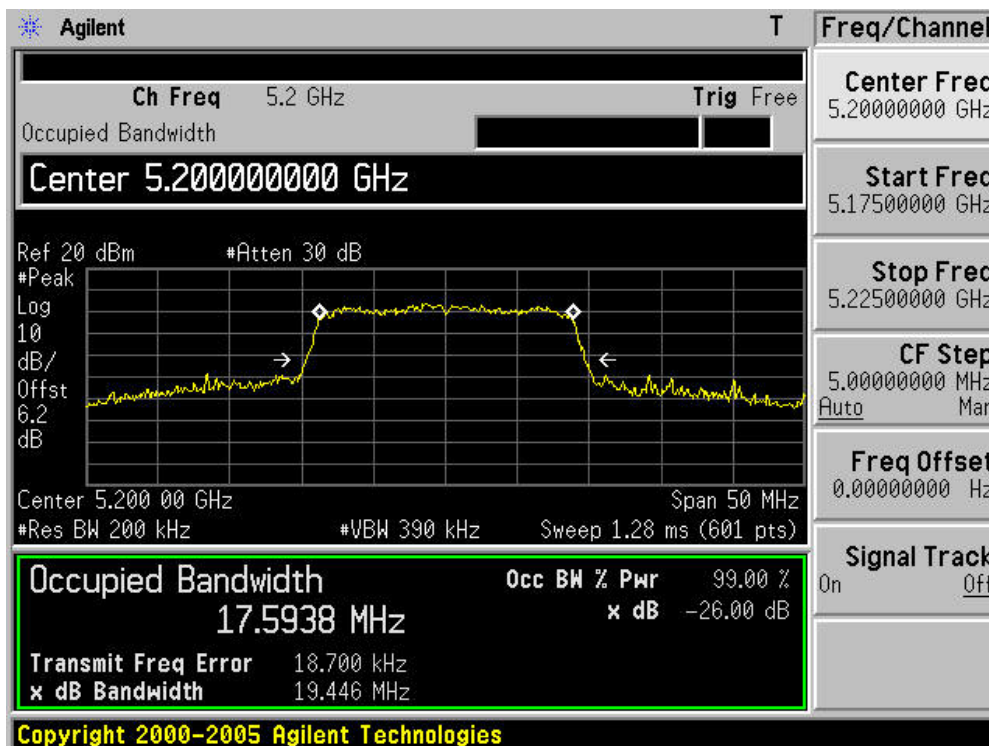
Product	:	IP-STB
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) (ant1)

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180	19.598	17.546
40	5200	19.446	17.594
48	5240	19.403	17.557

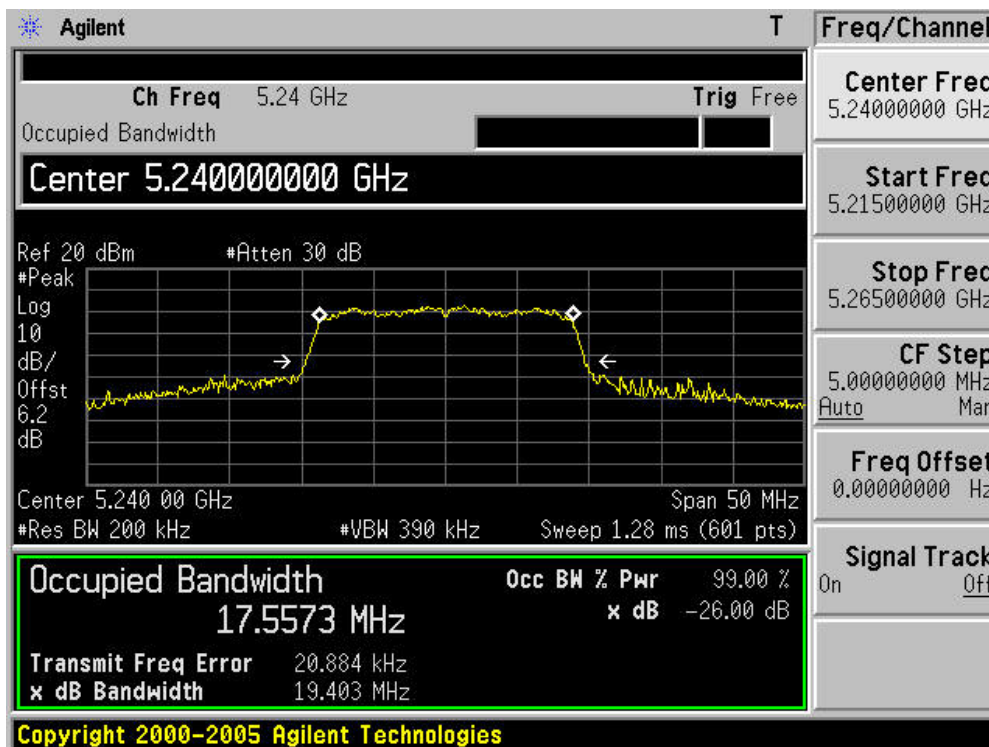
Channel 36 (5180MHz)



Channel 40 (5200MHz)



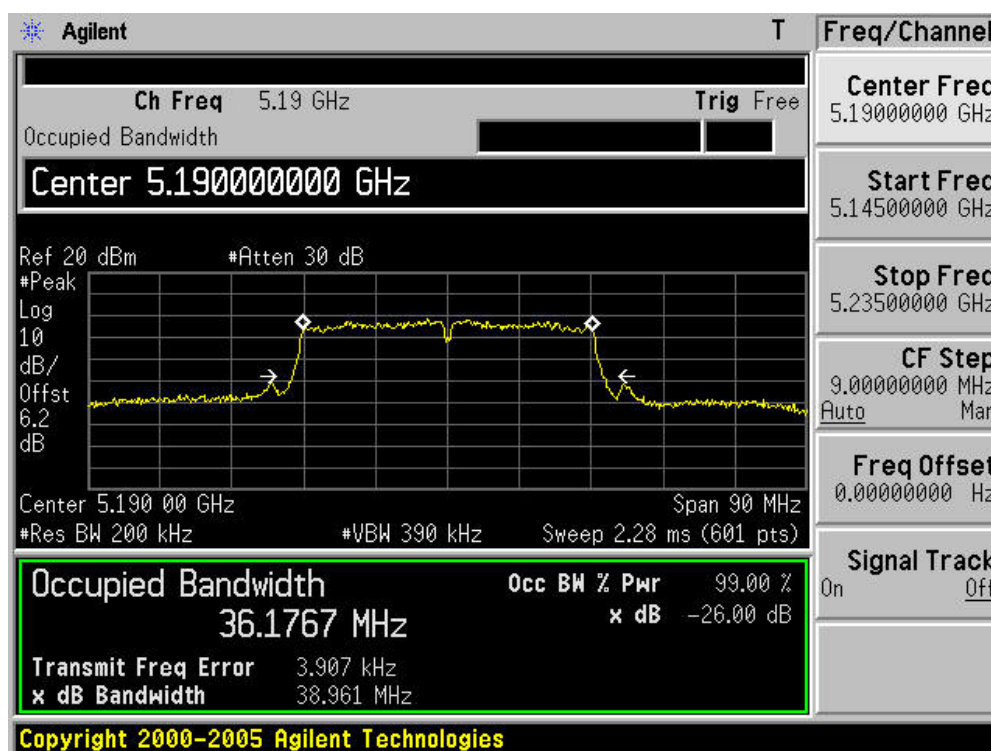
Channel 48 (5240MHz)



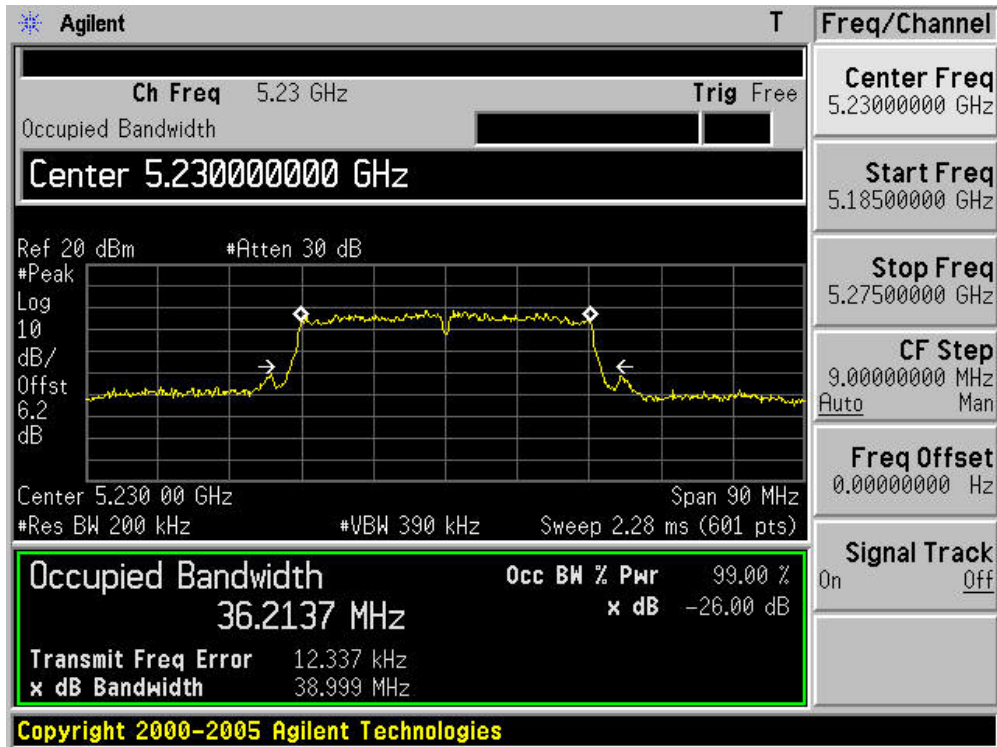
Product	:	IP-STB
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (40MHz) (ant0)

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190	38.961	36.176
46	5230	38.999	36.214

Channel 38 (5190MHz)



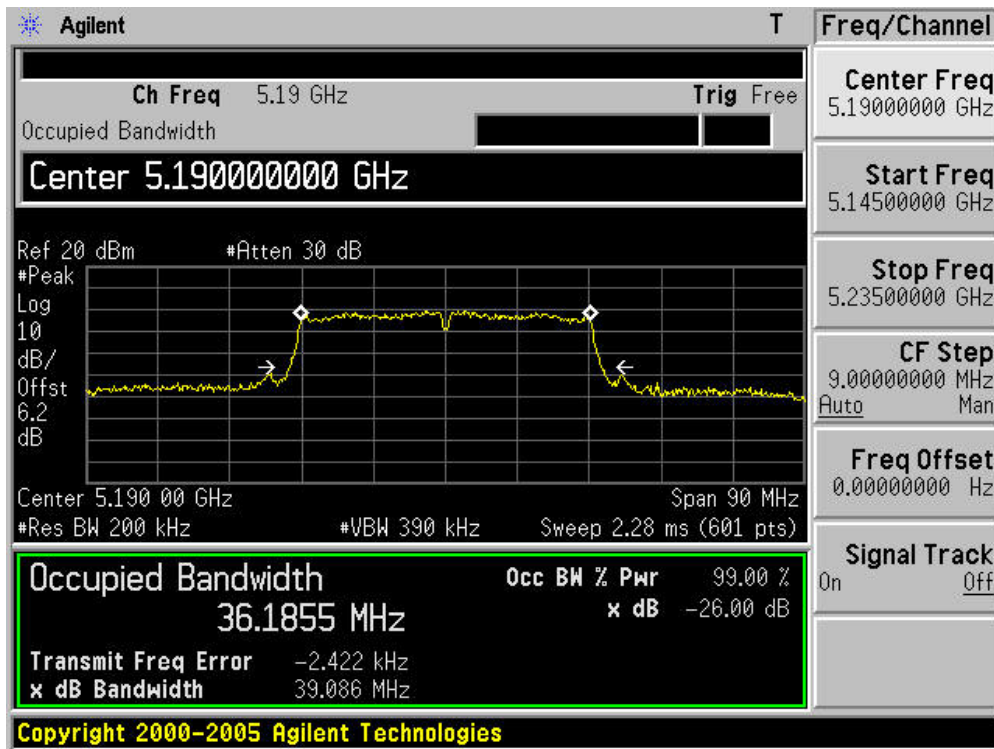
Channel 46 (5230MHz)



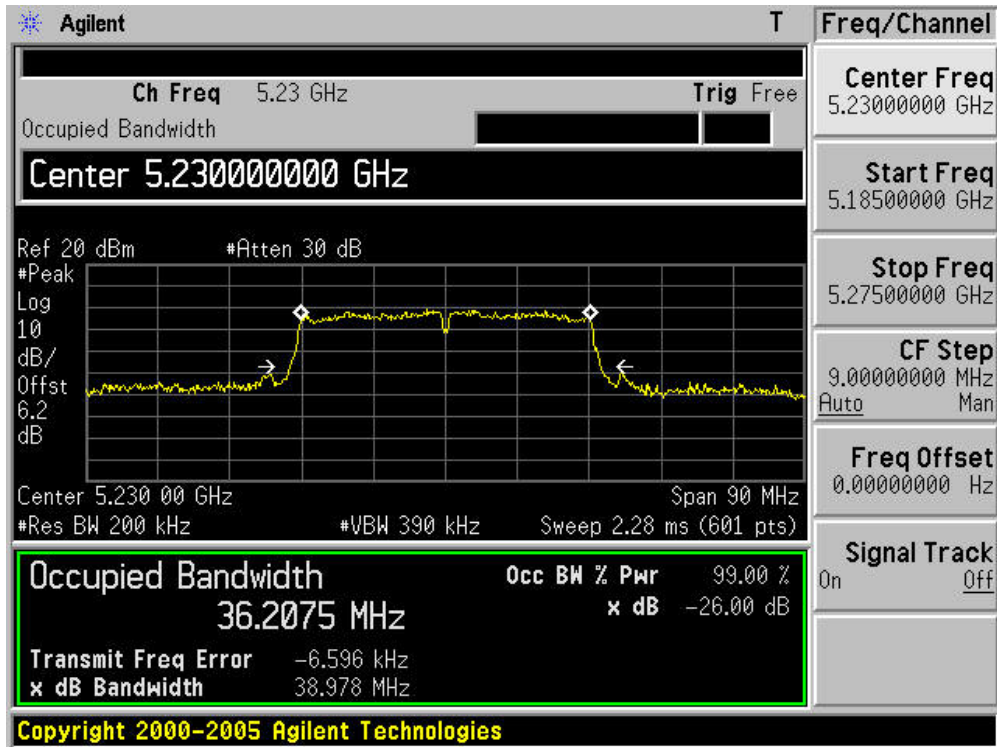
Product	:	IP-STB
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (40MHz) (ant1)

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190	39.086	36.185
46	5230	38.978	36.207

Channel 38 (5190MHz)



Channel 46 (5230MHz)



7. Power Output

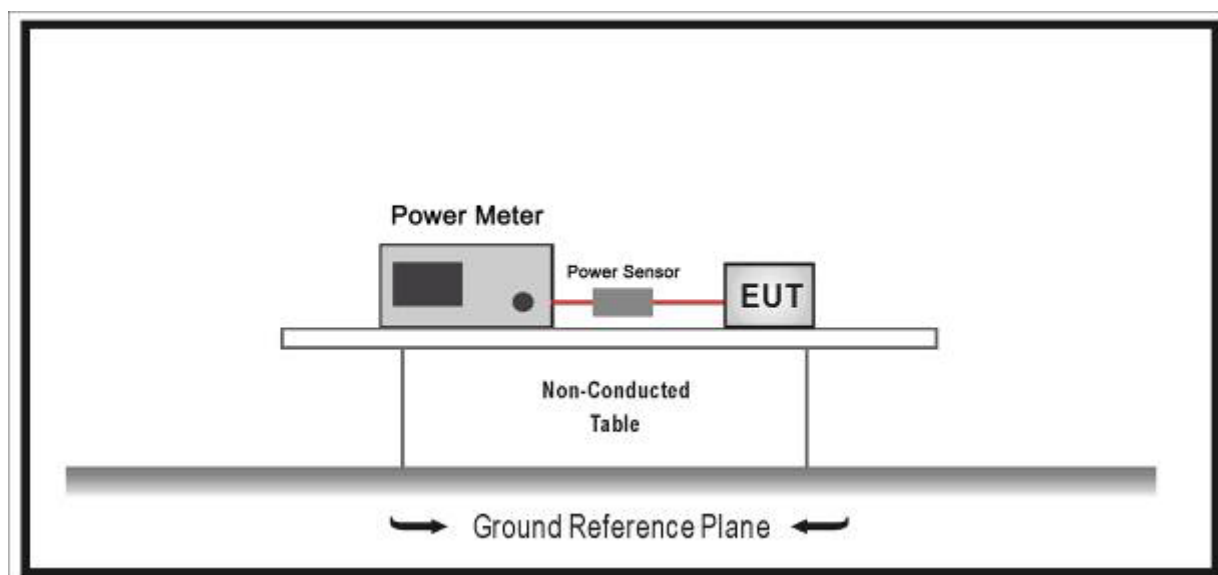
7.1. Test Equipment

Power Output / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Wideband Peak Power Meter	Anritsu	ML2495A	0905006	2014.11.01
Power Sensor	Anritsu	MA2411B	0846014	2014.11.01
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2014.05.07

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 the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- For the band 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 $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. If transmitting antenna of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6

dBi.

- For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10log B, where B is the 26 dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antenna with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power for each 1 dB of antenna gain in excess of 23 dBi would be required.

7.4. Test Procedure

The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

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

7.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

7.6. Test Result

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (blue marker) for final test of each channel.

MCS Index for 802.11n	Spatial Streams	Data Rate (Mbps)				
		802.11a	20MHz Bandwidth		40MHz Bandwidth	
			800ns GI	400ns GI	800ns GI	400ns GI
0	1	6	6.5	7.2	13.5	15.0
1	1	9	13.0	14.4	27.0	30.0
2	1	12	19.5	21.7	40.5	45.0
3	1	18	26.0	28.9	54.0	60.0
4	1	24	39.0	43.3	81.0	90.0
5	1	36	52.0	57.8	108.0	120.0
6	1	48	58.5	65.0	121.5	135.0
7	1	54	65.0	72.2	135.0	150.0
8	2	---	13.0	14.4	27.0	30.0
9	2	---	26.0	28.9	54.0	60.0
10	2	---	39.0	43.3	81.0	90.0
11	2	---	52.0	57.8	108.0	120.0
12	2	---	78.0	86.7	162.0	180.0
13	2	---	104.0	115.6	216.0	240.0
14	2	---	117.0	130.0	243.0	270.0
15	2	---	130.0	144.0	270.0	300.0

Power output at various data rates:

Test Mode	Bandwidth	Frequency (MHz)	Channel	Data Rate	RMS Power (dBm)
802.11a(Ant 0)	20	5200	40	6	16.52
				24	16.34
				54	16.27
802.11n(Ant 0)	20	5200	40	HT0	12.63
				HT4	12.24
				HT7	12.31
802.11n(Ant 0)	40	5190	38	HT0	11.19
				HT4	11.02
				HT7	10.92

Product	: IP-STB
Test Item	: Power Output
Test Site	: TR-8
Test Mode	: Mode 1: Transmit by 802.11a (ant0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
36	5180	15.83	N/A	15.83	17.00	Pass
40	5200	16.52	N/A	16.52	17.00	Pass
48	5240	16.31	N/A	16.31	17.00	Pass

Product	: IP-STB
Test Item	: Power Output
Test Site	: TR-8
Test Mode	: Mode 2: Transmit by 802.11n(20MHz) (ant0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
36	5180	11.72	N/A	11.72	17.00	Pass
40	5200	12.63	N/A	12.63	17.00	Pass
48	5240	11.79	N/A	11.79	17.00	Pass

Product	: IP-STB
Test Item	: Power Output
Test Site	: TR-8
Test Mode	: Mode 3: Transmit by 802.11n(40MHz) (ant0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
38	5190	11.19	N/A	11.19	17.00	Pass
46	5230	11.23	N/A	11.23	17.00	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a (ant1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
36	5180	N/A	15.67	15.67	17.00	Pass
40	5200	N/A	16.70	16.70	17.00	Pass
48	5240	N/A	16.41	16.41	17.00	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) (ant1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
36	5180	N/A	11.87	11.87	17.00	Pass
40	5200	N/A	12.96	12.96	17.00	Pass
48	5240	N/A	11.61	11.61	17.00	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz) (ant1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
38	5190	N/A	11.27	11.27	17.00	Pass
46	5230	N/A	11.64	11.64	17.00	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) (ant0+1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
36	5180	10.11	11.37	13.80	17.00	Pass
40	5200	11.31	12.24	14.81	17.00	Pass
48	5240	10.24	11.32	13.82	17.00	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz) (ant0+1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
38	5190	10.03	11.31	13.73	17.00	Pass
46	5230	9.45	11.67	13.71	17.00	Pass

8. Peak Power Spectral Density

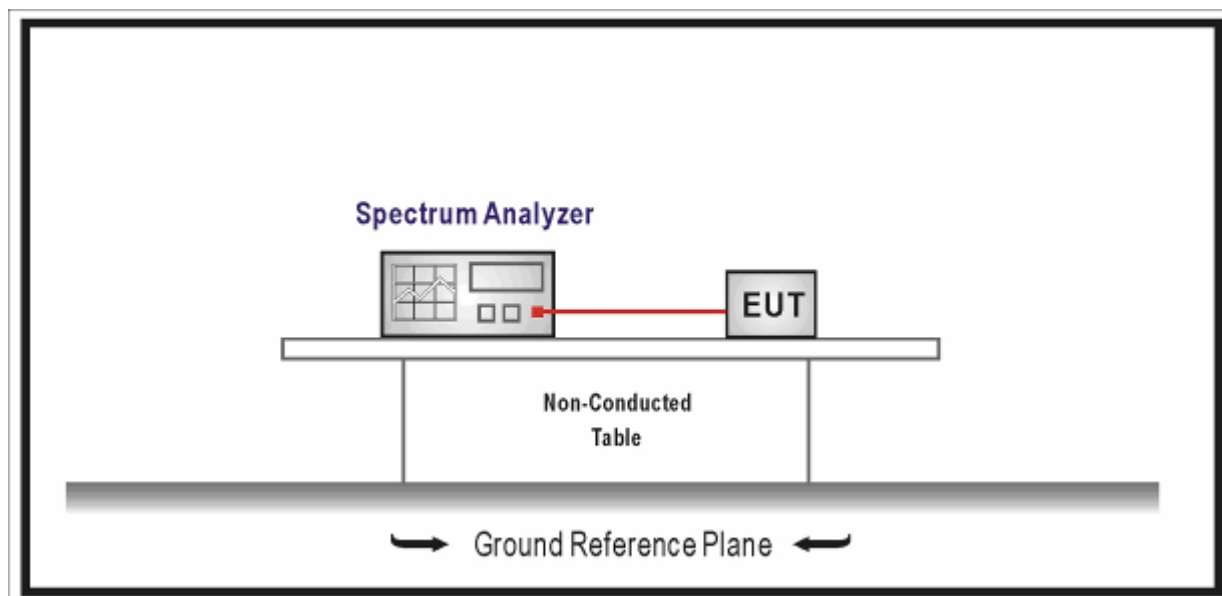
8.1. Test Equipment

Peak Power Spectral Density / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2015.01.07
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2014.05.07

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

8.2. Test Setup



8.3. Limit

- For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- For the band 5.25-5.35 GHz and 5.47-5.725 GHz bands, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 17 dBm

in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the peak 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 up to 23 dBi without any corresponding reduction in the peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required.

8.4. Test Procedure

The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW \geq 3 MHz.
- Number of points in sweep \geq 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- The trigger shall be set to “free run”.
- Trace average at least 100 traces in power averaging (i.e., RMS) mode.

8.5. Uncertainty

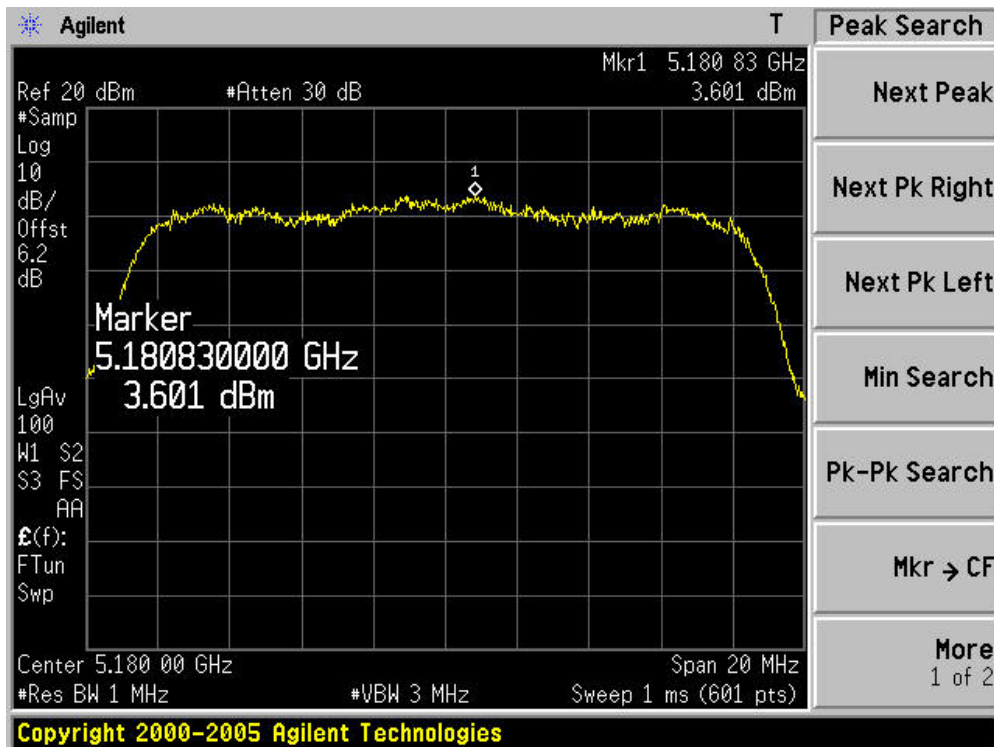
The measurement uncertainty is defined as ± 1.27 dB

8.6. Test Result

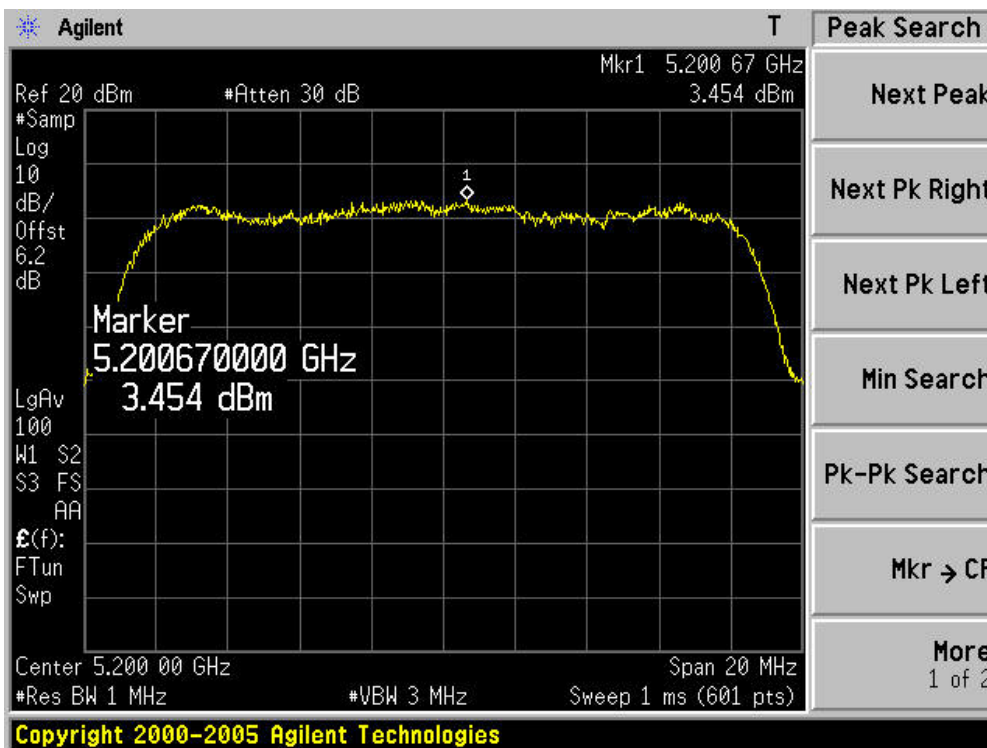
Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a (ant 0)

Channel No.	Frequency (MHz)	Measurement PPSD (dBm/MHz)		Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
		Ant 0	Ant 1			
36	5180	3.601	N/A	3.601	4.0	Pass
40	5200	3.454	N/A	3.454	4.0	Pass
48	5240	2.876	N/A	2.876	4.0	Pass

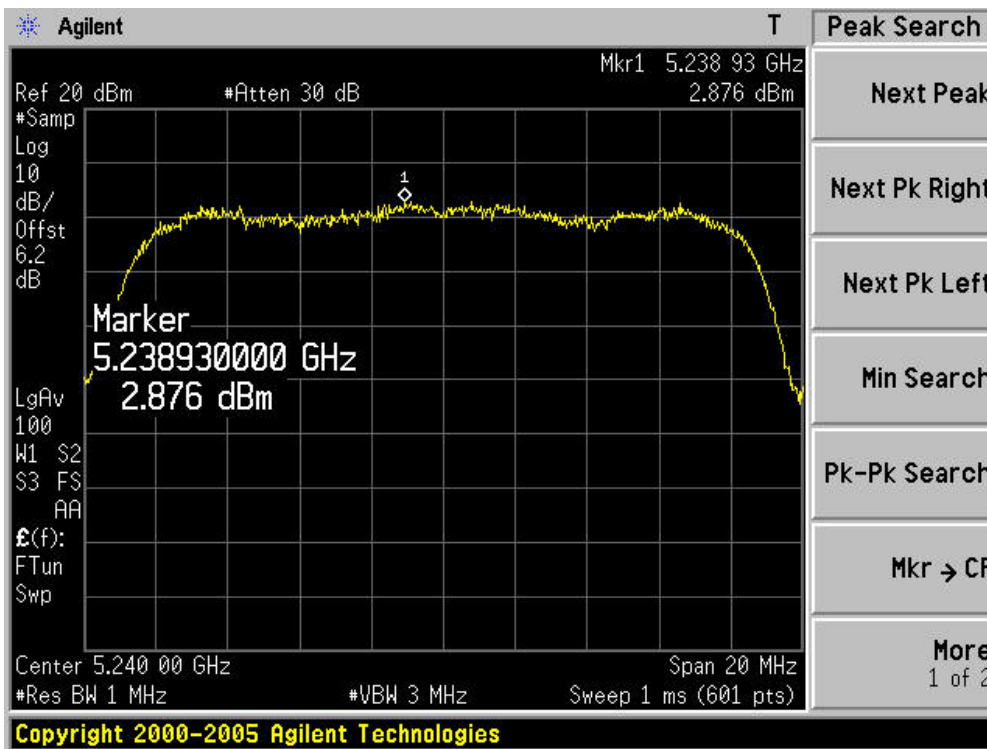
Channel 36 (5180MHz)



Channel 40 (5200MHz)



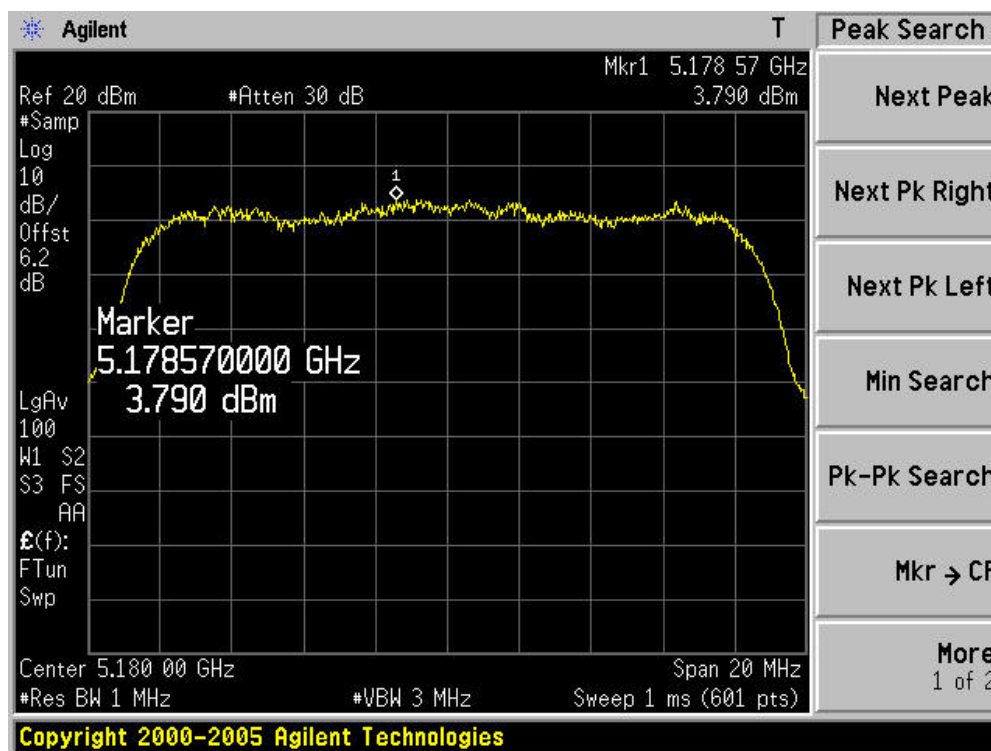
Channel 48 (5240MHz)



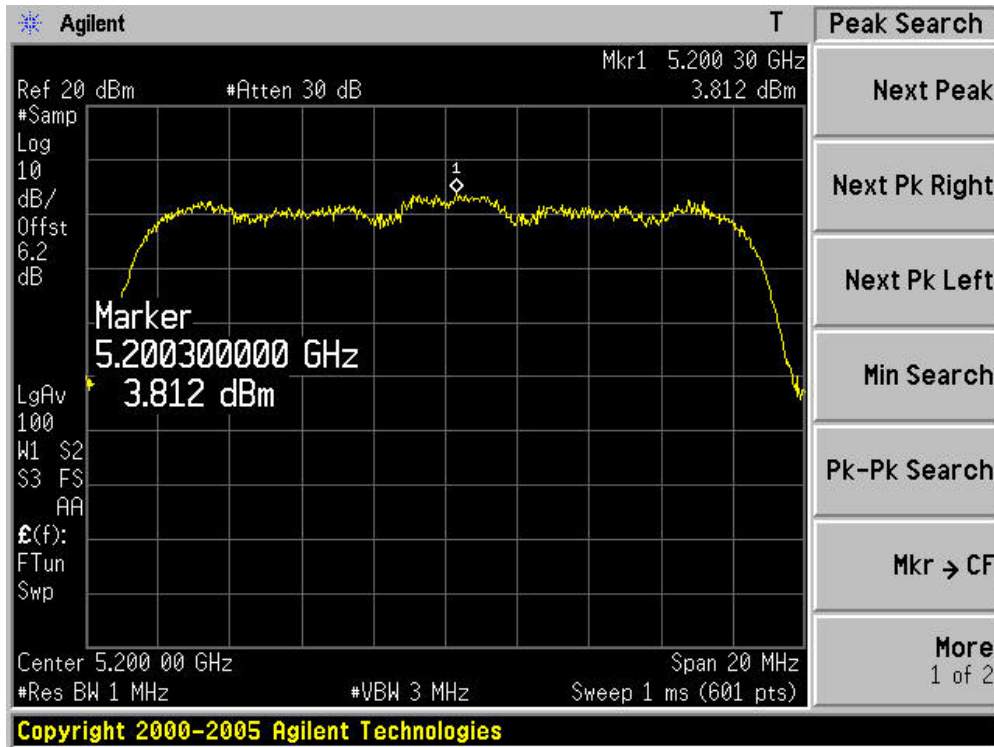
Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a (ant1)

Channel No.	Frequency (MHz)	Measurement PPSD (dBm/MHz)		Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
		Ant 0	Ant 1			
36	5180	N/A	3.790	3.790	4.0	Pass
40	5200	N/A	3.812	3.812	4.0	Pass
48	5240	N/A	3.287	3.287	4.0	Pass

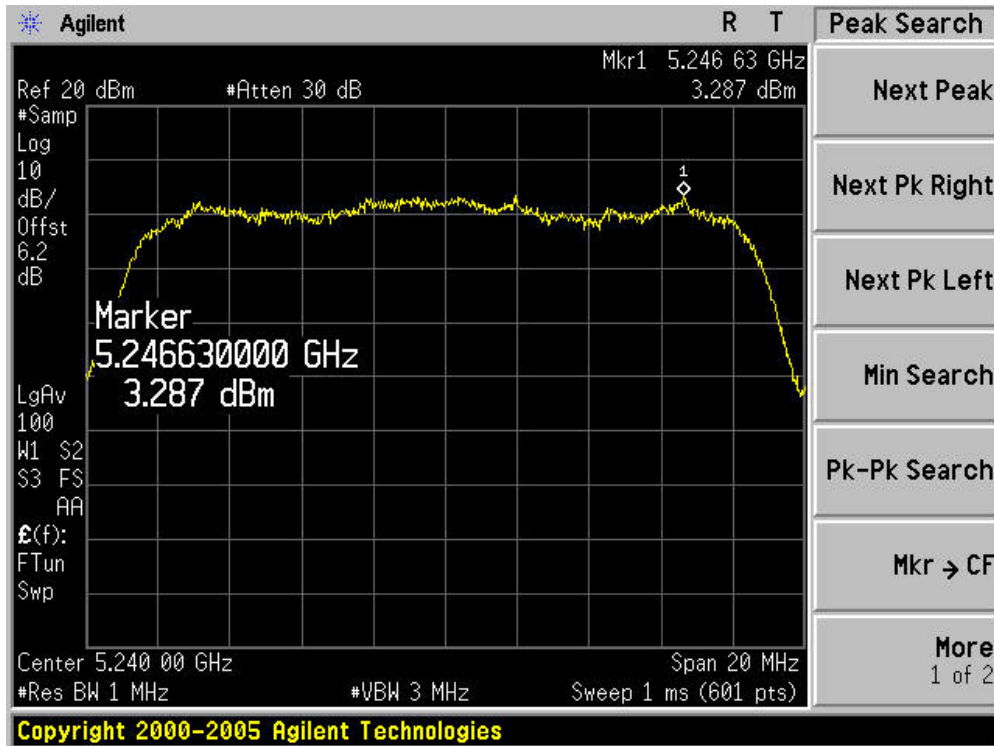
Channel 36 (5180MHz)



Channel 40 (5200MHz)



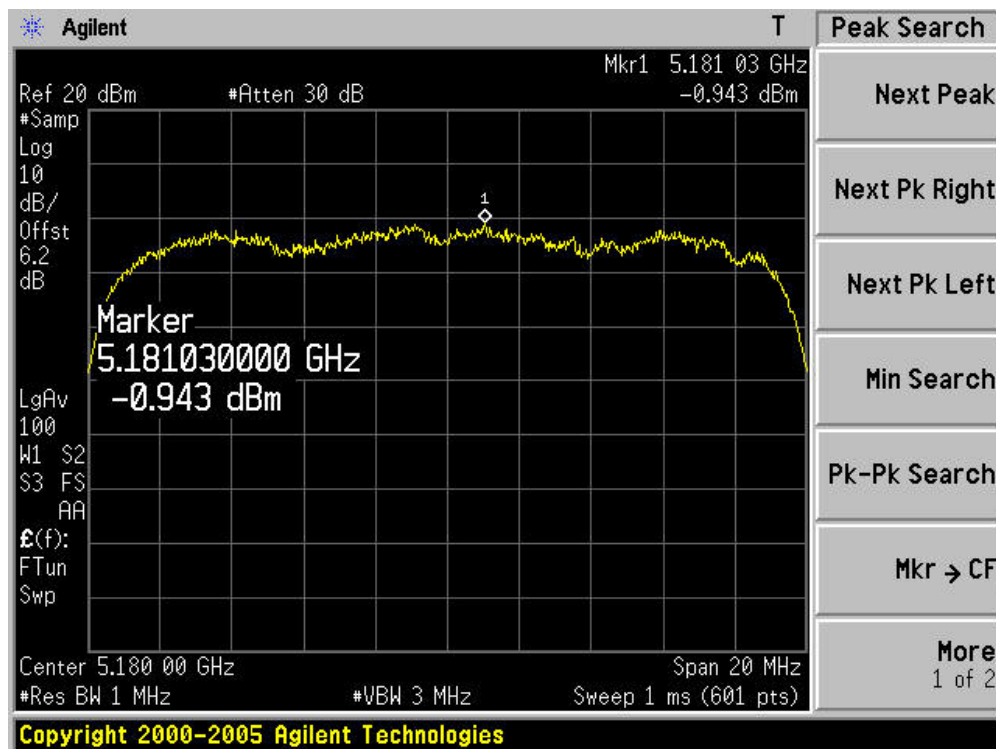
Channel 48 (5240MHz)



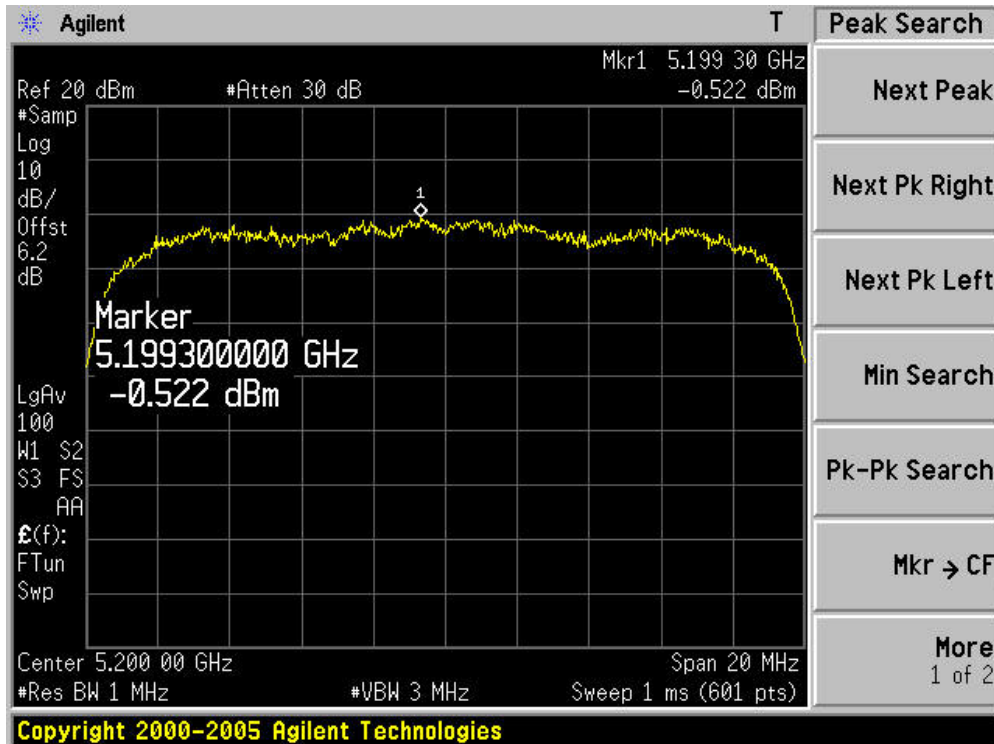
Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) (ant 0)

Channel No.	Frequency (MHz)	Measurement PPSD (dBm/MHz)		Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
		Ant 0	Ant 1			
36	5180	-0.943	N/A	-0.943	4.0	Pass
40	5200	-0.522	N/A	-0.522	4.0	Pass
48	5240	-1.854	N/A	-1.854	4.0	Pass

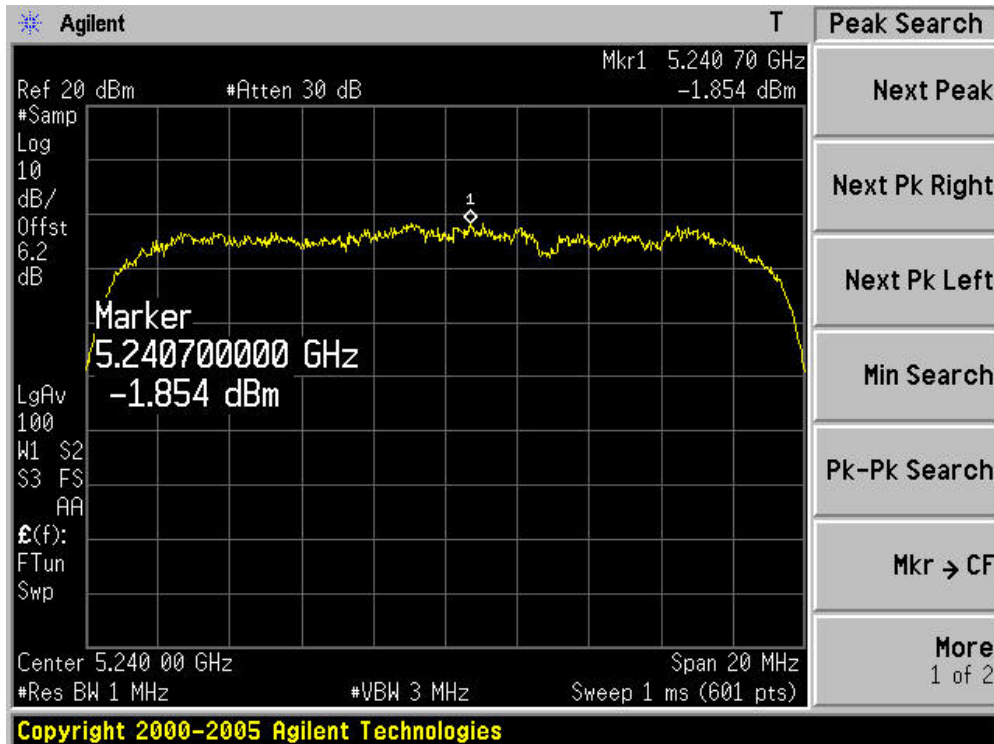
Channel 36 (5180MHz)



Channel 40 (5200MHz)



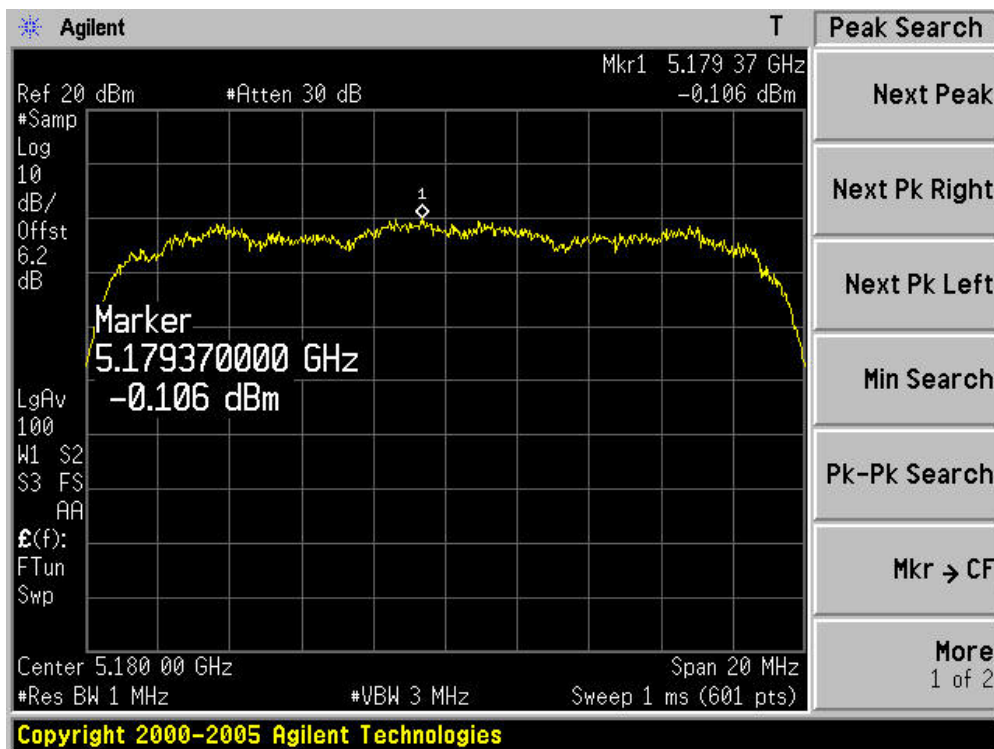
Channel 48 (5240MHz)



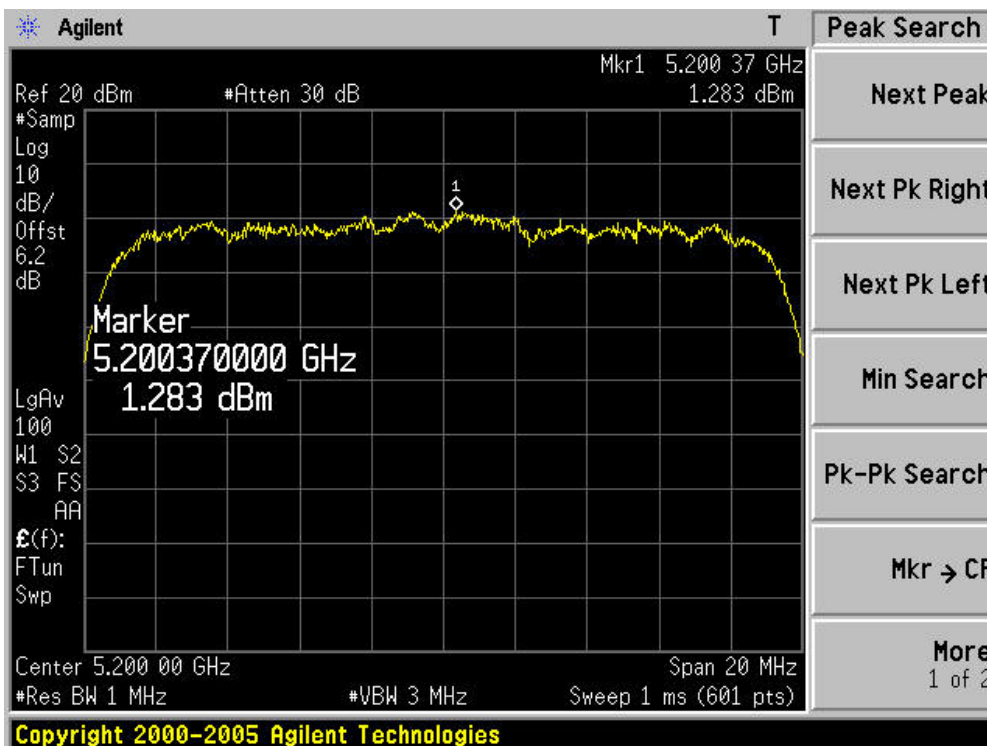
Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) (ant 0)

Channel No.	Frequency (MHz)	Measurement PPSD (dBm/MHz)		Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
		Ant 0	Ant 1			
36	5180	N/A	-0.106	-0.106	4.0	Pass
40	5200	N/A	1.283	1.283	4.0	Pass
48	5240	N/A	-0.666	-0.666	4.0	Pass

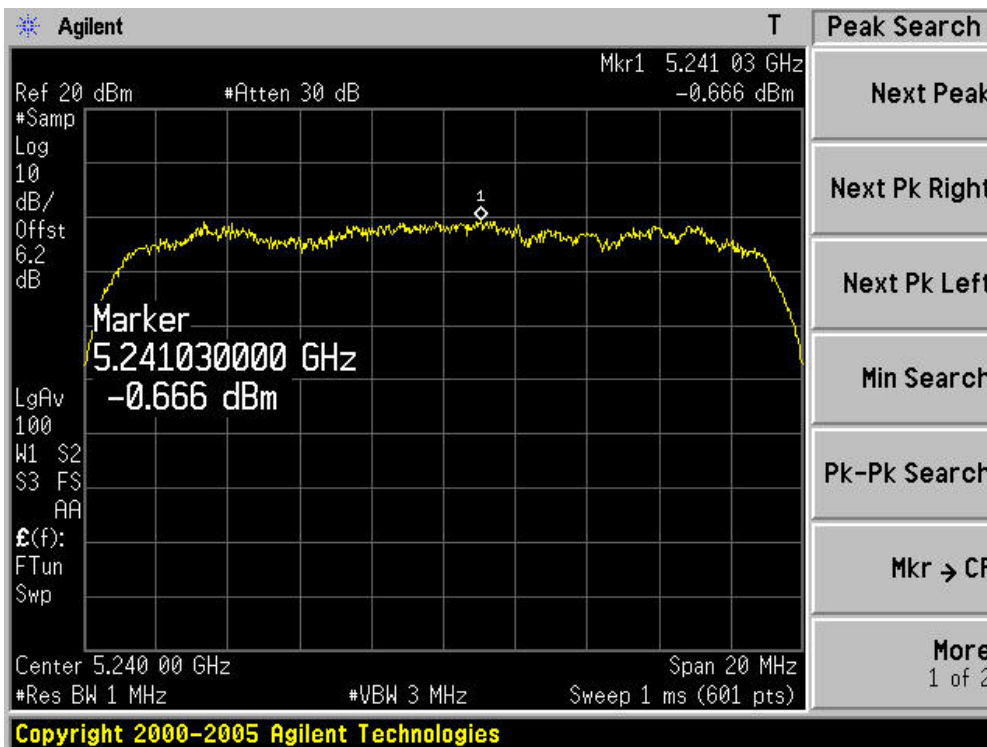
Channel 36 (5180MHz)



Channel 40 (5200MHz)



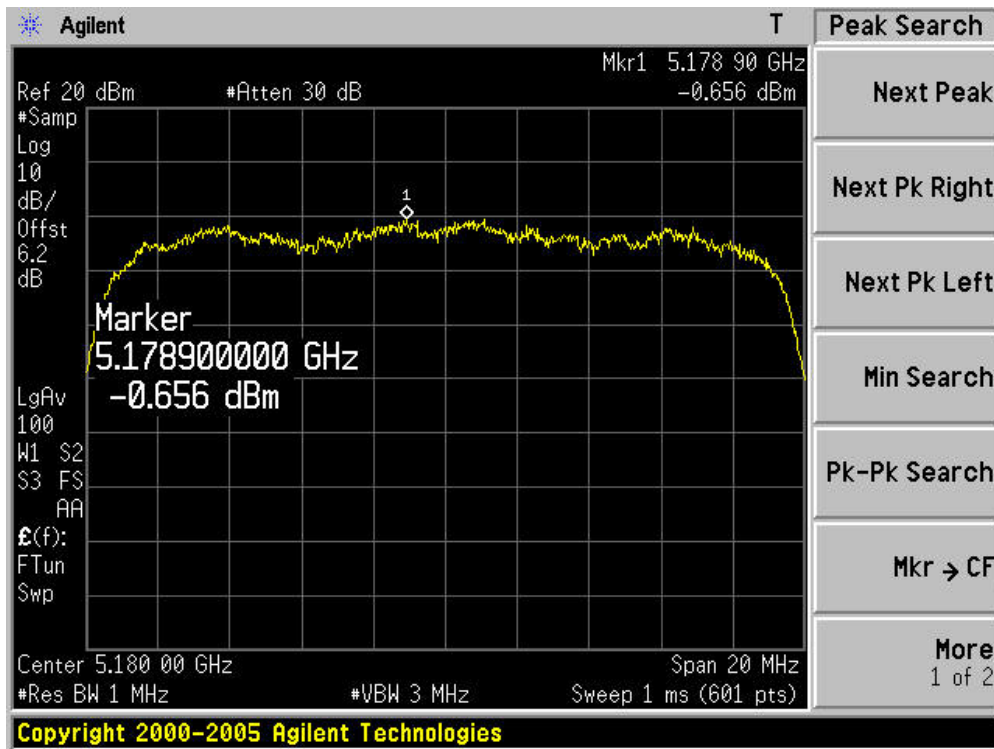
Channel 48 (5240MHz)



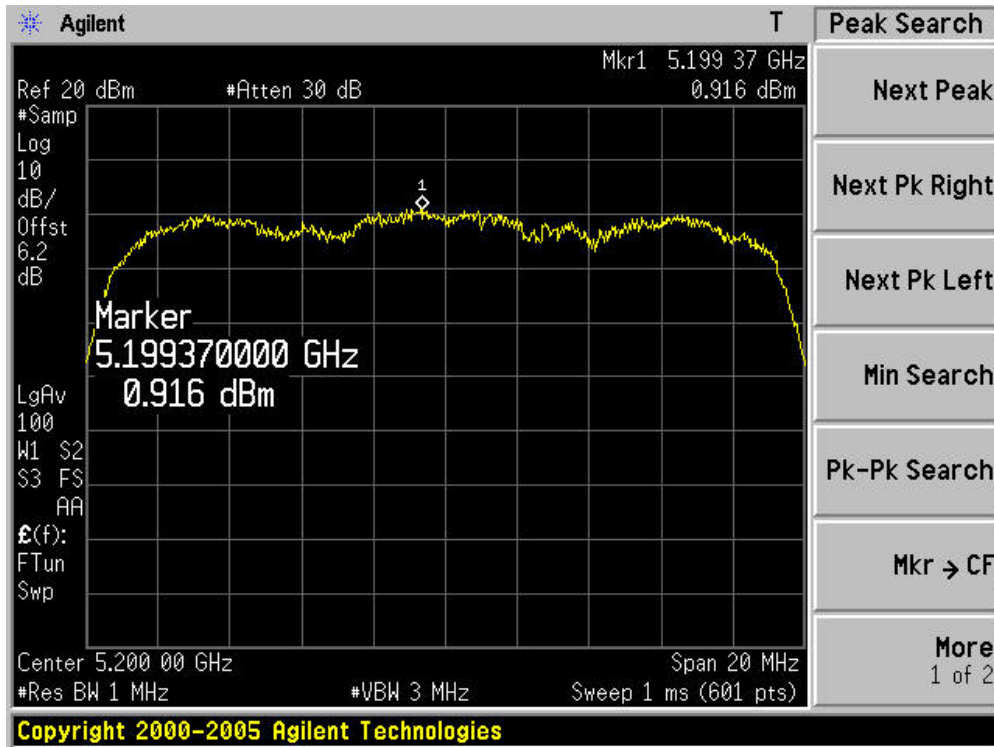
Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) (ant 1+2)

Channel No.	Frequency (MHz)	Measurement PPSD (dBm/MHz)		Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
		Ant 0	Ant 1			
36	5180	-0.656	-0.193	2.590	4.0	Pass
40	5200	-0.916	0.914	3.100	4.0	Pass
48	5240	-1.400	-0.350	2.170	4.0	Pass

Channel 36 (5180MHz) – Ant 1



Channel 40 (5200MHz) - Ant 1



Channel 48 (5240MHz) - Ant 1

