

FCC Test Report

Product Name	802.11a/b/g/n 2T2R Wireless Lan USB Module
Model No	WN4508R
FCC ID	PPQ-WN4508R

Applicant	Lite-On Technology Corp.
Address	4F, 90, Chien 1 Road, Chung Ho, New Taipei City 235, Taiwan, R.O.C.

Date of Receipt	Aug. 23, 2013
Issued Date	Sep. 24, 2013
Report No.	138472R-RFUSP31V01
Report Version	V1.0



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Test Report Certification

Issued Date: Sep. 24, 2013

Report No.: 138472R-RFUSP31V01



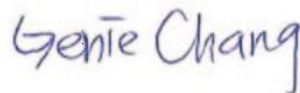
Product Name	802.11a/b/g/n 2T2R Wireless Lan USB Module
Applicant	Lite-On Technology Corp.
Address	4F, 90, Chien 1 Road, Chung Ho, New Taipei City 235, Taiwan, R.O.C.
Manufacturer	Lite-On Technology (Changzhou) CO., LTD
Model No.	WN4508R
FCC ID.	PPQ-WN4508R
EUT Rated Voltage	DC 3.3V
EUT Test Voltage	AC 120V/60Hz
Trade Name	LITE-ON
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2012 ANSI C63.4: 2003, ANSI C63.10: 2009, FCC KDB-789033
Test Result	Complied

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(Senior Adm. Specialist / Genie Chang)

Tested By :



(Engineer / Vincent Chu)

Approved By :



(Manager / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	802.11a/b/g/n 2T2R Wireless Lan USB Module
Trade Name	LITE-ON
FCC ID.	PPQ-WN4508R
Model No.	WN4508R
Frequency Range	802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz 802.11n-40MHz: 5190-5310, 5510-5670MHz
Number of Channels	802.11a/n-20MHz: 19; 802.11n-40MHz: 9
Data Rate	802.11a: 6 - 54Mbps 802.11n: up to 300Mbps
Channel Control	Auto
Type of Modulation	802.11a/n:OFDM, BPSK, QPSK, 16QAM, 64QAM
Antenna Type	PIFA
Antenna Gain	Refer to the table "Antenna List"

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Auden	151727-20 (Main) 151727-20 (Aux)	PIFA	6.14dBi For 5.15~5.25GHz 6.32 dBi For 5.25~5.35GHz 5.53dBi For 5.47~5.725GHz
2	HONG LIN	290-20031 (Main) 290-20031 (Aux)	PIFA	3.18dBi For 5.15~5.25GHz 3.77dBi For 5.25~5.35GHz 1.17dBi For 5.47~5.725GHz

Note: 1.The antenna of EUT is conform to FCC 15.203

2.Only the higher gain antenna was tested and recorded in this report.

802.11a/n-20MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 36:	5180 MHz	Channel 40:	5200 MHz	Channel 44:	5220 MHz	Channel 48:	5240 MHz
Channel 52:	5260 MHz	Channel 56:	5280 MHz	Channel 60:	5300 MHz	Channel 64:	5320 MHz
Channel 100:	5500 MHz	Channel 104:	5520 MHz	Channel 108:	5540 MHz	Channel 112:	5560 MHz
Channel 116:	5580 MHz	Channel 120:	5600 MHz	Channel 124:	5620 MHz	Channel 128:	5640 MHz
Channel 132:	5660 MHz	Channel 136:	5680 MHz	Channel 140:	5700 MHz		

802.11n-40MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 38:	5190 MHz	Channel 46:	5230 MHz	Channel 54:	5270 MHz	Channel 62:	5310 MHz
Channel 102:	5510 MHz	Channel 110:	5550 MHz	Channel 118:	5590 MHz	Channel 126:	5630 MHz
Channel 134:	5670 MHz						

Note:

1. This device is a 802.11a/b/g/n 2T2R Wireless Lan USB Module, with a built-in 2.4GHz and 5GHz band WLAN transceiver. This report for 5GHz band WLAN.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11a is 6Mbps 、 802.11n(20M-BW) is 14.4Mbps and 、 802.11n(40M-BW) is 30Mbps).
4. At result of pretests, module supports dual-channel transmission, only the worst case is shown in the report. (802.11a is chain A)
5. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.
6. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit (802.11a-6Mbps) Mode 2: Transmit (802.11n-20BW 14.4Mbps) Mode 3: Transmit (802.11n-40BW 30Mbps)
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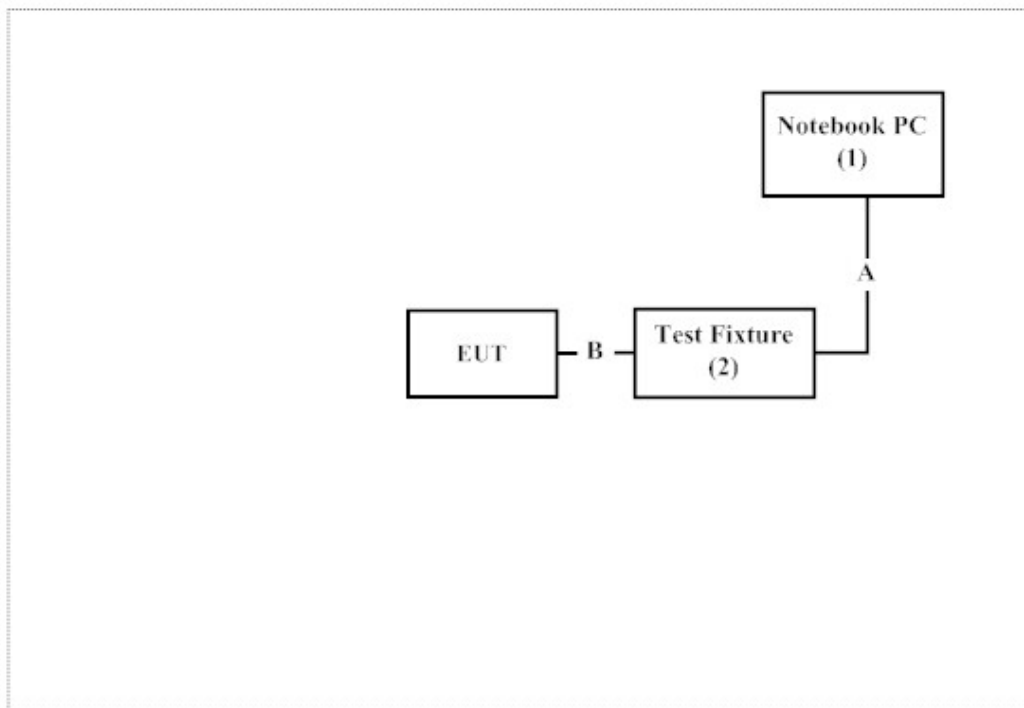
1.3. Tested System Details

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

Product	Manufacturer	Model No.	Serial No.	Power Cord
(1) Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
(2) Test Fixture	LITE-ON	N/A	N/A	N/A

Signal Cable Type	Signal cable Description
A USB Cable	Shielded 0.3m
B Signal Cable	Non-Shielded, 0.1m

1.4. Configuration of tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute program “QA Test V1.0.4.0” on the EUT.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press “OK” to start the continuous Transmit.
- (5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

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/>

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 92195

Site Name: Quietek Corporation
Site Address: No.5-22, Ruishukeng Linkou Dist., New Taipei City
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FCC Accreditation Number: TW1014

2. Conducted Emission

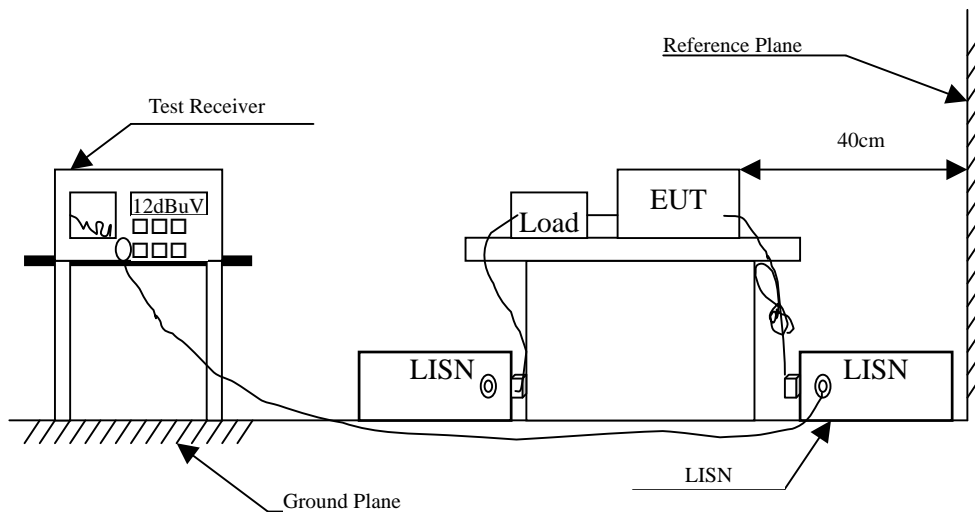
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2013	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2013	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2013	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2013	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2013	
	No.1 Shielded Room				

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by “X” are used to measure the final test results.

2.2. Test Setup



2.3. Limits

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

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.

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

The EUT was setup to ANSI C63.10, 2009; tested to DTS test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 1					
Quasi-Peak					
0.150	9.696	37.550	47.246	-18.754	66.000
0.302	9.703	28.510	38.213	-23.444	61.657
0.685	9.721	17.240	26.961	-29.039	56.000
0.900	9.731	14.450	24.181	-31.819	56.000
2.107	9.805	7.030	16.835	-39.165	56.000
8.654	9.870	12.330	22.200	-37.800	60.000
Average					
0.150	9.696	20.110	29.806	-26.194	56.000
0.302	9.703	19.900	29.603	-22.054	51.657
0.685	9.721	11.070	20.791	-25.209	46.000
0.900	9.731	7.720	17.451	-28.549	46.000
2.107	9.805	1.590	11.395	-34.605	46.000
8.654	9.870	7.460	17.330	-32.670	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 2					
Quasi-Peak					
0.193	9.678	34.800	44.478	-20.293	64.771
0.248	9.681	30.200	39.881	-23.319	63.200
0.591	9.696	27.480	37.176	-18.824	56.000
0.798	9.716	21.180	30.896	-25.104	56.000
1.123	9.731	18.730	28.461	-27.539	56.000
8.025	9.860	11.570	21.430	-38.570	60.000
Average					
0.193	9.678	19.880	29.558	-25.213	54.771
0.248	9.681	21.810	31.491	-21.709	53.200
0.591	9.696	19.570	29.266	-16.734	46.000
0.798	9.716	11.990	21.706	-24.294	46.000
1.123	9.731	12.480	22.211	-23.789	46.000
8.025	9.860	5.830	15.690	-34.310	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5270MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 1					
Quasi-Peak					
0.216	9.699	26.480	36.179	-27.935	64.114
0.283	9.702	34.620	44.322	-17.878	62.200
0.572	9.716	25.260	34.976	-21.024	56.000
0.865	9.729	17.050	26.779	-29.221	56.000
1.697	9.777	11.730	21.507	-34.493	56.000
7.373	9.850	10.800	20.650	-39.350	60.000
Average					
0.216	9.699	12.100	21.799	-32.315	54.114
0.283	9.702	30.700	40.402	-11.798	52.200
0.572	9.716	21.580	31.296	-14.704	46.000
0.865	9.729	11.890	21.619	-24.381	46.000
1.697	9.777	6.330	16.107	-29.893	46.000
7.373	9.850	5.250	15.100	-34.900	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5270MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 2					
Quasi-Peak					
0.201	9.679	32.730	42.409	-22.134	64.543
0.287	9.683	34.600	44.283	-17.803	62.086
0.455	9.690	21.380	31.070	-26.216	57.286
0.630	9.698	30.010	39.708	-16.292	56.000
1.033	9.727	16.500	26.227	-29.773	56.000
8.404	9.870	11.150	21.020	-38.980	60.000
Average					
0.201	9.679	18.440	28.119	-26.424	54.543
0.287	9.683	30.950	40.633	-11.453	52.086
0.455	9.690	10.590	20.280	-27.006	47.286
0.630	9.698	16.090	25.788	-20.212	46.000
1.033	9.727	10.870	20.597	-25.403	46.000
8.404	9.870	6.010	15.880	-34.120	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “█” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5550MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 1					
Quasi-Peak					
0.287	9.703	35.310	45.013	-17.073	62.086
0.505	9.713	21.790	31.503	-24.497	56.000
0.681	9.721	16.570	26.291	-29.709	56.000
0.849	9.728	18.550	28.278	-27.722	56.000
1.002	9.735	14.860	24.595	-31.405	56.000
8.646	9.870	12.470	22.340	-37.660	60.000
Average					
0.287	9.703	33.550	43.253	-8.833	52.086
0.505	9.713	14.780	24.493	-21.507	46.000
0.681	9.721	9.750	19.471	-26.529	46.000
0.849	9.728	12.160	21.888	-24.112	46.000
1.002	9.735	7.470	17.205	-28.795	46.000
8.646	9.870	7.140	17.010	-32.990	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5550MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 2					
Quasi-Peak					
0.181	9.678	35.920	45.598	-19.516	65.114
0.283	9.682	34.430	44.112	-18.088	62.200
0.322	9.684	26.210	35.894	-25.192	61.086
0.443	9.690	20.860	30.550	-27.079	57.629
0.630	9.698	30.410	40.108	-15.892	56.000
8.998	9.880	10.910	20.790	-39.210	60.000
Average					
0.181	9.678	19.880	29.558	-25.556	55.114
0.283	9.682	30.180	39.862	-12.338	52.200
0.322	9.684	17.460	27.144	-23.942	51.086
0.443	9.690	12.440	22.130	-25.499	47.629
0.630	9.698	16.330	26.028	-19.972	46.000
8.998	9.880	5.020	14.900	-35.100	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Maximun conducted output power

3.1. Test Equipment

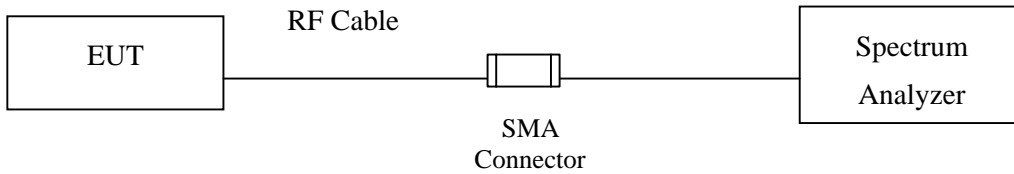
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2013
X	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2013
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2013

Note:

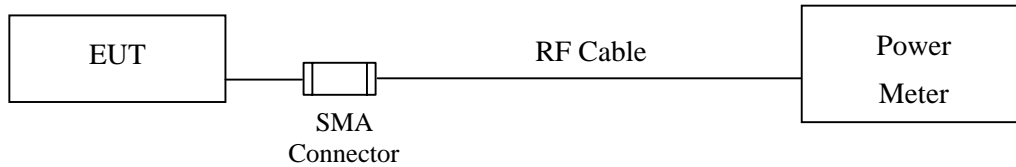
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

3.2. Test Setup

26dBc Occupied Bandwidth



Conduction Power Measurement



3.3. Limits

- (1) 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.
- (2) For the band 5.25-5.35 GHz, the maximum conducted output power over the frequency band 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 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.
- (3) 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 1W or $17 \text{ dBm} + 10\log B$, 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.

3.4. Test Procedure

As an alternative to FCC KDB-789033, the EUT maximum conducted output power was measured with an average power meter employing a video bandwidth greater than 6dB BW of the emission under test. Maximum conducted output power was read directly from the meter across all data rates, and across three channels within each sub-band. Special care was used to make sure that the EUT was transmitting in continuous mode. This method exceeds the limitations of FCC KDB-789033, and provides more accurate measurements.

The Maximum conducted output power using KDB 789033 section E)3)b) Method PM-G (Measurement using a gated RF average power meter).

3.5. Uncertainty

$\pm 1.27 \text{ dB}$

3.6. Test Result of Maximum conducted output power

Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

CHAIN A

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		6	9	12	18	24	36	48	54	
		Measurement Level (dBm)								
36	5180	14.42	--	--	--	--	--	--	--	<16.86dBm
44	5220	14.08	14.01	13.94	13.87	13.8	13.73	13.66	13.59	<16.86dBm
48	5240	13.98	--	--	--	--	--	--	--	<16.86dBm
52	5260	14.15	--	--	--	--	--	--	--	<23.68dBm
60	5300	14.05	13.98	13.91	13.84	13.77	13.7	13.63	13.56	<23.68dBm
64	5320	14.38	--	--	--	--	--	--	--	<23.68dBm
100	5500	14.34	--	--	--	--	--	--	--	<24dBm
116	5580	14.05	13.97	13.89	13.81	13.73	13.65	13.57	13.49	<24dBm
140	5700	14.24	--	--	--	--	--	--	--	<24dBm

Note: 1.Maximum conducted output power Value =Reading value on average power meter + cable loss

2.The peak antenna gain exceeds 6 dBi that therefore the limit needs to reduce.

CHAIN B

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		6	9	12	18	24	36	48	54	
		Measurement Level (dBm)								
36	5180	13.89	--	--	--	--	--	--	--	<16.86dBm
44	5220	13.78	13.72	13.66	13.6	13.54	13.48	13.42	13.36	<16.86dBm
48	5240	13.88	--	--	--	--	--	--	--	<16.86dBm
52	5260	13.88	--	--	--	--	--	--	--	<23.68dBm
60	5300	13.51	13.46	13.41	13.36	13.31	13.26	13.21	13.16	<23.68dBm
64	5320	13.68	--	--	--	--	--	--	--	<23.68dBm
100	5500	13.79	--	--	--	--	--	--	--	<24dBm
116	5580	13.84	13.79	13.74	13.69	13.64	13.59	13.54	13.49	<24dBm
140	5700	13.69	--	--	--	--	--	--	--	<24dBm

Note: 1.Maximum conducted output power Value =Reading value on average power meter + cable loss

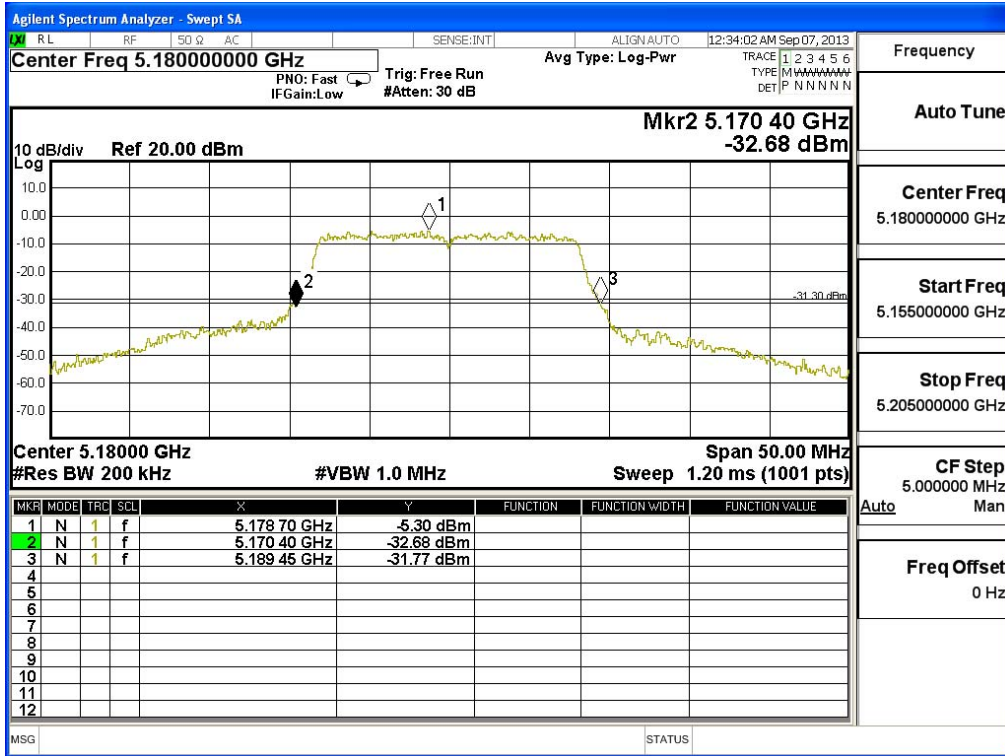
2.The peak antenna gain exceeds 6 dBi that therefore the limit needs to reduce.

Maximum conducted output power Measurement:

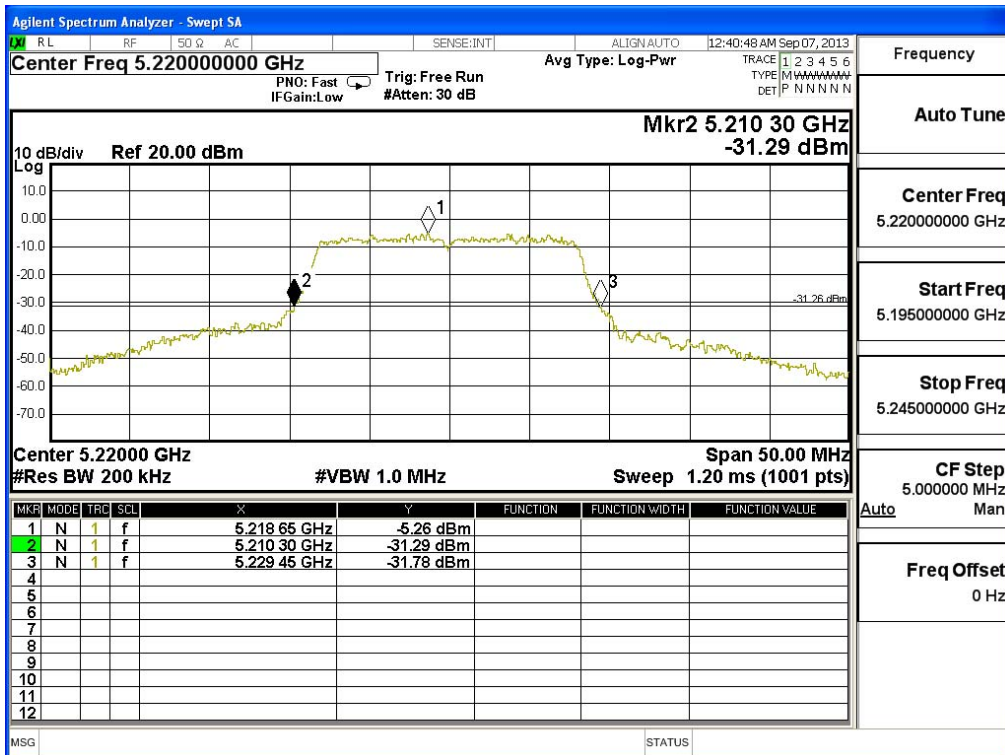
Channel Number	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
				(dBm)	dBm+10log(BW)
36	5180	19.050	14.42	16.86	16.66
44	5220	19.150	14.08	16.86	16.68
48	5240	19.400	13.98	16.86	16.74
52	5260	19.350	14.15	23.68	23.55
60	5300	19.350	14.05	23.68	23.55
64	5320	19.250	14.38	23.68	23.52
100	5500	19.150	14.34	24	23.82
116	5580	19.350	14.05	24	23.87
140	5700	19.250	14.24	24	23.84

Note: 1. Maximum conducted output power Value = Reading value on average power meter + cable loss
 2. The peak antenna gain exceeds 6 dBi that therefore the limit needs to reduce.

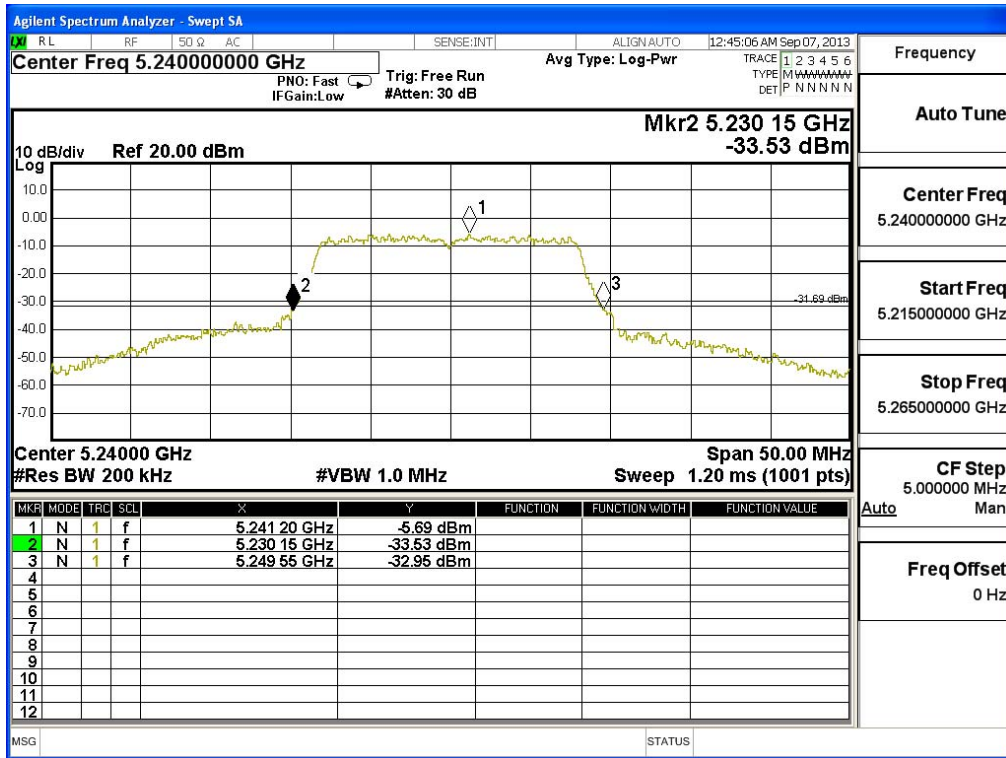
26dBc Occupied Bandwidth: Channel 36



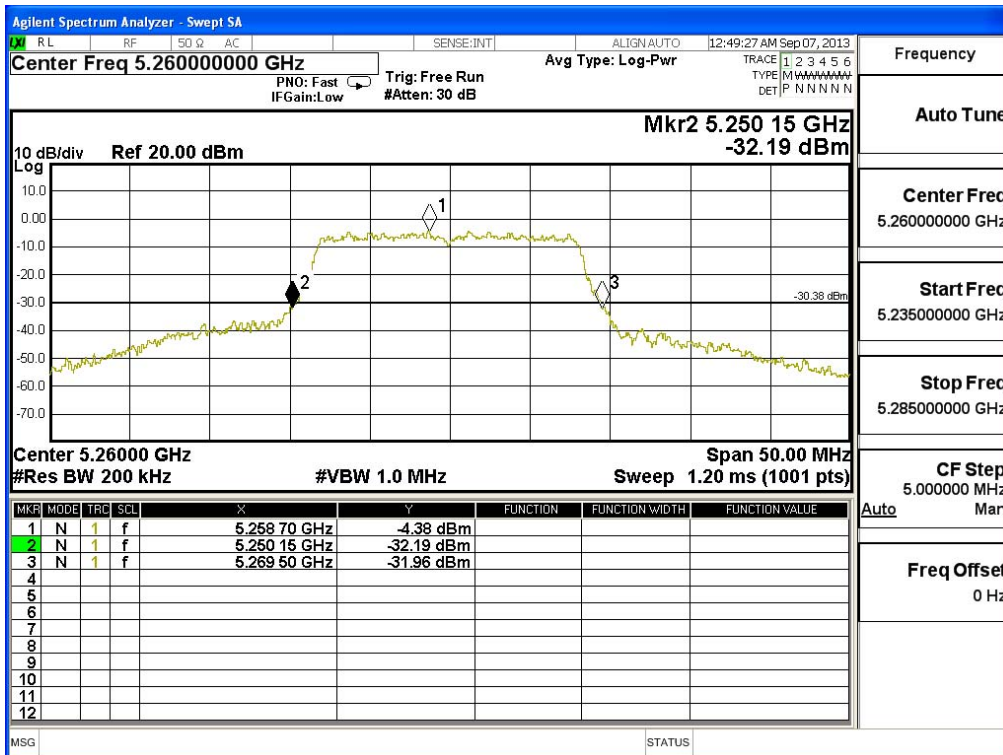
Channel 44



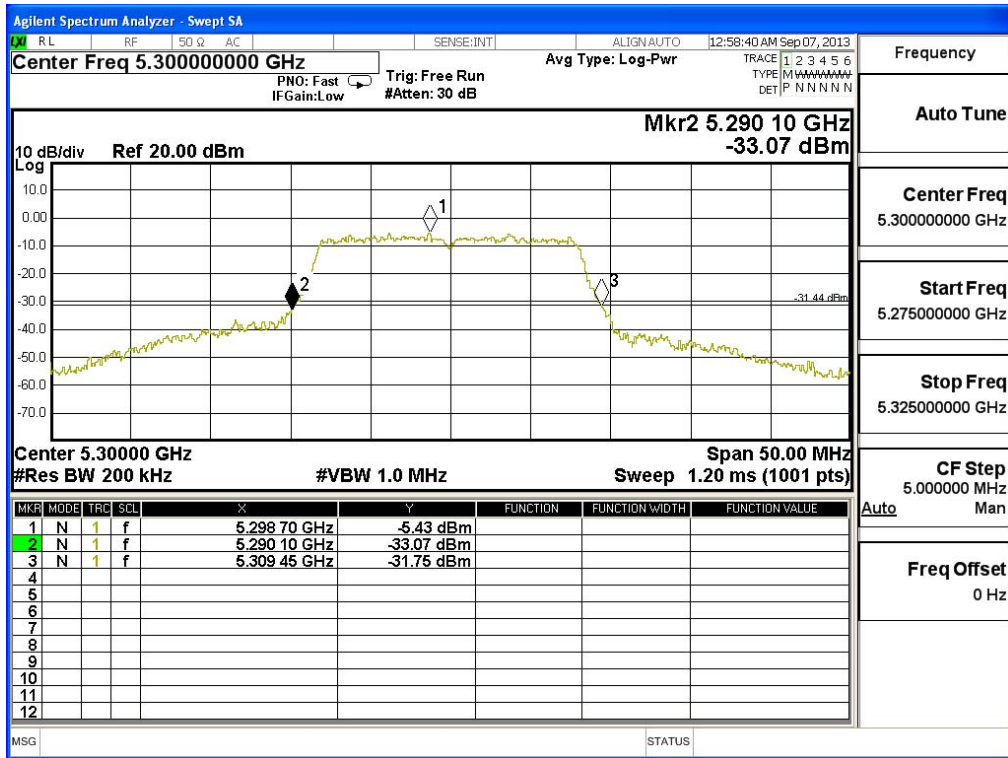
Channel 48



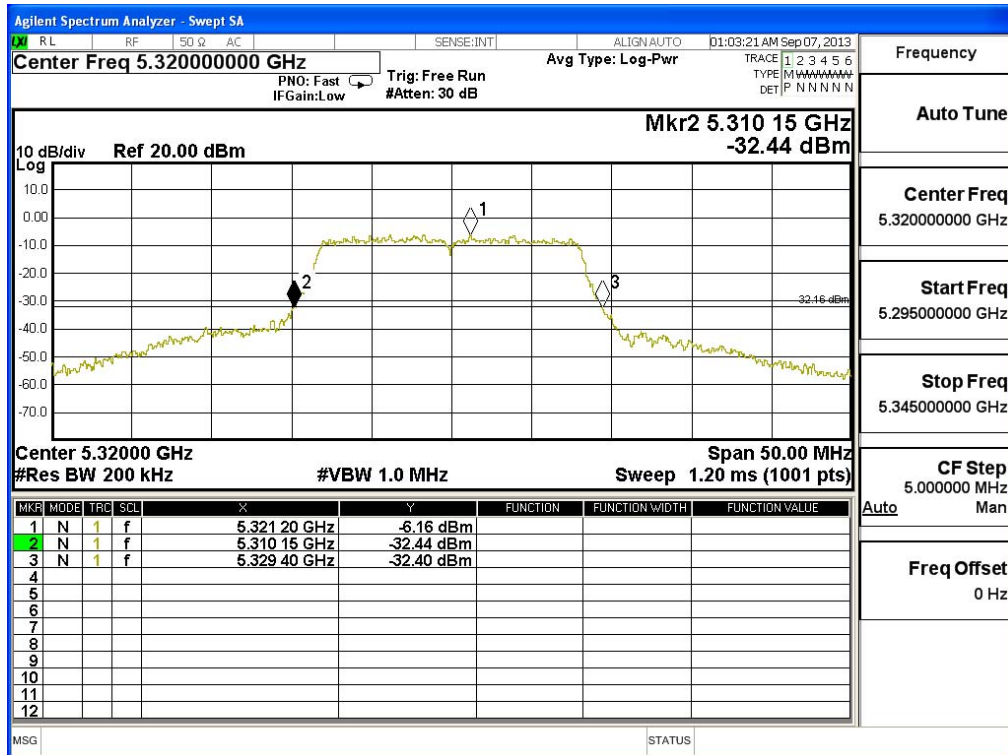
Channel 52



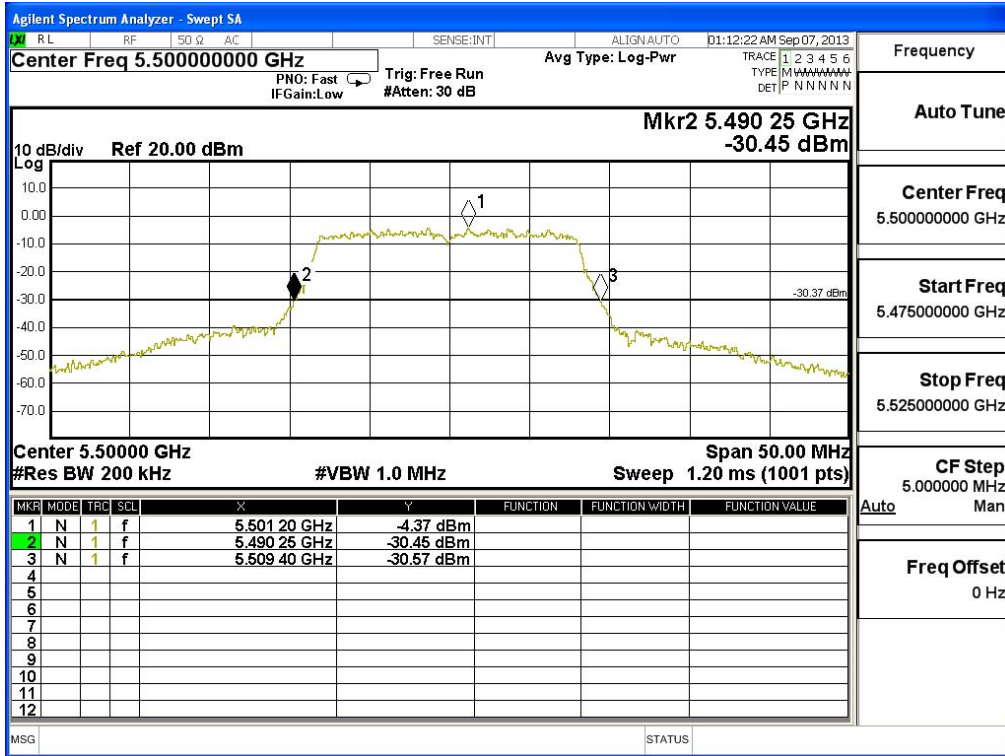
Channel 60



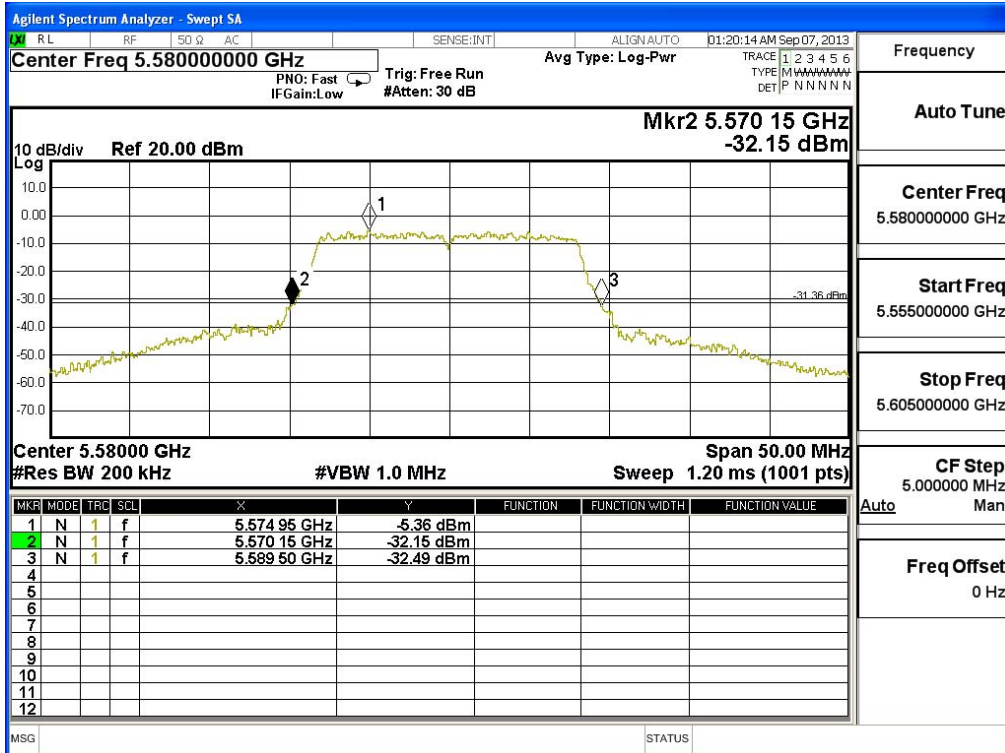
Channel 64



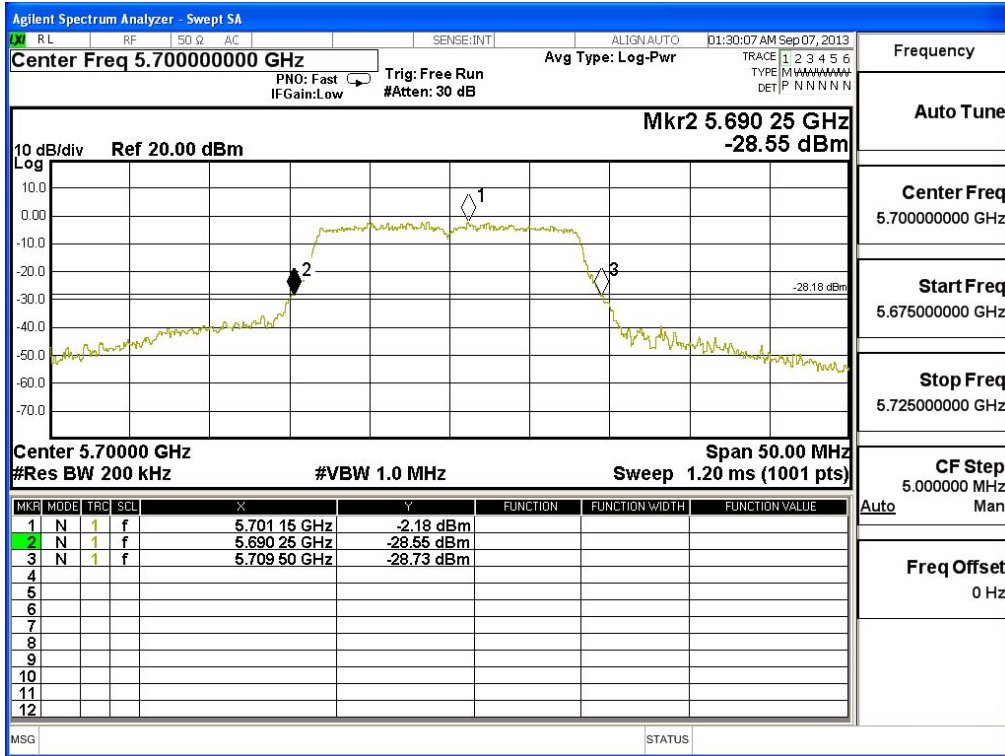
Channel 100



Channel 116



Channel 140



Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)

CHAIN A

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	
		Measurement Level (dBm)								
36	5180	13.88	--	--	--	--	--	--	--	<16.86dBm
44	5220	13.95	13.92	13.81	13.7	13.59	13.48	13.37	13.26	<16.86dBm
48	5240	13.88	--	--	--	--	--	--	--	<16.86dBm
52	5260	14.18	--	--	--	--	--	--	--	<23.68dBm
60	5300	14.01	13.94	13.87	13.8	13.73	13.66	13.59	13.52	<23.68dBm
64	5320	14.25	--	--	--	--	--	--	--	<23.68dBm
100	5500	14.49	--	--	--	--	--	--	--	<24dBm
116	5580	14.44	14.38	14.32	14.26	14.2	14.14	14.08	14.02	<24dBm
140	5700	14.2	--	--	--	--	--	--	--	<24dBm

Note: 1.Maximum conducted output power Value =Reading value on average power meter + cable loss
 2.The peak antenna gain exceeds 6 dBi that therefore the limit needs to reduce.

CHAIN B

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	
		Measurement Level (dBm)								
36	5180	13.78	--	--	--	--	--	--	--	<16.86dBm
44	5220	13.70	13.68	13.57	13.46	13.35	13.24	13.13	13.02	<16.86dBm
48	5240	13.80	--	--	--	--	--	--	--	<16.86dBm
52	5260	14.02	--	--	--	--	--	--	--	<23.68dBm
60	5300	14.12	13.99	13.86	13.73	13.6	13.47	13.34	13.21	<23.68dBm
64	5320	14.05	--	--	--	--	--	--	--	<23.68dBm
100	5500	13.89	--	--	--	--	--	--	--	<24dBm
116	5580	14.03	13.97	13.91	13.85	13.79	13.73	13.67	13.61	<24dBm
140	5700	14.02	--	--	--	--	--	--	--	<24dBm

Note: 1.Maximum conducted output power Value =Reading value on average power meter + cable loss
 2.The peak antenna gain exceeds 6 dBi that therefore the limit needs to reduce.

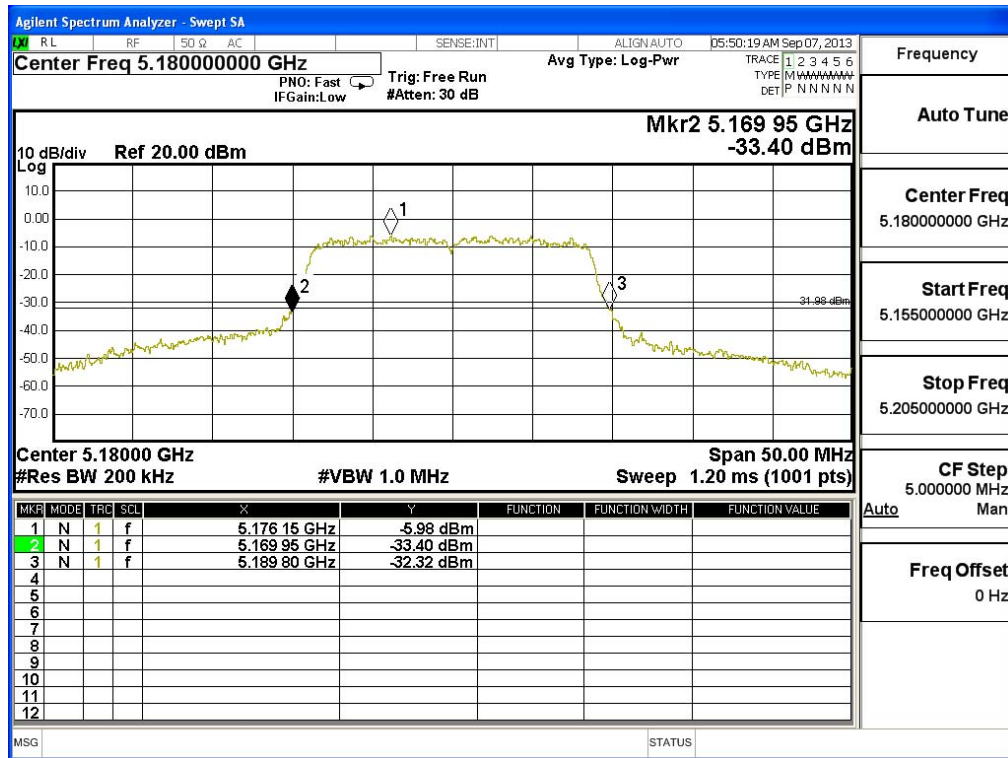
Maximum conducted output power Measurement:
CHAIN A+B

Channel Number	Frequency (MHz)	26dB Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit	
						(dBm)	dBm+10log(BW)
36	5180	19.850	13.88	13.78	16.84	16.86	16.84
44	5220	19.700	13.95	13.70	16.84	16.86	16.80
48	5240	19.800	13.88	13.80	16.85	16.86	16.83
52	5260	19.650	14.18	14.02	17.11	23.68	23.61
60	5300	19.800	14.01	14.12	17.08	23.68	23.65
64	5320	19.800	14.25	14.05	17.16	23.68	23.65
100	5500	19.300	14.49	13.89	17.21	24	23.86
116	5580	19.700	14.44	14.03	17.25	24	23.94
140	5700	19.650	14.20	14.02	17.12	24	23.93

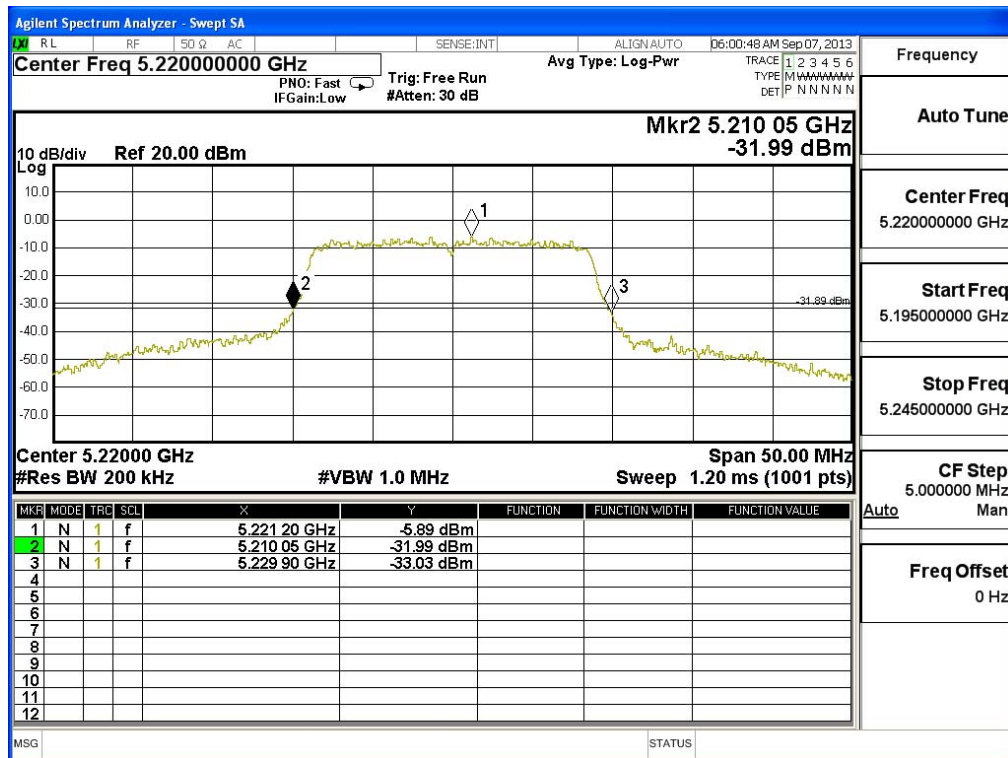
Note:

1. Power Output Value = Reading value on average power meter + cable loss
2. Output Power (dBm) = 10*LOG (Chain A Power (mW)+ Chain B Power (mW))
3. 26 dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.
4. The peak antenna gain exceeds 6 dBi that therefore the limit needs to reduce.

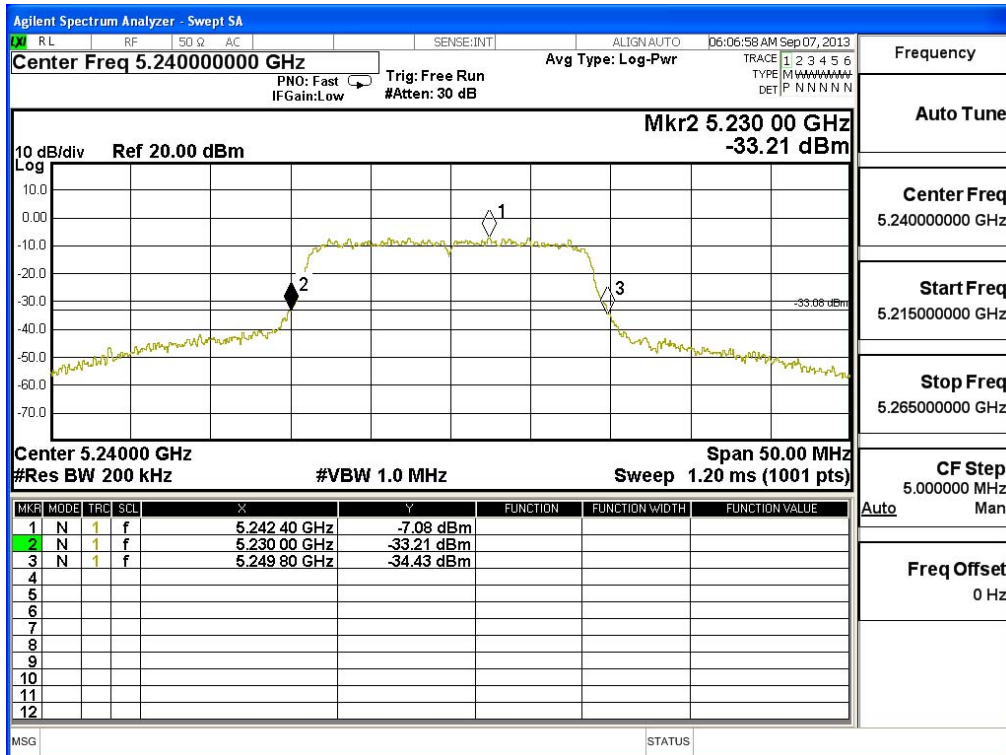
26dBc Occupied Bandwidth: Channel 36 -Chain A



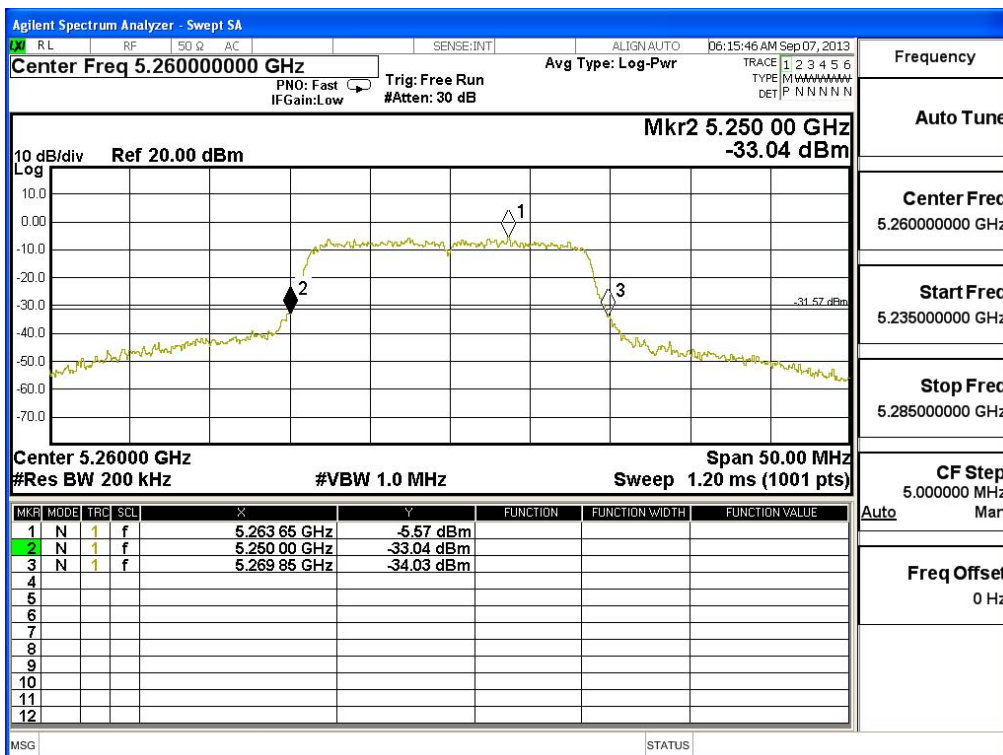
Channel 44 -Chain A



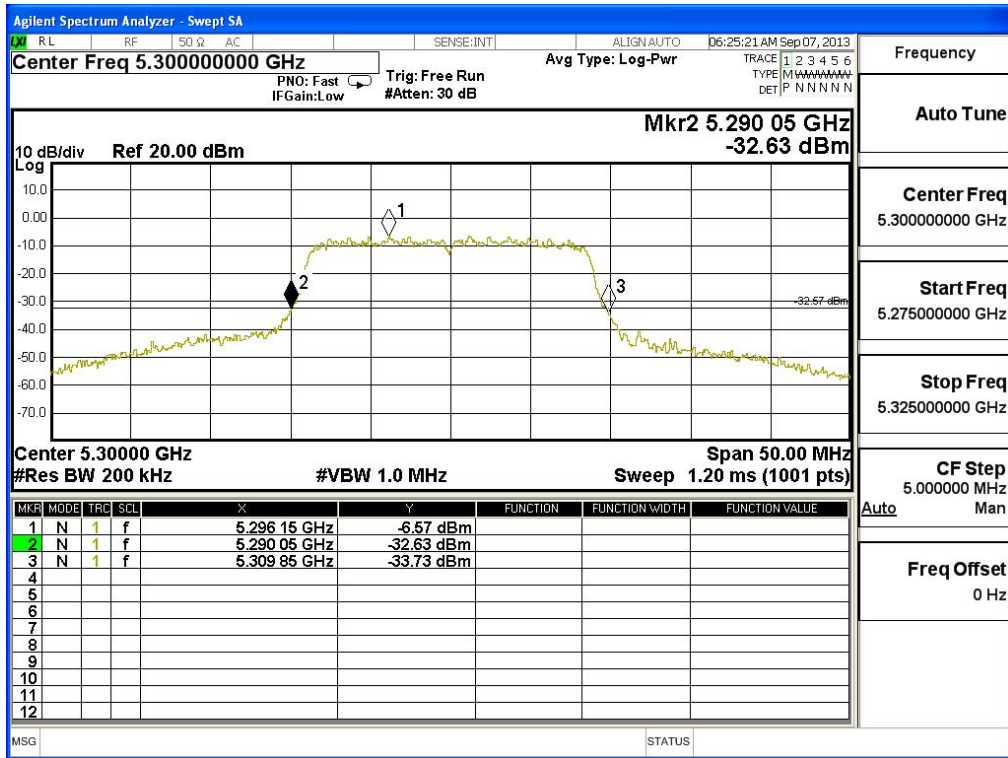
Channel 48 -Chain A



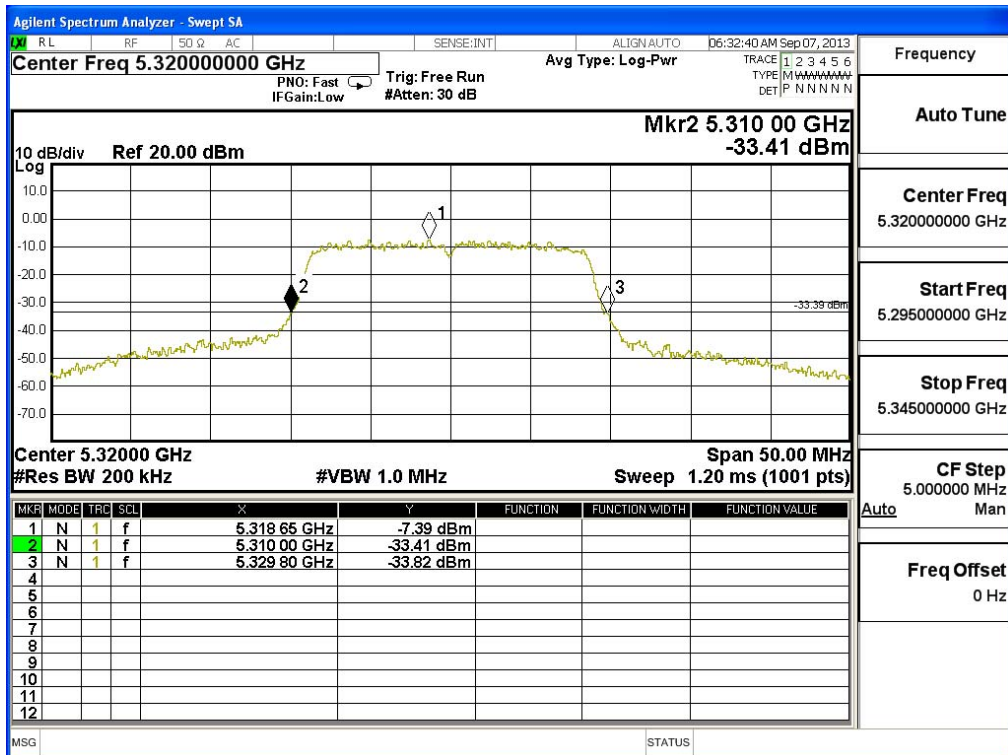
Channel 52 -Chain A



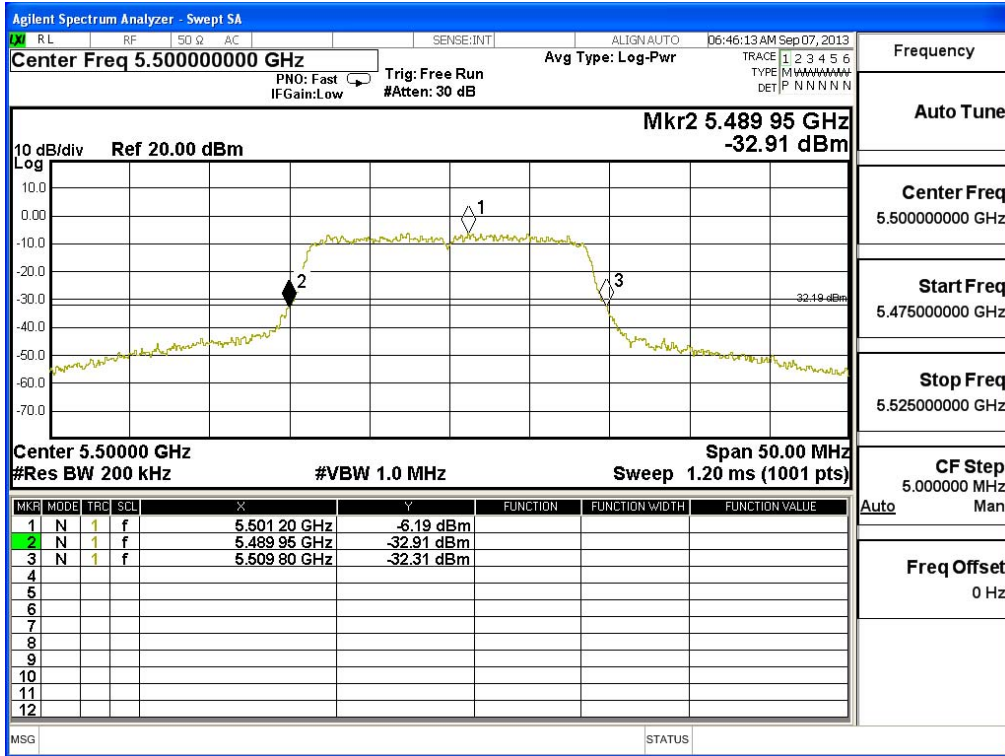
Channel 60 -Chain A



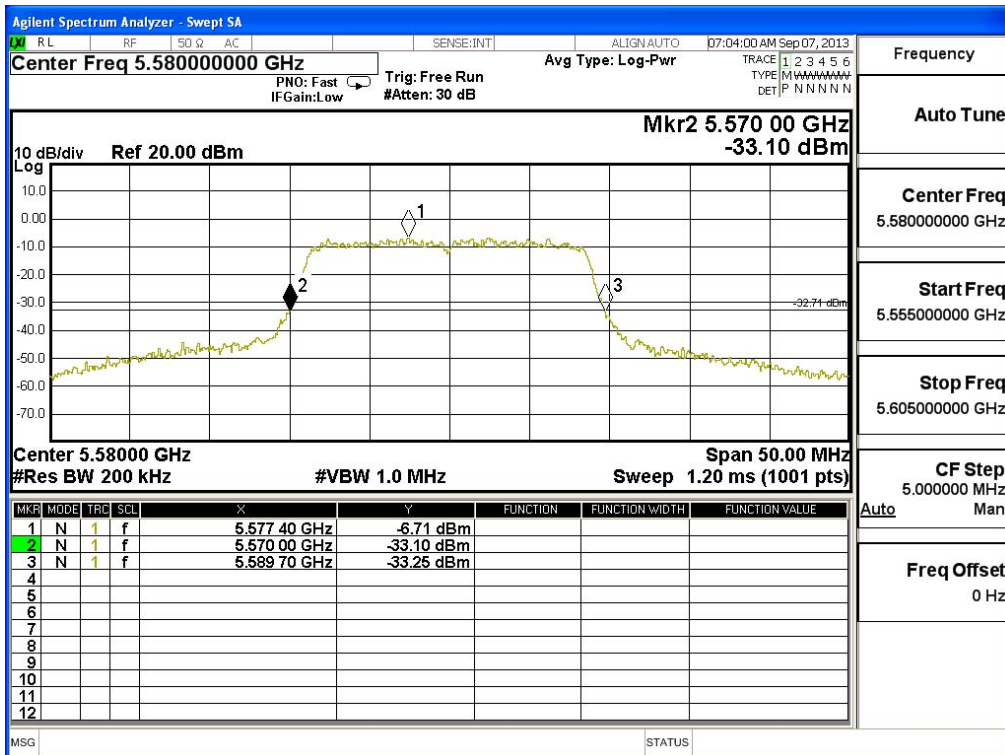
Channel 64 -Chain A



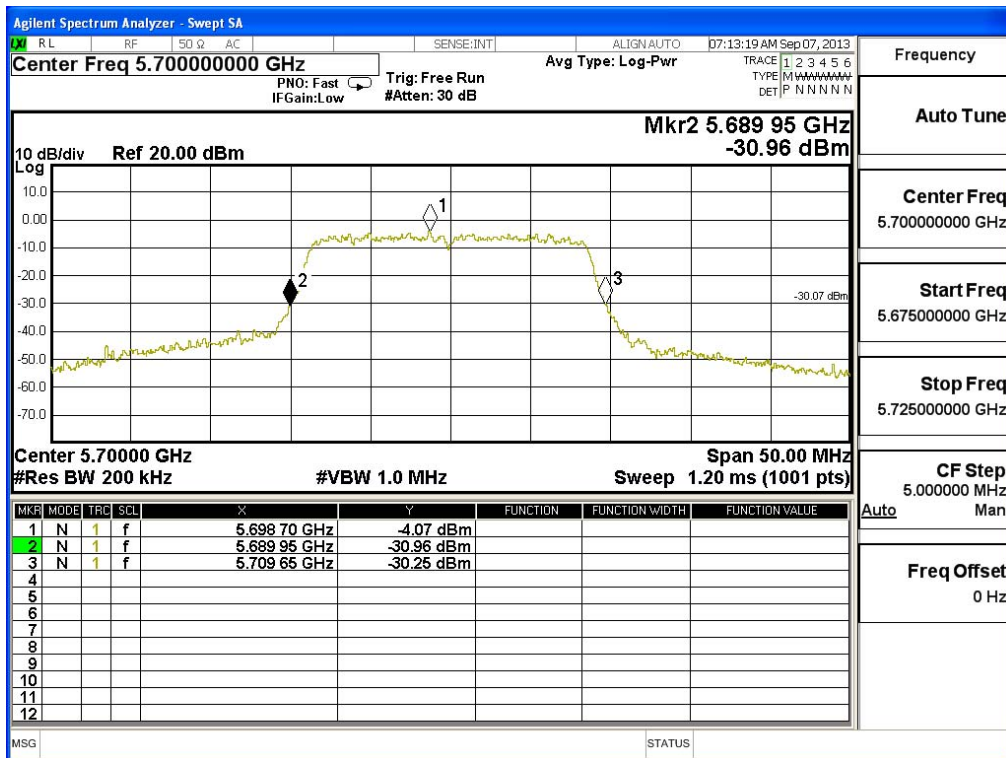
Channel 100 -Chain A



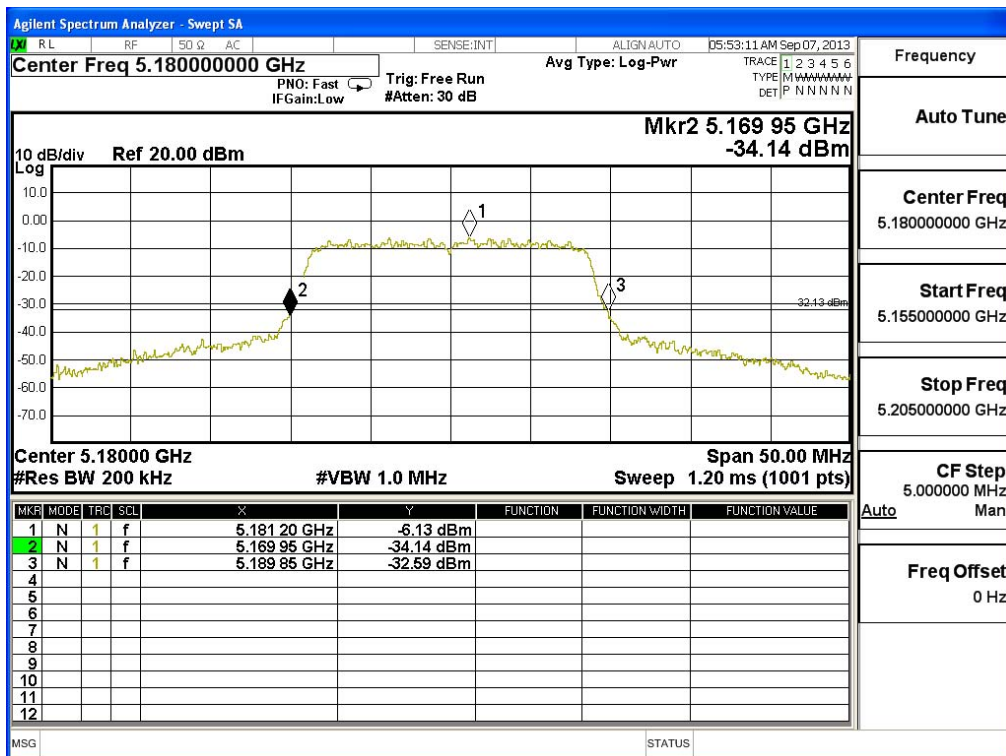
Channel 116 -Chain A



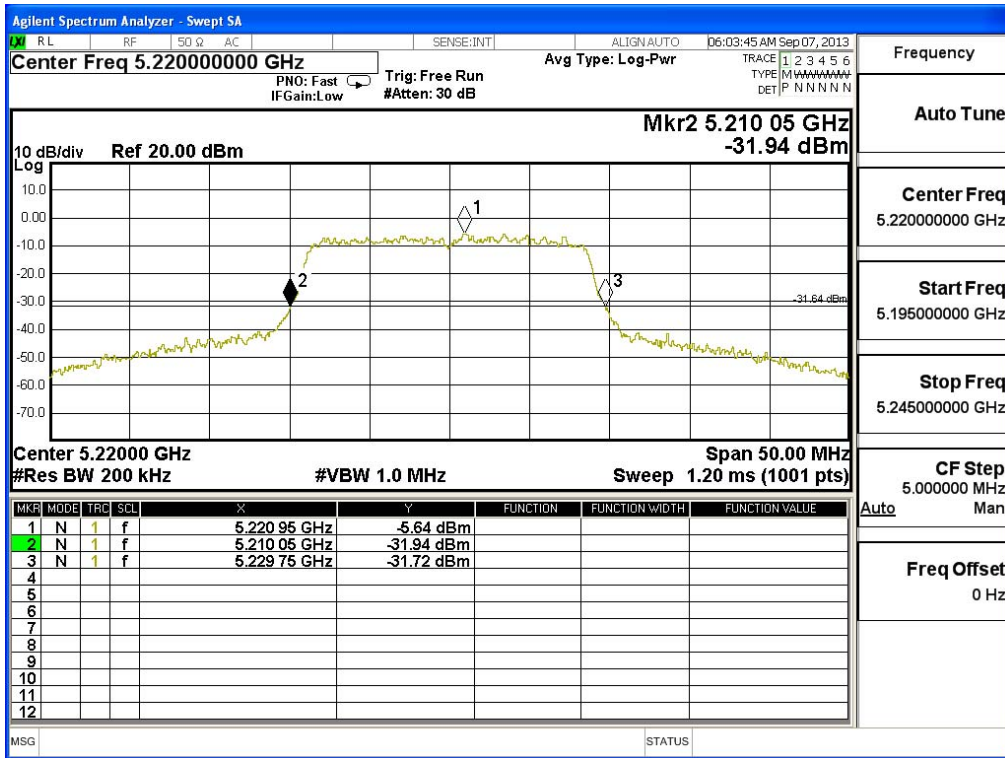
Channel 140 -Chain A



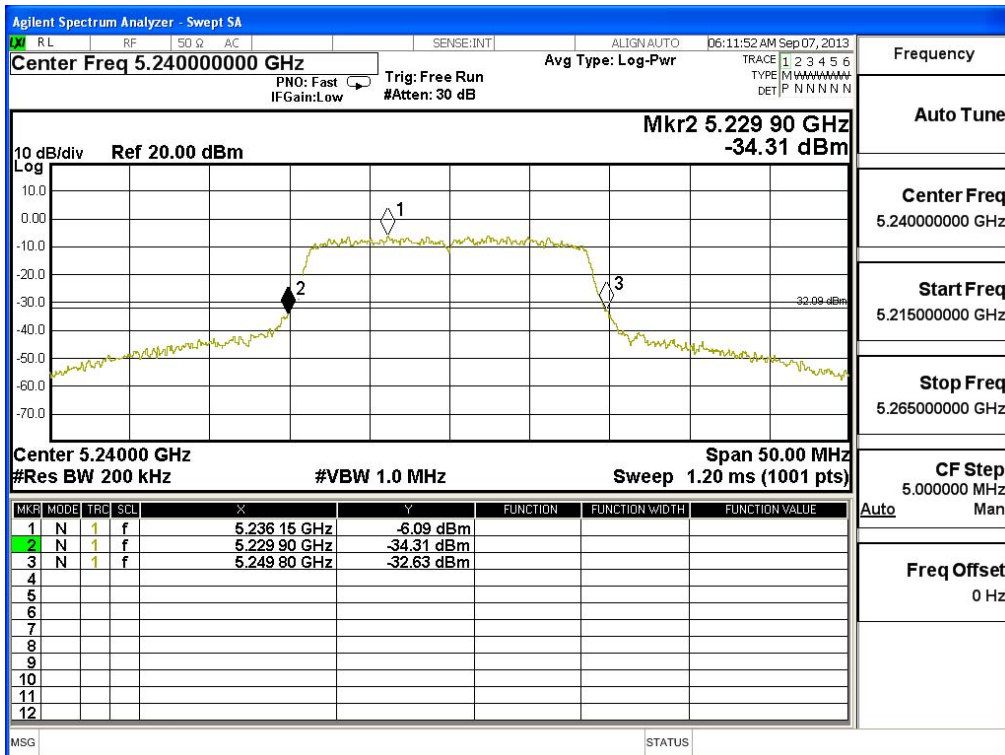
Channel 36 -Chain B



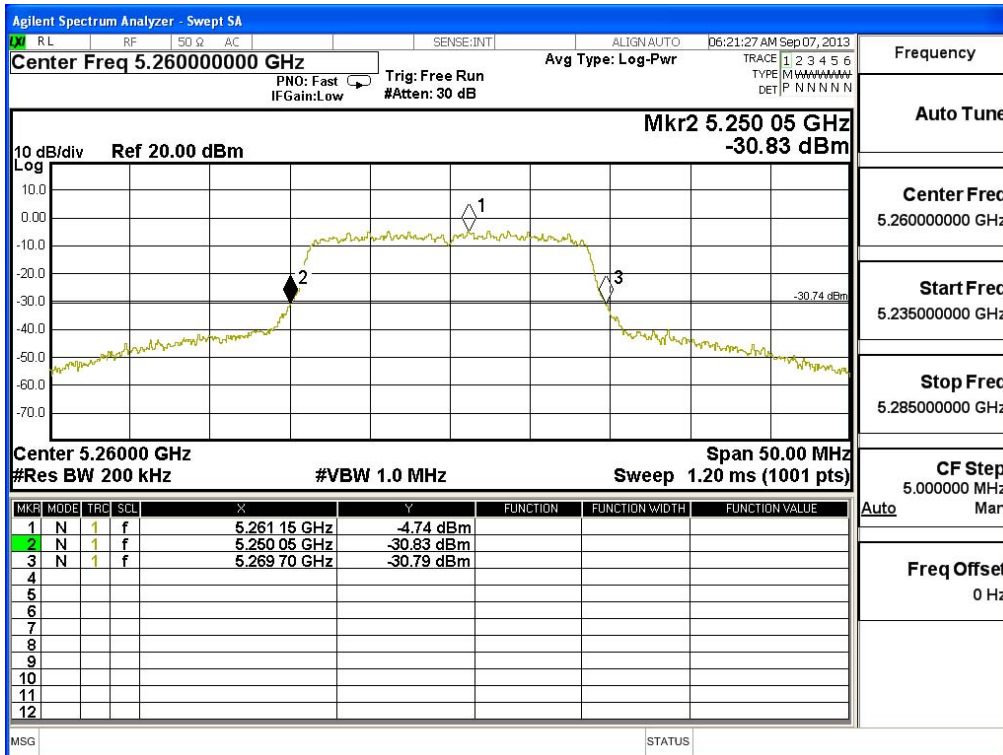
Channel 44 -Chain B



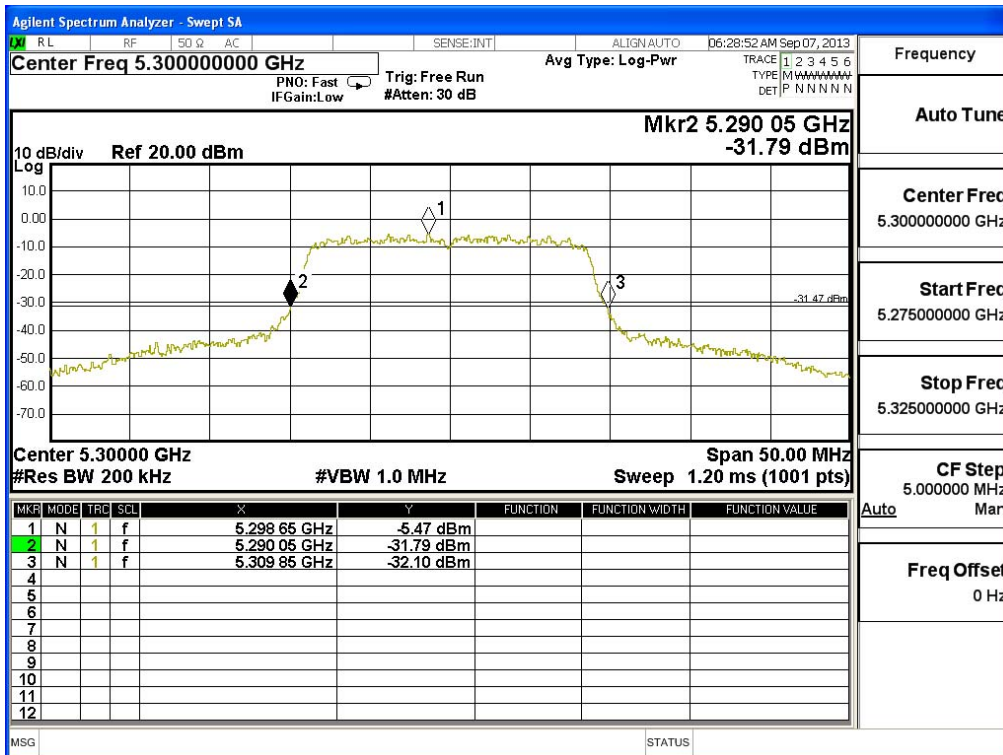
Channel 48 -Chain B



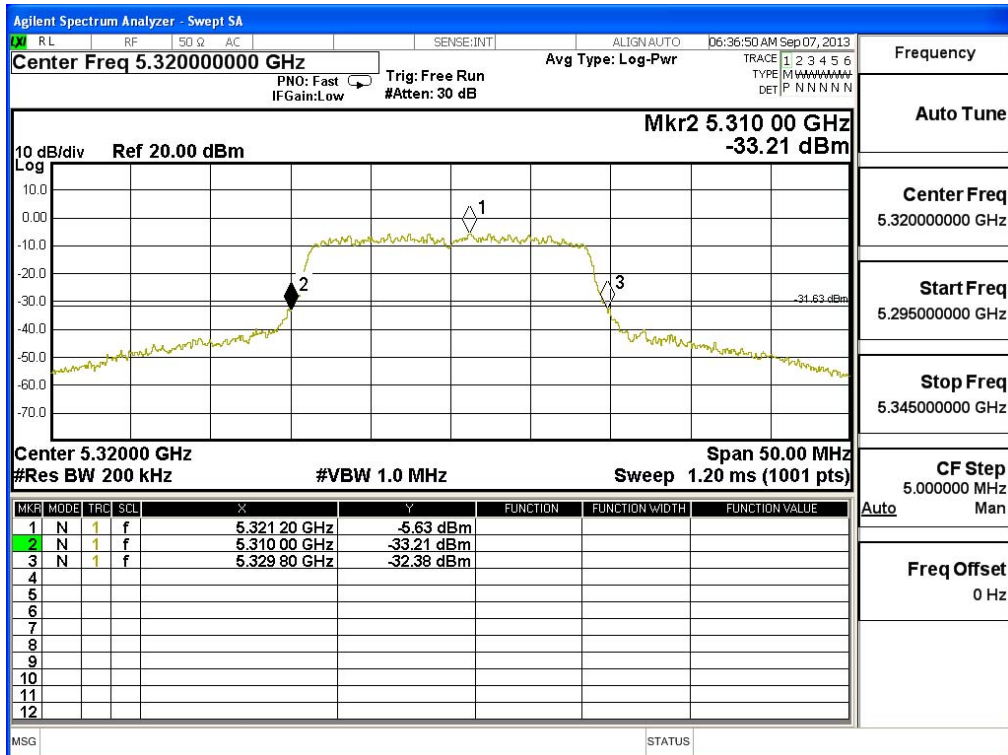
Channel 52 -Chain B



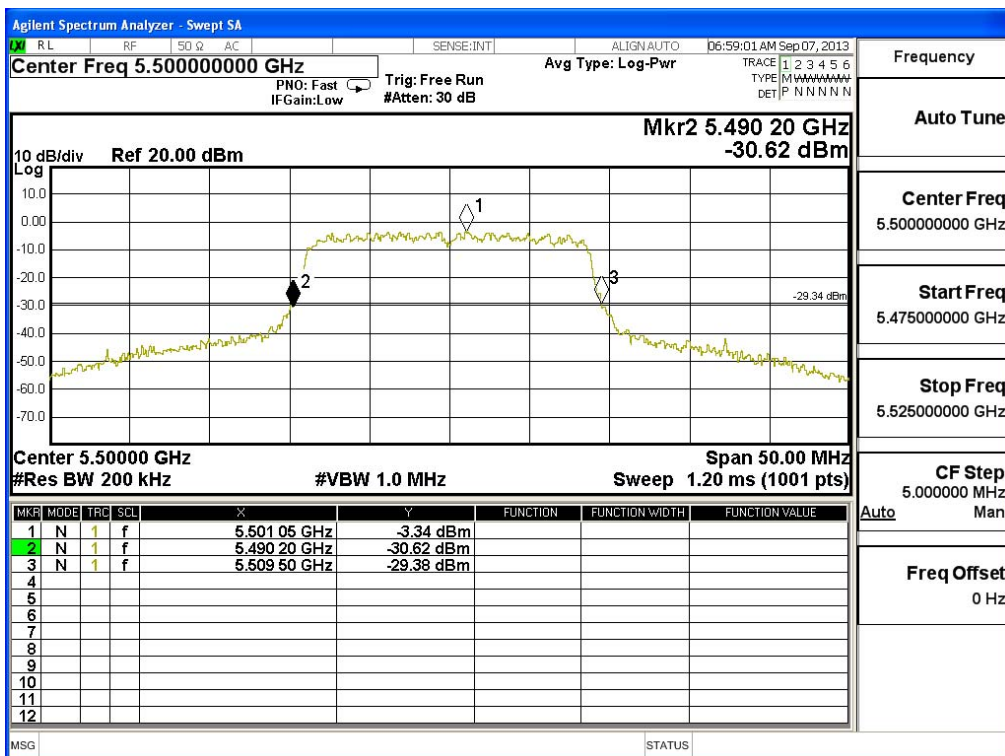
Channel 60 -Chain B



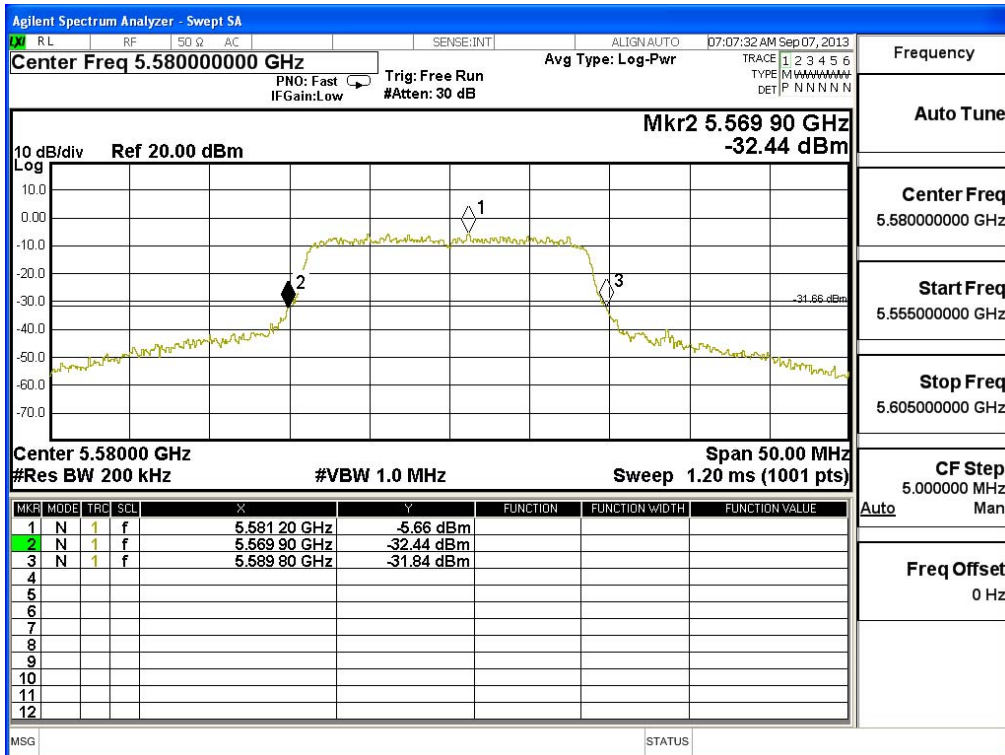
Channel 64 -Chain B



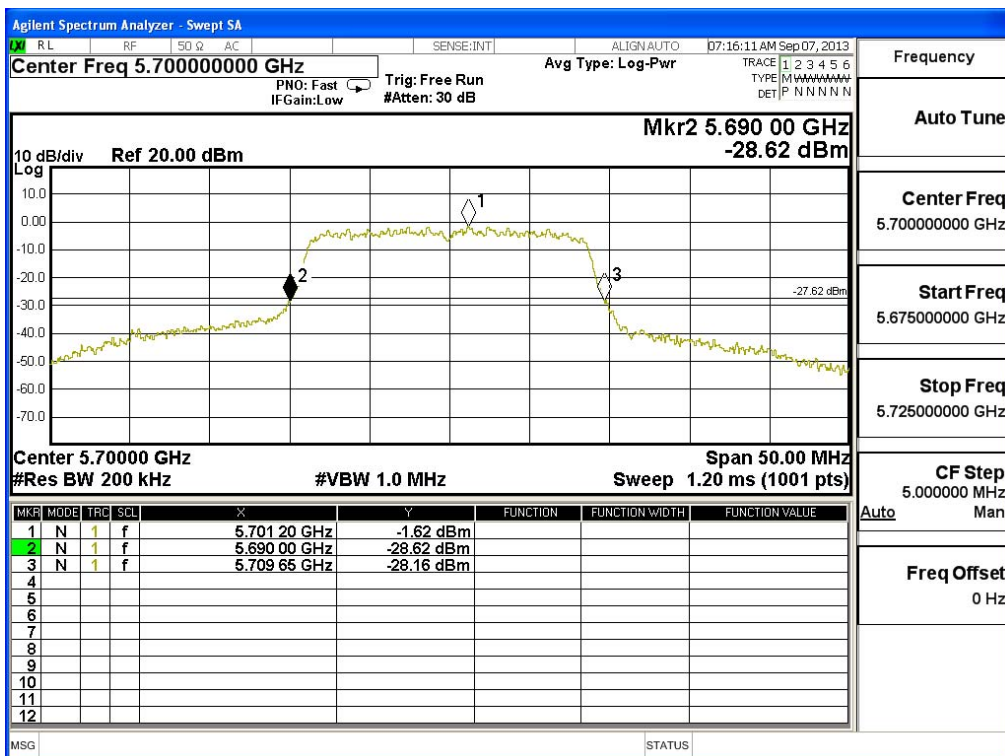
Channel 100 -Chain B



Channel 116 -Chain B



Channel 140 -Chain B



Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)

CHAIN A

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		30	60	90	120	180	240	270	300	
		Measurement Level (dBm)								
38	5190	12.29	--	--	--	--	--	--	--	<16.86dBm
46	5230	13.88	13.79	13.7	13.61	13.52	13.43	13.34	13.25	<16.86dBm
54	5270	14.05	--	--	--	--	--	--	--	<23.68dBm
62	5310	14.33	14.28	14.23	14.18	14.13	14.08	14.03	13.98	<23.68dBm
102	5510	14.19	--	--	--	--	--	--	--	<24dBm
110	5550	14.08	13.91	13.74	13.57	13.4	13.23	13.06	12.89	<24dBm
134	5670	13.88	--	--	--	--	--	--	--	<24dBm

Note: 1.Maximum conducted output power Value =Reading value on average power meter + cable loss

2.The peak antenna gain exceeds 6 dBi that therefore the limit needs to reduce.

CHAIN B

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		30	60	90	120	180	240	270	300	
		Measurement Level (dBm)								
38	5190	12.55	--	--	--	--	--	--	--	<16.86dBm
46	5230	13.61	13.57	13.53	13.49	13.45	13.41	13.37	13.33	<16.86dBm
54	5270	13.98	--	--	--	--	--	--	--	<23.68dBm
62	5310	13.68	13.57	13.46	13.35	13.24	13.13	13.02	12.91	<23.68dBm
102	5510	13.88	--	--	--	--	--	--	--	<24dBm
110	5550	13.78	13.65	13.52	13.39	13.26	13.13	13	12.87	<24dBm
134	5670	14.10	--	--	--	--	--	--	--	<24dBm

Note: 1.Maximum conducted output power Value =Reading value on average power meter + cable loss

2.The peak antenna gain exceeds 6 dBi that therefore the limit needs to reduce.

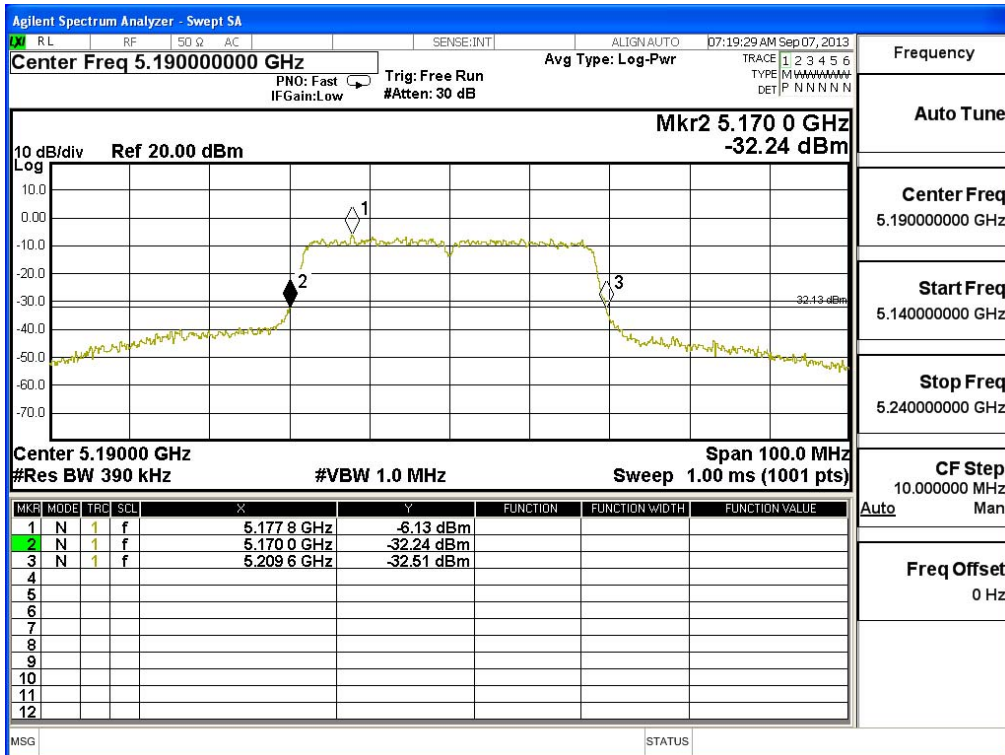
Maximum conducted output power Measurement:
CHAIN A+B

Channel Number	Frequency (MHz)	26dB Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit	
						(dBm)	dBm+10log(BW)
38	5190	39.600	12.29	12.55	15.43	16.86	19.84
46	5230	39.600	13.88	13.61	16.76	16.86	19.84
54	5270	39.600	14.05	13.98	17.03	23.68	26.66
62	5310	39.400	14.33	13.68	17.03	23.68	26.63
102	5510	39.600	14.19	13.88	17.05	24	26.98
110	5550	39.500	14.08	13.78	16.94	24	26.97
134	5670	39.500	13.88	14.10	17.00	24	26.97

Note:

1. Power Output Value = Reading value on average power meter + cable loss
2. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))
3. 26 dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.
4. The peak antenna gain exceeds 6 dBi that therefore the limit needs to reduce.

26dBc Occupied Bandwidth: Channel 38 – Chain A



Channel 46 – Chain A

