

FCC Test Report

(Class II Permissive Change)

Product Name	INTEL DUAL BAND WIRELESS-AC 7265
Model No	7265NGW
FCC ID	MSQ7265NG

Applicant	ASUSTeK COMPUTER INC.
Address	4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

Date of Receipt	Jan. 21, 2015
Issued Date	March 24, 2015
Report No.	1510451R-RFUSP29V00
Report Version	V1.0



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

Issued Date: March 24, 2015

Report No.: 1510451R-RFUSP29V00



Product Name	INTEL DUAL BAND WIRELESS-AC 7265
Applicant	ASUSTeK COMPUTER INC.
Address	4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan
Manufacturer	Intel Mobile Communications
Model No.	7265NGW
FCC ID.	MSQ7265NG
EUT Rated Voltage	DC 3.3V (via Mini-PCI Express slot)
EUT Test Voltage	AC 120V/60Hz
Trade Name	Intel
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2013 ANSI C63.10: 2013, KDB 789033 D01 General UNII Test Procedures v01r04
Test Result	Complied

Documented By :

Rita Huang

(Senior Adm. Specialist / Rita Huang)

Tested By :

Eason chen

(Engineer / Eason Chen)

Approved By :

Vincent Lin

(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	INTEL DUAL BAND WIRELESS-AC 7265
Trade Name	Intel
FCC ID.	MSQ7265NG
Model No.	7265NGW
Frequency Range	802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz 802.11n-40MHz: 5190-5310, 5510-5670MHz 802.11ac-20MHz: 5720, 802.11ac-40MHz: 5710 802.11ac-80MHz: 5210-5290MHz, 5530-5690MHz
Number of Channels	802.11a/n-20MHz: 19; 802.11n-40MHz: 9 802.11ac-20MHz: 1, 802.11ac-40MHz: 1, 802.11ac-80MHz: 5
Data Rate	802.11a: 6 - 54Mbps 802.11n: up to 300Mbps 802.11ac-80MHz: up to 866.7MHz
Channel Control	Auto
Type of Modulation	802.11a/n/ac:OFDM, BPSK, QPSK, 16QAM, 64QAM, 256QAM
Antenna Type	PIFA Antenna
Antenna Gain	Refer to the table "Antenna List"
Test Platform.(Notebook PC)	Brand Name: ASUS, M/N: UX305F
Power Adapter	MFR: DELTA, M/N: ADP-45AW B Input: AC 100-240V, 50-60Hz 1.2A Output: DC 19V, 2.37A Cable out: Non-Shielded, 2.2m.

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	INPAQ	WA-F-LBLB-02-005 (Main) WA-F-LBLB-02-005 (Aux)	PIFA Antenna	0.25dBi For 5.15~5.25GHz 1.94dBi For 5.25~5.35GHz 0.92dBi For 5.47~5.725GHz 0.63dBi For 5725-5825GHz
2	TONGDA	T-543-3010300-A (Main) T-543-3010300-A (Aux)	PIFA Antenna	1.55dBi For 5.15~5.25GHz 1.12dBi For 5.25~5.35GHz 1.00dBi For 5.47~5.725GHz 1.74dBi For 5725-5825GHz

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						

802.11ac-20MHz Carrier Frequency of Each Channel:

Channel	Frequency
Channel 144:	5720 MHz

802.11ac-40MHz Carrier Frequency of Each Channel:

Channel	Frequency
Channel 142:	5710 MHz

802.11ac-80MHz Carrier Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 42:	5210 MHz	Channel 58:	5290 MHz	Channel 106:	5530 MHz	Channel 122:	5610 MHz
Channel 138:	5690 MHz						

Note:

1. This device is a INTEL DUAL BAND WIRELESS–AC 7265, Contains functions and so on WLAN 、 Bluetooth , This report for 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 、 802.11ac(20M-BW) is 14.4Mbps and 802.11ac(40M-BW) is 30Mbps 、 802.11ac(80M-BW) is 65Mbps).
4. 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.
5. This is to request a Class II permissive change for FCC ID: MSQ7265NG, originally granted on 10/20/2014.

The major change filed under this application is:

Change #1: Additional Chassis added, Model number: UX305F

#2: Reduce the Output Power through firmware (only reduce Wi-Fi Power, bluetooth power haven't changes).

#3: Addition two new antennas, the antenna type is the same, the antenna gain is higher than the original application.

Test Mode	Mode 1: Transmit (802.11a-6Mbps) Mode 2: Transmit (802.11n-20BW 14.4Mbps) Mode 3: Transmit (802.11n-40BW 30Mbps) Mode 4: Transmit (802.11ac-20BW) Mode 5: Transmit (802.11ac-40BW) Mode 6: Transmit (802.11ac-80BW)
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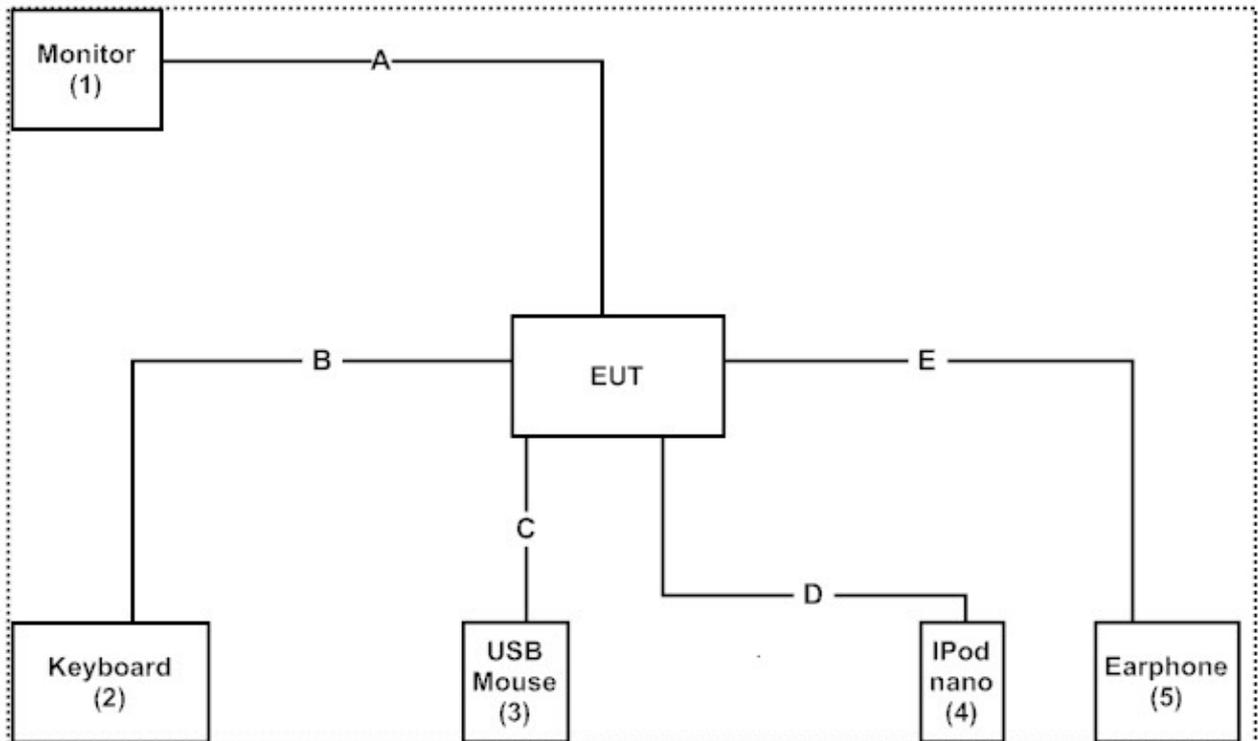
1.3. Tested System Details

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 Monitor	Dell	ST2320L	N/A	Non-Shielded, 1.8m
2 Keyboard	Logitech	Y-U0009	LZ027HU	N/A
3 USB Mouse	Logitech	M-BE58	LZE20852002	N/A
4 iPod nano	Apple	A1199	7R649LBKVQ5	N/A
5 Earphone	AIWA	N/A	N/A	N/A

Signal Cable Type	Signal cable Description
A HDMI Cable	Non-Shielded, 1.8m
B Keyboard Cable	Shielded, 1.8m
C Mouse Cable	Shielded, 1.8m
D USB Cable	Shielded, 1.2m
E Earphone Cable	Non-Shielded, 1.2m

1.4. Configuration of tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute "DRTU V1.7.3-895" program on the Notebook PC.
- (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
 24451, Taiwan, R.O.C.
 TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
 E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

2. Maximun conducted output power

2.1. Test Equipment

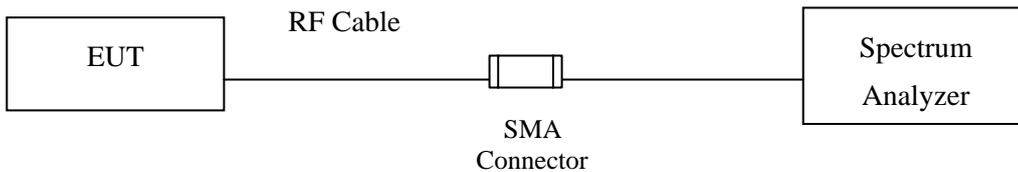
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2014
X	Power Sensor	Anritsu	MA2411B/0738448	Jun., 2014
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2014

Note:

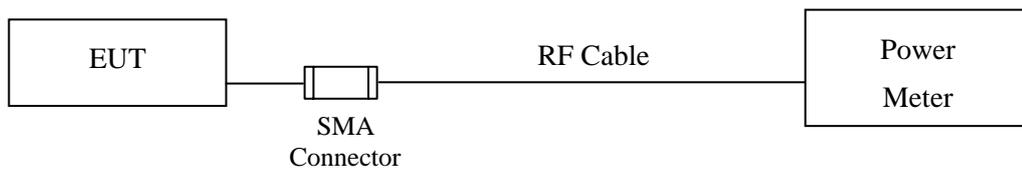
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

2.2. Test Setup

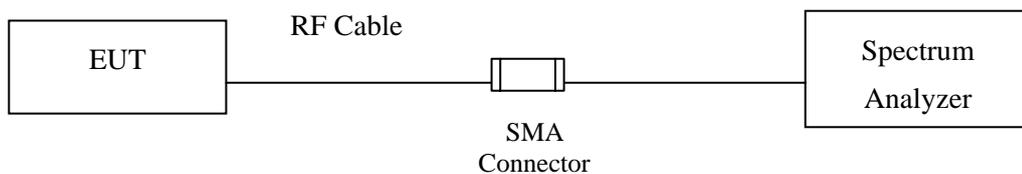
26dBc Occupied Bandwidth



Conduction Power Measurement (for 802.11a)



Conduction Power Measurement (for 802.11ac)



2.3. 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.

2.4. 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.

802.11an (BW \leq 40MHz) Maximum conducted output power using KDB 789033 section E)3)b) Method PM-G (Measurement using a gated RF average power meter)

Note: the power meter have a video bandwidth that is greater than or equal to the measurement bandwidth, (Anritsu/ MA2411B video bandwidth: 65MHz)

802.11ac (BW=80MHz) Maximum conducted output power using KDB 789033 section E)2)b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep).

When transmitted signals consist of two or more non-contiguous spectrum segments (e.g., 80+80 MHz mode) or when a single spectrum segment of a transmission crosses the boundary between two adjacent U-NII bands, KDB 644545 D01 section F) procedure is used for measurements.

2.5. Uncertainty

$\pm 1.27 \text{ dB}$

2.6. Test Result of Maximum conducted output power

Product : INTEL DUAL BAND WIRELESS-AC 7265
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Maximum conducted output power Measurement:

CHAIN A

Channel Number	Frequency (MHz)	Data Rate (Mbps)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
					(dBm)	dBm+10log(BW)
36	5180	6	22.950	12.91	17	17.61
40	5200	6	23.650	11.44	17	17.74
48	5240	6	23.000	11	17	17.62
52	5260	6	22.500	10.77	24	24.52
60	5300	6	23.700	11.46	24	24.75
64	5320	6	23.000	11.5	24	24.62
100	5500	6	23.500	10.76	24	24.71
120	5600	6	22.000	10.18	24	24.42
140	5700	6	22.800	12	24	24.58

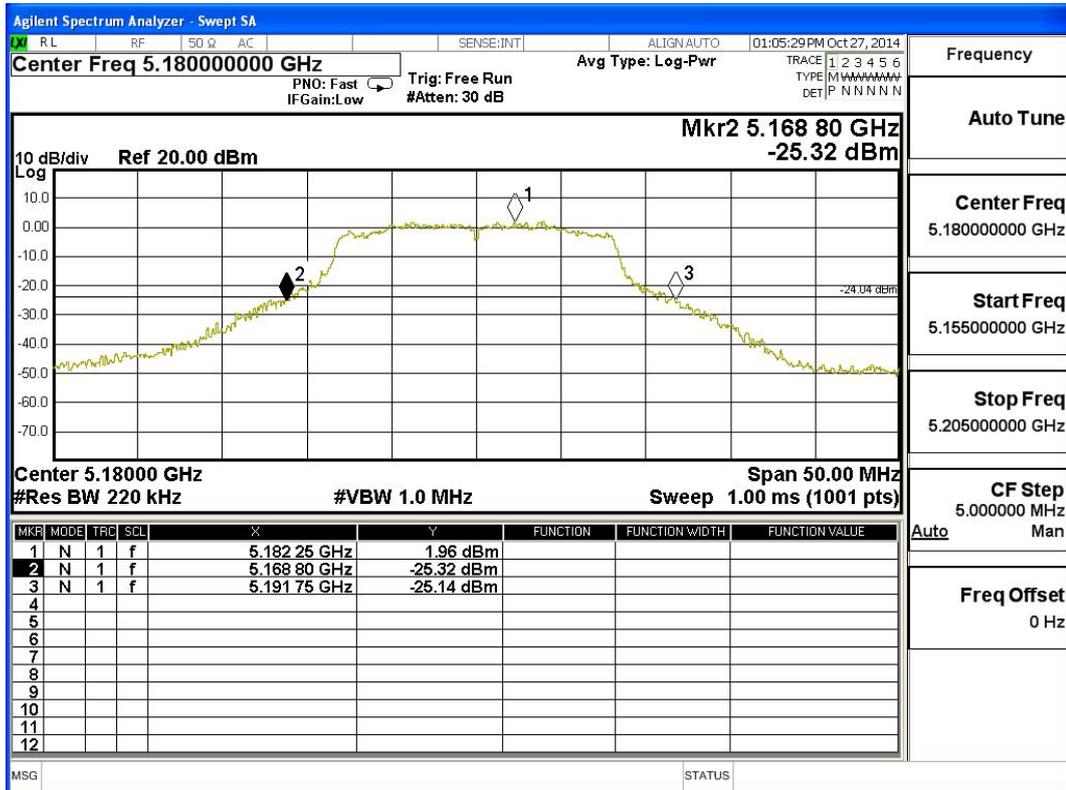
Note: Power Output Value =Reading value on average power meter + cable loss

CHAIN B

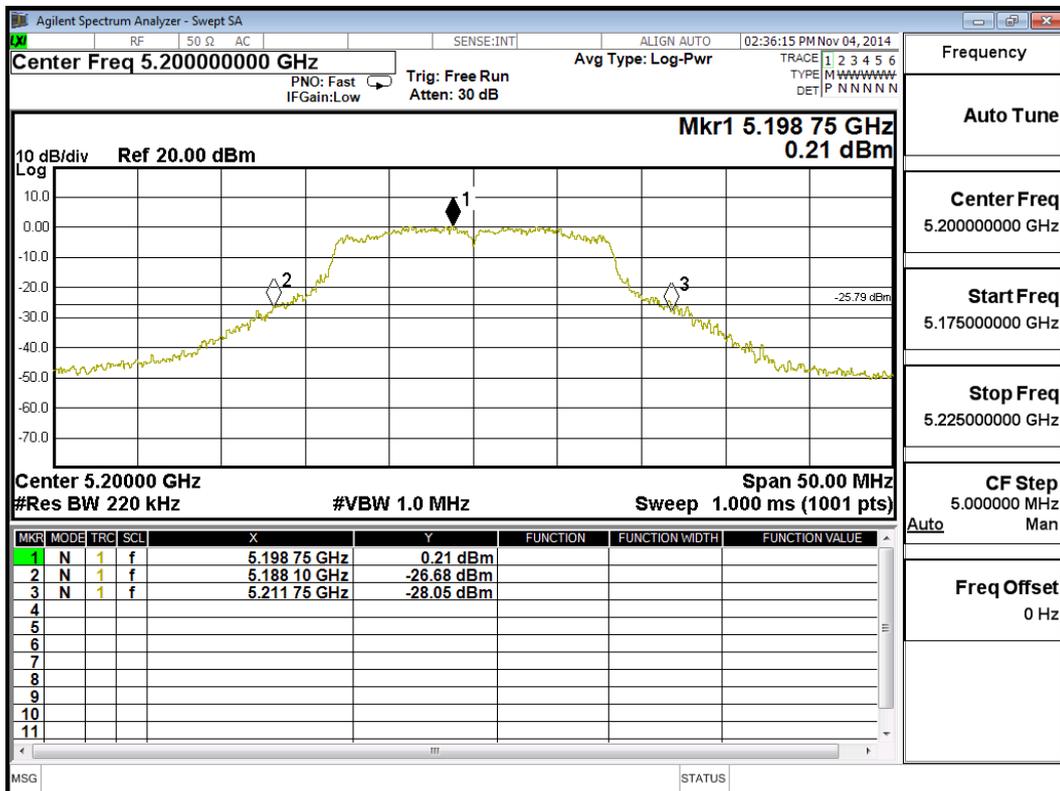
Channel Number	Frequency (MHz)	Data Rate (Mbps)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
					(dBm)	dBm+10log(BW)
36	5180	6	22.750	12.12	17	17.57
40	5200	6	22.300	13	17	17.48
48	5240	6	23.200	12.99	17	17.65
52	5260	6	23.500	12.94	24	24.71
60	5300	6	23.450	11.45	24	24.70
64	5320	6	23.750	11.43	24	24.76
100	5500	6	22.100	11.72	24	24.44
120	5600	6	22.500	12.49	24	24.52
140	5700	6	24.100	12.46	24	24.82

Note: Power Output Value =Reading value on average power meter + cable loss

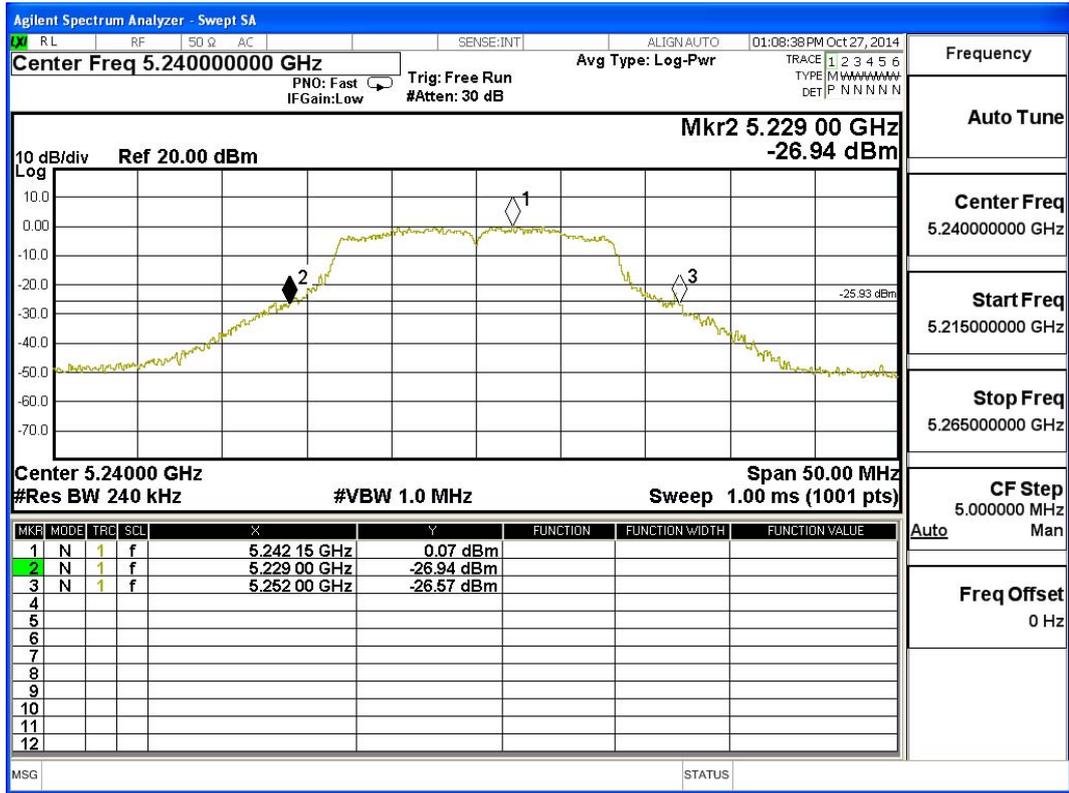
26dB Occupied Bandwidth:
Channel 36 -Chain A



Channel 40 -Chain A

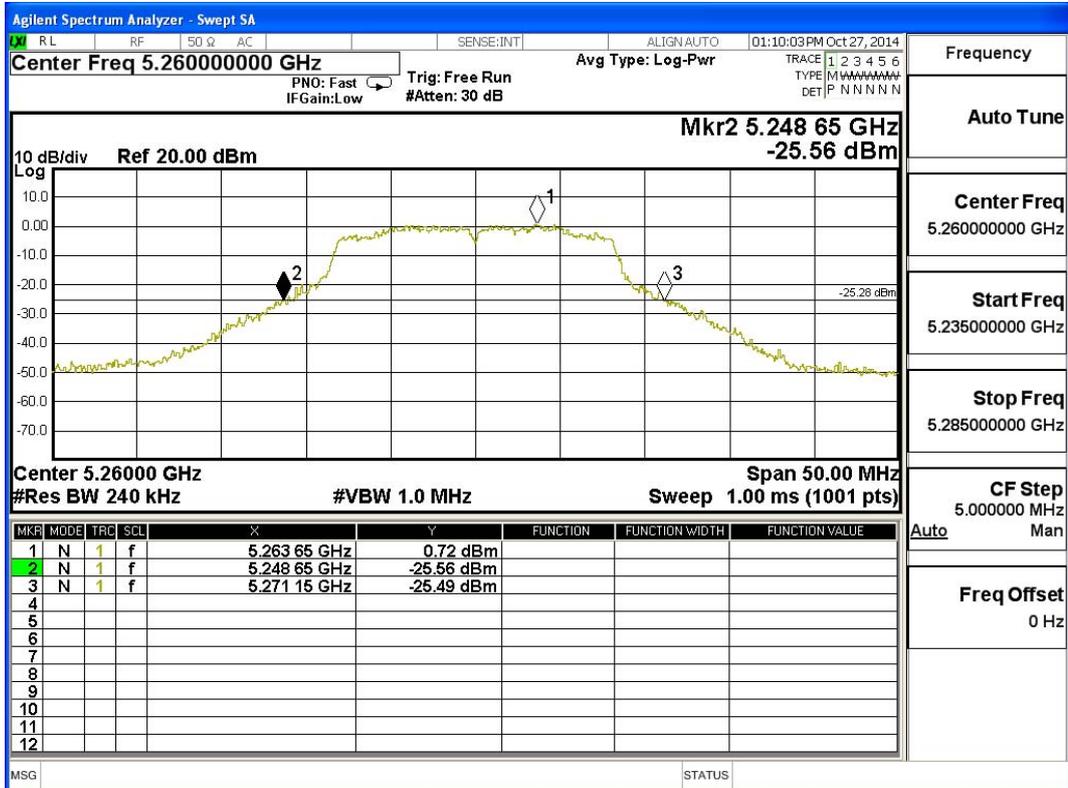


Channel 48 -Chain A



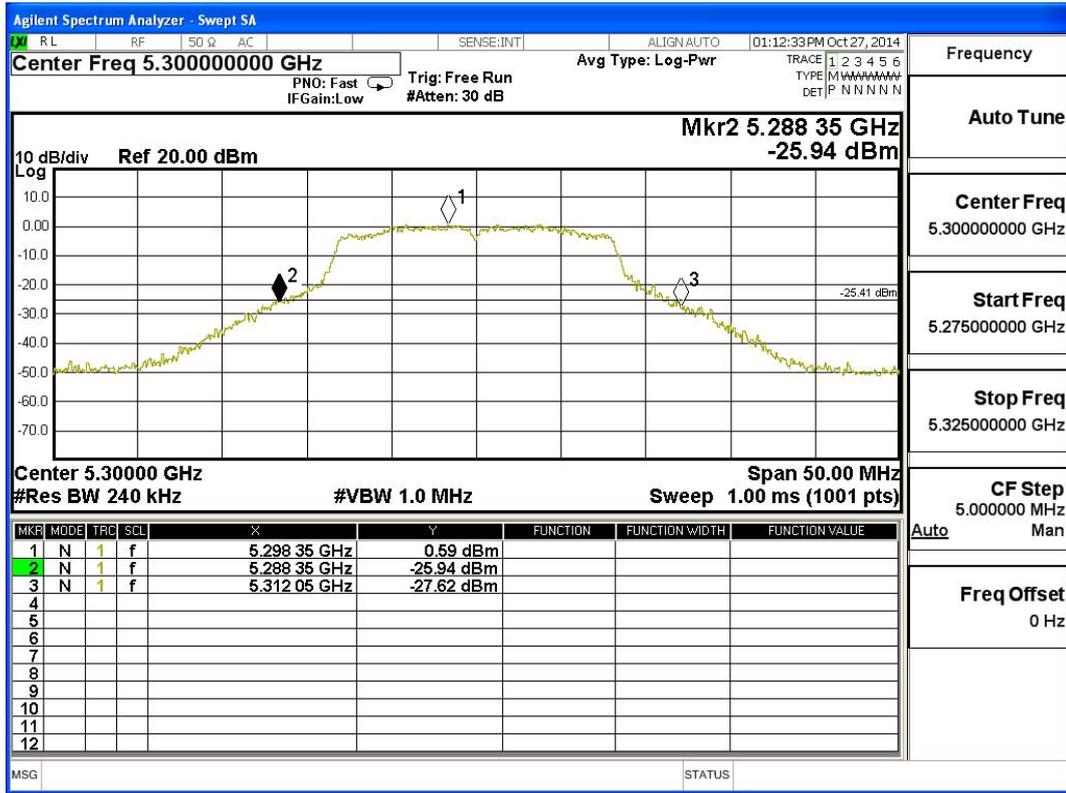
Frequency	
Auto Tune	
Center Freq	5.24000000 GHz
Start Freq	5.21500000 GHz
Stop Freq	5.26500000 GHz
CF Step	5.000000 MHz
Auto	Man
Freq Offset	0 Hz

Channel 52 -Chain A

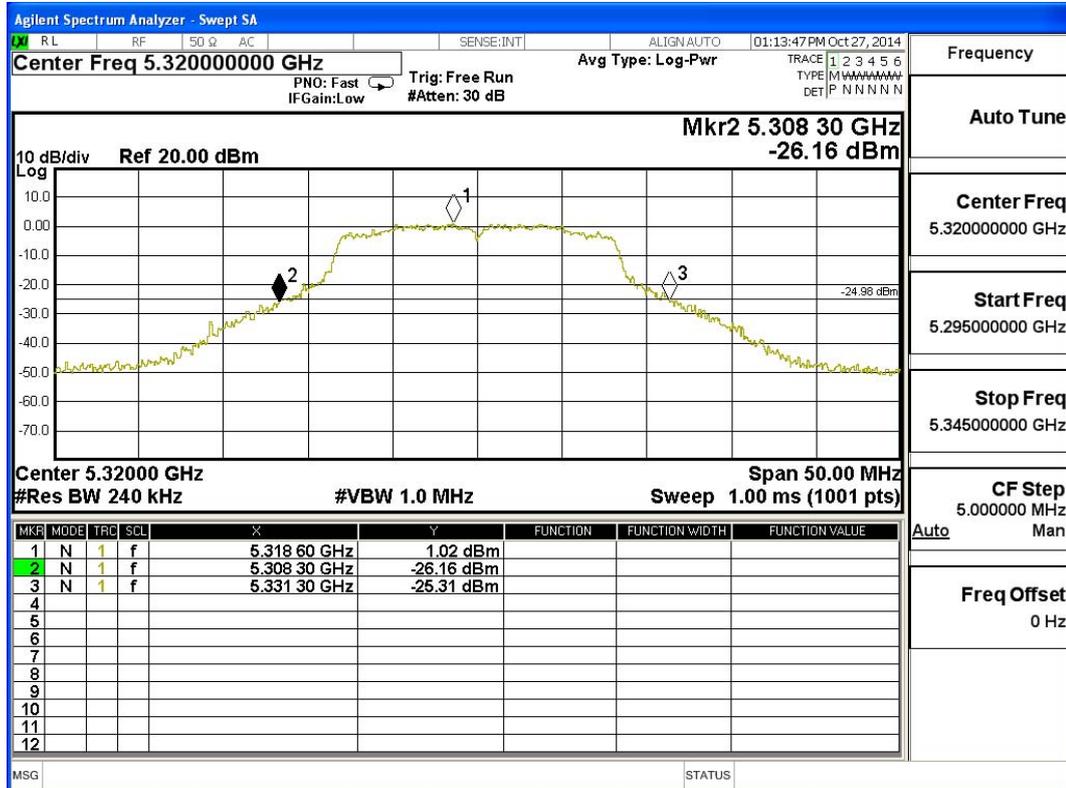


Frequency	
Auto Tune	
Center Freq	5.26000000 GHz
Start Freq	5.23500000 GHz
Stop Freq	5.28500000 GHz
CF Step	5.000000 MHz
Auto	Man
Freq Offset	0 Hz

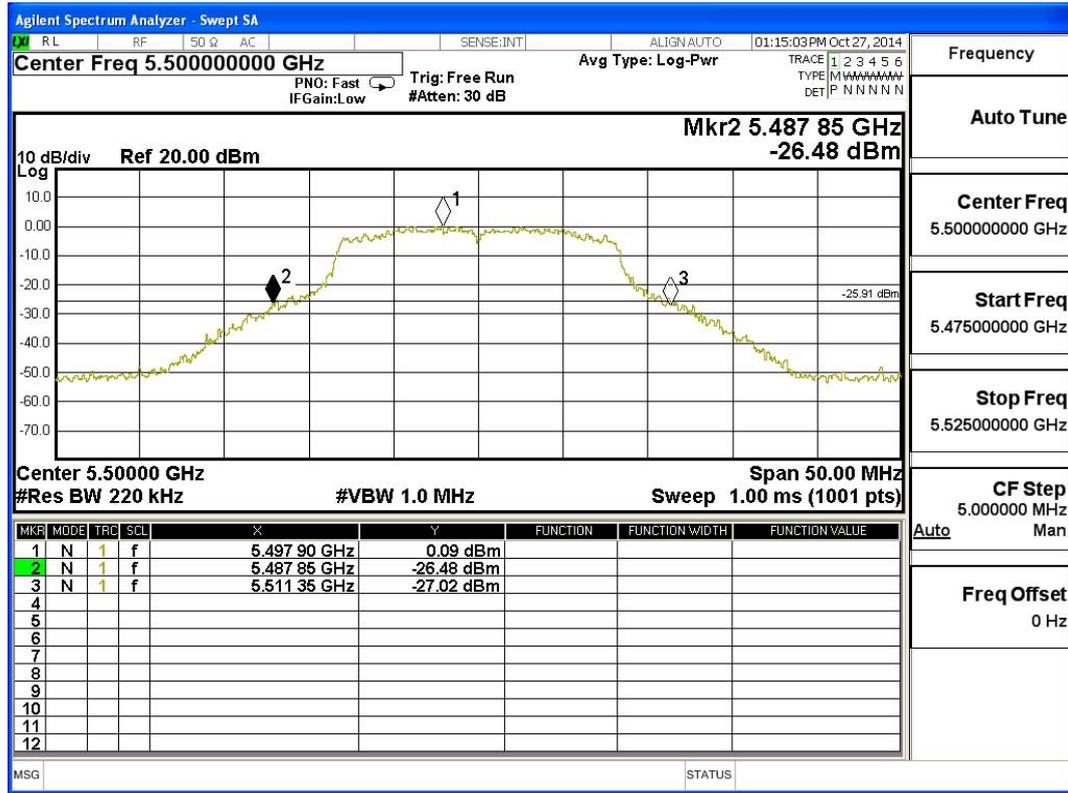
Channel 60 -Chain A



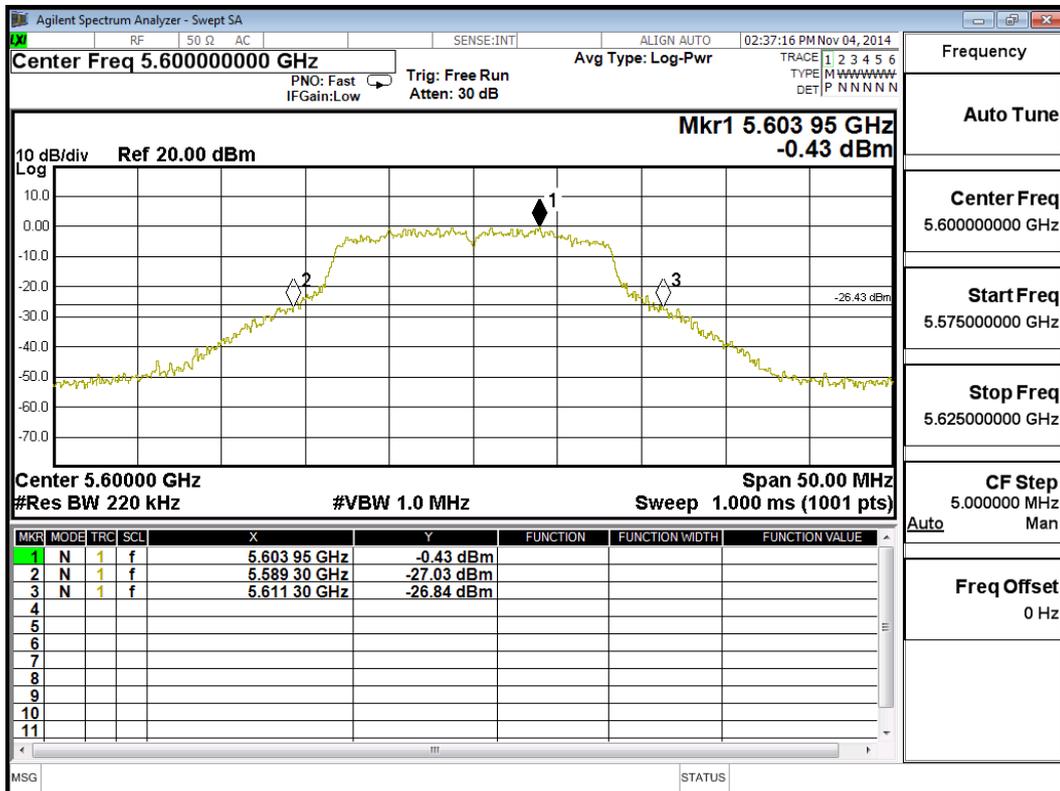
Channel 64 -Chain A



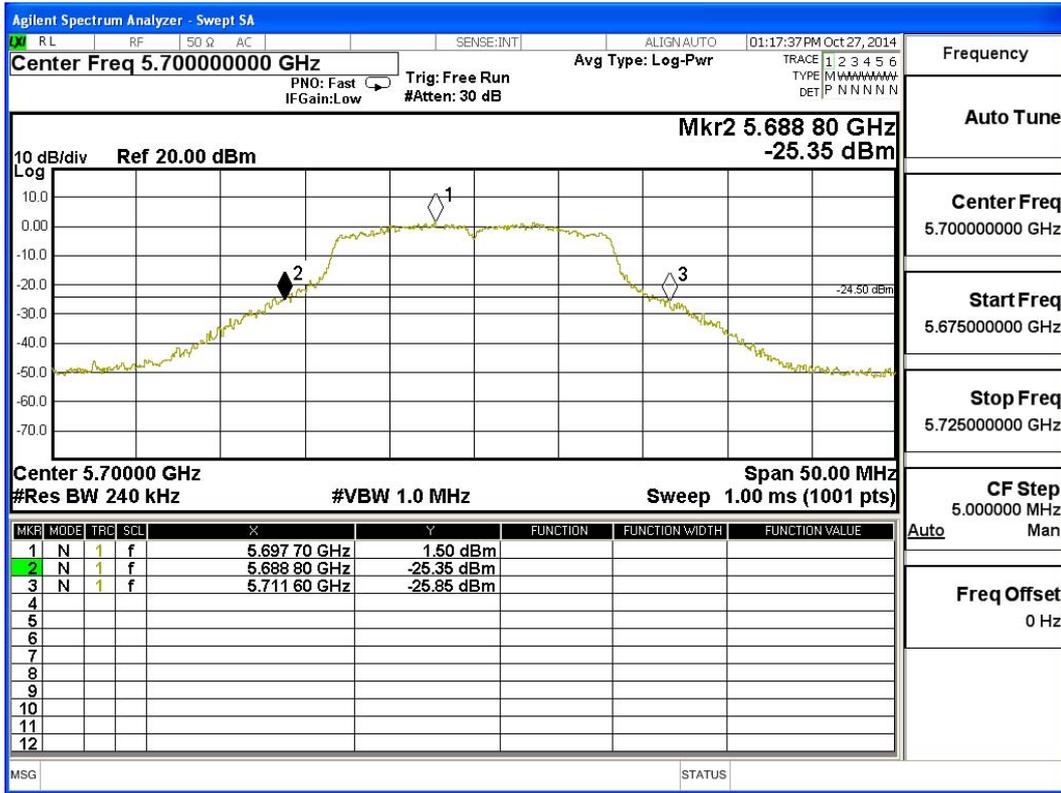
Channel 100 -Chain A



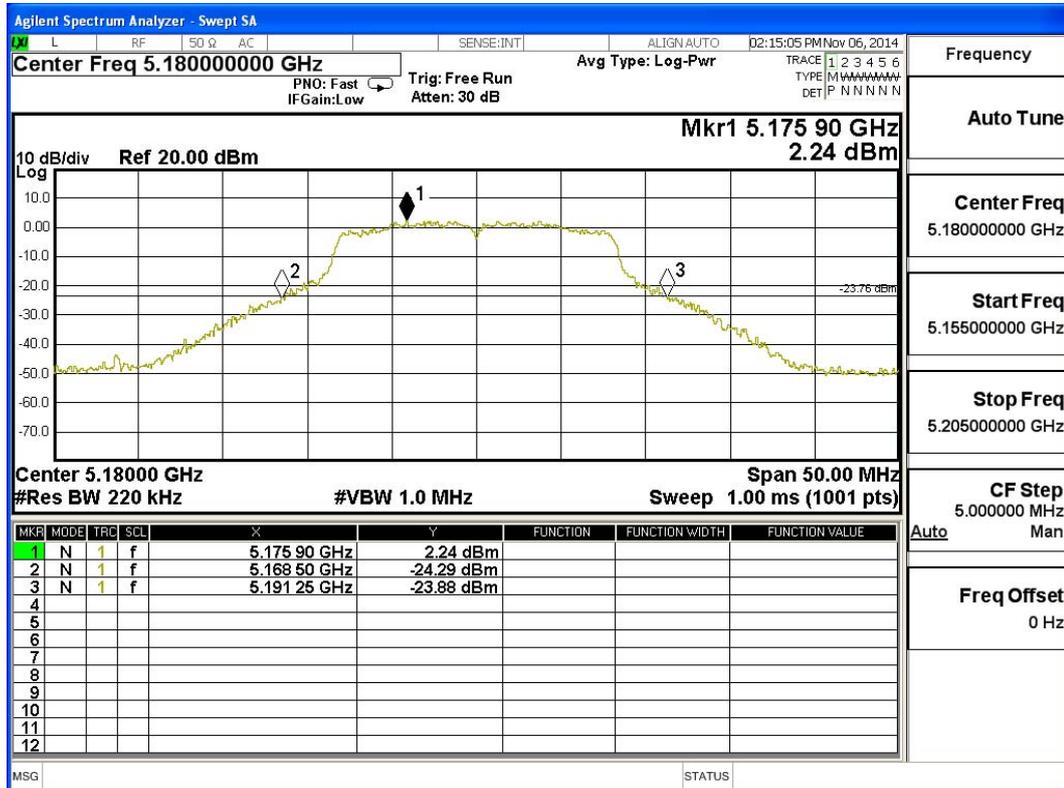
Channel 120 -Chain A



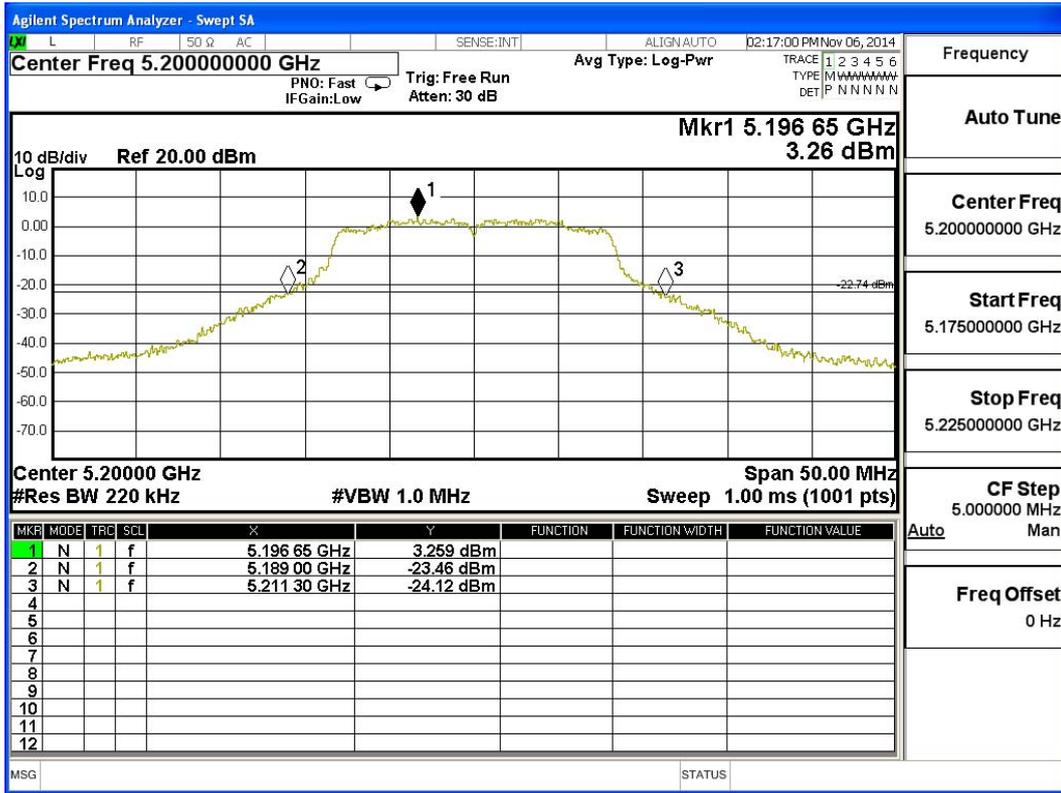
Channel 140 -Chain A



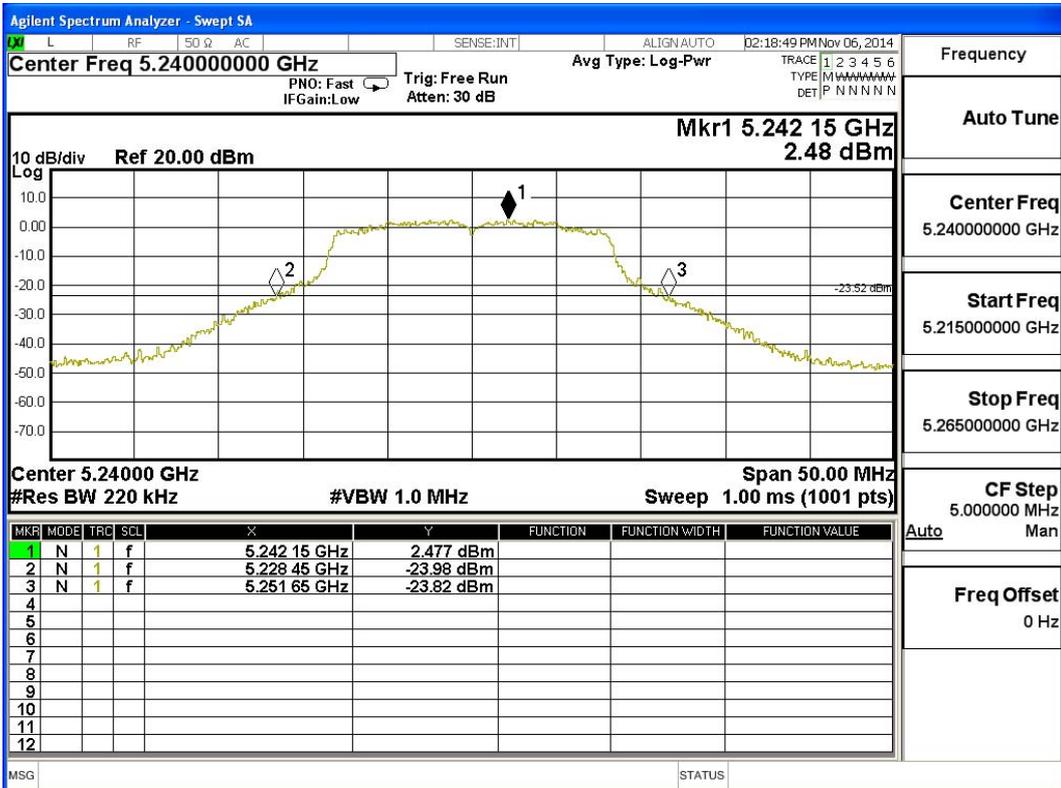
Channel 36 -Chain B



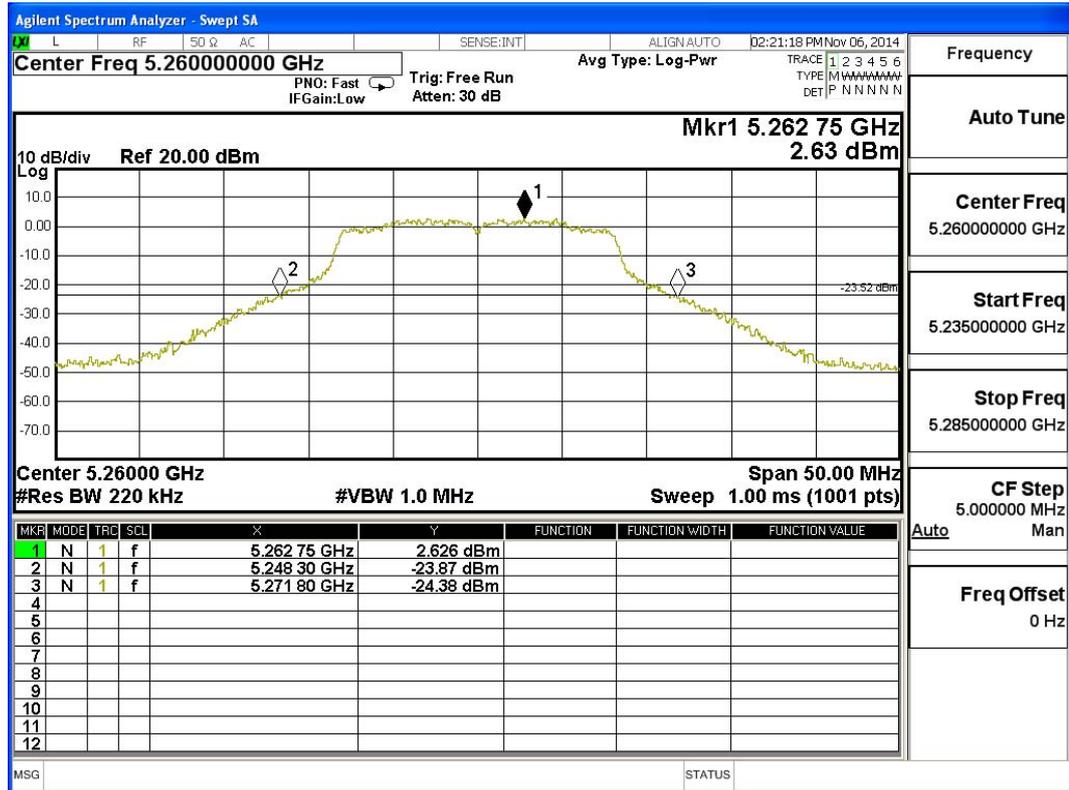
Channel 40 -Chain B



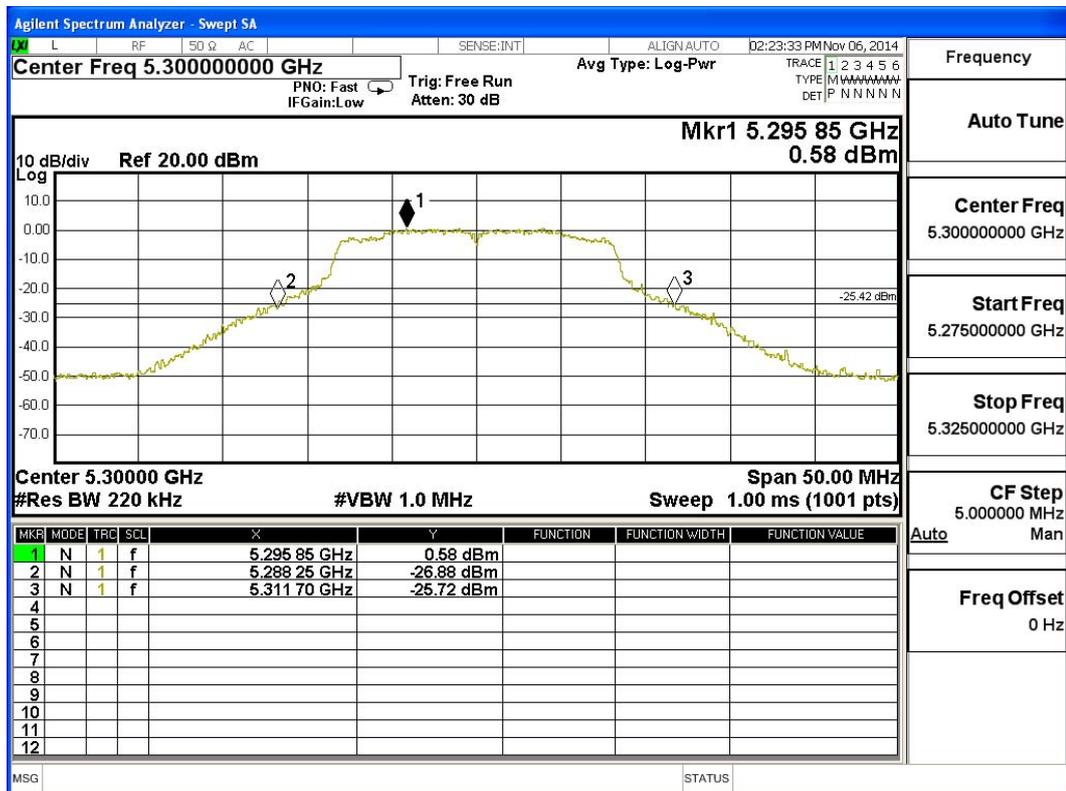
Channel 48 -Chain B



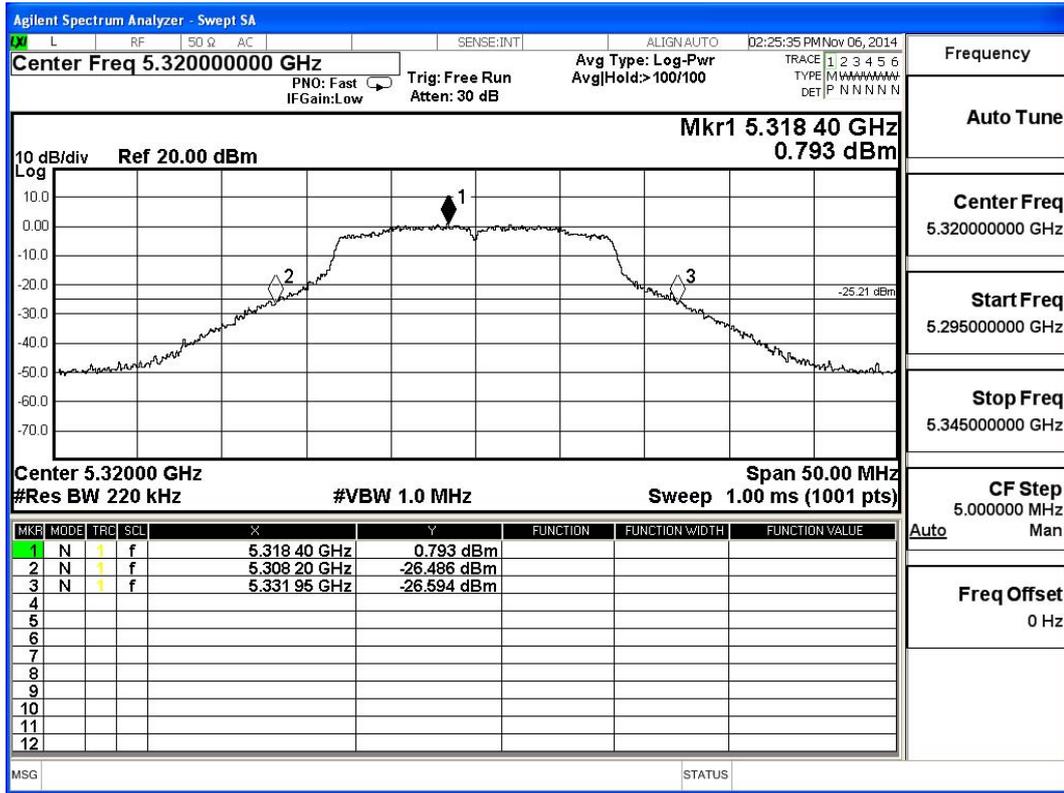
Channel 52-Chain B



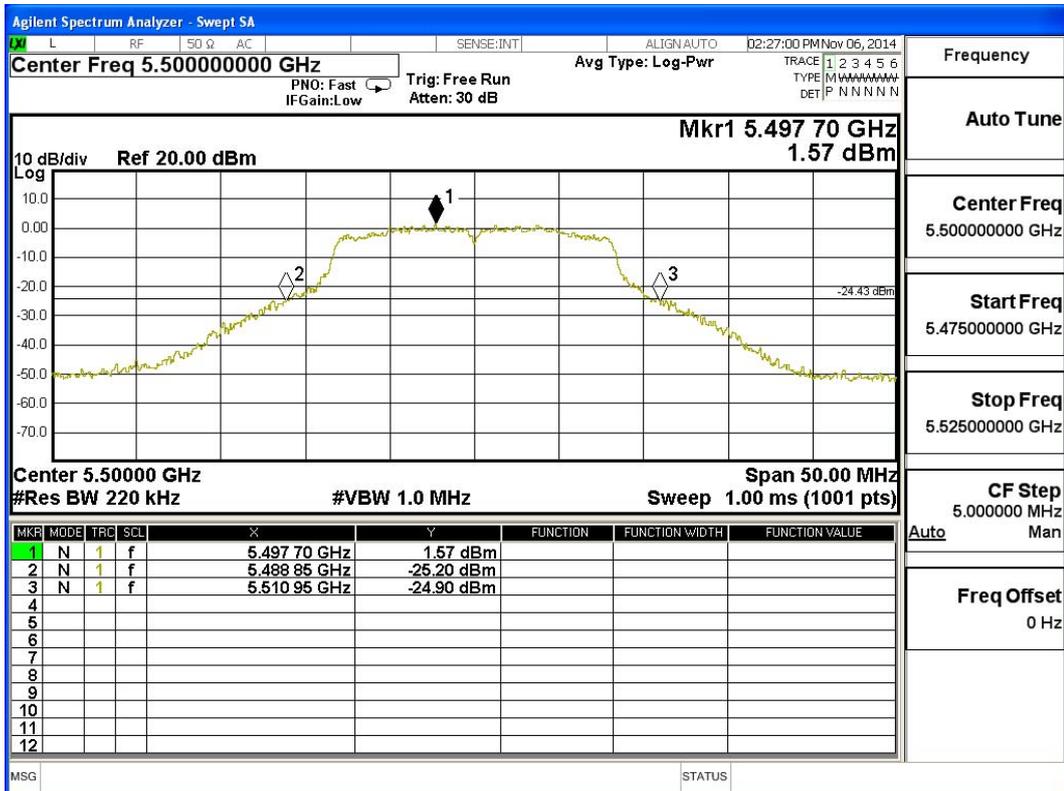
Channel 60 -Chain B



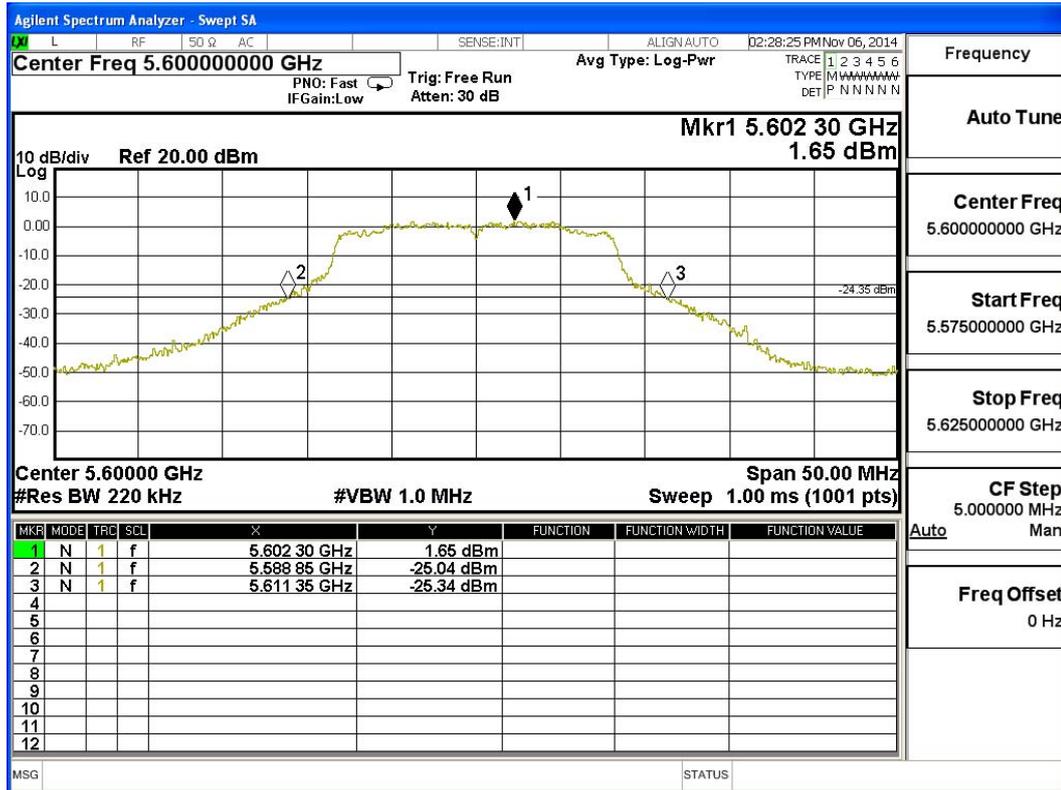
Channel 64 -Chain B



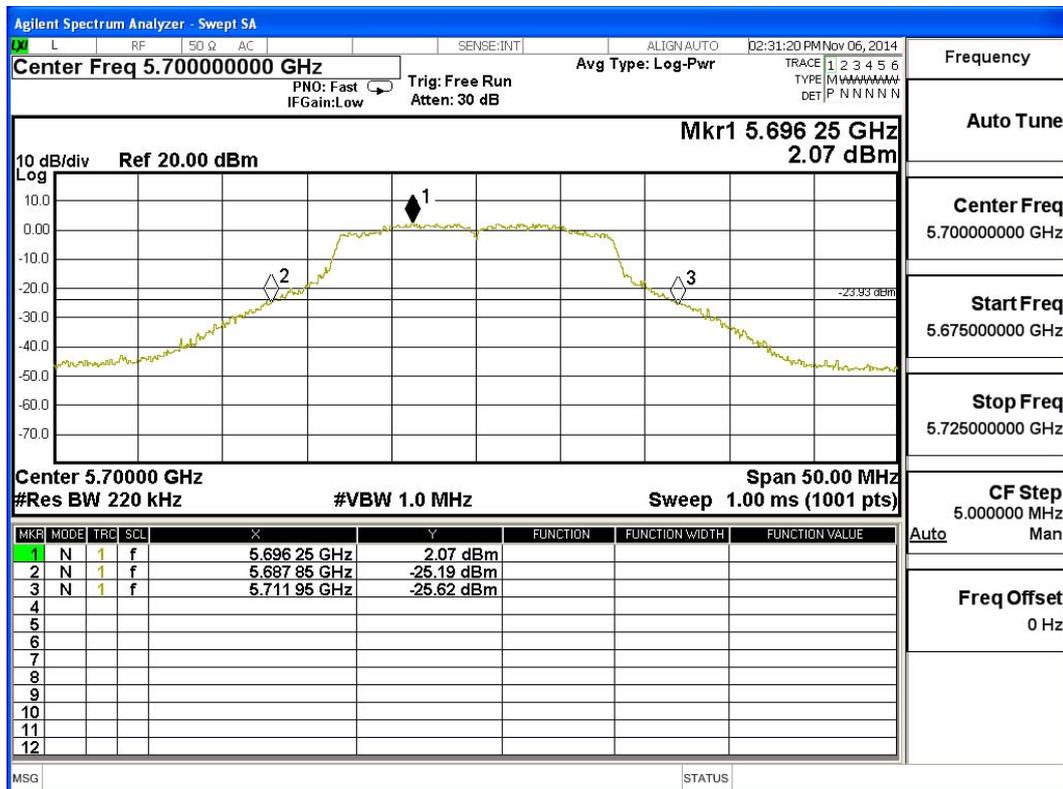
Channel 100 -Chain B



Channel 120-Chain B



Channel 140 -Chain B



Product : INTEL DUAL BAND WIRELESS-AC 7265
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)

Maximum conducted output power Measurement:

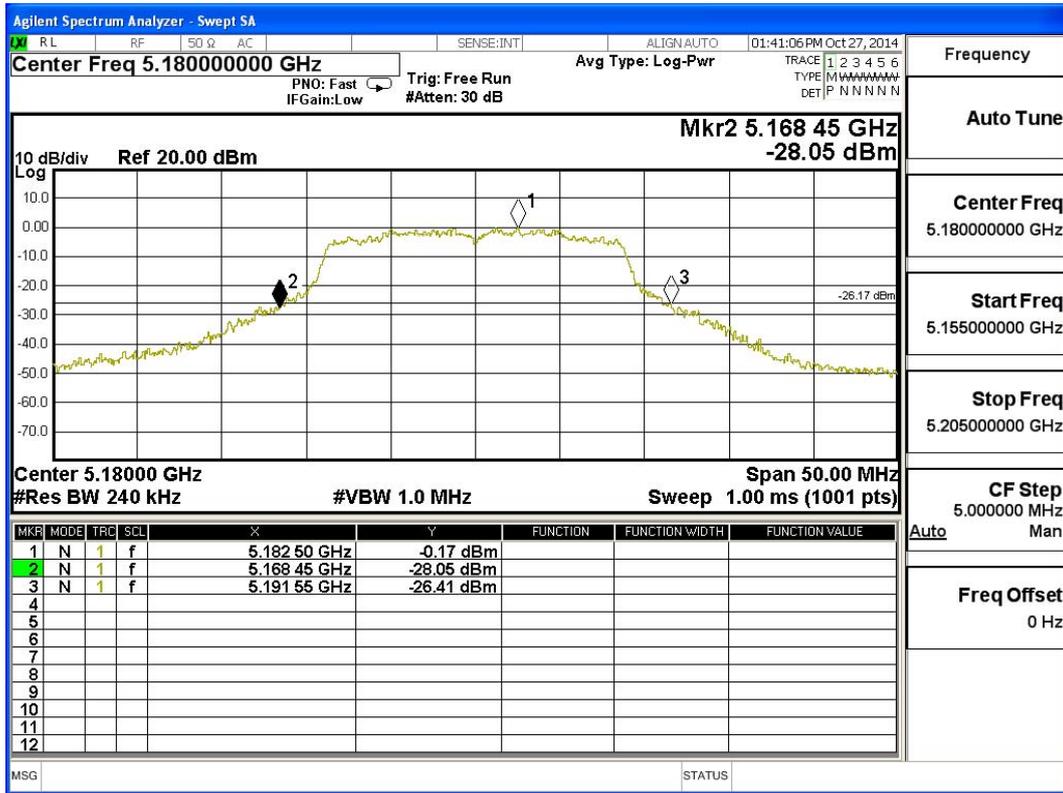
CHAIN A+B

Channel Number	Frequency (MHz)	Data Rate (Mbps)	26dB Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit	
							(dBm)	dBm+10log(BW)
36	5180	14.4	23.100	10.27	10.50	13.40	17	17.64
40	5200	14.4	22.800	9.18	10.00	12.62	17	17.58
48	5240	14.4	22.500	9.35	9.99	12.69	17	17.52
52	5260	14.4	23.200	10.50	10.50	13.51	24	24.65
60	5300	14.4	23.600	10.10	10.50	13.31	24	24.73
64	5320	14.4	22.550	10.28	10.50	13.40	24	24.53
100	5500	14.4	22.800	10.00	9.84	12.93	24	24.58
120	5600	14.4	23.150	10.00	9.88	12.95	24	24.65
140	5700	14.4	22.950	10.50	10.38	13.45	24	24.61

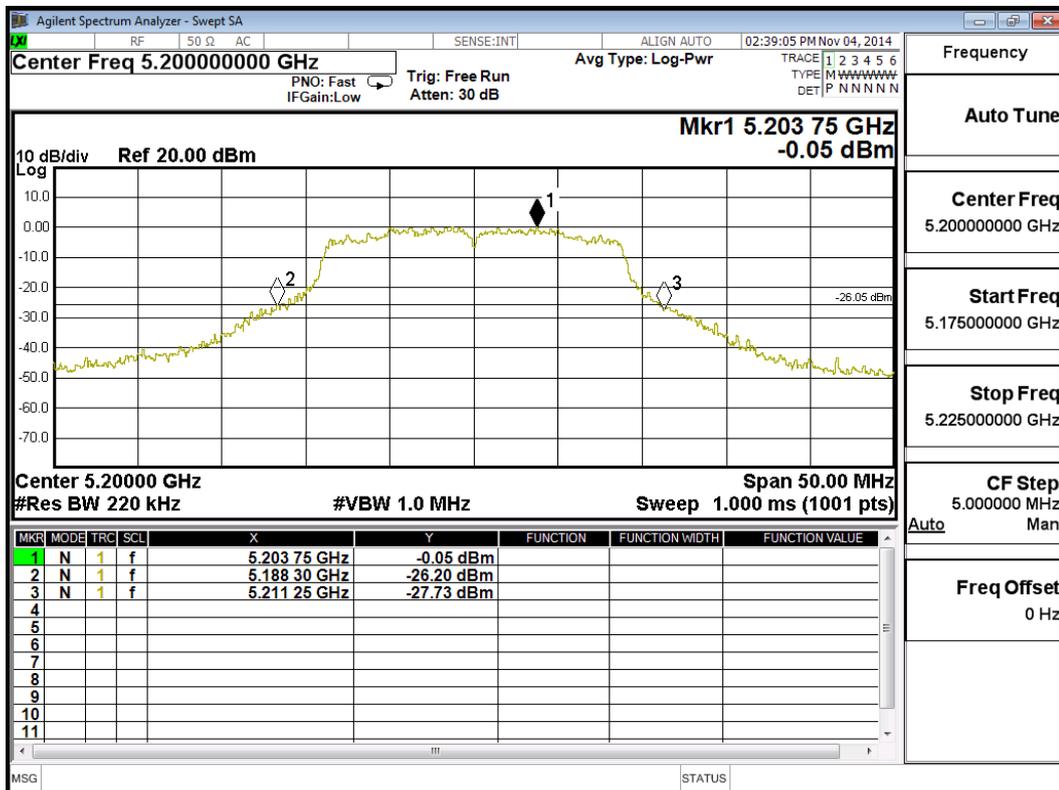
Note:

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.

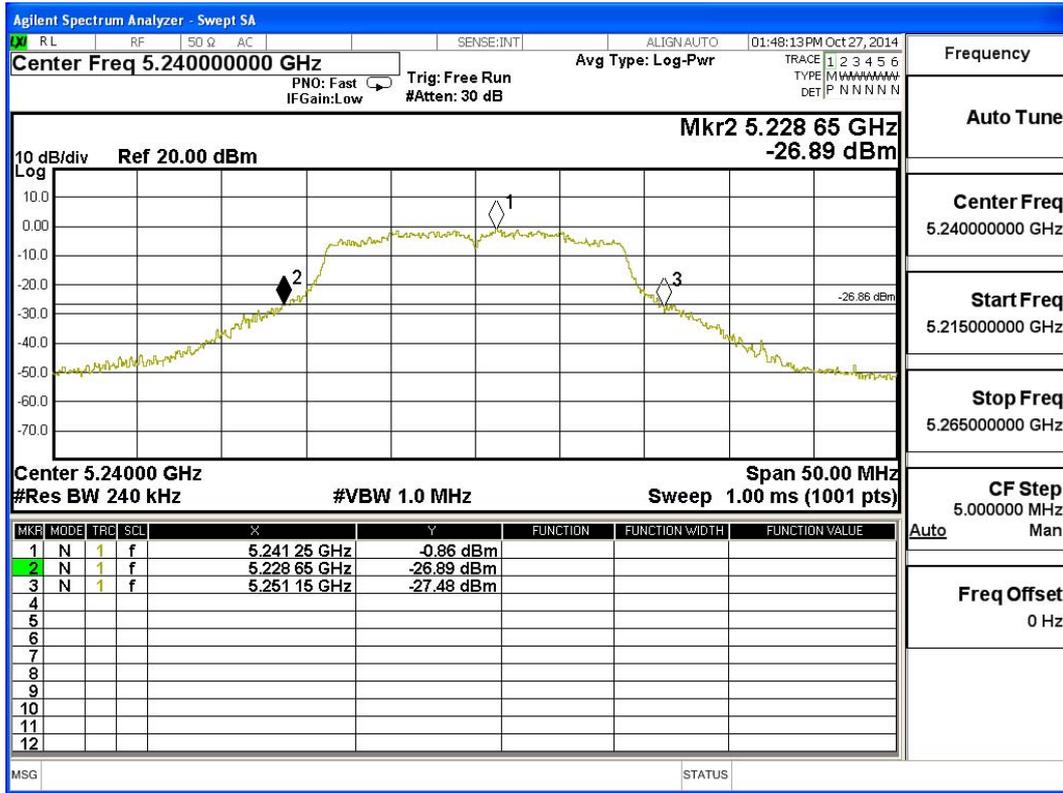
26dB Occupied Bandwidth:
Channel 36 -Chain A



Channel 40 -Chain A



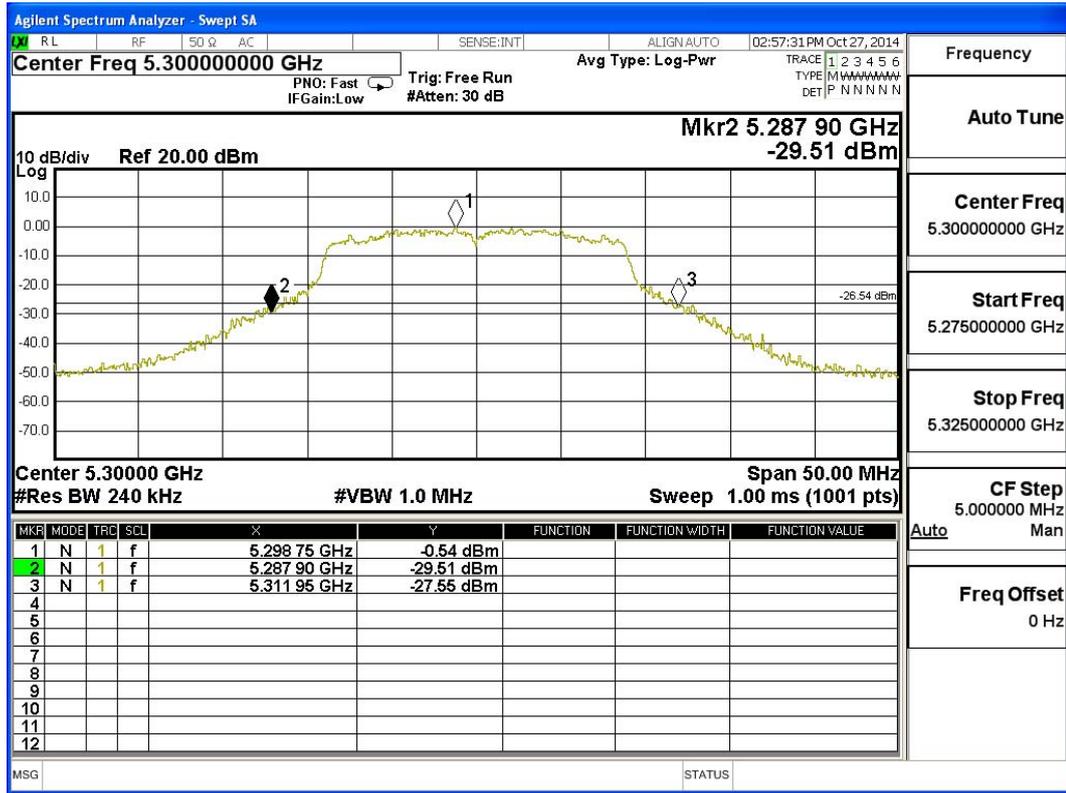
Channel 48 -Chain A



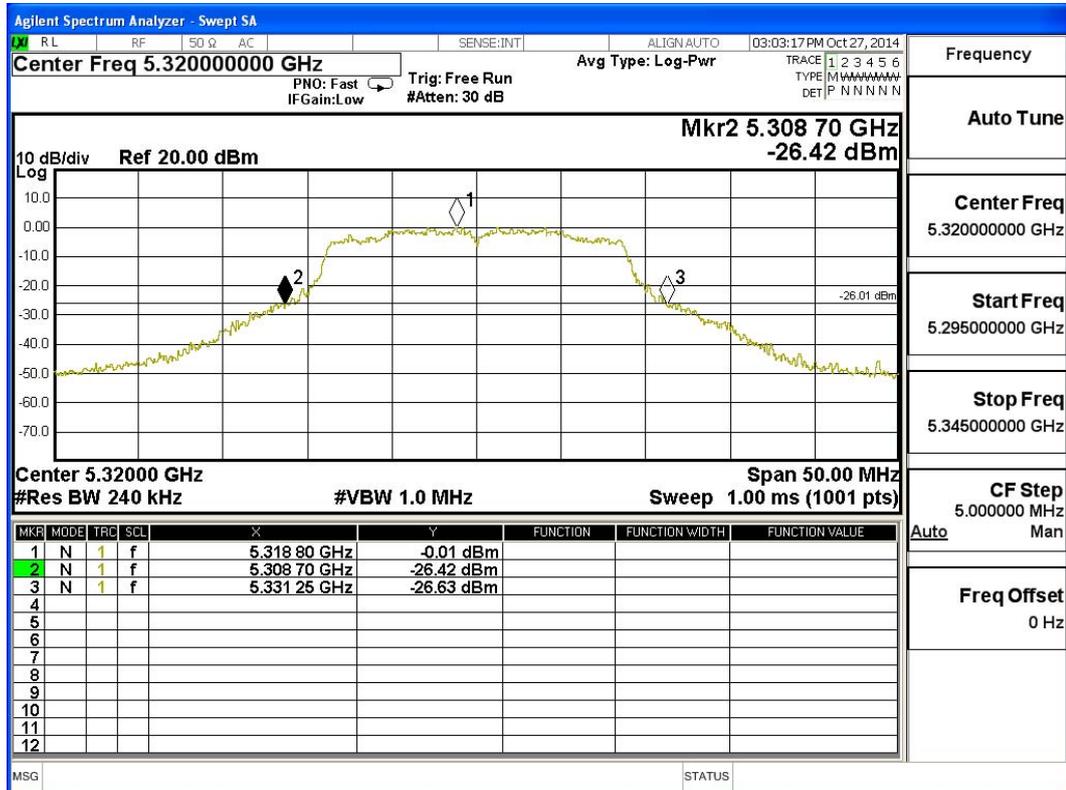
Channel 52 -Chain A



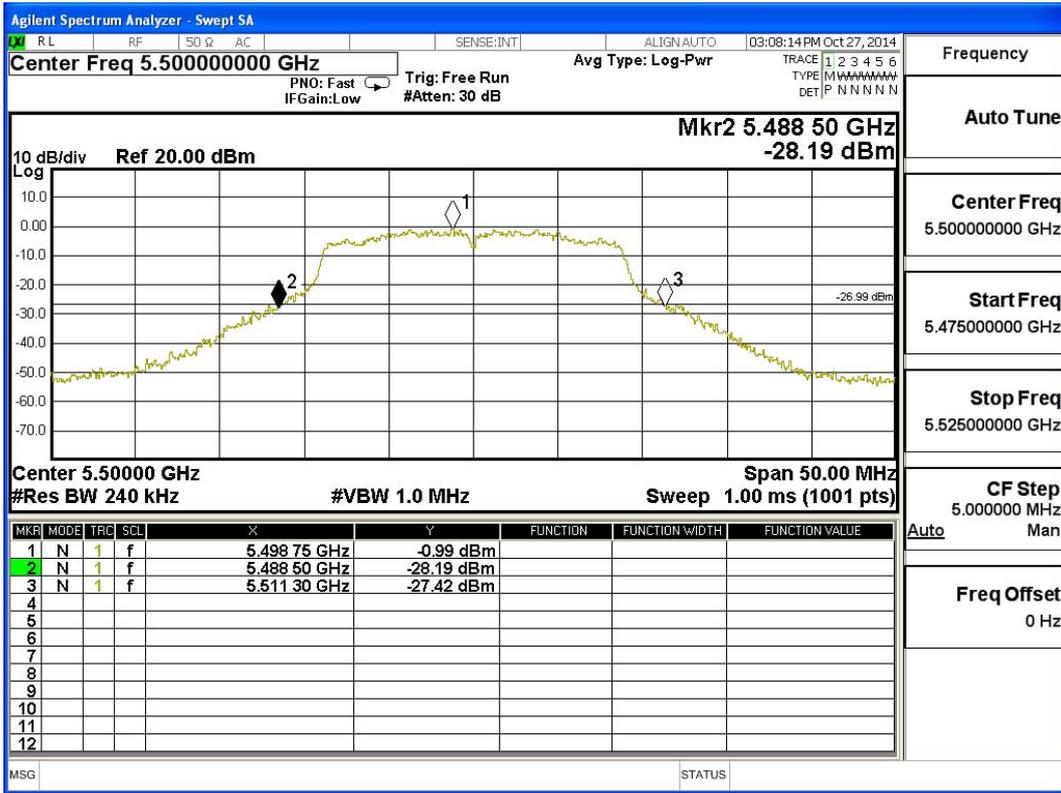
Channel 60 -Chain A



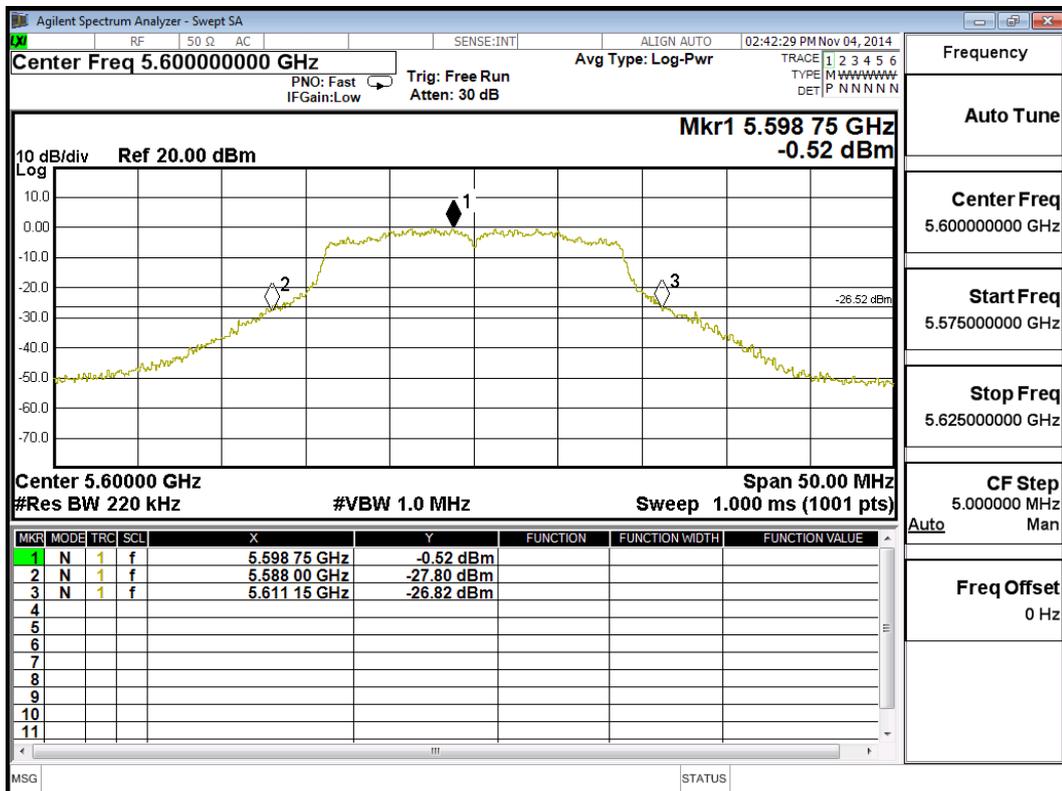
Channel 64 -Chain A



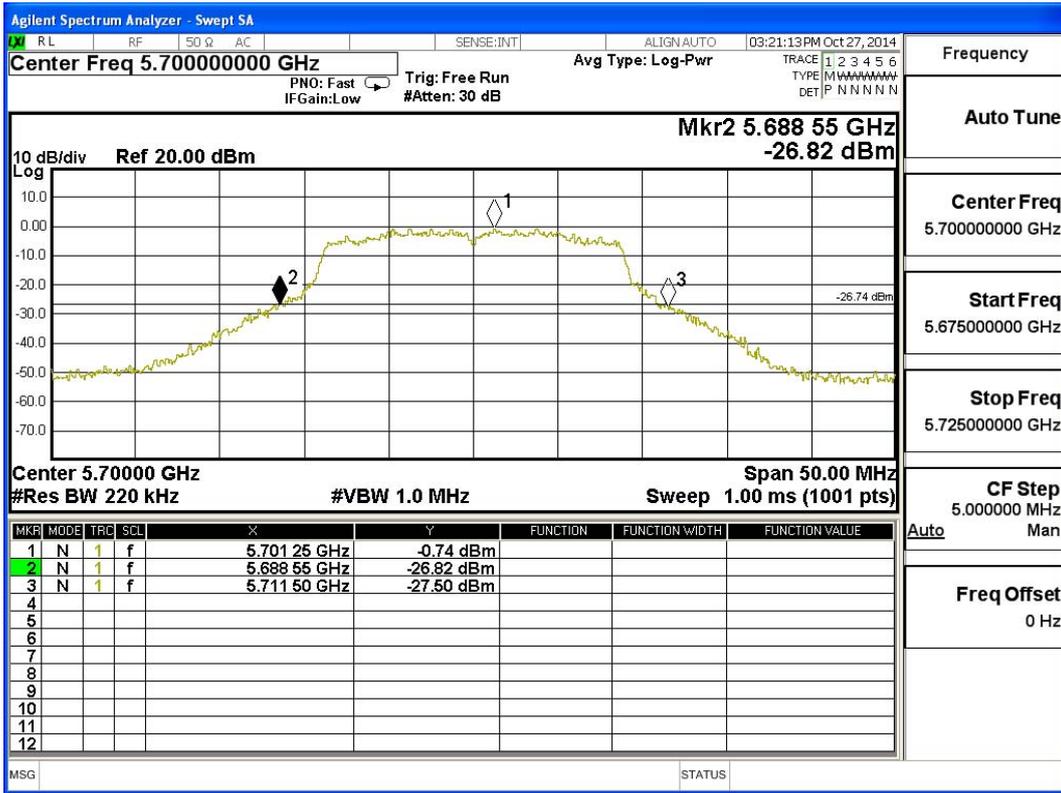
Channel 100 -Chain A



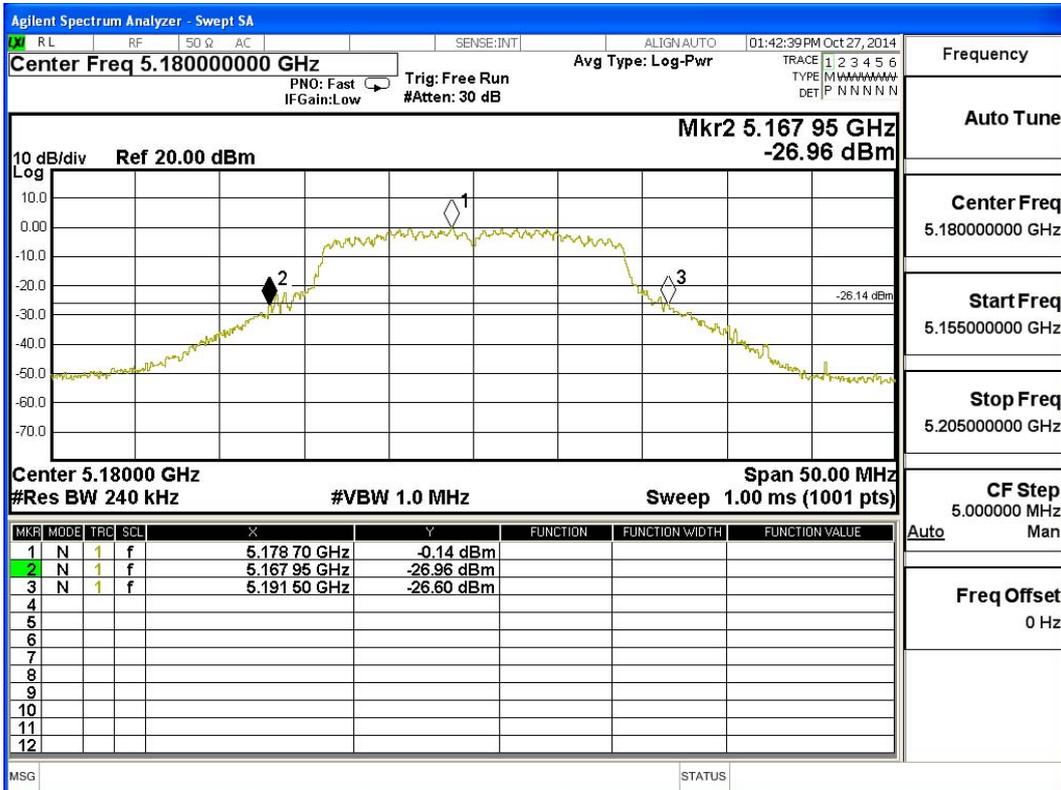
Channel 120 -Chain A



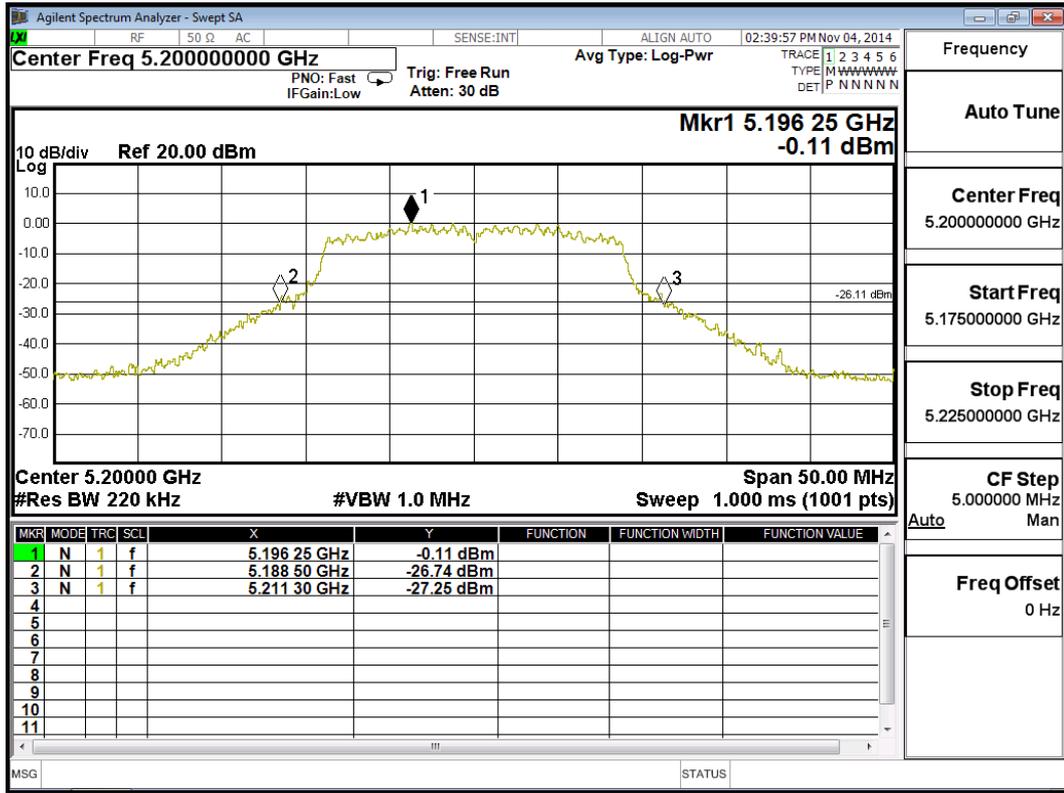
Channel 140 -Chain A



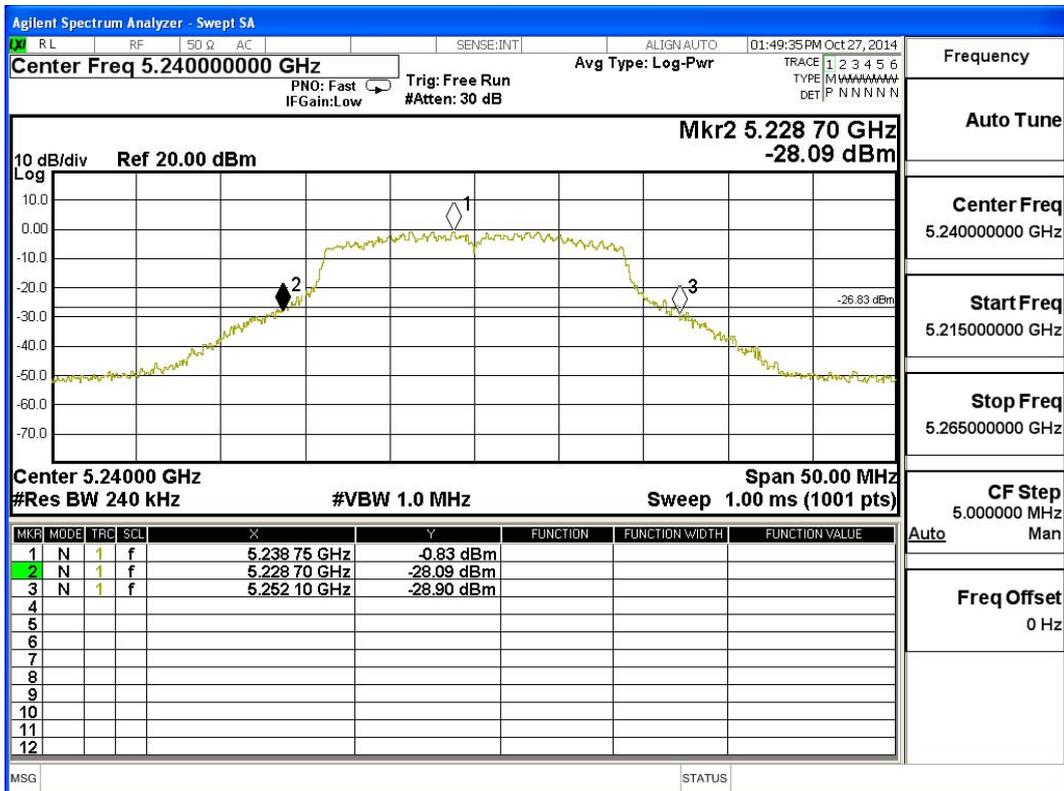
Channel 36 -Chain B



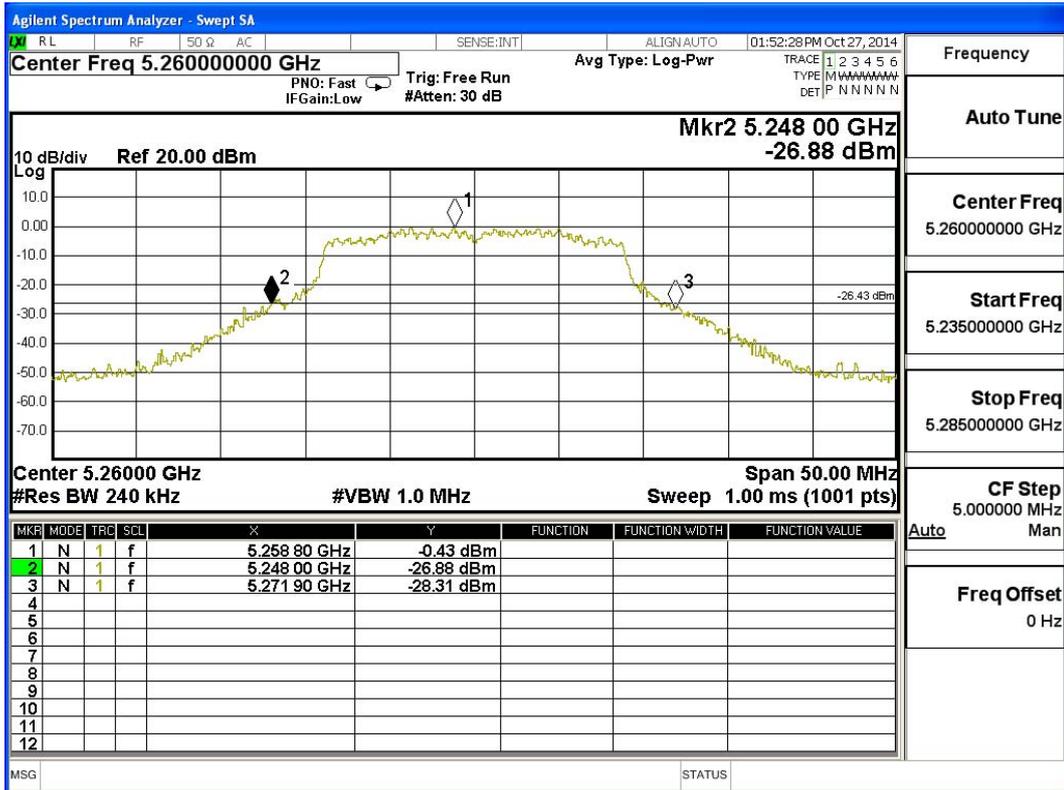
Channel 40-Chain B



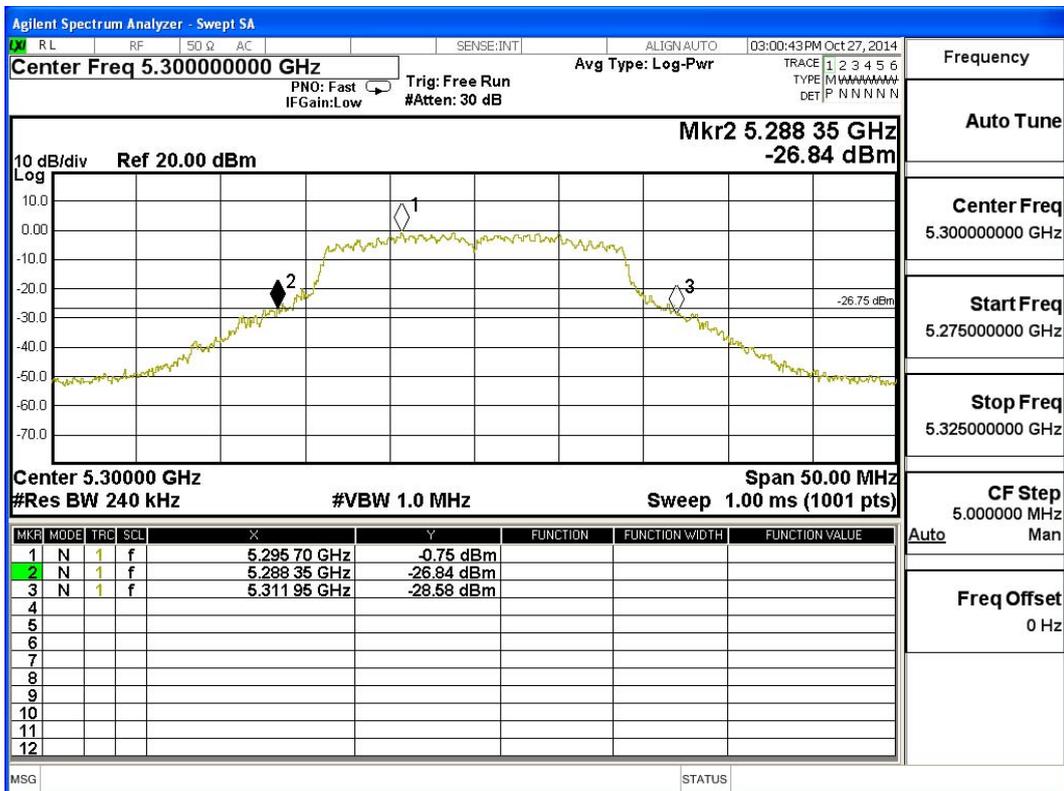
Channel 48 -Chain B



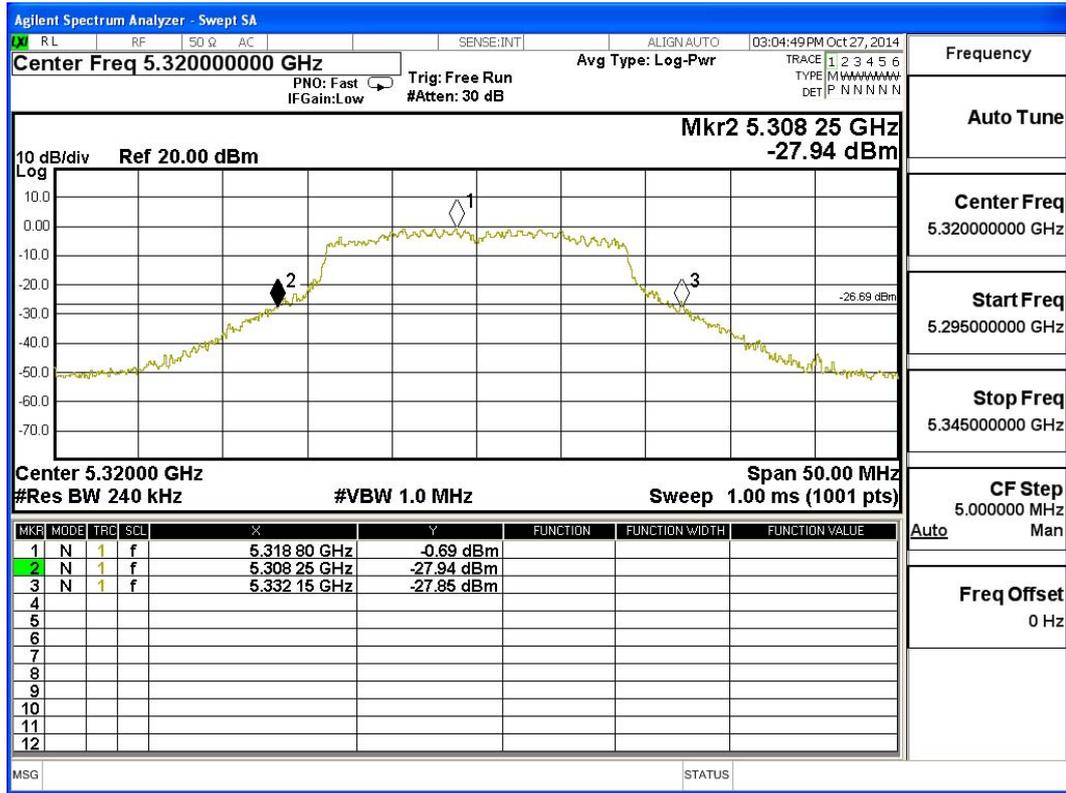
Channel 52 -Chain B



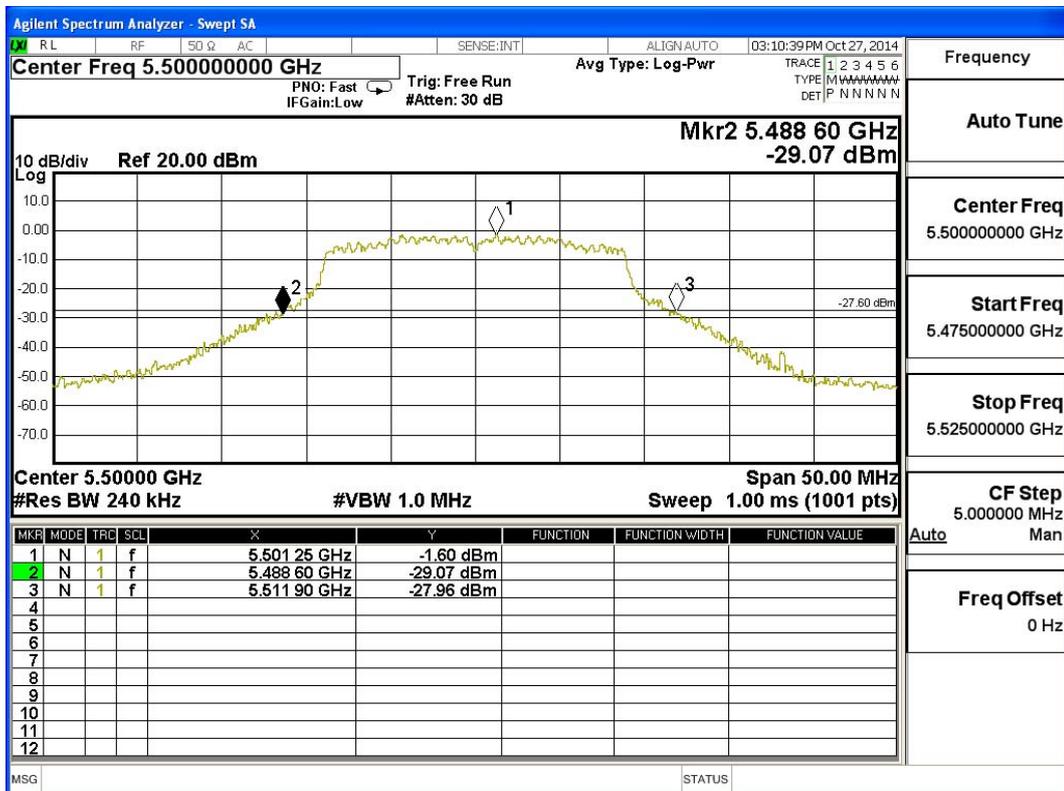
Channel 60 -Chain B



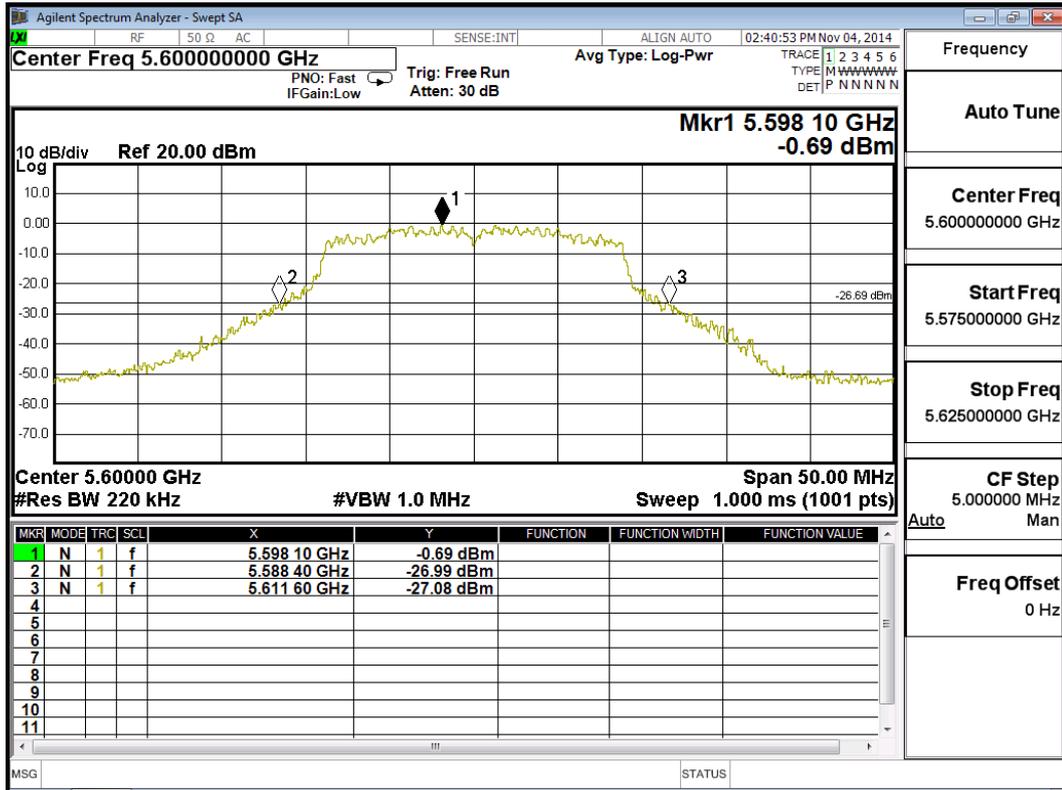
Channel 64 -Chain B



Channel 100 -Chain B

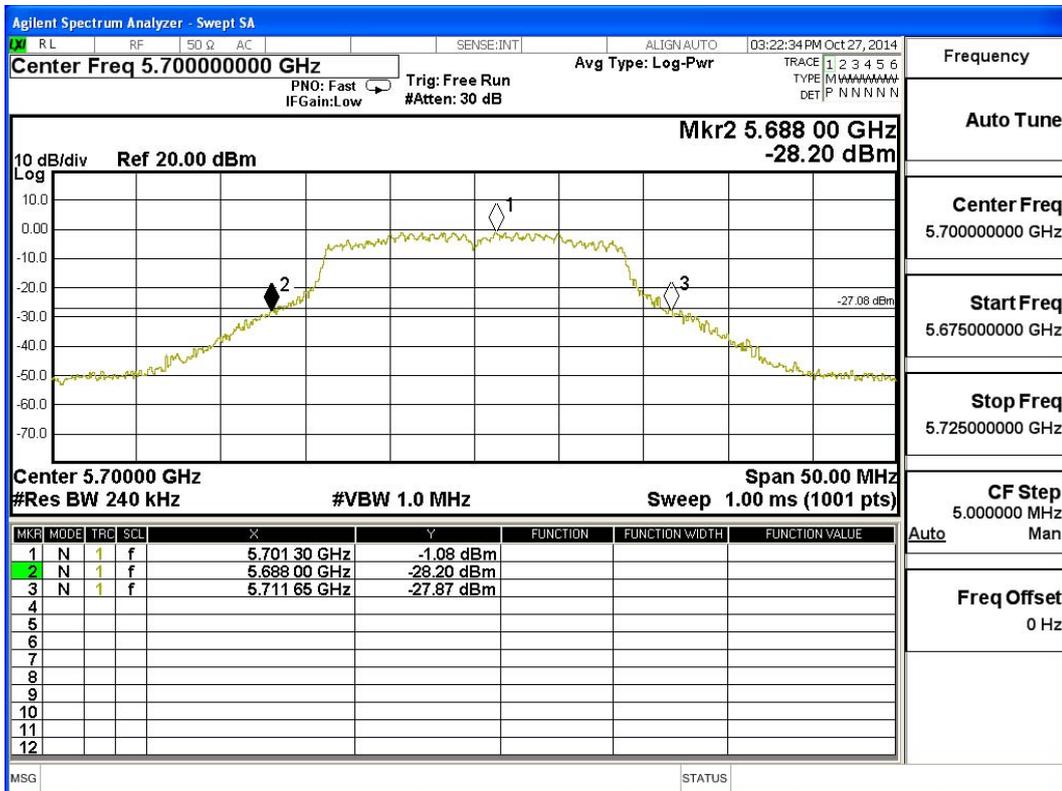


Channel 120 -Chain B



Frequency
Auto Tune
Center Freq 5.60000000 GHz
Start Freq 5.57500000 GHz
Stop Freq 5.62500000 GHz
CF Step 5.000000 MHz
Auto Man
Freq Offset 0 Hz

Channel 140 -Chain B



Frequency
Auto Tune
Center Freq 5.70000000 GHz
Start Freq 5.67500000 GHz
Stop Freq 5.72500000 GHz
CF Step 5.000000 MHz
Auto Man
Freq Offset 0 Hz