

## 4. Peak Power Spectral Density

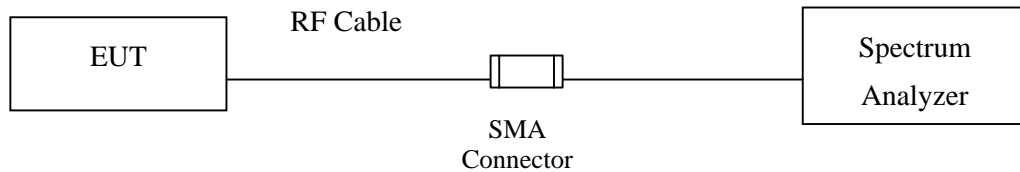
### 4.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2013
	Spectrum Analyzer	Agilent	E4407B / US39440758	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.

### 4.2. Test Setup



### 4.3. Limits

- (4) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm 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 directional gain of the antenna exceeds 6 dBi.
- (5) For the band 5.25-5.35 GHz, the peak power spectral density shall not exceed 11 dBm 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 directional gain of the antenna exceeds 6 dBi.
- (6) 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 antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.

#### 4.4. Test Procedure

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.

The Peak Power Spectral Density using KDB 789033 section F) procedure, Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer.

SA-1 method is selected to run the test.

#### 4.5. Uncertainty

$\pm 1.27$  dB

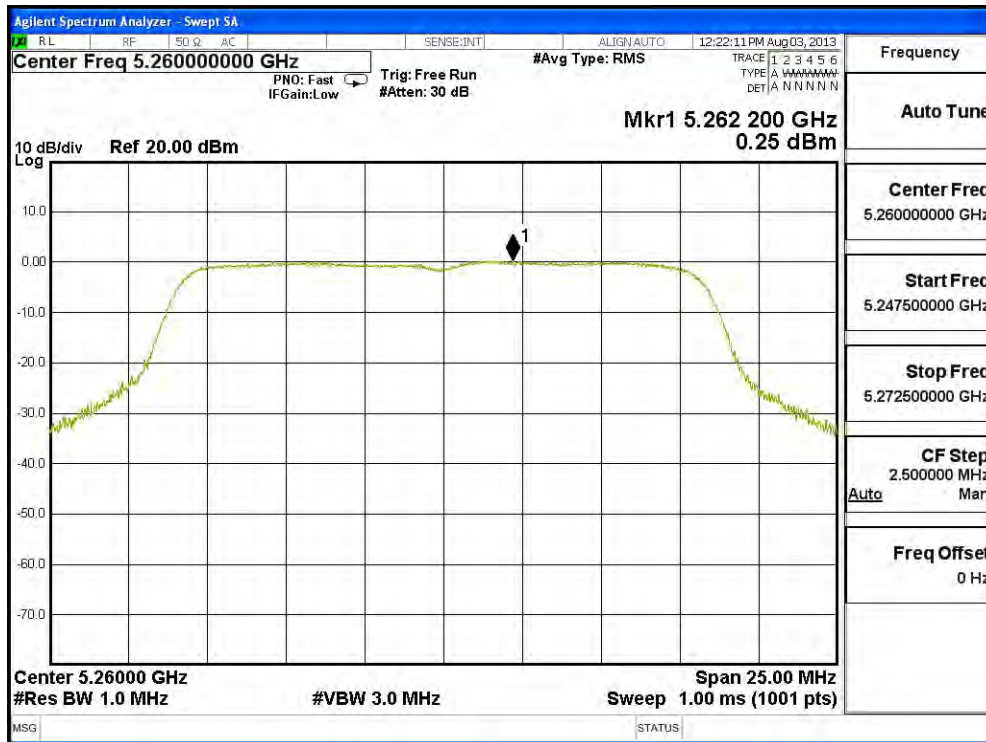
#### 4.6. Test Result of Peak Power Spectral Density

Product : SpectraGuard® Access Point / Sensor  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)(Dipole Antenna)

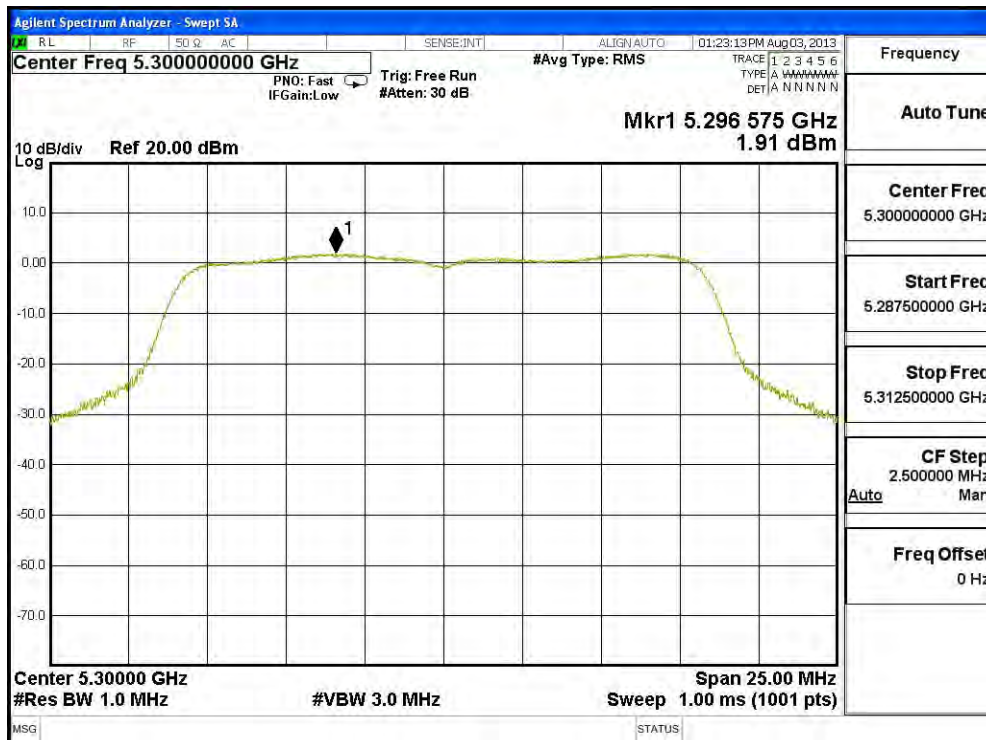
Channel No.	Frequency (MHz)	Chain (dBm)	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Required Limit (dBm)	Result
52	5260	A	0.250	5.021	<11	Pass
		B	-2.380	2.391	<11	Pass
		C	0.420	5.191	<11	Pass
60	5300	A	1.910	6.681	<11	Pass
		B	-1.480	3.291	<11	Pass
		C	1.680	6.451	<11	Pass
64	5320	A	2.350	7.121	<11	Pass
		B	-1.260	3.511	<11	Pass
		C	1.830	6.601	<11	Pass
100	5500	A	0.320	5.091	<11	Pass
		B	-3.450	1.321	<11	Pass
		C	-1.040	3.731	<11	Pass
116	5580	A	0.760	5.531	<11	Pass
		B	-3.650	1.121	<11	Pass
		C	-1.180	3.591	<11	Pass
140	5700	A	0.110	4.881	<11	Pass
		B	-1.920	2.851	<11	Pass
		C	0.270	5.041	<11	Pass

Note 1: The quantity  $10 \cdot \log 3$  (two antennas) is added to the spectrum peak value according to document 662911 D01.

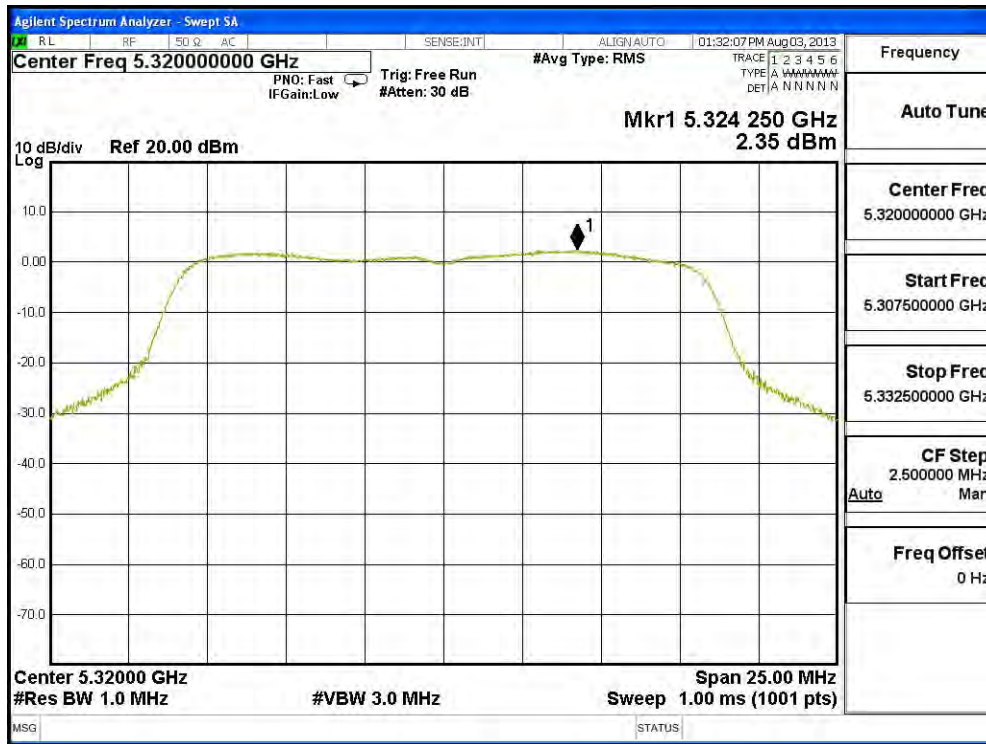
**Channel 52: CHAIN A**



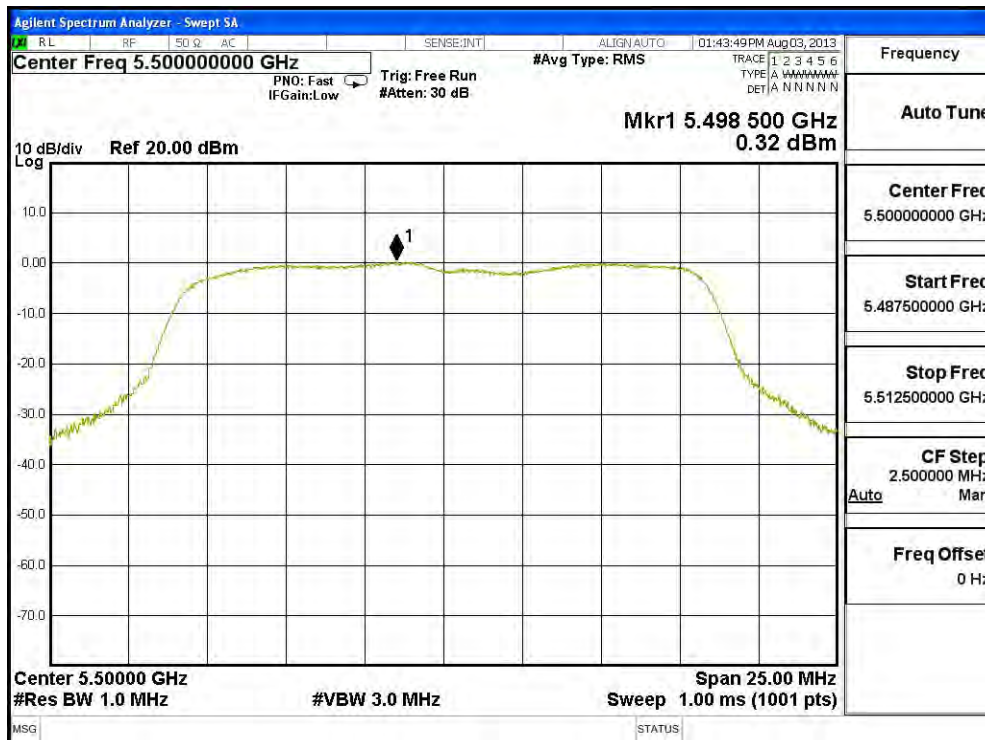
**Channel 60: CHAIN A**



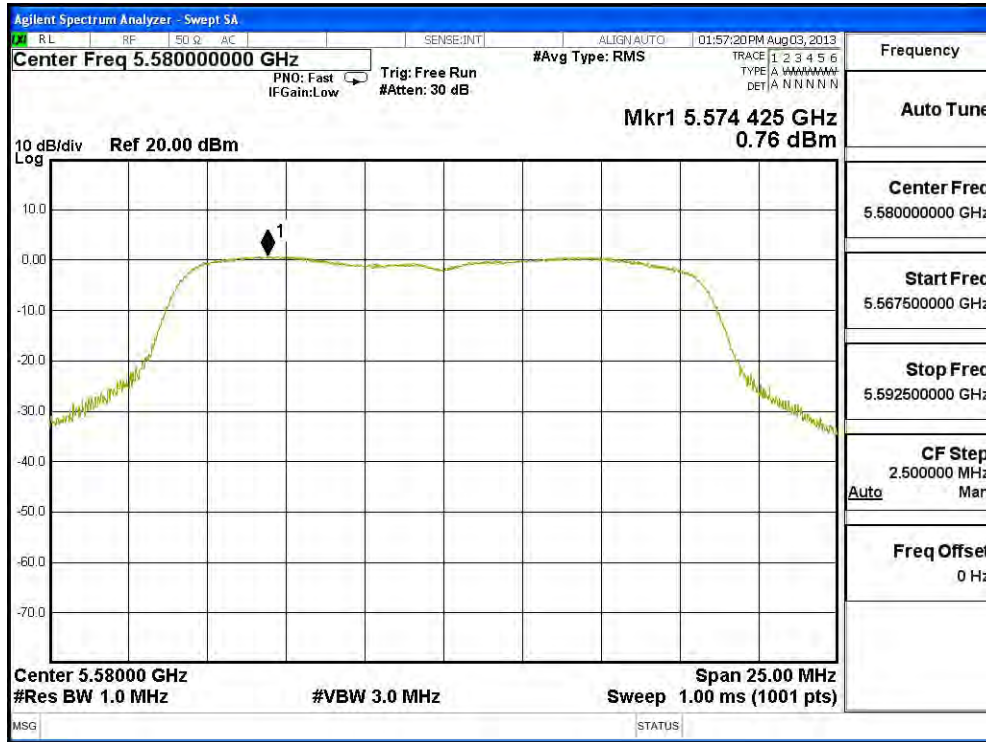
**Channel 64: CHAIN A**



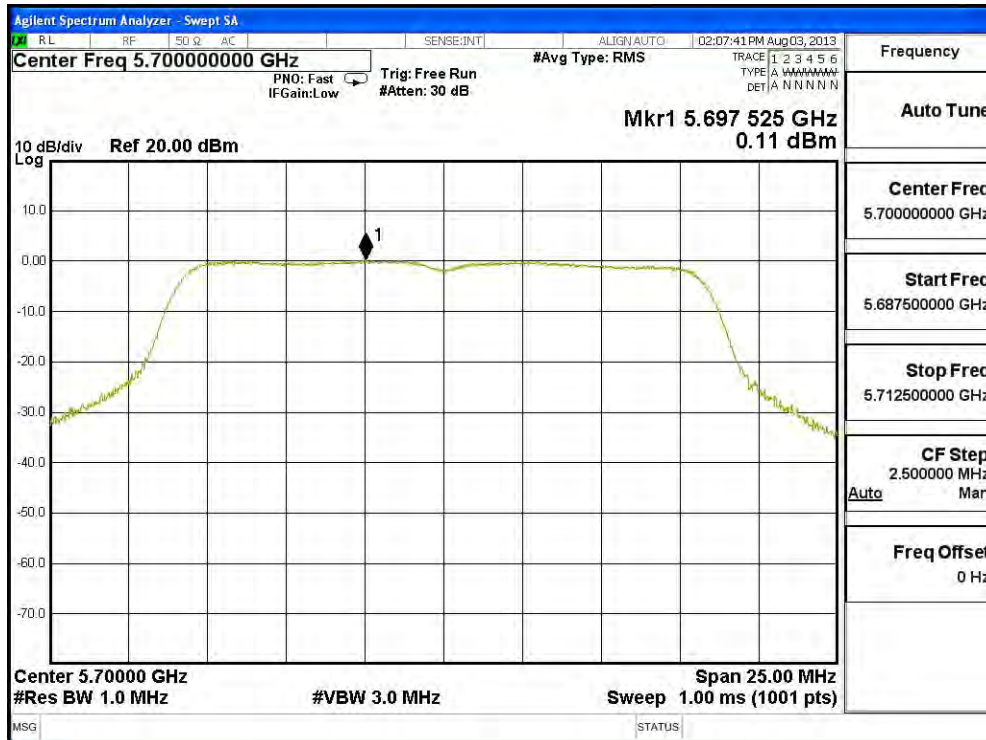
**Channel 100: CHAIN A**



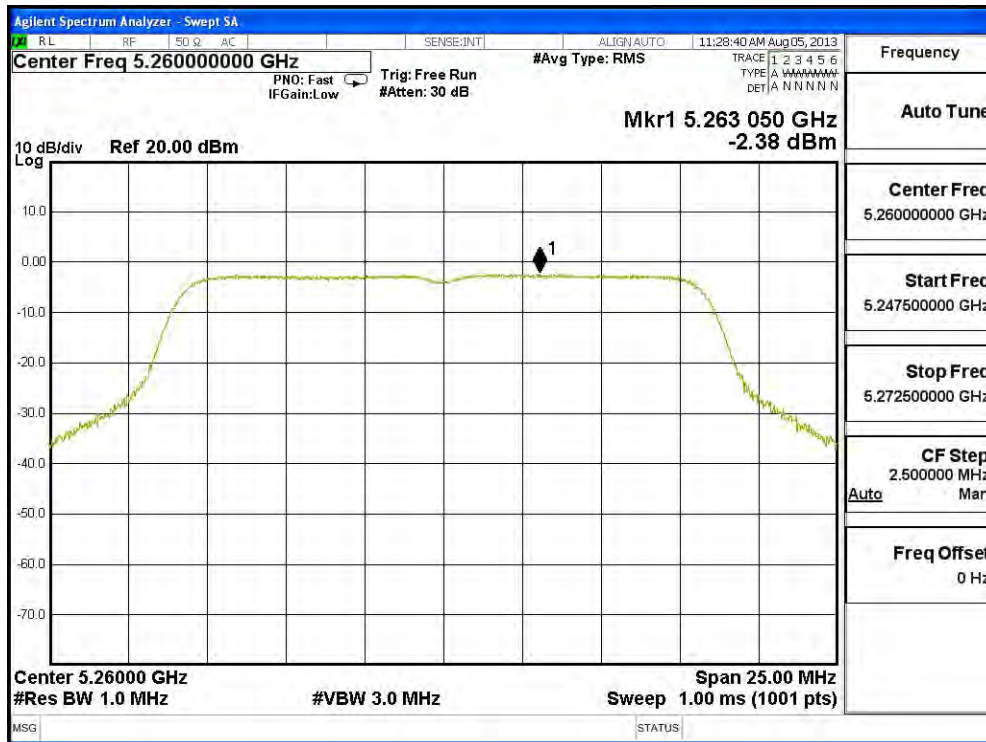
### Channel 116: CHAIN A



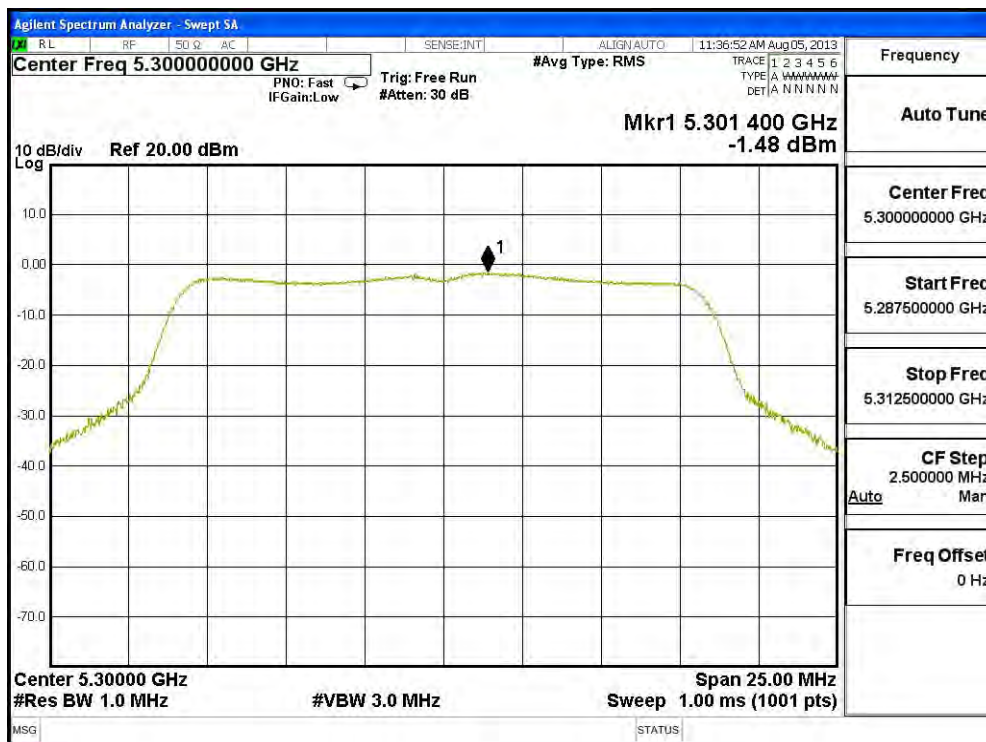
### Channel 140: CHAIN A



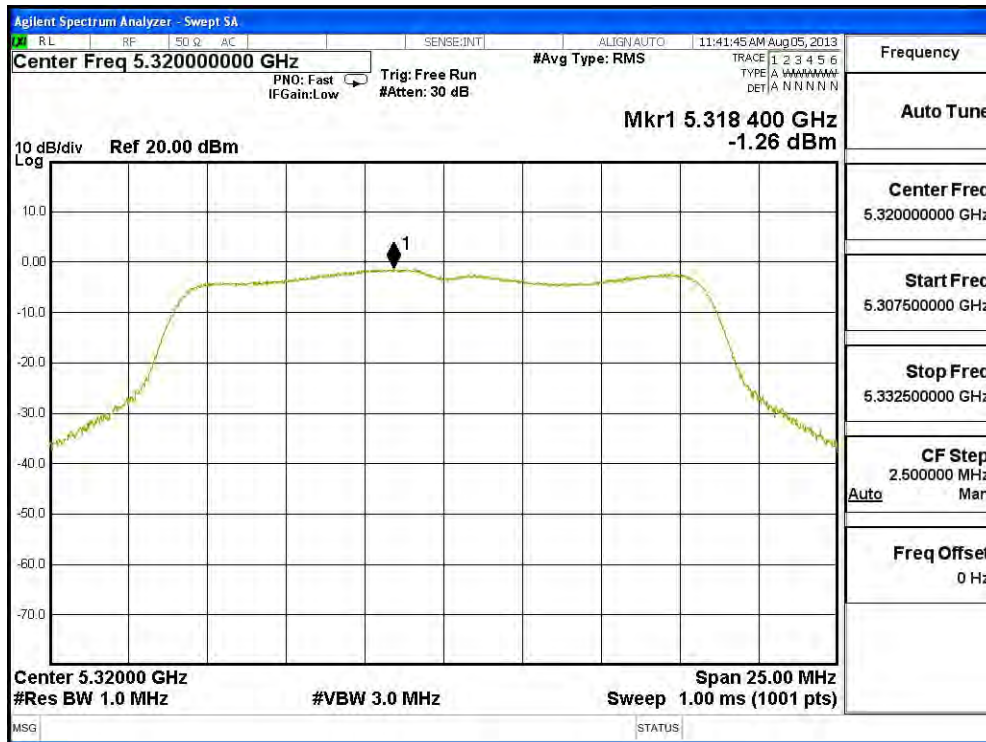
### Channel 52: CHAIN B



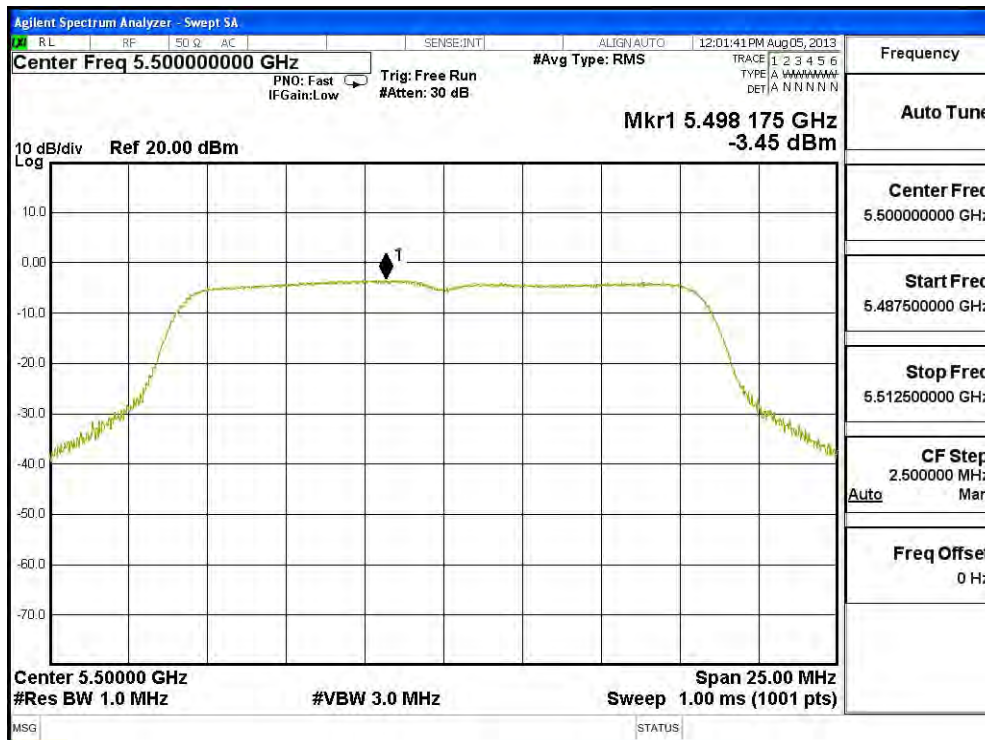
### Channel 60: CHAIN B



**Channel 64: CHAIN B**



**Channel 100: CHAIN B**





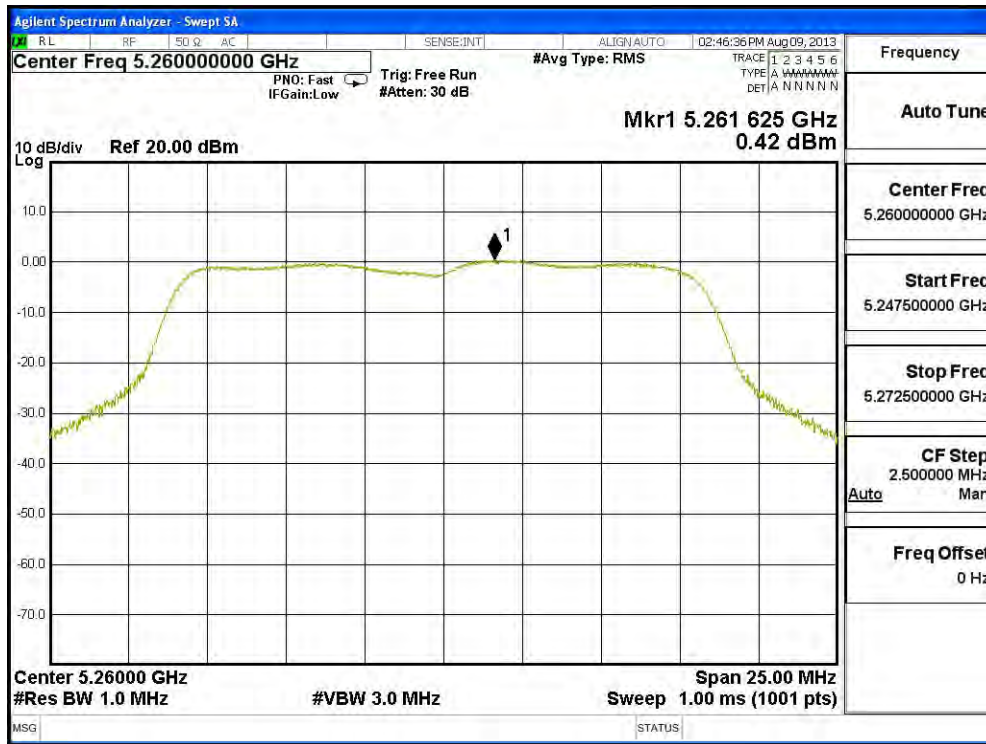
**Channel 116: CHAIN B**



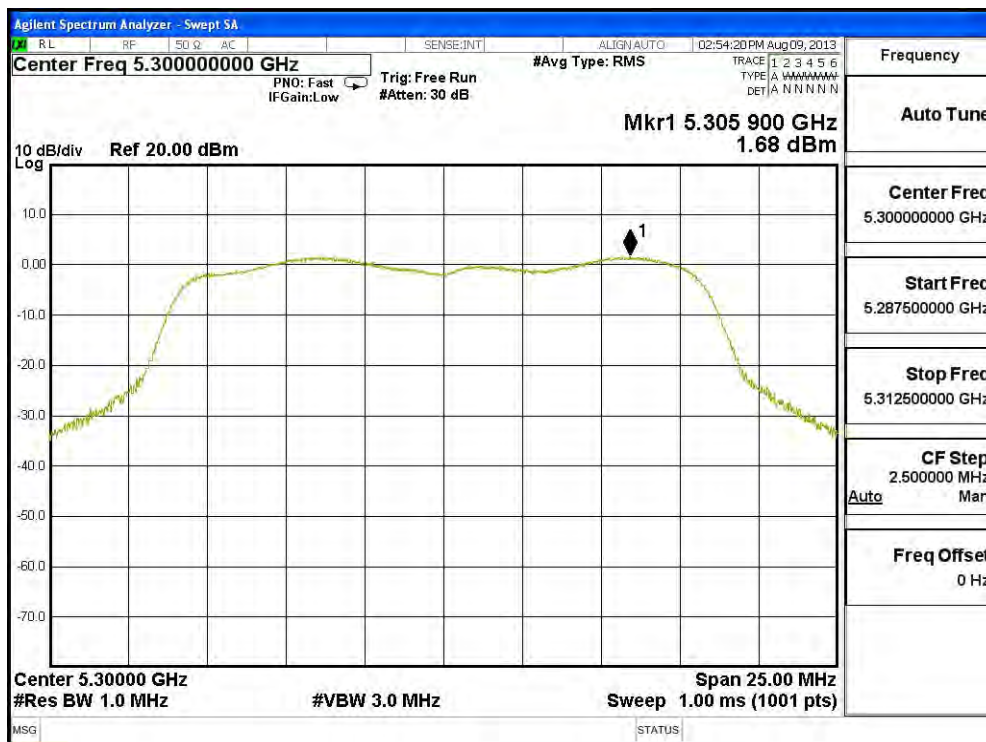
**Channel 140: CHAIN B**



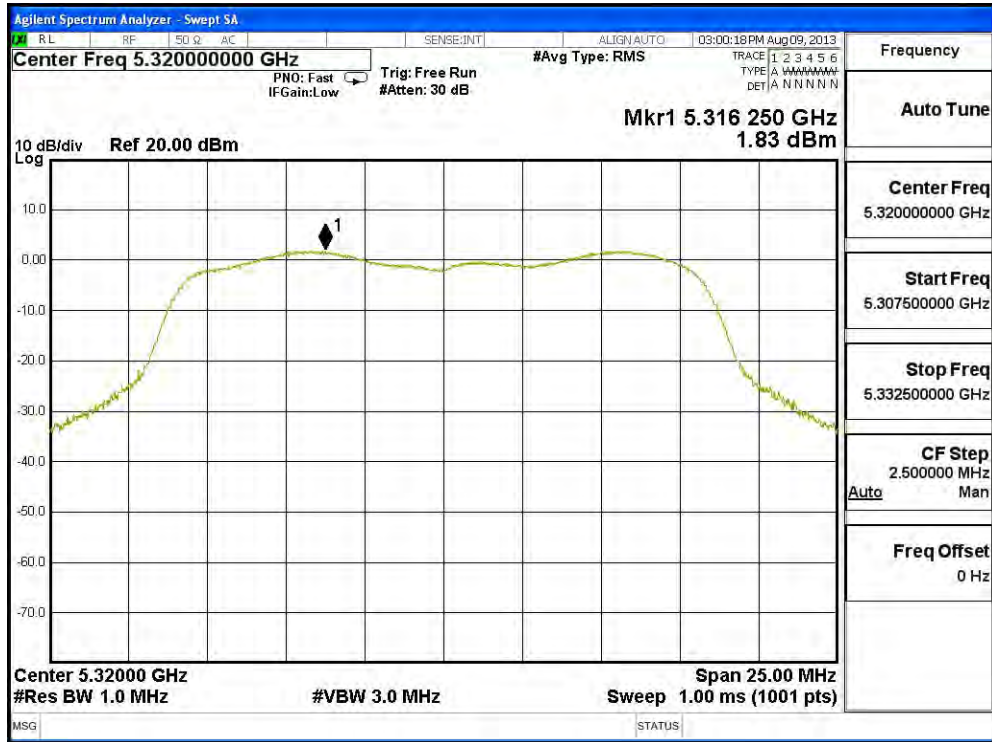
### Channel 52: CHAIN C



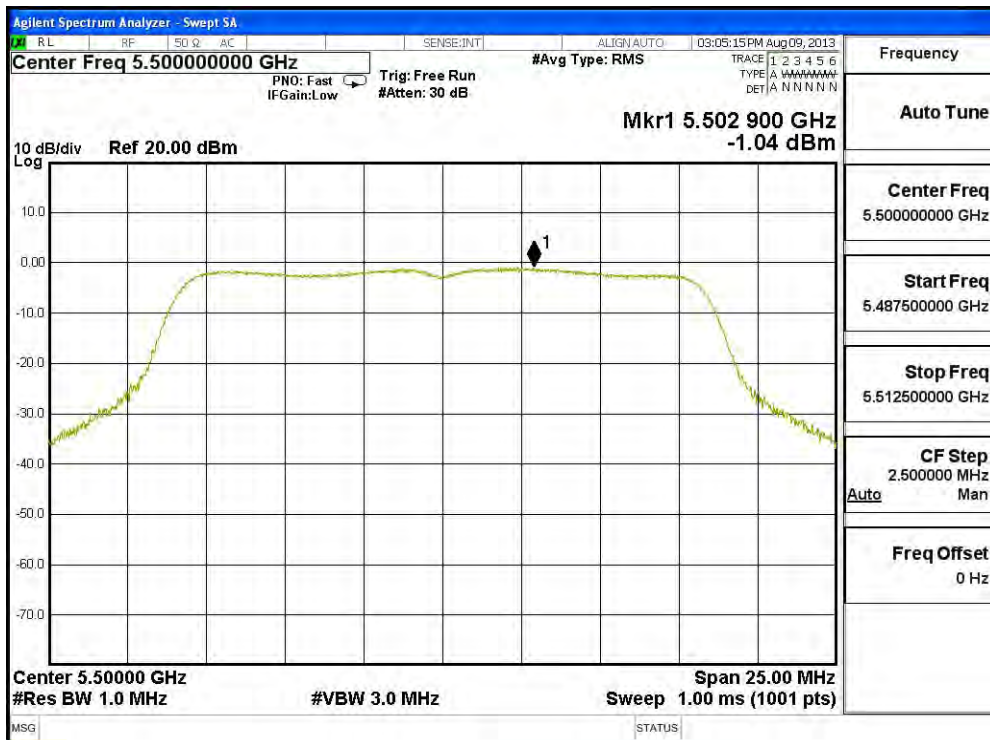
### Channel 60: CHAIN C



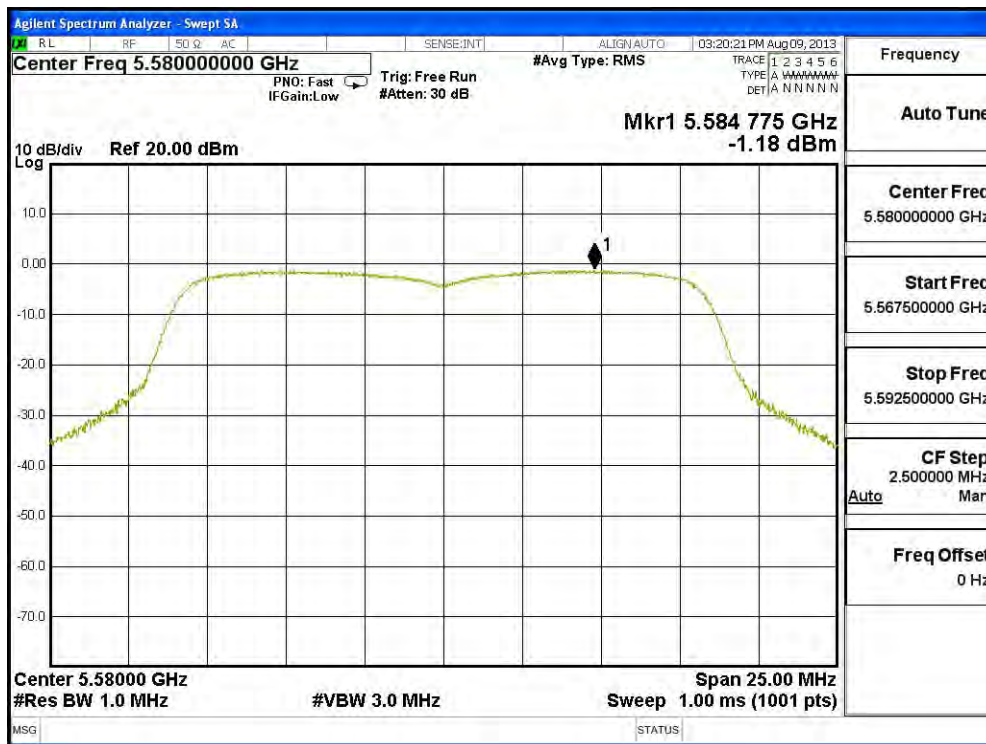
**Channel 64: CHAIN C**



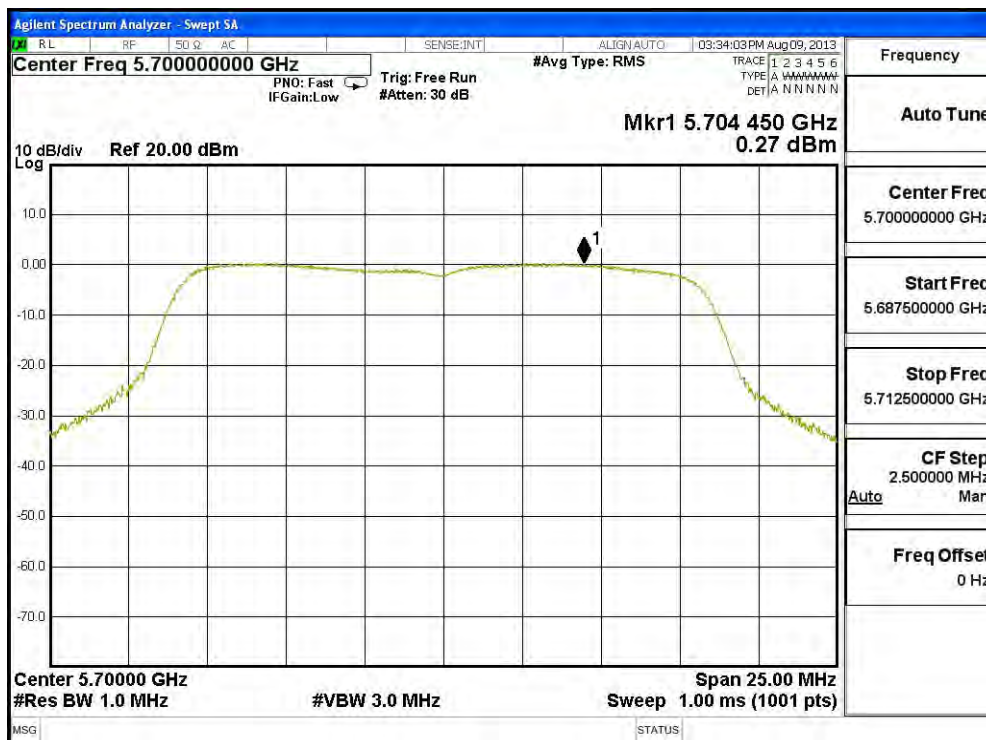
**Channel 100: CHAIN C**



### Channel 116: CHAIN C



### Channel 140: CHAIN C

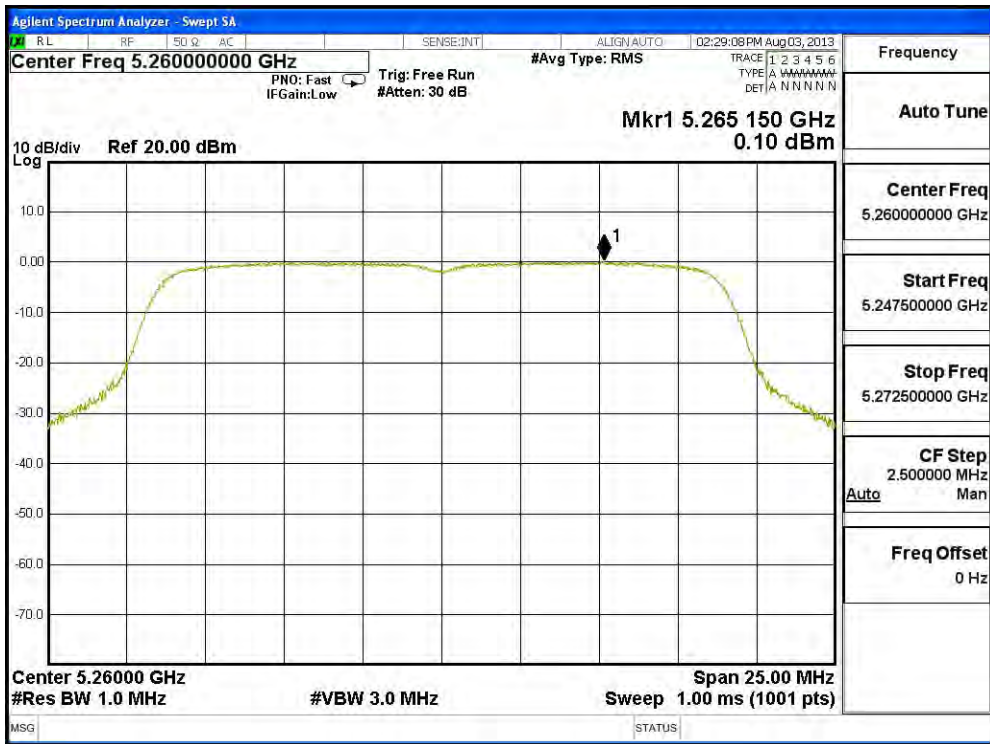


Product : SpectraGuard® Access Point / Sensor  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11n-20BW 21.7Mbps)(Dipole Antenna)

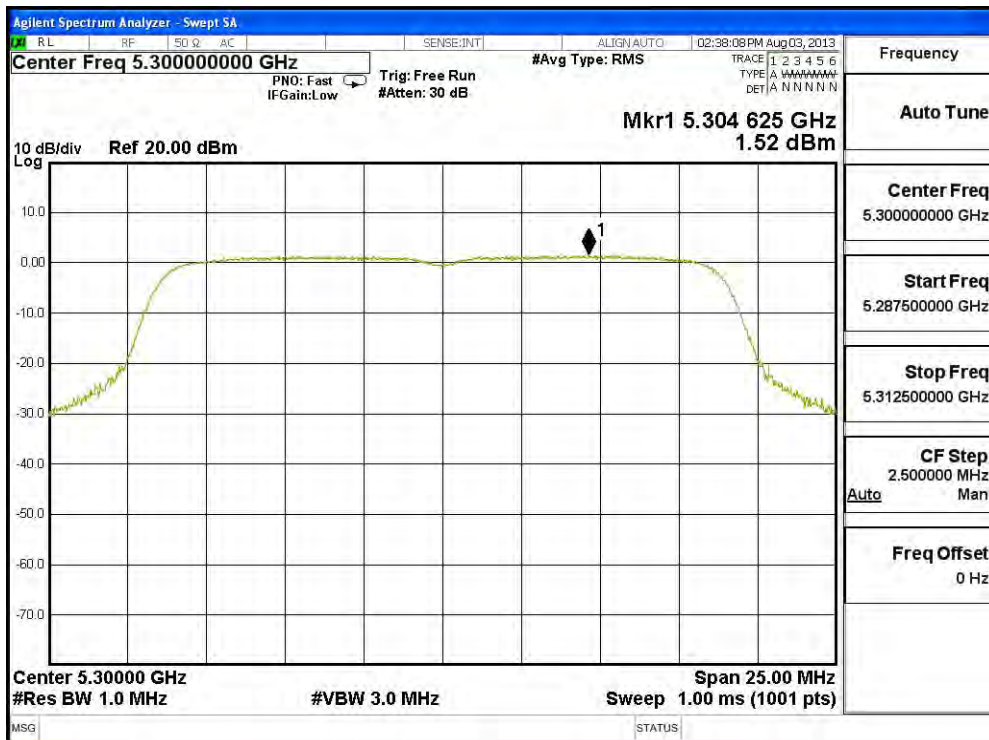
Channel No.	Frequency (MHz)	Chain (dBm)	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Required Limit (dBm)	Result
52	5260	A	0.100	4.871	<11	Pass
		B	-2.570	2.201	<11	Pass
		C	-0.160	4.611	<11	Pass
60	5300	A	1.520	6.291	<11	Pass
		B	-1.840	2.931	<11	Pass
		C	0.830	5.601	<11	Pass
64	5320	A	2.000	6.771	<11	Pass
		B	-2.620	2.151	<11	Pass
		C	0.480	5.251	<11	Pass
100	5500	A	0.440	5.211	<11	Pass
		B	-3.730	1.041	<11	Pass
		C	-0.630	4.141	<11	Pass
116	5580	A	1.200	5.971	<11	Pass
		B	-3.320	1.451	<11	Pass
		C	-1.150	3.621	<11	Pass
140	5700	A	0.850	5.621	<11	Pass
		B	-1.630	3.141	<11	Pass
		C	1.300	6.071	<11	Pass

Note 1: The quantity  $10 \cdot \log 3$  (two antennas) is added to the spectrum peak value according to document 662911 D01.

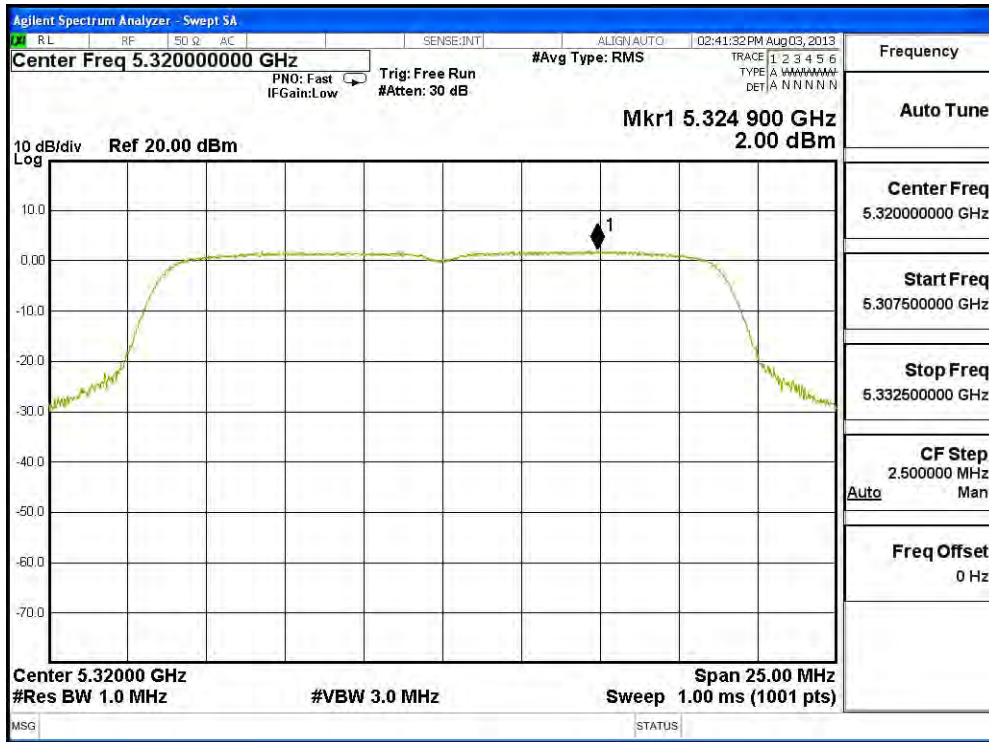
### Channel 52 – Chain A



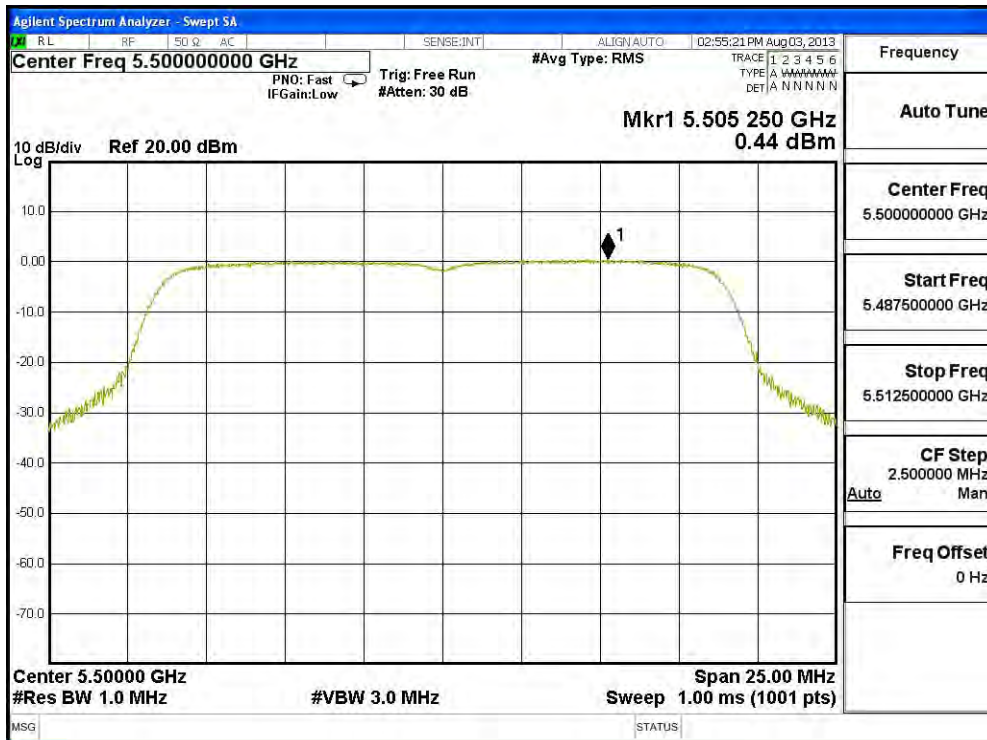
### Channel 60 – Chain A



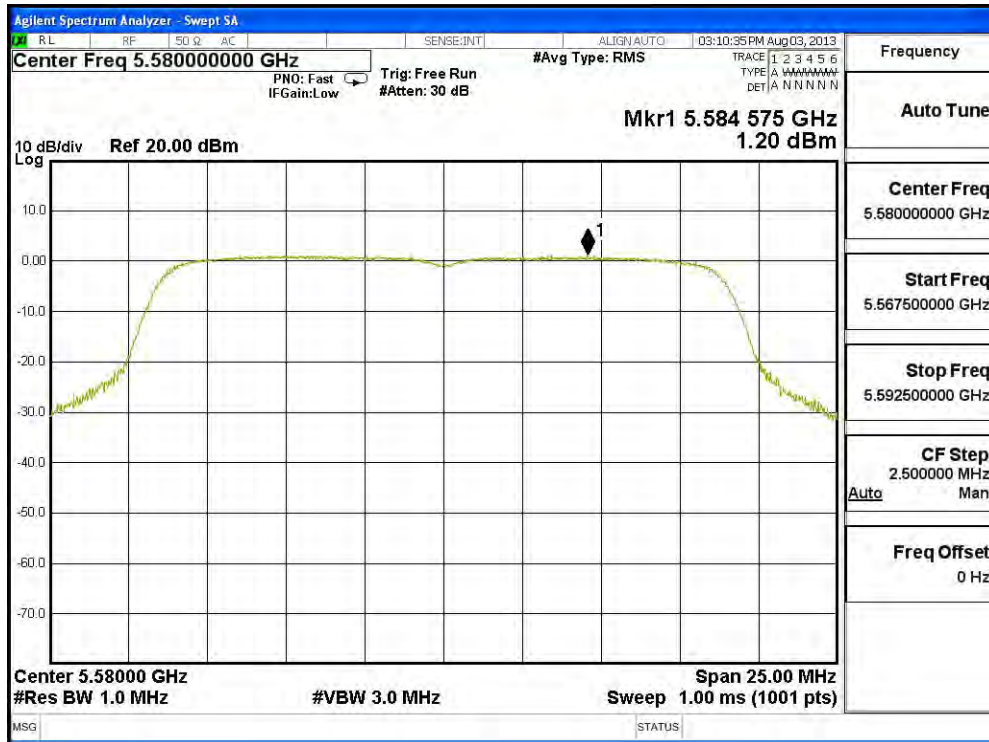
**Channel 64 – Chain A**



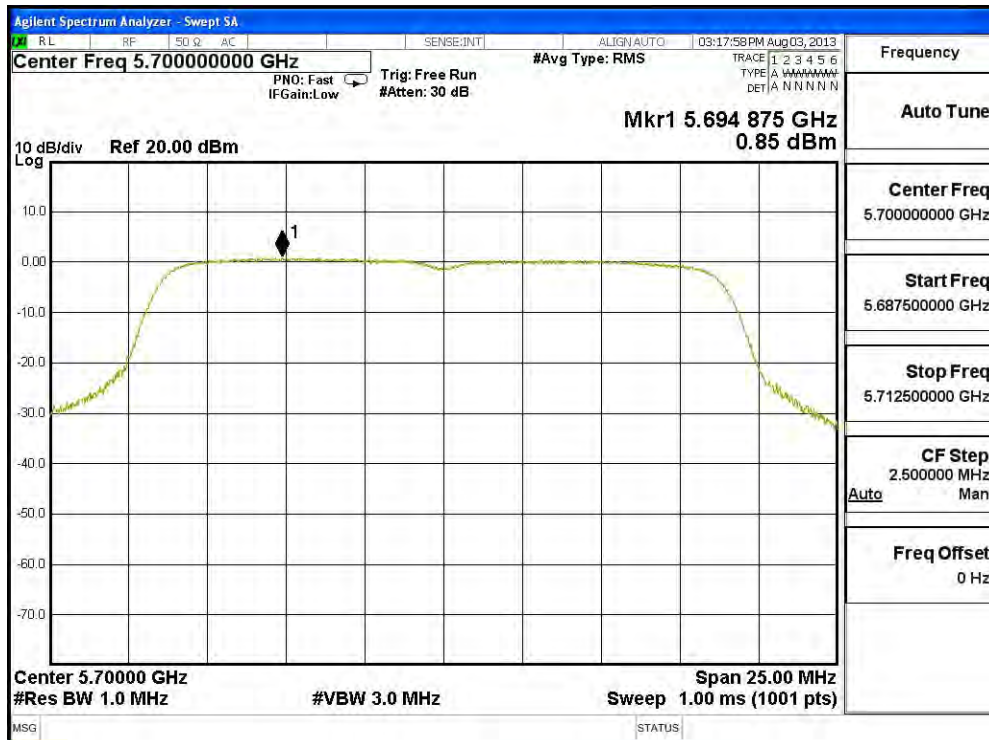
**Channel 100 – Chain A**



**Channel 116 – Chain A**

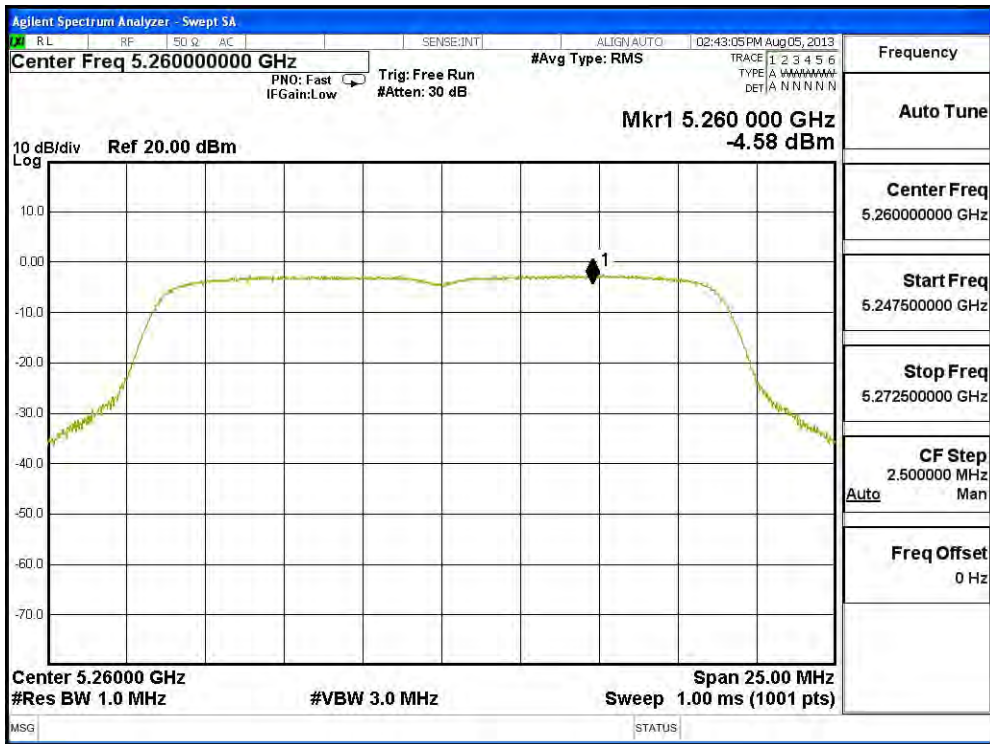


**Channel 140 – Chain A**

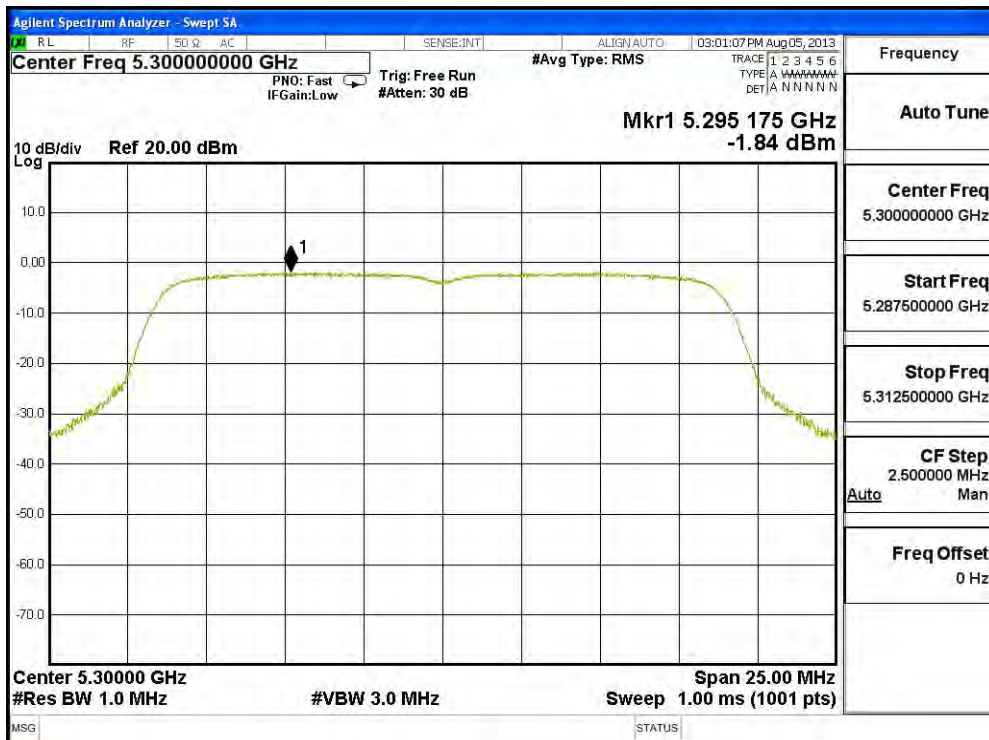




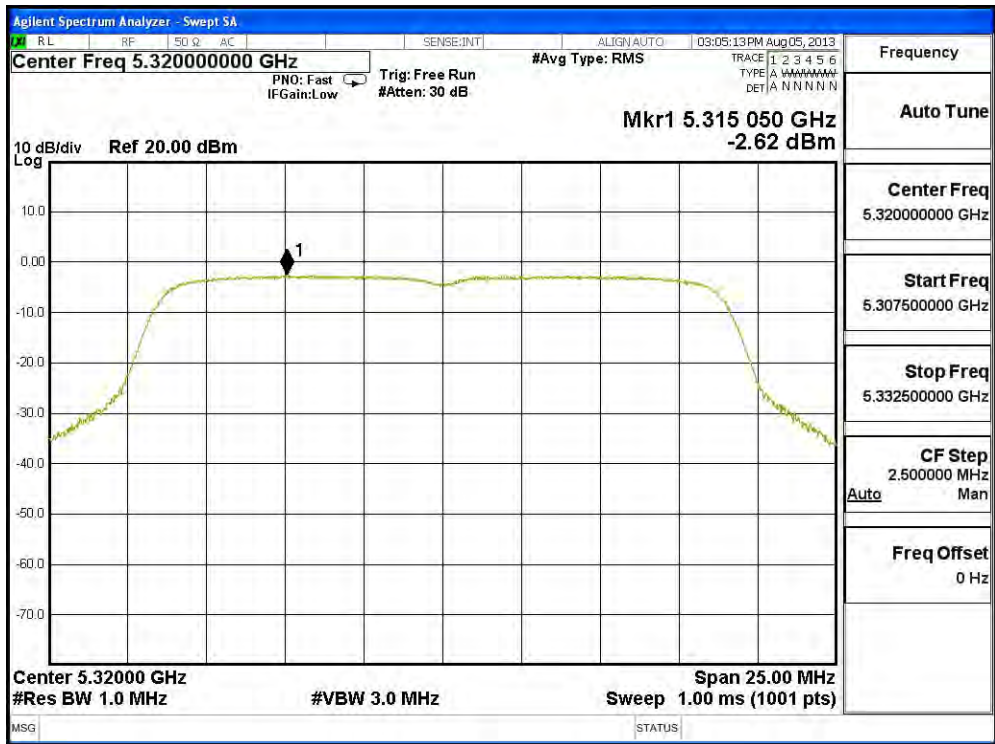
### Channel 52 – Chain B



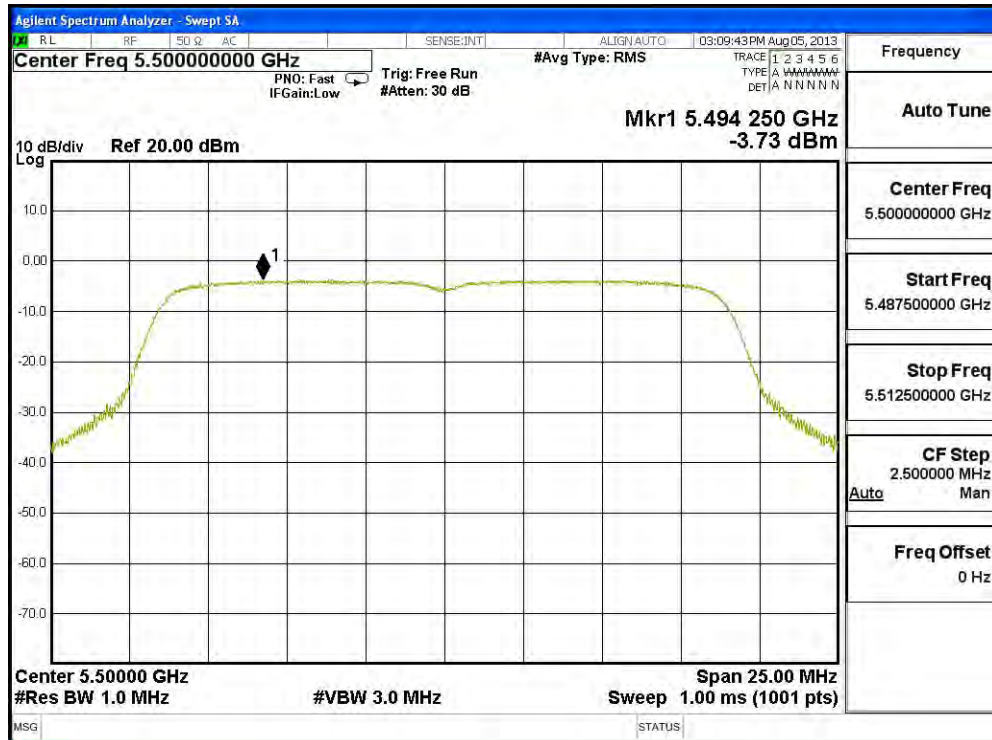
### Channel 60 – Chain B



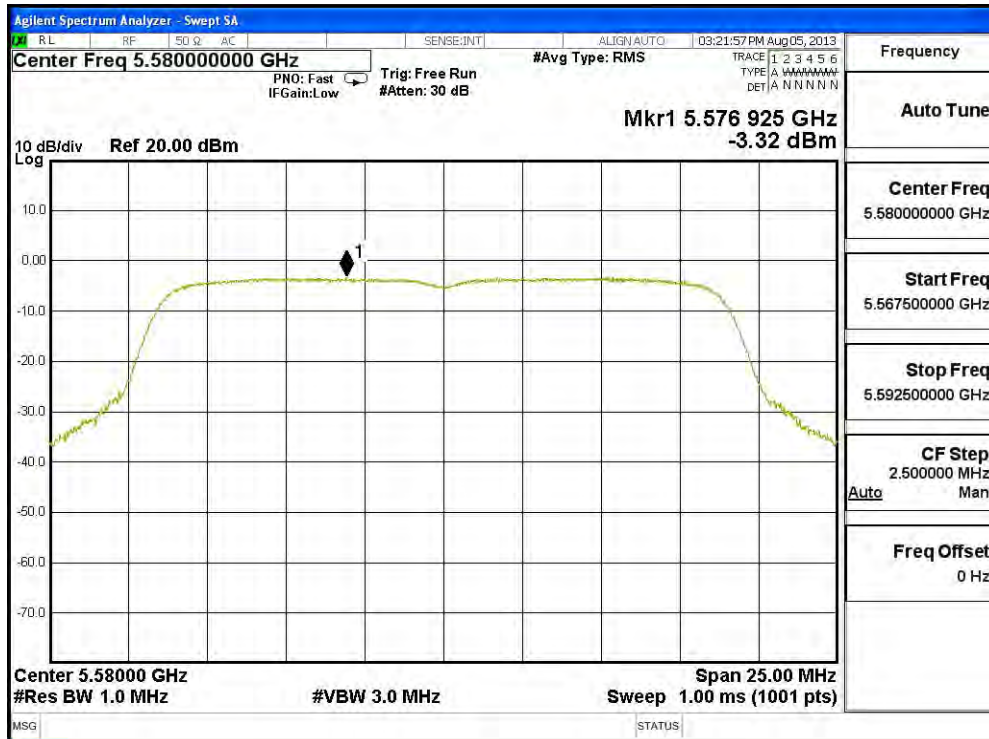
### Channel 64 – Chain B



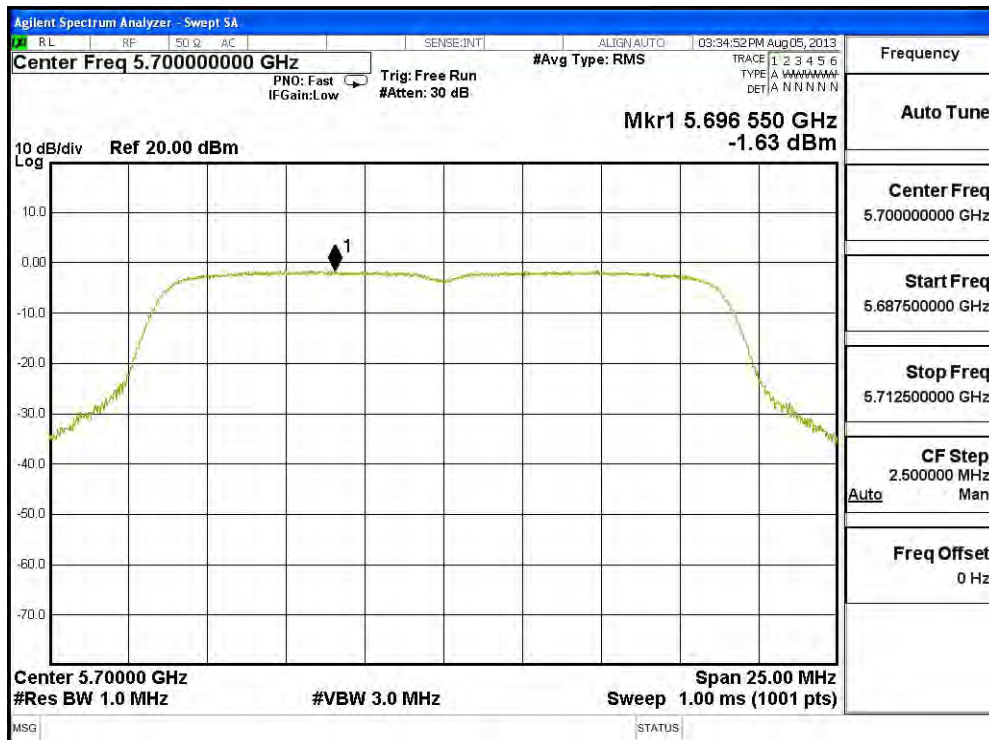
### Channel 100 – Chain B



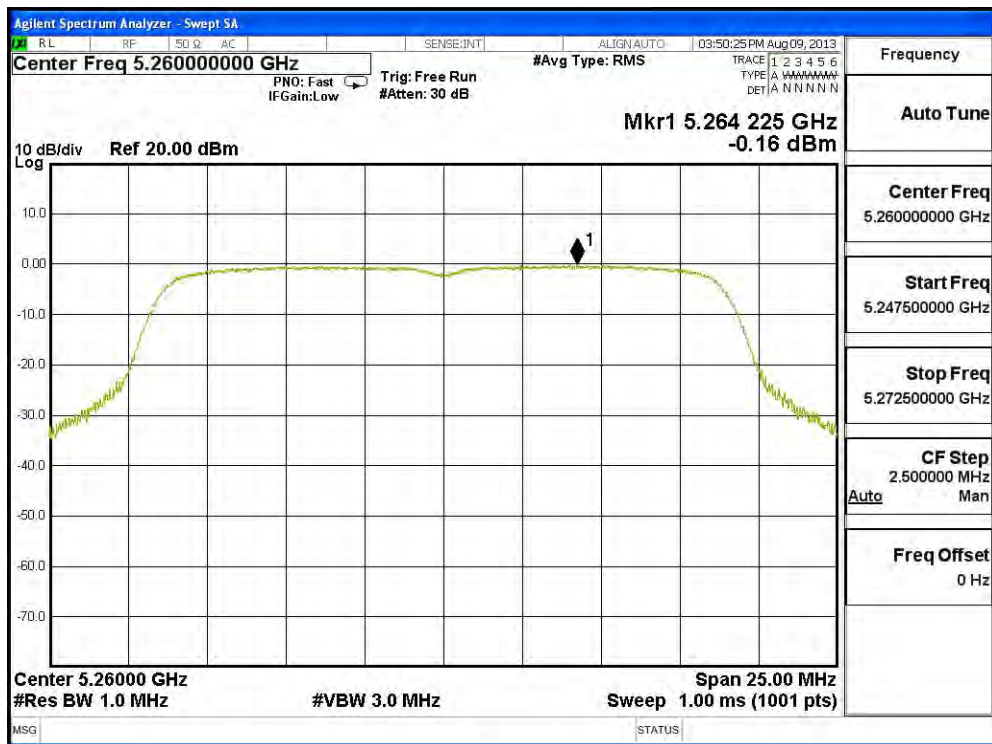
### Channel 116 – Chain B



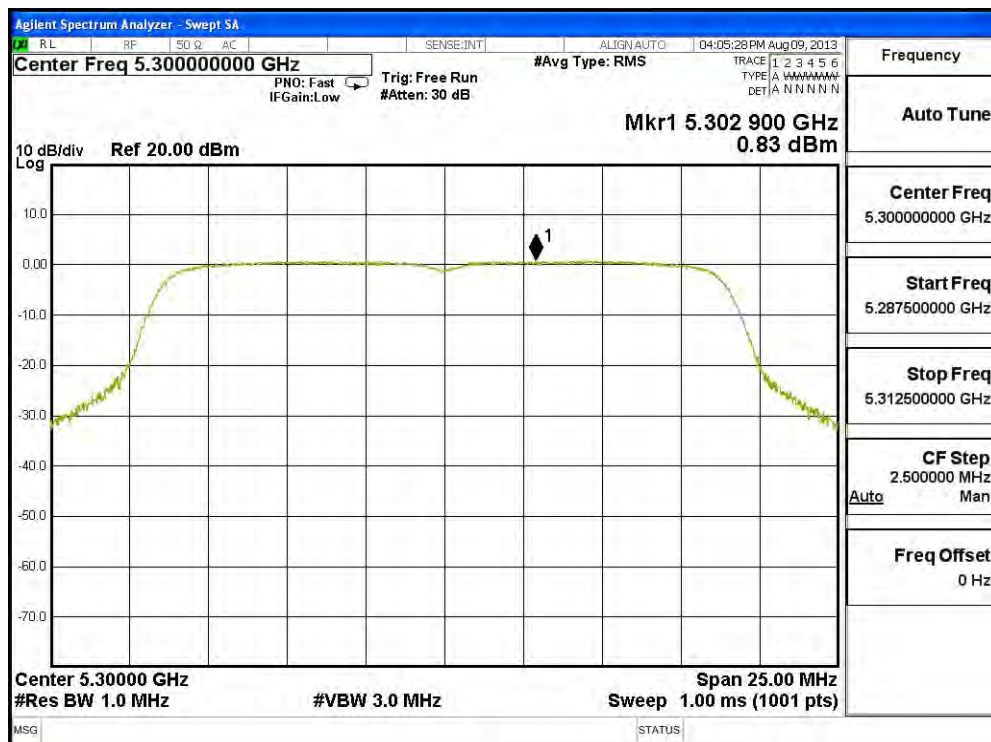
### Channel 140 – Chain B



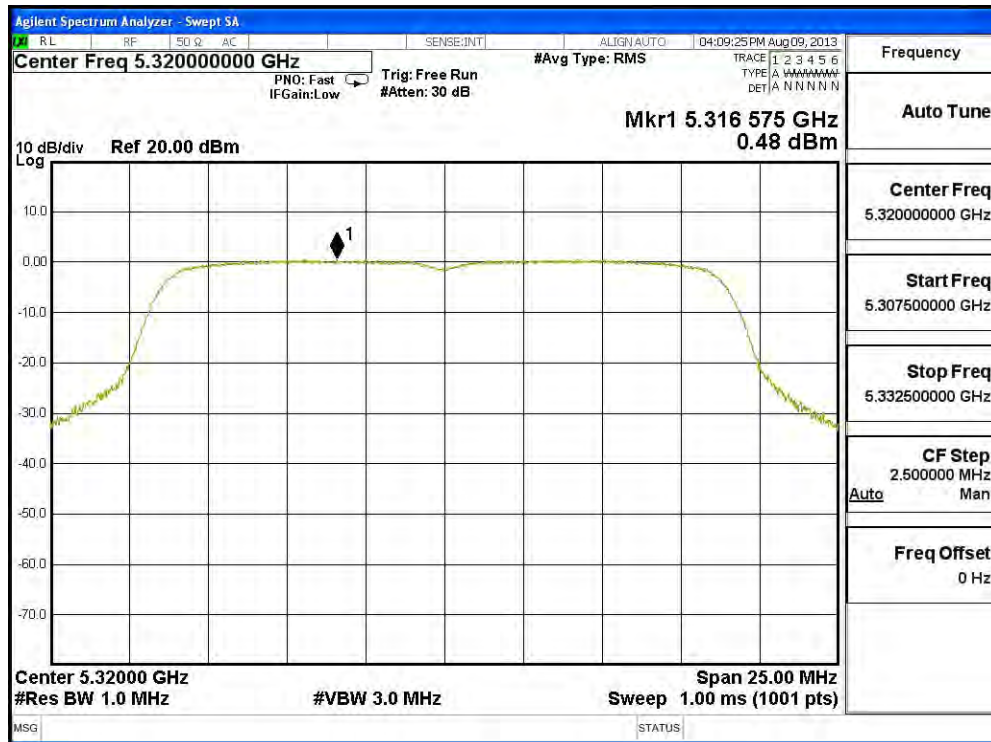
### Channel 52 – Chain C



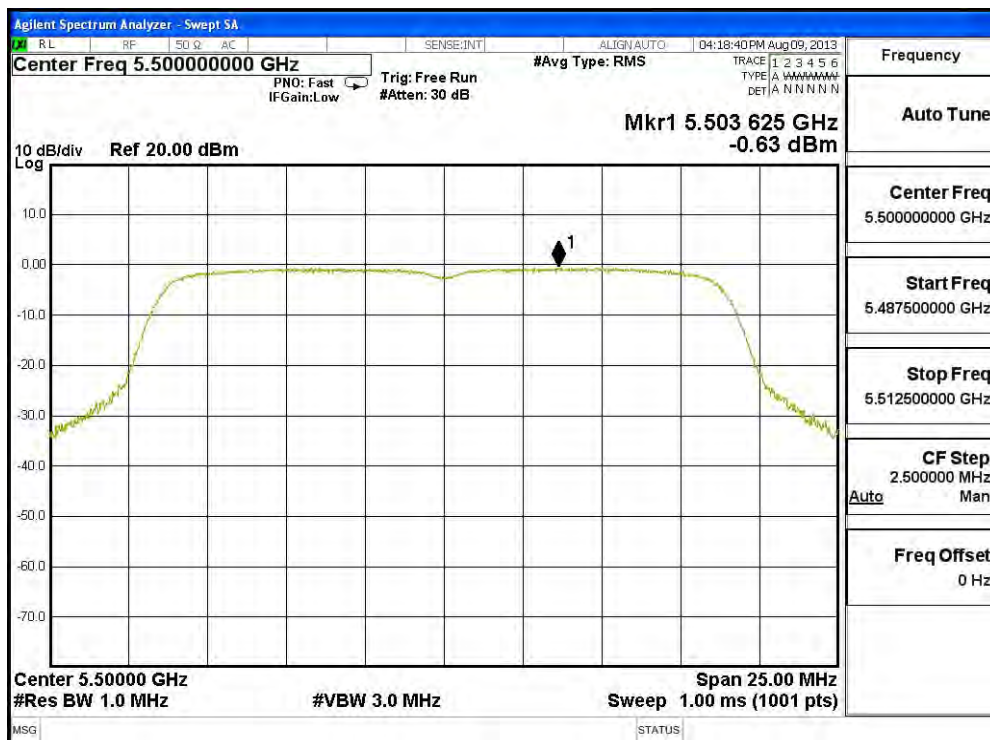
### Channel 60 – Chain C



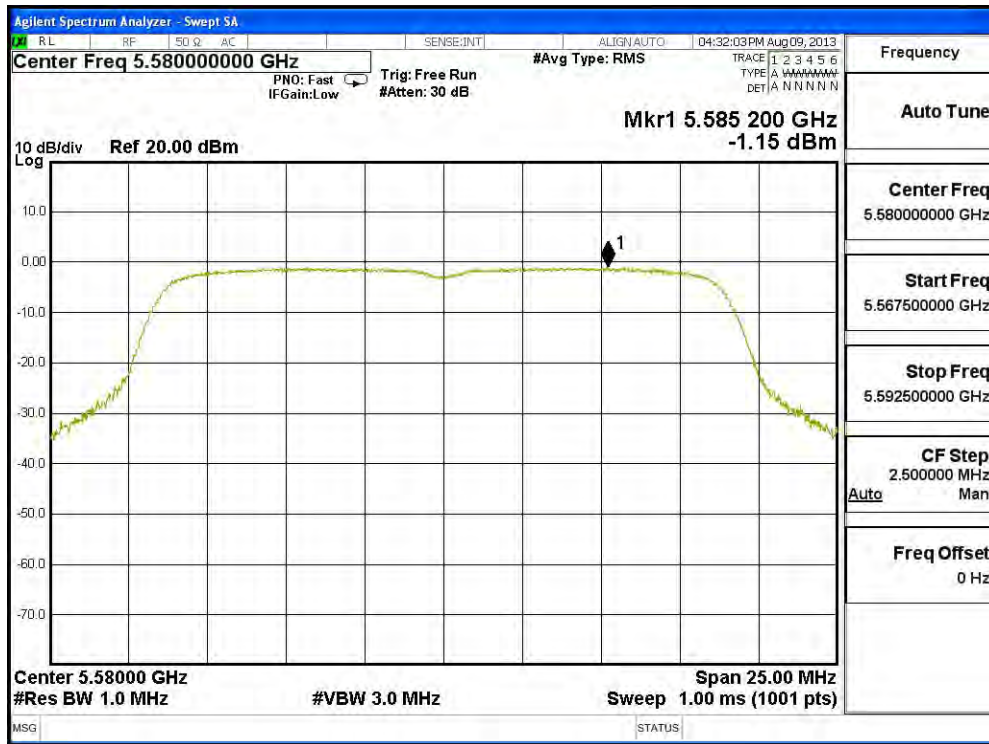
**Channel 64 – Chain C**



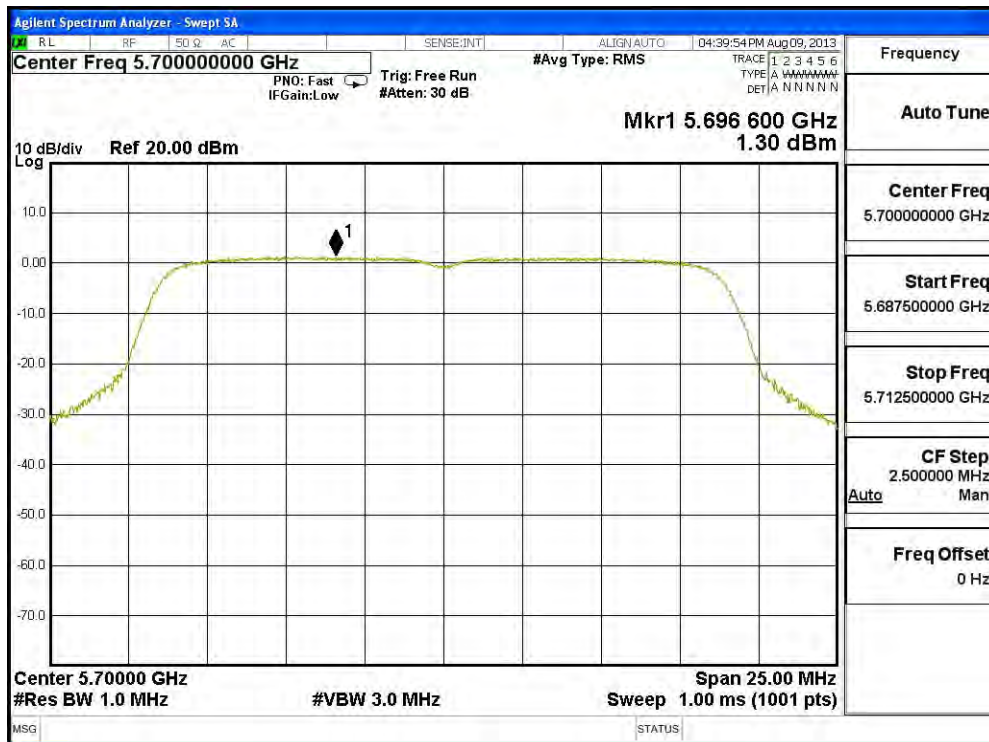
**Channel 100 – Chain C**



**Channel 116 – Chain C**



**Channel 140 – Chain C**

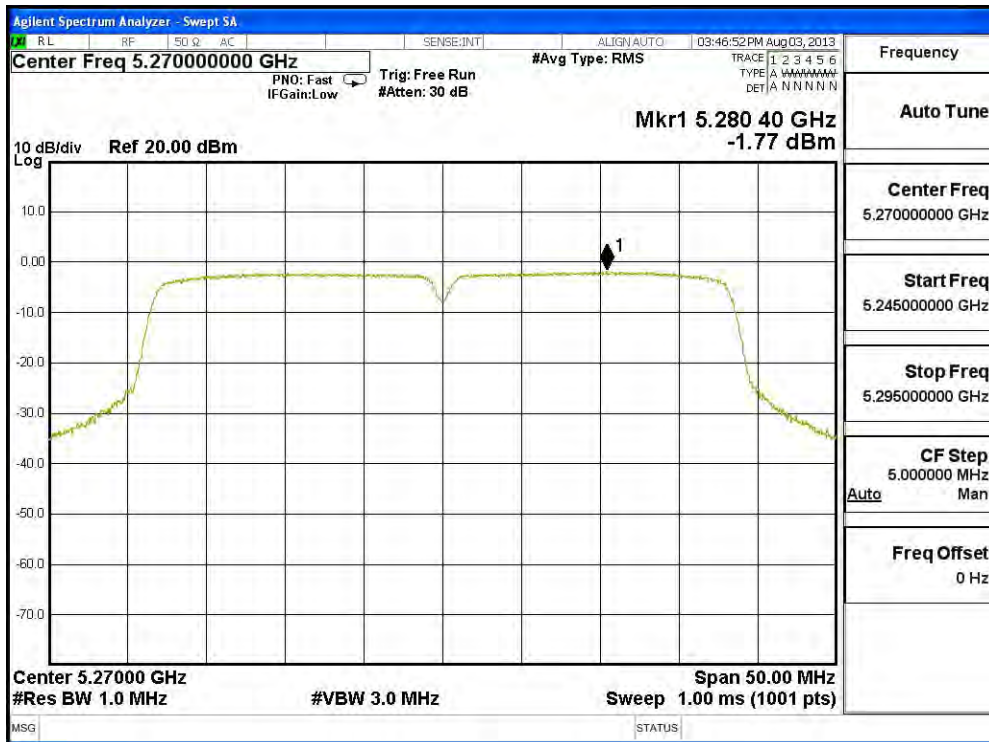


Product : SpectraGuard® Access Point / Sensor  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n-40BW 45Mbps)(Dipole Antenna)

Channel No.	Frequency (MHz)	Chain (dBm)	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Required Limit (dBm)	Result
54	5270	A	-1.770	3.001	<11	Pass
		B	-4.890	-0.119	<11	Pass
		C	-2.370	2.401	<11	Pass
62	5310	A	-4.440	0.331	<11	Pass
		B	-8.260	-3.489	<11	Pass
		C	-5.300	-0.529	<11	Pass
102	5510	A	-3.050	1.721	<11	Pass
		B	-7.460	-2.689	<11	Pass
		C	-4.170	0.601	<11	Pass
110	5550	A	-0.010	4.761	<11	Pass
		B	-4.150	0.621	<11	Pass
		C	-1.380	3.391	<11	Pass
134	5670	A	-1.240	3.531	<11	Pass
		B	-4.320	0.451	<11	Pass
		C	-1.790	2.981	<11	Pass

Note 1: The quantity  $10 \cdot \log 3$  (two antennas) is added to the spectrum peak value according to document 662911 D01.

### Channel 54 – Chain A

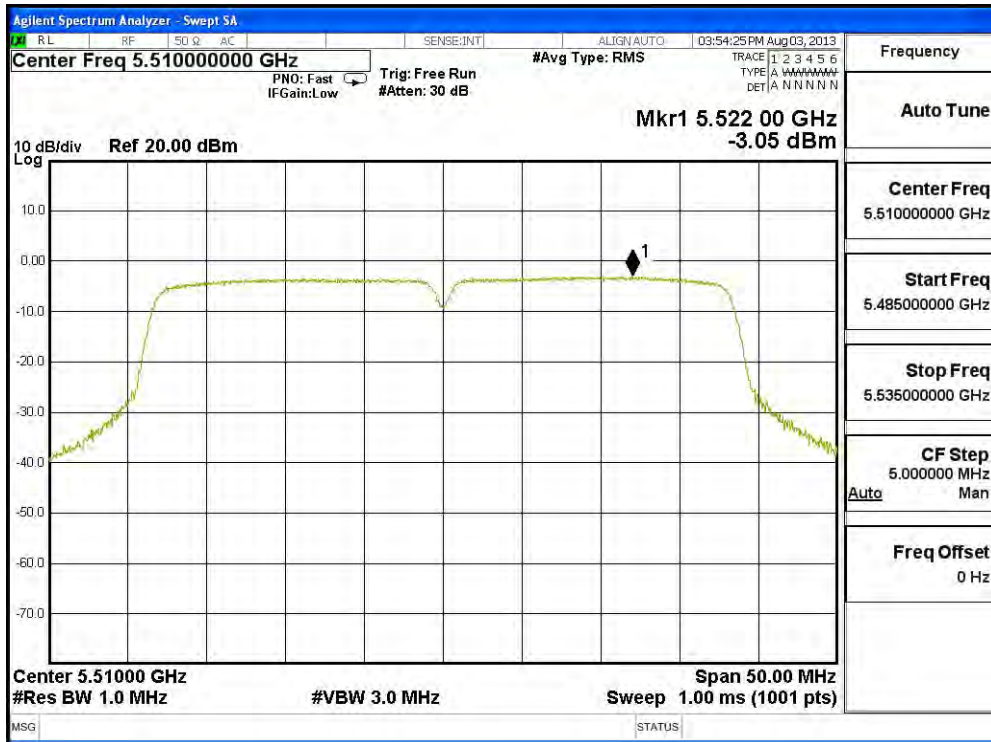


### Channel 62 – Chain A

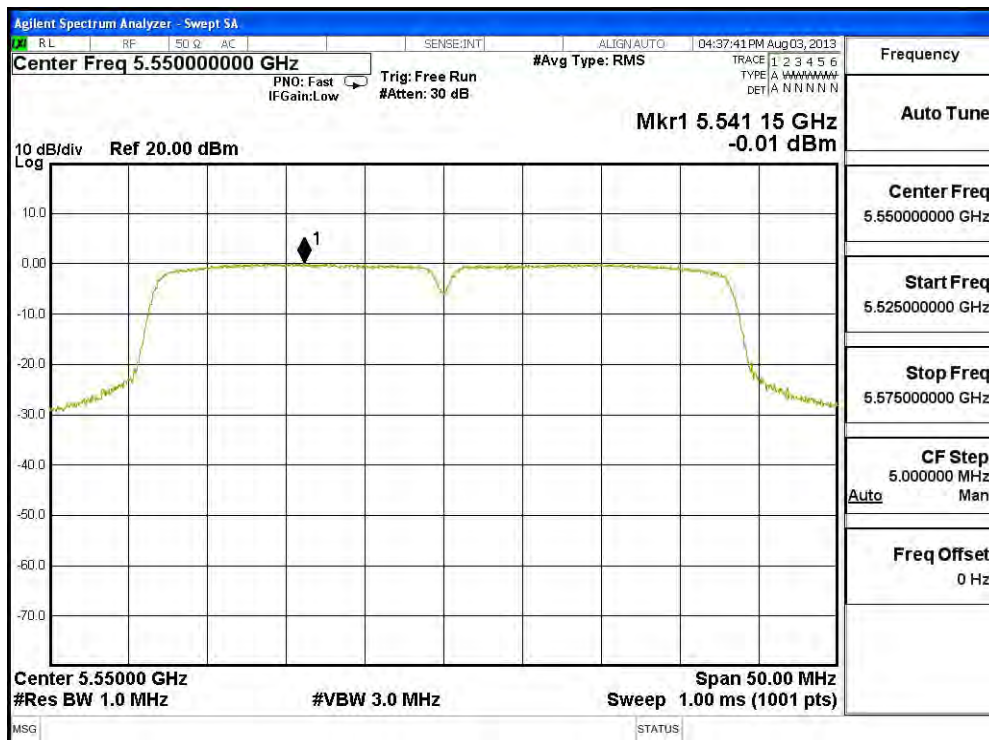




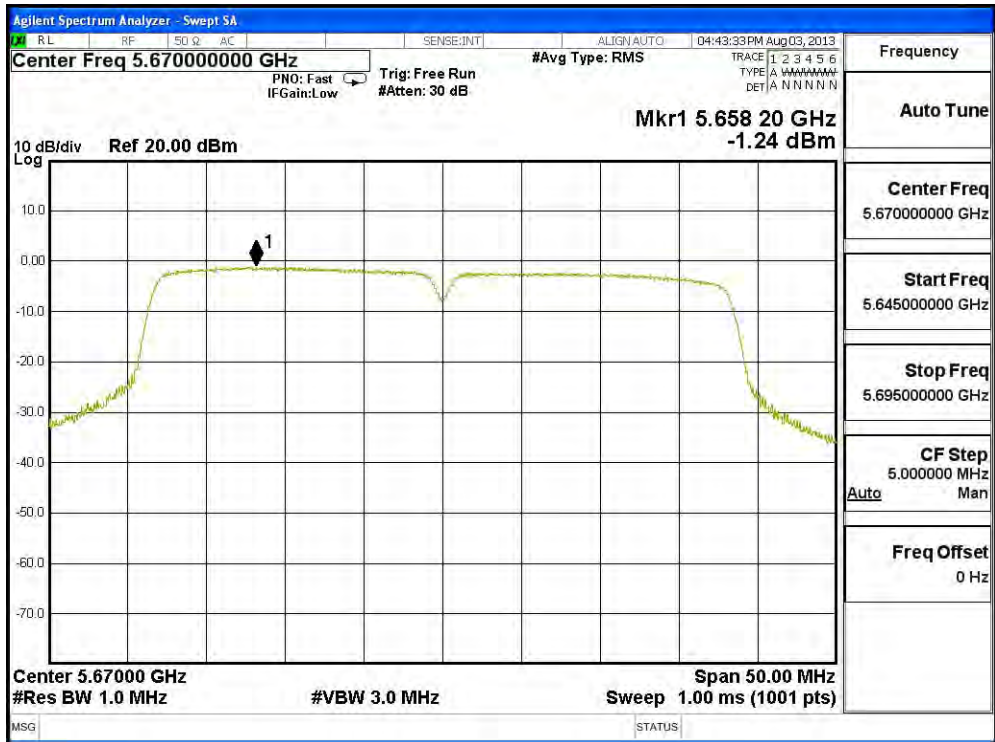
**Channel 102 – Chain A**



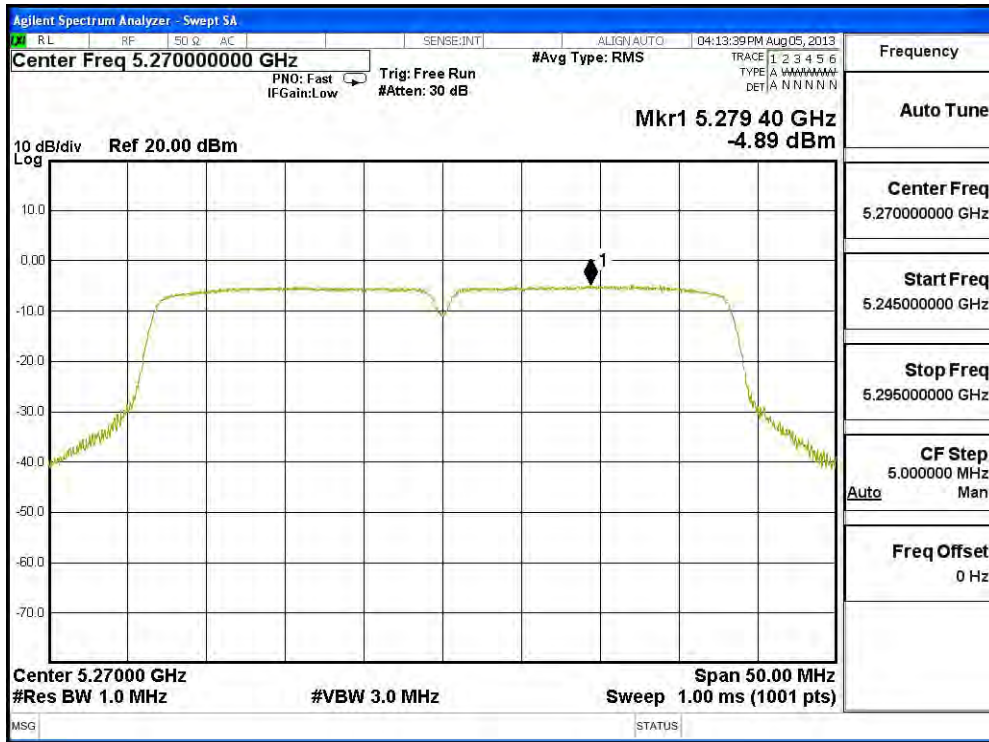
**Channel 110 – Chain A**



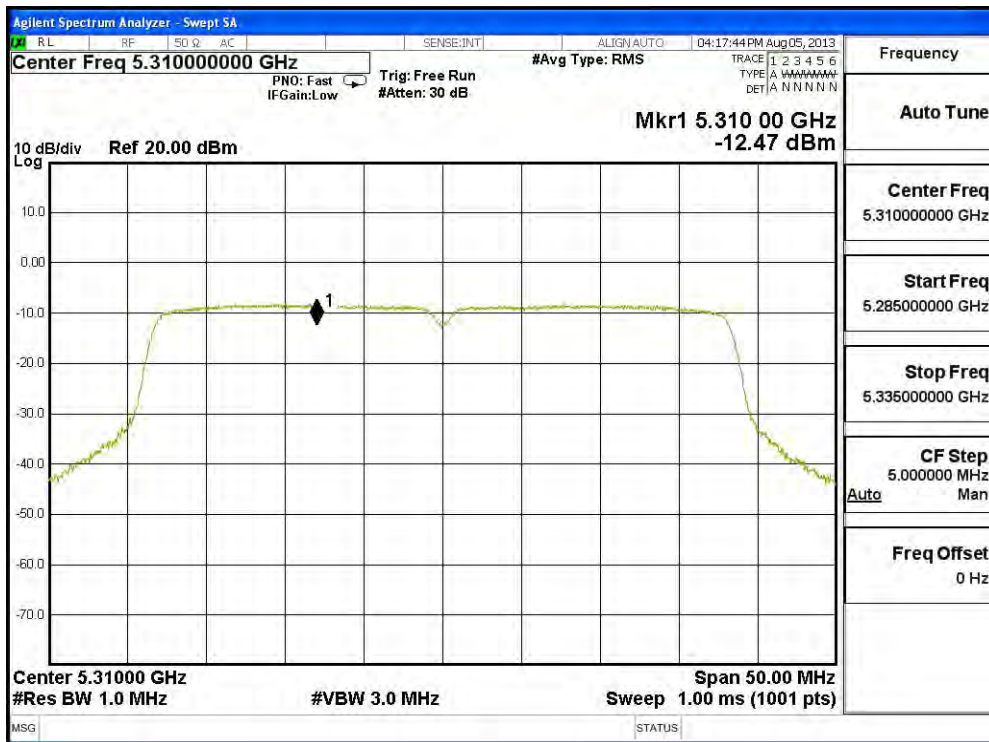
**Channel 134 – Chain A**



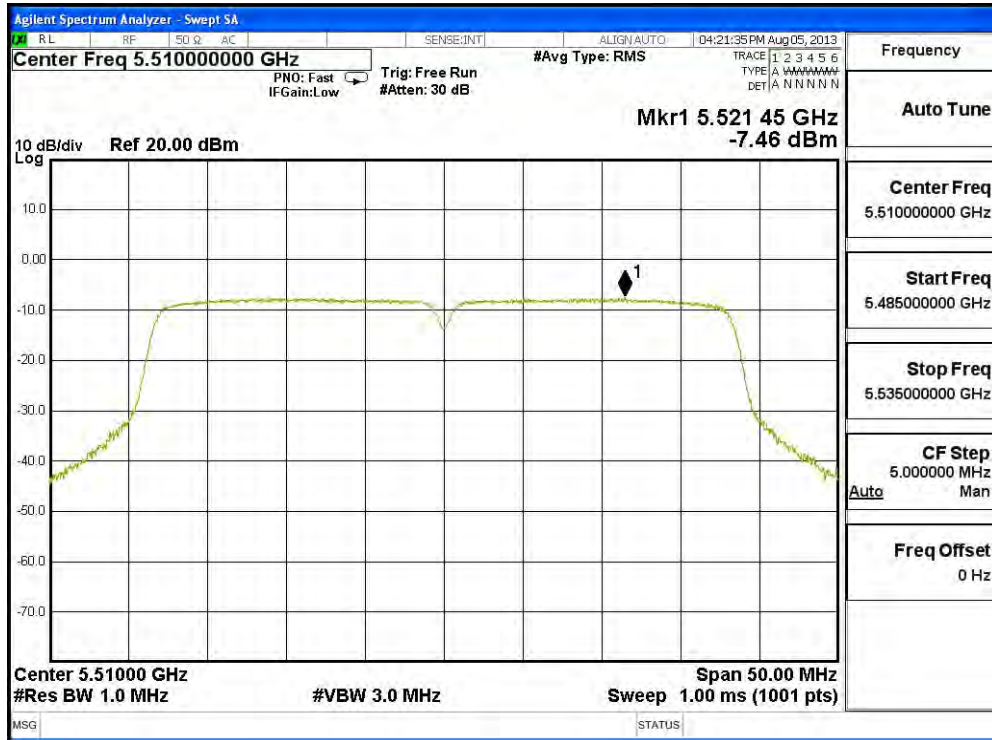
### Channel 54 – Chain B



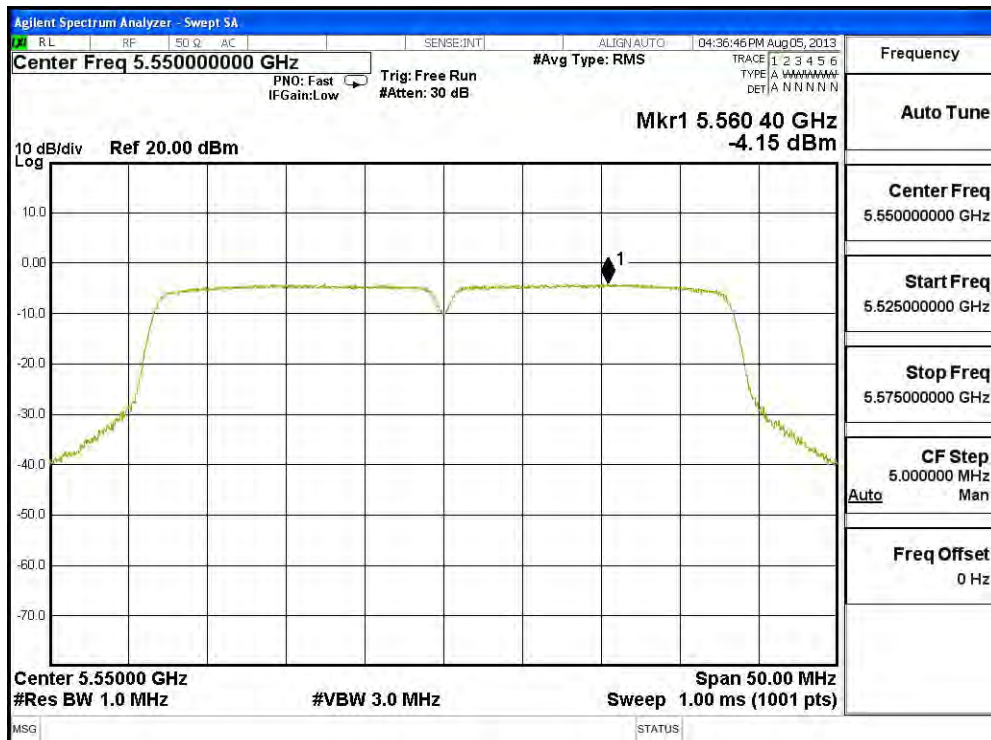
### Channel 62 – Chain B



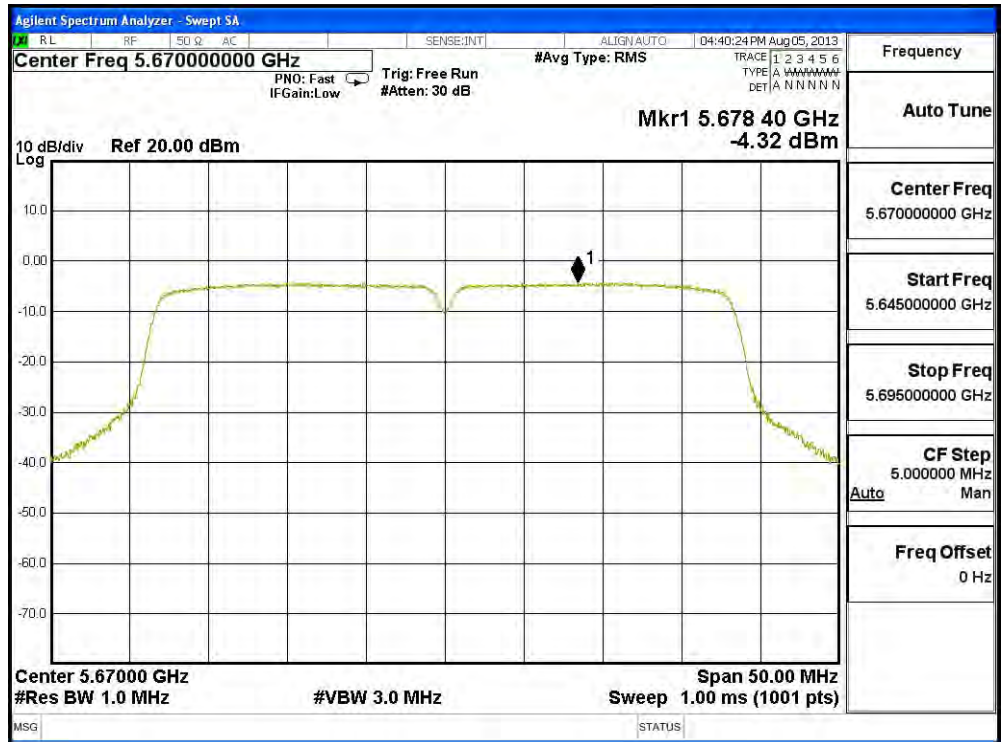
**Channel 102 – Chain B**



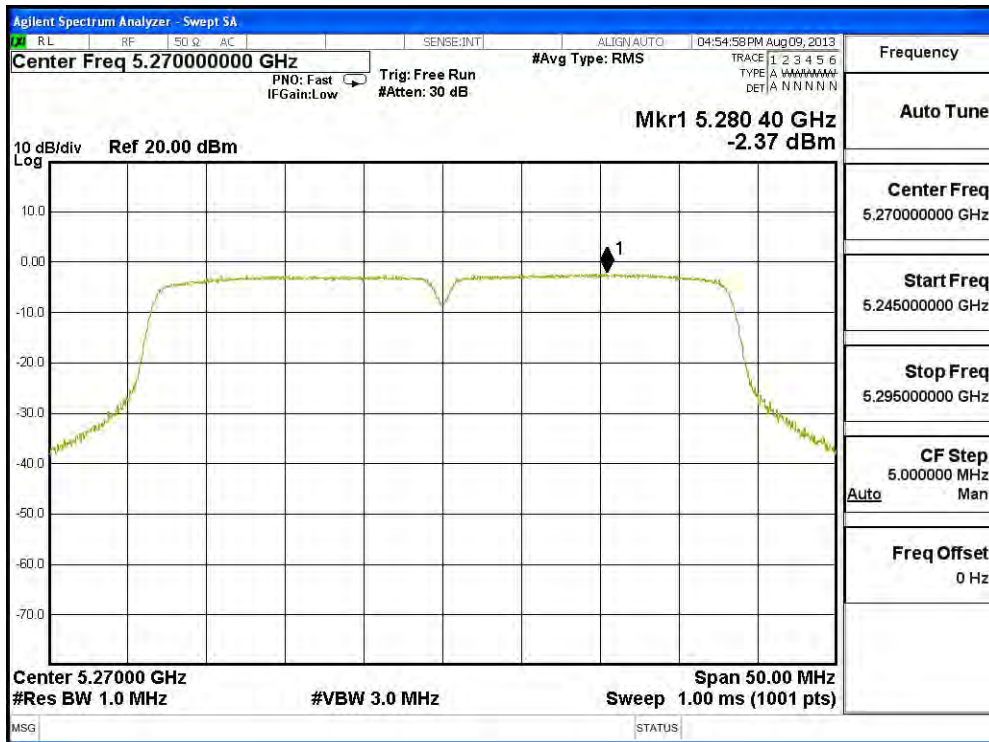
**Channel 110 – Chain B**



**Channel 134 – Chain B**



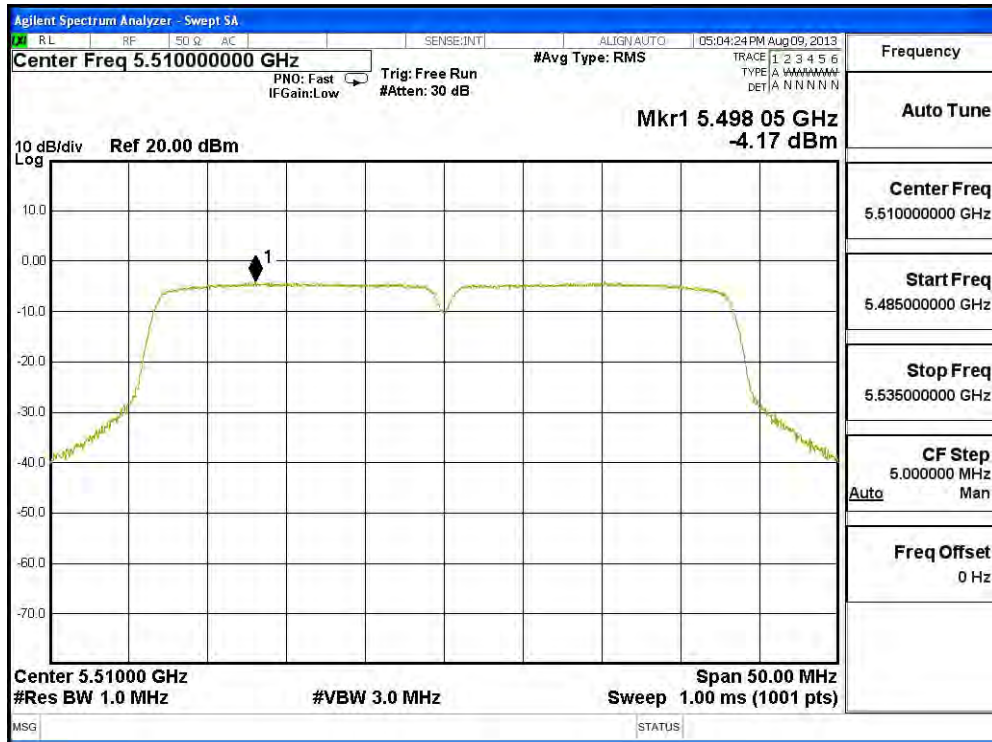
### Channel 54 – Chain C



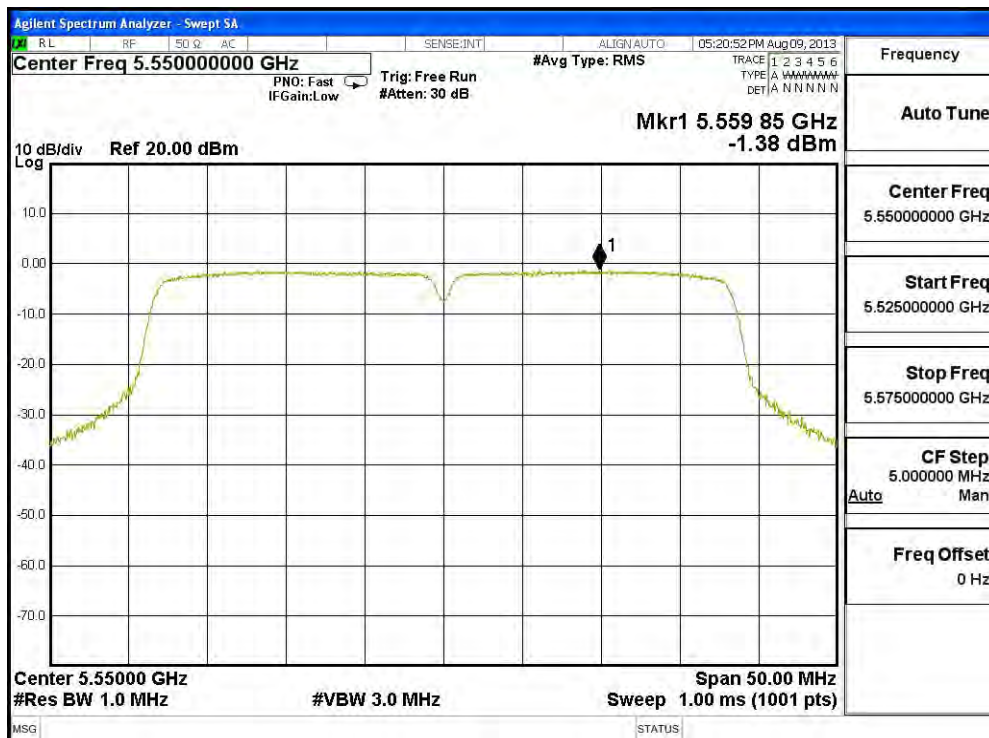
### Channel 62 – Chain C



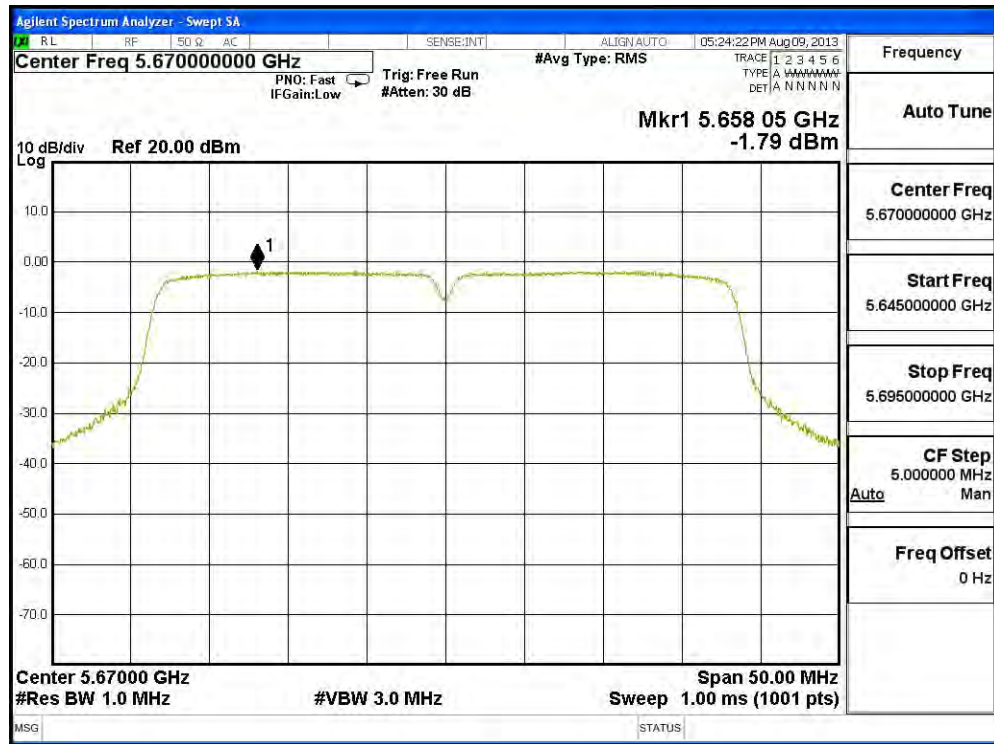
### Channel 102 – Chain C



### Channel 110 – Chain C



Channel 134 – Chain C



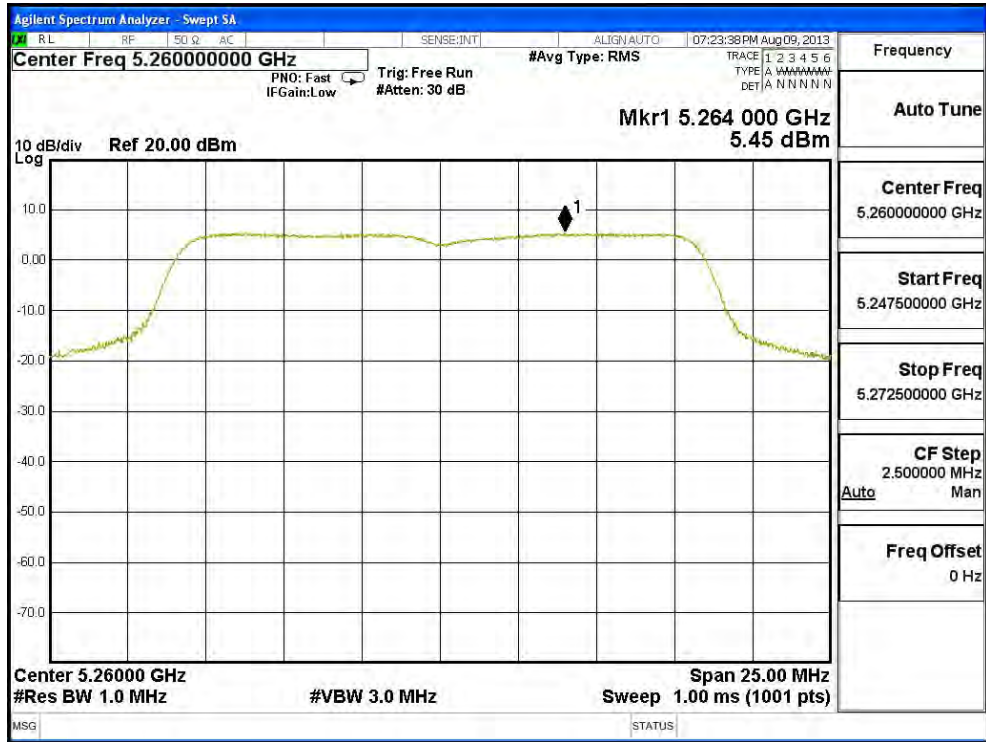


Product : SpectraGuard® Access Point / Sensor  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmit (802.11 a-6Mbps)(PIFA Antenna)

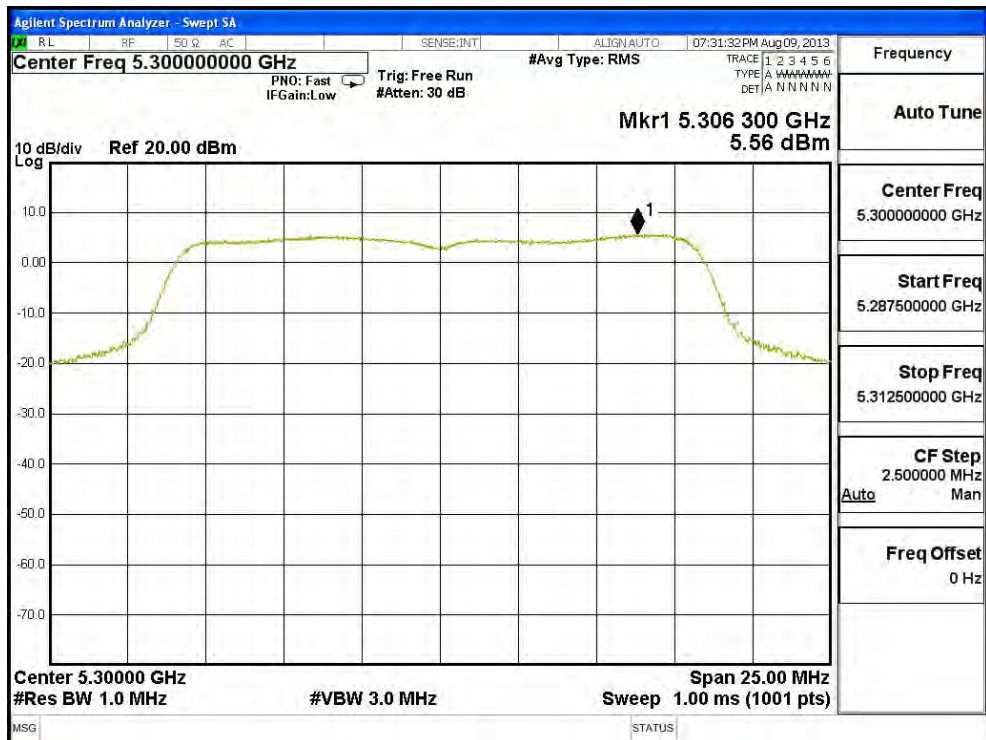
Channel No.	Frequency (MHz)	Chain (dBm)	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Required Limit (dBm)	Result
52	5260	A	5.450	10.221	<11	Pass
		B	1.700	6.471	<11	Pass
		C	4.280	9.051	<11	Pass
60	5300	A	5.560	10.331	<11	Pass
		B	2.130	6.901	<11	Pass
		C	4.240	9.011	<11	Pass
64	5320	A	5.840	10.611	<11	Pass
		B	1.070	5.841	<11	Pass
		C	4.080	8.851	<11	Pass
100	5500	A	4.540	9.311	<11	Pass
		B	0.480	5.251	<11	Pass
		C	4.060	8.831	<11	Pass
116	5580	A	5.600	10.371	<11	Pass
		B	0.200	4.971	<11	Pass
		C	3.740	8.511	<11	Pass
140	5700	A	5.720	10.491	<11	Pass
		B	2.980	7.751	<11	Pass
		C	5.340	10.111	<11	Pass

Note 1: The quantity  $10 \cdot \log 3$  (two antennas) is added to the spectrum peak value according to document 662911 D01.

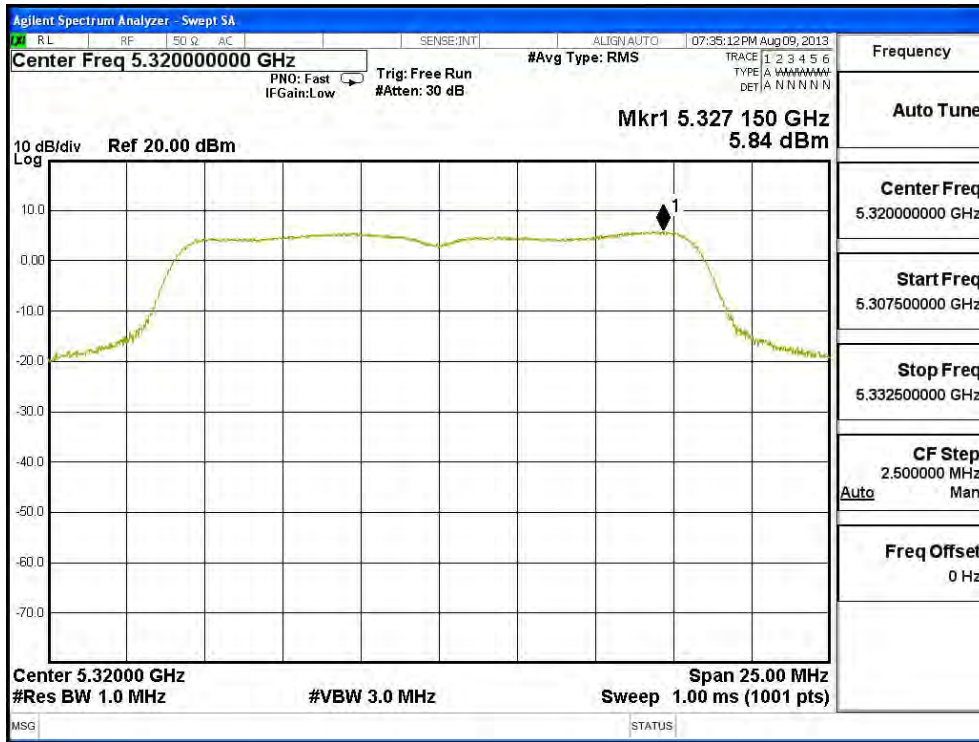
**Channel 52: CHAIN A**



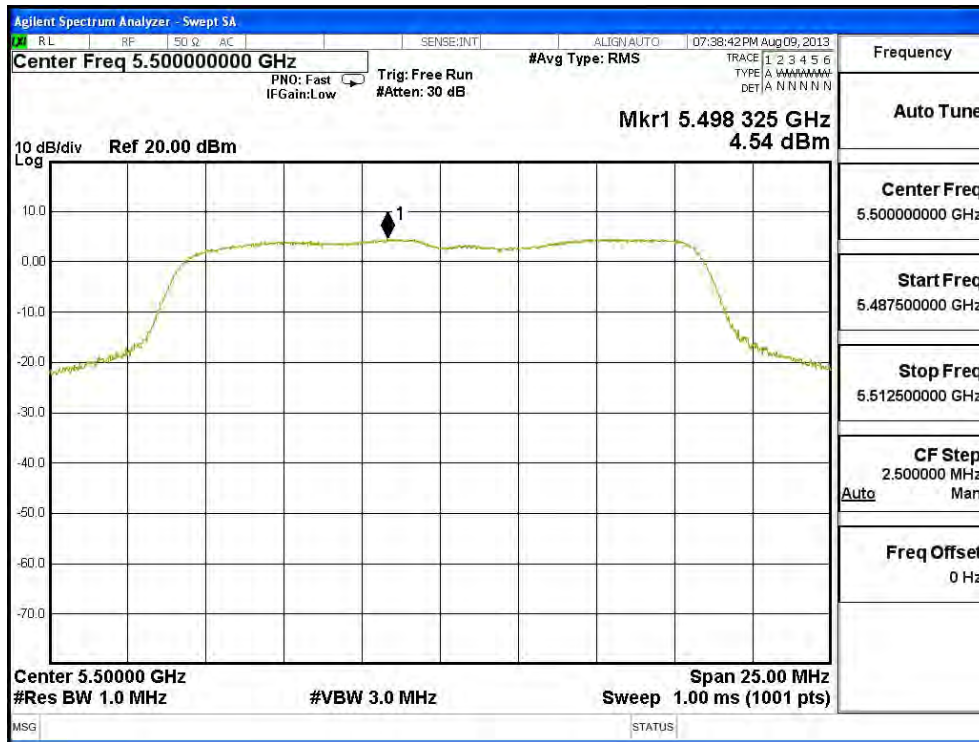
**Channel 60: CHAIN A**



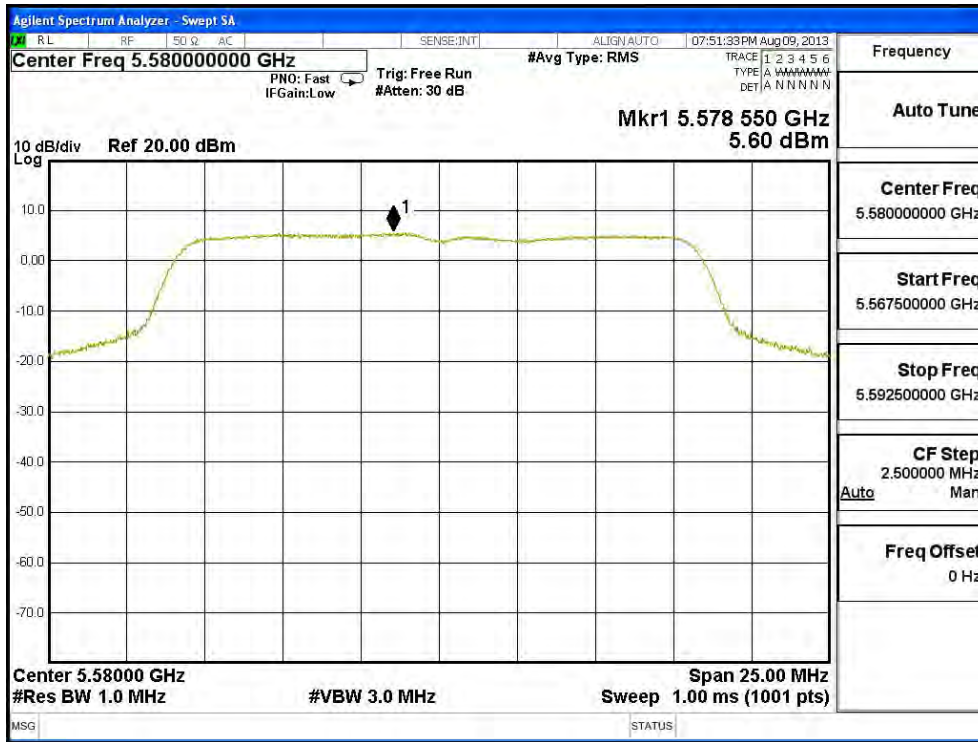
**Channel 64: CHAIN A**



**Channel 100: CHAIN A**



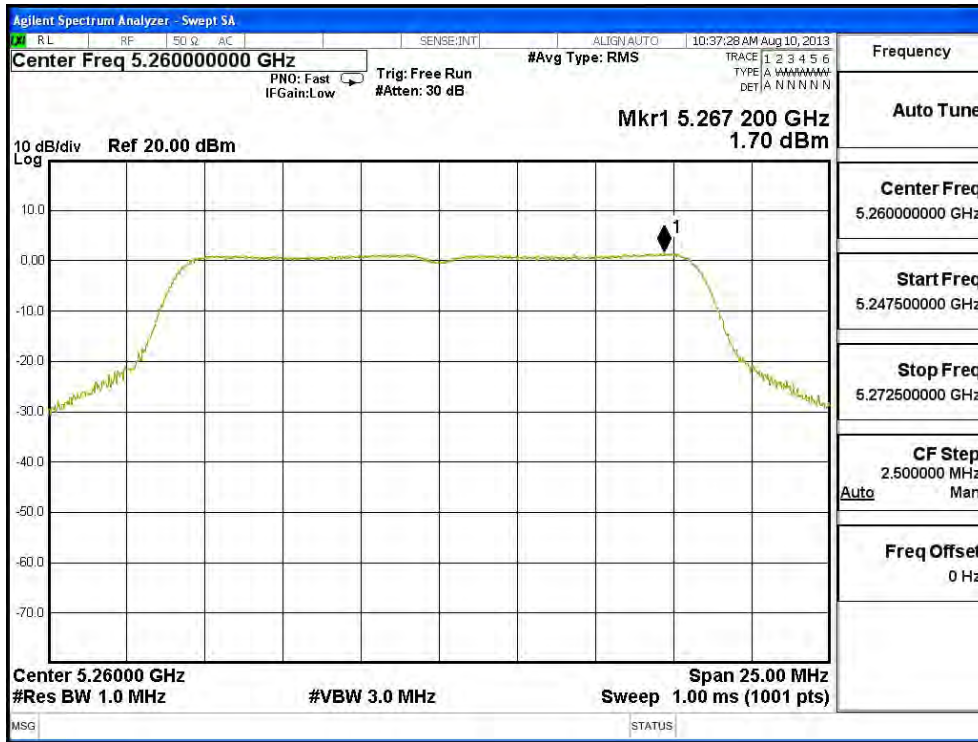
**Channel 116: CHAIN A**



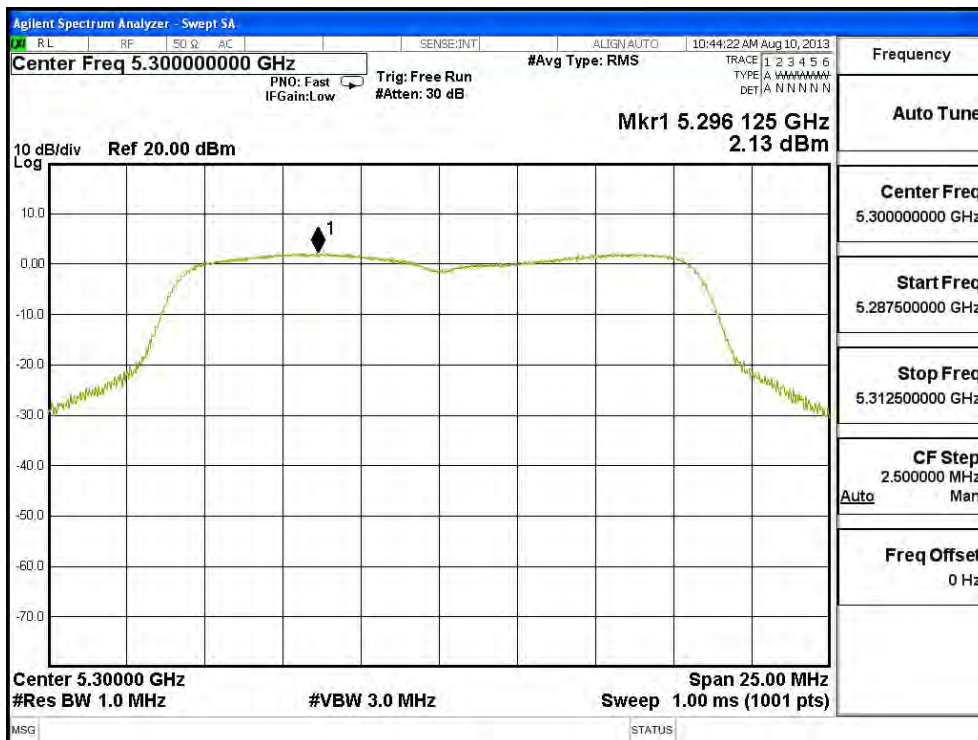
**Channel 140: CHAIN A**



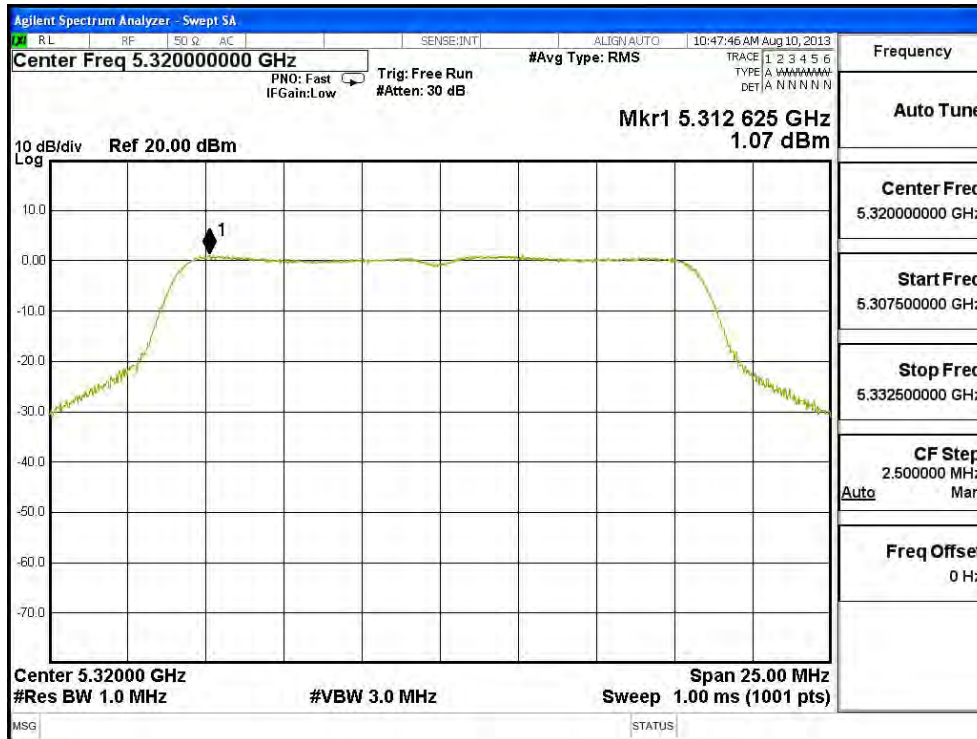
**Channel 52: CHAIN B**



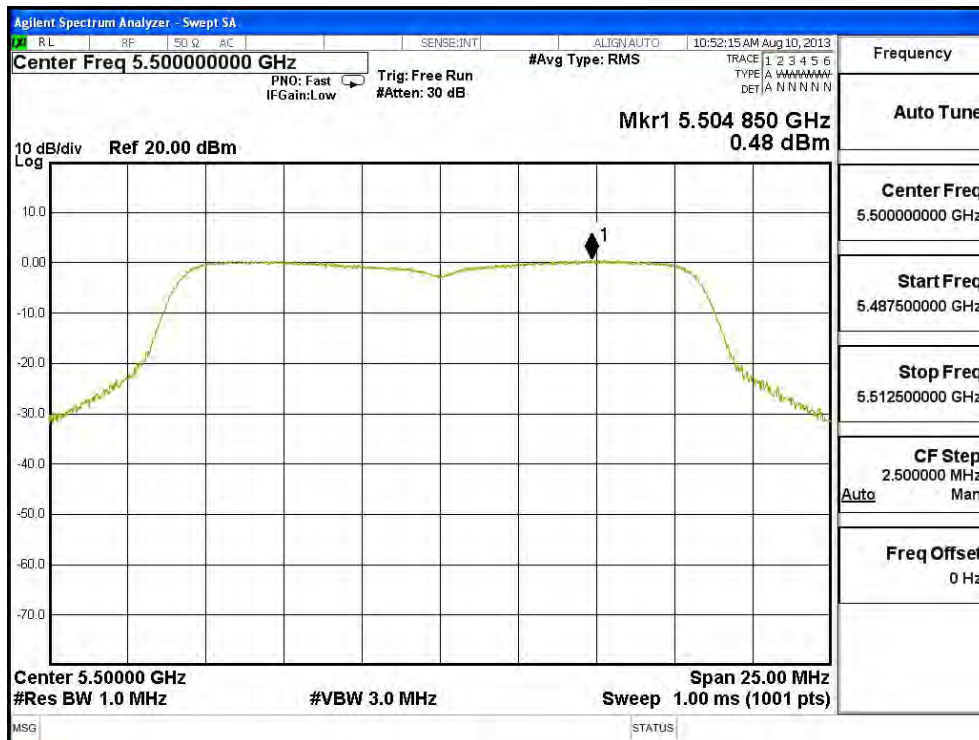
**Channel 60: CHAIN B**



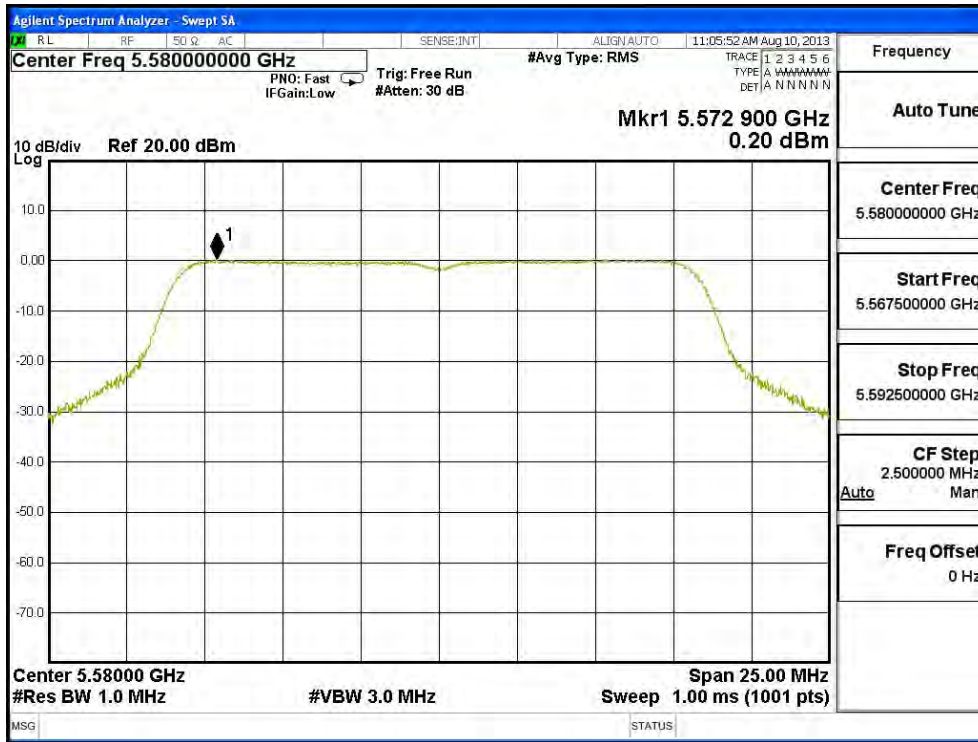
**Channel 64: CHAIN B**



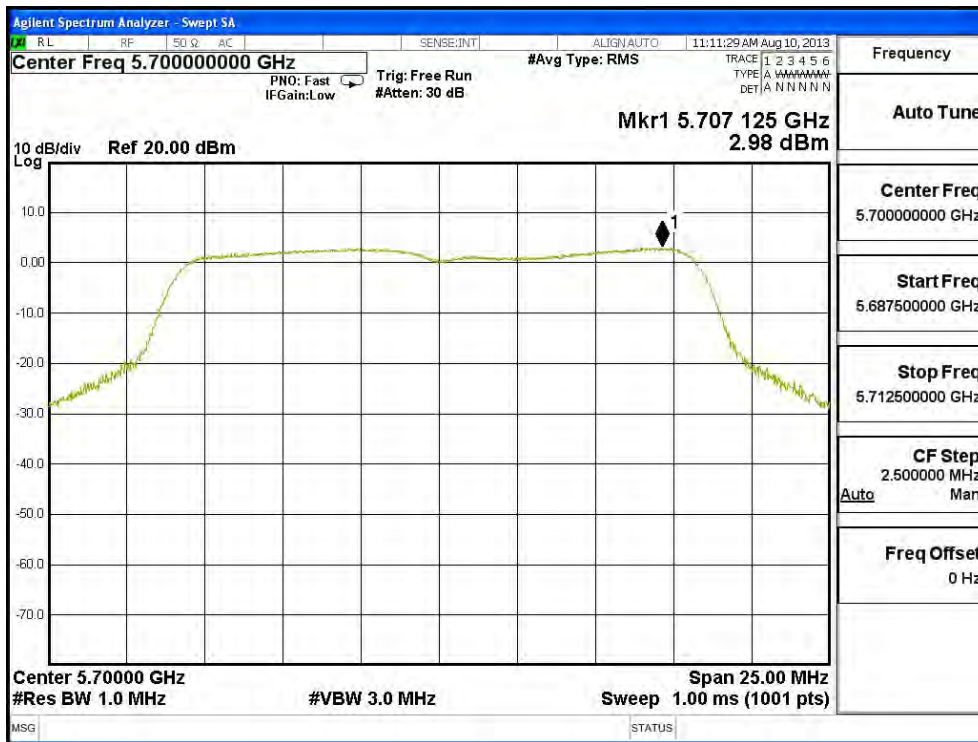
**Channel 100: CHAIN B**



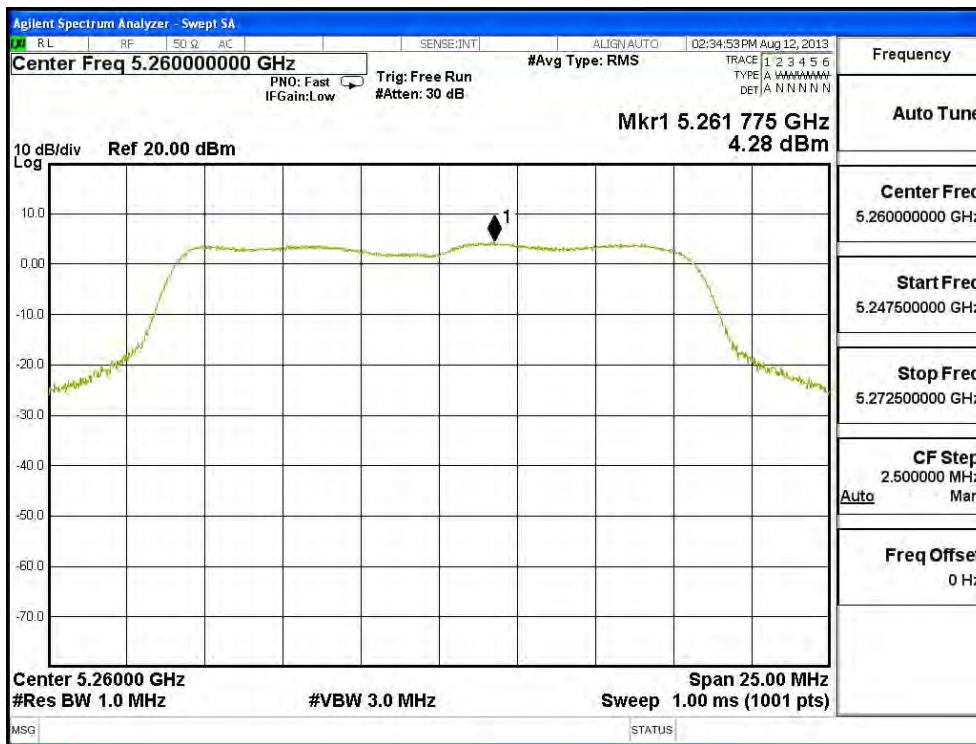
**Channel 116: CHAIN B**



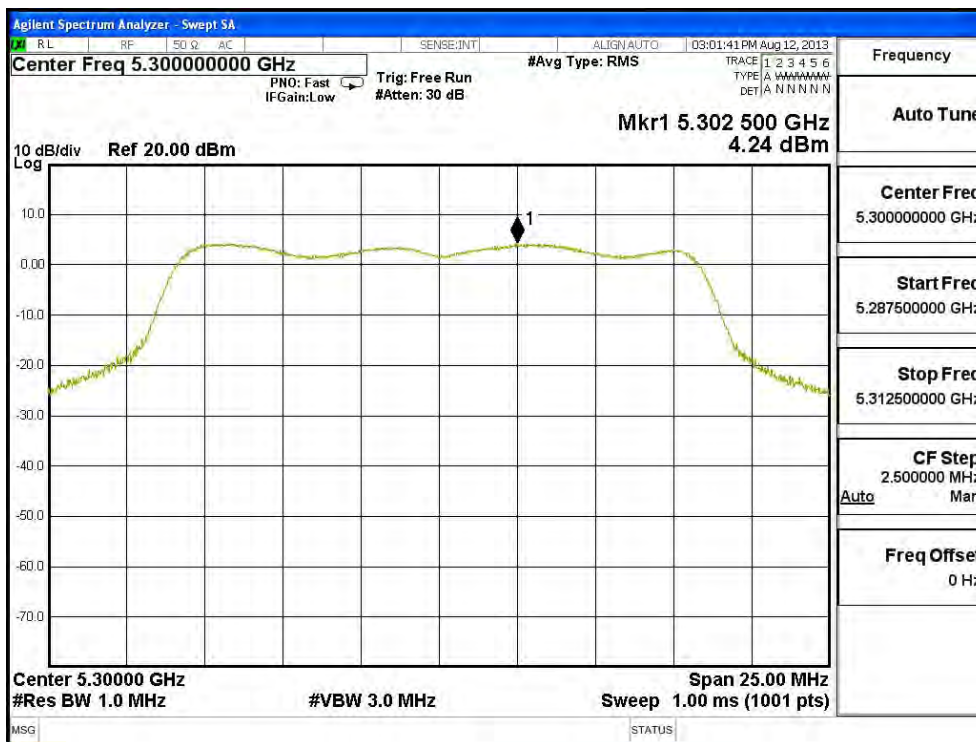
**Channel 140: CHAIN B**



### Channel 52: CHAIN C

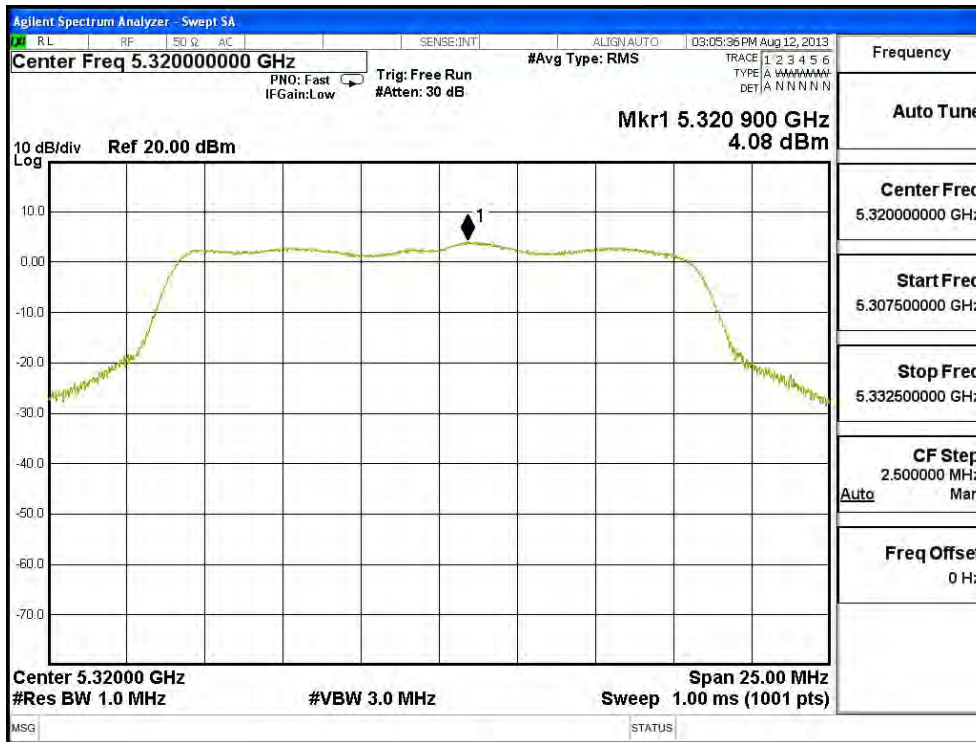


### Channel 60: CHAIN C

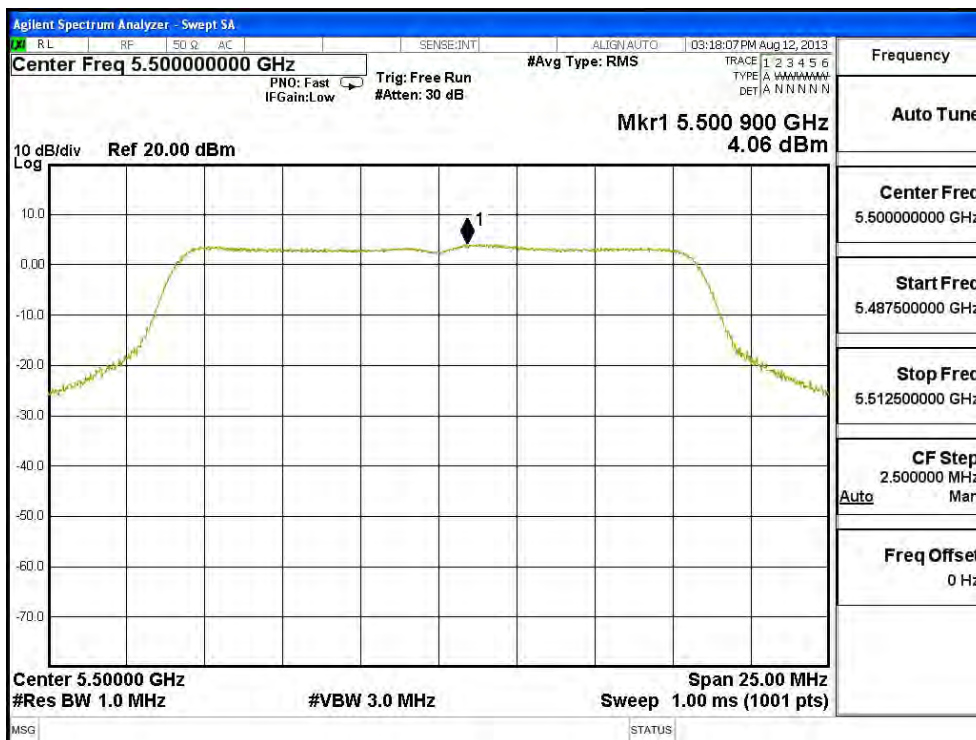




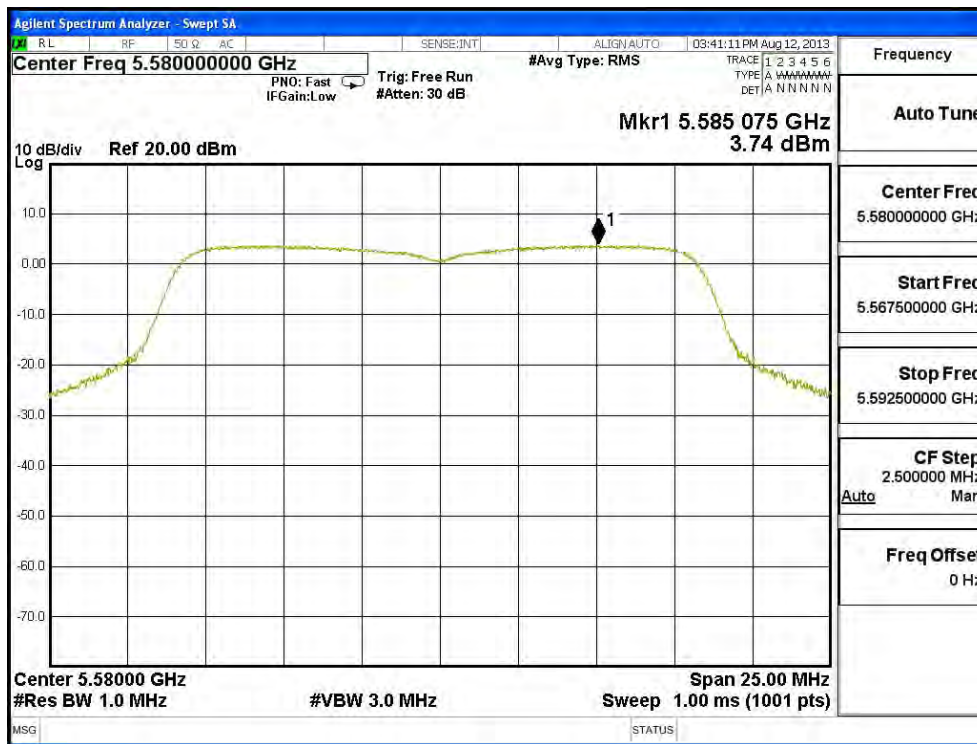
**Channel 64: CHAIN C**



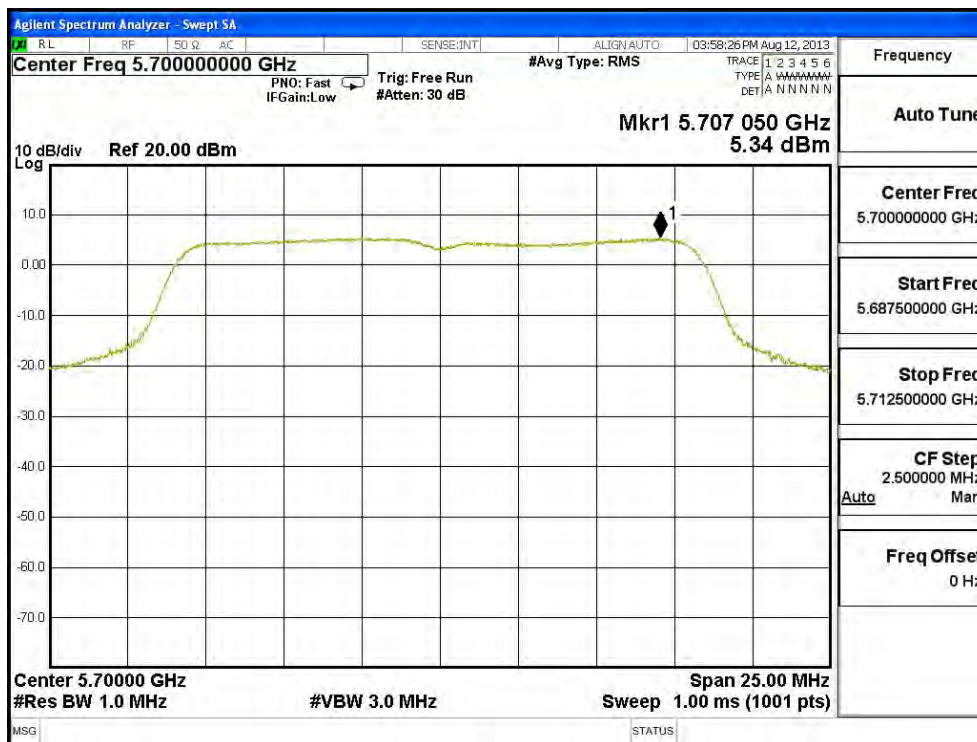
**Channel 100: CHAIN C**



### Channel 116: CHAIN C



### Channel 140: CHAIN C

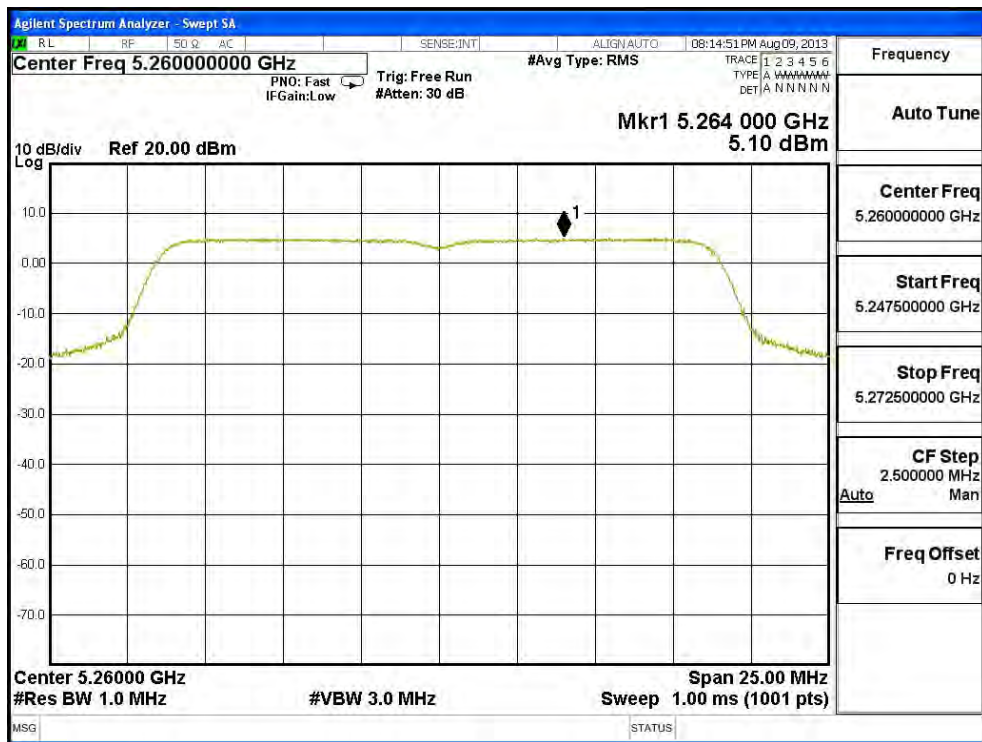


Product : SpectraGuard® Access Point / Sensor  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Mode : Mode 5: Transmit (802.11n-20BW 21.7Mbps)(PIFA Antenna)

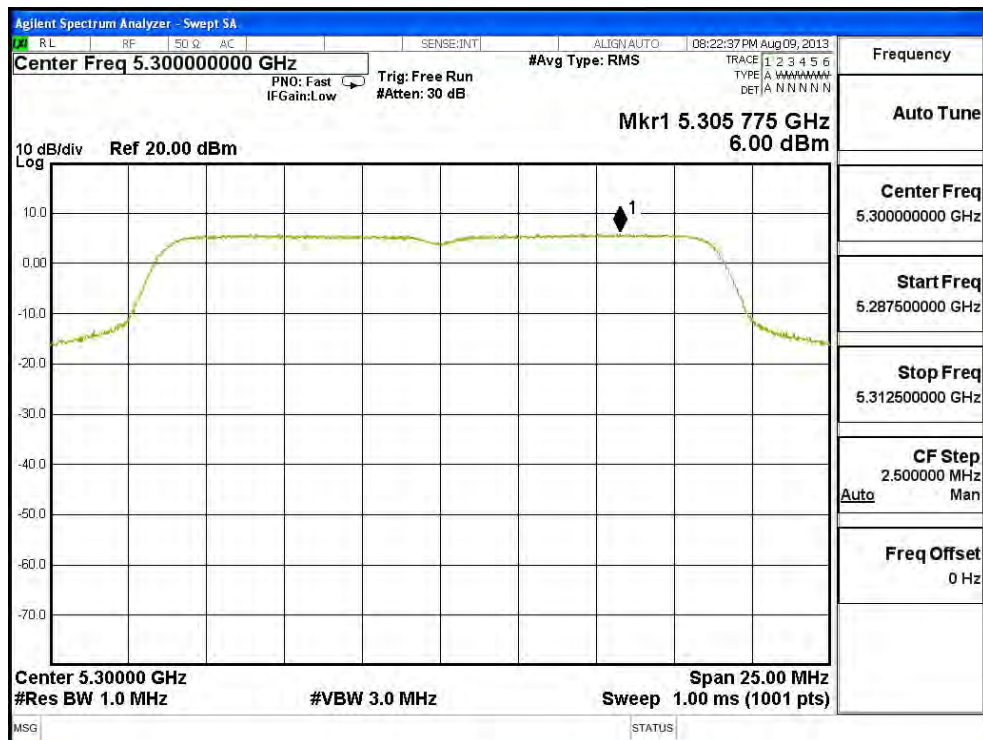
Channel No.	Frequency (MHz)	Chain (dBm)	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Required Limit (dBm)	Result
52	5260	A	5.100	9.871	<11	Pass
		B	1.470	6.241	<11	Pass
		C	3.680	8.451	<11	Pass
60	5300	A	6.000	10.771	<11	Pass
		B	2.770	7.541	<11	Pass
		C	4.870	9.641	<11	Pass
64	5320	A	5.860	10.631	<11	Pass
		B	1.410	6.181	<11	Pass
		C	4.140	8.911	<11	Pass
100	5500	A	4.220	8.991	<11	Pass
		B	-0.460	4.311	<11	Pass
		C	4.310	9.081	<11	Pass
116	5580	A	5.220	9.991	<11	Pass
		B	-0.160	4.611	<11	Pass
		C	3.070	7.841	<11	Pass
140	5700	A	5.100	9.871	<11	Pass
		B	1.470	6.241	<11	Pass
		C	4.640	9.411	<11	Pass

Note 1: The quantity  $10 \cdot \log 3$  (two antennas) is added to the spectrum peak value according to document 662911 D01.

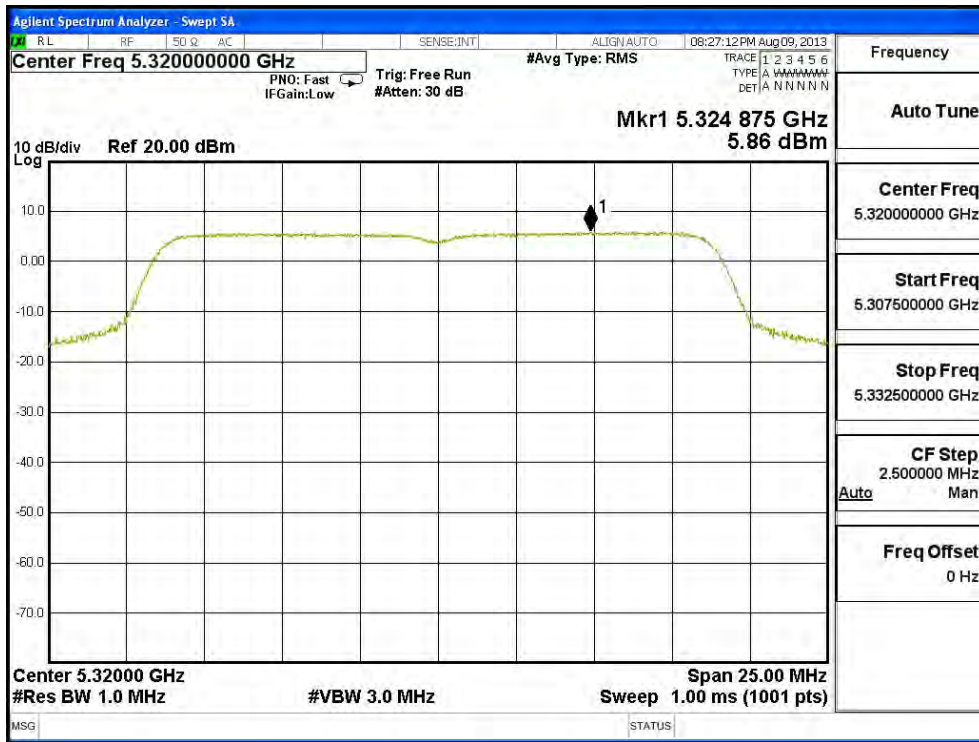
### Channel 52 – Chain A



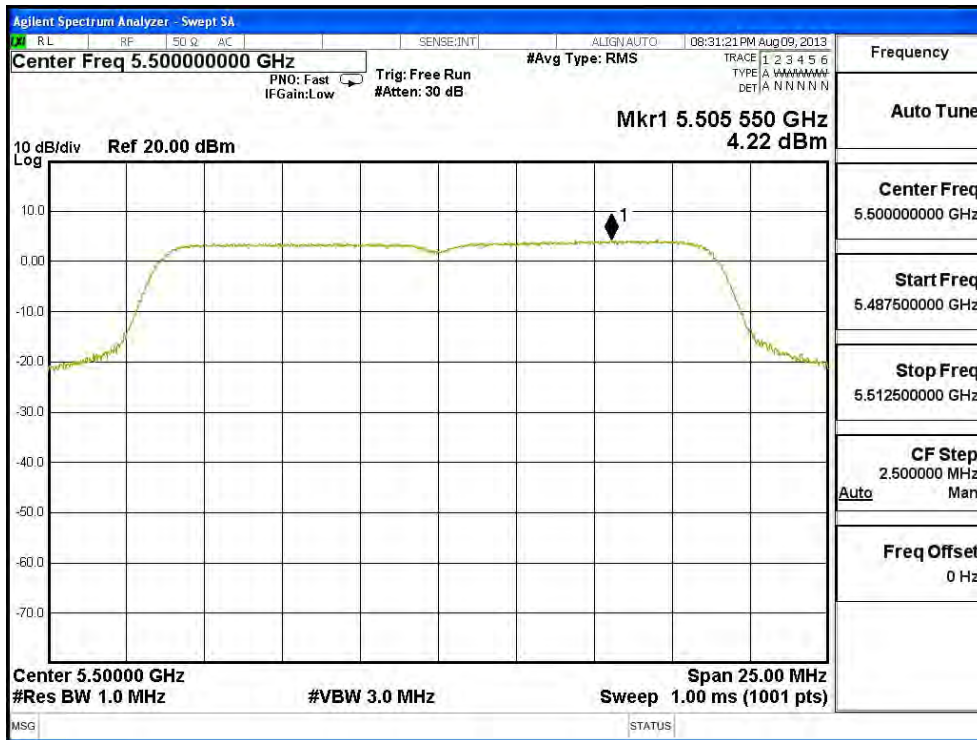
### Channel 60 – Chain A



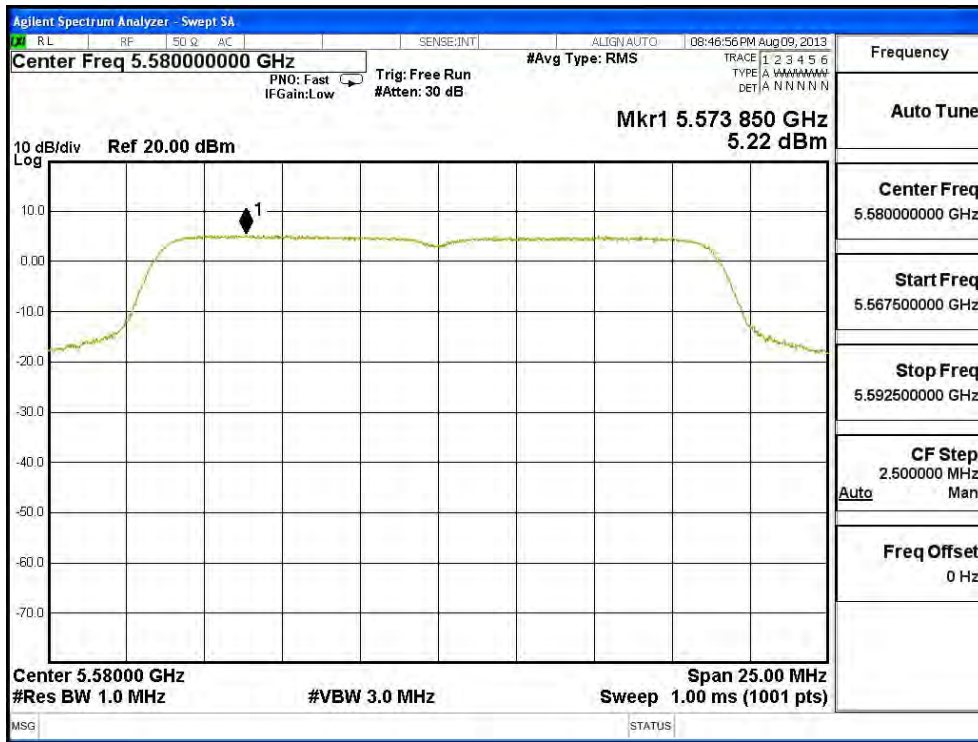
### Channel 64 – Chain A



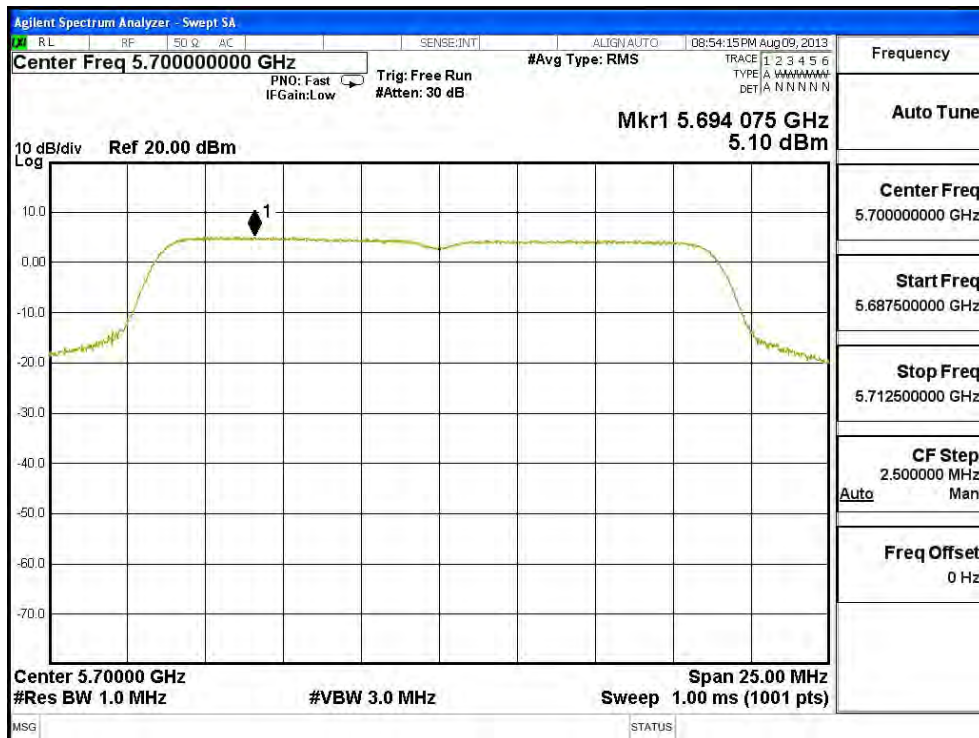
### Channel 100 – Chain A



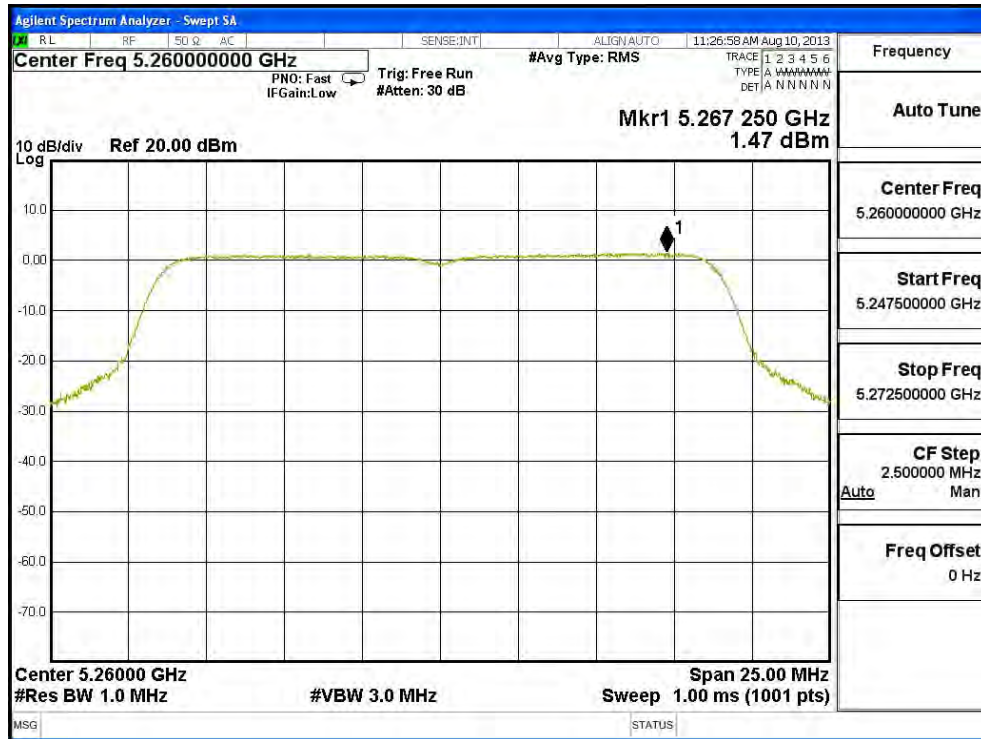
**Channel 120 – Chain A**



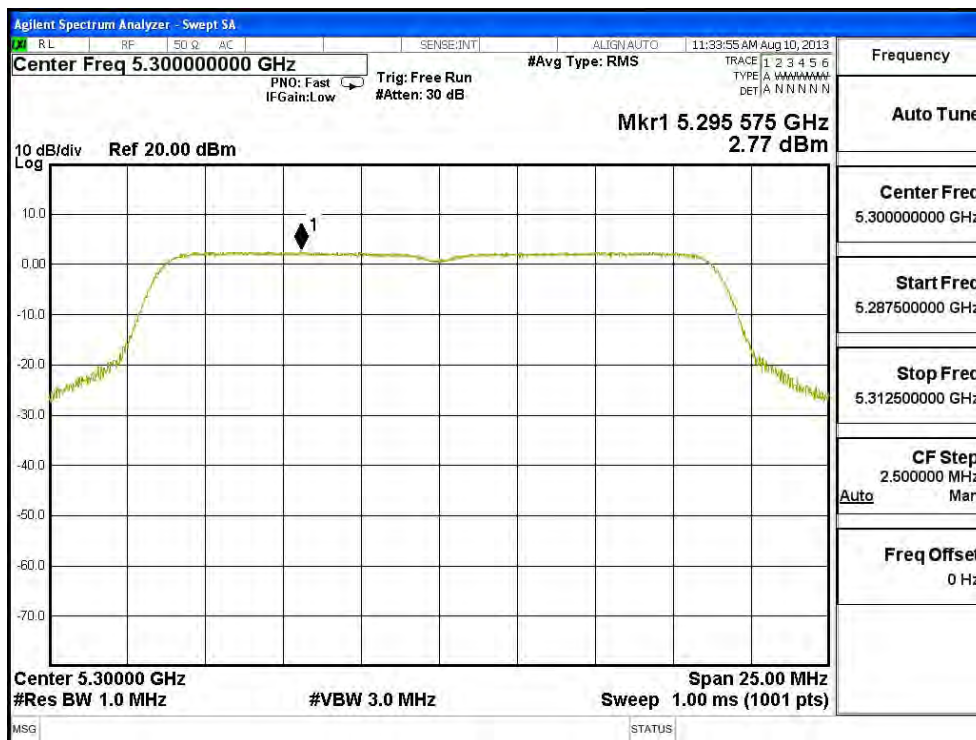
**Channel 140 – Chain A**



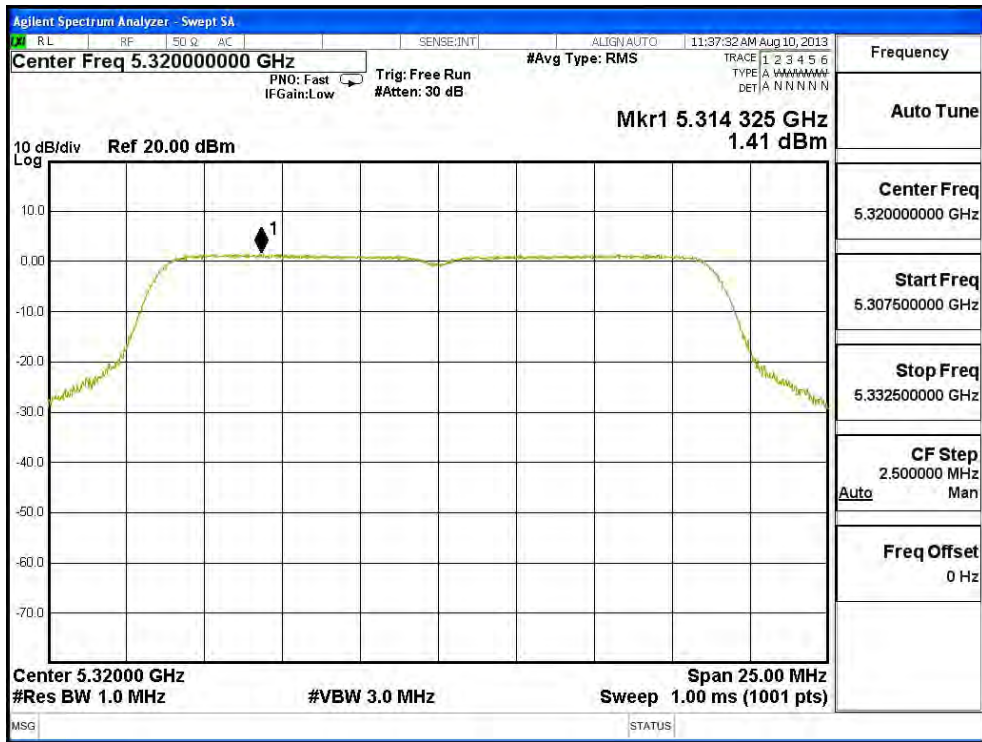
**Channel 52 – Chain B**



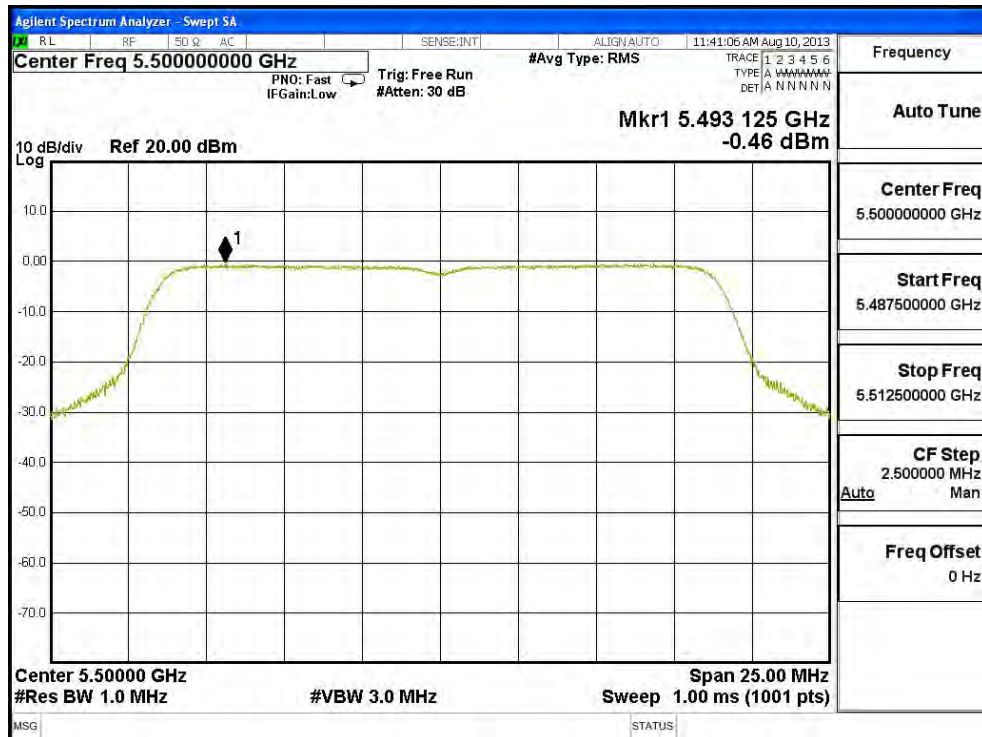
**Channel 60 – Chain B**



**Channel 64 – Chain B**

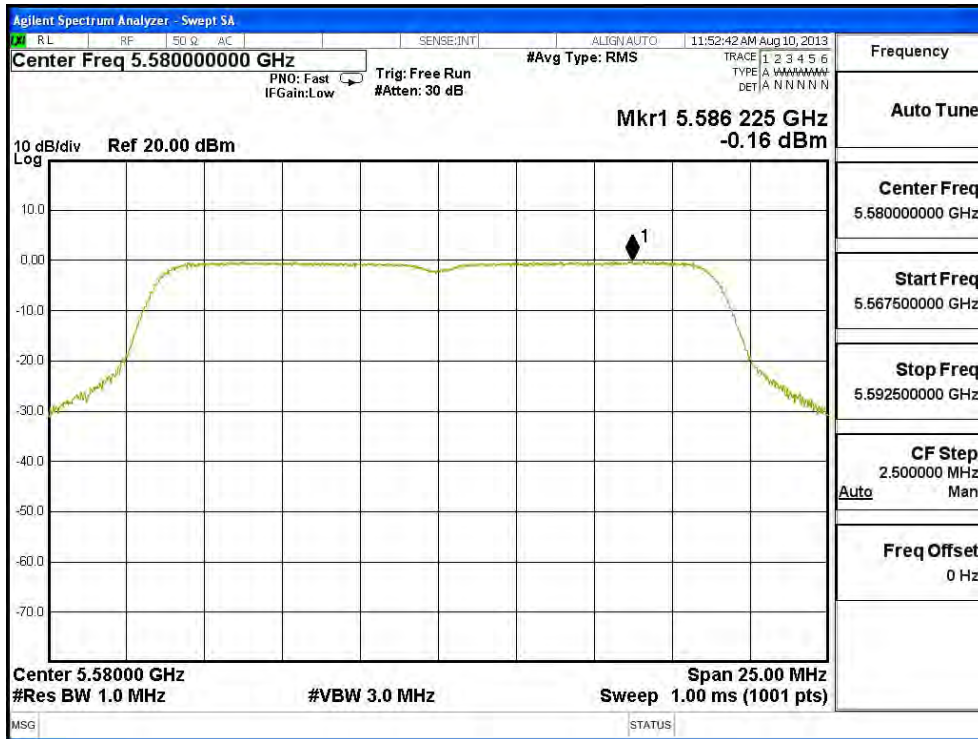


**Channel 100 – Chain B**

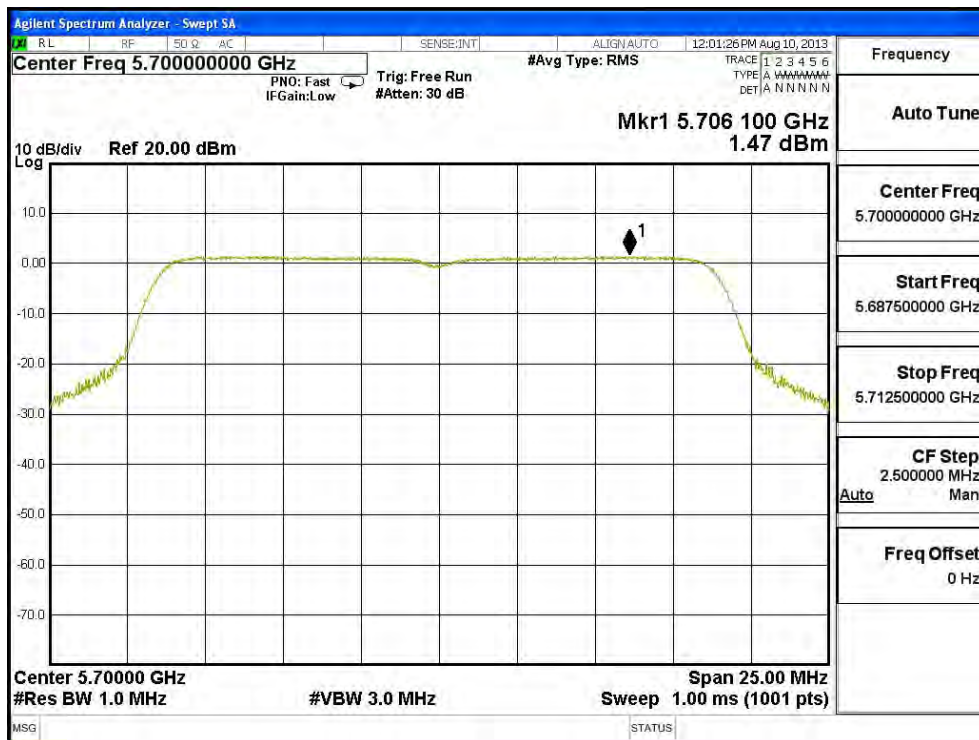




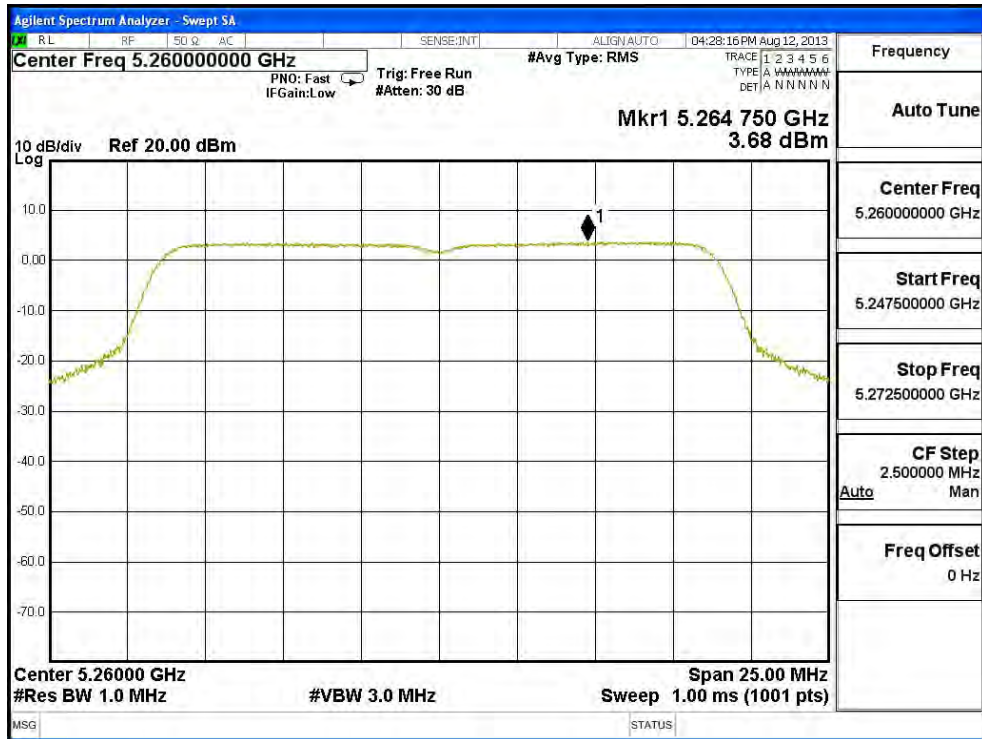
**Channel 120 – Chain B**



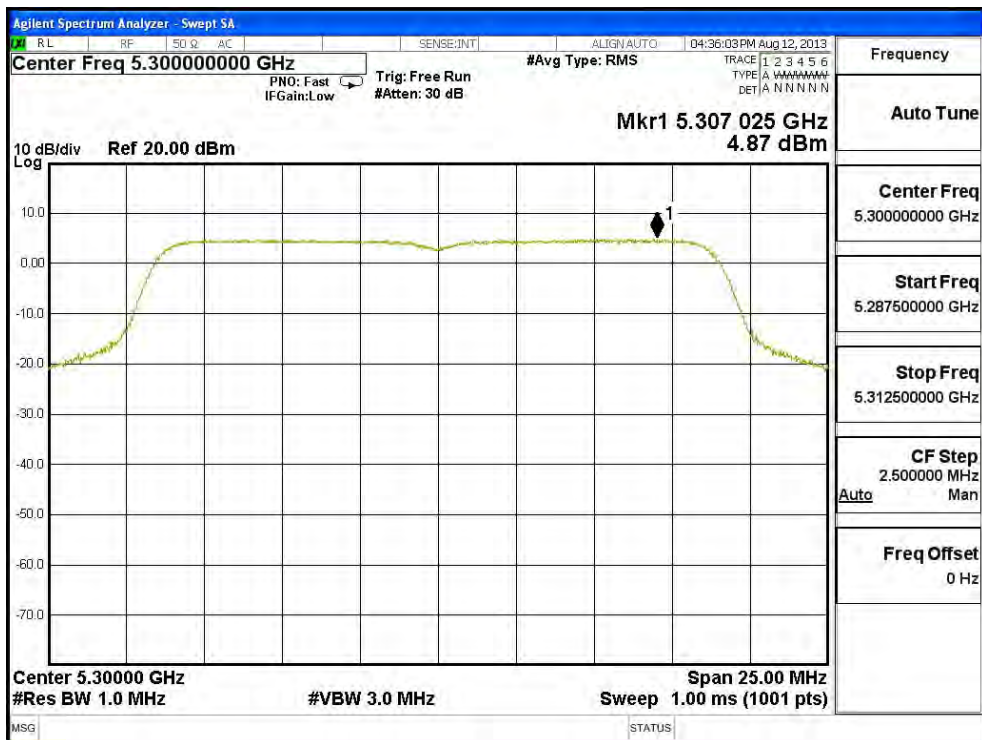
**Channel 140 – Chain B**



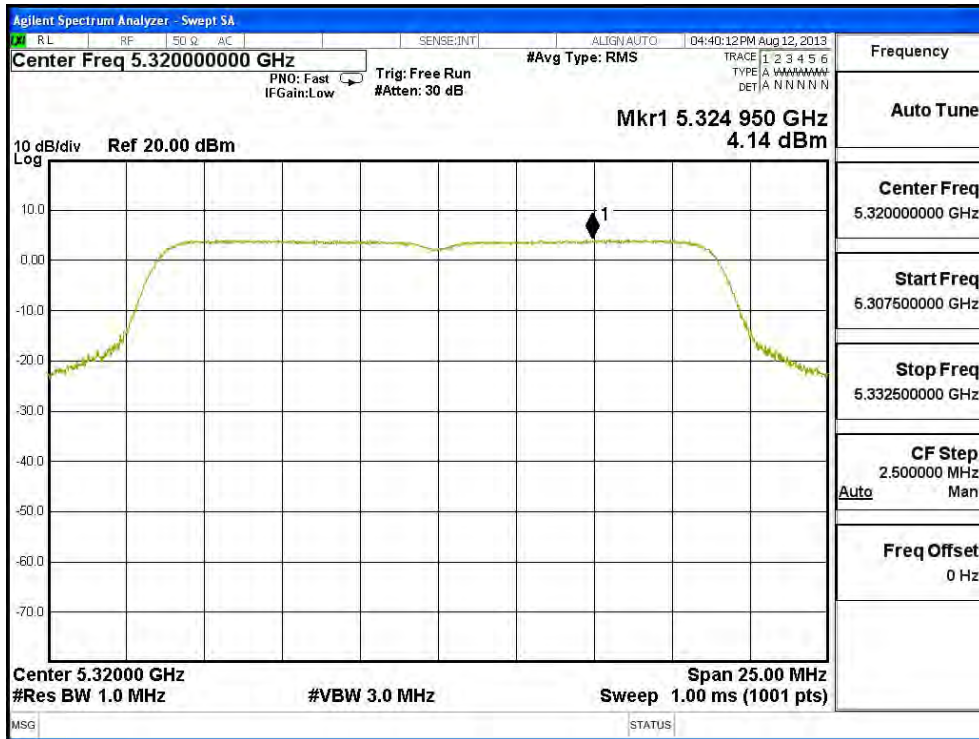
Channel 52 – Chain C



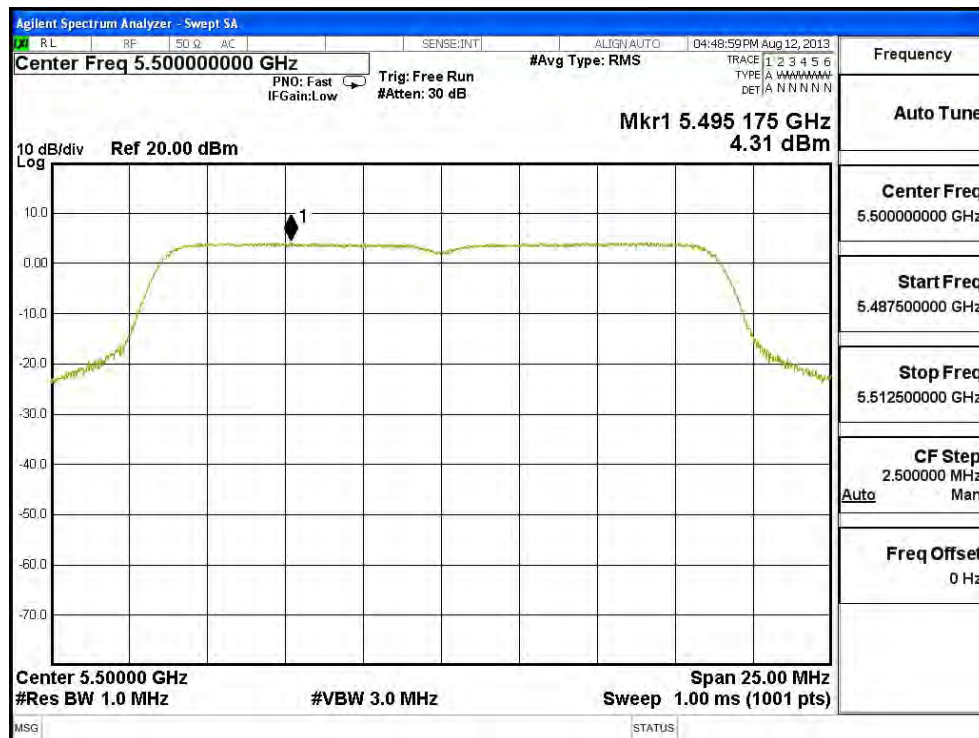
Channel 60 – Chain C



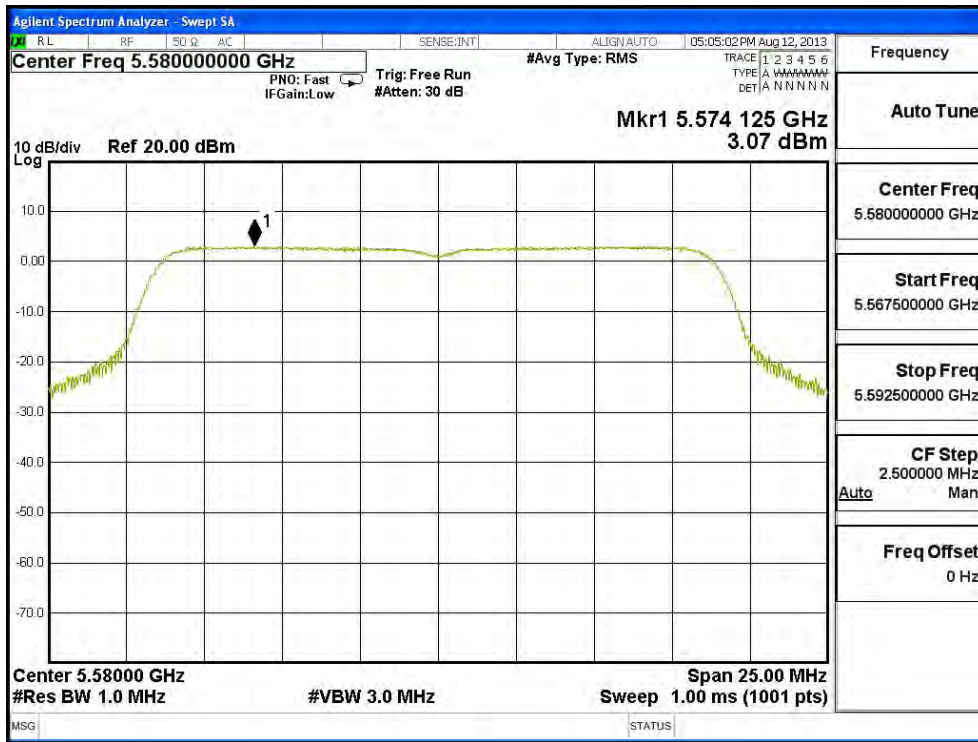
**Channel 64 – Chain C**



**Channel 100 – Chain C**



**Channel 120 – Chain C**



**Channel 140 – Chain C**

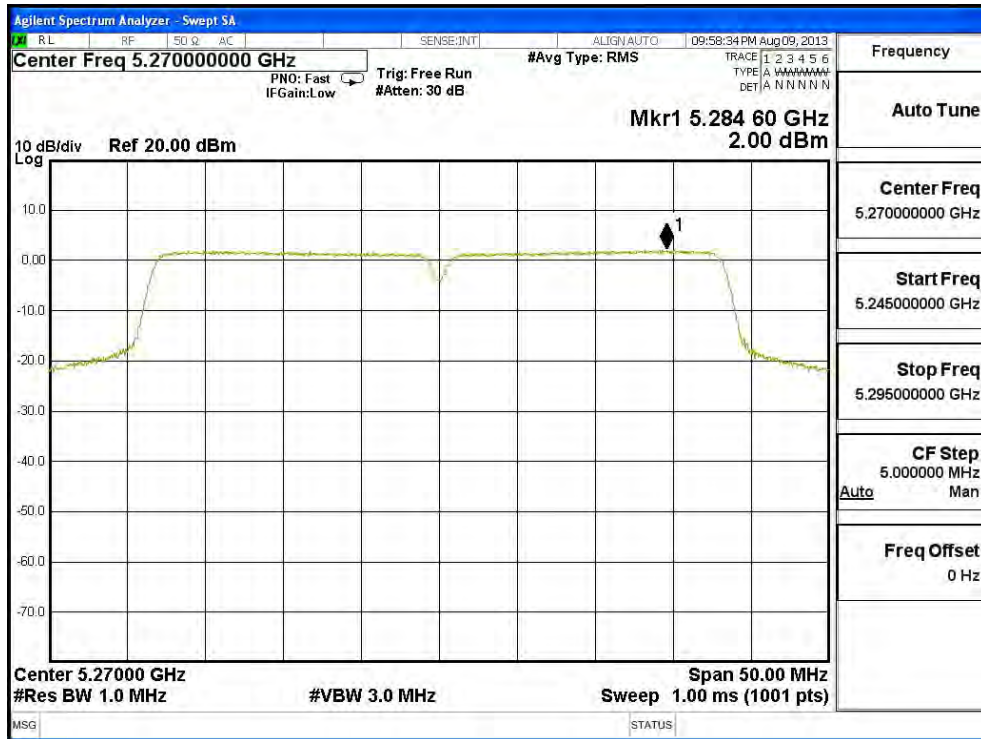


Product : SpectraGuard® Access Point / Sensor  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Mode : Mode 6 Transmit (802.11n-40BW 45Mbps)(PIFA Antenna)

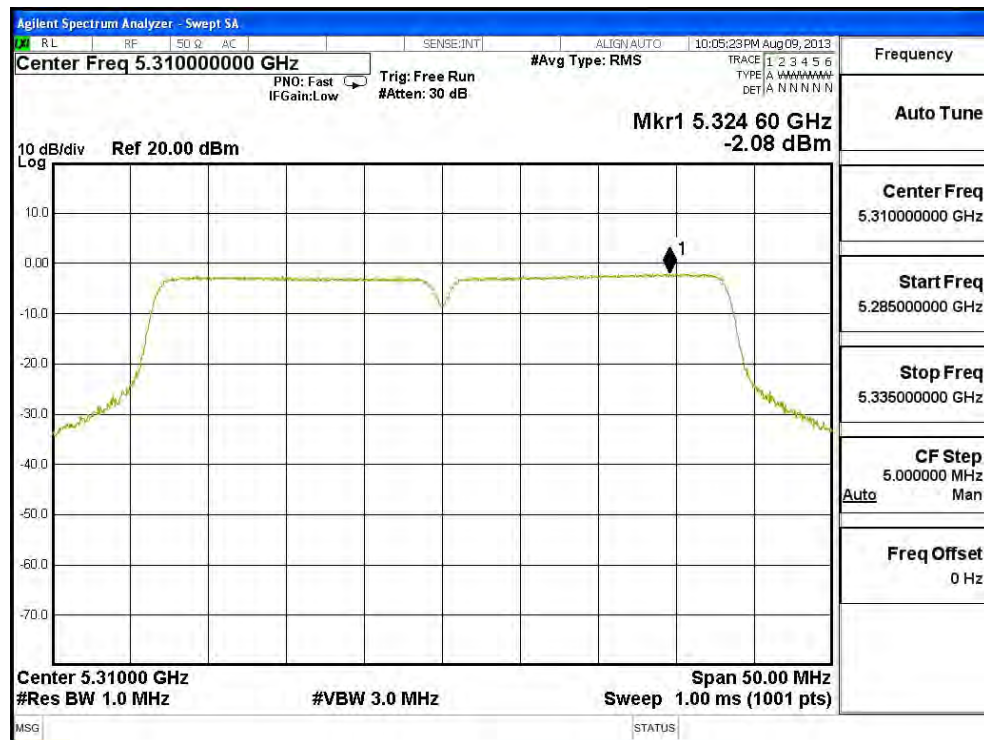
Channel No.	Frequency (MHz)	Chain (dBm)	PPSD/MHz (dBm)	Total PPSD/MHz (dBm)	Required Limit (dBm)	Result
54	5270	A	2.000	6.771	<11	Pass
		B	-1.340	3.431	<11	Pass
		C	1.060	5.831	<11	Pass
62	5310	A	-2.080	2.691	<11	Pass
		B	-6.110	-1.339	<11	Pass
		C	-3.190	1.581	<11	Pass
102	5510	A	-2.420	2.351	<11	Pass
		B	-7.310	-2.539	<11	Pass
		C	-3.580	1.191	<11	Pass
110	5550	A	1.450	6.221	<11	Pass
		B	-3.630	1.141	<11	Pass
		C	0.350	5.121	<11	Pass
134	5670	A	1.600	6.371	<11	Pass
		B	-2.550	2.221	<11	Pass
		C	1.150	5.921	<11	Pass

Note 1: The quantity  $10 \cdot \log 3$  (two antennas) is added to the spectrum peak value according to document 662911 D01.

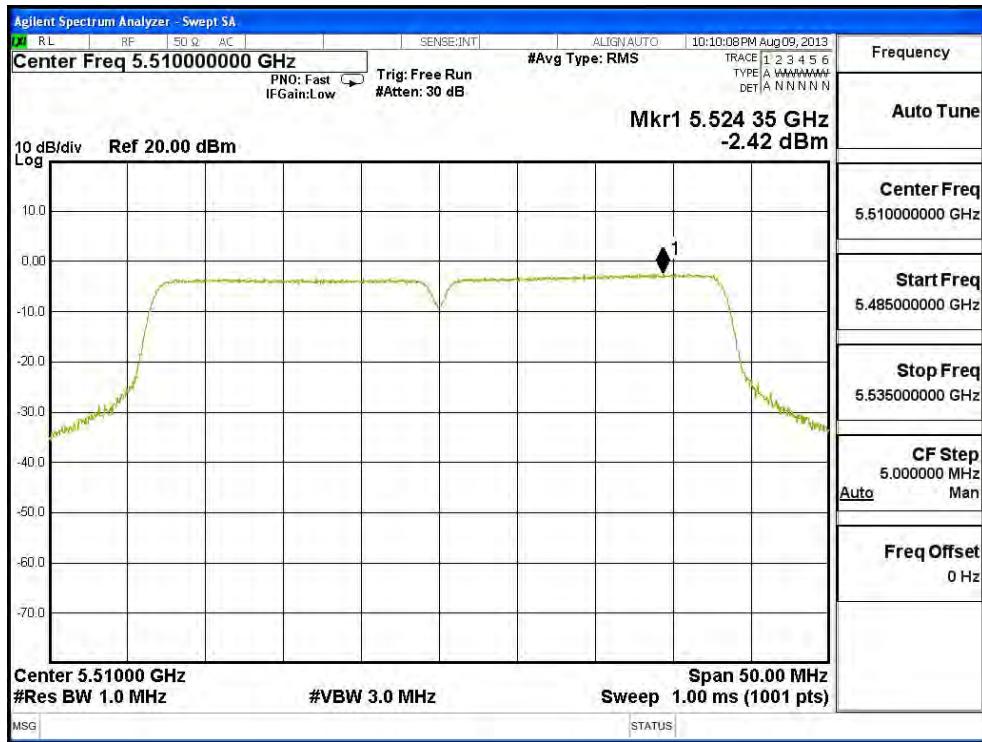
**Channel 54 – Chain A**



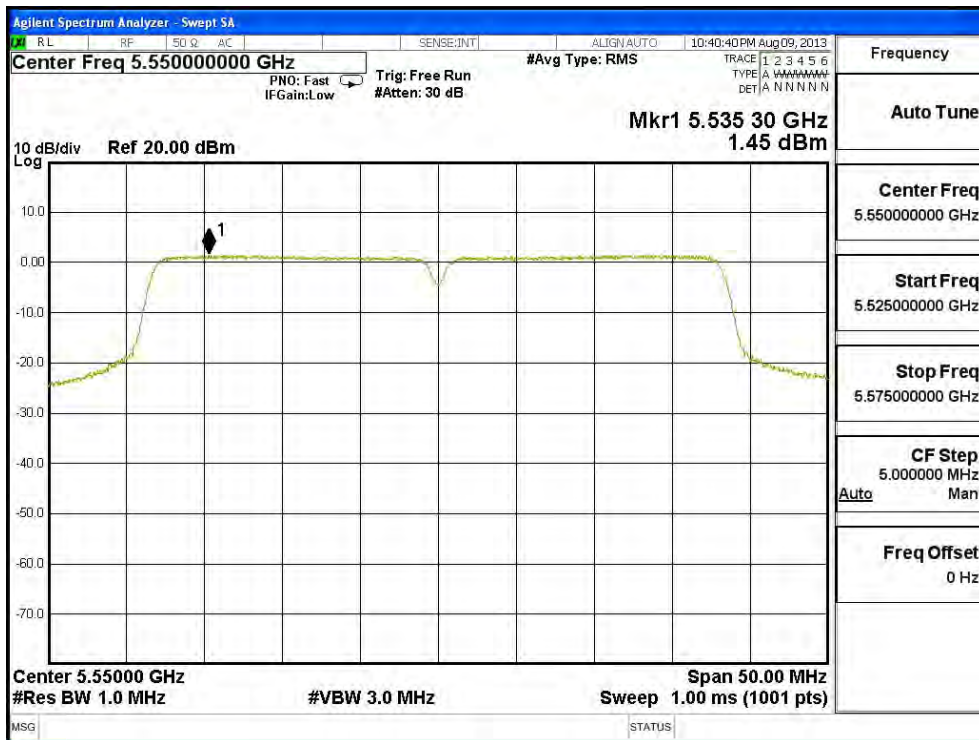
**Channel 62 – Chain A**



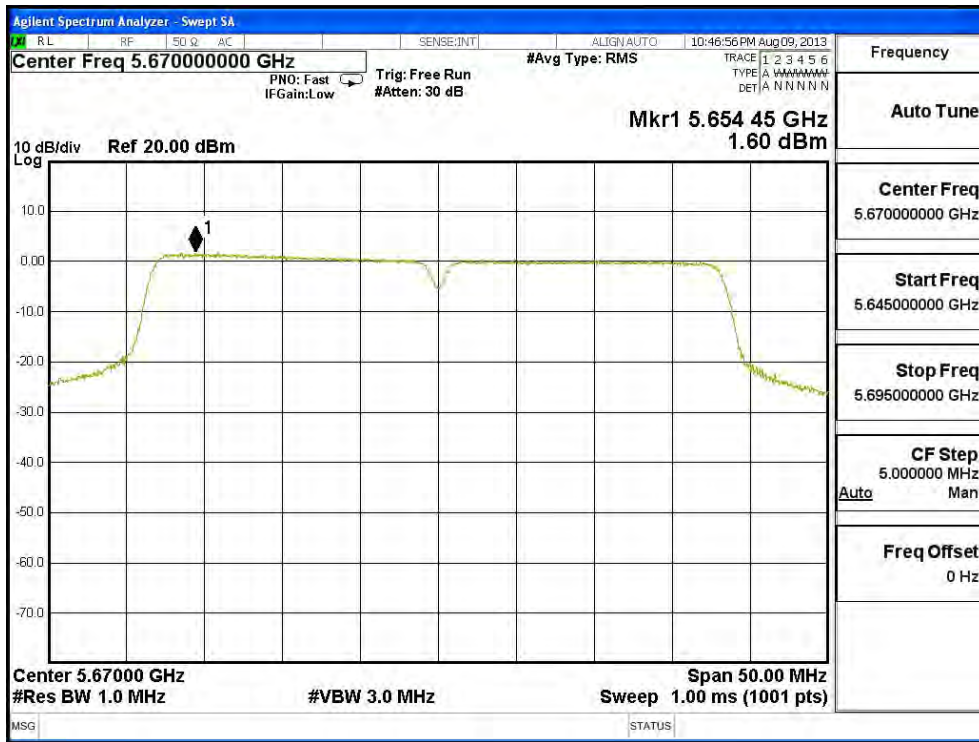
**Channel 102 – Chain A**



**Channel 110 – Chain A**

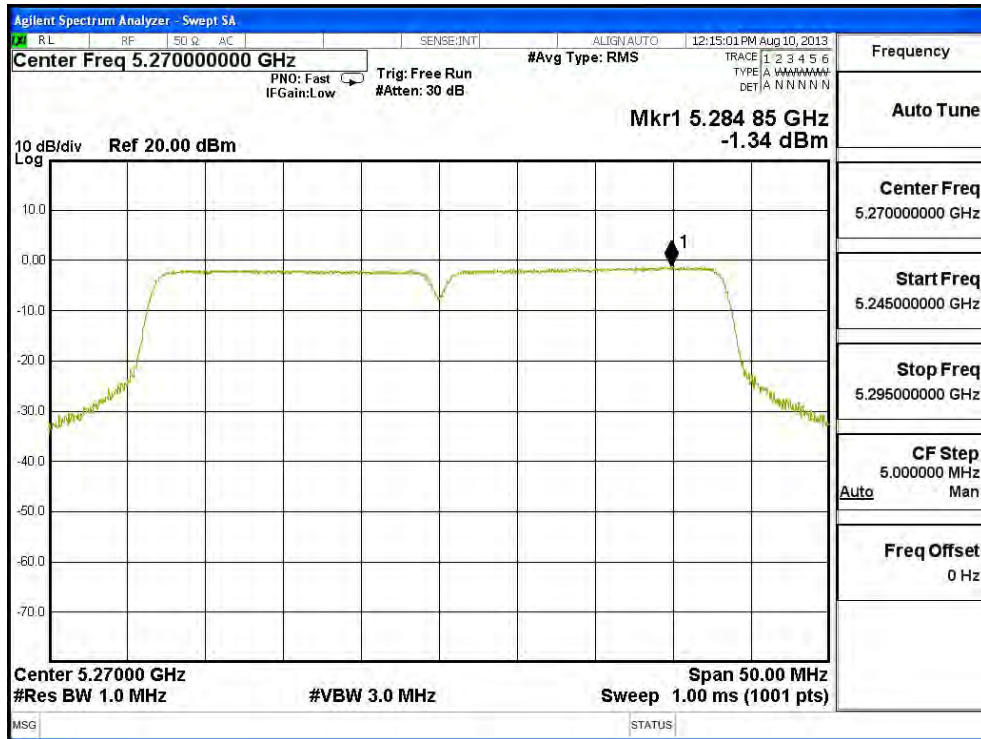


**Channel 134 – Chain A**





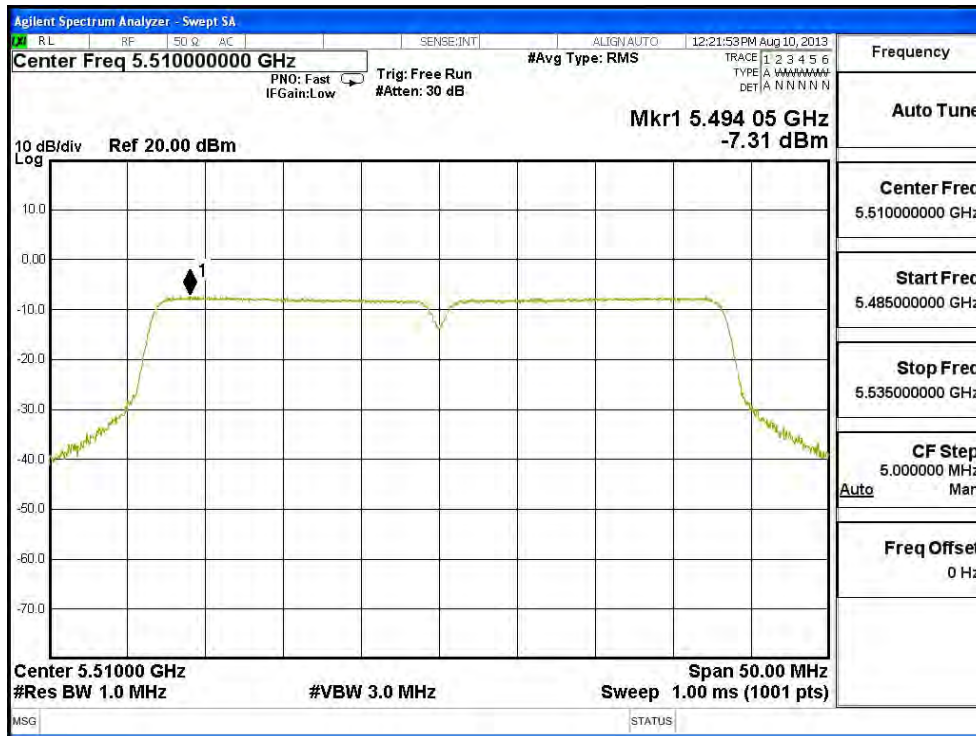
**Channel 54 – Chain B**



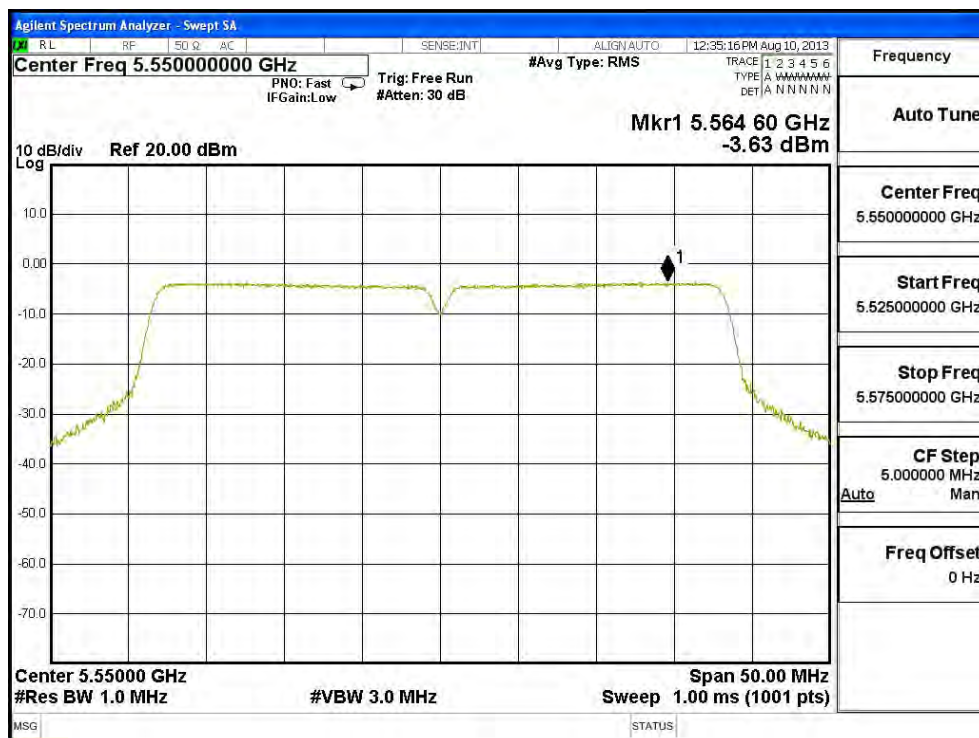
**Channel 62 – Chain B**



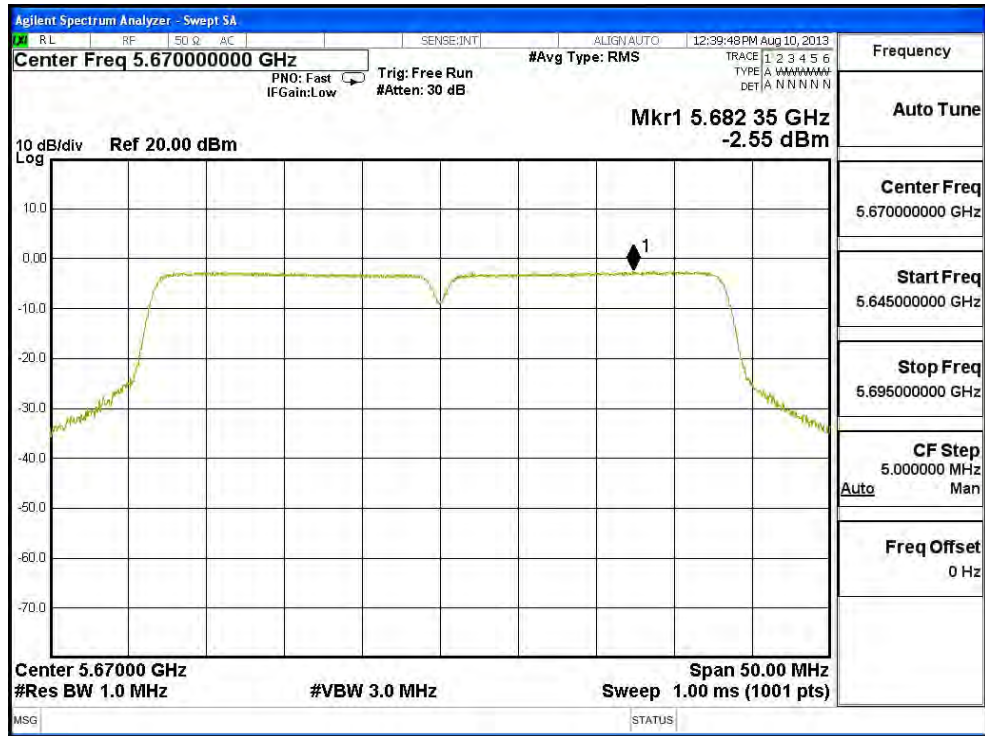
### Channel 102 – Chain B



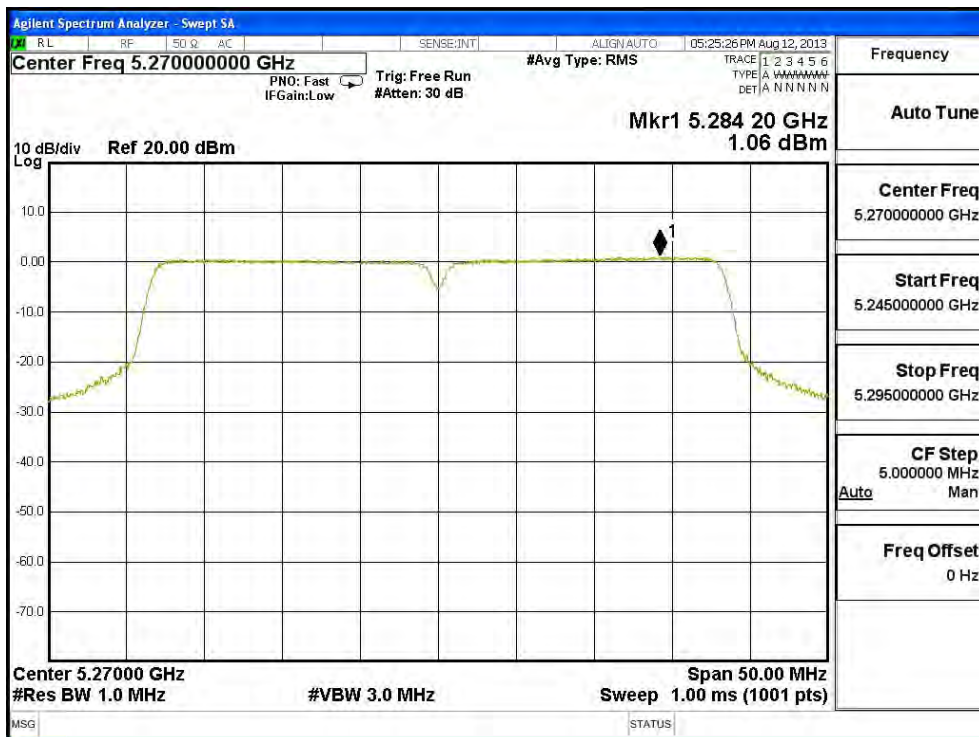
### Channel 110 – Chain B



**Channel 134 – Chain B**



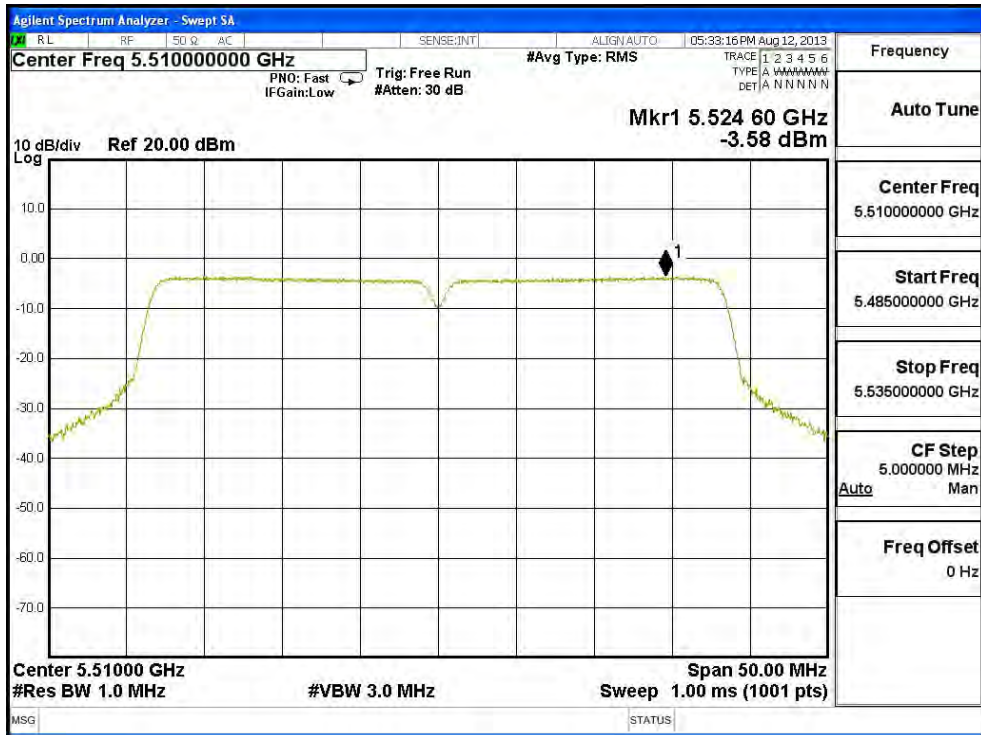
### Channel 54 – Chain C



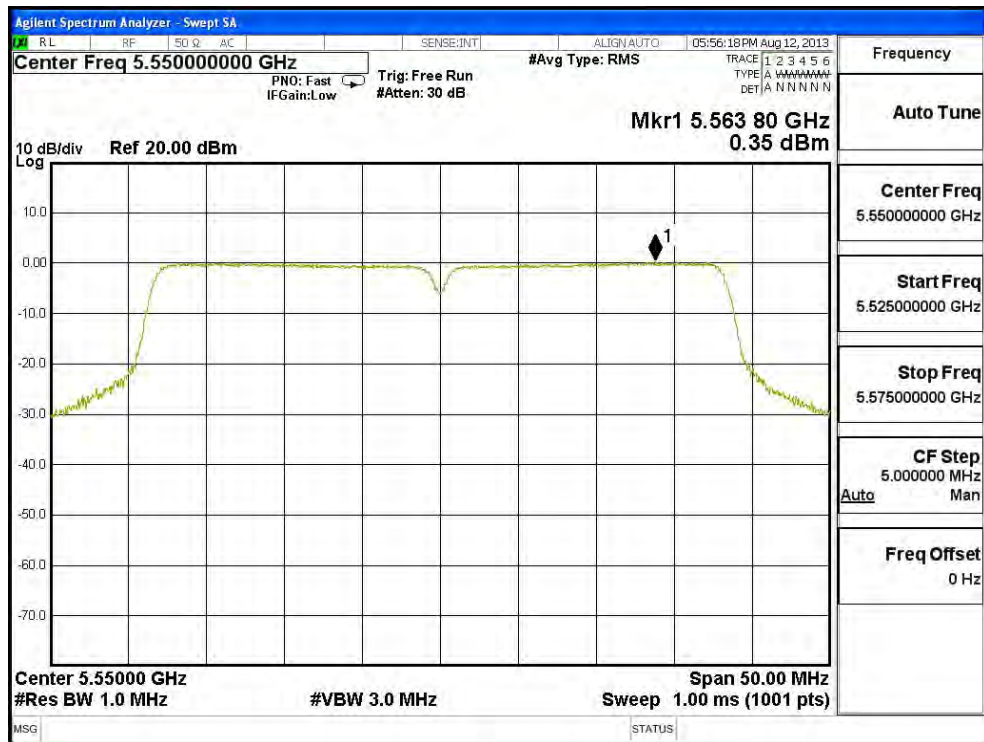
### Channel 62 – Chain C



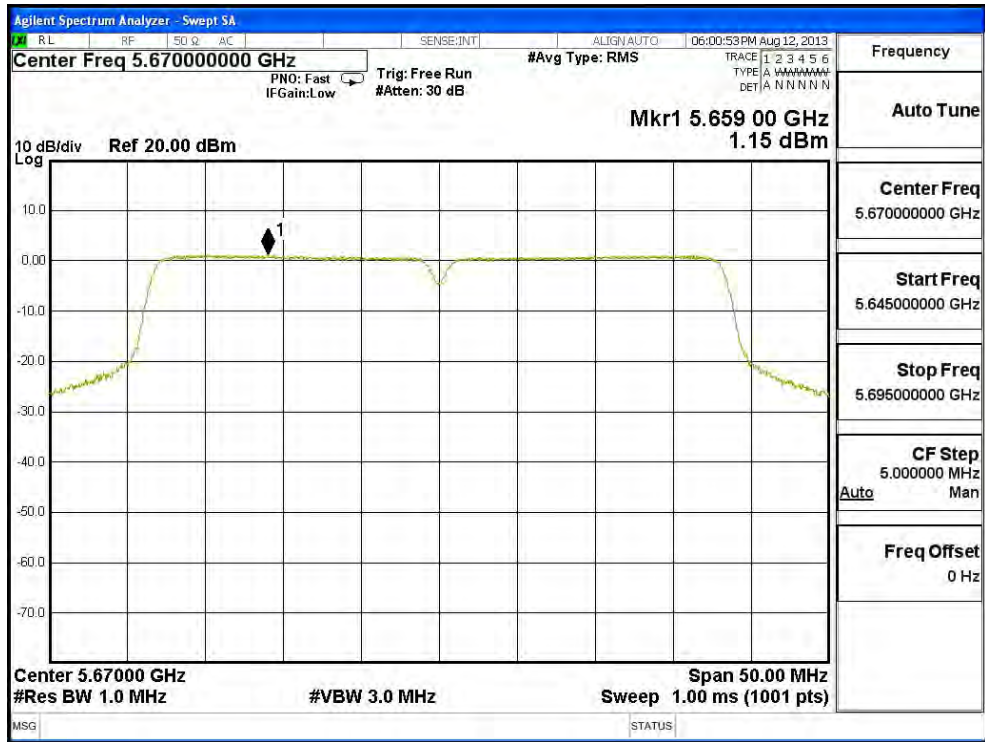
### Channel 102 – Chain C



### Channel 110 – Chain C



Channel 134 – Chain C



**5. Peak Excursion**

**5.1. Test Equipment**

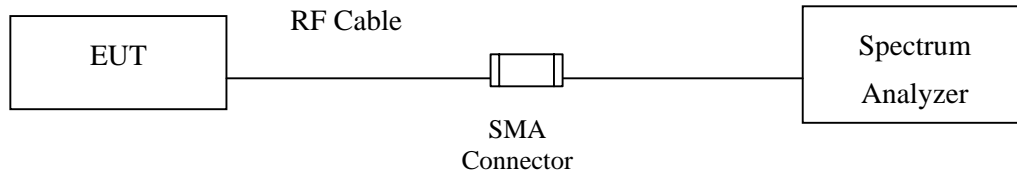
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2013
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2013
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2013

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.

**5.2. Test Setup**

**Conduction Power Measurement**



**5.3. Limits**

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the Maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

#### 5.4. Test Procedure

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.

Step 1: Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth.

Step 2: Find the maximum of the peak-max-hold spectrum.

(Set RBW = 1 MHz, VBW  $\geq$  3 MHz, Detector = peak, Trace mode = max-hold,

Allow the sweeps to continue until the trace stabilizes, Use the peak search function to find the peak of the spectrum.)

Step 3: Use the procedure found under KDB-789033 F) to measure the PPSD.

Step 4: Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

#### 5.5. Uncertainty

$\pm 1.27$  dB



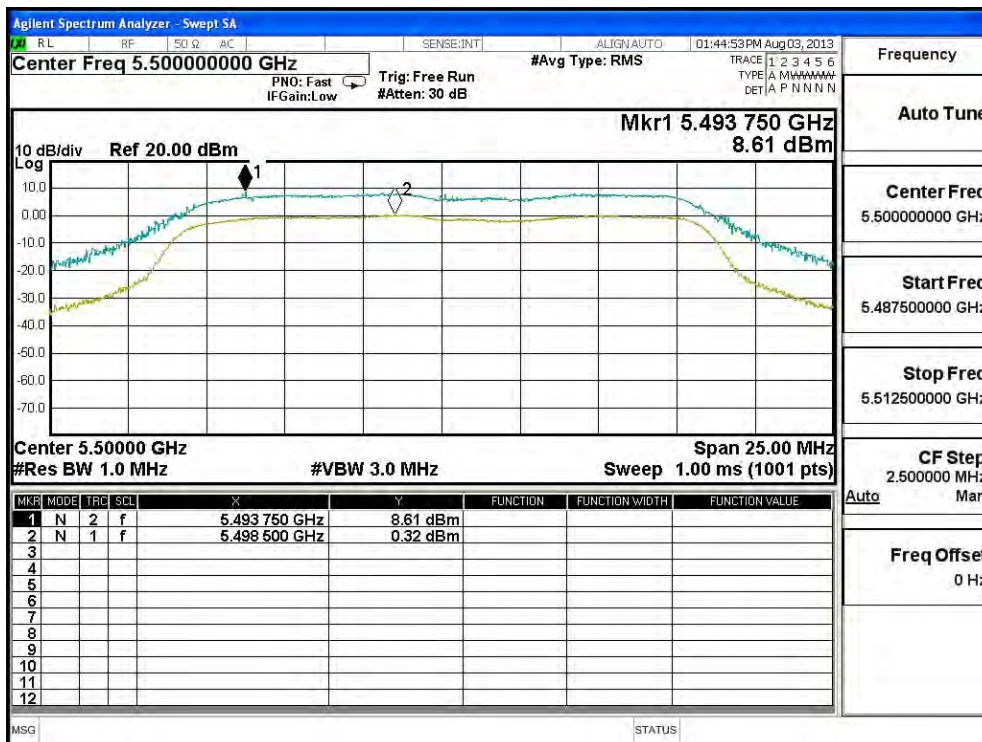
### 5.6. Test Result of Peak Excursion

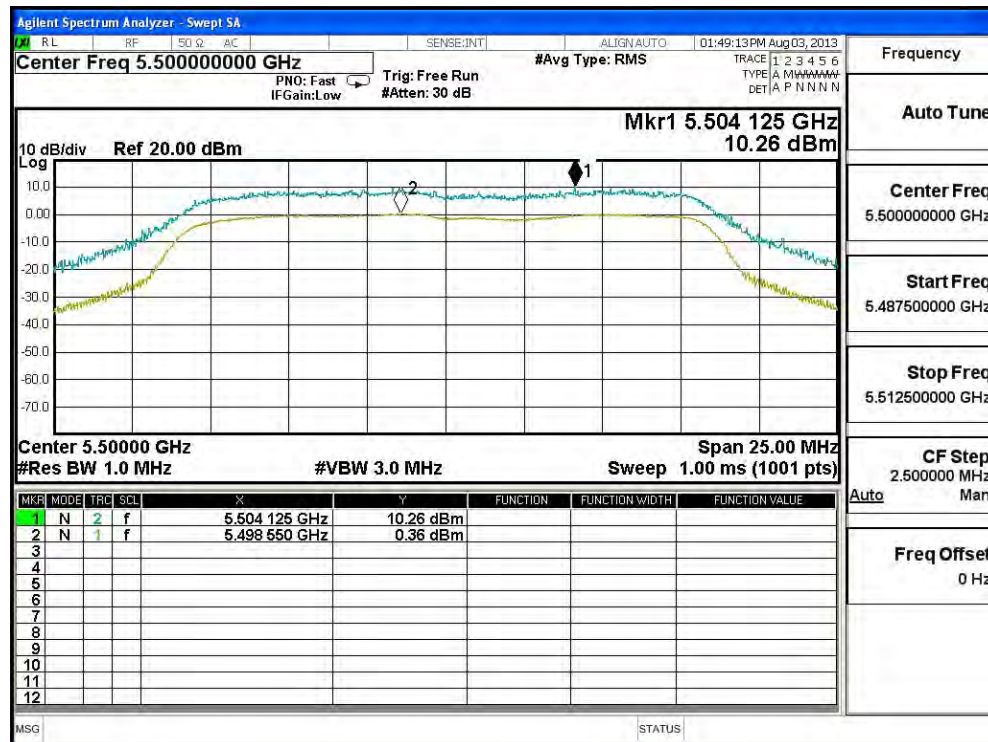
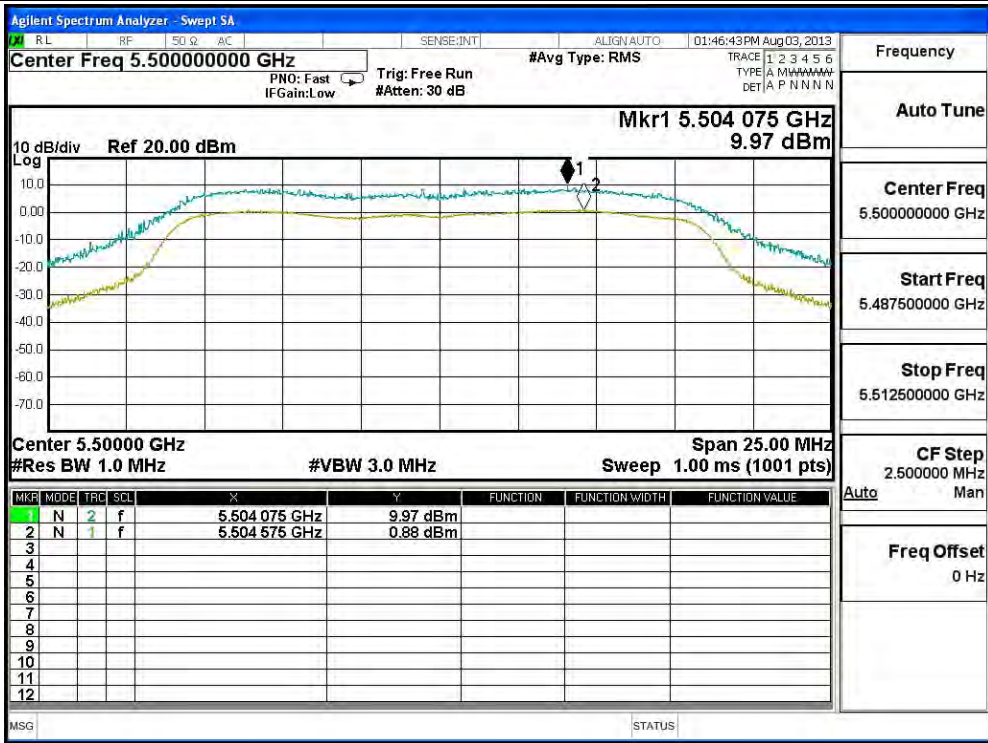
Product : SpectraGuard® Access Point / Sensor  
 Test Item : Peak Excursion  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)(Dipole Antenna)

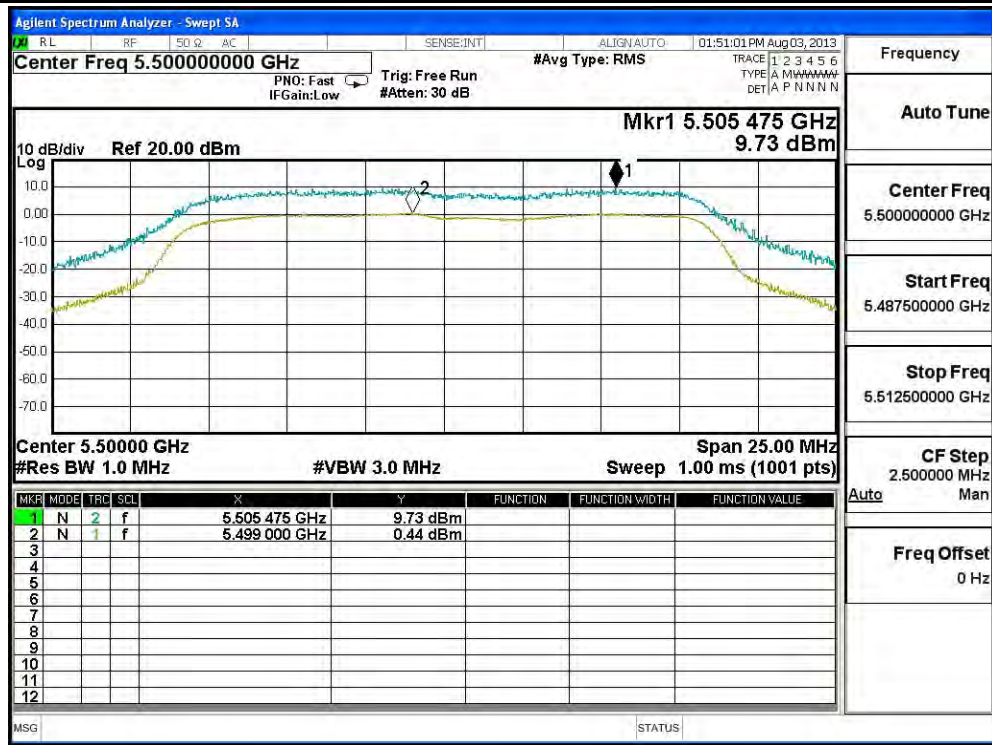
#### CHAIN A

Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dB)	Required Limit (dB)	Result
100	5500	MCS (0)	8.290	<13	Pass
		MCS (2)	9.090	<13	Pass
		MCS (4)	9.900	<13	Pass
		MCS (7)	9.290	<13	Pass

#### Channel 100:



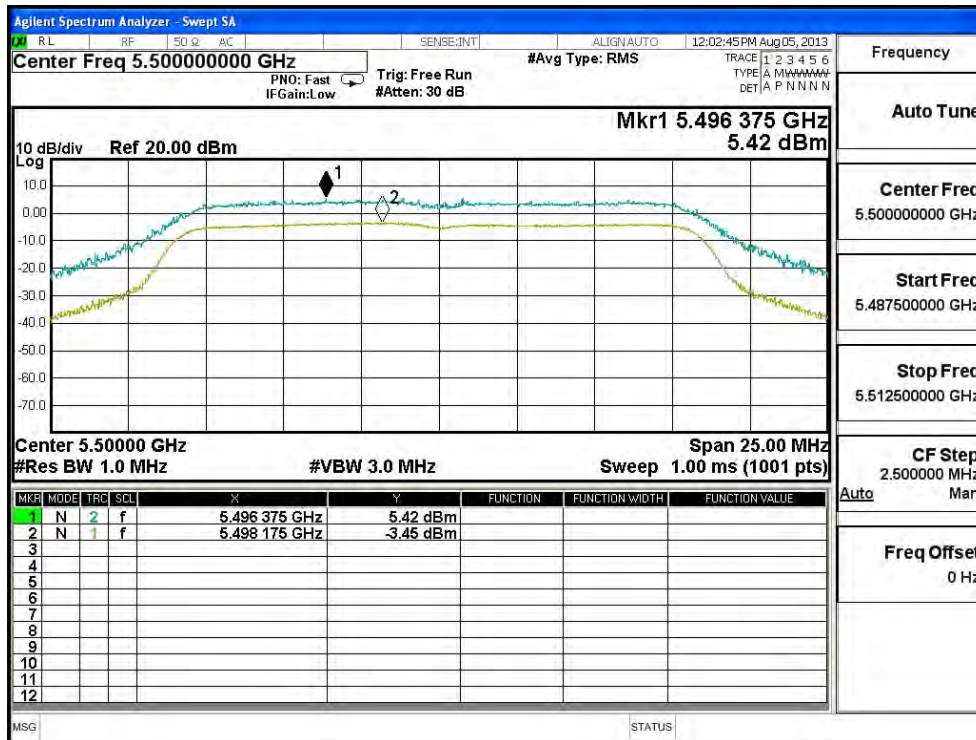


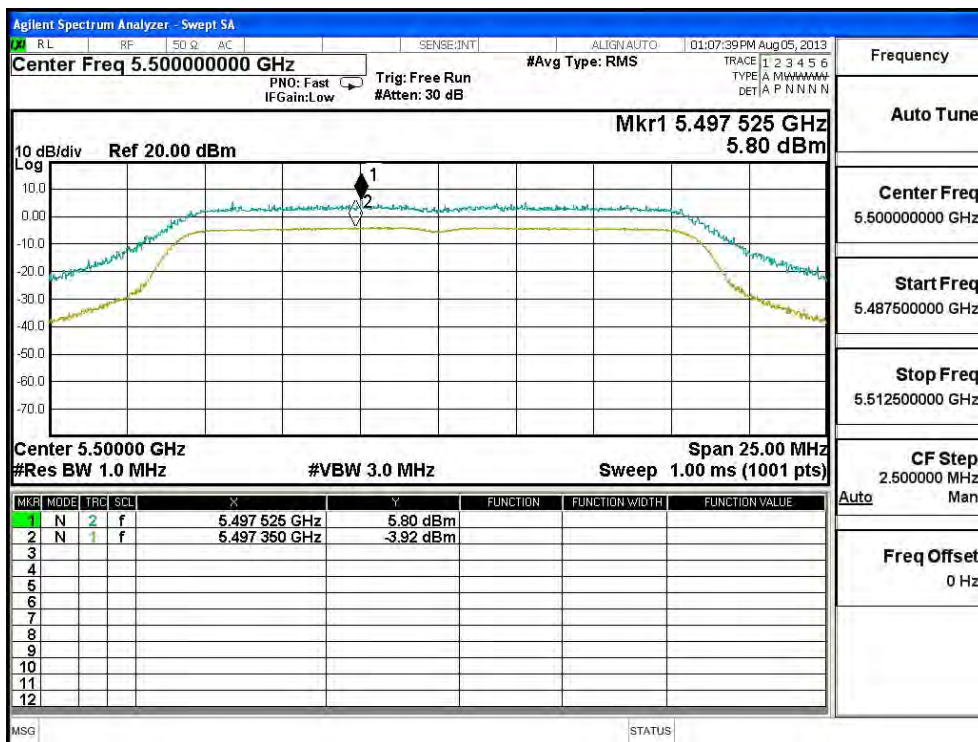
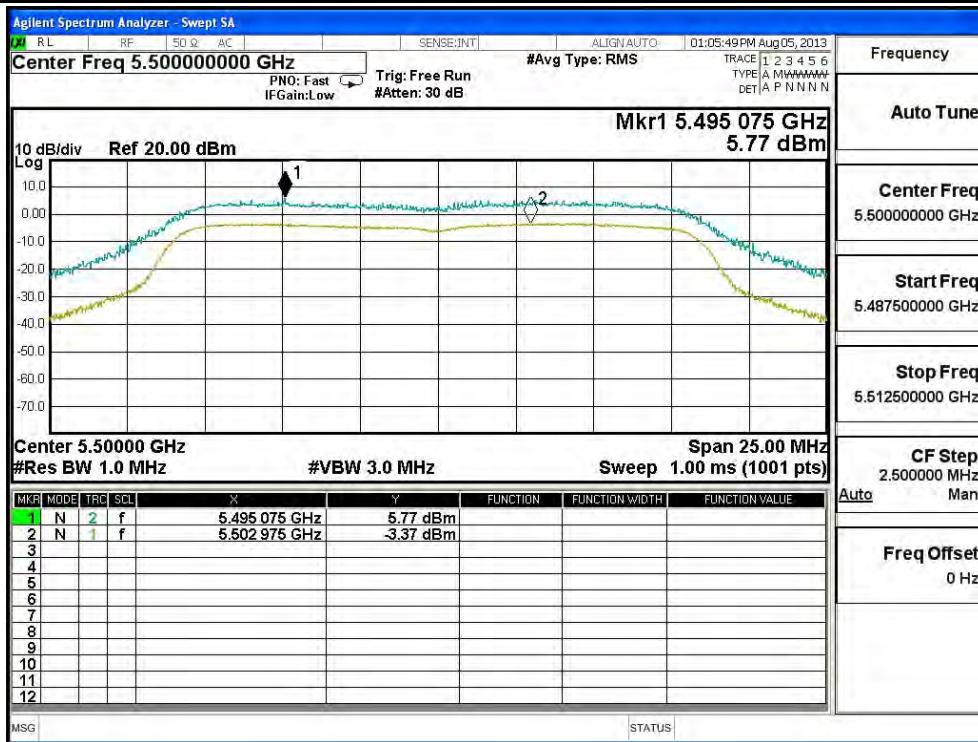


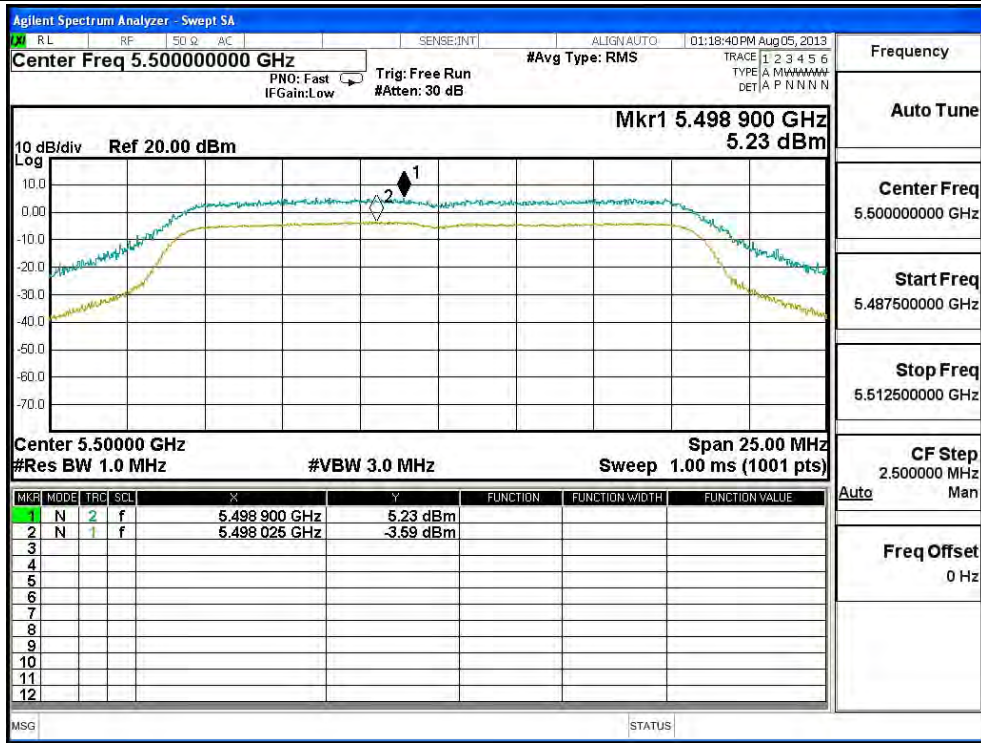
**CHAIN B**

Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dB)	Required Limit (dB)	Result
100	5500	MCS (0)	8.870	<13	Pass
		MCS (2)	9.140	<13	Pass
		MCS (4)	9.720	<13	Pass
		MCS (7)	8.820	<13	Pass

**Channel 100:**







**CHAIN C**

Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dB)	Required Limit (dB)	Result
100	5500	MCS (0)	9.590	<13	Pass
		MCS (2)	8.540	<13	Pass
		MCS (4)	8.920	<13	Pass
		MCS (7)	8.790	<13	Pass

**Channel 100:**

