

# FCC Test Report

Product Name	Wireless 5 x 2 HD Matrix Transmitter
Model No	GWHDMS52 - T, GWHDMS52W6 - T, VE819 - T, VE829 - T
FCC ID	QLEGWHDMS52

Applicant	ATEN Technology, Inc. dba IOGEAR
Address	19641 Da Vinci Foothill Ranch, CA 92610 United States

Date of Receipt	Mar. 07, 2013
Issued Date	Apr. 18, 2013
Report No.	133165R-RFUSP46V01
Report Version	V1.0



The test results relate only to the samples tested.

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# Test Report Certification

Issued Date: Apr. 18, 2013

Report No.: 133165R-RFUSP46V01



Product Name	Wireless 5 x 2 HD Matrix Transmitter
Applicant	ATEN Technology, Inc. dba IOGEAR
Address	19641 Da Vinci Foothill Ranch, CA 92610 United States
Manufacturer	ZINWELL CORPORATION
Model No.	GWHDMS52 - T, GWHDMS52W6 - T, VE819 - T, VE829 - T
FCC ID.	QLEGWHDMS52
EUT Rated Voltage	AC 100-240V, 50-60Hz
EUT Test Voltage	AC 120 V / 60 Hz
Trade Name	IOGEAR / ATEN
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

The Test Results relate only to the samples tested.

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Documented By :



( Adm. Specialist / Joanne Lin )

Tested By :



( Assistant Engineer / Vincent Chu )

Approved By :



( Manager / Vincent Lin )

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	Wireless 5 x 2 HD Matrix Transmitter
Trade Name	IOGEAR / ATEN
FCC ID.	QLEGWHDMS52
Model No.	GWHDMS52 - T, GWHDMS52W6 - T, VE819 - T, VE829 - T
Frequency Range	5180-5320MHz, 5510-5550MHz,5670MHz
Number of Channels	7
Data Rate	63Mbps
Channel Control	Auto
Type of Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna type	PIFA
Antenna Gain	Refer to the table "Antenna List"
USB to mini Cable	Shielded, 0.2m
YPbPr Adapter Cable	Shielded, 0.3m
IR Blaster Cable	Non-Shielded, 3.0m
HDMI Cable	Shielded, 1.5m
Power Adapter	MFR: SINO-AMERICAN, M/N: SA110C-05S-A Input: AC 100-240V, 50-60Hz, 0.3A Output: DC 5V, 2A, 10W Cable Out: Non-Shielded, 1.5m, with one ferrite core bonded.

#### Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	ZINWELLL	N/A (4TX, 1RX)	2.1dBi for 5.150~5.250GHz 2.2dBi for 5.250~5.350GHz 2.6dBi for 5.470~5.725GHz

Note: The antenna of EUT is conform to FCC 15.203

## 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 134:	5670 MHz		

## Note:

1. This device is a Wireless 5 x 2 HD Matrix Transmitter with a built-in 5GHz transceiver.
2. The EUT is including four models for different marketing requirement.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
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.

Test Mode	Mode 1: Transmitter
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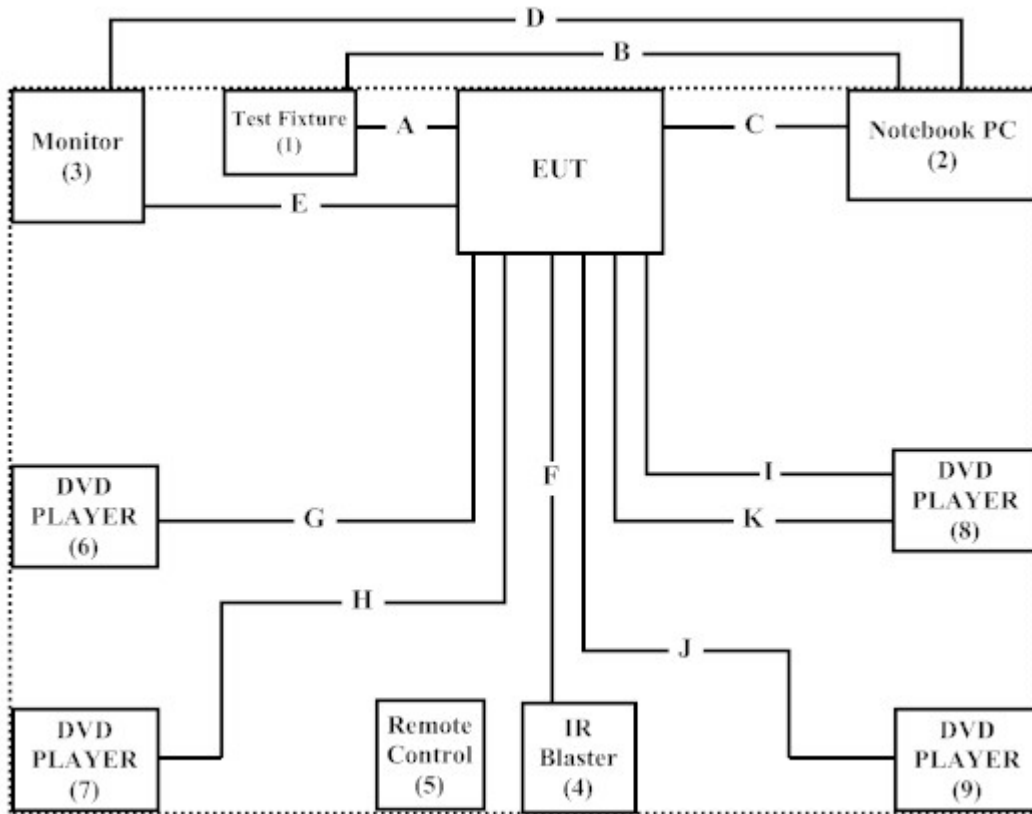
### 1.3. Tested System Details

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   Test Fixture	ZINWELL	N/A	N/A	N/A
2   Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
3   Monitor	Dell	2407WFPb	CN-0FC255-46633-638-1 MDS	Non-Shielded, 1.8m
4   IR Blaster	ZINWELL	N/A	N/A	N/A
5   Remote Control	ZINWELL	N/A	N/A	N/A
6   DVD PLAYER	Pioneer	DV-S969Avi	EAMP004399LW	Non-Shielded, 1.8m
7   DVD PLAYER	Pioneer	DV-S969Avi	EAMP004349LW	Non-Shielded, 1.8m
8   DVD PLAYER	Pioneer	DV-S969Avi	EAMP004305LW	Non-Shielded, 1.8m
9   DVD PLAYER	Pioneer	DV-989Avi-G	FEMP000538TA	Non-Shielded, 1.8m

Signal Cable Type	Signal cable Description
A   Test Fixture Cable	Non-Shielded, 0.15m
B   USB to RS-232 Cable	Shielded, 2.0m
C   USB to mini USB Cable	Shielded, 0.2m
D   VGA Cable	Shielded, 1.8m, with two ferrite cores bonded.
E   HDMI Cable	Shielded, 1.5m
F   IR Blaster Cable	Non-Shielded, 3.0m
G   HDMI Cable	Shielded, 1.5m
H   HDMI Cable	Shielded, 1.5m
I   HDMI Cable	Shielded, 1.5m
J   HDMI Cable	Shielded, 1.5m
K   YPbPr Cable	Non-Shielded, 0.3m

**1.4. Configuration of tested System**



**1.5. EUT Exercise Software**

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute program "AppCom v3.0.3.5" on the Notebook PC.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press "OK" to start the continuous transmission.
- (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://tw.quietek.com/modules/myalbum/>

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

Accreditation on NVLAP  
NVLAP Lab Code: 200533-0

Site Name: Quietek Corporation  
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E-Mail : [service@quietek.com](mailto:service@quietek.com)

FCC Accreditation Number: TW1014

## 2. Conducted Emission

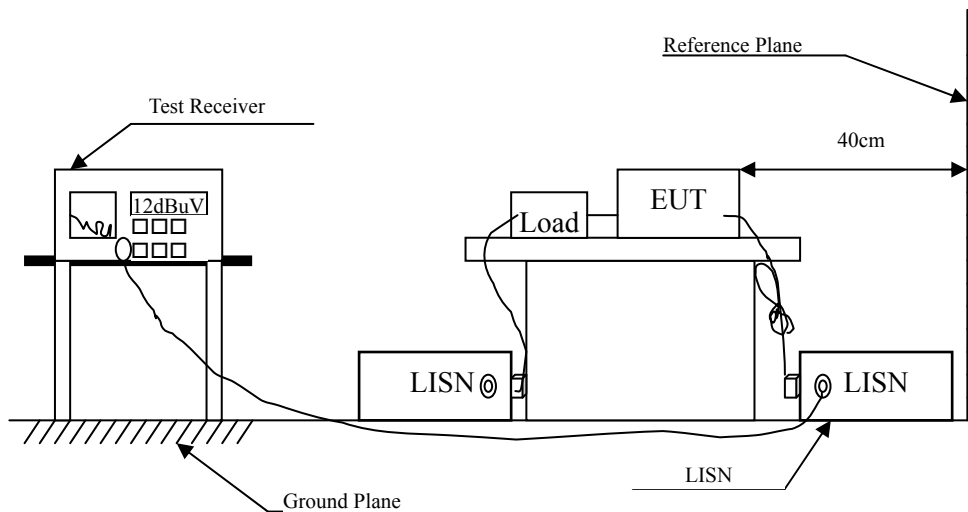
### 2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2012	
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**

<b>FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit</b>		
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 C63.4: 2003 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 : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmitter (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.193	9.790	31.350	41.140	-23.631	64.771
0.548	9.790	26.450	36.240	-19.760	56.000
0.822	9.790	23.860	33.650	-22.350	56.000
2.420	9.810	21.920	31.730	-24.270	56.000
10.716	9.995	38.100	48.095	-11.905	60.000
14.740	10.078	39.790	49.868	-10.132	60.000
<b>Average</b>					
0.193	9.790	25.050	34.840	-19.931	54.771
0.548	9.790	23.650	33.440	-12.560	46.000
0.822	9.790	19.190	28.980	-17.020	46.000
2.420	9.810	16.800	26.610	-19.390	46.000
10.716	9.995	31.750	41.745	-8.255	50.000
14.740	10.078	32.550	42.628	-7.372	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 : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.193	9.770	27.080	36.850	-27.921	64.771
0.619	9.770	27.850	37.620	-18.380	56.000
1.599	9.790	23.520	33.310	-22.690	56.000
3.314	9.800	21.530	31.330	-24.670	56.000
10.853	10.017	36.620	46.637	-13.363	60.000
14.064	10.116	38.800	48.916	-11.084	60.000
<b>Average</b>					
0.193	9.770	21.510	31.280	-23.491	54.771
0.619	9.770	24.520	34.290	-11.710	46.000
1.599	9.790	19.270	29.060	-16.940	46.000
3.314	9.800	16.420	26.220	-19.780	46.000
10.853	10.017	29.280	39.297	-10.703	50.000
14.064	10.116	32.630	42.746	-7.254	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 : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmitter (5270MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.193	9.790	30.310	40.100	-24.671	64.771
0.408	9.790	28.070	37.860	-20.769	58.629
0.646	9.790	27.470	37.260	-18.740	56.000
11.228	10.004	37.990	47.994	-12.006	60.000
14.177	10.068	38.830	48.898	-11.102	60.000
18.701	10.110	31.240	41.350	-18.650	60.000
<b>Average</b>					
0.193	9.790	27.190	36.980	-17.791	54.771
0.408	9.790	24.610	34.400	-14.229	48.629
0.646	9.790	23.750	33.540	-12.460	46.000
11.228	10.004	31.630	41.634	-8.366	50.000
14.177	10.068	32.040	42.108	-7.892	50.000
18.701	10.110	25.910	36.020	-13.980	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 : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter (5270MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.197	9.770	27.140	36.910	-27.747	64.657
0.412	9.770	27.870	37.640	-20.874	58.514
0.615	9.770	27.170	36.940	-19.060	56.000
1.666	9.790	22.530	32.320	-23.680	56.000
10.959	10.019	33.420	43.439	-16.561	60.000
13.416	10.094	40.100	50.194	-9.806	60.000
<b>Average</b>					
0.197	9.770	22.090	31.860	-22.797	54.657
0.412	9.770	24.240	34.010	-14.504	48.514
0.615	9.770	23.260	33.030	-12.970	46.000
1.666	9.790	19.670	29.460	-16.540	46.000
10.959	10.019	24.060	34.079	-15.921	50.000
13.416	10.094	33.310	43.404	-6.596	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 : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmitter (5550MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.193	9.790	30.520	40.310	-24.461	64.771
0.408	9.790	28.450	38.240	-20.389	58.629
0.619	9.790	26.790	36.580	-19.420	56.000
2.525	9.810	19.520	29.330	-26.670	56.000
11.869	10.026	34.570	44.596	-15.404	60.000
15.002	10.092	38.680	48.772	-11.228	60.000
<b>Average</b>					
0.193	9.790	22.890	32.680	-22.091	54.771
0.408	9.790	25.330	35.120	-13.509	48.629
0.619	9.790	23.750	33.540	-12.460	46.000
2.525	9.810	15.620	25.430	-20.570	46.000
11.869	10.026	29.600	39.626	-10.374	50.000
15.002	10.092	32.000	42.092	-7.908	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 : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter (5550MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.193	9.770	27.360	37.130	-27.641	64.771
0.412	9.770	29.030	38.800	-19.714	58.514
0.619	9.770	27.310	37.080	-18.920	56.000
0.900	9.780	25.020	34.800	-21.200	56.000
10.978	10.019	36.960	46.979	-13.021	60.000
14.611	10.135	38.420	48.555	-11.445	60.000
<b>Average</b>					
0.193	9.770	22.430	32.200	-22.571	54.771
0.412	9.770	26.280	36.050	-12.464	48.514
0.619	9.770	23.170	32.940	-13.060	46.000
0.900	9.780	23.560	33.340	-12.660	46.000
10.978	10.019	31.060	41.079	-8.921	50.000
14.611	10.135	31.530	41.665	-8.335	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

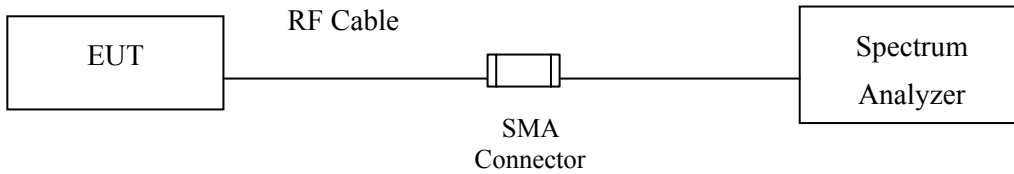
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2012
X	Power Sensor	Anritsu	MA2411B/0738448	Jun., 2012
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2013

Note:

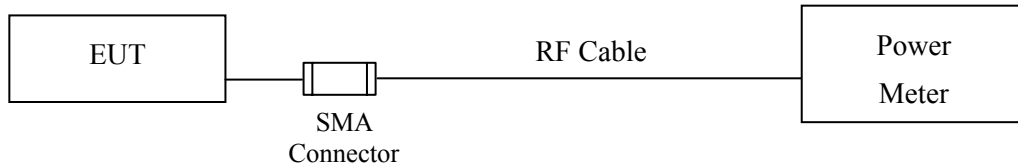
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

#### 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 Procedur

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.

### 3.5. Uncertainty

$\pm 1.27 \text{ dB}$

### 3.6. Test Result of Maximum conducted output power

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Maximum conducted output power  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter

#### CHAIN A

Cable loss=1dB		Maximum conducted output power		
Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit
38	5190	63	10.55	<17dBm
46	5230	63	10.51	<17dBm
54	5270	63	10.53	<24dBm
62	5310	63	10.54	<24dBm
102	5510	63	10.58	<24dBm
110	5550	63	10.57	<24dBm
134	5670	63	10.61	<24dBm

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

#### CHAIN B

Cable loss=1dB		Maximum conducted output power		
Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit
38	5190	63	10.50	<17dBm
46	5230	63	10.61	<17dBm
54	5270	63	10.67	<24dBm
62	5310	63	10.61	<24dBm
102	5510	63	10.67	<24dBm
110	5550	63	10.71	<24dBm
134	5670	63	10.71	<24dBm

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

**CHAIN C**

Cable loss=1dB		Maximum conducted output power		
Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit
38	5190	63	10.51	<17dBm
46	5230	63	10.66	<17dBm
54	5270	63	10.60	<24dBm
62	5310	63	10.60	<24dBm
102	5510	63	10.50	<24dBm
110	5550	63	10.73	<24dBm
134	5670	63	10.52	<24dBm

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

**CHAIN D**

Cable loss=1dB		Maximum conducted output power		
Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit
38	5190	63	10.55	<17dBm
46	5230	63	10.61	<17dBm
54	5270	63	10.66	<24dBm
62	5310	63	10.71	<24dBm
102	5510	63	10.51	<24dBm
110	5550	63	10.57	<24dBm
134	5670	63	10.61	<24dBm

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

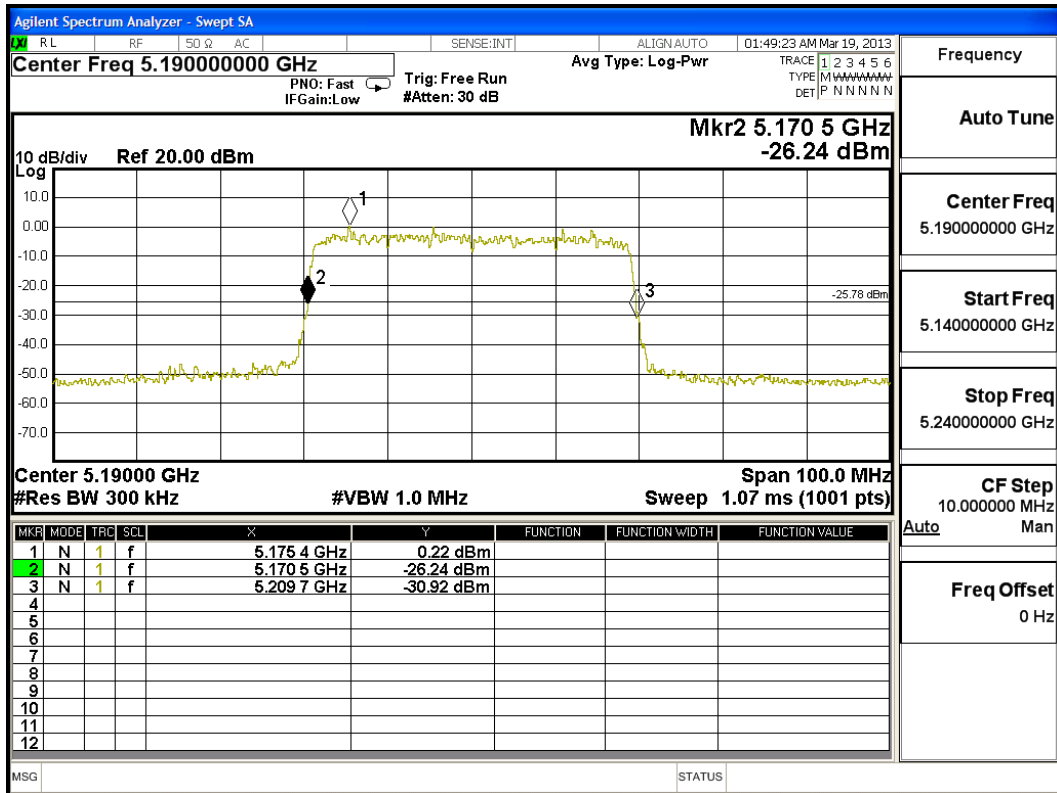
**Maximum conducted output power Measurement:**
**(CHAIN A+ B+C+D)**

Channel Number	Frequency (MHz)	26dB Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Chain C Power (dBm)	Chain D Power (dBm)	Output Power (dBm)	Output Power Limit	
								(dBm)	dBm+10log (BW)
38	5190	39.100	10.55	10.50	10.51	10.55	16.55	17	17.80
46	5230	39.000	10.51	10.61	10.66	10.61	16.62	17	17.79
54	5270	39.000	10.53	10.67	10.60	10.66	16.64	24	24.69
62	5310	39.200	10.54	10.61	10.60	10.71	16.64	24	24.71
102	5510	39.100	10.58	10.67	10.50	10.51	16.59	24	24.30
110	5550	39.100	10.57	10.71	10.73	10.57	16.67	24	24.30
134	5670	39.100	10.61	10.71	10.52	10.61	16.63	24	24.30

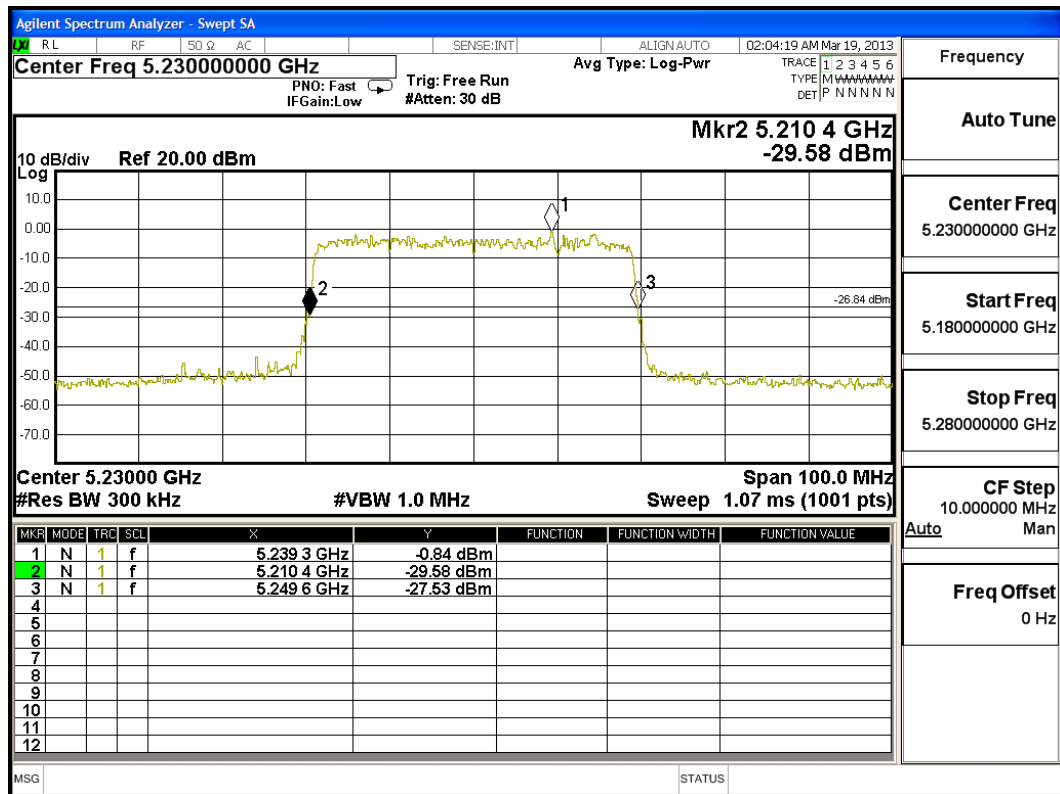
Note:

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)+ Chain C Power (mW)) + Chain D Power (mW))
3. 26 dB Bandwidth is the bandwidth of chain A or chain B or chain C or chain D whichever is less bandwidth, output power limitation is more stringent.

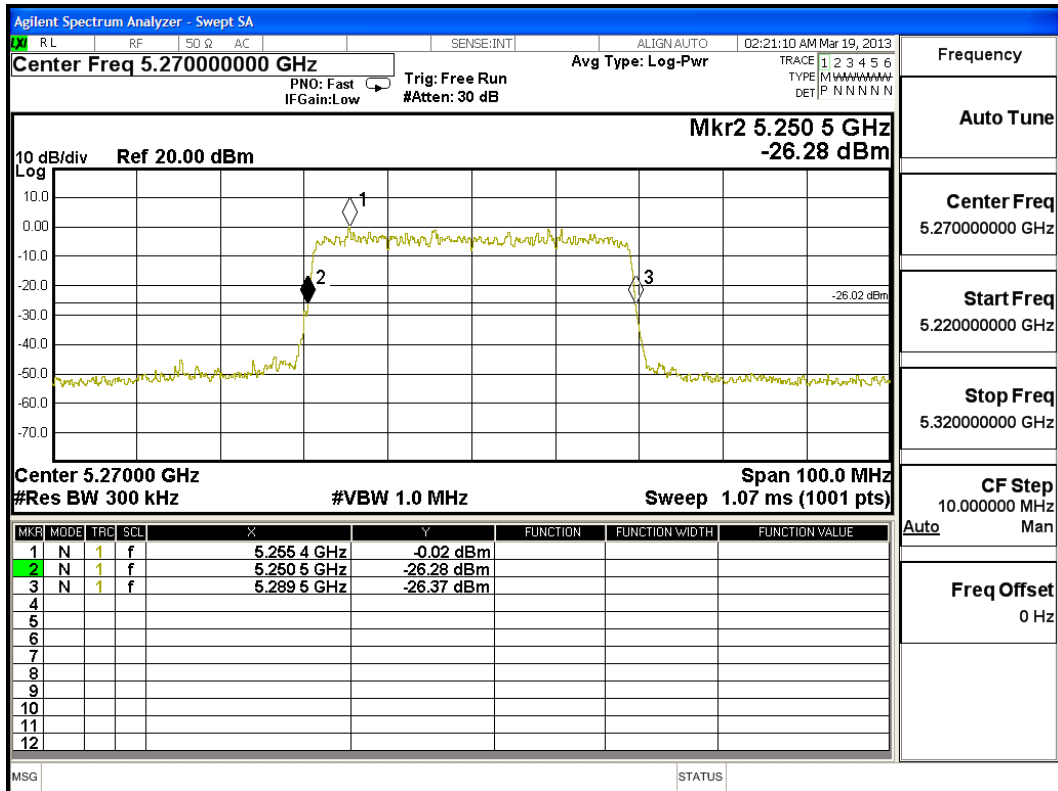
### 26dBc Occupied Bandwidth: Channel 38 – Chain A



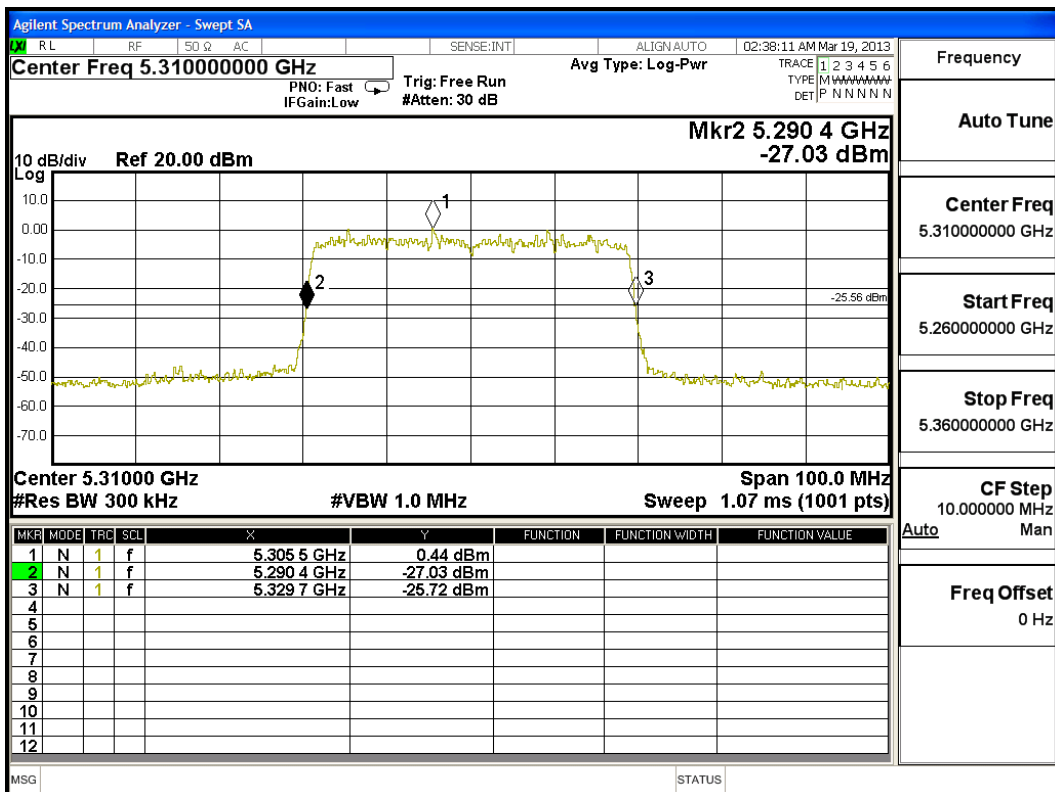
### Channel 46 – Chain A



**Channel 54 – Chain A**

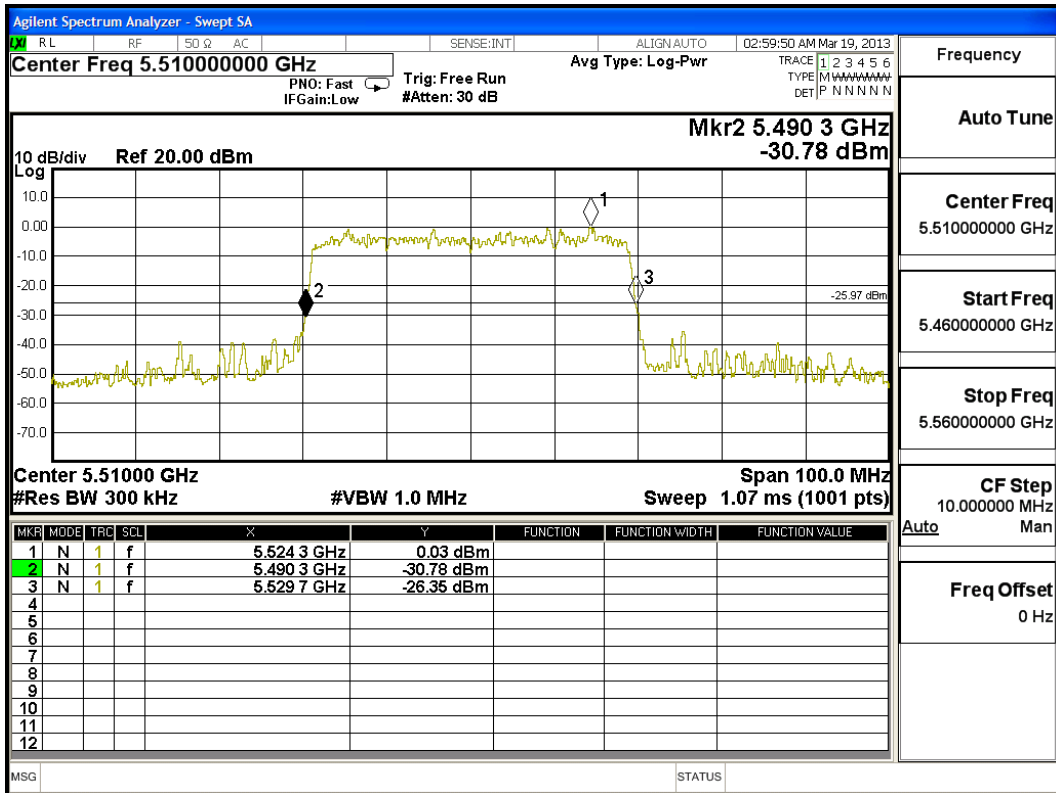


**Channel 62 – Chain A**

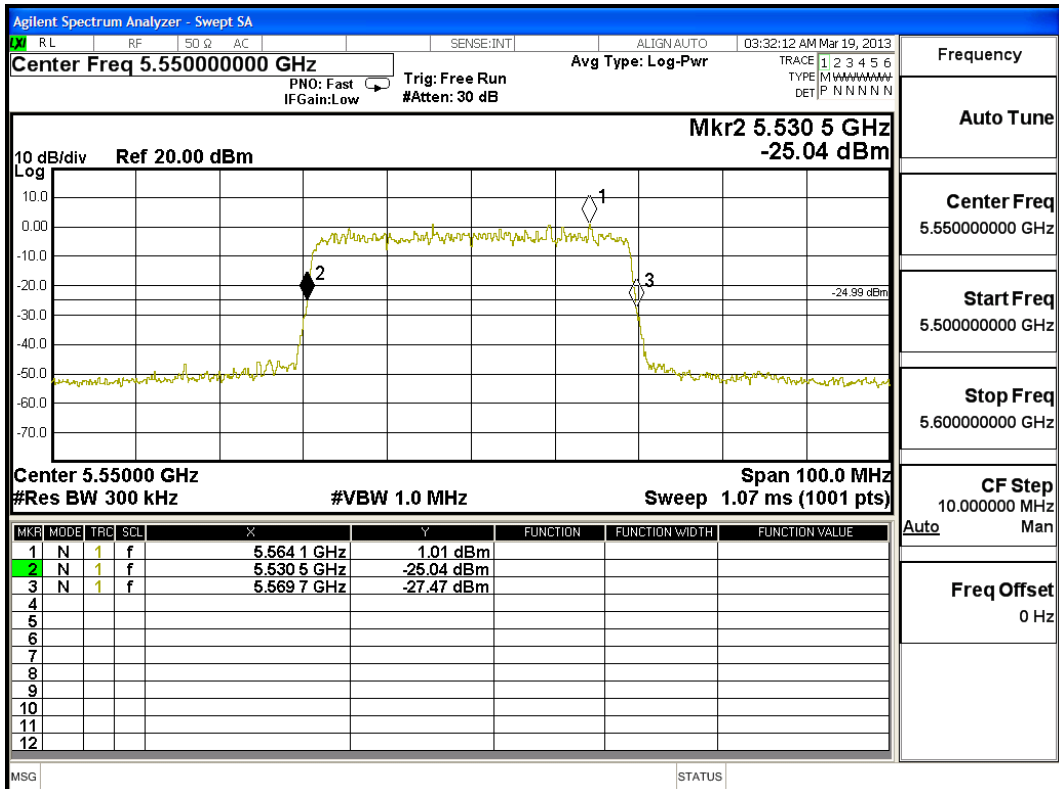




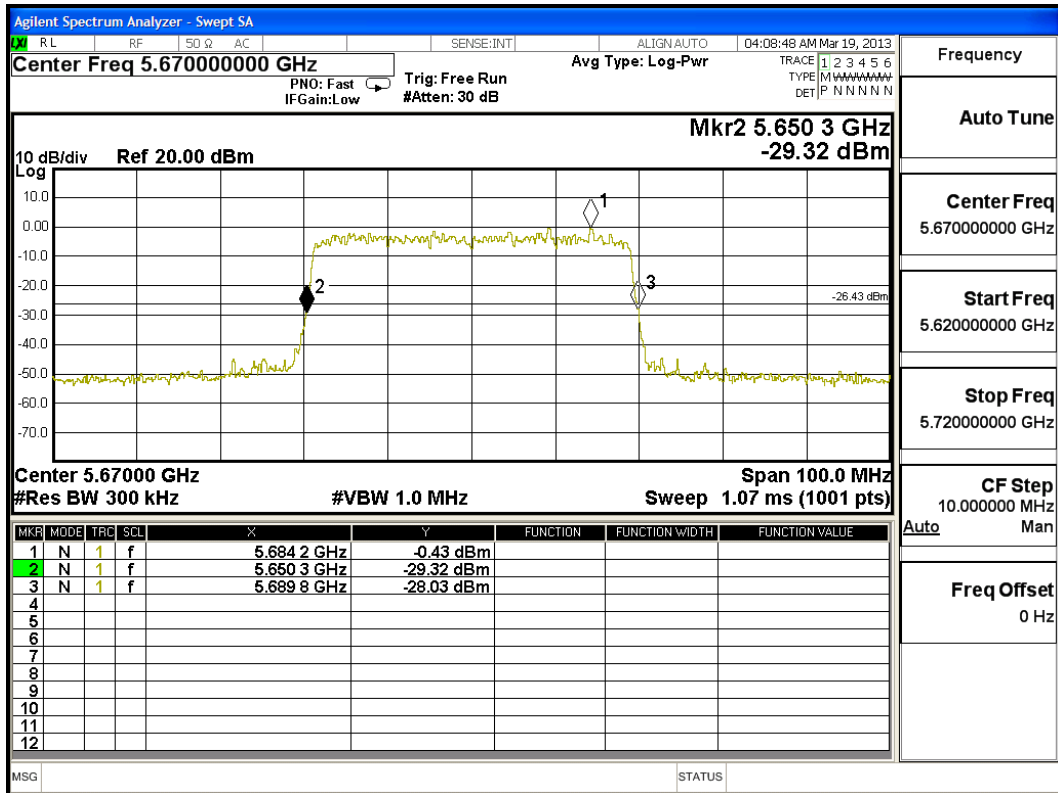
Channel 102 – Chain A



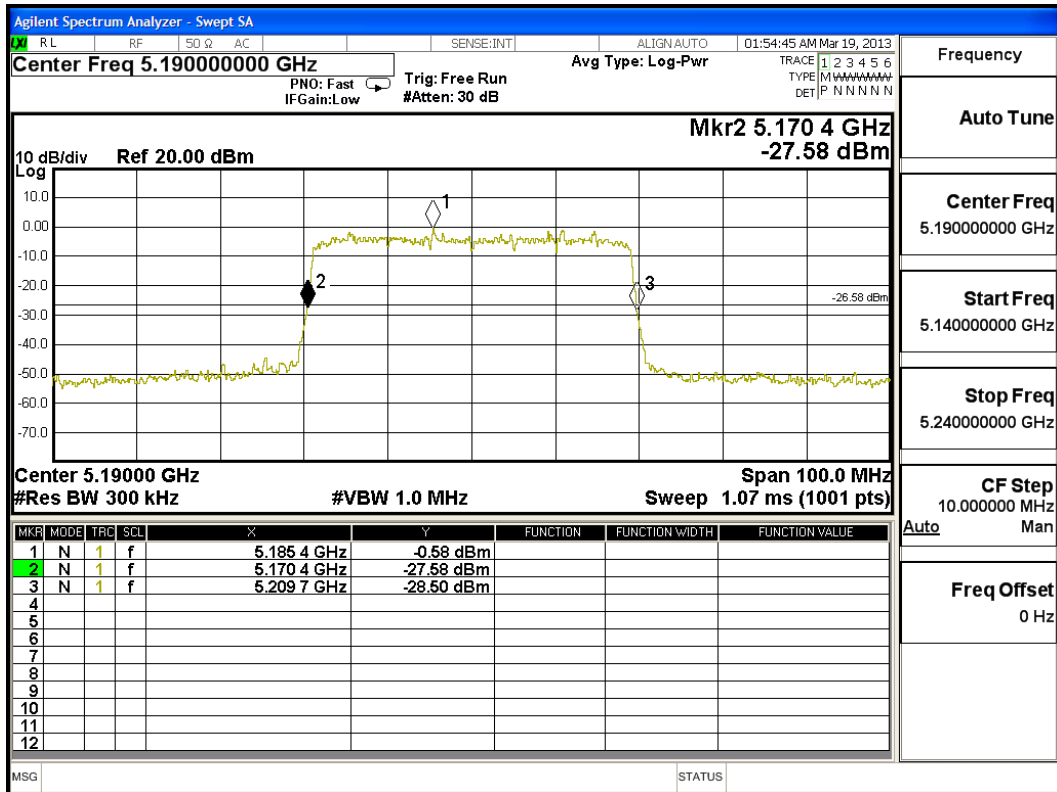
Channel 110 – Chain A



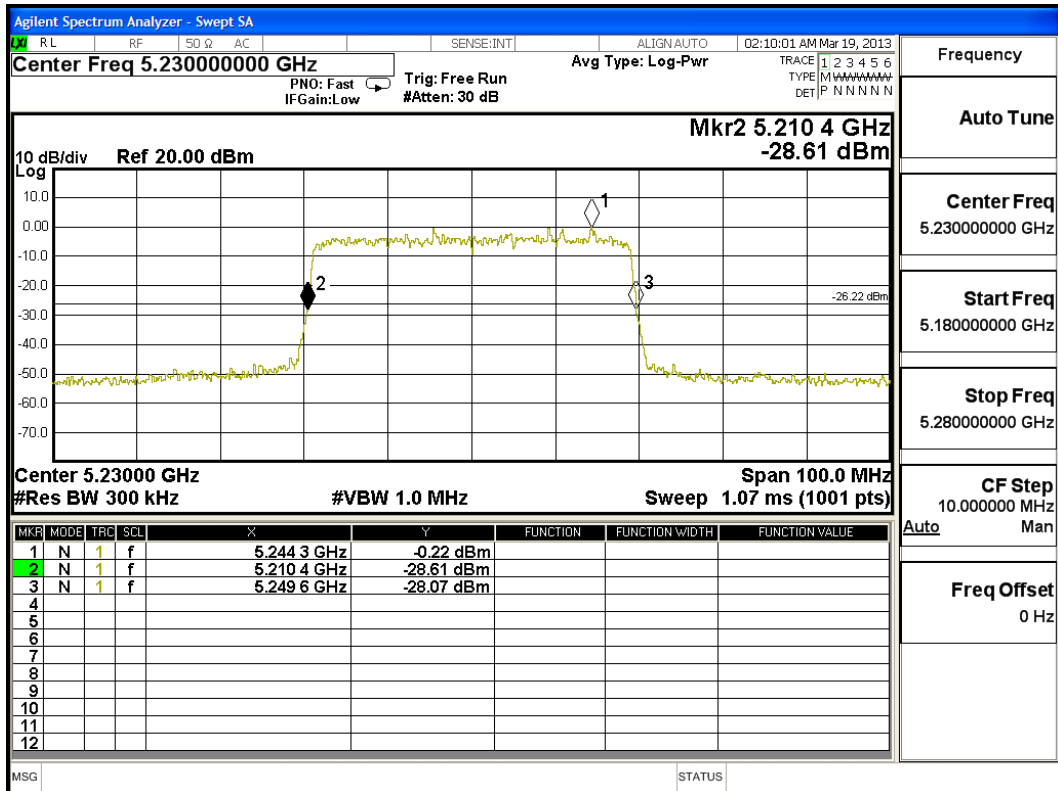
Channel 134 – Chain A



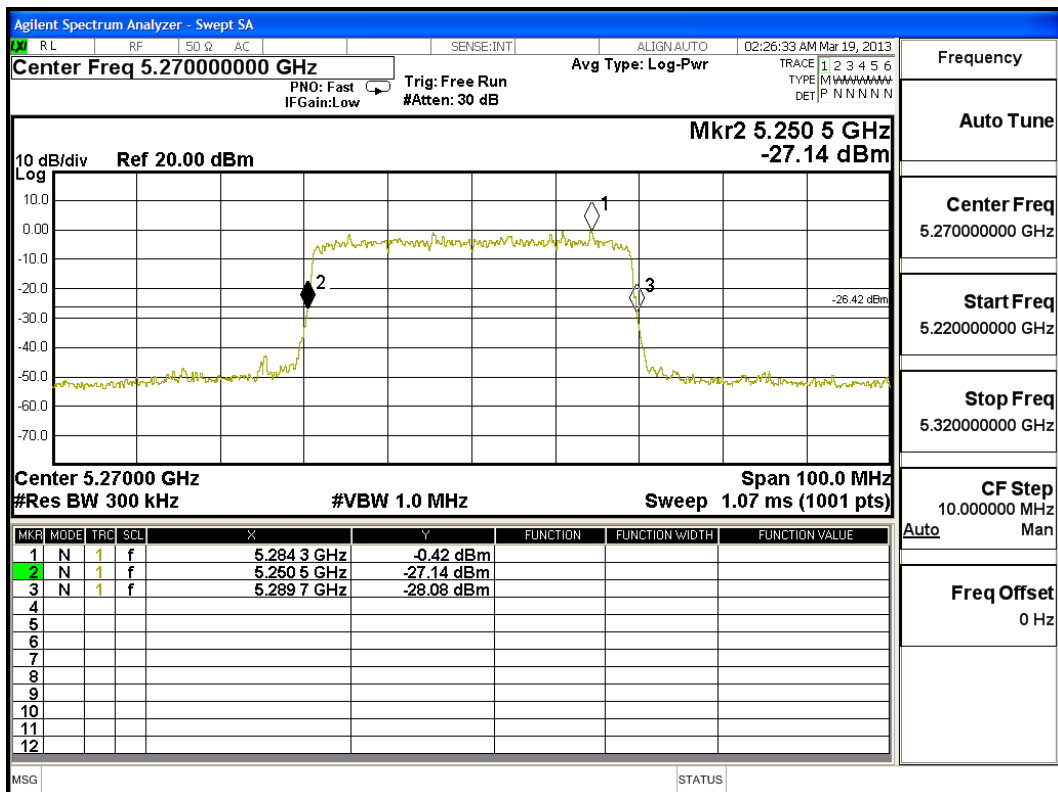
Channel 38 – Chain B



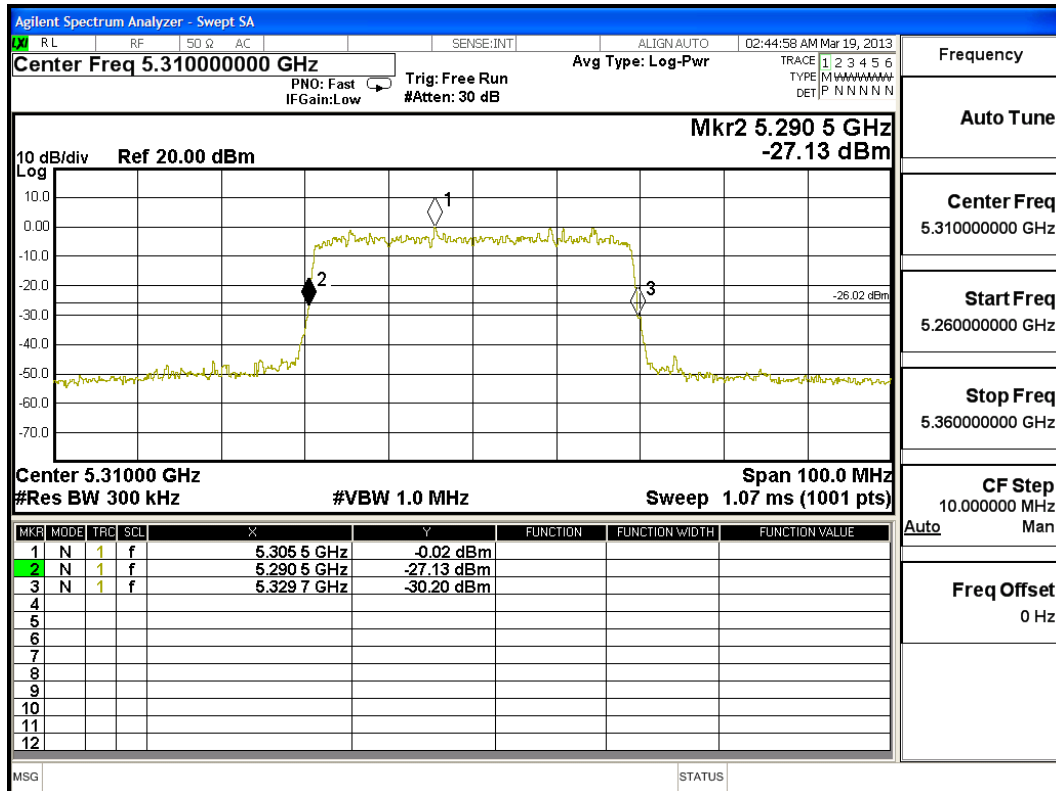
**Channel 46 – Chain B**



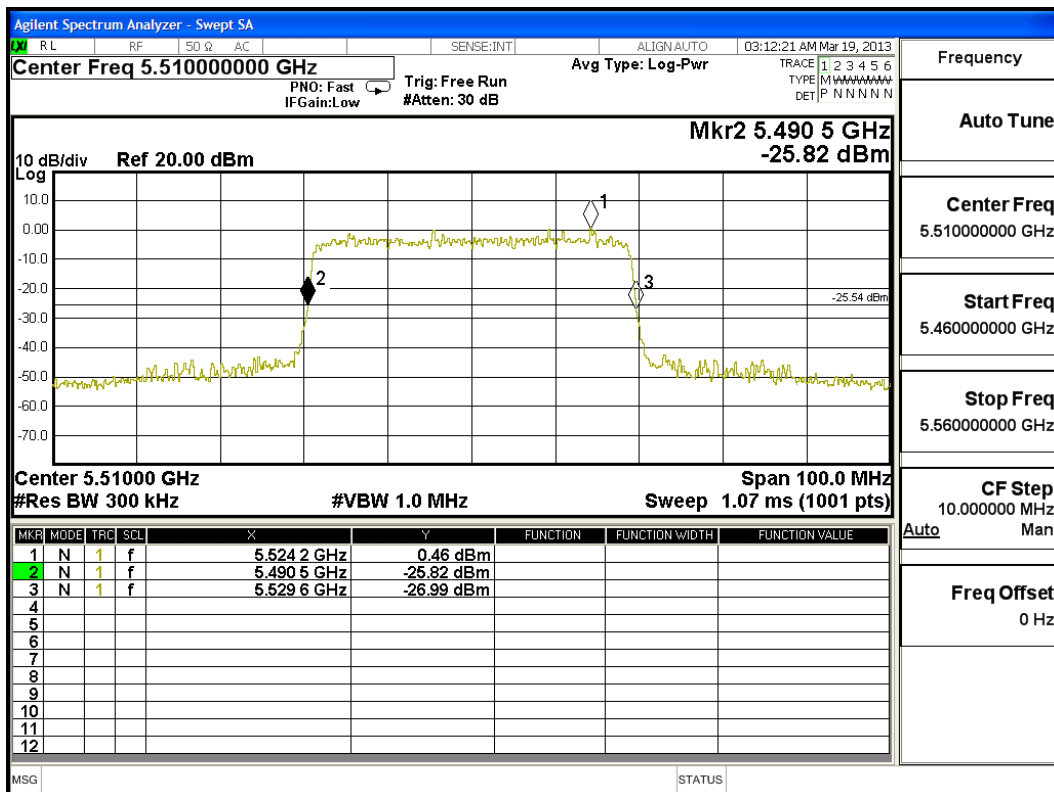
**Channel 54 – Chain B**



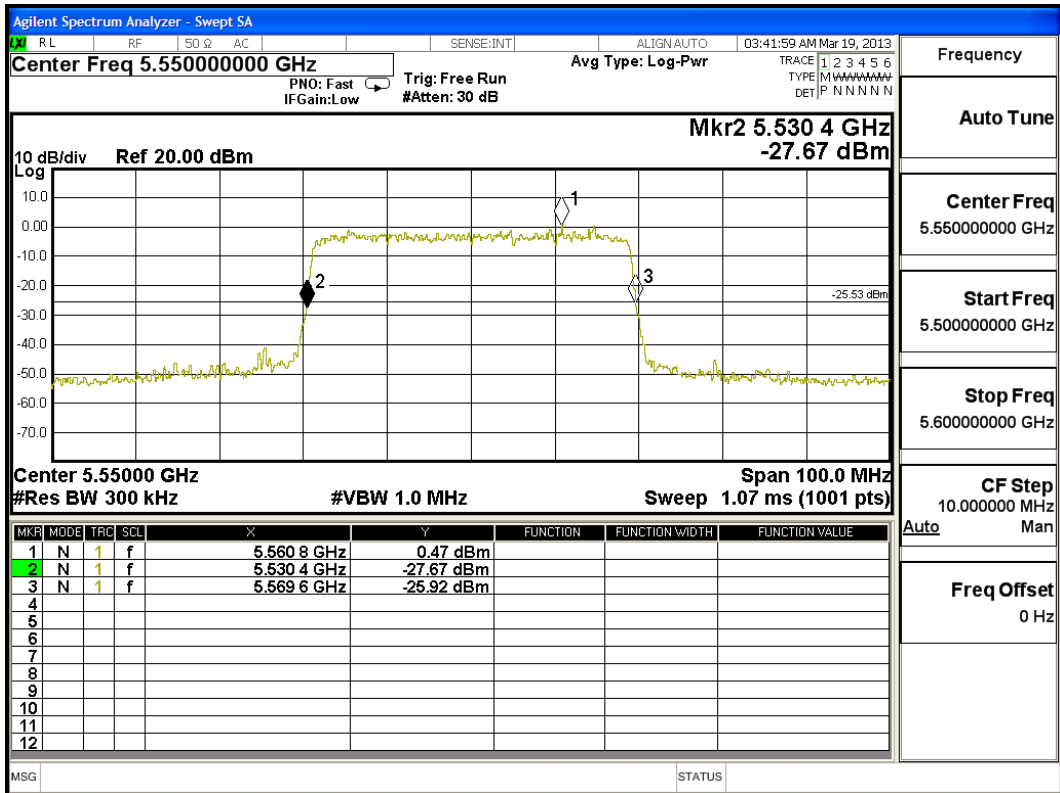
**Channel 62 – Chain B**



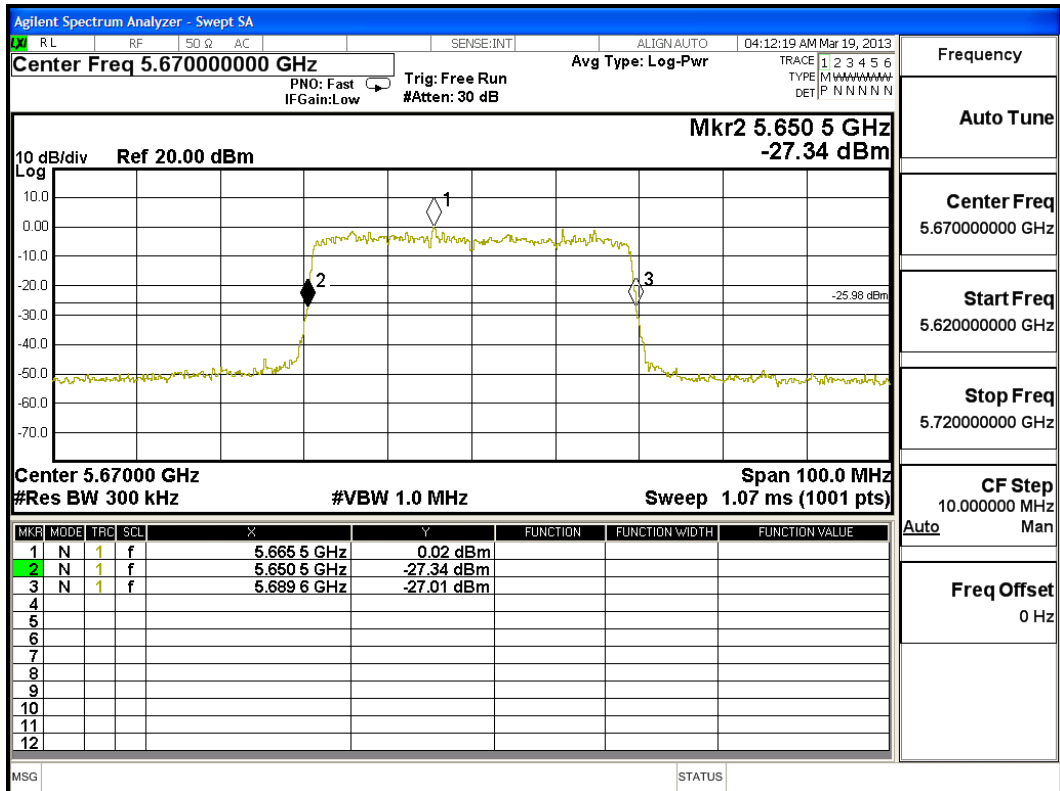
**Channel 102 – Chain B**



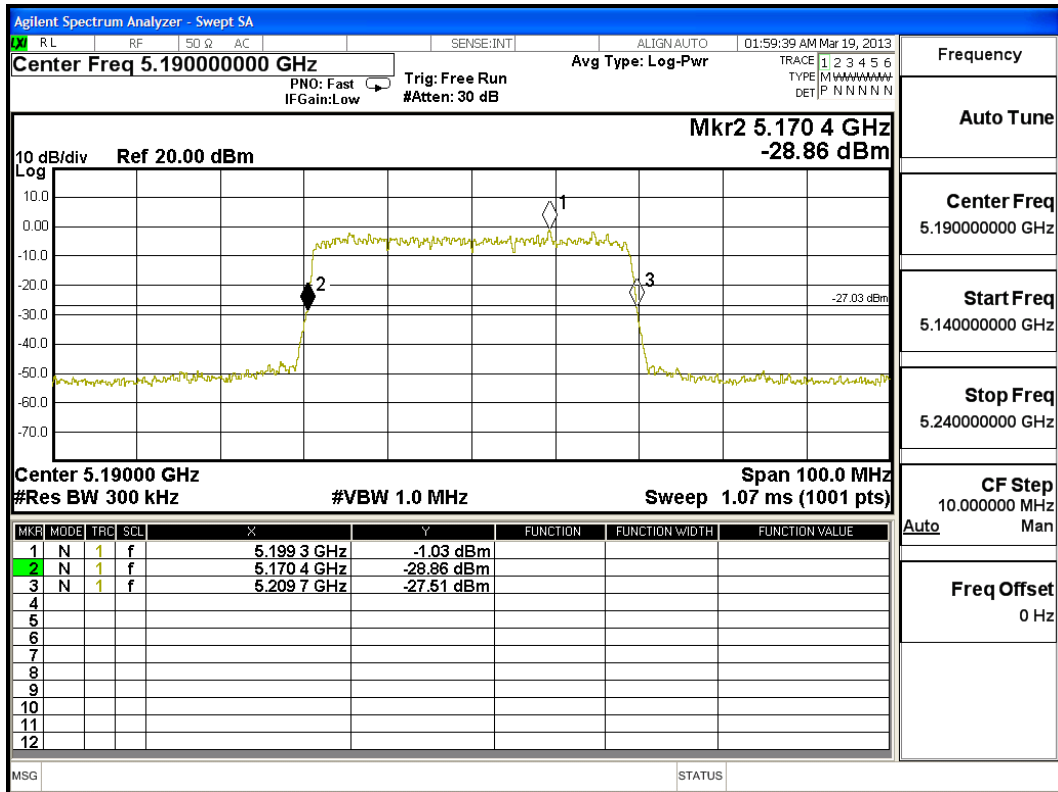
**Channel 110 – Chain B**



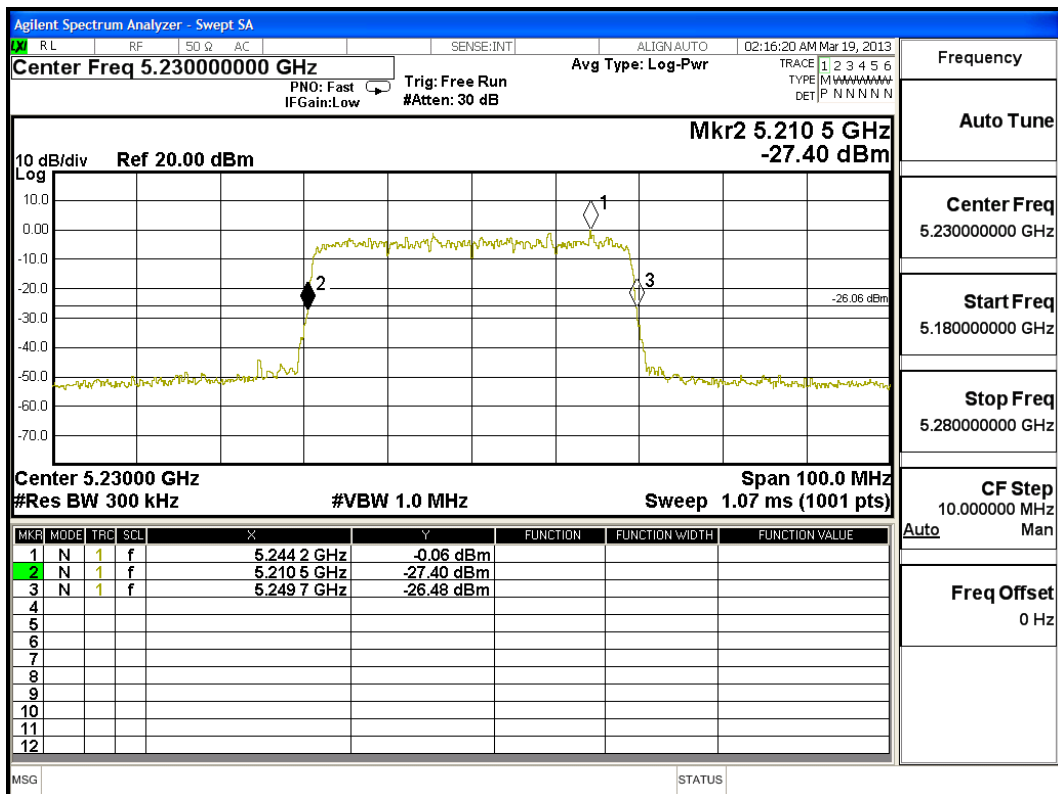
**Channel 134 – Chain B**



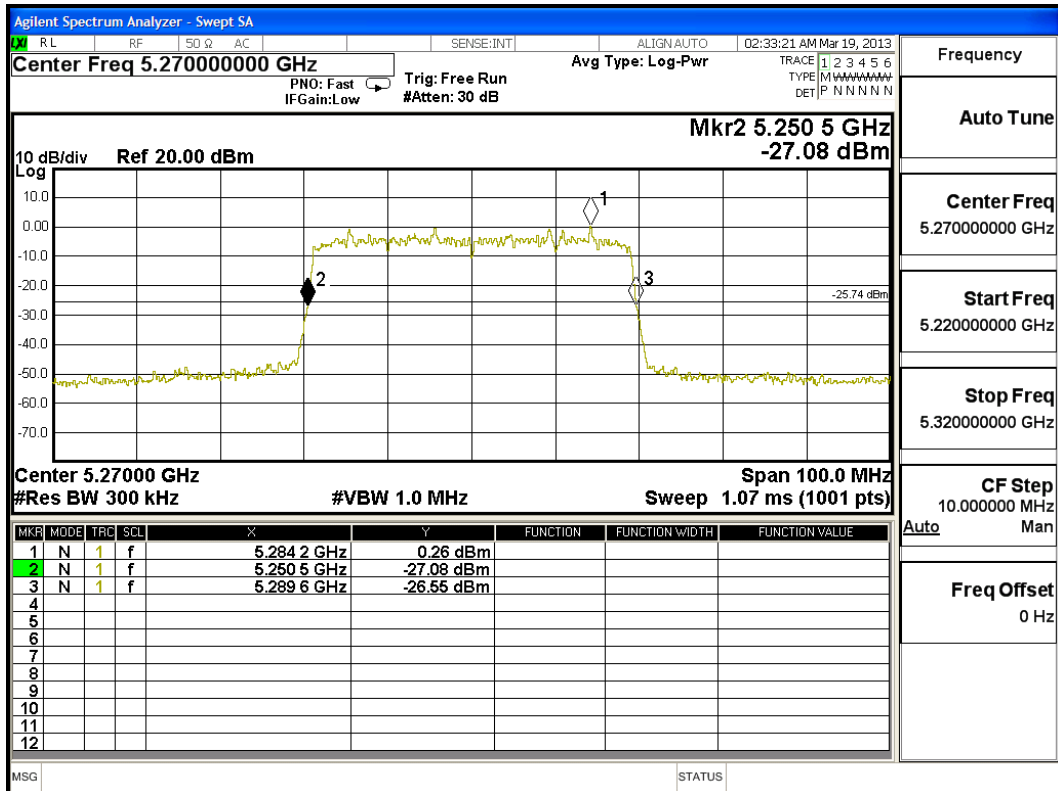
**Channel 38 – Chain C**



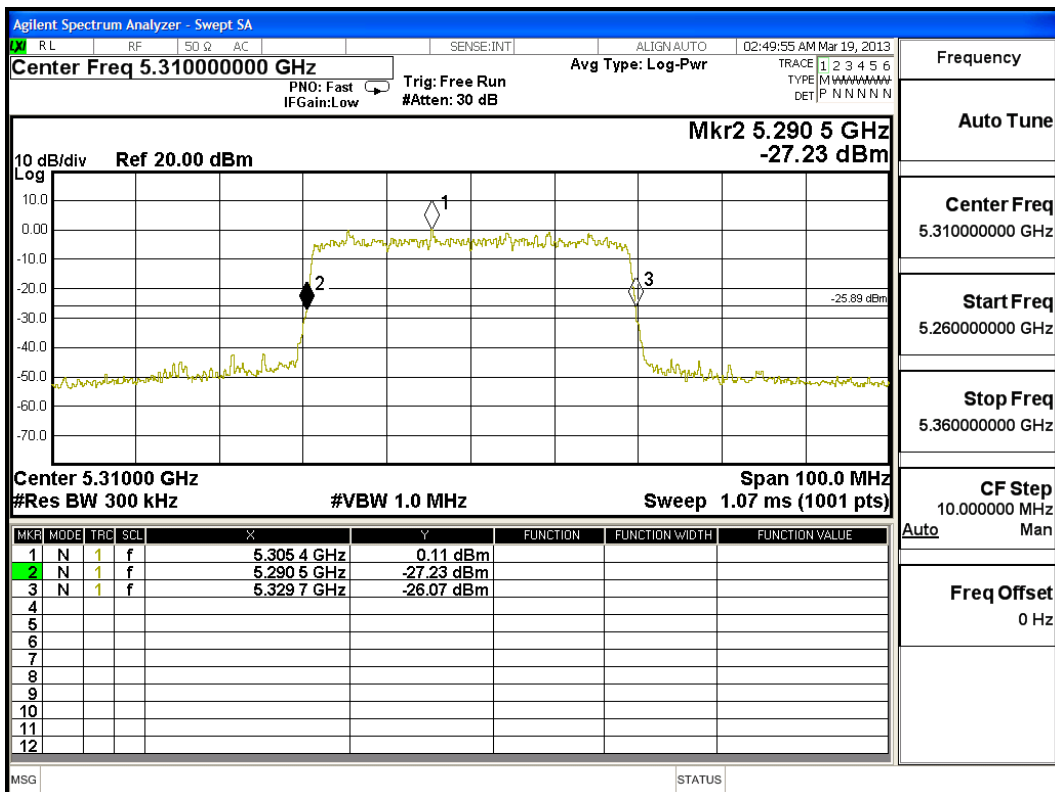
**Channel 46 – Chain C**



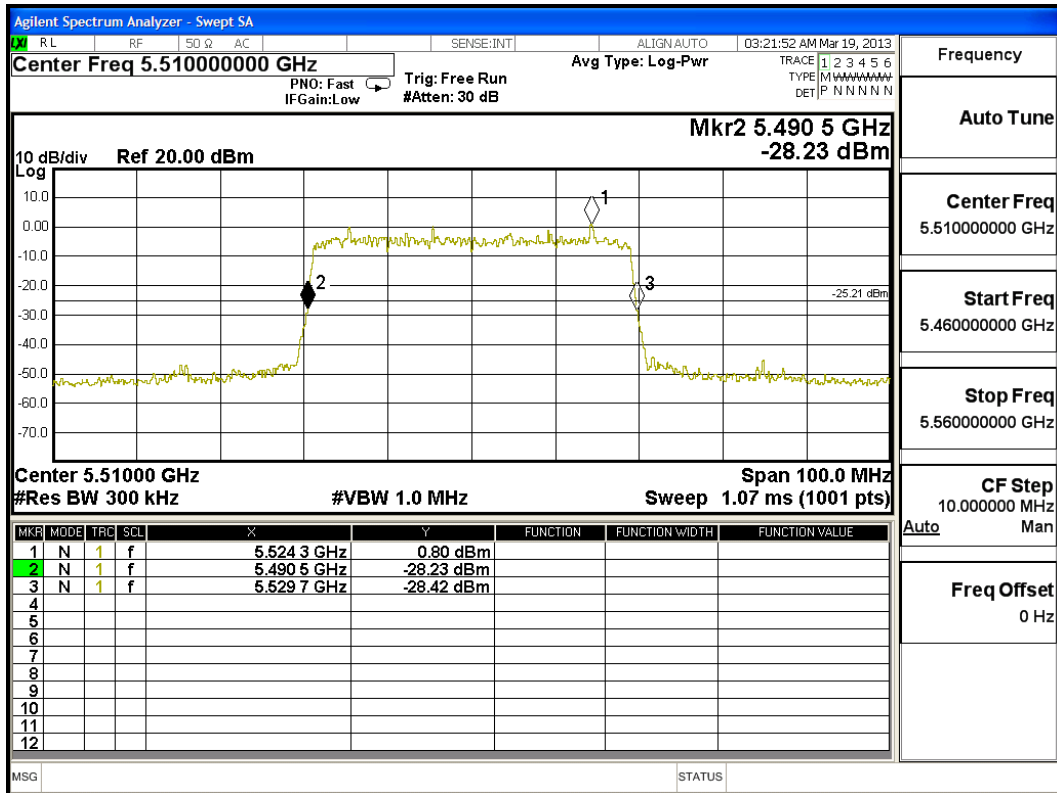
**Channel 54 – Chain C**



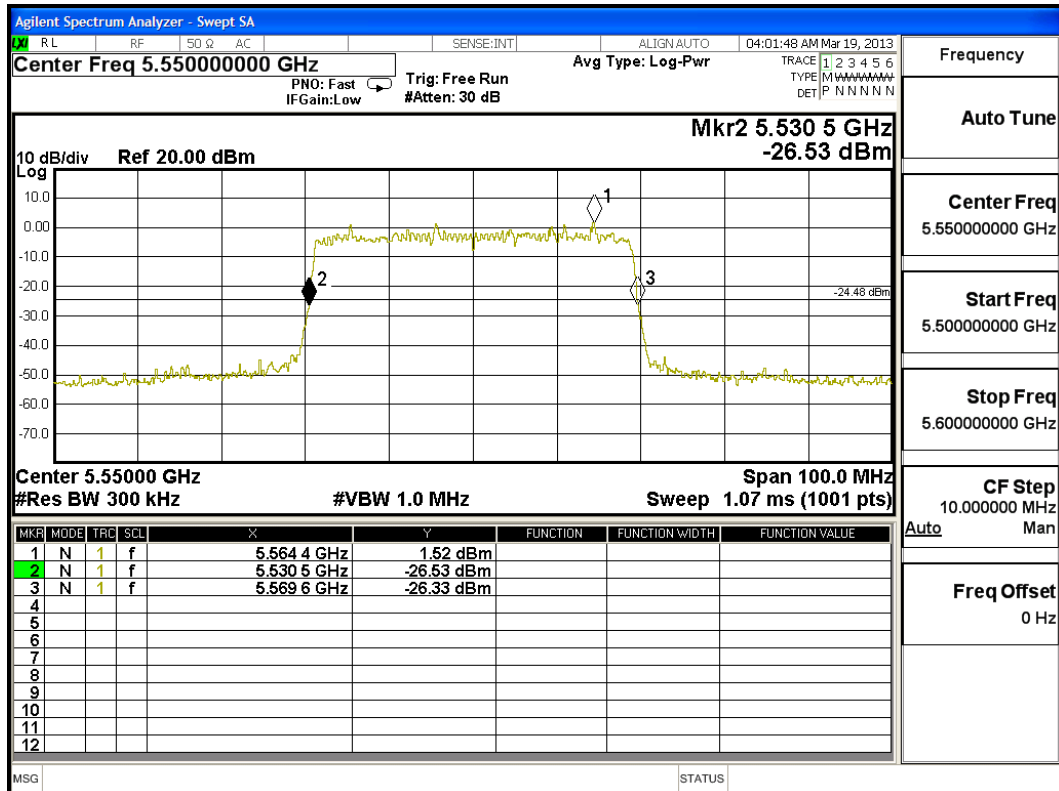
**Channel 62 – Chain C**



Channel 102 – Chain C

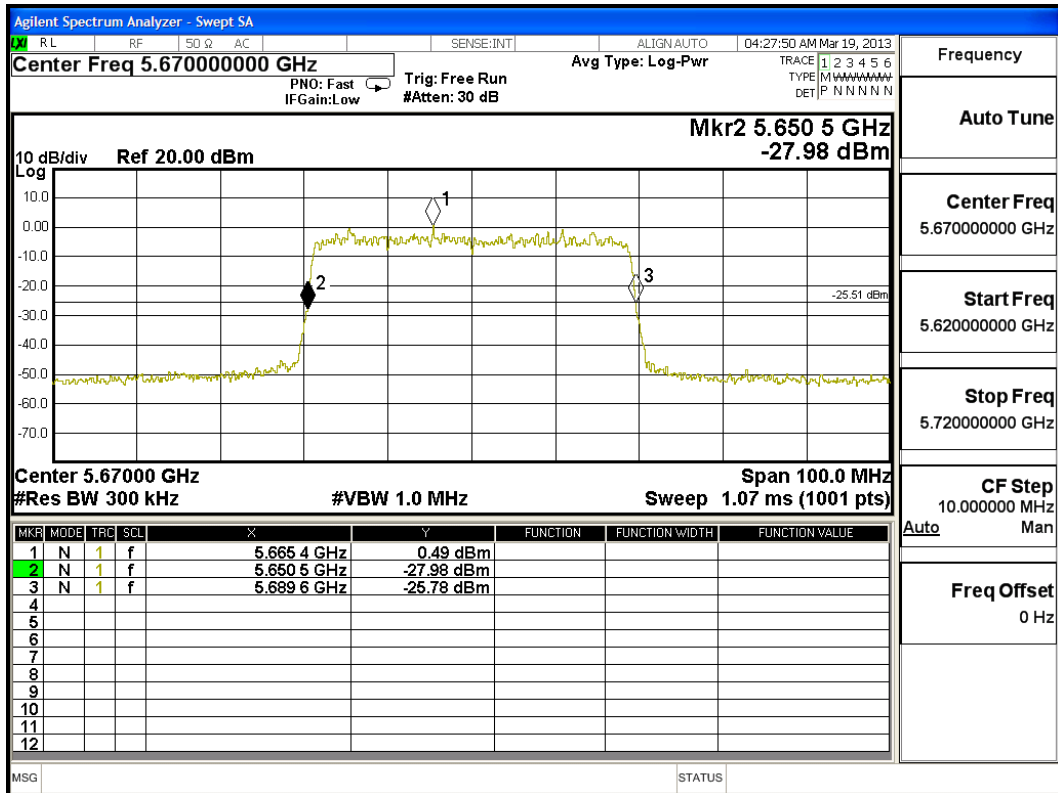


Channel 110 – Chain C

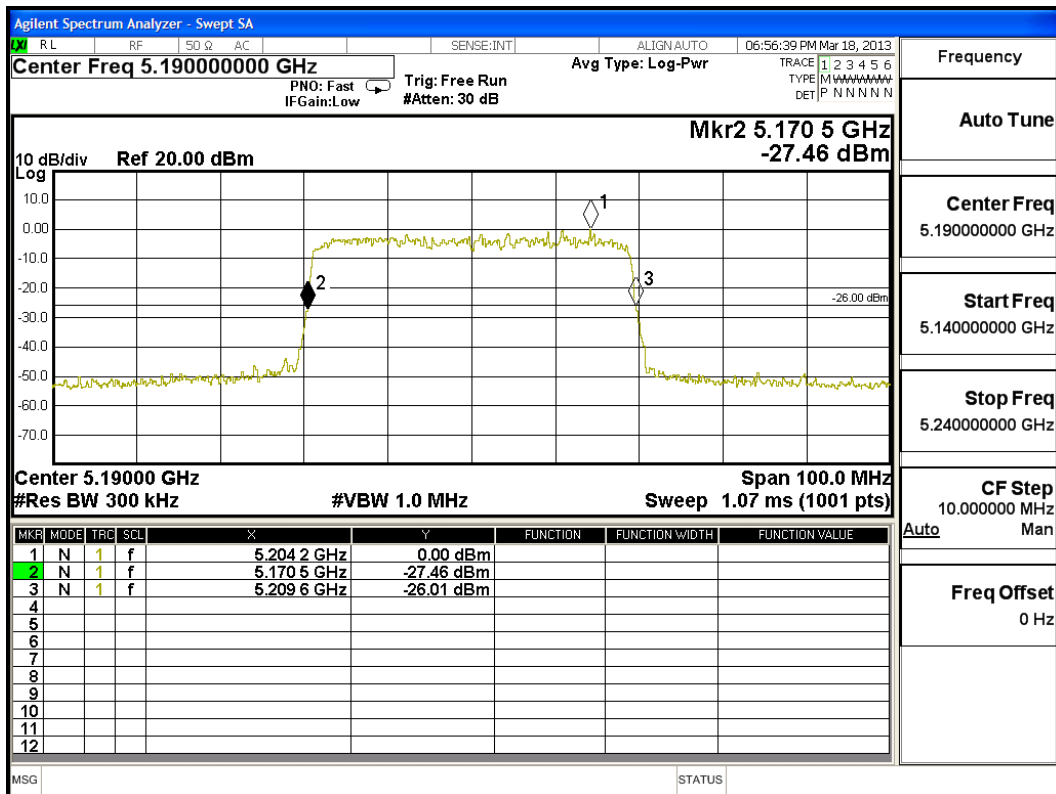




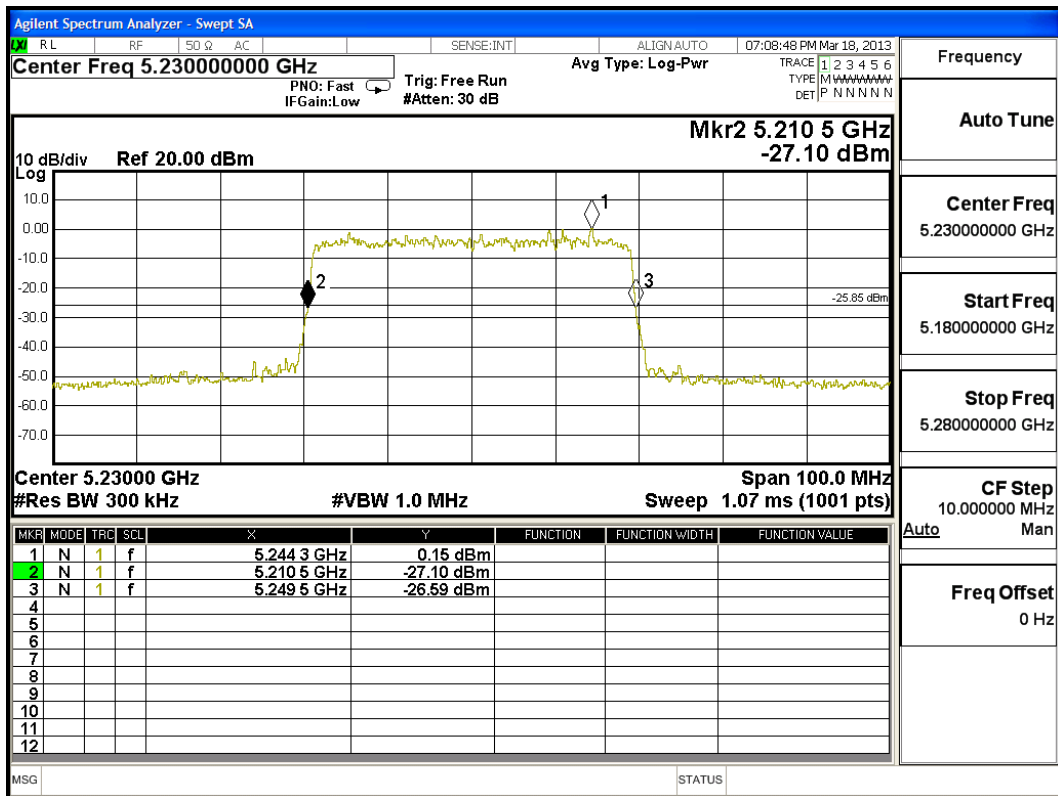
**Channel 134 – Chain C**



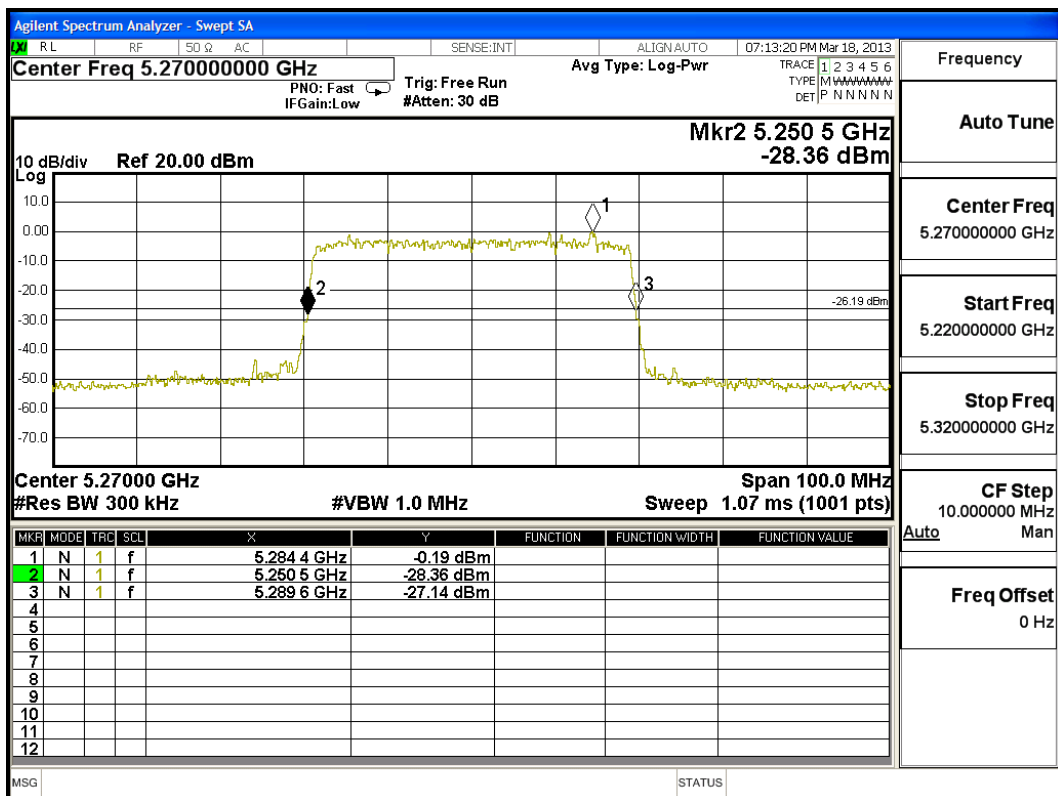
**Channel 38 – Chain D**



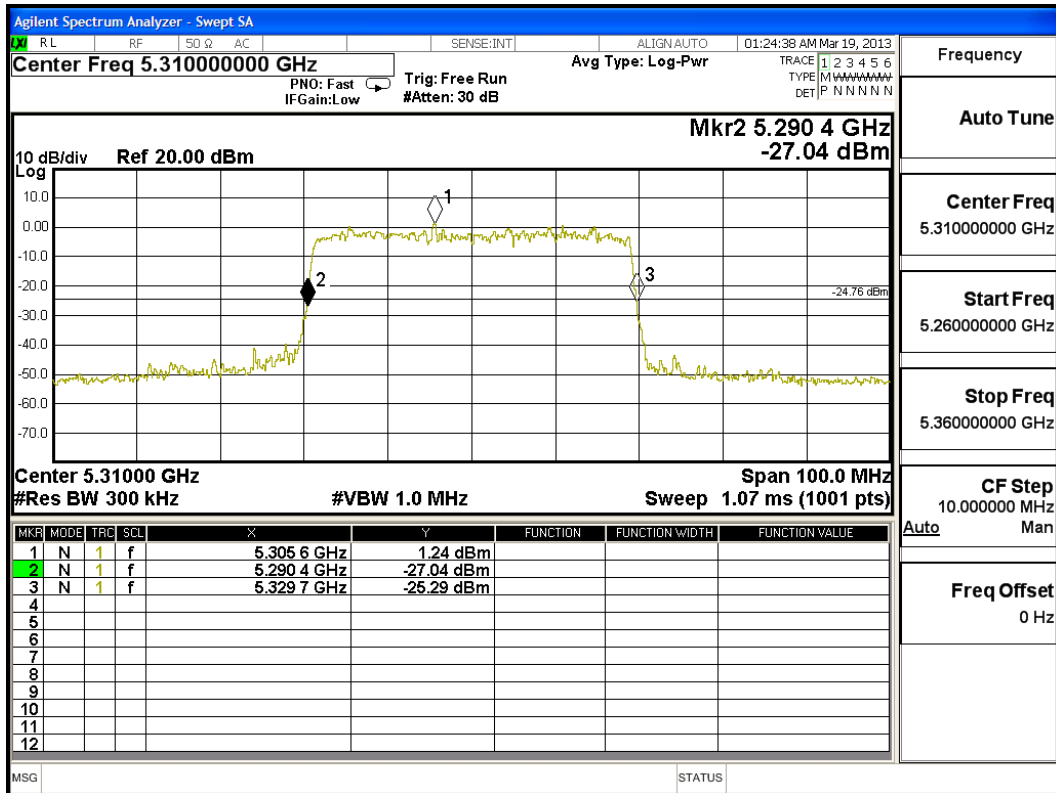
**Channel 46 – Chain D**



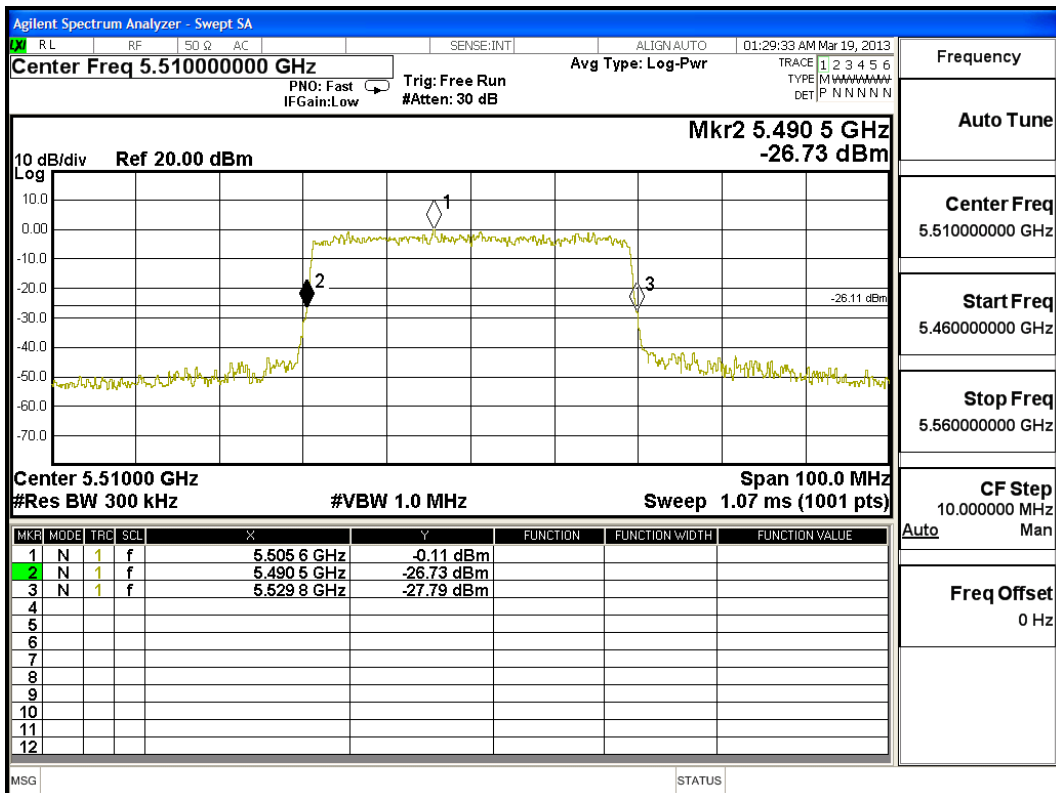
**Channel 54 – Chain D**



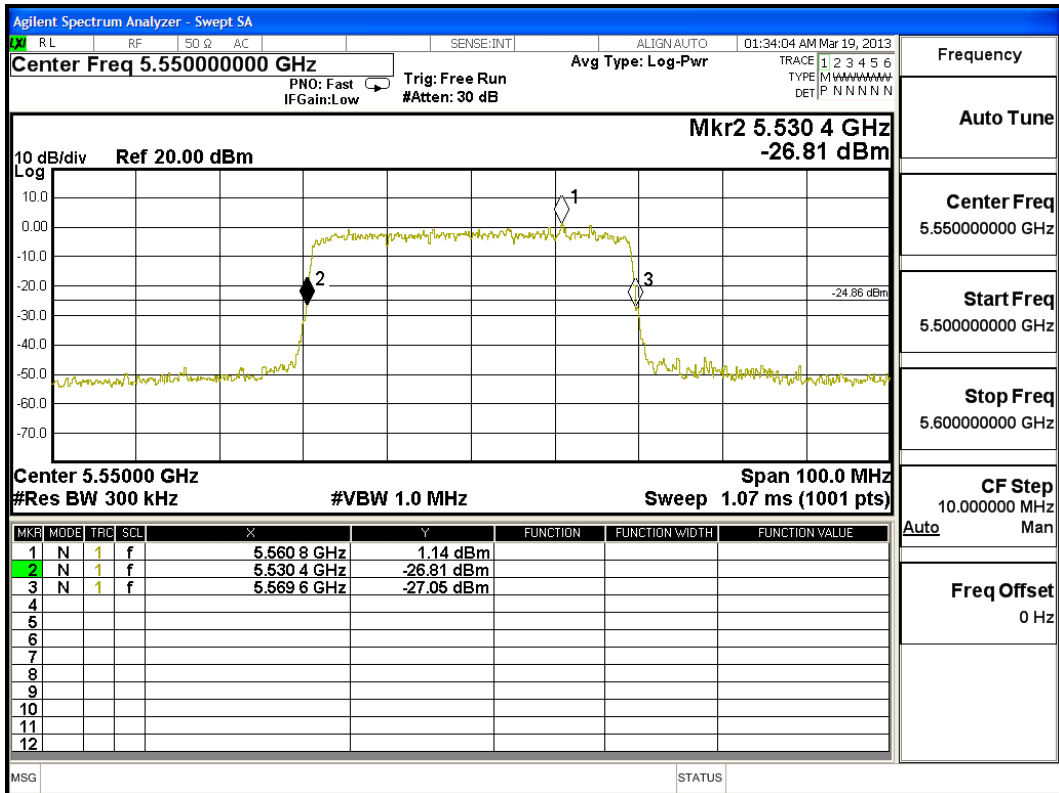
**Channel 62 – Chain D**



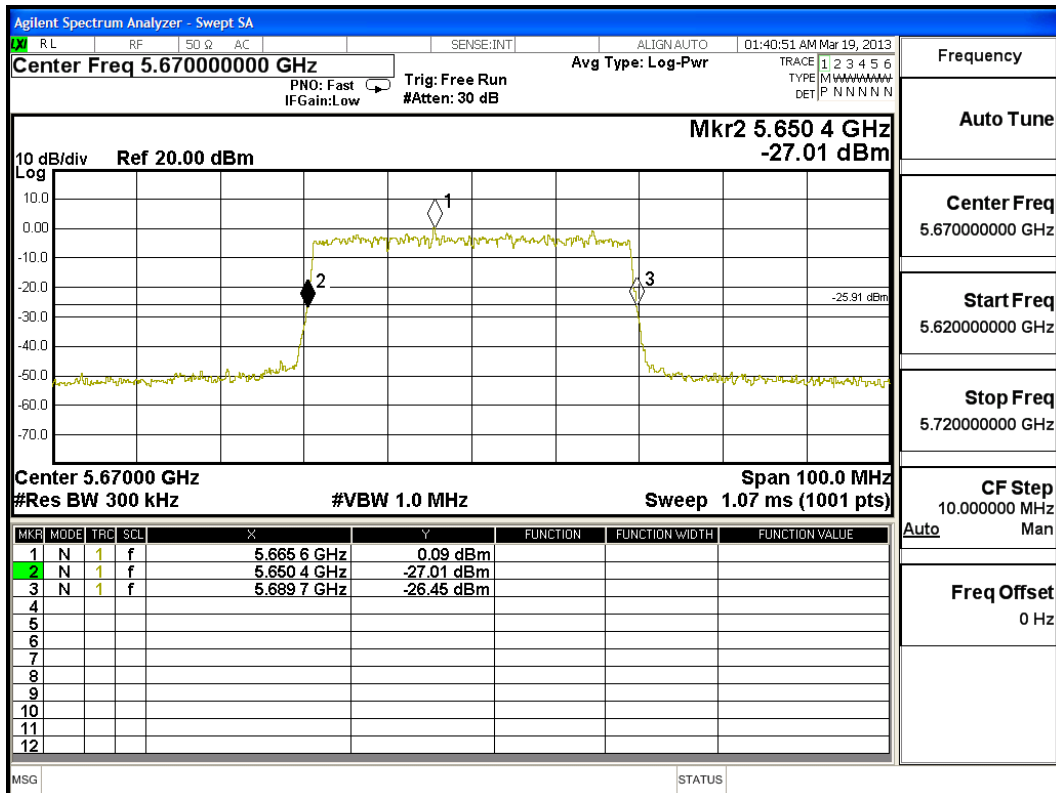
**Channel 102 – Chain D**



### Channel 110 – Chain D



### Channel 134 – Chain D



## 4. Peak Power Spectral Density

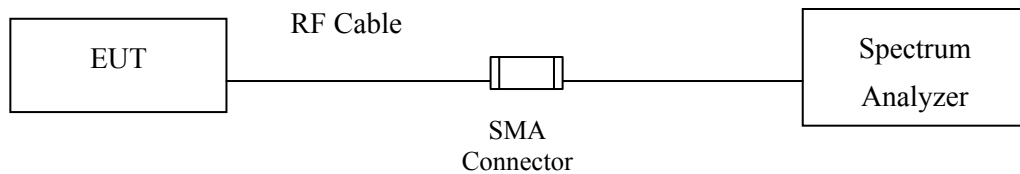
### 4.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2012
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2012
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

- (1) 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.
- (2) 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.
- (3) 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.

#### 4.5. Uncertainty

$\pm 1.27$  dB

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

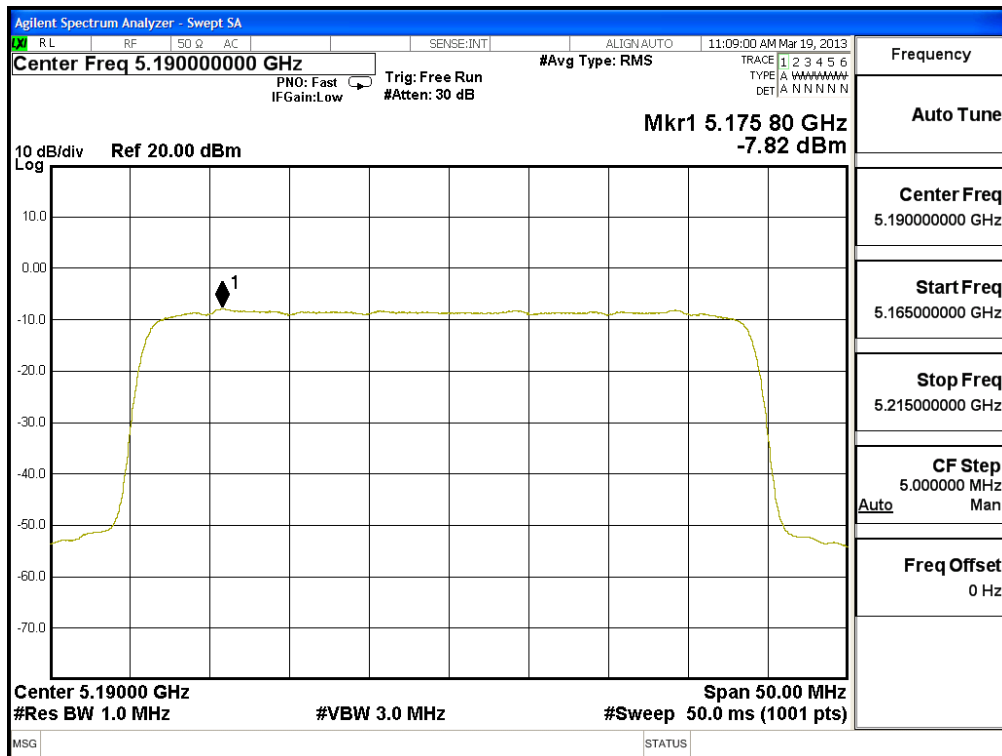
Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter

#### 5190MHz

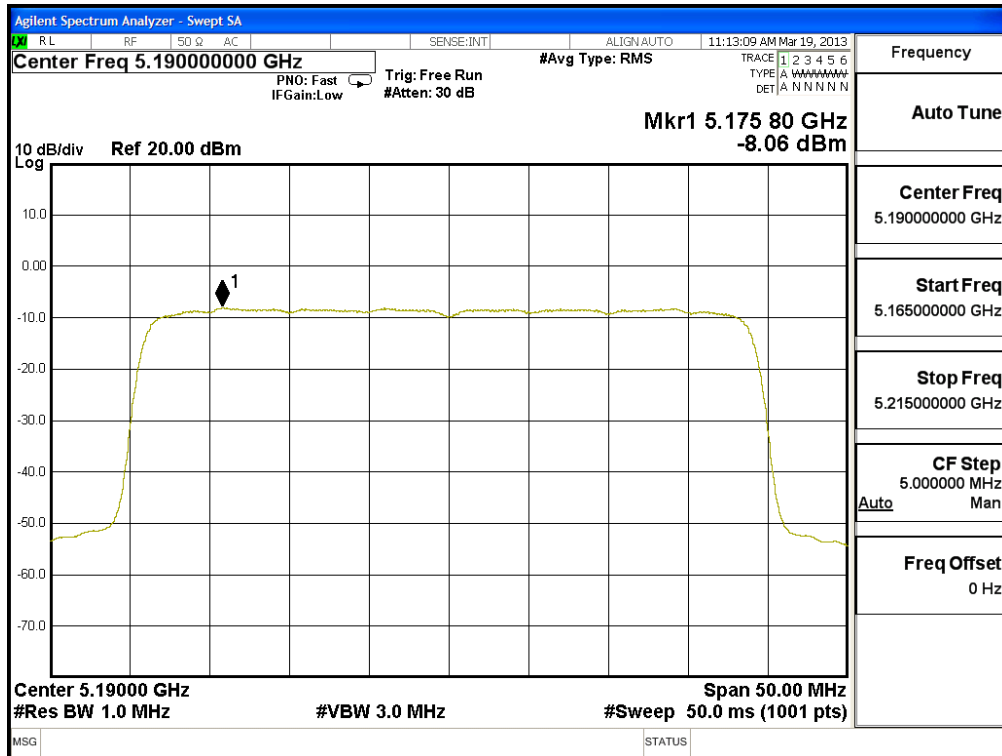
CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm) <sub>1</sub>	Limit	Result
A	-7.820	-1.820	< 4dBm	Pass
B	-8.060	-2.060	< 4dBm	Pass
C	-7.360	-1.360	< 4dBm	Pass
D	-8.210	-2.210	< 4dBm	Pass

Note 1: The quantity 10\*log 4 (four antennas) is added to the spectrum peak value according to document 662911 D01.

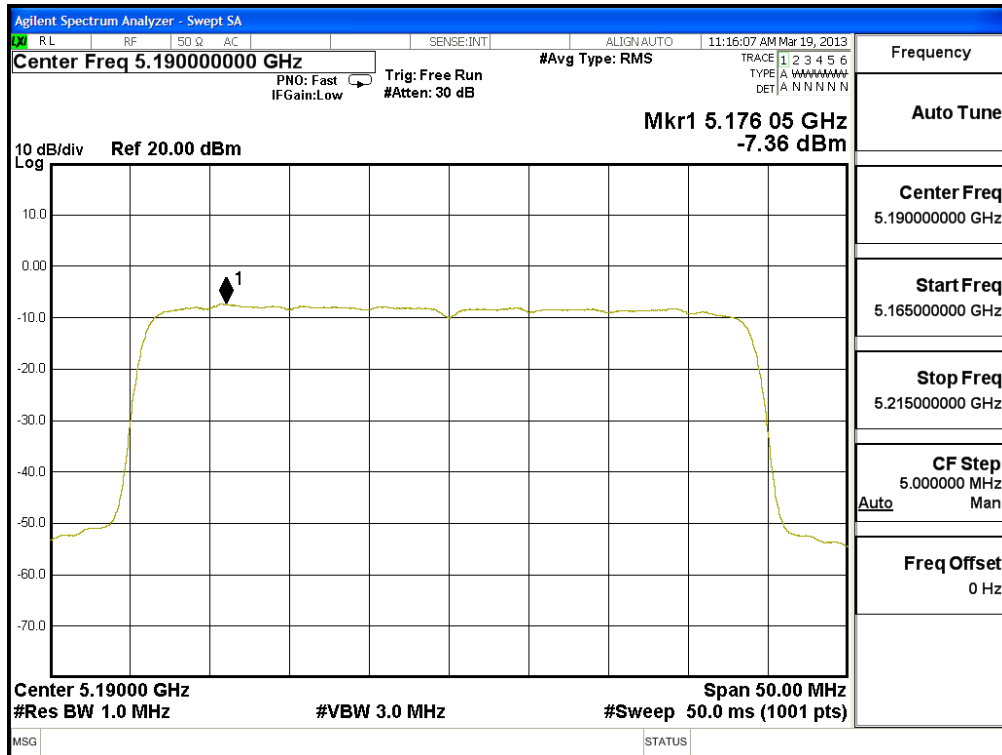
#### Channel 38 – Chain A



### Channel 38 – Chain B

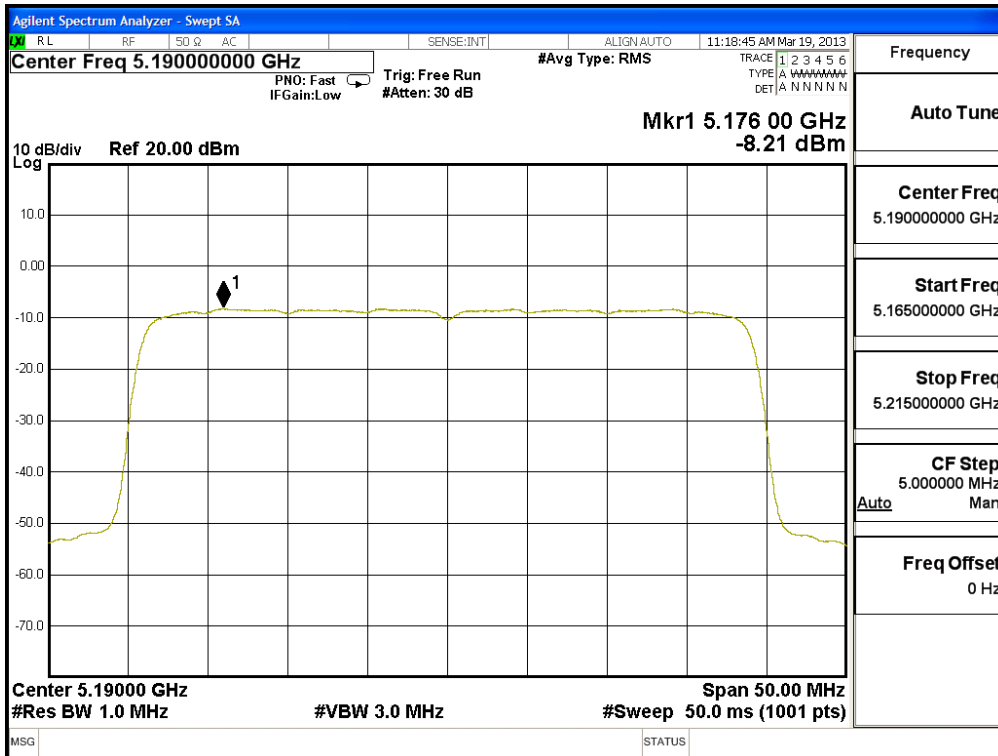


### Channel 38 – Chain C





**Channel 38 – Chain D**

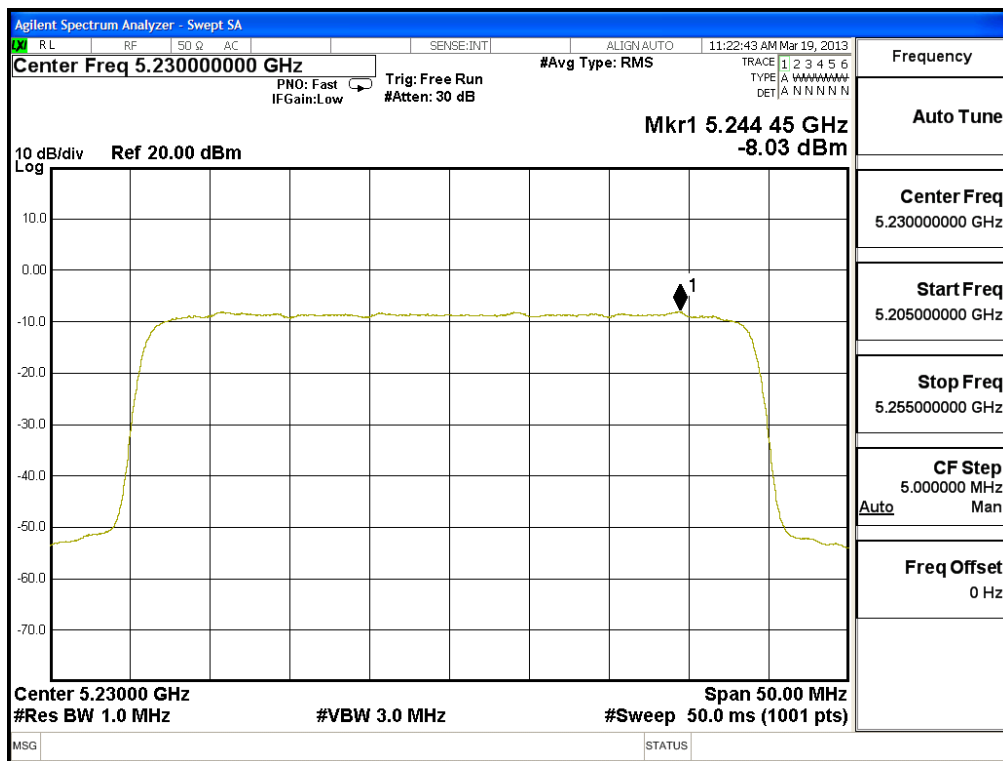


5230MHz

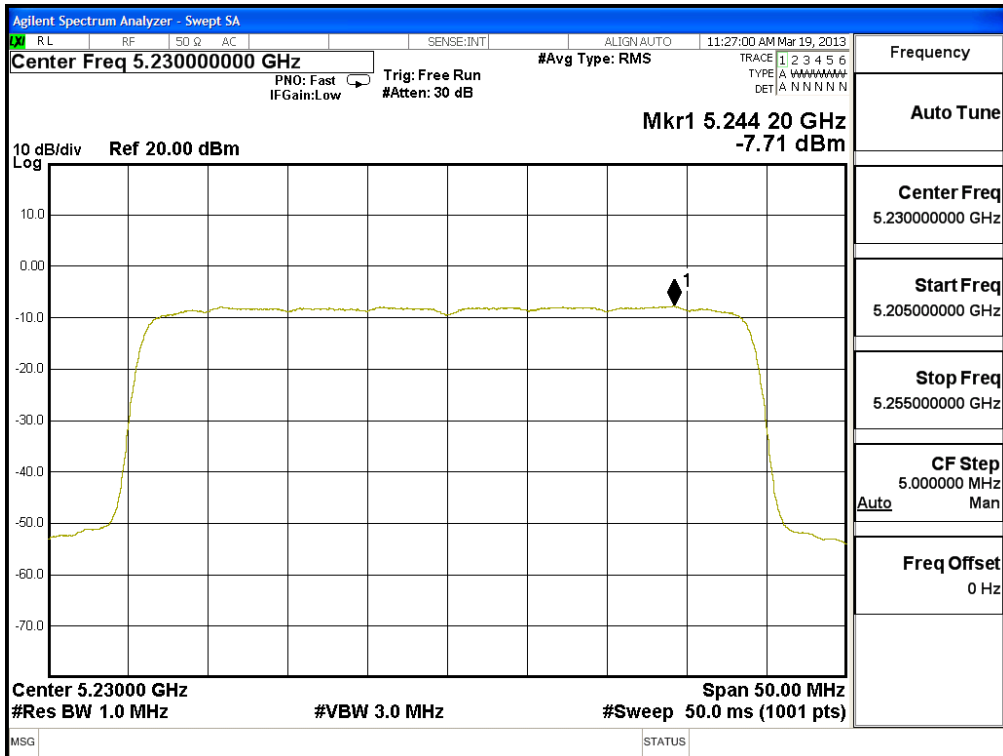
CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm) <sub>1</sub>	Limit	Result
A	-8.030	-2.030	< 4dBm	Pass
B	-7.710	-1.710	< 4dBm	Pass
C	-7.970	-1.970	< 4dBm	Pass
D	-7.500	-1.500	< 4dBm	Pass

Note 1: The quantity 10\*log 4 (four antennas) is added to the spectrum peak value according to document 662911 D01.

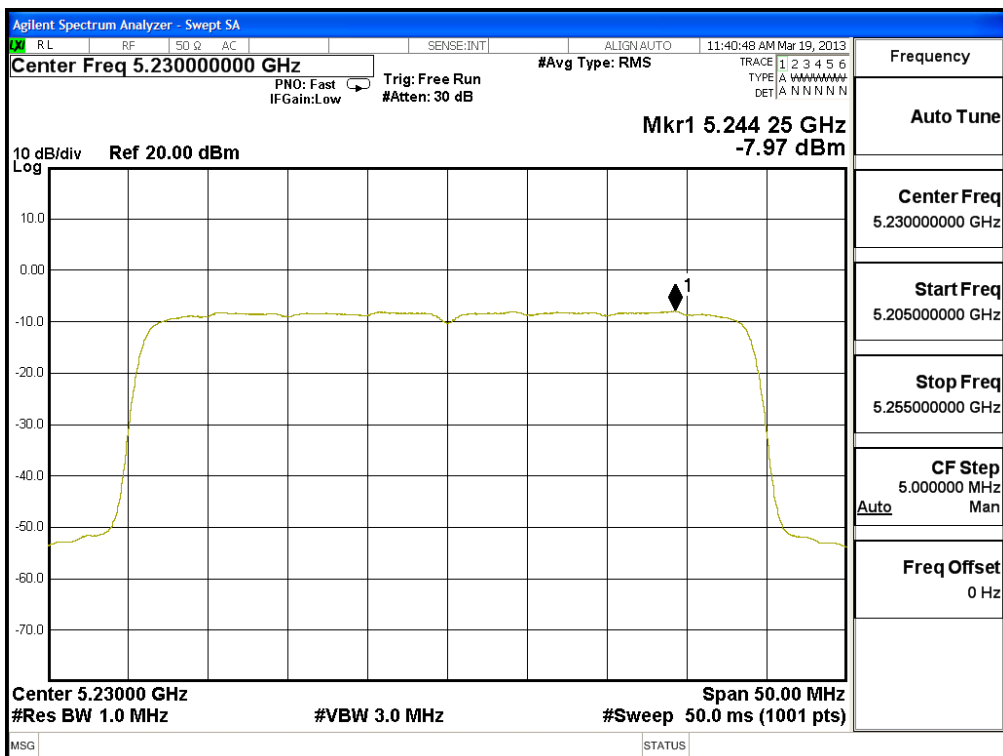
Channel 46 – Chain A



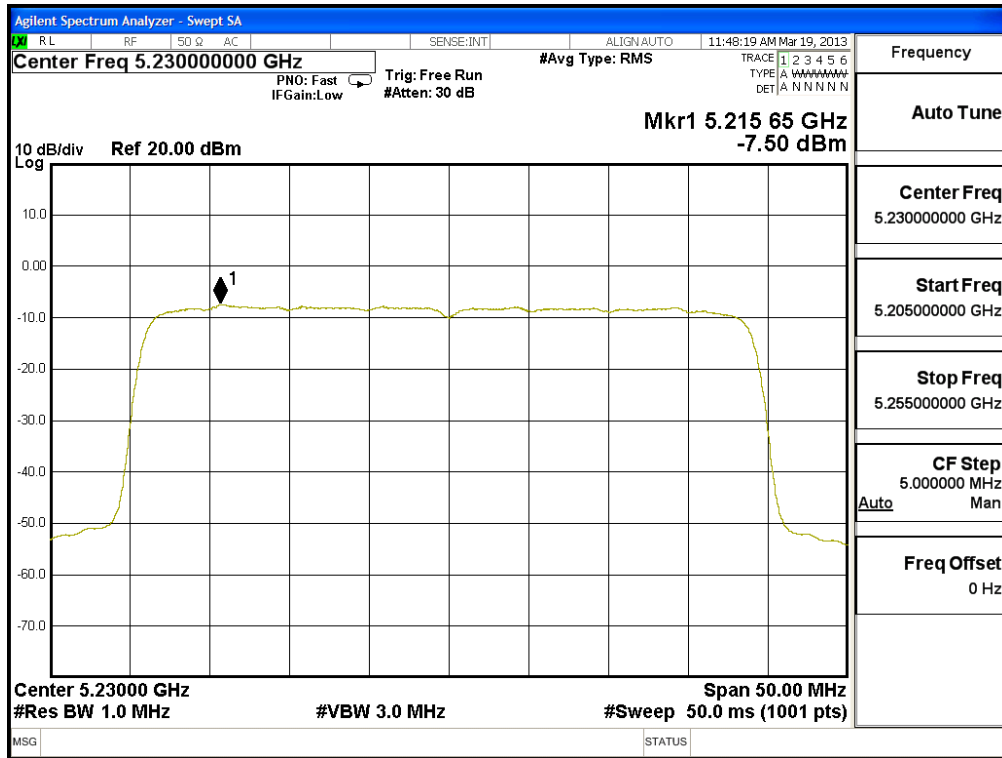
### Channel 46 – Chain B



### Channel 46 – Chain C



**Channel 46 – Chain D**

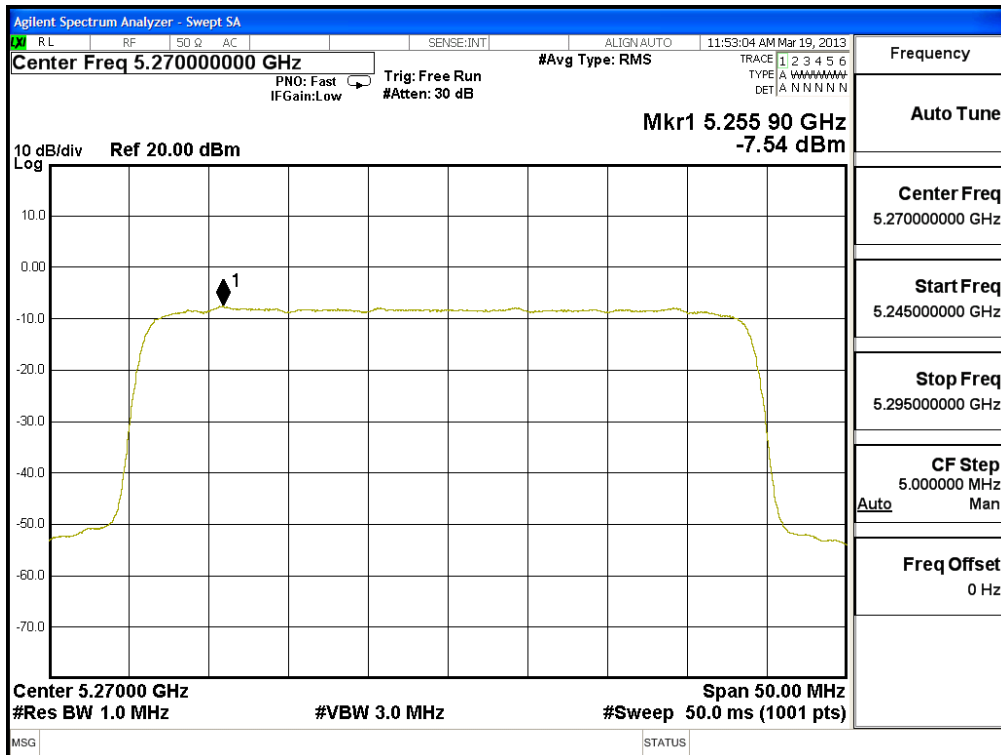


**5270MHz**

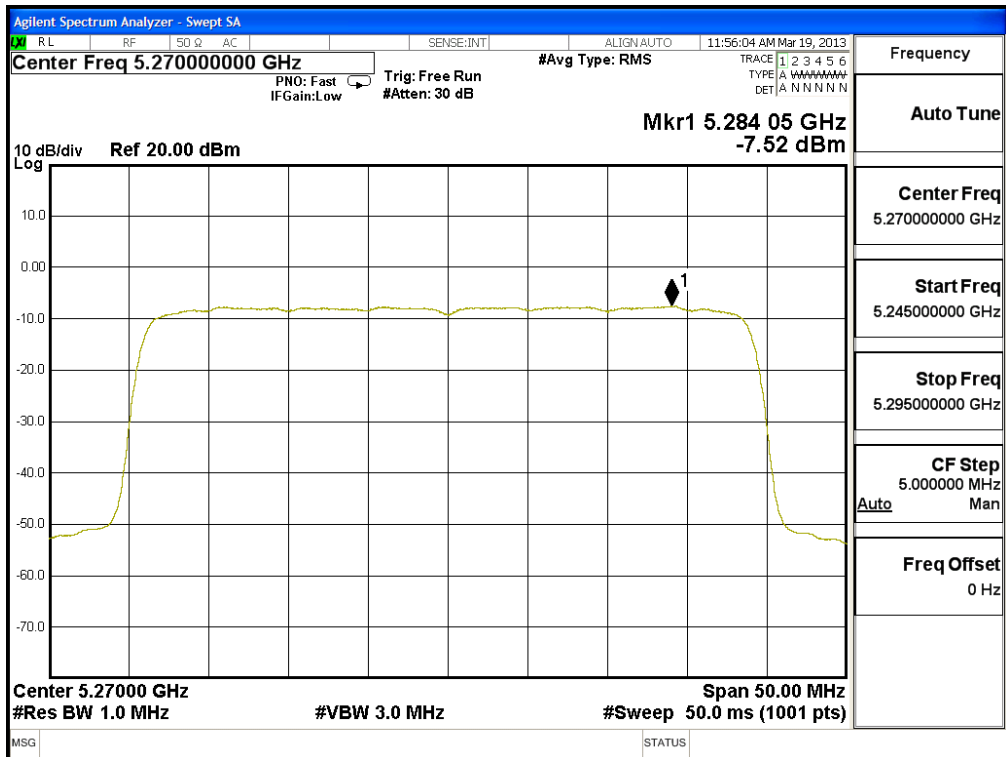
CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm) <sub>1</sub>	Limit	Result
A	-7.540	-1.540	< 11dBm	Pass
B	-7.520	-1.520	< 11dBm	Pass
C	-7.780	-1.780	< 11dBm	Pass
D	-7.410	-1.410	< 11dBm	Pass

Note 1: The quantity 10\*log 4 (four antennas) is added to the spectrum peak value according to document 662911 D01.

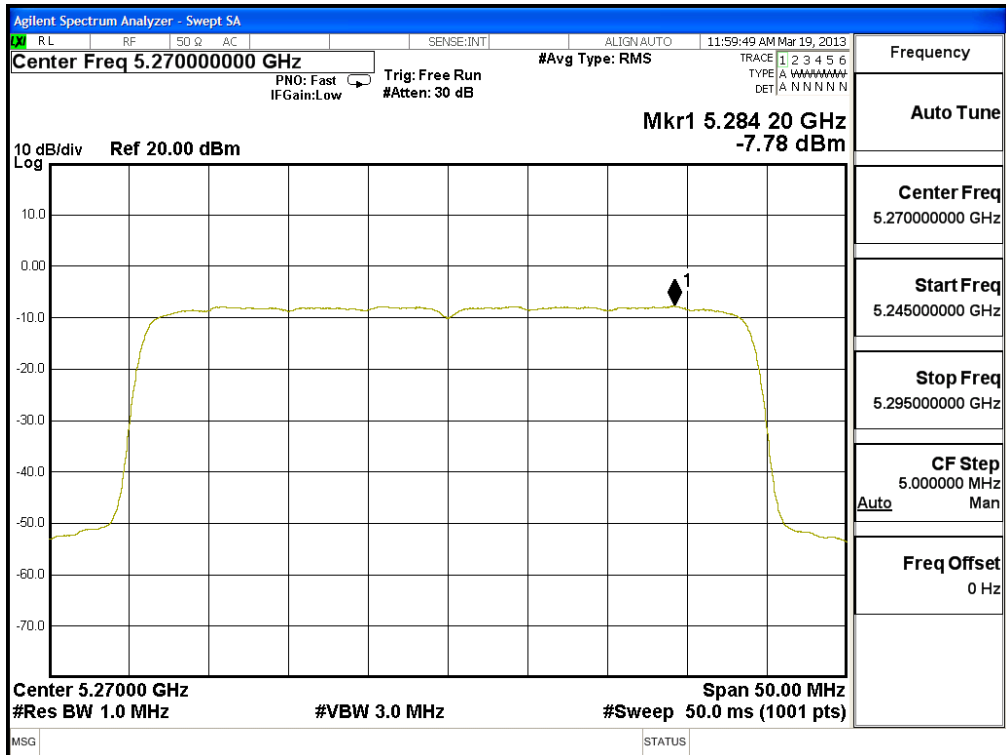
**Channel 54 – Chain A**



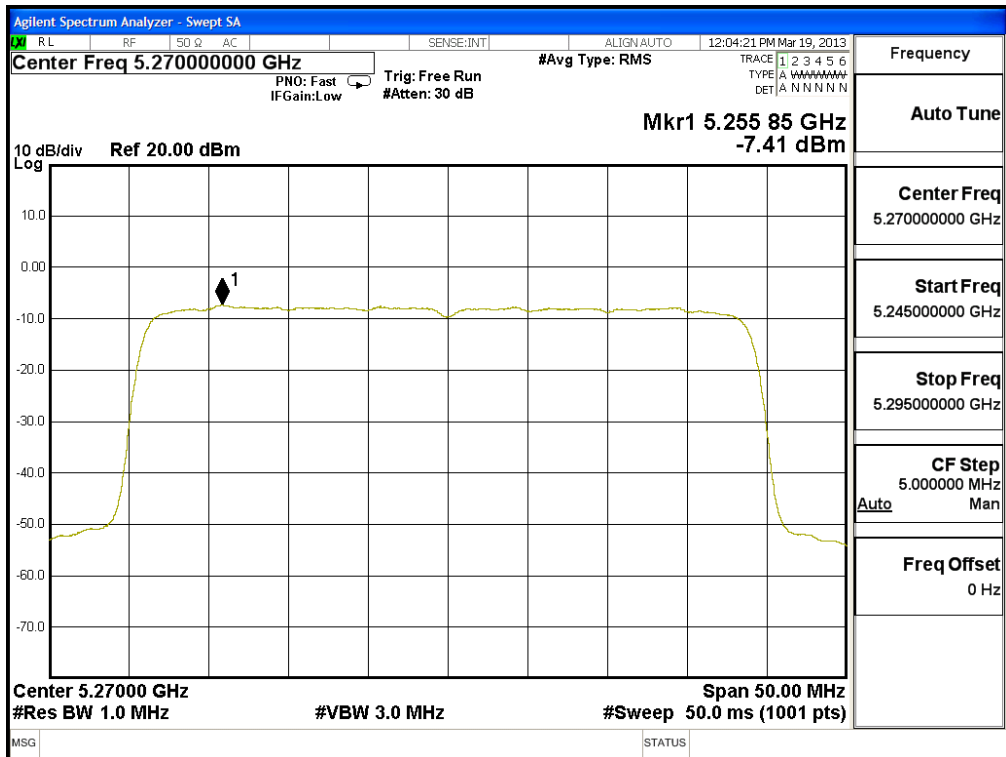
### Channel 54 – Chain B



### Channel 54 – Chain C



**Channel 54 – Chain D**

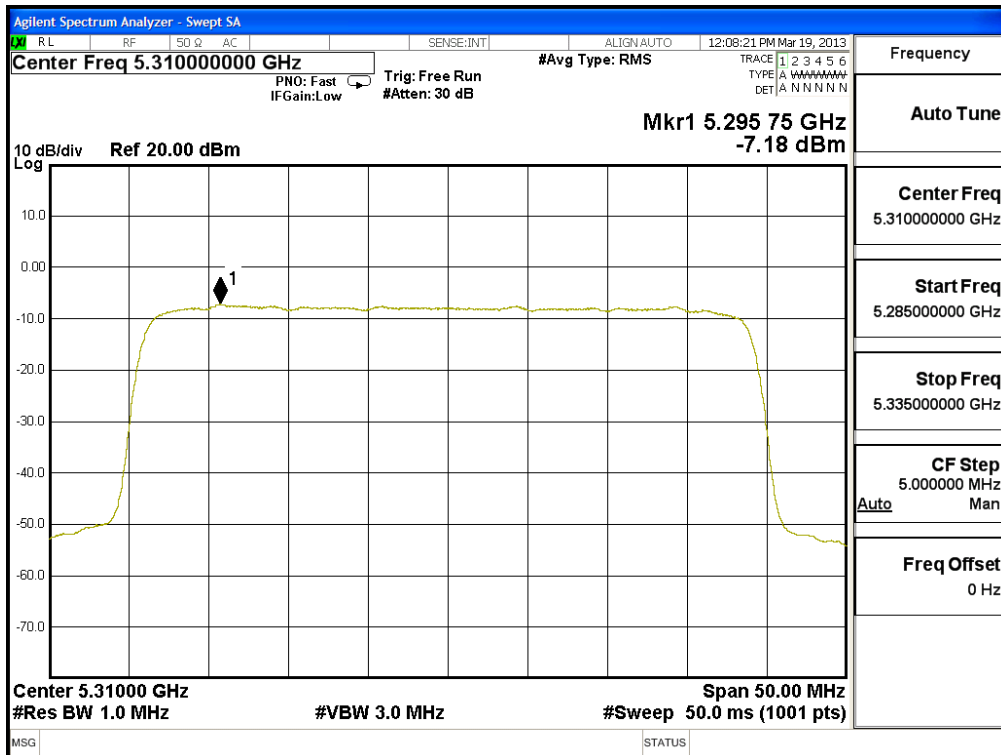


**5310MHz**

CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm) <sub>1</sub>	Limit	Result
A	-7.180	-1.180	< 11dBm	Pass
B	-7.550	-1.550	< 11dBm	Pass
C	-7.060	-1.060	< 11dBm	Pass
D	-7.370	-1.370	< 11dBm	Pass

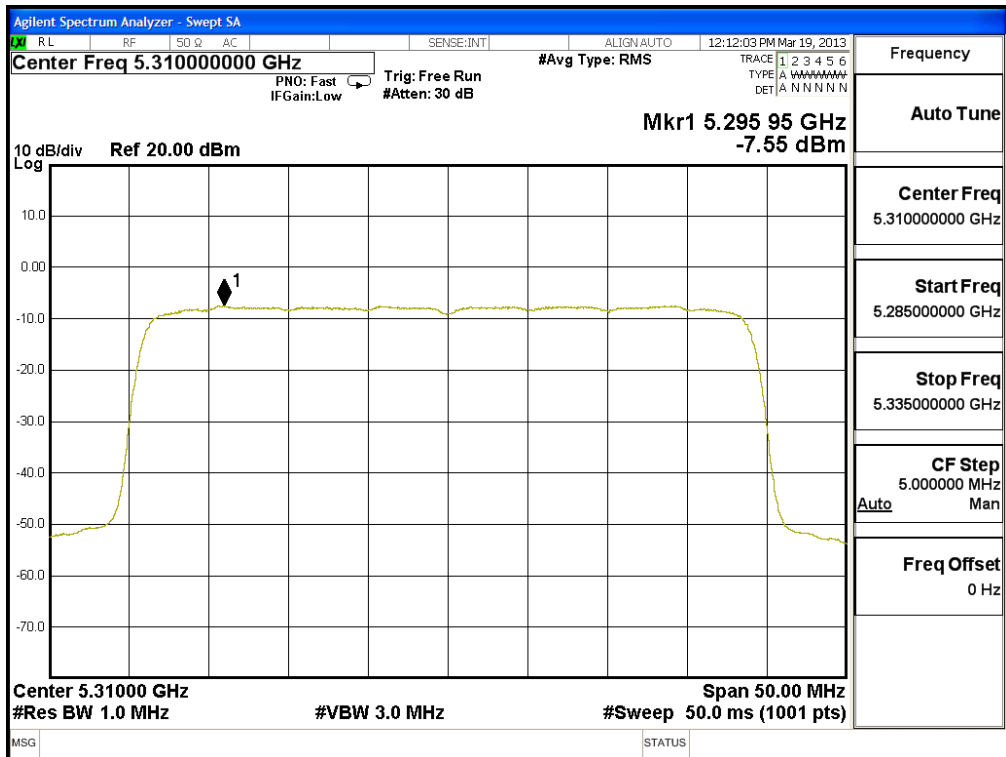
Note 1: The quantity 10\*log 4 (four antennas) is added to the spectrum peak value according to document 662911 D01.

**Channel 62 – Chain A**

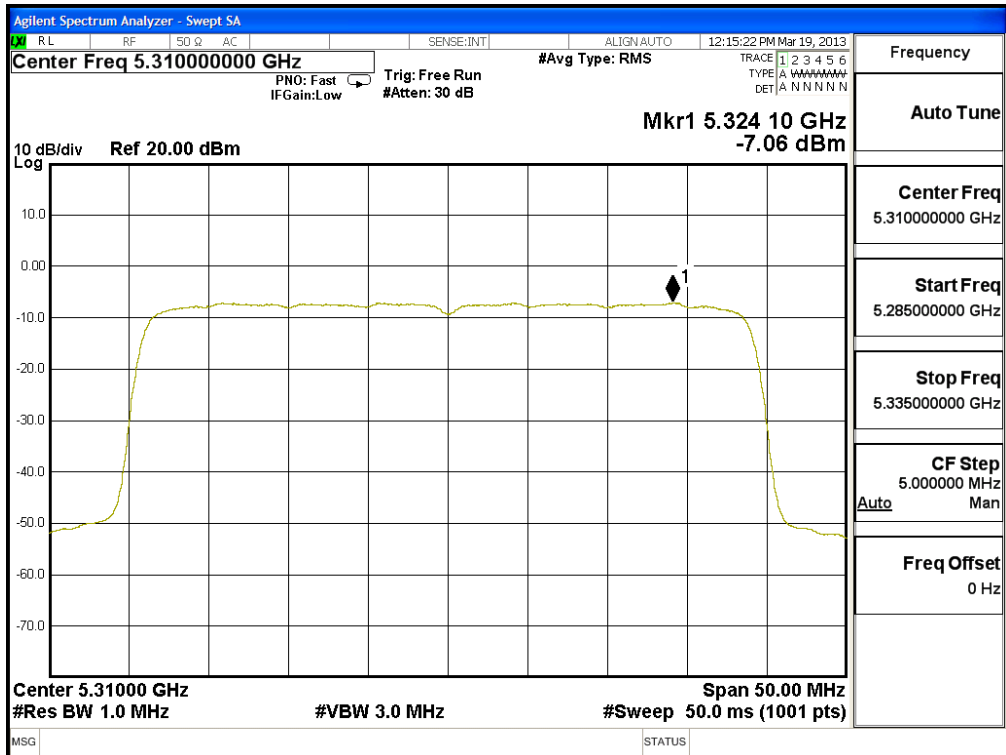




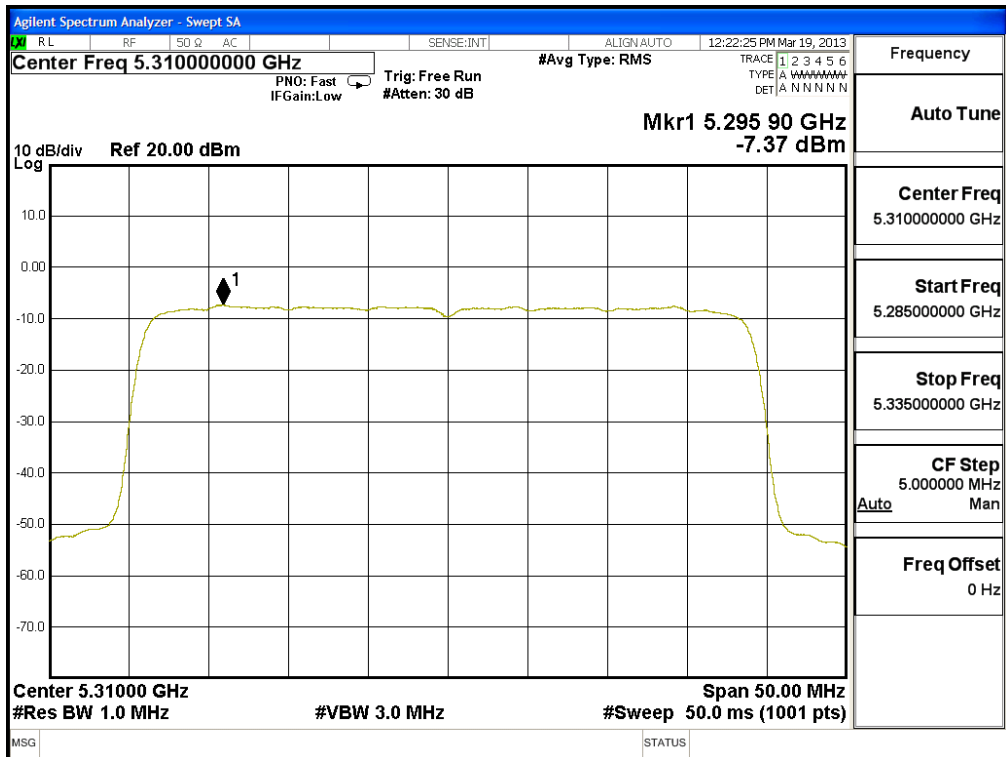
### Channel 62 – Chain B



### Channel 62 – Chain C



**Channel 62 – Chain D**

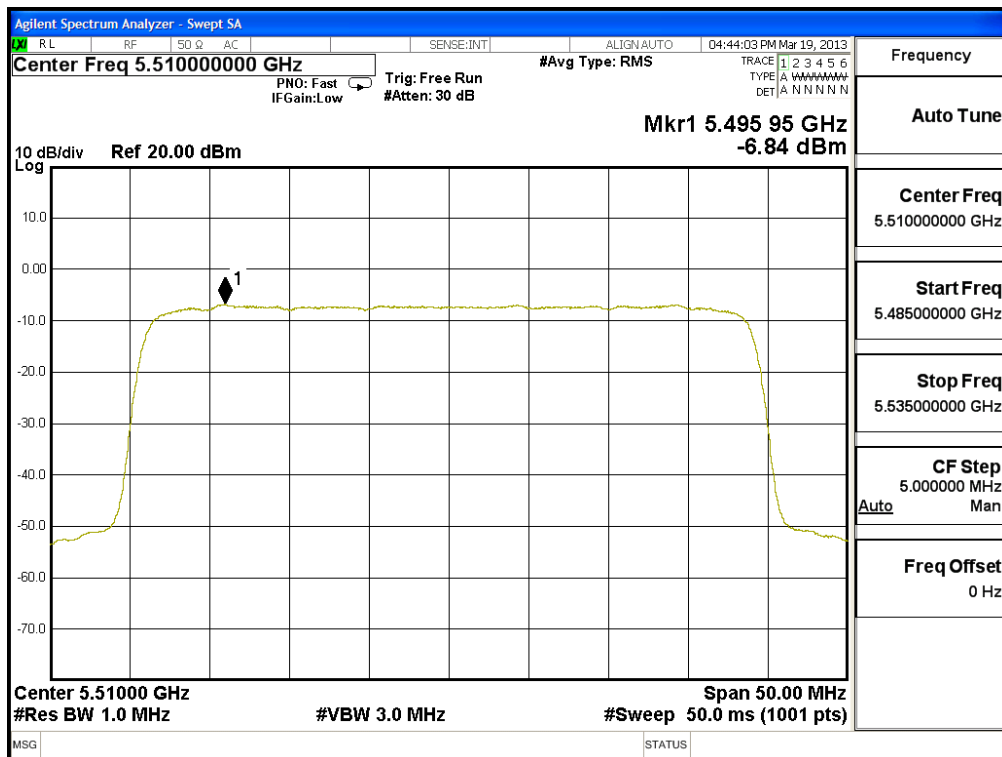


**5510MHz**

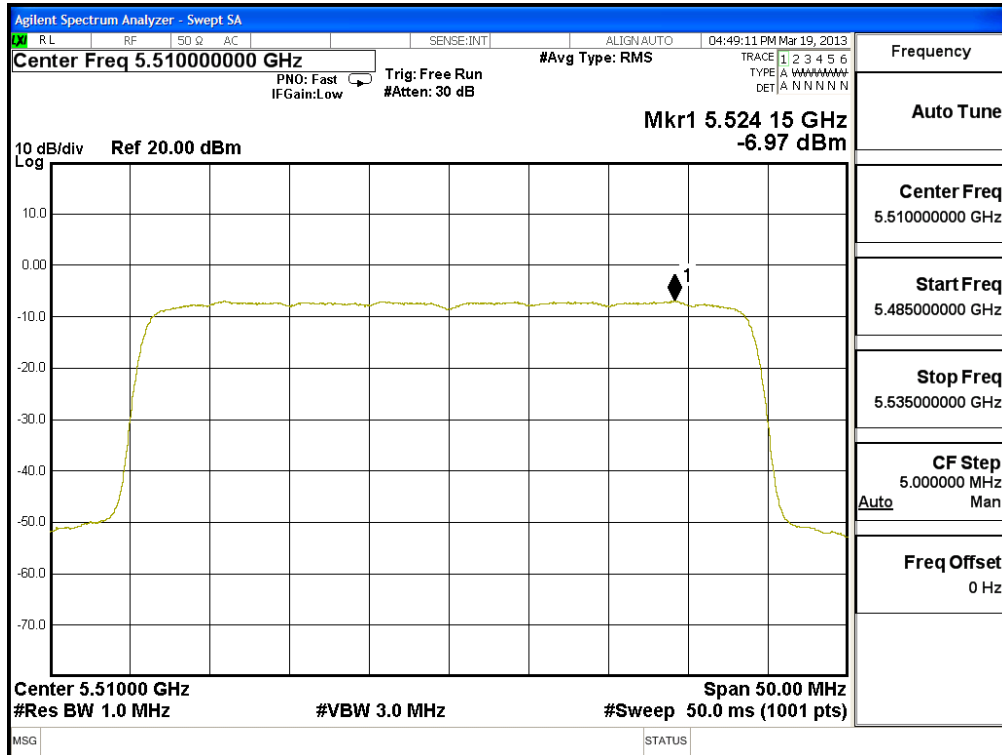
CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm) <sub>1</sub>	Limit	Result
A	-6.840	-0.840	< 11dBm	Pass
B	-6.970	-0.970	< 11dBm	Pass
C	-8.160	-2.160	< 11dBm	Pass
D	-7.440	-1.440	< 11dBm	Pass

Note 1: The quantity 10\*log 4 (four antennas) is added to the spectrum peak value according to document 662911 D01.

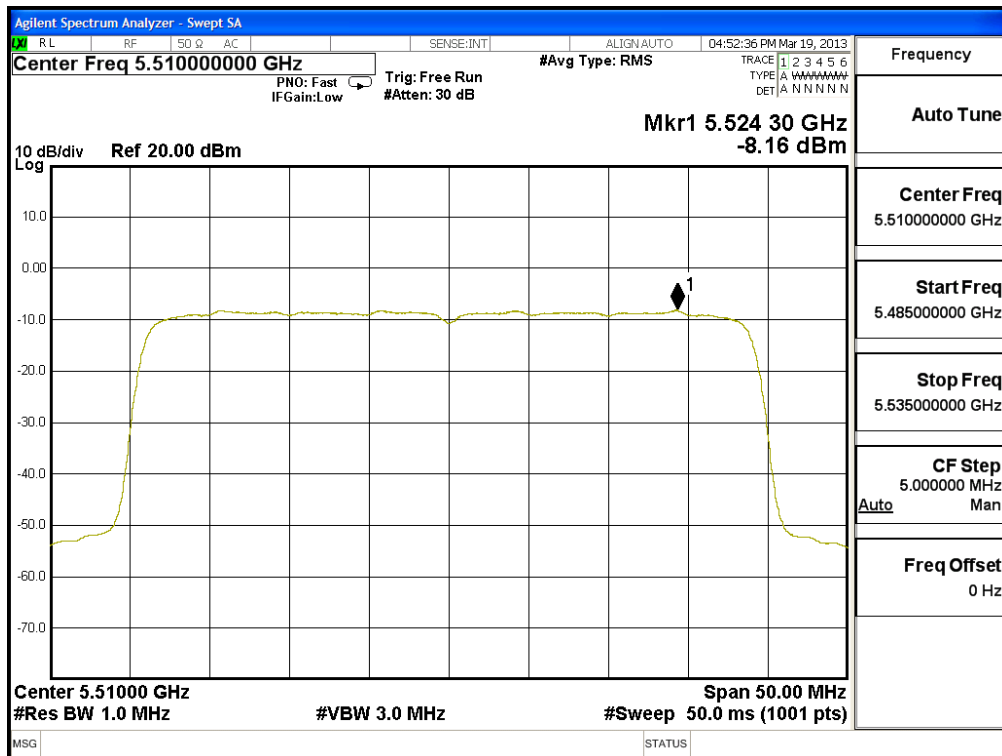
**Channel 102 – Chain A**



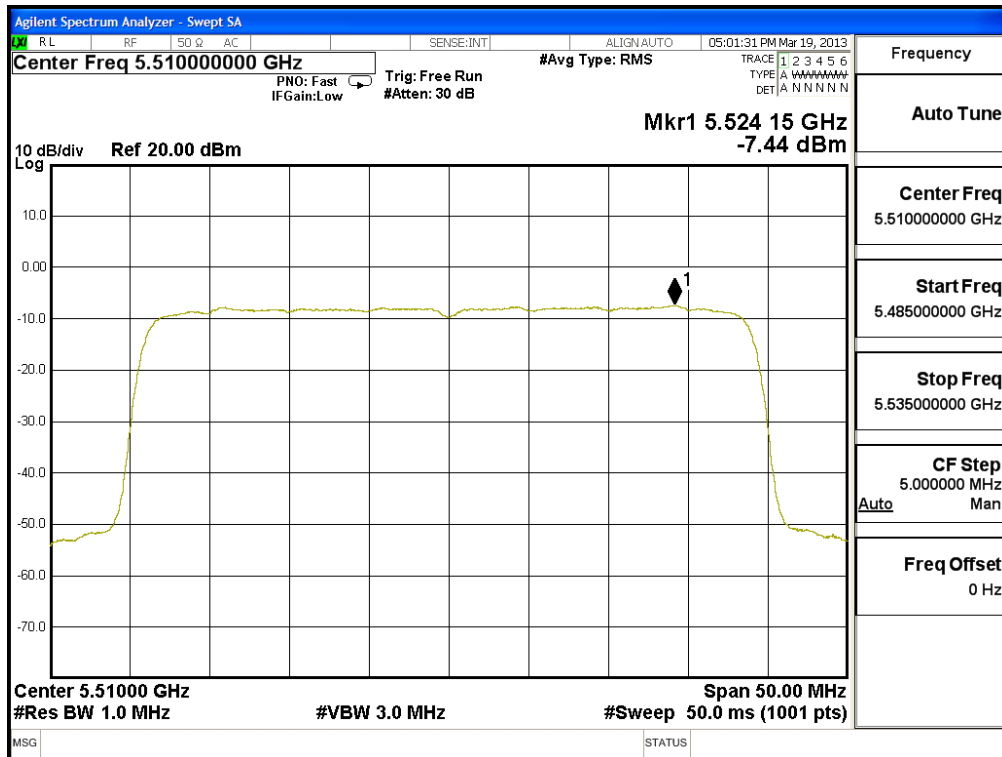
### Channel 102 – Chain B



### Channel 102 – Chain C



**Channel 102 – Chain D**

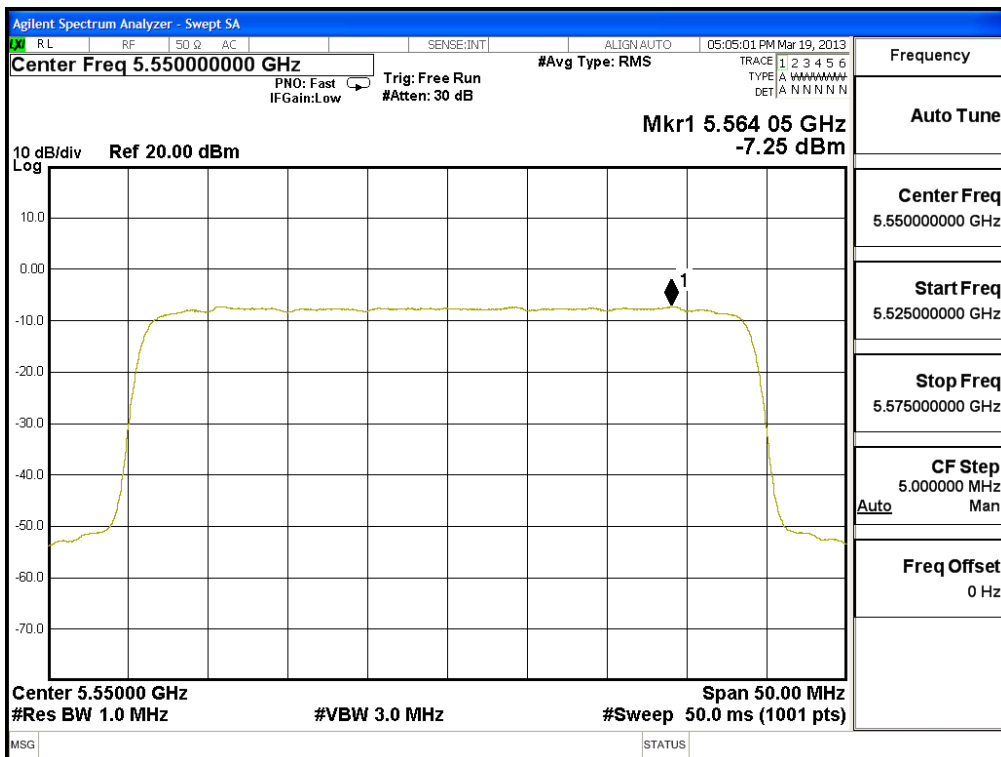


5550MHz

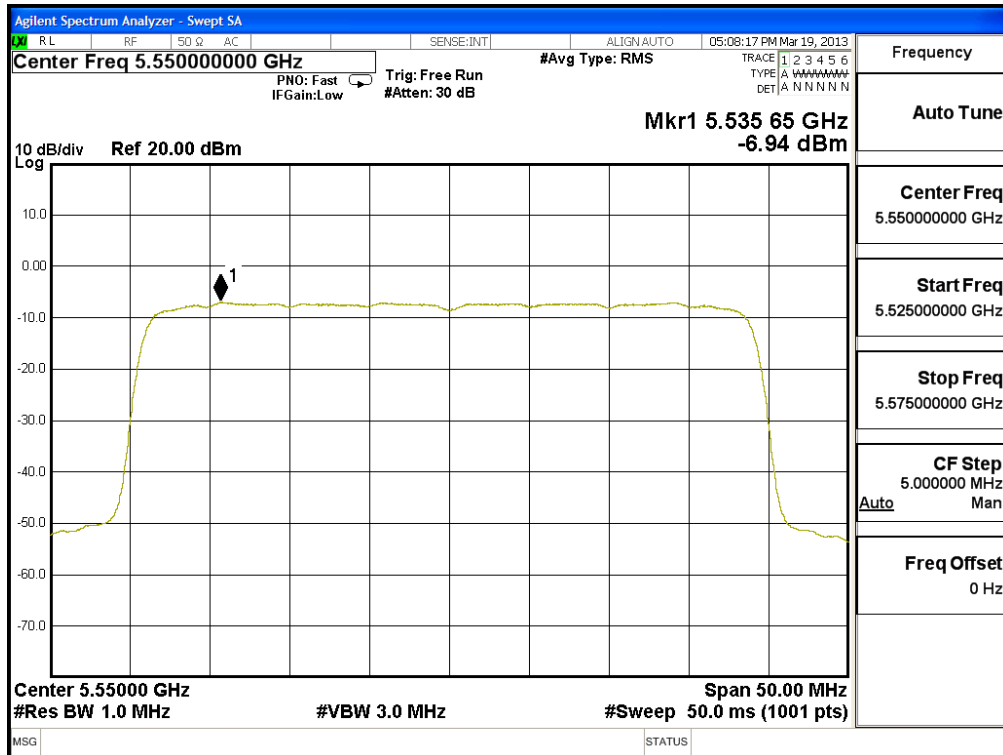
CHAIN	PPSD/MHz (dBm)	Total PSD/MHz (dBm) <sub>1</sub>	Limit	Result
A	-7.250	-1.250	< 11dBm	Pass
B	-6.940	-0.940	< 11dBm	Pass
C	-7.320	-1.320	< 11dBm	Pass
D	-7.060	-1.060	< 11dBm	Pass

Note 1: The quantity 10\*log 4 (four antennas) is added to the spectrum peak value according to document 662911 D01.

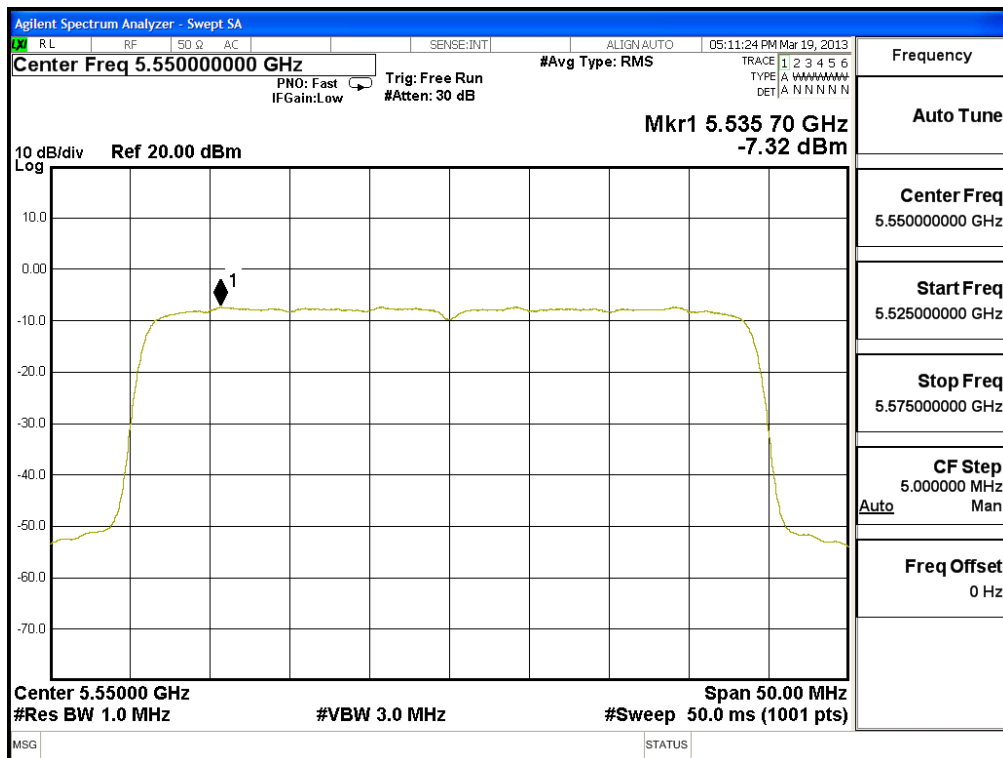
Channel 110 – Chain A



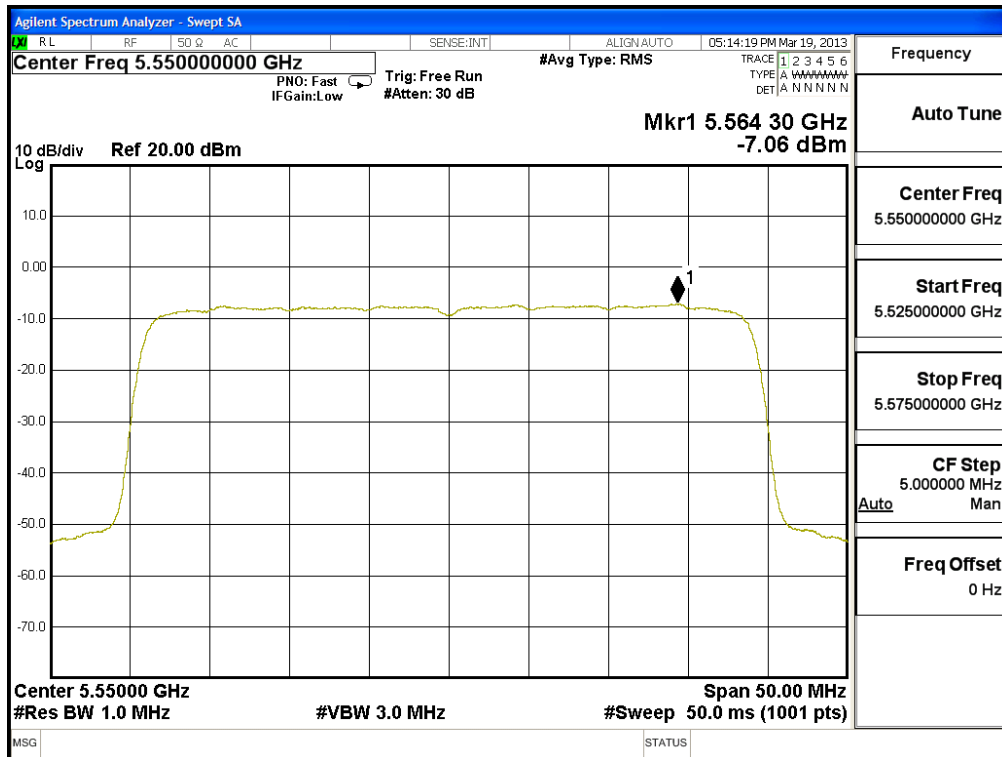
### Channel 110 – Chain B



### Channel 110 – Chain C



**Channel 110 – Chain D**



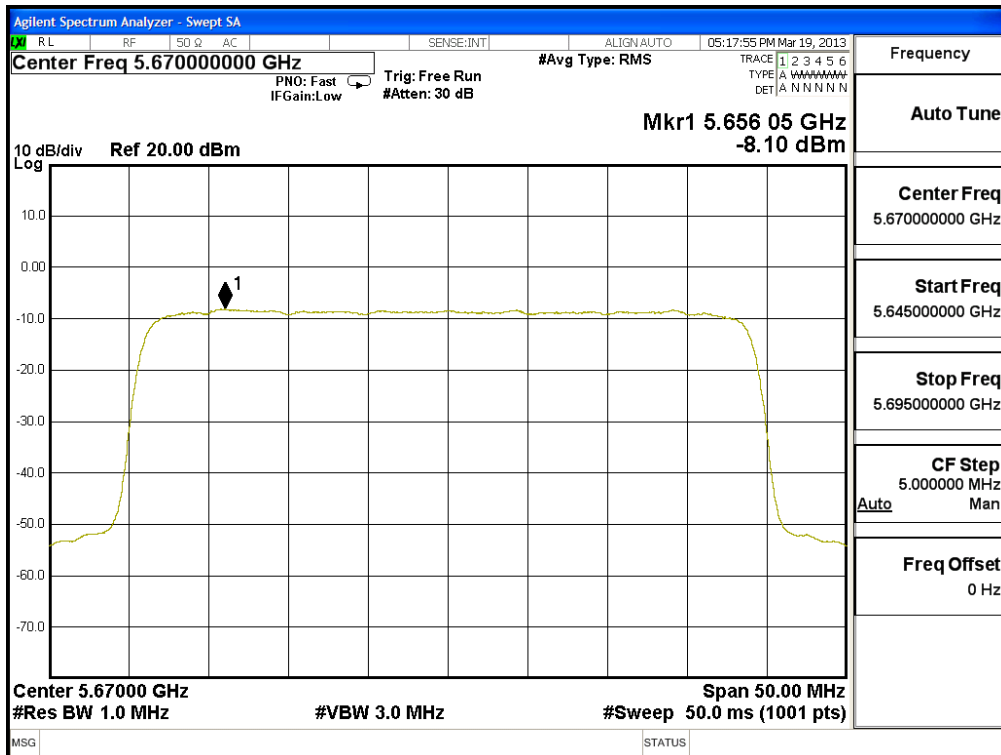


**5670MHz**

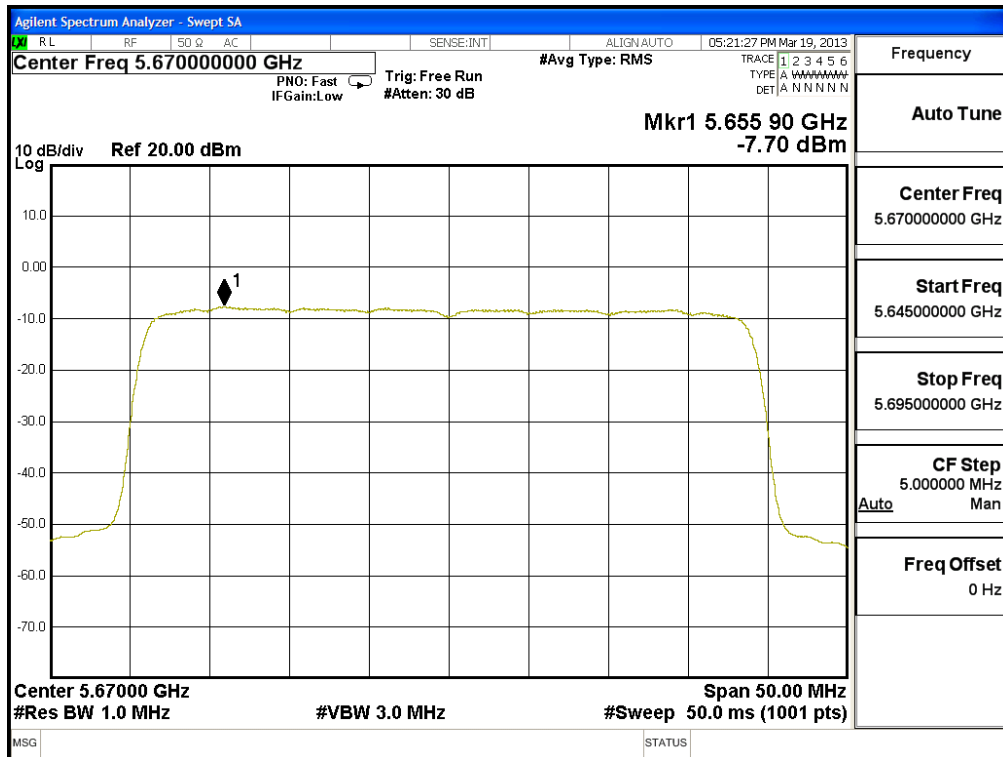
CHAIN	PPSD/MHz (dBm)	Total PPSD/MHz (dBm) <sub>1</sub>	Limit	Result
A	-8.100	-2.100	< 11dBm	Pass
B	-7.700	-1.700	< 11dBm	Pass
C	-8.820	-2.820	< 11dBm	Pass
D	-7.730	-1.730	< 11dBm	Pass

Note 1: The quantity 10\*log 4 (four antennas) is added to the spectrum peak value according to document 662911 D01.

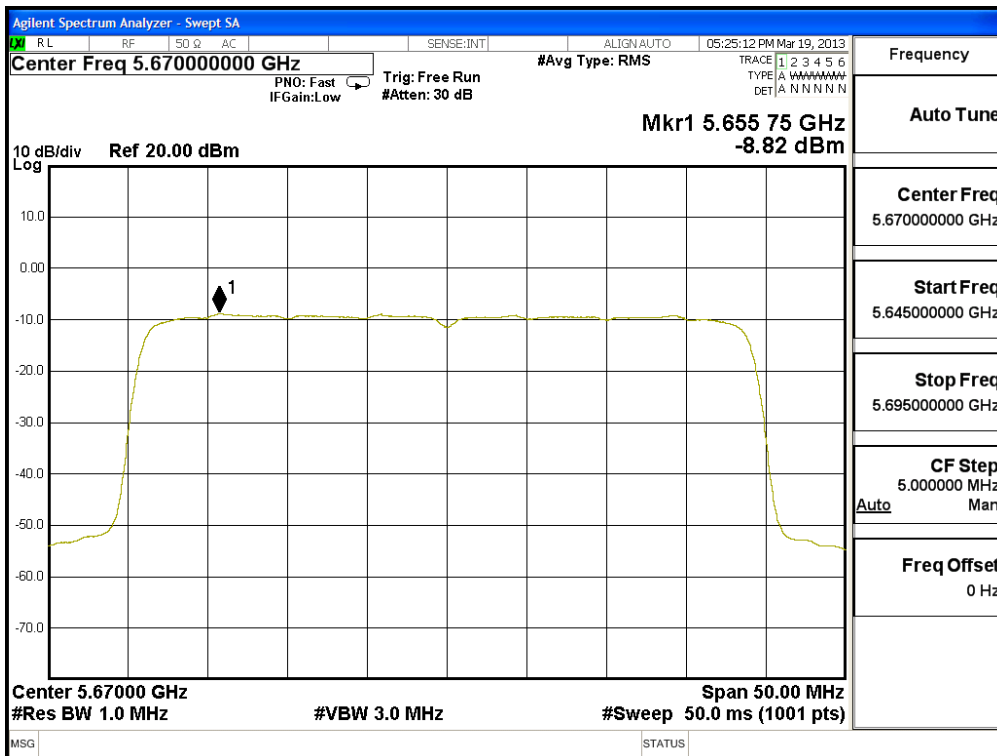
**Channel 134 – Chain A**



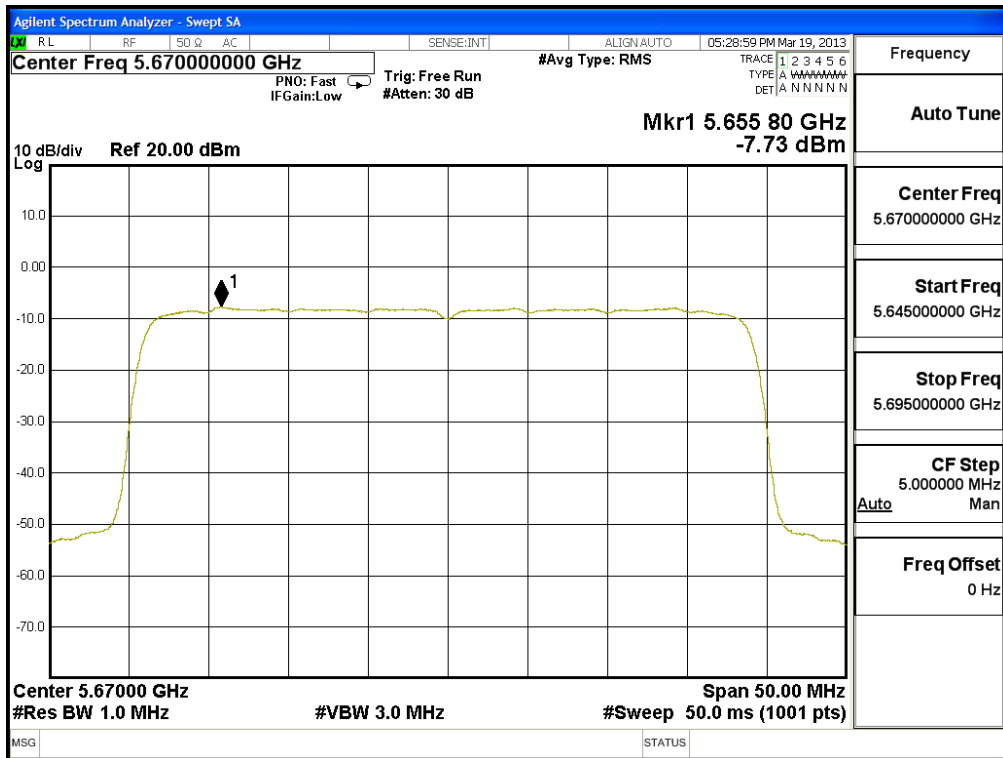
### Channel 134 – Chain B



### Channel 134 – Chain C



**Channel 134 – Chain D**



**5. Peak Excursion**

**5.1. Test Equipment**

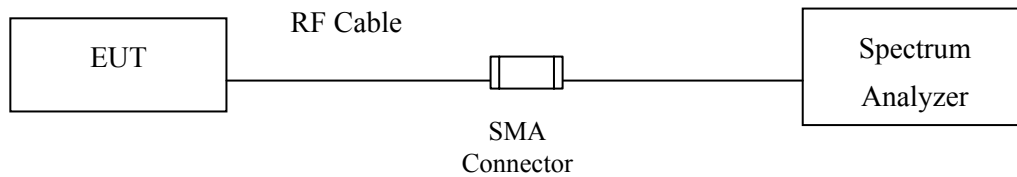
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2012
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2012
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2013

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.

**5.5. Uncertainty**

± 1.27 dB

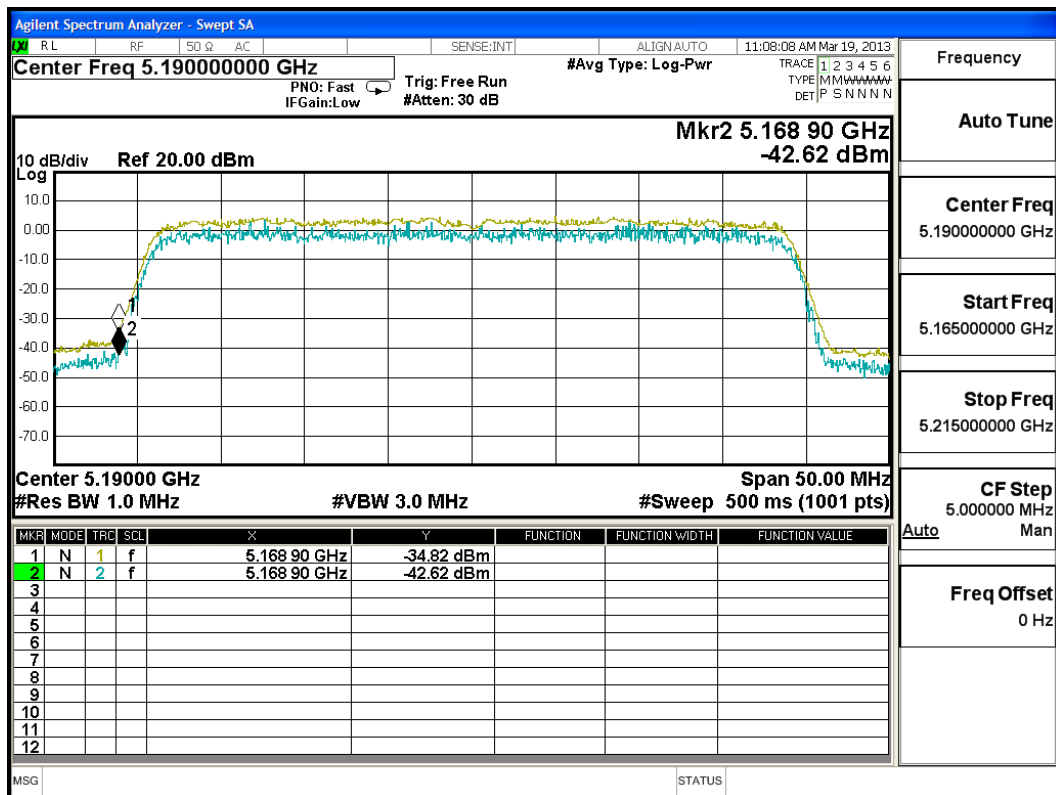
### 5.6. Test Result of Peak Excursion

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Peak Excursion  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter

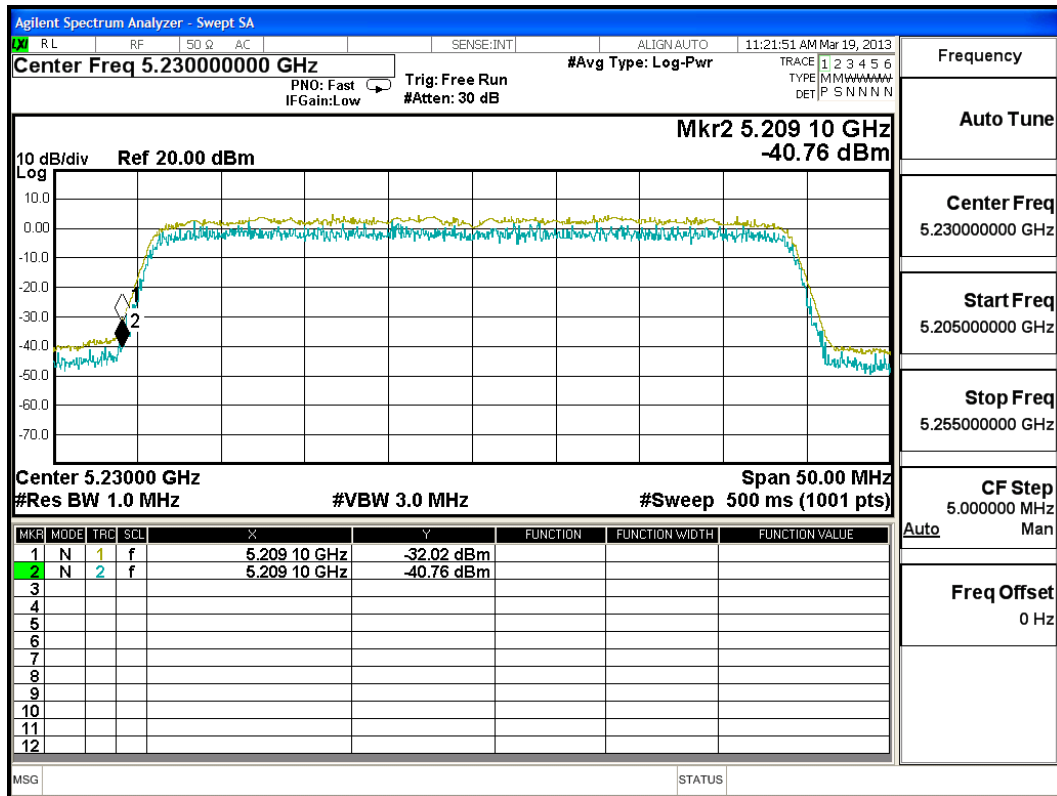
#### Chain A

Channel No.	Frequency (MHz)	Measurement Level (dB)	Required Limit (dB)	Result
38	5190	7.800	<13	Pass
46	5230	8.740	<13	Pass
54	5270	7.550	<13	Pass
62	5310	5.300	<13	Pass
102	5510	9.460	<13	Pass
110	5550	8.930	<13	Pass
134	5670	9.370	<13	Pass

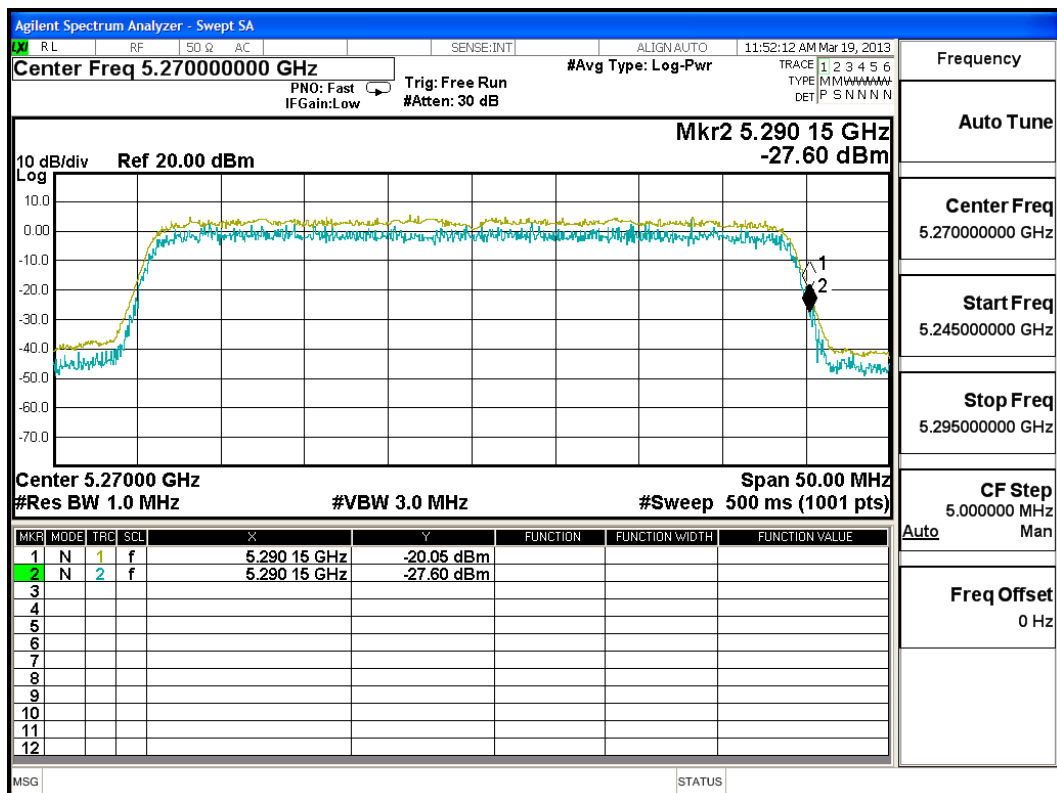
#### Channel 38:



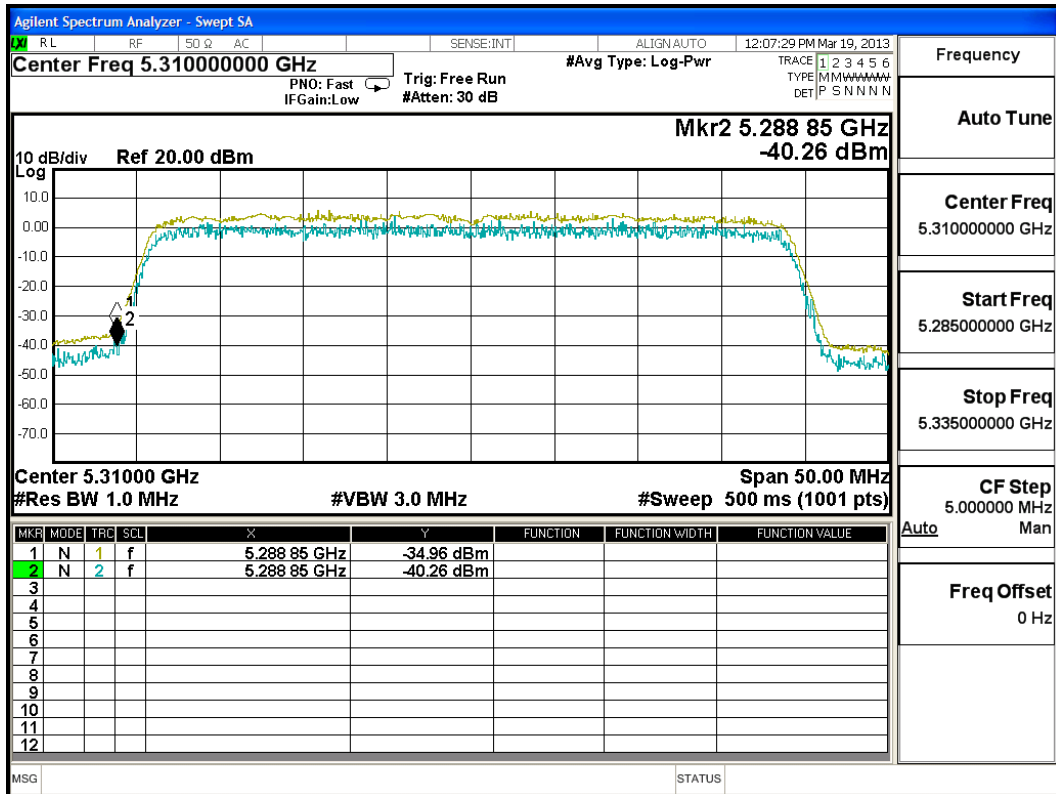
**Channel 46:**



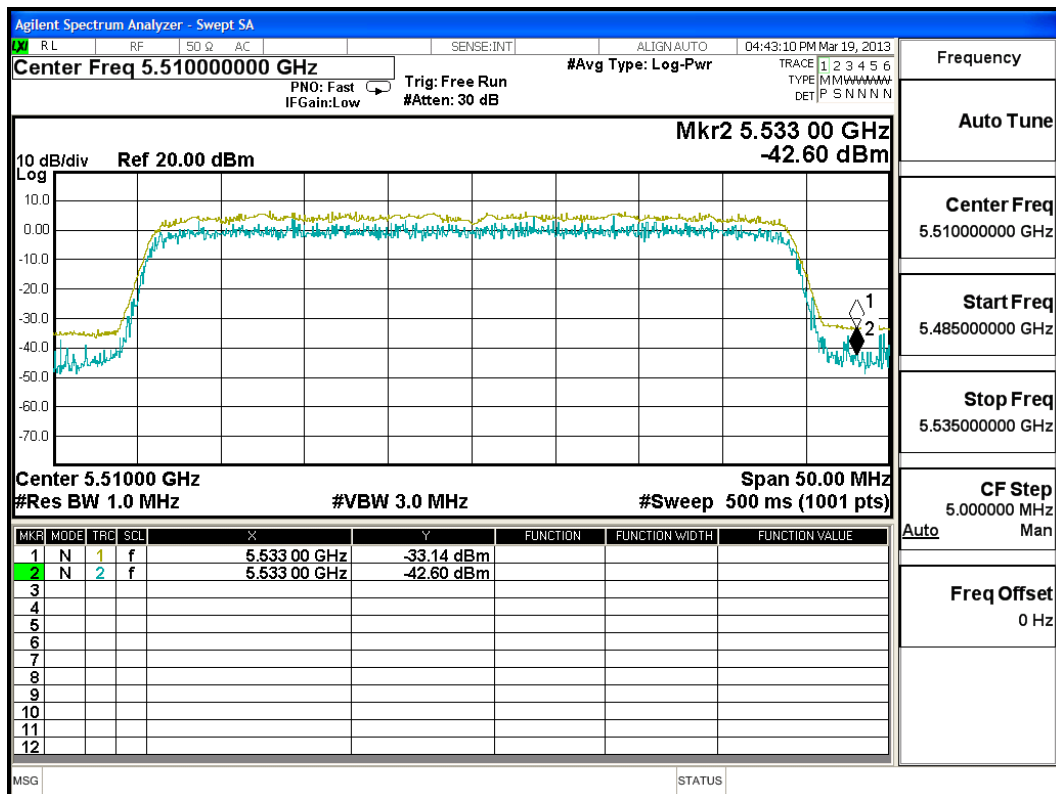
**Channel 54:**



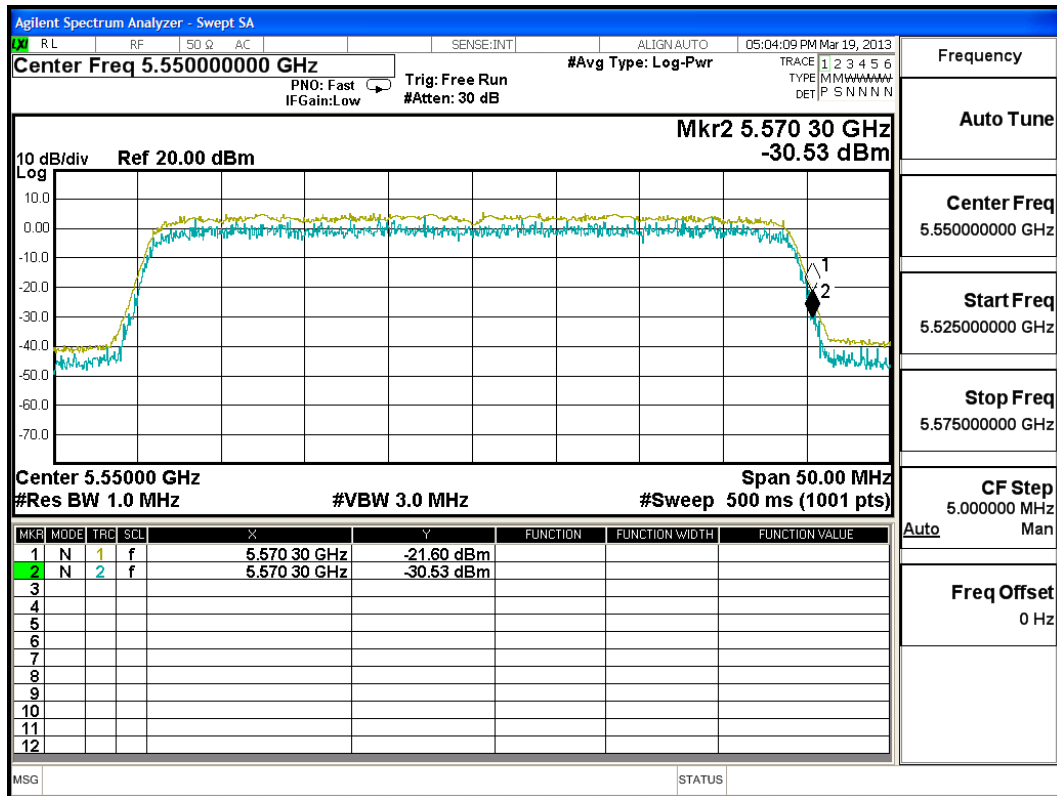
**Channel 62:**



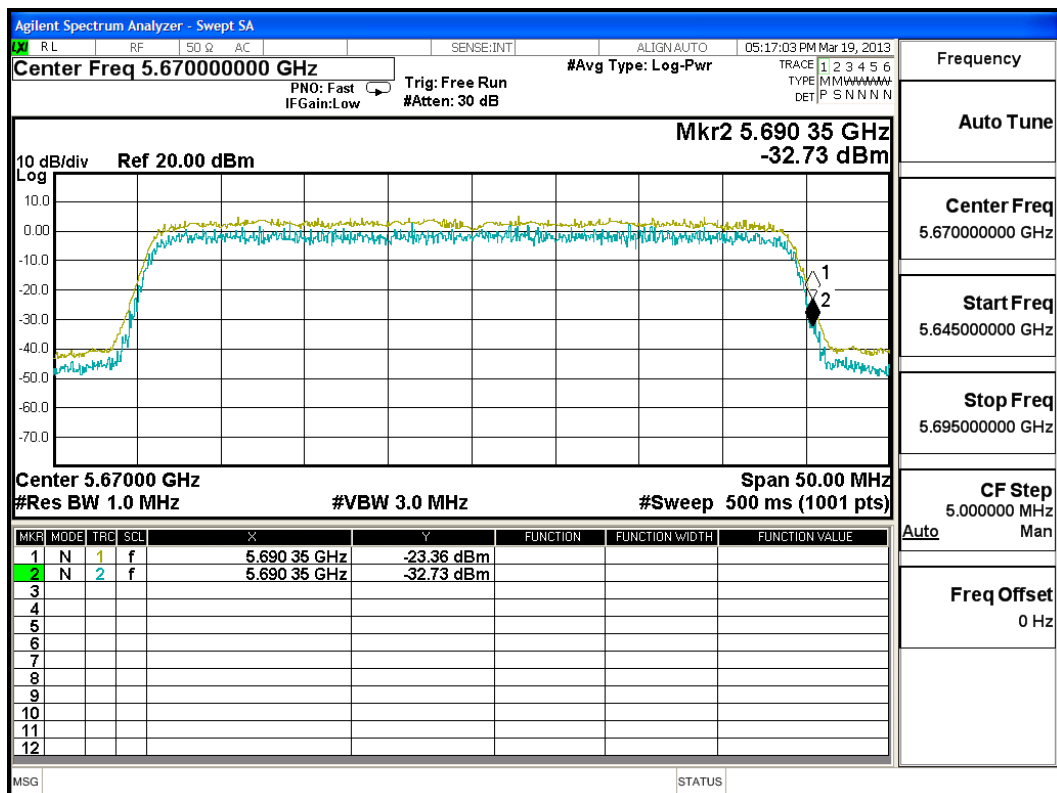
**Channel 102:**



**Channel 110:**



**Channel 134:**

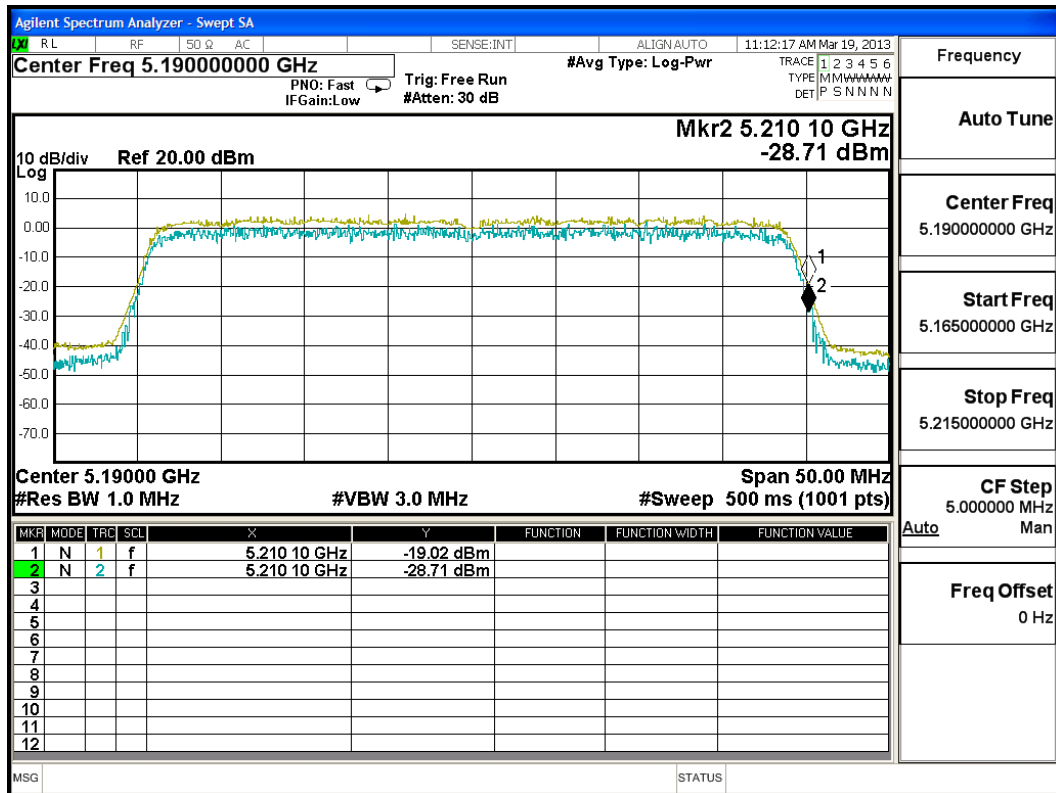




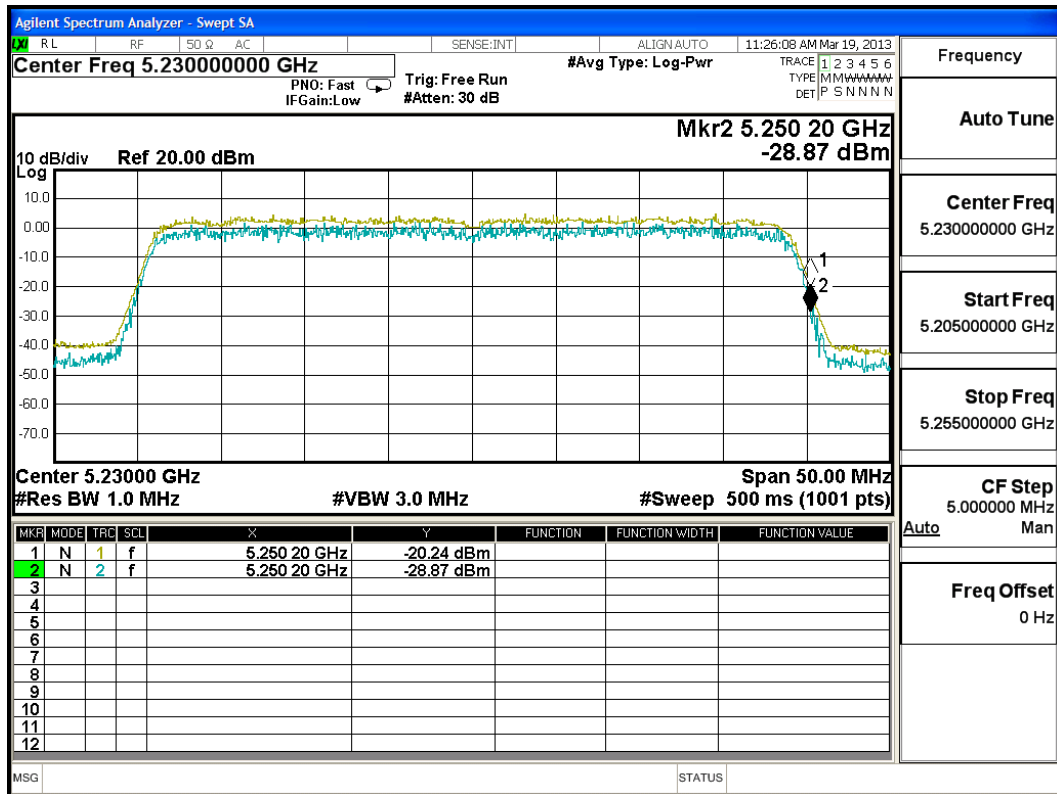
**Chain B**

Channel No.	Frequency (MHz)	Measurement Level (dB)	Required Limit (dB)	Result
38	5190	9.690	<13	Pass
46	5230	8.620	<13	Pass
54	5270	5.810	<13	Pass
62	5310	1.160	<13	Pass
102	5510	6.420	<13	Pass
110	5550	6.900	<13	Pass
134	5670	6.540	<13	Pass

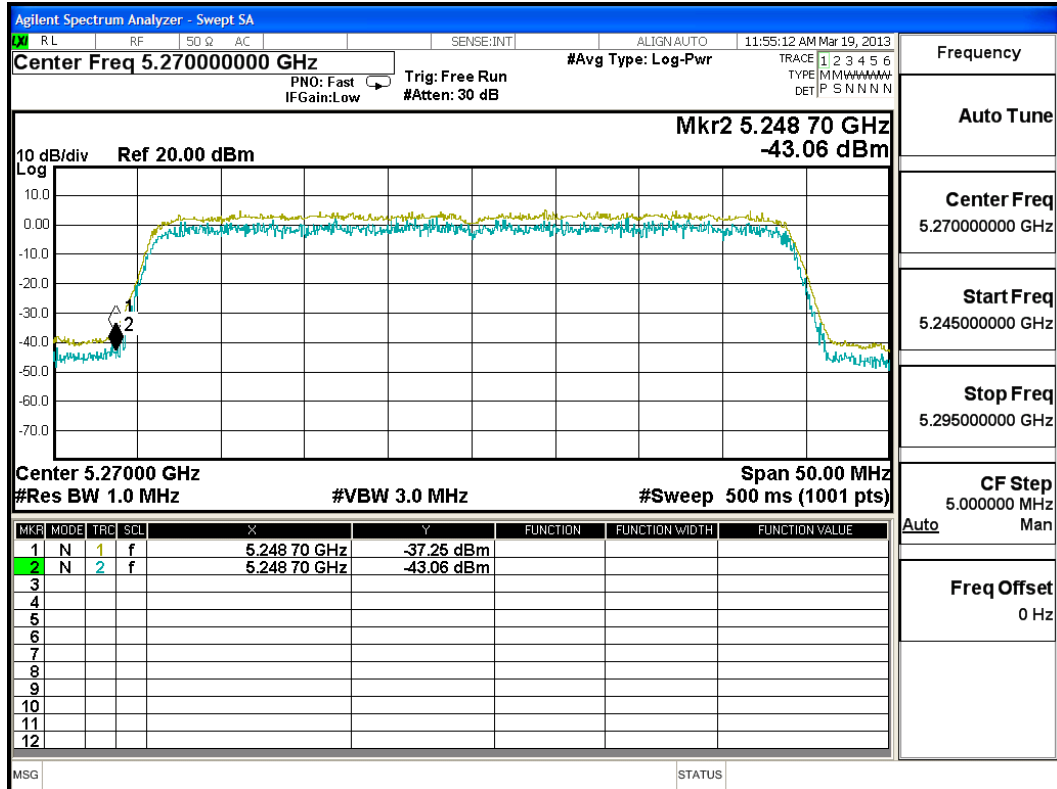
**Channel 38:**



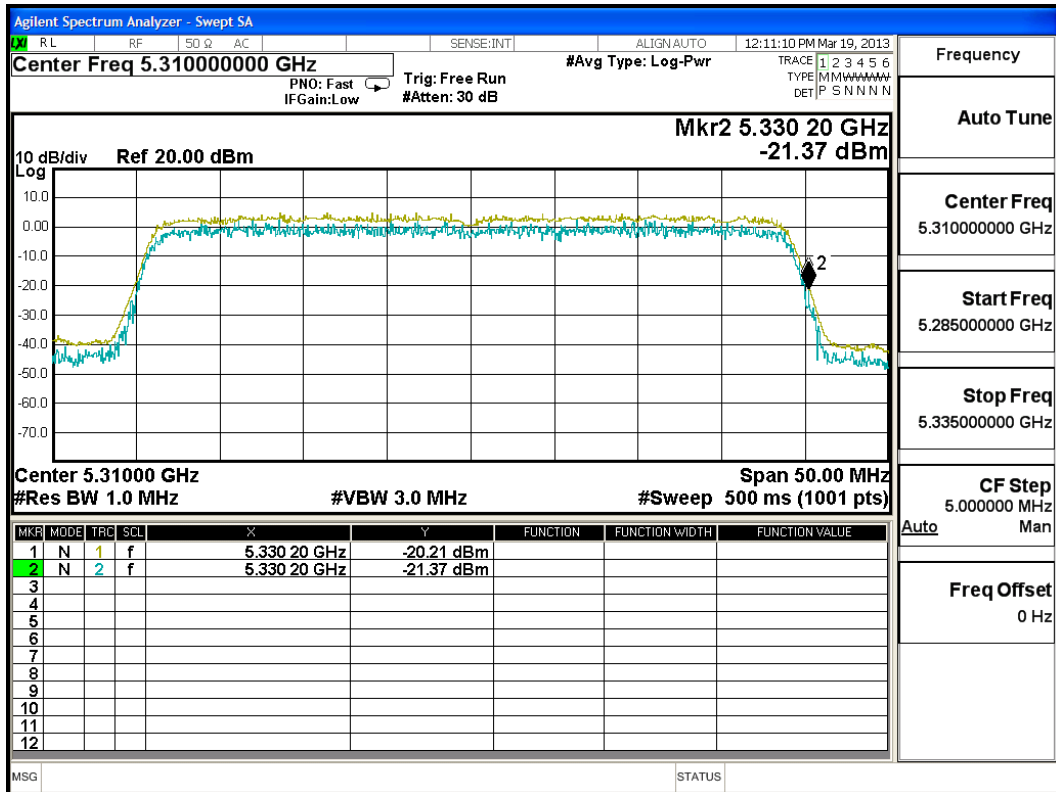
**Channel 46:**



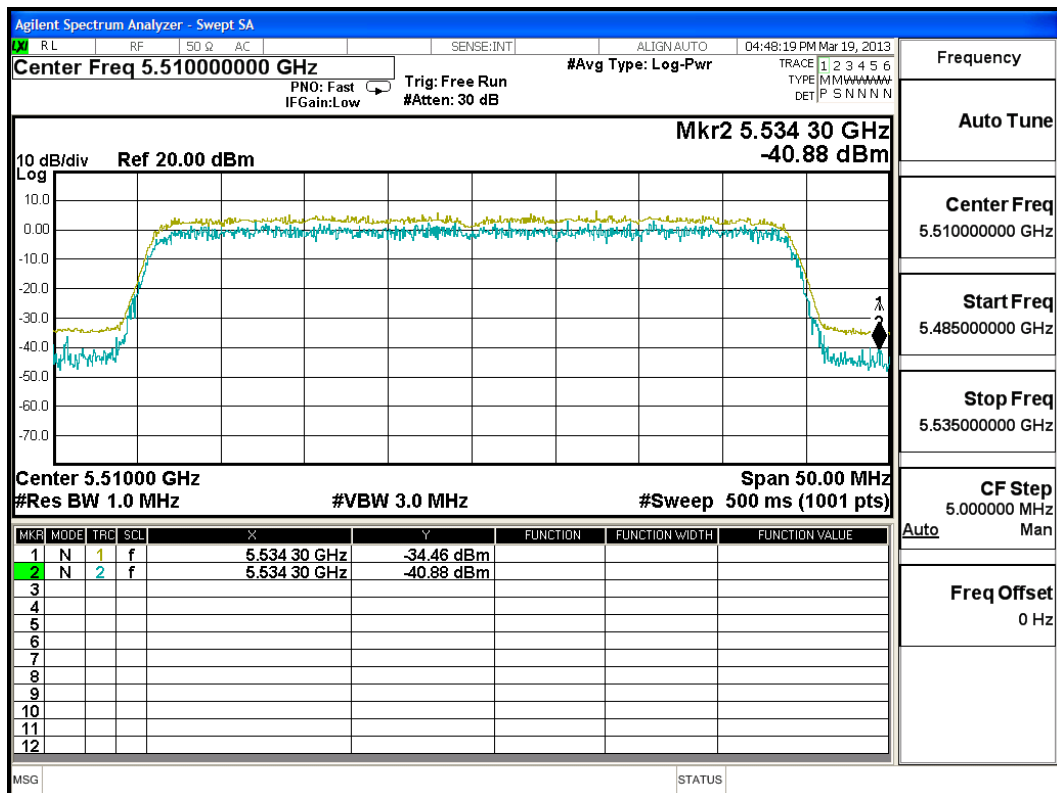
**Channel 54:**



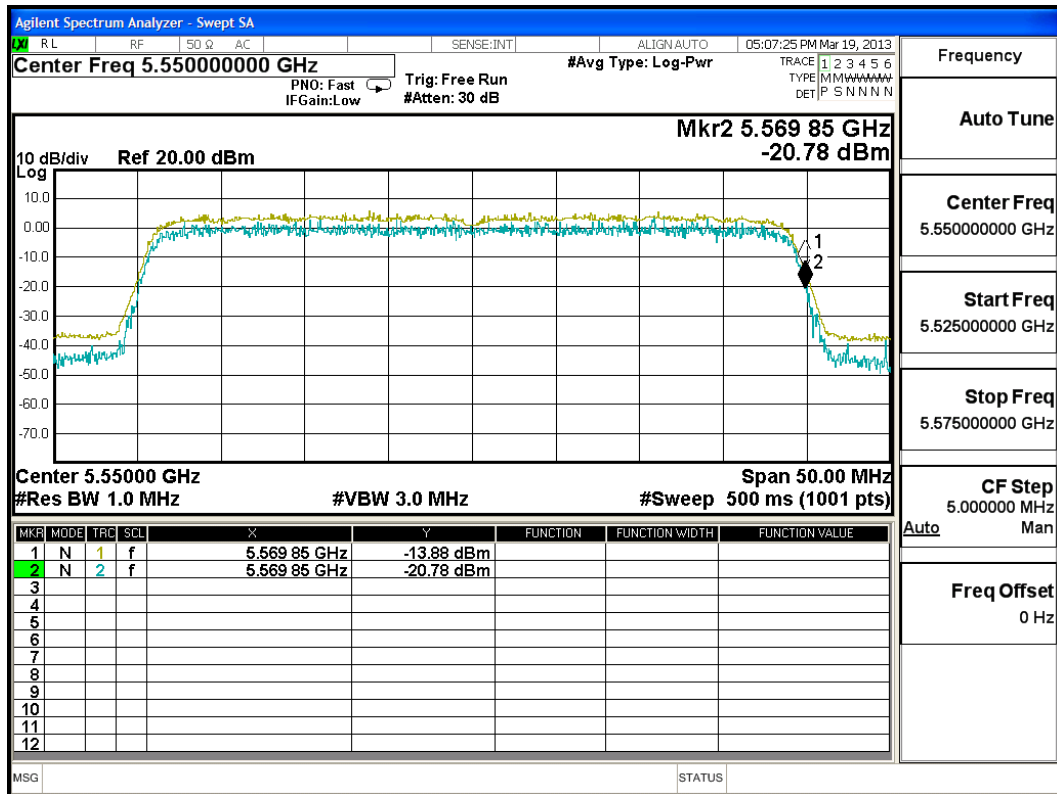
**Channel 62:**



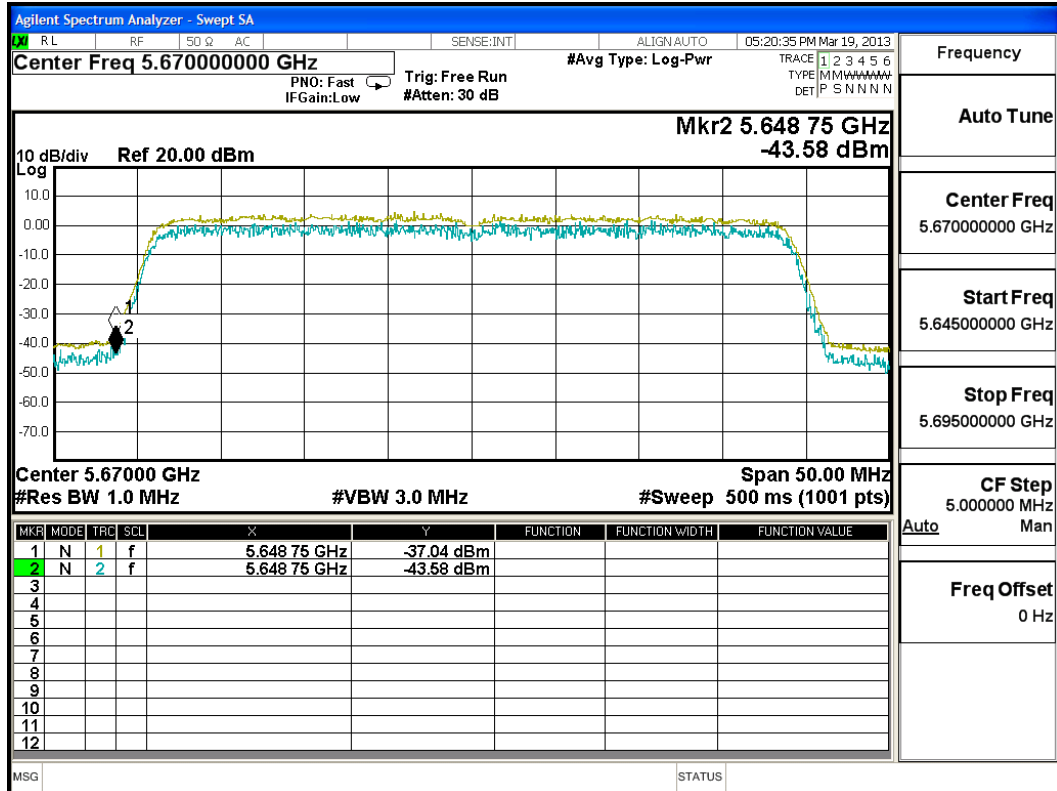
**Channel 102:**



**Channel 118:**



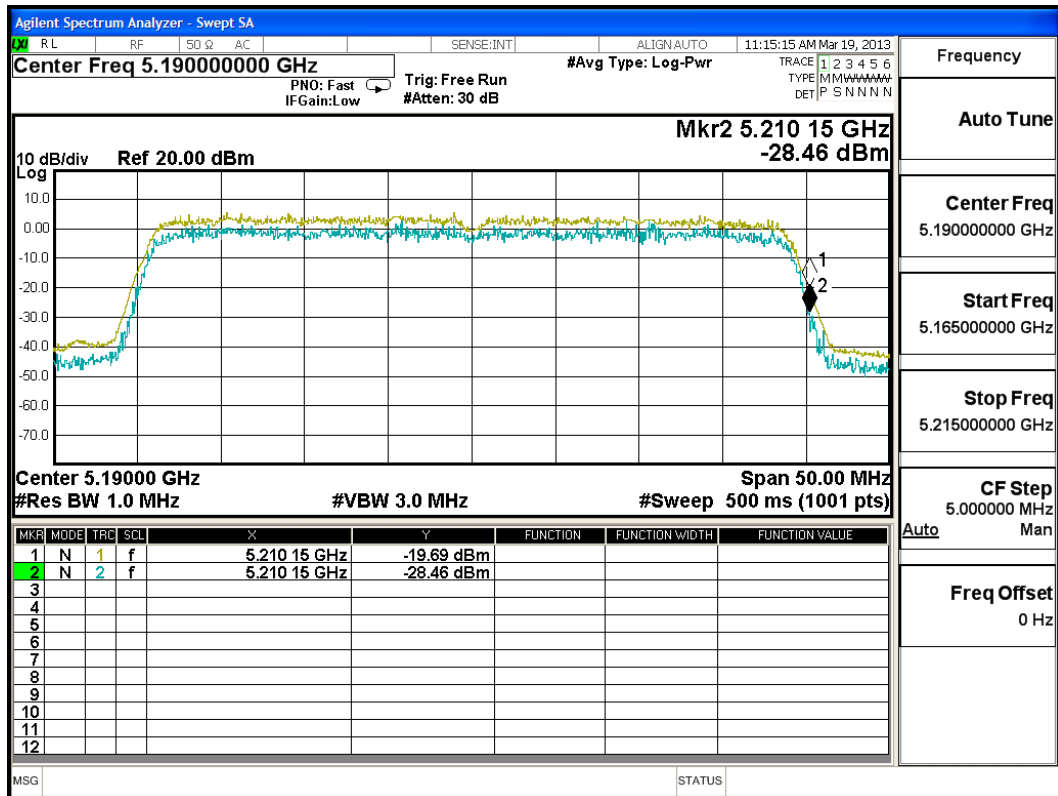
**Channel 134:**



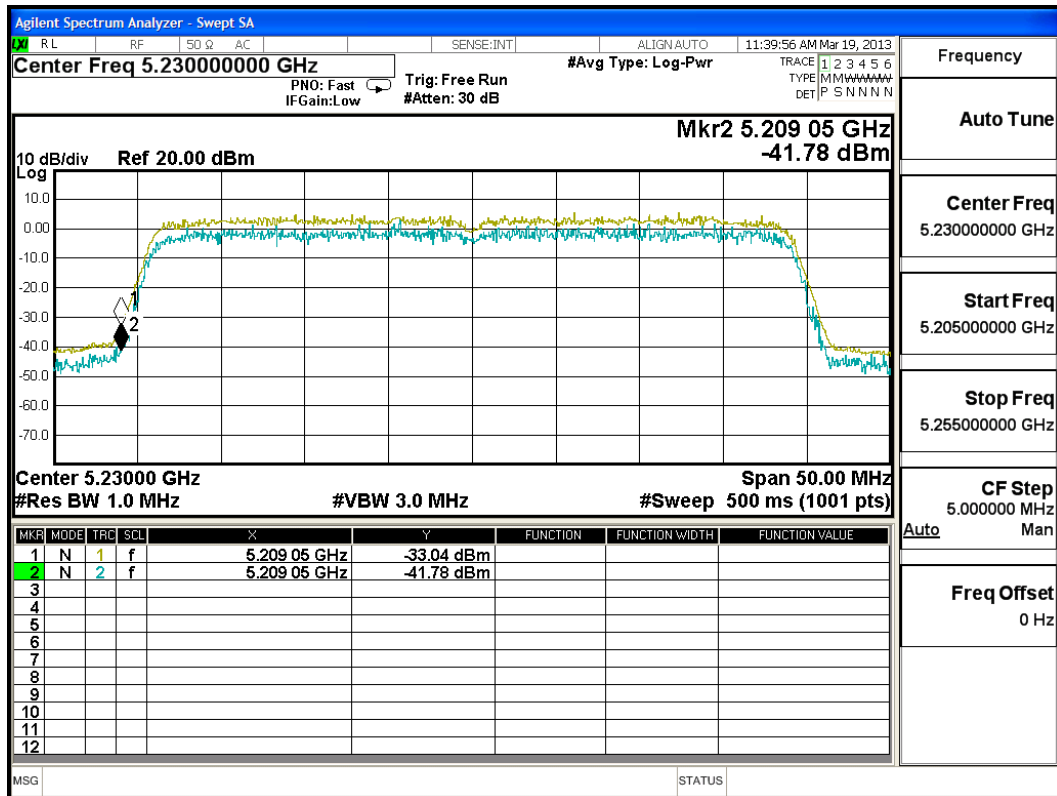
**Chain C**

Channel No.	Frequency (MHz)	Measurement Level (dB)	Required Limit (dB)	Result
38	5190	8.770	<13	Pass
46	5230	8.740	<13	Pass
54	5270	6.820	<13	Pass
62	5310	4.930	<13	Pass
102	5510	4.050	<13	Pass
110	5550	5.690	<13	Pass
134	5670	6.740	<13	Pass

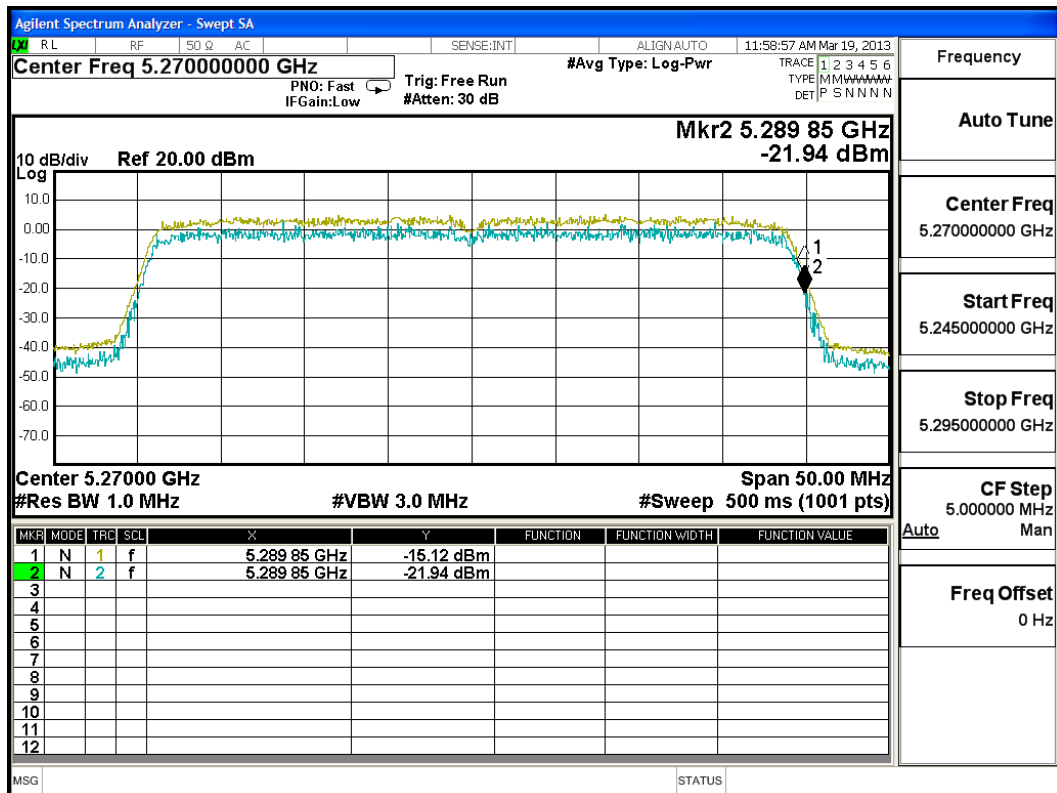
**Channel 38:**



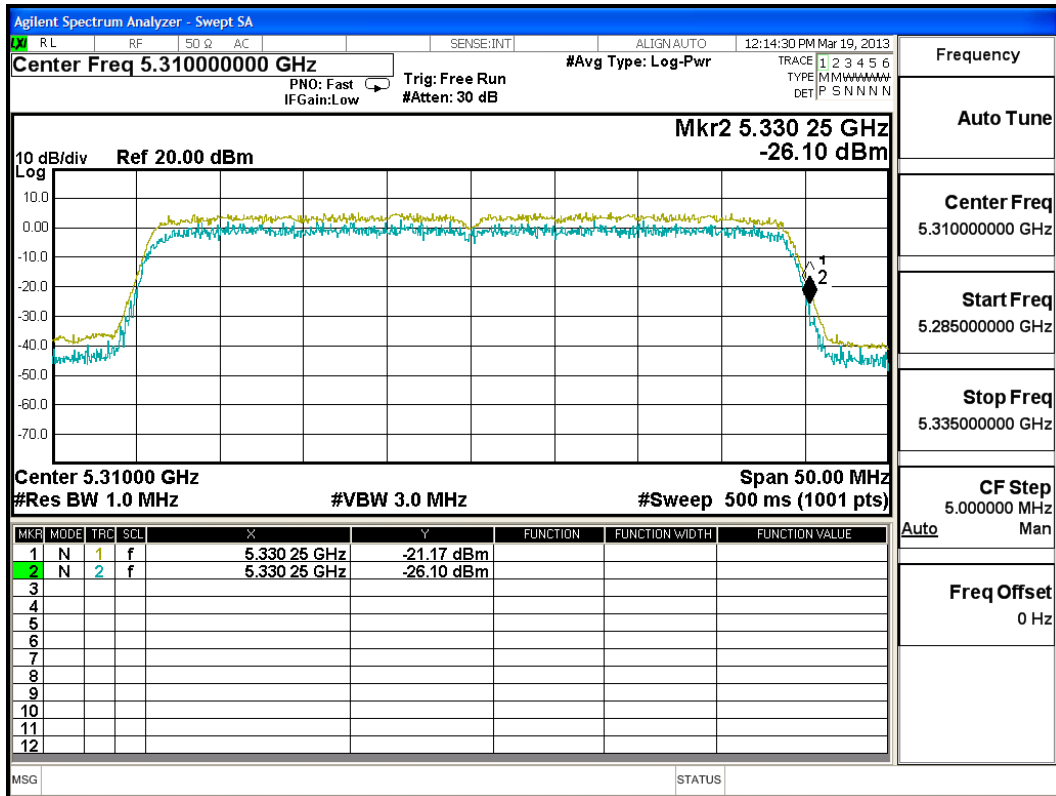
**Channel 46:**



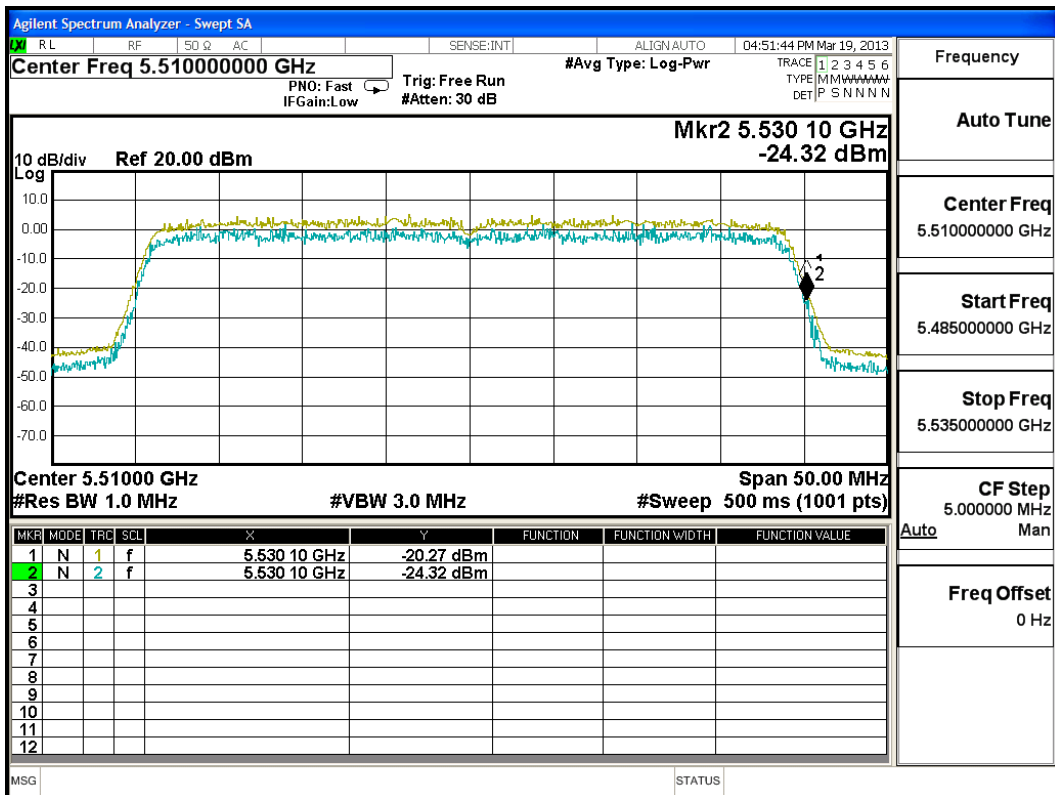
**Channel 54:**



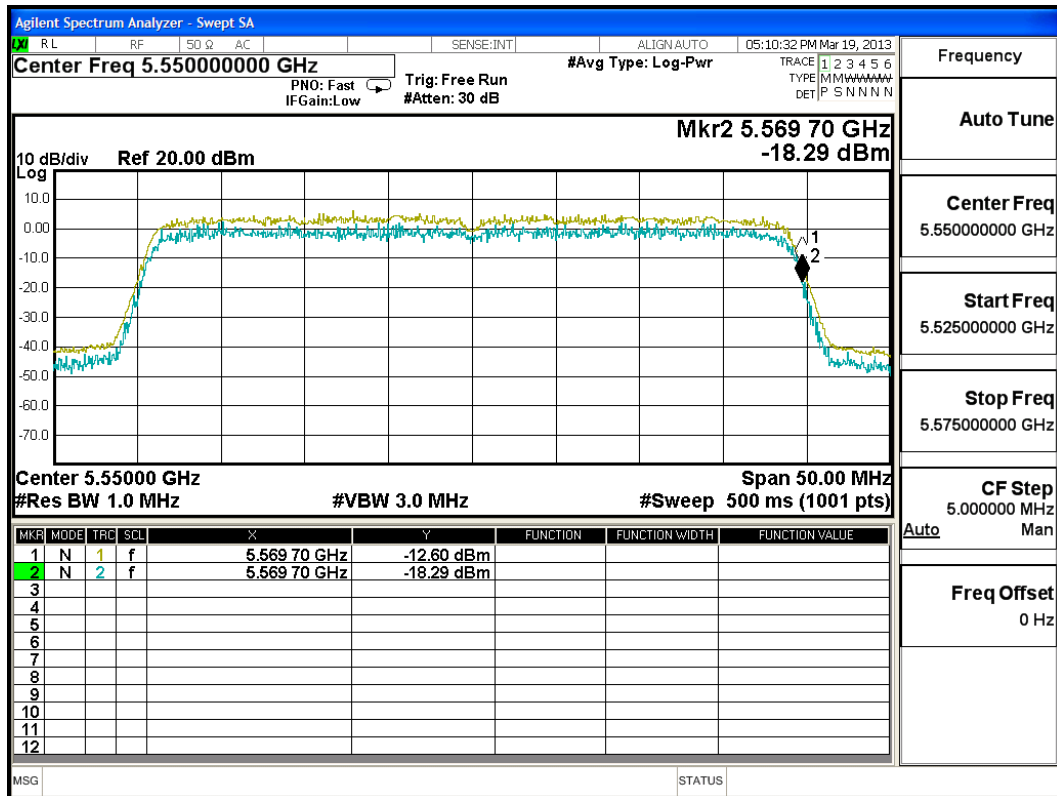
**Channel 62:**



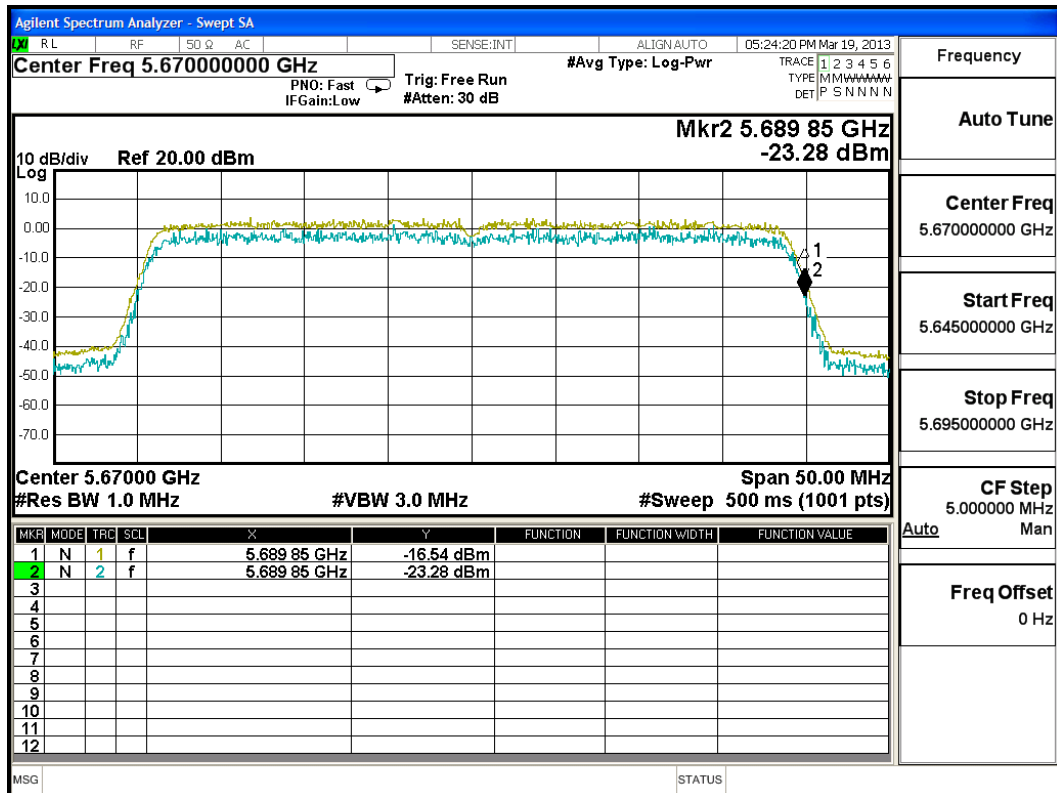
**Channel 102:**



**Channel 110:**



**Channel 134:**

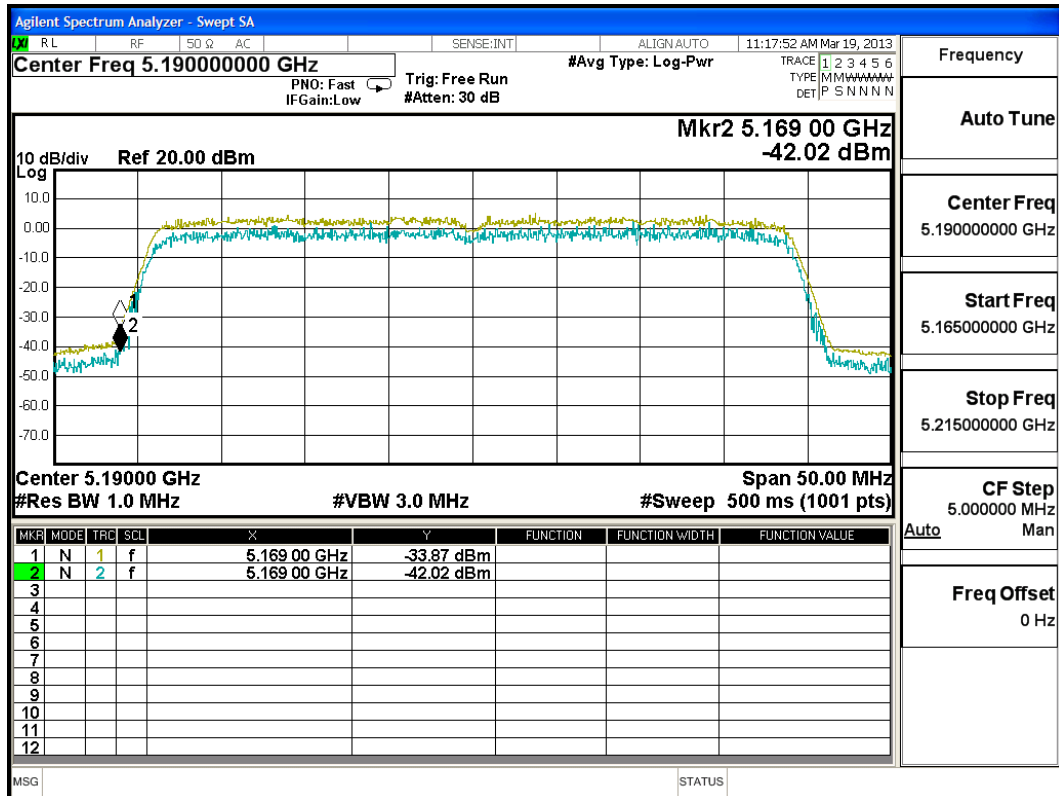




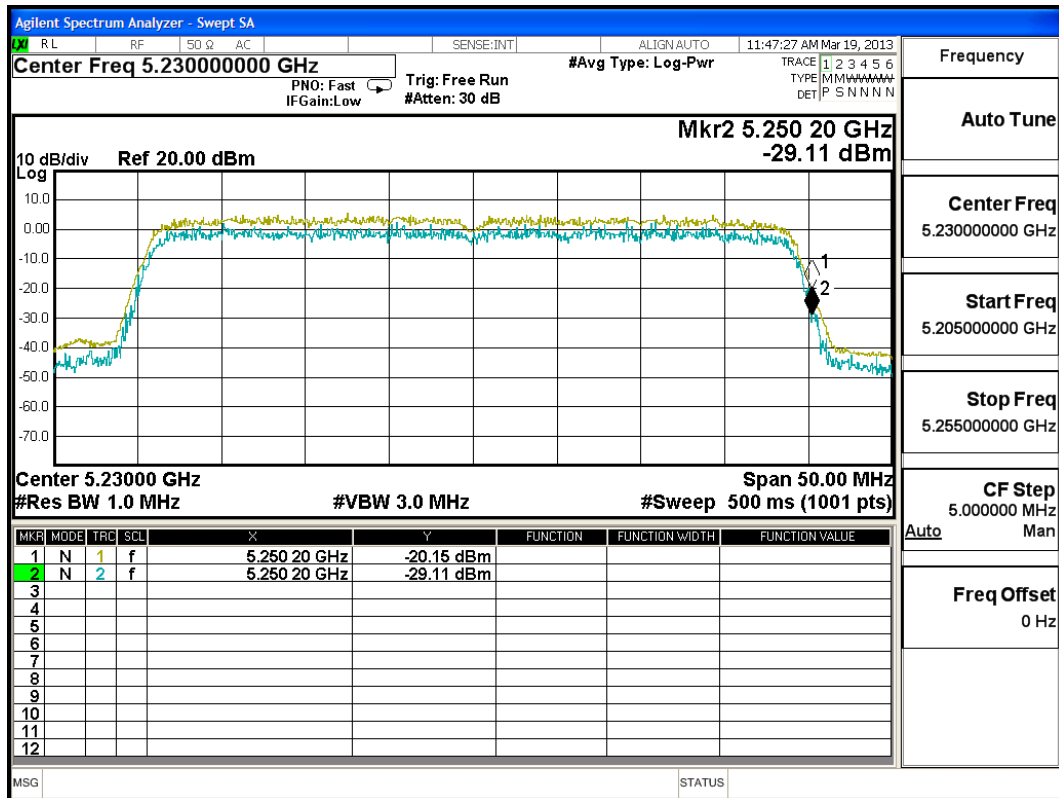
**Chain D**

Channel No.	Frequency (MHz)	Measurement Level (dB)	Required Limit (dB)	Result
38	5190	8.150	<13	Pass
46	5230	8.960	<13	Pass
54	5270	3.310	<13	Pass
62	5310	5.360	<13	Pass
102	5510	10.170	<13	Pass
110	5550	10.940	<13	Pass
134	5670	10.010	<13	Pass

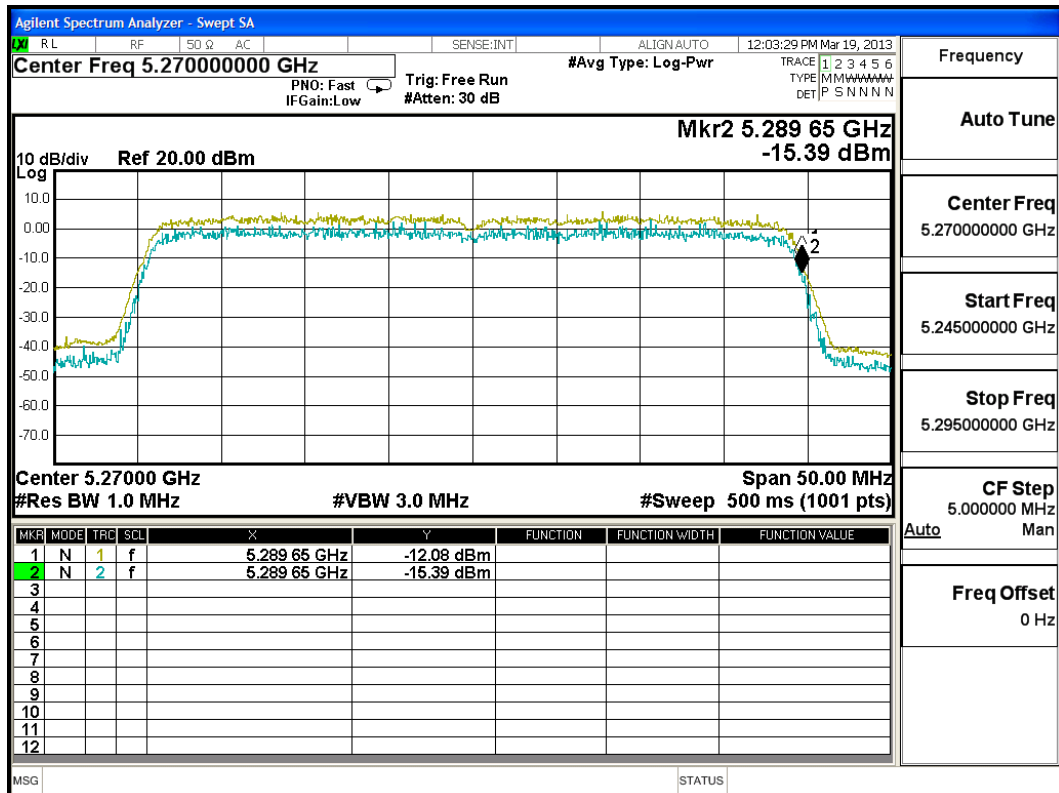
**Channel 38:**



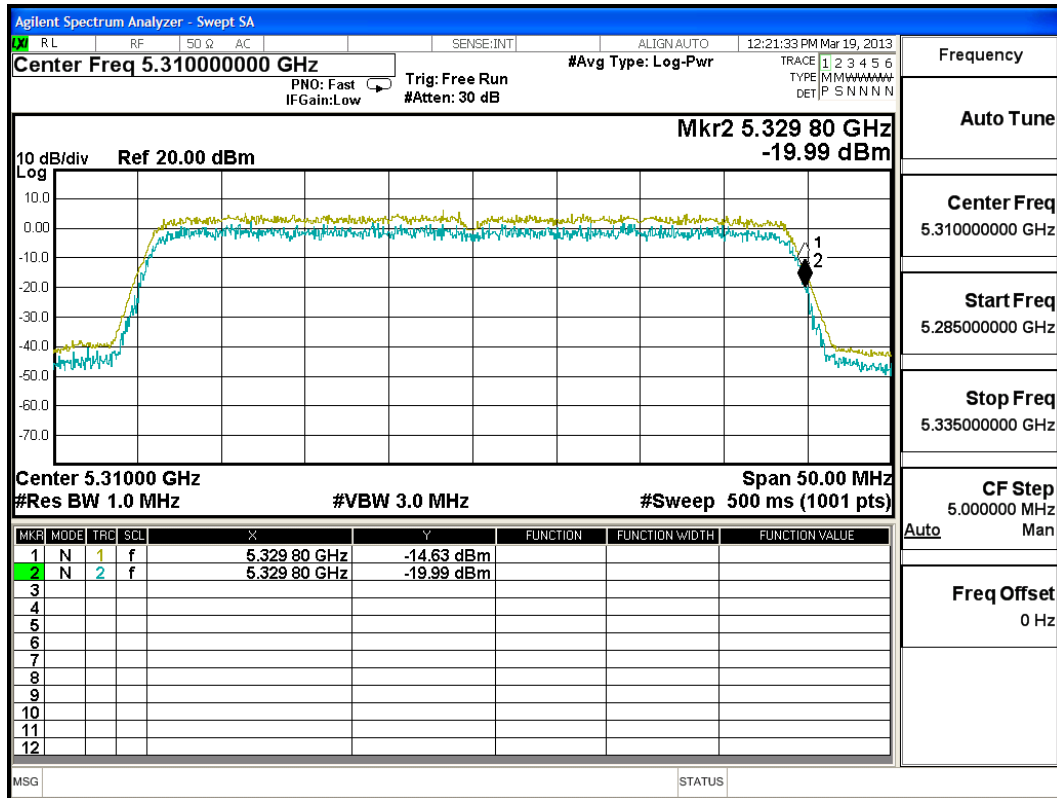
**Channel 46:**



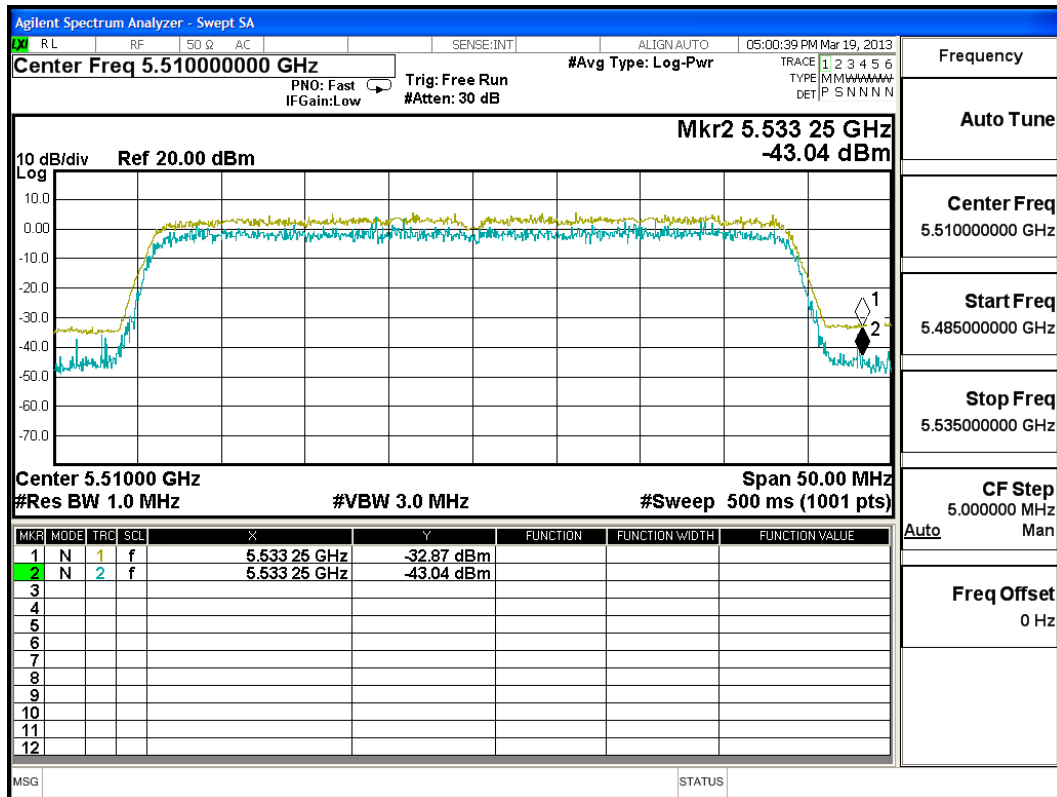
**Channel 54:**



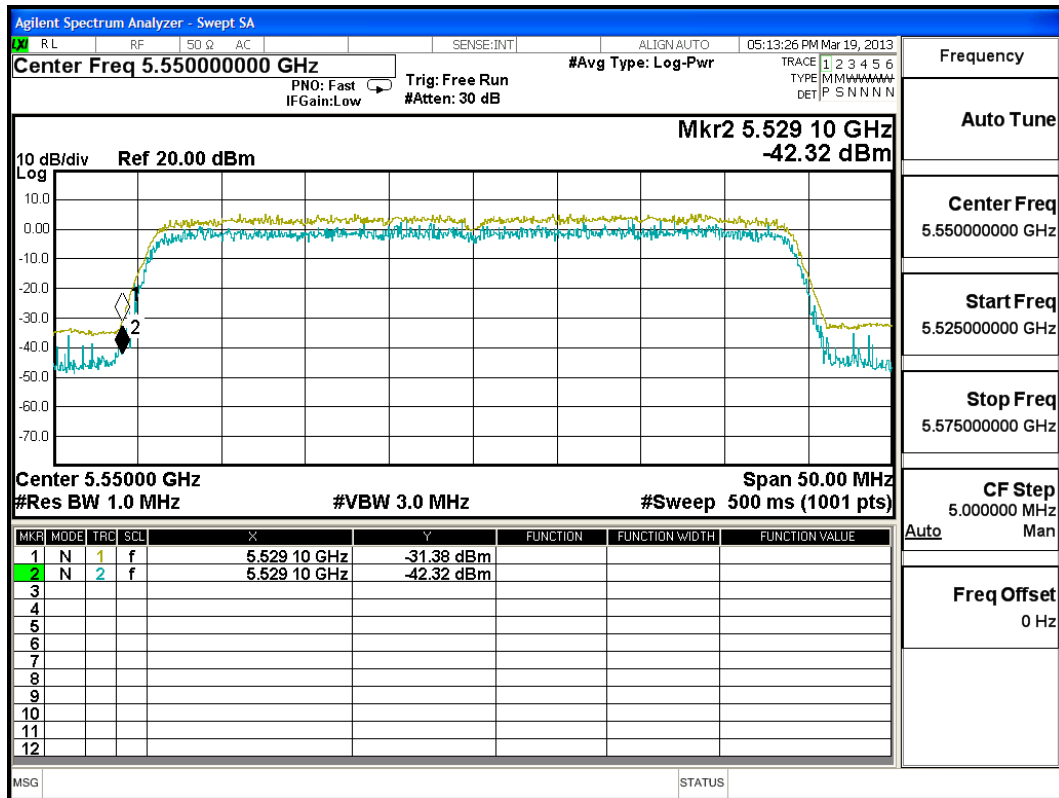
### Channel 62:



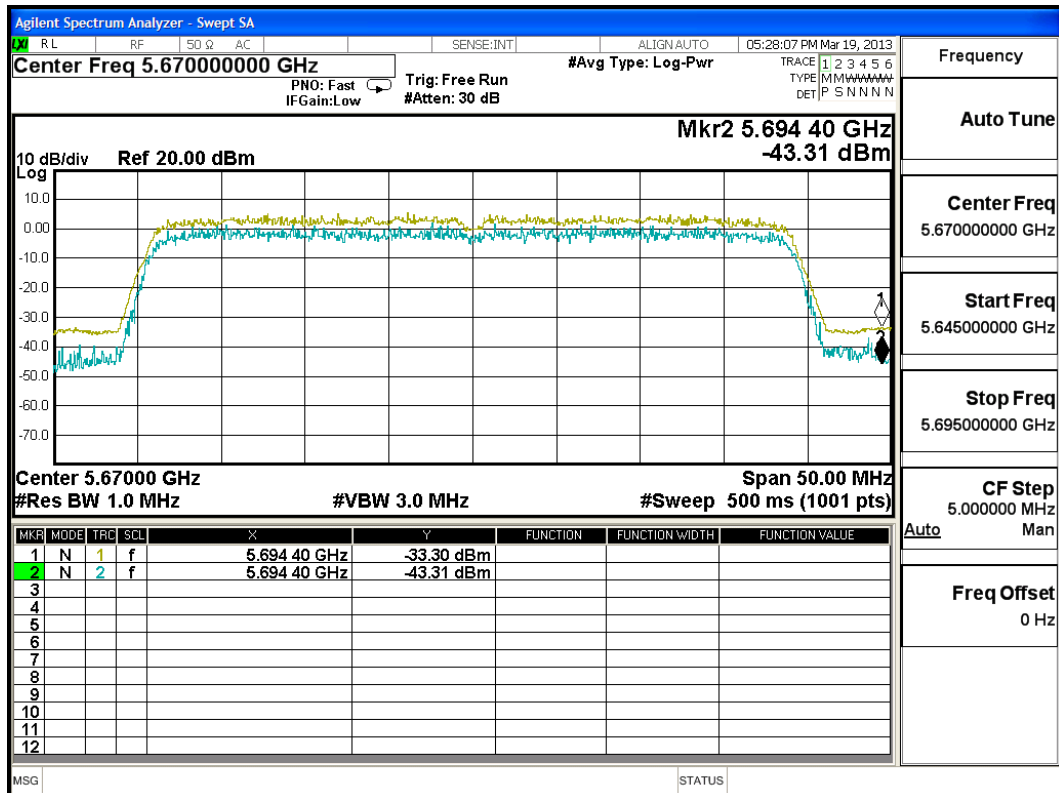
### Channel 102:



**Channel 110:**



**Channel 134:**



## 6. Radiated Emission

### 6.1. Test Equipment

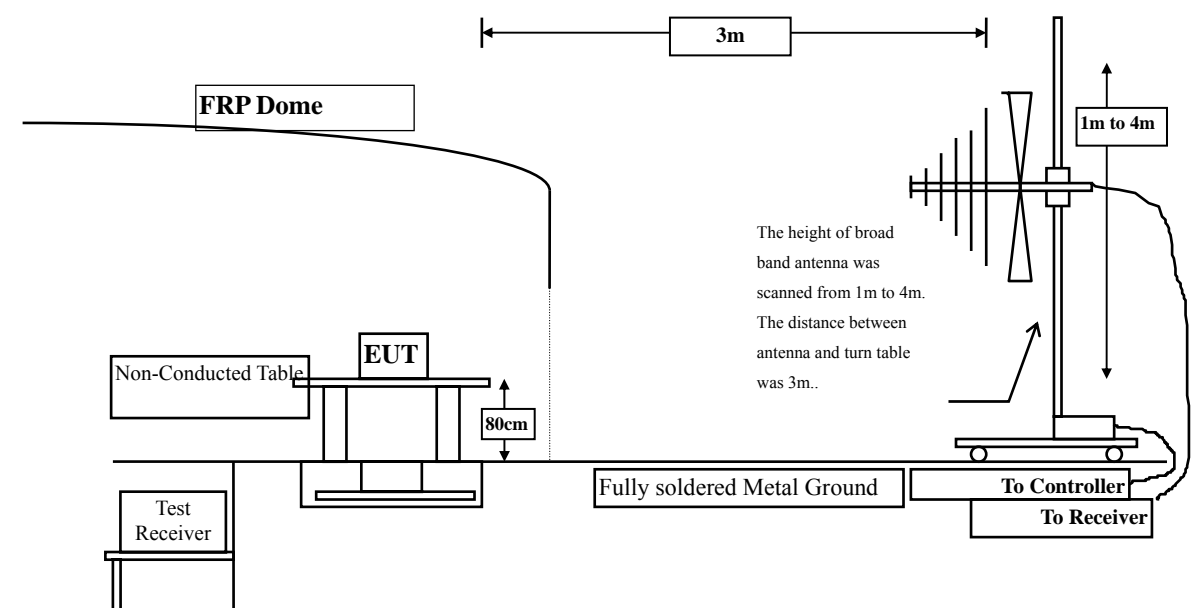
The following test equipments are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2012
	X Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2012
	X Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2012
	X Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2012
	X Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2012
	X Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar., 2013
	X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2012
	X Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2012
	X Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2013
	X Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X Coaxial Switch	Anritsu	MP59B/6200265729	N/A

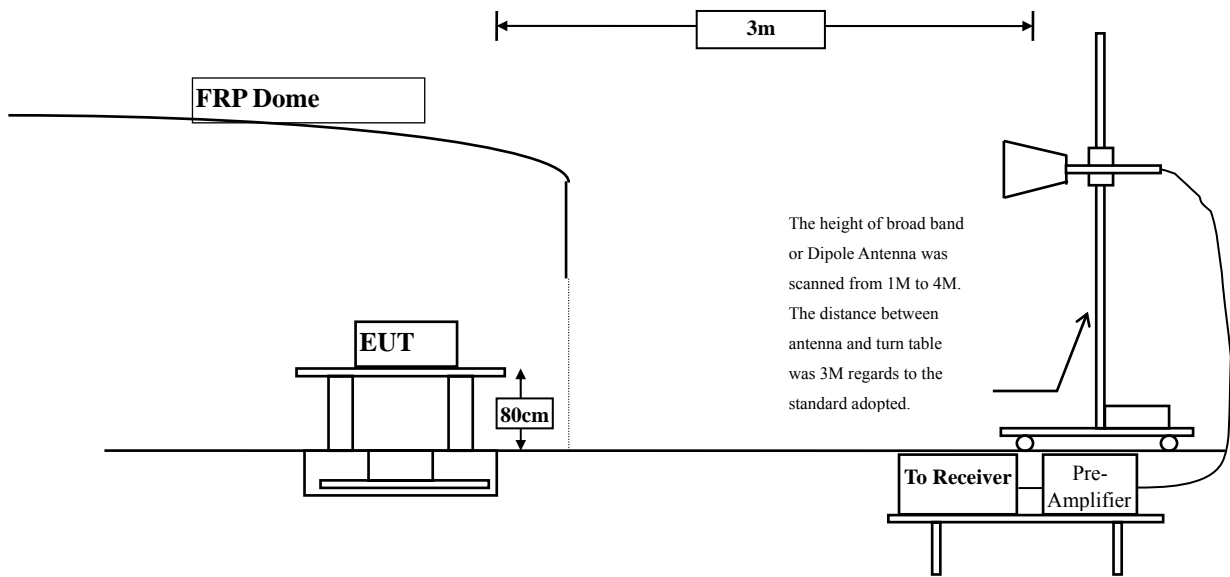
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with "X" are used to measure the final test results.

### 6.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



6.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks: E field strength (dBuV/m) = 20 log E field strength (uV/m)

#### **6.4. Test Procedure**

The EUT was setup according to ANSI C63.10: 2009 and tested according to FCC KDB-789033 test procedure for compliance to FCC 47CFR 15. 407 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2009 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range form 30MHz - 10th Harmonic of fundamental was investigated.

#### **6.5. Uncertainty**

± 3.8 dB below 1GHz

± 3.9 dB above 1GHz

## 6.6. Test Result of Radiated Emission

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
10380.000	12.939	38.090	51.029	-22.971	74.000
15570.000	*	*	*	*	74.000
20760.000	*	*	*	*	74.000
25950.000	*	*	*	*	74.000
31140.000	*	*	*	*	74.000
36330.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
15570.000	*	*	*	*	54.000
20760.000	*	*	*	*	54.000
25950.000	*	*	*	*	54.000
31140.000	*	*	*	*	54.000
36330.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
10380.000	13.796	37.170	50.966	-23.034	74.000
15570.000	*	*	*	*	74.000
20760.000	*	*	*	*	74.000
25950.000	*	*	*	*	74.000
31140.000	*	*	*	*	74.000
36330.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
15570.000	*	*	*	*	54.000
20760.000	*	*	*	*	54.000
25950.000	*	*	*	*	54.000
31140.000	*	*	*	*	54.000
36330.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5230MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
10460.000	13.508	37.180	50.688	-23.312	74.000
15690.000	*	*	*	*	74.000
20920.000	*	*	*	*	74.000
26150.000	*	*	*	*	74.000
31380.000	*	*	*	*	74.000
36610.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
15690.000	*	*	*	*	54.000
20920.000	*	*	*	*	54.000
26150.000	*	*	*	*	54.000
31380.000	*	*	*	*	54.000
36610.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5230MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
10460.000	14.433	37.290	51.723	-22.277	74.000
15690.000	*	*	*	*	74.000
20920.000	*	*	*	*	74.000
26150.000	*	*	*	*	74.000
31380.000	*	*	*	*	74.000
36610.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
15690.000	*	*	*	*	54.000
20920.000	*	*	*	*	54.000
26150.000	*	*	*	*	54.000
31380.000	*	*	*	*	54.000
36610.000	*	*	*	*	54.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5270MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
10540.000	14.151	37.130	51.280	-22.720	74.000
15810.000	*	*	*	*	74.000
21080.000	*	*	*	*	74.000
26350.000	*	*	*	*	74.000
31620.000	*	*	*	*	74.000
36890.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
15810.000	*	*	*	*	54.000
21080.000	*	*	*	*	54.000
26350.000	*	*	*	*	54.000
31620.000	*	*	*	*	54.000
36890.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5270MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
10540.000	14.829	36.720	51.548	-22.452	74.000
15810.000	*	*	*	*	74.000
21080.000	*	*	*	*	74.000
26350.000	*	*	*	*	74.000
31620.000	*	*	*	*	74.000
36890.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
15810.000	*	*	*	*	54.000
21080.000	*	*	*	*	54.000
26350.000	*	*	*	*	54.000
31620.000	*	*	*	*	54.000
36890.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5310MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
10620.000	14.623	36.400	51.023	-22.977	74.000
15930.000	*	*	*	*	74.000
21240.000	*	*	*	*	74.000
26550.000	*	*	*	*	74.000
31860.000	*	*	*	*	74.000
37170.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
15930.000	*	*	*	*	54.000
21240.000	*	*	*	*	54.000
26550.000	*	*	*	*	54.000
31860.000	*	*	*	*	54.000
37170.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5310MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
10620.000	14.970	36.790	51.760	-22.240	74.000
15930.000	*	*	*	*	74.000
21240.000	*	*	*	*	74.000
26550.000	*	*	*	*	74.000
31860.000	*	*	*	*	74.000
37170.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
15930.000	*	*	*	*	54.000
21240.000	*	*	*	*	54.000
26550.000	*	*	*	*	54.000
31860.000	*	*	*	*	54.000
37170.000	*	*	*	*	54.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5510MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
11020.000	16.474	36.190	52.663	-21.337	74.000
16530.000	*	*	*	*	74.000
22040.000	*	*	*	*	74.000
27550.000	*	*	*	*	74.000
33060.000	*	*	*	*	74.000
38570.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
16530.000	*	*	*	*	54.000
22040.000	*	*	*	*	54.000
27550.000	*	*	*	*	54.000
33060.000	*	*	*	*	54.000
38570.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5510MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
11020.000	17.224	36.270	53.494	-20.506	74.000
16530.000	*	*	*	*	74.000
22040.000	*	*	*	*	74.000
27550.000	*	*	*	*	74.000
33060.000	*	*	*	*	74.000
38570.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
16530.000	*	*	*	*	54.000
22040.000	*	*	*	*	54.000
27550.000	*	*	*	*	54.000
33060.000	*	*	*	*	54.000
38570.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5550MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
11100.000	16.681	35.570	52.251	-21.749	74.000
16650.000	*	*	*	*	74.000
22200.000	*	*	*	*	74.000
27750.000	*	*	*	*	74.000
33300.000	*	*	*	*	74.000
38850.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
16650.000	*	*	*	*	54.000
22200.000	*	*	*	*	54.000
27750.000	*	*	*	*	54.000
33300.000	*	*	*	*	54.000
38850.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5550MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
11100.000	17.523	34.810	52.333	-21.667	74.000
16650.000	*	*	*	*	74.000
22200.000	*	*	*	*	74.000
27750.000	*	*	*	*	74.000
33300.000	*	*	*	*	74.000
38850.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
16650.000	*	*	*	*	54.000
22200.000	*	*	*	*	54.000
27750.000	*	*	*	*	54.000
33300.000	*	*	*	*	54.000
38850.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5670MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
11340.000	16.408	35.690	52.097	-21.903	74.000
17010.000	*	*	*	*	74.000
22680.000	*	*	*	*	74.000
28350.000	*	*	*	*	74.000
34020.000	*	*	*	*	74.000
39690.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
17010.000	*	*	*	*	54.000
22680.000	*	*	*	*	54.000
28350.000	*	*	*	*	54.000
34020.000	*	*	*	*	54.000
39690.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5670MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
11340.000	17.167	35.740	52.907	-21.093	74.000
17010.000	*	*	*	*	74.000
22680.000	*	*	*	*	74.000
28350.000	*	*	*	*	74.000
34020.000	*	*	*	*	74.000
39690.000	*	*	*	*	74.000
<b>Average Detector:</b>					
--	*	*	*	*	54.000
17010.000	*	*	*	*	54.000
22680.000	*	*	*	*	54.000
28350.000	*	*	*	*	54.000
34020.000	*	*	*	*	54.000
39690.000	*	*	*	*	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : General Radiated Emission  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector</b>					
191.020	-10.040	49.237	39.197	-4.303	43.500
462.620	1.172	40.400	41.572	-4.428	46.000
612.000	3.819	38.578	42.397	-3.603	46.000
687.660	3.294	32.562	35.856	-10.144	46.000
800.180	5.141	28.589	33.730	-12.270	46.000
935.980	6.421	25.088	31.509	-14.491	46.000
<b>Vertical</b>					
<b>Peak Detector</b>					
204.600	-7.666	37.689	30.022	-13.478	43.500
375.320	-2.029	37.043	35.014	-10.986	46.000
530.520	-0.517	30.652	30.135	-15.865	46.000
749.740	2.510	27.868	30.378	-15.622	46.000
831.220	2.561	27.746	30.307	-15.693	46.000
930.160	6.477	28.540	35.017	-10.983	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : General Radiated Emission  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5270MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector</b>					
191.020	-10.040	49.733	39.693	-3.807	43.500
239.520	-6.851	44.516	37.666	-8.334	46.000
462.620	1.172	40.207	41.379	-4.621	46.000
689.600	3.628	31.583	35.211	-10.789	46.000
800.180	5.141	29.591	34.732	-11.268	46.000
961.200	6.450	25.441	31.891	-22.109	54.000
<b>Vertical</b>					
<b>Peak Detector</b>					
200.720	-7.835	38.947	31.112	-12.388	43.500
398.600	-4.678	39.042	34.364	-11.636	46.000
530.520	-0.517	31.092	30.575	-15.425	46.000
749.740	2.510	28.448	30.958	-15.042	46.000
825.400	3.430	26.569	29.999	-16.001	46.000
930.160	6.477	33.069	39.546	-6.454	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : General Radiated Emission  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (5550MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector</b>					
191.020	-10.040	48.721	38.681	-4.819	43.500
462.620	1.172	40.109	41.281	-4.719	46.000
612.000	3.819	38.322	42.141	-3.859	46.000
666.320	2.031	33.772	35.804	-10.196	46.000
800.180	5.141	28.124	33.265	-12.735	46.000
930.160	7.187	25.955	33.142	-12.858	46.000
<b>Vertical</b>					
<b>Peak Detector</b>					
198.780	-8.221	38.744	30.523	-12.977	43.500
398.600	-4.678	38.981	34.303	-11.697	46.000
532.460	-0.563	30.155	29.592	-16.408	46.000
676.020	0.041	28.708	28.749	-17.251	46.000
800.180	2.801	31.595	34.396	-11.604	46.000
932.100	6.152	28.161	34.313	-11.687	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.



## 7. Band Edge

### 7.1. Test Equipment

#### RF Conducted Measurement

The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2012
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2012
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.

#### RF Radiated Measurement:

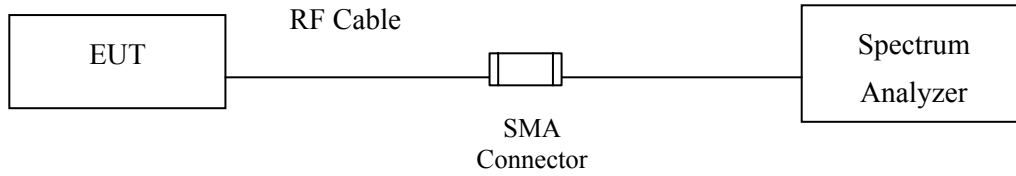
The following test equipments are used during the band edge tests:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	
☒ Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2012
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2012
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2012
		Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2012
	X	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2012
		Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar., 2013
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2012
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2012
	X	Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2013
	X	Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

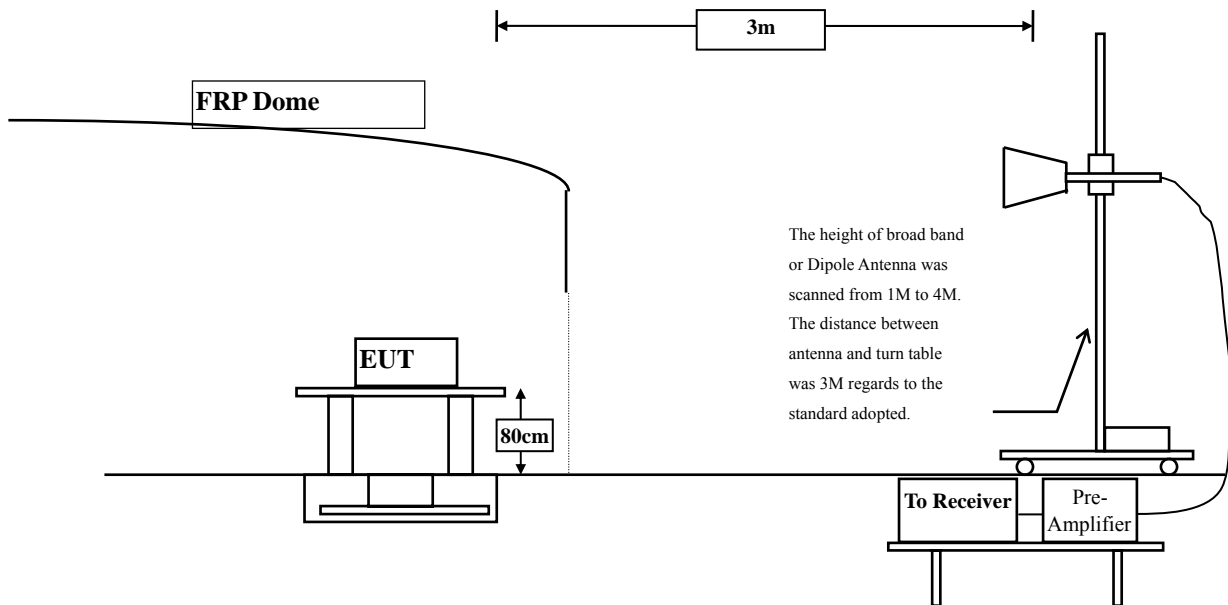
- Note:
1. All instruments are calibrated every one year.
  2. The test instruments marked by "X" are used to measure the final test results.

## 7.2. Test Setup

### RF Conducted Measurement



### RF Radiated Measurement:



### 7.3. Limits

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209:

<b>FCC Part 15 Subpart C Paragraph 15.209 Limits</b>		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
  2. In the Above Table, the tighter limit applies at the band edges.
  3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

### 7.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2009 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz. 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.

### 7.5. Uncertainty

- ± 3.8 dB below 1GHz
- ± 3.9 dB above 1GHz

## 7.6. Test Result of Band Edge

product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -Channel 38

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]	Detector
Horizontal	5190	34.907	72.95	107.858	Peak
Horizontal	5190	34.907	58.17	93.078	Average
Vertical	5190	37.077	64.14	101.218	Peak
Vertical	5190	37.077	49.85	86.928	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

### Band Edge Test Data (Chain A)

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5147.5	107.858	48.19	59.668	74.000	Peak
Horizontal	5150	93.078	47.84	45.238	54.000	Average
Vertical	5147.5	101.218	48.19	53.028	74.000	Peak
Vertical	5150	86.928	47.84	39.088	54.000	Average

### Band Edge Test Data (Chain B)

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5147.8	107.858	47.89	59.968	74.000	Peak
Horizontal	5150	93.078	47.16	45.918	54.000	Average
Vertical	5147.8	101.218	47.89	53.328	74.000	Peak
Vertical	5150	86.928	47.16	39.768	54.000	Average

**Band Edge Test Data (Chain C)**

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5134.4	107.858	48.22	59.638	74.000	Peak
Horizontal	5149.9	93.078	47.19	45.888	54.000	Average
Vertical	5134.4	101.218	48.22	52.998	74.000	Peak
Vertical	5149.9	86.928	47.19	39.738	54.000	Average

**Band Edge Test Data (Chain D)**

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5145.4	107.858	44.75	63.108	74.000	Peak
Horizontal	5150	93.078	47.43	45.648	54.000	Average
Vertical	5145.4	101.218	44.75	56.468	74.000	Peak
Vertical	5150	86.928	47.43	39.498	54.000	Average

**Note:**

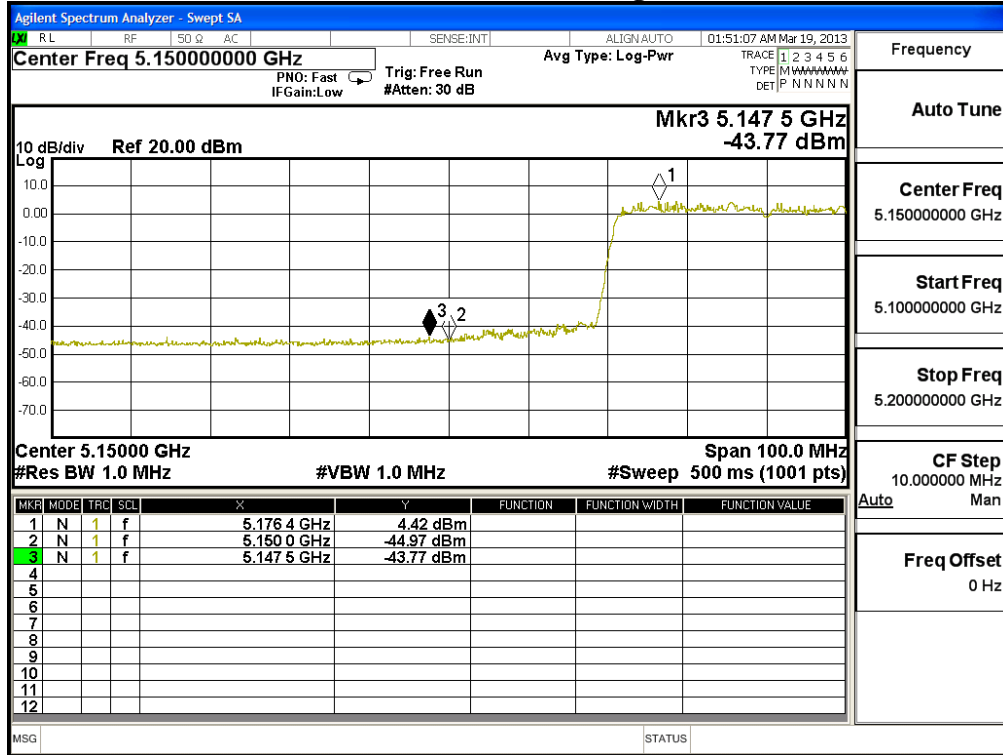
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

$$\text{Band Edge field Strength} = F - \Delta$$

F = Fundamental field Strength (Peak or Average)

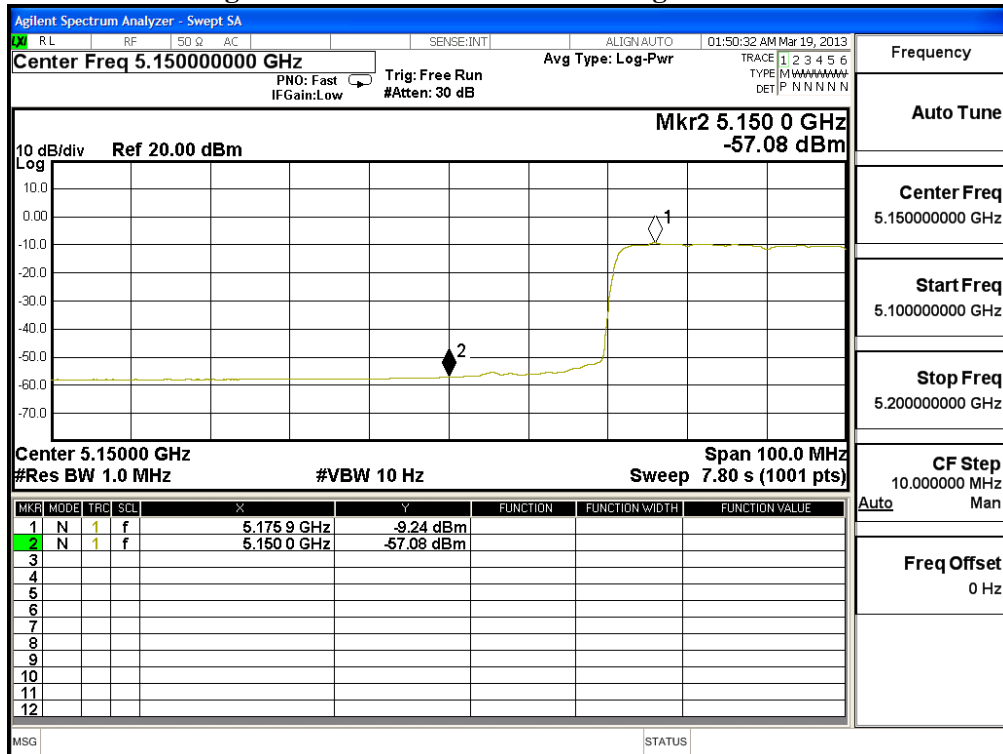
$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta-Chain A



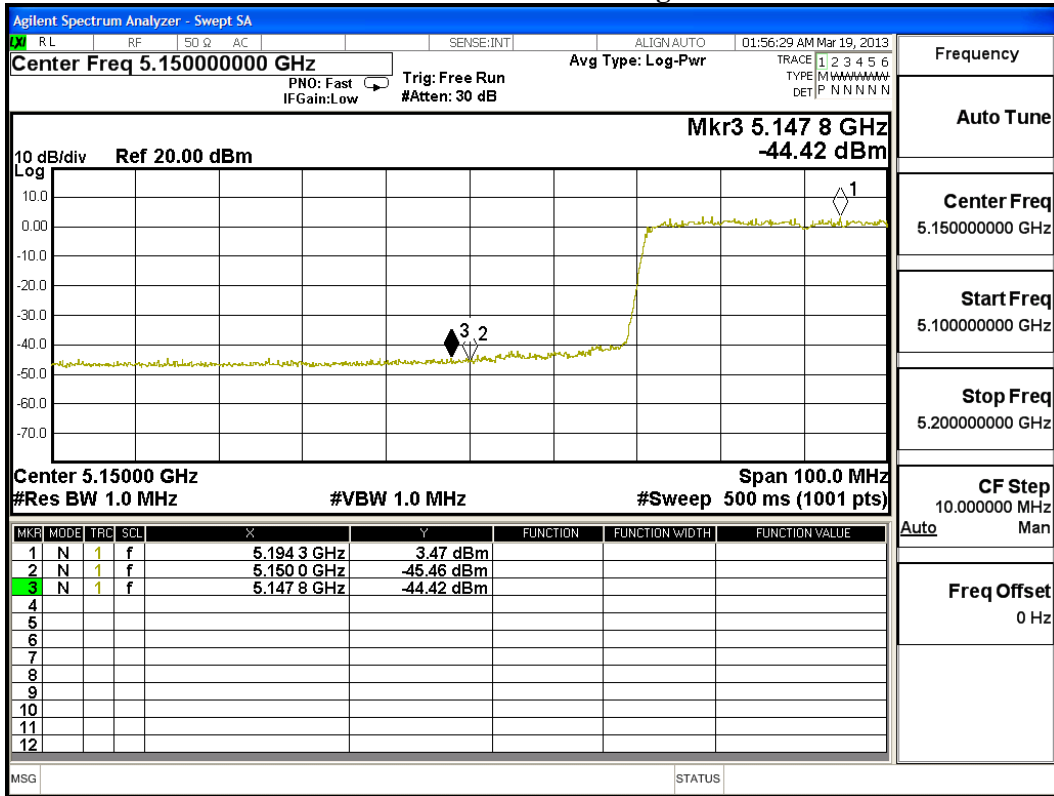
Frequency	
Auto Tune	
Center Freq	5.15000000 GHz
Start Freq	5.10000000 GHz
Stop Freq	5.20000000 GHz
CF Step	10.000000 MHz
Auto Man	Auto
Freq Offset	0 Hz

### Average Detector of conducted Band Edge Delta-Chain A

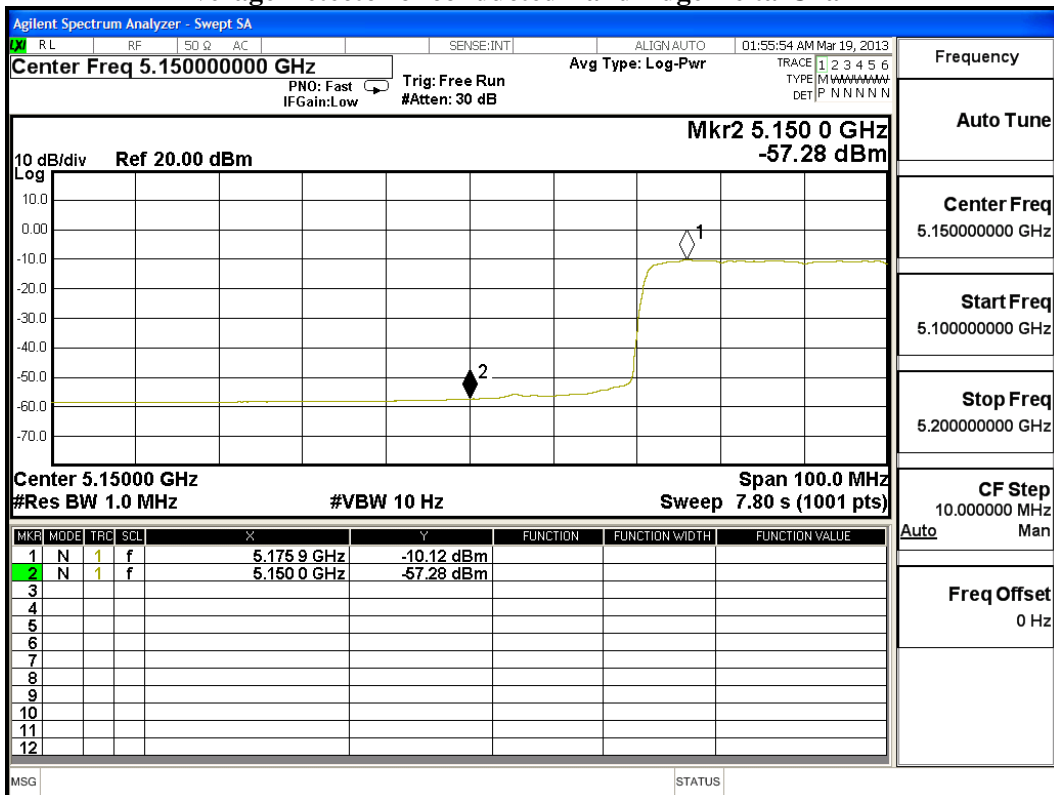


Frequency	
Auto Tune	
Center Freq	5.15000000 GHz
Start Freq	5.10000000 GHz
Stop Freq	5.20000000 GHz
CF Step	10.000000 MHz
Auto Man	Auto
Freq Offset	0 Hz

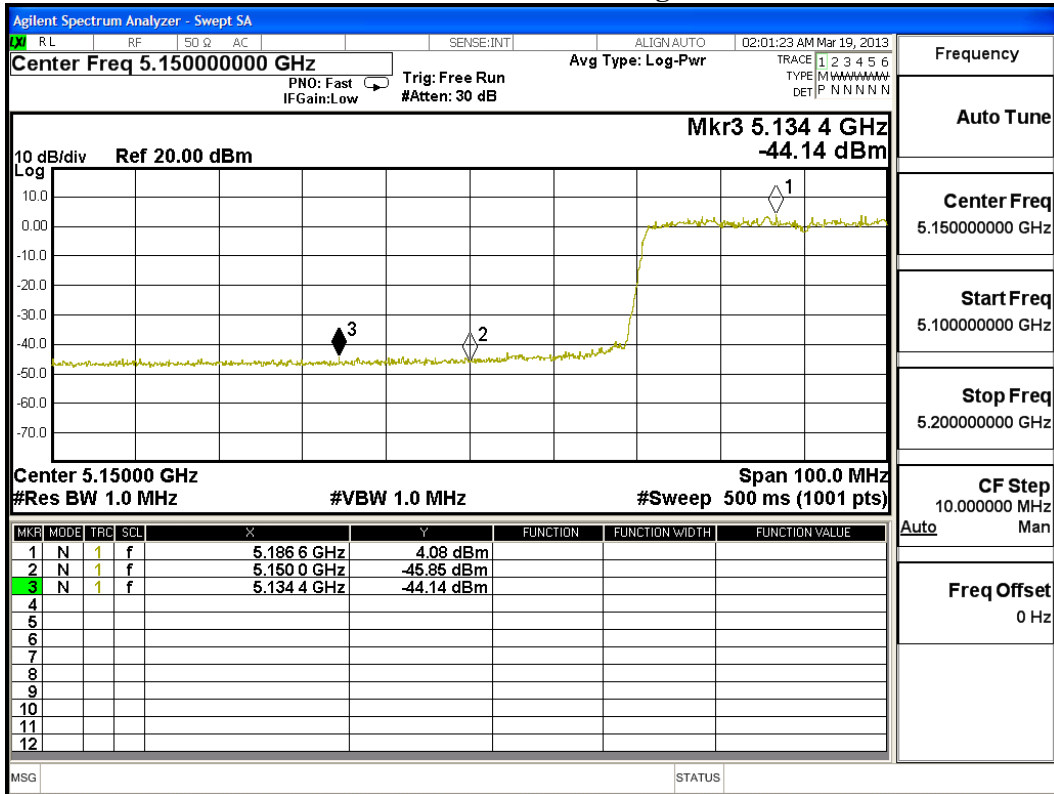
### Peak Detector of conducted Band Edge Delta-Chain B



### Average Detector of conducted Band Edge Delta-Chain B

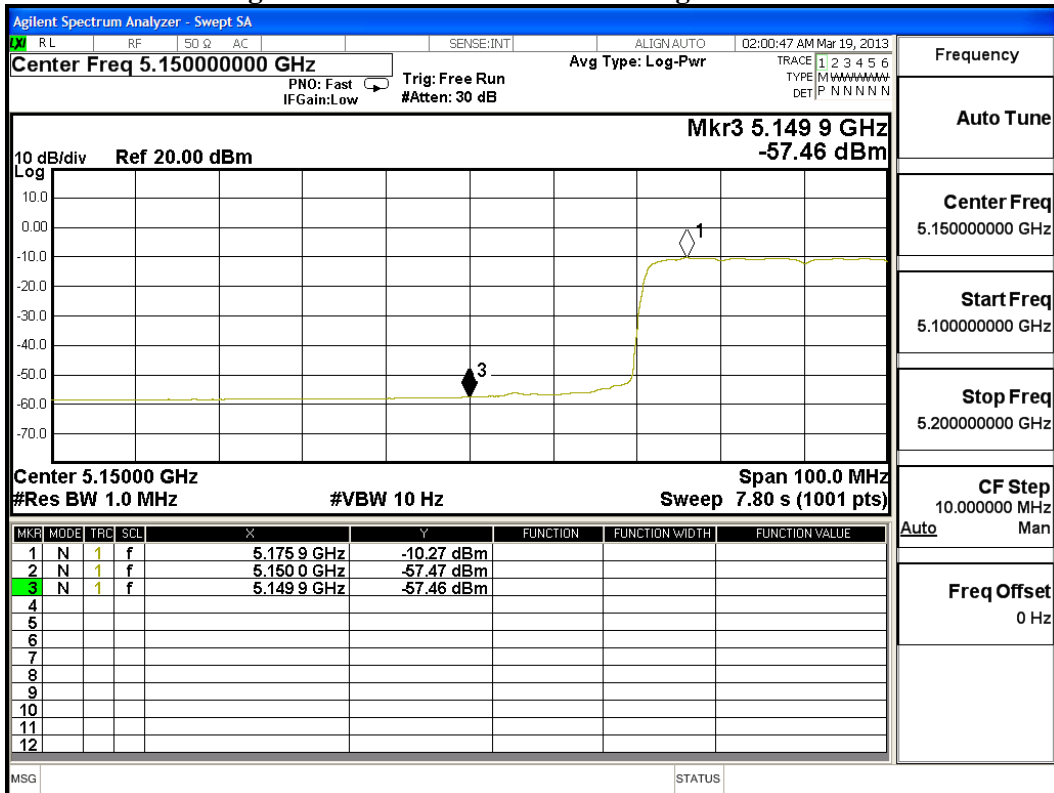


### Peak Detector of conducted Band Edge Delta-Chain C



Frequency	
Auto Tune	
Center Freq	5.15000000 GHz
Start Freq	5.10000000 GHz
Stop Freq	5.20000000 GHz
CF Step	10.000000 MHz
Auto	Man
Freq Offset	0 Hz

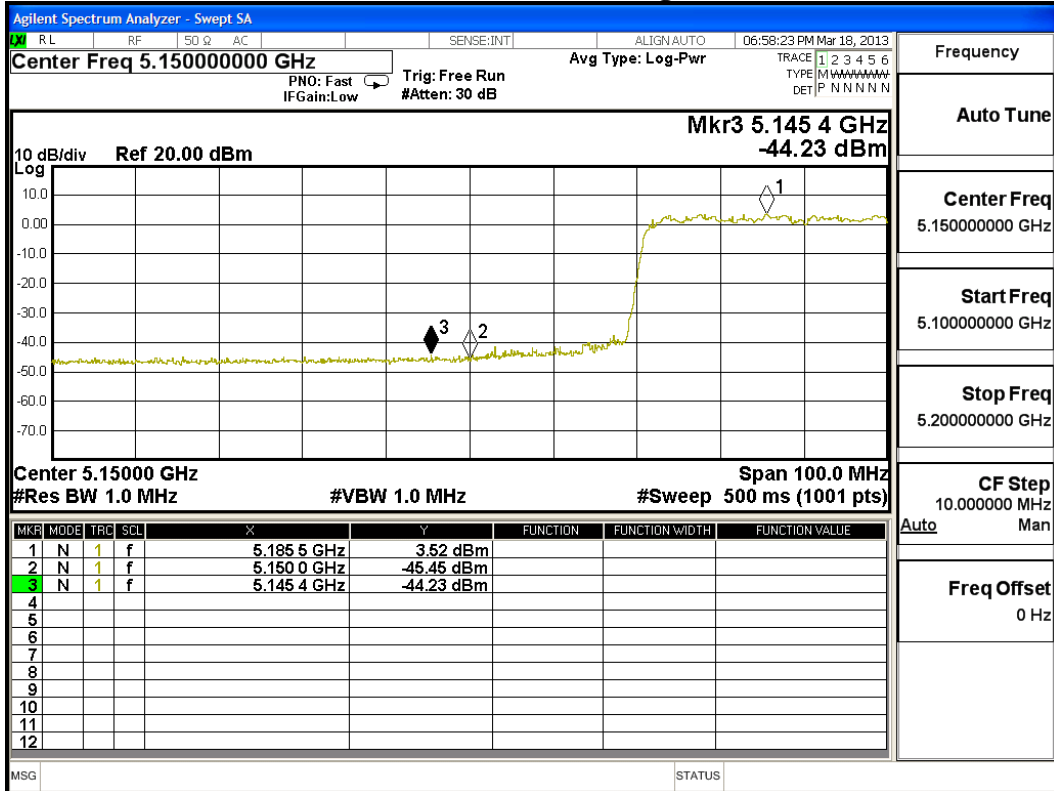
### Average Detector of conducted Band Edge Delta-Chain C



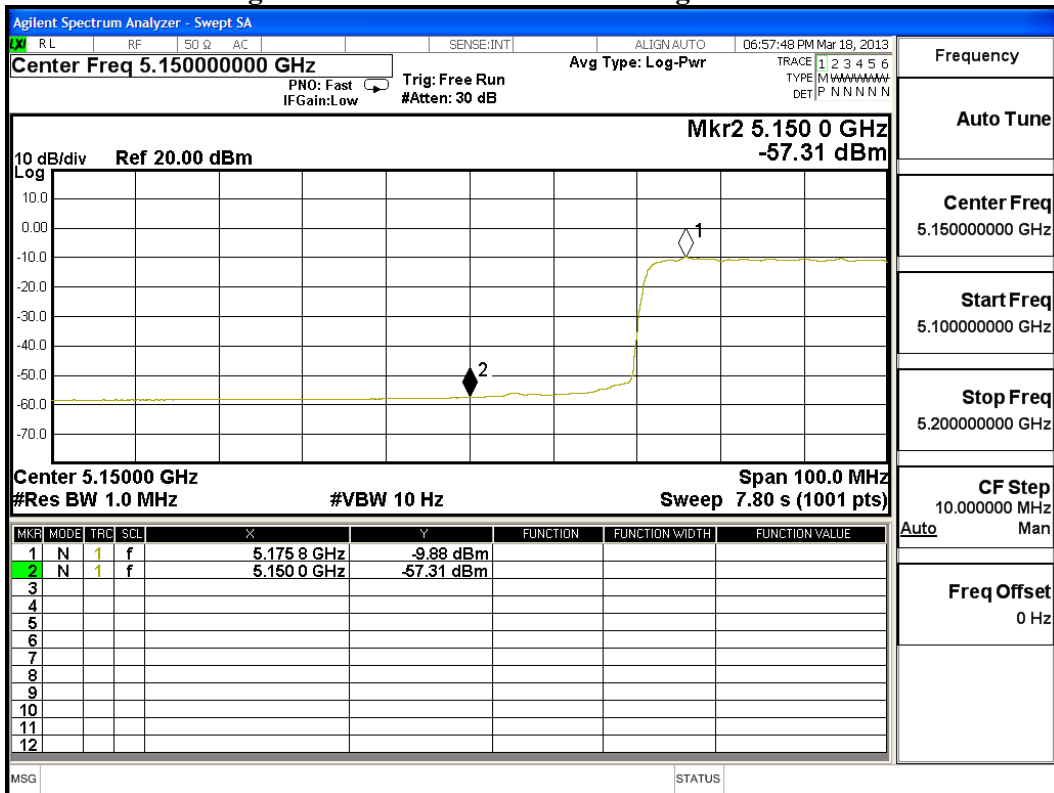
Frequency	
Auto Tune	
Center Freq	5.15000000 GHz
Start Freq	5.10000000 GHz
Stop Freq	5.20000000 GHz
CF Step	10.000000 MHz
Auto	Man
Freq Offset	0 Hz



**.Peak Detector of conducted Band Edge Delta-Chain D**



**Average Detector of conducted Band Edge Delta-Chain D**



Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -Channel 62

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]	Detector
Horizontal	5310	35.655	74.85	110.506	Peak
Horizontal	5310	35.655	60.14	95.796	Average
Vertical	5310	37.553	66.61	104.163	Peak
Vertical	5310	37.553	51.63	89.183	Average

Note: 1: Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

### Band Edge Test Data (Chain A)

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5361.3	110.506	48.43	62.076	74.000	Peak
Horizontal	5350.3	95.796	48.29	47.506	54.000	Average
Vertical	5361.3	104.163	48.43	55.733	74.000	Peak
Vertical	5350.3	89.183	48.29	40.893	54.000	Average

### Band Edge Test Data (Chain B)

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5353.9	110.506	48.64	61.866	74.000	Peak
Horizontal	5350.3	95.796	48.02	47.776	54.000	Average
Vertical	5353.9	104.163	48.64	55.523	74.000	Peak
Vertical	5350.3	89.183	48.02	41.163	54.000	Average

**Band Edge Test Data (Chain C)**

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5354.5	110.506	48.12	62.386	74.000	Peak
Horizontal	5350	95.796	48.03	47.766	54.000	Average
Vertical	5354.5	104.163	48.12	56.043	74.000	Peak
Vertical	5350	89.183	48.03	41.153	54.000	Average

**Band Edge Test Data (Chain D)**

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5367.1	110.506	48.83	61.676	74.000	Peak
Horizontal	5350.3	95.796	48.68	47.116	54.000	Average
Vertical	5367.1	104.163	48.83	55.333	74.000	Peak
Vertical	5350.3	89.183	48.68	40.503	54.000	Average

**Note:**

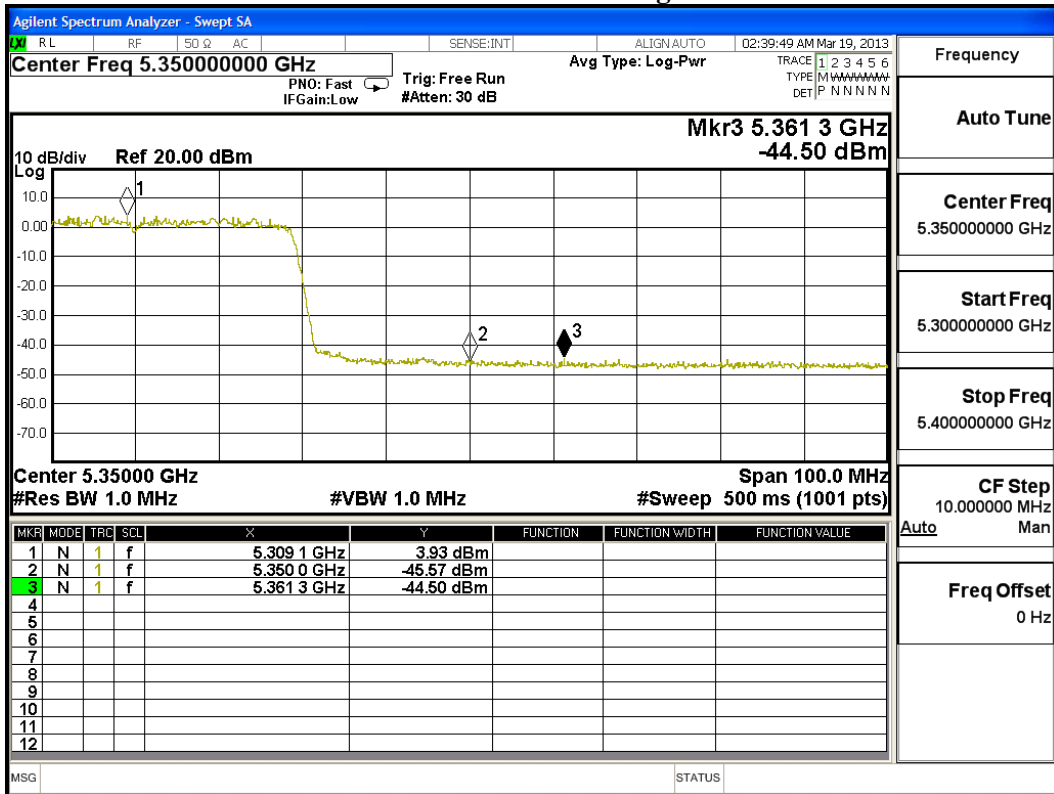
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

$$\text{Band Edge field Strength} = F - \Delta$$

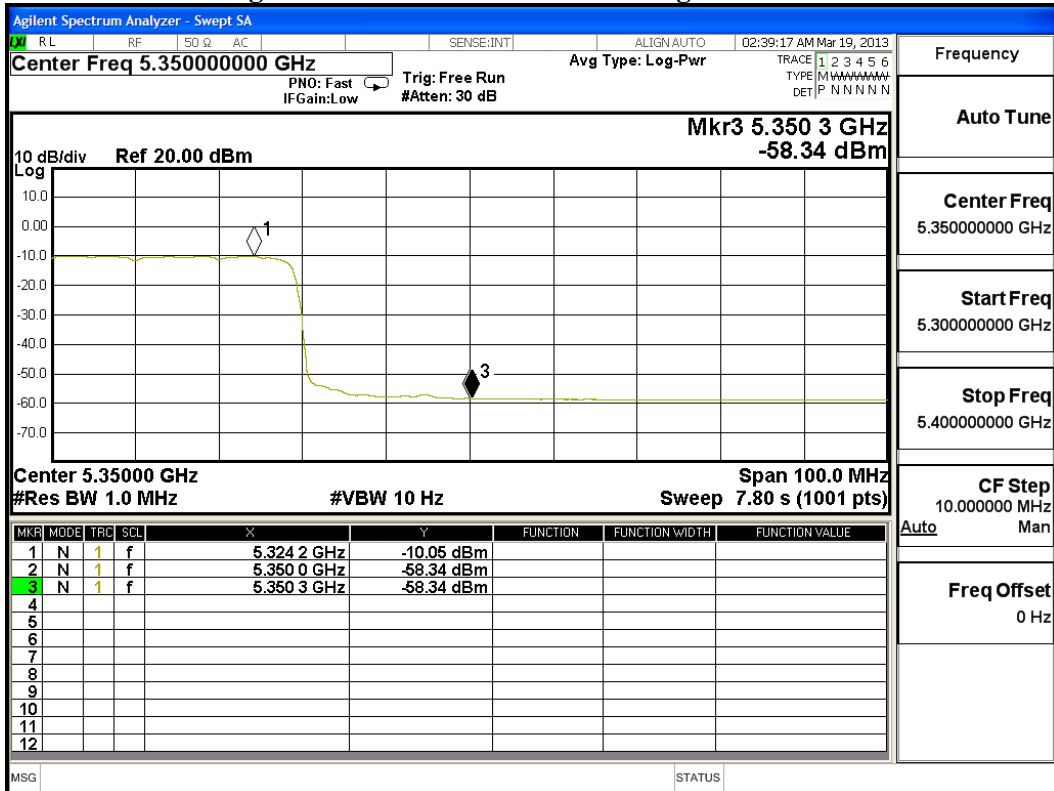
F = Fundantamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

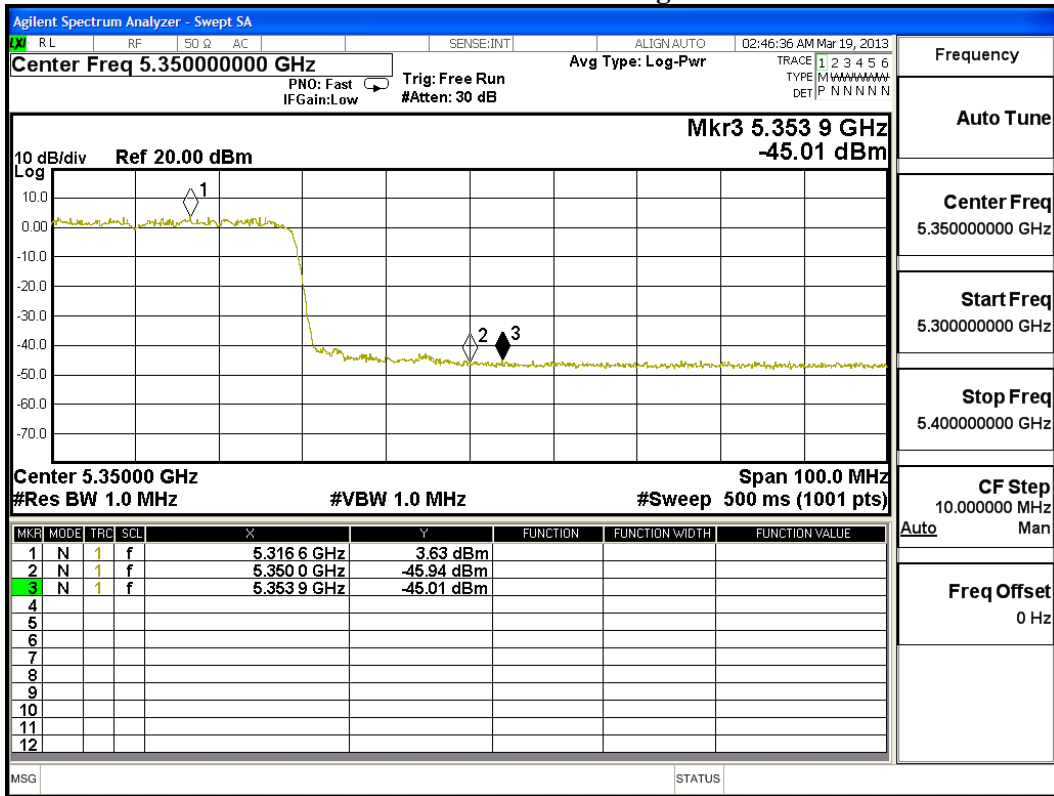
### Peak Detector of conducted Band Edge Delta-Chain A



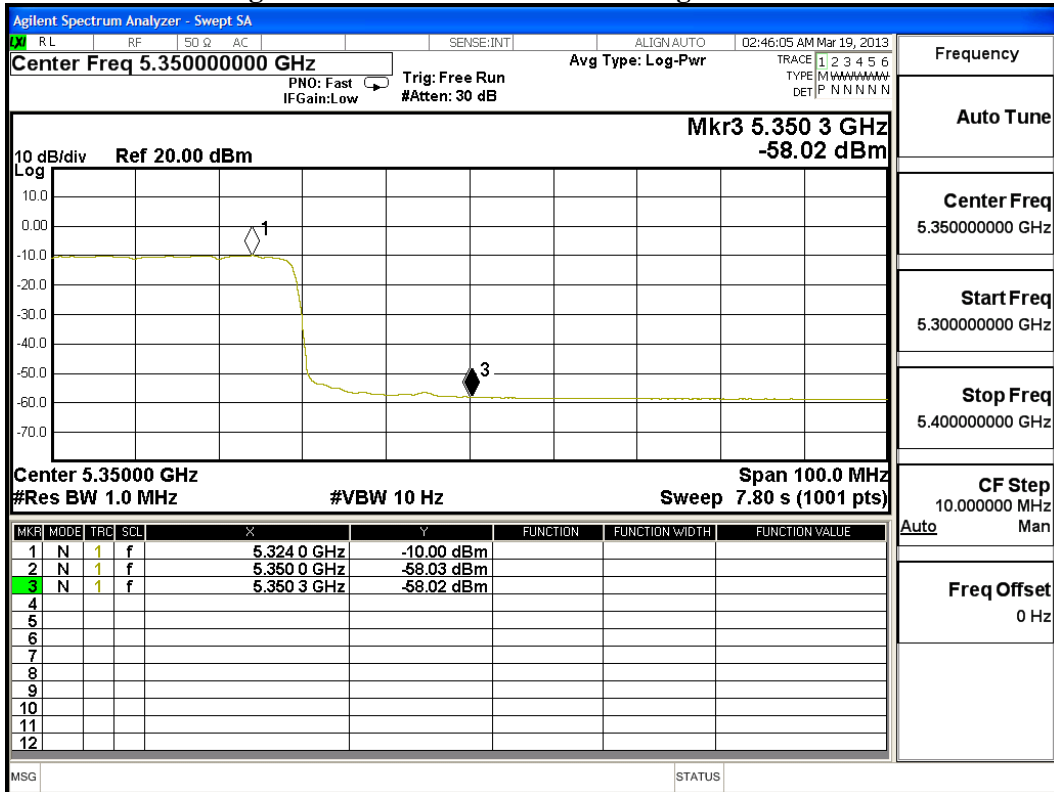
### Average Detector of conducted Band Edge Delta-Chain A



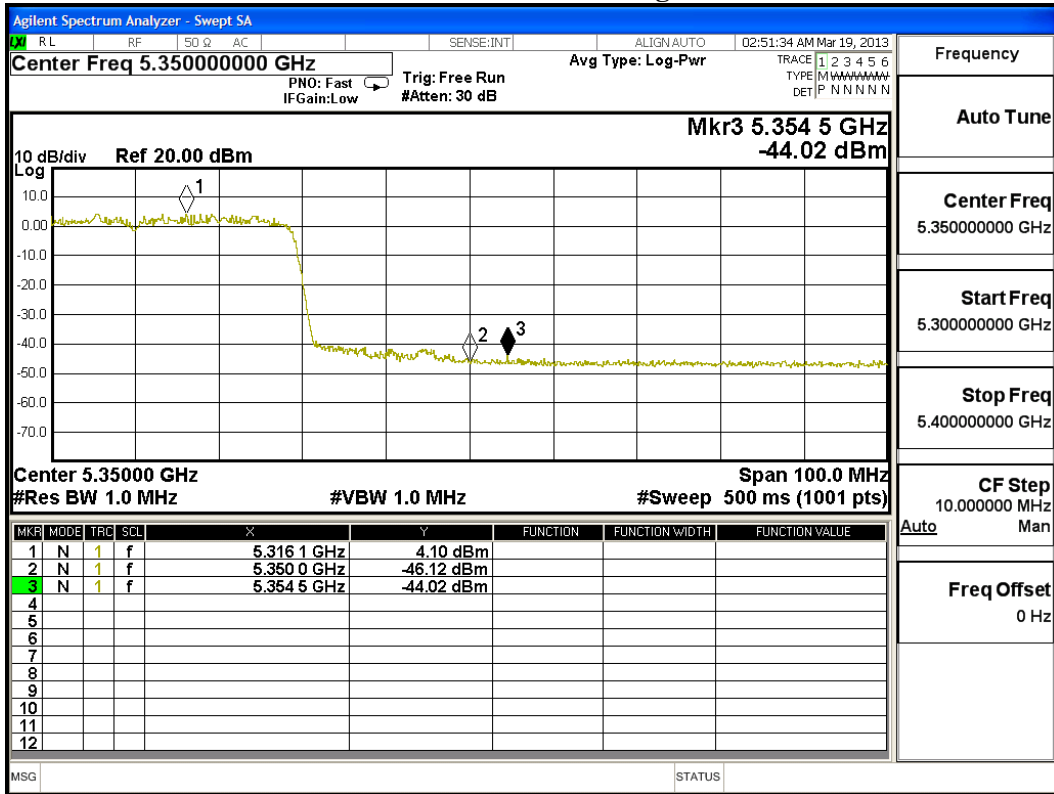
### Peak Detector of conducted Band Edge Delta-Chain B



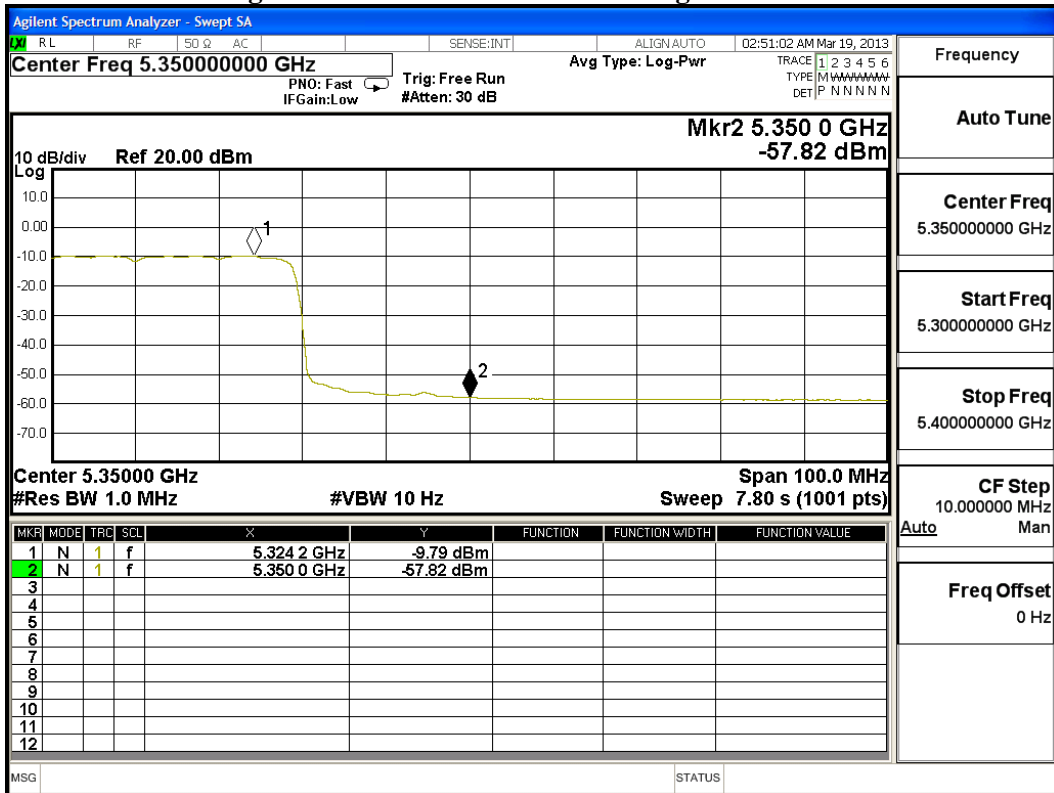
### Average Detector of conducted Band Edge Delta-Chain B



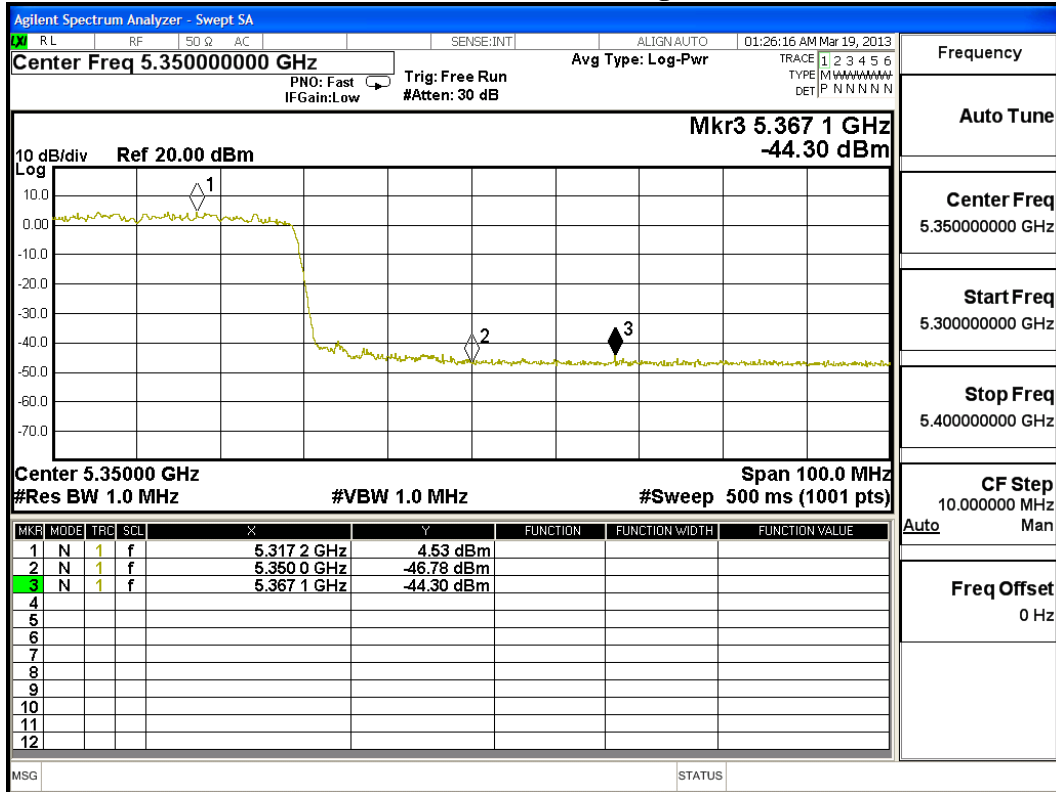
### Peak Detector of conducted Band Edge Delta-Chain C



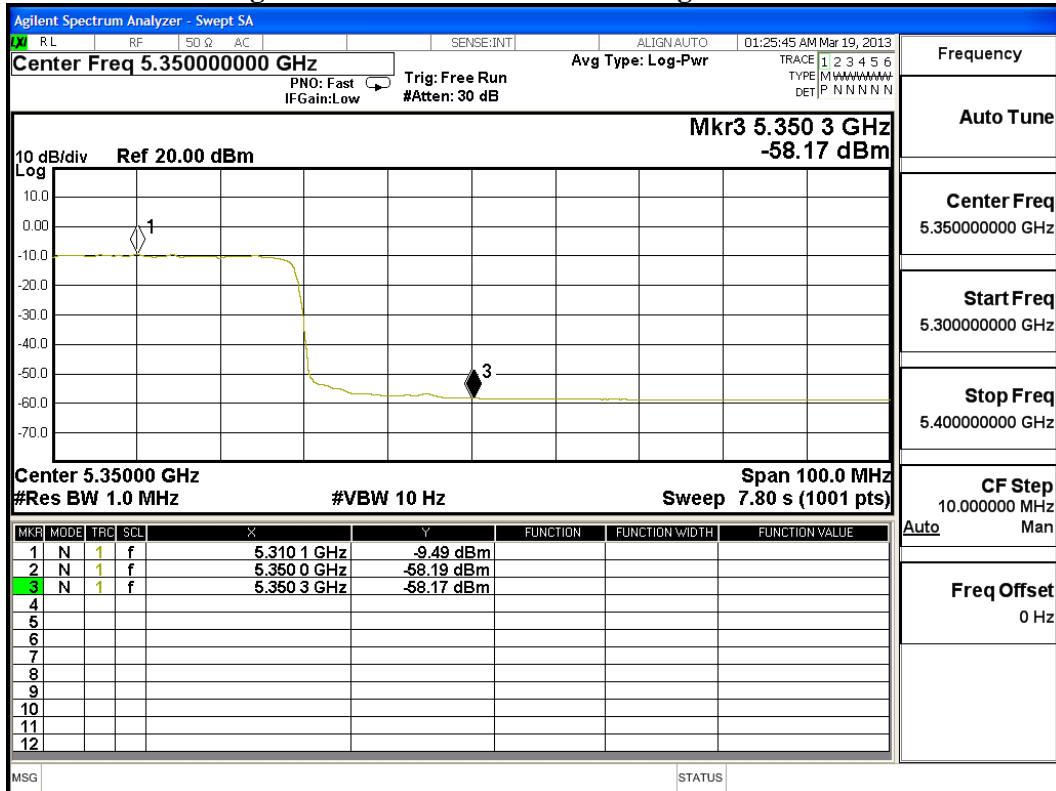
### Average Detector of conducted Band Edge Delta-Chain C



### Peak Detector of conducted Band Edge Delta-Chain D



### Average Detector of conducted Band Edge Delta-Chain D



Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter -Channel 102

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]	Detector
Horizontal	5510	36.675	72.38	109.055	Peak
Horizontal	5510	36.675	57.49	94.165	Average
Vertical	5510	38.124	65.56	103.684	Peak
Vertical	5510	38.124	51.22	89.344	Average

Note: 1: Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

### Band Edge Test Data (Chain A)

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5456.8	109.055	45.9	63.155	74.000	Peak
Horizontal	5458.2	94.165	48.33	45.835	54.000	Average
Vertical	5456.8	103.684	45.9	57.784	74.000	Peak
Vertical	5458.2	89.344	48.33	41.014	54.000	Average

### Band Edge Test Data (Chain B)

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5419.5	109.055	48.11	60.945	74.000	Peak
Horizontal	5460	94.165	48.82	45.345	54.000	Average
Vertical	5419.5	103.684	48.11	55.574	74.000	Peak
Vertical	5460	89.344	48.82	40.524	54.000	Average



**Band Edge Test Data (Chain C)**

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5415.8	109.055	48.25	60.805	74.000	Peak
Horizontal	5459.3	94.165	48.31	45.855	54.000	Average
Vertical	5415.8	103.684	48.25	55.434	74.000	Peak
Vertical	5459.3	89.344	48.31	41.034	54.000	Average

**Band Edge Test Data (Chain D)**

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5457.2	109.055	47.28	61.775	74.000	Peak
Horizontal	5459.9	94.165	49.15	45.015	54.000	Average
Vertical	5457.2	103.684	47.28	56.404	74.000	Peak
Vertical	5459.9	89.344	49.15	40.194	54.000	Average

Note:

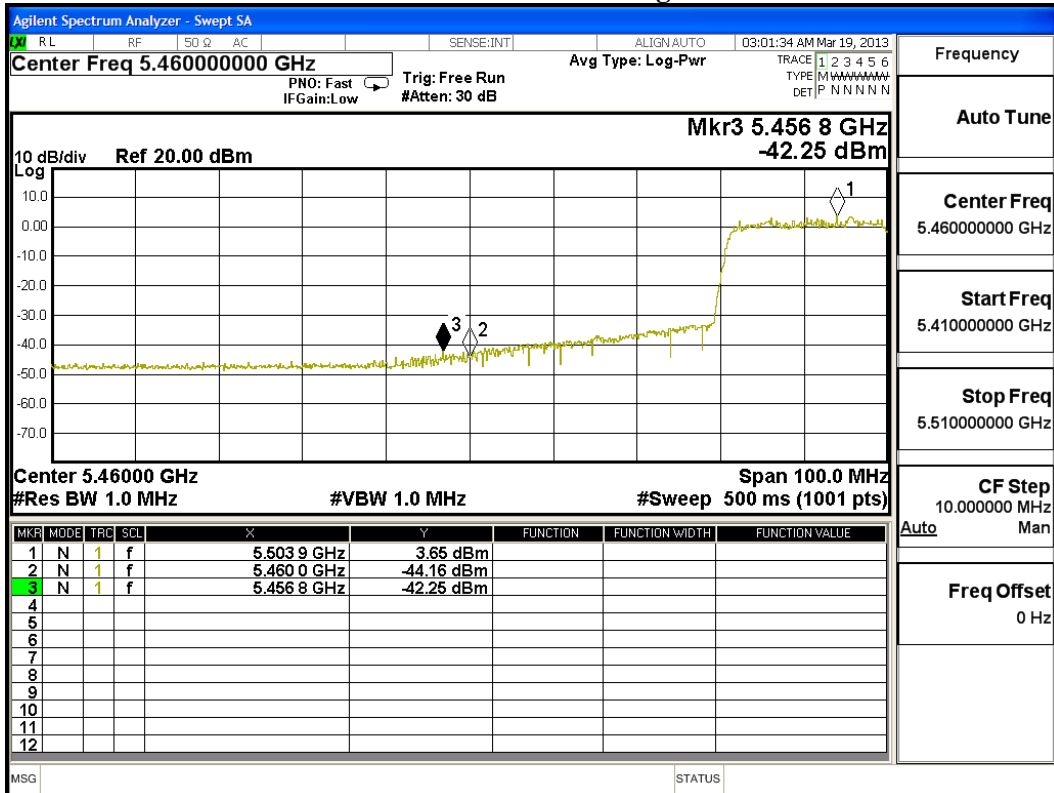
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

F = Fundantamental field Strength (Peak or Average)

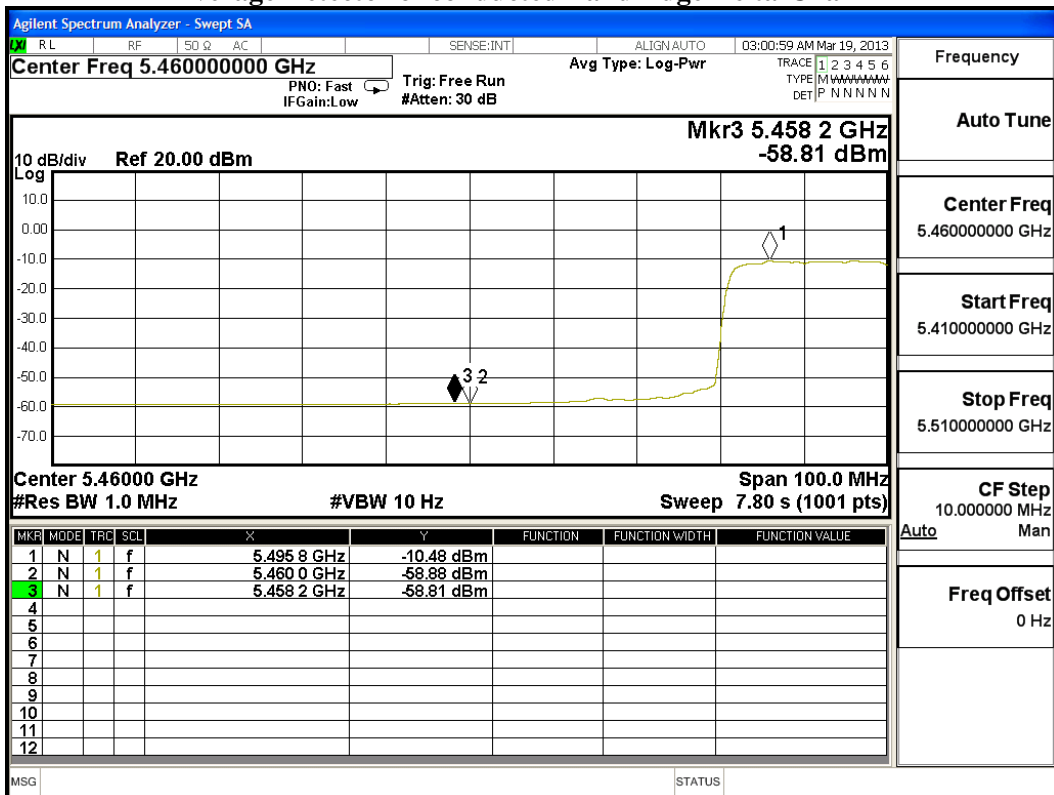
$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta-Chain A



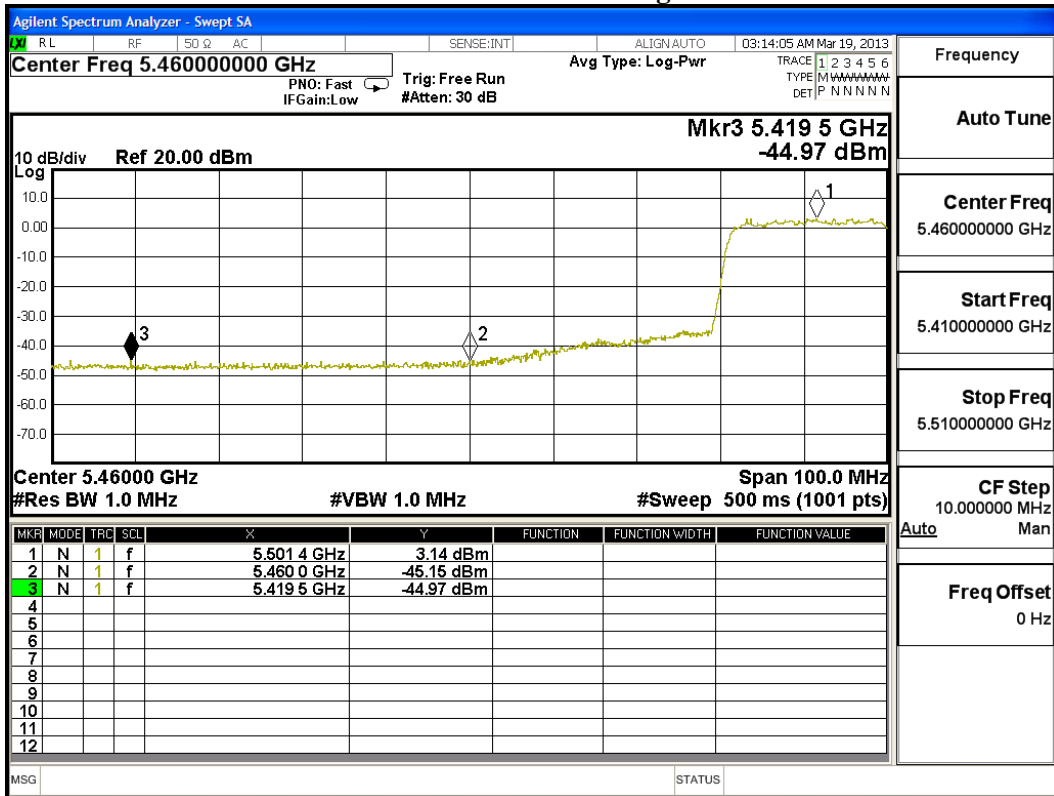
Frequency	
Auto Tune	
Center Freq	5.46000000 GHz
Start Freq	5.41000000 GHz
Stop Freq	5.51000000 GHz
CF Step	10.000000 MHz
Auto	Man
Freq Offset	0 Hz

### Average Detector of conducted Band Edge Delta-Chain A



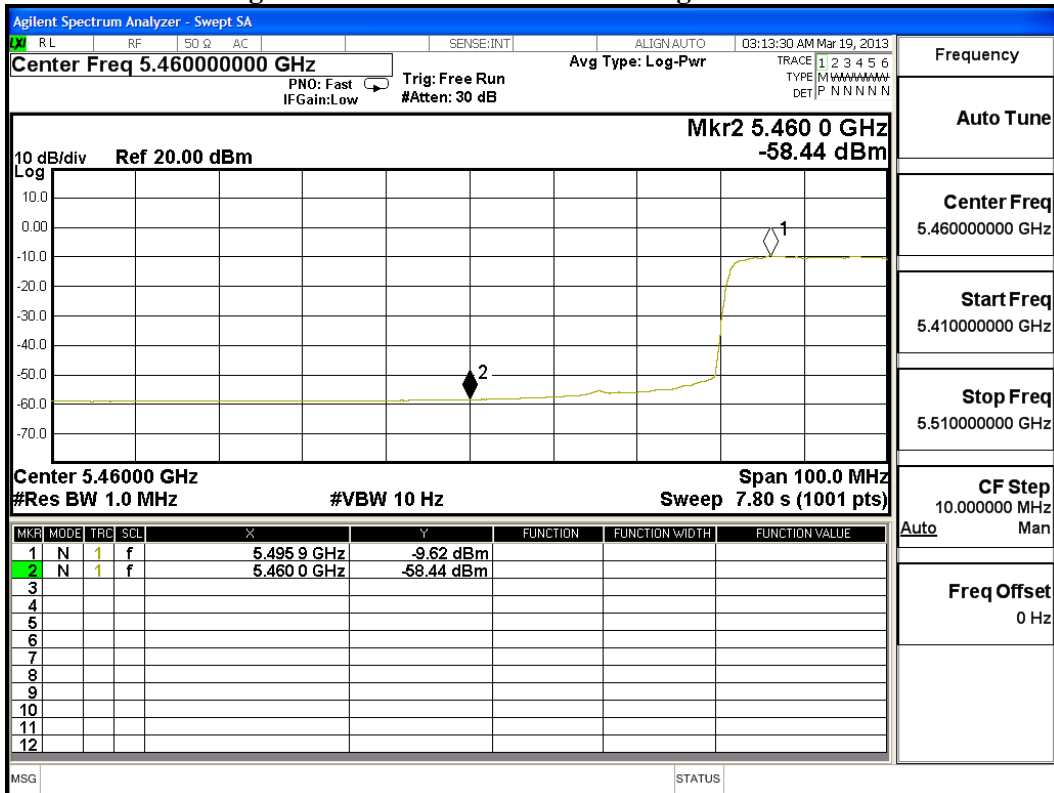
Frequency	
Auto Tune	
Center Freq	5.46000000 GHz
Start Freq	5.41000000 GHz
Stop Freq	5.51000000 GHz
CF Step	10.000000 MHz
Auto	Man
Freq Offset	0 Hz

### Peak Detector of conducted Band Edge Delta-Chain B



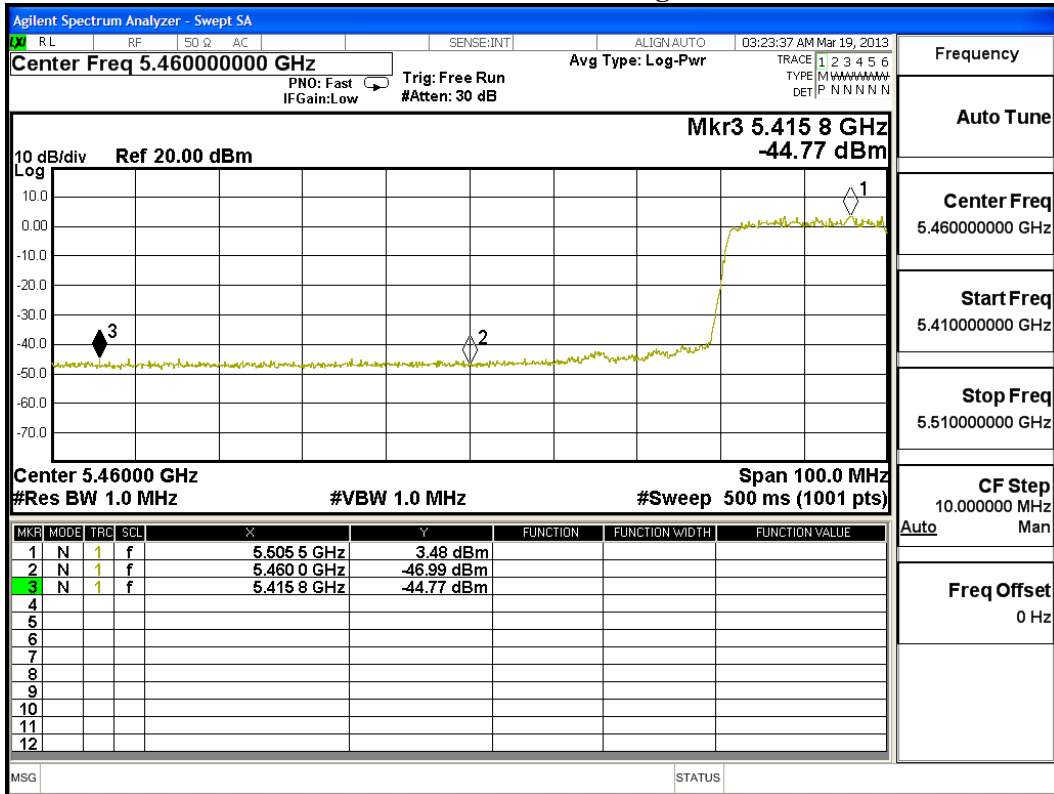
Frequency	
Auto Tune	
Center Freq	5.46000000 GHz
Start Freq	5.41000000 GHz
Stop Freq	5.51000000 GHz
CF Step	10.000000 MHz
Auto	Man
Freq Offset	0 Hz

### Average Detector of conducted Band Edge Delta-Chain B

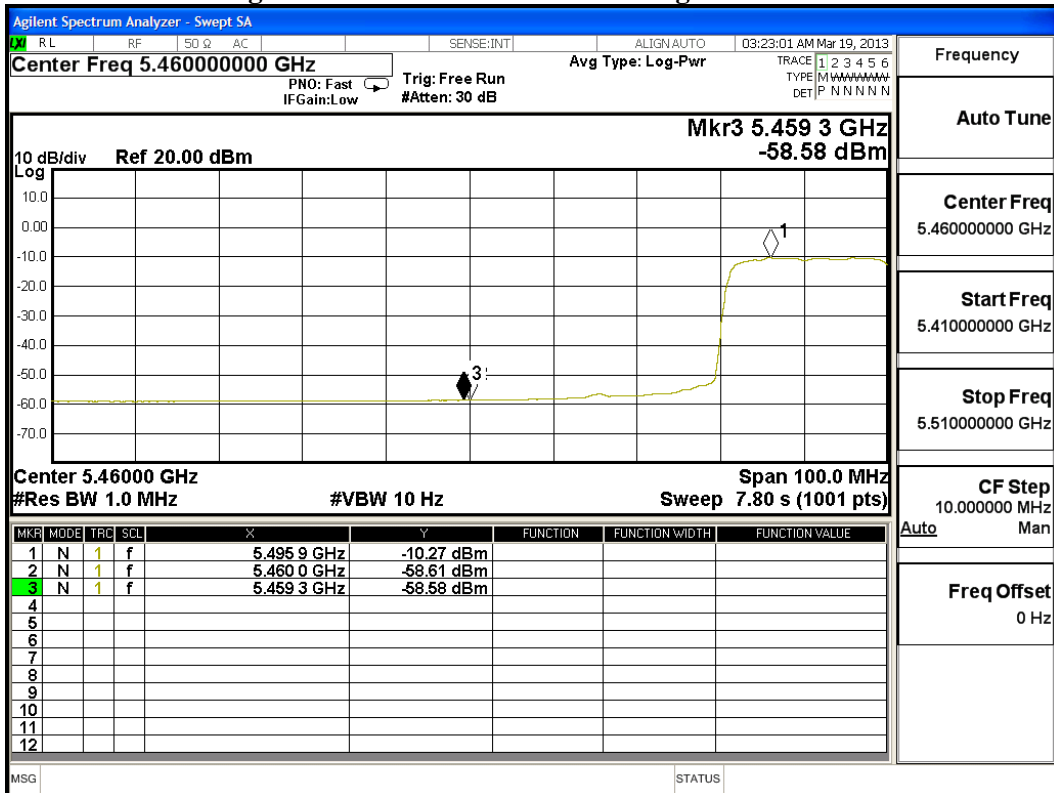


Frequency	
Auto Tune	
Center Freq	5.46000000 GHz
Start Freq	5.41000000 GHz
Stop Freq	5.51000000 GHz
CF Step	10.000000 MHz
Auto	Man
Freq Offset	0 Hz

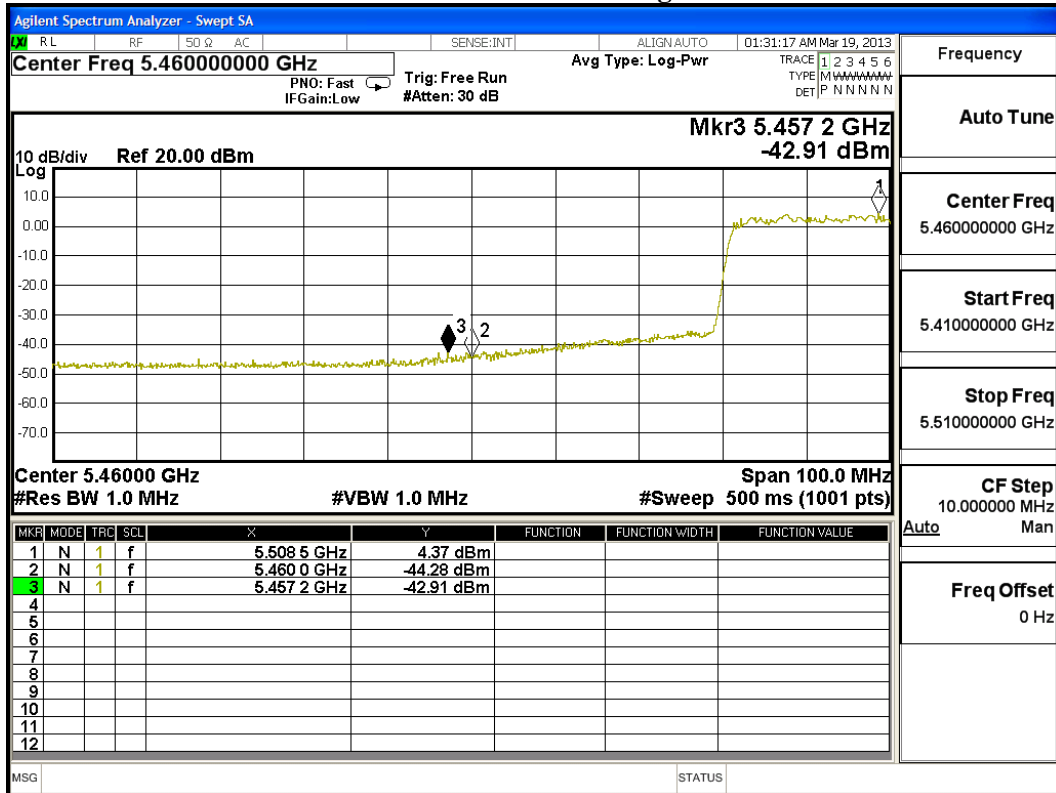
### Peak Detector of conducted Band Edge Delta-Chain C



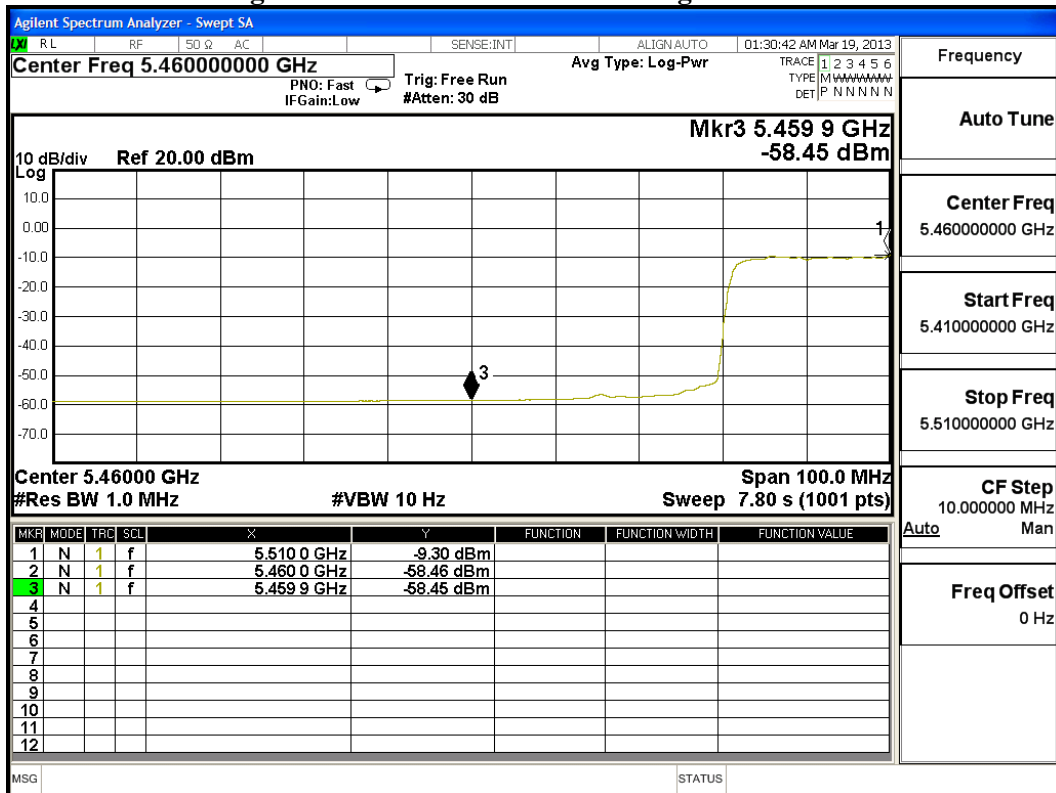
### Average Detector of conducted Band Edge Delta-Chain C



### Peak Detector of conducted Band Edge Delta-Chain D



### Average Detector of conducted Band Edge Delta-Chain D

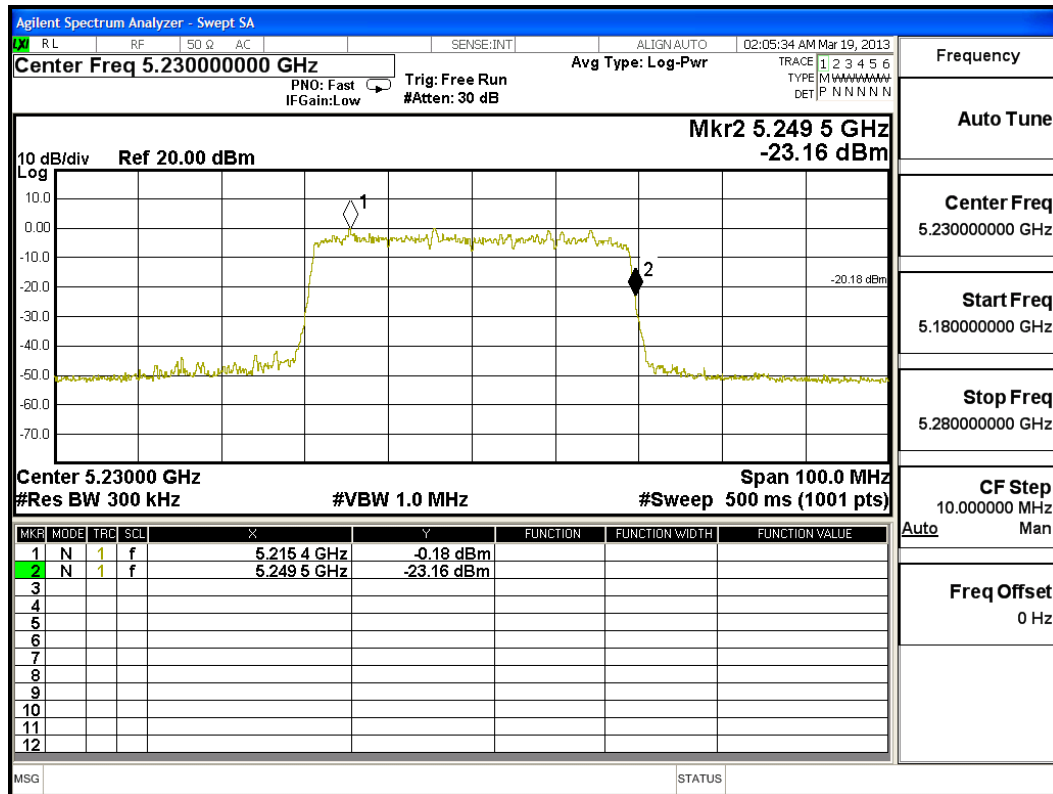


Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - Channel 46

**Chain A**

Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
5230	5249.50	<5250	PASS

NOTE: Accordance with 15.215 requirement.

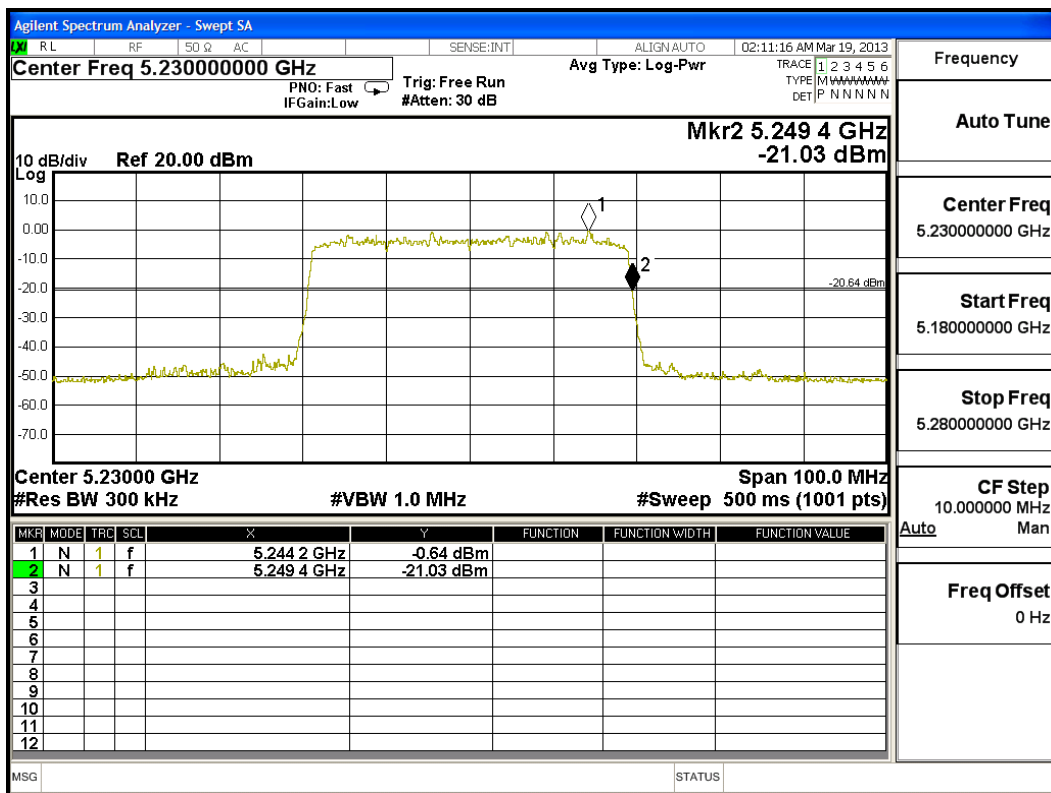


Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - Channel 46

**Chain B**

Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
5230	5249.40	<5250	PASS

NOTE: Accordance with 15.215 requirement.

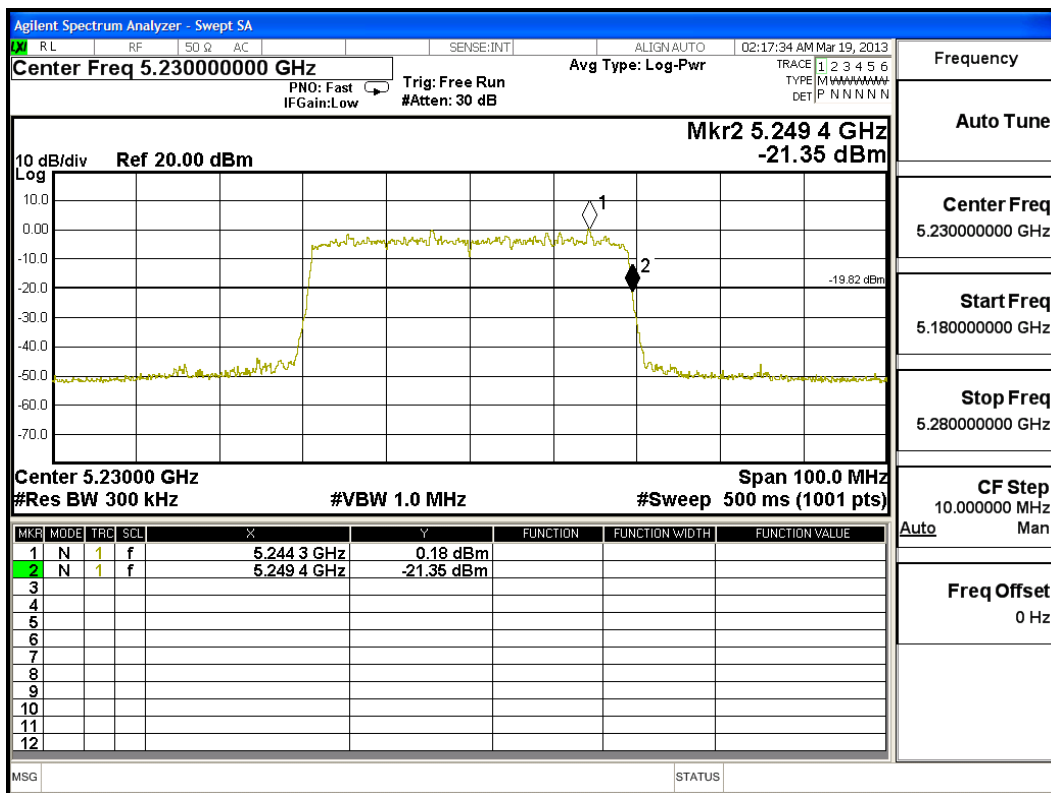


Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - Channel 46

**Chain C**

Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
5230	5249.40	<5250	PASS

NOTE: Accordance with 15.215 requirement.



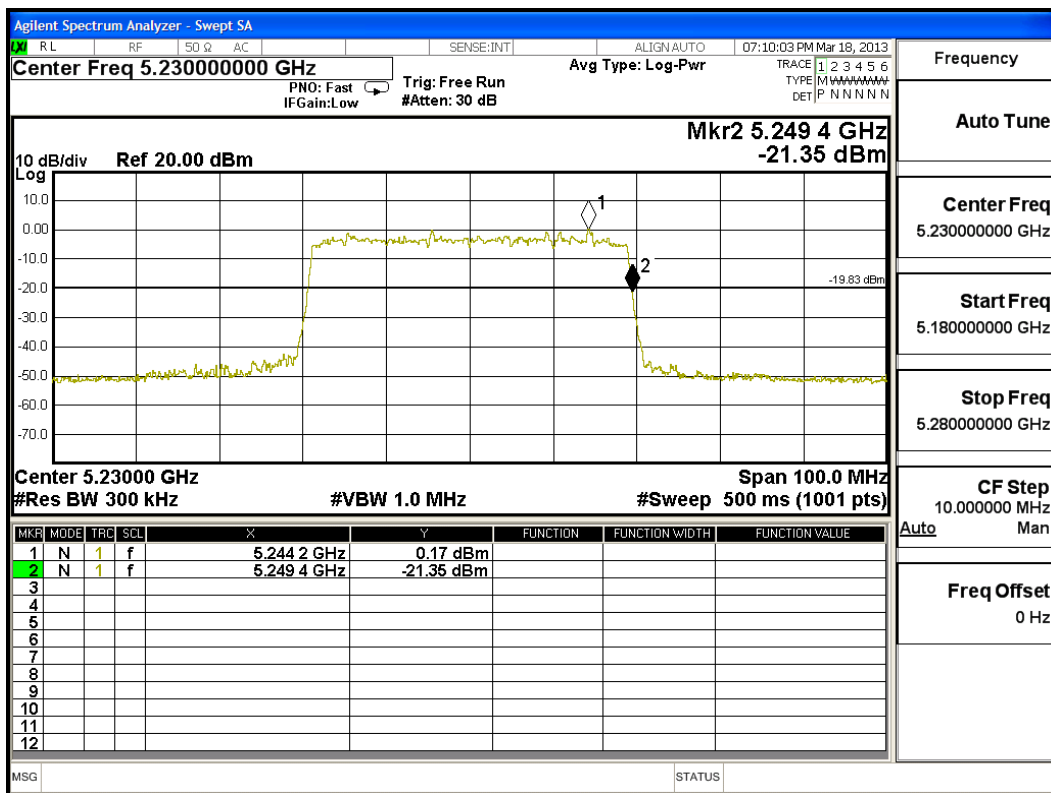


Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - Channel 46

**Chain D**

Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
5230	5249.40	<5250	PASS

NOTE: Accordance with 15.215 requirement.

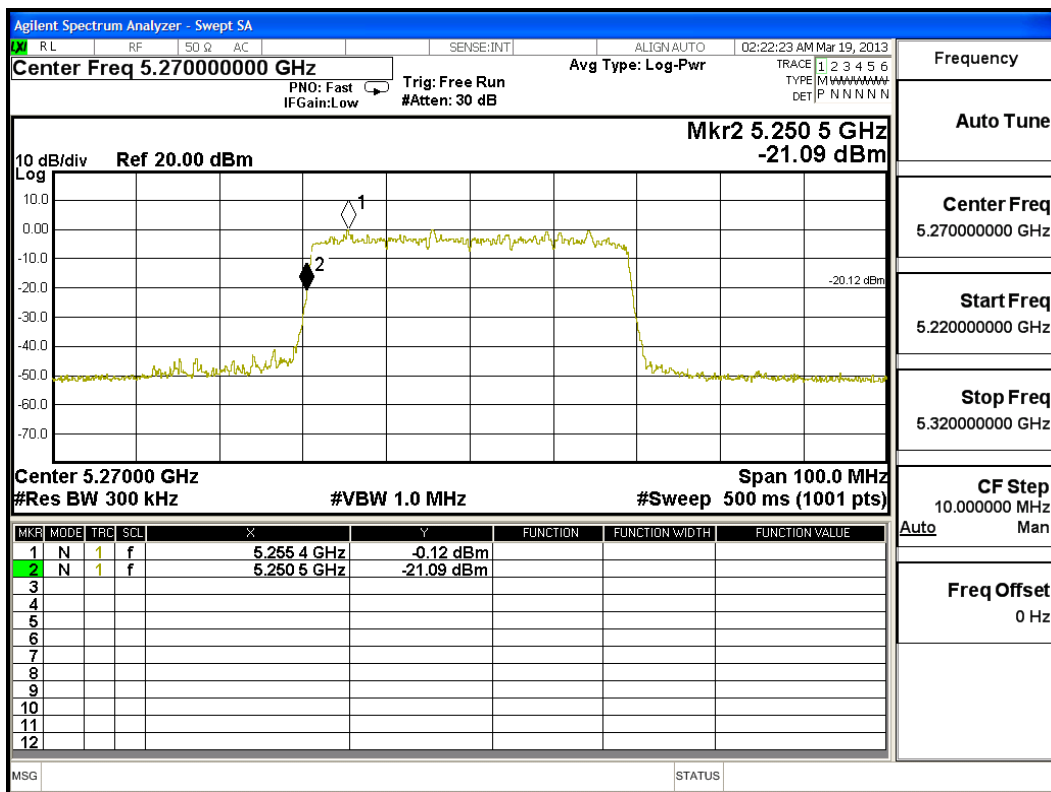


Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - Channel 54

**Chain A**

Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
5270	5250.50	>5250	PASS

NOTE: Accordance with 15.215 requirement.

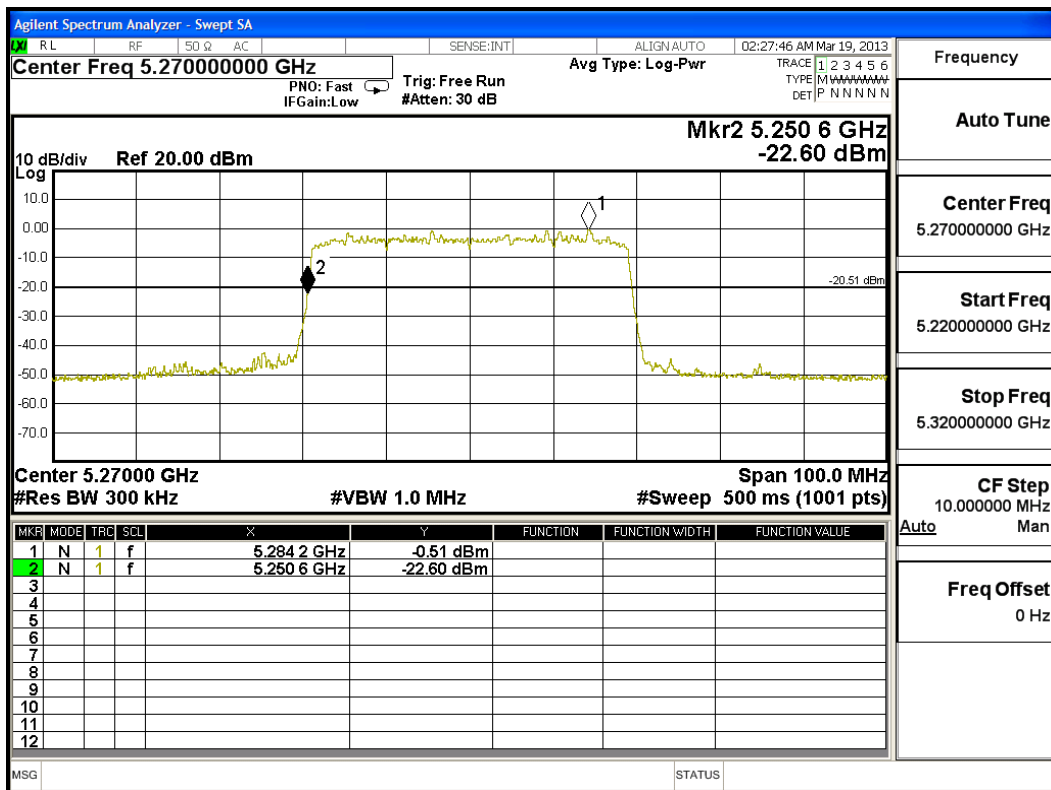


Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - Channel 54

**Chain B**

Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
5270	5250.60	>5250	PASS

NOTE: Accordance with 15.215 requirement.

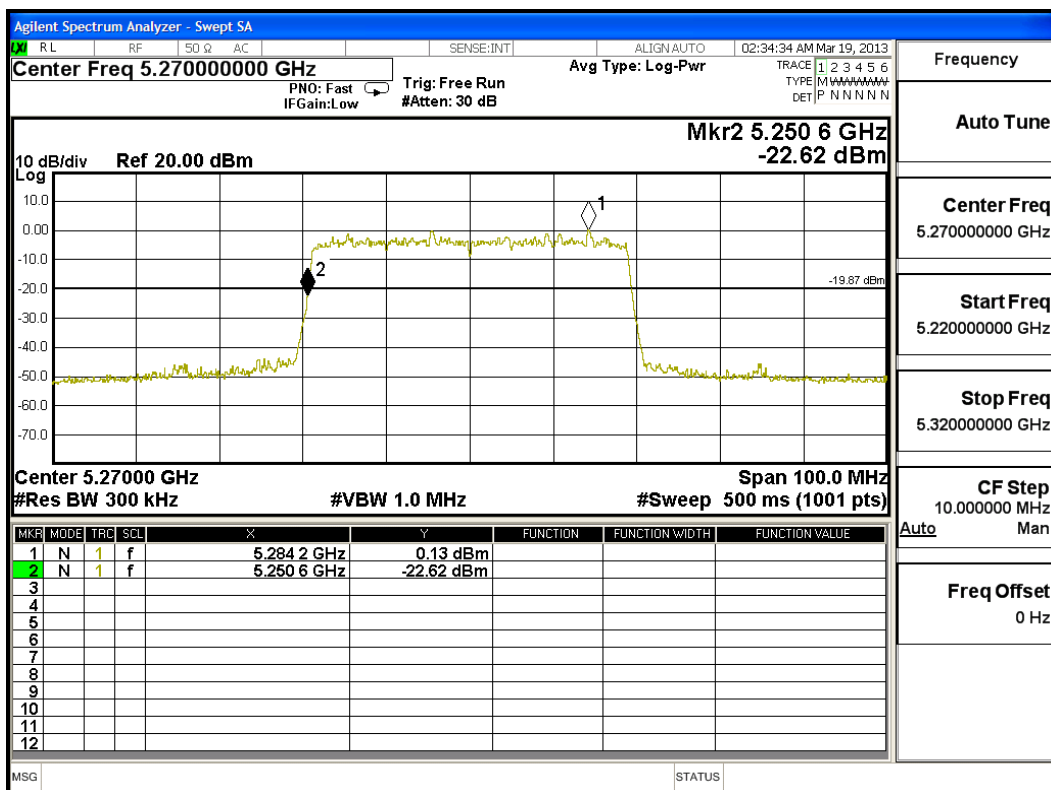


Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - Channel 54

**Chain C**

Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
5270	5250.60	>5250	PASS

NOTE: Accordance with 15.215 requirement.

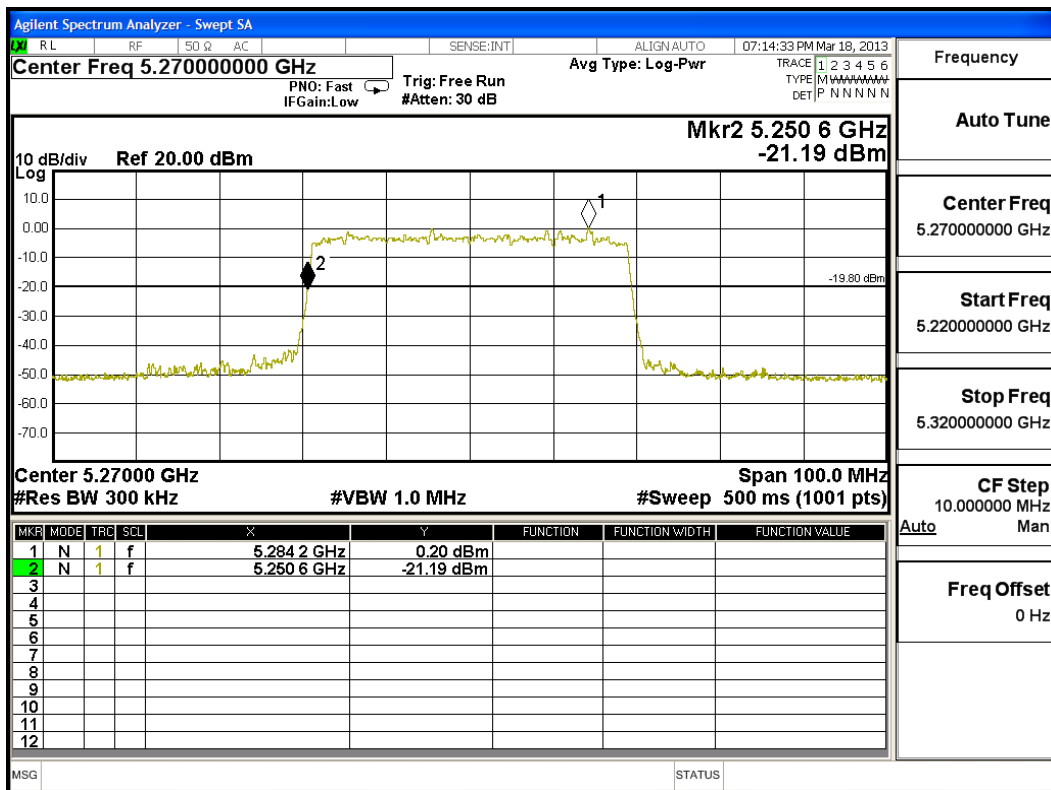


Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter - Channel 54

**Chain D**

Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
5270	5250.60	>5250	PASS

NOTE: Accordance with 15.215 requirement.



## 8. Frequency Stability

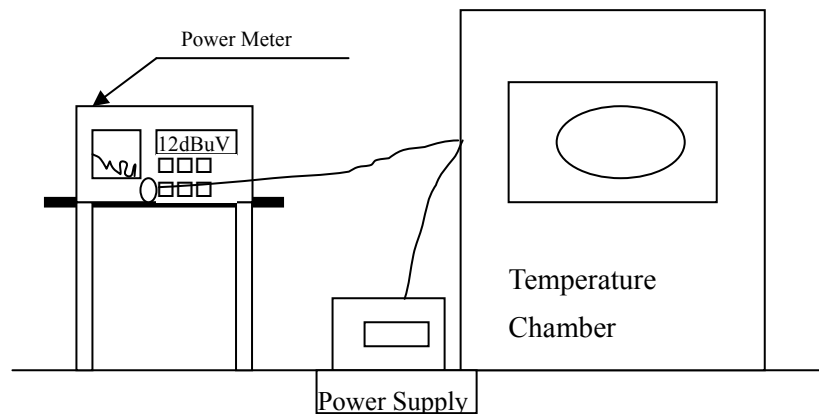
### 8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2012
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2012
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.

### 8.2. Test Setup



### 8.3. Limits

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

### 8.4. 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.

### 8.5. Uncertainty

± 150 Hz

## 8.6. Test Result of Frequency Stability

Product : Wireless 5 x 2 HD Matrix Transmitter  
 Test Item : Frequency Stability  
 Test Site : Temperature Chamber  
 Test Mode : Carrier Wave

### Chain A

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (20) °C	Vnom (120)V	38	5190.0000	5190.0072	-0.0072
		46	5230.0000	5230.0055	-0.0055
		54	5270.0000	5270.0019	-0.0019
		62	5310.0000	5310.0088	-0.0088
		102	5510.0000	5510.0067	-0.0067
		110	5550.0000	5550.0047	-0.0047
		134	5670.0000	5670.0017	-0.0017
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (50) °C	Vnom (138)V	38	5190.0000	5190.0062	-0.0062
		46	5230.0000	5230.0026	-0.0026
		54	5270.0000	5270.0074	-0.0074
		62	5310.0000	5310.0049	-0.0049
		102	5510.0000	5510.0047	-0.0047
		110	5550.0000	5550.0044	-0.0044
		134	5670.0000	5670.0076	-0.0076
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (50) °C	Vnom (93.5)V	38	5190.0000	5190.0036	-0.0036
		46	5230.0000	5230.0076	-0.0076
		54	5270.0000	5270.0020	-0.0020
		62	5310.0000	5310.0033	-0.0033
		102	5510.0000	5510.0039	-0.0039
		110	5550.0000	5550.0049	-0.0049
		134	5670.0000	5670.0077	-0.0077

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (0) °C	Vnom (126.5)V	38	5190.0000	5190.0002	-0.0002
		46	5230.0000	5230.0065	-0.0065
		54	5270.0000	5270.0023	-0.0023
		62	5310.0000	5310.0016	-0.0016
		102	5510.0000	5510.0027	-0.0027
		110	5550.0000	5550.0029	-0.0029
		134	5670.0000	5670.0005	-0.0005
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (0) °C	Vnom (102)V	38	5190.0000	5190.0016	-0.0016
		46	5230.0000	5230.0026	-0.0026
		54	5270.0000	5270.0016	-0.0016
		62	5310.0000	5310.0029	-0.0029
		102	5510.0000	5510.0003	-0.0003
		110	5550.0000	5550.0049	-0.0049
		134	5670.0000	5670.0005	-0.0005



**Chain B**

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (20) °C	Vnom (120)V	38	5190.0000	5190.0067	-0.0067
		46	5230.0000	5230.0064	-0.0064
		54	5270.0000	5270.0047	-0.0047
		62	5310.0000	5310.0067	-0.0067
		102	5510.0000	5510.0055	-0.0055
		110	5550.0000	5550.0008	-0.0008
		134	5670.0000	5670.0039	-0.0039
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (50) °C	Vnom (138)V	38	5190.0000	5190.0064	-0.0064
		46	5230.0000	5230.0087	-0.0087
		54	5270.0000	5270.0034	-0.0034
		62	5310.0000	5310.0490	-0.0490
		102	5510.0000	5510.0059	-0.0059
		110	5550.0000	5550.0011	-0.0011
		134	5670.0000	5670.0034	-0.0034
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (50) °C	Vnom (93.5)V	38	5190.0000	5190.0074	-0.0074
		46	5230.0000	5230.0077	-0.0077
		54	5270.0000	5270.0029	-0.0029
		62	5310.0000	5310.0049	-0.0049
		102	5510.0000	5510.0069	-0.0069
		110	5550.0000	5550.0065	-0.0065
		134	5670.0000	5670.0034	-0.0034

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (0) °C	Vnom (126.5)V	38	5190.0000	5190.0019	-0.0019
		46	5230.0000	5230.0046	-0.0046
		54	5270.0000	5270.0016	-0.0016
		62	5310.0000	5310.0026	-0.0026
		102	5510.0000	5510.0009	-0.0009
		110	5550.0000	5550.0003	-0.0003
		134	5670.0000	5670.0055	-0.0055
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (0) °C	Vnom (102)V	38	5190.0000	5190.0037	-0.0037
		46	5230.0000	5230.0016	-0.0016
		54	5270.0000	5270.0089	-0.0089
		62	5310.0000	5310.0049	-0.0049
		102	5510.0000	5510.0015	-0.0015
		110	5550.0000	5550.0049	-0.0049
		134	5670.0000	5670.0017	-0.0017

**Chain C**

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (20) °C	Vnom (120)V	38	5190.0000	5190.0037	-0.0037
		46	5230.0000	5230.0035	-0.0035
		54	5270.0000	5270.0029	-0.0029
		62	5310.0000	5310.0049	-0.0049
		102	5510.0000	5510.0077	-0.0077
		110	5550.0000	5550.0065	-0.0065
		134	5670.0000	5670.0069	-0.0069
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (50) °C	Vnom (138)V	38	5190.0000	5190.0075	-0.0075
		46	5230.0000	5230.0062	-0.0062
		54	5270.0000	5270.0049	-0.0049
		62	5310.0000	5310.0034	-0.0034
		102	5510.0000	5510.0086	-0.0086
		110	5550.0000	5550.0046	-0.0046
		134	5670.0000	5670.0027	-0.0027
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (50) °C	Vnom (93.5)V	38	5190.0000	5190.0016	-0.0016
		46	5230.0000	5230.0022	-0.0022
		54	5270.0000	5270.0039	-0.0039
		62	5310.0000	5310.0016	-0.0016
		102	5510.0000	5510.0049	-0.0049
		110	5550.0000	5550.0034	-0.0034
		134	5670.0000	5670.0017	-0.0017

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (0) °C	Vnom (126.5)V	38	5190.0000	5190.0026	-0.0026
		46	5230.0000	5230.0013	-0.0013
		54	5270.0000	5270.0034	-0.0034
		62	5310.0000	5310.0037	-0.0037
		102	5510.0000	5510.0029	-0.0029
		110	5550.0000	5550.0026	-0.0026
		134	5670.0000	5670.0027	-0.0027
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (0) °C	Vnom (102)V	38	5190.0000	5190.0033	-0.0033
		46	5230.0000	5230.0031	-0.0031
		54	5270.0000	5270.0025	-0.0025
		62	5310.0000	5310.0076	-0.0076
		102	5510.0000	5510.0035	-0.0035
		110	5550.0000	5550.0048	-0.0048
		134	5670.0000	5670.0026	-0.0026

**Chain D**

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (20) °C	Vnom (120)V	38	5190.0000	5190.0004	-0.0004
		46	5230.0000	5230.0085	-0.0085
		54	5270.0000	5270.0063	-0.0063
		62	5310.0000	5310.0039	-0.0039
		102	5510.0000	5510.0055	-0.0055
		110	5550.0000	5550.0011	-0.0011
		134	5670.0000	5670.0037	-0.0037
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (50) °C	Vnom (138)V	38	5190.0000	5190.0061	-0.0061
		46	5230.0000	5230.0087	-0.0087
		54	5270.0000	5270.0013	-0.0013
		62	5310.0000	5310.0030	-0.0030
		102	5510.0000	5510.0055	-0.0055
		110	5550.0000	5550.0011	-0.0011
		134	5670.0000	5670.0037	-0.0037
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (50) °C	Vnom (93.5)V	38	5190.0000	5190.0064	-0.0064
		46	5230.0000	5230.0067	-0.0067
		54	5270.0000	5270.0029	-0.0029
		62	5310.0000	5310.0039	-0.0039
		102	5510.0000	5510.0069	-0.0069
		110	5550.0000	5550.0066	-0.0066
		134	5670.0000	5670.0033	-0.0033

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (0) °C	Vnom (126.5)V	38	5190.0000	5190.0063	-0.0063
		46	5230.0000	5230.0066	-0.0066
		54	5270.0000	5270.0019	-0.0019
		62	5310.0000	5310.0068	-0.0068
		102	5510.0000	5510.0009	-0.0009
		110	5550.0000	5550.0055	-0.0055
		134	5670.0000	5670.0019	-0.0019
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	$\Delta F$ (MHz)
Tnom (0) °C	Vnom (102)V	38	5190.0000	5190.0036	-0.0036
		46	5230.0000	5230.0018	-0.0018
		54	5270.0000	5270.0037	-0.0037
		62	5310.0000	5310.0057	-0.0057
		102	5510.0000	5510.0015	-0.0015
		110	5550.0000	5550.0034	-0.0034
		134	5670.0000	5670.0068	-0.0068

## 9. EMI Reduction Method During Compliance Testing

No modification was made during testing.