

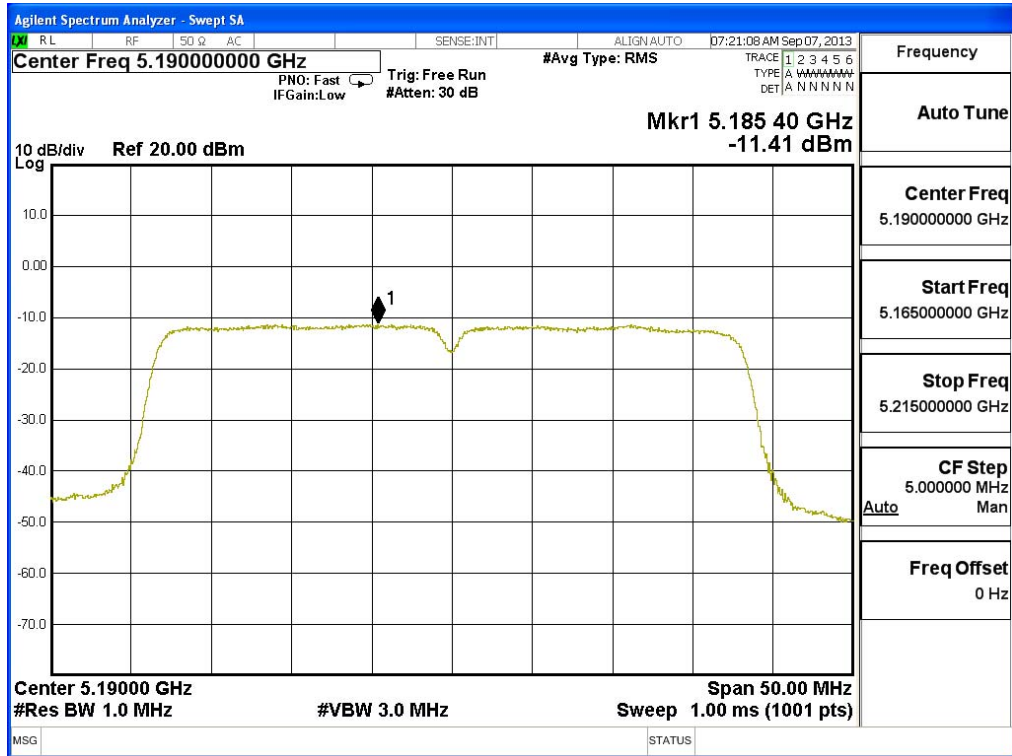
Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module  
 Test Item : Peak Power Spectral Density  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)

Channel Number	Frequency (MHz)	Chain	PPSD/MHz (dBm)	Total PPSD/MHz (dBm) <sub>1</sub>	Required Limit (dBm)	Result
38	5190	A	-11.41	-8.40	<3.86	Pass
		B	-11.58	-8.57	<3.86	Pass
46	5230	A	-11.88	-8.87	<3.86	Pass
		B	-10.92	-7.91	<3.86	Pass
54	5270	A	-10.72	-7.71	<10.68	Pass
		B	-9.99	-6.98	<10.68	Pass
62	5310	A	-12.43	-9.42	<10.68	Pass
		B	-10.59	-7.58	<10.68	Pass
102	5510	A	-11.27	-8.26	<11	Pass
		B	-11.77	-8.76	<11	Pass
110	5550	A	-13.45	-10.44	<11	Pass
		B	-13.28	-10.27	<11	Pass
134	5670	A	-14.13	-11.12	<11	Pass
		B	-2.83	0.18	<11	Pass

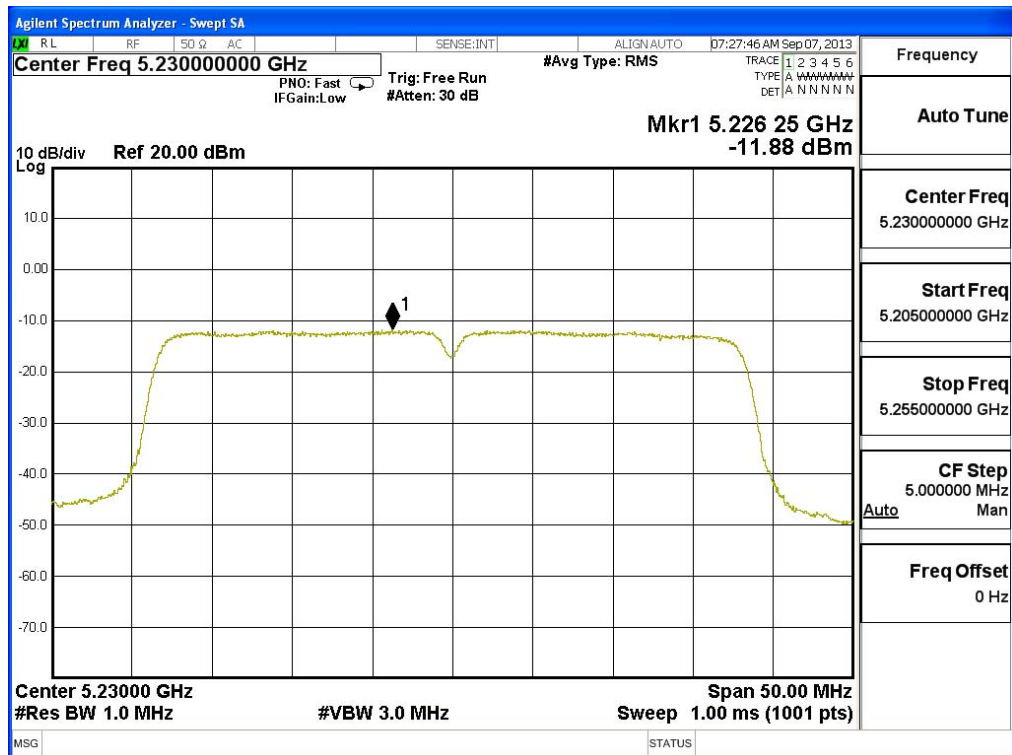
Note: 1. The quantity  $10 \cdot \log 2$  (two antennas) is added to the spectrum peak value according to document 662911 D01.

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

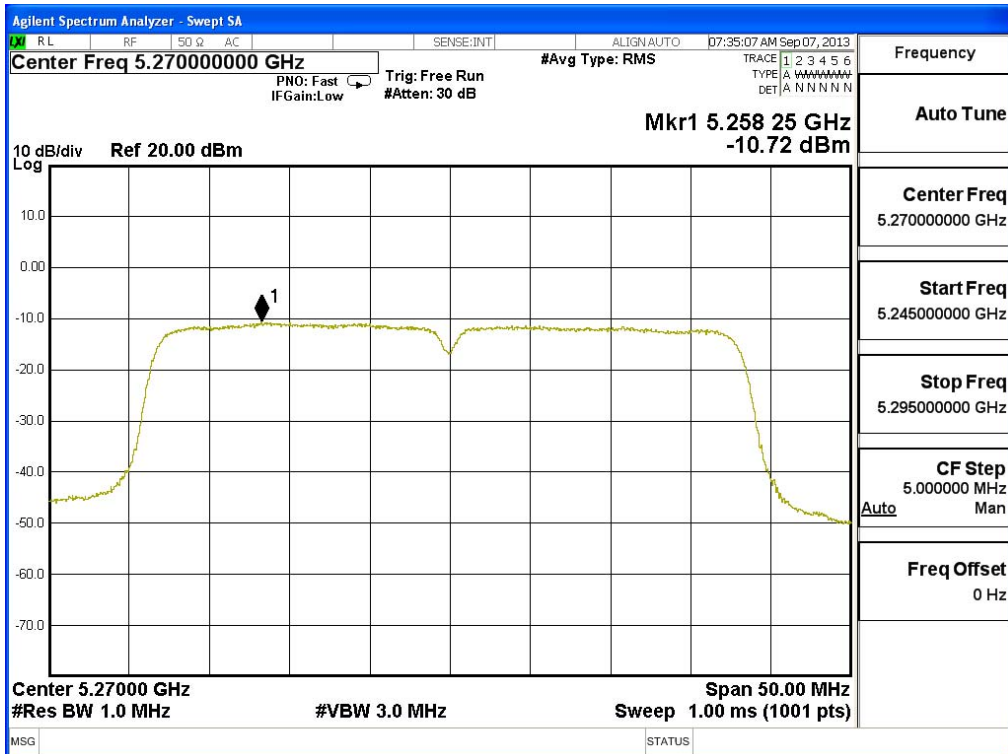
### Channel 38 – Chain A



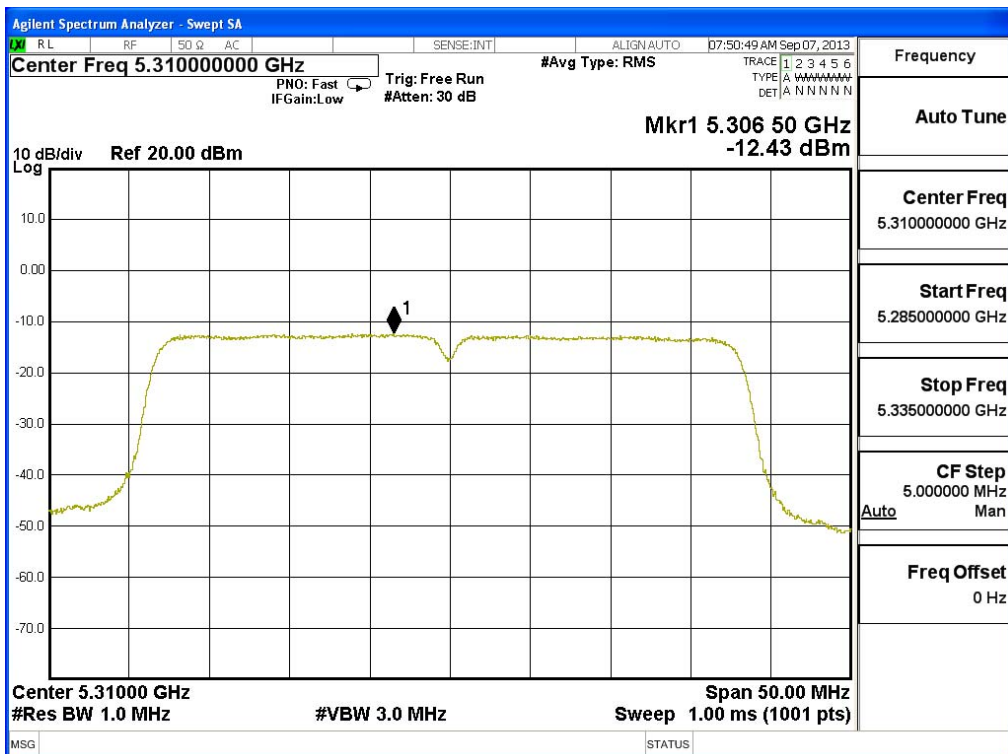
### Channel 46 – Chain A



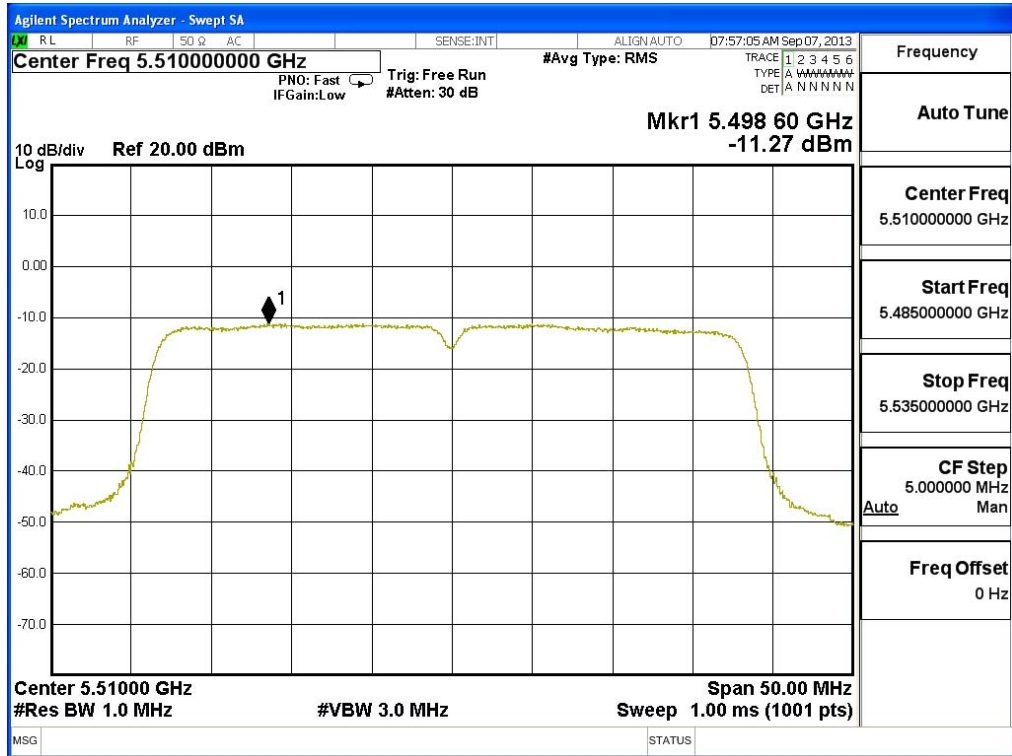
### Channel 54 – Chain A



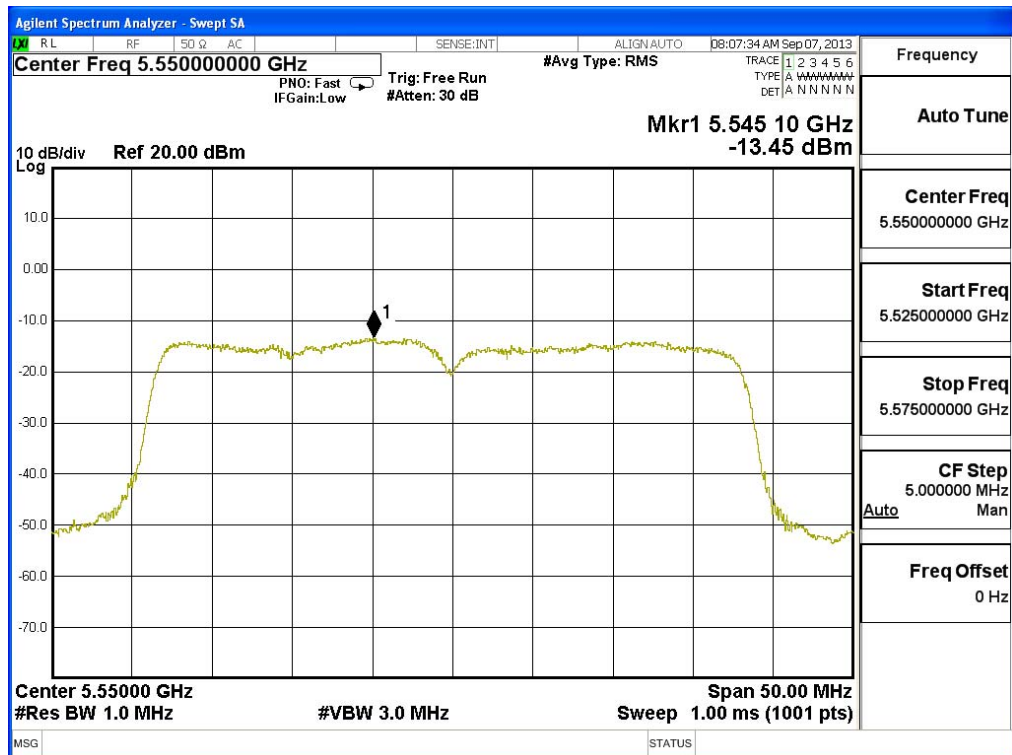
### Channel 62 – Chain A



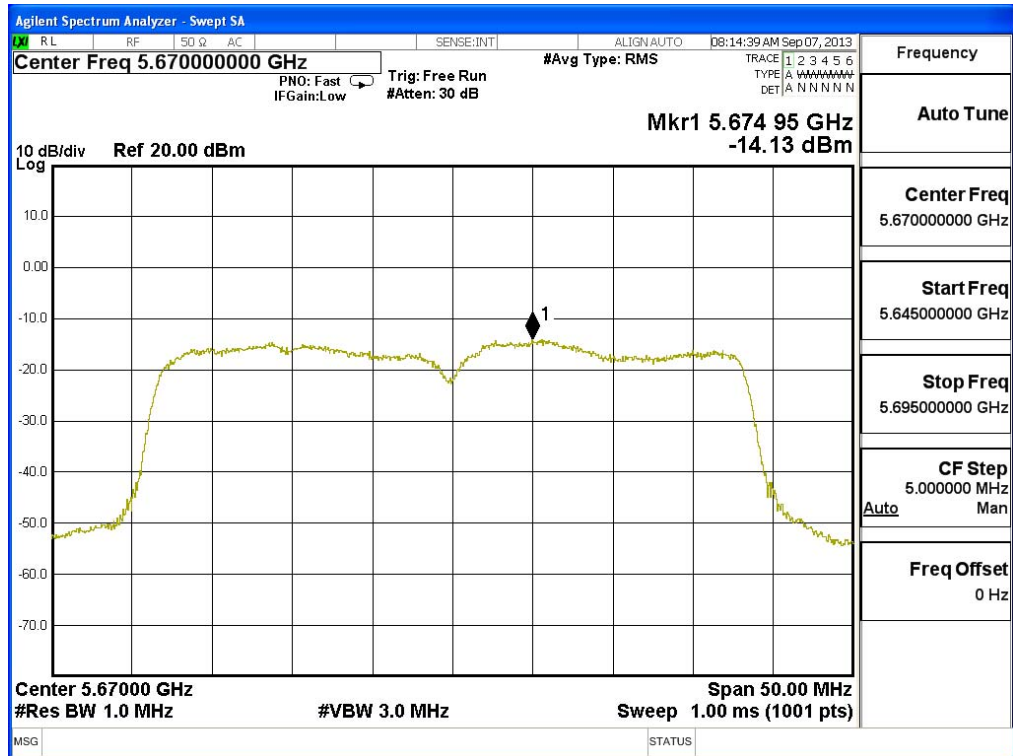
### Channel 102 – Chain A



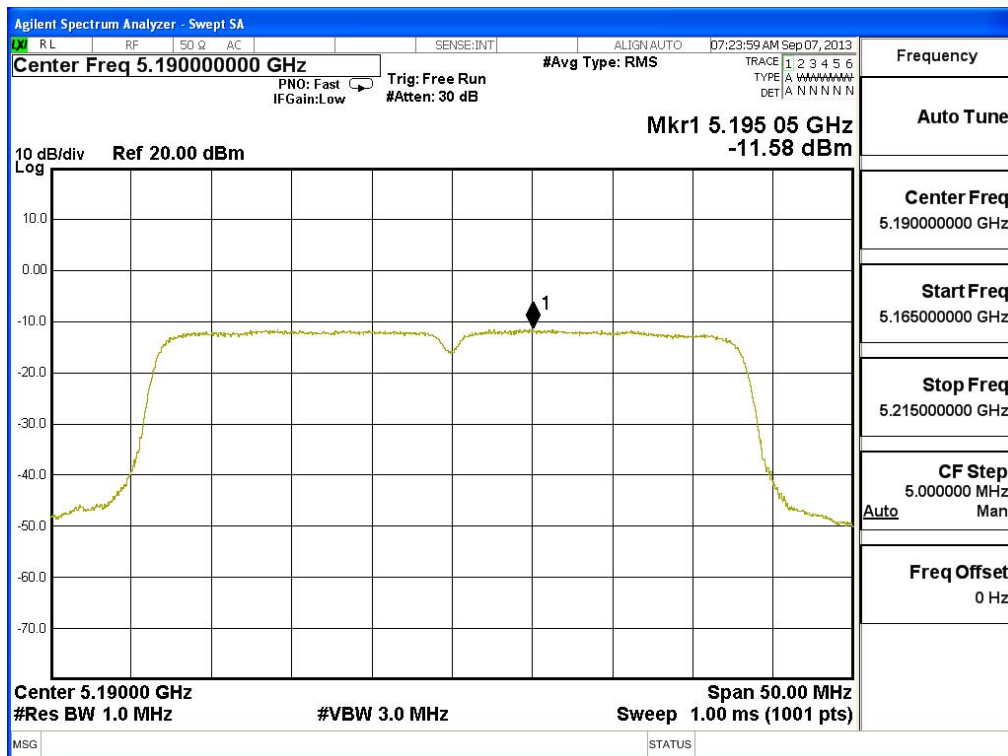
### Channel 110 – Chain A



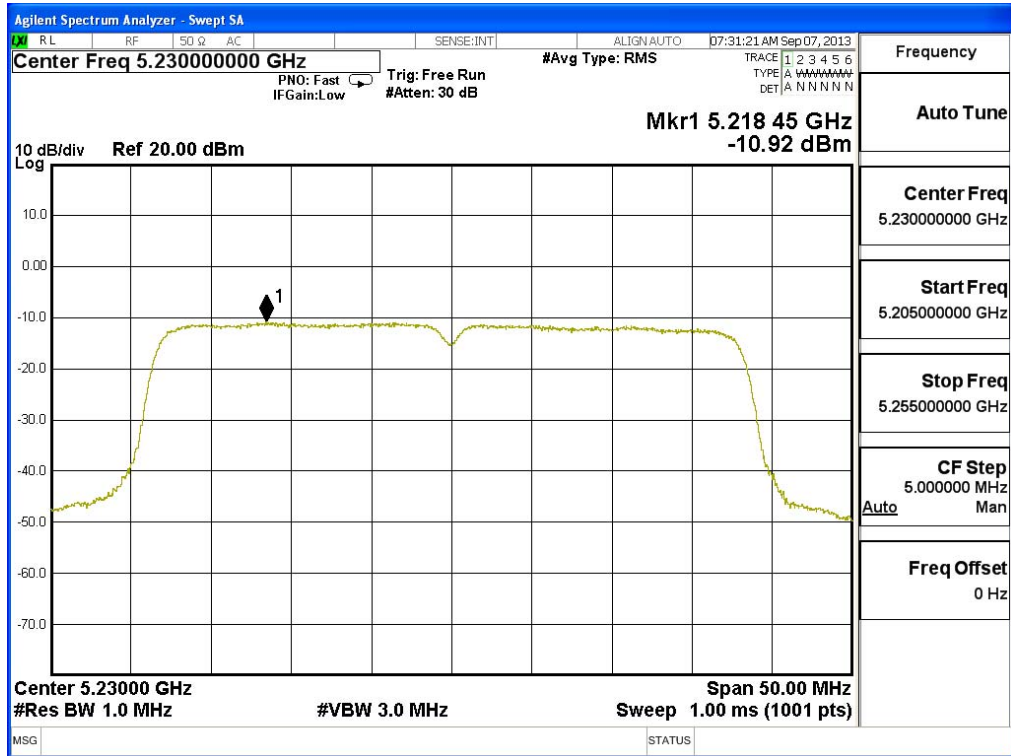
### Channel 134 – Chain A



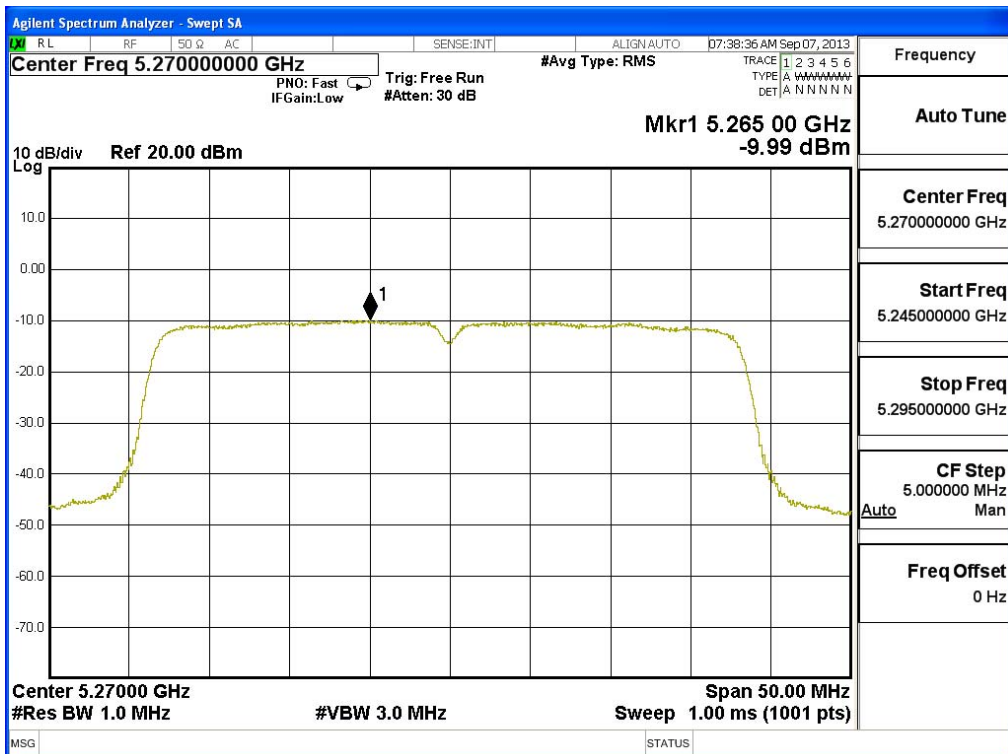
### Channel 38 – Chain B



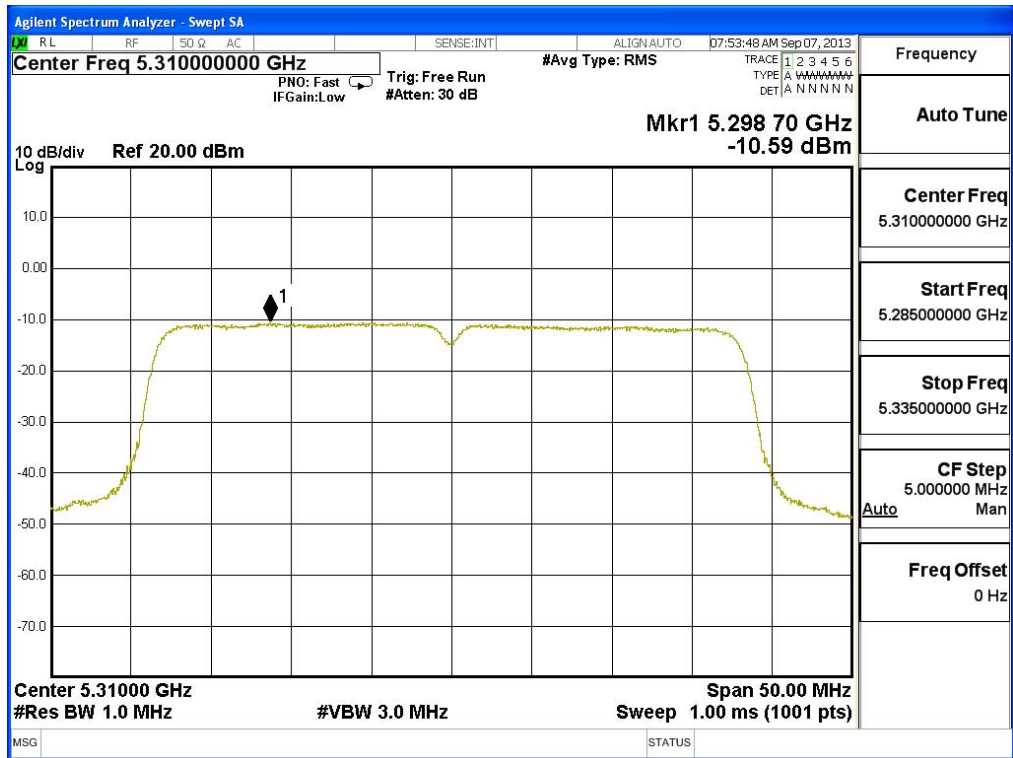
**Channel 46 – Chain B**



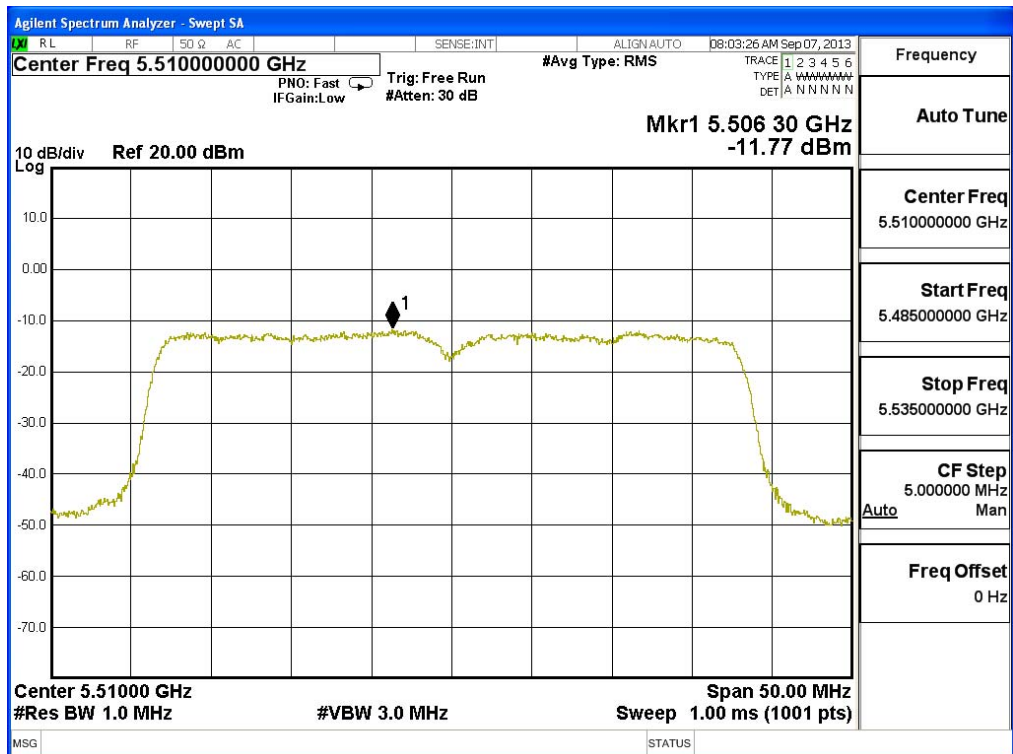
**Channel 54 – Chain B**



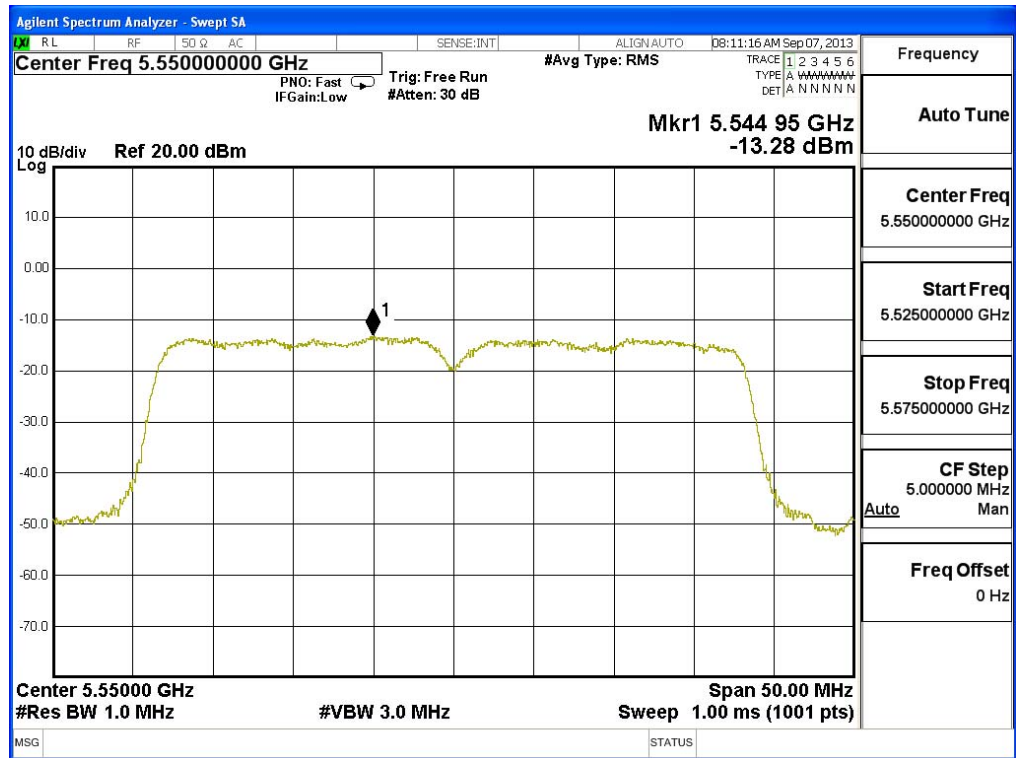
### Channel 62 – Chain B



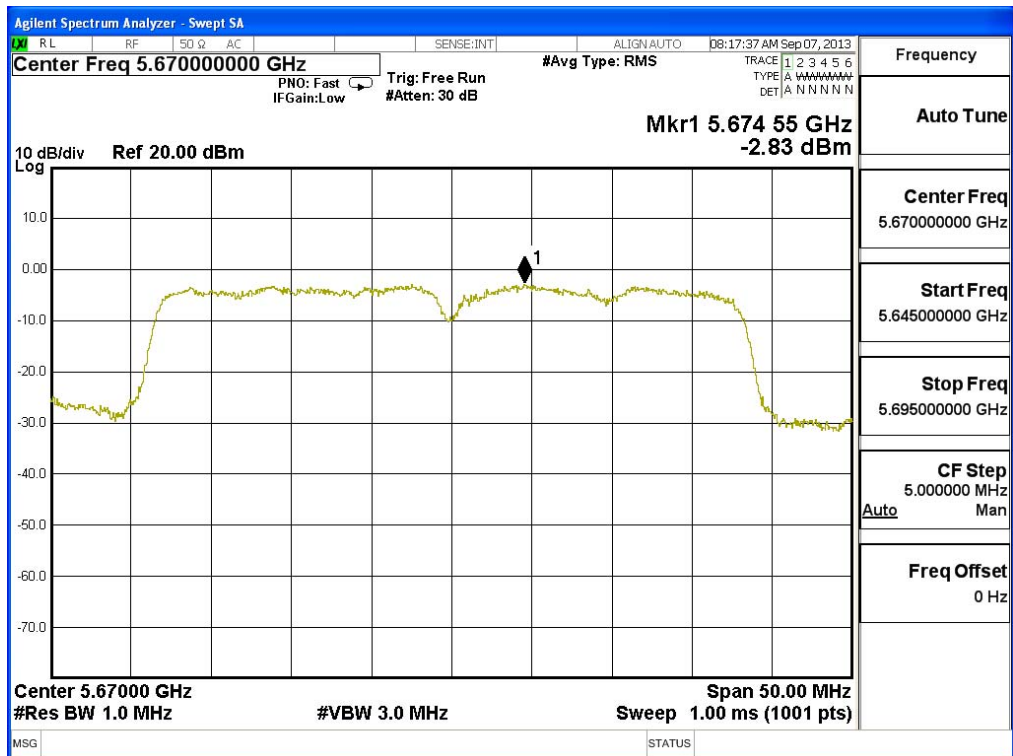
### Channel 102 – Chain B



Channel 110 – Chain B



Channel 134 – Chain B





**5. Peak Excursion**

**5.1. Test Equipment**

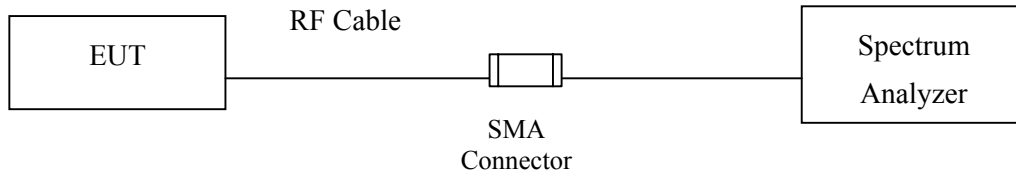
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2013
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2013
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2013

Note:

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

**5.2. Test Setup**

**Conduction Power Measurement**



**5.3. Limits**

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit 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 C63.4, 2010; tested to DTS test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

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

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

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

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

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

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

#### 5.5. Uncertainty

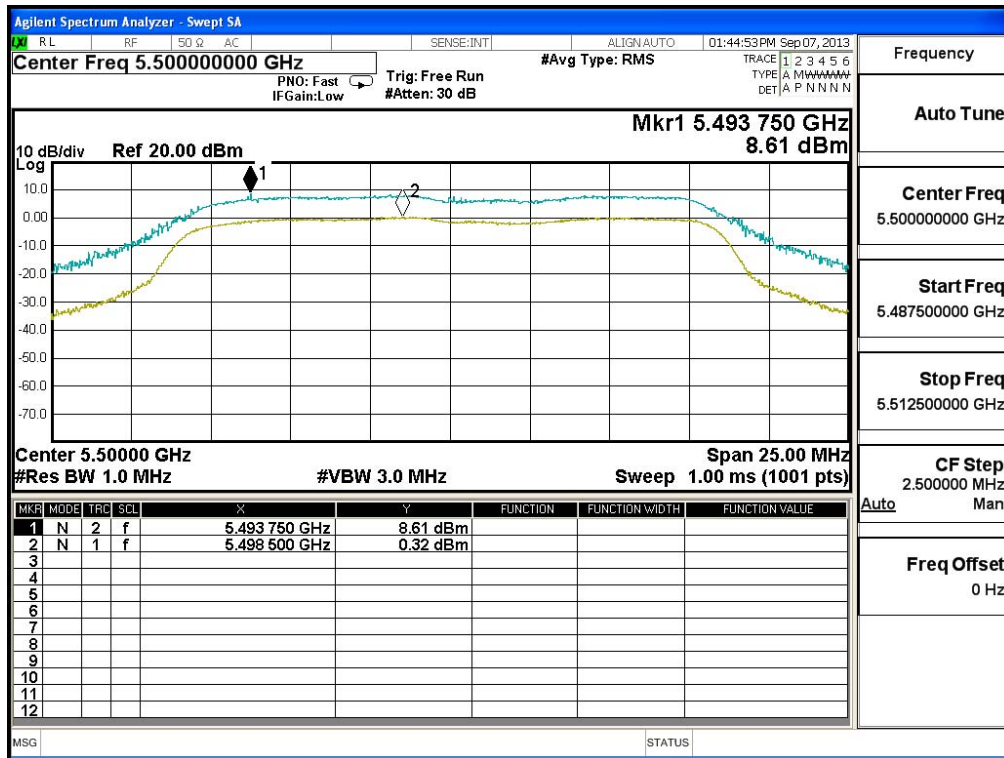
$\pm 1.27$  dB

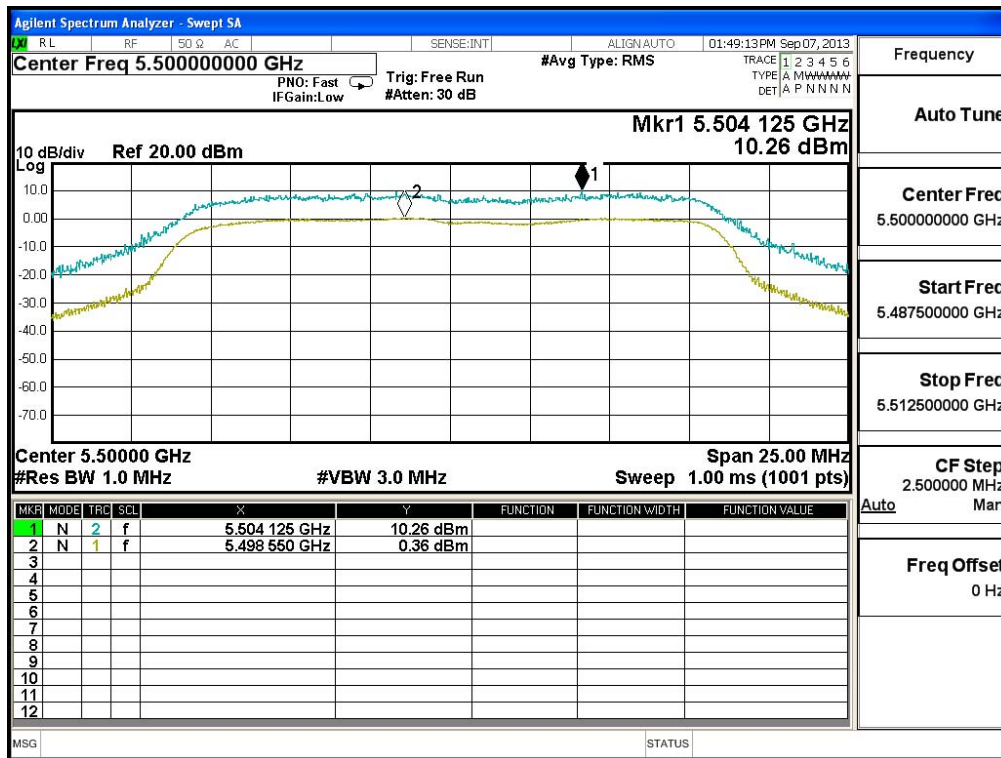
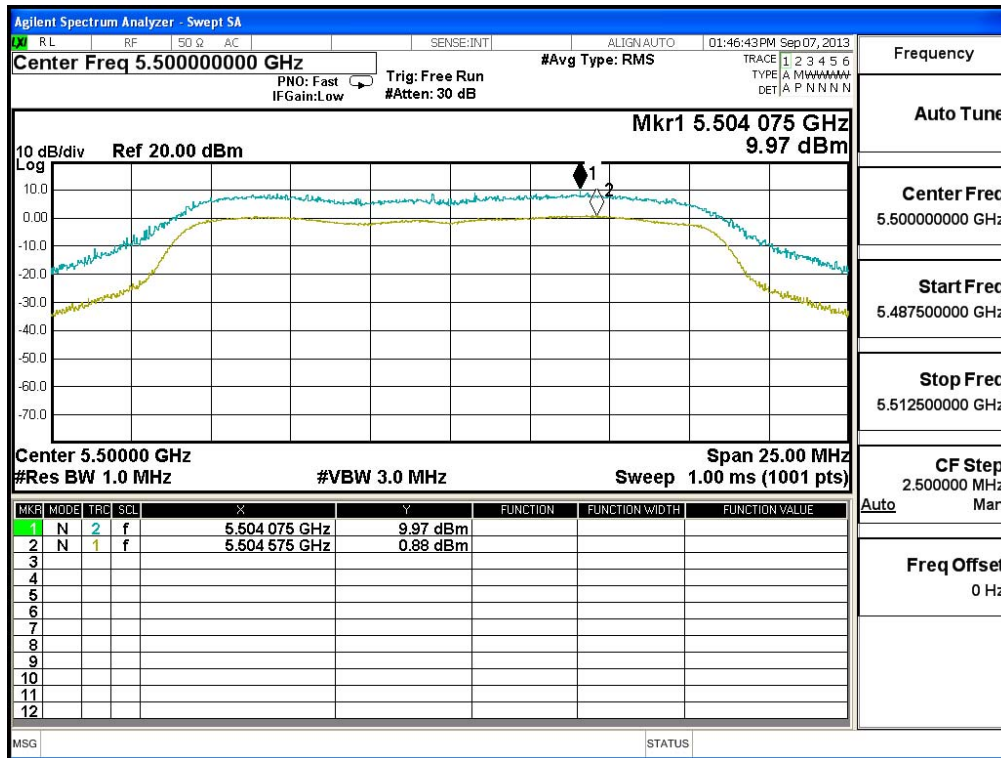
### 5.6. Test Result of Peak Excursion

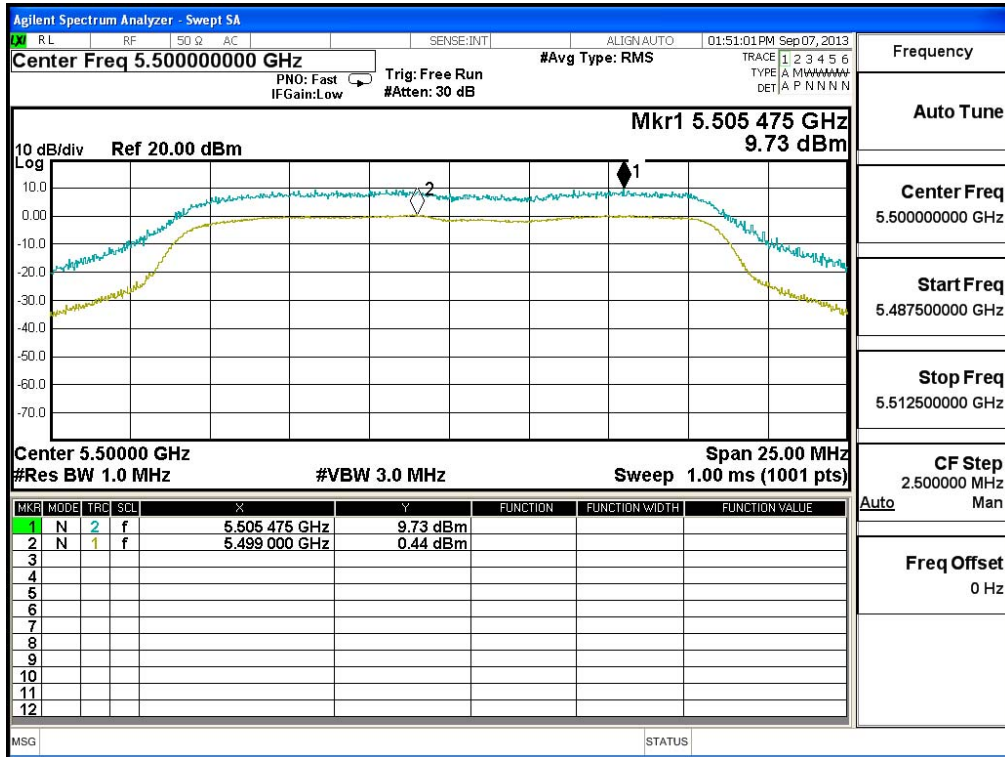
Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module  
 Test Item : Peak Excursion  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dB)	Required Limit (dB)	Result
100	5500	6	8.290	<13	Pass
		12	9.090	<13	Pass
		24	9.900	<13	Pass
		54	9.290	<13	Pass

Channel 100:





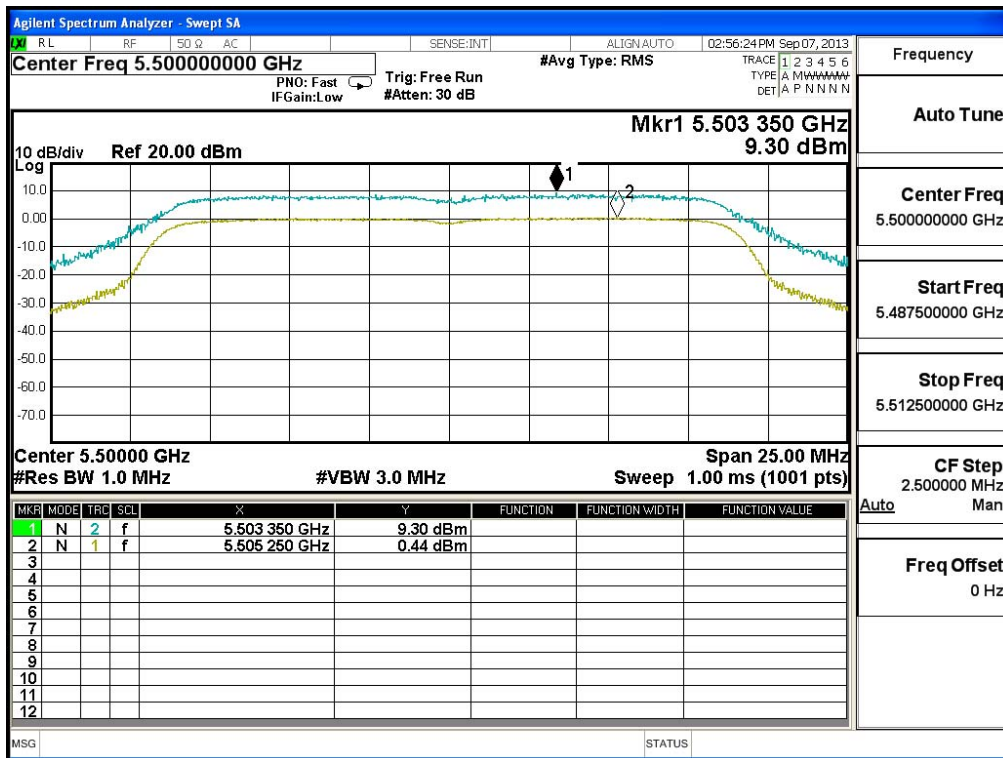


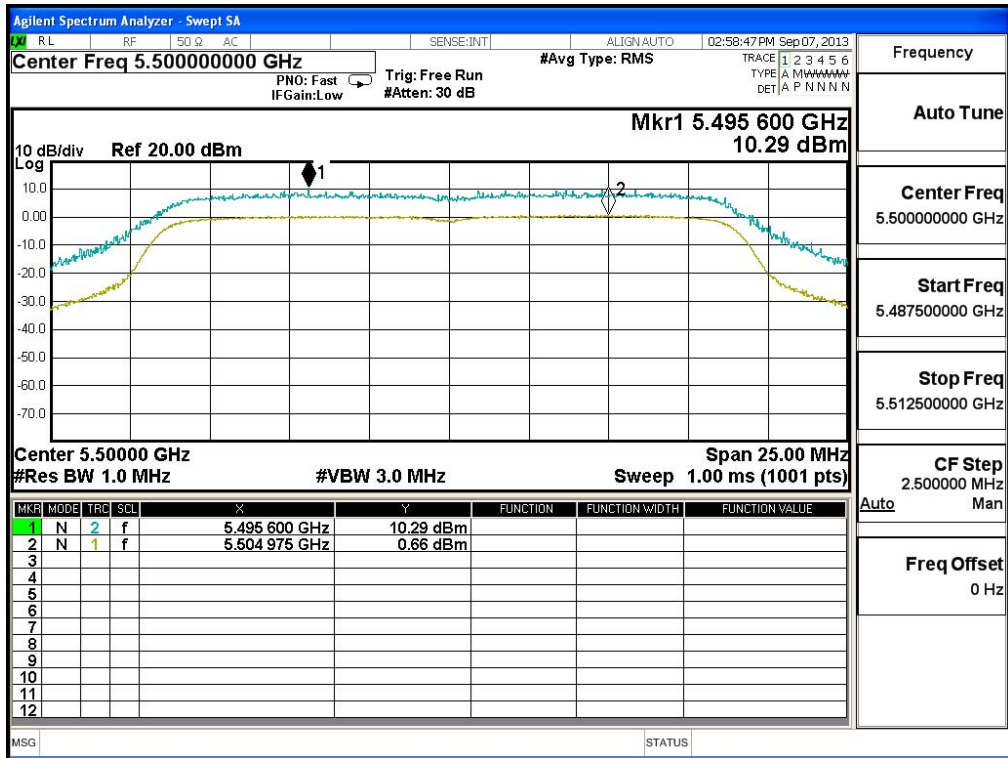
Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module  
 Test Item : Peak Excursion  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)

**Chain A**

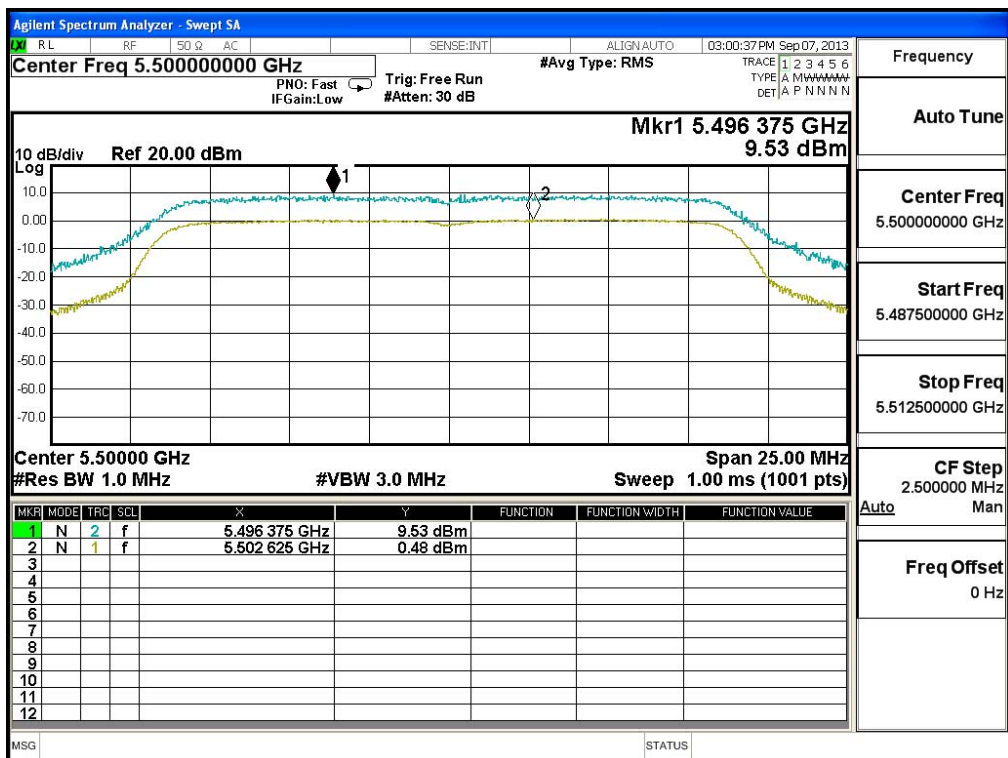
Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dB)	Required Limit (dB)	Result
100	5500	MCS (0)	8.860	<13	Pass
		MCS (2)	9.630	<13	Pass
		MCS (4)	9.050	<13	Pass
		MCS (7)	9.410	<13	Pass

**Channel 100:**

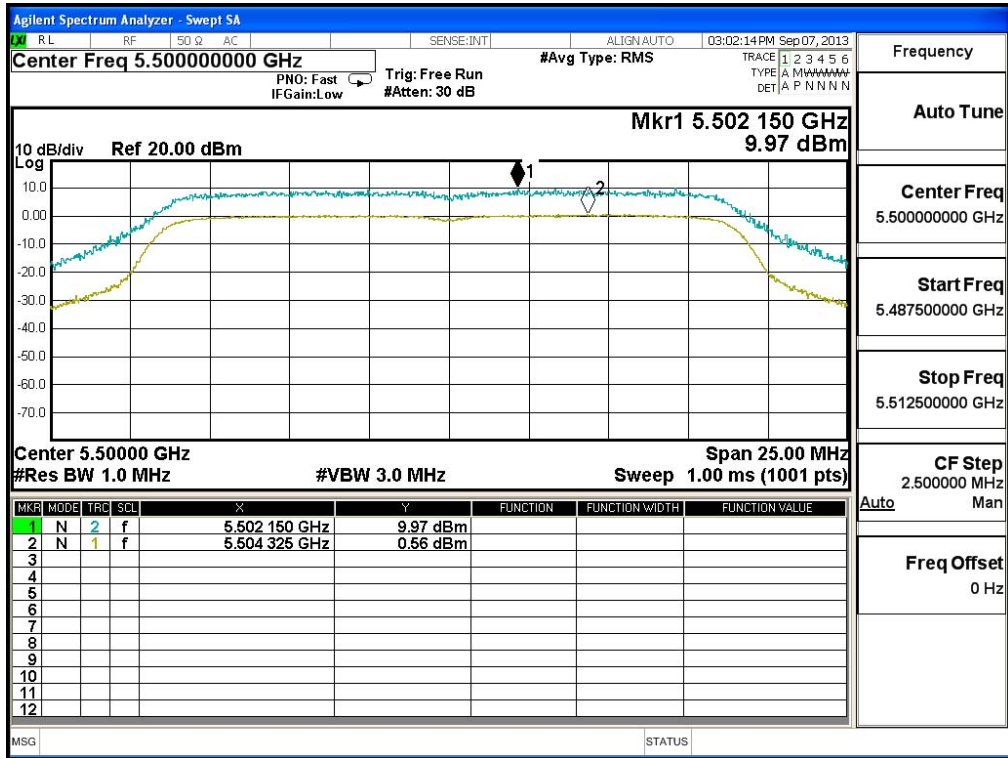




Frequency	
Auto Tune	
Center Freq	5.500000000 GHz
Start Freq	5.487500000 GHz
Stop Freq	5.512500000 GHz
CF Step	2.500000 MHz
Auto	Man
Freq Offset	0 Hz



Frequency	
Auto Tune	
Center Freq	5.500000000 GHz
Start Freq	5.487500000 GHz
Stop Freq	5.512500000 GHz
CF Step	2.500000 MHz
Auto	Man
Freq Offset	0 Hz

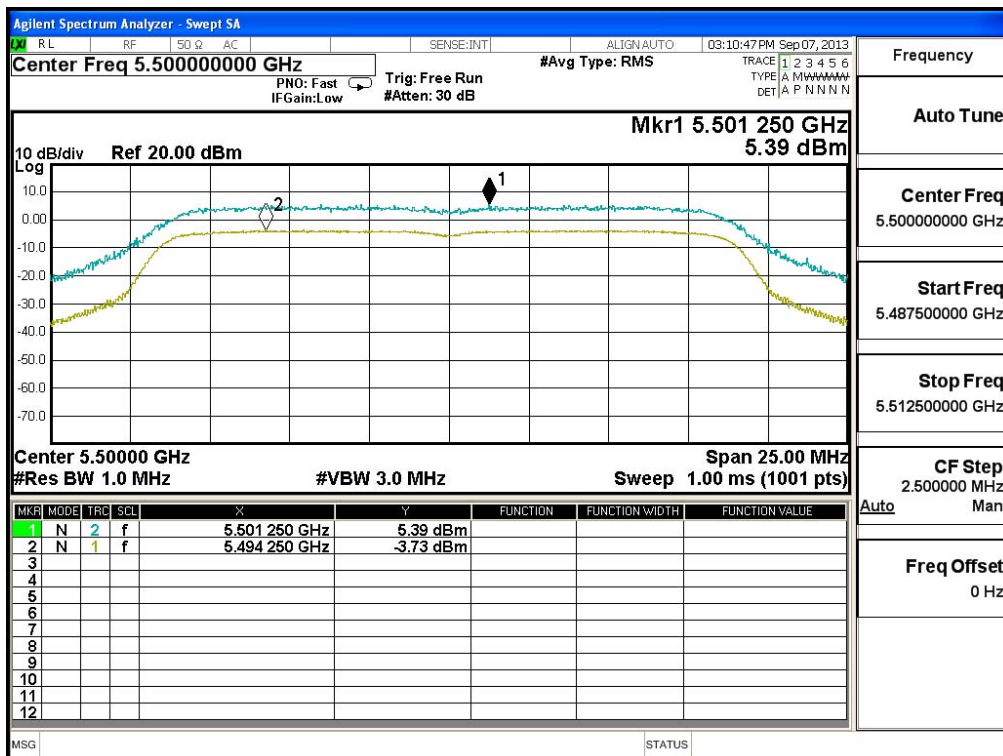


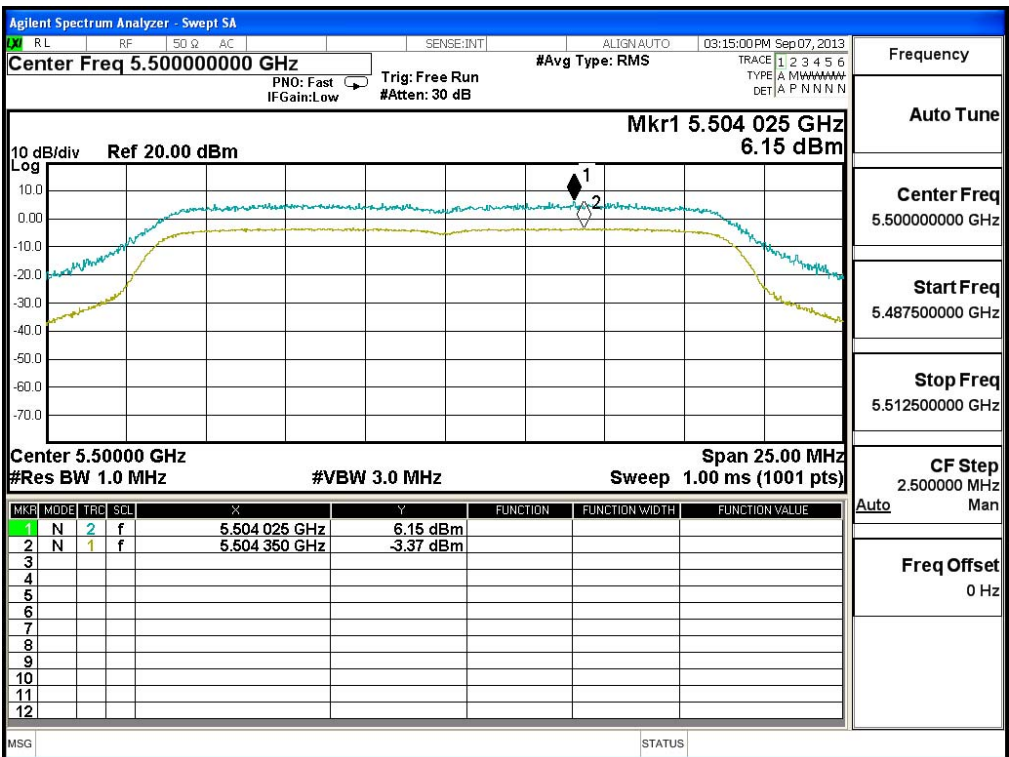
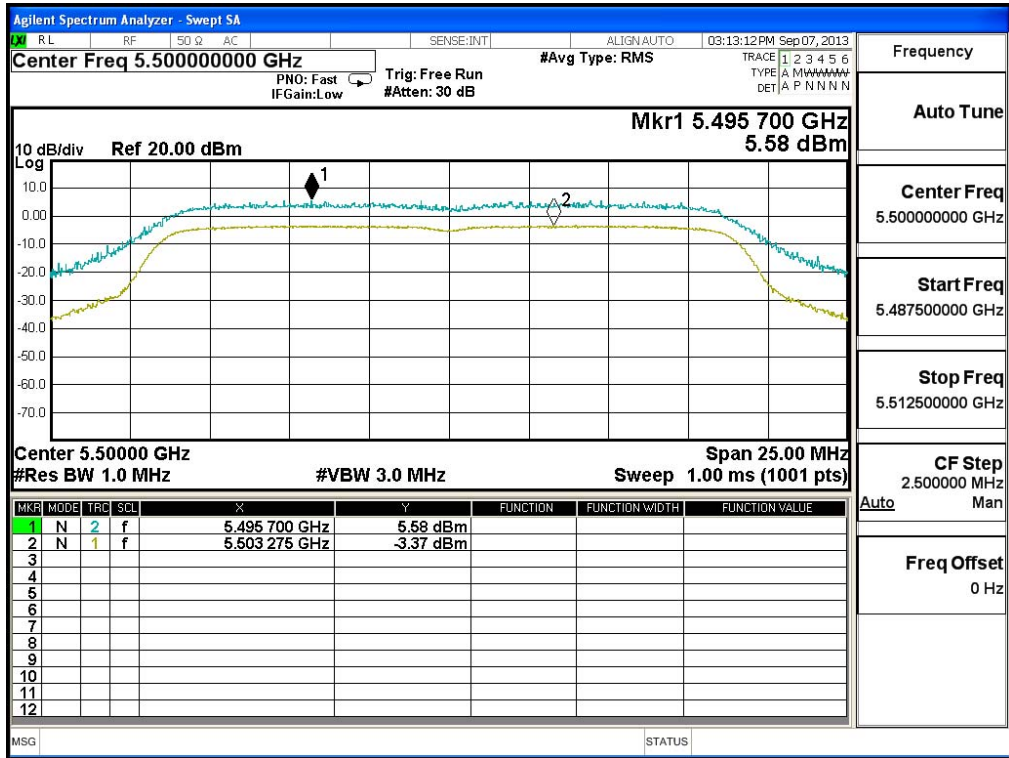


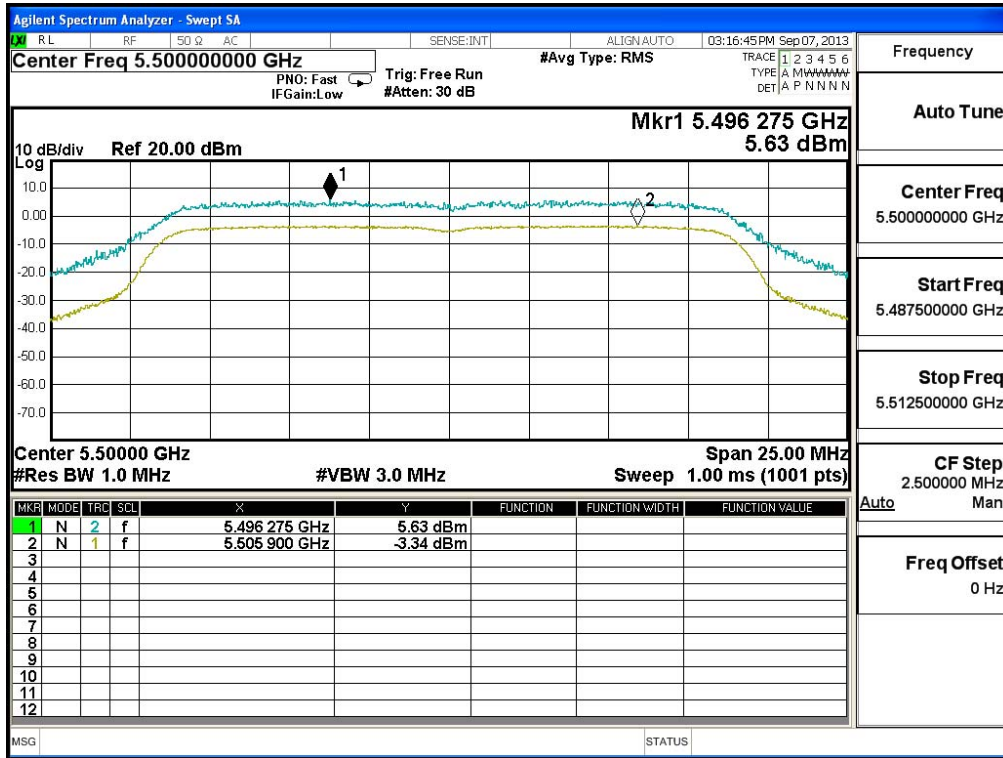
**Chain B**

Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dB)	Required Limit (dB)	Result
100	5500	MCS (0)	9.120	<13	Pass
		MCS (2)	8.950	<13	Pass
		MCS (4)	9.520	<13	Pass
		MCS (7)	8.970	<13	Pass

**Channel 100:**







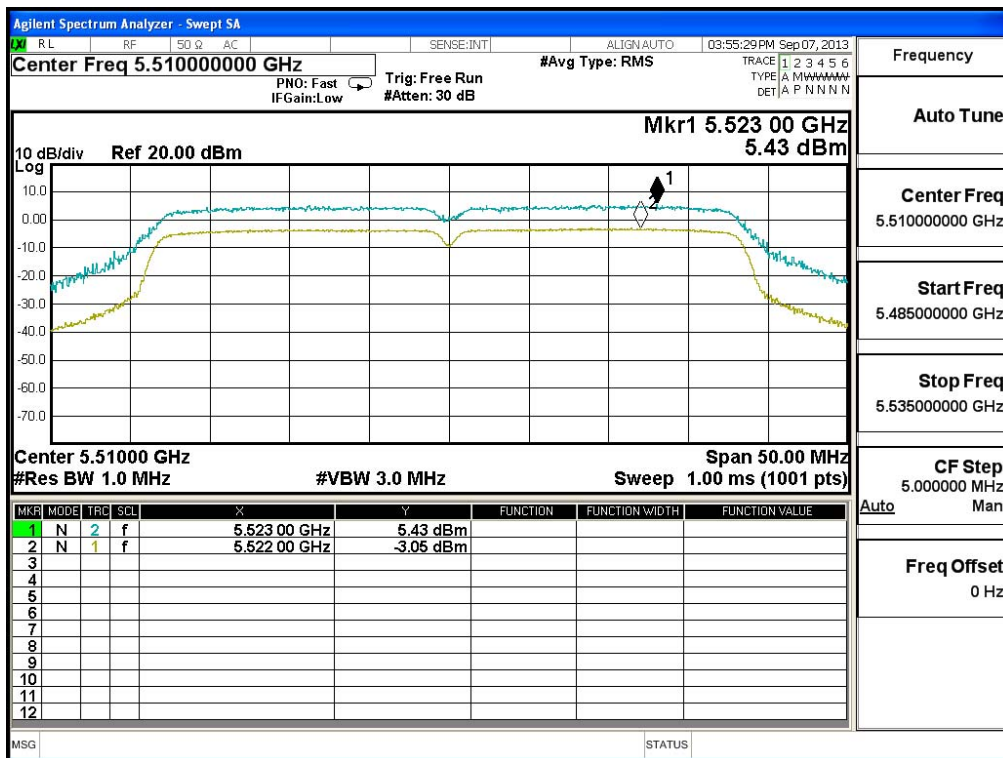
Frequency
Auto Tune
Center Freq 5.50000000 GHz
Start Freq 5.487500000 GHz
Stop Freq 5.512500000 GHz
CF Step 2.500000 MHz Auto Man
Freq Offset 0 Hz

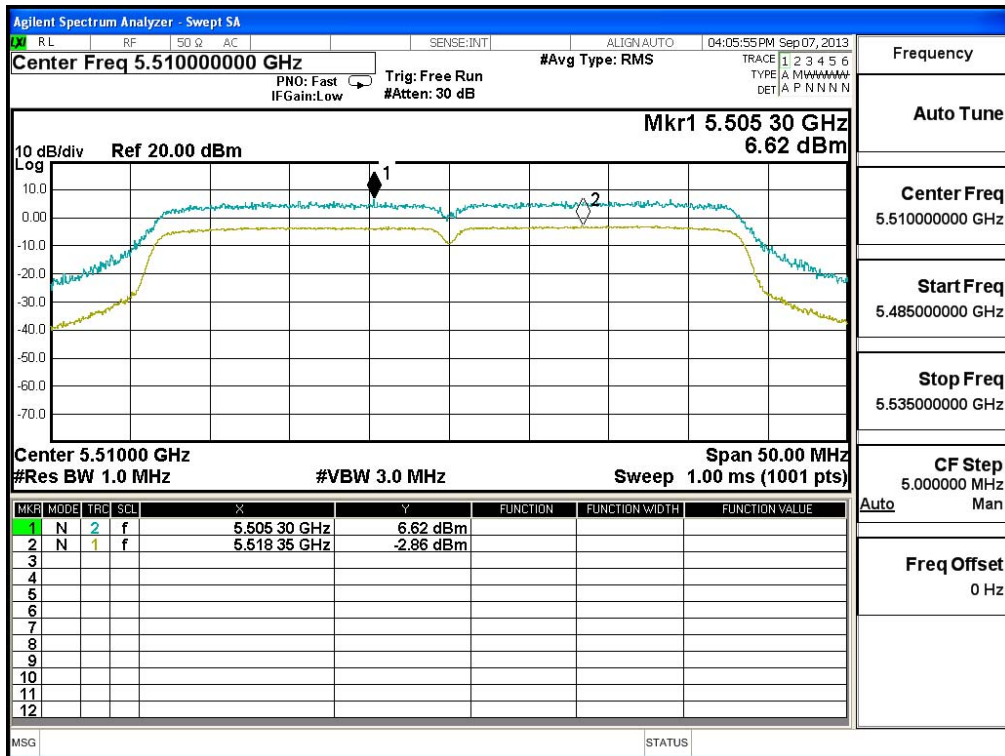
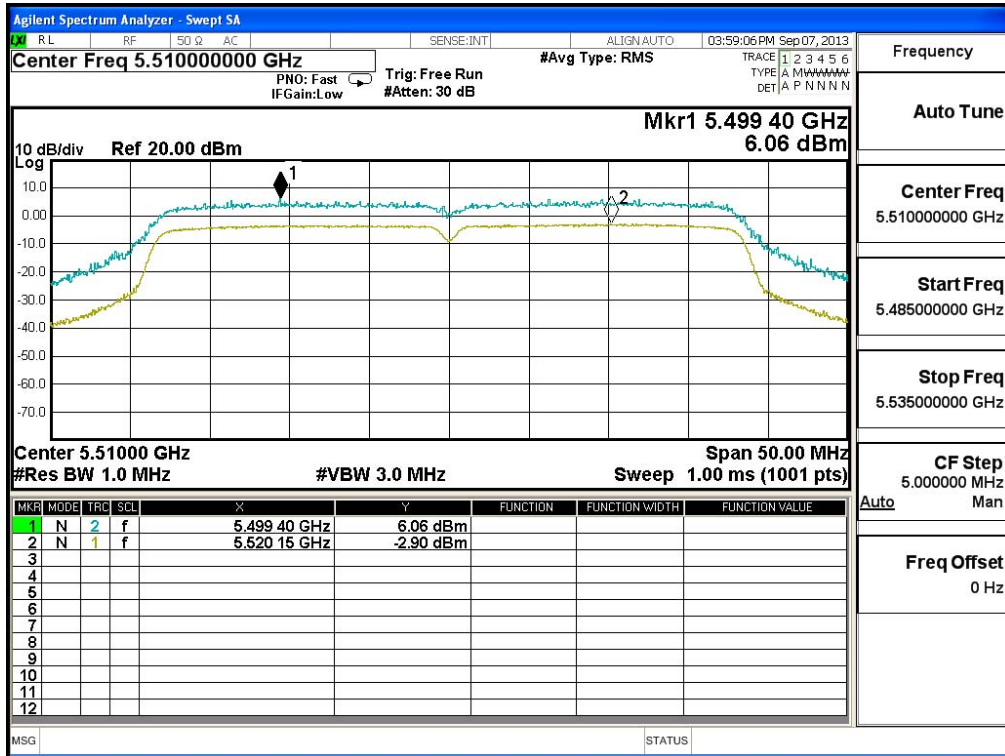
Product : 802.11a/b/g/n 2T2R Wireless Lan USB Module  
 Test Item : Peak Excursion  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)

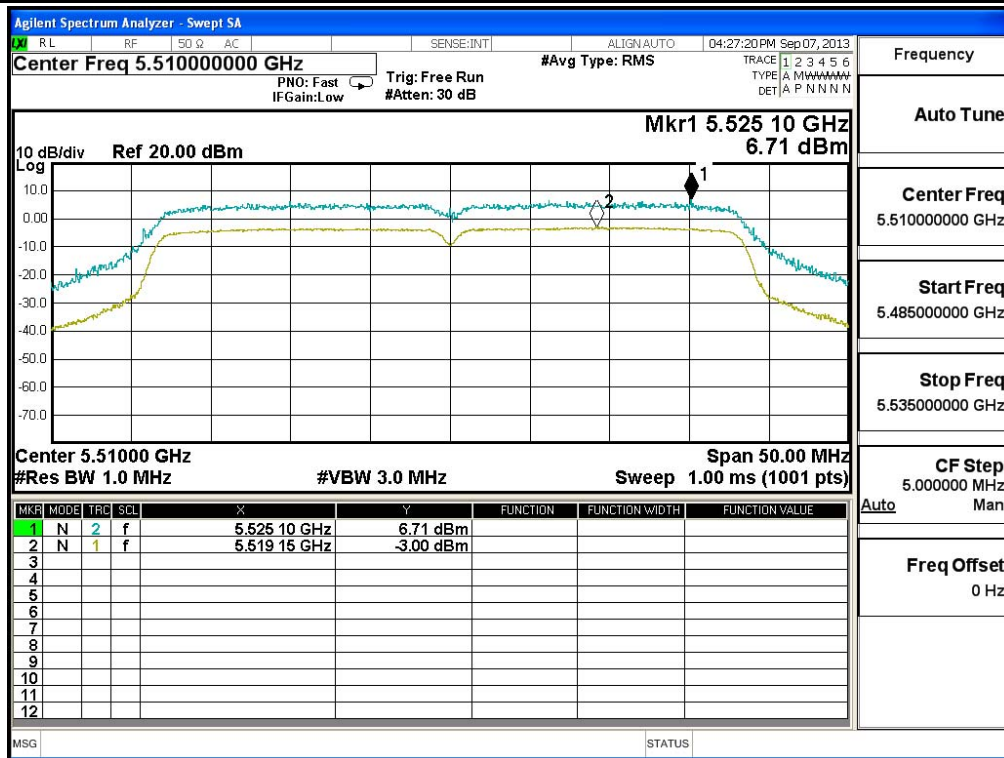
**Chain A**

Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dB)	Required Limit (dB)	Result
102	5510	MCS (0)	8.480	<13	Pass
		MCS (2)	8.920	<13	Pass
		MCS (4)	9.480	<13	Pass
		MCS (7)	9.710	<13	Pass

**Channel 102:**





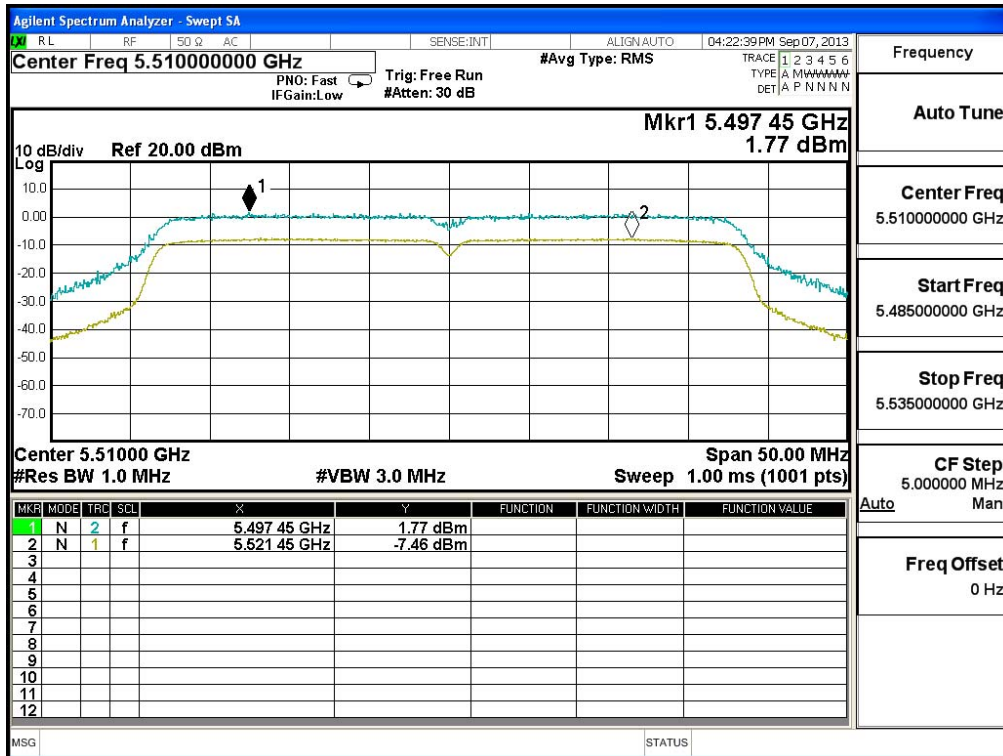


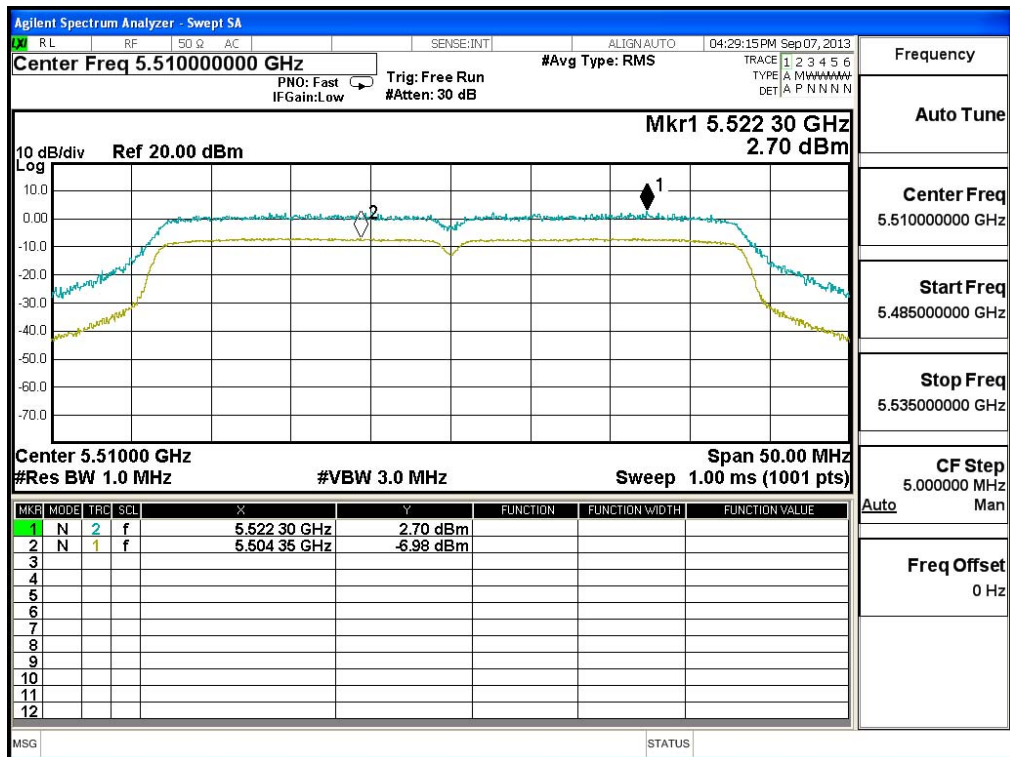
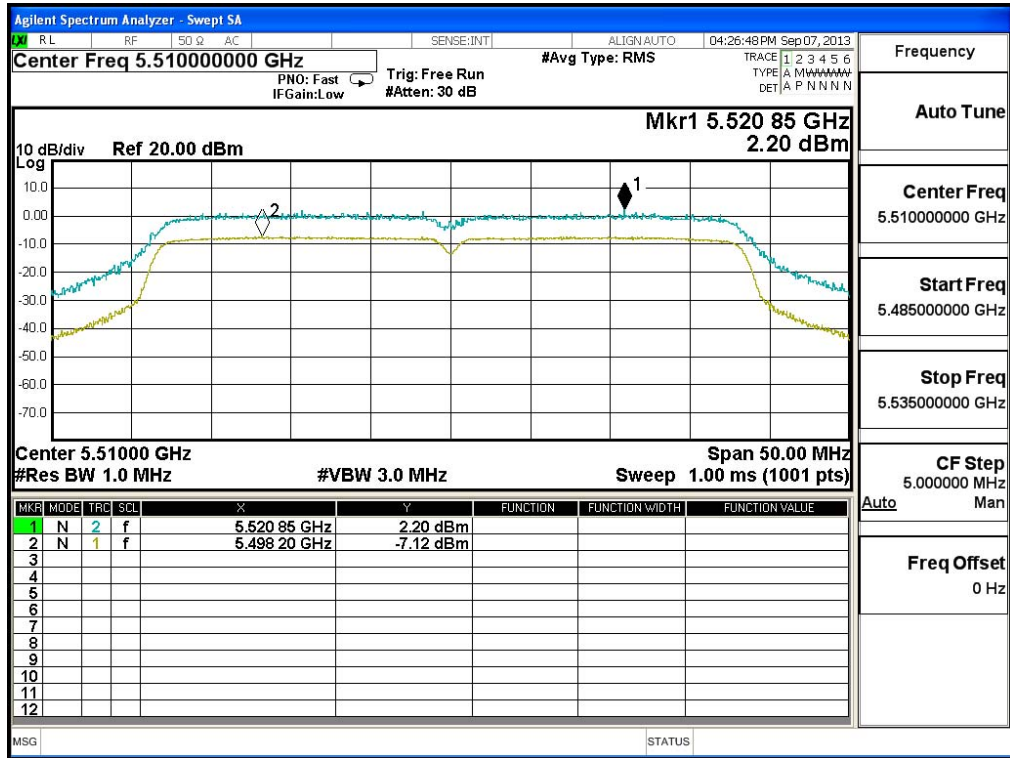
Frequency
Auto Tune
Center Freq 5.51000000 GHz
Start Freq 5.485000000 GHz
Stop Freq 5.535000000 GHz
CF Step 5.000000 MHz
Auto Man
Freq Offset 0 Hz

**Chain B**

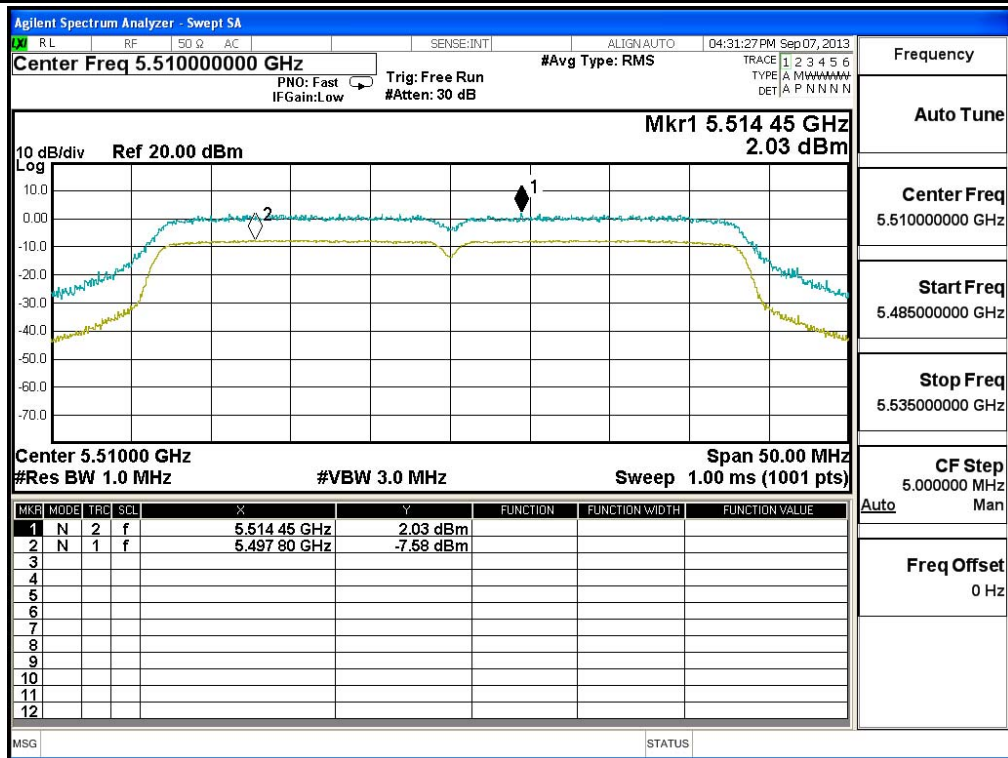
Channel No.	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dB)	Required Limit (dB)	Result
102	5510	MCS (0)	9.230	<13	Pass
		MCS (2)	9.320	<13	Pass
		MCS (4)	9.680	<13	Pass
		MCS (7)	9.610	<13	Pass

**Channel 102:**









Frequency
Auto Tune
Center Freq 5.51000000 GHz
Start Freq 5.48500000 GHz
Stop Freq 5.53500000 GHz
CF Step 5.000000 MHz
Auto Man
Freq Offset 0 Hz

## 6. Radiated Emission

### 6.1. Test Equipment

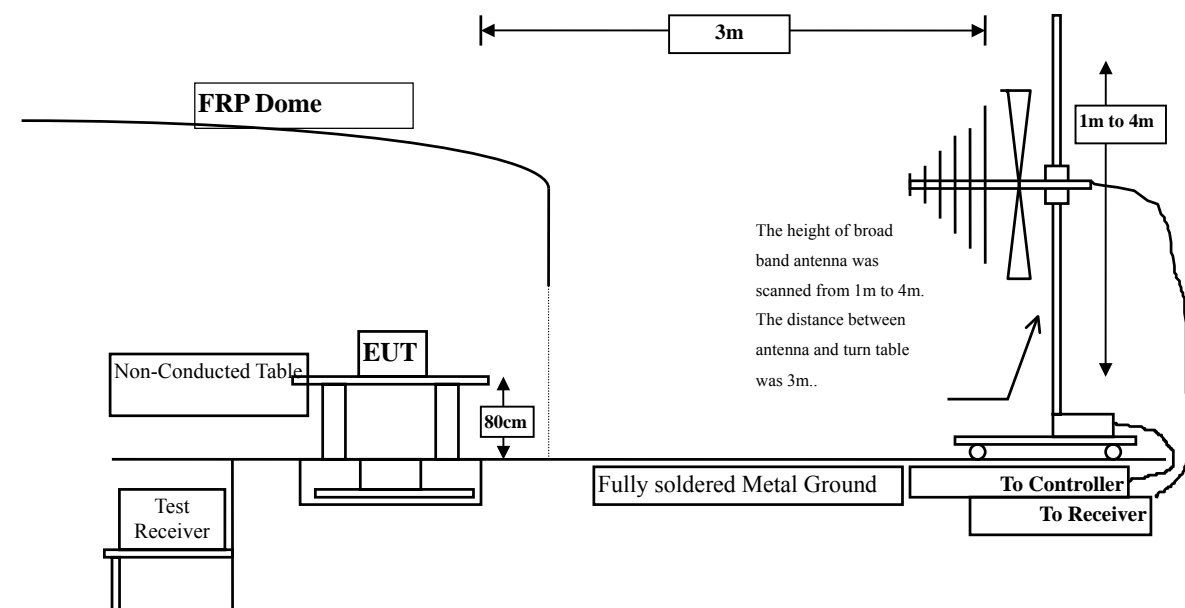
The following test equipments are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 3	X	Loop Antenna	Teseq	HLA6120 / 26739	Jul., 2013
	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2013
	X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2013
	X	Pre-Amplifier	QTK	AP-180C / CHM 0906076	Sep., 2013
	X	Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2013
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2013
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2013
	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

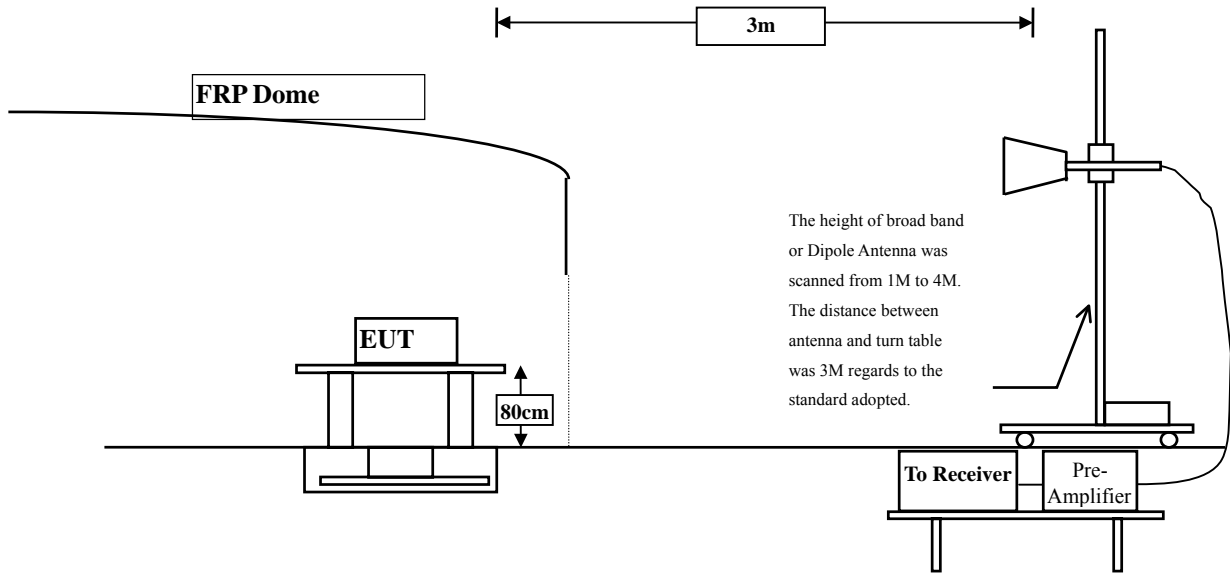
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with "X" are used to measure the final test results.

### 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	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
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)