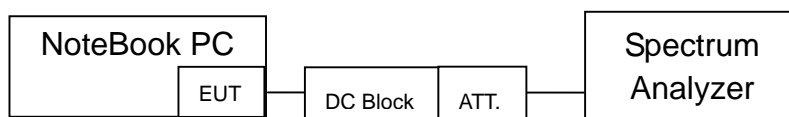


## 5 Peak excursion to average ratio test

### 5.1 Limits

Operating Frequency (MHz)	Peak excursion to average ratio limit
5150~5250	<13dB
5250~5350	<13dB
5725~5825	<13dB

### 5.2 Configuration of Measurement



### 5.3 Test Procedure

Peak excursion to average ratio was measured from the antenna port of the EUT. Using a 50ohm spectrum analyzer with the RBW=VBW=1MHz for peak measurement and RBW=1MHz, VBW=10kHz for average measurement. Peak excursion to average ratio was read directly.

### 5.4 Test Result

**PASS.**

The final test data is shown on as following pages.

### Peak excursion to Average ratio

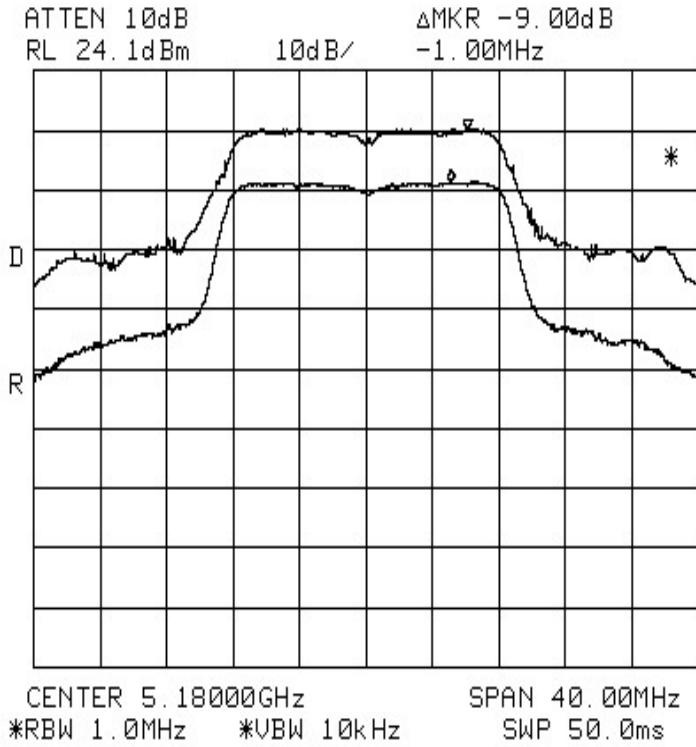
<b>Test Mode : 802.11a</b>					
<b>Test CH</b>		<b>PK excursion to Avg. ratio (dB)</b>			<b>Limit (dB)</b>
<b>CH No.</b>	<b>Freq. (MHz)</b>	<b>Chain A</b>	<b>Chain B</b>	<b>Chain C</b>	
36	5180	9.00	9.34	9.67	13
44	5220	9.17	9.33	9.67	13
48	5240	9.17	10.50	9.00	13
52	5260	9.33	9.84	8.66	13
60	5300	9.16	9.33	8.67	13
64	5320	8.50	9.17	8.50	13
100	5500	9.00	9.00	9.17	13
120	5600	9.00	8.67	8.50	13
140	5700	9.16	9.17	9.17	13

<b>Test Mode : 802.11n (HT20)</b>					
<b>Test CH</b>		<b>PK excursion to Avg. ratio (dB)</b>			<b>Limit (dB)</b>
<b>CH No.</b>	<b>Freq. (MHz)</b>	<b>Chain A</b>	<b>Chain B</b>	<b>Chain C</b>	
36	5180	9.00	8.34	9.17	13
44	5220	8.84	9.00	9.00	13
48	5240	9.16	8.67	9.17	13
52	5260	9.16	9.50	9.34	13
60	5300	8.83	9.17	9.00	13
64	5320	9.00	9.84	9.16	13
100	5500	9.00	9.00	8.84	13
120	5600	8.84	9.17	9.00	13
140	5700	9.16	9.50	9.16	13

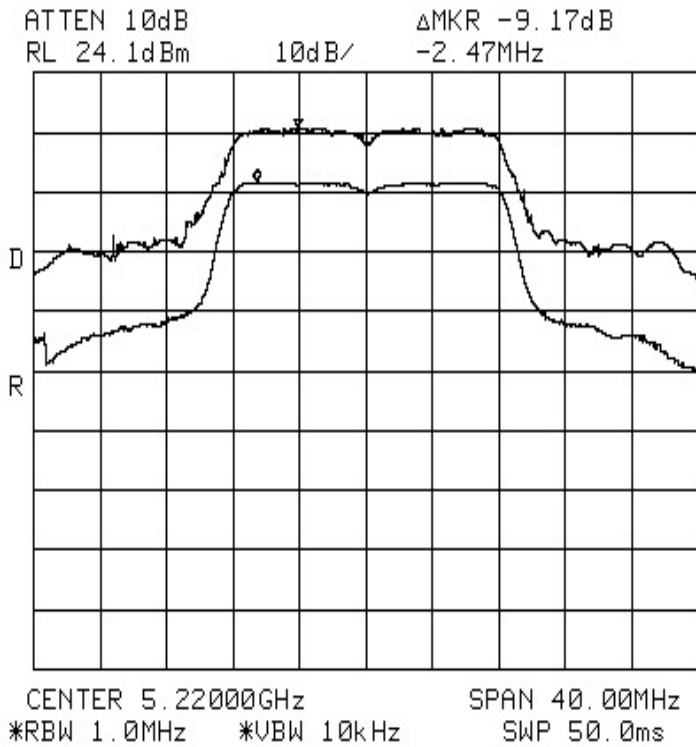
<b>Test Mode : 802.11n (HT40)</b>					
<b>Test CH</b>		<b>PK excursion to Avg. ratio (dB)</b>			<b>Limit (dB)</b>
<b>CH No.</b>	<b>Freq. (MHz)</b>	<b>Chain A</b>	<b>Chain B</b>	<b>Chain C</b>	
38	5190	9.16	9.50	9.50	13
46	5230	9.34	9.50	9.17	13
54	5270	9.34	9.50	10.00	13
62	5310	9.17	9.50	9.16	13
102	5510	9.17	9.33	9.33	13
118	5590	9.16	9.34	9.33	13
134	5670	9.33	9.50	9.33	13

### Peak excursion to Average ratio

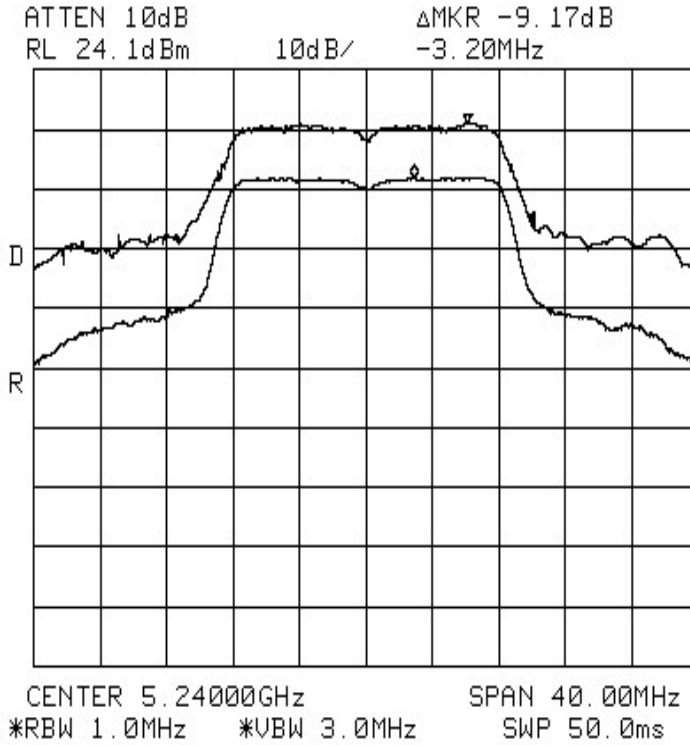
#### 802.11 a Chain A CH36 5180MHz PK to AV Ratio



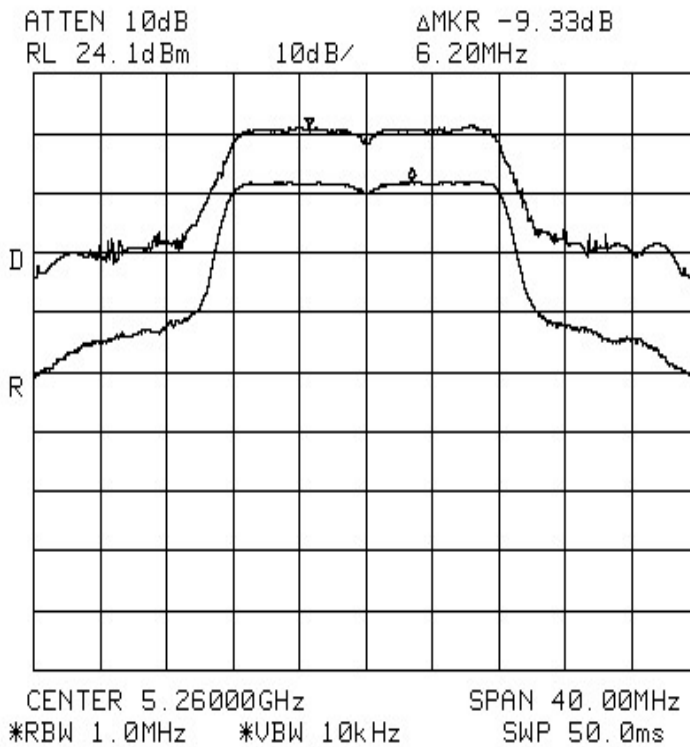
#### 802.11 a Chain A CH44 5220MHz PK to AV Ratio



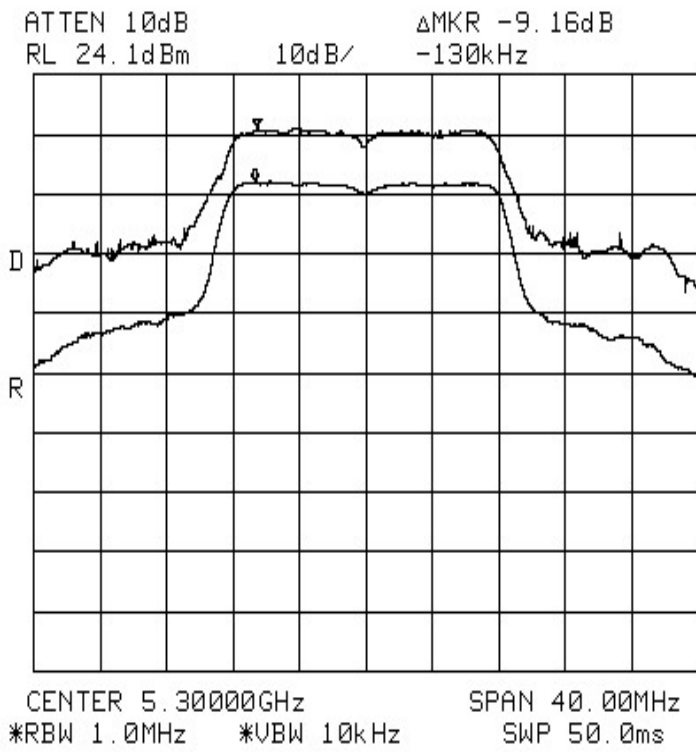
### 802.11 a Chain A CH48 5240MHz PK to AV Ratio



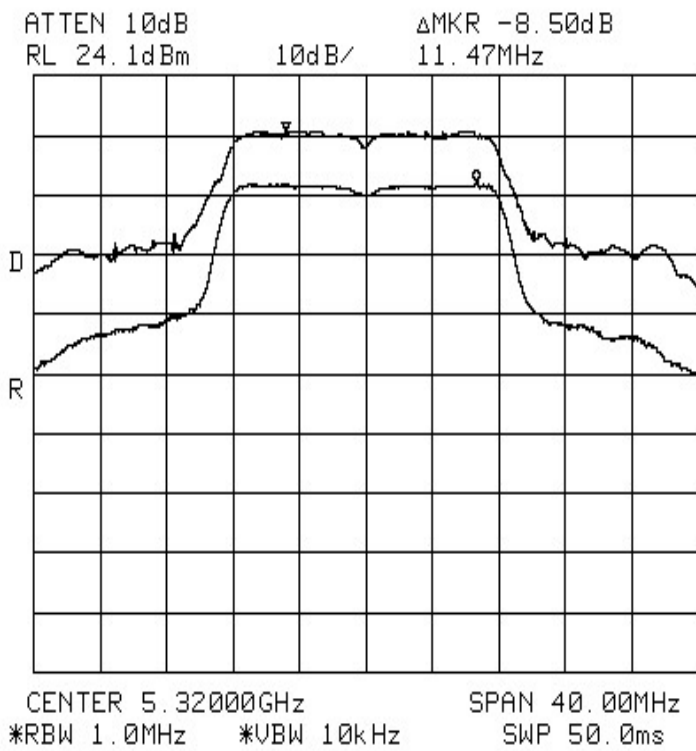
### 802.11 a Chain A CH52 5260MHz PK to AV Ratio



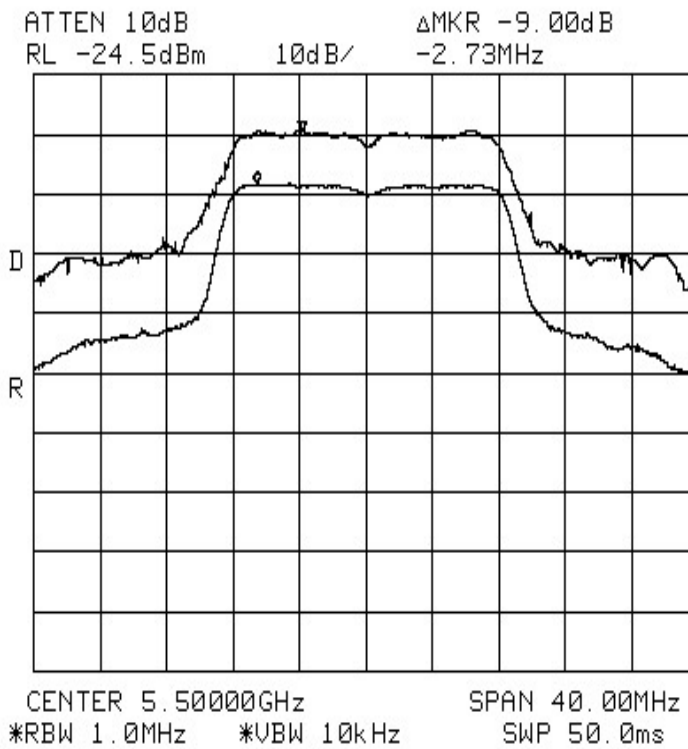
### 802.11 a Chain A CH60 5300MHz PK to AV Ratio



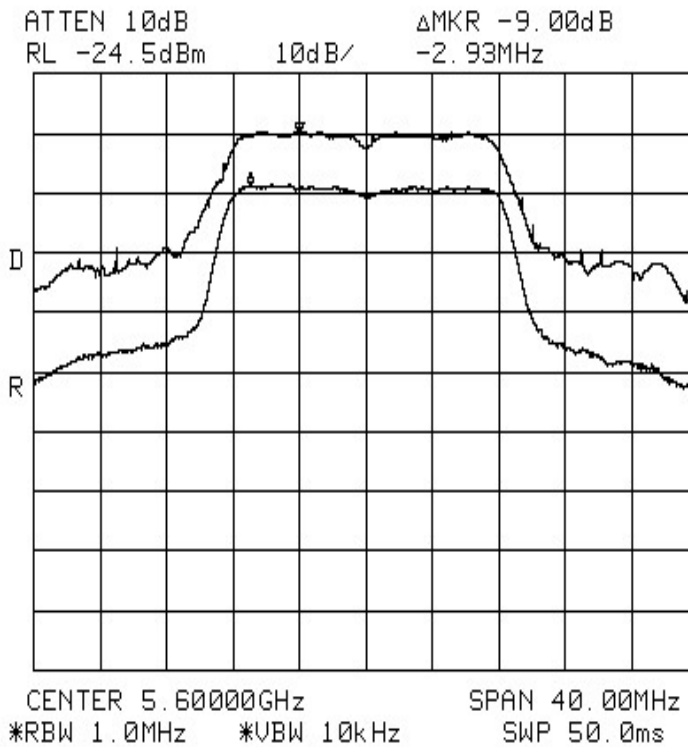
### 802.11 a Chain A CH64 5320MHz PK to AV Ratio



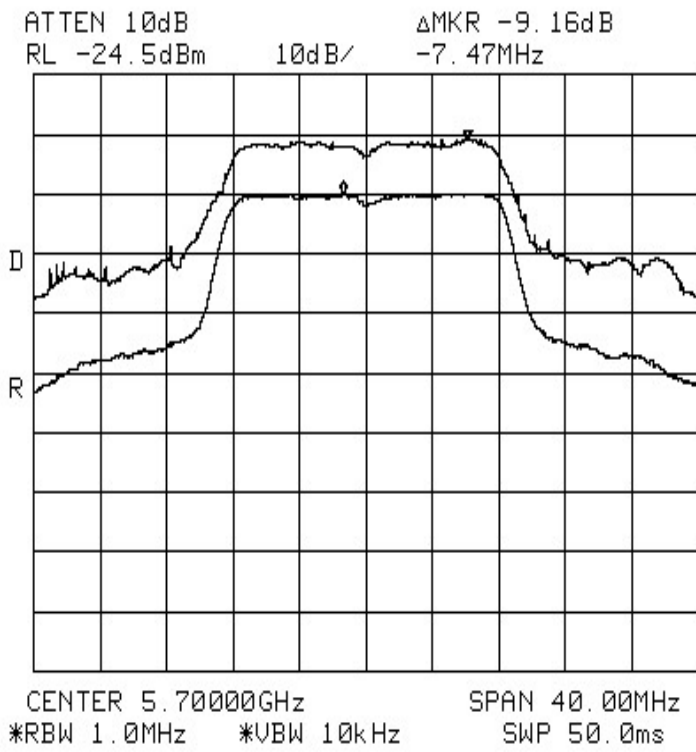
### 802.11 a Chain A CH100 5500MHz PK to AV Ratio



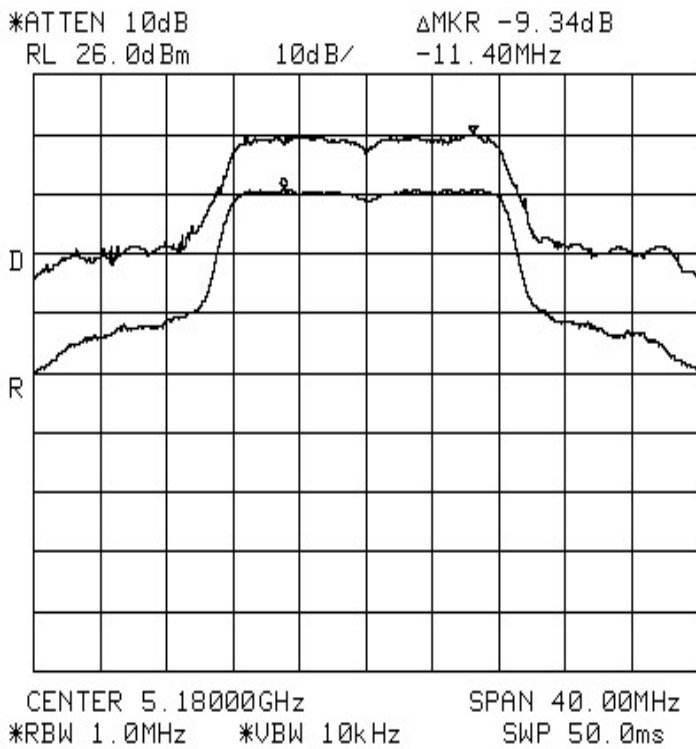
### 802.11 a Chain A CH120 5600MHz PK to AV Ratio



### 802.11 a Chain A CH140 5700MHz PK to AV Ratio

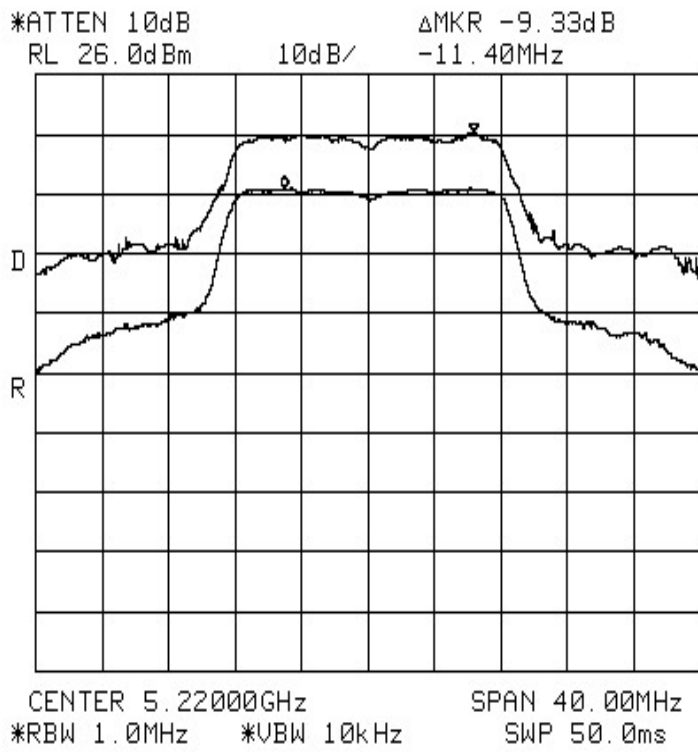


### 802.11 a Chain B CH36 5180MHz PK to AV Ratio

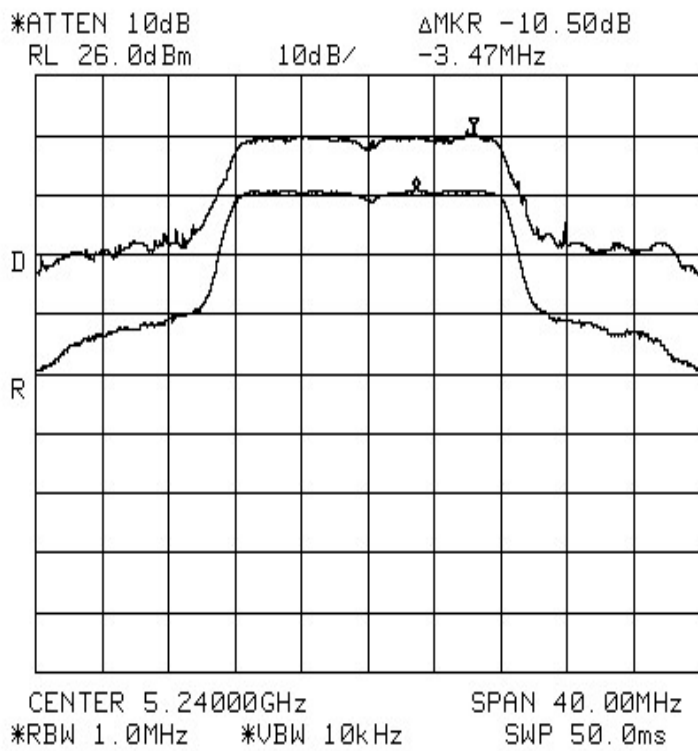




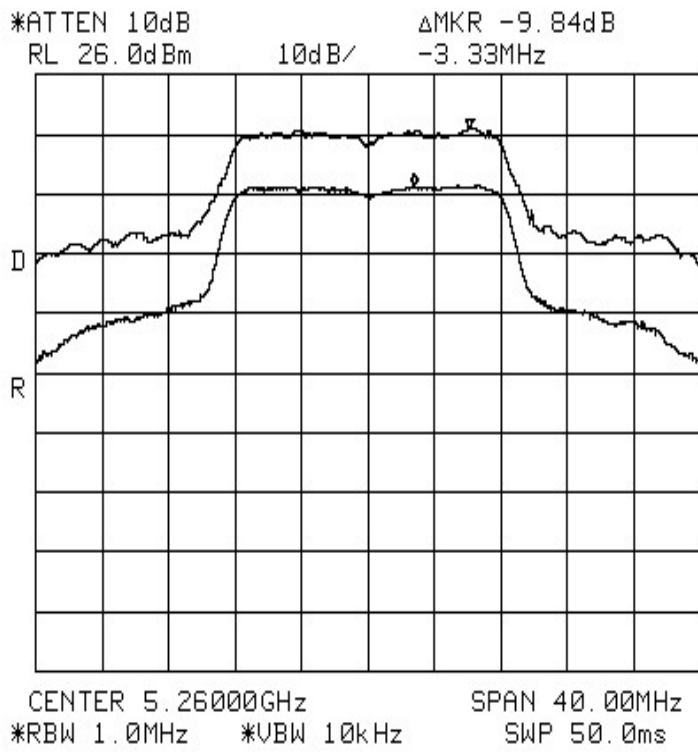
### 802.11 a Chain B CH44 5220MHz PK to AV Ratio



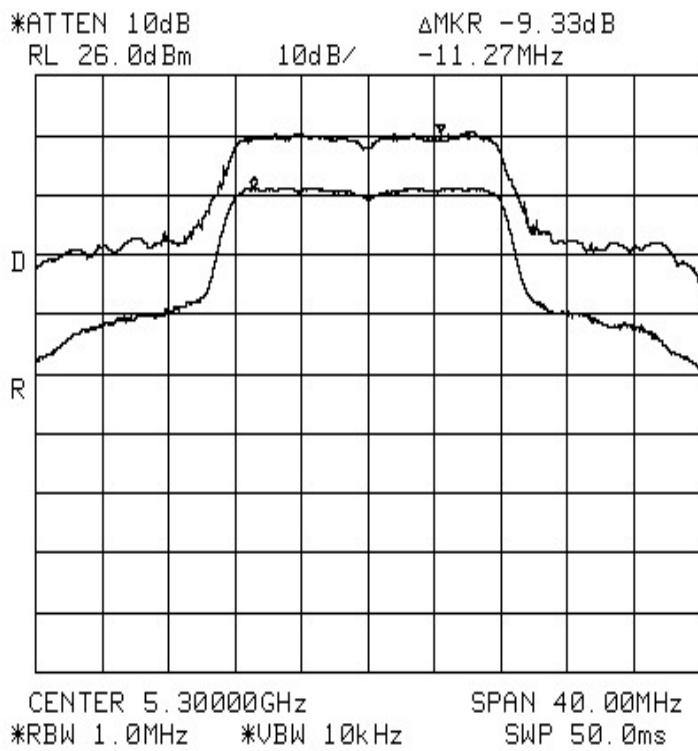
### 802.11 a Chain B CH48 5240MHz PK to AV Ratio



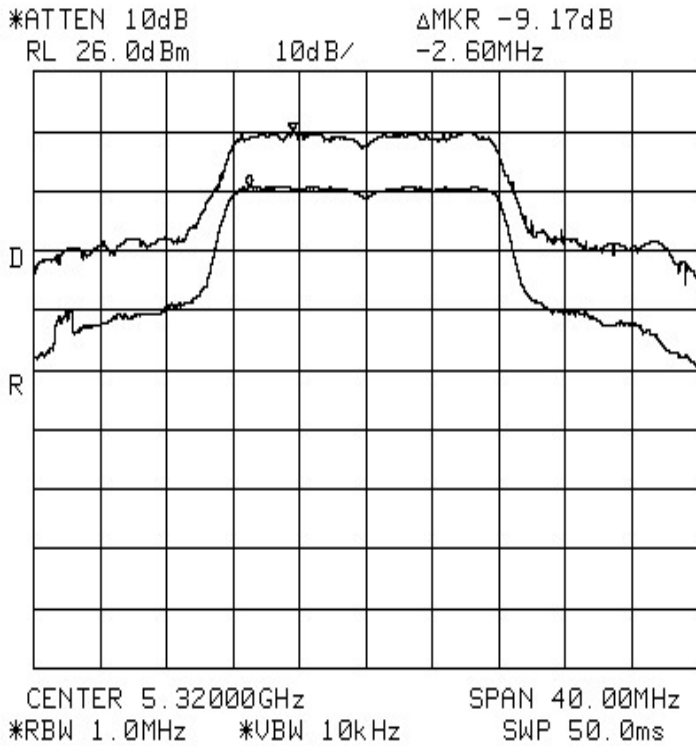
### 802.11 a Chain B CH52 5260MHz PK to AV Ratio



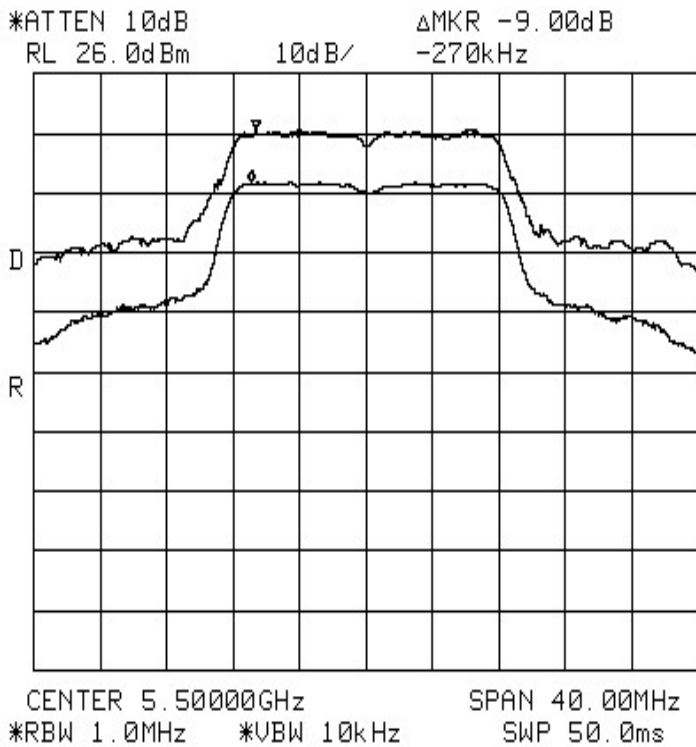
### 802.11 a Chain B CH60 5300MHz PK to AV Ratio



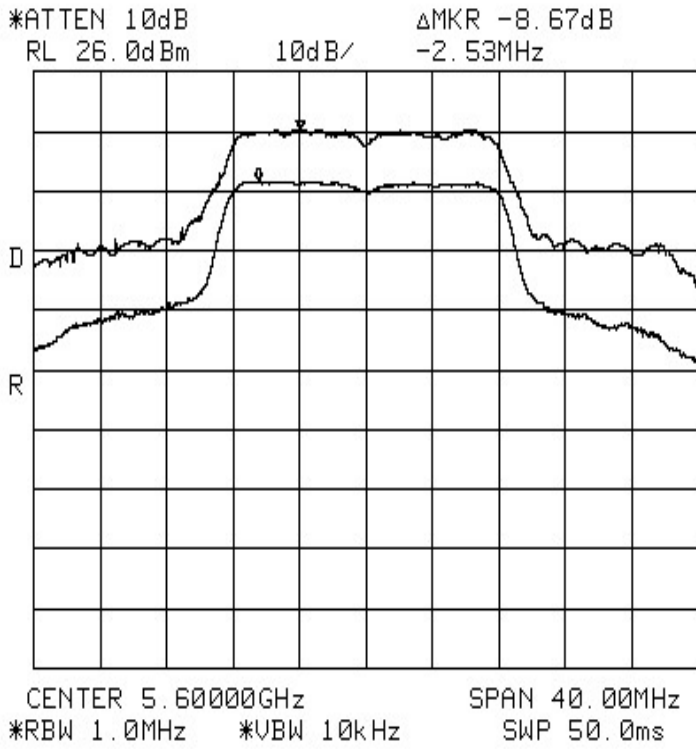
### 802.11 a Chain B CH64 5320MHz PK to AV Ratio



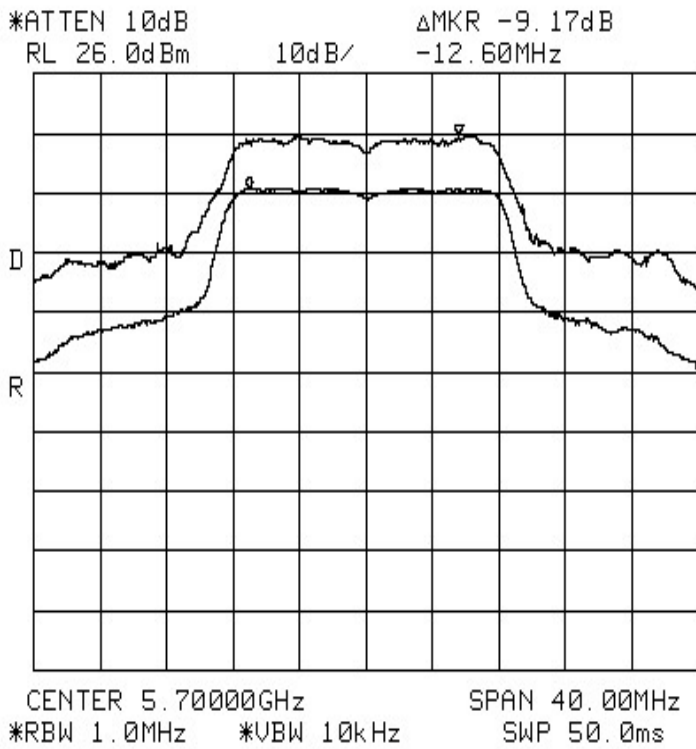
### 802.11 a Chain B CH100 5500MHz PK to AV Ratio



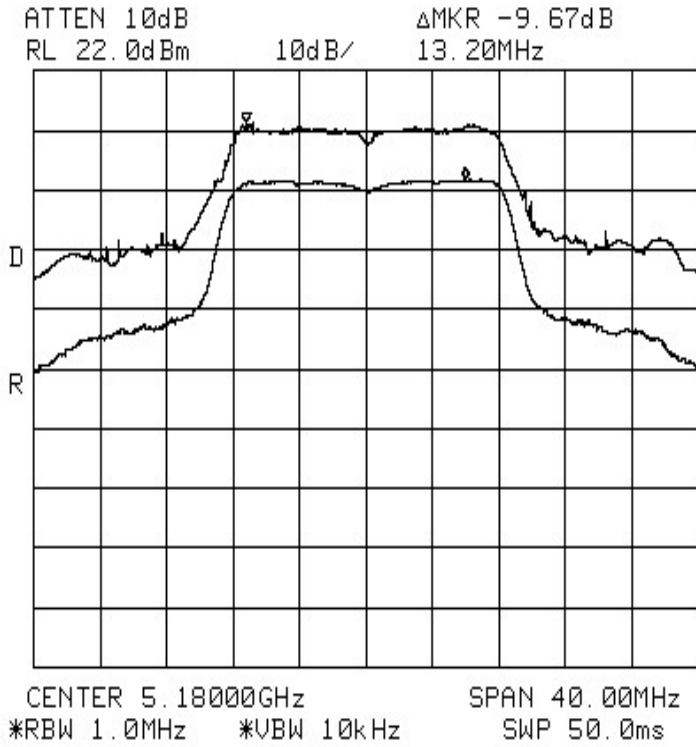
### 802.11 a Chain B CH120 5600MHz PK to AV Ratio



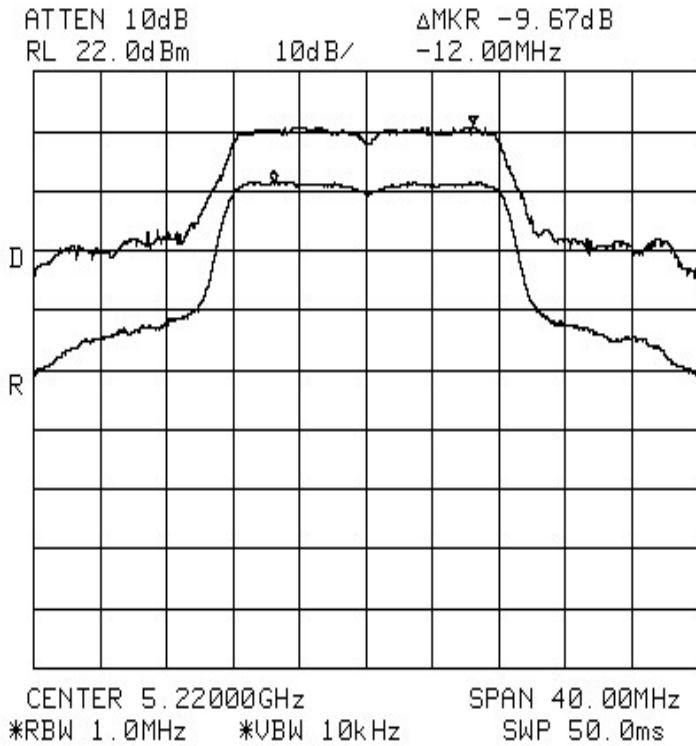
### 802.11 a Chain B CH140 5700MHz PK to AV Ratio



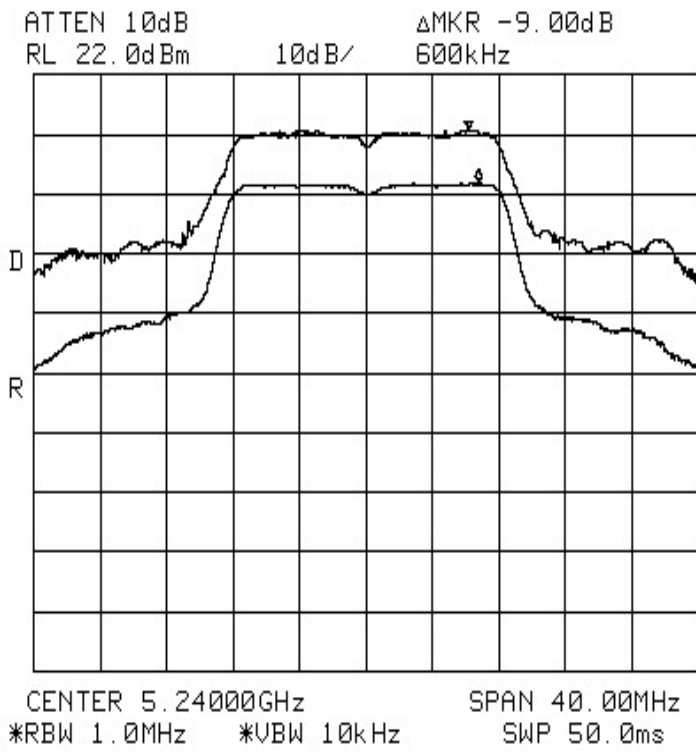
### 802.11 a Chain C CH36 5180MHz PK to AV Ratio



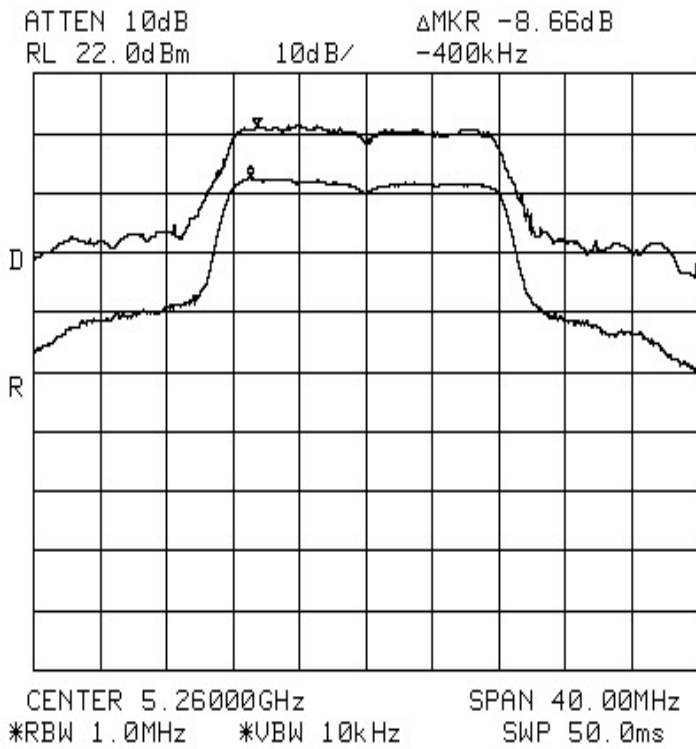
### 802.11 a Chain C CH44 5220MHz PK to AV Ratio



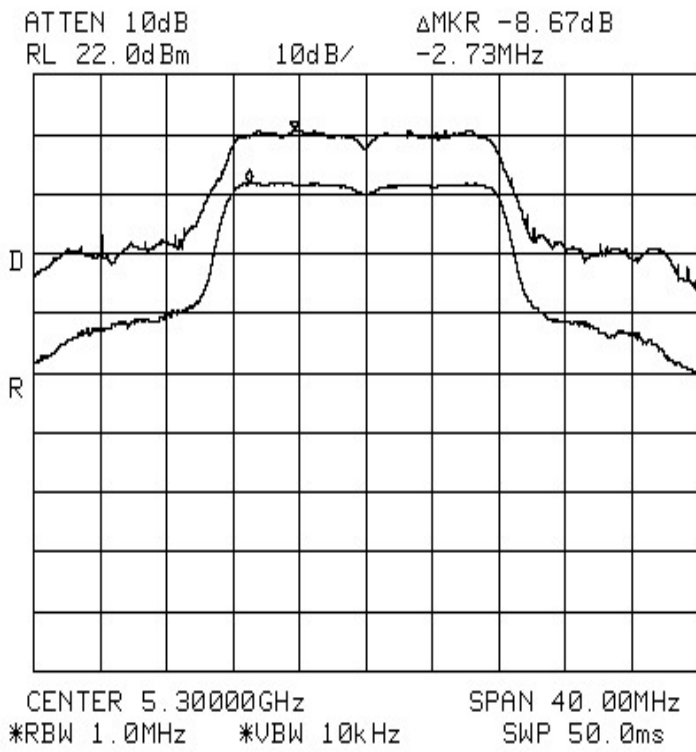
### 802.11 a Chain C CH48 5240MHz PK to AV Ratio



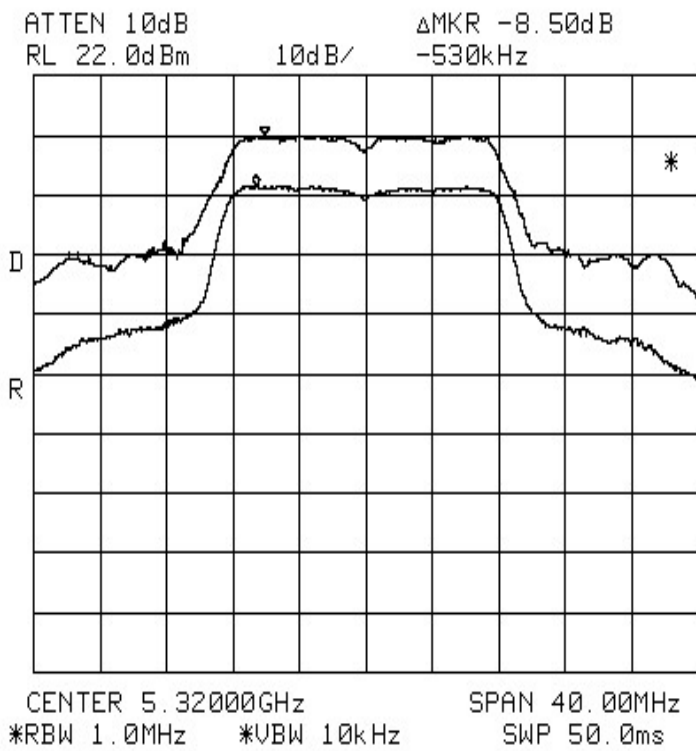
### 802.11 a Chain C CH52 5260MHz PK to AV Ratio



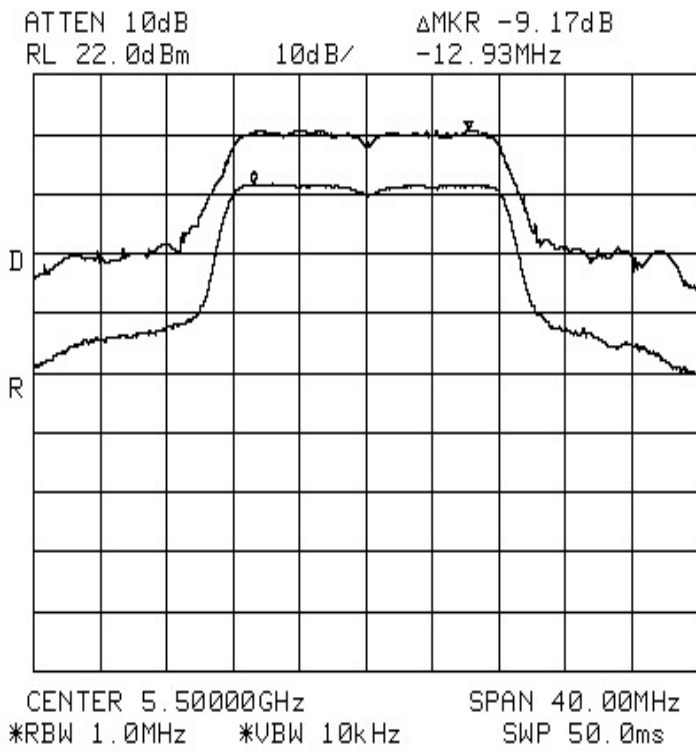
### 802.11 a Chain C CH60 5300MHz PK to AV Ratio



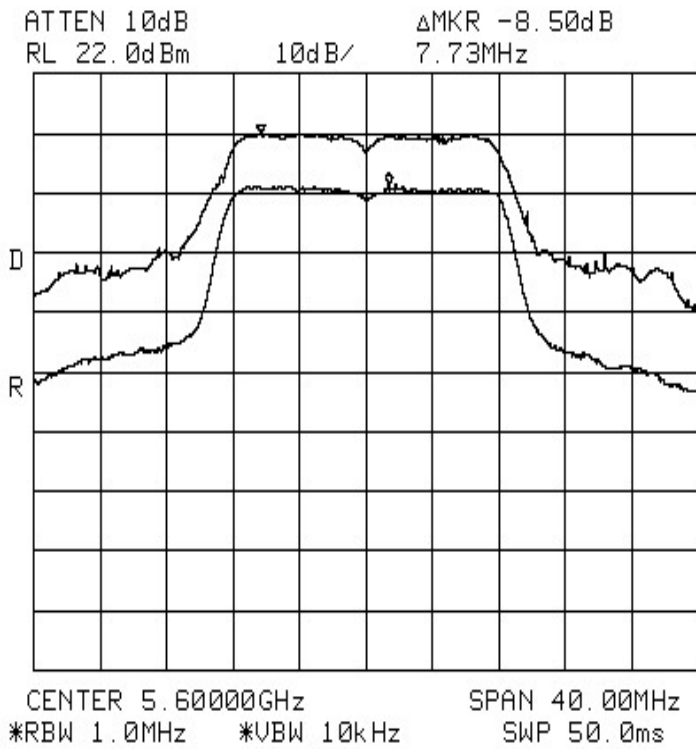
### 802.11 a Chain C CH64 5320MHz PK to AV Ratio



### 802.11 a Chain C CH100 5500MHz PK to AV Ratio

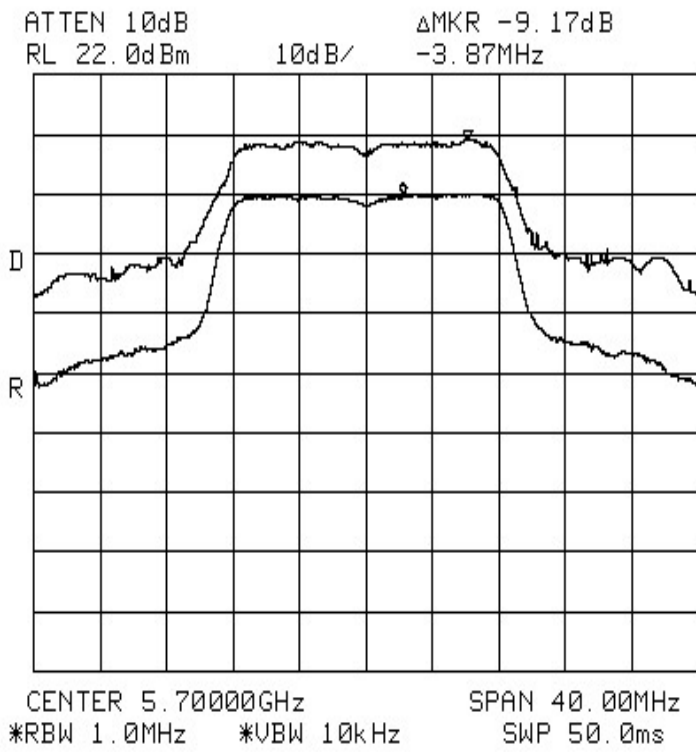


### 802.11 a Chain C CH120 5600MHz PK to AV Ratio

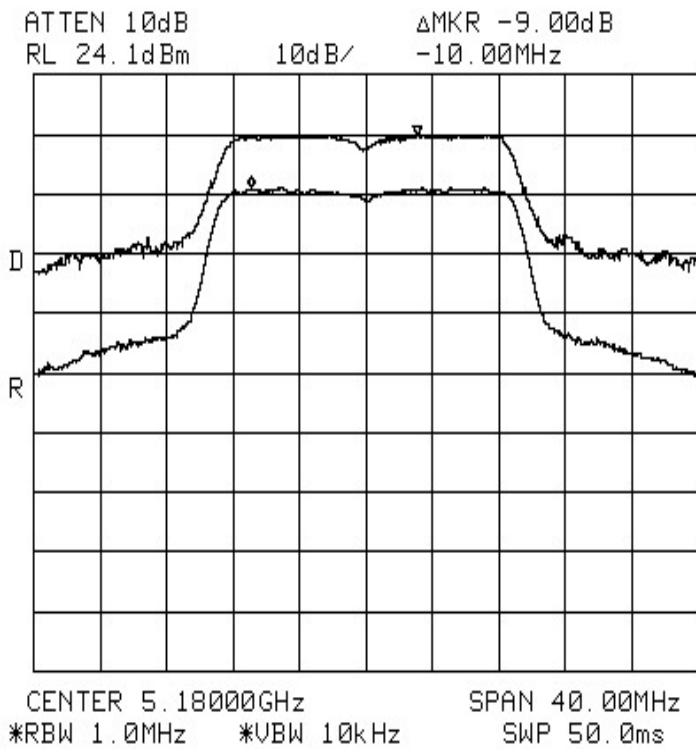




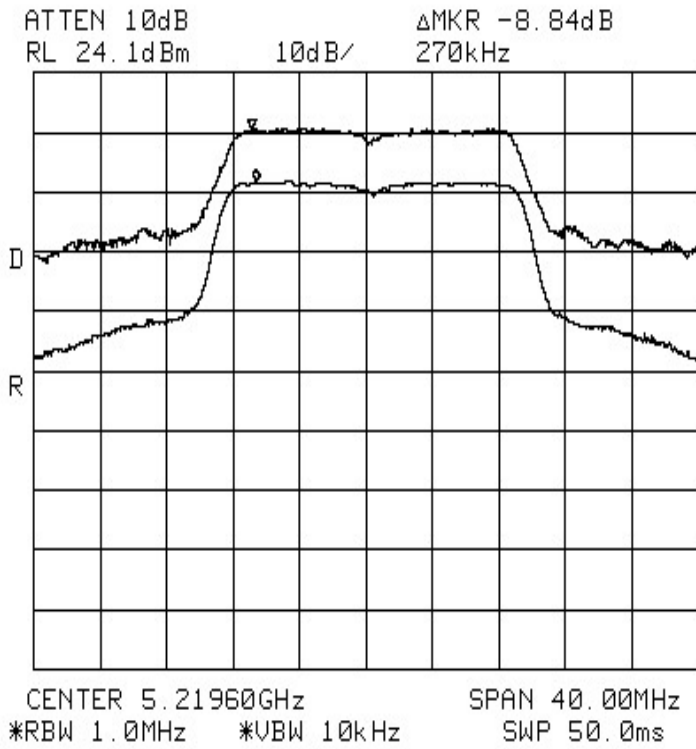
### 802.11 a Chain C CH140 5700MHz PK to AV Ratio



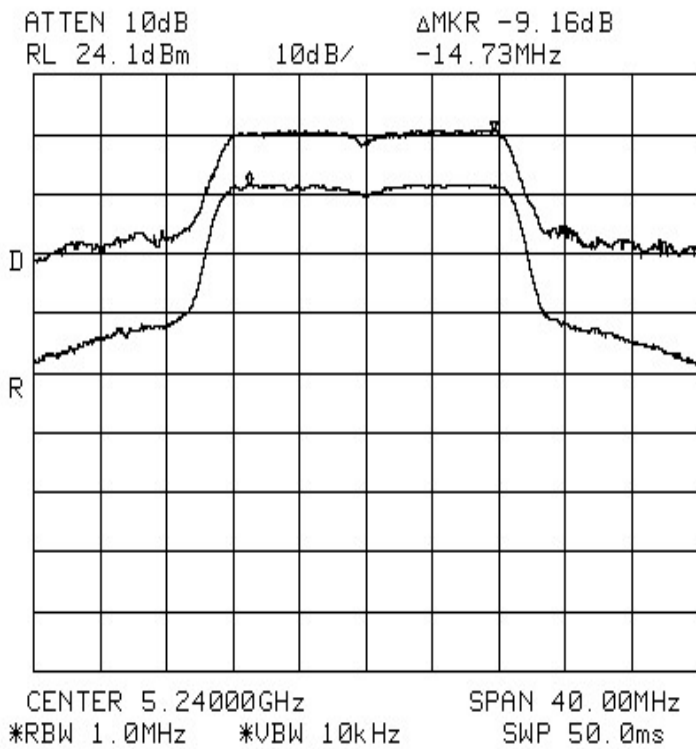
### 802.11 n (HT20) Chain A CH36 5180MHz PK to AV Ratio



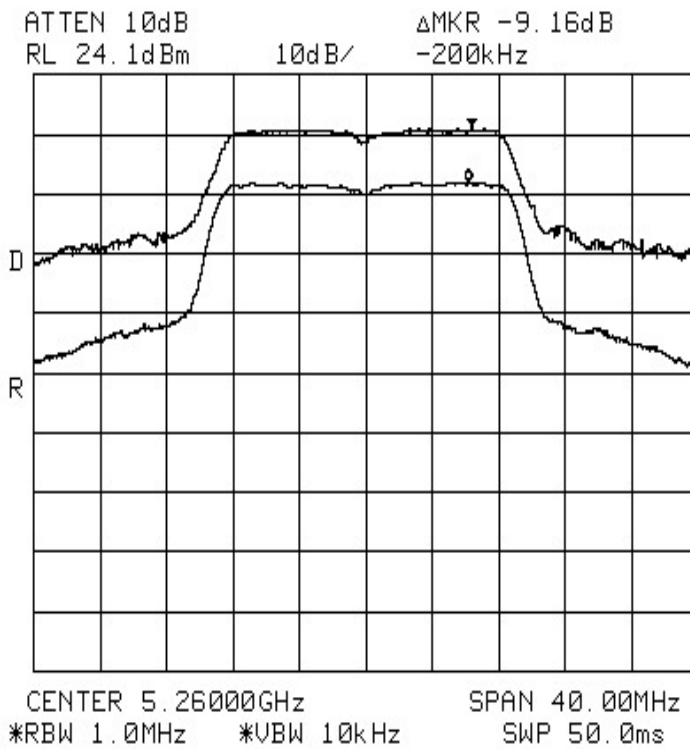
### 802.11 n (HT20) Chain A CH44 5220MHz PK to AV Ratio



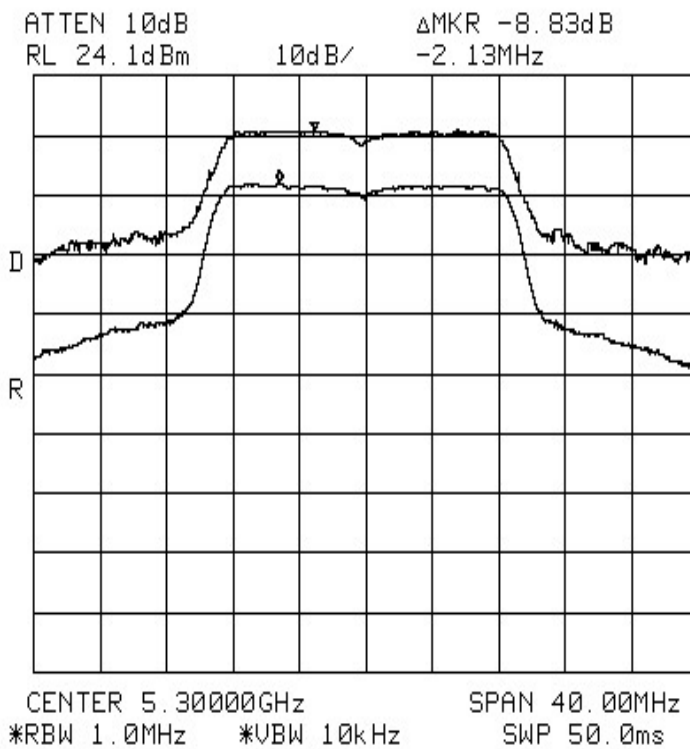
### 802.11 n (HT20) Chain A CH48 5240MHz PK to AV Ratio



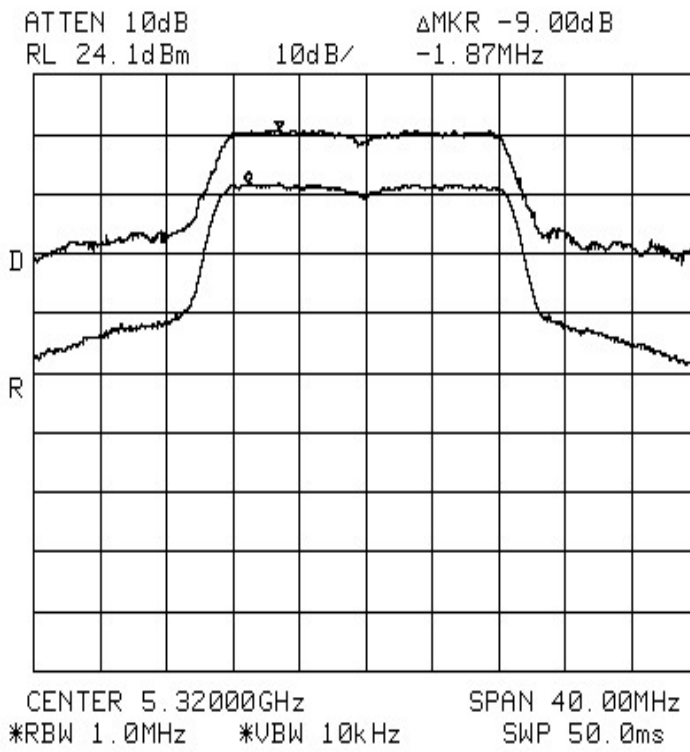
### 802.11 n (HT20) Chain A CH52 5260MHz PK to AV Ratio



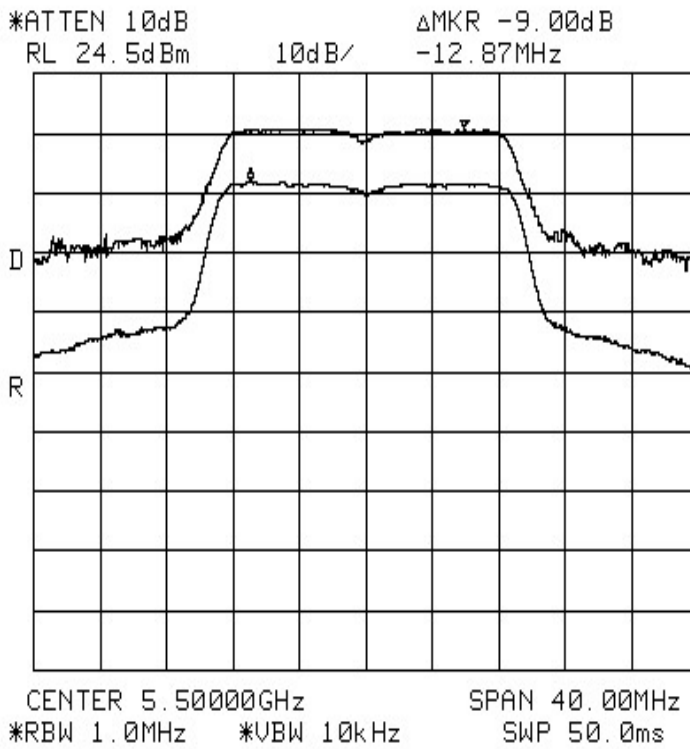
### 802.11 n (HT20) Chain A CH60 5300MHz PK to AV Ratio



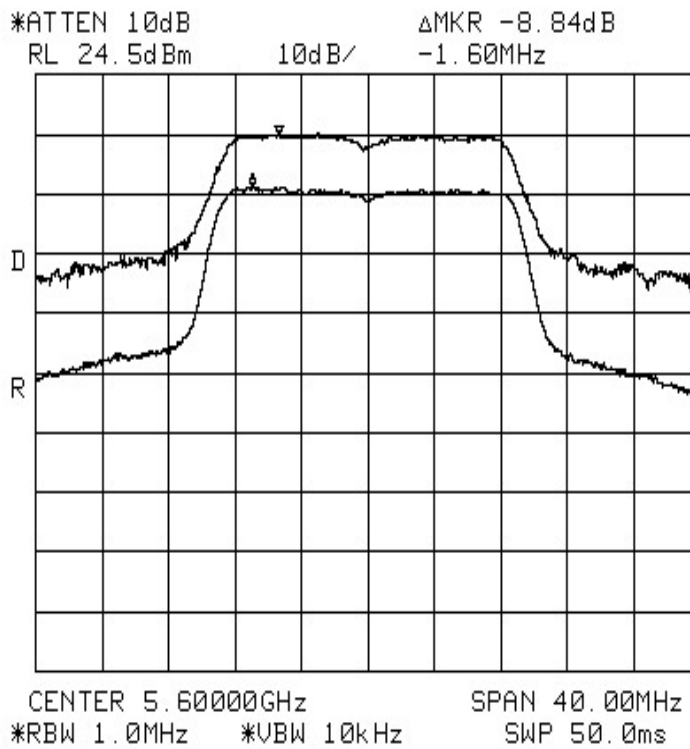
### 802.11 n (HT20) Chain A CH64 5320MHz PK to AV Ratio



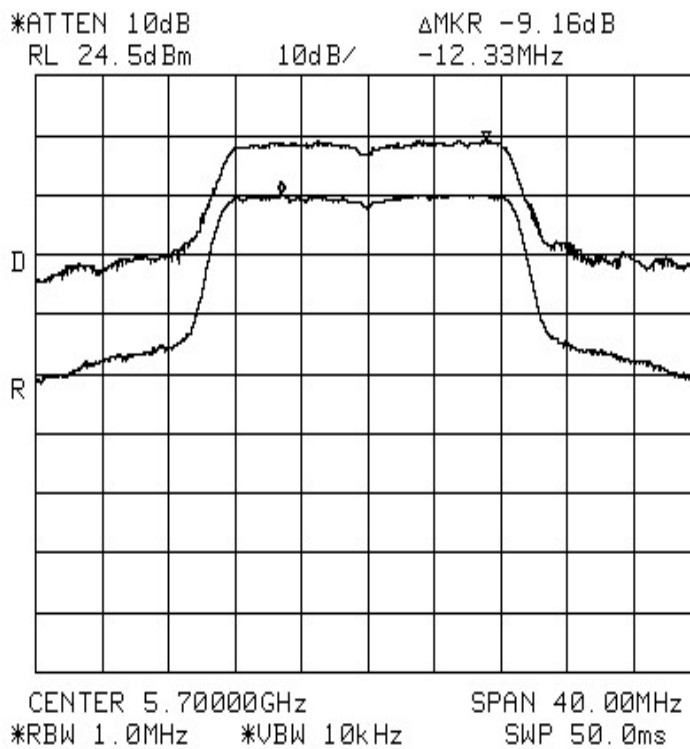
### 802.11 n (HT20) Chain A CH100 5500MHz PK to AV Ratio



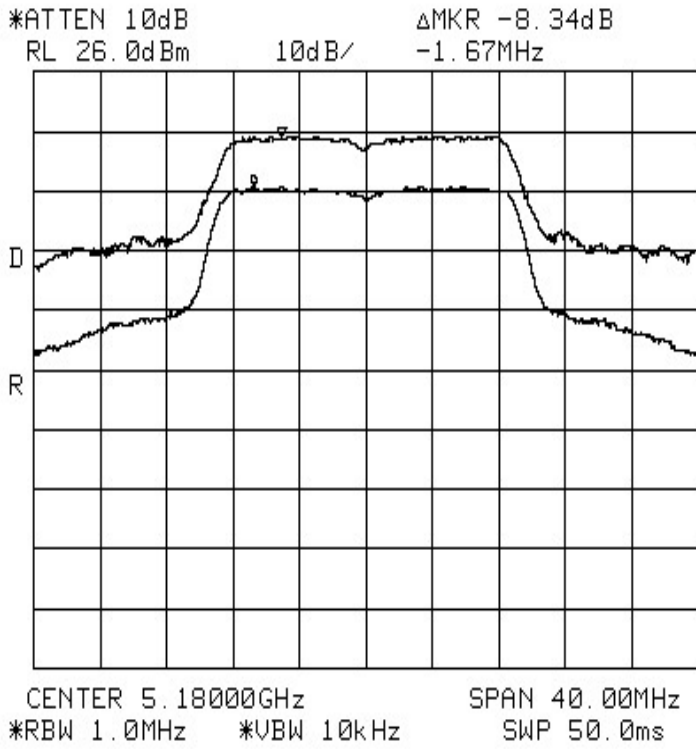
### 802.11 n (HT20) Chain A CH120 5600MHz PK to AV Ratio



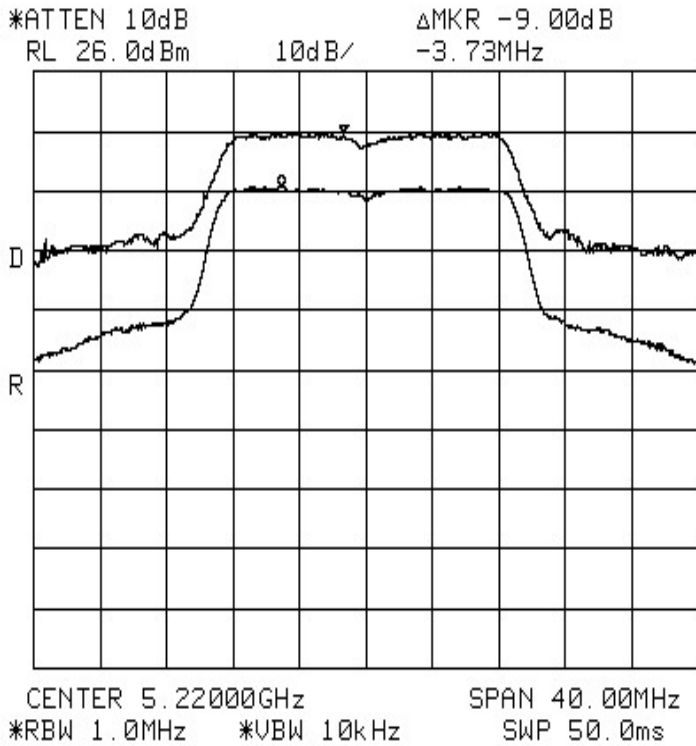
### 802.11 n (HT20) Chain A CH140 5700MHz PK to AV Ratio



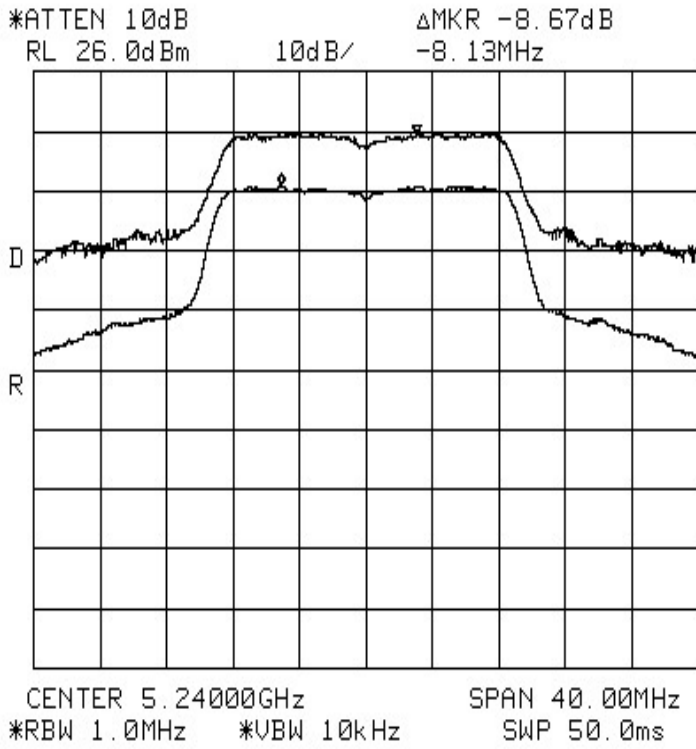
### 802.11 n (HT20) Chain B CH36 5180MHz PK to AV Ratio



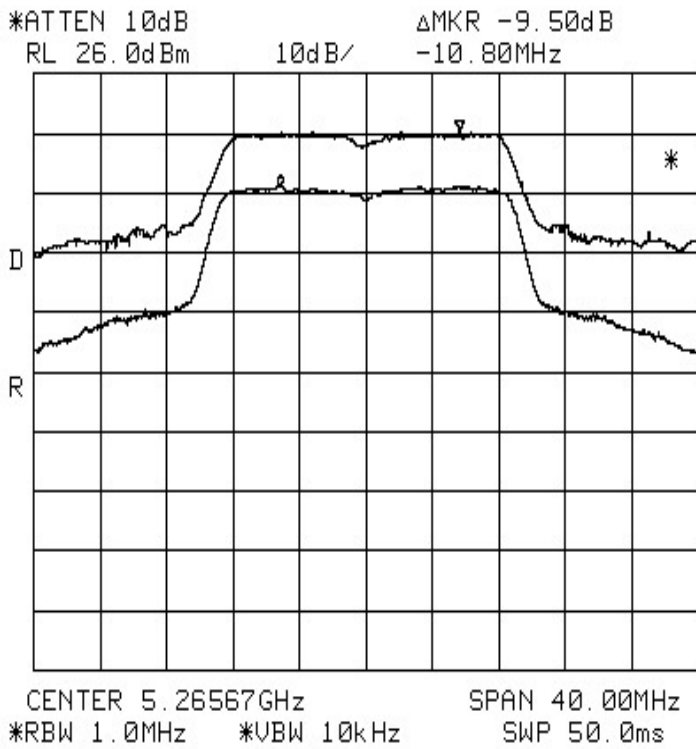
### 802.11 n (HT20) Chain B CH44 5220MHz PK to AV Ratio



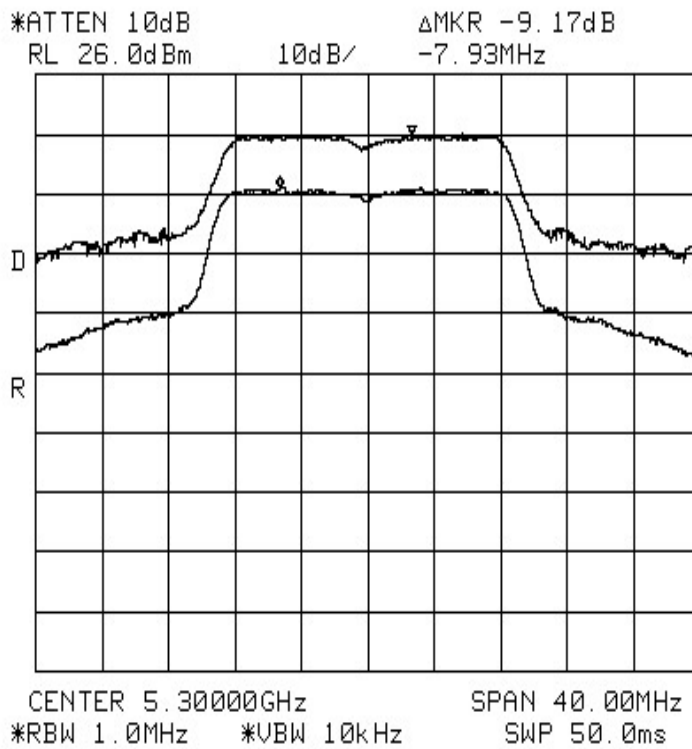
### 802.11 n (HT20) Chain B CH48 5240MHz PK to AV Ratio



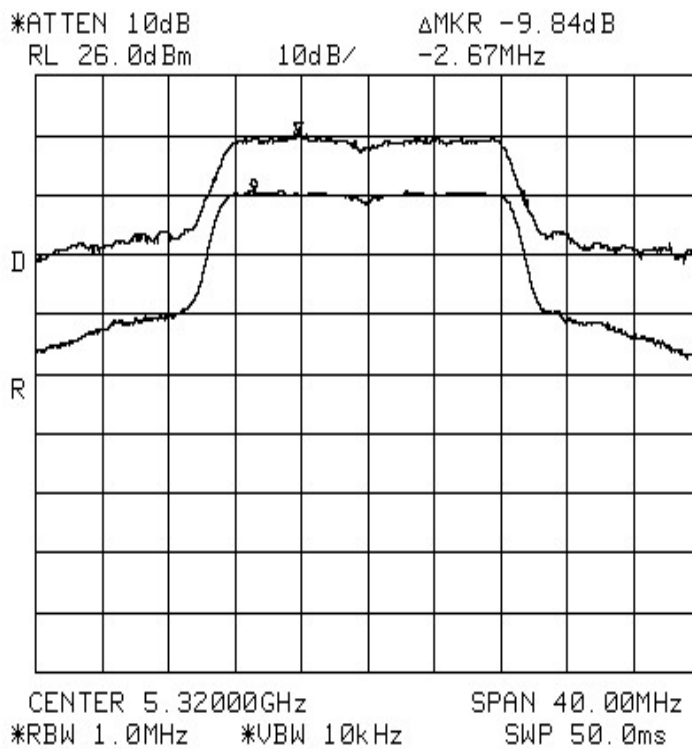
### 802.11 n (HT20) Chain B CH52 5260MHz PK to AV Ratio



### 802.11 n (HT20) Chain B CH60 5300MHz PK to AV Ratio

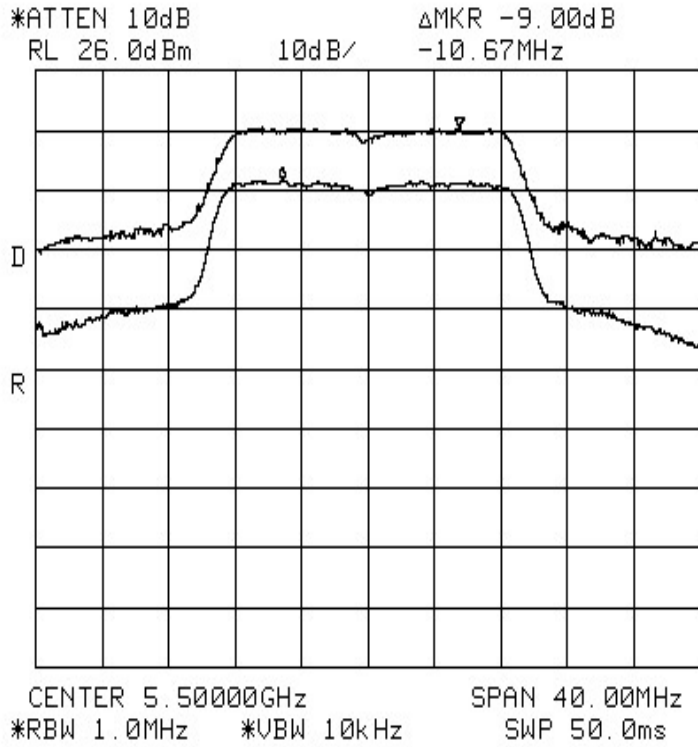


### 802.11 n (HT20) Chain B CH64 5320MHz PK to AV Ratio

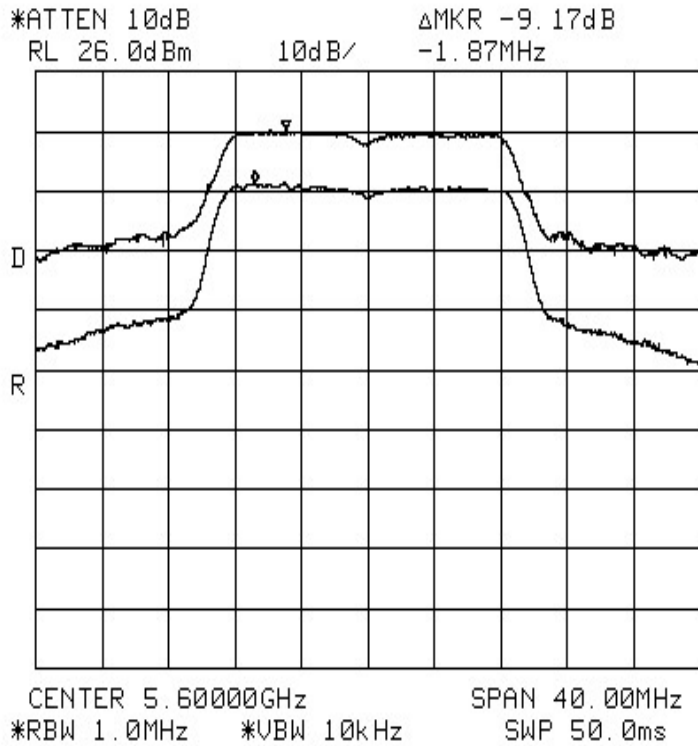




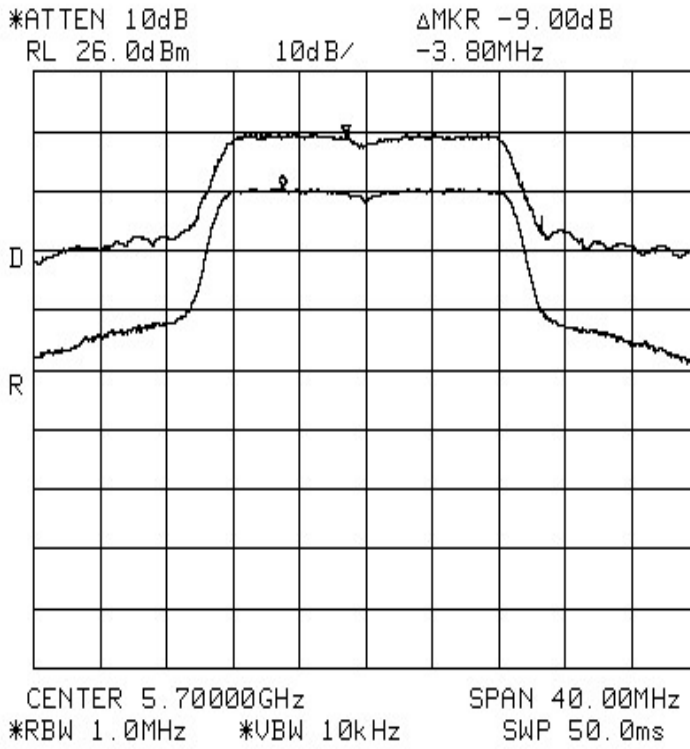
### 802.11 n (HT20) Chain B CH100 5500MHz PK to AV Ratio



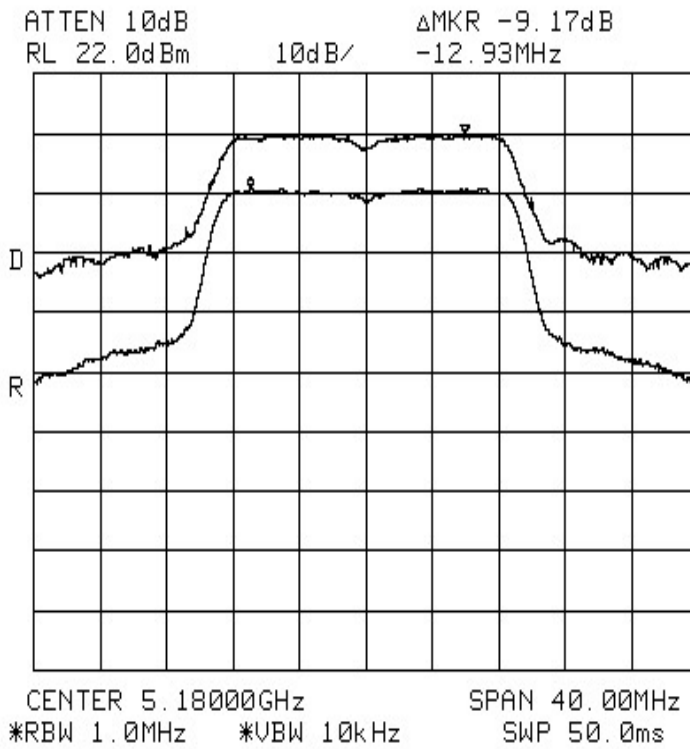
### 802.11 n (HT20) Chain B CH120 5600MHz PK to AV Ratio



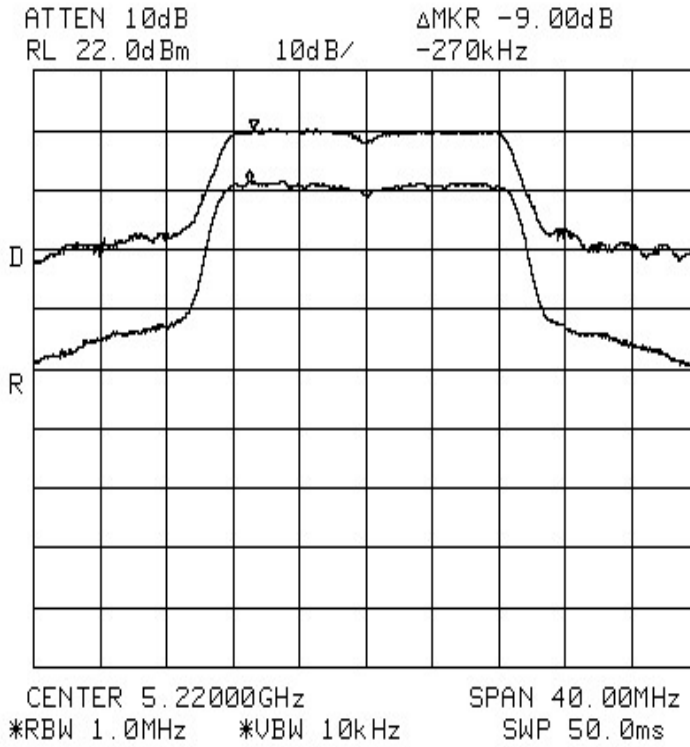
### 802.11 n (HT20) Chain B CH140 5700MHz PK to AV Ratio



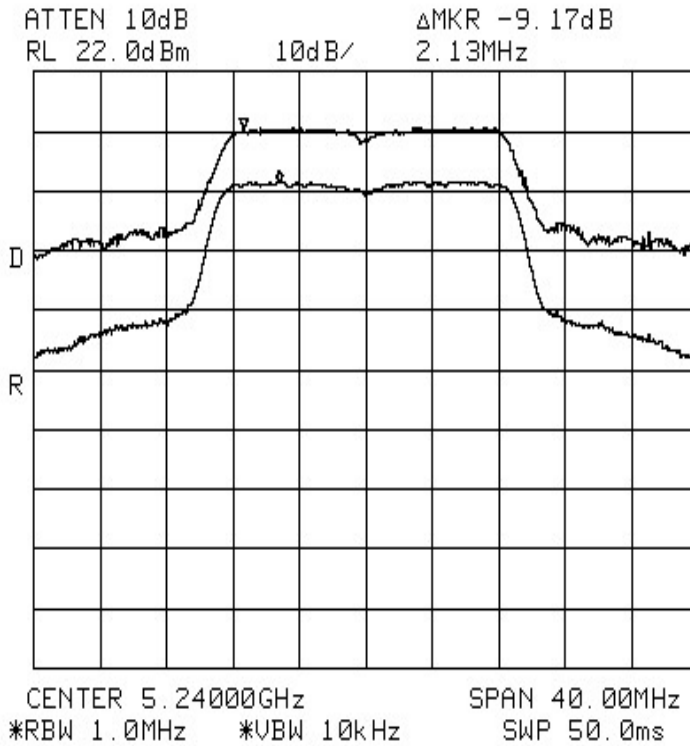
### 802.11 n (HT20) Chain C CH36 5180MHz PK to AV Ratio



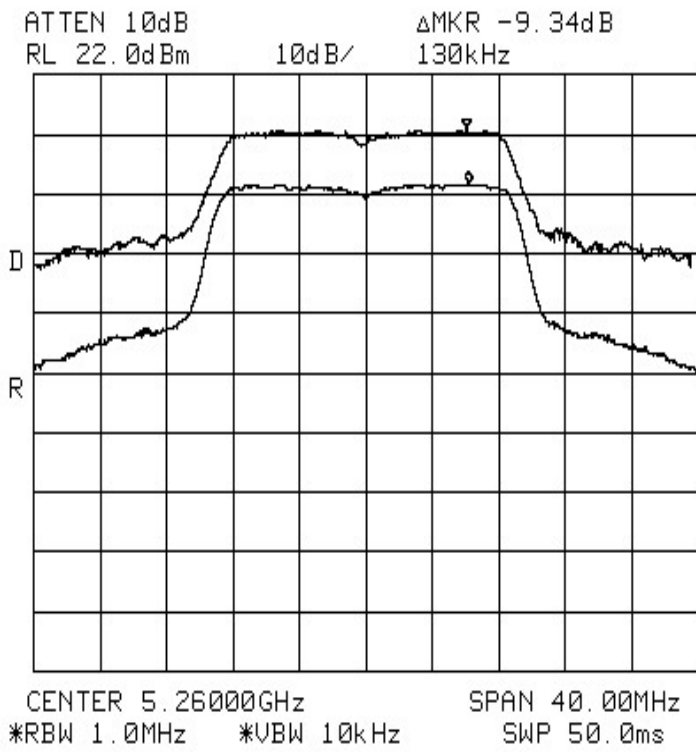
### 802.11 n (HT20) Chain C CH44 5220MHz PK to AV Ratio



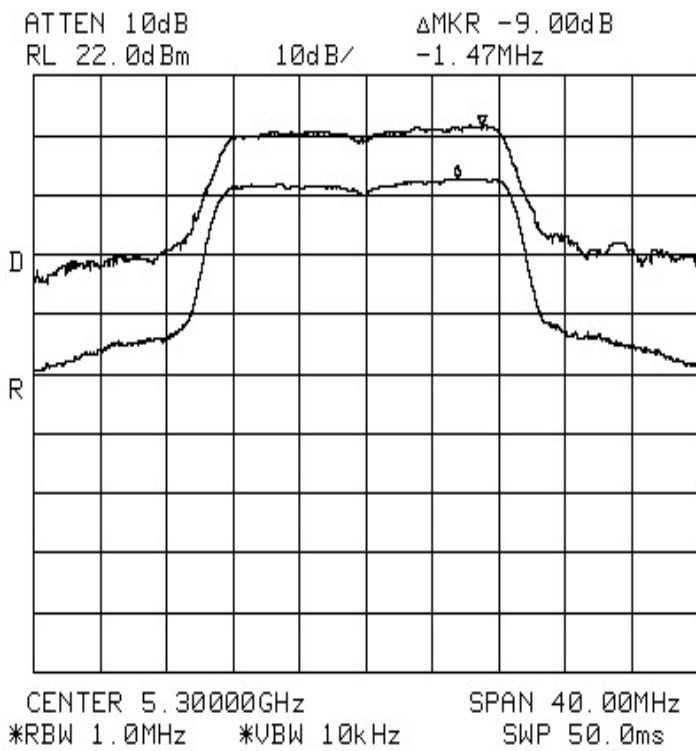
### 802.11 n (HT20) Chain C CH48 5240MHz PK to AV Ratio



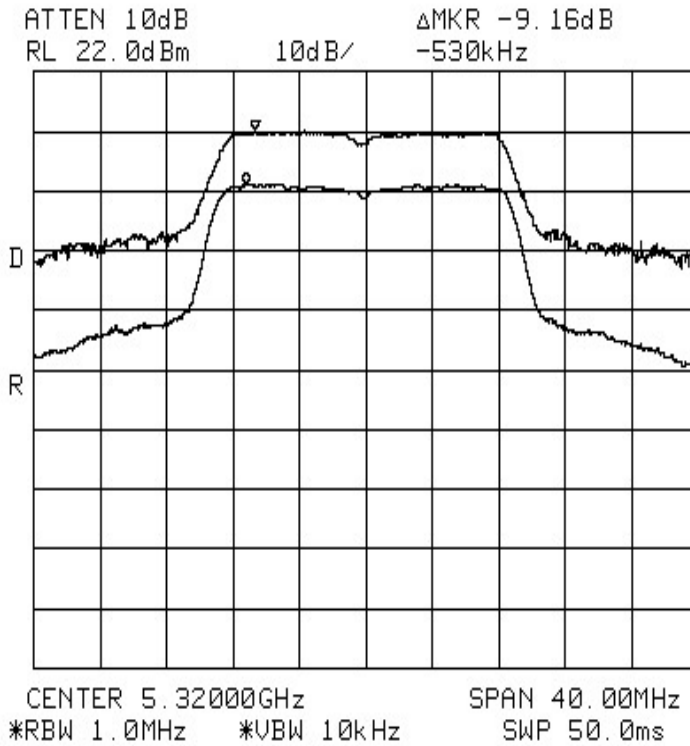
### 802.11 n (HT20) Chain C CH52 5260MHz PK to AV Ratio



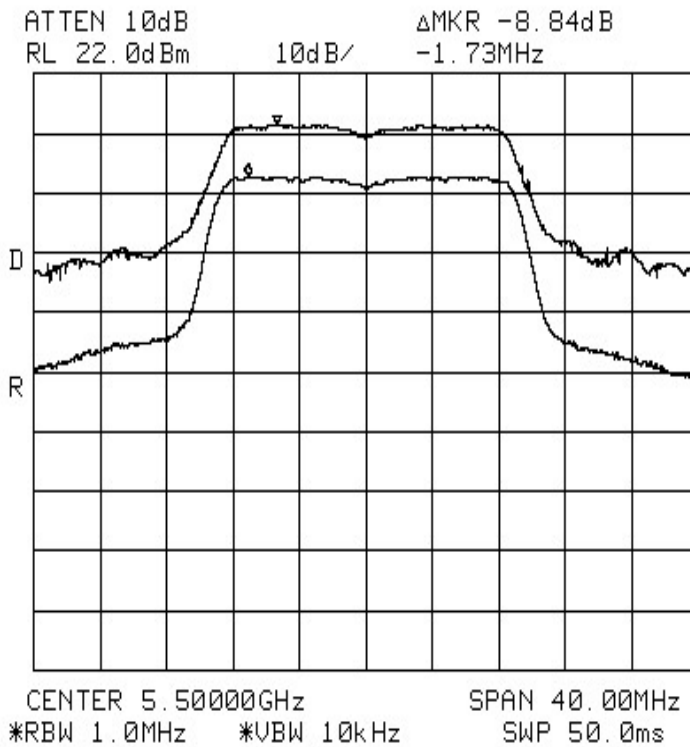
### 802.11 n (HT20) Chain C CH60 5300MHz PK to AV Ratio



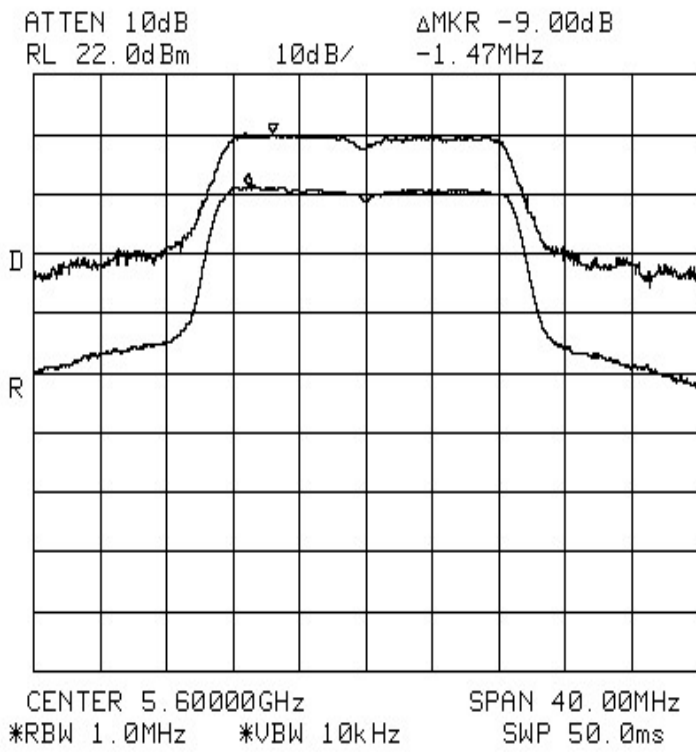
### 802.11 n (HT20) Chain C CH64 5320MHz PK to AV Ratio



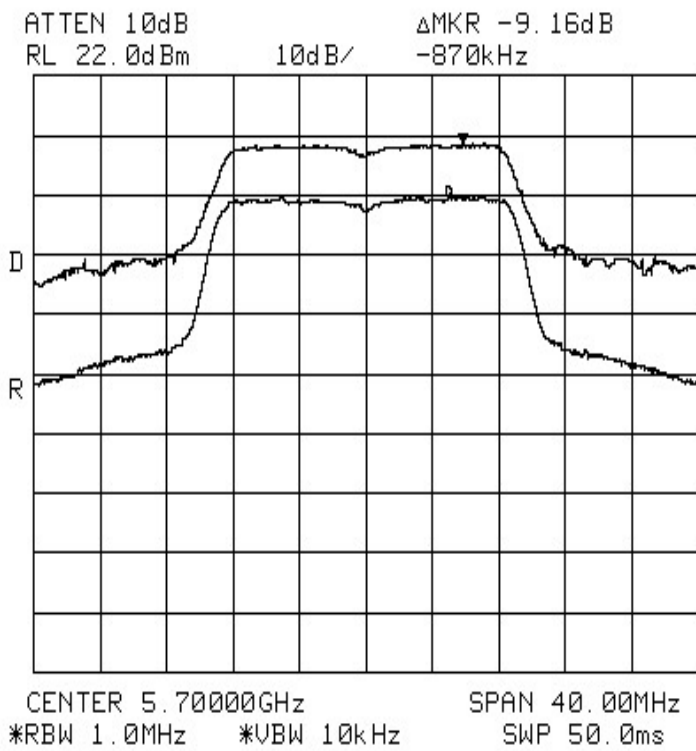
### 802.11 n (HT20) Chain C CH100 5500MHz PK to AV Ratio



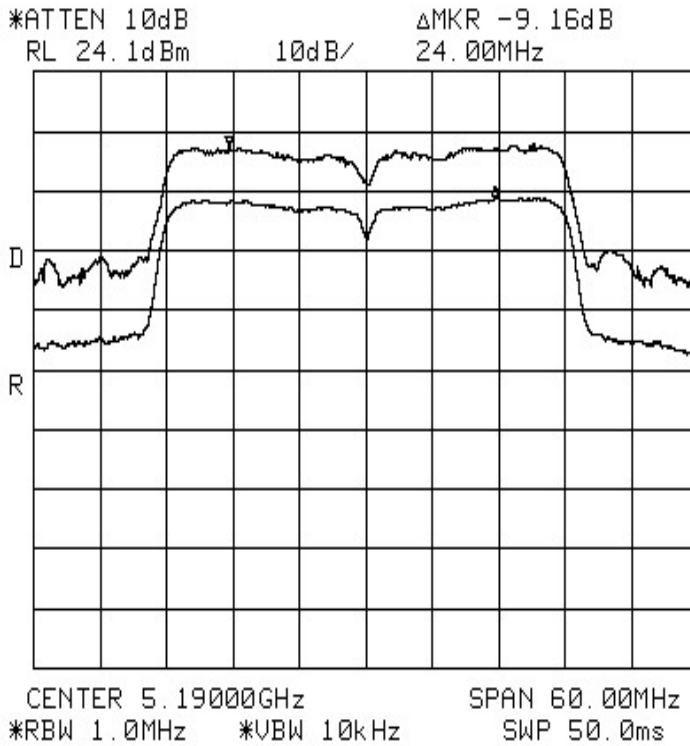
**802.11 n (HT20) Chain C CH120 5600MHz PK to AV Ratio**



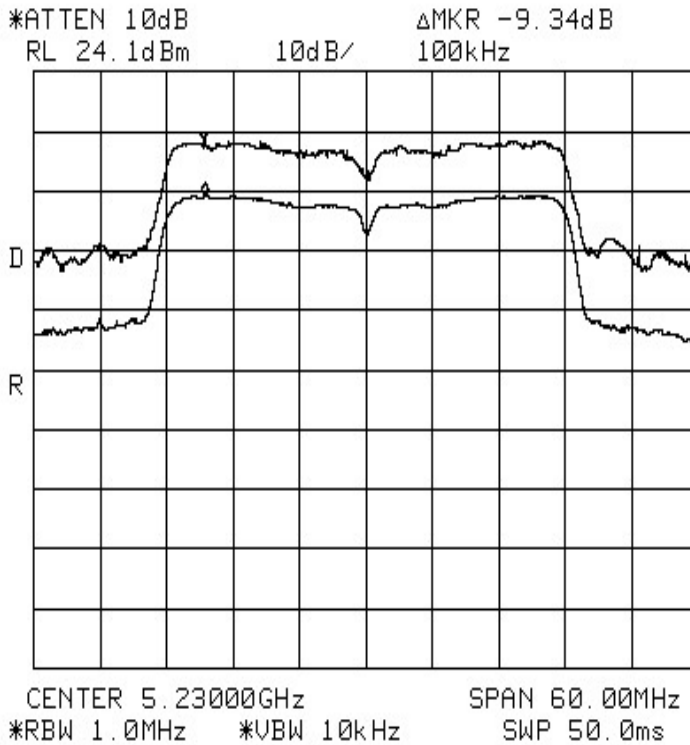
**802.11 n (HT20) Chain C CH140 5700MHz PK to AV Ratio**



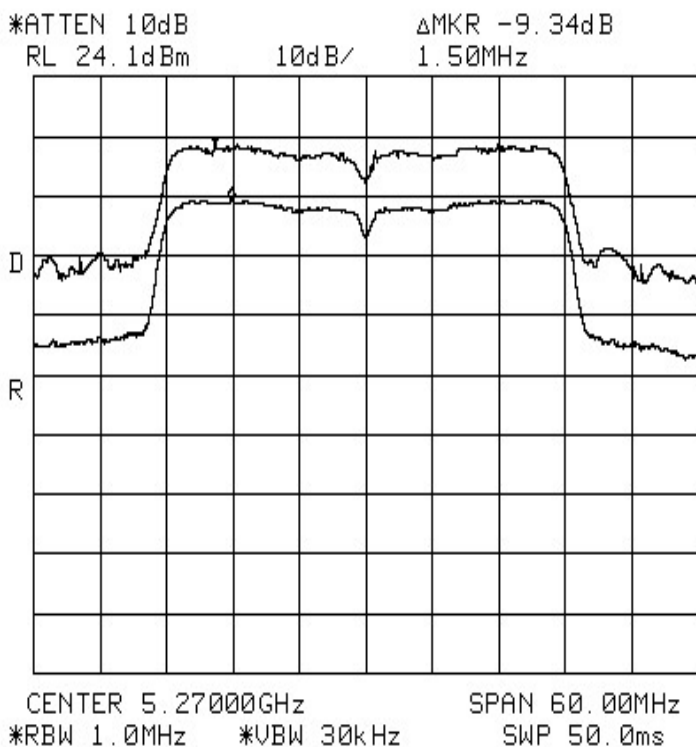
### 802.11 n (HT40) Chain A CH38 5190MHz PK to AV Ratio



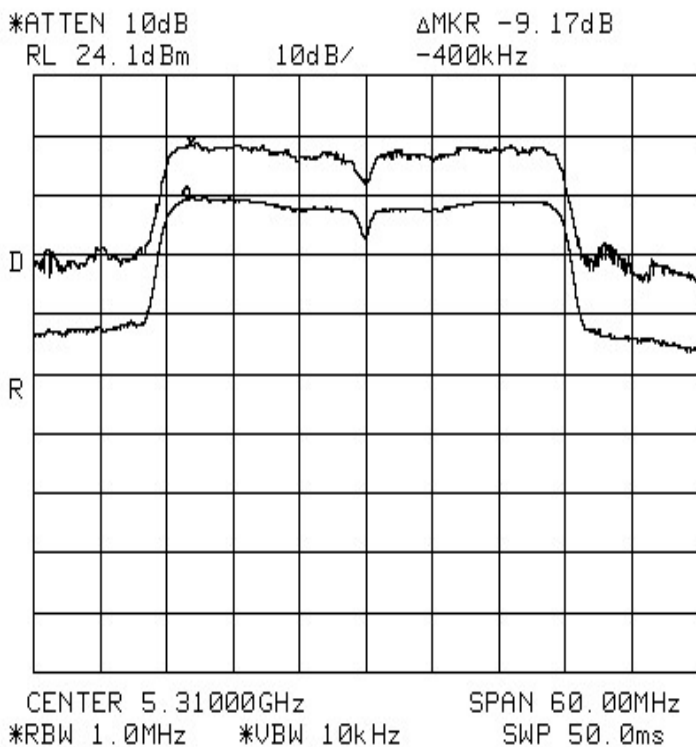
### 802.11 n (HT40) Chain A CH46 5230MHz PK to AV Ratio



### 802.11 n (HT40) Chain A CH54 5270MHz PK to AV Ratio

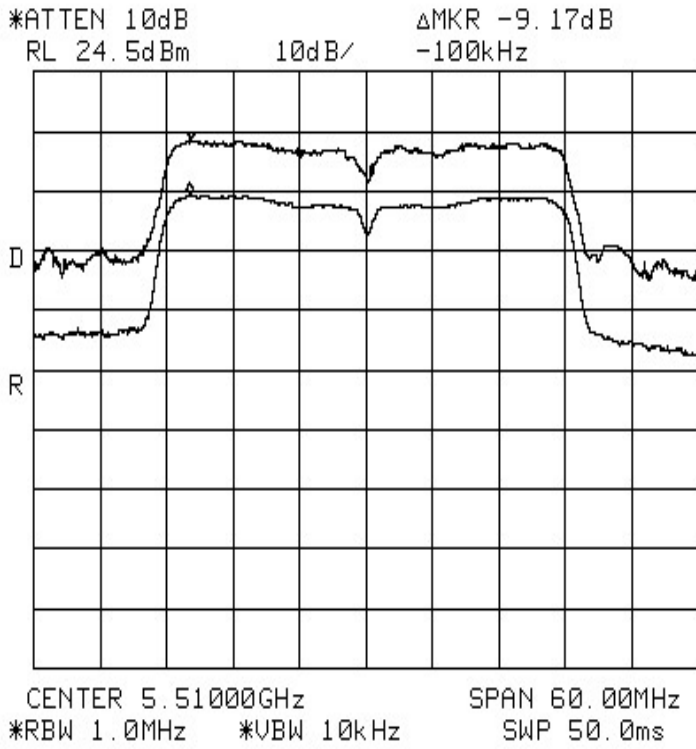


### 802.11 n (HT40) Chain A CH62 5310MHz PK to AV Ratio

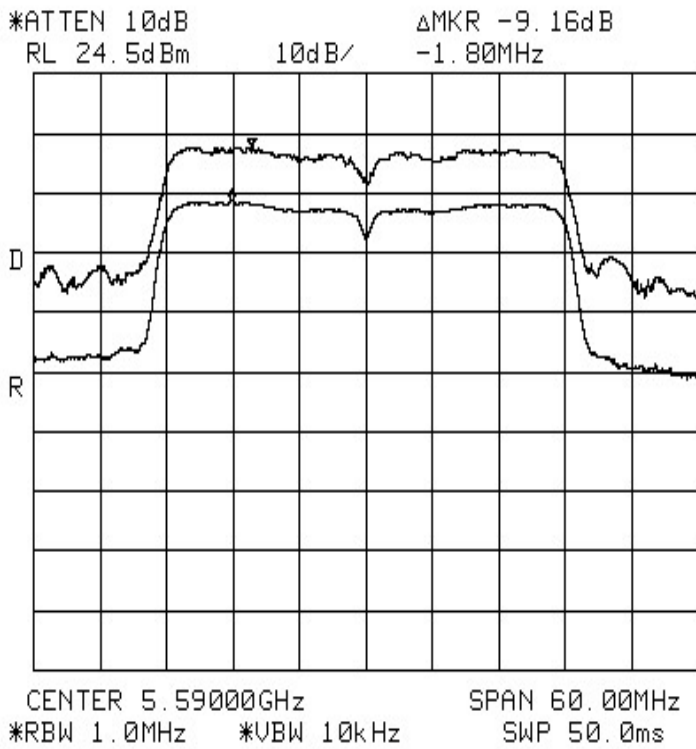




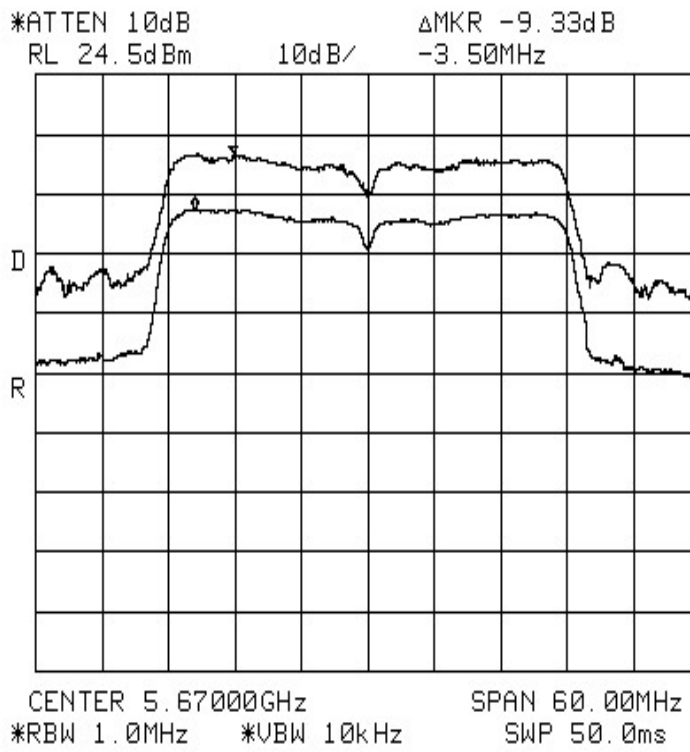
### 802.11 n (HT40) Chain A CH102 5510MHz PK to AV Ratio



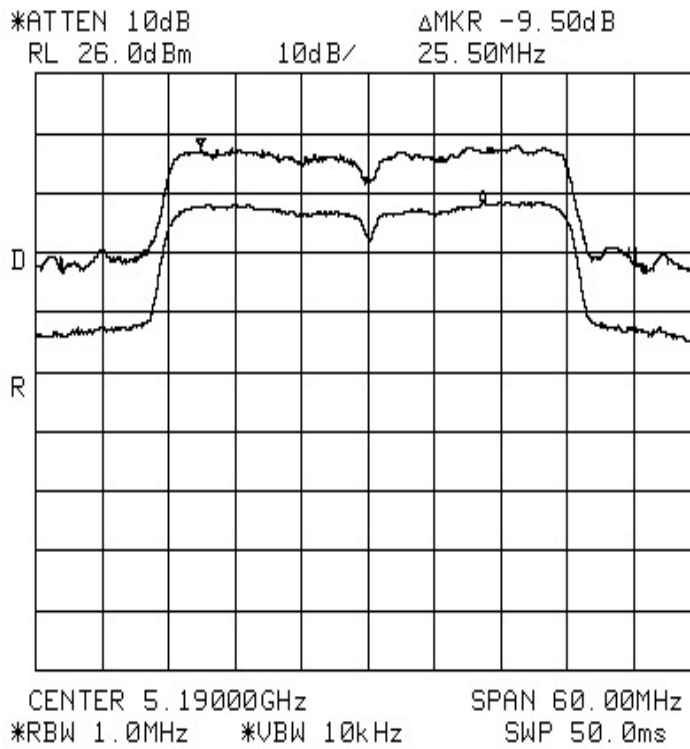
### 802.11 n (HT40) Chain A CH118 5590MHz PK to AV Ratio



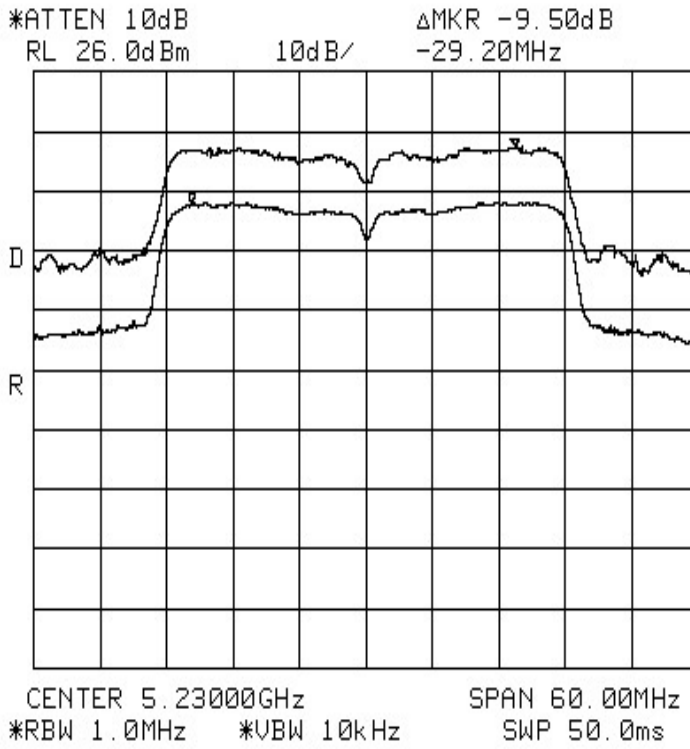
### 802.11 n (HT40) Chain A CH134 5670MHz PK to AV Ratio



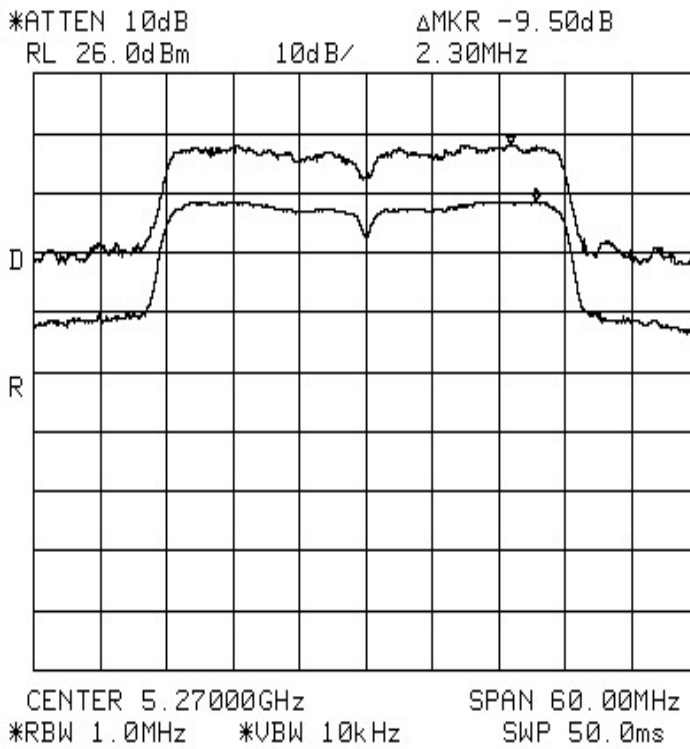
### 802.11 n (HT40) Chain B CH38 5190MHz PK to AV Ratio



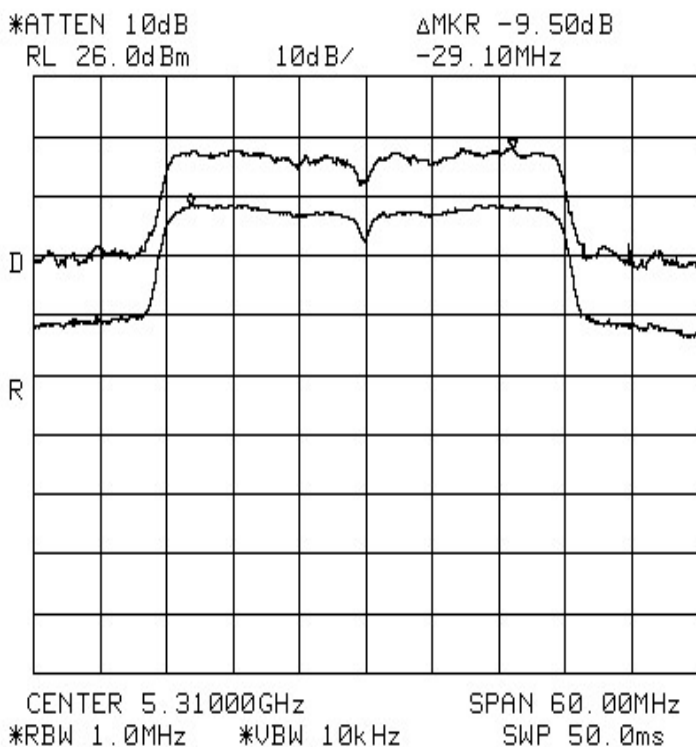
### 802.11 n (HT40) Chain B CH46 5230MHz PK to AV Ratio



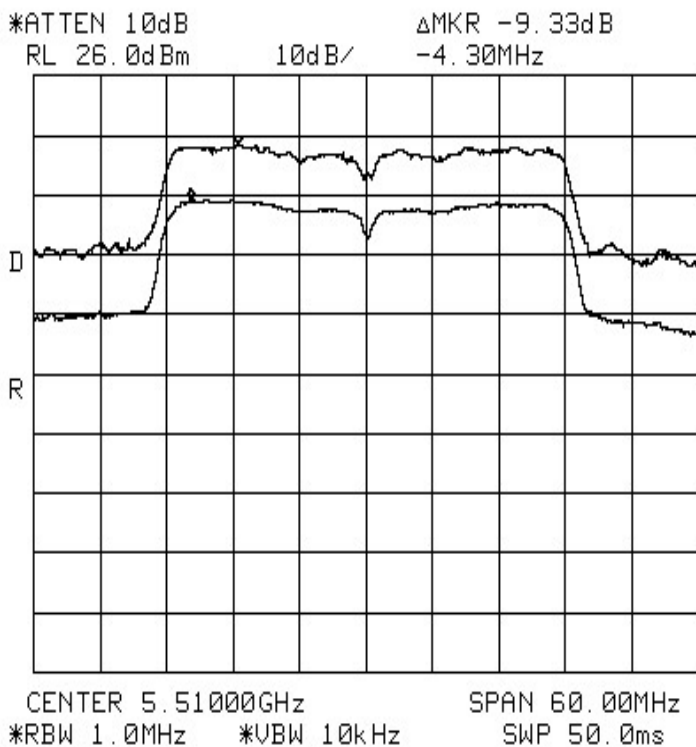
### 802.11 n (HT40) Chain B CH54 5270MHz PK to AV Ratio



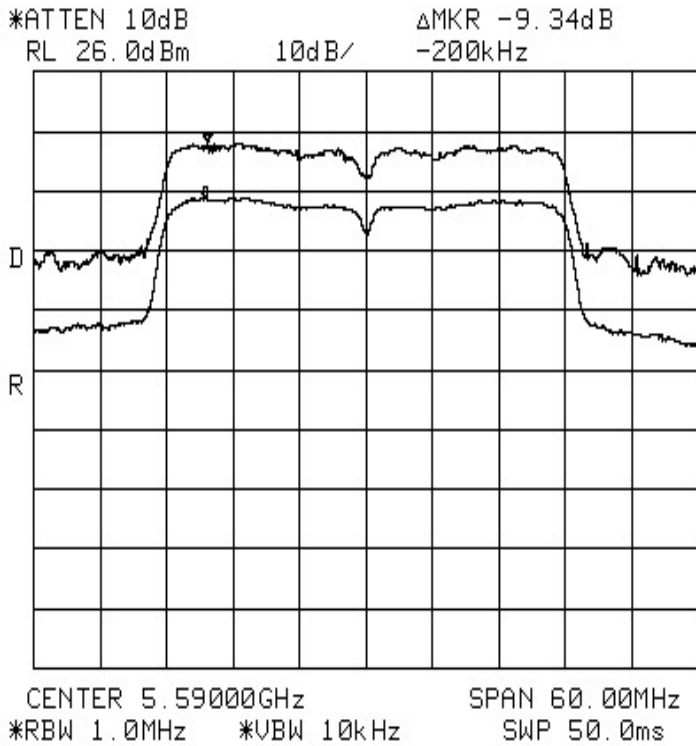
**802.11 n (HT40) Chain B CH62 5310MHz PK to AV Ratio**



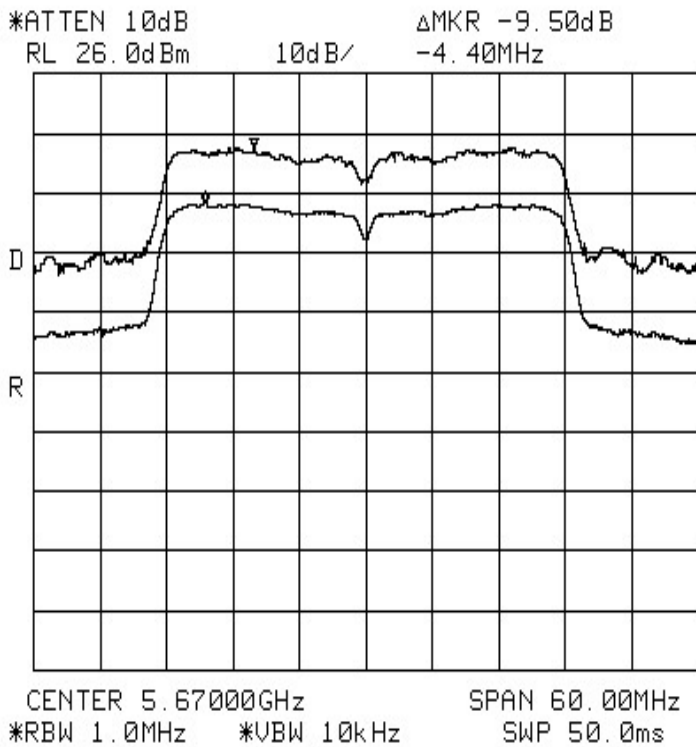
**802.11 n (HT40) Chain B CH102 5510MHz PK to AV Ratio**



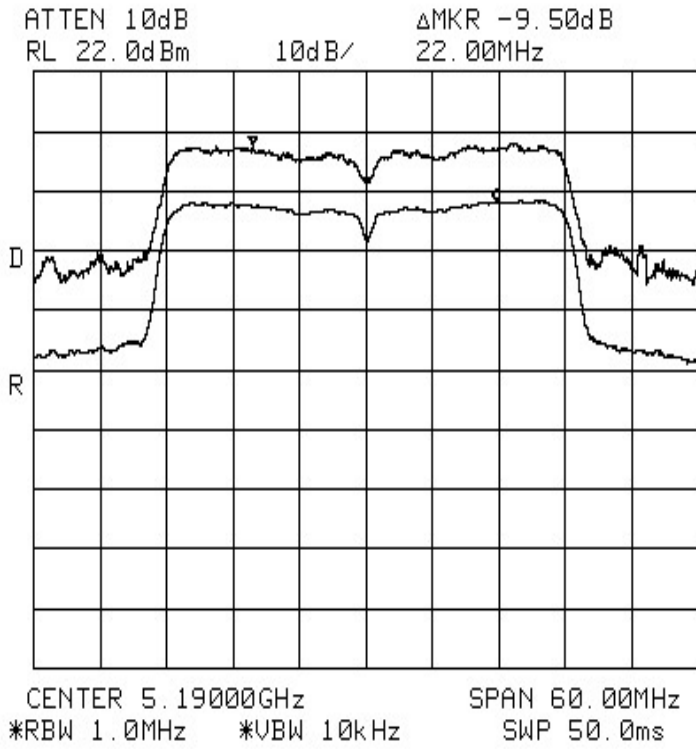
### 802.11 n (HT40) Chain B CH118 5590MHz PK to AV Ratio



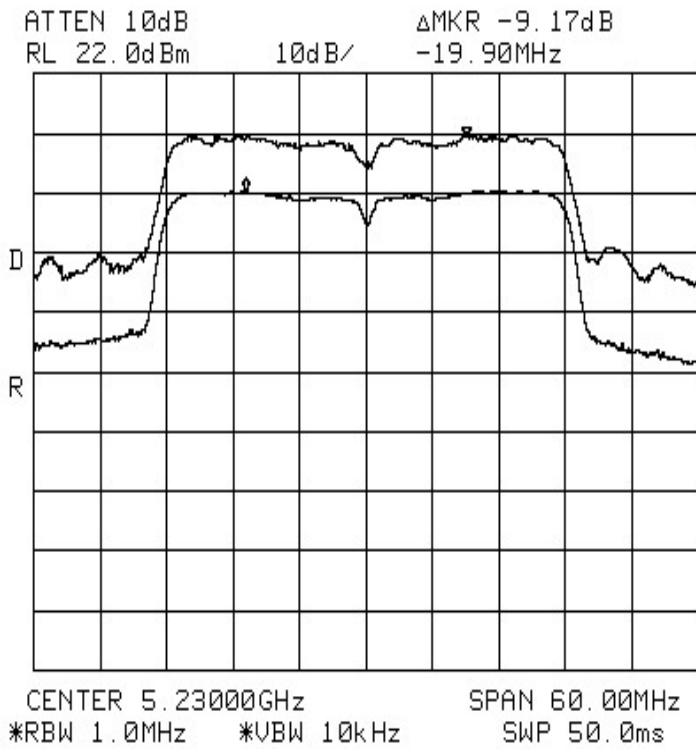
### 802.11 n (HT40) Chain B CH134 5670MHz PK to AV Ratio



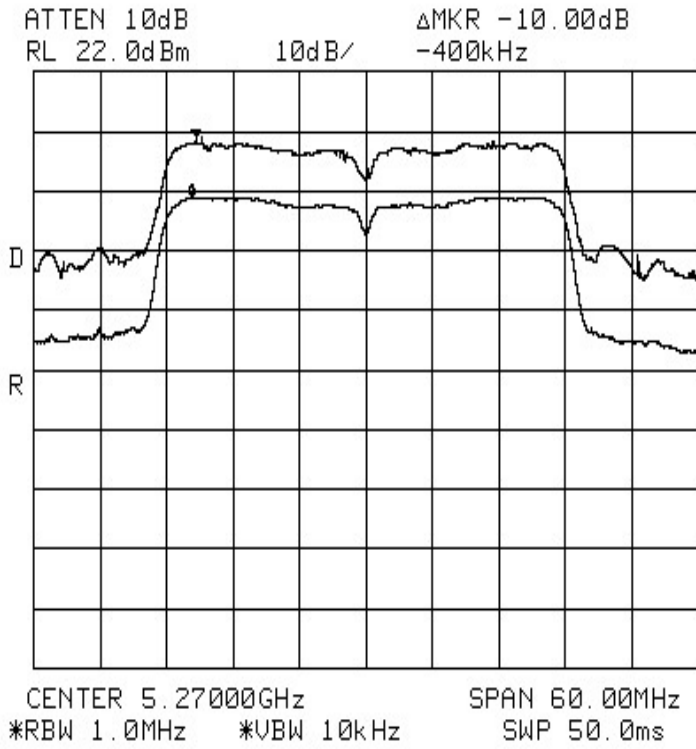
### 802.11 n (HT40) Chain C CH38 5190MHz PK to AV Ratio



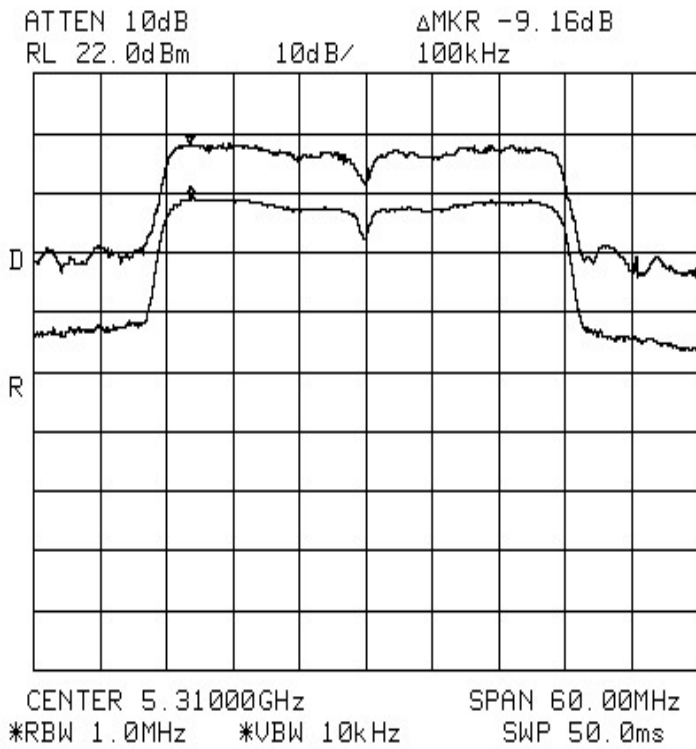
### 802.11 n (HT40) Chain C CH46 5230MHz PK to AV Ratio



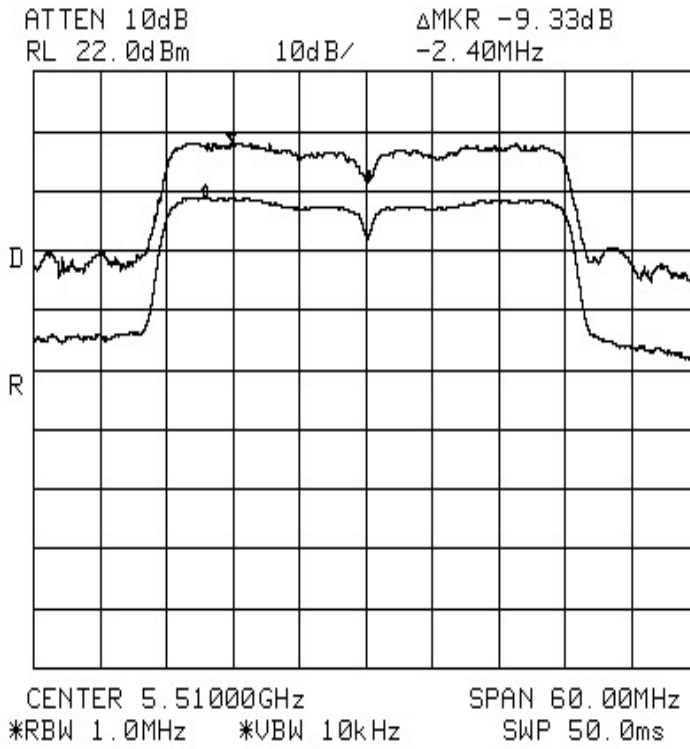
### 802.11 n (HT40) Chain C CH54 5270MHz PK to AV Ratio



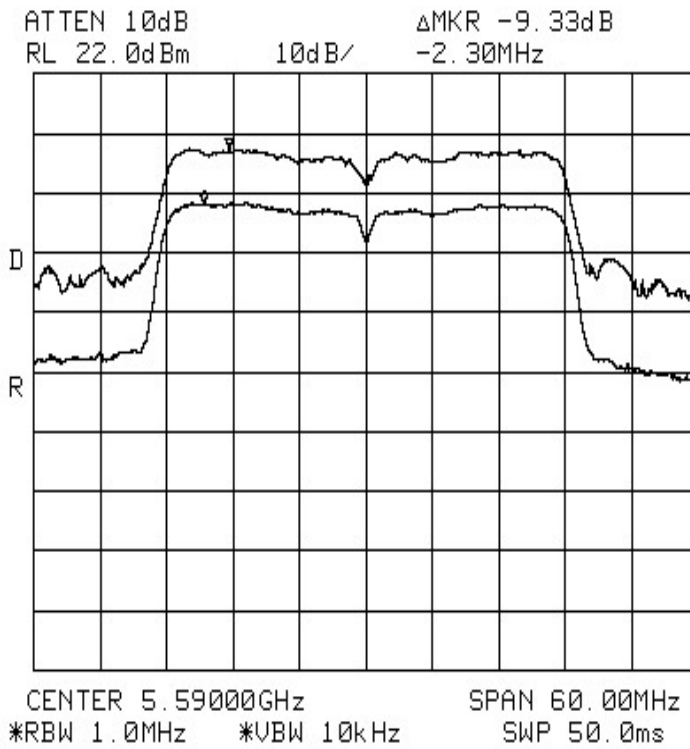
### 802.11 n (HT40) Chain C CH62 5310MHz PK to AV Ratio



### 802.11 n (HT40) Chain C CH102 5510MHz PK to AV Ratio

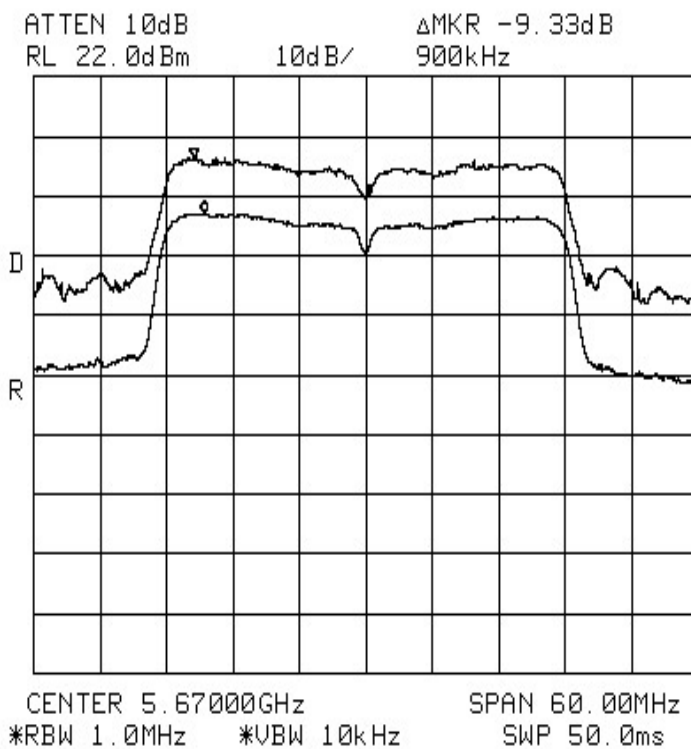


### 802.11 n (HT40) Chain C CH118 5590MHz PK to AV Ratio





### 802.11 n (HT40) Chain C CH134 5670MHz PK to AV Ratio



## 6 Radiated emission test (FCC Part 15.209)

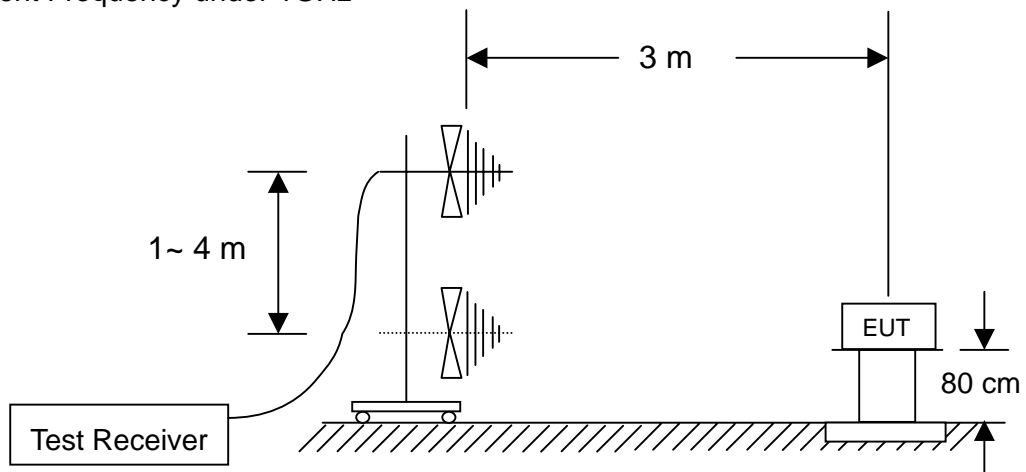
### 6.1 Limits

The radiated emission shall comply with §15.209(a).

Frequency (MHz)	Field strength Db(Mv/m)	Measurement distance (meters)
1.705~30.0	29.5	30
30 ~ 88	40	3
88~216	43.5	3
216~960	46	3
Above 960	54	3

### 6.2 Configuration of Measurement

Measurement Frequency under 1GHz



### **6.3 Test Procedure**

Radiated emission measurements were performed from 30MHz to1GHz. Spectrum Analyzer Resolution Bandwidth is 100kHz or greater.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to present worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

### **6.4 Test Result**

**PASS.**

The final test data is shown on as following pages.

## Radiated spurious emission

### Test Environment

Ambient temperature : 26.0°C  
 Relative humidity : 45%

### Radiated Emission below 1GHz

After verifying Single Tx & Dual Tx & Triple Tx, the worse case determine by Triple Tx Mode (802.11n HT20 Chain ABC), the data will present on report.

Worst case: 802.11n (HT20) CH36 5180MHz								
Frequency (MHz)	Antenna Polarization	Reading (dB μV)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Det. Mode
240.100	H	40.30	28.84	14.65	26.11	46.00	-19.89	QP
600.120	H	34.60	28.52	25.49	31.57	46.00	-14.43	QP
720.200	H	28.20	28.25	29.22	29.17	46.00	-16.83	QP
960.010	H	26.50	28.36	33.16	31.30	46.00	-14.70	QP
240.010	V	41.20	28.84	14.79	27.15	46.00	-18.85	QP
458.180	V	35.60	29.09	23.02	29.53	46.00	-16.47	QP
797.800	V	26.50	28.08	29.12	27.54	46.00	-18.46	QP
962.200	V	25.20	28.35	33.00	29.85	46.00	-16.15	QP

Remark : Corrected Level = Reading + Correction Factor – Preamp  
 Correction Factor = Antenna Factor + Cable Loss

The present spurious only show those points are above noise level and the frequency range test from 30MHz to 1GHz.

## 7 Band edge test

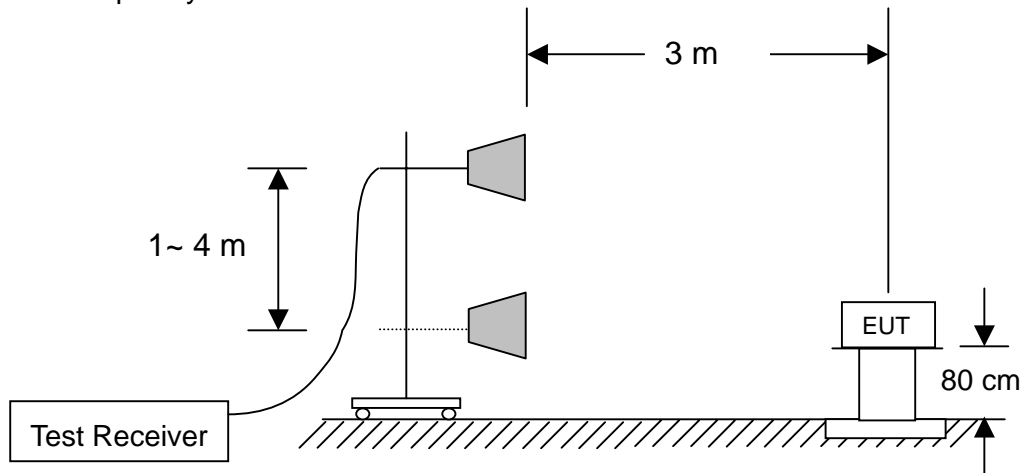
### 7.1 Limit

According to FCC Part 15.205 requirement :

Any radiated emission in the restricted bands shall be complied with the limits in 15.209.

### 7.2 Configuration of Measurement

Measurement Frequency above 1GHz



### 7.3 Test Procedure

Set RBW =1M, VBW= RBW for peak, and VBW=10Hz for average.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to present worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

### 7.4 Test Result

**PASS.**

The final test data is shown on as following pages.

## Band edge test

### Single Tx

802.11a Chain A					
CH	Restricted Band (MHz)	Maximum Level (dB $\mu$ V/m)	Limit (dBm)	Margin (dB)	Detector Mode
36	4500~5150	58.50	74	-15.50	PK
		46.34	54	-7.66	AV
64	5350~5460	62.67	74	-11.33	PK
		48.34	54	-5.66	AV
100	5350-5460	57.50	74	-16.50	PK
		46.00	54	-8.00	AV

802.11a Chain B					
CH	Restricted Band (MHz)	Maximum Level (dB $\mu$ V/m)	Limit (dBm)	Margin (dB)	Detector Mode
36	4500~5150	59.17	74	-14.83	PK
		47.00	54	-7.00	AV
64	5350~5460	60.67	74	-13.33	PK
		46.84	54	-7.16	AV
100	5350-5460	58.00	74	-16.00	PK
		46.17	54	-7.83	AV

802.11a Chain C					
CH	Restricted Band (MHz)	Maximum Level (dB $\mu$ V/m)	Limit (dBm)	Margin (dB)	Detector Mode
36	4500~5150	61.34	74	-12.66	PK
		46.67	54	-7.33	AV
64	5350~5460	58.34	74	-15.66	PK
		46.50	54	-7.50	AV
100	5350-5460	57.67	74	-16.33	PK
		46.00	54	-8.00	AV

<b>802.11n (HT20) Chain A</b>					
<b>CH</b>	<b>Restricted Band (MHz)</b>	<b>Maximum Level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>	<b>Detector Mode</b>
36	4500~5150	57.67	74	-16.33	PK
		46.00	54	-8.00	AV
64	5350~5460	58.84	74	-15.16	PK
		46.67	54	-7.33	AV
100	5350-5460	57.67	74	-16.33	PK
		46.00	54	-8.00	AV

<b>802.11n (HT20) Chain B</b>					
<b>CH</b>	<b>Restricted Band (MHz)</b>	<b>Maximum Level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>	<b>Detector Mode</b>
36	4500~5150	60.67	74	-13.33	PK
		46.50	54	-7.50	AV
64	5350~5460	58.50	74	-15.50	PK
		46.34	54	-7.66	AV
100	5350-5460	58.34	74	-15.66	PK
		46.00	54	-8.00	AV

<b>802.11n (HT20) Chain C</b>					
<b>CH</b>	<b>Restricted Band (MHz)</b>	<b>Maximum Level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>	<b>Detector Mode</b>
36	4500~5150	63.84	74	-10.16	PK
		48.34	54	-5.66	AV
64	5350~5460	60.67	74	-13.33	PK
		46.84	54	-7.16	AV
100	5350-5460	58.34	74	-15.66	PK
		46.00	54	-8.00	AV

<b>802.11n (HT40) Chain A</b>					
<b>CH</b>	<b>Restricted Band (MHz)</b>	<b>Maximum Level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>	<b>Detector Mode</b>
38	4500~5150	62.67	74	-11.33	PK
		50.34	54	-3.66	AV
62	5350~5460	60.34	74	-13.66	PK
		49.17	54	-4.83	AV
102	5350-5460	60.00	74	-14.00	PK
		47.00	54	-7.00	AV

<b>802.11n (HT40) Chain B</b>					
<b>CH</b>	<b>Restricted Band (MHz)</b>	<b>Maximum Level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>	<b>Detector Mode</b>
38	4500~5150	62.84	74	-11.16	PK
		50.17	54	-3.83	AV
62	5350~5460	61.84	74	-12.16	PK
		49.00	54	-5.00	AV
102	5350-5460	61.17	74	-12.83	PK
		47.84	54	-6.16	AV

<b>802.11n (HT40) Chain C</b>					
<b>CH</b>	<b>Restricted Band (MHz)</b>	<b>Maximum Level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>	<b>Detector Mode</b>
38	4500~5150	68.84	74	-5.16	PK
		53.17	54	-0.83	AV
62	5350~5460	63.84	74	-10.16	PK
		50.84	54	-3.16	AV
102	5350-5460	59.17	74	-14.83	PK
		47.17	54	-6.83	AV



## Band edge test

### Dual Tx

802.11n (HT20) Chain A+B					
CH	Restricted Band (MHz)	Maximum Level (dB $\mu$ V/m)	Limit (dBm)	Margin (dB)	Detector Mode
36	4500~5150	57.17	74	-16.83	PK
		45.84	54	-8.16	AV
64	5350~5460	57.17	74	-16.83	PK
		46.17	54	-7.83	AV
100	5350-5460	57.84	74	-16.16	PK
		46.00	54	-8.00	AV

802.11n (HT20) Chain B+C					
CH	Restricted Band (MHz)	Maximum Level (dB $\mu$ V/m)	Limit (dBm)	Margin (dB)	Detector Mode
36	4500~5150	58.67	74	-15.33	PK
		46.67	54	-7.33	AV
64	5350~5460	58.17	74	-15.83	PK
		46.00	54	-8.00	AV
100	5350-5460	57.84	74	-16.16	PK
		46.00	54	-8.00	AV

802.11n (HT20) Chain A+C					
CH	Restricted Band (MHz)	Maximum Level (dB $\mu$ V/m)	Limit (dBm)	Margin (dB)	Detector Mode
36	4500~5150	57.34	74	-16.66	PK
		46.00	54	-8.00	AV
64	5350~5460	57.50	74	-16.50	PK
		45.84	54	-8.16	AV
100	5350-5460	58.34	74	-15.66	PK
		46.00	54	-8.00	AV

<b>802.11n (HT40) Chain A+B</b>					
<b>CH</b>	<b>Restricted Band (MHz)</b>	<b>Maximum Level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>	<b>Detector Mode</b>
38	4500-5150	64.84	74	-9.16	PK
		51.34	54	-2.66	AV
62	5350-5460	64.17	74	-9.83	PK
		51.34	54	-2.66	AV
102	5350-5460	60.17	74	-13.83	PK
		47.50	54	-6.50	AV

<b>802.11n (HT40) Chain B+C</b>					
<b>CH</b>	<b>Restricted Band (MHz)</b>	<b>Maximum Level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>	<b>Detector Mode</b>
38	4500-5150	67.67	74	-6.33	PK
		52.84	54	-1.16	AV
62	5350-5460	65.67	74	-8.33	PK
		51.65	54	-2.35	AV
102	5350-5460	61.50	74	-12.50	PK
		48.00	54	-6.00	AV

<b>802.11n (HT40) Chain A+C</b>					
<b>CH</b>	<b>Restricted Band (MHz)</b>	<b>Maximum Level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>	<b>Detector Mode</b>
38	4500-5150	66.17	74	-7.83	PK
		53.34	54	-0.66	AV
62	5350-5460	62.67	74	-11.33	PK
		50.17	54	-3.83	AV
102	5350-5460	60.84	74	-13.16	PK
		47.50	54	-6.50	AV

## Band edge test

### Triple Tx

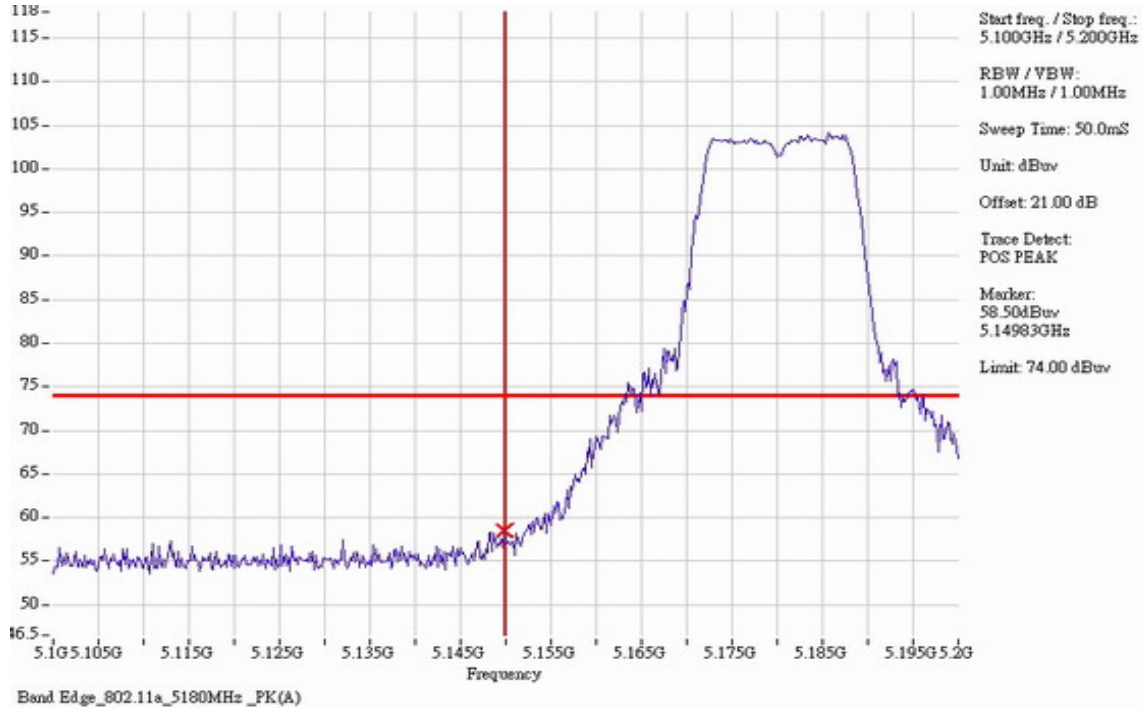
802.11n (HT20) Chain A+B+C					
CH	Restricted Band (MHz)	Maximum Level (dB $\mu$ V/m)	Limit (dBm)	Margin (dB)	Detector Mode
36	4500~5150	57.50	74	-16.50	PK
		46.17	54	-7.83	AV
64	5350~5460	57.50	74	-16.50	PK
		46.00	54	-8.00	AV
100	5350-5460	58.00	74	-16.00	PK
		46.00	54	-8.00	AV

802.11n (HT40) Chain A+B+C					
CH	Restricted Band (MHz)	Maximum Level (dB $\mu$ V/m)	Limit (dBm)	Margin (dB)	Detector Mode
38	4500-5150	65.00	74	-9.00	PK
		50.50	54	-3.50	AV
62	5350-5460	67.17	74	-6.83	PK
		51.84	54	-2.16	AV
102	5350-5460	64.50	74	-9.50	PK
		48.84	54	-5.16	AV

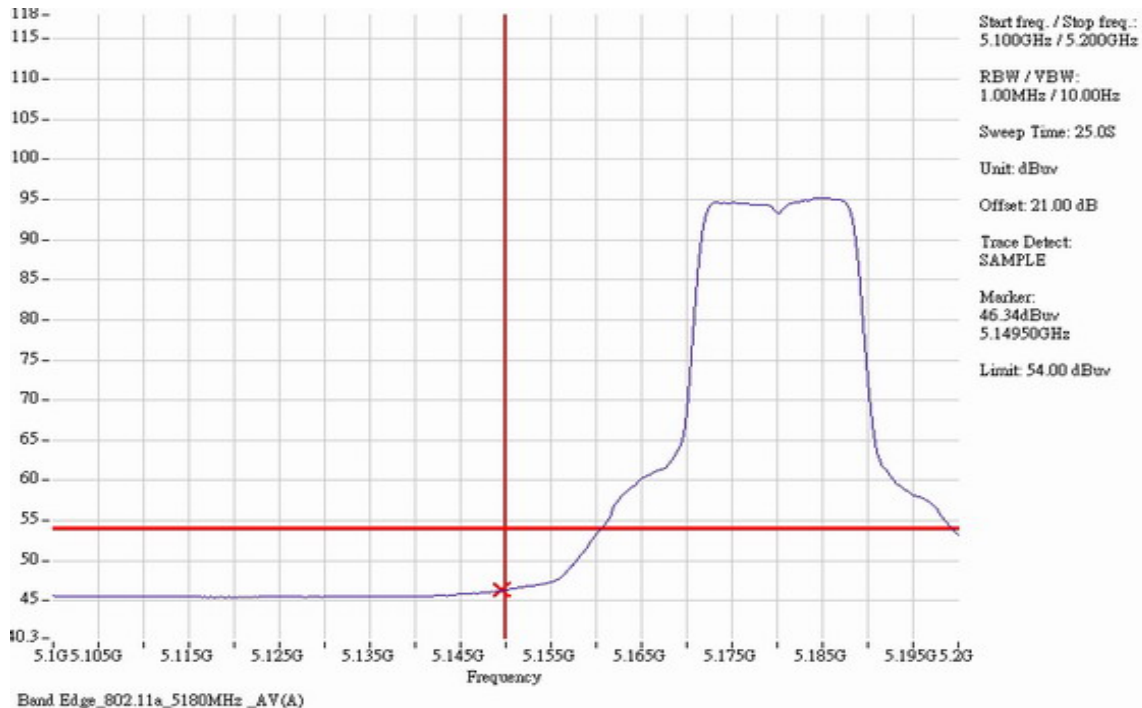
# Band edge test

## Single Tx

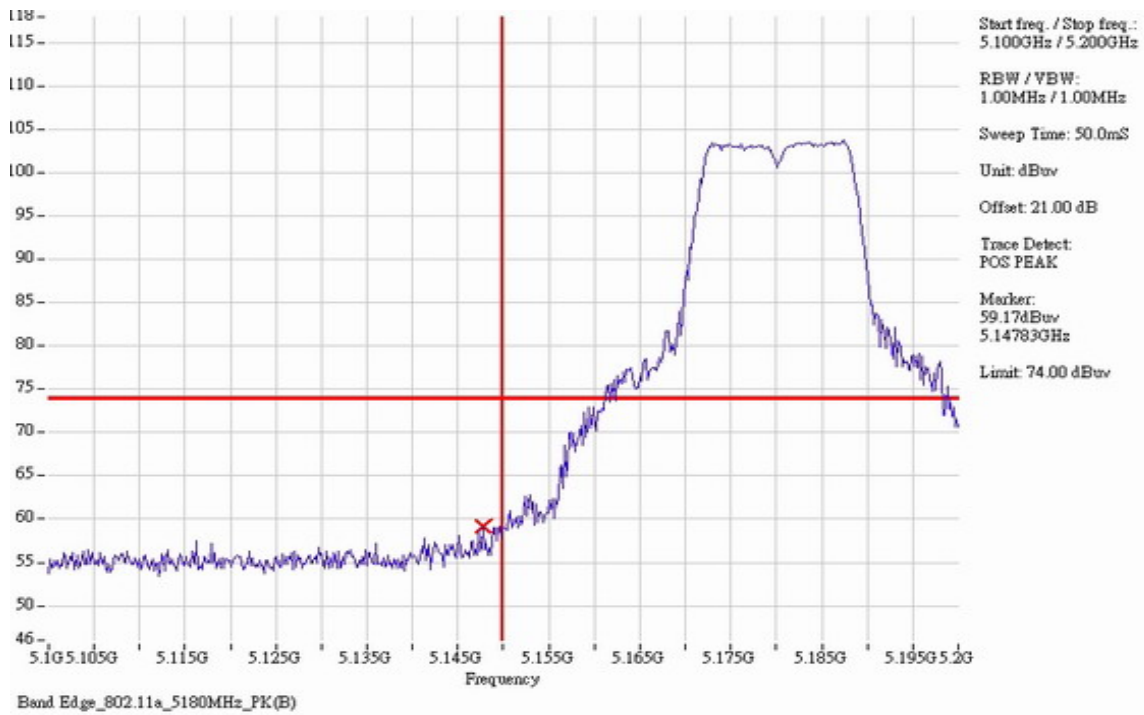
### 802.11a CH36 5180MHz PK Chain A



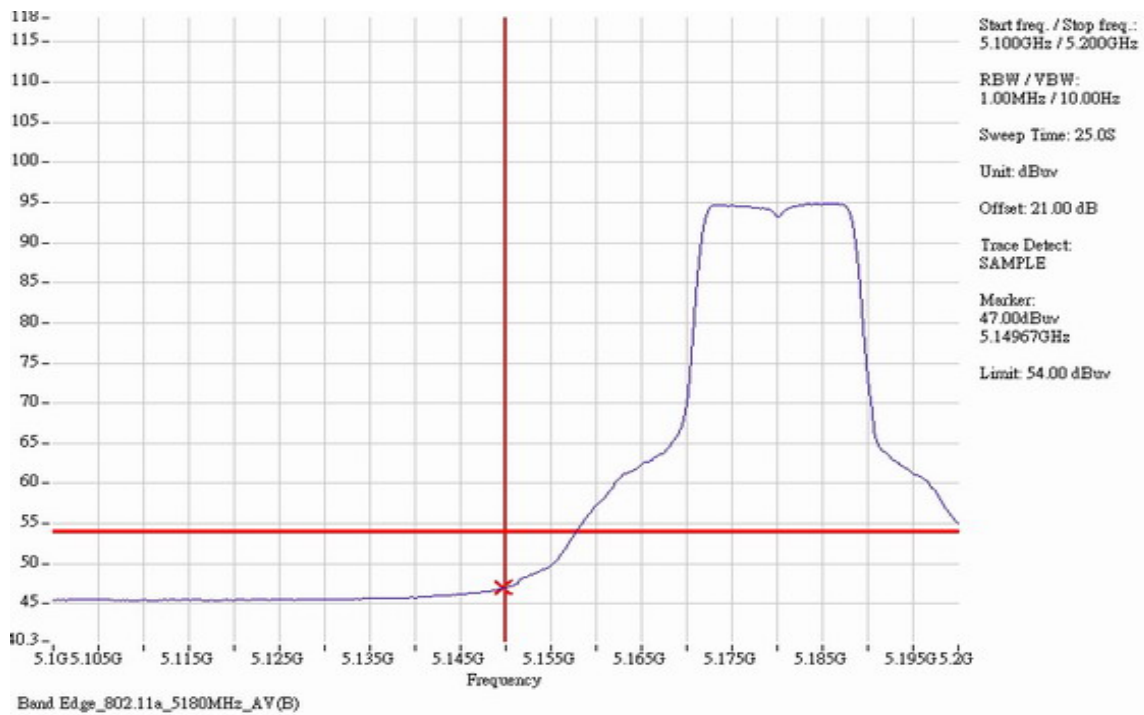
### 802.11a CH36 5180MHz AV Chain A



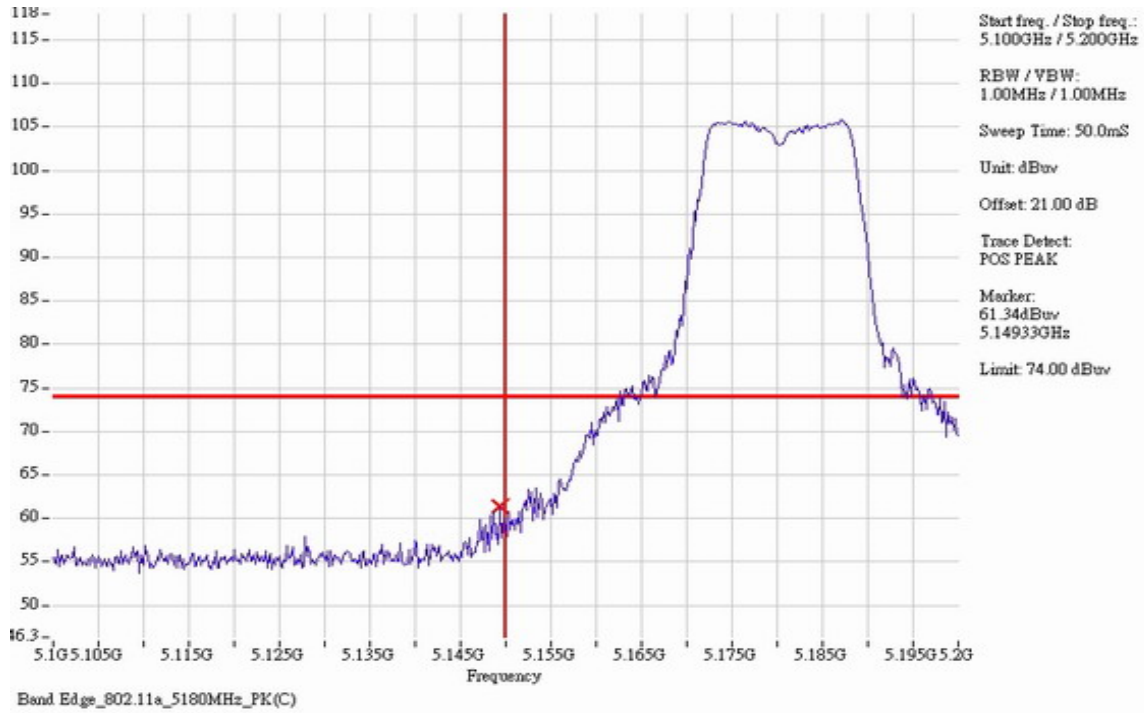
### 802.11a CH36 5180MHz PK Chain B



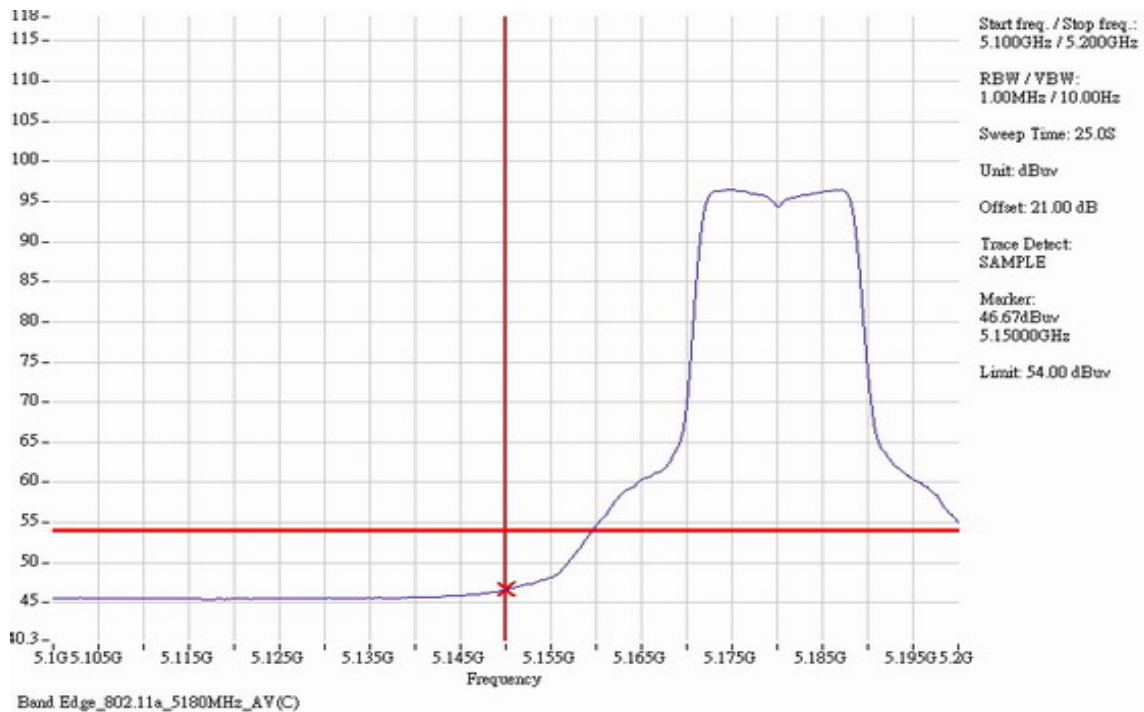
### 802.11a CH36 5180MHz AV Chain B



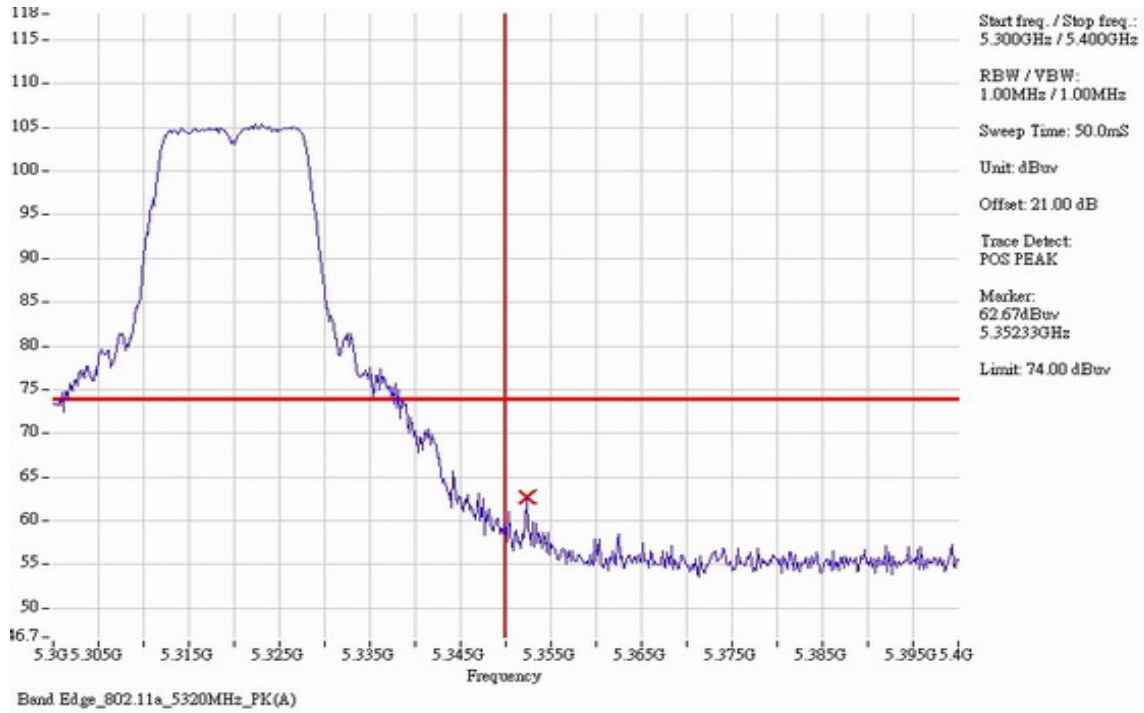
### 802.11a CH36 5180MHz PK Chain C



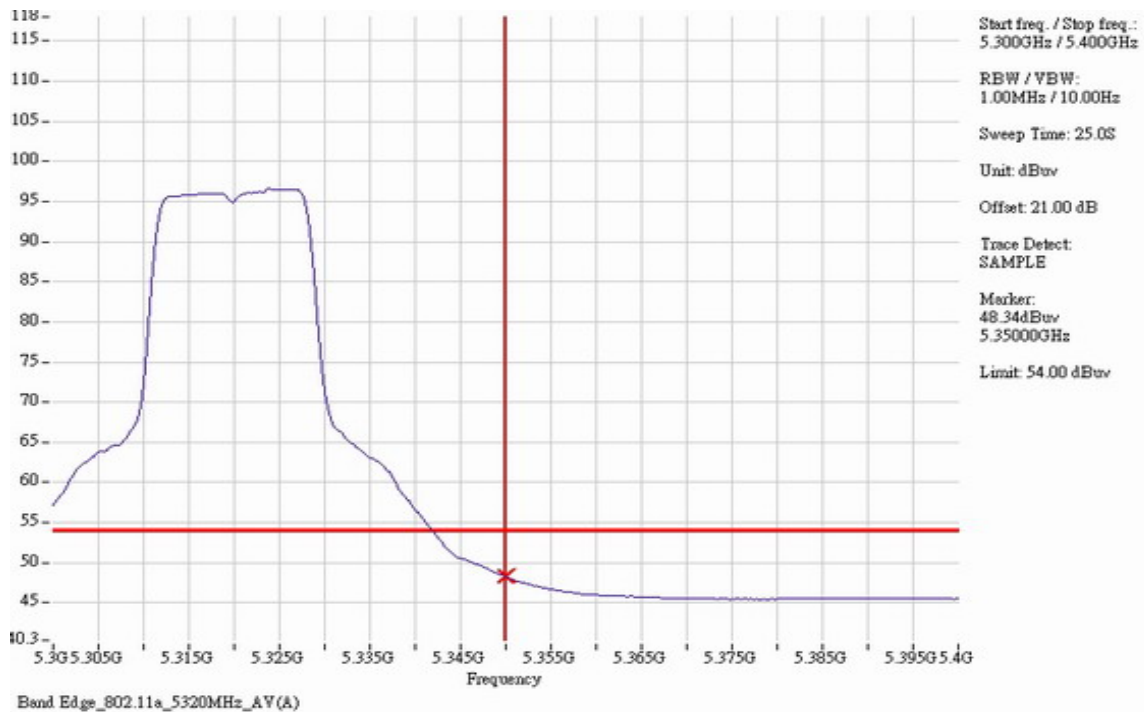
### 802.11a CH36 5180MHz AV Chain C



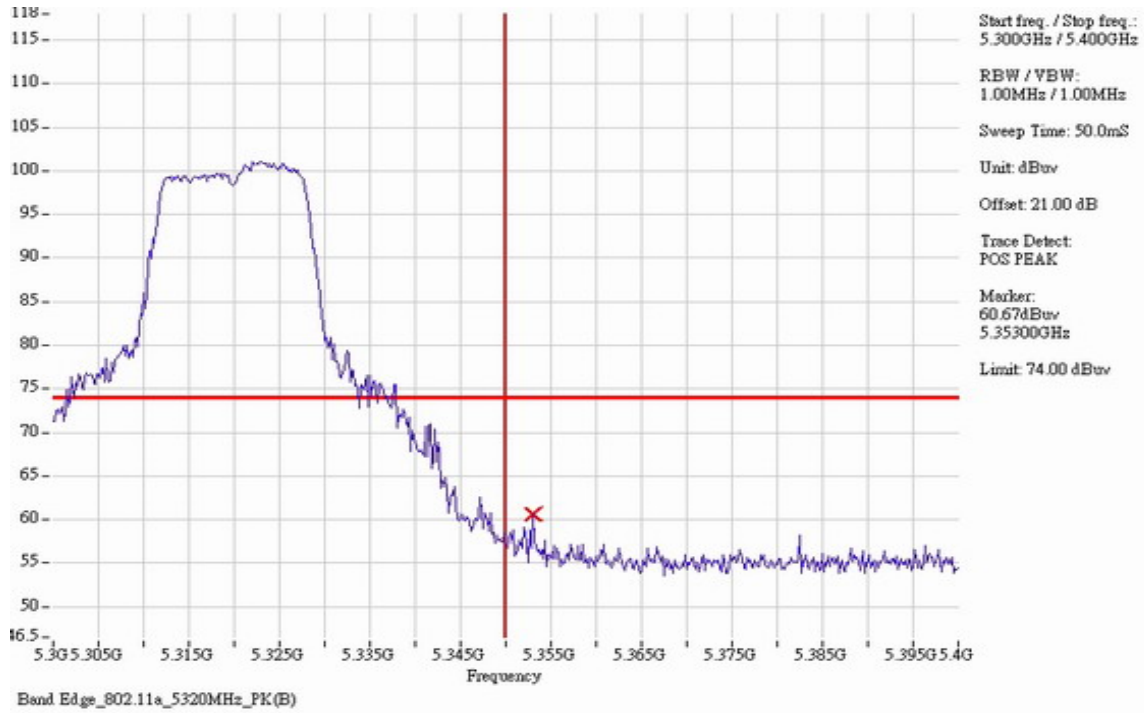
### 802.11a CH64 5320MHz PK Chain A



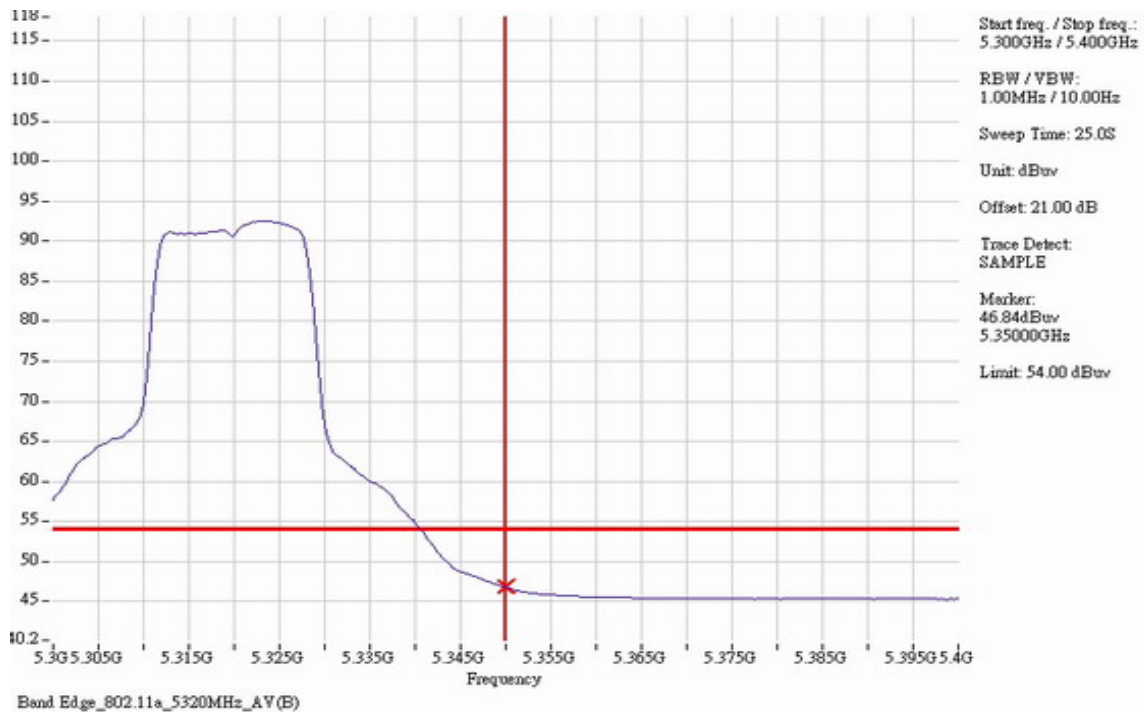
### 802.11a CH64 5320MHz AV Chain A



### 802.11a CH64 5320MHz PK Chain B

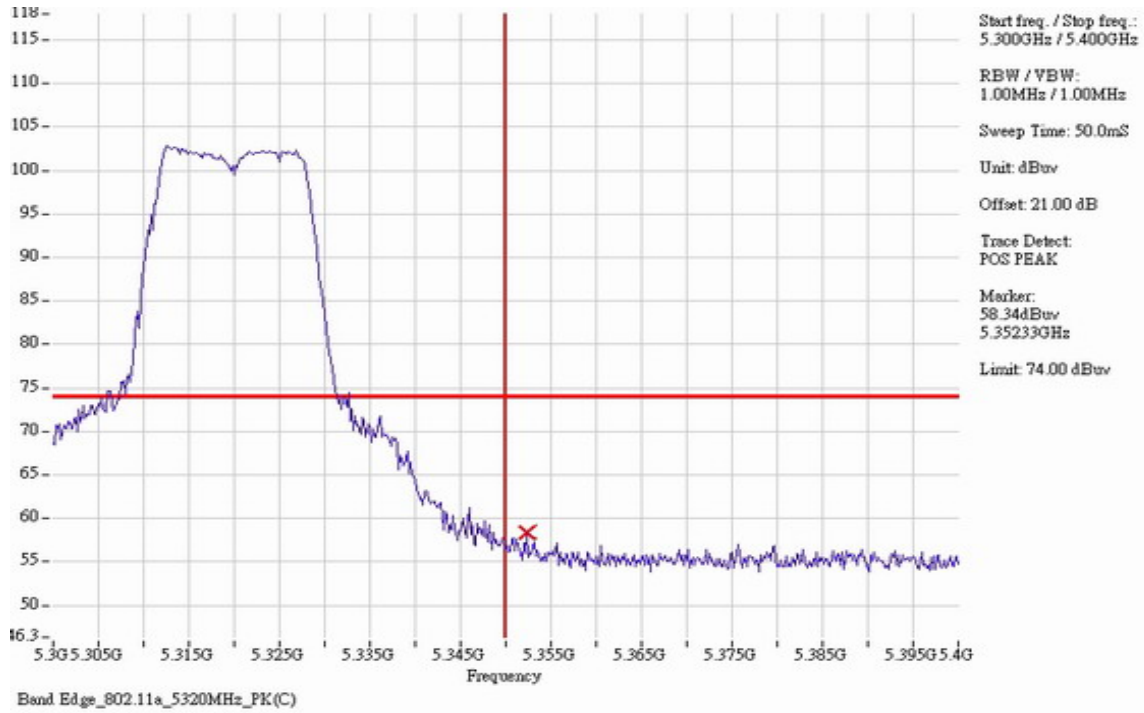


### 802.11a CH64 5320MHz AV Chain B





### 802.11a CH64 5320MHz PK Chain C



### 802.11a CH64 5320MHz AV Chain C

