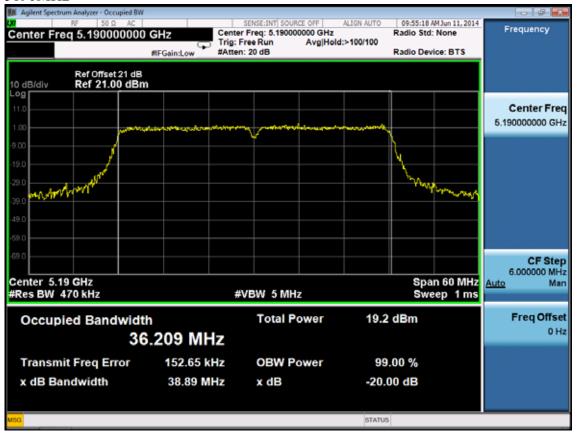
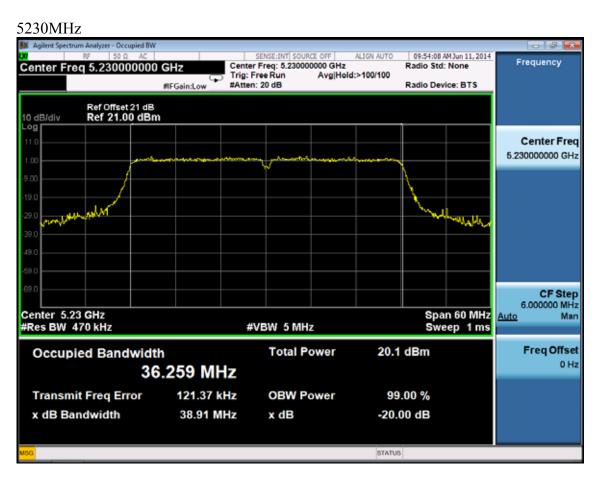


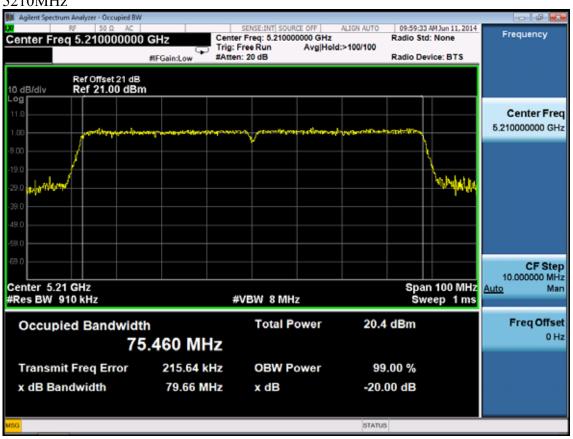
### **11ac VHT40**







## 11ac VHT80

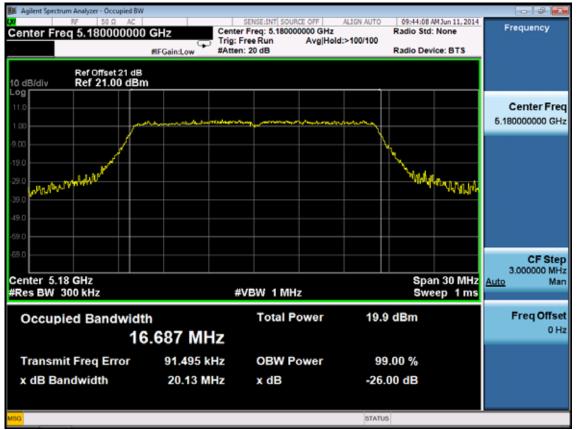


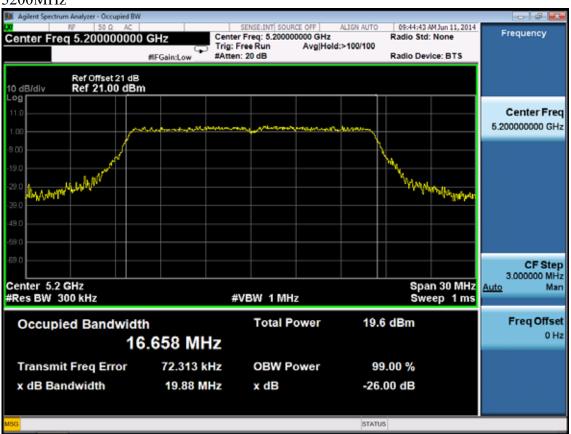


#### 26dB bandwidth:

#### 11a

#### 5180MHz







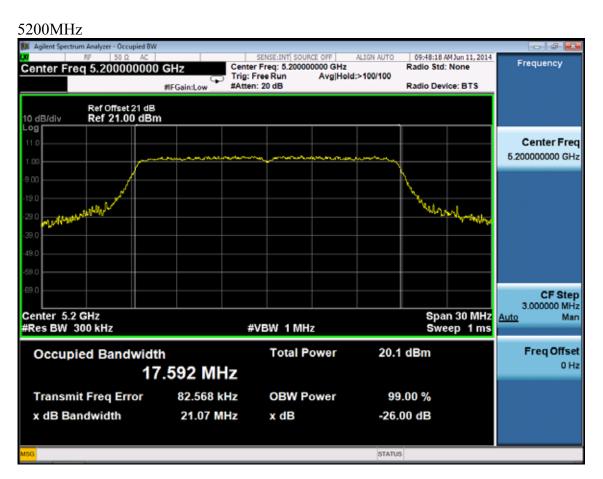
#### 5240MHz 09:45:38 AM Jun 11, 2014 Center Freq: 5.240000000 GHz Trig: Free Run Avg|Hold Radio Std: None Center Freq 5.240000000 GHz Avg|Hold:>100/100 Ref Offset 21 dB Ref 21.00 dBm 10 dB/div Center Freq 5.240000000 GHz **CF Step** 3.000000 MHz Center 5.24 GHz #Res BW 300 kHz Span 30 MHz Man #VBW 1 MHz Sweep 1 ms **Total Power** 19.9 dBm Freq Offset Occupied Bandwidth 0 Hz 16.674 MHz Transmit Freg Error 81.506 kHz **OBW Power** 99.00 % x dB Bandwidth 19.95 MHz x dB -26.00 dB STATUS

### 11n HT20







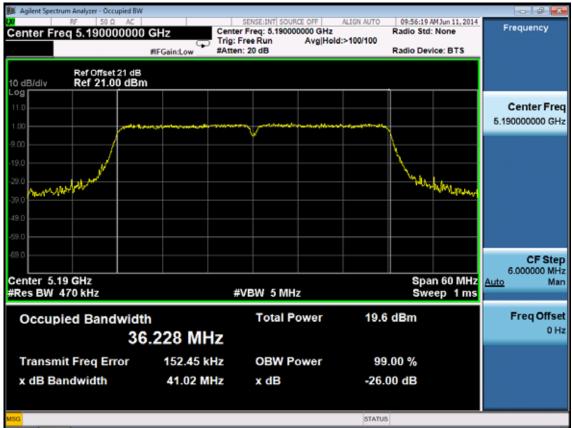


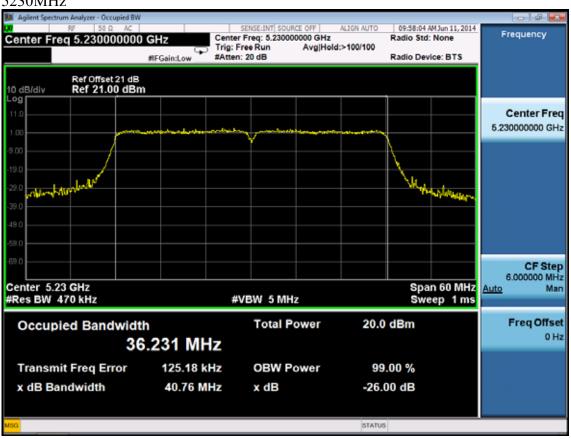




#### 11n HT40

5190MHz



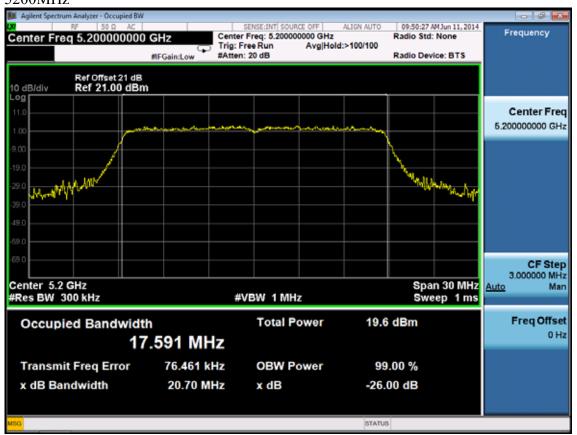




#### **11ac VHT20**

5180MHz

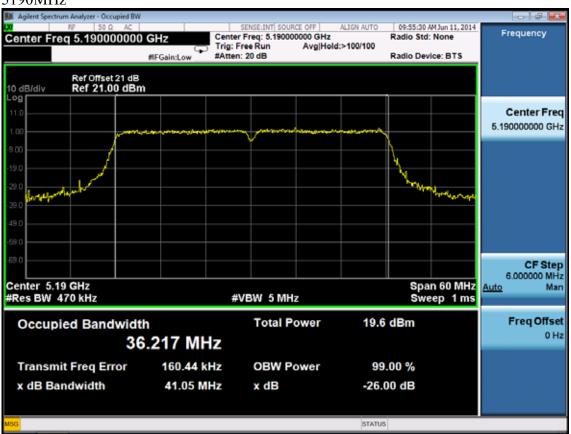




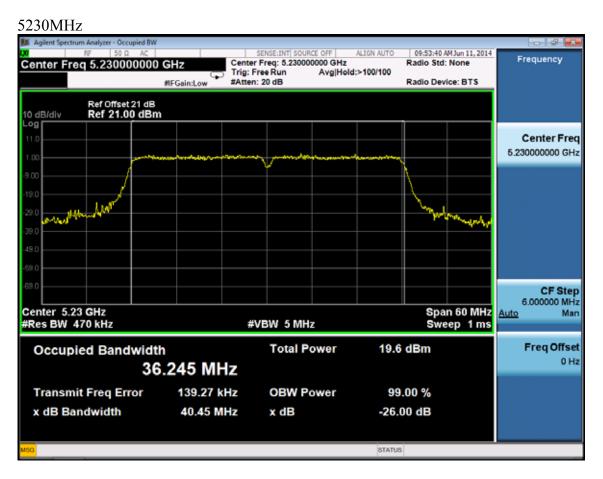


#### 5240MHz Center Freq: 5.240000000 GHz Trig: Free Run 09:52:21 AM Jun 11, 2014 Center Freq 5.240000000 GHz Avg|Hold:>100/100 Radio Device: BTS Ref Offset 21 dB Ref 21.00 dBm 10 dB/div Log Center Freq 5.240000000 GHz **CF Step** 3.000000 MHz Center 5.24 GHz #Res BW 300 kHz Span 30 MHz Man #VBW 1 MHz Sweep 1 ms **Total Power** 19.0 dBm Freq Offset Occupied Bandwidth 0 Hz 17.546 MHz Transmit Freg Error 75.119 kHz **OBW Power** 99.00 % x dB Bandwidth 20.63 MHz x dB -26.00 dB STATUS

### **11ac VHT40**







## 11ac VHT80



# 7. OUTPUT POWER TEST

# 7.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	N9030A	MY51380221	Oct.31, 13	1Year
2.	Power meter	Anritsu	ML2487A	6K00002472	April 28,14	1Year
3.	Power sensor	Anritsu	MA2491A	0033005	April 28,14	1Year
4.	Attenuator (20dB)	Agilent	8491B	MY39262165	April 28,14	1 Year
5.	RF Cable	Hubersuhner	SUCOFLEX102	28620/2	April 28,14	1 Year

# 7.2.Limit

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 dBm + 10log B, For the 5250-5350MHz and 5.47-5.725GHz the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250Mw or 11dBm+10 log B. where B is the 26-dB emission bandwidth in MHz, If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 7.3.Test Procedure

- 1. Connected the EUT's antenna port to measure device by 26dB attenuator.
- 2. For IEEE 802.11a and IEEE802.11n HT20 and 802.11ac VHT20 mode, use a PK power meter which's bandwidth is 20MHz and above 26dB bandwidth of signal to measure out each test modes' PK output power.
- 3. For IEEE802.11n HT40 and 802.11ac VHT40 & 80 mode, because the signal's bandwidth is about 40MHz and above 20MHz bandwidth of power sensor ML2491A. So use the test method described in KBD789033 clause E Method SA-1
  - 1) Connect the antenna port to the spectrum analyzer and Set span of the spectrum to encompass the entire 26-dB emission bandwidth (EBW) of the signal.
  - 2) Set the RBW=1MHz and VBW=3MHz
  - 3) Number of points in sweep  $\geq 2$  Span / RBW
  - 4) Detector = RMS
  - 5) Sweep time = auto couple
  - 6) Allow the sweep to "free run" and set the Trace average at least 100 traces in power averaging (i.e., RMS) mode.
  - 7) Compute power by integrating the spectrum across the 26 dB EBW of the signal using the instrument's band power measurement function with band limits set equal to the EBW band edges.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.



# 7.4. Test Results

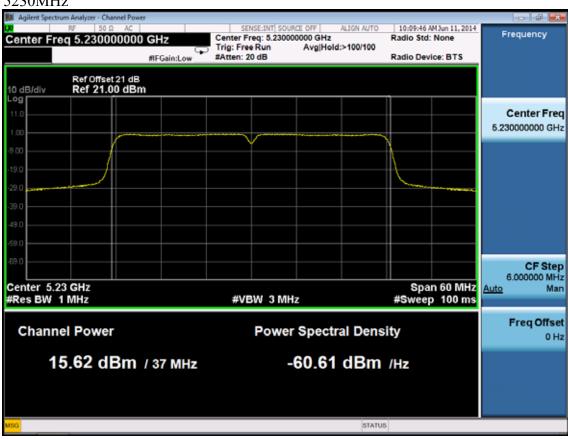
EUT: AC750 Wireless Dual Band Gigabit Router							
M/N:PW-AC4573R							
Test date: 2014-06-11	Pressure: 101.3±1.0 kpa	Humidity: 52.6±3.0%					
Tested by: Kevin_Hu	Test site: RF site	Temperature:22.3±0.6 ℃					

Cable loss: 1 dB		Attenuator loss: 20 dB				
Test Mode	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)			
	, ,	ANT 0	,			
	5180	14.40	17			
11a	5200	14.05	17			
	5240	14.16	17			
11	5180	14.28	17			
11n HT20	5200	14.53	17			
11120	5240	13.86	17			
11n	5190	15.02	17			
HT40	5230	15.62	17			
1.1	5180	14.43	17			
11ac VHT20	5200	14.80	17			
V11120	5240	14.61	17			
11ac	5190	15.69	17			
VHT40	5230	16.09	17			
11ac VHT80	5210	15.94	17			
Conclusion: P.	ASS	·	·			



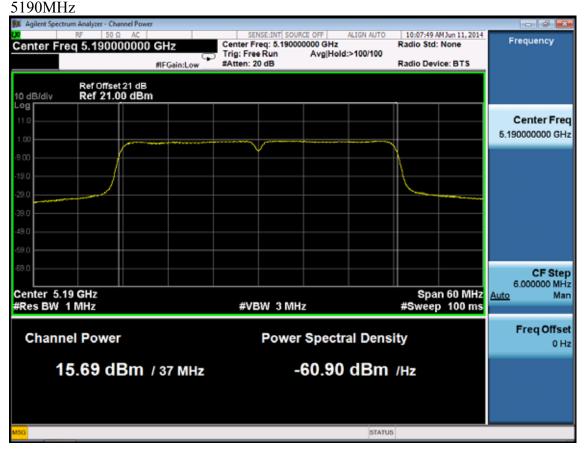
# 11n HT40

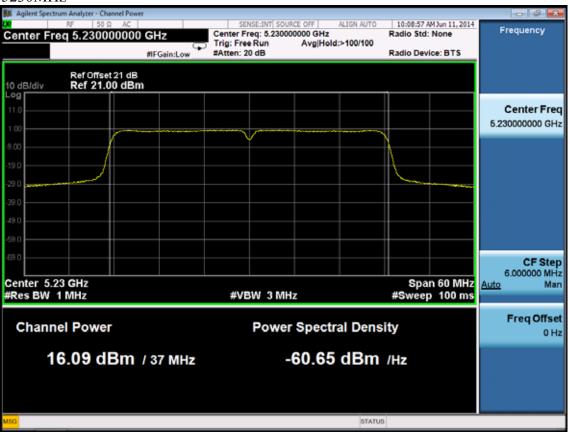






# 11ac VHT40







# 11ac VHT80



# 8. POWER SPECTRAL DENSITY TEST

# 8.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Oct.31, 13	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 13	1 Year
3.	Antenna	EMCO	3115	9607-4877	Aug.28, 13	1Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 13	1 Year

# 8.2.Limit

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 antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. 5250-5350MHz, 5470-5725MHz shall not exceed 11dBm in any 1-MHz band.

### 8.3. Test Procedure

The transmitter output was connected to a spectrum analyzer. Power density was measured by spectrum analyzer with 1MHz RBW and 3MHz VBW,RMS Detector.

So use the test method described in KDB789033 clause E

- 1) Set span of the spectrum to encompass the entire 26-dB emission bandwidth (EBW) of the signal.
- 2) Set the RBW=1MHz and VBW =3MHz
- 3) Number of points in sweep  $\geq 2$  Span / RBW
- 4) Detector = RMS
- 5) Sweep time = auto couple
- 6) Allow the sweep to "free run" and set the Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- 7) Use the peak search function find the max value as the power density in 1MHz.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.



# 8.4. Test Results

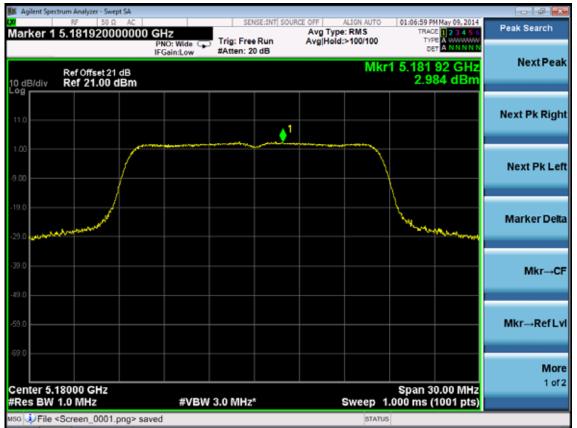
EUT:AC750 Wireless Dual Band Gigabit Router						
M/N:PW-AC4573R	M/N:PW-AC4573R					
Test date: 2014-04-20	Pressure: 101.3±1.0kpa	Humidity:52.6±3.0%				
Tested by:Kevin_Hu	Test site: RF site	Temperature:22.7±0.6 °C				

Cable loss:	1 dB	Attenuator loss: 20 dB	
Test Mode	Fraguenay (MHz)	Power density	Limit
	Frequency (MHz)	(dBm/MHz)	(dBm/MHz)
	5180	2.984	4
11a	5200	3.160	4
	5240	3.283	4
	5180	2.844	4
11n HT20	5200	2.634	4
	5240	2.676	4
11n HT40	5190	1.437	4
1111111140	5230	1.542	4
	5180	2.777	4
11ac VHT20	5200	3.034	4
, ,	5240	2.883	4
11ac	5190	1.624	4
VHT40	5230	1.631	4
11ac VHT80	5210	-1.180	4
Conclusion:	PASS		



## 11a

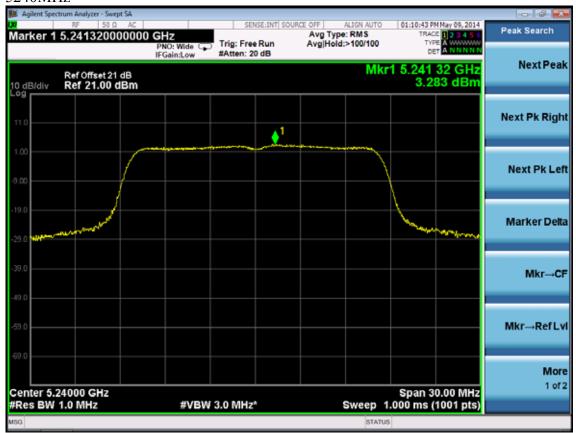
#### 5180MHz







#### 5240MHz



### 11nHT20





#### 5210MHz







#### 11nHT40

5190MHz







#### **11ac VHT20**

5180MHz







# 5240MHz 01:17:01 PM May 09, 2014 TRACE 123456 TYPE A WWWWW DET A NNNNN SENSE:INT SOURCE OFF Avg Type: RMS Avg|Hold:>100/100 Peak Search Marker 1 5.242010000000 GHz Trig: Free Run Next Peak Mkr1 5.242 01 GHz 2.883 dBm Ref Offset 21 dB Ref 21.00 dBm 10 dB/div Next Pk Right Next Pk Left Marker Delta Mkr→CF Mkr→Ref LvI More 1 of 2 Center 5.24000 GHz #Res BW 1.0 MHz Span 30.00 MHz #VBW 3.0 MHz\* Sweep 1.000 ms (1001 pts)

## 11nc VHT40





# 5230MHz SENSE:INT SOURCE OFF Avg Type: RMS Avg|Hold:>100/100 Peak Search Marker 1 5.232580000000 GHz TRACE 123456 TYPE A WWW.WW DET A NNNNN Trig: Free Run PNO: Fast G Next Peak Mkr1 5.232 58 GHz 1.631 dBm Ref Offset 21 dB Ref 21.00 dBm 10 dB/div Next Pk Right VI Next Pk Left Marker Delta Mkr→CF Mkr→Ref LvI More 1 of 2 Center 5.23000 GHz #Res BW 1.0 MHz Span 60.00 MHz #VBW 3.0 MHz\* Sweep 1.000 ms (1001 pts)

## 11ac VHT80



# 9. PEAK EXCURSION MEASUREMENT

# 9.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	April 28,14	1 Year
2.	Amp	HP	8449B	3008A02495	April 28,14	1 Year
3.	Horn Antenna	EMCO	3115	9510-4580	May.28, 13	1 Year
4.	HF Cable	Hubersuhne	SUCOFLEX104	274094/4	April 28,14	1 Year
5.	RF Cable	Hubersuhner	SUCOFLEX102	28618/2	April 28,14	1 Year

## 9.2.Limit

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

### 9.3. Test Procedure

- 1. The transmitter output (antenna port) was connected to the spectrum analyzer.
- 2. Set the spectrum analyzer span to view the entire emissions bandwidth. The largest difference between the following two traces (Peak Trace and Average Trace) must be ≤ 13 dB for all frequencies across the emissions bandwidth. Submit a plot.
- 3. Peak Trace: Set RBW = 1 MHz, VBW ≥ 3 MHz with peak detector and max-hold settings.
- 4. Average Trace: Method #3—video averaging with max hold--and sum power across the band. Set span to encompass the entire emissions bandwidth (EBW) of the signal. Set sweep trigger to "free run". Set RBW = 1 MHz. Set VBW  $\geq$  1/T (Draft n VBW = 300kHz  $\geq$  1/4  $\mu$  s). Use sample detector mode if bin width (i.e., span/number of points in spectrum) < 0.5 RBW. Otherwise use peak detector mode. Set max hold. Allow max hold to run for 60 seconds.



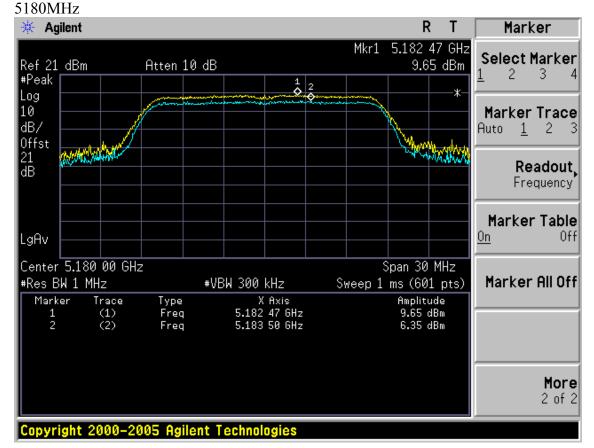
# 9.4.Test Results

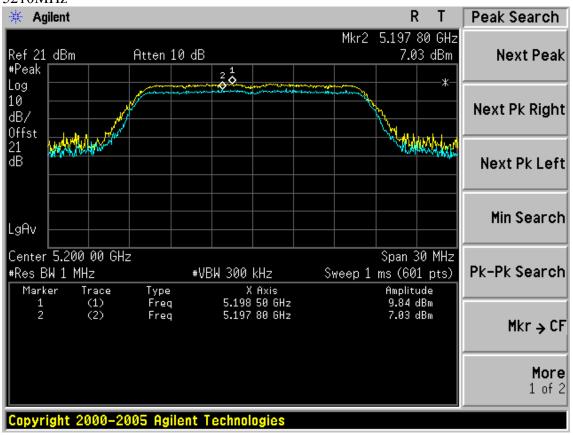
EUT:AC750 Wireless Dual Band Gigabit Router						
M/N:PW-AC4573R						
Test date: 2014-04-17	Pressure:	101.1±1.0 kpa	Humidity: 51.3±3.0%			
Tested by: Kevin_Hu	Test site:	RF Site	Temperature : 22.5±0.6°C			

Cable loss: 1 dB		Attenuator loss: 20 dB				
Test Mode	Frequency (MHz)	Power excursion (dB) ANT 0	Limit (dB)			
	5180	3.3	13			
11a	5200	2.81	13			
	5240	3.71	13			
	5180	3.14	13			
11nHT20	5200	3.83	13			
	5240	3.61	13			
11	5190	4.14	13			
11nHT40	5230	3.66	13			
	5180	3.69	13			
11ac VTH20	5200	3	13			
V 11120	5240	2.69	13			
11ac	5190	4.17	13			
VTH40	5230	3.74	13			
11ac VTH80	5210	3.57	13			
Conclusion	: PASS					



# 11a





page

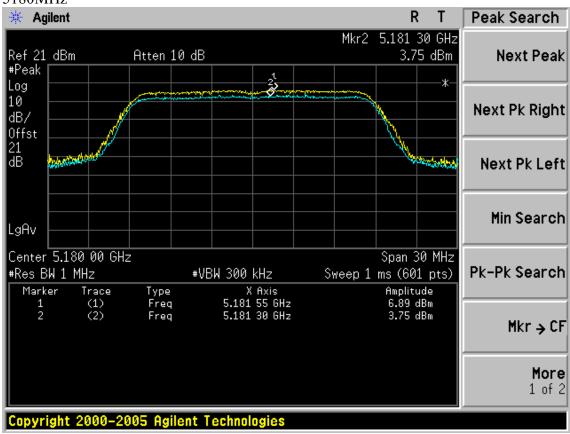


FCC ID:W6RRNX-AC750RT

5240MHz Agilent R Т Peak Search Mkr2 5.241 30 GHz Ref 21 dBm Atten 10 dB 6.48 dBm **Next Peak** #Peak 1 Log 10 Next Pk Right dB/ White white HALL THE THE REST Offst 21 dΒ Next Pk Left Min Search LgAv Center 5.240 00 GHz Span 30 MHz #Res BW 1 MHz #VBW 300 kHz Pk-Pk Search Sweep 1 ms (601 pts) X Axis 5.236 20 GHz 5.241 30 GHz Marker Trace Type Amplitude (1) (2) Freq 10.19 dBm 6.48 dBm 2 Freq Mkr → CF More 1 of 2

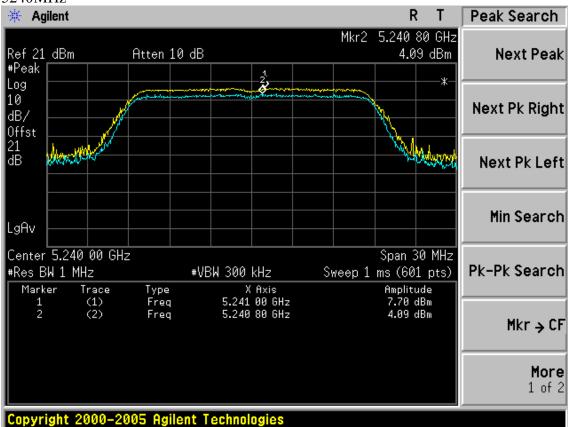
# 11nHT20

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#### 5210MHz R Peak Search \* Agilent Mkr2 5.201 55 GHz Ref 21 dBm Atten 10 dB 4.33 dBm **Next Peak** #Peak Log 10 Next Pk Right dB/ Offst A CONTRACTOR ďΒ Next Pk Left Min Search LgAv Center 5.200 00 GHz Span 30 MHz Pk-Pk Search #Res BW 1 MHz #VBW 300 kHz Sweep 1 ms (601 pts) X Axis 5.204 45 GHz 5.201 55 GHz Marker Type Amplitude Trace Freq Freq 8.16 dBm 4.33 dBm (1) (2) 2 Mkr → CF More 1 of 2 Copyright 2000-2005 Agilent Technologies



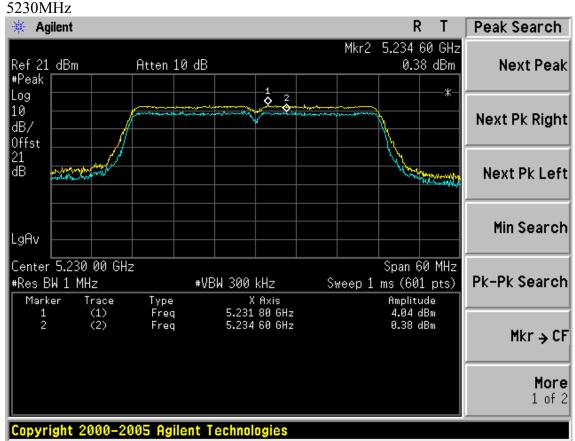


## 11nHT40

5190MHz 🔆 Agilent R Т Peak Search Mkr2 5.193 00 GHz Atten 10 dB 1.79 dBm Ref 21 dBm **Next Peak** #Peak Log 10 Next Pk Right dB/ Offst 21 dΒ Next Pk Left Min Search LgAv Center 5.190 00 GHz Span 60 MHz #Res BW 1 MHz #VBW 300 kHz Pk-Pk Search Sweep 1 ms (601 pts) X Axis 5.195 80 GHz 5.193 00 GHz Marker Trace Type Amplitude 5.93 dBm 1.79 dBm (1) (2) Freq 2 Freq Mkr → CF More 1 of 2

#### 5020N/II

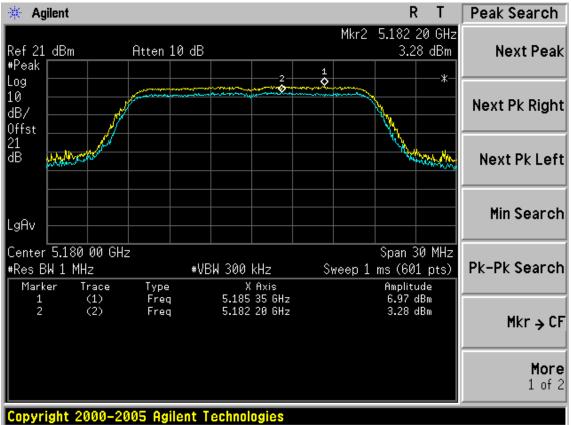
Copyright 2000-2005 Agilent Technologies

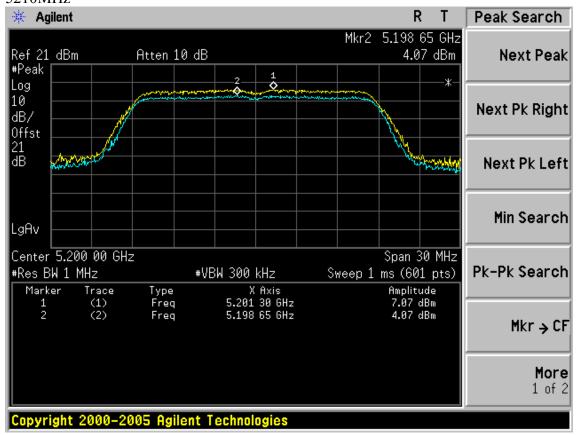




#### **11ac VHT20**

5180MHz





page

1 of 2

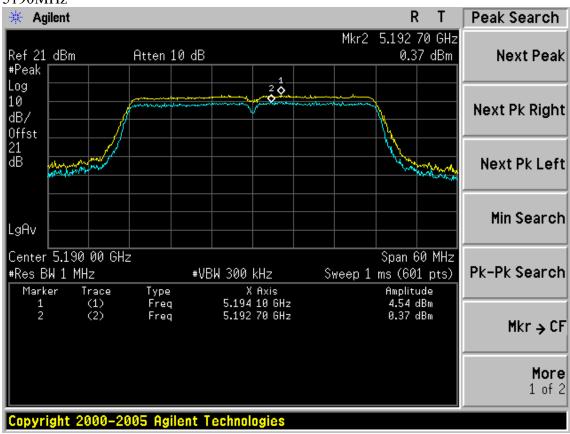


FCC ID:W6RRNX-AC750RT

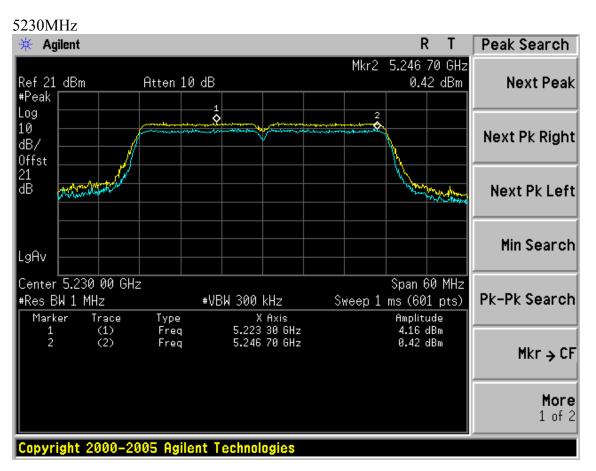
5240MHz Agilent R Т Peak Search Mkr2 5.239 30 GHz 4.10 dBm Ref 21 dBm Atten 10 dB **Next Peak** #Peak <u>1</u> Log 10 Next Pk Right dB/ Offst ďΒ Next Pk Left Min Search LgAv Center 5.240 00 GHz Span 30 MHz #Res BW 1 MHz #VBW 300 kHz Pk-Pk Search Sweep 1 ms (601 pts) X Axis 5.237 90 GHz 5.239 30 GHz Marker Trace Type Amplitude 6.79 dBm 4.10 dBm (1) (2) Freq 2 Freq Mkr → CF More

## **11ac VHT40**

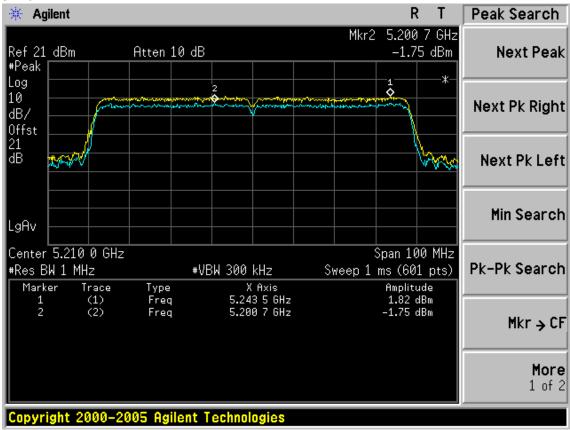
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## 11ac VHT80



# 10. FREQUENCY STABILITY MEASUREMENT

# 10.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	April 28,14	1 Year
2.	Amp	HP	8449B	3008A02495	April 28,14	1 Year
3.	Horn Antenna	EMCO	3115	9510-4580	May.28, 13	1 Year
4.	HF Cable	Hubersuhne	SUCOFLEX 104	274094/4	April 28,14	1 Year

### 10.2.Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emissions is maintained within the band of operation under all conditions of normal operation as specified in the user's manual or  $\pm 20$ ppm

### 10.3.Test Procedure

- 1. The transmitter output (antenna port) was connected to the spectrum analyser. EUT have transmitted absence of modulation signal and fixed channelize. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and the limit is less than ±20ppm The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
- 2. Extreme temperature rule is 0°C~50°C.



# 10.4.Test Result

EUT:AC750 Wire		Gigabit Router						
M/N:PW-AC4573								
Power: DC 12V F								
Test date: 2014-04	4-16	Test site: RF	Chamber	-	Γeste	d by: Kevin	_Hu	
Ambient Tempera	ture: 21.9±1.0°€	Relative Hum	idity: 53.5±1.	0%	Pre	essure:101.1	±1.0 kpa	
Frequency stability VS Voltage (Temperature:20°C)								
Supply Voltage (V)	Test frequency (MHz)	Test result (MHz)	Max Deviation (MHz)	Max Deviati (ppm	on	Limit (ppm)	Conclusion	
102V	5180	5179.9830						
120V	5180	5179.9845	0.017	-3.28	3	+/-20		
138V	5180	5179.8450						
102V	5200	5199.9815						
120V	5200	5199.9820	0.0185	-3.56		+/-20	PASS	
138V	5200	5199.9845						
102V	5240	5239.9835						
120V	5240	5239.9840	0.0165	-3.15	;	+/-20		
138V	5240	5239.9865						
Frequency stabilit	y VS Temperatur	e (supply volt	age AC 120V	/60Hz)				
Temperature	Test frequency	Test result	Max	Max		Limit		
(℃)	(MHz)	(MHz)	Deviation (MHz)	Deviati (ppm)		(ppm)	Conclusion	
0℃	5180	5179.9815						
10°C	5180	5179.9830						
20°C	5180	5179.9845	0.0105	2.57	,	1/20	PASS	
30°C	5180	5179.9850	0.0185	-3.5/	-3.57	+/-20		
40°C	5180	5179.9865						
50°C	5180	5179.9875						



F	VC T	(11-	AC 120V	//(011- )				
Frequency stability VS Temperature (supply voltage AC 120V/60Hz)								
Temperature	Test frequency	Test result	Max	Max	Limit			
(℃)	(MHz)	(MHz)	Deviation	Deviation	(ppm)	Conclusion		
			(MHz)	(ppm)				
0℃	5200	5199.9800						
10°C	5200	5199.9815						
20°C	5200	5199.9820	0.02	-3.85	+/-20	PASS		
30°C	5200	5199.9830	0.02	-3.83	+/-20			
40°C	5200	5199.9835						
50°C	5200	5199.9845						
Frequency stability	ty VS Temperatu	re (supply volta	age AC 120V	/60Hz)				
Temperature	Test frequency	Test result	Max	Max	Limit			
(℃)	(MHz)	(MHz)	Deviation	Deviation	(ppm)	Conclusion		
			(MHz)	(ppm)				
0℃	5240	5239.9810						
10°C	5240	5239.9825						
20°C	5240	5239.9840	0.010	2.62	1/20	PASS		
30°C	5240	5239.9855	0.019	-3.63	+/-20			
40°C	5240	5239.9860						
50°C	5240	5239.9865	1					



# 11.MPE ESTIMATION

# 11.1.Limit for General Population/ Uncontrolled Exposures

Frequency	Power density (mW/cm <sup>2</sup> )	Averaging time(minutes)		
300MHz1.5GHz	F/1500	30		
1.5GHz100GHz	1.0	30		

Frequency(MHz)	Power density (mW/cm <sup>2</sup> )	Averaging time(minutes)
2412	1	30
2437	1	30
2462	1	30

Note: F= Frequency in MHz

# 11.2. Estimation Result

EUT:AC750 Wireless Dual Bar	nd Gigabit Router	
M/N:PW-AC4573R		
Test date: 2014-05-09	Pressure: 101.6±1.0 kpa	Humidity: 48.4±3.0%
Tested by: Kevin_Hu	Test site: RF site	Temperature:22.7±0.6 °C

Cable loss: 1 dB		Attenuator loss: 20 dB			Antenna Gain: 3dBi		
Test Mode	СН	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Output Power (mW)	Anten na Gain (dBi)	Antenna Gain (Linear)	MPE
	CH36	5180	14.40	27.54	3	2.00	0.0109
11a	CH40	5200	14.05	25.41	3	2.00	0.0101
	CH48	5240	14.16	26.06	3	2.00	0.0104
CH36	5180	14.28	26.79	3	2.00	0.0106	
11n HT20	CH40	5200	14.53	28.38	3	2.00	0.0113
П120	CH48	5240	13.86	24.32	3	2.00	0.0097
11n	CH38	5190	15.02	31.77	3	2.00	0.0126
HT40	CH46	5230	15.62	36.48	3	2.00	0.0145
11	CH36	5180	14.43	27.73	3	2.00	0.0110
VH120 ——	CH40	5200	14.80	30.20	3	2.00	0.0120
	CH48	5240	14.61	28.91	3	2.00	0.0115
11ac	CH38	5190	15.69	37.07	3	2.00	0.0147
VHT40	CH46	5230	16.09	40.64	3	2.00	0.0161
11ac VHT80	CH42	5210	15.94	39.26	3	2.00	0.0156

$$MPE = \frac{PG}{4\Pi R^2} \quad (R=20cm)$$

# 12. NTENNA REQUIREMENT

# 12.1. STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

## 12.2. ANTENNA CONNECTED CONSTRUCTION

The antennas used for this product are dipole antenna that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 3dBi.



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3.DEVIATION TO TEST SPECIFICATIONS		
[ NONE]		