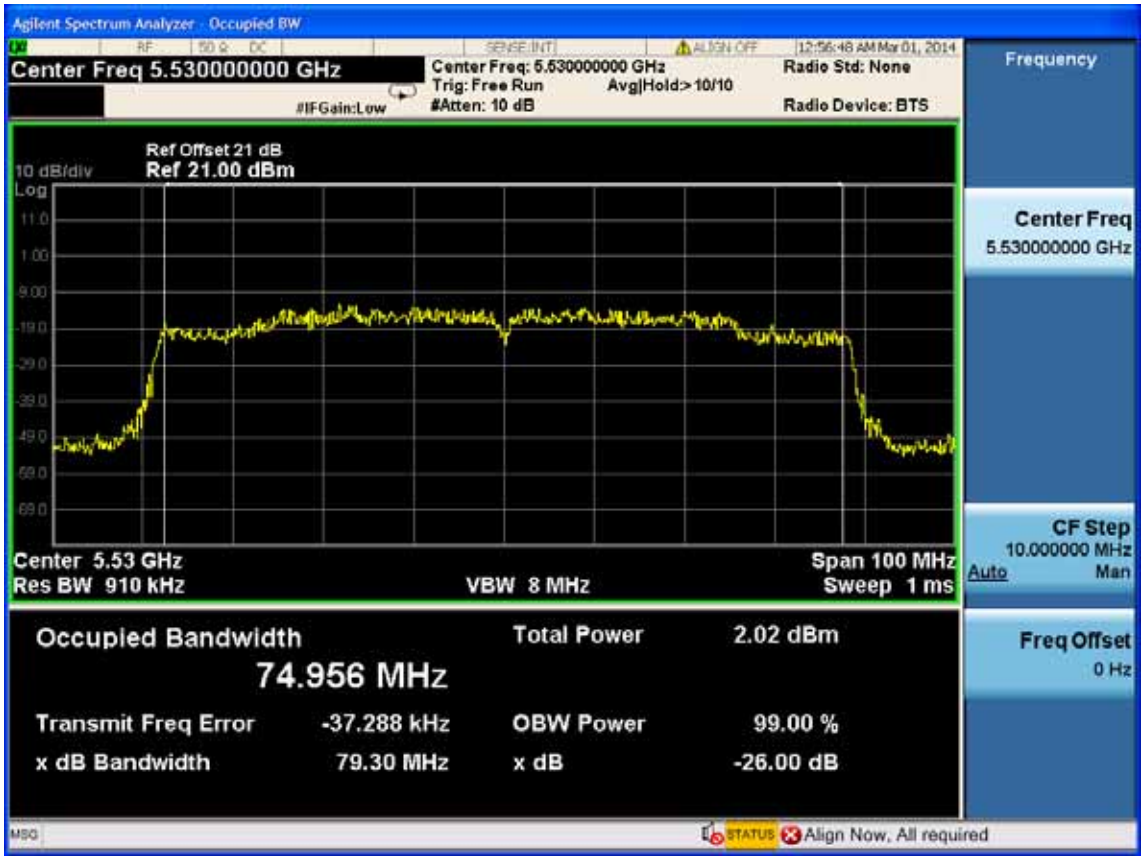
5710MHz

11ac VHT80

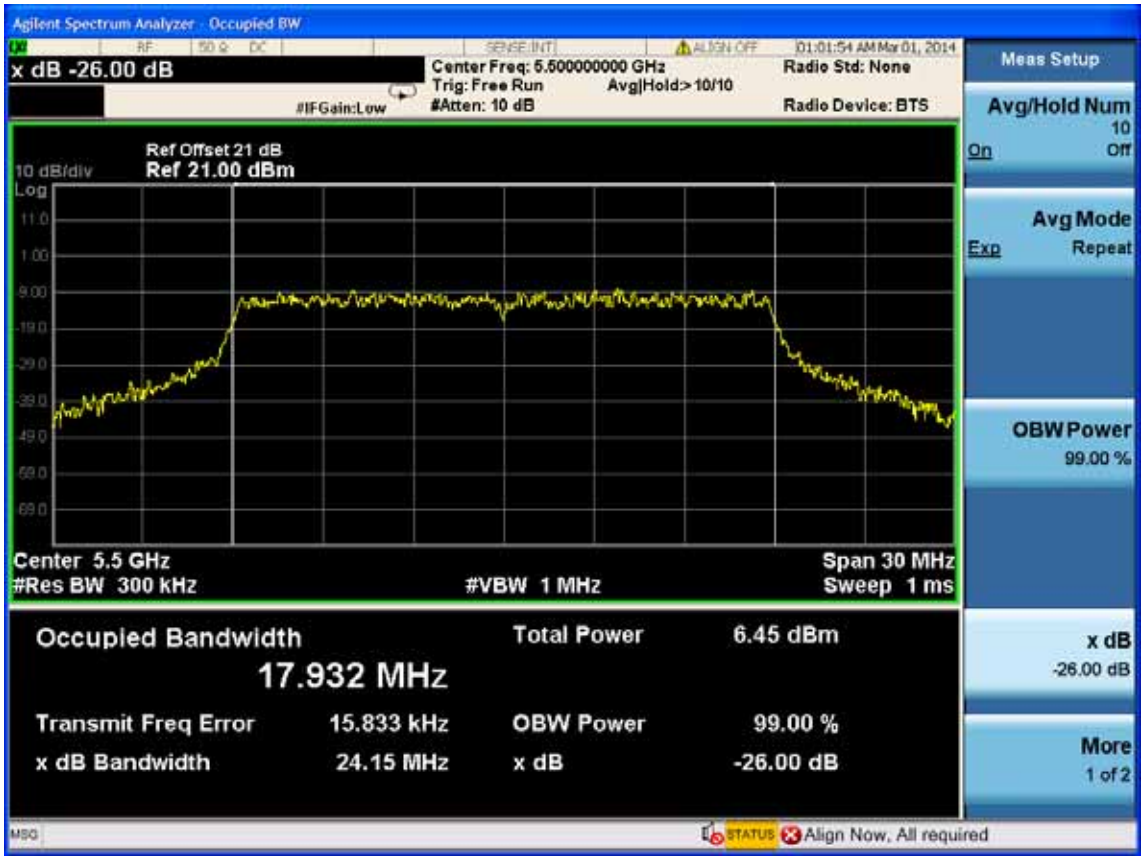
5530MHz



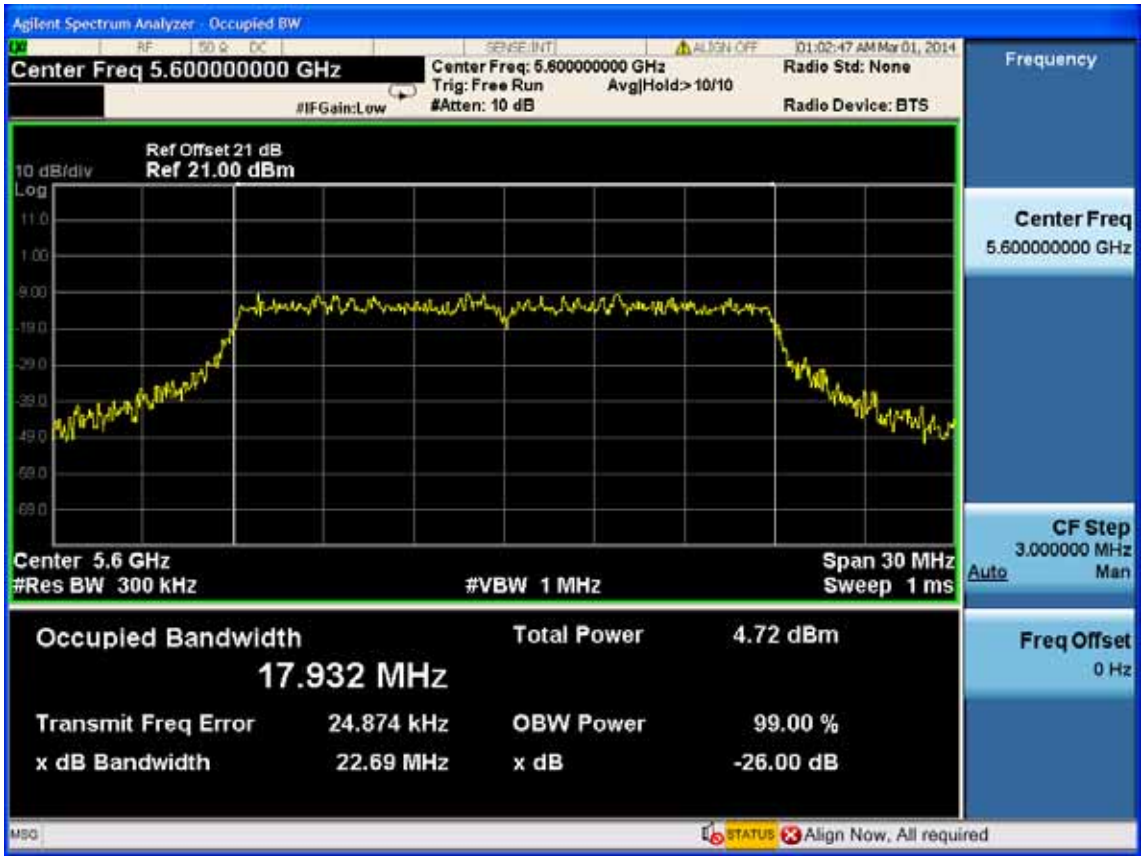
5690MHz

11nHT20

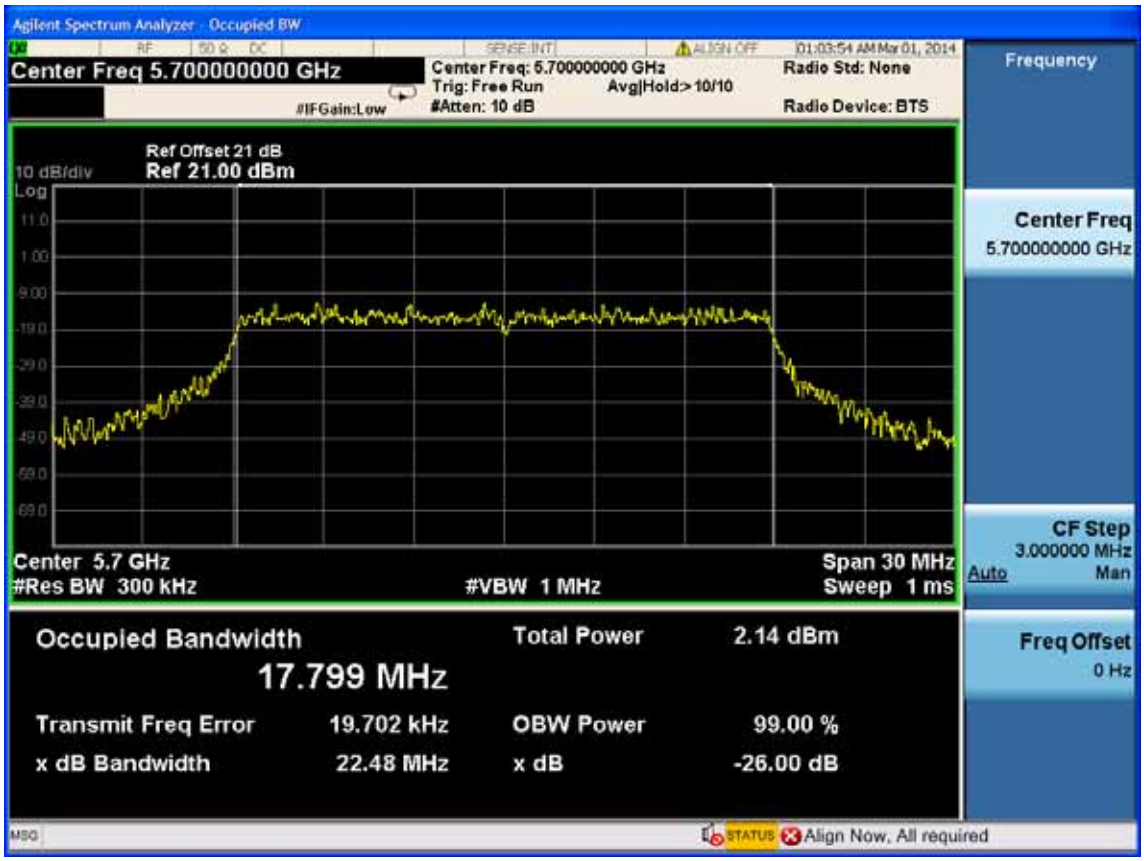
5500MHz



5600MHz



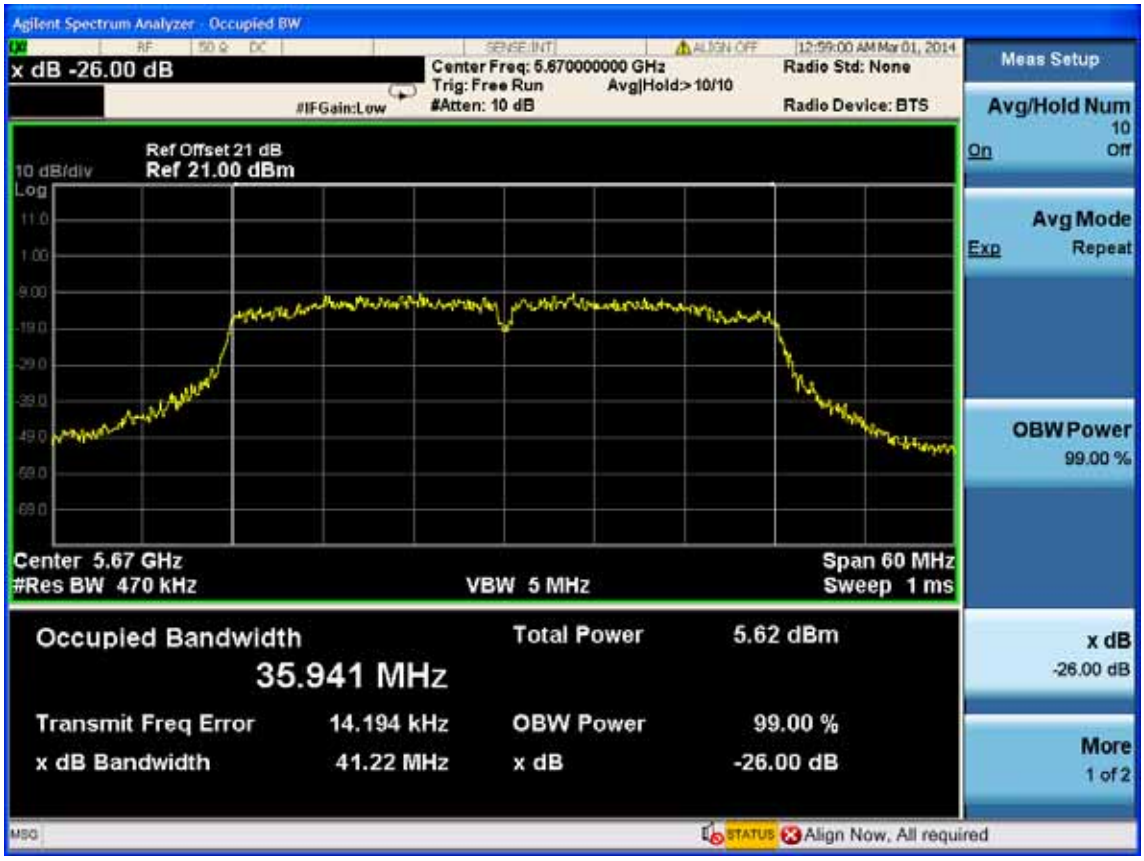
5700MHz



11nHT40

5510MHz

5670MHz



7. OUTPUT POWER TEST

7.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	May.08, 13	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 13	1 Year
3.	Antenna	EMCO	3115	9607-4877	May.08, 13	1Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 13	1 Year
5.	Power Meter	Anritsu	ML2487A	6K00002472	May.08, 13	1Year
6.	Power Sensor	Anritsu	MA2491A	033005	May.08, 13	1Year

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.

Souse the test method described in KBD789033 clause E.

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

7.4.Test Results

5150-5250MHz:

EUT:Notebook		
M/N:RZ09-0116		
Test date: 2014-02-27	Pressure: 101.3±1.0kpa	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)	Peak output Power (dBm)			Limit (dBm)
		Chain A	Chain B	Total	
11a	5180	10.12	9.04	N/A	15.8
	5200	12.01	11.62	N/A	15.8
	5240	12.18	11.83	N/A	15.8
11n HT20	5180	6.82	4.89	8.97	15.8
	5200	8.04	6.31	10.27	15.8
	5240	8.24	7.28	10.80	15.8
11n HT40	5190	4.12	3.60	6.88	15.8
	5230	8.60	8.35	11.49	15.8
11ac VHT20	5180	6.54	5.60	9.11	15.8
	5200	7.85	7.47	10.67	15.8
	5240	8.46	7.72	11.12	15.8
11ac VHT40	5190	4.37	3.17	6.82	15.8
	5230	8.64	8.53	11.60	15.8
11ac VHT80	5210	3.48	3.29	6.40	15.8

Conclusion: PASS
Note: One Antenna is 3.96dBi, and another one is 4.59dBi, the direction Gain=7.2dBi
so power limit=17-(7.2-6)=15.8dBm

5250-5350MHz

EUT:Notebook		
M/N:RZ09-0116		
Test date: 2014-02-28	Pressure: 101.3±1.0kpa	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)	Peak output Power (dBm)			Limit (dBm)
		Chain A	Chain B	Total	
11a	5260	14.33	11.94	N/A	22.8
	5300	14.15	10.86	N/A	22.8
	5320	10.44	7.79	N/A	22.8
11n HT20	5260	11.02	9.75	13.44	22.8
	5300	9.83	6.83	11.59	22.8
	5320	8.07	4.55	9.67	22.8
11n HT40	5270	6.08	5.03	8.60	22.8
	5310	6.44	4.91	8.75	22.8
11ac VHT20	5260	10.22	9.74	13.00	22.8
	5300	9.70	8.79	12.28	22.8
	5320	8.42	7.16	10.85	22.8
11ac VHT40	5270	5.96	5.56	8.77	22.8
	5310	6.43	4.79	8.70	22.8
11ac VHT80	5290	7.14	5.62	9.46	22.8

Conclusion: PASS
Note: One Antenna is 3.96dBi, and another one is 4.59dBi, the direction Gain=7.2dBi
so power limit=24-(7.2-6)=22.8dBm

5470-5725MHz:

EUT:Notebook		
M/N:RZ09-0116		
Test date: 2014-03-01	Pressure: 101.3±1.0kpa	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)	Peak output Power (dBm)			Limit (dBm)
		Chain A	Chain B	Total	
11a	5500	11.40	10.78	N/A	22.8
	5600	12.27	10.77	N/A	22.8
	5700	8.65	7.26	N/A	22.8
11n HT20	5500	9.08	8.19	11.67	22.8
	5600	9.66	8.79	12.26	22.8
	5700	7.68	6.28	10.05	22.8
11n HT40	5510	6.97	6.02	9.53	22.8
	5670	8.67	8.07	11.39	22.8
11ac VHT20	5500	8.92	8.43	11.69	22.8
	5600	9.36	8.93	12.16	22.8
	5720	9.32	9.13	12.24	22.8
11ac VHT40	5510	6.60	6.37	9.50	22.8
	5710	9.15	8.80	11.99	22.8
11ac VHT80	5530	6.02	5.25	8.66	22.8
	5690	10.31	9.63	12.99	22.8

Conclusion: PASS
Note: One Antenna is 3.96dBi, and another one is 4.59dBi, the direction Gain=7.2dBi
so power limit=24-(7.2-6)=22.8dBm

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

8.4.Test Results

5150-5250MHz:

EUT:Notebook		
M/N:RZ09-0116		
Test date: 2014-02-27	Pressure: 101.3±1.0 kpa	Humidity: 52.6±3.0%
Tested by: Kevin_Hu	Test site: RF Site	Temperature：22.7±0.6℃

Cable loss: 1 dB		Attenuator loss: 20 dB			
Test Mode	Frequency（MHz）	Chain A (dBm/MHz)	Chain B (dBm/MHz)	Total (dBm/MHz)	Limit （dBm/MHz）
11a	5180	-1.129	-1.019	N/A	4
	5200	1.178	1.180	N/A	4
	5240	1.753	1.589	N/A	4
11n HT20	5180	-4.094	-3.437	-0.74	4
	5200	-2.394	-2.070	0.78	4
	5240	-1.805	-1.895	1.16	4
11n HT40	5190	-8.969	-8.590	-5.77	4
	5230	-3.994	-4.365	-1.17	4
11ac VHT20	5180	-4.643	-4.332	-1.47	4
	5200	-2.468	-2.345	0.60	4
	5240	-2.038	-2.215	0.88	4
11ac VHT40	5190	-8.906	-8.521	-5.70	4
	5230	-4.604	-3.279	-0.88	4
11ac VHT80	5210	-12.416	-12.308	-9.35	4
Conclusion: PASS					

5250-5350MHz

EUT:Notebook		
M/N:RZ09-0116		
Test date: 2014-02-28	Pressure: 101.1±1.0 kpa	Humidity: 51.3±3.0%
Tested by: Kevin_Hu	Test site: RF Site	Temperature：22.5±0.6℃

Cable loss: 1 dB		Attenuator loss: 20 dB			
Test Mode	Frequency（MHz）	Chain A (dBm/MHz)	Chain B (dBm/MHz)	Total (dBm/MHz)	Limit （dBm/MHz）
11a	5260	1.750	1.971	N/A	11
	5300	2.136	0.976	N/A	11
	5320	-0.997	-2.370	N/A	11
11n HT20	5260	-1.832	-1.602	1.29	11
	5300	-1.573	-2.062	1.20	11
	5320	-3.054	-4.369	-0.65	11
11n HT40	5270	-8.038	-9.000	-5.48	11
	5310	-8.392	-8.591	-5.48	11
11ac VHT20	5260	-1.551	-1.721	1.38	11
	5300	-1.912	-2.798	0.68	11
	5320	-3.779	-4.939	-1.31	11
11ac VHT40	5270	-8.198	-9.460	-5.77	11
	5310	-7.897	-8.967	-5.39	11
11ac VHT80	5290	-10.245	-11.148	-7.66	11
Conclusion: PASS					

5470-5725MHz:

EUT:Notebook		
M/N:RZ09-0116		
Test date: 2014-03-01	Pressure: 101.1±2.0 kpa	Humidity: 51.9±3.0%
Tested by: Kevin_Hu	Test site: RF Site	Temperature：22.5±0.6℃

Cable loss: 1 dB		Attenuator loss: 20 dB			
Test Mode	Frequency（MHz）	Chain A (dBm/MHz)	Chain B (dBm/MHz)	Total (dBm/MHz)	Limit （dBm/MHz）
11a	5500	0.381	-0.177	N/A	11
	5600	1.956	0.431	N/A	11
	5700	-2.233	-3.410	N/A	11
11n HT20	5500	-3.081	-2.479	0.24	11
	5600	-2.489	-1.935	0.81	11
	5700	-5.889	-5.784	-2.83	11
11n HT40	5510	-8.104	-8.087	-5.09	11
	5670	-5.193	-5.738	-2.45	11
11ac VHT20	5500	-3.275	-2.971	-0.11	11
	5600	-1.672	-3.283	0.61	11
	5720	-3.058	-2.959	0.00	11
11ac VHT40	5510	-7.545	-7.865	-4.69	11
	5710	-5.472	-5.345	-2.40	11
11ac VHT80	5530	-11.061	-10.935	-7.99	11
	5690	-6.552	-7.201	-3.85	11
Conclusion: PASS					

(5150-5250MHz):

ANT A

11a

5180MHz

5210MHz

5240MHz

11ac VHT20

5180MHz

5200MHz

5240MHz

11ac VHT40

5190MHz

5230MHz

11ac VHT80

5210MHz

11nHT20

5180MHz

5210MHz

5240MHz

11nHT40

5190MHz

5230MHz

ANT B

11a

5180MHz

5210MHz

5240MHz

11ac VHT20

5180MHz

5200MHz

5240MHz

11ac VHT40

5190MHz

5230MHz

11ac VHT80

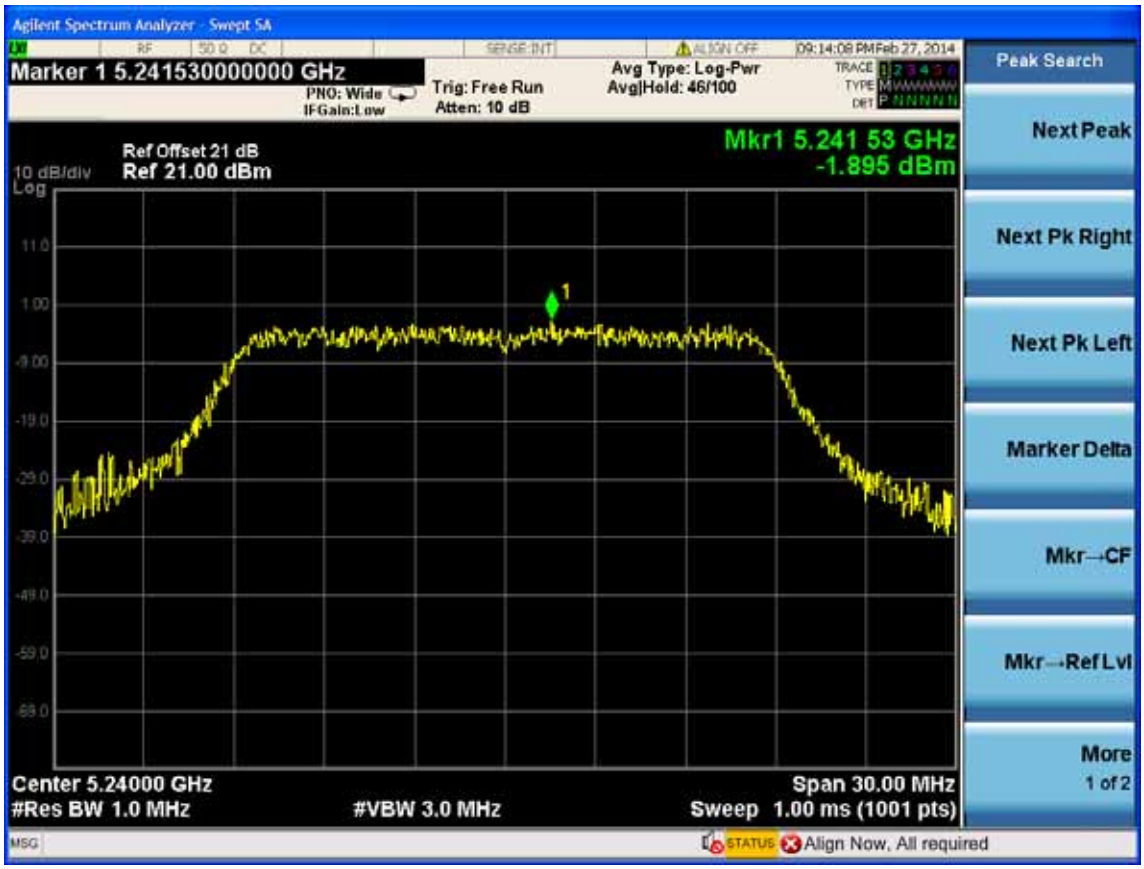
5210MHz

11nHT20

5180MHz

5210MHz

5240MHz



11nHT40

5190MHz

5230MHz

(5250-5350MHz):

ANT A

11a

5260MHz

5300MHz

5320MHz

11ac VHT20

5180MHz

5200MHz

5240MHz

11ac VHT40

5190MHz

5230MHz

11ac VHT80

5210MHz

11nHT20

5260MHz

5300MHz

5320MHz

11nHT40

5270MHz

5310MHz

ANT B
11a
5260MHz

5300MHz

5320MHz

11ac VHT20

5180MHz

5200MHz

5240MHz

11ac VHT40

5190MHz

5230MHz

11ac VHT80

5210MHz

11nHT20

5260MHz

5300MHz

5320MHz

11nHT40

5270MHz

5310MHz

(5470-5725MHz):

ANT A

11a

5500MHz

5600MHz

5700MHz

11ac VHT20

5500MHz

5600MHz

5700MHz

11ac VHT40

5510MHz

5710MHz

11ac VHT80

5530MHz

5690MHz

11nHT20

5500MHz

5600MHz

5700MHz

11nHT40

5500MHz

5700MHz

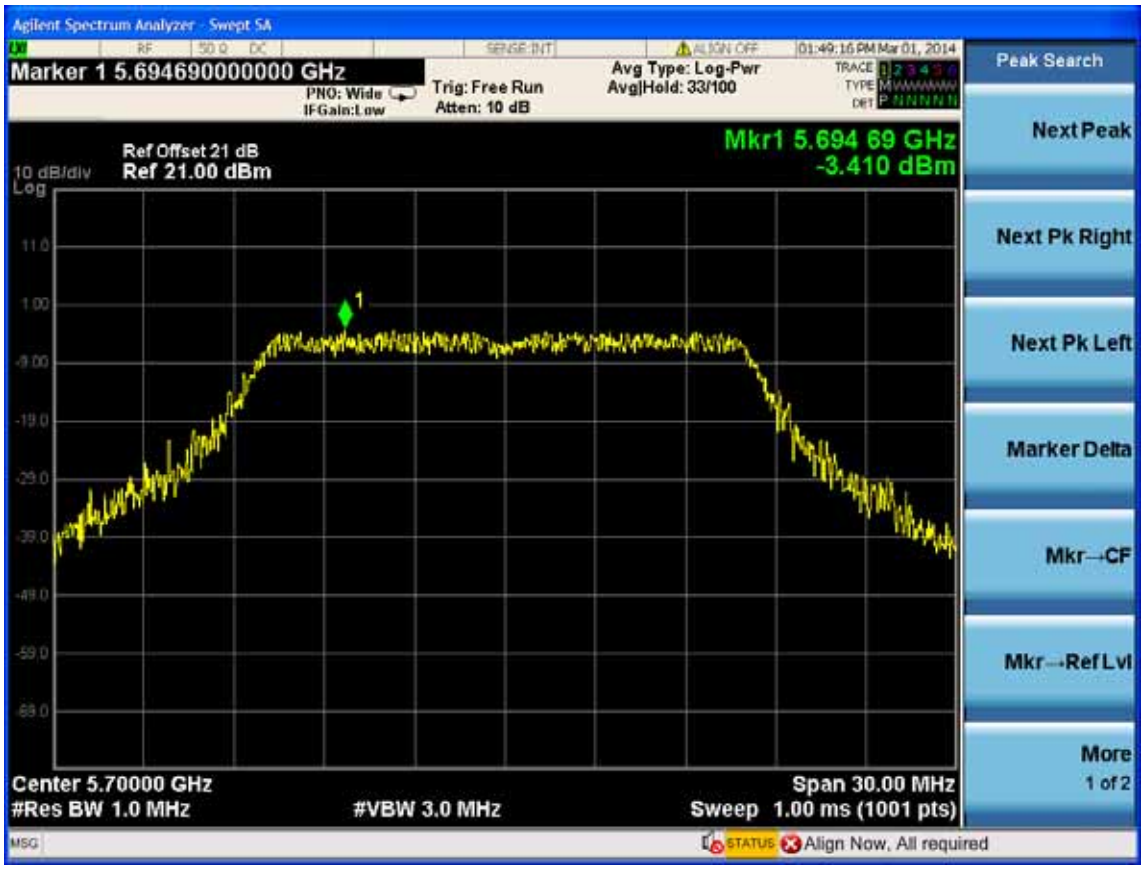
ANT B

11a

5500MHz

5600MHz

5700MHz



11ac VHT20

5500MHz

5600MHz

5720MHz

11ac VHT40

5510MHz

5710MHz

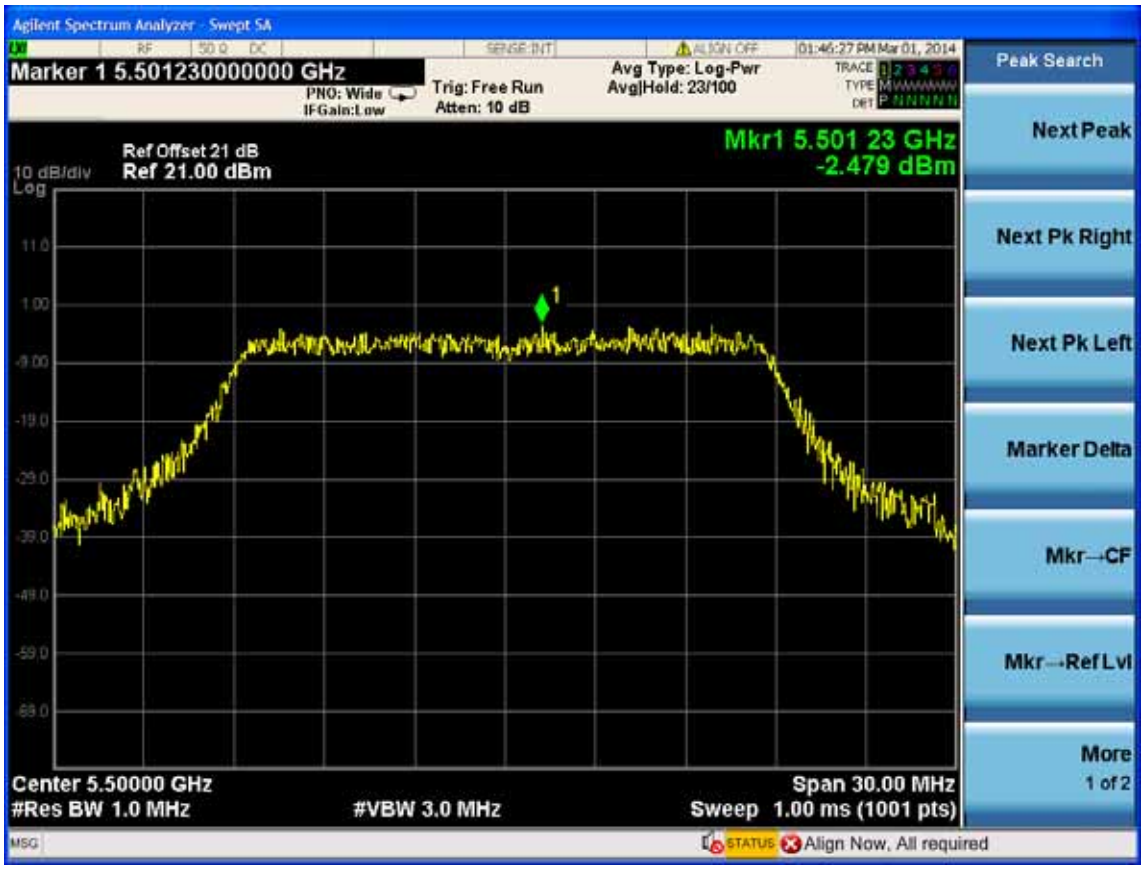
11ac VHT80

5530MHz

5690MHz

11nHT20

5500MHz



5600MHz

5700MHz

11nHT40

5500MHz

5700MHz

9. PEAK EXCURSION MEASUREMENT

9.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	May.08, 13	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 13	1 Year
3.	Antenna	EMCO	3115	9510-4580	May.08, 13	1Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 13	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 ≥ 1/T (Draft n VBW = 300kHz ≥ 1/4 μ 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

5150-5250MHz:

EUT:Notebook		
M/N:RZ09-0116		
Test date: 2014-02-27	Pressure: 101.1±1.0 kpa	Humidity: 51.3±3.0%
Tested by: Kevin_Hu	Test site: RF Site	Temperature：22.5±0.6℃

Cable loss: 1 dB		Attenuator loss: 20 dB		
Test Mode	Frequency (MHz)	Power excursion(dB)		Limit (dB)
		ANT A	ANT B	
11a	5180	1.826	2.124	13
	5200	2.472	2.892	13
	5240	2.524	2.194	13
11nHT20	5180	3.097	2.181	13
	5200	2.807	2.604	13
	5240	2.171	2.407	13
11nHT40	5190	2.383	2.654	13
	5230	2.71	2.297	13
11ac VTH20	5180	2.826	2.649	13
	5200	3.054	2.141	13
	5240	2.618	2.274	13
11ac VTH40	5190	2.878	2.637	13
	5230	3.025	2.374	13
11ac VTH80	5210	3.046	2.207	13
Conclusion：PASS				

5250-5350MHz

EUT:Notebook		
M/N:RZ09-0116		
Test date: 2014-02-28	Pressure: 101.1±1.0 kpa	Humidity: 51.3±3.0%
Tested by: Kevin_Hu	Test site: RF Site	Temperature：22.5±0.6℃

Cable loss: 1 dB		Attenuator loss: 20 dB		
Test Mode	Frequency（MHz）	Power excursion（dB）		Limit (dB)
		ANT A	ANT B	
11a	5260	1.912	2.415	13
	5300	2.028	2.647	13
	5320	2.417	2.37	13
11nHT20	5260	2.6	2.678	13
	5300	2.637	2.459	13
	5320	2.786	2.646	13
11nHT40	5270	3.48	2.537	13
	5310	3.394	2.302	13
11ac VTH20	5260	3.463	2.542	13
	5300	3.095	2.419	13
	5320	2.907	3.03	13
11ac VTH40	5270	3.122	2.971	13
	5310	2.8	1.92	13
11ac VTH80	5290	3.684	2.597	13
Conclusion：PASS				

5470-5725MHz:

EUT:Notebook		
M/N:RZ09-0116		
Test date: 2014-03-01	Pressure: 101.1±2.0 kpa	Humidity: 51.9±3.0%
Tested by: Kevin_Hu	Test site: RF Site	Temperature：22.5±0.6℃

Cable loss: 1 dB		Attenuator loss: 20 dB		
Test Mode	Frequency（MHz）	Power excursion（dB）		Limit (dB)
		ANT A	ANT B	
11a	5500	2.695	3.763	13
	5600	3.085	3.182	13
	5700	2.841	3.474	13
11nHT20	5500	2.517	2.846	13
	5600	2.703	2.931	13
	5700	4.123	2.421	13
11nHT40	5510	3.401	3.122	13
	5670	3.237	2.129	13
11ac VTH20	5500	3.275	2.655	13
	5600	3.462	3.228	13
	5720	4.04	2.572	13
11ac VTH40	5510	3.12	3.835	13
	5710	3.322	2.682	13
11ac VTH80	5530	3.229	3.814	13
	5690	2.814	3.341	13
Conclusion：PASS				

(5150-5250MHz):

ANT A

11a

5180MHz

5210MHz