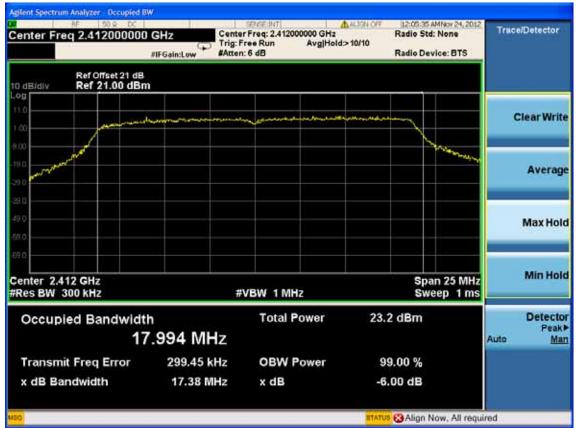


#### Test Mode: IEEE 802.11n HT20 TX

Test CH1: 2412MHz



## Test CH6: 2437MHz





#### Test CH11: 2462MHz 12:06:33 AMNov 24, 2012 Trace/Detector Center Freq: 2.462000000 GHz Center Freq 2.462000000 GHz Radio Std: None Avg|Hold>10/10 Trig: Free Run #Atten: 6 dB Radio Device: BTS Ref Offset 21 dB Ref 21.00 dBm 10 dB/div og **Clear Write** Average Max Hold Min Hold Center 2.462 GHz Span 25 MHz #Res BW 300 kHz **#VBW 1 MHz** Sweep 1 ms Detector **Total Power** 23.0 dBm Occupied Bandwidth Peak > 18.018 MHz Auto Man -145.21 kHz Transmit Freq Error **OBW Power** 99.00 % x dB Bandwidth 17.47 MHz -6.00 dB x dB STATUS Align Now, All required

Test Mode: IEEE 802.11n HT40 TX

Test CH1: 2422MHz





#### Test CH4: 2437MHz 07:11:20 PMNov 25, 2012 Frequency Center Freq: 2.437000000 GHz Radio Std: None Avg|Hold>10/10 Trig: Free Run #Atten: 10 dB Radio Device: BTS Ref Offset 21 dB Ref 21.00 dBm 10 dB/div og Center Freq 2.437000000 GHz CF Step 5.000000 MHz Center 2.437 GHz Res BW 470 kHz Span 50 MHz Auto #VBW 5 MHz Sweep 1 ms **Total Power** 16.7 dBm Occupied Bandwidth Freq Offset 0 Hz 36.887 MHz 227.90 kHz Transmit Freg Error **OBW Power** 99.00 % x dB Bandwidth 36.37 MHz x dB -6.00 dB STATUS Align Now, All required

## Test CH7: 2452MHz



## 8. OUTPUT POWER TEST

# 8.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Dct.31.12	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 12	1 Year
3.	Antenna	EMCO	3115	9510-4580	May.08, 12	1Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 12	1 Year
5.	Power Meter	Anritsu	ML2487A	6K00002472	May.08, 12	1Year
6.	Power Sensor	Anritsu	MA2491A	033005	May.08, 12	1Year

# 8.2.Limit (FCC Part 15C 15.247 b(3))

For systems using digital modulation in the 2400—2483.5MHz, The Peak out put Power shall not exceed 1W(30dBm)

#### 8.3.Test Procedure

- 1, Connected the EUT's antenna port to measure device by 26dB attenuator.
- 2, For IEEE 802.11b/g and IEEE802.11n HT20 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 mode, because the signal's bandwidth is about 40MHz and above 20MHz bandwidth of power sensor ML2491A. So Bandwidth correction method according to ANSI C63.10 clause 6.10.2.1 part (c) was used:
  - 1) Set the RBW=3MHz and VBW =8MHz
  - 2) Turn averaging off
  - 3) Set sweep to automatic
  - 4) Set the span just large enough to capture the emission
  - 5) Use a peak detector on max hold
  - 6) Record the measured power
  - 7) Calculate Output power of EUT use the formula:

Peak output power = measured power+ 10log[(26dB bandwidth of emission)/(analyzer RBW)]

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



## 8.4.Test Results

Group 1

EUT: A8-Ein Super WiFi Base Station

M/N: WA8011N

Test date: 2012-11-24 Pressure: 101.2±1.0 kpa Humidity: 52.1±3.0%

Tested by: Leo-Li Test site: RF Site Temperature: 22.2±0.6°C

Cable loss: 1	Cable loss: 1 dB		ss: 20 dB	Antenna Gain: 19dBi		
Test Mode	CH (MHz)	Peak	Limit			
	,	ANT 0	ANT 1	Total	(dBm)	
	CH1	13.34	12.78	16.08	17	
11b	СН6	13.41	12.82	16.14	17	
	CH11	13.47	12.63	16.08	17	
	CH1	13.46	12.78	16.14	17	
11g	СН6	13.57	12.71	16.17	17	
	CH11	13.52	12.74	16.16	17	
115	CH1	13.28	12.71	16.01	17	
11n HT20	СН6	13.37	12.83	16.12	17	
11120	CH11	13.40	12.89	16.16	17	

		Result	Limit				
Test Mode	СН	Measured power(dBm)/3MHz		PK Output power (dBm)		(dBm)	
		ANT 0	ANT 1	ANT 0	ANT 1	Total	
11n	CH3	1.483	0.722	13.623	12.832	16.26	17
HT40	CH6	1.677	0.917	13.817	13.027	16.45	17
	CH9	1.408	0.876	13.548	12.986	16.29	17

ANT 0:26dB Bandwidth for 11n HT40: 49.06 MHz

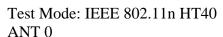
ANT 1:26dB Bandwidth for 11n HT40: 48.75MHz

ANT 0:BW correction factor =  $10\log[(49.06\text{MHz})/(3\text{MHz})] = 12.14\text{dB}$ 

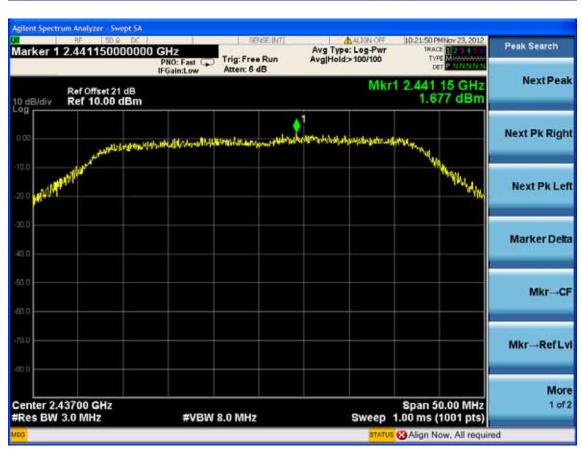
ANT 1:BW correction factor =  $10\log[(48.75\text{MHz})/(3\text{MHz})] = 12.11\text{dB}$ 

Conclusion: PASS











page 8-4 FCC ID:UCC-WA8011N kgilent Spectrum Analyzer - Swept SA 10:32:35 PMNov 23, 2012 TRACE 12:0 4:00 TYPE DET 14:00 MMH Avg Type: Log-Pwr Avg|Hold>100/100 Peak Search Marker 1 2.441250000000 GHz Trig: Free Run PNO: Fast (T)
IFGain:Low Atten: 6 dB **Next Peak** Mkr1 2.441 25 GHz 1.408 dBm Ref Offset 21 dB Ref 10.00 dBm 10 dB/div **Next Pk Right Next Pk Left** Marker Delta Mkr→CF Mkr---Ref Lvl More Center 2.45200 GHz Span 50.00 MHz 1 of 2 #Res BW 3.0 MHz **#VBW 8.0 MHz** Sweep 1.00 ms (1001 pts) Align Now, All required ANT 1 D8:42:48 PMNov 23, 2012 Peak Search Avg Type: Log-Pwr Avg|Hold>100/100 Marker 1 2.436450000000 GHz Trig: Free Run PNO: Fast (1)
IFGain:Low Atten: 6 dB



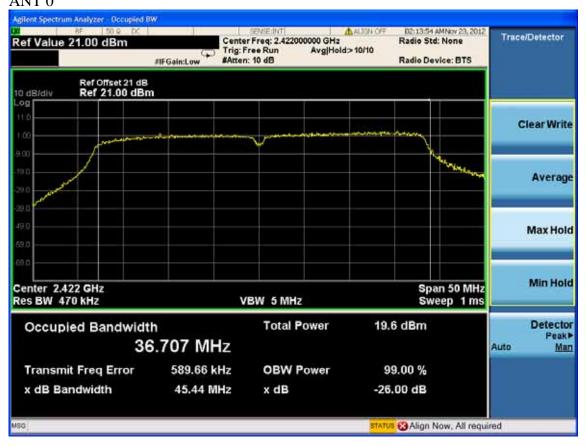






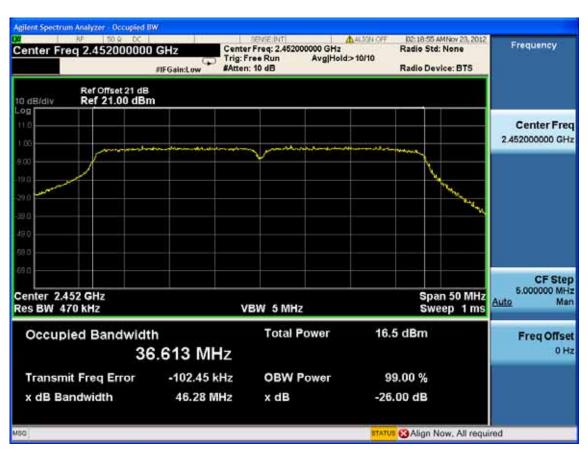


# 26dB Bandwidth ANT 0





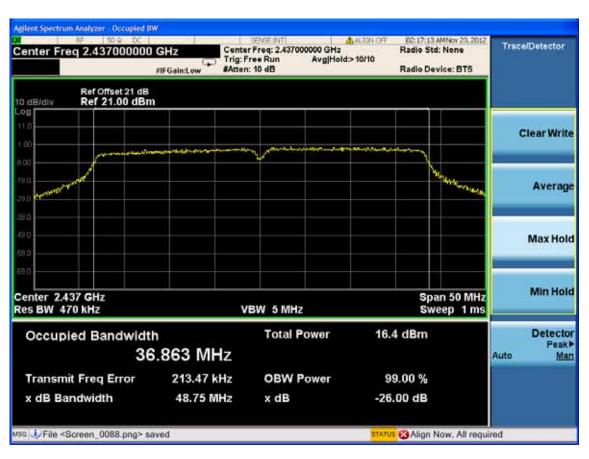




#### ANT 1











Group 2

EUT: A8-Ein Super WiFi Base Station

M/N: WA8011N

Test date: 2012-11-24 Pressure: 101.2±1.0 kpa Humidity: 52.4±3.0%

Tested by: Leo-Li Test site: RF Site Temperature: 22.8±0.6°C

Cable loss:	Cable loss: 1 dB		oss: 20 dB	Antenna Gain: 19dBi		
Test Mode	CH (MHz)	Peak	Limit			
1,1000	(11112)	ANT 0	ANT 1	Total	(dBm)	
	CH1	13.29	12.01	15.71	17	
11b	CH6	13.15	12.11	15.67	17	
	CH11	13.32	12.12	15.77	17	
	CH1	13.29	12.24	15.81	17	
11g	CH6	13.25	12.32	15.82	17	
	CH11	13.31	12.21	15.81	17	
11n HT20	CH1	13.20	12.74	15.99	17	
	CH6	13.27	12.72	16.01	17	
11120	CH11	13.29	12.85	16.09	17	

		Result	Limit				
Test Mode	СН	Measured power(dBm)/3MHz			PK Output power (dBm)		
		ANT 0	ANT 1	ANT 0	ANT 1	Total	
11n	CH3	1.188	0.876	13.278	12.976	16.14	17
HT40	CH6	1.358	0.756	13.448	12.856	16.17	17
	CH9	1.382	0.758	13.472	12.858	16.19	17

ANT 0:26dB Bandwidth for 11n HT40: 48.50MHz

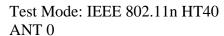
ANT 1:26dB Bandwidth for 11n HT40: 48.71MHz

ANT 0:BW correction factor =  $10\log[(48.50\text{MHz})/(3\text{MHz})] = 12.09\text{dB}$ 

ANT 1:BW correction factor =  $10\log[(48.71\text{MHz})/(3\text{MHz})] = 12.10\text{dB}$ 

Conclusion: PASS

























# 26dB Bandwidth ANT 0





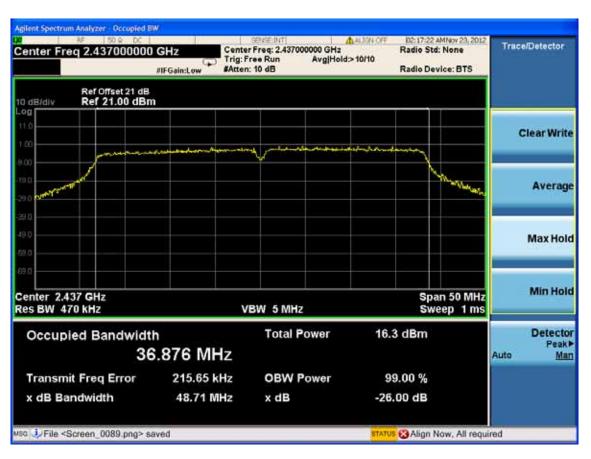




#### ANT 1











Group 3

EUT: A8-Ein Super WiFi Base Station								
M/N: WA8011N								
Test date: 2012-11-24	Pressure:	101.2±1.0 kpa	Humidity: 53.5±3.0%					
Tested by: Leo-Li	Test site:	RF Site	Temperature : 22.6±0.6℃					
	•							

Cable loss: 1	Cable loss: 1 dB		ss: 20 dB	Antenna Gain: 19dBi		
Test Mode	CH (MHz)	Peak	Limit			
	,	ANT 0	ANT 1	Total	(dBm)	
	CH1	13.15	12.91	16.04	17	
11b	CH6	13.30	12.92	16.12	17	
	CH11	13.13	12.01	15.62	17	
	CH1	13.17	12.93	16.06	17	
11g	CH6	13.34	12.24	15.84	17	
	CH11	13.29	12.18	15.78	17	
11	CH1	13.19	12.57	15.90	17	
11n HT20	CH6	13.31	12.64	16.00	17	
H120	CH11	13.27	12.71	16.01	17	

		Result	Result					
Test Mode	СН	Measured power(dBm)/3MHz		PK Output power (dBm)			(dBm)	
		ANT 0	ANT 1	ANT 0	ANT 1	Total		
11n	CH3	1.095	0.848	13.235	12.958	16.11	17	
HT40	CH6	1.514	0.841	13.654	12.951	16.33	17	
	CH9	1.197	0.852	13.337	12.962	16.16	17	

ANT 0:26dB Bandwidth for 11n HT40: 49.10MHz

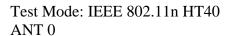
ANT 1:26dB Bandwidth for 11n HT40: 48.76MHz

ANT 0:BW correction factor =  $10\log[(49.10\text{MHz})/(3\text{MHz})] = 12.14\text{dB}$ 

ANT 1:BW correction factor =  $10\log[(48.76\text{MHz})/(3\text{MHz})] = 12.11\text{dB}$ 

Conclusion: PASS













### ANT 1



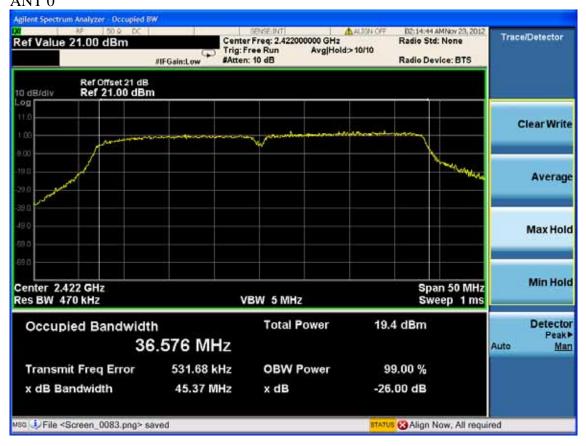








# 26dB Bandwidth ANT 0





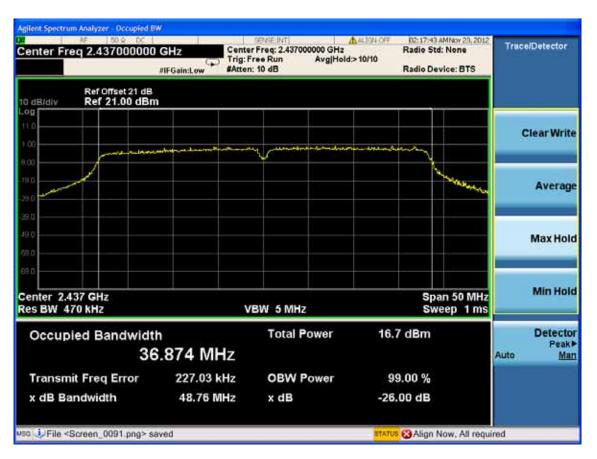




#### ANT 1











### Group 4

EUT: A8-Ein Super WiFi Base Station								
M/N: WA8011N								
Test date: 2012-11-24	Pressure:	101.2±1.0 kpa	Humidity: 53.2±3.0%					
Tested by: Leo-Li	Test site:	RF Site	Temperature : $23.1\pm0.6^{\circ}$ C					

Cable loss: 1	dB	Attenuator lo	oss: 20 dB	Antenna	Antenna Gain: 19dBi		
Test Mode	CH (MHz)	Peak	Limit				
	,	ANT 0	ANT 1	Total	(dBm)		
	CH1	13.15	12.84	16.01	17		
11b	СН6	13.01	12.77	15.90	17		
	CH11	13.13	12.81	15.98	17		
	CH1	13.22	12.89	16.07	17		
11g	СН6	13.32	12.91	16.13	17		
	CH11	13.19	12.87	16.04	17		
11n HT20	CH1	13.17	12.72	15.96	17		
	СН6	13.24	12.65	15.97	17		
	CH11	13.13	12.69	15.93	17		

		Result	Result					
Test Mode	СН	Measured power(dBm)/3MHz		PK Output power (dBm)			(dBm)	
		ANT 0	ANT 1	ANT 0	ANT 1	Total		
11n	CH3	0.925	0.889	13.045	13.009	16.04	17	
HT40	CH6	1.668	0.779	13.788	12.899	16.38	17	
	CH9	1.256	0.760	13.376	12.880	16.15	17	

ANT 0:26dB Bandwidth for 11n HT40: 48.83MHz

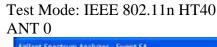
ANT 1:26dB Bandwidth for 11n HT40: 48.88MHz

ANT 0:BW correction factor =  $10\log[(48.83 \text{ MHz})/(3\text{MHz})] = 12.12\text{dB}$ 

ANT 1:BW correction factor =  $10\log[(48.88\text{MHz})/(3\text{MHz})] = 12.12\text{dB}$ 

Conclusion: PASS















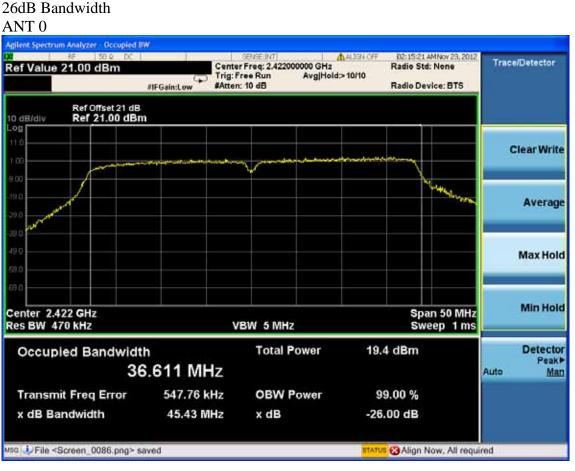


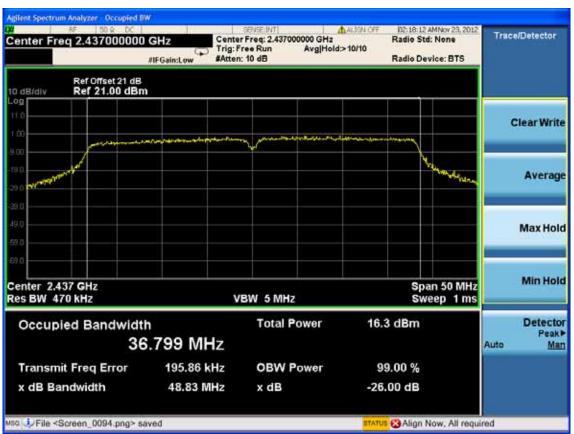




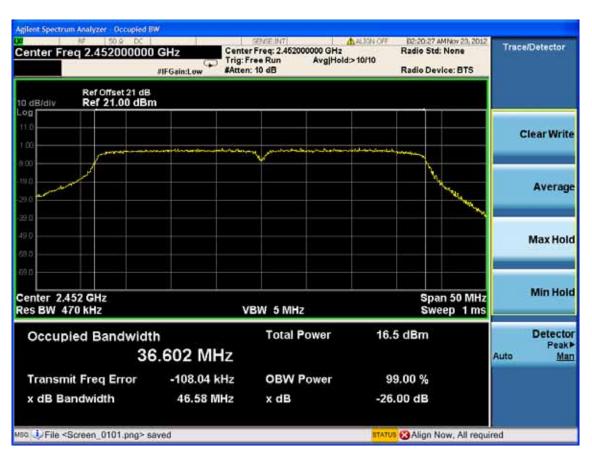








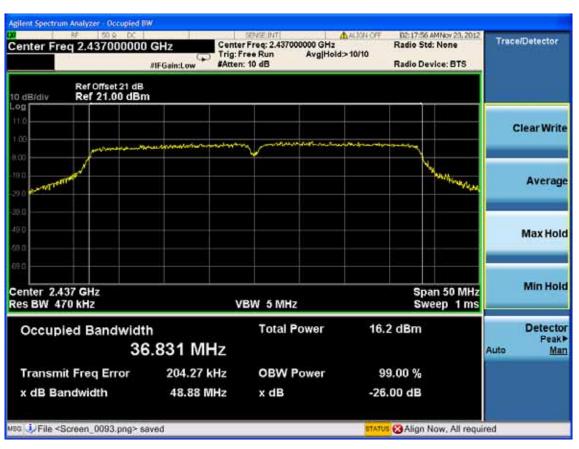




#### ANT 1











# 9. POWER SPECTRAL DENSITY TEST

# 9.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Dct.31.12	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 12	1 Year
3.	Antenna	EMCO	3115	9510-4580	May.31, 12	1Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 12	1 Year

## 9.2.Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

### 9.3. Test Procedure

- 1. Connected the EUT's antenna port to spectrum analyzer device by 20dB attenuator.
- 2.Set the test frequency as center frequency,Set RBW=100KHz,VBW=300KHz,Span to 5-30 % greater than the EBW,Read out maximum peak leval of the test frequency.
- 3, adjusting (reducing) the measured power in step 2 by a bandwidth correction factor (BWCF) where BWCF =  $10\log(3 \text{ kHz}/100 \text{ kHz} = -15.2 \text{ dB})$

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



## 9.4.Test Results

Cable loss: 1 dB		Attenuator loss: 20 dB				
Test Mode	СН	Power density (dBm/100KHz)			Power density (dBm/3KHz)	Limit (dBm/3KHz)
		ANT 0	ANT 1	Total	ANT 1	,
11b	CH1	4.986	4.648	7.83	-7.37	8
	CH6	5.755	6.433	9.12	-6.08	8
	CH11	3.453	4.319	6.92	-8.28	8
11g	CH1	2.511	3.040	5.79	-9.41	8
	CH6	3.583	4.121	6.87	-8.33	8
	CH11	1.374	2.264	4.85	-10.35	8
11n HT20	CH1	3.263	3.065	6.18	-9.02	8
	CH6	3.623	3.882	6.76	-8.44	8
	CH11	1.843	2.128	5.00	-10.20	8
11n HT40	CH1	3.560	2.130	5.91	-9.29	8
	CH4	2.008	0.927	4.51	-10.69	8
	CH7	1.523	0.499	4.05	-11.15	8

BW correction factor =  $10\log[(3/100\text{KHz})] = -15.2$ 

Conclusion: PASS



#### ANT 0

Test Mode: IEEE 802.11b TX

Test CH1: 2412MHz



Test CH6: 2437MHz





#### Test CH11: 2462MHz



Test Mode: IEEE 802.11g TX

Test CH1: 2412MHz



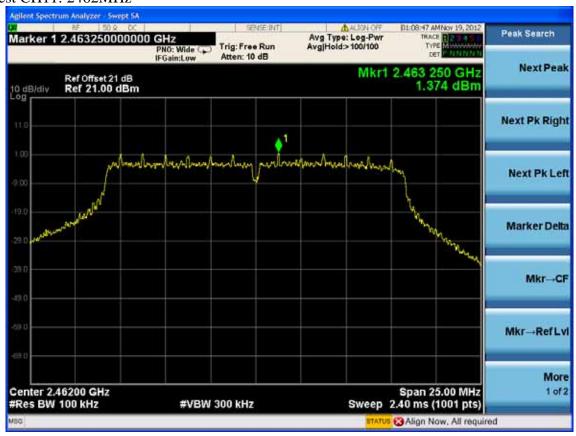
Align Now, All required



FCC ID:UCC-WA8011N page 9-5

## Test CH6: 2437MHz ALIGN OFF D1:08:15 AMNov 19, 2012 Peak Search Avg Type: Log-Pwr Avg|Hold>100/100 Marker 1 2.4407500000000 GHz Trig: Free Run PNO: Wide ( Atten: 10 dB **Next Peak** Mkr1 2.440 750 GHz Ref Offset 21 dB Ref 21.00 dBm 3.583 dBm 10 dB/div **Next Pk Right** handbrown mary **Next Pk Left** NAME WANT ! Marker Delta Mkr→CF Mkr---Ref Lvl More Center 2.43700 GHz #Res BW 100 kHz Span 25.00 MHz Sweep 2.40 ms (1001 pts) 1 of 2 **#VBW 300 kHz**

## Test CH11: 2462MHz



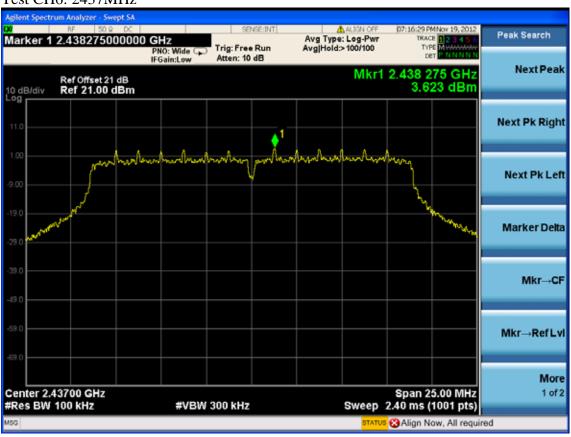


Test Mode: IEEE 802.11n HT20 TX

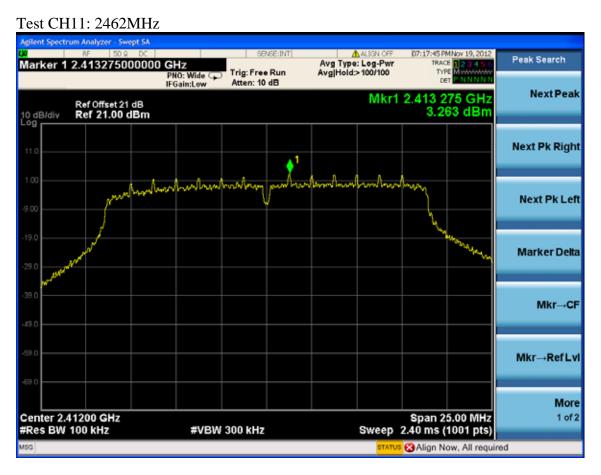
Test CH1: 2412MHz



## Test CH6: 2437MHz







Test Mode: IEEE 802.11n HT40 TX

Test CH1: 2422MHz





#### Test CH4: 2437MHz



## Test CH7: 2452MHz





#### ANT 1

Test Mode: IEEE 802.11b TX

Test CH1: 2412MHz



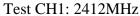
Test CH6: 2437MHz

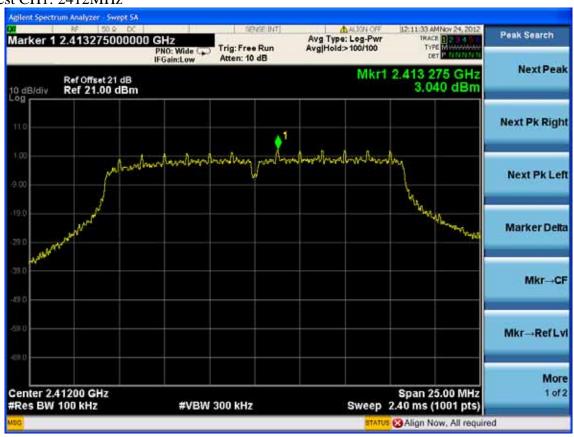






Test Mode: IEEE 802.11g TX







#### Test CH6: 2437MHz



## Test CH11: 2462MHz





### Test Mode: IEEE 802.11n HT20 TX

Test CH1: 2412MHz



## Test CH6: 2437MHz







Test Mode: IEEE 802.11n HT40 TX

Test CH1: 2422MHz





## Test CH4: 2437MHz



## Test CH7: 2452MHz





# 10. ANTENNA REQUIREMENT

## 10.1. 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 15.247 (b), 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.

## 10.2. 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 19dBi.



## 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: A8-Ein Super WiFi Base Station				
M/N: WA8011N				
Test date: 2012-11-25	Pressure:	101.4±1.0 kpa	Humidity: 55.6±3.0%	
Tested by: Leo-Li	Test site:	RF Site	Temperature : 22.4 $\pm$ 0.6 °C	

Cable loss: 1 dB		Attenuator loss: 20 dB			Antenna Gain: 19 dBi		
Test Mode	СН	Frequency (MHz)	Peak Output Power (dBm)	Output Power (mW)	Antenna Gain (dBi)	Antenna Gain (Linear)	МРЕ
11b	CH1	2412	16.08	40.55	19	79.43	0.6411
	CH6	2437	16.14	41.11	19	79.43	0.6501
	CH11	2462	16.08	40.55	19	79.43	0.6411
11g	CH1	2412	16.14	41.11	19	79.43	0.6501
	CH6	2437	16.17	41.40	19	79.43	0.6546
	CH11	2462	16.16	41.30	19	79.43	0.6531
11n HT20	CH1	2412	16.01	39.90	19	79.43	0.6309
	CH6	2437	16.12	40.93	19	79.43	0.6471
	CH11	2462	16.16	41.30	19	79.43	0.6531
11n HT40	CH1	2422	16.26	42.27	19	79.43	0.6683
	CH4	2437	16.45	44.16	19	79.43	0.6982
	CH7	2452	16.29	42.56	19	79.43	0.6729



FCC ID:UCC-WA8011N	page 12-1
12.DEVIATION TO TEST SPECIFICATIONS	
[ NONE]	