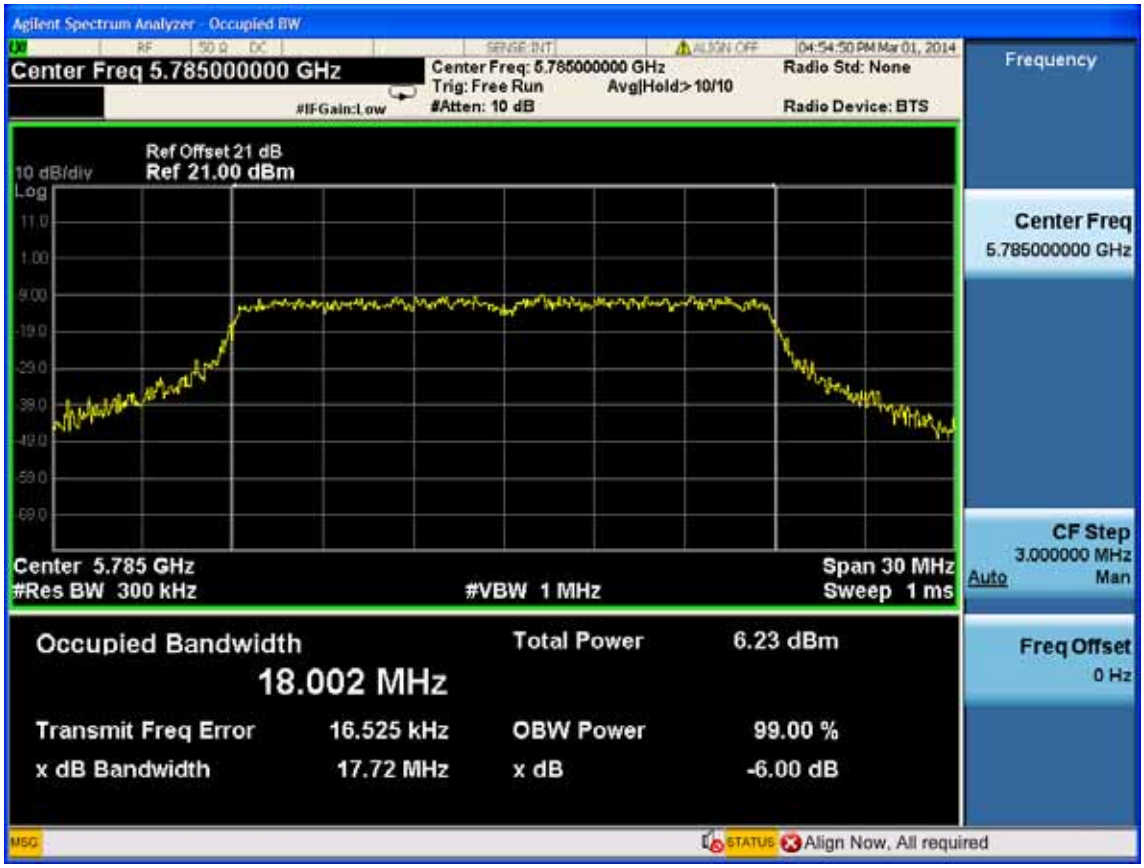
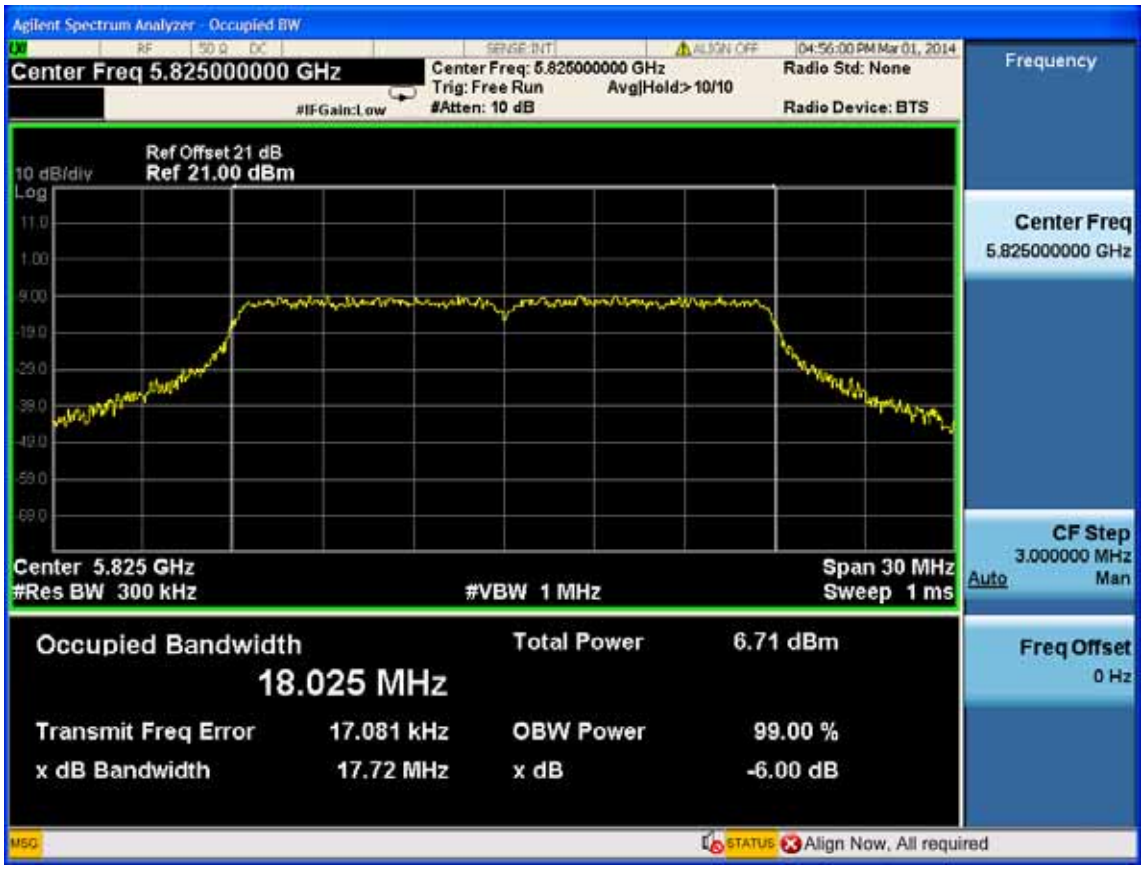
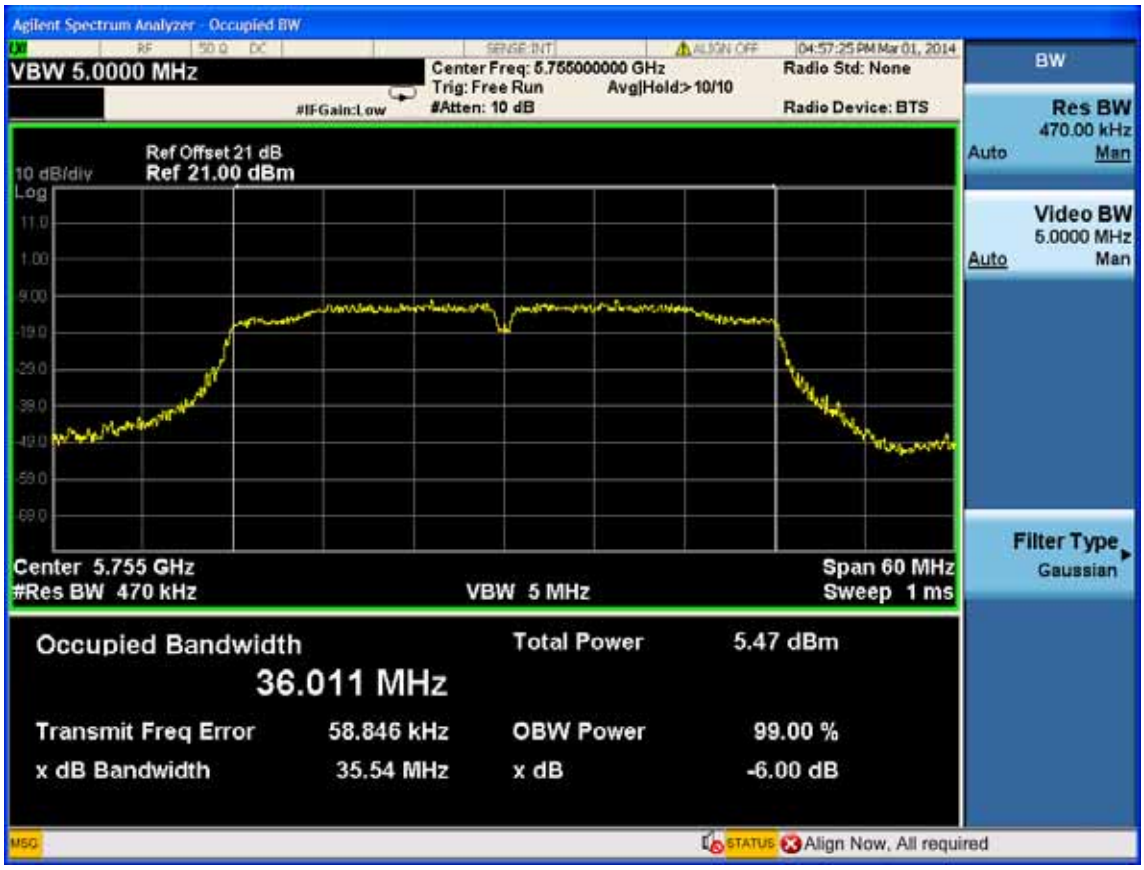
Test CH157: 5785MHz



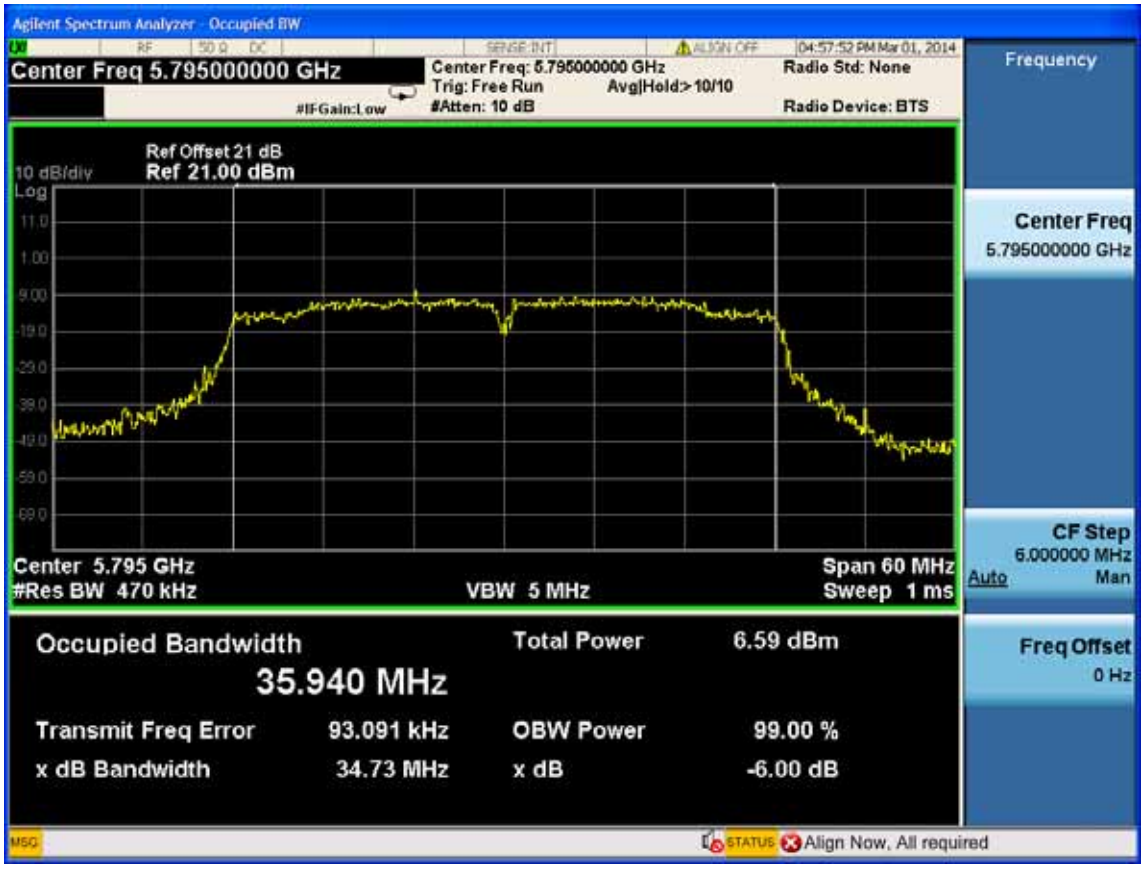
Test CH165: 5825MHz



Test Mode: IEEE 802.11n HT40 TX
Test CH151: 5755MHz



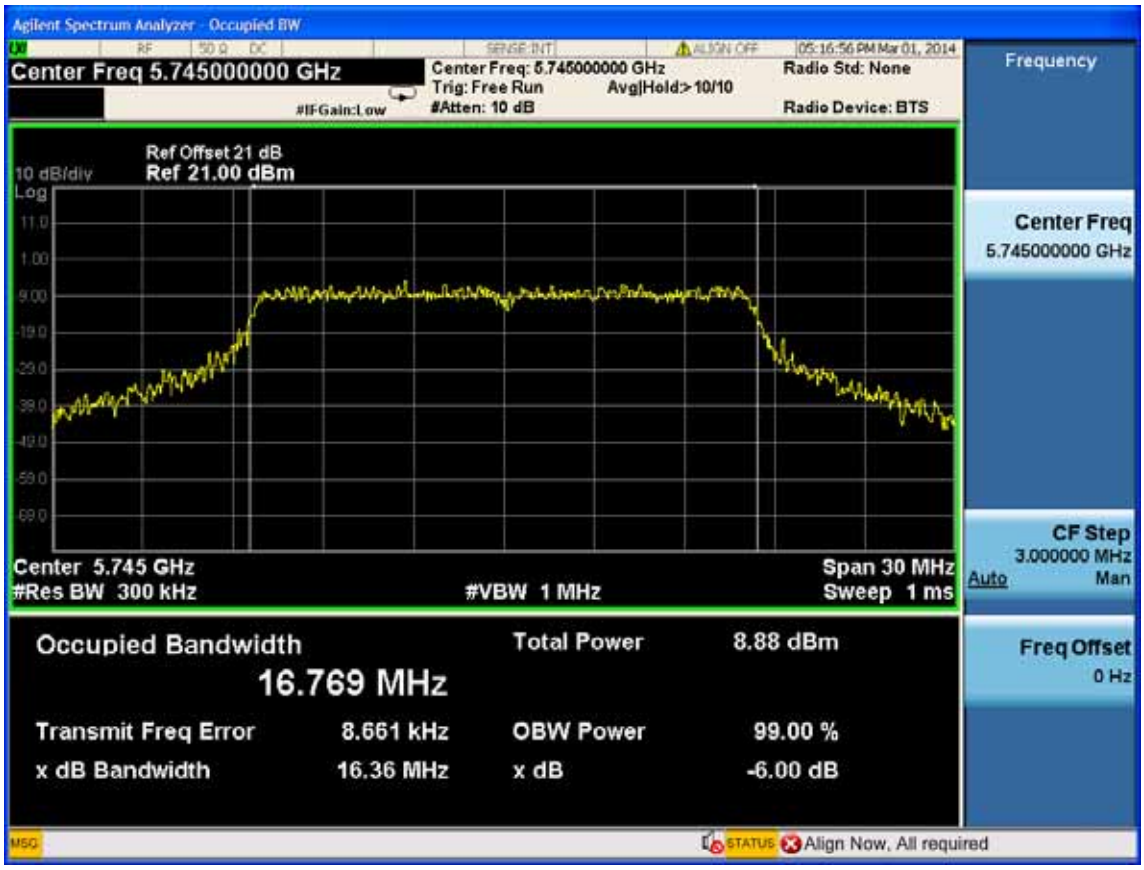
Test CH159: 5795MHz



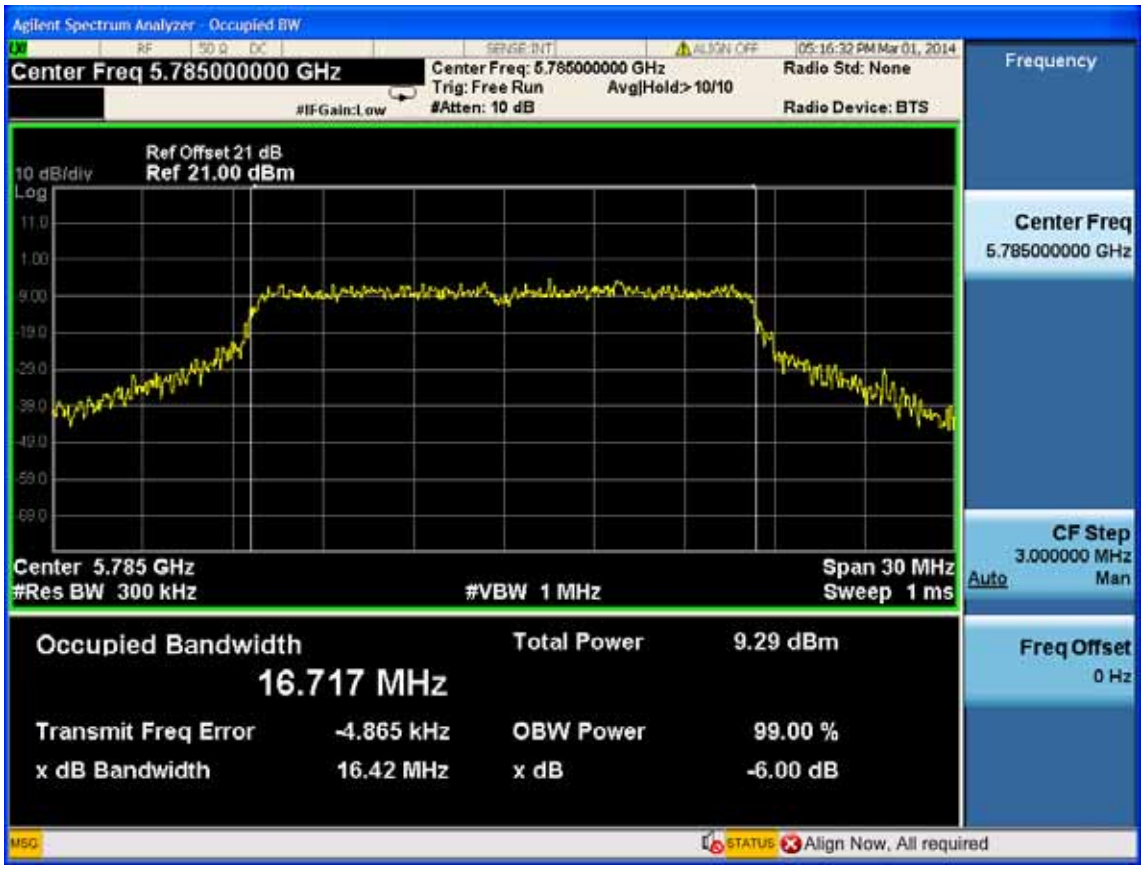
Chain B:

Test Mode: IEEE 802.11a TX

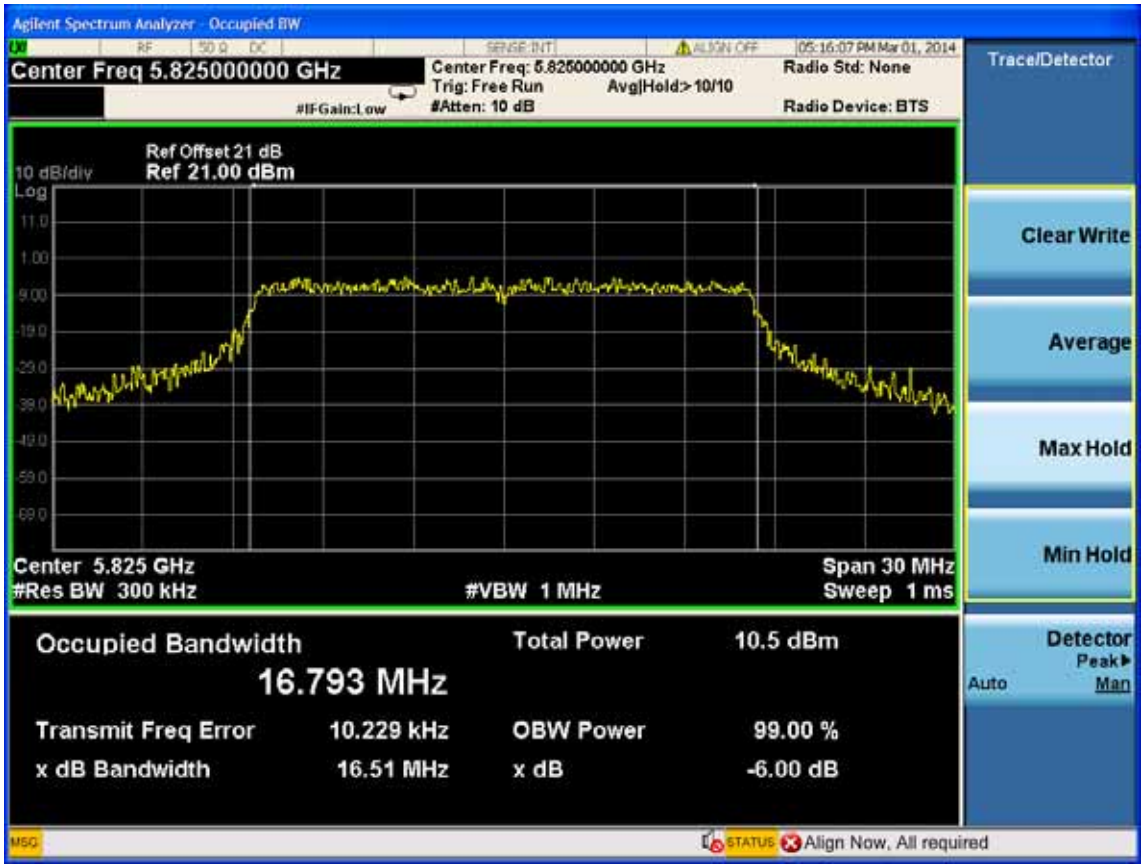
Test CH149: 5745MHz



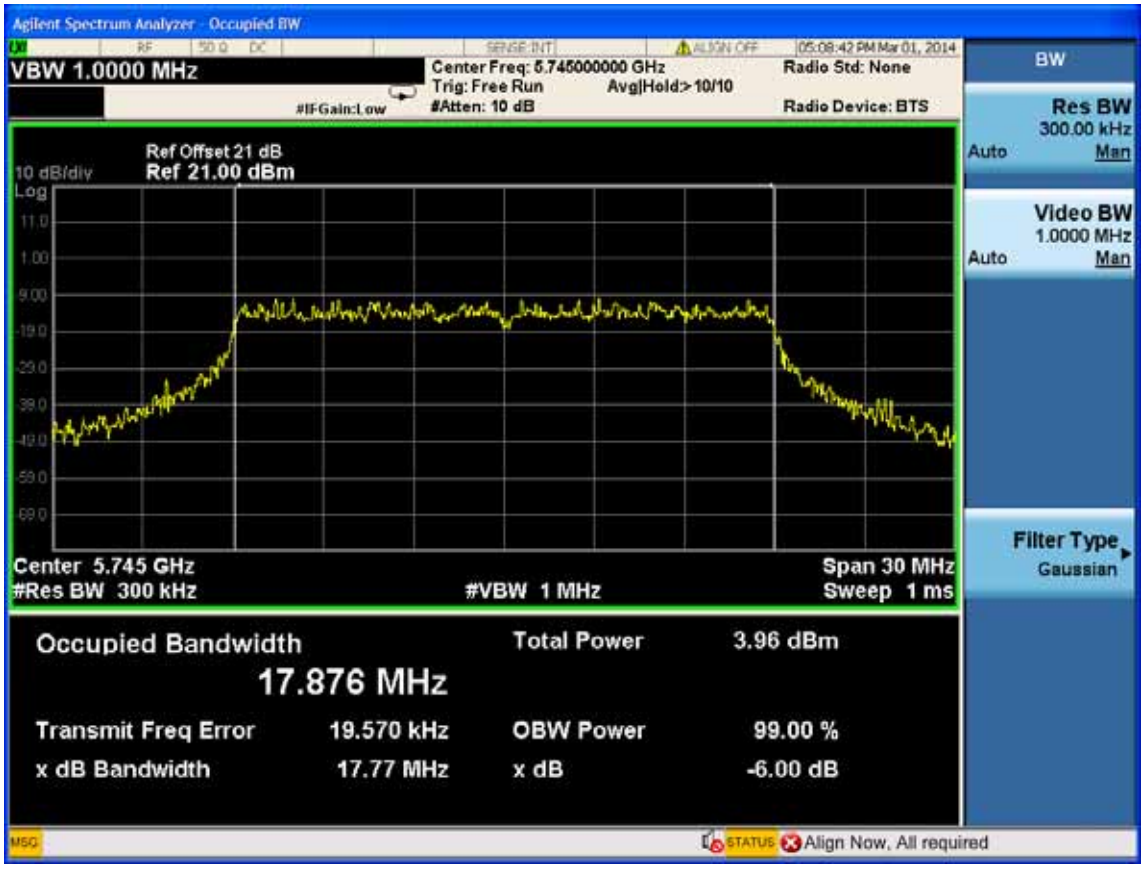
Test CH157: 5785MHz



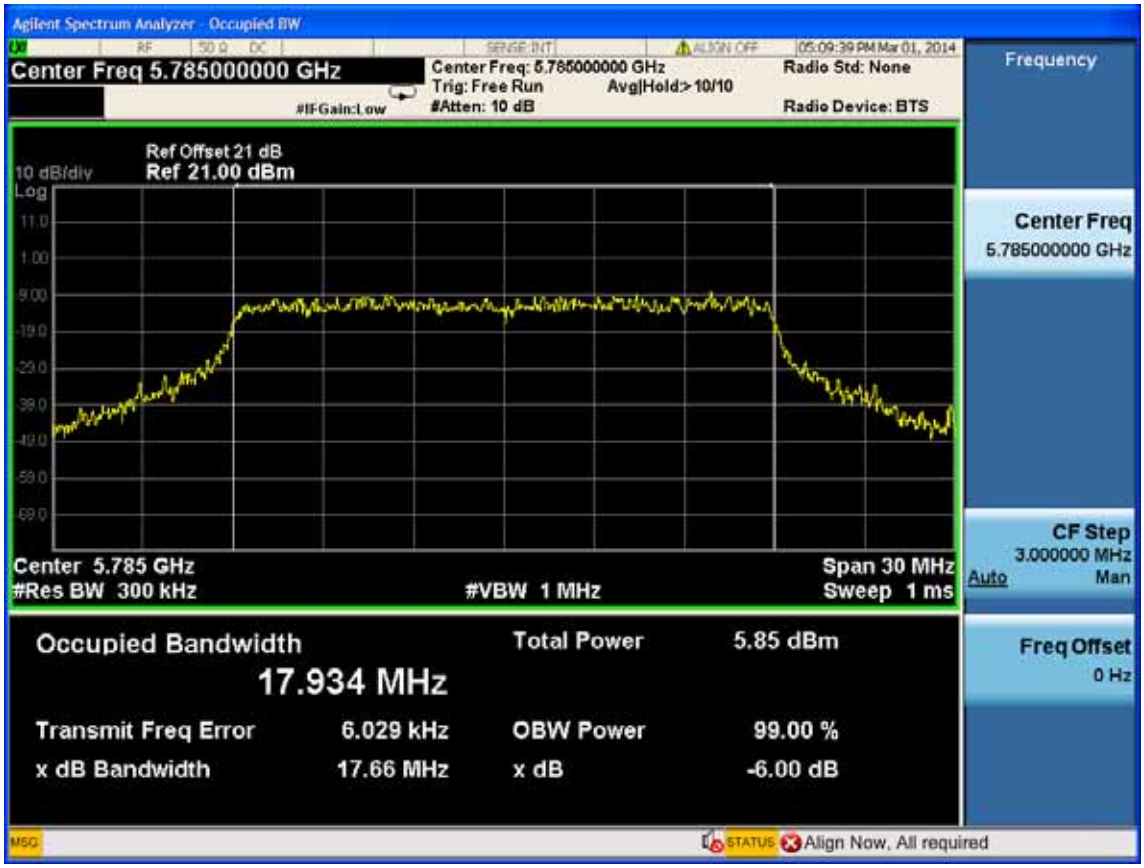
Test CH165: 5825MHz



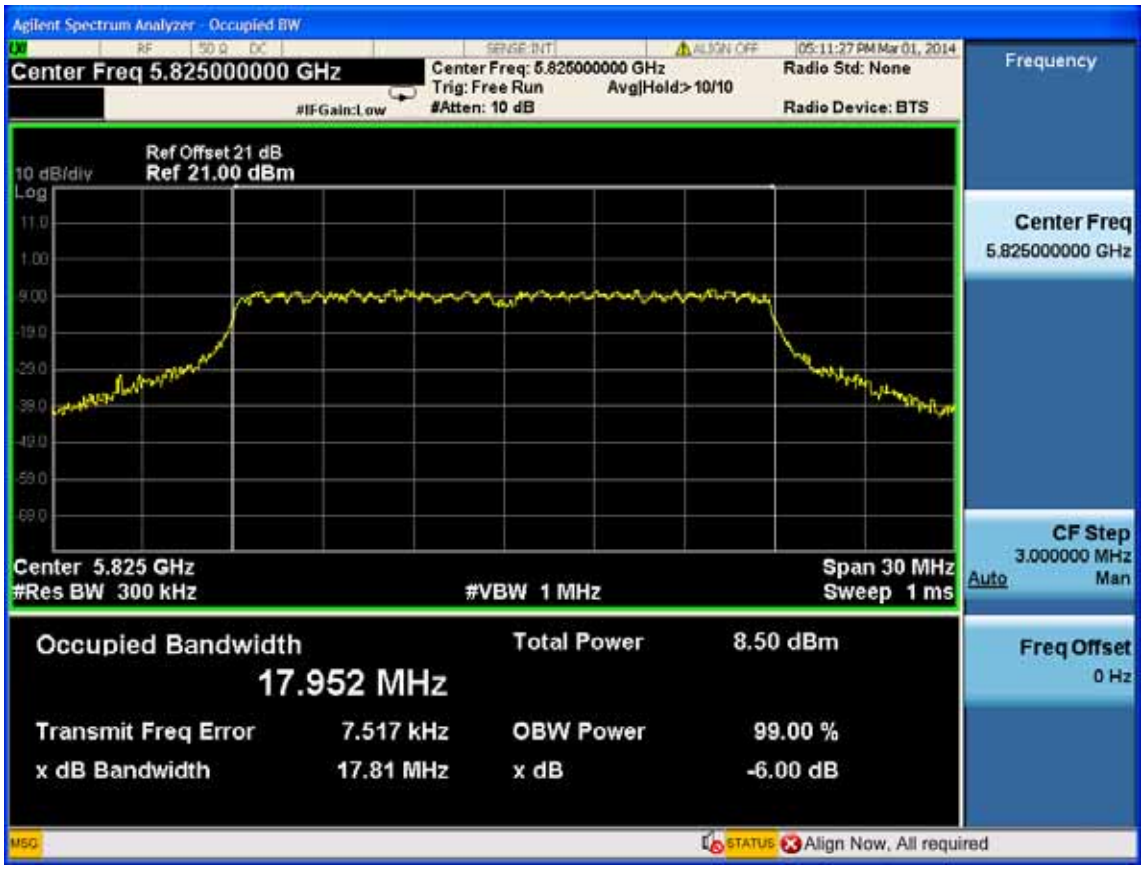
Test Mode: IEEE 802.11ac VHT20 TX
Test CH149: 5745MHz



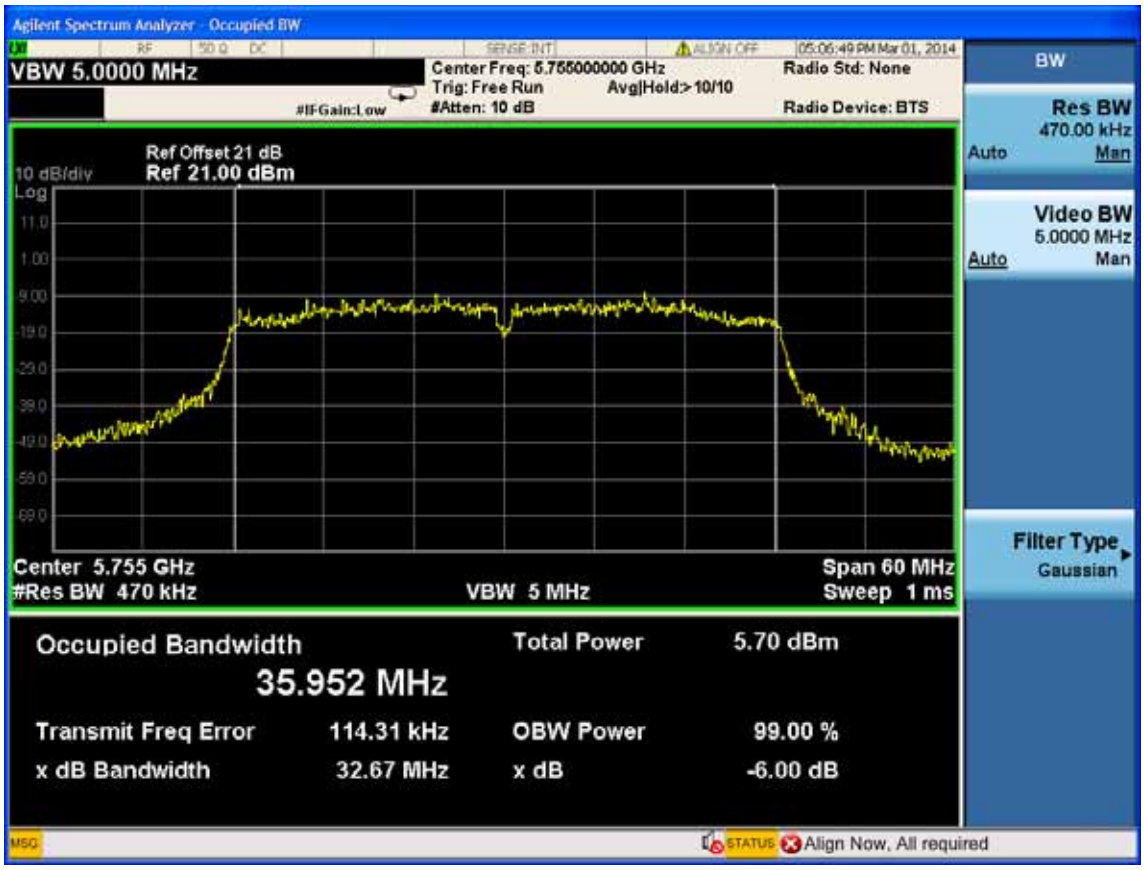
Test CH157: 5785MHz



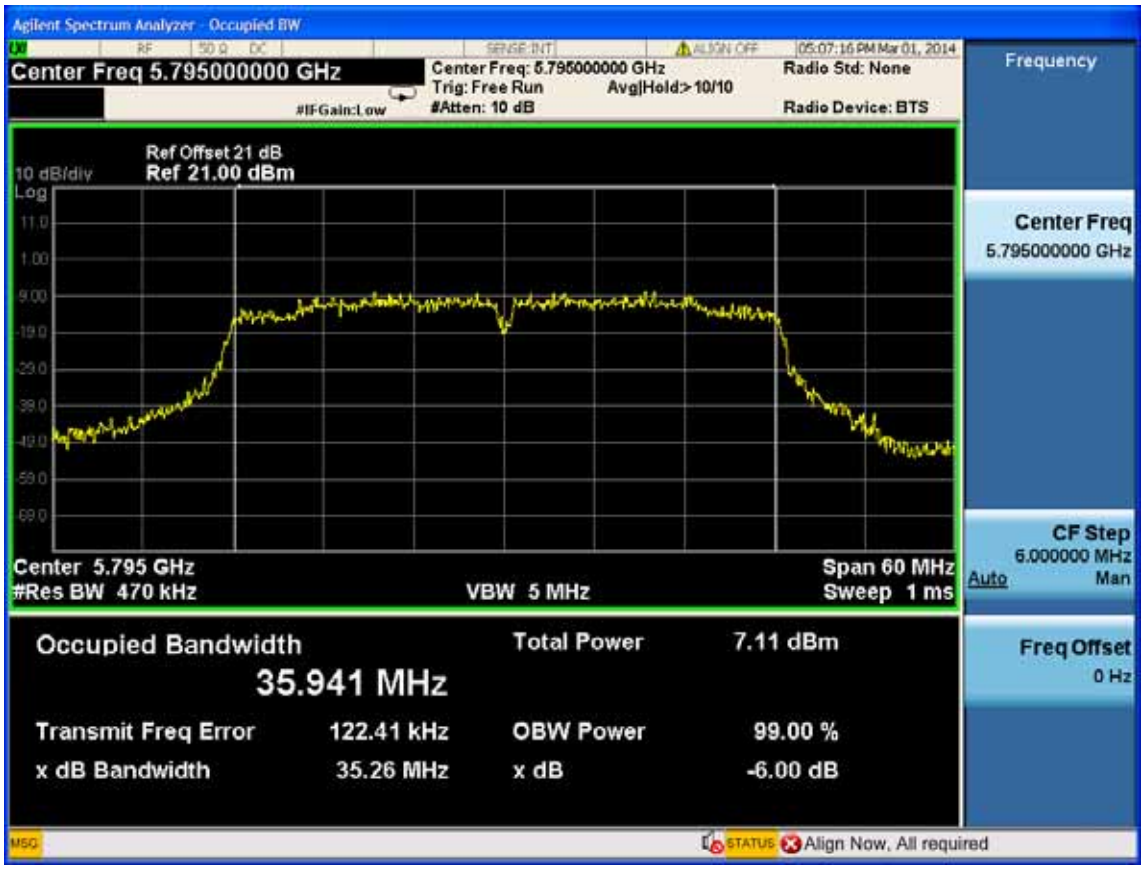
Test CH165: 5825MHz



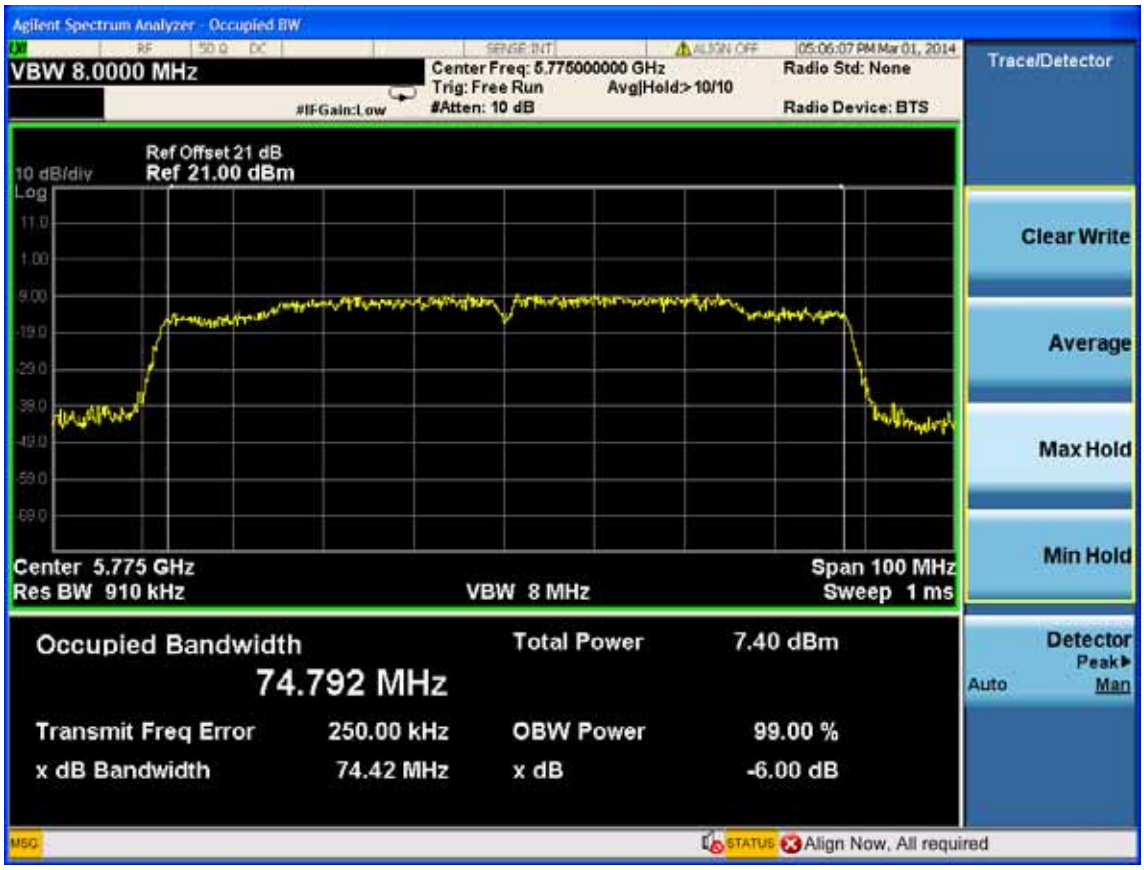
Test Mode: IEEE 802.11ac VHT40 TX
Test CH151: 5755MHz



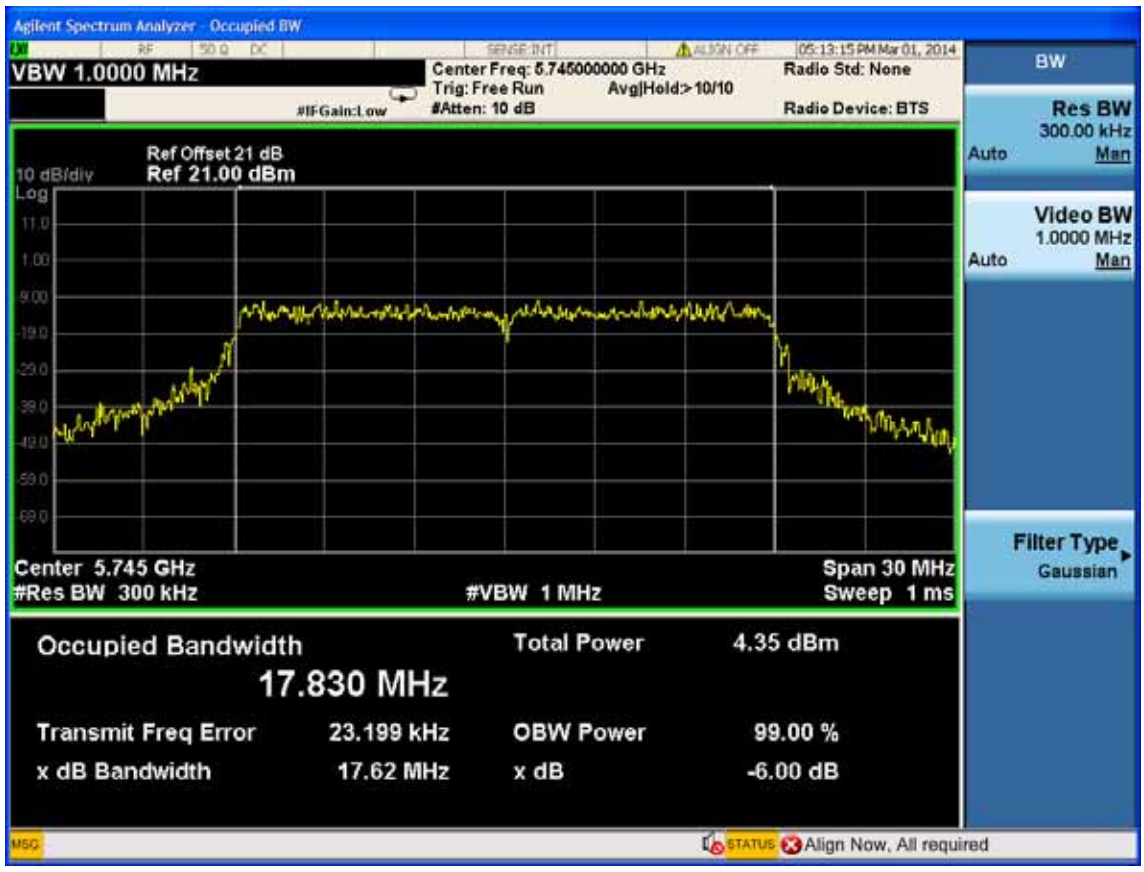
Test CH159: 5795MHz



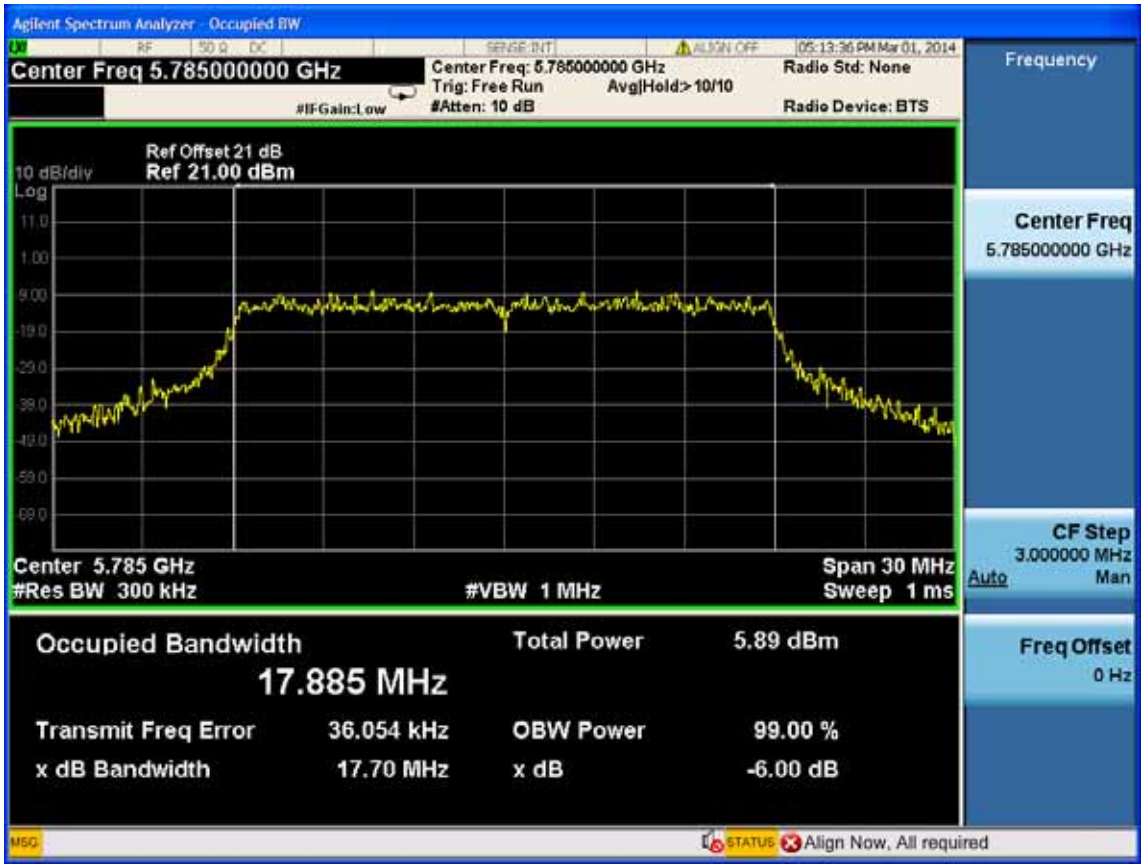
Test Mode: IEEE 802.11ac VHT80 TX
Test CH155: 5775MHz



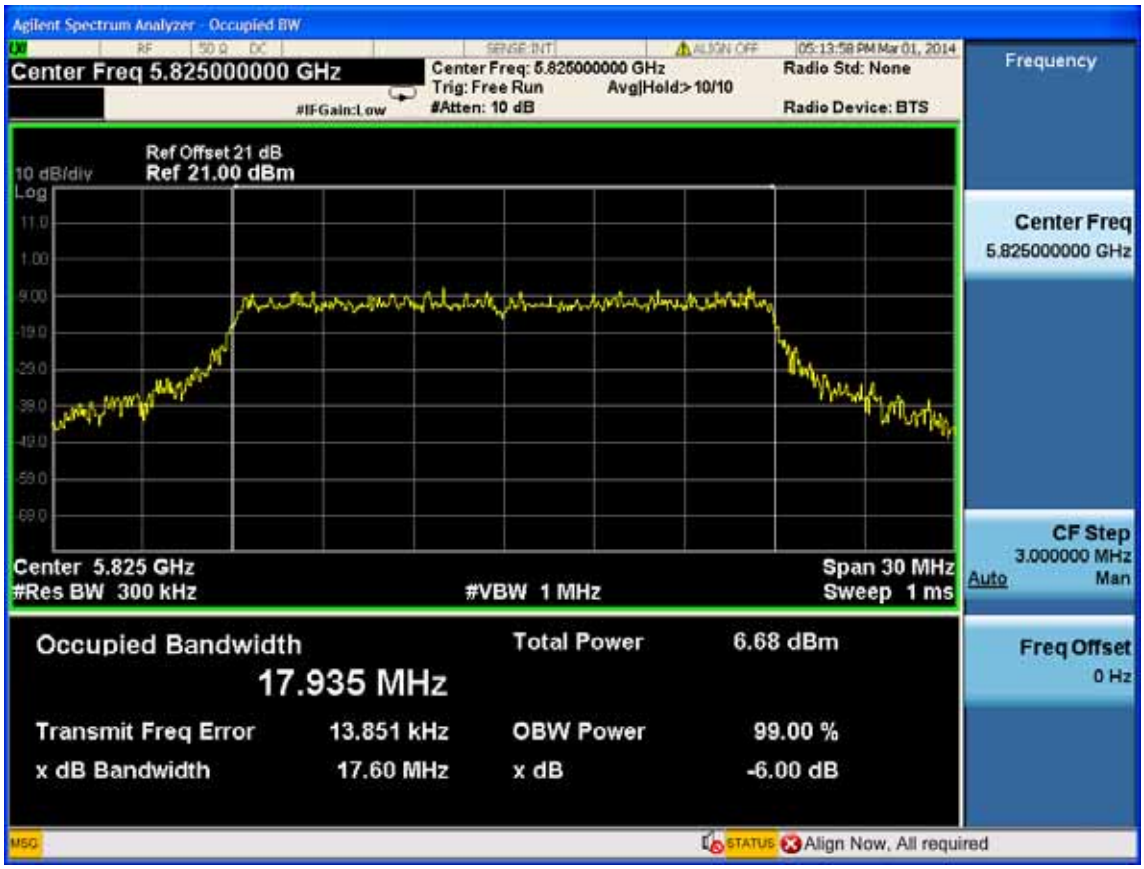
Test Mode: IEEE 802.11n HT20 TX
Test CH149: 5745MHz



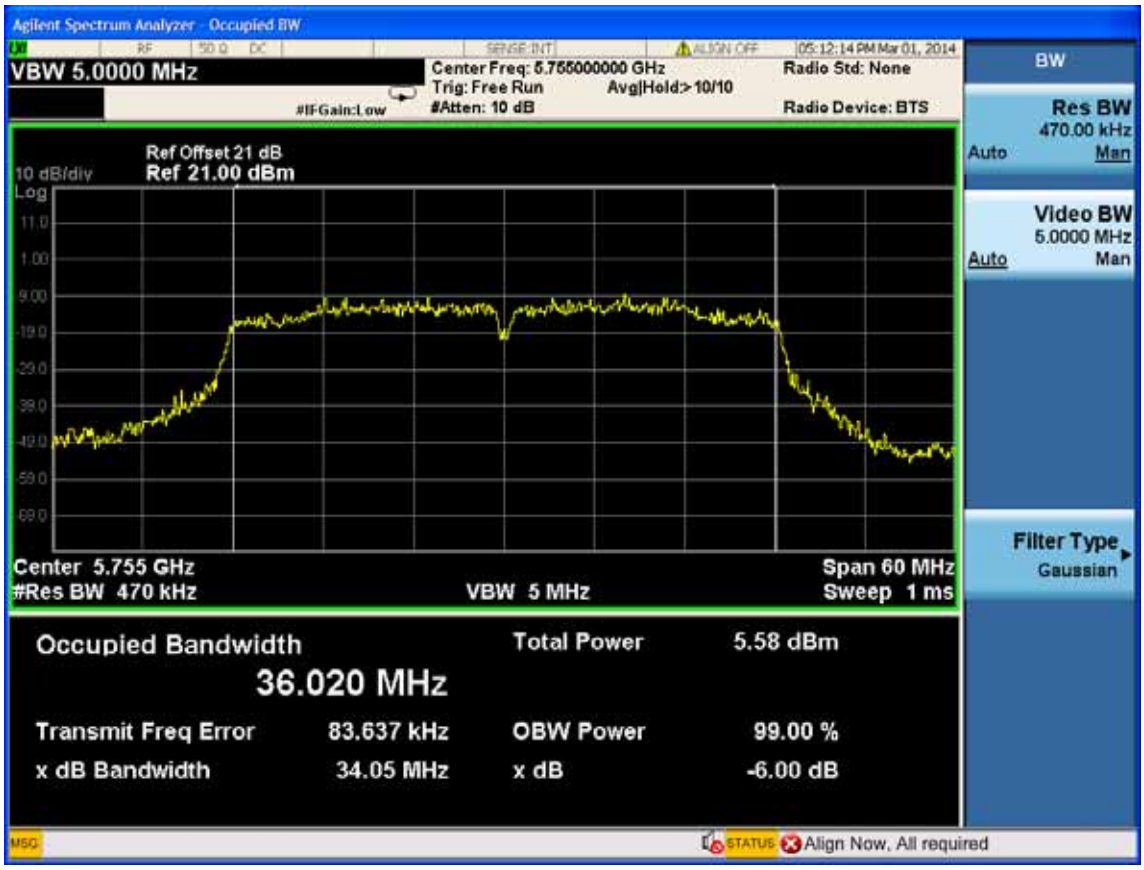
Test CH157: 5785MHz



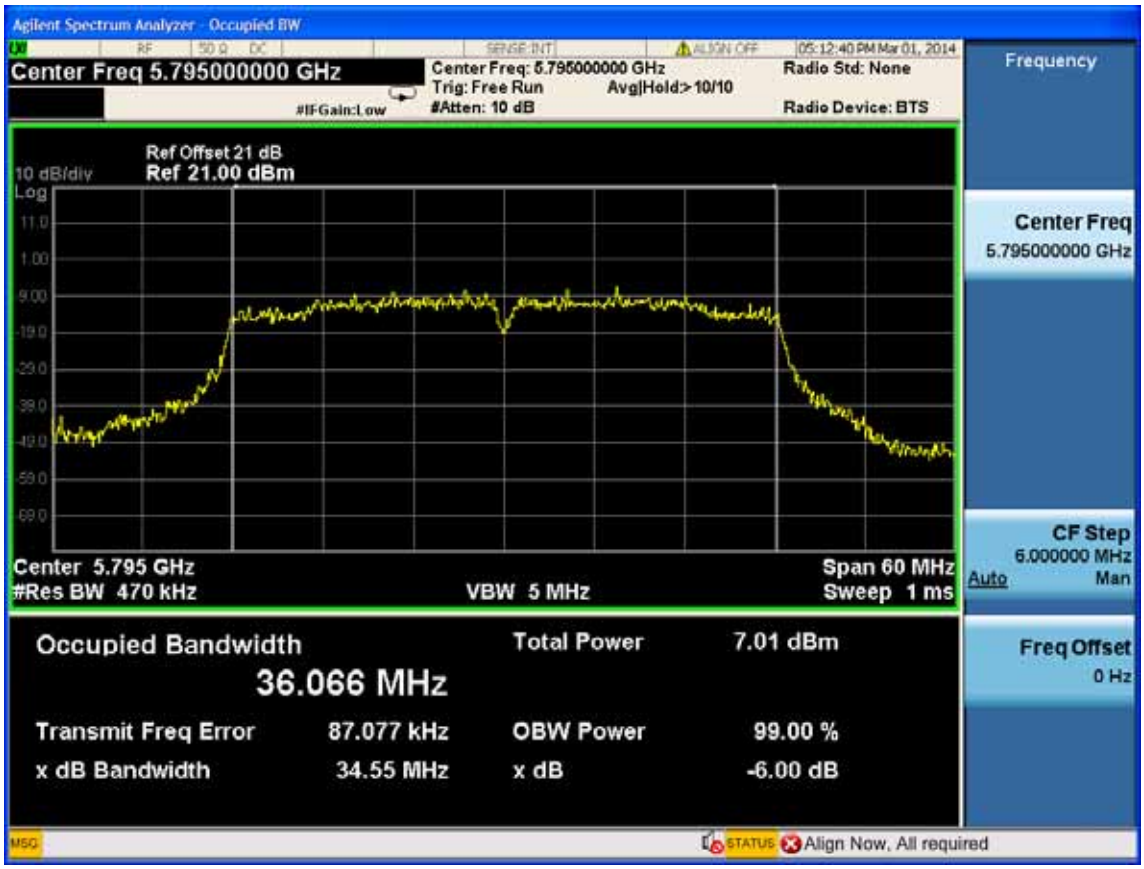
Test CH165: 5825MHz



Test Mode: IEEE 802.11n HT40 TX
Test CH151: 5755MHz



Test CH159: 5795MHz



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	Oct.31, 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

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

For systems using digital modulation in the 2400—2483.5MHz, 5725-5850MHz, 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; IEEE802.11ac VHT40; IEEE802.11ac VHT80 mode, because the signal's bandwidth is about 40MHz and above 20MHz bandwidth of power sensor ML2491A. So used the test method per KDB558074.

1) Set the RBW=1MHz and VBW =3MHz
2) Set the span to a value that is 5-30% greater than EBW
3) Detector = peak
4) Sweep time = auto couple
5) Trace Mode = max hold
6) allow trace to fully stabilize
7) use the spectrum amalyser's integrated band power measurement function with band limits set equal to the EBW band edges.

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

2.4G:

EUT:Notebook		
M/N:RZ09-0116		
Test date: 2014-02-25	Pressure: 101.2±1.0 kpa	Humidity: 51.4±3.0%
Tested by: Kevin_Hu	Test site: RF site	Temperature:22.9±0.6 ℃

Cable loss: 1 dB		Attenuator loss: 20 dB			
Test Mode	CH	Peak output Power（dBm）			Limit (dBm)
		Chain A	Chain B	Total	
11b	CH1	15.13	14.64	N/A	30
	CH6	15.41	14.23	N/A	30
	CH11	16.73	15.30	N/A	30
11g	CH1	18.02	17.55	N/A	30
	CH6	21.23	20.54	N/A	30
	CH11	19.56	19.88	N/A	30
11n HT20	CH1	17.86	17.30	20.60	30
	CH6	21.03	20.25	23.67	30
	CH11	19.43	19.74	22.60	30
11n HT40	CH1	16.56	15.28	18.98	30
	CH4	20.94	18.97	23.08	30
	CH7	18.58	18.79	21.70	30
Conclusion: PASS					

5.8G:

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	5745	10.43	10.34	N/A	28.8
	5785	11.68	11.33	N/A	28.8
	5825	12.68	12.59	N/A	28.8
11n HT20	5745	9.14	8.94	12.05	28.8
	5785	9.97	9.05	12.54	28.8
	5825	10.34	9.12	12.78	28.8
11n HT40	5755	10.78	8.76	12.90	28.8
	5795	10.51	9.89	13.22	28.8
11ac VHT20	5745	8.63	7.34	11.04	28.8
	5785	10.31	9.61	12.98	28.8
	5825	10.93	9.91	13.46	28.8
11ac VHT40	5755	8.28	7.94	11.12	28.8
	5795	10.27	10.05	13.17	28.8
11ac VHT80	5775	10.31	9.64	13.00	28.8
Conclusion: PASS					

Note: The Antenna gain of two antennas in 5745-5825 is 3.96dBi and 4.59dBi, the direction gain is 7.2dBi, so the power limit is 30-(7.2-6)dB =28.8dBm.

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	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

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=3KHz,VBW=10KHz,Span large enough capture the entire frequency,Read out maximum peak leval frequency

3. Set the frequency read from produce 2 as center frequency,then set the span= 300KHz, Sweep time=Span/RBW,Then Max hold,read out each mode and each chain's Power density.

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

9.4.Test Results

2.4G:

EUT:Notebook		
M/N:RZ09-0116		
Test date: 2014-02-25	Pressure: 101.4±1.0 kpa	Humidity: 51.8±3.0%
Tested by: Kevin_Hu	Test site: RF Site	Temperature: 21.6±0.6℃

Cable loss: 1 dB		Attenuator loss: 20 dB			
Test Mode	CH	Power density（dBm/3KHz）			Limit (dBm/3KHz)
		ANT A	ANT B	Total	
11b	CH1	-12.930	-14.402	N/A	8
	CH6	-13.381	-14.024	N/A	8
	CH11	-12.094	-12.610	N/A	8
11g	CH1	-15.274	-15.895	N/A	8
	CH6	-13.681	-12.372	N/A	8
	CH11	-14.499	-13.764	N/A	8
11n Mode					
Test Mode	CH	Power density（dBm/3KHz）			Limit (dBm/3KHz)
		ANT A	ANT B	Total	
11n HT20	CH1	-16.139	-16.872	-13.48	8
	CH6	-11.336	-12.729	-8.97	8
	CH11	-15.015	-13.464	-11.16	8
11n HT40	CH1	-19.825	-21.237	-17.46	8
	CH4	-15.246	-17.481	-13.21	8
	CH7	-17.385	-15.993	-13.62	8
Conclusion：PASS					

5.8G:

EUT: Notebook		
M/N:RZ09-0116		
Test date: 2014-03-02	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	5745	-19.325	-22.605	N/A	8
	5785	-18.568	-20.758	N/A	8
	5825	-17.730	-19.759	N/A	8
11n HT20	5745	-25.874	-26.224	-23.04	8
	5785	-24.360	-25.513	-21.89	8
	5825	-24.586	-23.830	-21.18	8
11n HT40	5755	-27.921	-23.343	-22.04	8
	5795	-25.925	-26.353	-23.12	8
11ac VHT20	5745	-26.159	-27.146	-23.61	8
	5785	-24.117	-24.496	-21.29	8
	5825	-23.820	-23.632	-20.71	8
11ac VHT40	5755	-27.502	-27.356	-24.42	8
	5795	-27.405	-26.086	-23.69	8
11ac VHT80	5775	-28.944	-28.875	-25.90	8
Conclusion: PASS					

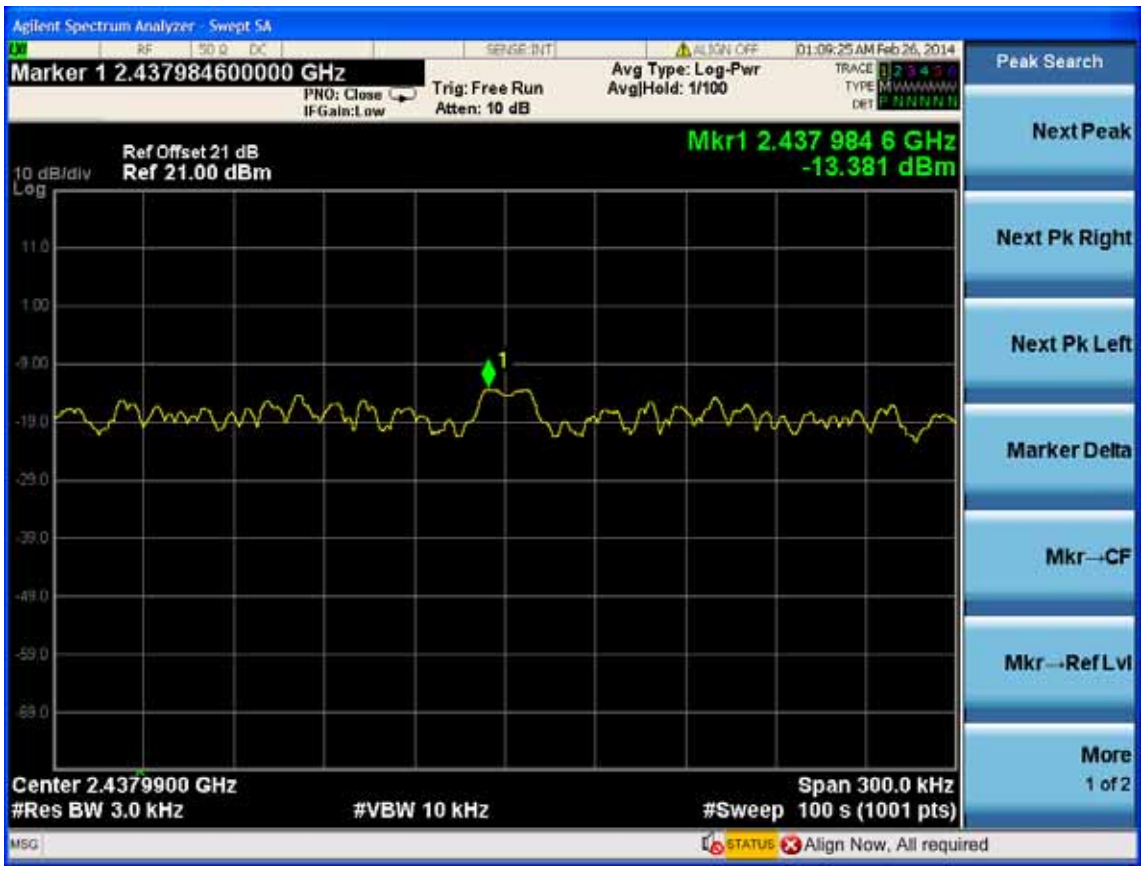
2.4G:

Chain A:

Test Mode: IEEE 802.11b TX

Test CH1: 2412MHz

Test CH6: 2437MHz



Test CH11: 2462MHz

Test Mode: IEEE 802.11g TX
Test CH1: 2412MHz

Test CH6: 2437MHz

Test CH11: 2462MHz

Test Mode: IEEE 802.11n HT20 TX
Test CH1: 2412MHz

Test CH6: 2437MHz

Test CH11: 2462MHz

Test Mode: IEEE 802.11n HT40 TX
Test CH1: 2422MHz

Test CH4: 2437MHz

Test CH7: 2452MHz

Chain B:

Test Mode: IEEE 802.11b TX

Test CH1: 2412MHz

Test CH6: 2437MHz

Test CH11: 2462MHz

Test Mode: IEEE 802.11g TX
Test CH1: 2412MHz

Test CH6: 2437MHz

Test CH11: 2462MHz

Test Mode: IEEE 802.11n HT20 TX
Test CH1: 2412MHz

Test CH6: 2437MHz

Test CH11: 2462MHz

Test Mode: IEEE 802.11n HT40 TX
Test CH1: 2422MHz

Test CH4: 2437MHz

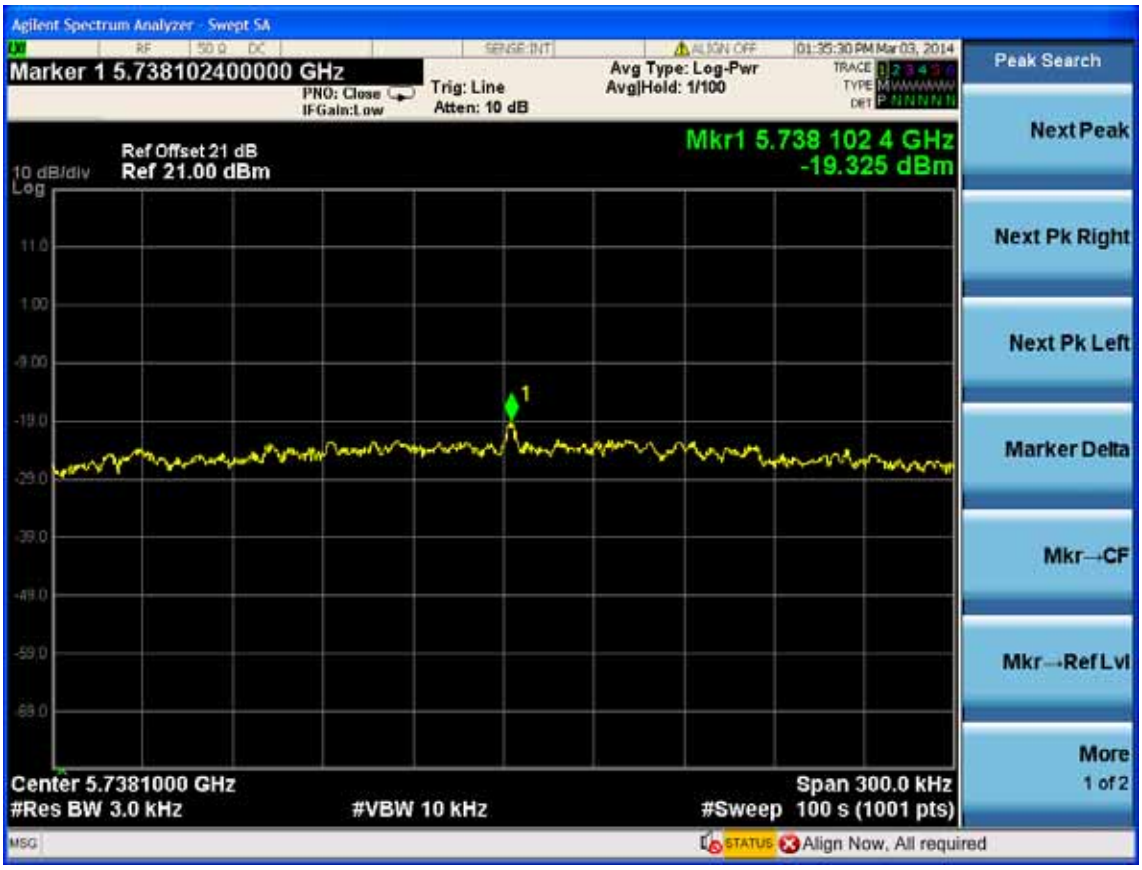
Test CH7: 2452MHz

5.8G:

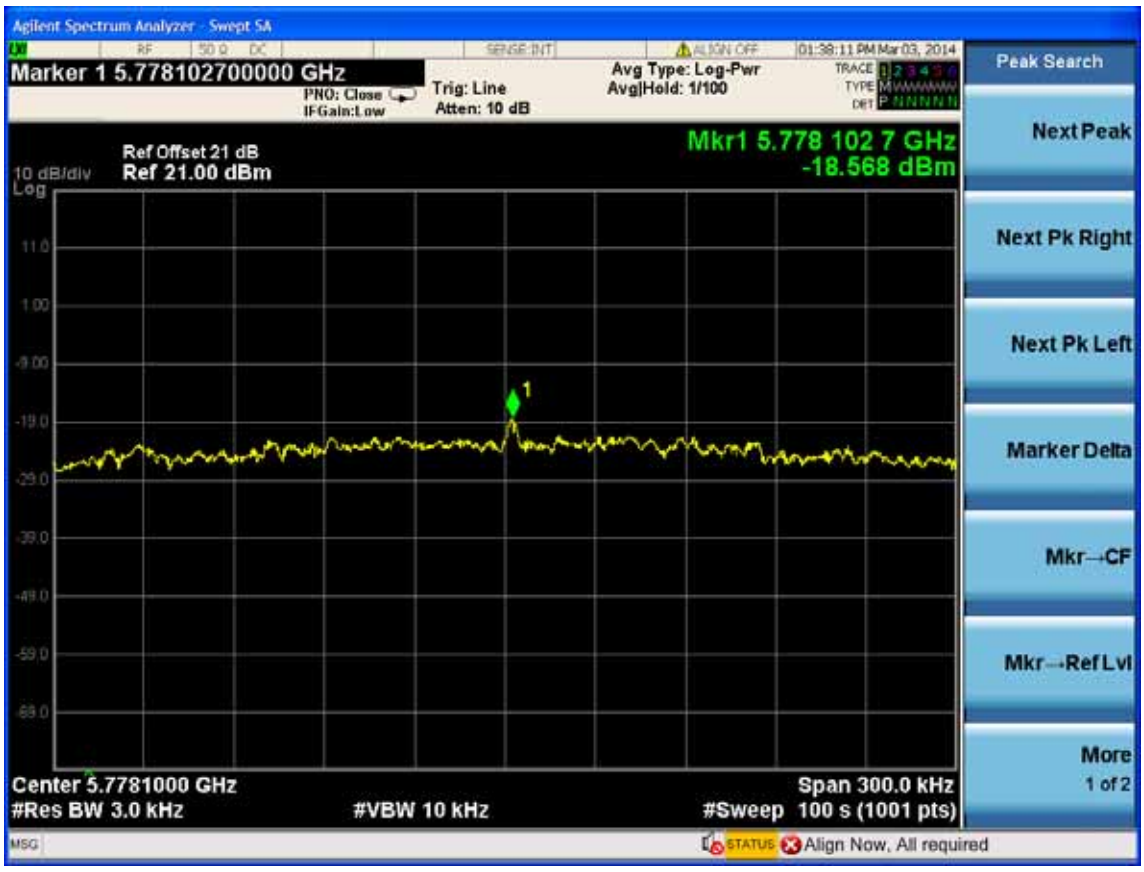
Chain A:

Test Mode: IEEE 802.11a TX

Test CH149: 5745MHz



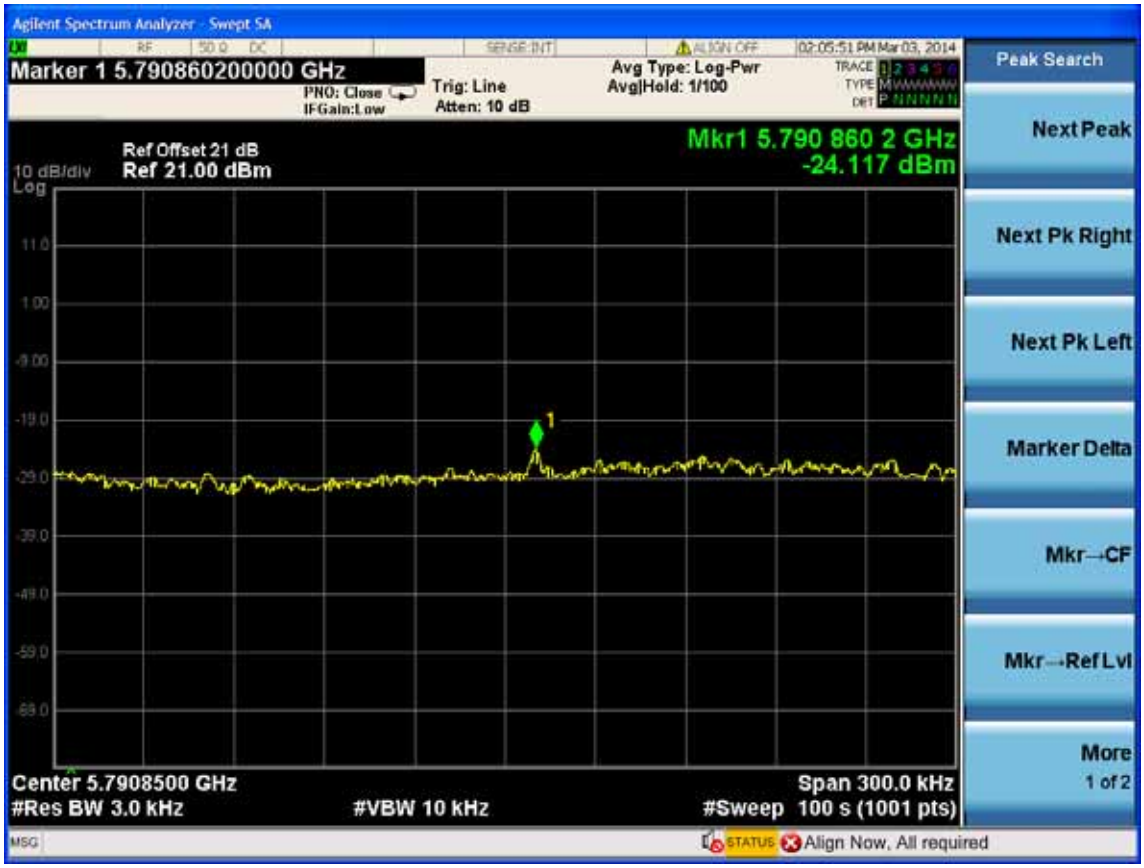
Test CH157: 5785MHz



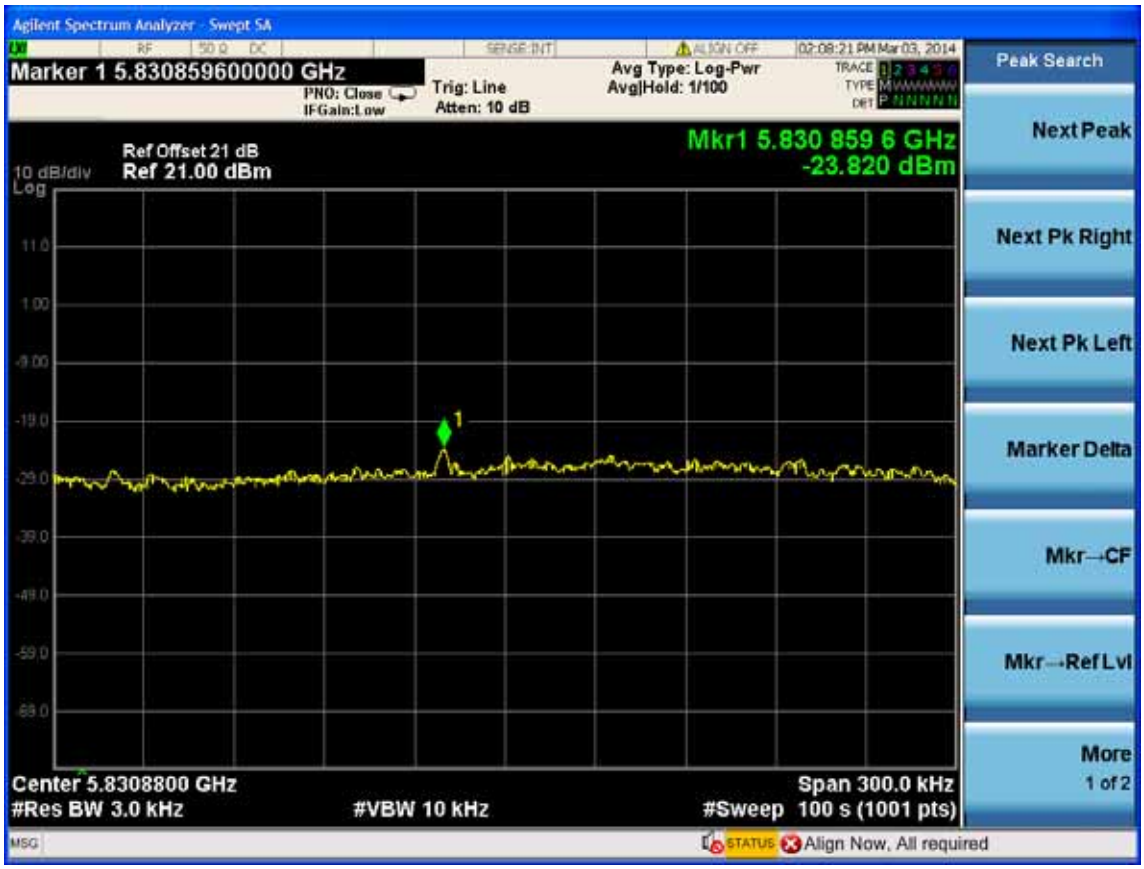
Test CH165: 5825MHz

Test Mode: IEEE 802.11ac VHT20 TX
Test CH149: 5745MHz

Test CH157: 5785MHz



Test CH165: 5825MHz



Test Mode: IEEE 802.11ac VHT40 TX
Test CH151: 5755MHz

Test CH159: 5795MHz

Test Mode: IEEE 802.11ac VHT80 TX
Test CH155: 5775MHz

Test Mode: IEEE 802.11n HT20 TX
Test CH149: 5745MHz

Test CH157: 5785MHz

Test CH165: 5825MHz

Test Mode: IEEE 802.11n HT40 TX
Test CH151: 5755MHz

Test CH159: 5795MHz

Chain B:

Test Mode: IEEE 802.11a TX

Test CH149: 5745MHz

Test CH157: 5785MHz

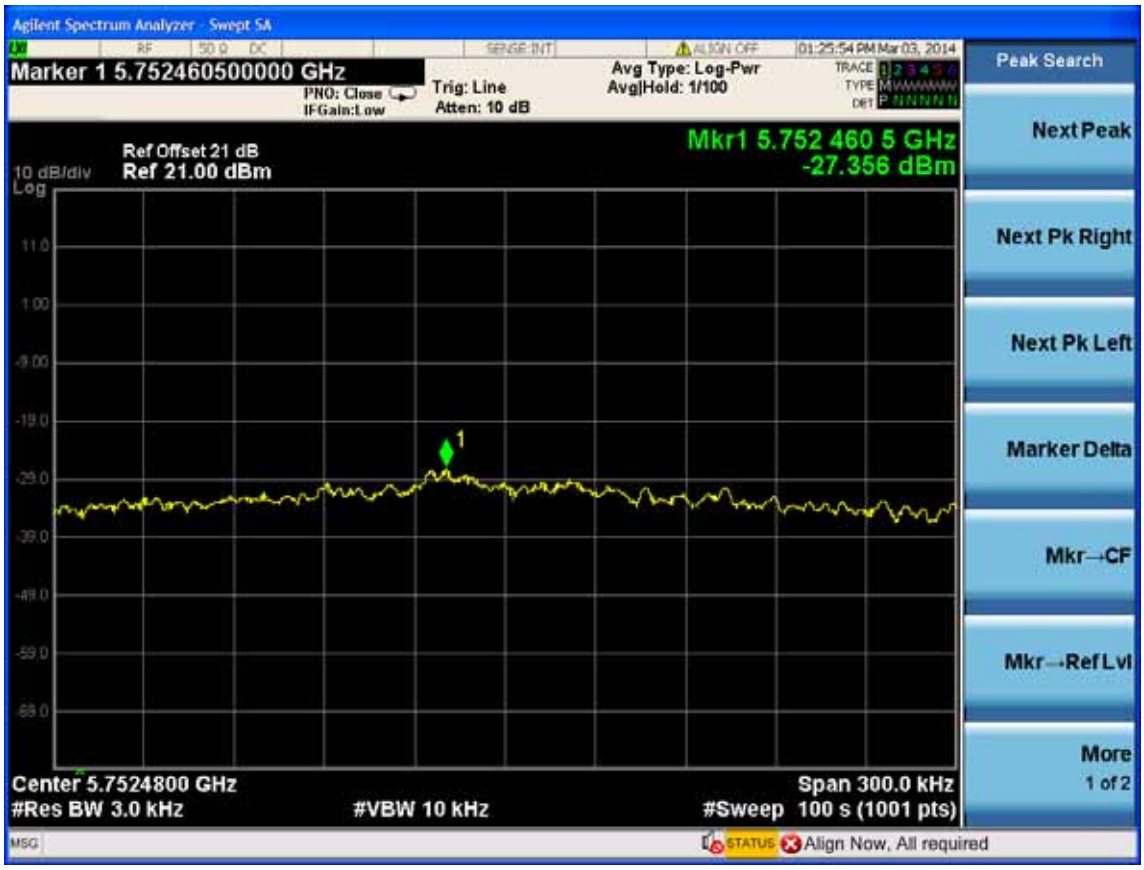
Test CH165: 5825MHz

Test Mode: IEEE 802.11ac VHT20 TX
Test CH149: 5745MHz

Test CH157: 5785MHz

Test CH165: 5825MHz

Test Mode: IEEE 802.11ac VHT40 TX
Test CH151: 5755MHz

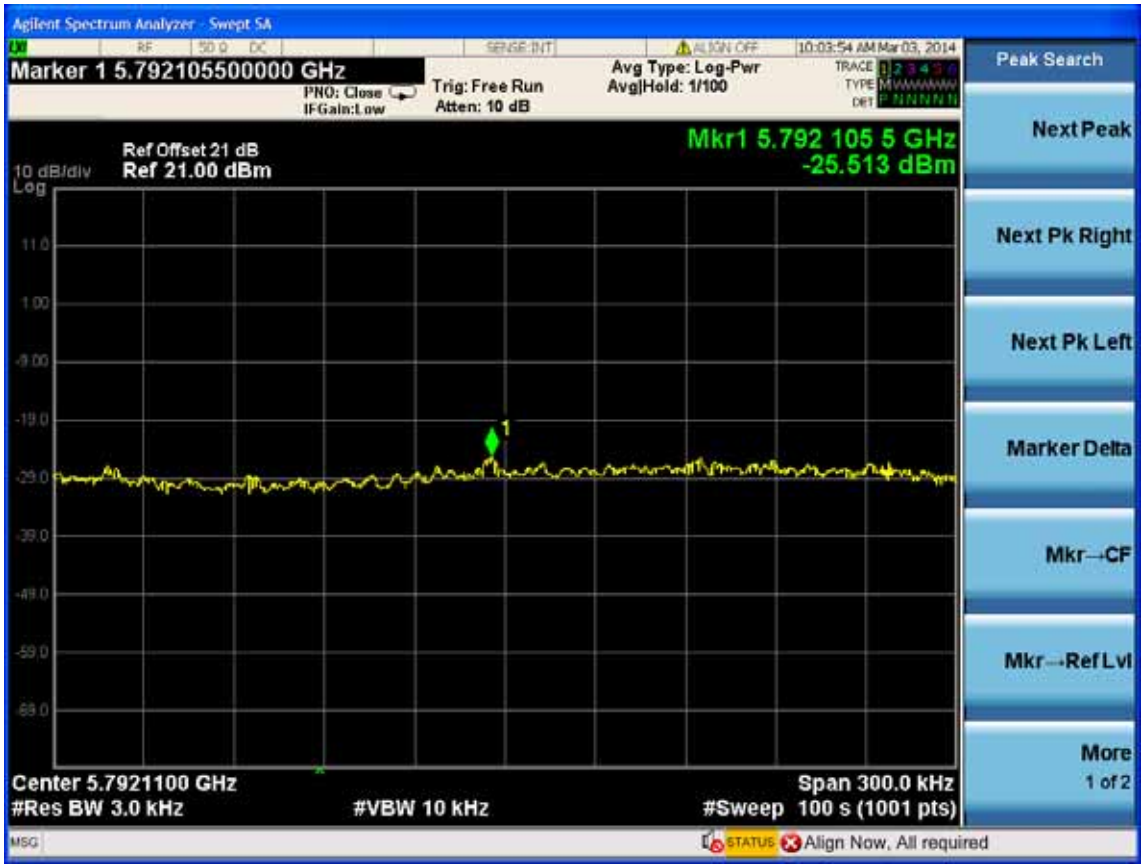


Test CH159: 5795MHz

Test Mode: IEEE 802.11ac VHT80 TX
Test CH155: 5775MHz

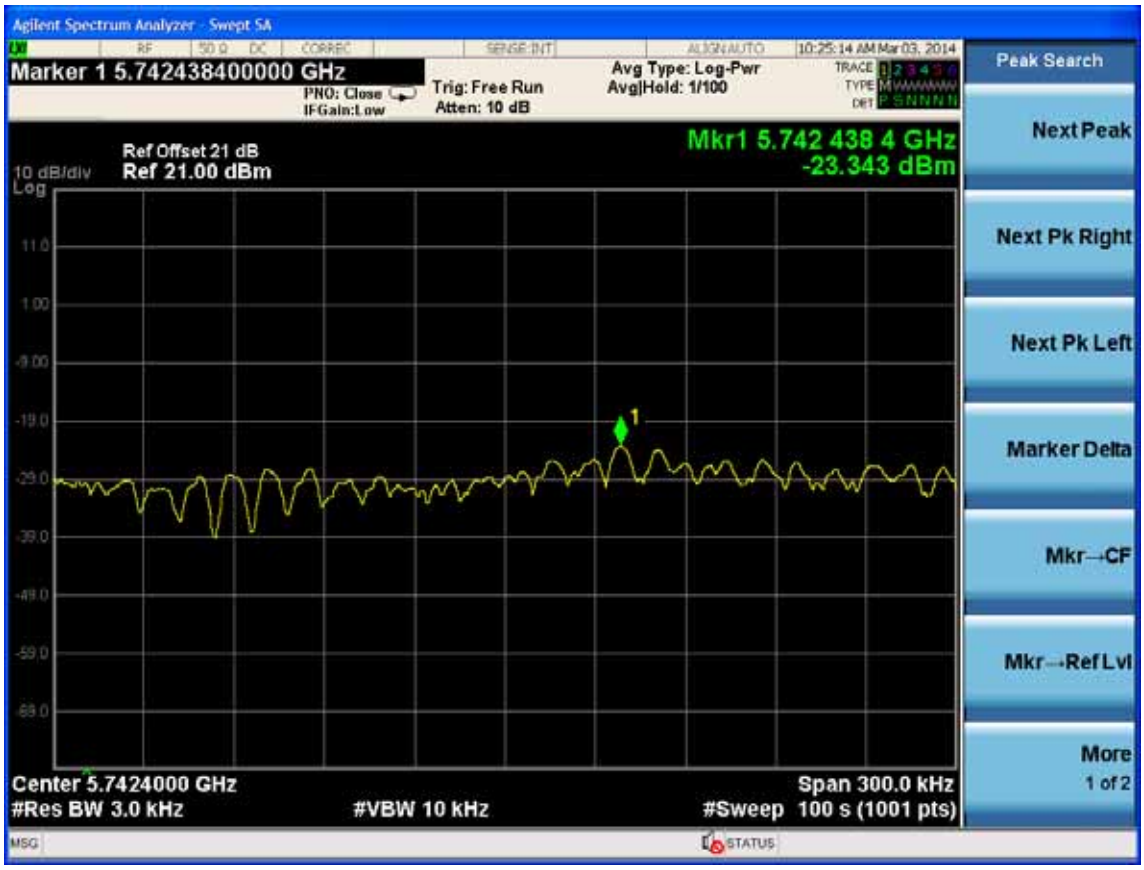
Test Mode: IEEE 802.11n HT20 TX
Test CH149: 5745MHz

Test CH157: 5785MHz



Test CH165: 5825MHz

Test Mode: IEEE 802.11n HT40 TX
Test CH151: 5755MHz



Test CH159: 5795MHz

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 IFA 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 4.59dBi.

11.DEVIATION TO TEST SPECIFICATIONS

[NONE]