IEEE 802.11acwith 5.8G:

Remark: A RBW of 500KHz can not be set for the Spectrum Analyzer, and the results of RBW 510KHz are worse than RBW of 500KHz, therefore, if results of the RBW 510KHz complies with limit, results of RBW 500KHz are deemed to comply with limit

9 Bandwidth

9.1 Test limit

Please refer section15.407

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

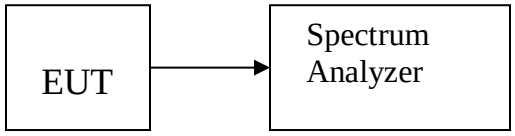
9.2 Method of measurement

Details see the KDB558074 D01 Meas Guidance

a) The bandwidth is measured at an amplitude level reduced 26dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

b) The test receiver set RBW = 1-5 % EBW, VBW≥3RBW, Sweep time set auto, detail see the test plot. Peak detector is used.

9.3 Test Setup



9.4 Test Results

PASS.

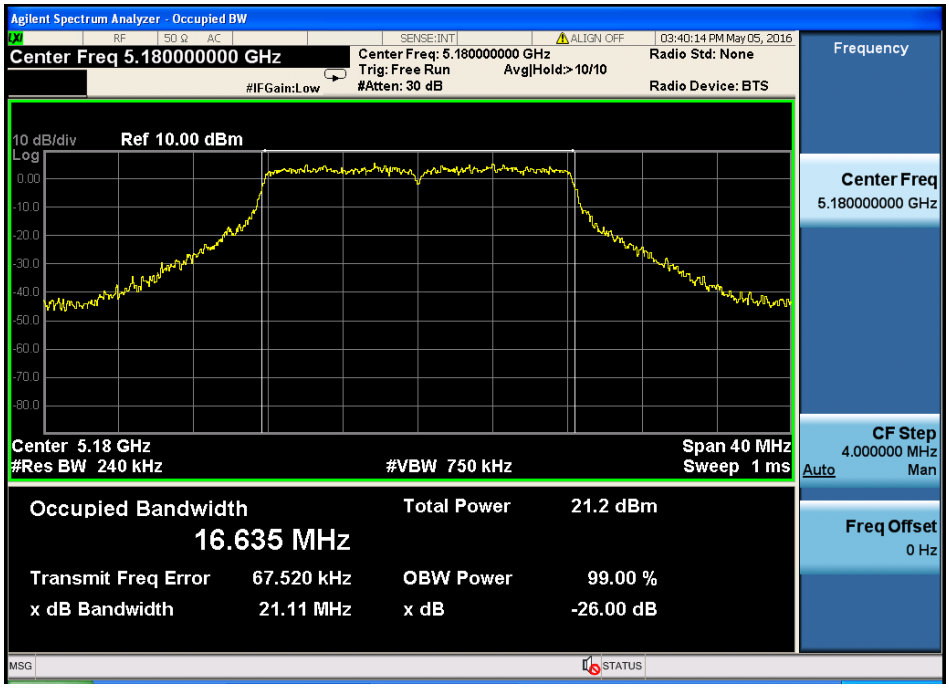
Antenna 0 and Antenna 1port all have been tested ,
only worse case is reported

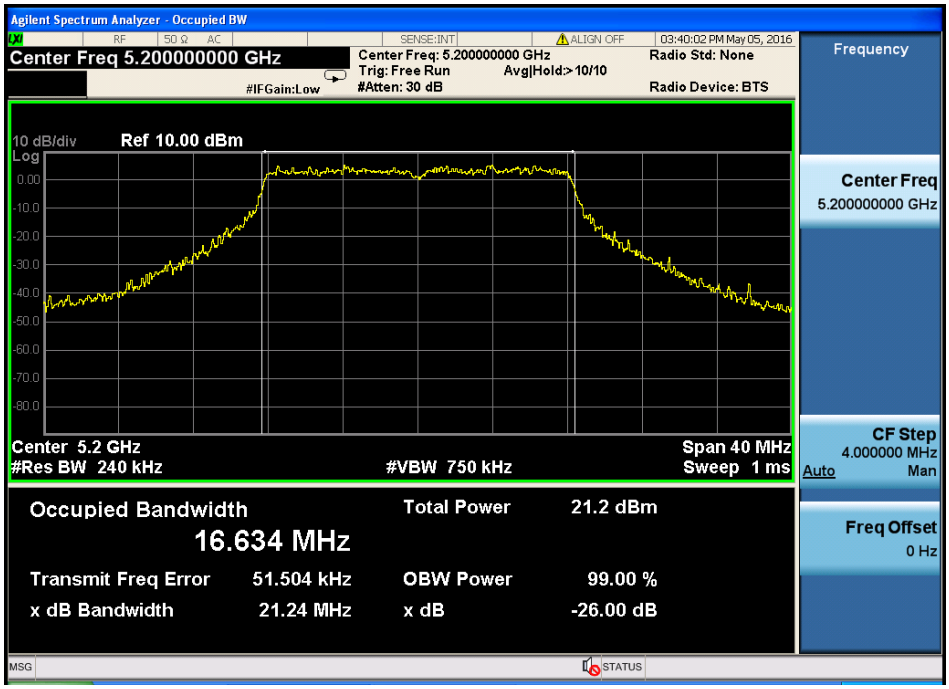
Detailed information please see the following page.

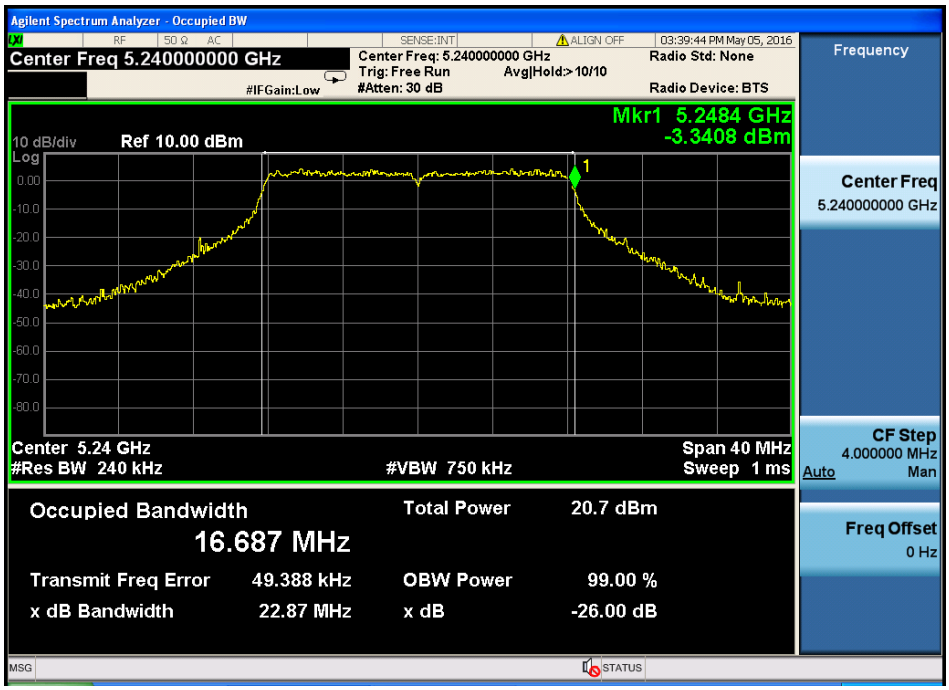
5.2G

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11a:					
Low	5180	21.11	16.635	/	PASS
Mid	5200	21.24	16.634	/	PASS
High	5240	22.87	16.687	/	PASS
IEEE 802.11n/HT20:					
Low	5180	22.27	17.804	/	PASS
Mid	5200	22.45	17.795	/	PASS
High	5240	22.77	17.807	/	PASS
IEEE 802.11n/HT40:					
Low	5190	42.23	36.147	/	PASS
High	5230	42.71	36.192	/	PASS
IEEE 802.11ac:					
	5210	82.11	75.569	/	PASS

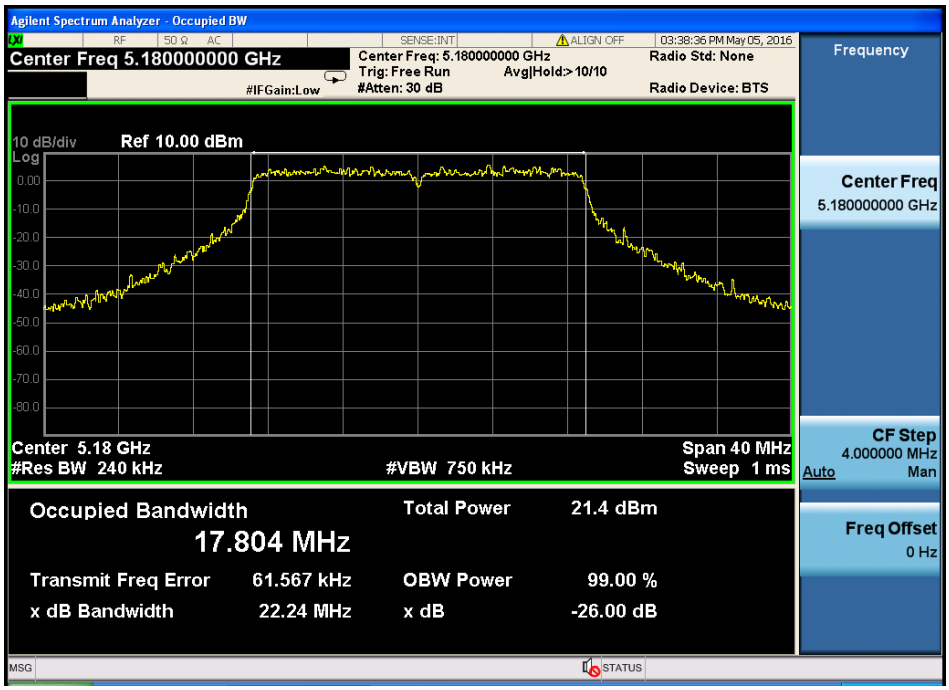
IEEE 802.11a

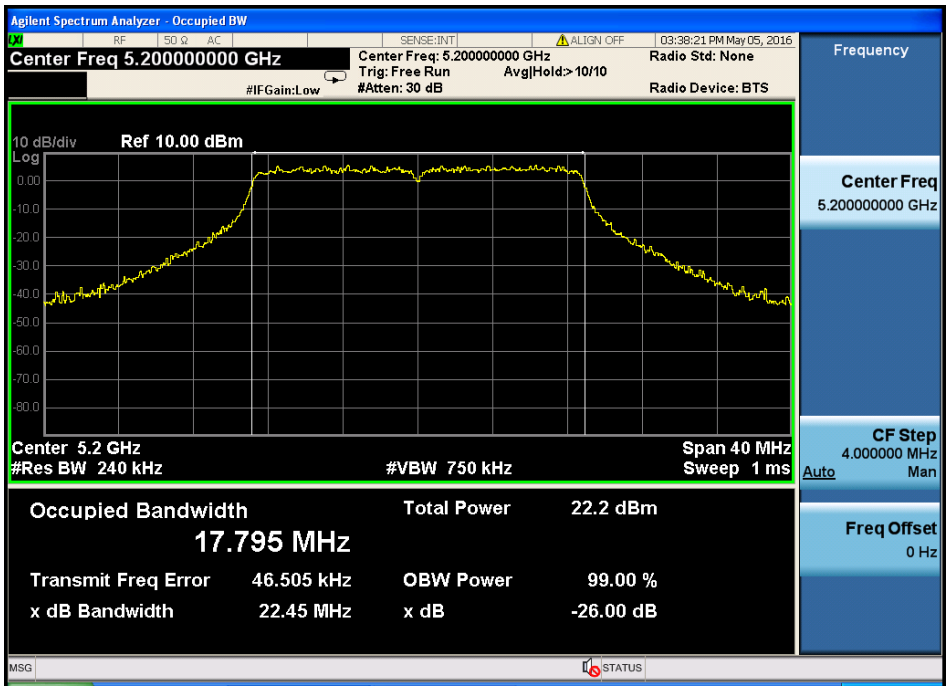

Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN OFF
03:40:14 PM May 05, 2016
Center Freq 5.180000000 GHz
Center Freq: 5.180000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 5.18 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
16.635 MHz
Total Power 21.2 dBm
Transmit Freq Error 67.520 kHz
OBW Power 99.00 %
x dB Bandwidth 21.11 MHz
x dB -26.00 dB
Center Freq
5.180000000 GHz
CF Step
4.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

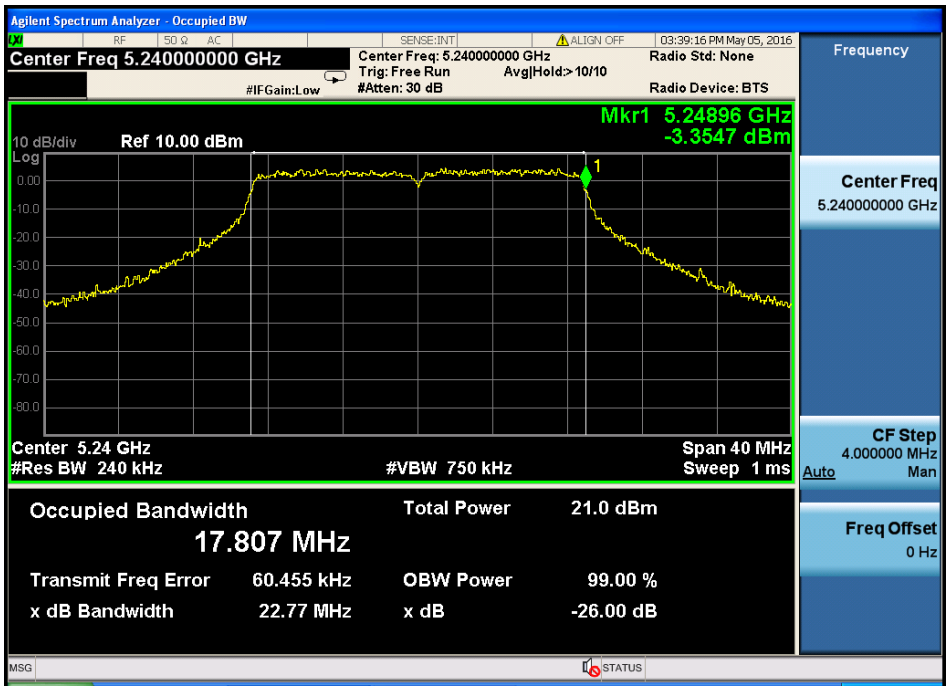

Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN OFF
03:40:02 PM May 05, 2016
Center Freq 5.200000000 GHz
Center Freq: 5.200000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 5.2 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
16.634 MHz
Total Power 21.2 dBm
Transmit Freq Error 51.504 kHz
OBW Power 99.00 %
x dB Bandwidth 21.24 MHz
x dB -26.00 dB
Center Freq
5.200000000 GHz
CF Step
4.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS



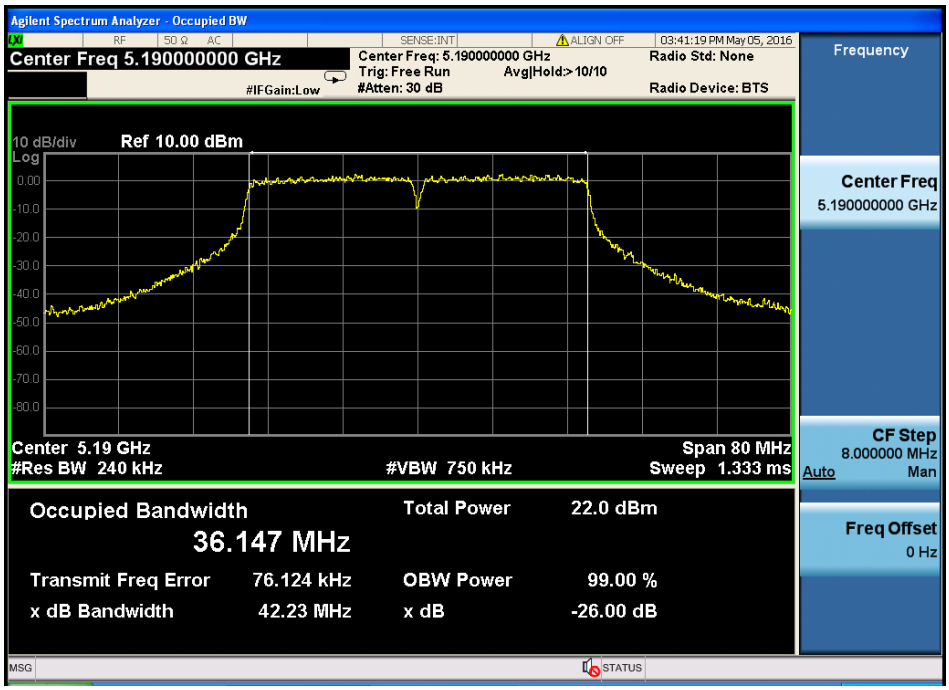
IEEE 802.11n HT20:

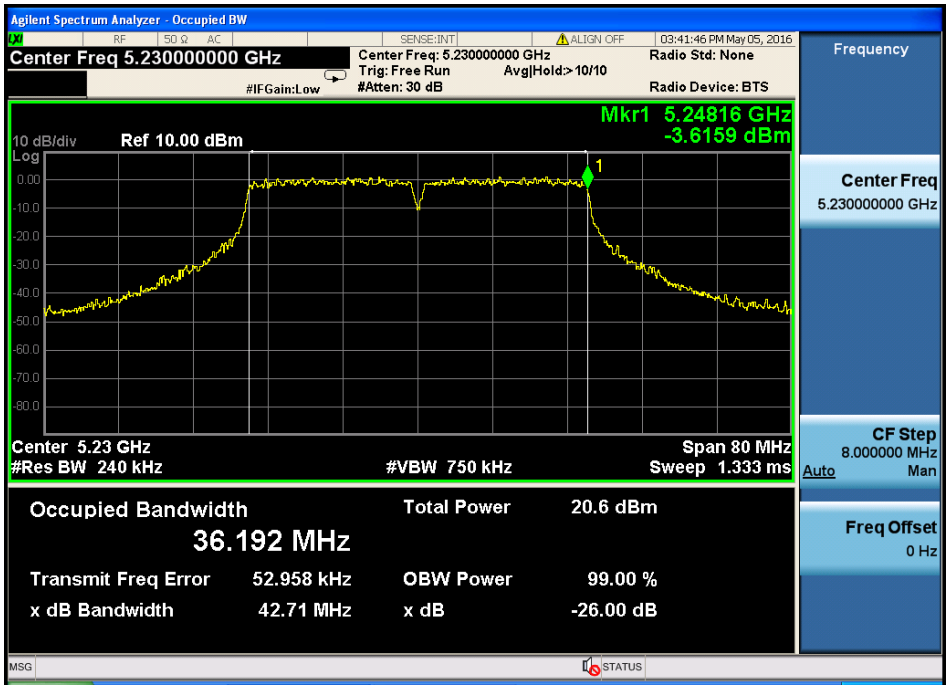



Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN OFF
03:38:21 PM May 05, 2016
Center Freq 5.200000000 GHz
Center Freq: 5.200000000 GHz
Trig: Free Run Avg|Hold:>10/10
#IFGain:Low #Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div Ref 10.00 dBm
Log
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 5.2 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
17.795 MHz
Total Power 22.2 dBm
Transmit Freq Error 46.505 kHz
OBW Power 99.00 %
x dB Bandwidth 22.45 MHz
x dB -26.00 dB
Center Freq
5.200000000 GHz
CF Step
4.000000 MHz
Auto Man
Freq Offset
0 Hz
MSG
STATUS

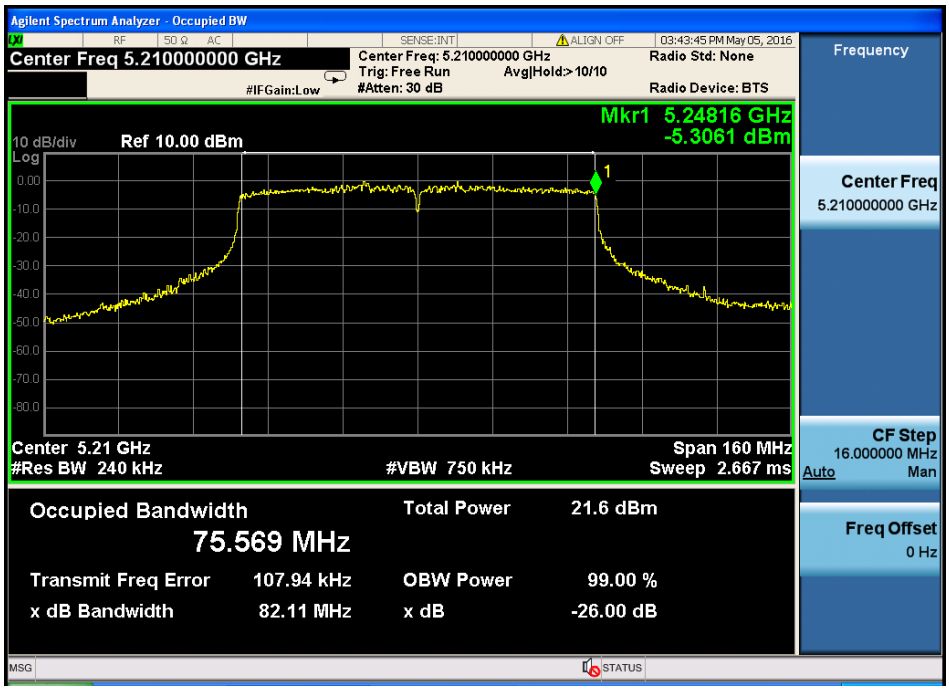

Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN OFF
03:39:16 PM May 05, 2016
Center Freq 5.240000000 GHz
Center Freq: 5.240000000 GHz
Trig: Free Run Avg|Hold:>10/10
#IFGain:Low #Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
Mkr1 5.24896 GHz
-3.3547 dBm
10 dB/div Ref 10.00 dBm
Log
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 5.24 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
17.807 MHz
Total Power 21.0 dBm
Transmit Freq Error 60.455 kHz
OBW Power 99.00 %
x dB Bandwidth 22.77 MHz
x dB -26.00 dB
Center Freq
5.240000000 GHz
CF Step
4.000000 MHz
Auto Man
Freq Offset
0 Hz
MSG
STATUS

IEEE 802.11n HT40:



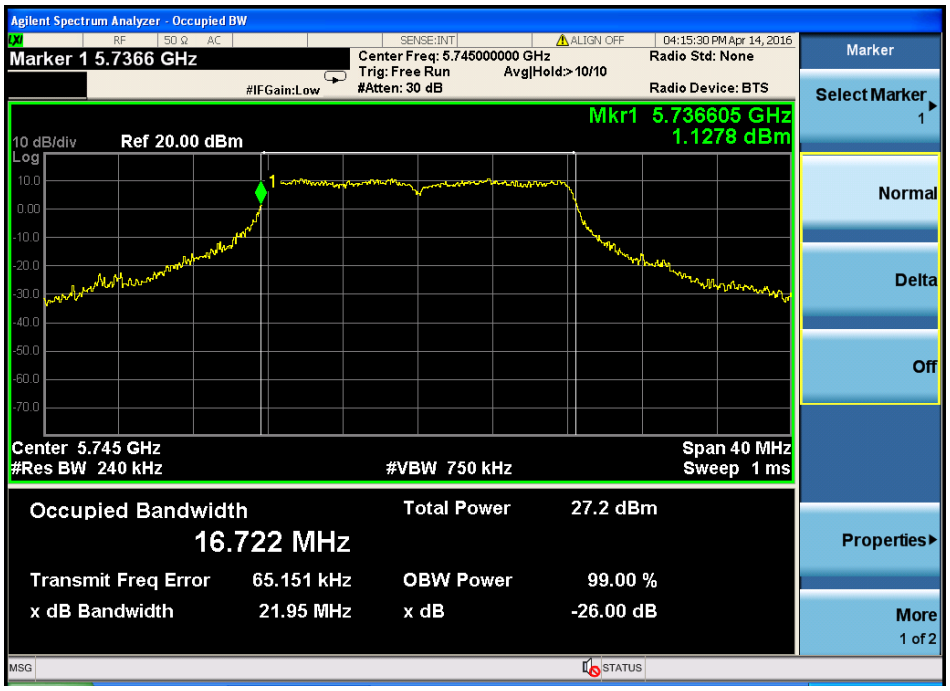


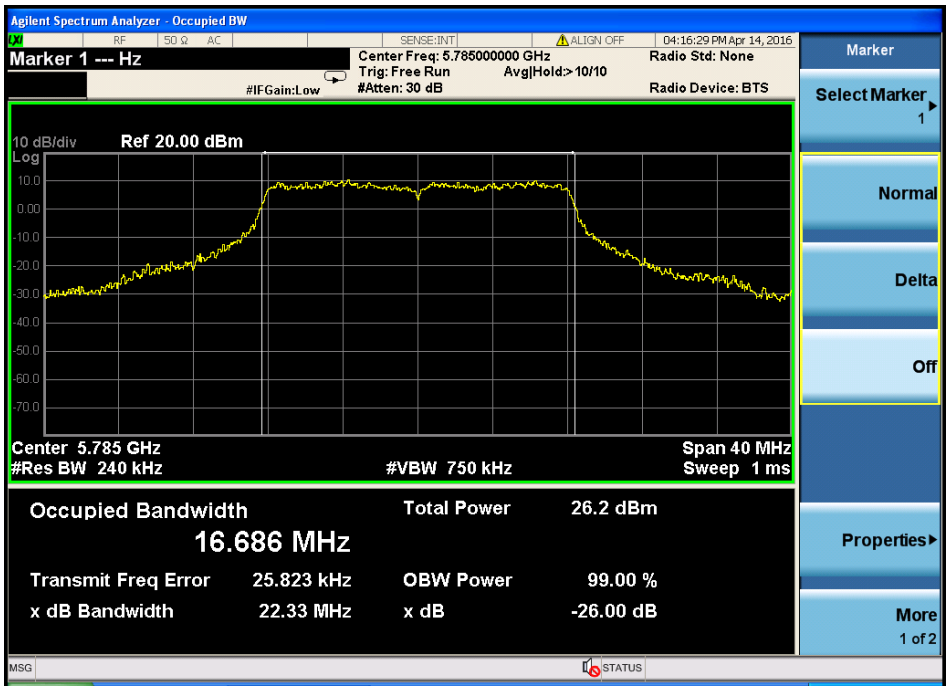
IEEE 802.11ac

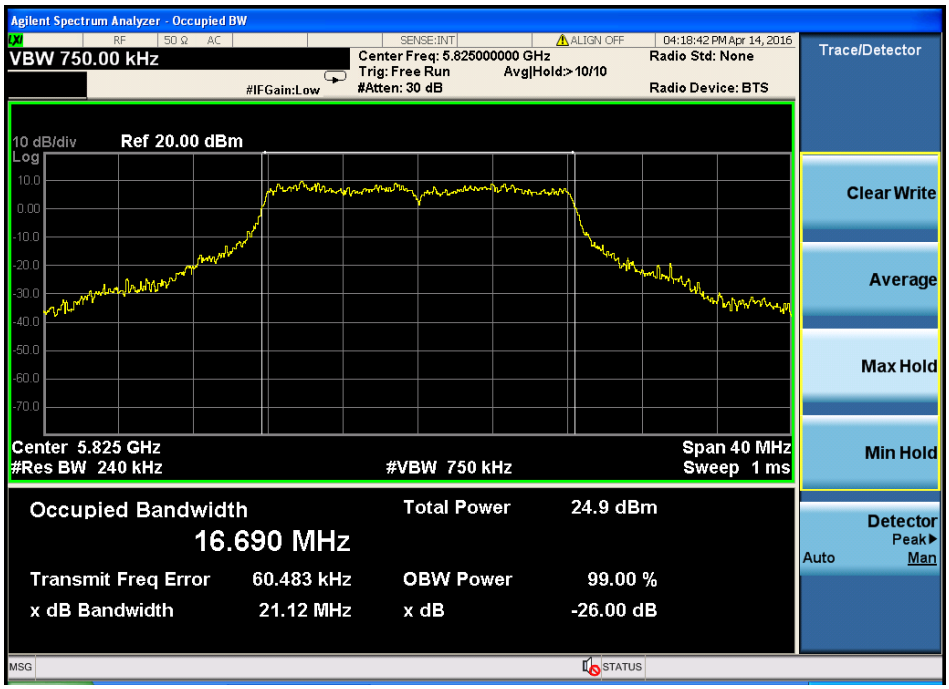


Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11a:					
Low	5745	21.95	16.722	/	PASS
Mid	5785	22.33	16.686	/	PASS
High	5825	21.12	16.690	/	PASS
IEEE 802.11n/HT20:					
Low	5745	23.02	17.777	/	PASS
Mid	5785	21.70	17.784	/	PASS
High	5825	22.31	17.824	/	PASS
IEEE 802.11n/HT40:					
Low	5755	43.01	36.183	/	PASS
High	5795	42.02	36.200	/	PASS
IEEE 802.11ac:					
	5775	81.12	75.391	/	PASS

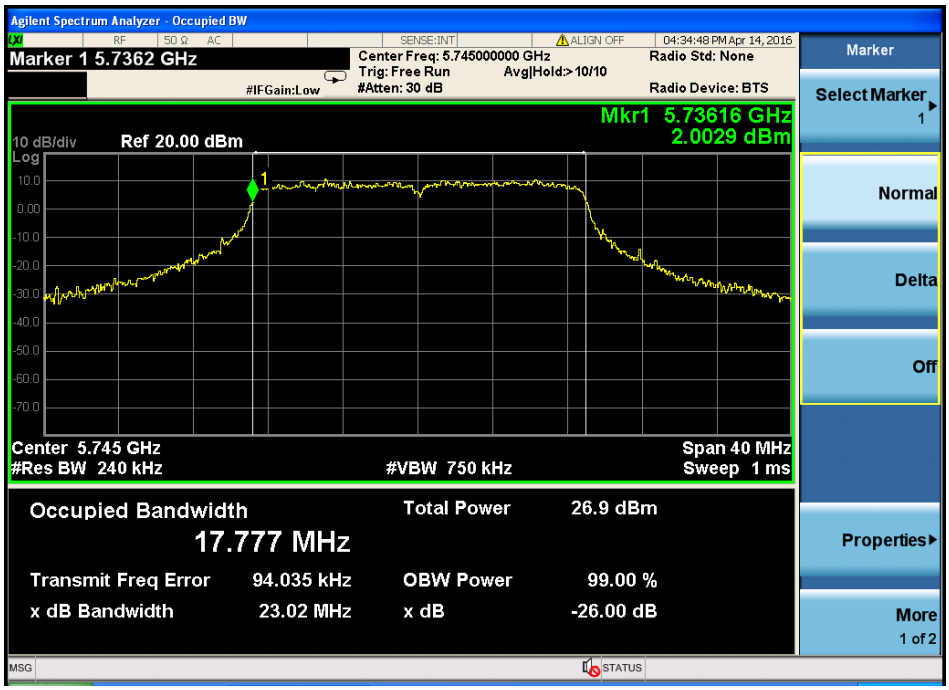
IEEE 802.11a

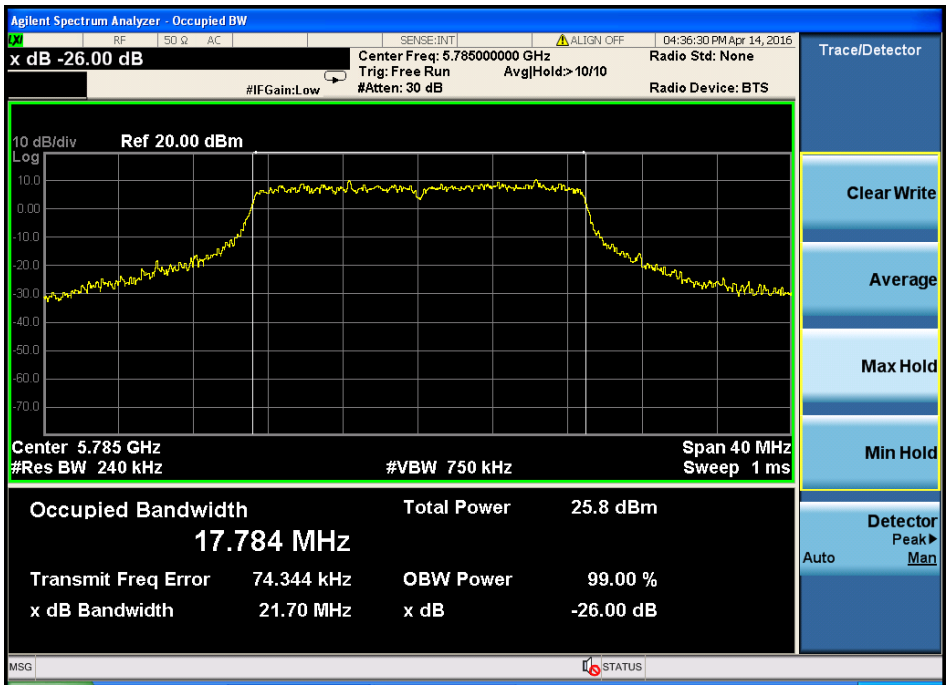

Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN OFF
04:15:30 PM Apr 14, 2016
Marker 1 5.7366 GHz
#IFGain:Low
Center Freq: 5.745000000 GHz
Trig: Free Run Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Mkr1 5.736605 GHz
1.1278 dBm
10 dB/div Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.745 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
16.722 MHz
Total Power 27.2 dBm
Transmit Freq Error 65.151 kHz
OBW Power 99.00 %
x dB Bandwidth 21.95 MHz
x dB -26.00 dB
MSG
STATUS
Marker
Select Marker 1
Normal
Delta
Off
Properties
More 1 of 2

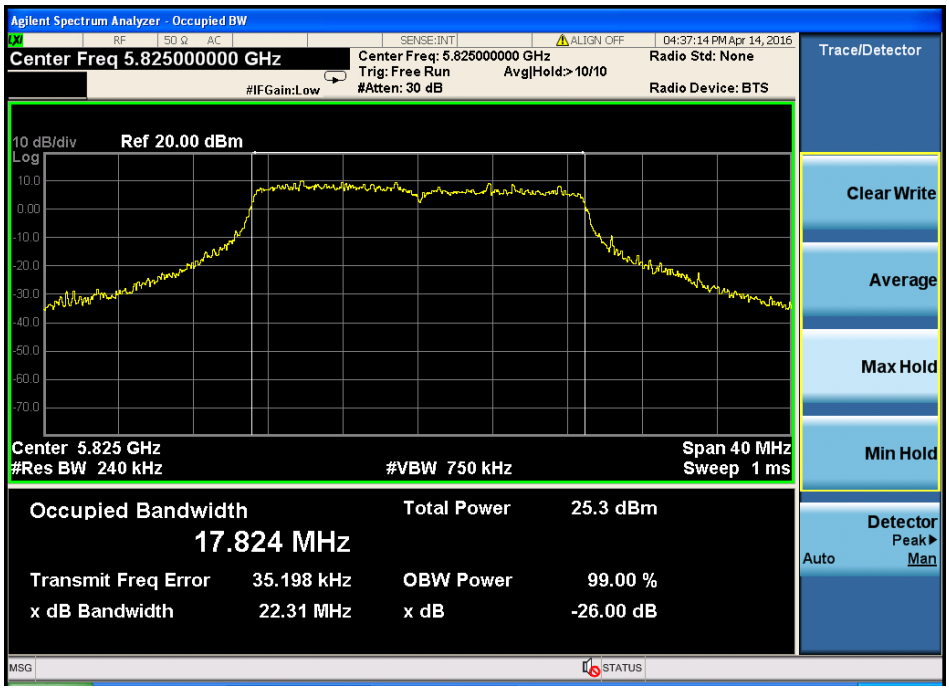

Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN OFF
04:16:29 PM Apr 14, 2016
Marker 1 --- Hz
#IFGain:Low
Center Freq: 5.785000000 GHz
Trig: Free Run Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
10 dB/div Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.785 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
16.686 MHz
Total Power 26.2 dBm
Transmit Freq Error 25.823 kHz
OBW Power 99.00 %
x dB Bandwidth 22.33 MHz
x dB -26.00 dB
MSG
STATUS
Marker
Select Marker 1
Normal
Delta
Off
Properties
More 1 of 2



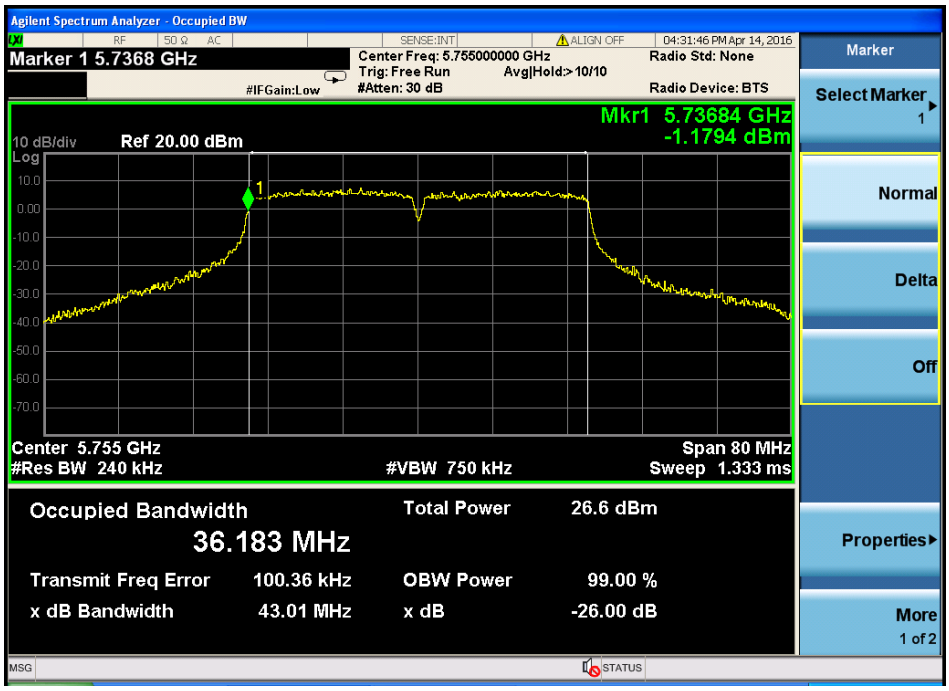
IEEE 802.11n HT20:

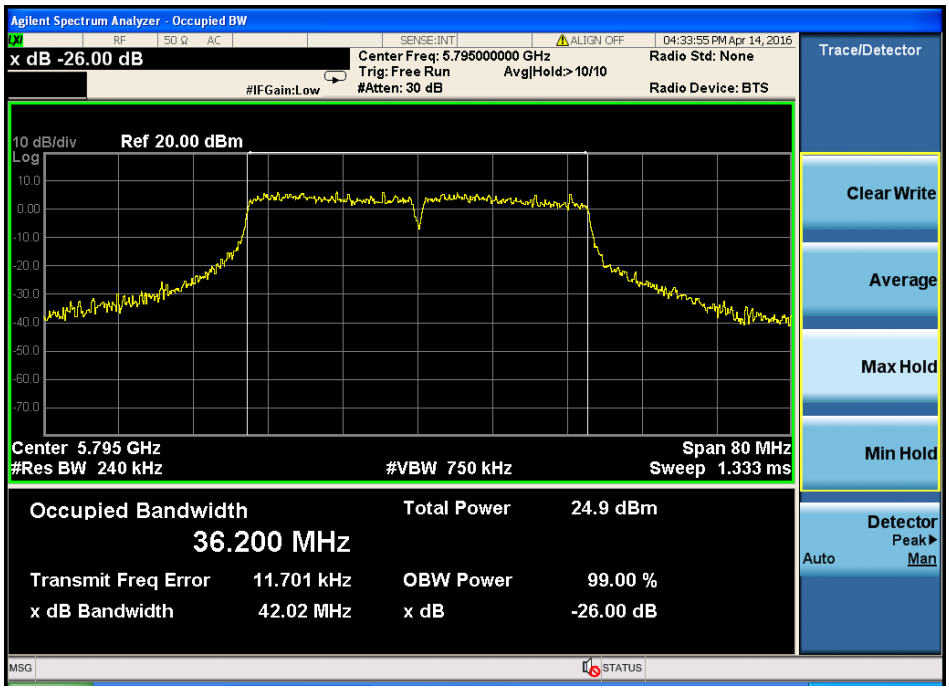



Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN OFF
04:36:30 PM Apr 14, 2016
x dB -26.00 dB
Center Freq: 5.785000000 GHz
Trig: Free Run Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.785 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
17.784 MHz
Total Power 25.8 dBm
Transmit Freq Error 74.344 kHz
OBW Power 99.00 %
x dB Bandwidth 21.70 MHz
x dB -26.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

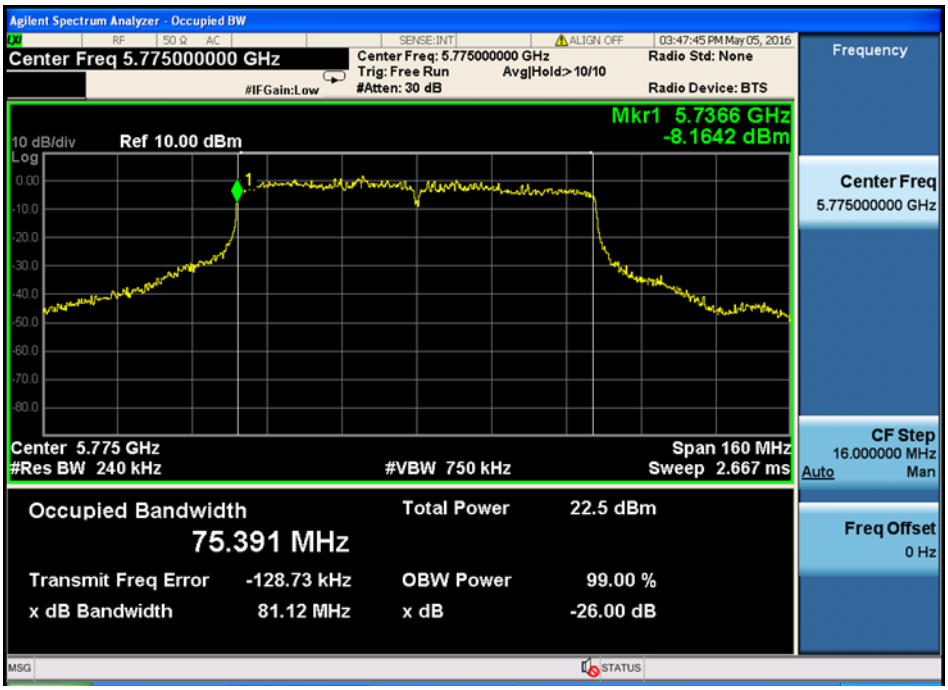

Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN OFF
04:37:14 PM Apr 14, 2016
Center Freq 5.825000000 GHz
Center Freq: 5.825000000 GHz
Trig: Free Run Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.825 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
17.824 MHz
Total Power 25.3 dBm
Transmit Freq Error 35.198 kHz
OBW Power 99.00 %
x dB Bandwidth 22.31 MHz
x dB -26.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

IEEE 802.11n HT40:



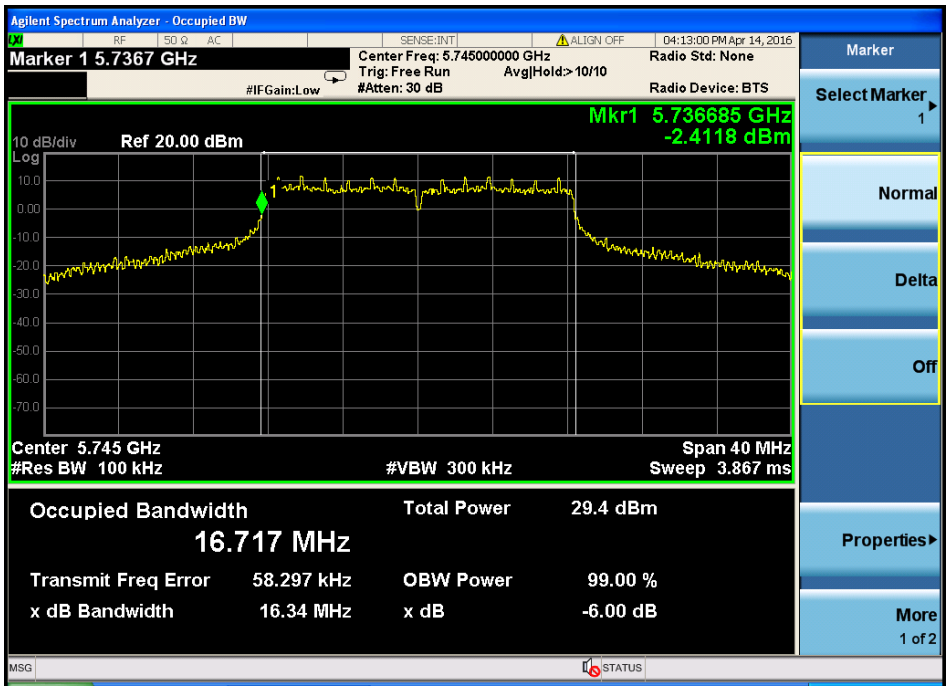


IEEE 802.11ac

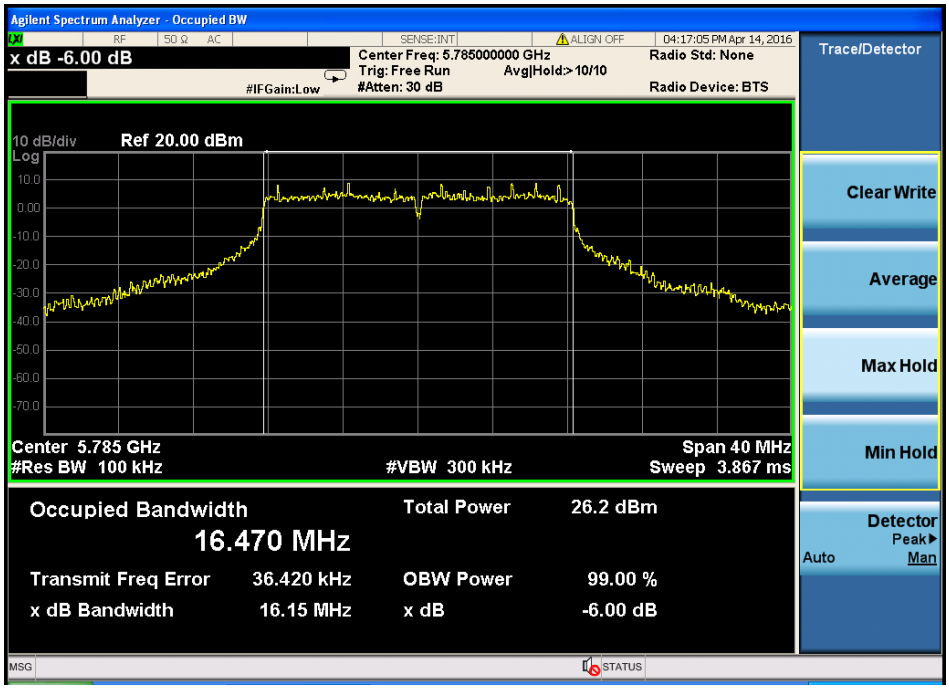


Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11a:					
Low	5745	16.34	16.717	0.5	PASS
Mid	5785	16.15	16.470	0.5	PASS
High	5825	16.30	16.469	0.5	PASS
IEEE 802.11n/HT20:					
Low	5745	17.29	17.630	0.5	PASS
Mid	5785	17.17	17.680	0.5	PASS
High	5825	16.32	17.671	0.5	PASS
IEEE 802.11n/HT40:					
Low	5755	36.73	36.144	0.5	PASS
High	5795	36.73	36.186	0.5	PASS
IEEE 802.11ac:					
	5775	71.36	75.302	0.5	PASS

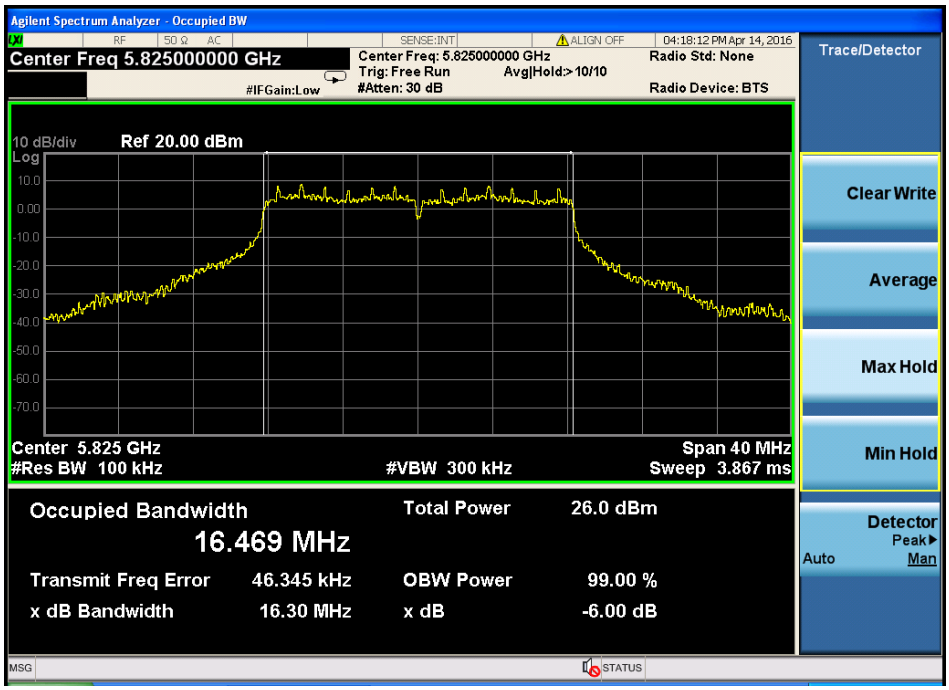
IEEE 802.11a with 5.8G:
CH Low :



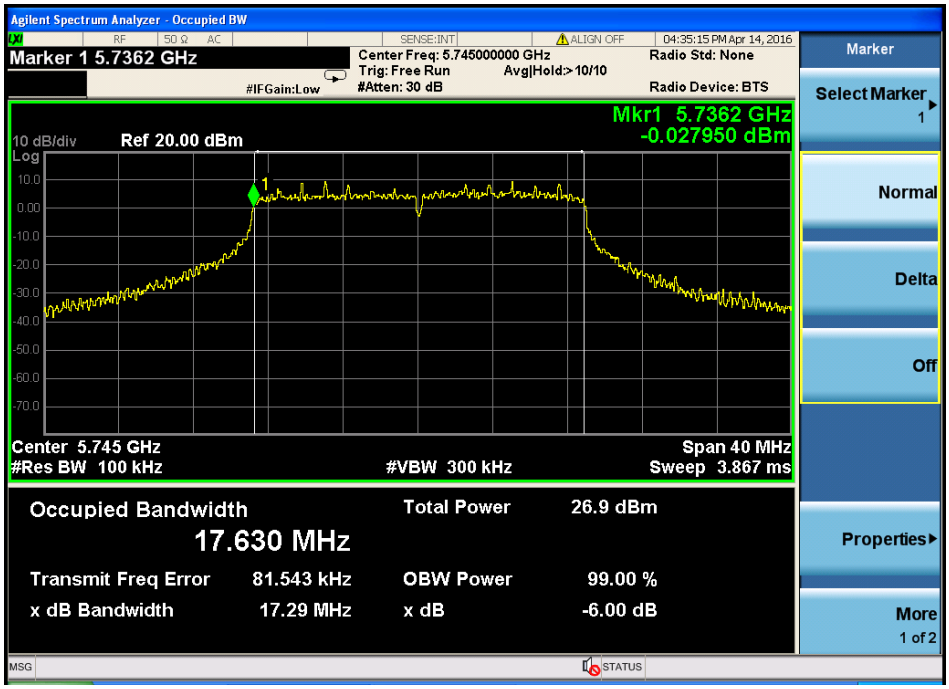
CH Mid :



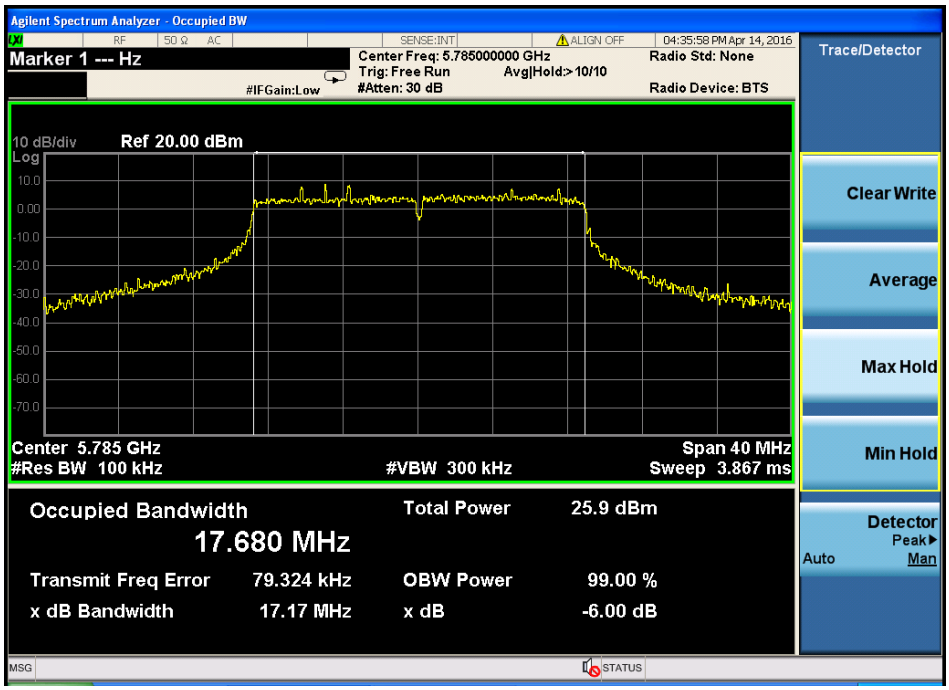
CH High :



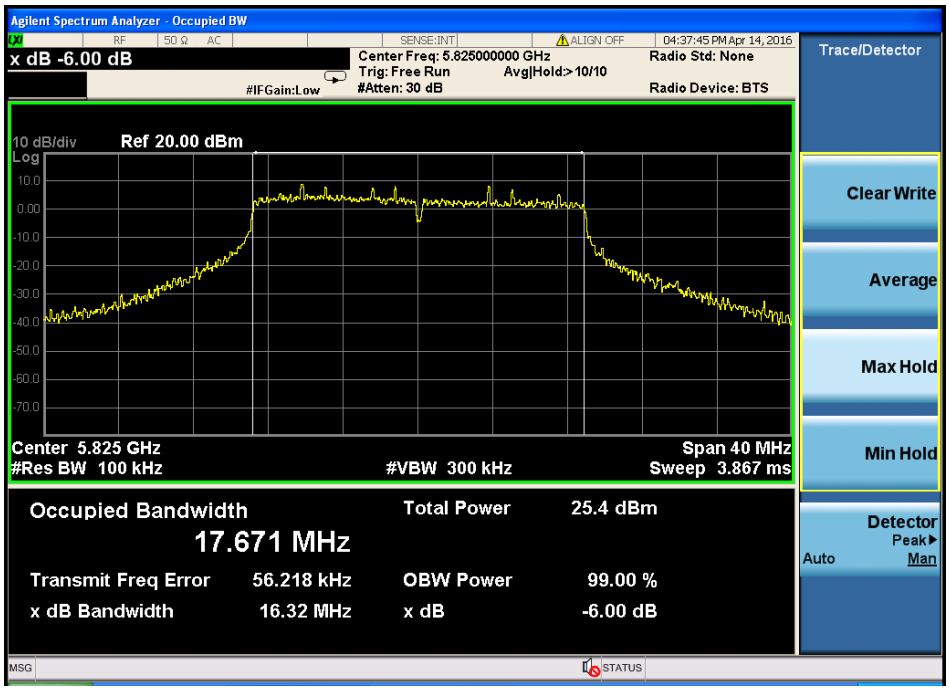
IEEE 802.11n HT20:
CH Low :



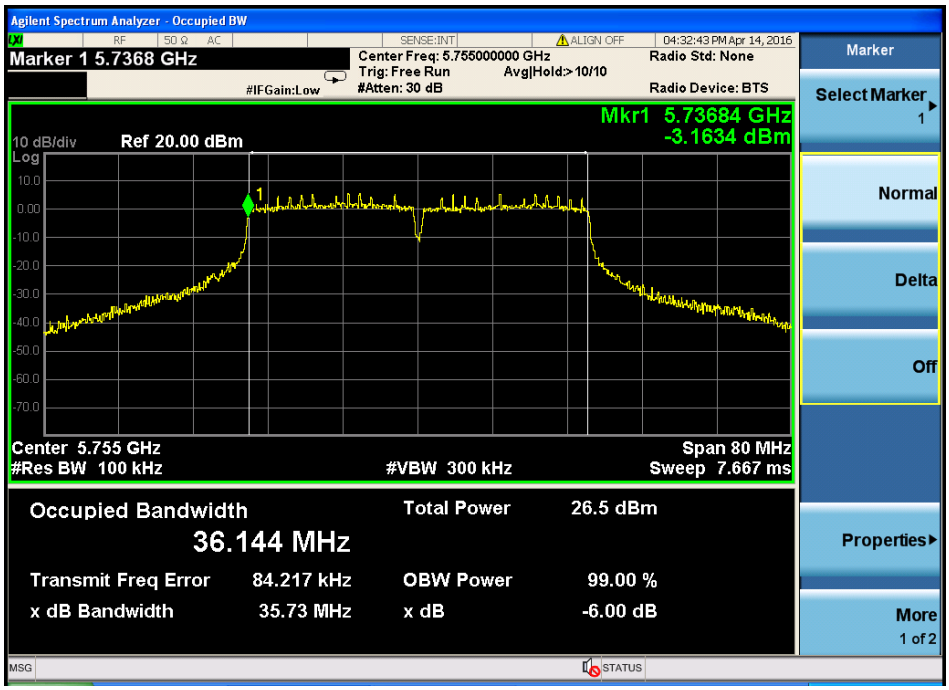
CH Mid :



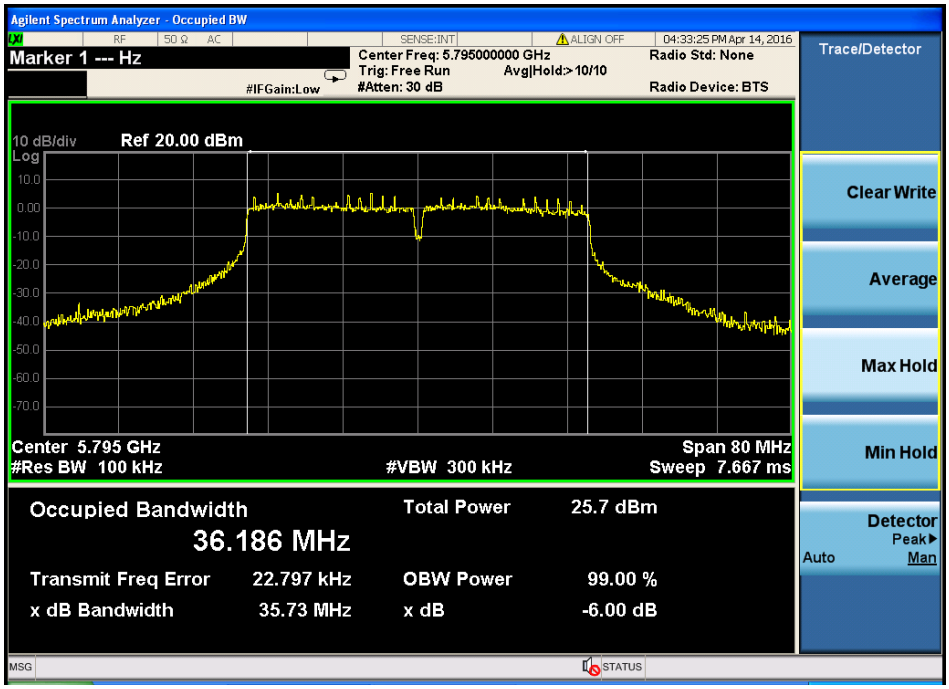
CH High :



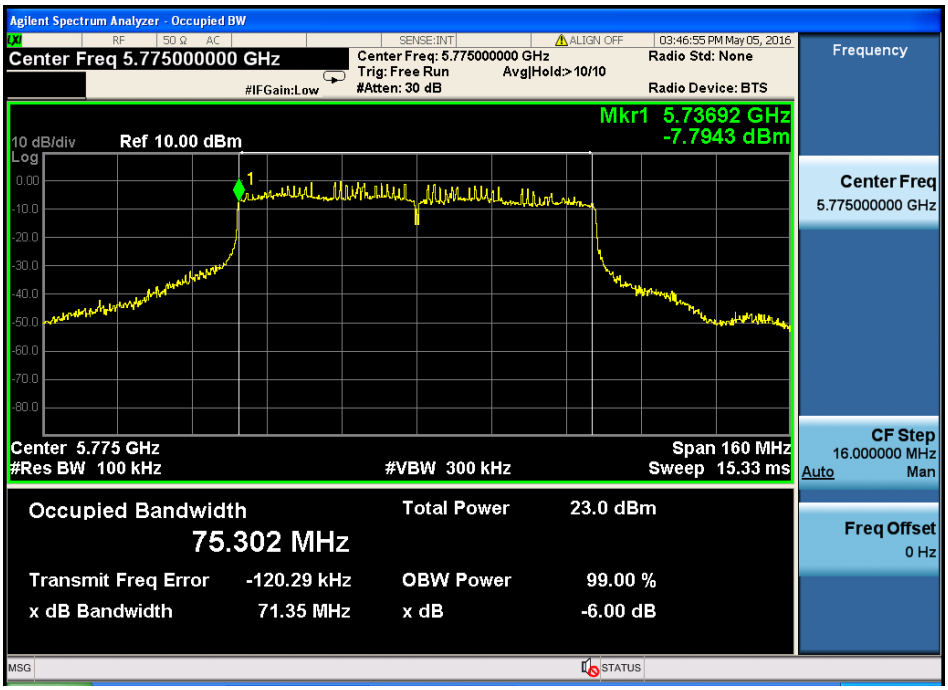
IEEE 802.11n/HT40:
CH Low :



CH High :



IEEE 802.11ac:



10 Undesirable emission

10.1 Test limit

Except as shown in paragraph (7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth
in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits

10.2 Test Procedure

12.2.1 Put the EUT on a 0.8m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission

12.2.2 Check the spurious emissions out of band.

12.2.3 RBW 1MHz ,VBW 3MHz ,peak detector for peak value , RBW 1MHz ,VBW 3MHz , RMS detector for AV value.

10.3 Test Setup

Same as 5.2.2.

10.4 Test Result

PASS.

Detailed information please see the following page.

5.2G Band
Radiated Method:
IEEE 802.11a CH LOW

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5150	43.75	31.65	5.92	33.9	47.42	68.2	20.78	**PK**
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5150	43.28	31.65	5.92	33.9	46.95	68.2	21.25	**PK**
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5150MHz band is -27+95.2=68.2 dBuV/m.

IEEE 802.11a CH High

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5350	44.68	31.73	6.05	33.73	48.73	68.2	19.47	**PK**
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5350	42.69	31.73	6.05	33.73	46.74	68.2	21.46	**PK**
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5150MHz band is -27+95.2=68.2 dBuV/m.

IEEE 802.11n HT20 CH Low

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5150	43.12	31.65	5.92	33.9	46.79	68.2	21.41	**PK**
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5150	42.97	31.65	5.92	33.9	46.64	68.2	21.56	**PK**
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5150MHz band is -27+95.2=68.2 dBuV/m.

IEEE 802.11n HT20 CH High

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5350	43.77	31.73	6.05	33.73	47.82	68.2	20.38	**PK**
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5350	43.27	31.73	6.05	33.73	47.32	68.2	20.88	**PK**
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5150MHz band is -27+95.2=68.2 dBuV/m.

IEEE 802.11n HT40 CH Low

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5150	42.38	31.65	5.92	33.9	46.05	68.2	22.15	**PK**
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5150	43.63	31.65	5.92	33.9	47.3	68.2	20.9	**PK**
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5150MHz band is -27+95.2=68.2 dBuV/m.

IEEE 802.11n HT40 CH High

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5350	46.39	31.73	6.05	33.73	50.44	68.2	17.76	**PK**
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5350	43.12	31.73	6.05	33.73	47.17	68.2	21.03	**PK**
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5150MHz band is -27+95.2=68.2 dBuV/m.

IEEE 802.11ac

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5150	43.12	31.65	5.92	33.9	46.79	68.2	21.41	**PK**
5350	44.32	31.73	6.05	33.73	48.37	68.2	19.83	**PK**
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5150	42.78	31.65	5.92	33.9	46.45	68.2	21.75	**PK**
5350	42.16	31.73	6.05	33.73	46.21	68.2	21.99	**PK**
Note: 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Result = Read level + Antenna factor + cable loss-Amp factor 3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5150MHz band is -27+95.2=68.2 dBuV/m.

5.8G Band
Radiated Method:
IEEE 802.11a CH LOW

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5460	41.78	31.81	6.11	33.68	46.02	68.2	22.18	**PK**
5725	43.28	32.17	6.26	33.58	48.13	68.2	20.07	PK
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5460	41.63	31.81	6.11	33.68	45.87	68.2	22.33	**PK**
5725	44.32	32.17	6.26	33.58	49.17	68.2	19.03	PK
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5460MHz is -27+95.2=68.2 dBuV/m. Limit for 5725MHz is -17+95.2=78.2 dBuV/m.

IEEE 802.11a CH High

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5850	43.55	32.5	6.33	33.64	48.74	68.2	19.46	**PK**
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5850	42.78	32.5	6.33	33.64	47.97	68.2	20.23	**PK**
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5460MHz is -27+95.2=68.2 dBuV/m. Limit for 5725MHz is -17+95.2=78.2 dBuV/m.

IEEE 802.11n HT20 CH Low

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5460	41.38	31.81	6.11	33.68	45.62	68.2	22.58	**PK**
5725	43.86	32.17	6.26	33.58	48.71	68.2	19.49	PK
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5460	41.68	31.81	6.11	33.68	45.92	68.2	22.28	**PK**
5725	43.83	32.17	6.26	33.58	48.68	68.2	19.52	PK
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5460MHz is -27+95.2=68.2 dBuV/m. Limit for 5725MHz is -17+95.2=78.2 dBuV/m.

IEEE 802.11n HT20 CH High

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5850	43.52	32.5	6.33	33.64	48.71	68.2	19.49	**PK**
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5850	42.93	32.5	6.33	33.64	48.12	68.2	20.08	**PK**
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5460MHz is -27+95.2=68.2 dBuV/m. Limit for 5725MHz is -17+95.2=78.2 dBuV/m.

IEEE 802.11n HT40 CH Low

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5460	42.36	31.81	6.11	33.68	46.6	68.2	21.6	**PK**
5725	44.06	32.17	6.26	33.58	48.91	68.2	19.29	PK
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5460	41.32	31.81	6.11	33.68	45.56	68.2	22.64	**PK**
5725	43.89	32.17	6.26	33.58	48.74	68.2	19.46	PK
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5460MHz is -27+95.2=68.2 dBuV/m. Limit for 5725MHz is -17+95.2=78.2 dBuV/m.

IEEE 802.11n HT40 CH High

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5850	43.22	32.5	6.33	33.64	48.41	68.2	19.79	**PK**
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5850	42.83	32.5	6.33	33.64	48.02	68.2	20.18	**PK**
--	--	--	--	--	--	--	--	--

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Result = Read level + Antenna factor + cable loss-Amp factor
3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5460MHz is -27+95.2=68.2 dBuV/m. Limit for 5725MHz is -17+95.2=78.2 dBuV/m.

IEEE 802.11ac

Band Edge Test result								
EUT: Broadband Digital Transmission System M/N: FWBD-2901								
Power: DC 48V From adapter								
Test date: 2016-05-05 Test site: 3m Chamber Tested by: Simple Guan								
Test mode: MIMO TX Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5460	42.72	31.81	6.11	33.68	46.96	68.2	21.24	**PK**
5725	44.12	32.17	6.26	33.58	48.97	68.2	19.23	PK
5850	42.24	32.5	6.33	33.64	47.43	68.2	20.77	PK
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
5460	41.57	31.81	6.11	33.68	45.81	68.2	22.39	**PK**
5725	43.76	32.17	6.26	33.58	48.61	68.2	19.59	PK
5850	42.03	32.5	6.33	33.64	47.22	68.2	20.98	**PK**
--	--	--	--	--	--	--	--	--
Note: 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Result = Read level + Antenna factor + cable loss-Amp factor 3, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

Note: According to KDB 789033, EIRP【dBm】=E【dBuV/m】-95.2, thus, limit for 5460MHz is -27+95.2=68.2 dBuV/m. Limit for 5725MHz is -17+95.2=78.2 dBuV/m.

11 Frequency stability

11.1 Test limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

11.2 Result

802.11a Mode:

EUT: Broadband Digital Transmission System M/N: FWBD-2901					
Power: DC 48V From adapter					
Ambient Temperature:23℃		Relative Humidity: 60%			
Test date: 2016-05-05		Test site: RF site		Tested by: Simple Guan	
Conclusion: PASS					
Mode	Voltage (V)	FH_L (5180MHz)	Deviation (KHz)	FH_H (5240MHz)	Deviation (KHz)
5.2G Band	132 V	5179.974	26	5239.975	25
	120 V	5179.974	26	5239.975	25
	108 V	5179.974	26	5239.975	25
5.8G Band	Voltage (V)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
	132 V	5744.936	24	5824.969	31
	120 V	5744.936	24	5824.969	31
	108 V	5744.936	24	5824.969	31

Mode	Temperature (℃)	FH_L (5180MHz)	Deviation (KHz)	FH_H (5240MHz)	Deviation (KHz)
5.2G Band	-30	5179.938	62	5239.945	55
	-20	5179.952	48	5239.953	47
	-10	5179.962	38	5239.956	44
	0	5179.951	49	5239.961	39
	10	5179.972	28	5239.962	38
	20	5179.975	25	5239.967	33
	30	5179.969	31	5239.971	29
	40	5179.978	22	5239.976	24
	50	5179.982	18	5239.979	21
5.8G Band	Temperature (℃)	FH_L (5745MHz)	Deviation (KHz)	FH_H (5825MHz)	Deviation (KHz)
	-30	5744.925	75	5824.939	61
	-20	5744.931	69	5824.928	72
	-10	5744.934	66	5824.951	49
	0	5744.947	53	5824.925	75
	10	5744.951	49	5824.953	47
	20	5744.953	47	5824.979	21
	30	5744.956	44	5824.965	35
	40	5744.968	32	5824.957	43
	50	5744.979	21	5824.983	17

802.11n20 Mode:

EUT: Broadband Digital Transmission System M/N: FWBD-2901					
Power: DC 48V From adapter					
Ambient Temperature:23℃		Relative Humidity: 60%			
Test date: 2016-05-05		Test site: RF site		Tested by: Simple Guan	
Conclusion: PASS					
Mode	Voltage (V)	FH_L (5180MHz)	Deviation (KHz)	FH_H (5240MHz)	Deviation (KHz)
5.2G Band	132 V	5179.974	26	5239.975	25
	120 V	5179.974	26	5239.975	25
	108 V	5179.974	26	5239.975	25
5.8G Band	Voltage (V)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
	132 V	5744.936	24	5824.969	31
	120 V	5744.936	24	5824.969	31
	108 V	5744.936	24	5824.969	31

Mode	Temperature (℃)	FH_L (5180MHz)	Deviation (KHz)	FH_H (5240MHz)	Deviation (KHz)
5.2G Band	-30	5179.938	62	5239.945	55
	-20	5179.952	48	5239.953	47
	-10	5179.962	38	5239.956	44
	0	5179.951	49	5239.961	39
	10	5179.972	28	5239.962	38
	20	5179.975	25	5239.967	33
	30	5179.969	31	5239.971	29
	40	5179.978	22	5239.976	24
	50	5179.982	18	5239.979	21
5.8G Band	Temperature (℃)	FH_L (5745MHz)	Deviation (KHz)	FH_H (5825MHz)	Deviation (KHz)
	-30	5744.925	75	5824.939	61
	-20	5744.931	69	5824.928	72
	-10	5744.934	66	5824.951	49
	0	5744.947	53	5824.925	75
	10	5744.951	49	5824.953	47
	20	5744.953	47	5824.979	21
	30	5744.956	44	5824.965	35
	40	5744.968	32	5824.957	43
	50	5744.979	21	5824.983	17

802.11n40 Mode:

EUT: Broadband Digital Transmission System M/N: FWBD-2901					
Power: DC 48V From adapter					
Ambient Temperature:23℃		Relative Humidity: 60%			
Test date: 2016-05-05		Test site: RF site		Tested by: Simple Guan	
Conclusion: PASS					
Mode	Voltage (V)	FH_L (5190MHz)	Deviation (KHz)	FH_H (5230MHz)	Deviation (KHz)
5.2G Band	132 V	5189.975	25	5229.977	23
	120 V	5189.975	25	5229.977	23
	108 V	5189.975	25	5229.977	23
5.8G Band	Voltage (V)	FHL (5755MHz)	Deviation (KHz)	FHH (5795MHz)	Deviation (KHz)
	132 V	5754.969	31	5794.965	35
	120 V	5754.969	31	5794.965	35
	108 V	5754.969	31	5794.965	35

Mode	Temperature (℃)	FH_L (5190MHz)	Deviation (KHz)	FH_H (5230MHz)	Deviation (KHz)
5.2G Band	-30	5189.968	32	5229.957	43
	-20	5189.962	38	5229.951	49
	-10	5189.957	43	5229.944	56
	0	5189.972	28	5229.953	47
	10	5189.977	23	5229.957	43
	20	5189.975	25	5229.938	62
	30	5189.968	32	5229.962	38
	40	5189.972	28	5229.968	32
	50	5189.978	22	5229.975	25
5.8G Band	Temperature (℃)	FH_L (5755MHz)	Deviation (KHz)	FH_H (5795MHz)	Deviation (KHz)
	-30	5754.938	62	5794.957	43
	-20	5754.947	53	5794.943	57
	-10	5754.952	48	5794.958	42
	0	5754.956	44	5794.957	43
	10	5754.957	43	5794.961	39
	20	5754.968	32	5794.957	43
	30	5754.971	29	5794.968	32
	40	5754.977	23	5794.972	28
	50	5754.979	21	5794.977	23

802.11ac Mode:

EUT: Broadband Digital Transmission System M/N: FWBD-2901					
Power: DC 48V From adapter					
Ambient Temperature:23℃		Relative Humidity: 60%			
Test date: 2016-05-05		Test site: RF site		Tested by: Simple Guan	
Conclusion: PASS					
Mode	Voltage (V)	FH_L (5210MHz)	Deviation (KHz)		
5.2G Band	132 V	5189.975	25		
	120 V	5189.975	25		
	108 V	5189.975	25		
5.8G Band	Voltage (V)	FHL (5775MHz)	Deviation (KHz)		
	132 V	5774.973	27		
	120 V	5774.973	27		
	108 V	5774.973	27		

Mode	Temperature (℃)	FH_L (5210MHz)	Deviation (KHz)		
5.2G Band	-30	5209.948	52		
	-20	5209.957	43		
	-10	5209.963	37		
	0	5209.968	32		
	10	5209.959	41		
	20	5209.972	28		
	30	5209.949	51		
	40	5209.963	37		
	50	5209.982	18		
5.8G Band	Temperature (℃)	FH_L (5775MHz)	Deviation (KHz)		
	-30	5774.952	48		
	-20	5774.956	44		
	-10	5774.949	51		
	0	5774.958	42		
	10	5774.962	32		
	20	5774.972	28		
	30	5774.968	32		
	40	5774.982	18		
	50	5774.977	23		

12 Antenna Requirement

12.1 Standard Requirement

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

12.2 Antenna Connected Construction

The antenna connector is unique antenna and no consideration of replacement. Please see EUT photo for details.

12.3 Result

The EUT antenna is professional installed. It comply with the standard requirement.

---------END OF THE REPORT-------