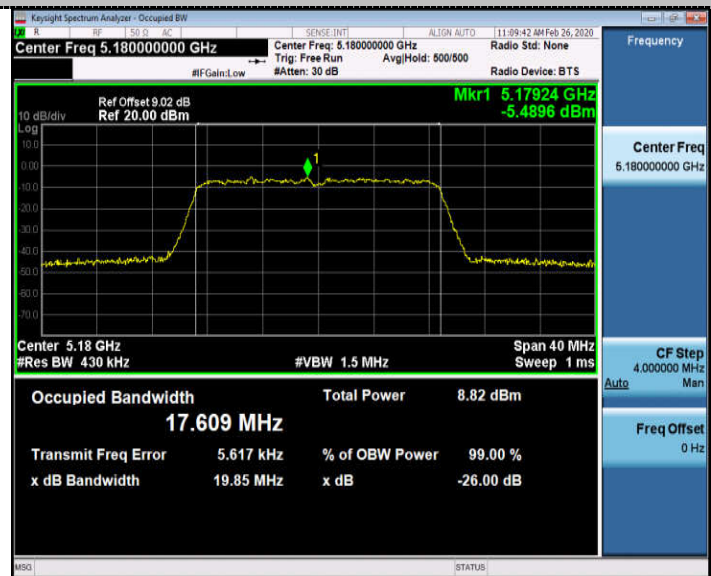
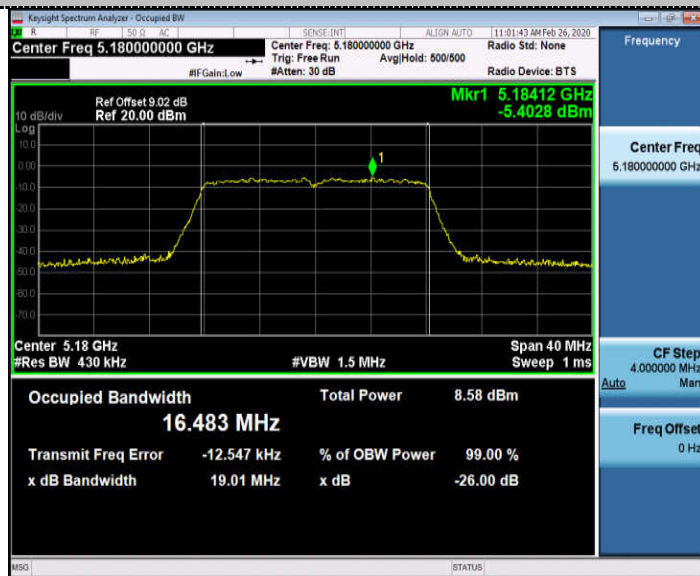


Antenna 0:

99%Bandwidth

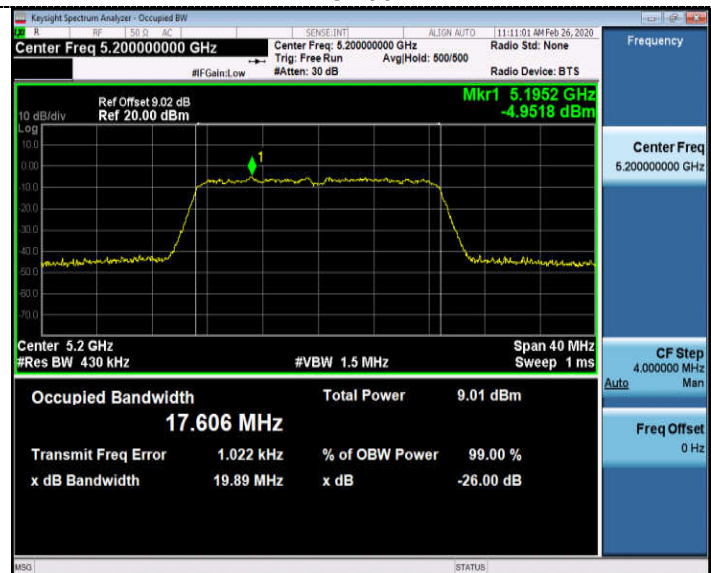
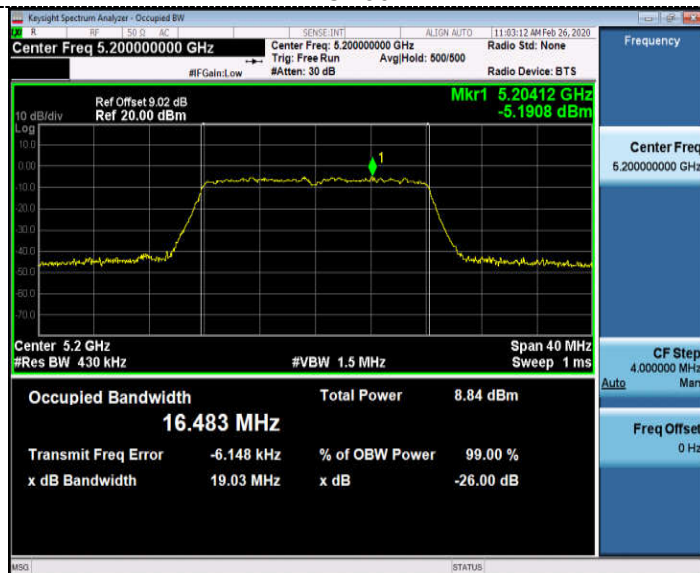
802.11a

802.11n HT20



CH36

CH36



CH40

CH40



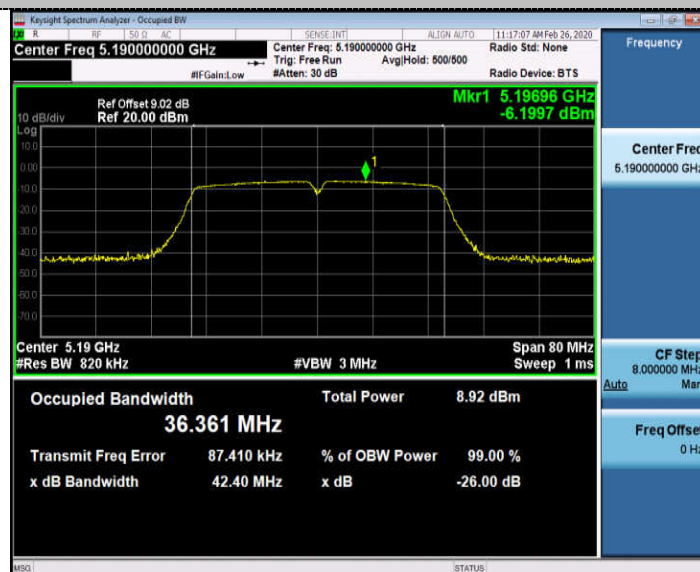
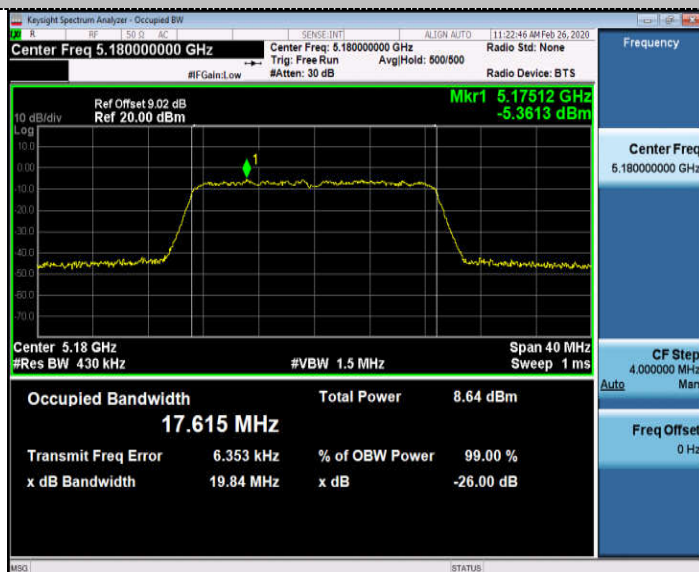
CH48

CH48

99%Bandwidth

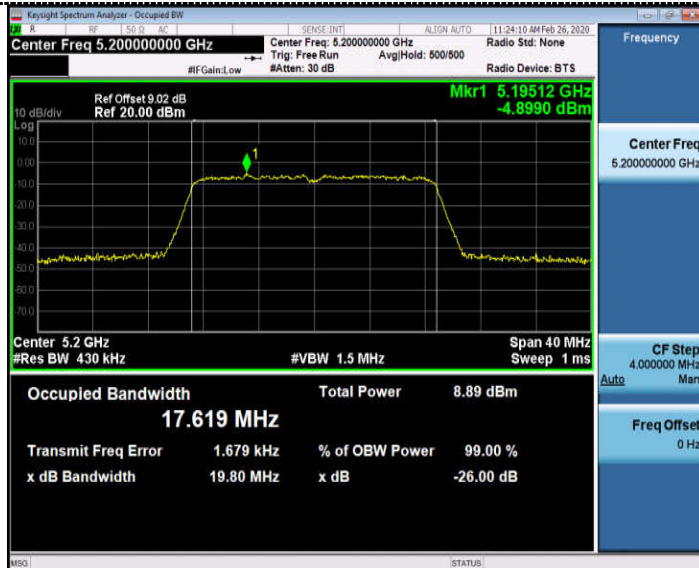
802.11ac20

802.11n HT40



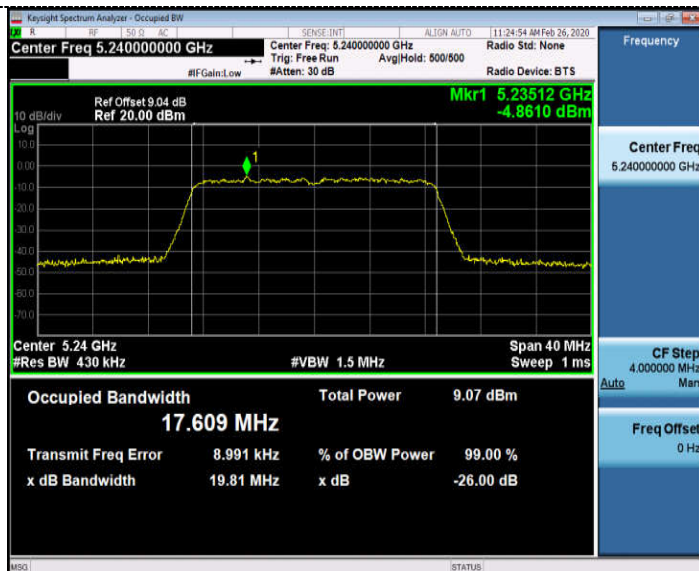
CH36

CH38



CH40

CH46



CH48



26dB Bandwidth

802.11a

802.11n HT20



CH36

CH36



CH40

CH40



CH48

CH48

26dB Bandwidth

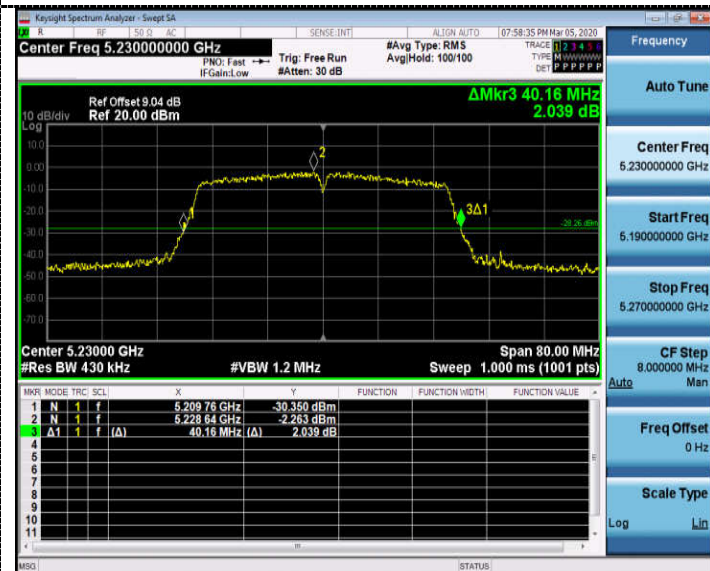
802.11ac20

802.11n HT40



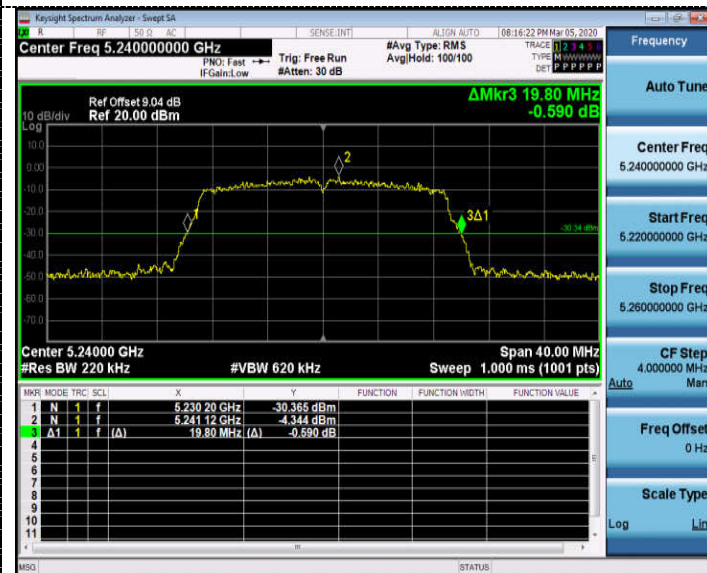
CH36

CH38



CH40

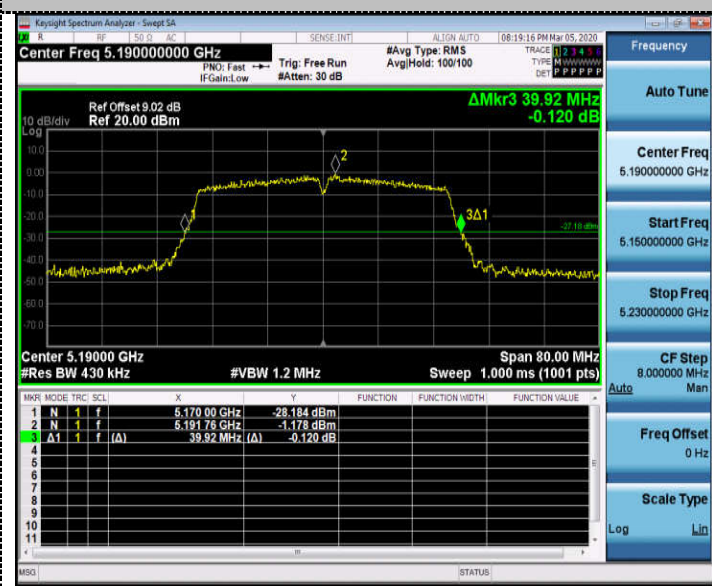
CH46



CH48

26dB Bandwidth

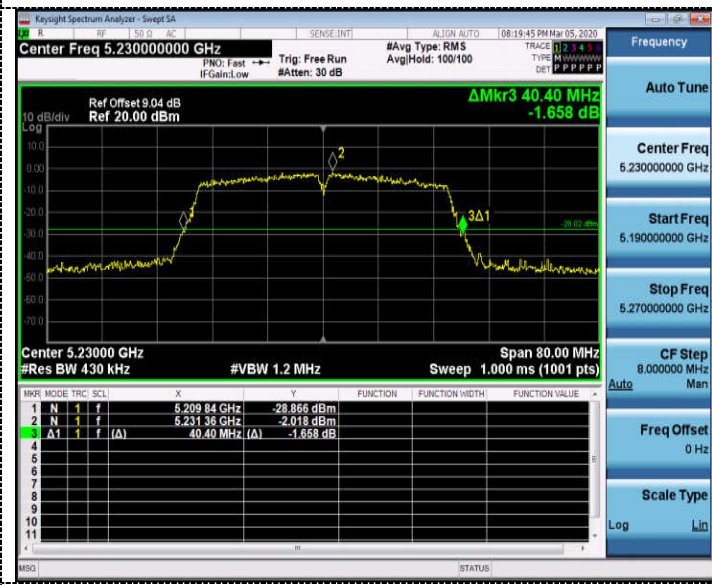
802.11ac40



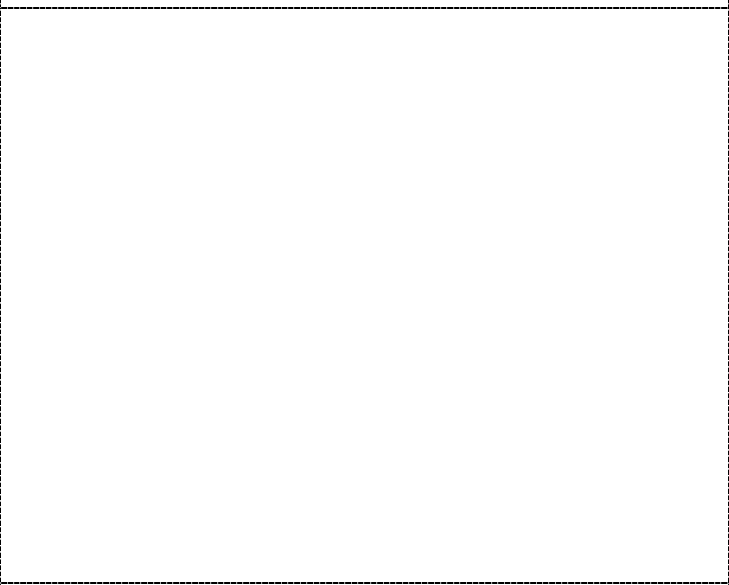
802.11ac80



CH38



CH42



CH46

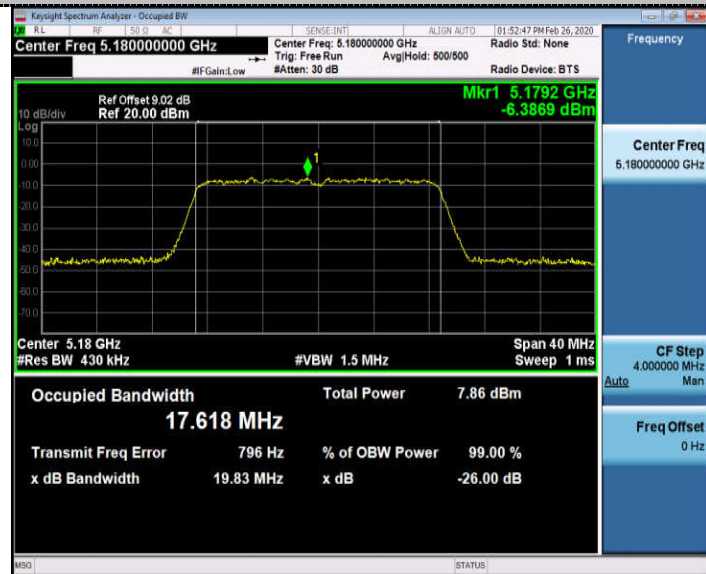
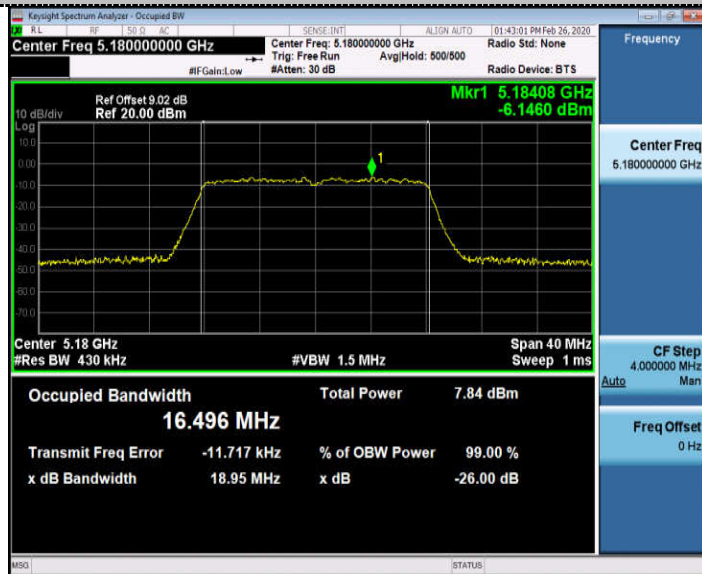


Antenna 1:

99%Bandwidth

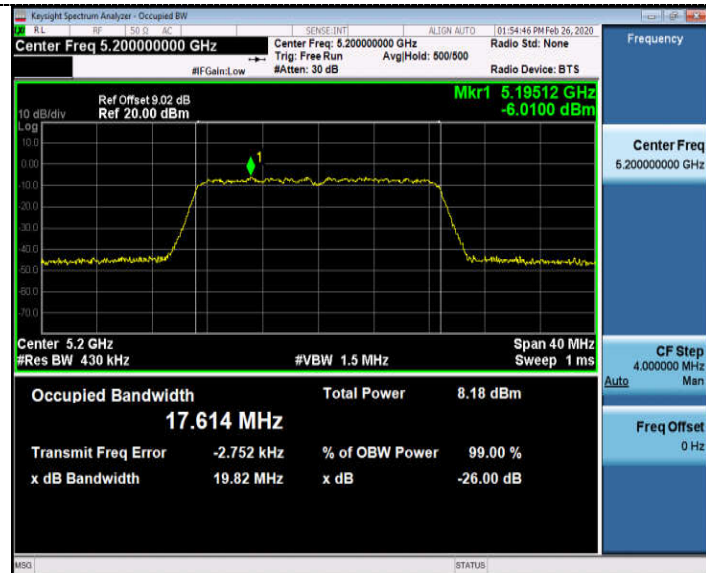
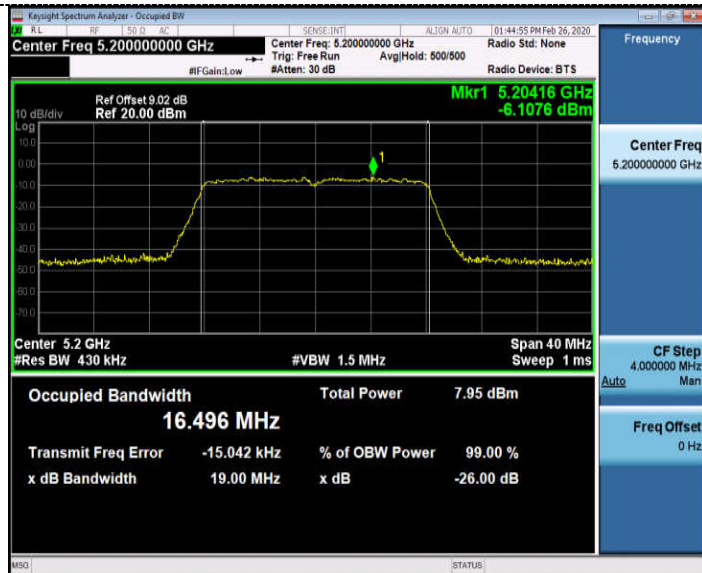
802.11a

802.11n HT20



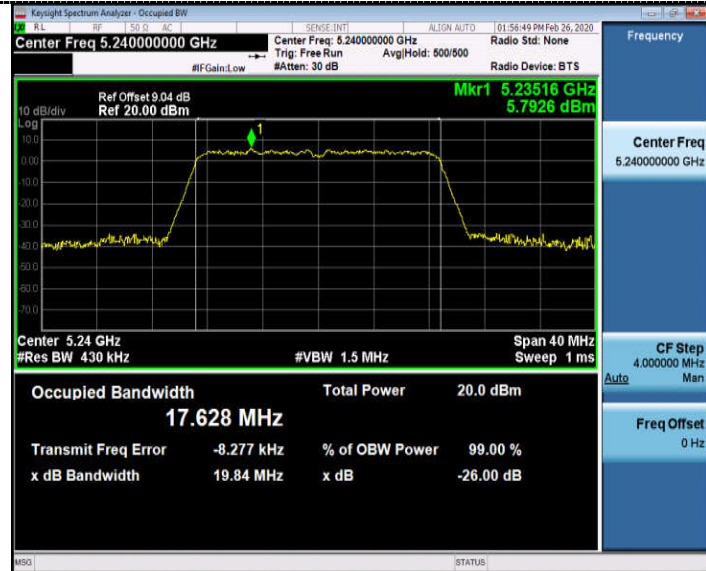
CH36

CH36



CH40

CH40



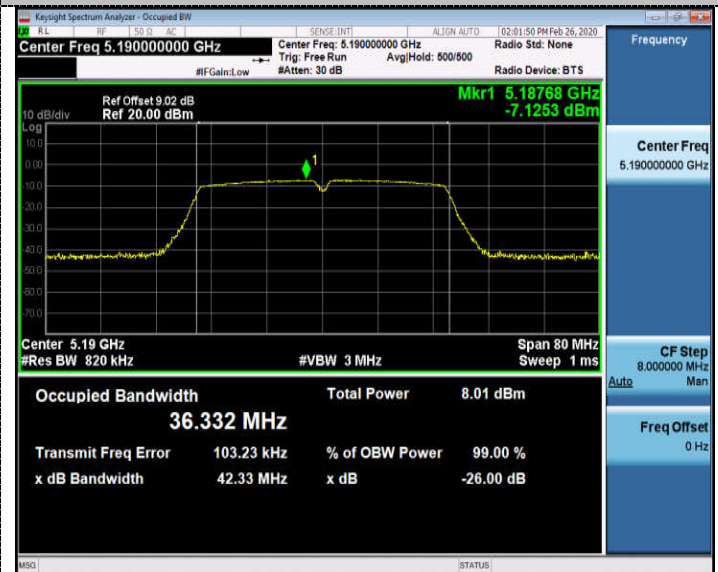
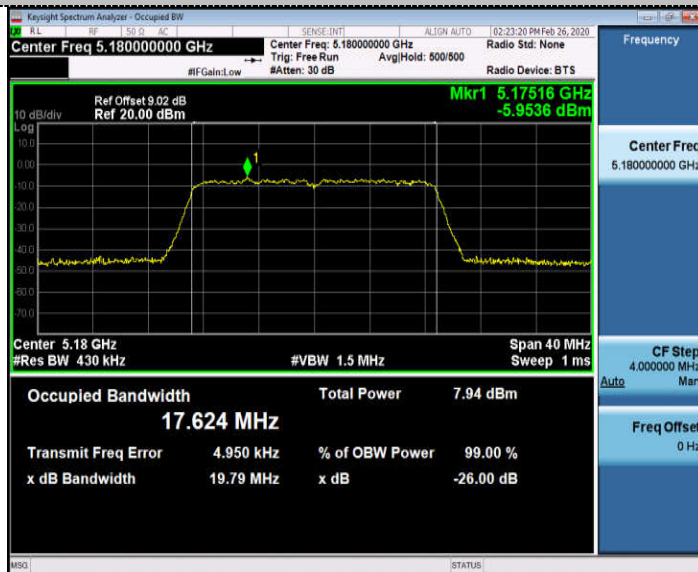
CH48

CH48

99%Bandwidth

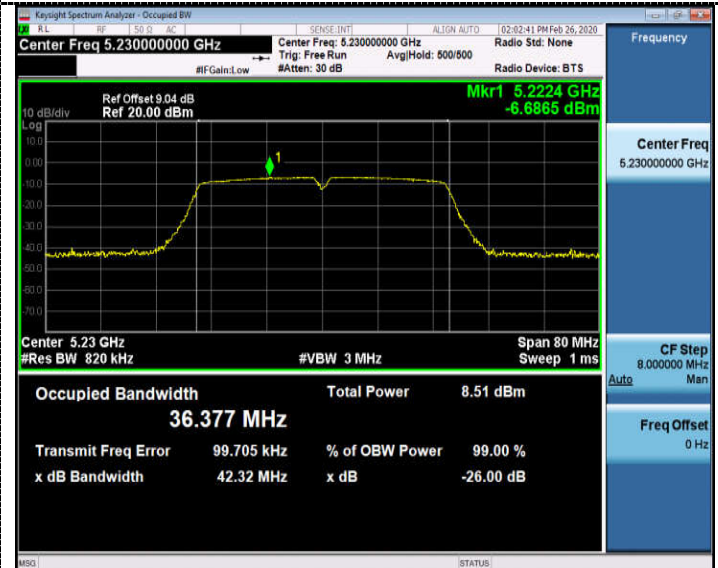
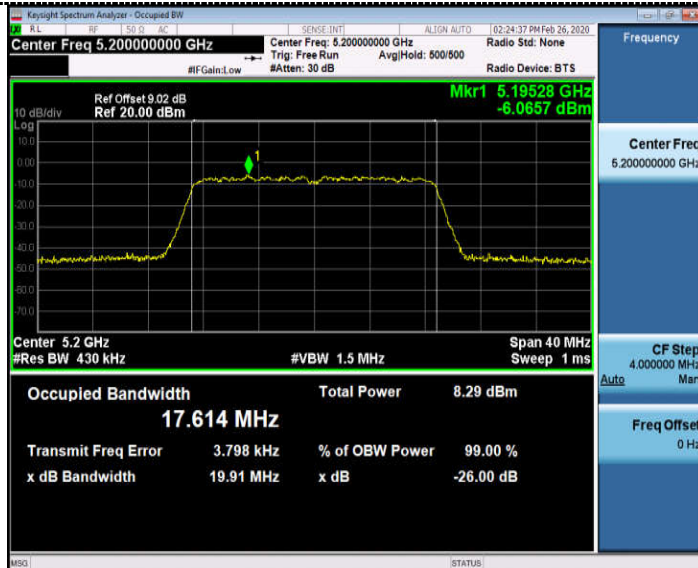
802.11ac20

802.11n HT40



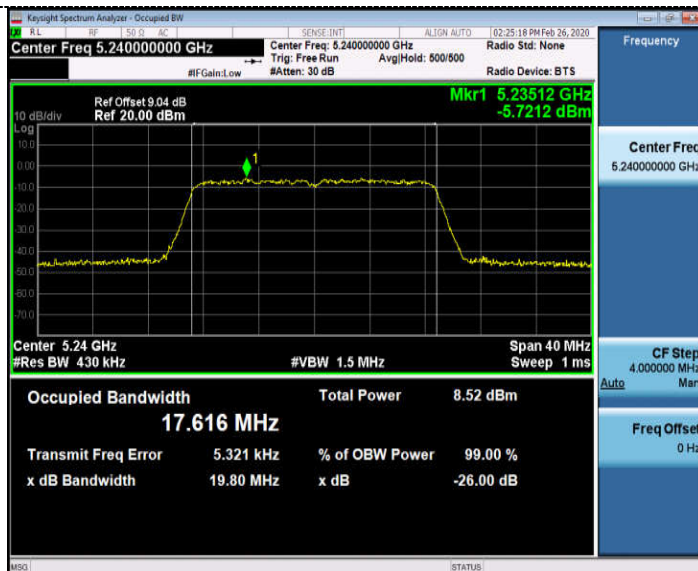
CH36

CH38



CH40

CH46



CH48



CH46

Keysight Spectrum Analyzer - Occupied BW

Center Freq 5.23000000 GHz

Center Freq: 5.23000000 GHz

Trig: Free Run

Avg/Hold: 500/500

Radio Std: None

#IFGain:Low

#Atten: 30 dB

Radio Device: BTS

Frequency

10 dB/div

Ref Offset 9.04 dB

Ref 20.00 dBm

Mkr1 5.23408 GHz

-6.9419 dBm

Center Freq 5.23000000 GHz

CF Step 8.000000 MHz

Auto

Freq Offset 0 Hz

Center 5.23 GHz

#Res BW 820 kHz

#VBW 3 MHz

Span 80 MHz

Sweep 1 ms

Occupied Bandwidth 36.387 MHz

Total Power 8.19 dBm

Transmit Freq Error 91.477 kHz

% of OBW Power 99.00 %

x dB Bandwidth 42.52 MHz

x dB -26.00 dB

MSO

STATUS

26dB Bandwidth

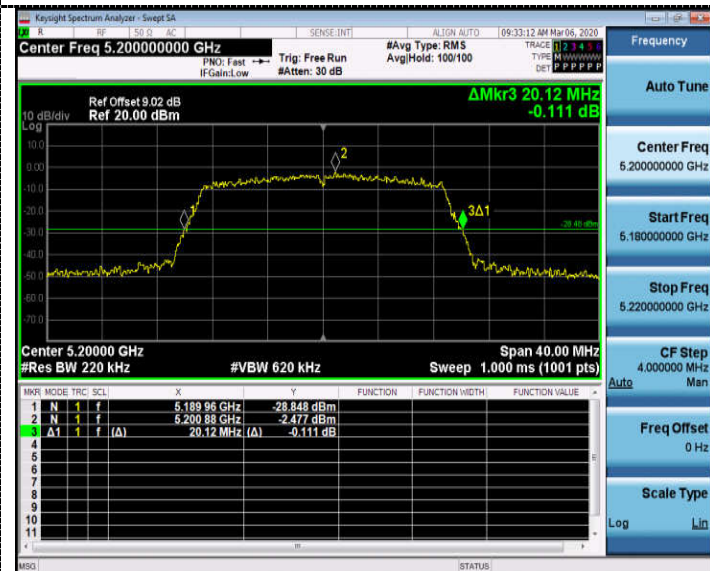
802.11a

802.11n HT20



CH36

CH36



CH40

CH40



CH48

CH48

26dB Bandwidth

802.11ac20

802.11n HT40



CH36



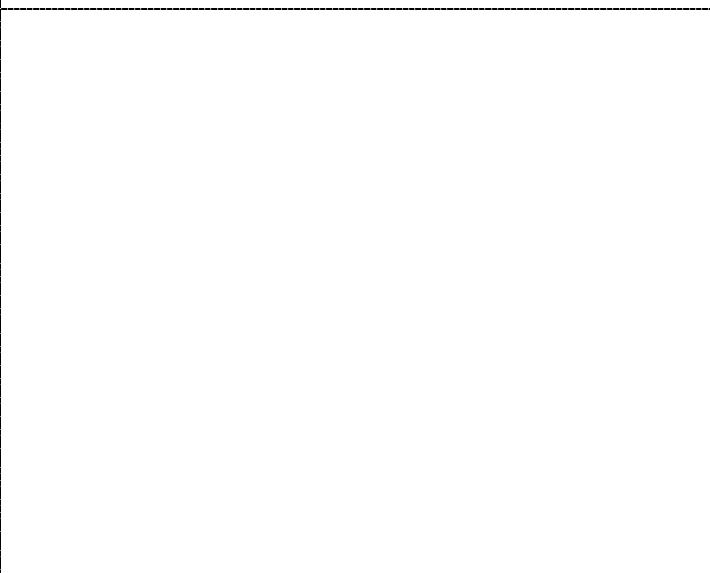
CH38



CH40



CH46



CH48

26dB Bandwidth

802.11ac40



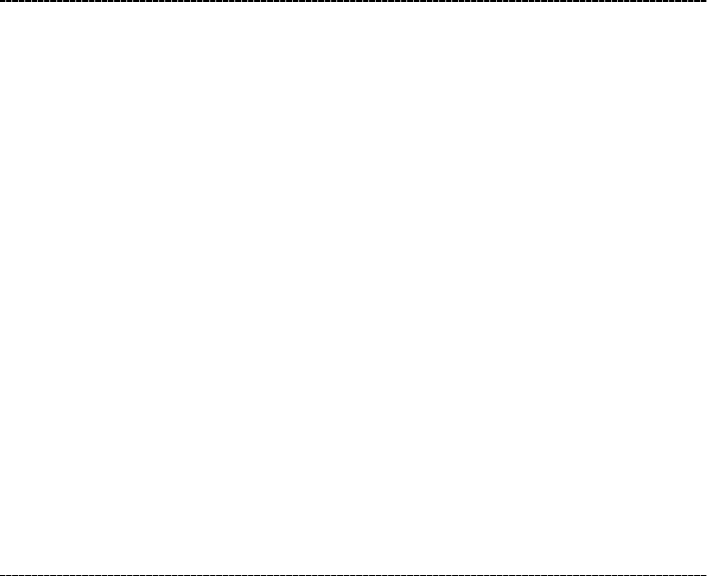
802.11ac80



CH38



CH42

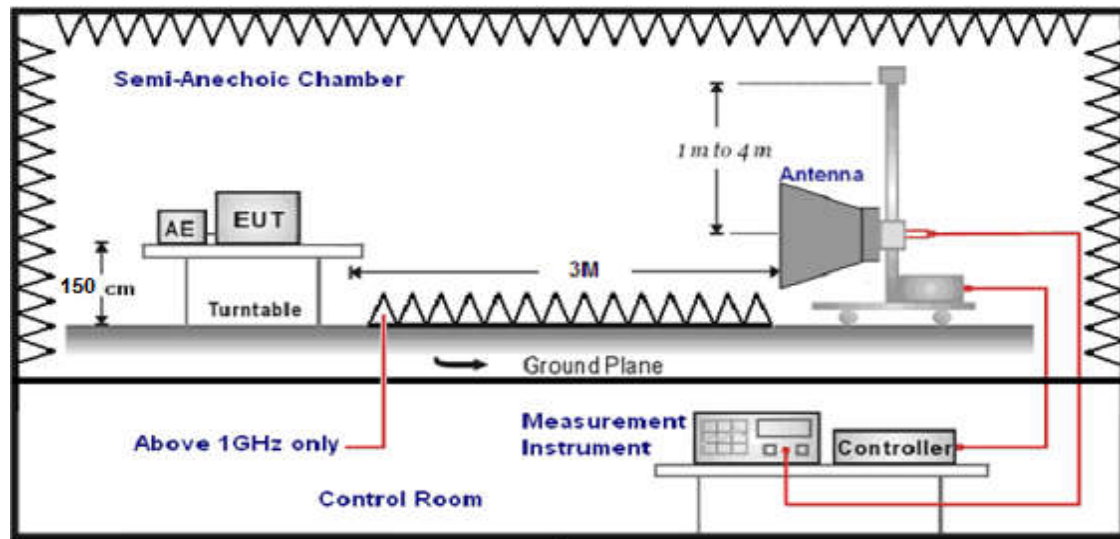


CH46



4.8. Band Edge Compliance

TEST CONFIGURATION



LIMIT

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz})) + 40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz})) + 40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30) + 40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

According to §15.407 (b): Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits

Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dBμV/m)
5150-5250	-27	68.2
5250-5350	-27	68.2
5470-5725	-27	68.2
5725-5850	-27 (beyond 10MHz of the bandedge)	68.2
	-17 (within 10 MHz of band edge)	78.2

TEST PROCEDURE

1. The EUT was placed on a turn table which is 1.5m above 1GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed..
5. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
1GHz-18GHz	Double Ridged Horn Antenna	3

6. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
1GHz-18GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

TEST RESULTS

Remark:For radiated bandedge We measured at both mode, recorded worst case at MIMO 802.11 ac20 mode;

For Radiated Bandedge Measurement

802.11 ac20/ Channel 36 :5180 MHz									
Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector	Polarization
4500.0	35.24	35.58	29.04	8.28	50.06	68.20	-18.14	Peak	Horizontal
4500.0	30.19	35.58	29.04	8.28	45.01	54.00	-8.99	AV	Horizontal
5150.0	39.14	35.58	29.04	8.28	53.96	68.20	-14.24	Peak	Horizontal
5150.0	30.48	35.58	29.04	8.28	45.30	54.00	-8.70	AV	Horizontal

802.11 ac20/ Channel 48 :5240 MHz									
Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector	Polarization
5350.0	35.28	35.42	29.06	8.39	50.03	68.20	-18.17	Peak	Horizontal
5350.0	30.32	35.42	29.06	8.39	45.07	54.00	-8.93	AV	Horizontal
5460.0	39.01	35.42	29.06	8.39	53.76	68.20	-14.44	Peak	Horizontal
5460.0	30.68	35.42	29.06	8.39	45.43	54.00	-8.57	AV	Horizontal

802.11 ac20/ Channel 149 :5745 MHz									
Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector	Polarization
5650.0	35.19	35.29	29.13	8.65	50.00	68.20	-18.20	Peak	Horizontal
5700.0	30.29	35.29	29.13	8.65	45.10	68.20	-23.10	Peak	Horizontal
5720.0	39.20	35.29	29.13	8.65	54.01	68.20	-14.19	Peak	Horizontal
5725.0	30.51	35.29	29.13	8.65	45.32	68.20	-22.88	Peak	Horizontal

802.11 ac20/ Channel 165 :5825 MHz									
Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector	Polarization
5850.0	35.15	35.29	29.18	8.80	50.06	68.20	-18.14	Peak	Horizontal
5855.0	30.23	35.29	29.18	8.80	45.14	68.20	-23.06	Peak	Horizontal
5875.0	39.20	35.29	29.18	8.80	54.11	68.20	-14.09	Peak	Horizontal
5925.0	30.55	35.29	29.18	8.80	45.46	68.20	-22.74	Peak	Horizontal

REMARKS:

1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. The other emission levels were very low against the limit.
3. The average measurement was not performed when the peak measured data under the limit of average detection.
4. Detector AV is setting spectrum/receiver. RBW=1MHz/VBW=10Hz/Sweep time=Auto/Detector=Peak;