

## **APPENDIX A – TEST DATA OF CONDUCTED EMISSION**

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Data rate below means worst-case rate of each test item.

Worst-case data rates are shown as following table.

Test Mode	Data Rate
802.11a	6Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

We chose the Worst-modes are shown as following table:

Test Mode	Chain	Note
802.11a	Chian0/Chain1	---
802.11n HT20	Chian0/Chain1	Cover 802.11ac VHT20
802.11n HT40	Chian0/Chain1	Cover 802.11ac VHT40
802.11ac VHT80	Chian0/Chain1	---

### **Directional gain**

Band	Chain0 Ant Gain (dBi)	Chain1 Ant Gain (dBi)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit
5.2GHz	3.0	3.0	6.0	30.0	17.0(dBm/MHz)
5.8GHz	3.0	3.0	6.0	30.0	30.0(dBm/500kHz)

### **Duty cycle**

Test Mode	Duty Cycle (%)	Correction Factor(dB)
802.11a	95.07	0.22
802.11n HT20	94.74	0.23
802.11n HT40	89.90	0.46
802.11ac VHT20	95.00	0.22
802.11ac VHT40	90.76	0.42
802.11ac VHT80	83.14	0.80

**Output Power  
UNII-1**

Mode	Freq. (MHz)	Average power output(dBm)		
		Chain0	Chain1	MIMO
802.11a	5180	14.49	14.35	NA
	5220	14.61	14.29	NA
	5240	14.57	14.27	NA
802.11n HT20	5180	14.27	14.20	17.25
	5220	14.38	14.19	17.30
	5240	14.33	14.21	17.28
802.11n HT40	5190	15.02	15.08	18.06
	5230	15.15	14.97	18.07
802.11ac VHT20	5180	14.29	14.17	17.24
	5220	14.34	14.15	17.26
	5240	14.31	14.11	17.22
802.11ac VHT40	5190	14.95	15.00	17.99
	5230	15.09	14.89	18.00
802.11ac VHT80	5210	14.88	14.71	17.81

**UNII-3**

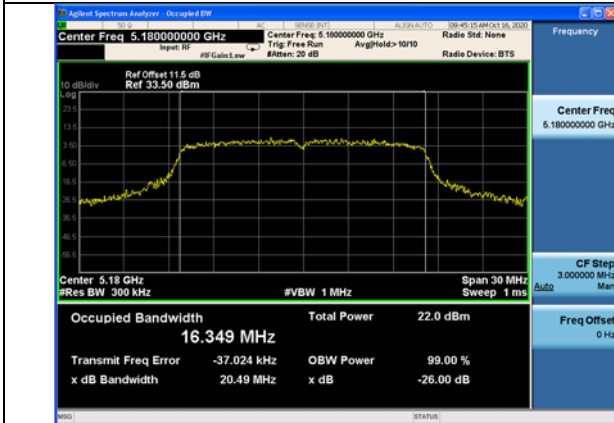
Mode	Freq. (MHz)	Average power output(dBm)		
		Chain0	Chain1	MIMO
802.11a	5745	14.49	14.34	NA
	5785	14.43	14.43	NA
	5805	14.55	14.45	NA
802.11n HT20	5745	14.25	14.05	17.16
	5785	14.21	14.25	17.24
	5805	14.28	14.20	17.25
802.11n HT40	5755	14.98	14.74	17.87
	5795	15.09	14.97	18.04
802.11ac VHT20	5745	14.23	14.01	17.13
	5785	14.14	14.23	17.20
	5805	14.26	14.16	17.22
802.11ac VHT40	5755	14.90	14.67	17.80
	5795	15.03	14.90	17.98
802.11ac VHT80	5775	14.64	14.58	17.62

**Occupied Bandwidth  
UNII-1**

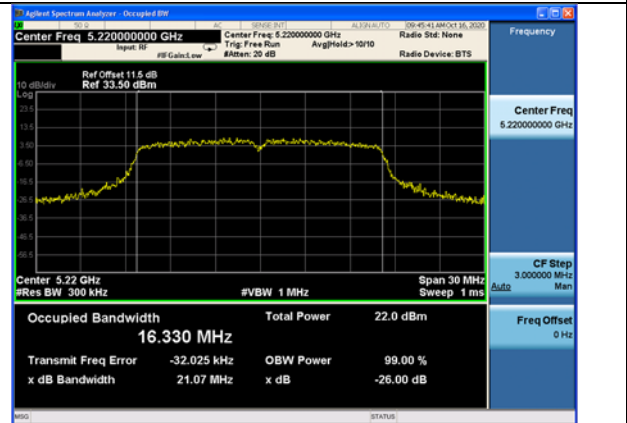
Offset 11.5dB = Attenuator 10dB+ Temporary antenna connector loss 0.5dB+ Cable loss 1dB  
Test Mode: 802.11a

Carrier frequency (MHz)	Channel No.	26dB Bandwidth (MHz) Chain0	26dB Bandwidth (MHz) Chain1
5180	36	20.49	23.25
5220	44	21.07	22.77
5240	48	20.87	22.75

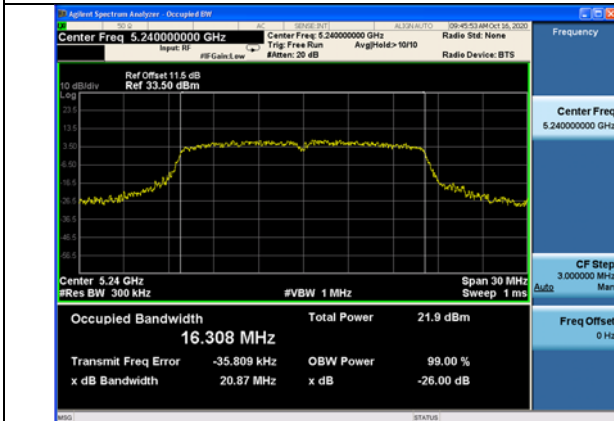
Test Mode: 802.11a Chain0



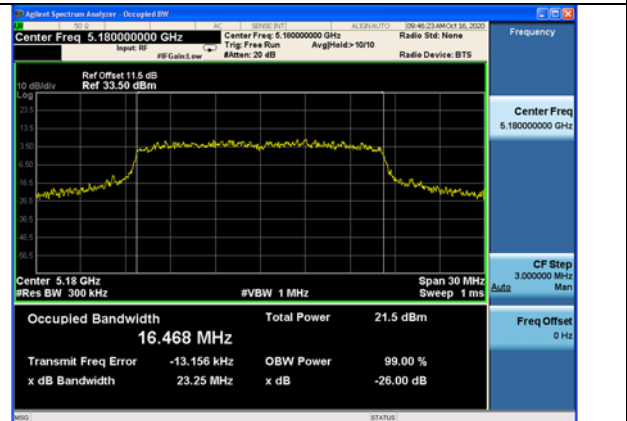
Test Mode: 802.11a Chain0



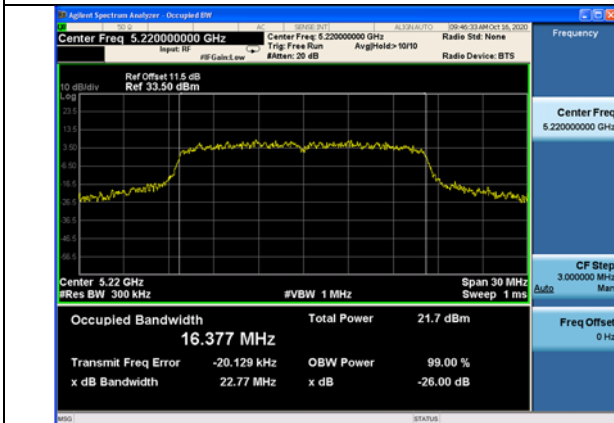
Test Mode: 802.11a Chain0



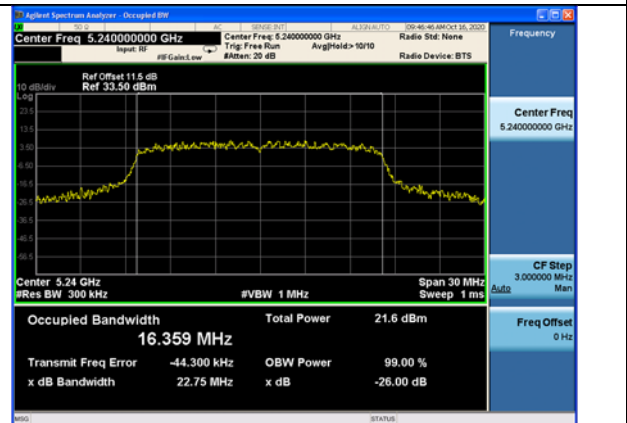
Test Mode: 802.11a Chain1



Test Mode: 802.11a Chain1



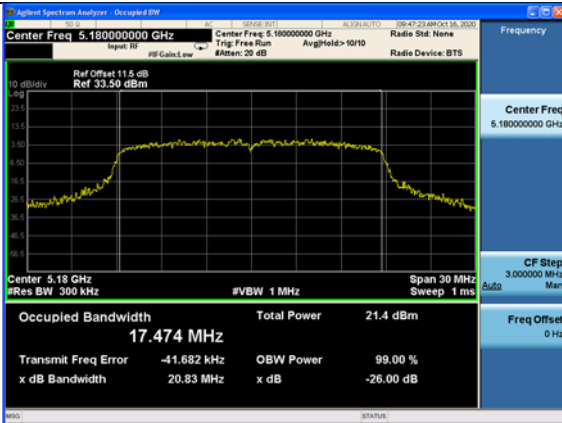
Test Mode: 802.11a Chain1



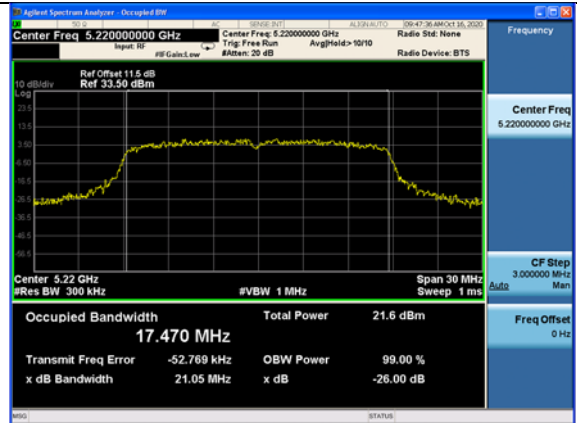
Test Mode: 802.11n HT20

Carrier frequency (MHz)	Channel No.	26dB Bandwidth (MHz) Chain0	26dB Bandwidth (MHz) Chain1
5180	36	20.83	22.91
5220	44	21.05	21.94
5240	48	20.80	22.10

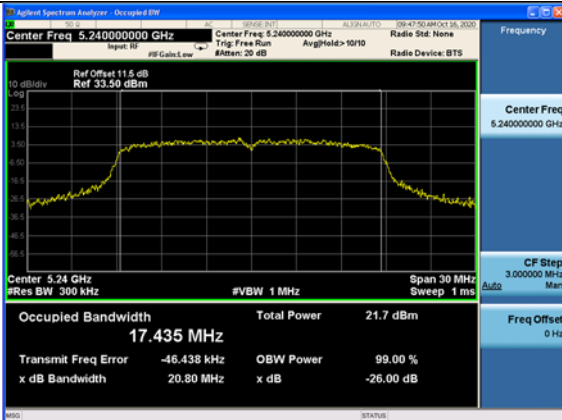
Test Mode: 802.11n HT20 Chain0



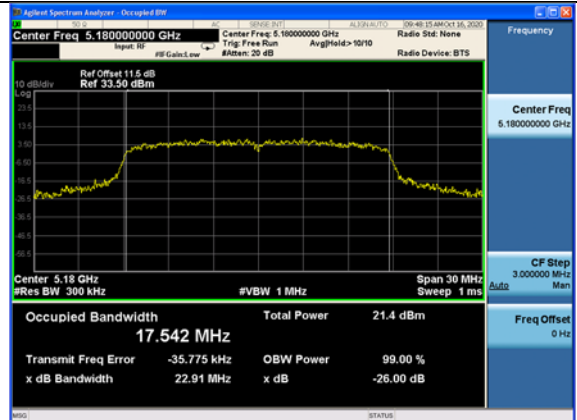
Test Mode: 802.11n HT20 Chain0



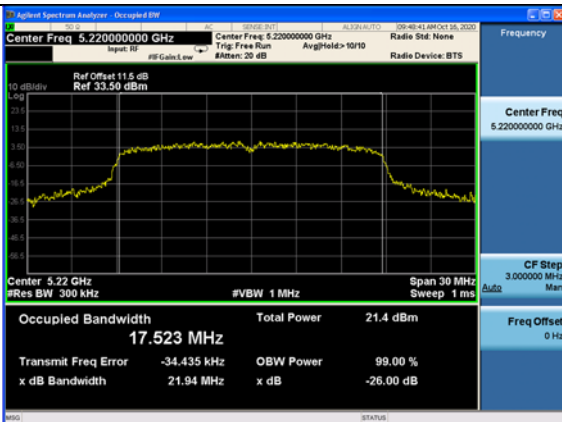
Test Mode: 802.11n HT20 Chain0



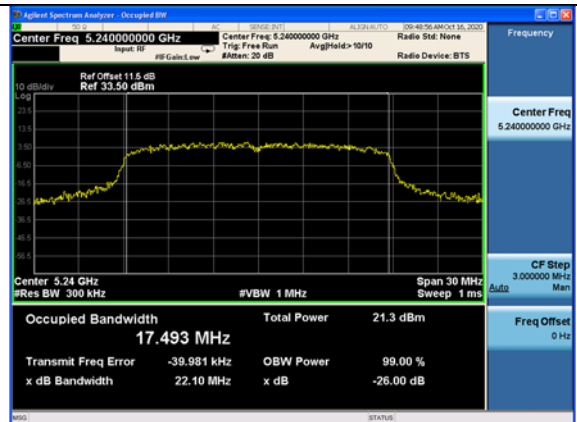
Test Mode: 802.11n HT20 Chain1



Test Mode: 802.11n HT20 Chain1



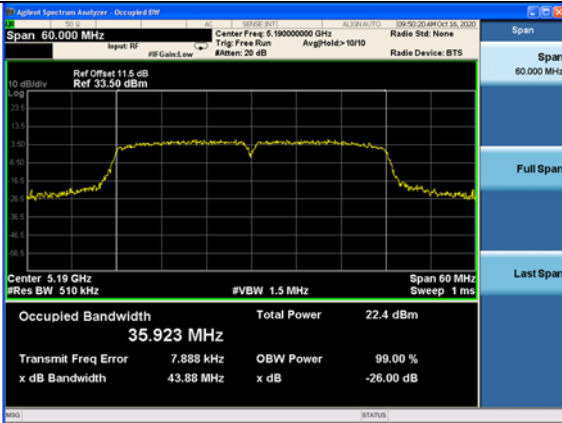
Test Mode: 802.11n HT20 Chain1



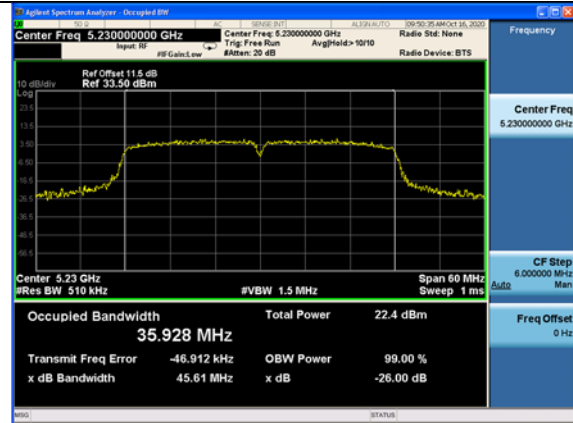
Test Mode: 802.11n HT40

Carrier frequency (MHz)	Channel No.	26dB Bandwidth (MHz) Chain0	26dB Bandwidth (MHz) Chain1
5190	38	43.88	60.00
5230	46	45.61	58.62

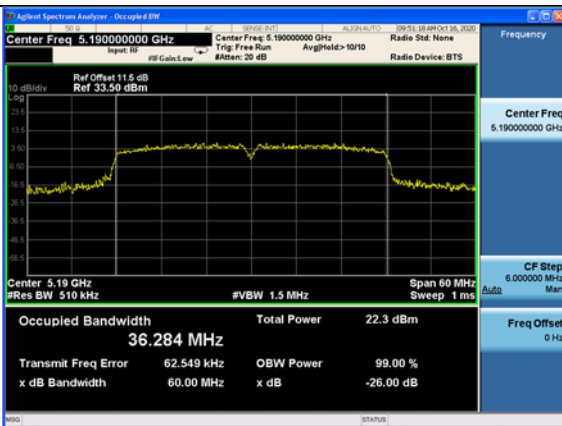
Test Mode: 802.11n HT40 Chain0



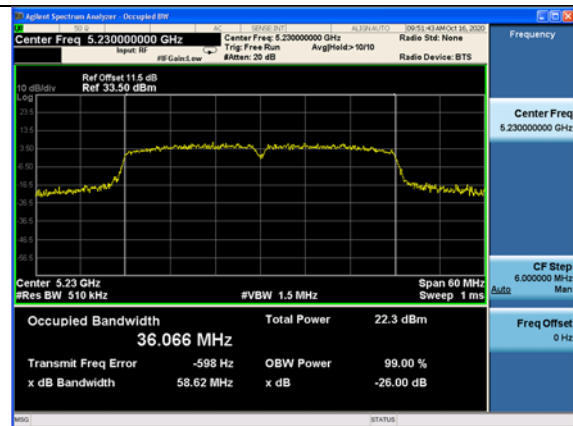
Test Mode: 802.11n HT40 Chain0



Test Mode: 802.11n HT40 Chain1



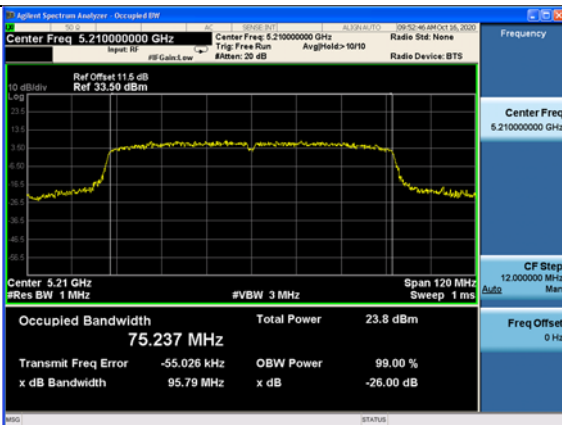
Test Mode: 802.11n HT40 Chain1



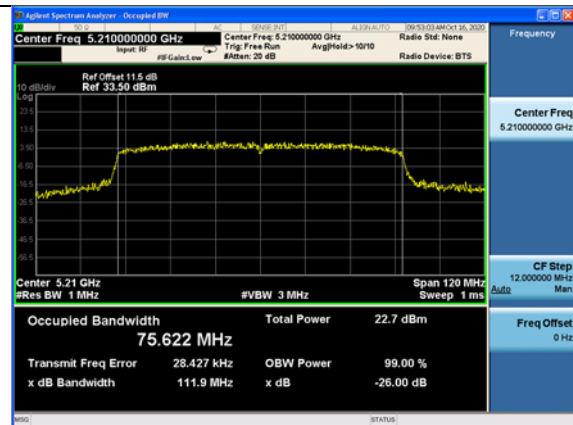
Test Mode: 802.11ac VHT80

Carrier frequency (MHz)	Channel No.	26dB Bandwidth (MHz) Chain0	26dB Bandwidth (MHz) Chain1
5190	42	95.79	111.90

Test Mode: 802.11ac VHT80 Chain0



Test Mode: 802.11ac VHT80 Chain1



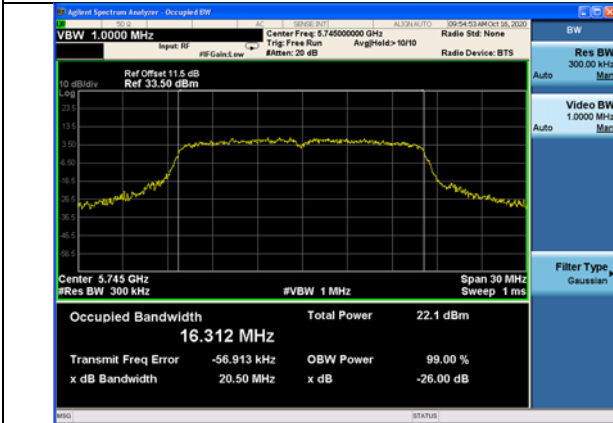


**UNII-3**

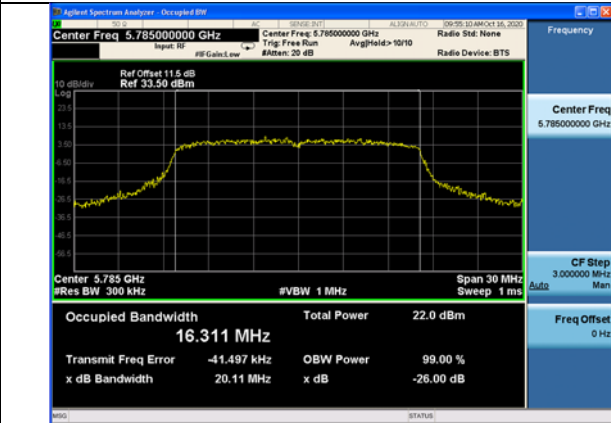
Offset 11.5dB = Attenuator 10dB+ Temporary antenna connector loss 0.5dB+ Cable loss 1dB  
Test Mode: 802.11a

Carrier frequency (MHz)	Channel No.	26dB Bandwidth (MHz) Chain0	26dB Bandwidth (MHz) Chain1
5745	149	20.50	20.14
5785	157	20.11	19.88
5805	161	20.14	20.20

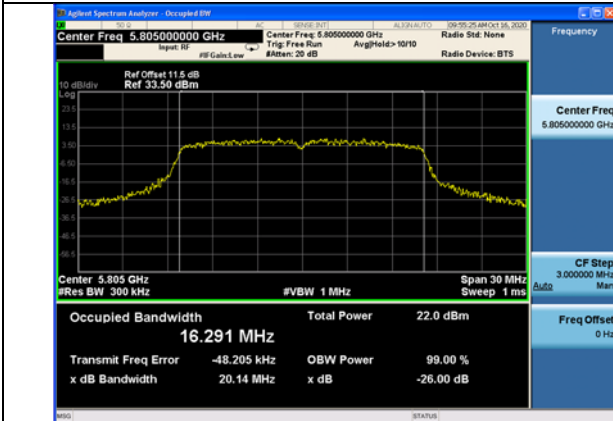
Test Mode: 802.11a Chain0



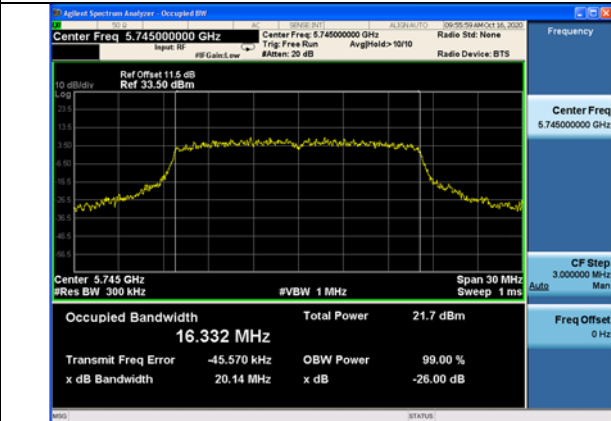
Test Mode: 802.11a Chain0



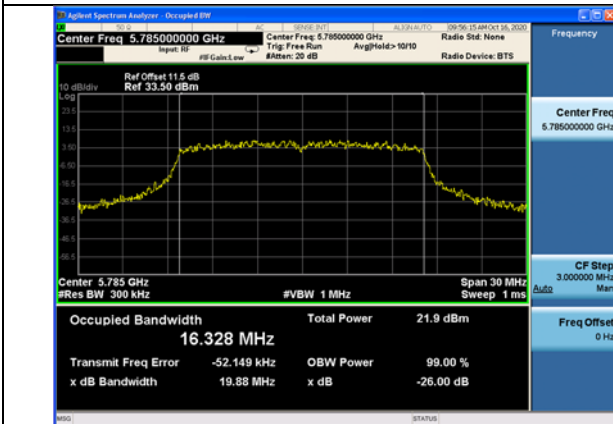
Test Mode: 802.11a Chain0



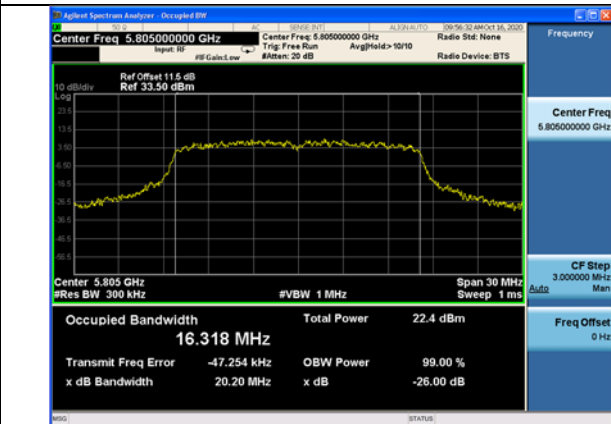
Test Mode: 802.11a Chain1



Test Mode: 802.11a Chain1



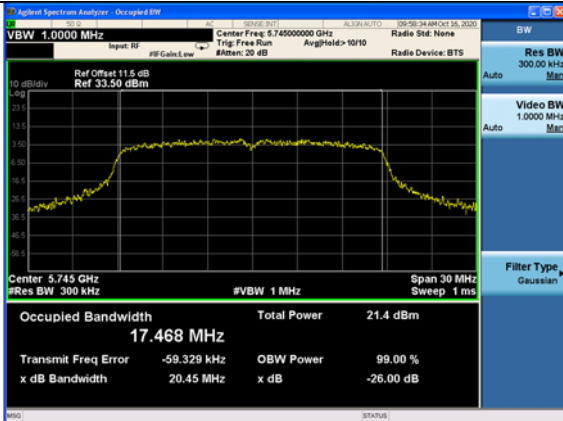
Test Mode: 802.11a Chain1



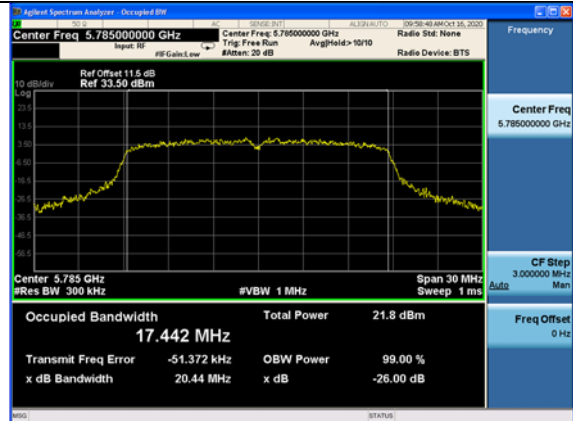
Test Mode: 802.11n HT20

Carrier frequency (MHz)	Channel No.	26dB Bandwidth (MHz) Chain0	26dB Bandwidth (MHz) Chain1
5745	149	20.45	20.48
5785	157	20.44	20.17
5805	161	20.52	20.24

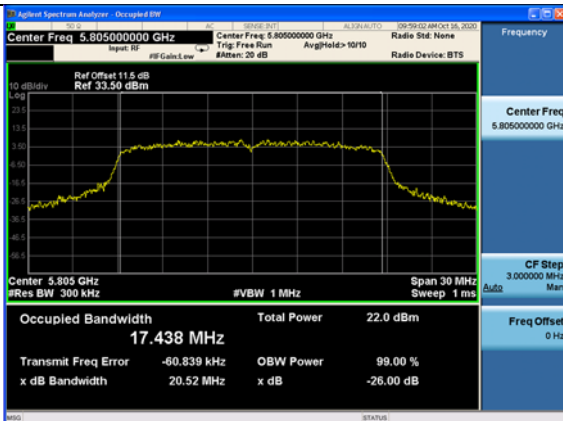
Test Mode: 802.11n HT20 Chain0



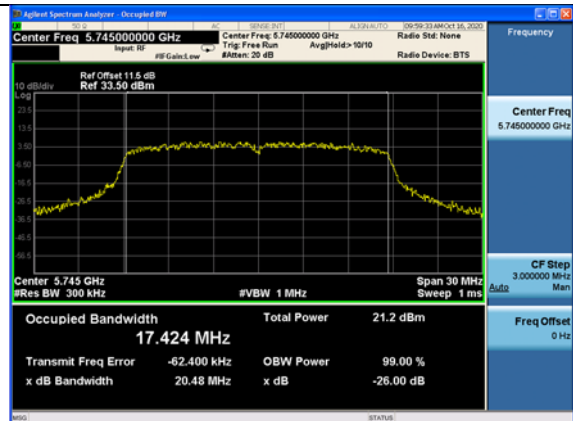
Test Mode: 802.11n HT20 Chain0



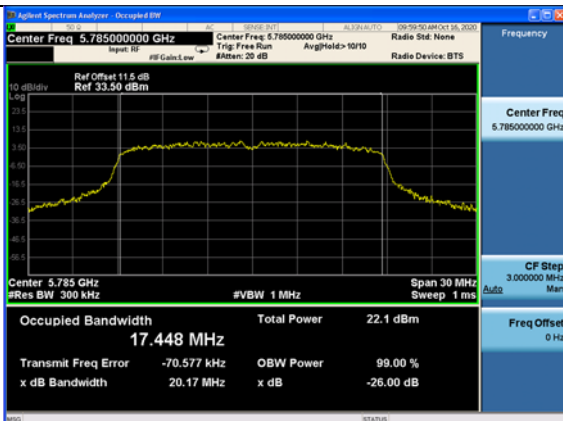
Test Mode: 802.11n HT20 Chain0



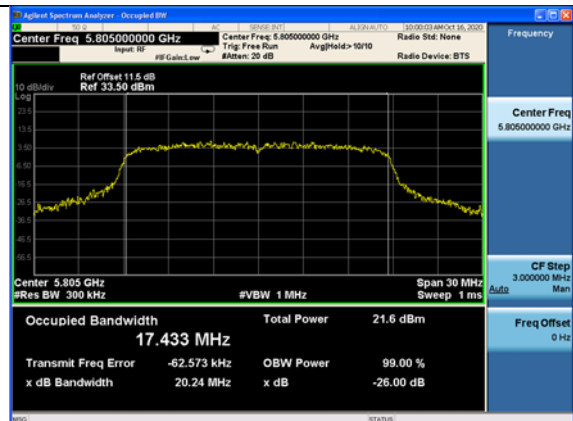
Test Mode: 802.11n HT20 Chain1



Test Mode: 802.11n HT20 Chain1



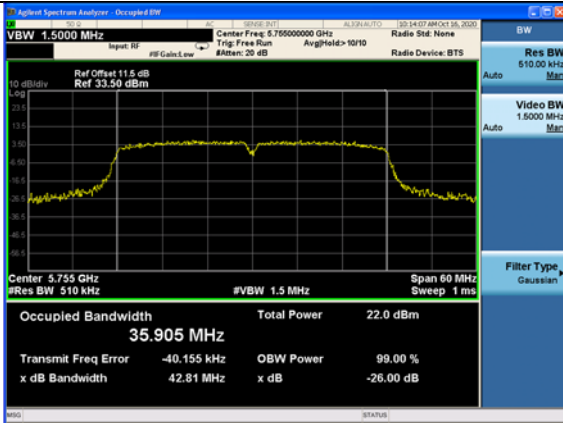
Test Mode: 802.11n HT20 Chain1



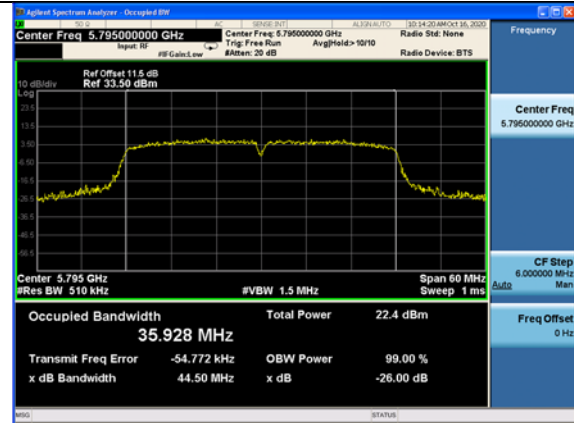
Test Mode: 802.11n HT40

Carrier frequency (MHz)	Channel No.	26dB Bandwidth (MHz) Chain0	26dB Bandwidth (MHz) Chain1
5755	151	42.81	40.86
5795	159	44.50	41.01

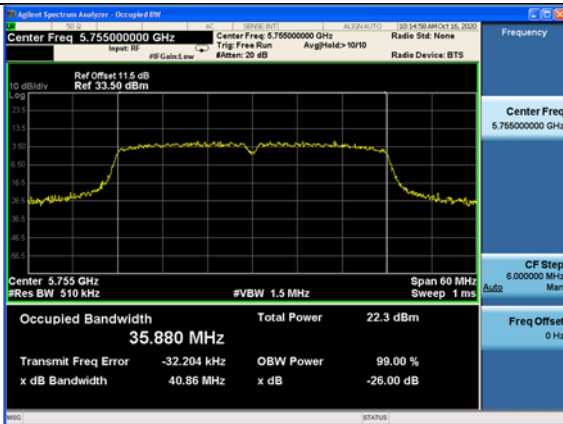
Test Mode: 802.11n HT40 Chain0



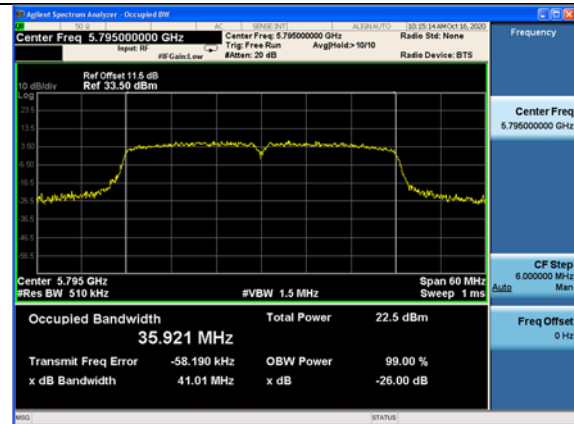
Test Mode: 802.11n HT40 Chain0



Test Mode: 802.11n HT40 Chain1



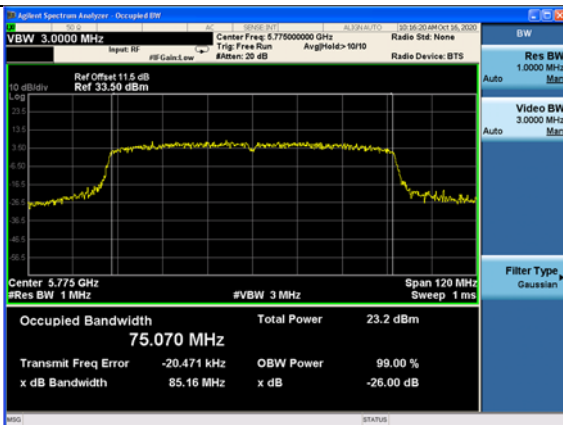
Test Mode: 802.11n HT40 Chain1



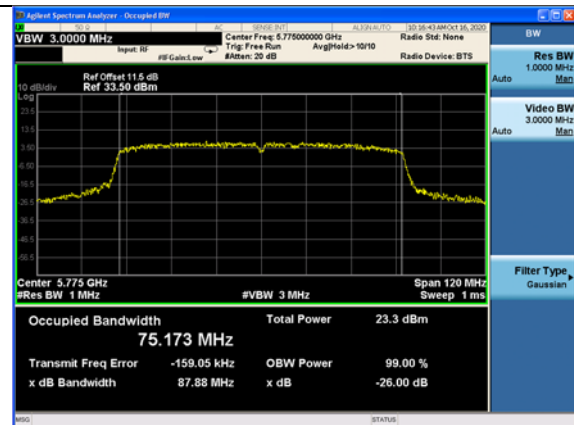
Test Mode: 802.11ac VHT80

Carrier frequency (MHz)	Channel No.	26dB Bandwidth (MHz) Chain0	26dB Bandwidth (MHz) Chain1
5775	155	85.16	87.88

Test Mode: 802.11ac VHT80 Chain0



Test Mode: 802.11ac VHT80 Chain1



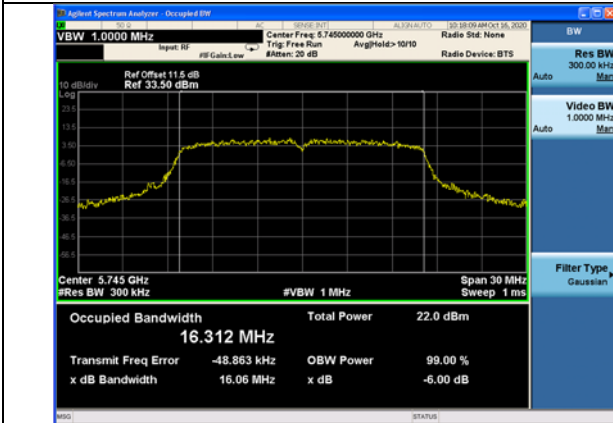


**6dB Bandwidth  
UNII-3**

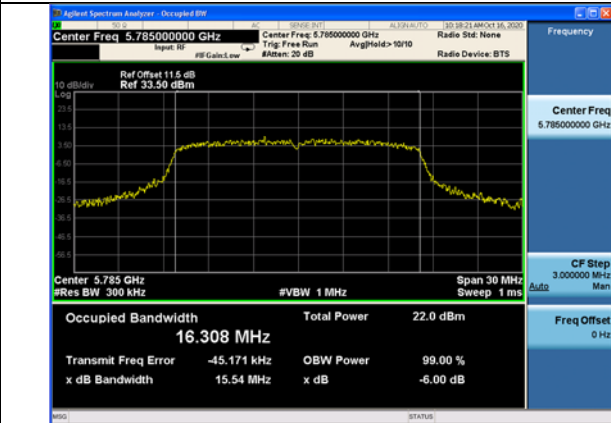
Offset 11.5dB = Attenuator 10dB+ Temporary antenna connector loss 0.5dB+ Cable loss 1dB  
Test Mode: 802.11a

Carrier frequency (MHz)	Channel No.	6dB Bandwidth (MHz) Chain0	6dB Bandwidth (MHz) Chain1
5745	149	16.06	15.96
5785	157	15.54	16.13
5805	161	15.72	16.11

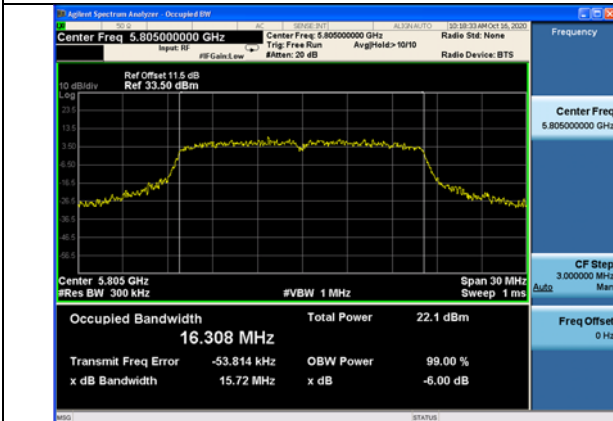
Test Mode: 802.11a Chain0



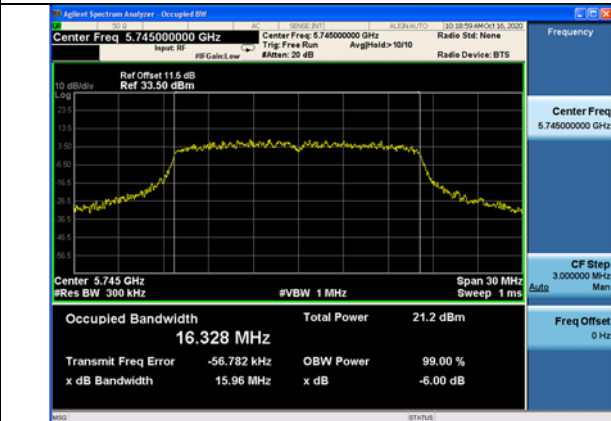
Test Mode: 802.11a Chain0



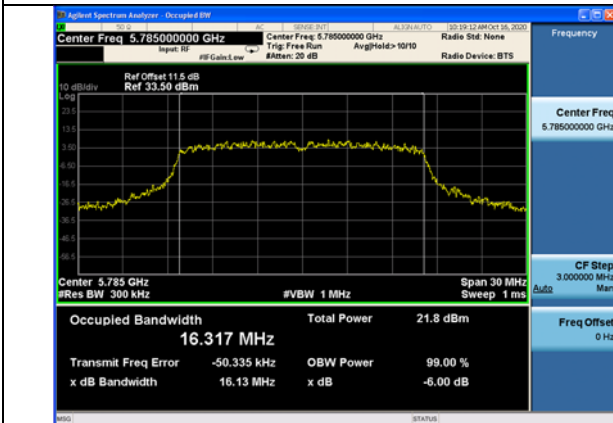
Test Mode: 802.11a Chain0



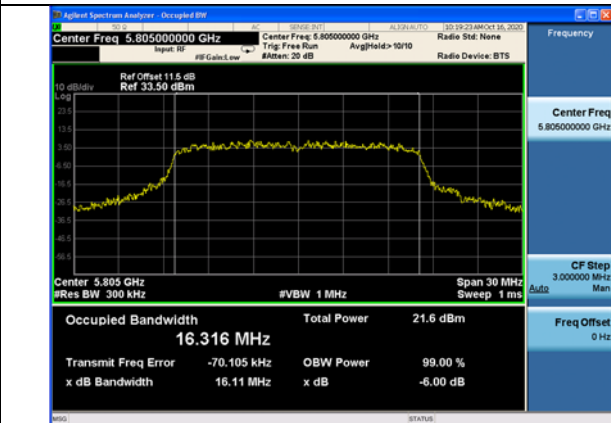
Test Mode: 802.11a Chain1



Test Mode: 802.11a Chain1



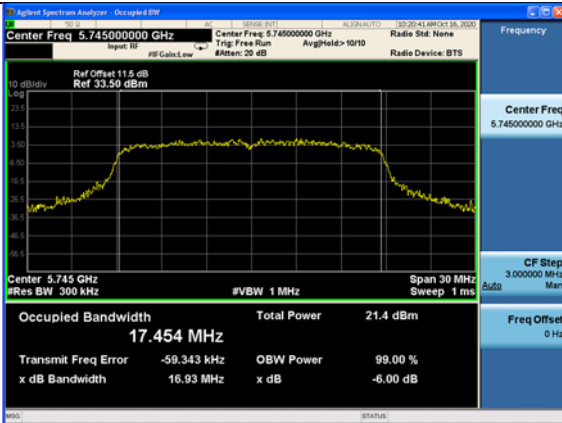
Test Mode: 802.11a Chain1



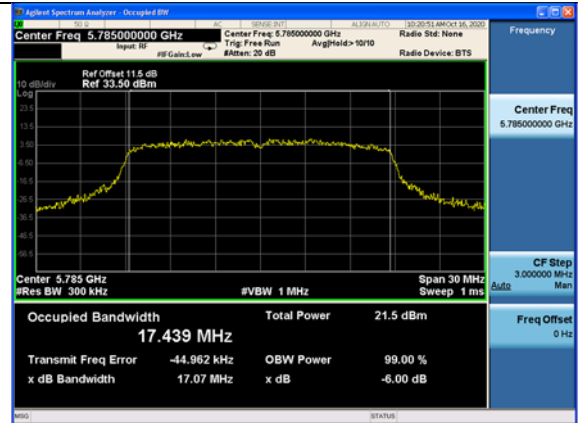
Test Mode: 802.11n HT20

Carrier frequency (MHz)	Channel No.	6dB Bandwidth (MHz) Chain0	6dB Bandwidth (MHz) Chain1
5745	149	16.93	17.02
5785	157	17.07	16.55
5805	161	16.76	16.93

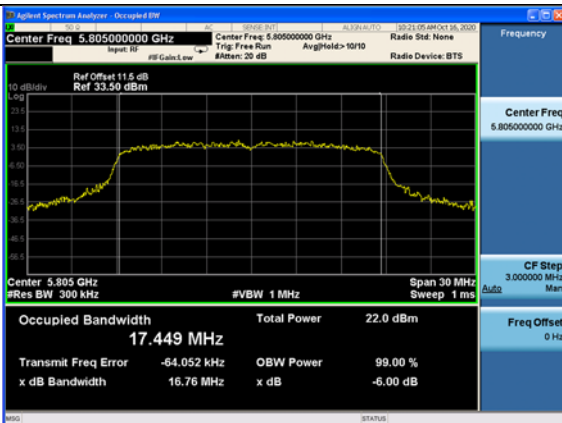
Test Mode: 802.11n HT20 Chain0



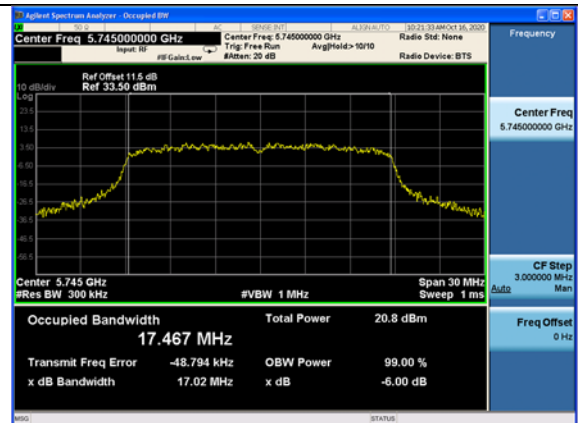
Test Mode: 802.11n HT20 Chain0



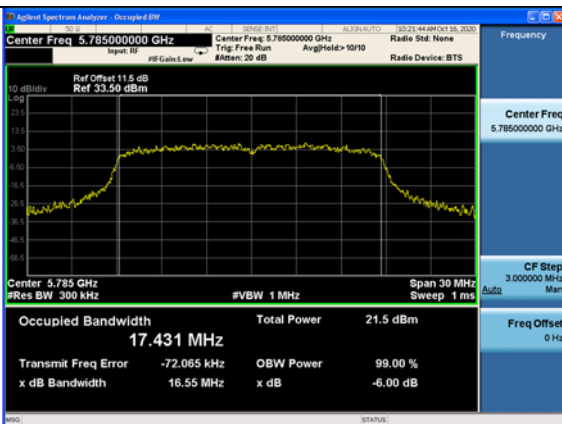
Test Mode: 802.11n HT20 Chain0



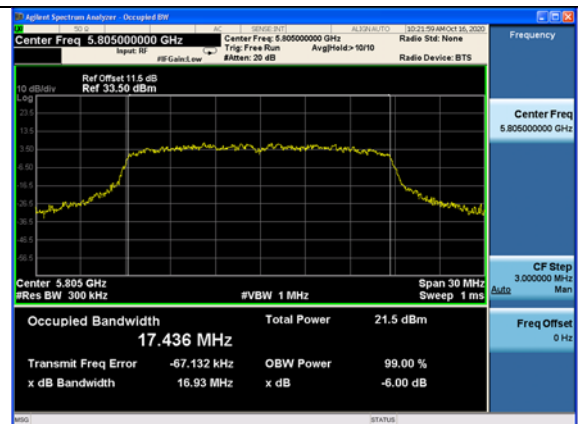
Test Mode: 802.11n HT20 Chain1



Test Mode: 802.11n HT20 Chain1



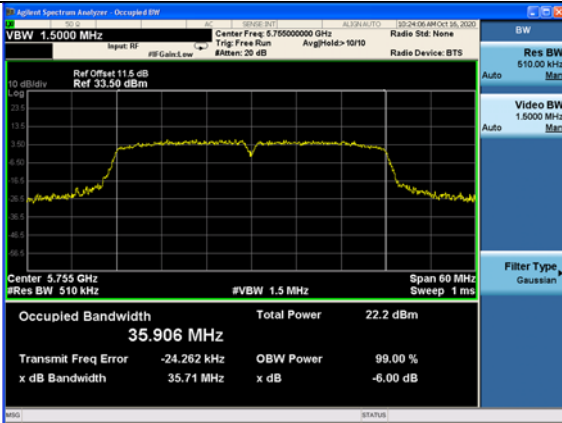
Test Mode: 802.11n HT20 Chain1



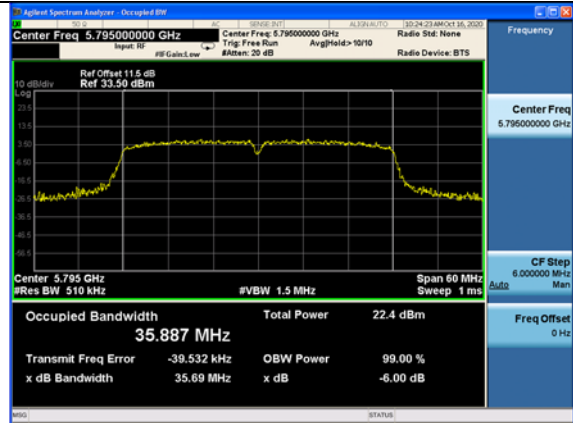
Test Mode: 802.11n HT40

Carrier frequency (MHz)	Channel No.	6dB Bandwidth (MHz) Chain0	6dB Bandwidth (MHz) Chain1
5755	151	35.71	35.41
5795	159	35.69	35.67

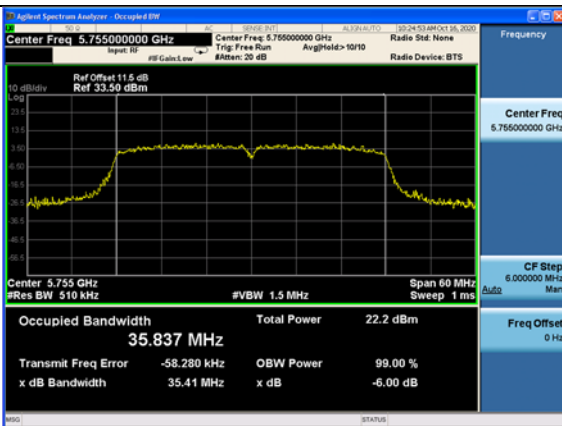
Test Mode: 802.11n HT40 Chain0



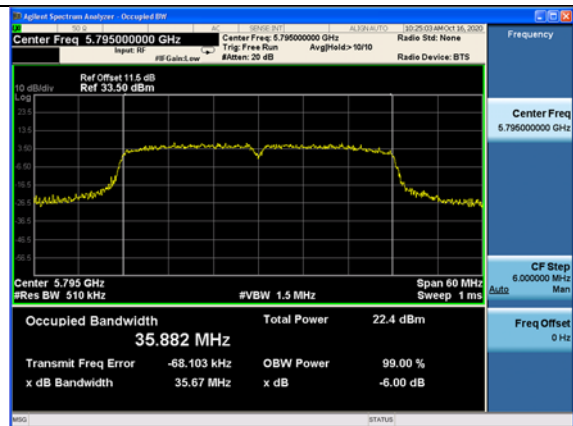
Test Mode: 802.11n HT40 Chain0



Test Mode: 802.11n HT40 Chain1



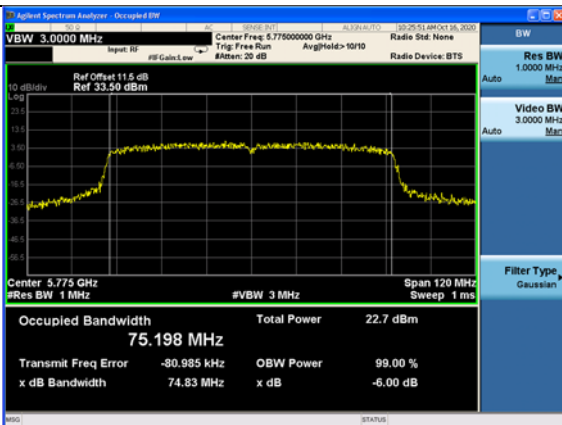
Test Mode: 802.11n HT40 Chain1



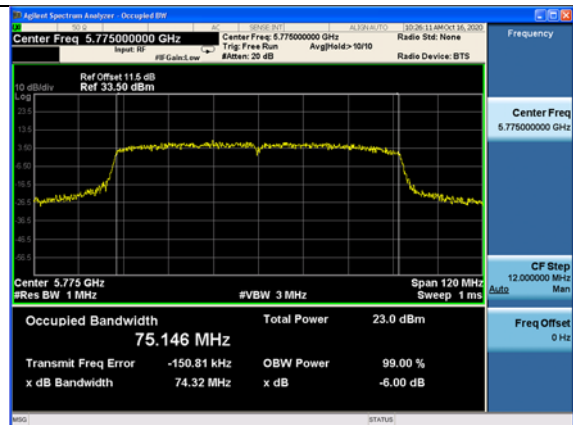
Test Mode: 802.11ac VHT80

Carrier frequency (MHz)	Channel No.	6dB Bandwidth (MHz) Chain0	6dB Bandwidth (MHz) Chain1
5775	155	74.83	74.32

Test Mode: 802.11ac VHT80 Chain0



Test Mode: 802.11ac VHT80 Chain1



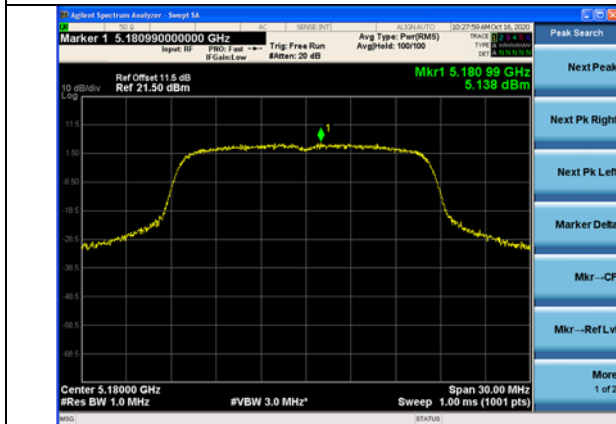
### Transmitter Power Spectral Density UNII-1

Offset 11.5dB = Attenuator 10dB+ Temporary antenna connector loss 0.5dB+ Cable loss 1dB

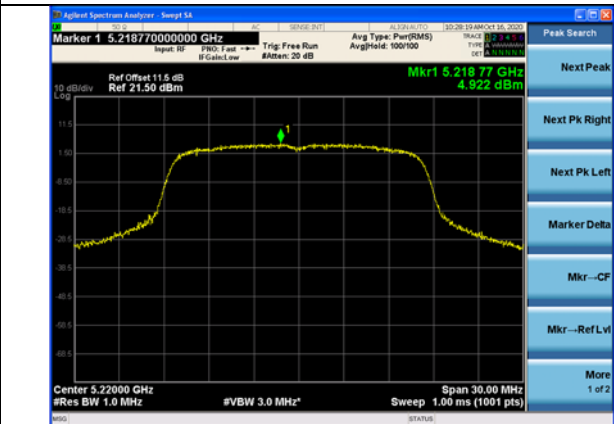
Test Mode: 802.11a

Carrier frequency (MHz)	Correction Factor(dB)	Power Density (dBm) Chain0	Power Density (dBm) Chain1
5180	0.22	5.358	5.818
5220	0.22	5.142	5.398
5240	0.22	5.531	5.145

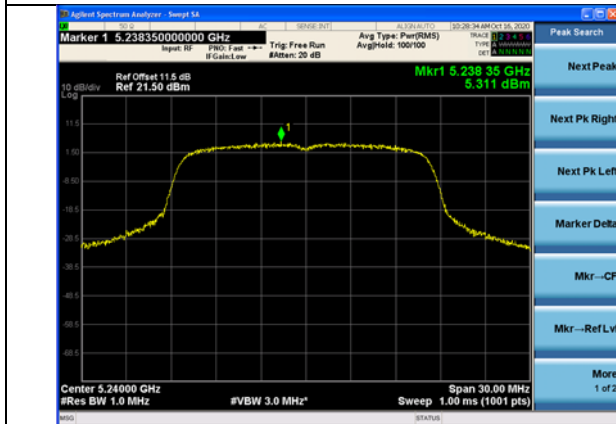
Test Mode: 802.11a Chain0



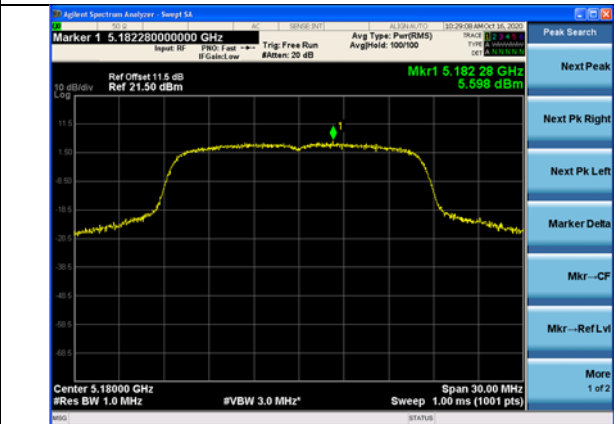
Test Mode: 802.11a Chain0



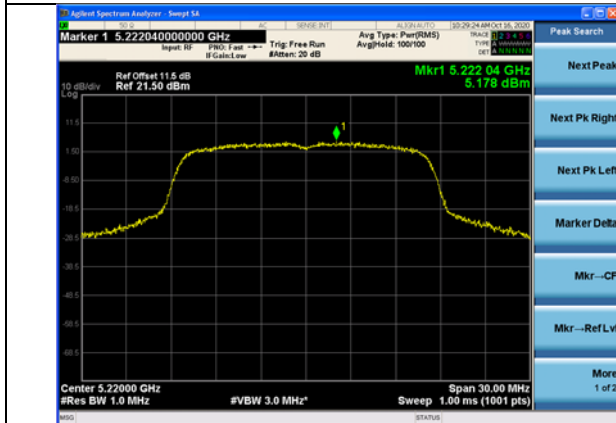
Test Mode: 802.11a Chain0



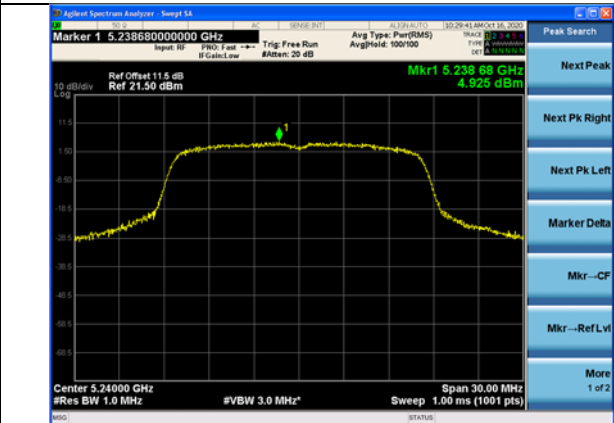
Test Mode: 802.11a Chain1



Test Mode: 802.11a Chain1



Test Mode: 802.11a Chain1

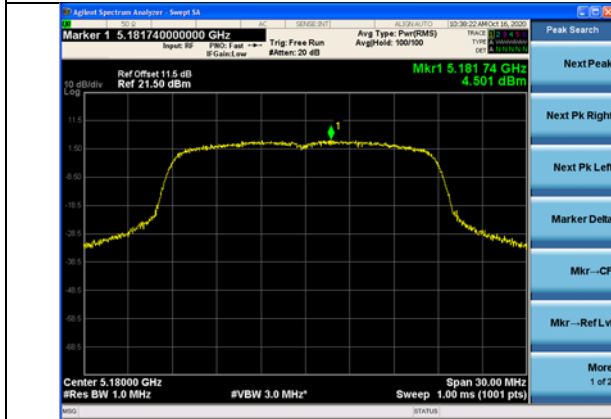




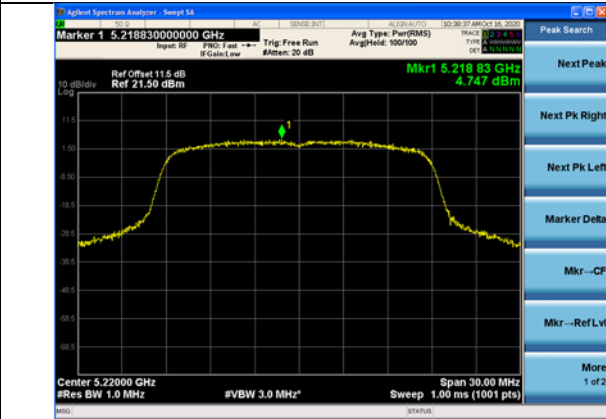
Test Mode: 802.11n HT20

Carrier frequency (MHz)	Correction Factor(dB)	Power Density (dBm) Chain0	Power Density (dBm) Chain1	Power Density (dBm) MIMO
5180	0.23	4.731	4.606	7.679
5220	0.23	4.977	4.715	7.858
5240	0.23	5.233	4.707	7.988

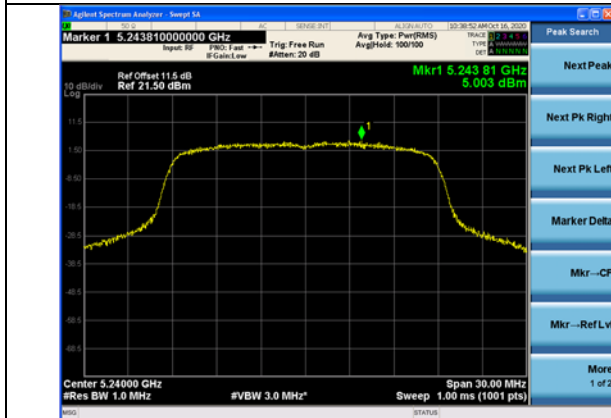
Test Mode: 802.11n HT20 Chain0



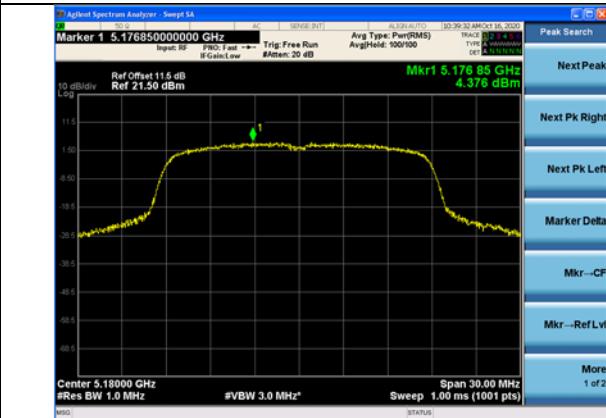
Test Mode: 802.11n HT20 Chain0



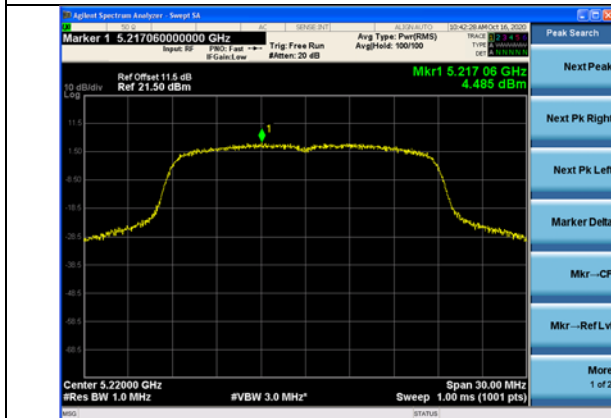
Test Mode: 802.11n HT20 Chain0



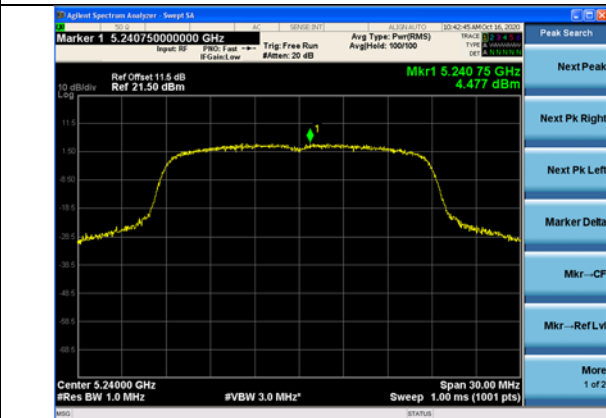
Test Mode: 802.11n HT20 Chain1



Test Mode: 802.11n HT20 Chain1



Test Mode: 802.11n HT20 Chain1

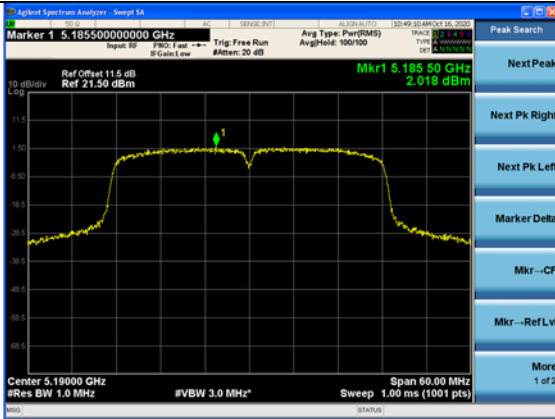




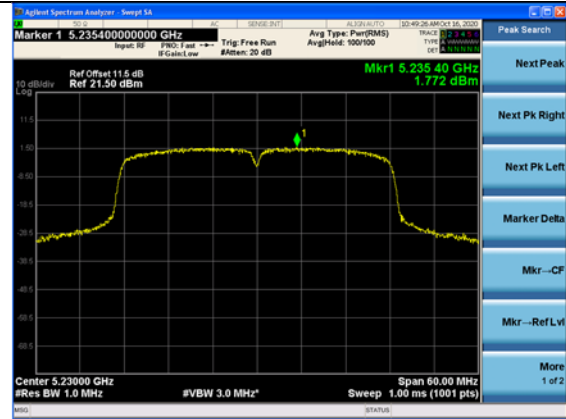
Test Mode: 802.11n HT40

Carrier frequency (MHz)	Correction Factor(dB)	Power Density (dBm) Chain0	Power Density (dBm) Chain1	Power Density (dBm) MIMO
5190	0.46	2.478	2.301	5.401
5230	0.46	2.232	2.396	5.325

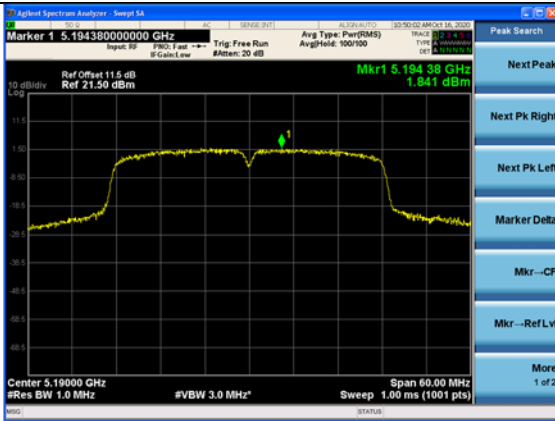
Test Mode: 802.11n HT40 Chain0



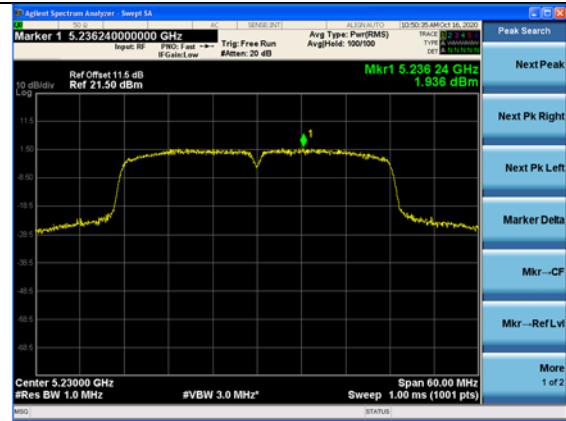
Test Mode: 802.11n HT40 Chain0



Test Mode: 802.11n HT40 Chain1



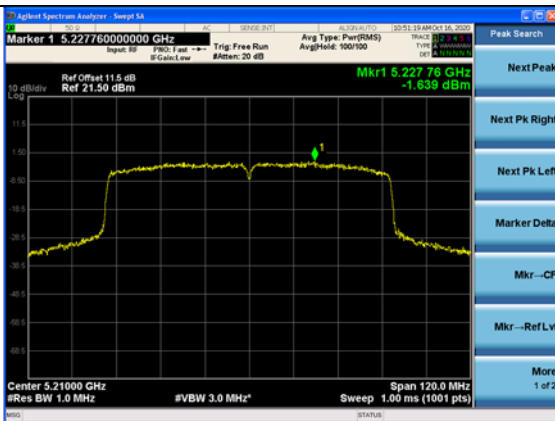
Test Mode: 802.11n HT40 Chain1



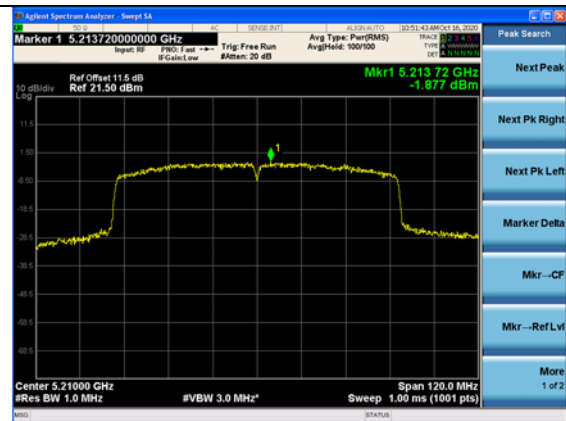
Test Mode: 802.11ac VHT80

Carrier frequency (MHz)	Correction Factor(dB)	Power Density (dBm) Chain0	Power Density (dBm) Chain1	Power Density (dBm) MIMO
5210	0.80	-0.839	-1.077	2.054

Test Mode: 802.11ac VHT80 Chain0



Test Mode: 802.11ac VHT80 Chain1

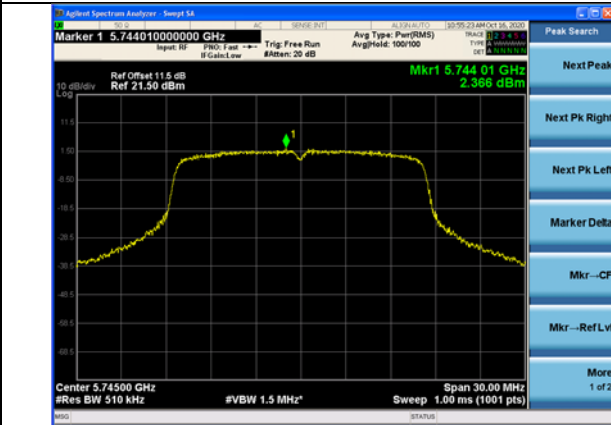


**UNII-3**

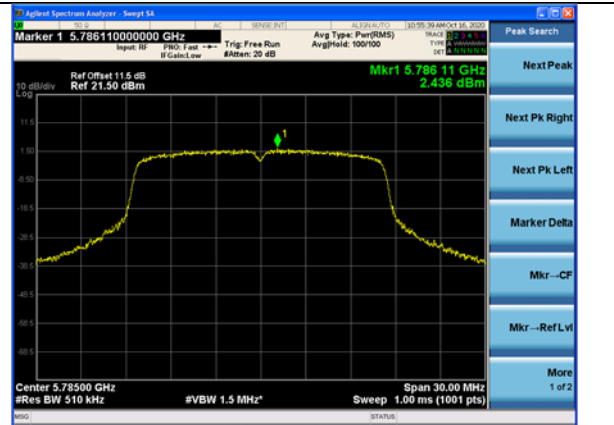
Offset 11.5dB = Attenuator 10dB+ Temporary antenna connector loss 0.5dB+ Cable loss 1dB  
Test Mode: 802.11a

Carrier frequency (MHz)	Correction Factor(dB)	Power Density (dBm) Chain0	Power Density (dBm) Chain1
5745	0.22	2.586	2.522
5785	0.22	2.656	2.550
5805	0.22	2.547	2.380

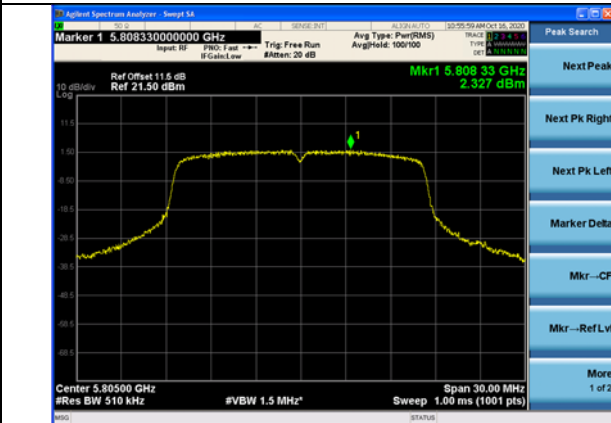
Test Mode: 802.11a Chain0



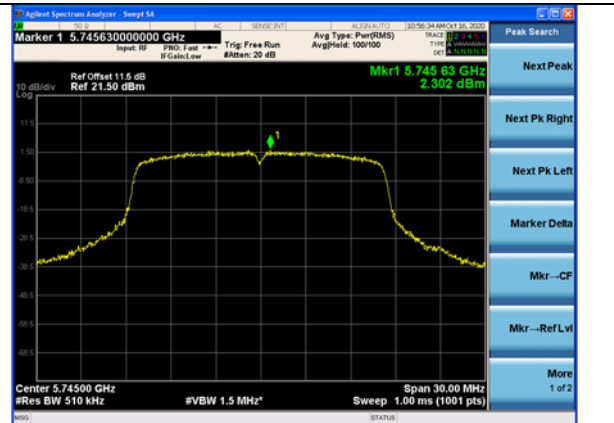
Test Mode: 802.11a Chain0



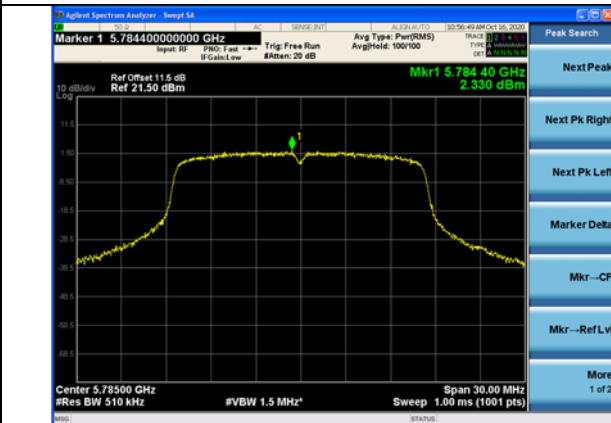
Test Mode: 802.11a Chain0



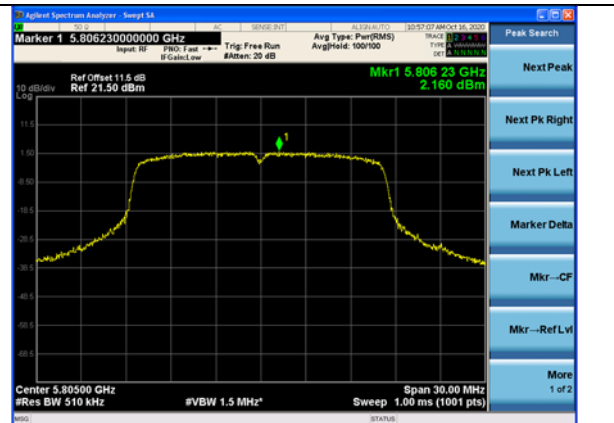
Test Mode: 802.11a Chain1



Test Mode: 802.11a Chain1



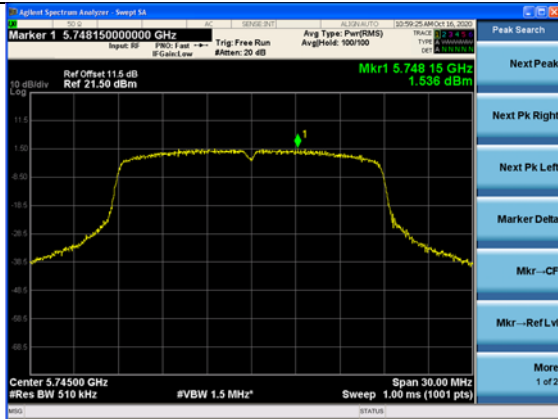
Test Mode: 802.11a Chain1



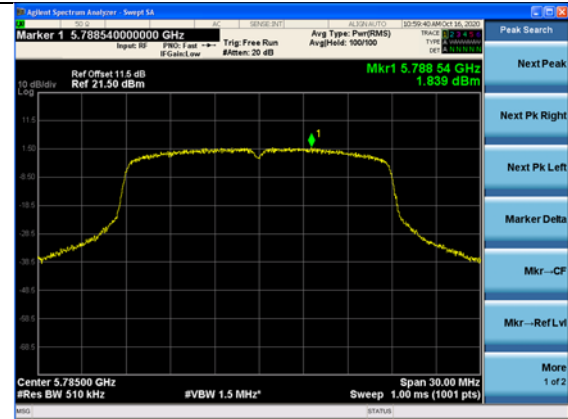
Test Mode: 802.11n HT20

Carrier frequency (MHz)	Correction Factor(dB)	Power Density (dBm) Chain0	Power Density (dBm) Chain1	Power Density (dBm) MIMO
5745	0.23	1.766	2.532	5.176
5785	0.23	2.069	2.560	5.332
5805	0.23	2.614	2.390	5.514

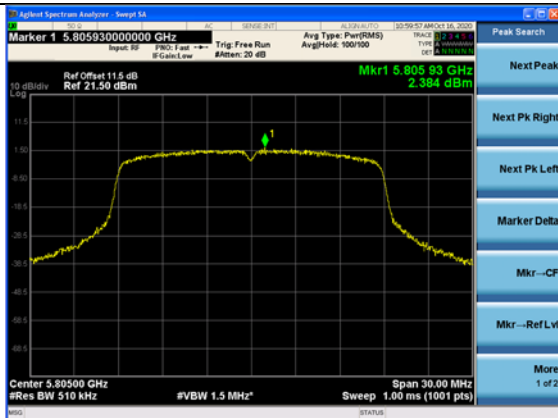
Test Mode: 802.11n HT20 Chain0



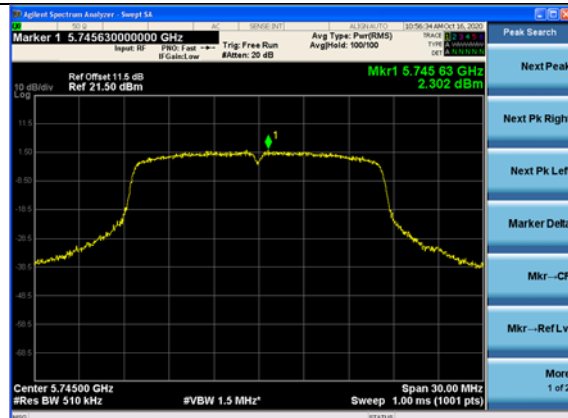
Test Mode: 802.11n HT20 Chain0



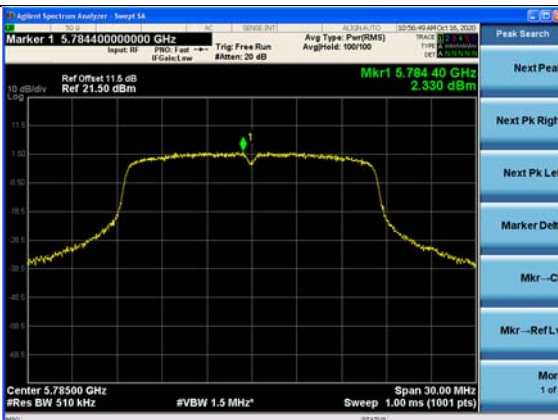
Test Mode: 802.11n HT20 Chain0



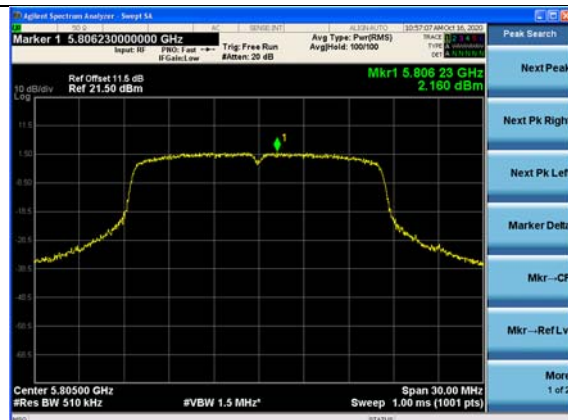
Test Mode: 802.11n HT20 Chain1



Test Mode: 802.11n HT20 Chain1



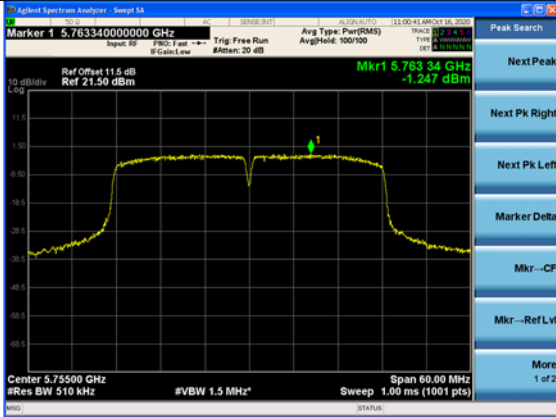
Test Mode: 802.11n HT20 Chain1



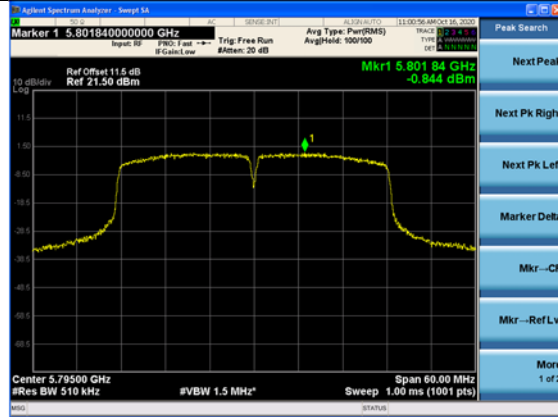
Test Mode: 802.11n HT40

Carrier frequency (MHz)	Correction Factor(dB)	Power Density (dBm) Chain0	Power Density (dBm) Chain1	Power Density (dBm) MIMO
5755	0.46	-0.787	-0.797	2.218
5795	0.46	-0.384	-0.232	2.703

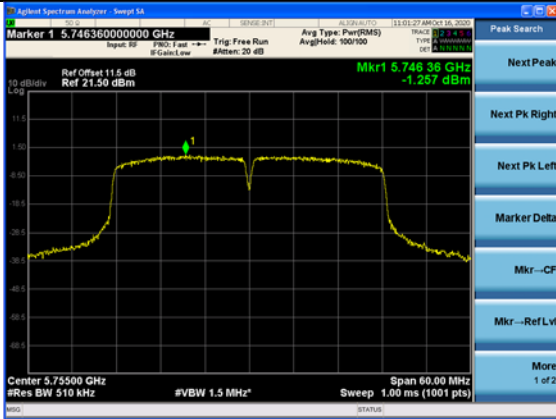
Test Mode: 802.11n HT40 Chain0



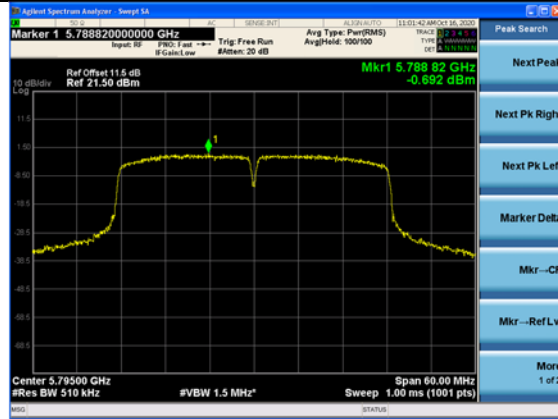
Test Mode: 802.11n HT40 Chain0



Test Mode: 802.11n HT40 Chain1



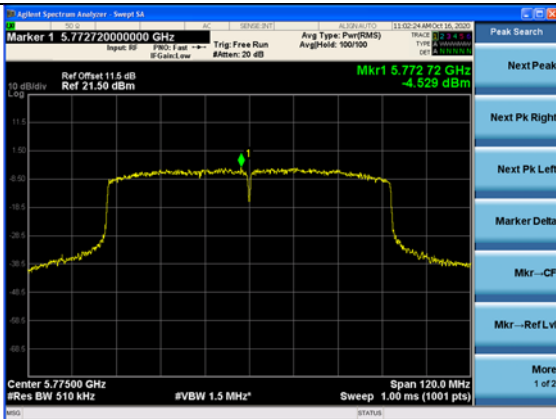
Test Mode: 802.11n HT40 Chain1



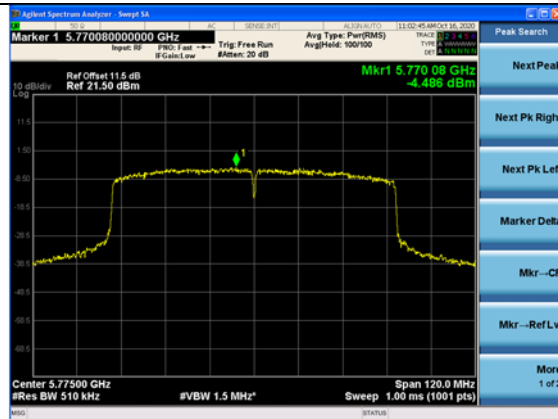
Test Mode: 802.11ac VHT80

Carrier frequency (MHz)	Correction Factor(dB)	Power Density (dBm) Chain0	Power Density (dBm) Chain1	Power Density (dBm) MIMO
5775	0.80	-3.729	-3.686	-0.697

Test Mode: 802.11ac VHT80 Chain0



Test Mode: 802.11ac VHT80 Chain1



## Frequency Stability

### U-NII-1

Mode	Data Rate	Ant	Center Frequency (MHz)	Measured Frequency (MHz)	Frequency Stability (ppm)	Voltage (V)	Temperature (°C)
802.11a	6Mbps	Chain0	5180	5179.982751	-3.33	NV	-10
			5180	5180.025434	4.91	NV	0
			5180	5180.003263	0.63	NV	+10
			5180	5179.991919	-1.56	NV	+20
			5180	5180.000311	0.06	HV	+20
			5180	5179.981818	-3.51	LV	+20
			5180	5179.977156	-4.41	NV	+30
			5180	5180.012018	2.32	NV	+35
802.11a	6Mbps	Chain1	5180	5180.020306	3.92	NV	-10
			5180	5180.021393	4.13	NV	0
			5180	5179.989899	-1.95	NV	+10
			5180	5179.978451	-4.16	NV	+20
			5180	5180.002849	0.55	HV	+20
			5180	5179.974618	-4.90	LV	+20
			5180	5180.02331	4.50	NV	+30
			5180	5180.025175	4.86	NV	+35

### U-NII-3

Mode	Data Rate	Ant	Center Frequency (MHz)	Measured Frequency (MHz)	Frequency Stability (ppm)	Voltage (V)	Temperature (°C)
802.11a	6Mbps	Chain0	5745	5744.987936	-2.10	NV	-10
			5745	5745.000689	0.12	NV	0
			5745	5744.973745	-4.57	NV	+10
			5745	5744.991095	-1.55	NV	+20
			5745	5744.972309	-4.82	HV	+20
			5745	5745.024072	4.19	LV	+20
			5745	5745.021544	3.75	NV	+30
			5745	5744.97409	-4.51	NV	+35
802.11a	6Mbps	Chain1	5745	5744.988165	-2.06	NV	-10
			5745	5744.977767	-3.87	NV	0
			5745	5745.012639	2.20	NV	+10
			5745	5744.988165	-2.06	NV	+20
			5745	5745.023612	4.11	HV	+20
			5745	5744.98288	-2.98	LV	+20
			5745	5745.020854	3.63	NV	+30
			5745	5744.999368	-0.11	NV	+35