

**8.4. Test Result and Data (6dB Bandwidth)**

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth(MHz)		Minimum Limit (MHz)
			ANT A	ANT B	
11a	149	5745	16.29	16.32	0.50
11a	157	5785	16.29	16.35	0.50
11a	165	5825	16.32	15.69	0.50
11ac VHT20	149	5745	17.58	17.58	0.50
11ac VHT20	157	5785	17.55	17.55	0.50
11ac VHT20	165	5825	17.55	17.49	0.50
11ac VHT40	151	5755	36.30	36.30	0.50
11ac VHT40	159	5795	36.30	36.30	0.50
11ac VHT80	155	5775	73.80	75.00	0.50
11ax HE20	149	5745	18.81	18.51	0.50
11ax HE20	157	5785	18.78	18.12	0.50
11ax HE20	165	5825	18.84	18.30	0.50
11ax HE40	151	5755	37.98	37.86	0.50
11ax HE40	159	5795	37.86	37.92	0.50
11ax HE80	155	5775	77.16	75.84	0.50

**8.5. Test Result and Data (99% Occupied Bandwidth)**

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT B
11a	149	5745	33.39	26.84
11a	157	5785	32.11	29.64
11a	165	5825	28.72	25.16
11ac VHT20	149	5745	31.53	25.47
11ac VHT20	157	5785	33.40	30.90
11ac VHT20	165	5825	28.67	25.31
11ac VHT40	151	5755	37.72	37.08
11ac VHT40	159	5795	36.85	36.72
11ac VHT80	155	5775	75.42	75.45
11ax HE20	149	5745	31.30	24.49
11ax HE20	157	5785	32.43	29.64
11ax HE20	165	5825	27.60	23.84
11ax HE40	151	5755	38.75	38.58
11ax HE40	159	5795	38.29	38.22
11ax HE80	155	5775	77.33	77.33



6dB Bandwidth, ANT A
Modulation Type: 802.11a (6Mbps)
CH149



Modulation Type: 802.11ac, VHT20 (6.5Mbps)
CH149



CH157



CH157



CH165



CH165





6dB Bandwidth, ANT A
Modulation Type: 802.11ac, VHT40 (13.5Mbps)
CH151



Modulation Type: 802.11ac, VHT80 (29.3Mbps)
CH155



CH159





6dB Bandwidth, ANT A

Modulation Type: 802.11ax HE20 (7.3Mbps)
CH149



Modulation Type: 802.11ax HE40 (14.6Mbps)
CH151



CH157



CH159



CH165





6dB Bandwidth, ANT A
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155





6dB Bandwidth, ANT B
Modulation Type: 802.11a (6Mbps)
CH149



Modulation Type: 802.11ac, VHT20 (6.5Mbps)
CH149



CH157



CH157



CH165



CH165





6dB Bandwidth, ANT B
Modulation Type: 802.11ac, VHT40 (13.5Mbps)
CH151



Modulation Type: 802.11ac, VHT80 (29.3Mbps)
CH155



CH159





6dB Bandwidth, ANT B

Modulation Type: 802.11ax HE20 (7.3Mbps)
CH149



Modulation Type: 802.11ax HE40 (14.6Mbps)
CH151



CH157



CH159



CH165





6dB Bandwidth, ANT B
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155





99% Occupied Bandwidth, ANT A
Modulation Type: 802.11a (6Mbps)
CH149



Modulation Type: 802.11ac, VHT20 (6.5Mbps)
CH149



CH157



CH157



CH165



CH165





99% Occupied Bandwidth, ANT A
Modulation Type: 802.11ac, VHT40 (13.5Mbps)
CH151



Modulation Type: 802.11ac, VHT80 (29.3Mbps)
CH155



CH159





99% Occupied Bandwidth, ANT A
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH149



Modulation Type: 802.11ax HE40 (14.6Mbps)
CH151



CH157



CH159



CH165





99% Occupied Bandwidth, ANT A
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155





99% Occupied Bandwidth, ANT B
Modulation Type: 802.11a (6Mbps)
CH149



Modulation Type: 802.11ac, VHT20 (6.5Mbps)
CH149



CH157



CH157



CH165



CH165





Keysight Spectrum Analyzer 1

Occupied BW

Input: RF, Center Freq: AC, Span: 60.000 MHz, Res BW: 1.0000 MHz, Video BW: 2.0000 MHz, Sweep: 1.00 ms (1001 pts)

Center Freq: 5.755000000 GHz, Span: 60.000 MHz, Ch Span: 60.000000 MHz, Freq Offset: 0 Hz

Ref Loss Offset: 15.50 dB, Ref Value: 30.00 dBm

Occupied Bandwidth: 37.061 MHz, Total Power: 34.5 dBm, Transient Freq Error: -52.314 kHz, % of OBW Power: 99.00 %, x dB Bandwidth: 60.00 MHz



KEYSIGHT Spectrum Analyzer 1
 Input: RF Input, Output: RF Output, Input: RF Input, Output: RF Output
 Input: RF Input, Output: RF Output, Input: RF Input, Output: RF Output

1 Graph
 Scale/Div 10.0 dB
 1.00
 0.00
 -10.00
 -20.00
 -30.00
 -40.00
 -50.00
 -60.00
 -70.00
 -80.00
 -90.00
 -100.00

Ref Loss Offset 15.26 dB
 Ref Value 30.00 (dBm)

Center 5.795 GHz
 Span 60 MHz
 #Video BW 3.0000 MHz
 Sweep 1.00 ms (1001 pts)

2 Metrics

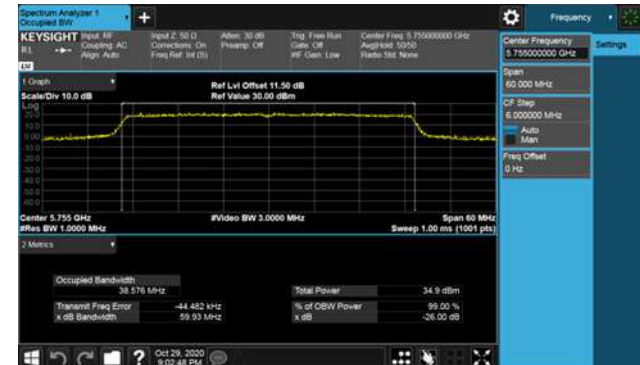
Metric	Value
Occupied Bandwidth	36.723 MHz
Total Power	33.6 dBm
Transmit Freq Error	-18.254 kHz
% of OSW Power	99.00 %
% dB Bandwidth	-29.00 dB



99% Occupied Bandwidth, ANT B
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH149



Modulation Type: 802.11ax HE40 (14.6Mbps)
CH151



CH157



CH159



CH165





99% Occupied Bandwidth, ANT B
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155





9. 26dB Bandwidth & 99% Occupied Bandwidth

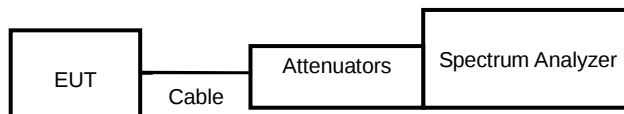
9.1. Test Limit

None; for reporting purposes only.

9.2. Test Procedure

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW = approximately 1% of the emission bandwidth, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

9.3. Test Setup Layout





9.4. Test Result and Data (26dB Bandwidth)

Master

In the 5.2G Band

Mode	Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
			ANT A	ANT B
11a	36	5180	20.63	20.68
11a	40	5200	21.17	20.92
11a	48	5240	21.50	21.41
11ac VHT20	36	5180	21.26	20.90
11ac VHT20	40	5200	22.62	22.49
11ac VHT20	48	5240	23.88	23.92
11ac VHT40	38	5190	41.67	41.37
11ac VHT40	46	5230	46.18	44.83
11ac VHT80	42	5210	82.41	82.48
11ax HE20	36	5180	21.37	21.76
11ax HE20	40	5200	24.11	24.24
11ax HE20	48	5240	23.50	25.03
11ax HE40	38	5190	41.88	42.06
11ax HE40	46	5230	43.13	44.74
11ax HE80	42	5210	82.18	82.18

Client

In the 5.2G Band

Mode	Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
			ANT A	ANT B
11a	36	5180	20.45	20.35
11a	40	5200	20.51	20.43
11a	48	5240	20.16	20.53
11ac VHT20	36	5180	21.09	21.04
11ac VHT20	40	5200	21.19	21.30
11ac VHT20	48	5240	21.17	20.94
11ac VHT40	38	5190	41.67	41.37
11ac VHT40	46	5230	41.74	41.52
11ac VHT80	42	5210	82.41	82.48
11ax HE20	36	5180	21.79	21.49
11ax HE20	40	5200	21.46	21.63
11ax HE20	48	5240	21.84	21.55
11ax HE40	38	5190	41.88	42.06
11ax HE40	46	5230	42.03	42.12
11ax HE80	42	5210	82.18	82.18



9.5. Test Result and Data (99% Occupied Bandwidth)

Master

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT B
11a	36	5180	16.43	16.43
11a	40	5200	16.48	16.46
11a	48	5240	16.51	16.47
11ac VHT20	36	5180	17.59	17.62
11ac VHT20	40	5200	17.67	17.65
11ac VHT20	48	5240	17.71	17.70
11ac VHT40	38	5190	36.23	36.22
11ac VHT40	46	5230	36.49	36.50
11ac VHT80	42	5210	75.26	75.26
11ax HE20	36	5180	18.94	18.91
11ax HE20	40	5200	19.01	18.95
11ax HE20	48	5240	19.01	19.01
11ax HE40	38	5190	37.90	37.85
11ax HE40	46	5230	38.03	38.05
11ax HE80	42	5210	75.26	75.32

Client

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT B
11a	36	5180	16.42	16.41
11a	40	5200	16.41	16.42
11a	48	5240	16.43	16.41
11ac VHT20	36	5180	17.58	17.62
11ac VHT20	40	5200	17.58	17.60
11ac VHT20	48	5240	17.59	17.60
11ac VHT40	38	5190	36.23	36.22
11ac VHT40	46	5230	36.24	36.24
11ac VHT80	42	5210	75.26	75.26
11ax HE20	36	5180	18.94	18.94
11ax HE20	40	5200	18.91	18.90
11ax HE20	48	5240	18.92	18.92
11ax HE40	38	5190	37.90	37.85
11ax HE40	46	5230	37.88	37.92
11ax HE80	42	5210	75.26	75.32



26dB Bandwidth, Master, ANT A

Modulation Type: 802.11a (6Mbps)

CH36



Modulation Type: 802.11ac VHT20 (6.5Mbps)

CH36



CH40



CH40



CH48



CH48





26dB Bandwidth, Master, ANT A

Modulation Type: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Type: 802.11ac VHT80 (29.3Mbps)
CH42



CH46





26dB Bandwidth, Master, ANT A
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36



Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38



CH40



CH46



CH48





26dB Bandwidth, Master, ANT A
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42





26dB Bandwidth, Master, ANT B
Modulation Type: 802.11a (6Mbps)
CH36



Modulation Type: 802.11ac VHT20 (6.5Mbps)
CH36



CH40



CH40



CH48



CH48





26dB Bandwidth, Master, ANT B

Modulation Type: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Type: 802.11ac VHT80 (29.3Mbps)
CH42



CH46





26dB Bandwidth, Master, ANT B
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36



Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38



CH40



CH46



CH48





26dB Bandwidth, Master, ANT B
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42





26dB Bandwidth, Client, ANT A
Modulation Type: 802.11a (6Mbps)
CH36



Modulation Type: 802.11ac VHT20 (6.5Mbps)
CH36



CH40



CH40



CH48



CH48





26dB Bandwidth, Client, ANT A

Modulation Type: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Type: 802.11ac VHT80 (29.3Mbps)
CH42



CH46





26dB Bandwidth, Client, ANT A
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36



Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38



CH40



CH46



CH48





26dB Bandwidth, Client, ANT A
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42





26dB Bandwidth, Client, ANT B
Modulation Type: 802.11a (6Mbps)
CH36



Modulation Type: 802.11ac VHT20 (6.5Mbps)
CH36



CH40



CH40



CH48



CH48





26dB Bandwidth, Client, ANT B

Modulation Type: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Type: 802.11ac VHT80 (29.3Mbps)
CH42



CH46





26dB Bandwidth, Client, ANT B
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36



Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38



CH40



CH46



CH48





26dB Bandwidth, Client, ANT B
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42





99% Bandwidth, Master, ANT A
Modulation Type: 802.11a (6Mbps)
CH36



Modulation Type: 802.11ac VHT20 (6.5Mbps)
CH36



CH40



CH40



CH48



CH48





99% Bandwidth, Master, ANT A

Modulation Type: 802.11ac VHT40 (13.5Mbps)

CH38



Modulation Type: 802.11ac VHT80 (29.3Mbps)

CH42



CH46





99% Bandwidth, Master, ANT A
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36



Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38



CH40



CH46



CH48





99% Bandwidth, Master, ANT A
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42





99% Bandwidth, Master, ANT B
Modulation Type: 802.11a (6Mbps)
CH36



Modulation Type: 802.11ac VHT20 (6.5Mbps)
CH36



CH40



CH40



CH48



CH48





99% Bandwidth, Master, ANT B

Modulation Type: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Type: 802.11ac VHT80 (29.3Mbps)
CH42



CH46





99% Bandwidth, Master, ANT B
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36



Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38



CH40



CH46



CH48





99% Bandwidth, Master, ANT B
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42





99% Bandwidth, Client, ANT A
Modulation Type: 802.11a (6Mbps)
CH36



Modulation Type: 802.11ac VHT20 (6.5Mbps)
CH36



CH40



CH40



CH48



CH48





99% Bandwidth, Client, ANT A

Modulation Type: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Type: 802.11ac VHT80 (29.3Mbps)
CH42



CH46





99% Bandwidth, Client, ANT A

Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

CH40



CH46



CH48





99% Bandwidth, Client, ANT A
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42





99% Bandwidth, Client, ANT B

Modulation Type: 802.11a (6Mbps)

CH36



Modulation Type: 802.11ac VHT20 (6.5Mbps)

CH36



CH40



CH40



CH48



CH48





99% Bandwidth, Client, ANT B

Modulation Type: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Type: 802.11ac VHT80 (29.3Mbps)
CH42



CH46





99% Bandwidth, Client, ANT B

Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

CH40



CH46



CH48





99% Bandwidth, Client, ANT B
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42





10. Average Power

10.1. Test Limit

Output Power:

Frequency Band		Limit
☒	5.15~5.25GHz	
	Operating Mode	
☐	Outdoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30degrees as measured from the horizon must not exceed 125 mW (21 dBm).
☒	Indoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☐	Fixed point-to-point access points	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
☒	client devices	The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.



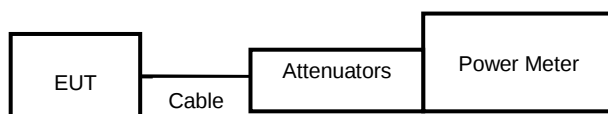
Frequency Band		Limit
☐	5.25-5.35 GHz	The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☐	5.470-5.725 GHz	
☒	5.725~5.85 GHz	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

10.2.Test Procedure

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

10.3.Test Setup Layout



**10.4. Test Result and Data**

In the 5.2G Band

Master, Non Beamforming

Modulation Type	Data Rate	Setting	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	Total power (mW)	FCC Limit (dBm)
					ANT A (J8)	ANT B (J1002)			
11a	6 Mbps	22	36	5180	22.21	22.23	25.23	333.450	30.00
11a	6 Mbps	23.5	40	5200	23.72	23.57	26.66	463.015	30.00
11a	6 Mbps	24	48	5240	23.83	23.78	26.82	480.327	30.00
11n HT20	MCS 0	22	36	5180	21.91	21.93	24.93	311.194	30.00
11n HT20	MCS 0	24	40	5200	23.97	23.89	26.94	494.366	30.00
11n HT20	MCS 0	24.5	48	5240	24.18	24.01	27.11	513.586	30.00
11n HT40	MCS 0	16.5	38	5190	17.12	17.10	20.12	102.809	30.00
11n HT40	MCS 0	24	46	5230	24.01	23.92	26.98	498.372	30.00
11ac VHT20	NSS1-MCS0	22	36	5180	21.93	21.94	24.95	312.270	30.00
11ac VHT20	NSS1-MCS0	24	40	5200	24.00	23.91	26.97	497.225	30.00
11ac VHT20	NSS1-MCS0	24.5	48	5240	24.22	24.03	27.14	517.171	30.00
11ac VHT40	NSS1-MCS0	16.5	38	5190	17.14	17.13	20.15	103.402	30.00
11ac VHT40	NSS1-MCS0	24	46	5230	24.02	23.95	27.00	500.661	30.00
11ac VHT80	NSS1-MCS0	16	42	5210	15.89	15.85	18.88	77.274	30.00
11ax HE20	NSS1-MCS0	22	36	5180	21.81	21.83	24.83	304.110	30.00
11ax HE20	NSS1-MCS0	24.5	40	5200	24.41	24.22	27.33	540.299	30.00
11ax HE20	NSS1-MCS0	25	48	5240	24.49	24.44	27.48	559.161	30.00
11ax HE40	NSS1-MCS0	17	38	5190	17.29	17.18	20.25	105.819	30.00
11ax HE40	NSS1-MCS0	24	46	5230	24.07	23.97	27.03	504.730	30.00
11ax HE80	NSS1-MCS0	16	42	5210	15.73	15.71	18.73	74.650	30.00



In the 5.2G Band
Master, Beamforming

Modulation Type	Data Rate	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	Total power (mW)	FCC Limit (dBm)
				ANT A (J8)	ANT B (J1002)			
11n HT20	MCS 0	36	5180	18.90	18.92	21.92	155.608	29.09
11n HT20	MCS 0	40	5200	20.96	20.88	23.93	247.200	29.09
11n HT20	MCS 0	48	5240	21.17	21.00	24.10	256.811	29.09
11n HT40	MCS 0	38	5190	14.11	14.09	17.11	51.408	29.09
11n HT40	MCS 0	46	5230	21.00	20.91	23.97	249.203	29.09
11ac VHT20	NSS1-MCS0	36	5180	18.92	18.93	21.94	156.146	29.09
11ac VHT20	NSS1-MCS0	40	5200	20.99	20.90	23.96	248.630	29.09
11ac VHT20	NSS1-MCS0	48	5240	21.21	21.02	24.13	258.603	29.09
11ac VHT40	NSS1-MCS0	38	5190	14.13	14.12	17.14	51.705	29.09
11ac VHT40	NSS1-MCS0	46	5230	21.01	20.94	23.99	250.348	29.09
11ac VHT80	NSS1-MCS0	42	5210	12.88	12.84	15.87	38.640	29.09
11ax HE20	NSS1-MCS0	36	5180	18.80	18.82	21.82	152.066	29.09
11ax HE20	NSS1-MCS0	40	5200	21.40	21.21	24.32	270.168	29.09
11ax HE20	NSS1-MCS0	48	5240	21.48	21.43	24.47	279.600	29.09
11ax HE40	NSS1-MCS0	38	5190	14.28	14.17	17.24	52.913	29.09
11ax HE40	NSS1-MCS0	46	5230	21.06	20.96	24.02	252.382	29.09
11ax HE80	NSS1-MCS0	42	5210	12.72	12.70	15.72	37.328	29.09



In the 5.2G Band

Client, Non Beamforming

Modulation Type	Data Rate	Setting	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	Total power (mW)	FCC Limit (dBm)
					ANT A (J8)	ANT B (J1002)			
11a	6 Mbps	17	36	5180	17.42	17.31	20.38	109.035	24.00
11a	6 Mbps	17.5	40	5200	17.83	17.58	20.72	117.953	24.00
11a	6 Mbps	17.5	48	5240	17.54	17.36	20.46	111.205	24.00
11n HT20	MCS 0	18	36	5180	18.13	18.11	21.13	129.727	24.00
11n HT20	MCS 0	18	40	5200	17.88	17.85	20.88	122.330	24.00
11n HT20	MCS 0	18.5	48	5240	18.07	17.91	21.00	125.923	24.00
11n HT40	MCS 0	16.5	38	5190	17.11	17.09	20.11	102.573	24.00
11n HT40	MCS 0	20.5	46	5230	20.62	20.56	23.60	229.108	24.00
11ac VHT20	NSS1-MCS0	18	36	5180	18.16	18.13	21.16	130.477	24.00
11ac VHT20	NSS1-MCS0	18	40	5200	17.90	17.89	20.91	123.177	24.00
11ac VHT20	NSS1-MCS0	18.5	48	5240	18.11	17.94	21.04	126.944	24.00
11ac VHT40	NSS1-MCS0	16.5	38	5190	17.14	17.13	20.15	103.402	24.00
11ac VHT40	NSS1-MCS0	20.5	46	5230	20.67	20.60	23.65	231.496	24.00
11ac VHT80	NSS1-MCS0	16	42	5210	15.89	15.85	18.88	77.274	24.00
11ax HE20	NSS1-MCS0	18.5	36	5180	18.49	18.32	21.42	138.552	24.00
11ax HE20	NSS1-MCS0	18.5	40	5200	18.23	18.27	21.26	133.670	24.00
11ax HE20	NSS1-MCS0	19	48	5240	18.43	18.44	21.45	139.486	24.00
11ax HE40	NSS1-MCS0	17	38	5190	17.29	17.18	20.25	105.819	24.00
11ax HE40	NSS1-MCS0	21	46	5230	20.75	20.72	23.75	236.882	24.00
11ax HE80	NSS1-MCS0	16	42	5210	15.73	15.71	18.73	74.650	24.00



In the 5.2G Band

Client, Beamforming

Modulation Type	Data Rate	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	Total power (mW)	FCC Limit (dBm)
				ANT A (J8)	ANT B (J1002)			
11n HT20	MCS 0	36	5180	15.12	15.10	18.12	64.868	23.09
11n HT20	MCS 0	40	5200	14.87	14.84	17.87	61.169	23.09
11n HT20	MCS 0	48	5240	15.06	14.90	17.99	62.966	23.09
11n HT40	MCS 0	38	5190	14.10	14.08	17.10	51.290	23.09
11n HT40	MCS 0	46	5230	17.61	17.55	20.59	114.562	23.09
11ac VHT20	NSS1-MCS0	36	5180	15.15	15.12	18.15	65.243	23.09
11ac VHT20	NSS1-MCS0	40	5200	14.89	14.88	17.90	61.593	23.09
11ac VHT20	NSS1-MCS0	48	5240	15.10	14.93	18.03	63.477	23.09
11ac VHT40	NSS1-MCS0	38	5190	14.13	14.12	17.14	51.705	23.09
11ac VHT40	NSS1-MCS0	46	5230	17.66	17.59	20.64	115.756	23.09
11ac VHT80	NSS1-MCS0	42	5210	12.88	12.84	15.87	38.640	23.09
11ax HE20	NSS1-MCS0	36	5180	15.48	15.31	18.41	69.281	23.09
11ax HE20	NSS1-MCS0	40	5200	15.22	15.26	18.25	66.840	23.09
11ax HE20	NSS1-MCS0	48	5240	15.42	15.43	18.44	69.748	23.09
11ax HE40	NSS1-MCS0	38	5190	14.28	14.17	17.24	52.913	23.09
11ax HE40	NSS1-MCS0	46	5230	17.74	17.71	20.74	118.449	23.09
11ax HE80	NSS1-MCS0	42	5210	12.72	12.70	15.72	37.328	23.09



In the 5.8G Band
Non Beamforming

Modulation Type	Data Rate	Setting	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	Total power (mW)	FCC Limit (dBm)
					ANT A (J8)	ANT B (J1002)			
11a	6 Mbps	25.5	149	5745	26.83	26.44	29.65	922.503	30.00
11a	6 Mbps	27	157	5785	26.88	26.98	29.94	986.413	30.00
11a	6 Mbps	27	165	5825	26.43	26.30	29.38	866.121	30.00
11n HT20	MCS 0	25.5	149	5745	26.69	26.41	29.56	904.181	30.00
11n HT20	MCS 0	27	157	5785	26.75	26.93	29.85	966.325	30.00
11n HT20	MCS 0	27	165	5825	25.97	25.94	28.97	788.012	30.00
11n HT40	MCS 0	24.5	151	5755	25.15	25.13	28.15	653.177	30.00
11n HT40	MCS 0	24.5	159	5795	24.61	24.28	27.46	556.985	30.00
11ac VHT20	NSS1-MCS0	25.5	149	5745	26.72	26.43	29.59	909.436	30.00
11ac VHT20	NSS1-MCS0	27	157	5785	26.77	26.95	29.87	970.785	30.00
11ac VHT20	NSS1-MCS0	27	165	5825	25.99	25.96	28.99	791.649	30.00
11ac VHT40	NSS1-MCS0	24.5	151	5755	25.17	25.16	28.18	656.947	30.00
11ac VHT40	NSS1-MCS0	24.5	159	5795	24.63	24.29	27.47	558.937	30.00
11ac VHT80	NSS1-MCS0	22.5	155	5775	22.46	22.76	25.62	364.997	30.00
11ax HE20	NSS1-MCS0	25.5	149	5745	26.78	26.41	29.61	913.953	30.00
11ax HE20	NSS1-MCS0	27	157	5785	26.75	26.91	29.84	964.059	30.00
11ax HE20	NSS1-MCS0	27	165	5825	26.00	25.97	29.00	793.474	30.00
11ax HE40	NSS1-MCS0	24.5	151	5755	25.20	25.18	28.20	660.741	30.00
11ax HE40	NSS1-MCS0	24.5	159	5795	24.70	24.43	27.58	572.453	30.00
11ax HE80	NSS1-MCS0	22.5	155	5775	22.33	22.58	25.47	352.136	30.00



In the 5.8G Band
Beamforming

Modulation Type	Data Rate	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	Total power (mW)	FCC Limit (dBm)
				ANT A (J8)	ANT B (J1002)			
11n HT20	MCS 0	149	5745	23.68	23.40	26.55	452.122	28.89
11n HT20	MCS 0	157	5785	23.74	23.92	26.84	483.196	28.89
11n HT20	MCS 0	165	5825	22.96	22.93	25.96	394.033	28.89
11n HT40	MCS 0	151	5755	22.14	22.12	25.14	326.611	28.89
11n HT40	MCS 0	159	5795	21.60	21.27	24.45	278.512	28.89
11ac VHT20	NSS1-MCS0	149	5745	23.71	23.42	26.58	454.749	28.89
11ac VHT20	NSS1-MCS0	157	5785	23.76	23.94	26.86	485.426	28.89
11ac VHT20	NSS1-MCS0	165	5825	22.98	22.95	25.98	395.852	28.89
11ac VHT40	NSS1-MCS0	151	5755	22.16	22.15	25.17	328.496	28.89
11ac VHT40	NSS1-MCS0	159	5795	21.62	21.28	24.46	279.488	28.89
11ac VHT80	NSS1-MCS0	155	5775	19.45	19.75	22.61	182.511	28.89
11ax HE20	NSS1-MCS0	149	5745	23.77	23.40	26.60	457.008	28.89
11ax HE20	NSS1-MCS0	157	5785	23.74	23.90	26.83	482.063	28.89
11ax HE20	NSS1-MCS0	165	5825	22.99	22.96	25.99	396.764	28.89
11ax HE40	NSS1-MCS0	151	5755	22.19	22.17	25.19	330.393	28.89
11ax HE40	NSS1-MCS0	159	5795	21.69	21.42	24.57	286.246	28.89
11ax HE80	NSS1-MCS0	155	5775	19.32	19.57	22.46	176.080	28.89



11. Power Spectral Density

11.1. Test Limit

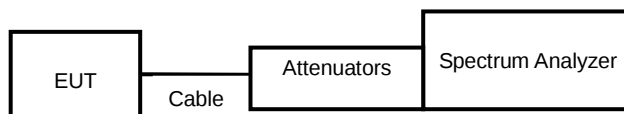
PSD:

Frequency Band		Limit
☒	5.15~5.25GHz	
	Operating Mode	
☐	Outdoor access point	17 dBm/MHz
☒	Indoor access point	17 dBm/MHz
☐	Fixed point-to-point access points	17 dBm/MHz
☒	Mobile and portable client devices	11 dBm/MHz
☐	5.725~5.85 GHz	11 dBm/MHz
☐	5.470-5.725 GHz	11 dBm/MHz
☒	5.725~5.85 GHz	30 dBm/500kHz

11.2. Test Procedure

Reference to KDB789033 D02 General UNII Test Procedures New Rules v02r01

11.3. Test Setup Layout



**11.4. Test Result and Data**

Master

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	Meas PSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	Total Corr'd PSD (dBm/MHz)	PSD Limit (dBm/MHz)
			ANT A	ANT B				
11a	36	5180	11.38	11.17	14.29	0.26	14.55	16.09
11a	40	5200	12.77	12.55	15.67	0.26	15.93	16.09
11a	48	5240	12.86	12.64	15.76	0.26	16.02	16.09
11ac VHT20	36	5180	10.84	10.68	13.77	0.19	13.96	16.09
11ac VHT20	40	5200	12.85	12.68	15.78	0.19	15.97	16.09
11ac VHT20	48	5240	12.95	12.72	15.85	0.19	16.04	16.09
11ac VHT40	38	5190	3.09	2.86	5.98	0.25	6.23	16.09
11ac VHT40	46	5230	10.11	9.90	13.02	0.25	13.27	16.09
11ac VHT80	42	5210	-0.96	-1.31	1.88	0.19	2.07	16.09
11ax HE20	36	5180	10.46	10.22	13.35	0.17	13.52	16.09
11ax HE20	40	5200	12.89	12.65	15.78	0.17	15.95	16.09
11ax HE20	48	5240	12.95	12.76	15.86	0.17	16.03	16.09
11ax HE40	38	5190	3.09	2.87	5.99	0.25	6.24	16.09
11ax HE40	46	5230	9.78	9.54	12.67	0.25	12.92	16.09
11ax HE80	42	5210	-1.28	-1.52	1.62	0.22	1.84	16.09

Client

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	Meas PSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	Total Corr'd PSD (dBm/MHz)	PSD Limit (dBm/MHz)
			ANT A	ANT B				
11a	36	5180	6.54	6.20	9.39	0.26	9.65	10.09
11a	40	5200	6.89	6.57	9.74	0.26	10.00	10.09
11a	48	5240	6.66	6.08	9.39	0.26	9.65	10.09
11ac VHT20	36	5180	6.97	6.76	9.88	0.19	10.07	10.09
11ac VHT20	40	5200	6.91	6.65	9.79	0.19	9.98	10.09
11ac VHT20	48	5240	6.92	6.51	9.73	0.19	9.92	10.09
11ac VHT40	38	5190	3.09	2.86	5.98	0.25	6.23	10.09
11ac VHT40	46	5230	6.45	6.20	9.34	0.25	9.59	10.09
11ac VHT80	42	5210	-0.96	-1.31	1.88	0.19	2.07	10.09
11ax HE20	36	5180	7.07	6.71	9.90	0.17	10.07	10.09
11ax HE20	40	5200	6.85	6.62	9.74	0.17	9.91	10.09
11ax HE20	48	5240	6.88	6.81	9.85	0.17	10.02	10.09
11ax HE40	38	5190	3.09	2.87	5.99	0.25	6.24	10.09
11ax HE40	46	5230	6.47	6.22	9.36	0.25	9.61	10.09
11ax HE80	42	5210	-1.28	-1.52	1.62	0.22	1.84	10.09



In the 5.8G Band

Modulation Type	Channel (MHz)	Frequency (MHz)	Meas PSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	10log(500KHz/RBW) CF (dB)	Total Corr'd PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)
			ANT A	ANT B					
11a	149	5745	15.56	15.36	18.47	0.26	-3.01	15.72	28.89
11a	157	5785	15.38	15.61	18.51	0.26	-3.01	15.76	28.89
11a	165	5825	15.00	15.03	18.02	0.26	-3.01	15.27	28.89
11ac VHT20	149	5745	15.09	14.88	17.99	0.19	-3.01	15.17	28.89
11ac VHT20	157	5785	15.05	15.24	18.16	0.19	-3.01	15.34	28.89
11ac VHT20	165	5825	14.67	14.81	17.75	0.19	-3.01	14.93	28.89
11ac VHT40	151	5755	11.20	11.30	14.26	0.25	-3.01	11.50	28.89
11ac VHT40	159	5795	10.42	10.40	13.42	0.25	-3.01	10.66	28.89
11ac VHT80	155	5775	5.16	5.52	8.35	0.19	-3.01	5.53	28.89
11ax HE20	149	5745	14.72	14.54	17.64	0.17	-3.01	14.80	28.89
11ax HE20	157	5785	14.86	15.00	17.94	0.17	-3.01	15.10	28.89
11ax HE20	165	5825	14.43	14.46	17.46	0.17	-3.01	14.62	28.89
11ax HE40	151	5755	10.73	10.90	13.83	0.25	-3.01	11.07	28.89
11ax HE40	159	5795	9.93	10.09	13.02	0.25	-3.01	10.26	28.89
11ax HE80	155	5775	4.82	5.31	8.08	0.22	-3.01	5.29	28.89



Master, ANT A

Modulation Type: 802.11a (6Mbps)

CH36



Modulation Type: 802.11ac VHT20 (6.5Mbps)

CH36



CH40



CH40



CH48



CH48





Master, ANT A

Modulation Type: 802.11ac VHT40 (13.5Mbps)

CH38



Modulation Type: 802.11ac VHT80 (29.3Mbps)

CH42



CH46





Master, ANT A

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH36



Modulation Type: 802.11ax HE40 (14.6Mbps)

CH38



CH40



CH46



CH48





Master, ANT A

Modulation Type: 802.11ax HE80 (30.6Mbps)

CH42





Master, ANT B

Modulation Type: 802.11a (6Mbps)

CH36



Modulation Type: 802.11ac VHT20 (6.5Mbps)

CH36



CH40



CH40



CH48



CH48







Master, ANT B

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH36



Modulation Type: 802.11ax HE40 (14.6Mbps)

CH38



CH40



CH46



CH48

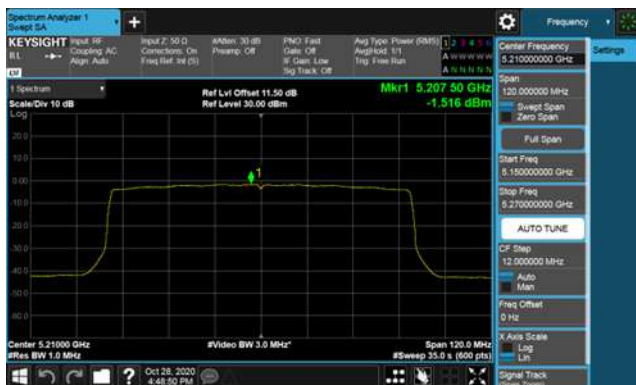




Master, ANT B

Modulation Type: 802.11ax HE80 (30.6Mbps)

CH42





Client, ANT A

Modulation Type: 802.11a (6Mbps)

CH36



Modulation Type: 802.11ac VHT20 (6.5Mbps)

CH36



CH40



CH40



CH48



CH48





Client, ANT A

Modulation Type: 802.11ac VHT40 (13.5Mbps)

CH38



Modulation Type: 802.11ac VHT80 (29.3Mbps)

CH42



CH46





Client, ANT A

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH36



Modulation Type: 802.11ax HE40 (14.6Mbps)

CH38



CH40



CH46



CH48





Client, ANT A

Modulation Type: 802.11ax HE80 (30.6Mbps)

CH42





CH36



CH36



CH40



CH40



CH48



CH48





Client, ANT B

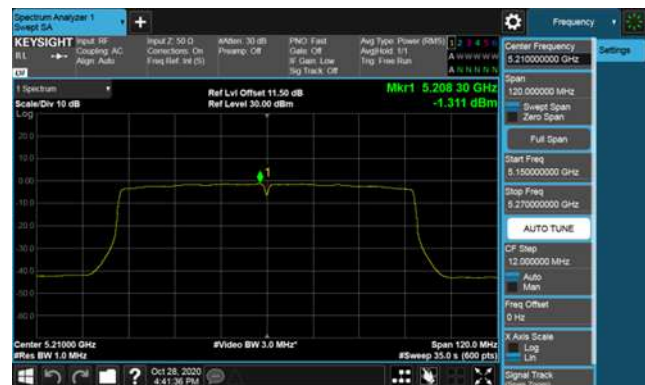
Modulation Type: 802.11ac VHT40 (13.5Mbps)

CH38



Modulation Type: 802.11ac VHT80 (29.3Mbps)

CH42



CH46





Client, ANT B

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH36



Modulation Type: 802.11ax HE40 (14.6Mbps)

CH38



CH40



CH46



CH48

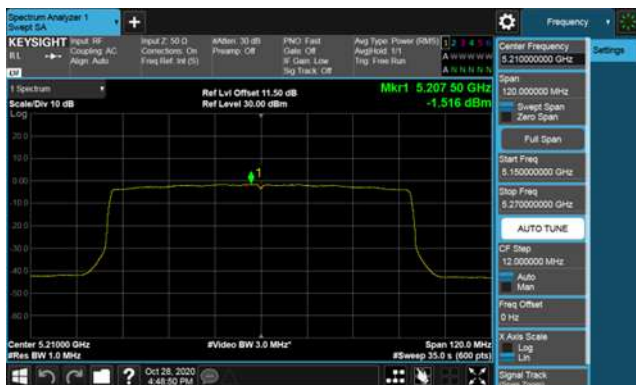




Client, ANT B

Modulation Type: 802.11ax HE80 (30.6Mbps)

CH42





ANT A

Modulation Type: 802.11a (6Mbps)

CH149



Modulation Type: 802.11ac VHT20 (6.5Mbps)

CH149



CH157



CH157



CH165



CH165





ANT A

Modulation Type: 802.11ac VHT40 (13.5Mbps)

CH151



Modulation Type: 802.11ac VHT80 (29.3Mbps)

CH155



CH159





ANT A

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149



Modulation Type: 802.11ax HE40 (14.6Mbps)

CH151



CH157



CH159



CH165





ANT A

Modulation Type: 802.11ax HE80 (30.6Mbps)

CH155





ANT B

Modulation Type: 802.11a (6Mbps)

CH149



Modulation Type: 802.11ac VHT20 (6.5Mbps)

CH149



CH157



CH157



CH165



CH165





ANT B

Modulation Type: 802.11ac VHT40 (13.5Mbps)

CH151



Modulation Type: 802.11ac VHT80 (29.3Mbps)

CH155



CH159





ANT B

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149



Modulation Type: 802.11ax HE40 (14.6Mbps)

CH151



CH157



CH159



CH165





ANT B

Modulation Type: 802.11ax HE80 (30.6Mbps)

CH155



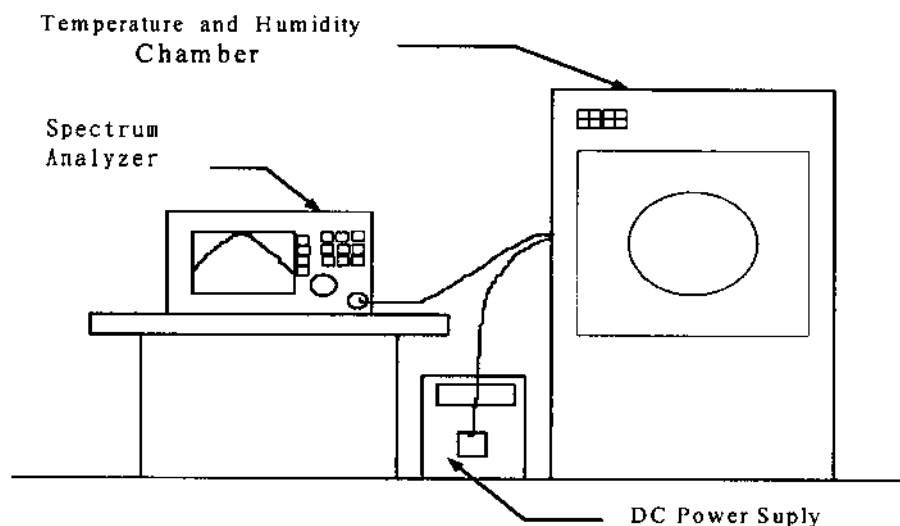


12. Frequency Stability

12.1. Test Procedure

1. The EUT was placed inside the Temperature and Humidity chamber.
2. The transmitter output was connected to spectrum analyzer.
3. Turn the EUT on and couple its output to a spectrum analyzer.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
6. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
7. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

12.2. Test Setup Layout





12.3. Test Result and Data

Operating frequency: 5180 MHz							
Temp (°C)	Power supply (V)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	102	5179.9902	-0.000189	5179.9911	-0.000172	5179.9922	-0.000151
	120	5179.9905	-0.000183	5179.9912	-0.000170	5179.9923	-0.000149
	138	5179.9906	-0.000181	5179.9915	-0.000164	5179.9925	-0.000145
40	102	5179.9966	-0.000066	5179.9938	-0.000120	5179.9906	-0.000181
	120	5179.9969	-0.000060	5179.9938	-0.000120	5179.9908	-0.000178
	138	5179.9971	-0.000056	5179.9939	-0.000118	5179.9908	-0.000178
30	102	5180.0037	0.000071	5180.0011	0.000021	5179.9997	-0.000006
	120	5180.0039	0.000075	5180.0012	0.000023	5179.9997	-0.000006
	138	5180.0039	0.000075	5180.0013	0.000025	5179.9998	-0.000004
20	102	5180.0075	0.000145	5180.0061	0.000118	5180.0042	0.000081
	120	5180.0078	0.000151	5180.0062	0.000120	5180.0045	0.000087
	138	5180.0078	0.000151	5180.0064	0.000124	5180.0048	0.000093
10	102	5180.0045	0.000087	5180.0049	0.000095	5180.0061	0.000118
	120	5180.0045	0.000087	5180.0051	0.000098	5180.0062	0.000120
	138	5180.0047	0.000091	5180.0054	0.000104	5180.0064	0.000124
0	102	5180.0264	0.000510	5180.0264	0.000510	5180.0257	0.000496
	120	5180.0266	0.000514	5180.0265	0.000512	5180.0259	0.000500
	138	5180.0269	0.000519	5180.0267	0.000515	5180.0262	0.000506
-10	102	5180.0371	0.000716	5180.0377	0.000728	5180.0392	0.000757
	120	5180.0374	0.000722	5180.0380	0.000734	5180.0393	0.000759
	138	5180.0376	0.000726	5180.0382	0.000737	5180.0395	0.000763
-20	102	5180.0562	0.001085	5180.0571	0.001102	5180.0603	0.001164
	120	5180.0562	0.001085	5180.0574	0.001108	5180.0604	0.001166
	138	5180.0564	0.001089	5180.0576	0.001112	5180.0604	0.001166
-30	102	5180.0702	0.001355	5180.0723	0.001396	5180.0752	0.001452
	120	5180.0702	0.001355	5180.0724	0.001398	5180.0752	0.001452
	138	5180.0704	0.001359	5180.0726	0.001402	5180.0754	0.001456

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.