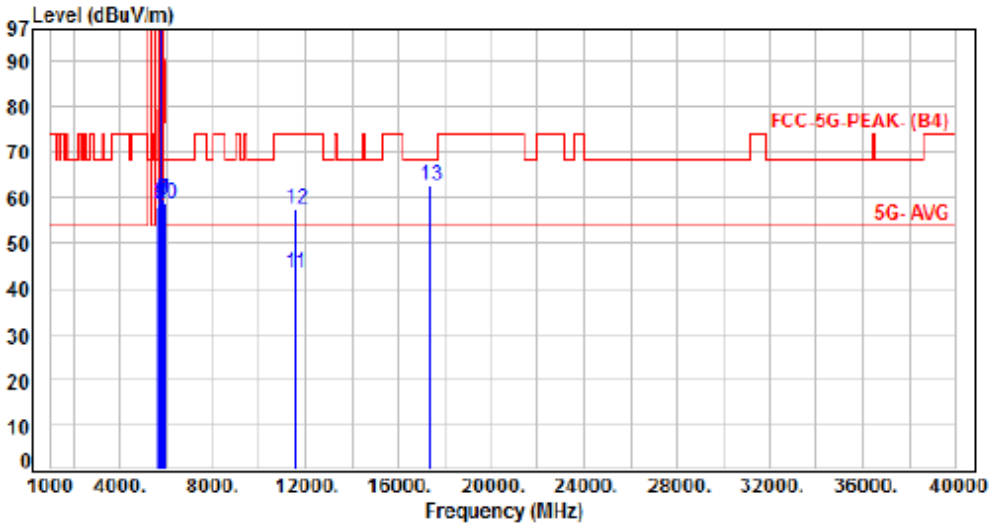
BeamForming

Power	:	DC 12V From adapter (120V/60Hz)	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 5, Band 4, CH157		:	

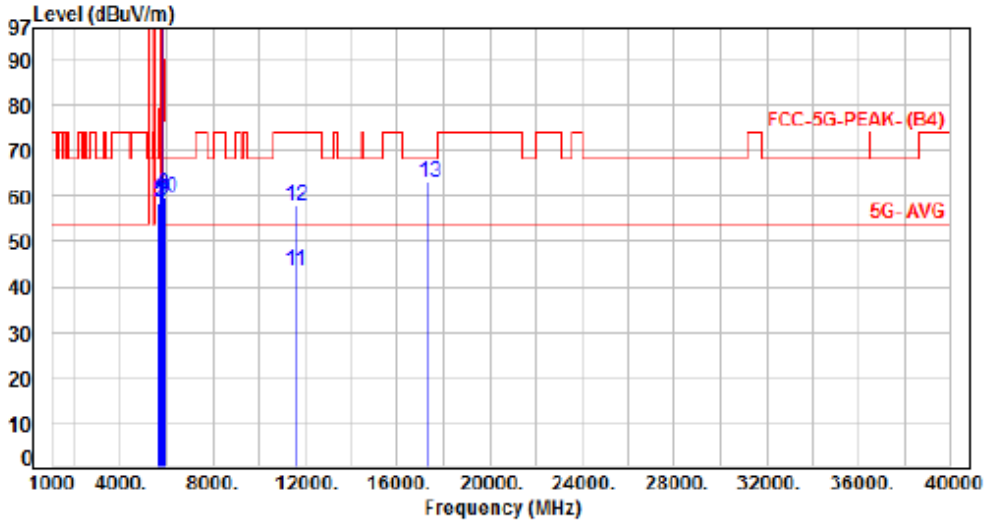


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	6.12	51.96	58.08	68.20	-10.12	Peak	100	306	P
2	5700.00	6.56	51.99	58.55	105.20	-46.65	Peak	100	306	P
3	5720.00	6.61	52.03	58.64	110.80	-52.16	Peak	100	306	P
4	5725.00	6.63	52.46	59.09	122.20	-63.11	Peak	100	306	P
5	5785.00	6.71	89.97	96.68	200.00	-103.32	Average	100	306	P
6	5785.00	6.71	102.39	109.10	200.00	-90.90	Peak	100	306	P
7	5850.00	6.76	53.09	59.85	122.20	-62.35	Peak	100	306	P
8	5855.00	6.77	52.86	59.63	110.80	-51.17	Peak	100	306	P
9	5875.00	6.78	52.43	59.21	105.20	-45.99	Peak	100	306	P
10	5925.00	6.82	51.96	58.78	68.20	-9.42	Peak	100	306	P
11	11570.00	15.21	28.21	43.42	54.00	-10.58	Average	100	63	P
12	11570.00	15.21	42.20	57.41	74.00	-16.59	Peak	100	63	P
13	17355.00	20.13	42.62	62.75	68.20	-5.45	Peak	100	349	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor

BeamForming

Power	:	DC 12V From adapter (120V/60Hz)	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 5, Band 4, CH157		:	

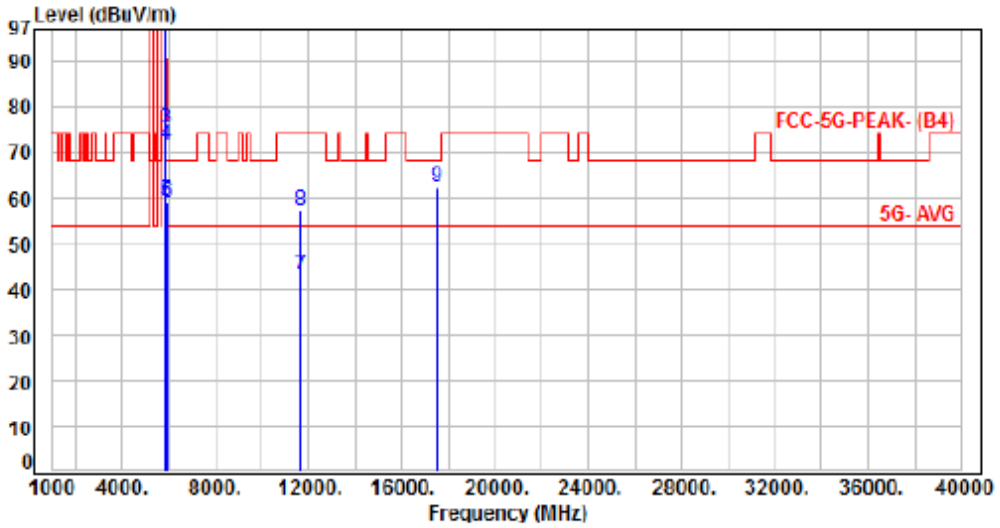


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	6.12	52.03	58.15	68.20	-10.05	Peak	219	66	P
2	5700.00	6.56	52.09	58.65	105.20	-46.55	Peak	219	66	P
3	5720.00	6.61	52.21	58.82	110.80	-51.98	Peak	219	66	P
4	5725.00	6.63	53.78	60.41	122.20	-61.79	Peak	219	66	P
5	5785.00	6.71	91.76	98.47	200.00	-101.53	Average	219	66	P
6	5785.00	6.71	104.83	111.54	200.00	-88.46	Peak	219	66	P
7	5850.00	6.76	52.54	59.30	122.20	-62.90	Peak	219	66	P
8	5855.00	6.77	53.54	60.31	110.80	-50.49	Peak	219	66	P
9	5875.00	6.78	52.41	59.19	105.20	-46.01	Peak	219	66	P
10	5925.00	6.82	52.80	59.62	68.20	-8.58	Peak	219	66	P
11	11570.00	15.21	28.17	43.38	54.00	-10.62	Average	100	89	P
12	11570.00	15.21	42.68	57.89	74.00	-16.11	Peak	100	89	P
13	17355.00	20.13	42.95	63.08	68.20	-5.12	Peak	100	286	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor

BeamForming

Power	:	DC 12V From adapter (120V/60Hz)	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 5, Band 4, CH165		:	

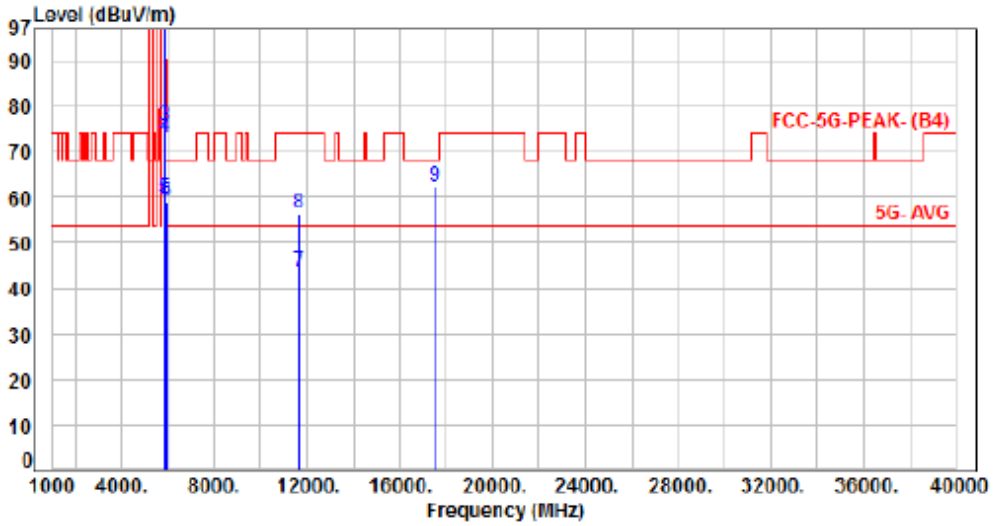


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5825.00	6.74	89.34	96.08	200.00	-103.92	Average	100	306	P
2	5825.00	6.74	102.22	108.96	200.00	-91.04	Peak	100	306	P
3	5850.00	6.76	68.39	75.15	122.20	-47.05	Peak	100	306	P
4	5855.00	6.77	64.88	71.65	110.80	-39.15	Peak	100	306	P
5	5875.00	6.78	52.60	59.38	105.20	-45.82	Peak	100	306	P
6	5925.00	6.82	52.30	59.12	68.20	-9.08	Peak	100	306	P
7	11650.00	15.14	28.04	43.18	54.00	-10.82	Average	100	106	P
8	11650.00	15.14	42.04	57.18	74.00	-16.82	Peak	100	106	P
9	17475.00	20.35	42.09	62.44	68.20	-5.76	Peak	100	277	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor

BeamForming

Power	:	DC 12V From adapter (120V/60Hz)	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 5, Band 4, CH165		:	

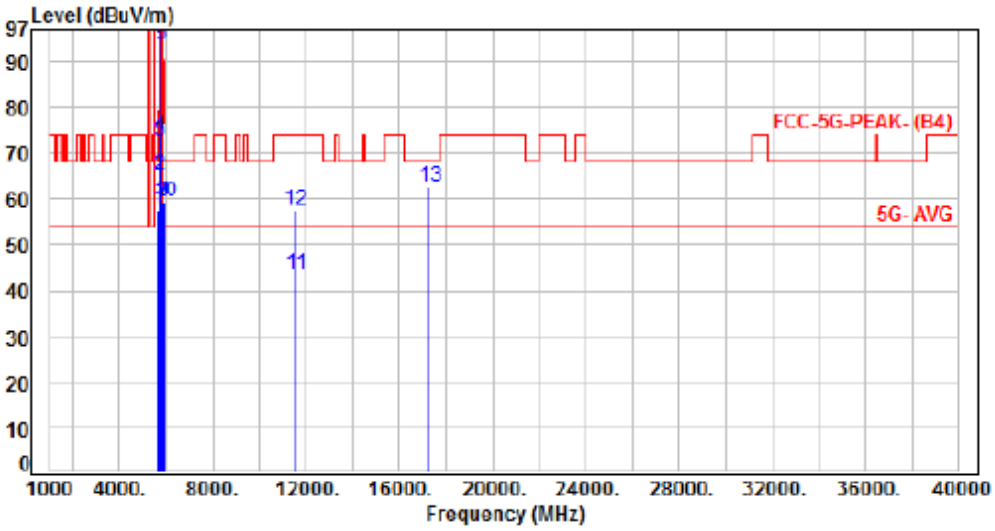


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5825.00	6.74	91.33	98.07	200.00	-101.93	Average	321	285	P
2	5825.00	6.74	104.02	110.76	200.00	-89.24	Peak	321	285	P
3	5850.00	6.76	68.85	75.61	122.20	-46.59	Peak	321	285	P
4	5855.00	6.77	66.43	73.20	110.80	-37.60	Peak	321	285	P
5	5875.00	6.78	53.09	59.87	105.20	-45.33	Peak	321	285	P
6	5925.00	6.82	52.27	59.09	68.20	-9.11	Peak	321	285	P
7	11650.00	15.14	28.25	43.39	54.00	-10.61	Average	100	49	P
8	11650.00	15.14	41.46	56.60	74.00	-17.40	Peak	100	49	P
9	17475.00	20.35	42.00	62.35	68.20	-5.85	Peak	100	333	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor

BeamForming

Power	:	DC 12V From adapter (120V/60Hz)	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 6, Band 4, CH151		:	

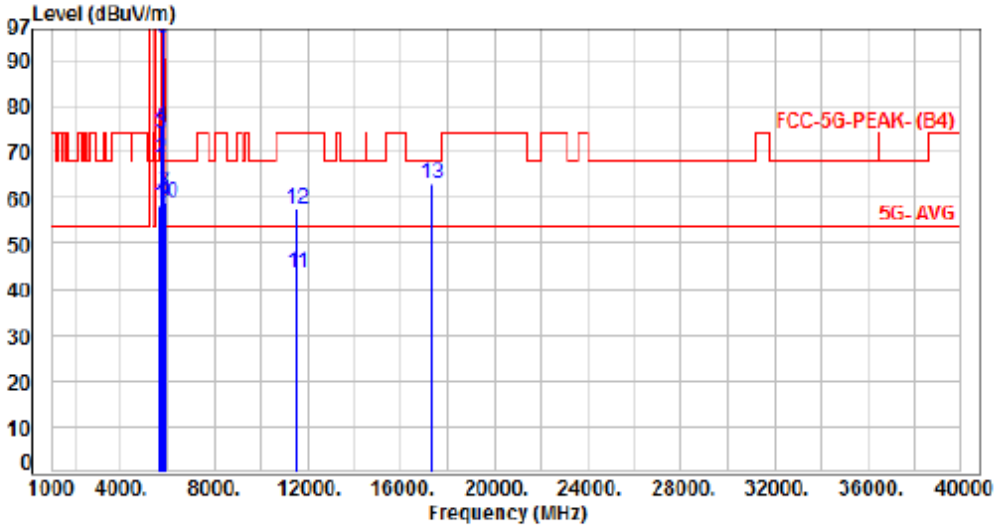


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	6.12	51.54	57.66	68.20	-10.54	Peak	235	318	P
2	5700.00	6.56	58.77	65.33	105.20	-39.87	Peak	235	318	P
3	5720.00	6.61	66.17	72.78	110.80	-38.02	Peak	235	318	P
4	5725.00	6.63	67.05	73.68	122.20	-48.52	Peak	235	318	P
5	5755.00	6.69	86.97	93.66	200.00	-106.34	Average	235	318	P
6	5755.00	6.69	103.42	110.11	200.00	-89.89	Peak	235	318	P
7	5850.00	6.76	52.78	59.54	122.20	-62.66	Peak	235	318	P
8	5855.00	6.77	52.66	59.43	110.80	-51.37	Peak	235	318	P
9	5875.00	6.78	52.57	59.35	105.20	-45.85	Peak	235	318	P
10	5925.00	6.82	52.50	59.32	68.20	-8.88	Peak	235	318	P
11	11510.00	15.21	28.18	43.39	54.00	-10.61	Average	100	61	P
12	11510.00	15.21	42.38	57.59	74.00	-16.41	Peak	100	61	P
13	17265.00	19.95	42.65	62.60	68.20	-5.60	Peak	100	329	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor

BeamForming

Power	:	DC 12V From adapter (120V/60Hz)	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 6, Band 4, CH151		:	

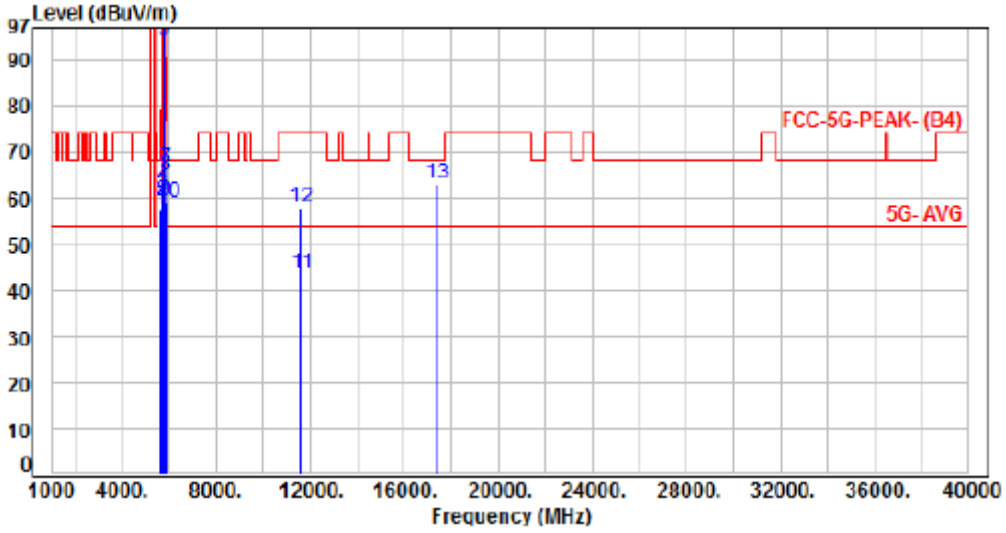


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	6.12	51.97	58.09	68.20	-10.11	Peak	109	291	P
2	5700.00	6.56	61.89	68.45	105.20	-36.75	Peak	109	291	P
3	5720.00	6.61	67.42	74.03	110.80	-36.77	Peak	109	291	P
4	5725.00	6.63	69.12	75.75	122.20	-46.45	Peak	109	291	P
5	5755.00	6.69	88.00	94.69	200.00	-105.31	Average	109	291	P
6	5755.00	6.69	100.61	107.30	200.00	-92.70	Peak	109	291	P
7	5850.00	6.76	54.08	60.84	122.20	-61.36	Peak	109	291	P
8	5855.00	6.77	53.16	59.93	110.80	-50.87	Peak	109	291	P
9	5875.00	6.78	52.28	59.06	105.20	-46.14	Peak	109	291	P
10	5925.00	6.82	52.17	58.99	68.20	-9.21	Peak	109	291	P
11	11510.00	15.21	28.26	43.47	54.00	-10.53	Average	100	62	P
12	11510.00	15.21	42.25	57.46	74.00	-16.54	Peak	100	62	P
13	17265.00	19.95	43.18	63.13	68.20	-5.07	Peak	100	287	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor

BeamForming

Power	:	DC 12V From adapter (120V/60Hz)	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 6, Band 4, CH159		:	

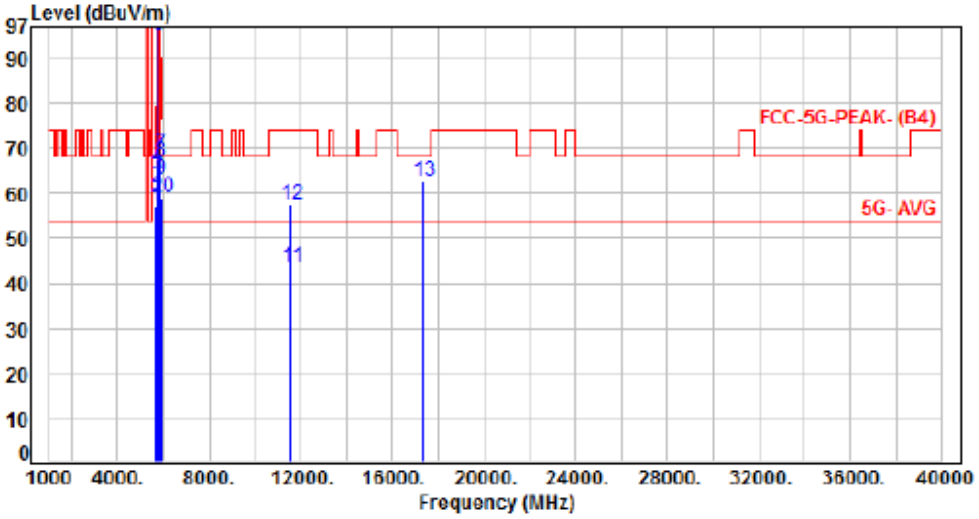


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	6.12	51.41	57.53	68.20	-10.67	Peak	100	321	P
2	5700.00	6.56	52.74	59.30	105.20	-45.90	Peak	100	321	P
3	5720.00	6.61	54.15	60.76	110.80	-50.04	Peak	100	321	P
4	5725.00	6.63	55.78	62.41	122.20	-59.79	Peak	100	321	P
5	5795.00	6.72	87.42	94.14	200.00	-105.86	Average	100	321	P
6	5795.00	6.72	99.67	106.39	200.00	-93.61	Peak	100	321	P
7	5850.00	6.76	59.56	66.32	122.20	-55.88	Peak	100	321	P
8	5855.00	6.77	58.11	64.88	110.80	-45.92	Peak	100	321	P
9	5875.00	6.78	52.55	59.33	105.20	-45.87	Peak	100	321	P
10	5925.00	6.82	52.33	59.15	68.20	-9.05	Peak	100	321	P
11	11590.00	15.20	28.33	43.53	54.00	-10.47	Average	100	81	P
12	11590.00	15.20	42.58	57.78	74.00	-16.22	Peak	100	81	P
13	17385.00	20.20	42.80	63.00	68.20	-5.20	Peak	100	306	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor

BeamForming

Power	:	DC 12V From adapter (120V/60Hz)	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 6, Band 4, CH159		:	

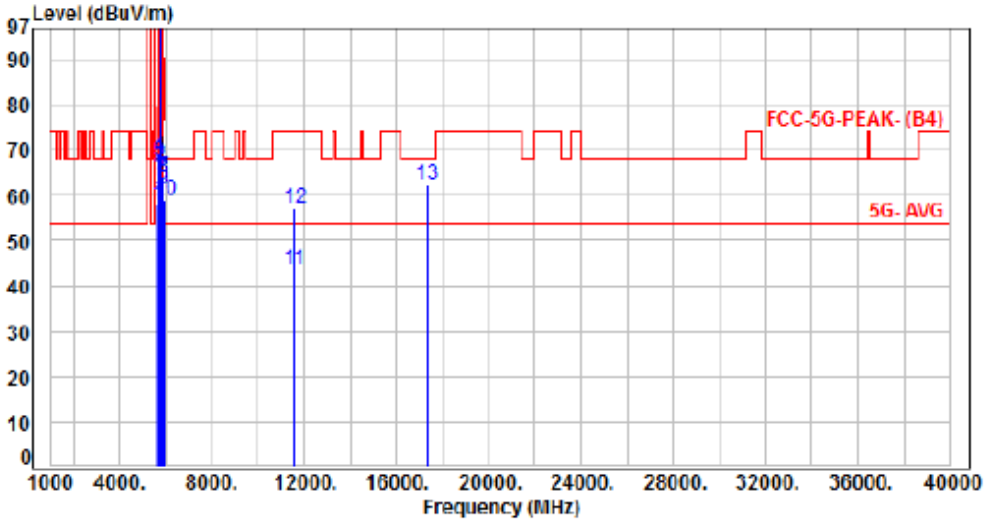


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	6.12	51.18	57.30	68.20	-10.90	Peak	100	286	P
2	5700.00	6.56	52.50	59.06	105.20	-46.14	Peak	100	286	P
3	5720.00	6.61	57.50	64.11	110.80	-46.69	Peak	100	286	P
4	5725.00	6.63	59.16	65.79	122.20	-56.41	Peak	100	286	P
5	5795.00	6.72	88.56	95.28	200.00	-104.72	Average	100	286	P
6	5795.00	6.72	104.94	111.66	200.00	-88.34	Peak	100	286	P
7	5850.00	6.76	61.96	68.72	122.20	-53.48	Peak	100	286	P
8	5855.00	6.77	60.46	67.23	110.80	-43.57	Peak	100	286	P
9	5875.00	6.78	56.14	62.92	105.20	-42.28	Peak	100	286	P
10	5925.00	6.82	52.23	59.05	68.20	-9.15	Peak	100	286	P
11	11590.00	15.20	28.23	43.43	54.00	-10.57	Average	100	194	P
12	11590.00	15.20	42.39	57.59	74.00	-16.41	Peak	100	194	P
13	17385.00	20.20	42.38	62.58	68.20	-5.62	Peak	100	291	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor

BeamForming

Power	:	DC 12V From adapter (120V/60Hz)	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 7, Band 4, CH155		:	

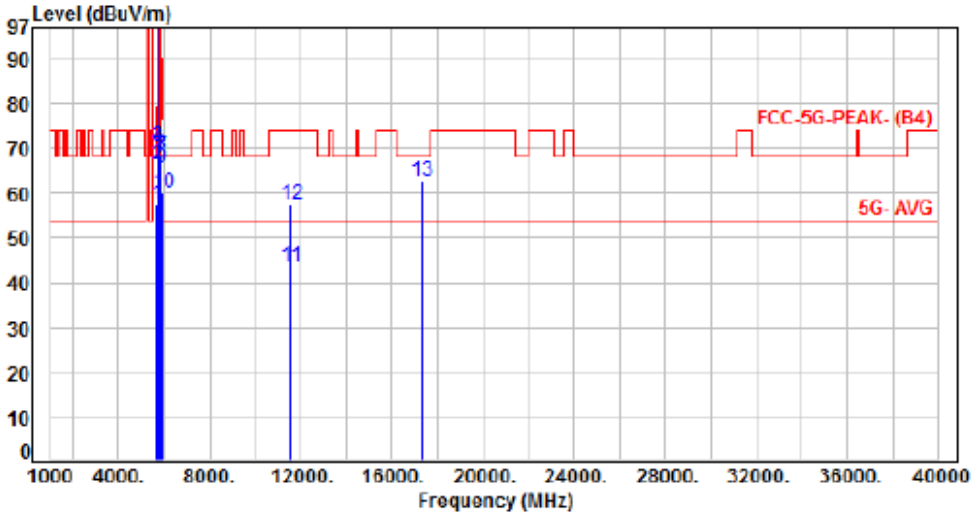


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	6.12	51.78	57.90	68.20	-10.30	Peak	100	315	P
2	5700.00	6.56	59.95	66.51	105.20	-38.69	Peak	100	315	P
3	5720.00	6.61	60.73	67.34	110.80	-43.46	Peak	100	315	P
4	5725.00	6.63	62.13	68.76	122.20	-53.44	Peak	100	315	P
5	5775.00	6.70	89.08	95.78	200.00	-104.22	Average	100	315	P
6	5775.00	6.70	98.63	105.33	200.00	-94.67	Peak	100	315	P
7	5850.00	6.76	57.28	64.04	122.20	-58.16	Peak	100	315	P
8	5855.00	6.77	56.92	63.69	110.80	-47.11	Peak	100	315	P
9	5875.00	6.78	54.46	61.24	105.20	-43.96	Peak	100	315	P
10	5925.00	6.82	52.36	59.18	68.20	-9.02	Peak	100	315	P
11	11550.00	15.21	28.33	43.54	54.00	-10.46	Average	100	69	P
12	11550.00	15.21	42.08	57.29	74.00	-16.71	Peak	100	69	P
13	17325.00	20.06	42.31	62.37	68.20	-5.83	Peak	100	298	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor

BeamForming

Power	:	DC 12V From adapter (120V/60Hz)	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 7, Band 4, CH155		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	6.12	51.48	57.60	68.20	-10.60	Peak	107	291	P
2	5700.00	6.56	59.77	66.33	105.20	-38.87	Peak	107	291	P
3	5720.00	6.61	63.93	70.54	110.80	-40.26	Peak	107	291	P
4	5725.00	6.63	63.99	70.62	122.20	-51.58	Peak	107	291	P
5	5775.00	6.70	90.73	97.43	200.00	-102.57	Average	107	291	P
6	5775.00	6.70	99.83	106.53	200.00	-93.47	Peak	107	291	P
7	5850.00	6.76	61.44	68.20	122.20	-54.00	Peak	107	291	P
8	5855.00	6.77	61.75	68.52	110.80	-42.28	Peak	107	291	P
9	5875.00	6.78	58.79	65.57	105.20	-39.63	Peak	107	291	P
10	5925.00	6.82	53.45	60.27	68.20	-7.93	Peak	107	291	P
11	11550.00	15.21	28.47	43.68	54.00	-10.32	Average	100	86	P
12	11550.00	15.21	42.16	57.37	74.00	-16.63	Peak	100	86	P
13	17325.00	20.06	42.53	62.59	68.20	-5.61	Peak	100	309	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor

6.7. Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.150
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

**: Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

7. On Time, Duty Cycle and Measurement methods

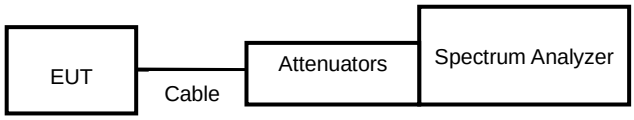
7.1. Test Limit

None; for reporting purposes only.

7.2. Test Procedure

KDB 789033 Zero-Span Spectrum Analyzer Method.

7.3. Test Setup Layout



7.4. Test Result and Data

Non BeamForming

Modulation Type	On Time (ms)	Period Time (ms)	Duty Cycle (%)
802.11a,6M	1.98	2.09	94.74%
802.11ax HE20	5.48	5.98	91.67%
802.11ax HE40	5.46	5.96	91.55%
802.11ax HE80	5.46	5.95	91.82%

BeamForming

Modulation Type	On Time (ms)	Period Time (ms)	Duty Cycle (%)
802.11ax HE20	7.96	8.20	97.07%
802.11ax HE40	8.02	8.22	97.57%
802.11ax HE80	8.16	8.38	97.37%

7.5. Measurement Methods

26 dB and 6dB Emission BW	KDB 789033 D02 v02r01, Section C
99% Occupied BW	KDB 789033 D02 v02r01, Section D
Conducted Output Power	KDB 789033 D02 v02r01, Section E.2.d and E.3.b (Method PM-G)
Power Spectral Density	KDB 789033 D02 v02r01, Section F
Unwanted emissions in restricted bands	KDB 789033 D02 v02r01, Sections G and H
Unwanted emissions in non-restricted bands	KDB 789033 D02 v02r01, Sections G and H

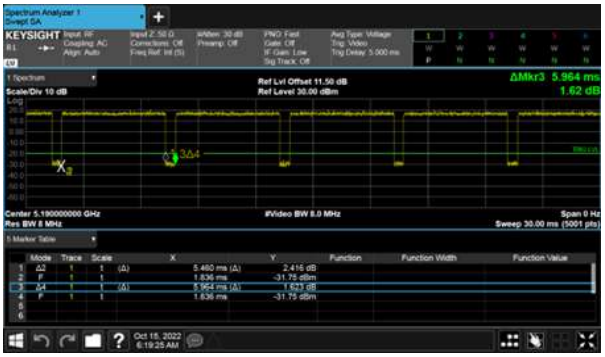
Non BeamForming

Modulation Type: 802.11a (6Mbps)

Modulation Type: 802.11ax HE80 (30.6Mbps)

Modulation Type: 802.11ax HE20 (7.3Mbps)

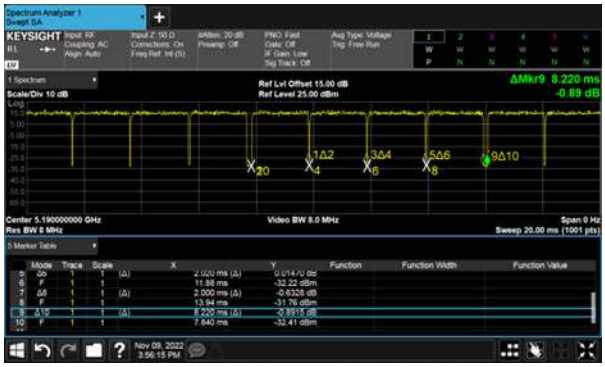
Modulation Type: 802.11ax HE40 (14.6Mbps)



BeamForming

Modulation Type: 802.11ax HE20 (7.3Mbps)

Modulation Type: 802.11ax HE40 (14.6Mbps)



BeamForming
Modulation Type: 802.11ax HE80 (30.6Mbps)

8. 6dB Bandwidth & 99% Occupied Bandwidth

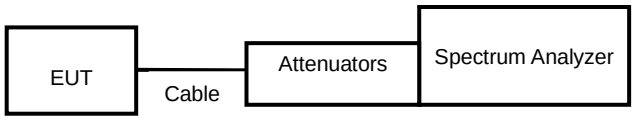
8.1. Test Limit

FCC §15.407
The minimum 6 dB bandwidth shall be at least 500 kHz.

8.2. 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 set to100KHz, the VBW >= 3 x RBW, peak detector and max hold.

8.3. Test Setup Layout



8.4. Test Result and Data

Non BeamForming

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth(MHz)		Minimum Limit (MHz)
			ANT 1	ANT 2	
11a	149	5745	15.12	15.12	0.50
11a	157	5785	15.13	15.12	0.50
11a	165	5825	15.11	15.13	0.50
11ax HE20	149	5745	15.87	15.15	0.50
11ax HE20	157	5785	15.46	15.40	0.50
11ax HE20	165	5825	15.38	16.87	0.50
11ax HE40	151	5755	33.83	33.82	0.50
11ax HE40	159	5795	35.98	36.29	0.50
11ax HE80	155	5775	45.05	70.04	0.50

Non BeamForming

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT 1	ANT 2
11a	149	5745	16.57	19.04
11a	157	5785	16.71	19.41
11a	165	5825	17.14	20.29
11ax HE20	149	5745	18.93	19.30
11ax HE20	157	5785	18.98	19.32
11ax HE20	165	5825	19.07	19.48
11ax HE40	151	5755	38.74	38.71
11ax HE40	159	5795	38.16	38.79
11ax HE80	155	5775	77.33	77.91

BeamForming

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth(MHz)		Minimum Limit (MHz)
			ANT 1	ANT 2	
11ax HE20	149	5745	18.59	19.06	0.50
11ax HE20	157	5785	17.37	18.17	0.50
11ax HE20	165	5825	17.69	15.06	0.50
11ax HE40	151	5755	36.41	31.48	0.50
11ax HE40	159	5795	31.28	33.56	0.50
11ax HE80	155	5775	40.11	48.88	0.50

BeamForming

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT 1	ANT 2
11ax HE20	149	5745	19.05	19.09
11ax HE20	157	5785	19.03	19.07
11ax HE20	165	5825	19.13	19.06
11ax HE40	151	5755	38.14	38.33
11ax HE40	159	5795	38.27	38.23
11ax HE80	155	5775	77.08	77.10

6dB Bandwidth

Non BeamForming

ANT 1

Modulation Type: 802.11a (6Mbps)

CH149

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149

CH157

CH157

CH165

CH165

6dB Bandwidth
Non BeamForming
ANT 1
Modulation Type: 802.11ax HE40 (14.6Mbps)
CH151

Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155

CH159

6dB Bandwidth

Non BeamForming

ANT 2

Modulation Type: 802.11a (6Mbps)

CH149

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149

CH157

CH157

CH165

CH165

6dB Bandwidth
Non BeamForming
ANT 2
Modulation Type: 802.11ax HE40 (14.6Mbps)
CH151

Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155

CH159

99% Occupied Bandwidth

Non BeamForming

ANT 1

Modulation Type: 802.11a (6Mbps)

CH149

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149

CH157

CH157

CH165

CH165

99% Occupied Bandwidth
Non BeamForming
ANT 1
Modulation Type: 802.11ax HE40 (14.6Mbps)
CH151

Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155

CH159

99% Occupied Bandwidth

Non BeamForming

ANT 2

Modulation Type: 802.11a (6Mbps)

CH149

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149

CH157

CH157

CH165

CH165

99% Occupied Bandwidth
Non BeamForming
ANT 2
Modulation Type: 802.11ax HE40 (14.6Mbps)
CH151

Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155

CH159

6dB Bandwidth

BeamForming

ANT 1

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149

Modulation Type: 802.11ax HE40 (14.6Mbps)

CH151

CH157

CH159

CH165

6dB Bandwidth
BeamForming
ANT 1
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155

6dB Bandwidth

BeamForming

ANT 2

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149

Modulation Type: 802.11ax HE40 (14.6Mbps)

CH151

CH157

CH159

CH165

6dB Bandwidth
BeamForming
ANT 2
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155

99% Occupied Bandwidth

BeamForming

ANT 1

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149

Modulation Type: 802.11ax HE40 (14.6Mbps)

CH151

CH157

CH159

CH165

99% Occupied Bandwidth
BeamForming
ANT 1
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155

99% Occupied Bandwidth

BeamForming

ANT 2

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149

Modulation Type: 802.11ax HE40 (14.6Mbps)

CH151

CH157

CH159

CH165

99% Occupied Bandwidth
BeamForming
ANT 2
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155

9. 26dB Bandwidth & 99% Occupied Bandwidth

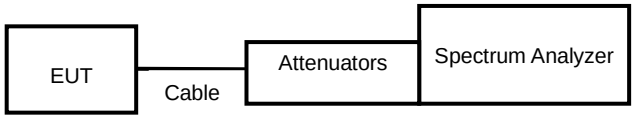
9.1. Test Limit

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 >= 3 x RBW, peak detector and max hold.

9.3. Test Setup Layout



9.4. Test Result and Data

Non BeamForming

In the 5.2G Band

Mode	Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
			ANT 1	ANT 2
11a	36	5180	21.24	21.46
11a	40	5200	25.09	25.65
11a	48	5240	25.7	29.49
11ax HE20	36	5180	21.57	22.17
11ax HE20	40	5200	28.95	28.55
11ax HE20	48	5240	26.41	29.91
11ax HE40	38	5190	40.84	41.11
11ax HE40	46	5230	48.16	54.68
11ax HE80	42	5210	81.52	81.57

In the 5.2G Band

Mode	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT 1	ANT 2
11a	36	5180	16.35	16.38
11a	40	5200	16.48	16.62
11a	48	5240	16.55	17.27
11ax HE20	36	5180	18.85	18.89
11ax HE20	40	5200	19.00	19.06
11ax HE20	48	5240	18.97	19.08
11ax HE40	38	5190	37.61	37.65
11ax HE40	46	5230	37.91	38.02
11ax HE80	42	5210	76.62	76.65

BeamForming

In the 5.2G Band

Mode	Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
			ANT 1	ANT 2
11ax HE20	36	5180	21.76	22.07
11ax HE20	40	5200	18.8	22.3
11ax HE20	48	5240	22.35	21.67
11ax HE40	38	5190	46.8	42.74
11ax HE40	46	5230	45.23	59.63
11ax HE80	42	5210	81.54	81.55

In the 5.2G Band

Mode	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT 1	ANT 2
11ax HE20	36	5180	19.05	19.09
11ax HE20	40	5200	16.35	19.17
11ax HE20	48	5240	19.08	19.03
11ax HE40	38	5190	38.07	38.22
11ax HE40	46	5230	38.36	38.56
11ax HE80	42	5210	76.93	77.34

26dB Bandwidth
Non BeamForming
ANT 1

Modulation Type: 802.11a (6Mbps)
CH36

Modulation Type: 802.11ax HE20 (7.3Mbps
CH36

CH40

CH40

CH48

CH48

26dB Bandwidth

Non BeamForming
ANT 1
Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42

CH46

99% Occupied Bandwidth
Non BeamForming
ANT 1

Modulation Type: 802.11a (6Mbps)
CH36

Modulation Type: 802.11ac VHT20 (6.5Mbps)
CH36

CH40

CH40

CH48

CH48

99% Occupied Bandwidth

Non BeamForming
ANT 1
Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42

CH46

26dB Bandwidth
Non BeamForming
ANT 2

Modulation Type: 802.11a (6Mbps)
CH36

Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36

CH40

CH40

CH48

CH48

26dB Bandwidth

Non BeamForming
ANT 2
Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42

CH46

99% Occupied Bandwidth
Non BeamForming
ANT 2

Modulation Type: 802.11a (6Mbps)
CH36

Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36

CH40

CH40

CH48

CH48

99% Occupied Bandwidth

Non BeamForming
ANT 2
Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42

CH46

26dB Bandwidth
BeamForming
ANT 1
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36

Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

CH40

CH46

CH48

26dB Bandwidth

BeamForming
ANT 1
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42

99% Occupied Bandwidth
BeamForming
ANT 1
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36

Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

CH40

CH46

CH48

99% Occupied Bandwidth

BeamForming
ANT 1
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42

26dB Bandwidth
BeamForming
ANT 2
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36

Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

CH40

CH46

CH48

26dB Bandwidth

BeamForming
ANT 2
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42

99% Occupied Bandwidth
BeamForming
ANT 2

Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36

Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

CH40

CH46

CH48

99% Occupied Bandwidth

BeamForming
ANT 2
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42

10. Average Power

10.1. Test Limit

Output Power:

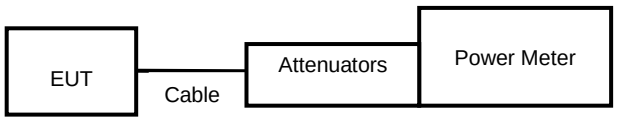
Frequency Band			Limit
☒	5.15~5.25GHz		
	Operating Mode		
	☐	Outdoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi 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 exceed125 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

According to the methods defined in ANSI C63.10-2013 Section 12.3
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

Non BeamForming

In the 5.2G Band

Modulation Type	Data Rate	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	Total power (mW)	FCC Limit (dBm)
				ANT 1	ANT 2			
11a	6 Mbps	36	5180	20.63	20.39	23.52	225.007	30.00
11a	6 Mbps	40	5200	21.55	21.38	24.48	280.294	30.00
11a	6 Mbps	48	5240	21.43	21.46	24.46	278.954	30.00
11ax HE20	NSS1-MCS0	36	5180	20.34	20.13	23.25	211.182	30.00
11ax HE20	NSS1-MCS0	40	5200	20.97	21.20	24.10	256.852	30.00
11ax HE20	NSS1-MCS0	48	5240	21.14	21.19	24.18	261.539	30.00
11ax HE40	NSS1-MCS0	38	5190	18.24	18.11	21.19	131.395	30.00
11ax HE40	NSS1-MCS0	46	5230	21.77	21.71	24.75	298.566	30.00
11ax HE80	NSS1-MCS0	42	5210	17.76	17.42	20.60	114.911	30.00

Non BeamForming

In the 5.8G Band

Modulation Type	Data Rate	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	Total power (mW)	FCC Limit (dBm)
				ANT 1	ANT 2			
11a	6 Mbps	149	5745	20.89	21.04	23.98	249.801	30.00
11a	6 Mbps	157	5785	21.01	21.03	24.03	252.948	30.00
11a	6 Mbps	165	5825	21.02	21.25	24.15	259.826	30.00
11ax HE20	NSS1-MCS0	149	5745	20.62	20.75	23.70	234.196	30.00
11ax HE20	NSS1-MCS0	157	5785	20.73	20.80	23.78	238.531	30.00
11ax HE20	NSS1-MCS0	165	5825	20.81	21.01	23.92	246.686	30.00
11ax HE40	NSS1-MCS0	151	5755	21.14	21.24	24.20	263.062	30.00
11ax HE40	NSS1-MCS0	159	5795	21.13	21.21	24.18	261.847	30.00
11ax HE80	NSS1-MCS0	155	5775	20.68	21.01	23.86	243.133	30.00

BeamForming

In the 5.2G Band

Modulation Type	Data Rate	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	Total power (mW)	FCC Limit (dBm)
				ANT 1	ANT 2			
11ax HE20	NSS1-MCS0	36	5180	16.31	16.84	19.59	91.062	28.42
11ax HE20	NSS1-MCS0	40	5200	16.58	16.73	19.67	92.597	28.42
11ax HE20	NSS1-MCS0	48	5240	16.25	16.87	19.58	90.810	28.42
11ax HE40	NSS1-MCS0	38	5190	16.72	17.01	19.88	97.224	28.42
11ax HE40	NSS1-MCS0	46	5230	16.50	17.22	19.89	97.391	28.42
11ax HE80	NSS1-MCS0	42	5210	16.88	16.83	19.87	96.948	28.42

BeamForming

In the 5.8G Band

Modulation Type	Data Rate	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	Total power (mW)	FCC Limit (dBm)
				ANT 1	ANT 2			
11ax HE20	NSS1-MCS0	149	5745	16.20	16.06	19.14	82.051	28.75
11ax HE20	NSS1-MCS0	157	5785	16.03	16.11	19.08	80.919	28.75
11ax HE20	NSS1-MCS0	165	5825	16.41	16.15	19.29	84.962	28.75
11ax HE40	NSS1-MCS0	151	5755	16.12	16.52	19.33	85.801	28.75
11ax HE40	NSS1-MCS0	159	5795	16.36	16.29	19.34	85.811	28.75
11ax HE80	NSS1-MCS0	155	5775	16.23	16.35	19.30	85.128	28.75

11. Power Spectral Density

11.1.Test Limit

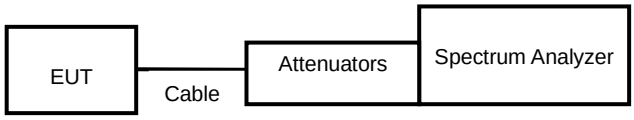
PSD:

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

Non BeamForming

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 1	ANT 2				
11a	36	5180	7.87	7.86	10.87	0.23	11.10	15.42
11a	40	5200	8.71	8.83	11.78	0.23	12.01	15.42
11a	48	5240	9.16	9.52	12.36	0.23	12.59	15.42
11ax HE20	36	5180	6.96	6.94	9.96	0.38	10.34	15.42
11ax HE20	40	5200	8.27	8.39	11.34	0.38	11.72	15.42
11ax HE20	48	5240	8.24	8.64	11.45	0.38	11.83	15.42
11ax HE40	38	5190	1.85	2.01	4.94	0.38	5.32	15.42
11ax HE40	46	5230	5.63	5.96	8.81	0.38	9.19	15.42
11ax HE80	42	5210	-0.68	-0.56	2.39	0.37	2.76	15.42

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 1	ANT 2					
11a	149	5745	8.52	8.44	11.49	0.23	-3.01	8.71	28.75
11a	157	5785	8.48	8.56	11.53	0.23	-3.01	8.75	28.75
11a	165	5825	8.58	8.45	11.53	0.23	-3.01	8.74	28.75
11ax HE20	149	5745	7.45	7.53	10.50	0.38	-3.01	7.87	28.75
11ax HE20	157	5785	7.41	7.62	10.53	0.38	-3.01	7.90	28.75
11ax HE20	165	5825	7.52	7.53	10.53	0.38	-3.01	7.90	28.75
11ax HE40	151	5755	5.45	5.43	8.45	0.38	-3.01	5.82	28.75
11ax HE40	159	5795	5.32	5.48	8.41	0.38	-3.01	5.78	28.75
11ax HE80	155	5775	2.87	2.82	5.86	0.37	-3.01	3.22	28.75

BeamForming

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 1	ANT 2				
11ax HE20	36	5180	-0.01	0.41	3.21	0.13	3.34	15.42
11ax HE20	40	5200	-0.26	0.57	3.19	0.13	3.32	15.42
11ax HE20	48	5240	-0.33	0.21	2.96	0.13	3.09	15.42
11ax HE40	38	5190	-3.04	-2.30	0.36	0.11	0.47	15.42
11ax HE40	46	5230	-3.17	-2.71	0.08	0.11	0.19	15.42
11ax HE80	42	5210	-5.98	-5.59	-2.77	0.12	-2.65	15.42

BeamForming

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 1	ANT 2					
11ax HE20	149	5745	-1.06	-0.07	2.47	0.13	-3.01	-0.41	28.75
11ax HE20	157	5785	-0.98	-0.07	2.51	0.13	-3.01	-0.37	28.75
11ax HE20	165	5825	-0.91	-0.27	2.43	0.13	-3.01	-0.45	28.75
11ax HE40	151	5755	-3.89	-2.99	-0.40	0.11	-3.01	-3.31	28.75
11ax HE40	159	5795	-3.56	-2.86	-0.19	0.11	-3.01	-3.09	28.75
11ax HE80	155	5775	-6.57	-5.96	-3.25	0.12	-3.01	-6.14	28.75

Non BeamForming
ANT 1
Modulation Type: 802.11a (6Mbps)
CH36

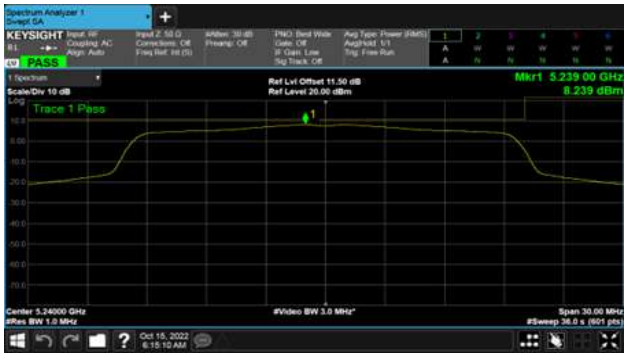
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36

CH40

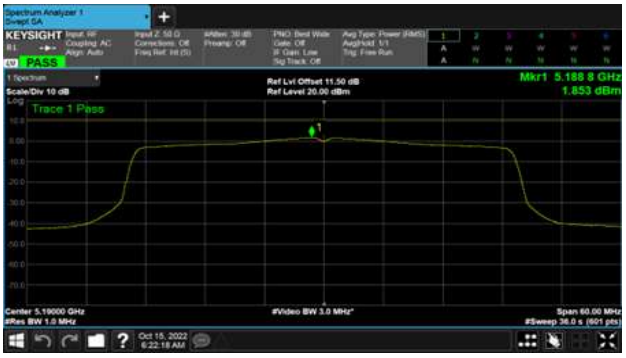
CH40

CH48

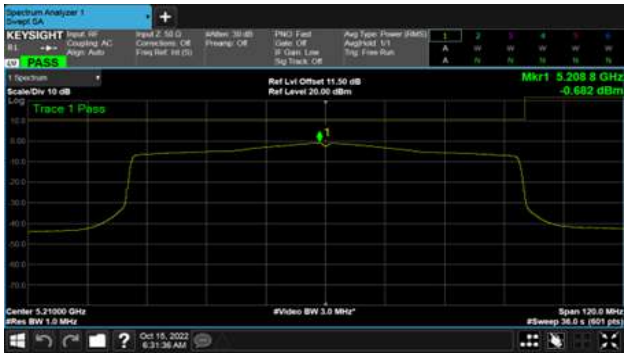
CH48



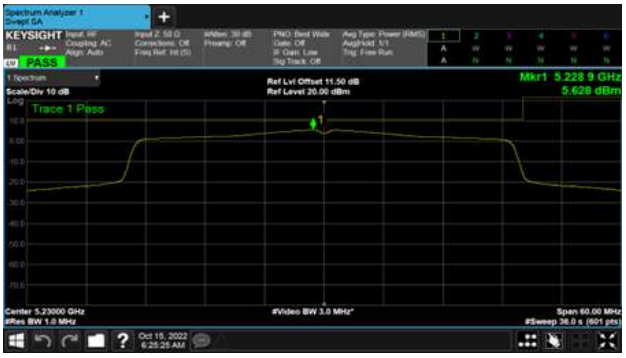
Non BeamForming
ANT 1
Modulation Type: 8802.11ax HE40 (14.6Mbps)
CH38



Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42



CH46



Non BeamForming
ANT 2

Modulation Type: 802.11a (6Mbps)
CH36

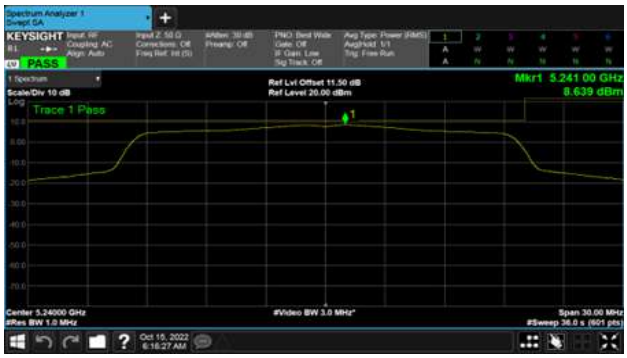
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36

CH40

CH40

CH48

CH48



Non BeamForming
ANT 2
Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42

CH46

Non BeamForming

ANT 1

Modulation Type: 802.11a (6Mbps)

CH149

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149

CH157

CH157

CH165

CH165

Non BeamForming
ANT 1
Modulation Type: 802.11ax HE40 (14.6Mbps)
CH151

Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155

CH159

Non BeamForming

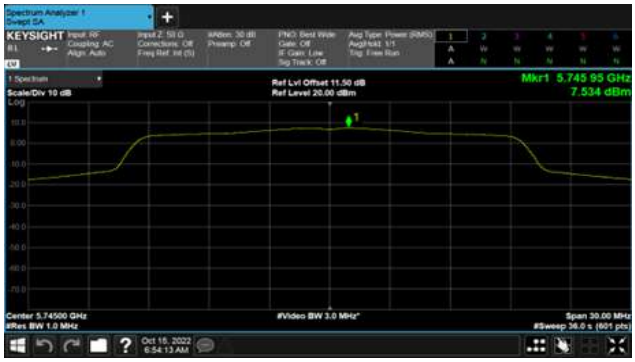
ANT 2

Modulation Type: 802.11a (6Mbps)

CH149

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149



CH157

CH157

CH165

CH165

Non BeamForming
ANT 2
Modulation Type: 802.11ax HE40 (14.6Mbps)
CH151

Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155

CH159

BeamForming
ANT 1
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36

Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

CH40

CH46

CH48

BeamForming
ANT 1
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42

BeamForming
ANT 2
Modulation Type: 802.11ax HE20 (7.3Mbps)
CH36

Modulation Type: 802.11ax HE40 (14.6Mbps)
CH38

CH40

CH46

CH48

BeamForming
ANT 2
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH42

BeamForming

ANT 1

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149

Modulation Type: 802.11ax HE40 (14.6Mbps)

CH151

CH157

CH159

CH165

BeamForming
ANT 1
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155

BeamForming

ANT 2

Modulation Type: 802.11ax HE20 (7.3Mbps)

CH149

Modulation Type: 802.11ax HE40 (14.6Mbps)

CH151

CH157

CH159

CH165

BeamForming
ANT 2
Modulation Type: 802.11ax HE80 (30.6Mbps)
CH155