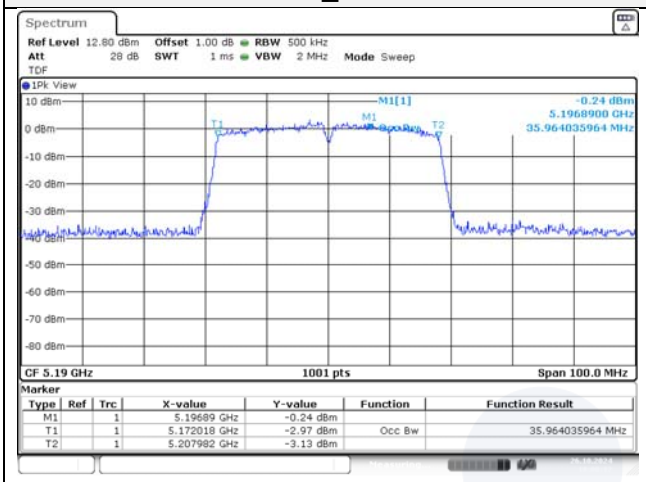
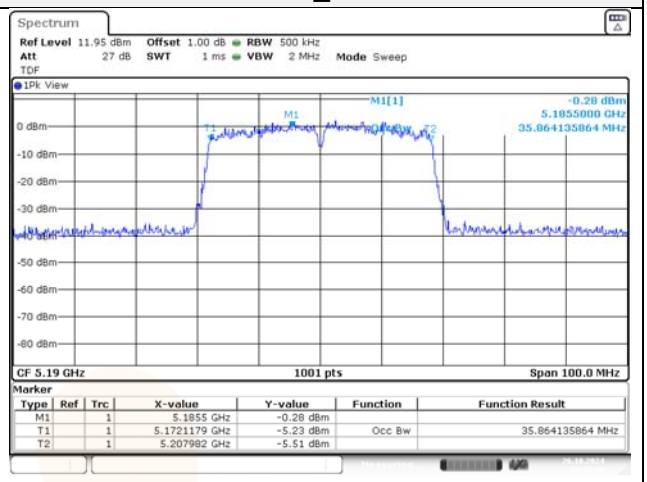
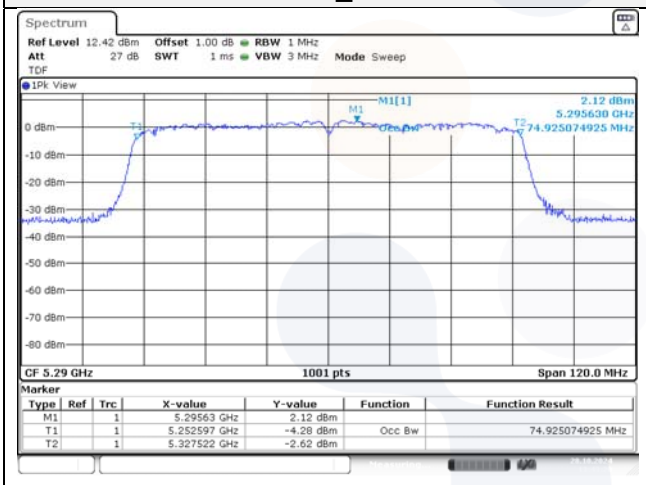
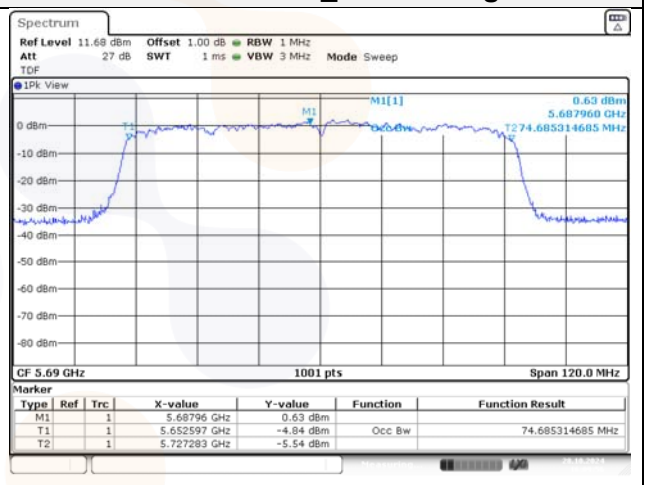
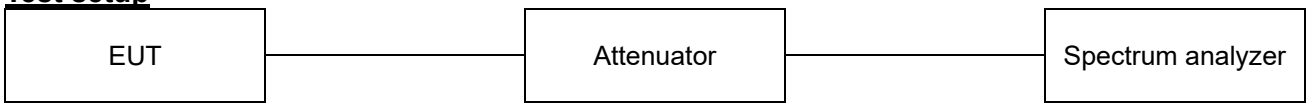
ANT 1	ANT 2
UNII-1 / 802.11ac_VHT40 / Low ch.	**UNII-1 / 802.11ac_VHT40 / Low ch.**
	
UNII-2A / 802.11ac_VHT80 / Mid ch.	**UNII-2C / 802.11ac_VHT80 / High ch.**
	

7.4. 6 dB Bandwidth & 99% Bandwidth

Test setup



Limit

According to §15.407(e), Within the 5.725-5.850 ㎓ band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500㎑.

Test procedure

ANSI C63.10-2013 Section 6.9.2
KDB 789033 D02 v02r01 - Section C.2

Test settings

Minimum Emission Bandwidth for the band 5.725−5.85 ㎓.

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 ㎑ for the band 5.725−5.85 ㎓ band. The following procedure shall be used for measuring this Bandwidth:

1. Set RBW = 100 ㎑.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test results

SISO

Test mode	Band	Frequency (㎒)	6㏈ bandwidth (㎒)		Limit (㎒)	99% bandwidth (㎒)	
			ANT1	ANT2		ANT1	ANT2
802.11a	UNII-3	5 745	14.49	-	0.50	16.33	-
		5 785	15.63	-	0.50	16.38	-
		5 825	15.78	-	0.50	16.33	-
802.11n HT20	UNII-3	5 745	15.78	15.93	0.50	17.43	17.48
		5 785	17.18	17.63	0.50	17.73	17.53
		5 825	15.63	15.78	0.50	17.48	17.48
802.11n HT40	UNII-3	5 755	35.26	35.26	0.50	36.06	36.06
		5 795	35.36	35.36	0.50	36.06	36.06
802.11ac VHT20	UNII-3	5 745	15.18	15.78	0.50	17.48	17.58
		5 785	17.13	12.09	0.50	17.53	17.48
		5 825	16.03	15.43	0.50	17.43	17.48
802.11ac VHT40	UNII-3	5 755	35.26	35.26	0.50	35.96	35.96
		5 795	35.36	35.36	0.50	35.96	35.96
802.11ac VHT80	UNII-3	5 775	74.09	74.09	0.50	74.57	74.45

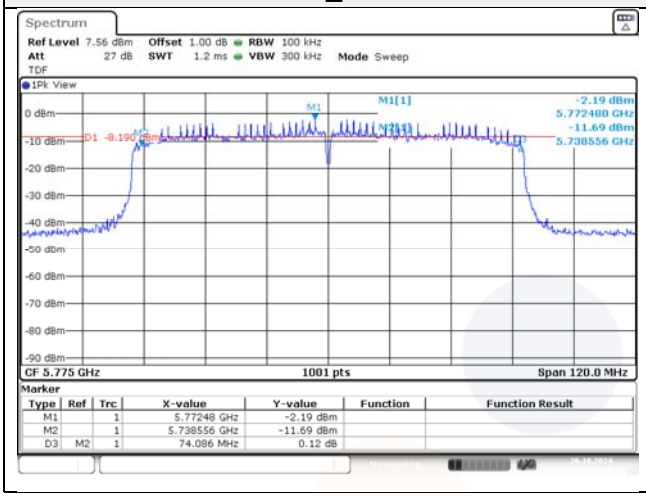
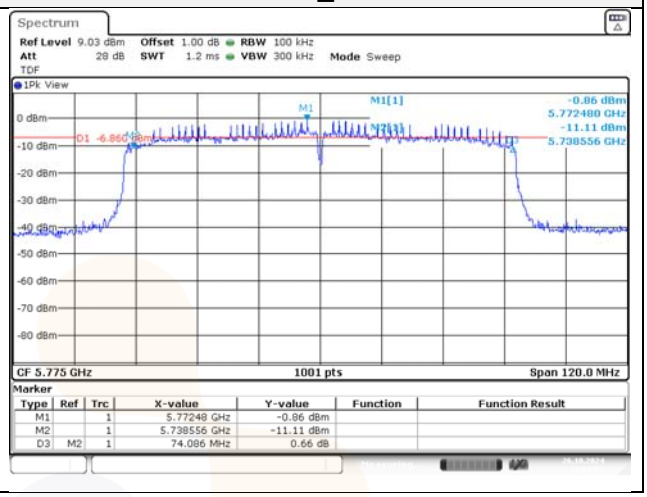
MIMO

Test mode	Band	Frequency (㎒)	6㏈ bandwidth (㎒)		Limit (㎒)	99% bandwidth (㎒)	
			ANT1	ANT2		ANT1	ANT2
802.11n HT20	UNII-3	5 745	15.13	17.68	0.50	17.48	17.48
		5 785	17.63	15.78	0.50	17.53	17.48
		5 825	15.73	16.33	0.50	17.48	17.53
802.11n HT40	UNII-3	5 755	35.26	35.26	0.50	35.96	35.96
		5 795	35.26	35.26	0.50	35.96	35.96
802.11ac VHT20	UNII-3	5 745	16.83	16.03	0.50	17.48	17.53
		5 785	16.83	14.84	0.50	17.43	17.48
		5 825	17.13	16.33	0.50	17.53	17.53
802.11ac VHT40	UNII-3	5 755	35.26	35.26	0.50	35.96	35.76
		5 795	35.36	35.26	0.50	35.86	35.76
802.11ac VHT80	UNII-3	5 775	75.29	75.29	0.50	74.69	74.81

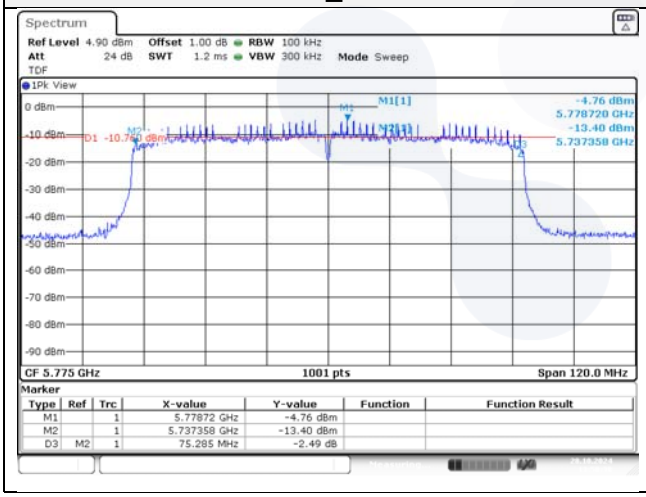
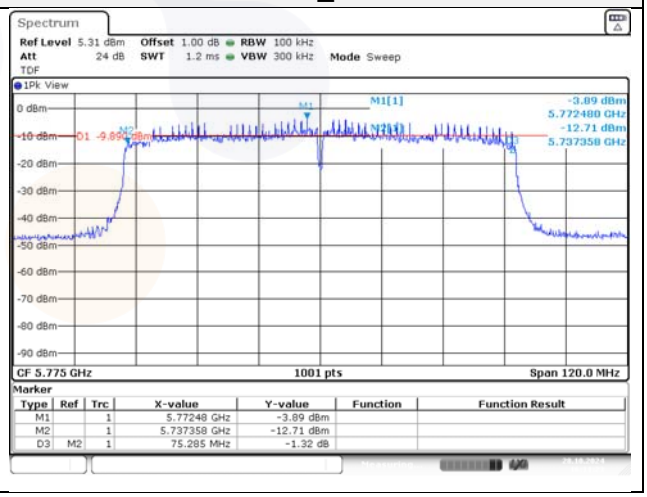
In order to simplify the report, the attached plot is the widest bandwidth ins Band

6 dB bandwidth

SISO

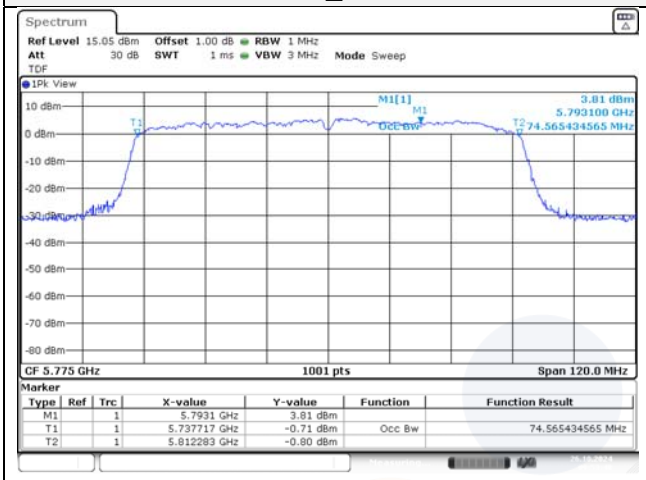
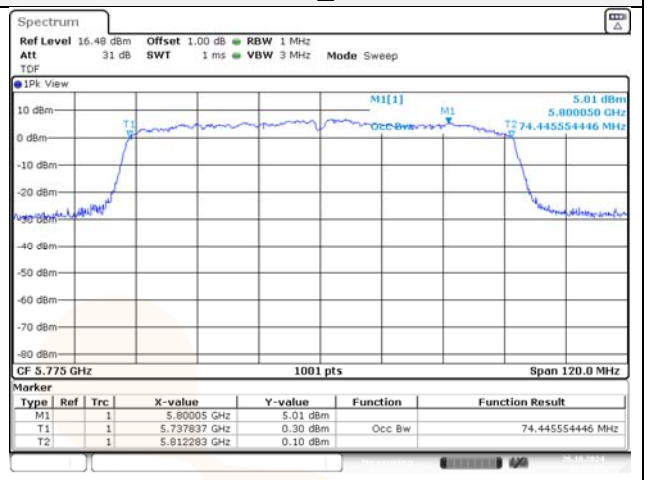
ANT 1	ANT 2
UNII-3 / 802.11ac_VHT80 / Mid ch.	UNII-3 / 802.11ac_VHT80 / Mid ch.
	

MIMO

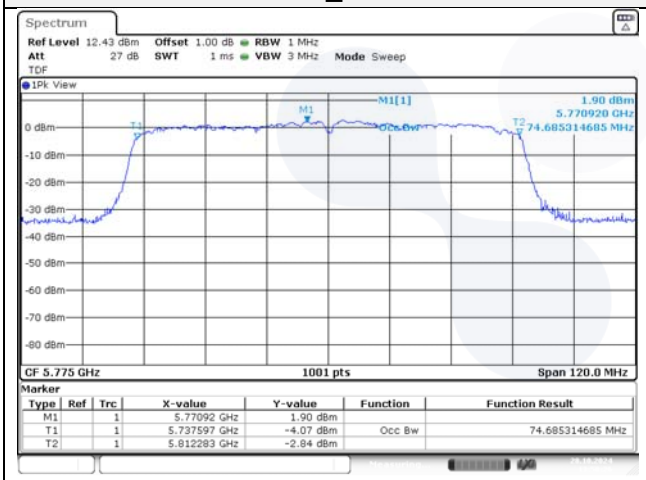
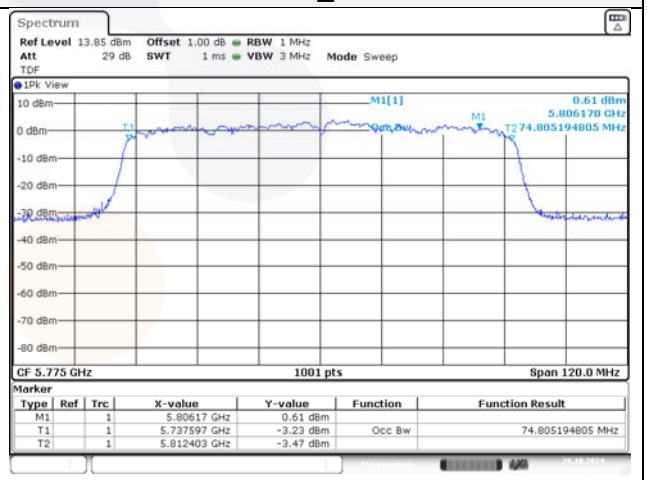
ANT 1	ANT 2
UNII-3 / 802.11ac_VHT80 / Mid ch.	UNII-3 / 802.11ac_VHT80 / Mid ch.
	

99% bandwidth

SISO

ANT 1	ANT 2
UNII-3 / 802.11ac_VHT80 / Mid ch.	UNII-3 / 802.11ac_VHT80 / Mid ch.
	

MIMO

ANT 1	ANT 2
UNII-3 / 802.11ac_VHT80 / Mid ch.	UNII-3 / 802.11ac_VHT80 / Mid ch.
	

7.5. Straddle channel

26dB bandwidth & 99% Bandwidth

SISO

Test mode	Band	Frequency (㎒)	26dB Bandwidth (㎒)		99% Bandwidth (㎒)	
			ANT1	ANT2	ANT1	ANT2
802.11a	UNII-2C	5 720	14.34	-	16.28	-
802.11n_HT20		5 720	14.89	14.84	17.48	17.53
802.11n_HT40		5 710	34.68	34.68	36.06	35.86
802.11ac_VHT20		5 720	14.84	14.79	17.48	17.53
802.11ac_VHT40		5 710	34.68	34.58	35.96	35.96
802.11ac_VHT80		5 690	75.52	75.76	74.81	74.81
802.11a	UNII-3	5 720	4.34	4.29	-	-
802.11n_HT20		5 720	4.79	4.74	-	-
802.11n_HT40		5 710	4.58	4.58	-	-
802.11ac_VHT20		5 720	4.79	4.79	-	-
802.11ac_VHT40		5 710	4.68	4.68	-	-
802.11ac_VHT80		5 690	6.00	6.00	-	-

Notes:

1. For 99% Bandwidth, measured 99% occupied bandwidth is separated as below.
   - For UNII band 2C = 5 725 ㎒ – T1 (Measured frequency on the marker table)
   - For UNII band 3 = T2 (Measured frequency on the marker table) – 5 725 ㎒

MIMO

Test mode	Band	Frequency (㎒)	26㏈ Bandwidth (㎒)		99% Bandwidth (㎒)	
			ANT1	ANT2	ANT1	ANT2
802.11n_HT20	UNII-2C	5 720	14.74	14.84	17.53	17.53
802.11n_HT40		5 710	34.58	34.48	35.86	35.96
802.11ac_VHT20		5 720	14.74	14.59	17.53	17.53
802.11ac_VHT40		5 710	34.48	34.38	35.96	35.76
802.11ac_VHT80		5 690	75.76	75.40	74.81	74.69
802.11n_HT20	UNII-3	5 720	4.79	4.79	-	-
802.11n_HT40		5 710	4.68	4.58	-	-
802.11ac_VHT20		5 720	4.59	4.64	-	-
802.11ac_VHT40		5 710	4.48	4.48	-	-
802.11ac_VHT80		5 690	5.64	5.28	-	-

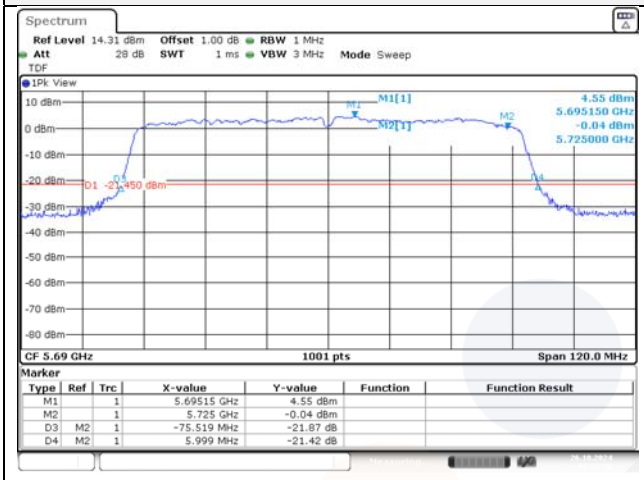
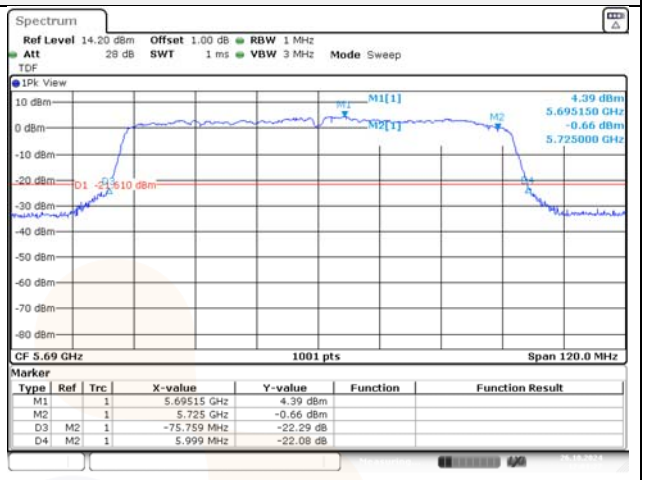
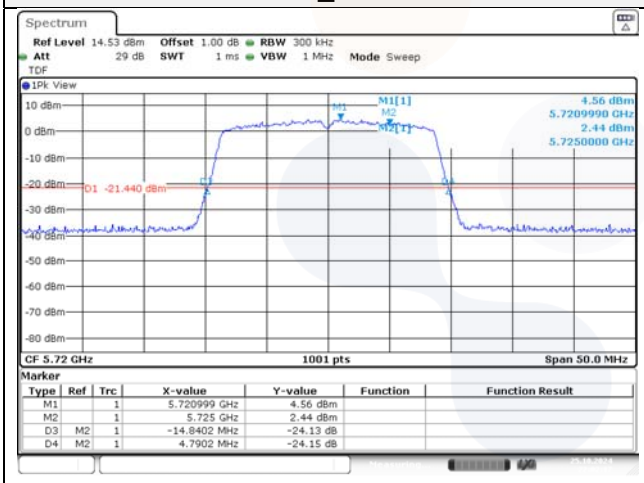
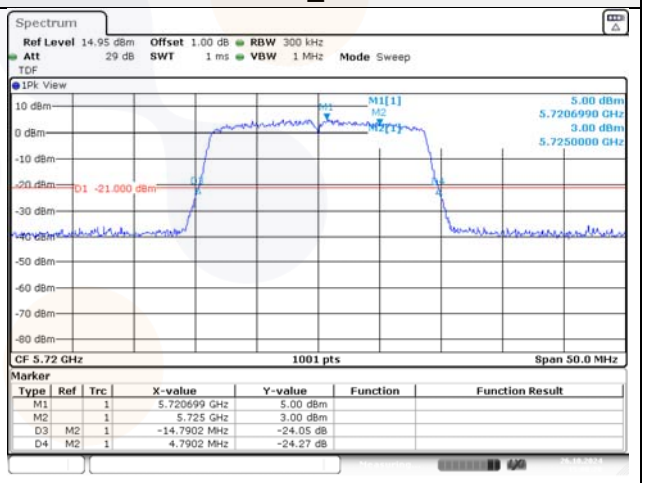
Notes:

2. For 99% Bandwidth, measured 99% occupied bandwidth is separated as below.
   - For UNII band 2C = 5 725 ㎒ – T1 (Measured frequency on the marker table)
   - For UNII band 3 = T2 (Measured frequency on the marker table) – 5 725 ㎒

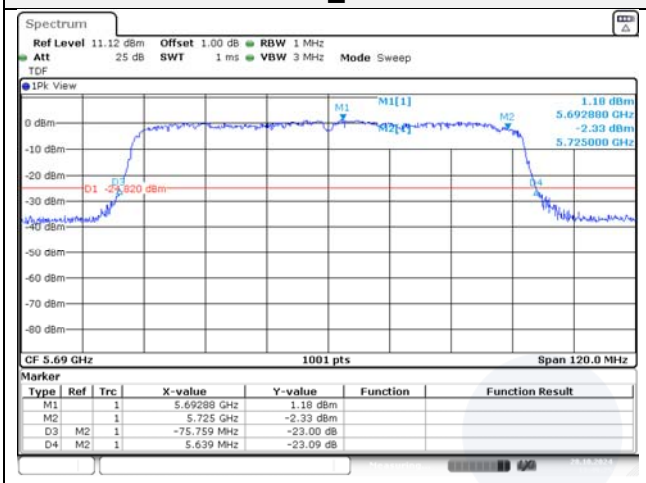
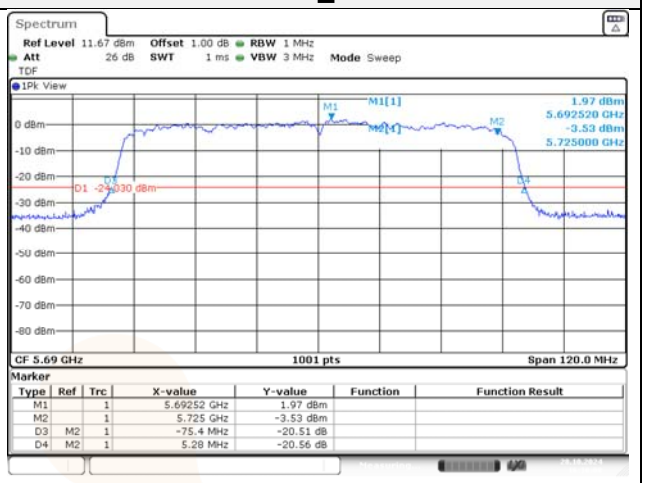
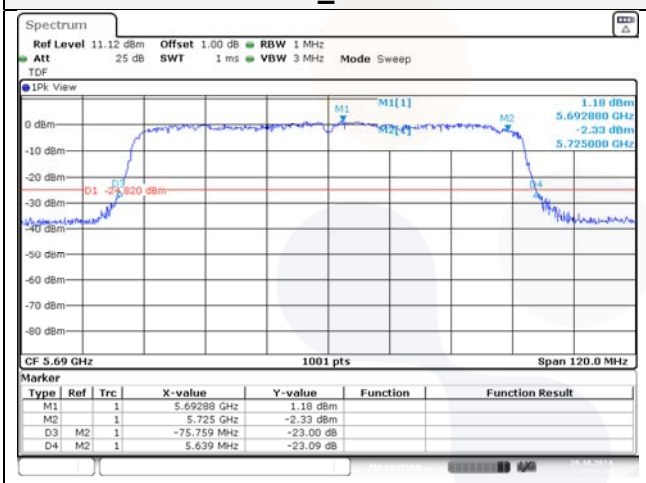
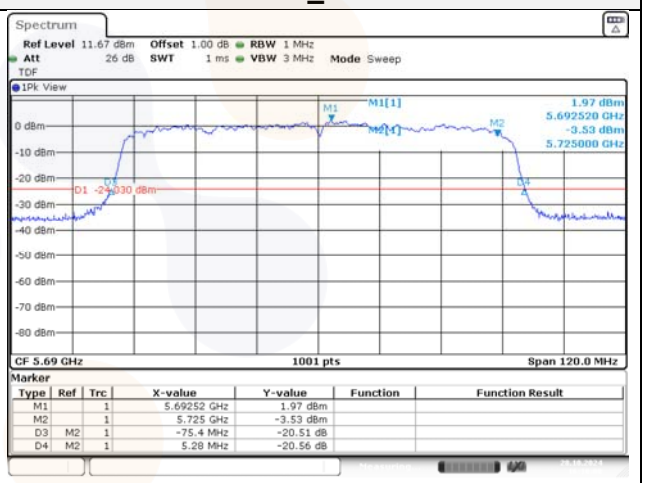
In order to simplify the report, the attached plot is the widest bandwidth ins Band.

26dB bandwidth

SISO

ANT 1	ANT 2
UNII-2C / 802.11ac_VHT80 / 5 690 ㎒	**UNII-2C / 802.11ac_VHT80 / 5 690 ㎒**
	
UNII-3 / 802.11ac_VHT20 / 5 720 ㎒	**UNII-3 / 802.11ac_VHT20 / 5 720 ㎒**
	

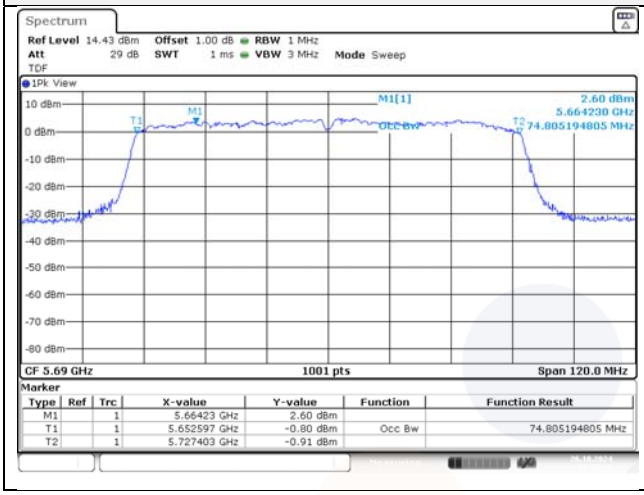
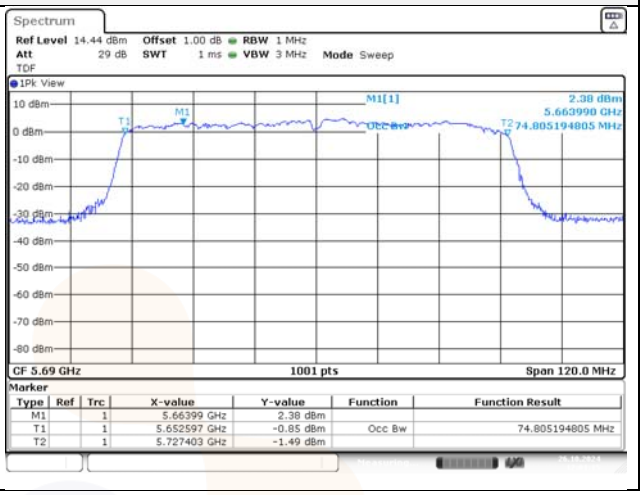
MIMO

ANT 1	ANT 2
UNII-2C / 802.11ac_VHT80 / 5 690 ㎒	**UNII-2C / 802.11ac_VHT80 / 5 690 ㎒**
	
UNII-3 / 802.11ac_VHT80 / 5 690 ㎒	**UNII-3 / 802.11ac_VHT80 / 5 690 ㎒**
	

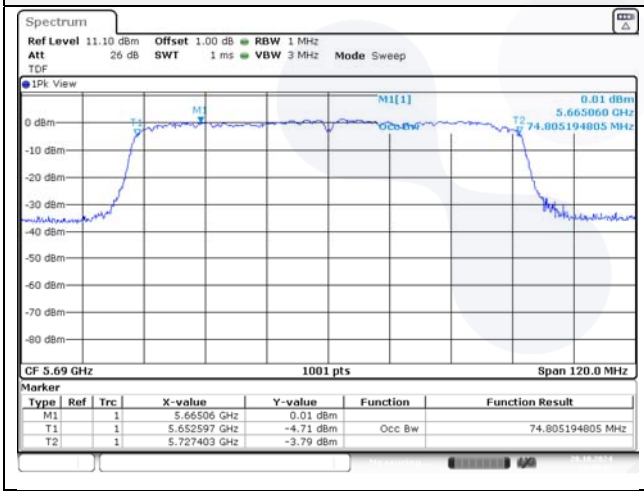
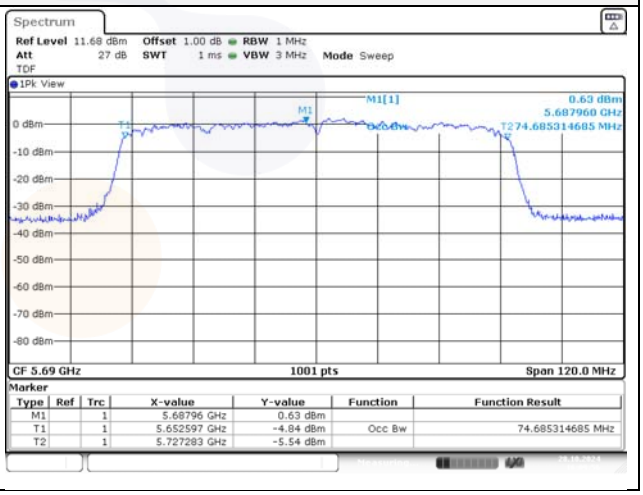
In order to simplify the report, the attached plot is the widest bandwidth ins Band.

99% bandwidth

SISO

ANT 1	ANT 2
UNII-2C / 802.11ac_VHT80 / 5 690 ㎒	UNII-2C / 802.11ac_VHT80 / 5 690 ㎒
	

MIMO

ANT 1	ANT 2
UNII-2C / 802.11ac_VHT80 / 5 690 ㎒	UNII-2C / 802.11ac_VHT80 / 5 690 ㎒
	

6dB bandwidth

SISO

Test mode	Band	Frequency (㎒)	6dB Bandwidth (㎒)		Limit (㎒)
			ANT1	ANT2	
802.11a	UNII-3	5 720	2.59	-	0.50
802.11n_HT20		5 720	2.59	2.79	0.50
802.11n_HT40		5 710	2.68	2.58	0.50
802.11ac_VHT20		5 720	3.14	3.79	0.50
802.11ac_VHT40		5 710	2.68	2.58	0.50
802.11ac_VHT80		5 690	2.64	2.64	0.50

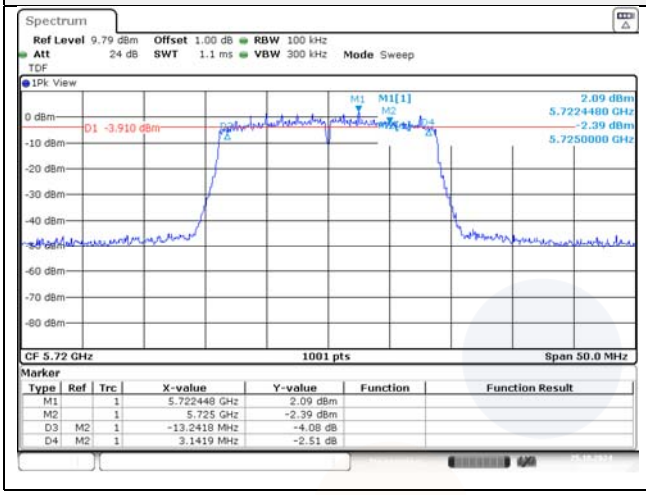
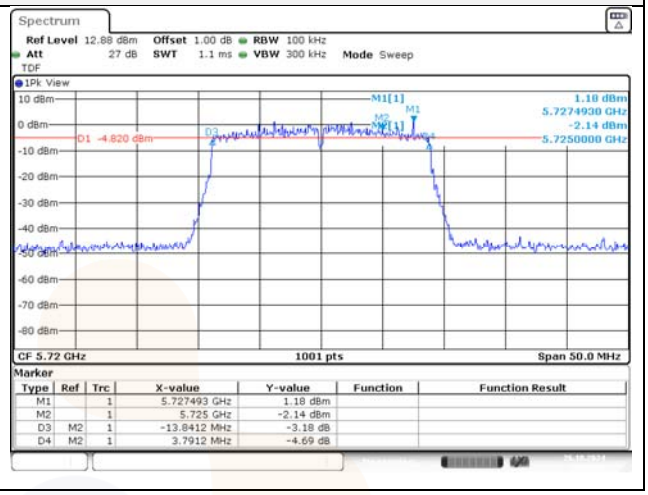
MIMO

Test mode	Band	Frequency (㎒)	6dB Bandwidth (㎒)		Limit (㎒)
			ANT1	ANT2	
802.11n_HT20	UNII-3	5 720	3.79	3.79	0.50
802.11n_HT40		5 710	2.68	2.58	0.50
802.11ac_VHT20		5 720	3.79	3.14	0.50
802.11ac_VHT40		5 710	2.68	2.58	0.50
802.11ac_VHT80		5 690	2.64	2.64	0.50

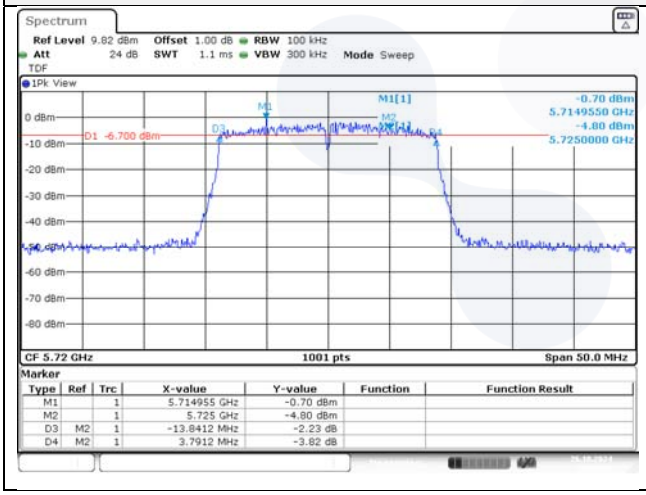
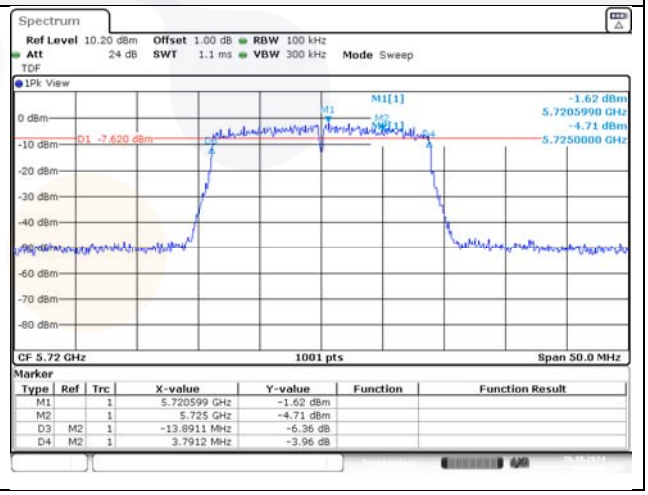
In order to simplify the report, the attached plot is the widest bandwidth ins Band.

6dB bandwidth

SISO

ANT 1	ANT 2
UNII-3 / 802.11ac_VHT20 / 5 720 ㎒	**UNII-3 / 802.11ac_VHT20 / 5 720 ㎒**
	

MIMO

ANT 1	ANT 2
UNII-3 / 802.11n_HT20 / 5 720 ㎒	**UNII-3 / 802.11n_HT20 / 5 720 ㎒**
	

Conducted Output Power

SISO

Test mode	Band	Frequency (㎒)	Measured output power									
			Conducted Output Power (dBm)		FCC Limit (dBm)		ANT gain (dBi)		MAX e.i.r.p. (dBm)		MAX e.i.r.p. Limit (dBm)	
			ANT 1	ANT 2	ANT 1	ANT 2	ANT 1	ANT 2	ANT 1	ANT 2	ANT 1	ANT 2
802.11a	UNII-2C	5 720	14.45	-	22.57	-	1.23	0.34	14.79	-	29.12	-
802.11n HT20		5 720	14.13	14.51	22.73	22.71			14.47	14.85	29.43	29.44
802.11n HT40		5 710	13.93	14.56	23.98	23.98			14.27	14.90	30.00	30.00
802.11ac VHT20		5 720	12.44	13.43	22.71	22.70			12.78	13.77	29.43	29.44
802.11ac VHT40		5 710	12.84	13.21	23.98	23.98			13.18	13.55	30.00	30.00
802.11ac VHT80		5 690	13.09	12.92	23.98	23.98			13.43	13.26	30.00	30.00
802.11a	UNII-3	5 720	7.20	6.98	30.00	30.00	1.43	-0.53	6.67	6.45	30.00	30.00
802.11n HT20		5 720	7.50	7.64	30.00	30.00			6.97	7.11	30.00	30.00
802.11n HT40		5 710	2.20	2.77	30.00	30.00			1.67	2.24	30.00	30.00
802.11ac VHT20		5 720	5.91	6.48	30.00	30.00			5.38	5.95	30.00	30.00
802.11ac VHT40		5 710	1.21	1.06	30.00	30.00			0.68	0.53	30.00	30.00
802.11ac VHT80		5 690	-2.96	-3.29	30.00	30.00			-3.49	-3.82	30.00	30.00

Notes:

1. Conducted output power (dBm) = Average power (dBm) + D.C.F (dB)
2. e.i.r.p. Calculation: e.i.r.p. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

MIMO

Test mode	Band	Frequency (㎒)	Measured output power					
			Conducted Output Power (dBm)		FCC Limit (dBm)	Directional gain(dBi)	MAX e.i.r.p. (dBm)	MAX e.i.r.p. Limit (dBm)
			ANT 1	ANT 2			ANT 1+ ANT 2	
802.11n_HT20	UNII-2C	5 720	11.23	11.23	22.69	0.81	15.05	29.44
802.11n_HT40		5 710	12.37	9.79	23.98		15.09	30.00
802.11ac_VHT20		5 720	8.86	9.45	22.64		12.99	29.44
802.11ac_VHT40		5 710	9.60	8.99	23.98		13.12	30.00
802.11ac_VHT80		5 690	8.65	8.43	23.98		12.36	30.00
802.11n_HT20	UNII-3	5 720	4.57	4.45	30.00	0.56	8.08	30.00
802.11n_HT40		5 710	0.81	-2.03	30.00		3.19	30.00
802.11ac_VHT20		5 720	2.15	2.72	30.00		6.02	30.00
802.11ac_VHT40		5 710	-1.93	-3.11	30.00		1.09	30.00
802.11ac_VHT80		5 690	-7.83	-8.22	30.00		-4.45	30.00

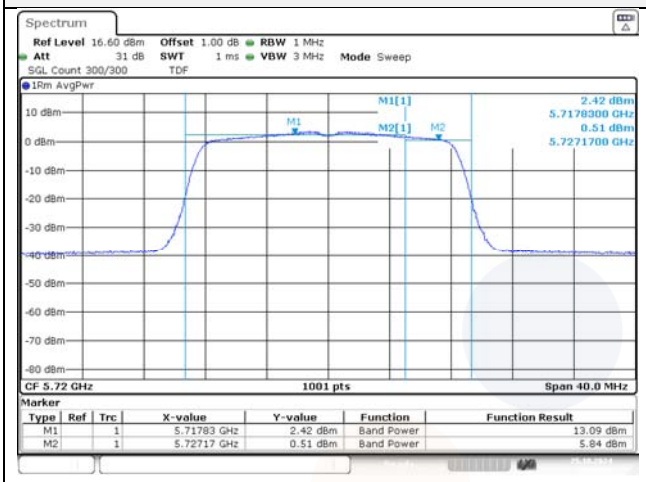
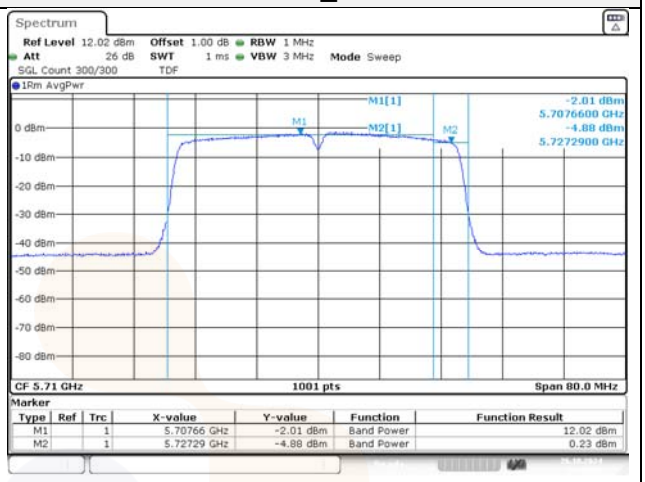
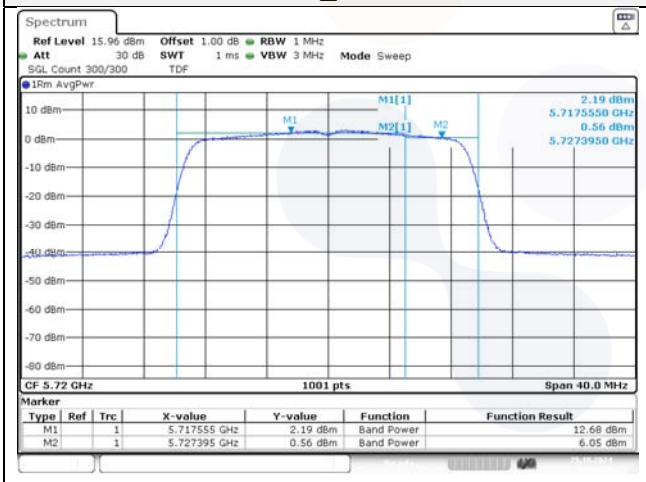
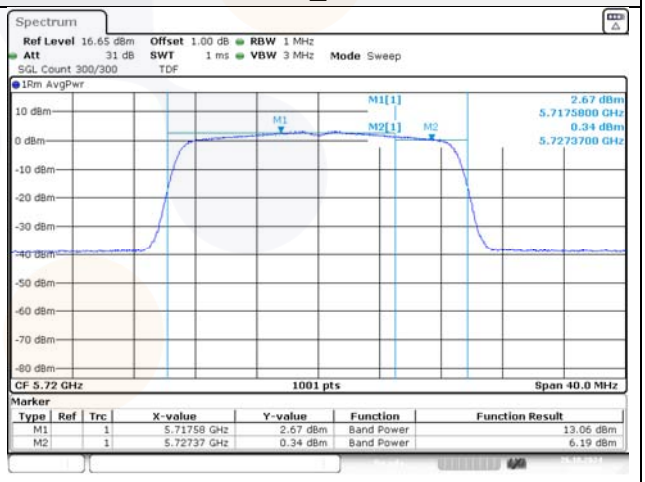
Notes:

1. Conducted output power (dBm) = Average power(10log($10^{(ANT1/10)}$ + $10^{(ANT2/10)}$)) (dBm) + D.C.F (dB)
2. e.i.r.p. Calculation : e.i.r.p. (dBm) = Conducted output power (dBm) + Directional gain (dBi)
3. Directional gain = Uncorrelated (MIMO) and referred to 2.4 tables in the applicable report.

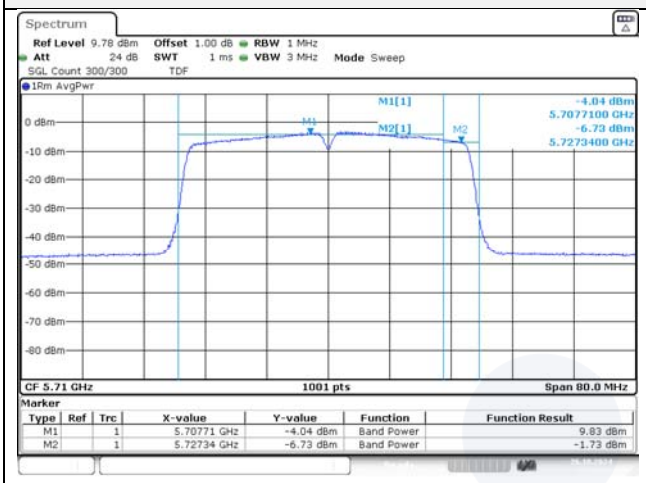
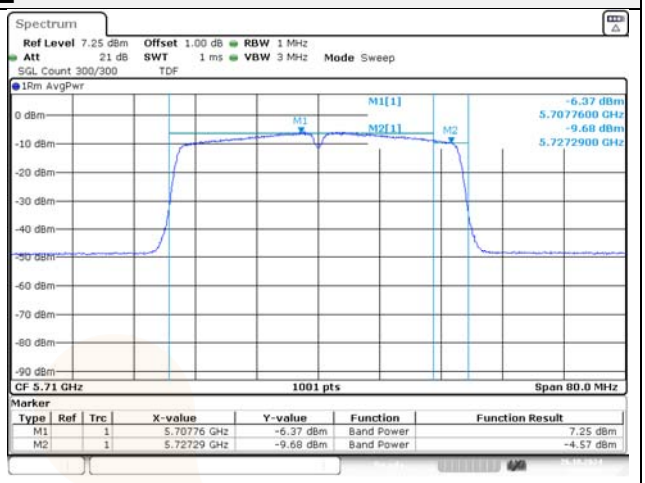
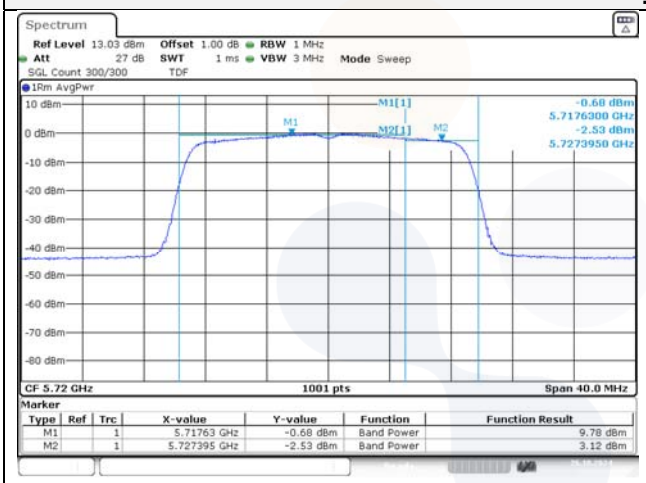
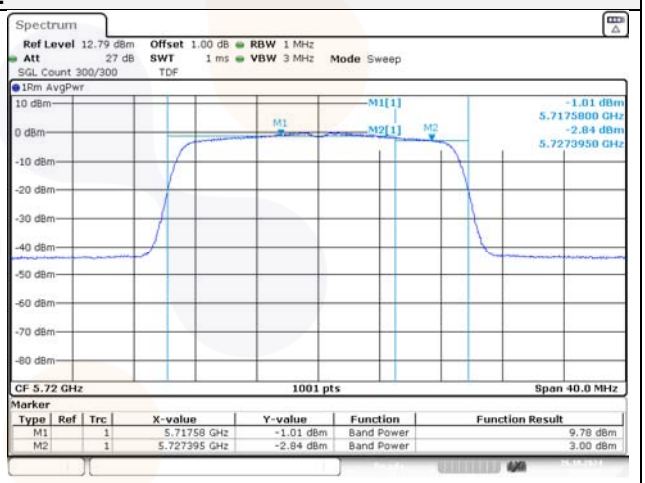
In order to simplify the report, the attached plot is the worst Conducted output power ins Band.

Conducted Output Power

SISO

ANT 1	ANT 2
UNII-2C / 802.11a / 5 720 ㎒	**UNII-2C / 802.11n_HT40 / 5 710 ㎒**
	
UNII-3 / 802.11n_HT20 / 5 720 ㎒	**UNII-3 / 802.11n_HT20 / 5 720 ㎒**
	

MIMO

ANT 1	ANT 2
UNII-2C / 802.11n_HT40 / 5 710 ㎒	
	
UNII-3 / 802.11n_HT20 / 5 720 ㎒	
	

Power Spectral Density

SISO

Test mode	Band	Frequency (㎒)	Measured PSD (dBm/㎒)		DCF (dB)	Maximum PSD (dB m/㎒)		Limit (dBm/㎒)
			ANT1	ANT2		ANT1	ANT2	
802.11a	UNII-2C	5 720	3.61	-	1.36	4.97	-	11.00
802.11n_HT20		5 720	3.12	3.75	1.45	4.57	5.20	
802.11n_HT40		5 710	-1.61	-0.79	2.54	0.93	1.75	
802.11ac_VHT20		5 720	1.46	2.33	1.44	2.90	3.77	
802.11ac_VHT40		5 710	-2.39	-1.90	2.53	0.14	0.63	
802.11ac_VHT80		5 690	-6.98	-7.37	4.13	-2.85	-3.24	

Test mode	Band	Frequency (㎒)	Measured PSD (dBm/500 ㎑)		DCF (dB)	Maximum PSD (dB m/500 ㎑)		Limit (dBm/ 500 ㎑)
			ANT1	ANT2		ANT1	ANT2	
802.11a	UNII-3	5 720	-1.08	-	1.36	0.28	-	30.00
802.11n_HT20		5 720	-1.28	-0.84	1.45	0.17	0.61	
802.11n_HT40		5 710	-6.66	-6.43	2.54	-4.12	-3.89	
802.11ac_VHT20		5 720	-2.50	-1.94	1.44	-1.06	-0.50	
802.11ac_VHT40		5 710	-7.77	-7.95	2.53	-5.24	-5.42	
802.11ac_VHT80		5 690	-13.31	-13.98	4.13	-9.18	-9.85	

Note:

1. Maximum PSD(dB m/㎒) = Reading (dB m/㎒, 500 ㎑) + DCF(dB)
2. The Unit of UNII-2C is (dB m / ㎒) and Unit of UNII-3 is (dB m / 500㎑)

MIMO

Test mode	Band	Frequency (㎒)	Measured PSD (dBm/㎒)		DCF (dB)	Maximum PSD (dB m/㎒)	Limit (dBm/㎒)
			ANT1	ANT2		ANT+ ANT2	
802.11n_HT20	UNII-2C	5 720	0.58	0.42	1.44	4.96	11.00
802.11n_HT40		5 710	-3.30	-5.78	2.54	1.18	
802.11ac_VHT20		5 720	-2.10	-1.44	2.45	3.70	
802.11ac_VHT40		5 710	-5.76	-6.47	3.91	0.82	
802.11ac_VHT80		5 690	-11.40	-11.78	5.72	-2.86	

Test mode	Band	Frequency (㎒)	Measured PSD (dBm/500 ㎑)		DCF (dB)	Maximum PSD (dB m/500 ㎑)	Limit (dBm/ 500 ㎑)
			ANT1	ANT2		ANT+ ANT2	
802.11n_HT20	UNII-3	5 720	-4.09	-4.22	1.44	0.30	30.00
802.11n_HT40		5 710	-8.20	-11.32	2.54	-3.94	
802.11ac_VHT20		5 720	-6.52	-5.74	2.45	-0.66	
802.11ac_VHT40		5 710	-10.87	-11.77	3.91	-4.38	
802.11ac_VHT80		5 690	-17.36	-18.46	5.72	-9.14	

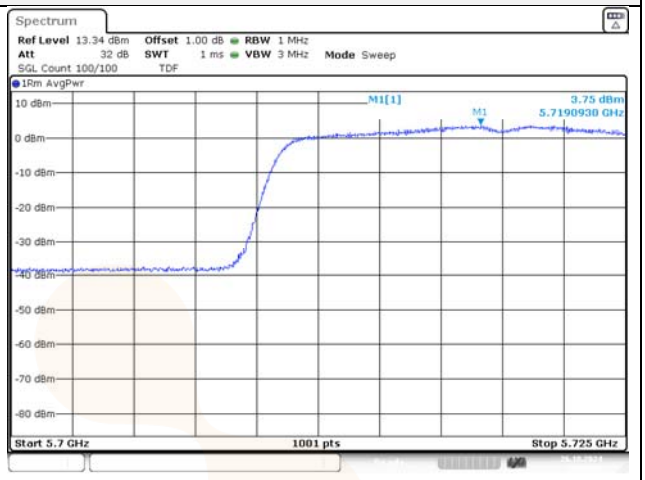
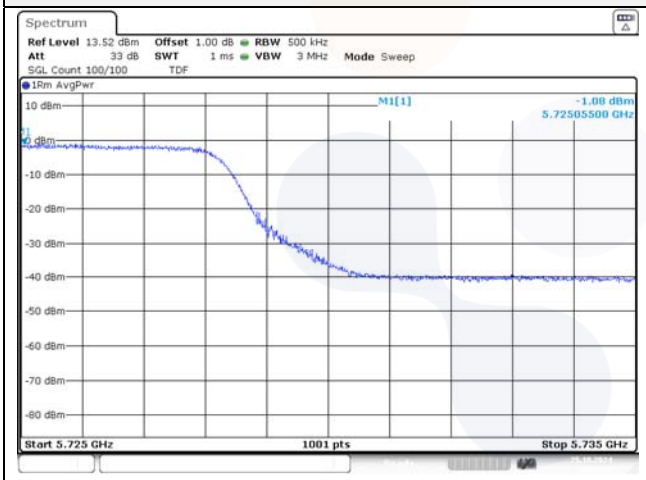
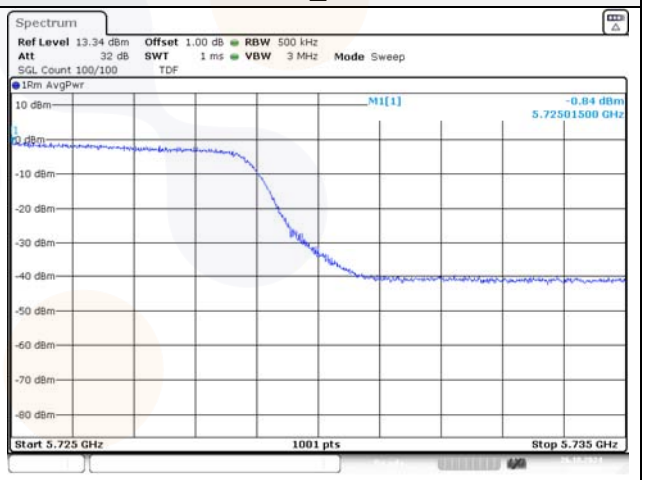
Note:

1. Maximum PSD(dB m/㎒) = Measured PSD(10log($10^{(ANT1/10)}$ + $10^{(ANT2/10)}$)) (dB m/㎒, 500 ㎑) + DCF(dB)
2. The Unit of UNII-2C is (dB m / ㎒) and Unit of UNII-3 is (dB m / 500㎑)

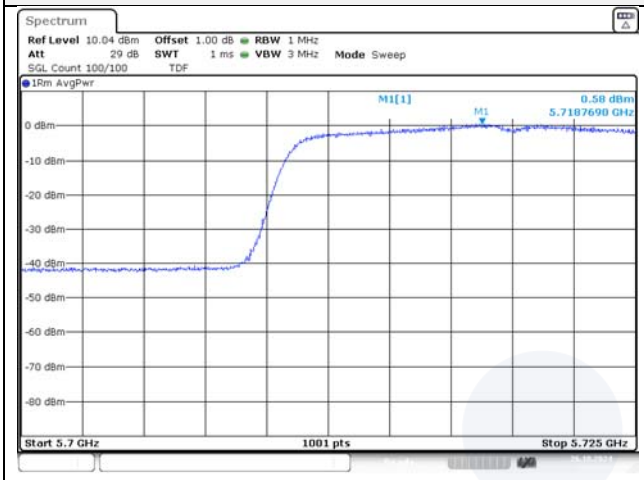
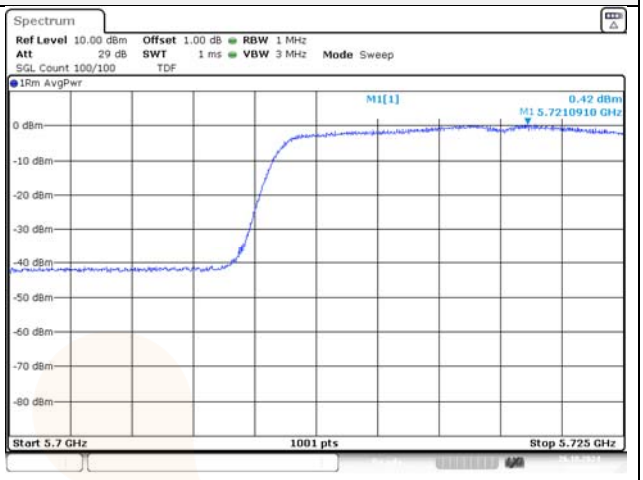
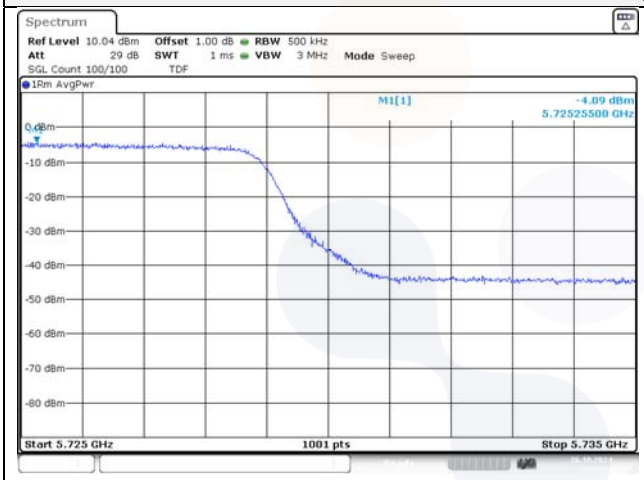
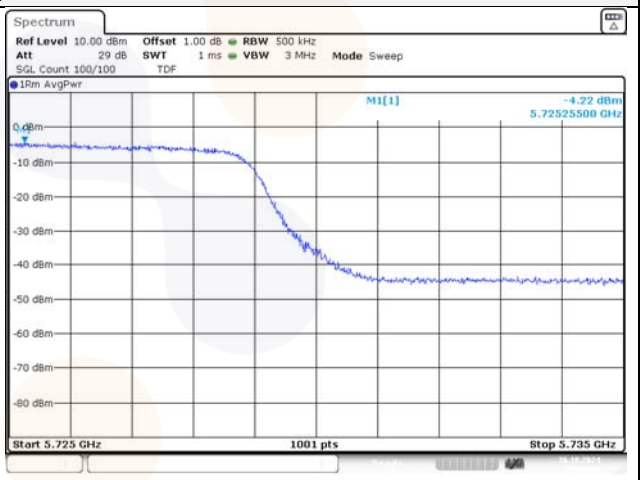
In order to simplify the report, the attached plot is the worst output power ins Band.

Power Spectral Density

SISO

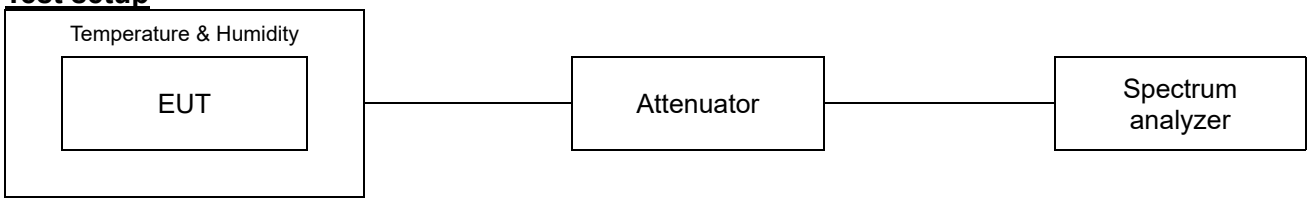
ANT 1	ANT 2
UNII-2C / 802.11a / 5 720 ㎒	**UNII-2C / 802.11n_HT20 / 5 720 ㎒**
	
UNII-3 / 802.11a / 5 720 ㎒	**UNII-3 / 802.11n_HT20 / 5 720 ㎒**
	

MIMO

ANT 1	ANT 2
UNII-2C / 802.11n_HT20 / 5 720 ㎒	
	
UNII-3 / 802.11n_HT20 / 5 720 ㎒	
	

7.6. Frequency stability

Test setup



Limit

According to §15.407(g),
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.

According to RSS-GEN(6.11),
For licence-exempt devices, the following conditions apply:

(a) at the temperatures of -20°C (-4°F), +20°C (+68°F) and +50°C (+122°F), and at the manufacturer's rated supply voltage

(b) at the temperature of +20°C (+68°F) and at ±15% of the manufacturer's rated supply voltage

If the frequency stability limits are only met within a temperature range that is smaller than the range specified in (a) for licensed or licence-exempt devices, the frequency stability requirement will be deemed to be met if the transmitter is automatically prevented from operating outside this smaller temperature range and if the published operating characteristics for the equipment are revised to reflect this restricted temperature range.

If the device contains both licence and licence-exempt transmitter modules, the device's frequency stability shall be measured under the most stringent condition specified in the applicable RSS of the transmitter module.

In addition, if an unmodulated carrier is not available, the method used to measure frequency stability shall be described in the test report.

According to RSS-GEN(8.11),
If the frequency stability of the licence-exempt radio apparatus is not specified in the applicable RSS, the fundamental emissions of the radio apparatus should be kept within at least the central 80% of its permitted operating frequency band in order to minimize the possibility of out-of-band operation. In addition, its occupied bandwidth shall be entirely outside the restricted bands and the prohibited TV bands of 54-72 ㎒, 76-88 ㎒, 174-216 ㎒, and 470-602 ㎒, unless otherwise indicated.

Test procedure

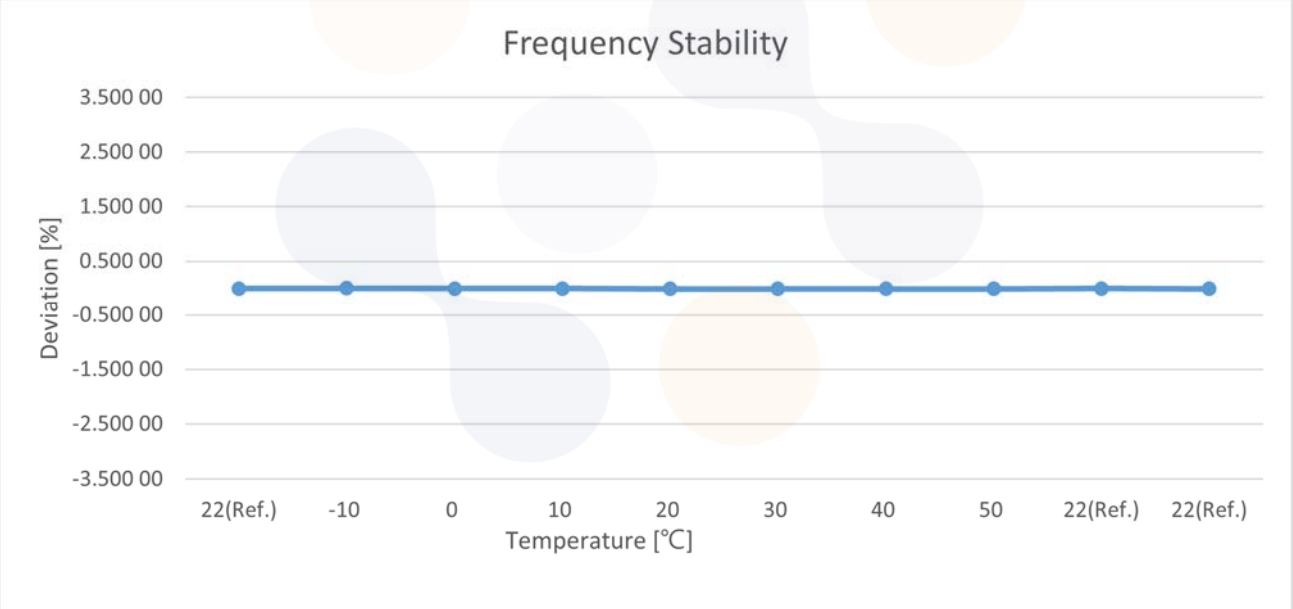
ANSI C63.10-2013 - Section 6.8.1

Test results

Test band : UNII-1

Frequency (㎐) : 5 180 000 000

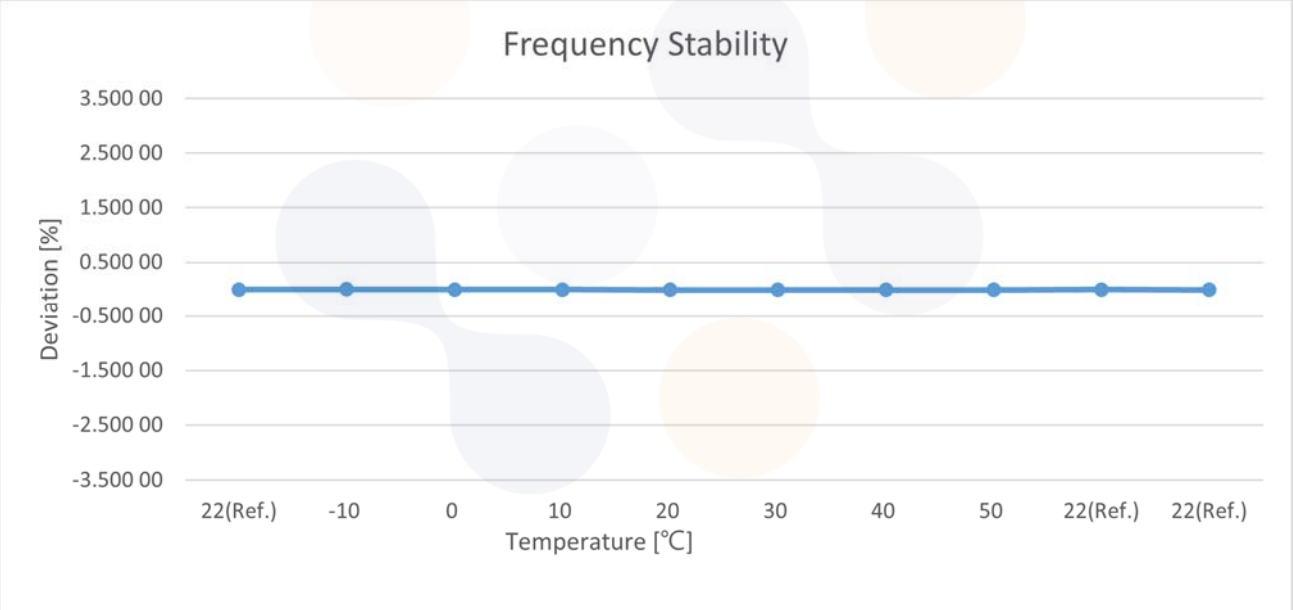
Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100	5.00	22(Ref.)	5 179 940 060	-59 940	-11.57	-0.001 16
		-10	5 180 139 860	139 860	27.00	0.002 70
		0	5 180 000 000	0	0	0
		10	5 179 800 200	-199 800	-38.57	-0.003 86
		20	5 179 780 220	-219 780	-42.43	-0.004 24
		30	5 179 760 240	-239 760	-46.29	-0.004 63
		40	5 179 760 240	-239 760	-46.29	-0.004 63
		50	5 179 780 220	-219 780	-42.43	-0.004 24
85	4.25	22(Ref.)	5 179 940 060	-59 940	-11.57	-0.001 16
115	5.75	22(Ref.)	5 179 760 240	-239 760	-46.29	-0.004 63



Test band : UNII-2A

Frequency (㎐) : 5 260 000 000

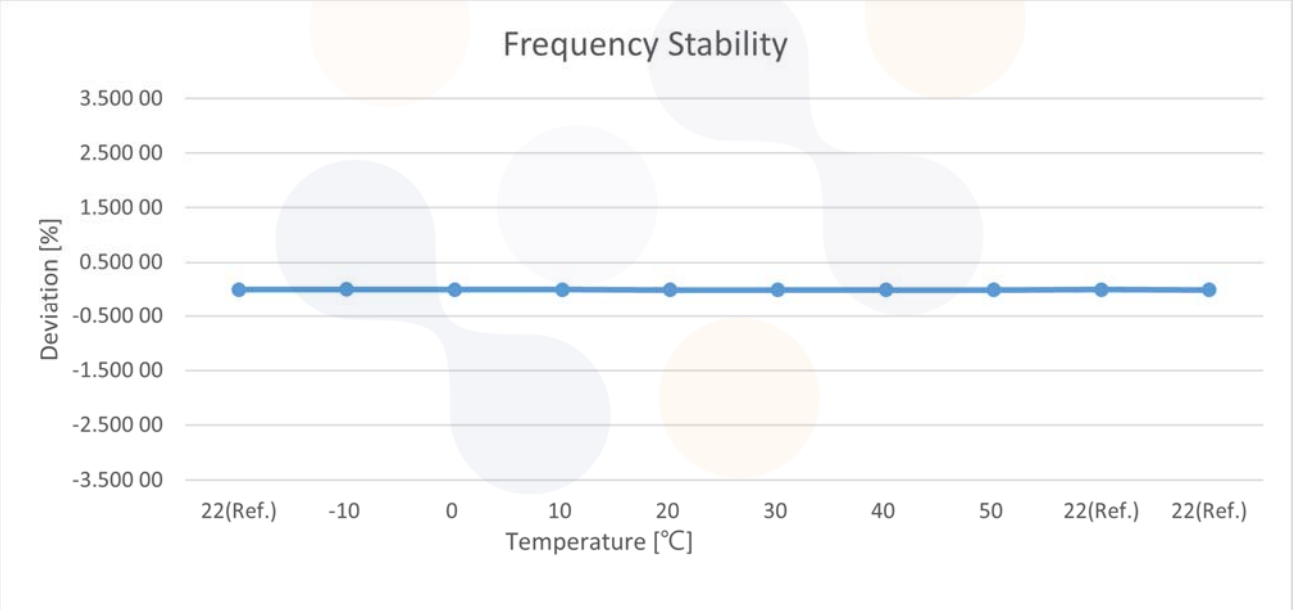
Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100	5.00	22(Ref.)	5 259 760 240	-239 760	-45.58	-0.004 56
		-10	5 259 740 260	-259 740	-49.38	-0.004 94
		0	5 260 099 900	99 900	18.99	0.001 90
		10	5 259 780 220	-219 780	-41.79	-0.004 18
		20	5 260 059 940	59 940	11.40	0.001 14
		30	5 259 760 240	-239 760	-45.58	-0.004 56
		40	5 260 059 940	59 940	11.40	0.001 14
		50	5 259 940 060	-59 940	-11.40	-0.001 14
85	4.25	22(Ref.)	5 259 760 240	-239 760	-45.58	-0.004 56
115	5.75	22(Ref.)	5 259 760 240	-239 760	-45.58	-0.004 56



Test band : UNII-2C

Frequency (㎐) : 5 500 000 000

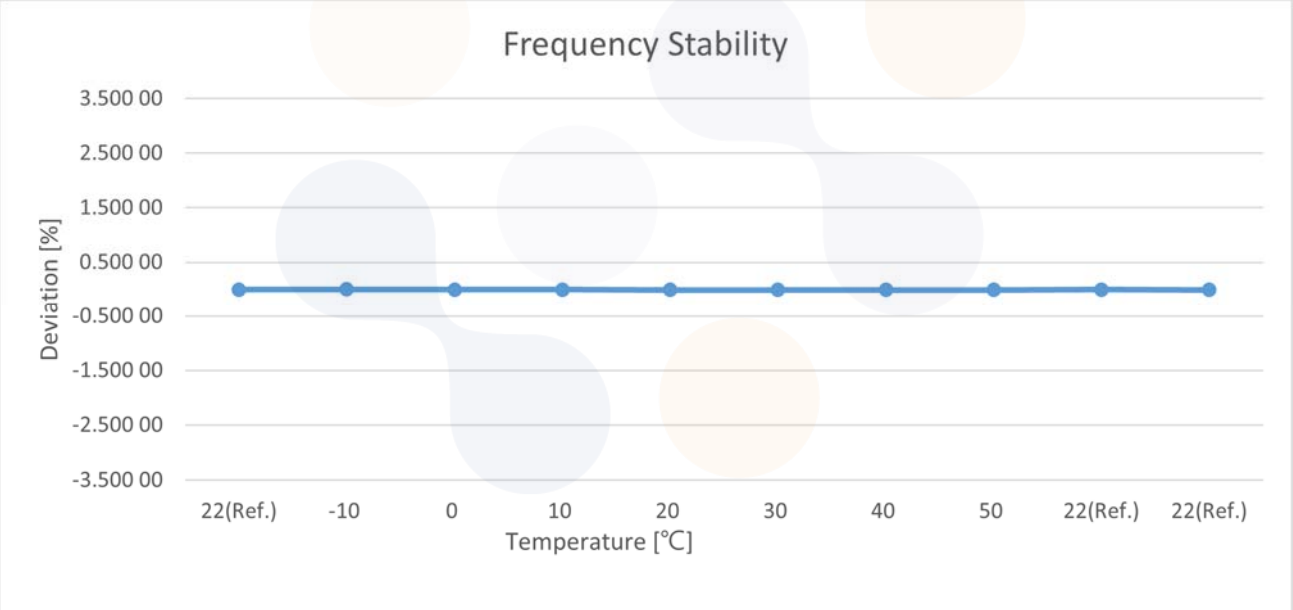
Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100	5.00	22(Ref.)	5 499 760 240	-239 760	-43.59	-0.004 36
		-10	5 500 039 960	39 960	7.27	0.000 73
		0	5 500 099 900	99 900	18.16	0.001 82
		10	5 500 000 000	0	0	0
		20	5 499 980 020	-19 980	-3.63	-0.000 36
		30	5 500 059 940	59 940	10.90	0.001 09
		40	5 499 940 060	-59 940	-10.90	-0.001 09
		50	5 499 960 040	-39 960	-7.27	-0.000 73
85	4.25	22(Ref.)	5 499 780 220	-219 780	-39.96	-0.004 00
115	5.75	22(Ref.)	5 499 780 220	-219 780	-39.96	-0.004 00



Test band : UNII-3

Frequency (㎐) : 5 745 000 000

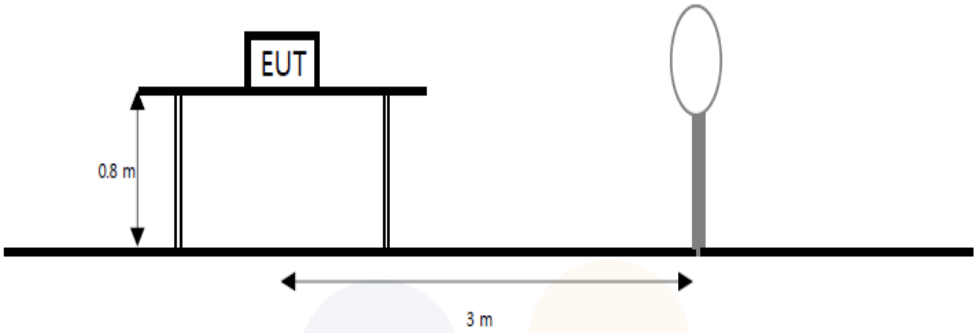
Voltage (%)	Power (V)	Temp. (°C)	Frequency (㎐)	Frequency error (㎐)	Deviation	
					(ppm)	(%)
100	5.00	22(Ref.)	5 744 940 060	-59 940	-10.43	-0.001 04
		-10	5 745 139 860	139 860	24.34	0.002 43
		0	5 745 119 880	119 880	20.87	0.002 09
		10	5 745 079 920	79 920	13.91	0.001 39
		20	5 744 960 040	-39 960	-6.96	-0.000 70
		30	5 745 059 940	59 940	10.43	0.001 04
		40	5 744 760 240	-239 760	-41.74	-0.004 17
		50	5 744 940 060	-59 940	-10.43	-0.001 04
85	4.25	22(Ref.)	5 744 760 240	-239 760	-41.74	-0.004 17
115	5.75	22(Ref.)	5 744 960 040	-39 960	-6.96	-0.000 70



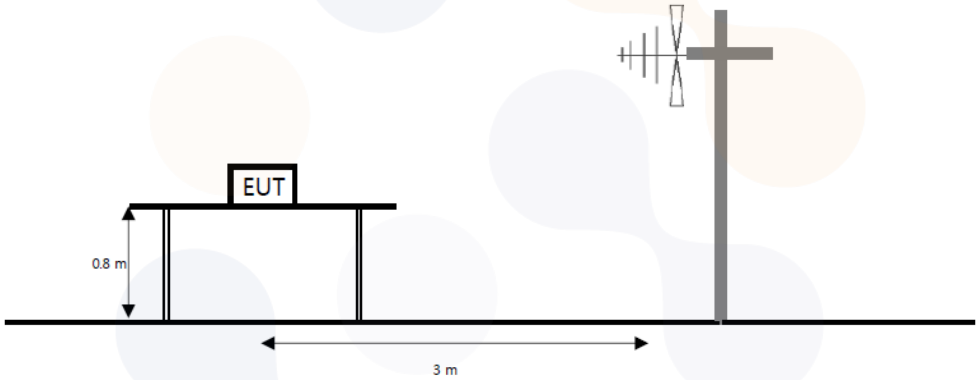
7.7. Spurious Emission, Band Edge and Restricted bands

Test setup

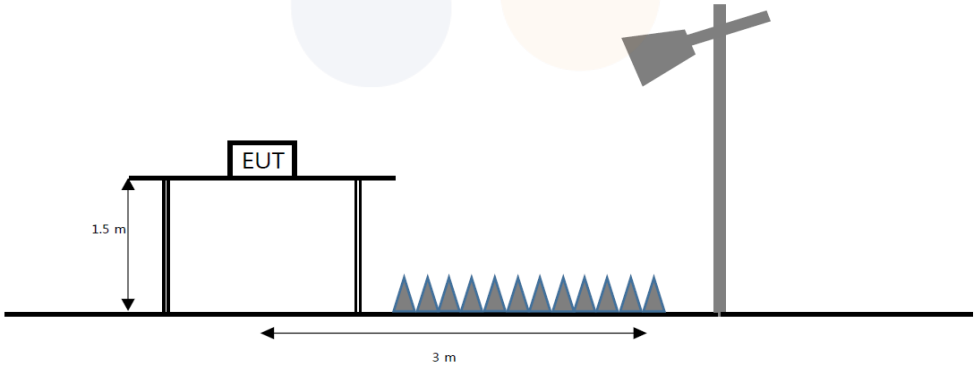
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒ Emissions



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to the tenth harmonic of the highest fundamental frequency or to 40 ㎓ emissions, whichever is lower.



Limit

FCC

According to section 15.209(a) except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (㎒)	Field strength (㎶/m)	Measurement distance (m)
0.009 - 0.490	2 400/F(㎑)	300
0.490 - 1.705	24 000/F(㎑)	30
1.705 - 30	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 ㎒, 76–88 ㎒, 174–216 ㎒ or 470–806 ㎒. However, operation within these frequency bands is permitted under other sections of this part, e.g., Section15.231 and 15.241.

According to section 15.205(a) and (b) only spurious emissions are permitted in any of the frequency bands listed below:

㎒	㎒	㎒	㎓
0.009 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.694 75 - 16.695 25	608 - 614	5.35 - 5.46
2.173 5 - 2.190 5	16.804 25 - 16.804 75	960 – 1 240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1 300 – 1 427	8.025 - 8.5
4.177 25 - 4.177 75	37.5 - 38.25	1 435 – 1 626.5	9.0 - 9.2
4.207 25 - 4.207 75	73 - 74.6	1 645.5 – 1 646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1 660 – 1 710	10.6 - 12.7
6.267 75 - 6.268 25	108 - 121.94	1 718.8 – 1 722.2	13.25 - 13.4
6.311 75 - 6.312 25	123 - 138	2 200 – 2 300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2 310 – 2 390	15.35 - 16.2
8.362 - 8.366	156.524 75 - 156.525 25	2 483.5 – 2 500	17.7 - 21.4
8.376 25 - 8.386 75		2 690 – 2 900	22.01 - 23.12
8.414 25 - 8.414 75	156.7 - 156.9	3 260 – 3 267	23.6 - 24.0
12.29 - 12.293	162.012 5 - 167.17	3 332 – 3 339	31.2 - 31.8
12.519 75 - 12.520 25	167.72 - 173.2	3 345.8 – 3 358	36.43 - 36.5
12.576 75 - 12.577 25	240 - 285	3 600 – 4 400	Above 38.6
13.36 - 13.41	322 - 335.4		

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in section 15.209. At frequencies equal to or less than 1 000 ㎒, compliance with the limits in section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1 000 ㎒, compliance with the emission limits in section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in section 15.35 apply to these measurements.

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

For transmitters operating in the 5.15-5.25 ㎓ band: All emissions outside of the 5.15-5.35 ㎓ band shall not exceed an e.i.r.p.. of −27 dBm/㎒
For transmitters operating in the 5.25-5.35 ㎓ band: All emissions outside of the 5.15-5.35 ㎓ band shall not exceed an e.i.r.p.. of −27 dBm/㎒.
For transmitters operating in the 5.47-5.725 ㎓ band: All emissions outside of the 5.15-5.35 ㎓ band shall not exceed an e.i.r.p.. of −27 dBm/㎒.

For transmitters operating in the 5.725-5.85 ㎓ band: All emissions shall be limited to a level of -27 dBm/㎒ at 75 ㎒ or more above or below the band edge increasing linearly to 10 dBm/㎒ at 25 ㎒ above or below the band edge, and form 25 ㎒ above or below the band edge increasing linearly to a level of 15.6 dBm/㎒ at 5 ㎒ above or below the band edge, and from 5 ㎒ above or below the band edge increasing linearly to a level of 27 dBm/㎒ at the band edge.

IC
According to RSS-247(5.5), In any 100 ㎑ bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 ㎑ bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

According to RSS-Gen(8.9), Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

Table 5- General field strength limits at frequencies above 30 ㎒

Frequency(㎒)	Field strength (㎶/m at 3 m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 6- General field strength limits at frequencies below 30 ㎒

Frequency	Magnetic field strength (H-Field) (㎂/m)	Measurement distance(m)
9 – 490 ㎑[1)]	6.37/F (F in ㎑)	300
490 – 1705 ㎑	63.7/F (F in ㎑)	30
1.705 - 30 ㎒	0.08	30

According to RSS-Gen(8.10), Restricted frequency bands, identified in table 7, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

(a) The transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD).
(b) Unwanted emissions that fall into restricted frequency bands listed in table 7 shall comply with the limits specified in table 5 and table 6.
(c) Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

Table 7- Restricted frequency bands*

MHz	MHz	GHz
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 - 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 - 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 - 138	--	

* Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

Test procedure

ANSI C63.10-2013 Section 12.7.7.2, 12.7.5, 12.7.6
KDB 789033 D02 v02r01 – Section G

Test settings

Peak field strength measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in table
3. VBW ≥ (3×RBW)
4. Detector = peak
5. Sweep time = auto
6. Trace mode = max hold
7. Allow sweeps to continue until the trace stabilizes

Table. RBW as a function of frequency

Frequency	RBW
9 ㎑ to 150 ㎑	200 ㎐ to 300 ㎐
0.15 ㎒ to 30 ㎒	9 ㎑ to 10 ㎑
30 ㎒ to 1 000 ㎒	100 ㎑ to 120 ㎑
> 1 000 ㎒	1 ㎒

Average field strength measurements

Trace averaging with continuous EUT transmission at full power

If the EUT can be configured or modified to transmit continuously (D ≥ 98%), then the average emission levels shall be measured using the following method (with EUT transmitting continuously):

1. RBW = 1 ㎒ (unless otherwise specified).
2. VBW ≥ (3×RBW).
3. Detector = RMS (power averaging), if [span / (# of points in sweep)] ≤ (RBW / 2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
4. Averaging type = power (i.e., rms):
   1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
   2) Some instruments require linear display mode to use linear voltage averaging. Log or ㏈ averaging shall not be used.
5. Sweep time = auto.
6. Perform a trace average of at least 100 traces.

Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction

If continuous transmission of the EUT (D ≥ 98%) cannot be achieved and the duty cycle is constant (duty cycle variations are less than ±2%), then the following procedure shall be used:

1. The EUT shall be configured to operate at the maximum achievable duty cycle.
2. Measure the duty cycle D of the transmitter output signal as described in 11.6.
3. RBW = 1 ㎒ (unless otherwise specified).
4. VBW ≥ [3 × RBW].
5. Detector = RMS (power averaging), if [span / (# of points in sweep)] ≤ (RBW / 2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
6. Averaging type = power (i.e., rms):
   1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
   2) Some instruments require linear display mode to use linear voltage averaging. Log or ㏈ averaging shall not be used.
7. Sweep time = auto.
8. Perform a trace average of at least 100 traces.
9. A correction factor shall be added to the measurement results prior to comparing with the emission limit to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
   1) If power averaging (rms) mode was used in step f), then the applicable correction factor is [10 log (1 / D)], where D is the duty cycle.
   2) If linear voltage averaging mode was used in step f), then the applicable correction factor is [20 log (1 / D)], where D is the duty cycle.
   3) If a specific emission is demonstrated to be continuous (D ≥ 98%) rather than turning ON and OFF with with the transmit cycle, then no duty cycle correction is required for that emission.

Band edge measurements

Integration Method

For maximum emissions measurements, follow the procedures described in II.G.5., “Procedures for unwanted maximum Emissions Measurements above 1000 ㎒. Except for the following changes:

1. Set RBW = 100 ㎑
2. Set VBW ≥ 3 × RBW
3. Perform a band-power integration across the 1 ㎒ bandwidth in which the band edge emission level is to be measured. CAUTION: you must ensure that the spectrum analyzer or EMI receiver is set for peak detection and max-hold for this measurement.

For average emissions measurements, follow the procedures described in II.G.6., “Procedures for average unwanted Emissions Measurements above 1000 ㎒. Except for the following changes:

1. Set RBW = 100 ㎑
2. Set VBW ≥ 3 × RBW
3. Perform a band-power integration across the 1 ㎒ bandwidth in which the band edge emission level is to be measured.

Notes:

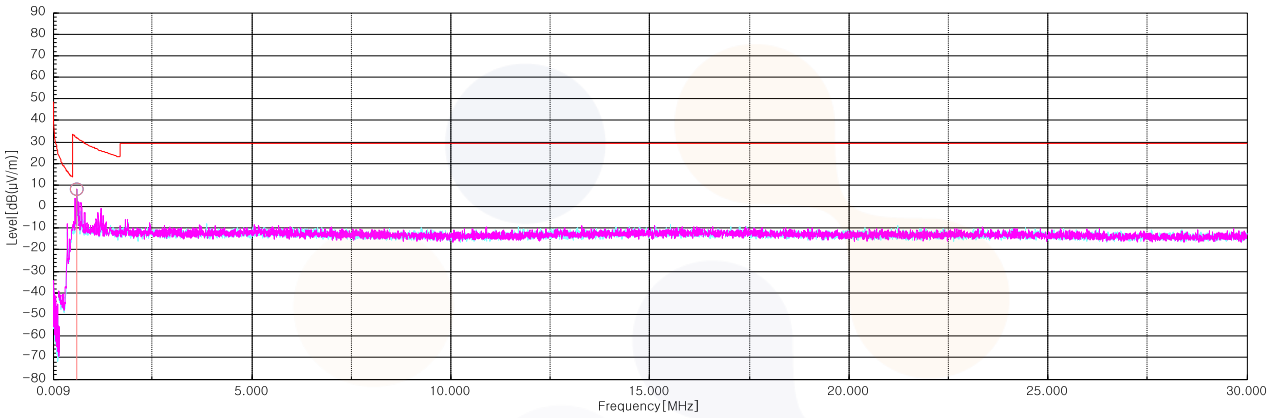
1. *f* <30 ㎒, extrapolation factor of 40 ㏈/decade of distance. $F_d = 40\log(D_m/D_s)$
   f ≥30 ㎒, extrapolation factor of 20 ㏈/decade of distance. $F_d = 20\log(D_m/D_s)$
   Where:
   F_d= Distance factor in ㏈
   D_m= Measurement distance in meters
   D_s= Specification distance in meters
2. Factors(㏈) = Antenna factor(㏈/m) + Cable loss(㏈) + or Amp. gain(㏈) + or F_d(㏈)
3. The worst-case emissions are reported however emissions whose levels were not within 20 ㏈ of respective limits were not reported.
4. Average test would be performed if the peak result were greater than the average limit.
5. 1) means restricted band.
6. Above 1 ㎓ the worst results between two antenna polarizations (H and V) were documented in the test report.
7. Below 30 ㎒ frequency range, In order to search for the worst result, all orientations about parallel, perpendicular, and ground-parallel were investigated then reported. when the emission level was higher than 20 ㏈ of the limit, then the following statement shall be made: “No spurious emissions were detected within 20 ㏈ of the limit.”
8. For above 1 ㎓ pre-scan to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 ㎒; the video bandwidth is set to 30 ㎑ for peak measurements.
9. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X ㎑ resulted in a level of Y ㏈㎶/m, which is equivalent to Y - 51.5 = Z ㏈㎂/m, which has the same margin, W ㏈, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.
10. In SISO mode, we tested both Ant 1 and Ant 2, but attached only the data of ANT 1 with the highest conducted output power to simplify the report.

In SISO mode, we tested both Ant 1 and Ant 2, but attached only the data of ANT 1 with the highest conducted output power to simplify the report.

Test results (Below 30 ㎒) – Worst case: 802.11a / UNII-2A_5 280 ㎒_SISO_ANT 1

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data								
No spurious emissions were detected within 20 ㏈ of the limit.								

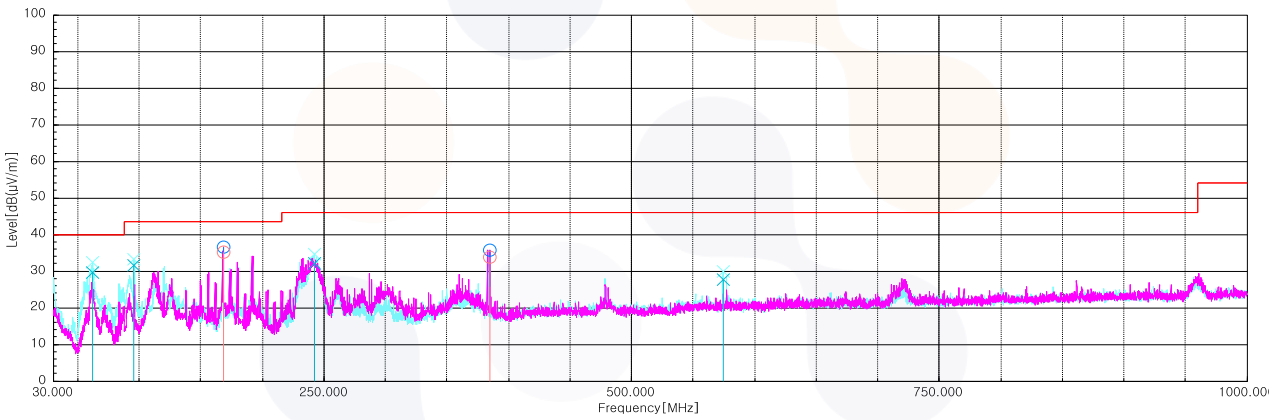
Horizontal/Vertical



Test results (Below 1 000 ㎒) – Worst case: 802.11a / UNII-2A_5 280 ㎒_SISO_ANT 1

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data								
62.37	V	48.90	12.27	-31.71	-	29.46	40.00	10.54
95.72	V	47.20	15.72	-31.44	-	31.48	43.50	12.02
168.35[1)]	H	50.70	15.47	-31.10	-	35.07	43.50	8.43
242.43[1)]	V	45.30	17.74	-30.94	-	32.10	46.00	13.90
384.90	H	43.30	21.20	-30.72	-	33.78	46.00	12.22
574.29	V	33.30	24.50	-30.20	-	27.60	46.00	18.40

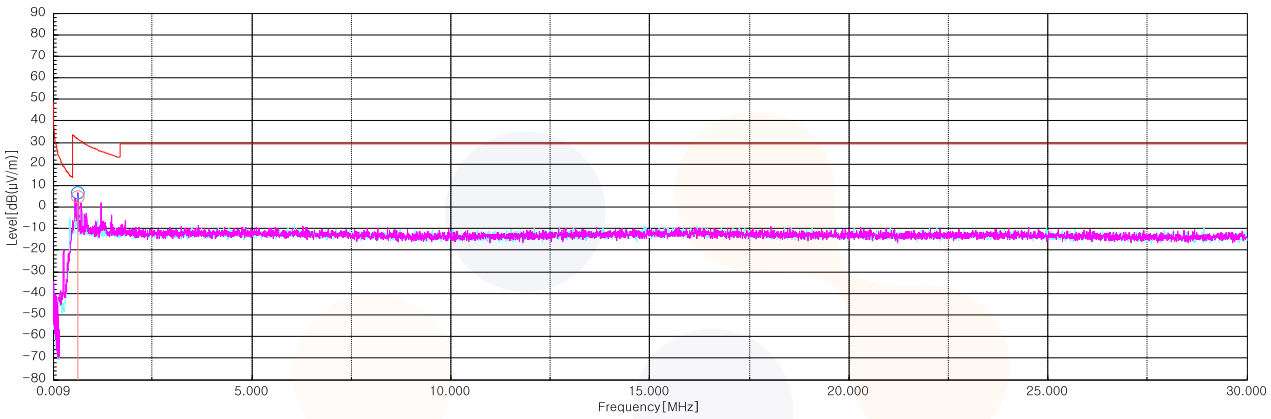
Horizontal/Vertical



Test results (Below 30 ㎒) – Worst case: 802.11n HT40 / UNII-2A_5 310 ㎒_MIMO

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data								
No spurious emissions were detected within 20 ㏈ of the limit.								

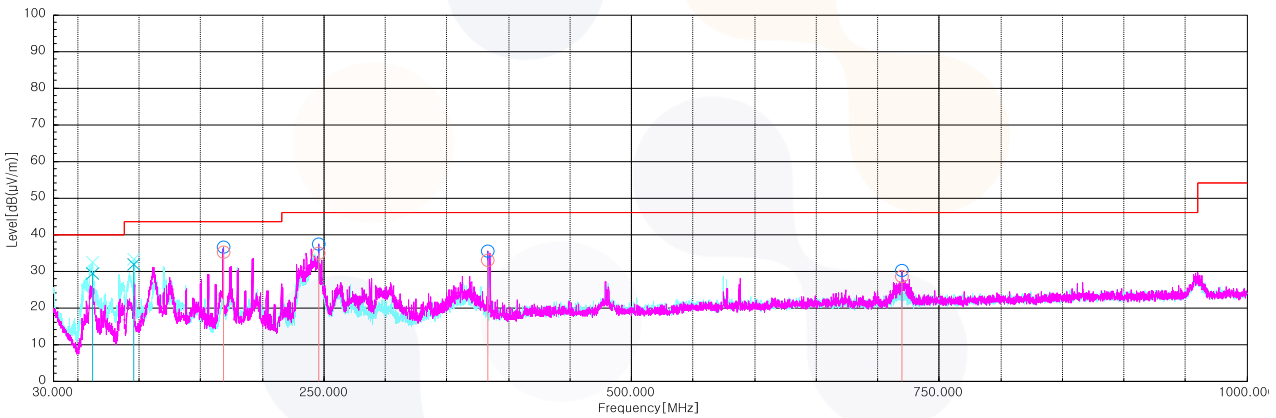
Horizontal/Vertical



Test results (Below 1 000 ㎒) – Worst case: 802.11n HT40 / UNII-2A_5 310 ㎒_MIMO

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data								
62.01	V	48.70	12.20	-31.71	-	29.19	40.00	10.81
95.72	V	47.60	15.72	-31.44	-	31.88	43.50	11.62
168.47[1)]	H	50.80	15.45	-31.10	-	35.15	43.50	8.35
245.58[1)]	H	47.60	18.06	-30.86	-	34.80	46.00	11.20
383.08	H	42.60	21.20	-30.76	-	33.04	46.00	12.96
719.67	H	33.60	25.18	-30.18	-	28.60	46.00	17.40

Horizontal/Vertical



In SISO mode, we tested both Ant 1 and Ant 2, but attached only the data of ANT 1 with the highest conducted output power to simplify the report.

Test results (Above 1 000 ㎒)

UNII-1 SISO ANT 1

802.11a_Lowest Channel (5 180 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 149.82[1)]	H	45.64	34.22	-24.13	-	55.73	74.00	18.27
10 366.68	V	60.94	37.52	-48.56	-	49.90	68.20	18.30
15 542.10[1)]	V	69.31	39.90	-46.80	-	62.41	74.00	11.59
Average Data								
5 149.82[1)]	H	32.53	34.22	-24.13	1.36	43.98	54.00	10.02
15 542.10[1)]	V	56.94	39.90	-46.80	1.36	51.40	54.00	2.60

802.11a_Middle Channel (5 200 ㎒)

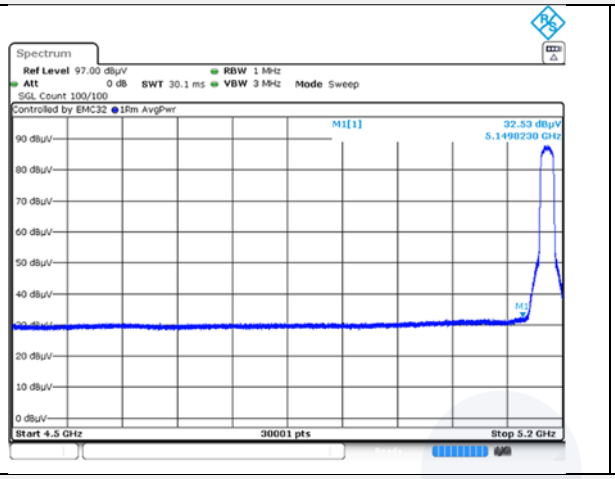
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 401.57	V	59.99	37.54	-48.49	-	49.04	68.20	19.16
15 600.54[1)]	V	67.54	39.90	-46.81	-	60.63	74.00	13.37
Average Data								
15 600.54[1)]	V	57.18	39.90	-46.81	1.36	51.63	54.00	2.37

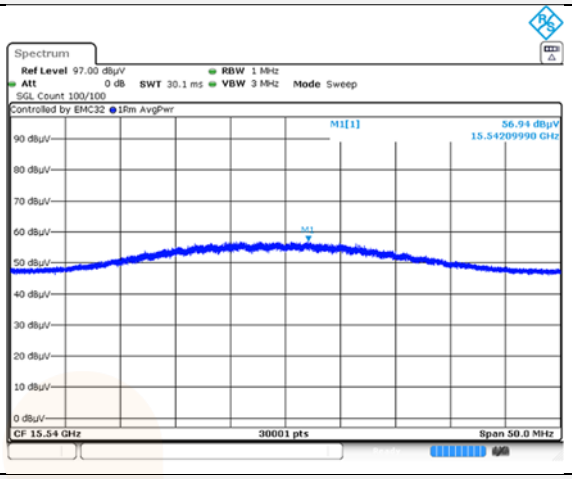
802.11a_Highest Channel (5 240 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 481.68	V	62.97	37.59	-48.34	-	52.22	68.20	15.98
15 722.54[1)]	V	70.20	39.90	-46.83	-	63.27	74.00	10.73
Average Data								
15 722.54[1)]	V	56.14	39.90	-46.83	1.36	50.57	54.00	3.43

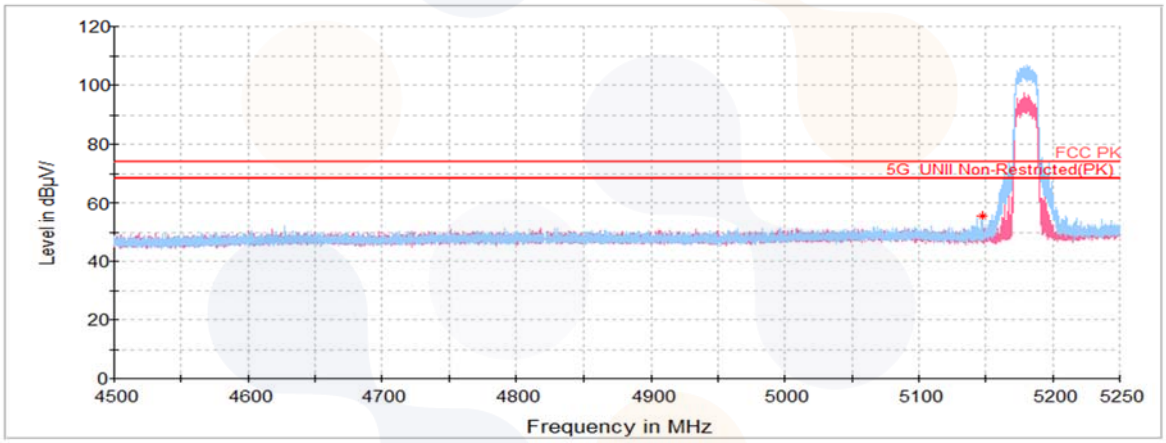
802.11a_Lowest Channel (5 180 ㎒)

Average data





Horizontal/Vertical for Band-edge



802.11n_HT20_Lowest Channel (5 180 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 148.17[1)]	H	45.52	34.22	-24.13	-	55.61	74.00	18.39
7 977.75	V	66.09	35.90	-51.39	-	50.60	68.20	17.60
10 364.38	H	59.38	37.52	-48.57	-	48.33	68.20	19.87
15 542.97[1)]	V	62.62	39.90	-46.80	-	55.72	74.00	18.28
Average Data								
5 148.17[1)]	H	32.03	34.22	-24.13	1.45	43.57	54.00	10.43
15 542.97[1)]	V	50.76	39.90	-46.80	1.45	45.31	54.00	8.69

802.11n_HT20_Middle Channel (5 200 ㎒)

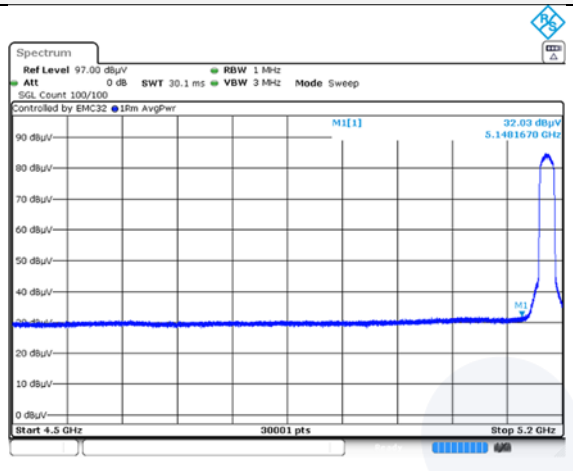
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 391.98	V	58.33	37.54	-48.51	-	47.36	68.20	20.84
15 601.88[1)]	V	62.96	39.90	-46.81	-	56.05	74.00	17.95
Average Data								
15 601.88[1)]	V	51.47	39.90	-46.81	1.45	46.01	54.00	7.99

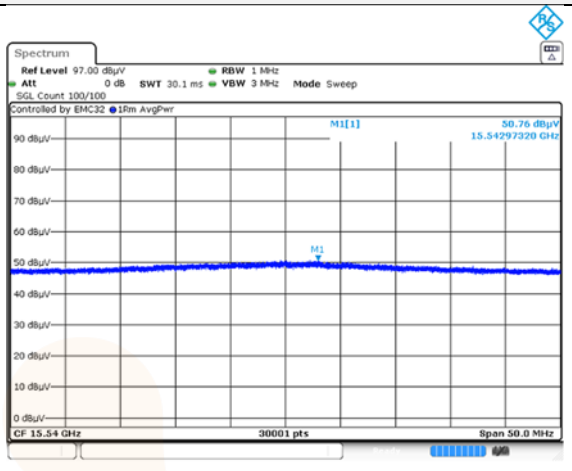
802.11n_HT20_Highest Channel (5 240 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 489.35	V	59.03	37.59	-48.32	-	48.30	68.20	19.90
15 711.88[1)]	V	63.84	39.90	-46.83	-	56.91	74.00	17.09
Average Data								
15 711.88[1)]	V	54.33	39.90	-46.83	1.45	48.85	54.00	5.15

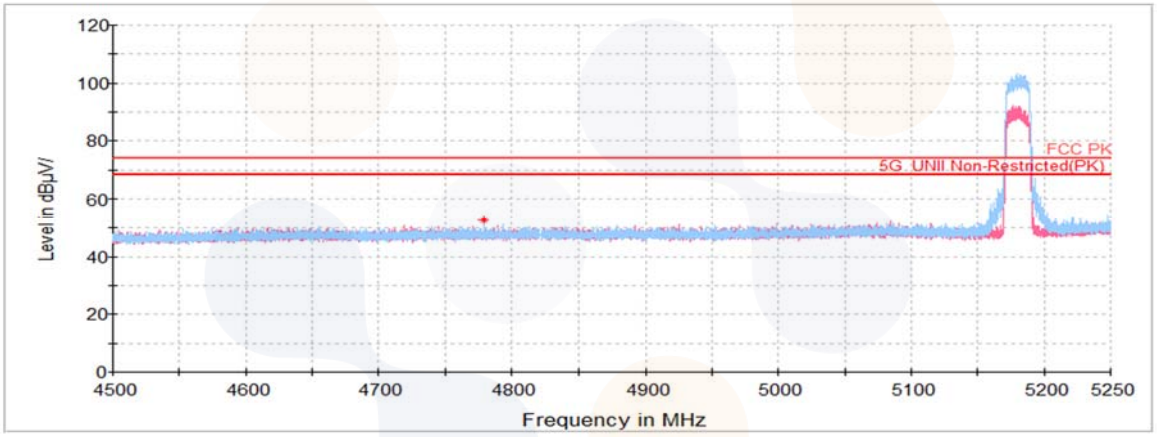
In order to simplify the report, attached plots were only the lowest margin condition 802.11n_HT20_Lowest Channel (5 180 ㎒)

Average data





Horizontal/Vertical for Band-edge



802.11n_HT40_Lowest Channel (5 190 ㎒)

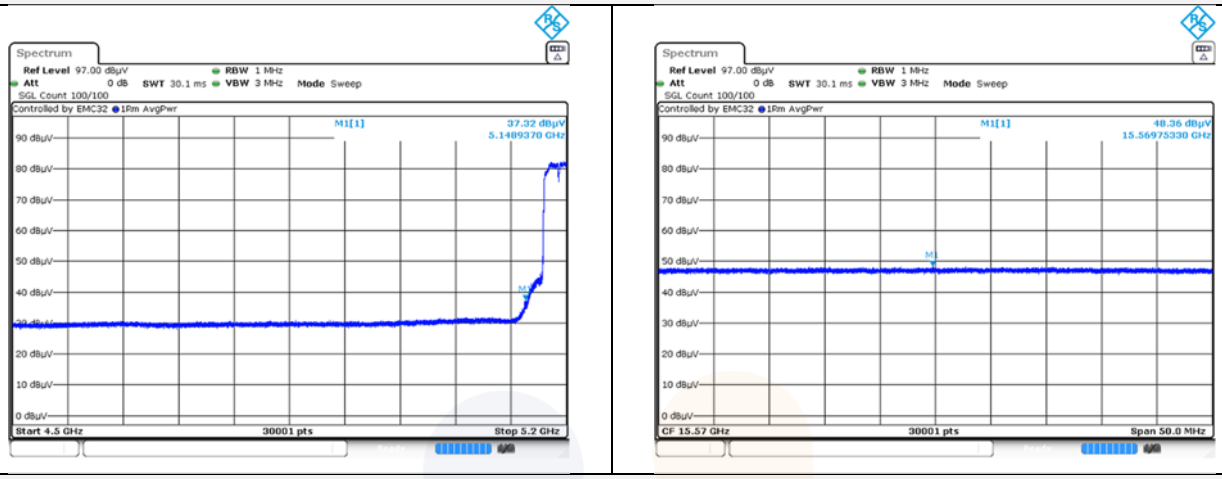
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 148.94[1)]	H	53.66	34.22	-24.13	-	63.75	74.00	10.25
10 372.05	V	59.21	37.52	-48.55	-	48.18	68.20	20.02
15 569.75[1)]	V	62.06	39.90	-46.81	-	55.15	74.00	18.85
Average Data								
5 148.94[1)]	H	37.32	34.22	-24.13	2.54	49.95	54.00	4.05
15 569.75[1)]	V	48.36	39.90	-46.81	2.54	43.99	54.00	10.01

802.11n_HT40_Highest Channel (5 230 ㎒)

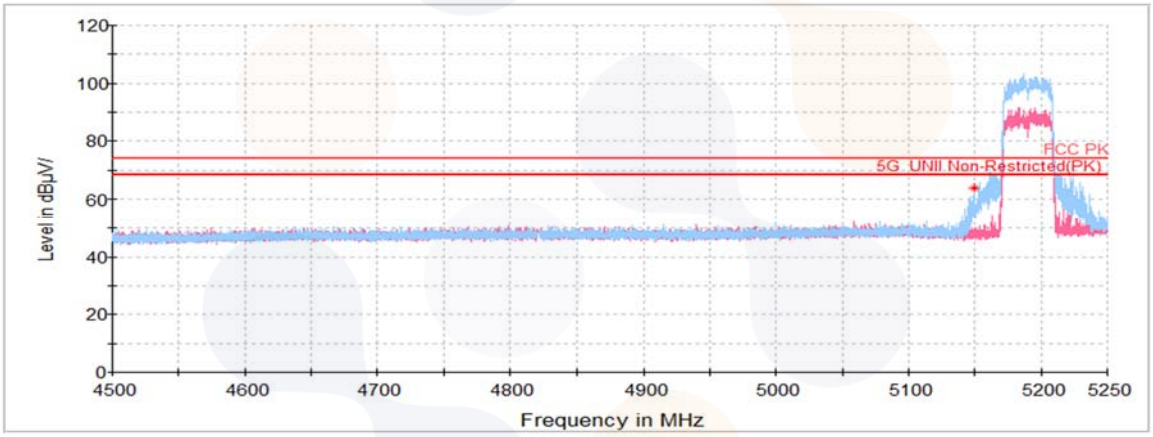
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 465.97	V	58.46	37.58	-48.37	-	47.67	68.20	20.53
15 687.08[1)]	V	66.04	39.90	-46.83	-	59.11	74.00	14.89
15 687.08[1)]	V	54.47	39.90	-46.83	2.54	50.08	54.00	3.92
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11n_HT40_Lowest Channel (5 190 ㎒)

Average data



Horizontal/Vertical for Band-edge



802.11ac_VHT20_Lowest Channel (5 180 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 095.37[1)]	H	43.08	34.18	-24.07	-	53.19	74.00	20.81
10 325.67	V	58.77	37.50	-48.64	-	47.63	68.20	20.57
15 539.55[1)]	V	59.49	39.90	-46.80	-	52.59	74.00	21.41
Average Data								
5 095.37[1)]	H	31.68	34.18	-24.07	1.44	43.23	54.00	10.77
15 539.55[1)]	V	50.22	39.90	-46.80	1.44	44.76	54.00	9.24

802.11ac_VHT20_Middle Channel (5 200 ㎒)

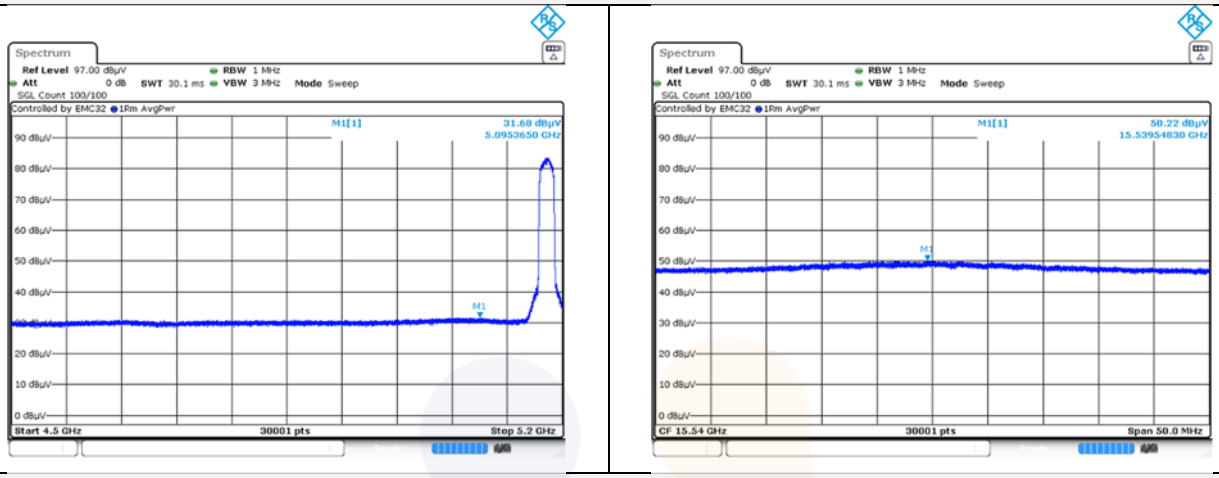
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 386.23	H	59.10	37.53	-48.52	-	48.11	68.20	20.09
15 601.44[1)]	V	59.40	39.90	-46.81	-	52.49	74.00	21.51
Average Data								
15 601.44[1)]	V	51.32	39.90	-46.81	1.44	45.85	54.00	8.15

802.11ac_VHT20_Highest Channel (5 240 ㎒)

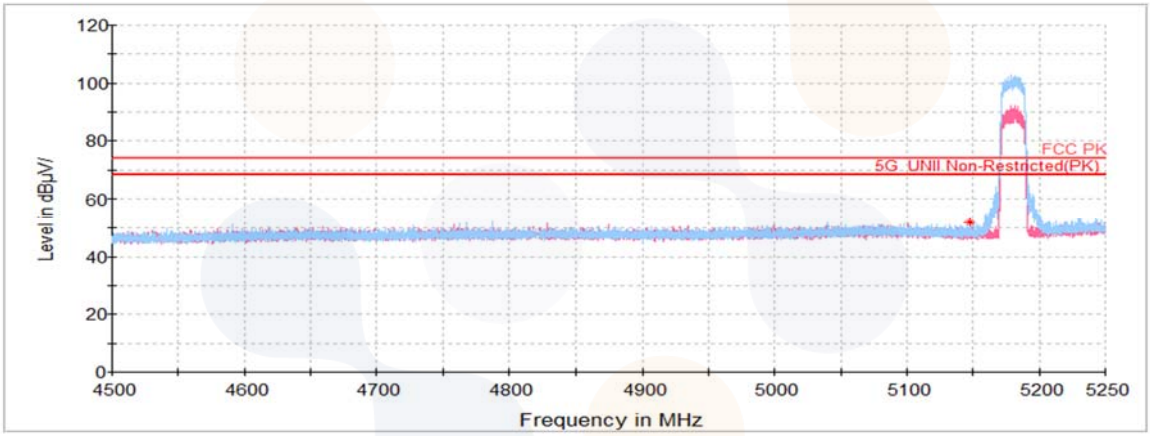
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 482.07	V	58.06	37.59	-48.34	-	47.31	68.20	20.89
15 718.34[1)]	V	62.06	39.90	-46.83	-	55.13	74.00	18.87
Average Data								
15 718.34[1)]	V	52.99	39.90	-46.83	1.44	47.50	54.00	6.50

In order to simplify the report, attached plots were only the lowest margin condition
802.11ac_VHT20_Lowest Channel (5 180 ㎒)

Average data



Horizontal/Vertical for Band-edge



802.11ac_VHT40_Lowest Channel (5 190 ㎒)

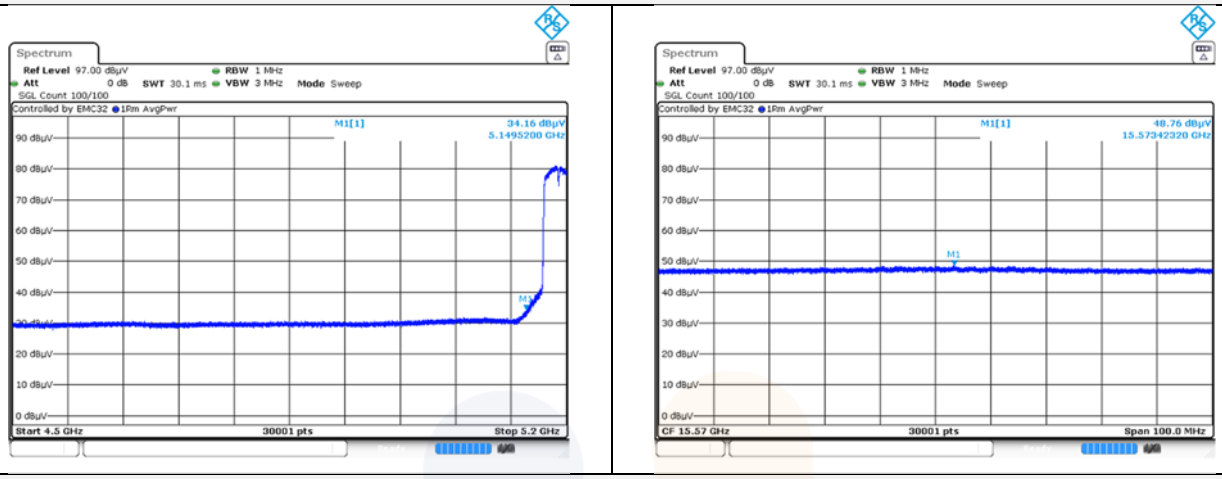
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 149.52[1)]	H	44.42	34.22	-24.13	-	54.51	74.00	19.49
10 390.83	H	58.61	37.53	-48.51	-	47.63	68.20	20.57
15 573.42[1)]	V	58.48	39.90	-46.81	-	51.57	74.00	22.43
Average Data								
5 149.52[1)]	H	34.16	34.22	-24.13	2.53	46.78	54.00	7.22
15 573.42[1)]	V	48.76	39.90	-46.81	2.53	44.38	54.00	9.62

802.11ac_VHT40_Highest Channel (5 240 ㎒)

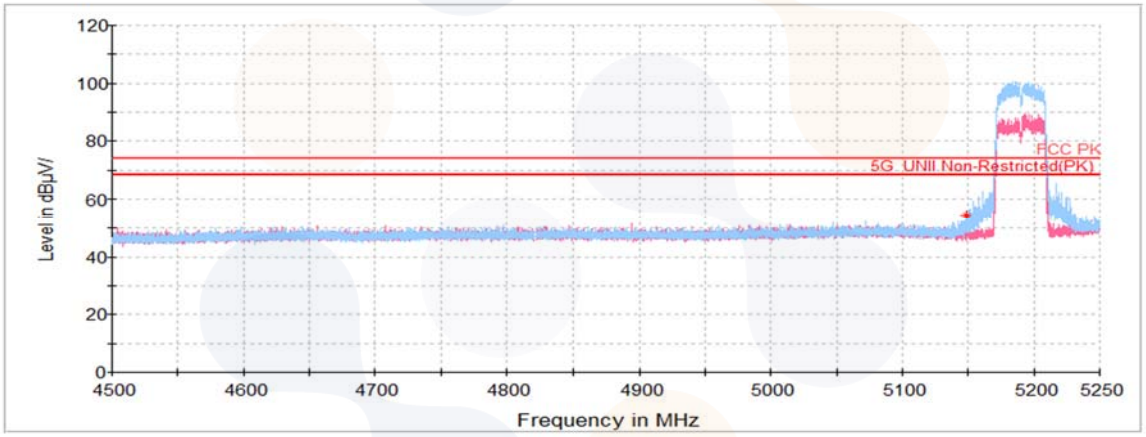
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 466.73	V	58.76	37.58	-48.37	-	47.97	68.20	20.23
15 688.86[1)]	V	61.86	39.90	-46.83	-	54.93	74.00	19.07
Average Data								
15 688.86[1)]	V	51.38	39.90	-46.83	2.53	46.98	54.00	7.02

802.11ac_VHT40_Lowest Channel (5 190 ㎒)

Average data



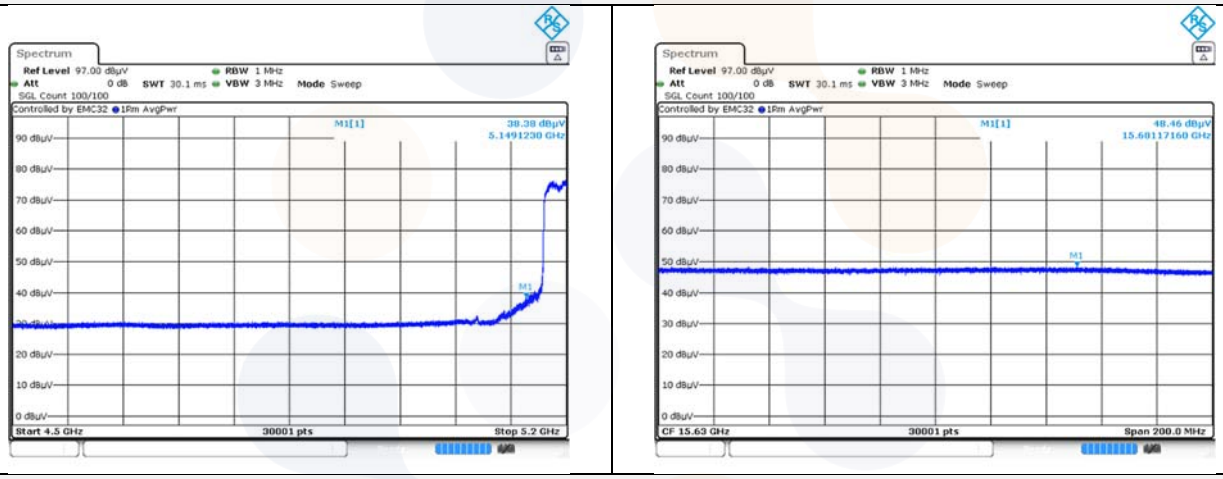
Horizontal/Vertical for Band-edge



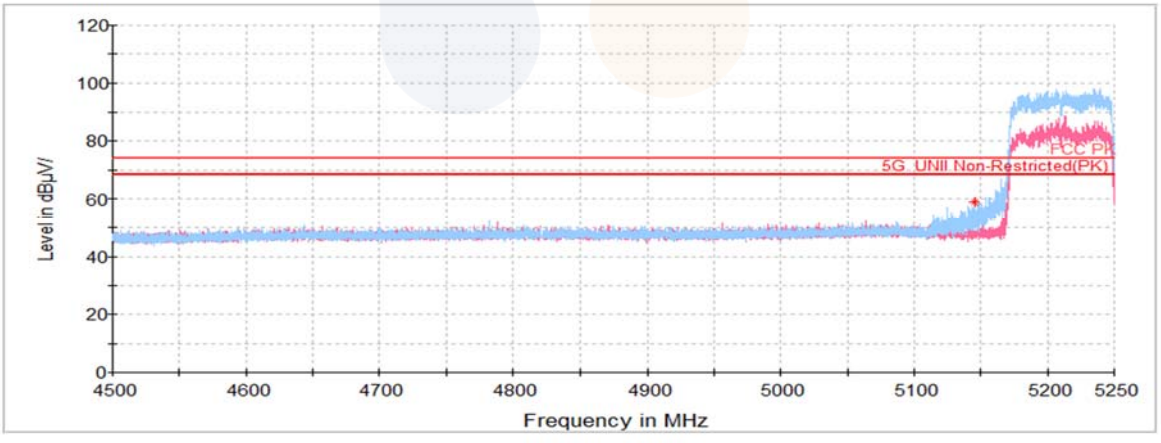
802.11ac_VHT80_Middle Channel (5 210 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 149.12[1)]	H	48.92	34.22	-24.13	-	59.01	74.00	14.99
10 417.67	V	57.71	37.55	-48.46	-	46.80	68.20	21.40
15 681.17[1)]	V	58.39	39.90	-46.82	-	51.47	74.00	22.53
Average Data								
5 149.12[1)]	H	38.38	34.22	-24.13	4.13	52.60	54.00	1.40
15 681.17[1)]	V	48.46	39.90	-46.82	4.13	45.67	54.00	8.33

Average data



Horizontal/Vertical for Band-edge



UNII-1_MIMO

802.11n_HT20_Lowest Channel (5 180 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 102.09[1)]	H	41.96	34.18	-24.07	-	52.07	74.00	21.93
10 365.53	H	60.17	37.52	-48.56	-	49.13	68.20	19.07
15 549.73[1)]	H	57.36	39.90	-46.80	-	50.46	74.00	23.54
Average Data								
5 102.09[1)]	H	31.89	34.18	-24.07	1.44	43.44	54.00	10.56

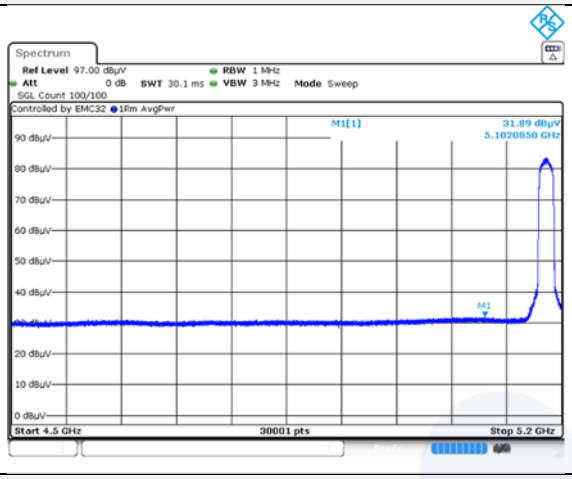
802.11n_HT20_Middle Channel (5 200 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 400.80	V	57.85	37.54	-48.49	-	46.90	68.20	21.30
15 619.88[1)]	V	56.85	39.90	-46.81	-	49.94	74.00	24.06
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

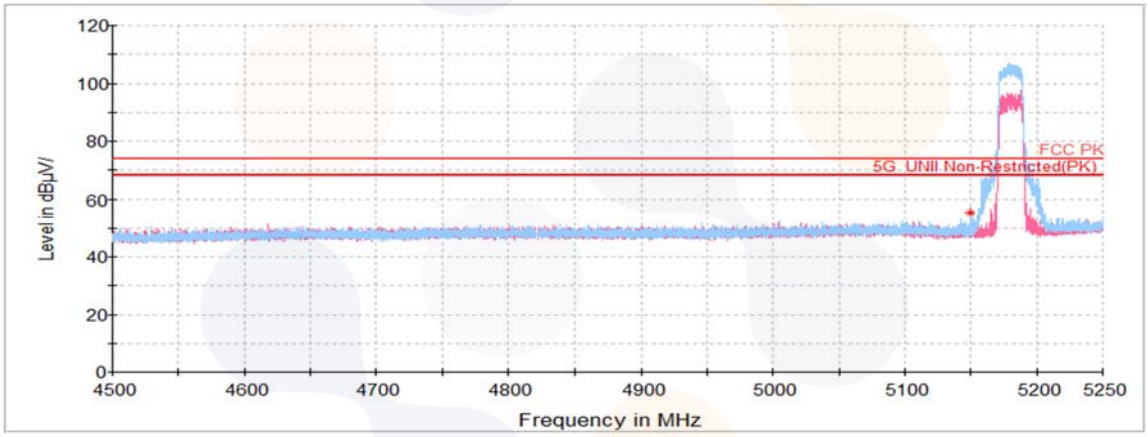
802.11n_HT20_Highest Channel (5 240 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 458.68	V	58.01	37.58	-48.38	-	47.21	68.20	20.99
15 714.57[1)]	H	57.46	39.90	-46.83	-	50.53	74.00	23.47
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

802.11n_HT20_Lowest Channel (5 180 ㎒)

Average data	
	Blank

Horizontal/Vertical for Band-edge



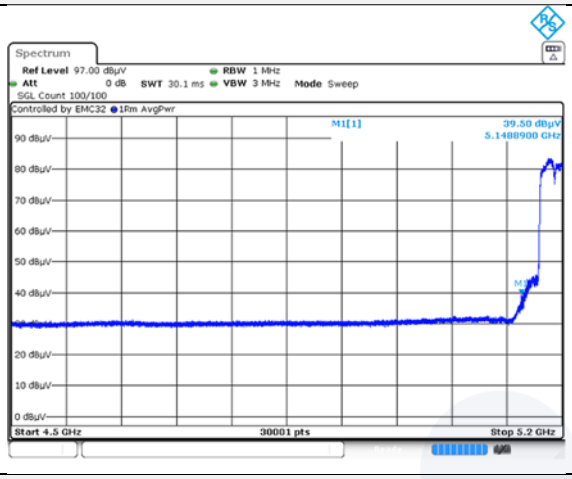
802.11n_HT40_Lowest Channel (5 190 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 148.89[1)]	H	53.28	34.22	-24.13	-	63.37	74.00	10.63
10 358.25	V	57.67	37.51	-48.58	-	46.60	68.20	21.60
15 588.07[1)]	V	57.22	39.90	-46.81	-	50.31	74.00	23.69
Average Data								
5 148.89[1)]	H	39.50	34.22	-24.13	2.54	52.13	54.00	1.87

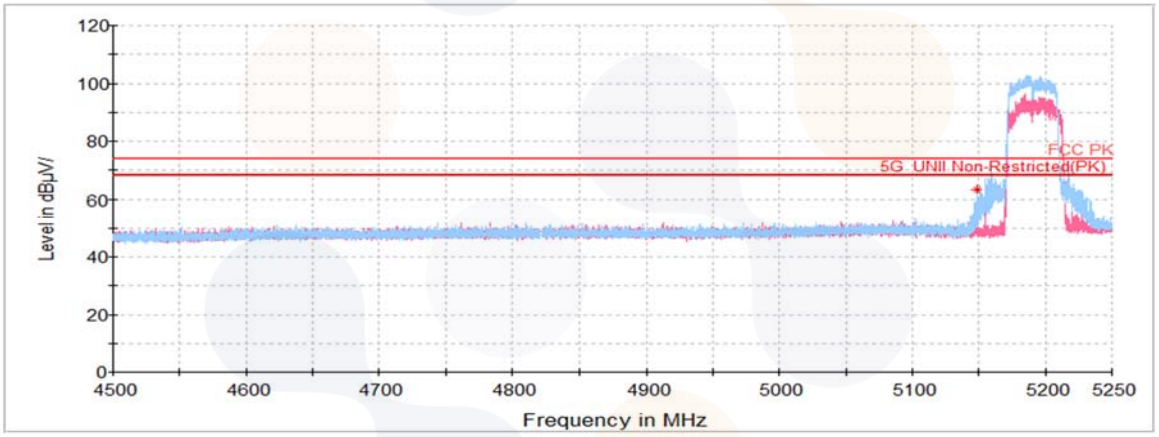
802.11n_HT40_Highest Channel (5 230 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 466.73	V	58.14	37.58	-48.37	-	47.35	68.20	20.85
15 704.60[1)]	H	57.64	39.90	-46.83	-	50.71	74.00	23.29
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11n_HT40_Lowest Channel (5 190 ㎒)

Average data	
	Blank

Horizontal/Vertical for Band-edge



802.11ac_VHT20_Lowest Channel (5 180 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 095.37[1)]	H	42.11	34.18	-24.07		52.22	74.00	21.78
10 358.63	H	58.00	37.52	-48.58	-	46.94	68.20	21.26
15 545.52[1)]	V	57.38	39.90	-46.80	-	50.48	74.00	23.52
Average Data								
5 095.37[1)]	H	31.68	34.18	-24.07	2.45	44.24	54.00	9.76

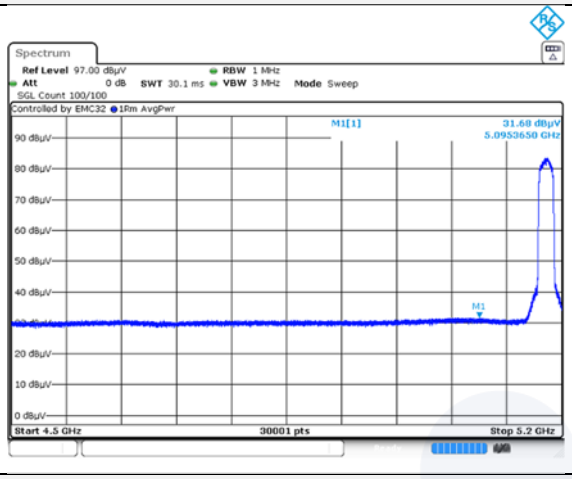
802.11ac_VHT20_Middle Channel (5 200 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 390.07	H	58.59	37.53	-48.52	-	47.60	68.20	20.60
15 618.73[1)]	V	57.33	39.90	-46.81	-	50.42	74.00	23.58
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

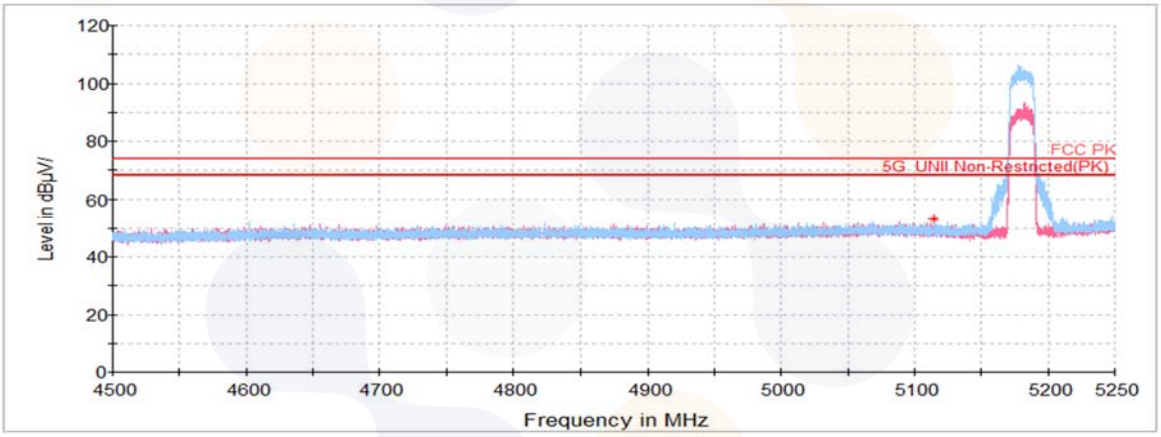
802.11ac_VHT20_Highest Channel (5 240 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 465.20	H	58.47	37.58	-48.37	-	47.68	68.20	20.52
15 690.80[1)]	V	57.73	39.90	-46.83	-	50.80	74.00	23.20
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

802.11ac_VHT20_Lowest Channel (5 180 ㎒)

Average data	
	Blank

Horizontal/Vertical for Band-edge



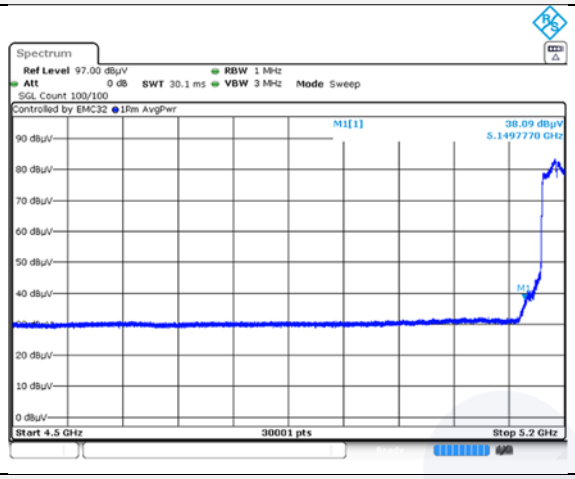
802.11ac_VHT40_Lowest Channel (5 190 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 149.78[1)]	H	52.17	34.22	-24.13	-	62.26	74.00	11.74
10 374.73	V	57.91	37.52	-48.55	-	46.88	68.20	21.32
15 551.27[1)]	V	57.57	39.90	-46.80	-	50.67	74.00	23.33
Average Data								
5 149.78[1)]	H	38.09	34.22	-24.13	3.91	52.09	54.00	1.91

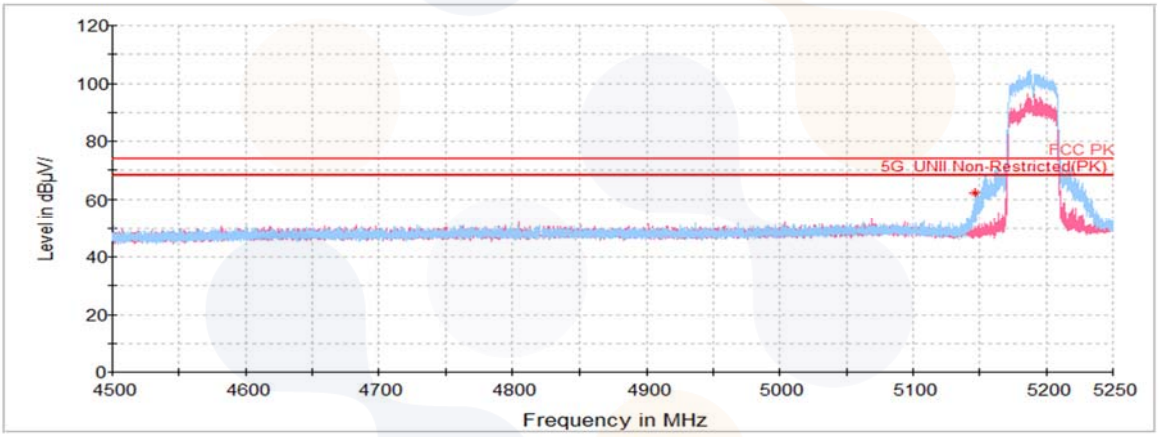
802.11ac_VHT40_Highest Channel (5 230 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 470.95	V	57.97	37.58	-48.36	-	47.19	68.20	21.01
15 703.07[1)]	H	57.58	39.90	-46.83	-	50.65	74.00	23.35
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

802.11ac_VHT40_Lowest Channel (5 190 ㎒)

Average data	
	Blank

Horizontal/Vertical for Band-edge



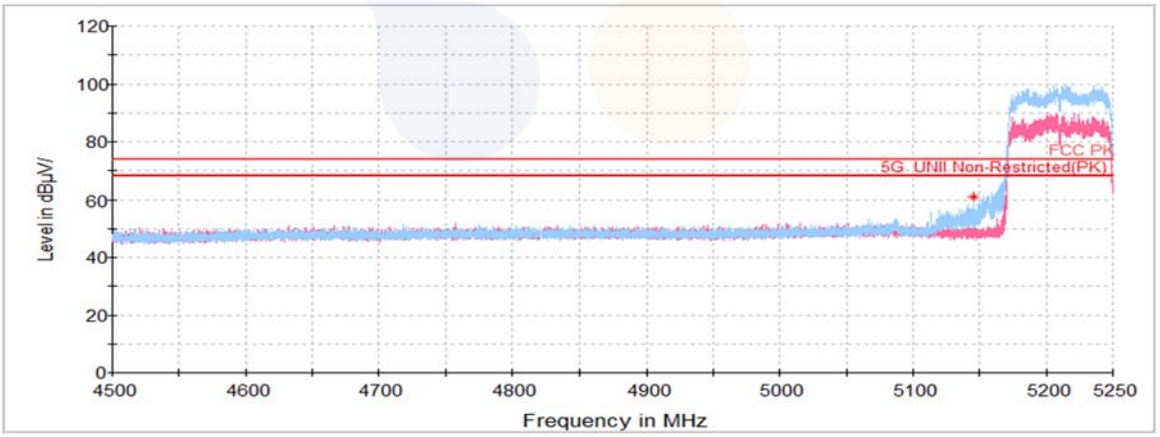
802.11ac_VHT80_Middle Channel (5 210 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 145.81[1)]	H	50.71	34.22	-24.13	-	60.80	74.00	13.20
10 421.12	V	58.52	37.55	-48.46	-	47.61	68.20	20.59
15 603.02[1)]	V	57.75	39.90	-46.81	-	50.84	74.00	23.16
Average Data								
5 145.81[1)]	H	36.75	34.22	-24.13	5.72	52.56	54.00	1.44

Average data

Blank

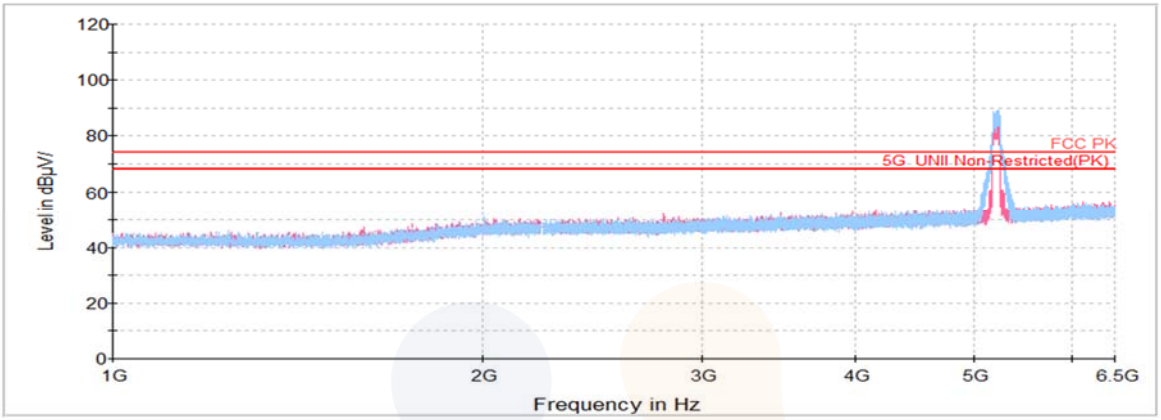
Horizontal/Vertical for Band-edge



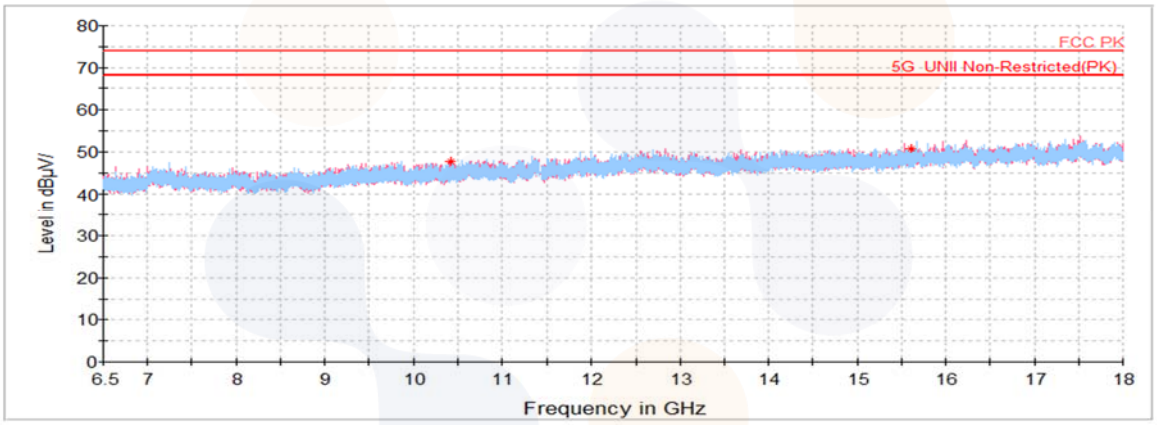
Plot of Harmonics and Spurious Emissions

In order to simplify the report, attached plots were only the lowest margin condition
802.11ac_VHT80_UNII-1_MIMO_Middle Channel (5 210 ㎒)

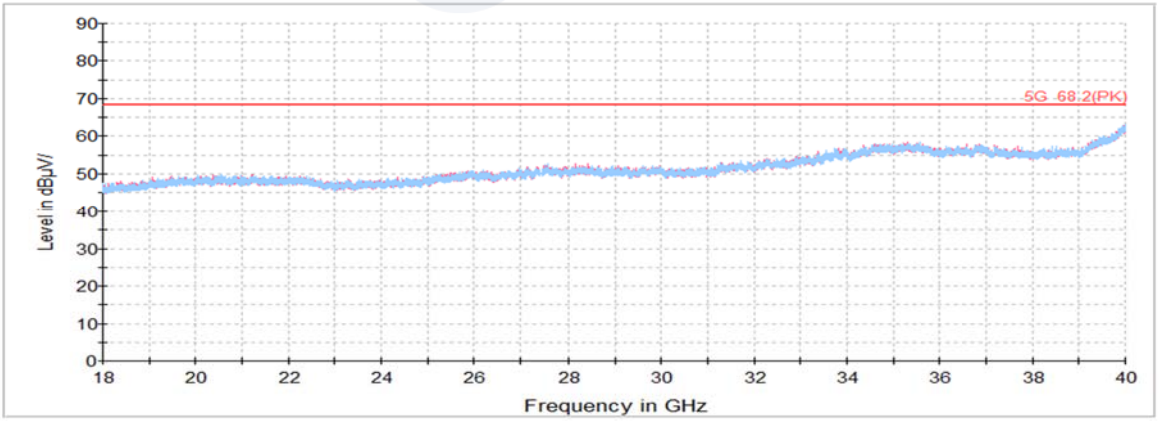
Horizontal/Vertical for 1 ㎓ ~ 6.5 ㎓



Horizontal/Vertical for 6.5 ㎓ ~ 18 ㎓



Horizontal/Vertical for 18 ㎓ ~ 40 ㎓



In SISO mode, we tested both Ant 1 and Ant 2, but attached only the data of ANT 1 with the highest conducted output power to simplify the report.

UNII-2A SISO ANT 1

802.11a_Lowest Channel (5 260 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 482.83	H	59.75	37.59	-48.33	-	49.01	68.20	19.19
15 781.42[1)]	V	61.01	39.90	-46.84	-	54.07	74.00	19.93
Average Data								
15 781.42[1)]	V	49.88	39.90	-46.84	1.36	44.30	54.00	9.70

802.11a_Middle Channel (5 280 ㎒)

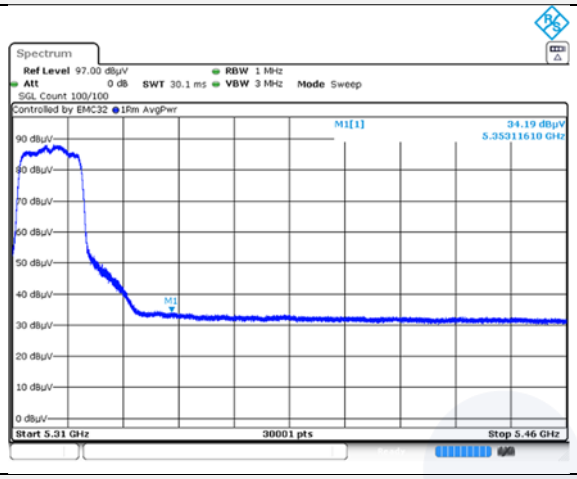
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 557.58	V	58.69	37.63	-48.34	-	47.98	68.20	20.22
15 840.84[1)]	V	61.09	39.90	-46.85	-	54.14	74.00	19.86
Average Data								
15 840.84[1)]	V	49.94	39.90	-46.85	1.36	44.35	54.00	9.65

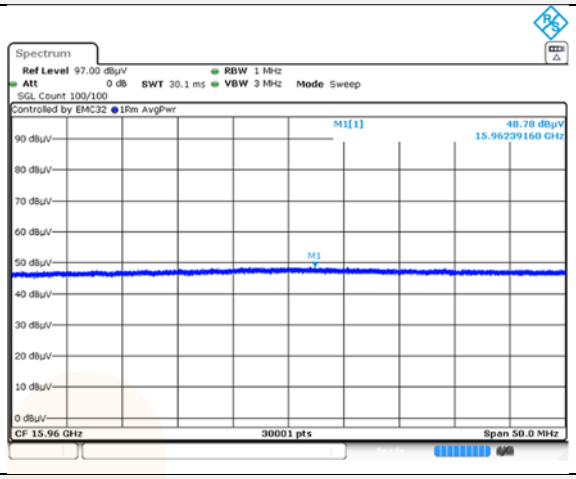
802.11a_Highest Channel (5 320 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 353.12[1)]	H	44.21	34.38	-23.38	-	55.21	74.00	18.79
10 641.92[1)]	H	59.06	37.69	-48.39	-	48.36	74.00	25.64
15 962.39[1)]	V	60.18	39.90	-46.87	-	53.21	74.00	20.79
Average Data								
5 353.12[1)]	H	34.19	34.38	-23.38	1.36	46.55	54.00	7.45
15 962.39[1)]	V	48.78	39.90	-46.87	1.36	43.17	54.00	10.83

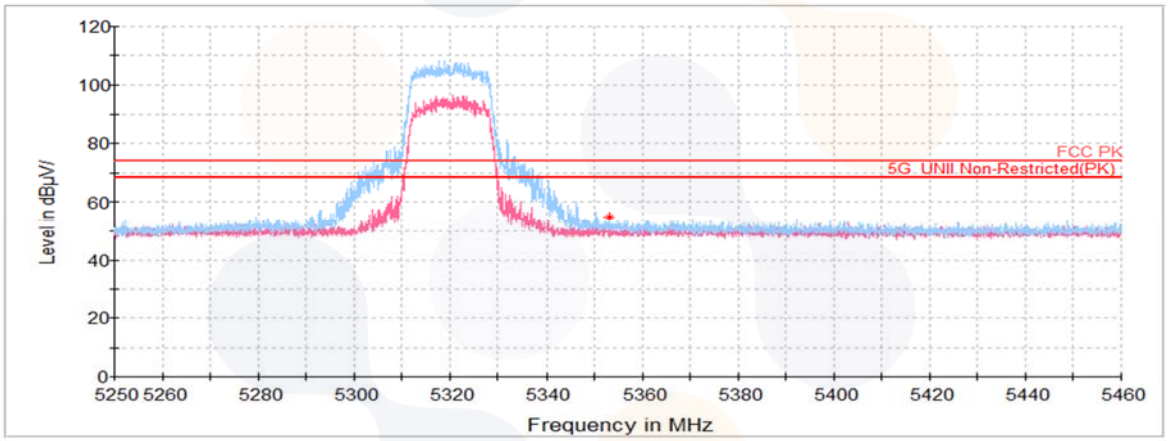
802.11a_Highest Channel (5 320 ㎒)

Average data





Horizontal/Vertical for Band-edge



802.11n_HT20_Lowest Channel (5 260 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 521.93	V	58.97	37.61	-48.31	-	48.27	68.20	19.93
15 774.44[1)]	V	60.60	39.90	-46.84	-	53.66	74.00	20.34
Average Data								
15 774.44[1)]	V	48.84	39.90	-46.84	1.45	43.35	54.00	10.65

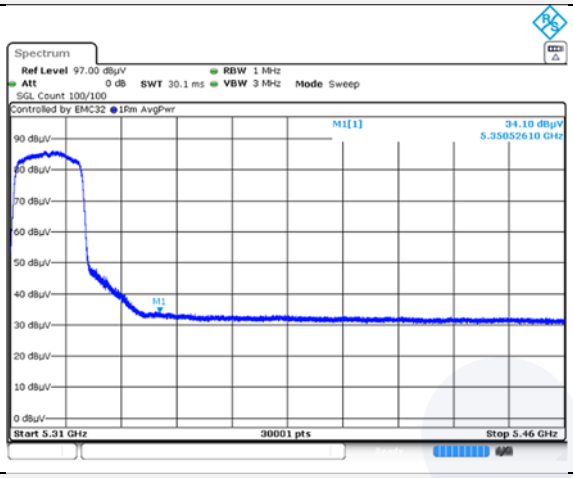
802.11n_HT20_Middle Channel (5 280 ㎒)

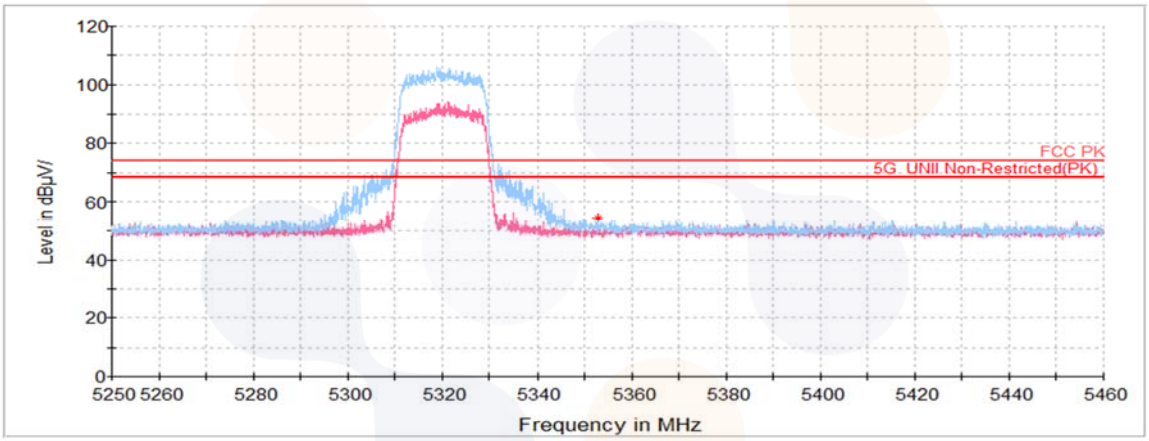
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 569.08	V	59.29	37.64	-48.34	-	48.59	68.20	19.61
15 842.84[1)]	V	58.86	39.90	-46.85	-	51.91	74.00	22.09
Average Data								
15 842.84[1)]	V	48.20	39.90	-46.85	1.45	42.70	54.00	11.30

802.11n_HT20_Highest Channel (5 320 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 350.53[1)]	H	43.52	34.38	-23.36	-	54.54	74.00	19.46
10 642.30[1)]	H	58.72	37.69	-48.39	-	48.02	74.00	25.98
15 943.42[1)]	H	57.80	39.90	-46.87	-	50.83	74.00	23.17
Average Data								
5 350.53[1)]	H	34.10	34.38	-23.36	1.45	46.57	54.00	7.43

In order to simplify the report, attached plots were only the lowest margin condition 802.11n_HT20_Highest Channel (5 320 ㎒)

Average data	
	Blank

Horizontal/Vertical for Band-edge


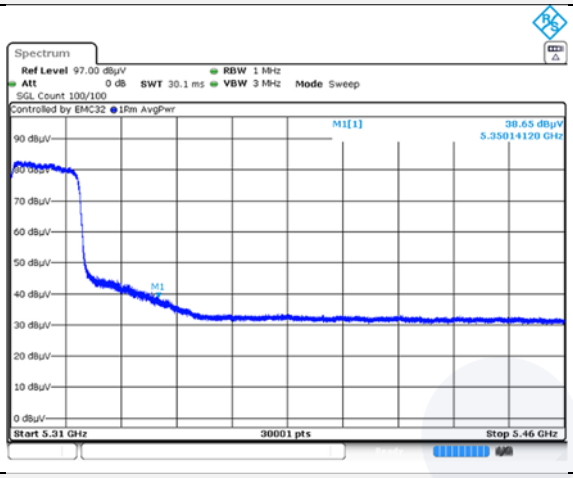
802.11n_HT40_Lowest Channel (5 270 ㎒)

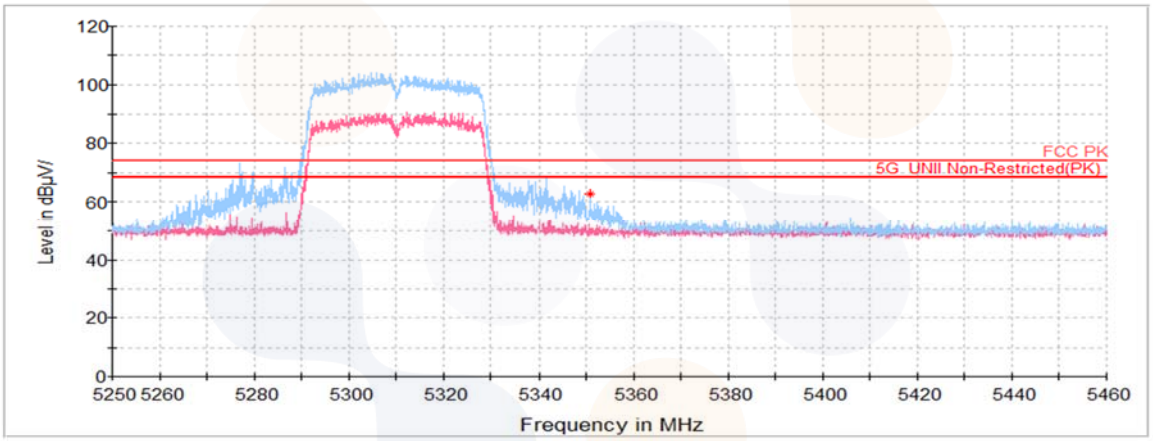
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 555.28	V	58.31	37.63	-48.34	-	47.60	68.20	20.60
15 850.08[1)]	V	58.86	39.90	-46.85	-	51.91	74.00	22.09
Average Data								
15 850.08[1)]	V	47.92	39.90	-46.85	2.54	43.51	54.00	10.49

802.11n_HT40_Highest Channel (5 310 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 350.14[1)]	H	51.78	34.38	-23.35	-	62.81	74.00	11.19
10 614.70[1)]	V	59.55	37.67	-48.37	-	48.85	74.00	25.15
15 886.68[1)]	V	57.77	39.90	-46.86	-	50.81	74.00	23.19
Average Data								
5 350.14[1)]	H	38.65	34.38	-23.35	2.54	52.22	54.00	1.78

In order to simplify the report, attached plots were only the lowest margin condition 802.11n_HT40_Highest Channel (5 310 ㎒)

Average data	
	Blank

Horizontal/Vertical for Band-edge


802.11ac_VHT20_Lowest Channel (5 260 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 522.32	H	58.40	37.61	-48.31	-	47.70	68.20	20.50
15 777.82[1)]	V	57.33	39.90	-46.84	-	50.39	74.00	23.61
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11ac_VHT20_Middle Channel (5 280 ㎒)

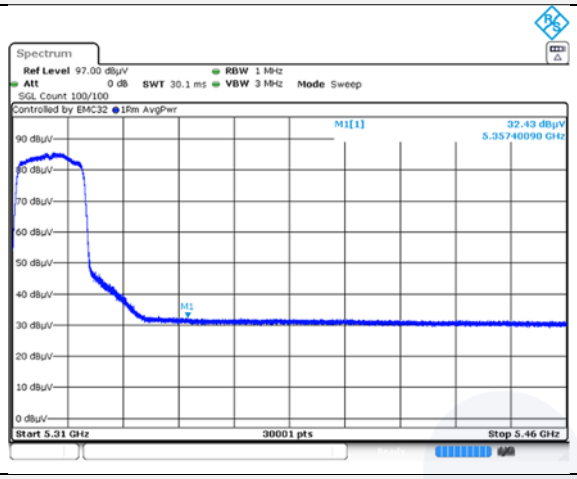
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 577.90	H	58.34	37.65	-48.35	-	47.64	68.20	20.56
15 837.62[1)]	V	57.69	39.90	-46.85	-	50.74	74.00	23.26
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11ac_VHT20_Highest Channel (5 320 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 357.40[1)]	H	41.30	34.39	-23.41	-	52.28	74.00	21.72
10 628.88[1)]	V	59.18	37.68	-48.38	-	48.48	74.00	25.52
15 930.00[1)]	V	57.56	39.90	-46.87	-	50.59	74.00	23.41
Average Data								
5 357.40[1)]	H	32.43	34.39	-23.41	1.44	44.85	54.00	9.15

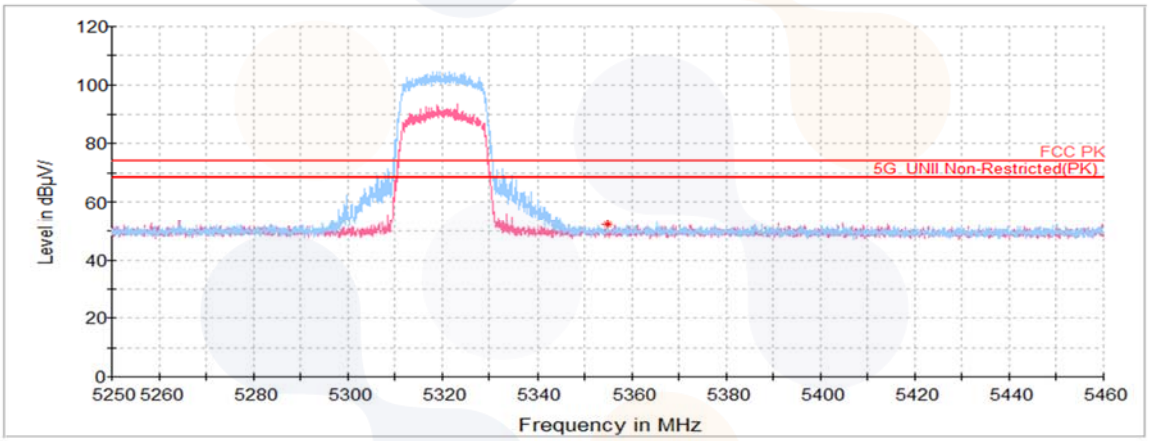
802.11ac_VHT20_Highest Channel (5 320 ㎒)

Average data



Blank

Horizontal/Vertical for Band-edge



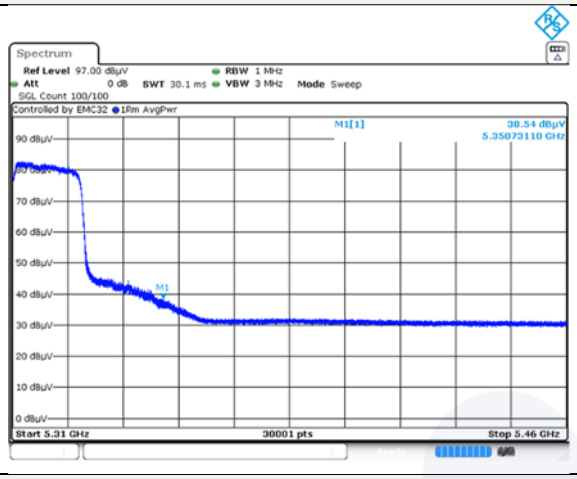
802.11ac_VHT40_Lowest Channel (5 270 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 538.80	H	58.59	37.62	-48.32	-	47.89	68.20	20.31
15 790.47[1)]	H	57.57	39.90	-46.84	-	50.63	74.00	23.37
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

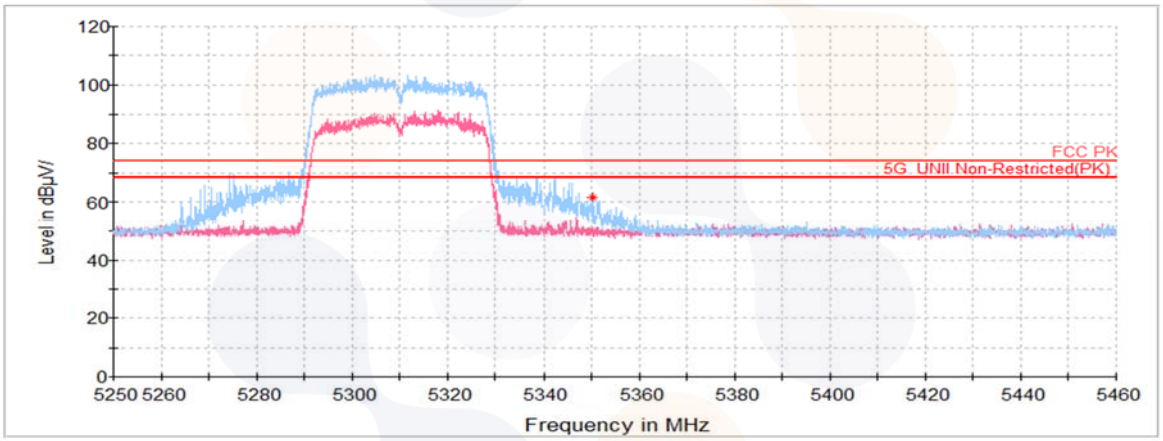
802.11ac_VHT40_Highest Channel (5 310 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 350.73[1)]	H	50.67	34.38	-23.36	-	61.69	74.00	12.31
10 627.35[1)]	V	58.96	37.68	-48.38	-	48.26	74.00	25.74
15 948.40[1)]	H	57.46	39.90	-46.87	-	50.49	74.00	23.51
Average Data								
5 350.73[1)]	H	38.54	34.38	-23.36	2.53	52.09	54.00	1.91

802.11ac_VHT40_Highest Channel (5 310 ㎒)

Average data	
	Blank

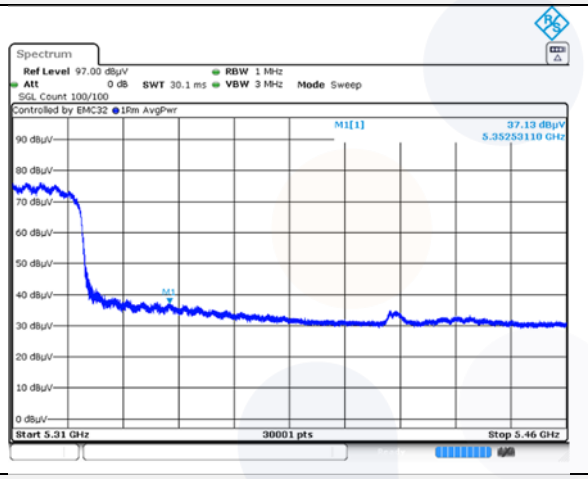
Horizontal/Vertical for Band-edge



802.11ac_VHT80_Middle Channel (5 290 ㎒)

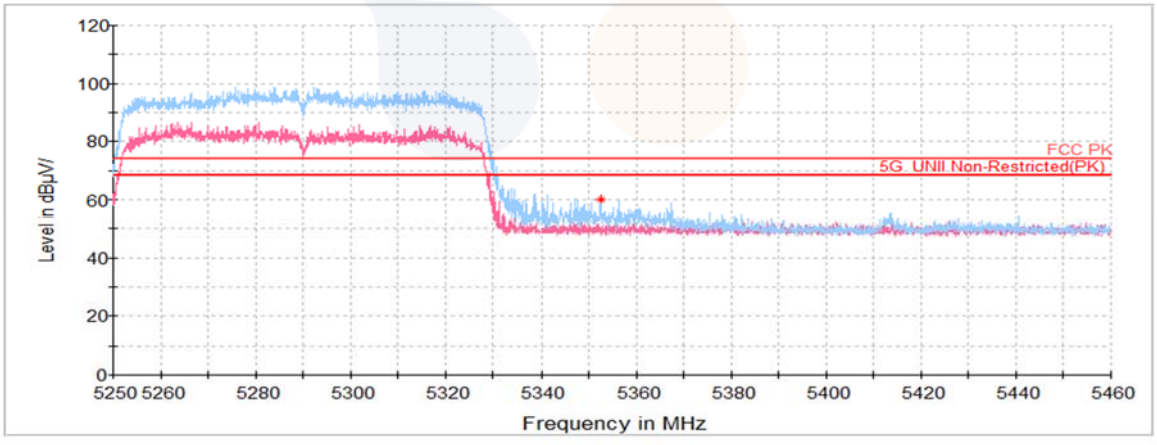
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 352.53[1)]	H	53.88	34.38	-23.37	-	64.89	74.00	9.11
10 557.97	H	58.71	37.63	-48.34	-	48.00	68.20	20.20
15 902.02[1)]	H	57.84	39.90	-46.86	-	50.88	74.00	23.12
Average Data								
5 352.53[1)]	H	37.13	34.38	-23.37	4.13	52.27	54.00	1.73

Average data



Blank

Horizontal/Vertical for Band-edge



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802.11n_HT20_Lowest Channel (5 260 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 557.97	H	58.28	37.63	-48.34	-	47.57	68.20	20.63
15 783.95[1)]	V	57.41	39.90	-46.84	-	50.47	74.00	23.53
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

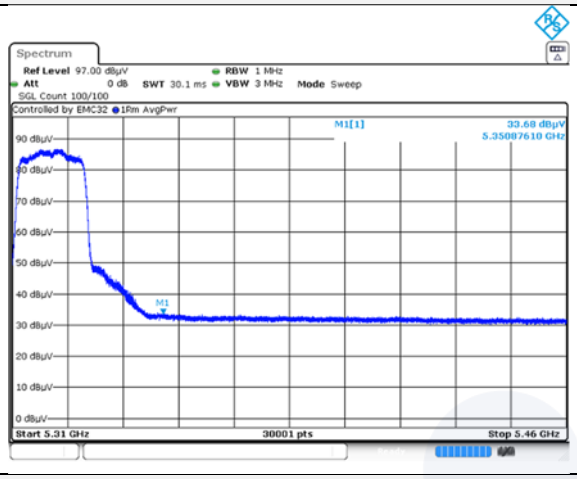
802.11n_HT20_Middle Channel (5 280 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 585.18	V	58.22	37.65	-48.35	-	47.52	68.20	20.68
15 846.05[1)]	V	57.47	39.90	-46.85	-	50.52	74.00	23.48
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

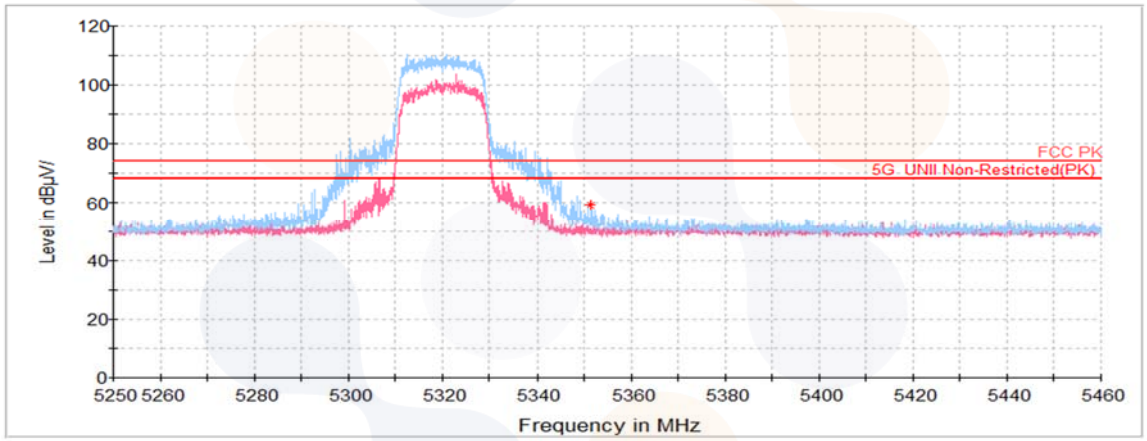
802.11n_HT20_Highest Channel (5 320 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 350.88[1)]	H	48.08	34.38	-23.36	-	59.10	74.00	14.90
10 661.08[1)]	V	58.26	37.70	-48.40	-	47.56	74.00	26.44
15 972.17[1)]	H	57.53	39.90	-46.88	-	50.55	74.00	23.45
Average Data								
5 350.88[1)]	H	33.68	34.38	-23.36	1.44	46.14	54.00	7.86

802.11n_HT20_Highest Channel (5 320 ㎒)

Average data	
	Blank

Horizontal/Vertical for Band-edge



802.11n_HT40_Lowest Channel (5 270 ㎒)

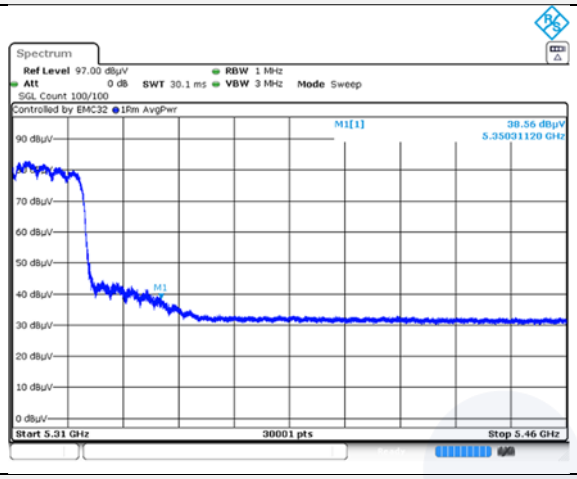
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 544.55	H	58.02	37.63	-48.33	-	47.32	68.20	20.88
15 806.18[1)]	H	57.83	39.90	-46.85	-	50.88	74.00	23.12
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11n_HT40_Highest Channel (5 310 ㎒)

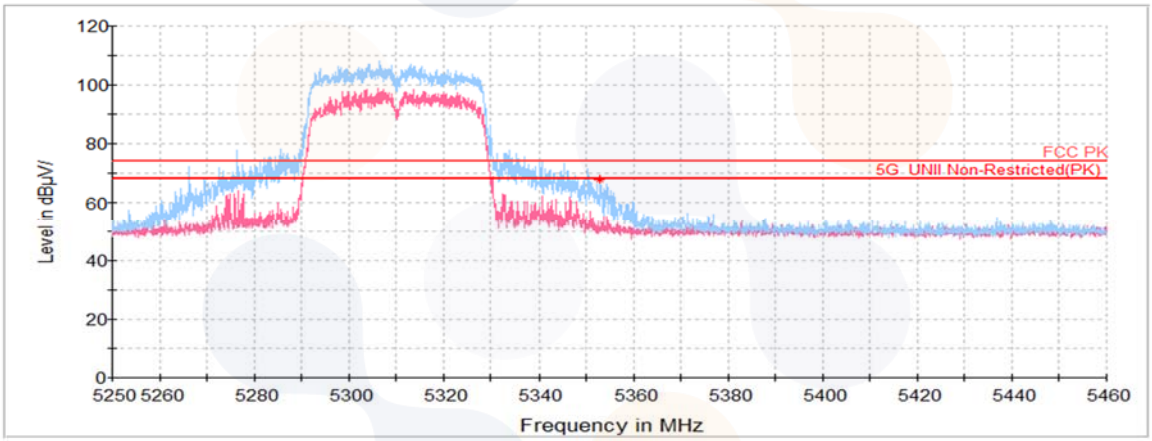
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 350.31[1)]	H	56.69	34.38	-23.36	-	67.71	74.00	6.29
10 615.85[1)]	H	59.65	37.67	-48.37	-	48.95	74.00	25.05
15 922.72[1)]	V	57.78	39.90	-46.87	-	50.81	74.00	23.19
Average Data								
5 350.31[1)]	H	38.56	34.38	-23.36	2.54	52.12	54.00	1.88

802.11n_HT40_Highest Channel (5 310 ㎒)

Average data



Horizontal/Vertical for Band-edge



802.11ac_VHT20_Lowest Channel (5 260 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 571.38	V	58.69	37.64	-48.35	-	47.98	68.20	20.22
15 792.77[1)]	H	57.52	39.90	-46.84	-	50.58	74.00	23.42
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

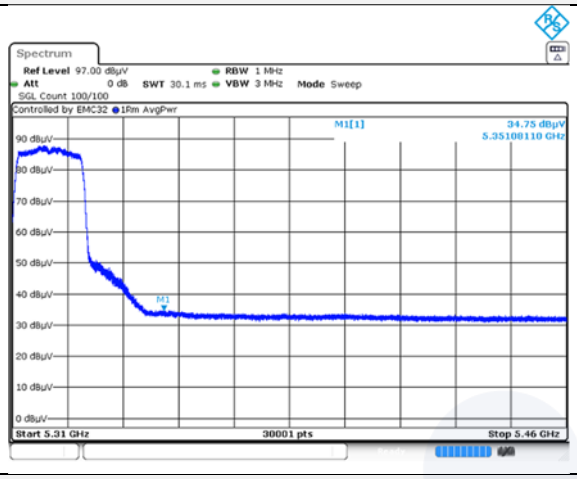
802.11ac_VHT20_Middle Channel (5 280 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 577.52	H	57.92	37.65	-48.35	-	47.22	68.20	20.98
15 847.58[1)]	V	57.43	39.90	-46.85	-	50.48	74.00	23.52
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

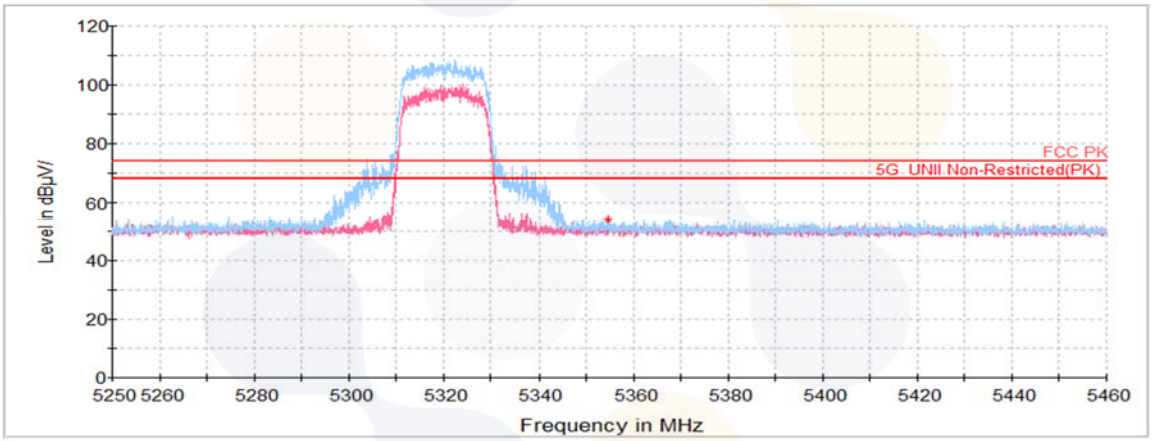
802.11ac_VHT20_Highest Channel (5 320 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 351.08[1)]	H	43.26	34.38	-23.36	-	54.28	74.00	19.72
10 663.77[1)]	V	57.80	37.70	-48.40	-	47.10	74.00	26.90
15 960.28[1)]	V	56.98	39.90	-46.87	-	50.01	74.00	23.99
Average Data								
5 351.08[1)]	H	34.75	34.38	-23.36	2.45	48.22	54.00	5.78

802.11ac_VHT20_Highest Channel (5 320 ㎒)

Average data	
	Blank

Horizontal/Vertical for Band-edge



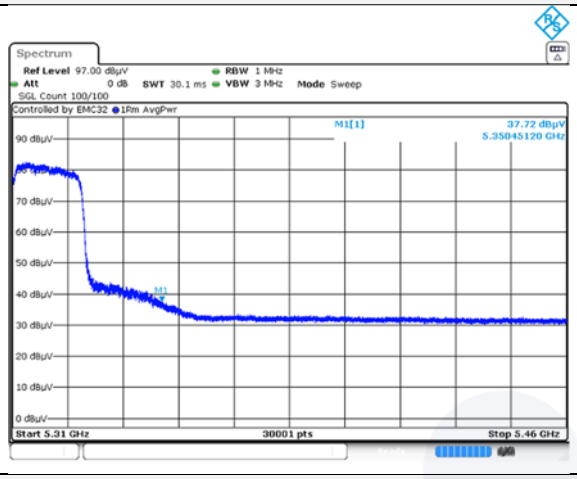
802.11ac_VHT40_Lowest Channel (5 270 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
10 564.10	V	58.06	37.64	-48.34	-	47.36	68.20	20.84
15 814.23[1)]	V	57.46	39.90	-46.85	-	50.51	74.00	23.49
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

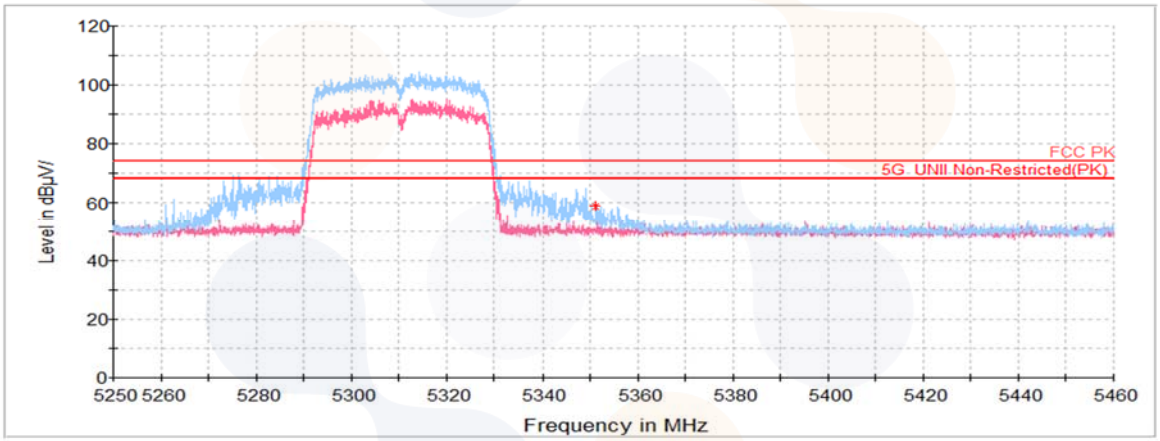
802.11ac_VHT40_Highest Channel (5 310 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 350.45[1)]	H	47.68	34.38	-23.36	-	58.70	74.00	15.30
10 662.62[1)]	H	59.65	37.70	-48.40	-	48.95	74.00	25.05
15 916.97[1)]	H	57.69	39.90	-46.87	-	50.72	74.00	23.28
Average Data								
5 350.45[1)]	H	37.72	34.38	-23.36	3.91	52.65	54.00	1.35

802.11ac_VHT40_Highest Channel (5 310 ㎒)

Average data	
	Blank

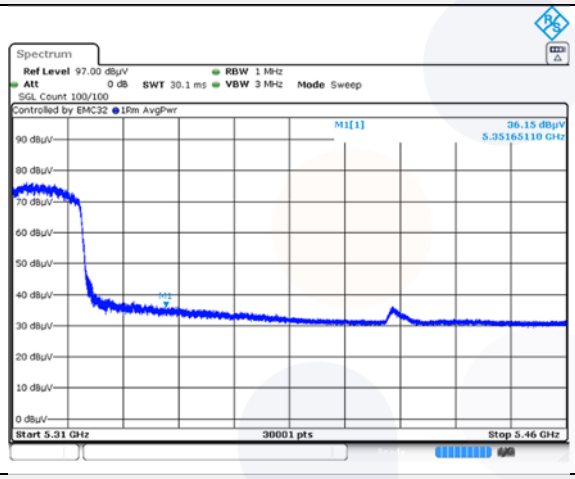
Horizontal/Vertical for Band-edge



802.11ac_VHT80_Middle Channel (5 290 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 353.71[1)]	H	48.37	34.38	-23.38	-	59.37	74.00	14.63
10 592.08	H	59.53	37.66	-48.36	-	48.83	68.20	19.37
15 911.22[1)]	H	57.95	39.90	-46.87	-	50.98	74.00	23.02
Average Data								
5 353.71[1)]	H	36.15	34.38	-23.38	5.72	52.87	54.00	1.13

Average data



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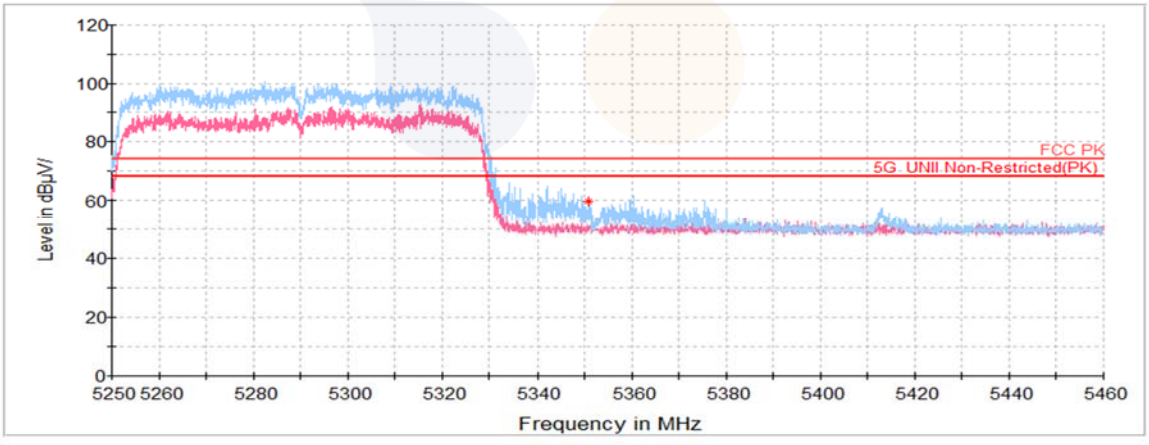
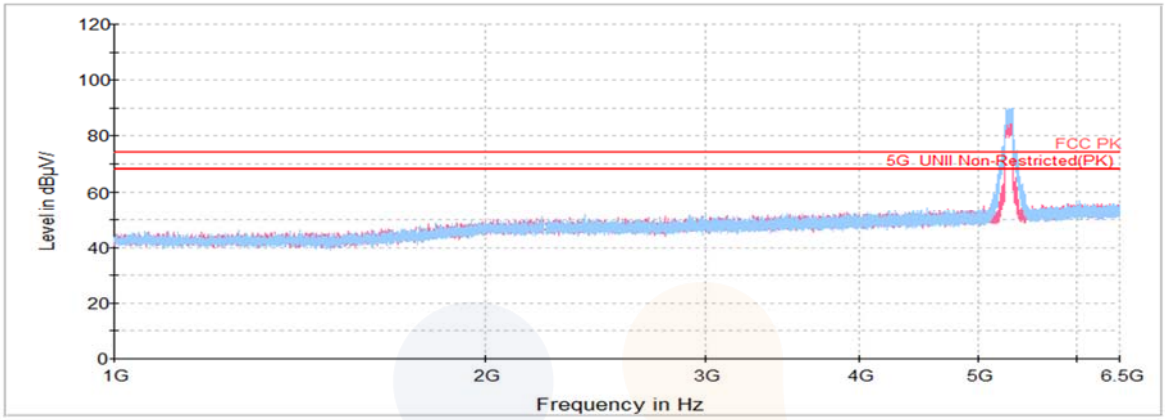
Horizontal/Vertical for Band-edge



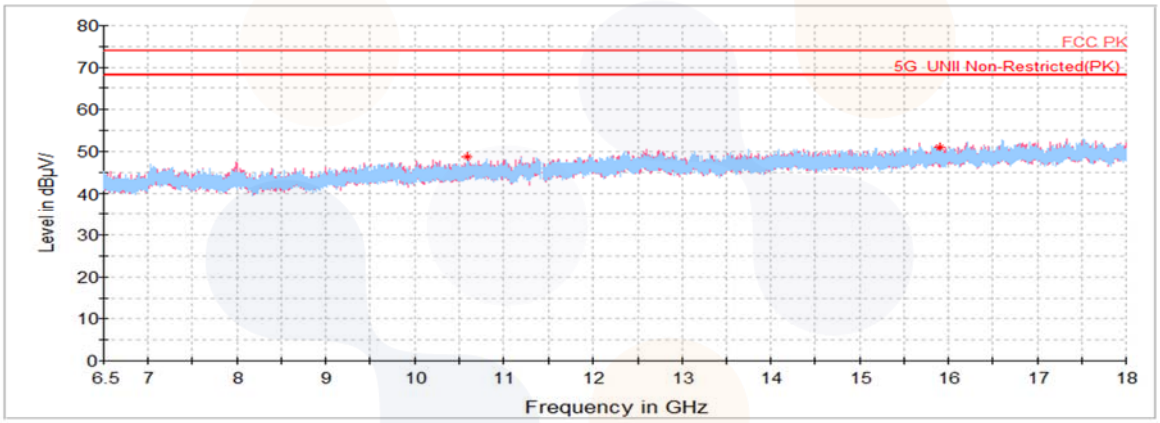
Plot of Harmonics and Spurious Emissions

In order to simplify the report, attached plots were only the lowest margin condition
802.11ac_VHT80 UNII-2A_MIMO_ Middle Channel (5 290 ㎒)

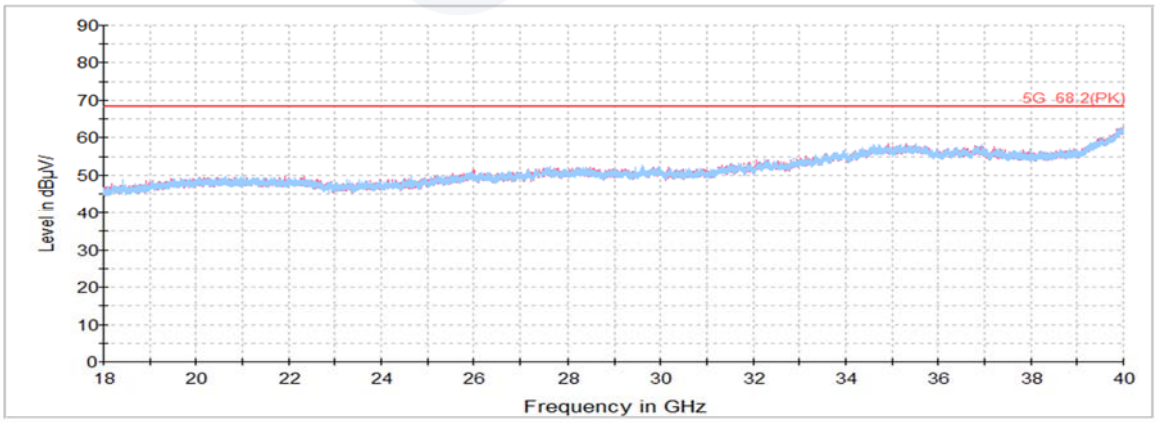
Horizontal/Vertical for 1 ㎓ ~ 6.5 ㎓



Horizontal/Vertical for 6.5 ㎓ ~ 18 ㎓



Horizontal/Vertical for 18 ㎓ ~ 40 ㎓



In SISO mode, we tested both Ant 1 and Ant 2, but attached only the data of ANT 1 with the highest conducted output power to simplify the report.

UNII-2C SISO ANT 1

802.11a_Lowest Channel (5 500 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 453.78[1)]	H	42.69	34.46	-23.31	-	53.84	74.00	20.16
11 005.32[1)]	V	59.65	37.90	-48.62	-	48.93	74.00	25.07
16 552.53	H	56.87	41.25	-46.14	-	51.98	68.20	16.22
Average Data								
5 453.78[1)]	H	32.44	34.46	-23.31	1.36	44.95	54.00	9.05

802.11a_Middle Channel (5 600 ㎒)

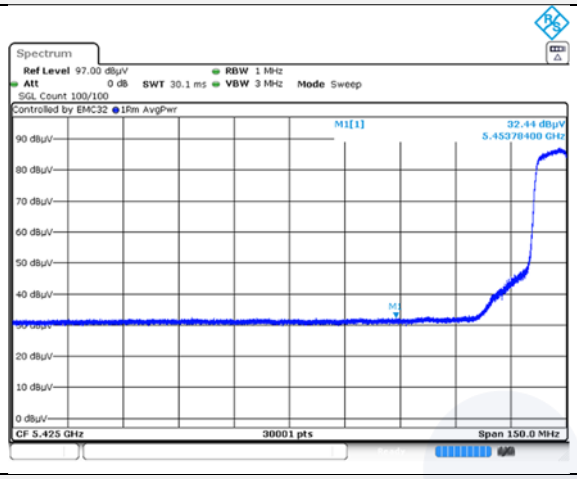
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
11 198.52[1)]	H	59.99	38.06	-48.58	-	49.47	74.00	24.53
16 806.30	V	56.84	41.51	-46.02	-	52.33	68.20	15.87
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11a_Highest Channel (5 700 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 739.17	H	43.66	34.88	-23.07	-	55.47	68.20	12.73
11 396.32[1)]	V	60.10	38.22	-48.54	-	49.78	74.00	24.22
17 106.83	V	56.03	41.44	-45.81	-	51.66	68.20	16.54
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11a_Lowest Channel (5 500 ㎒)

Average data



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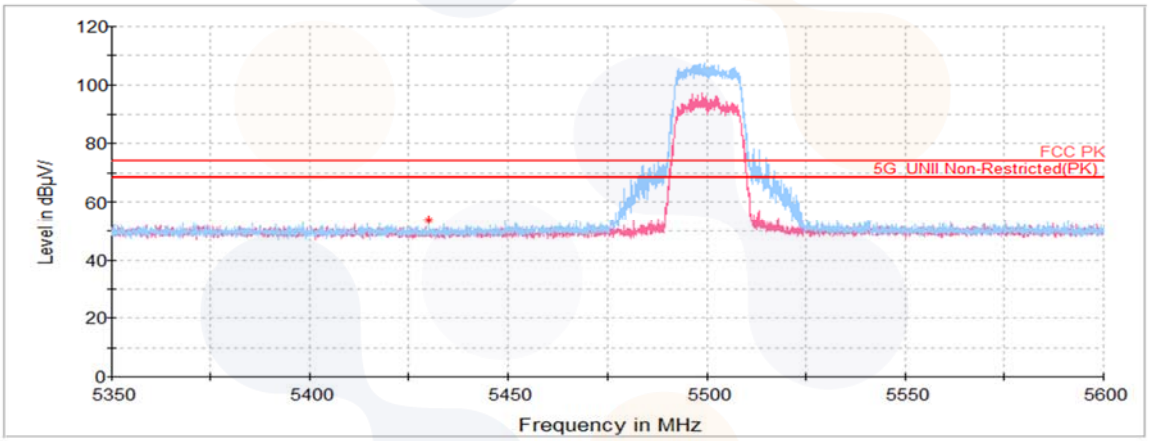
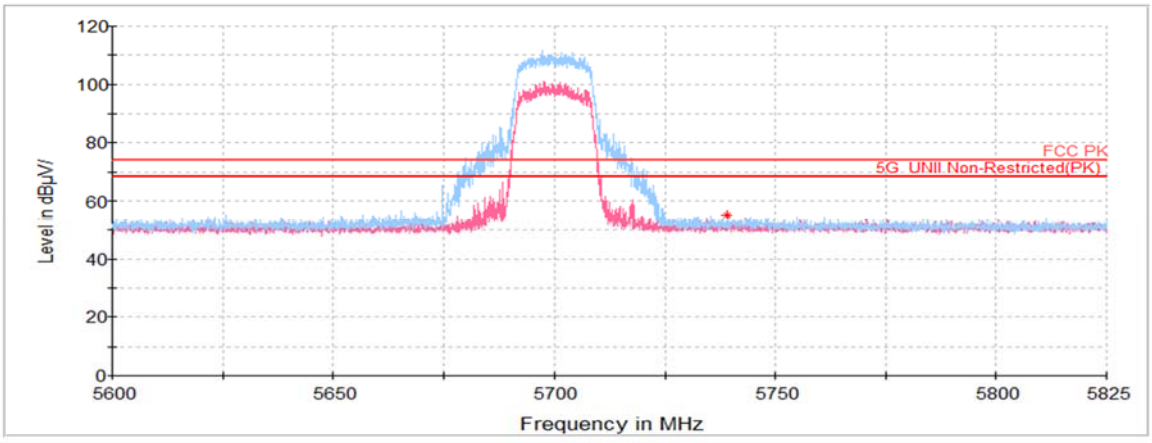
Horizontal/Vertical for Band-edge



Highest Channel (5 700 ㎒)

Horizontal/Vertical for Band-edge



802.11n_HT20_Lowest Channel (5 500 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 443.63[1)]	H	41.92	34.45	-23.38	-	52.99	74.00	21.01
10 989.98[1)]	V	59.16	37.89	-48.61	-	48.44	74.00	25.56
16 506.92	H	56.94	41.21	-46.17	-	51.98	68.20	16.22
Average Data								
5 443.63[1)]	H	32.07	34.45	-23.38	1.45	44.59	54.00	9.41

802.11n_HT20_Middle Channel (5 600 ㎒)

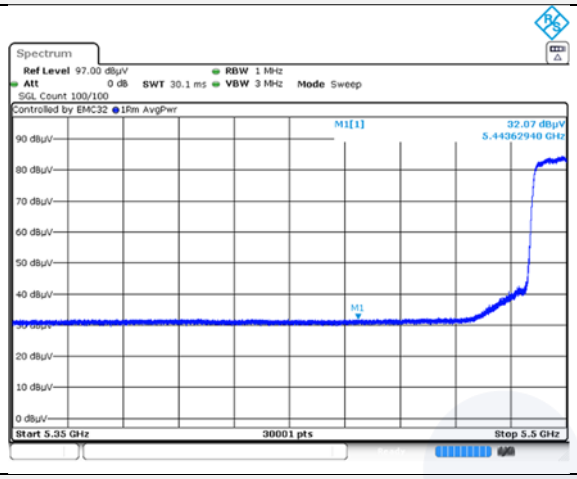
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
11 194.30[1)]	H	59.29	38.06	-48.58	-	48.77	74.00	25.23
16 818.57	H	56.45	41.52	-46.02	-	51.95	68.20	16.25
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11n_HT20_Highest Channel (5 700 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 725.06	H	47.74	34.86	-23.14	-	59.46	68.20	8.74
11 415.48[1)]	H	58.66	38.23	-48.54	-	48.35	74.00	25.65
17 105.68	V	56.12	41.44	-45.81	-	51.75	68.20	16.45
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11n_HT20_Lowest Channel (5 500 ㎒)

Average data



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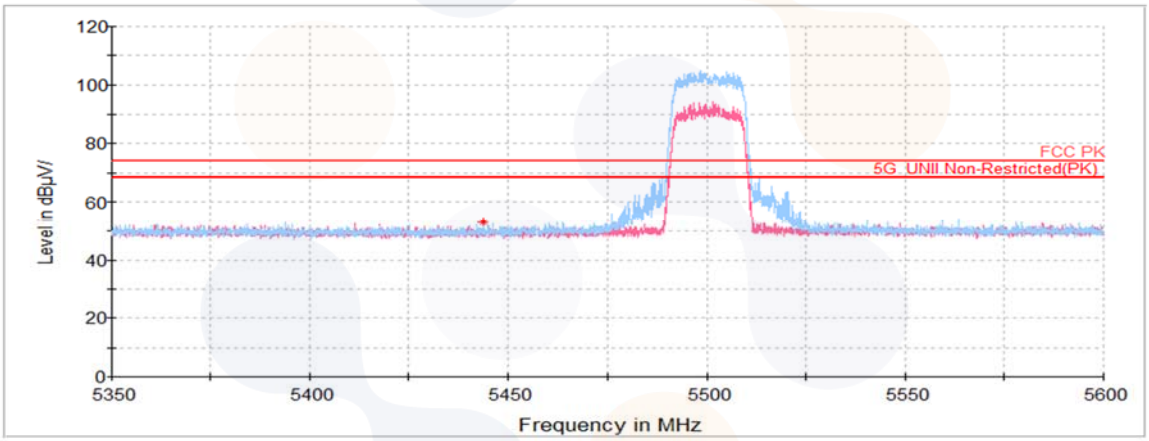
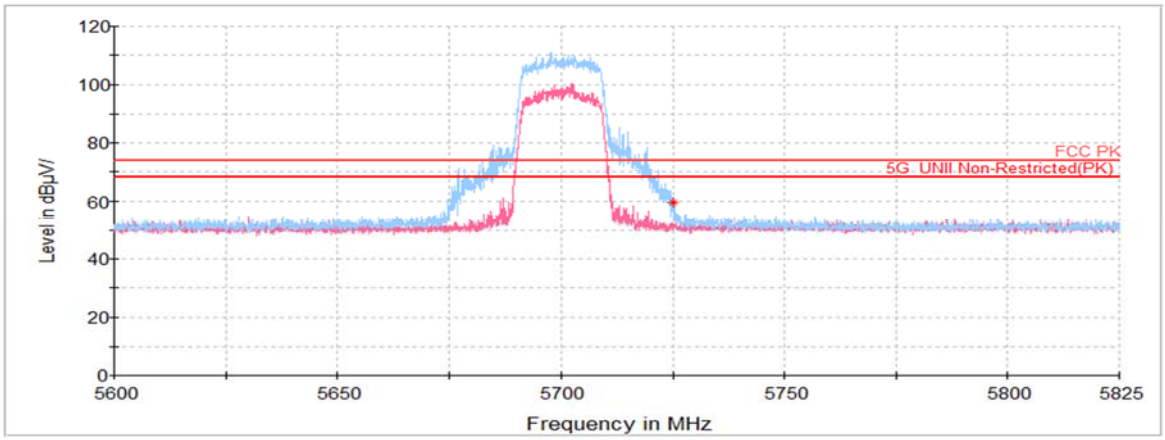
Horizontal/Vertical for Band-edge



Highest Channel (5 700 ㎒)

Horizontal/Vertical for Band-edge



802.11n_HT40_Lowest Channel (5 510 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 459.76[1)]	H	42.64	34.47	-23.26	-	53.85	74.00	20.15
11 049.40[1)]	H	57.88	37.94	-48.61	-	47.21	74.00	26.79
16 516.88	V	56.41	41.22	-46.16	-	51.47	68.20	16.73
Average Data								
5 459.76[1)]	H	32.56	34.47	-23.26	2.54	46.31	54.00	7.69

802.11n_HT40_Middle Channel (5 590 ㎒)

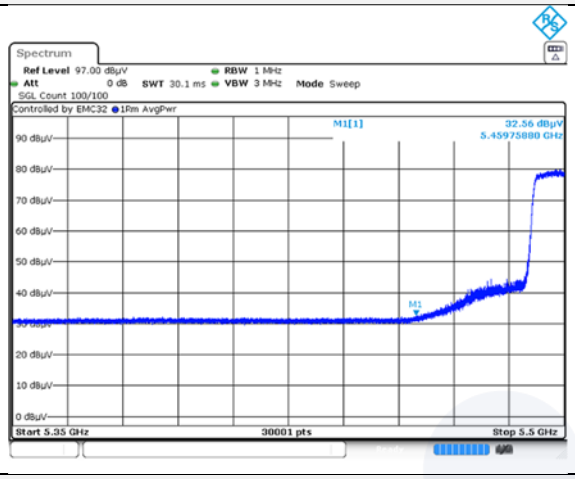
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
11 186.25[1)]	V	59.10	38.05	-48.58	-	48.57	74.00	25.43
16 794.42	H	57.95	41.49	-46.03	-	53.41	68.20	14.79
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11n_HT40_Highest Channel (5 670 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 728.30	H	42.75	34.87	-23.13	-	54.49	68.20	13.71
11 351.85[1)]	H	60.51	38.18	-48.55	-	50.14	74.00	23.86
17 079.23	V	55.38	41.43	-45.84	-	50.97	68.20	17.23
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11n_HT40_Lowest Channel (5 510 ㎒)

Average data



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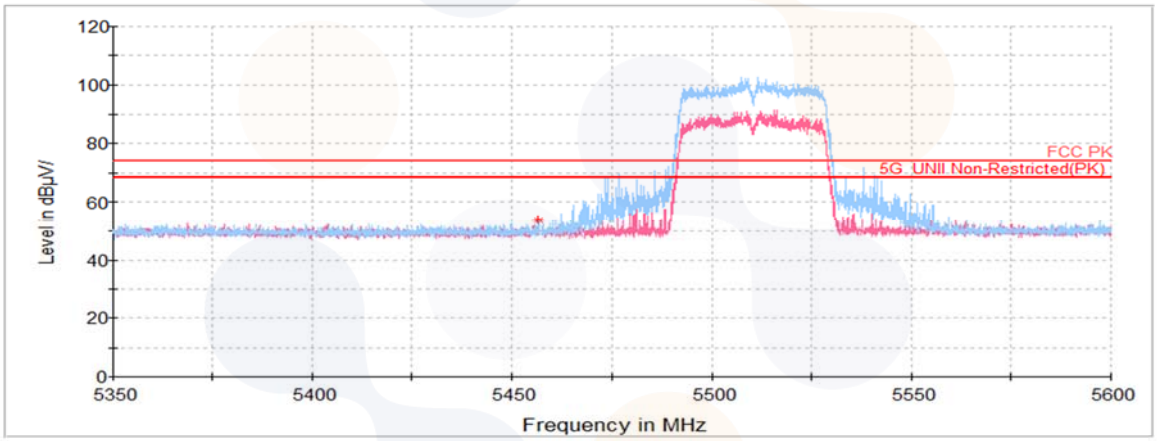
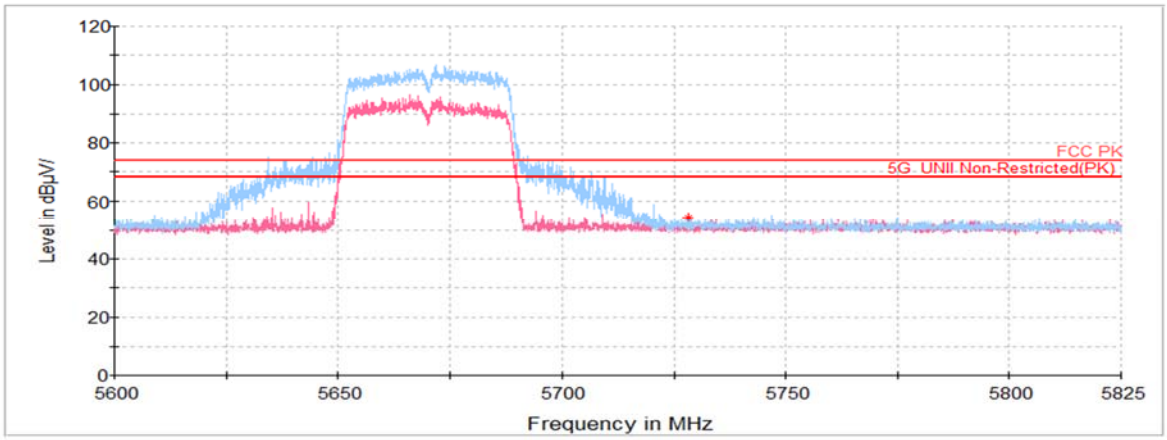
Horizontal/Vertical for Band-edge



Highest Channel (5 670 ㎒)

Horizontal/Vertical for Band-edge



802.11ac_VHT20_Lowest Channel (5 500 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 417.79[1)]	H	42.08	34.43	-23.58	-	52.93	74.00	21.07
11 018.73[1)]	H	59.26	37.91	-48.61	-	48.56	74.00	25.44
16 547.17	V	57.35	41.25	-46.15	-	52.45	68.20	15.75
Average Data								
5 417.79[1)]	H	32.16	34.43	-23.58	1.44	44.45	54.00	9.55

802.11ac_VHT20_Middle Channel (5 600 ㎒)

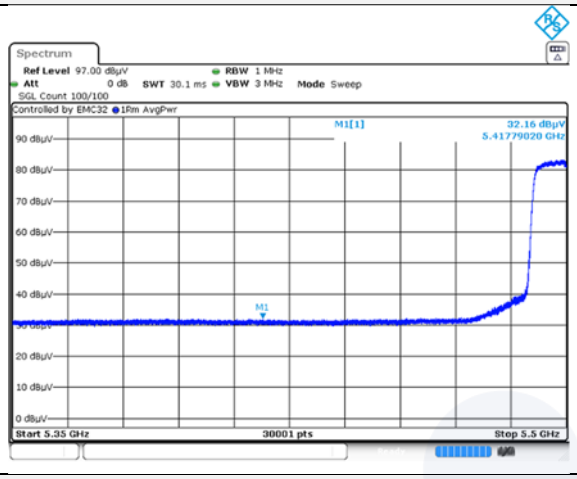
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
11 187.02[1)]	H	59.25	38.05	-48.58	-	48.72	74.00	25.28
16 791.73	H	57.95	41.49	-46.03	-	53.41	68.20	14.79
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

802.11ac_VHT20_Highest Channel (5 700 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 725.59	H	43.98	34.86	-23.14	-	55.70	68.20	12.50
11 392.87[1)]	V	58.78	38.21	-48.54	-	48.45	74.00	25.55
17 132.52	H	56.17	41.45	-45.78	-	51.84	68.20	16.36
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

802.11ac_VHT20_Lowest Channel (5 500 ㎒)

Average data



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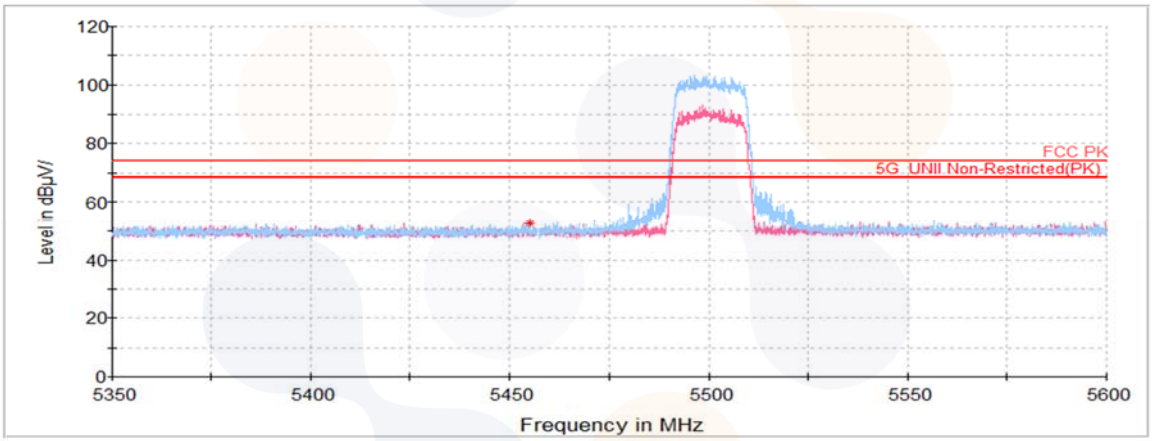
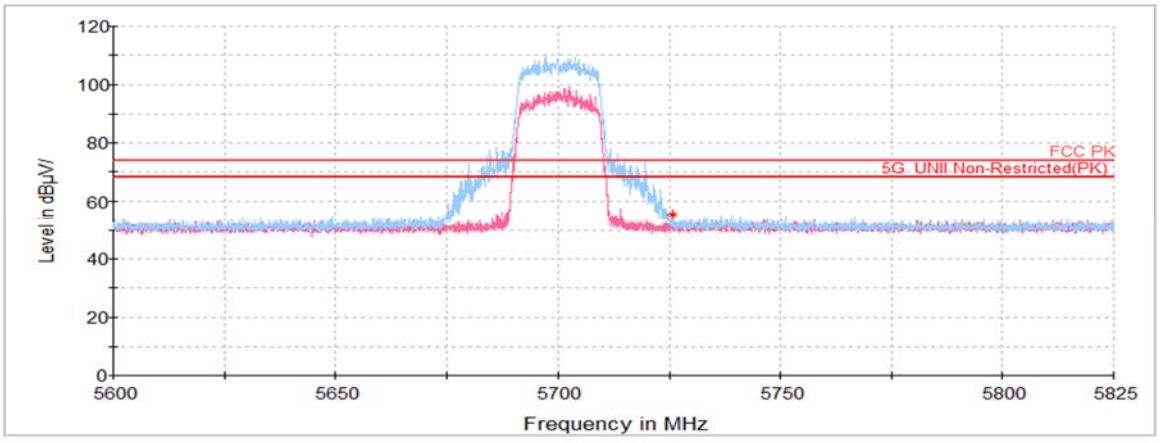
Horizontal/Vertical for Band-edge



Highest Channel (5 700 ㎒)

Horizontal/Vertical for Band-edge



802.11ac_VHT40_Lowest Channel (5 510 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 444.57[1)]	H	41.76	34.46	-23.38	-	52.84	74.00	21.16
11 060.90[1)]	V	58.39	37.95	-48.60	-	47.74	74.00	26.26
16 571.32	V	57.87	41.27	-46.13	-	53.01	68.20	15.19
Average Data								
5 444.57[1)]	H	32.23	34.46	-23.38	2.53	45.84	54.00	8.16

802.11ac_VHT40_Middle Channel (5 590 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
11 178.58[1)]	H	59.86	38.04	-48.58	-	49.32	74.00	24.68
16 813.58	V	57.53	41.51	-46.02	-	53.02	68.20	15.18
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11ac_VHT40_Highest Channel (5 670 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 725.25	H	40.84	34.86	-23.14	-	52.56	68.20	15.64
11 398.62[1)]	V	59.63	38.22	-48.54	-	49.31	74.00	24.69
17 000.27	H	57.18	41.40	-45.93	-	52.65	68.20	15.55
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								