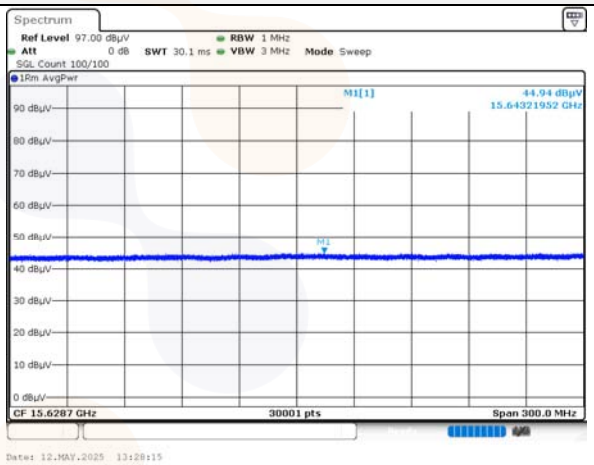
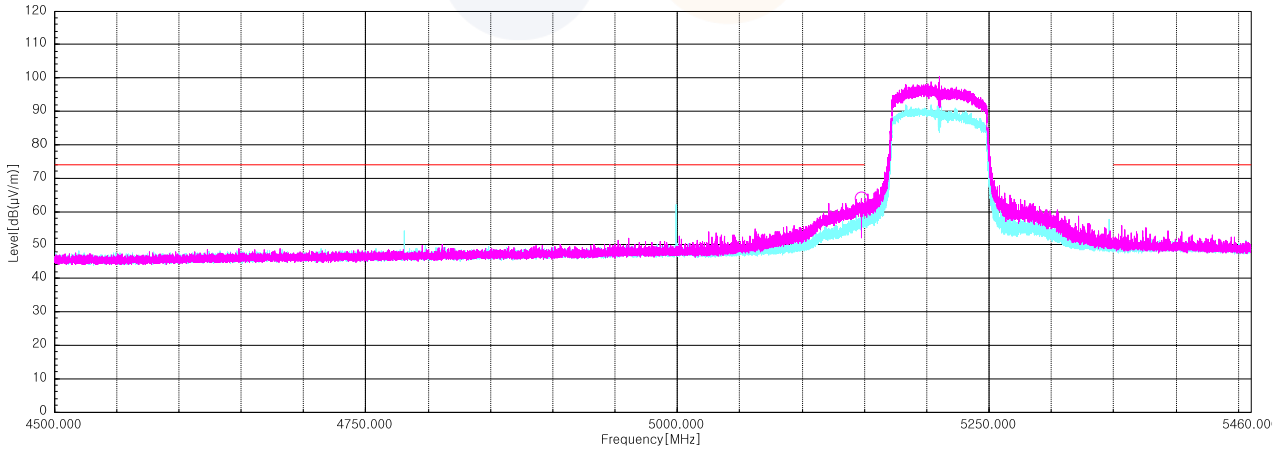
802.11ac_VHT80_Middle Channel (5 210 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 138.60[1)]	V	65.60	25.20	-48.01	-	42.79	74.00	31.21
5 145.79[1)]	H	57.10	33.20	-26.64	-	63.66	74.00	10.34
6 946.58	H	56.60	36.00	-42.26	-	50.34	68.20	17.86
10 461.75	V	55.90	38.92	-43.06	-	51.76	68.20	16.44
15 643.22[1)]	V	54.80	37.81	-40.92	-	51.69	74.00	22.31
Average Data								
5 145.79[1)]	H	46.00	33.20	-26.64	-	52.56	54.00	1.44
15 643.22[1)]	V	44.94	37.81	-40.92	-	41.83	54.00	12.17

Average data



Horizontal/Vertical for Band-edge

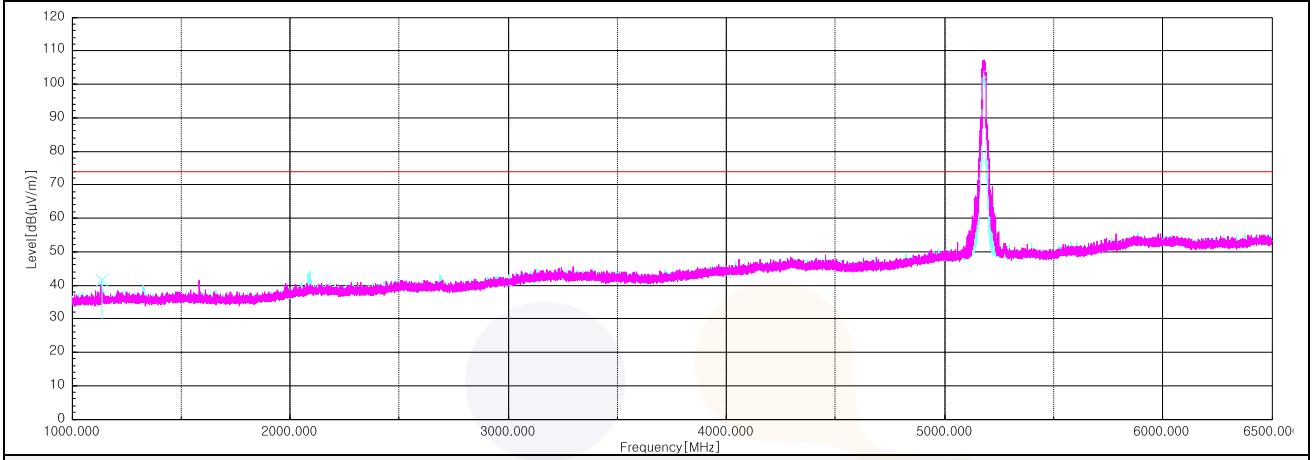


Plot of Harmonics and Spurious Emissions

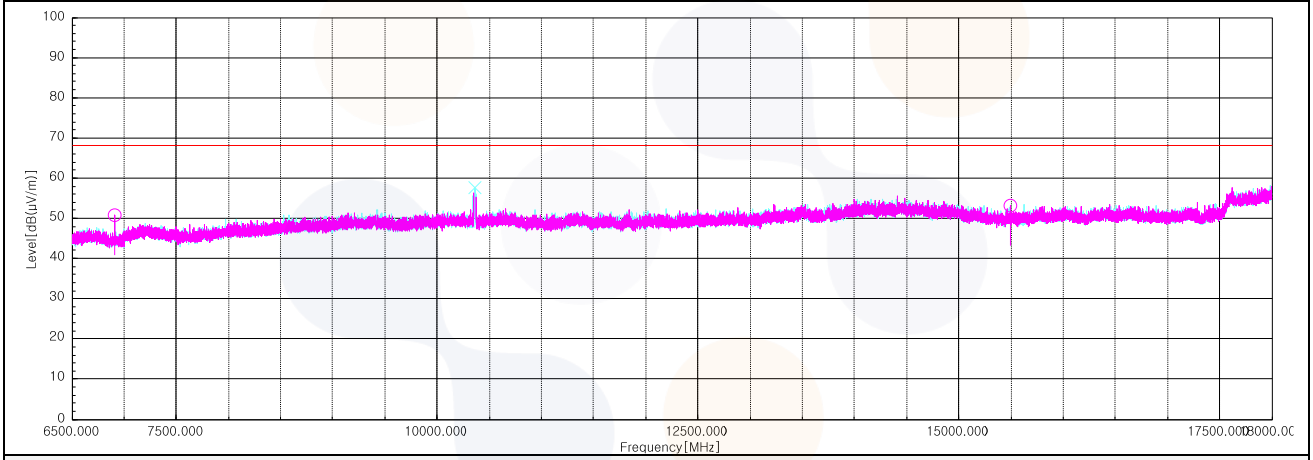
In order to simplify the report, attached plots were only the lowest margin condition

802.11ac VHT20_UNII 1_ Lowest Channel (5 180 ㎒)

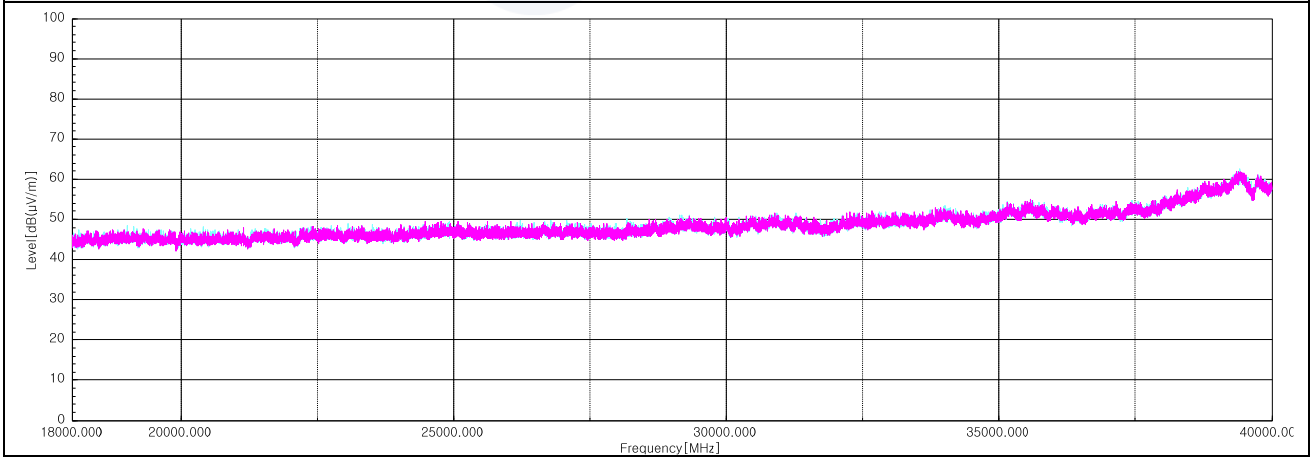
Horizontal/Vertical for 1 ㎓ ~ 6.5 ㎓



Horizontal/Vertical for 6.5 ㎓ ~ 18 ㎓



Horizontal/Vertical for 18 ㎓ ~ 40 ㎓



UNII 3

802.11a_Lowest Channel (5 745 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 139.15[1)]	H	66.50	25.20	-48.01	-	43.69	74.00	30.31
5 723.22	H	72.50	33.49	-25.67	-	80.32	118.20	37.88
11 490.54[1)]	V	59.80	38.92	-42.23	-	56.49	74.00	17.51
17 232.18	V	67.80	38.13	-40.58	-	65.35	68.20	2.85
Average Data								
11 490.54[1)]	V	51.88	38.92	-42.23	-	48.57	54.00	5.43

802.11a_Middle Channel (5 785 ㎒)

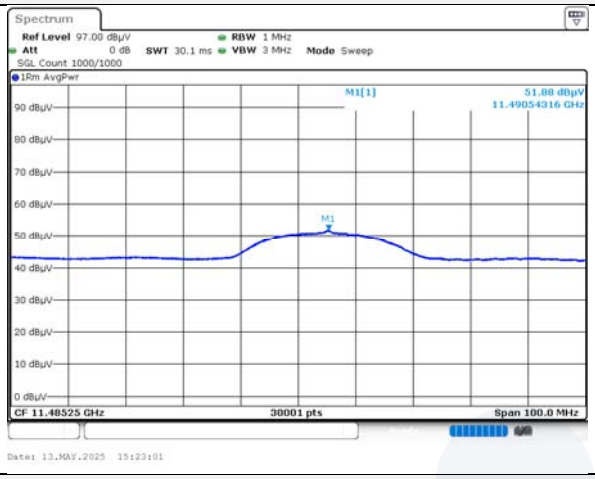
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 137.32[1)]	V	66.20	25.20	-48.01	-	43.39	74.00	30.61
11 570.30[1)]	H	59.60	38.76	-41.96	-	56.40	74.00	17.60
17 360.60	V	67.70	38.52	-40.91	-	65.31	68.20	2.89
Average Data								
11 570.30[1)]	H	52.85	38.76	-41.96	-	49.65	54.00	4.35

802.11a_Highest Channel (5 825 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 133.83[1)]	H	64.50	25.20	-48.01	-	41.69	74.00	32.31
5 850.64	H	66.70	34.20	-25.43	-	75.47	120.80	45.33
11 650.53[1)]	V	58.40	38.60	-41.67	-	55.33	74.00	18.67
17 472.53	V	66.70	39.14	-41.34	-	64.50	68.20	3.70
Average Data								
11 650.53[1)]	V	51.10	38.60	-41.67	-	48.03	54.00	5.97

802.11a_Lowest Channel (5 745 ㎒)

Average data



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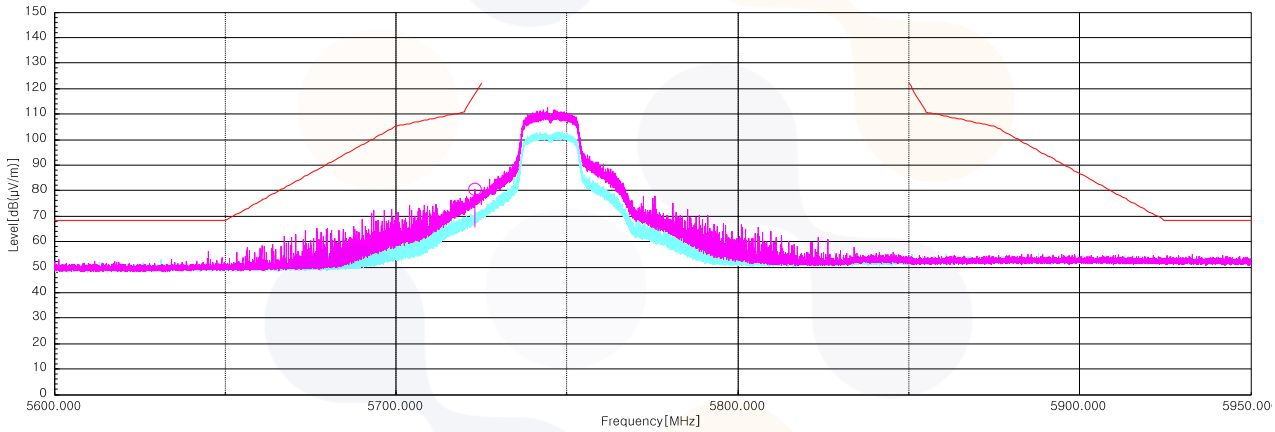
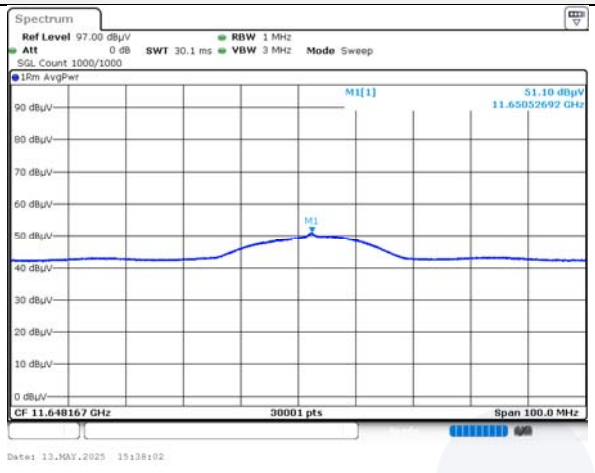
Horizontal/Vertical for Band-edge



802.11a_Highest Channel (5 825 ㎒)

Average data



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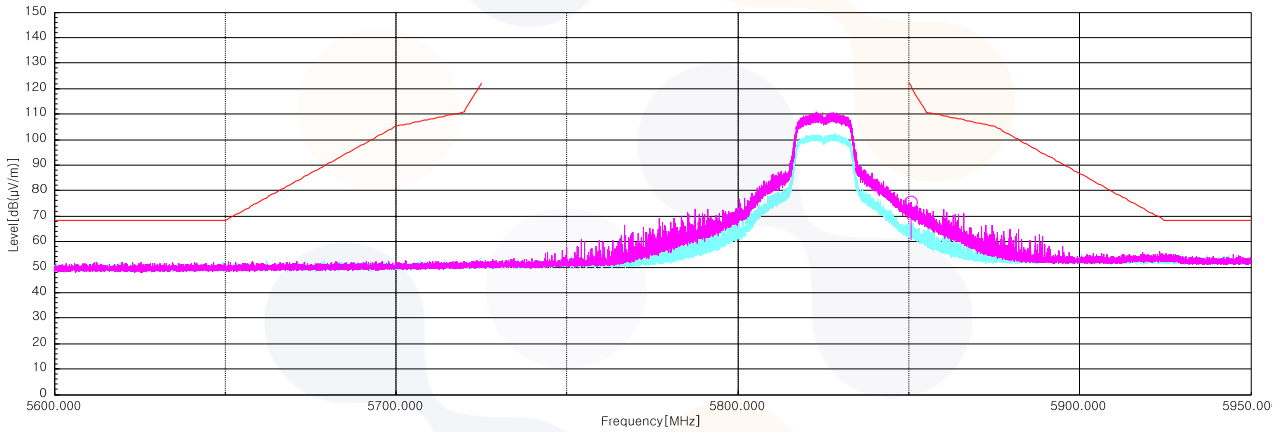
Horizontal/Vertical for Band-edge



802.11n_HT20_Lowest Channel (5 745 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 139.15[1)]	H	65.50	25.20	-48.01	-	42.69	74.00	31.31
5 724.92	H	70.60	33.50	-25.67	-	78.43	122.00	43.57
11 490.39[1)]	V	60.60	38.92	-42.23	-	57.29	74.00	16.71
17 240.62	V	68.60	38.16	-40.54	-	66.22	68.20	1.98
Average Data								
11 490.39[1)]	V	51.28	38.92	-42.23	-	47.97	54.00	6.03

802.11n_HT20_Middle Channel (5 785 ㎒)

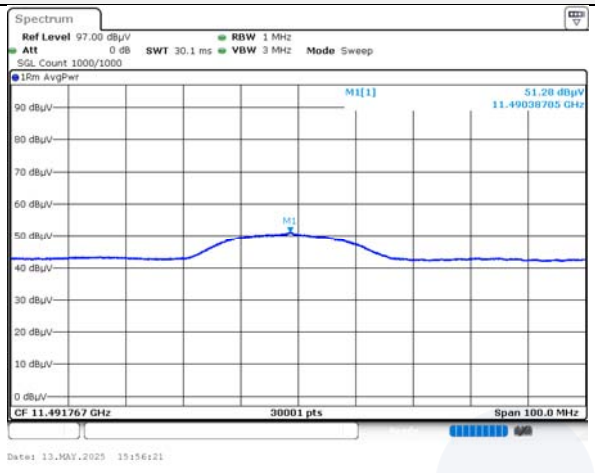
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 138.42[1)]	H	67.70	25.20	-48.01	-	44.89	74.00	29.11
11 570.20[1)]	V	60.10	38.76	-41.96	-	56.90	74.00	17.10
17 356.38	V	68.00	38.51	-40.89	-	65.62	68.20	2.58
Average Data								
11 570.20[1)]	V	52.22	38.76	-41.96	-	49.02	54.00	4.98

802.11n_HT20_Highest Channel (5 825 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 136.58[1)]	H	64.60	25.20	-48.01	-	41.79	74.00	32.21
5 851.30	H	66.10	34.21	-25.43	-	74.88	119.20	44.32
11 650.29[1)]	V	59.40	38.60	-41.67	-	56.33	74.00	17.67
17 468.32	V	65.40	39.11	-41.32	-	63.19	68.20	5.01
Average Data								
11 650.29[1)]	V	50.26	38.60	-41.67	-	47.19	54.00	6.81

802.11n_HT20_Lowest Channel (5 745 ㎒)

Average data



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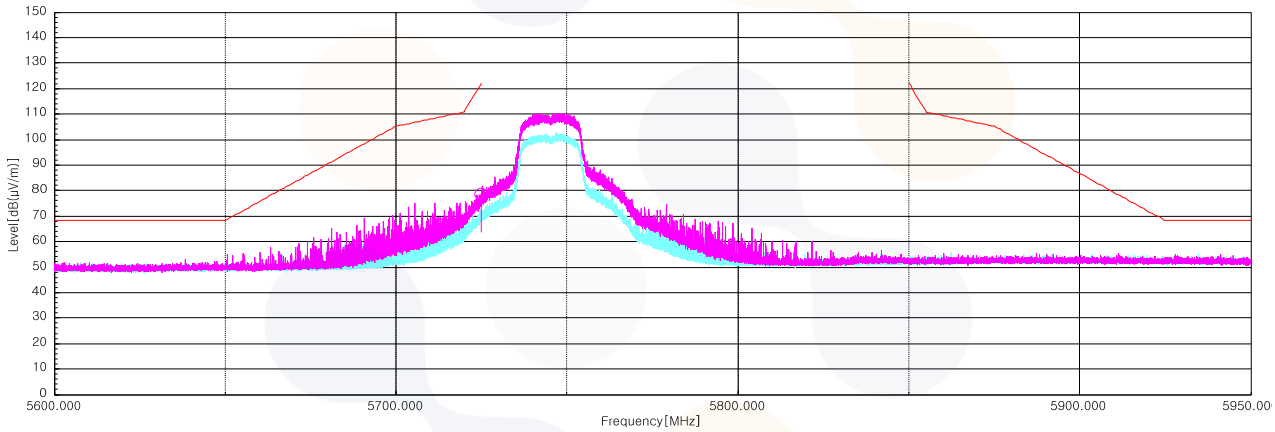
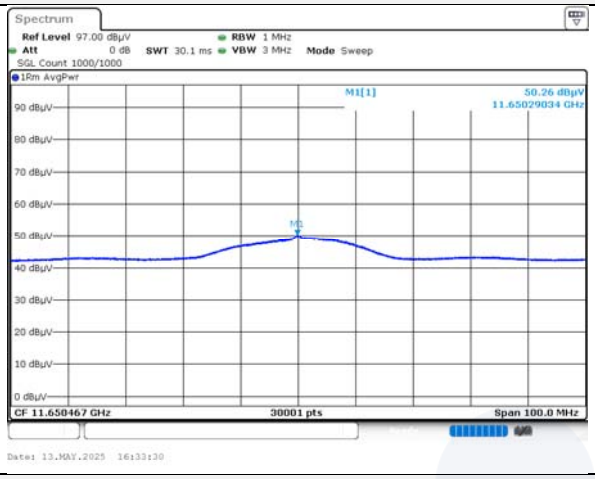
Horizontal/Vertical for Band-edge



802.11n_HT20_Highest Channel (5 825 ㎒)

Average data



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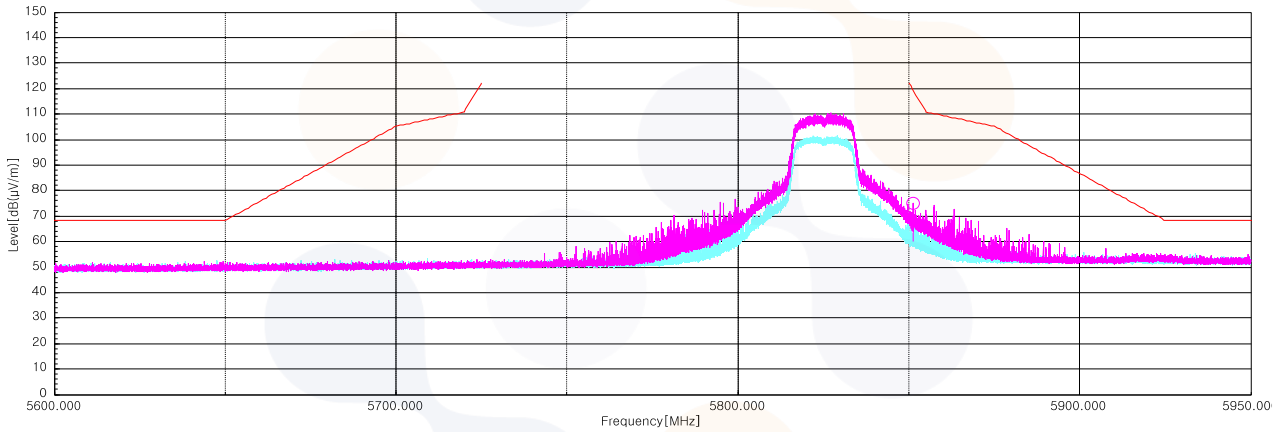
Horizontal/Vertical for Band-edge



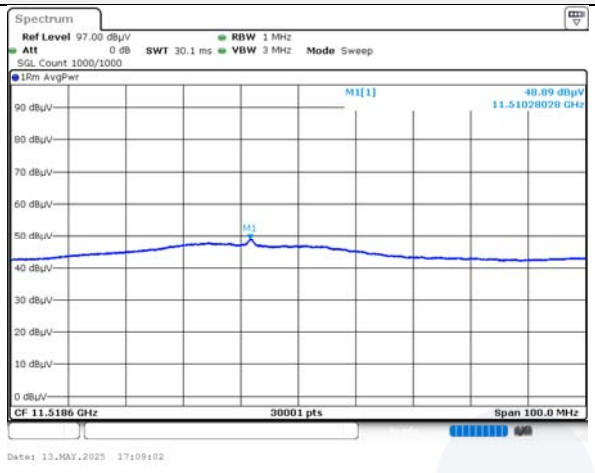
802.11n_HT40_Lowest Channel (5 755 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 136.22[1)]	H	66.30	25.20	-48.01	-	43.49	74.00	30.51
5 724.19	H	72.60	33.50	-25.67	-	80.43	120.40	39.97
11 510.28[1)]	V	57.70	38.88	-42.17	-	54.41	74.00	19.59
17 254.03	V	62.90	38.22	-40.51	-	60.61	68.20	7.59
Average Data								
11 510.28[1)]	V	48.89	38.88	-42.17	-	45.60	54.00	8.40

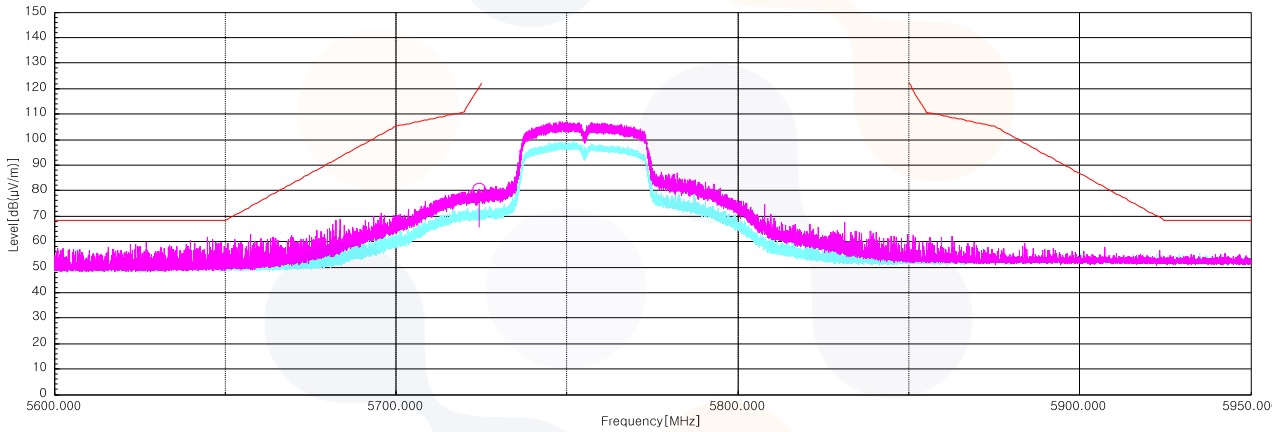
802.11n_HT40_Highest Channel (5 795 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 137.68[1)]	V	65.70	25.20	-48.01	-	42.89	74.00	31.11
5 854.70	H	60.60	34.22	-25.42	-	69.40	111.50	42.10
11 590.39[1)]	V	57.40	38.72	-41.88	-	54.24	74.00	19.76
17 390.50	V	63.70	38.58	-41.02	-	61.26	68.20	6.94
Average Data								
11 590.39[1)]	V	49.01	38.72	-41.88	-	45.85	54.00	8.15

802.11n_HT40_Lowest Channel (5 755 ㎒)

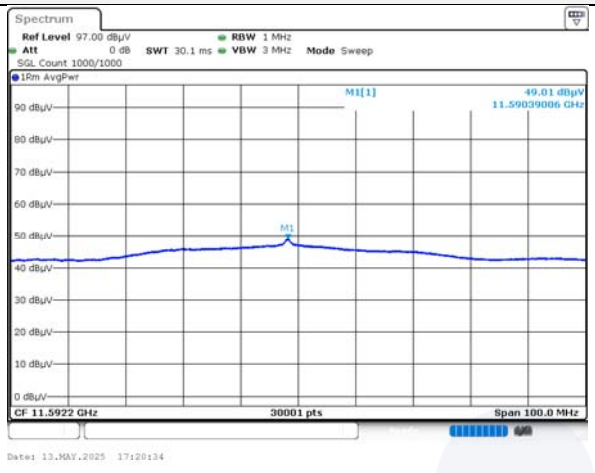
Average data	
	Blank

Horizontal/Vertical for Band-edge



802.11n_HT40_Highest Channel (5 795 ㎒)

Average data



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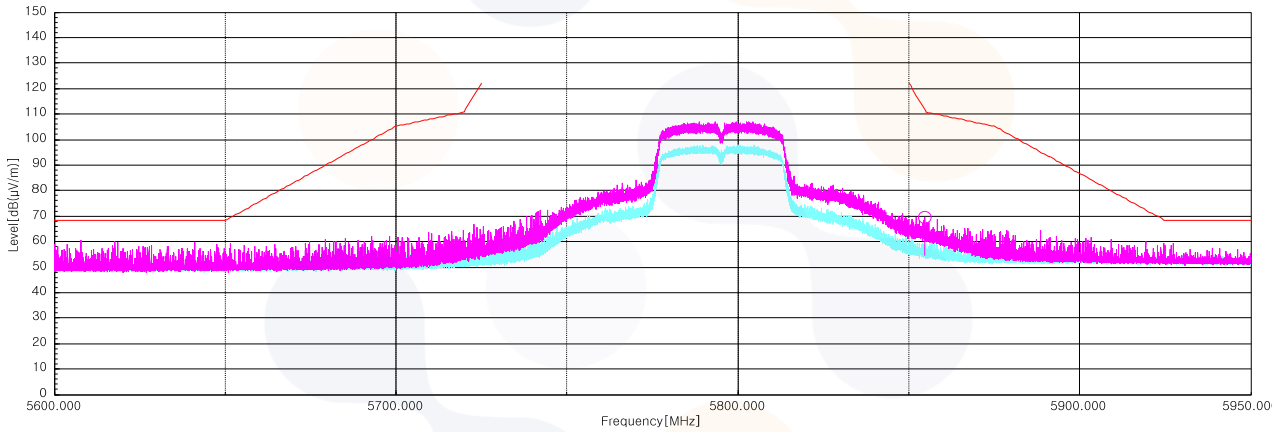
Horizontal/Vertical for Band-edge



802.11ac_VHT20_Lowest Channel (5 745 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 138.05[1)]	H	66.00	25.20	-48.01	-	43.19	74.00	30.81
5 724.81	H	73.20	33.50	-25.67	-	81.03	121.80	40.77
11 490.32[1)]	V	60.80	38.92	-42.23	-	57.49	74.00	16.51
17 241.38	H	65.60	38.17	-40.53	-	63.24	68.20	4.96
Average Data								
11 490.32[1)]	V	50.98	38.92	-42.23	-	47.67	54.00	6.33

802.11ac_VHT20_Middle Channel (5 785 ㎒)

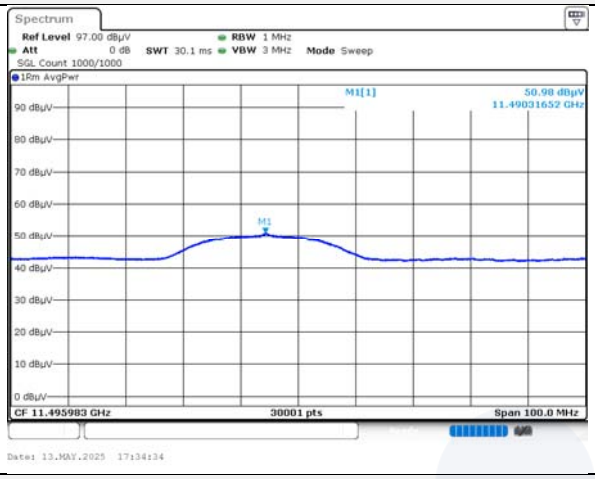
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 138.05[1)]	V	66.20	25.20	-48.01	-	43.39	74.00	30.61
11 570.32[1)]	V	61.90	38.76	-41.96	-	58.70	74.00	15.30
17 357.53	V	67.80	38.52	-40.90	-	65.42	68.20	2.78
Average Data								
11 570.32[1)]	V	51.74	38.76	-41.96	-	48.54	54.00	5.46

802.11ac_VHT20_Highest Channel (5 825 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 142.08[1)]	H	65.50	25.20	-48.01	-	42.69	74.00	31.31
5 853.52	H	65.90	34.21	-25.43	-	74.68	114.20	39.52
11 650.34[1)]	V	59.50	38.60	-41.67	-	56.43	74.00	17.57
17 459.12	V	65.40	39.05	-41.28	-	63.17	68.20	5.03
Average Data								
11 650.34[1)]	V	49.65	38.60	-41.67	-	46.58	54.00	7.42

802.11ac_VHT20_Lowest Channel (5 745 ㎒)

Average data



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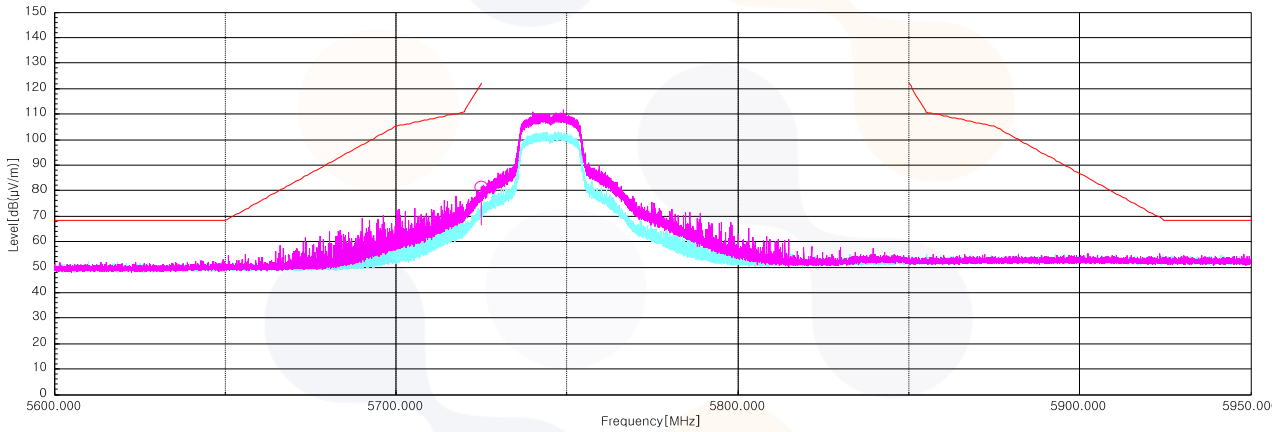
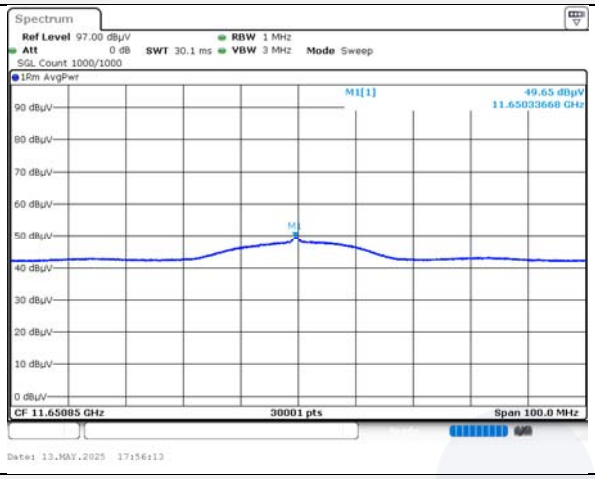
Horizontal/Vertical for Band-edge



802.11ac_VHT20_Highest Channel (5 825 ㎒)

Average data



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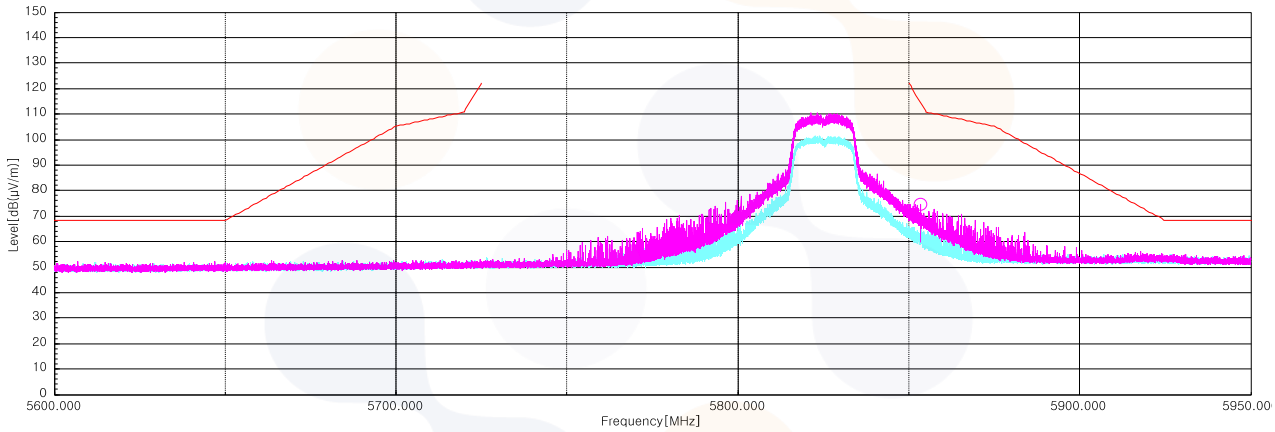
Horizontal/Vertical for Band-edge



802.11ac_VHT40_Lowest Channel (5 755 ㎒)

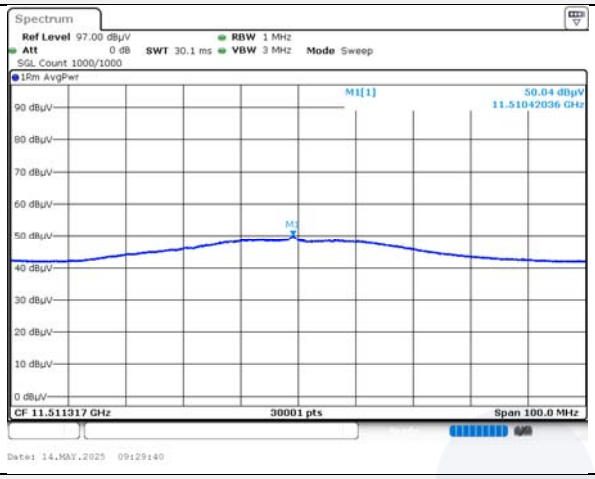
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 138.78[1)]	H	65.50	25.20	-48.01	-	42.69	74.00	31.31
5 724.38	H	73.10	33.50	-25.67	-	80.93	120.80	39.87
11 510.42[1)]	V	58.40	38.88	-42.17	-	55.11	74.00	18.89
17 257.10	V	66.20	38.23	-40.52	-	63.91	68.20	4.29
Average Data								
11 510.42[1)]	V	50.04	38.88	-42.17	-	46.75	54.00	7.25

802.11ac_VHT40_Highest Channel (5 795 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 137.50[1)]	V	67.20	25.20	-48.01	-	44.39	74.00	29.61
5 853.86	H	62.20	34.22	-25.43	-	70.99	113.40	42.41
11 590.48[1)]	V	58.70	38.72	-41.88	-	55.54	74.00	18.46
17 379.38	V	63.50	38.56	-40.98	-	61.08	68.20	7.12
Average Data								
11 590.48[1)]	V	49.54	38.72	-41.88	-	46.38	54.00	7.62

802.11ac_VHT40_Lowest Channel (5 755 ㎒)

Average data



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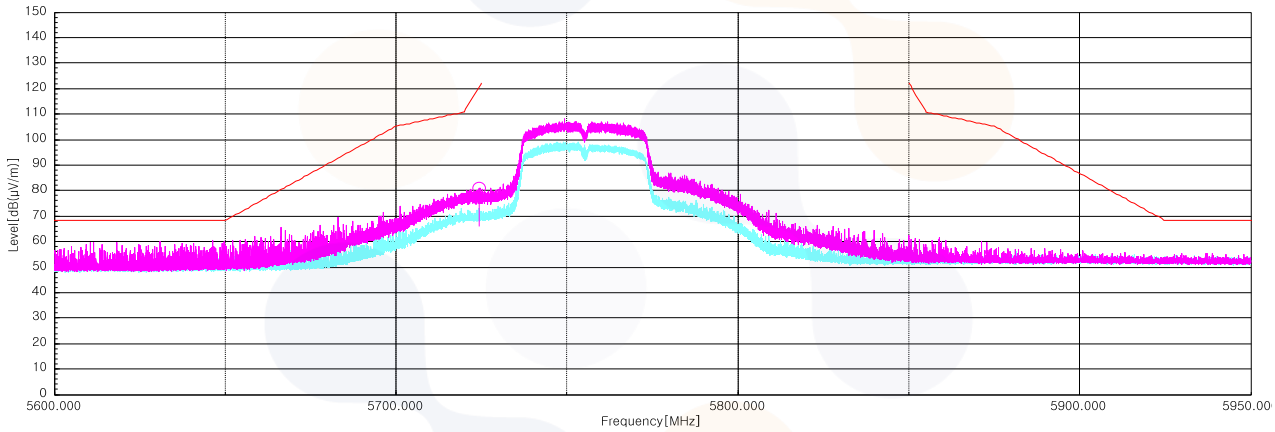
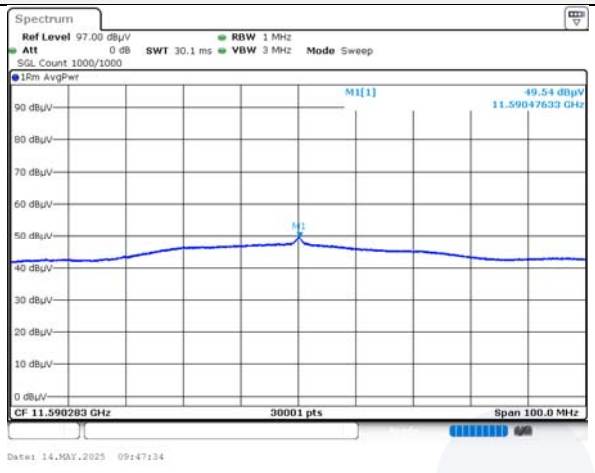
Horizontal/Vertical for Band-edge



802.11ac_VHT40_Highest Channel (5 795 ㎒)

Average data



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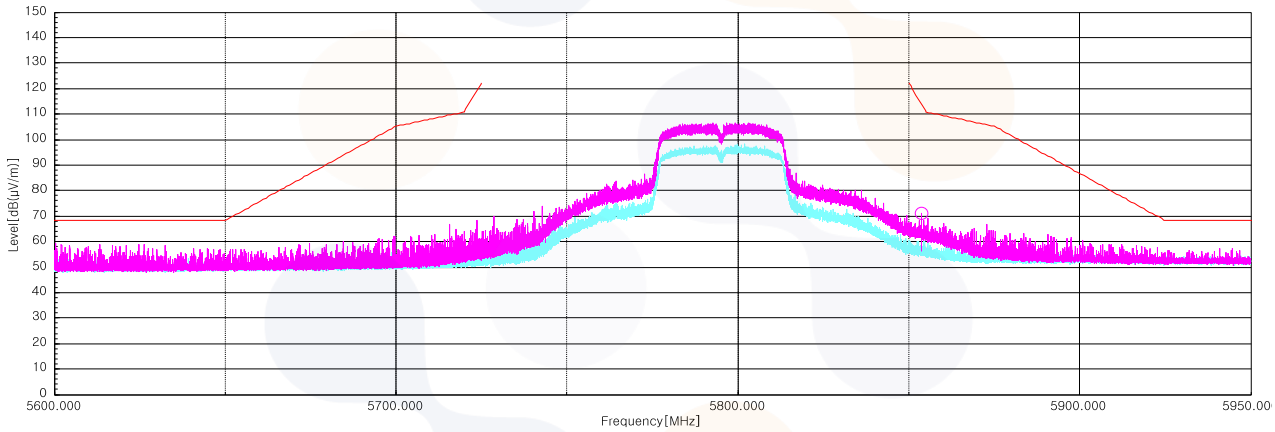
Horizontal/Vertical for Band-edge

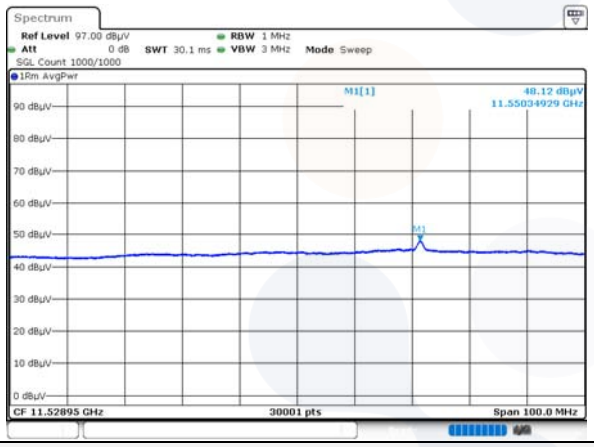


802.11ac_VHT80_Middle Channel (5 775 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
1 135.48[1)]	H	65.70	25.20	-48.01	-	42.89	74.00	31.11
5 724.24	H	74.60	33.50	-25.67	-	82.43	120.50	38.07
5 854.10	H	72.20	34.22	-25.43	-	80.99	112.90	31.91
11 550.35[1)]	V	57.30	38.80	-42.03	-	54.07	74.00	19.93
17 310.00	V	62.30	38.44	-40.72	-	60.02	68.20	8.18
Average Data								
11 550.35[1)]	V	48.12	38.80	-42.03	-	44.89	54.00	9.11

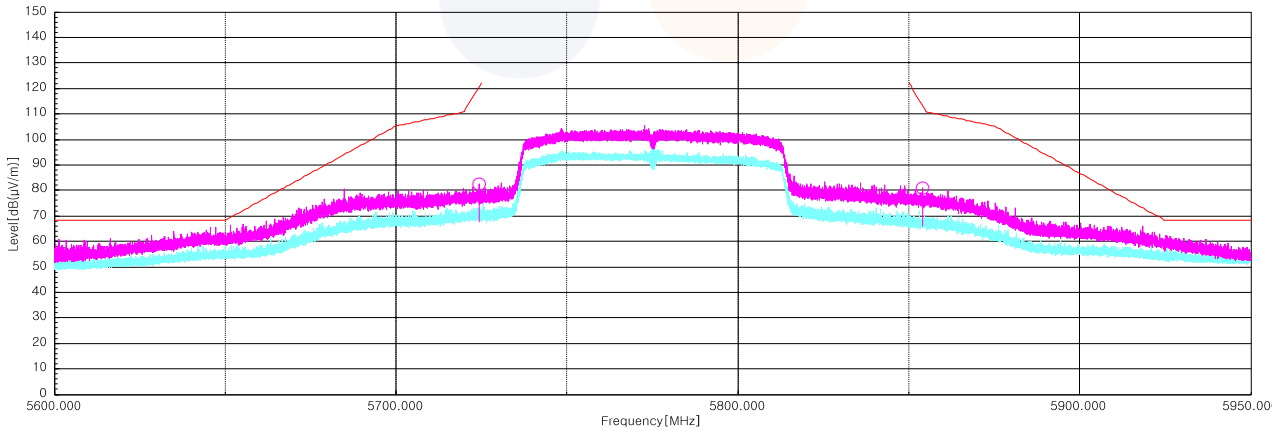
Average data

Blank



Blank

Horizontal/Vertical for Band-edge

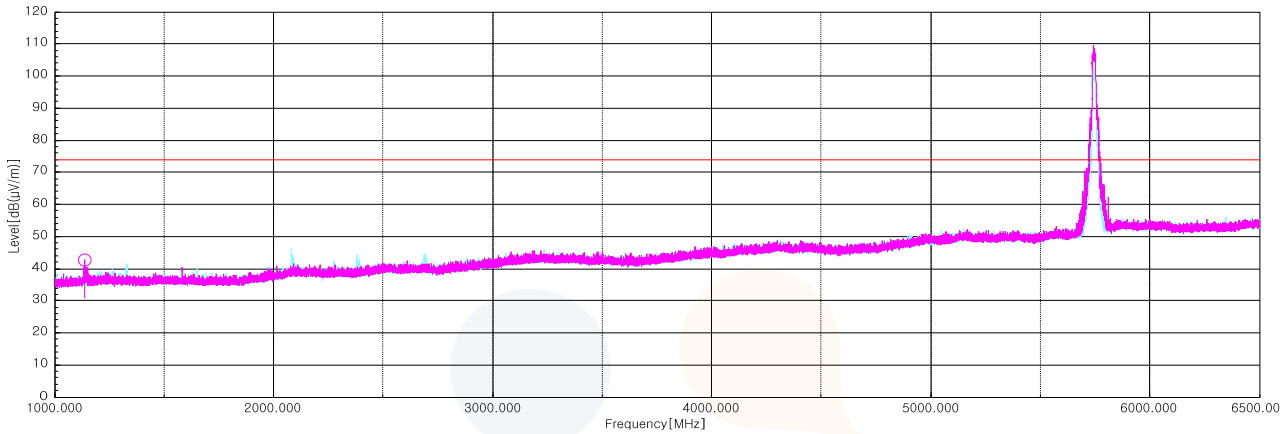


Plot of Harmonics and Spurious Emissions

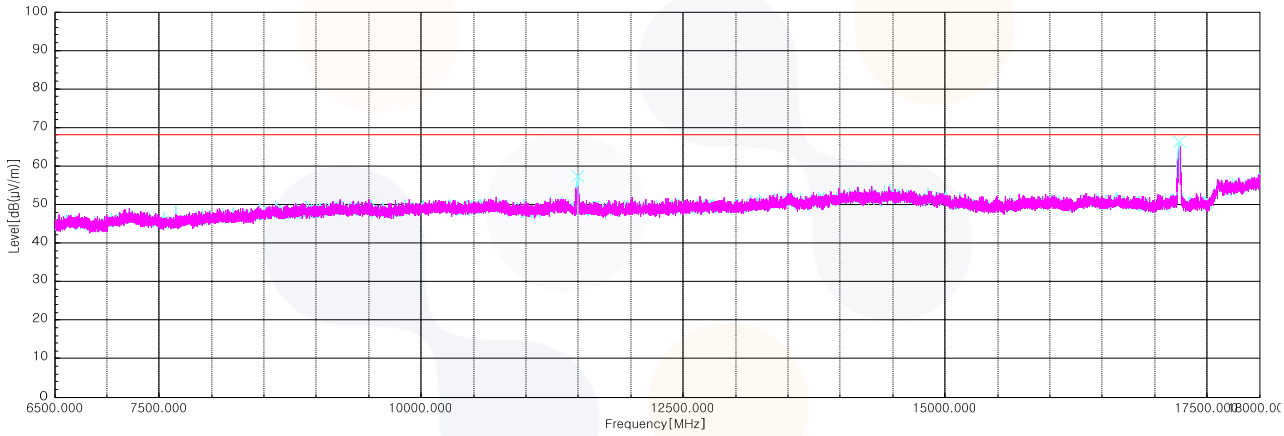
In order to simplify the report, attached plots were only the lowest margin condition

802.11n HT20_UNII 3_ Lowest Channel (5 745 ㎒)

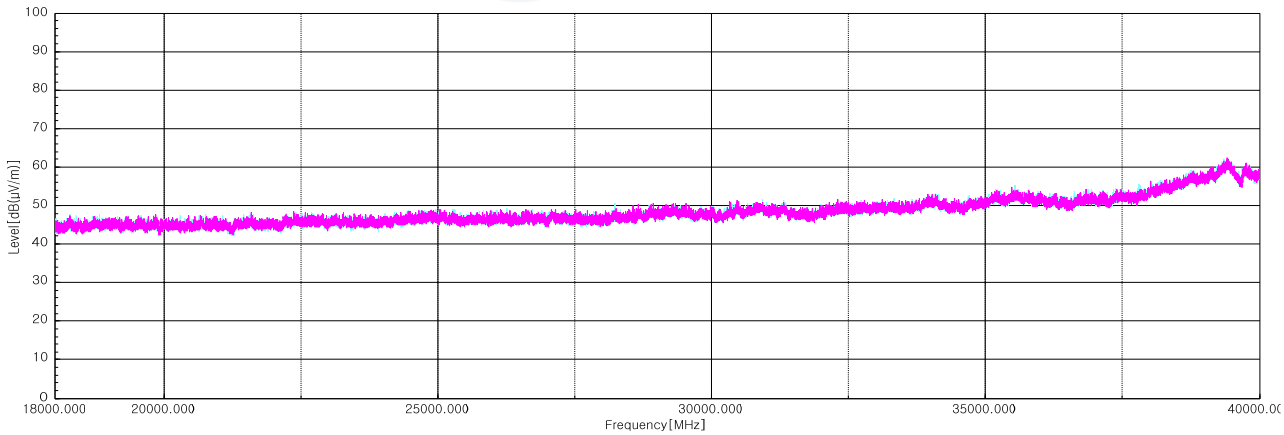
Horizontal/Vertical for 1 ㎓ ~ 6.5 ㎓



Horizontal/Vertical for 6.5 ㎓ ~ 18 ㎓

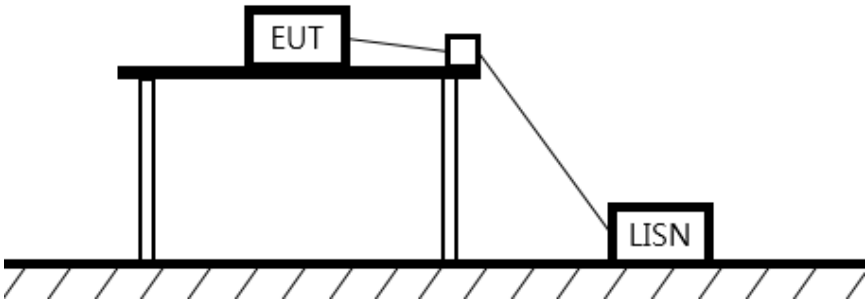


Horizontal/Vertical for 18 ㎓ ~ 40 ㎓



7.7. AC Conducted emission

Test setup



Limit

§15.407

According to 15.207(a) and RSS-Gen (8.8),

for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50uH/50 ohm line). Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequencies ranges.

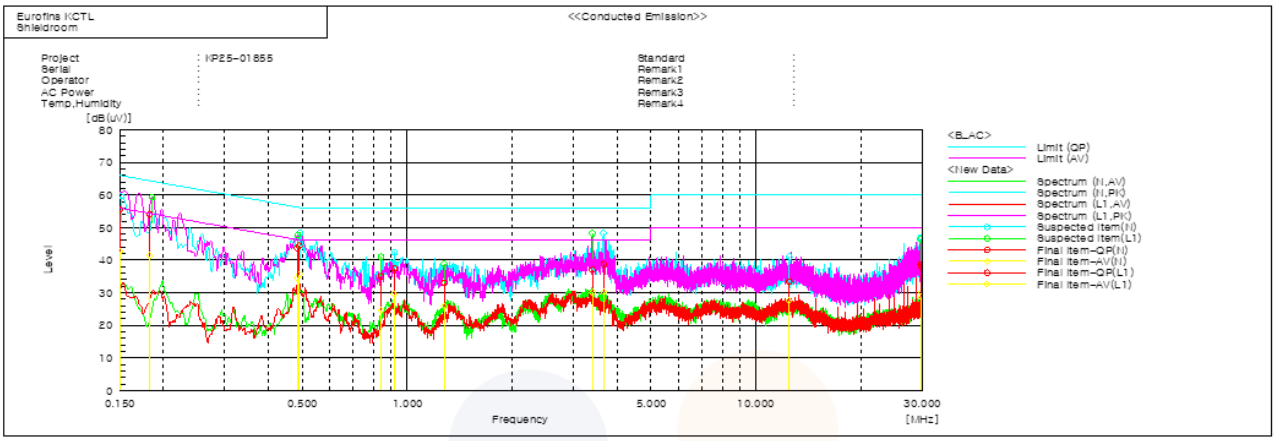
Frequency of Emission (㎒)	Conducted limit (dBμV/m)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

Measurement procedure

1. The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 ㎝ in which is located 40 ㎝ away from the vertical wall and 1.5m away from the side wall of the shielded room.
2. Each current-carrying conductor of the EUT power cord was individually connected through a 50Ω/50μH LISN, which is an input transducer to a spectrum analyzer or an EMI/Field Intensity Meter, to the input power source.
3. Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.
4. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 ㎒ to 30 ㎒.
5. The measurements were made with the detector set to peak amplitude within a bandwidth of 10 ㎑ or to quasi-peak and average within a bandwidth of 9 ㎑. The EUT was in transmitting mode during the measurements.

Test results

Worst case: 802.11ac VHT20/ UNII 1_5 180 ㎒



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.15006	45.8	32.8	9.8	55.6	42.6	66.0	56.0	10.4	13.4
2	0.49005	34.4	25.6	10.0	44.4	35.6	56.2	46.2	11.8	10.6
3	0.91914	27.5	19.8	9.9	37.4	29.7	56.0	46.0	18.6	16.3
4	3.65487	29.1	20.5	9.7	38.8	30.2	56.0	46.0	17.2	15.8
5	12.45705	23.3	17.5	10.1	33.4	27.6	60.0	50.0	26.6	22.4
6	29.64488	28.4	19.9	10.3	38.7	30.2	60.0	50.0	21.3	19.8

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.1828	44.1	31.3	10.1	54.2	41.4	64.4	54.4	10.2	13.0
2	0.48348	33.7	24.7	10.0	43.7	34.7	56.3	46.3	12.6	11.6
3	0.84123	25.1	14.6	10.0	35.1	24.6	56.0	46.0	20.9	21.4
4	1.27828	23.1	15.9	9.9	33.0	25.8	56.0	46.0	23.0	20.2
5	3.39353	27.3	20.4	9.8	37.1	30.2	56.0	46.0	18.9	15.8
6	29.65802	27.8	18.5	10.3	38.1	28.8	60.0	50.0	21.9	21.2

8. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Spectrum Analyzer	R&S	FSV3044	101421	25.07.26
Attenuator	Weinschel ENGINEERING	56-10	51395	26.01.21
DC Power Supply	AGILENT	E3632A	MY51220373	25.07.01
Temp & Humid Chamber	Myeongseong R&P	CTHC-50P-DT	20150824-3	26.01.16
Vector Signal Generator	R&S	SMBV100A	257566	25.07.01
Signal Generator	R&S	SMB100A	176206	26.01.17
Amplifier	SONOMA INSTRUMENT	310N	421910	25.10.11
Bilog Antenna	Teseq GmbH	CBL 6112D	61521	26.12.11
Loop Antenna	R&S	HFH2-Z2	100355	26.06.25
DC Power Supply	POWERCOM	DCP-50100A	20220610-01	26.01.16
Spectrum Analyzer	R&S	FSVA40	101575	26.04.23
Broadband PreAmplifier	SCHWARZBECK	BBV9718D	57	26.01.16
Low Noise Amplifier	TESTEK	TK-PA18H	220124-L	25.10.11
Low Noise Amplifier	TESTEK	TK-PA1840H	220133-L	25.10.14
Horn Antenna	SCHWARZBECK	BBHA9120D	2763	25.10.24
Horn Antenna	SCHWARZBECK	BBHA9170	1267	25.10.15
High Pass Filter	QOTANA TECHNOLOGIES	DBHF0508004000A	23041800061	25.06.24
High Pass Filter	Wainwright Instruments GmbH	WHKX8-5655-6500-18000-40SS	SN8	25.10.15
Controller	INNCO SYSTEMS	CO3000	1441/54370322/P	-
Antenna Mast	INNCO SYSTEMS	MA4640-XP-ET	AM003	-
Turn Device	INNCO SYSTEMS	DS1200-S-1t	3	-
TWO-LINE V - NETWORK	R&S	ENV216	101584	26.03.25
EMI TEST RECEIVER	R&S	ESCI3	101428	25.08.12

End of test report