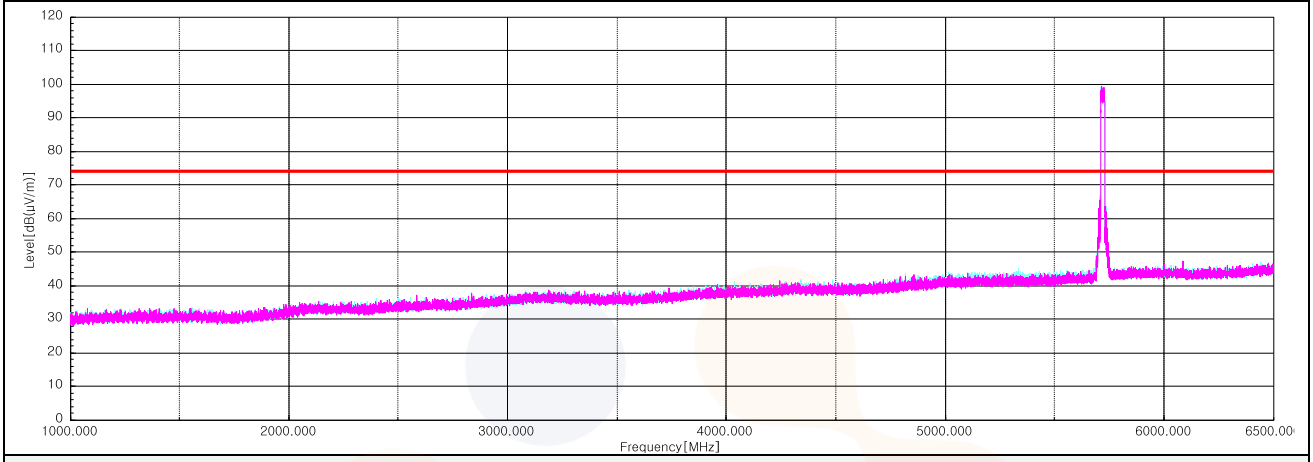
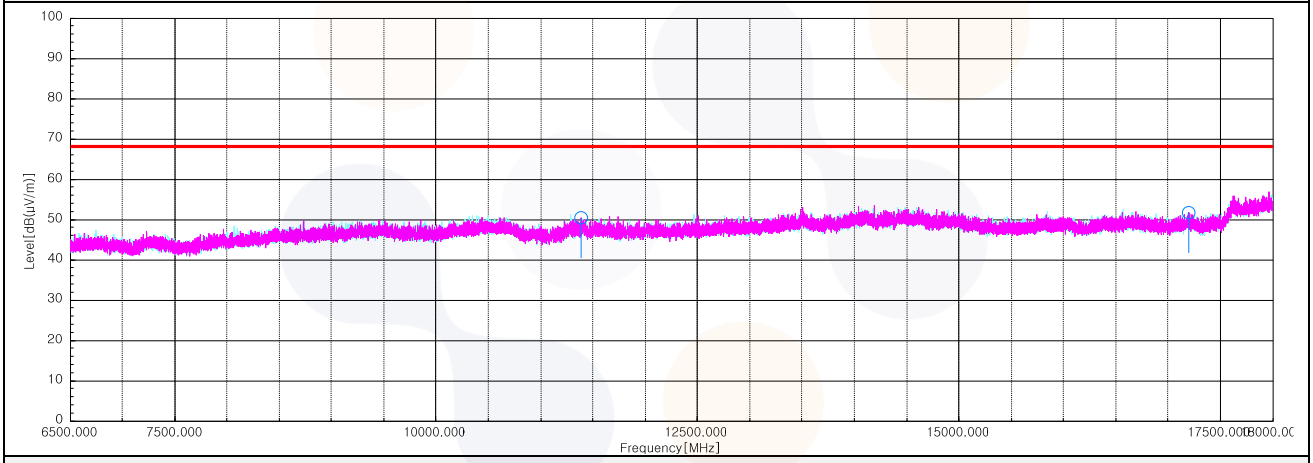
Plot of Harmonics and Spurious Emissions
In order to simplify the report, attached plots were only the lowest margin condition

802.11n HT20_Straddle Channel (5 720 ㎒)

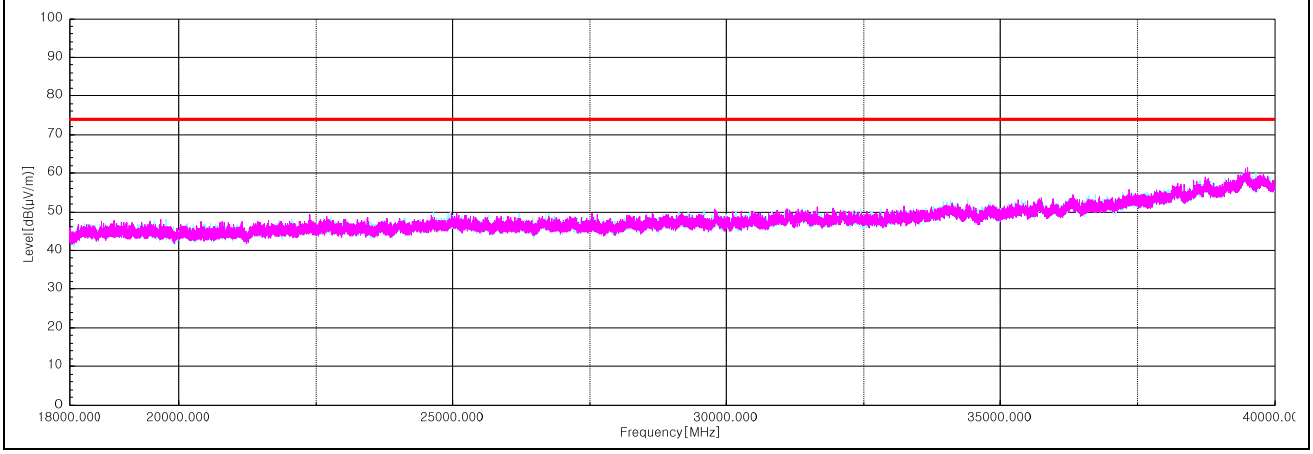
Horizontal/Vertical for 1 ㎓ ~ 6.5 ㎓



Horizontal/Vertical for 6.5 ㎓ ~ 18 ㎓



Horizontal/Vertical for 18 ㎓ ~ 40 ㎓



802.11a_UNII-3

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								
5 723.89	V	39.70	33.74	-26.65	-	46.79	119.70	72.91
11 495.98[1)]	H	53.90	39.01	-42.75	-	50.16	74.00	23.84
17 237.17	H	54.10	38.45	-41.22	-	51.33	68.20	16.87
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

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								
11 578.40[1)]	V	54.00	38.84	-42.52	-	50.32	74.00	23.68
17 359.45	H	53.70	38.74	-41.48	-	50.96	68.20	17.24
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

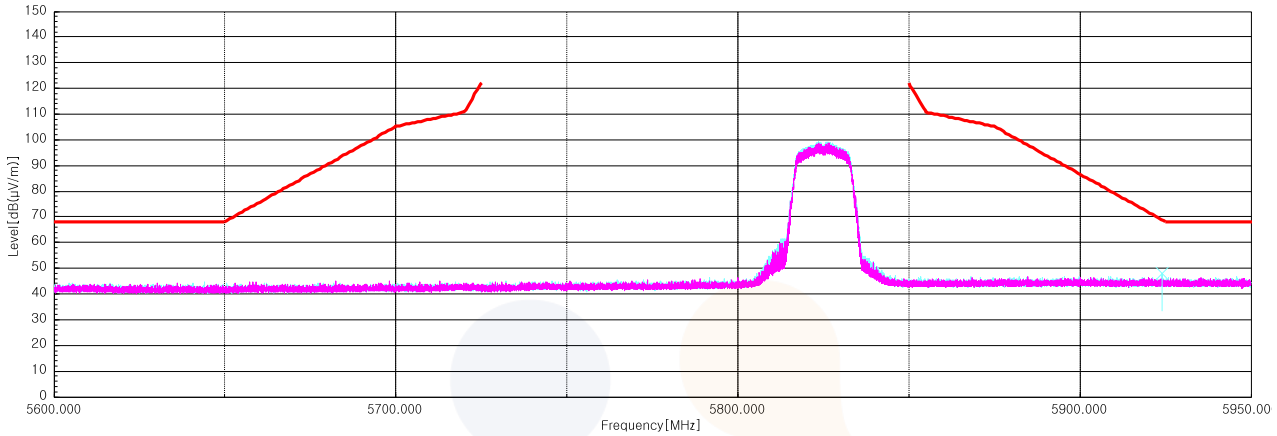
Highest Channel (5 825 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 923.97	V	39.80	34.35	-25.97	-	48.18	69.00	20.82
11 652.00[1)]	V	53.40	38.80	-42.31	-	49.89	74.00	24.11
17 473.30	V	54.30	39.29	-41.83	-	51.76	68.20	16.44
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

802.11a_UNII-3

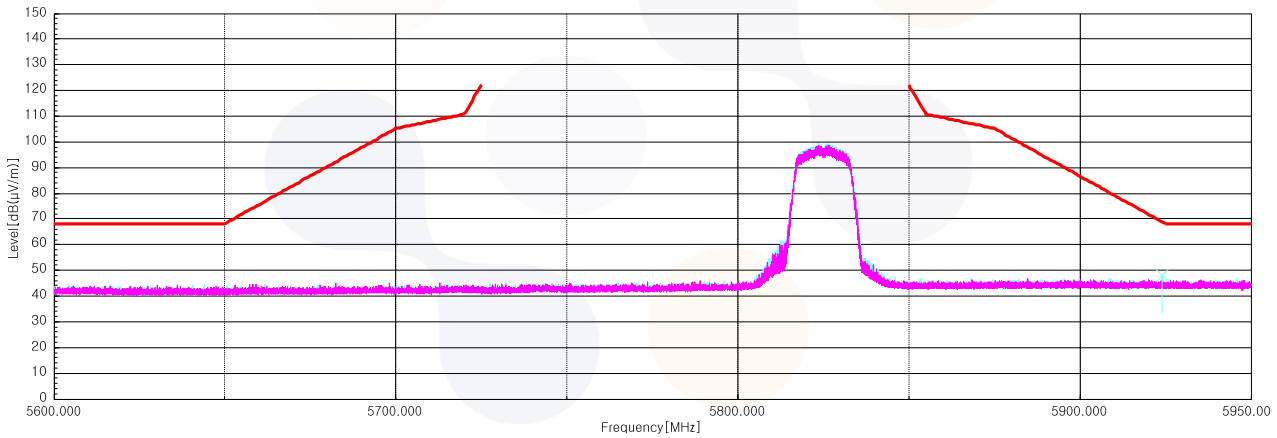
Lowest Channel (5 745 ㎒)

Horizontal/Vertical for Band-edge



Highest Channel (5 825 ㎒)

Horizontal/Vertical for Band-edge



802.11n HT20_UNII-3

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								
5 724.97	V	40.90	33.75	-26.65	-	48.00	122.10	74.10
11 493.68[1)]	V	53.20	39.01	-42.76	-	49.45	74.00	24.55
17 234.10	V	54.20	38.44	-41.23	-	51.41	68.20	16.79
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

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								
11 565.37[1)]	H	52.70	38.87	-42.55	-	49.02	74.00	24.98
17 356.77	V	54.70	38.73	-41.47	-	51.96	68.20	16.24
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

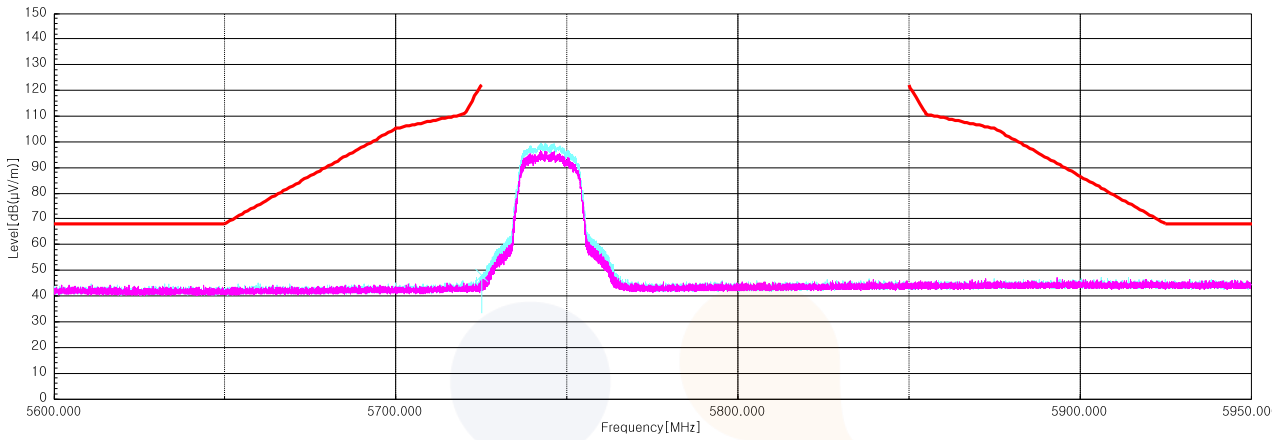
Highest Channel (5 825 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 904.08	V	38.90	34.31	-26.05	-	47.16	83.60	36.44
11 656.98[1)]	H	52.70	38.80	-42.29	-	49.21	74.00	24.79
17 471.38	V	52.10	39.29	-41.82	-	49.57	68.20	18.63
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

802.11n HT20_UNII-3

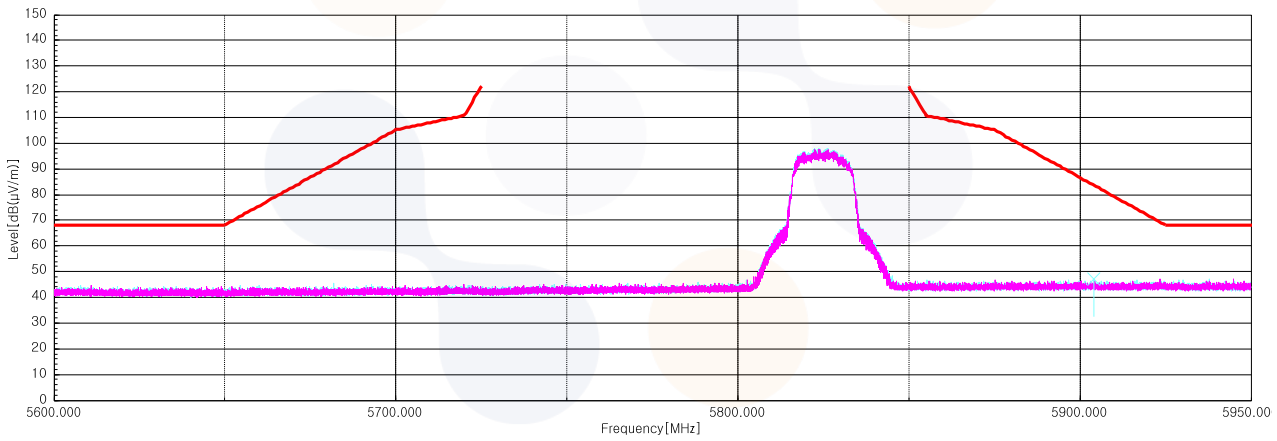
Lowest Channel (5 745 ㎒)

Horizontal/Vertical for Band-edge



Highest Channel (5 825 ㎒)

Horizontal/Vertical for Band-edge



802.11ac VHT20_UNII-3

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								
5 723.76	V	39.30	33.74	-26.65	-	46.39	119.40	73.01
11 498.67[1)]	H	54.30	39.00	-42.74	-	50.56	74.00	23.44
17 239.08	V	54.90	38.46	-41.21	-	52.15	68.20	16.05
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

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								
11 567.67[1)]	H	54.00	38.86	-42.55	-	50.31	74.00	23.69
17 358.68	H	52.60	38.73	-41.48	-	49.85	68.20	18.35
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

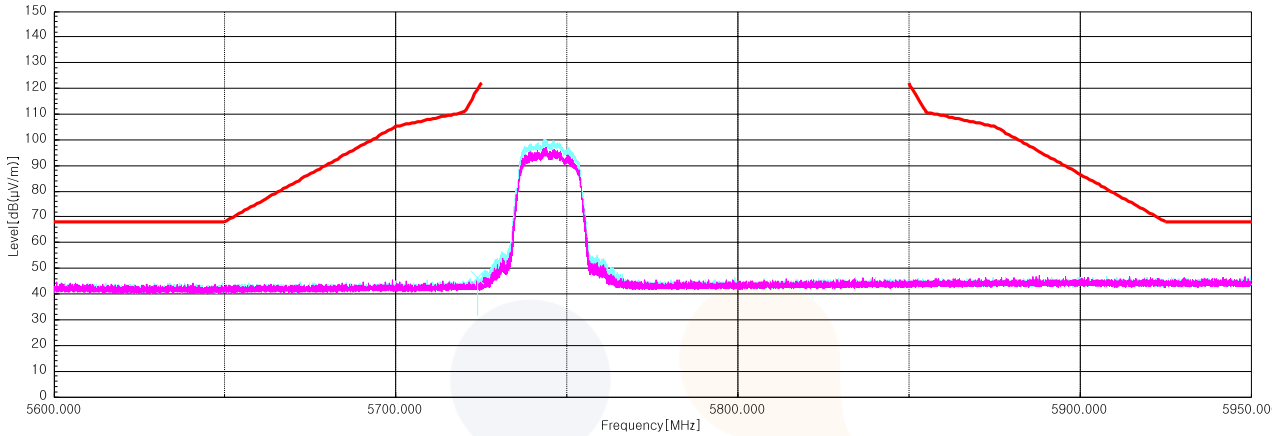
Highest Channel (5 825 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
5 857.10	V	39.10	34.23	-26.24	-	47.09	110.20	63.11
11 648.17[1)]	H	51.80	38.70	-42.32	-	48.18	74.00	25.82
17 472.92	V	51.40	39.29	-41.83	-	48.86	68.20	19.34
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

802.11ac VHT20_UNII-3

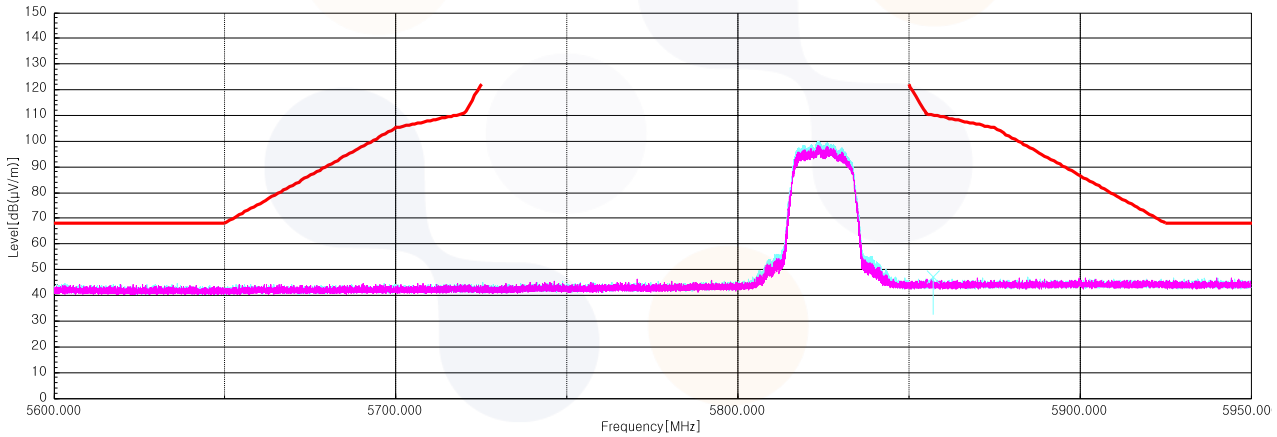
Lowest Channel (5 745 ㎒)

Horizontal/Vertical for Band-edge



Highest Channel (5 825 ㎒)

Horizontal/Vertical for Band-edge

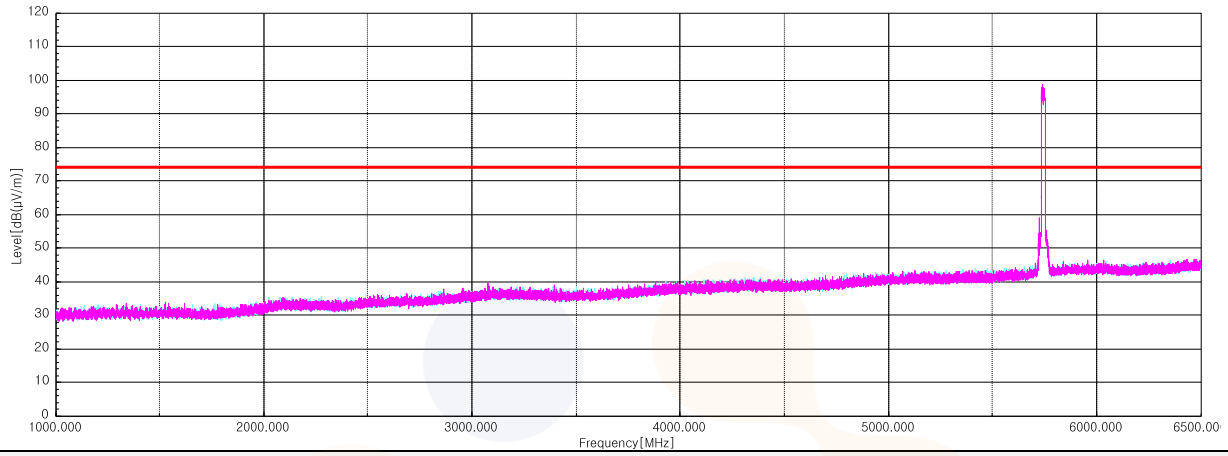


Plot of Harmonics and Spurious Emissions

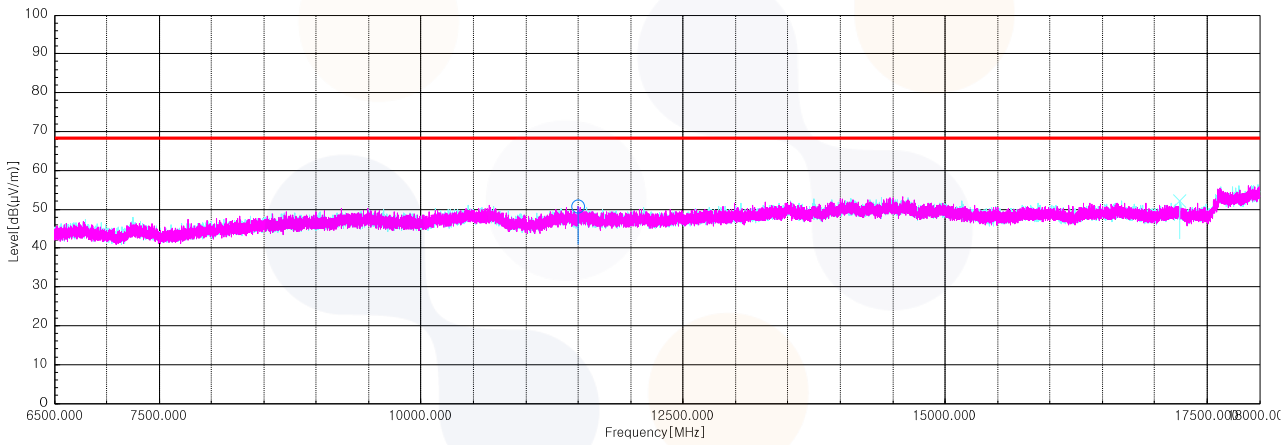
In order to simplify the report, attached plots were only the lowest margin condition

802.11ac VHT20_UNII-3_Lowest Channel (5 745 ㎒)

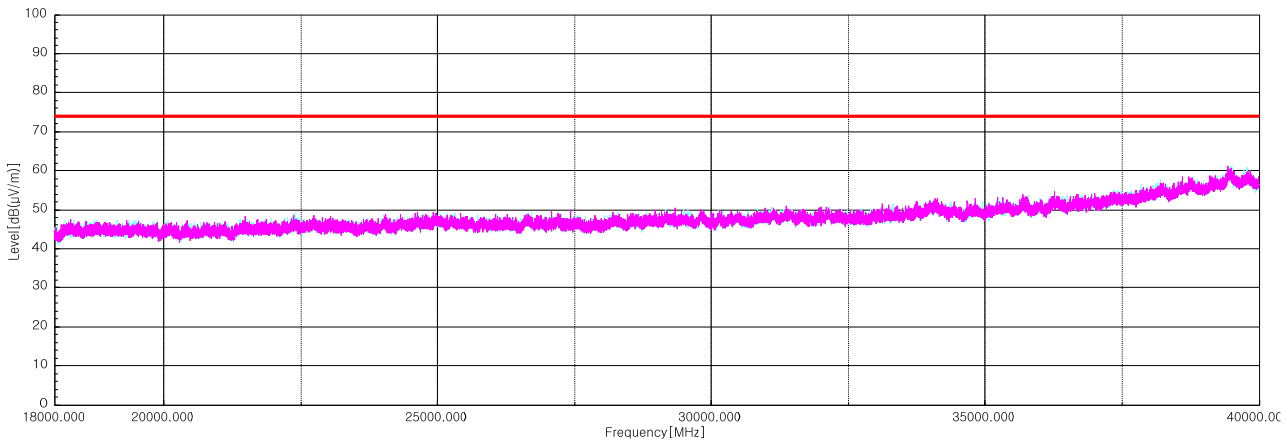
Horizontal/Vertical for 1 ㎓ ~ 6.5 ㎓



Horizontal/Vertical for 6.5 ㎓ ~ 18 ㎓

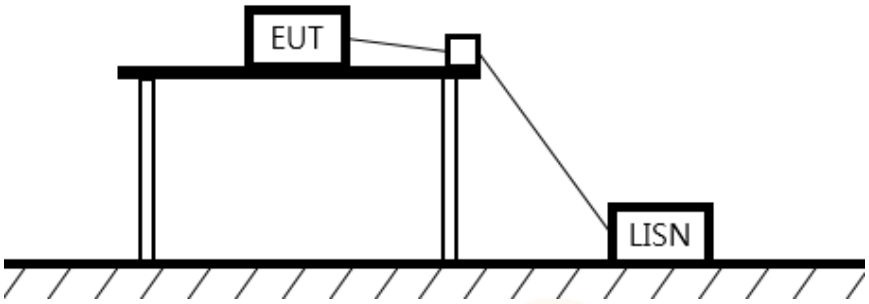


Horizontal/Vertical for 18 ㎓ ~ 40 ㎓



7.8. 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 impedance stabilization network (LISN). 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

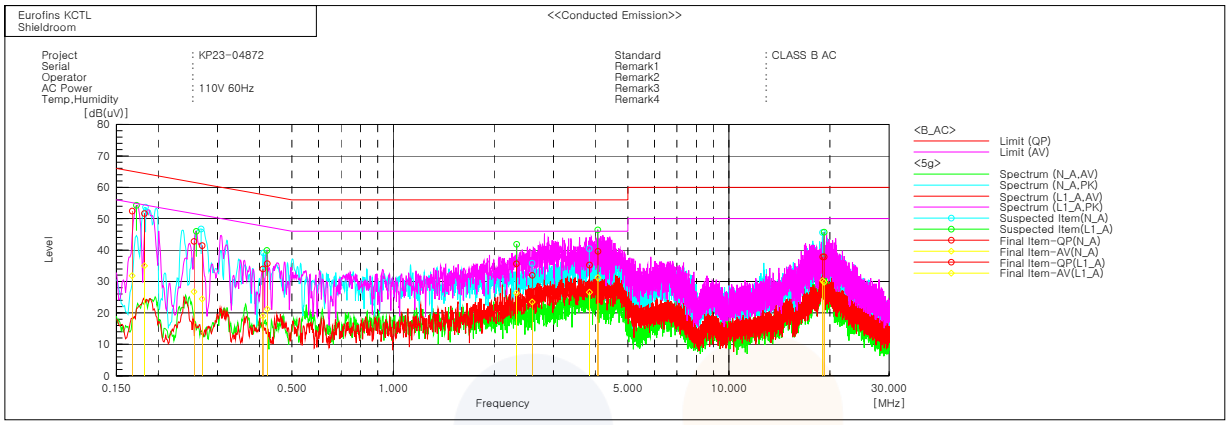
Measurement procedure

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

[DC 5 V]

Worst case: 802.11a / UNII-2C_5 700 ㎒



Final Result

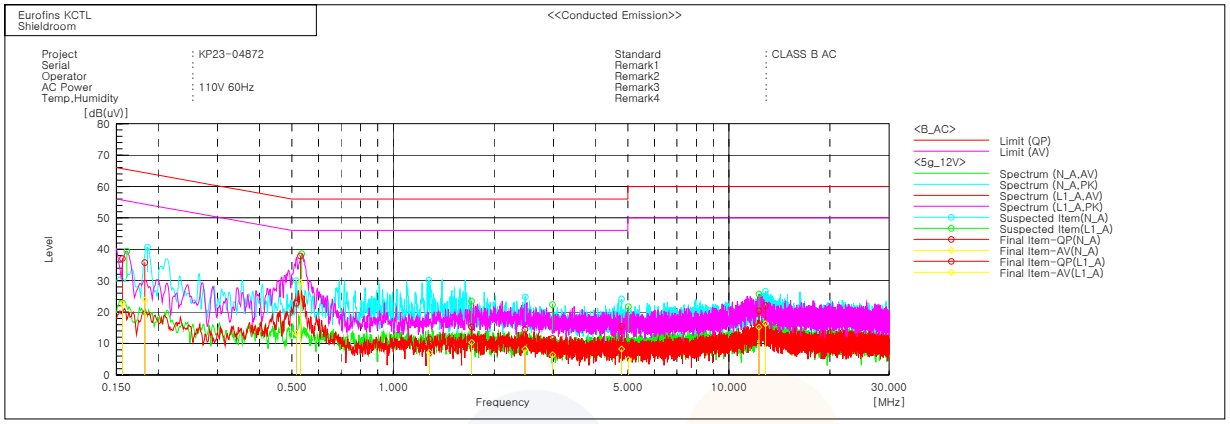
--- N_A Phase ---

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	0.18183	41.5	24.8	10.2	51.7	35.0	64.4	54.4	12.7	19.4
2	0.27022	31.7	14.7	9.7	41.4	24.4	61.1	51.1	19.7	26.7
3	0.40968	24.1	9.1	9.9	34.0	19.0	57.7	47.7	23.7	28.7
4	2.59745	22.2	13.7	9.8	32.0	23.5	56.0	46.0	24.0	22.5
5	3.84224	25.4	16.8	9.8	35.2	26.6	56.0	46.0	20.8	19.4
6	19.01284	26.8	19.1	11.1	37.9	30.2	60.0	50.0	22.1	19.8

--- L1_A 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	0.1672	42.2	21.7	10.2	52.4	31.9	65.1	55.1	12.7	23.2
2	0.25535	33.1	17.1	9.7	42.8	26.8	61.6	51.6	18.8	24.8
3	0.42166	25.8	11.3	9.9	35.7	21.2	57.4	47.4	21.7	26.2
4	2.33033	25.8	16.5	9.8	35.6	26.3	56.0	46.0	20.4	19.7
5	4.07336	29.8	21.5	9.8	39.6	31.3	56.0	46.0	16.4	14.7
6	19.21874	26.9	18.9	10.9	37.8	29.8	60.0	50.0	22.2	20.2

[DC 12 V]
Worst case: 802.11a / UNII-2C_5 700 ㎒



Final Result

--- N_A 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	0.18225	25.6	13.6	10.2	35.8	23.8	64.4	54.4	28.6	30.6
2	0.51457	12.9	3.3	9.9	22.8	13.2	56.0	46.0	33.2	32.8
3	1.28202	1.6	-2.7	9.8	11.4	7.1	56.0	46.0	44.6	38.9
4	2.47163	4.7	-1.6	9.8	14.5	8.2	56.0	46.0	41.5	37.8
5	4.79037	5.6	-1.6	9.9	15.5	8.3	56.0	46.0	40.5	37.7
6	12.85242	11.4	5.7	10.6	22.0	16.3	60.0	50.0	38.0	33.7

--- L1_A 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	0.15629	27.2	12.8	9.9	37.1	22.7	65.7	55.7	28.6	33.0
2	0.52951	28.0	19.5	9.9	37.9	29.4	56.0	46.0	18.1	16.6
3	1.71311	5.5	0.6	9.8	15.3	10.4	56.0	46.0	40.7	35.6
4	2.98542	1.8	-3.4	9.8	11.6	6.4	56.0	46.0	44.4	39.6
5	5.01935	-0.4	-5.0	9.9	9.5	4.9	60.0	50.0	50.5	45.1
6	12.28888	9.8	4.6	10.6	20.4	15.2	60.0	50.0	39.6	34.8

8. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Controller	INNCO SYSTEMS	CO3000	1441/54370322/P	-
Antenna Mast	INNCO SYSTEMS	MA4640-XP-ET	-	-
Turn Device	INNCO SYSTEMS	DS1200-S-1t	-	-
Spectrum Analyzer	R&S	FSVA40	101575	24.06.19
PSA Spectrum Analyzer	Agilent	E4440A	MY46186407	24.03.22
Amplifier	SONOMA INSTRUMENT	310N	421821	24.10.12
Bilog Antenna	Teseq GmbH	CBL 6112D	63756	24.11.17
Loop Antenna	R&S	HFH2-Z2	100355	24.08.10
Signal & Spectrum Analyzer	R&S	FSV3030	1330.5000K30-101710-Wt	24.07.03
Spectrum Analyzer	R&S	FSV40	100989	24.10.12
Power Sensor	R&S	NRP-Z81	1137.9009.02-106223-bB	24.04.25
Signal Generator	R&S	SMB100A	176206	25.01.18
Vector Signal Generator	R&S	SMBV100A	257566	24.07.04
Broadband PreAmplifier	SCHWARZBECK	BBV9718D	57	24.03.17
Low Noise Amplifier	TESTEK	TK-PA18H	220124-L	24.10.12
Low Noise Amplifier	TESTEK	TK-PA1840H	220133-L	24.10.17
Horn Antenna	SCHWARZBECK	BBHA9120D	2763	24.10.18
Horn Antenna	SCHWARZBECK	BBHA9170	1267	24.10.16
High Pass Filter	Wainwright Instruments GmbH	WHKX8-5655-6500-18000-40SS	SN8	24.10.16
TWO-LINE V - NETWORK	R&S	ENV216	101358	24.09.27
EMI TEST RECEIVER	R&S	ESCI3	101428	24.08.18
Attenuator	HP	8491A	18591	25.01.18

End of test report