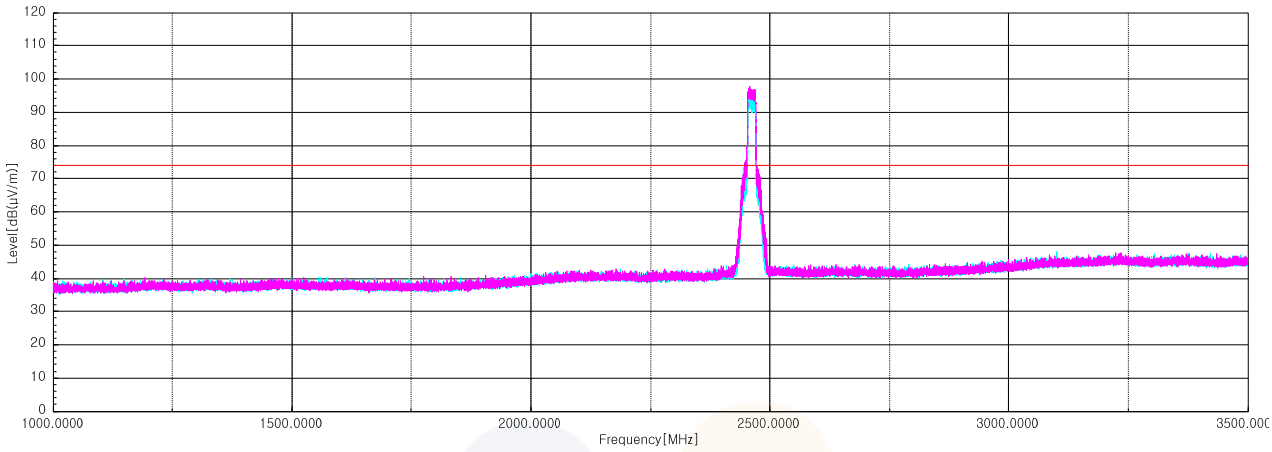
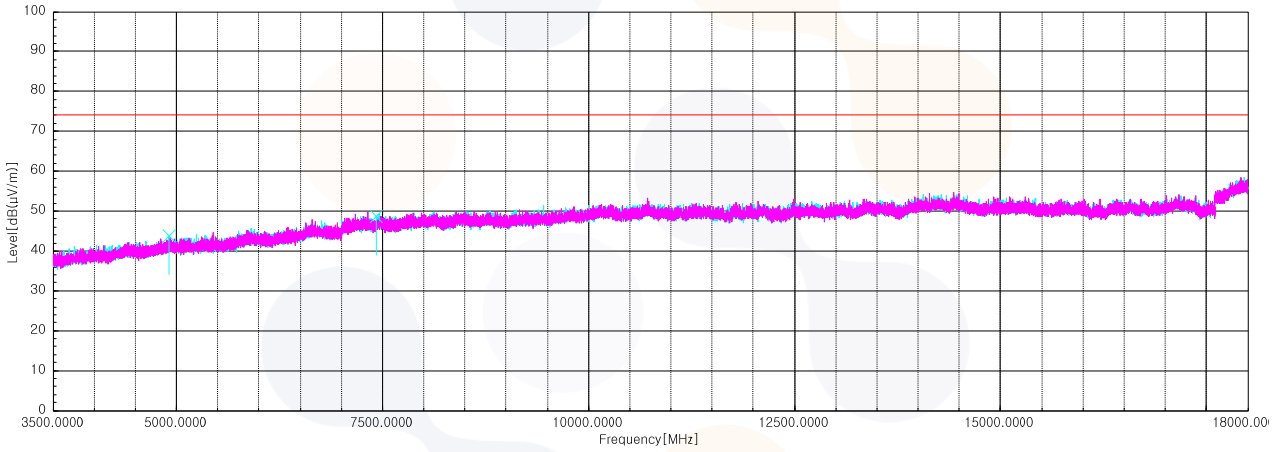
Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



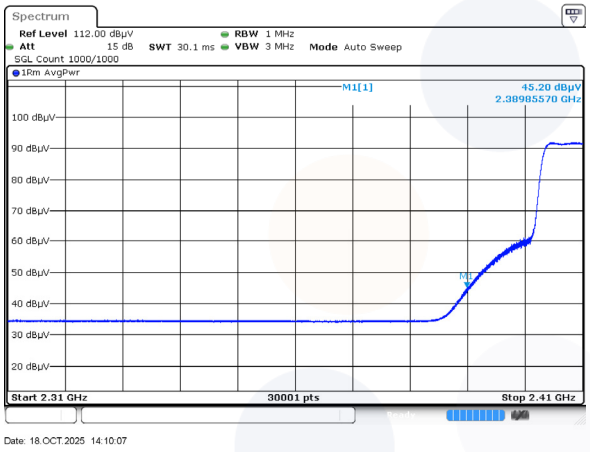
Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



802.11n HT20_2 412 ㎒

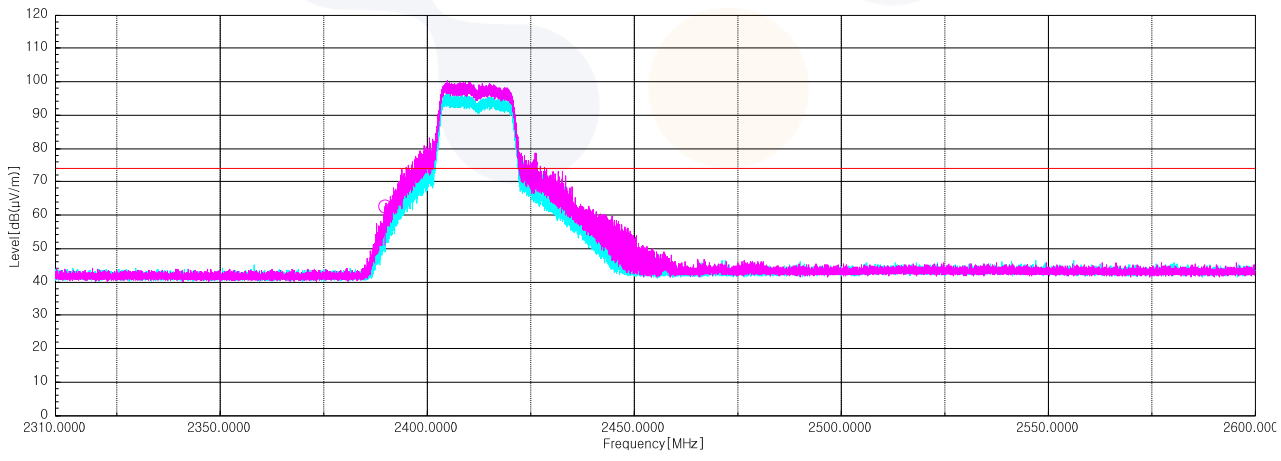
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.86[1)]	H	64.90	27.20	-29.55	-	62.55	74.00	11.45
4 782.77[1)]	H	53.10	32.07	-42.73	-	42.44	74.00	31.56
7 180.10	H	52.30	36.78	-40.25	-	48.83	74.00	25.17
Average Data								
2 389.86[1)]	H	45.20	27.20	-29.55	0.20	43.05	54.00	10.95

Average data

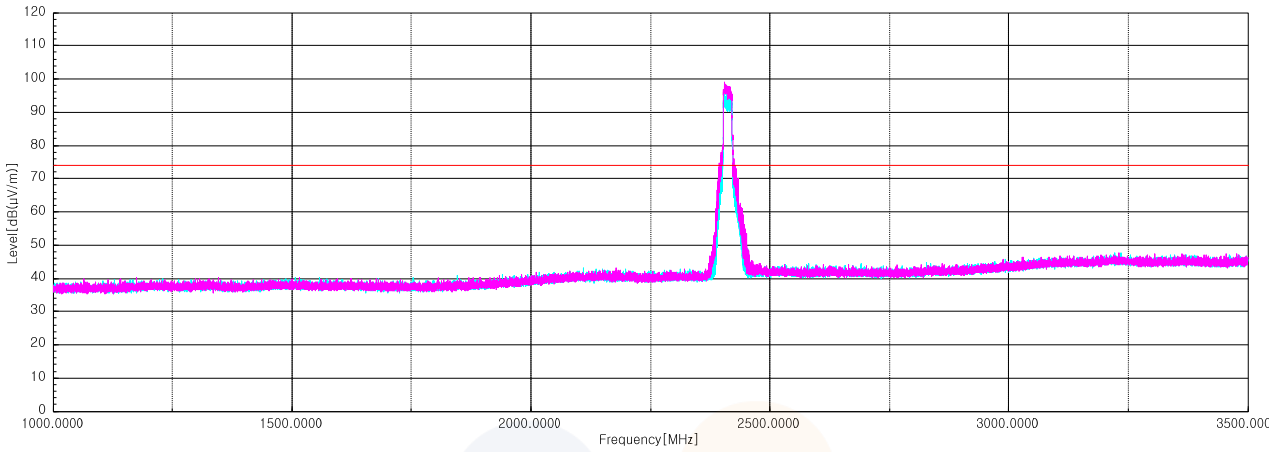


Blank

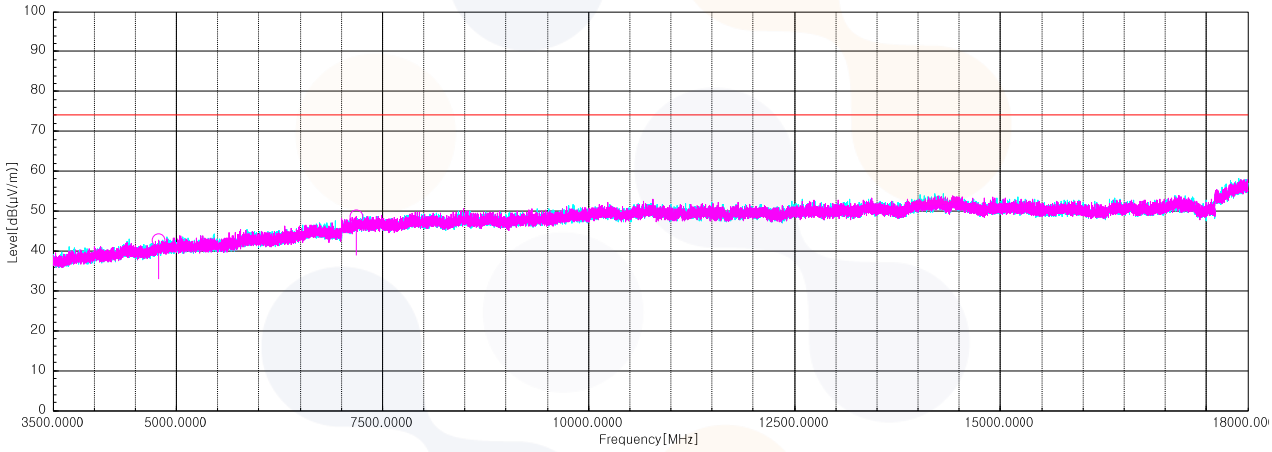
Horizontal/Vertical for Band-edge



Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



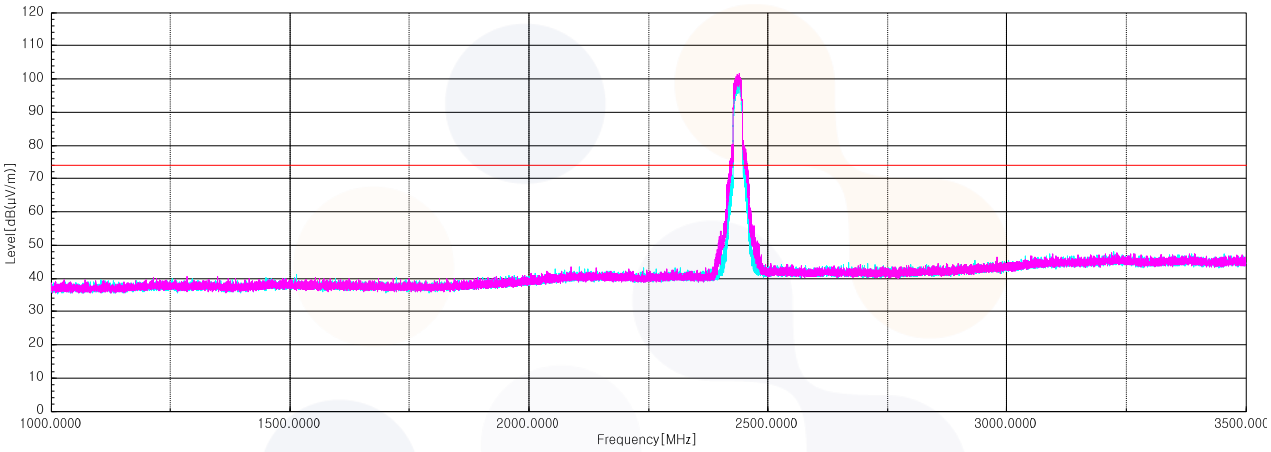
Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



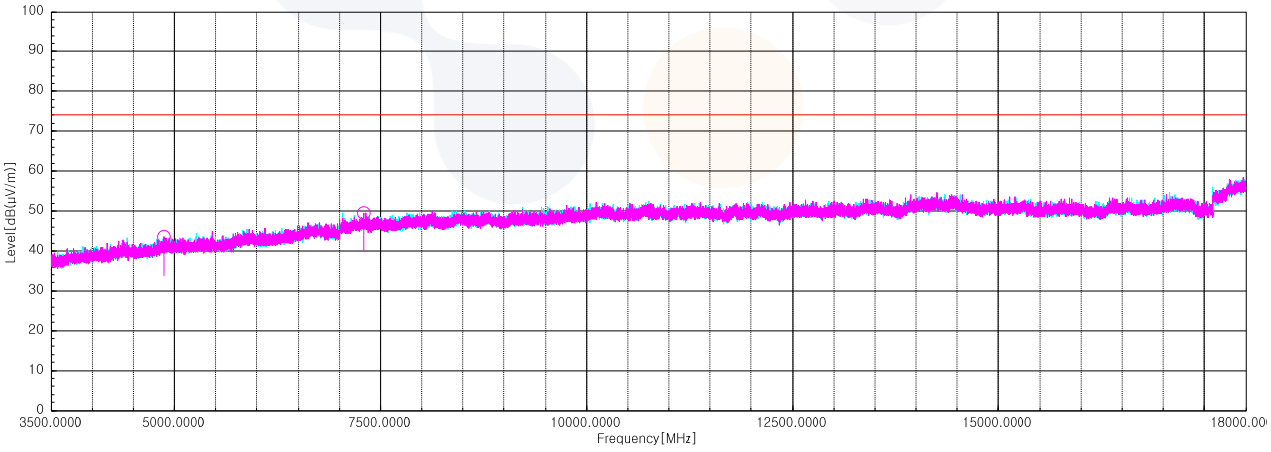
802.11n HT20_2 437 ㎒

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 867.83[1)]	H	53.30	32.71	-42.61	-	43.40	74.00	30.60
7 291.27[1)]	H	53.00	36.98	-40.35	-	49.63	74.00	24.37
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



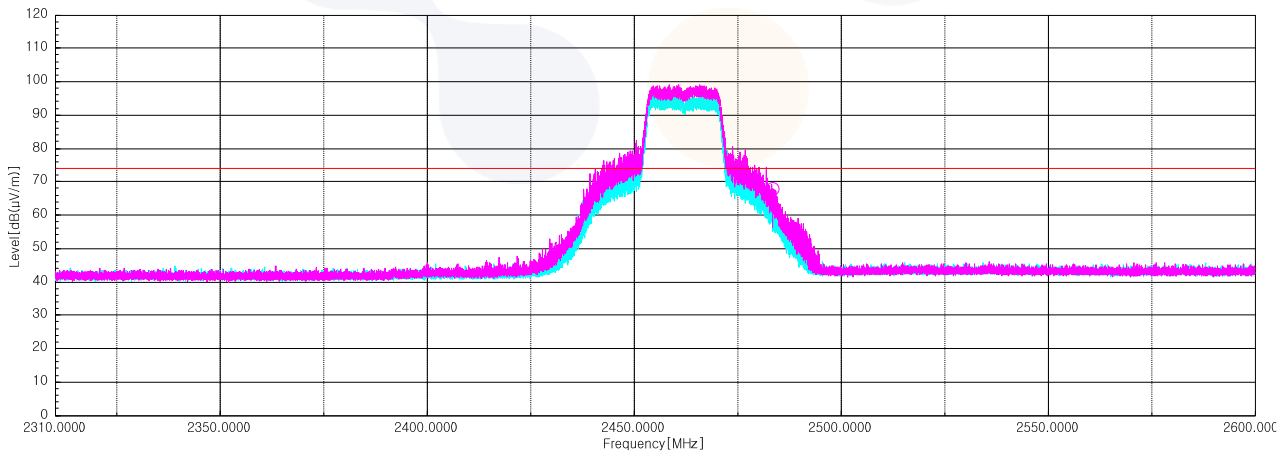
802.11n HT20_2 462 ㎒

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 483.70[1)]	H	69.40	27.84	-29.43	-	67.81	74.00	6.19
4 945.17[1)]	H	53.50	32.98	-42.50	-	43.98	74.00	30.02
7 431.92[1)]	H	53.40	36.44	-40.32	-	49.52	74.00	24.48
Average Data								
2 483.70[1)]	H	50.13	27.84	-29.43	0.20	48.74	54.00	5.26

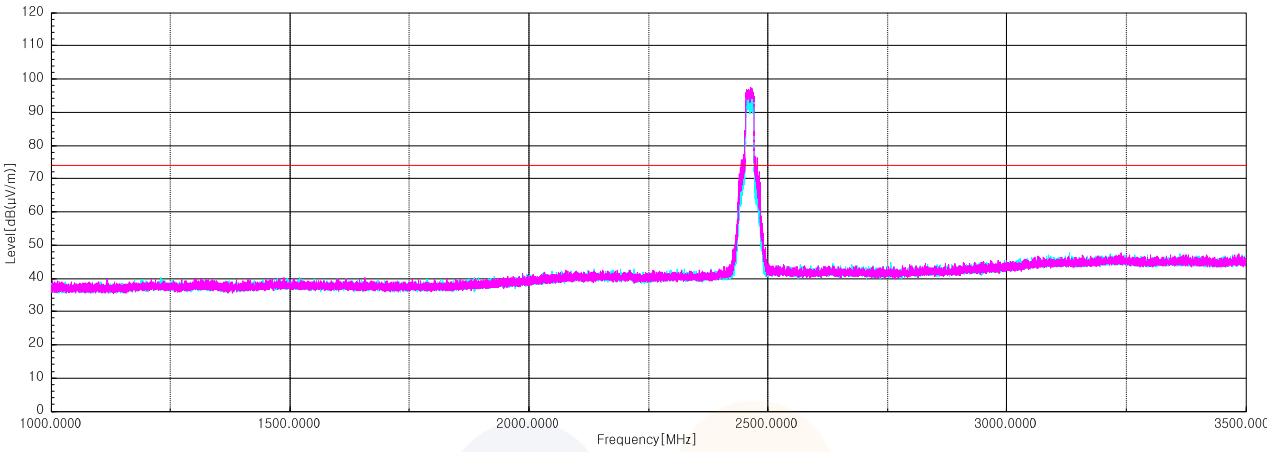
Average data

Blank

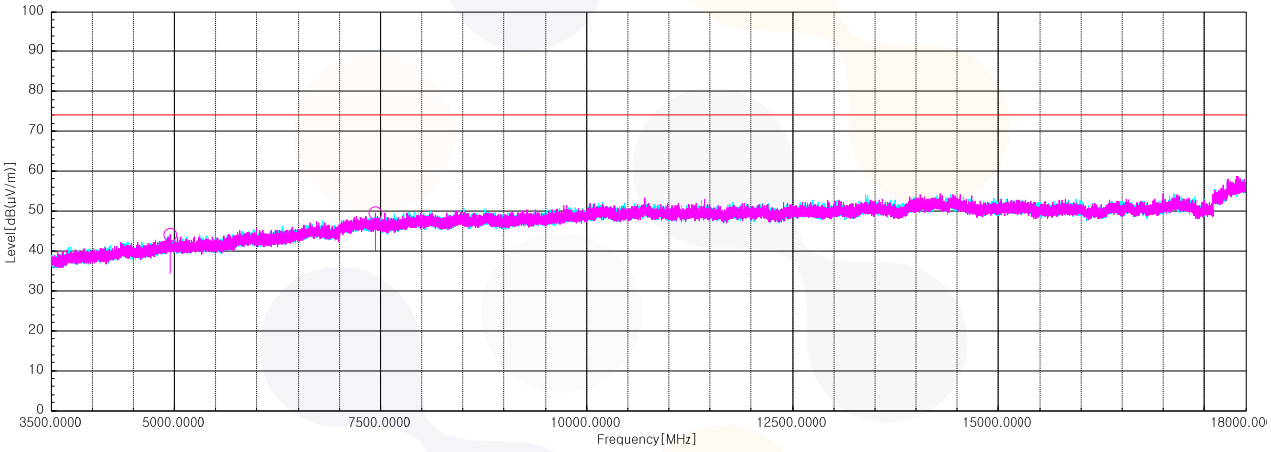
Horizontal/Vertical for Band-edge



Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



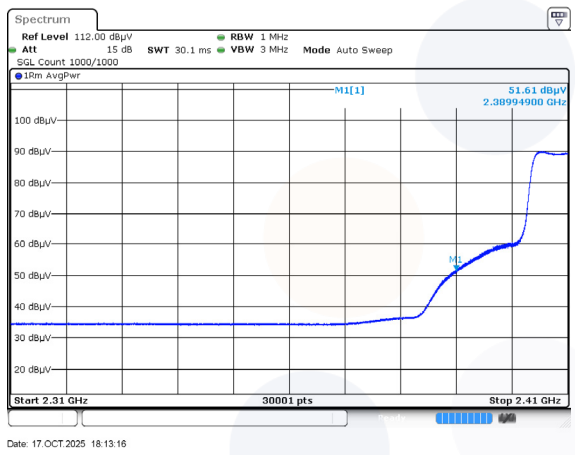
Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



802.11n HT40_2 422 ㎒

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.95[1)]	H	68.80	27.20	-29.55	-	66.45	74.00	7.55
4 862.03[1)]	V	53.30	32.67	-42.62	-	43.35	74.00	30.65
7 269.03[1)]	V	52.70	36.94	-40.36	-	49.28	74.00	24.72
Average Data								
2 389.95[1)]	H	51.61	27.20	-29.55	0.39	49.65	54.00	4.35

Average data



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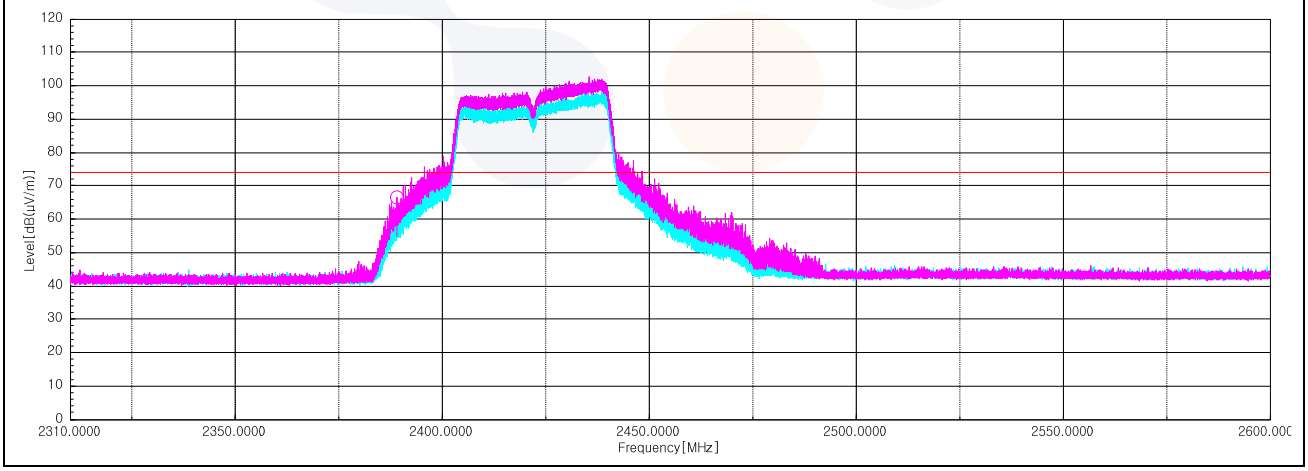
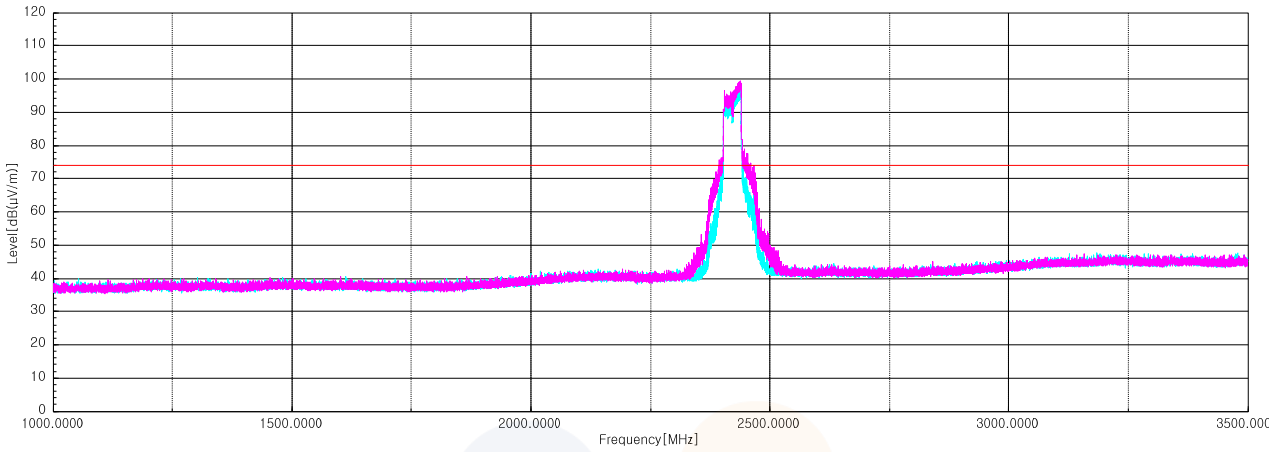
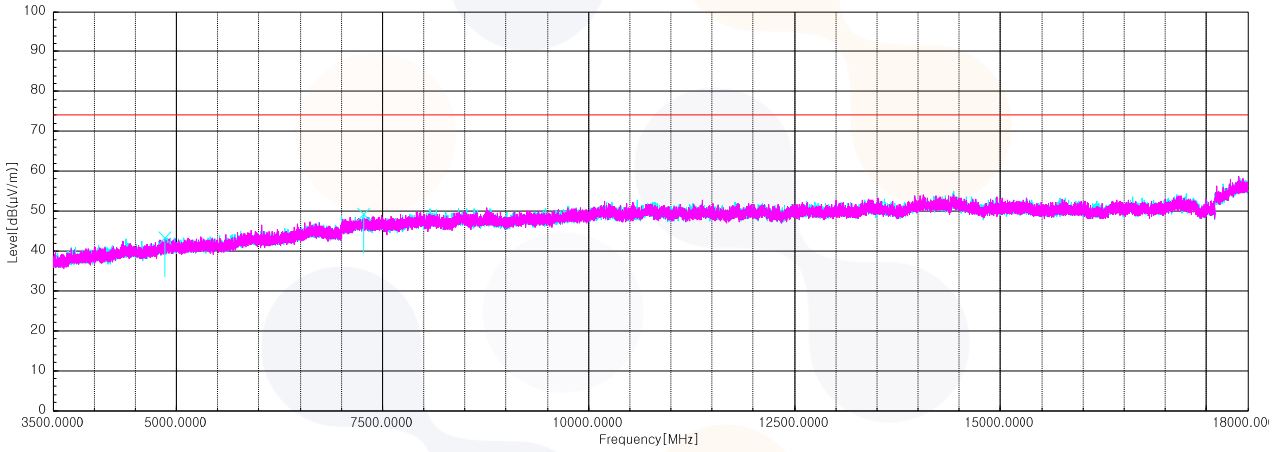
Horizontal/Vertical for Band-edge



Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



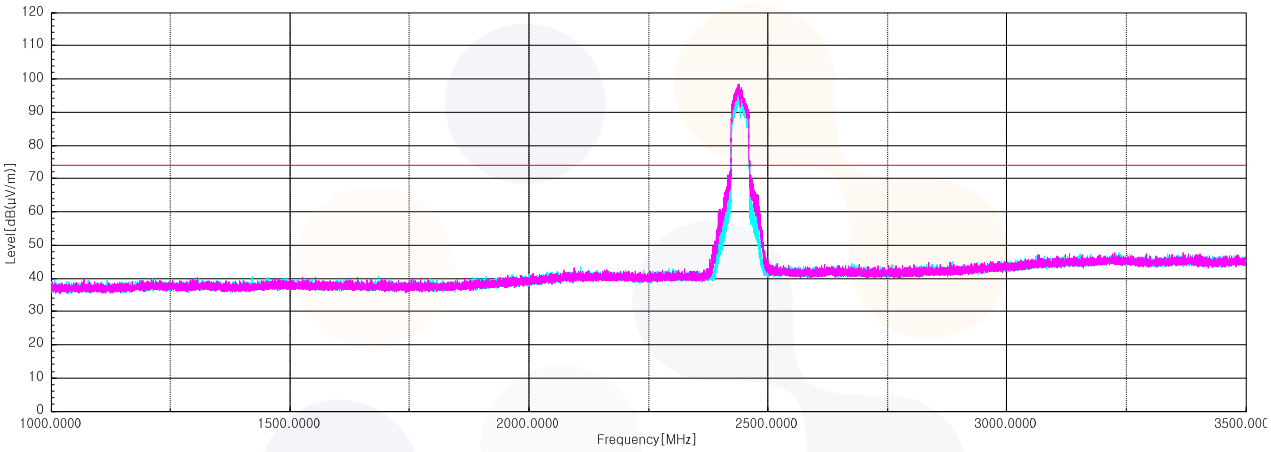
Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



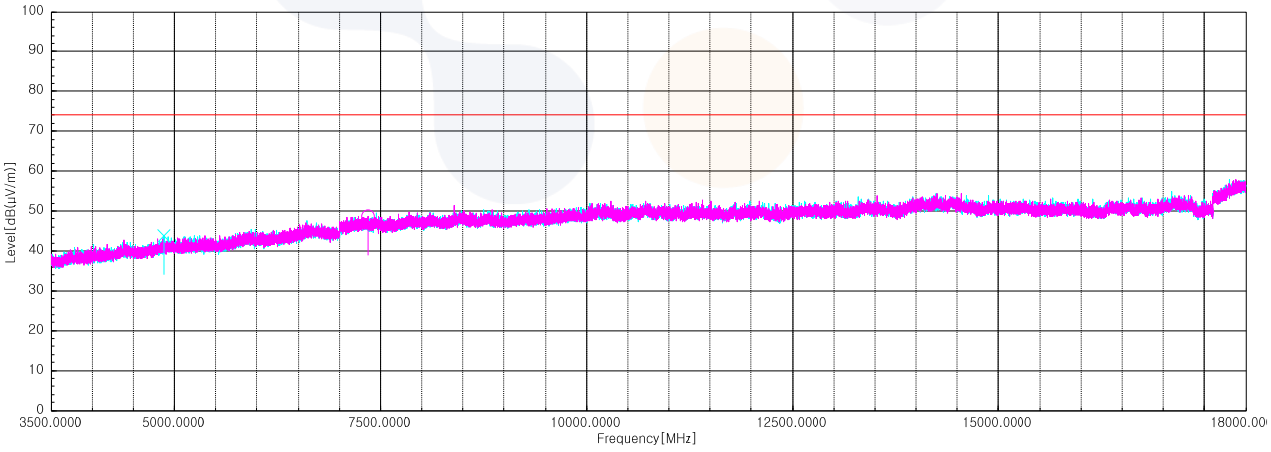
802.11n HT40_2 437 ㎒

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 868.32[1)]	V	53.60	32.71	-42.61	-	43.70	74.00	30.30
7 348.30[1)]	H	52.30	36.51	-40.34	-	48.47	74.00	25.53
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



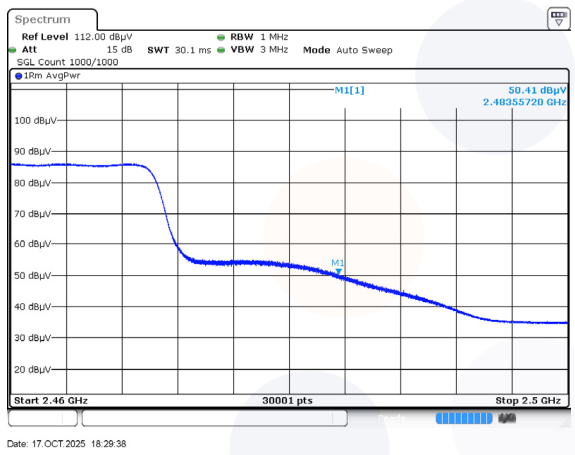
Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



802.11n HT40_2 452 ㎒

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 483.56[1)]	H	68.00	27.84	-29.43	-	66.41	74.00	7.59
4 863.48[1)]	H	53.30	32.68	-42.62	-	43.36	74.00	30.64
7 321.23[1)]	H	52.80	36.62	-40.35	-	49.07	74.00	24.93
Average Data								
2 483.56[1)]	H	50.41	27.84	-29.43	0.39	49.21	54.00	4.79

Average data



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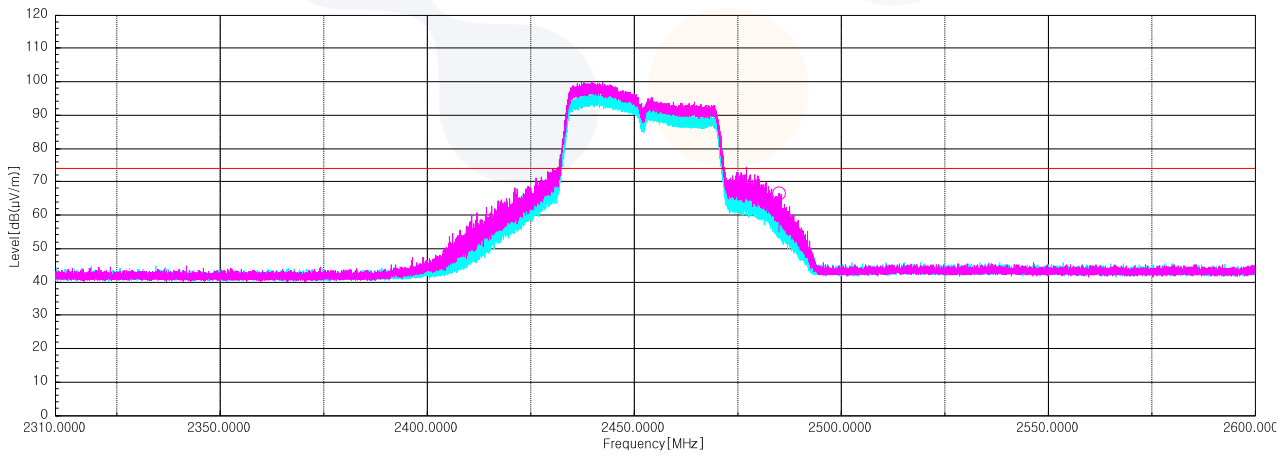
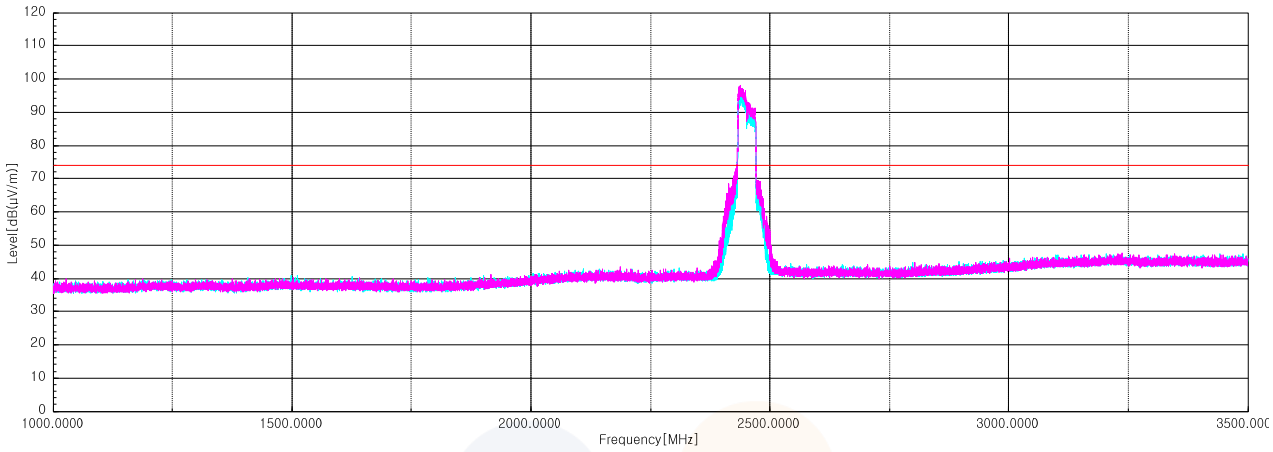
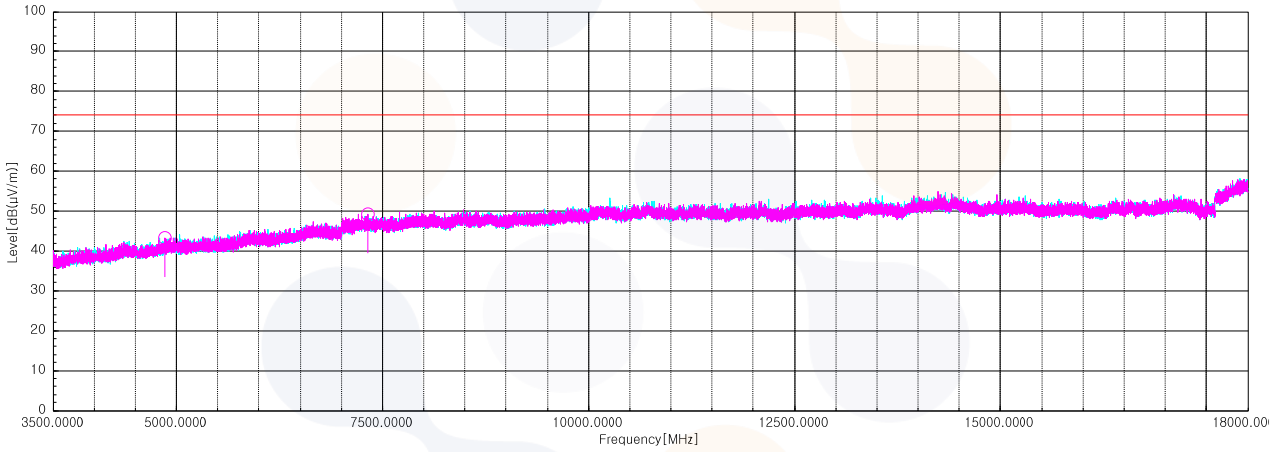
Horizontal/Vertical for Band-edge



Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓

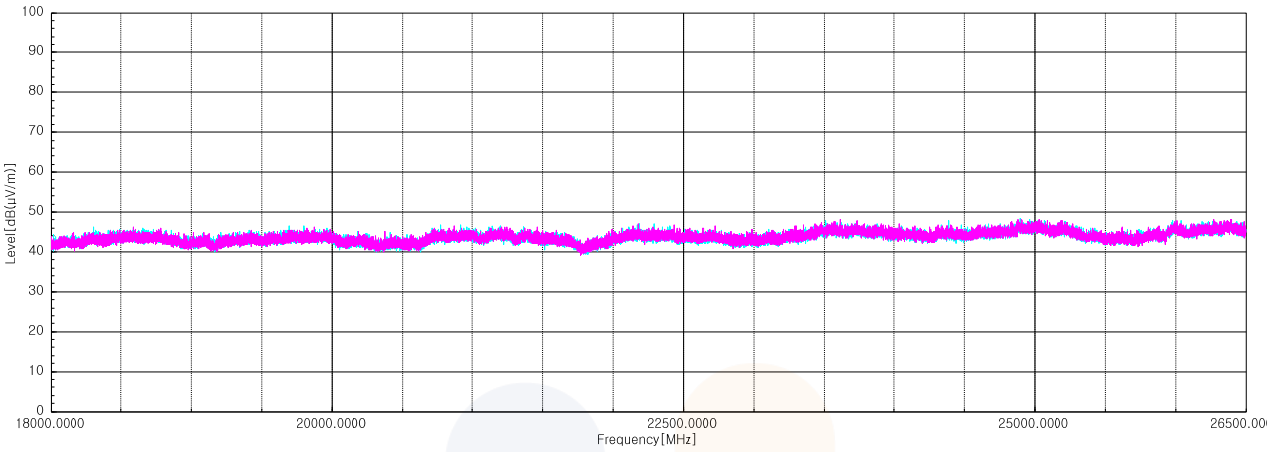


Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



Test results (Above 18 ㎓) – Worst case: 802.11n HT40 / 2 422 ㎒

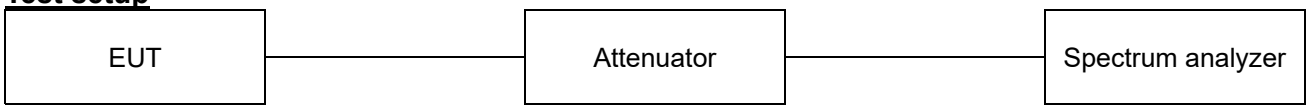
Horizontal/Vertical for 18 ㎓ ~ 26.5 ㎓



Note: The Worst case was based on the lowest margin condition considering Harmonic and Spurious Emission

7.5. Conducted Spurious Emission

Test setup



Limit

According to §15.247(d),

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 ㏈ 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 be30 ㏈ instead of 20 ㏈. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Limit : 20 ㏈c

According to RSS-247(6.6),

In any 100 ㎑ bandwidth outside the frequency band in which the spread spectrum device, digitally modulated device, or hybrid system is operating, the RF power that is produced shall be at least 20 ㏈ 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 6.3.2, the attenuation required shall be 30 ㏈ instead of 20 ㏈. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Limit : 20 ㏈c

Test procedure

ANSI C63.10-2020 - Section 11.11.3
ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024-Section 11.11.3
KDB 558074 D01 v05 - Section 8.5

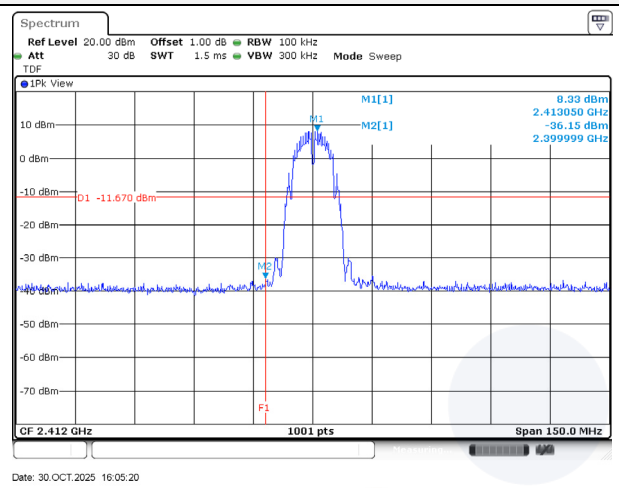
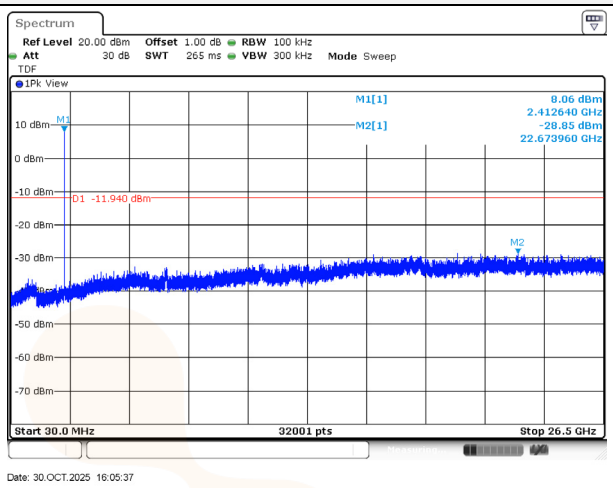
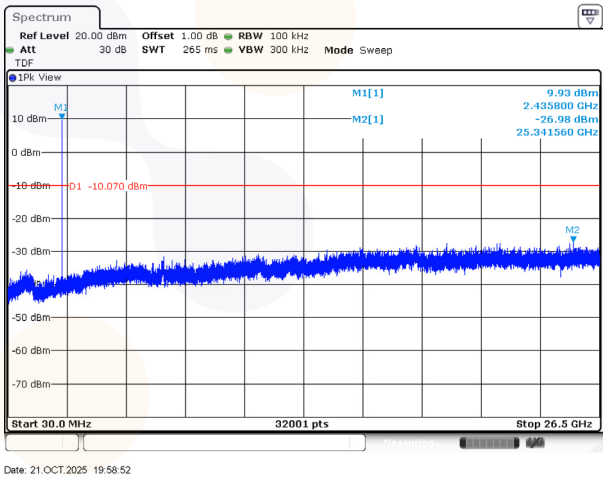
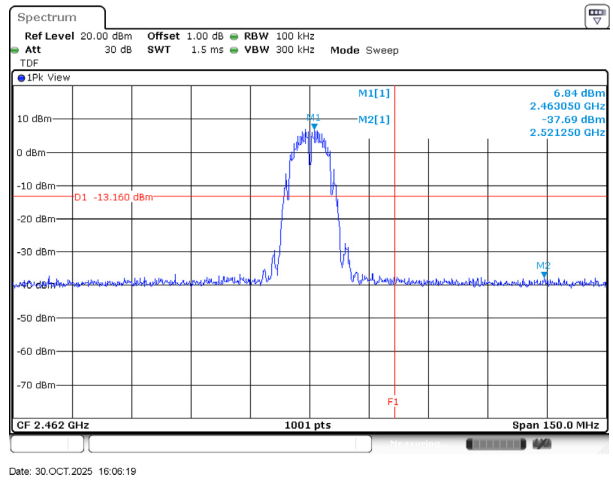
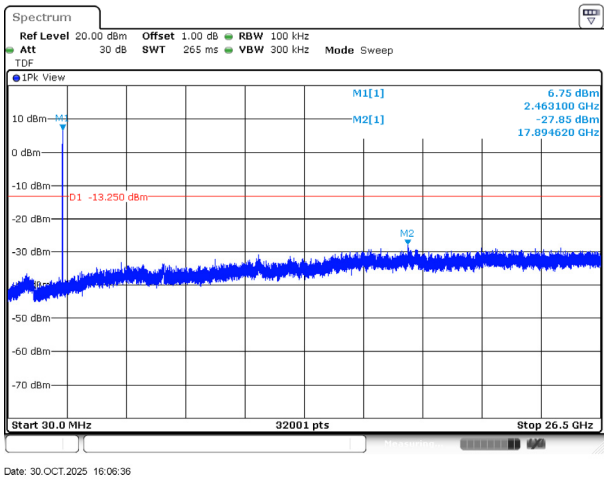
Test settings

Establish an emission level by using the following procedure:

1) Set the center frequency and span to encompass frequency range to be measured.
2) Set the RBW = 100 ㎑
3) Set the VBW ≥ [3 x RBW]
4) Detector = peak
5) Sweep time = No faster than coupled (auto) time
6) Trace mode = max hold
7) Allow trace to fully stabilize.
8) Use the peak marker function to determine the maximum amplitude level.

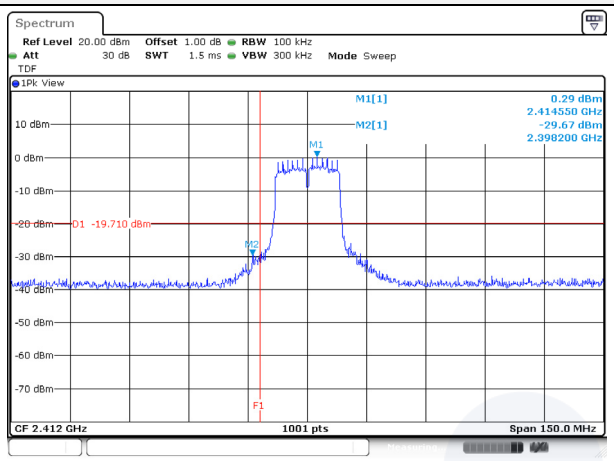
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Test results

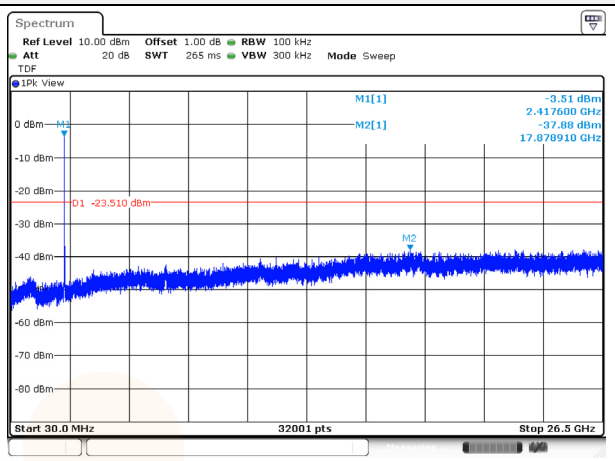
802.11b	
Conducted band-edge / 2 412 ㎒	**Conducted spurious / 2 412 ㎒**
	
Conducted band-edge / 2 437 ㎒	**Conducted spurious / 2 437 ㎒**
Blank	
Conducted band-edge / 2 462 ㎒	**Conducted spurious / 2 462 ㎒**
	

802.11g

Conducted band-edge / 2 412 ㎒



Conducted spurious / 2 412 ㎒



Conducted band-edge / 2 437 ㎒

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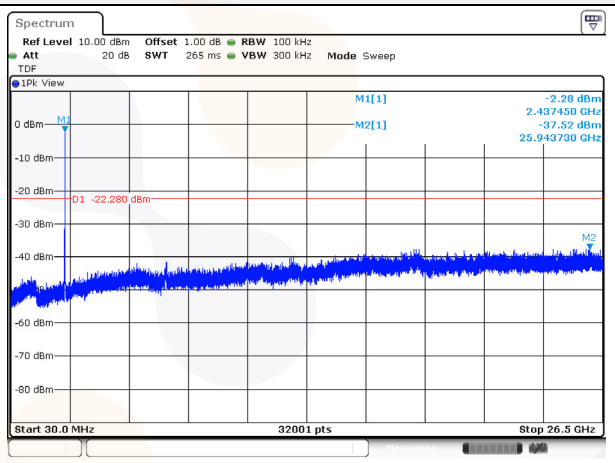
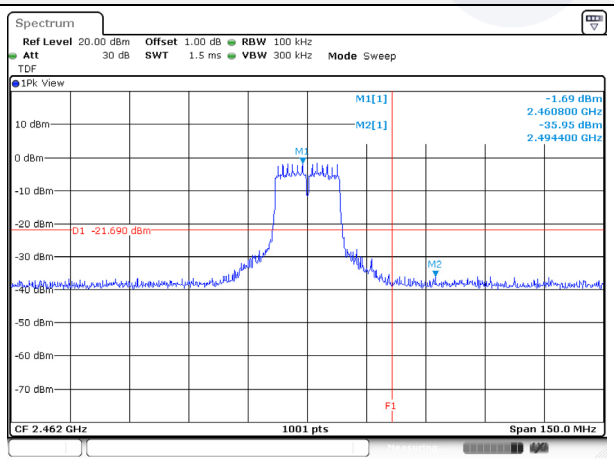
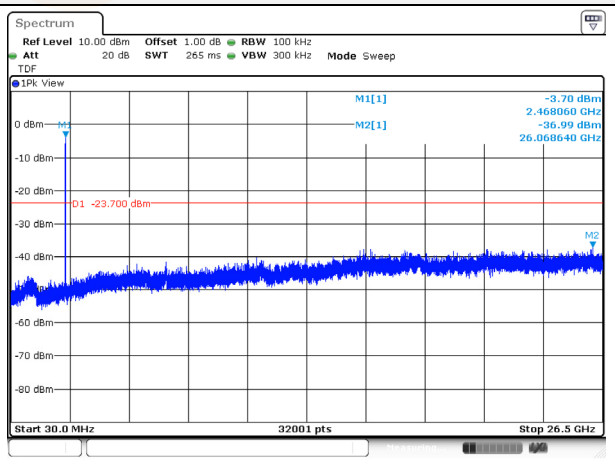
Conducted spurious / 2 437 ㎒



Conducted band-edge / 2 462 ㎒

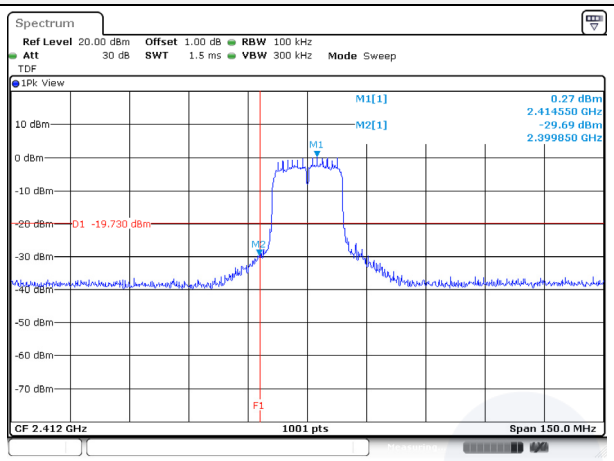


Conducted spurious / 2 462 ㎒

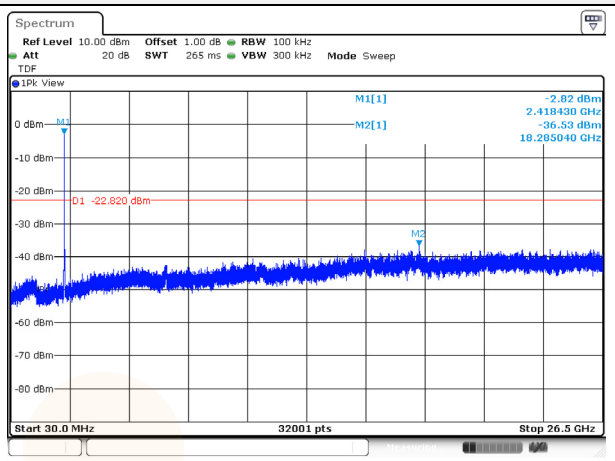


802.11n HT20

Conducted band-edge / 2 412 ㎒



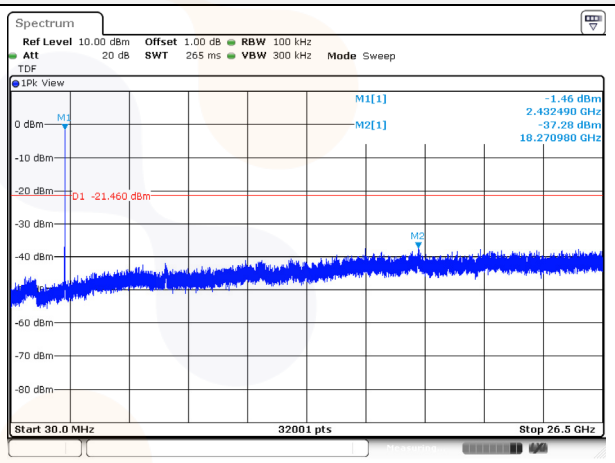
Conducted spurious / 2 412 ㎒



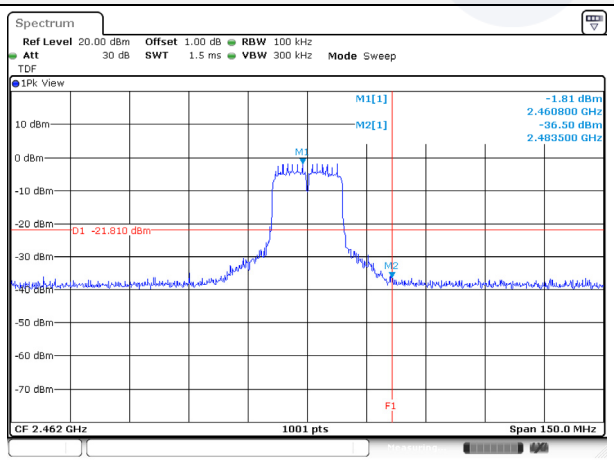
Conducted band-edge / 2 437 ㎒

Blank

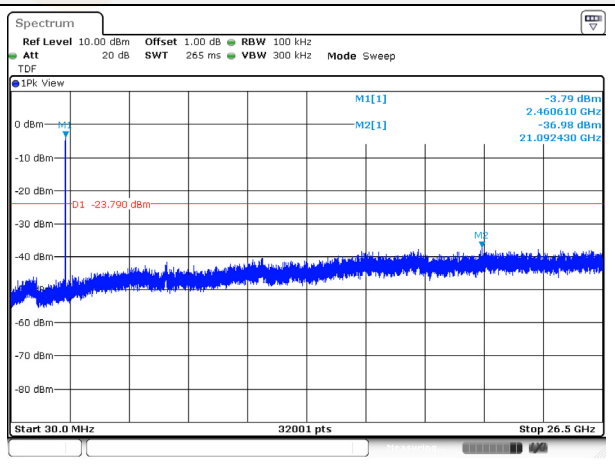
Conducted spurious / 2 437 ㎒



Conducted band-edge / 2 462 ㎒

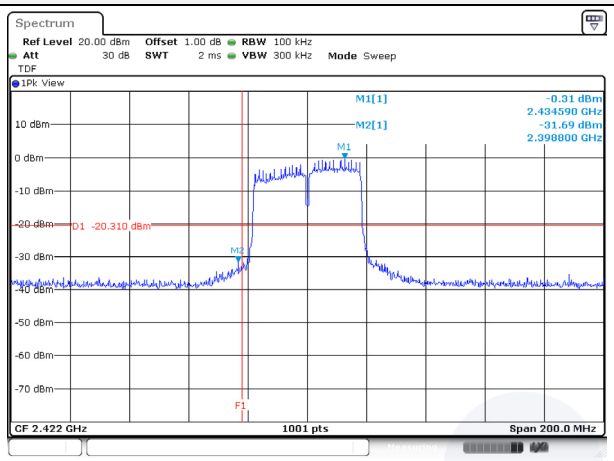


Conducted spurious / 2 462 ㎒

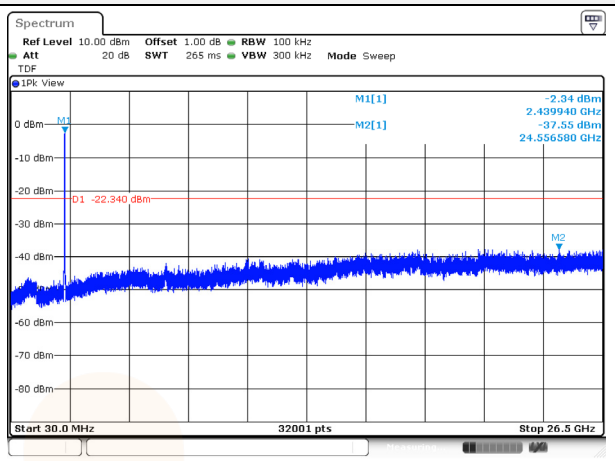


802.11n HT40

Conducted band-edge / 2 422 ㎒



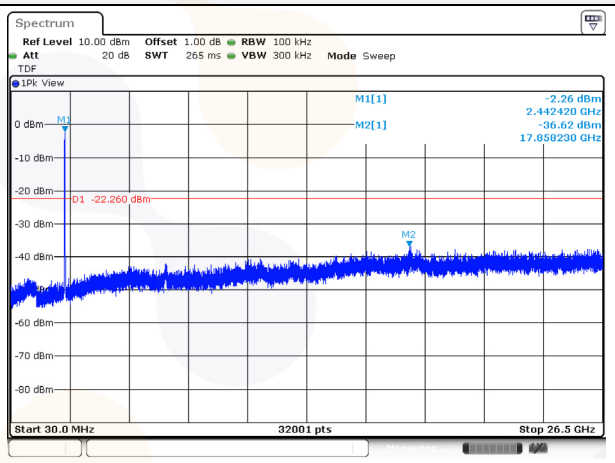
Conducted spurious / 2 422 ㎒



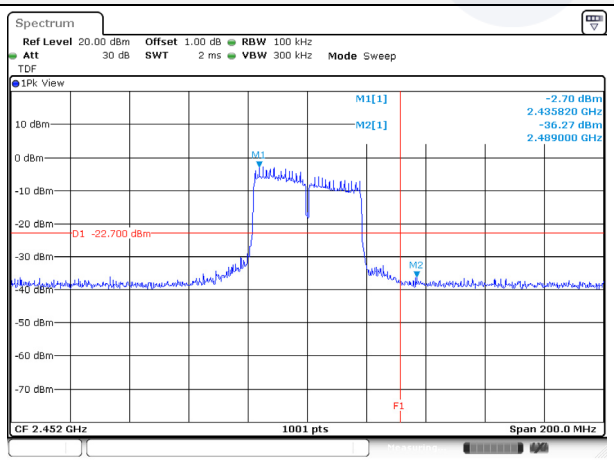
Conducted band-edge / 2 437 ㎒

Blank

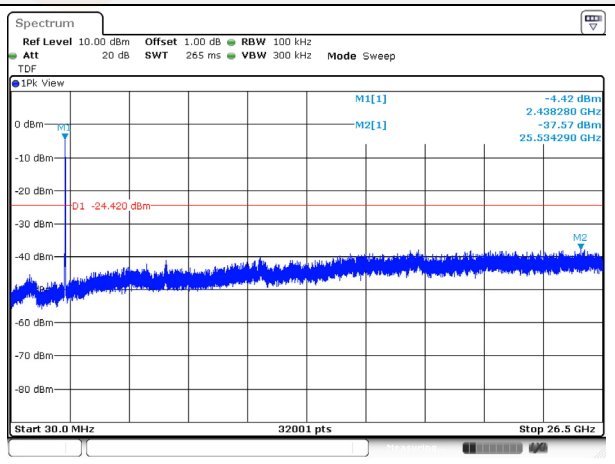
Conducted spurious / 2 437 ㎒



Conducted band-edge / 2 452 ㎒

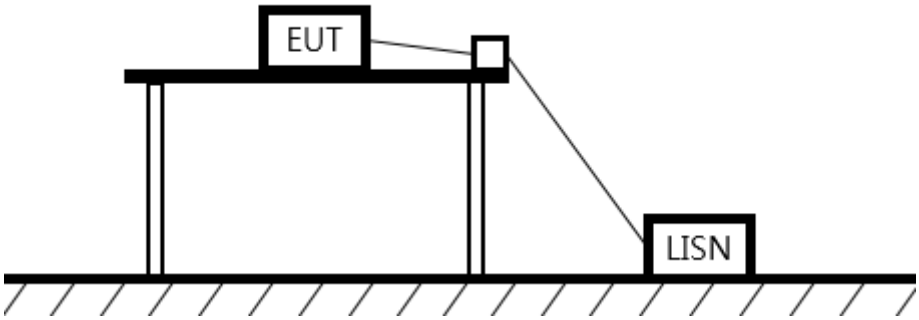


Conducted spurious / 2 452 ㎒



7.6. AC Conducted emission

Test setup



Limit

According to 15.207(a), 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 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

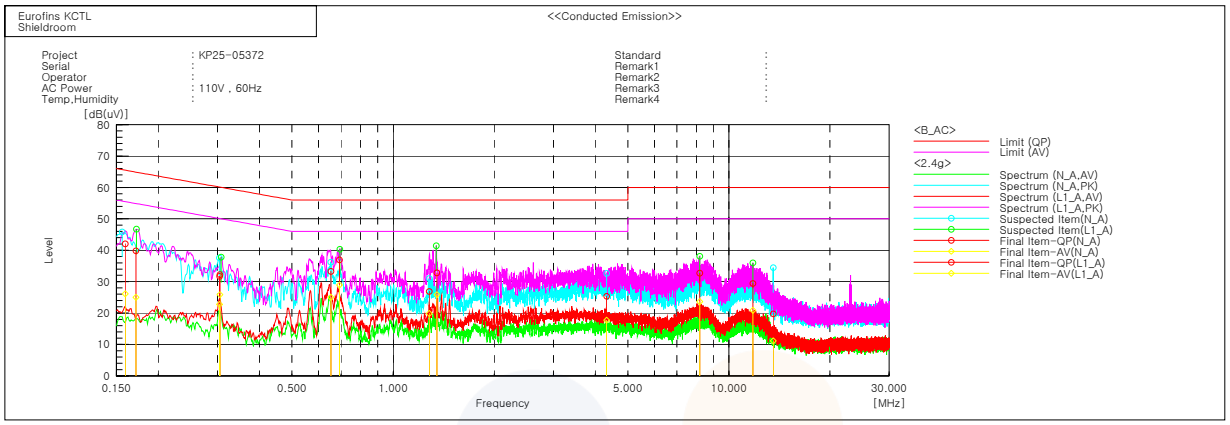
Frequency of Emission (㎒)	Conducted limit (㏈㎶/m)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

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: 802.11b_2 437 ㎒



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	0.15945	31.9	16.0	10.1	42.0	26.1	65.5	55.5	23.5	29.4
2	0.30439	21.8	12.8	9.9	31.7	22.7	60.1	50.1	28.4	27.4
3	0.65324	23.3	15.0	10.0	33.3	25.0	56.0	46.0	22.7	21.0
4	1.28133	17.0	10.0	9.9	26.9	19.9	56.0	46.0	29.1	26.1
5	4.32324	15.4	7.7	10.0	25.4	17.7	56.0	46.0	30.6	28.3
6	13.55667	9.3	0.6	10.5	19.8	11.1	60.0	50.0	40.2	38.9

--- 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	0.17147	29.6	14.8	10.2	39.8	25.0	64.9	54.9	25.1	29.9
2	0.30505	22.4	16.1	9.8	32.2	25.9	60.1	50.1	27.9	24.2
3	0.69264	26.9	18.9	10.0	36.9	28.9	56.0	46.0	19.1	17.1
4	1.3505	22.9	15.9	9.9	32.8	25.8	56.0	46.0	23.2	20.2
5	8.18433	22.5	13.5	10.2	32.7	23.7	60.0	50.0	27.3	26.3
6	11.78665	18.9	10.4	10.5	29.4	20.9	60.0	50.0	30.6	29.1

8. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Amplifier	SONOMA INSTRUMENT	310N	421910	26.07.01
Bilog Antenna	Teseq GmbH	CBL 6112D	61521	26.12.11
Loop Antenna	R&S	HFH2-Z2	100355	26.06.25
Vector Signal Generator	R&S	SMBV100A	257566	26.07.01
Spectrum Analyzer	R&S	FSV40	100988	26.04.24
Broadband PreAmplifier	SCHWARZBECK	BBV9718D	53	26.07.01
Low Noise Amplifier	TESTEK	TK-PA18H	220123-L	26.07.01
Low Noise Amplifier	TESTEK	TK-PA1840H	220234-L	26.06.30
Horn Antenna	SCHWARZBECK	BBHA9120D	2764	26.06.30
Horn Antenna	SCHWARZBECK	BBHA9170	1266	26.06.29
High Pass Filter	Wainwright Instruments GmbH	WHKX12-2805-3000-18000-40SS	SN59	26.06.27
High Pass Filter	Qotana	DBHF058004000A	23041800061	26.04.28
Signal Generator	R&S	SMB100A	176206	26.01.17
TWO-LINE V - NETWORK	R&S	ENV216	101358	26.04.22
EMI TEST RECEIVER	R&S	ESCI3	101408	26.08.11
Spectrum Analyzer	R&S	FSV40	100989	26.09.29
Attenuator	HUBER+SUHNER	6610_SK-50-1/199_NE	ATT15	26.07.07
Attenuator	R&S	DNF	0008	26.01.17
Power Sensor	R&S	NRP-Z81	1137.9009.02-106223-bB	26.04.23
DC Power Supply	AGILENT	E3632A	MY4000880	26.06.30
Controller	INNCO SYSTEMS	CO3000	1442/54370322/P	-
Antenna Mast	INNCO SYSTEMS	MA4640-XP-ET	AM002	-
Turn Device	INNCO SYSTEMS	DS1200-S-1t	1	-

End of test report