

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 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz

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

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

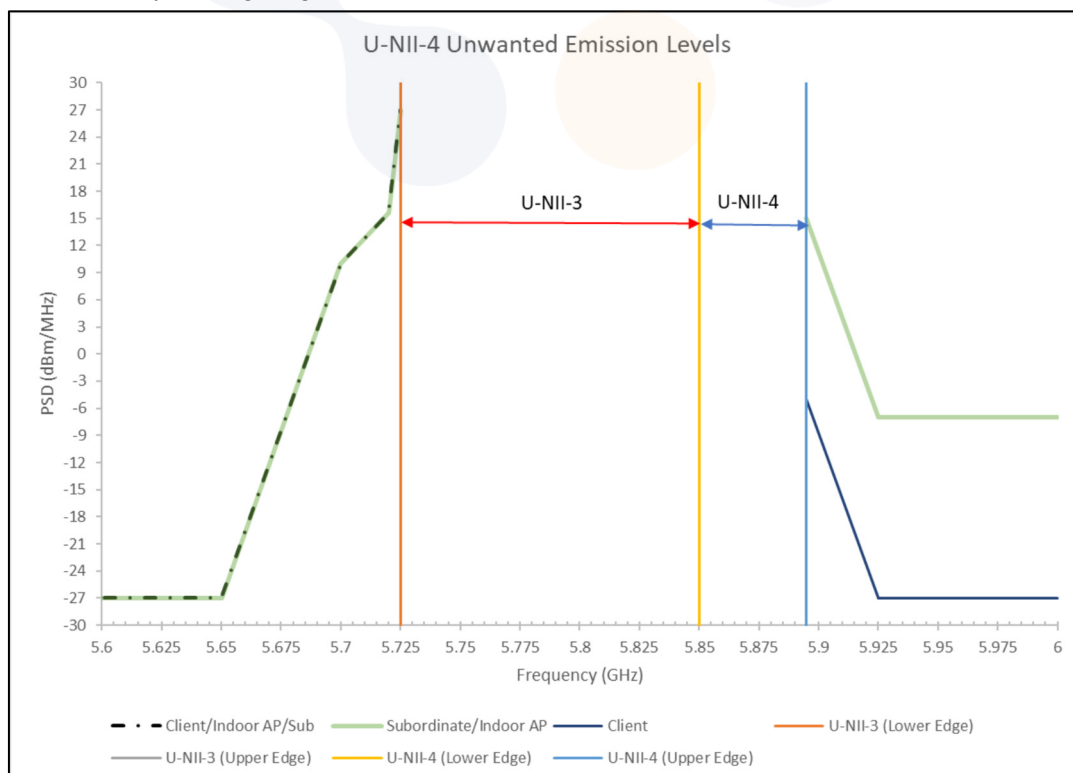
For transmitters operating solely in the 5.850-5.895 GHz band or operating on a channel that spans across 5.725-5.895 GHz:

[RMS detector]

For a client device, all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of -5 dBm/MHz and shall decrease linearly to an e.i.r.p. of -27 dBm/MHz at or above 5.925 GHz.

[Peak detector]

For a client device or indoor access point or subordinate device, all emissions below 5.725 GHz shall not exceed an e.i.r.p. of -27 dBm/MHz at 5.65 GHz increasing linearly to 10 dBm/MHz at 5.7 GHz, and from 5.7 GHz increasing linearly to a level of 15.6 dBm/MHz at 5.72 GHz, and from 5.72 GHz increasing linearly to a level of 27 dBm/MHz at 5.725 GHz.



Test procedure

ANSI C63.10-2013 Section 12.7.7.2, 12.7.5, 12.7.6

KDB 789033 D02 v02r01 – Section G

KDB 291074 D02 v01 – 2.10.2

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 $\geq$ (3 $\times$ 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 kHz to 150 kHz	200 Hz to 300 Hz
0.15 MHz to 30 MHz	9 kHz to 10 kHz
30 MHz to 1 000 MHz	100 kHz to 120 kHz
> 1 000 MHz	1 MHz

Average field strength measurements

Trace averaging with continuous EUT transmission at full power

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

1. RBW = 1 MHz (unless otherwise specified).
2. VBW $\geq$ (3 $\times$ RBW).
3. Detector = RMS (power averaging), if $[\text{span} / (\# \text{ of points in sweep})] \leq (\text{RBW} / 2)$. 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 dB averaging shall not be used.
5. Sweep time = auto.
6. Perform a trace average of at least 100 traces.

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

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

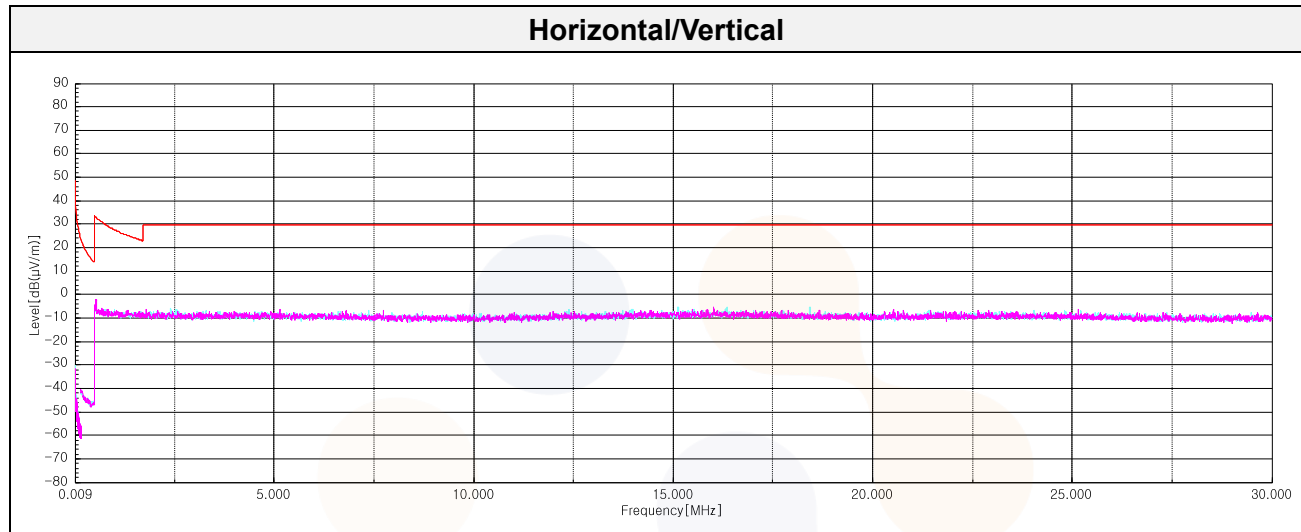
1. The EUT shall be configured to operate at the maximum achievable duty cycle.
2. Measure the duty cycle D of the transmitter output signal as described in 11.6.
3. $RBW = 1 \text{ MHz}$ (unless otherwise specified).
4. $VBW \geq [3 \times RBW]$.
5. Detector = RMS (power averaging), if $[\text{span} / (\# \text{ of points in sweep})] \leq (RBW / 2)$. 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 dB 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 ($D \geq 98\%$) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Notes:

1. $f < 30 \text{ MHz}$, extrapolation factor of 40 dB/decade of distance. $F_d = 40 \log(D_m/D_s)$
 $f \geq 30 \text{ MHz}$, extrapolation factor of 20 dB/decade of distance. $F_d = 20 \log(D_m/D_s)$
Where:
 F_d = Distance factor in dB
 D_m = Measurement distance in meters
 D_s = Specification distance in meters
2. $\text{Factors(dB)} = \text{Antenna factor(dB/m)} + \text{Cable loss(dB)} + \text{or Amp. gain(dB)} + \text{or } F_d(\text{dB})$
3. The worst-case emissions are reported however emissions whose levels were not within 20 dB 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. Below 30 MHz 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 dB of the limit, then the following statement shall be made: "No spurious emissions were detected within 20 dB of the limit."
7. Above 1 GHz the worst results between two antenna polarizations (H and V) were documented in the test report.
8. For above 1 GHz pre-scan to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.

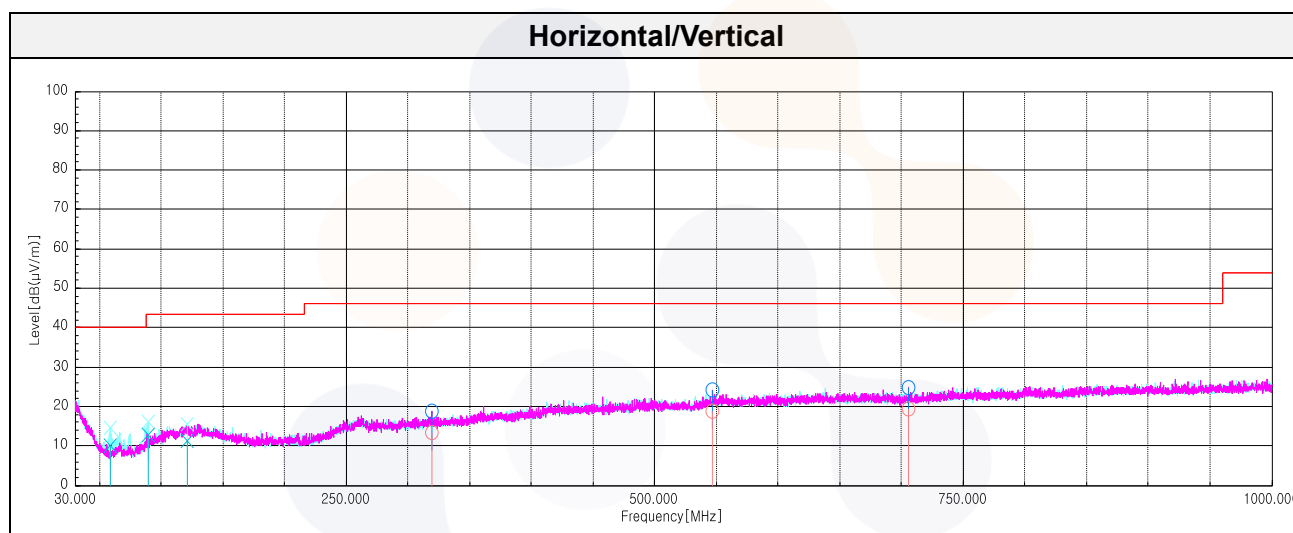
Test results (Below 30 MHz) – Worst case: 802.11a 2TX MIMO / UNII 4_5 865 MHz

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



Test results (Below 1 000 MHz) – Worst case: 802.11a 2TX MIMO / UNII 4_5 865 MHz

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Quasi peak data								
58.74	V	29.60	12.20	-31.66	-	10.14	40.00	29.86
89.05	V	29.40	14.90	-31.54	-	12.76	43.52	30.76
120.82 ¹⁾	V	24.80	17.90	-31.45	-	11.25	43.52	32.27
318.94	H	24.70	19.55	-30.86	-	13.39	46.02	32.63
547.01	H	24.60	24.60	-30.50	-	18.70	46.02	27.32
705.85	H	24.70	24.80	-30.20	-	19.30	46.02	26.72



Test results (Above 1 000 MHz)

UNII 1 2TX MIMO

802.11a_Lowest Channel (5 180 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 147.37 ¹⁾	H	45.90	33.20	-27.26	-	51.84	74.00	22.16
7 769.98	V	63.80	36.68	-41.05	-	59.43	68.20	8.77
10 274.69	H	55.00	38.70	-42.45	-	51.25	68.20	16.95
15 512.96 ¹⁾	V	54.50	38.27	-40.19	-	52.58	74.00	21.42
Average Data								
5 147.37 ¹⁾	H	36.02	33.20	-27.26	0.28	42.24	54.00	11.76
15 512.96 ¹⁾	V	43.04	38.27	-40.19	0.28	41.40	54.00	12.60

802.11a_Middle Channel (5 200 MHz)

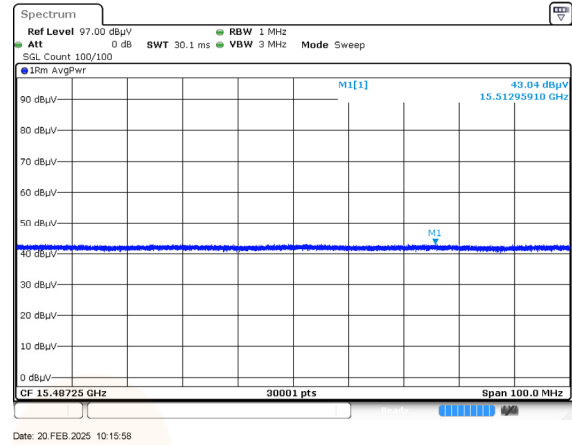
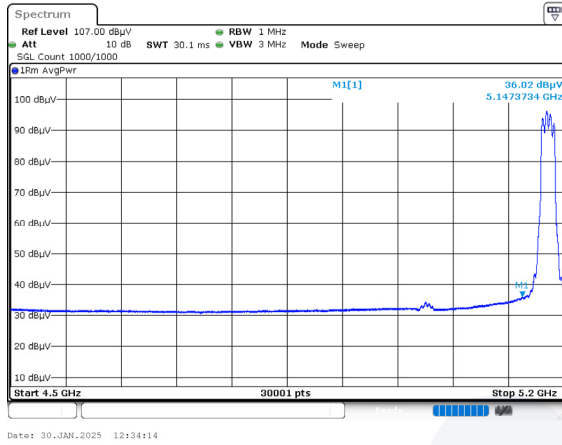
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
7 799.88	V	62.60	36.80	-41.00	-	58.40	68.20	9.80
10 393.13	V	54.10	38.51	-42.05	-	50.56	68.20	17.64
15 607.62 ¹⁾	V	53.00	38.08	-40.10	-	50.98	74.00	23.02
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11a_Highest Channel (5 240 MHz)

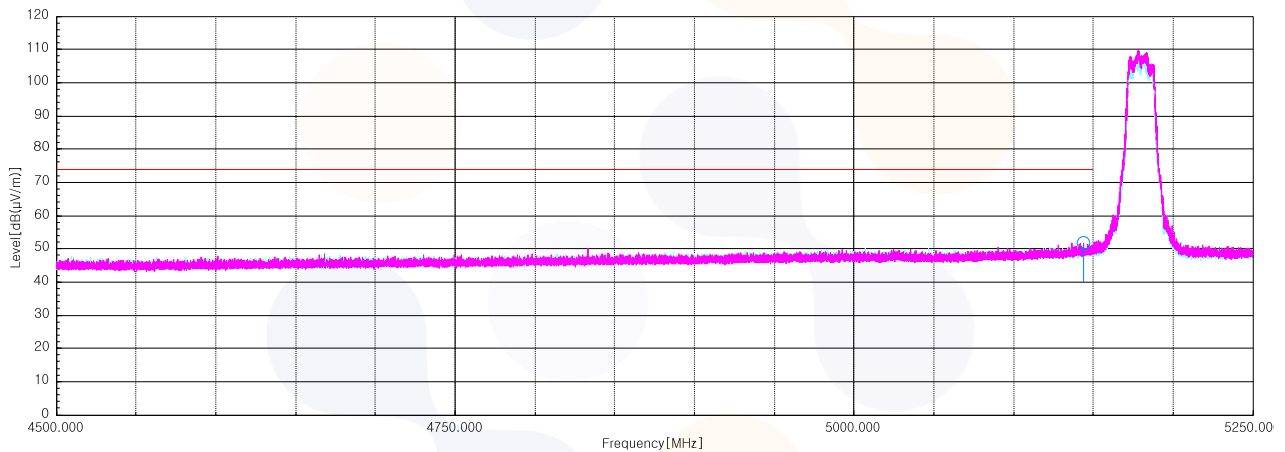
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
7 860.07	V	60.40	36.92	-41.05	-	56.27	68.20	11.93
10 480.53	V	56.00	38.60	-42.01	-	52.59	68.20	15.61
15 693.18 ¹⁾	H	52.90	38.10	-39.74	-	51.26	74.00	22.74
Average Data								
15 693.18 ¹⁾	H	42.88	38.10	-39.74	0.28	41.52	54.00	12.48

802.11a_Lowest Channel (5 180 MHz)

Average data



Horizontal/Vertical for Band-edge



802.11n_HT20_Lowest Channel (5 180 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 149.26 ¹⁾	H	45.80	33.20	-27.26	-	51.74	74.00	22.26
7 769.98	V	63.60	36.68	-41.05	-	59.23	68.20	8.97
10 413.83	H	53.90	38.60	-41.97	-	50.53	68.20	17.67
15 538.66 ¹⁾	H	53.50	38.22	-40.20	-	51.52	74.00	22.48
Average Data								
5 149.26 ¹⁾	H	35.55	33.20	-27.26	0.61	42.10	54.00	11.90
15 538.66 ¹⁾	H	42.98	38.22	-40.20	0.61	41.61	54.00	12.39

802.11n_HT20_Middle Channel (5 200 MHz)

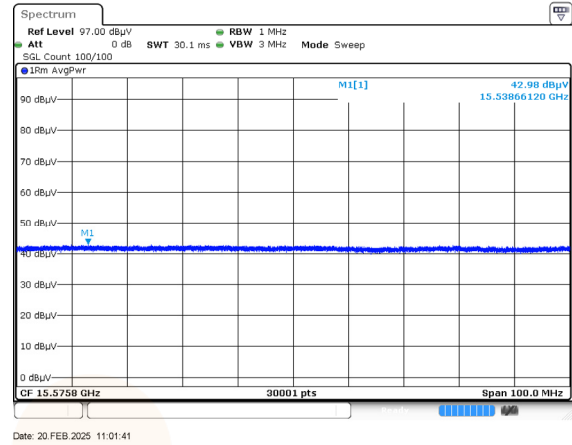
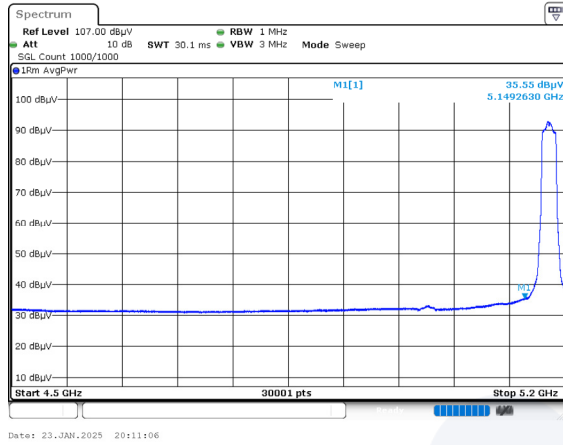
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
7 799.88	V	62.30	36.80	-41.00	-	58.10	68.20	10.10
10 407.32	V	54.20	38.60	-41.98	-	50.82	68.20	17.38
15 555.76 ¹⁾	H	53.20	38.19	-40.19	-	51.20	74.00	22.80
Average Data								
15 555.76 ¹⁾	H	42.71	38.19	-40.19	0.61	41.32	54.00	12.68

802.11n_HT20_Highest Channel (5 240 MHz)

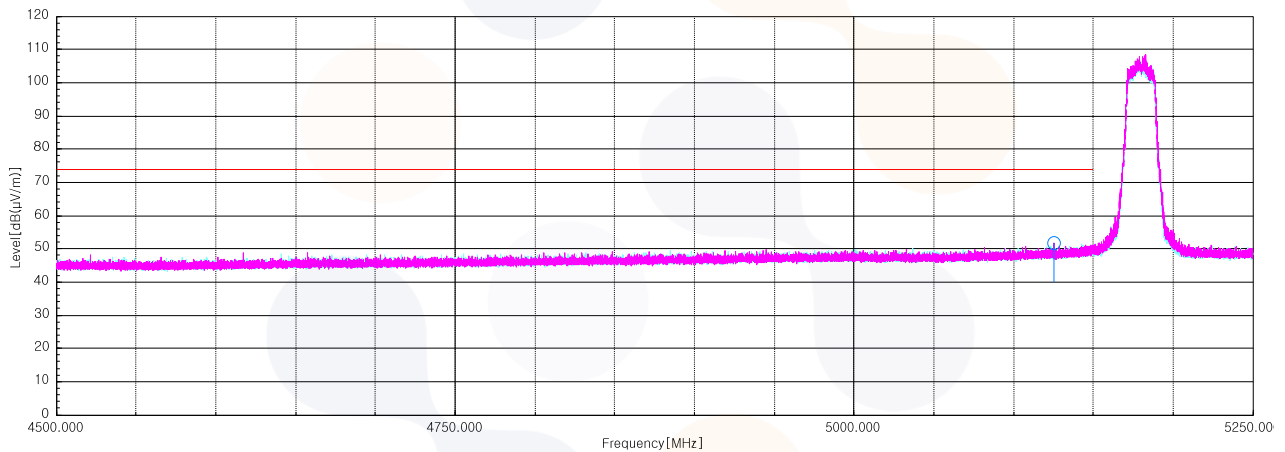
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
7 860.07	V	60.30	36.92	-41.05	-	56.17	68.20	12.03
10 478.62	H	54.60	38.60	-42.00	-	51.20	68.20	17.00
15 692.33 ¹⁾	V	52.60	38.10	-39.74	-	50.96	74.00	23.04
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11n_HT20_Lowest Channel (5 180 MHz)

Average data



Horizontal/Vertical for Band-edge



802.11n_HT40_Lowest Channel (5 190 MHz)

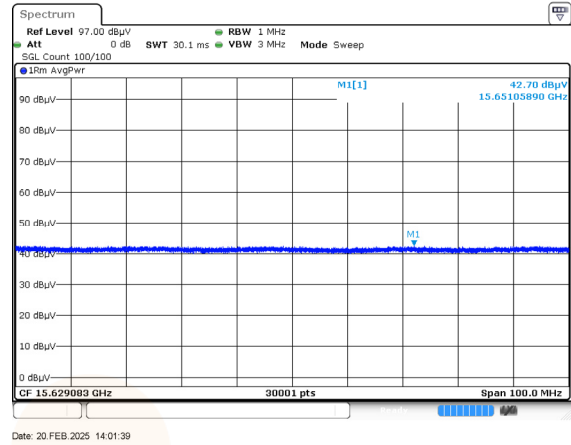
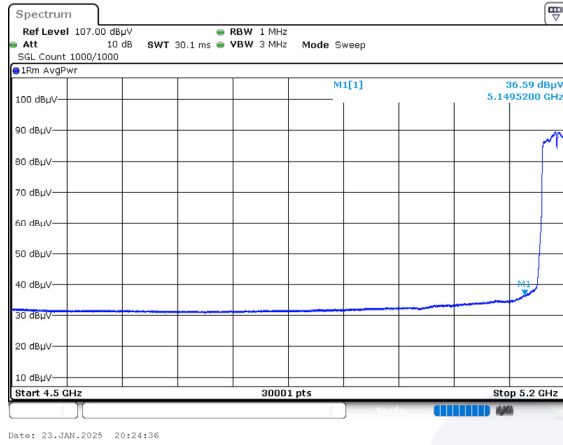
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 149.52 ¹⁾	H	47.00	33.20	-27.26	-	52.94	74.00	21.06
7 784.93	V	63.20	36.74	-41.02	-	58.92	68.20	9.28
10 374.35	V	54.90	38.55	-42.19	-	51.26	68.20	16.94
15 651.06 ¹⁾	V	53.40	38.10	-39.81	-	51.69	74.00	22.31
Average Data								
5 149.52 ¹⁾	H	36.59	33.20	-27.26	1.11	43.64	54.00	10.36
15 651.06 ¹⁾	V	42.70	38.10	-39.81	1.11	42.10	54.00	11.90

802.11n_HT40_Highest Channel (5 230 MHz)

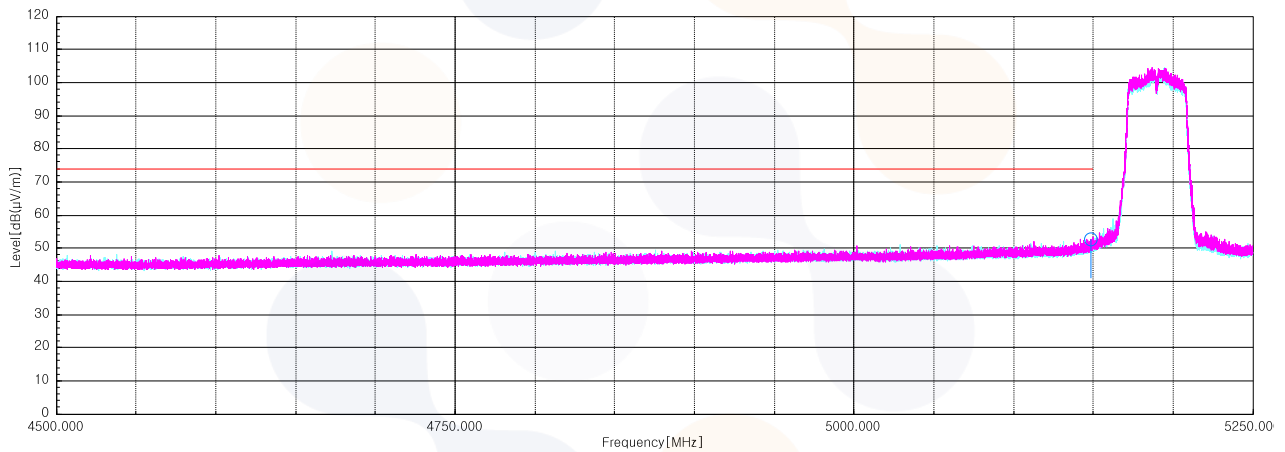
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
7 845.12	V	61.30	36.98	-41.08	-	57.20	68.20	11.00
10 519.63	V	54.40	38.74	-42.13	-	51.01	68.20	17.19
15 605.41 ¹⁾	V	53.20	38.09	-40.11	-	51.18	74.00	22.82
Average Data								
15 605.41 ¹⁾	V	42.65	38.09	-40.11	1.11	41.74	54.00	12.26

802.11n_HT40_Lowest Channel (5 190 MHz)

Average data



Horizontal/Vertical for Band-edge



802.11ac_VHT20_Lowest Channel (5 180 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 149.50 ¹⁾	H	45.70	33.20	-27.26	-	51.64	74.00	22.36
7 769.98	V	63.10	36.68	-41.05	-	58.73	68.20	9.47
10 369.37	H	54.20	38.56	-42.23	-	50.53	68.20	17.67
15 537.22 ¹⁾	H	53.60	38.23	-40.19	-	51.64	74.00	22.36
Average Data								
5 149.50 ¹⁾	H	35.42	33.20	-27.26	0.61	41.97	54.00	12.03
15 537.22 ¹⁾	H	42.78	38.23	-40.19	0.61	41.43	54.00	12.57

802.11ac_VHT20_Middle Channel (5 200 MHz)

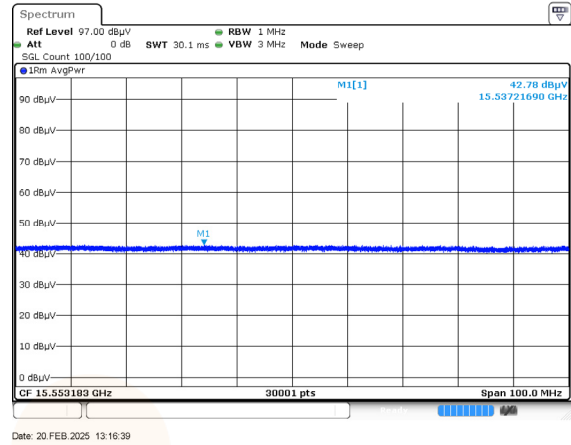
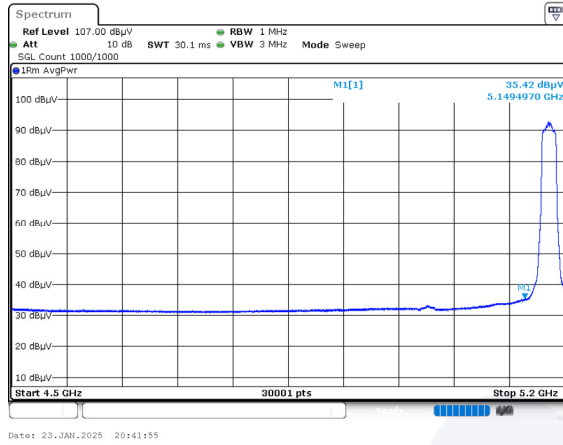
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
7 799.88	V	62.40	36.80	-41.00	-	58.20	68.20	10.00
10 370.13	H	54.00	38.56	-42.22	-	50.34	68.20	17.86
15 556.96 ¹⁾	H	53.30	38.19	-40.19	-	51.30	74.00	22.70
Average Data								
15 556.96 ¹⁾	H	42.93	38.19	-40.19	0.61	41.54	54.00	12.46

802.11ac_VHT20_Highest Channel (5 240 MHz)

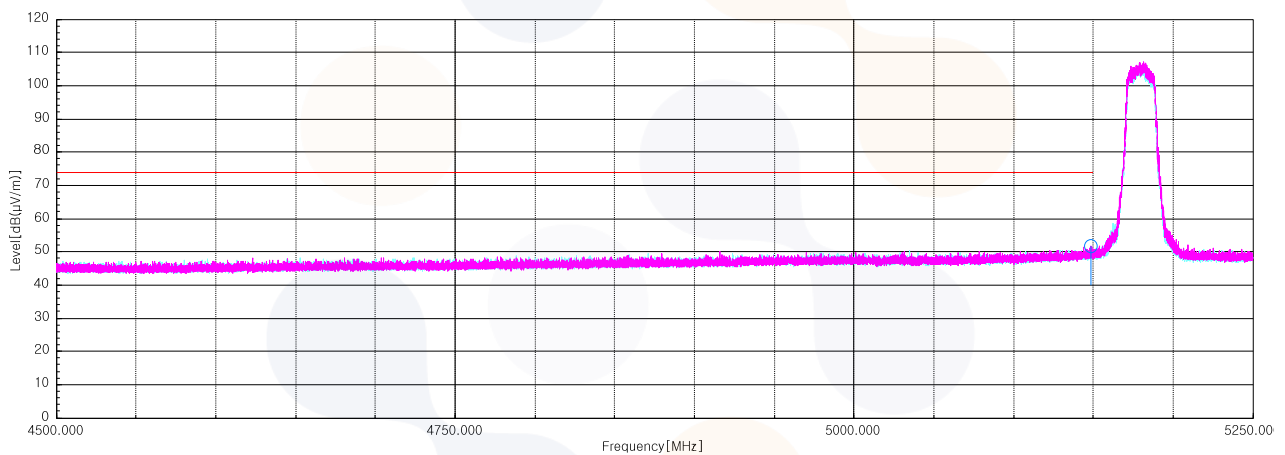
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
7 860.07	V	59.60	36.92	-41.05	-	55.47	68.20	12.73
10 479.00	H	55.50	38.60	-42.01	-	52.09	68.20	16.11
15 726.68 ¹⁾	V	53.10	38.10	-39.54	-	51.66	74.00	22.34
Average Data								
15 726.68 ¹⁾	V	42.42	38.10	-39.54	0.61	41.59	54.00	12.41

802.11ac_VHT20_Lowest Channel (5 180 MHz)

Average data



Horizontal/Vertical for Band-edge



802.11ac_VHT40_Lowest Channel (5 190 MHz)

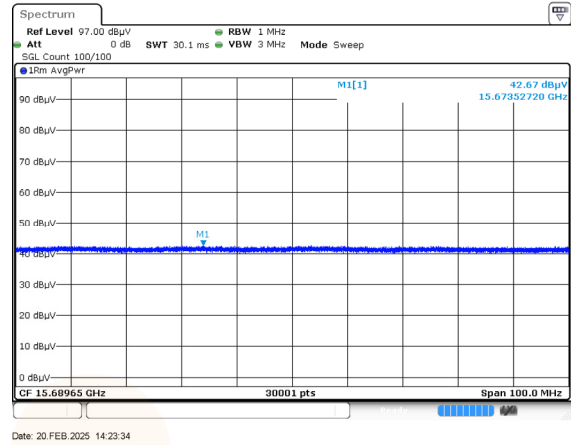
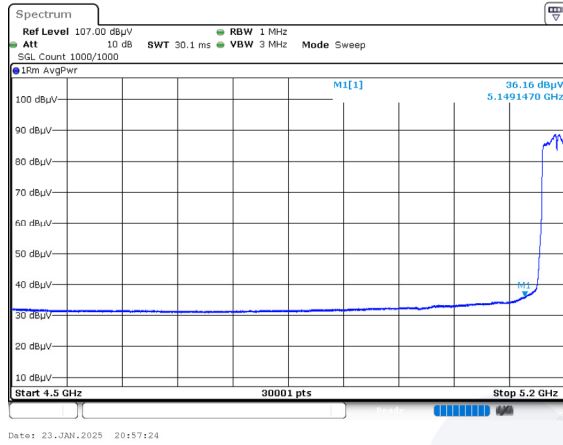
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 149.15 ¹⁾	H	45.90	33.20	-27.26	-	51.84	74.00	22.16
7 785.32	V	62.70	36.74	-41.02	-	58.42	68.20	9.78
10 410.00	H	53.30	38.60	-41.98	-	49.92	68.20	18.28
15 673.53 ¹⁾	V	53.70	38.10	-39.77	-	52.03	74.00	21.97
Average Data								
5 149.15 ¹⁾	H	36.16	33.20	-27.26	1.10	43.20	54.00	10.80
15 673.53 ¹⁾	V	42.67	38.10	-39.77	1.10	42.10	54.00	11.90

802.11ac_VHT40_Highest Channel (5 230 MHz)

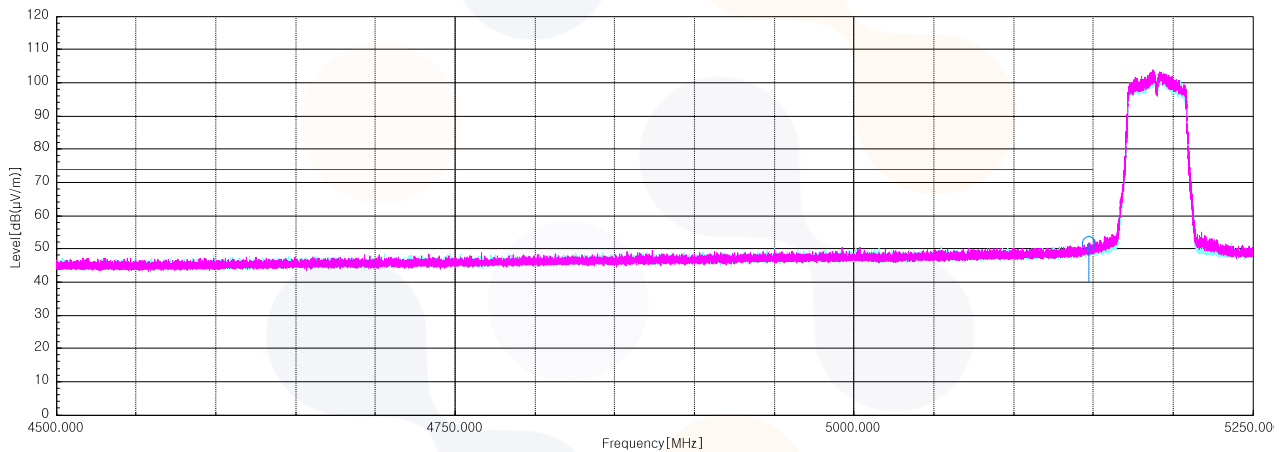
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
7 845.12	V	61.00	36.98	-41.08	-	56.90	68.20	11.30
10 498.55	H	54.10	38.60	-42.08	-	50.62	68.20	17.58
15 670.84 ¹⁾	H	52.60	38.10	-39.78	-	50.92	74.00	23.08
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ac_VHT40_Lowest Channel (5 190 MHz)

Average data

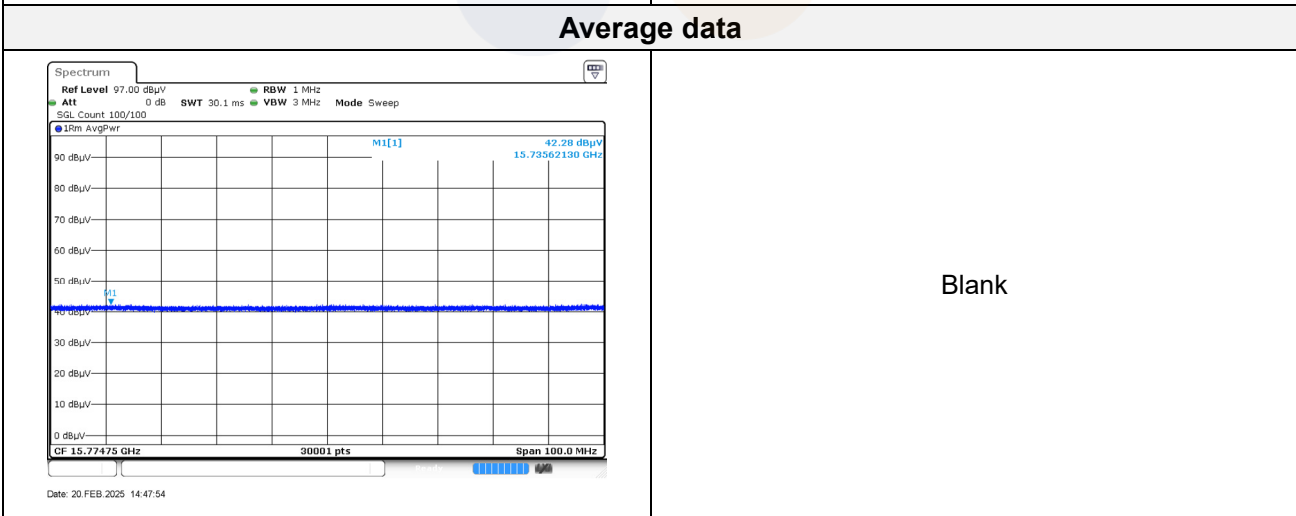
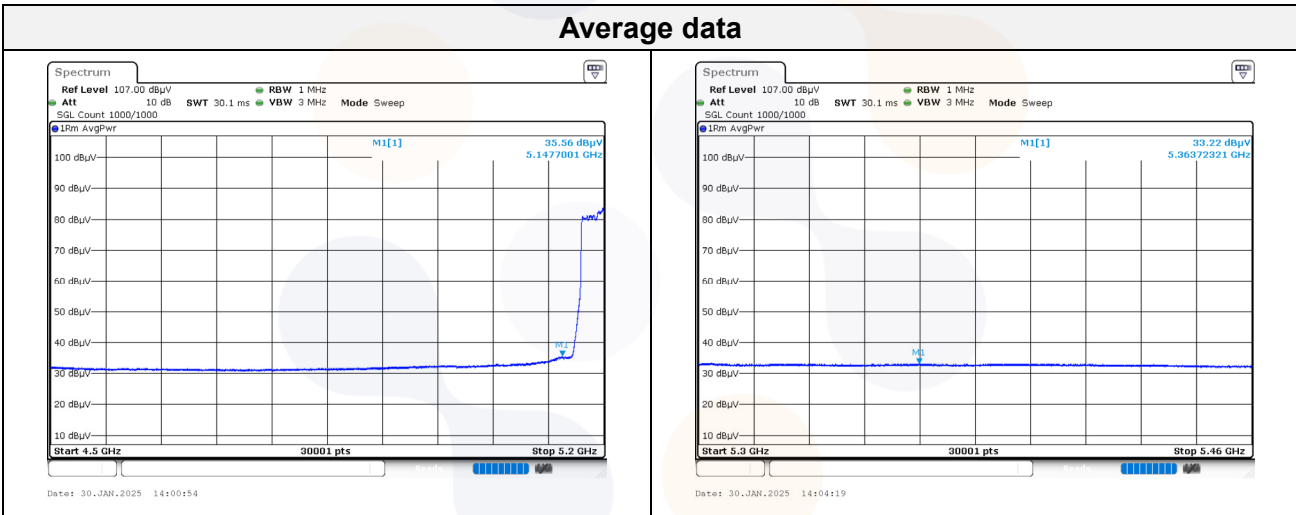


Horizontal/Vertical for Band-edge

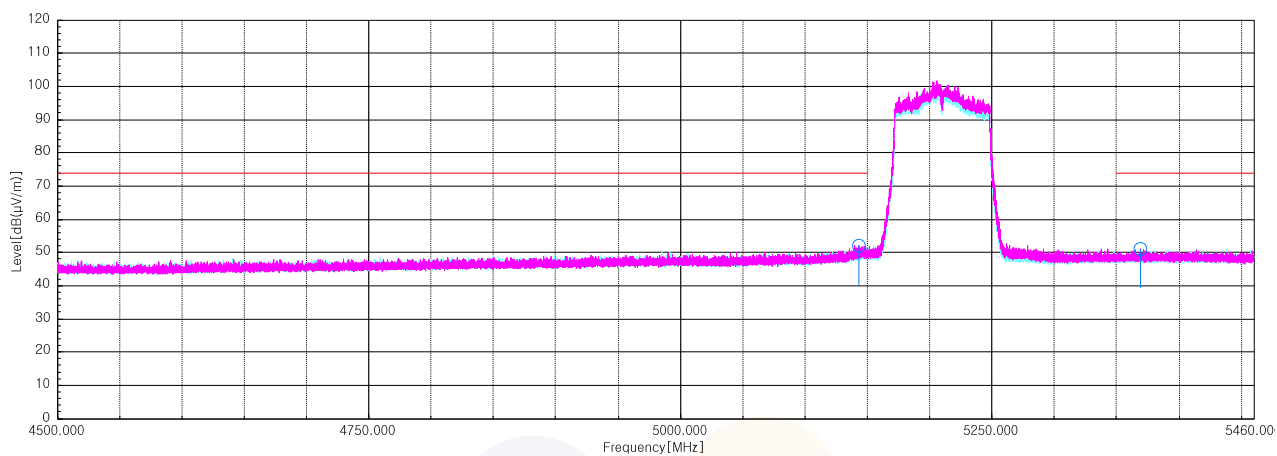


802.11ac_VHT80_Middle Channel (5 210 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 147.70 ¹⁾	H	46.20	33.20	-27.26	-	52.14	74.00	21.86
5 363.72 ¹⁾	H	44.90	33.00	-26.91	-	50.99	74.00	23.01
7 814.83	V	62.30	36.86	-41.03	-	58.13	68.20	10.07
10 426.48	V	54.60	38.60	-41.94	-	51.26	68.20	16.94
15 735.62 ¹⁾	H	53.00	38.10	-39.47	-	51.63	74.00	22.37
Average Data								
5 147.70 ¹⁾	H	35.56	33.20	-27.26	1.86	43.36	54.00	10.64
5 363.72 ¹⁾	H	33.22	33.00	-26.91	1.86	41.17	54.00	12.83
15 735.62 ¹⁾	H	42.28	38.10	-39.47	1.86	42.77	54.00	11.23

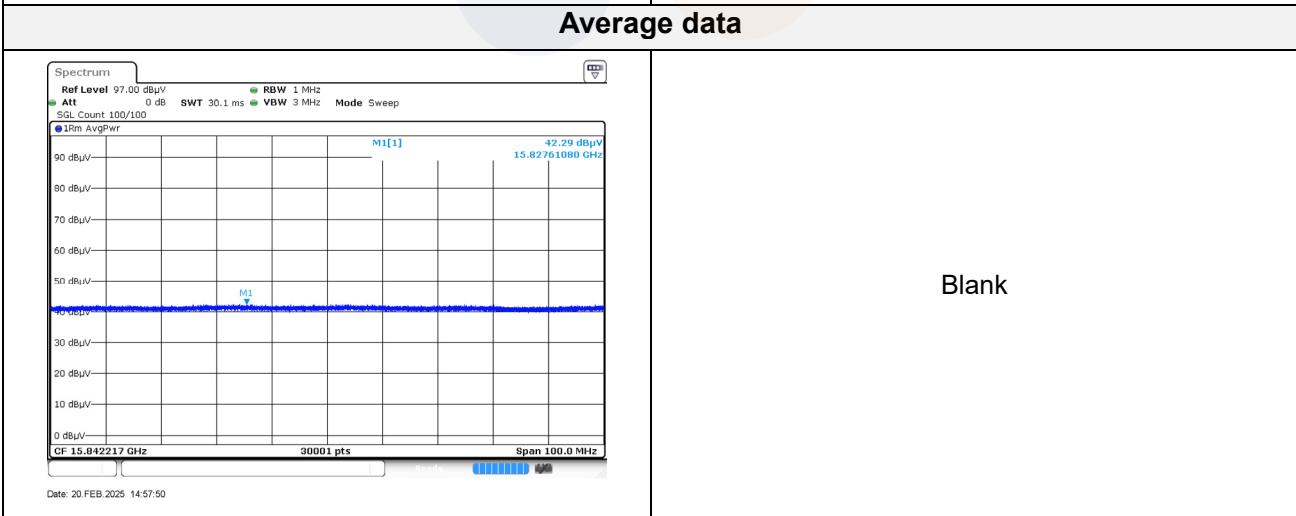
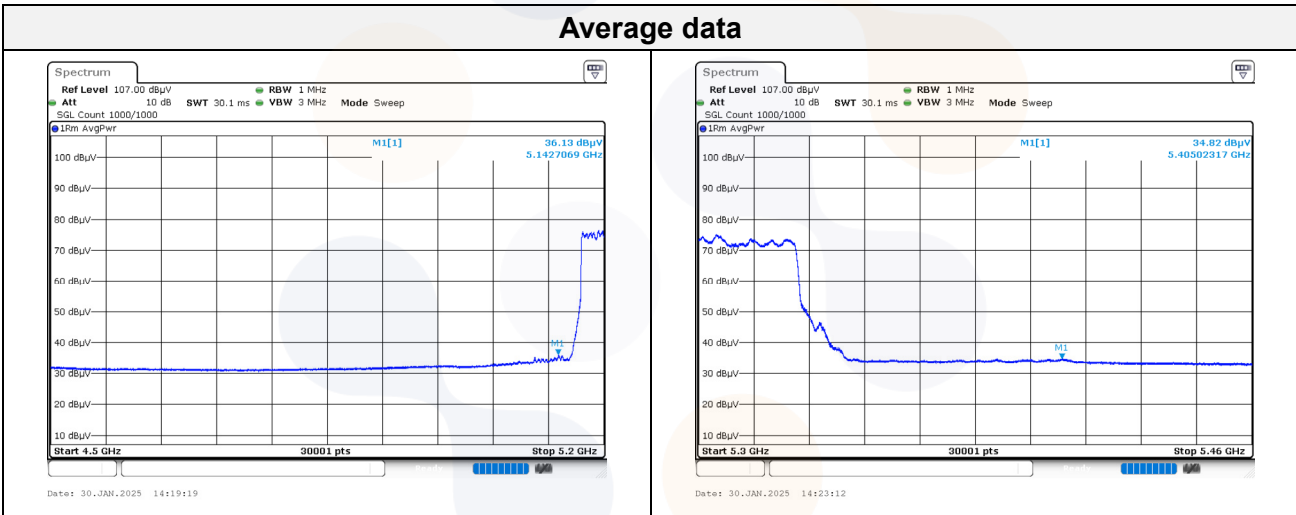


Horizontal/Vertical for Band-edge

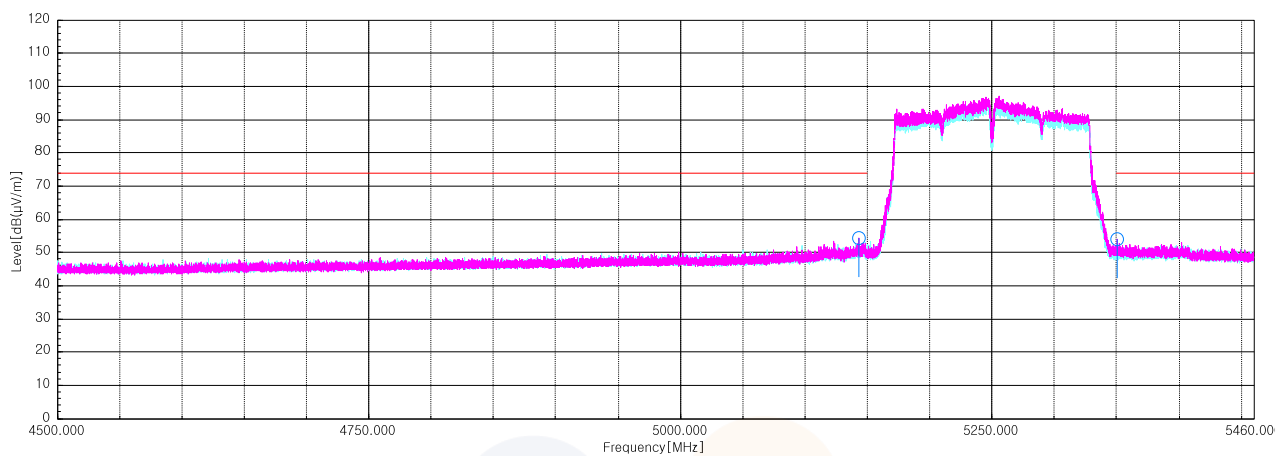


802.11ac_VHT160_Middle Channel (5 250 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 142.71 ¹⁾	H	48.40	33.20	-27.28	-	54.32	74.00	19.68
5 405.02 ¹⁾	H	47.80	33.00	-26.87	-	53.93	74.00	20.07
7 860.07	V	60.40	36.92	-41.05	-	56.27	68.20	11.93
10 473.63	H	55.30	38.60	-41.98	-	51.92	68.20	16.28
15 827.61 ¹⁾	H	53.00	38.10	-39.27	-	51.83	74.00	22.17
Average Data								
5 142.71 ¹⁾	H	36.13	33.20	-27.28	2.69	44.74	54.00	9.26
5 405.02 ¹⁾	H	34.82	33.00	-26.87	2.69	43.64	54.00	10.36
15 827.61 ¹⁾	H	42.29	38.10	-39.27	2.69	43.81	54.00	10.19



Horizontal/Vertical for Band-edge

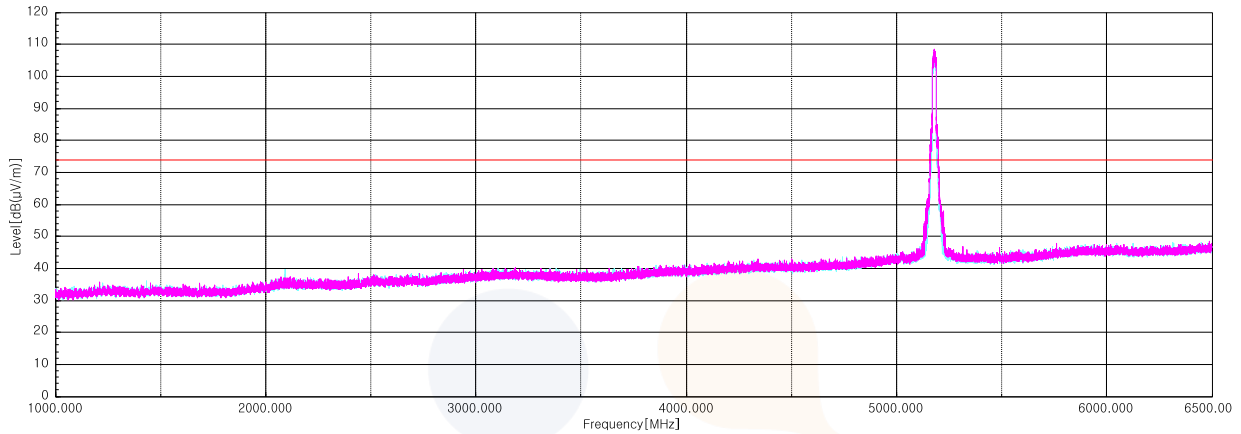


Plot of Harmonics and Spurious Emissions

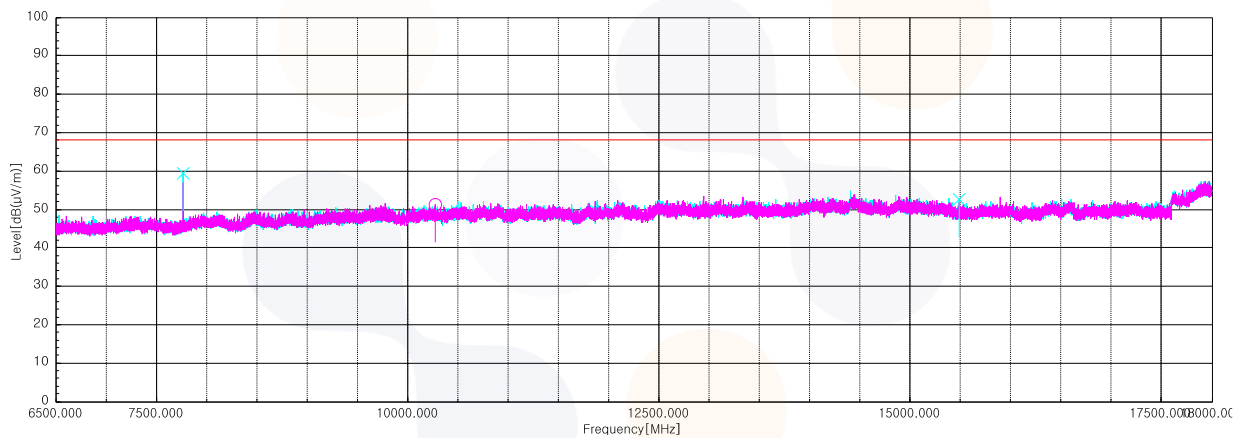
In order to simplify the report, attached plots were only the lowest margin condition

802.11a_UNII 1_2TX MIMO_Lowest Channel (5 180 MHz)

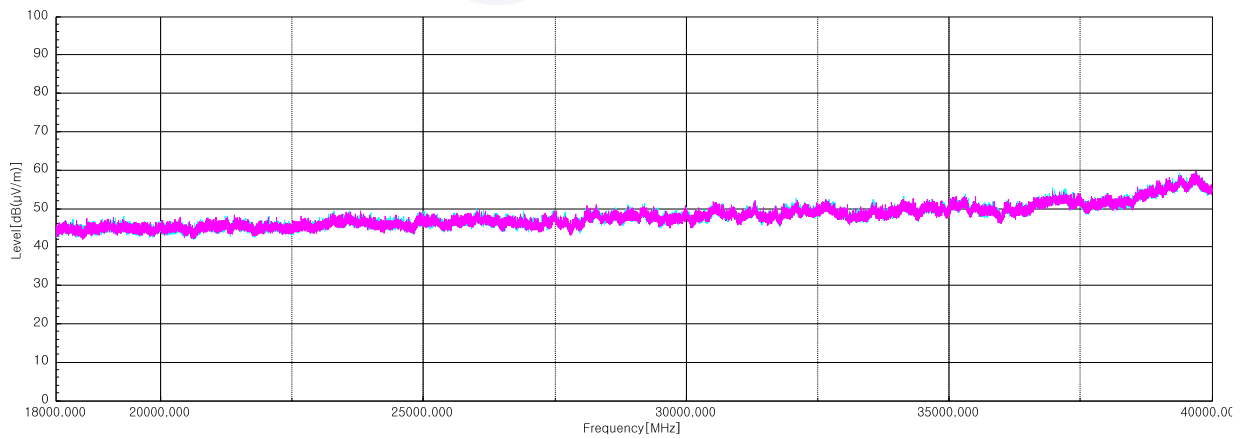
Horizontal/Vertical for 1 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 40 GHz



UNII 2A 2TX MIMO

802.11a_Lowest Channel (5 260 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
6 311.90	H	63.70	34.52	-44.48	-	53.74	68.20	14.46
10 521.93	V	57.30	38.74	-42.13	-	53.91	68.20	14.29
15 717.17 ¹⁾	V	53.10	38.10	-39.61	-	51.59	74.00	22.41
Average Data								
15 717.17 ¹⁾	V	42.65	38.10	-39.61	0.28	41.42	54.00	12.58

802.11a_Middle Channel (5 280 MHz)

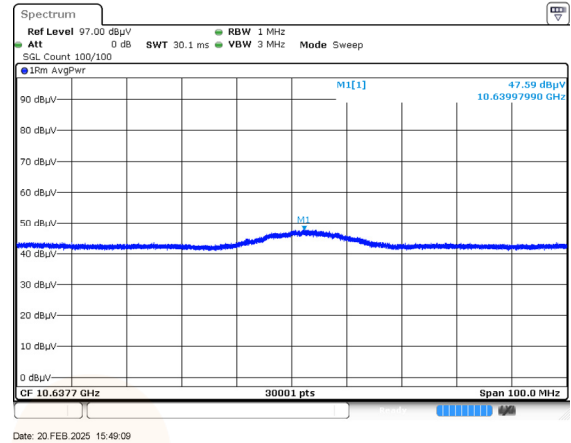
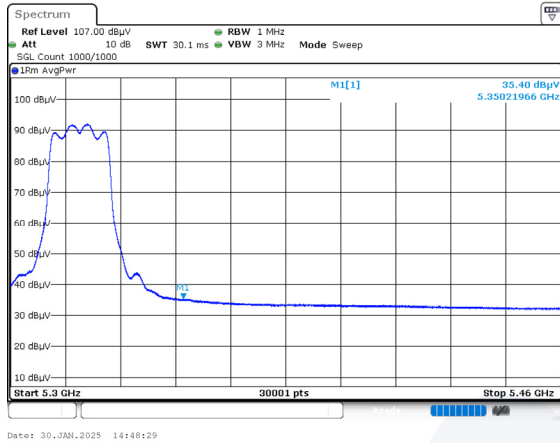
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
6 336.83	H	61.90	34.57	-44.45	-	52.02	68.20	16.18
10 561.80	V	56.90	38.82	-42.23	-	53.49	68.20	14.71
15 906.23 ¹⁾	V	51.70	38.21	-39.26	-	50.65	74.00	23.35
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11a_Highest Channel (5 320 MHz)

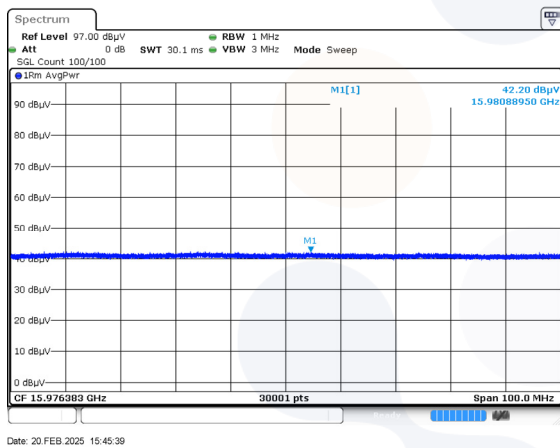
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 350.22 ¹⁾	V	46.60	33.00	-26.92	-	52.68	74.00	21.32
6 384.13	H	61.80	34.67	-44.38	-	52.09	68.20	16.11
10 639.98 ¹⁾	V	56.70	38.98	-42.48	-	53.20	74.00	20.80
15 980.89 ¹⁾	V	53.00	38.20	-38.99	-	52.21	74.00	21.79
Average Data								
5 350.22 ¹⁾	V	35.40	33.00	-26.92	0.28	41.76	54.00	12.24
10 639.98 ¹⁾	V	47.59	38.98	-42.48	0.28	44.37	54.00	9.63
15 980.89 ¹⁾	V	42.20	38.20	-38.99	0.28	41.69	54.00	12.31

802.11a_Highest Channel (5 320 MHz)

Average data

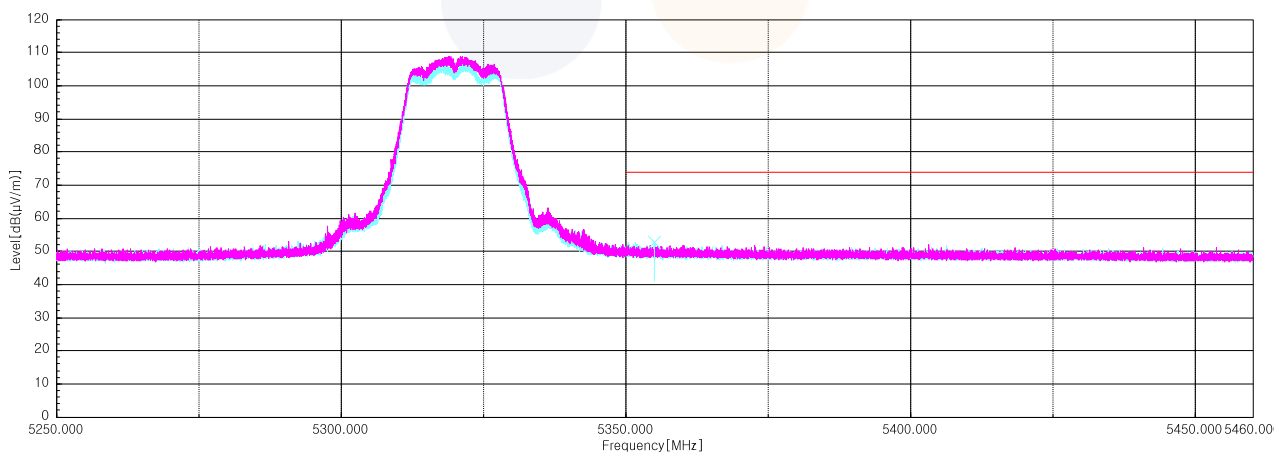


Average data



Blank

Horizontal/Vertical for Band-edge



802.11n_HT20_Lowest Channel (5 260 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
6 311.90	H	62.40	34.52	-44.48	-	52.44	68.20	15.76
10 522.70	V	55.50	38.75	-42.14	-	52.11	68.20	16.09
15 780.87 ¹⁾	H	52.80	38.10	-39.25	-	51.65	74.00	22.35
Average Data								
15 780.87 ¹⁾	H	42.29	38.10	-39.25	0.61	41.75	54.00	12.25

802.11n_HT20_Middle Channel (5 280 MHz)

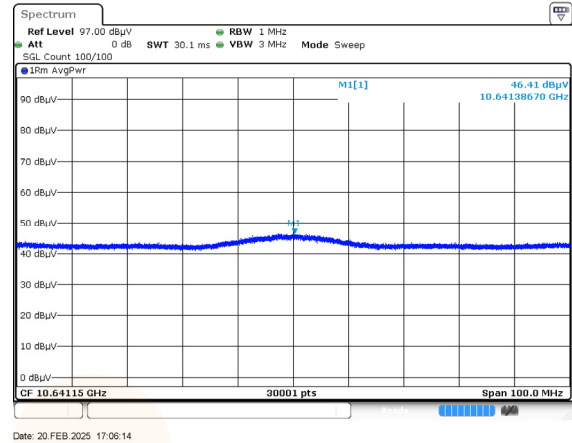
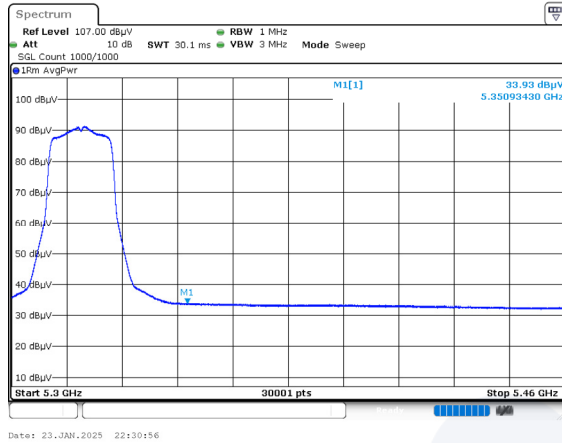
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
6 336.47	H	62.40	34.57	-44.45	-	52.52	68.20	15.68
10 564.10	V	56.20	38.83	-42.24	-	52.79	68.20	15.41
15 820.77 ¹⁾	V	52.80	38.10	-39.24	-	51.66	74.00	22.34
Average Data								
15 820.77 ¹⁾	V	42.49	38.10	-39.24	0.61	41.96	54.00	12.04

802.11n_HT20_Highest Channel (5 320 MHz)

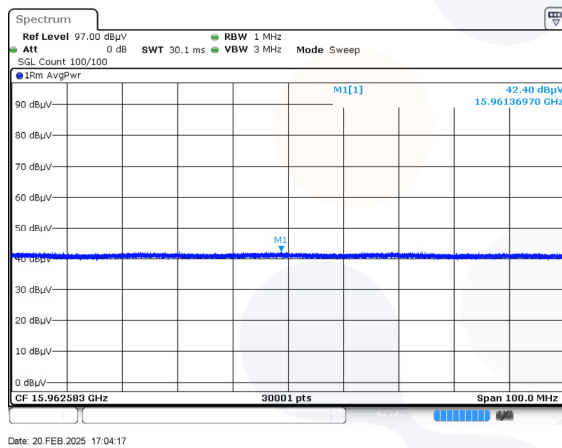
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 350.93 ¹⁾	H	45.80	33.00	-26.92	-	51.88	74.00	22.12
6 384.32	V	61.20	34.67	-44.38	-	51.49	68.20	16.71
10 641.39 ¹⁾	V	55.00	38.98	-42.48	-	51.50	74.00	22.50
15 961.37 ¹⁾	H	52.70	38.20	-39.15	-	51.75	74.00	22.25
Average Data								
5 350.93 ¹⁾	H	33.93	33.00	-26.92	0.61	40.62	54.00	13.38
10 641.39 ¹⁾	V	46.41	38.98	-42.48	0.61	43.52	54.00	10.48
15 961.37 ¹⁾	H	42.40	38.20	-39.15	0.61	42.06	54.00	11.94

802.11n_HT20_Highest Channel (5 320 MHz)

Average data

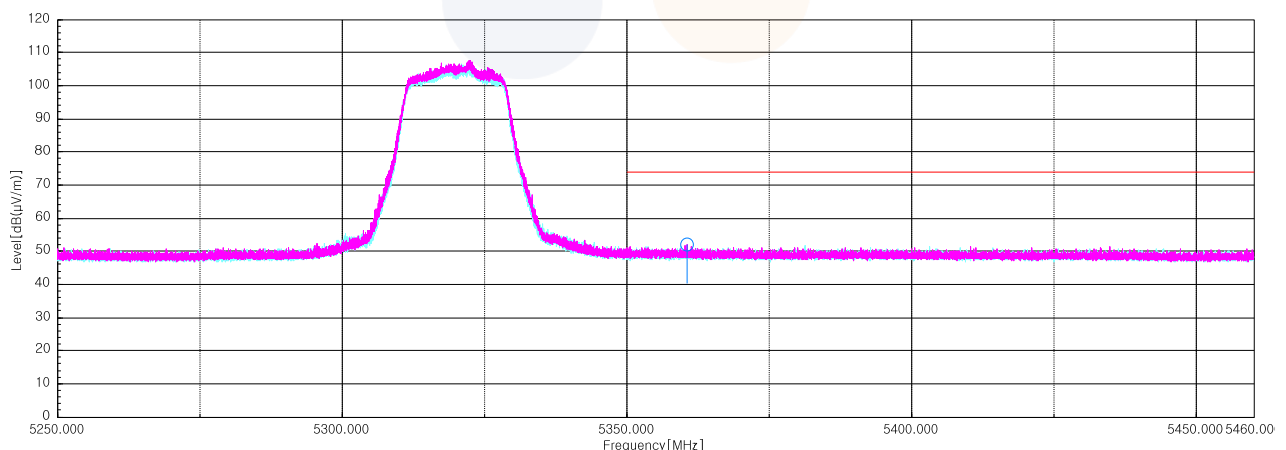


Average data



Blank

Horizontal/Vertical for Band-edge



802.11n_HT40_Lowest Channel (5 270 MHz)

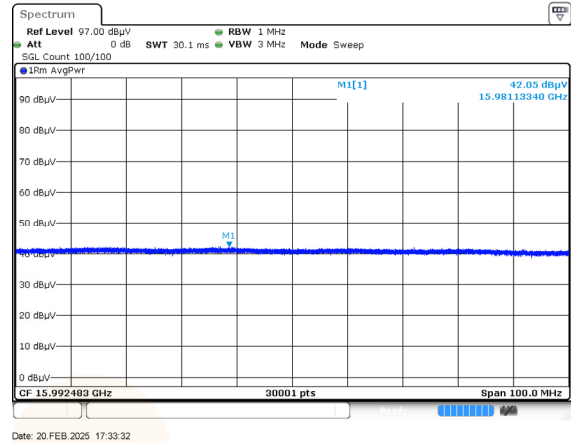
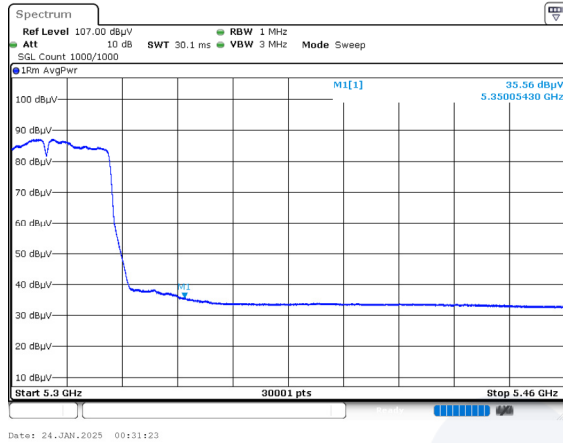
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
6 324.37	H	61.50	34.55	-44.46	-	51.59	68.20	16.61
10 554.90	V	55.70	38.81	-42.21	-	52.30	68.20	15.90
15 802.31 ¹⁾	H	52.40	38.10	-39.18	-	51.32	74.00	22.68
Average Data								
15 802.31 ¹⁾	H	42.24	38.10	-39.18	1.11	42.27	54.00	11.73

802.11n_HT40_Highest Channel (5 310 MHz)

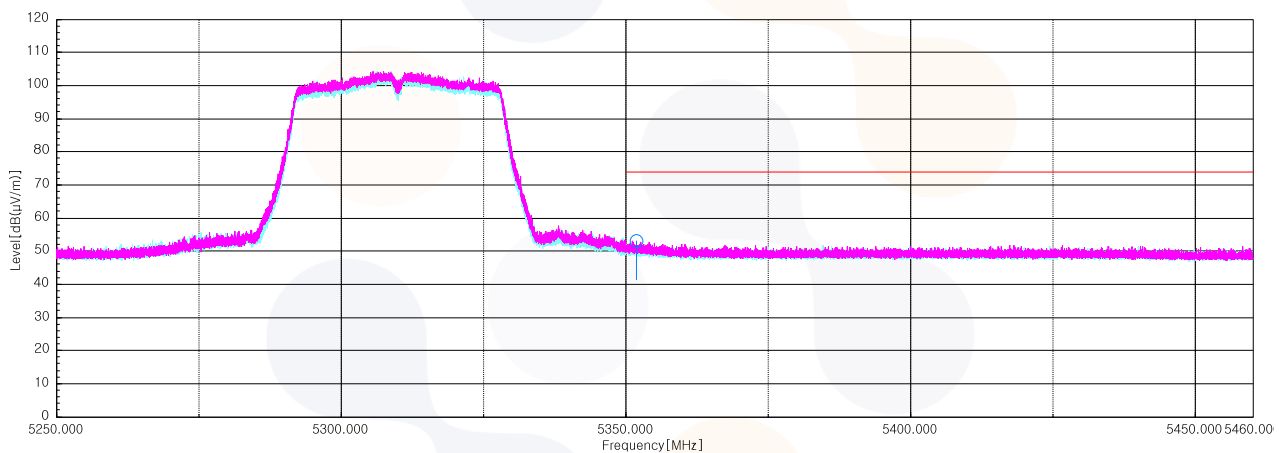
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 350.05 ¹⁾	H	47.00	33.00	-26.92	-	53.08	74.00	20.92
6 372.03	H	61.20	34.64	-44.40	-	51.44	68.20	16.76
10 706.32 ¹⁾	V	54.10	38.90	-42.26	-	50.74	74.00	23.26
15 981.13 ¹⁾	V	52.20	38.20	-38.99	-	51.41	74.00	22.59
Average Data								
5 350.05 ¹⁾	H	35.56	33.00	-26.92	1.11	42.75	54.00	11.25
15 981.13 ¹⁾	V	42.05	38.20	-38.99	1.11	42.37	54.00	11.63

802.11n_HT40_Highest Channel (5 310 MHz)

Average data



Horizontal/Vertical for Band-edge



802.11ac VHT20_Lowest Channel (5 260 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
6 312.45	H	63.50	34.52	-44.48	-	53.54	68.20	14.66
10 517.72	V	54.90	38.74	-42.13	-	51.51	68.20	16.69
15 737.10 ¹⁾	V	52.60	38.10	-39.46		51.24	74.00	22.76
Average Data								
15 737.10 ¹⁾	V	42.20	38.10	-39.46	0.61	41.45	54.00	12.55

802.11ac VHT20_Middle Channel (5 280 MHz)

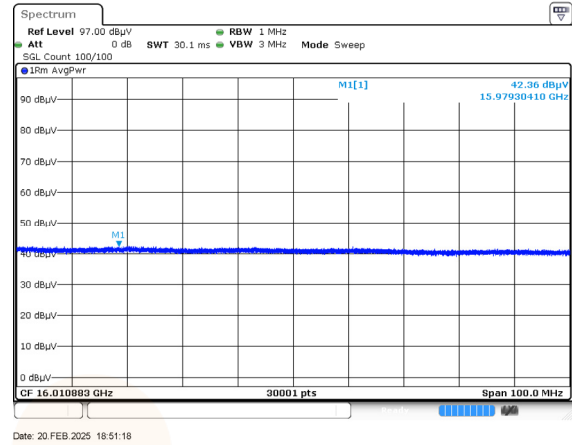
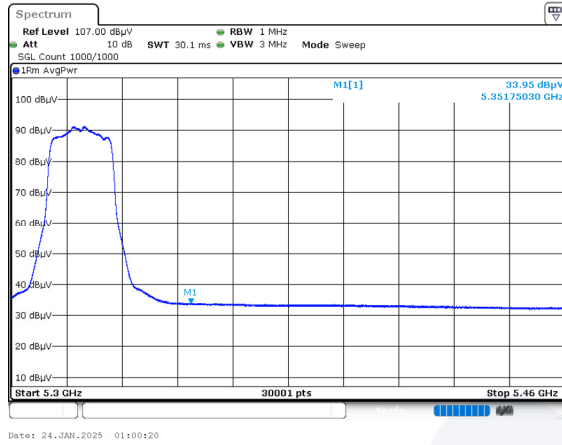
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
6 336.10	H	62.80	34.57	-44.45	-	52.92	68.20	15.28
10 563.33	V	54.70	38.83	-42.24	-	51.29	68.20	16.91
15 839.15 ¹⁾	V	52.20	38.10	-39.31	-	50.99	74.00	23.01
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

802.11ac VHT20_Highest Channel (5 320 MHz)

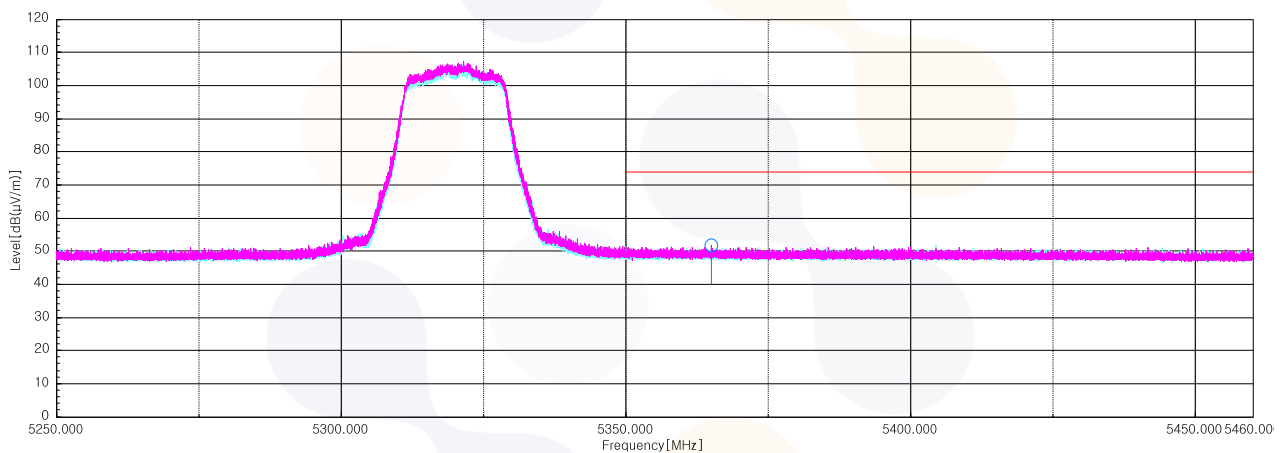
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 351.75 ¹⁾	H	45.60	33.00	-26.92	-	51.68	74.00	22.32
6 384.32	H	61.30	34.67	-44.38	-	51.59	68.20	16.61
10 697.88 ¹⁾	H	54.10	38.90	-42.31	-	50.69	74.00	23.31
15 979.30 ¹⁾	V	52.40	38.20	-39.00	-	51.60	74.00	22.40
Average Data								
5 351.75 ¹⁾	H	33.95	33.00	-26.92	0.61	40.64	54.00	13.36
15 979.30 ¹⁾	V	42.36	38.20	-39.00	0.61	42.17	54.00	11.83

802.11ac VHT20_Highest Channel (5 320 MHz)

Average data



Horizontal/Vertical for Band-edge



802.11ac VHT40_Lowest Channel (5 270 MHz)

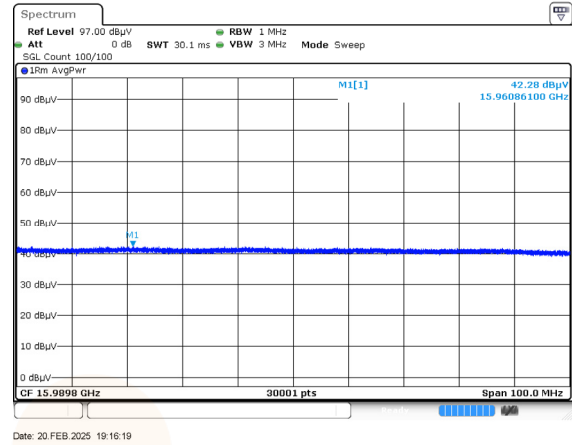
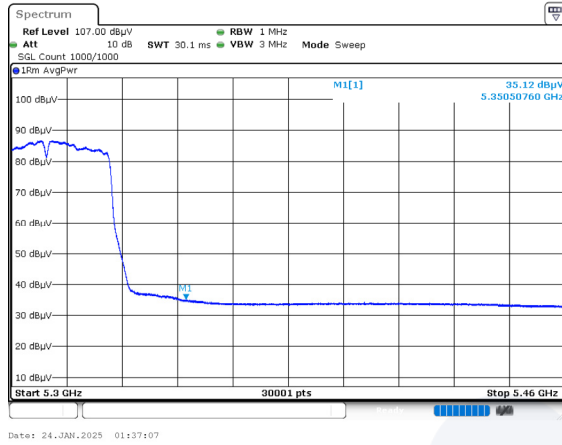
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
6 324.18	H	60.90	34.55	-44.46	-	50.99	68.20	17.21
10 491.27	H	54.50	38.60	-42.06	-	51.04	68.20	17.16
15 841.31 ¹⁾	H	53.20	38.10	-39.32	-	51.98	74.00	22.02
Average Data								
15 841.31 ¹⁾	H	42.40	38.10	-39.32	1.10	42.28	54.00	11.72

802.11ac VHT40_Highest Channel (5 310 MHz)

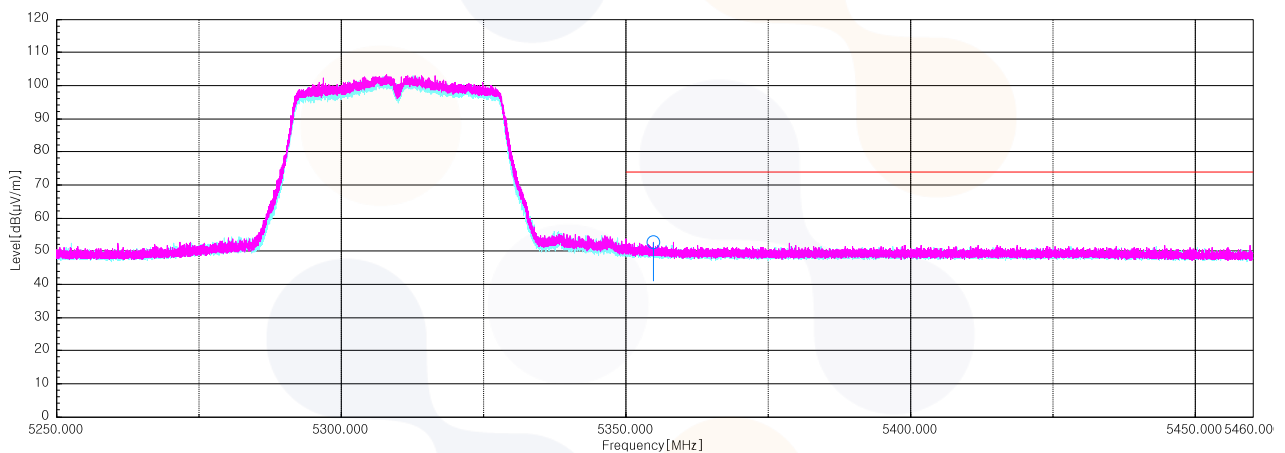
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 350.51 ¹⁾	H	46.70	33.00	-26.92	-	52.78	74.00	21.22
6 372.03	H	61.00	34.64	-44.40	-	51.24	68.20	16.96
10 585.57 ¹⁾	V	54.60	38.87	-42.31	-	51.16	68.20	17.04
15 960.86 ¹⁾	V	52.80	38.20	-39.16	-	51.84	74.00	22.16
Average Data								
5 350.51 ¹⁾	H	35.12	33.00	-26.92	1.10	42.30	54.00	11.70
15 960.86 ¹⁾	V	42.28	38.20	-39.16	1.10	42.42	54.00	11.58

802.11ac VHT40_Highest Channel (5 310 MHz)

Average data



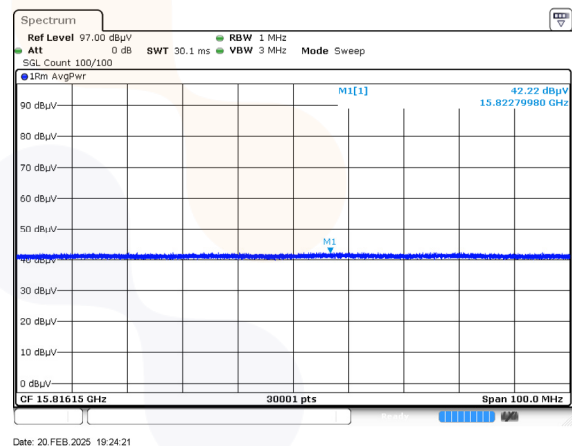
Horizontal/Vertical for Band-edge



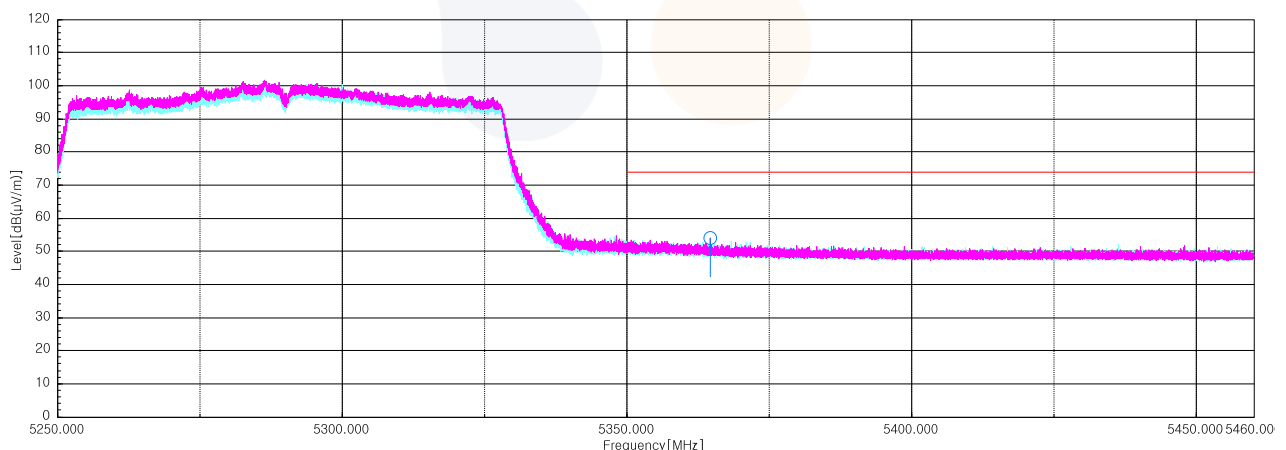
802.11ac VHT80_Middle Channel (5 290 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 356.19 ¹⁾	H	48.00	33.00	-26.91	-	54.09	74.00	19.91
10 573.30	V	54.00	38.85	-42.27	-	50.58	68.20	17.62
15 822.80 ¹⁾	H	52.80	38.10	-39.25	-	51.65	74.00	22.35
Average Data								
5 356.19 ¹⁾	H	35.94	33.00	-26.91	1.86	43.89	54.00	10.11
15 822.80 ¹⁾	H	42.22	38.10	-39.25	1.86	42.93	54.00	11.07

Average data



Horizontal/Vertical for Band-edge

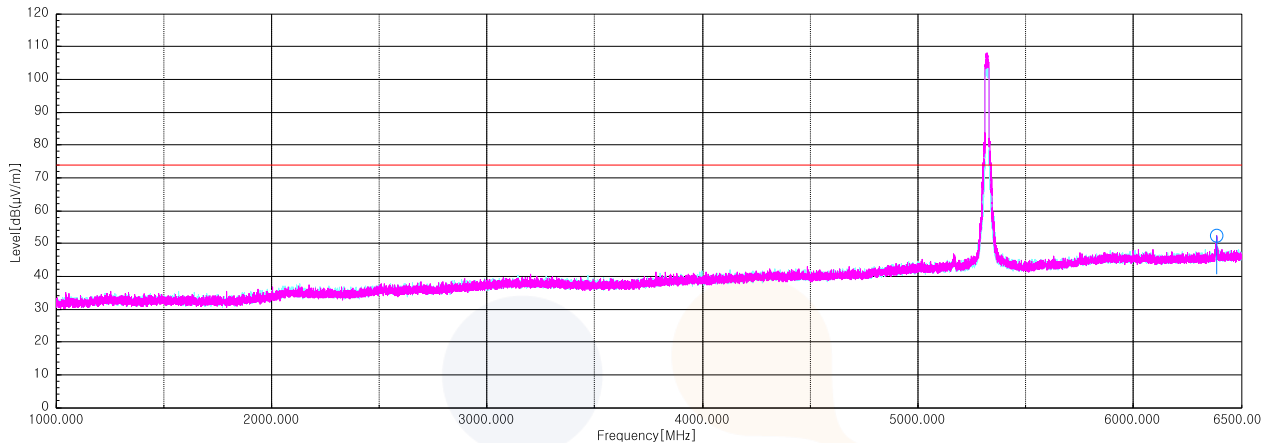


Plot of Harmonics and Spurious Emissions

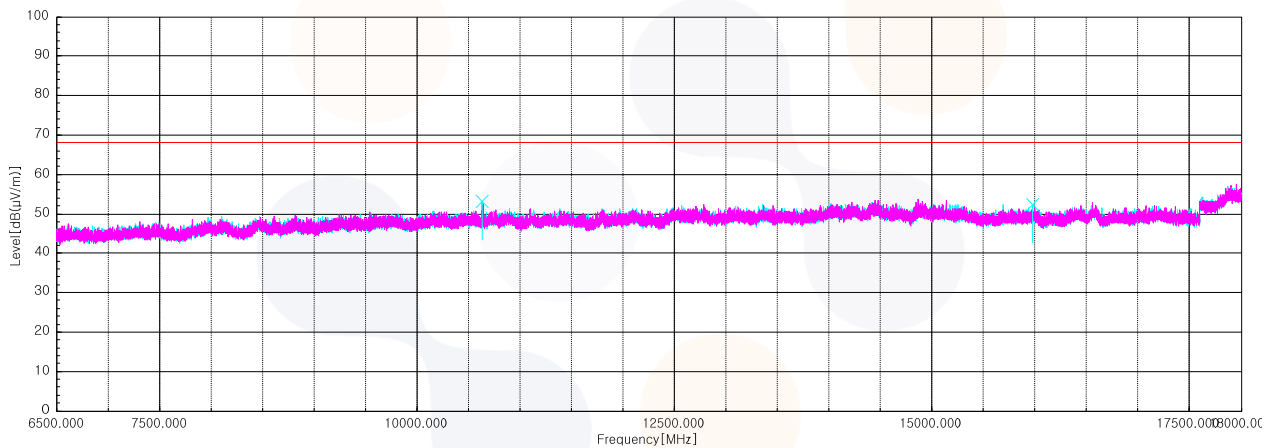
In order to simplify the report, attached plots were only the lowest margin condition

802.11a UNII 2A_2TX MIMO_Highest Channel (5 320 MHz)

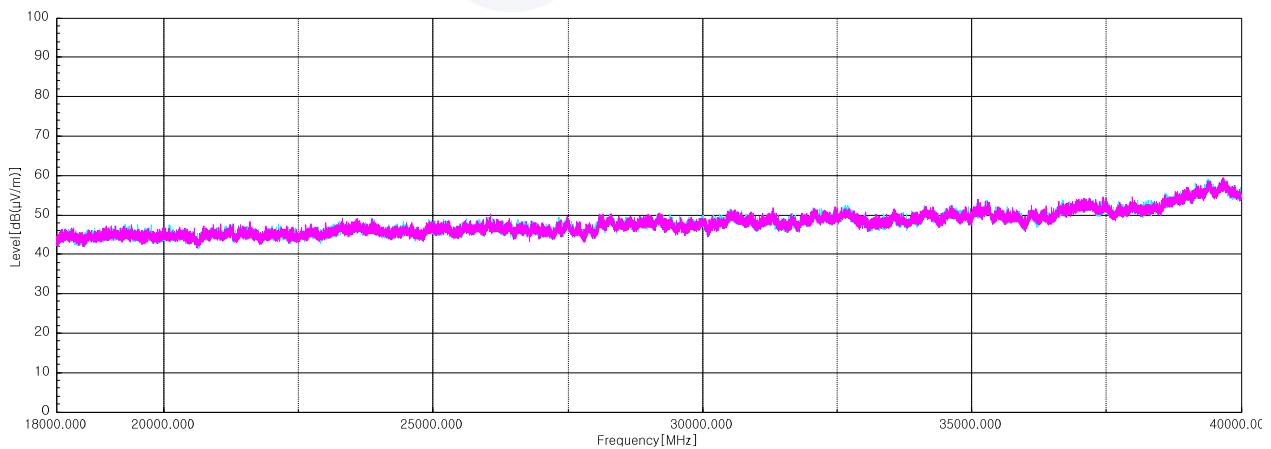
Horizontal/Vertical for 1 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 40 GHz



UNII 2C 2TX MIMO

802.11a_Lowest Channel (5 500 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 457.84 ¹⁾	H	45.10	33.00	-26.82	-	51.28	74.00	22.72
10 939.00 ¹⁾	H	53.30	38.90	-41.56	-	50.64	74.00	23.36
16 557.13	V	51.80	38.40	-37.91	-	52.29	68.20	15.91
Average Data								
5 457.84 ¹⁾	H	34.49	33.00	-26.82	0.28	40.95	54.00	13.05

802.11a_Middle Channel (5 600 MHz)

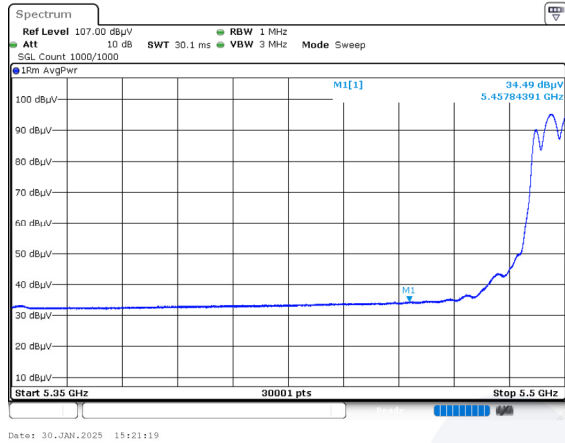
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
6 717.73	H	54.00	36.00	-40.75	-	49.25	68.20	18.95
11 214.23 ¹⁾	V	53.70	38.70	-41.62	-	50.78	74.00	23.22
16 831.98	V	51.50	38.04	-37.76	-	51.78	68.20	16.42
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

802.11a_Highest Channel (5 700 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 726.21	H	51.00	33.50	-26.14	-	58.36	68.20	9.84
11 404.00 ¹⁾	V	53.90	38.90	-41.81	-	50.99	74.00	23.01
17 184.27	V	51.00	38.17	-36.92	-	52.25	68.20	15.95
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

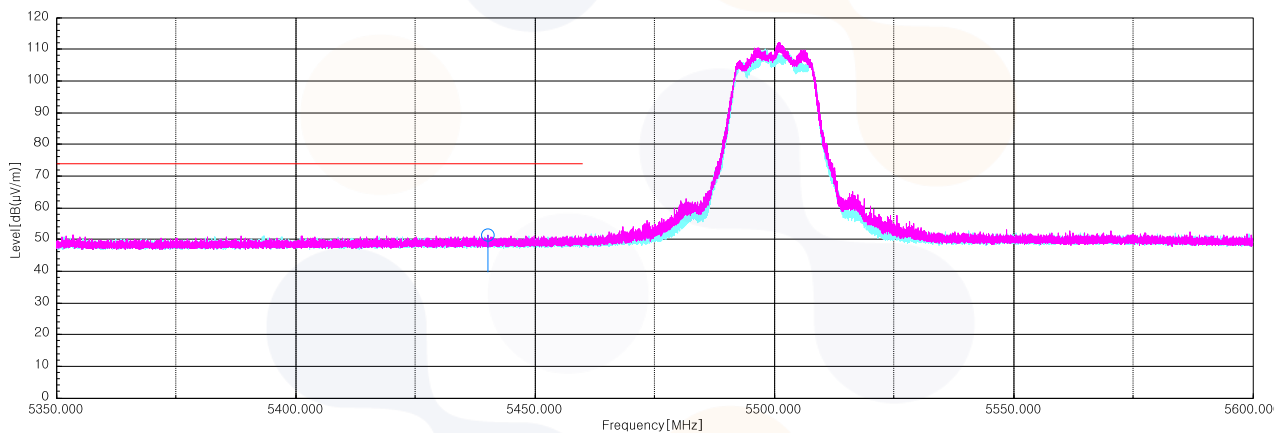
802.11a_Lowest Channel (5 500 MHz)

Average data



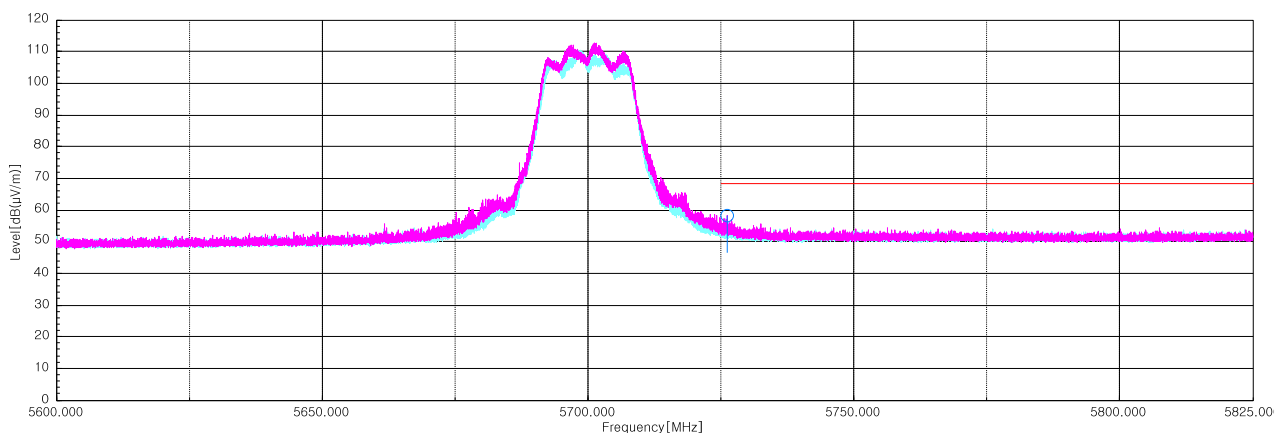
Blank

Horizontal/Vertical for Band-edge



Highest Channel (5 700 MHz)

Horizontal/Vertical for Band-edge



802.11n HT20_Lowest Channel (5 500 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 457.56 ¹⁾	H	46.00	33.00	-26.82	-	52.18	74.00	21.82
10 971.58 ¹⁾	V	53.30	38.76	-41.78	-	50.28	74.00	23.72
16 563.27	V	52.10	38.40	-37.94	-	52.56	68.20	15.64
Average Data								
5 457.56 ¹⁾	H	34.61	33.00	-26.82	0.61	41.40	54.00	12.60

802.11n HT20_Middle Channel (5 600 MHz)

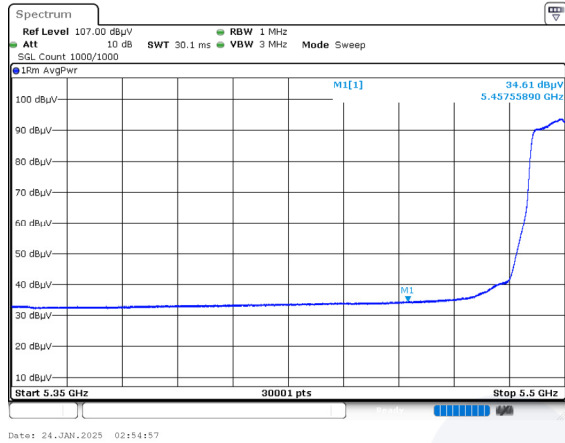
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
6 723.48	H	54.00	36.00	-40.76	-	49.24	68.20	18.96
11 118.66 ¹⁾	V	54.90	38.74	-41.59	-	52.05	74.00	21.95
16 981.10	V	52.40	37.90	-37.69	-	52.61	68.20	15.59
Average Data								
11 118.66 ¹⁾	V	43.45	38.74	-41.59	0.61	41.21	54.00	12.79

802.11n HT20_Highest Channel (5 700 MHz)

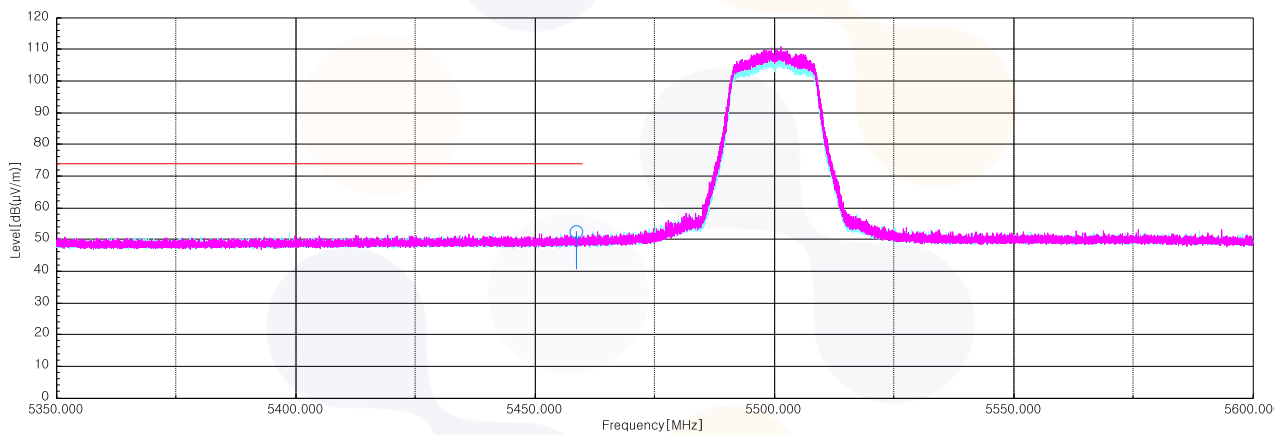
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 729.62	H	46.80	33.52	-26.13	-	54.19	68.20	14.01
11 499.14 ¹⁾	H	54.10	38.70	-41.43	-	51.37	74.00	22.63
17 127.92	H	50.80	38.00	-37.46	-	51.34	68.20	16.86
Average Data								
11 499.14 ¹⁾	H	43.10	38.70	-41.43	0.61	40.98	54.00	13.02

802.11n HT20_Lowest Channel (5 500 MHz)

Average data

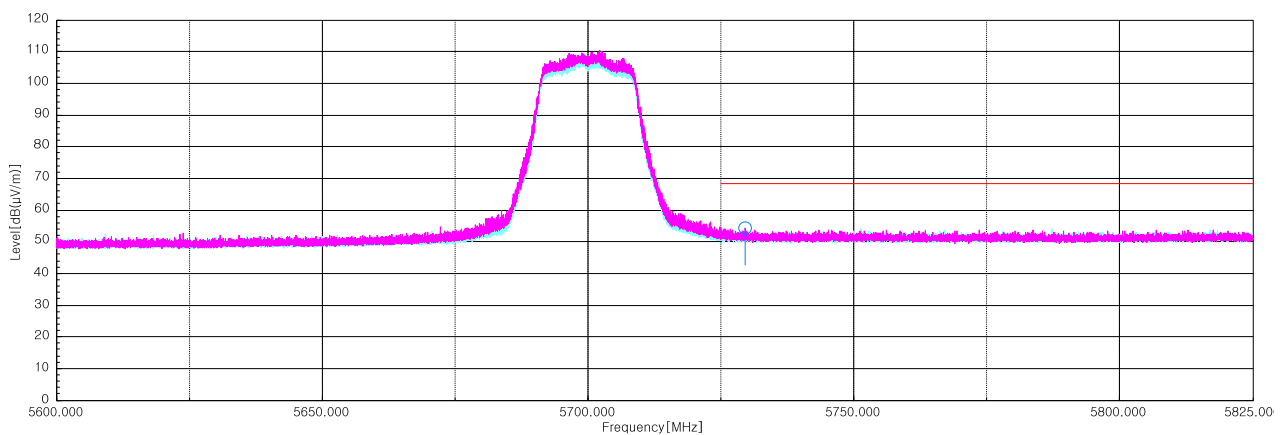


Horizontal/Vertical for Band-edge



Highest Channel (5 700 MHz)

Horizontal/Vertical for Band-edge



802.11n HT40_Lowest Channel (5 510 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 459.02 ¹⁾	V	47.50	33.00	-26.82	-	53.68	74.00	20.32
11 119.30 ¹⁾	H	54.40	38.74	-41.59	-	51.55	74.00	22.45
16 413.38	H	52.20	38.30	-38.17	-	52.33	68.20	15.87
Average Data								
5 459.02 ¹⁾	V	35.15	33.00	-26.82	1.11	42.44	54.00	11.56
11 119.30 ¹⁾	H	43.28	38.74	-41.59	1.11	41.54	54.00	12.46

802.11n HT40_Middle Channel (5 590 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
11 301.59 ¹⁾	V	54.40	38.90	-41.56	-	51.74	74.00	22.26
16 759.92	V	51.30	38.18	-38.22	-	51.26	68.20	16.94
Average Data								
11 301.59 ¹⁾	V	43.65	38.90	-41.56	1.11	42.10	54.00	11.90

802.11n HT40_Highest Channel (5 670 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 735.76	H	47.30	33.54	-26.11	-	54.73	68.20	13.47
11 388.27 ¹⁾	V	53.70	38.90	-41.81	-	50.79	74.00	23.21
17 131.75	V	51.10	38.00	-37.42	-	51.68	68.20	16.52
Average Data								
No spurious emissions were detected within 20 dB of the limit.								