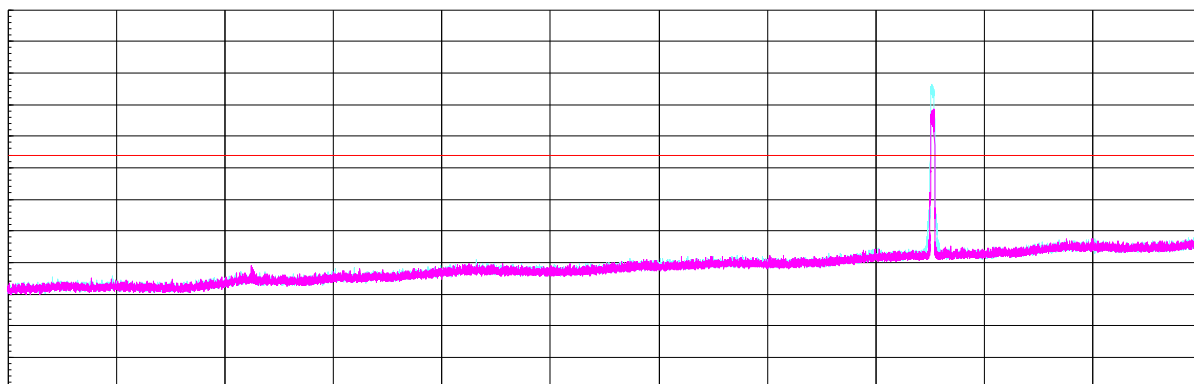
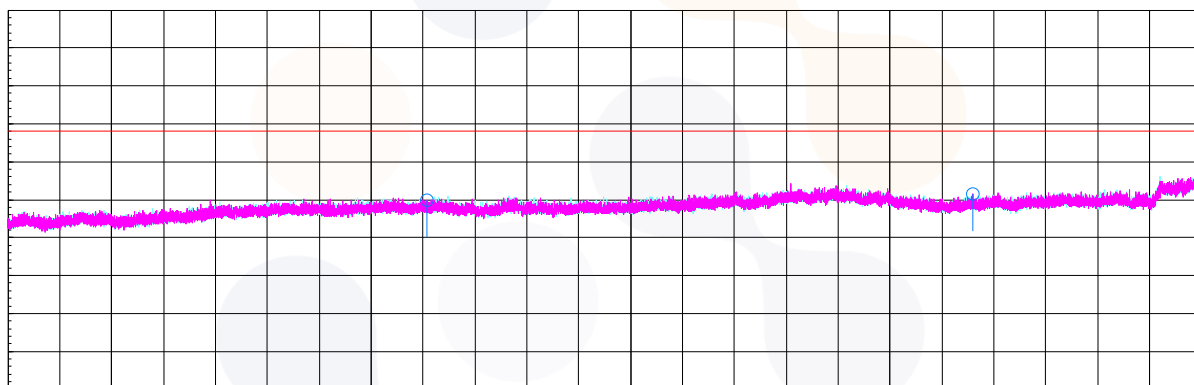


Horizontal/Vertical for 1 GHz ~ 6.5 GHz



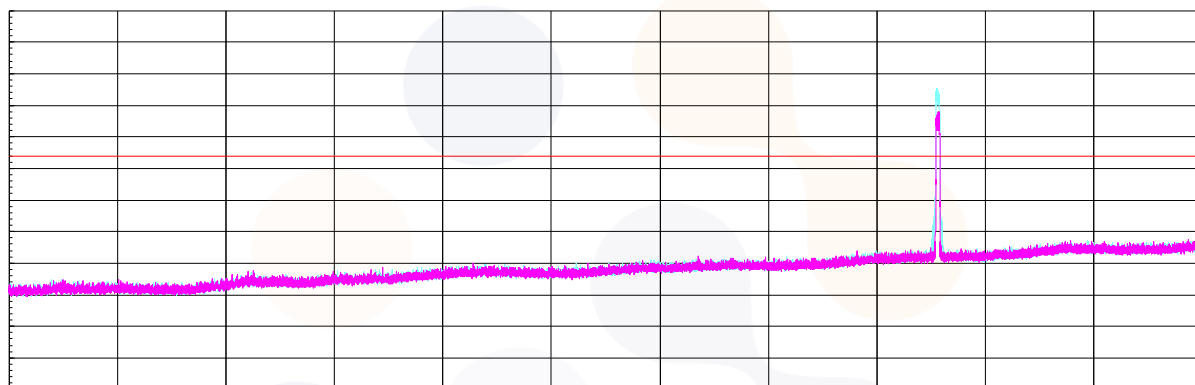
Horizontal/Vertical for 6.5 GHz ~ 18 GHz



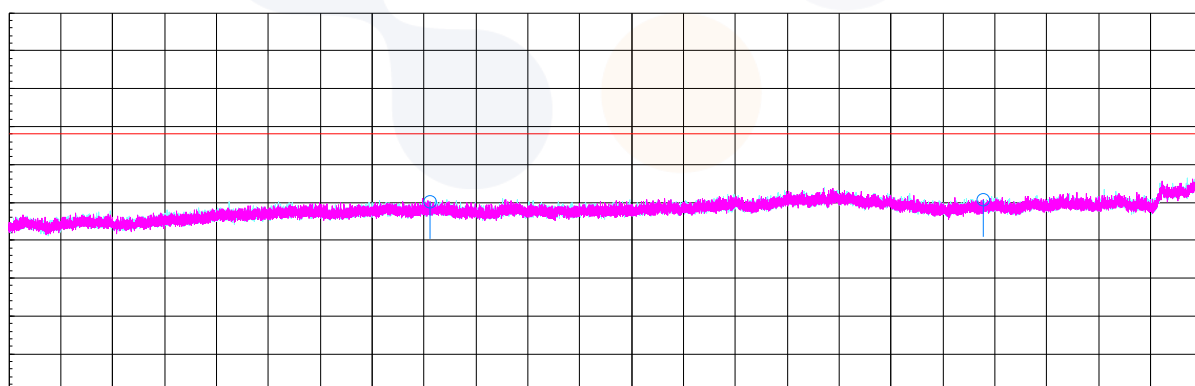
Middle Channel (5 280 MHz)

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
10 561.80	H	55.70	39.02	-44.58	-	50.14	68.20	18.06
15 890.52 ¹⁾	H	54.70	38.08	-42.02	-	50.76	74.00	23.24
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

Horizontal/Vertical for 1 GHz ~ 6.5 GHz

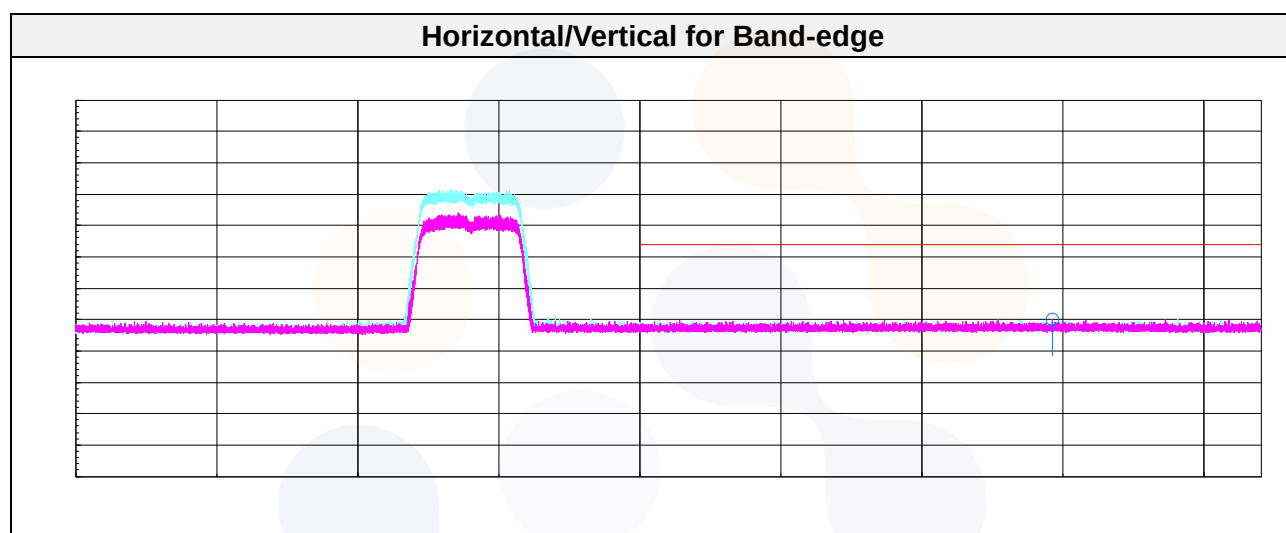


Horizontal/Vertical for 6.5 GHz ~ 18 GHz

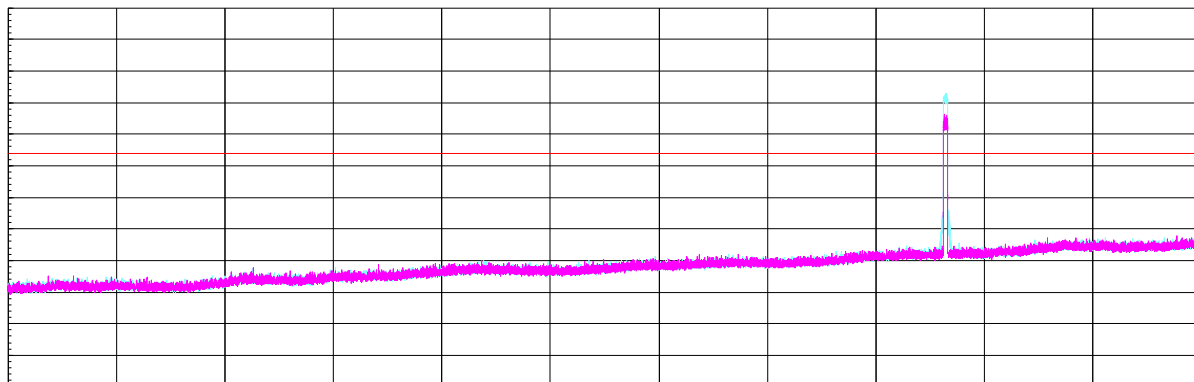


Highest Channel (5 320 MHz)

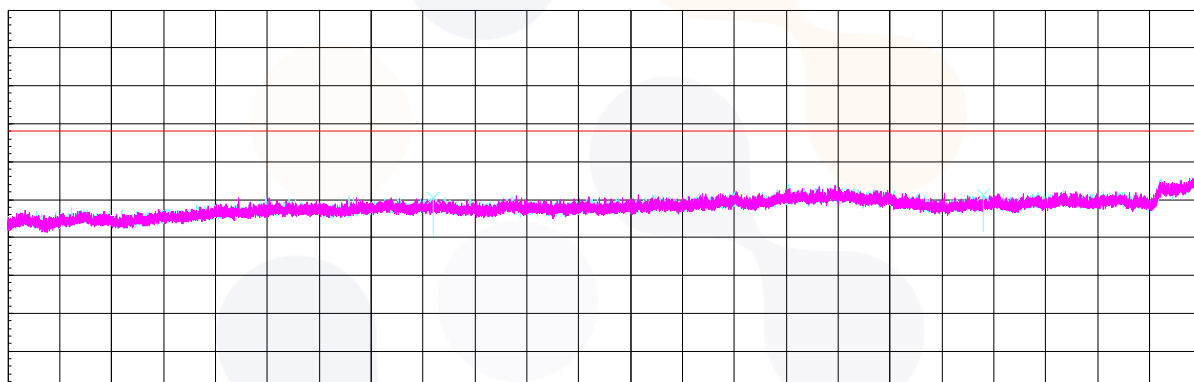
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 423.00 ¹⁾	H	44.00	33.00	-26.85	-	50.15	74.00	23.85
10 602.43 ¹⁾	V	56.00	39.10	-44.64	-	50.46	74.00	23.54
15 882.09 ¹⁾	V	55.10	38.06	-42.04	-	51.12	74.00	22.88
Average Data								
No spurious emissions were detected within 20 dB of the limit.								



Horizontal/Vertical for 1 GHz ~ 6.5 GHz



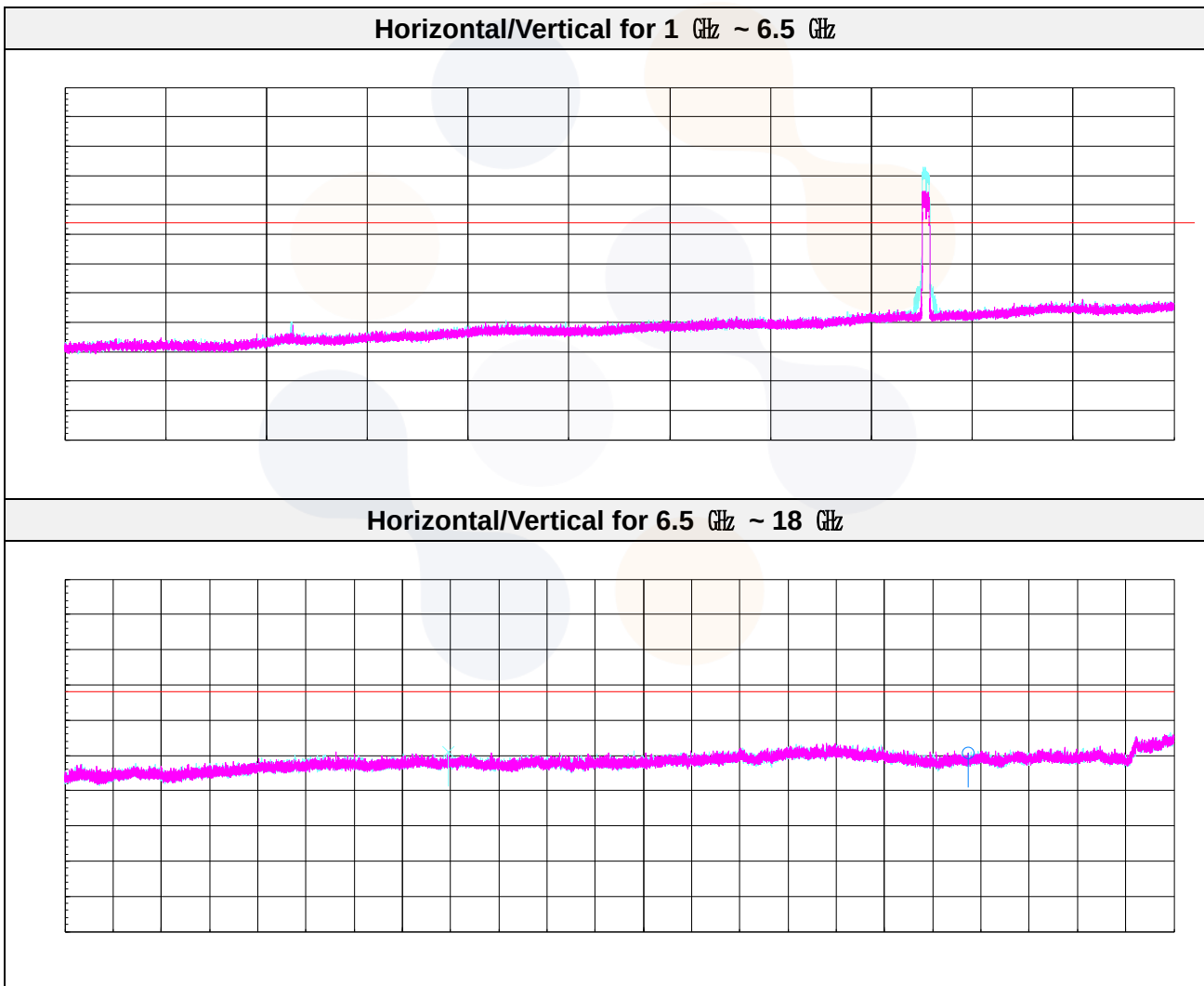
Horizontal/Vertical for 6.5 GHz ~ 18 GHz



802.11n HT40 UNII 2A

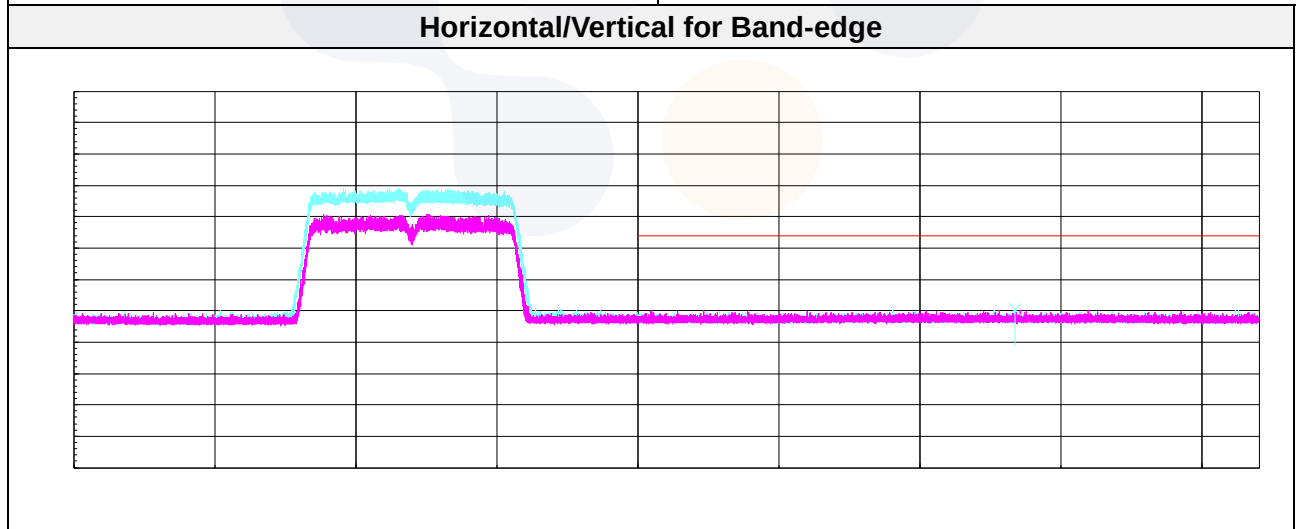
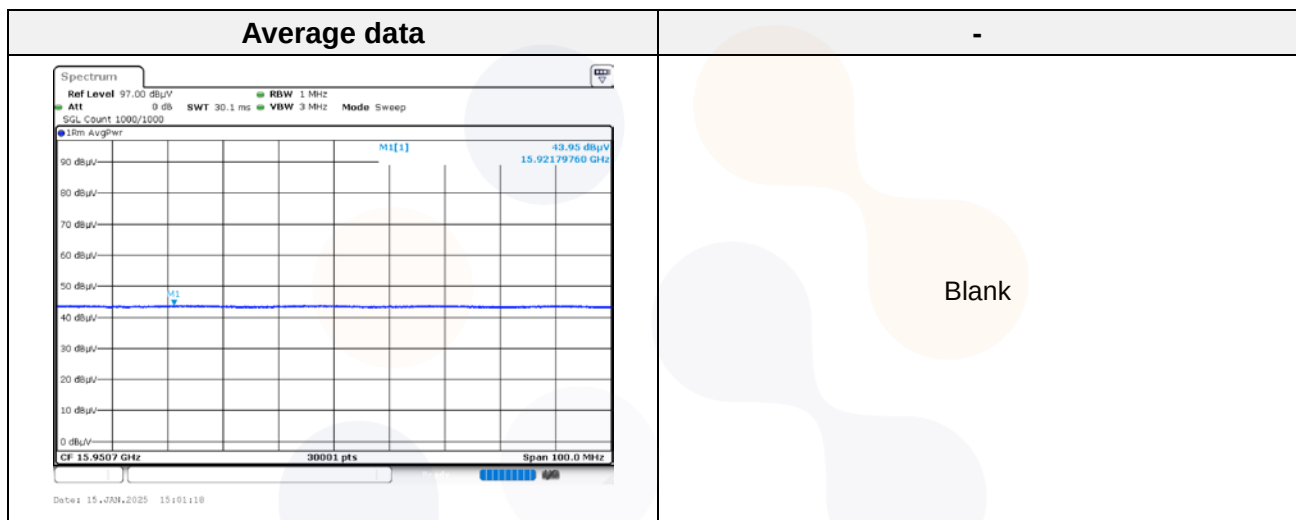
Lowest Channel (5 270 MHz)

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB($\mu V/m$))	(dB($\mu V/m$))	(dB)
Peak data								
10 472.48	V	56.50	38.94	-44.51	-	50.93	68.20	17.27
15 863.30 ¹⁾	H	54.70	38.03	-42.10	-	50.63	74.00	23.37
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

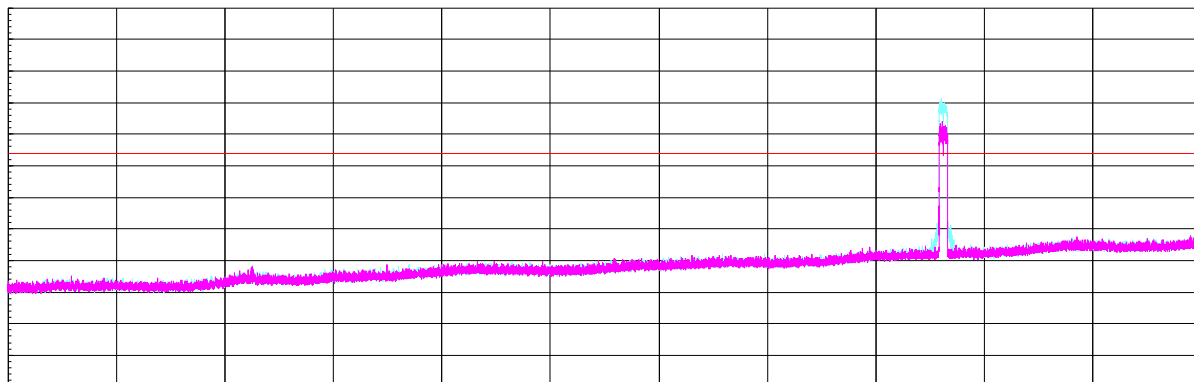


Highest Channel (5 310 MHz)

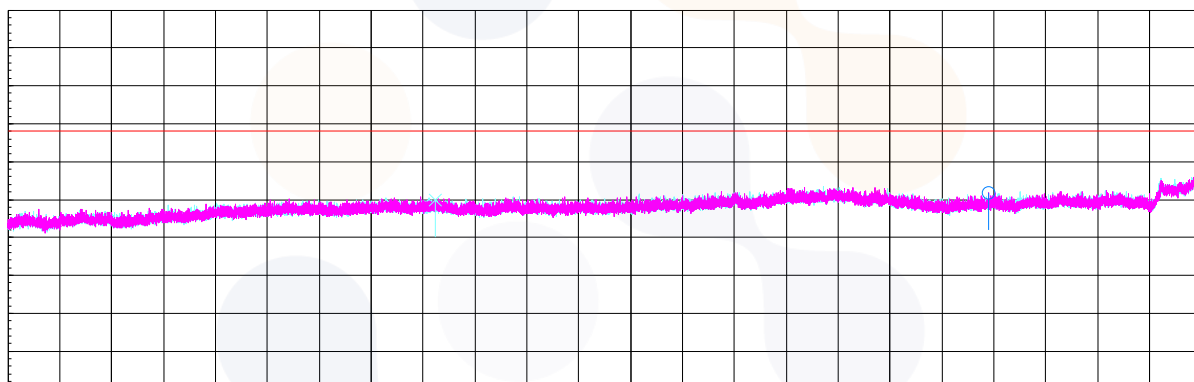
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 416.82 ¹⁾	V	44.10	33.00	-26.86	-	50.24	74.00	23.76
10 623.13 ¹⁾	V	55.40	39.15	-44.66	-	49.89	74.00	24.11
15 921.80 ¹⁾	H	55.60	38.00	-41.93	-	51.67	74.00	22.33
Average Data								
15 921.80 ¹⁾	H	43.95	38.00	-41.93	0.65	40.67	54.00	13.33



Horizontal/Vertical for 1 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz

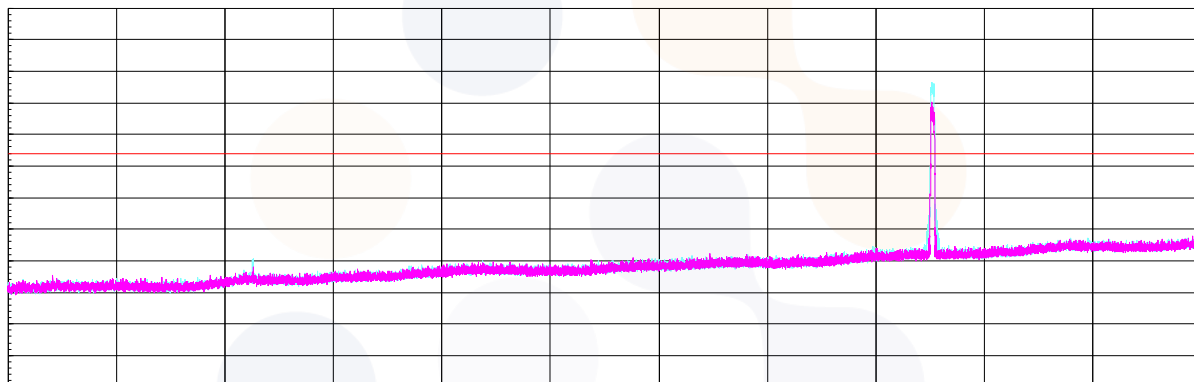


802.11ac VHT20 UNII 2A

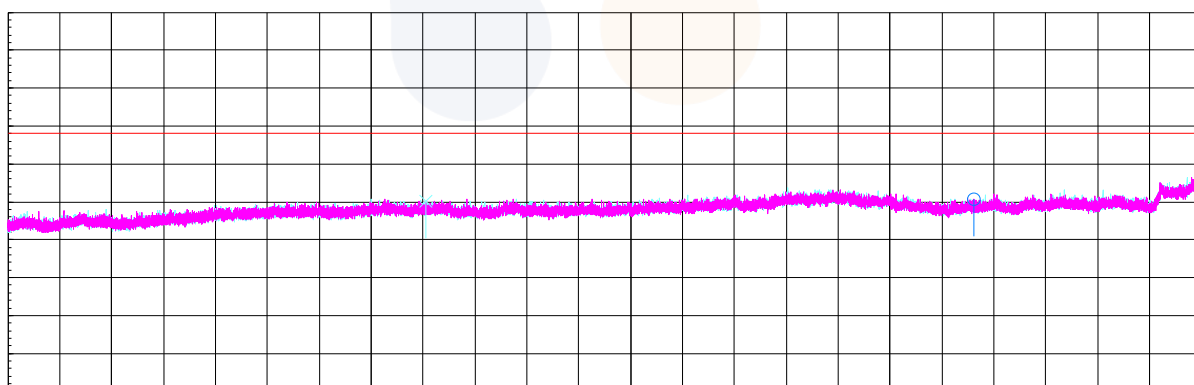
Lowest Channel (5 260 MHz)

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB($\mu V/m$))	(dB($\mu V/m$))	(dB)
Peak data								
10 532.28	V	55.70	38.90	-44.54	-	50.06	68.20	18.14
15 802.73 ¹⁾	H	55.00	37.90	-42.27	-	50.63	74.00	23.37
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

Horizontal/Vertical for 1 GHz ~ 6.5 GHz

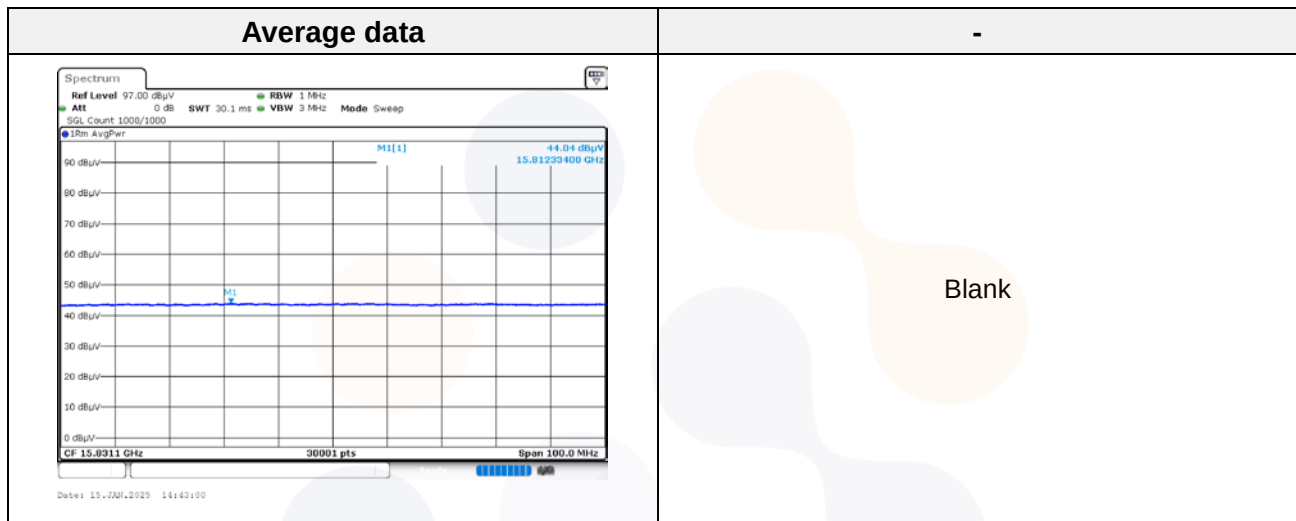


Horizontal/Vertical for 6.5 GHz ~ 18 GHz

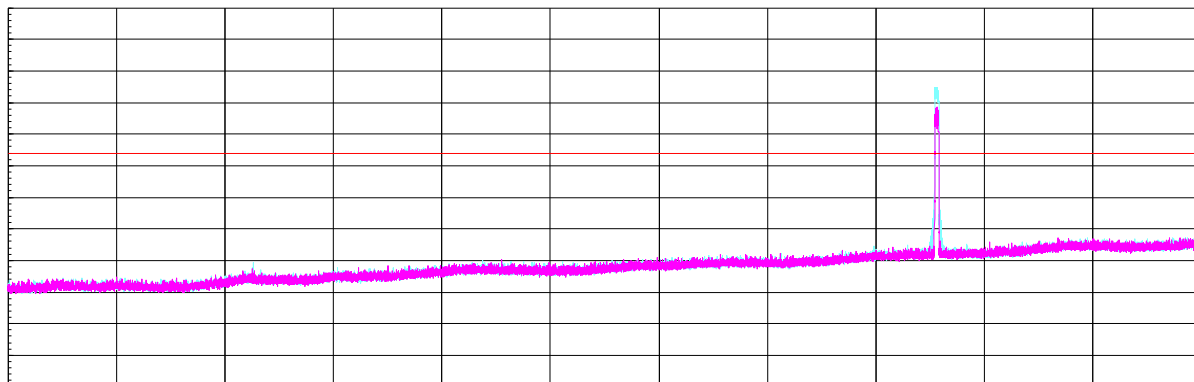


Middle Channel (5 280 MHz)

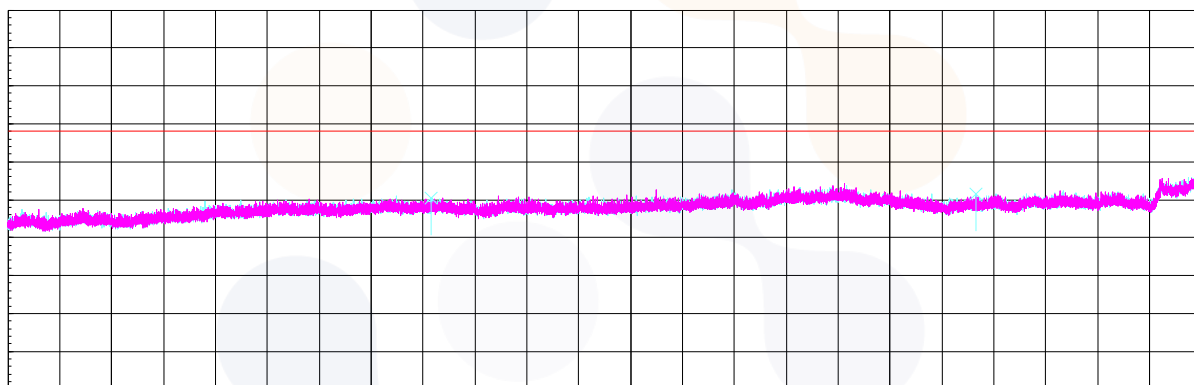
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
10 576.75	V	55.80	39.05	-44.60	-	50.25	68.20	17.95
15 812.33 ¹⁾	V	55.80	37.90	-42.24	-	51.46	74.00	22.54
Average Data								
15 812.33 ¹⁾	V	44.04	37.90	-42.24	0.65	40.35	54.00	13.65



Horizontal/Vertical for 1 GHz ~ 6.5 GHz

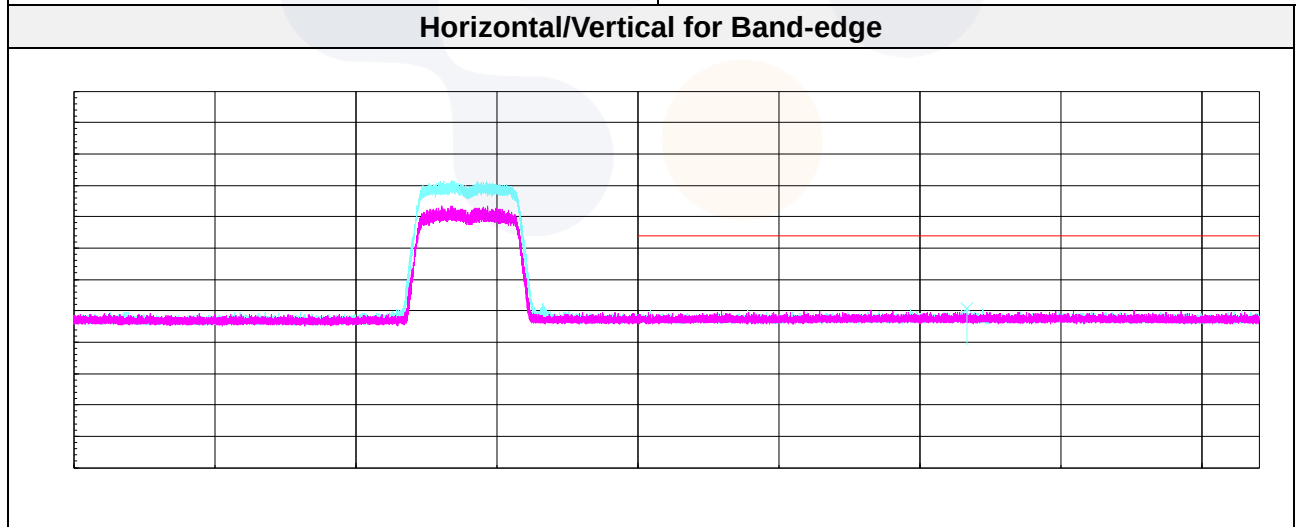
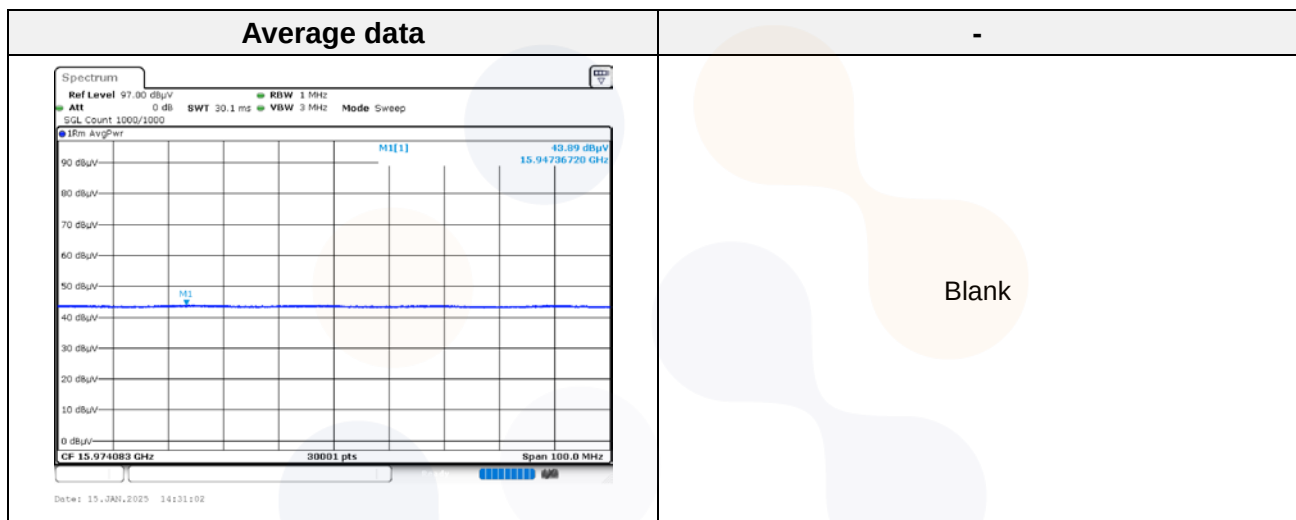


Horizontal/Vertical for 6.5 GHz ~ 18 GHz

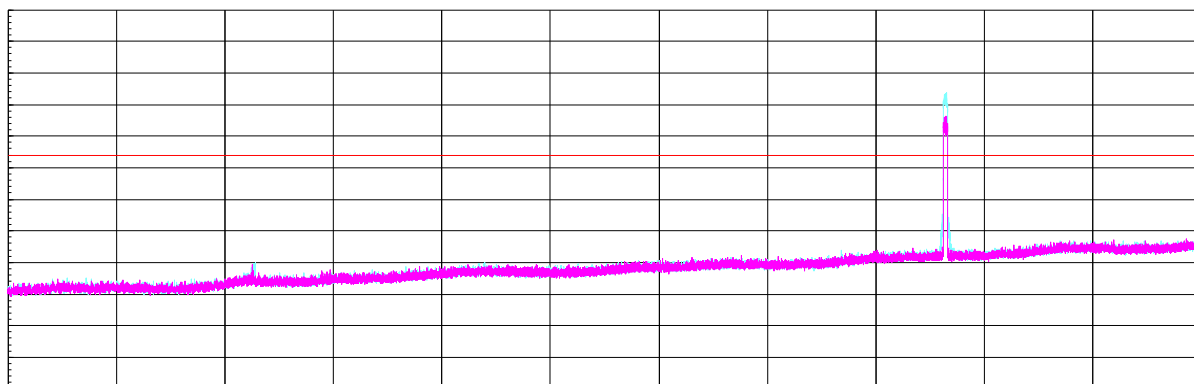


Highest Channel (5 320 MHz)

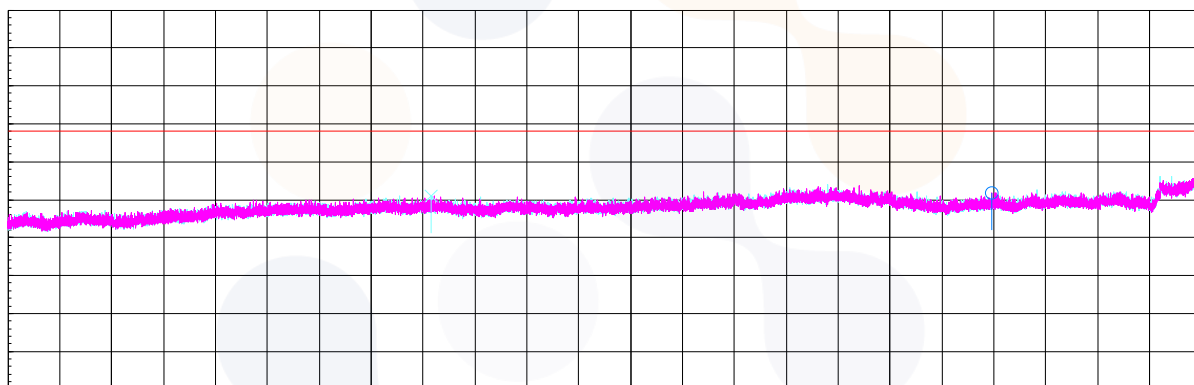
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
5 408.31 ¹⁾	V	44.40	33.00	-26.86	-	50.54	74.00	23.46
10 582.88	V	56.50	39.07	-44.61	-	50.96	68.20	17.24
15 947.37 ¹⁾	H	55.60	38.00	-41.86	-	51.74	74.00	22.26
Average Data								
15 947.37 ¹⁾	H	43.89	38.00	-41.86	0.61	40.64	54.00	13.36



Horizontal/Vertical for 1 GHz ~ 6.5 GHz



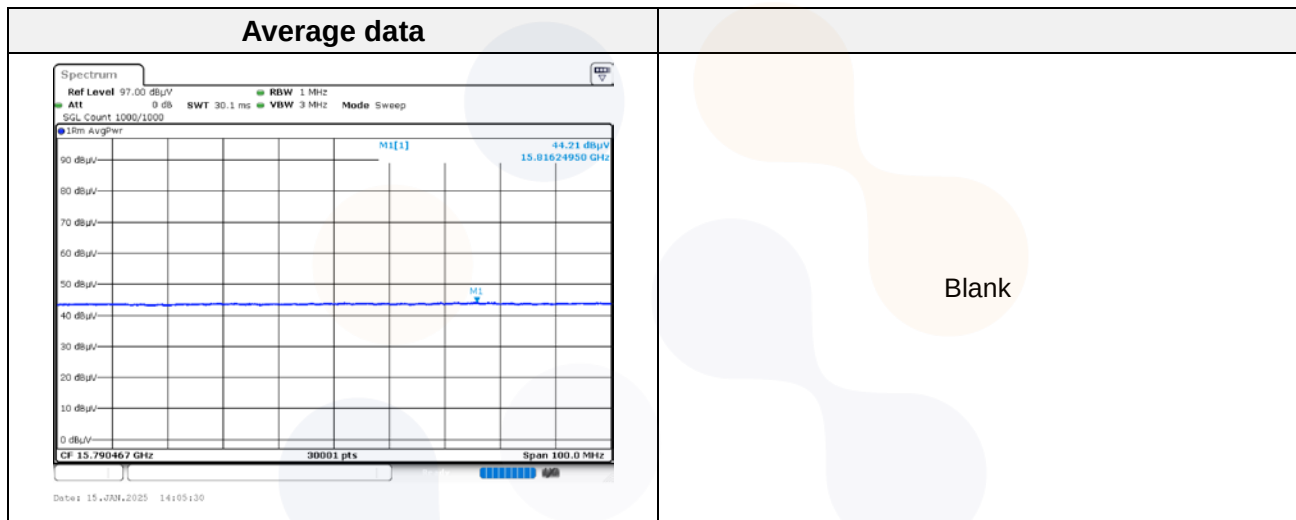
Horizontal/Vertical for 6.5 GHz ~ 18 GHz



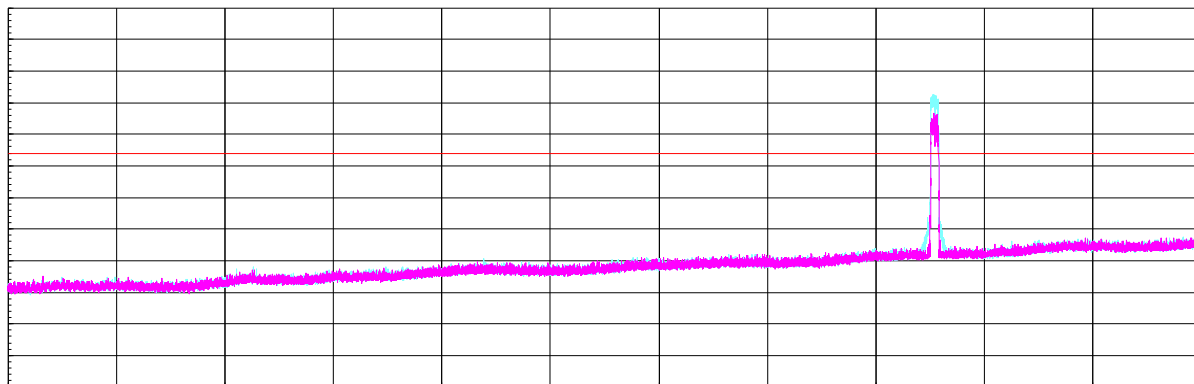
802.11ac VHT40 UNII 2A

Lowest Channel (5 270 MHz)

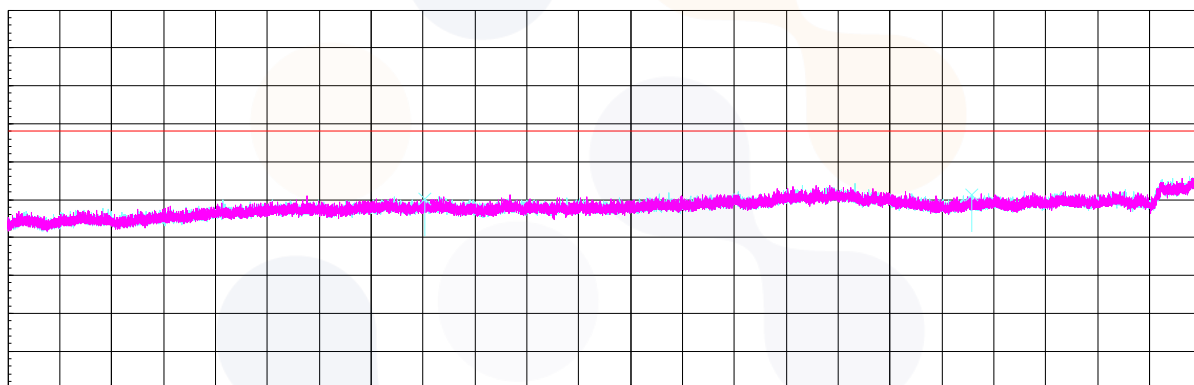
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB($\mu V/m$))	(dB($\mu V/m$))	(dB)
Peak data								
10 518.10	V	55.70	38.90	-44.52	-	50.08	68.20	18.12
15 816.25 ¹⁾	V	55.50	37.90	-42.23	-	51.17	74.00	22.83
Average Data								
15 816.25 ¹⁾	V	44.21	37.90	-42.23	1.12	41.00	54.00	13.00



Horizontal/Vertical for 1 GHz ~ 6.5 GHz

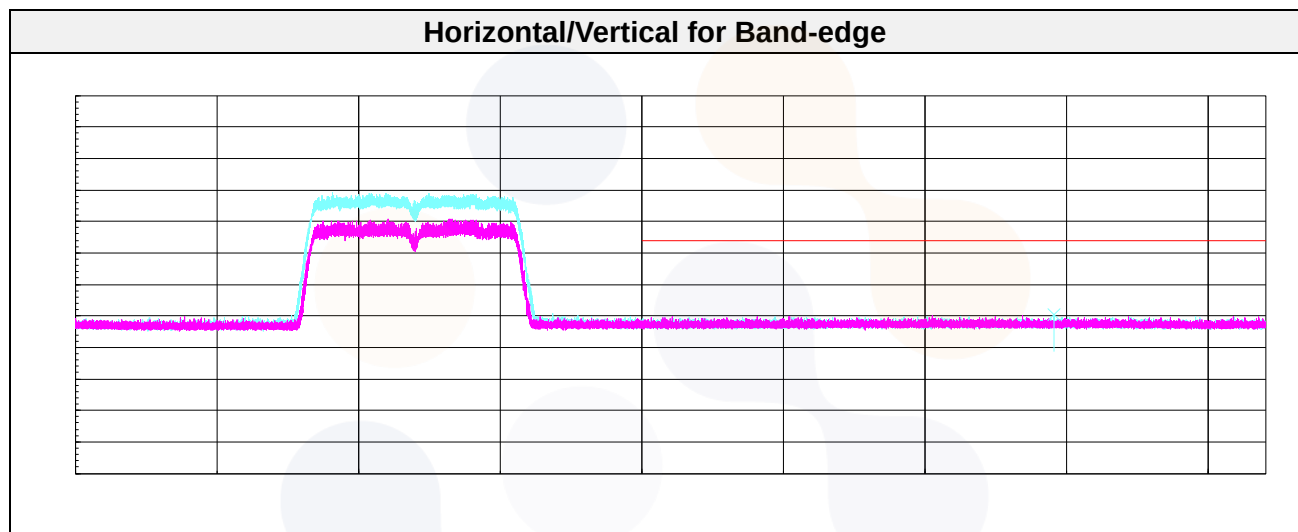


Horizontal/Vertical for 6.5 GHz ~ 18 GHz

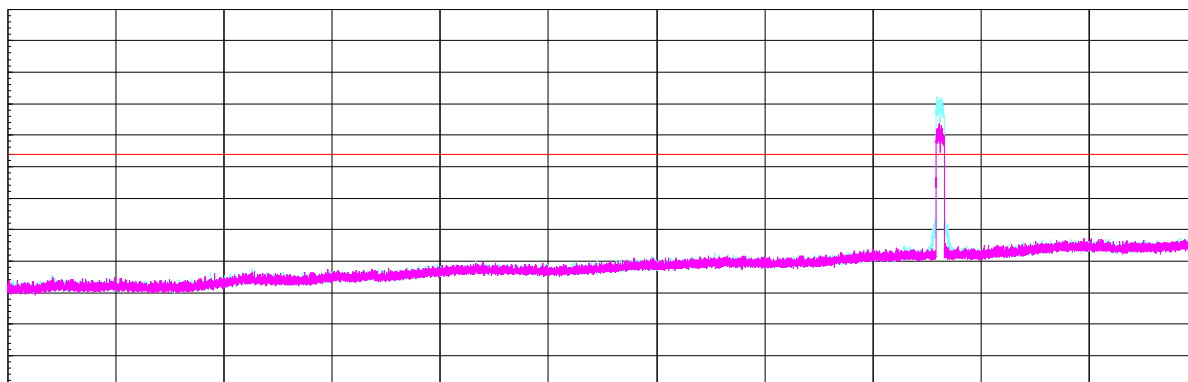


Highest Channel (5 310 MHz)

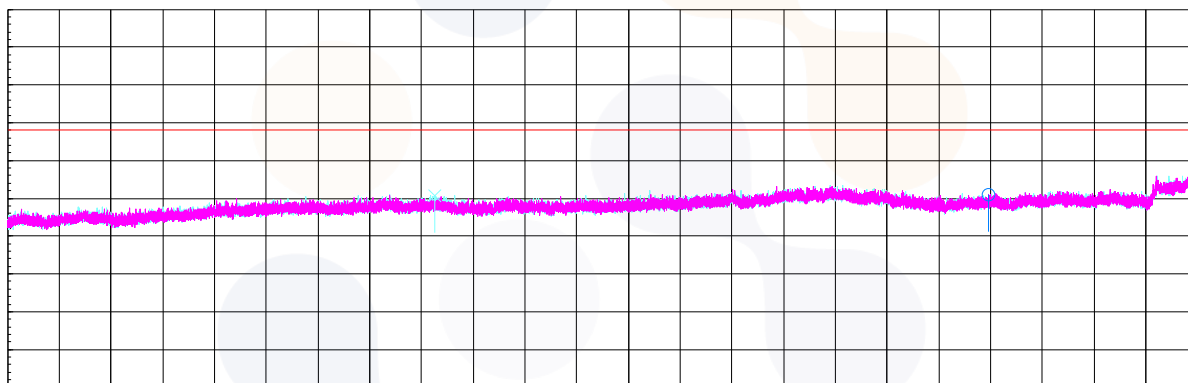
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB($\mu V/m$))	(dB($\mu V/m$))	(dB)
Peak data								
5 422.75 ¹⁾	V	44.10	33.00	-26.85	-	50.25	74.00	23.75
10 632.33 ¹⁾	V	56.20	39.16	-44.67	-	50.69	74.00	23.31
15 980.98 ¹⁾	H	54.60	38.00	-41.76	-	50.84	74.00	23.16
Average Data								
No spurious emissions were detected within 20 dB of the limit.								



Horizontal/Vertical for 1 GHz ~ 6.5 GHz



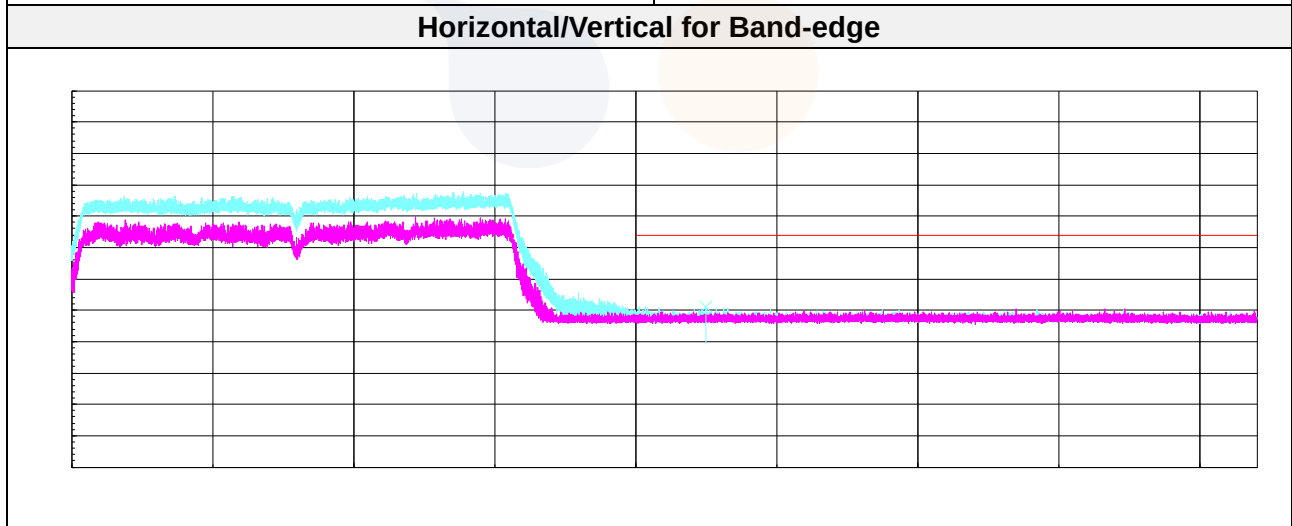
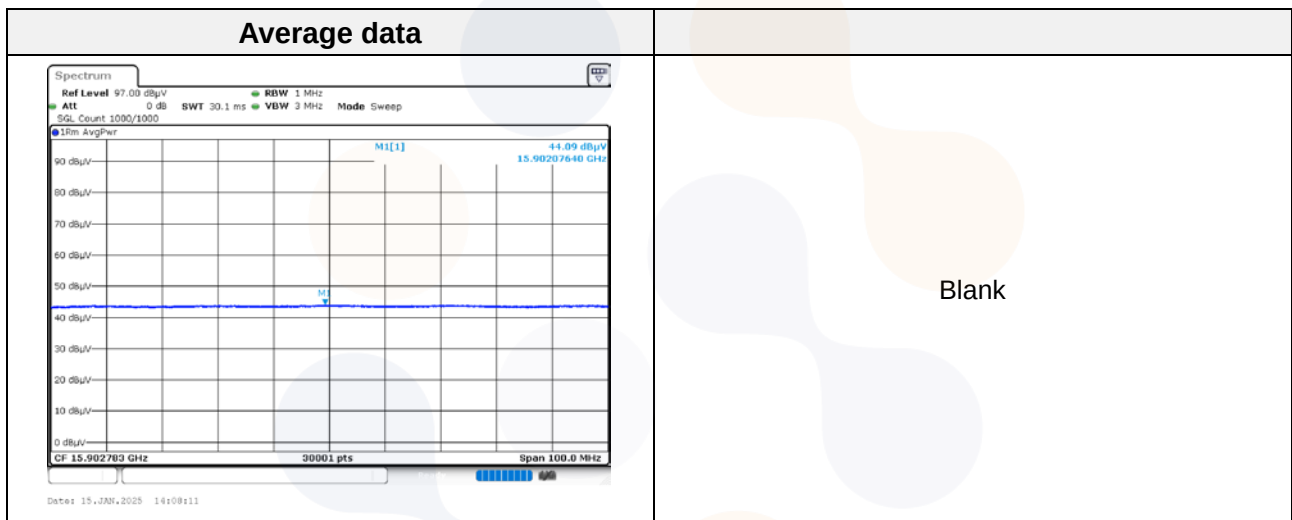
Horizontal/Vertical for 6.5 GHz ~ 18 GHz



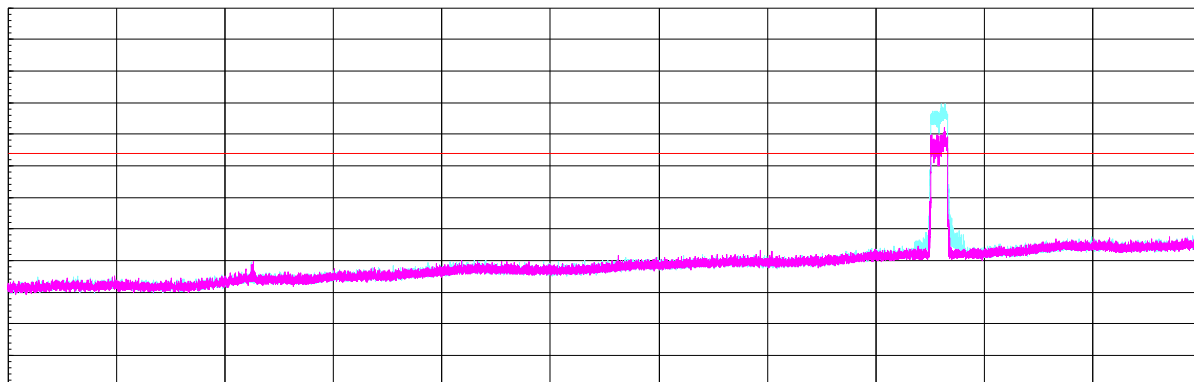
802.11ac VHT80 UNII 2A

Lowest Channel (5 290 MHz)

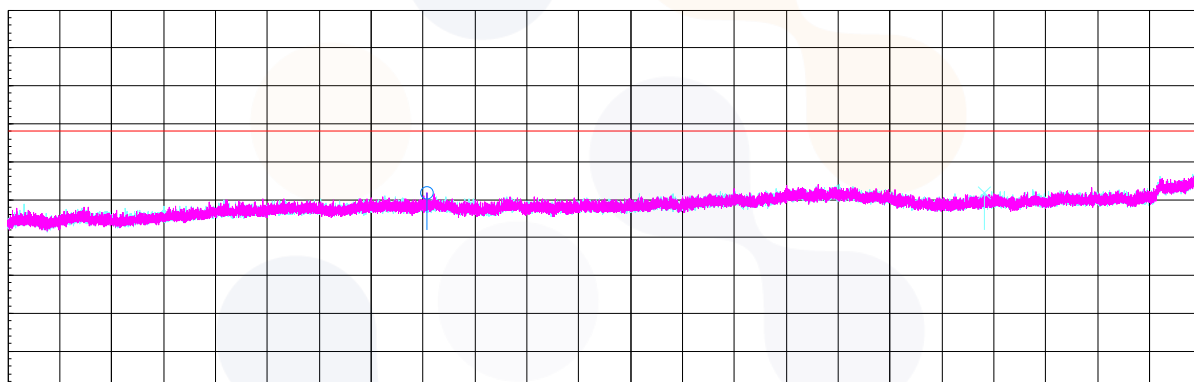
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB($\mu V/m$))	(dB($\mu V/m$))	(dB)
Peak data								
5 362.49 ¹⁾	V	44.90	33.00	-26.91	-	50.99	74.00	23.01
10 538.42	H	57.40	38.90	-44.55	-	51.75	68.20	16.45
15 902.08 ¹⁾	V	55.80	38.00	-41.99	-	51.81	74.00	22.19
Average Data								
15 902.08 ¹⁾	V	44.09	38.00	-41.99	1.87	41.97	54.00	12.03



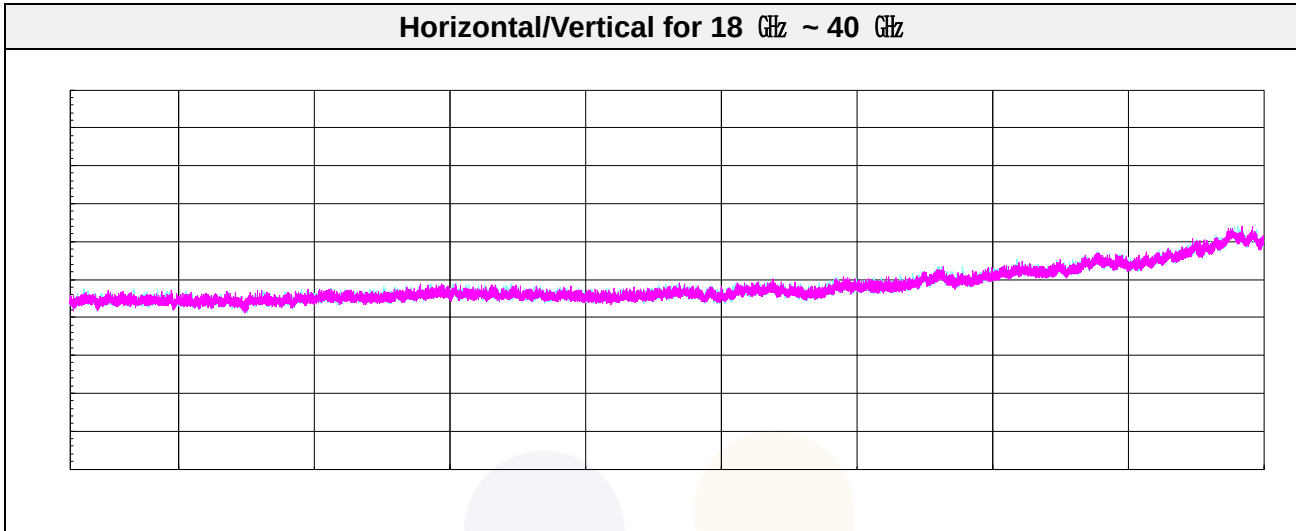
Horizontal/Vertical for 1 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz



Test results (Above 18 GHz) – Worst case: 802.11ac VHT80_UNII 1_5 290 MHz



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

Spurious Emission for Simultaneous Tx Condition

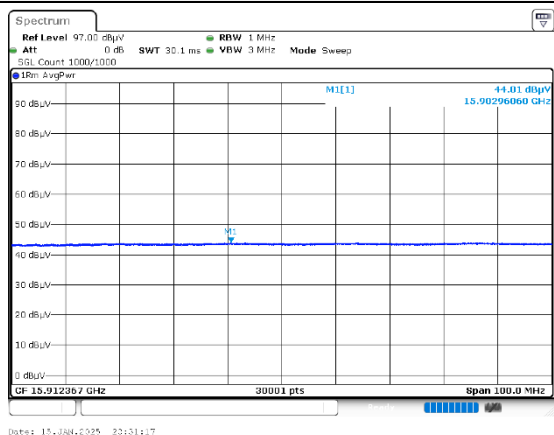
Case	WLAN 5 GHz (MIMO)	Bluetooth (ANT2)
Mode	802.11ac80	BLE
Channel	58	39
Frequency	5 290 MHz	2 480 MHz
Data Rate	MCS0	2M Bits/s,37Packet

Notes.

The lowest margin condition among the channels and modes were selected for test.

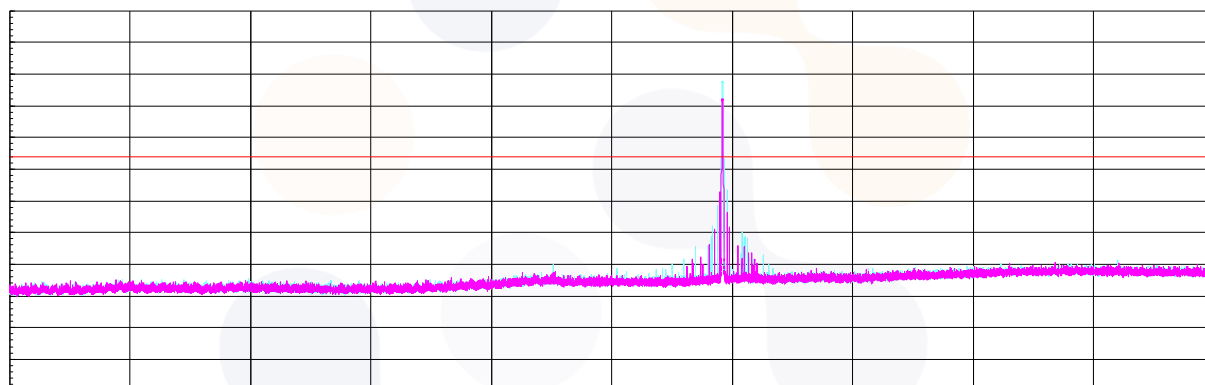
Frequency	Pol.	Reading	Ant. Factor	Amp.+Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
4 992.90 ¹⁾	V	61.70	33.07	-45.56	-	49.21	74.00	24.79
7 435.72 ¹⁾	V	53.30	36.63	-43.59	-	46.34	74.00	27.66
10 545.32	V	55.80	38.90	-44.56	-	50.14	74.00	23.86
15 902.96 ¹⁾	H	55.30	38.00	-41.99	-	51.31	74.00	22.69
Average Data								
15 902.96 ¹⁾	H	44.01	38.00	-41.99	9.87	49.89	54.00	4.11

Average data

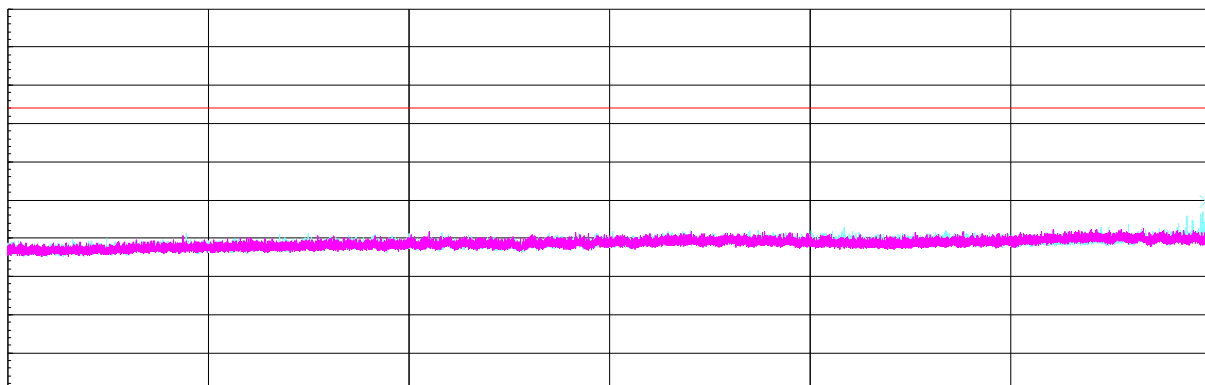


Blank

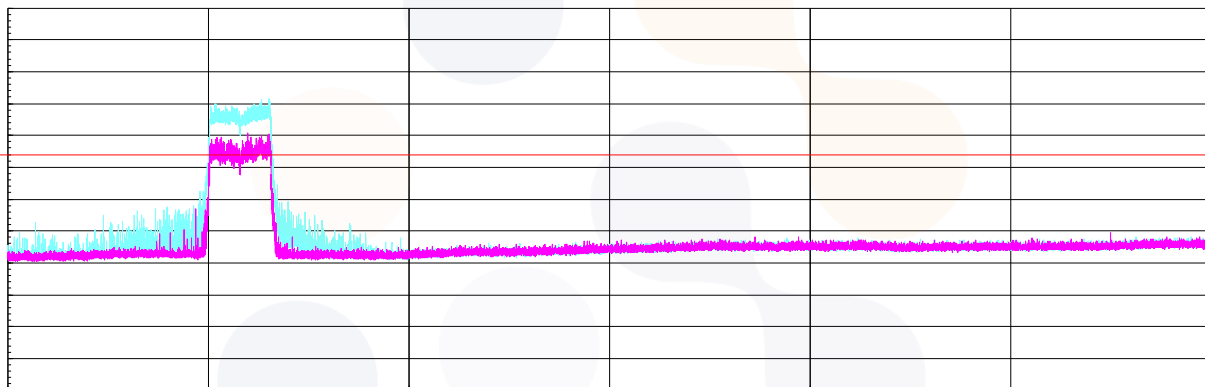
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



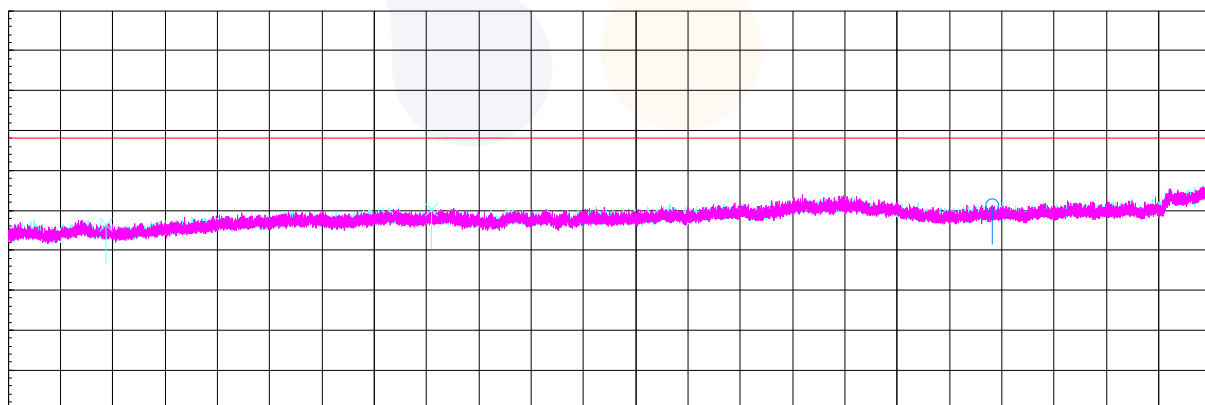
Horizontal/Vertical for 3.5 GHz ~ 5 GHz



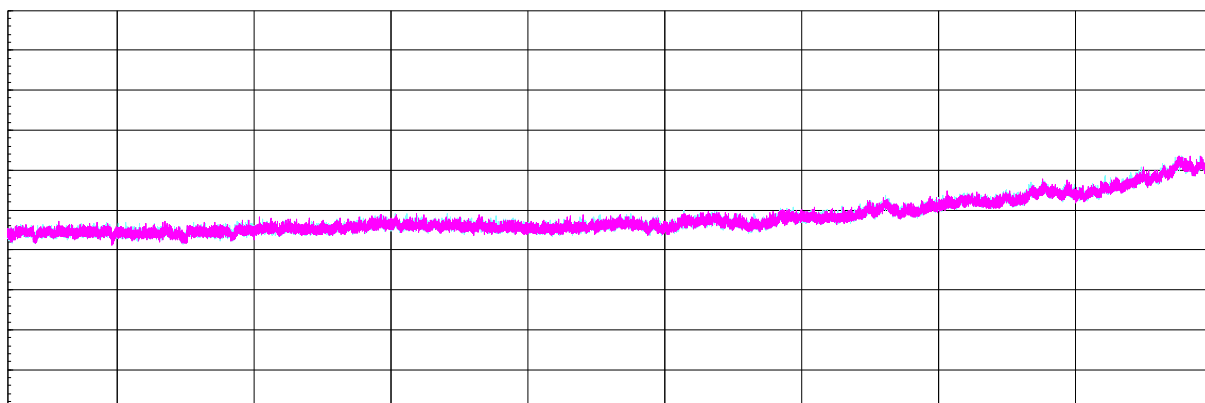
Horizontal/Vertical for 5 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz

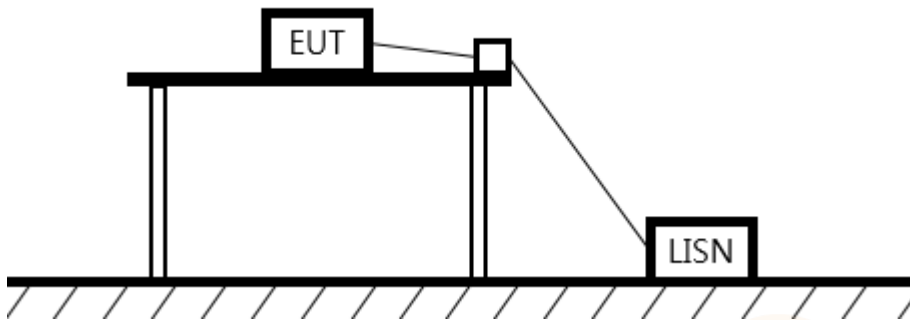


Horizontal/Vertical for 18 GHz ~ 40 GHz



7.2. AC Conducted emission

Test setup



Limit

According to 15.207(a), 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 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/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.

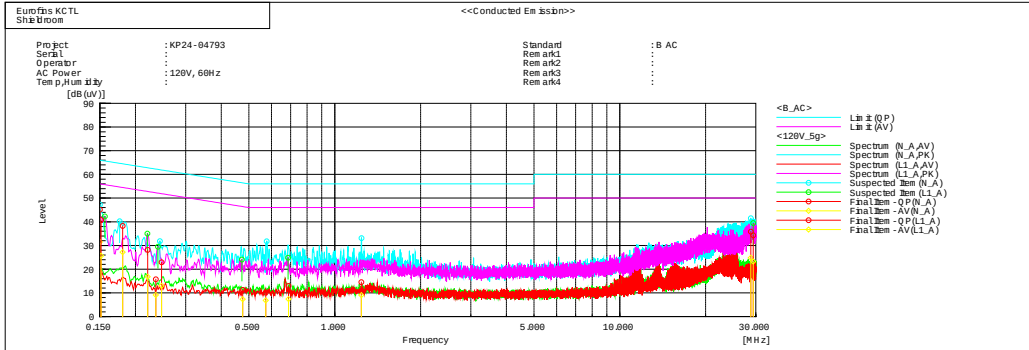
Frequency of Emission (MHz)	Conducted limit (dB μ V/m)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

Measurement procedure

1. The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 cm in which is located 40 cm 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 50 Ω /50 μ H 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 MHz to 30 MHz.
5. The measurements were made with the detector set to peak amplitude within a bandwidth of 10 kHz or to quasi-peak and average within a bandwidth of 9 kHz. The EUT was in transmitting mode during the measurements.

Test results

- Worst case: 802.11n HT40_UNII 1_5 190 MHz AC 120 V



Final Result

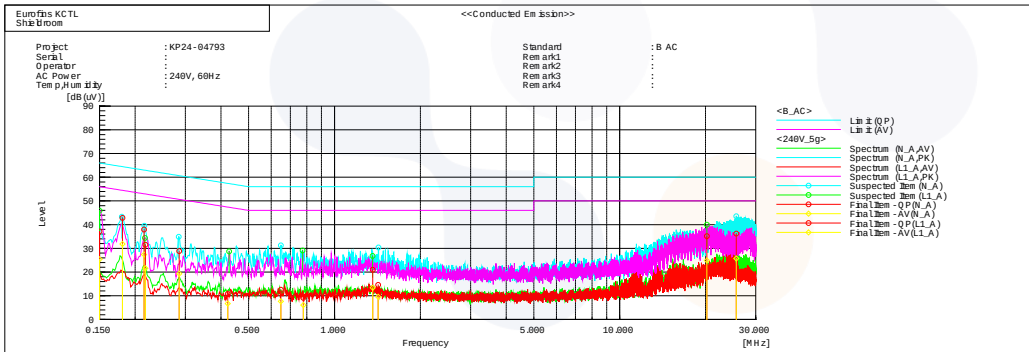
--- N.A Phase ---

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	0.15006	35.2	21.6	9.9	45.1	31.5	66.0	56.0	20.9	24.5
2	0.18029	28.0	17.0	10.2	38.2	27.2	64.5	54.5	26.3	27.3
3	0.24674	13.1	3.2	9.8	22.9	13.0	61.9	51.9	39.0	38.9
4	0.57253	0.1	-3.2	10.0	10.1	6.8	56.0	46.0	45.9	39.2
5	1.2401	4.6	-0.9	9.9	14.5	9.0	56.0	46.0	41.5	37.0
6	28.81399	24.6	13.6	11.2	35.8	24.8	60.0	50.0	24.2	25.2

--- 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	0.15138	30.8	15.7	9.9	40.7	25.6	65.9	55.9	25.2	30.3
2	0.22064	18.2	6.9	9.9	28.1	16.8	62.8	52.8	34.7	36.0
3	0.23583	5.9	-0.7	9.8	15.7	9.1	62.2	52.2	46.5	43.1
4	0.47559	1.1	-2.8	10.1	11.2	7.3	56.4	46.4	45.2	39.1
5	0.68370	2.9	-2.6	10.0	12.9	7.4	56.0	46.0	43.1	38.6
6	29.37142	23.1	12.0	11.2	34.3	23.2	60.0	50.0	25.7	26.8

- Worst case: 802.11n HT40_UNII 1_5 190 MHz AC 240 V



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	0.18057	32.6	21.6	10.2	42.8	31.8	64.5	54.5	21.7	22.7
2	0.21487	28.0	17.5	9.9	37.9	27.4	63.0	53.0	25.1	25.6
3	0.28523	19.1	9.5	9.8	28.9	19.3	60.7	50.7	31.8	31.4
4	0.64832	2.5	-2.4	10.0	12.5	7.6	56.0	46.0	43.5	38.4
5	1.42211	4.7	-0.3	9.9	14.6	9.6	56.0	46.0	41.4	36.4
6	25.63174	25.0	14.5	11.2	36.2	25.7	60.0	50.0	23.8	24.3

--- 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	0.15004	27.2	15.5	9.9	37.1	25.4	66.0	56.0	28.9	30.6
2	0.21719	21.6	11.7	9.9	31.5	21.6	62.9	52.9	31.4	31.3
3	0.42252	0.7	-3.4	10.1	10.8	6.7	57.4	47.4	46.6	40.7
4	0.77761	-0.9	-4.0	10.0	9.1	6.0	56.0	46.0	46.9	40.0
5	1.3622	11.1	3.5	9.9	21.0	13.4	56.0	46.0	35.0	32.6
6	20.214	24.1	13.9	11.0	35.1	24.9	60.0	50.0	24.9	25.1

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	AM003	-
Turn Device	INNCO SYSTEMS	DS1200-S-1t	0003	-
Spectrum Analyzer	R&S	FSVA40	101575	25.04.24
Spectrum Analyzer	R&S	FSV40	100988	25.05.27
Amplifier	SONOMA INSTRUMENT	310N	421821	25.10.11
Bilog Antenna	Teseq GmbH	CBL 6112D	63756	26.12.11
Loop Antenna	R&S	HFH2-Z2	100355	26.06.25
Vector Signal Generator	R&S	SMBV100A	257566	25.07.01
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
Signal Generator	R&S	SMB100A	176206	26.01.17
High Pass Filter	Wainwright Instruments GmbH	WHKX12-2805-3000-18000-40SS	SN58	25.10.15
Band Reject Filter	Wainwright Instruments GmbH	WTRCJV8-5100-5850-20-100-50SSK	62	25.10.10
TWO-LINE V - NETWORK	R&S	ENV216	101358	25.10.13
EMI TEST RECEIVER	R&S	ESCI3	101428	25.08.12

End of test report