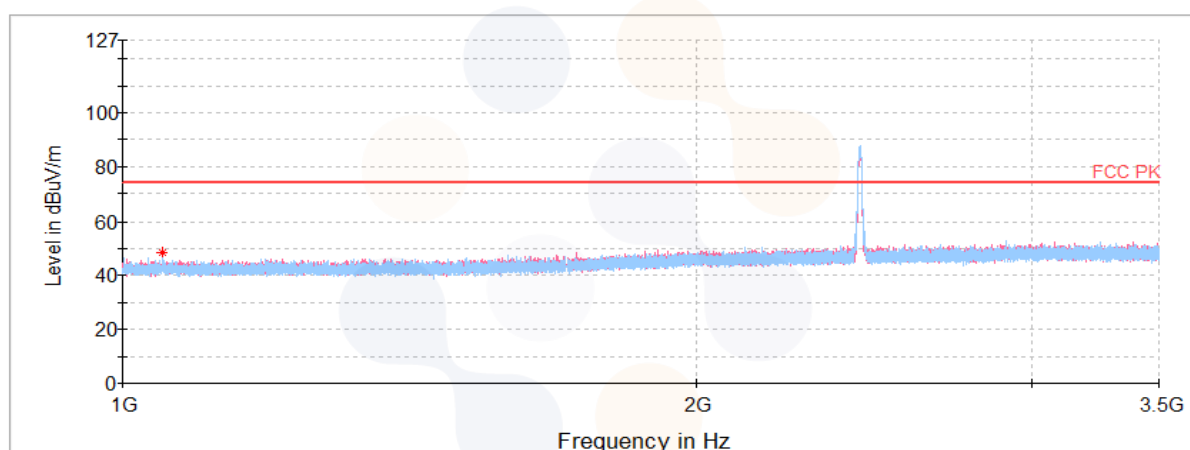


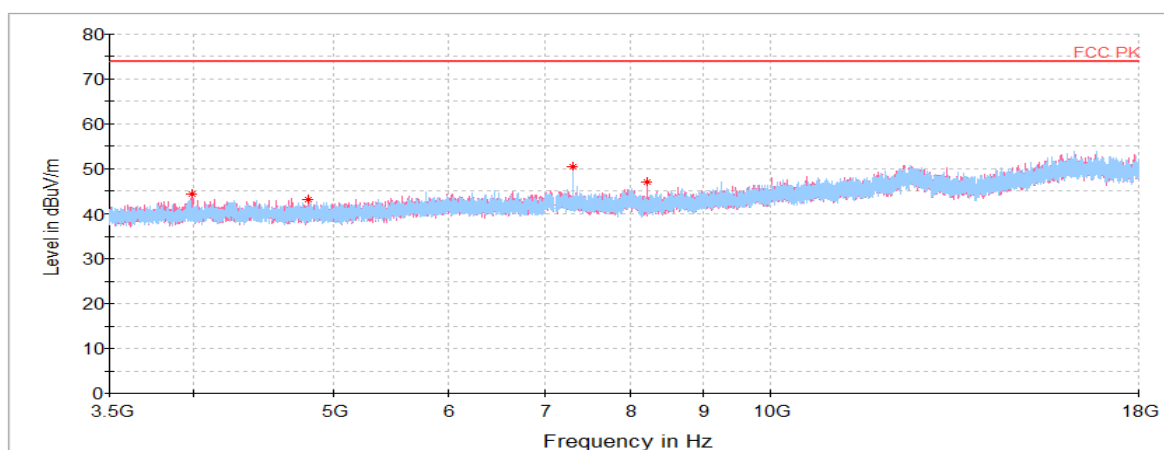
2 437 MHz

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								
1 050.39 ¹⁾	V	41.02	28.03	-20.47	-	48.58	74.00	25.42
3 990.28 ¹⁾	V	67.14	33.59	-56.35	-	44.38	74.00	29.62
4 809.53 ¹⁾	V	64.44	33.70	-55.15	-	42.99	74.00	31.01
7 311.23 ¹⁾	H	66.89	35.16	-51.58	-	50.47	74.00	23.53
8 234.25 ¹⁾	V	62.19	35.40	-50.58	-	47.01	74.00	26.99
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

Horizontal/Vertical for 1 GHz ~ 3.5 GHz

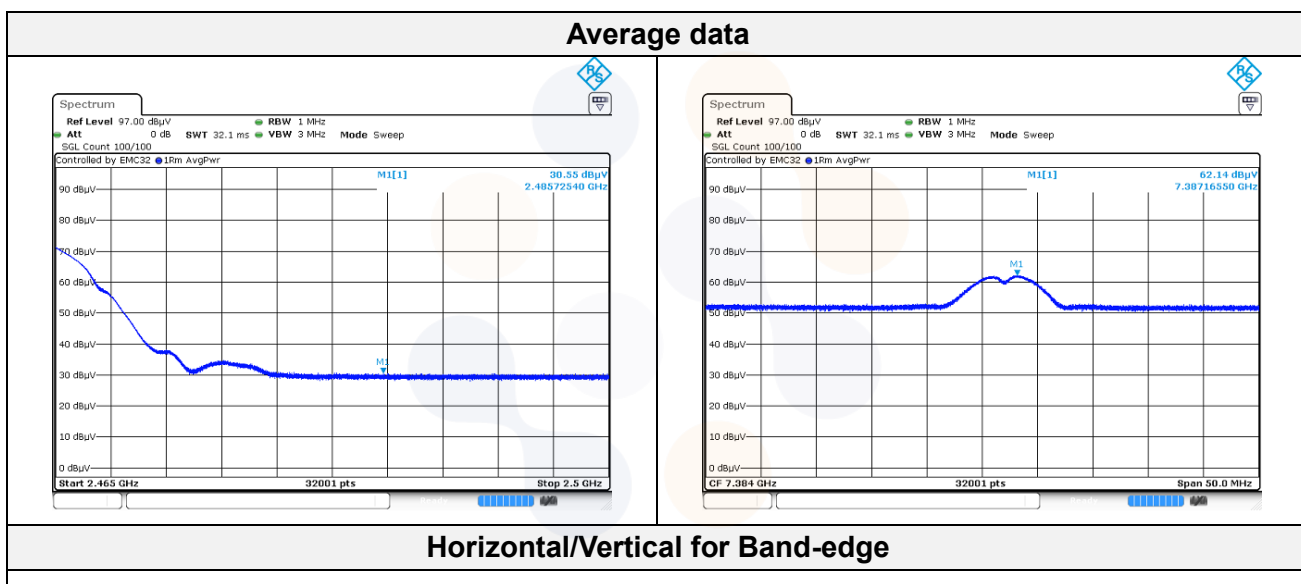


Horizontal/Vertical for 3.5 GHz ~ 18 GHz

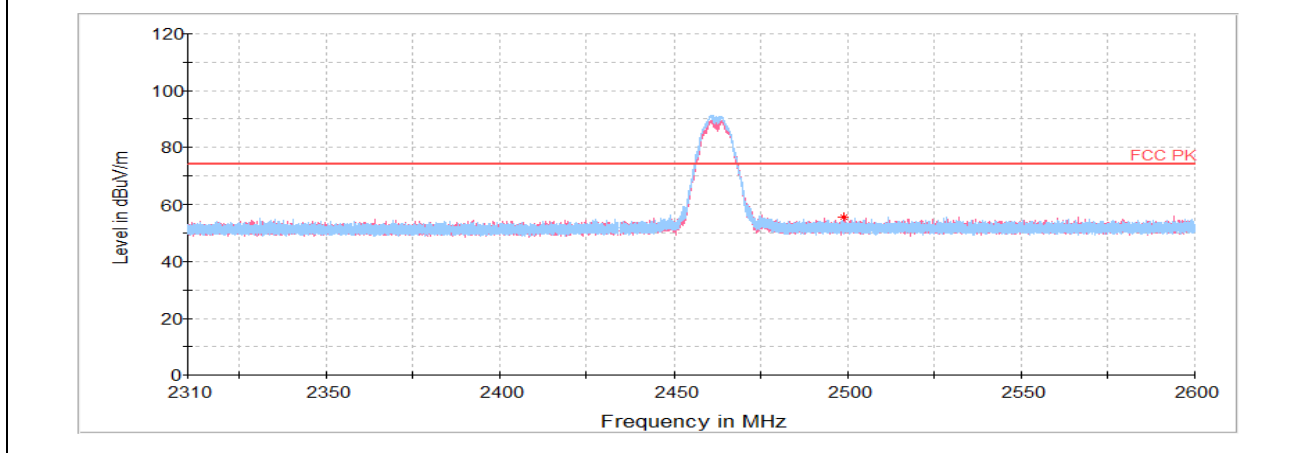


2 462 MHz

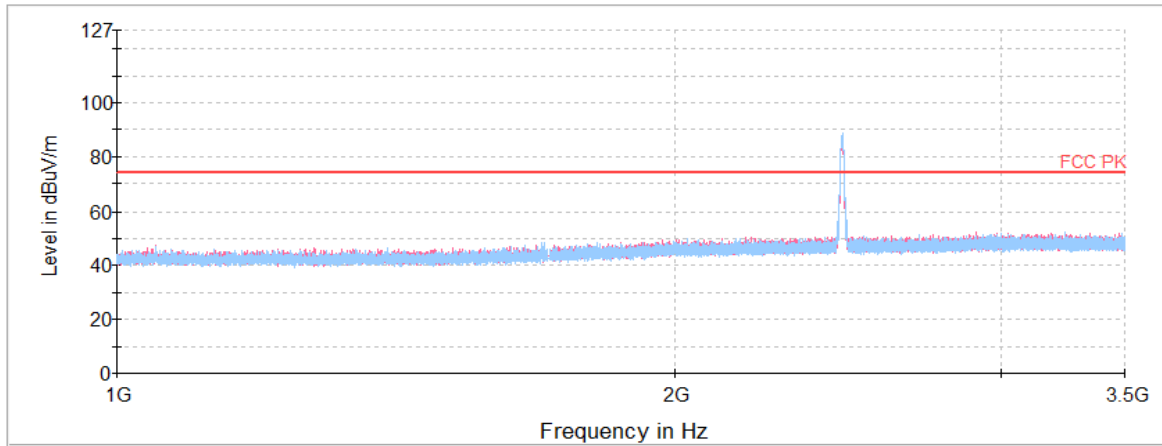
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 485.73 ¹⁾	H	41.07	32.37	-17.88	-	55.56	74.00	18.44
3 986.20 ¹⁾	V	67.70	33.58	-56.36	-	44.92	74.00	29.08
5 428.05 ¹⁾	V	65.21	34.21	-54.70	-	44.72	74.00	29.28
7 387.17 ¹⁾	H	68.22	35.18	-51.60	-	51.80	74.00	22.20
Average Data								
2 485.73 ¹⁾	H	30.55	32.37	-17.88	-	45.04	54.00	8.96
7 387.17 ¹⁾	H	62.14	35.18	-51.60	-	45.72	54.00	8.28



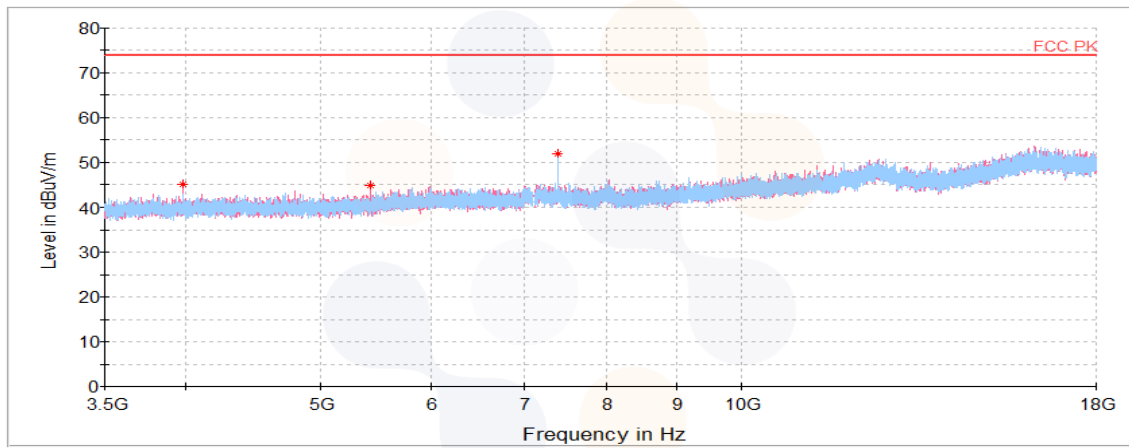
Horizontal/Vertical for Band-edge



Horizontal/Vertical for 1 GHz ~ 3.5 GHz



Horizontal/Vertical for 3.5 GHz ~ 18 GHz

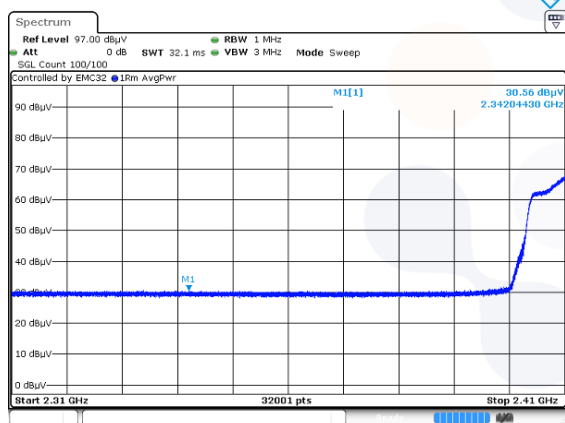


802.11g

2 412 MHz

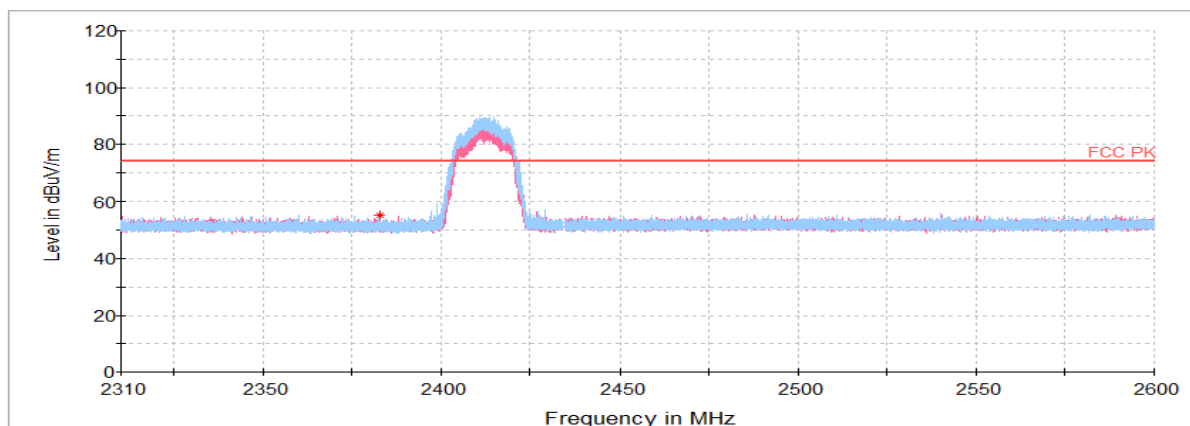
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
1 049.84 ¹⁾	V	39.97	28.03	-20.47	-	47.53	74.00	26.47
2 342.04 ¹⁾	H	41.60	32.05	-18.16	-	55.49	74.00	18.51
3 568.88	H	66.78	33.08	-56.62	-	43.24	74.00	30.76
4 858.02 ¹⁾	H	65.18	33.70	-55.11	-	43.77	74.00	30.23
7 237.83	H	63.87	35.15	-51.56	-	47.46	74.00	26.54
Average Data								
2 342.04 ¹⁾	H	30.56	32.05	-18.16	0.30	44.76	54.00	9.24

Average data

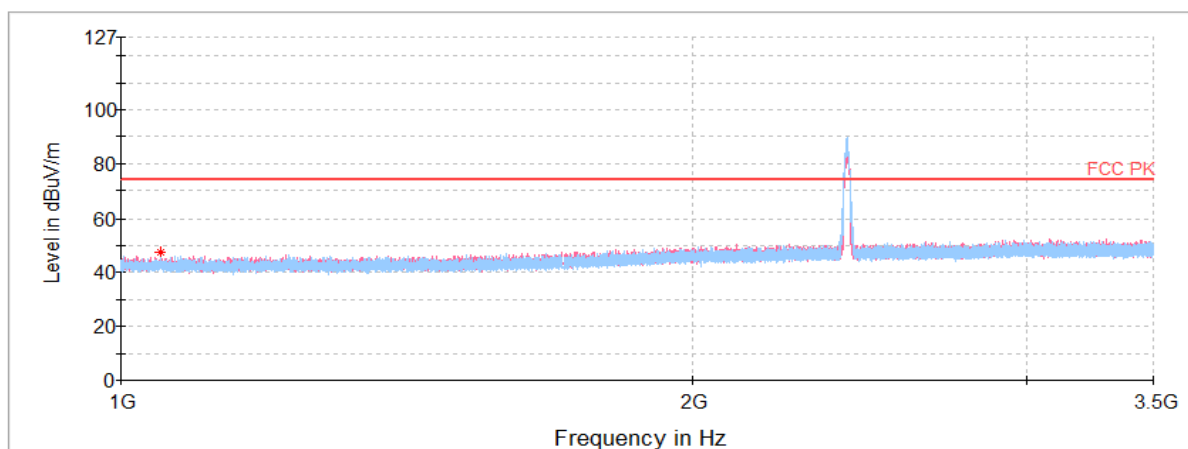


Blank

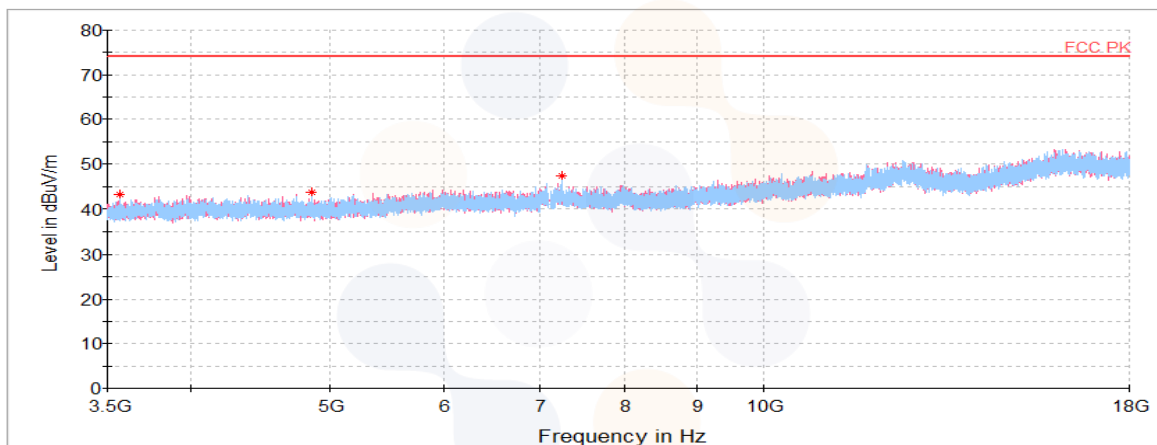
Horizontal/Vertical for Band-edge



Horizontal/Vertical for 1 GHz ~ 3.5 GHz



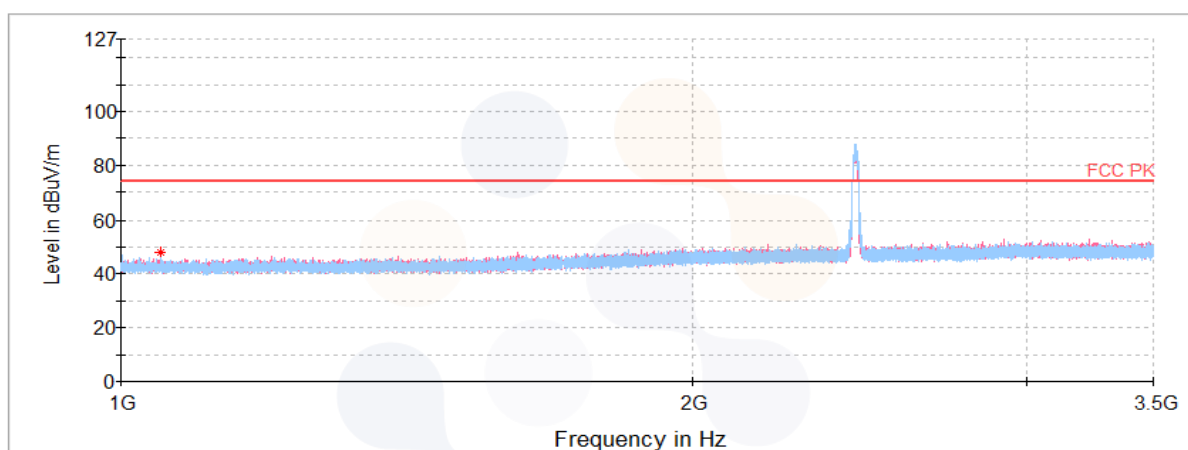
Horizontal/Vertical for 3.5 GHz ~ 18 GHz



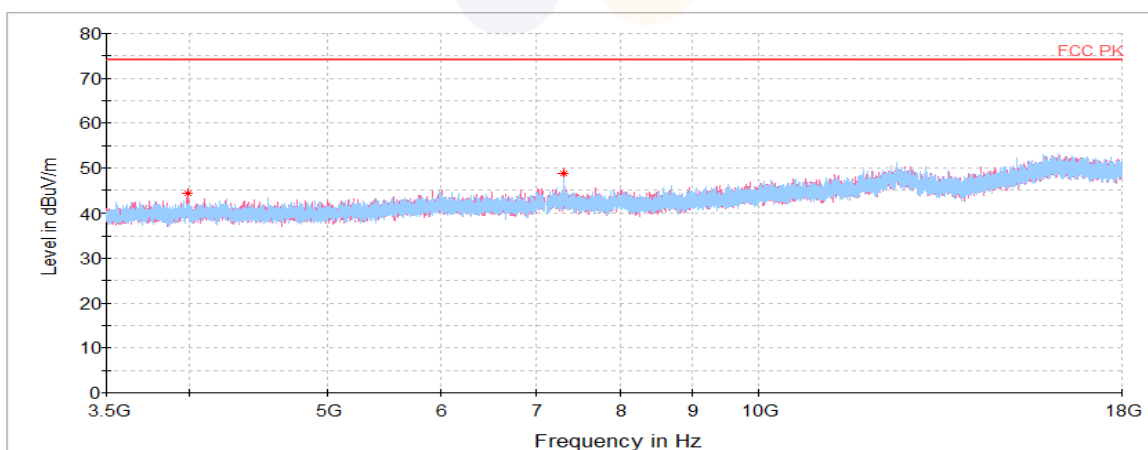
2 437 MHz

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								
1 049.92 ¹⁾	V	40.62	28.03	-20.47	-	48.18	74.00	25.82
3 990.73 ¹⁾	V	67.09	33.59	-56.35	-	44.33	74.00	29.67
7 308.97 ¹⁾	H	65.27	35.16	-51.58	-	48.85	74.00	25.15
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

Horizontal/Vertical for 1 GHz ~ 3.5 GHz

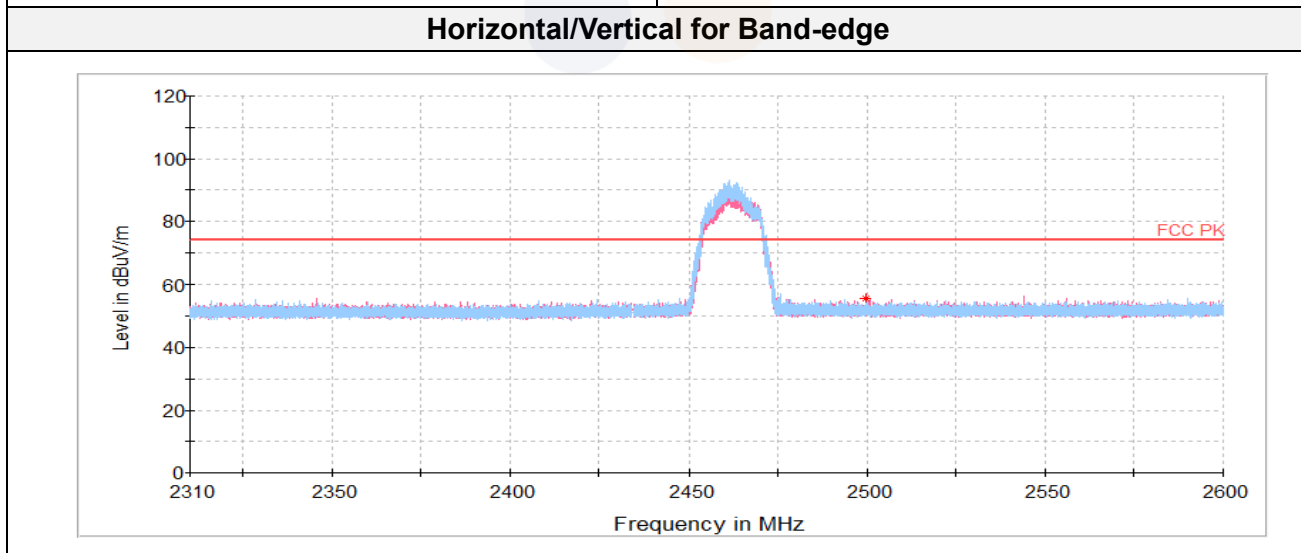
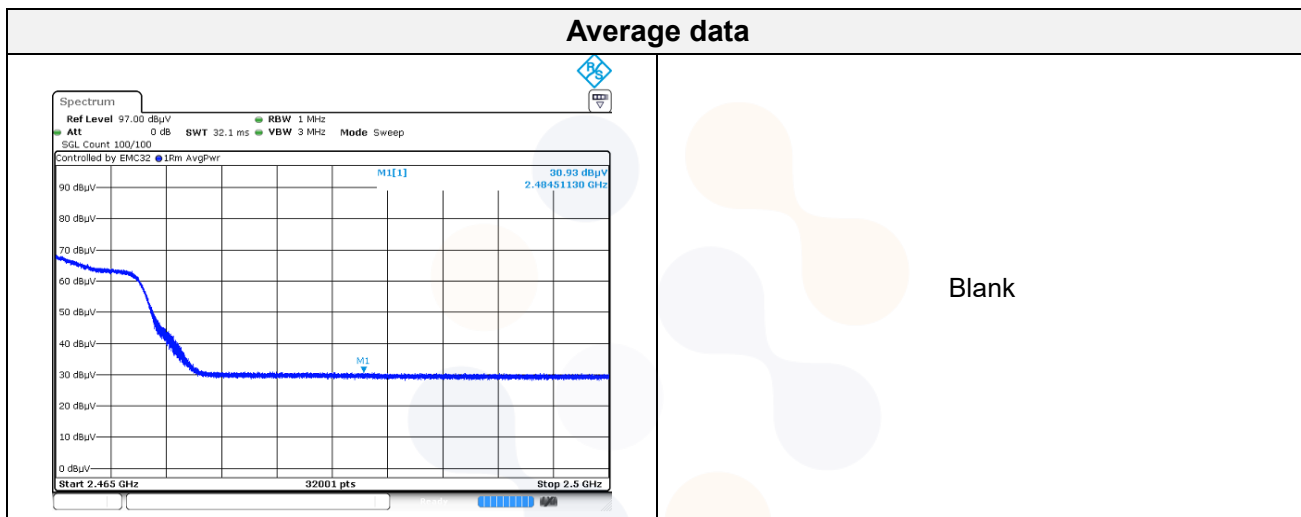


Horizontal/Vertical for 3.5 GHz ~ 18 GHz

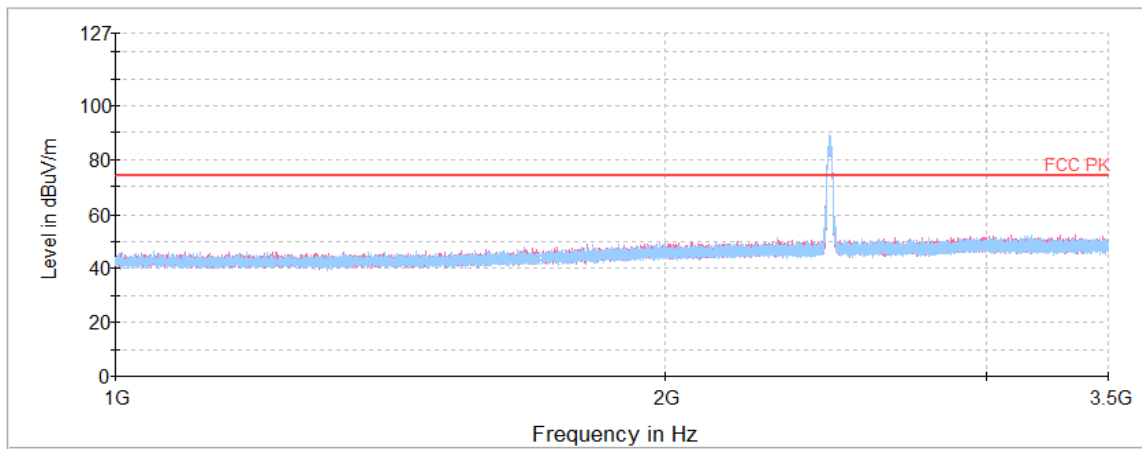


2 462 MHz

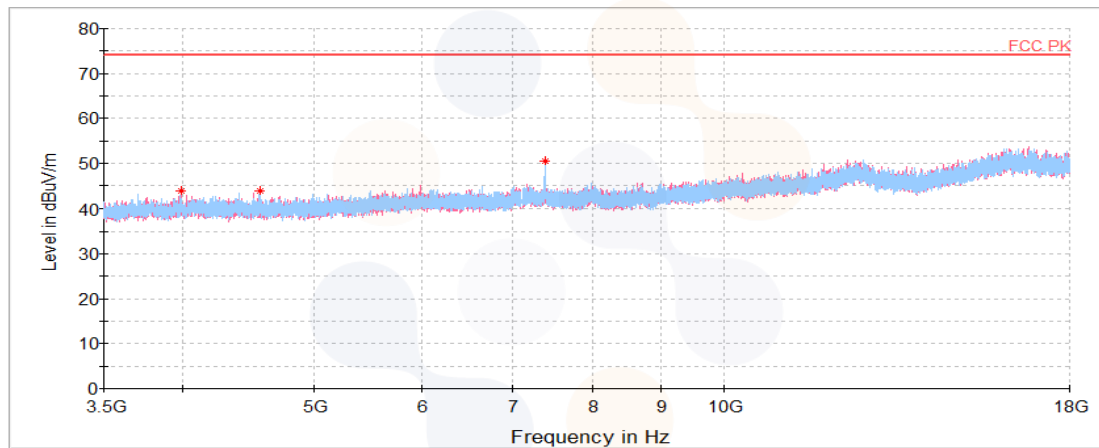
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 484.51 ¹⁾	H	41.03	32.37	-17.88	-	55.52	74.00	18.48
3 993.91 ¹⁾	V	66.67	33.59	-56.35	-	43.91	74.00	30.09
4 559.41 ¹⁾	H	65.92	33.70	-55.71	-	43.91	74.00	30.09
7 385.09 ¹⁾	H	66.92	35.18	-51.60	-	50.50	74.00	23.50
Average Data								
2 484.51 ¹⁾	H	30.93	32.37	-17.88	0.30	45.42	54.00	8.58



Horizontal/Vertical for 1 GHz ~ 3.5 GHz



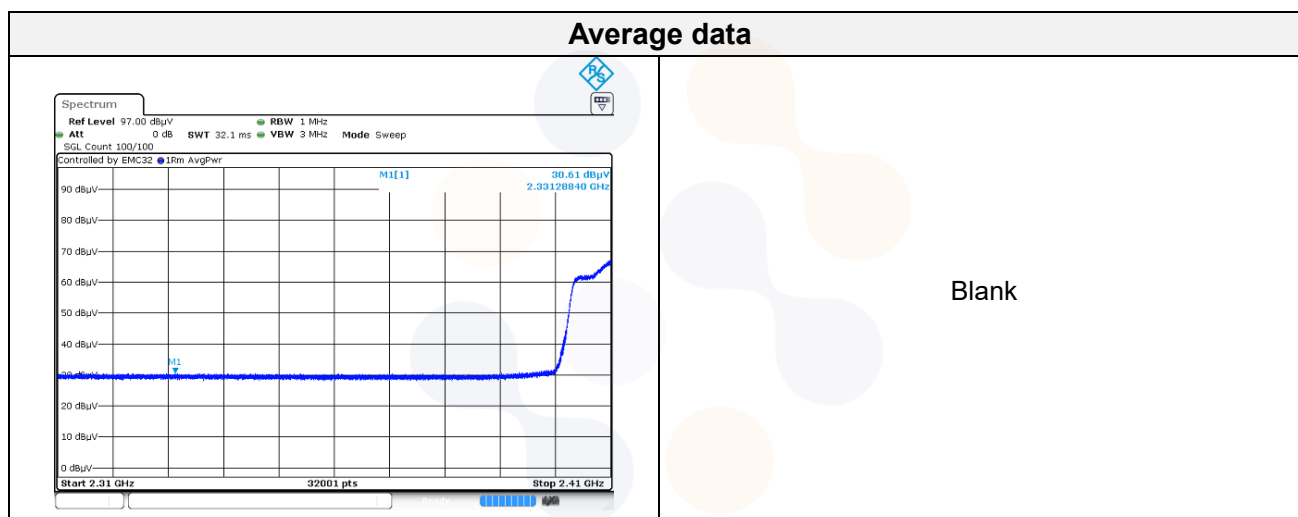
Horizontal/Vertical for 3.5 GHz ~ 18 GHz



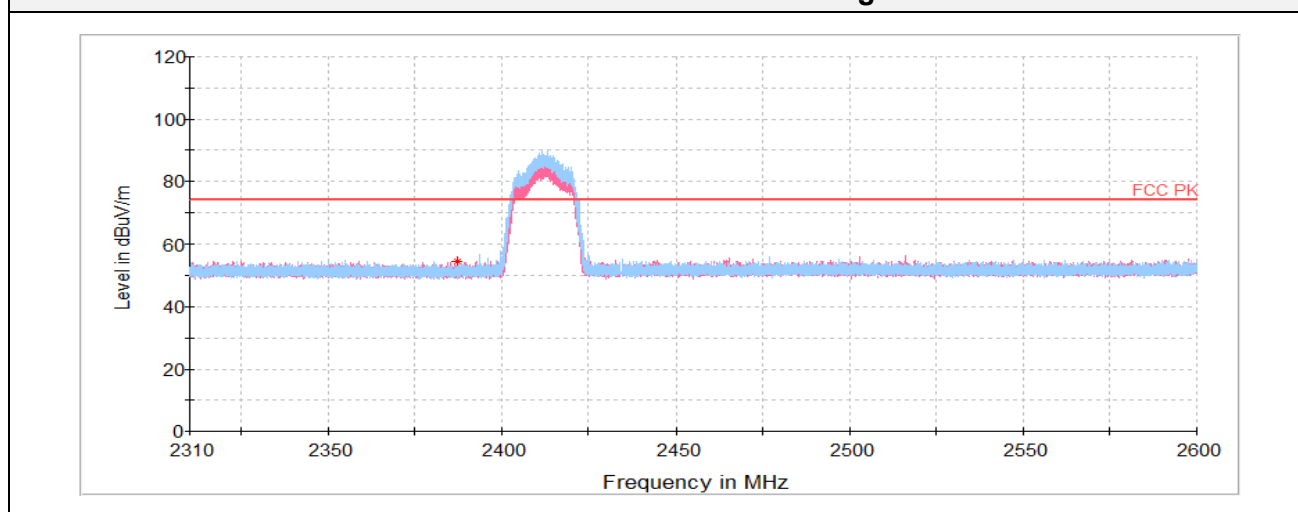
802.11n HT20

2 412 MHz

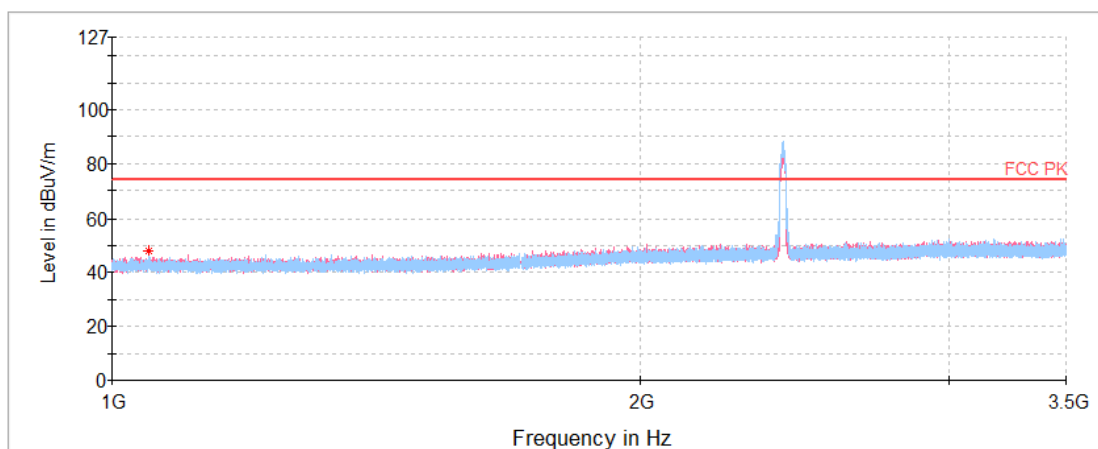
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
1 050.47 ¹⁾	H	40.63	28.03	-20.47	-	48.19	74.00	25.81
2 331.29 ¹⁾	H	40.78	32.03	-18.16	-	54.65	74.00	19.35
3 995.27 ¹⁾	V	66.79	33.59	-56.34	-	44.04	74.00	29.96
7 233.75	H	63.00	35.15	-51.56	-	46.59	74.00	27.41
Average Data								
2 331.29 ¹⁾	H	30.61	32.03	-18.16	0.32	44.82	54.00	9.18



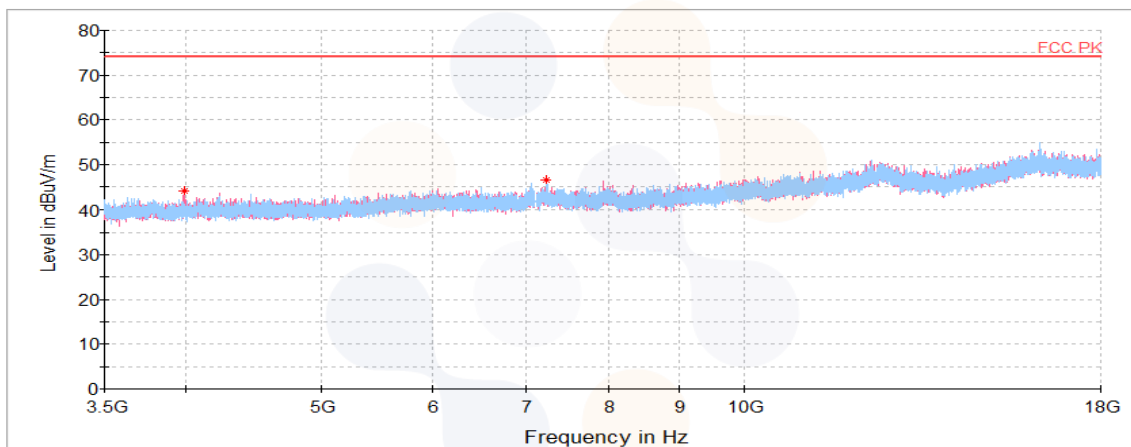
Horizontal/Vertical for Band-edge



Horizontal/Vertical for 1 GHz ~ 3.5 GHz



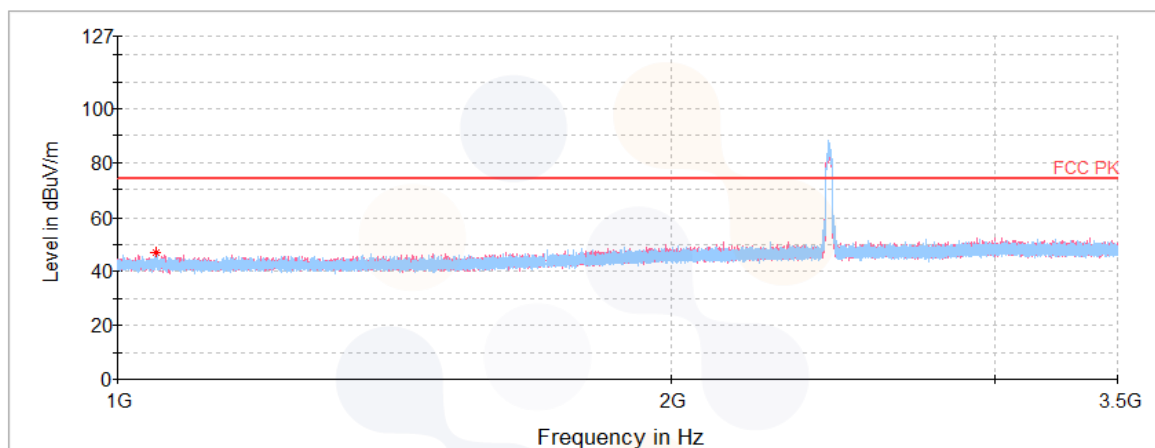
Horizontal/Vertical for 3.5 GHz ~ 18 GHz



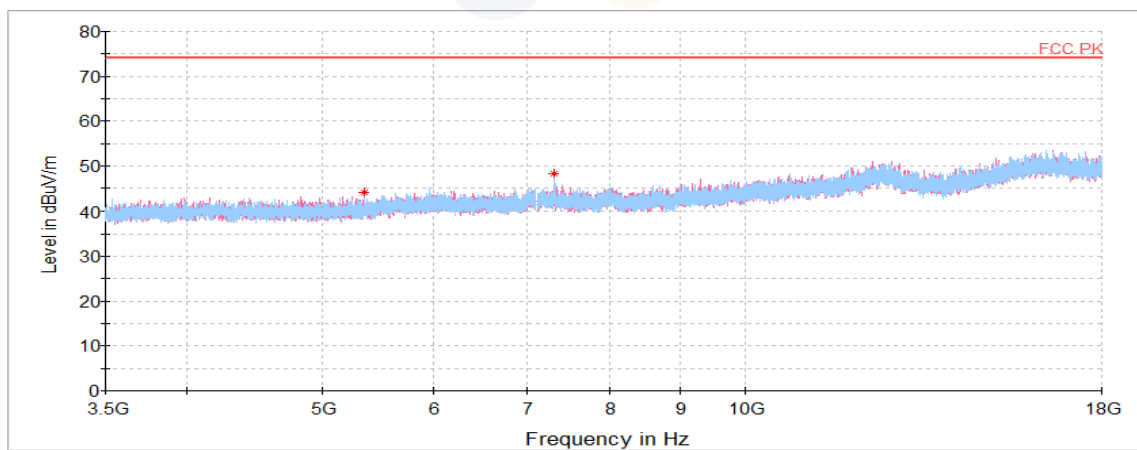
2 437 MHz

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								
1 050.00 ¹⁾	H	39.34	28.03	-20.47	-	46.90	74.00	27.10
5 360.53 ¹⁾	H	64.72	34.13	-54.81	-	44.04	74.00	29.96
7 314.41 ¹⁾	H	64.64	35.16	-51.58	-	48.22	74.00	25.78
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

Horizontal/Vertical for 1 GHz ~ 3.5 GHz

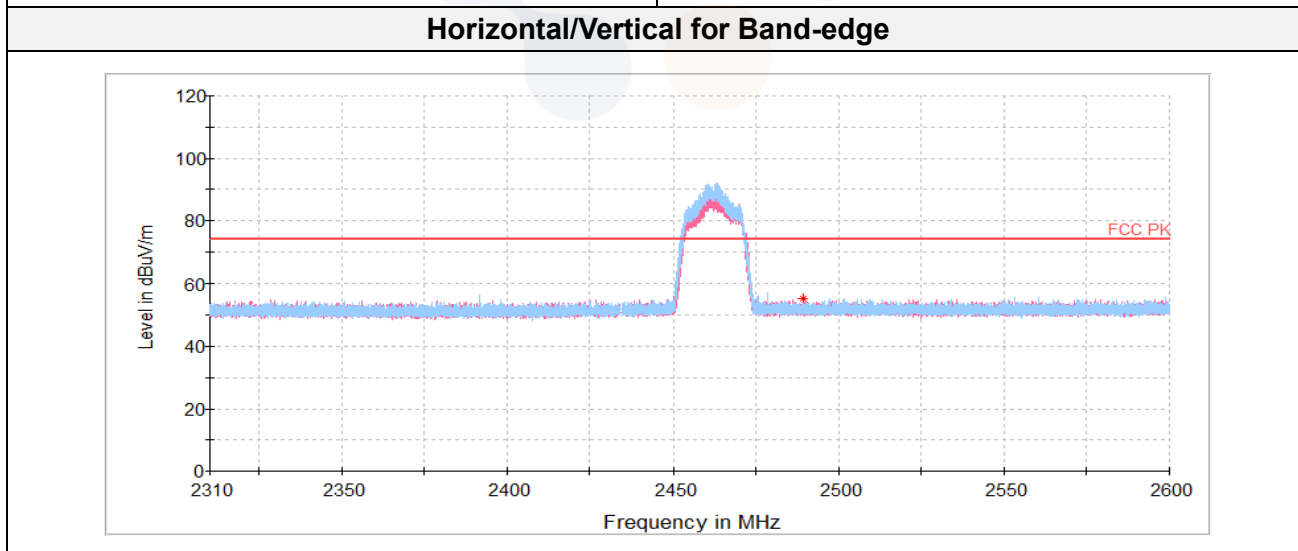
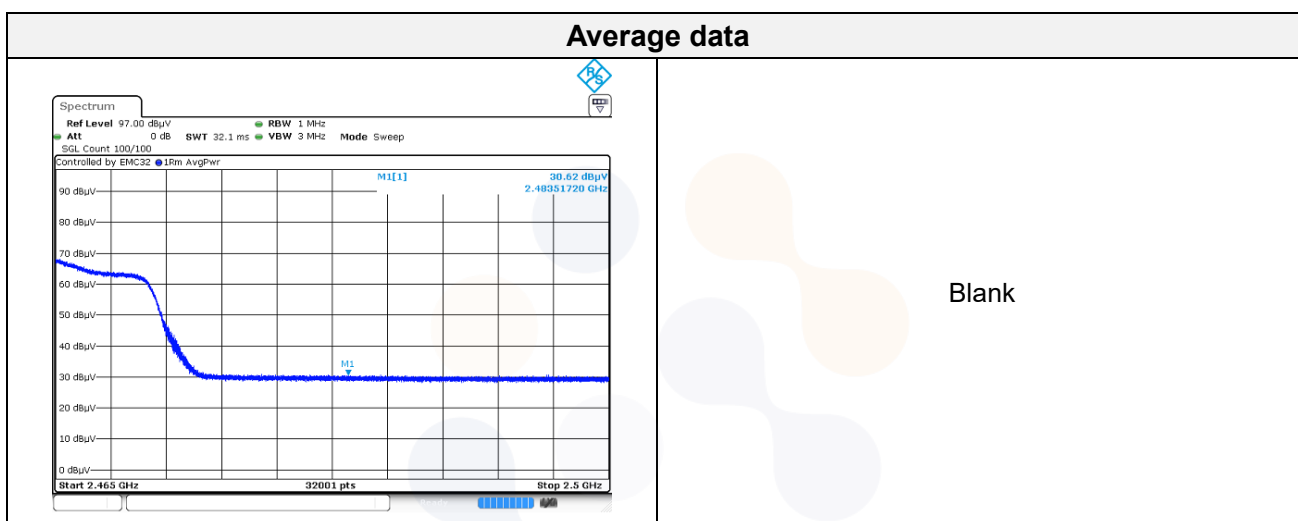


Horizontal/Vertical for 3.5 GHz ~ 18 GHz

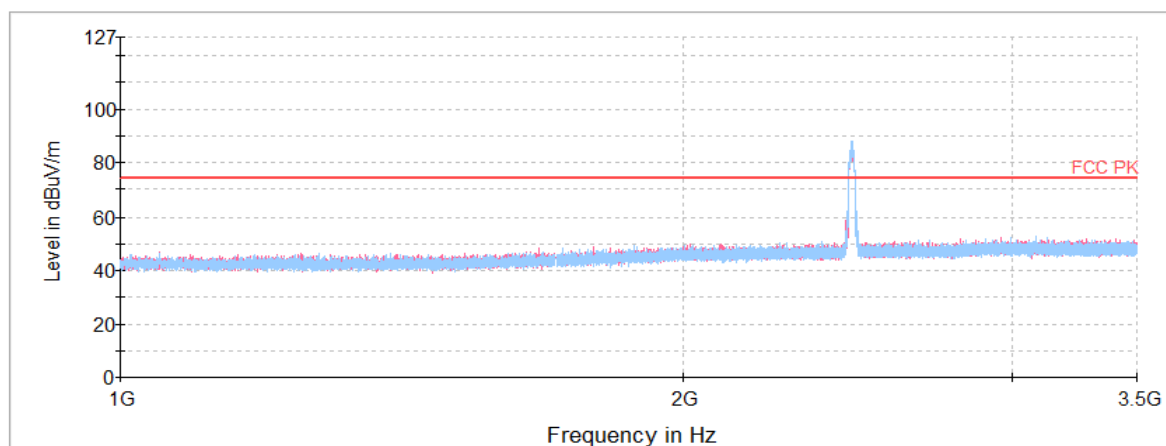


2 462 MHz

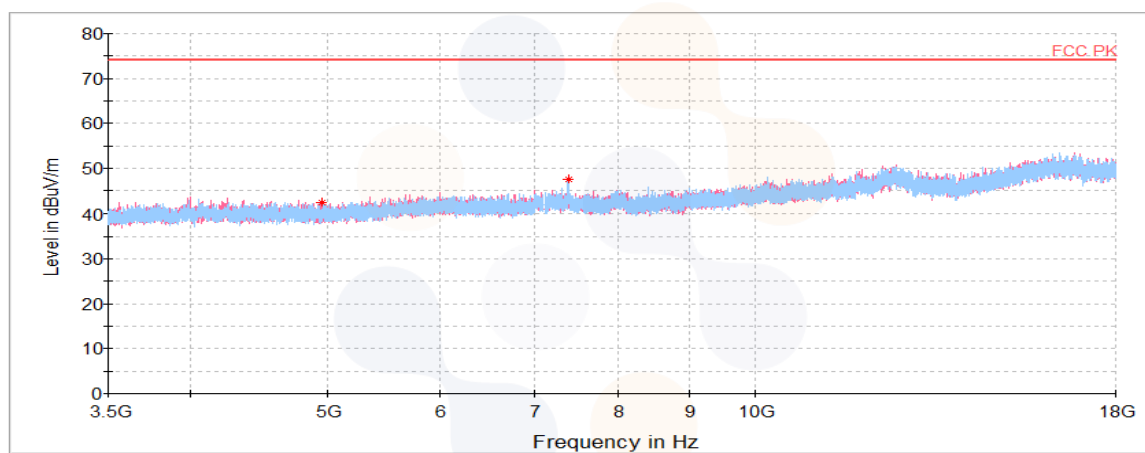
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 483.52 ¹⁾	H	41.01	32.36	-17.89	-	55.48	74.00	18.52
4 961.33 ¹⁾	V	63.71	33.70	-54.98	-	42.43	74.00	31.57
7 383.28 ¹⁾	H	63.97	35.18	-51.60	-	47.55	74.00	26.45
Average Data								
2 483.52 ¹⁾	H	30.62	32.36	-17.89	0.32	45.43	54.00	8.57



Horizontal/Vertical for 1 GHz ~ 3.5 GHz



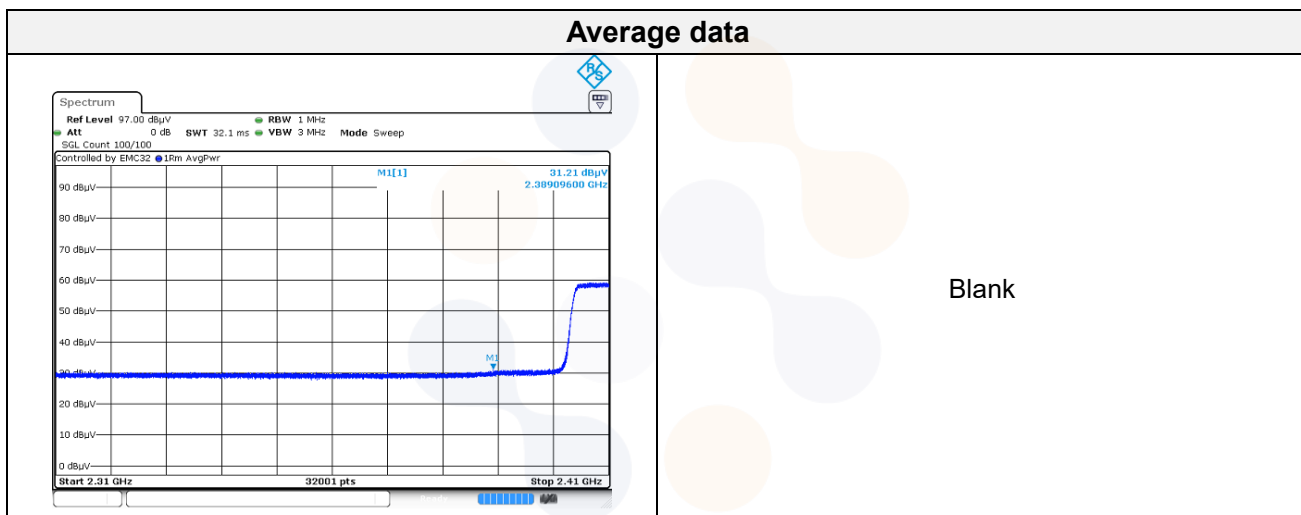
Horizontal/Vertical for 3.5 GHz ~ 18 GHz



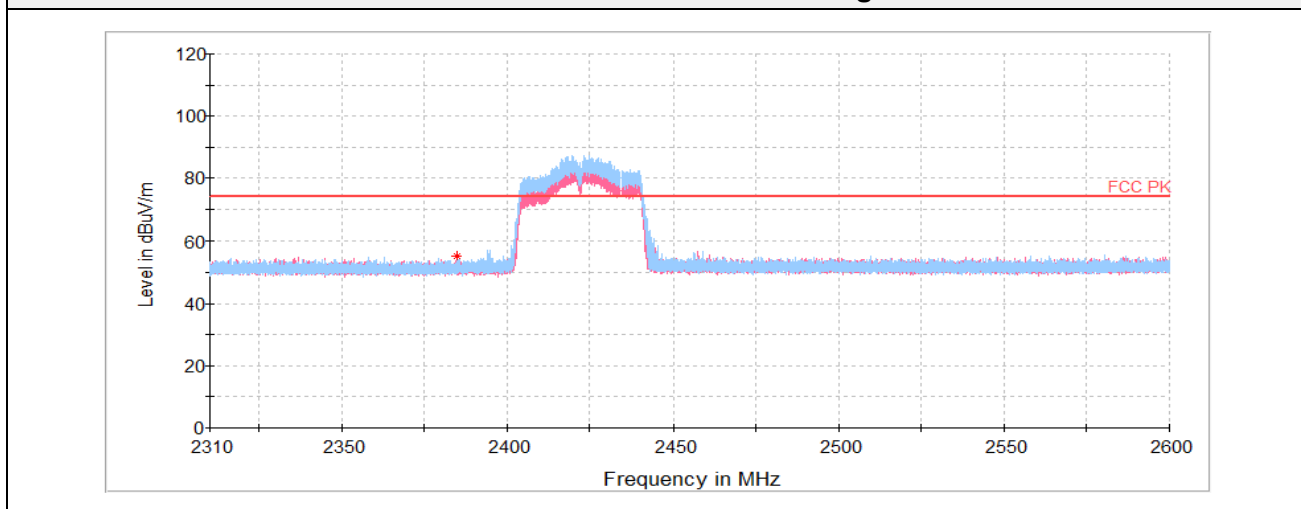
802.11n HT40

2 422 MHz

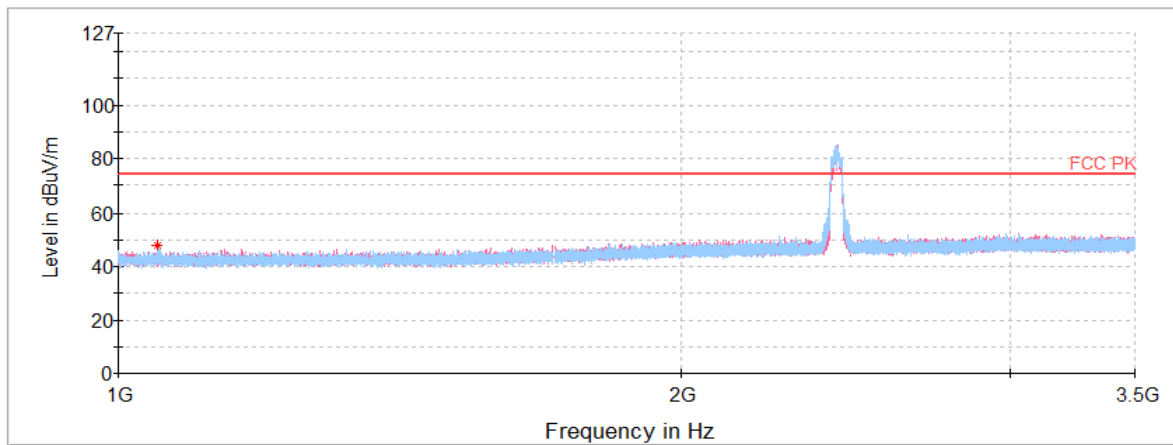
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
1 049.84 ¹⁾	V	40.30	28.03	-20.47	-	47.86	74.00	26.14
2 389.10 ¹⁾	H	41.33	32.16	-18.17	-	55.32	74.00	18.68
4 857.11 ¹⁾	V	64.72	33.70	-55.11	-	43.31	74.00	30.69
7 185.27	H	63.10	35.14	-51.54	-	46.70	74.00	27.30
Average Data								
2 389.10 ¹⁾	H	31.21	32.16	-18.17	0.63	45.83	54.00	8.17



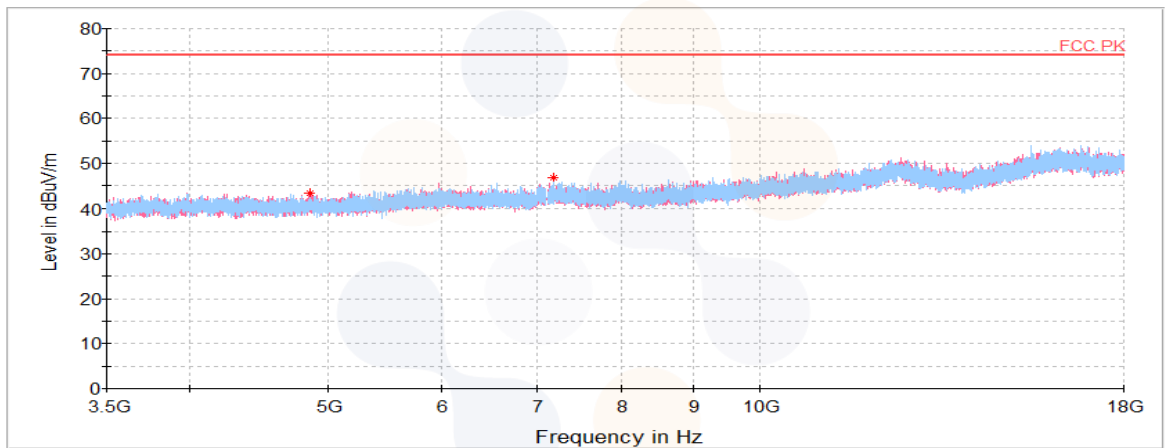
Horizontal/Vertical for Band-edge



Horizontal/Vertical for 1 GHz ~ 3.5 GHz



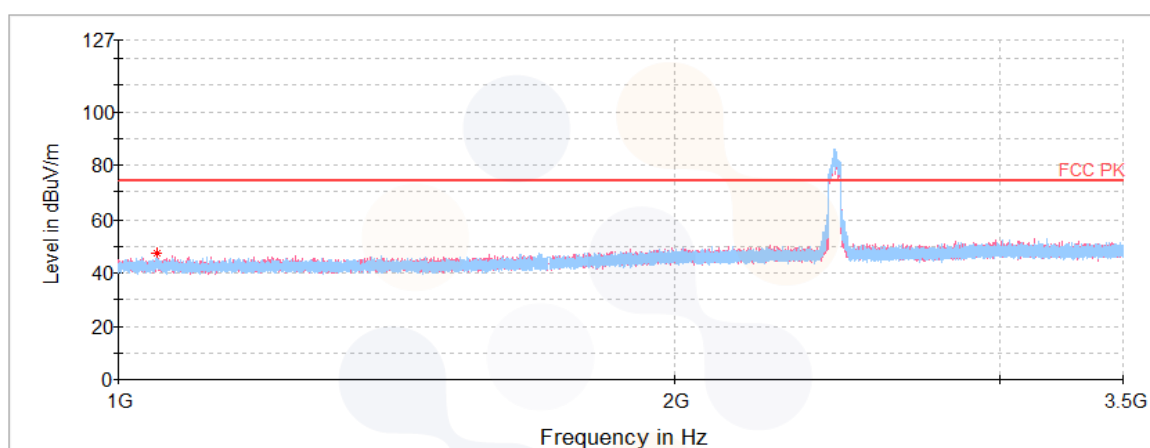
Horizontal/Vertical for 3.5 GHz ~ 18 GHz



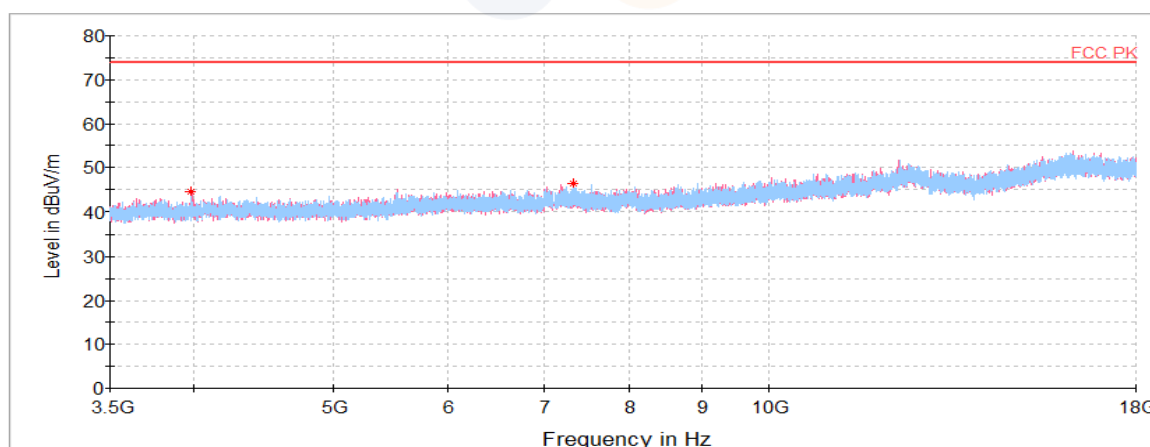
2 437 MHz

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								
1 049.77 ¹⁾	V	40.08	28.03	-20.47	-	47.64	74.00	26.36
3 987.56 ¹⁾	V	67.36	33.59	-56.36	-	44.59	74.00	29.41
7 318.03 ¹⁾	H	62.71	35.16	-51.58	-	46.29	74.00	27.71
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

Horizontal/Vertical for 1 GHz ~ 3.5 GHz

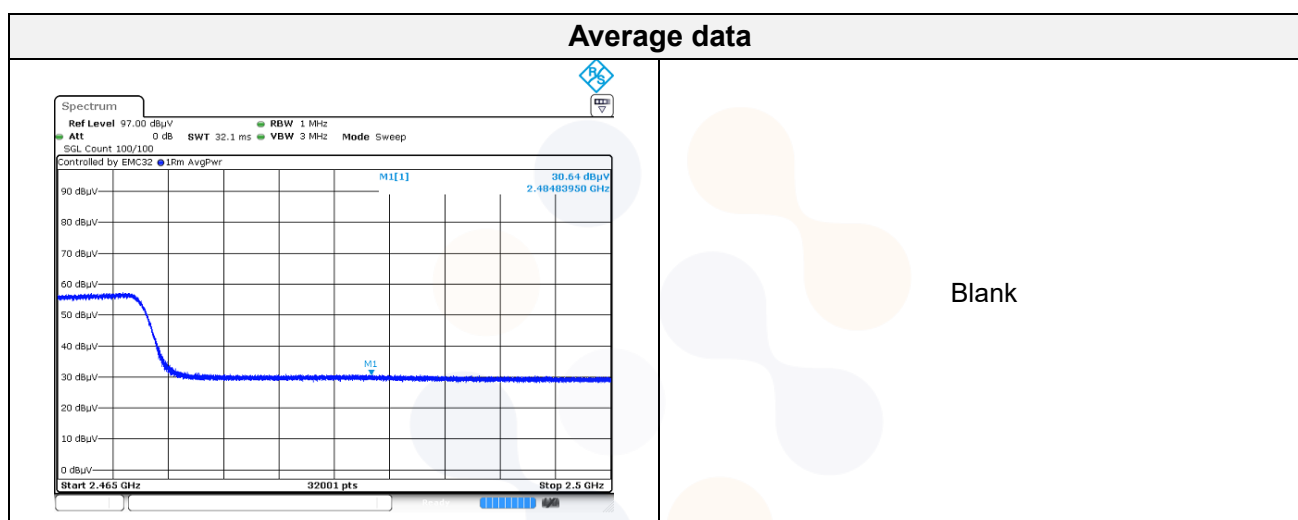


Horizontal/Vertical for 3.5 GHz ~ 18 GHz

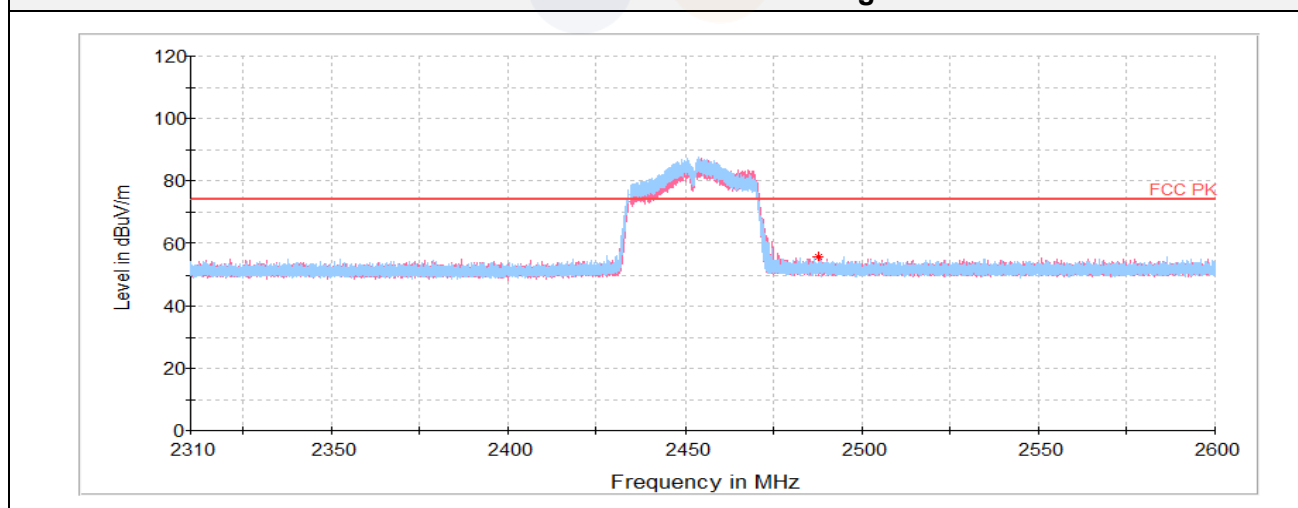


2 452 MHz

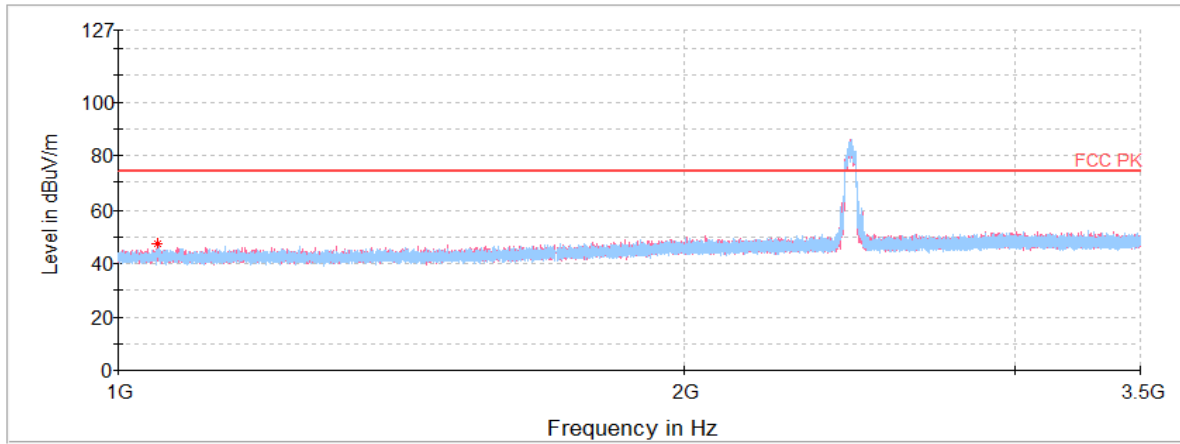
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
1 049.92 ¹⁾	H	39.73	28.03	-20.47	-	47.29	74.00	26.71
2 484.84 ¹⁾	V	41.29	32.37	-17.88	-	55.78	74.00	18.22
5 089.56 ¹⁾	H	64.82	33.81	-54.95	-	43.68	74.00	30.32
7 347.94 ¹⁾	H	63.29	35.17	-51.59	-	46.87	74.00	27.13
Average Data								
2 484.84 ¹⁾	V	30.64	32.37	-17.88	0.63	45.76	54.00	8.24



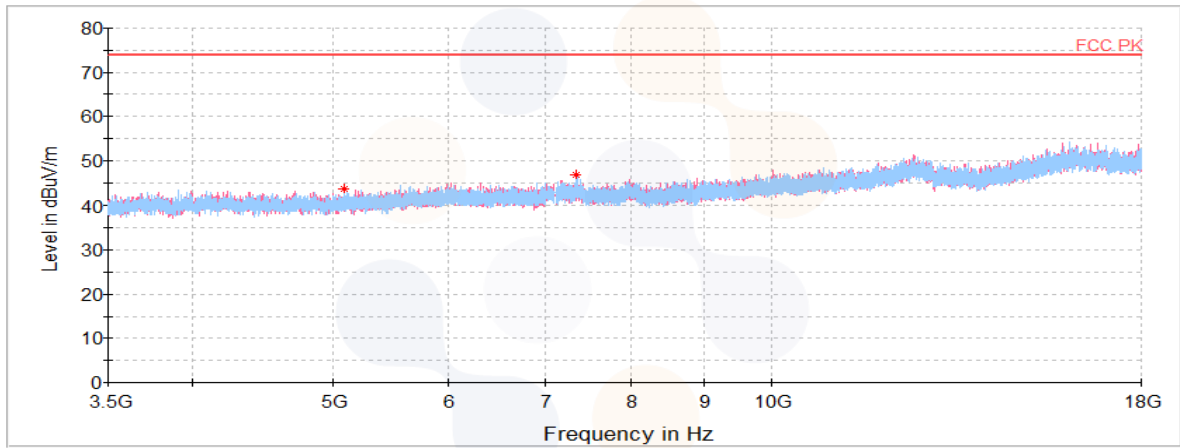
Horizontal/Vertical for Band-edge



Horizontal/Vertical for 1 GHz ~ 3.5 GHz

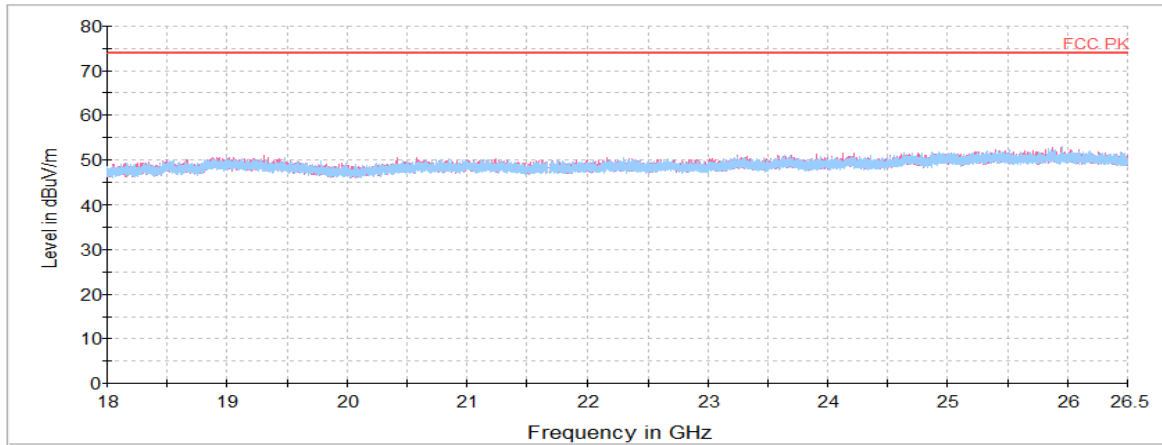


Horizontal/Vertical for 3.5 GHz ~ 18 GHz



Test results (Above 18 GHz) – Worst Case : 802.11n HT20 mode / 2 462 MHz

Horizontal/Vertical for 18 GHz ~ 26.5 GHz

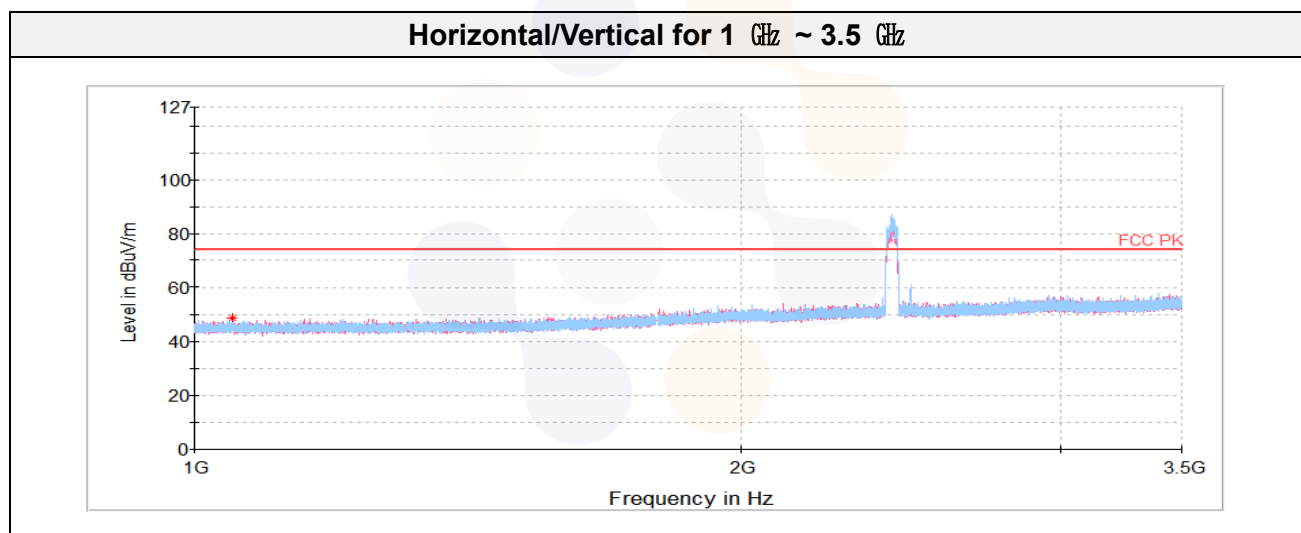


Note: The Worst case was based on the lowest margin condition considering Harmonic and Spurious Emission.

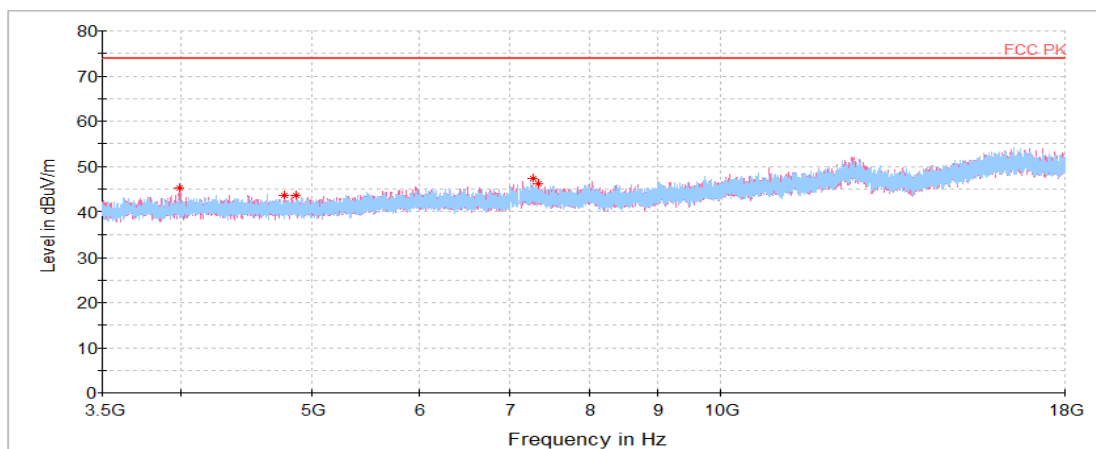
Simultaneous condition

Case 1 : 802.11n HT40 (2 422 MHz) + BT_EDR(3DH1)(2 480 MHz)

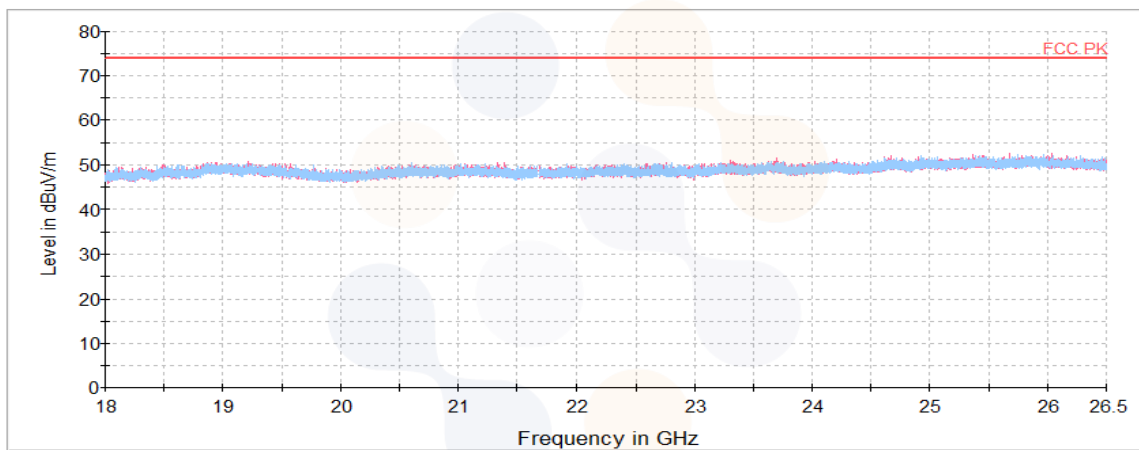
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
1 050.16 ¹⁾	V	41.17	28.03	-20.47	-	48.73	74.00	25.27
3 992.09 ¹⁾	V	67.91	33.59	-56.35	-	45.15	74.00	28.85
4 769.20 ¹⁾	V	65.17	33.70	-55.23	-	43.64	74.00	30.36
4 872.06 ¹⁾	V	64.96	33.70	-55.09	-	43.57	74.00	30.43
7 267.73 ¹⁾	H	63.69	35.15	-51.56	-	47.28	74.00	26.72
7 340.69 ¹⁾	V	62.64	35.17	-51.58	-	46.23	74.00	27.77
Average Data								
No spurious emissions were detected within 20 dB of the limit.								



Horizontal/Vertical for 3.5 GHz ~ 18 GHz

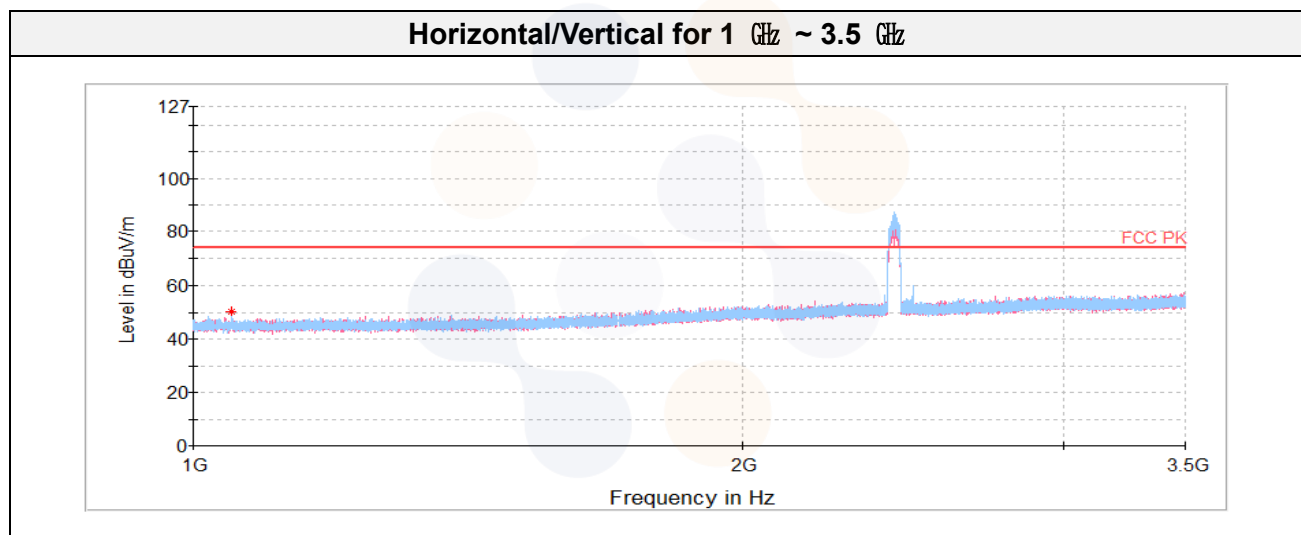


Horizontal/Vertical for 18 GHz ~ 26.5 GHz

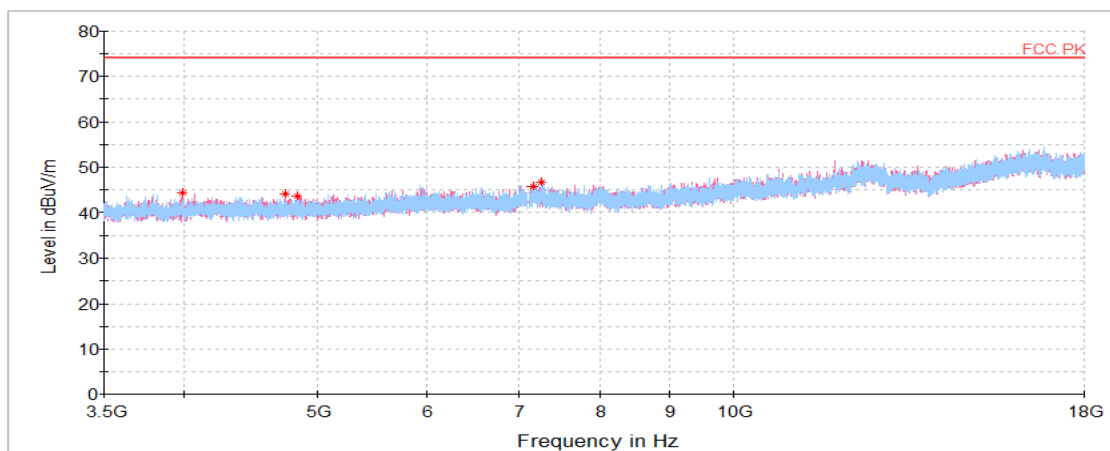


Case 2 : 802.11n HT40 (2 422 MHz) + BLE_1 MBit/s(37 Bytes)(2 480 MHz)

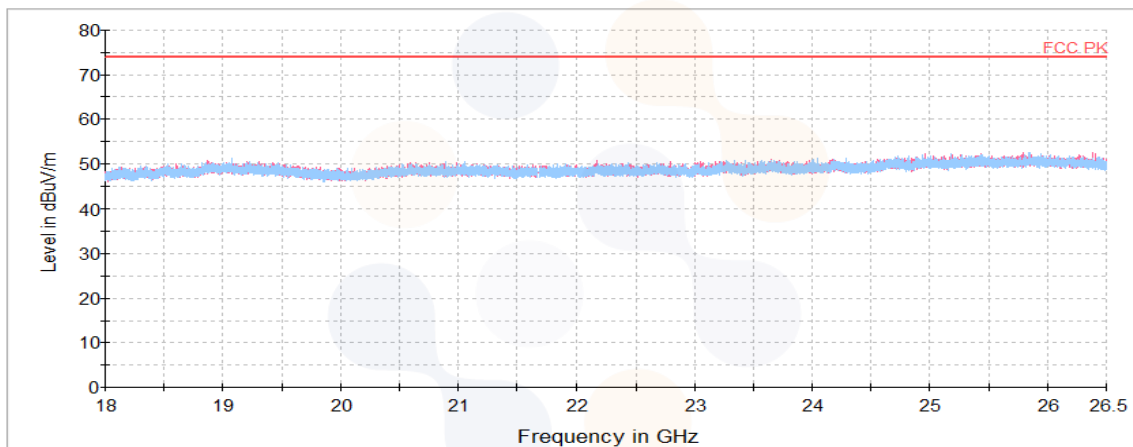
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
1 050.23 ¹⁾	H	42.70	28.03	-20.47	-	50.26	74.00	23.74
3 991.19 ¹⁾	V	67.11	33.59	-56.35	-	44.35	74.00	29.65
4 742.92 ¹⁾	V	65.51	33.70	-55.28	-	43.93	74.00	30.07
4 842.16 ¹⁾	H	64.92	33.70	-55.12	-	43.50	74.00	30.50
7 167.59	H	62.17	35.13	-51.54	-	45.76	74.00	28.24
7 262.30 ¹⁾	H	63.01	35.15	-51.56	-	46.60	74.00	27.40
Average Data								
No spurious emissions were detected within 20 dB of the limit.								



Horizontal/Vertical for 3.5 GHz ~ 18 GHz

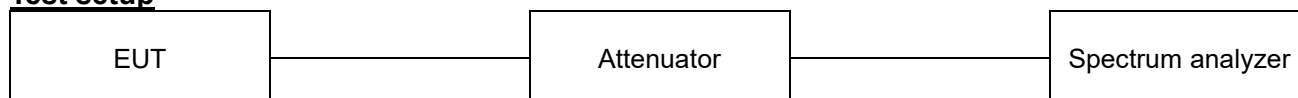


Horizontal/Vertical for 18 GHz ~ 26.5 GHz



7.5. Conducted Spurious Emission

Test setup



Limit

According to §15.247(d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operation, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation specified in §15.209(a) is not required. In addition, radiated emission limits specified in §15.209(a) (see §15.205(c)).

Limit : 20 dBc

Test procedure

ANSI C63.10 - Section 11.11.3, 14.3.3

Test settings

Establish an emission level by using the following procedure:

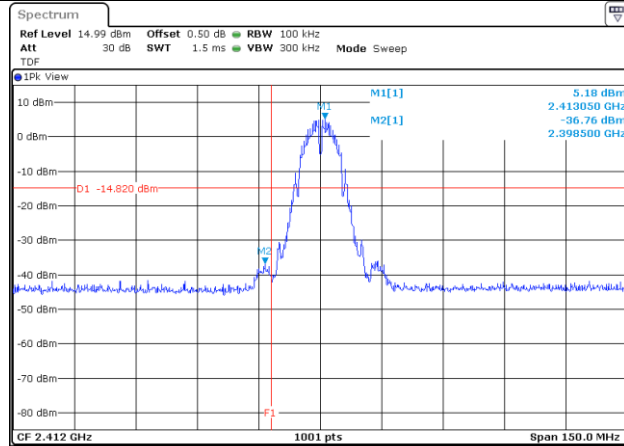
- 1) Set the center frequency and span to encompass frequency range to be measured.
- 2) Set the RBW = 100 kHz
- 3) Set the VBW $\geq [3 \times \text{RBW}]$
- 4) Detector = peak
- 5) Sweep time = auto couple
- 6) Trace mode = max hold
- 7) Allow trace to fully stabilize.
- 8) Use the peak marker function 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.

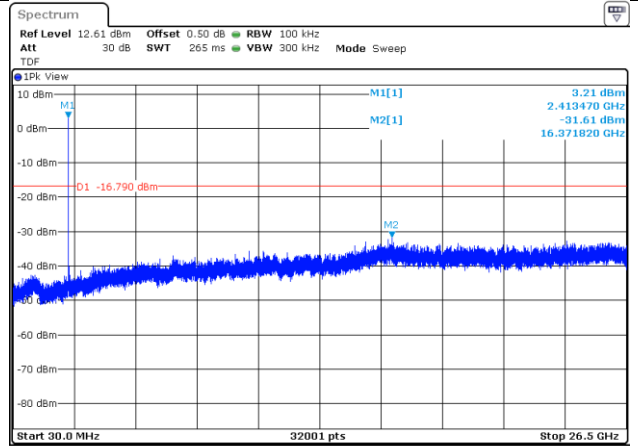
Test results

802.11b

Conducted band-edge / 2 412 MHz



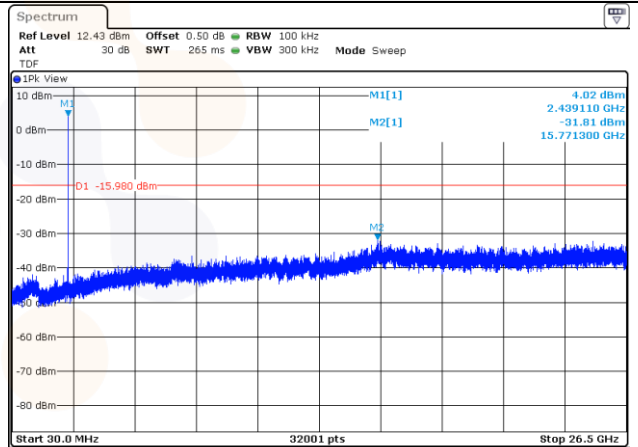
Conducted spurious / 2 412 MHz



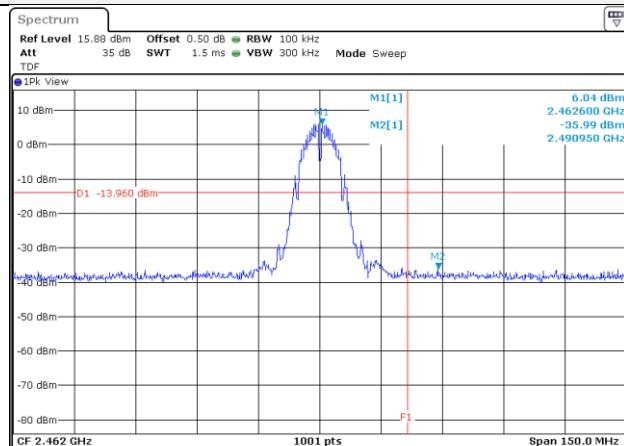
Conducted band-edge / 2 437 MHz

Blank

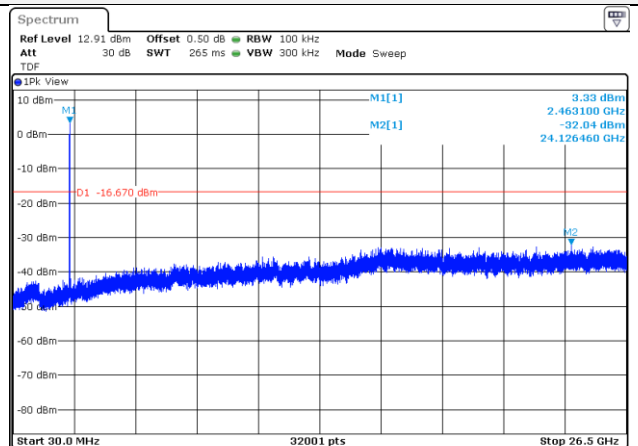
Conducted spurious / 2 437 MHz



Conducted band-edge / 2 462 MHz

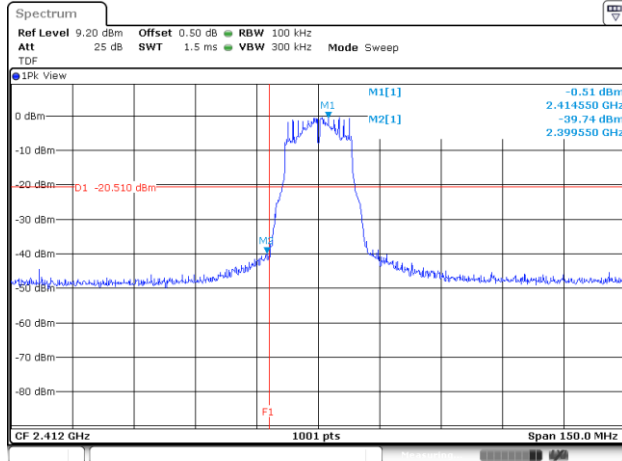


Conducted spurious / 2 462 MHz

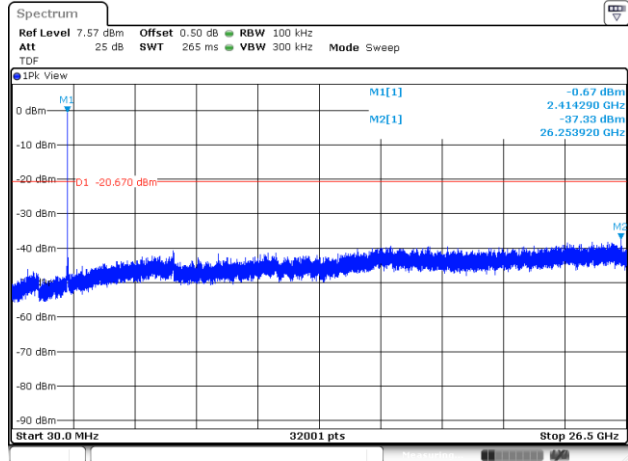


802.11g

Conducted band-edge / 2 412 MHz



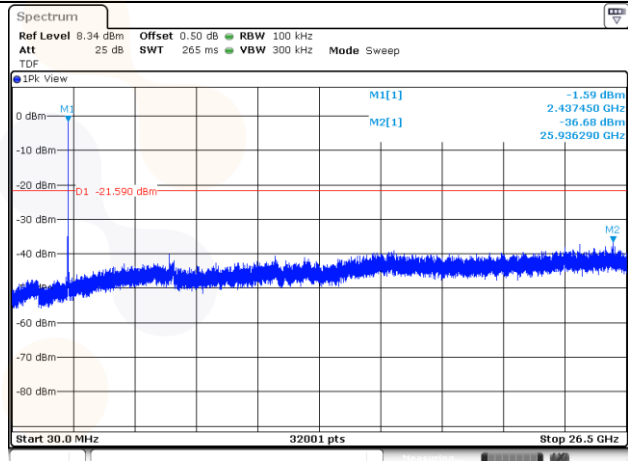
Conducted spurious / 2 412 MHz



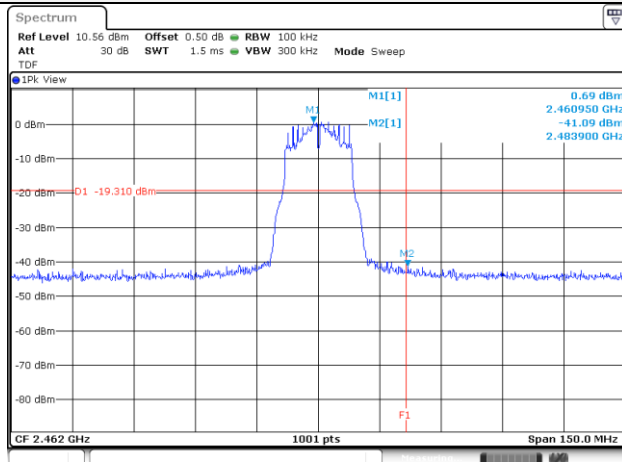
Conducted band-edge / 2 437 MHz

Blank

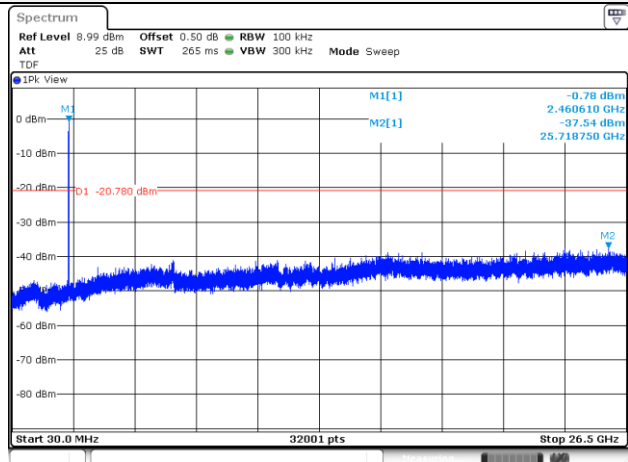
Conducted spurious / 2 437 MHz



Conducted band-edge / 2 462 MHz

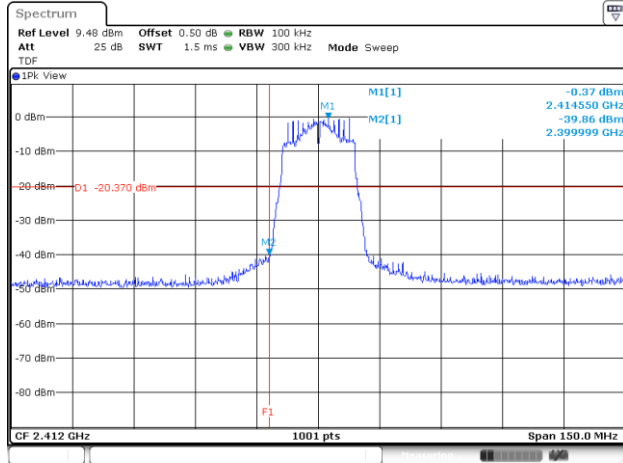


Conducted spurious / 2 462 MHz

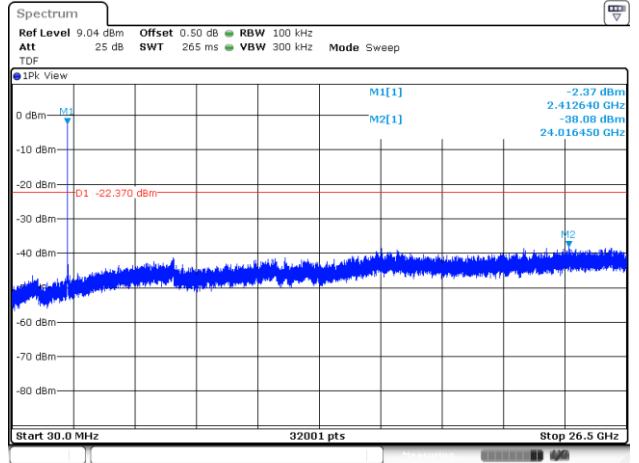


802.11n_HT20

Conducted band-edge / 2 412 MHz



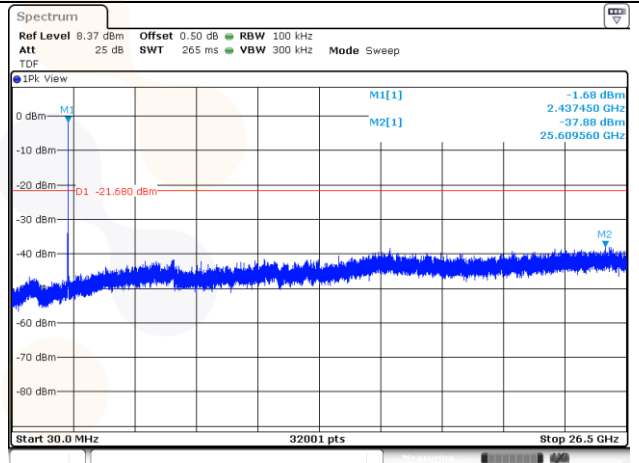
Conducted spurious / 2 412 MHz



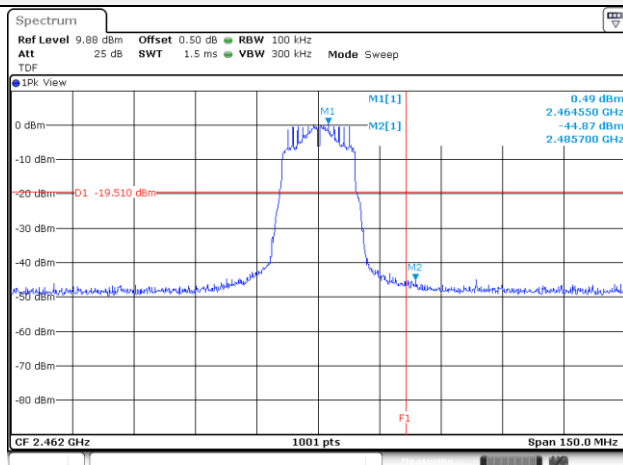
Conducted band-edge / 2 437 MHz

Blank

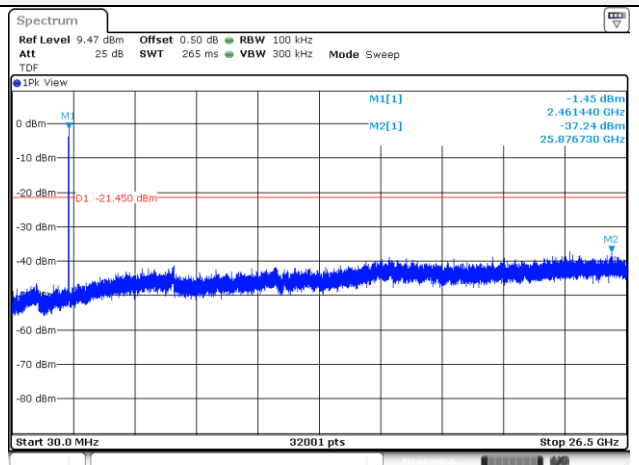
Conducted spurious / 2 437 MHz



Conducted band-edge / 2 462 MHz

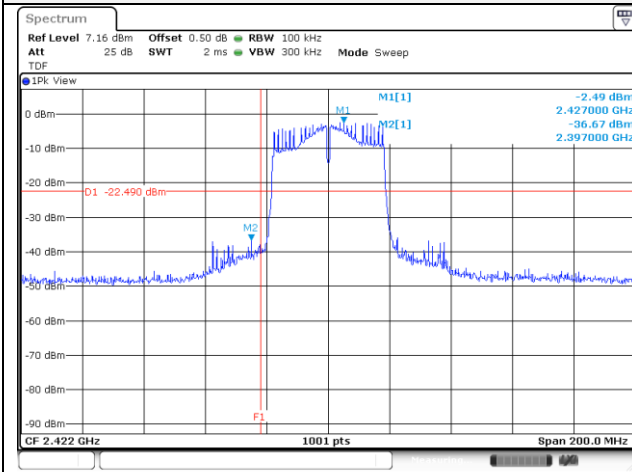


Conducted spurious / 2 462 MHz

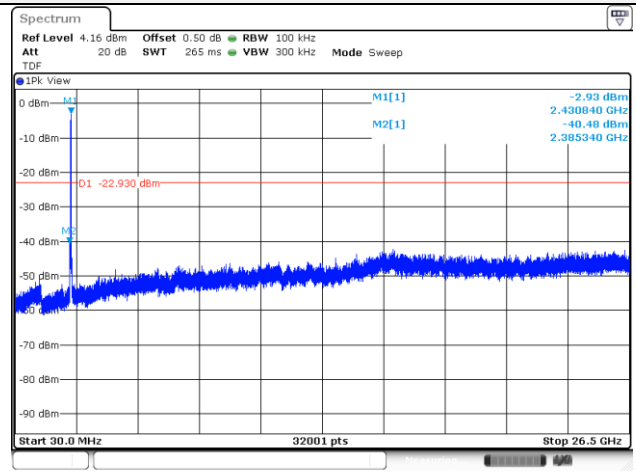


802.11n_HT40

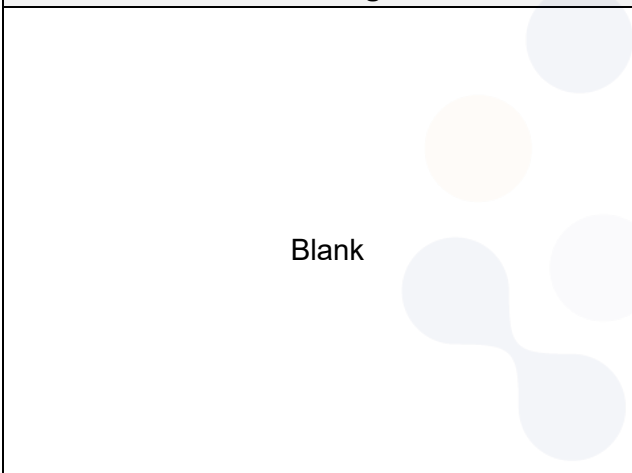
Conducted band-edge / 2 422 MHz



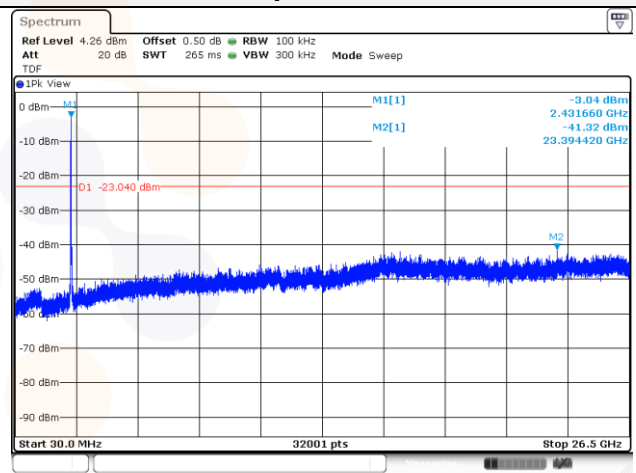
Conducted spurious / 2 422 MHz



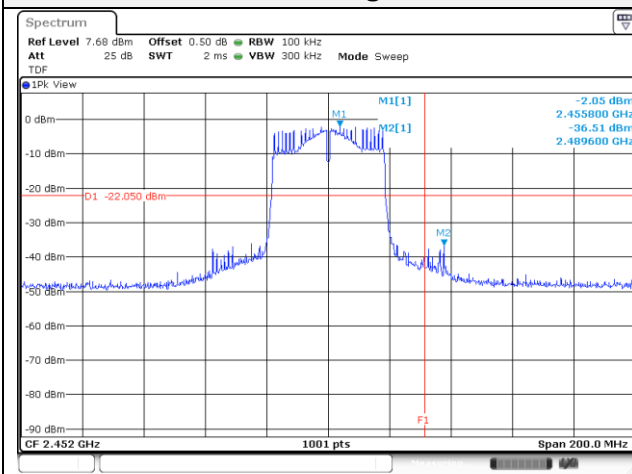
Conducted band-edge / 2 437 MHz



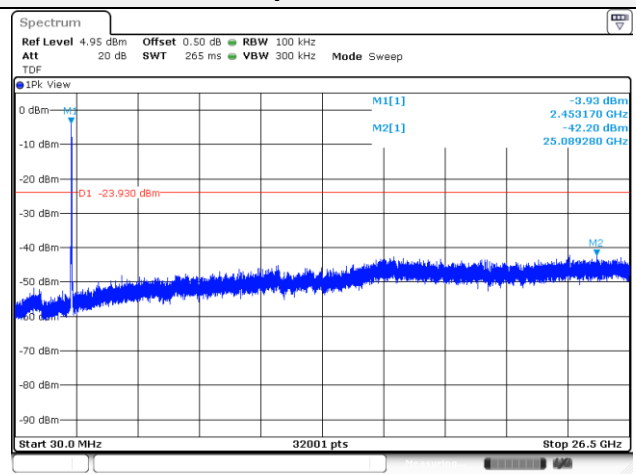
Conducted spurious / 2 437 MHz



Conducted band-edge / 2 452 MHz

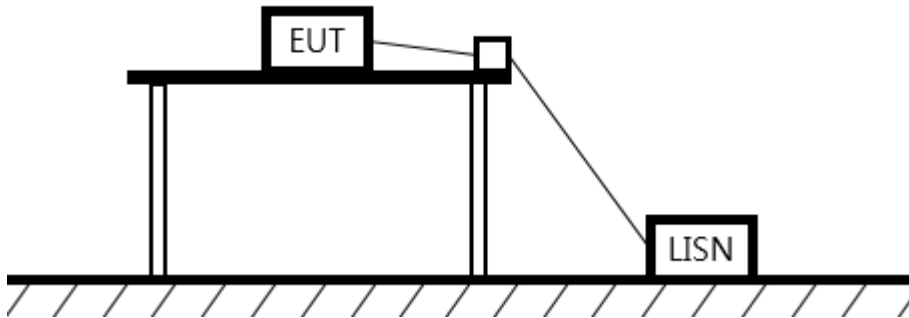


Conducted spurious / 2 452 MHz



7.6. AC Conducted emission

Test setup



Limit

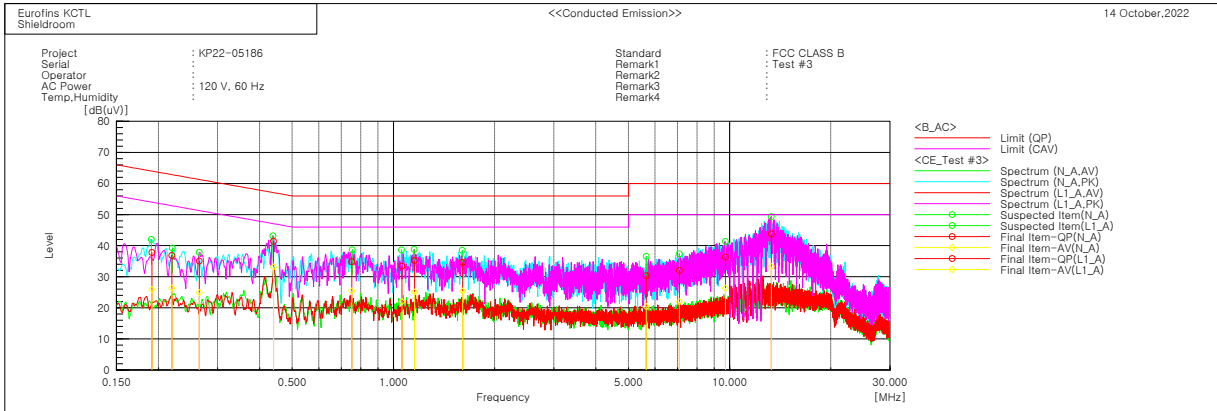
According to 15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50μH/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 (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 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 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 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 mode / 2 452 MHz



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]
1	0.19133	27.8	15.8	10.0	37.8	25.8	64.0	54.0	26.2
2	0.21928	27.0	16.6	9.8	36.8	26.4	62.8	52.8	26.0
3	0.75232	24.8	15.4	10.0	34.8	25.4	56.0	46.0	21.2
4	1.06006	23.5	12.1	9.9	33.4	22.0	56.0	46.0	22.6
5	1.60648	24.7	15.5	9.9	34.6	25.4	56.0	46.0	21.4
6	5.64813	20.3	10.4	10.0	30.3	20.4	60.0	50.0	29.7

--- 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]
1	0.26449	25.2	15.1	9.8	35.0	24.9	61.3	51.3	26.3
2	0.4398	31.4	23.2	10.0	41.4	33.2	57.1	47.1	15.7
3	1.1554	25.3	15.2	9.9	35.2	25.1	56.0	46.0	20.8
4	7.08779	21.9	11.9	10.1	32.0	22.0	60.0	50.0	28.0
5	9.71676	26.0	16.0	10.3	36.3	26.3	60.0	50.0	23.7
6	13.30635	33.3	22.8	10.5	43.8	33.3	60.0	50.0	16.2

8. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Spectrum Analyzer	R&S	FSV30	101437	23.07.12
DC Power Supply	AGILENT	E3632A	MY51220373	23.07.11
Attenuator	API Inmet	40AH2W-10	18	23.05.03
Power Sensor	R&S	NRP-Z81	1137.9009.02-106223-bB	23.05.03
Signal Generator	R&S	SMB100A	176206	23.01.19
Vector Signal Generator	R&S	SMBV100A	257566	23.07.04
Spectrum Analyzer	R&S	FSV40	100989	23.10.14
EMI TEST RECEIVER	R&S	ESCi7	100732	23.01.19
Bi-Log Antenna	TESEQ	CBL 6112D	62438	24.08.24
Amplifier	SONOMA INSTRUMENT	310N	284608	23.08.18
ATTENUATOR	KEYSIGHT	8491B-6dB	MY39271060	24.04.27
ISOLATION TRANSFORMER	ONETECH CO., LTD	OT-IT500VA	OTR1-16026	23.03.28
Horn antenna	ETS.lindgren	3117	155787	23.09.29
Horn antenna	ETS.lindgren	3116	86635	23.05.04
Attenuator	API Inmet	40AH2W-10	12	23.05.03
AMPLIFIER	B&Z Technologies	BZRT-00504000-481055-382525	26299-27735	23.09.19
AMPLIFIER	B&Z Technologies	BZR-0050400-551028-252525	27736	23.09.19
LOOP Antenna	R&S	HFH2-Z2	100355	24.08.10
Antenna Mast	Innco Systems	MA4640-XP-ET	-	-
Turn Table	Innco Systems	CO3000	1175/45850319/P	-
Antenna Mast	Innco Systems	MA4000-EP	303	-
Turn Table	Innco Systems	CO3000	1175/45850319/P	-
Highpass Filter	WT	WT-A1698-HS	WT160411001	23.05.03
Highpass Filter	Qotana	DBHF058004000A	20070100016	23.07.04
TWO-LINE V - NETWORK	R&S	ENV216	101358	23.09.29
EMI TEST RECEIVER	R&S	ESCi3	100001	23.08.18

*Tests related to this equipment were progressed after the calibration was completed.

End of test report