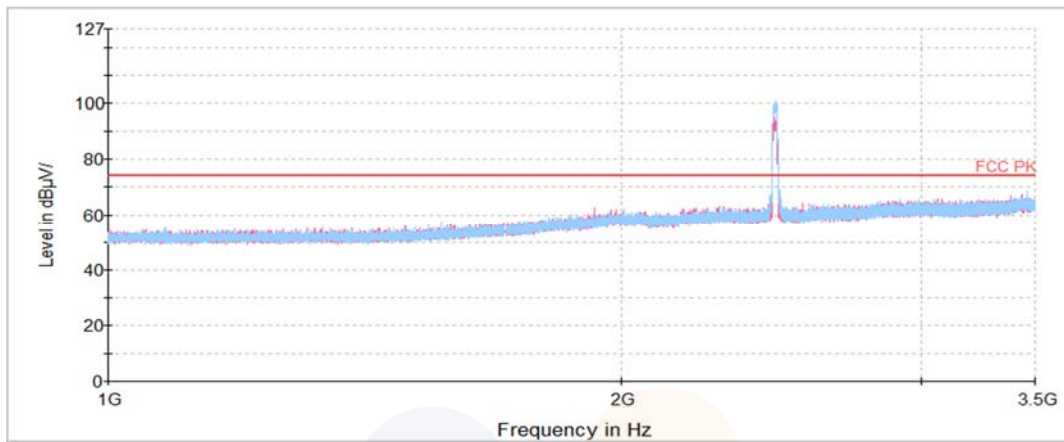
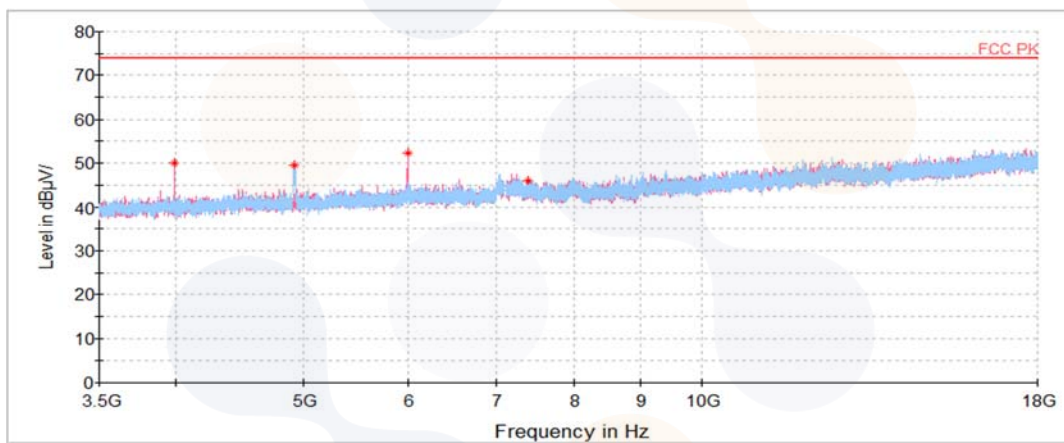


Horizontal/Vertical for 1 GHz ~ 3.5 GHz



Horizontal/Vertical for 3.5 GHz ~ 18 GHz



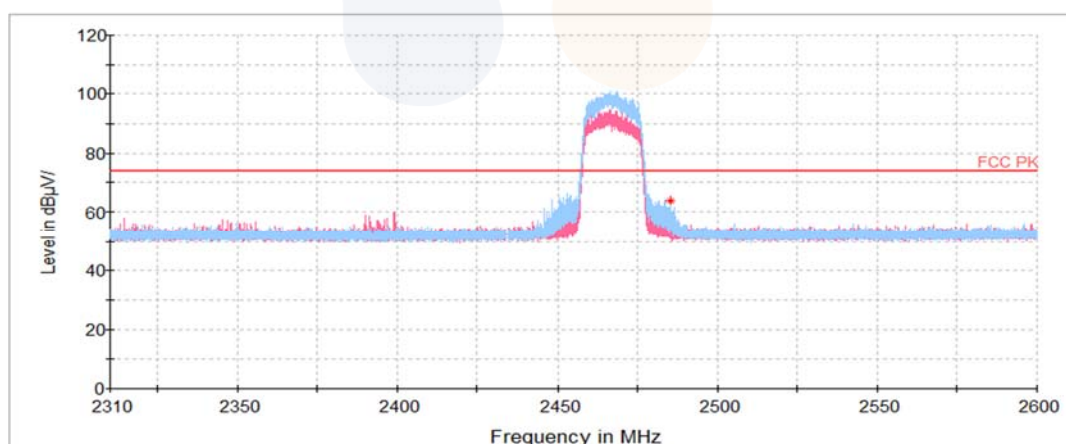
802.11n_HT20_2 467 MHz

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								
2 483.53 ¹⁾	H	49.48	32.18	-17.81	-	63.85	74.00	10.15
4 939.37 ¹⁾	H	72.43	34.08	-55.65	-	50.86	74.00	23.14
6 000.28	V	70.58	35.30	-53.84	-	52.04	74.00	21.96
7 403.88 ¹⁾	V	62.33	35.80	-52.27	-	45.86	74.00	28.14
Average Data								
2 483.53 ¹⁾	H	35.09	32.18	-17.81	2.46	51.92	54.00	2.08

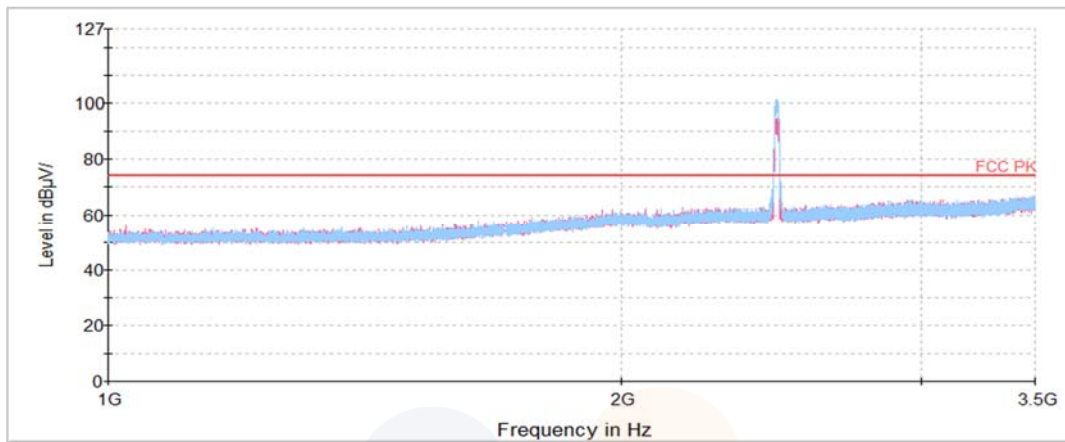
Average data



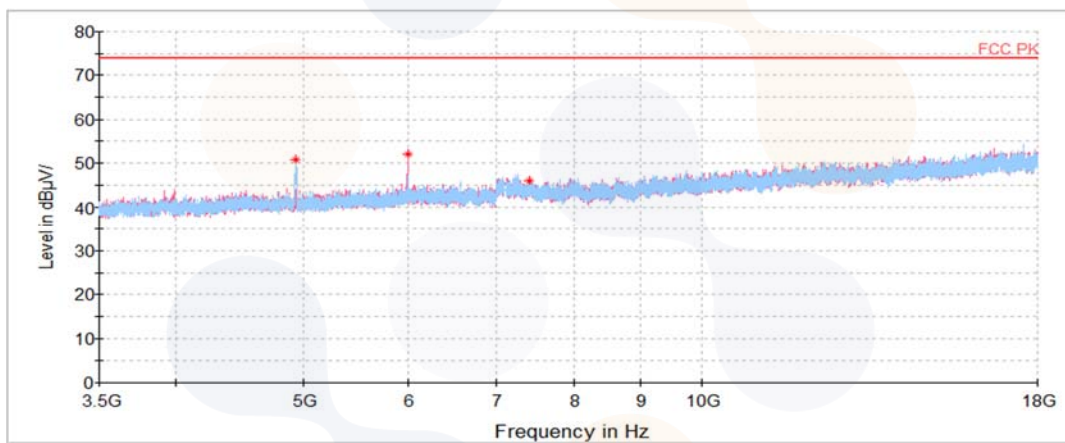
Horizontal/Vertical for Band-edge



Horizontal/Vertical for 1 GHz ~ 3.5 GHz



Horizontal/Vertical for 3.5 GHz ~ 18 GHz



802.11n_HT20_2 472 MHz

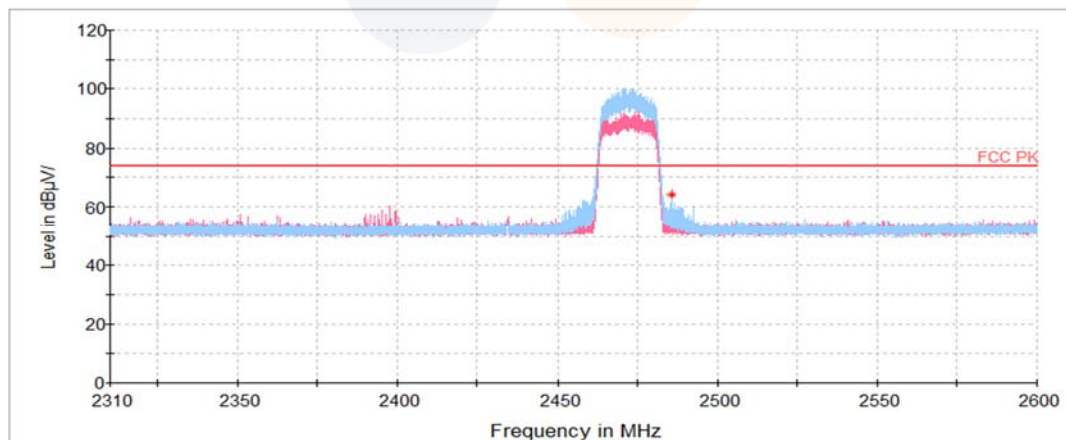
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 483.51 ¹⁾	H	49.58	32.18	-17.81	-	63.95	74.00	10.05
3 995.90 ¹⁾	V	71.37	33.30	-56.87	-	47.80	74.00	26.20
4 941.78 ¹⁾	H	69.95	34.08	-55.65	-	48.38	74.00	25.62
6 000.28	V	70.64	35.30	-53.84	-	52.10	74.00	21.90
7 411.13 ¹⁾	V	61.86	35.80	-52.28	-	45.38	74.00	28.62
Average Data								
2 483.51 ¹⁾	H	35.90	32.18	-17.81	2.46	52.73	54.00	1.27

Average data

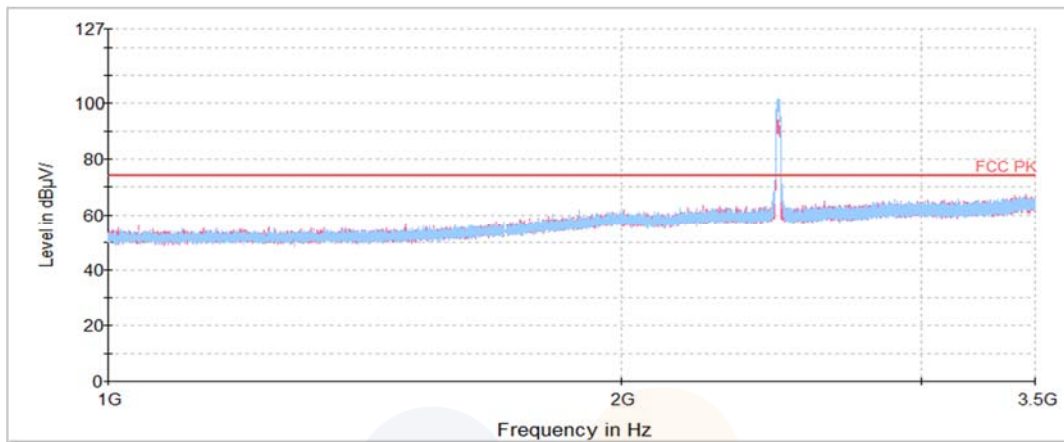


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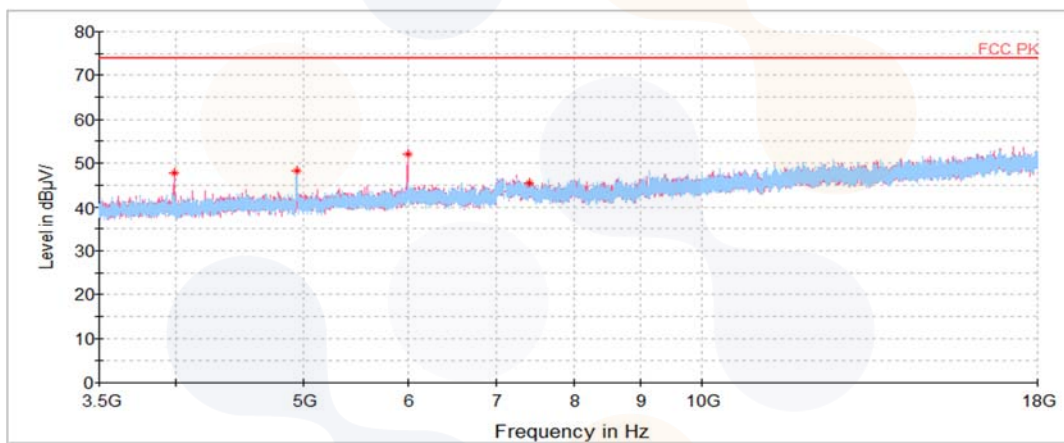
Horizontal/Vertical for Band-edge

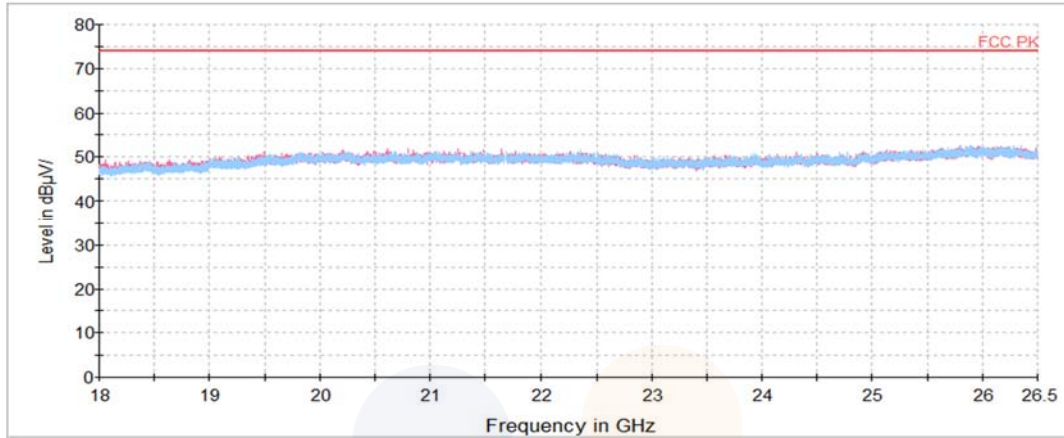


Horizontal/Vertical for 1 GHz ~ 3.5 GHz



Horizontal/Vertical for 3.5 GHz ~ 18 GHz

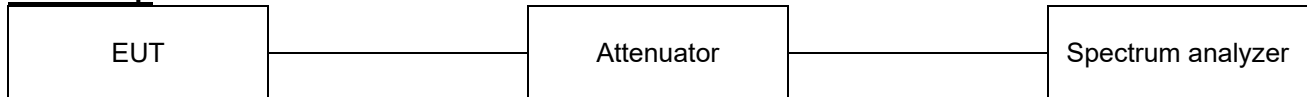


Test results (Above 18 GHz) – Worst case: 802.11n_HT20 / 2 472 MHz**Horizontal/Vertical for 18 GHz ~ 26.5 GHz**

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

7.5. Conducted Spurious Emission

Test setup



Limit

According to §15.247(d) and RSS-247(5.5), 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

KDB 558074 D01 v05 - Section 8.5

KDB 662911 D01 v02r01 – section (E)(3)(b)

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.

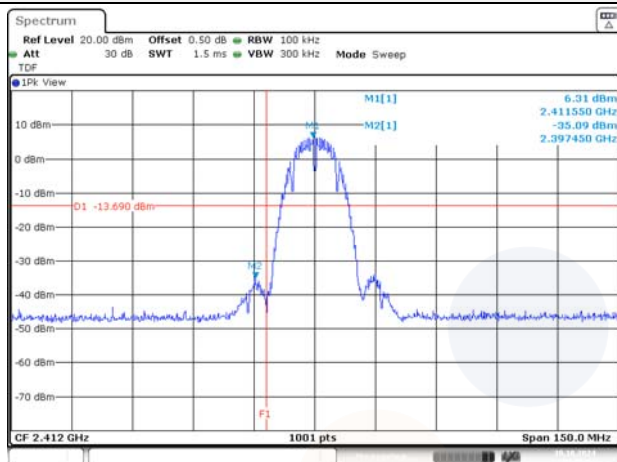
Test results

In SISO mode, we tested both Ant 1 and Ant 2, but attached only the plot of ANT 2 with the highest conducted output power to simplify the report.

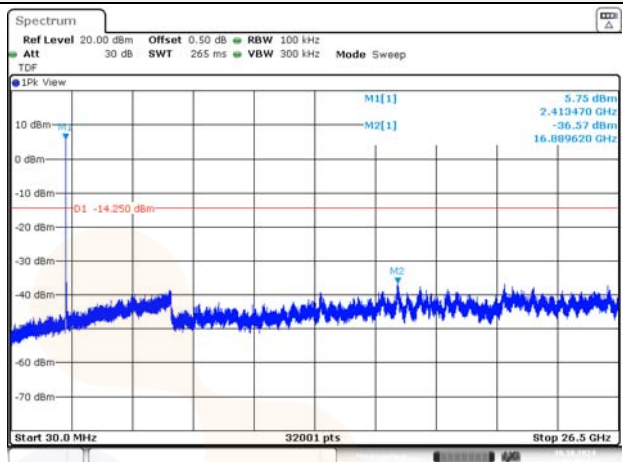
SISO

802.11b

Conducted band-edge / 2 412 MHz



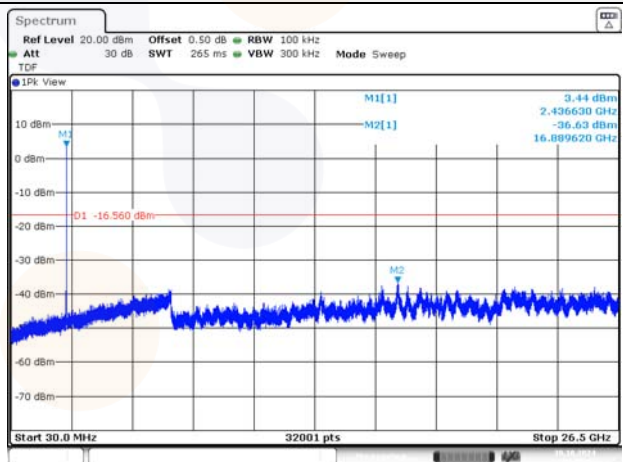
Conducted spurious / 2 412 MHz



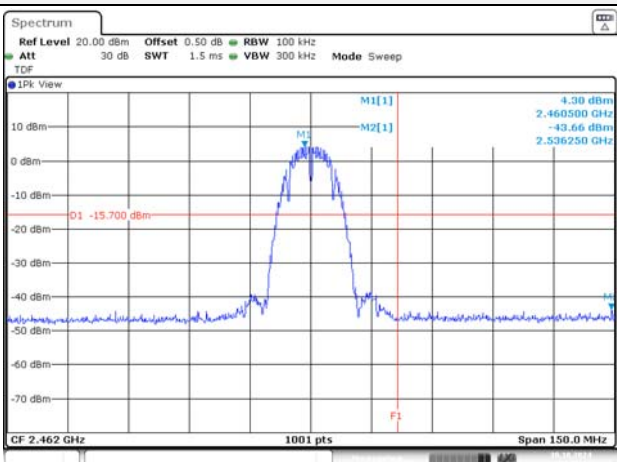
Conducted band-edge / 2 437 MHz

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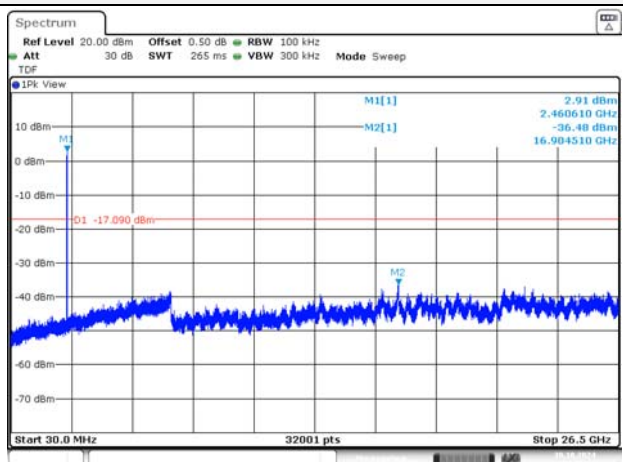
Conducted spurious / 2 437 MHz



Conducted band-edge / 2 462 MHz

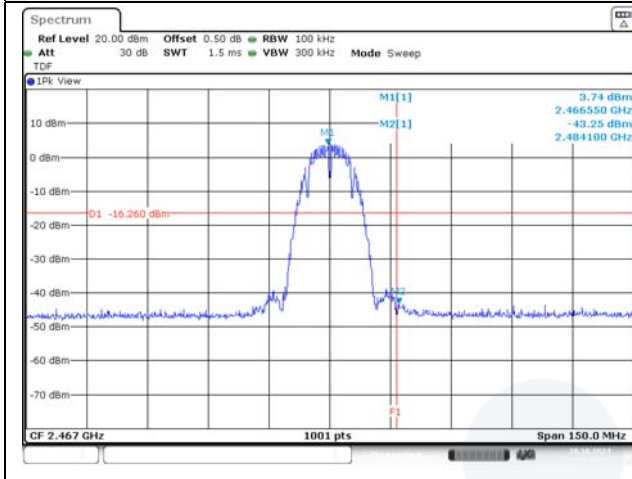


Conducted spurious / 2 462 MHz

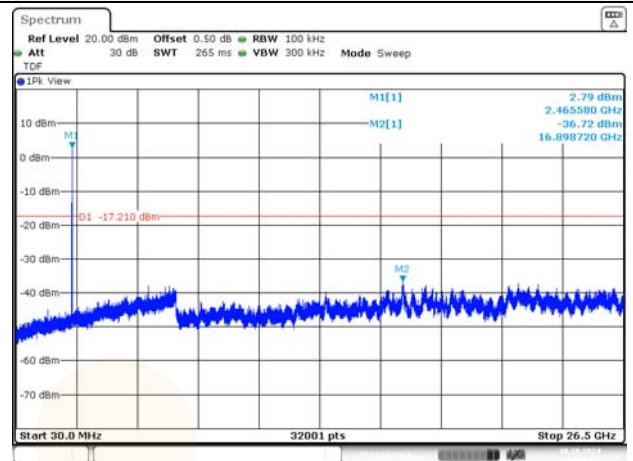


802.11b

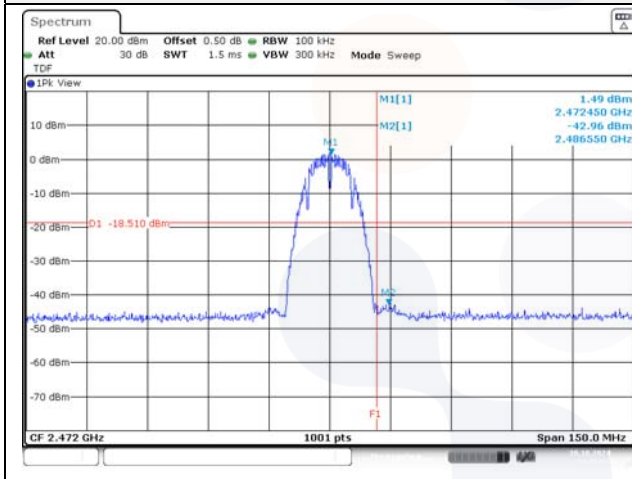
Conducted band-edge / 2 467 MHz



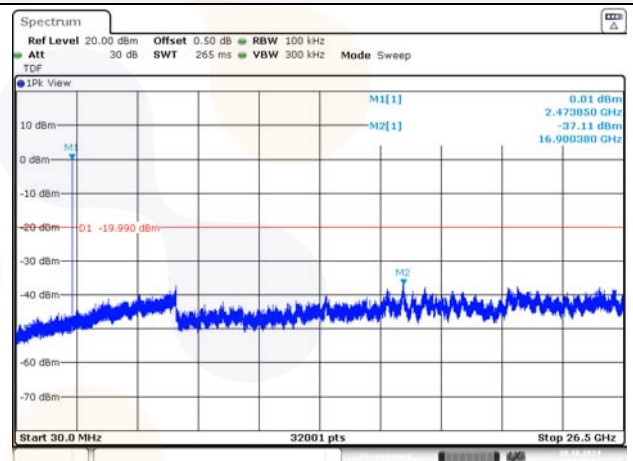
Conducted spurious / 2 467 MHz



Conducted band-edge / 2 472 MHz

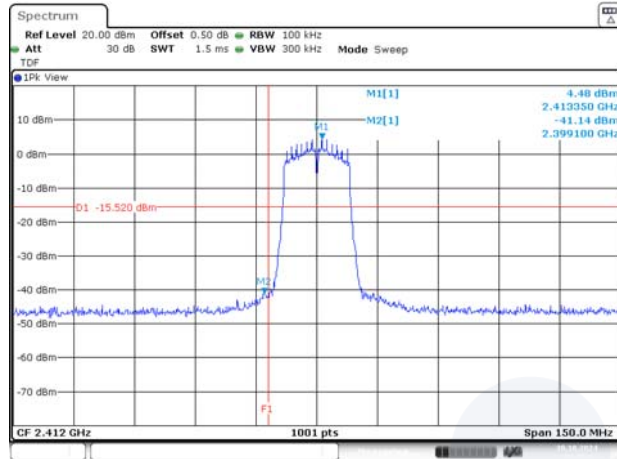


Conducted spurious / 2 472 MHz

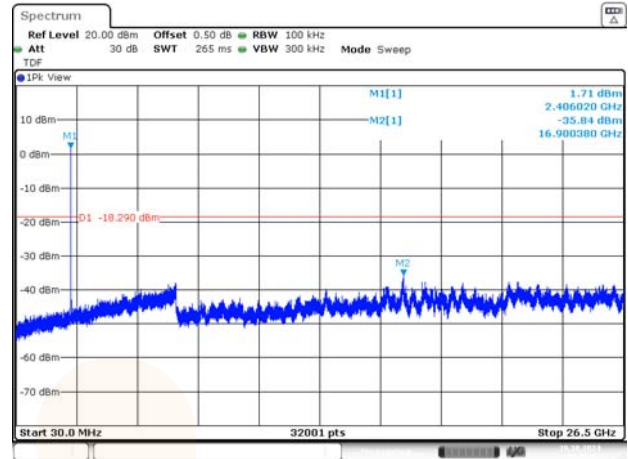


802.11g

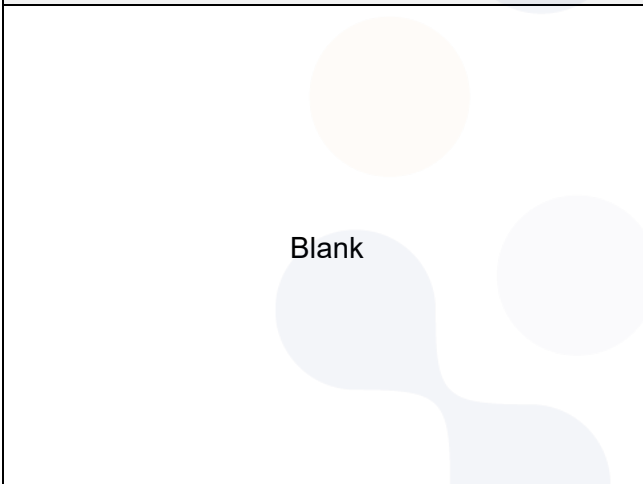
Conducted band-edge / 2 412 MHz



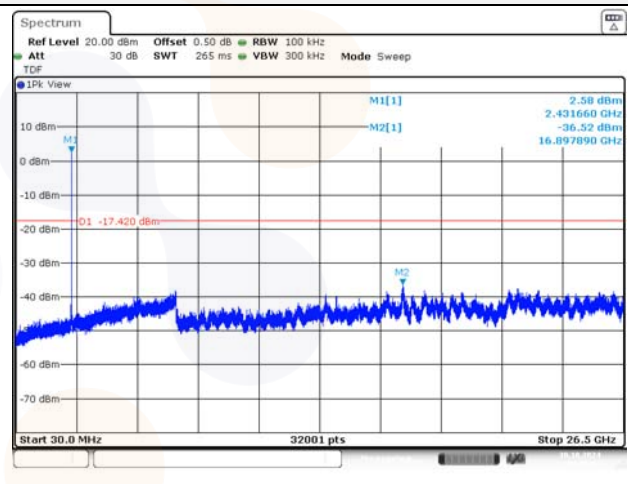
Conducted spurious / 2 412 MHz



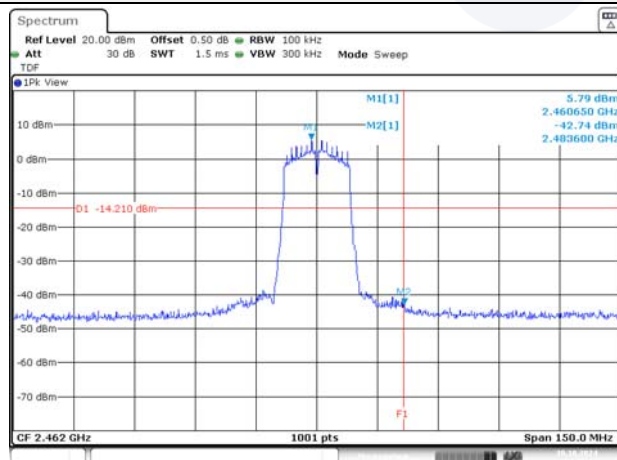
Conducted band-edge / 2 437 MHz



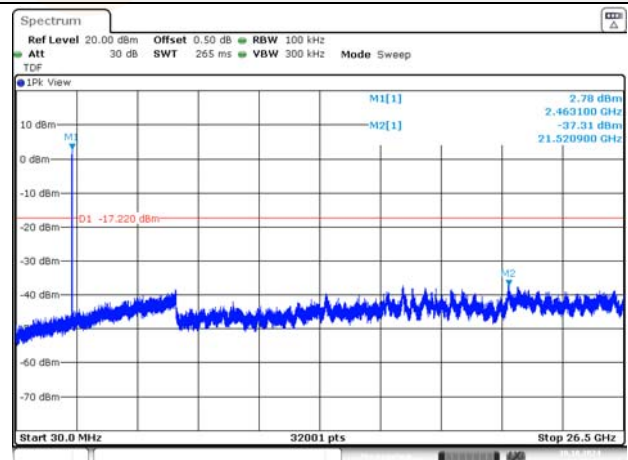
Conducted spurious / 2 437 MHz



Conducted band-edge / 2 462 MHz

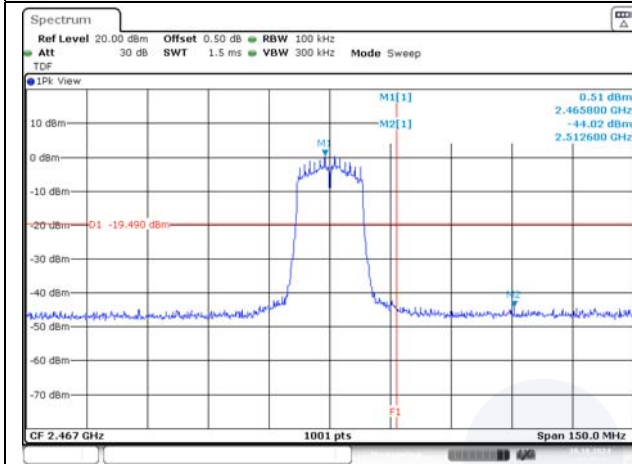


Conducted spurious / 2 462 MHz

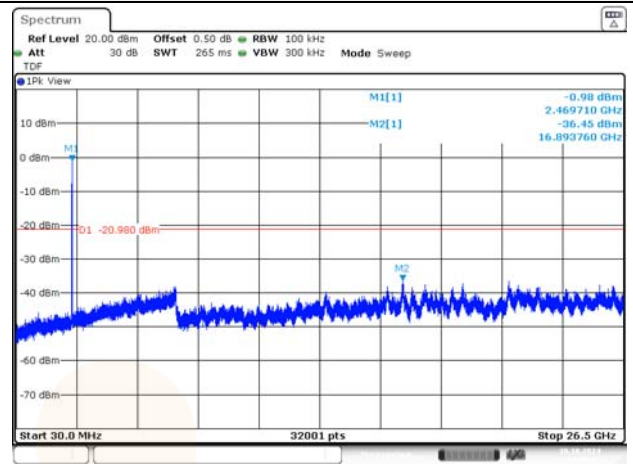


802.11g

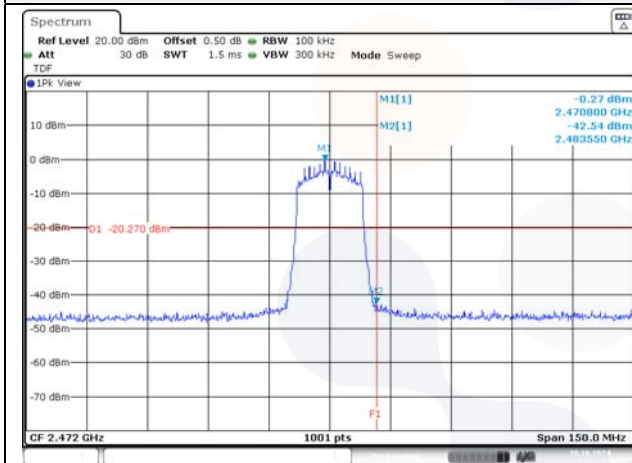
Conducted band-edge / 2 467 MHz



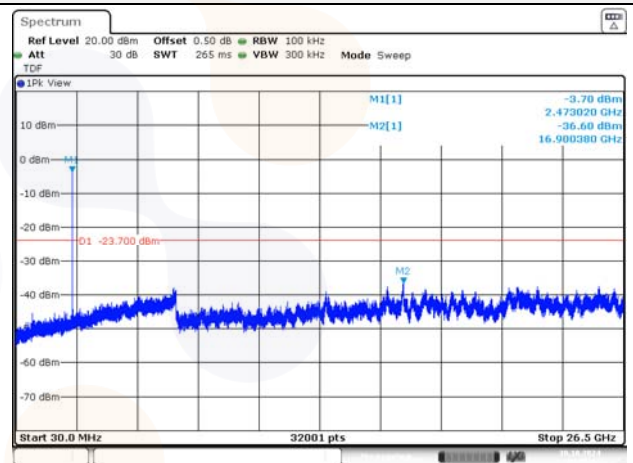
Conducted spurious / 2 467 MHz



Conducted band-edge / 2 472 MHz

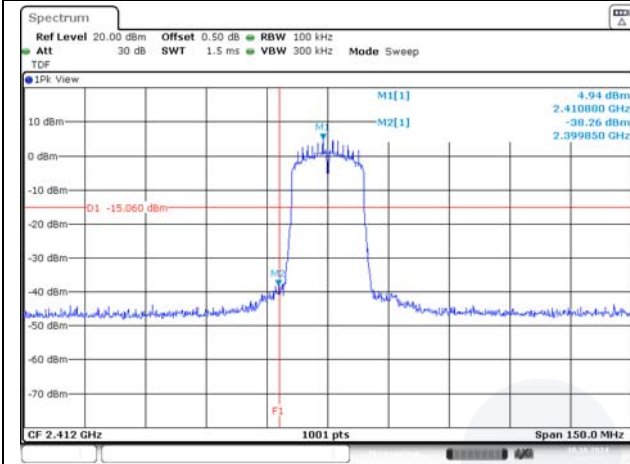


Conducted spurious / 2 472 MHz

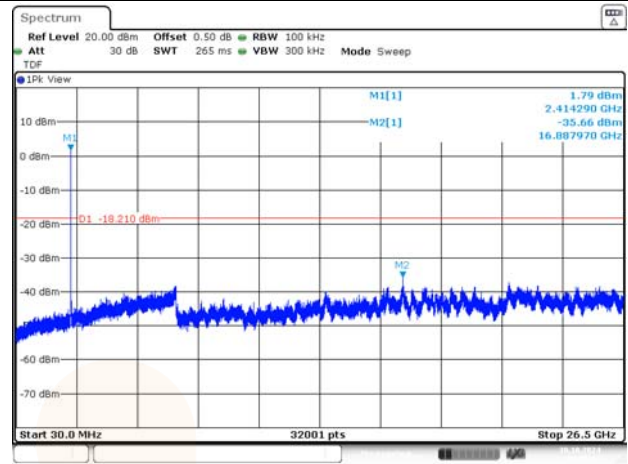


802.11n_HT20

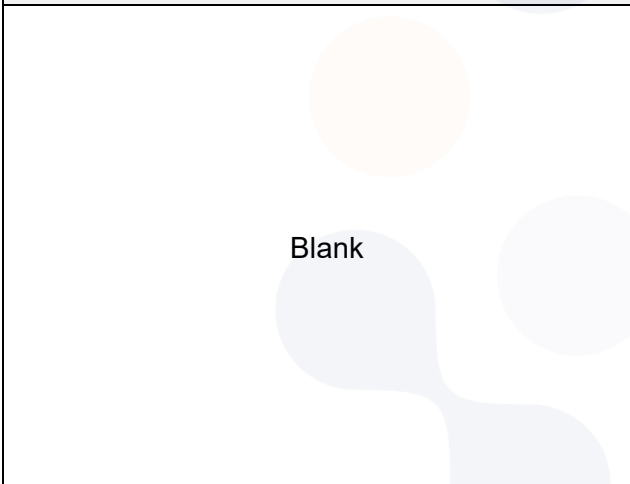
Conducted band-edge / 2 412 MHz



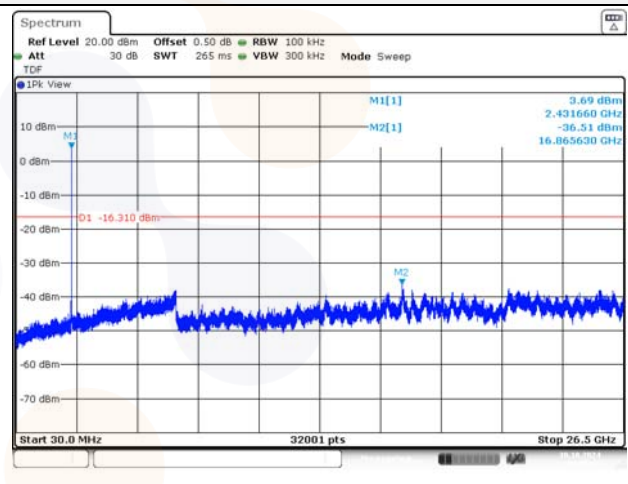
Conducted spurious / 2 412 MHz



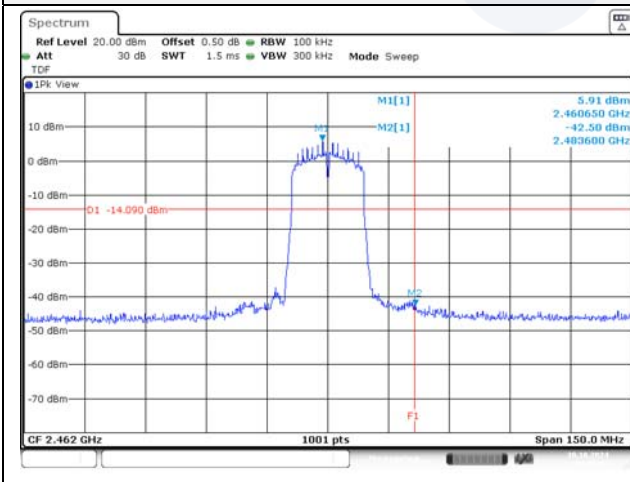
Conducted band-edge / 2 437 MHz



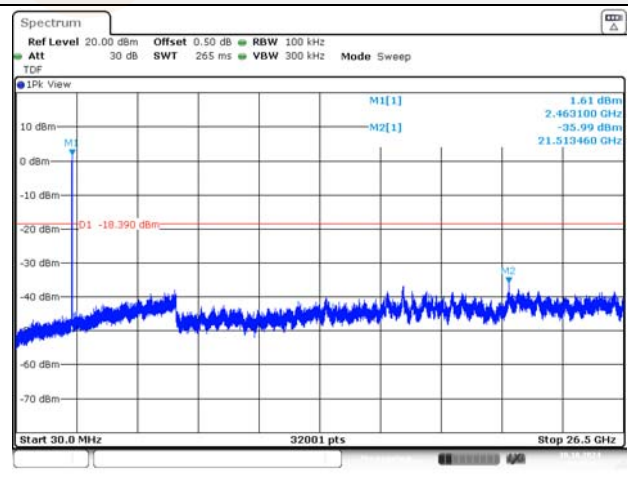
Conducted spurious / 2 437 MHz



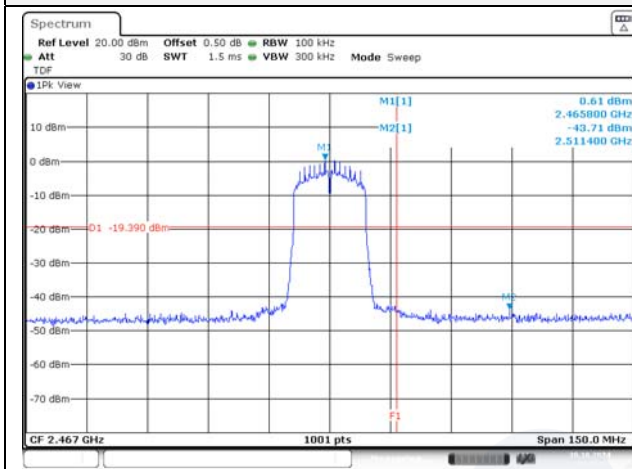
Conducted band-edge / 2 462 MHz



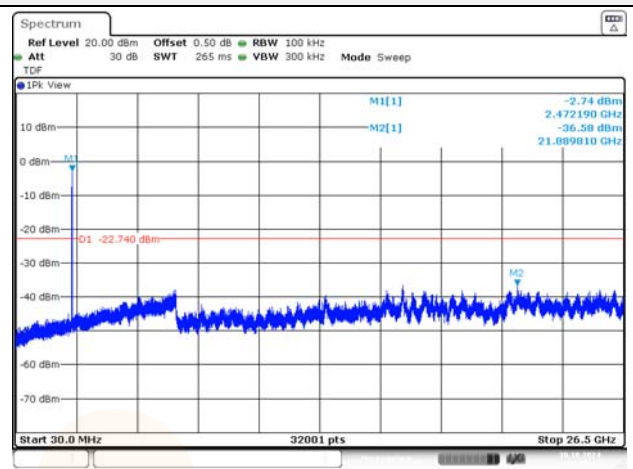
Conducted spurious / 2 462 MHz



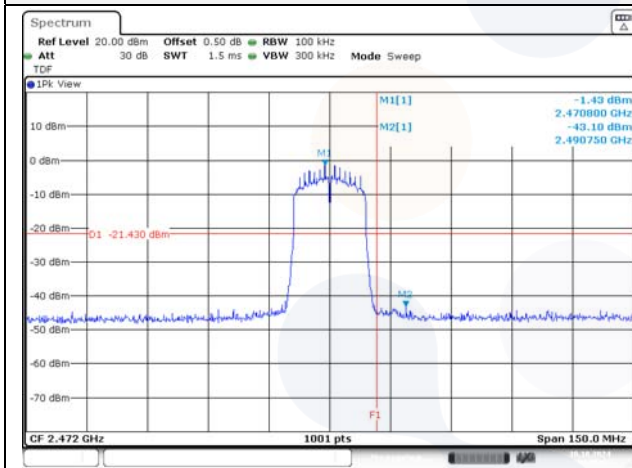
Conducted band-edge / 2 467 MHz



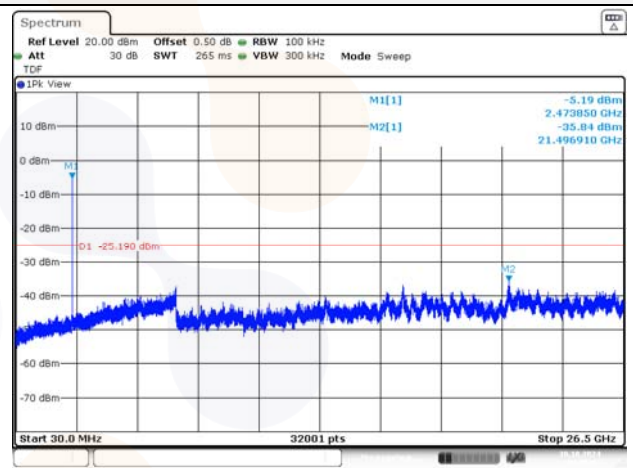
Conducted spurious / 2 467 MHz



Conducted band-edge / 2 472 MHz



Conducted spurious / 2 472 MHz

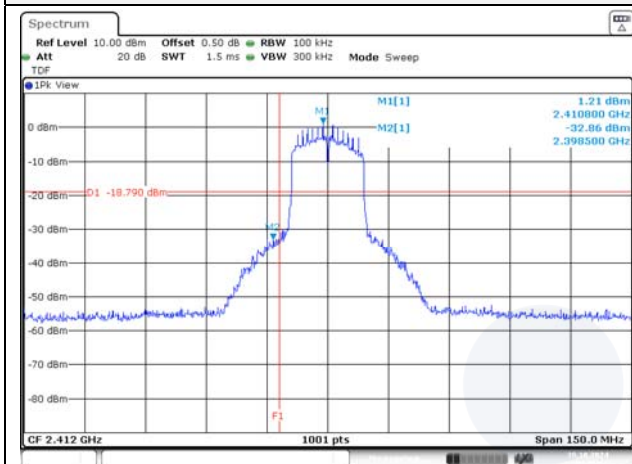


MIMO

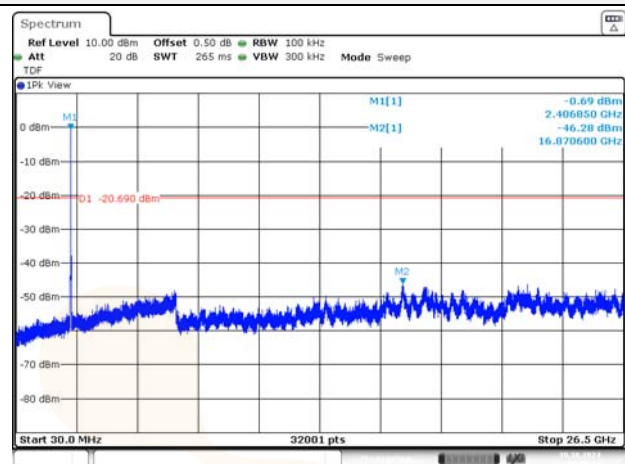
ANT 1

802.11n_HT20

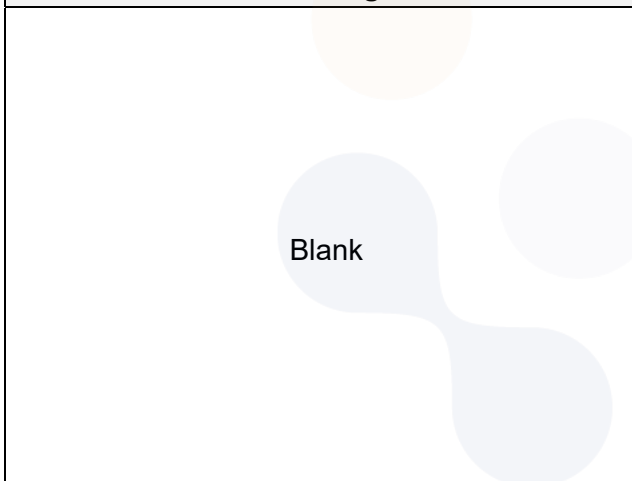
Conducted band-edge / 2 412 MHz



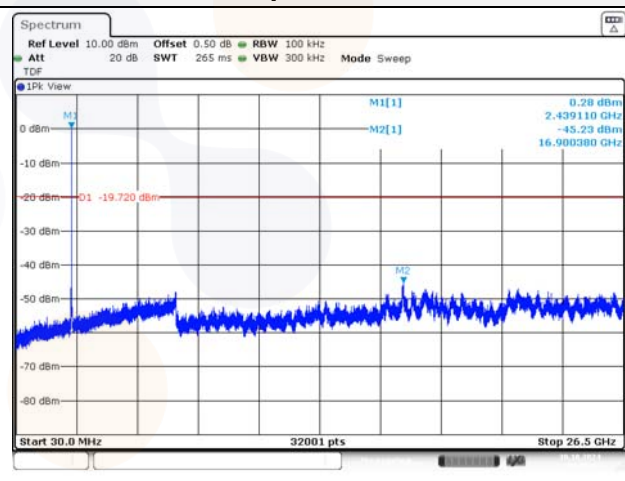
Conducted spurious / 2 412 MHz



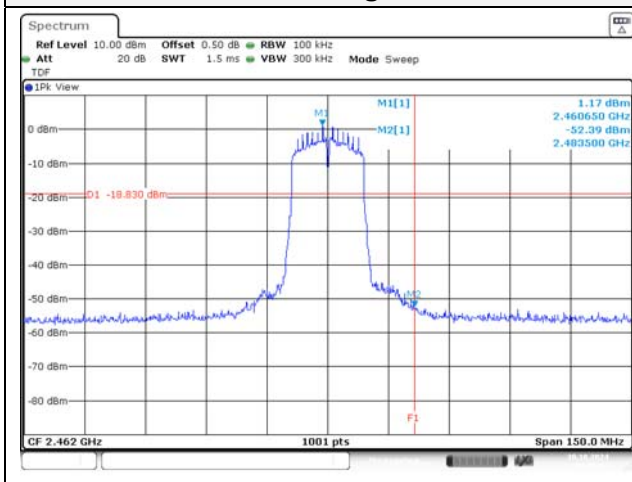
Conducted band-edge / 2 437 MHz



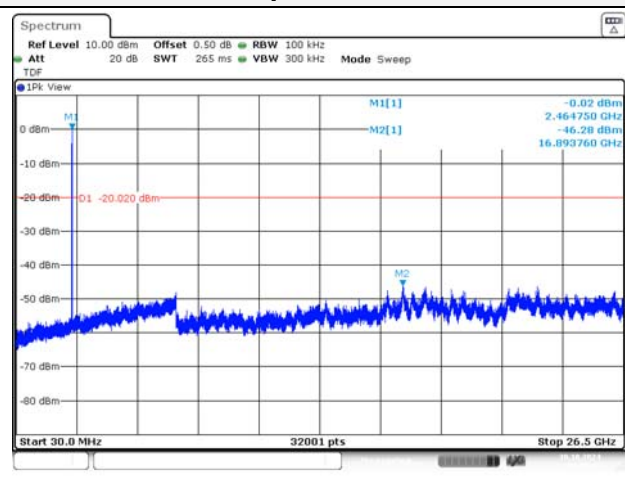
Conducted spurious / 2 437 MHz



Conducted band-edge / 2 462 MHz



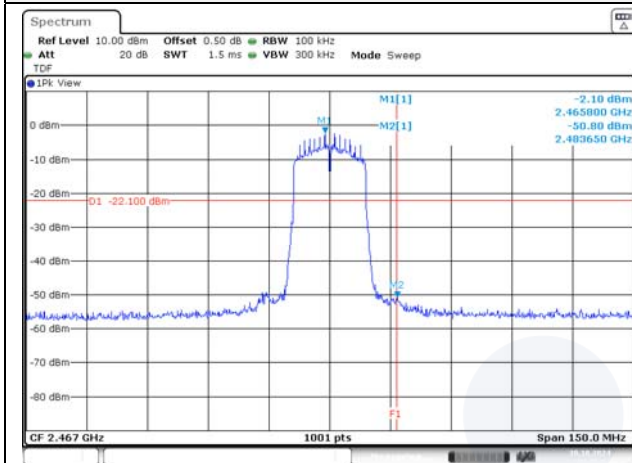
Conducted spurious / 2 462 MHz



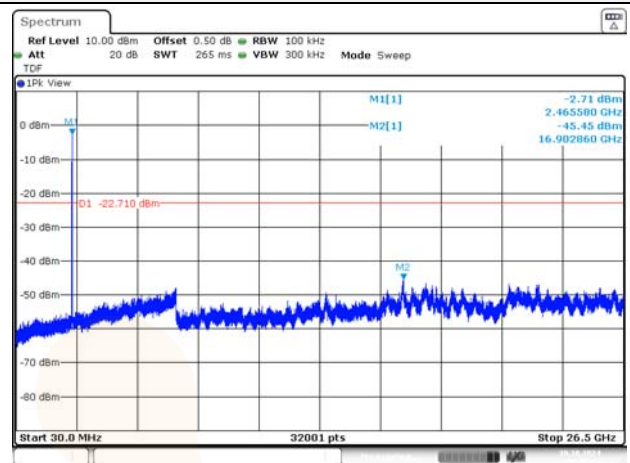
ANT 1

802.11n_HT20

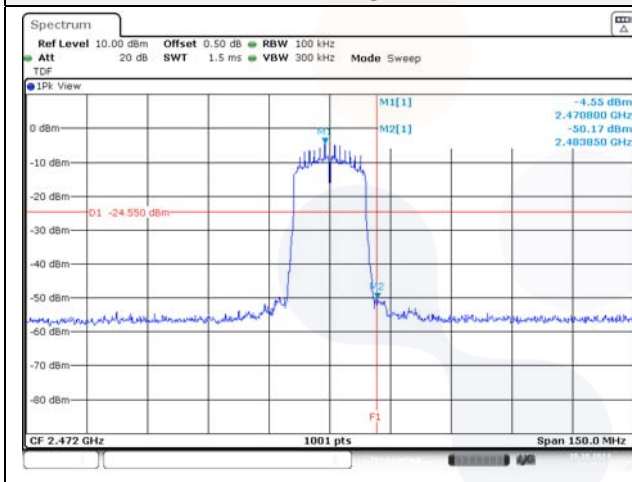
Conducted band-edge / 2 467 MHz



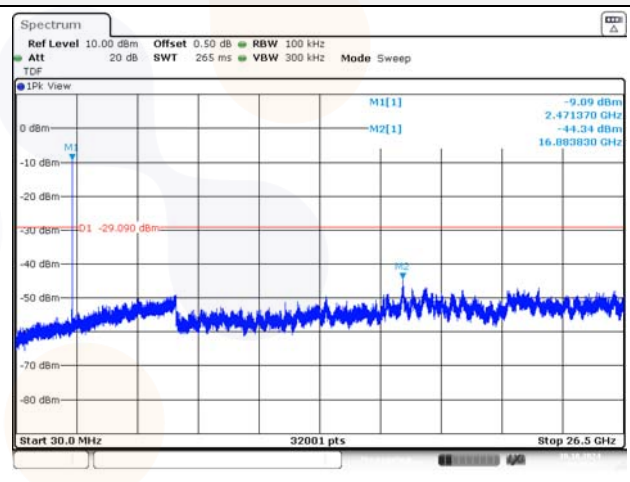
Conducted spurious / 2 467 MHz



Conducted band-edge / 2 472 MHz



Conducted spurious / 2 472 MHz

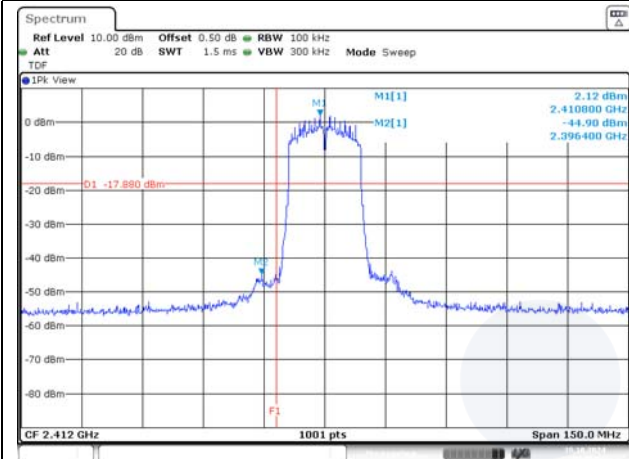


MIMO

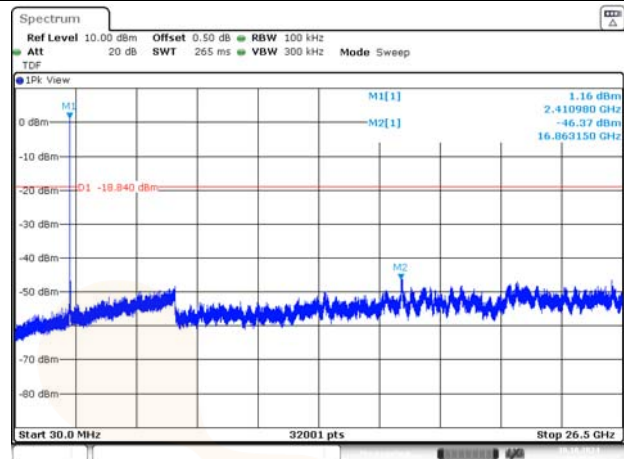
ANT 2

802.11n_HT20

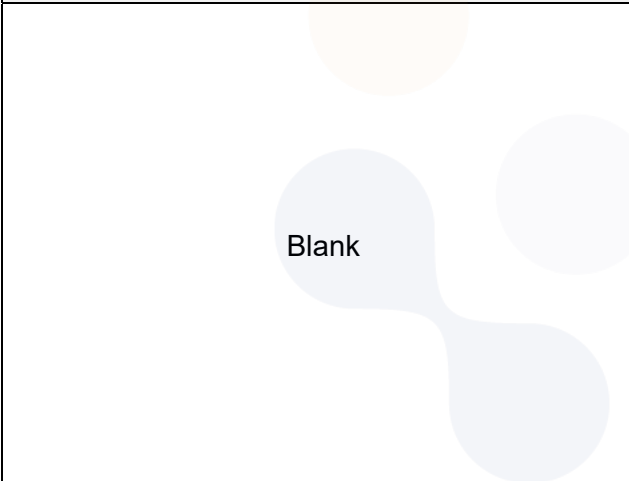
Conducted band-edge / 2 412 MHz



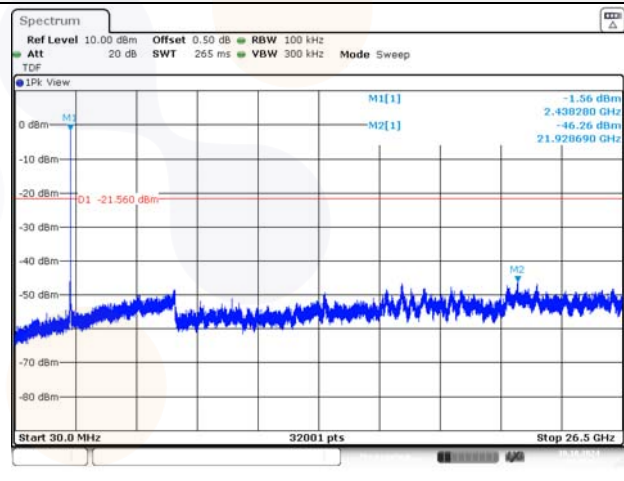
Conducted spurious / 2 412 MHz



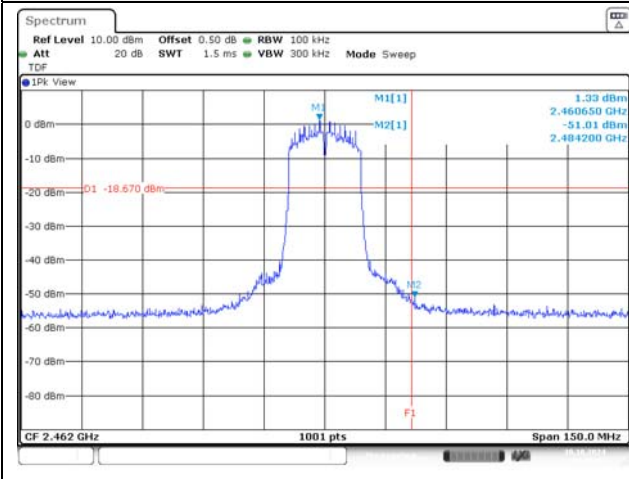
Conducted band-edge / 2 437 MHz



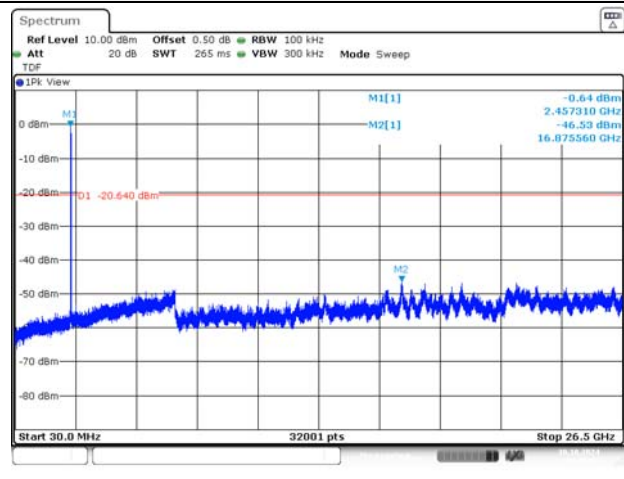
Conducted spurious / 2 437 MHz



Conducted band-edge / 2 462 MHz



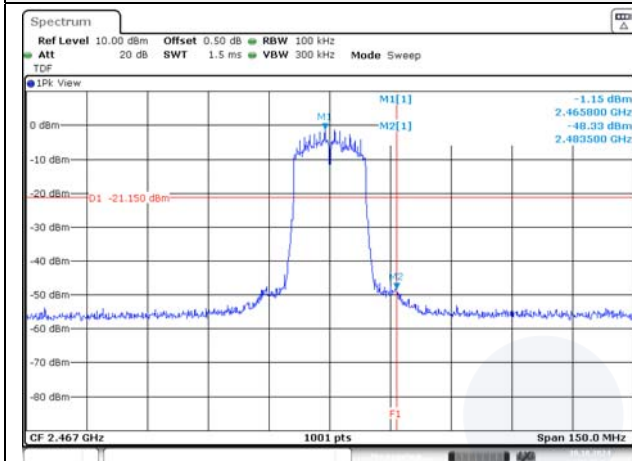
Conducted spurious / 2 462 MHz



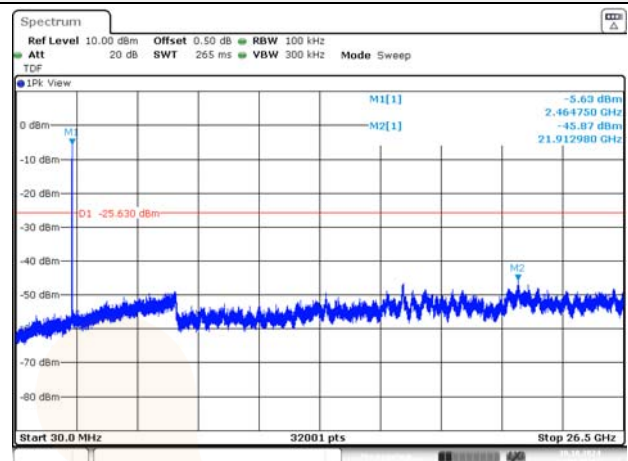
ANT 2

802.11n_HT20

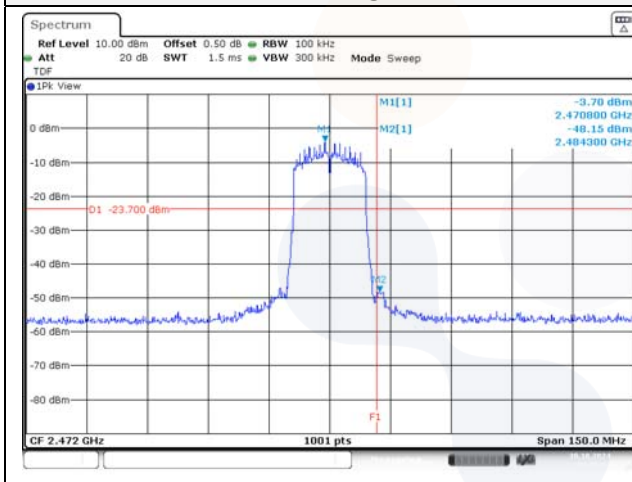
Conducted band-edge / 2 467 MHz



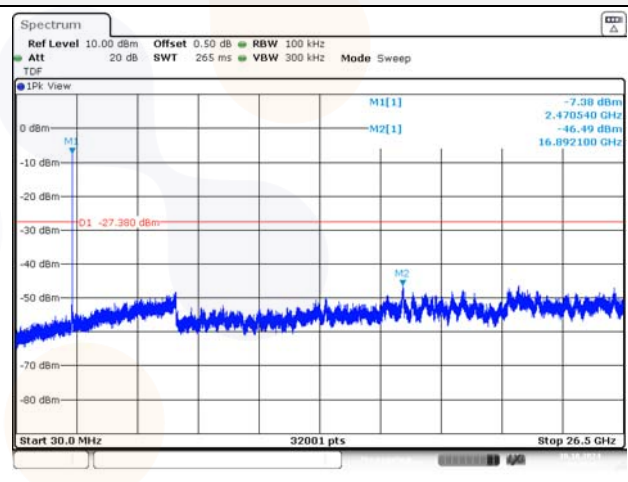
Conducted spurious / 2 467 MHz



Conducted band-edge / 2 472 MHz

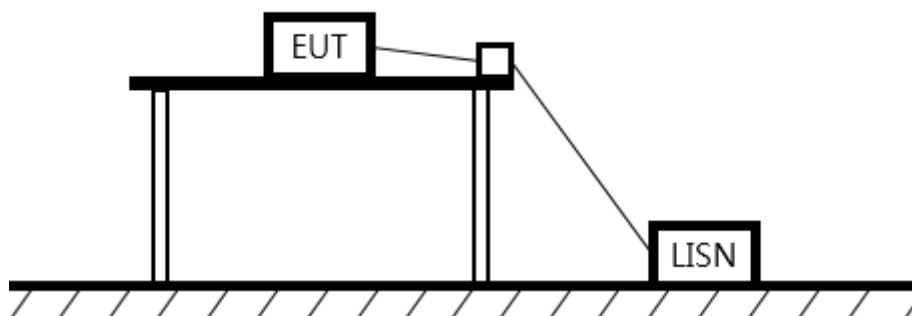


Conducted spurious / 2 472 MHz



7.6. AC Conducted emission

Test setup



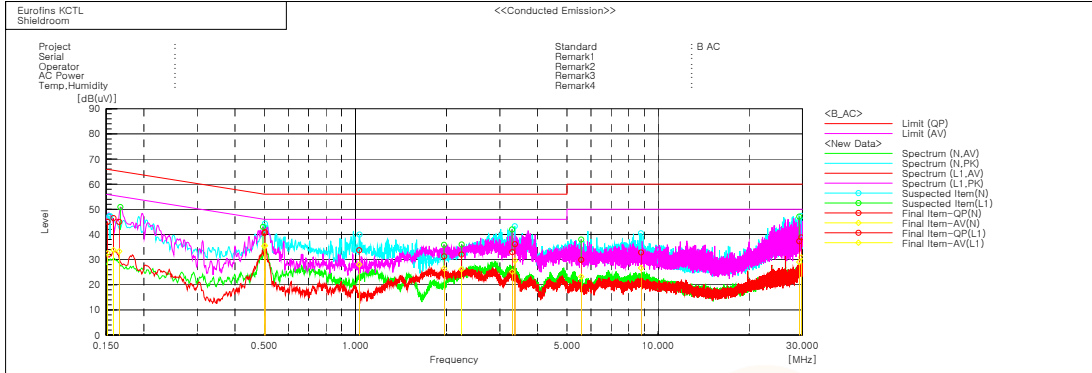
Limit

According to 15.207(a) and RSS-Gen(8.8), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 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 be 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

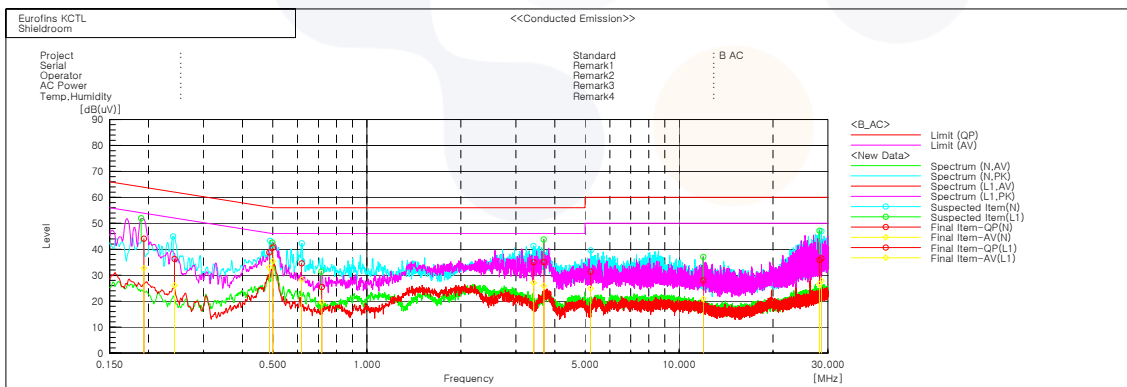
Measurement procedure

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: 802.11g / 2 462 MHz_SISO_ANT 2****Final Result**

--- N Phase ---									
No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin
	[MHz]	[dB(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB]	Margin CAV
1	0.15866	36.7	23.9	9.9	46.6	33.8	65.5	55.5	18.9
2	0.5028	31.0	25.7	9.9	40.9	35.6	56.0	46.0	15.1
3	1.02891	23.9	18.2	9.8	33.7	28.0	56.0	46.0	22.3
4	3.3641	26.3	19.8	9.8	36.1	29.6	56.0	46.0	19.9
5	8.7865	22.9	16.8	9.9	32.8	26.7	60.0	50.0	27.2
6	29.74415	28.8	20.9	10.0	38.8	30.9	60.0	50.0	21.2
7	0.1516	35.3	22.8	9.8	45.1	32.6	65.9	55.9	20.8

--- L1 Phase ---									
No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin
	[MHz]	[dB(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB]	Margin CAV
1	0.16575	34.9	23.2	10.1	45.0	33.3	65.2	55.2	20.2
2	0.49942	30.6	25.5	9.9	40.5	35.4	56.0	46.0	15.5
3	1.96399	21.5	16.7	9.8	31.3	26.5	56.0	46.0	24.7
4	3.297	23.2	15.4	9.8	33.0	25.2	56.0	46.0	23.0
5	5.57597	20.1	13.4	9.8	29.9	23.2	60.0	50.0	30.1
6	29.26285	27.3	19.0	10.0	37.3	29.0	60.0	50.0	22.7
7	2.24179	22.2	16.4	9.8	32.0	26.2	56.0	46.0	24.0

Worst case: 802.11n HT20 / 2 437 MHz_MIMO**Final Result**

--- N Phase ---									
No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin
	[MHz]	[dB(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB]	Margin CAV
1	0.24197	26.7	16.4	9.6	36.3	26.0	62.0	52.0	25.7
2	0.4873	28.9	23.0	9.9	38.8	32.9	56.2	46.2	17.4
3	0.61853	24.7	18.4	9.9	34.6	28.3	56.0	46.0	21.4
4	3.42232	25.2	17.3	9.8	35.0	27.1	56.0	46.0	21.0
5	5.21364	21.6	15.1	9.8	31.4	24.9	60.0	50.0	28.6
6	28.5619	26.5	17.9	10.0	36.5	27.9	60.0	50.0	23.5

--- L1 Phase ---									
No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin
	[MHz]	[dB(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB]	Margin CAV
1	0.19334	34.1	22.8	9.9	44.0	32.7	63.9	53.9	19.9
2	0.49844	30.7	25.5	9.9	40.6	35.4	56.0	46.0	15.4
3	0.71793	15.5	9.6	9.9	25.4	19.5	56.0	46.0	30.6
4	3.69241	25.2	16.1	9.8	35.0	25.9	56.0	46.0	21.0
5	11.96603	18.1	10.9	9.9	28.0	20.8	60.0	50.0	32.0
6	28.185	25.9	16.6	10.0	35.9	26.6	60.0	50.0	24.1

8. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Spectrum Analyzer	R&S	FSV30	100808	25.07.01
DC Power Supply	TOYOTECH	TL305TP	21040092	25.07.01
Attenuator	Weinschel ENGINEERING	56-10	51395	25.01.19
Power Sensor	R&S	NRP-Z81	1137.9009.02- 106223-bB	25.04.24
Attenuator	R&S	DNF	0006	25.01.18
Vector Signal Generator	R&S	SMBV100A	257566	25.07.01
Signal Generator	R&S	SMB100A	176206	25.01.18
Spectrum Analyzer	R&S	FSV40	100989	25.10.10
Horn antenna	ETS.lindgren	3117	00251528	25.01.26
Horn antenna	ETS.lindgren	3116	00086635	25.01.25
AMPLIFIER	B&Z Technologies	BZRT-00504000- 481055-382525	26299-27735	25.06.24
AMPLIFIER	B&Z Technologies	BZR-0050400- 551028-252525	27736	25.06.24
Attenuator	API Inmet	40AH2W-10	12	25.04.30
High pass Filter	WT	WT-A1698-HS	WT160411001	25.04.25
High pass Filter	Qotana	DBHF058004000A	20070100016	25.06.24
TWO-LINE V - NETWORK	R&S	ENV216	101353	25.03.27
EMI TEST RECEIVER	R&S	ESCI3	100001	25.08.12
Spectrum Analyzer	R&S	FSVA40	101575	25.05.27
PSA Spectrum Analyzer	Agilent	E4440A	MY44303500	25.07.02
Amplifier	SONOMA INSTRUMENT	310N	421821	25.10.11
Bilog Antenna	Teseq GmbH	CBL 6112D	62027	26.10.17
Loop Antenna	R&S	HFH2-Z2	100355	26.06.25
Controller	INNCO SYSTEMS	CO3000	1441/54370322/ P	-
Antenna Mast	INNCO SYSTEMS	MA4640-XP-ET	-	-
Turn Device	INNCO SYSTEMS	DS1200-S-1t	-	-
Antenna Mast	Innco Systems	MA4640-XP-ET	MA4000/396/30 810213/L	-
Controller	Innco Systems	CO3000	1175/45850319/ P	-

End of test report