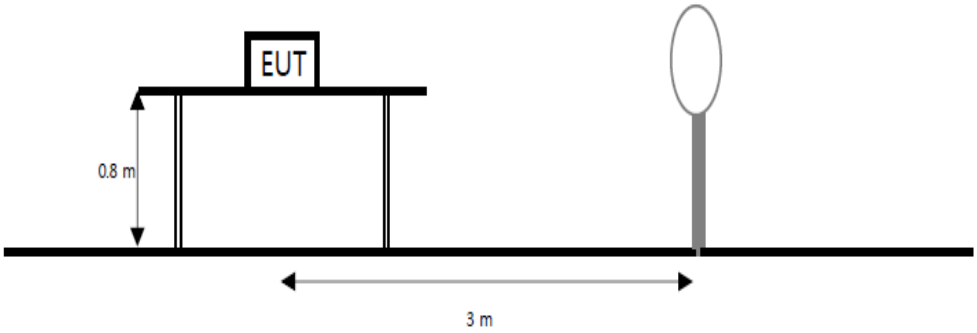
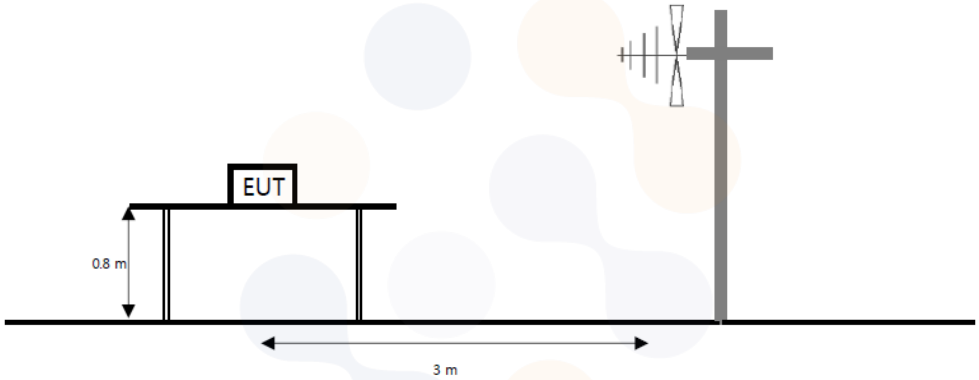
7.4. Spurious Emission, Band Edge and Restricted bands

Test setup

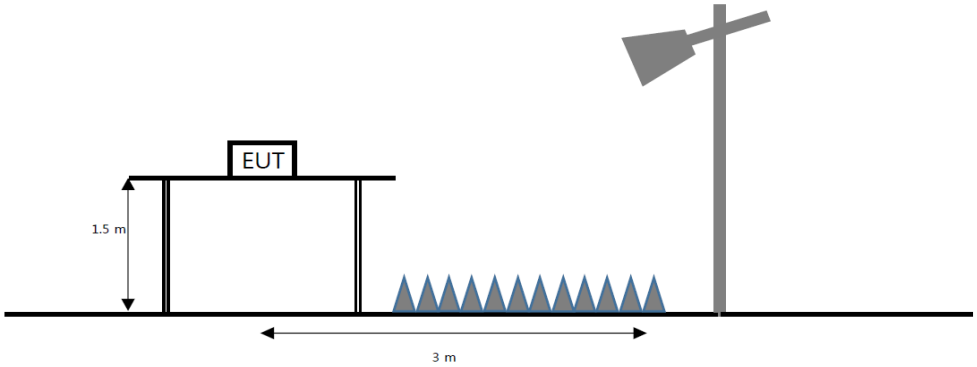
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒ Emissions



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to the tenth harmonic of the highest fundamental frequency or to 40 ㎓ emissions, whichever is lower.



Limit

FCC

According to section 15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (㎒)	Field strength (㎶/m)	Measurement distance (m)
0.009 - 0.490	2 400/F(㎑)	300
0.490 - 1.705	24 000/F(㎑)	30
1.705 - 30	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 ㎒, 76–88 ㎒, 174–216 ㎒ or 470–806 ㎒. However, operation within these frequency bands is permitted under other sections of this part, e.g., Section15.231 and 15.241.

According to section 15.205(a) and (b), only spurious emissions are permitted in any of the frequency bands listed below:

㎒	㎒	㎒	㎓
0.009 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.694 75 - 16.695 25	608 - 614	5.35 - 5.46
2.173 5 - 2.190 5	16.804 25 - 16.804 75	960 – 1 240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1 300 – 1 427	8.025 - 8.5
4.177 25 - 4.177 75	37.5 - 38.25	1 435 – 1 626.5	9.0 - 9.2
4.207 25 - 4.207 75	73 - 74.6	1 645.5 – 1 646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1 660 – 1 710	10.6 - 12.7
6.267 75 - 6.268 25	108 - 121.94	1 718.8 – 1 722.2	13.25 - 13.4
6.311 75 - 6.312 25	123 - 138	2 200 – 2 300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2 310 – 2 390	15.35 - 16.2
8.362 - 8.366	156.524 75 - 156.525 25	2 483.5 – 2 500	17.7 - 21.4
8.376 25 - 8.386 75		2 690 – 2 900	22.01 - 23.12
8.414 25 - 8.414 75	156.7 - 156.9	3 260 – 3 267	23.6 - 24.0
12.29 - 12.293	162.012 5 - 167.17	3 332 – 3 339	31.2 - 31.8
12.519 75 - 12.520 25	167.72 - 173.2	3 345.8 – 3 358	36.43 - 36.5
12.576 75 - 12.577 25	240 - 285	3 600 – 4 400	Above 38.6
13.36 - 13.41	322 - 335.4		

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in section 15.209. At frequencies equal to or less than 1 000 ㎒, compliance with the limits in section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1 000 ㎒, compliance with the emission limits in section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in section 15.35 apply to these measurements.

IC

According to RSS-247(5.5), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

According to RSS-Gen(8.9), Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

Table 5- General field strength limits at frequencies above 30 MHz

Frequency(㎒)	Field strength (μV/m at 3 m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 6- General field strength limits at frequencies below 30 MHz

Frequency	Magnetic field strength (H-Field) (㎂ A/m)	Measurement distance(m)
9 – 490 ㎑ 1)	6.37/F (F in ㎑)	300
490 – 1705 ㎑	63.7/F (F in ㎑)	30
1.705 - 30 ㎒	0.08	30

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

According to RSS-Gen(8.10), Restricted frequency bands, identified in table 7, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

(a) The transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD).
(b) Unwanted emissions that fall into restricted frequency bands listed in table 7 shall comply with the limits specified in table 5 and table 6.
(c) Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

Table 7- Restricted frequency bands*

MHz	MHz	GHz
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 - 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 - 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 - 138	--	

* Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

Test procedure
ANSI C63.10-2013

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 ≥ (3×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 ㎑ to 150 ㎑	200 ㎐ to 300 ㎐
0.15 ㎒ to 30 ㎒	9 ㎑ to 10 ㎑
30 ㎒ to 1 000 ㎒	100 ㎑ to 120 ㎑
> 1 000 ㎒	1 ㎒

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 ≥ 98%), then the average emission levels shall be measured using the following method (with EUT transmitting continuously):

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

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

If continuous transmission of the EUT (D ≥ 98%) cannot be achieved and the duty cycle is constant (duty cycle variations are less than ±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 ㎒ (unless otherwise specified).
4. VBW ≥ [3 × RBW].
5. Detector = RMS (power averaging), if [span / (# of points in sweep)] ≤ (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 ≥ 98%) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

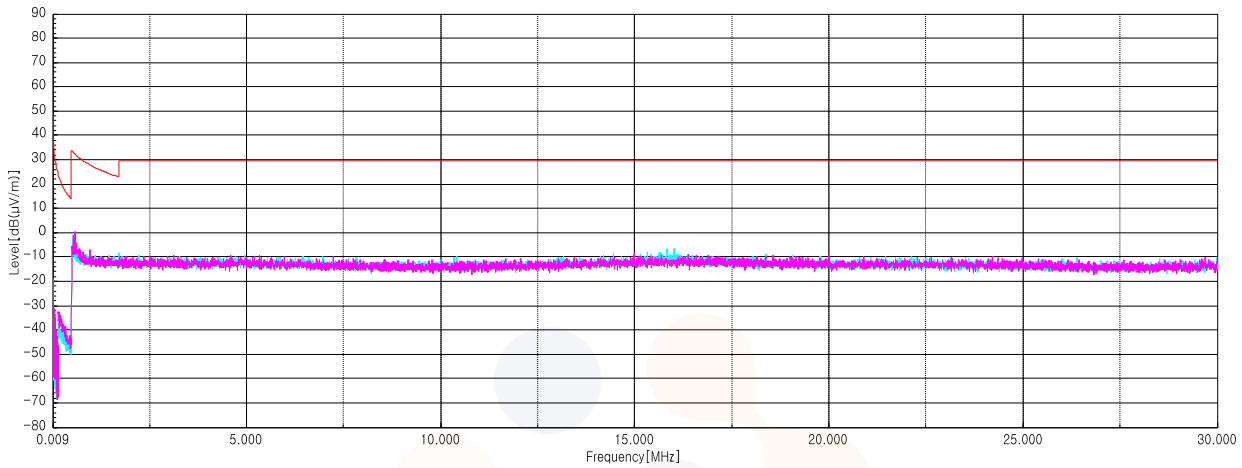
Notes:

1. *f* <30 ㎒, extrapolation factor of 40 dB/decade of distance. F_d = 40log(D_m/Ds)
   f ≥30 ㎒, extrapolation factor of 20 dB/decade of distance. F_d = 20log(D_m/Ds)
   Where:
   F_d= Distance factor in dB
   D_m= Measurement distance in meters
   D_s= Specification distance in meters
2. Factors(dB) = Antenna factor(dB/m) + Cable loss(dB) + or Amp. gain(dB) + or F_d(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. Above 1 ㎓ the worst results between two antenna polarizations (H and V) were documented in the test report.
7. Below 30 ㎒ 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.”
8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X ㎑ resulted in a level of Y dBμV/m, which is equivalent to Y - 51.5 = Z dBμA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.
9. Measurement configuration for 11ax RU allocations
   1) For the radiated band-edge test, it was tested at 11ax RU allocations near the band edge.
   2) For the spurious emissions, it was tested at the RU allocations with actual highest power considering each bandwidth/channel.

Test results (Below 30 ㎒) – Worst case: 802.11ax HE20 SU MIMO / 2 437 ㎒

Frequency	Pol.	Reading	Ant. Factor	Amp. +Cable	Distance Factor	DCF	Result	Limit	Margin
[㎒]	[V/H]	[dB(㎶)]	[dB]	[dB]	[dB]	[dB]	[dB(㎶/m)]	[dB(㎶/m)]	[dB]
No spurious emissions were detected within 20 ㏈ of the limit.									

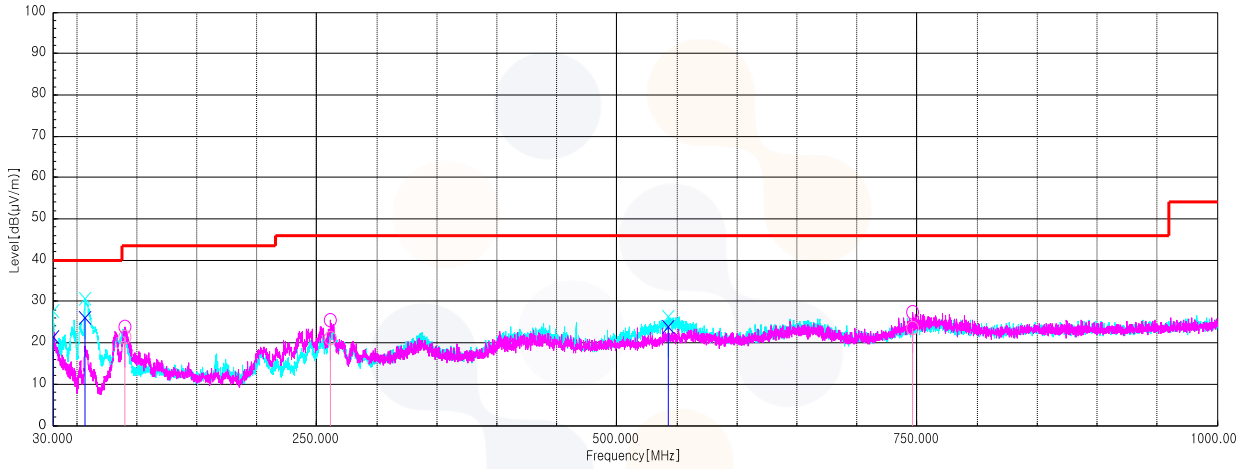
Horizontal/Vertical



Test results (Below 1 000 ㎒) – Worst case: 802.11ax HE20 SU MIMO / 2 437 ㎒

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data								
30.36	V	29.10	24.55	-32.43	-	21.22	40.00	18.78
57.16	V	46.00	12.20	-32.26	-	25.94	40.00	14.06
90.50	H	38.50	15.20	-32.08	-	21.62	43.50	21.88
261.10[1)]	H	32.60	19.68	-31.60	-	20.68	46.00	25.32
542.65	V	31.00	24.26	-31.13	-	24.13	46.00	21.87
746.59	H	28.90	25.60	-30.81	-	23.69	46.00	22.31

Horizontal/Vertical



Test results (Above 1 000 ㎒)

SISO Restricted Band edge (Lowest Channel)

802.11ax_HE20 SU mode_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.89[1)]	V	69.60	27.10	-30.53	-	66.17	74.00	7.83
2 483.77[1)]	V	64.70	27.84	-30.41	-	62.13	74.00	11.87
Average Data								
2 389.89[1)]	V	53.96	27.10	-30.53	0.38	50.91	54.00	3.09
2 483.77[1)]	V	46.62	27.84	-30.41	0.38	44.43	54.00	9.57

802.11ax_HE20 RU mode (26T / RU offset 0)_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 390.00[1)]	V	69.50	27.10	-30.53	-	66.07	74.00	7.93
2 483.63[1)]	V	61.40	27.84	-30.41	-	58.83	74.00	15.17
Average Data								
2 390.00[1)]	V	47.79	27.10	-30.53	0.15	44.51	54.00	9.49
2 483.63[1)]	V	41.82	27.84	-30.41	0.15	39.40	54.00	14.60

802.11ax_HE20 RU mode (52T / RU offset 37)_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.38[1)]	V	58.70	27.10	-30.53	-	55.27	74.00	18.73
2 483.67[1)]	V	56.70	27.84	-30.41	-	54.13	74.00	19.87
Average Data								
2 389.38[1)]	V	40.26	27.10	-30.53	-	36.83	54.00	17.17
2 483.67[1)]	V	40.61	27.84	-30.41	-	38.04	54.00	15.96

802.11ax_HE20 RU mode (106T / RU offset 53)_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.92[1)]	V	58.90	27.10	-30.53	-	55.47	74.00	18.53
2 483.53[1)]	V	57.60	27.84	-30.41	-	55.03	74.00	18.97
Average Data								
2 389.92[1)]	V	40.52	27.10	-30.53	0.18	37.27	54.00	16.73
2 483.53[1)]	V	40.73	27.84	-30.41	0.18	38.34	54.00	15.66

802.11ax_HE20 RU mode (242T / RU offset 61)_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.99[1)]	V	59.20	27.10	-30.53	-	55.77	74.00	18.23
2 483.73[1)]	V	57.00	27.84	-30.41	-	54.43	74.00	19.57
Average Data								
2 389.99[1)]	V	41.35	27.10	-30.53	0.37	38.29	54.00	15.71
2 483.73[1)]	V	41.19	27.84	-30.41	0.37	38.99	54.00	15.01

MIMO Restricted Band edge (Lowest Channel)

802.11ax_HE20 SU mode_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.96[1)]	V	71.20	27.10	-30.53	-	67.77	74.00	6.23
2 483.71[1)]	V	65.00	27.84	-30.41	-	62.43	74.00	11.57
Average Data								
2 389.96[1)]	V	53.80	27.10	-30.53	0.70	51.07	54.00	2.93
2 483.71[1)]	V	47.31	27.84	-30.41	0.70	45.44	54.00	8.56

802.11ax_HE20 RU mode (26T / RU offset 0)_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 388.19[1)]	V	59.10	27.10	-30.53	-	55.67	74.00	18.33
2 483.72[1)]	V	55.80	27.84	-30.41	-	53.23	74.00	20.77
Average Data								
2 388.19[1)]	V	40.59	27.10	-30.53	-	37.16	54.00	16.84
2 483.72[1)]	V	40.41	27.84	-30.41	-	37.84	54.00	16.16

802.11ax_HE20 RU mode (52T / RU offset 37)_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.07[1)]	V	59.00	27.10	-30.53	-	55.57	74.00	18.43
2 484.01[1)]	V	56.10	27.84	-30.41	-	53.53	74.00	20.47
Average Data								
2 389.07[1)]	V	41.13	27.10	-30.53	0.16	37.86	54.00	16.14
2 484.01[1)]	V	40.44	27.84	-30.41	0.16	38.03	54.00	15.97

802.11ax_HE20 RU mode (106T / RU offset 53)_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.52[1)]	V	59.50	27.10	-30.53	-	56.07	74.00	17.93
2 484.07[1)]	V	56.10	27.84	-30.41	-	53.53	74.00	20.47
Average Data								
2 389.52[1)]	V	41.28	27.10	-30.53	0.33	38.18	54.00	15.82
2 484.07[1)]	V	40.82	27.84	-30.41	0.33	38.58	54.00	15.42

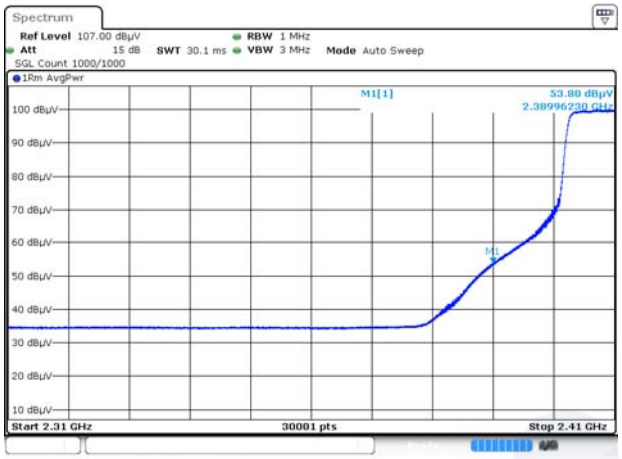
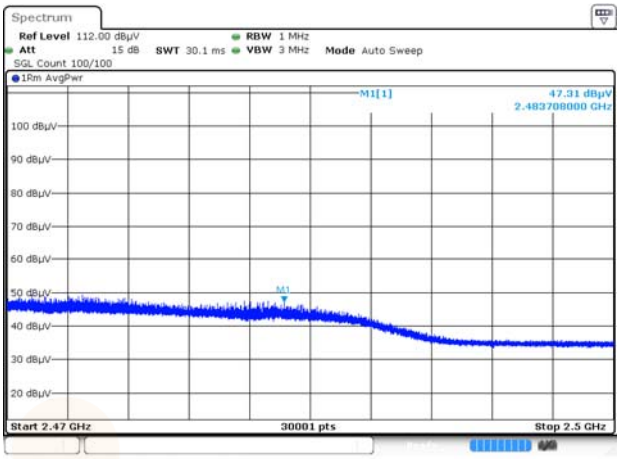
802.11ax_HE20 RU mode (242T / RU offset 61)_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 388.97[1)]	V	59.50	27.10	-30.53	-	56.07	74.00	17.93
2 483.63[1)]	V	58.10	27.84	-30.41	-	55.53	74.00	18.47
Average Data								
2 388.97[1)]	V	42.48	27.10	-30.53	0.68	39.73	54.00	14.27
2 483.63[1)]	V	40.79	27.84	-30.41	0.68	38.90	54.00	15.10

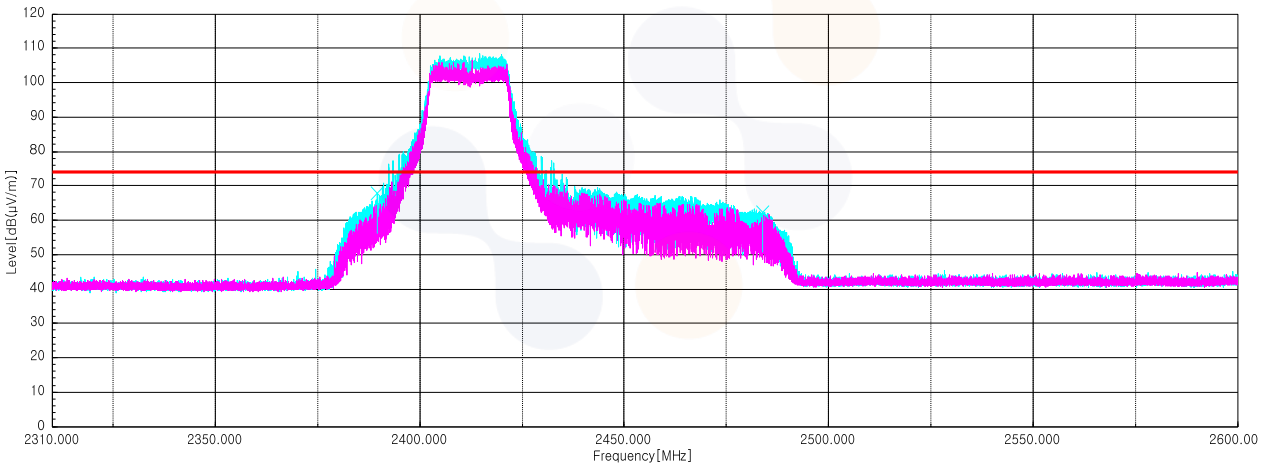
Plot of Band edge

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

802.11ax_MIMO_HE20 SU mode_Lowest Channel (2 412 ㎒)

Average data	Average data
	

Horizontal/Vertical for Band-edge



SISO Restricted Band edge (Highest Channel)

802.11ax_HE20 SU mode_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.15[1)]	V	66.10	27.10	-30.53	-	62.67	74.00	11.33
2 483.73[1)]	V	74.40	27.84	-30.41	-	71.83	74.00	2.17
Average Data								
2 389.15[1)]	V	47.47	27.10	-30.53	0.38	44.42	54.00	9.58
2 483.73[1)]	V	52.40	27.84	-30.41	0.38	50.21	54.00	3.79

802.11ax_HE20 RU mode (26T / RU offset 8)_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.00[1)]	V	63.30	27.10	-30.53	-	59.87	74.00	14.13
2 484.47[1)]	V	73.60	27.84	-30.41	-	71.03	74.00	2.97
Average Data								
2 389.00[1)]	V	42.01	27.10	-30.53	0.15	38.73	54.00	15.27
2 484.47[1)]	V	51.29	27.84	-30.41	0.15	48.87	54.00	5.13

802.11ax_HE20 RU mode (52T / RU offset 40)_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 388.97[1)]	V	57.60	27.10	-30.53	-	54.17	74.00	19.83
2 484.57[1)]	V	60.20	27.85	-30.41	-	57.64	74.00	16.36
Average Data								
2 388.97[1)]	V	40.46	27.10	-30.53	-	37.03	54.00	16.97
2 484.57[1)]	V	42.02	27.85	-30.41	-	39.46	54.00	14.54

802.11ax_HE20 RU mode (106T / RU offset 54)_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.79[1)]	V	57.50	27.10	-30.53	-	54.07	74.00	19.93
2 483.95[1)]	V	65.60	27.84	-30.41	-	63.03	74.00	10.97
Average Data								
2 389.79[1)]	V	40.98	27.10	-30.53	0.18	37.73	54.00	16.27
2 483.95[1)]	V	45.36	27.84	-30.41	0.18	42.97	54.00	11.03

802.11ax_HE20 RU mode (242T / RU offset 61) mode_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.93[1)]	V	57.30	27.10	-30.53	-	53.87	74.00	20.13
2 485.05[1)]	V	63.40	27.85	-30.41	-	60.84	74.00	13.16
Average Data								
2 389.93[1)]	V	40.94	27.10	-30.53	0.37	37.88	54.00	16.12
2 485.05[1)]	V	43.58	27.85	-30.41	0.37	41.39	54.00	12.61

MIMO Restricted Band edge (Highest Channel)

802.11ax_HE20 SU mode_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.63[1)]	V	65.50	27.10	-30.53	-	62.07	74.00	11.93
2 483.71[1)]	V	72.80	27.84	-30.41	-	70.23	74.00	3.77
Average Data								
2 389.63[1)]	V	47.91	27.10	-30.53	0.70	45.18	54.00	8.82
2 483.71[1)]	V	53.35	27.84	-30.41	0.70	51.48	54.00	2.52

802.11ax_HE20 RU mode (26T / RU offset 8)_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.96[1)]	V	56.00	27.10	-30.53	-	52.57	74.00	21.43
2 483.52[1)]	V	58.00	27.84	-30.41	-	55.43	74.00	18.57
Average Data								
2 389.93[1)]	V	40.35	27.10	-30.53	-	36.92	54.00	17.08
2 483.52[1)]	V	41.35	27.84	-30.41	-	38.78	54.00	15.22

802.11ax_HE20 RU mode (52T / RU offset 40)_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.61[1)]	V	56.50	27.10	-30.53	-	53.07	74.00	20.93
2 484.14[1)]	V	58.80	27.84	-30.41	-	56.23	74.00	17.77
Average Data								
2 389.61[1)]	V	40.56	27.10	-30.53	0.16	37.29	54.00	16.71
2 484.14[1)]	V	41.53	27.84	-30.41	0.16	39.12	54.00	14.88

802.11ax_HE20 RU mode (106T / RU offset 54)_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.98[1)]	V	56.50	27.10	-30.53	-	53.07	74.00	20.93
2 483.65[1)]	V	61.70	27.84	-30.41	-	59.13	74.00	14.87
Average Data								
2 389.98[1)]	V	40.52	27.10	-30.53	0.33	37.42	54.00	16.58
2 483.65[1)]	V	42.37	27.84	-30.41	0.33	40.13	54.00	13.87

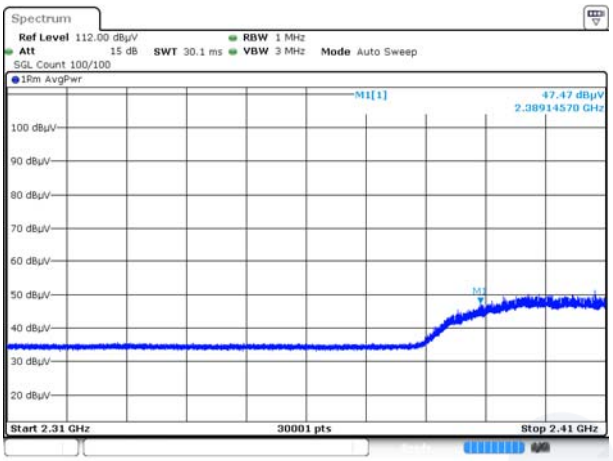
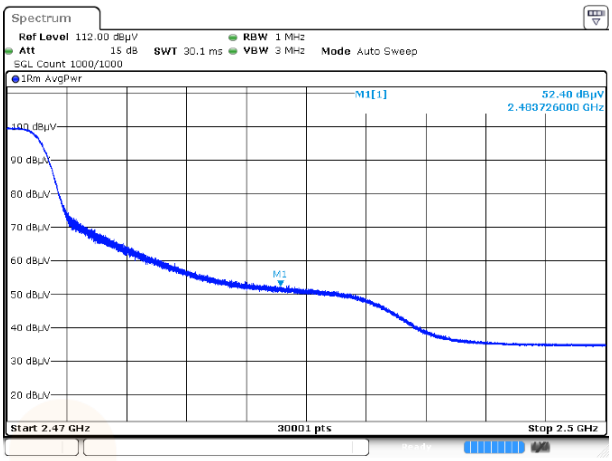
802.11ax_HE20 RU mode (242T / RU offset 61)_ Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
2 389.98[1)]	V	58.10	27.10	-30.53	-	54.67	74.00	19.33
2 484.07[1)]	V	68.00	27.84	-30.41	-	65.43	74.00	8.57
Average Data								
2 389.98[1)]	V	40.90	27.10	-30.53	0.68	38.15	54.00	15.85
2 484.07[1)]	V	45.48	27.84	-30.41	0.68	43.59	54.00	10.41

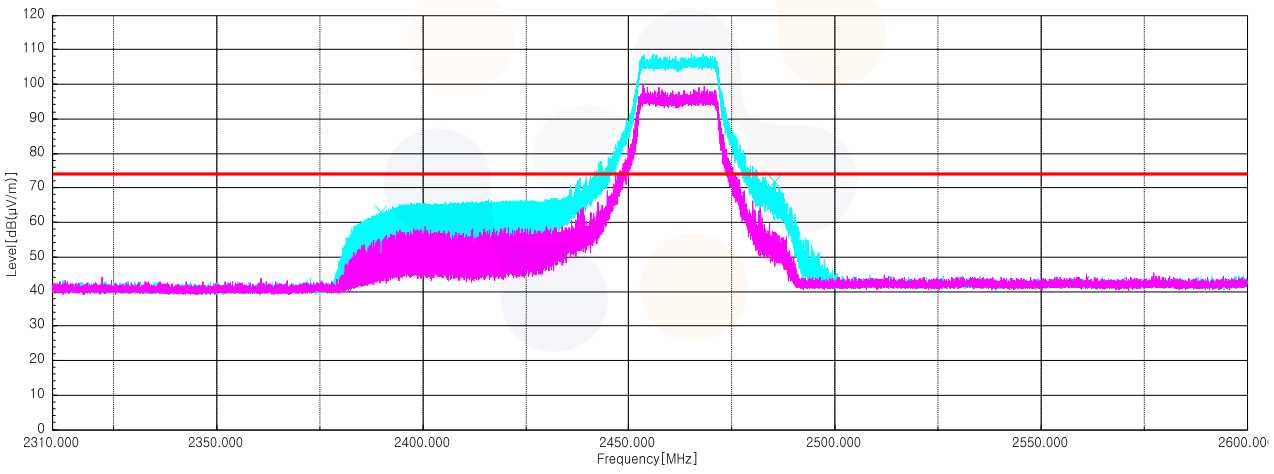
Plot of Band edge

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

802.11ax_SISO_HE20 SU mode_Highest Channel (2 462 ㎒)

Average data	Average data
	

Horizontal/Vertical for Band-edge



SISO Harmonics and Spurious Emissions

802.11ax_HE20 SU mode_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 879.92[1)]	H	52.50	32.52	-43.05	-	41.97	74.00	32.03
7 209.58	H	51.00	36.82	-41.40	-	46.42	74.00	27.58
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11ax_HE20 RU mode (106T / RU offset 54)_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 787.60[1)]	V	53.90	32.25	-43.23	-	42.92	74.00	31.08
7 249.70	H	51.40	36.90	-41.46	-	46.84	74.00	27.16
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11ax_HE20 SU mode_Middle Channel (2 437 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 885.72[1)]	V	52.80	32.54	-43.04	-	42.30	74.00	31.70
7 280.63[1)]	V	51.40	36.96	-41.49	-	46.87	74.00	27.13
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

802.11ax_HE20 RU mode (26T / RU offset 8)_Middle Channel (2 437 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 855.75[1)]	H	52.70	32.42	-43.10	-	42.02	74.00	31.98
7 299.00[1)]	V	51.50	37.00	-41.51	-	46.99	74.00	27.01
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

802.11ax_HE20 SU mode_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 862.52[1)]	V	53.00	32.45	-43.08	-	42.37	74.00	31.63
7 425.63[1)]	V	51.80	36.45	-41.64	-	46.61	74.00	27.39
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

802.11ax_HE20 RU mode (26T / RU offset 8)_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 940.82[1)]	H	52.60	32.94	-42.93	-	42.61	74.00	31.39
7 390.35[1)]	V	51.90	36.44	-41.61	-	46.73	74.00	27.27
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

MIMO Harmonics and Spurious Emissions

802.11ax_HE20 SU mode_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 846.57[1)]	H	53.00	32.29	-43.12	-	42.17	74.00	31.83
7 249.70	H	51.00	36.90	-41.46	-	46.44	74.00	27.56
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

802.11ax_HE20 RU mode (52T / RU offset 40)_Lowest Channel (2 412 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 825.78[1)]	H	53.00	32.25	-43.16	-	42.09	74.00	31.91
7 299.48[1)]	H	52.30	37.00	-41.51	-	47.79	74.00	26.21
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

802.11ax_HE20 SU mode_Middle Channel (2 437 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 894.90[1)]	H	52.50	32.58	-43.02	-	42.06	74.00	31.94
7 251.15[1)]	H	51.70	36.90	-41.46	-	47.14	74.00	26.86
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

802.11ax_HE20 RU mode (106T / RU offset 54)_Middle Channel (2 437 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 902.15[1)]	V	52.30	32.71	-43.01	-	42.00	74.00	32.00
7 324.13[1)]	H	51.00	36.75	-41.54	-	46.21	74.00	27.79
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

802.11ax_HE20 SU mode_Highest Channel (2 462 ㎒)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 967.40[1)]	V	53.30	32.97	-42.88	-	43.39	74.00	30.61
7 360.38[1)]	V	51.50	36.56	-41.57	-	46.49	74.00	27.51
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

802.11ax_HE20 RU mode (106T / RU offset 53)_Highest Channel (2 462 ㎒)

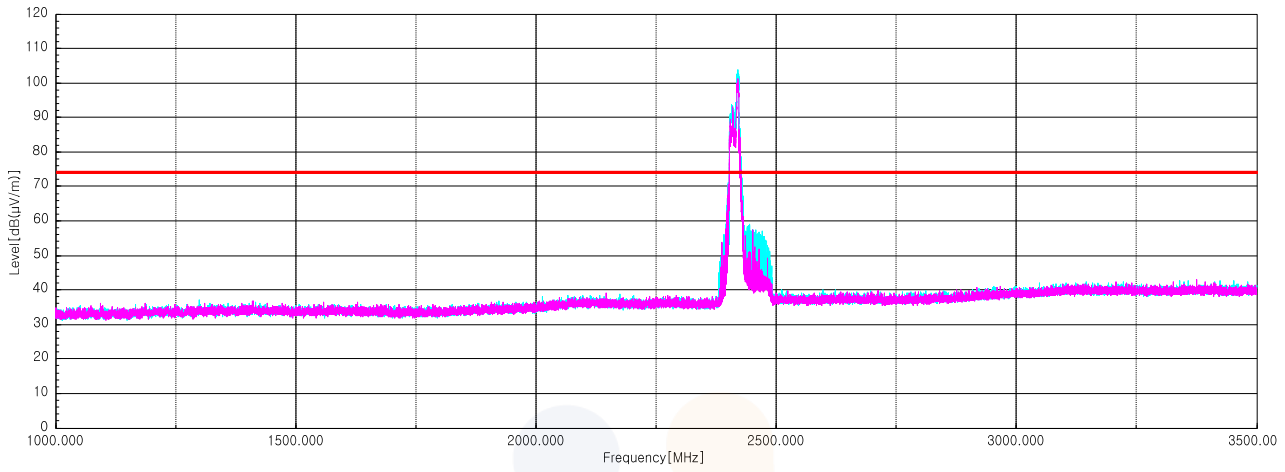
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
4 944.20[1)]	H	53.10	32.97	-42.92	-	43.15	74.00	30.85
7 375.37[1)]	H	51.50	36.50	-41.59	-	46.41	74.00	27.59
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit								

Plot of Harmonics and Spurious Emissions

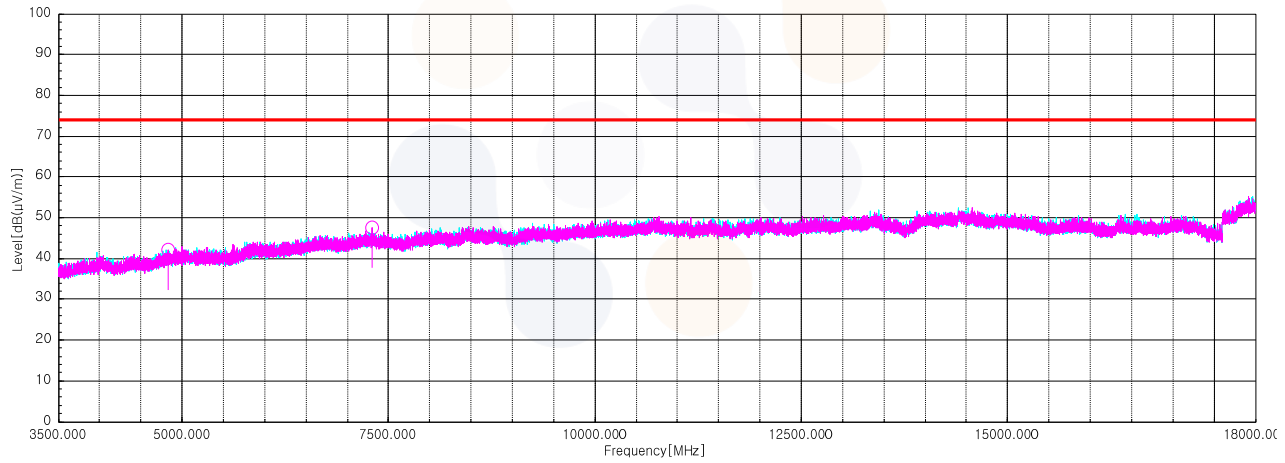
In order to simplify the report, attached plots were only the lowest margin condition

MIMO 802. 11ax_HE20 RU mode (52T / RU offset 40)_Lowest Channel (2 412 ㎒)

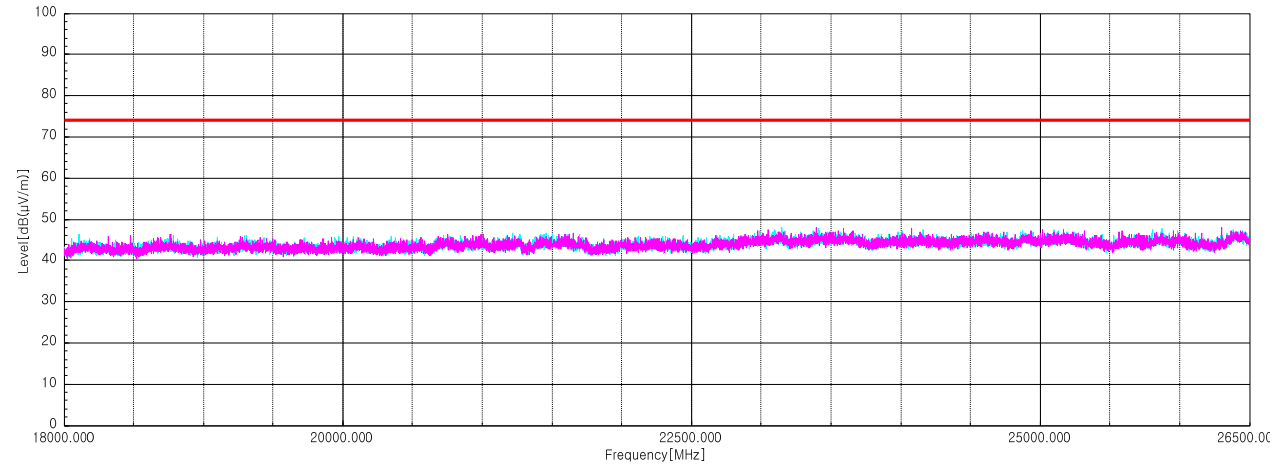
Horizontal/Vertical for 1 ㎓ ~ 3.5 ㎓



Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓

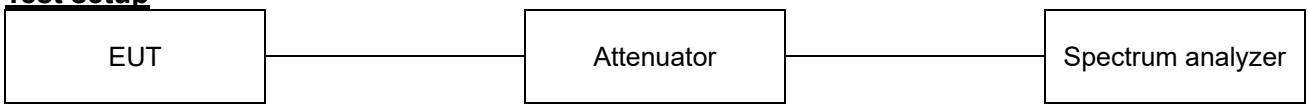


Horizontal/Vertical for 18 ㎓ ~ 26.5 ㎓



7.5. Conducted Spurious Emission

Test setup



Limit

According to §15.247(d) and RSS-247(5.5), In any 100 ㎑ 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 ㏈ below that in the 100 ㎑ bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided 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 ㏈c

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 ㎑
3) Set the VBW ≥ [3 x 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.

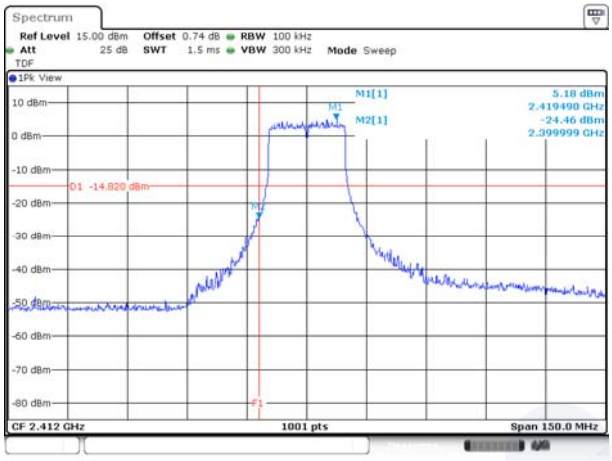
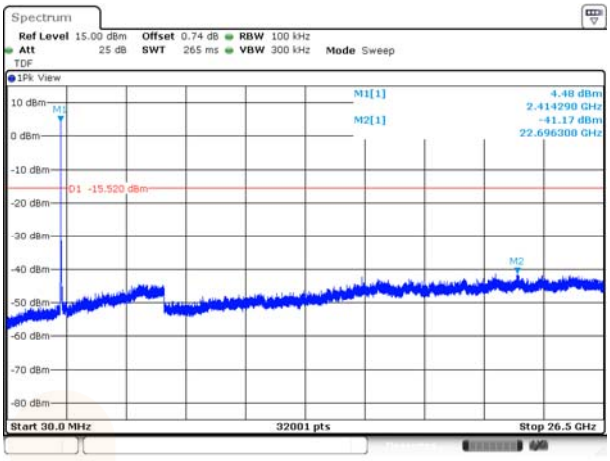
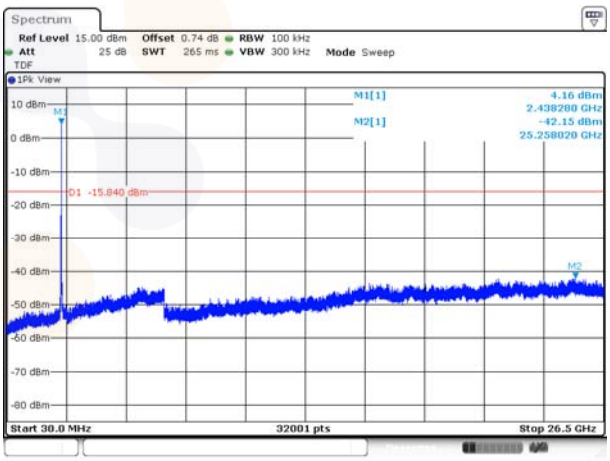
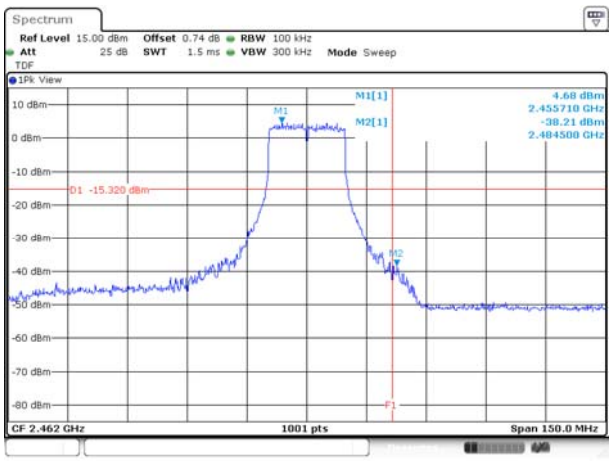
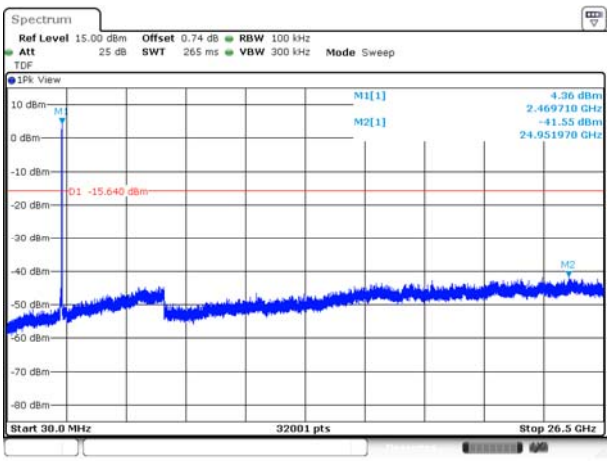
Notes:

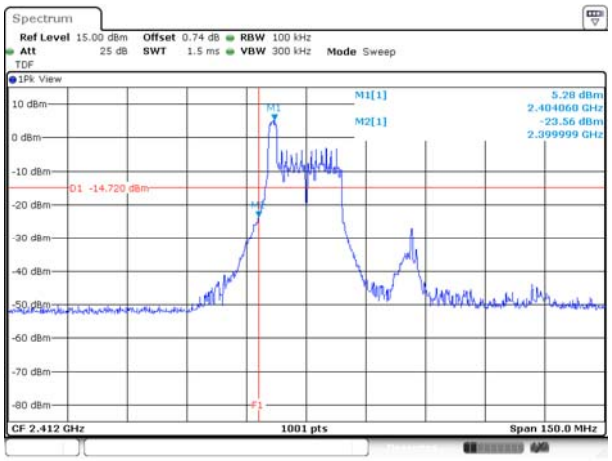
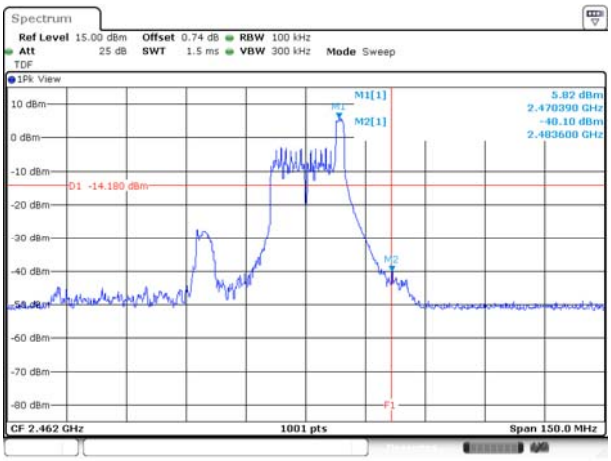
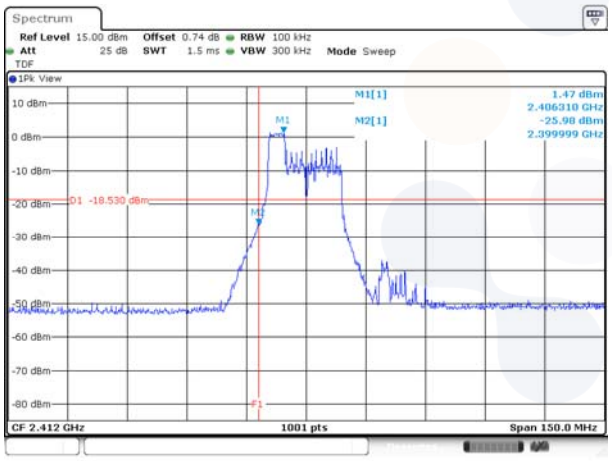
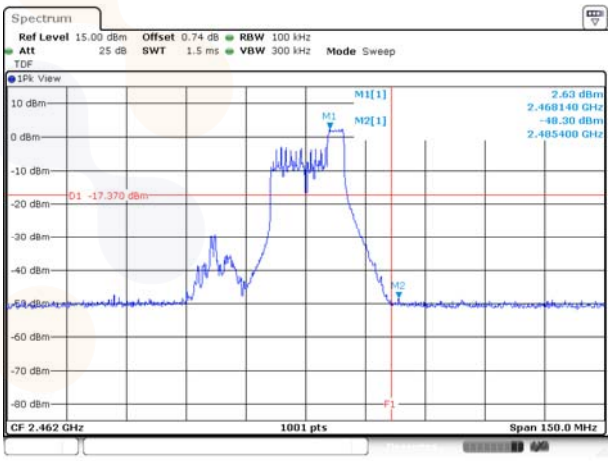
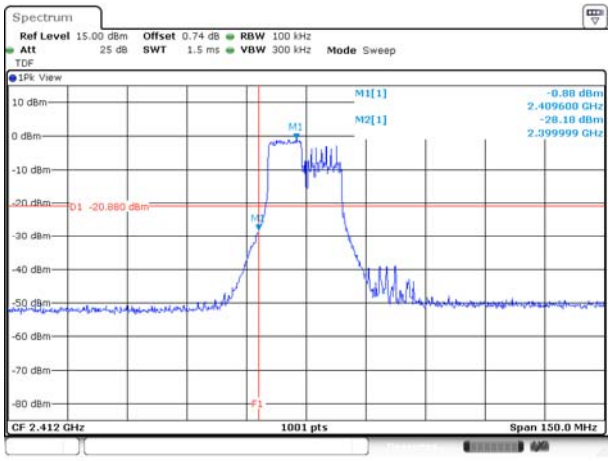
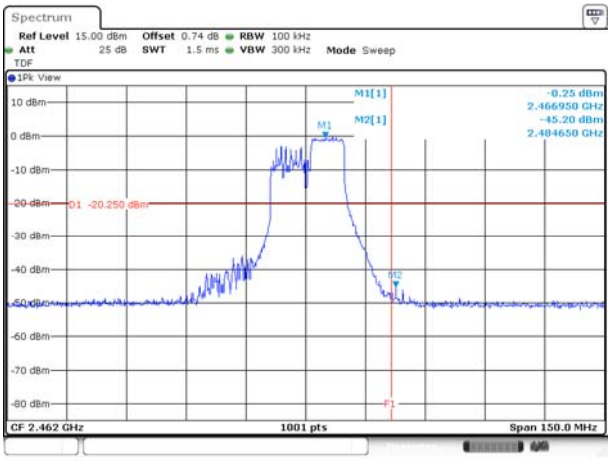
1. For the conducted spurious, it was tested at the RU allocation with actual highest power and RU allocation with actual highest PSD for channel

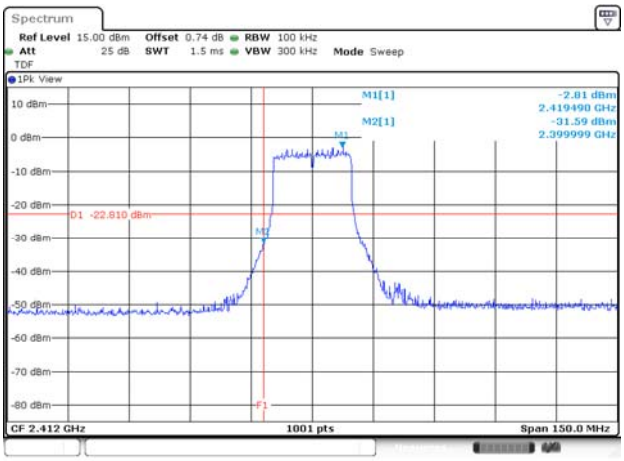
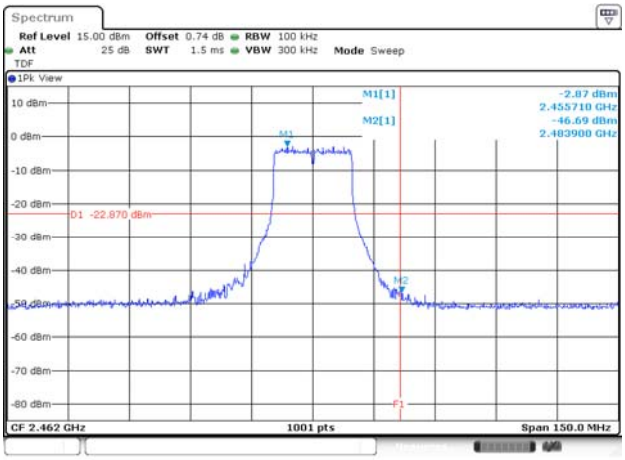
Test results

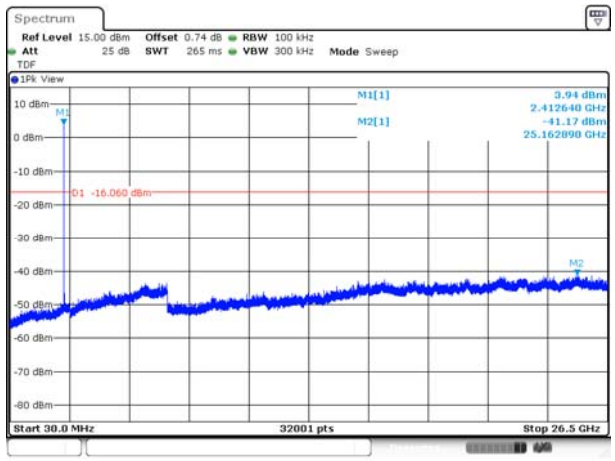
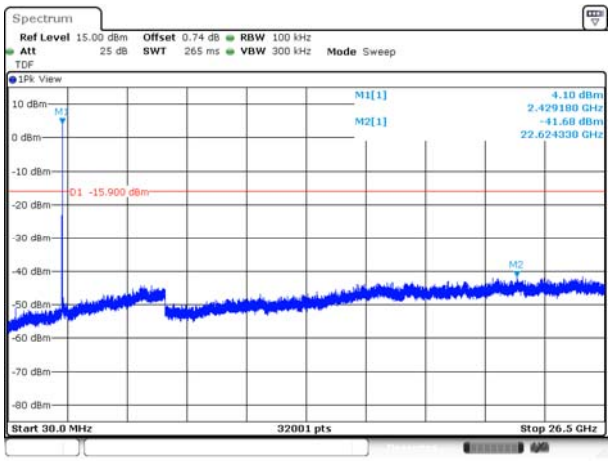
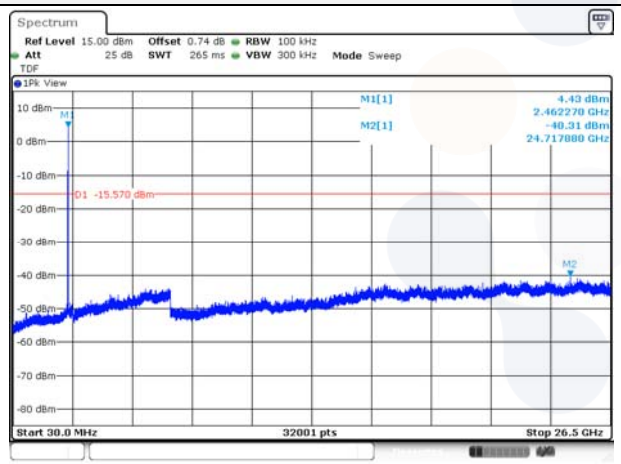
SISO

SU

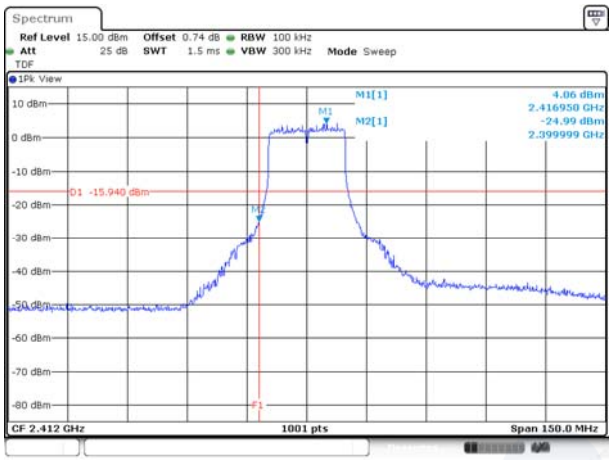
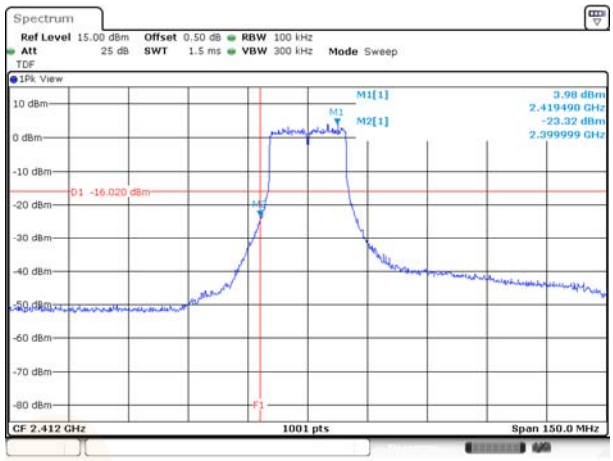
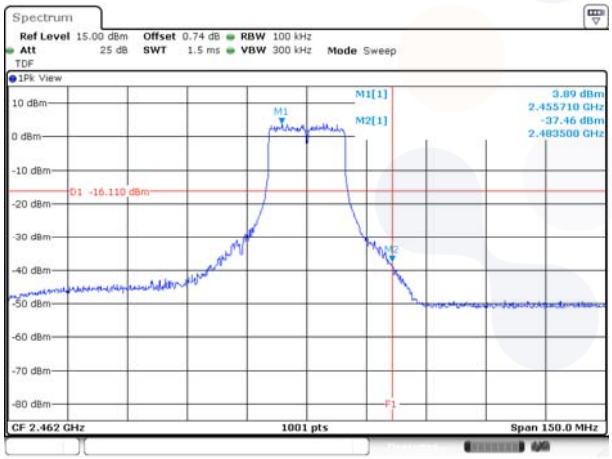
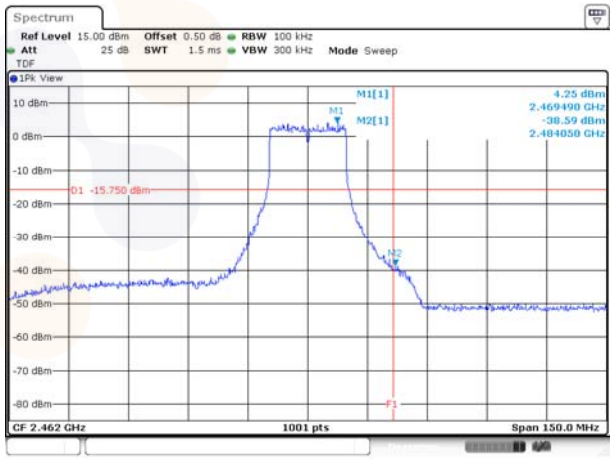
Conducted band-edge / 2 412 ㎒	Conducted spurious / 2 412 ㎒
	
Conducted band-edge / 2 437 ㎒	**Conducted spurious / 2 437 ㎒**
Blank	
Conducted band-edge / 2 462 ㎒	**Conducted spurious / 2 462 ㎒**
	

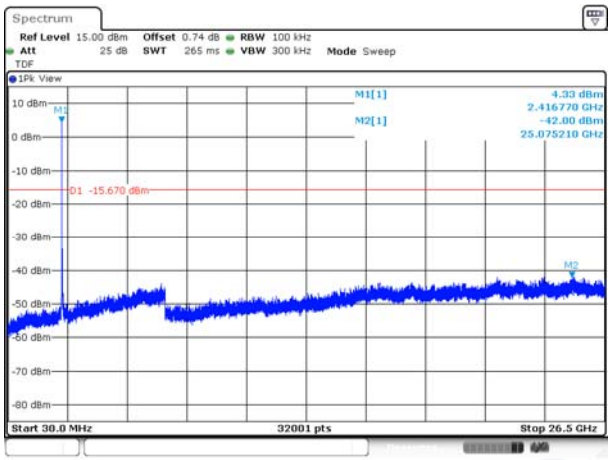
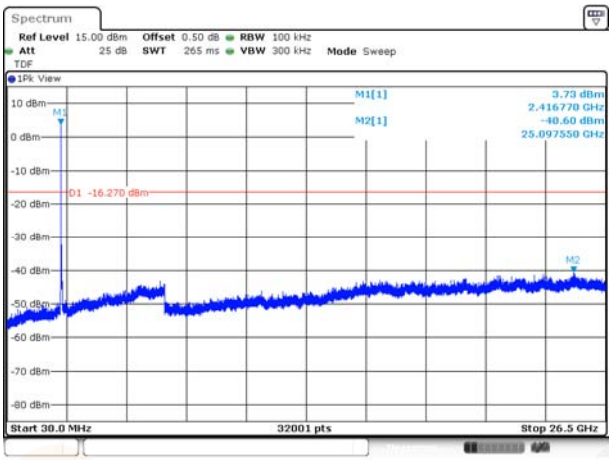
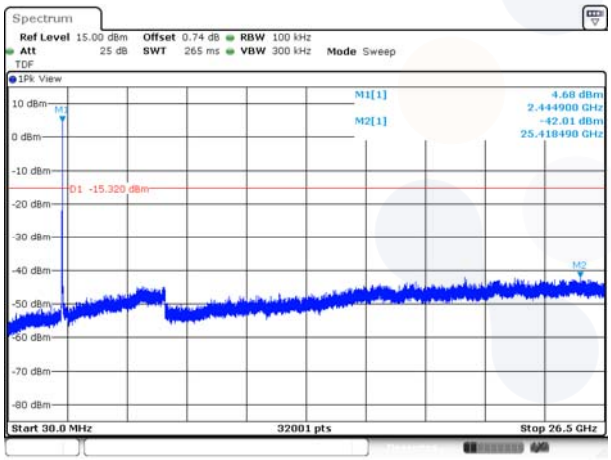
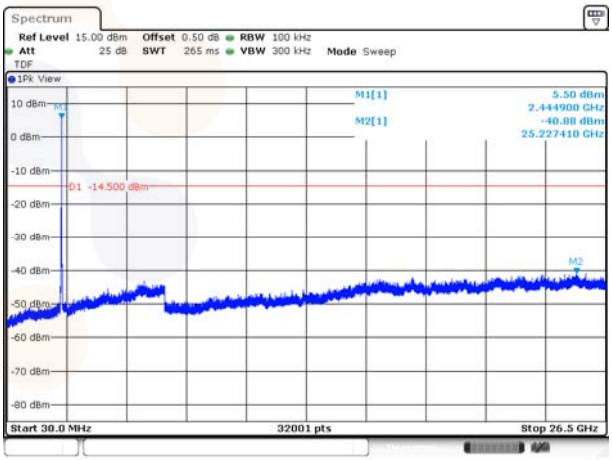
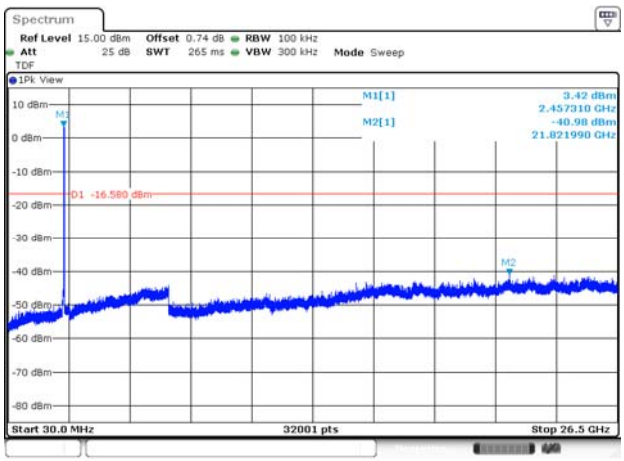
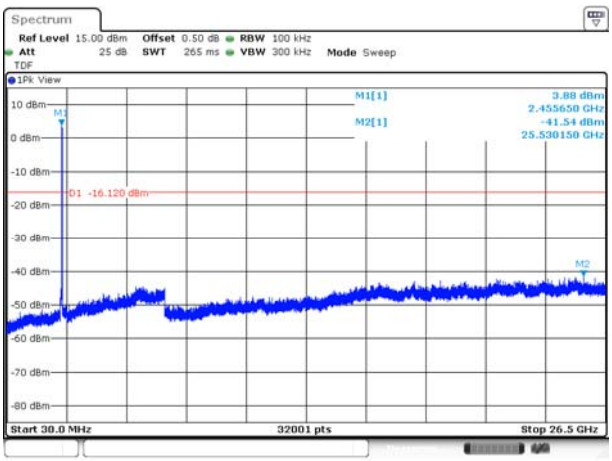
26T / RU offset 0	26T / RU offset 8
Conducted band-edge / 2 412 ㎒	**Conducted band-edge / 2 462 ㎒**
	
52T / RU offset 37	**52T / RU offset 40**
Conducted band-edge / 2 412 ㎒	**Conducted band-edge / 2 462 ㎒**
	
106T / RU offset 53	**106T / RU offset 54**
Conducted band-edge / 2 412 ㎒	**Conducted band-edge / 2 462 ㎒**
	

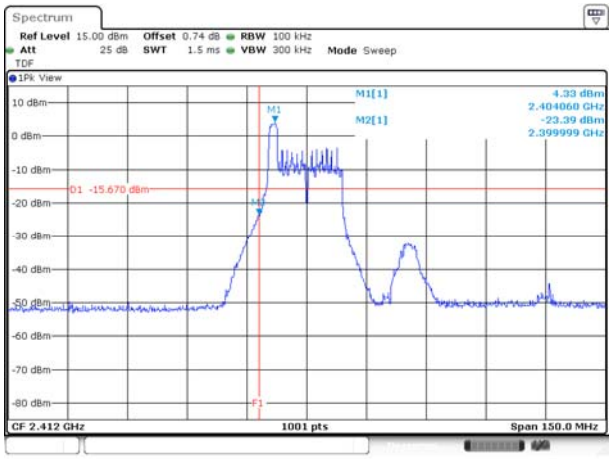
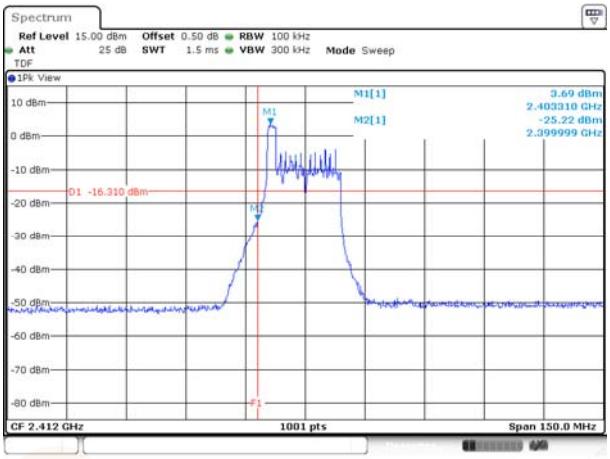
242T / RU offset 61	
Conducted band-edge / 2 412 ㎒	**Conducted band-edge / 2 462 ㎒**
	

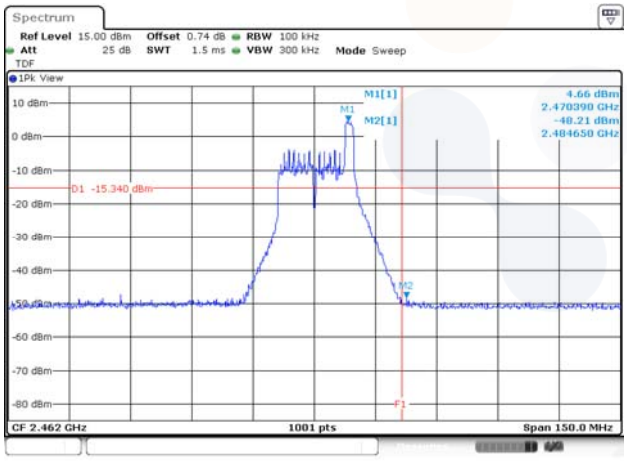
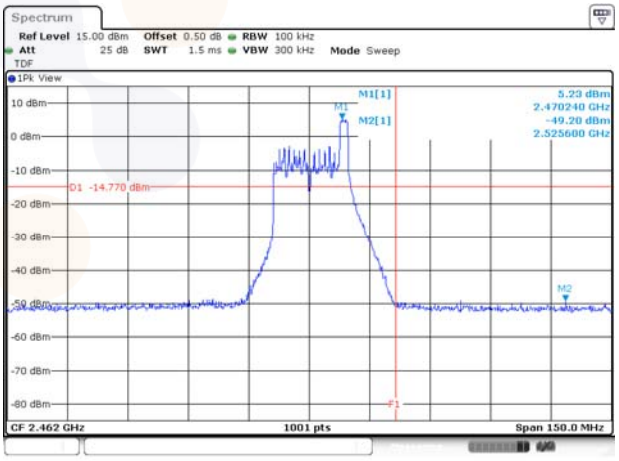
26T / RU offset 4	26T / RU offset 0
Conducted spurious / 2 412 ㎒	**Conducted spurious / 2 437 ㎒**
	
26T / RU offset 4	**-**
Conducted spurious / 2 462 ㎒	**-**
	Blank

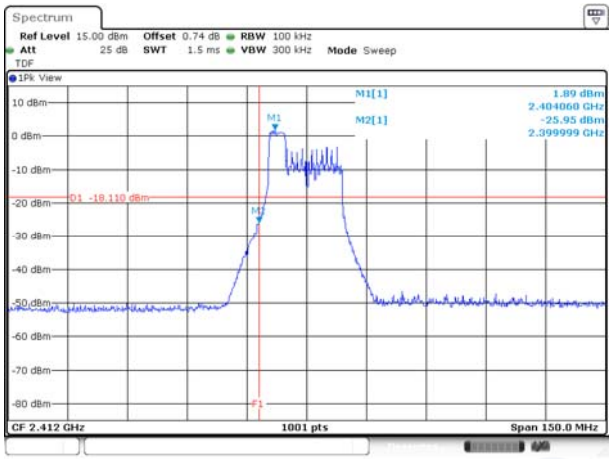
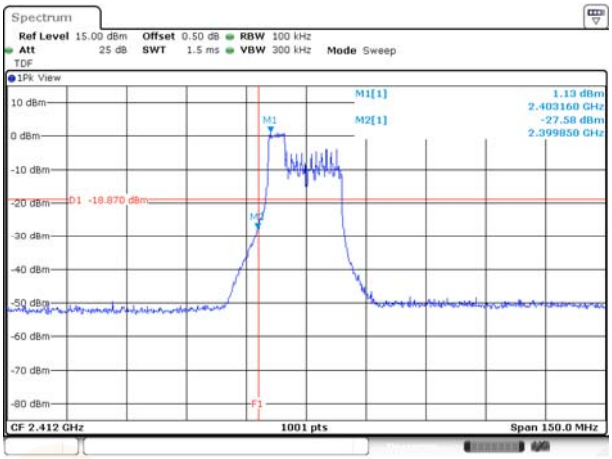
MIMO

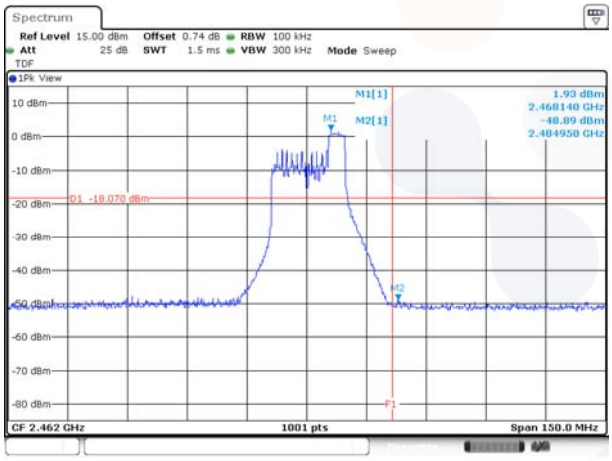
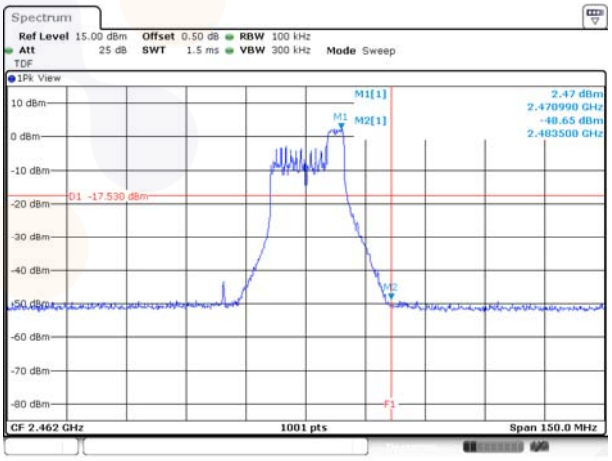
SU	
ANT 1	**ANT 2**
Conducted band-edge / 2 412 ㎒	**Conducted band-edge / 2 412 ㎒**
	
Conducted band-edge / 2 462 ㎒	**Conducted band-edge / 2 462 ㎒**
	

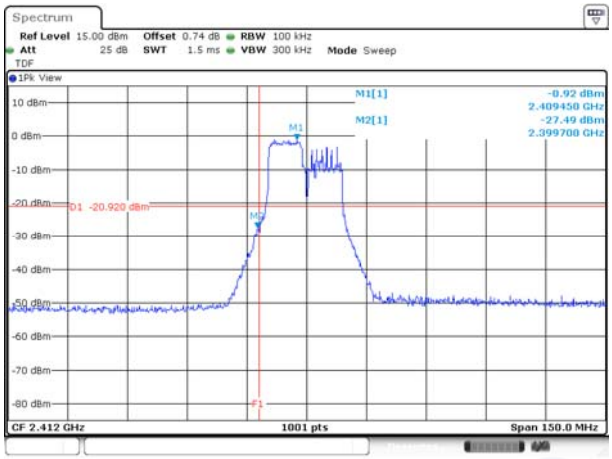
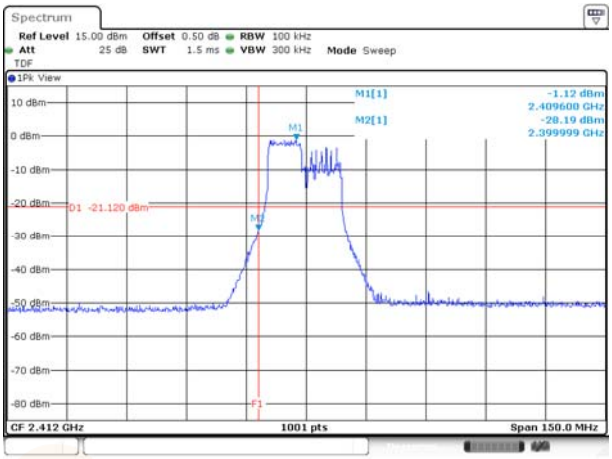
SU	
ANT 1	**ANT 2**
Conducted spurious / 2 412 ㎒	**Conducted spurious / 2 412 ㎒**
	
Conducted spurious / 2 437 ㎒	**Conducted spurious / 2 437 ㎒**
	
Conducted spurious / 2 462 ㎒	**Conducted spurious / 2 462 ㎒**
	

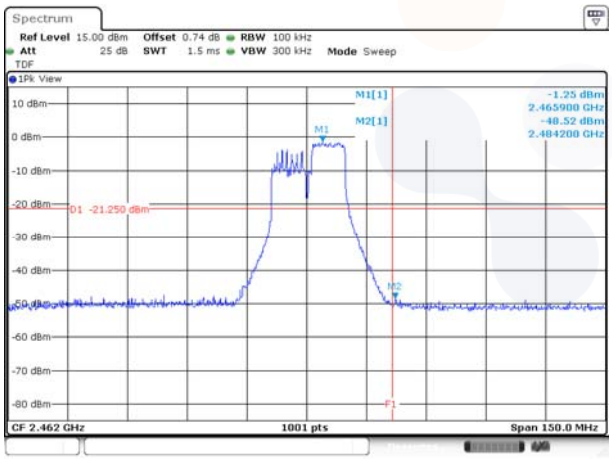
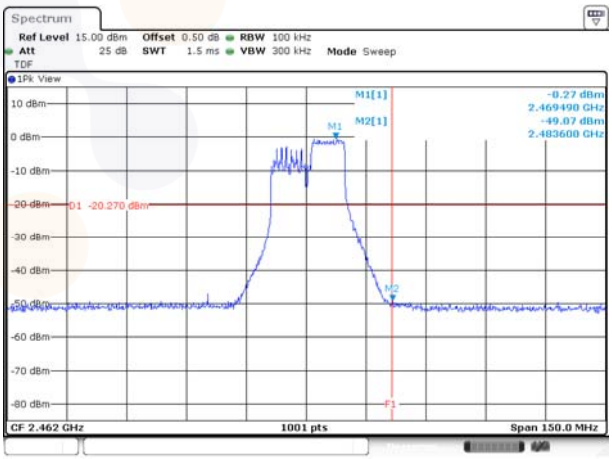
26T / RU offset 0	
ANT 1	**ANT 2**
Conducted band-edge / 2 412 ㎒	**Conducted band-edge / 2 412 ㎒**
	

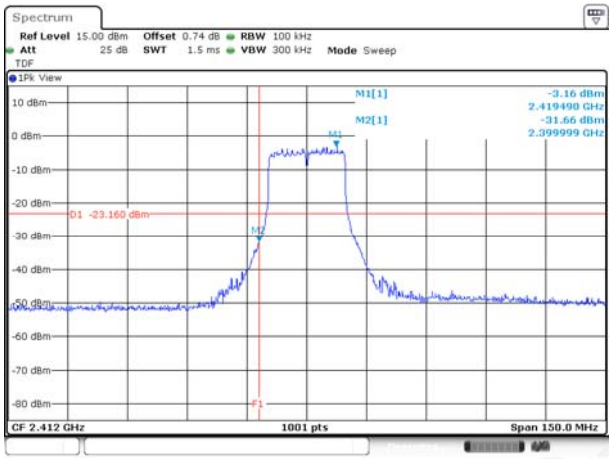
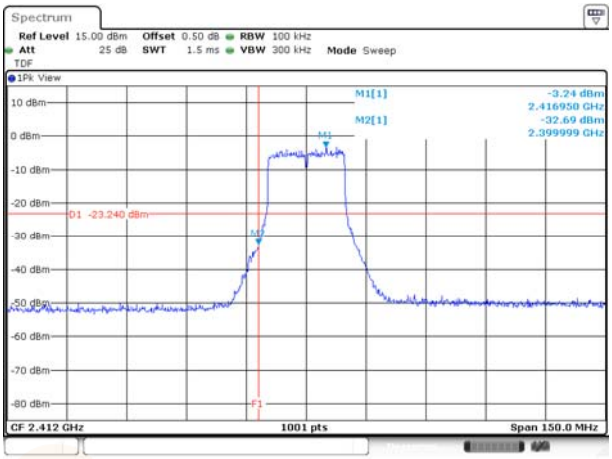
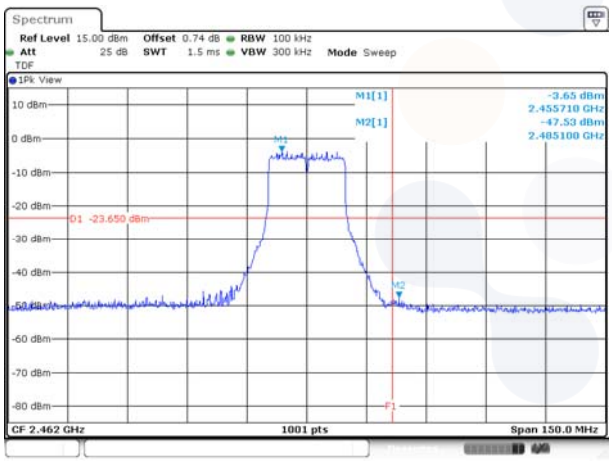
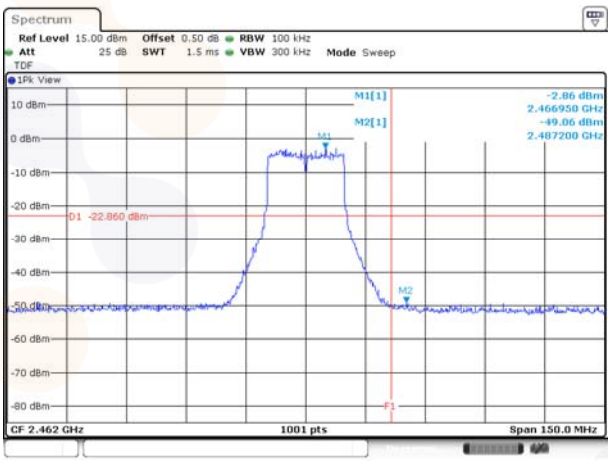
26T / RU offset 8	
ANT 1	**ANT 2**
Conducted band-edge / 2 462 ㎒	**Conducted band-edge / 2 462 ㎒**
	

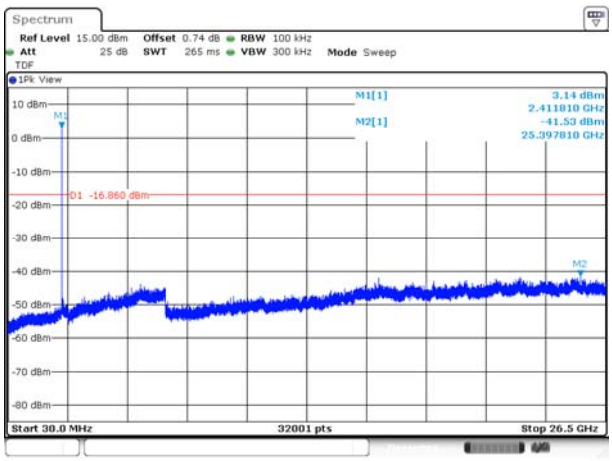
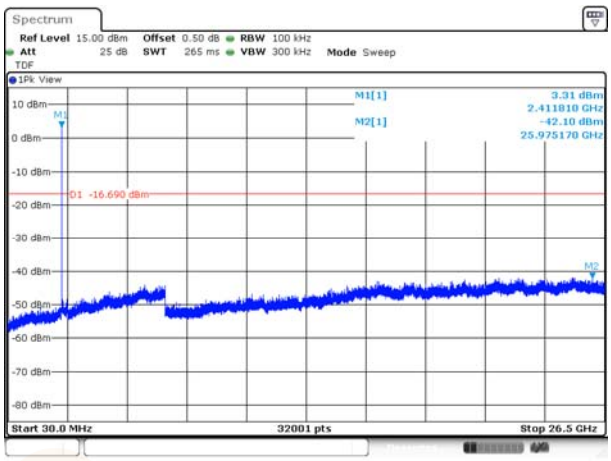
52T / RU offset 37	
ANT 1	**ANT 2**
Conducted band-edge / 2 412 ㎒	**Conducted band-edge / 2 412 ㎒**
	

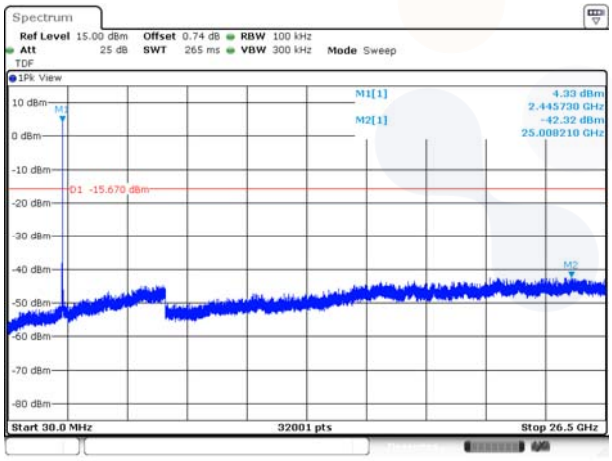
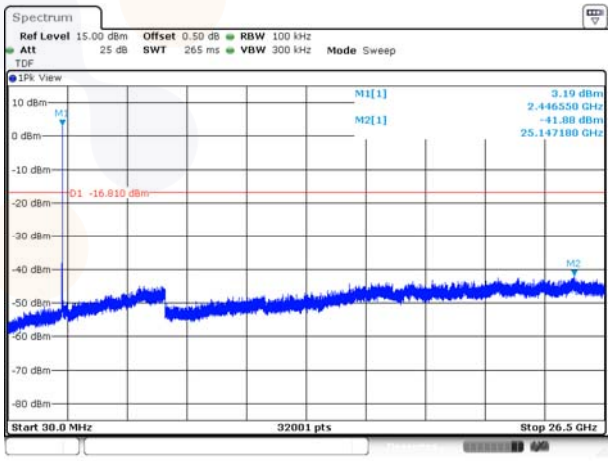
52T / RU offset 40	
ANT 1	**ANT 2**
Conducted band-edge / 2 462 ㎒	**Conducted band-edge / 2 462 ㎒**
	

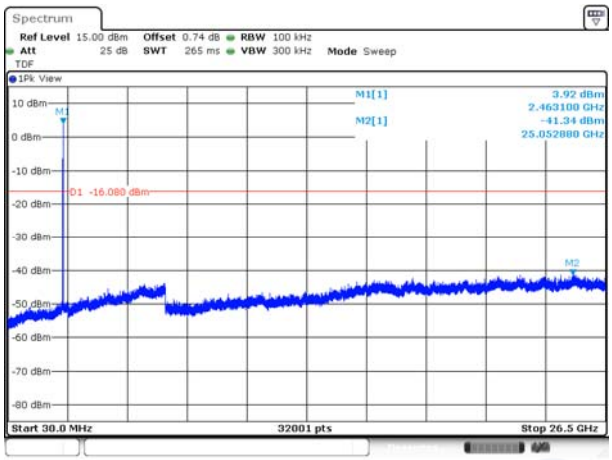
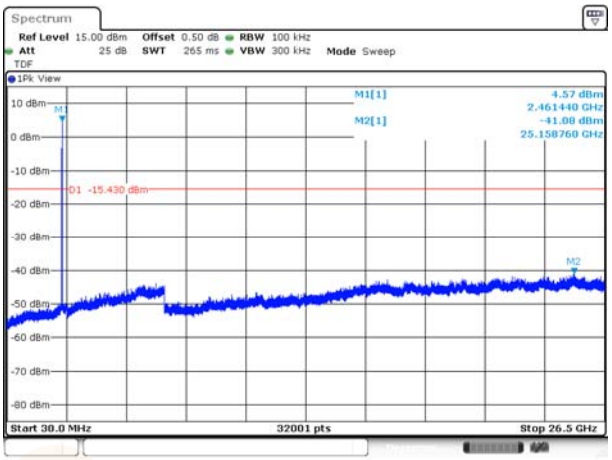
106T / RU offset 53	
ANT 1	**ANT 2**
Conducted band-edge / 2 412 ㎒	**Conducted band-edge / 2 412 ㎒**
	

106T / RU offset 54	
ANT 1	**ANT 2**
Conducted band-edge / 2 462 ㎒	**Conducted band-edge / 2 462 ㎒**
	

242T / RU offset 61	
ANT 1	**ANT 2**
Conducted band-edge / 2 412 ㎒	**Conducted band-edge / 2 412 ㎒**
	
Conducted band-edge / 2 462 ㎒	**Conducted band-edge / 2 462 ㎒**
	

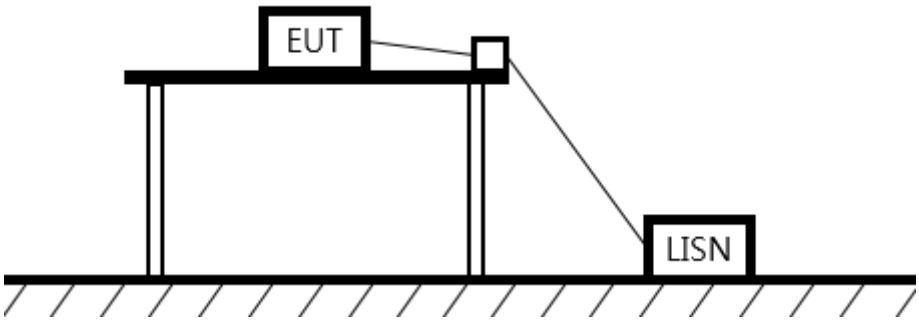
26T / RU offset 4	
ANT 1	**ANT 2**
Conducted spurious / 2 412 ㎒	**Conducted spurious / 2 412 ㎒**
	

26T / RU offset 8	
ANT 1	**ANT 2**
Conducted spurious / 2 437 ㎒	**Conducted spurious / 2 437 ㎒**
	

26T / RU offset 4	
ANT 1	**ANT 2**
Conducted spurious / 2 462 ㎒	**Conducted spurious / 2 462 ㎒**
	

7.6. AC Conducted emission

Test setup



Limit

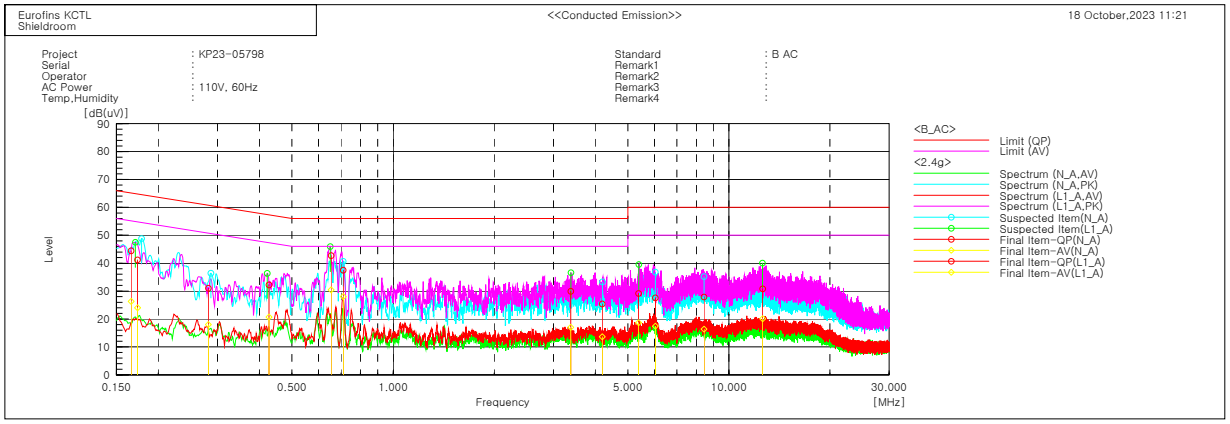
According to 15.207(a) and RSS-Gen(8.8), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50uH/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 (㎒)	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 ㎝ in which is located 40 ㎝ away from the vertical wall and 1.5m away from the side wall of the shielded room.
2. Each current-carrying conductor of the EUT power cord was individually connected through a 50Ω/50μH LISN, which is an input transducer to a spectrum analyzer or an EMI/Field Intensity Meter, to the input power source.
3. Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.
4. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 ㎒ to 30 ㎒.
5. The measurements were made with the detector set to peak amplitude within a bandwidth of 10 ㎑ or to quasi-peak and average within a bandwidth of 9 ㎑. The EUT was in transmitting mode during the measurements.

Test results – Worst case: 802.11ax HE20 SU MIMO / 2 437 ㎒



Final Result

--- N_A Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.17344	31.0	13.8	10.2	41.2	24.0	64.8	54.8	23.6	30.8
2	0.28181	21.3	8.3	9.7	31.0	18.0	60.8	50.8	29.8	32.8
3	0.71035	27.6	18.1	9.9	37.5	28.0	56.0	46.0	18.5	18.0
4	4.19471	15.6	3.8	9.8	25.4	13.6	56.0	46.0	30.6	32.4
5	6.03727	17.7	7.5	9.9	27.6	17.4	60.0	50.0	32.4	32.6
6	8.43504	17.7	6.1	10.2	27.9	16.3	60.0	50.0	32.1	33.7

--- 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]	Margin CAV [dB]
1	0.16597	34.2	16.1	10.2	44.4	26.3	65.2	55.2	20.8	28.9
2	0.42698	22.3	10.8	9.9	32.2	20.7	57.3	47.3	25.1	26.6
3	0.65385	32.8	20.5	9.9	42.7	30.4	56.0	46.0	13.3	15.6
4	3.38419	20.1	7.2	9.8	29.9	17.0	56.0	46.0	26.1	29.0
5	5.38762	19.3	8.7	9.9	29.2	18.6	60.0	50.0	30.8	31.4
6	12.59604	20.2	9.5	10.6	30.8	20.1	60.0	50.0	29.2	29.9

8. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Spectrum Analyzer	R&S	FSVA40	101574	24.03.28
Spectrum Analyzer	R&S	FSV40	100988	24.07.03
PSA Spectrum Analyzer	Agilent	E4440A	MY44303500	24.07.04
EMI TEST RECEIVER	R&S	ESCI3	100001	24.08.18
Signal Generator	R&S	SMB100A	176206	24.01.19
DC Power Supply	AGILENT	E3632A	MY51220373	24.07.03
Power Sensor	R&S	NRP-Z81	1137.9009.02-106223-bB	24.04.25
Attenuator	R&S	DNF Dämpfungsglied 10 dB in N-50 Ohm	0002	24.04.25
Attenuator	API Inmet	40AH2W-10	17	24.05.03
High Pass Filter	Wainwright Instruments GmbH	WHKX12-2805-3000-18000-40SS	SN59	24.10.16**
High Pass Filter	Qotana	DBHF058004000A	23041800061	24.07.10
Broadband PreAmplifier	SCHWARZBECK	BBV9718D	53	24.03.17
Low Noise Amplifier	TESTEK	TK-PA18H	220123-L	24.10.12**
Low Noise Amplifier	TESTEK	TK-PA1840H	220234-L	24.10.17**
Amplifier	SONOMA INSTRUMENT	310N	421910	24.10.12**
Horn Antenna	SCHWARZBECK	BBHA9120D	2764	24.10.18**
Horn Antenna	SCHWARZBECK	BBHA9170	1266	24.10.16**
Bilog Antenna	Teseq GmbH	CBL 6112D	61521	24.11.17**
Loop Antenna	R&S	HFH2-Z2	100355	24.08.10
TWO-LINE V - NETWORK	R&S	ENV216	101358	24.09.27*
Controller	INNCO SYSTEMS	CO3000	1442/54370322/P	-
Antenna Mast	INNCO SYSTEMS	MA4640-XP-ET	-	-
Turn Device	INNCO SYSTEMS	DS1200-S-1t	-	-

*This equipment was calibrated during the test period, and was used after calibration.
**This equipment was calibrated during the test period, and was used before calibration.

End of test report