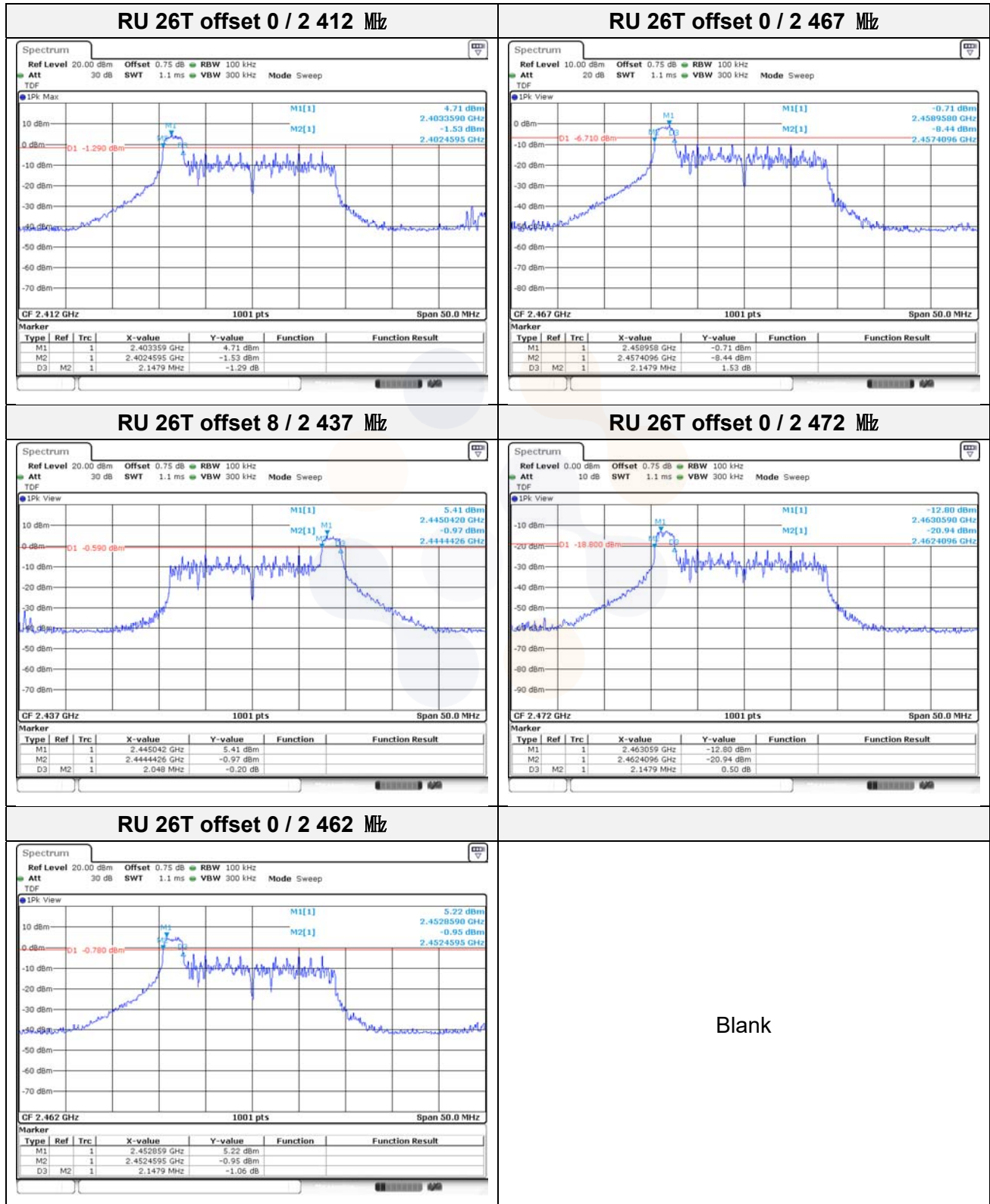
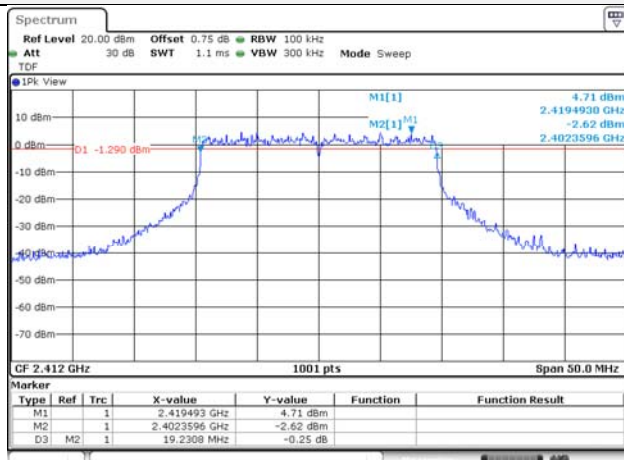


In order to simplify the report, attached plots were the worst case per RU offset & SU Mode.

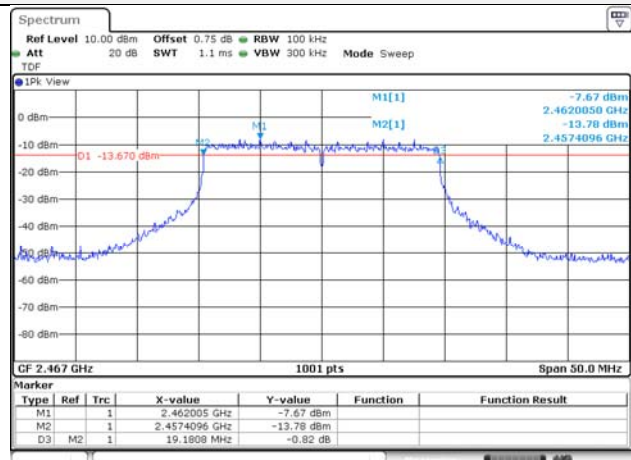
6 dB Bandwidth
SISO



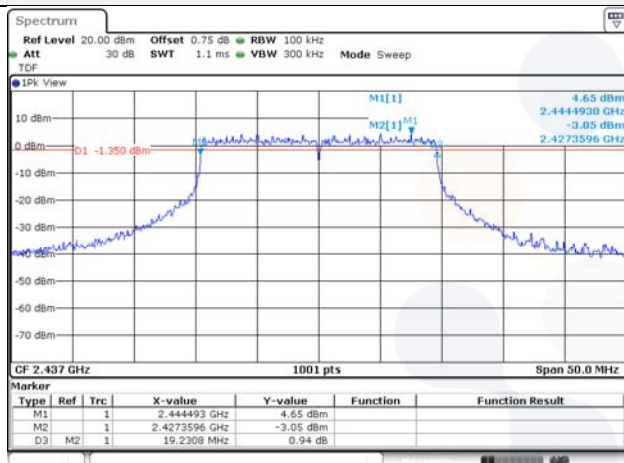
SU / 2 412 MHz



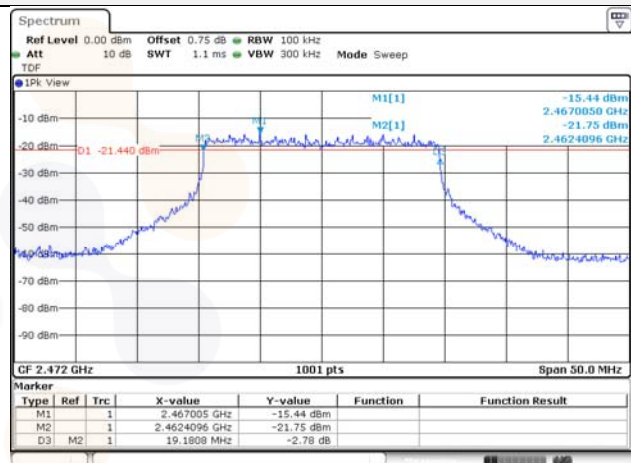
SU / 2 467 MHz



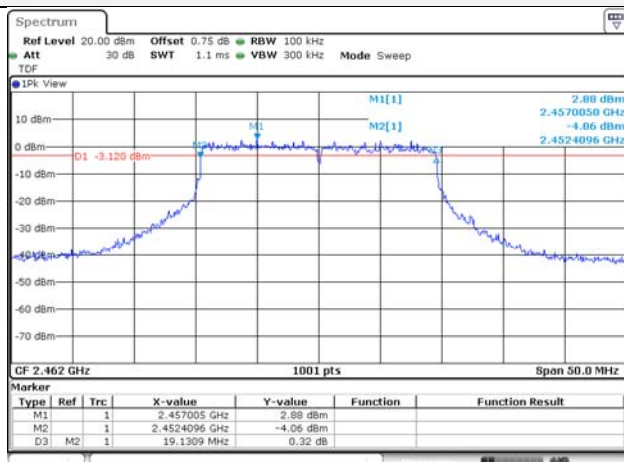
SU / 2 437 MHz



SU / 2 472 MHz

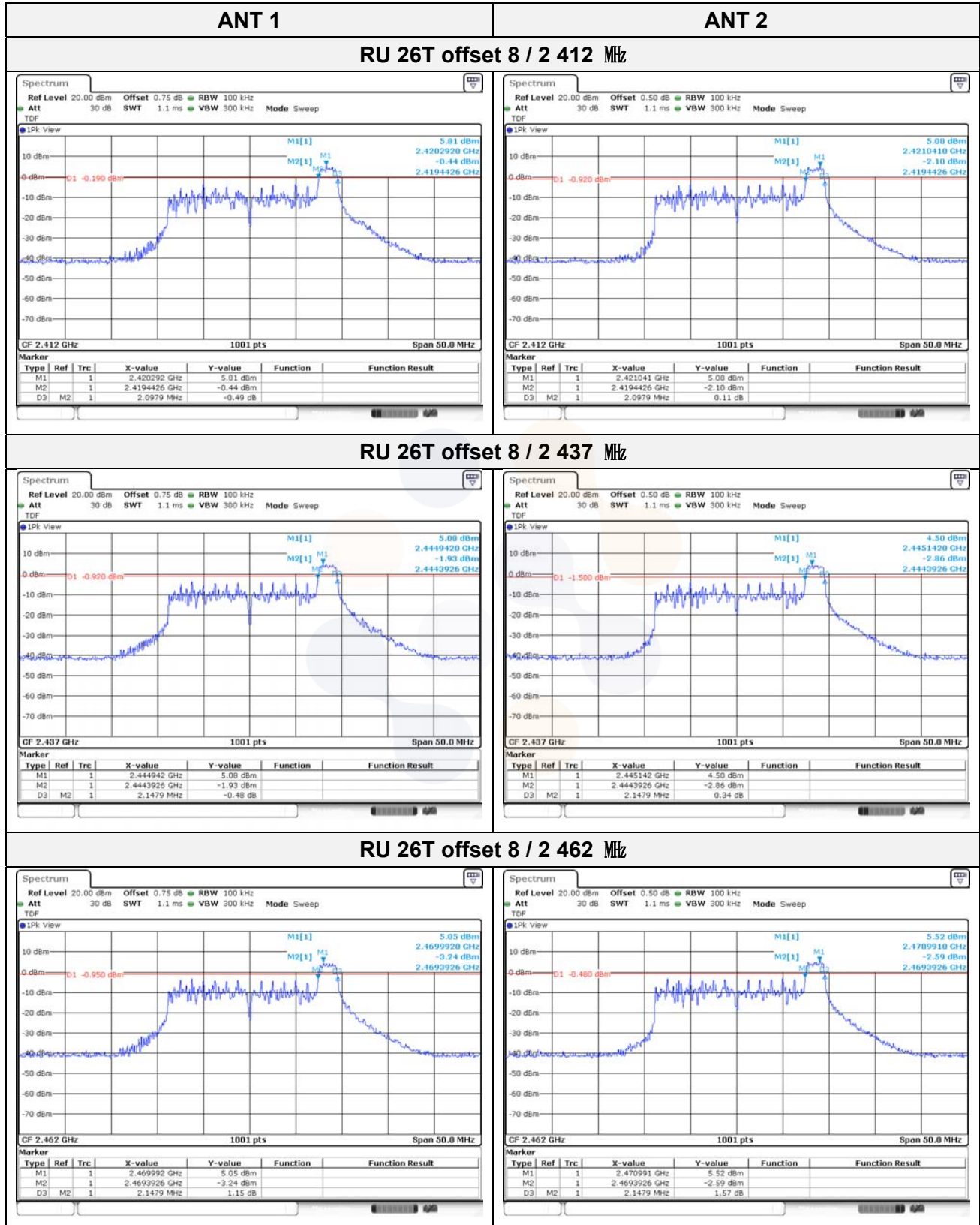


SU / 2 462 MHz



Blank

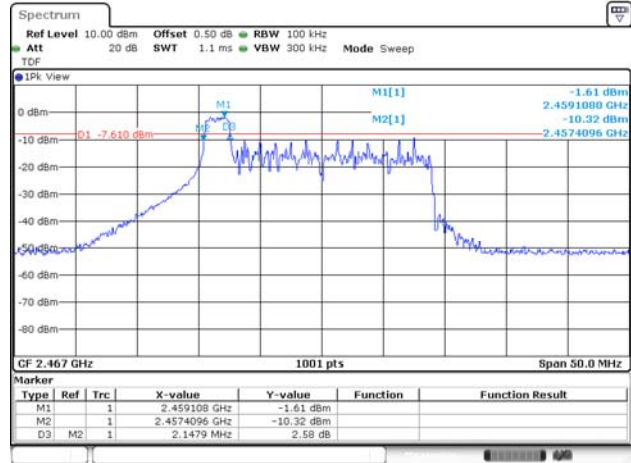
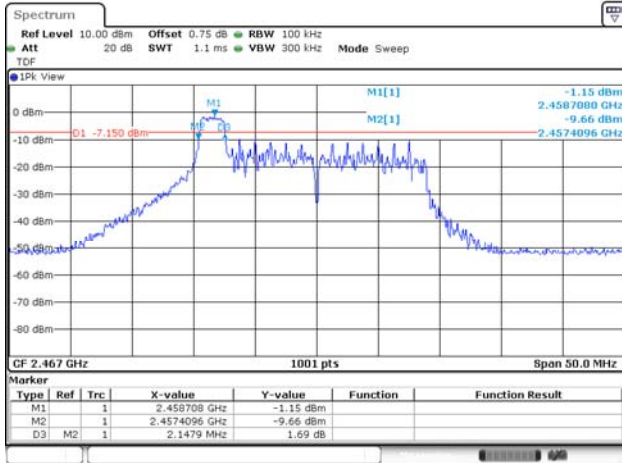
MIMO



ANT 1

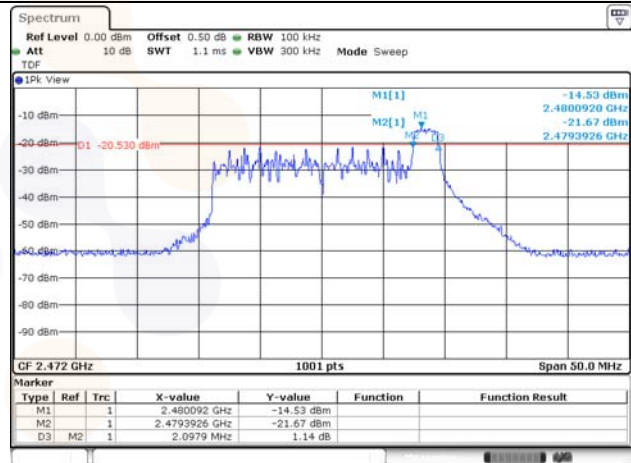
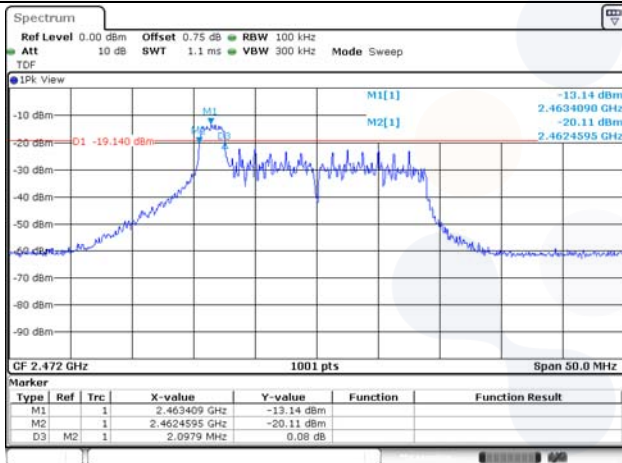
ANT 2

RU 26T offset 0 / 2 467 MHz



RU 26T offset 0 / 2 472 MHz

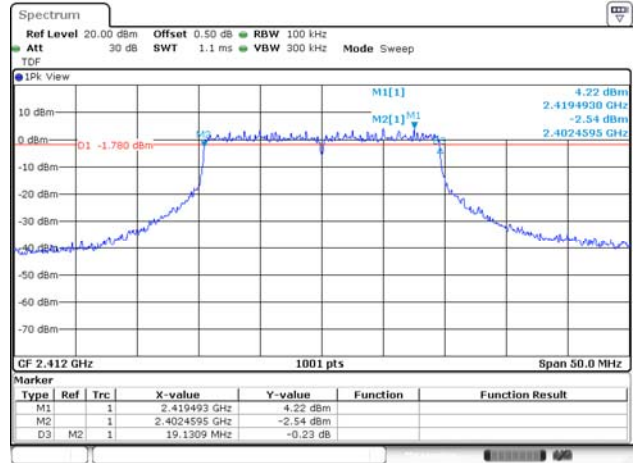
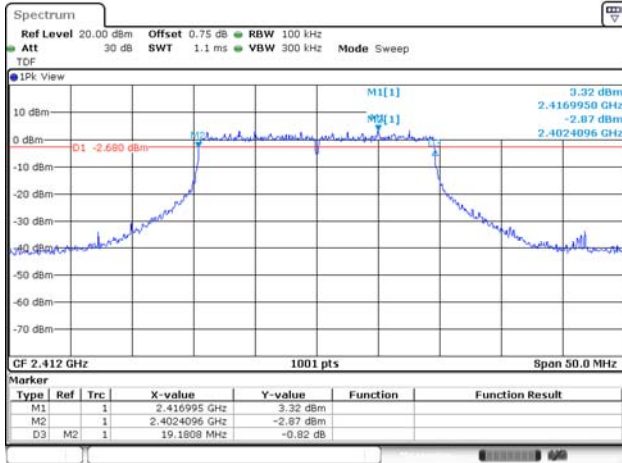
RU 26T offset 8 / 2 472 MHz



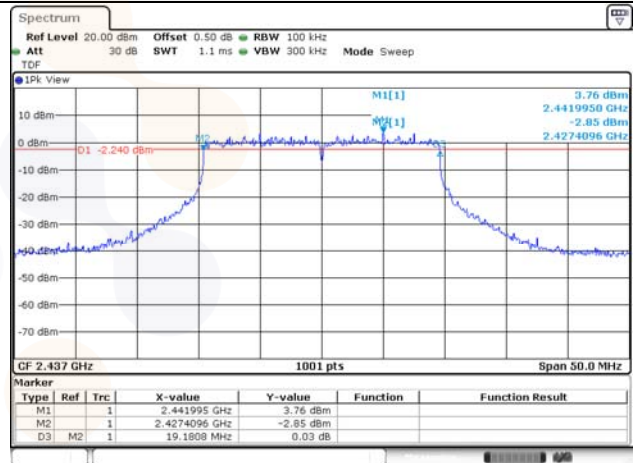
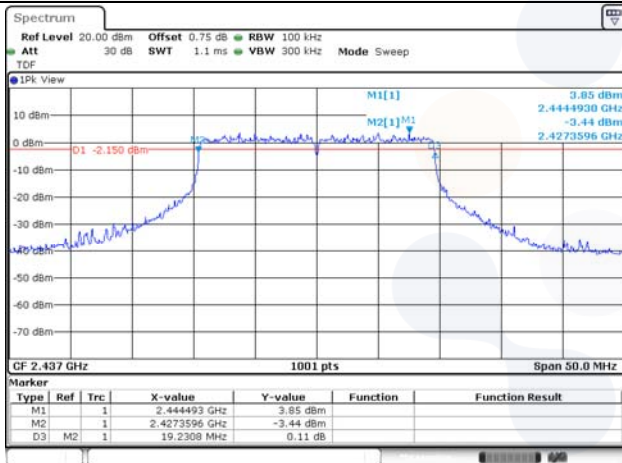
ANT 1

ANT 2

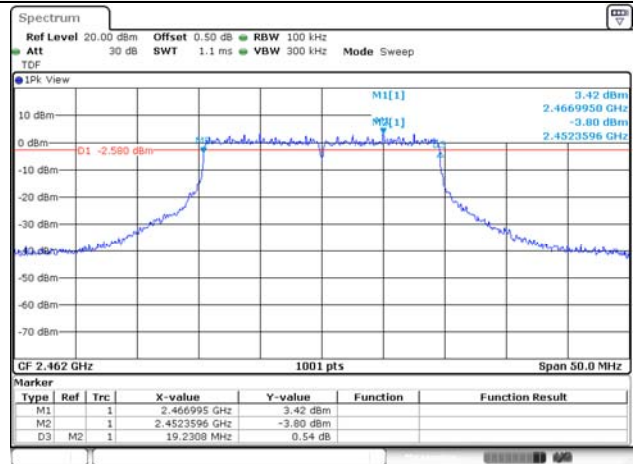
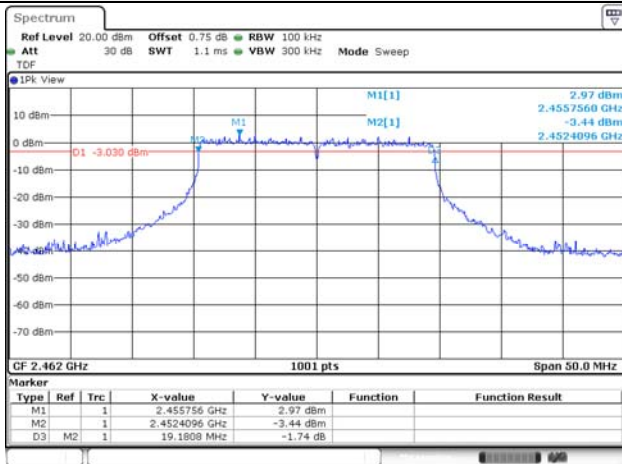
SU / 2 412 MHz



SU / 2 437 MHz



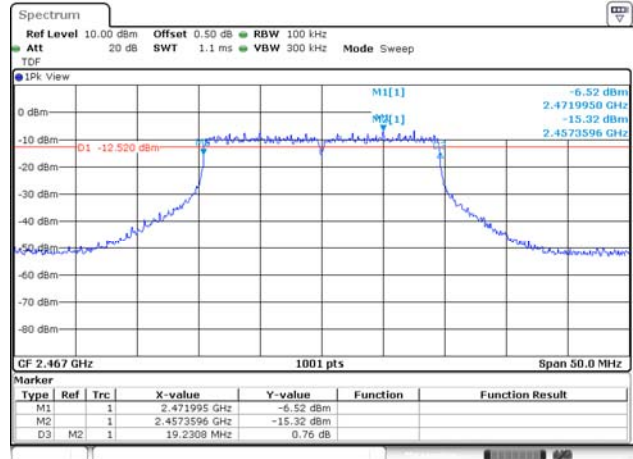
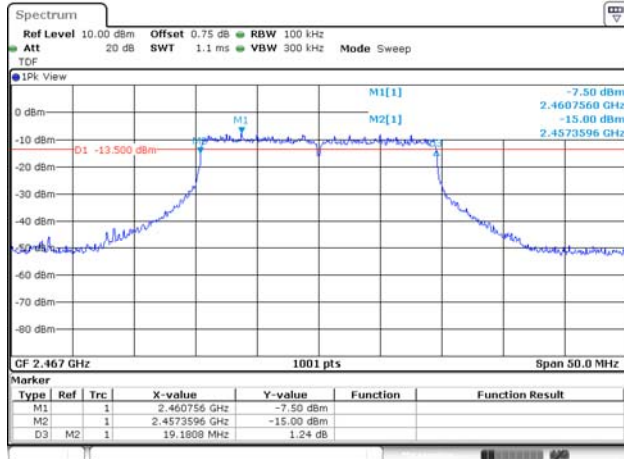
SU / 2 462 MHz



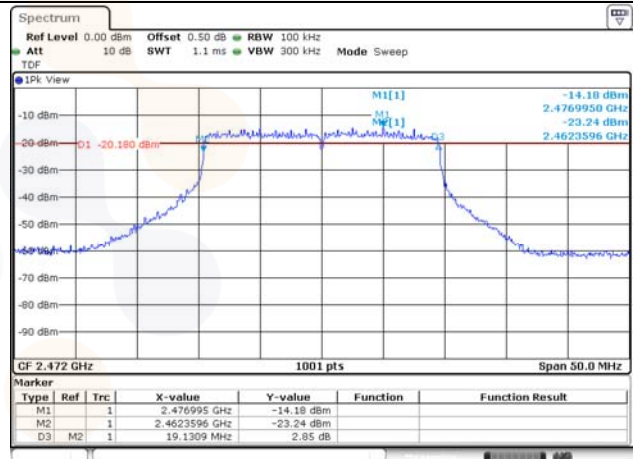
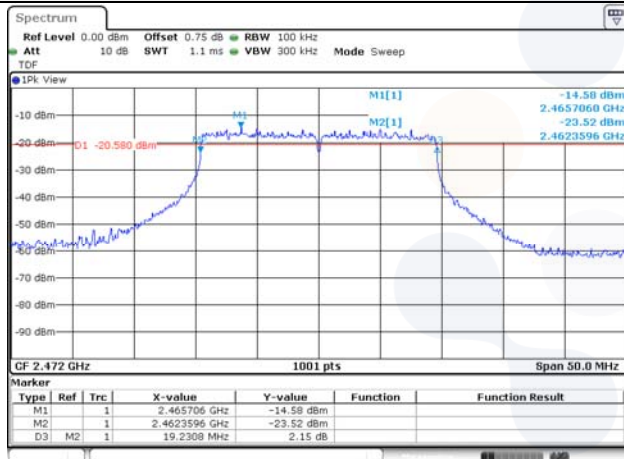
ANT 1

ANT 2

SU / 2 467 MHz



SU / 2 472 MHz



In order to simplify the report, only SU mode test plots are attached.

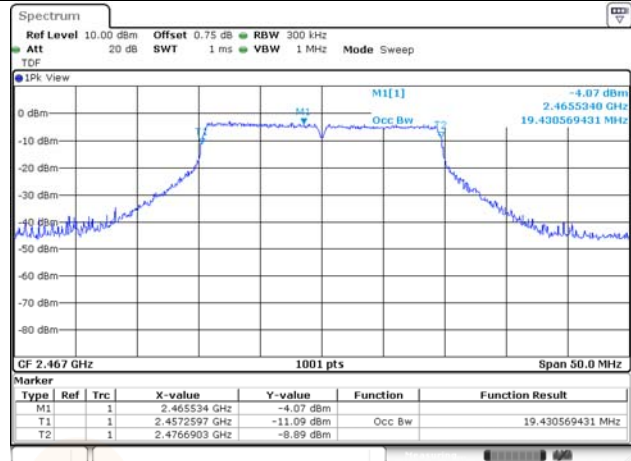
99% bandwidth

SISO

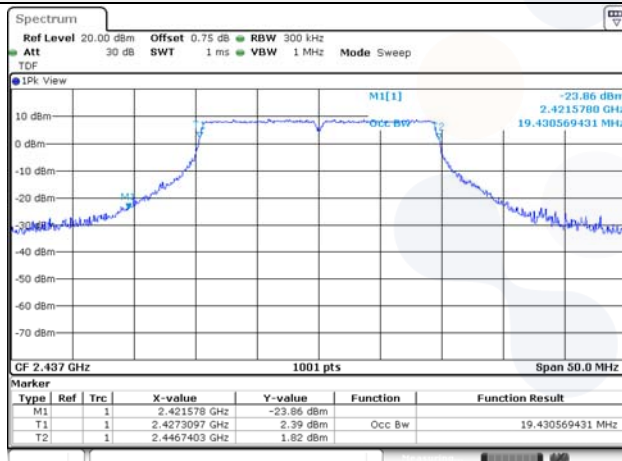
SU / 2 412 MHz



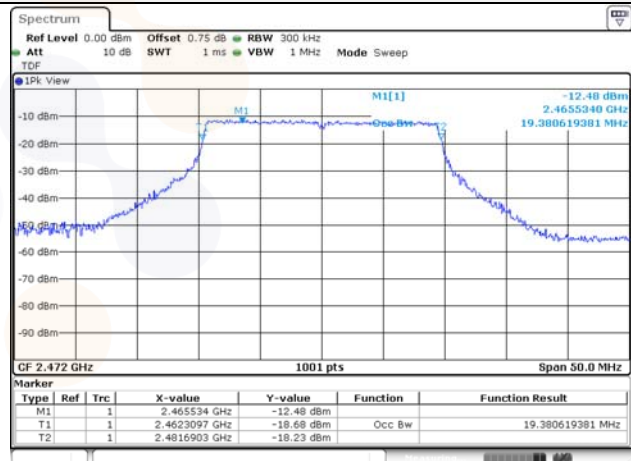
SU / 2 467 MHz



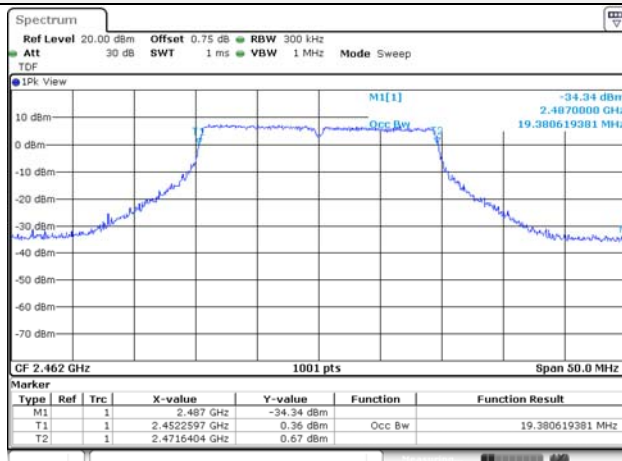
SU / 2 437 MHz



SU / 2 472 MHz

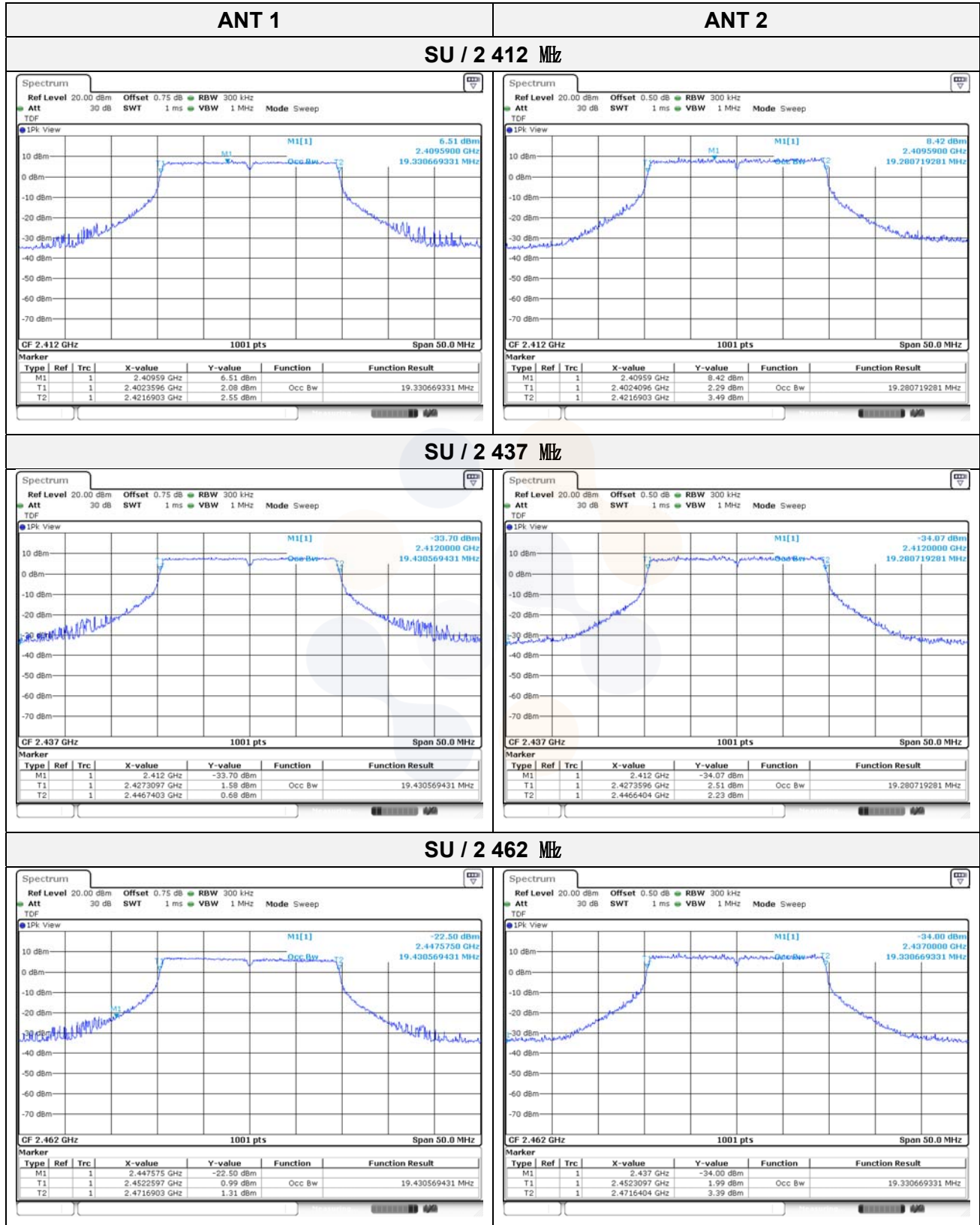


SU / 2 462 MHz



Blank

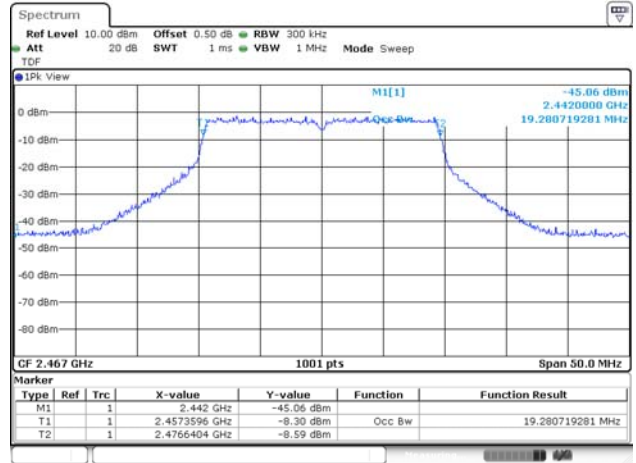
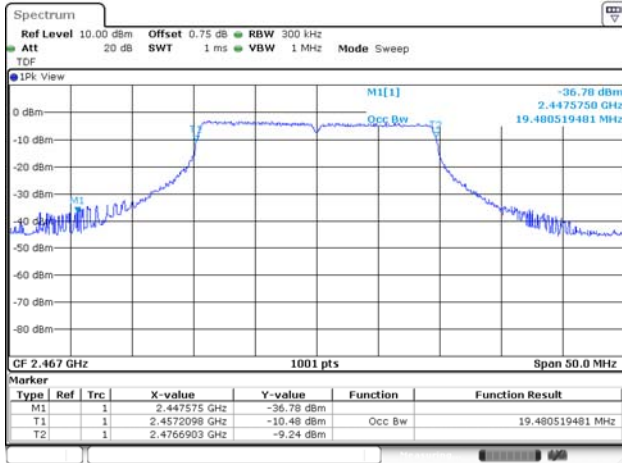
MIMO



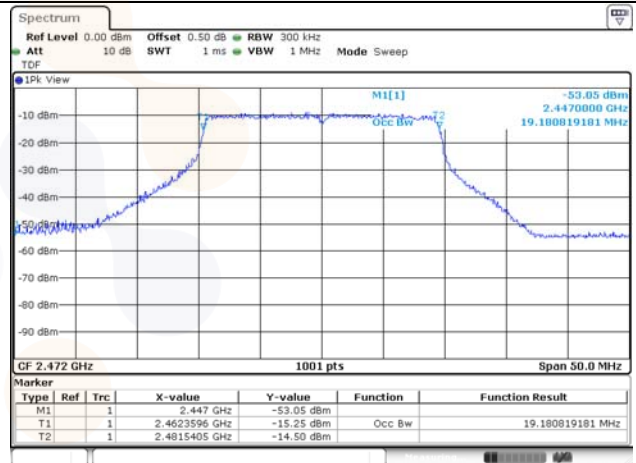
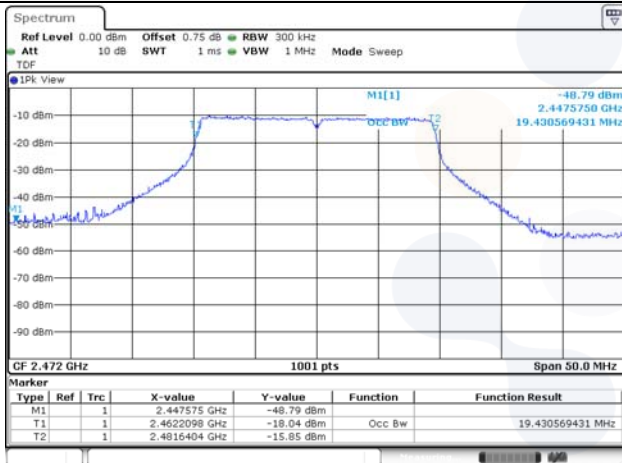
ANT 1

ANT 2

SU / 2 467 MHz



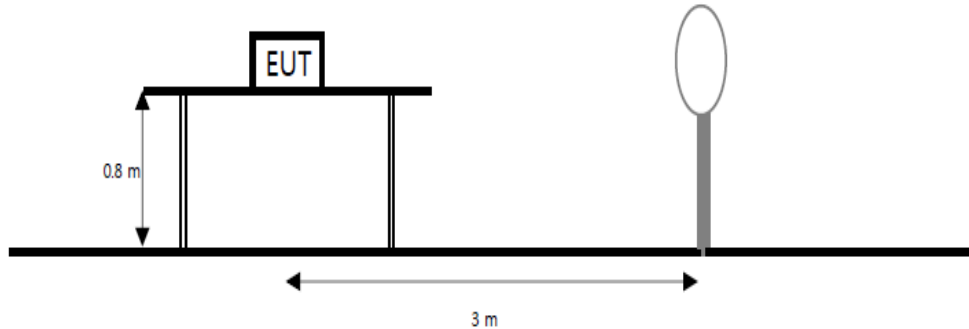
SU / 2 472 MHz



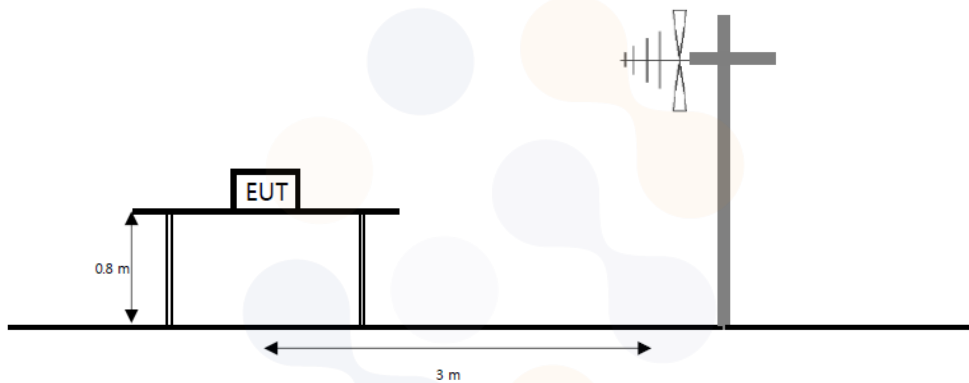
7.4. Spurious Emission, Band Edge and Restricted bands

Test setup

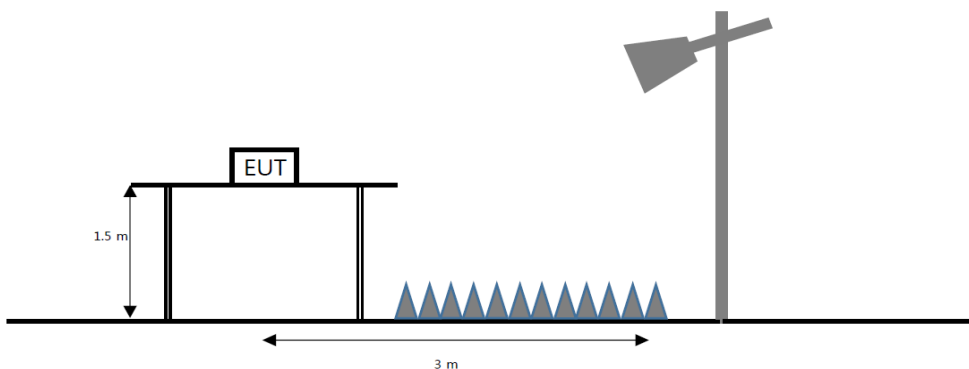
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions



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



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz 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 (MHz)	Field strength ($\mu V/m$)	Measurement distance (m)
0.009 - 0.490	2 400/F(kHz)	300
0.490 - 1.705	24 000/F(kHz)	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 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., Section 15.231 and 15.241.

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

MHz	MHz	MHz	GHz
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	2 483.5 - 2 500	17.7 - 21.4
8.376 25 - 8.386 75	25	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 MHz, compliance with the limits in section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1 000 MHz, 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(MHz)	Field strength (μ V/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) (μ A/m)	Measurement distance(m)
9 – 490 kHz ¹⁾	6.37/F (F in kHz)	300
490 – 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	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:

- 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).
- Unwanted emissions that fall into restricted frequency bands listed in table 7 shall comply with the limits specified in table 5 and table 6.
- 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 $\geq$ (3 $\times$ RBW)
4. Detector = peak
5. Sweep time = auto
6. Trace mode = max hold
7. Allow sweeps to continue until the trace stabilizes

Table. RBW as a function of frequency

Frequency	RBW
9 kHz to 150 kHz	200 Hz to 300 Hz
0.15 MHz to 30 MHz	9 kHz to 10 kHz
30 MHz to 1 000 MHz	100 kHz to 120 kHz
> 1 000 MHz	1 MHz

Average field strength measurements

Trace averaging with continuous EUT transmission at full power

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

1. RBW = 1 MHz (unless otherwise specified).
2. VBW $\geq$ (3 $\times$ RBW).
3. Detector = RMS (power averaging), if $[\text{span} / (\# \text{ of points in sweep})] \leq (\text{RBW} / 2)$. Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
4. Averaging type = power (i.e., rms):
 - 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
 - 2) Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.
5. Sweep time = auto.
6. Perform a trace average of at least 100 traces.

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

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

1. The EUT shall be configured to operate at the maximum achievable duty cycle.
2. Measure the duty cycle D of the transmitter output signal as described in 11.6.
3. RBW = 1 MHz (unless otherwise specified).
4. VBW $\geq [3 \times \text{RBW}]$.
5. Detector = RMS (power averaging), if $[\text{span} / (\# \text{ of points in sweep})] \leq (\text{RBW} / 2)$. Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
6. Averaging type = power (i.e., rms):

Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR23-SRF0226 Page (61) of (110)	
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- 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
- 2) Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.
7. Sweep time = auto.
8. Perform a trace average of at least 100 traces.
9. A correction factor shall be added to the measurement results prior to comparing with the emission limit to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
 - 1) If power averaging (rms) mode was used in step f), then the applicable correction factor is $[10 \log (1 / D)]$, where D is the duty cycle.
 - 2) If linear voltage averaging mode was used in step f), then the applicable correction factor is $[20 \log (1 / D)]$, where D is the duty cycle.
 - 3) If a specific emission is demonstrated to be continuous ($D \geq 98\%$) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Notes:

1. $f < 30$ MHz, extrapolation factor of 40 dB/decade of distance. $F_d = 40 \log(D_m/D_s)$
 $f \geq 30$ MHz, extrapolation factor of 20 dB/decade of distance. $F_d = 20 \log(D_m/D_s)$
Where:
 F_d = Distance factor in dB
 D_m = Measurement distance in meters
 D_s = Specification distance in meters
2. 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 GHz the worst results between two antenna polarizations (H and V) were documented in the test report.
7. Below 30 MHz frequency range, In order to search for the worst result, all orientations about parallel, perpendicular, and ground-parallel were investigated then reported. when the emission level was higher than 20 dB of the limit, then the following statement shall be made: "No spurious emissions were detected within 20 dB of the limit."
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 kHz 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 (Above 1 000 MHz)

SISO Restricted Band edge (Lowest Channel)

802.11ax_HE20 SU mode_Lowest Channel (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								
2 389.72 ¹⁾	V	72.10	27.30	-30.59	-	68.81	74.00	5.19
2 483.83 ¹⁾	V	64.10	27.80	-30.48	-	61.42	74.00	12.58
Average Data								
2 389.72 ¹⁾	V	52.98	27.30	-30.59	0.38	50.07	54.00	3.93
2 483.83 ¹⁾	V	49.81	27.80	-30.48	0.38	47.51	54.00	6.49

802.11ax_HE20 RU mode (26T / RU offset 0)_Lowest Channel (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								
2 389.65 ¹⁾	V	68.60	27.30	-30.59	-	65.31	74.00	8.69
2 483.79 ¹⁾	V	62.60	27.80	-30.48	-	59.92	74.00	14.08
Average Data								
2 389.65 ¹⁾	V	42.22	27.30	-30.59	0.16	39.09	54.00	14.91
2 483.79 ¹⁾	V	43.00	27.80	-30.48	0.16	40.48	54.00	13.52

802.11ax_HE20 RU mode (52T / RU offset 37)_Lowest Channel (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								
2 389.49 ¹⁾	V	58.80	27.29	-30.59	-	55.50	74.00	18.50
2 485.03 ¹⁾	V	58.40	27.80	-30.48	-	55.72	74.00	18.28
Average Data								
2 389.49 ¹⁾	V	38.50	27.29	-30.59	-	35.20	54.00	18.80
2 485.03 ¹⁾	V	40.95	27.80	-30.48	-	38.27	54.00	15.73

802.11ax_HE20 RU mode (106T / RU offset 53)_Lowest Channel (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								
2 389.86 ¹⁾	V	59.30	27.30	-30.59	-	56.01	74.00	17.99
2 485.76 ¹⁾	V	58.20	27.80	-30.48	-	55.52	74.00	18.48
Average Data								
2 389.86 ¹⁾	V	39.28	27.30	-30.59	0.17	36.16	54.00	17.84
2 483.76 ¹⁾	V	42.33	27.80	-30.48	0.17	39.82	54.00	14.18

802.11ax_HE20 RU mode (242T / RU offset 61)_Lowest Channel (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								
2 389.95 ¹⁾	V	59.40	27.30	-30.59	-	56.11	74.00	17.89
2 483.52 ¹⁾	V	58.90	27.80	-30.48	-	56.22	74.00	17.78
Average Data								
2 389.95 ¹⁾	V	39.39	27.30	-30.59	0.37	36.47	54.00	17.53
2 483.52 ¹⁾	V	42.72	27.80	-30.48	0.37	40.41	54.00	13.59

MIMO Restricted Band edge (Lowest Channel)

802.11ax_HE20 SU mode_Lowest Channel (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								
2 389.87 ¹⁾	V	71.70	27.30	-30.59	-	68.41	74.00	5.59
2 483.57 ¹⁾	V	68.70	27.80	-30.48	-	66.02	74.00	7.98
Average Data								
2 389.87 ¹⁾	V	53.62	27.30	-30.59	0.69	51.02	54.00	2.98
2 483.57 ¹⁾	V	49.94	27.80	-30.48	0.69	47.95	54.00	6.05

802.11ax_HE20 RU mode (26T / RU offset 0)_Lowest Channel (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								
2 389.95 ¹⁾	V	57.90	27.30	-30.59	-	54.61	74.00	19.39
2 483.67 ¹⁾	V	56.70	27.80	-30.48	-	54.02	74.00	19.98
Average Data								
2 389.95 ¹⁾	V	37.34	27.30	-30.59	-	34.05	54.00	19.95
2 483.67 ¹⁾	V	41.84	27.80	-30.48	-	39.16	54.00	14.84

802.11ax_HE20 RU mode (52T / RU offset 37)_Lowest Channel (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								
2 389.50 ¹⁾	V	57.80	27.29	-30.59	-	54.50	74.00	19.50
2 484.08 ¹⁾	V	57.60	27.80	-30.48	-	54.92	74.00	19.08
Average Data								
2 389.50 ¹⁾	V	37.57	27.29	-30.59	0.16	34.43	54.00	19.57
2 484.08 ¹⁾	V	41.71	27.80	-30.48	0.16	39.19	54.00	14.81

802.11ax_HE20 RU mode (106T / RU offset 53)_Lowest Channel (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								
2 389.72 ¹⁾	V	58.20	27.30	-30.59	-	54.91	74.00	19.09
2 483.86 ¹⁾	V	57.60	27.80	-30.48	-	54.92	74.00	19.08
Average Data								
2 389.72 ¹⁾	V	38.01	27.30	-30.59	0.33	35.05	54.00	18.95
2 483.86 ¹⁾	V	41.85	27.80	-30.48	0.33	39.50	54.00	14.50

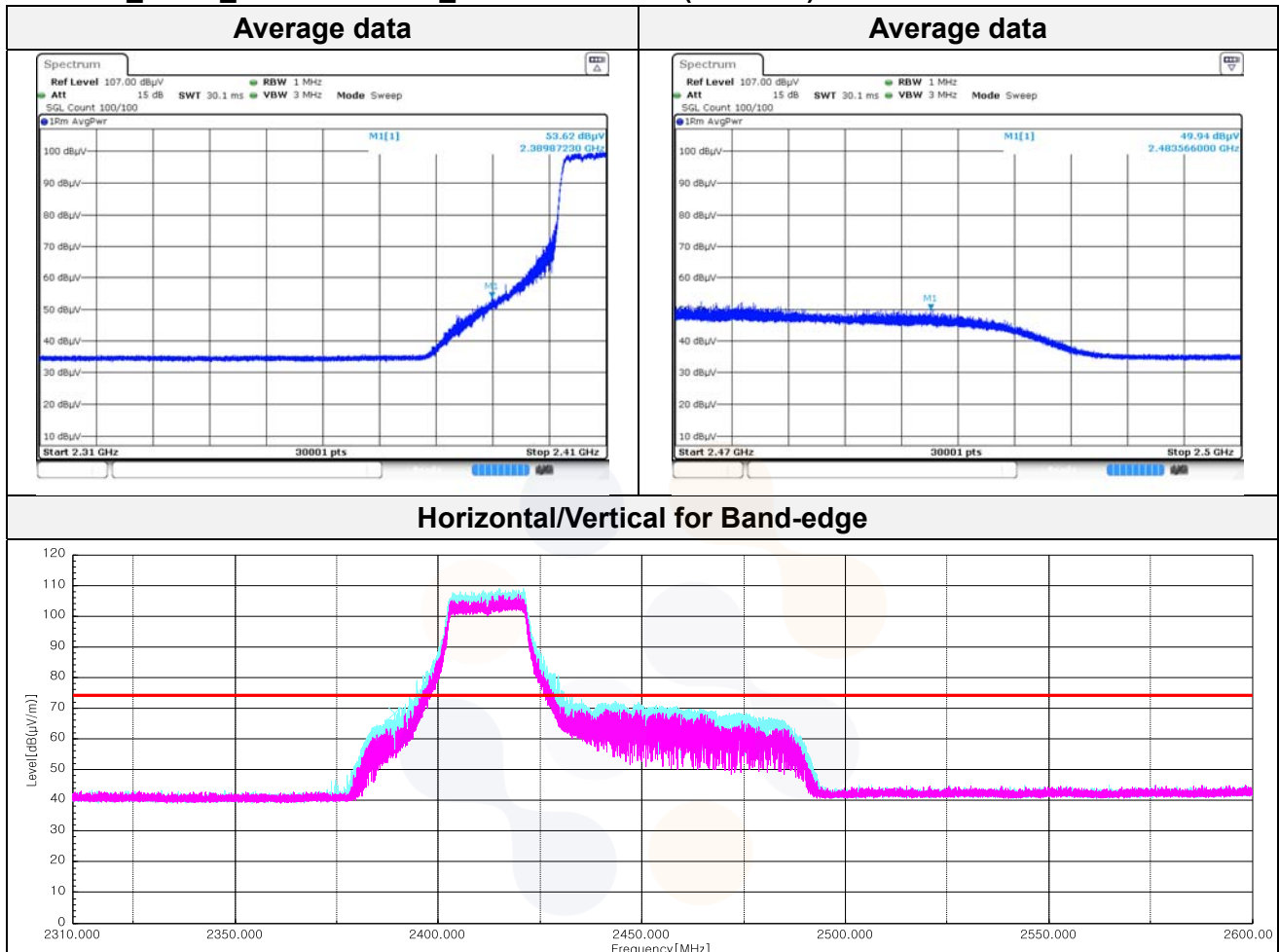
802.11ax_HE20 RU mode (242T / RU offset 61)_Lowest Channel (2 412 MHz)

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								
2 389.77 ¹⁾	V	61.80	27.30	-30.59	-	58.51	74.00	15.49
2 483.63 ¹⁾	V	57.50	27.80	-30.48	-	54.82	74.00	19.18
Average Data								
2 389.77 ¹⁾	V	38.39	27.30	-30.59	0.68	35.78	54.00	18.22
2 483.63 ¹⁾	V	42.80	27.80	-30.48	0.68	40.80	54.00	13.20

Plot of Bandedge

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

802.11ax_MIMO_HE20 SU mode_Lowest Channel (2 412 MHz)



SISO Restricted Band edge (11 Channel)

802.11ax_HE20 SU mode_11 Channel (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								
2 389.72 ¹⁾	V	63.10	27.30	-30.59	-	59.81	74.00	14.19
2 483.54 ¹⁾	V	73.20	27.80	-30.48	-	70.52	74.00	3.48
Average Data								
2 389.72 ¹⁾	V	45.11	27.30	-30.59	0.38	42.20	54.00	11.80
2 483.54 ¹⁾	V	52.72	27.80	-30.48	0.38	50.42	54.00	3.58

802.11ax_HE20 RU mode (26T / RU offset 8)_11 Channel (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								
2 389.82 ¹⁾	V	62.30	27.30	-30.59	-	59.01	74.00	14.99
2 483.59 ¹⁾	V	72.00	27.80	-30.48	-	69.32	74.00	4.68
Average Data								
2 389.82 ¹⁾	V	42.14	27.30	-30.59	0.16	39.01	54.00	14.99
2 483.59 ¹⁾	V	44.53	27.80	-30.48	0.16	42.01	54.00	11.99

802.11ax_HE20 RU mode (52T / RU offset 40)_11 Channel (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								
2 389.93 ¹⁾	V	56.80	27.30	-30.59	-	53.51	74.00	20.49
2 483.66 ¹⁾	V	60.50	27.80	-30.48	-	57.82	74.00	16.18
Average Data								
2 389.93 ¹⁾	V	40.41	27.30	-30.59	-	37.12	54.00	16.88
2 483.66 ¹⁾	V	40.48	27.80	-30.48	-	37.80	54.00	16.20

802.11ax_HE20 RU mode (106T / RU offset 54)_11 Channel (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								
2 389.97 ¹⁾	V	58.10	27.30	-30.59	-	54.81	74.00	19.19
2 483.64 ¹⁾	V	62.60	27.80	-30.48	-	59.92	74.00	14.08
Average Data								
2 389.97 ¹⁾	V	40.58	27.30	-30.59	0.17	37.46	54.00	16.54
2 483.64 ¹⁾	V	42.06	27.80	-30.48	0.17	39.55	54.00	14.45

802.11ax_HE20 RU mode (242T / RU offset 61) mode_11 Channel (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								
2 389.67 ¹⁾	V	57.80	27.30	-30.59	-	54.51	74.00	19.49
2 483.67 ¹⁾	V	62.10	27.80	-30.48	-	59.42	74.00	14.58
Average Data								
2 389.67 ¹⁾	V	41.05	27.30	-30.59	0.37	38.13	54.00	15.87
2 483.67 ¹⁾	V	42.93	27.80	-30.48	0.37	40.62	54.00	13.38

MIMO Restricted Band edge (11 Channel)

802.11ax_HE20 SU mode_11 Channel (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								
2 389.46 ¹⁾	V	64.80	27.29	-30.59	-	61.50	74.00	12.50
2 483.50 ¹⁾	V	71.80	27.80	-30.48	-	69.12	74.00	4.88
Average Data								
2 389.46 ¹⁾	V	50.56	27.29	-30.59	0.69	47.95	54.00	6.05
2 483.50 ¹⁾	V	53.78	27.80	-30.48	0.69	51.79	54.00	2.21

802.11ax_HE20 RU mode (26T / RU offset 8)_11 Channel (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								
2 389.97 ¹⁾	V	57.20	27.30	-30.59	-	53.91	74.00	20.09
2 483.52 ¹⁾	V	60.20	27.80	-30.48	-	57.52	74.00	16.48
Average Data								
2 389.97 ¹⁾	V	40.57	27.30	-30.59	-	37.28	54.00	16.72
2 483.52 ¹⁾	V	39.93	27.80	-30.48	-	37.25	54.00	16.75

802.11ax_HE20 RU mode (52T / RU offset 40)_11 Channel (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								
2 389.94 ¹⁾	V	56.10	27.30	-30.59	-	52.81	74.00	21.19
2 483.52 ¹⁾	V	61.00	27.80	-30.48	-	58.32	74.00	15.68
Average Data								
2 389.94 ¹⁾	V	39.86	27.30	-30.59	0.16	36.73	54.00	17.27
2 483.52 ¹⁾	V	39.85	27.80	-30.48	0.16	37.33	54.00	16.67

802.11ax_HE20 RU mode (106T / RU offset 54)_11 Channel (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								
2 389.58 ¹⁾	V	58.00	27.30	-30.59	-	54.71	74.00	19.29
2 484.01 ¹⁾	V	61.20	27.80	-30.48	-	58.52	74.00	15.48
Average Data								
2 389.58 ¹⁾	V	40.11	27.30	-30.59	0.33	37.15	54.00	16.85
2 484.01 ¹⁾	V	40.25	27.80	-30.48	0.33	37.90	54.00	16.10

802.11ax_HE20 RU mode (242T / RU offset 61)_11 Channel (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								
2 388.44 ¹⁾	V	57.80	27.28	-30.59	-	54.49	74.00	19.51
2 483.77 ¹⁾	V	67.40	27.80	-30.48	-	64.72	74.00	9.28
Average Data								
2 388.44 ¹⁾	V	40.58	27.28	-30.59	0.68	37.95	54.00	16.05
2 483.77 ¹⁾	V	41.87	27.80	-30.48	0.68	39.87	54.00	14.13

SISO Restricted Band edge (12 Channel)

802.11ax_HE20 SU mode_12 Channel (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								
2 389.90 ¹⁾	V	52.90	27.30	-30.59	-	49.61	74.00	24.39
2 483.58 ¹⁾	V	68.30	27.80	-30.48	-	65.62	74.00	8.38
Average Data								
2 483.58 ¹⁾	V	46.34	27.80	-30.48	0.38	44.04	54.00	9.96

802.11ax_HE20 RU mode (26T / RU offset 8)_12 Channel (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								
2 388.34 ¹⁾	V	57.00	27.28	-30.59	-	53.69	74.00	20.31
2 483.54 ¹⁾	V	74.40	27.80	-30.48	-	71.72	74.00	2.28
-Average Data								
2 388.34 ¹⁾	V	37.44	27.28	-30.59	0.16	34.29	54.00	19.71
2 483.54 ¹⁾	V	52.64	27.80	-30.48	0.16	50.12	54.00	3.88

802.11ax_HE20 RU mode (52T / RU offset 40)_12 Channel (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								
2 389.64 ¹⁾	V	50.60	27.30	-30.59	-	47.31	74.00	26.69
2 483.51 ¹⁾	V	70.90	27.80	-30.48	-	68.22	74.00	5.78
Average Data								
2 483.51 ¹⁾	V	49.22	27.80	-30.48	-	46.54	54.00	7.46

802.11ax_HE20 RU mode (106T / RU offset 54)_12 Channel (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								
2 389.67 ¹⁾	V	51.30	27.30	-30.59	-	48.01	74.00	25.99
2 483.57 ¹⁾	V	68.50	27.80	-30.48	-	65.82	74.00	8.18
Average Data								
2 483.57 ¹⁾	V	47.10	27.80	-30.48	0.17	44.59	54.00	9.41

802.11ax_HE20 RU mode (242T / RU offset 61)_12 Channel (2 467 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB($\mu V/m$))	(dB($\mu V/m$))	(dB)
Peak data								
2 389.57 ¹⁾	V	51.40	27.30	-30.59	-	48.11	74.00	25.89
2 483.52 ¹⁾	V	65.40	27.80	-30.48	-	62.72	74.00	11.28
Average Data								
2 483.52 ¹⁾	V	43.97	27.80	-30.48	0.37	41.66	54.00	12.34



MIMO Restricted Band edge (12 Channel)

802.11ax_HE20 SU mode_12 Channel (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								
2 389.91 ¹⁾	V	49.30	32.00	-30.59	-	50.71	74.00	23.29
2 483.88 ¹⁾	V	66.50	32.64	-30.48	-	68.66	74.00	5.34
Average Data								
2 483.88 ¹⁾	V	41.95	32.64	-30.48	0.69	44.80	54.00	9.20

802.11ax_HE20 RU mode (26T / RU offset 8)_12 Channel (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								
2 389.77 ¹⁾	V	51.00	27.30	-30.59	-	47.71	74.00	26.29
2 483.56 ¹⁾	V	72.70	27.80	-30.48	-	70.02	74.00	3.98
Average Data								
2 483.56 ¹⁾	V	50.93	27.80	-30.48	-	48.25	54.00	5.75

802.11ax_HE20 RU mode (52T / RU offset 40)_12 Channel (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								
2 387.99 ¹⁾	V	50.60	27.28	-30.59	-	47.29	74.00	26.71
2 483.56 ¹⁾	V	71.20	27.80	-30.48	-	68.52	74.00	5.48
Average Data								
2 483.56 ¹⁾	V	48.70	27.80	-30.48	0.16	46.18	54.00	7.82

802.11ax_HE20 RU mode (106T / RU offset 54)_12 Channel (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								
2 389.46 ¹⁾	V	52.60	27.29	-30.59	-	49.30	74.00	24.70
2 483.53 ¹⁾	V	69.00	27.80	-30.48	-	66.32	74.00	7.68
Average Data								
2 483.53 ¹⁾	V	46.83	27.80	-30.48	0.33	44.48	54.00	9.52

802.11ax_HE20 RU mode (242T / RU offset 61)_12 Channel (2 467 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB($\mu V/m$))	(dB($\mu V/m$))	(dB)
Peak data								
2 389.87 ¹⁾	V	53.60	27.30	-30.59	-	50.31	74.00	23.69
2 483.52 ¹⁾	V	67.80	27.80	-30.48	-	65.12	74.00	8.88
Average Data								
2 483.52 ¹⁾	V	44.67	27.80	-30.48	0.68	42.67	54.00	11.33



SISO Restricted Band edge (Highest Channel)

802.11ax_HE20 SU mode_Highest Channel (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								
2 389.10 ¹⁾	V	49.40	27.29	-30.59	-	46.10	74.00	27.90
2 483.58 ¹⁾	V	74.30	27.80	-30.48	-	71.62	74.00	2.38
Average Data								
2 483.58 ¹⁾	V	52.13	27.80	-30.48	0.38	49.83	54.00	4.17

802.11ax_HE20 RU mode (26T / RU offset 8)_Highest Channel (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								
2 353.27 ¹⁾	V	41.40	31.90	-30.63	-	42.67	74.00	31.33
2 483.53 ¹⁾	V	69.70	32.64	-30.48	-	71.86	74.00	2.14
Average Data								
2 483.53 ¹⁾	V	46.77	32.64	-30.48	0.16	49.09	54.00	4.91

802.11ax_HE20 RU mode (52T / RU offset 40)_Highest Channel (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								
2 311.58 ¹⁾	H	47.40	27.20	-30.68	-	43.92	74.00	30.08
2 483.58 ¹⁾	V	73.30	27.80	-30.48	-	70.62	74.00	3.38
Average Data								
2 483.58 ¹⁾	V	52.16	27.80	-30.48	-	49.48	54.00	4.52

802.11ax_HE20 RU mode (106T / RU offset 54)_Highest Channel (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								
2 366.55 ¹⁾	V	47.20	27.07	-30.61	-	43.66	74.00	30.34
2 483.50 ¹⁾	V	70.30	27.80	-30.48	-	67.62	74.00	6.38
Average Data								
2 483.50 ¹⁾	V	48.82	27.80	-30.48	0.17	46.31	54.00	7.69

802.11ax_HE20 RU mode (242T / RU offset 61)_Highest Channel (2 472 MHz)

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
2 389.79 ¹⁾	V	47.60	27.30	-30.59	-	44.31	74.00	29.69
2 483.57 ¹⁾	V	67.40	27.80	-30.48	-	64.72	74.00	9.28
Average Data								
2 483.57 ¹⁾	V	45.46	27.80	-30.48	0.37	43.15	54.00	10.85



MIMO Restricted Band edge (Highest Channel)

802.11ax_HE20 SU mode_Highest Channel (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								
2 389.86 ¹⁾	V	51.70	27.30	-30.59	-	48.41	74.00	25.59
2 483.53 ¹⁾	V	73.50	27.80	-30.48	-	70.82	74.00	3.18
Average Data								
2 483.53 ¹⁾	V	51.22	27.80	-30.48	0.69	49.23	54.00	4.77

802.11ax_HE20 RU mode (26T / RU offset 8)_Highest Channel (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								
2 369.69 ¹⁾	H	41.20	32.10	-30.61	-	42.69	74.00	31.31
2 483.61 ¹⁾	V	68.60	32.64	-30.48	-	70.76	74.00	3.24
Average Data								
2 483.61 ¹⁾	V	46.18	32.64	-30.48	-	48.34	54.00	5.66

802.11ax_HE20 RU mode (52T / RU offset 40)_Highest Channel (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								
2 389.48 ¹⁾	V	46.80	27.29	-30.59	-	43.50	74.00	30.50
2 483.65 ¹⁾	V	73.40	27.80	-30.48	-	70.72	74.00	3.28
Average Data								
2 483.65 ¹⁾	V	50.56	27.80	-30.48	0.16	48.04	54.00	5.96

802.11ax_HE20 RU mode (106T / RU offset 54)_Highest Channel (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								
2 389.91 ¹⁾	V	43.30	32.00	-30.59	-	44.71	74.00	29.29
2 483.51 ¹⁾	V	65.60	32.64	-30.48	-	67.76	74.00	6.24
Average Data								
2 483.51 ¹⁾	V	44.32	32.64	-30.48	0.33	46.81	54.00	7.19

802.11ax_HE20 RU mode (242T / RU offset 61)_Highest Channel (2 472 MHz)

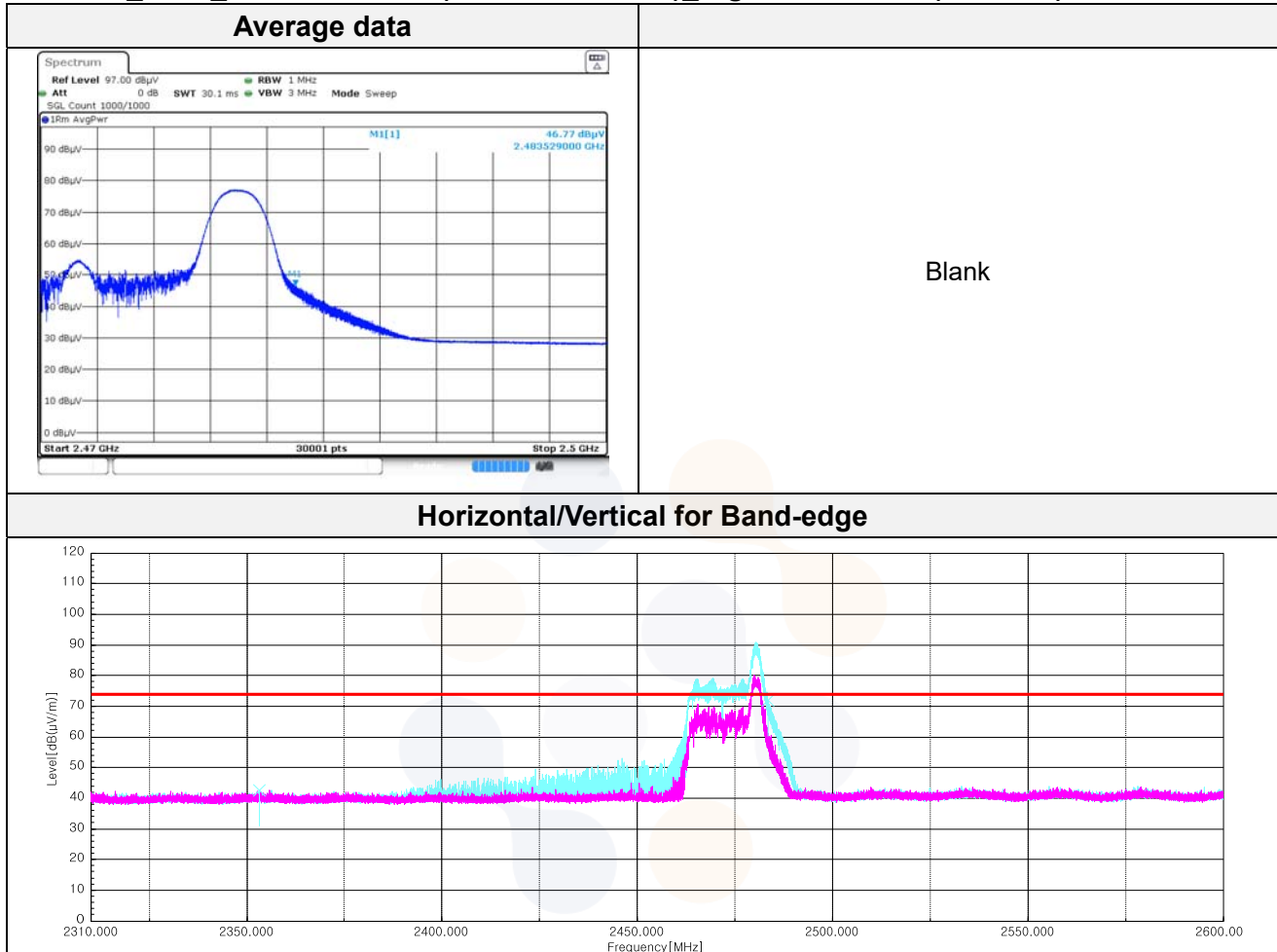
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μ V))	(dB)	(dB)	(dB)	(dB(μ V/m))	(dB(μ V/m))	(dB)
Peak data								
2 386.54 ¹⁾	V	42.30	32.00	-30.59	-	43.71	74.00	30.29
2 483.55 ¹⁾	V	61.60	32.64	-30.48	-	63.76	74.00	10.24
Average Data								
2 483.55 ¹⁾	V	40.56	32.64	-30.48	0.68	43.40	54.00	10.60



Plot of Band edge

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

802.11ax_SISO_HE20 RU mode (26T / RU offset 8)_Highest Channel (2 472 MHz)



SISO Harmonics and Spurious Emissions

802.11ax_HE20 SU mode_Lowest Channel (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								
4 820.95 ¹⁾	H	54.30	32.43	-45.77	-	40.96	74.00	33.04
7 231.82	V	52.80	37.16	-44.29	-	45.67	74.00	28.33
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

802.11ax_HE20 RU mode (106T / RU offset 54)_Lowest Channel (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								
4 825.30 ¹⁾	V	53.80	32.45	-45.75	-	40.50	74.00	33.50
7 251.15 ¹⁾	H	53.10	37.30	-44.34	-	46.06	74.00	27.94
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

802.11ax_HE20 SU mode_Middle Channel (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								
4 884.27 ¹⁾	V	53.80	32.81	-45.49	-	41.12	74.00	32.88
7 309.63 ¹⁾	V	52.40	37.06	-44.19	-	45.27	74.00	28.73
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

802.11ax_HE20 RU mode (52T / RU offset 38)_Middle Channel (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								
4 881.37 ¹⁾	H	53.60	32.79	-45.50	-	40.89	74.00	33.11
7 313.02 ¹⁾	H	52.30	37.05	-44.18	-	45.17	74.00	28.83
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 SU mode_11 Channel (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								
4 924.87 ¹⁾	H	52.90	32.75	-45.31	-	40.34	74.00	33.66
7 387.45 ¹⁾	H	53.00	36.93	-44.00	-	45.93	74.00	28.07
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 RU mode (26T / RU offset 8)_11 Channel (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								
4 913.27 ¹⁾	V	55.20	32.73	-45.36	-	42.57	74.00	31.43
7 390.35 ¹⁾	H	52.00	36.92	-43.99	-	44.93	74.00	29.07
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 SU mode_12 Channel (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								
4 932.12 ¹⁾	V	53.50	32.76	-45.28	-	40.98	74.00	33.02
7 411.13 ¹⁾	H	52.40	36.88	-43.94	-	45.34	74.00	28.66
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 RU mode (26T / RU offset 8)_12 Channel (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								
4 924.87 ¹⁾	H	52.90	32.75	-45.31	-	40.34	74.00	33.66
7 387.45 ¹⁾	H	53.00	36.93	-44.00	-	45.93	74.00	28.07
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 SU mode_Highest Channel (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								
4 938.40 ¹⁾	V	52.80	32.78	-45.25	-	40.33	74.00	33.67
7 410.17 ¹⁾	V	52.60	36.88	-43.94	-	45.54	74.00	28.46
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 RU mode (26T / RU offset 0)_Highest Channel (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								
4 946.62 ¹⁾	H	52.90	32.79	-45.21	-	40.48	74.00	33.52
7 411.62 ¹⁾	H	52.70	36.88	-43.94	-	45.64	74.00	28.36
Average Data								
No spurious emissions were detected within 20 dB of the limit								

MIMO Harmonics and Spurious Emissions

802.11ax_HE20 SU mode_Lowest Channel (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								
4 821.43 ¹⁾	H	55.20	32.43	-45.77	-	41.86	74.00	32.14
7 226.02	V	53.40	37.15	-44.28	-	46.27	74.00	27.73
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 RU mode (52T / RU offset 40)_Lowest Channel (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								
4 824.33 ¹⁾	H	54.00	32.45	-45.75	-	40.70	74.00	33.30
7 229.40	H	53.60	37.16	-44.29	-	46.47	74.00	27.53
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 SU mode_Middle Channel (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								
4 864.93 ¹⁾	V	53.70	32.69	-45.57	-	40.82	74.00	33.18
7 343.95 ¹⁾	H	51.90	36.92	-44.11	-	44.71	74.00	29.29
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 RU mode (106T / RU offset 54)_Middle Channel (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								
4 879.43 ¹⁾	V	53.50	32.78	-45.51	-	40.77	74.00	33.23
7 309.15 ¹⁾	H	52.20	37.06	-44.19	-	45.07	74.00	28.93
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 SU mode_11 Channel (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								
4 911.33 ¹⁾	H	54.20	32.72	-45.37	-	41.55	74.00	32.45
7 386.97 ¹⁾	H	52.70	36.93	-44.00	-	45.63	74.00	28.37
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 RU mode (106T / RU offset 53)_11 Channel (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								
4 914.72 ¹⁾	V	53.80	32.73	-45.36	-	41.17	74.00	32.83
7 385.52 ¹⁾	V	52.30	36.93	-44.00	-	45.23	74.00	28.77
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 SU mode_12 Channel (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								
4 934.53 ¹⁾	H	53.20	32.77	-45.27	-	40.70	74.00	33.30
7 398.57 ¹⁾	V	52.00	36.90	-43.97	-	44.93	74.00	29.07
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 RU mode (26T / RU offset 8)_12 Channel (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								
4 932.12 ¹⁾	V	54.10	32.76	-45.28	-	41.58	74.00	32.42
7 410.65 ¹⁾	V	52.50	36.88	-43.94	-	45.44	74.00	28.56
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 SU mode_Highest Channel (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								
4 950.00 ¹⁾	V	52.70	32.80	-45.20	-	40.30	74.00	33.70
7 421.28 ¹⁾	V	52.20	36.86	-43.92	-	45.14	74.00	28.86
Average Data								
No spurious emissions were detected within 20 dB of the limit								

802.11ax_HE20 RU mode (52T / RU offset 38)_Highest Channel (2 472 MHz)

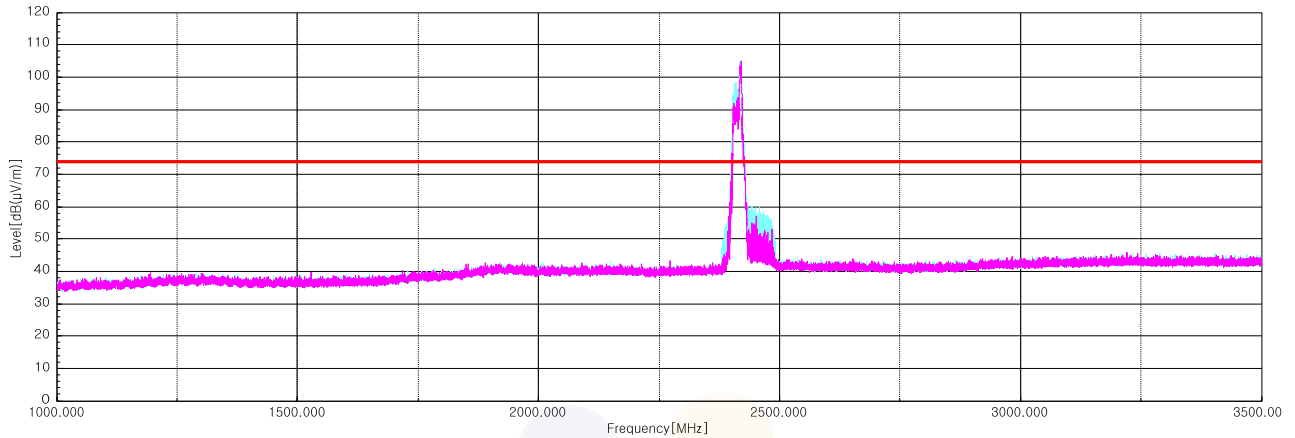
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
4 937.92 ¹⁾	V	53.00	32.78	-45.25	-	40.53	74.00	33.47
7 408.23 ¹⁾	H	52.90	36.88	-43.95	-	45.83	74.00	28.17
Average Data								
No spurious emissions were detected within 20 dB of the limit								

Plot of Harmonics and Spurious Emissions

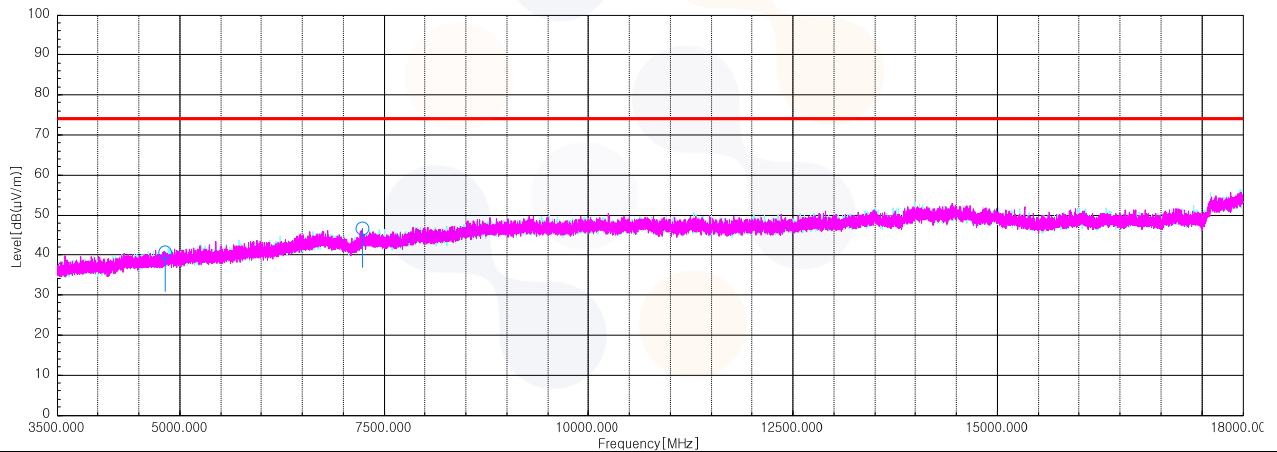
In order to simplify the report, attached plots were only the lowest margin condition

MIMO 802.11ax_ HE20 RU mode (52T / RU offset 40)_Lowest Channel (2 412 MHz)

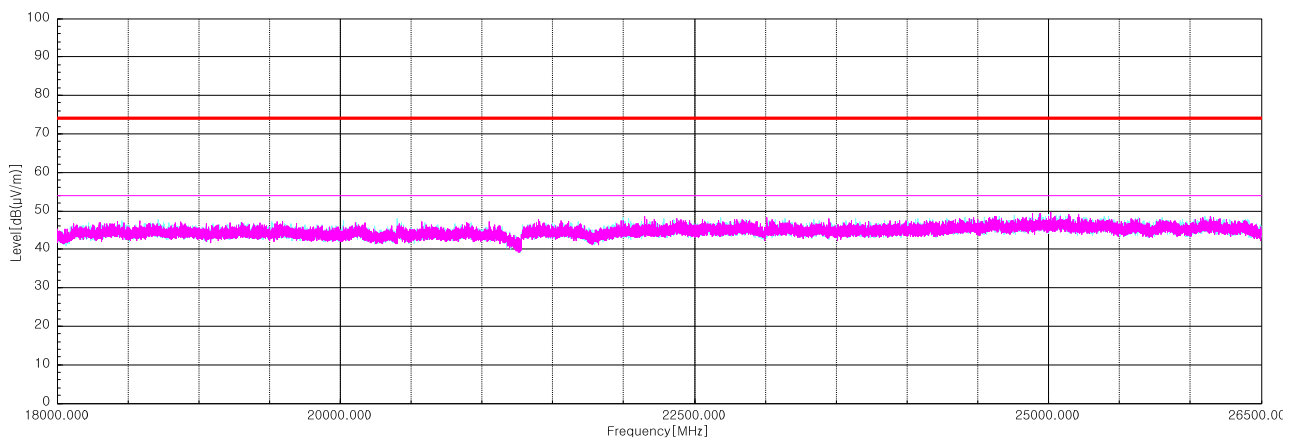
Horizontal/Vertical for 1 GHz ~ 3.5 GHz



Horizontal/Vertical for 3.5 GHz ~ 18 GHz

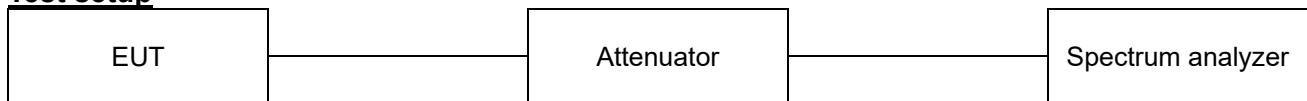


Horizontal/Vertical for 18 GHz ~ 26.5 GHz



7.5. Conducted Spurious Emission

Test setup



Limit

According to §15.247(d) 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.

Notes:

For the worst case scenario of 11ax SU/RU allocation, the measurement was evaluated as below.

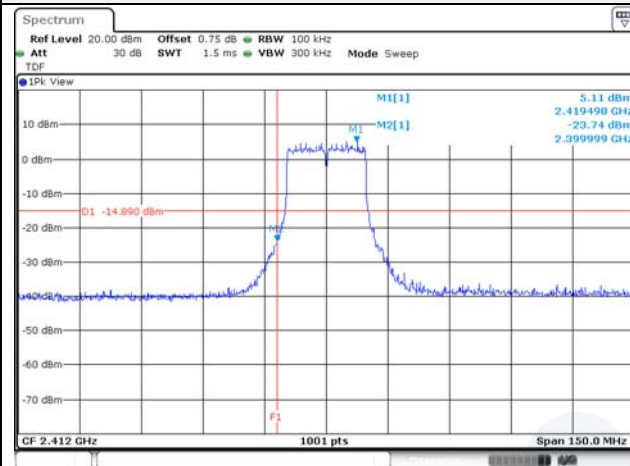
- Band Edge: 11ax SU, 11ax RU all tones/offsets with the nearest to the band edge.
- Spurious Emission: 11ax SU, 11ax RU allocation with the actual highest PSD for the channel.

Test results

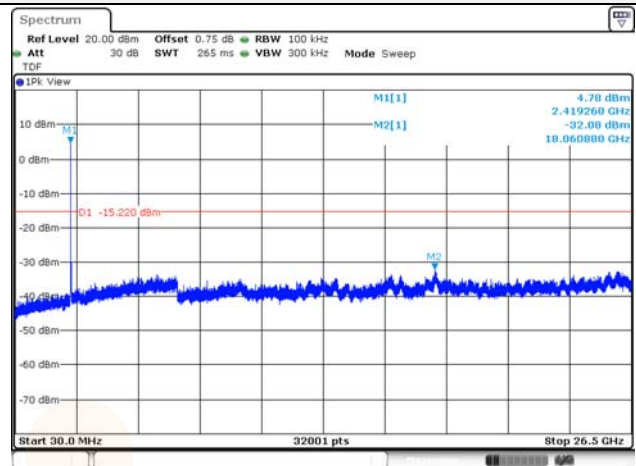
SISO

SU

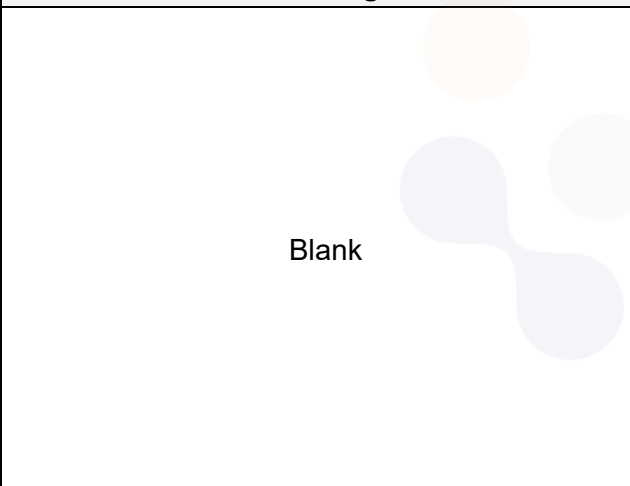
Conducted band-edge / 2 412 MHz



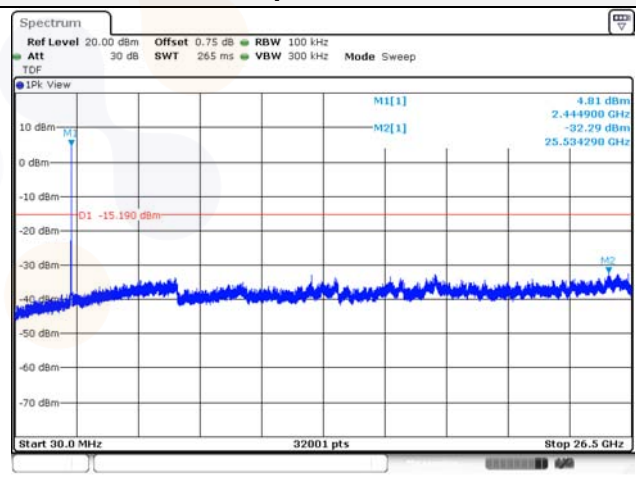
Conducted spurious / 2 412 MHz



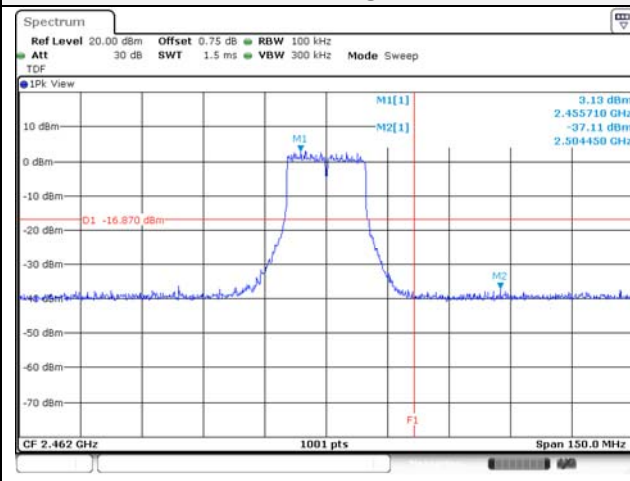
Conducted band-edge / 2 437 MHz



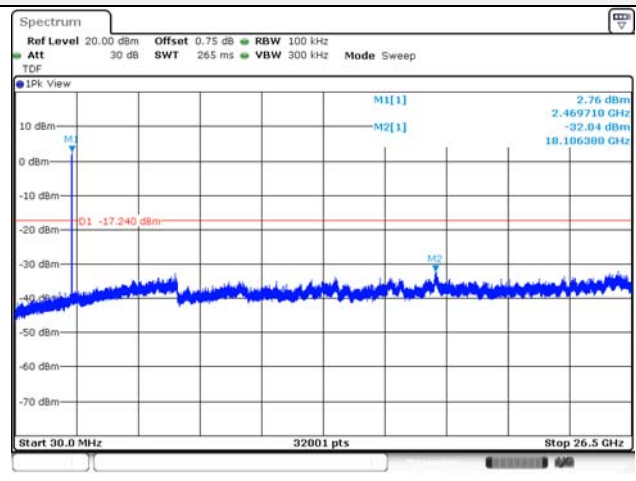
Conducted spurious / 2 437 MHz



Conducted band-edge / 2 462 MHz

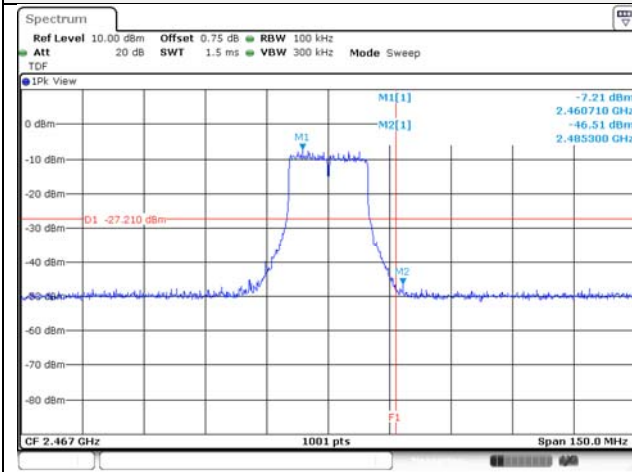


Conducted spurious / 2 462 MHz

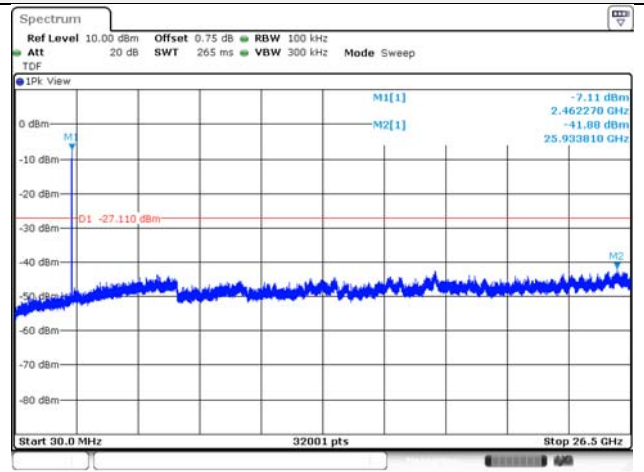


SU

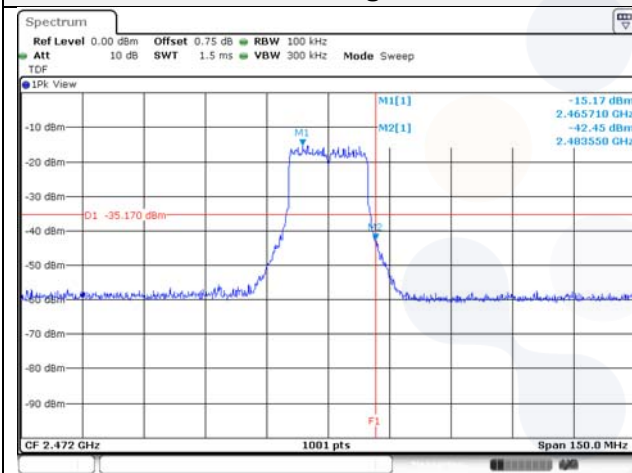
Conducted band-edge / 2 467 MHz



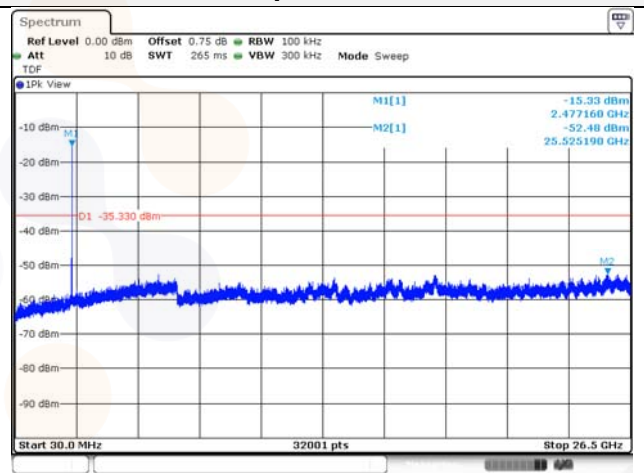
Conducted spurious / 2 467 MHz



Conducted band-edge / 2 472 MHz

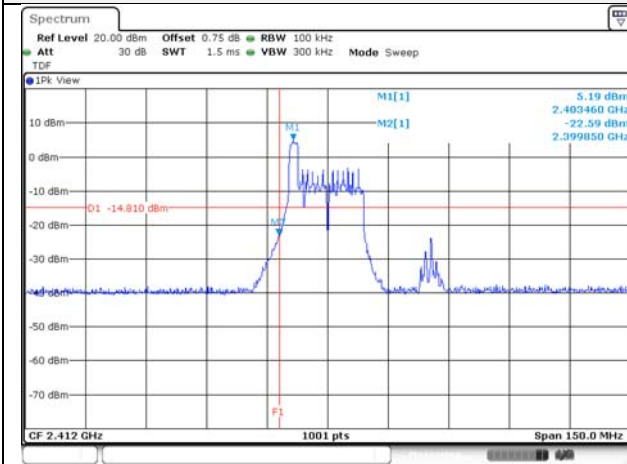


Conducted spurious / 2 472 MHz



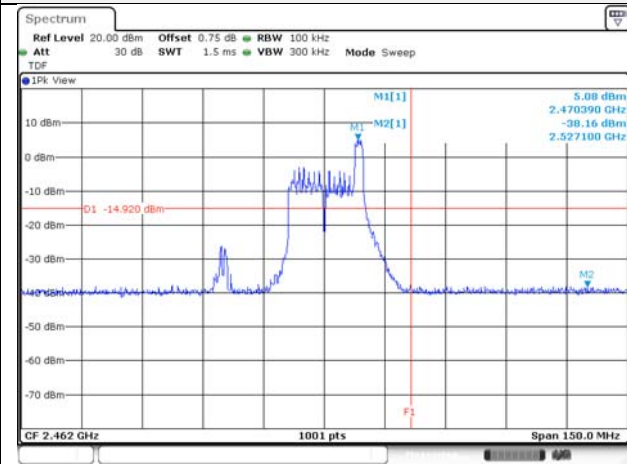
26T / RU offset 0

Conducted band-edge / 2 412 MHz



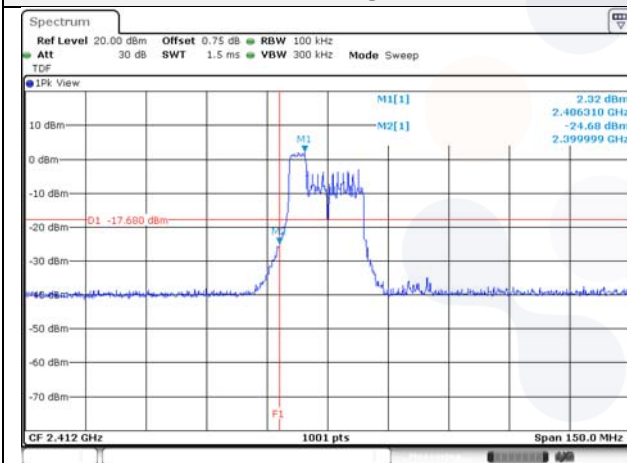
26T / RU offset 8

Conducted band-edge / 2 462 MHz



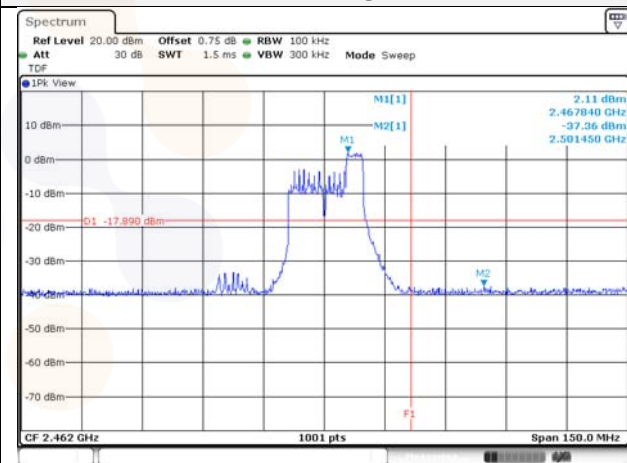
52T / RU offset 37

Conducted band-edge / 2 412 MHz



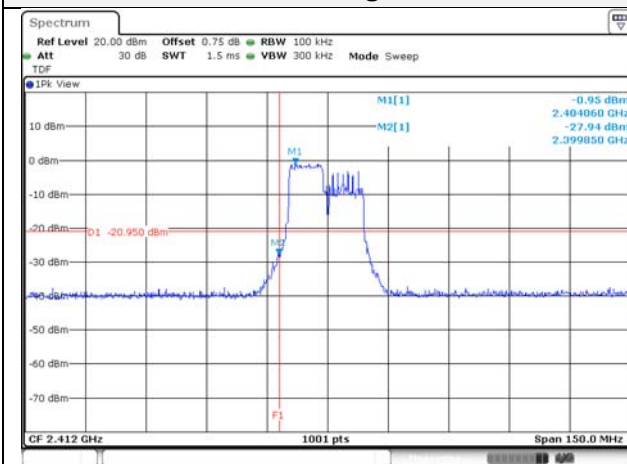
52T / RU offset 40

Conducted band-edge / 2 462 MHz



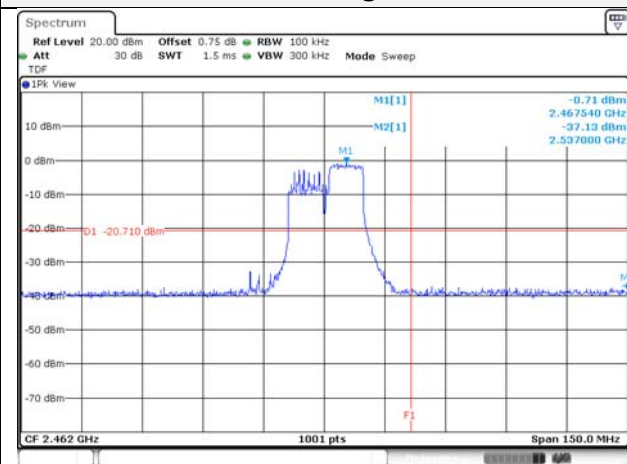
106T / RU offset 53

Conducted band-edge / 2 412 MHz



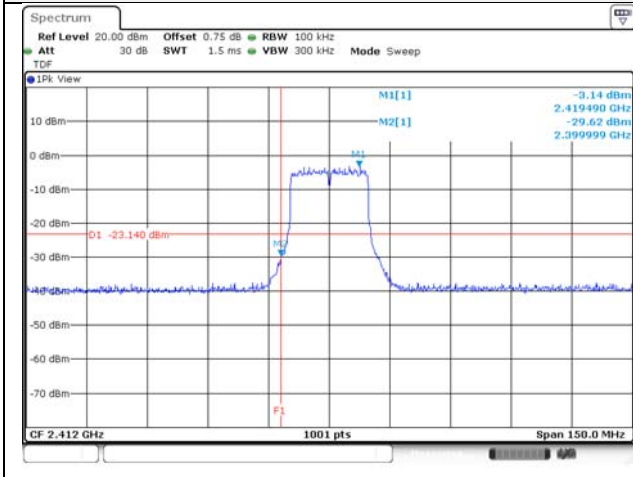
106T / RU offset 54

Conducted band-edge / 2 462 MHz

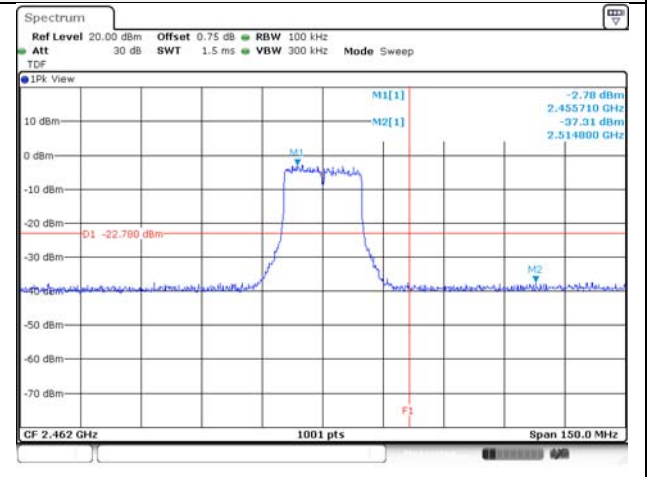


242T / RU offset 61

Conducted band-edge / 2 412 MHz

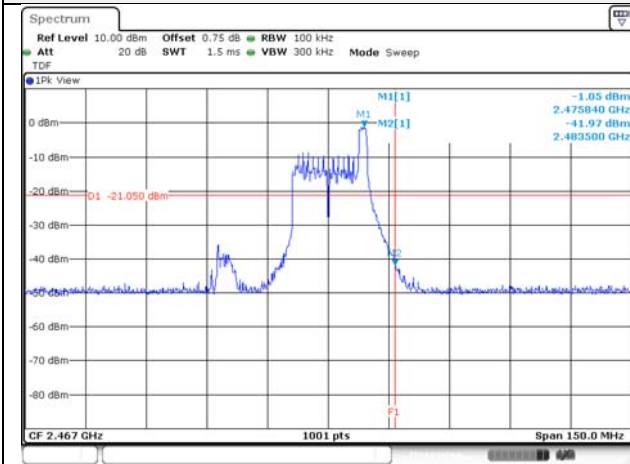


Conducted band-edge / 2 462 MHz

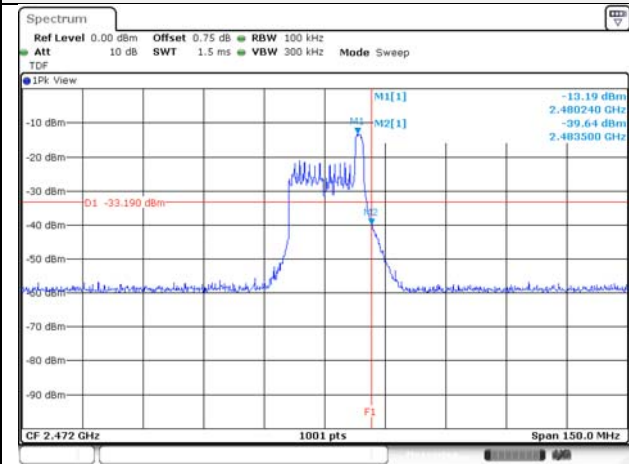


26T / RU offset 8

Conducted band-edge / 2 467 MHz



Conducted band-edge / 2 472 MHz

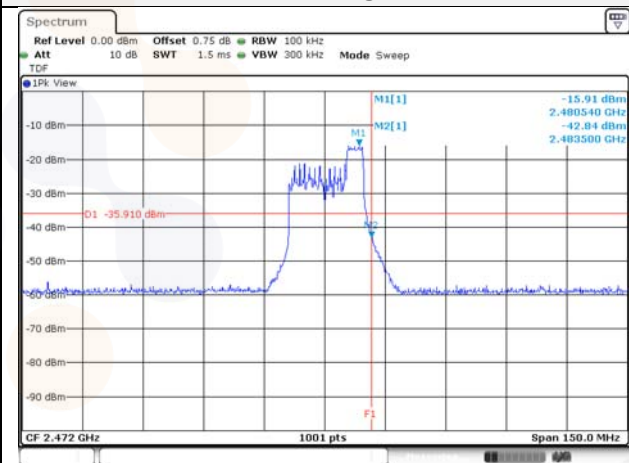


52T / RU offset 40

Conducted band-edge / 2 467 MHz

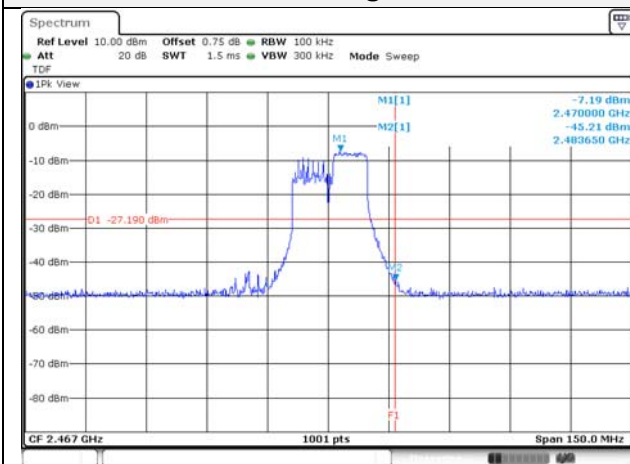


Conducted band-edge / 2 472 MHz

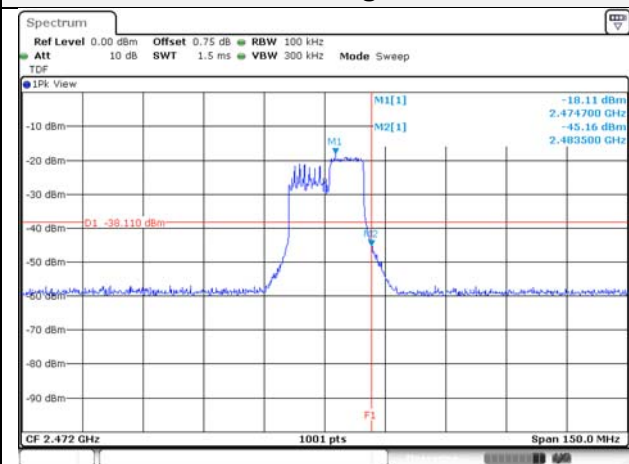


106T / RU offset 54

Conducted band-edge / 2 467 MHz

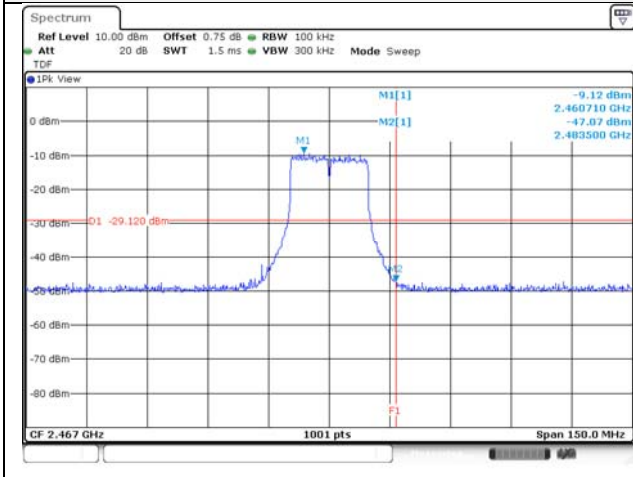


Conducted band-edge / 2 472 MHz

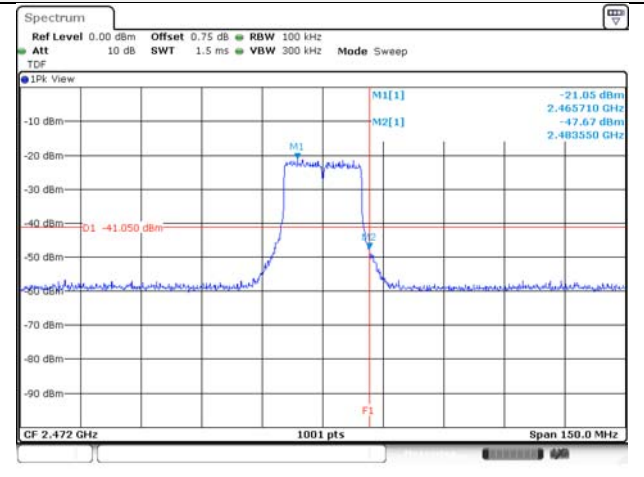


242T / RU offset 61

Conducted band-edge / 2 467 MHz

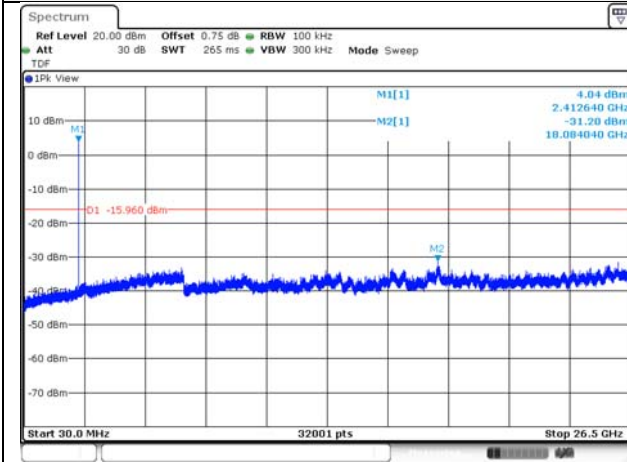


Conducted band-edge / 2 472 MHz



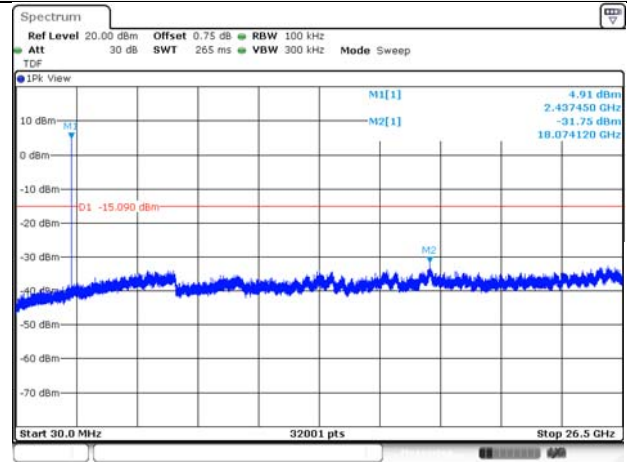
26T / RU offset 4

Conducted spurious / 2 412 MHz



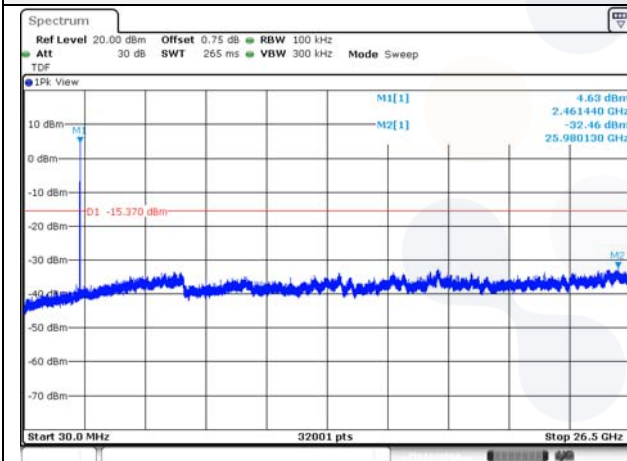
26T / RU offset 4

Conducted spurious / 2 437 MHz



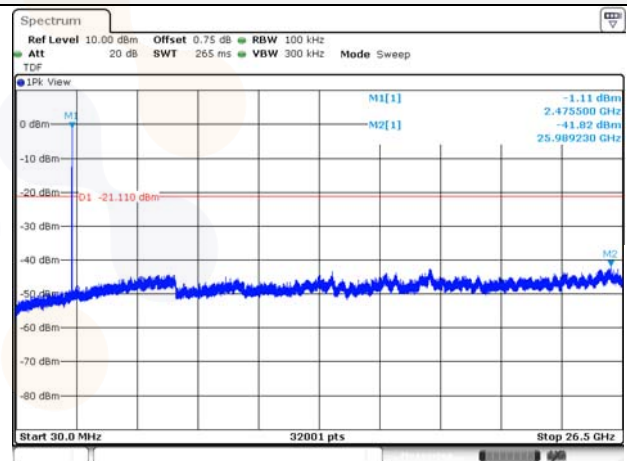
26T / RU offset 4

Conducted spurious / 2 462 MHz



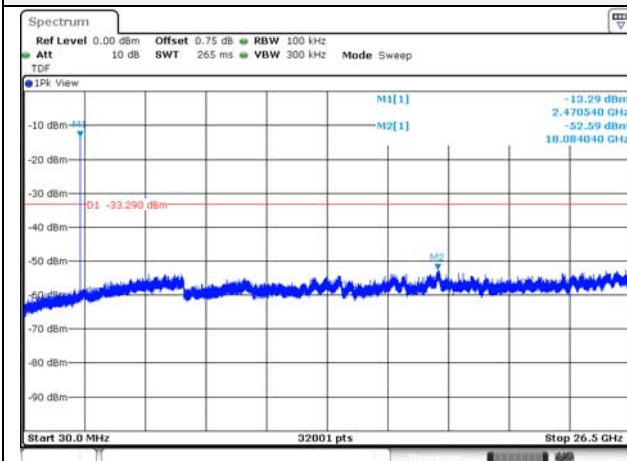
26T / RU offset 8

Conducted spurious / 2 467 MHz



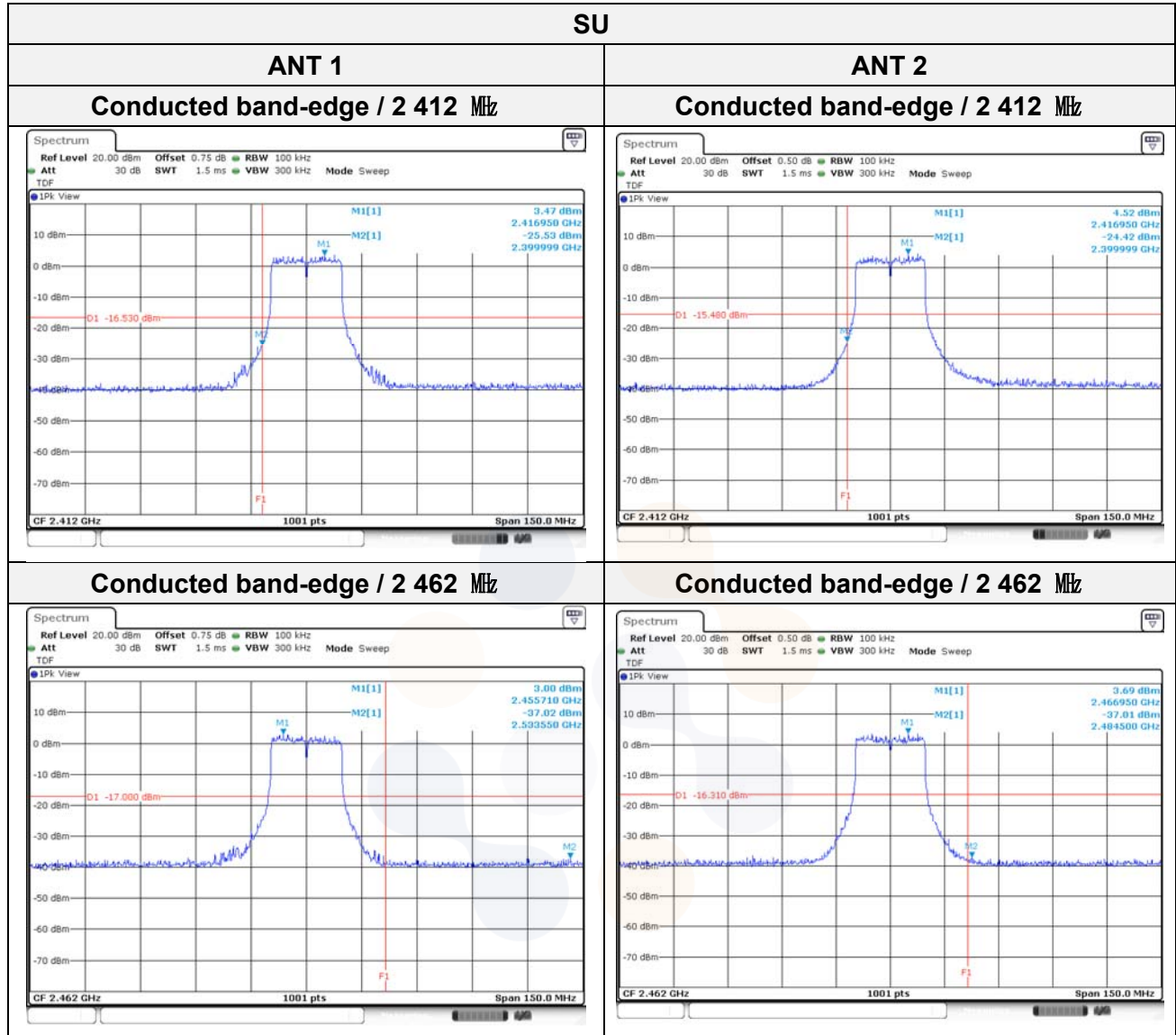
26T / RU offset 4

Conducted spurious / 2 472 MHz



Blank

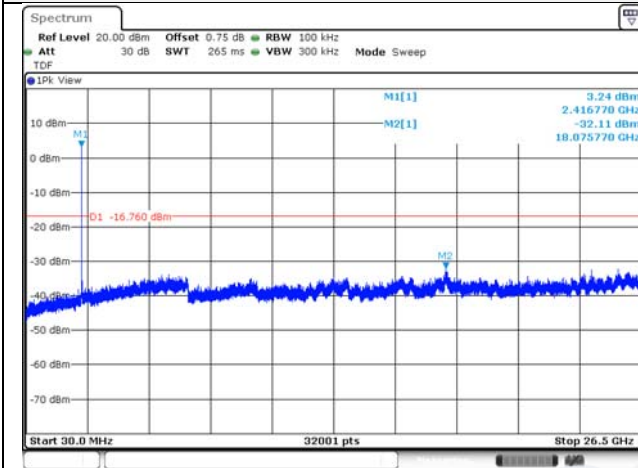
MIMO



SU

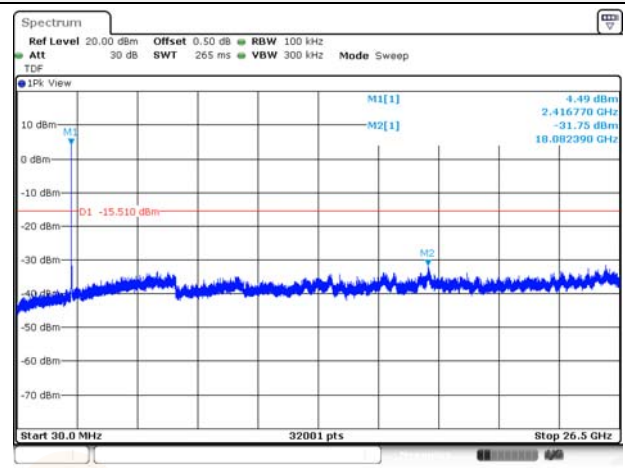
ANT 1

Conducted spurious / 2 412 MHz

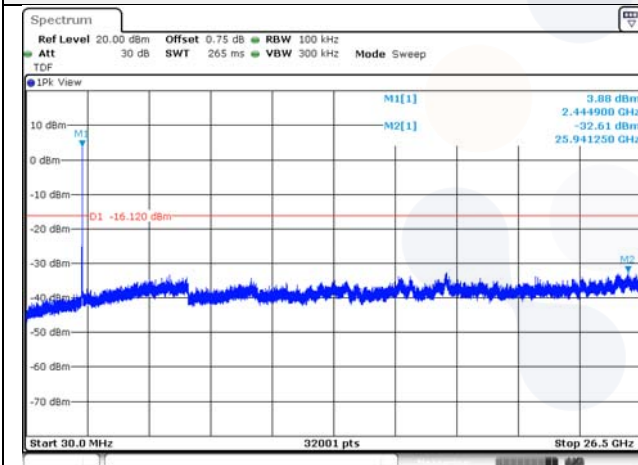


ANT 2

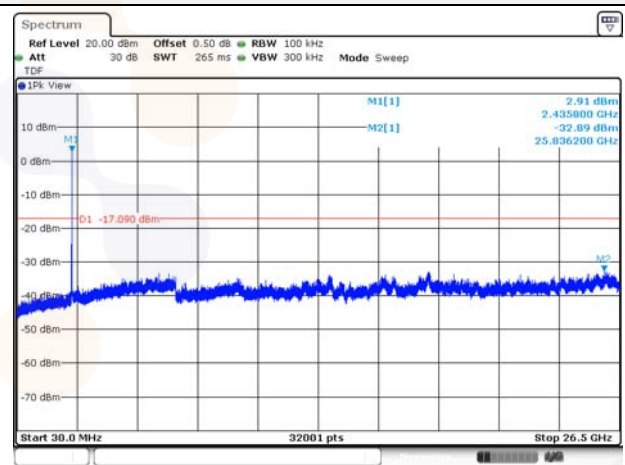
Conducted spurious / 2 412 MHz



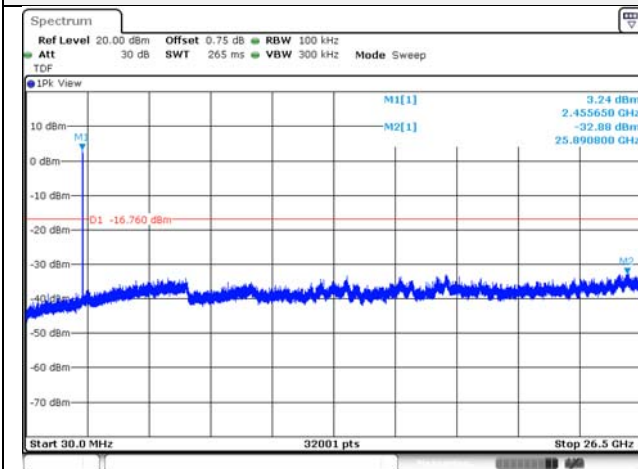
Conducted spurious / 2 437 MHz



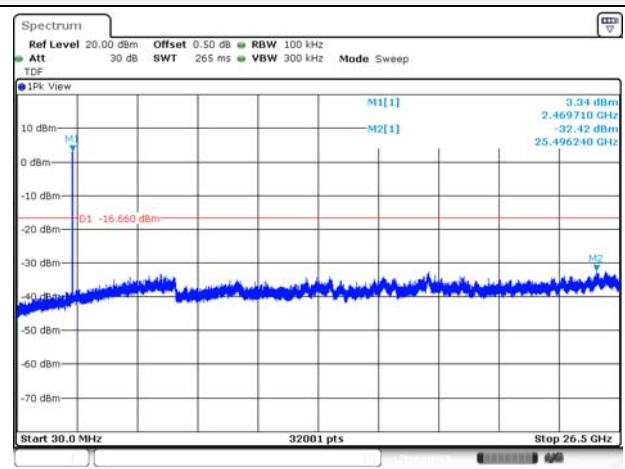
Conducted spurious / 2 437 MHz



Conducted spurious / 2 462 MHz



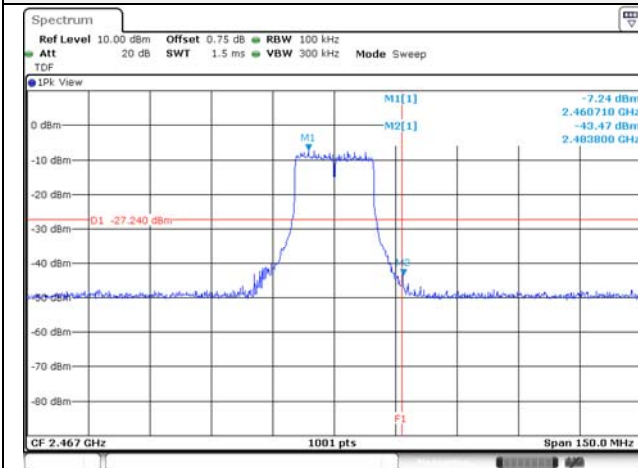
Conducted spurious / 2 462 MHz



SU

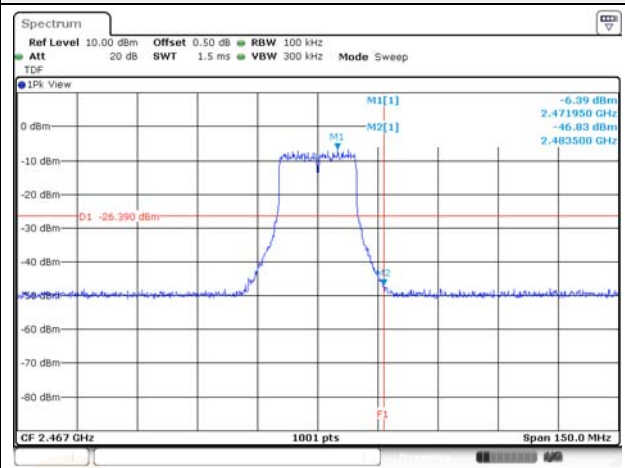
ANT 1

Conducted band-edge / 2 467 MHz

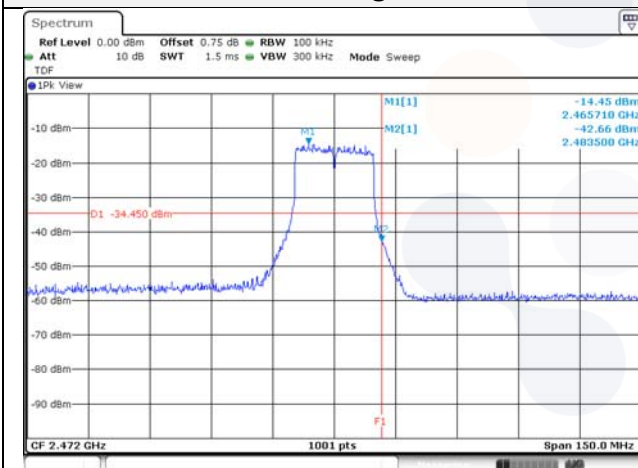


ANT 2

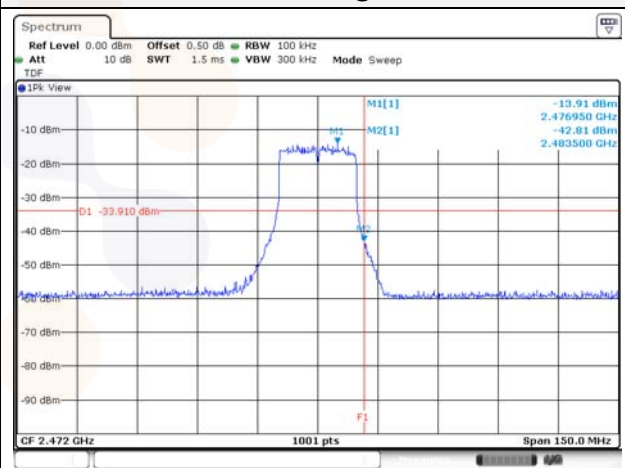
Conducted band-edge / 2 467 MHz



Conducted band-edge / 2 472 MHz



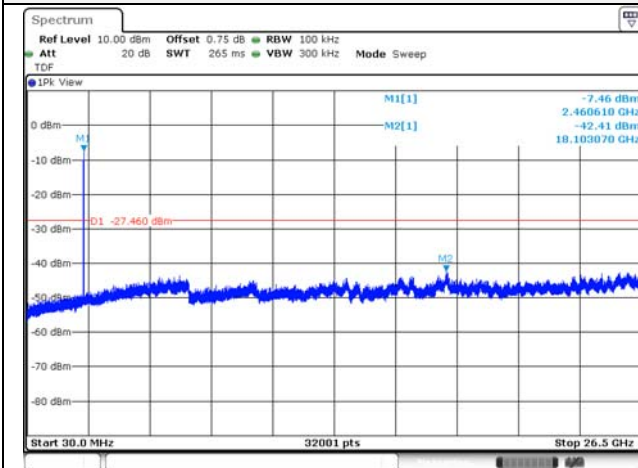
Conducted band-edge / 2 472 MHz



SU

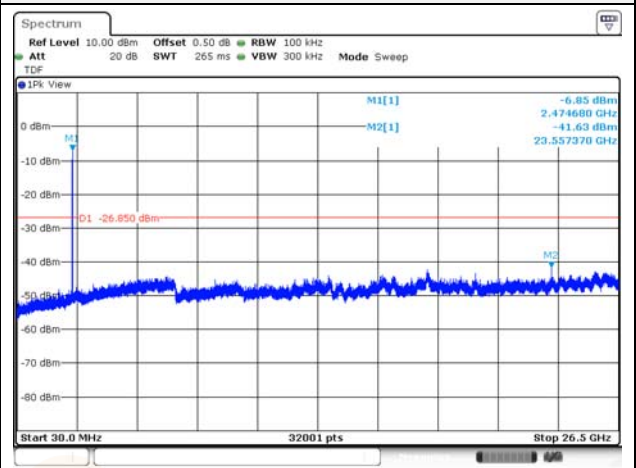
ANT 1

Conducted spurious / 2 467 MHz

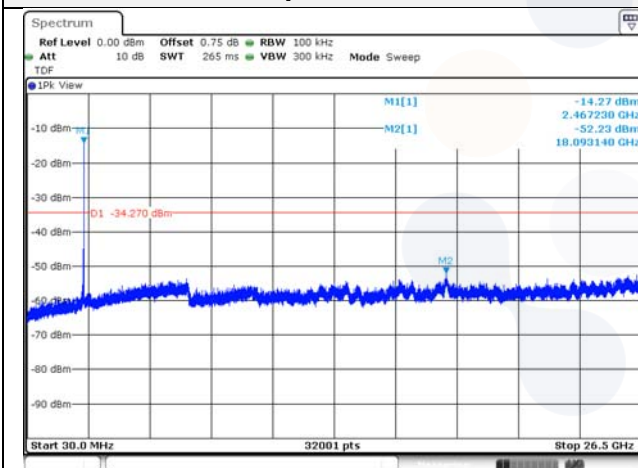


ANT 2

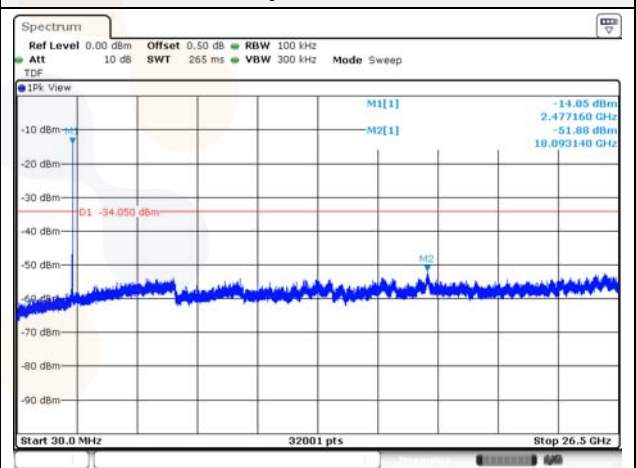
Conducted spurious / 2 467 MHz



Conducted spurious / 2 472 MHz



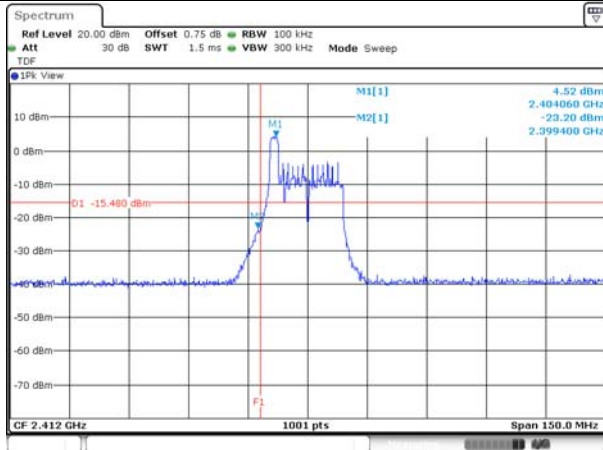
Conducted spurious / 2 472 MHz



26T / RU offset 0

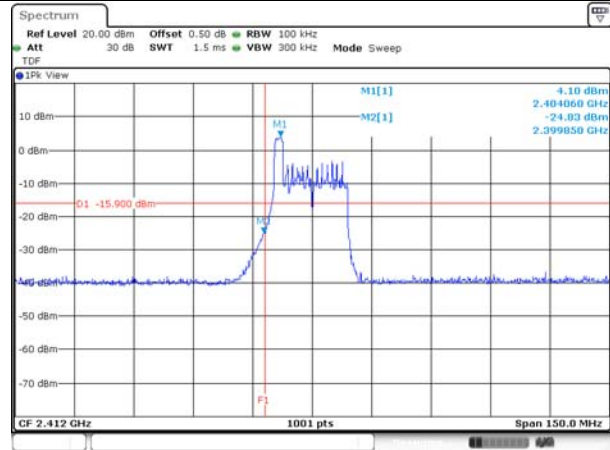
ANT 1

Conducted band-edge / 2 412 MHz



ANT 2

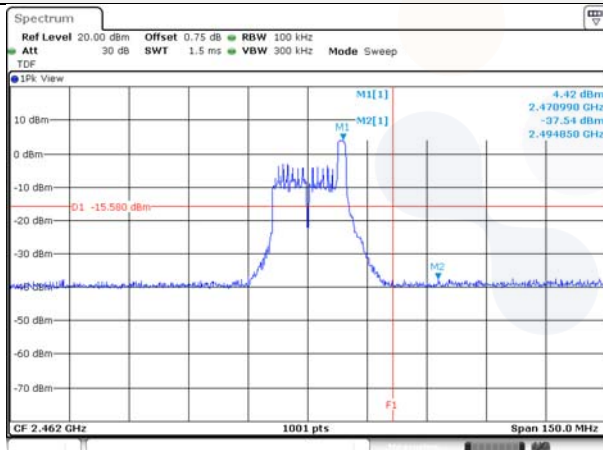
Conducted band-edge / 2 412 MHz



26T / RU offset 8

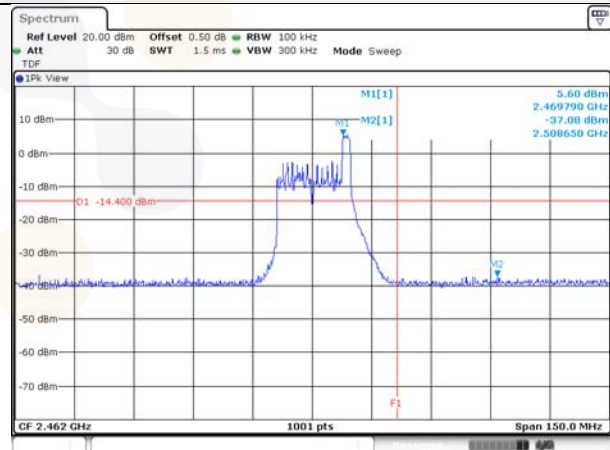
ANT 1

Conducted band-edge / 2 462 MHz



ANT 2

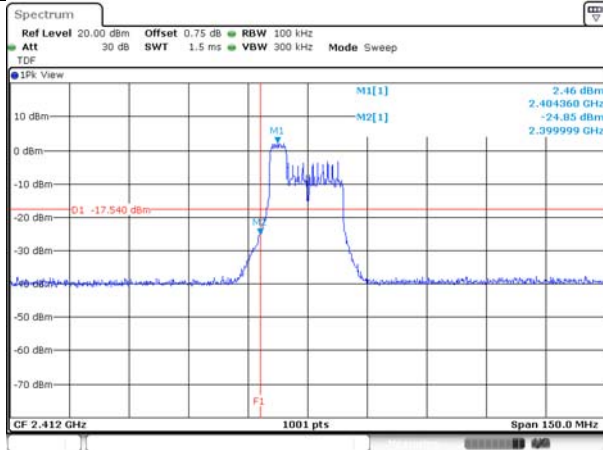
Conducted band-edge / 2 462 MHz



52T / RU offset 37

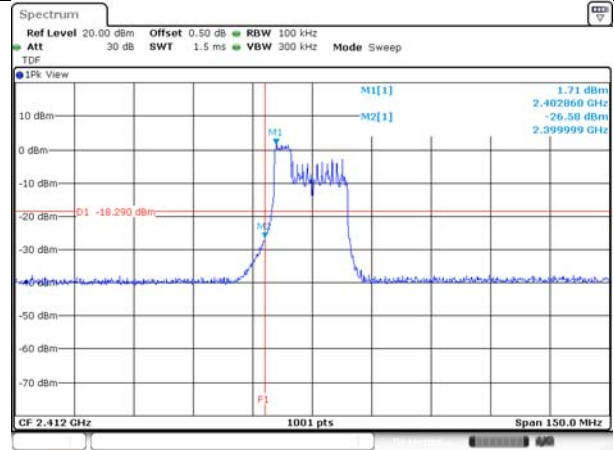
ANT 1

Conducted band-edge / 2 412 MHz



ANT 2

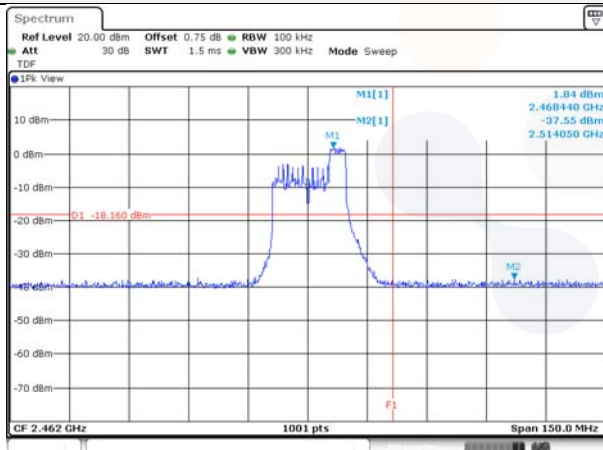
Conducted band-edge / 2 412 MHz



52T / RU offset 40

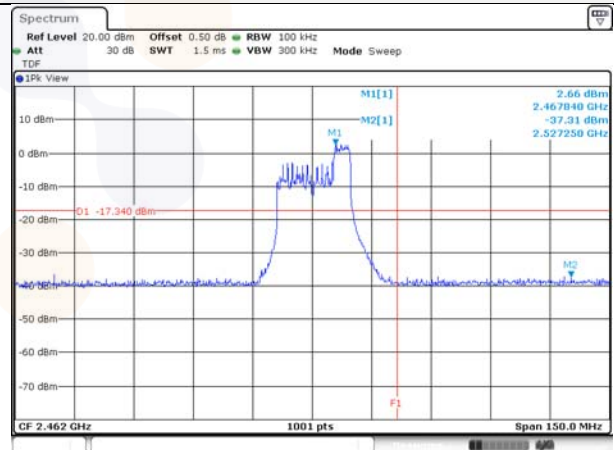
ANT 1

Conducted band-edge / 2 462 MHz



ANT 2

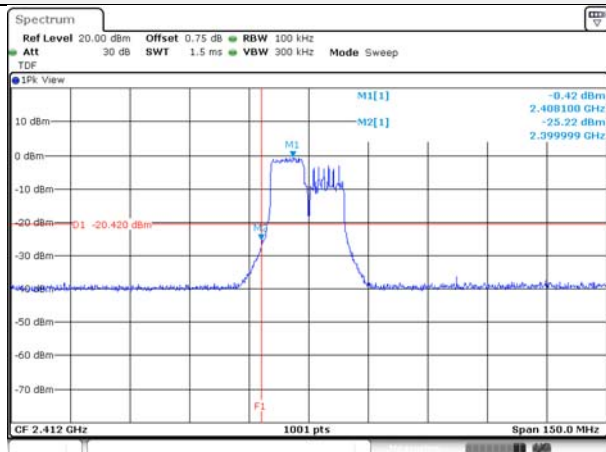
Conducted band-edge / 2 462 MHz



106T / RU offset 53

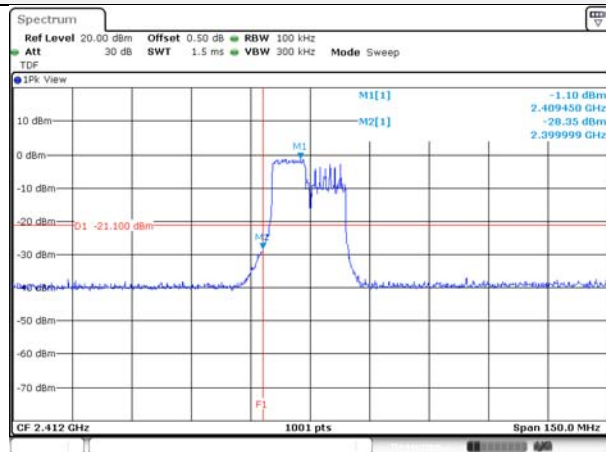
ANT 1

Conducted band-edge / 2 412 MHz



ANT 2

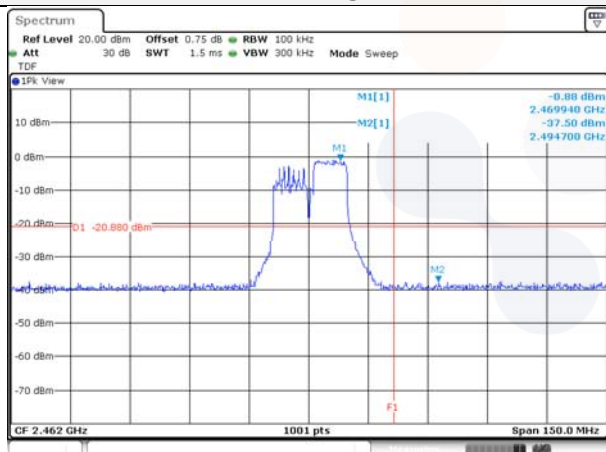
Conducted band-edge / 2 412 MHz



106T / RU offset 54

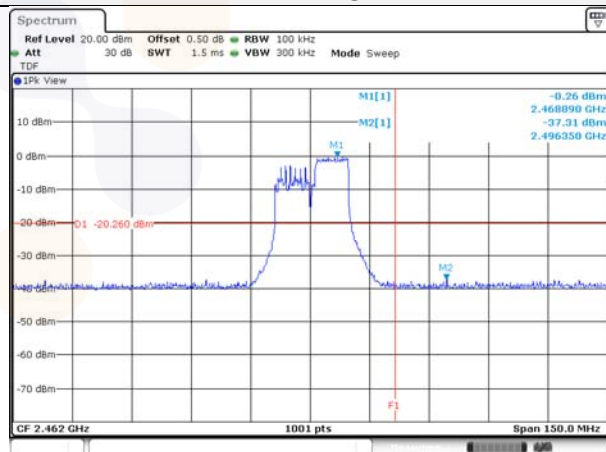
ANT 1

Conducted band-edge / 2 462 MHz



ANT 2

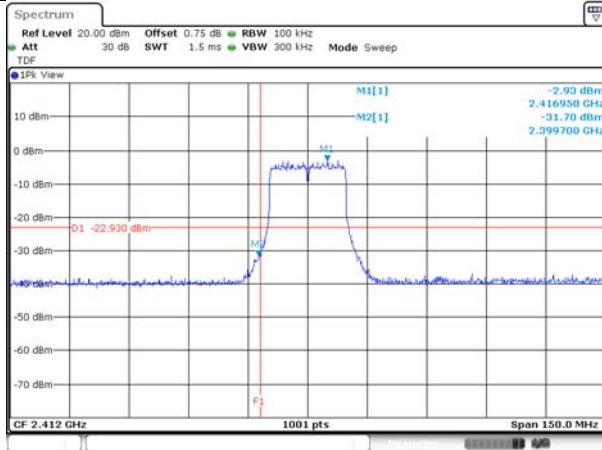
Conducted band-edge / 2 462 MHz



242T / RU offset 61

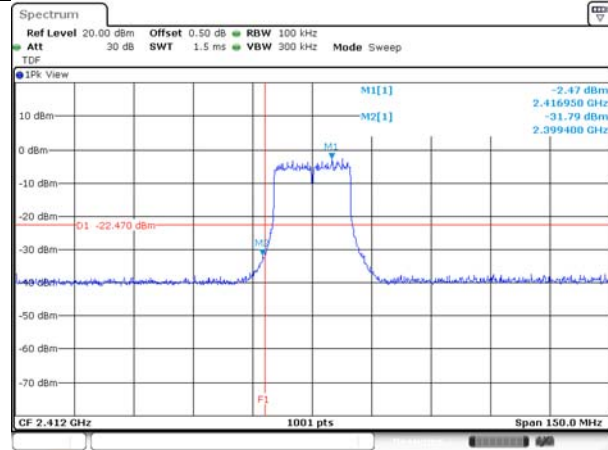
ANT 1

Conducted band-edge / 2 412 MHz

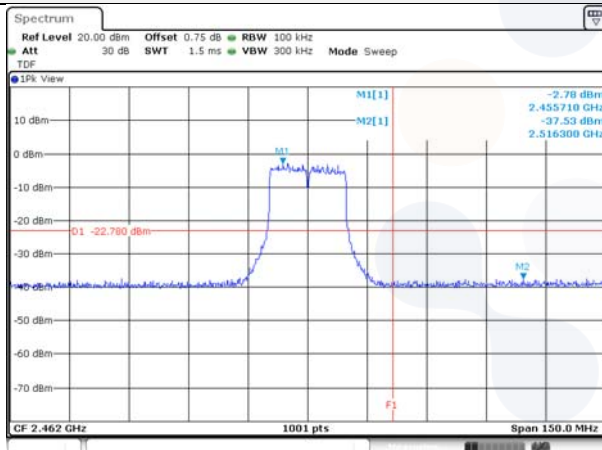


ANT 2

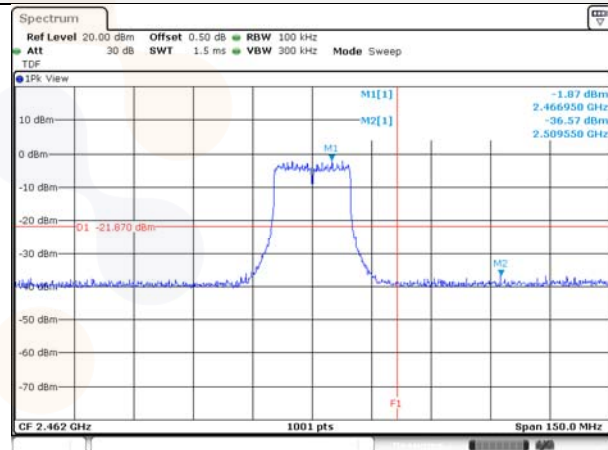
Conducted band-edge / 2 412 MHz



Conducted band-edge / 2 462 MHz



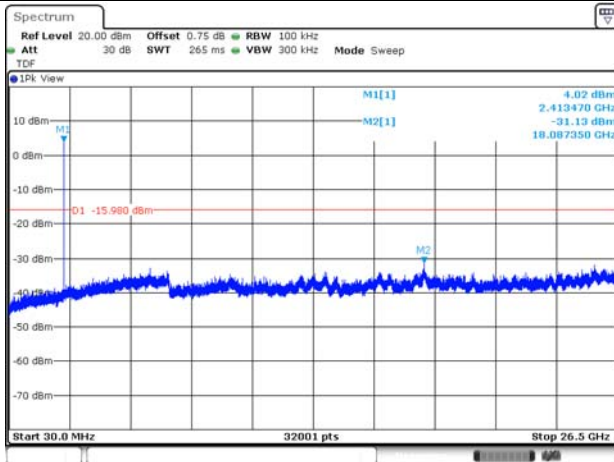
Conducted band-edge / 2 462 MHz



26T / RU offset 4

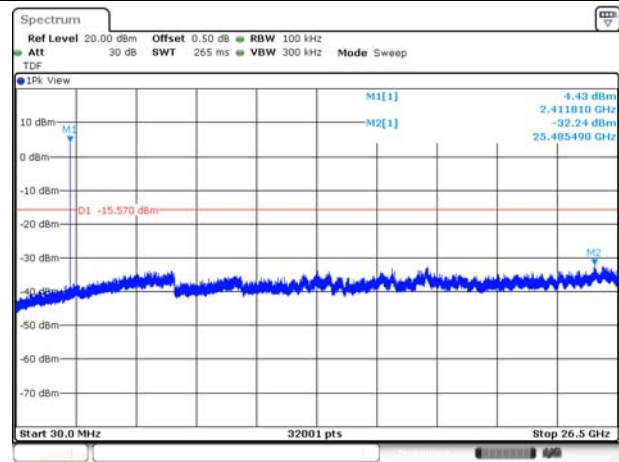
ANT 1

Conducted spurious / 2 412 MHz



ANT 2

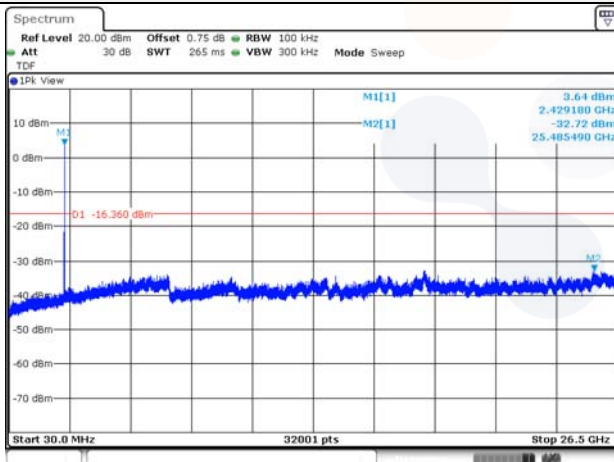
Conducted spurious / 2 412 MHz



26T / RU offset 0

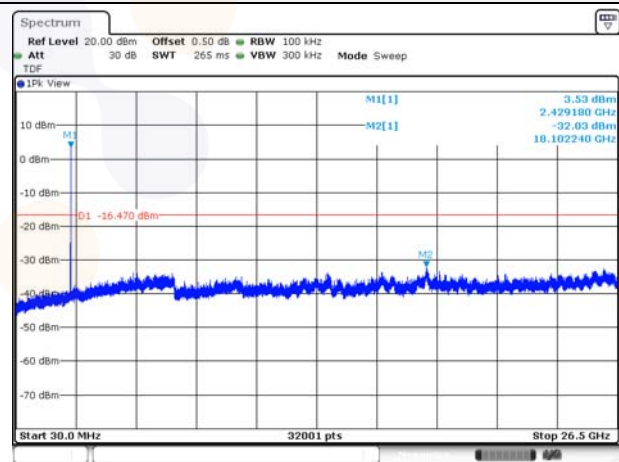
ANT 1

Conducted spurious / 2 437 MHz



ANT 2

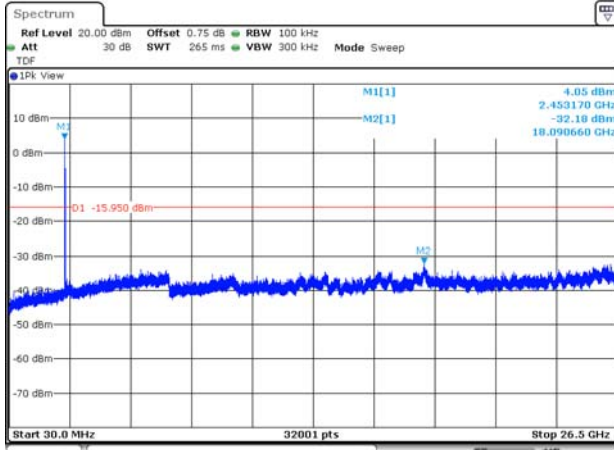
Conducted spurious / 2 437 MHz



26T / RU offset 0

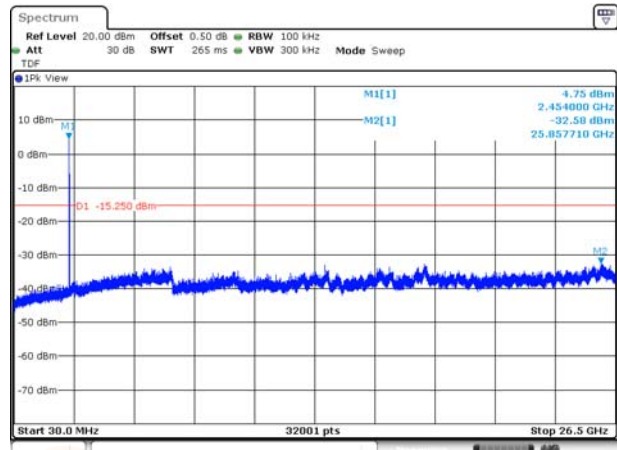
ANT 1

Conducted spurious / 2 462 MHz



ANT 2

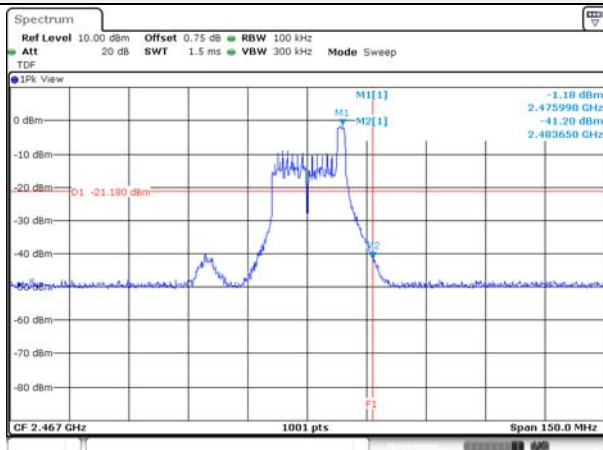
Conducted spurious / 2 462 MHz



26T / RU offset 8

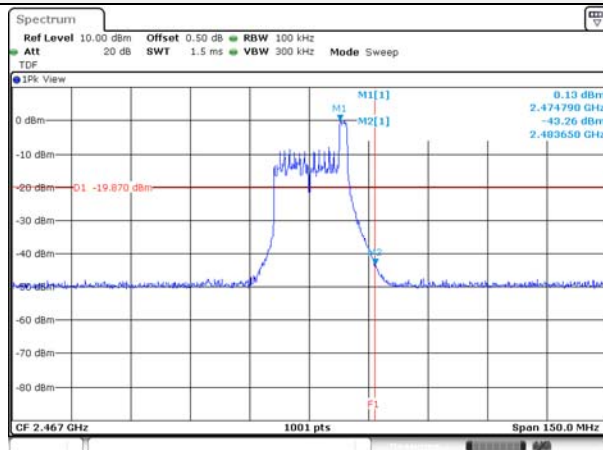
ANT 1

Conducted band-edge / 2 467 MHz

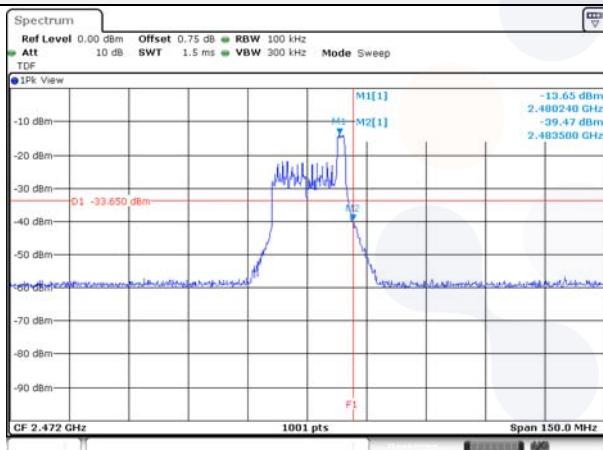


ANT 2

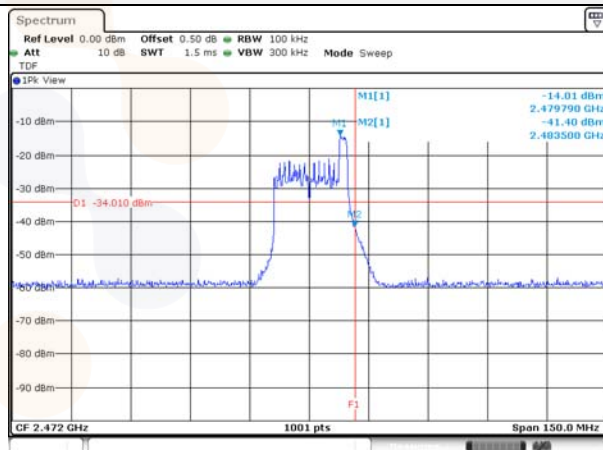
Conducted band-edge / 2 467 MHz



Conducted band-edge / 2 472 MHz



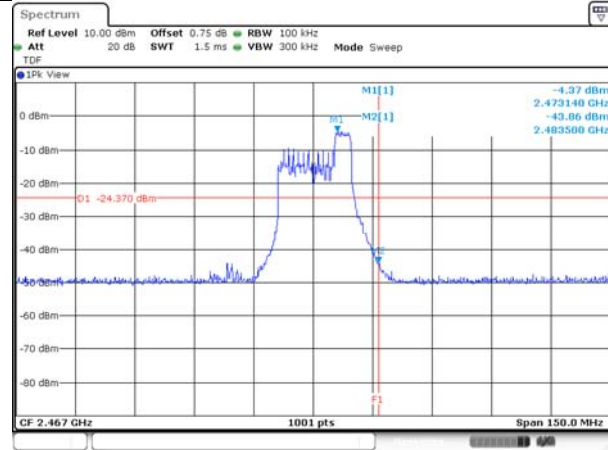
Conducted band-edge / 2 472 MHz



52T / RU offset 40

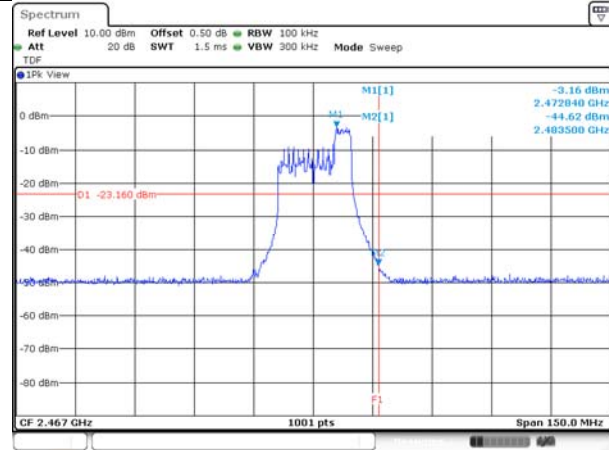
ANT 1

Conducted band-edge / 2 467 MHz

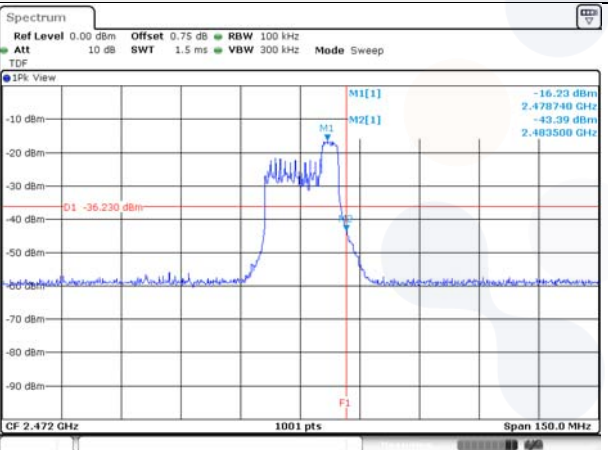


ANT 2

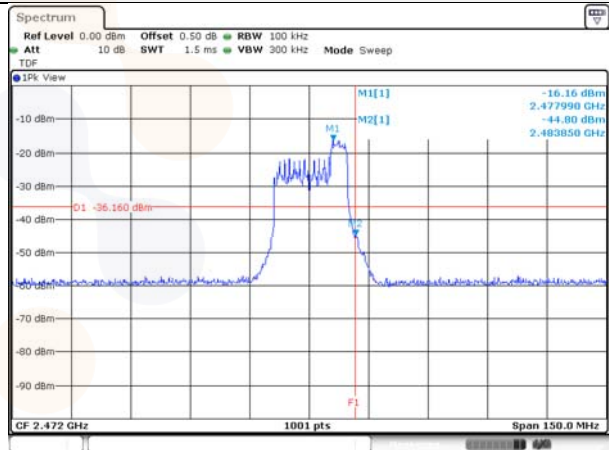
Conducted band-edge / 2 467 MHz



Conducted band-edge / 2 472 MHz



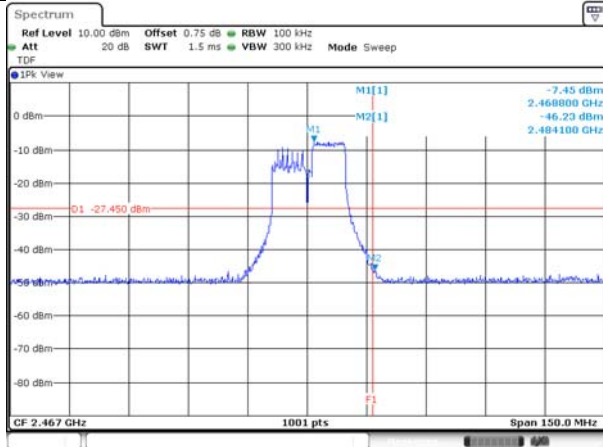
Conducted band-edge / 2 472 MHz



106T / RU offset 54

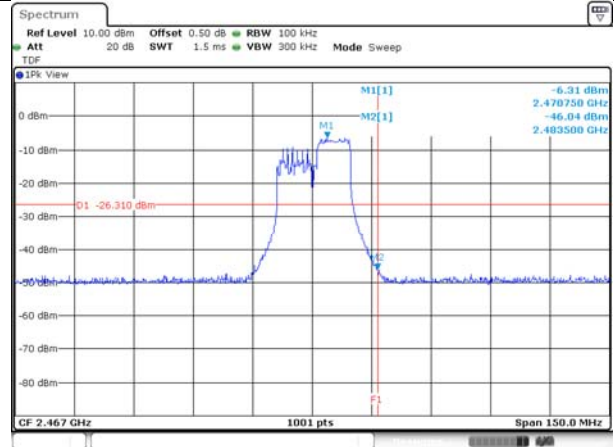
ANT 1

Conducted band-edge / 2 467 MHz

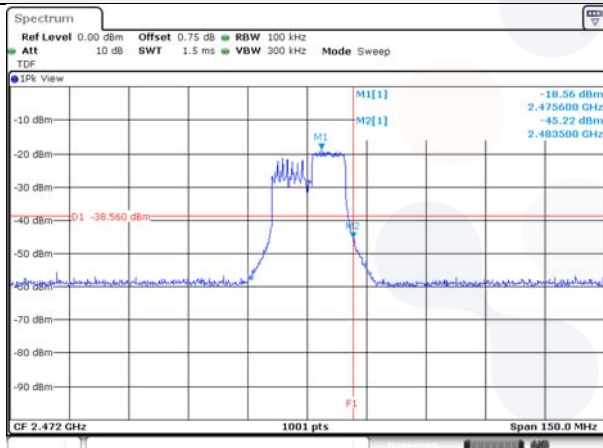


ANT 2

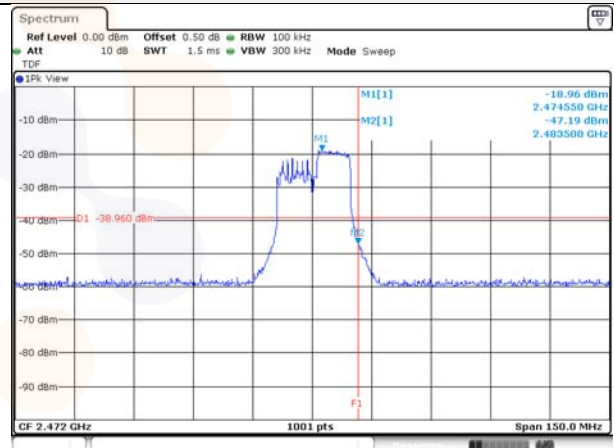
Conducted band-edge / 2 467 MHz



Conducted band-edge / 2 472 MHz



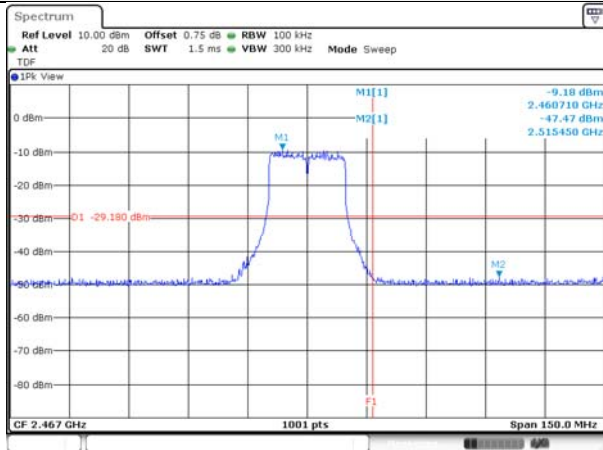
Conducted band-edge / 2 472 MHz



242T / RU offset 61

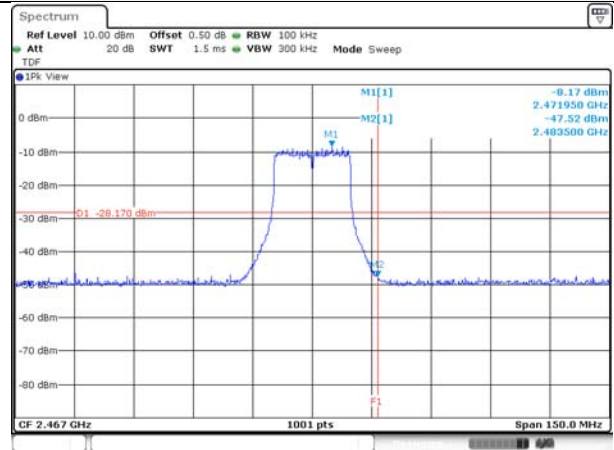
ANT 1

Conducted band-edge / 2 467 MHz

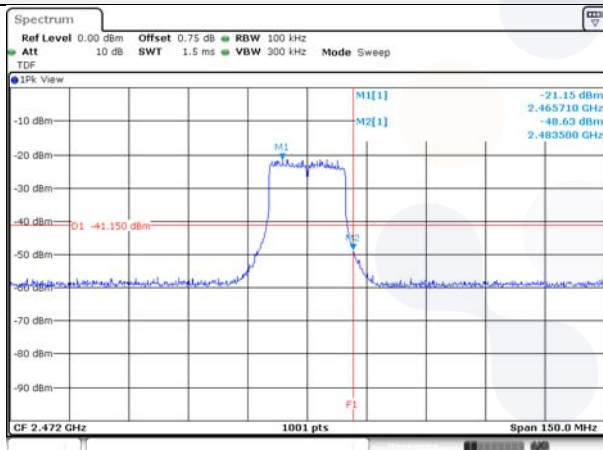


ANT 2

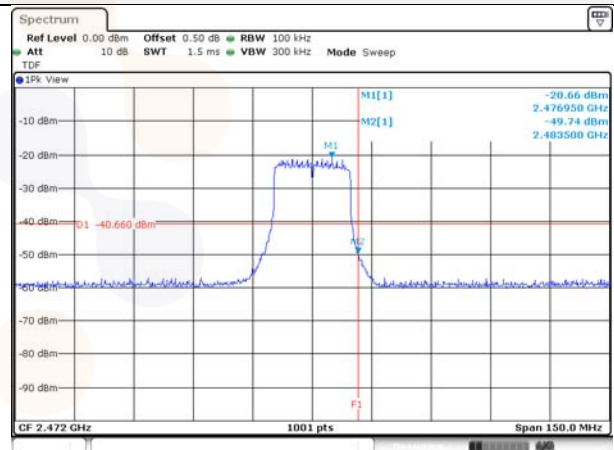
Conducted band-edge / 2 467 MHz



Conducted band-edge / 2 472 MHz



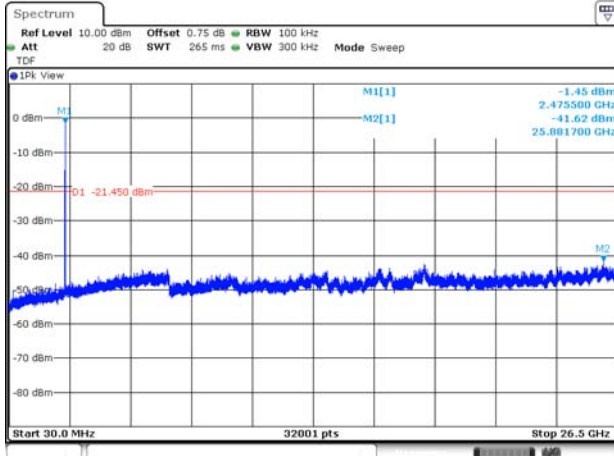
Conducted band-edge / 2 472 MHz



26T / RU offset 8

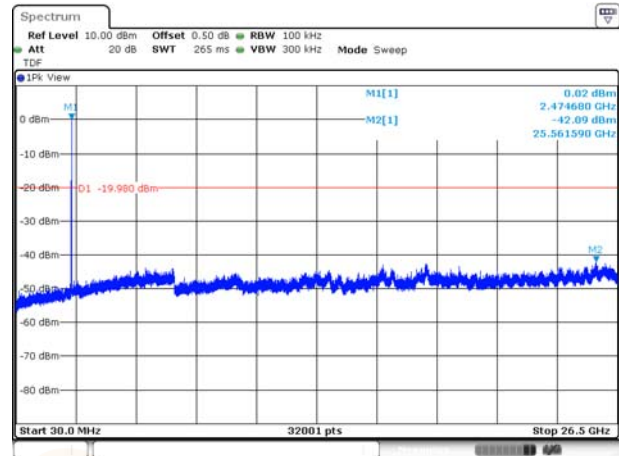
ANT 1

Conducted spurious / 2 467 MHz



ANT 2

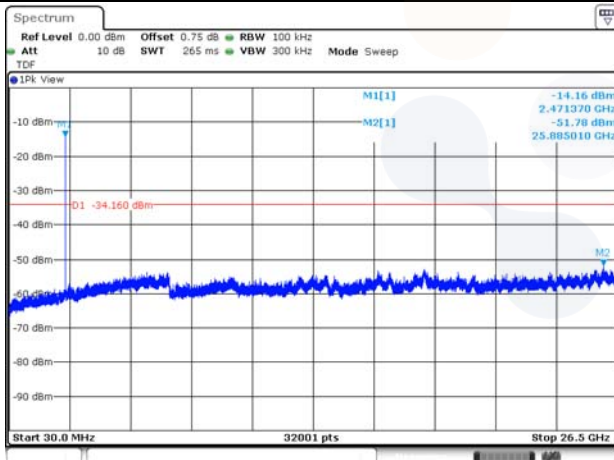
Conducted spurious / 2 467 MHz



26T / RU offset 4

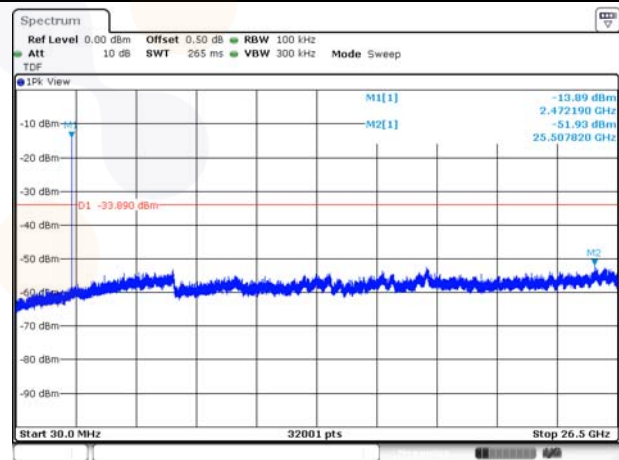
ANT 1

Conducted spurious / 2 472 MHz



ANT 2

Conducted spurious / 2 472 MHz



8. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Spectrum Analyzer	R&S	FSV30	100807	24.07.03
Attenuator	API Inmet	40AH2W-10	11	24.05.03
DC Power Supply	AGILENT	E3632A	MY51220373	24.07.03
Signal Generator	R&S	SMB100A	176206	24.01.19
Vector Signal Generator	R&S	SMBV100A	257566	24.07.04
Power Sensor	R&S	NRP-Z81	1137.9009.02-106224-tg	24.09.12
Attenuator	R&S	DNF Dämpfungsglied 10 dB in N-50 Ohm	31211	24.04.25
Spectrum Analyzer	R&S	FSVA40	101575	24.06.19
PSA Spectrum Analyzer	Agilent	E4440A	MY46186407	24.03.22
Broadband PreAmplifier	SCHWARZBECK	BBV9718D	57	24.03.17
Low Noise Amplifier	TESTEK	TK-PA18H	220124-L	24.10.12**
Low Noise Amplifier	TESTEK	TK-PA1840H	220133-L	24.10.17**
Amplifier	SONOMA INSTRUMENT	310N	421821	24.10.12**
Horn Antenna	SCHWARZBECK	BBHA9120D	2763	24.10.18**
Horn Antenna	SCHWARZBECK	BBHA9170	1267	24.10.16**
Horn Antenna	ETS-LINDGREN	3117	246058	24.03.23
Bilog Antenna	Teseq GmbH	CBL 6112D	63756	24.11.17
Loop Antenna	R&S	HFH2-Z2	100355	24.08.10
High Pass Filter	Wainwright Instruments GmbH	WHKX12-2805-3000- 18000-40SS	SN58	24.10.16**
TWO-LINE V - NETWORK	R&S	ENV216	101428	24.09.27*
EMI TEST RECEIVER	R&S	ESC13	101428	24.08.18
Controller	INNCO SYSTEMS	CO3000	1441/54370322/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