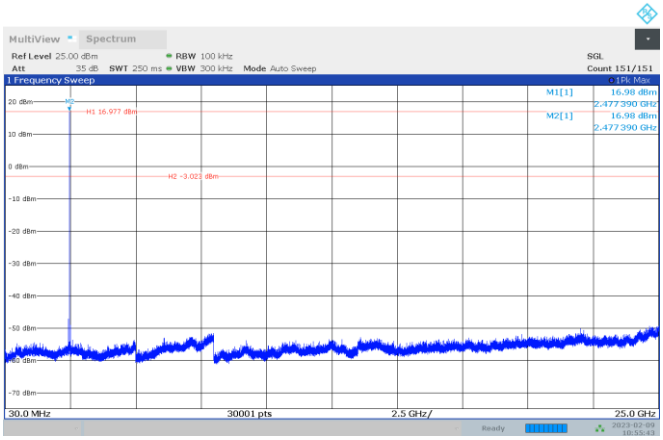

Figure 8.4-13: *TSM-Bandwidth 1.2MHz conducted spurious emission, 2478 MHz*

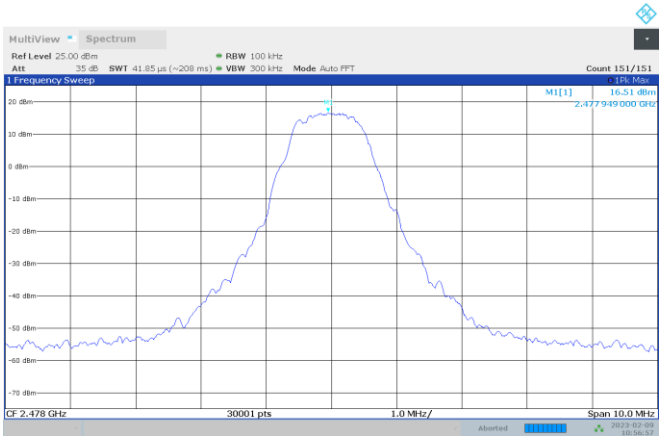

Figure 8.4-14: *TSM-Bandwidth 1.2MHz conducted spurious emission reference level, 2478 MHz*

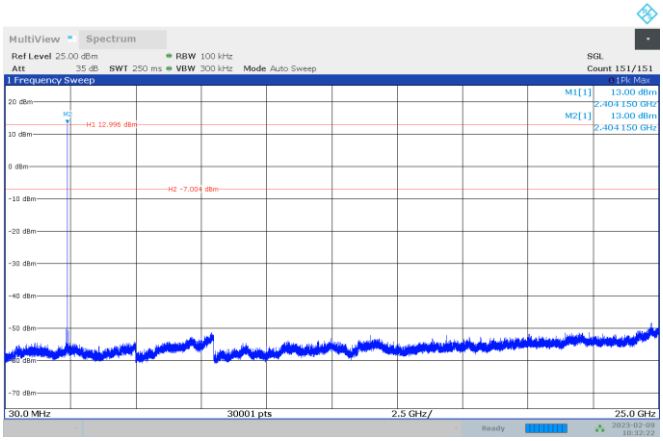

Figure 8.4-15: *TSM-Bandwidth 3.6MHz conducted spurious emission, 2404 MHz*

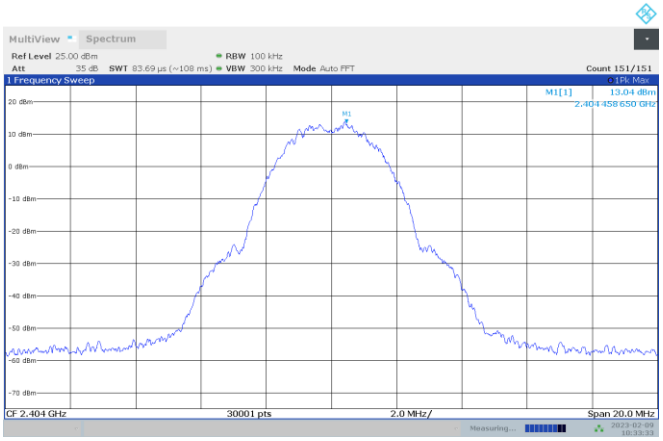

Figure 8.4-16: *TSM-Bandwidth 3.6MHz conducted spurious emission reference level, 2404 MHz*

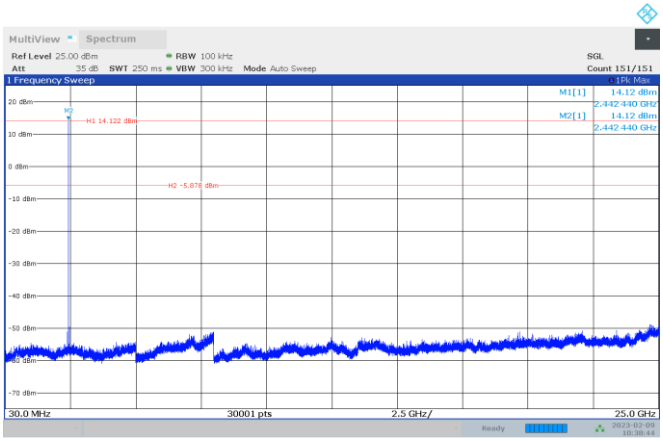

Figure 8.4-17: *TSM-Bandwidth 3.6MHz conducted spurious emission, 2442 MHz*

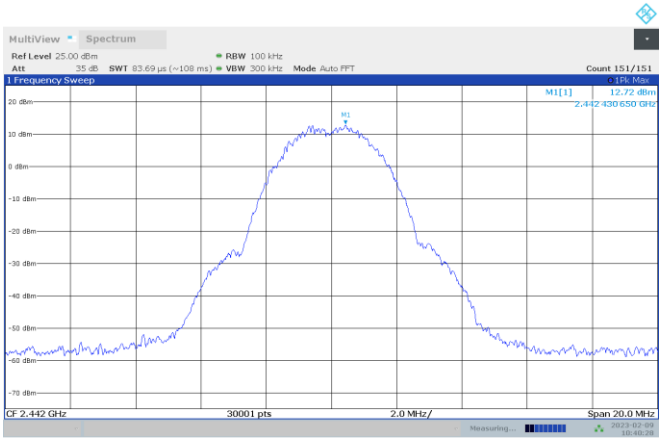

Figure 8.4-18: *TSM-Bandwidth 3.6MHz conducted spurious emission reference level, 2442 MHz*

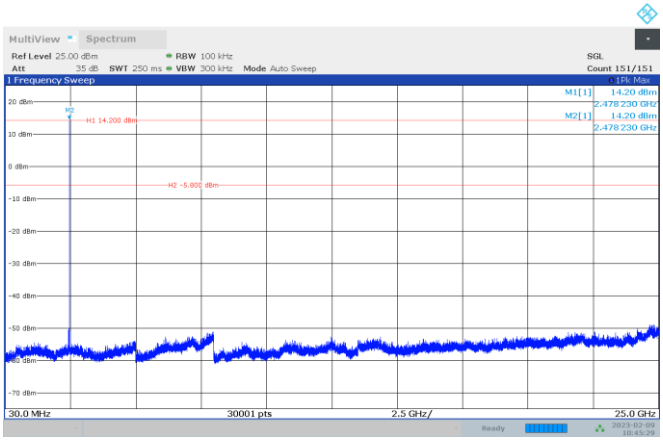

Figure 8.4-19: *TSM-Bandwidth 3.6MHz conducted spurious emission 2478 MHz*

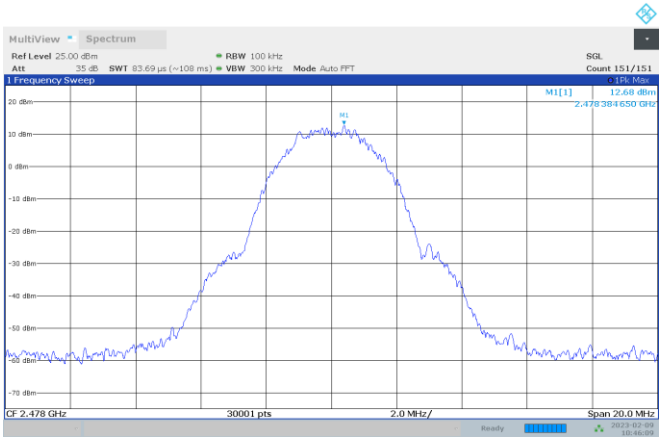

Figure 8.4-20: *TSM-Bandwidth 3.6MHz conducted spurious emission reference level, 2478 MHz*

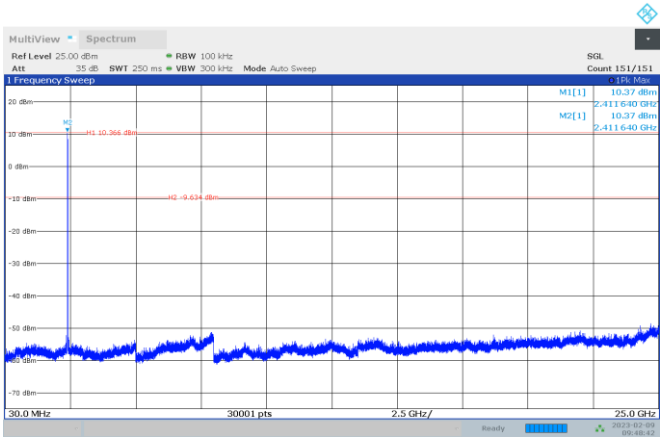

Figure 8.4-21: *TSM-Bandwidth 10MHz conducted spurious emission, 2412 MHz*

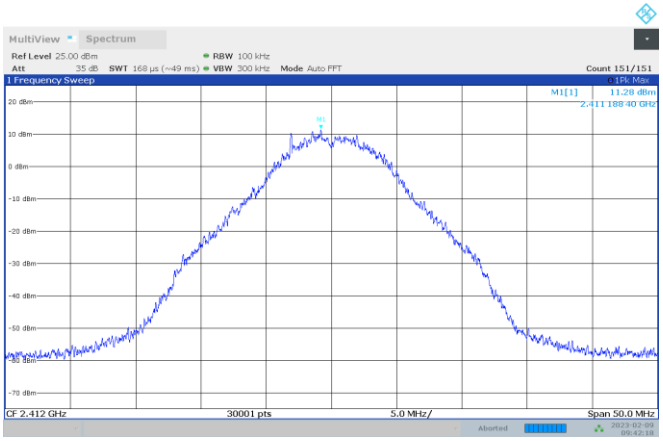

Figure 8.4-22: *TSM-Bandwidth 10MHz conducted spurious emission reference level, 2412 MHz*

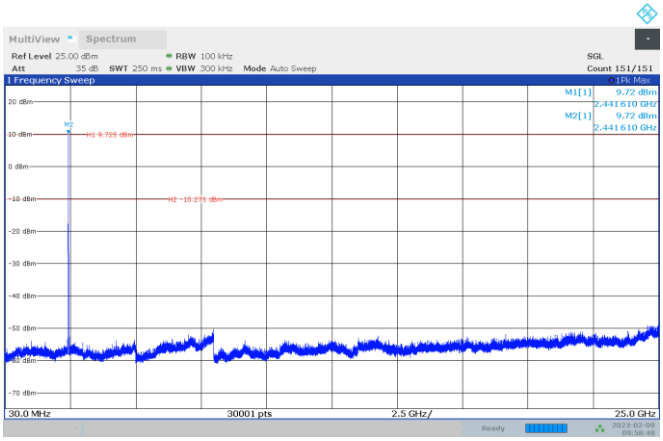

Figure 8.4-23: *TSM-Bandwidth 10MHz conducted spurious emission, 2442 MHz*

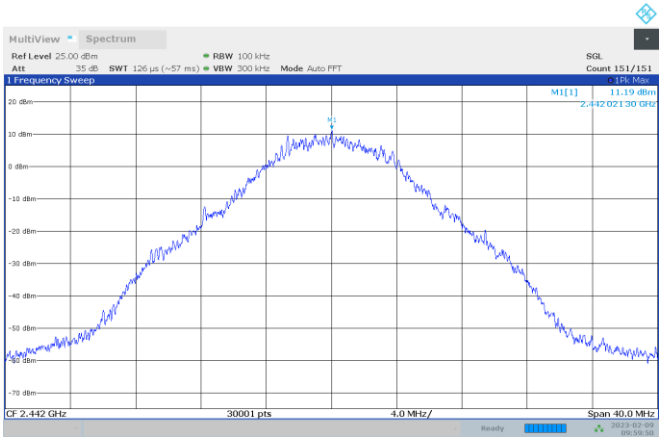

Figure 8.4-24: *TSM-Bandwidth 10MHz conducted spurious emission reference level, 2442 MHz*

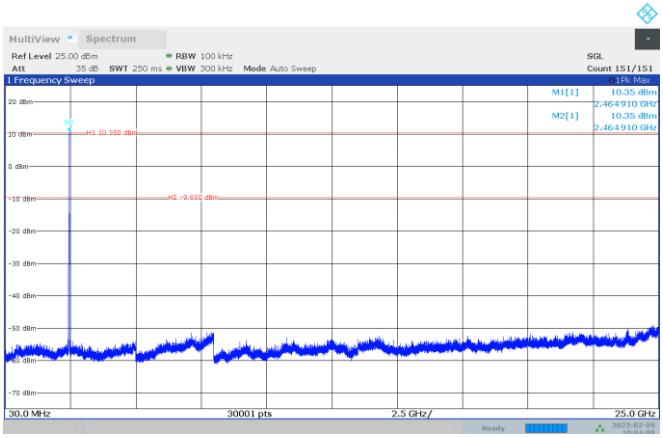

Figure 8.4-25: *TSM-Bandwidth 10MHz conducted spurious emission, 2465 MHz*

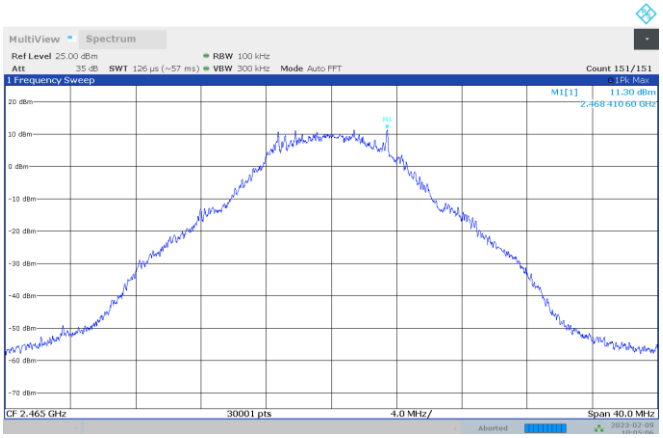

Figure 8.4-26: *TSM-Bandwidth 10MHz conducted spurious emission reference level, 2465 MHz*

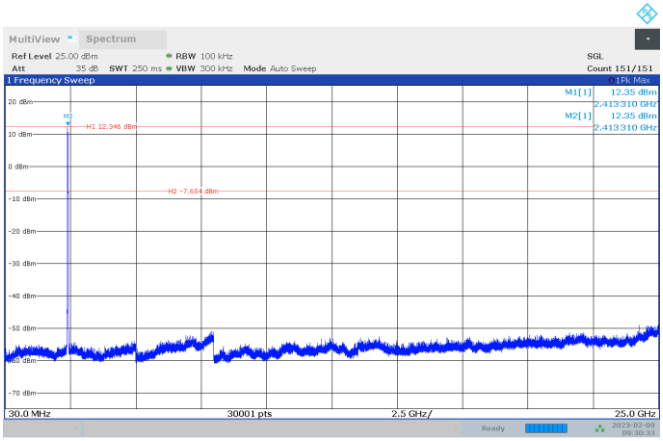

Figure 8.4-27: *TSM-Bandwidth 20MHz conducted spurious emission, 2422 MHz*

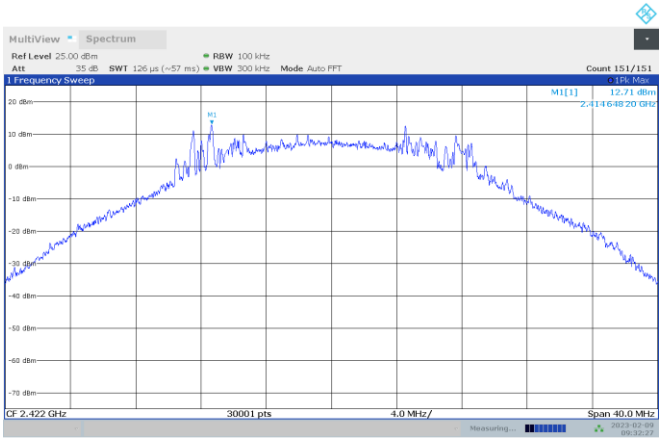

Figure 8.4-28: *TSM-Bandwidth 20MHz conducted spurious emission reference level, 2422 MHz*

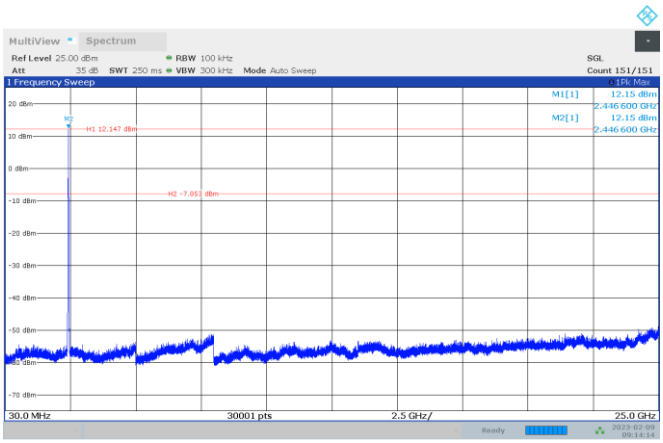

Figure 8.4-29: *TSM-Bandwidth 20MHz conducted spurious emission, 2442 MHz*

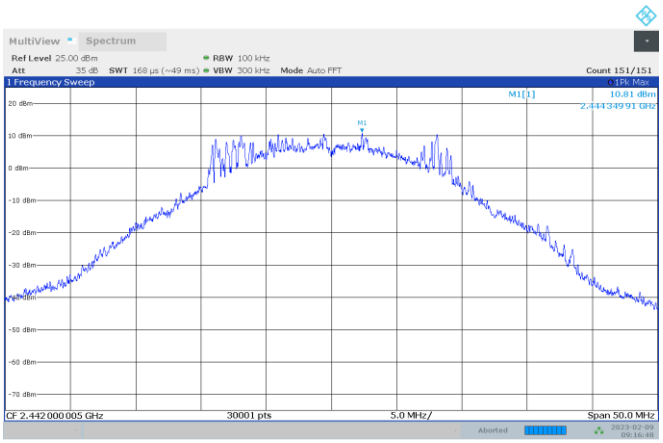

Figure 8.4-30: *TSM-Bandwidth 20MHz conducted spurious emission reference level, 2442 MHz*

Radiated restricted band edge emissions

TSM-BE-low-TW860-BW1.2-2403MHz

Full Spectrum

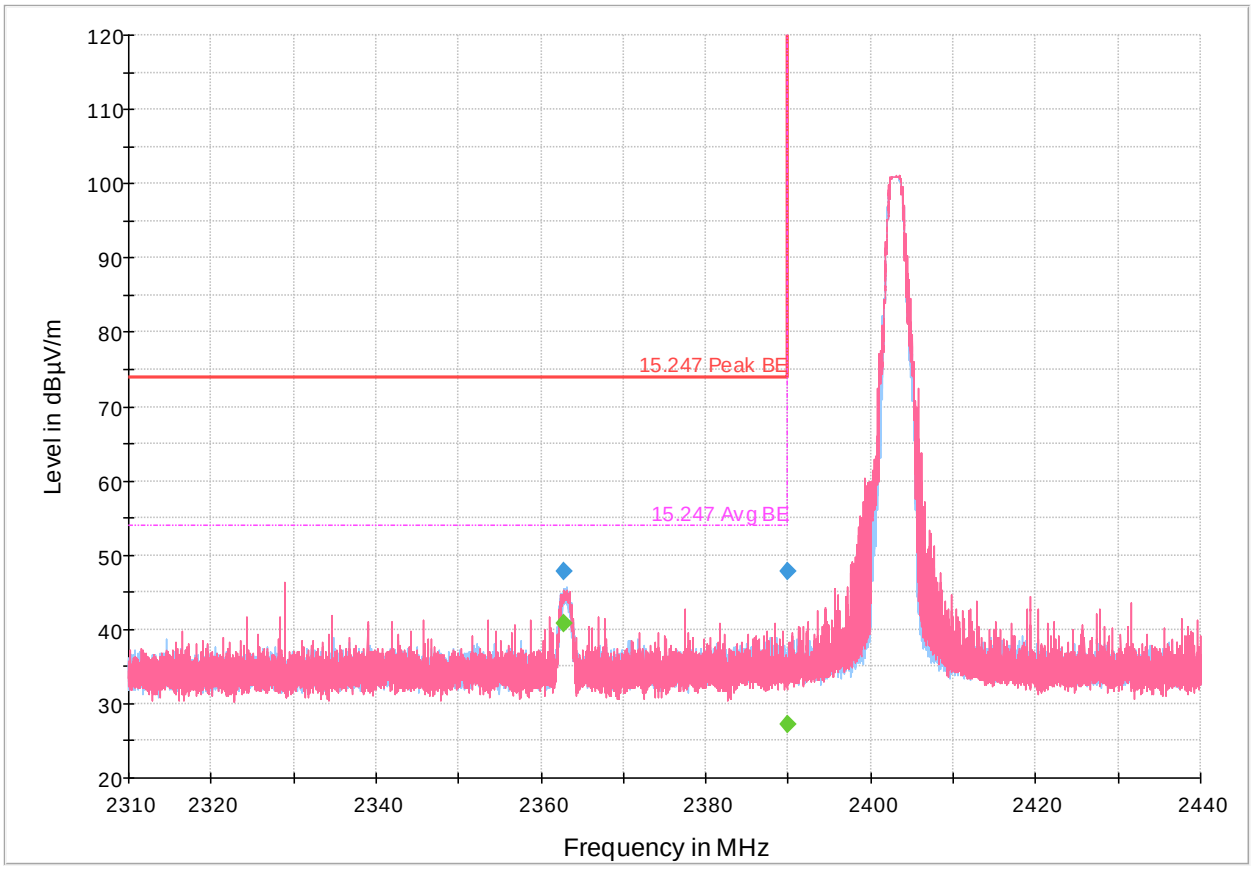

Figure 8.4-31: *Radiated emissions spectral plot (2.31 GHz - 2.44 GHz)*

Table 8.4-3*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2362.858000	---	40.91	53.90	12.99	5000.0	1000.000	319.0	H	0.0	-10.1
2362.858000	47.74	---	73.90	26.16	5000.0	1000.000	319.0	H	0.0	-10.1
2390.000000	---	27.13	53.90	26.77	5000.0	1000.000	128.0	V	302.0	-10.0
2390.000000	47.76	---	73.90	26.14	5000.0	1000.000	128.0	V	302.0	-10.0

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-BE-high-TW860-BW1.2-2478MHz

Full Spectrum

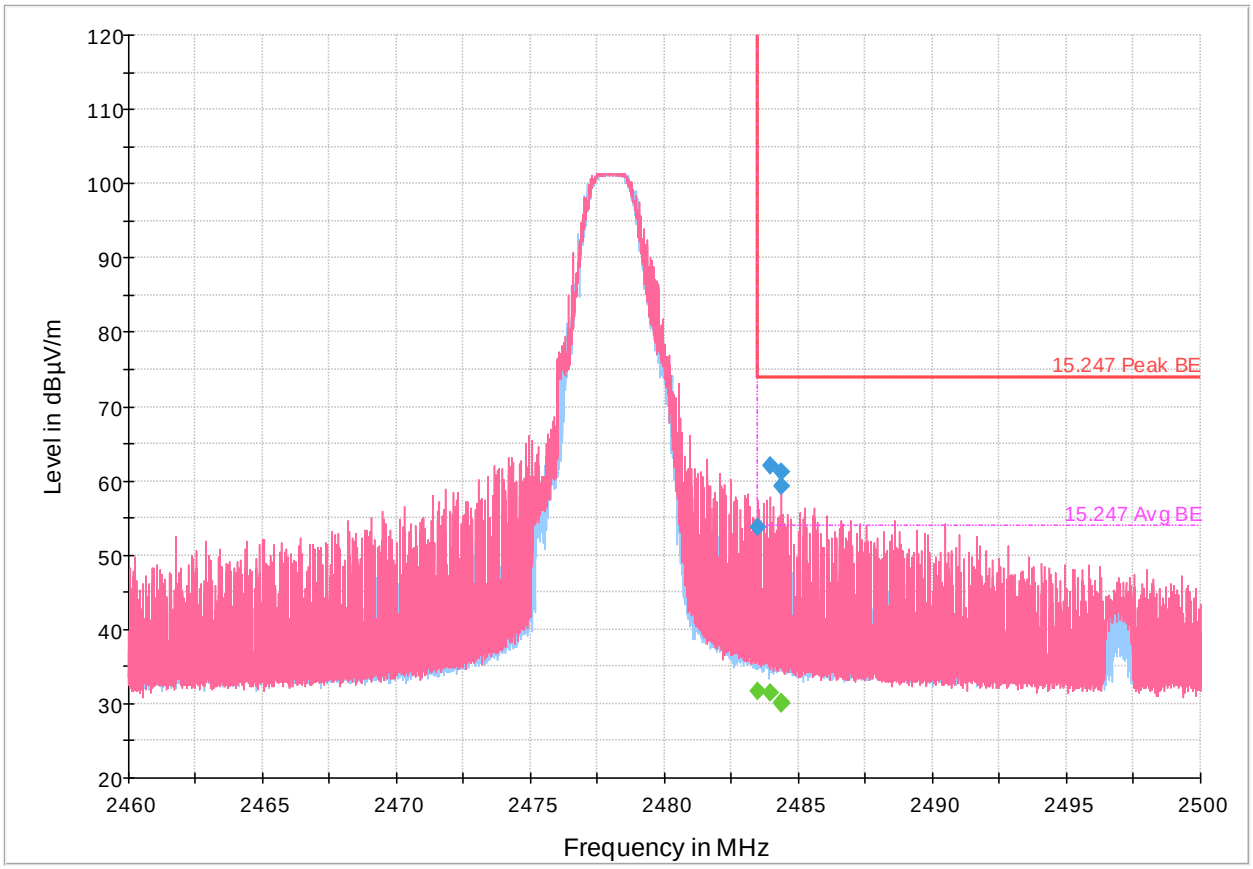

Figure 8.4-32: *Radiated emissions spectral plot (2.46 GHz - 2.5 GHz)*

Table 8.4-4*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	---	31.63	53.90	22.27	5000.0	1000.000	202.0	H	0.0	-9.7
2483.500000	53.68	---	73.90	20.22	5000.0	1000.000	202.0	H	0.0	-9.7
2483.968000	61.97	---	73.90	11.93	5000.0	1000.000	139.0	V	150.0	-9.7
2483.968000	---	31.42	53.90	22.48	5000.0	1000.000	139.0	V	150.0	-9.7
2484.337333	59.34	---	73.90	14.56	5000.0	1000.000	175.0	V	136.0	-9.7
2484.337333	---	30.01	53.90	23.89	5000.0	1000.000	186.0	H	341.0	-9.7
2484.337333	---	30.27	53.90	23.63	5000.0	1000.000	222.0	V	64.0	-9.7
2484.337333	61.26	---	73.90	12.64	5000.0	1000.000	222.0	V	64.0	-9.7

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-BE-low-TW860-BW3.6-2404MHz

Full Spectrum

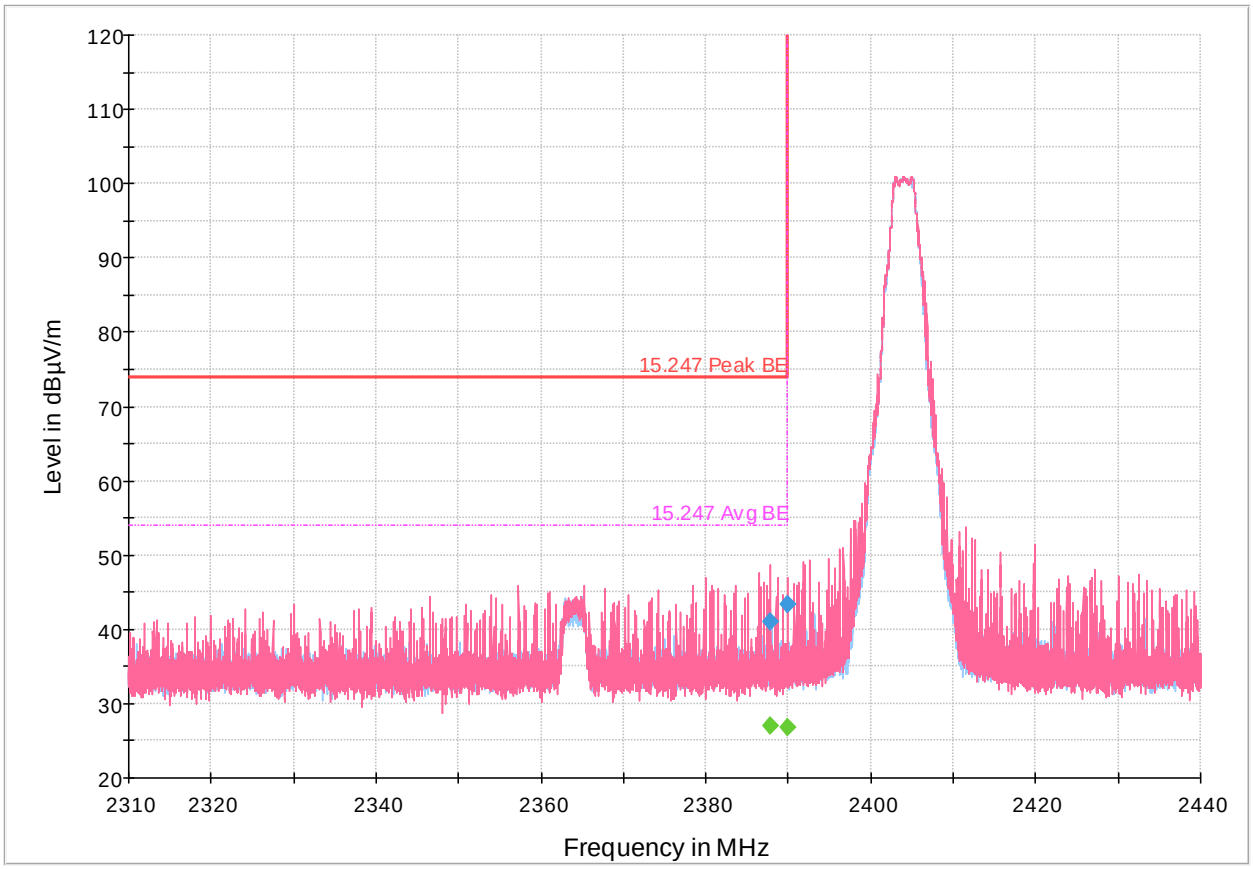

Figure 8.4-33: *Radiated emissions spectral plot (2.31 GHz - 2.44 GHz)*

Table 8.4-5*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2387.800667	---	26.99	53.90	26.91	5000.0	1000.000	200.0	H	310.0	-10.0
2387.800667	40.99	---	73.90	32.91	5000.0	1000.000	200.0	H	310.0	-10.0
2390.000000	---	26.72	53.90	27.18	5000.0	1000.000	186.0	H	0.0	-10.0
2390.000000	43.40	---	73.90	30.50	5000.0	1000.000	186.0	H	0.0	-10.0

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-BE-high-TW860-BW3.6-2478MHz

Full Spectrum

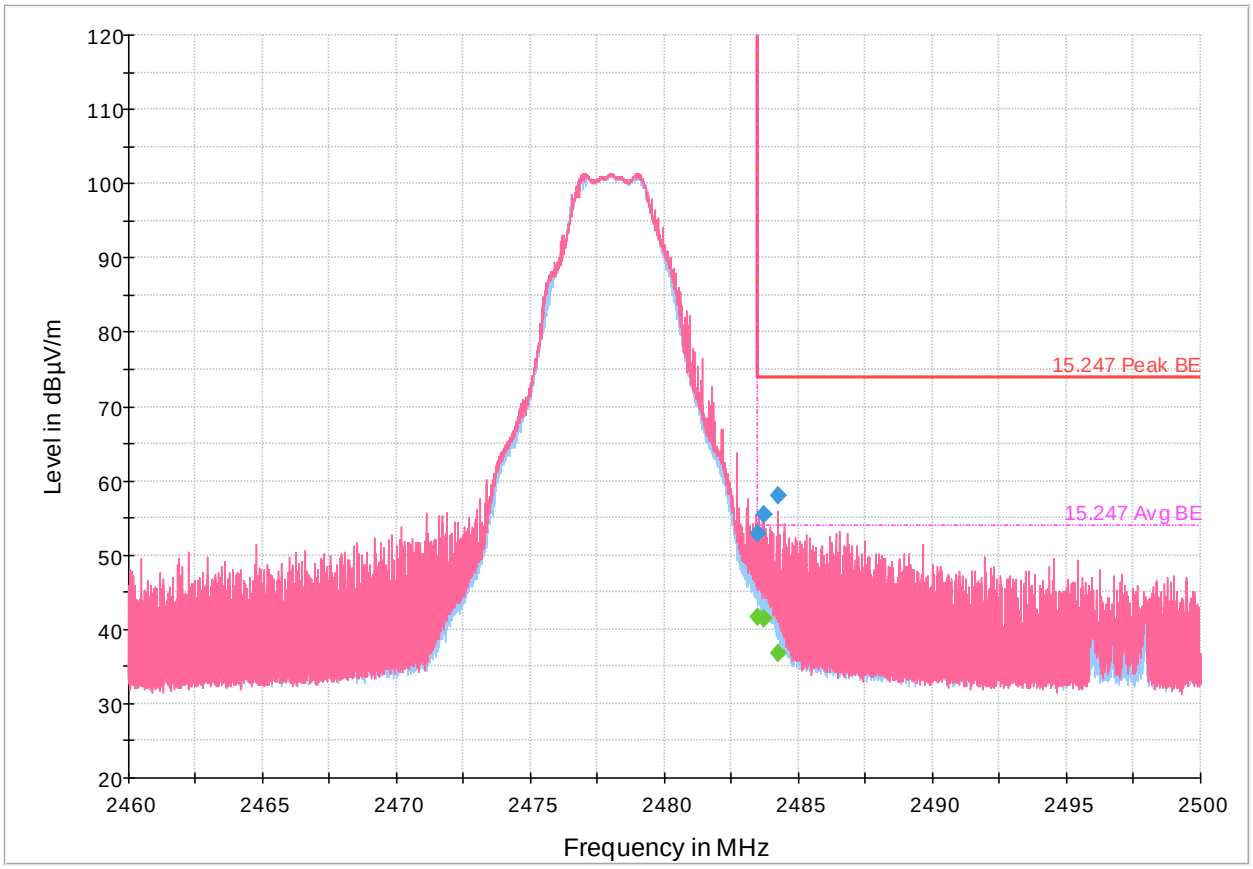

Figure 8.4-34: *Radiated emissions spectral plot (2.46 GHz - 2.5 GHz)*

Table 8.4-6*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	---	41.59	53.90	12.31	5000.0	1000.000	214.0	H	0.0	-9.7
2483.500000	52.94	---	73.90	20.96	5000.0	1000.000	214.0	H	0.0	-9.7
2483.716000	---	41.35	53.90	12.55	5000.0	1000.000	180.0	V	330.0	-9.7
2483.716000	55.49	---	73.90	18.41	5000.0	1000.000	180.0	V	330.0	-9.7
2484.230667	---	36.87	53.90	17.03	5000.0	1000.000	132.0	V	199.0	-9.7
2484.230667	57.94	---	73.90	15.96	5000.0	1000.000	132.0	V	199.0	-9.7

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-BE-low-TW860-BW10-2412MHz

Full Spectrum

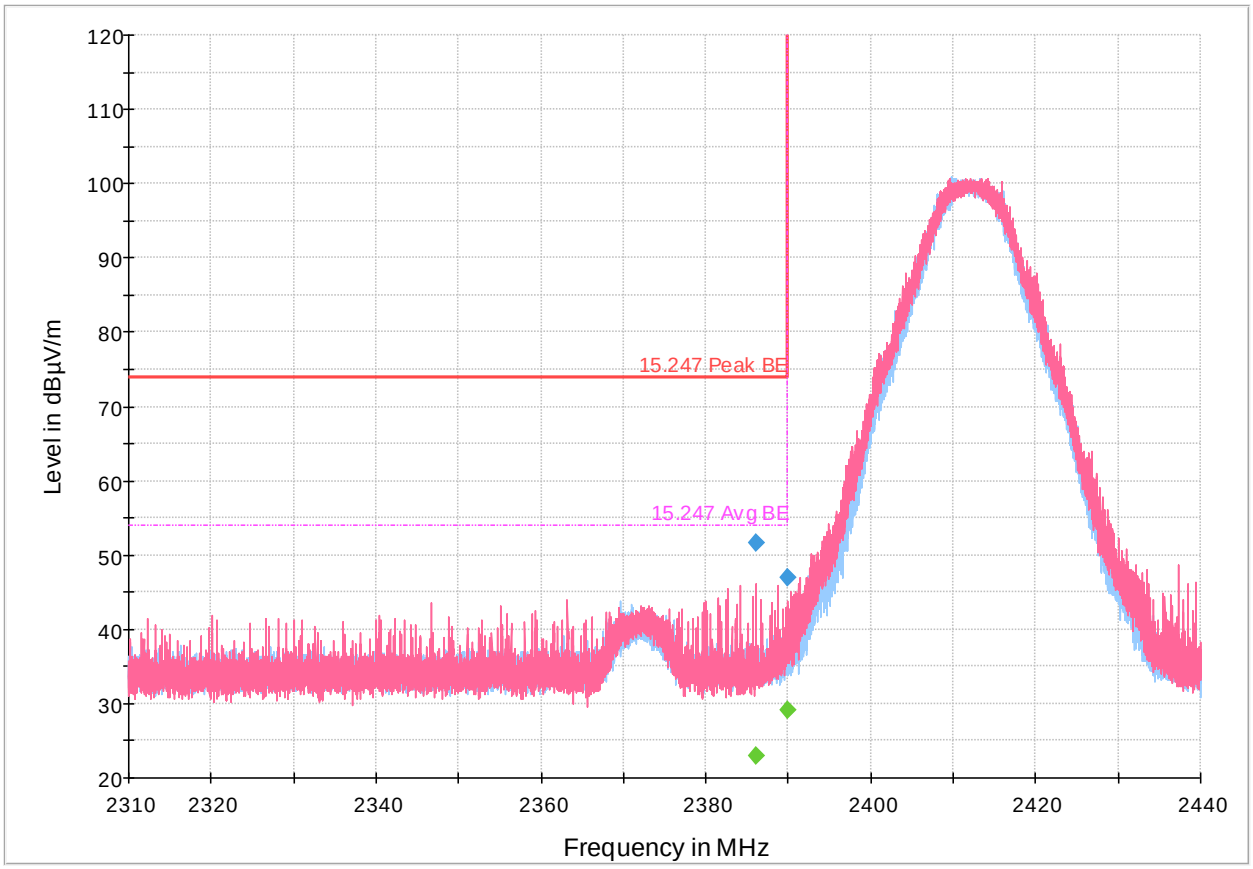

Figure 8.4-35: *Radiated emissions spectral plot (2.31 GHz - 2.44 GHz)*

Table 8.4-7*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2386.145333	51.73	---	73.90	22.17	5000.0	1000.000	136.0	V	201.0	-10.0
2386.145333	---	22.98	53.90	30.92	5000.0	1000.000	136.0	V	201.0	-10.0
2390.000000	46.92	---	73.90	26.98	5000.0	1000.000	135.0	H	0.0	-10.0
2390.000000	---	29.13	53.90	24.77	5000.0	1000.000	135.0	H	0.0	-10.0

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-BE-high-TW860-BW10-2465MHz

Full Spectrum

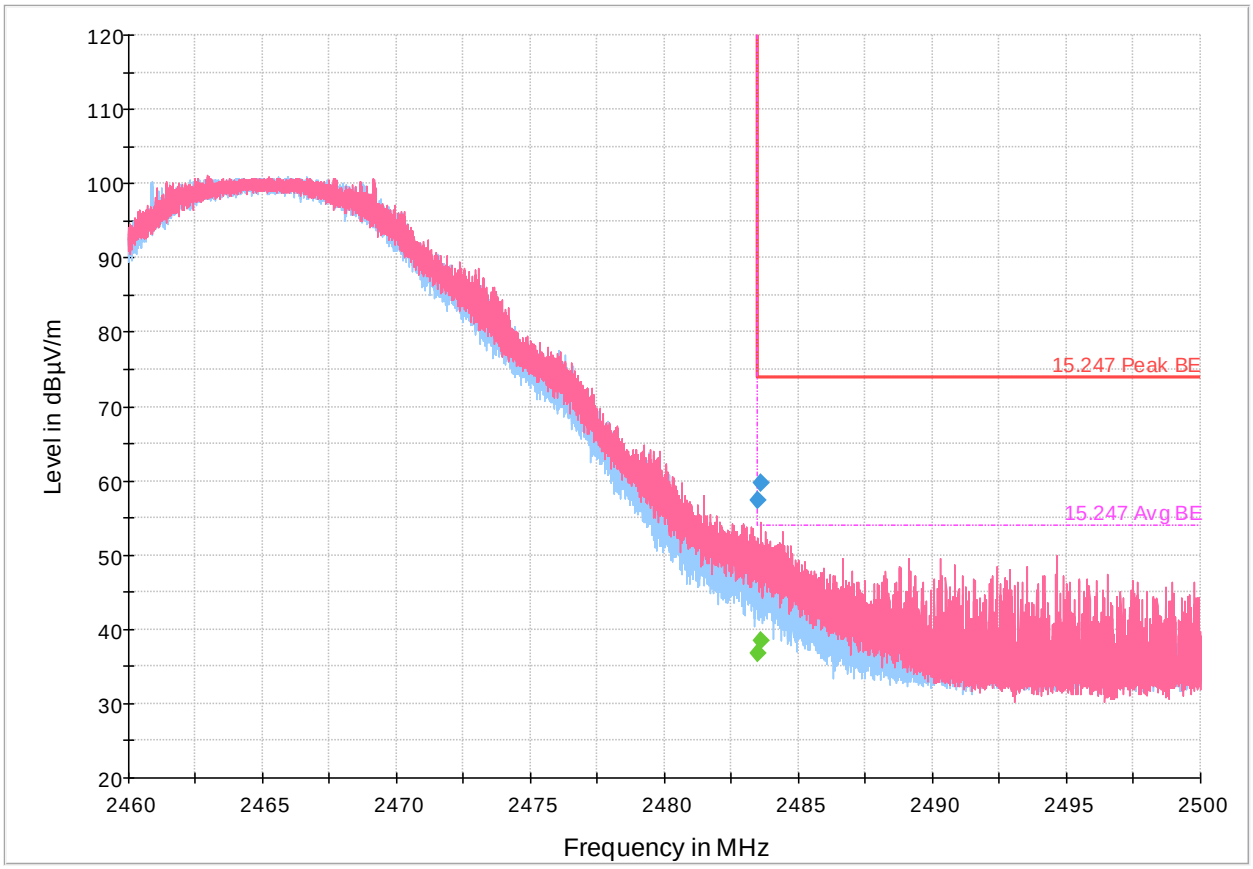

Figure 8.4-36: *Radiated emissions spectral plot (2.46 GHz - 2.5 GHz)*

Table 8.4-8*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	---	36.81	53.90	17.09	5000.0	1000.000	389.0	V	177.0	-9.7
2483.500000	57.39	---	73.90	16.51	5000.0	1000.000	389.0	V	177.0	-9.7
2483.612000	---	38.52	53.90	15.38	5000.0	1000.000	151.0	V	37.0	-9.7
2483.612000	59.68	---	73.90	14.22	5000.0	1000.000	151.0	V	37.0	-9.7

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-BE-low-TW860-BW20-2422MHz

Full Spectrum

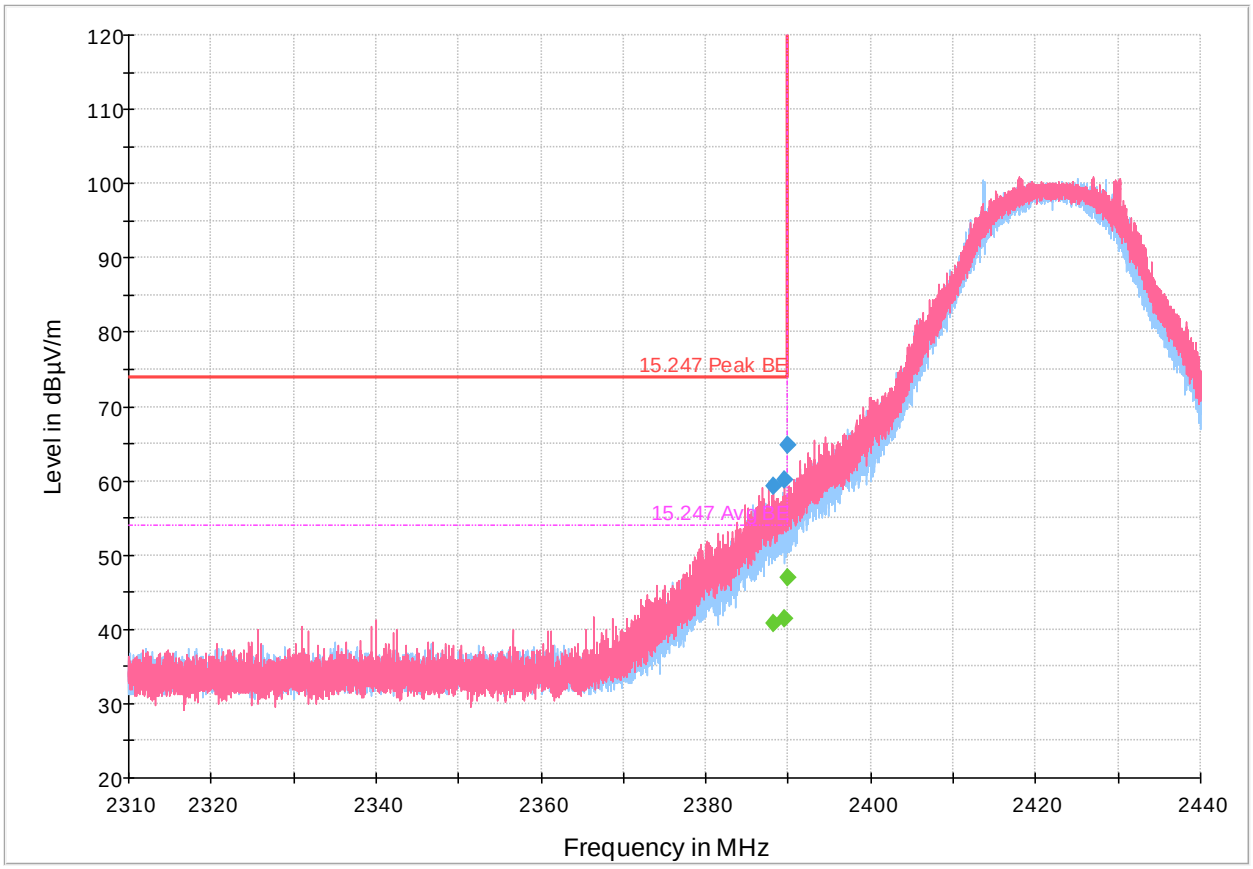

Figure 8.4-37: *Radiated emissions spectral plot (2.31 GHz - 2.44 GHz)*

Table 8.4-9*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2388.182000	59.28	---	73.90	14.62	5000.0	1000.000	383.0	V	149.0	-10.0
2388.182000	---	40.84	53.90	13.06	5000.0	1000.000	383.0	V	149.0	-10.0
2389.447333	60.04	---	73.90	13.86	5000.0	1000.000	288.0	H	0.0	-10.0
2389.447333	---	41.54	53.90	12.36	5000.0	1000.000	288.0	H	0.0	-10.0
2390.000000	---	47.00	53.90	6.90	5000.0	1000.000	302.0	V	119.0	-10.0
2390.000000	64.84	---	73.90	9.06	5000.0	1000.000	302.0	V	119.0	-10.0

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-BE-high-TW860-BW20-2442MHz

Full Spectrum

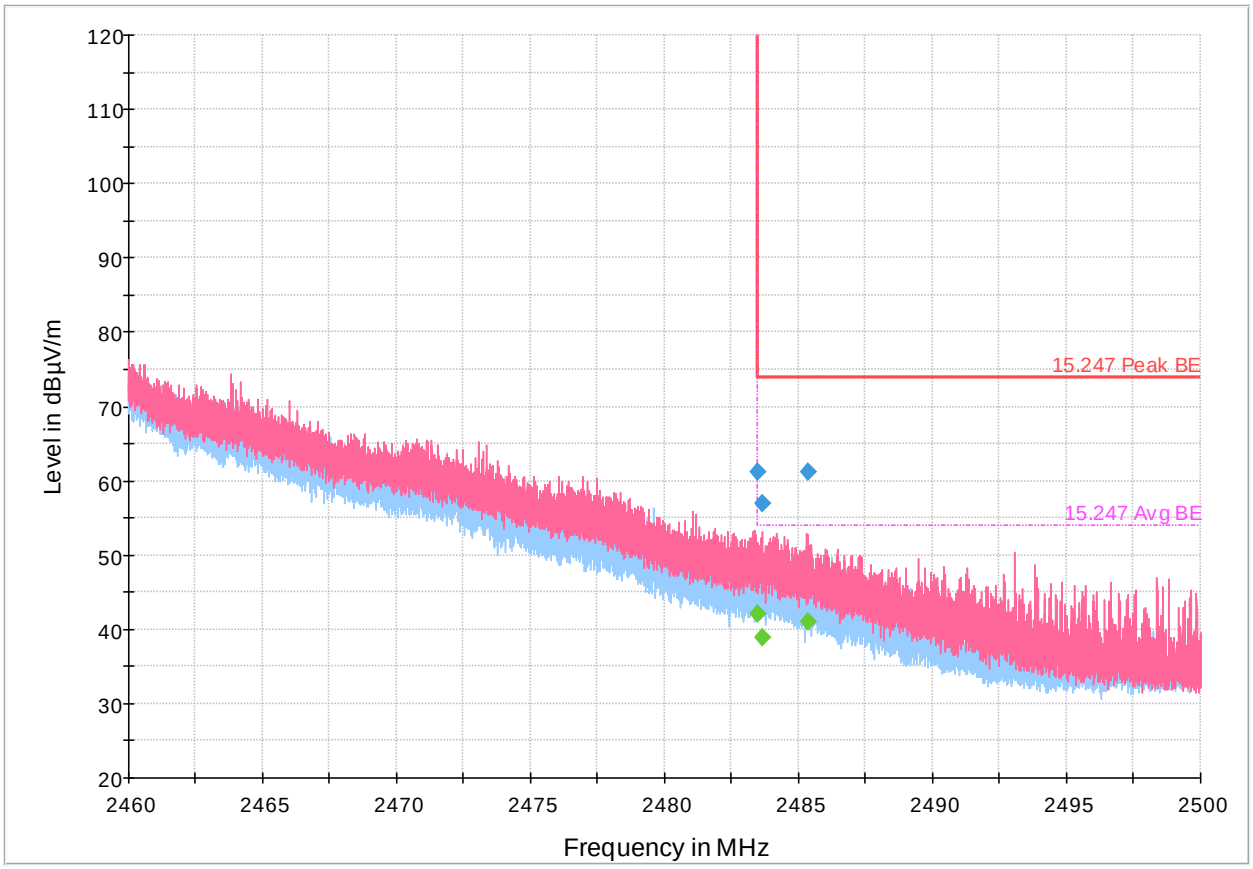

Figure 8.4-38: *Radiated emissions spectral plot (2.46 GHz - 2.5 GHz)*

Table 8.4-10*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	61.23	---	73.90	12.67	5000.0	1000.000	296.0	V	51.0	-9.7
2483.500000	---	42.14	53.90	11.76	5000.0	1000.000	296.0	V	51.0	-9.7
2483.630667	56.97	---	73.90	16.93	5000.0	1000.000	234.0	H	0.0	-9.7
2483.630667	---	38.98	53.90	14.92	5000.0	1000.000	234.0	H	0.0	-9.7
2485.326667	---	40.94	53.90	12.96	5000.0	1000.000	298.0	V	50.0	-9.7
2485.326667	61.16	---	73.90	12.74	5000.0	1000.000	298.0	V	50.0	-9.7

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Radiated emissions in restricted bands

TSM-RE-30-1000MHz-TW860-BW3.6-2403MHz

Full Spectrum

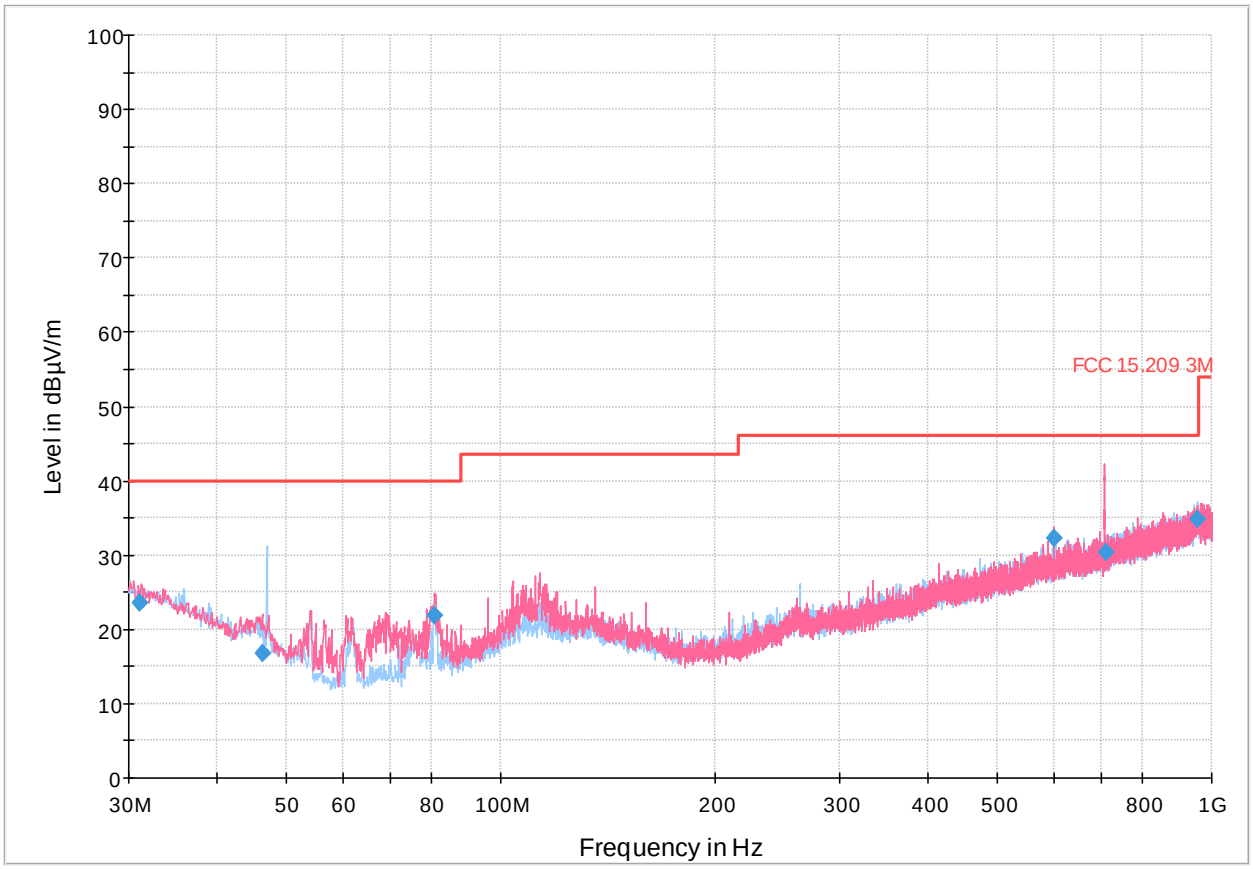

Figure 8.4-39: *Radiated emissions spectral plot (30 MHz - 1 GHz)*

Table 8.4-11*: Radiated emissions results*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.080000	23.62	40.00	16.38	5000.0	120.000	212.0	V	21.0	26.0
46.295000	16.80	40.00	23.20	5000.0	120.000	155.0	H	317.0	17.9
80.931000	21.94	40.00	18.06	5000.0	120.000	361.0	V	308.0	15.2
600.029000	32.23	46.00	13.77	5000.0	120.000	200.0	V	353.0	29.1
708.807000	30.33	46.00	15.67	5000.0	120.000	357.0	V	317.0	30.6
956.058000	34.74	46.00	11.26	5000.0	120.000	356.0	H	302.0	34.9

Notes:
[1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-RE-30-1000MHz-TW860-BW3.6-2442MHz

Full Spectrum

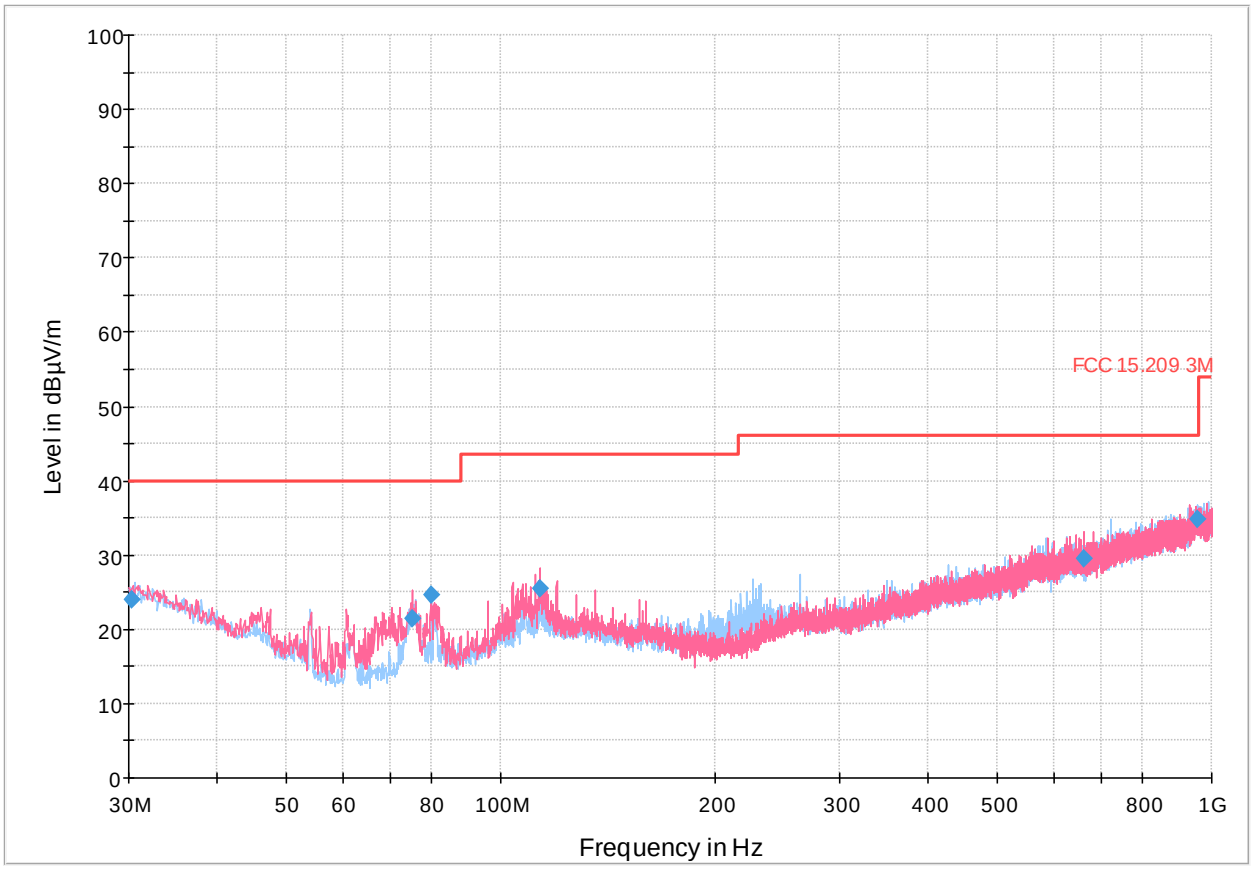

Figure 8.4-40: *Radiated emissions spectral plot (30 MHz - 1 GHz)*

Table 8.4-12*: Radiated emissions results*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.240000	24.01	40.00	15.99	5000.0	120.000	137.0	H	75.0	26.5
75.042000	21.37	40.00	18.63	5000.0	120.000	133.0	V	122.0	14.5
79.995000	24.62	40.00	15.38	5000.0	120.000	247.0	H	355.0	15.1
113.654000	25.51	43.50	17.99	5000.0	120.000	377.0	V	34.0	19.2
661.632000	29.46	46.00	16.54	5000.0	120.000	400.0	V	343.0	29.9
955.569000	34.76	46.00	11.24	5000.0	120.000	132.0	H	357.0	34.9

Notes:
[1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-RE-30-1000MHz-TW860-BW3.6-2478MHz

Full Spectrum

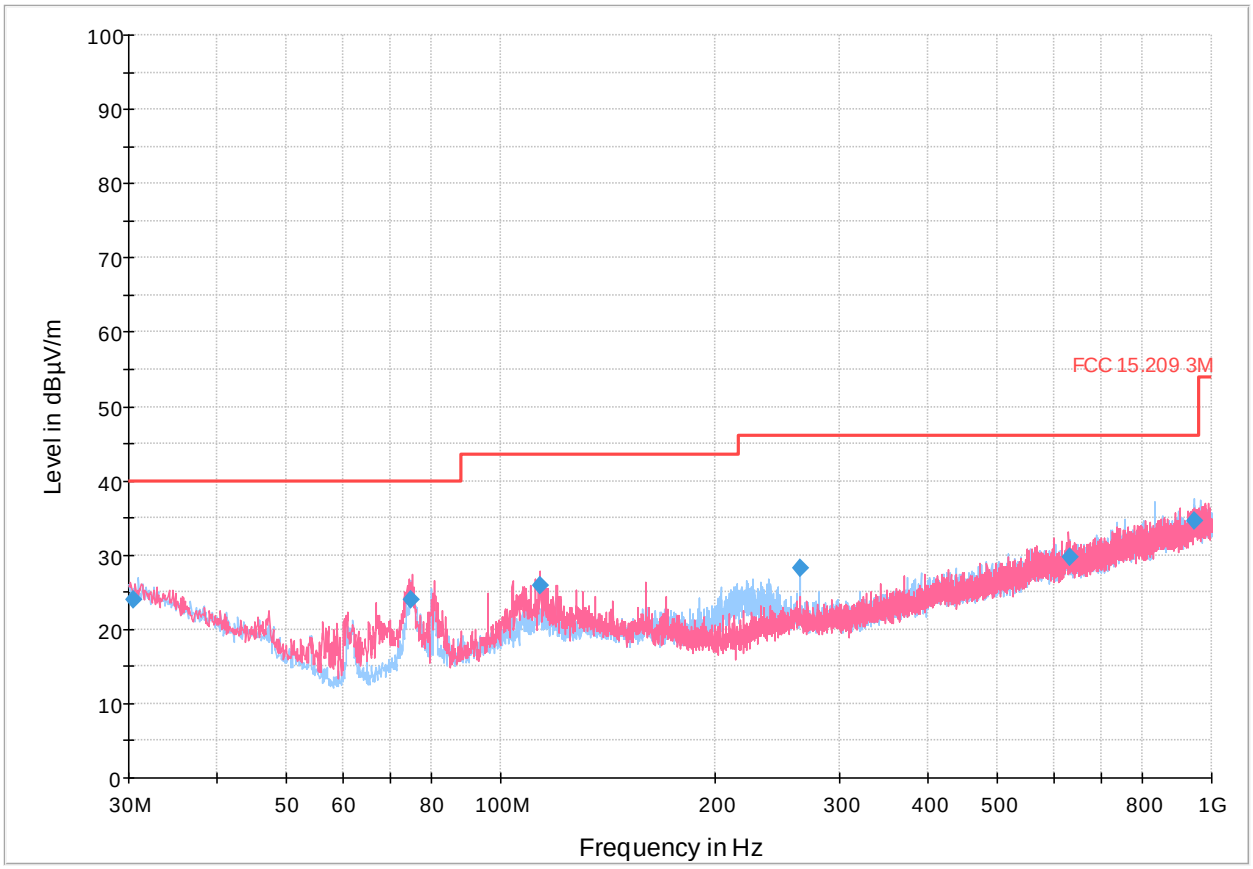

Figure 8.4-41: *Radiated emissions spectral plot (30 MHz - 1 GHz)*

Table 8.4-13*: Radiated emissions results*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.480000	23.90	40.00	16.10	5000.0	120.000	389.0	H	47.0	26.3
74.825000	24.01	40.00	15.99	5000.0	120.000	104.0	V	84.0	14.5
113.654000	25.86	43.50	17.64	5000.0	120.000	384.0	V	141.0	19.2
264.004000	28.27	46.00	17.73	5000.0	120.000	122.0	H	60.0	21.8
630.242000	29.77	46.00	16.23	5000.0	120.000	256.0	V	50.0	30.0
945.817000	34.57	46.00	11.43	5000.0	120.000	276.0	H	254.0	34.8

Notes:
[1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-RE-1-18GHz-TW860-BW3.6-2404MHz

Full Spectrum

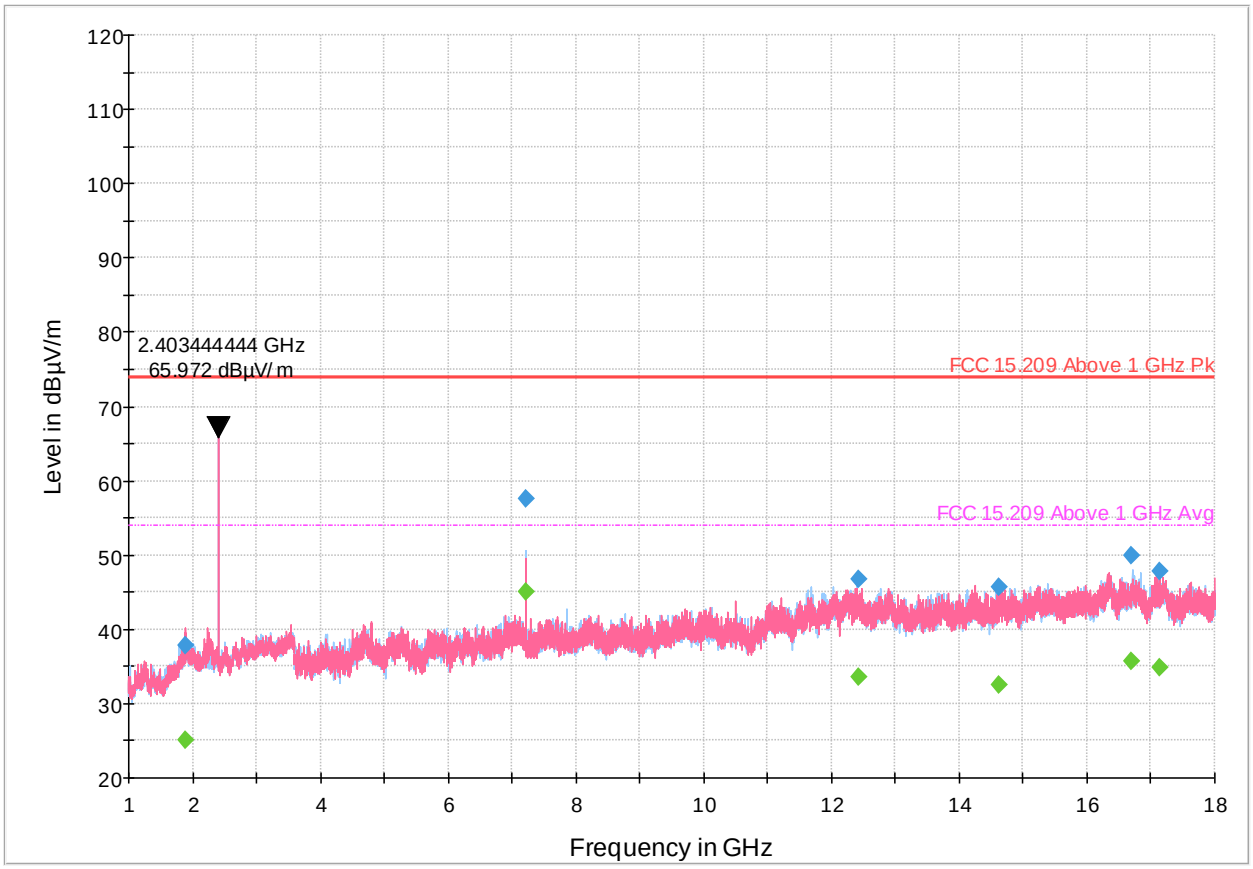

Figure 8.4-42: *Radiated emissions spectral plot (1 GHz - 18 GHz)*

Table 8.4-14*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1881.488889	37.82	---	73.90	36.08	5000.0	1000.000	161.0	V	324.0	-10.7
1881.488889	---	25.14	53.90	28.76	5000.0	1000.000	161.0	V	324.0	-10.7
7209.211111	57.67	---	73.90	16.23	5000.0	1000.000	164.0	H	88.0	0.4
7209.211111	---	45.03	53.90	8.87	5000.0	1000.000	164.0	H	88.0	0.4
12413.400000	46.78	---	73.90	27.12	5000.0	1000.000	292.0	H	0.0	7.3
12413.400000	---	33.56	53.90	20.34	5000.0	1000.000	292.0	H	0.0	7.3
14629.922222	---	32.52	53.90	21.38	5000.0	1000.000	114.0	V	238.0	9.3
14629.922222	45.66	---	73.90	28.24	5000.0	1000.000	114.0	V	238.0	9.3
16701.966667	49.86	---	73.90	24.04	5000.0	1000.000	255.0	H	344.0	14.7
16701.966667	---	35.70	53.90	18.20	5000.0	1000.000	255.0	H	344.0	14.7
17130.500000	---	34.89	53.90	19.01	5000.0	1000.000	120.0	V	224.0	14.0
17130.500000	47.88	---	73.90	26.02	5000.0	1000.000	120.0	V	224.0	14.0

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-RE-1-18GHz-TW860-BW3.6-2442MHz

Full Spectrum

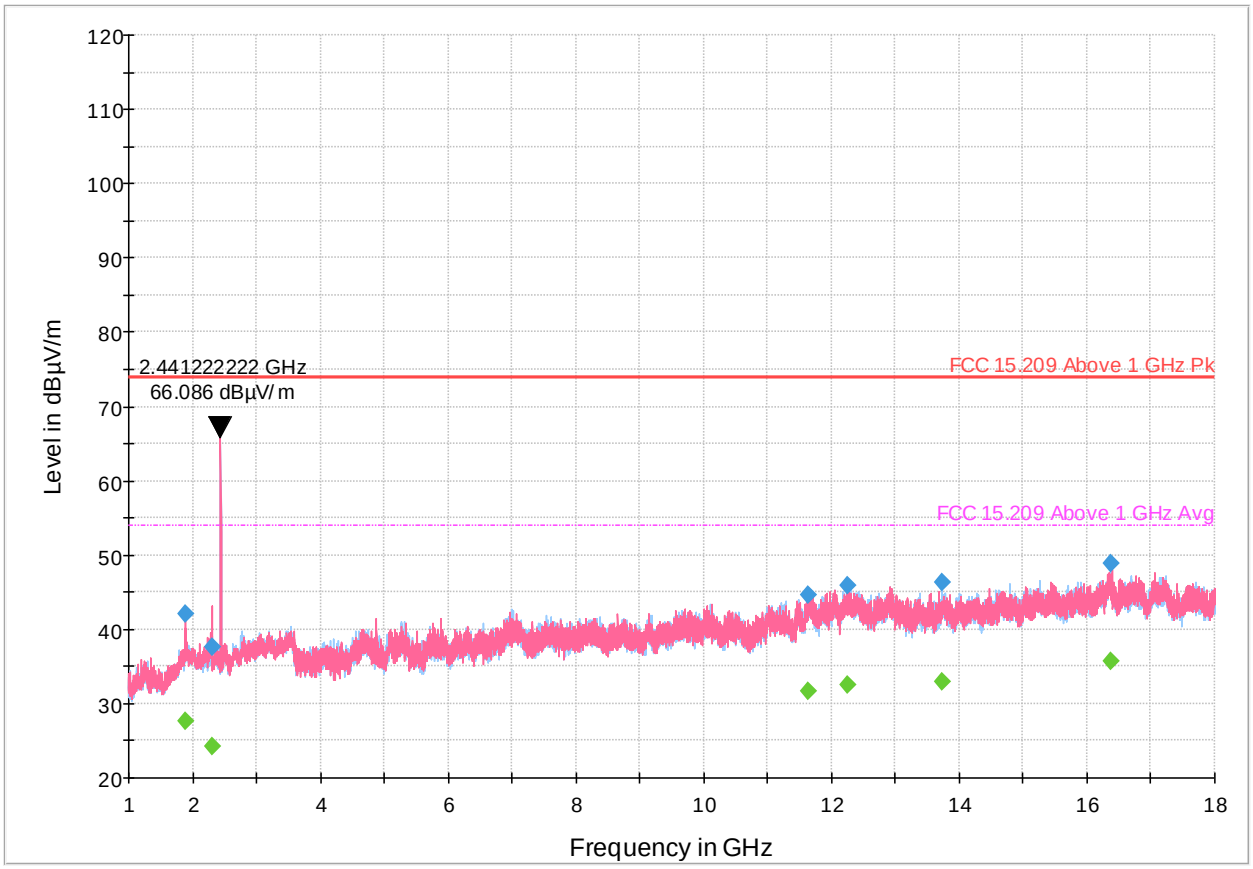

Figure 8.4-43: *Radiated emissions spectral plot (1 GHz - 18 GHz)*

Table 8.4-15*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1894.611111	---	27.65	53.90	26.25	5000.0	1000.000	328.0	V	288.0	-10.8
1894.611111	42.00	---	73.90	31.90	5000.0	1000.000	328.0	V	288.0	-10.8
2305.944444	---	24.20	53.90	29.70	5000.0	1000.000	378.0	V	242.0	-10.6
2305.944444	37.69	---	73.90	36.21	5000.0	1000.000	378.0	V	242.0	-10.6
11630.922222	44.55	---	73.90	29.35	5000.0	1000.000	194.0	H	264.0	4.9
11630.922222	---	31.58	53.90	22.32	5000.0	1000.000	194.0	H	264.0	4.9
12261.511111	---	32.60	53.90	21.30	5000.0	1000.000	190.0	V	286.0	7.0
12261.511111	45.82	---	73.90	28.08	5000.0	1000.000	190.0	V	286.0	7.0
13731.733333	46.41	---	73.90	27.49	5000.0	1000.000	226.0	H	0.0	9.7
13731.733333	---	32.86	53.90	21.04	5000.0	1000.000	226.0	H	0.0	9.7
16366.188889	48.81	---	73.90	25.09	5000.0	1000.000	107.0	H	300.0	12.9
16366.188889	---	35.78	53.90	18.12	5000.0	1000.000	107.0	H	300.0	12.9

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-RE-1-18GHz-TW860-BW3.6-2478MHz

Full Spectrum

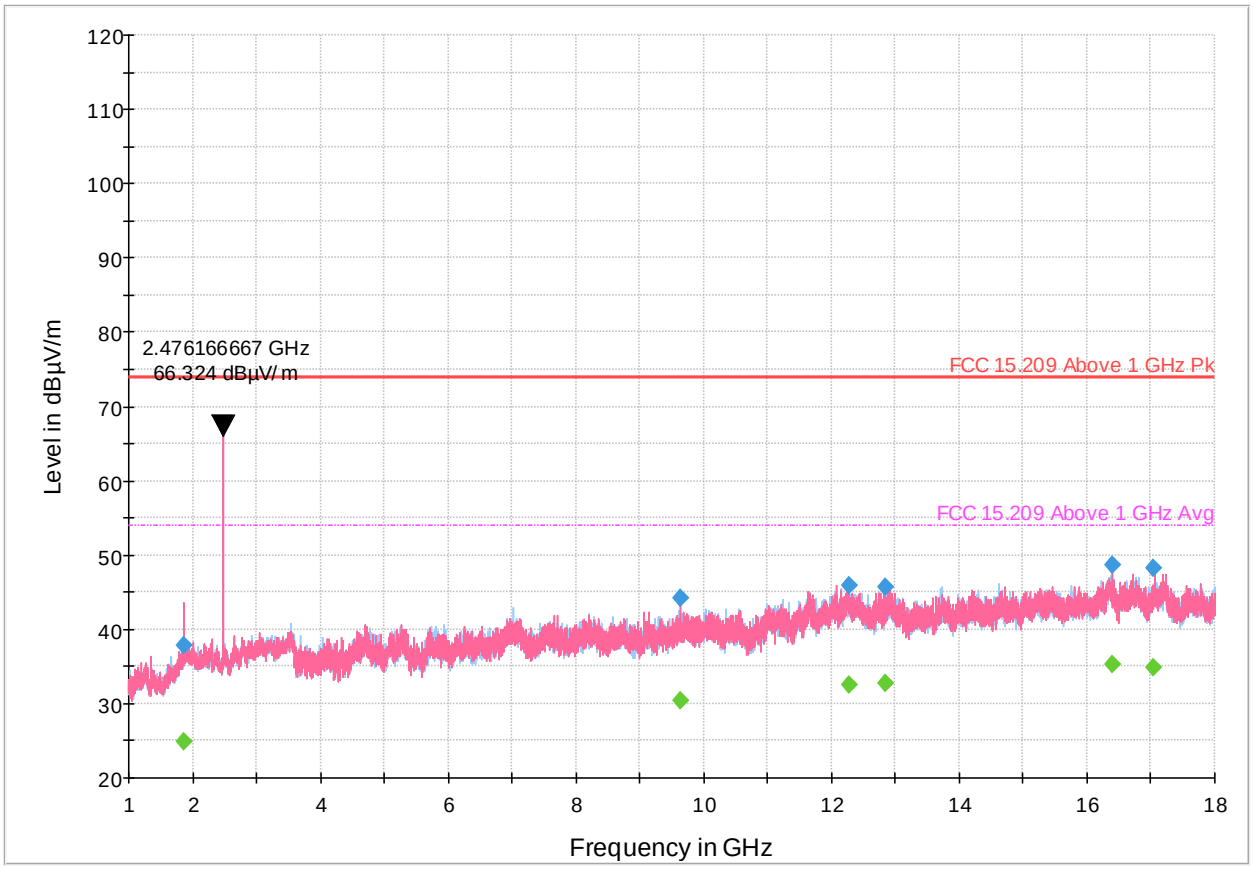

Figure 8.4-44: *Radiated emissions spectral plot (1 GHz - 18 GHz)*

Table 8.4-16*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1873.177778	37.87	---	73.90	36.03	5000.0	1000.000	104.0	V	260.0	-10.8
1873.177778	---	24.80	53.90	29.10	5000.0	1000.000	104.0	V	260.0	-10.8
9638.644444	44.24	---	73.90	29.66	5000.0	1000.000	256.0	V	277.0	3.6
9638.644444	---	30.35	53.90	23.55	5000.0	1000.000	256.0	V	277.0	3.6
12284.444444	---	32.43	53.90	21.47	5000.0	1000.000	256.0	V	136.0	7.1
12284.444444	45.96	---	73.90	27.94	5000.0	1000.000	256.0	V	136.0	7.1
12844.066667	---	32.64	53.90	21.26	5000.0	1000.000	384.0	H	146.0	8.7
12844.066667	45.76	---	73.90	28.14	5000.0	1000.000	384.0	H	146.0	8.7
16389.000000	---	35.38	53.90	18.52	5000.0	1000.000	380.0	V	136.0	12.6
16389.000000	48.57	---	73.90	25.33	5000.0	1000.000	380.0	V	136.0	12.6
17045.811111	---	34.87	53.90	19.03	5000.0	1000.000	291.0	V	167.0	12.4
17045.811111	48.14	---	73.90	25.76	5000.0	1000.000	291.0	V	167.0	12.4

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-RE-18-26.5GHz-TW860-BW3.6-2404MHz

Full Spectrum

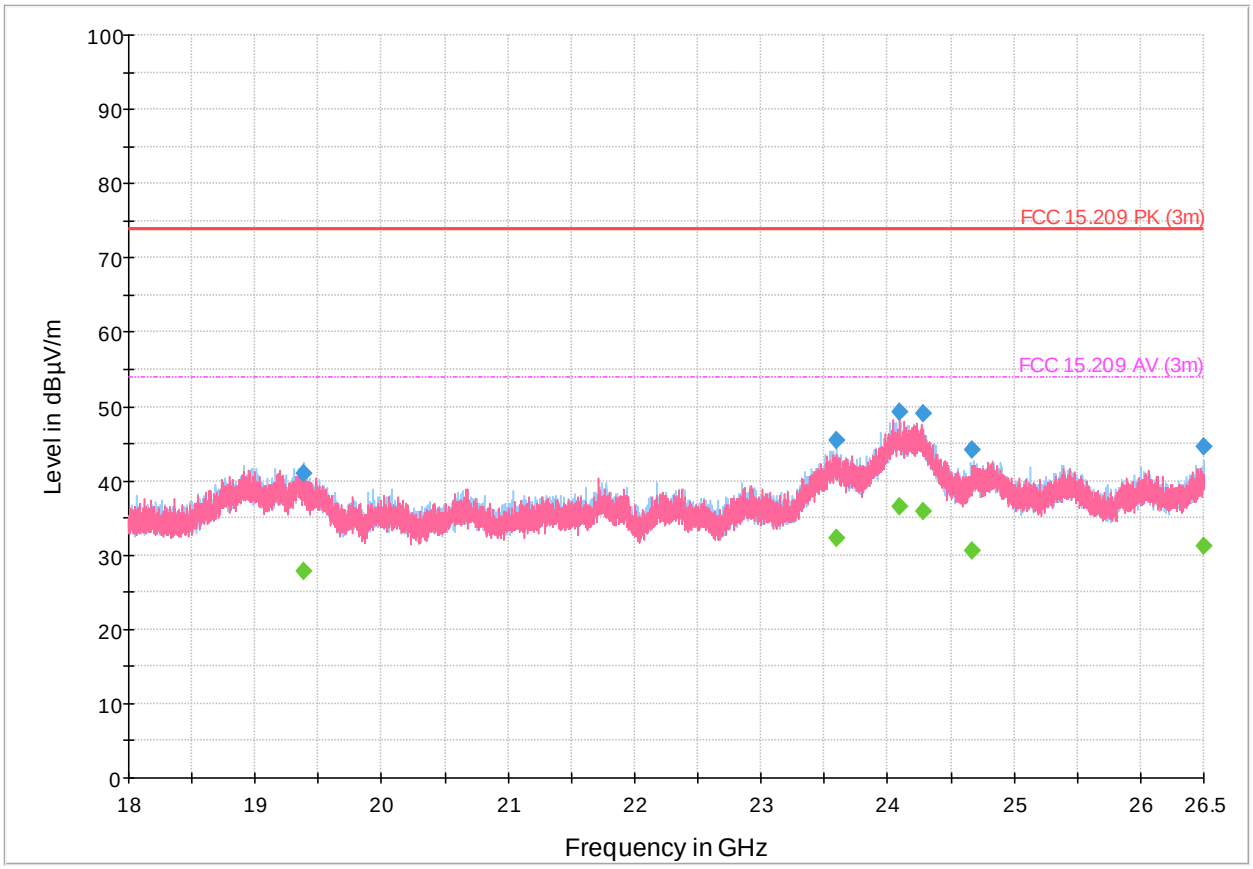

Figure 8.4-45: *Radiated emissions spectral plot (18 GHz - 26.5 GHz)*

Table 8.4-17*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
19379.450000	---	27.86	53.90	26.04	5000.0	1000.000	339.0	H	275.0	16.6
19379.450000	40.91	---	73.90	32.99	5000.0	1000.000	339.0	H	275.0	16.6
23600.250000	45.53	---	73.90	28.37	5000.0	1000.000	276.0	H	0.0	23.8
23600.250000	---	32.26	53.90	21.64	5000.0	1000.000	276.0	H	0.0	23.8
24090.443750	49.27	---	73.90	24.63	5000.0	1000.000	384.0	V	223.0	27.4
24090.443750	---	36.48	53.90	17.42	5000.0	1000.000	384.0	V	223.0	27.4
24277.500000	---	35.86	53.90	18.04	5000.0	1000.000	326.0	V	48.0	26.6
24277.500000	49.04	---	73.90	24.86	5000.0	1000.000	326.0	V	48.0	26.6
24670.950000	44.06	---	73.90	29.84	5000.0	1000.000	220.0	H	309.0	22.5
24670.950000	---	30.60	53.90	23.30	5000.0	1000.000	220.0	H	309.0	22.5
26496.212500	44.51	---	73.90	29.39	5000.0	1000.000	100.0	H	122.0	23.4
26496.212500	---	31.28	53.90	22.62	5000.0	1000.000	100.0	H	122.0	23.4

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-RE-18-26.5GHz-TW860-BW3.6-2442MHz

Full Spectrum

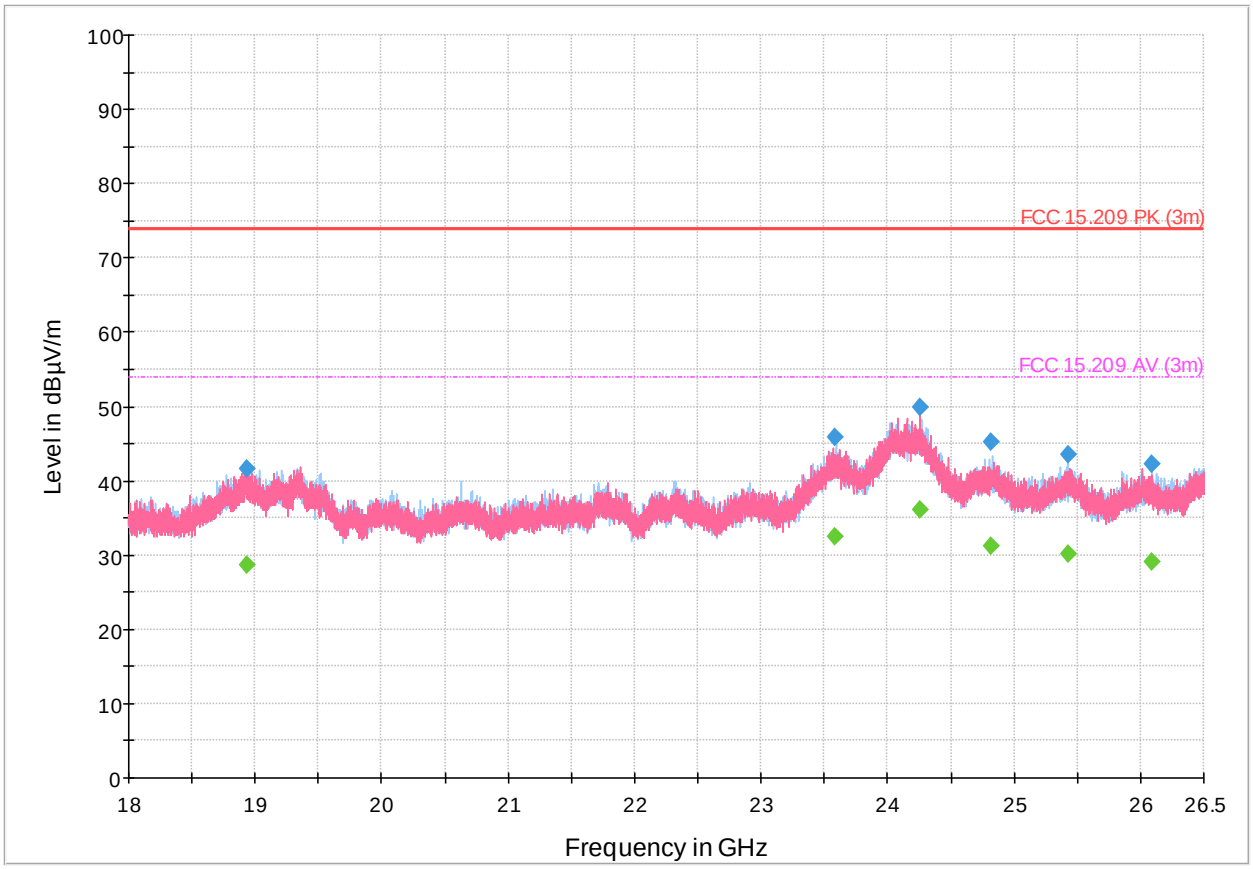

Figure 8.4-46: *Radiated emissions spectral plot (18 GHz - 26.5 GHz)*

Table 8.4-18*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18933.987500	41.70	---	73.90	32.20	5000.0	1000.000	167.0	V	273.0	15.9
18933.987500	---	28.74	53.90	25.16	5000.0	1000.000	167.0	V	273.0	15.9
23588.812500	45.82	---	73.90	28.08	5000.0	1000.000	168.0	H	177.0	23.9
23588.812500	---	32.44	53.90	21.46	5000.0	1000.000	168.0	H	177.0	23.9
24254.593750	---	36.10	53.90	17.80	5000.0	1000.000	313.0	V	72.0	26.9
24254.593750	49.81	---	73.90	24.09	5000.0	1000.000	313.0	V	72.0	26.9
24822.637500	---	31.21	53.90	22.69	5000.0	1000.000	224.0	H	160.0	22.3
24822.637500	45.29	---	73.90	28.61	5000.0	1000.000	224.0	H	160.0	22.3
25428.918750	---	30.19	53.90	23.71	5000.0	1000.000	327.0	H	112.0	21.7
25428.918750	43.47	---	73.90	30.43	5000.0	1000.000	327.0	H	112.0	21.7
26091.550000	---	28.99	53.90	24.91	5000.0	1000.000	175.0	H	314.0	21.9
26091.550000	42.22	---	73.90	31.68	5000.0	1000.000	175.0	H	314.0	21.9

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

TSM-RE-18-26.5GHz-TW860-BW3.6-2478MHz

Full Spectrum

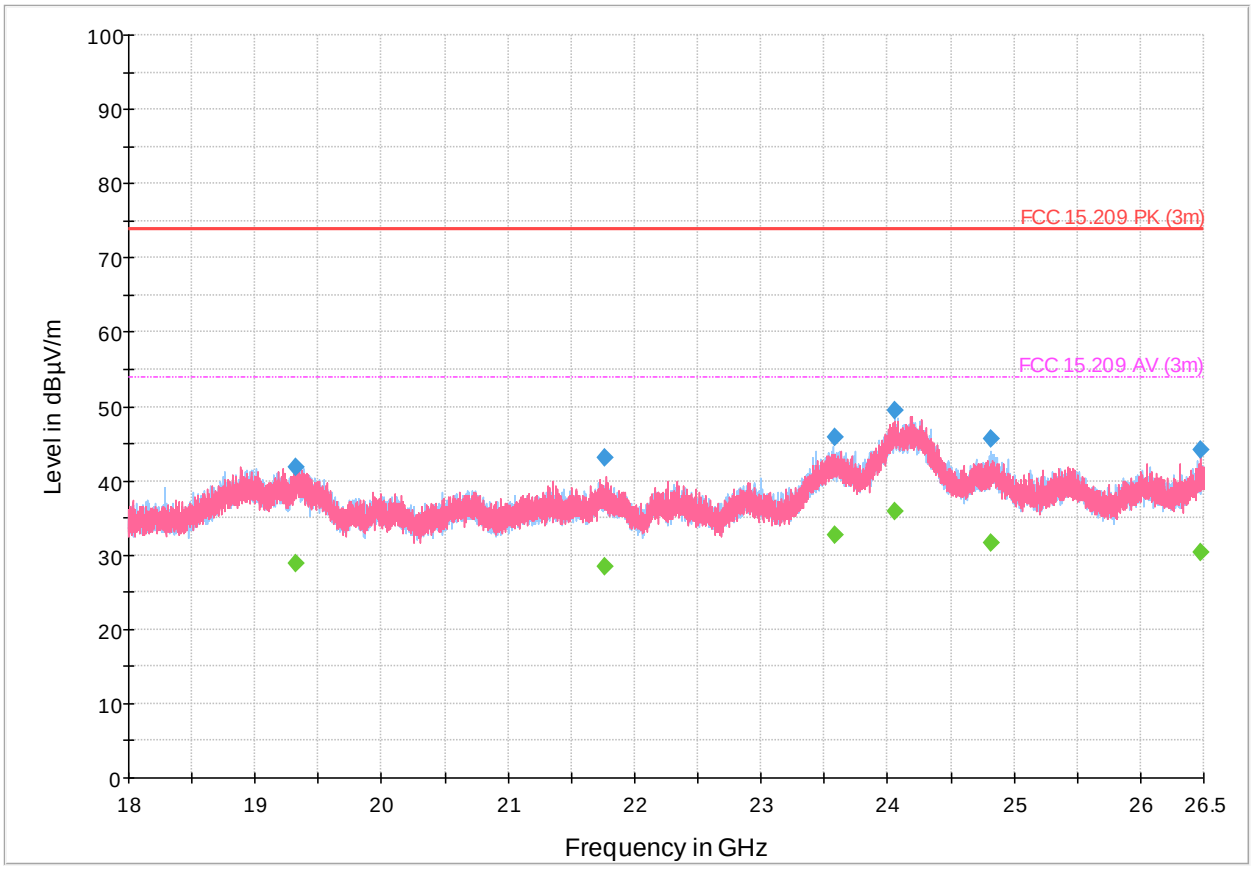

Figure 8.4-47: *Radiated emissions spectral plot (18 GHz - 26.5 GHz)*

Table 8.4-19*: Radiated emissions results*

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
19316.231250	41.81	---	73.90	32.09	5000.0	1000.000	100.0	H	138.0	16.7
19316.231250	---	28.89	53.90	25.01	5000.0	1000.000	100.0	H	138.0	16.7
21769.406250	---	28.55	53.90	25.35	5000.0	1000.000	366.0	V	344.0	17.6
21769.406250	43.02	---	73.90	30.88	5000.0	1000.000	366.0	V	344.0	17.6
23580.206250	45.95	---	73.90	27.95	5000.0	1000.000	303.0	H	250.0	23.9
23580.206250	---	32.79	53.90	21.11	5000.0	1000.000	303.0	H	250.0	23.9
24055.381250	49.40	---	73.90	24.50	5000.0	1000.000	190.0	H	282.0	27.6
24055.381250	---	35.93	53.90	17.97	5000.0	1000.000	190.0	H	282.0	27.6
24822.937500	---	31.69	53.90	22.21	5000.0	1000.000	304.0	H	47.0	22.3
24822.937500	45.72	---	73.90	28.18	5000.0	1000.000	304.0	H	47.0	22.3
26471.375000	44.17	---	73.90	29.73	5000.0	1000.000	335.0	V	280.0	23.3
26471.375000	---	30.44	53.90	23.46	5000.0	1000.000	335.0	V	280.0	23.3

Notes: [1] Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

8.5 Power spectral density

8.5.1 References and limits

- FCC 47 CFR Part 15, Subpart B: §15.247(e)
- RSS-247: §5.2(b)
- Test method: ANSI C63.10 §11.10.7 (Method AVGPSD-3)

§15.247:
(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
RSS-247:
5.4 DTSs include systems that employ digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to the bands 902-928 MHz and 2400-2483.5 MHz:
(b) The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of section 5.4(d), (i.e., the power spectral density shall be determined using the same method as is used to determine the conducted output power).

8.5.2 Test summary

Verdict	Pass		
Test date	February 8, 2023	Temperature	19.74 °C
Test engineer	Chenhao Ma, Wireless Test Technician	Air pressure	1002.4 mbar
Test location	☒ Wireless bench ☐ Other:	Relative humidity	39.98 %

8.5.3 Notes

Testing was performed with the transmitter operating on a fixed channel at full power. Low, middle and high channels were tested.
Use method AVGSA-3 for testing.

8.5.4 Setup details

EUT power input during test	Battery supply
EUT setup configuration	☒ Table-top ☐ Floor standing ☐ Other:

Spectrum analyzer settings:

Resolution bandwidth	See plot
Video bandwidth	See plot
Detector mode	RMS
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

8.5.5 Test data

Table 8.5-1: *TSM-Bandwidth 1.2MHz power spectral density test data*

Test frequency (MHz)	Measured power spectral density (dBm/3kHz)	Limit (dBm/3kHz)
2403	5.71	8.0
2442	5.97	8.0
2478	6.07	8.0

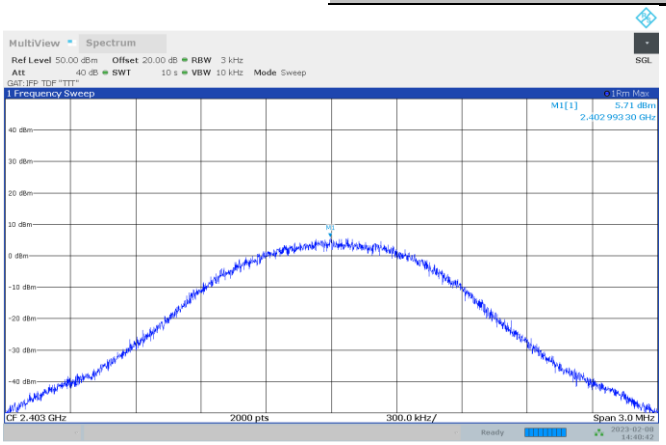

Figure 8.5-1: *TSM-Power spectral density, 2403 MHz*

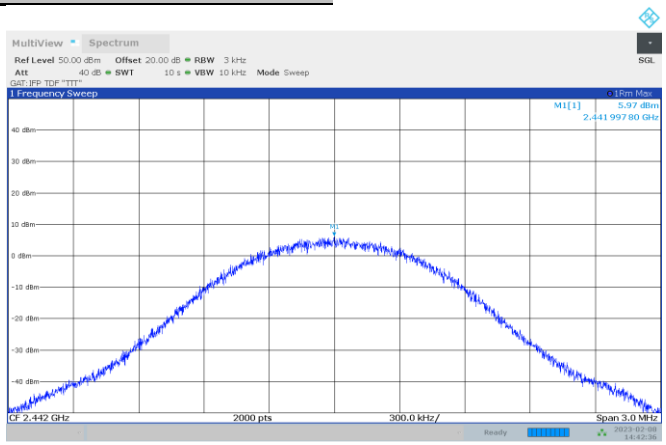

Figure 8.5-2: *TSM-Power spectral density, 2442 MHz*

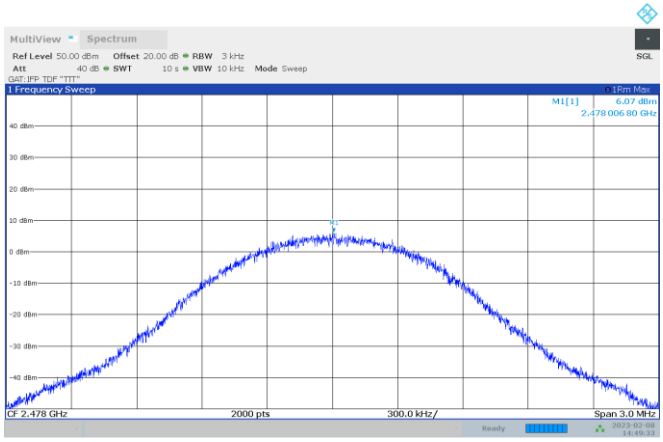

Figure 8.5-3: *TSM-Power spectral density, 2478 MHz*

Table 8.5-2: *TSM-Bandwidth 3.6MHz power spectral density test data*

Test frequency (MHz)	Measured power spectral density (dBm/3kHz)	Limit (dBm/3kHz)
2404	2.71	8.0
2442	2.04	8.0
2478	2.50	8.0

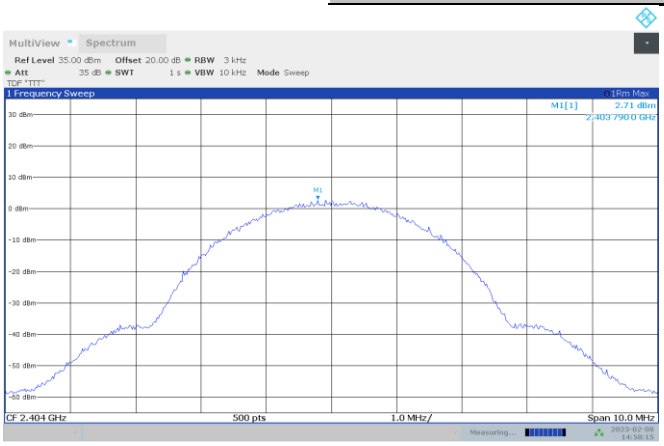

Figure 8.5-4: *TSM- Bandwidth 3.6MHz Power spectral density, 2404 MHz*

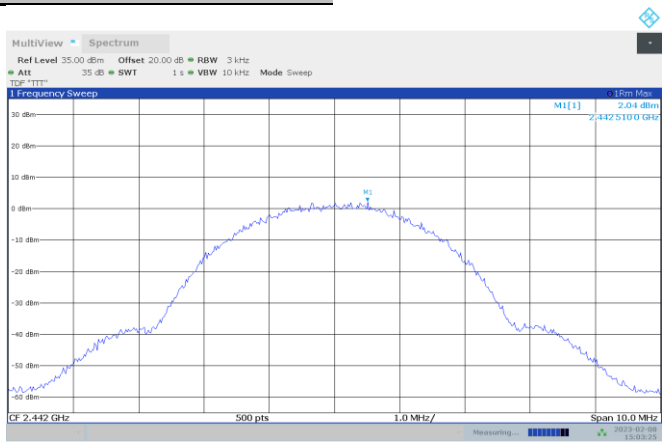

Figure 8.5-5: *TSM- Bandwidth 3.6MHz Power spectral density, 2442 MHz*

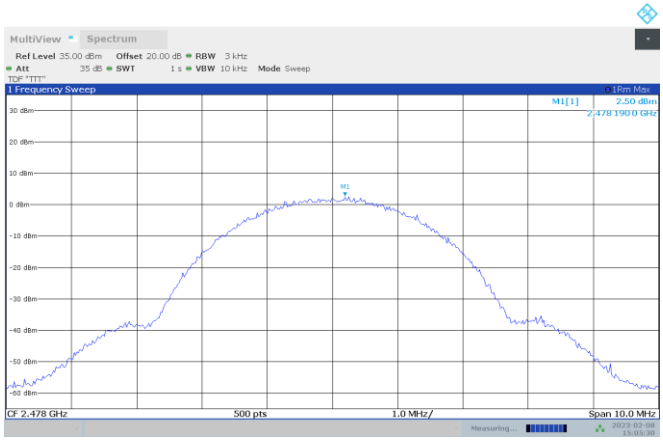

Figure 8.5-6: *TSM- Bandwidth 3.6MHz Power spectral density, 2478 MHz*

Table 8.5-3: *TSM-Bandwidth 10MHz power spectral density test data*

Test frequency (MHz)	Measured power spectral density (dBm/3kHz)	Limit (dBm/3kHz)
2412	2.19	8.0
2442	1.78	8.0
2465	1.94	8.0

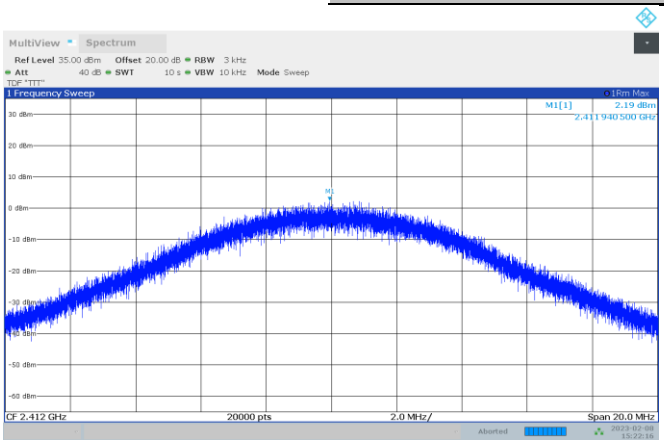

Figure 8.5-7: *TSM- Bandwidth 10MHz Power spectral density, 2412 MHz*

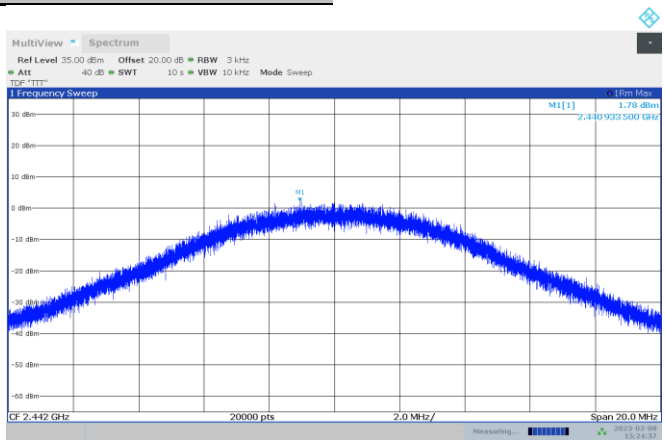

Figure 8.5-8: *TSM- Bandwidth 10MHz Power spectral density, 2442 MHz*

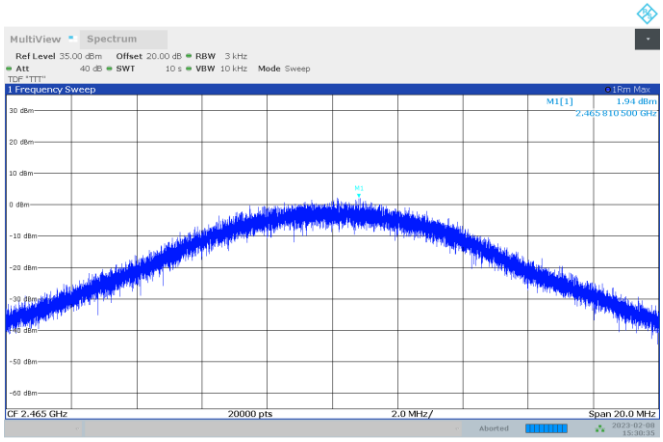

Figure 8.5-9: *TSM- Bandwidth 10MHz Power spectral density, 2465 MHz*

Table 8.5-4: *TSM-Bandwidth 20MHz power spectral density test data*

Test frequency (MHz)	Measured power spectral density (dBm/3kHz)	Limit (dBm/3kHz)
2422	1.97	30.0
2442	2.05	30.0

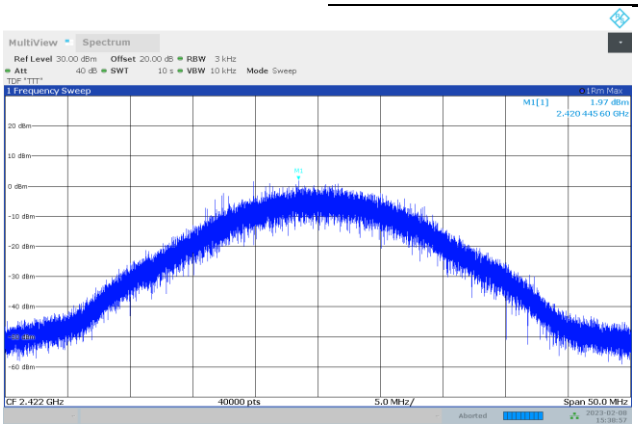

Figure 8.5-10: *TSM- Bandwidth 20MHz Power spectral density, 2422 MHz*

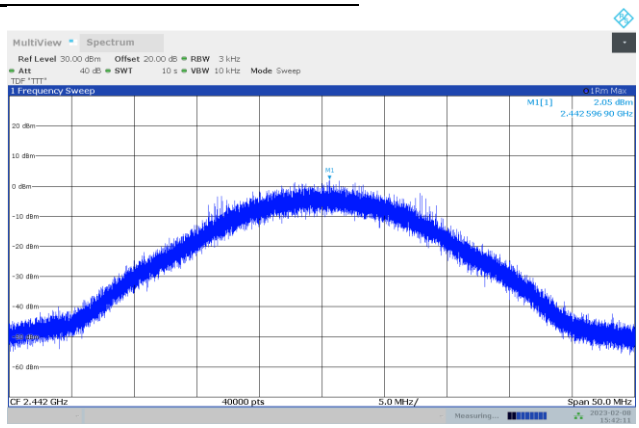

Figure 8.5-11: *TSM- Bandwidth 20MHz Power spectral density, 2442 MHz*

8.6 99 % occupied bandwidth

8.6.1 References and limits

- RSS-Gen: §6.7
- Test method: ANSI C63.4-2014: §6.9.2

RSS-GEN:

6.7 The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

8.6.2 Test summary

Verdict	Pass		
Test date	February 9, 2023	Temperature	18.22 °C
Test engineer	Chenhao Ma, Wireless Test Technician	Air pressure	996.7 mbar
Test location	☒ Wireless bench ☐ Other:	Relative humidity	41.26 %

8.6.3 Notes

Testing was performed with the transmitter operating on a fixed channel at full power. Low, middle and high channels were tested.

8.6.4 Setup details

EUT power input during test	12 VDC
EUT setup configuration	☒ Table-top ☐ Floor standing ☐ Other:

Receiver settings:

Resolution bandwidth	See plot
Video bandwidth	See plot
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

8.6.5 Test data

Table 8.6-1: *TSM-bandwidth 1.2MHz 99 % occupied bandwidth test data*

Test frequency (MHz)	Bandwidth (MHz)	Measured f_c (MHz)	Measured f_L (MHz)	Measured f_H (MHz)	Limit
2403	1.288	2402.979	2402.326	2403.615	f_H and f_L within 2400 – 2483.5 MHz
2442	1.247	2442.021	2441.362	2442.609	f_H and f_L within 2400 – 2483.5 MHz
2478	1.245	2477.979	2477.362	2478.608	f_H and f_L within 2400 – 2483.5 MHz

Table 8.6-2: *TSM-bandwidth 3.6MHz 99 % occupied bandwidth test data*

Test frequency (MHz)	Bandwidth (MHz)	Measured f_c (MHz)	Measured f_L (MHz)	Measured f_H (MHz)	Limit
2404	3.557	2404.229	2402.222	2405.779	f_H and f_L within 2400 – 2483.5 MHz
2442	3.567	2441.979	2440.215	2443.783	f_H and f_L within 2400 – 2483.5 MHz
2478	3.561	2477.979	2476.228	2479.790	f_H and f_L within 2400 – 2483.5 MHz

Table 8.6-3: *TSM-bandwidth 10MHz 99 % occupied bandwidth test data*

Test frequency (MHz)	Bandwidth (MHz)	Measured f_c (MHz)	Measured f_L (MHz)	Measured f_H (MHz)	Limit
2412	11.137	2413.059	2406.459	2417.597	f_H and f_L within 2400 – 2483.5 MHz
2442	11.135	2438.682	2436.468	2447.603	f_H and f_L within 2400 – 2483.5 MHz
2465	11.113	2465.021	2459.474	2470.587	f_H and f_L within 2400 – 2483.5 MHz

Table 8.6-4: *TSM-bandwidth 20MHz 99 % occupied bandwidth test data*

Test frequency (MHz)	Bandwidth (MHz)	Measured f_c (MHz)	Measured f_L (MHz)	Measured f_H (MHz)	Limit
2422	20.220	2421.979	2411.983	2432.213	f_H and f_L within 2400 – 2483.5 MHz
2442	20.182	2441.979	2432.018	2452.200	f_H and f_L within 2400 – 2483.5 MHz

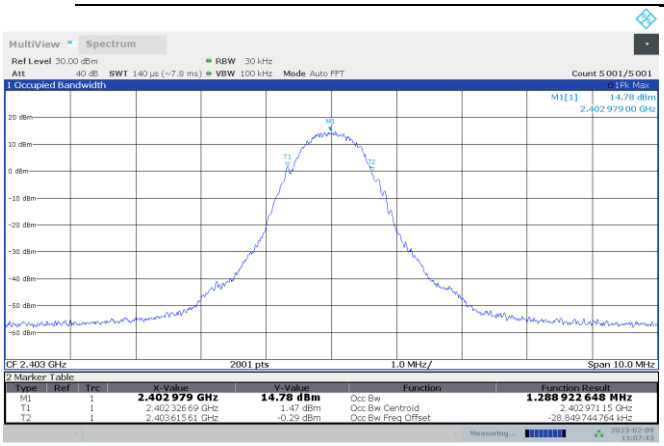

Figure 8.6-1: *TSM-Bandwidth 1.2MHz 99 % occupied bandwidth, 2403 MHz*

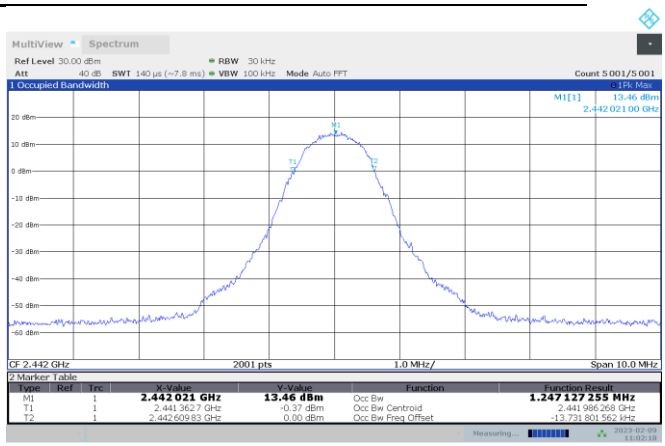

Figure 8.6-2: *TSM-Bandwidth 1.2MHz 99 % occupied bandwidth, 2442 MHz*

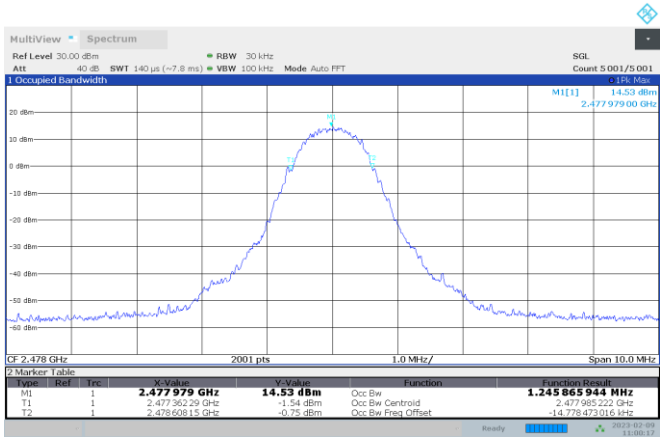

Figure 8.6-3: *TSM-Bandwidth 1.2MHz 99 % occupied bandwidth, 2478 MHz*

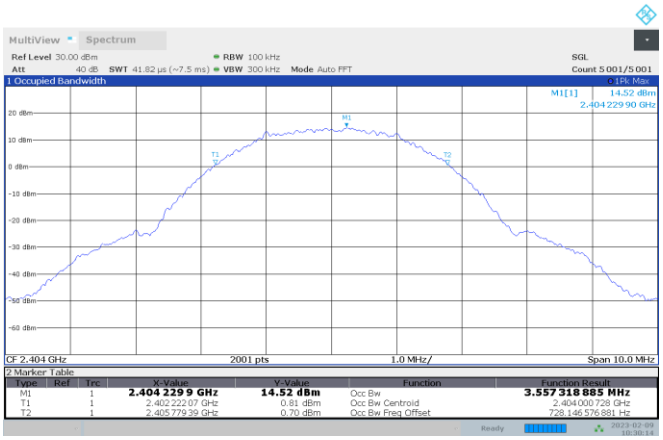

Figure 8.6-4: *TSM-Bandwidth 3.6MHz 99 % occupied bandwidth, 2404 MHz*

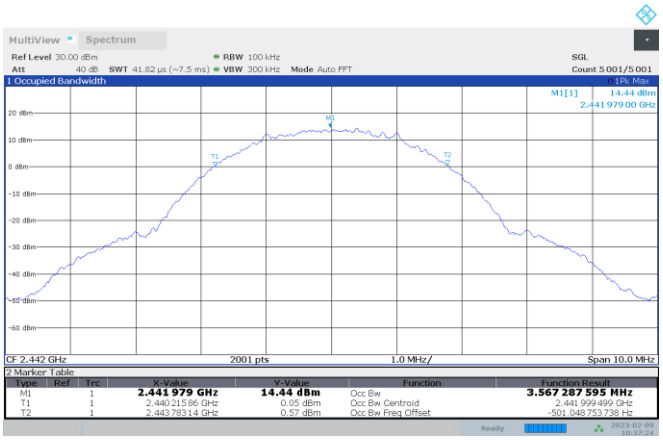

Figure 8.6-5: *TSM-Bandwidth 3.6MHz 99 % occupied bandwidth, 2442 MHz*

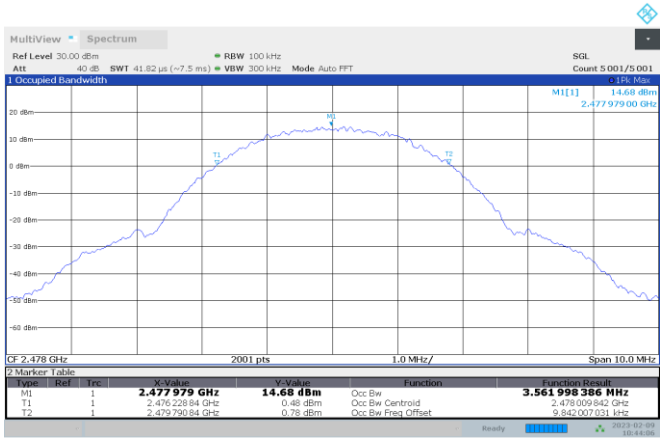

Figure 8.6-6: *TSM-Bandwidth 3.6MHz 99 % occupied bandwidth, 2478 MHz*

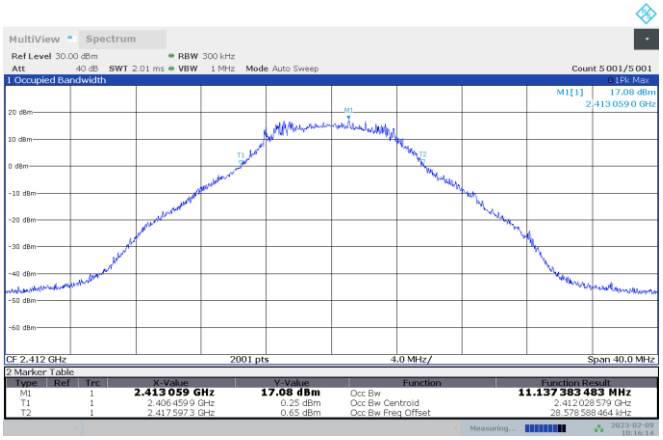

Figure 8.6-7: *TSM-Bandwidth 10MHz 99 % occupied bandwidth, 2412 MHz*

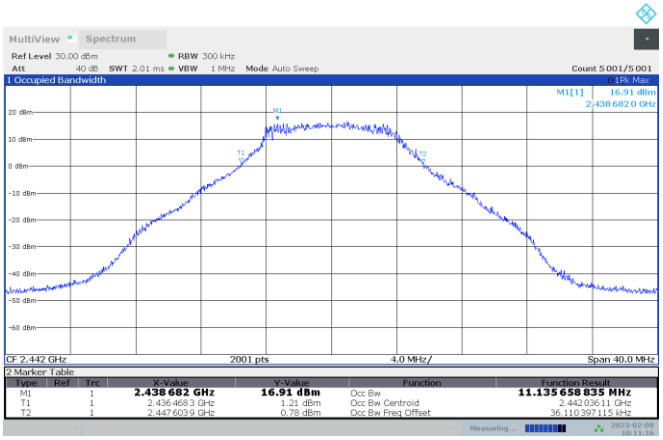

Figure 8.6-8: *TSM-Bandwidth 10MHz 99 % occupied bandwidth, 2442 MHz*

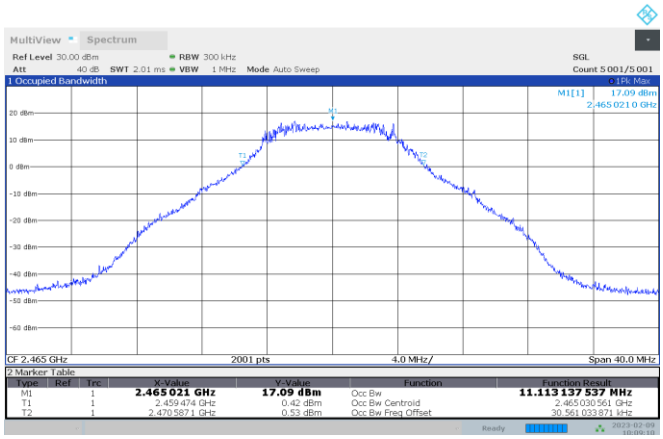

Figure 8.6-9: *TSM-Bandwidth 10MHz 99 % occupied bandwidth, 2465 MHz*

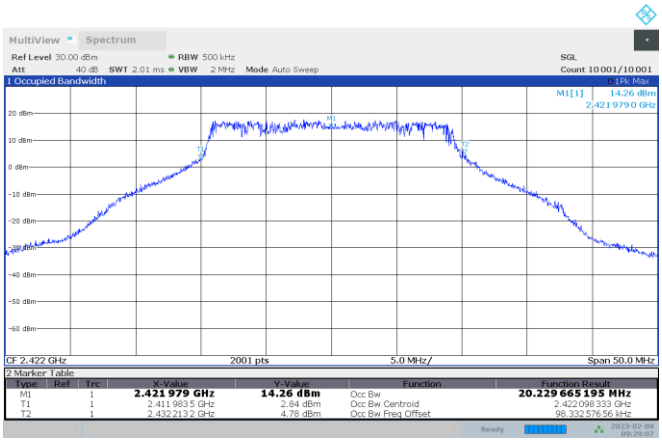

Figure 8.6-10: *TSM-Bandwidth 20MHz 99 % occupied bandwidth, 2422 MHz*

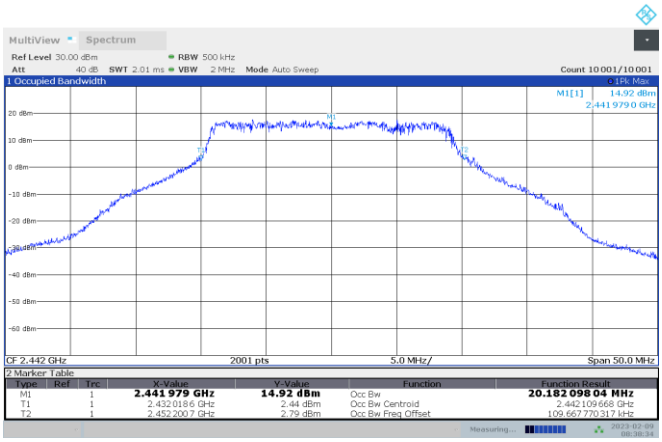

Figure 8.6-11: *TSM-Bandwidth 20MHz 99 % occupied bandwidth, 2442 MHz*

End of test report