



4.4 Conducted Spurious Emission & Band Edge

4.4.1 Test procedure

ANSI C63.10-2020 Clause 11.11, 11.12

4.4.2 Limit

§15.247 (d)

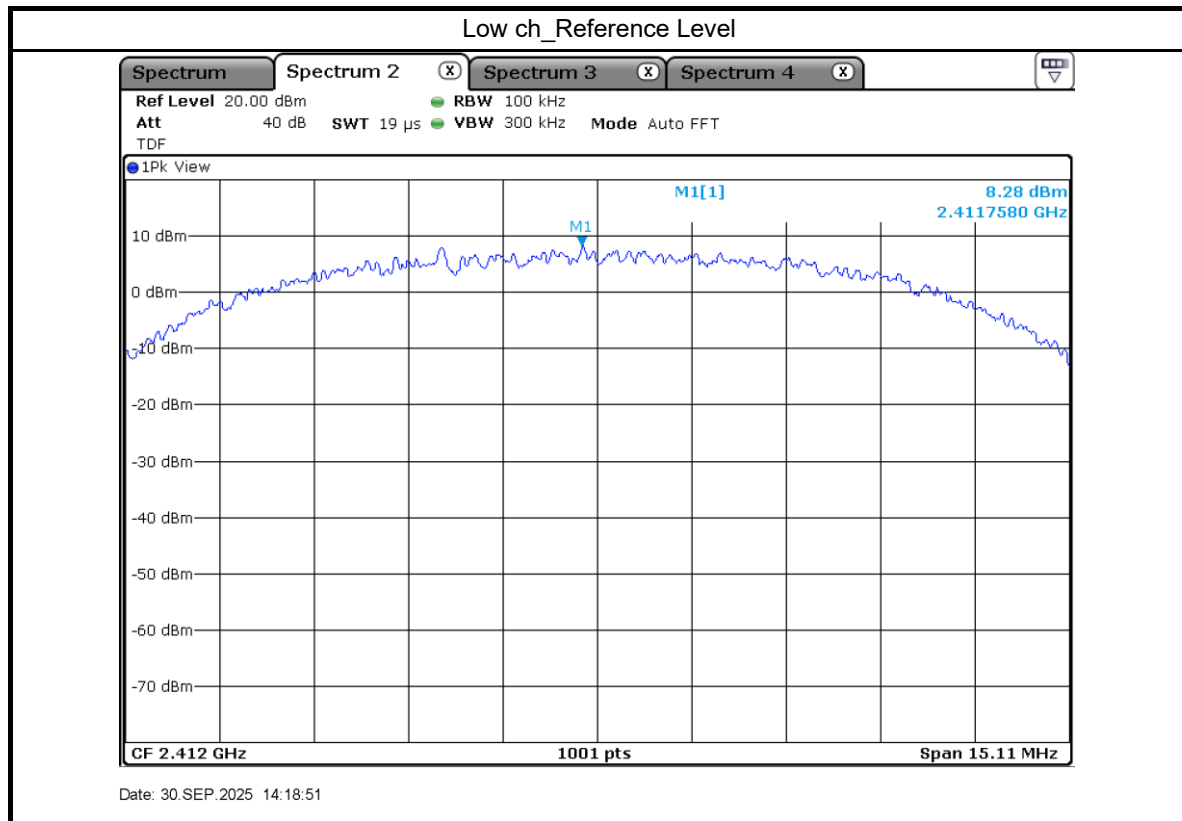
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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 limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

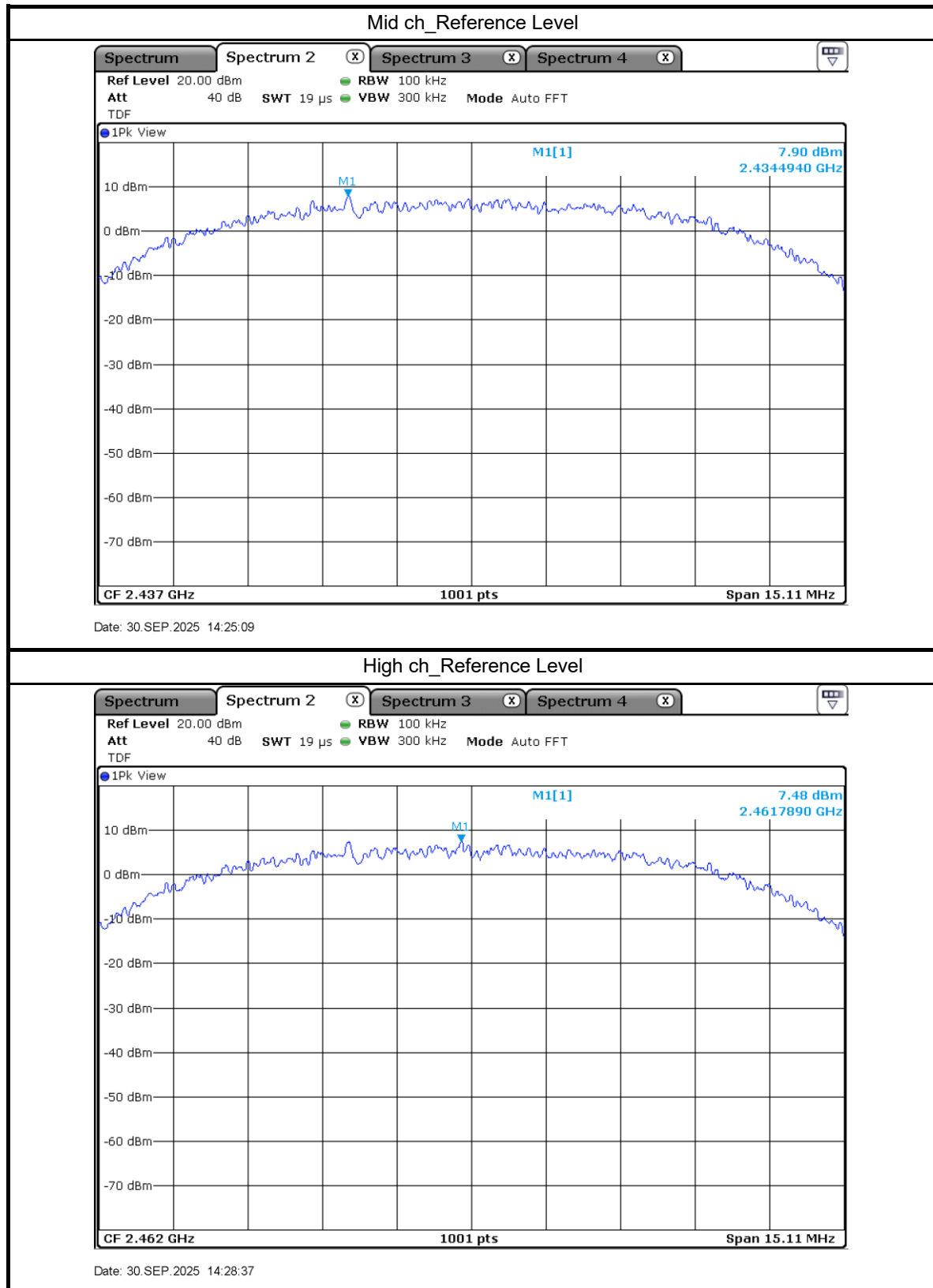


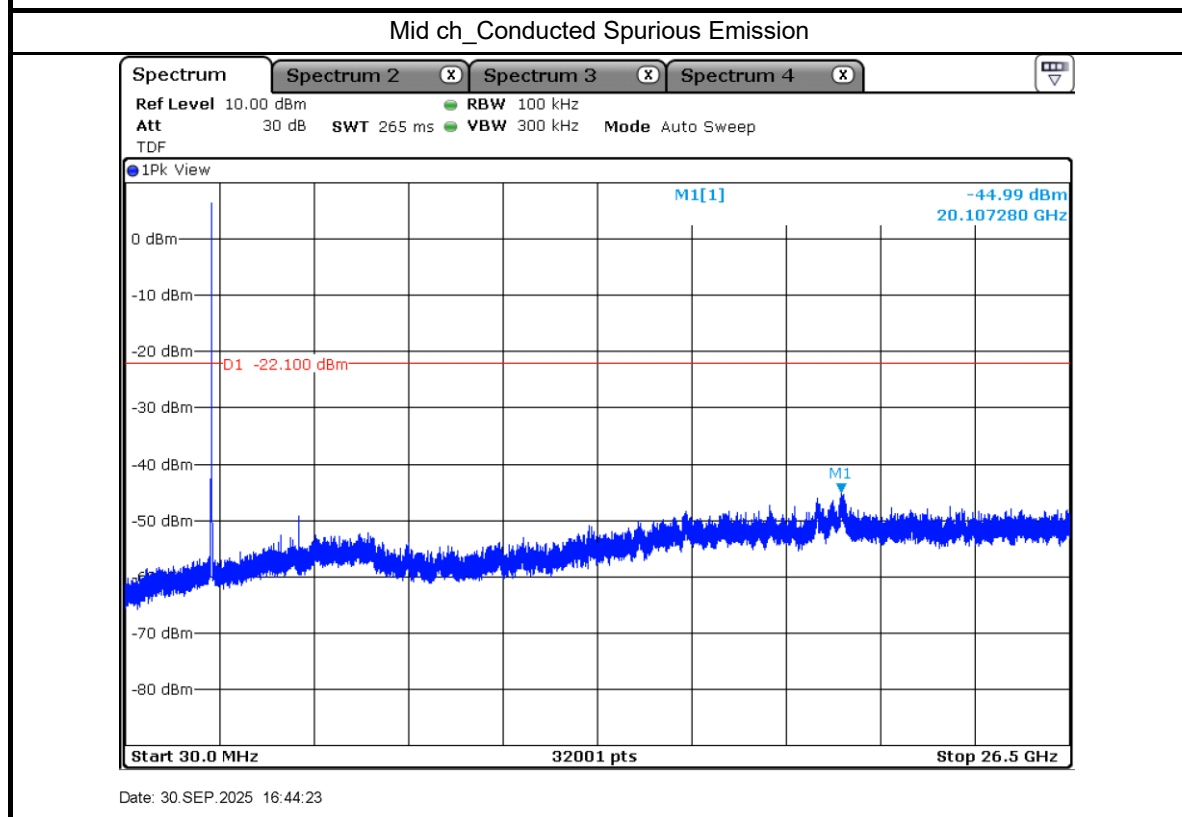
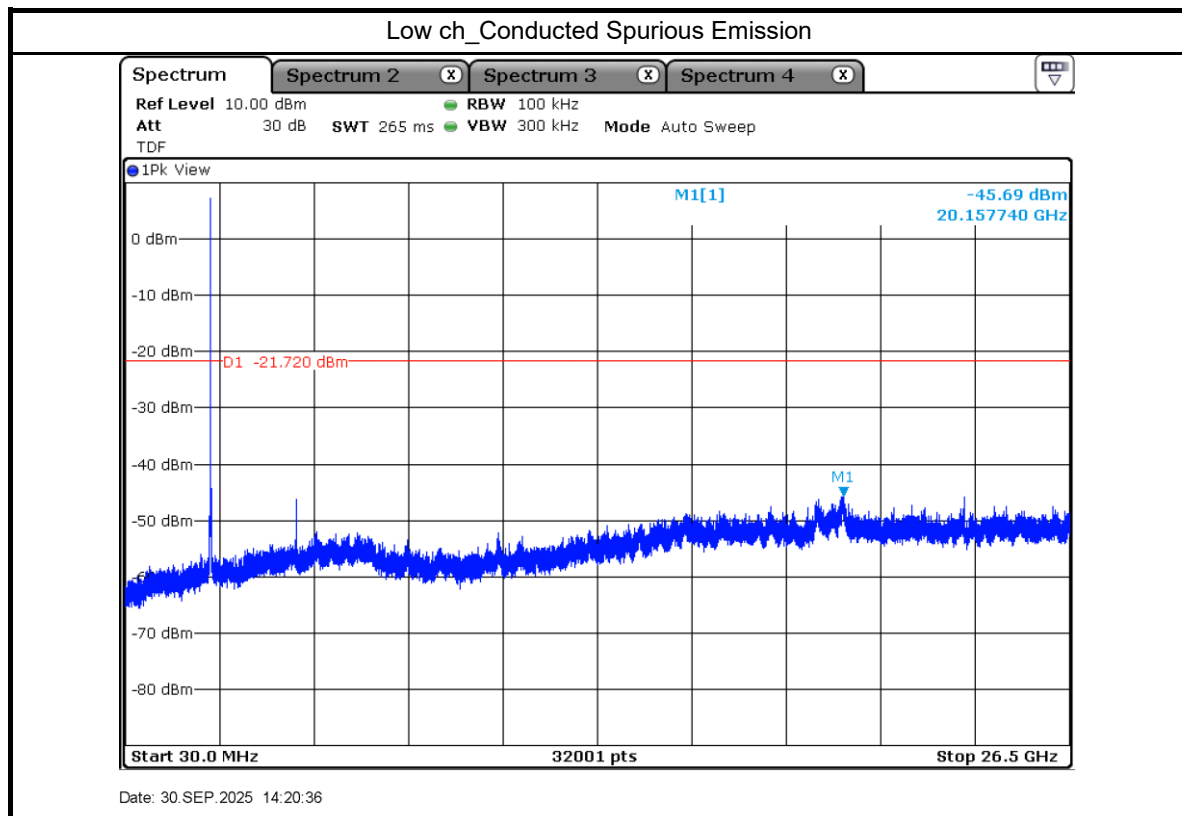
4.4.3 Test data

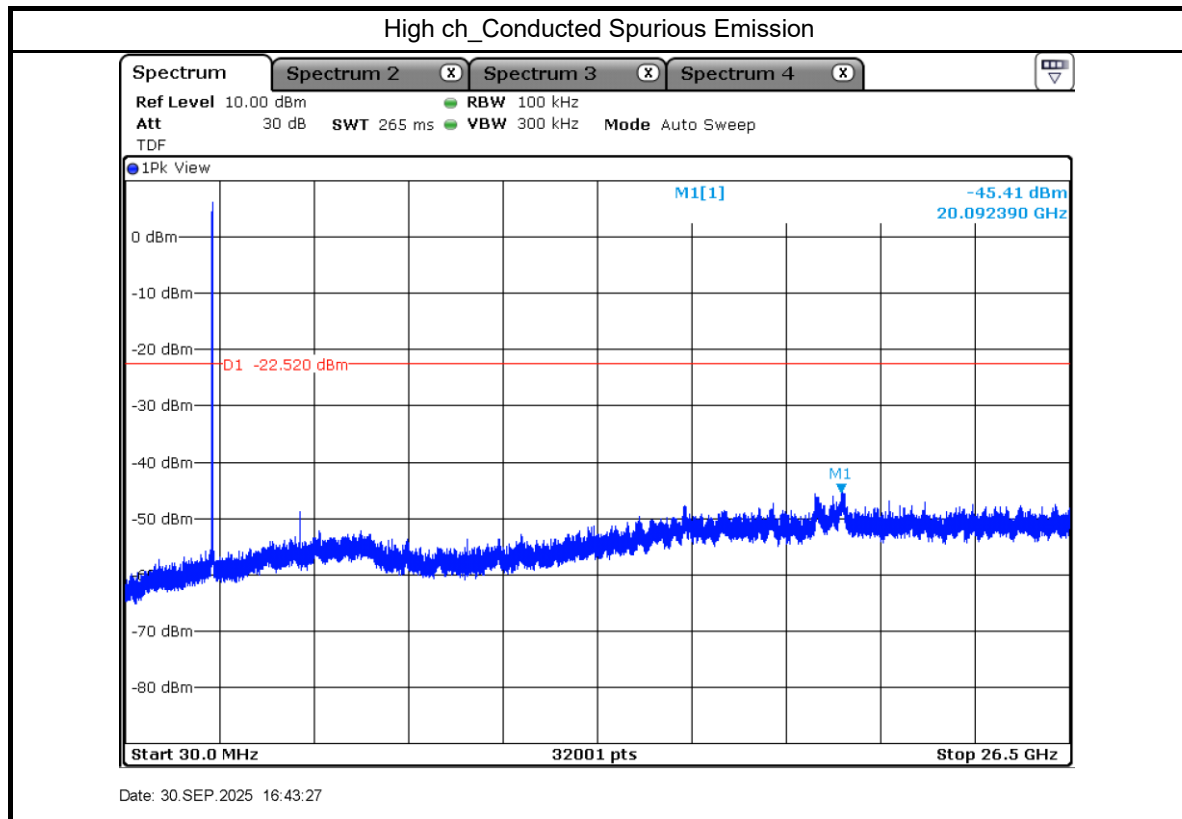
Result : Pass

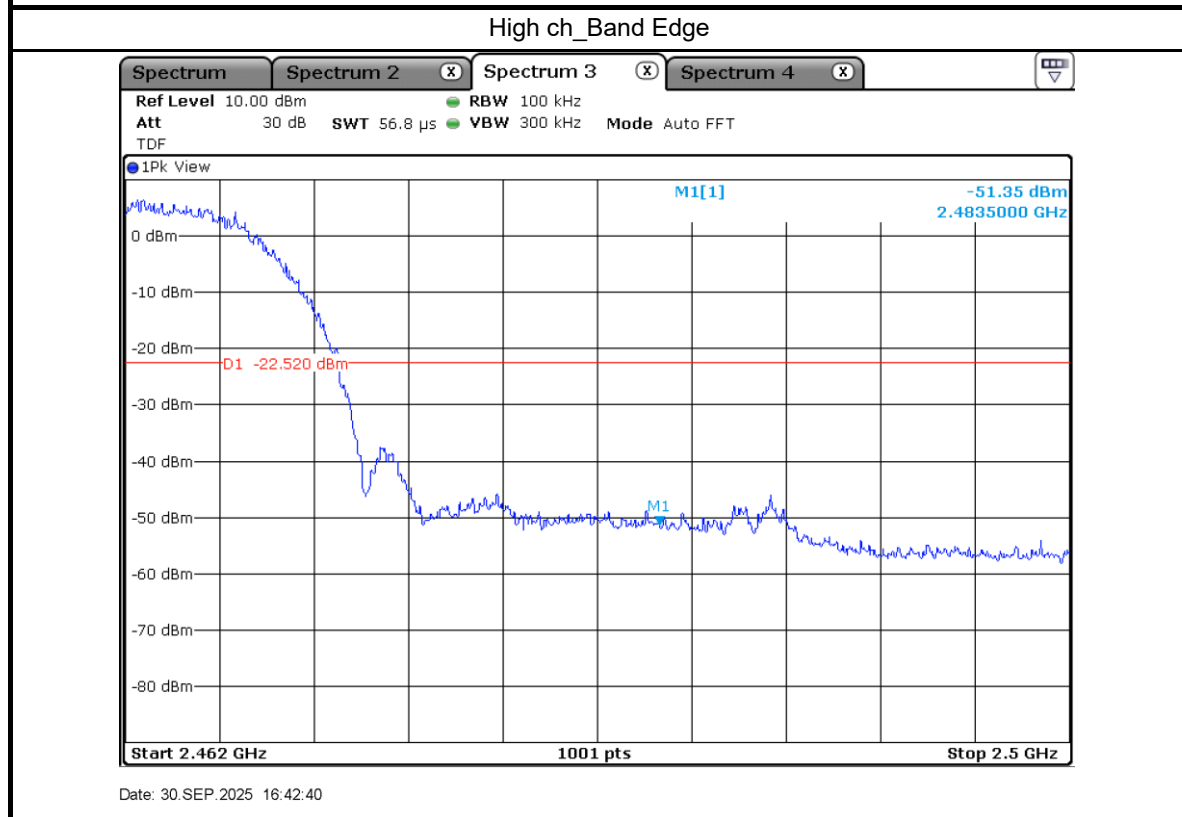
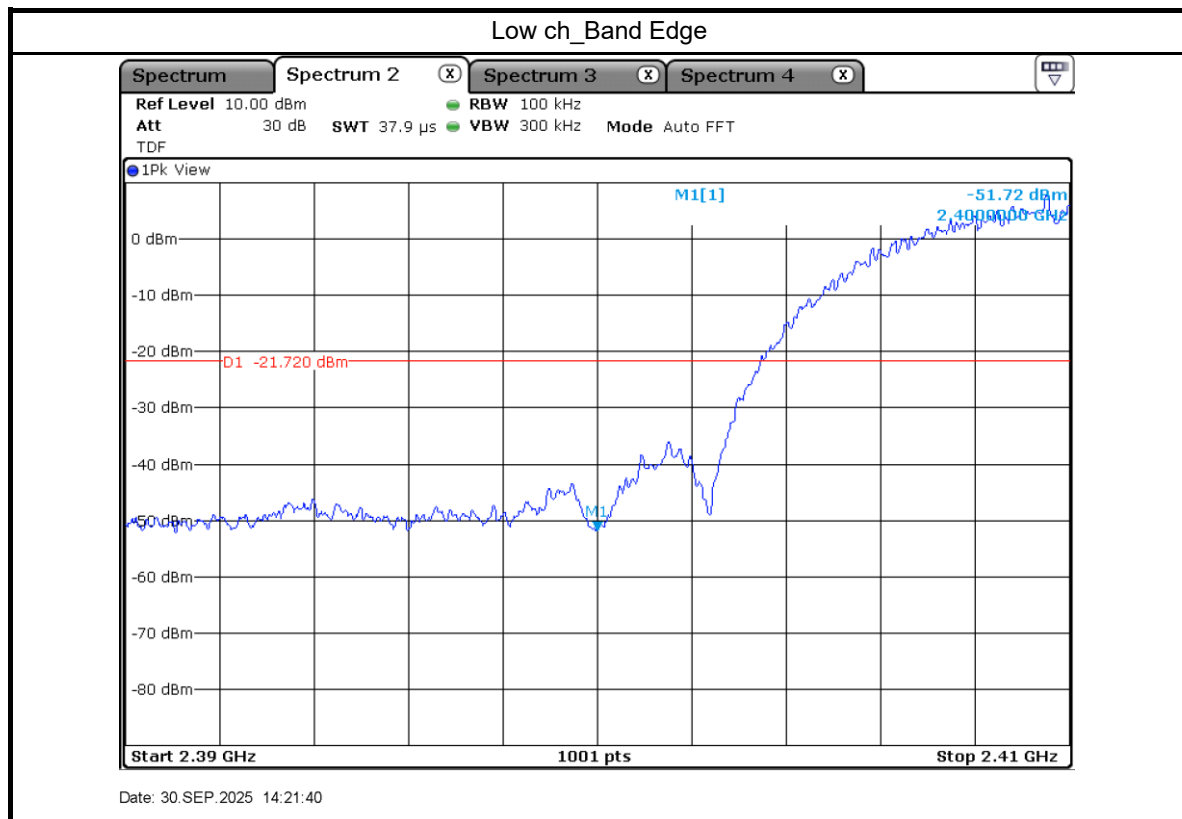
Mode : 802.11b(20 MHz BW)





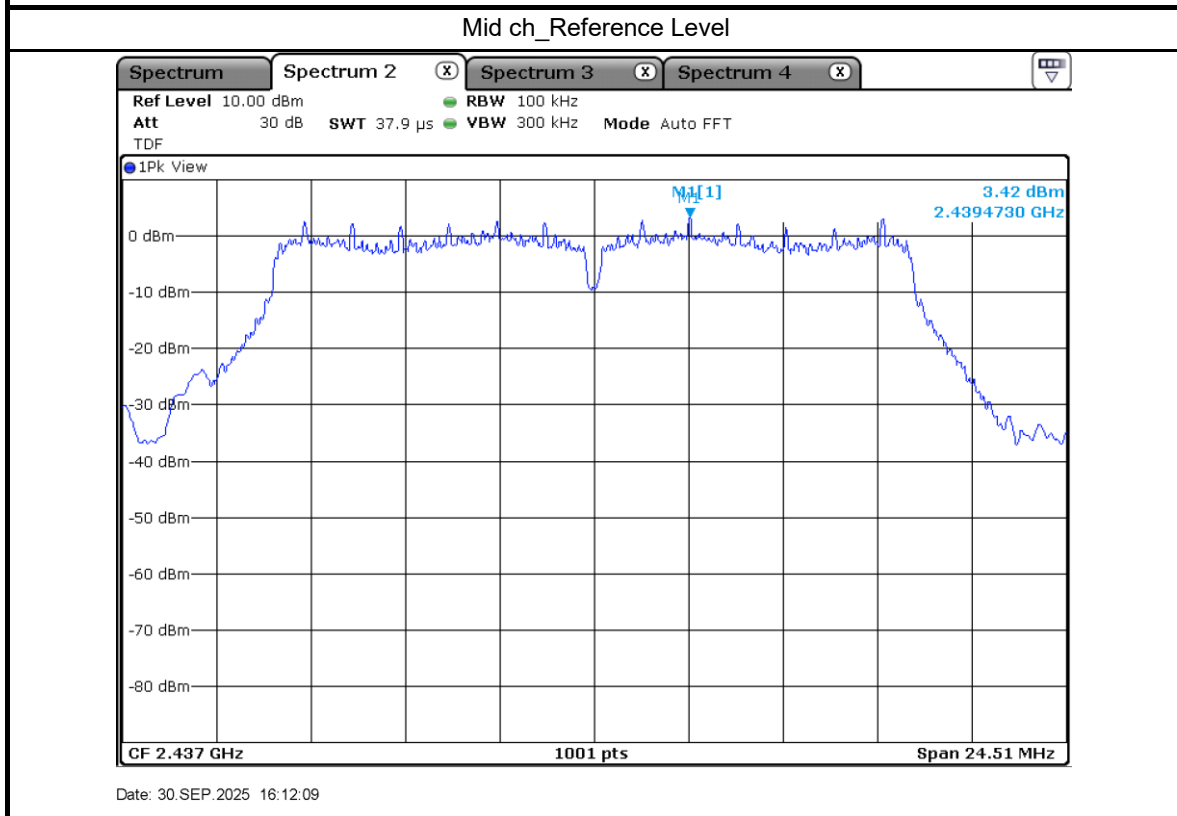
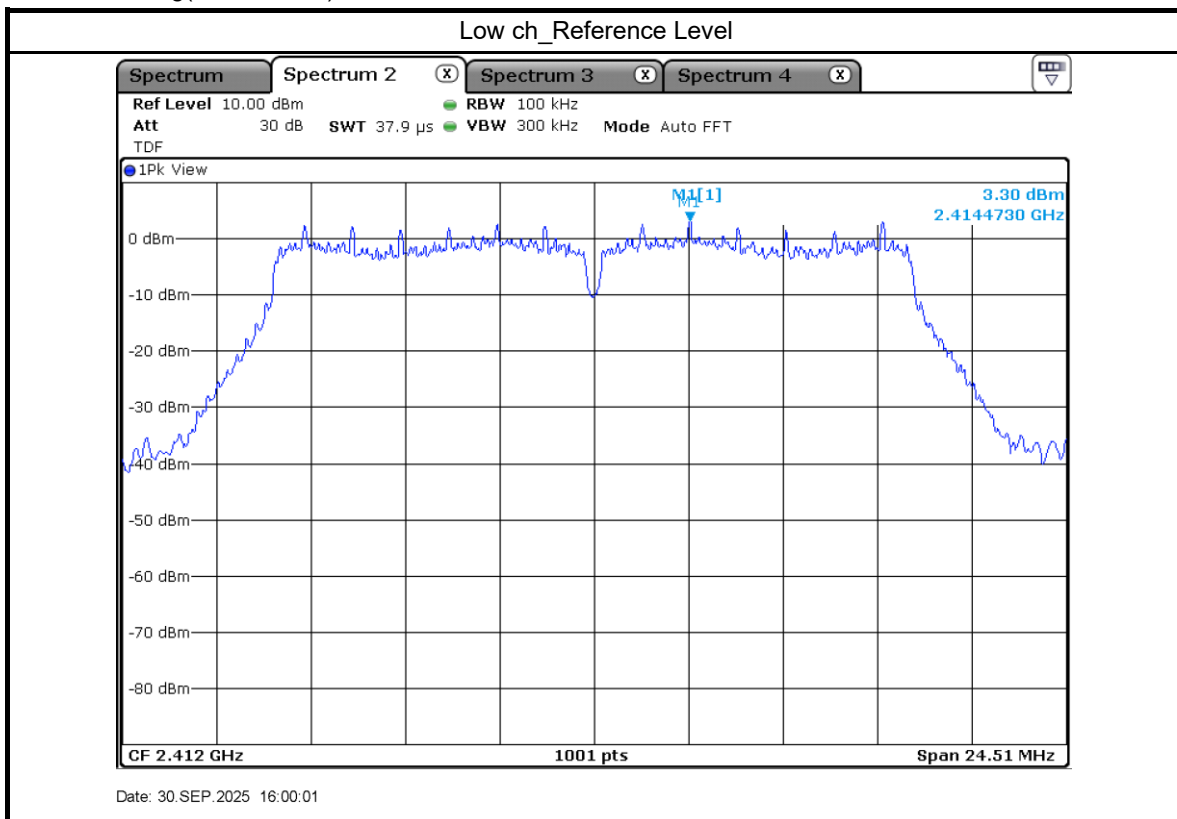


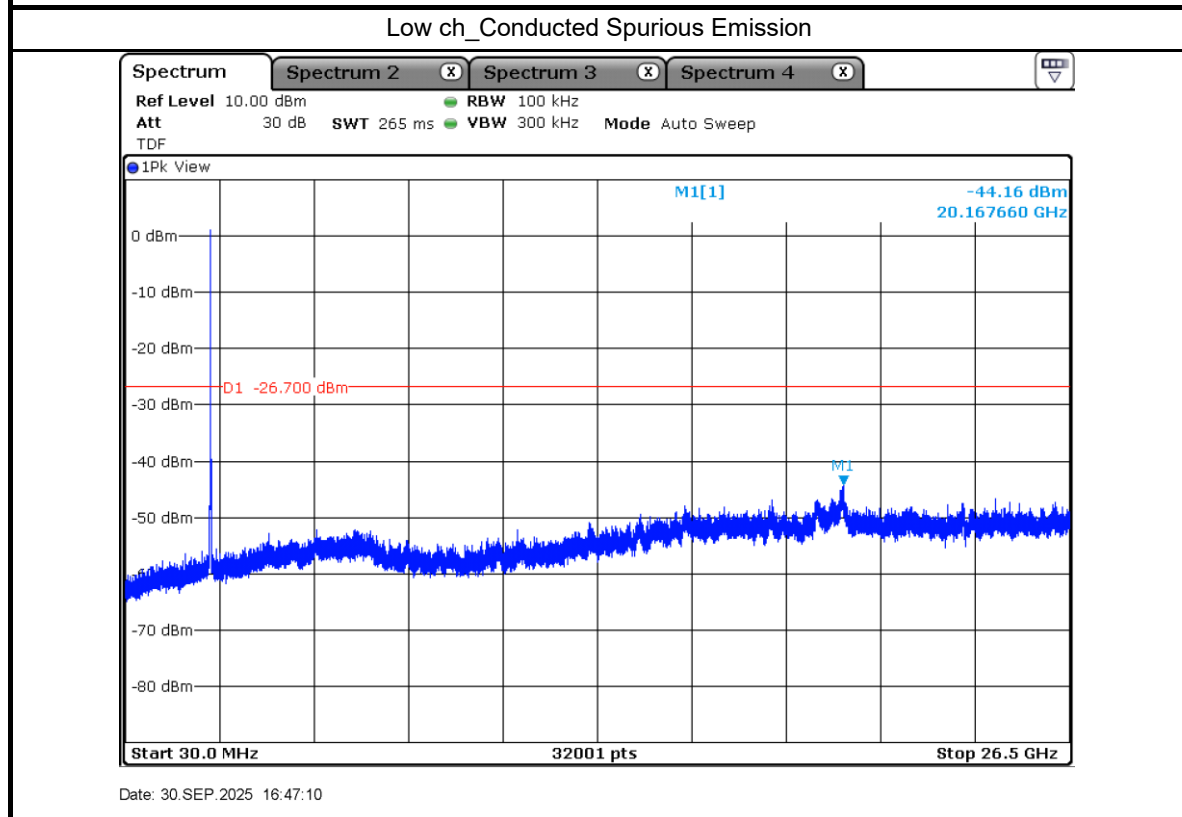
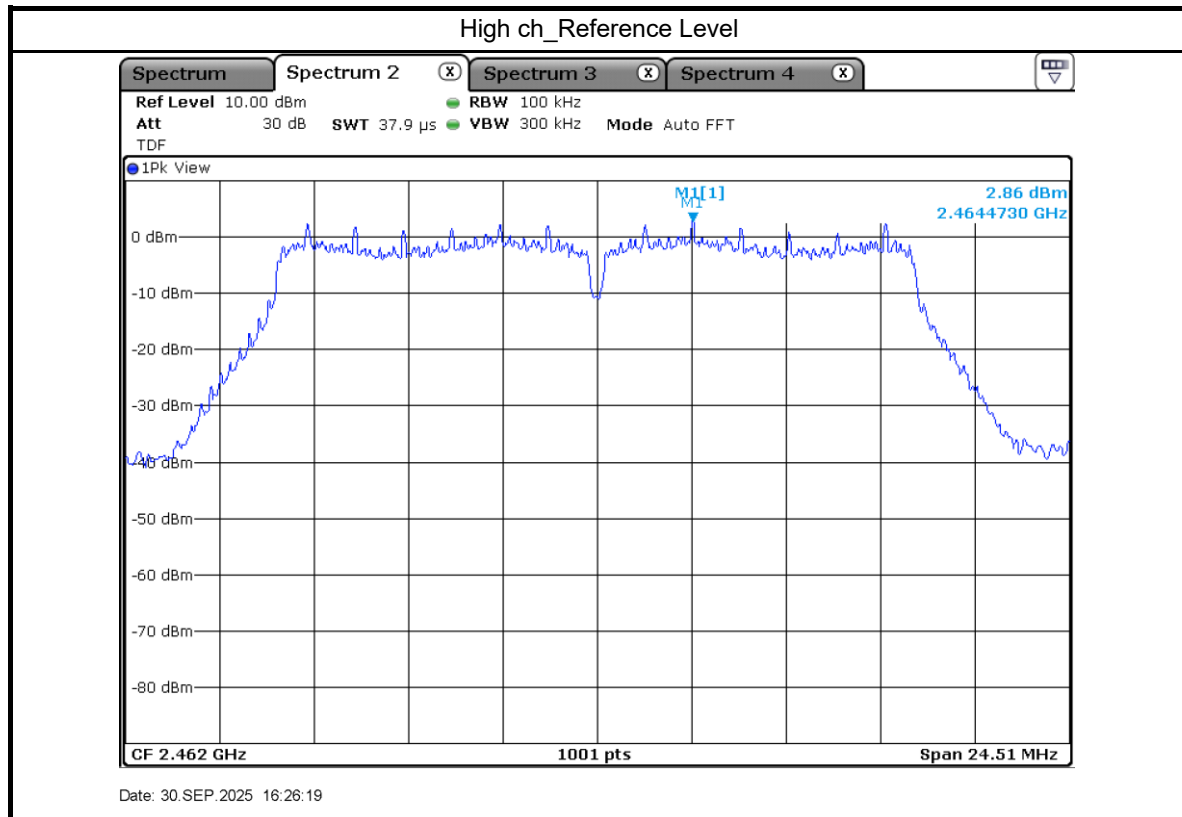


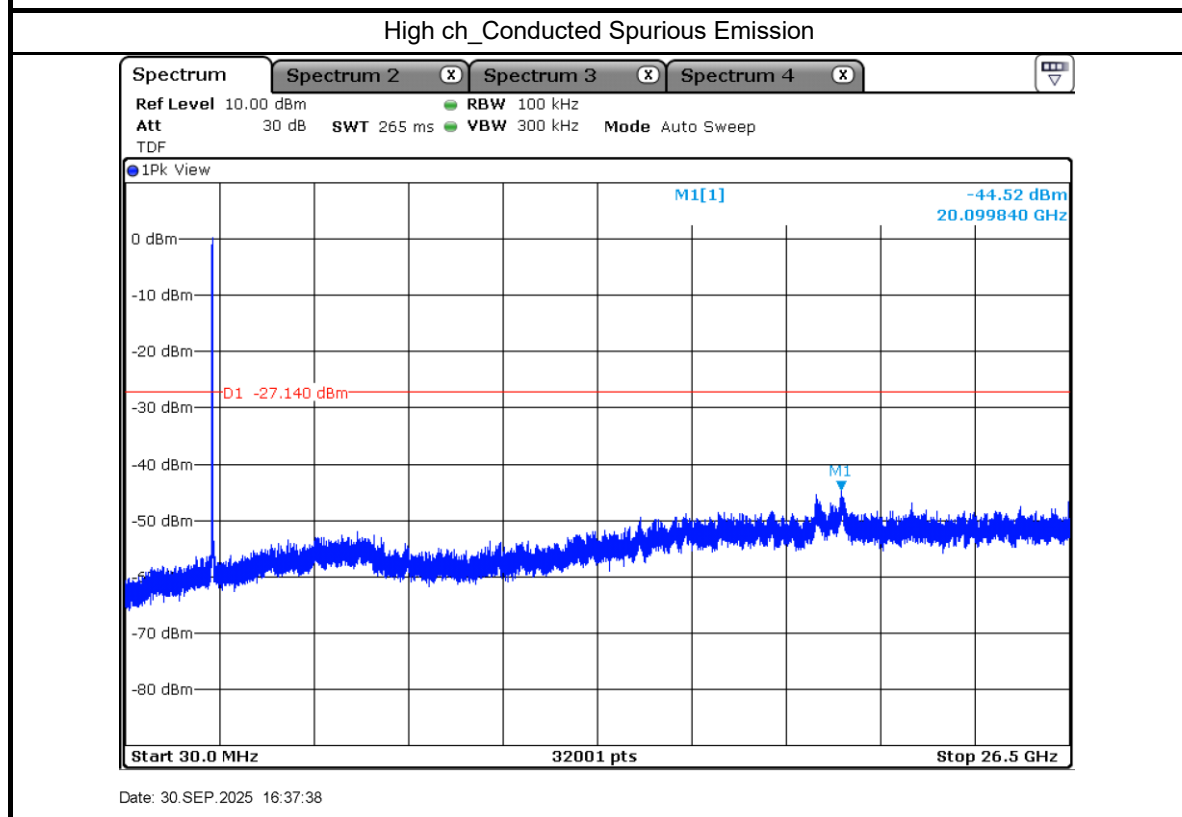
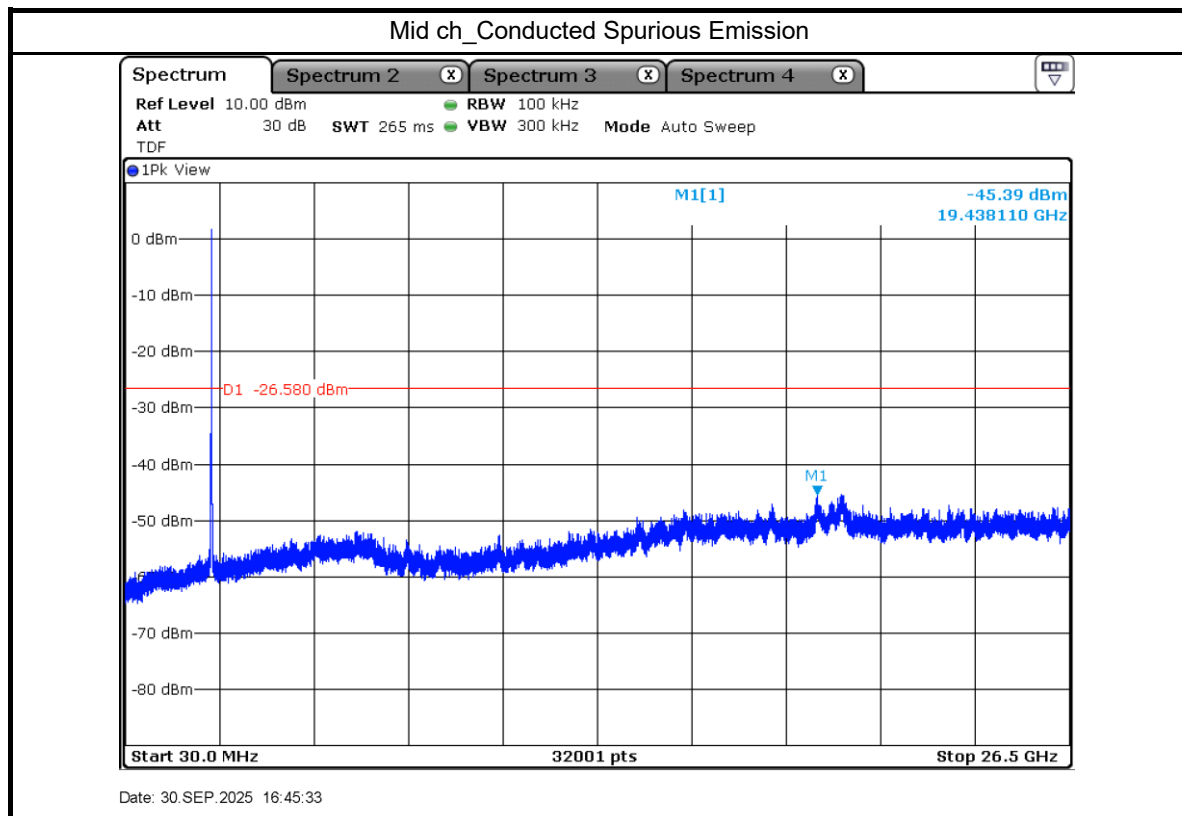


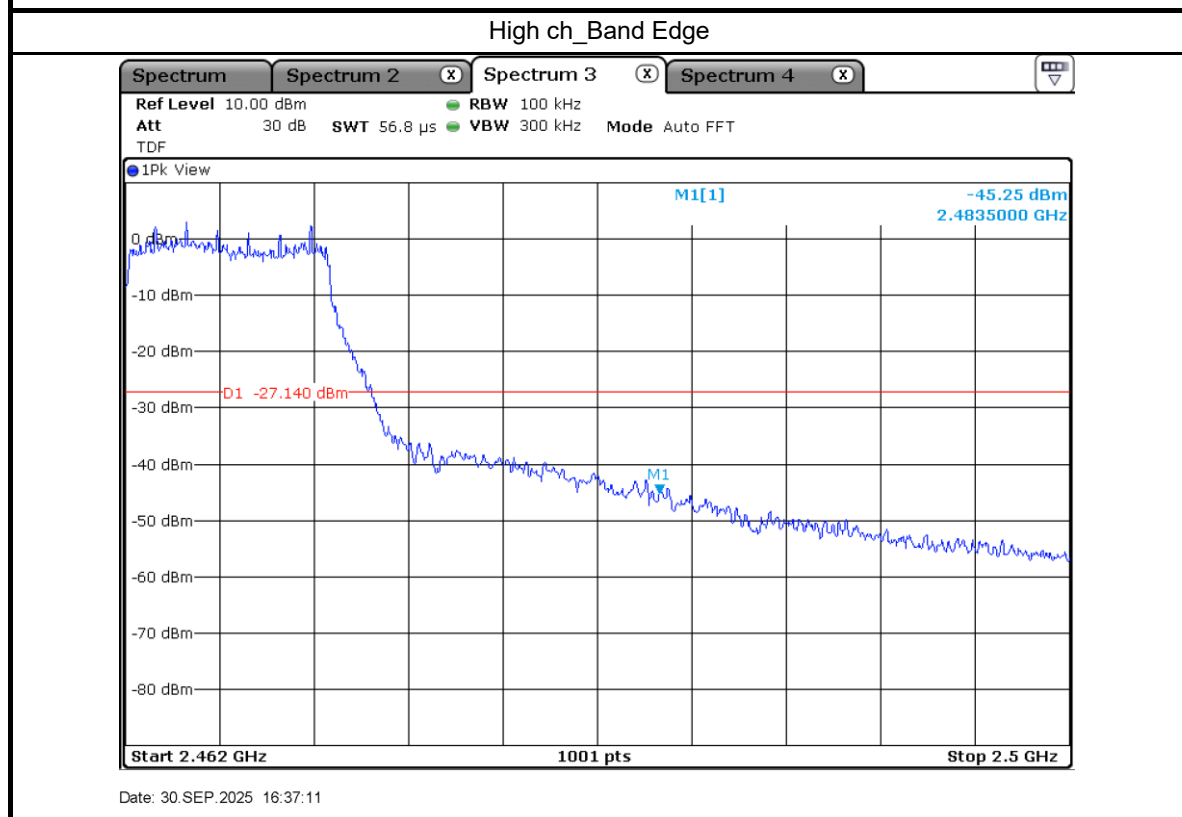
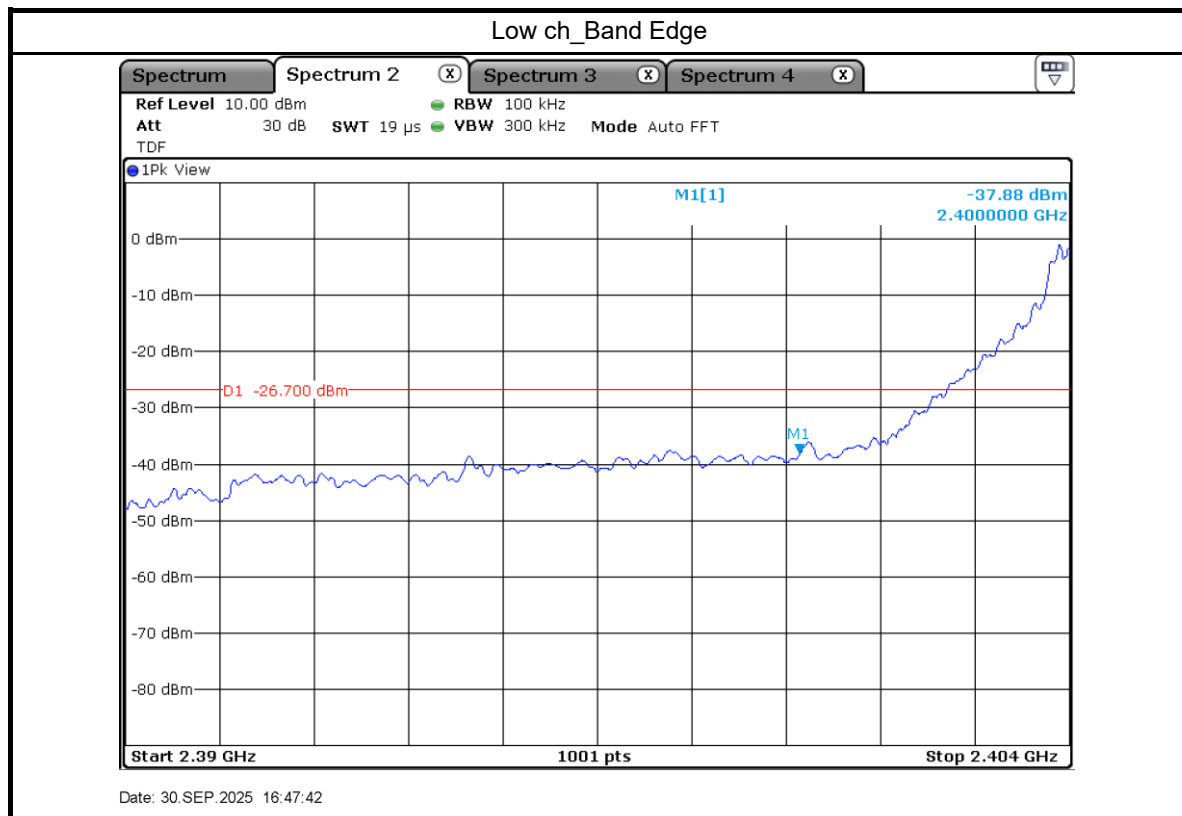


Mode : 802.11g(20 MHz BW)



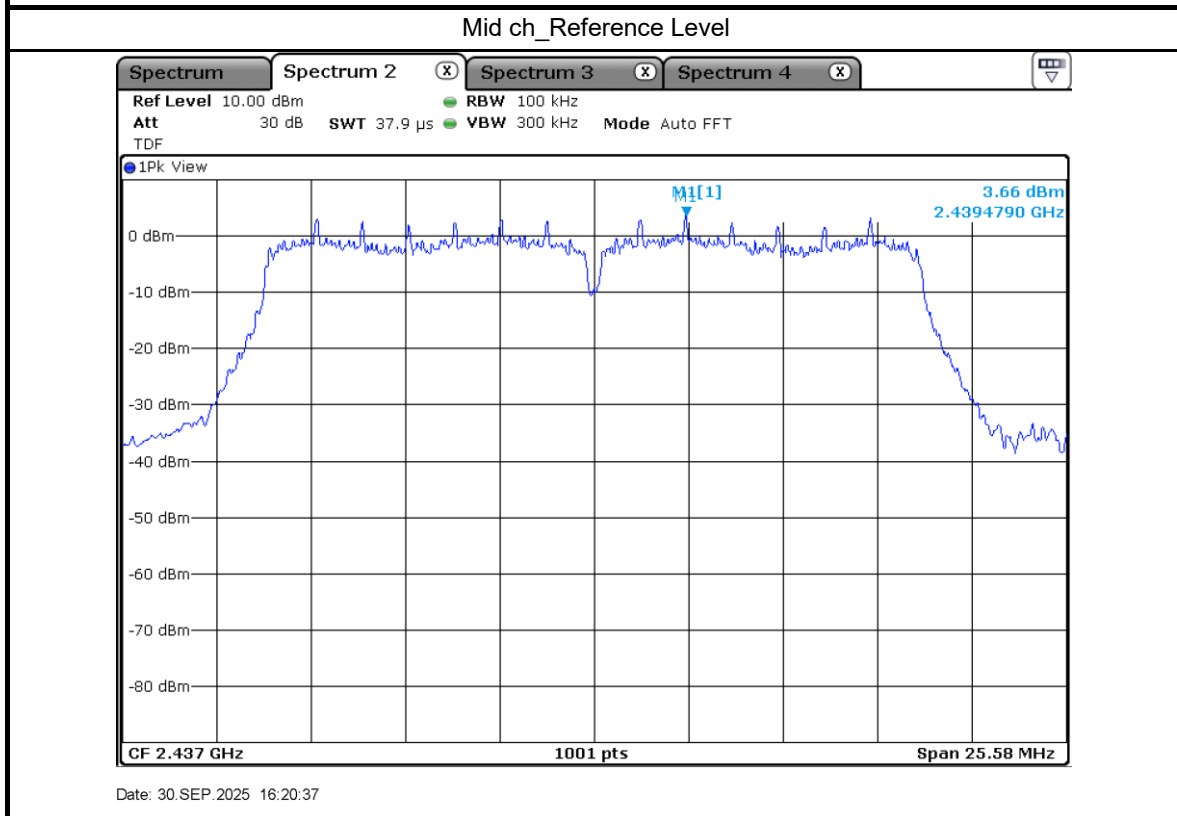
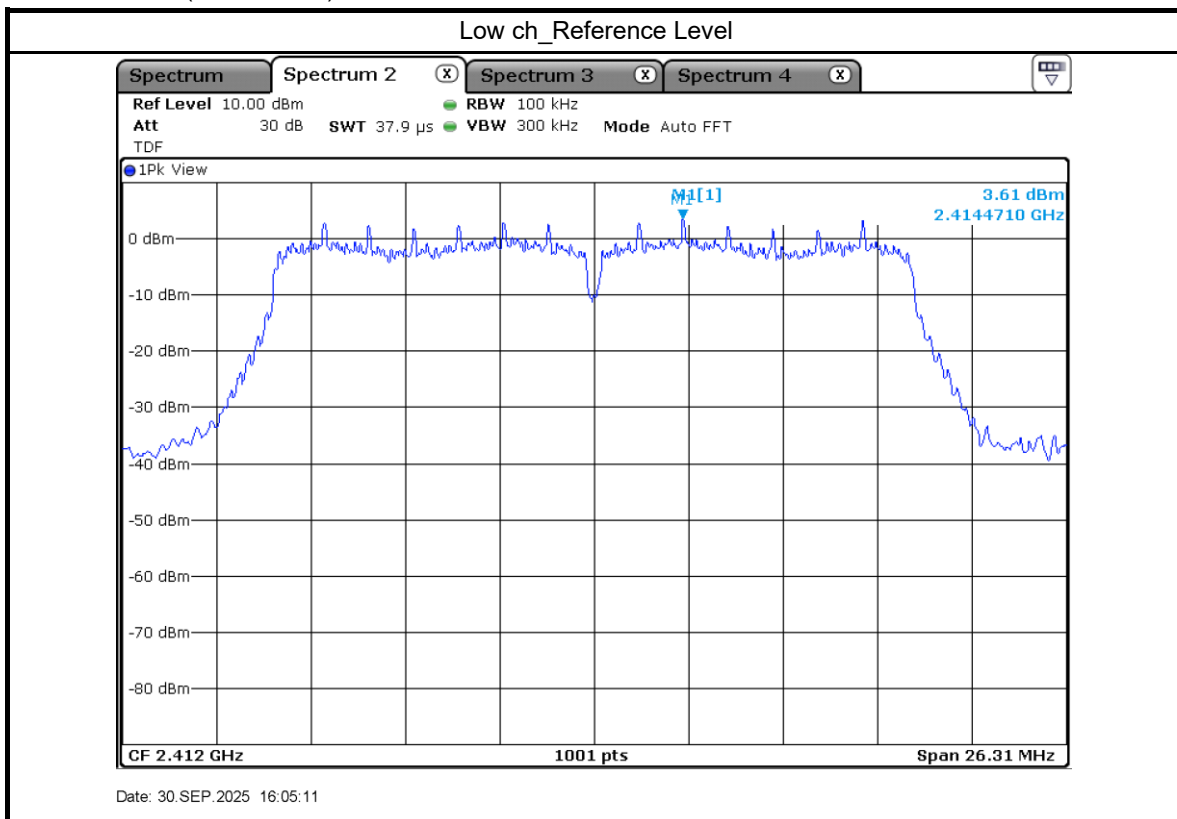


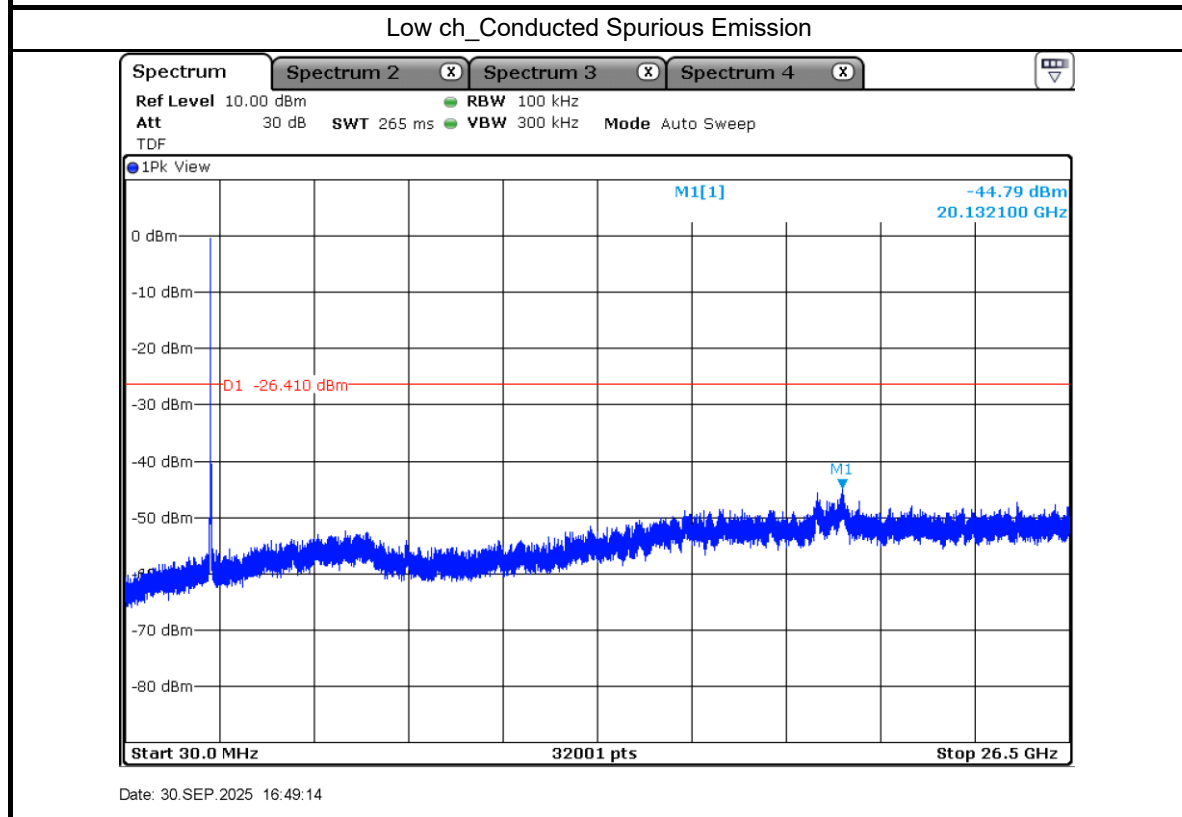
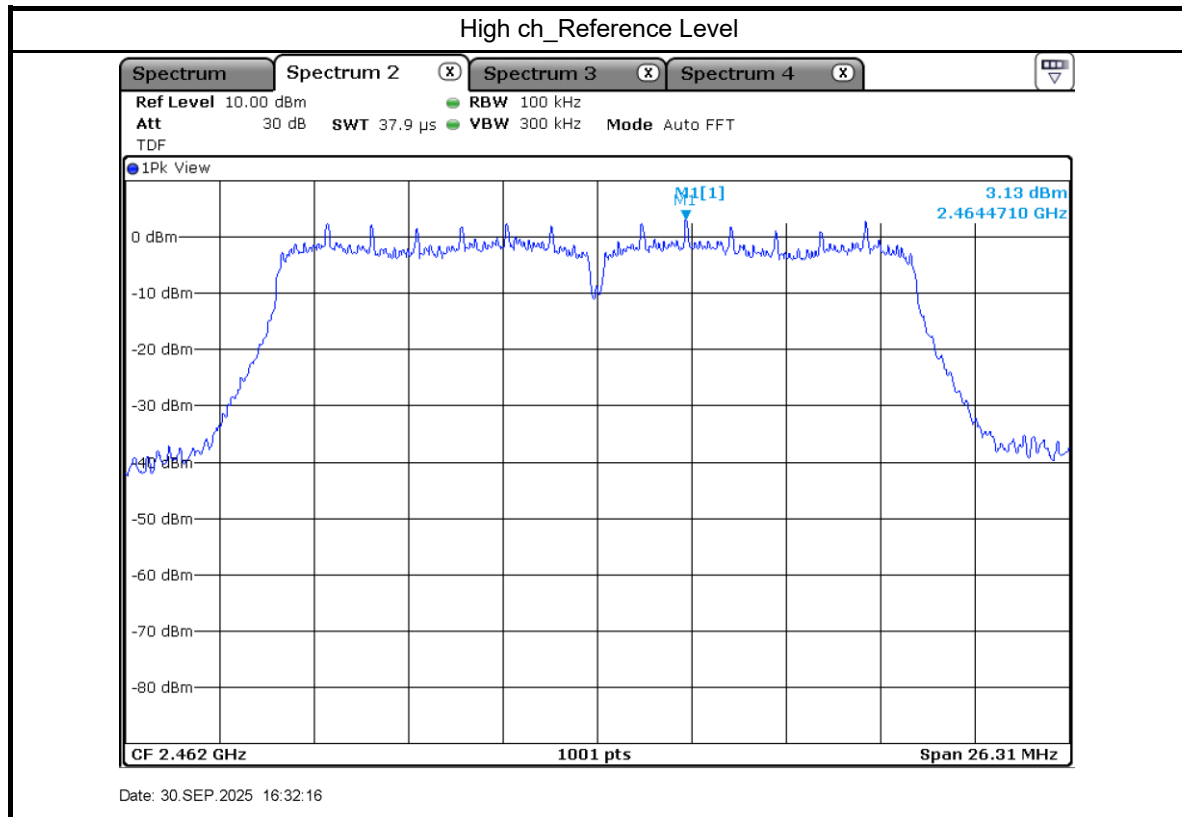


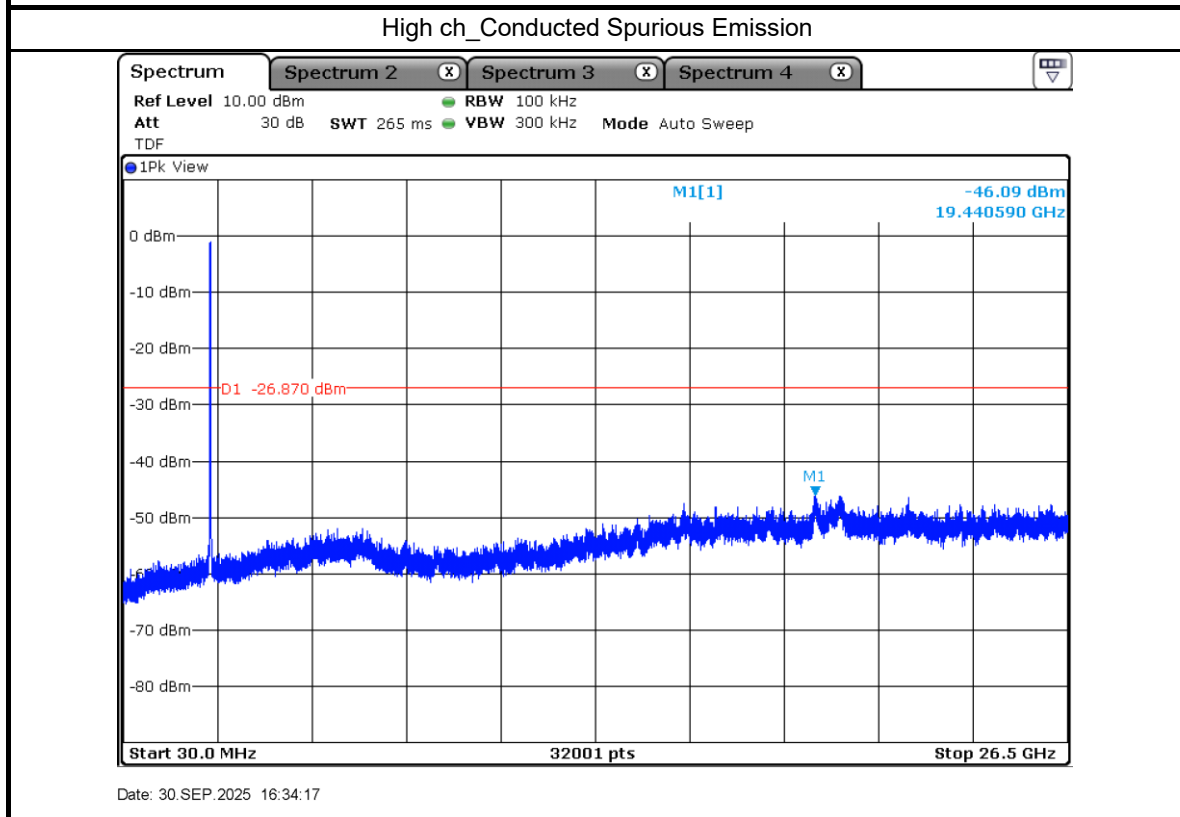
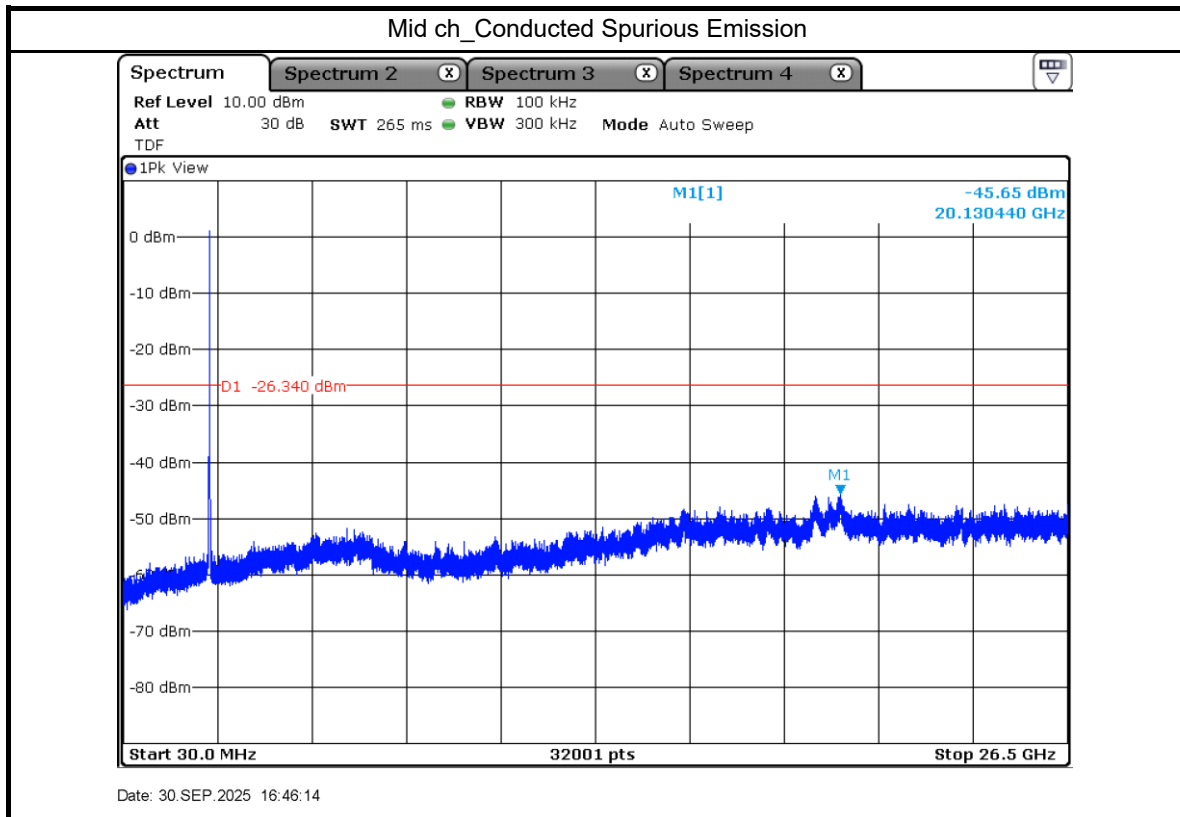


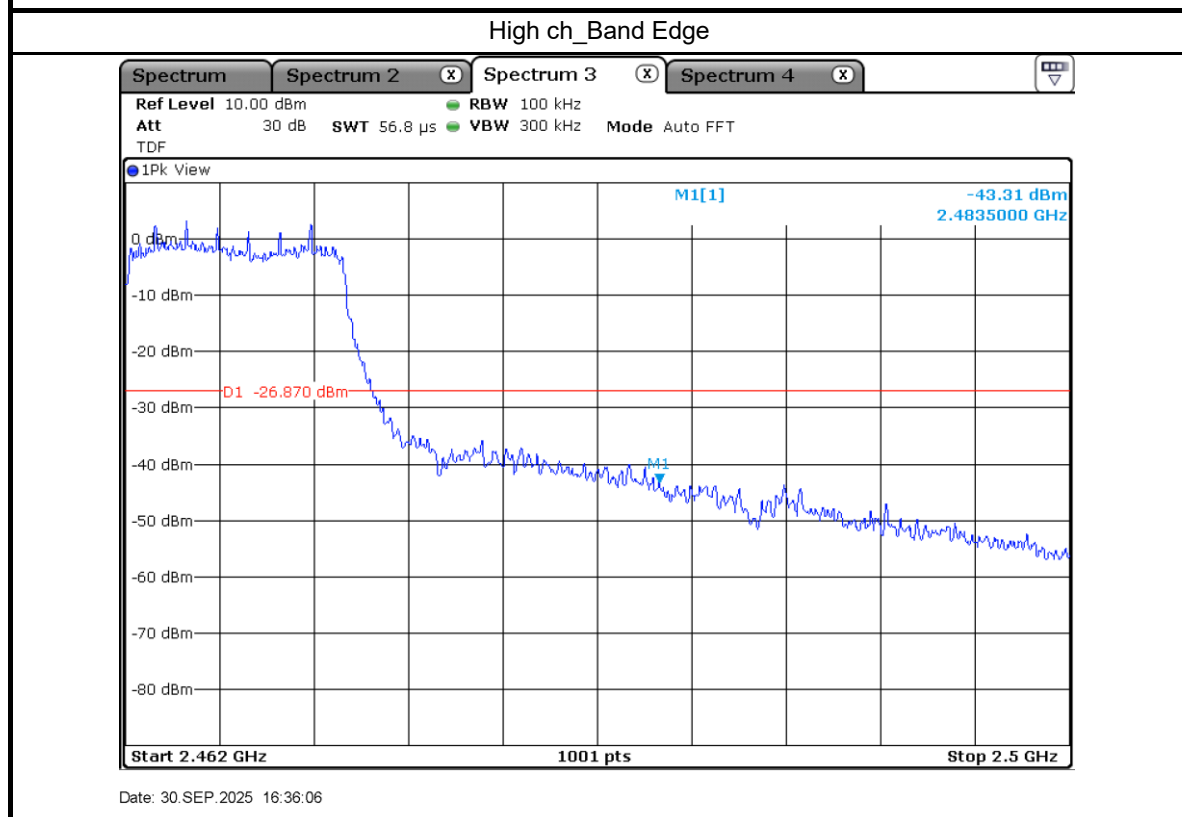
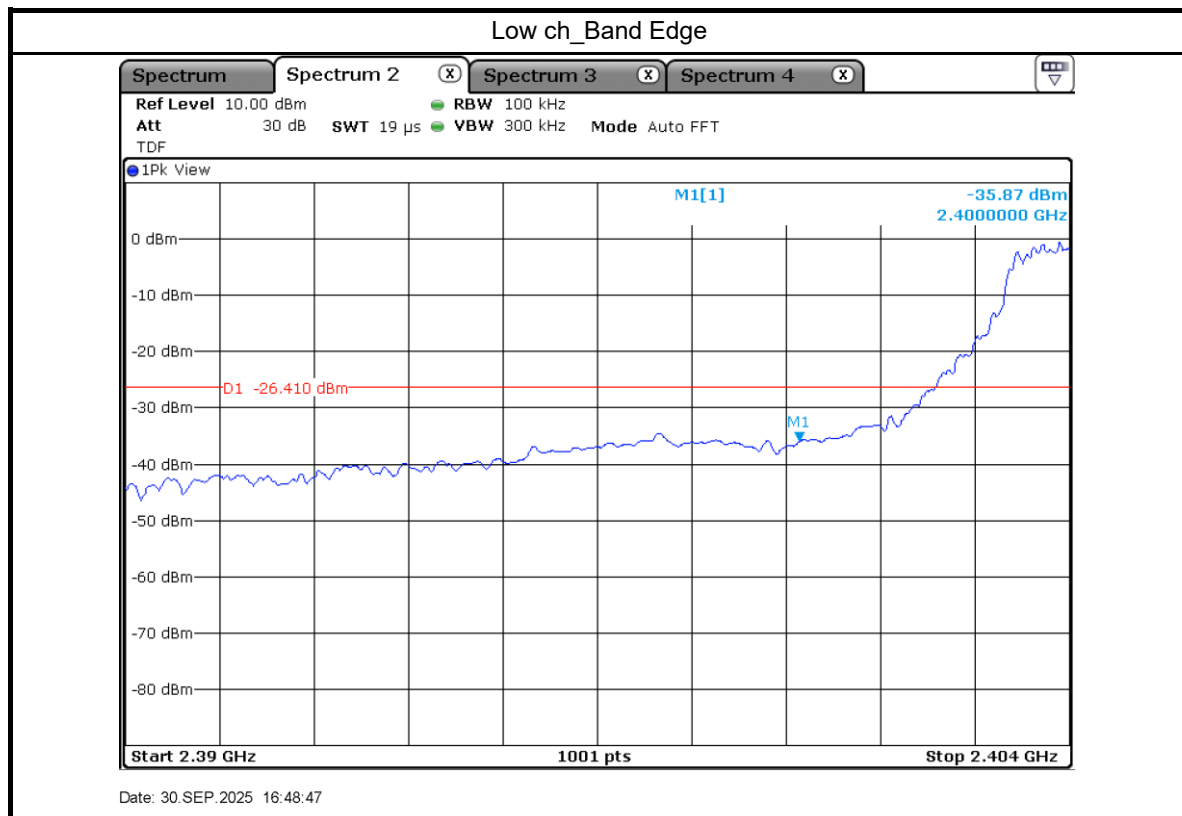


Mode : 802.11n(20 MHz BW)



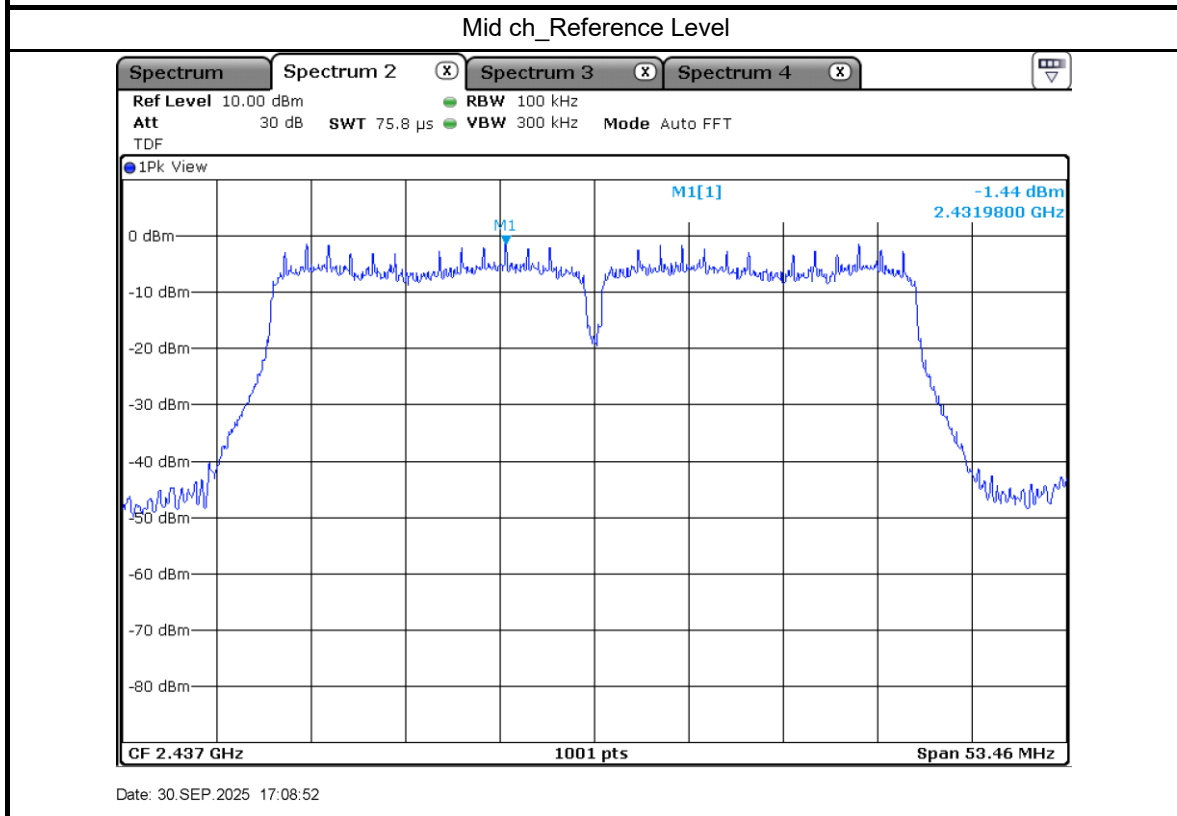
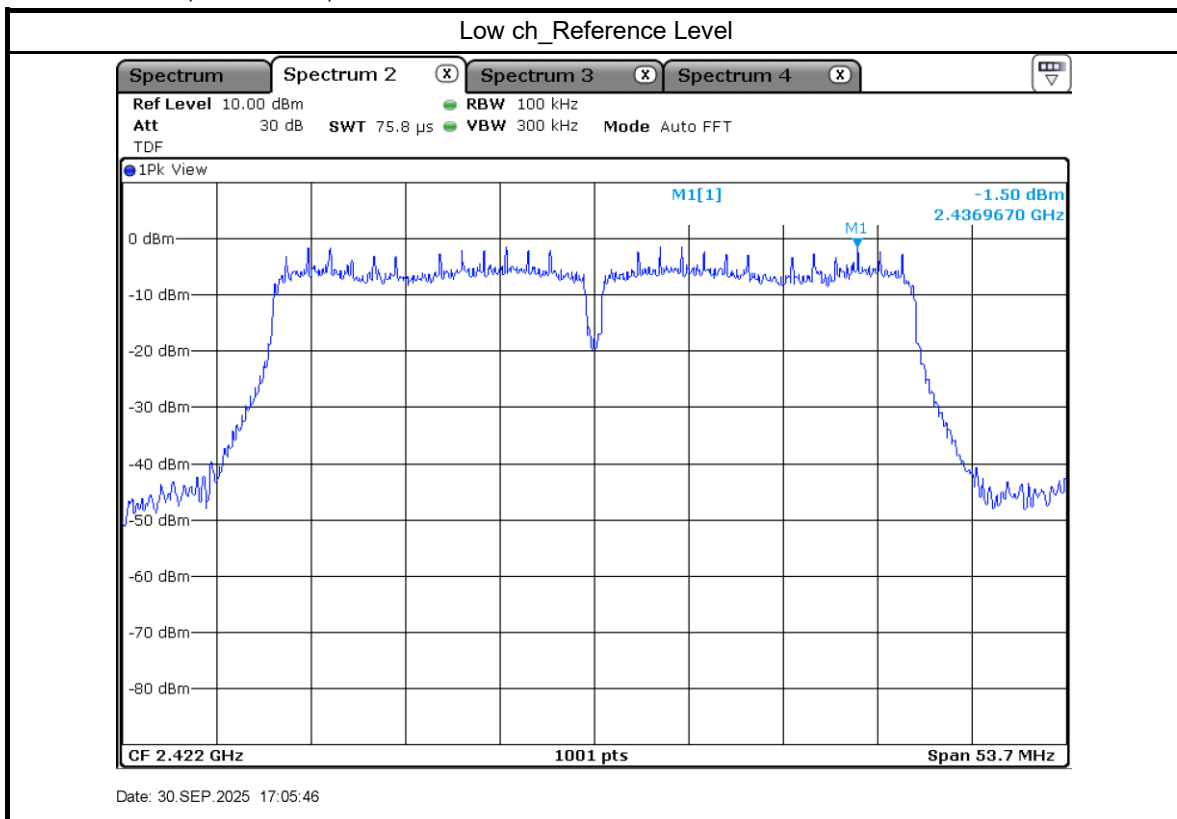


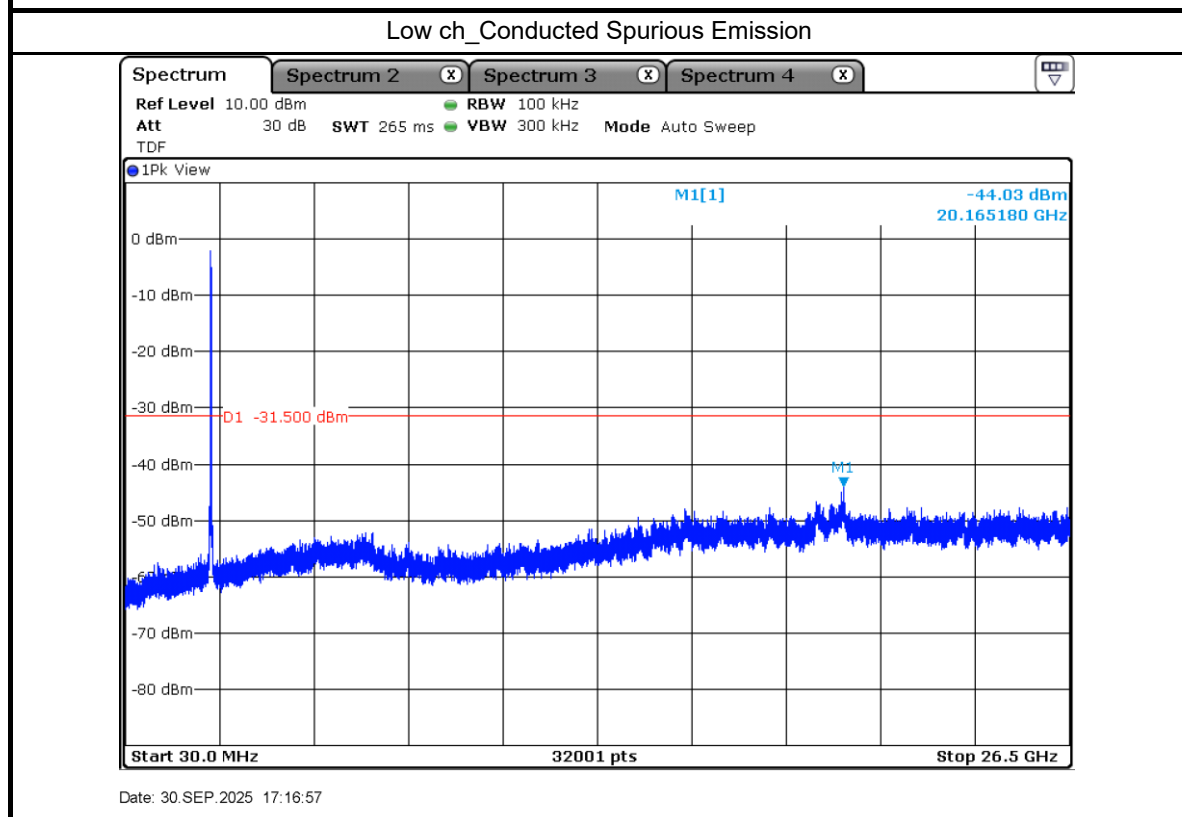
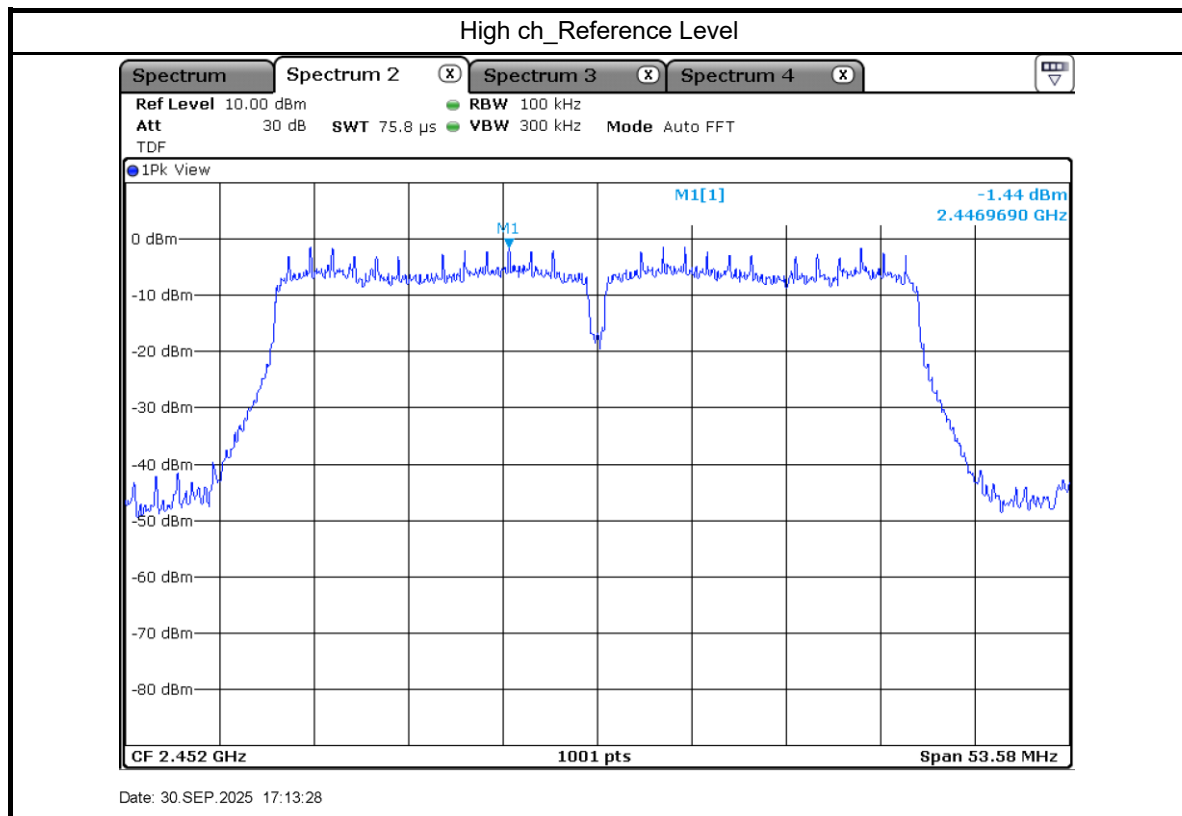


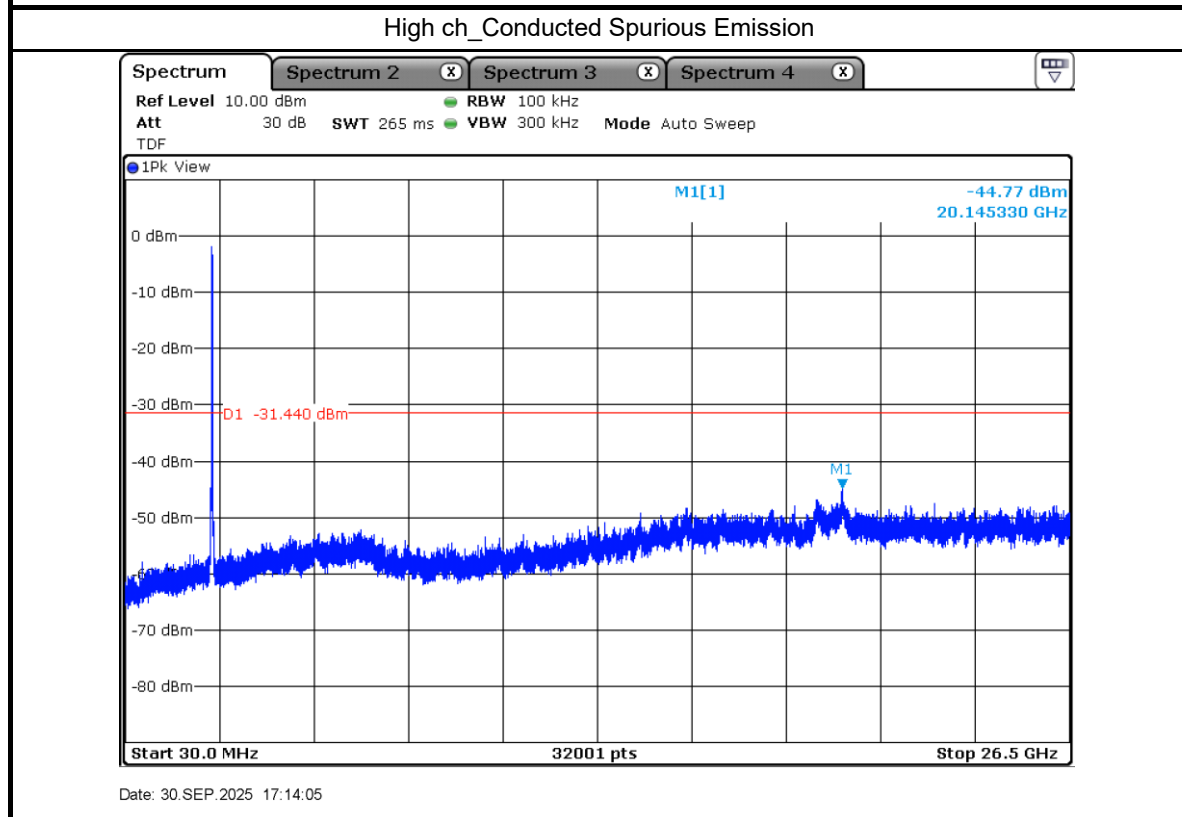
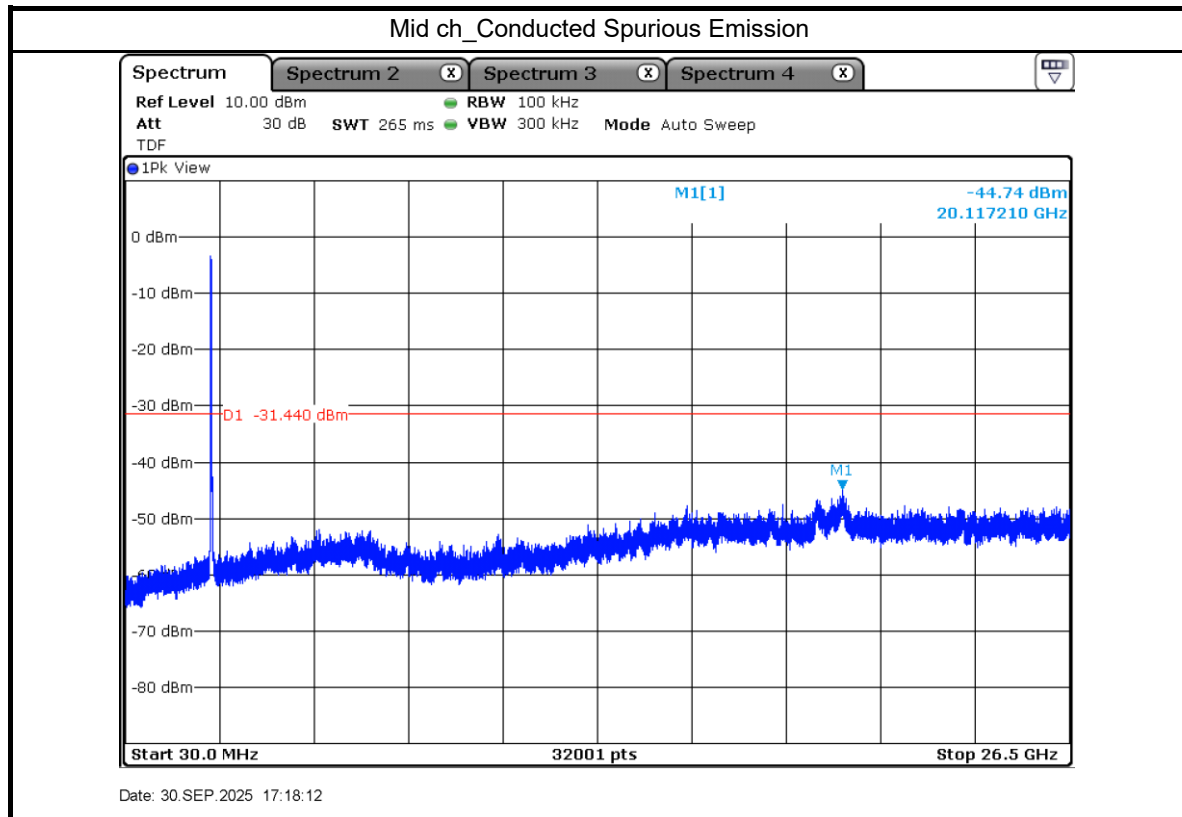


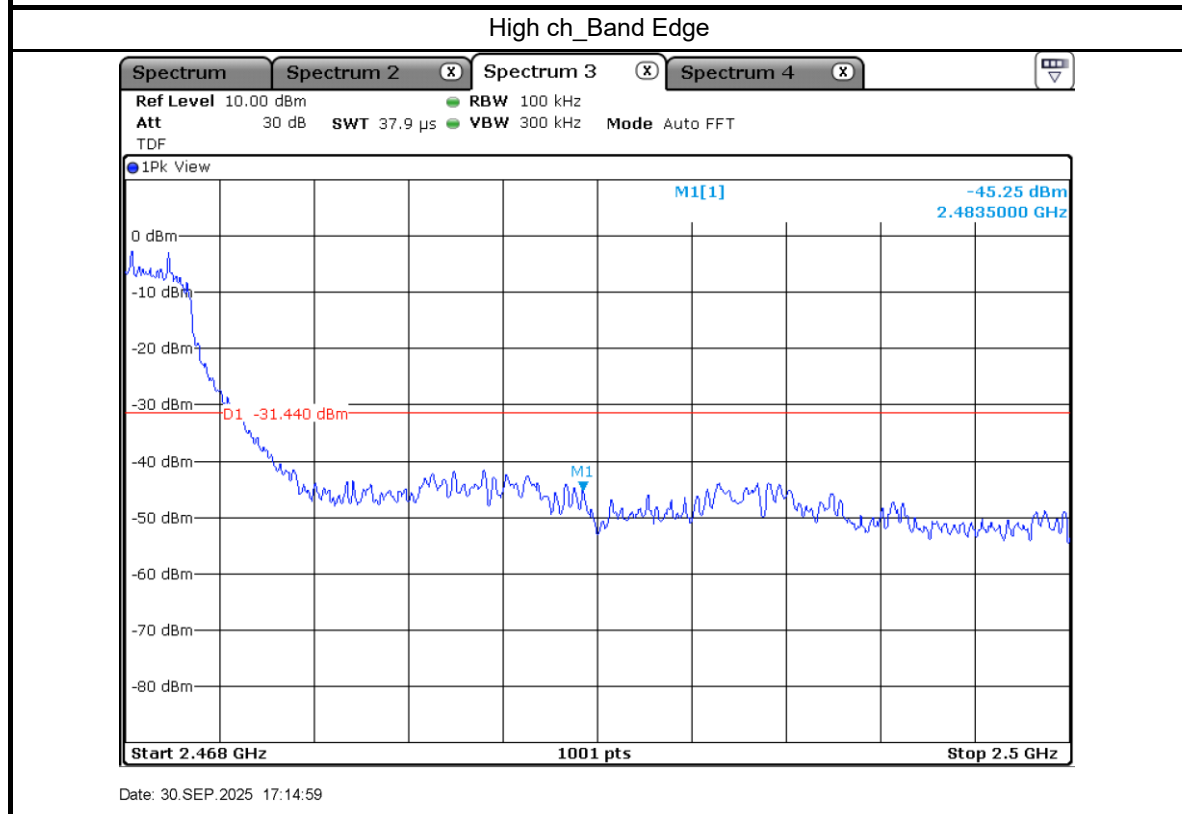
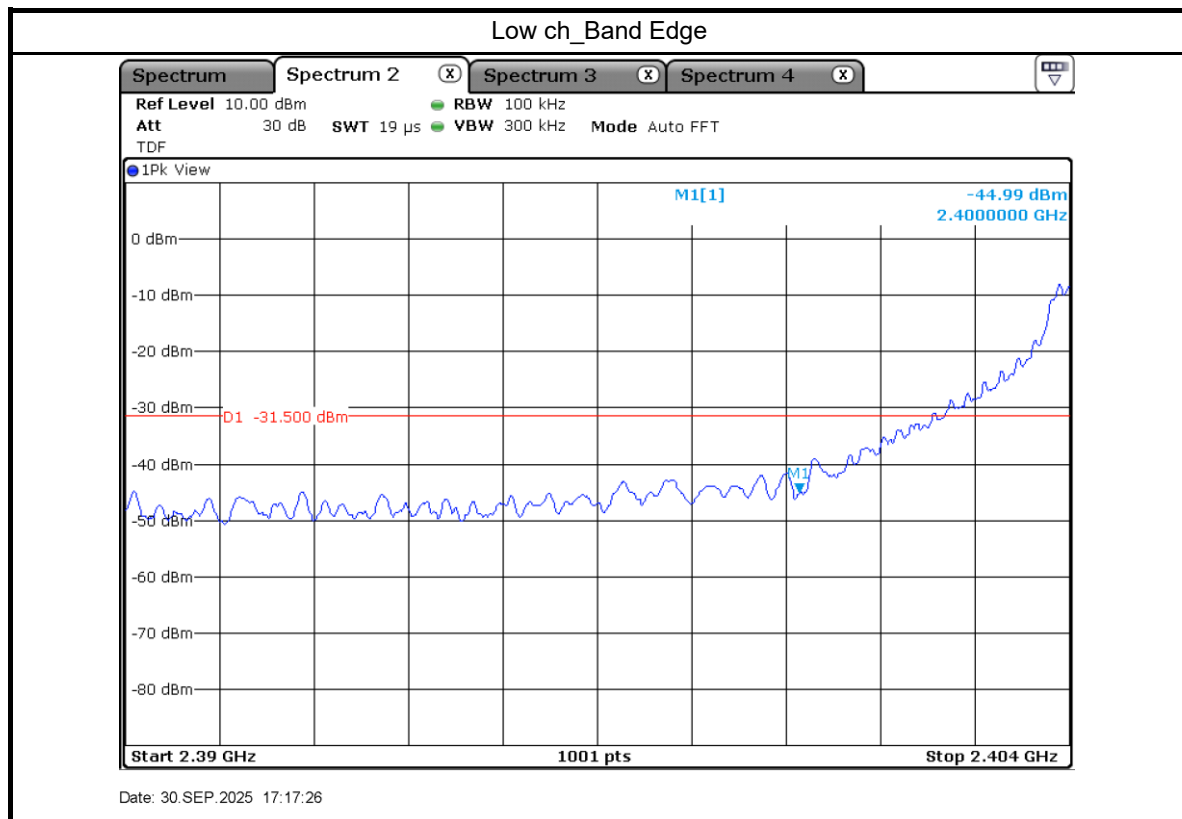


Mode : 802.11n(40 MHz BW)



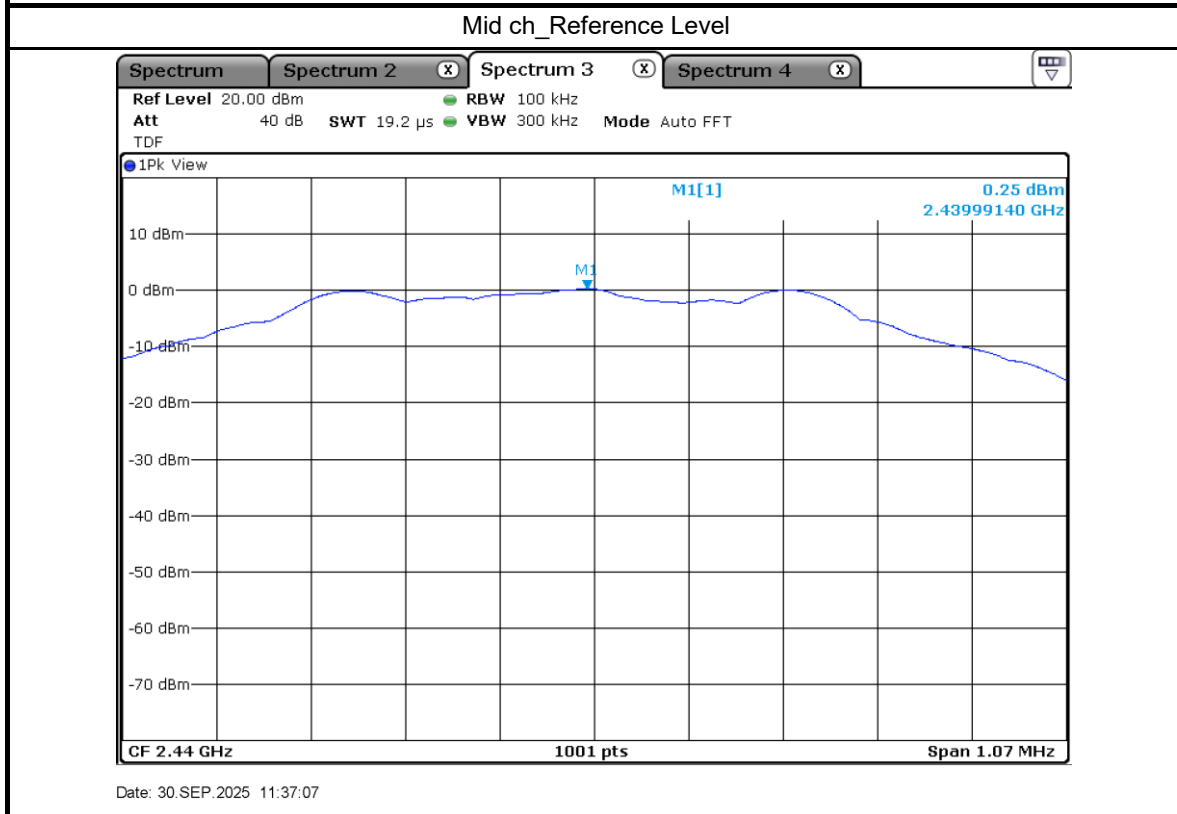
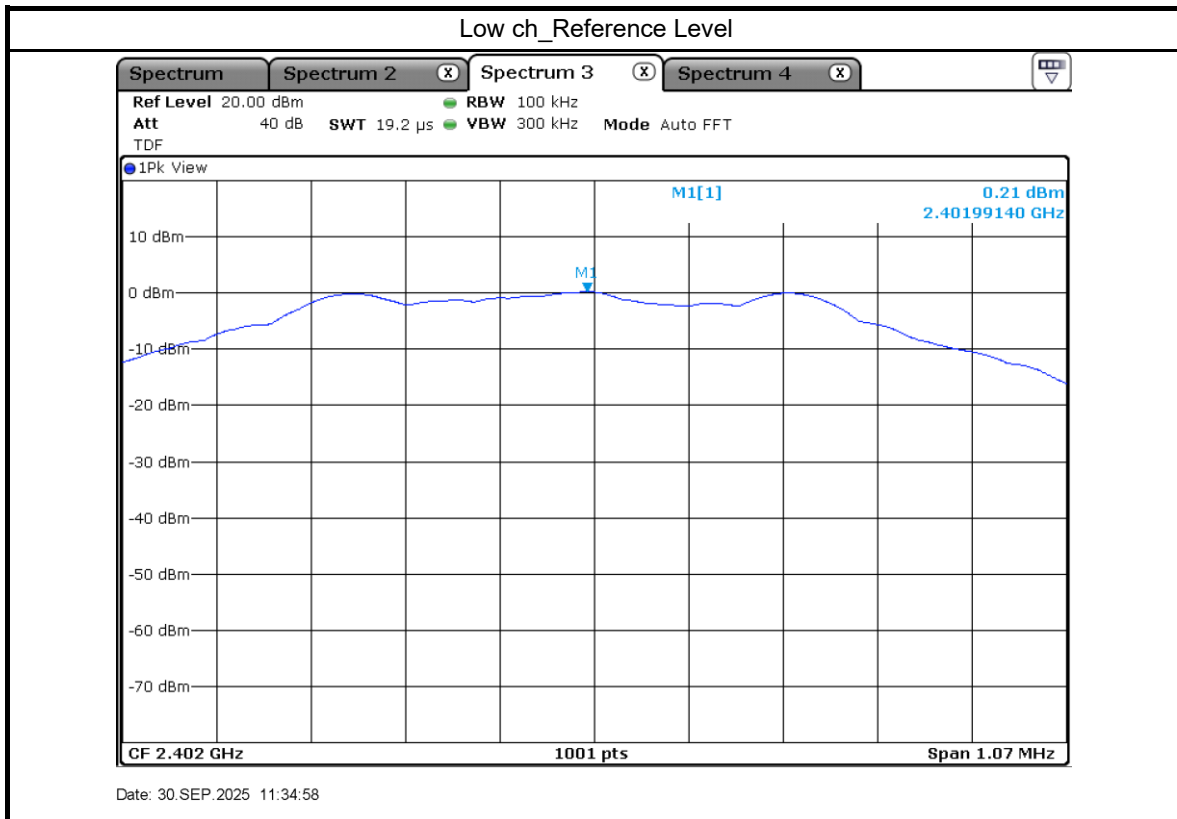


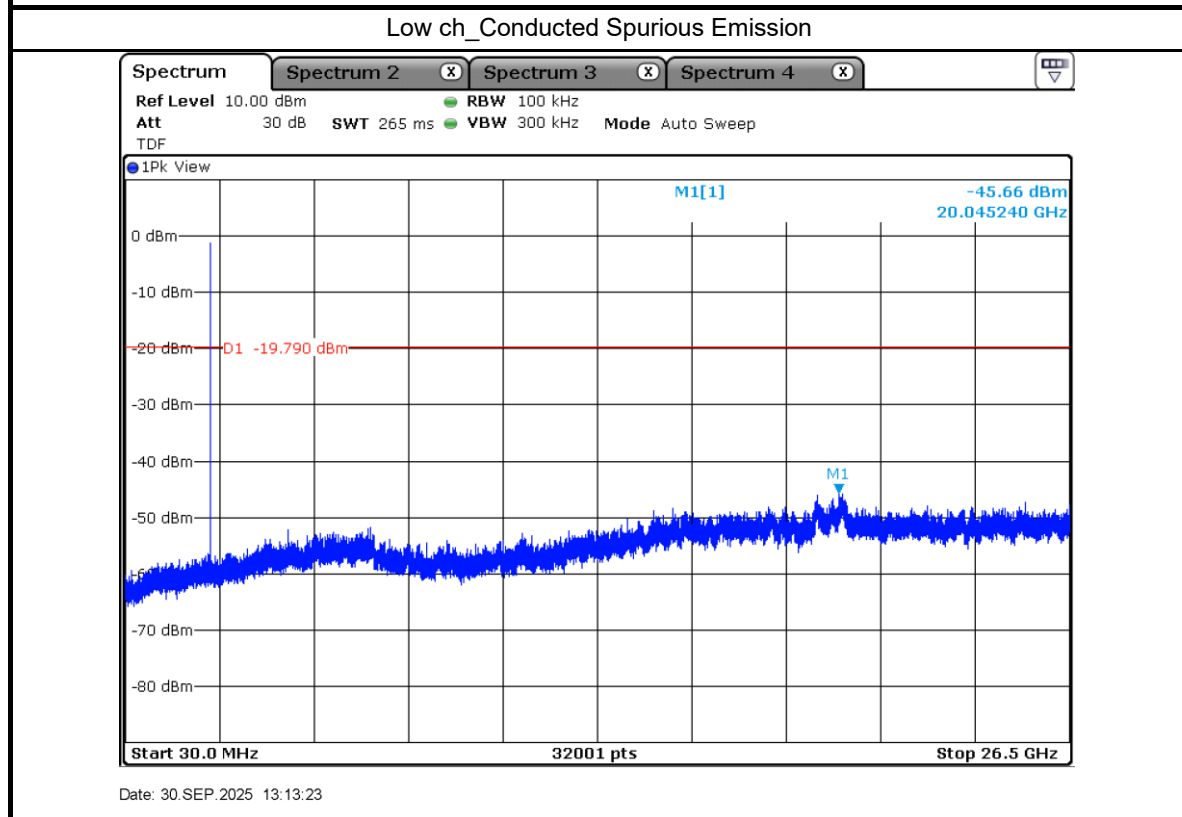
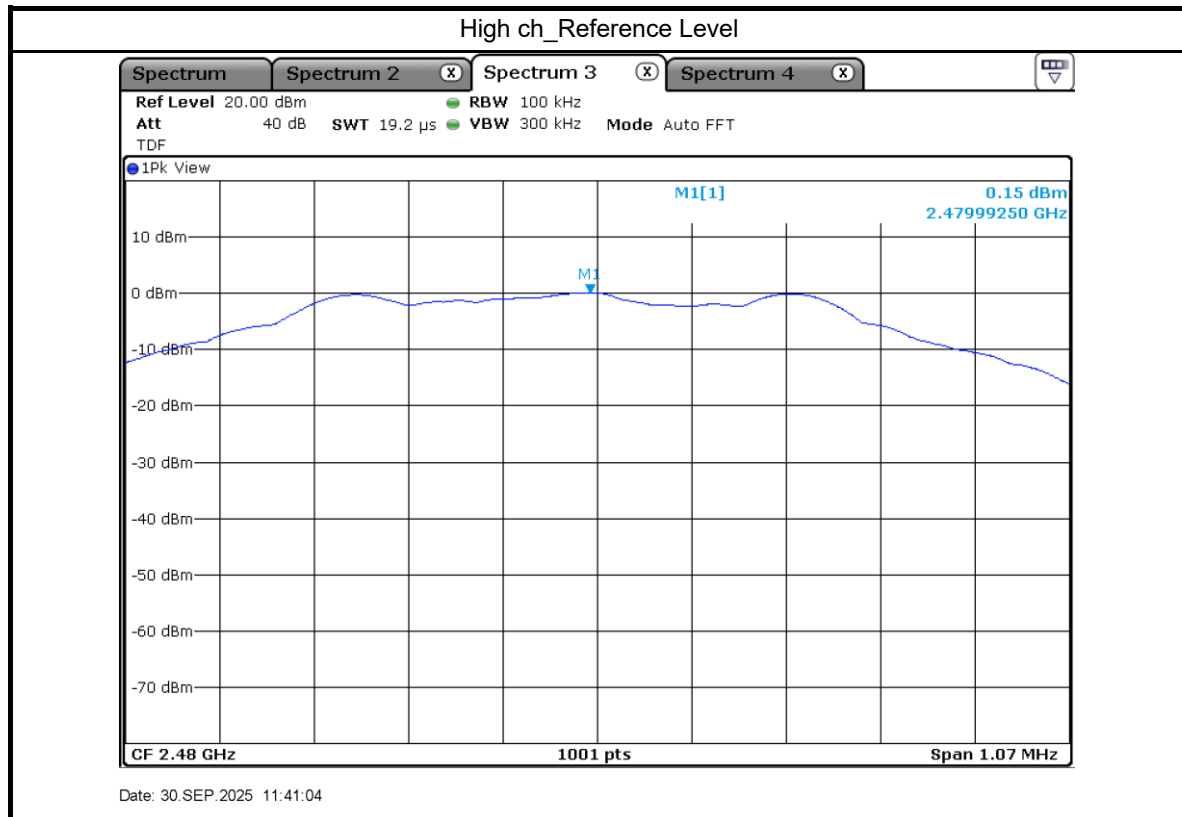


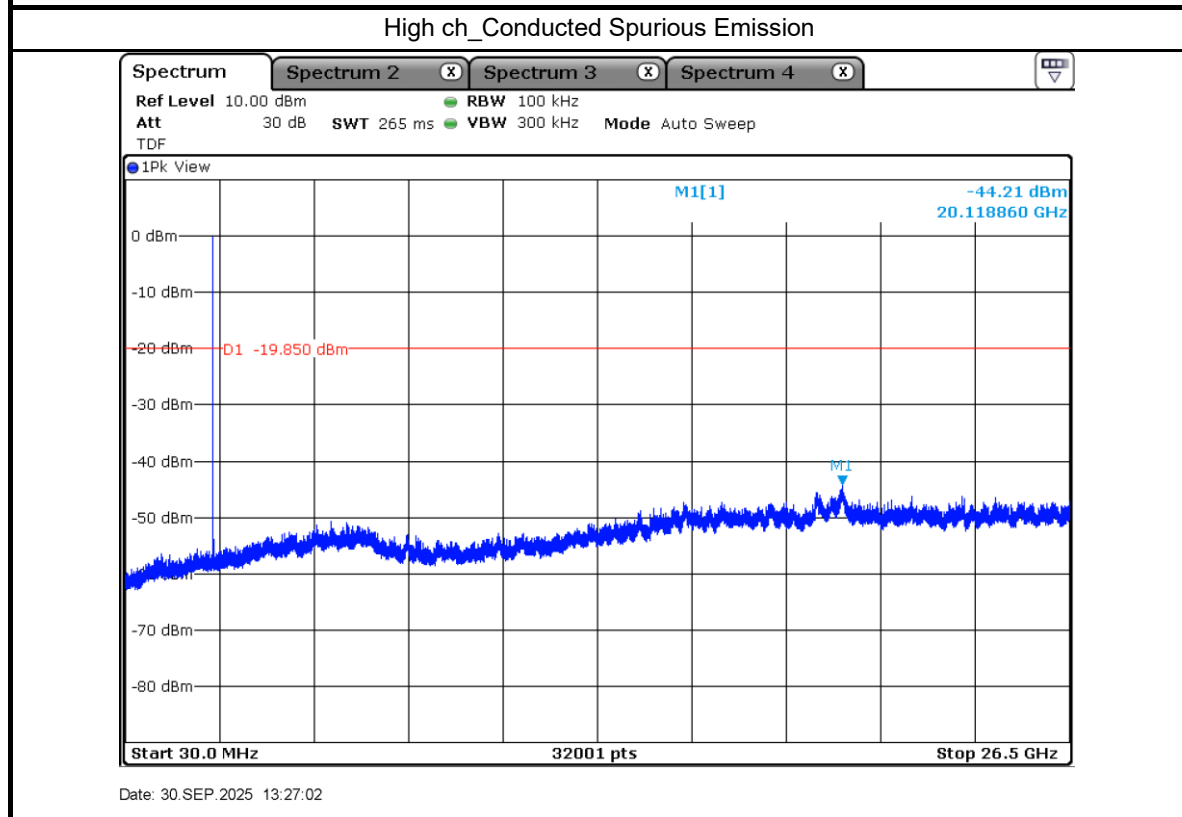
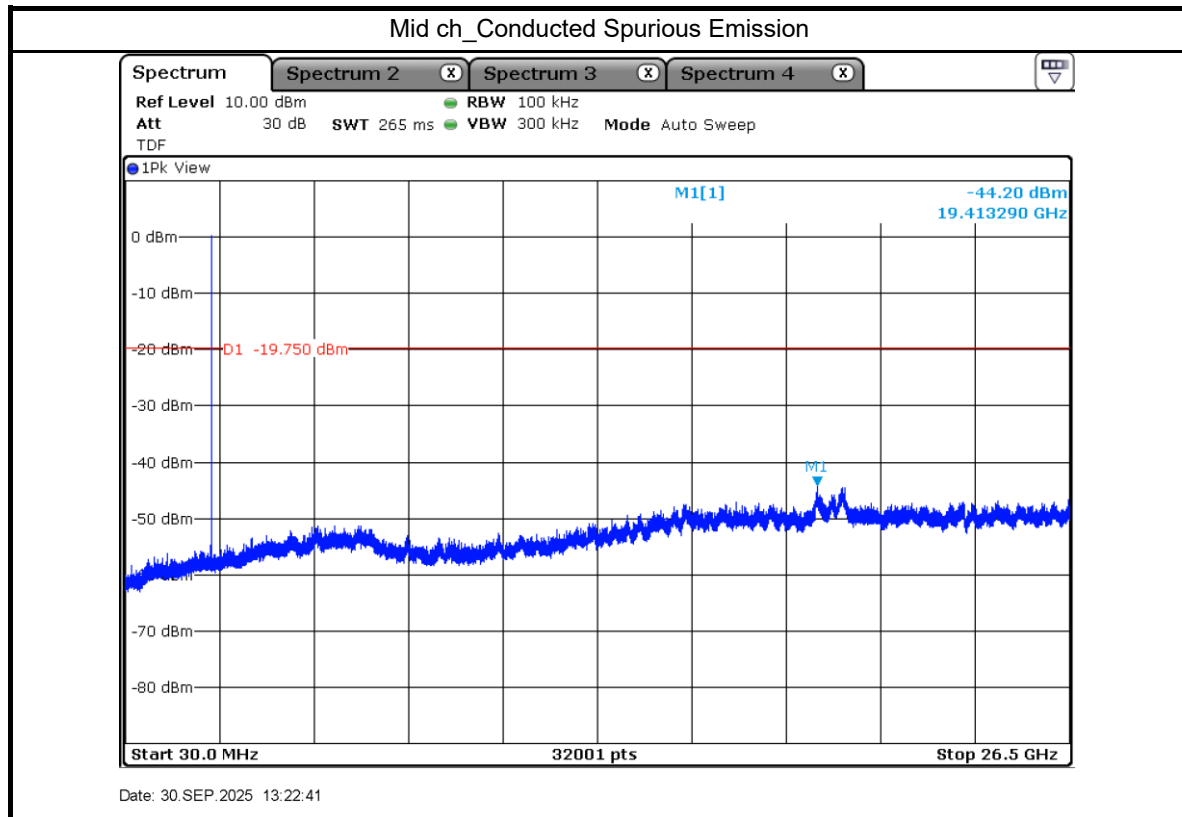


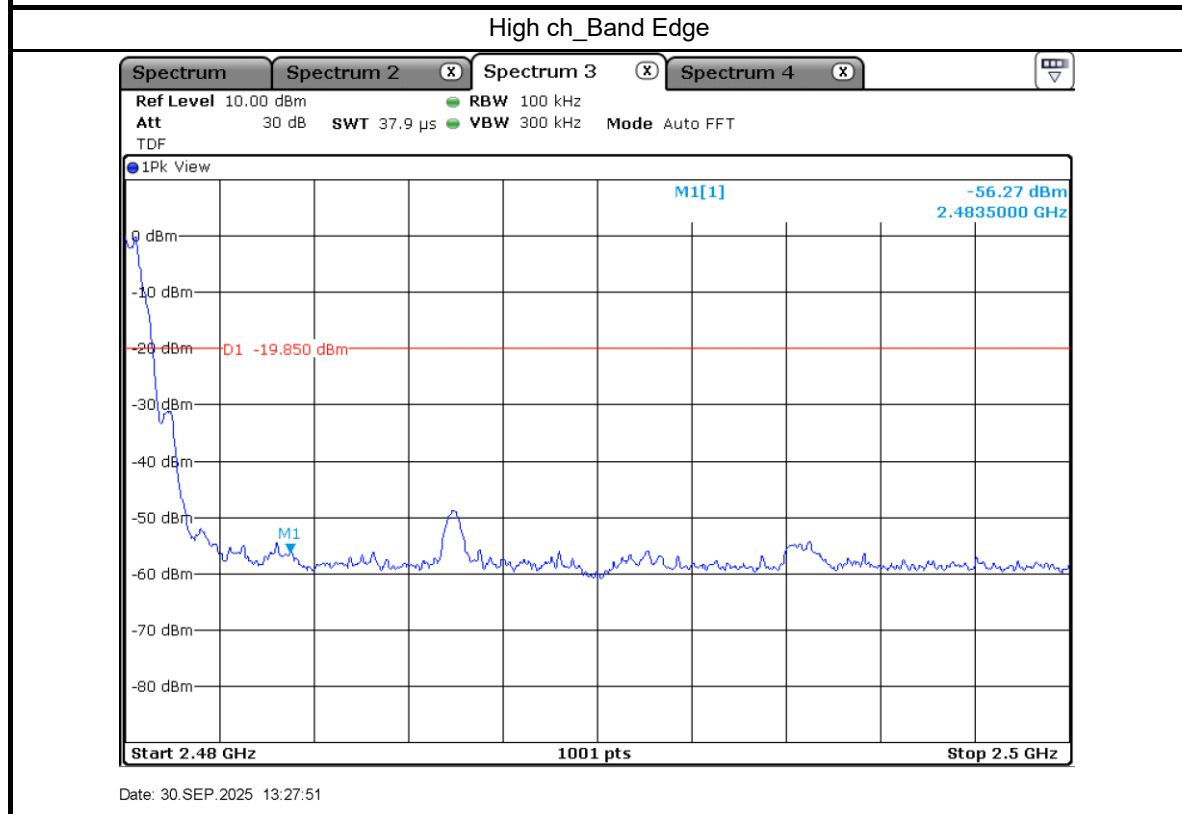
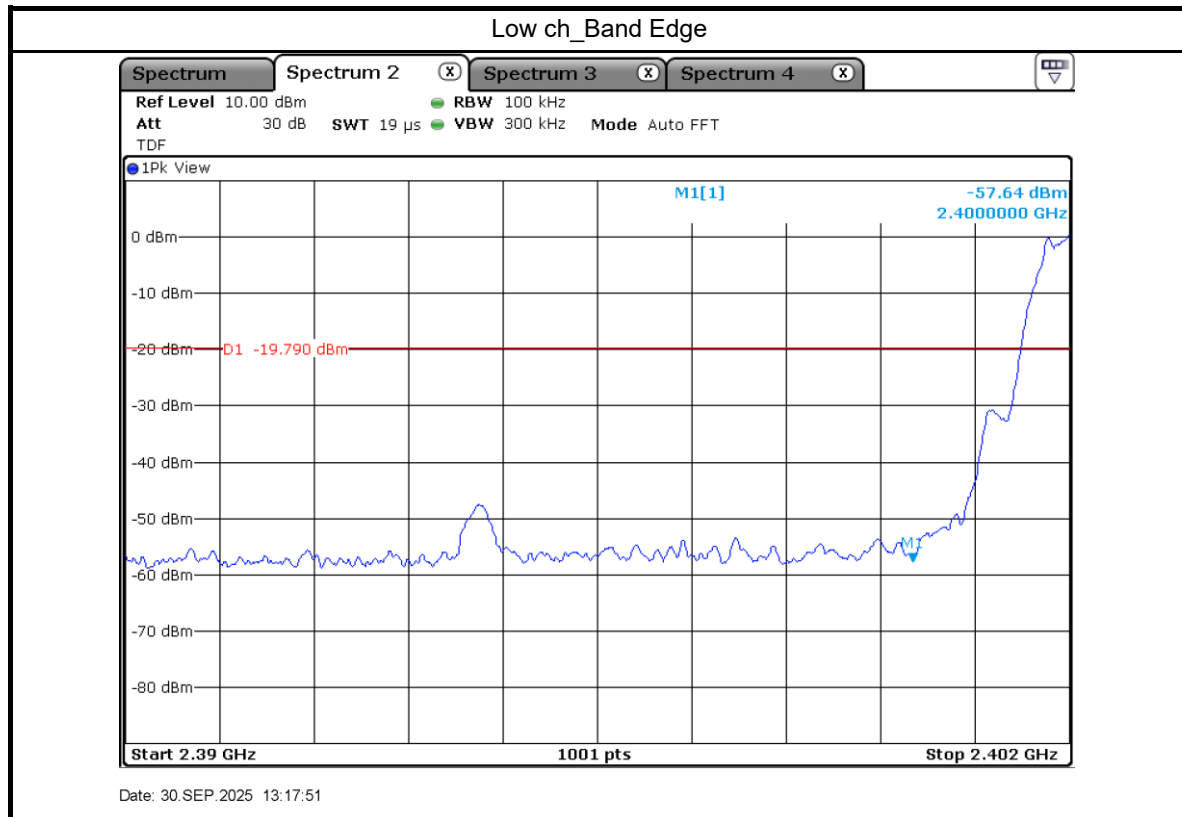


Mode : Bluetooth LE 1M



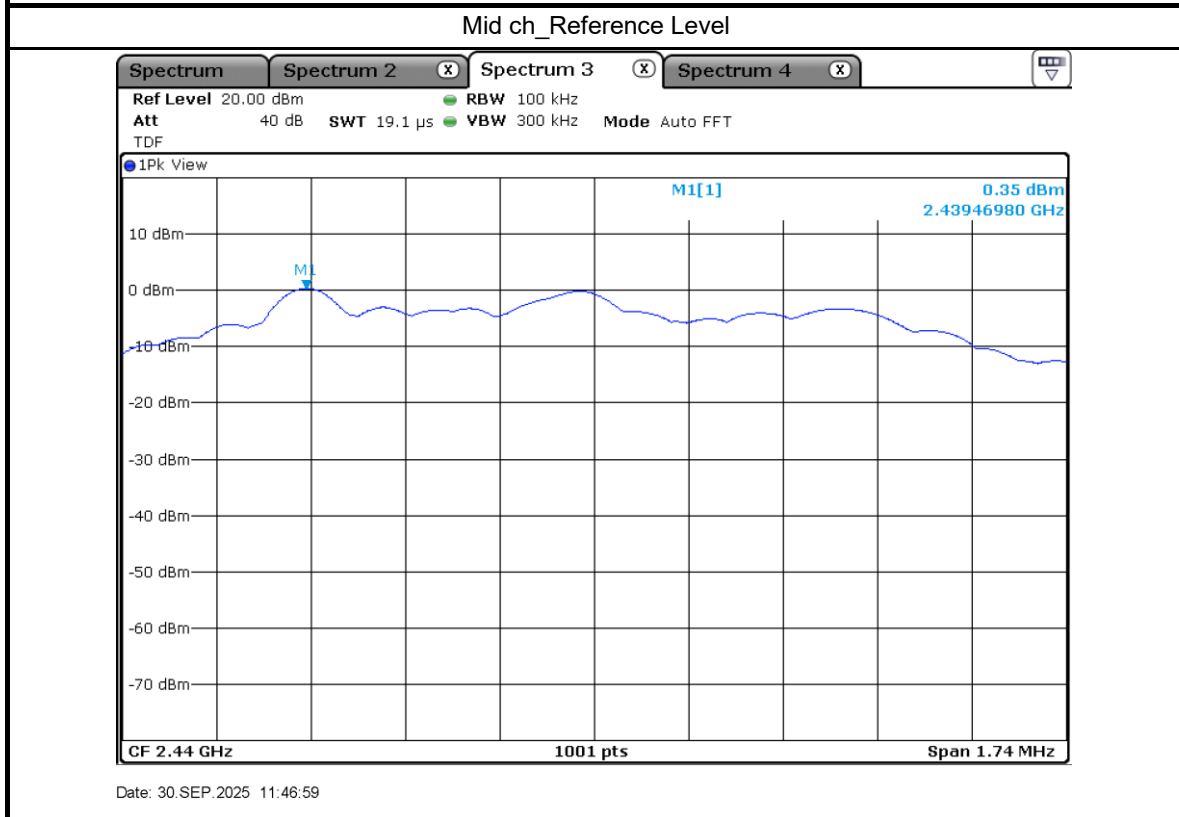
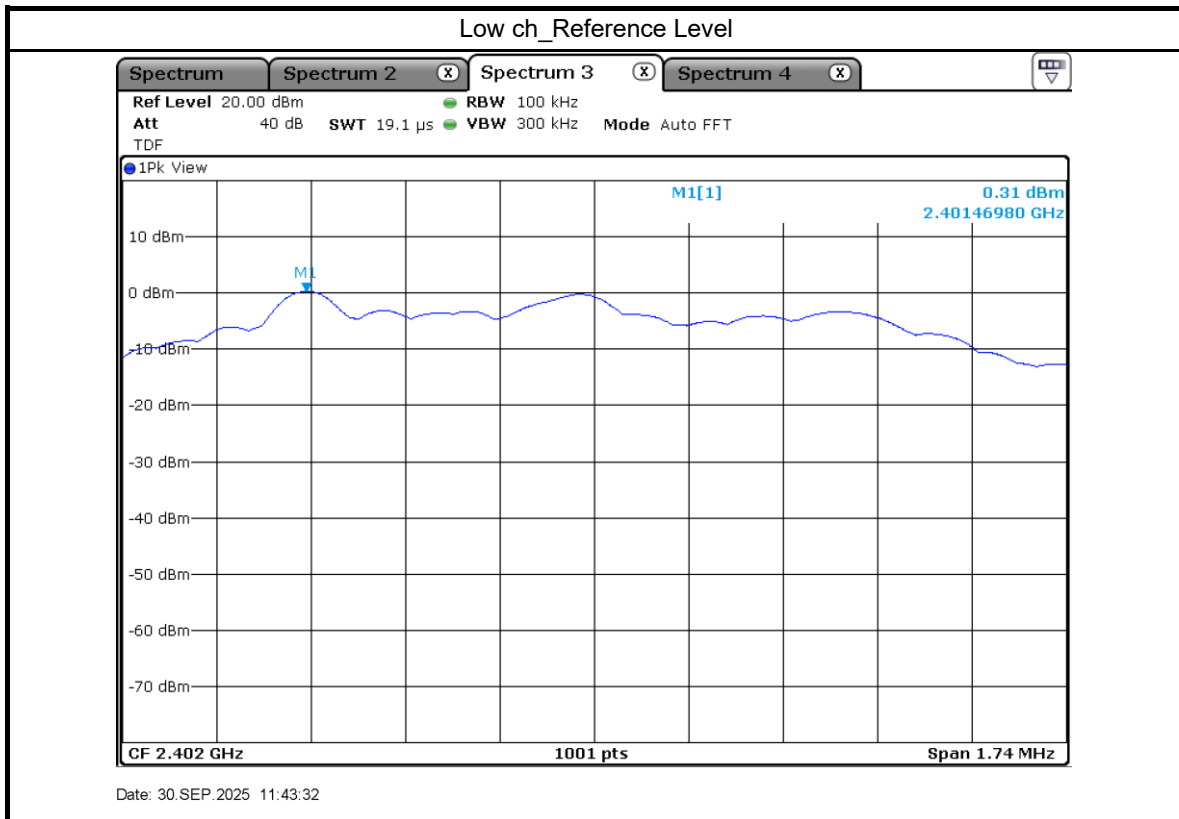


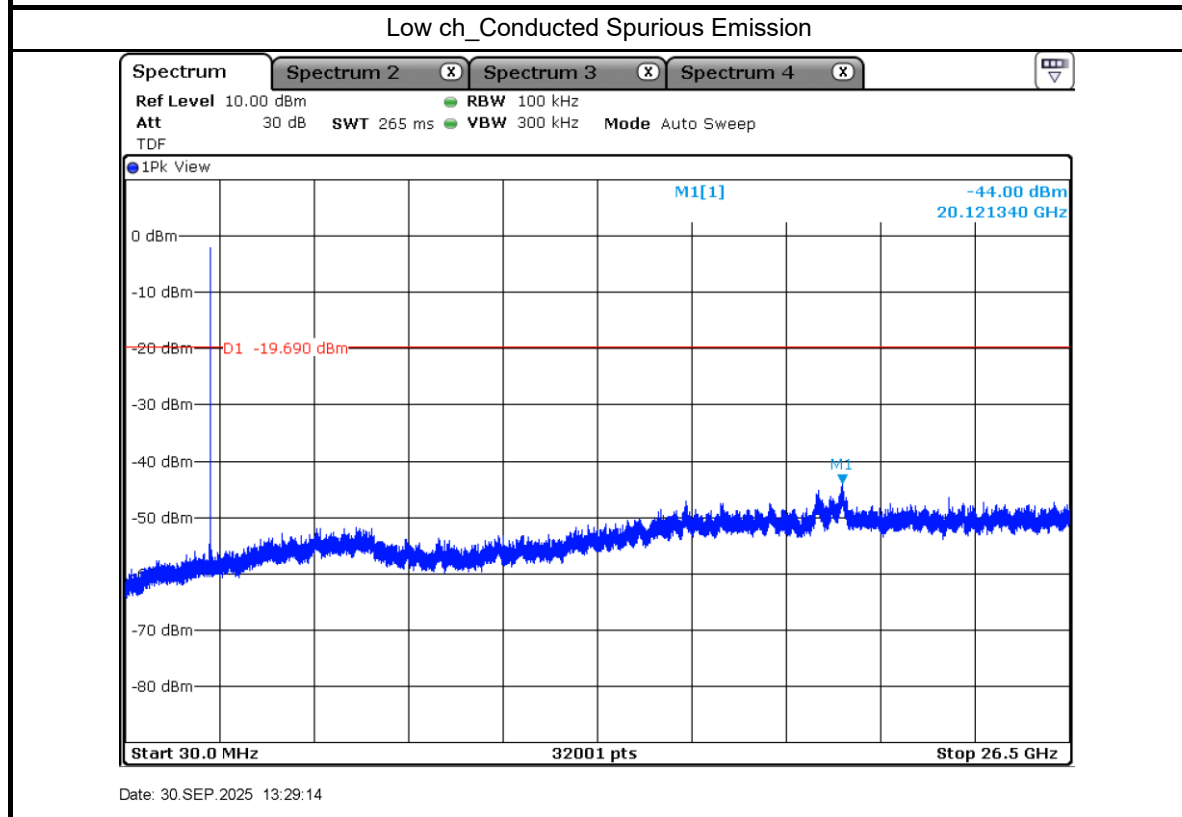
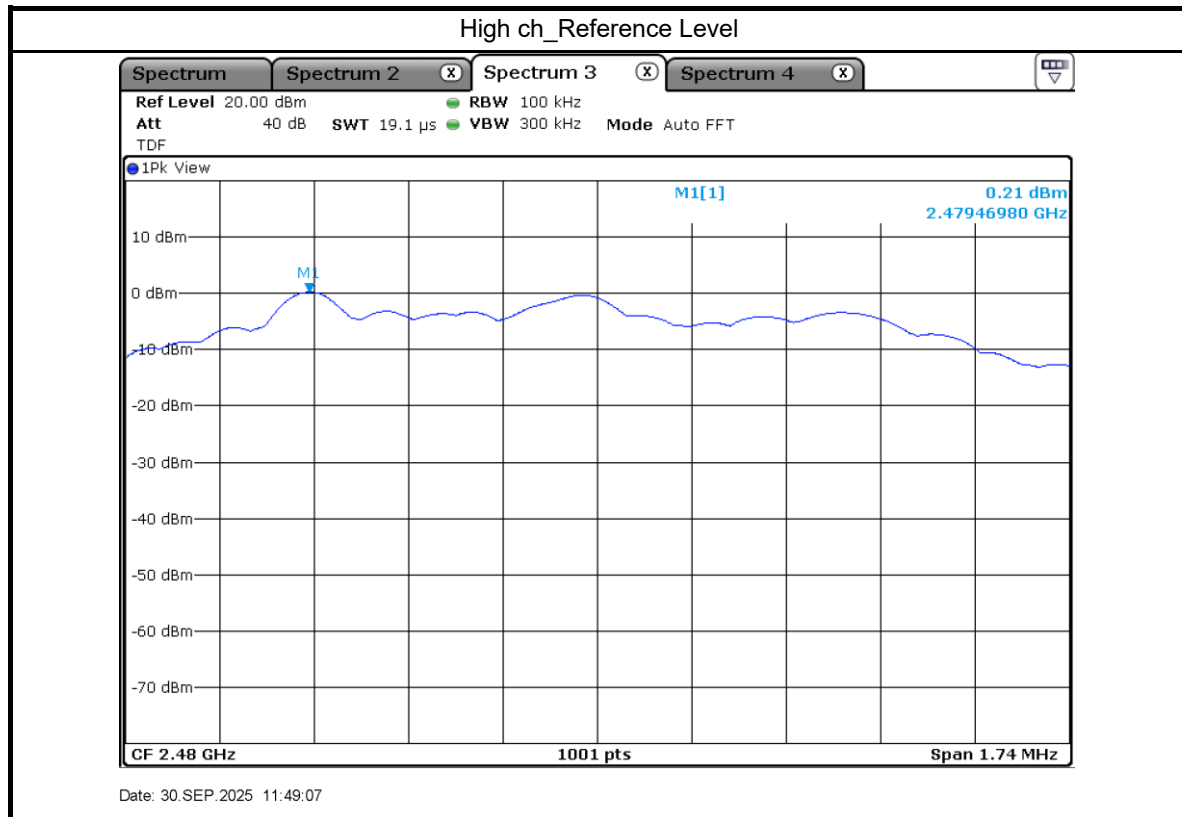


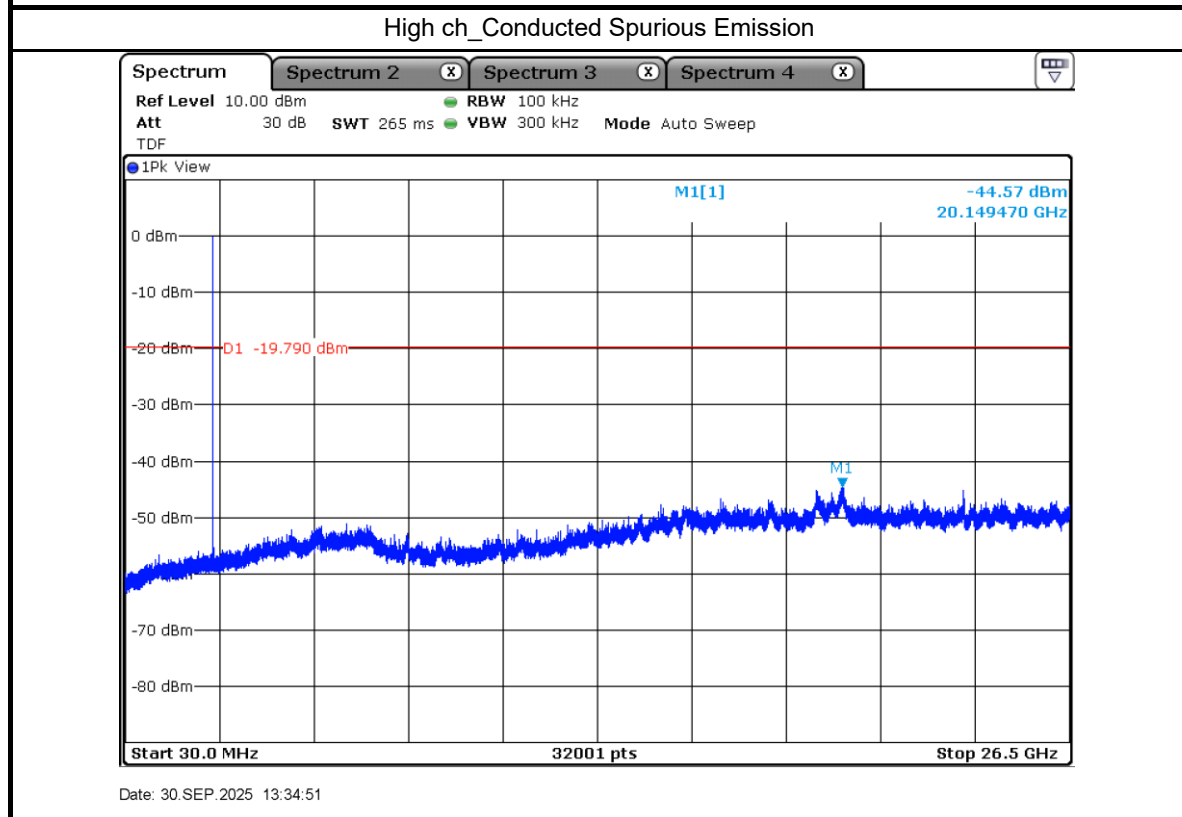
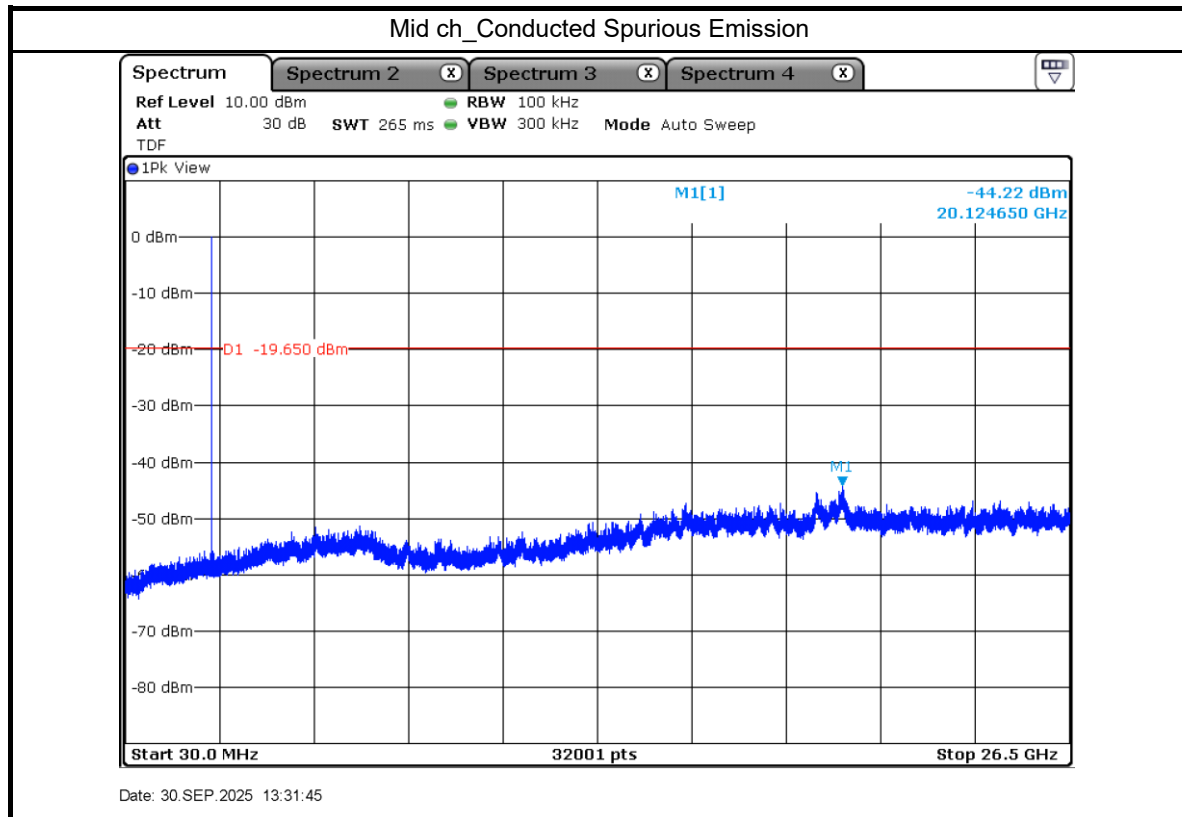


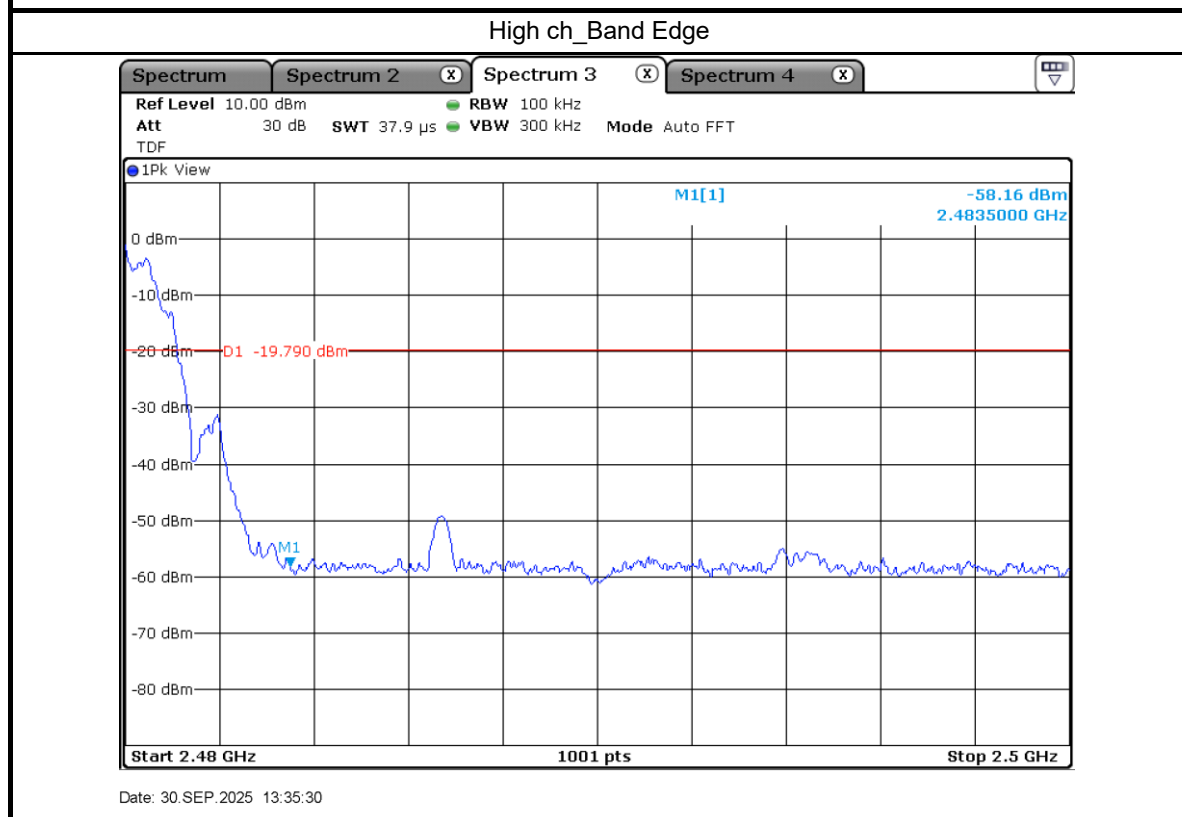
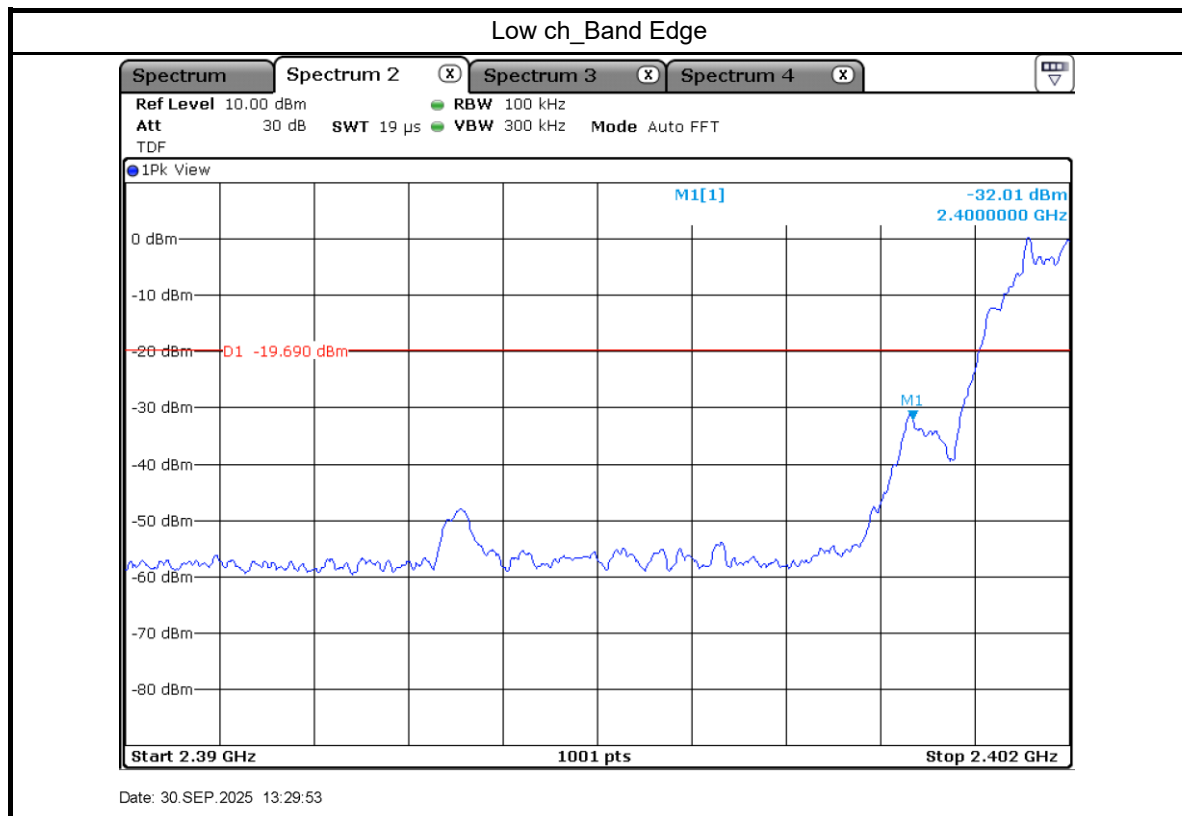


Mode : Bluetooth LE 2M



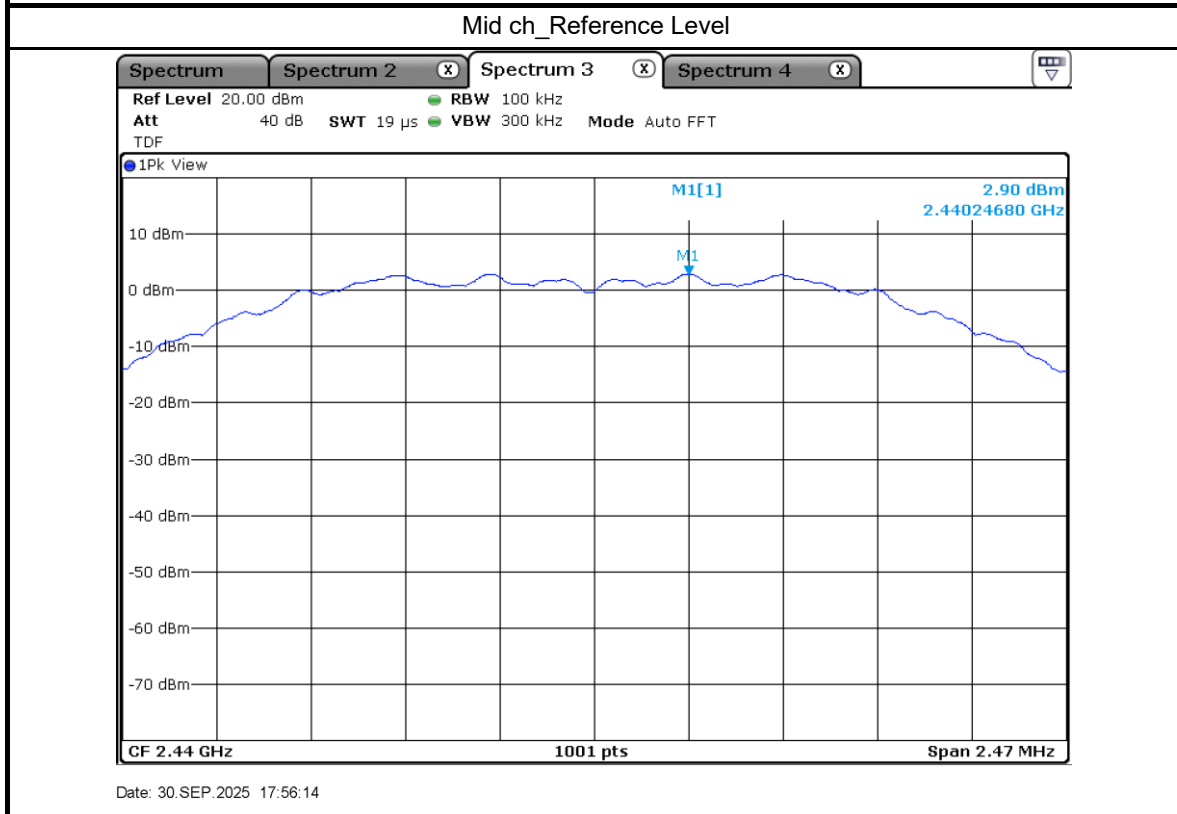
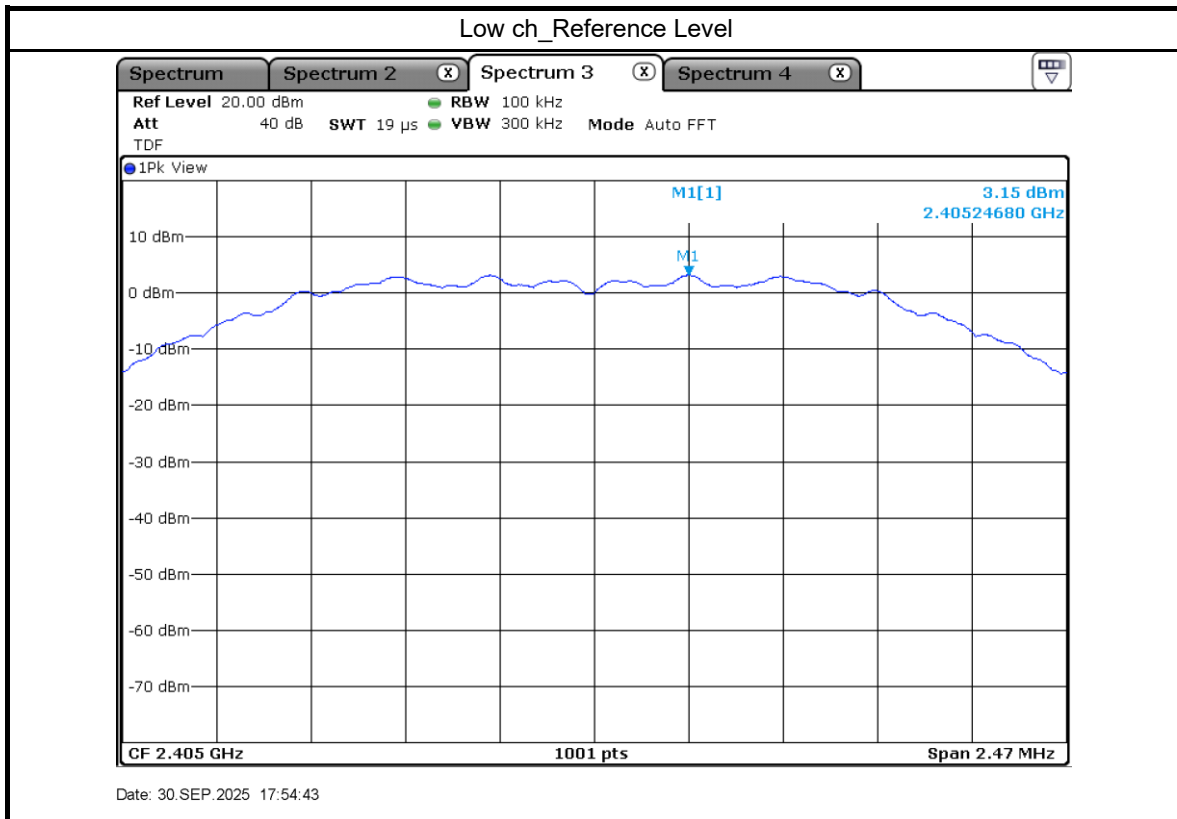


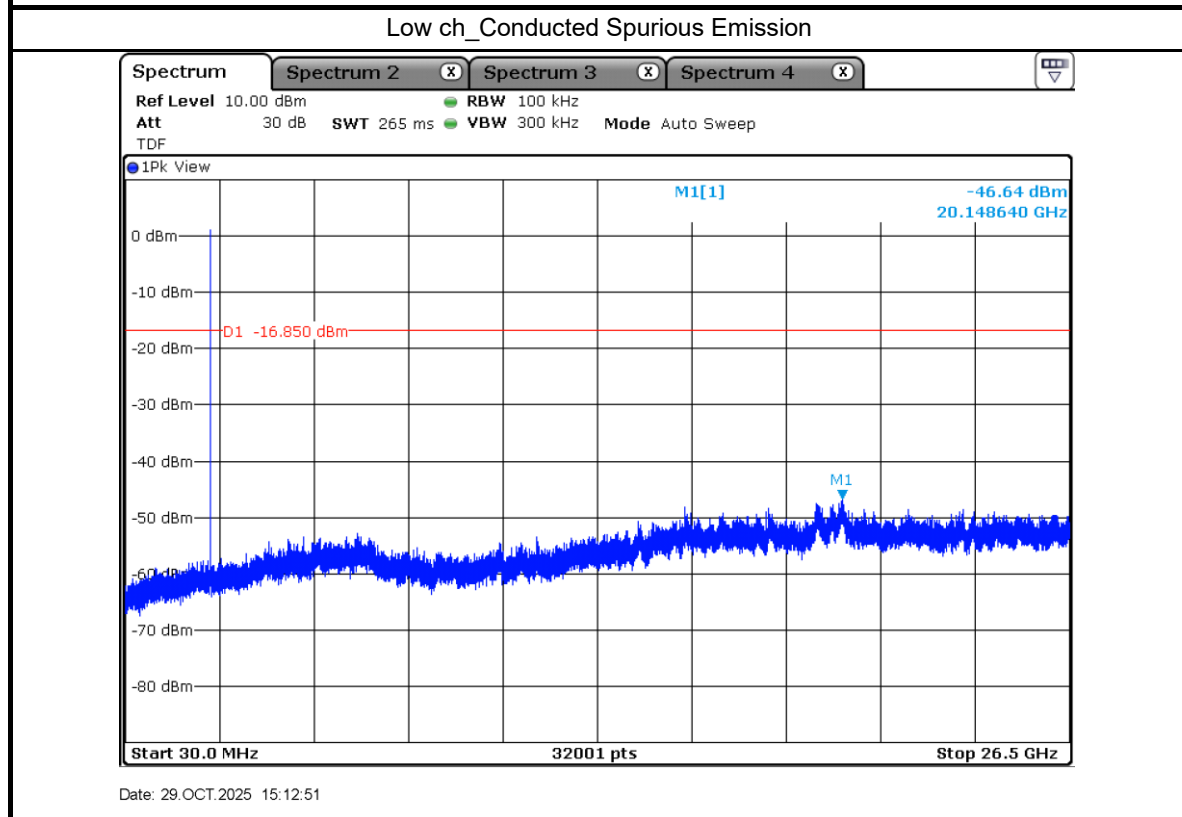
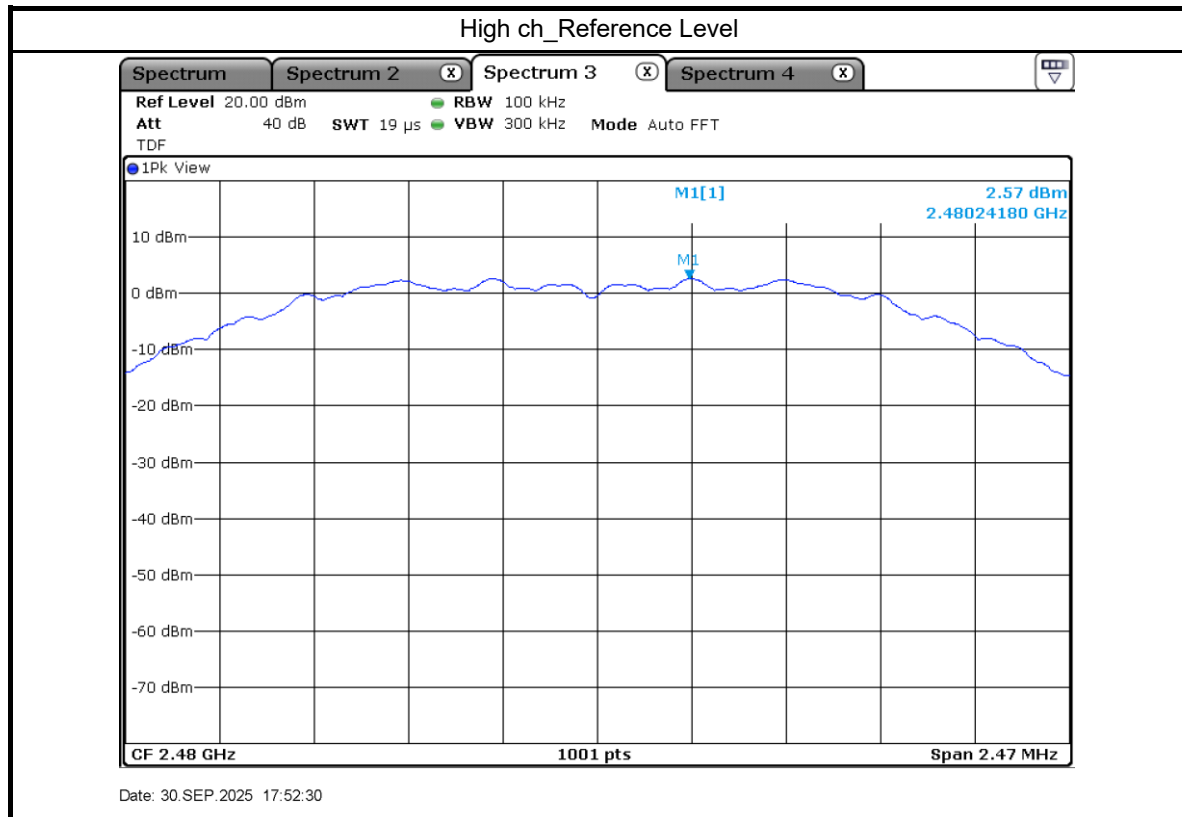


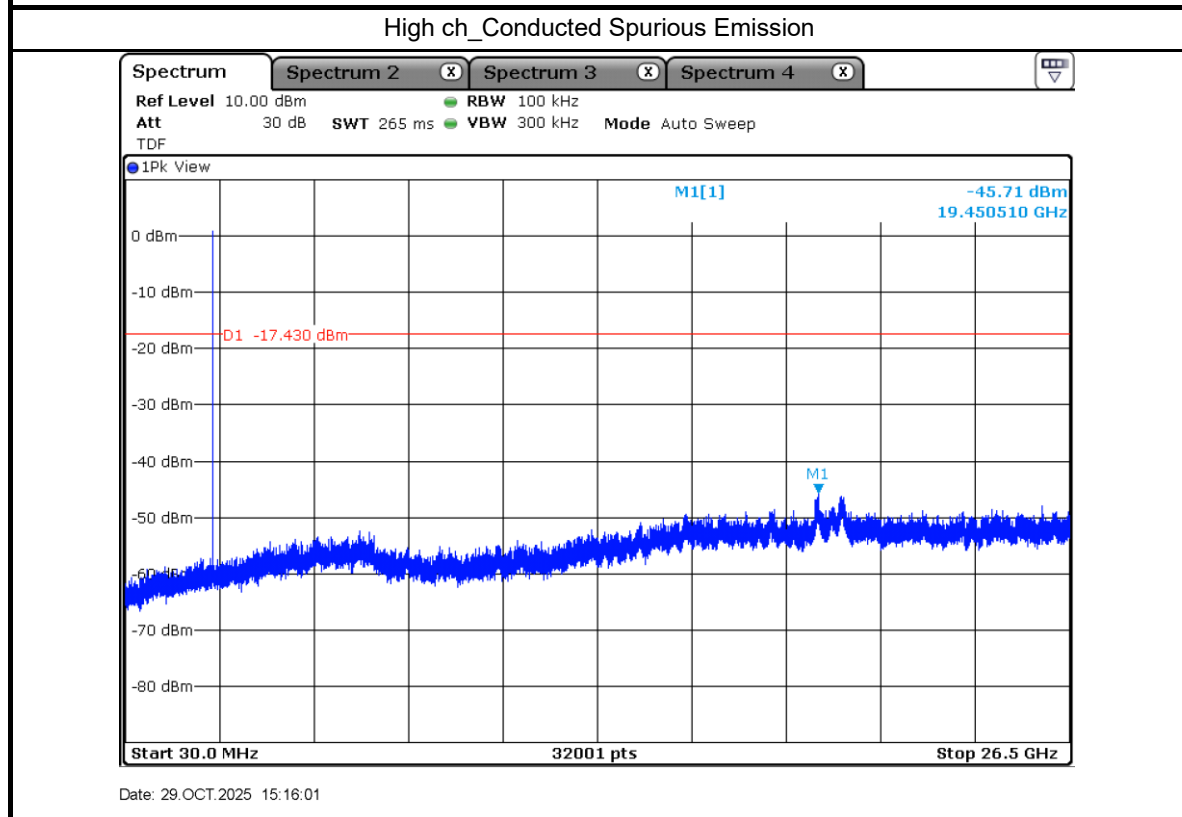
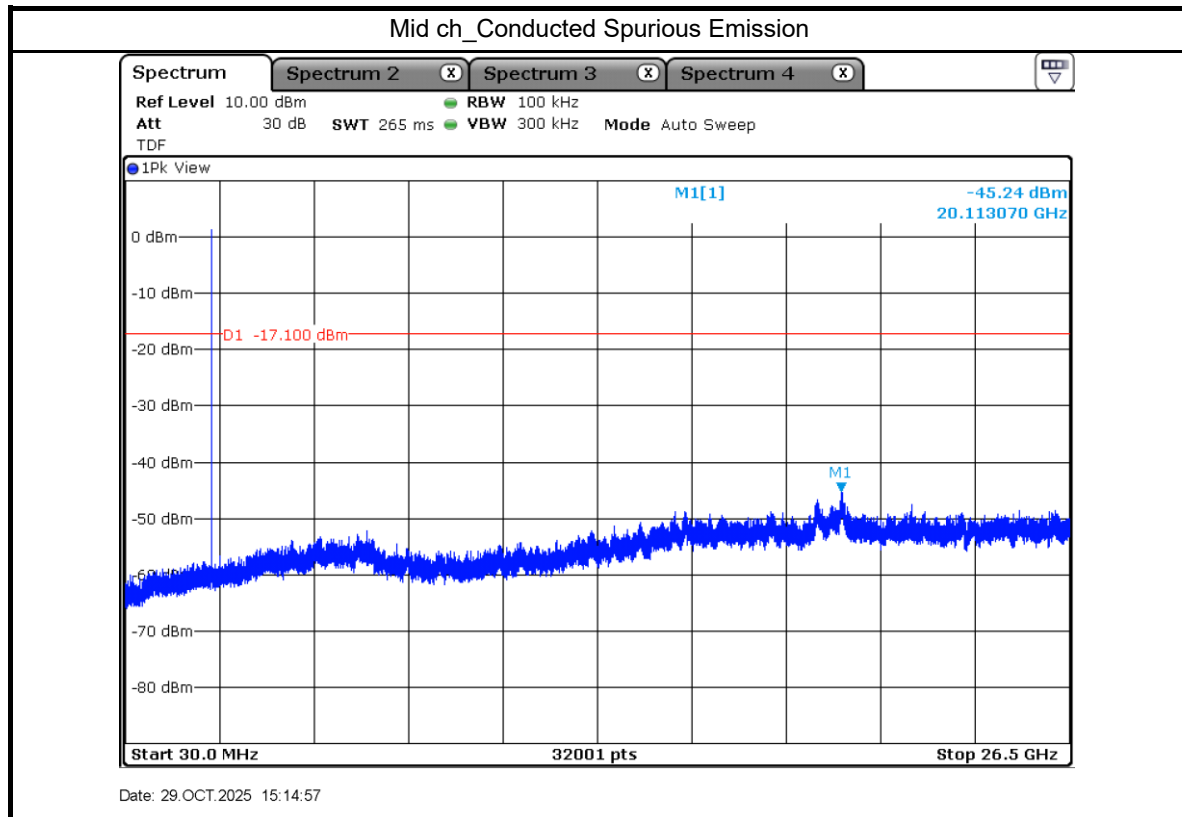


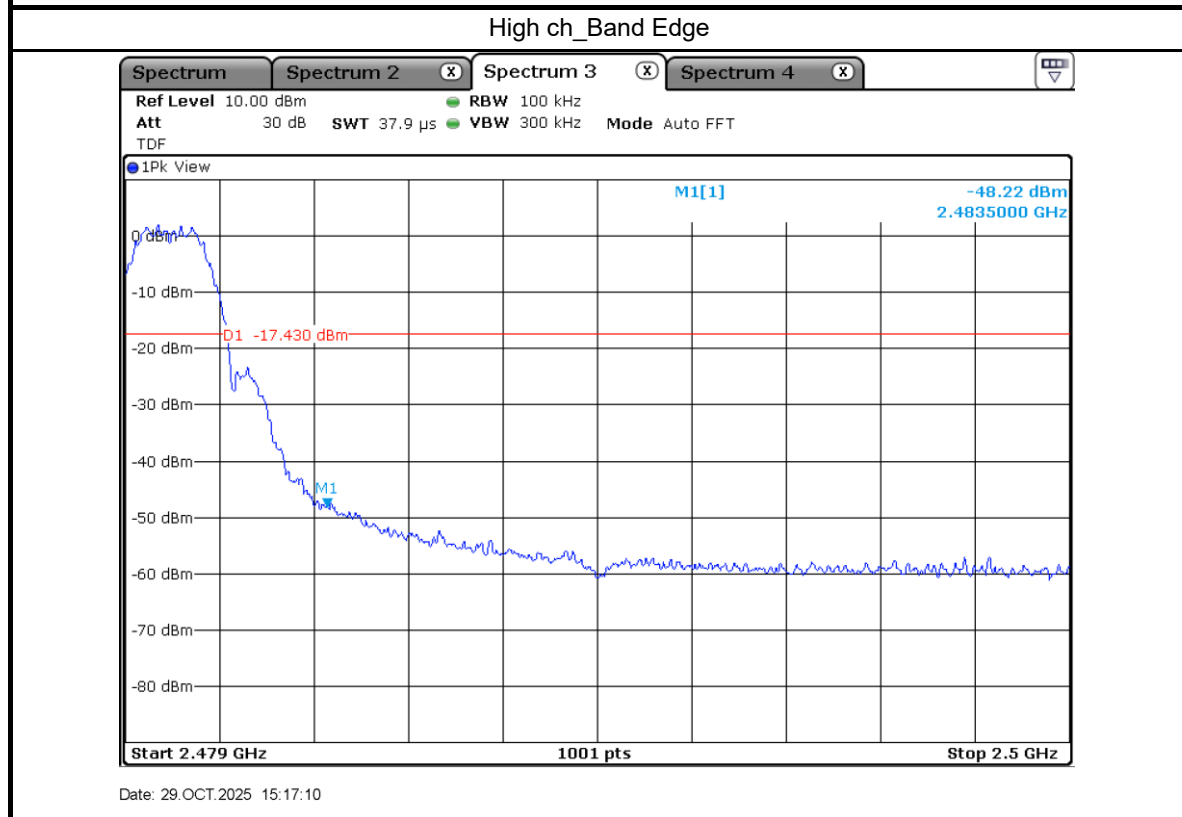
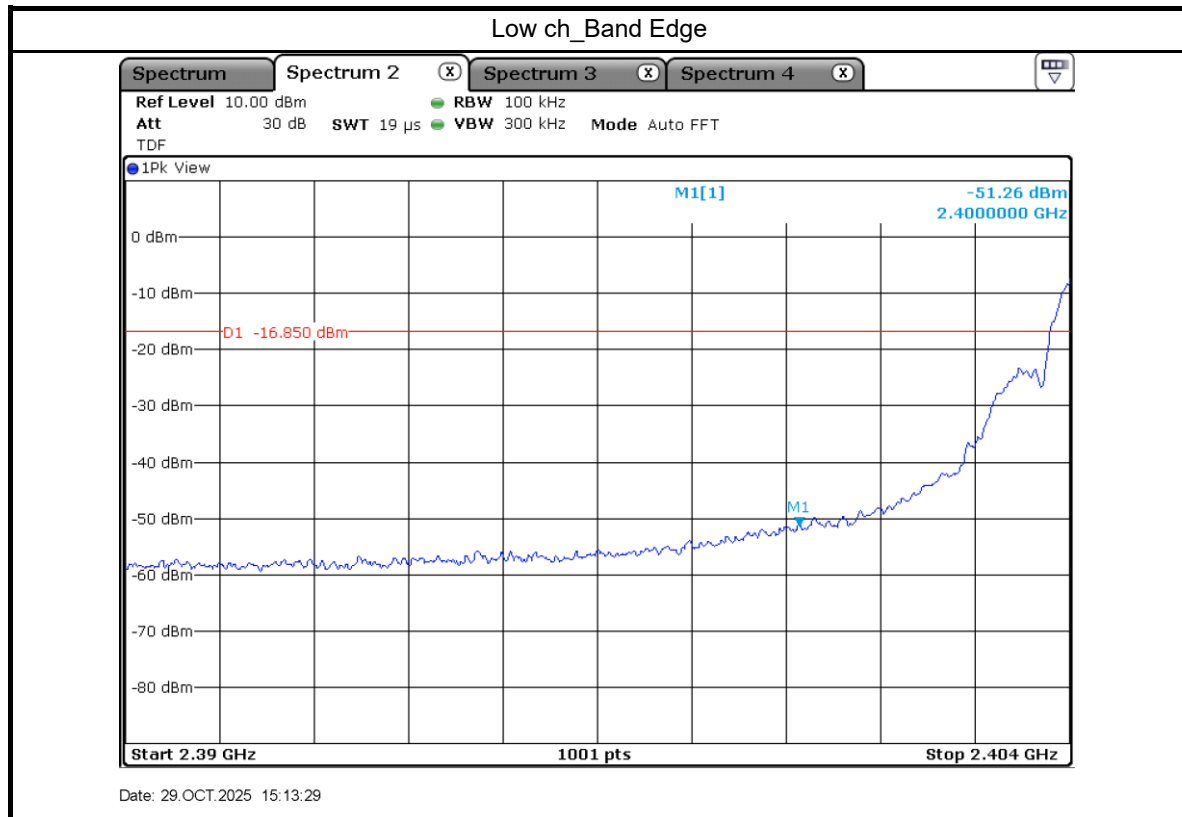


Mode : Zigbee











4.5 Radiated Spurious Emission

4.5.1 Test procedure

ANSI C63.10-2020 Clause 11.11, 11.12

4.5.2 Limit

§15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, 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 limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

§15.209 Radiated emission limits; general requirements.(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 (microvolts/meter)	Measurement distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	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., §§ 15.231 and 15.241.



§15.205 Restricted bands of operation.(a),(b)

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
¹ 0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	(²)
13.36–13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490–0.510 MHz.

² Above 38.6

Except as provided in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35 apply to these measurements.



4.5.3 Test data

Result : Pass

Mode : worst case

- Below 30 MHz

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
0.595	19.31	QP	H	19.90	39.21	72.36	33.15	-
1.222	13.22	QP	H	19.90	33.12	66.04	32.92	-
1.514	17.05	QP	V	19.90	36.95	64.00	27.05	-
1.598	16.85	QP	V	20.00	36.85	63.55	26.70	-
1.637	25.81	QP	V	20.00	45.81	63.34	17.53	-
1.663	14.43	QP	V	20.00	34.43	63.20	28.77	-

- Below 30 MHz

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
0.454	21.68	QP	H	19.90	41.58	94.49	52.91	-
0.616	30.98	QP	H	19.90	50.88	72.07	21.19	-
1.219	22.04	QP	H	19.90	41.94	66.06	24.12	-
1.604	16.38	QP	V	20.00	36.38	63.52	27.14	-
3.714	11.93	QP	V	20.00	31.93	69.54	37.61	-
6.890	24.55	QP	V	19.90	44.45	69.54	25.09	-

- Below 30 MHz_Co-location

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1.481	16.65	QP	H	19.90	36.55	64.21	27.66	-
1.595	15.45	QP	H	20.00	35.45	63.57	28.12	-
1.654	15.61	QP	H	20.00	35.61	63.24	27.63	-
9.404	13.63	QP	H	20.00	33.63	69.54	35.91	-
11.732	11.85	QP	V	20.10	31.95	69.54	37.59	-
22.803	15.17	QP	V	20.90	36.07	69.54	33.47	-



- 30 MHz ~ 1 GHz

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
64.241	49.99	QP	V	-16.60	33.39	40.00	6.61	-
68.8	48.20	QP	V	-18.20	30.00	40.00	10.00	-
74.135	51.28	QP	V	-20.30	30.98	40.00	9.02	-
13.298	48.64	QP	V	-19.30	29.34	43.52	14.18	-
192.863	45.26	QP	H	-16.60	28.66	43.52	14.86	-
600.069	37.33	QP	V	-5.70	31.63	46.02	14.39	-

- 30 MHz ~ 1 GHz

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
64.047	48.98	QP	V	-16.50	32.48	40.00	7.52	-
69.285	48.64	QP	V	-18.50	30.14	40.00	9.86	-
96.154	46.26	QP	V	-16.60	29.66	43.52	13.86	-
134.566	51.07	QP	V	-19.50	31.57	43.52	11.95	-
192.378	45.15	QP	V	-16.60	28.55	43.52	14.97	-
600.069	38.19	QP	V	-5.70	32.49	46.02	13.53	-

- 30 MHz ~ 1 GHz_Co-location

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
64.047	44.85	QP	V	-16.50	28.35	40.00	11.65	-
69.673	46.71	QP	V	-18.80	27.91	40.00	12.09	-
94.699	35.05	QP	V	-16.80	18.25	43.52	25.27	-
192.475	45.54	QP	H	-16.60	28.94	43.52	14.58	-
600.069	35.91	QP	V	-5.70	30.21	46.02	15.81	-
800.083	33.57	QP	H	-3.00	30.57	46.02	15.45	-



Mode : 802.11b

- 1 GHz Above_Low ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1 535.25	64.90	PK	H	-15.30	49.60	74.00	24.40	Spurious Emission
	63.79	AVG	H		48.49	54.00	5.51	
2 311.25	55.00	PK	V	-11.20	43.80	74.00	30.20	Restricted band
	33.54	AVG	V		22.34	54.00	31.66	
3 198.50	53.50	PK	V	-6.90	46.60	74.00	27.40	Spurious Emission
	33.71	AVG	V		26.81	54.00	27.19	
5 543.05	43.91	PK	V	-1.10	42.81	74.00	31.19	Spurious Emission
	30.80	AVG	V		29.70	54.00	24.30	
17 692.60	53.62	PK	V	13.40	67.02	74.00	6.98	Spurious Emission
	37.28	AVG	V		50.68	54.00	3.32	

- 1 GHz Above_Mid ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1 535.25	70.16	PK	V	-15.30	54.86	74.00	19.14	Spurious Emission
	66.97	AVG	V		51.67	54.00	2.33	
4 903.60	51.67	PK	V	-11.10	40.57	74.00	33.43	2nd Harmonic
	38.89	AVG	V		27.79	54.00	26.21	
5 543.05	44.49	PK	V	-1.10	43.39	74.00	30.61	Spurious Emission
	31.68	AVG	V		30.58	54.00	23.42	
7 319.30	51.01	PK	V	-2.40	48.61	74.00	25.39	3rd Harmonic
	37.96	AVG	V		35.56	54.00	18.44	

- 1 GHz Above_High ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1 535.50	64.87	PK	H	-15.30	49.57	74.00	24.43	Spurious Emission
	63.49	AVG	H		48.19	54.00	5.81	
2 491.00	48.68	PK	V	-10.10	38.58	74.00	35.42	Restricted band
	34.97	AVG	V		24.87	54.00	29.13	
7 372.95	47.82	PK	V	0.90	48.72	74.00	25.28	3rd Harmonic
	34.56	AVG	V		35.46	54.00	18.54	
17 702.75	52.84	PK	H	13.40	66.24	74.00	7.76	Spurious Emission
	38.13	AVG	H		51.53	54.00	2.47	



Mode : 802.11g

- 1 GHz Above_Low ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
2 345.25	47.40	PK	V	-11.00	36.40	74.00	37.60	Restricted band
	34.09	AVG	V		23.09	54.00	30.91	
3 070.50	52.99	PK	V	-7.30	45.69	74.00	28.31	Spurious Emission
	48.13	AVG	V		40.83	54.00	13.17	
4 825.30	44.80	PK	V	-2.70	42.10	74.00	31.90	2nd Harmonic
	31.87	AVG	V		29.17	54.00	24.83	
5 543.05	45.07	PK	V	-1.10	43.97	74.00	30.03	Spurious Emission
	32.77	AVG	V		31.67	54.00	22.33	
7 246.80	46.82	PK	V	0.90	47.72	74.00	26.28	3rd Harmonic
	34.22	AVG	V		35.12	54.00	18.88	

- 1 GHz Above_Mid ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1 535.25	69.77	PK	H	-15.30	54.47	74.00	19.53	Spurious Emission
	67.09	AVG	H		51.79	54.00	2.21	
4 893.45	43.76	PK	V	-2.40	41.36	74.00	32.64	2nd Harmonic
	30.85	AVG	V		28.45	54.00	25.55	
7 307.70	48.26	PK	H	0.90	49.16	74.00	24.84	3rd Harmonic
	34.67	AVG	H		35.57	54.00	18.43	

- 1 GHz Above_High ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
2 484.50	47.39	PK	V	-10.20	37.19	74.00	36.81	Restricted band
	34.26	AVG	V		24.06	54.00	29.94	
4 958.70	43.43	PK	H	-2.30	41.13	74.00	32.87	2nd Harmonic
	30.75	AVG	H		28.45	54.00	25.55	
5 544.50	47.51	PK	V	-1.10	46.41	74.00	27.59	Spurious Emission
	38.10	AVG	V		37.00	54.00	17.00	
7 384.55	48.02	PK	H	0.90	48.92	74.00	25.08	3rd Harmonic
	34.88	AVG	H		35.78	54.00	18.22	



Mode : 802.11n20

- 1 GHz Above_Low ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
2 345.50	46.89	PK	H	-11.00	35.89	74.00	38.11	Restricted band
	33.96	AVG	H		22.96	54.00	31.04	
2 600.75	45.94	PK	V	-9.40	36.54	74.00	37.46	Spurious Emission
	33.35	AVG	V		23.95	54.00	30.05	
4 836.90	44.44	PK	V	-2.60	41.84	74.00	32.16	2nd Harmonic
	31.91	AVG	V		29.31	54.00	24.69	
7 235.20	47.23	PK	V	0.90	48.13	74.00	25.87	3rd Harmonic
	34.27	AVG	V		35.17	54.00	18.83	

- 1 GHz Above_Mid ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
2 600.25	50.61	PK	V	-9.40	41.21	74.00	32.79	Spurious Emission
	33.27	AVG	V		23.87	54.00	30.13	
4 880.40	43.98	PK	V	-2.40	41.58	74.00	32.42	2nd Harmonic
	30.81	AVG	V		28.41	54.00	25.59	
7 323.65	47.74	PK	V	0.90	48.64	74.00	25.36	3rd Harmonic
	34.94	AVG	V		35.84	54.00	18.16	

- 1 GHz Above_High ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
2 488.25	47.79	PK	V	-10.10	37.69	74.00	36.31	Restricted band
	34.44	AVG	V		24.34	54.00	29.66	
4 948.55	44.15	PK	V	-2.30	41.85	74.00	32.15	2nd Harmonic
	30.80	AVG	V		28.50	54.00	25.50	
5 544.50	47.31	PK	V	-1.10	46.21	74.00	27.79	Spurious Emission
	37.62	AVG	V		36.52	54.00	17.48	
7 367.15	47.55	PK	H	0.90	48.45	74.00	25.55	3rd Harmonic
	34.94	AVG	H		35.84	54.00	18.16	



Mode : 802.11n40

- 1 GHz Above_Low ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1 535.25	67.85	PK	H	-15.30	52.55	74.00	21.45	Spurious Emission
	66.95	AVG	H		51.65	54.00	2.35	
2 344.00	46.53	PK	V	-11.00	35.53	74.00	38.47	Restricted band
	33.98	AVG	V		22.98	54.00	31.02	
4 845.60	44.99	PK	H	-2.60	42.39	74.00	31.61	2nd Harmonic
	31.97	AVG	H		29.37	54.00	24.63	
5 543.05	45.07	PK	V	-1.10	43.97	74.00	30.03	Spurious Emission
	32.22	AVG	V		31.12	54.00	22.88	
7 287.40	47.92	PK	V	0.90	48.82	74.00	25.18	3rd Harmonic
	34.53	AVG	V		35.43	54.00	18.57	

- 1 GHz Above_Mid ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
4 876.05	44.14	PK	H	-2.40	41.74	74.00	32.26	2nd Harmonic
	30.76	AVG	H		28.36	54.00	25.64	
5 543.05	44.99	PK	V	-1.10	43.89	74.00	30.11	Spurious Emission
	32.31	AVG	V		31.21	54.00	22.79	
7 310.60	48.47	PK	H	0.90	49.37	74.00	24.63	3rd Harmonic
	34.70	AVG	H		35.60	54.00	18.40	

- 1 GHz Above_High ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1 535.25	67.92	PK	H	-15.30	52.62	74.00	21.38	Spurious Emission
	66.28	AVG	H		50.98	54.00	3.02	
2 200.25	53.30	PK	V	-11.70	41.60	74.00	32.40	Spurious Emission
	35.09	AVG	V		23.39	54.00	30.61	
2 498.00	47.34	PK	V	-10.00	37.34	74.00	36.66	Restricted band
	34.49	AVG	V		24.49	54.00	29.51	
4 909.40	43.82	PK	H	-2.40	41.42	74.00	32.58	2nd Harmonic
	30.79	AVG	H		28.39	54.00	25.61	
7 375.85	48.14	PK	H	0.90	49.04	74.00	24.96	3rd Harmonic
	34.91	AVG	H		35.81	54.00	18.19	



Mode : Bluetooth LE1M

- 1 GHz Above_Low ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1 535.25	65.25	PK	H	-15.30	49.95	74.00	24.05	Spurious Emission
	64.26	AVG	H		48.96	54.00	5.04	
2 311.00	46.94	PK	H	-11.20	35.74	74.00	38.26	Restricted band
	33.26	AVG	H		22.06	54.00	31.94	
3 197.75	55.83	PK	V	-6.90	48.93	74.00	25.07	Spurious Emission
	35.06	AVG	V		28.16	54.00	25.84	
4 805.00	44.57	PK	V	-2.80	41.77	74.00	32.23	2nd Harmonic
	31.47	AVG	V		28.67	54.00	25.33	
7 210.55	47.29	PK	V	0.90	48.19	74.00	25.81	3rd Harmonic
	34.19	AVG	V		35.09	54.00	18.91	

- 1 GHz Above_Mid ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
4 877.50	43.52	PK	V	-2.40	41.12	74.00	32.88	2nd Harmonic
	30.75	AVG	V		28.35	54.00	25.65	
5 543.05	45.24	PK	V	-1.10	44.14	74.00	29.86	Spurious Emission
	32.75	AVG	V		31.65	54.00	22.35	
7 322.20	47.87	PK	H	0.90	48.77	74.00	25.23	3rd Harmonic
	34.90	AVG	H		35.80	54.00	18.20	

- 1 GHz Above_High ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1 535.25	68.51	PK	H	-15.30	53.21	74.00	20.79	Spurious Emission
	66.63	AVG	H		51.33	54.00	2.67	
2 494.00	47.87	PK	H	-10.10	37.77	74.00	36.23	Restricted band
	34.57	AVG	H		24.47	54.00	29.53	
4 965.95	43.70	PK	V	-2.30	41.40	74.00	32.60	2nd Harmonic
	30.73	AVG	V		28.43	54.00	25.57	
7 441.10	47.92	PK	V	1.00	48.92	74.00	25.08	3rd Harmonic
	35.17	AVG	V		36.17	54.00	17.83	



Mode : Bluetooth LE2M

- 1 GHz Above_Low ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1 535.25	68.07	PK	H	-15.30	52.77	74.00	21.23	Spurious Emission
	67.27	AVG	H		51.97	54.00	2.03	
2 366.00	52.43	PK	V	-10.90	41.53	74.00	32.47	Restricted band
	33.72	AVG	V		22.82	54.00	31.18	
2 599.50	61.96	PK	V	-9.40	52.56	74.00	21.44	Spurious Emission
	37.43	AVG	V		28.03	54.00	25.97	
3 192.75	53.25	PK	V	-6.80	46.45	74.00	27.55	Spurious Emission
	33.33	AVG	V		26.53	54.00	27.47	

- 1 GHz Above_Mid ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1 535.25	64.43	PK	H	-15.30	49.13	74.00	24.87	Spurious Emission
	63.24	AVG	H		47.94	54.00	6.06	
2 600.25	62.94	PK	V	-9.40	53.54	74.00	20.46	Spurious Emission
	33.47	AVG	V		24.07	54.00	29.93	
3 190.75	55.37	PK	V	-6.80	48.57	74.00	25.43	Spurious Emission
	34.94	AVG	V		28.14	54.00	25.86	
4 883.30	44.15	PK	H	-2.40	41.75	74.00	32.25	2nd Harmonic
	30.22	AVG	H		27.82	54.00	26.18	
7 320.75	47.57	PK	V	0.90	48.47	74.00	25.53	3rd Harmonic
	34.66	AVG	V		35.56	54.00	18.44	

- 1 GHz Above_High ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
1 535.50	67.70	PK	H	-15.30	52.40	74.00	21.60	Spurious Emission
	66.77	AVG	H		51.47	54.00	2.53	
2 499.00	47.71	PK	V	-10.00	37.71	74.00	36.29	Restricted band
	34.33	AVG	V		24.33	54.00	29.67	
7 446.90	48.60	PK	V	1.10	49.70	74.00	24.30	3rd Harmonic
	34.95	AVG	V		36.05	54.00	17.95	
17 672.30	53.06	PK	H	13.30	66.36	74.00	7.64	Spurious Emission
	38.31	AVG	H		51.61	54.00	2.39	



Mode : Zigbee

- 1 GHz Above_Low ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
2 331.33	75.85	PK	H	-11.10	64.75	74.00	9.25	Restricted band
	34.80	AVG	H		23.70	54.00	30.30	
2 555.00	72.03	PK	H	-9.60	62.43	74.00	11.57	Spurious Emission
	35.07	AVG	H		25.47	54.00	28.53	
4 810.80	45.10	PK	V	-2.80	42.30	74.00	31.70	2nd Harmonic
	32.10	AVG	V		29.30	54.00	24.70	
7 214.90	47.91	PK	V	0.90	48.81	74.00	25.19	3rd Harmonic
	34.34	AVG	V		35.24	54.00	18.76	
19 394.85	38.59	PK	V	6.90	45.49	74.00	28.51	Spurious Emission
	25.61	AVG	V		32.51	54.00	21.49	

- 1 GHz Above_Mid ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
4 887.65	43.27	PK	H	-2.40	40.87	74.00	33.13	2nd Harmonic
	30.60	AVG	H		28.20	54.00	25.80	
7 330.90	47.96	PK	V	0.80	48.76	74.00	25.24	3rd Harmonic
	35.08	AVG	V		35.88	54.00	18.12	
17 707.10	53.16	PK	H	13.40	66.56	74.00	7.44	Spurious Emission
	38.44	AVG	H		51.84	54.00	2.16	

- 1 GHz Above_High ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
2 484.10	65.13	PK	H	-10.20	54.93	74.00	19.07	Restricted band
	51.65	AVG	H		41.45	54.00	12.55	
4 965.95	43.63	PK	V	-2.30	41.33	74.00	32.67	2nd Harmonic
	30.79	AVG	V		28.49	54.00	25.51	
7 438.20	48.39	PK	V	1.00	49.39	74.00	24.61	3rd Harmonic
	35.20	AVG	V		36.20	54.00	17.80	



Mode : Co-location worst case

- 1 GHz Above_Low ch

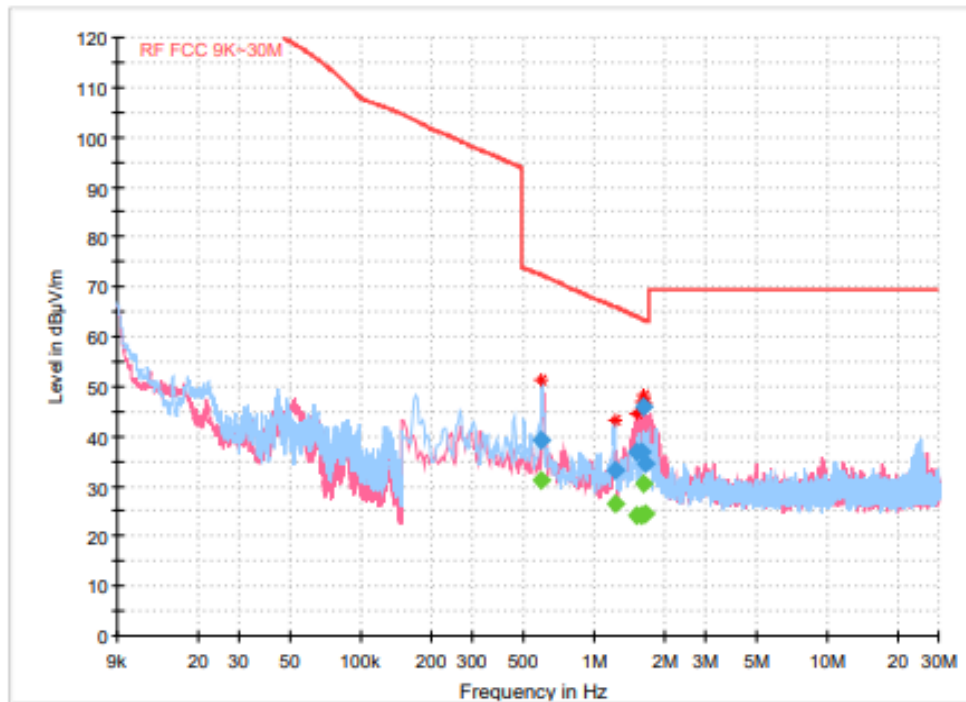
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2 352.00	81.81	PK	H	-11.00	70.81	74.00	3.19	Restricted band
	49.13	AVG	H		38.13	54.00	15.87	
2 490.80	79.87	PK	H	-10.10	69.77	74.00	4.23	Restricted band
	40.31	AVG	H		30.21	54.00	23.79	
2 525.20	75.36	PK	H	-9.80	65.56	74.00	8.44	Spurious Emission
	41.95	AVG	H		32.15	54.00	21.85	
4 794.40	44.19	PK	V	-2.90	41.29	74.00	32.71	2nd Harmonic
	31.29	AVG	V		28.39	54.00	25.61	
5 544.10	48.00	PK	V	-1.10	46.90	74.00	27.10	Spurious Emission
	40.28	AVG	V		39.18	54.00	14.82	
7 242.40	46.16	PK	H	0.90	47.06	74.00	26.94	3rd Harmonic
	33.19	AVG	H		34.09	54.00	19.91	
17 998.30	50.71	PK	H	14.10	64.81	74.00	9.19	Spurious Emission
	37.78	AVG	H		51.88	54.00	2.12	
26 495.75	35.56	PK	H	9.20	44.76	74.00	29.24	Spurious Emission
	22.44	AVG	H		31.64	54.00	22.36	



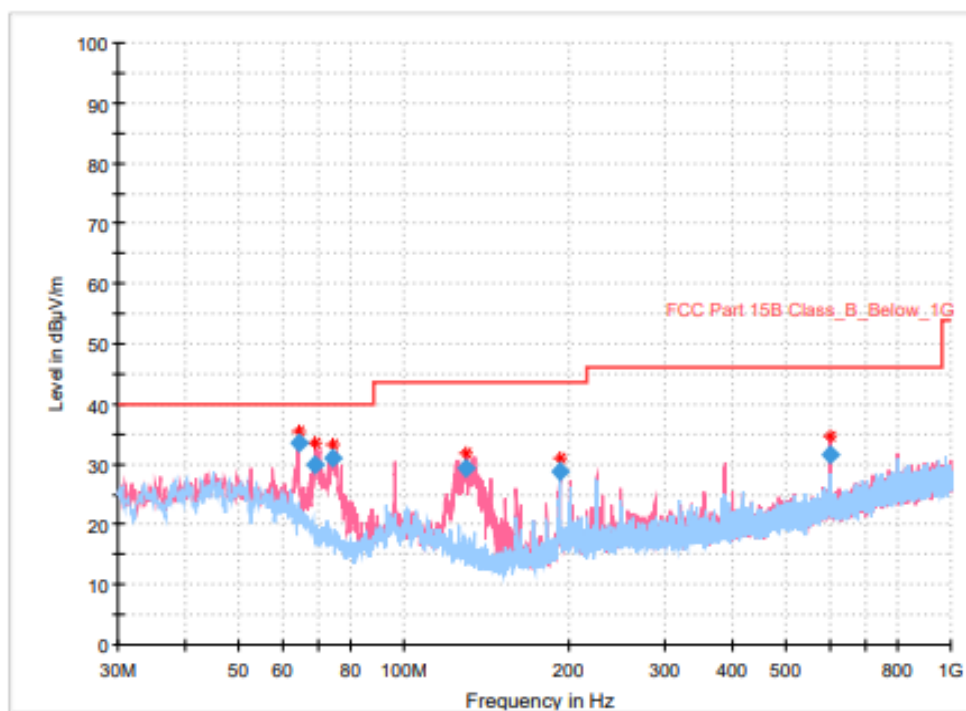
4.6.4 Test plot

Worst case Mode

Below_30 MHz

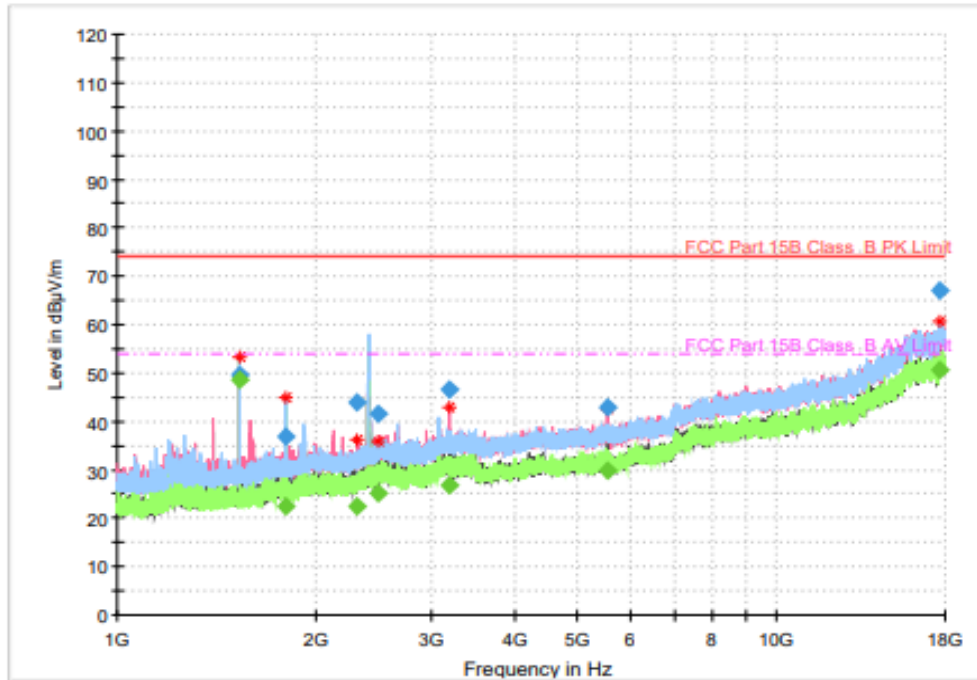


Below_1 GHz

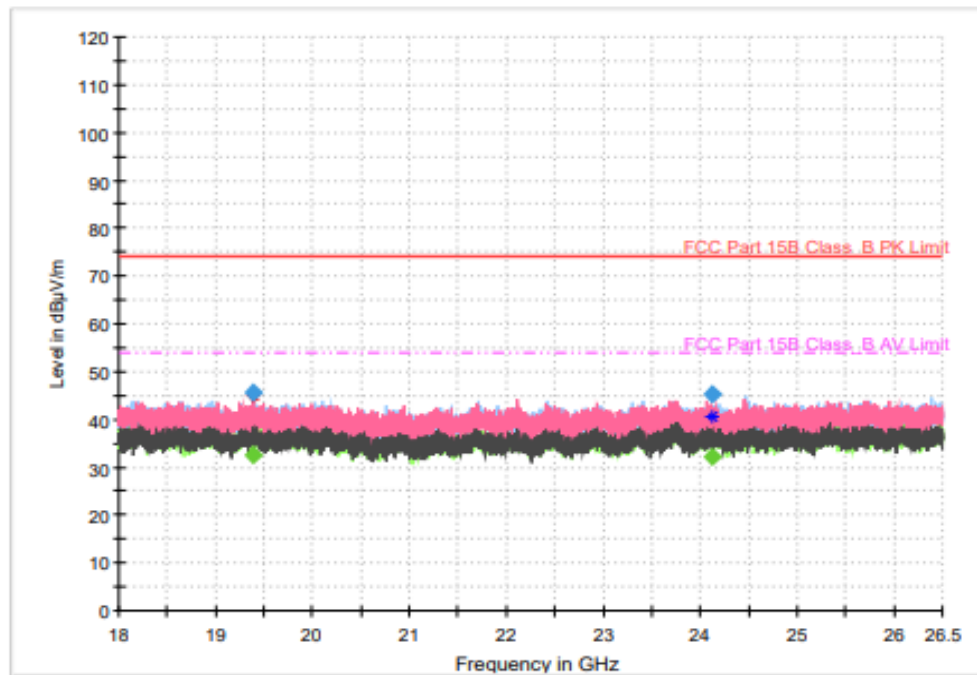




Above_1 GHz



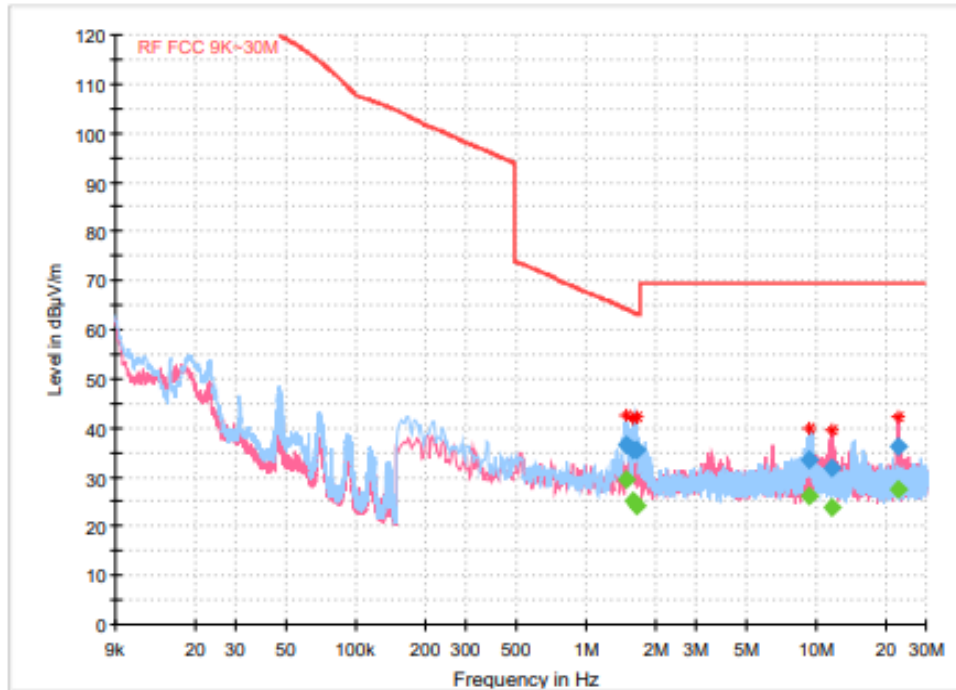
Above_18 GHz



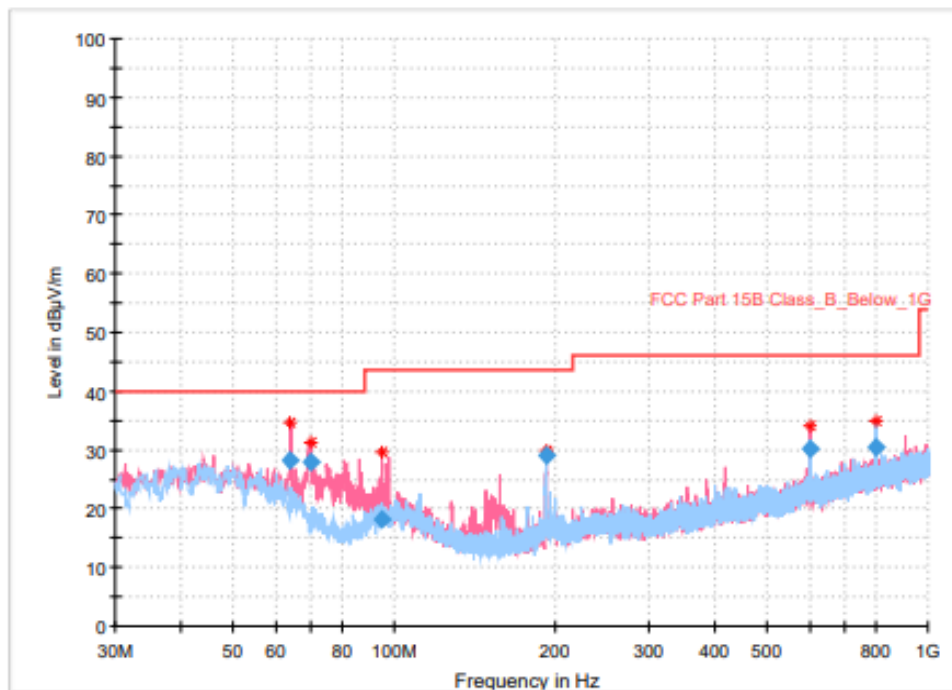


Worst case Co-location Mode

Below_30 MHz

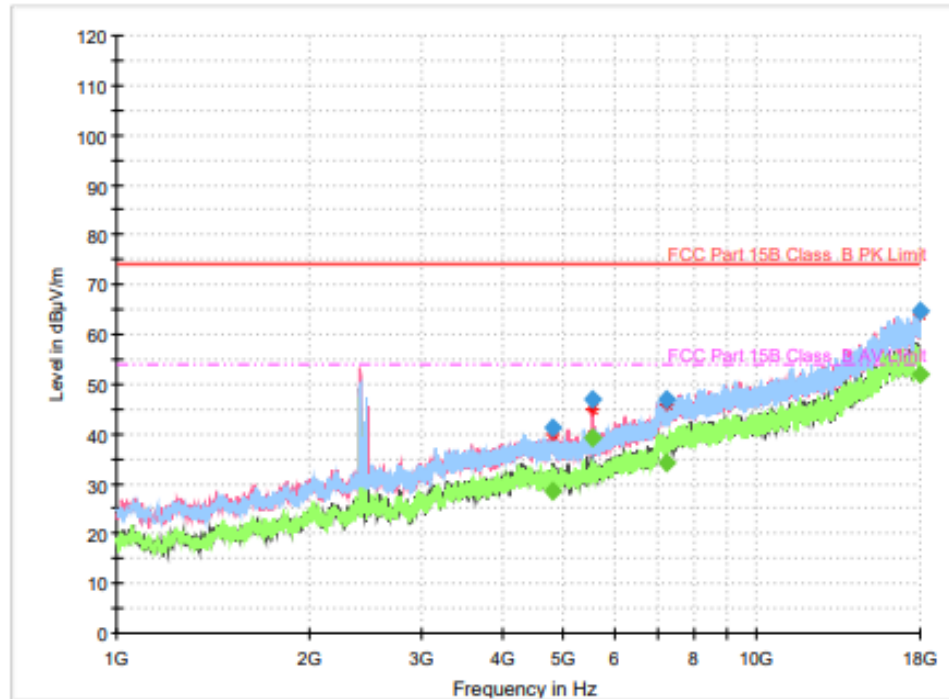


Below_1 GHz

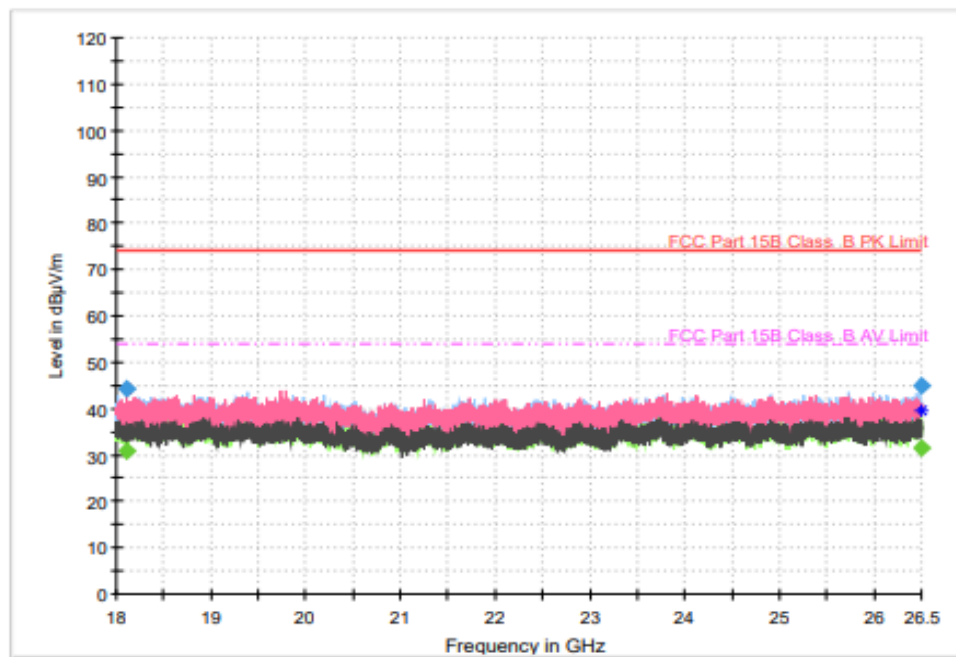




Above_1 GHz



Above_18 GHz





4.6 Power Line Conducted Emission

4.6.1 Test procedure

ANSI C63.10-2020 Clause 6.2

4.6.2 Limit

§15.207 (a)

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

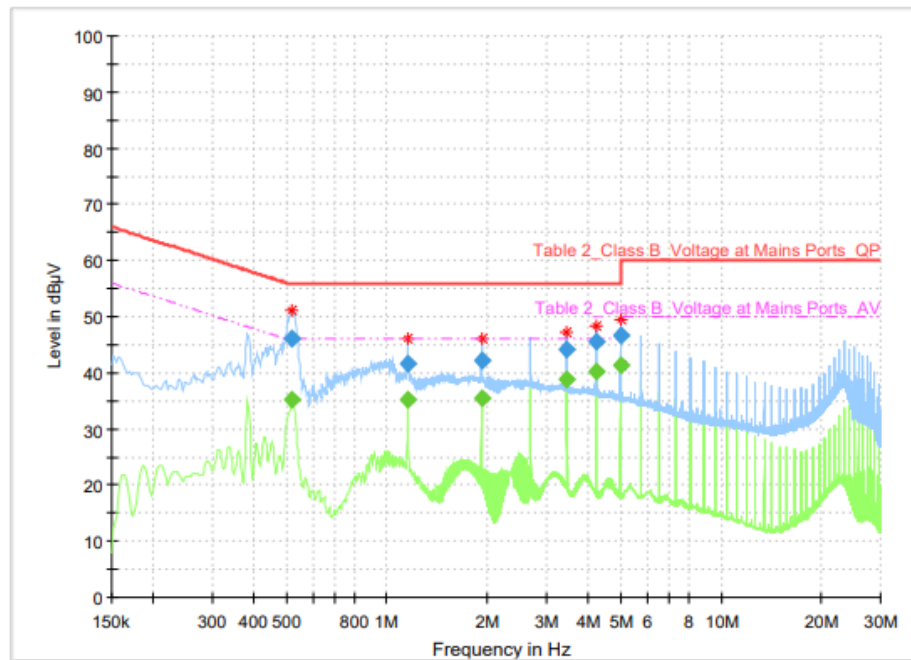
*Decreases with the logarithm of the frequency.



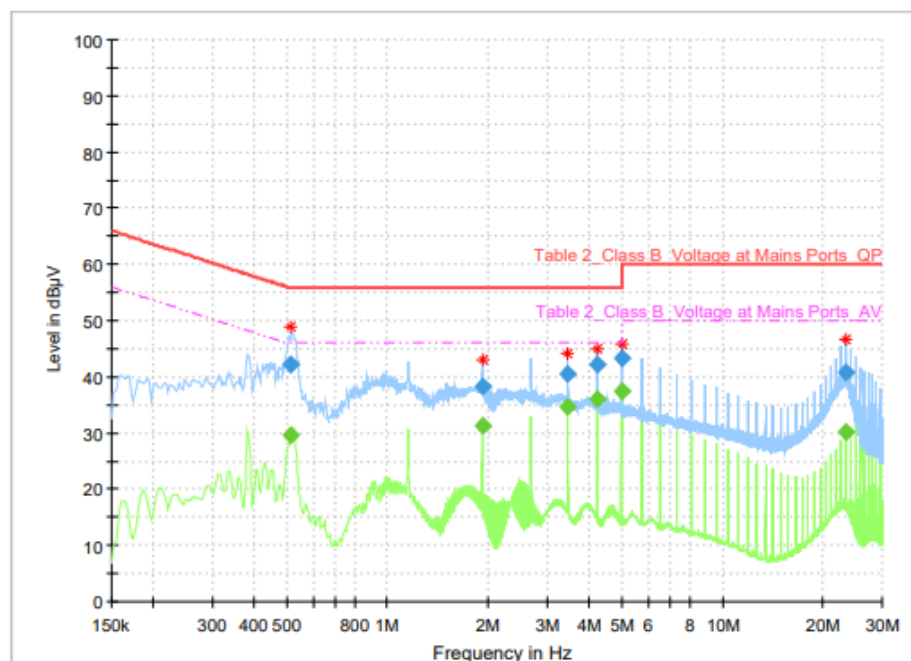
4.6.3 Test data

Result : Pass

L-Line Conducted Emission



N-Line Conducted Emission





L-Line Conducted Emission

Frequency (MHz)	Reading (dBuV/m)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
0.519	36.06	QP	10.00	46.06	56.00	9.94	-
	25.23	AVG		35.23	46.00	10.77	
1.151	31.96	QP	9.80	41.76	56.00	14.24	-
	25.43	AVG		35.23	46.00	10.77	
1.919	32.24	QP	9.80	42.04	56.00	13.96	-
	25.79	AVG		35.59	46.00	10.41	
3.455	34.33	QP	9.80	44.13	56.00	11.87	-
	28.90	AVG		38.70	46.00	7.30	
4.225	35.84	QP	9.80	45.64	56.00	10.36	-
	30.47	AVG		40.27	46.00	5.73	
4.992	36.87	QP	9.80	46.67	56.00	9.33	-
	31.59	AVG		41.39	46.00	4.61	

N-Line Conducted Emission

Frequency (MHz)	Reading (dBuV/m)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
0.515	32.12	QP	10.00	42.12	56.00	13.88	-
	19.60	AVG		29.60	46.00	16.40	
1.919	28.46	QP	9.80	38.26	56.00	17.74	-
	21.49	AVG		31.29	46.00	14.71	
3.455	30.81	QP	9.80	40.61	56.00	15.39	-
	24.73	AVG		34.53	46.00	11.47	
4.225	32.45	QP	9.80	42.25	56.00	13.75	-
	26.35	AVG		36.15	46.00	9.85	
4.992	33.50	QP	9.80	43.30	56.00	12.70	-
	27.51	AVG		37.31	46.00	8.69	
23.424	30.78	QP	10.10	40.88	60.00	19.12	-
	20.14	AVG		30.24	50.00	19.76	



5. Used equipment

	Description	Model Name	Manufacturer	Serial Number	Next Cal
■	SIGNAL GENERATOR	SMB100A	ROHDE & SCHWARZ	180607	2026-02-24
■	SPECTRUM ANALYZER	FSV40-N	ROHDE & SCHWARZ	101303	2026-02-24
■	DC BLOCK	PDCB-00012650-SMSF-2	PSATEK INC.	-	2026-03-04
■	DC POWER SUPPLY	E3632A	AGILENT	MY40011056	2026-01-22
■	LOOP ANTENNA	HFH2-Z2	ROHDE & SCHWARZ	100271	2027-03-04
■	TRILOG BROADBAND ANTENNA	VULB 9162	SCHWARZBECK	120	2026-12-09
■	EMI TEST RECEIVER	ESR26	ROHDE & SCHWARZ	101462	2026-03-24
■	SIGNAL CONDITIONING UNIT	SCU 08	ROHDE & SCHWARZ	100746	2026-03-24
■	DOUBLE-RIDGED HORN ANTENNA	HF907	ROHDE & SCHWARZ	102556	2026-07-28
■	HIGH PASS FILTER	WT-A1698-HS	WT MICROWAVE	WT171201-6-4	2026-02-24
■	SIGNAL CONDITIONING UNIT	SCU18	ROHDE & SCHWARZ	102342	2026-03-24
■	EMI TEST RECEIVER	ESR26	ROHDE & SCHWARZ	101461	2026-03-24
■	HORN ANTENNA	LB-42-10-C-KF	A-INFOMW	J202024625	2026-03-07
■	RF PRE AMPLIFIER	AMF-4F-18265-35-8P-1	MITEQ	771846	2026-03-06
■	TWO-LINE V-NETWORK	ENV216	ROHDE & SCHWARZ	102195	2026-09-04
■	EMI TEST RECEIVER	ESR7	ROHDE & SCHWARZ	102034	2026-03-24

- END OF REPORT.