
FCC§2.1051, §22.917(a) & §24.238(a) & §27.53 – Spurious Emissions At Antenna Terminals

Applicable Standard

FCC § 2.1051, §22.917, § 24.238, § 27.53

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

The resolution bandwidth of the spectrum analyzer was set at 100 kHz for below 1GHz & 1MHz for above 1GHz.

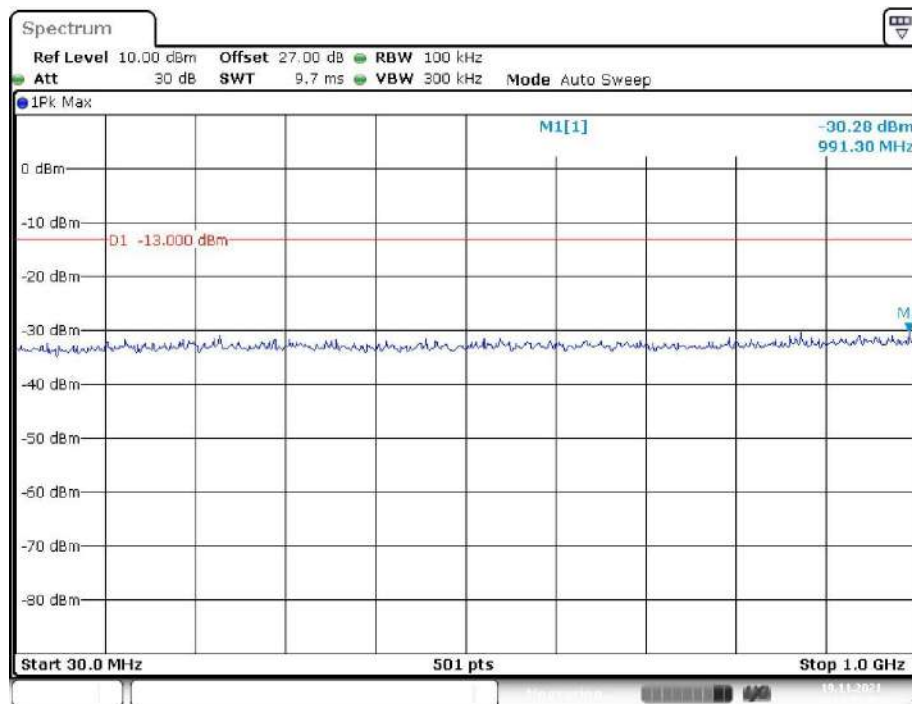
Test Results

(Worst case is Resource Block & RB offset : RB1#0)

Please refer to the following plots

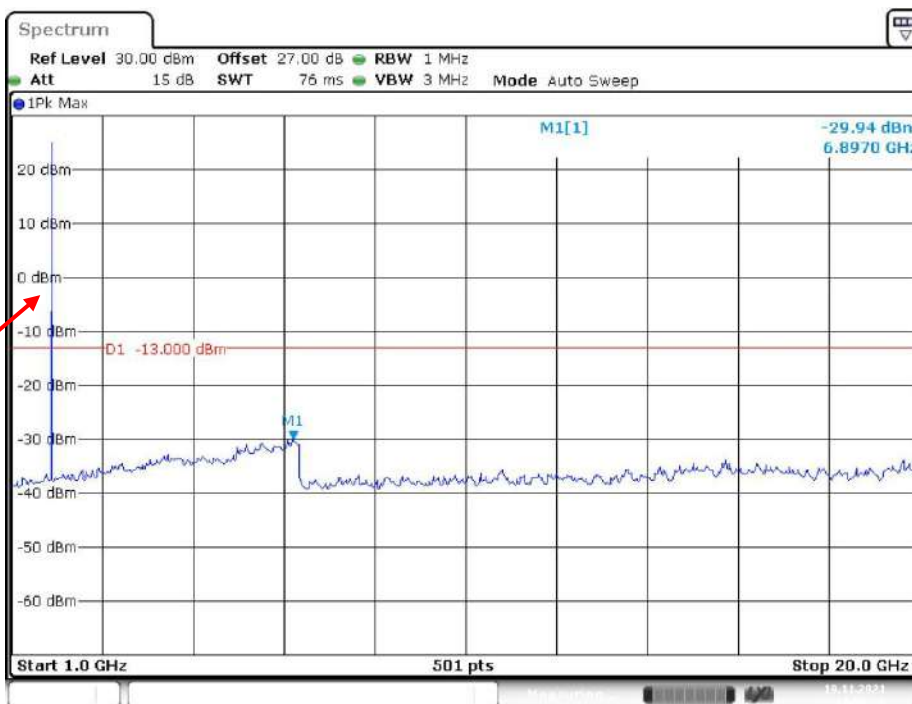
LTE Band 2

30 MHz – 1 GHz (1.4 MHz, QPSK, Low Channel)



Date: 19.NOV.2021 14:51:57

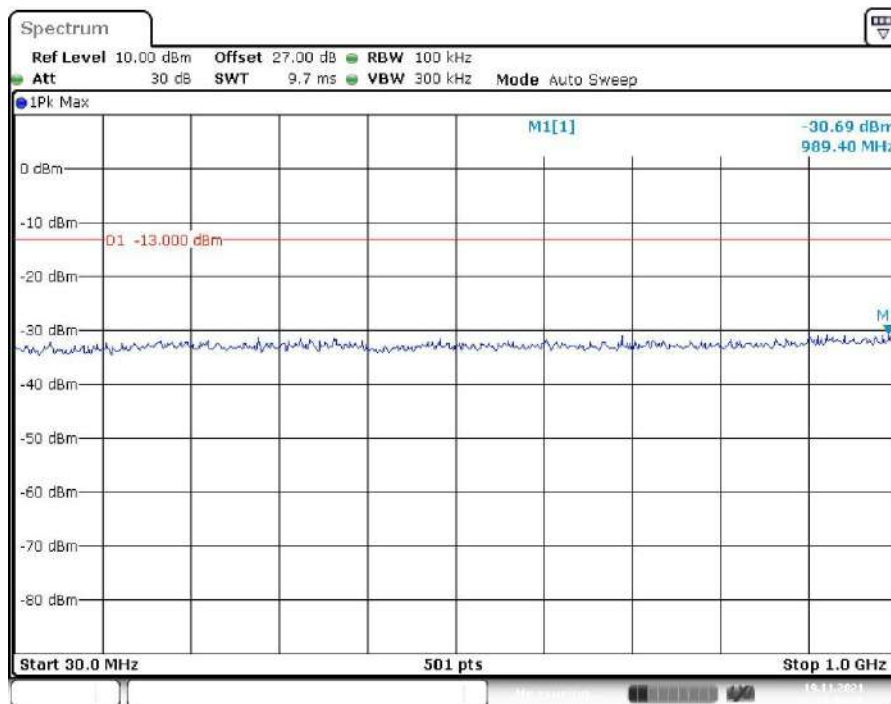
1 GHz – 20 GHz (1.4 MHz, QPSK, Low Channel)



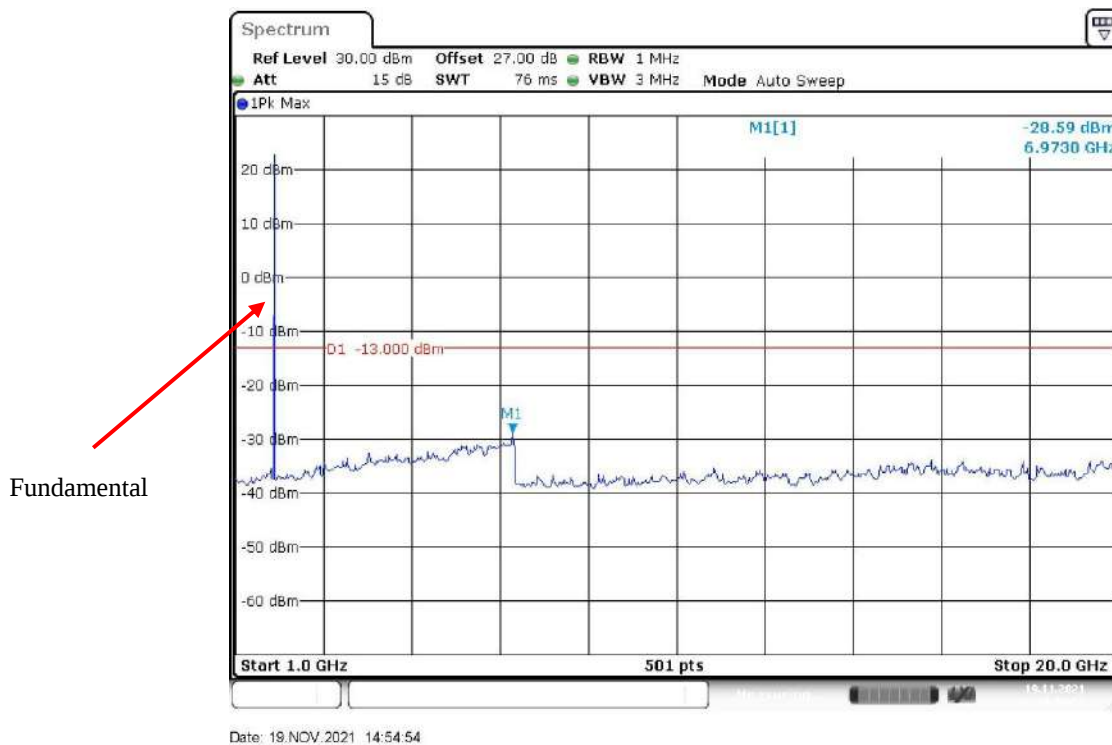
Date: 19.NOV.2021 14:52:16

Note: It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.
(New Taipei Laboratory)

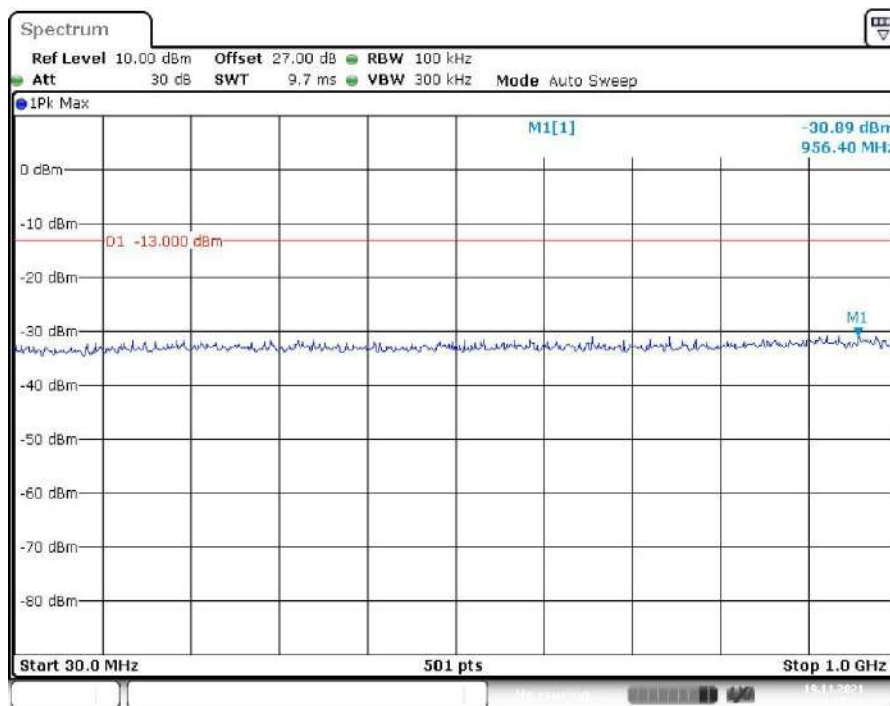
30 MHz – 1 GHz (3 MHz, QPSK, Low Channel)



1 GHz – 20 GHz (3 MHz, QPSK, Low Channel)

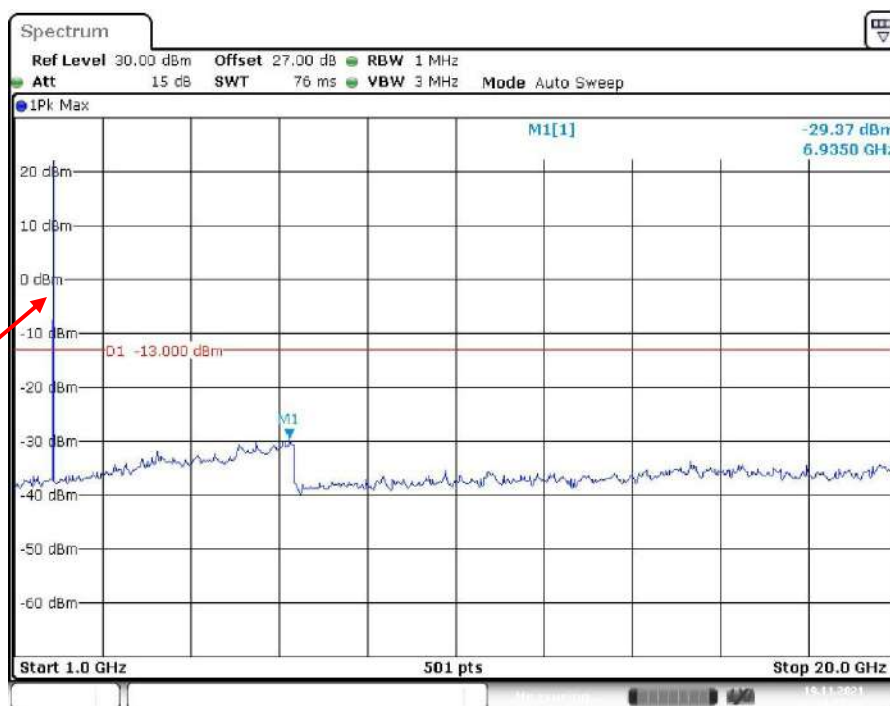


30 MHz – 1 GHz (5 MHz, QPSK, Low Channel)



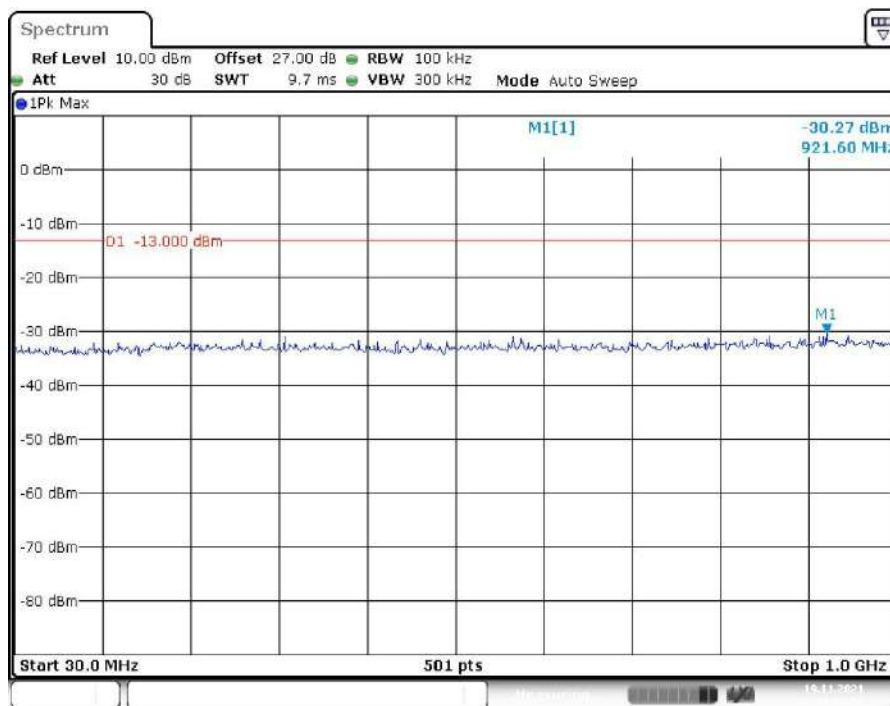
Date: 19.NOV.2021 14:57:16

1 GHz – 20 GHz (5 MHz, QPSK, Low Channel)

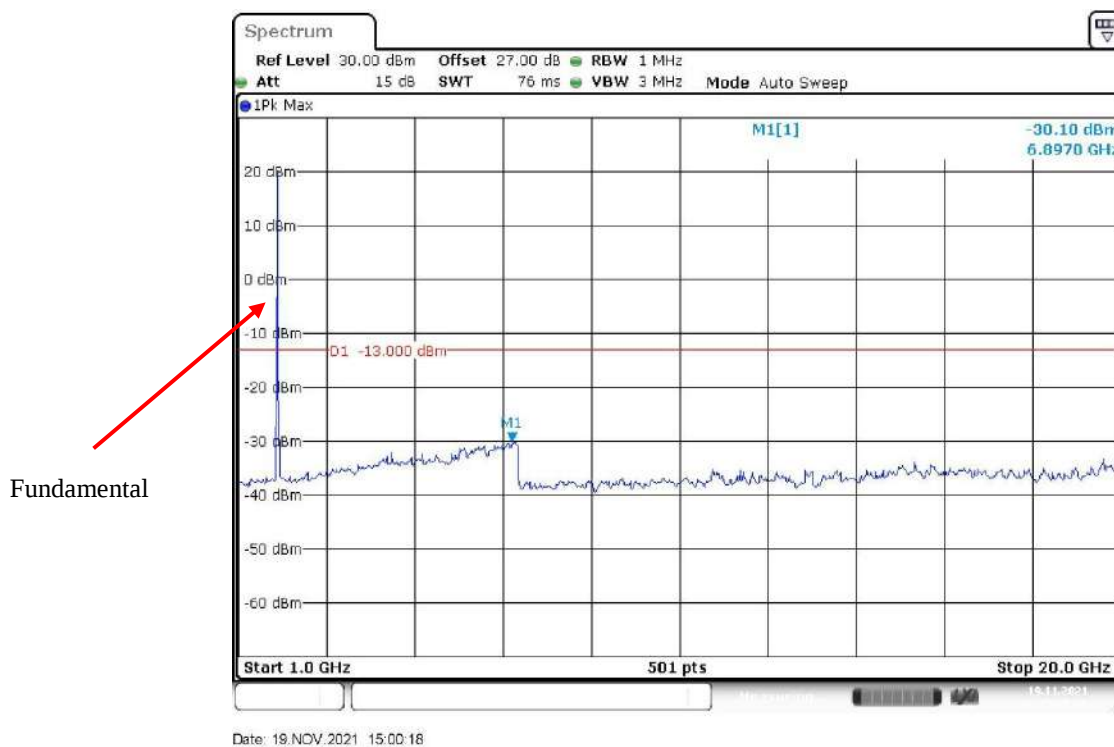


Fundamental

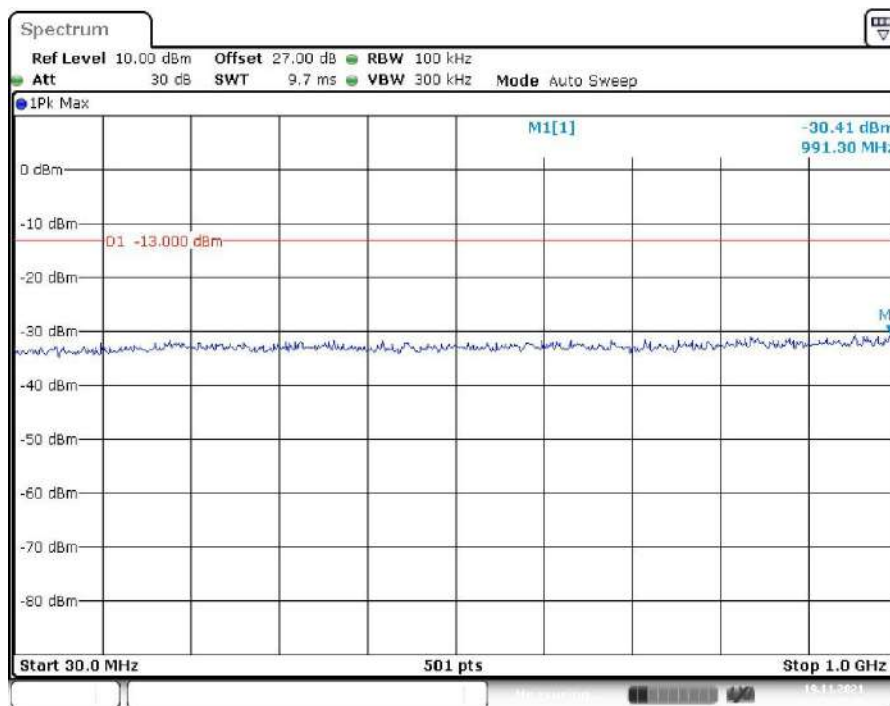
30 MHz – 1 GHz (10 MHz, QPSK, Low Channel)



1 GHz – 20 GHz (10 MHz, QPSK, Low Channel)

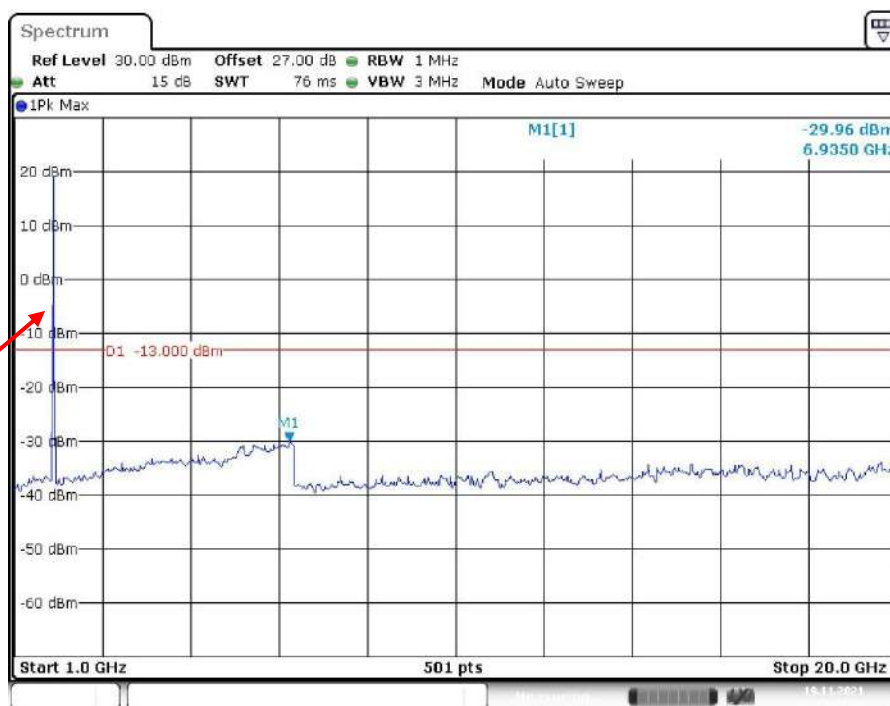


30 MHz – 1 GHz (15 MHz, QPSK, Low Channel)



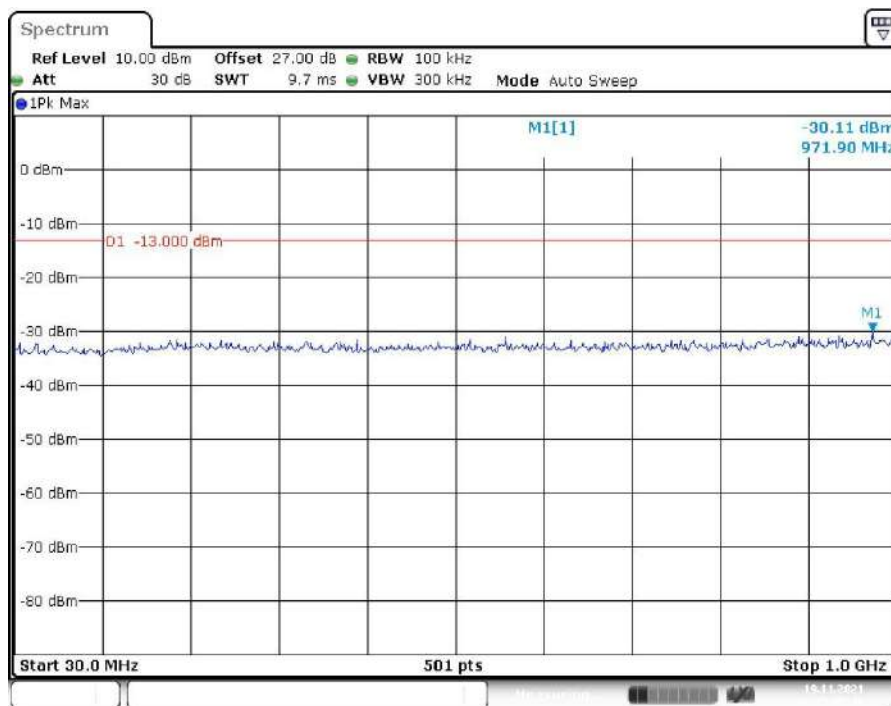
Date: 19.NOV.2021 15:02:48

1 GHz – 20 GHz (15 MHz, QPSK, Low Channel)



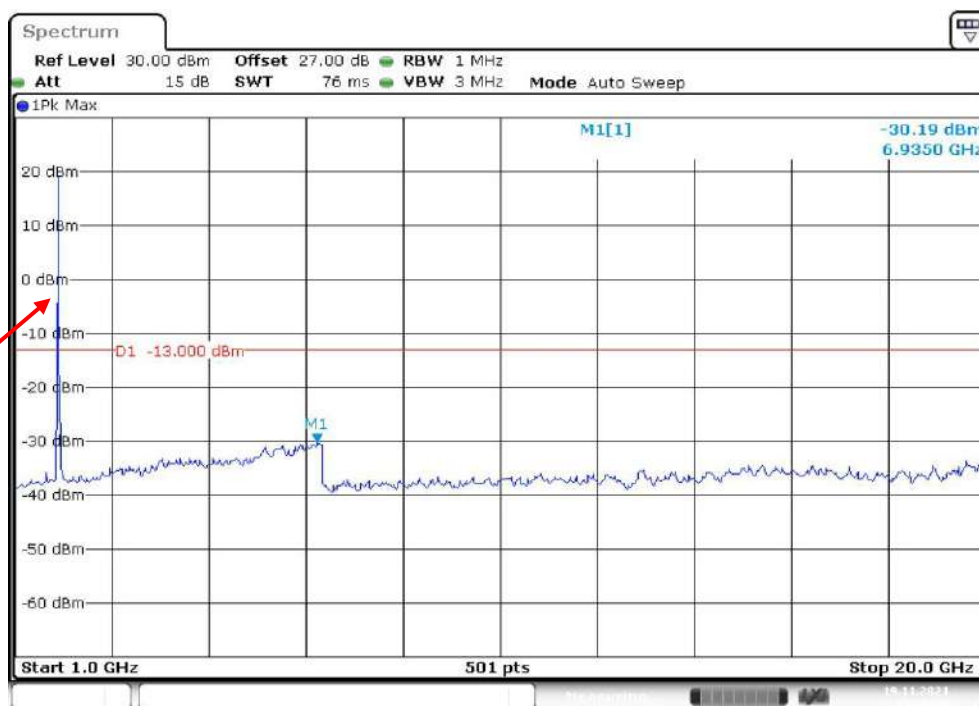
Date: 19.NOV.2021 15:03:15

30 MHz – 1 GHz (20MHz, QPSK, Low Channel)



Date: 19.NOV.2021 15:05:47

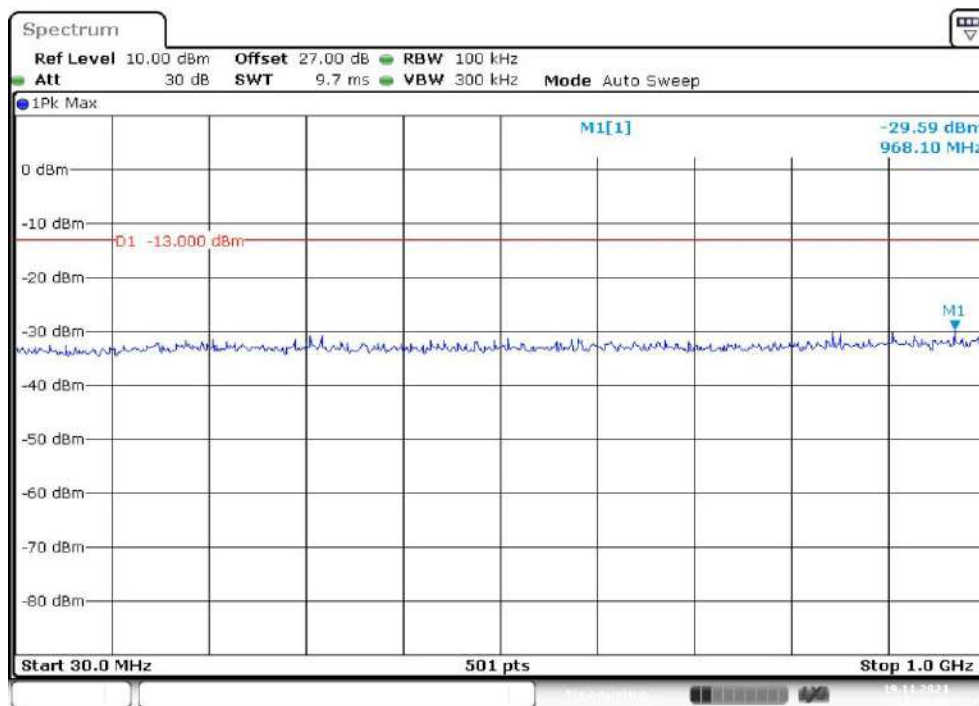
1 GHz – 20 GHz (20 MHz, QPSK, Low Channel)



Fundamental

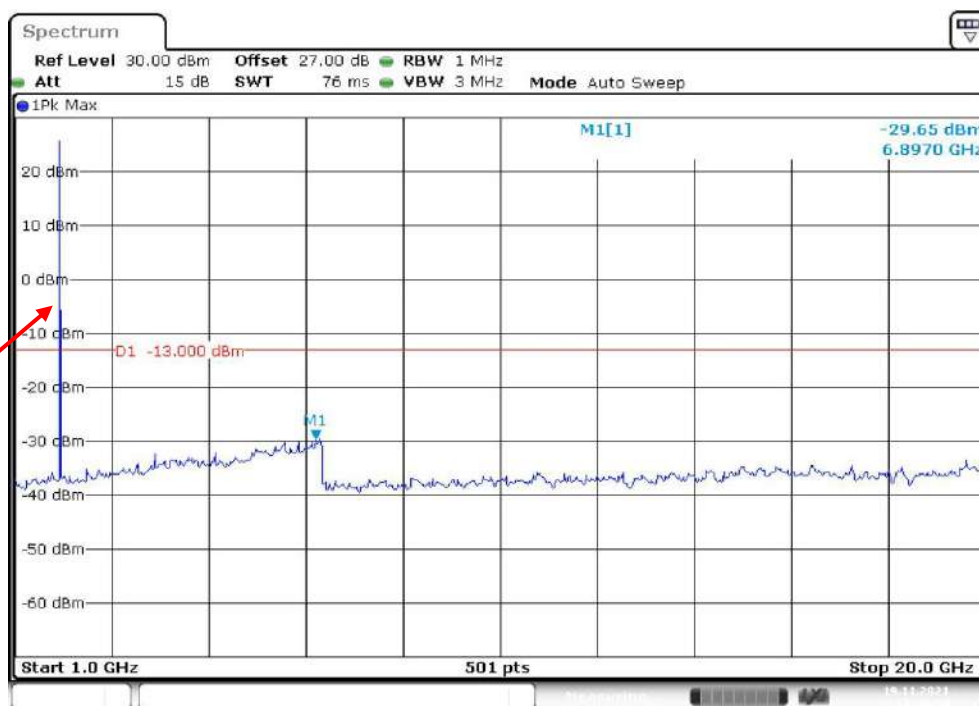
Date: 19.NOV.2021 15:06:10

30 MHz – 1 GHz (1.4 MHz, QPSK, Middle Channel)

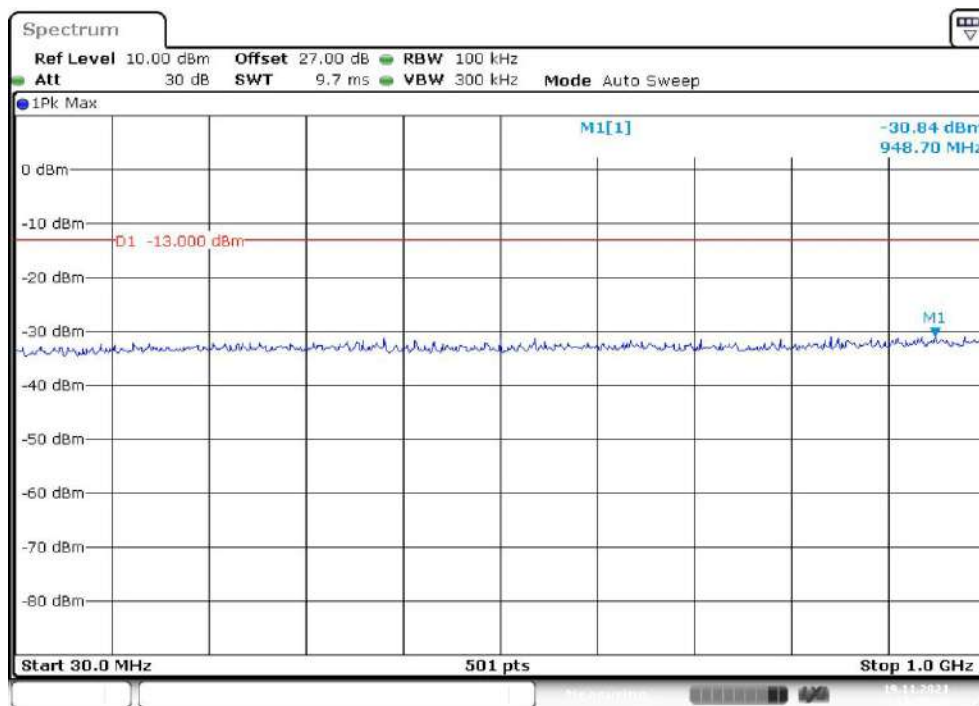


Date: 19 NOV 2021 14:52:42

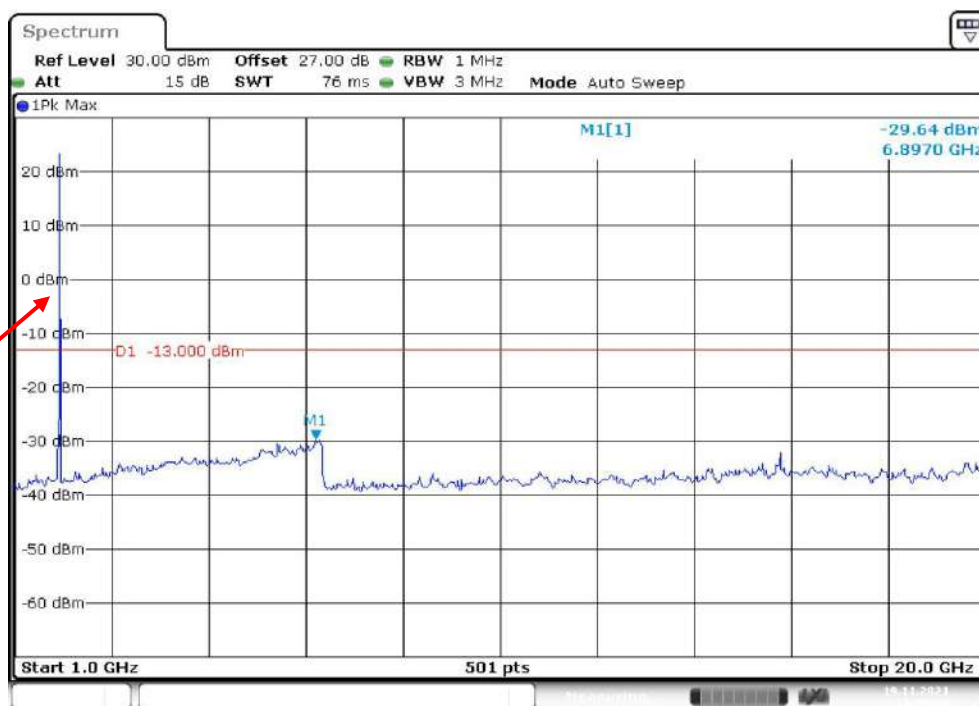
1 GHz – 20 GHz (1.4 MHz, QPSK, Middle Channel)



Fundamental

30 MHz – 1 GHz (3 MHz, QPSK, Middle Channel)

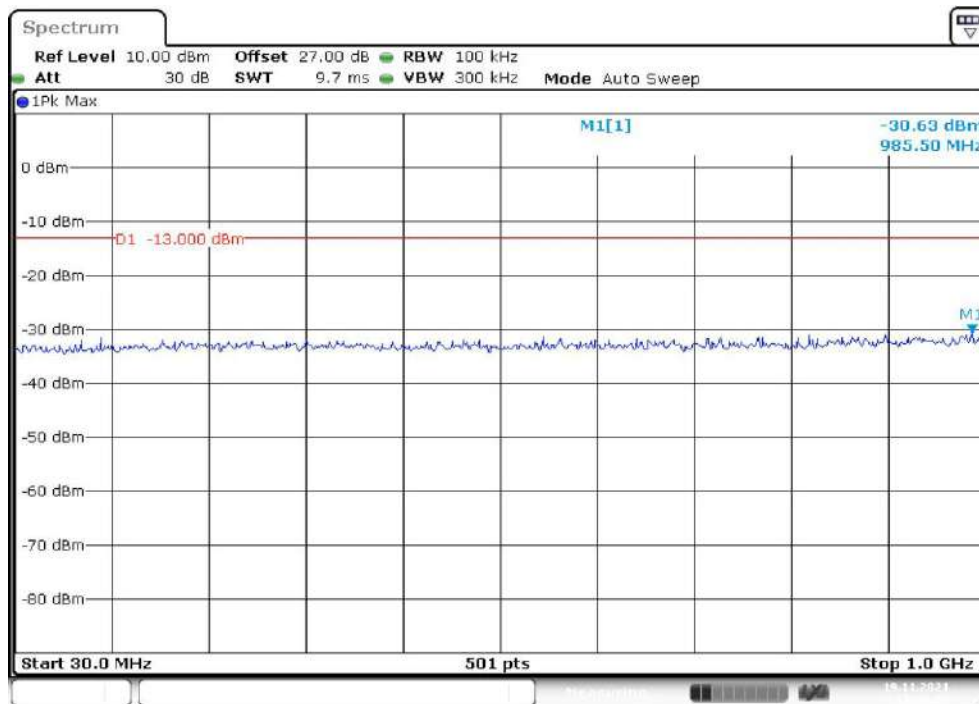
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1 GHz – 20 GHz (3 MHz, QPSK, Middle Channel)

Date: 19.NOV.2021 14:55:46

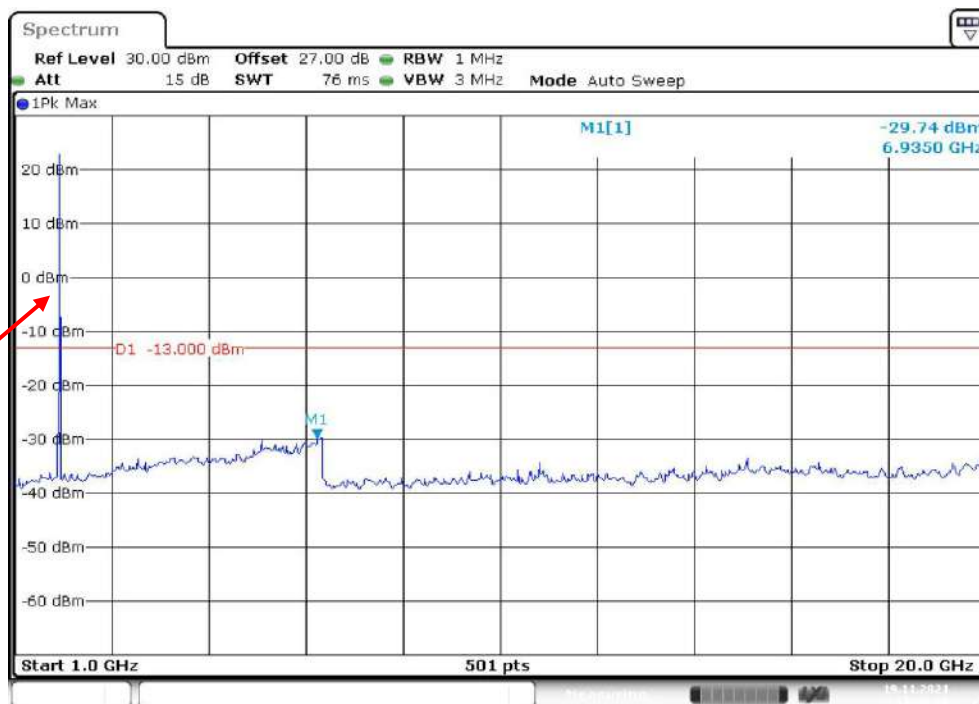
Fundamental

30 MHz – 1 GHz (5 MHz, QPSK, Middle Channel)



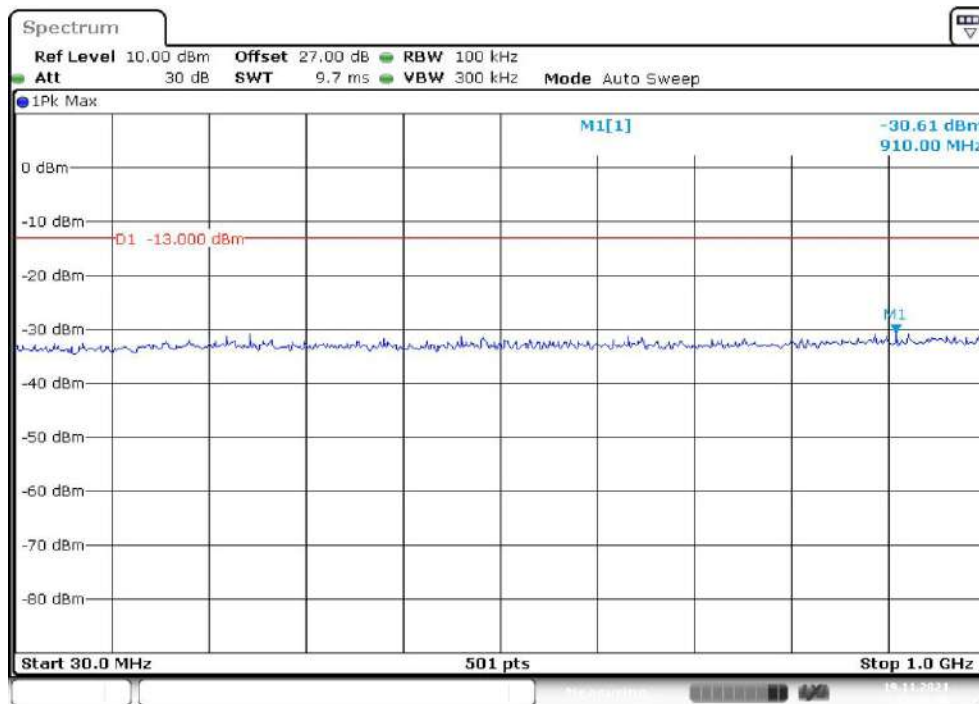
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1 GHz – 20 GHz (5 MHz, QPSK, Middle Channel)



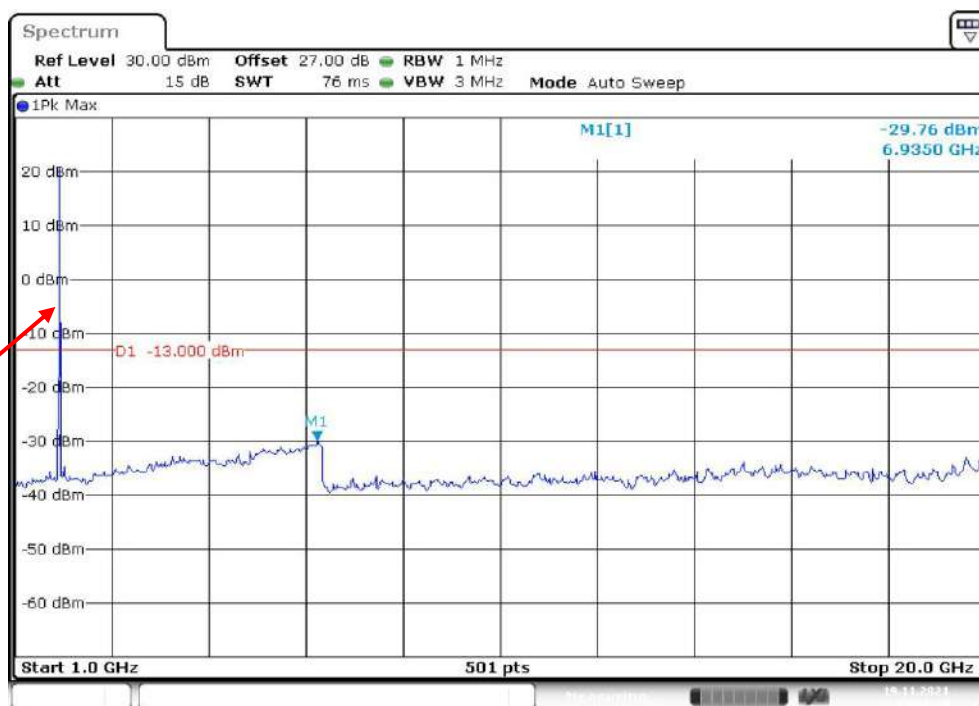
Fundamental

30 MHz – 1 GHz (10 MHz, QPSK, Middle Channel)



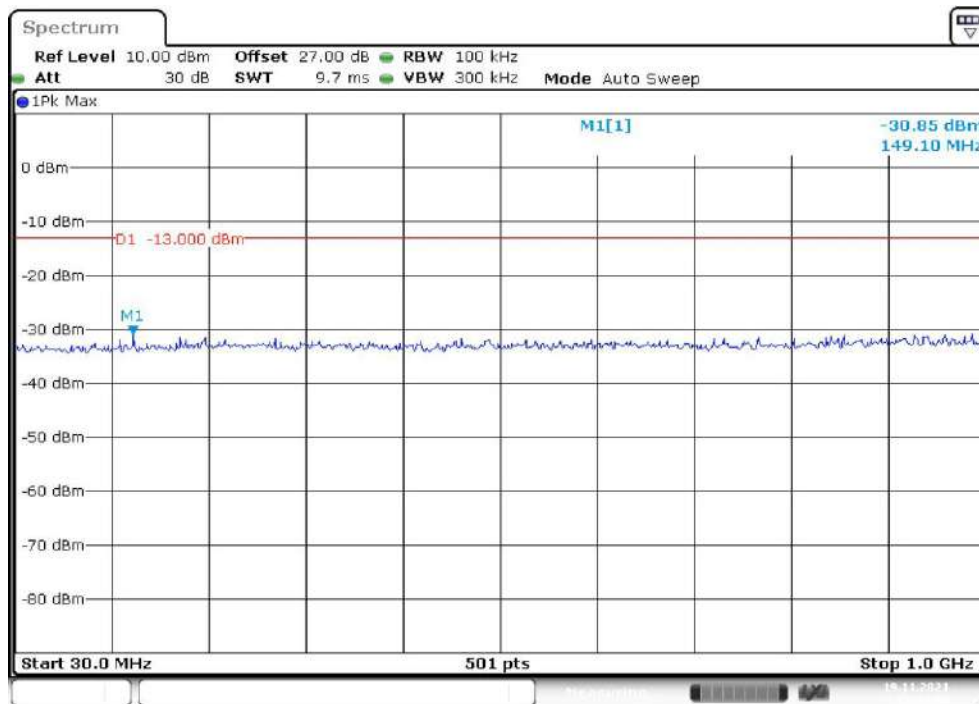
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1 GHz – 20 GHz (10 MHz, QPSK, Middle Channel)



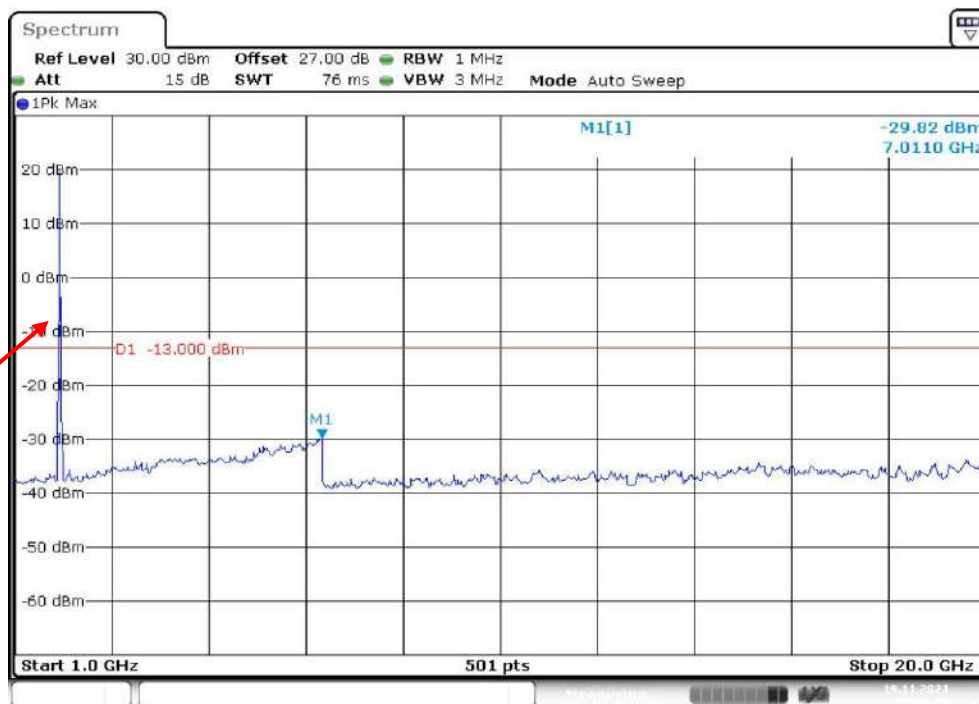
Fundamental

30 MHz – 1 GHz (15 MHz, QPSK, Middle Channel)



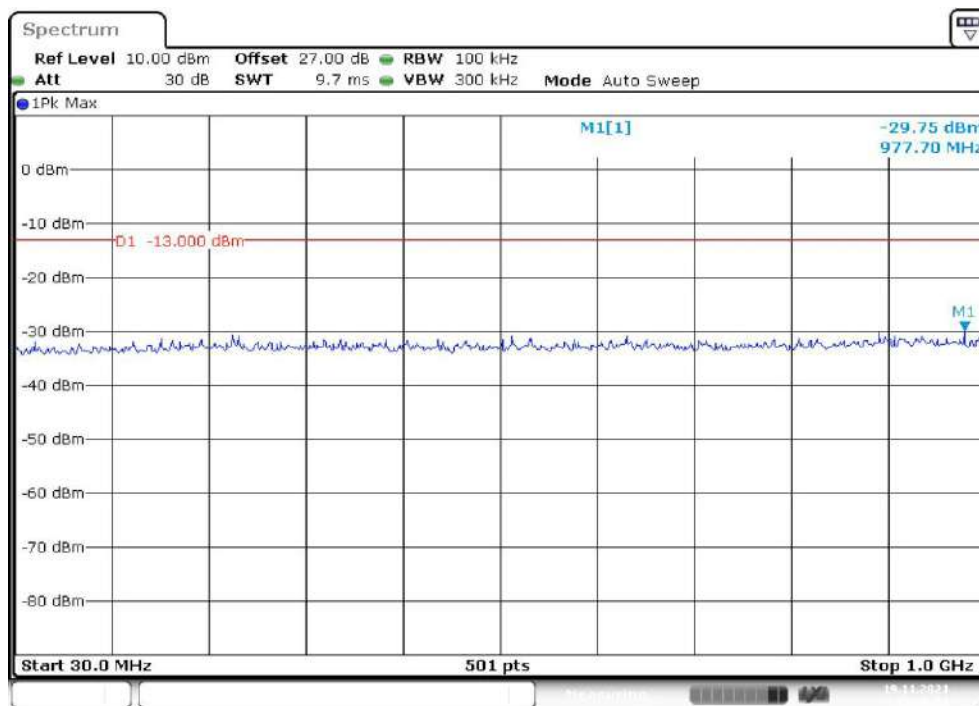
Date: 19.NOV.2021 15:03:44

1 GHz – 20 GHz (15 MHz, QPSK, Middle Channel)



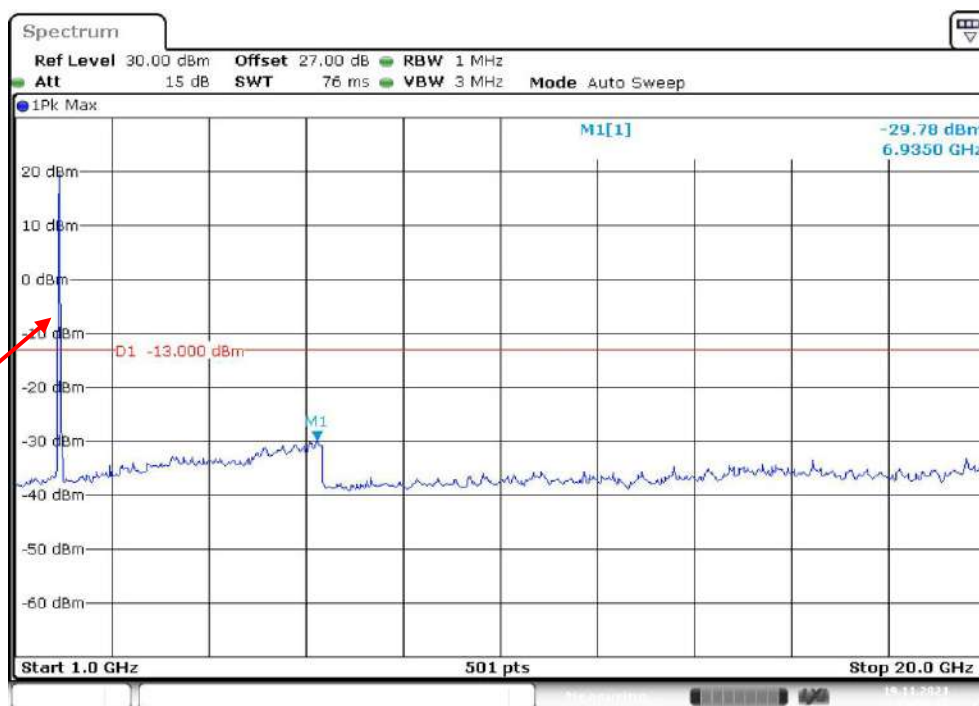
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30 MHz – 1 GHz (20 MHz, QPSK, Middle Channel)



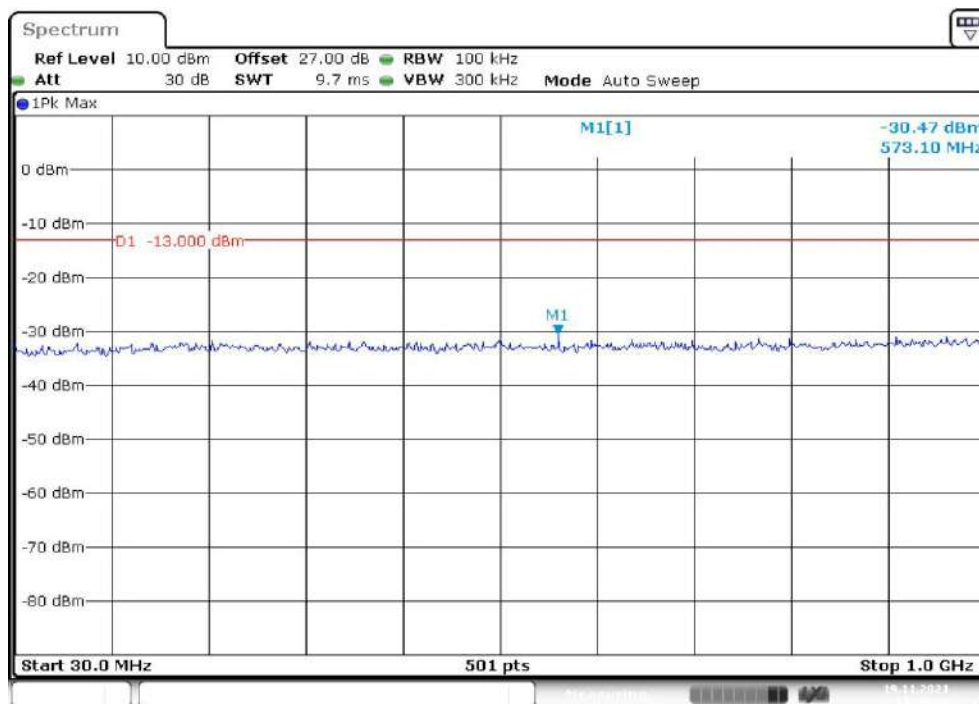
Date: 19.NOV.2021 15:06:52

1 GHz – 20 GHz (20 MHz, QPSK, Middle Channel)



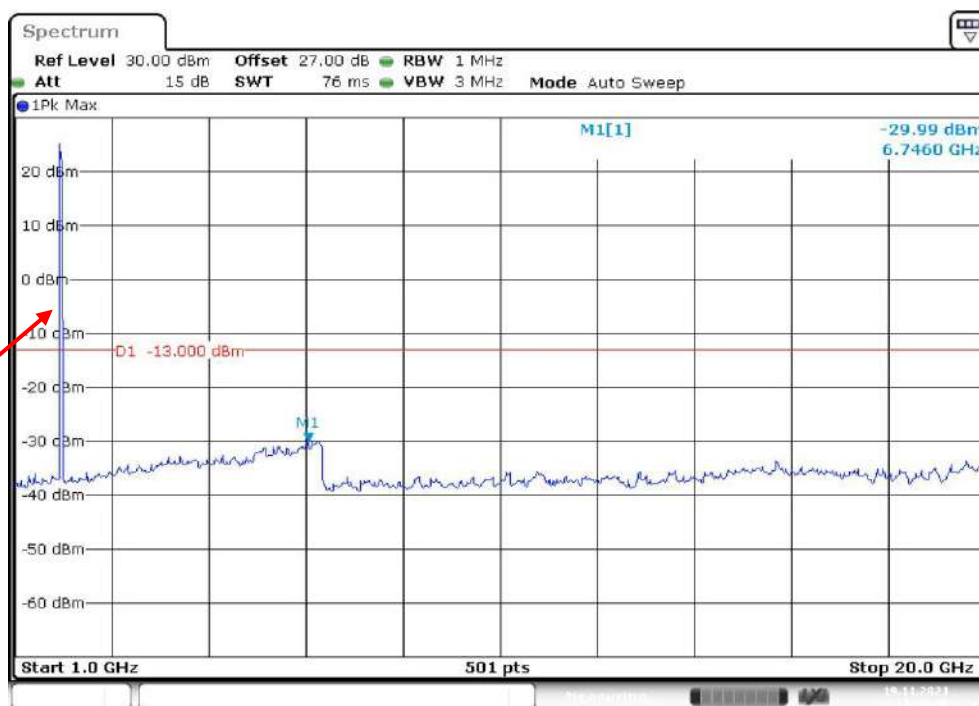
Fundamental

30 MHz – 1 GHz (1.4 MHz, QPSK, High Channel)



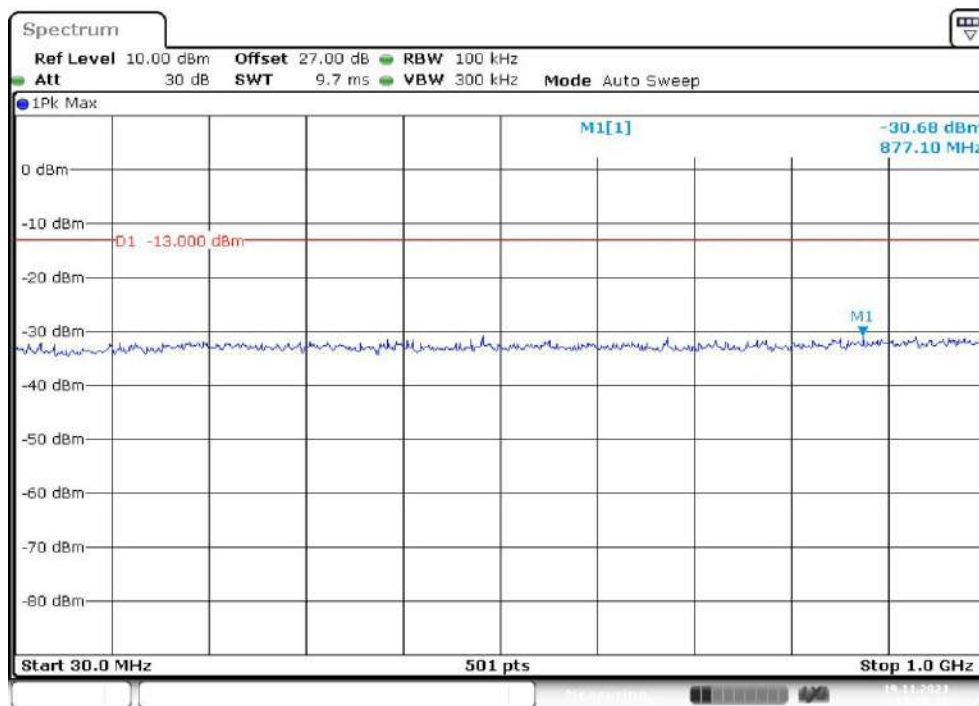
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1 GHz – 20 GHz (1.4 MHz, QPSK, High Channel)



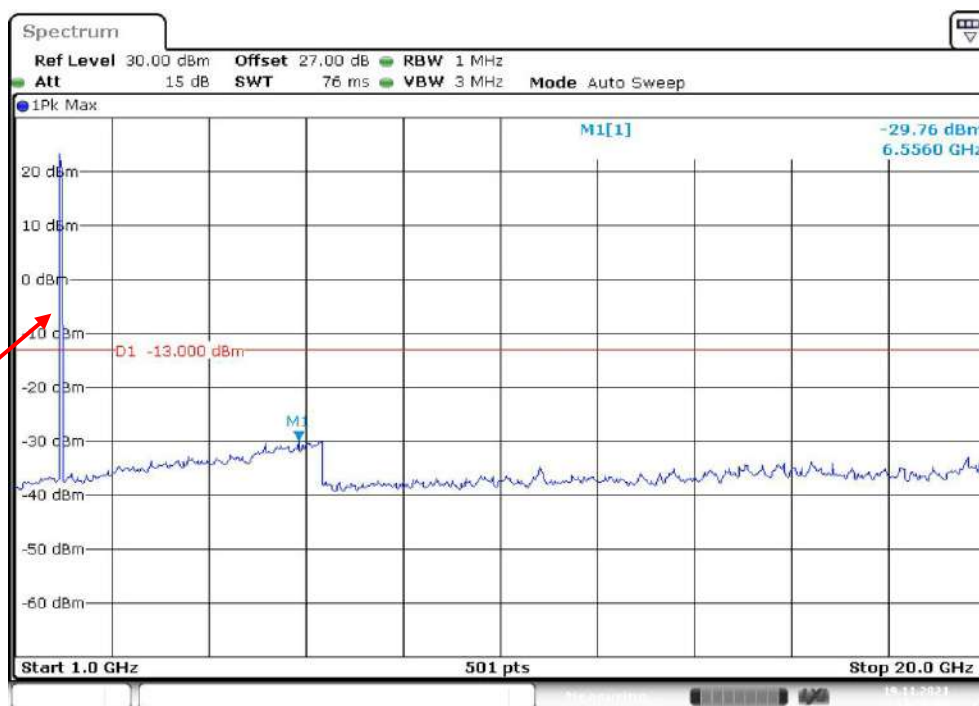
Fundamental

30 MHz – 1 GHz (3 MHz, QPSK, High Channel)



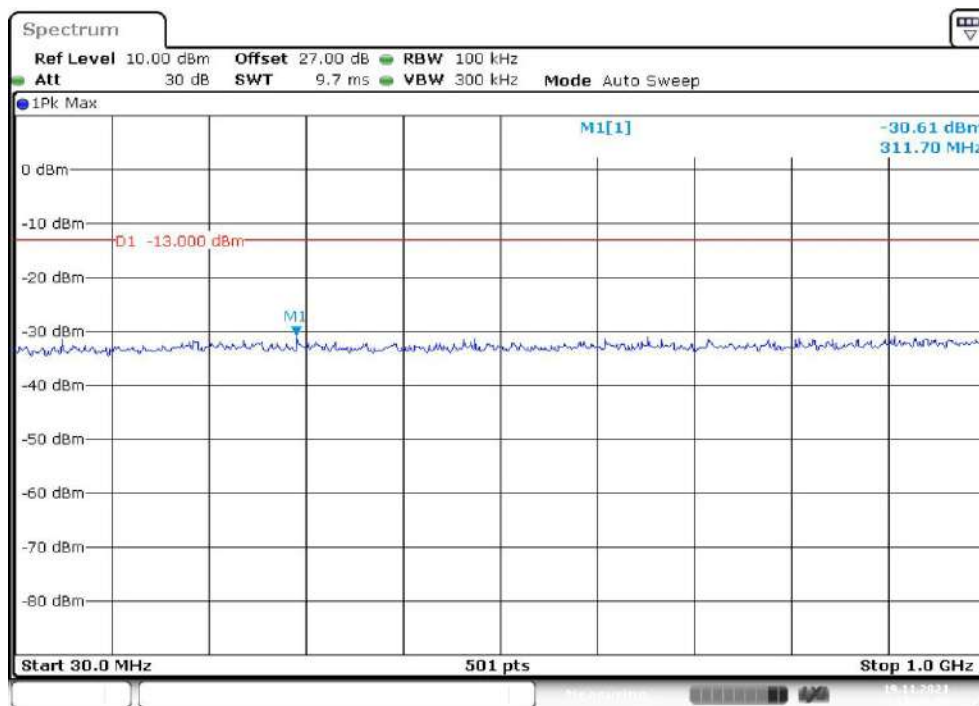
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1 GHz – 20 GHz (3 MHz, QPSK, High Channel)



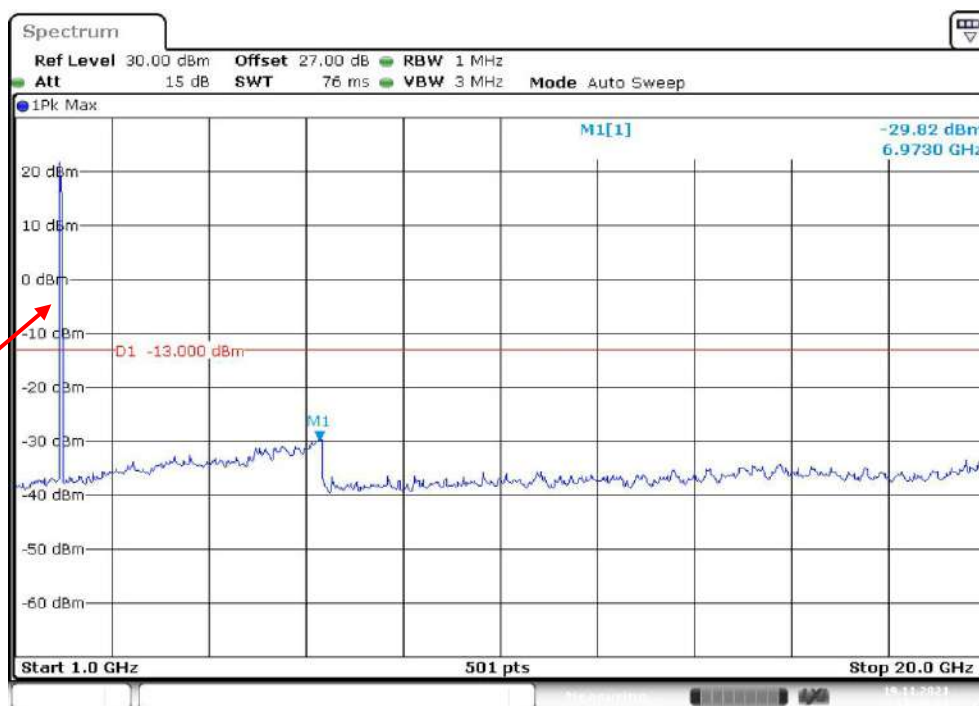
Fundamental

30 MHz – 1 GHz (5 MHz, QPSK, High Channel)



Date: 19.NOV.2021 14:59:03

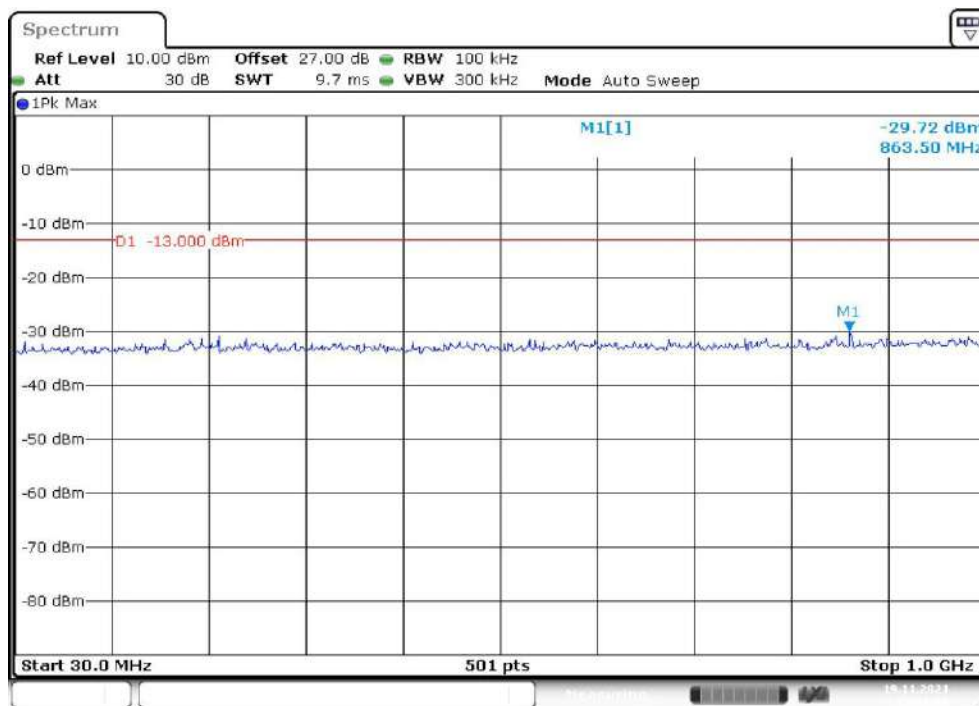
1 GHz – 20 GHz (5 MHz, QPSK, High Channel)



Date: 19.NOV.2021 14:59:22

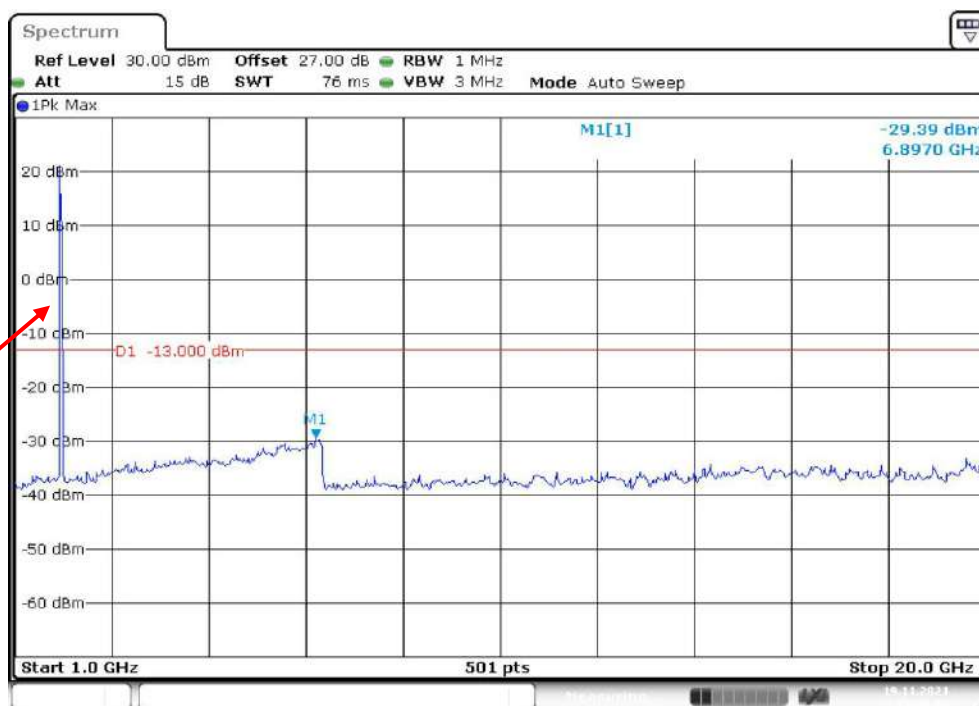
Fundamental

30 MHz – 1 GHz (10 MHz, QPSK, High Channel)

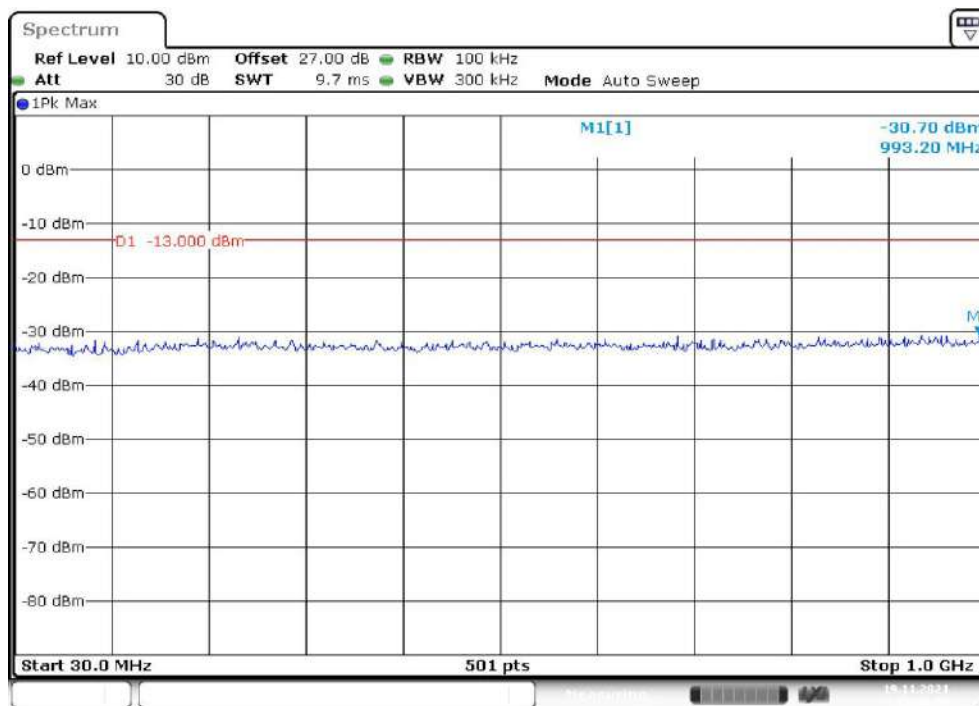


1 GHz – 20 GHz (10 MHz, QPSK, High Channel)

Fundamental

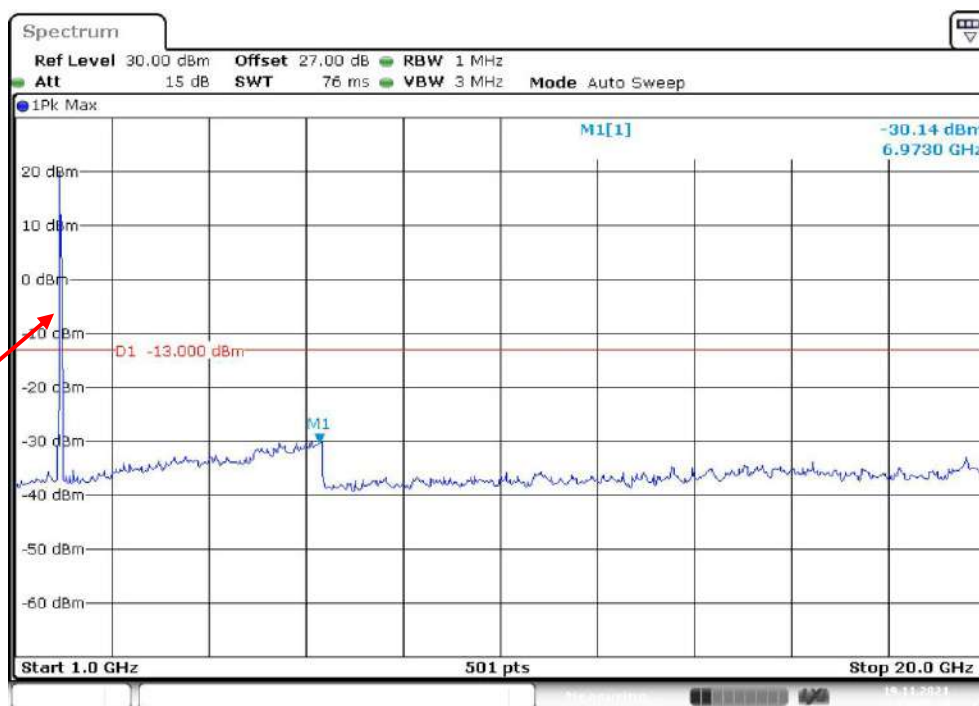


30 MHz – 1 GHz (15 MHz, QPSK, High Channel)



Date: 19.NOV.2021 15:04:49

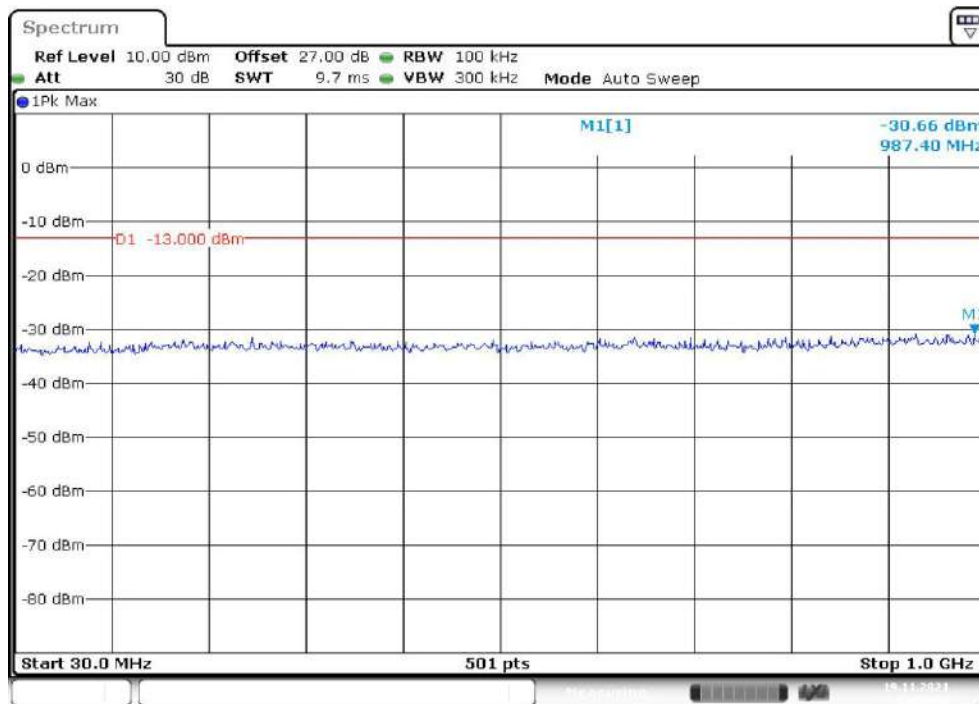
1 GHz – 20 GHz (15 MHz, QPSK, High Channel)



Date: 19.NOV.2021 15:05:14

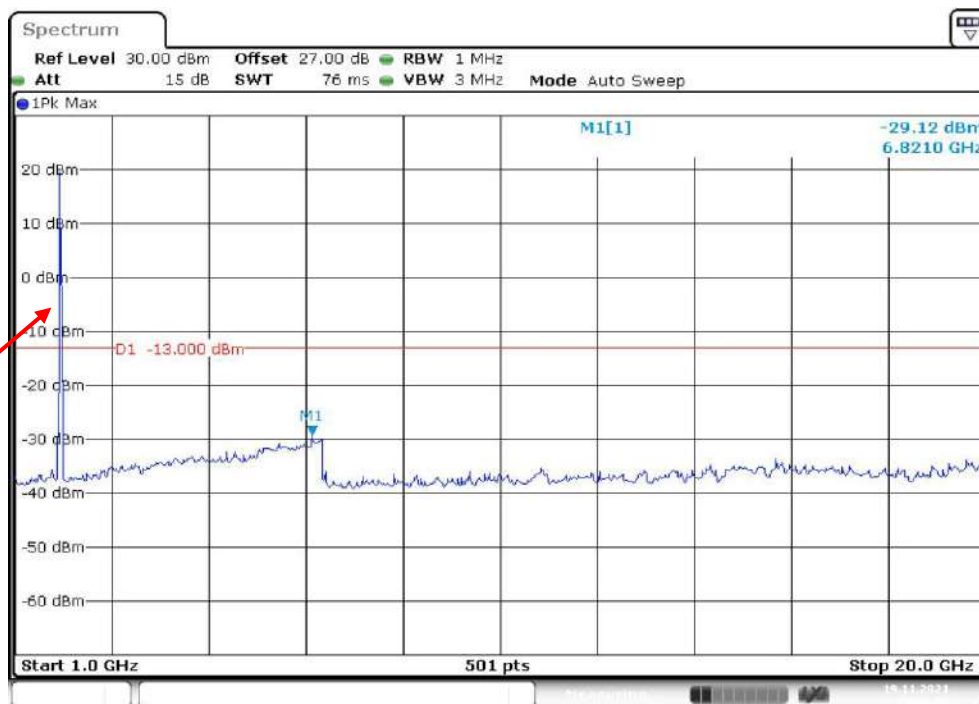
Fundamental

30 MHz – 1 GHz (20 MHz, QPSK, High Channel)



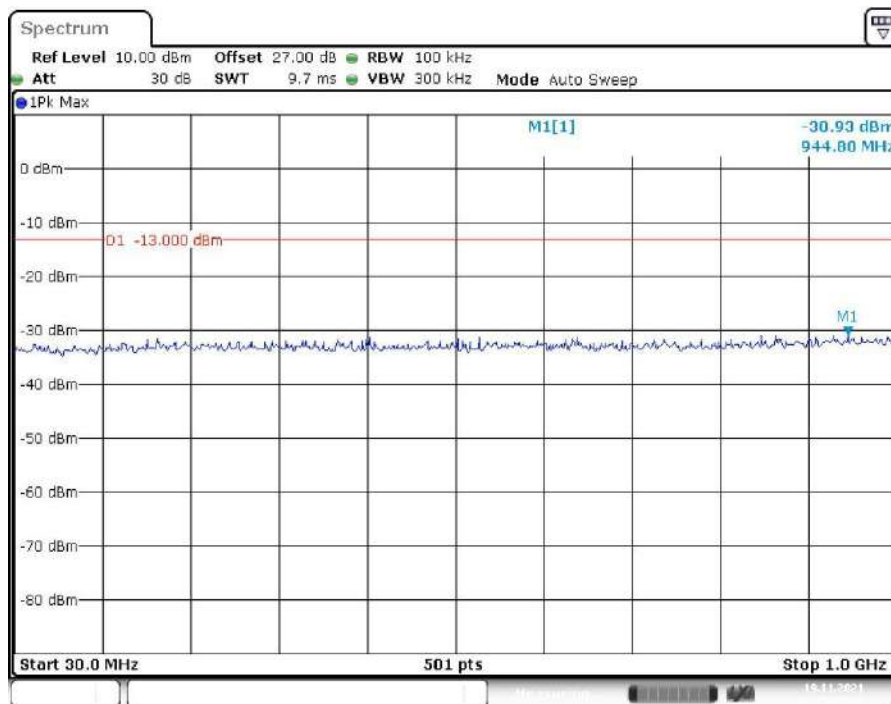
Date: 19 NOV. 2021 15:07:44

1 GHz – 20 GHz (20 MHz, QPSK, High Channel)



Fundamental

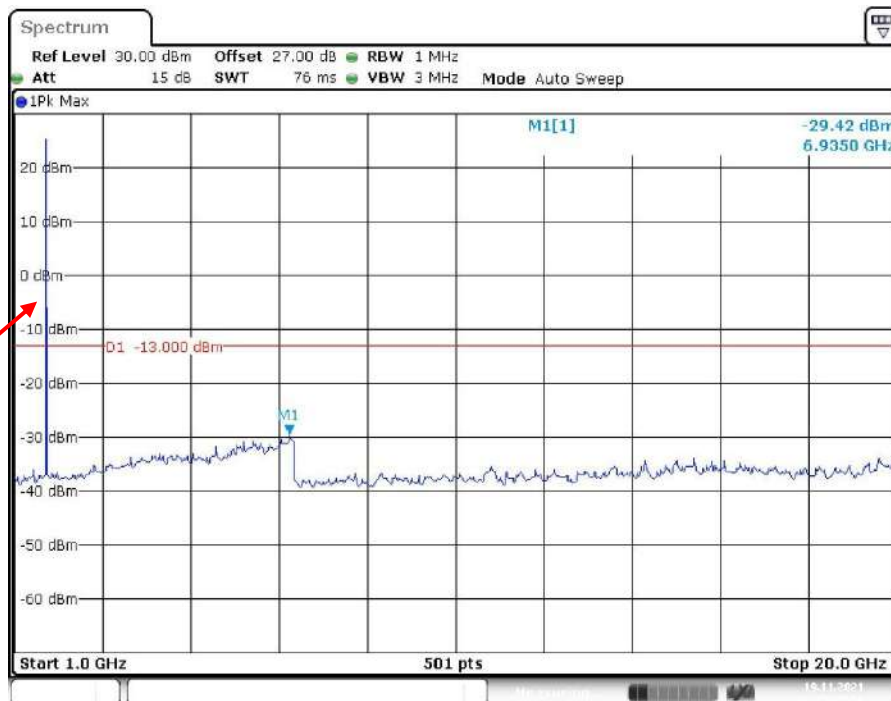
LTE Band 4 **30 MHz – 1 GHz (1.4 MHz, QPSK, Low Channel)**



Date: 19.NOV.2021 15:08:37

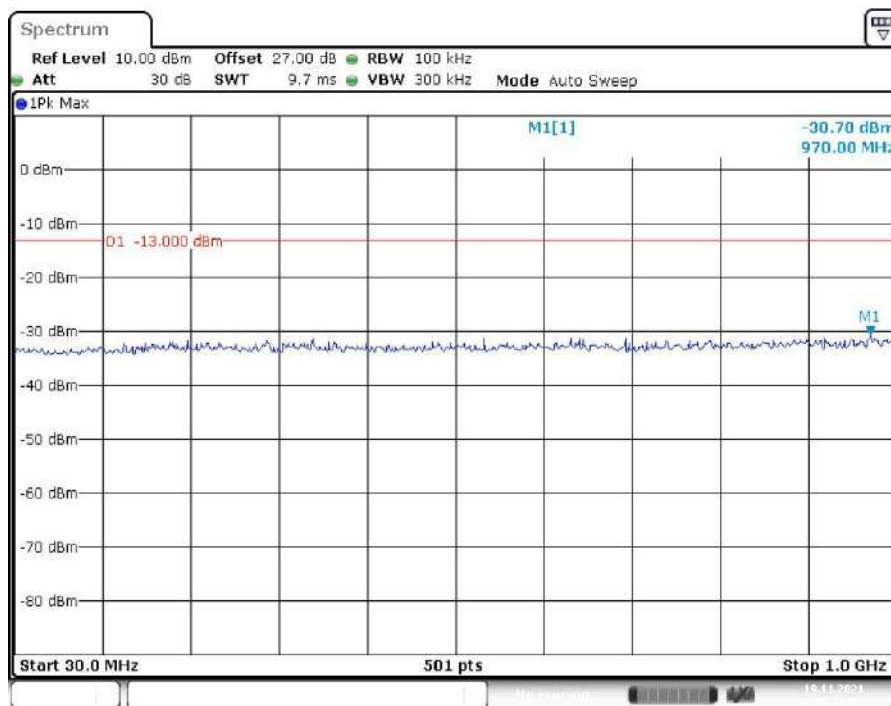
1 GHz – 20 GHz (1.4 MHz, QPSK, Low Channel)

Fundamental



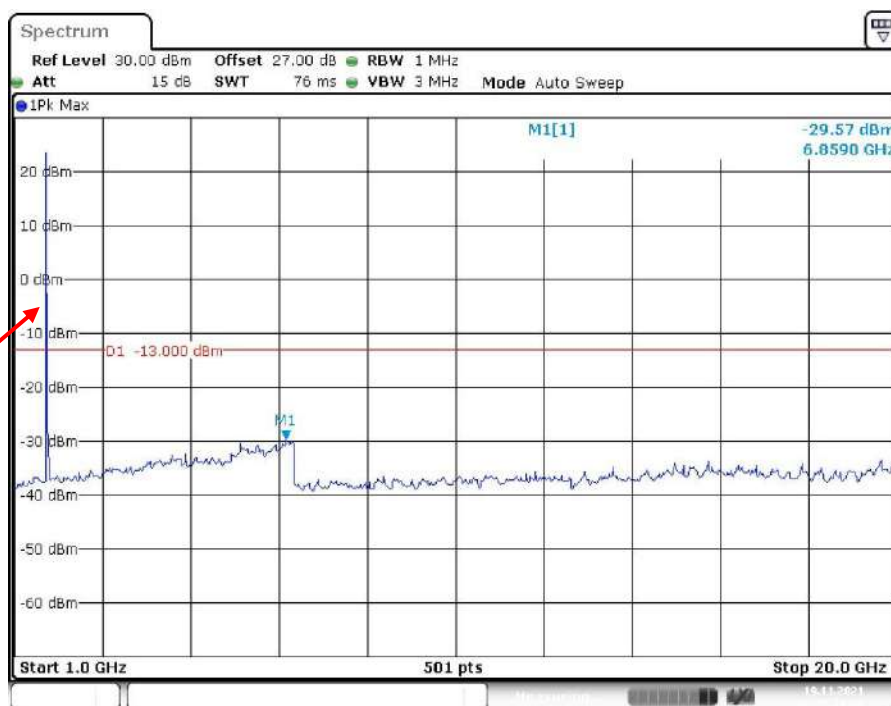
Date: 19.NOV.2021 15:08:56

30 MHz – 1 GHz (3 MHz, QPSK, Low Channel)



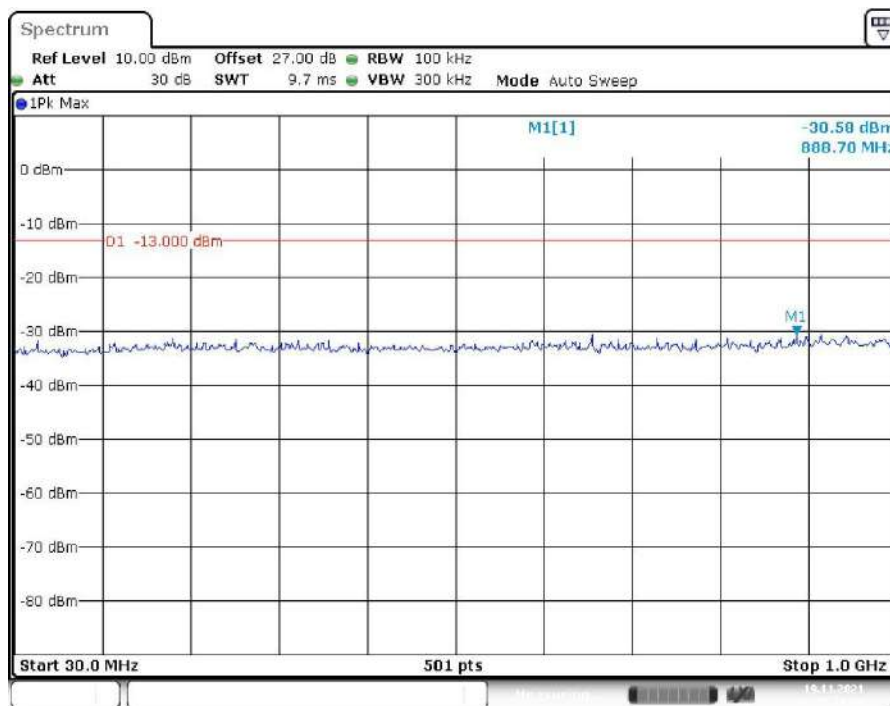
Date: 19.NOV.2021 15:11:02

1 GHz – 20 GHz (3 MHz, QPSK, Low Channel)

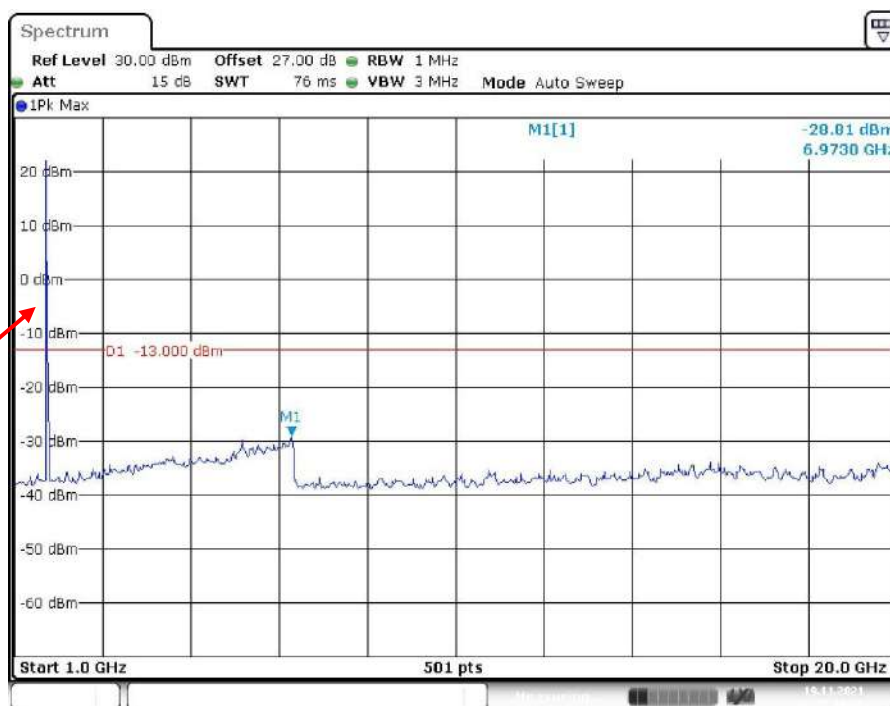


Date: 19.NOV.2021 15:11:28

Fundamental

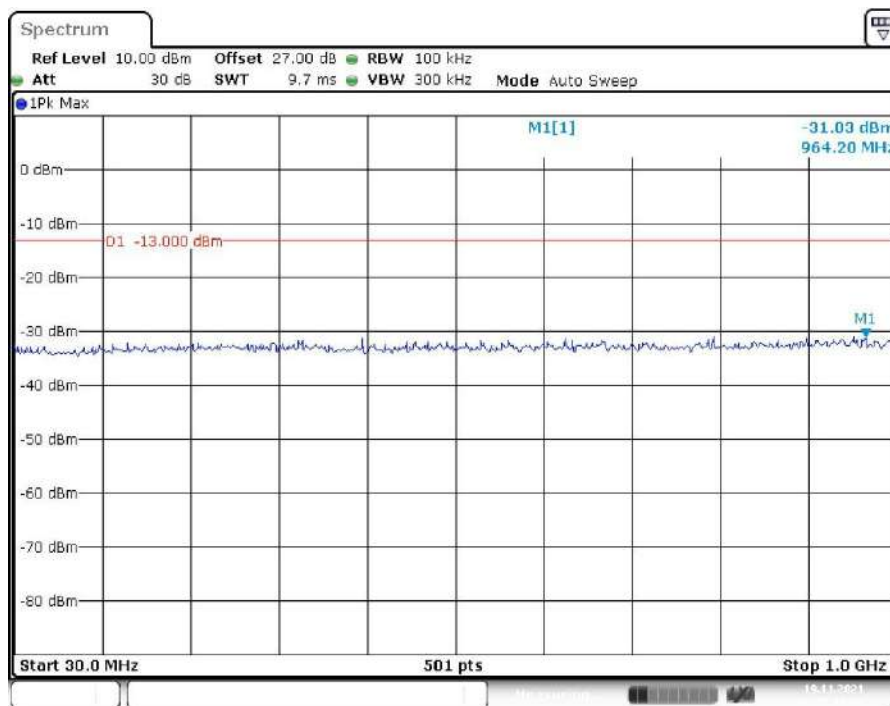
30 MHz – 1 GHz (5 MHz, QPSK, Low Channel)

Date: 19.NOV.2021 15:13:44

1 GHz – 20 GHz (5 MHz, QPSK, Low Channel)

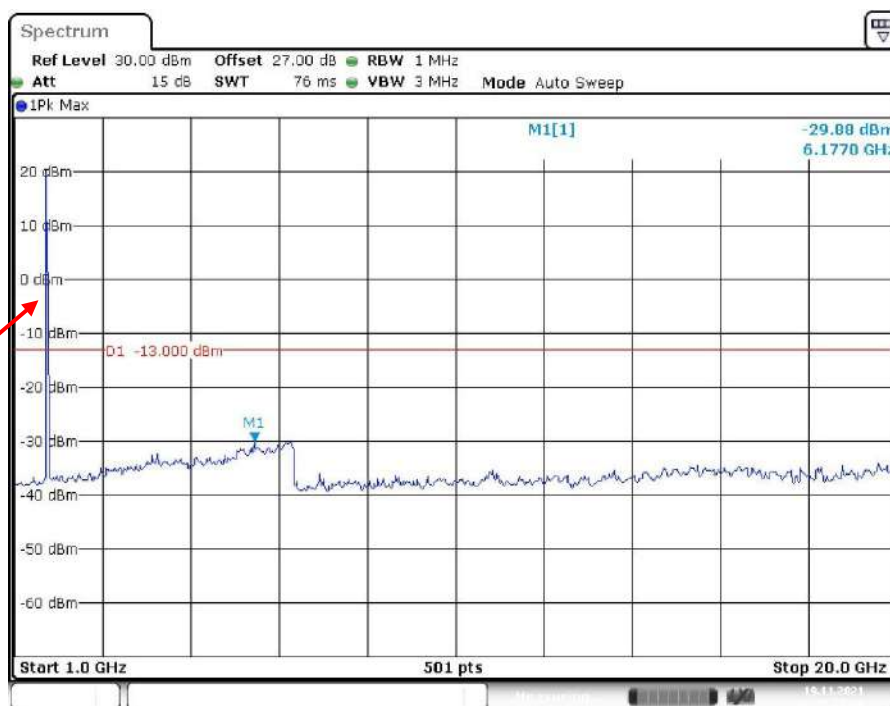
Date: 19.NOV.2021 15:14:08

30 MHz – 1 GHz (10 MHz, QPSK, Low Channel)



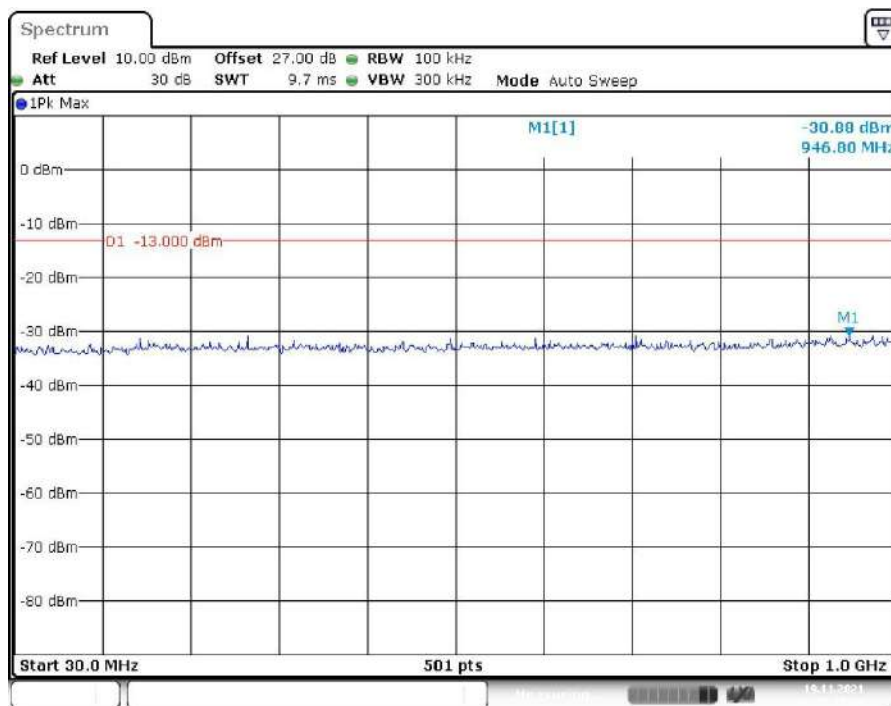
Date: 19.NOV.2021 15:16:42

1 GHz – 20 GHz (10 MHz, QPSK, Low Channel)



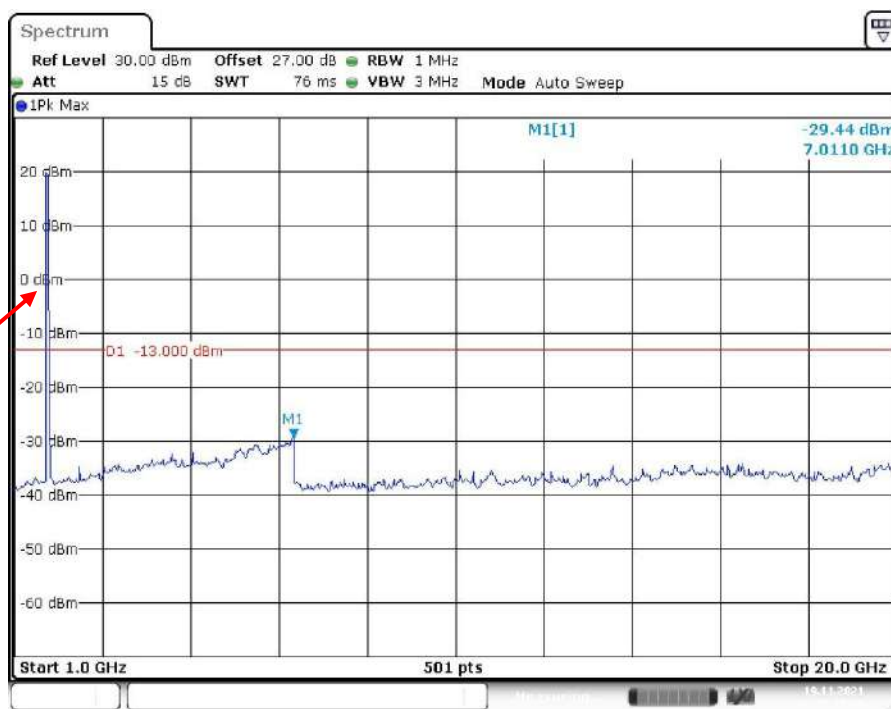
Date: 19.NOV.2021 15:17:04

30 MHz – 1 GHz (15 MHz, QPSK, Low Channel)



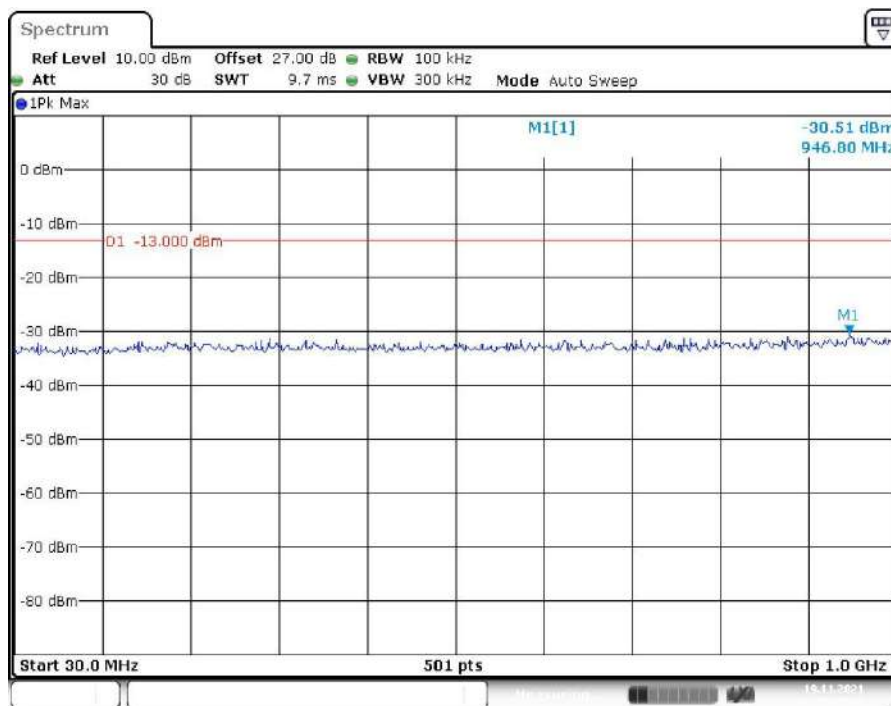
Date: 19.NOV.2021 15:19:22

1 GHz – 20 GHz (15 MHz, QPSK, Low Channel)



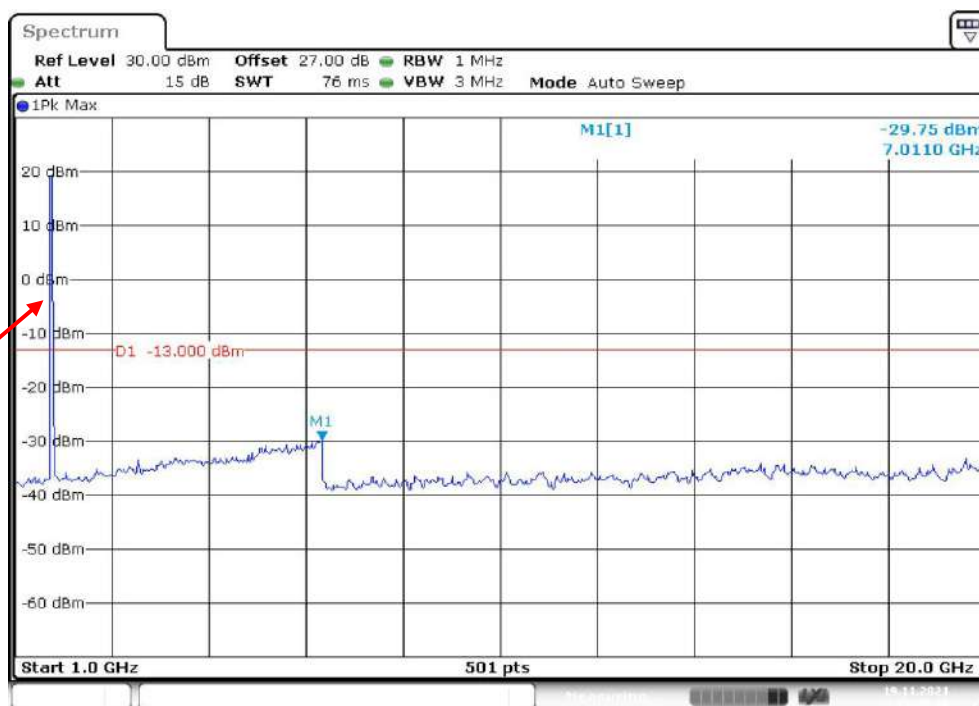
Fundamental

30 MHz – 1 GHz (20 MHz, QPSK, Low Channel)



Date: 19.NOV.2021 15:22:07

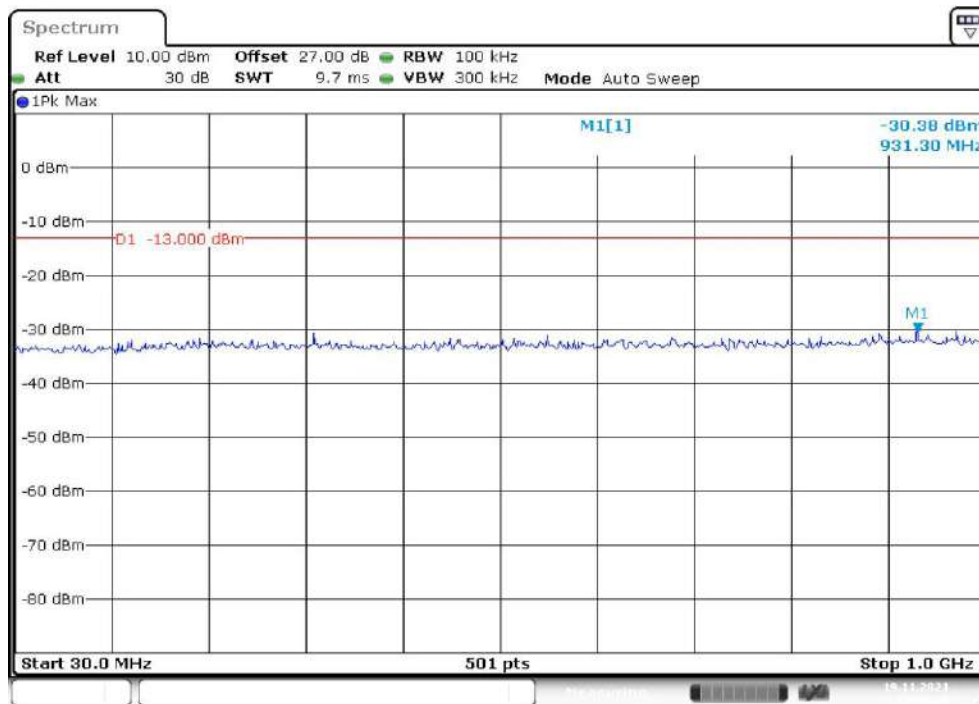
1 GHz – 20 GHz (20 MHz, QPSK, Low Channel)



Fundamental

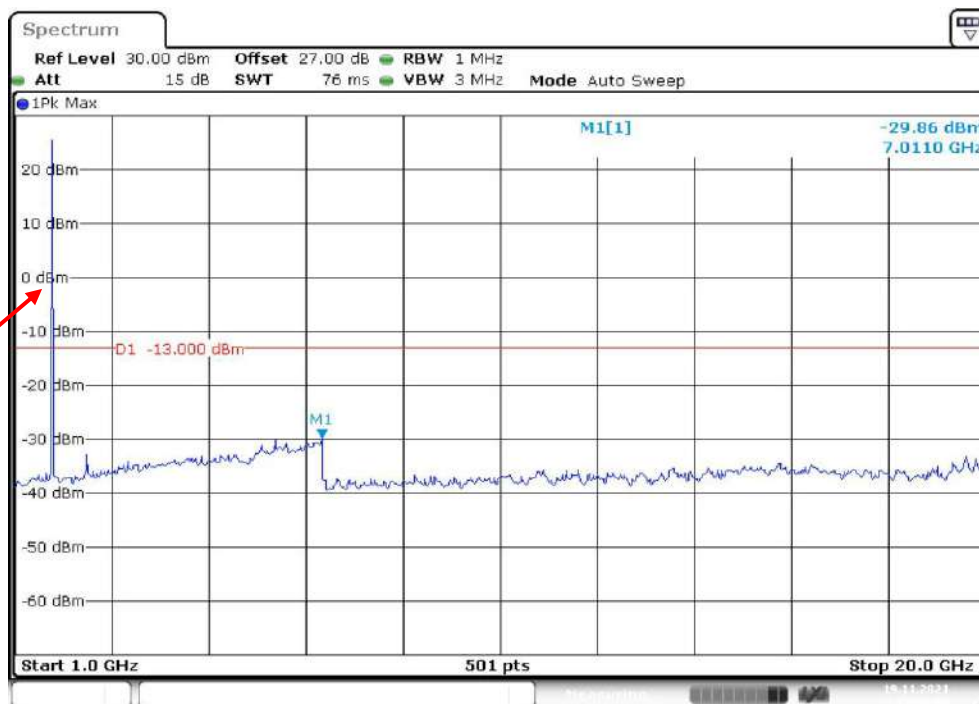
Date: 19.NOV.2021 15:22:39

30 MHz – 1 GHz (1.4 MHz, QPSK, Middle Channel)



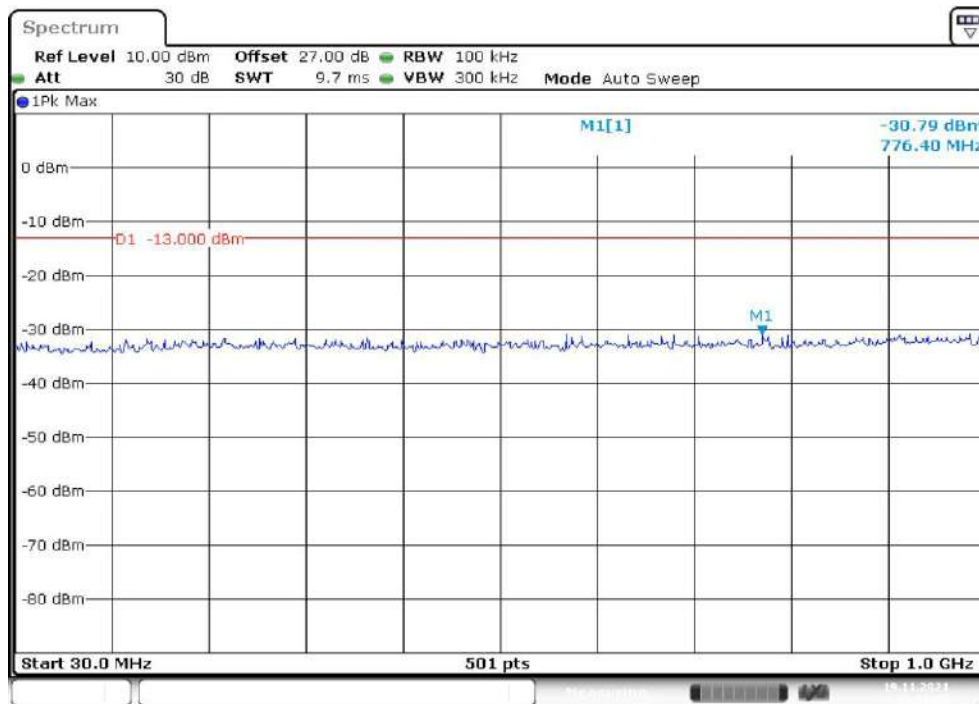
Date: 19.NOV.2021 15:09:25

1 GHz – 20 GHz (1.4 MHz, QPSK, Middle Channel)



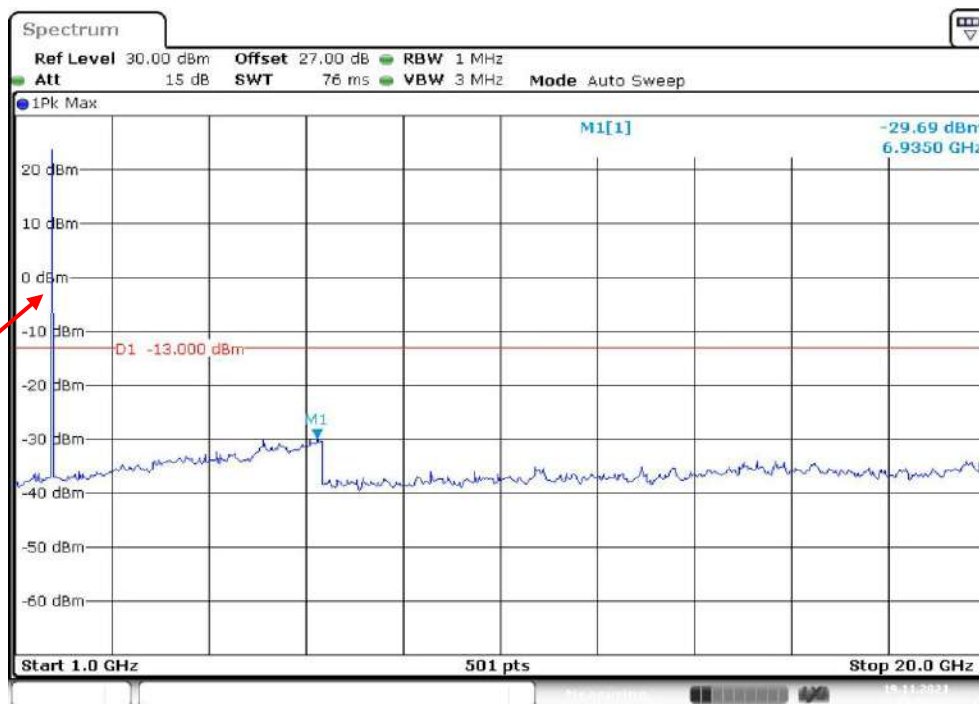
Date: 19.NOV.2021 15:09:45

30 MHz – 1 GHz (3 MHz, QPSK, Middle Channel)

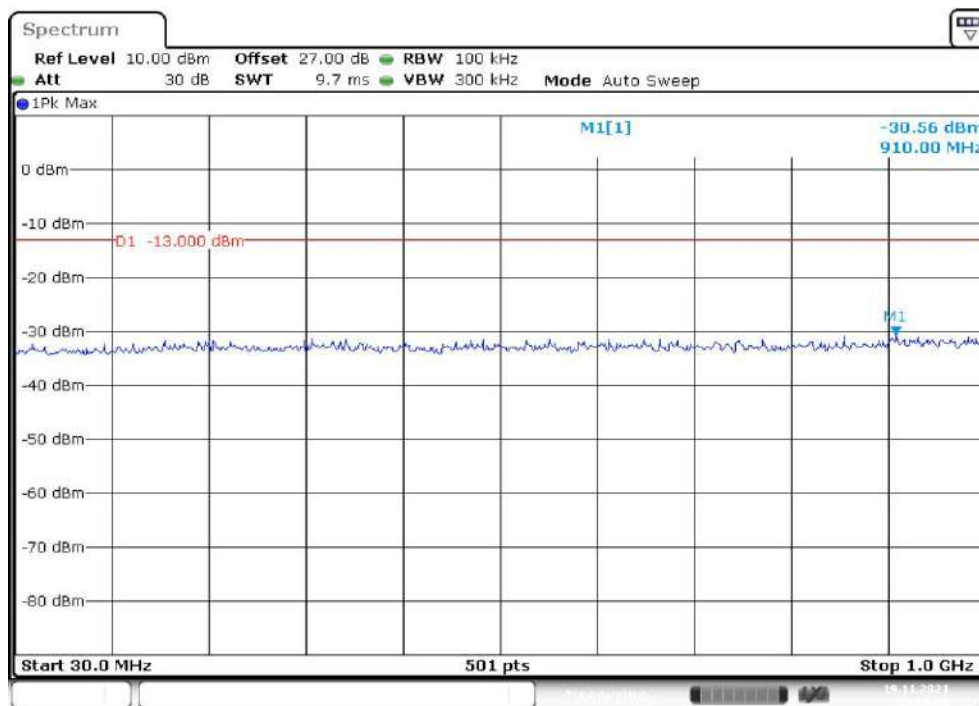


Date: 19 NOV. 2021 15:11:57

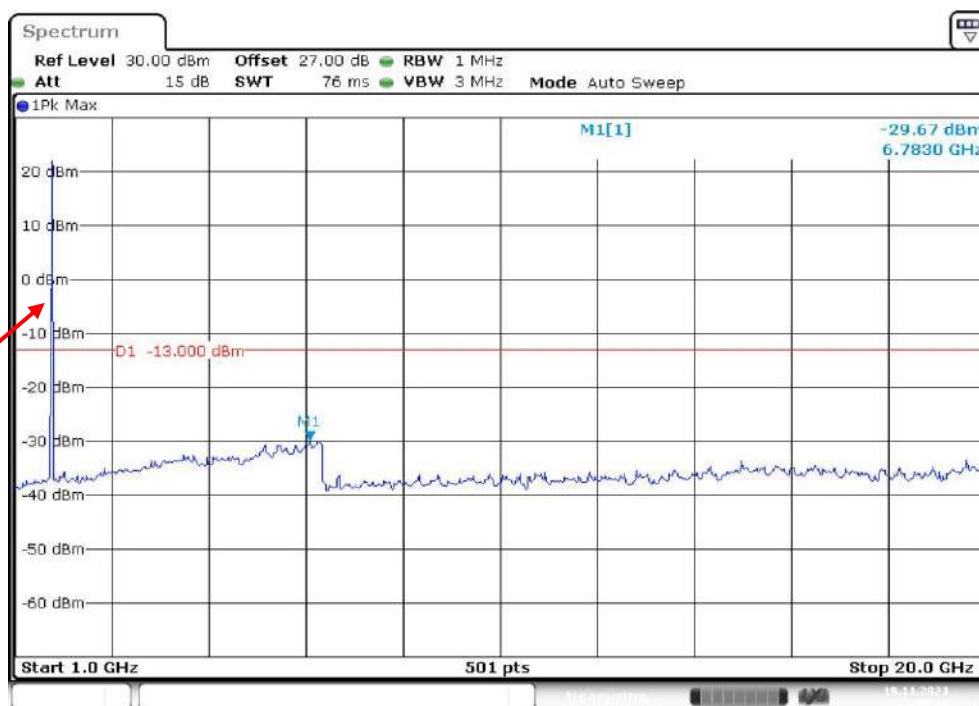
1 GHz – 20 GHz (3 MHz, QPSK, Middle Channel)



Fundamental

30 MHz – 1 GHz (5 MHz, QPSK, Middle Channel)

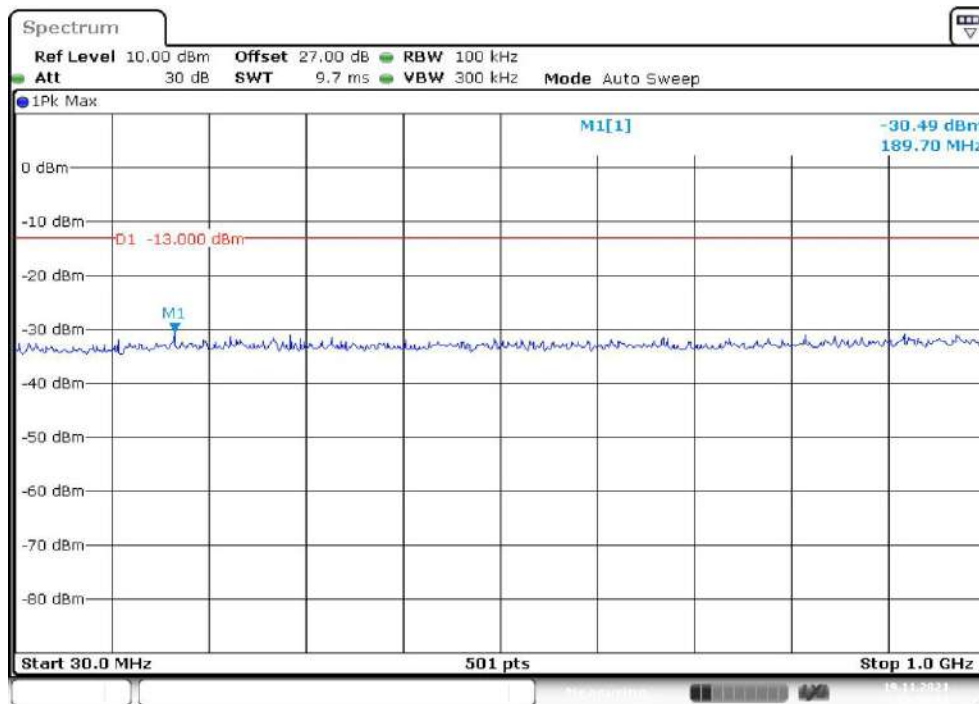
Date: 19.NOV.2021 15:14:38

1 GHz – 20 GHz (5 MHz, QPSK, Middle Channel)

Fundamental

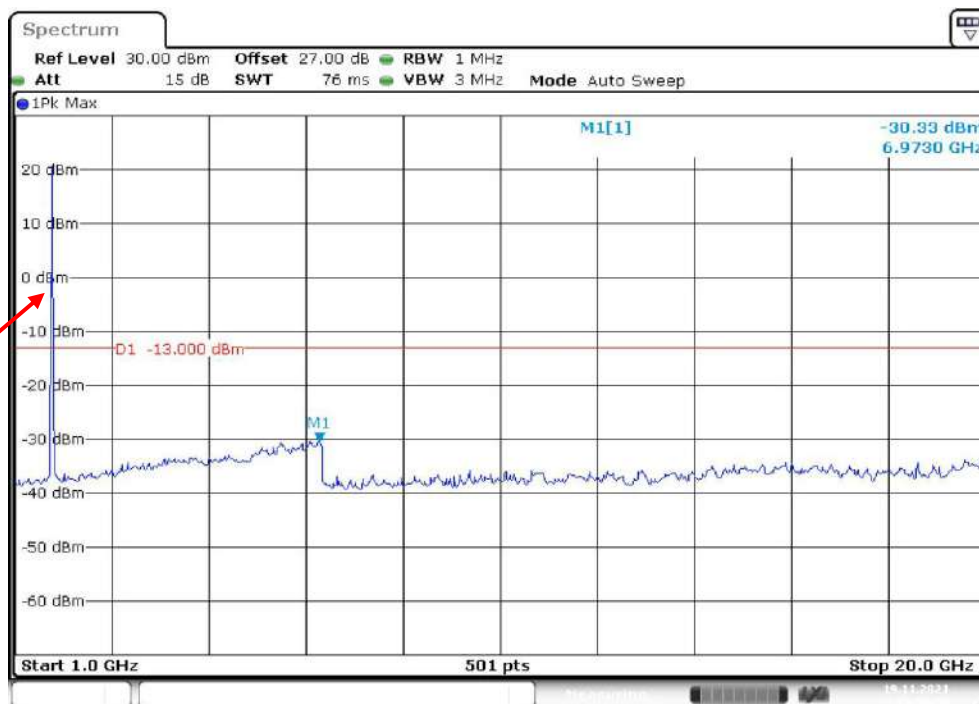
Date: 19.NOV.2021 15:15:10

30 MHz – 1 GHz (10 MHz, QPSK, Middle Channel)



Date: 19.NOV.2021 15:17:31

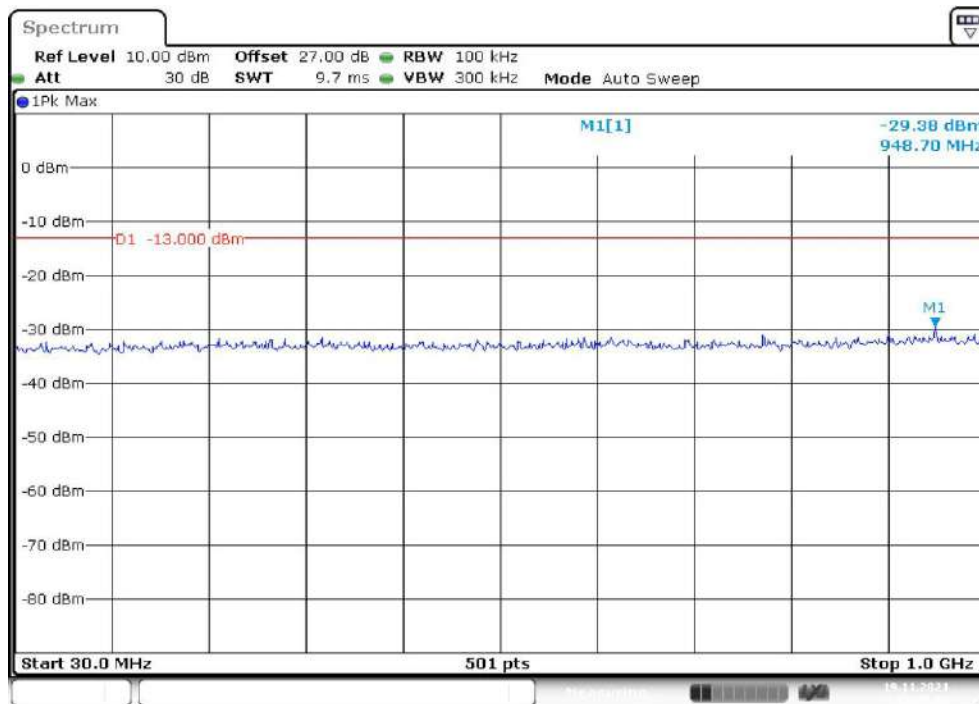
1 GHz – 20 GHz (10 MHz, QPSK, Middle Channel)



Date: 19.NOV.2021 15:17:54

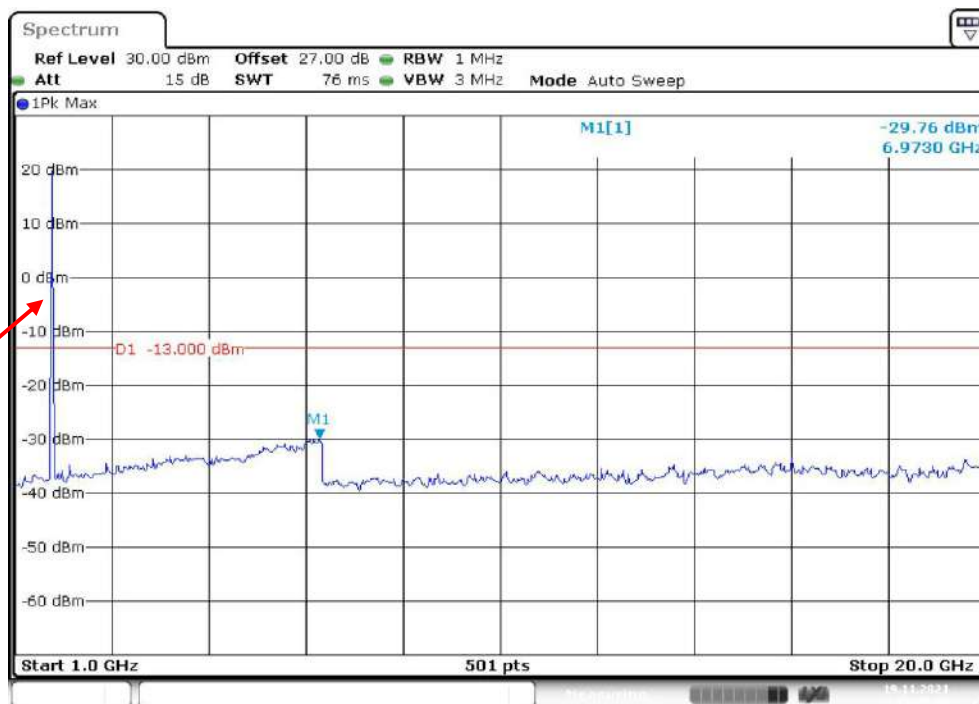
Fundamental

30 MHz – 1 GHz (15 MHz, QPSK, Middle Channel)

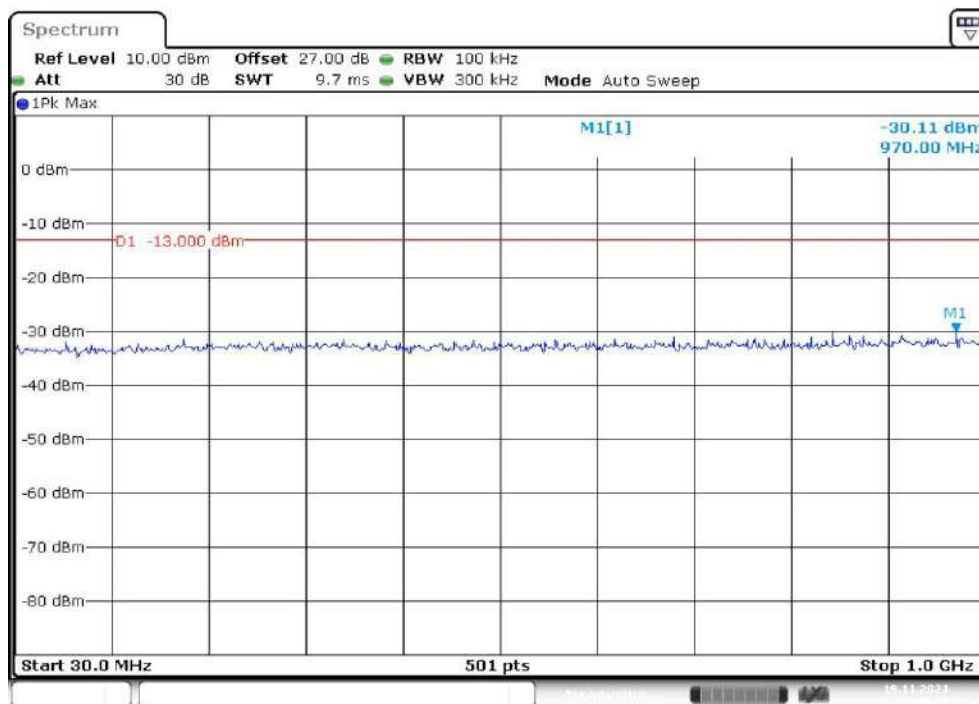
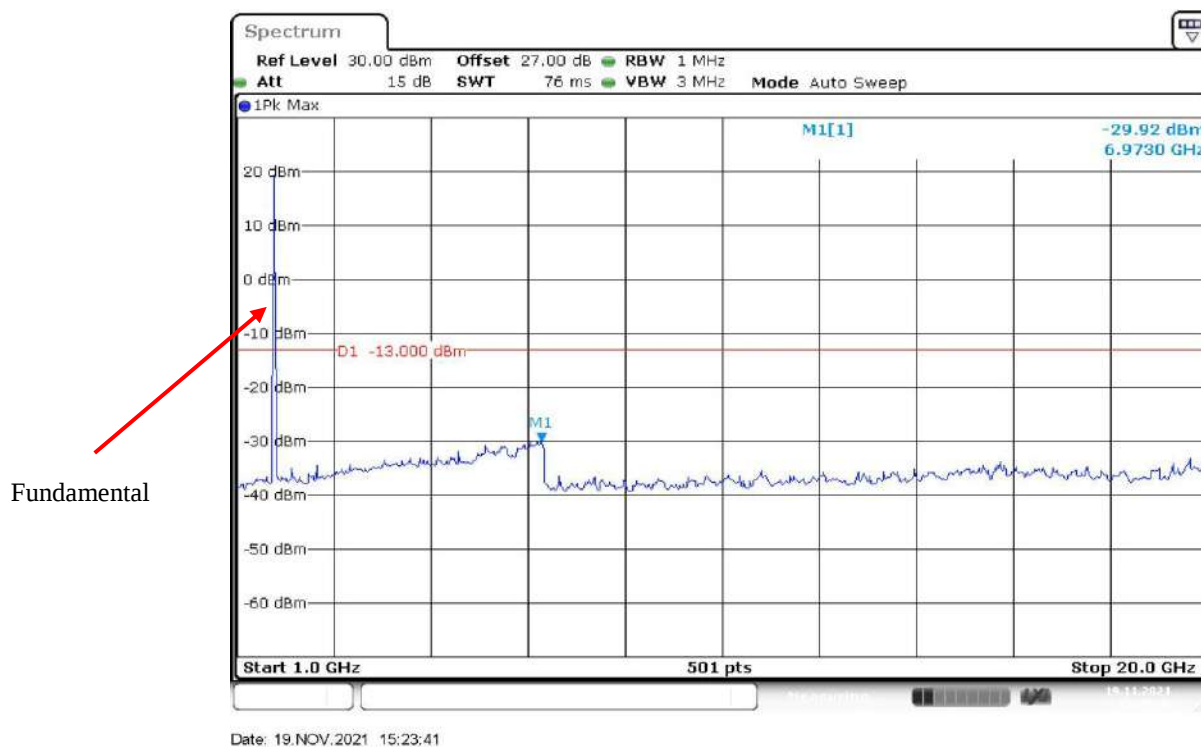


Date: 19.NOV.2021 15:20:14

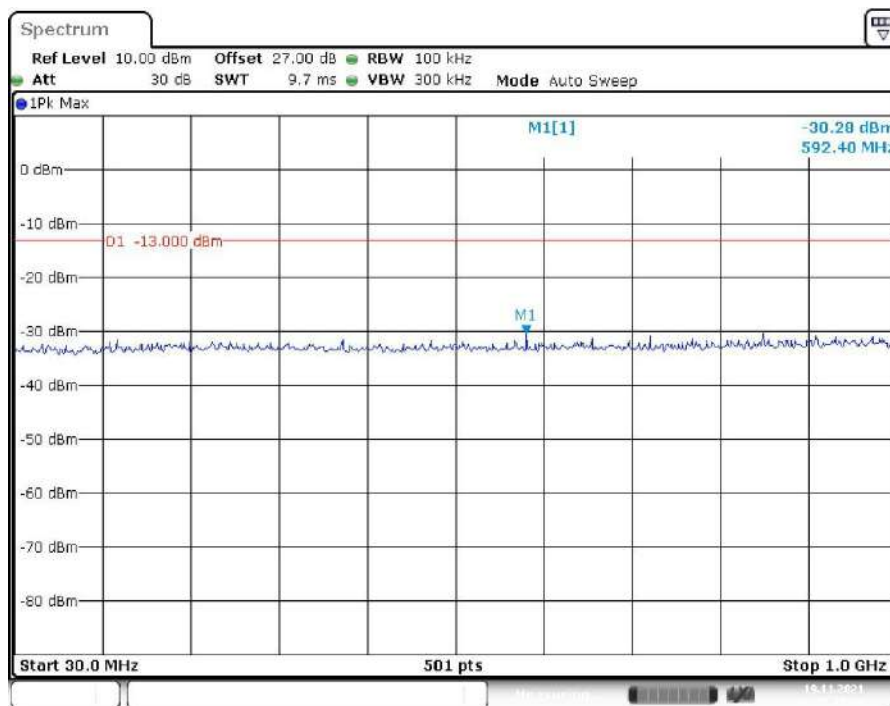
1 GHz – 20 GHz (15 MHz, QPSK, Middle Channel)



Fundamental

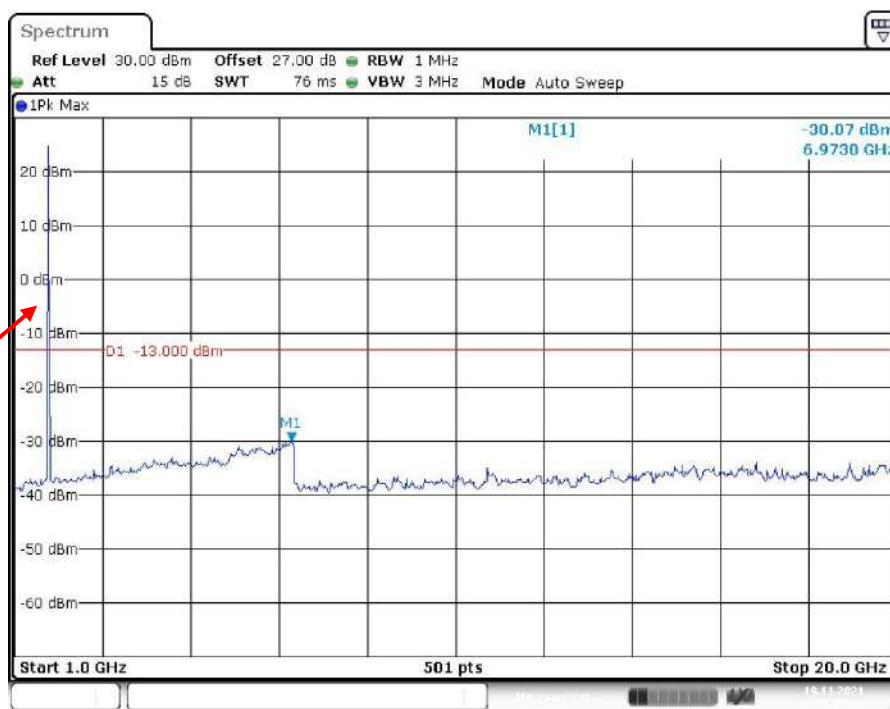
30 MHz – 1 GHz (20 MHz, QPSK, Middle Channel)**1 GHz – 20 GHz (20 MHz, QPSK, Middle Channel)**

30 MHz – 1 GHz (1.4 MHz, QPSK, High Channel)



Date: 19.NOV.2021 15:10:14

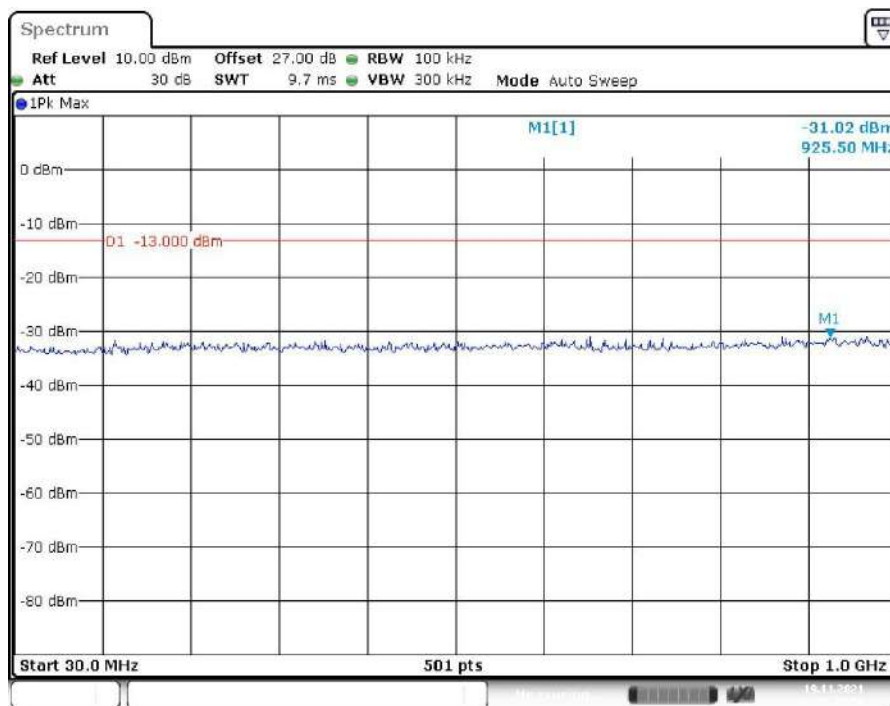
1 GHz – 20 GHz (1.4 MHz, QPSK, High Channel)



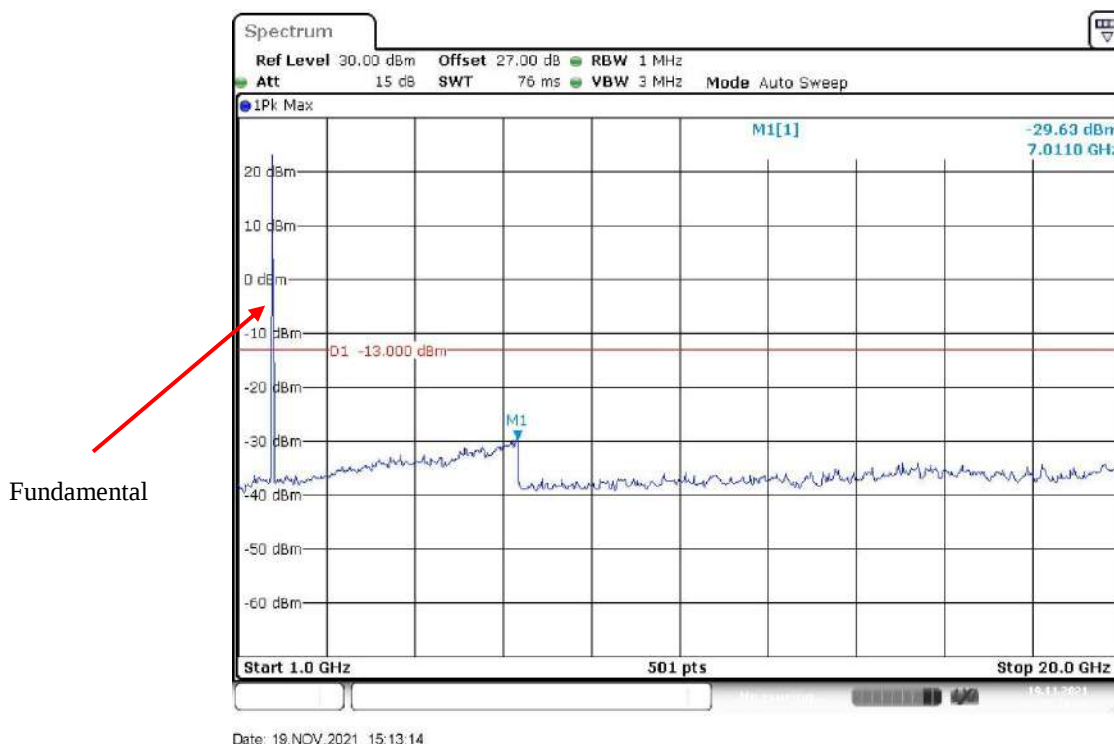
Date: 19.NOV.2021 15:10:33

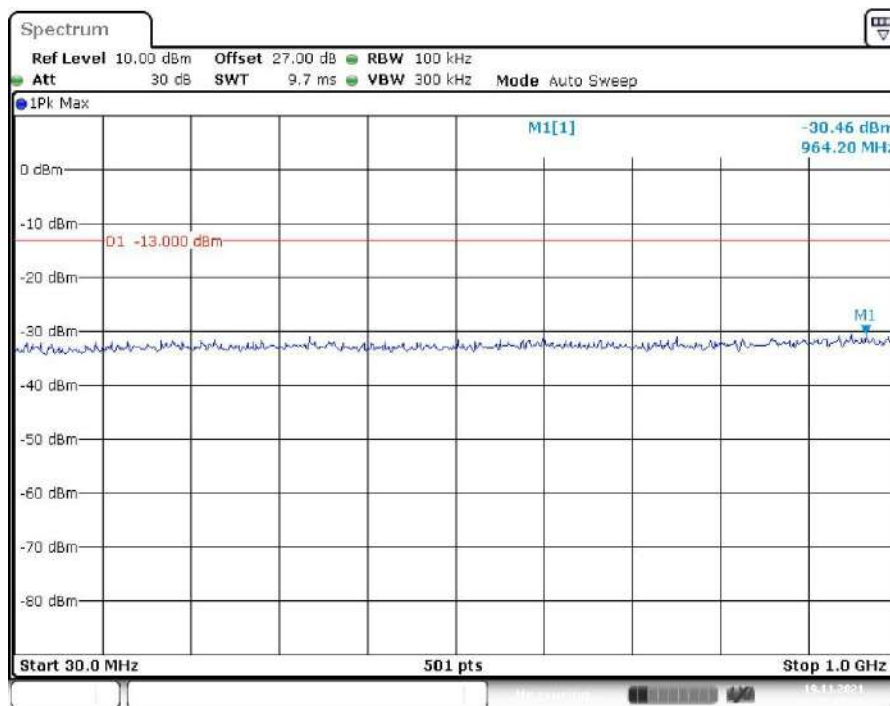
Fundamental

30 MHz – 1 GHz (3 MHz, QPSK, High Channel)



1 GHz – 20 GHz (3 MHz, QPSK, High Channel)

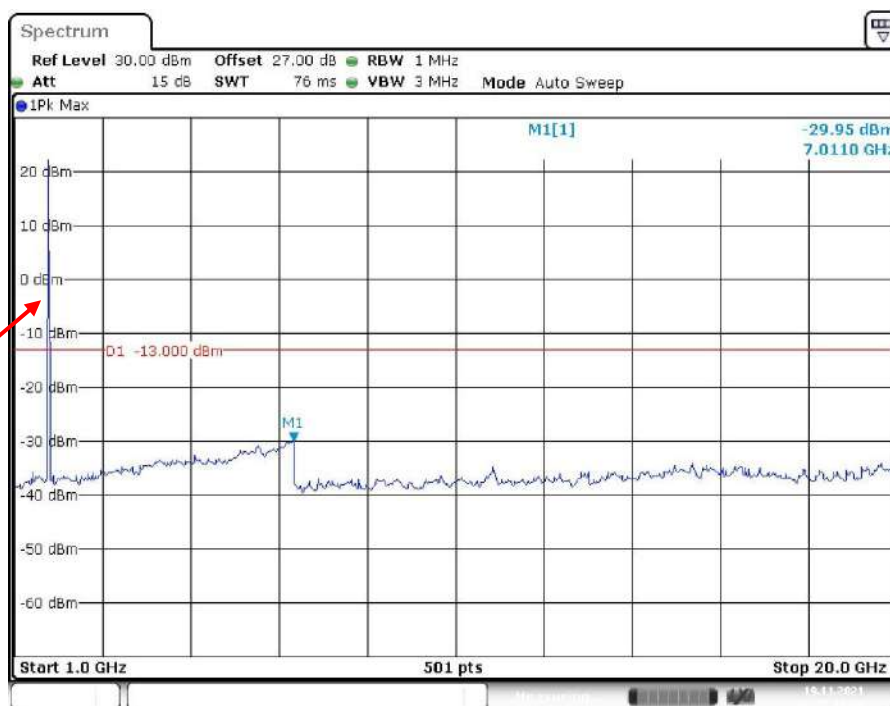


30 MHz – 1 GHz (5 MHz, QPSK, High Channel)

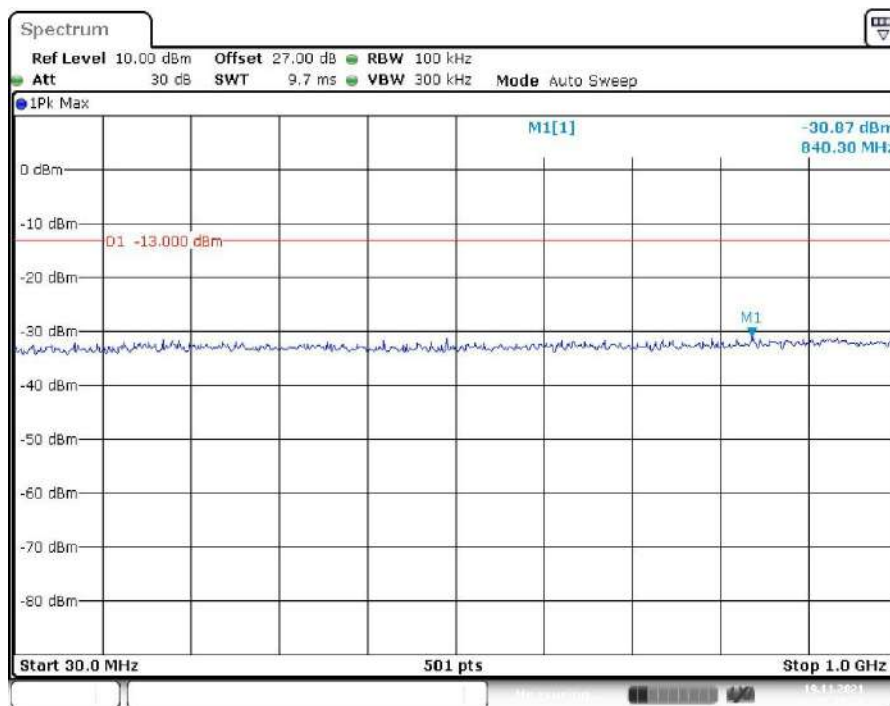
Date: 19.NOV.2021 15:15:48

1 GHz – 20 GHz (5 MHz, QPSK, High Channel)

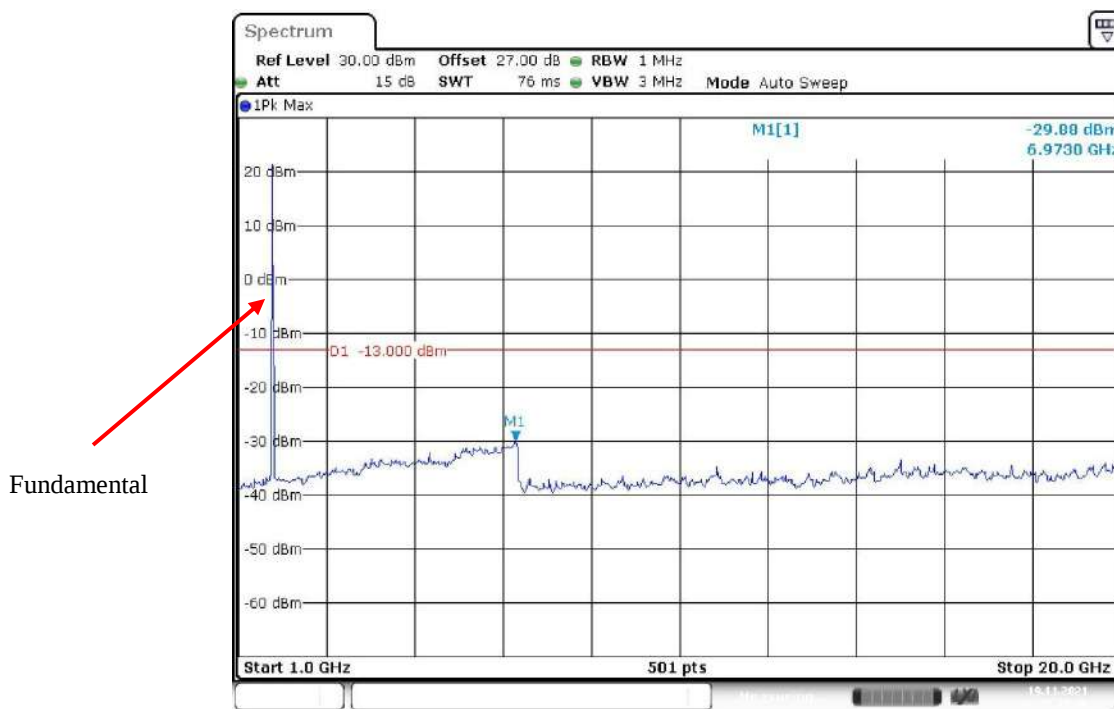
Fundamental



Date: 19.NOV.2021 15:16:11

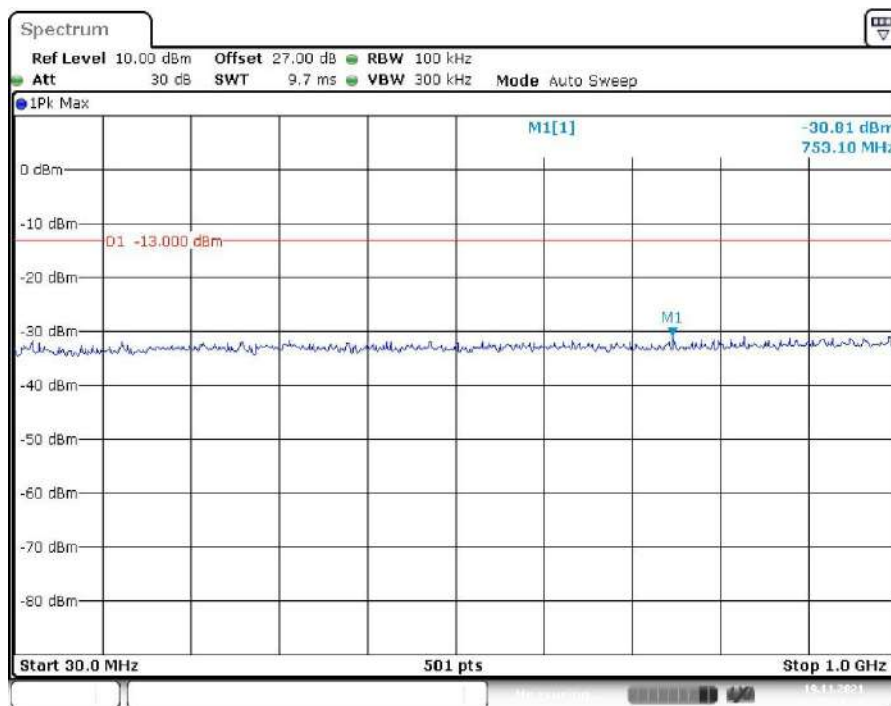
30 MHz – 1 GHz (10 MHz, QPSK, High Channel)

Date: 19.NOV.2021 15:18:27

1 GHz – 20 GHz (10 MHz, QPSK, High Channel)

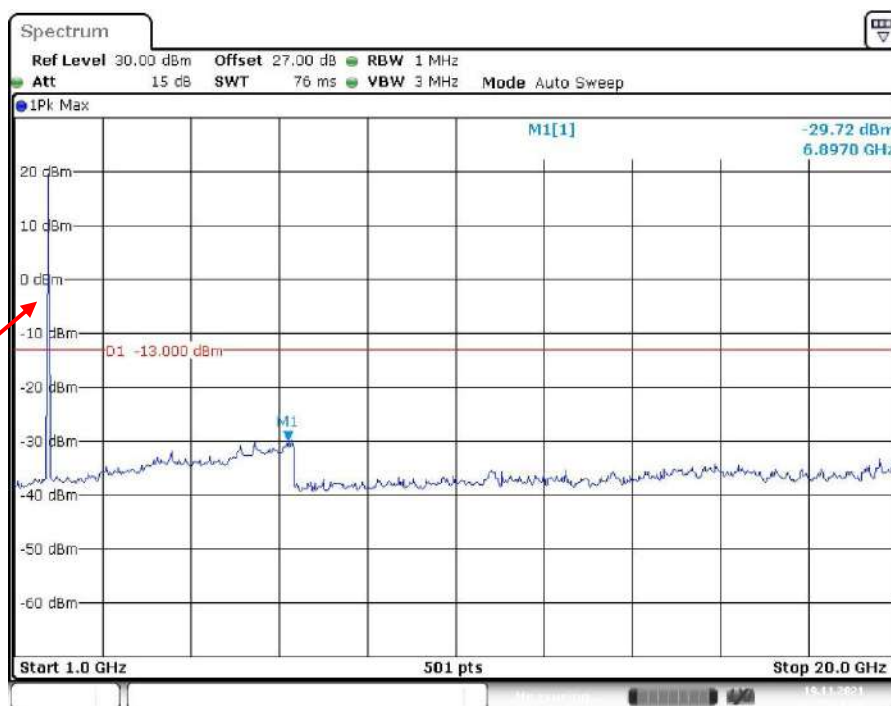
Date: 19.NOV.2021 15:18:46

30 MHz – 1 GHz (15 MHz, QPSK, High Channel)



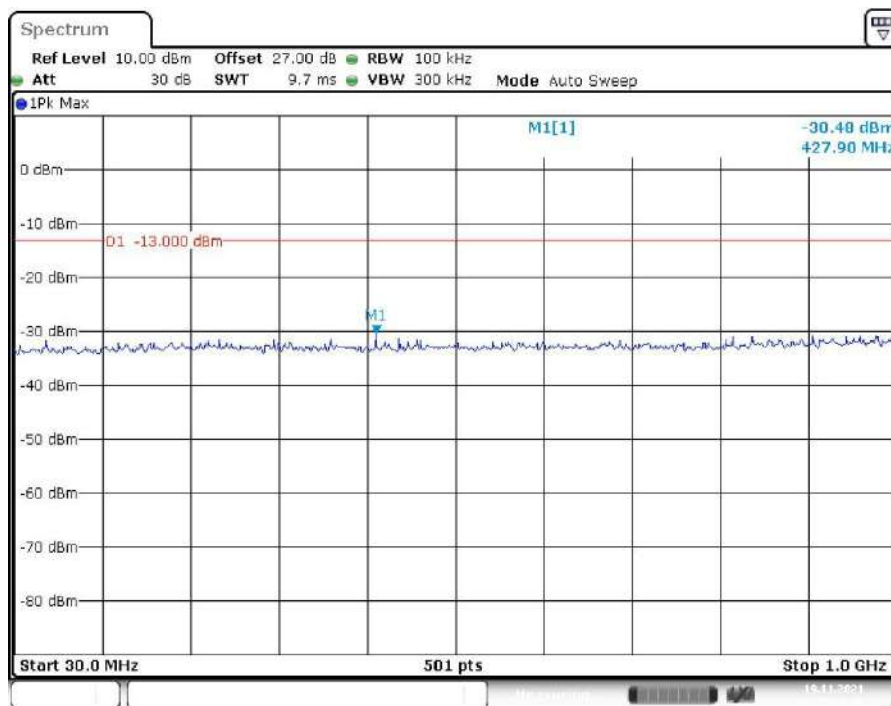
Date: 19.NOV.2021 15:21:12

1 GHz – 20 GHz (15 MHz, QPSK, High Channel)

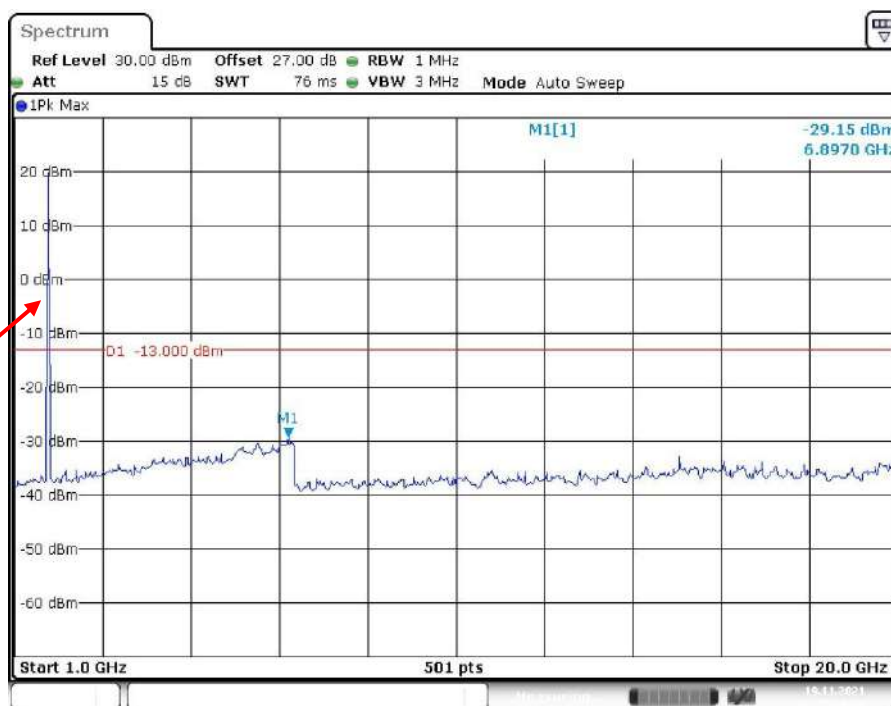


Date: 19.NOV.2021 15:21:32

Fundamental

30 MHz – 1 GHz (20 MHz, QPSK, High Channel)

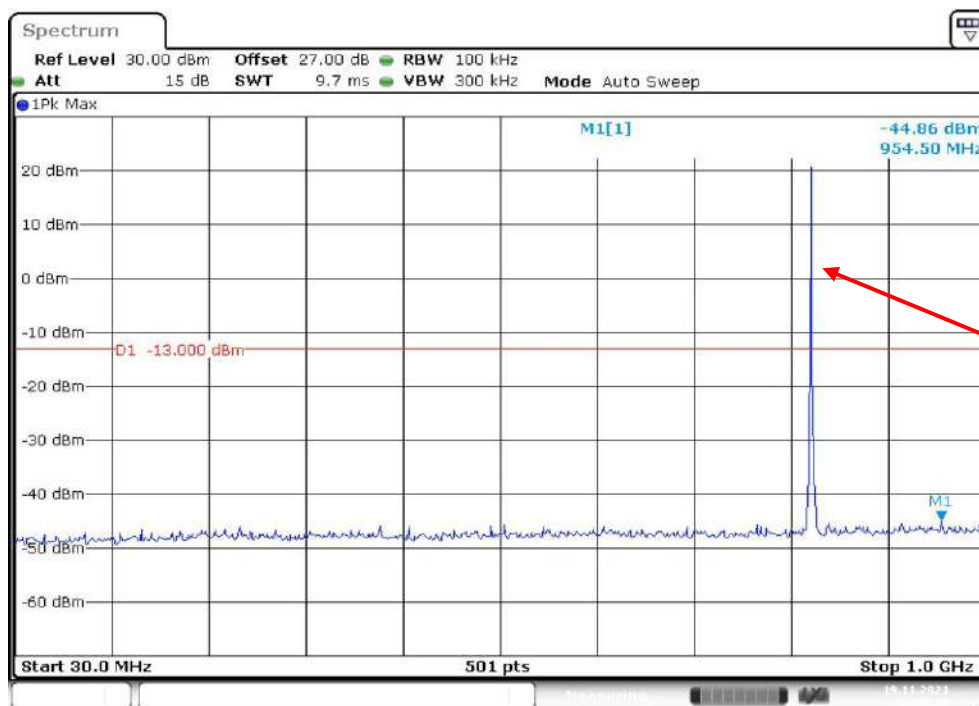
Date: 19.NOV.2021 15:24:16

1 GHz – 20 GHz (20 MHz, QPSK, High Channel)

Fundamental

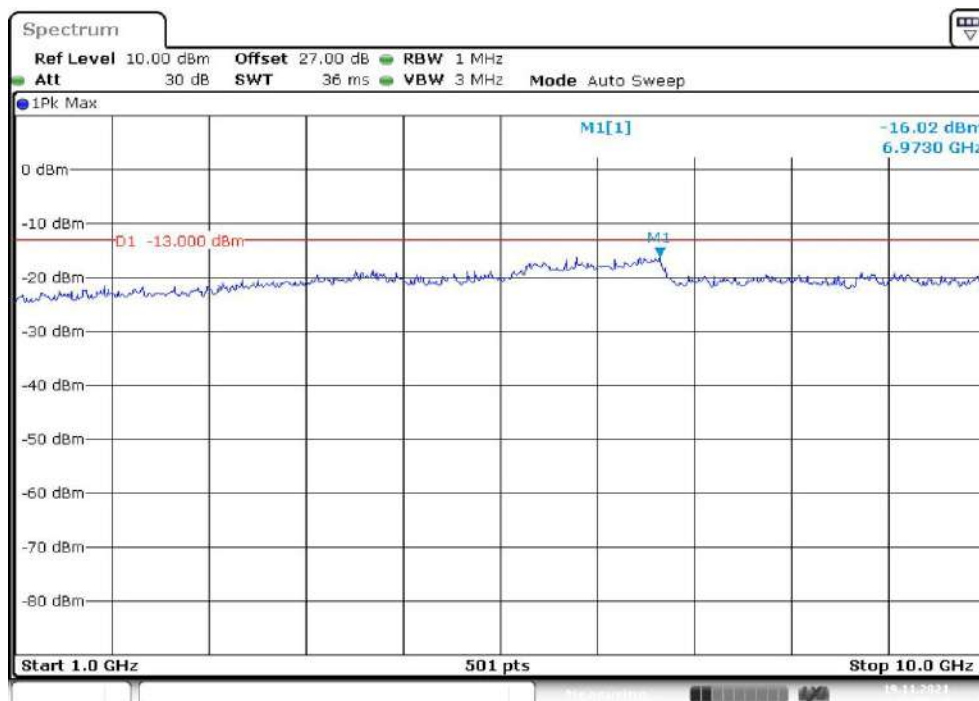
Date: 19.NOV.2021 15:24:45

LTE Band 5 30 MHz – 1 GHz (QPSK, 1.4 MHz, Low Channel)

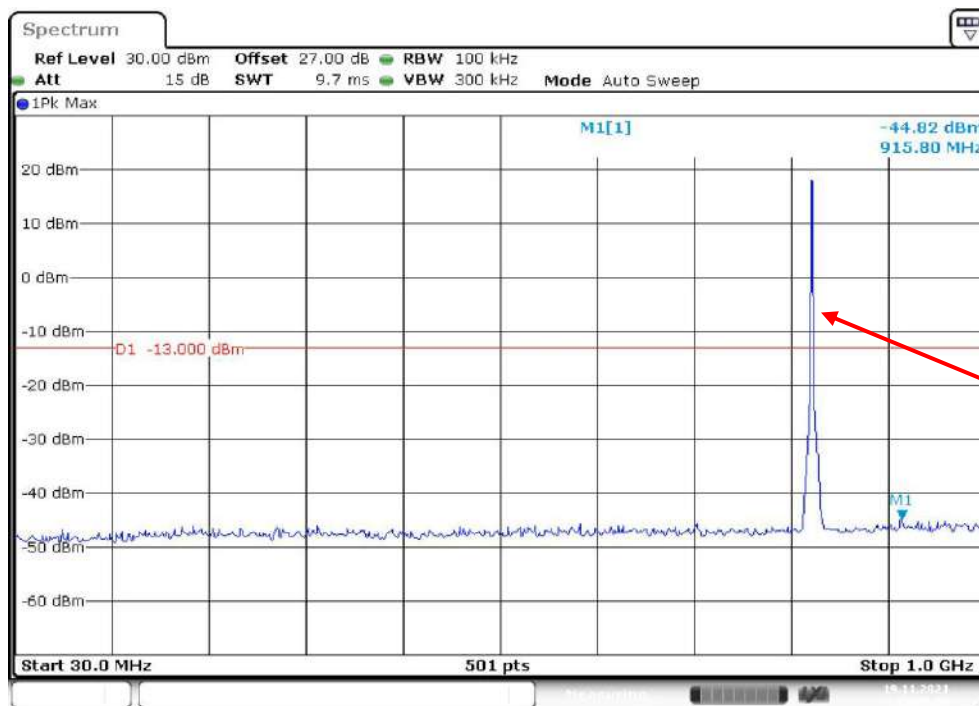
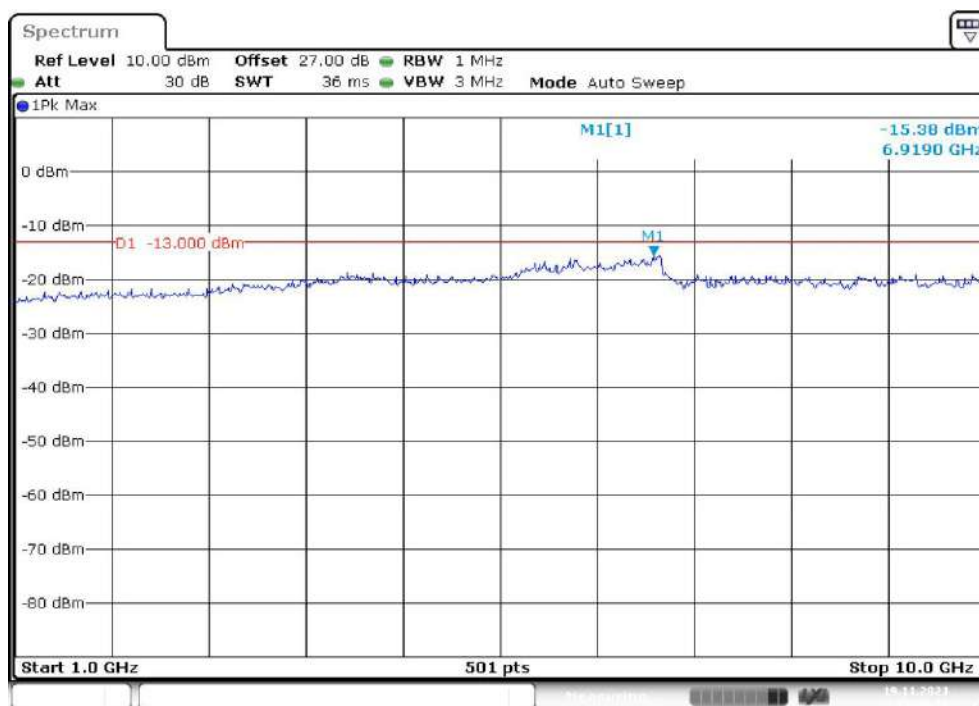


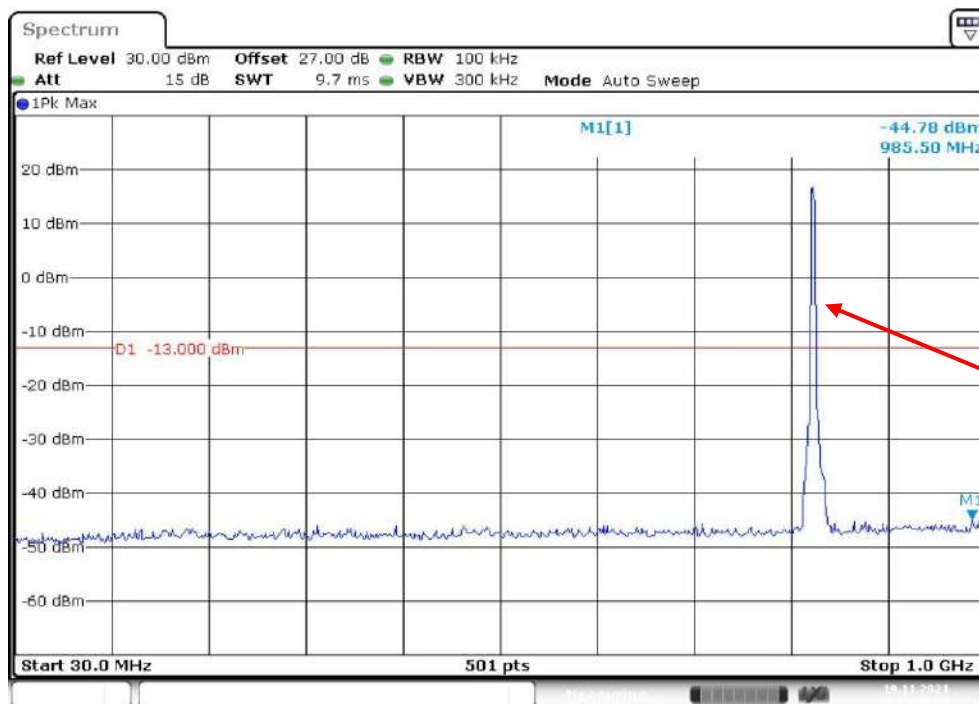
Date: 19.NOV.2021 15:25:18

1 GHz – 10 GHz (QPSK, 1.4 MHz, Low Channel)

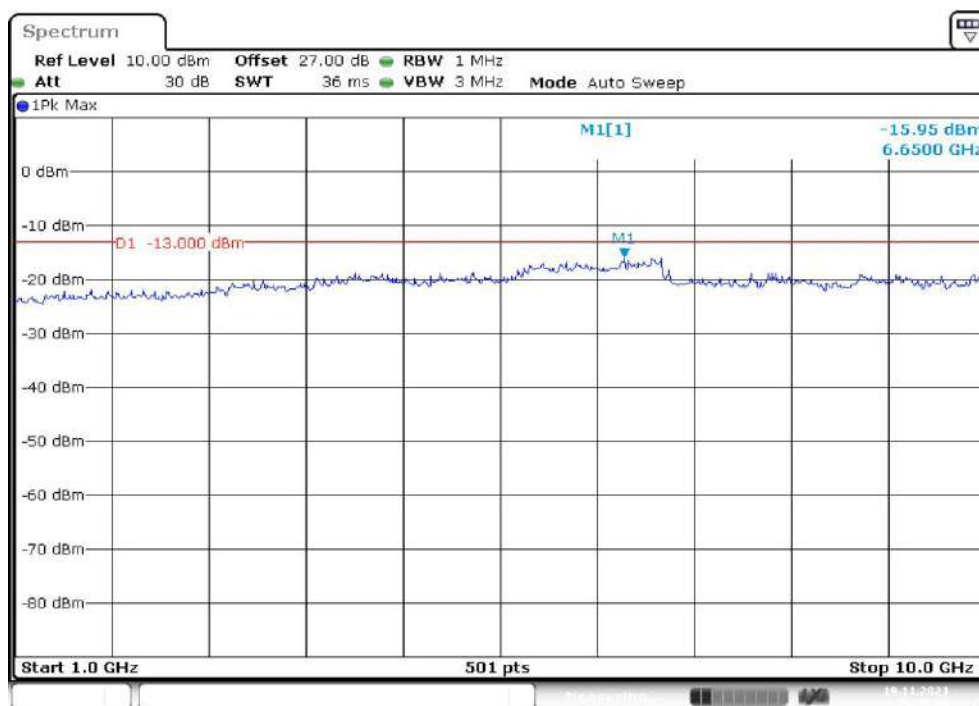


Date: 19.NOV.2021 15:25:34

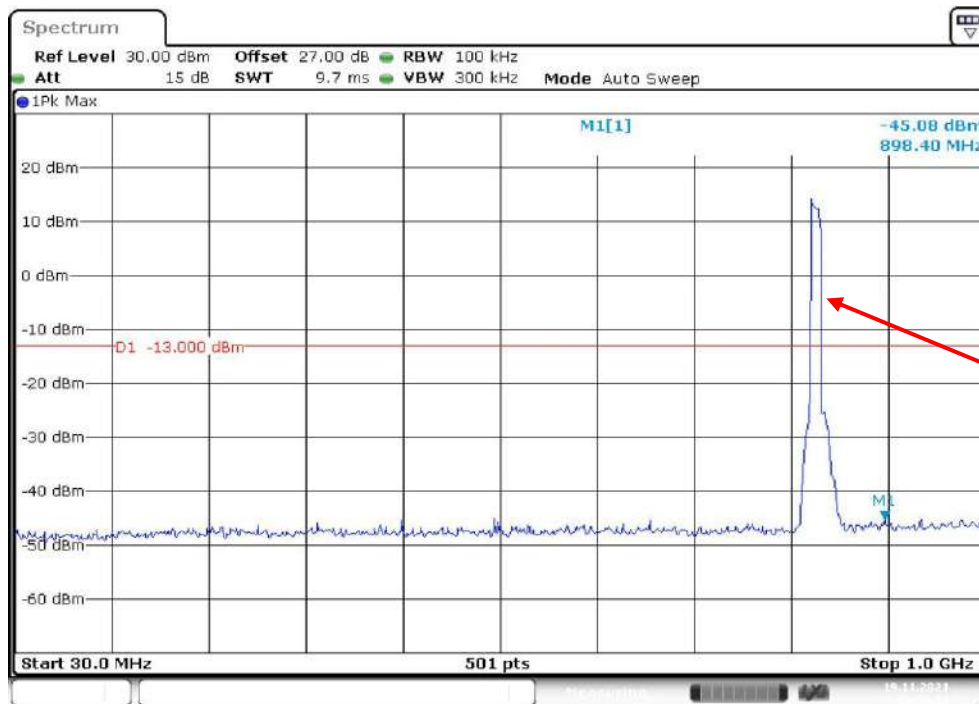
30 MHz – 1 GHz (QPSK, 3.0 MHz, Low Channel)**1 GHz – 10 GHz (QPSK, 3.0 MHz, Low Channel)**

30 MHz – 1 GHz (QPSK, 5.0 MHz, Low Channel)

Fundamental

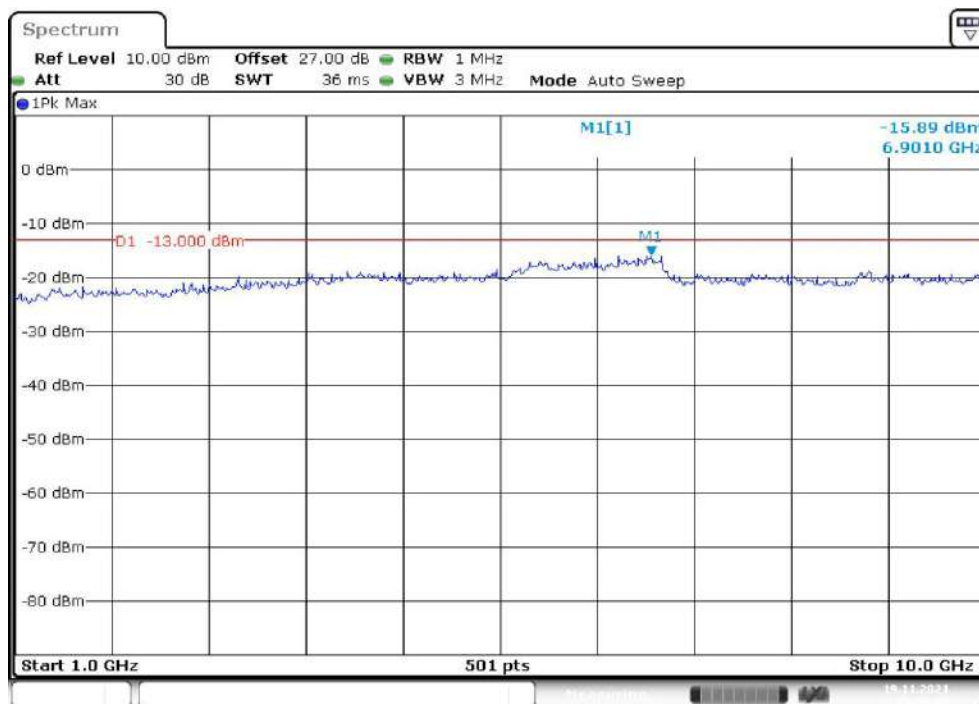
1 GHz – 10 GHz (QPSK, 5.0MHz, Low Channel)

30 MHz – 1 GHz (QPSK, 10.0 MHz, Low Channel)

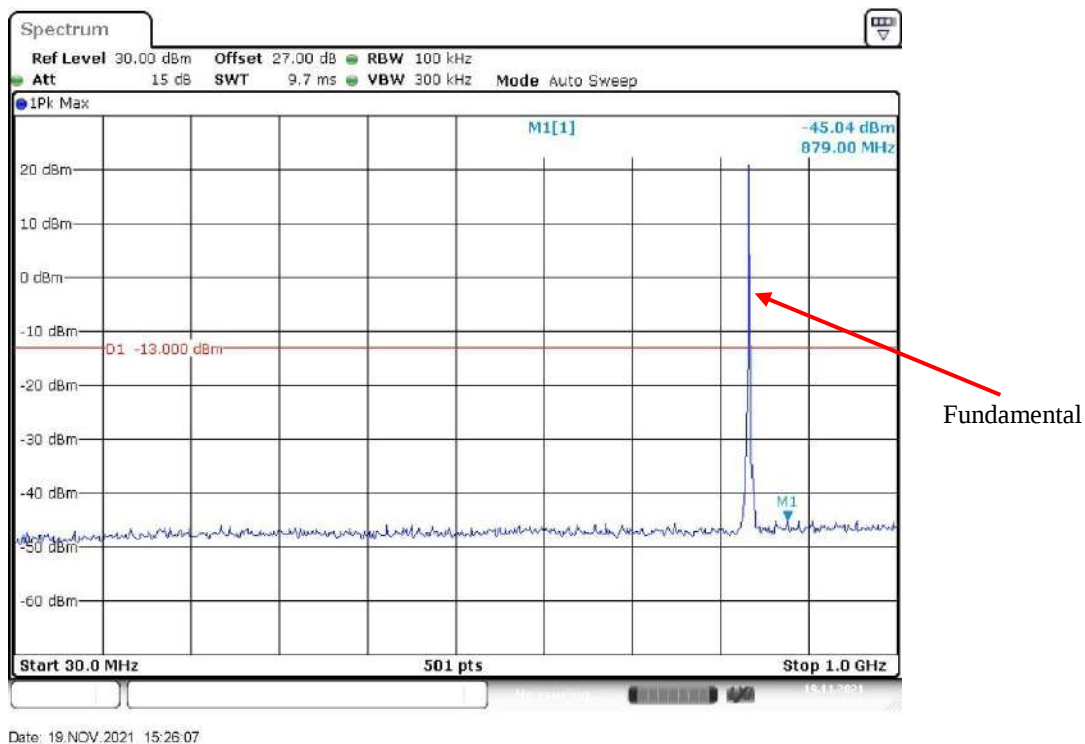
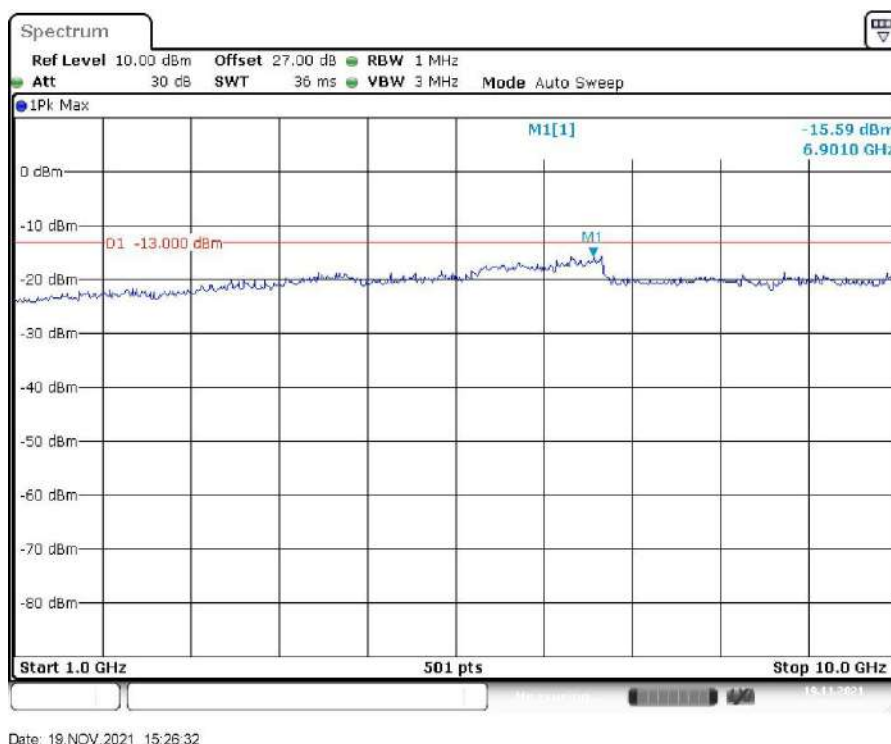


Date: 19.NOV.2021 15:33:11

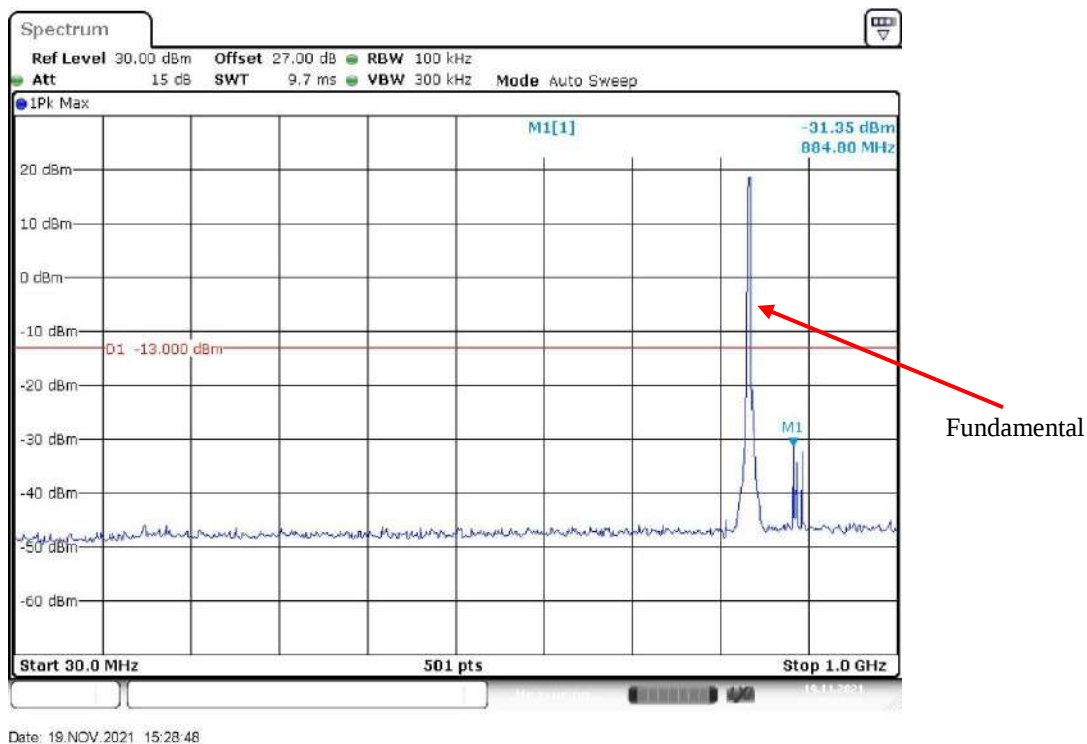
1 GHz – 10 GHz (QPSK, 10.0 MHz, Low Channel)



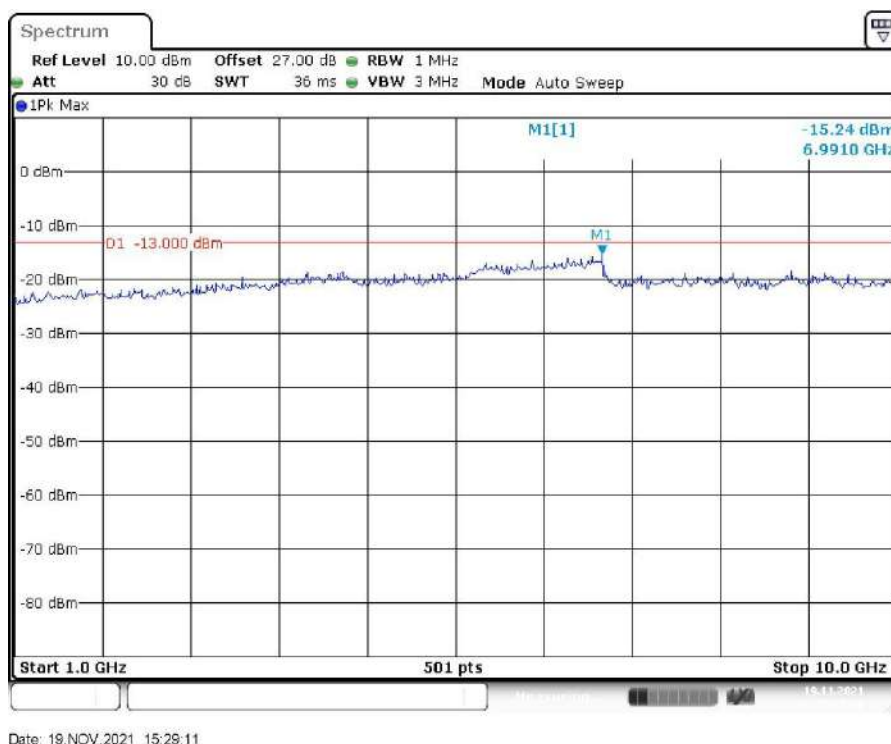
Date: 19.NOV.2021 15:33:37

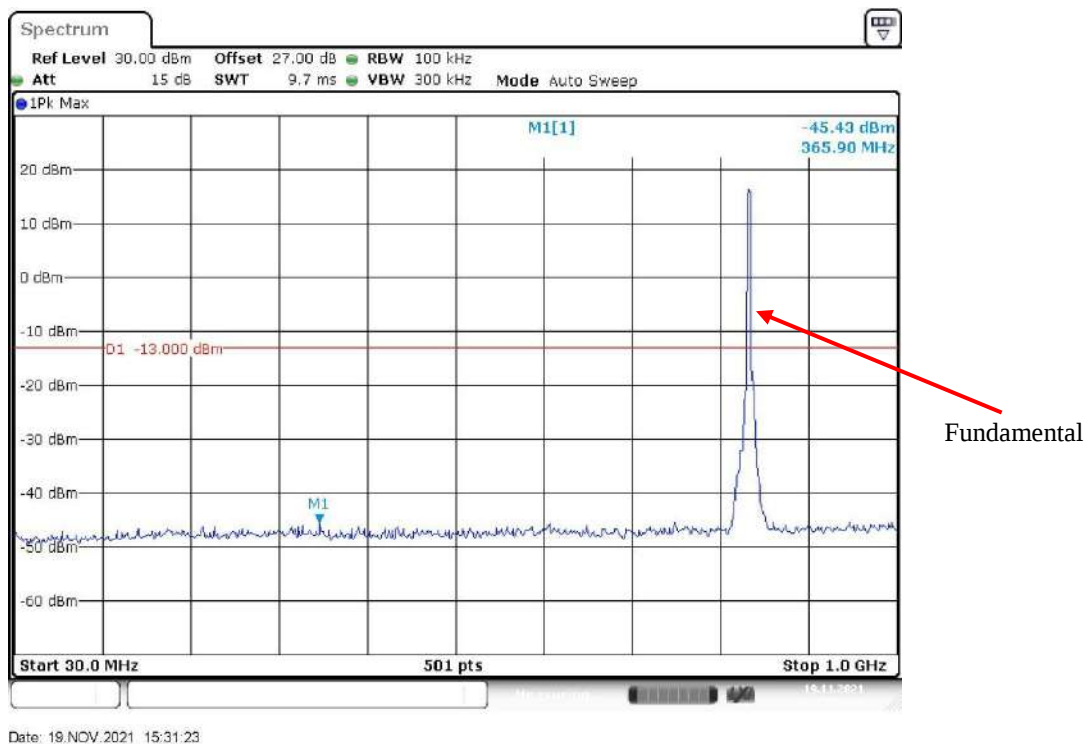
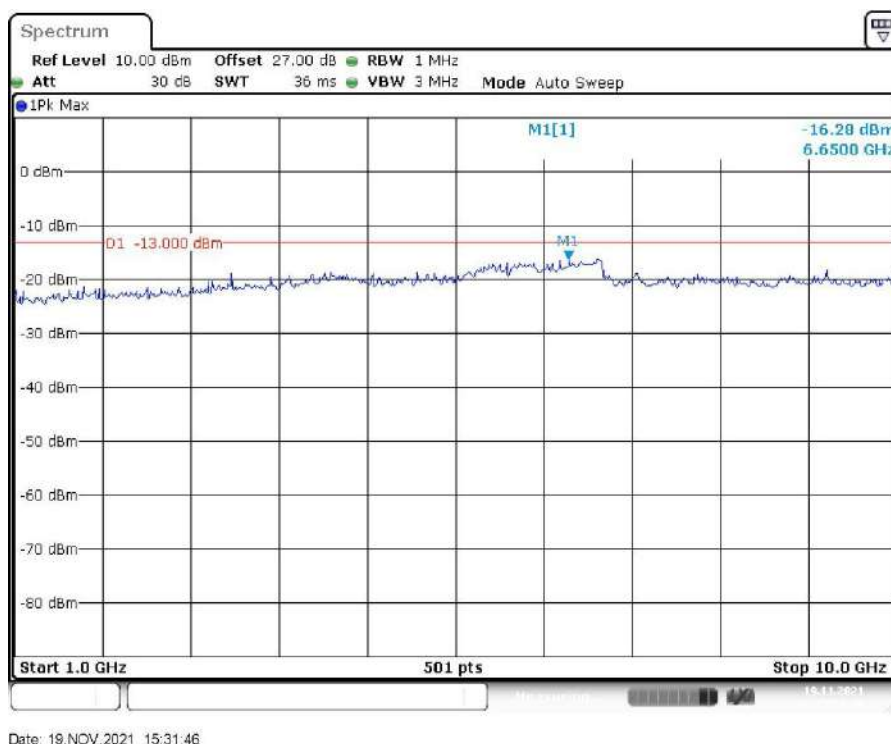
30 MHz – 1 GHz (QPSK, 1.4 MHz, Middle Channel)**1 GHz – 10 GHz (QPSK, 1.4 MHz, Middle Channel)**

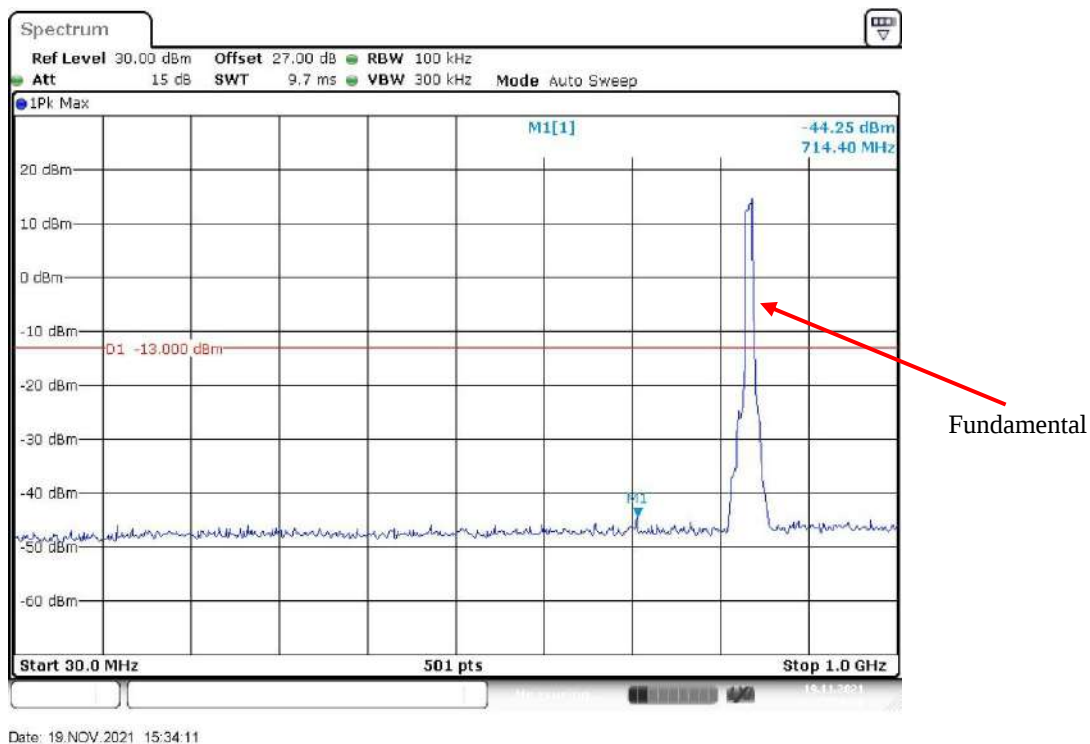
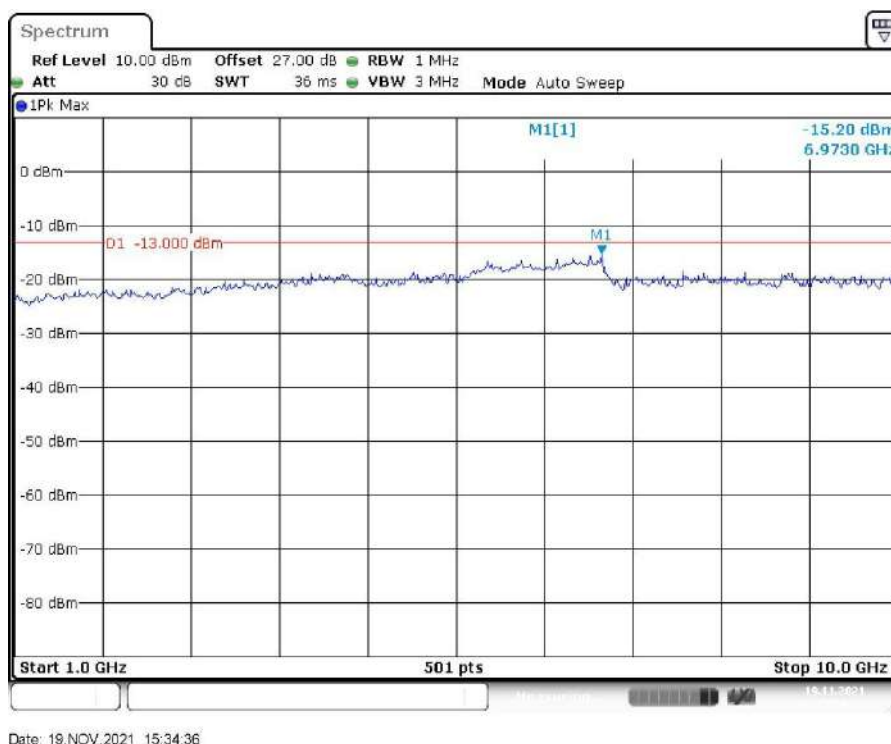
30 MHz – 1 GHz (QPSK, 3.0 MHz, Middle Channel)



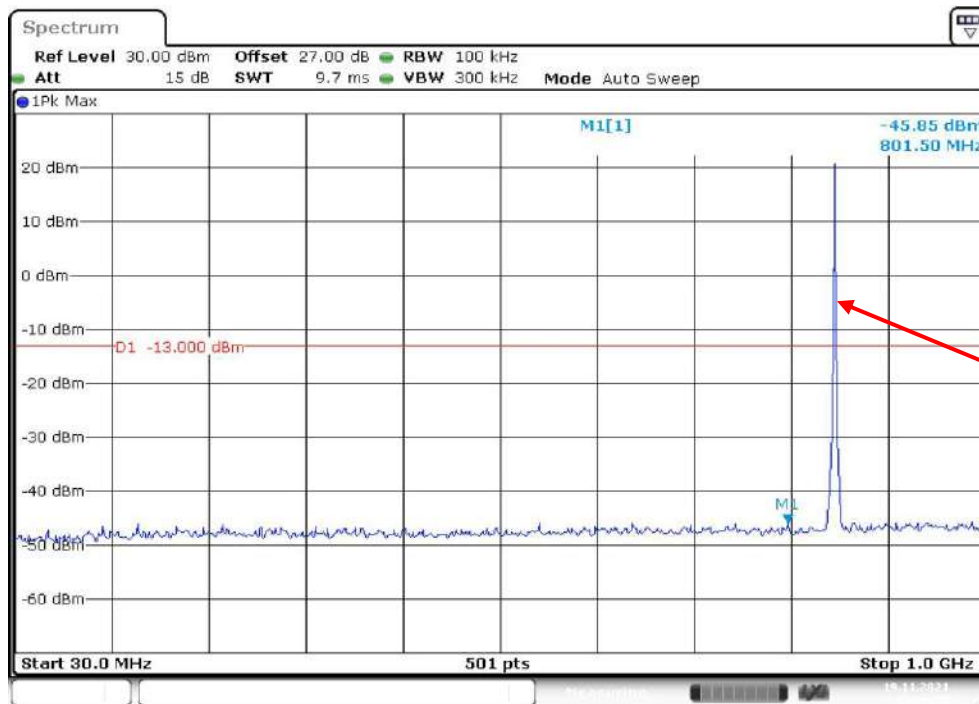
1 GHz – 10 GHz (QPSK, 3.0 MHz, Middle Channel)



30 MHz – 1 GHz (QPSK, 5.0 MHz, Middle Channel)**1 GHz – 10 GHz (QPSK, 5.0MHz, Middle Channel)**

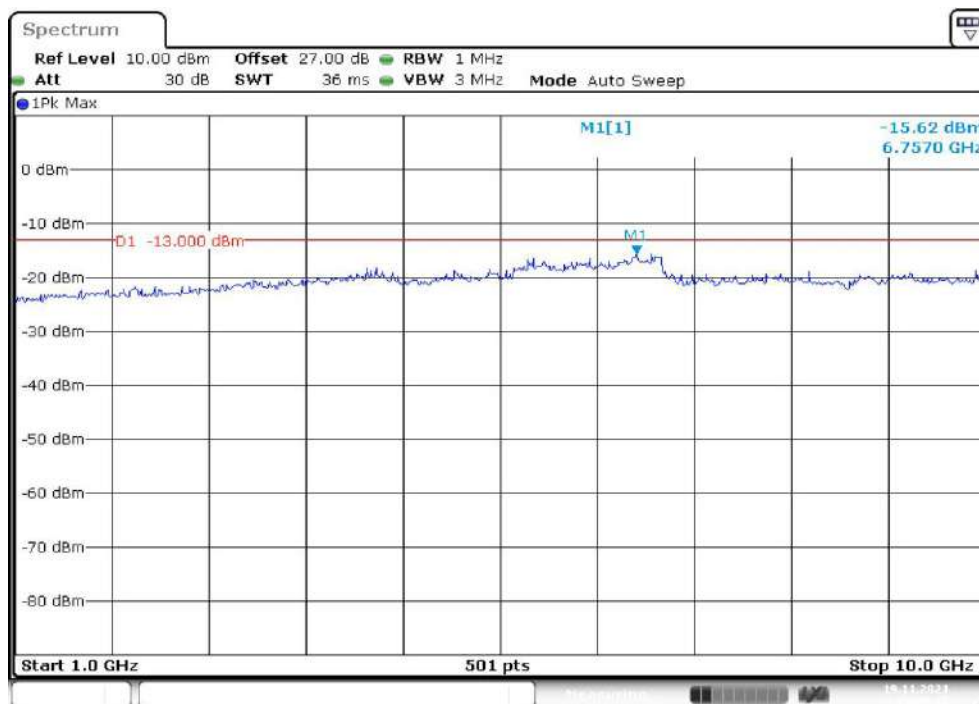
30 MHz – 1 GHz (QPSK, 10.0 MHz, Middle Channel)**1 GHz – 10 GHz (QPSK, 10.0 MHz, Middle Channel)**

30 MHz – 1 GHz (QPSK, 1.4 MHz, High Channel)

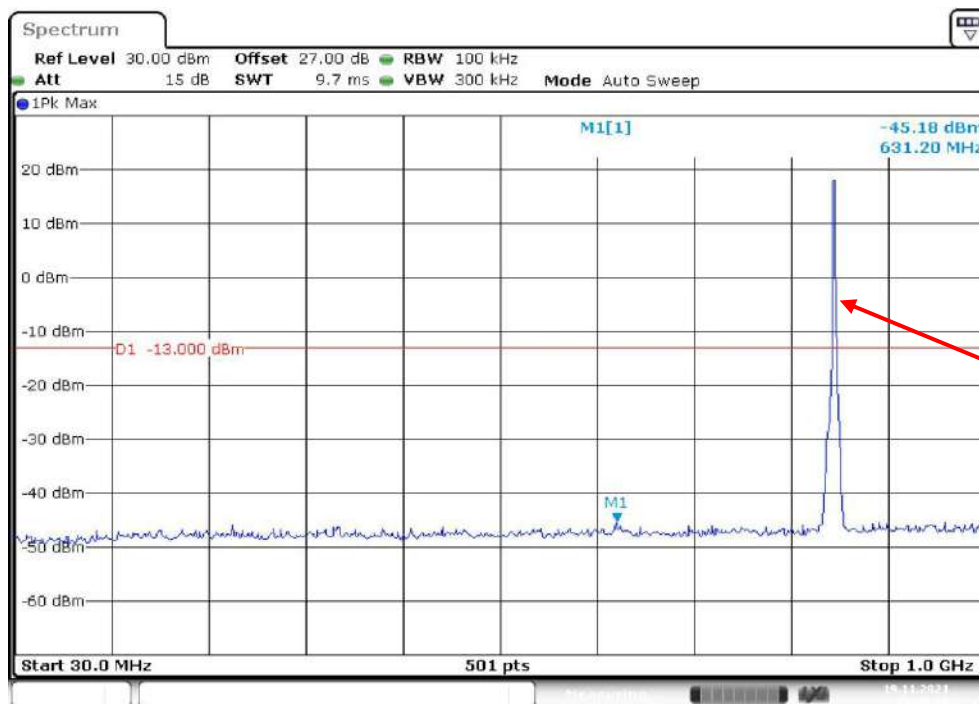


Date: 19.NOV.2021 15:28:55

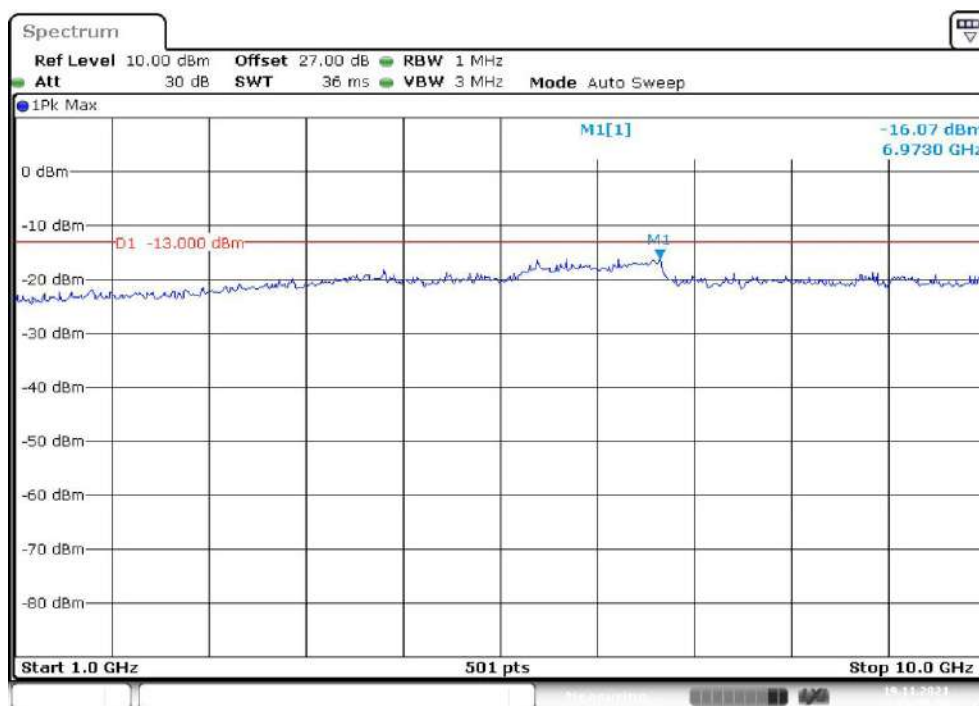
1 GHz – 10 GHz (QPSK, 1.4 MHz, High Channel)

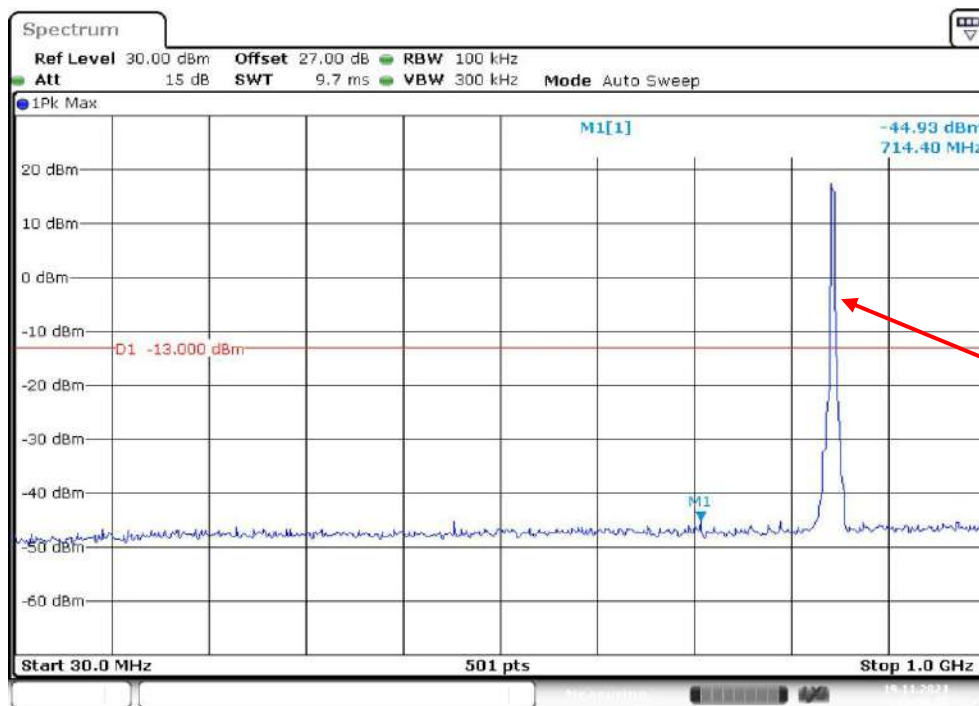
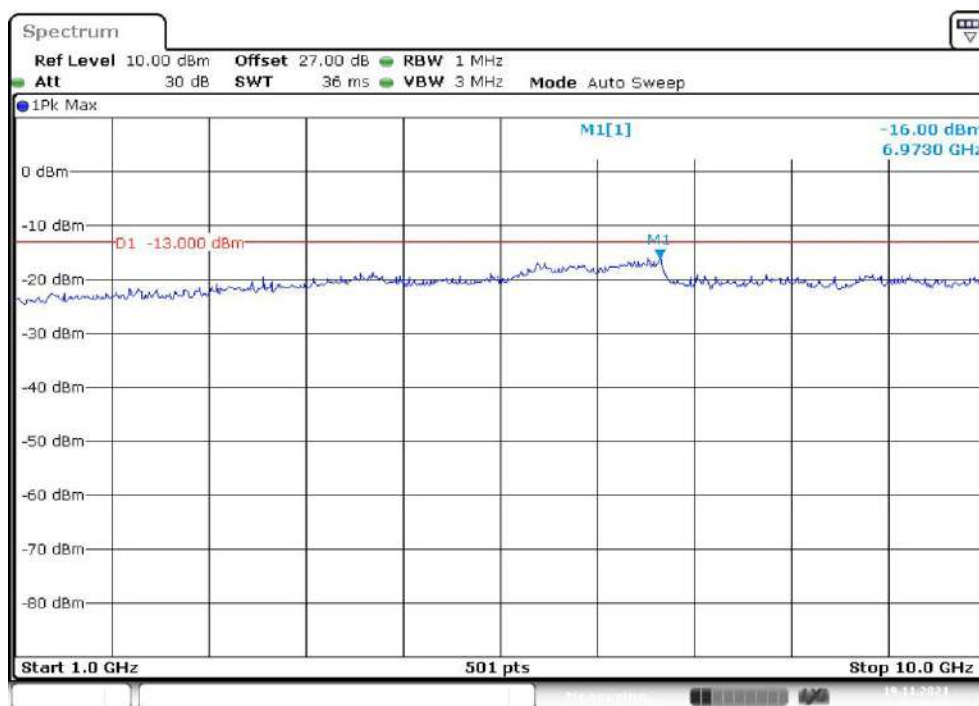


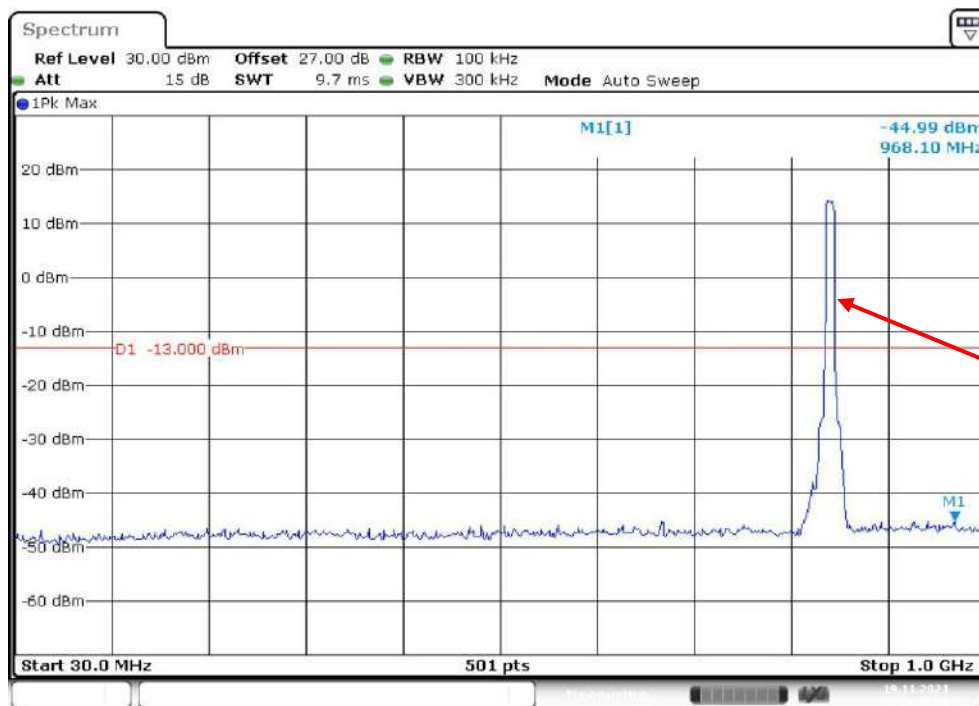
Date: 19.NOV.2021 15:27:18

30 MHz – 1 GHz (QPSK, 3.0 MHz, High Channel)

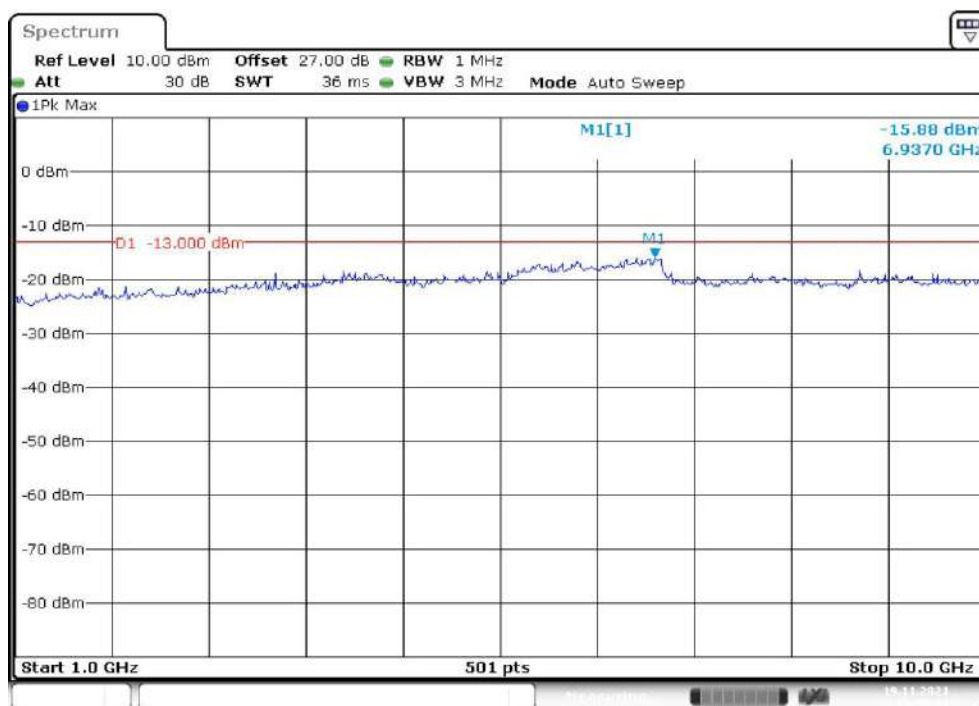
Fundamental

1 GHz – 10 GHz (QPSK, 3.0 MHz, High Channel)

30 MHz – 1 GHz (QPSK, 5.0 MHz, High Channel)**1 GHz – 10 GHz (QPSK, 5.0MHz, High Channel)**

30 MHz – 1 GHz (QPSK, 10.0 MHz, High Channel)

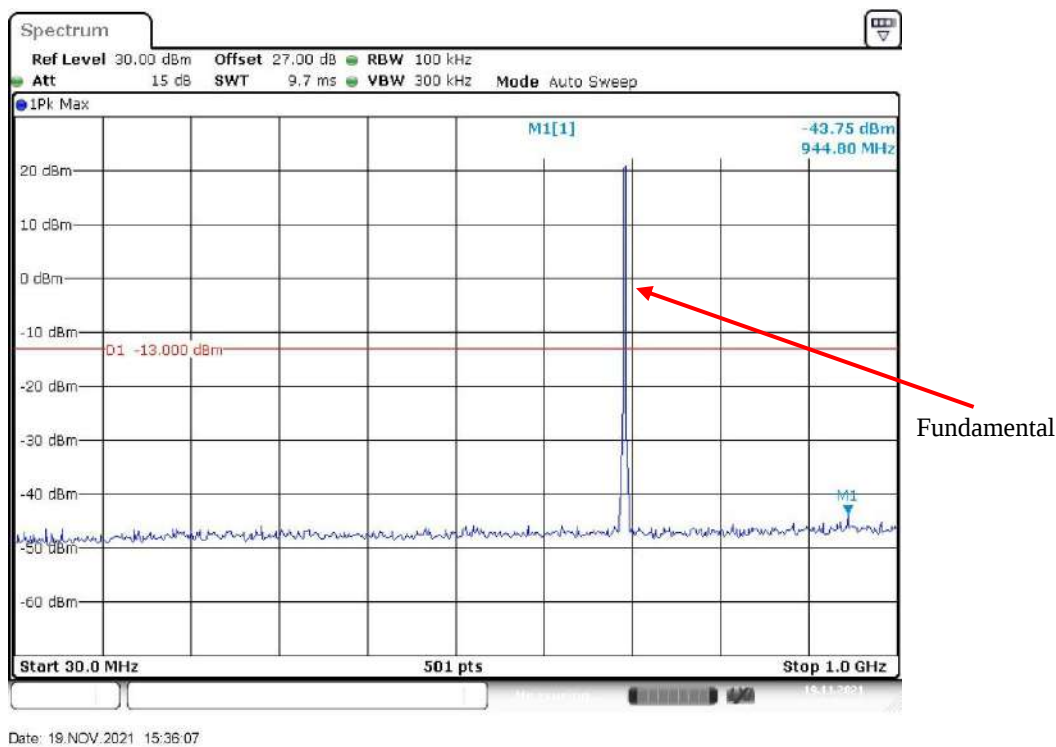
Date: 19.NOV.2021 15:35:06

1 GHz – 10 GHz (QPSK, 10.0 MHz, High Channel)

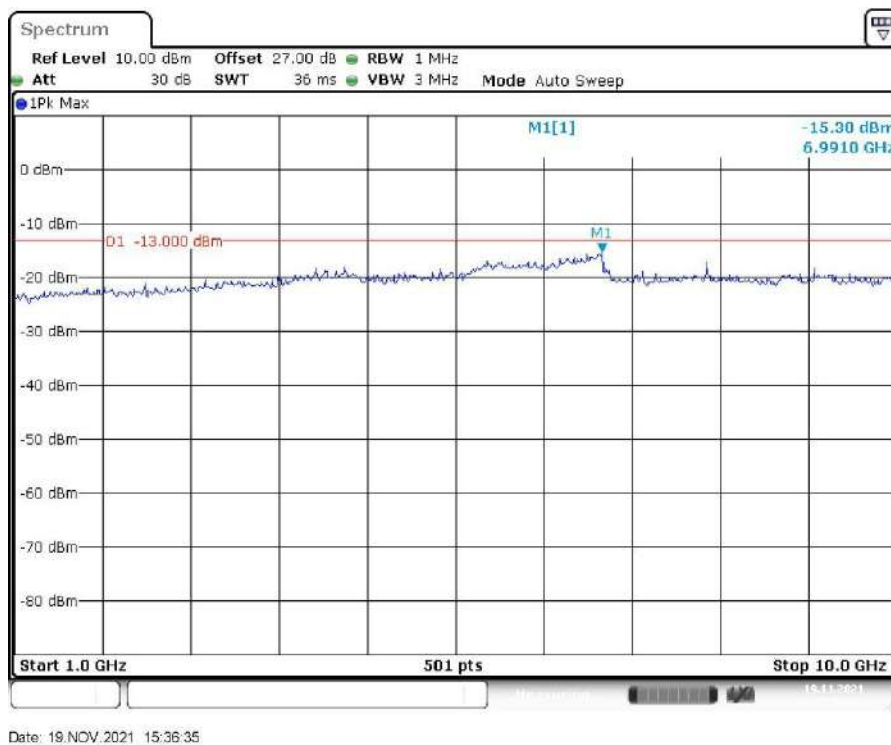
Date: 19.NOV.2021 15:35:32

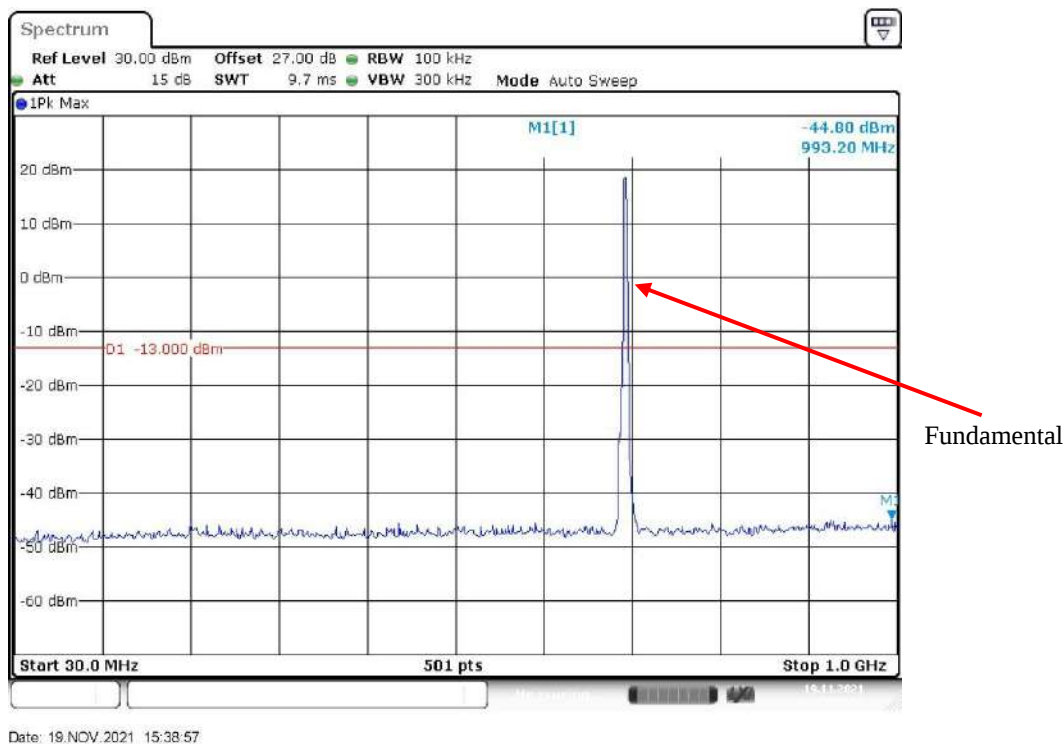
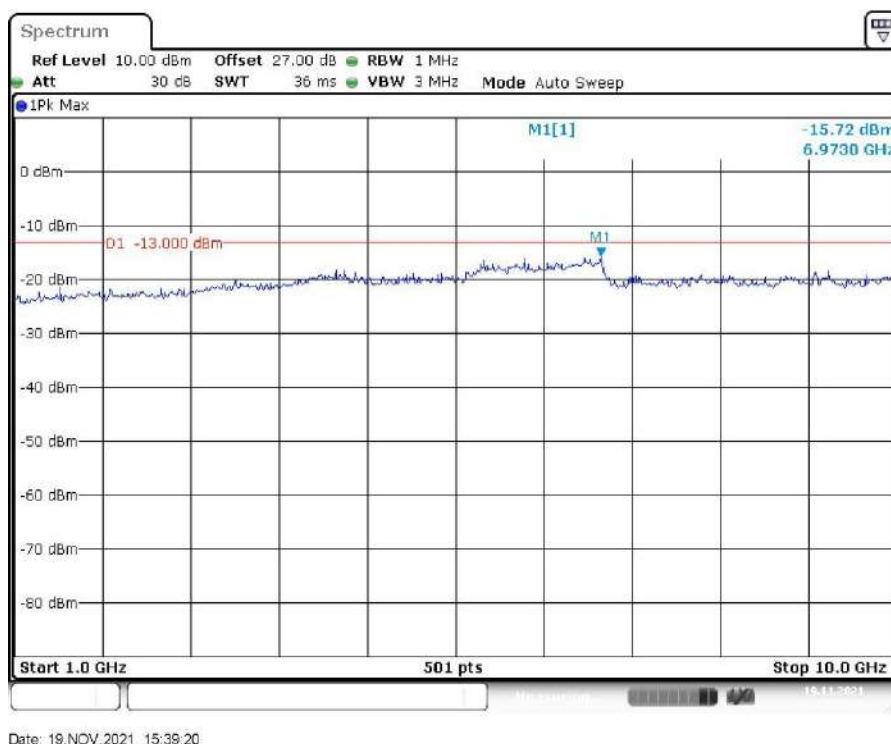
LTE Band 12

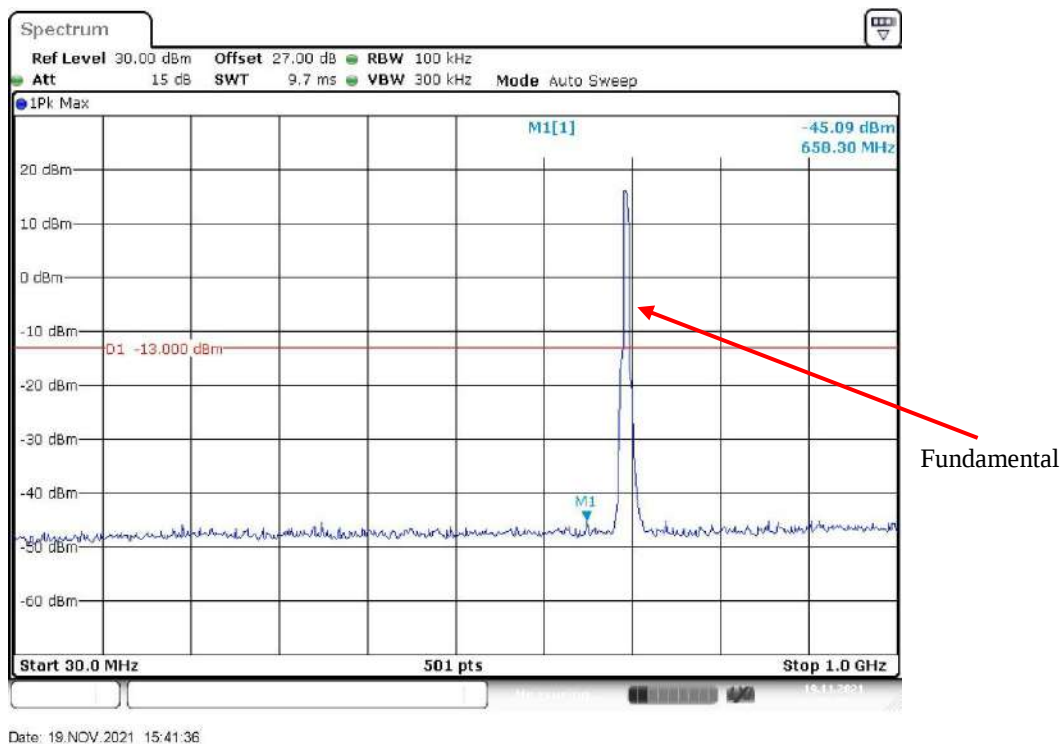
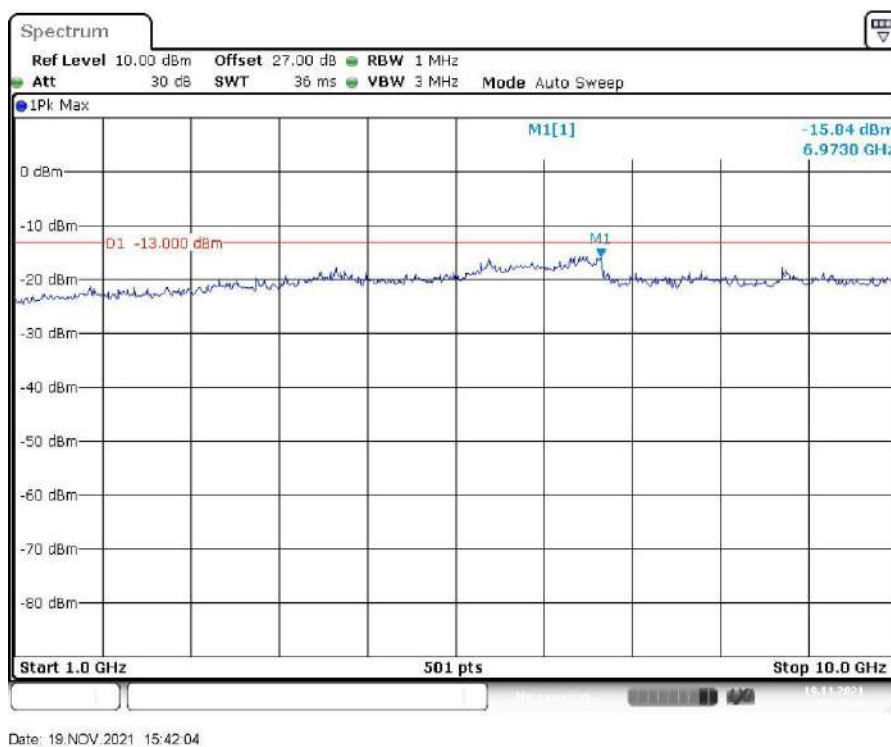
30 MHz – 1 GHz (QPSK, 1.4 MHz, Low Channel)

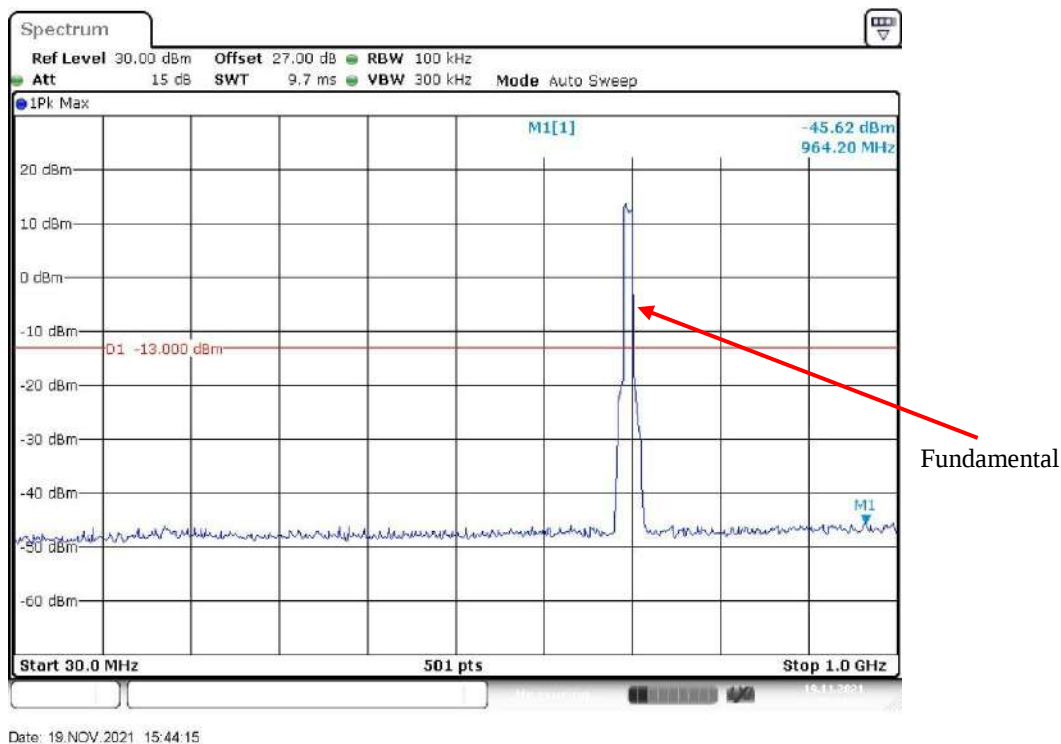
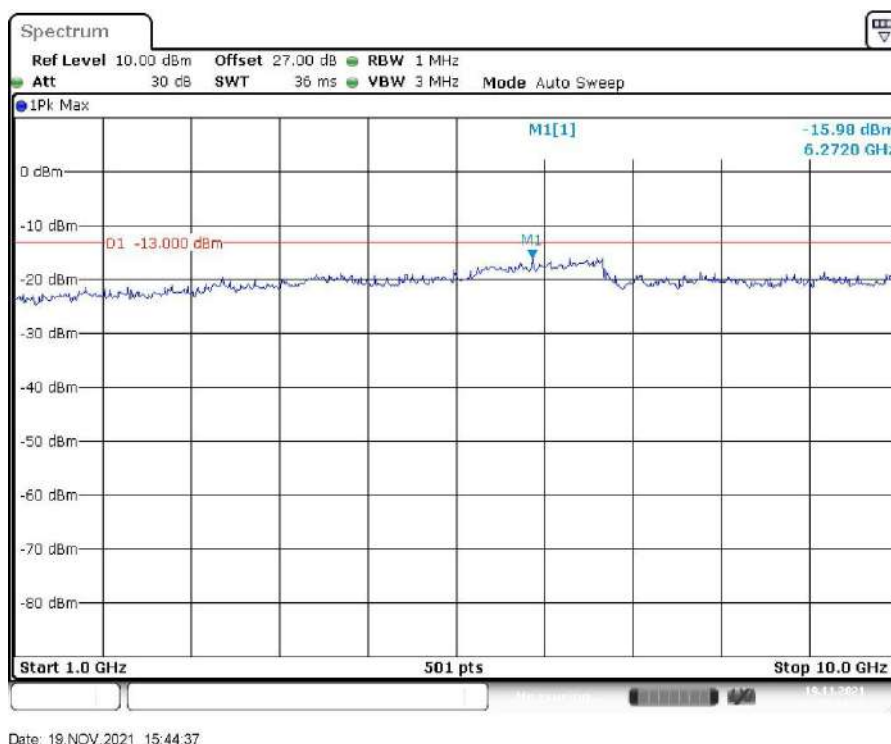


1 GHz – 10 GHz (QPSK, 1.4 MHz, Low Channel)

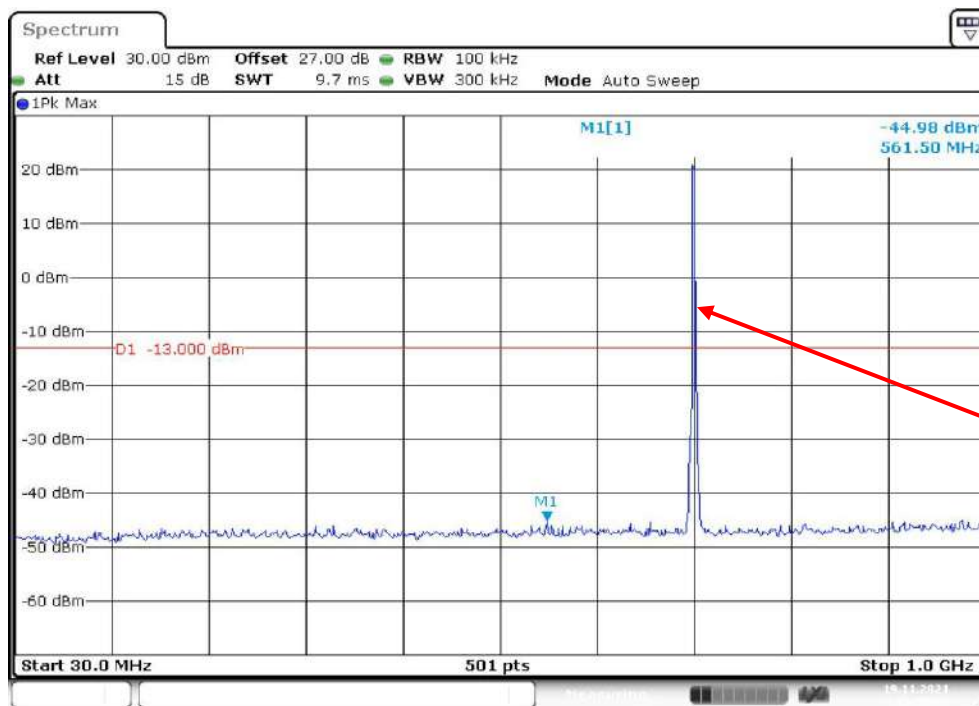


30 MHz – 1 GHz (QPSK, 3.0 MHz, Low Channel)**1 GHz – 10 GHz (QPSK, 3.0 MHz, Low Channel)**

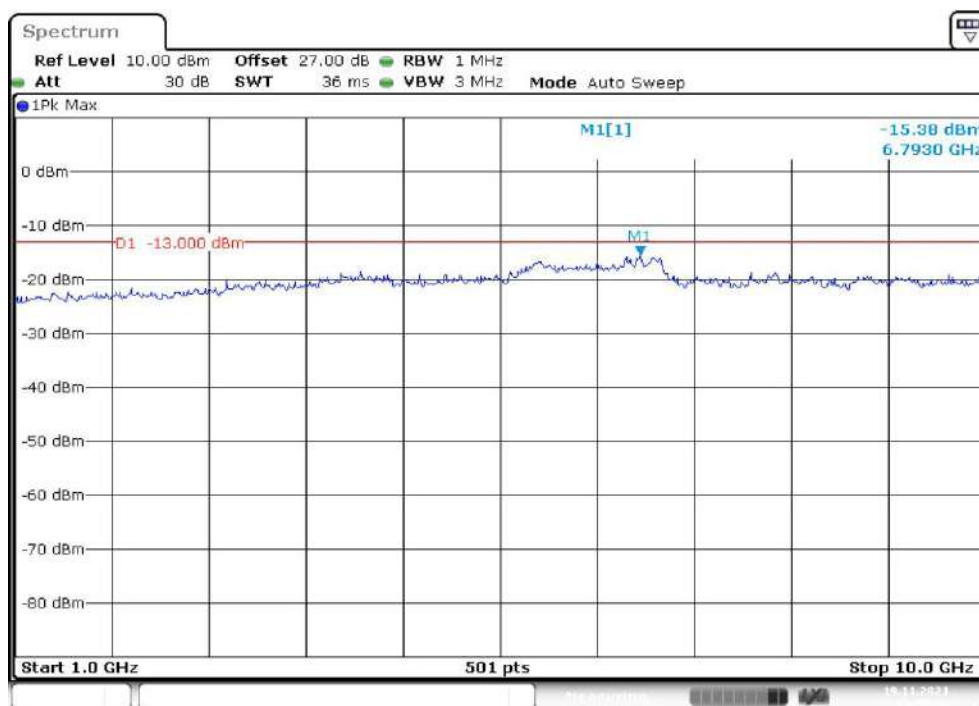
30 MHz – 1 GHz (QPSK, 5.0 MHz, Low Channel)**1 GHz – 10 GHz (QPSK, 5.0MHz, Low Channel)**

30 MHz – 1 GHz (QPSK, 10.0 MHz, Low Channel)**1 GHz – 10 GHz (QPSK, 10.0 MHz, Low Channel)**

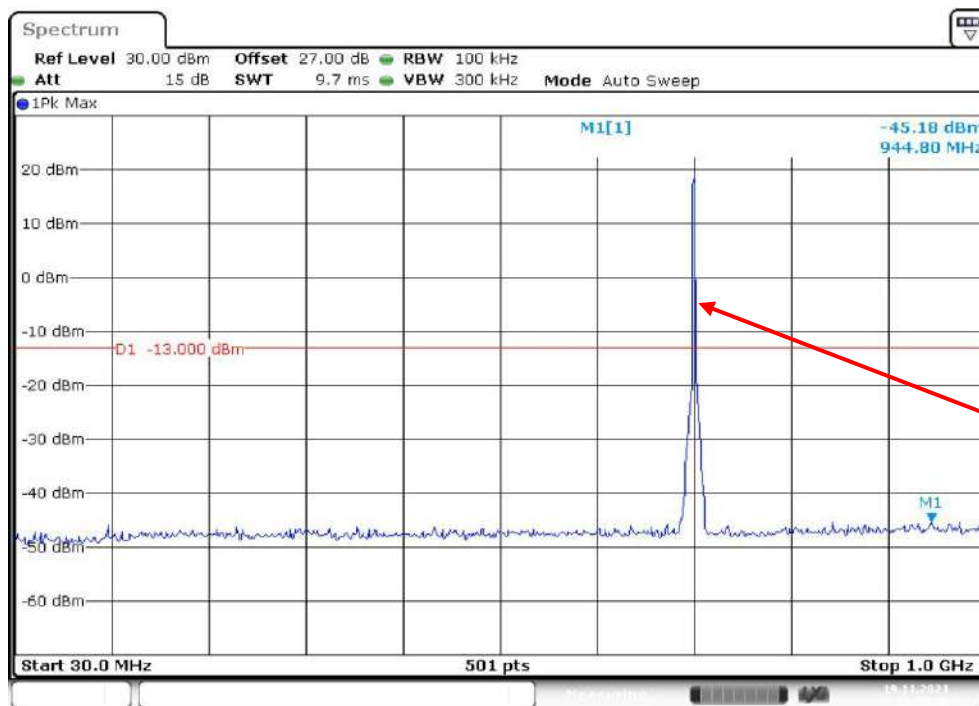
30 MHz – 1 GHz (QPSK, 1.4 MHz, Middle Channel)



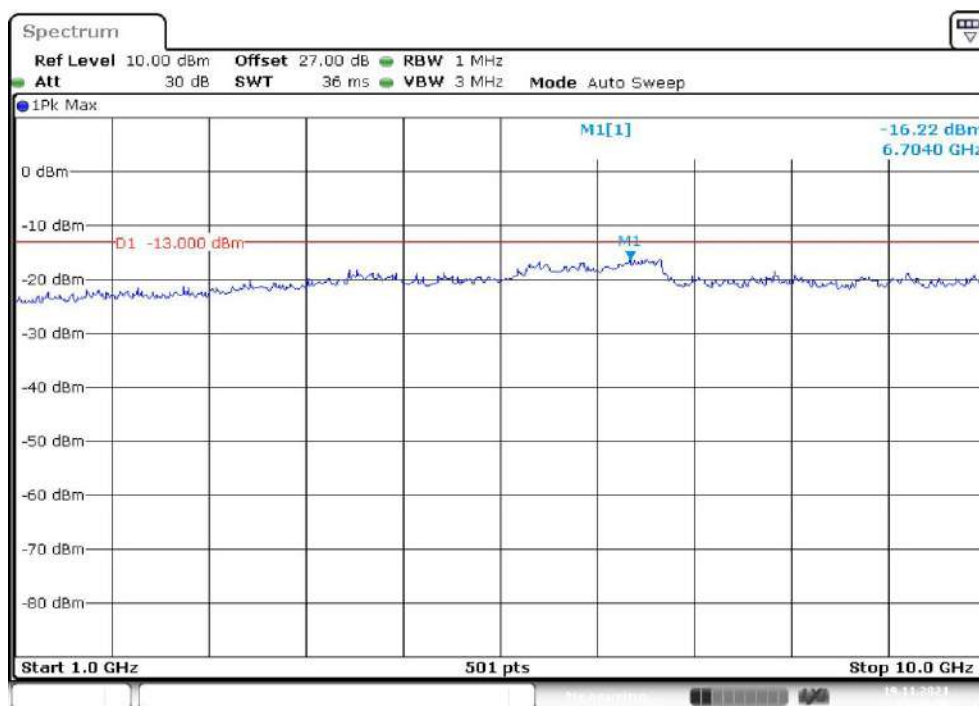
1 GHz – 10 GHz (QPSK, 1.4 MHz, Middle Channel)



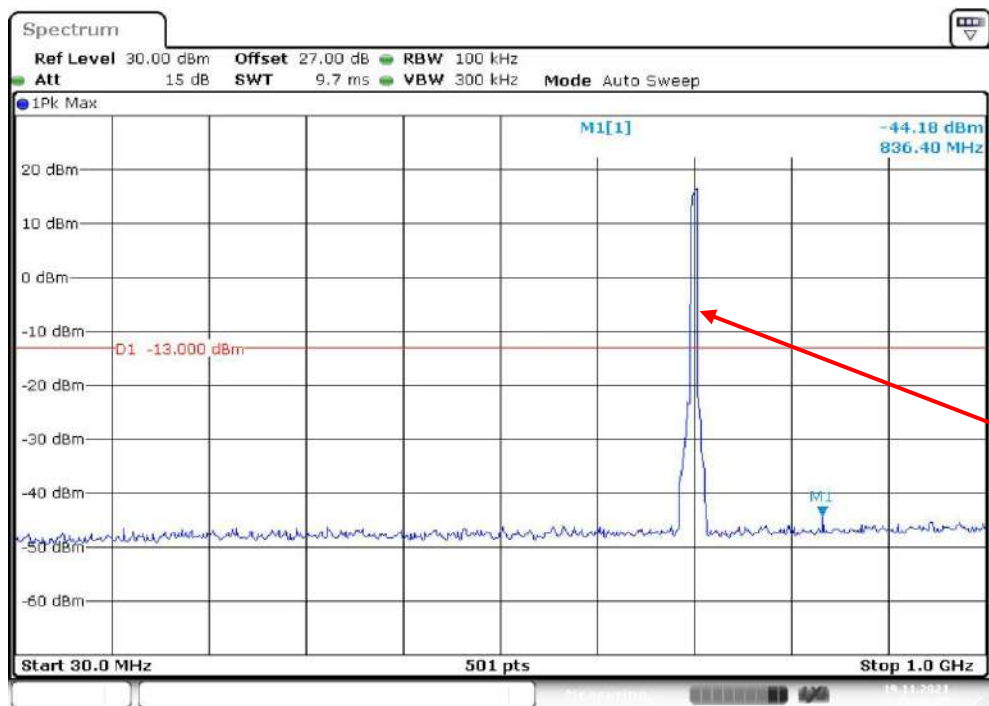
30 MHz – 1 GHz (QPSK, 3.0 MHz, Middle Channel)



1 GHz – 10 GHz (QPSK, 3.0 MHz, Middle Channel)

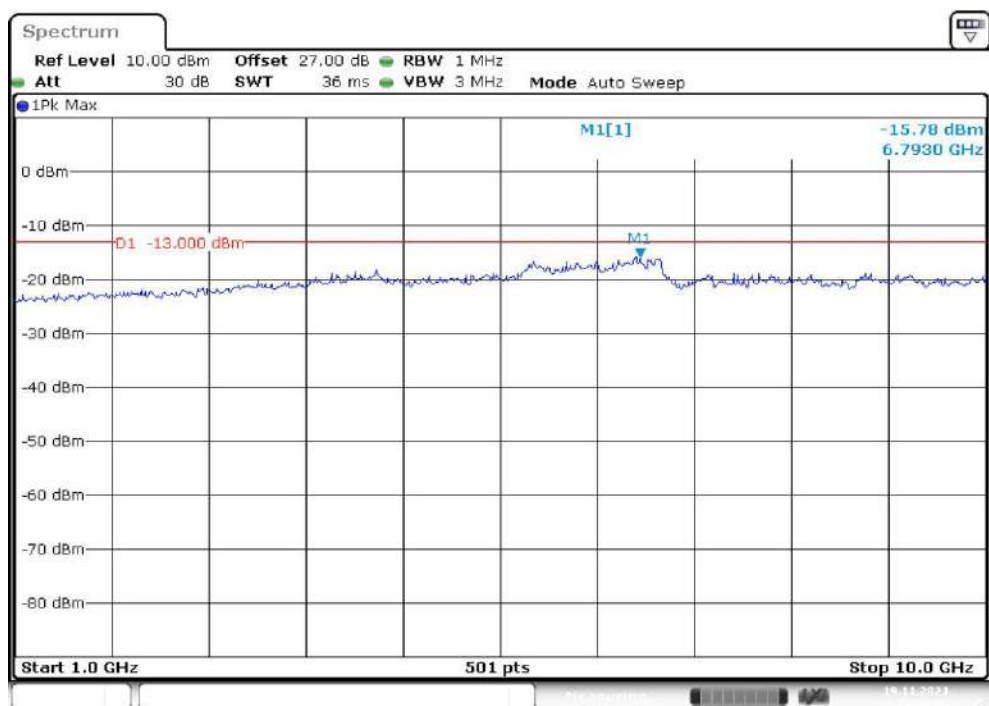


30 MHz – 1 GHz (QPSK, 5.0 MHz, Middle Channel)

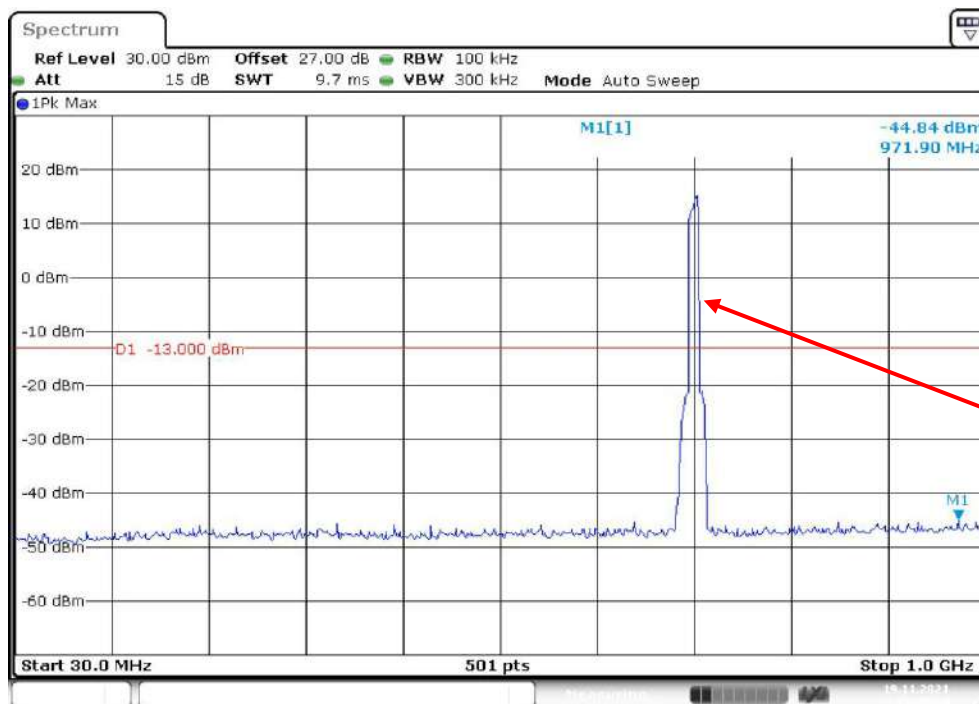


Date: 19.NOV.2021 15:42:27

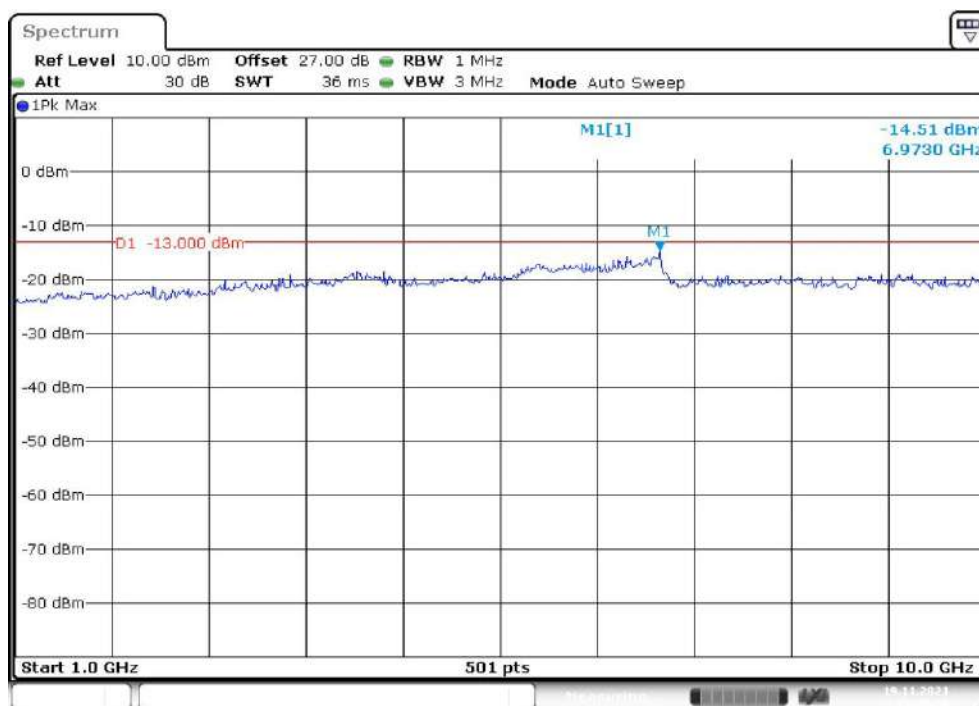
1 GHz – 10 GHz (QPSK, 5.0MHz, Middle Channel)



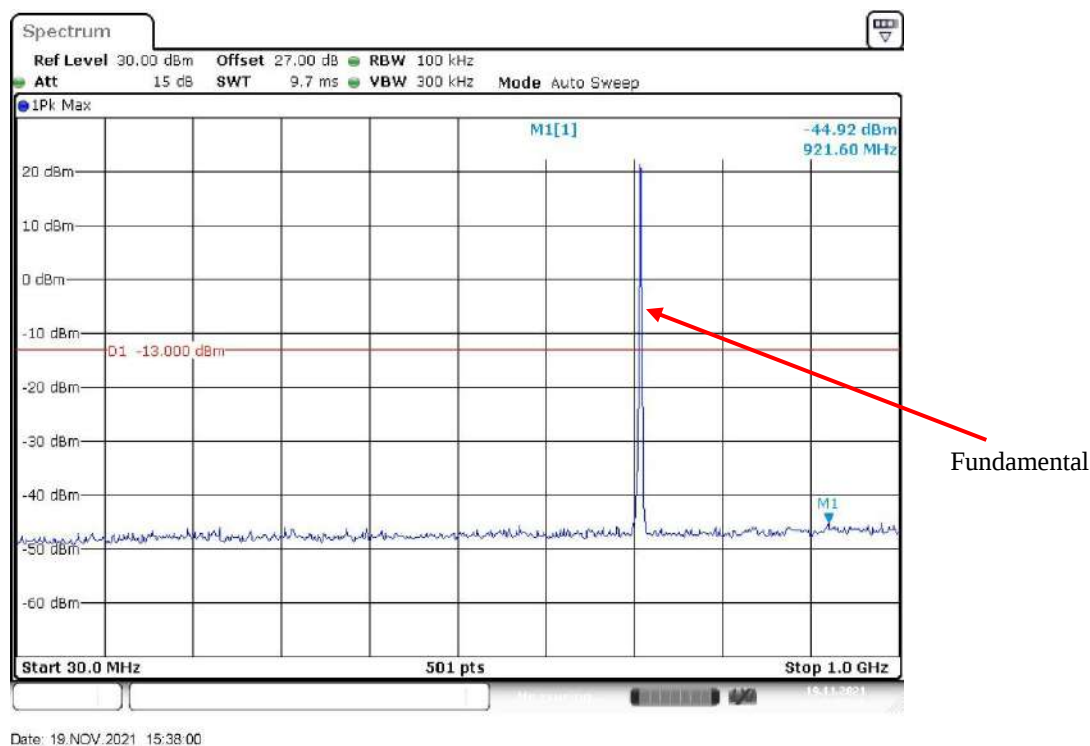
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30 MHz – 1 GHz (QPSK, 10.0 MHz, Middle Channel)

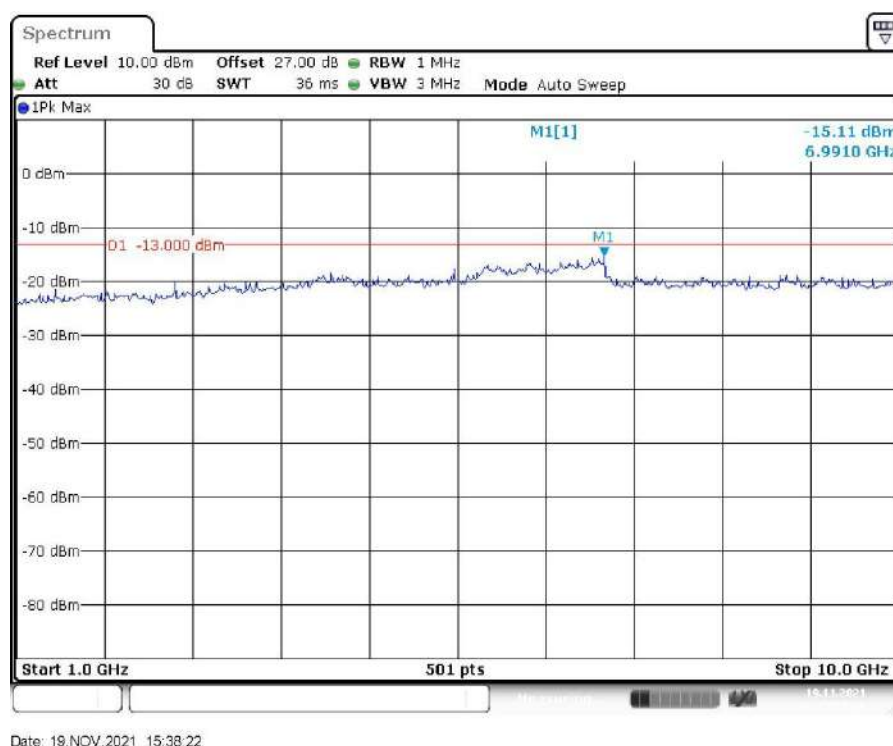
Fundamental

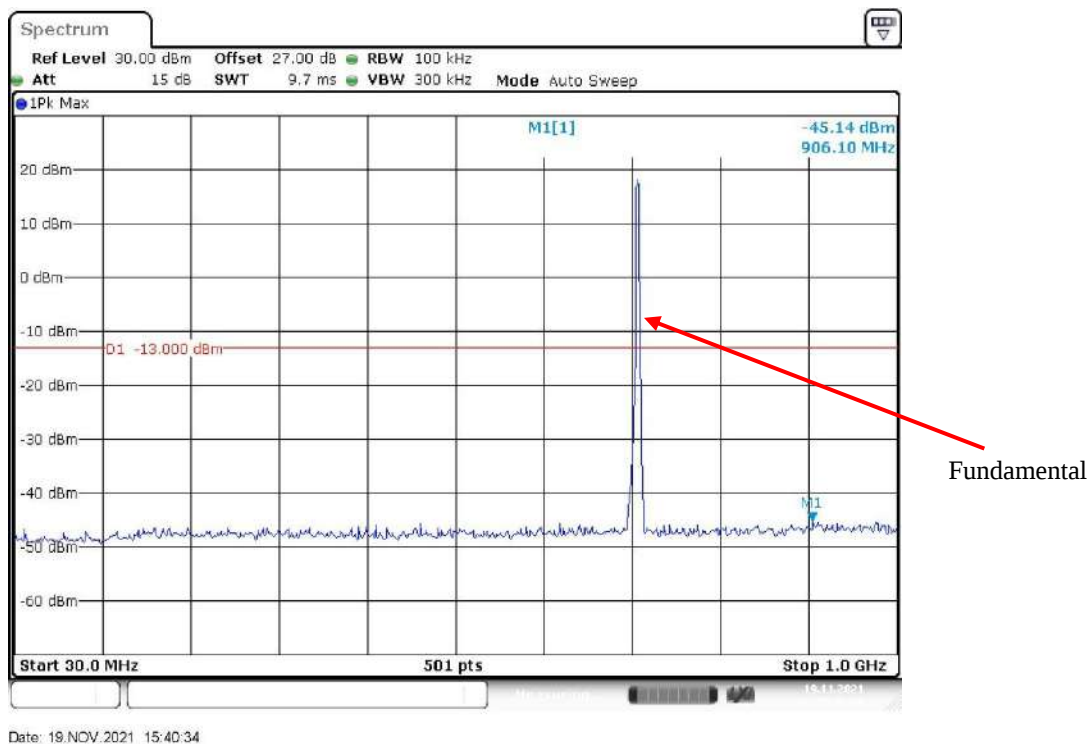
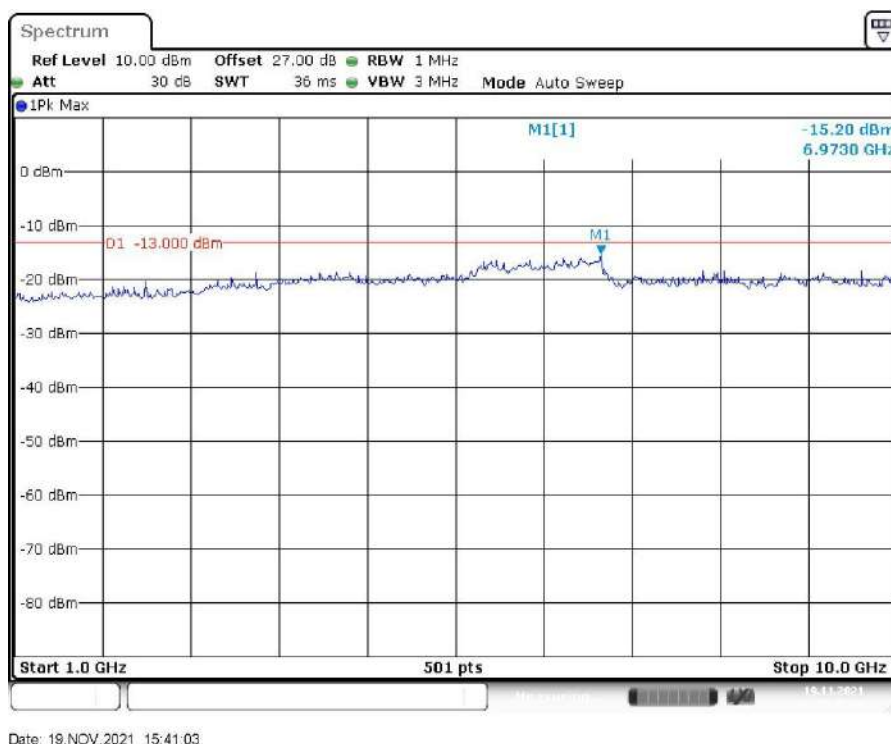
1 GHz – 10 GHz (QPSK, 10.0 MHz, Middle Channel)

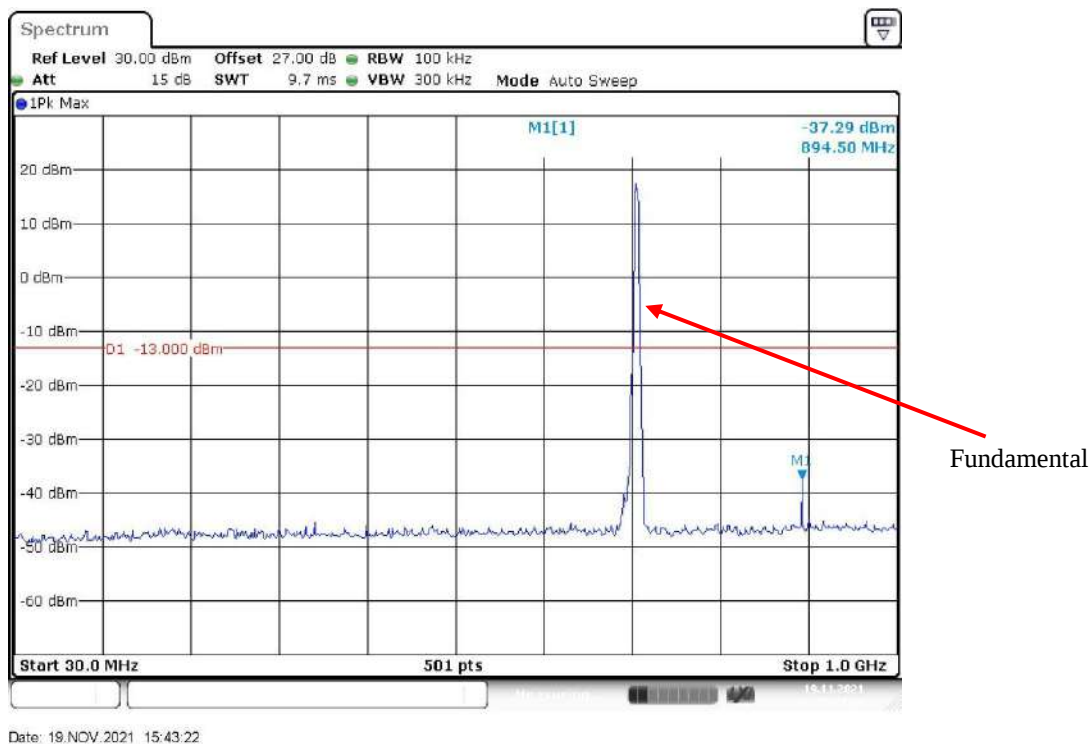
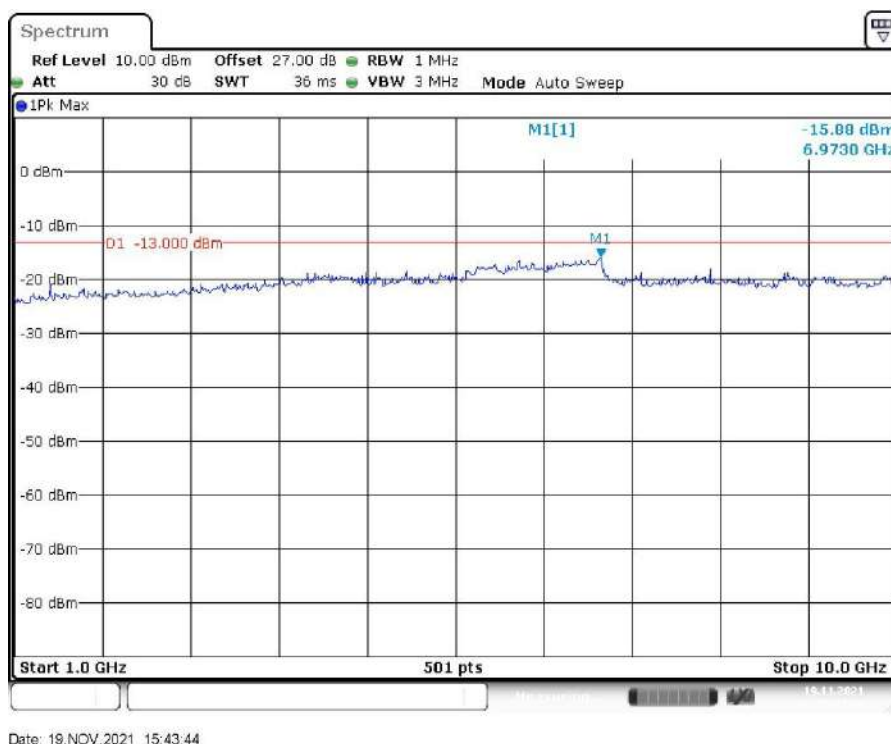
30 MHz – 1 GHz (QPSK, 1.4 MHz, High Channel)

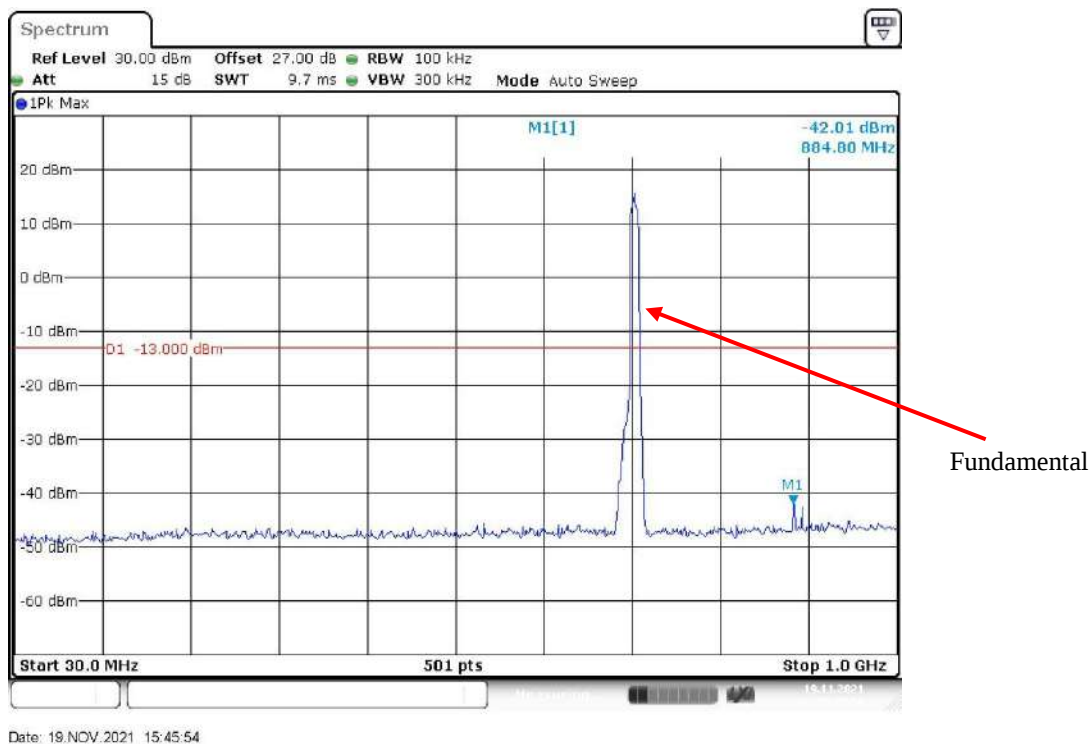
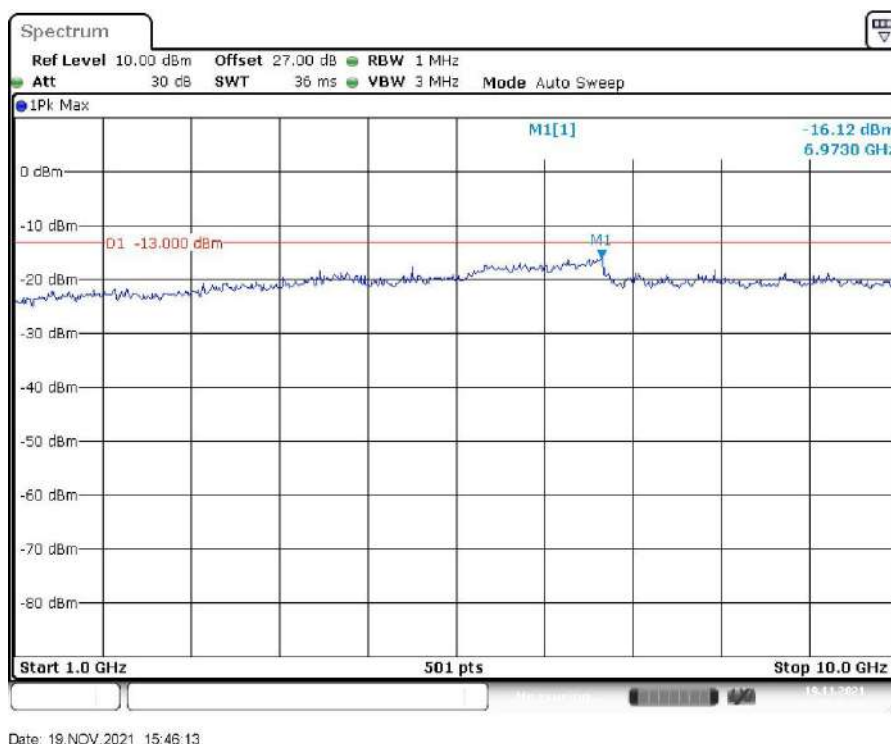


1 GHz – 10 GHz (QPSK, 1.4 MHz, High Channel)



30 MHz – 1 GHz (QPSK, 3.0 MHz, High Channel)**1 GHz – 10 GHz (QPSK, 3.0 MHz, High Channel)**

30 MHz – 1 GHz (QPSK, 5.0 MHz, High Channel)**1 GHz – 10 GHz (QPSK, 5.0MHz, High Channel)**

30 MHz – 1 GHz (QPSK, 10.0 MHz, High Channel)**1 GHz – 10 GHz (QPSK, 10.0 MHz, High Channel)**

FCC§2.1053, §22.917 & §24.238 & §27.53 – Spurious Radiated Emissions**Applicable Standard**

FCC § 2.1053, §22.917, § 24.238 and § 27.53

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

ANSI C63.26-2015 the defined surrogate measurement reproduces the EUT's emission in a two-stage measurement using a well-characterized transmission path. The EUT's transmissions are replicated using alternate antenna settings and the transmit power is calculated using the known characteristics of each transmit's transmit path.

This alternative method uses the same well-characterized transmit path to establish a reference radiated power chosen by the tester to characterize the path loss from the transmit antenna to the measurement receiver. This allows calculation of correction factors that can be used to directly determine EUT emissions without having to perform two-stage measurements for each emissions.

EUT emissions correction = S.G.

S.G = Result + Cable loss - Antenna gain

Spurious emissions in dB = 10 lg (TX pwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts)

Test Mode: Transmitting*(Worst case is Resource Block & RB offset : RB1#0)**Pre-scan with all the bandwidth, worse case as below:***LTE Band 2****30MHz-20GHz****Horizontal**

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh (cm)	Degree (°)
QPSK 10MHz Bandwidth, Low channel								
75.5900	-64.63	0.84	-6.49	-71.96	-13.00	-58.96	150	25
90.1400	-66.19	0.93	-4.58	-71.70	-13.00	-58.70	150	359
172.5900	-60.68	1.3	-3.07	-65.05	-13.00	-52.05	150	348
187.1400	-62.63	1.35	-2.15	-66.13	-13.00	-53.13	150	2
199.7500	-62.61	1.4	-3.09	-67.10	-13.00	-54.10	150	350
389.8700	-59.19	1.95	0.18	-60.96	-13.00	-47.96	150	39
3710.000	-53.24	6.35	10.85	-48.74	-13.00	-35.74	142	12
5565.000	-66.91	7.45	11.33	-63.03	-13.00	-50.03	156	57
QPSK 10MHz Bandwidth, Middle channel								
57.1600	-59.36	0.73	-9.37	-69.46	-13.00	-56.46	150	89
74.6200	-63.32	0.84	-6.62	-70.78	-13.00	-57.78	150	192
86.2600	-66.74	0.91	-5.06	-72.71	-13.00	-59.71	150	359
170.6500	-62.92	1.29	-3.19	-67.40	-13.00	-54.40	150	175
188.1100	-62.39	1.35	-2.09	-65.83	-13.00	-52.83	150	359
389.8700	-57.41	1.95	0.18	-59.18	-13.00	-46.18	150	34
3760.000	-55.6	6.33	10.6	-51.33	-13.00	-38.33	142	17
5640.000	-68.57	7.49	11.4	-64.66	-13.00	-51.66	150	201
QPSK 10MHz Bandwidth, High channel								
75.5900	-60.5	0.84	-6.49	-67.83	-13.00	-54.83	150	18
129.9100	-60.81	1.13	-7.77	-69.71	-13.00	-56.71	150	34
176.4700	-61.88	1.31	-2.82	-66.01	-13.00	-53.01	150	345
188.1100	-62.84	1.35	-2.09	-66.28	-13.00	-53.28	150	347
203.6300	-63.95	1.41	-2.21	-67.57	-13.00	-54.57	150	340
388.9000	-57.76	1.95	0.17	-59.54	-13.00	-46.54	150	32
3810.000	-54.69	6.33	10.38	-50.64	-13.00	-37.64	117	32
5715.000	-65.57	7.45	11.33	-61.69	-13.00	-48.69	139	194

Result = S.G. - Cable loss + Antenna gain

Margin = Result – Limit

Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh (cm)	Degree (°)
QPSK 10MHz Bandwidth, Low channel								
62.0100	-56.34	0.76	-8.57	-65.67	-13.00	-52.67	150	270
74.6200	-58.55	0.84	-6.62	-66.01	-13.00	-53.01	150	316
88.2000	-56.57	0.92	-4.8	-62.29	-13.00	-49.29	150	125
95.9600	-56.38	0.96	-5.56	-62.90	-13.00	-49.90	150	77
116.3300	-55.11	1.06	-8.19	-64.36	-13.00	-51.36	150	164
390.8400	-61.18	1.95	0.18	-62.95	-13.00	-49.95	150	203
3710.000	-51.39	6.35	10.85	-46.89	-13.00	-33.89	123	236
5565.000	-61.49	7.45	11.33	-57.61	-13.00	-44.61	157	104
QPSK 10MHz Bandwidth, Middle channel								
73.6500	-53.16	0.83	-6.75	-60.74	-13.00	-47.74	150	228
90.1400	-57.64	0.93	-4.58	-63.15	-13.00	-50.15	150	128
97.9000	-54.73	0.97	-5.89	-61.59	-13.00	-48.59	150	18
116.3300	-54.73	1.06	-8.19	-63.98	-13.00	-50.98	150	167
170.6500	-63.4	1.29	-3.19	-67.88	-13.00	-54.88	150	81
387.9300	-61.81	1.95	0.15	-63.61	-13.00	-50.61	150	16
3760.000	-54.03	6.33	10.6	-49.76	-13.00	-36.76	128	53
5640.000	-68.55	7.49	11.4	-64.64	-13.00	-51.64	150	277
QPSK 10MHz Bandwidth, High channel								
53.2800	-48.85	0.71	-10.02	-59.58	-13.00	-46.58	150	173
75.5900	-53.74	0.84	-6.49	-61.07	-13.00	-48.07	150	18
96.9300	-55.31	0.96	-5.72	-61.99	-13.00	-48.99	150	356
116.3300	-54.91	1.06	-8.19	-64.16	-13.00	-51.16	150	181
193.9300	-64.1	1.38	-2.42	-67.90	-13.00	-54.90	150	144
389.8700	-61.51	1.95	0.18	-63.28	-13.00	-50.28	150	45
3810.000	-54.22	6.33	10.38	-50.17	-13.00	-37.17	144	120
5715.000	-60.89	7.45	11.33	-57.01	-13.00	-44.01	132	103

Result = S.G - Cable loss + Antenna gain

Margin = Result – Limit

Spurious emissions more than 20 dB below the limit were not reported.

LTE Band 4**30MHz-20GHz****Horizontal**

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh (cm)	Degree (°)
QPSK 10MHz Bandwidth, Low channel								
75.5900	-63.49	0.84	-6.49	-70.82	-13.00	-57.82	150	216
103.7200	-62.97	1	-6.86	-70.83	-13.00	-57.83	150	180
130.8800	-60.6	1.13	-7.65	-69.38	-13.00	-56.38	150	4
175.5000	-60.61	1.31	-2.88	-64.80	-13.00	-51.80	150	359
246.3100	-65.55	1.55	-0.06	-67.16	-13.00	-54.16	150	281
390.8400	-57.82	1.95	0.18	-59.59	-13.00	-46.59	150	32
3430.000	-55.29	6.08	10.39	-50.98	-13.00	-37.98	153	113
5145.000	-59.5	7.24	10.44	-56.30	-13.00	-43.30	129	359
QPSK 10MHz Bandwidth, Middle channel								
57.1600	-55.78	0.73	-9.37	-65.88	-13.00	-52.88	150	113
73.6500	-63.27	0.83	-6.75	-70.85	-13.00	-57.85	150	221
130.8800	-60.58	1.13	-7.65	-69.36	-13.00	-56.36	150	89
174.5300	-60.99	1.31	-2.94	-65.24	-13.00	-52.24	150	122
189.0800	-62.85	1.36	-2.03	-66.24	-13.00	-53.24	150	4
388.9000	-57.68	1.95	0.17	-59.46	-13.00	-46.46	150	29
3465.000	-50.76	6.12	10.49	-46.39	-13.00	-33.39	132	128
5197.500	-62.46	7.18	10.59	-59.05	-13.00	-46.05	114	19
QPSK 10MHz Bandwidth, High channel								
74.6200	-62.09	0.84	-6.62	-69.55	-13.00	-56.55	150	219
106.6300	-61.18	1.01	-7.35	-69.54	-13.00	-56.54	150	92
176.4700	-61.93	1.31	-2.82	-66.06	-13.00	-53.06	150	125
189.0800	-62.59	1.36	-2.03	-65.98	-13.00	-52.98	150	188
203.6300	-64.27	1.41	-2.21	-67.89	-13.00	-54.89	150	332
385.9900	-57.35	1.94	0.13	-59.16	-13.00	-46.16	150	38
3500.000	-47.77	6.16	10.6	-43.33	-13.00	-30.33	112	122
5250.000	-68.15	7.25	10.8	-64.60	-13.00	-51.60	144	164

Result = S.G - Cable loss + Antenna gain

Margin = Result – Limit

Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh (cm)	Degree (°)
QPSK 10MHz Bandwidth, Low channel								
50.3700	-50.01	0.69	-10.5	-61.20	-13.00	-48.20	150	218
86.2600	-56.84	0.91	-5.06	-62.81	-13.00	-49.81	150	102
116.3300	-54.15	1.06	-8.19	-63.40	-13.00	-50.40	150	102
147.3700	-59.78	1.2	-5.55	-66.53	-13.00	-53.53	150	264
201.6900	-62.86	1.41	-2.69	-66.96	-13.00	-53.96	150	122
391.8100	-61.19	1.96	0.18	-62.97	-13.00	-49.97	150	178
3430.000	-52.14	6.08	10.39	-47.83	-13.00	-34.83	119	305
5145.000	-56.33	7.24	10.44	-53.13	-13.00	-40.13	165	246
QPSK 10MHz Bandwidth, Middle channel								
58.1300	-57.35	0.74	-9.21	-67.30	-13.00	-54.30	150	5
90.1400	-57.07	0.93	-4.58	-62.58	-13.00	-49.58	150	2
95.9600	-54.64	0.96	-5.56	-61.16	-13.00	-48.16	150	7
195.8700	-64.04	1.38	-2.65	-68.07	-13.00	-55.07	150	24
306.4500	-60.16	1.74	-0.21	-62.11	-13.00	-49.11	150	188
391.8100	-60.81	1.96	0.18	-62.59	-13.00	-49.59	150	1
3465.000	-48.1	6.12	10.49	-43.73	-13.00	-30.73	122	189
5197.500	-60.96	7.18	10.59	-57.55	-13.00	-44.55	148	167
QPSK 10MHz Bandwidth, High channel								
57.1600	-57.84	0.73	-9.37	-67.94	-13.00	-54.94	150	118
86.2600	-55.7	0.91	-5.06	-61.67	-13.00	-48.67	150	98
94.9900	-55.66	0.95	-5.4	-62.01	-13.00	-49.01	150	56
116.3300	-54.02	1.06	-8.19	-63.27	-13.00	-50.27	150	96
186.1700	-64.21	1.35	-2.21	-67.77	-13.00	-54.77	150	273
384.0500	-59.98	1.94	0.1	-61.82	-13.00	-48.82	150	1
3500.000	-45.13	6.16	10.6	-40.69	-13.00	-27.69	135	334
5250.000	-68.71	7.25	10.8	-65.16	-13.00	-52.16	150	206

Result = S.G - Cable loss + Antenna gain

Margin = Result – Limit

Spurious emissions more than 20 dB below the limit were not reported.

LTE Band 5

30MHz-10GHz

Horizontal

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh (cm)	Degree (°)
QPSK 10MHz Bandwidth, Low channel								
71.7100	-52.08	0.82	-7.01	-59.91	-13.00	-46.91	150	209
103.7200	-61.82	1	-6.86	-69.68	-13.00	-56.68	150	118
126.0300	-60.15	1.11	-8	-69.26	-13.00	-56.26	150	27
171.6200	-61.06	1.3	-3.13	-65.49	-13.00	-52.49	150	345
190.0500	-63.92	1.36	-1.98	-67.26	-13.00	-54.26	150	350
391.8100	-57.83	1.96	0.18	-59.61	-13.00	-46.61	150	21
1658.000	-60.87	4	9.52	-55.35	-13.00	-42.35	115	34
2487.000	-69.97	4.98	9.11	-65.84	-13.00	-52.84	142	120
QPSK 10MHz Bandwidth, Middle channel								
56.1900	-57.31	0.73	-9.53	-67.57	-13.00	-54.57	150	107
74.6200	-64.69	0.84	-6.62	-72.15	-13.00	-59.15	150	249
130.8800	-60.55	1.13	-7.65	-69.33	-13.00	-56.33	150	220
176.4700	-60.51	1.31	-2.82	-64.64	-13.00	-51.64	150	350
390.8400	-57.97	1.95	0.18	-59.74	-13.00	-46.74	150	232
621.7000	-57.98	2.49	0.38	-60.09	-13.00	-47.09	150	342
1673.000	-58.78	4.02	9.55	-53.25	-13.00	-40.25	138	163
2509.500	-70.63	5.01	9.11	-66.53	-13.00	-53.53	151	220
QPSK 10MHz Bandwidth, High channel								
74.6200	-63.59	0.84	-6.62	-71.05	-13.00	-58.05	150	228
97.9000	-64.74	0.97	-5.89	-71.60	-13.00	-58.60	150	182
138.6400	-61.88	1.16	-6.66	-69.70	-13.00	-56.70	150	115
176.4700	-59.45	1.31	-2.82	-63.58	-13.00	-50.58	150	334
187.1400	-61.9	1.35	-2.15	-65.40	-13.00	-52.40	150	336
387.9300	-57.36	1.95	0.15	-59.16	-13.00	-46.16	150	37
1688.000	-55.65	4.04	9.58	-50.11	-13.00	-37.11	126	334
2532.000	-69.26	5.04	9.13	-65.17	-13.00	-52.17	137	118

Result = S.G - Cable loss + Antenna gain

Margin = Result – Limit

Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh (cm)	Degree (°)
QPSK 10MHz Bandwidth, Low channel								
43.5800	-48	0.64	-16.19	-64.83	-13.00	-51.83	150	287
59.1000	-54.07	0.74	-9.05	-63.86	-13.00	-50.86	150	292
75.5900	-54.27	0.84	-6.49	-61.60	-13.00	-48.60	150	175
97.9000	-54.46	0.97	-5.89	-61.32	-13.00	-48.32	150	239
116.3300	-54.7	1.06	-8.19	-63.95	-13.00	-50.95	150	112
390.8400	-61.21	1.95	0.18	-62.98	-13.00	-49.98	150	25
1658.000	-64.6	4	9.52	-59.08	-13.00	-46.08	118	26
2487.000	-70.78	4.98	9.11	-66.65	-13.00	-53.65	153	38
QPSK 10MHz Bandwidth, Middle channel								
70.7400	-56.91	0.81	-7.14	-64.86	-13.00	-51.86	150	256
90.1400	-55.38	0.93	-4.58	-60.89	-13.00	-47.89	150	138
97.9000	-56.57	0.97	-5.89	-63.43	-13.00	-50.43	150	281
116.3300	-54.67	1.06	-8.19	-63.92	-13.00	-50.92	150	63
196.8400	-64.21	1.39	-2.76	-68.36	-13.00	-55.36	150	267
389.8700	-61.98	1.95	0.18	-63.75	-13.00	-50.75	150	14
1673.000	-58.83	4.02	9.55	-53.30	-13.00	-40.30	143	22
2509.500	-70.36	5.01	9.11	-66.26	-13.00	-53.26	162	56
QPSK 10MHz Bandwidth, High channel								
46.4900	-48.66	0.66	-13.64	-62.96	-13.00	-49.96	150	226
87.2300	-56.24	0.91	-4.93	-62.08	-13.00	-49.08	150	193
95.9600	-55.65	0.96	-5.56	-62.17	-13.00	-49.17	150	65
117.3000	-55.43	1.07	-8.24	-64.74	-13.00	-51.74	150	205
226.9100	-63.38	1.5	-0.43	-65.31	-13.00	-52.31	150	175
389.8700	-61.98	1.95	0.18	-63.75	-13.00	-50.75	150	17
1688.000	-59.73	4.04	9.58	-54.19	-13.00	-41.19	120	191
2532.000	-70.76	5.04	9.13	-66.67	-13.00	-53.67	114	39

Result = S.G - Cable loss + Antenna gain

Margin = Result – Limit

Spurious emissions more than 20 dB below the limit were not reported.

LTE Band 12**30MHz-10GHz****Horizontal**

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh (cm)	Degree (°)
QPSK 10MHz Bandwidth, Low channel								
39.7000	-41.83	0.61	-18.94	-61.38	-13.00	-48.38	150	221
86.2600	-65.41	0.91	-5.09	-71.41	-13.00	-58.41	150	111
107.6000	-62.83	1.02	-7.43	-71.28	-13.00	-58.28	150	118
183.2600	-70.69	1.34	-2.09	-74.12	-13.00	-61.12	150	154
383.0800	-69.56	1.94	0.49	-71.01	-13.00	-58.01	150	228
807.9400	-65.37	2.83	0.57	-67.63	-13.00	-54.63	150	264
1408.000	-66.93	3.68	8.16	-62.45	-13.00	-49.45	152	88
2112.000	-64.48	4.56	8.51	-60.53	-13.00	-47.53	157	162
QPSK 10MHz Bandwidth, Middle channel								
39.7000	-41.17	0.61	-18.94	-60.72	-13.00	-47.72	100	52
53.2800	-61.76	0.71	-9.46	-71.93	-13.00	-58.93	100	44
86.2600	-64.73	0.91	-5.09	-70.73	-13.00	-57.73	100	163
109.5400	-63.71	1.03	-7.74	-72.48	-13.00	-59.48	100	125
185.2000	-69.31	1.34	-1.97	-72.62	-13.00	-59.62	100	85
383.0800	-70.19	1.94	0.49	-71.64	-13.00	-58.64	100	63
1415.000	-67.47	3.69	8.22	-62.94	-13.00	-49.94	154	11
2122.500	-64.64	4.57	8.6	-60.61	-13.00	-47.61	152	23
QPSK 10MHz Bandwidth, High channel								
39.7000	-40.24	0.61	-18.94	-59.79	-13.00	-46.79	100	41
86.2600	-64.1	0.91	-5.09	-70.10	-13.00	-57.10	100	52
109.5400	-63.28	1.03	-7.74	-72.05	-13.00	-59.05	100	124
183.2600	-69.62	1.34	-2.09	-73.05	-13.00	-60.05	100	122
383.0800	-70.96	1.94	0.49	-72.41	-13.00	-59.41	100	52
392.7800	-71.3	1.96	0.56	-72.70	-13.00	-59.70	100	63
1422.000	-67.65	3.7	8.28	-63.07	-13.00	-50.07	159	41
2133.000	-63.61	4.59	8.7	-59.50	-13.00	-46.50	159	11

Result = S.G - Cable loss + Antenna gain

Margin = Result – Limit

Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh (cm)	Degree (°)
QPSK 10MHz Bandwidth, Low channel								
39.7000	-41.16	0.61	-18.94	-60.71	-13.00	-47.71	100	123
80.4400	-56.61	0.87	-5.75	-63.23	-13.00	-50.23	100	22
95.9600	-62.77	0.96	-5.6	-69.33	-13.00	-56.33	100	247
107.6000	-62.79	1.02	-7.43	-71.24	-13.00	-58.24	100	111
185.2000	-66.3	1.34	-1.97	-69.61	-13.00	-56.61	100	17
749.7400	-64.01	2.72	0.96	-65.77	-13.00	-52.77	100	62
1408.000	-67.66	3.68	8.16	-63.18	-13.00	-50.18	150	22
2112.000	-65.35	4.56	8.51	-61.40	-13.00	-48.40	150	41
QPSK 10MHz Bandwidth, Middle channel								
39.7000	-42.43	0.61	-18.94	-61.98	-13.00	-48.98	100	141
53.2800	-58.98	0.71	-9.46	-69.15	-13.00	-56.15	100	111
80.4400	-57.11	0.87	-5.75	-63.73	-13.00	-50.73	100	62
105.6600	-63.71	1.01	-7.13	-71.85	-13.00	-58.85	100	241
185.2000	-66.03	1.34	-1.97	-69.34	-13.00	-56.34	100	114
730.3400	-64.93	2.7	0.92	-66.71	-13.00	-53.71	100	22
1415.000	-67.43	3.69	8.22	-62.90	-13.00	-49.90	145	41
2122.500	-64.21	4.57	8.6	-60.18	-13.00	-47.18	162	96
QPSK 10MHz Bandwidth, High channel								
39.7000	-41.58	0.61	-18.94	-61.13	-13.00	-48.13	100	152
80.4400	-55.94	0.87	-5.75	-62.56	-13.00	-49.56	100	111
107.6000	-63.31	1.02	-7.43	-71.76	-13.00	-58.76	100	96
183.2600	-67.09	1.34	-2.09	-70.52	-13.00	-57.52	100	23
383.0800	-71.61	1.94	0.49	-73.06	-13.00	-60.06	100	75
769.1400	-62.44	2.76	0.8	-64.40	-13.00	-51.40	100	236
1422.000	-67.65	3.7	8.28	-63.07	-13.00	-50.07	158	52
2133.000	-65.79	4.59	8.7	-61.68	-13.00	-48.68	158	164

Result = S.G - Cable loss + Antenna gain

Margin = Result – Limit

Spurious emissions more than 20 dB below the limit were not reported.