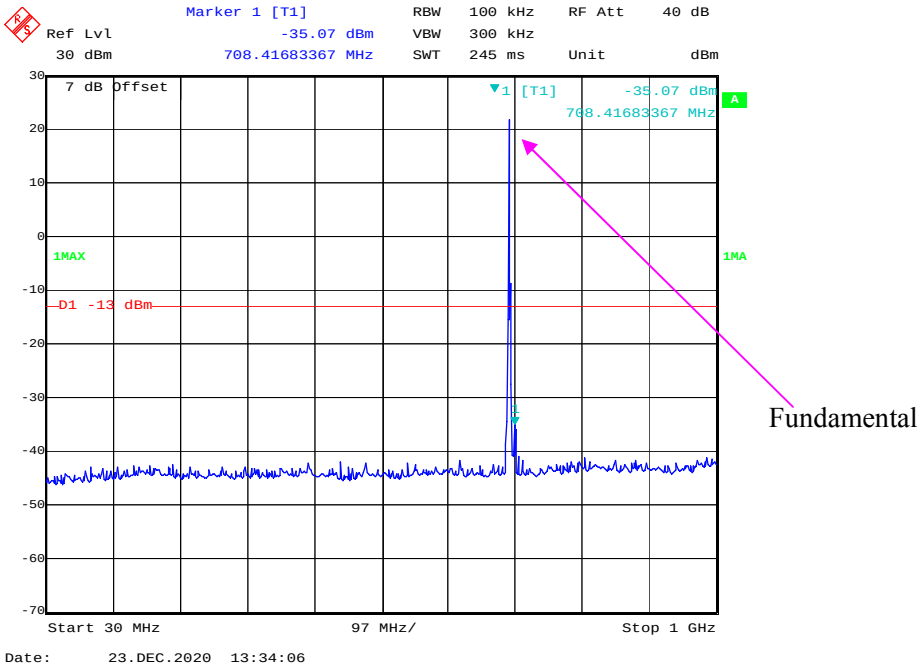
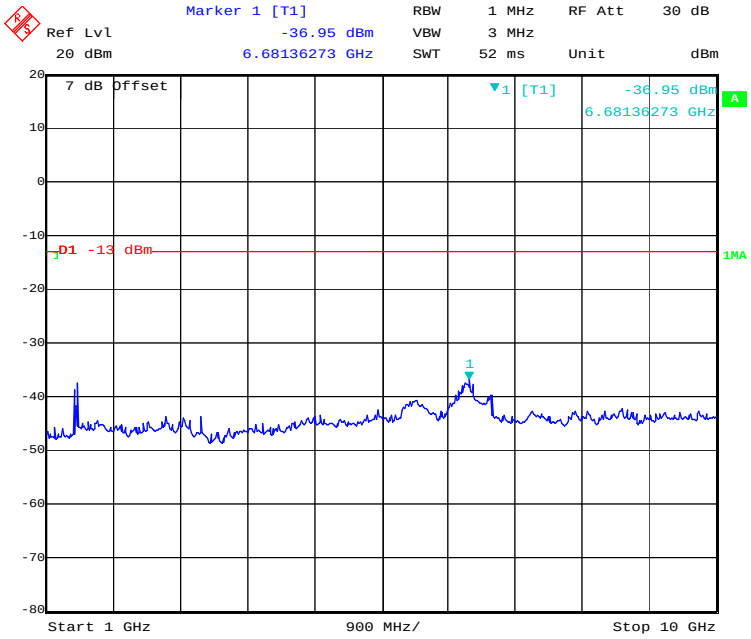
30 MHz - 1 GHz (3 MHz, QPSK, Low Channel)



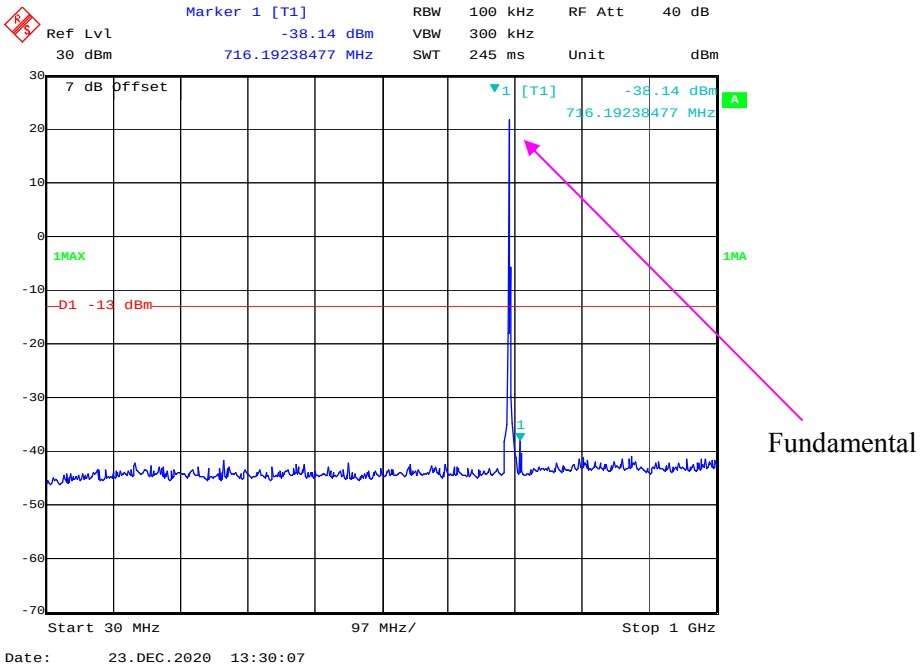
Date: 23.DEC.2020 13:34:06

1 GHz – 10 GHz (3 MHz, QPSK, Low Channel)



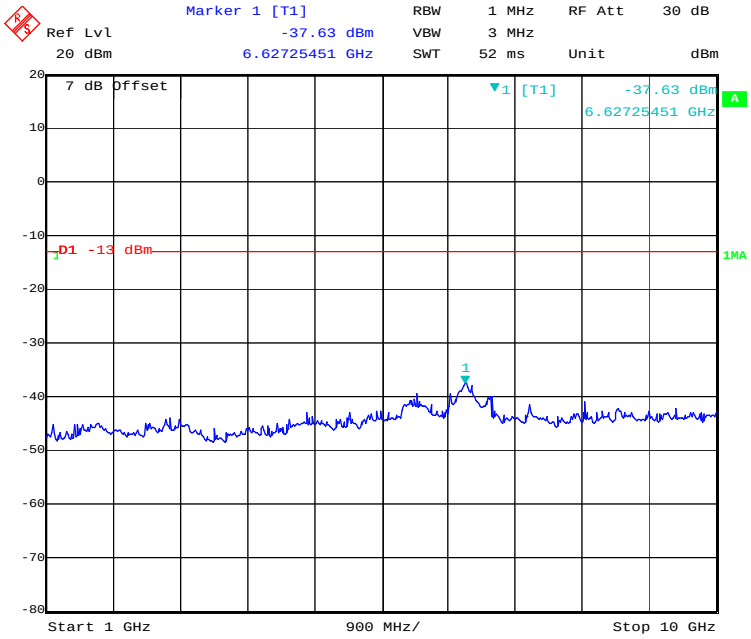
Date: 23.DEC.2020 13:34:17

30 MHz - 1 GHz (3 MHz, 16-QAM, Low Channel)



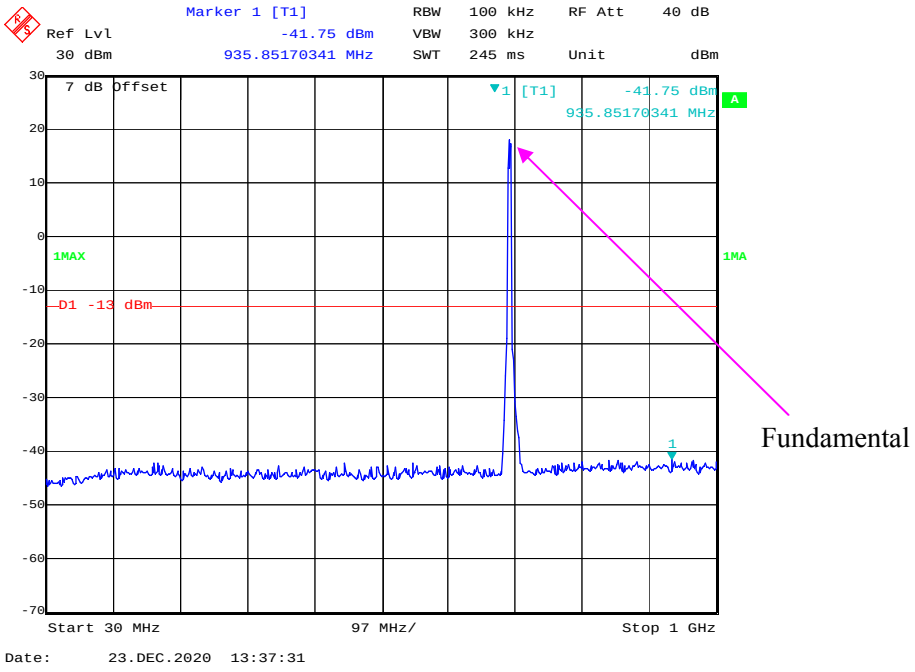
Date: 23.DEC.2020 13:30:07

1 GHz – 10 GHz (3 MHz, 16-QAM, Low Channel)



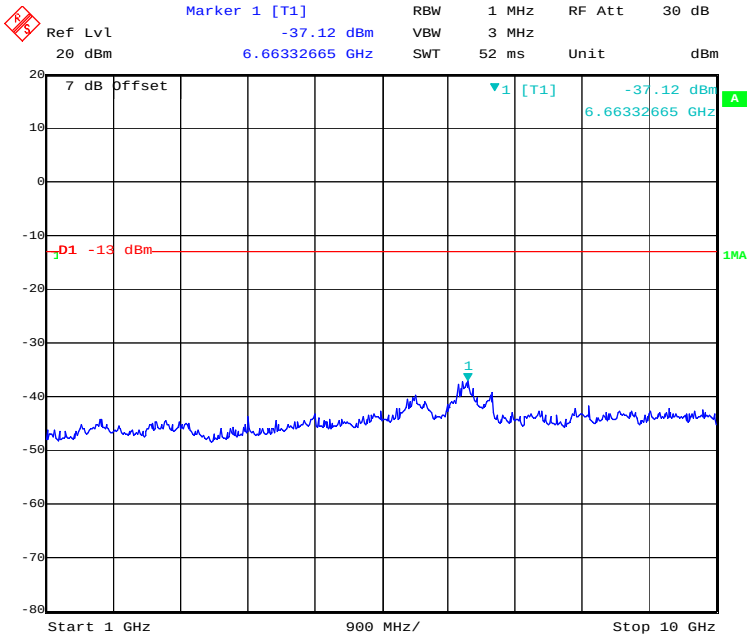
Date: 23.DEC.2020 13:30:18

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



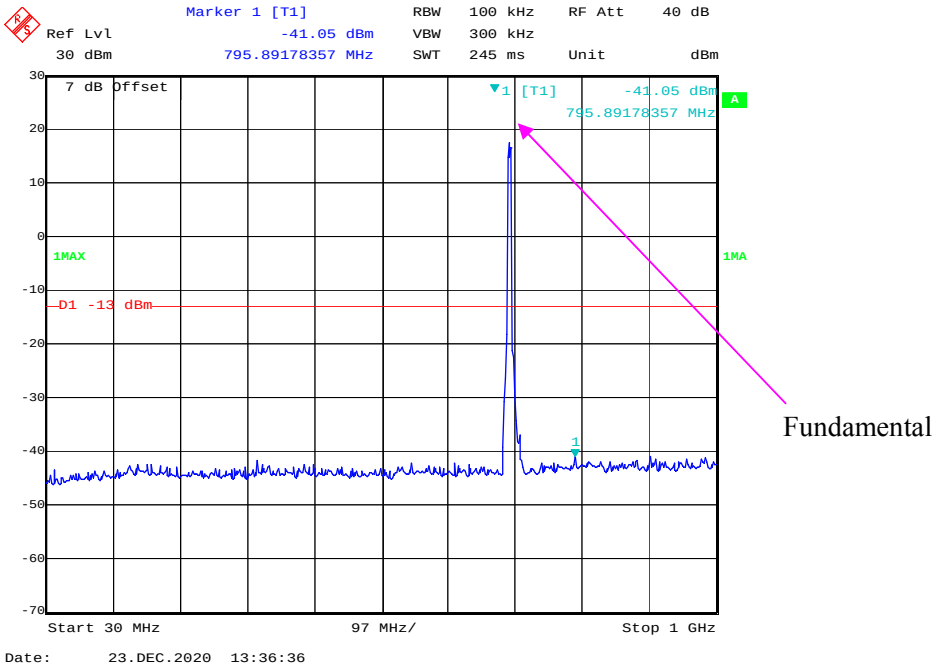
Date: 23.DEC.2020 13:37:31

1 GHz – 10 GHz (5 MHz, QPSK, Low Channel)



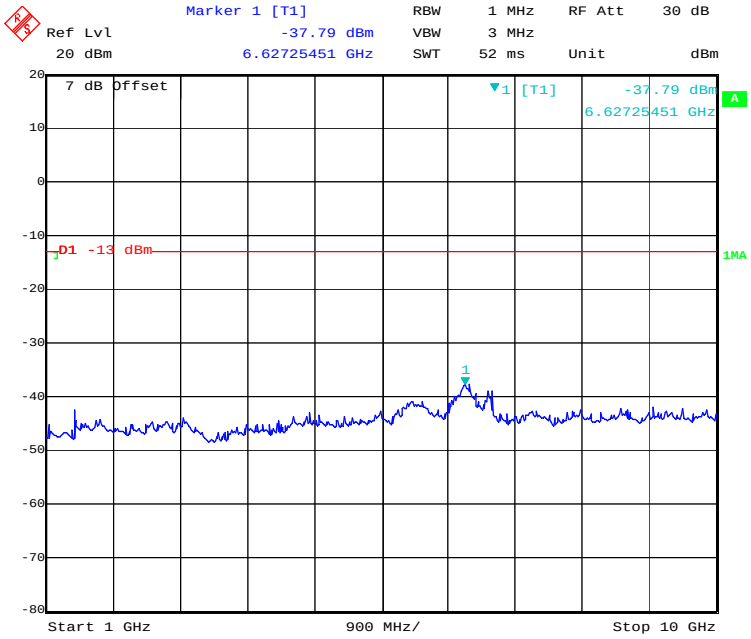
Date: 23.DEC.2020 13:37:42

30 MHz - 1 GHz (5 MHz, 16-QAM, Low Channel)



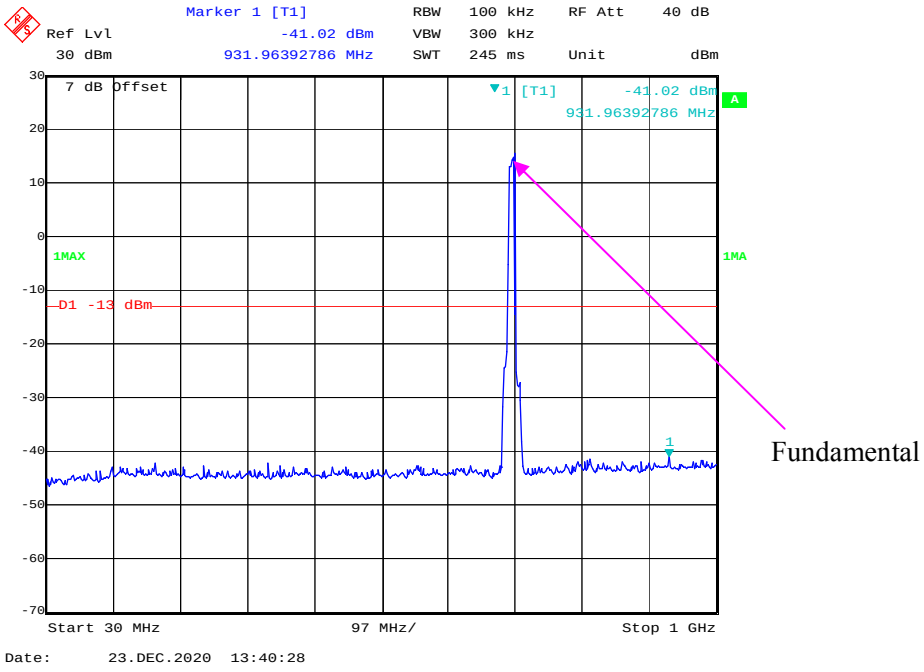
Date: 23.DEC.2020 13:36:36

1 GHz – 10 GHz (5 MHz, 16-QAM, Low Channel)



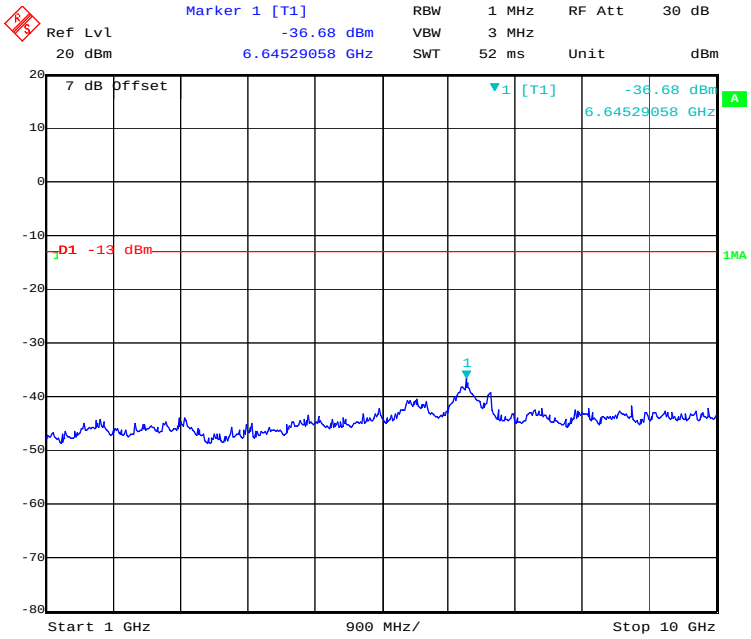
Date: 23.DEC.2020 13:36:47

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



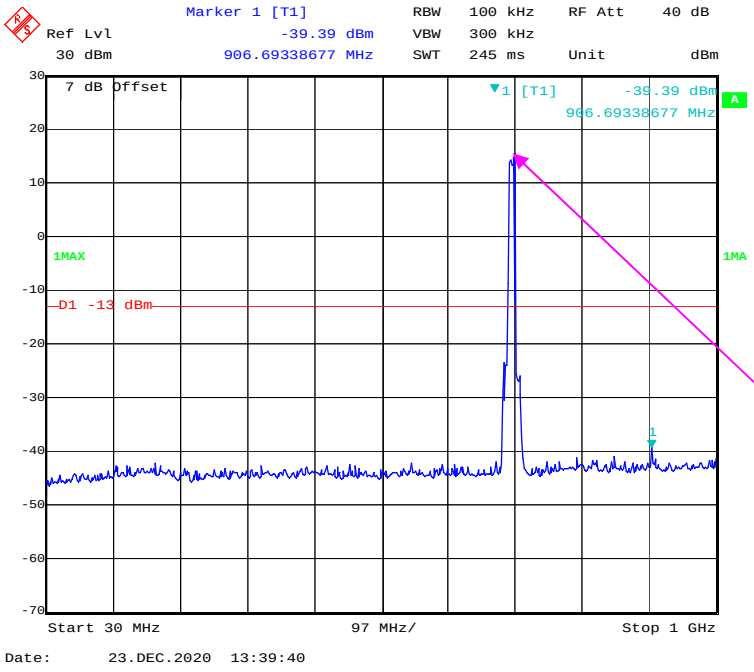
Date: 23.DEC.2020 13:40:28

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



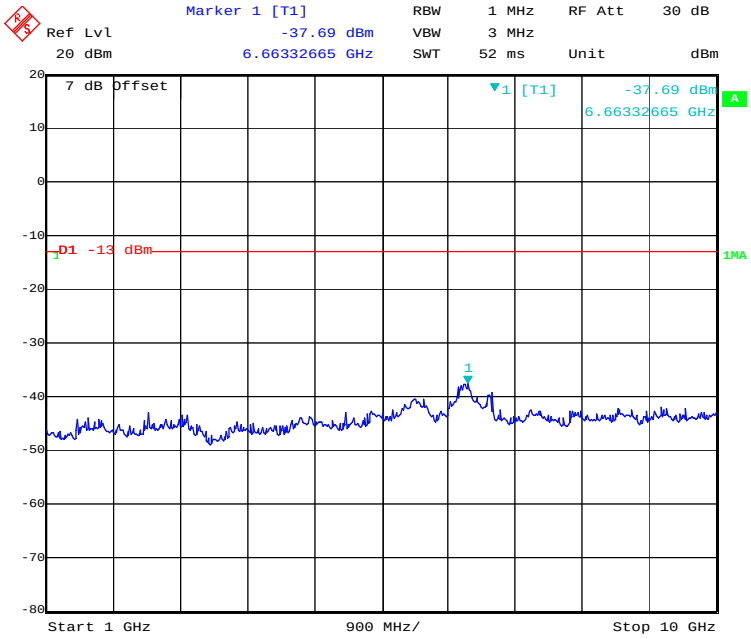
Date: 23.DEC.2020 13:40:40

30 MHz - 1 GHz (10 MHz, 16-QAM, Low Channel)



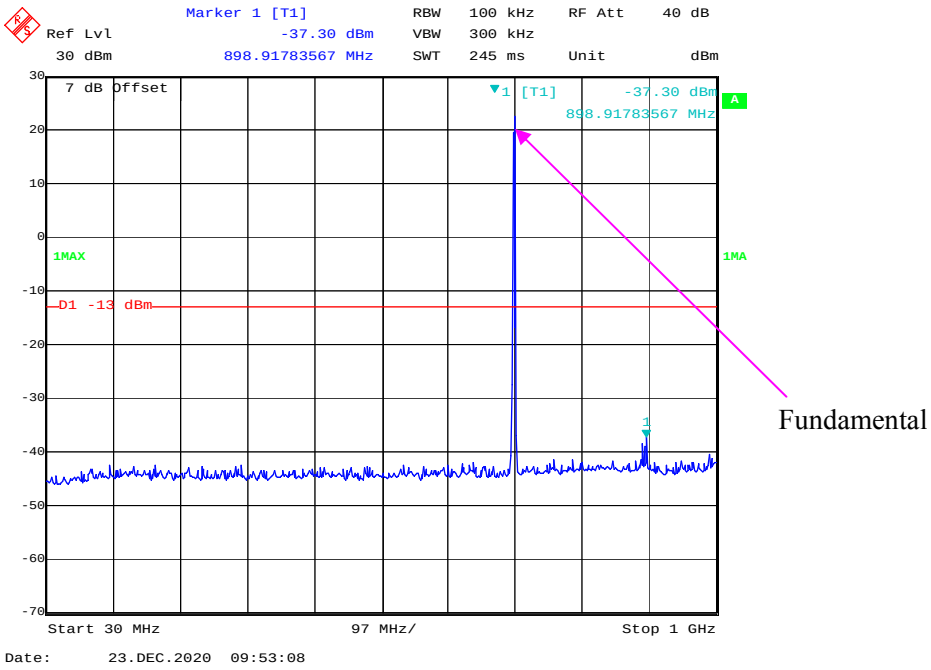
Date: 23.DEC.2020 13:39:40

1 GHz – 10 GHz (10 MHz, 16-QAM, Low Channel)

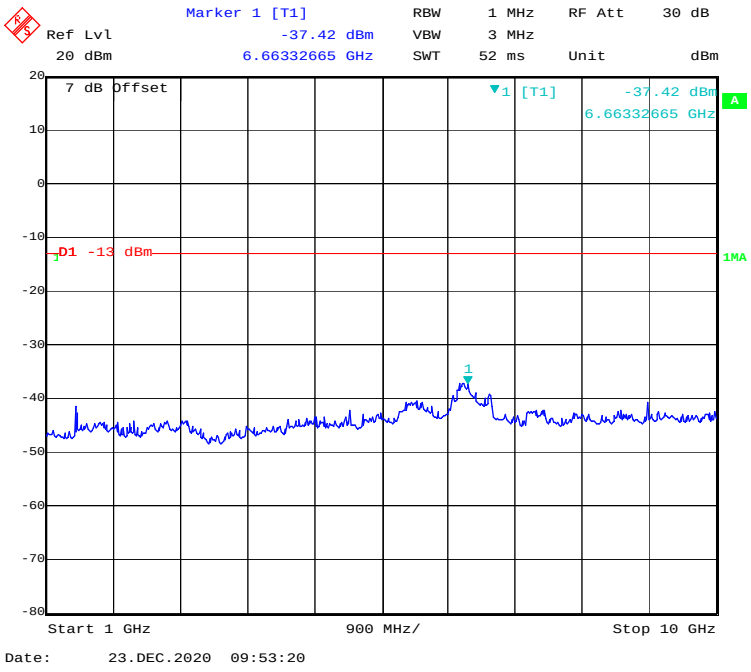


Date: 23.DEC.2020 13:39:51

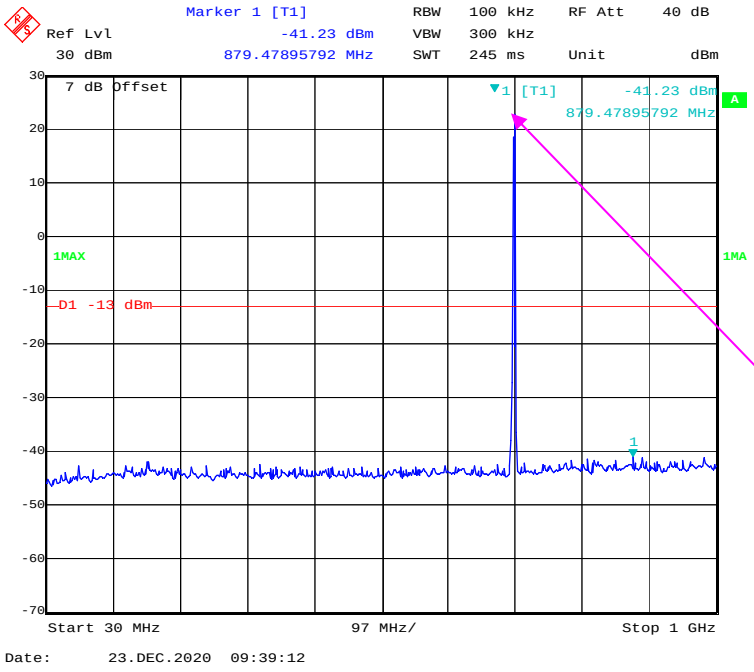
30 MHz - 1 GHz (1.4 MHz, QPSK, Middle Channel)



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

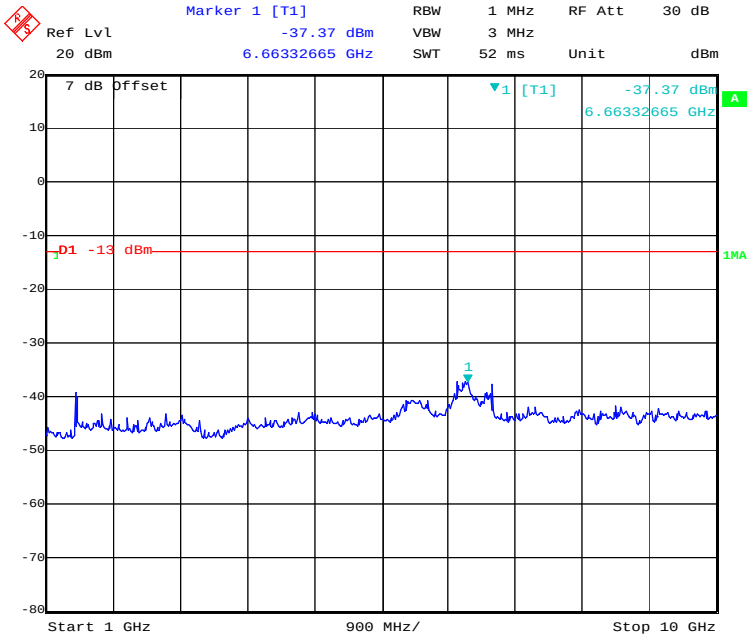


30 MHz - 1 GHz (1.4 MHz, 16-QAM, Middle Channel)



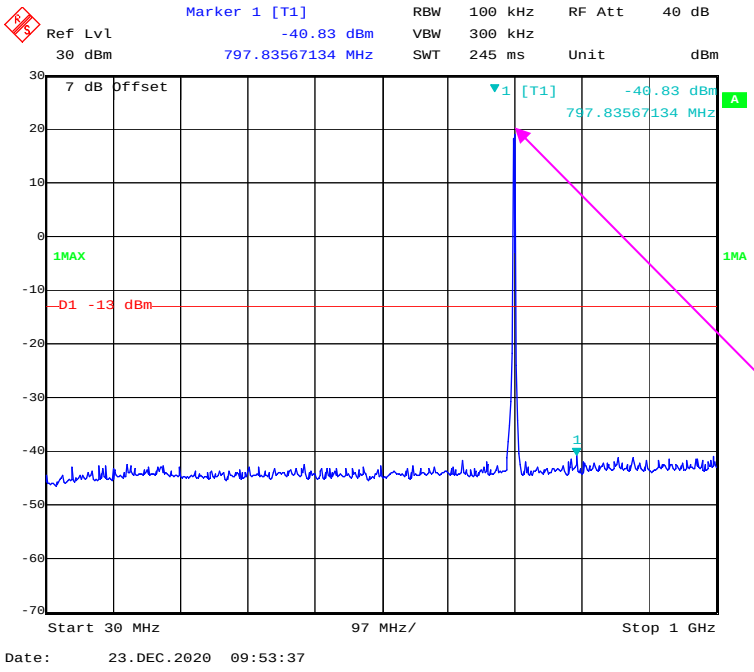
Date: 23.DEC.2020 09:39:12

1 GHz – 10 GHz (1.4 MHz, 16-QAM, Middle Channel)



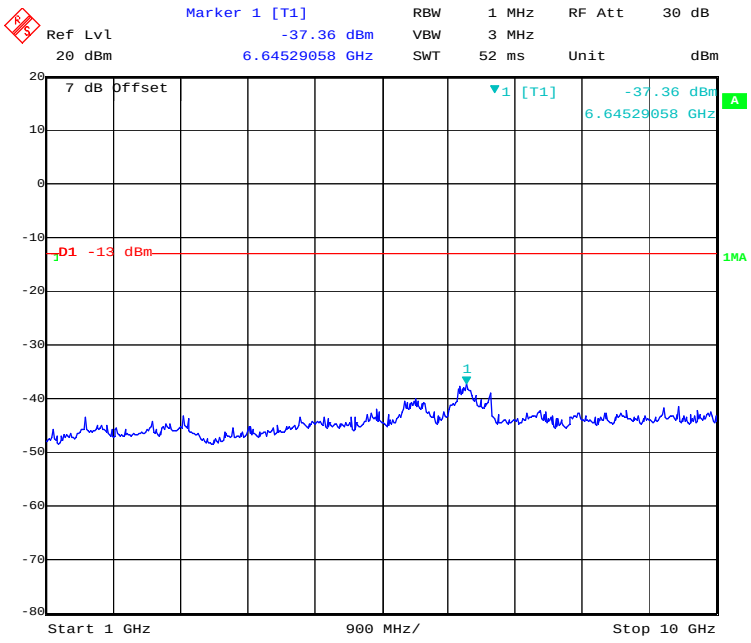
Date: 23.DEC.2020 09:39:23

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



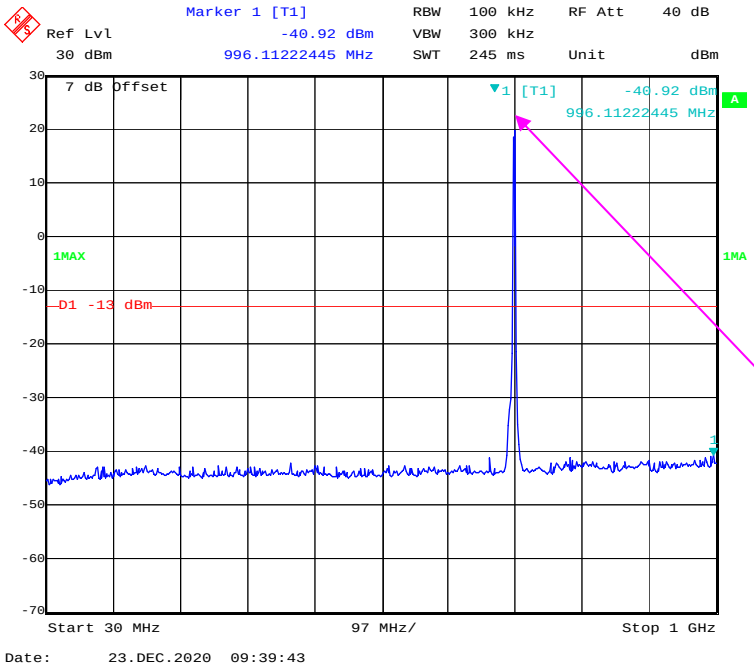
Date: 23.DEC.2020 09:53:37

1 GHz – 10 GHz (3 MHz, QPSK, Middle Channel)



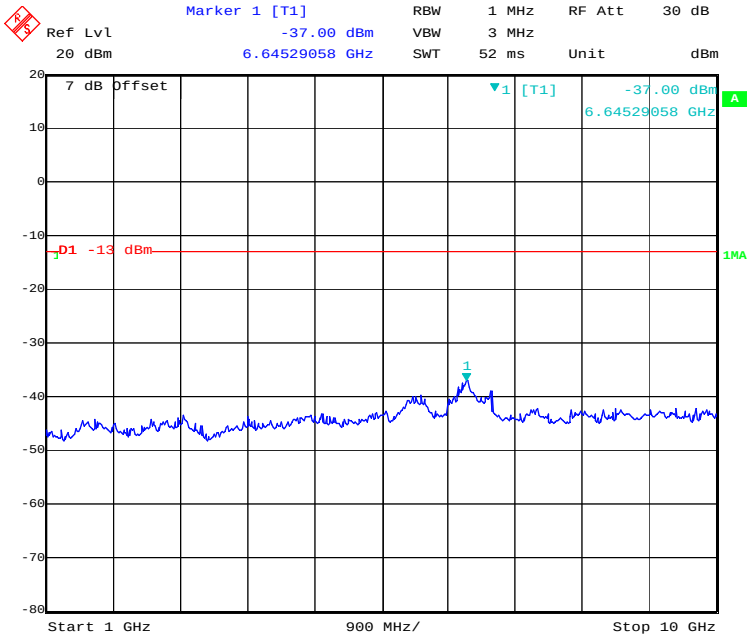
Date: 23.DEC.2020 09:53:48

30 MHz - 1 GHz (3 MHz, 16-QAM, Middle Channel)



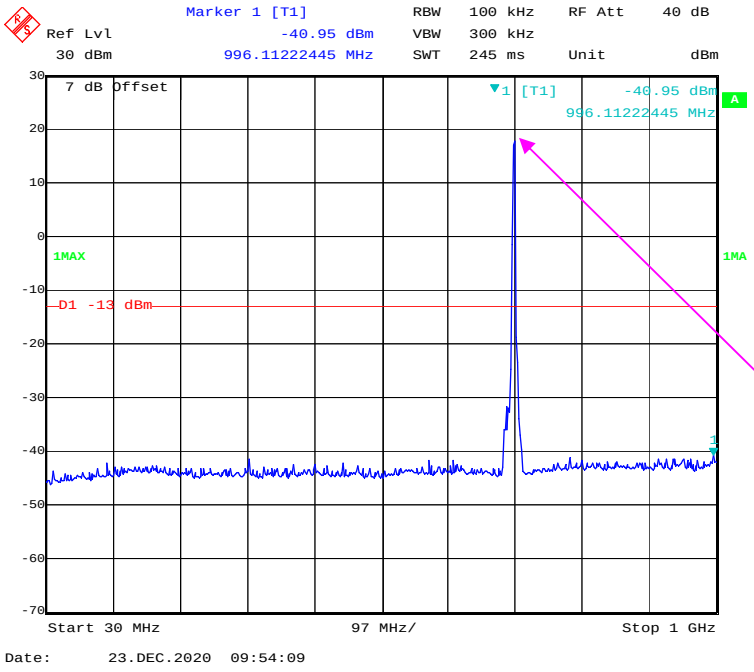
Date: 23.DEC.2020 09:39:43

1 GHz – 10 GHz (3 MHz, 16-QAM, Middle Channel)



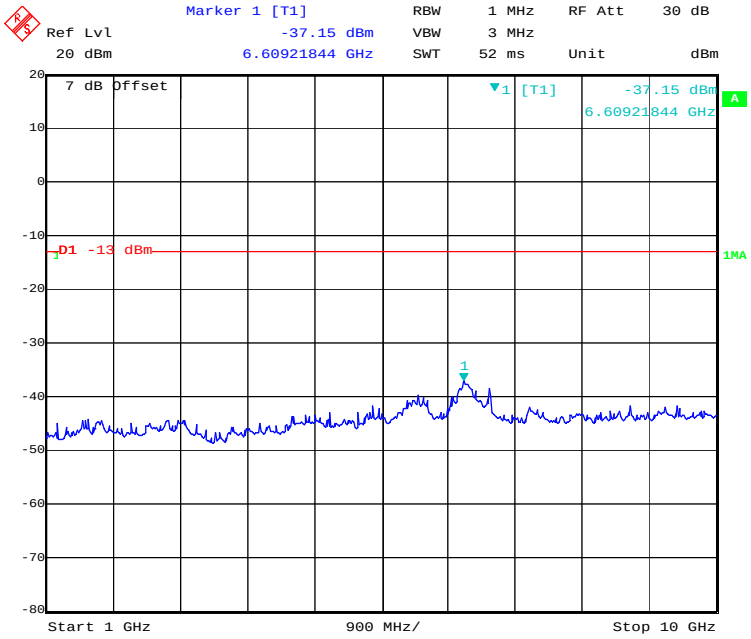
Date: 23.DEC.2020 09:39:54

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



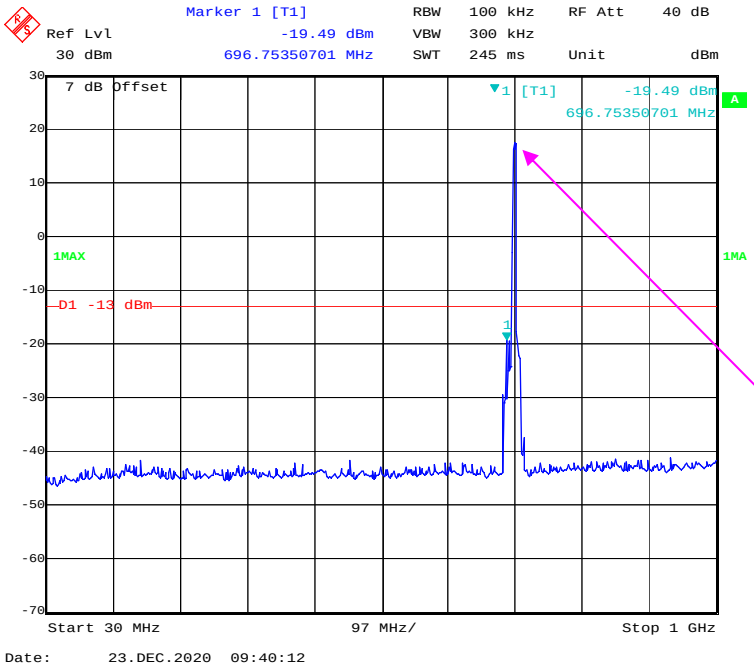
Date: 23.DEC.2020 09:54:09

1 GHz – 10 GHz (5 MHz, QPSK, Middle Channel)



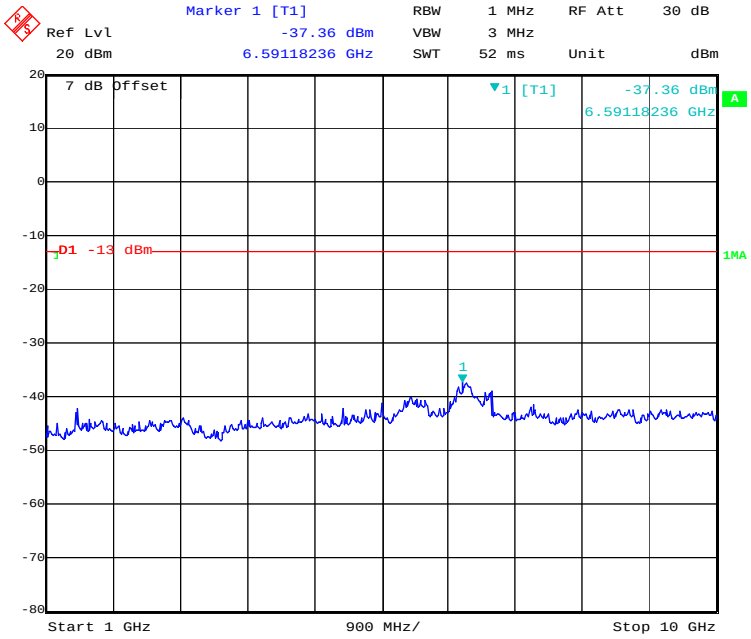
Date: 23.DEC.2020 09:54:20

30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)



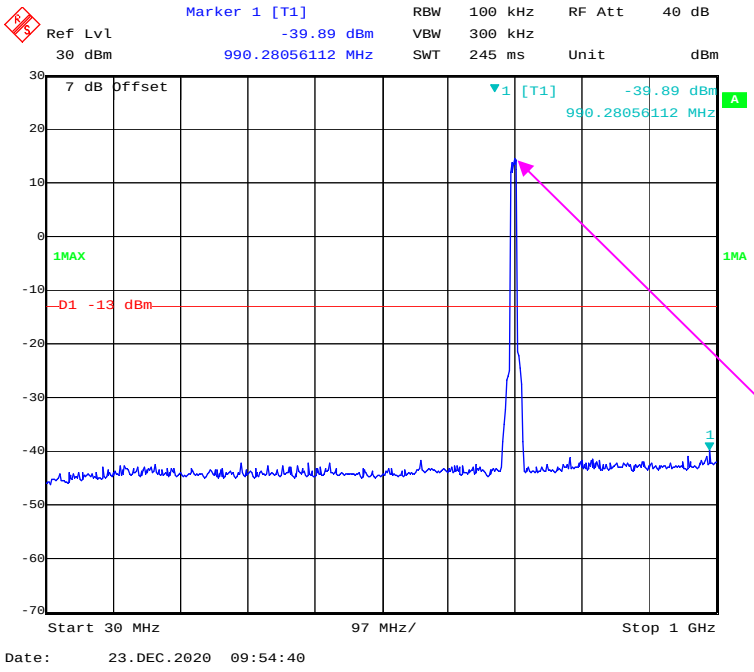
Date: 23.DEC.2020 09:40:12

1 GHz – 10 GHz (5 MHz, 16-QAM, Middle Channel)



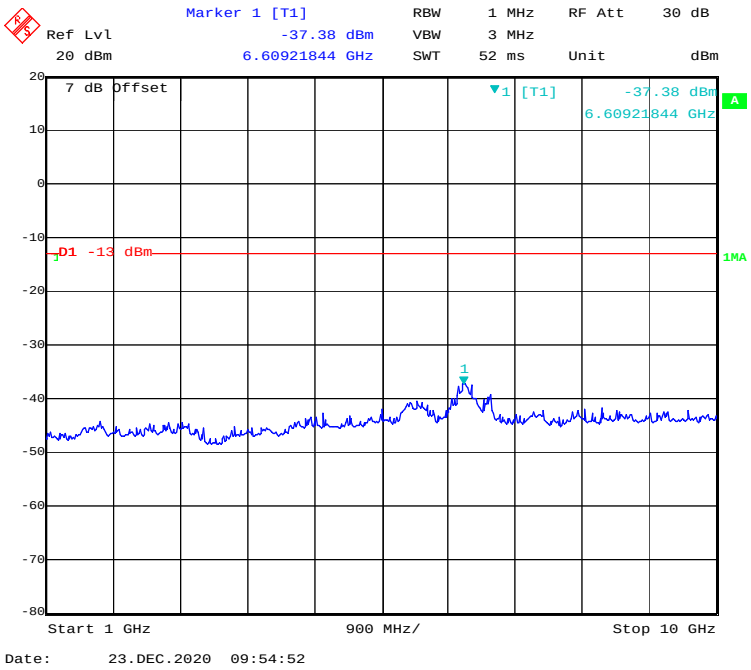
Date: 23.DEC.2020 09:40:23

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

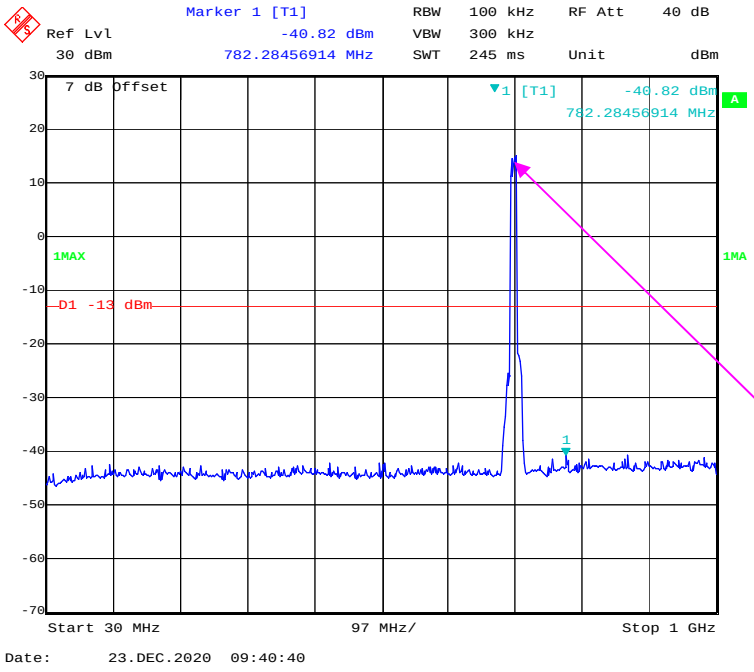


Fundamental

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

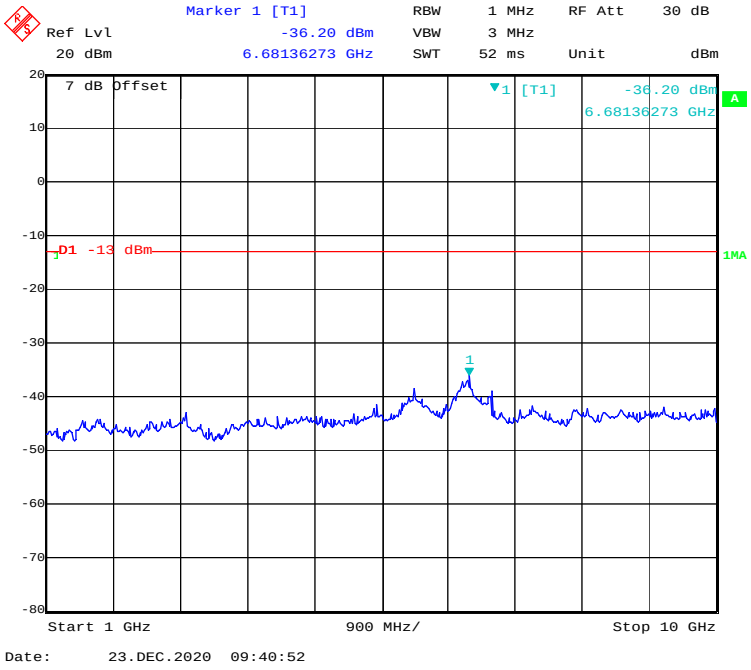


30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)

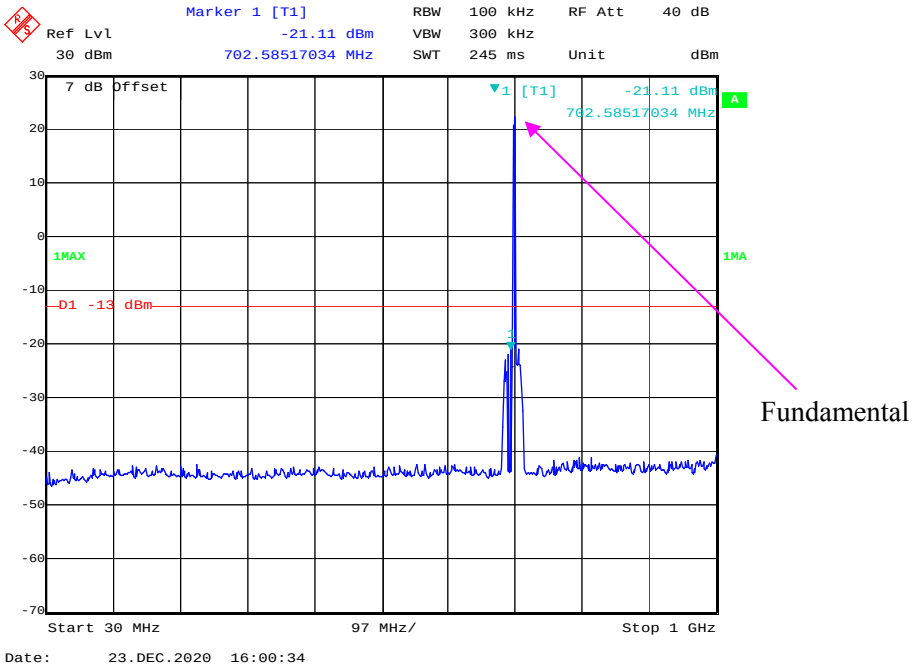


Fundamental

1 GHz – 10 GHz (10 MHz, 16-QAM, Middle Channel)

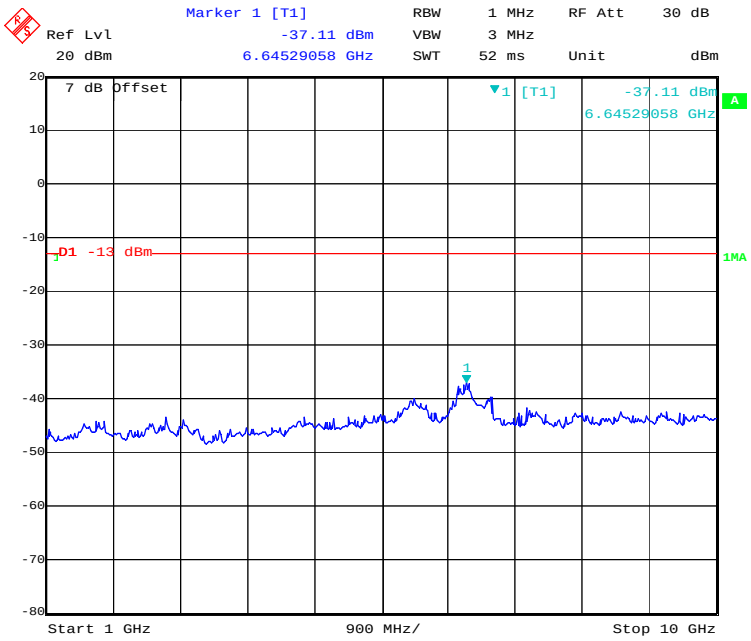


30 MHz - 1 GHz (1.4 MHz, QPSK, High Channel)



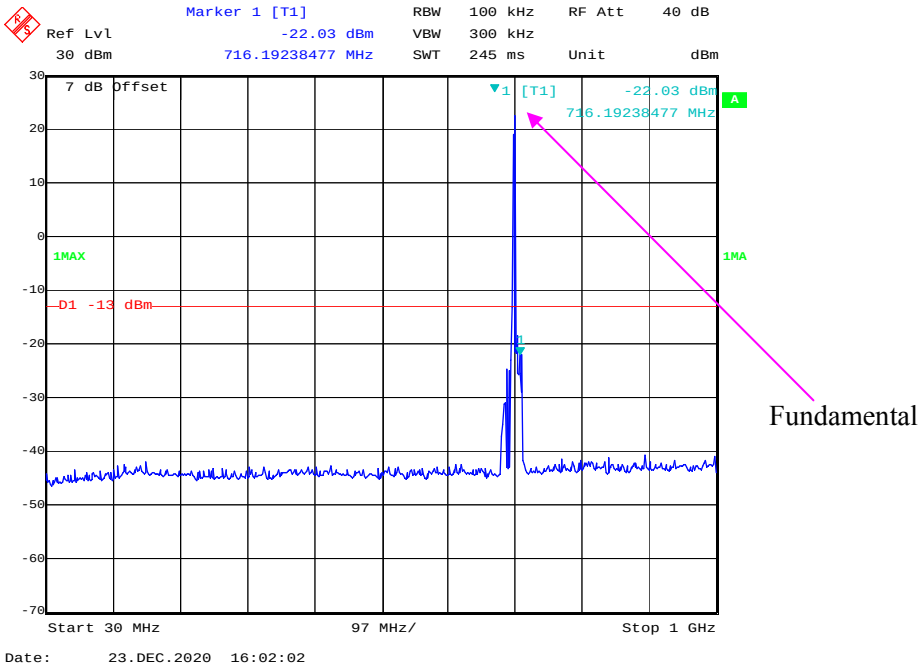
Date: 23.DEC.2020 16:00:34

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

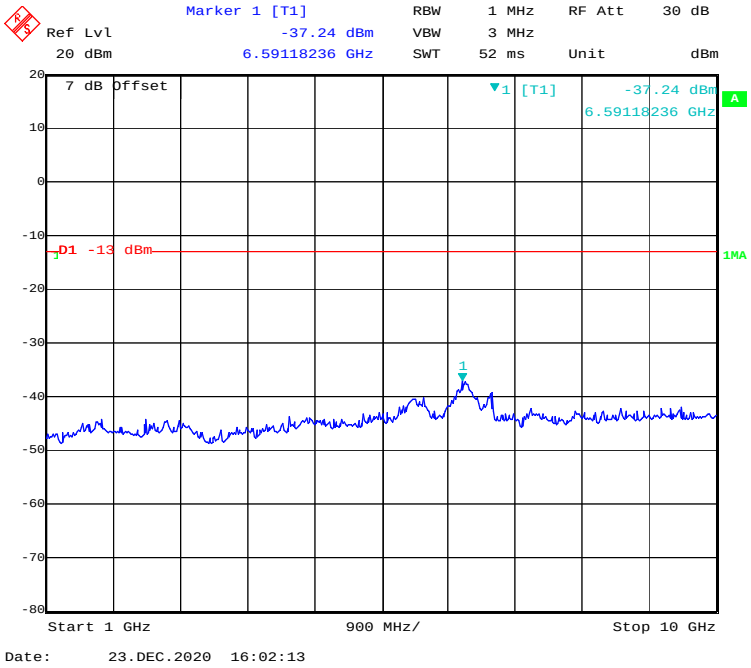


Date: 23.DEC.2020 16:00:45

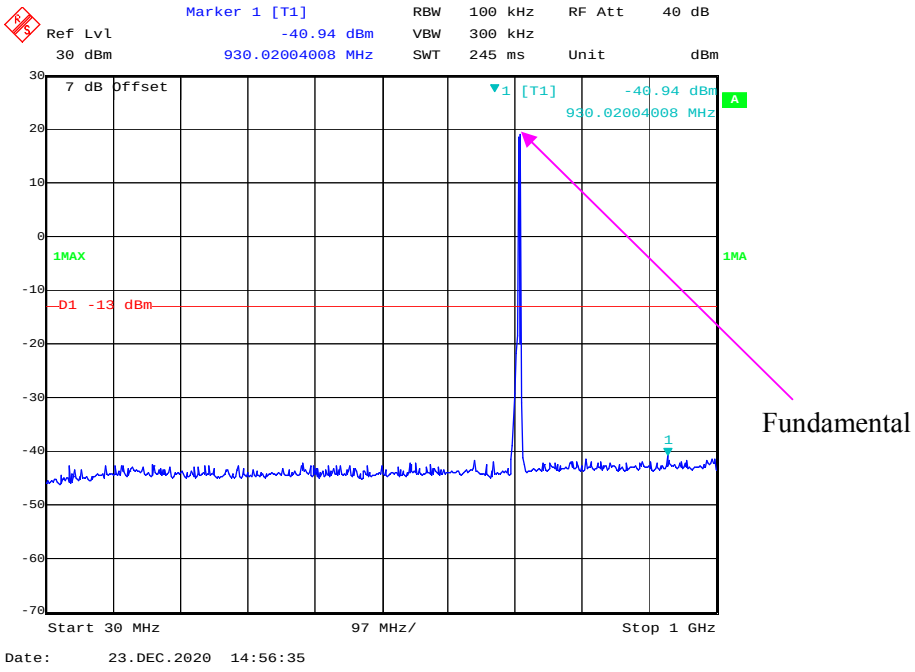
30 MHz - 1 GHz (1.4 MHz, 16-QAM, High Channel)



1 GHz – 10 GHz (1.4 MHz, 16-QAM, High Channel)

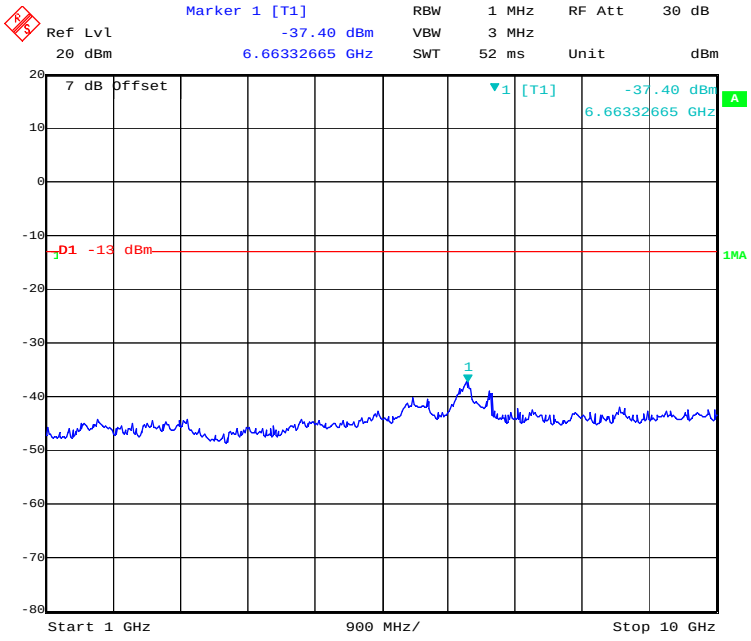


30 MHz - 1 GHz (3 MHz, QPSK, High Channel)



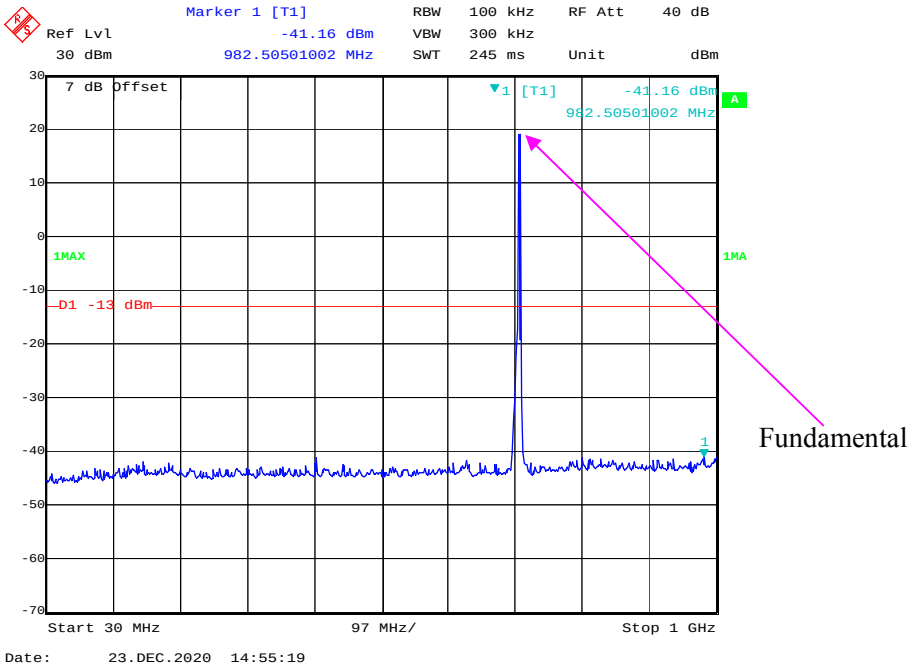
Date: 23.DEC.2020 14:56:35

1 GHz – 10 GHz (3 MHz, QPSK, High Channel)

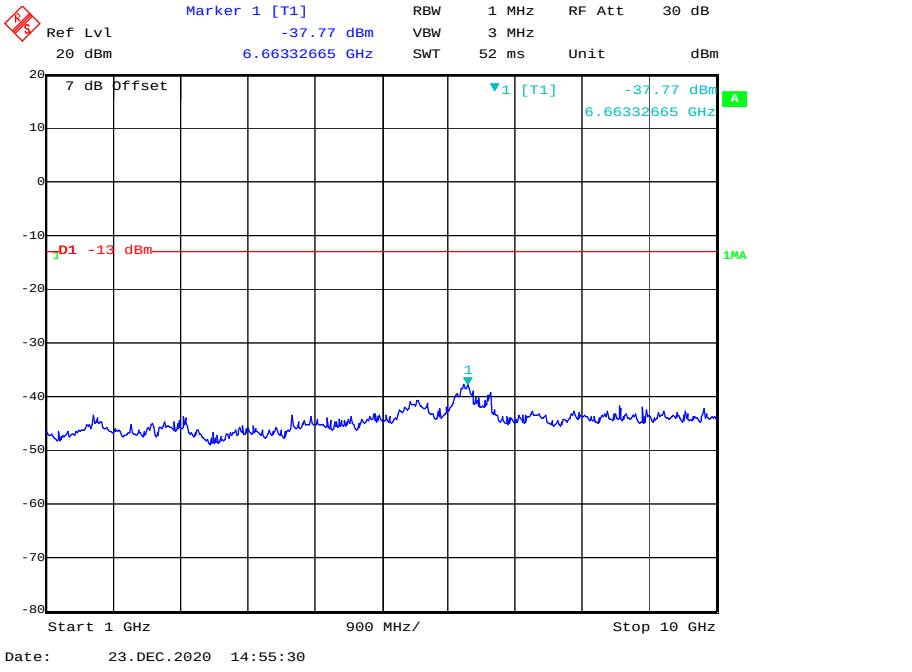


Date: 23.DEC.2020 14:56:46

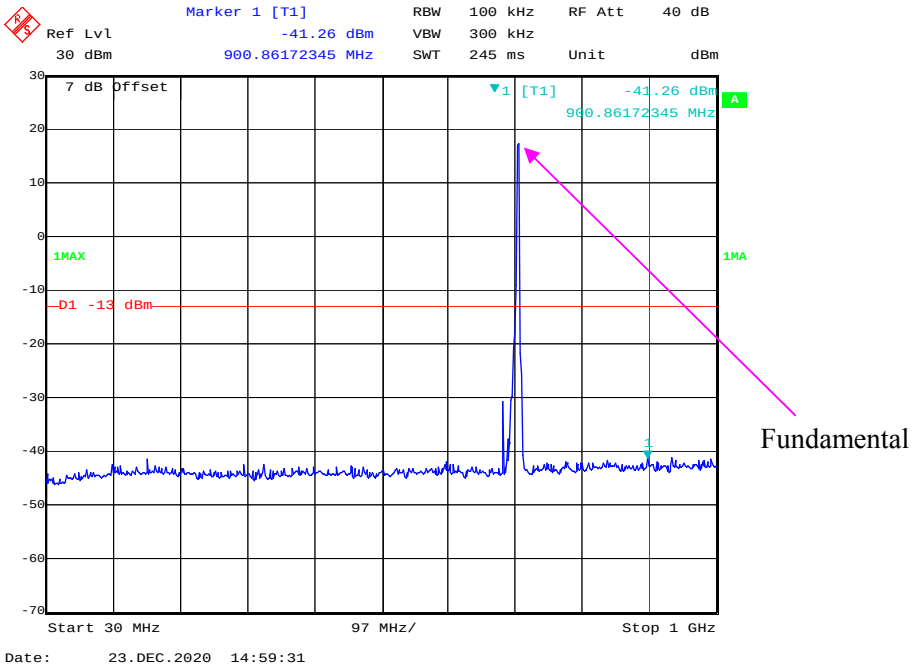
30 MHz - 1 GHz (3 MHz, 16-QAM, High Channel)



1 GHz – 10 GHz (3 MHz, 16-QAM, High Channel)

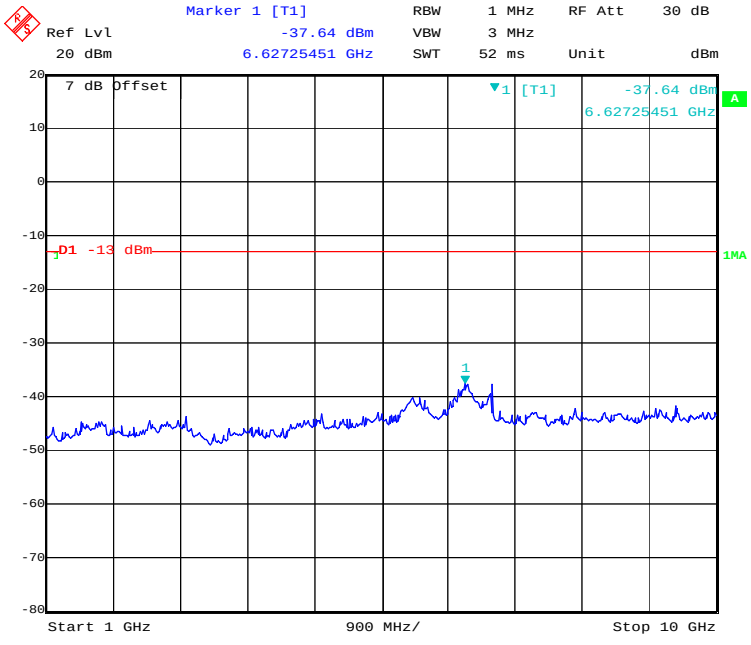


30 MHz - 1 GHz (5 MHz, QPSK, High Channel)



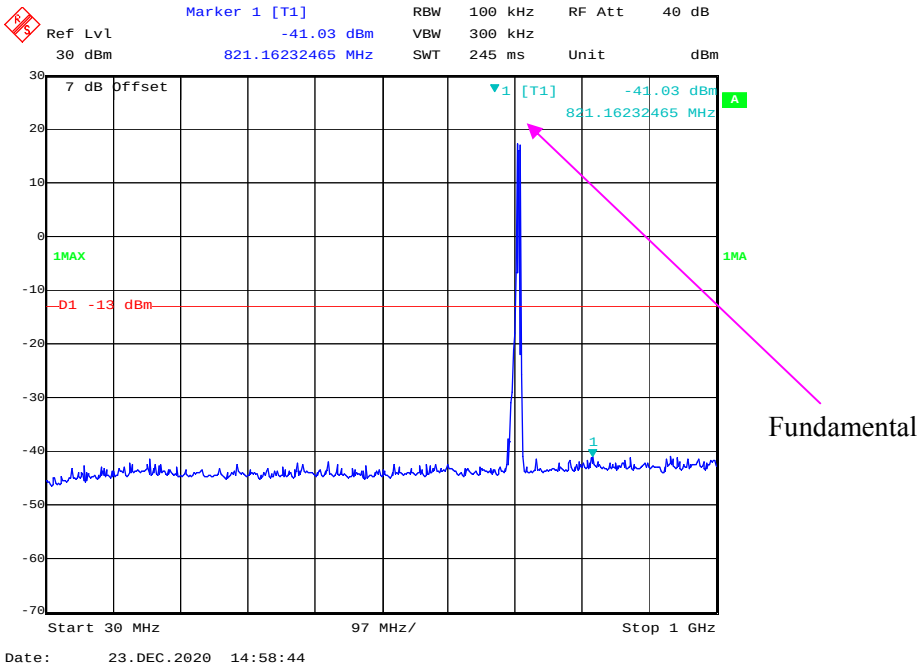
Date: 23.DEC.2020 14:59:31

1 GHz – 10 GHz (5 MHz, QPSK, High Channel)



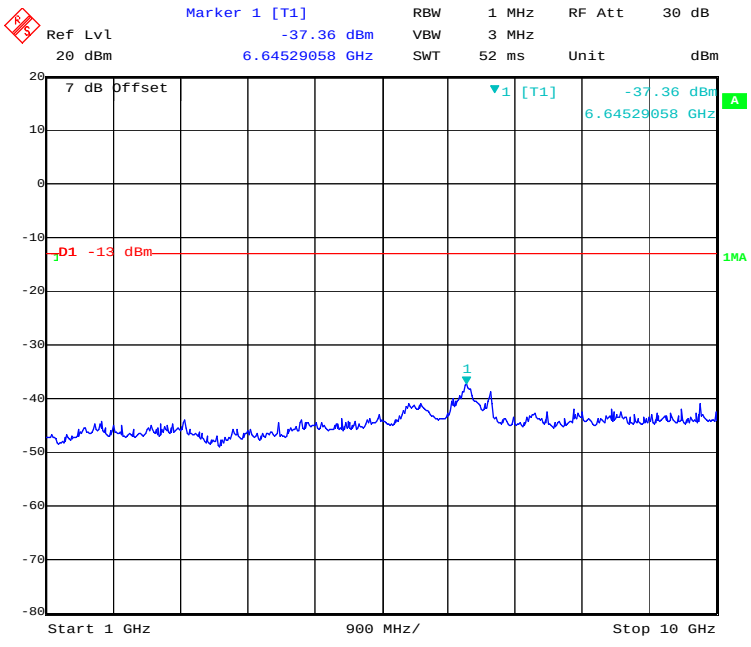
Date: 23.DEC.2020 14:59:43

30 MHz - 1 GHz (5 MHz, 16-QAM, High Channel)



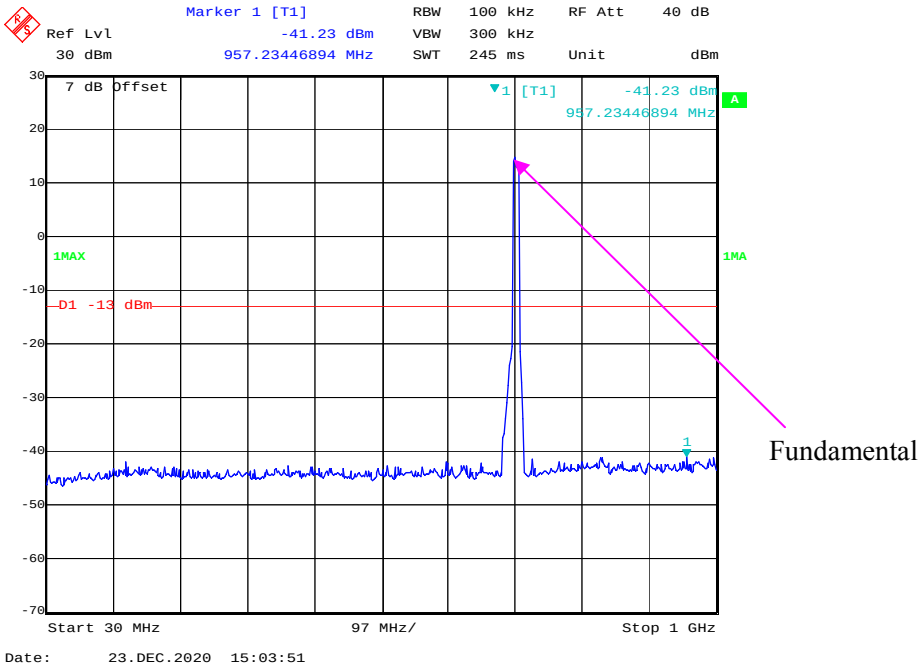
Date: 23.DEC.2020 14:58:44

1 GHz – 10 GHz (5 MHz, 16-QAM, High Channel)



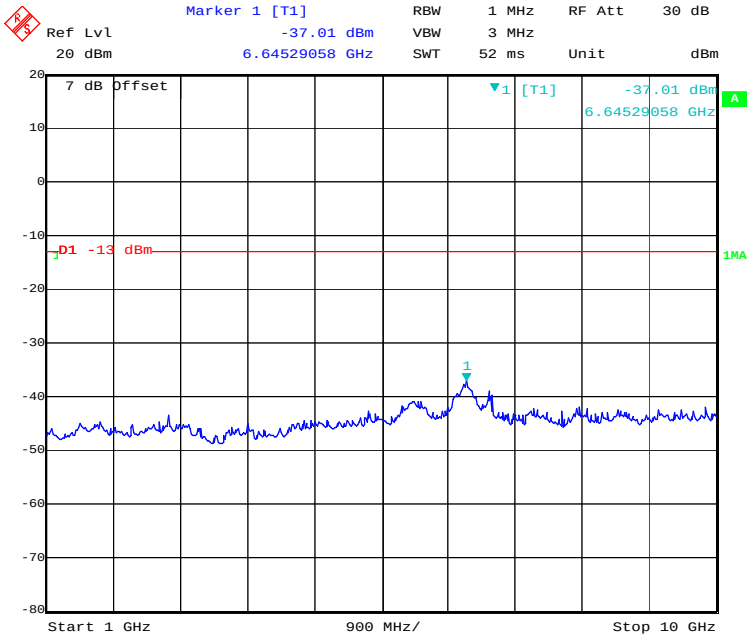
Date: 23.DEC.2020 14:58:55

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



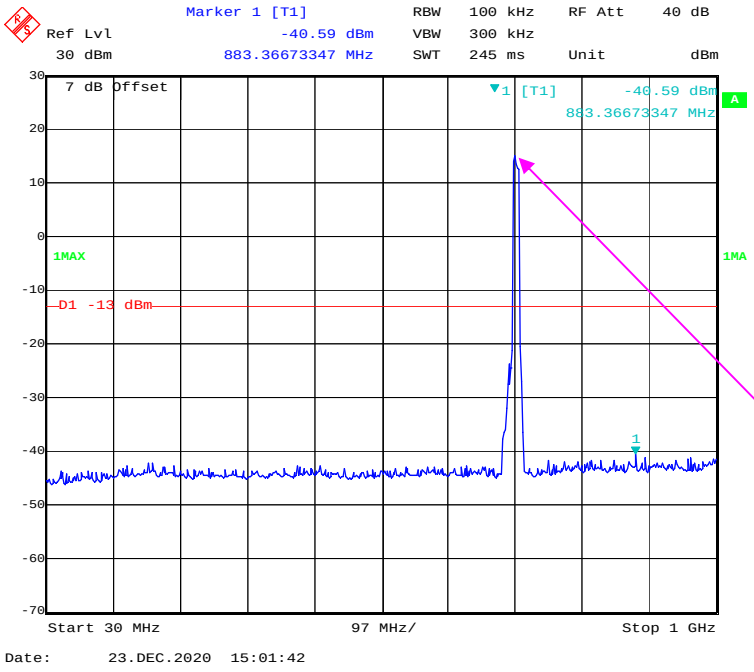
Date: 23.DEC.2020 15:03:51

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



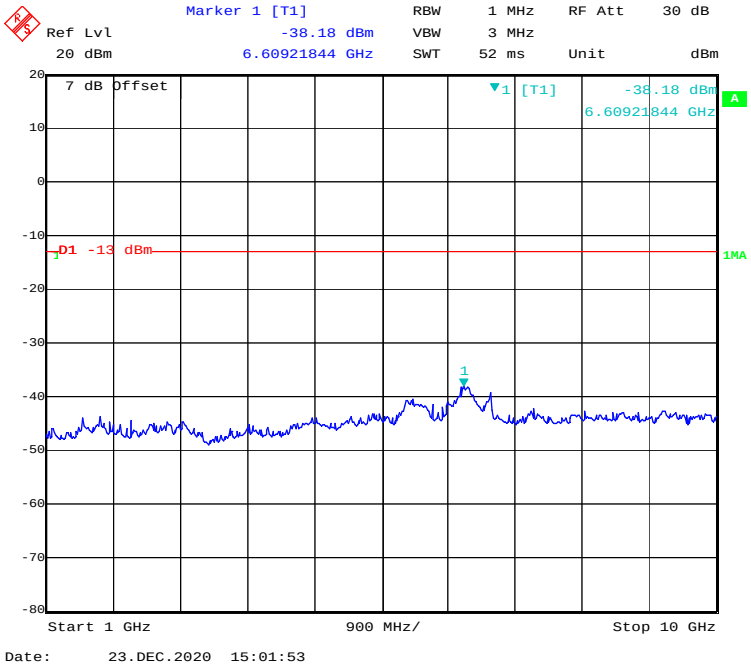
Date: 23.DEC.2020 15:04:02

30 MHz - 1 GHz (10 MHz, 16-QAM, High Channel)



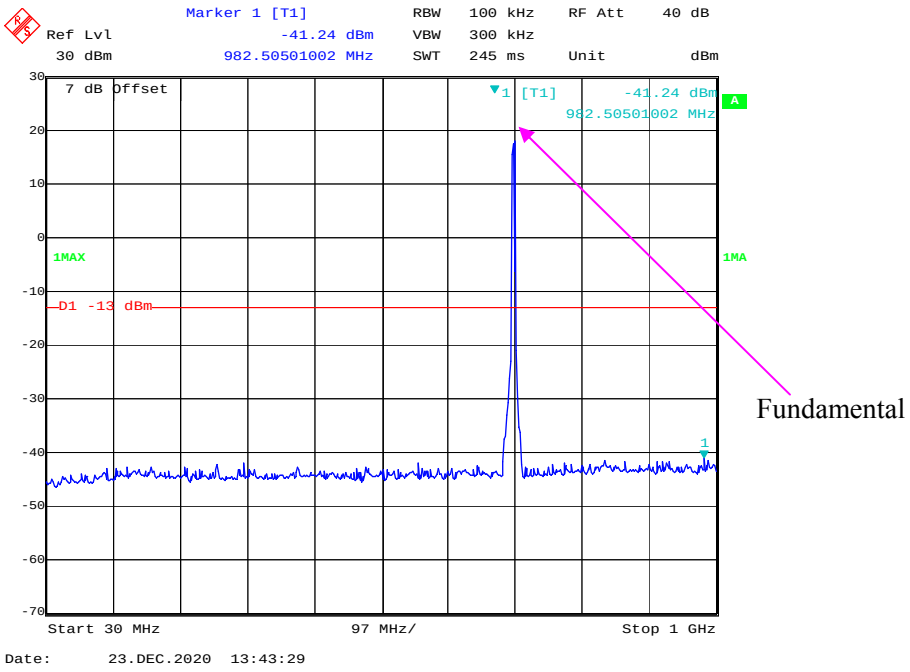
Fundamental

1 GHz – 10 GHz (10 MHz, 16-QAM, High Channel)

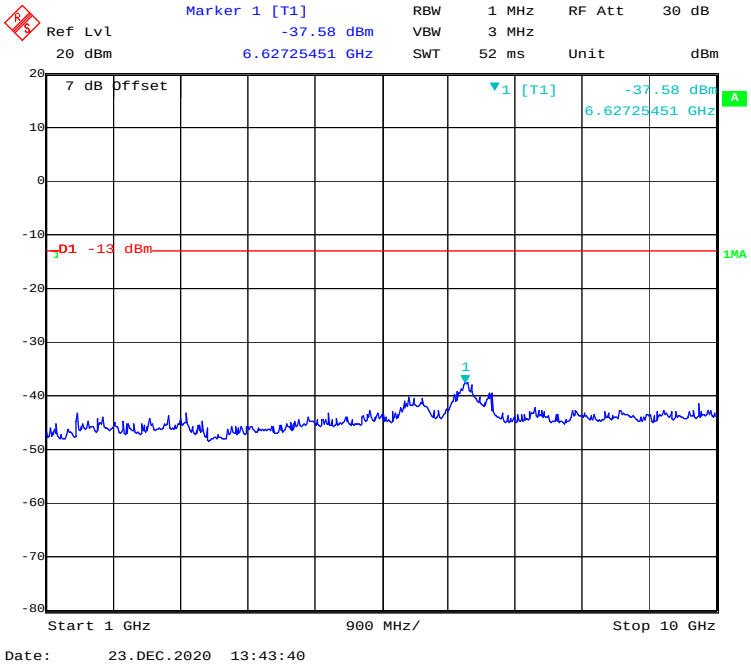


LTE Band 17:

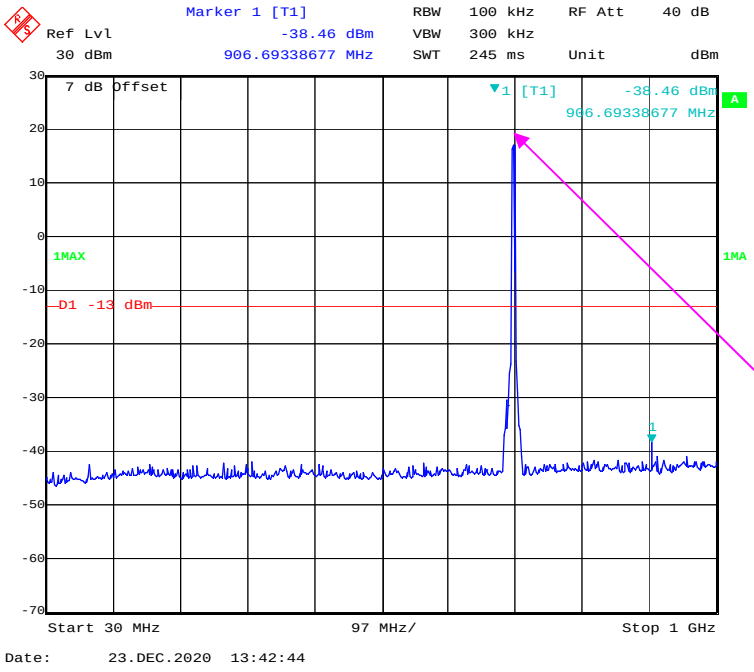
30 MHz - 1 GHz (5 MHz, QPSK, Low Channel)



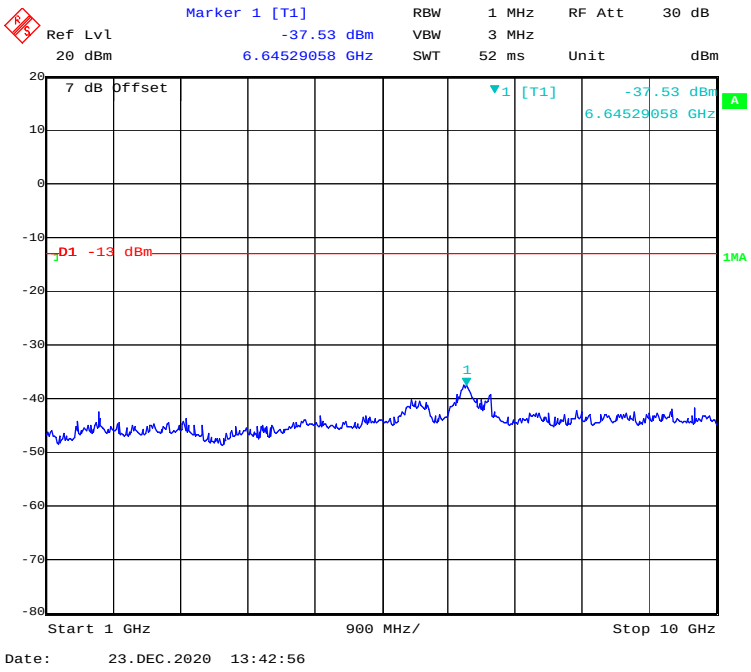
1 GHz – 10 GHz (5 MHz, QPSK, Low Channel)



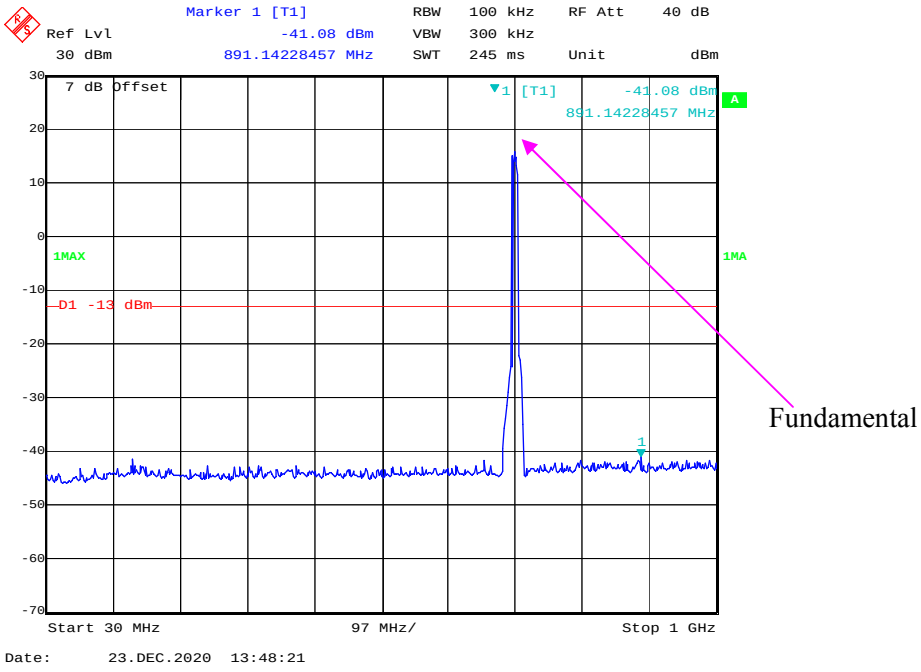
30 MHz - 1 GHz (5 MHz, 16-QAM, Low Channel)



1 GHz – 10 GHz (5 MHz, 16-QAM, Low Channel)



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



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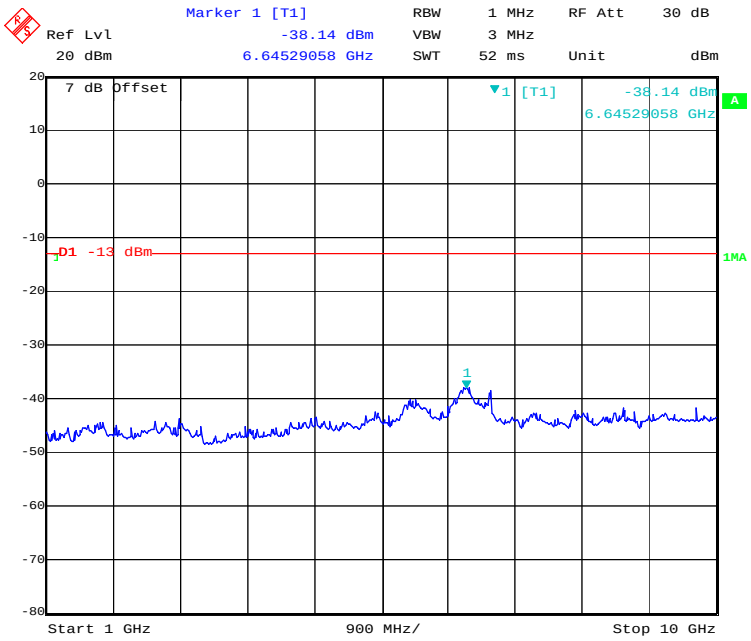
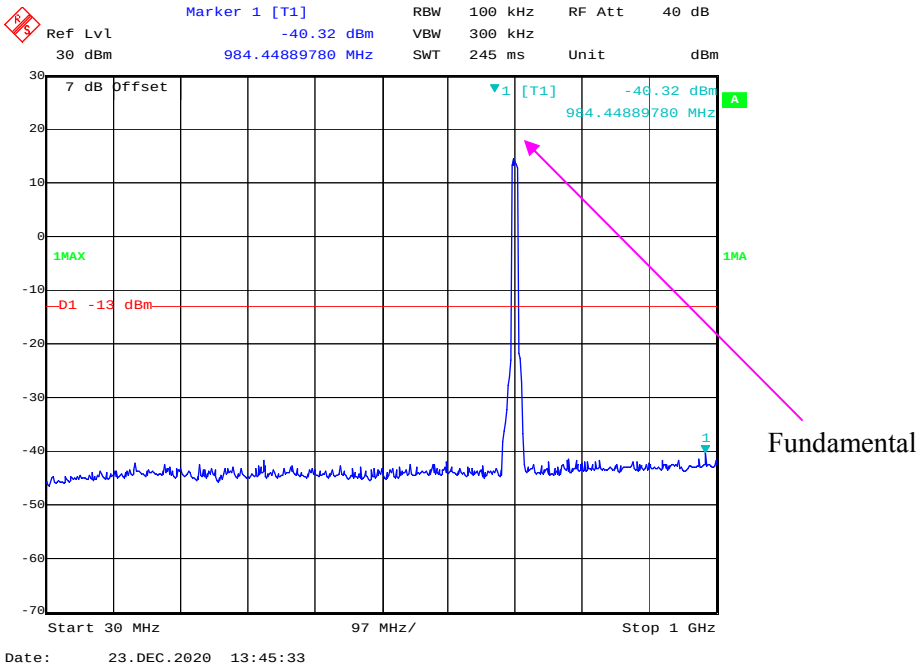
1 GHz – 10 GHz (10 MHz, QPSK, Low Channel)



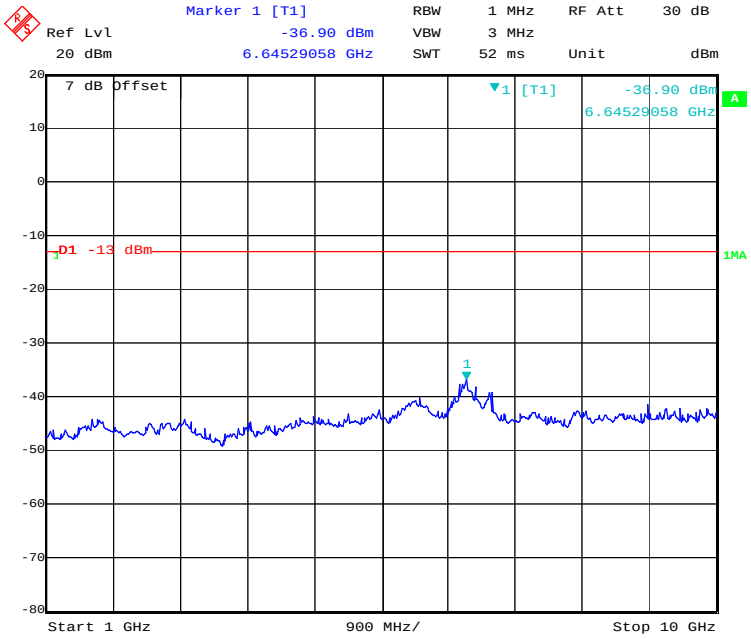
Date: 23.DEC.2020 13:48:33

30 MHz - 1 GHz (10 MHz, 16-QAM, Low Channel)



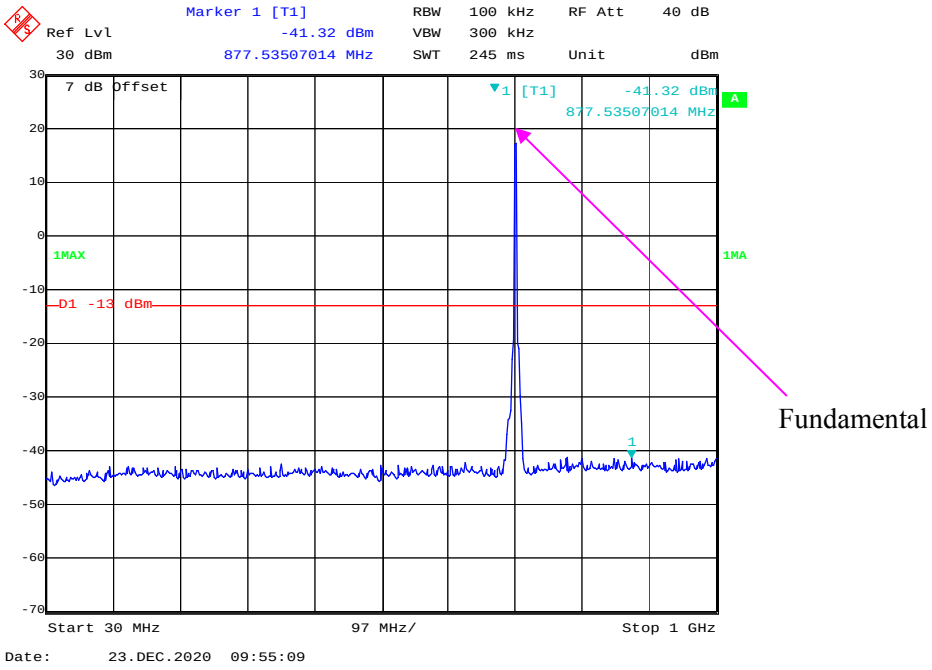
Date: 23.DEC.2020 13:45:33

1 GHz – 10 GHz (10 MHz, 16-QAM, Low Channel)

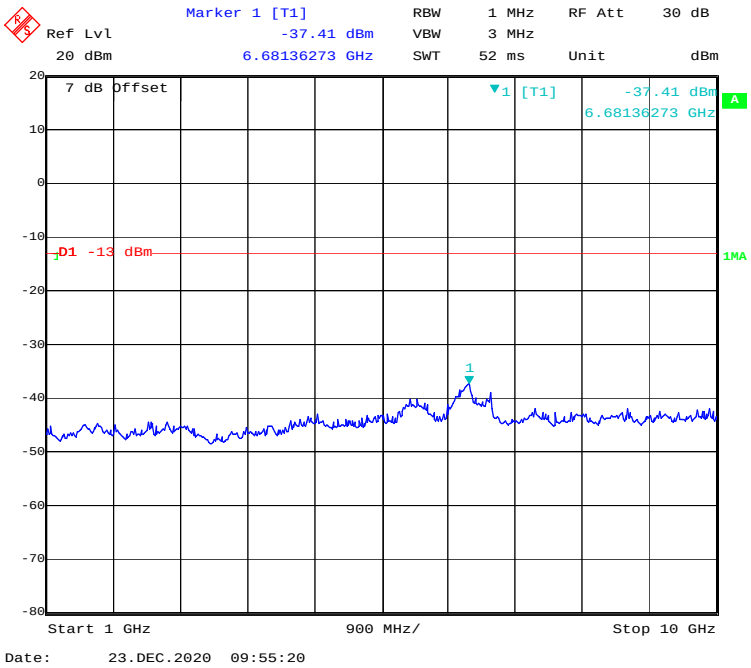


Date: 23.DEC.2020 13:45:44

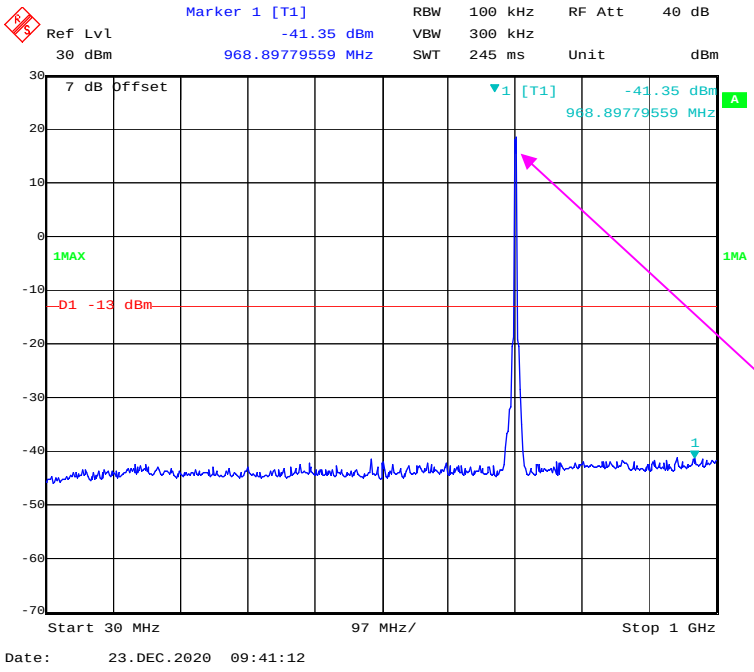
30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)



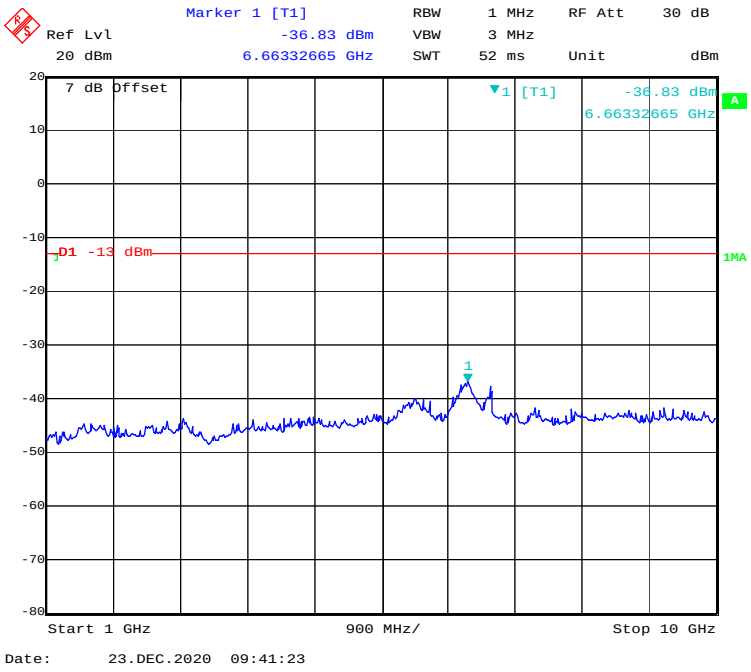
1 GHz – 10 GHz (5 MHz, QPSK, Middle Channel)



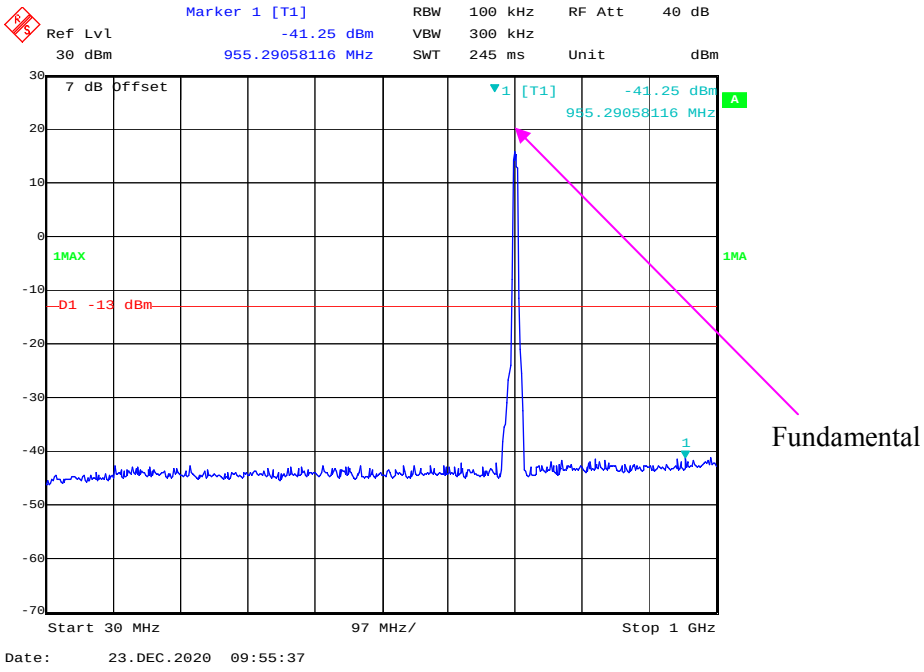
30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)



1 GHz – 10 GHz (5 MHz, 16-QAM, Middle Channel)

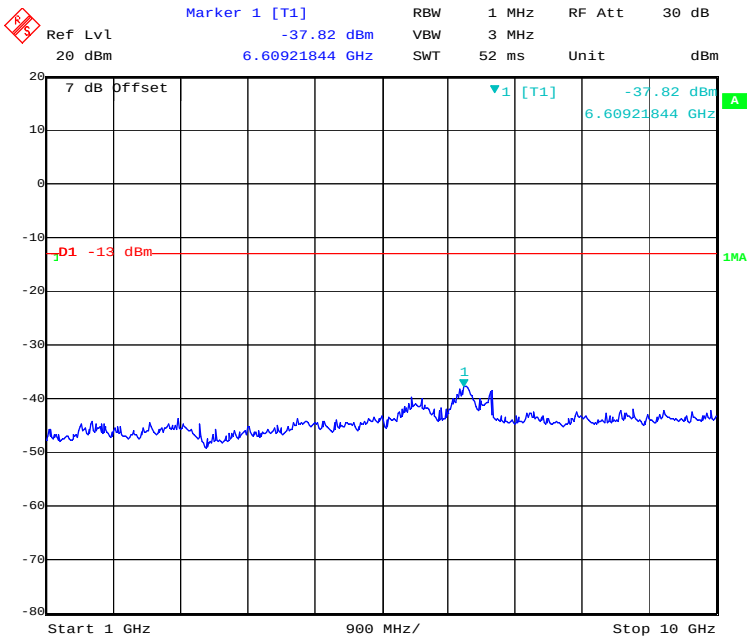


30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)



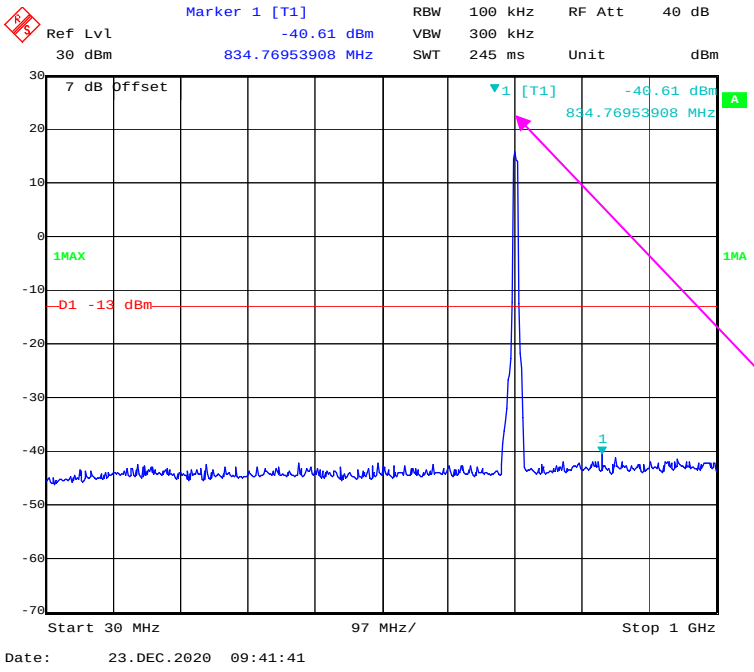
Date: 23.DEC.2020 09:55:37

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



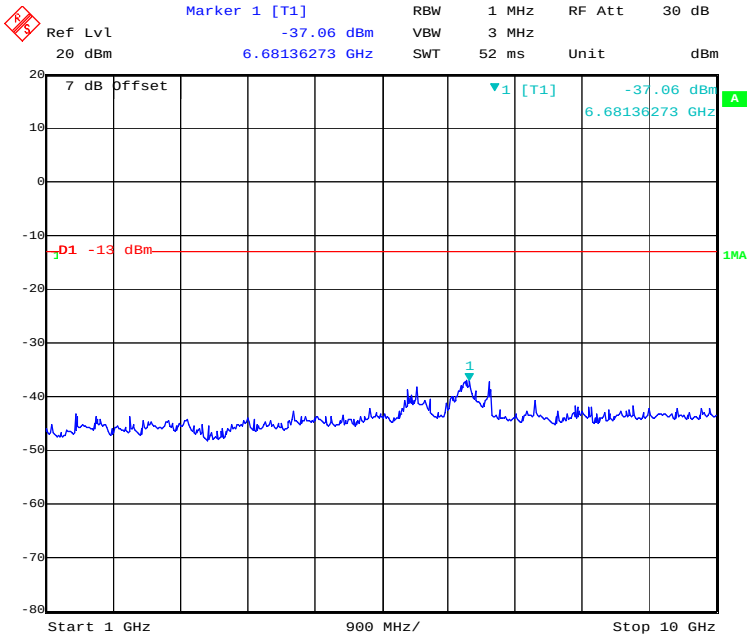
Date: 23.DEC.2020 09:55:49

30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)



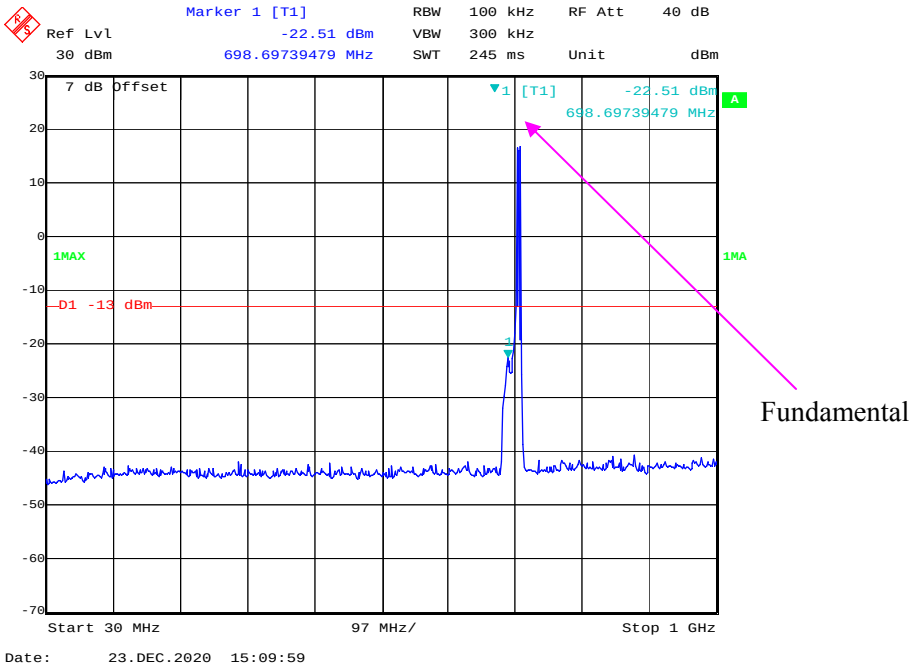
Date: 23.DEC.2020 09:41:41

1 GHz – 10 GHz (10 MHz, 16-QAM, Middle Channel)



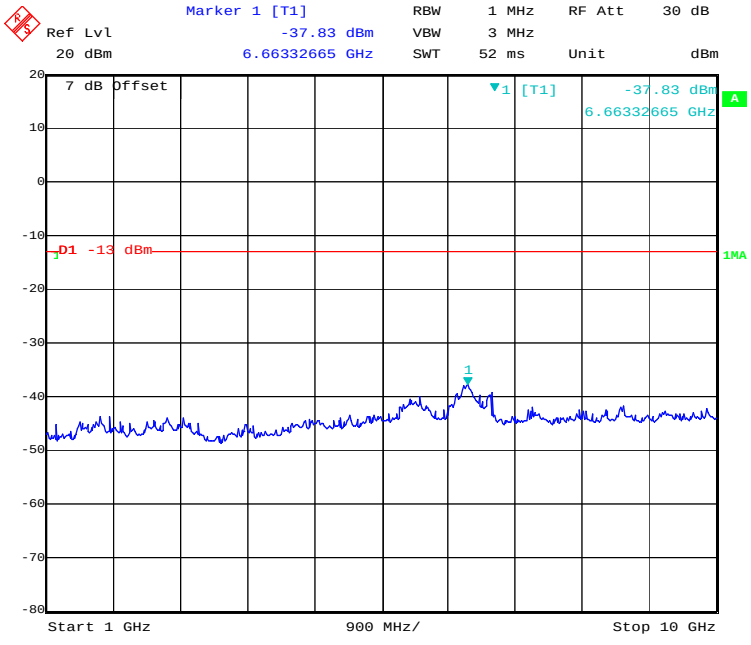
Date: 23.DEC.2020 09:41:52

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



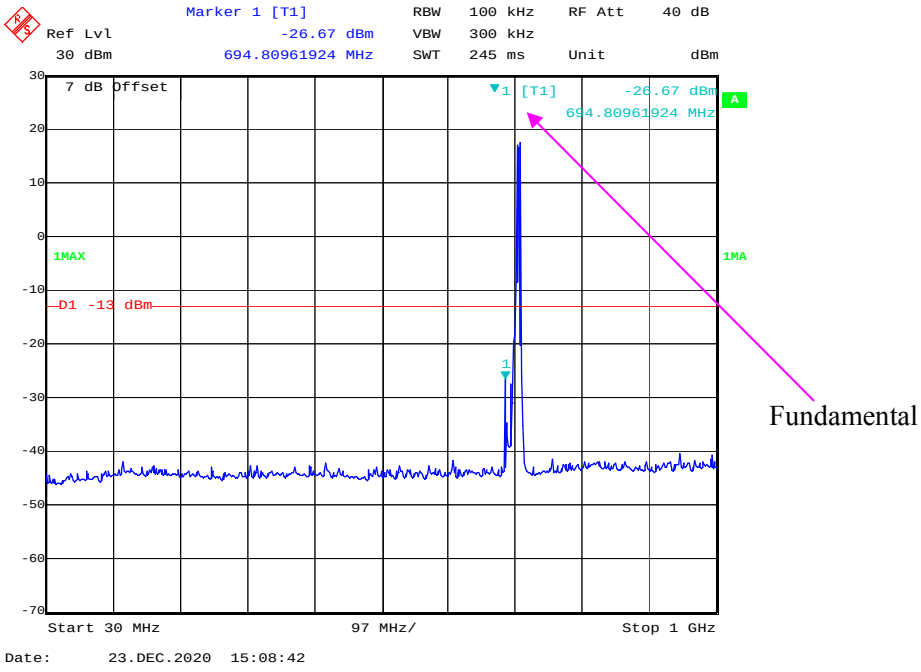
Date: 23.DEC.2020 15:09:59

1 GHz – 10 GHz (5 MHz, QPSK, High Channel)



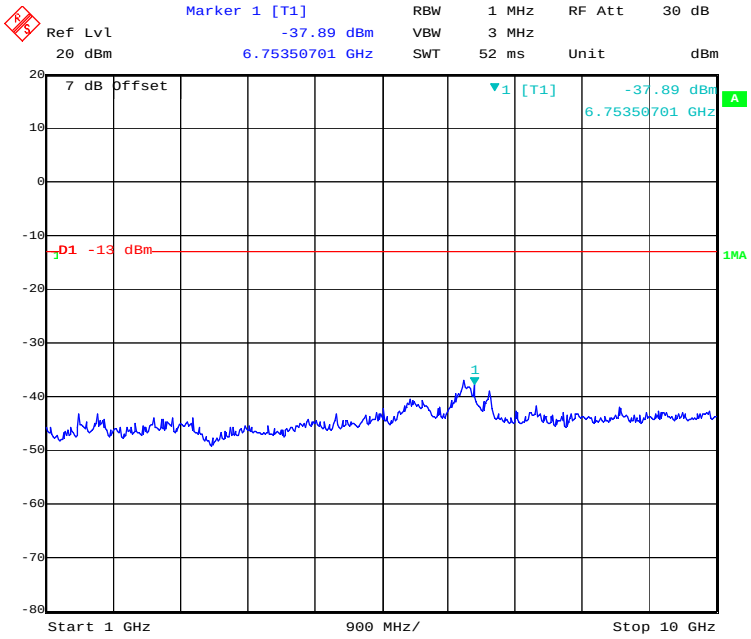
Date: 23.DEC.2020 15:10:11

30 MHz - 1 GHz (5 MHz, 16-QAM, High Channel)



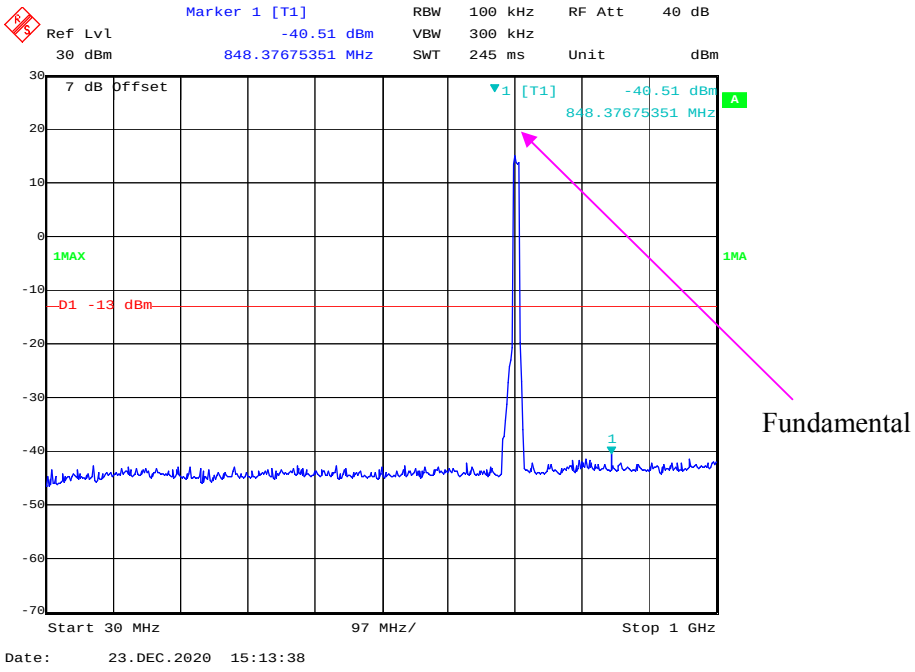
Date: 23.DEC.2020 15:08:42

1 GHz – 10 GHz (5 MHz, 16-QAM, High Channel)



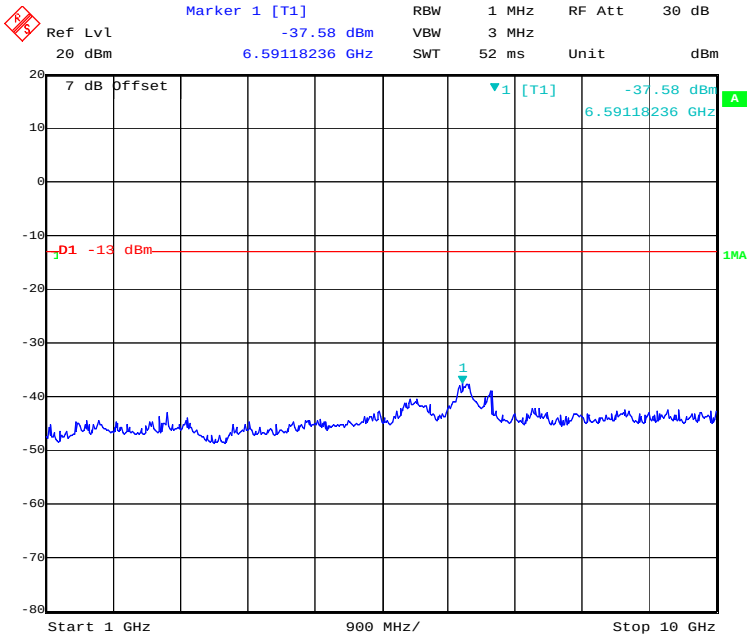
Date: 23.DEC.2020 15:08:53

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



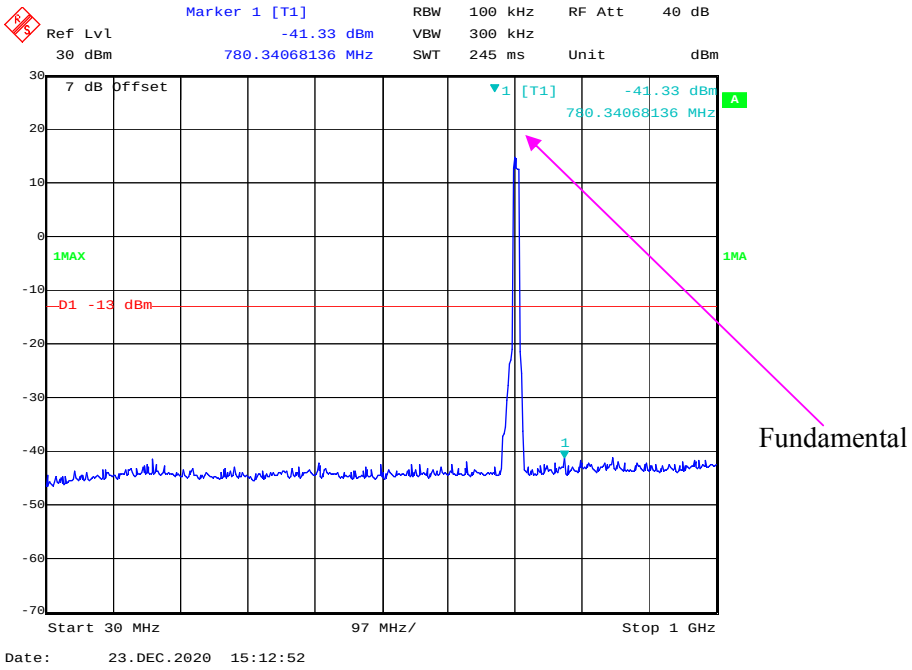
Date: 23.DEC.2020 15:13:38

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



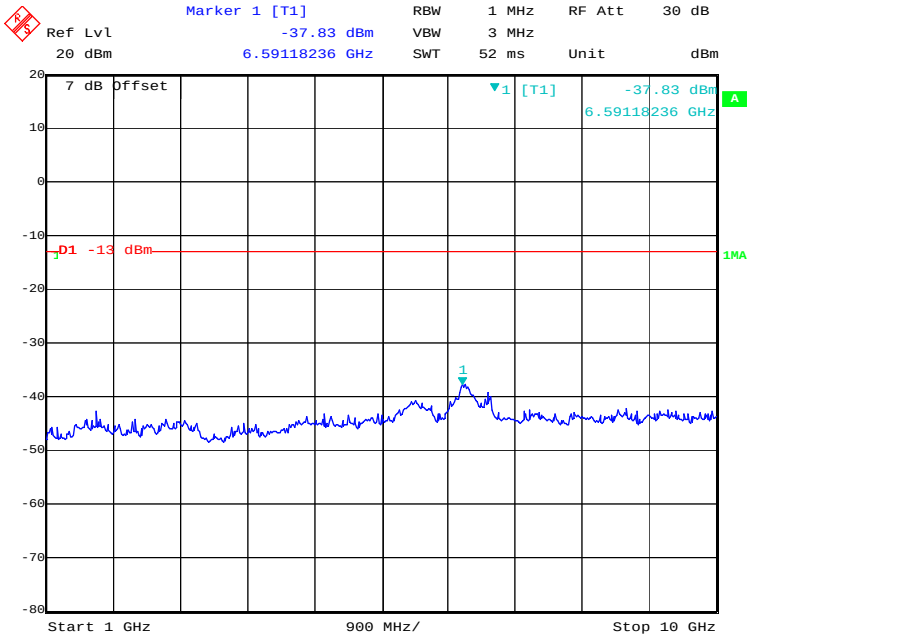
Date: 23.DEC.2020 15:13:49

30 MHz - 1 GHz (10 MHz, 16-QAM, High Channel)



Date: 23.DEC.2020 15:12:52

1 GHz – 10 GHz (10 MHz, 16-QAM, High Channel)



Date: 23.DEC.2020 15:13:03

FCC § 2.1053; § 22.917 (a); § 24.238 (a) ; § 27.53 (g) (h) - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC § 2.1053, §22.917(a) ,§ 24.238(a) and § 27.53 (g) (h)

22.917 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

(h) For operations in the 1710-1755 MHz, 1755-1780 MHz, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

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.

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

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Data

Environmental Conditions

Temperature:	23.4~24.1 ℃
Relative Humidity:	49~52 %
ATM Pressure:	100.5~102.1 kPa

The testing was performed by Jack Jiao from 2020-12-23 to 2020-12-24.

Test mode: Transmitting (Pre-scan with low, middle and high channels, and the worse case data as below)

30 MHz ~ 10 GHz:

GPRS 850 Band

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
GPRS Mode, Low channel										
296.99	55.79	195	210	H	-51.08	0.46	-2.16	-53.7	-13	40.7
296.99	55.17	56	158	V	-51.7	0.46	-2.16	-54.32	-13	41.32
1648.40	50.57	78	125	H	-62.78	0.84	8.44	-55.18	-13	42.18
1648.40	50.24	96	139	V	-63.11	0.84	8.44	-55.51	-13	42.51
GPRS Mode, Middle channel										
296.99	55.62	262	100	H	-51.25	0.46	-2.16	-53.87	-13	40.87
296.99	55.6	219	150	V	-51.27	0.46	-2.16	-53.89	-13	40.89
1673.20	55.27	306	150	H	-48.12	0.84	8.48	-40.48	-13	27.48
1673.20	55.78	177	150	V	-47.61	0.84	8.48	-39.97	-13	26.97
GPRS Mode, High channel										
296.99	55.44	195	210	H	-51.43	0.46	-2.16	-54.05	-13	41.05
296.99	55.84	56	158	V	-51.03	0.46	-2.16	-53.65	-13	40.65
1697.60	50.31	78	125	H	-62.7	0.84	8.52	-55.02	-13	42.02
1697.60	49.56	96	139	V	-63.45	0.84	8.52	-55.77	-13	42.77

WCDMA Band V

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Low channel										
335.30	55.18	123	150	H	-52.9	0.48	-1.87	-55.25	-13	42.25
335.30	55.19	57	150	V	-52.89	0.48	-1.87	-55.24	-13	42.24
1652.80	36.72	241	100	H	-76.6	0.84	8.44	-69	-13	56
1652.80	36.76	231	100	V	-76.56	0.84	8.44	-68.96	-13	55.96
WCDMA Mode, Middle channel										
335.30	55.62	247	150	H	-52.46	0.48	-1.87	-54.81	-13	41.81
335.30	55.24	151	150	V	-52.84	0.48	-1.87	-55.19	-13	42.19
1673.20	36.14	323	100	H	-67.25	0.84	8.48	-59.61	-13	46.61
1673.20	36.87	193	100	V	-66.52	0.84	8.48	-58.88	-13	45.88
WCDMA Mode, High channel										
335.30	55.5	208	150	H	-52.58	0.48	-1.87	-54.93	-13	41.93
335.30	55.01	261	150	V	-53.07	0.48	-1.87	-55.42	-13	42.42
1693.20	36.99	30	100	H	-76.04	0.84	8.51	-68.37	-13	55.37
1693.20	36.48	201	100	V	-76.55	0.84	8.51	-68.88	-13	55.88

30 MHz ~ 20 GHz:

PCS 1900 Band

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
GPRS Mode, Low channel										
296.99	56	55	145	H	-50.87	0.46	-2.16	-53.49	-13	40.49
296.99	55.36	302	156	V	-51.51	0.46	-2.16	-54.13	-13	41.13
3700.40	42.87	225	189	H	-64.1	0.95	9.78	-55.27	-13	42.27
3700.40	42.24	110	200	V	-64.73	0.95	9.78	-55.9	-13	42.9
GPRS Mode, Middle channel										
296.99	55.89	147	100	H	-50.98	0.46	-2.16	-53.6	-13	40.6
296.99	55.33	331	100	V	-51.54	0.46	-2.16	-54.16	-13	41.16
3760.00	55.38	6	200	H	-51.4	0.95	9.74	-42.61	-13	29.61
3760.00	55.35	279	200	V	-51.75	0.95	9.74	-42.96	-13	29.96
GPRS Mode, High channel										
296.99	55.74	55	145	H	-51.13	0.46	-2.16	-53.75	-13	40.75
296.99	55.67	302	156	V	-51.2	0.46	-2.16	-53.82	-13	40.82
3819.60	42.67	225	189	H	-63.92	0.96	9.71	-55.17	-13	42.17
3819.60	42.6	110	200	V	-63.99	0.96	9.71	-55.24	-13	42.24

WCDMA Band II

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Low channel										
557.43	53.33	162	150	H	-51.30	0.58	-1.2	-53.08	-13	40.08
557.43	53.54	65	150	V	-51.09	0.58	-1.2	-52.87	-13	39.87
3704.80	37.46	271	200	H	-69.50	0.95	9.78	-60.67	-13	47.67
3704.80	37.97	341	100	V	-68.99	0.95	9.78	-60.16	-13	47.16
WCDMA Mode, Middle channel										
557.43	53.79	130	150	H	-50.84	0.58	-1.2	-52.62	-13	39.62
557.43	53.56	156	150	V	-51.07	0.58	-1.2	-52.85	-13	39.85
3760.00	37.29	358	200	H	-69.49	0.95	9.74	-60.7	-13	47.7
3760.00	37.83	302	100	V	-68.95	0.95	9.74	-60.16	-13	47.16
WCDMA Mode, High channel										
557.43	53.68	335	150	H	-50.95	0.58	-1.2	-52.73	-13	39.73
557.43	53.77	13	150	V	-50.86	0.58	-1.2	-52.64	-13	39.64
3815.20	37.16	356	200	H	-69.44	0.96	9.71	-60.69	-13	47.69
3815.20	37.27	71	100	V	-69.33	0.96	9.71	-60.58	-13	47.58

Note:
1) Absolute Level (dBm) = Submitted Level (dBm) - Cable loss (dB) + Antenna Gain (dBd/dBi)
2) Margin (dB) = Limit (dBm) - Absolute Level (dBm)

Test mode: Transmitting (Pre-scan with all the bandwidth, and worse case as below)

30 MHz ~ 20 GHz:
LTE Band 2:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Low Channel										
459.58	52.91	182	100	H	-46.48	0.55	-1.71	-44.22	-13	31.22
459.58	52.3	339	200	V	-47.09	0.55	-1.71	-44.83	-13	31.83
3701.40	41.77	57	150	H	-65.19	0.95	9.78	-56.36	-13	43.36
3701.40	41.14	309	100	V	-65.82	0.95	9.78	-56.99	-13	43.99
16-QAM 1.4MHz Bandwidth Low Channel										
459.58	52.02	111	150	H	-47.37	0.55	-1.71	-45.11	-13	32.11
459.58	51.76	254	150	V	-47.63	0.55	-1.71	-45.37	-13	32.37
3701.40	41.45	311	200	H	-65.51	0.95	9.78	-56.68	-13	43.68
3701.40	41.39	271	200	V	-65.57	0.95	9.78	-56.74	-13	43.74

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
459.58	52.91	182	100	H	-46.48	0.55	-1.71	-44.22	-13	31.22
459.58	52.3	339	200	V	-47.09	0.55	-1.71	-44.83	-13	31.83
3760.00	41.77	57	150	H	-65.19	0.95	9.78	-56.36	-13	43.36
3760.00	41.14	309	100	V	-65.82	0.95	9.78	-56.99	-13	43.99
16-QAM 1.4MHz Bandwidth Middle Channel										
459.58	52.02	111	150	H	-47.37	0.55	-1.71	-45.11	-13	32.11
459.58	51.76	254	150	V	-47.63	0.55	-1.71	-45.37	-13	32.37
3760.00	41.45	311	200	H	-65.51	0.95	9.78	-56.68	-13	43.68
3760.00	41.39	271	200	V	-65.57	0.95	9.78	-56.74	-13	43.74

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth High Channel										
459.58	52.42	246	100	H	-46.97	0.55	-1.71	-44.71	-13	31.71
459.58	52.66	155	200	V	-46.73	0.55	-1.71	-44.47	-13	31.47
3818.60	41.00	76	150	H	-65.6	0.96	9.71	-56.85	-13	43.85
3818.60	41.45	258	100	V	-65.15	0.96	9.71	-56.4	-13	43.40
16-QAM 1.4MHz Bandwidth High Channel										
459.58	53.12	286	150	H	-46.27	0.55	-1.71	-44.01	-13	31.01
459.58	52.74	37	150	V	-46.65	0.55	-1.71	-44.39	-13	31.39
3818.60	41.02	348	200	H	-65.58	0.96	9.71	-56.83	-13	43.83
3818.60	40.85	178	200	V	-65.75	0.96	9.71	-57	-13	44.00

30 MHz ~ 20 GHz:
LTE Band 4:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Low Channel										
457.52	51.01	123	100	H	-48.12	0.55	-1.69	-45.88	-13	32.88
457.52	51.89	21	200	V	-47.24	0.55	-1.69	-45	-13	32
3421.40	42.46	174	150	H	-65.48	0.93	9.82	-56.59	-13	43.59
3421.40	42.84	299	100	V	-65.1	0.93	9.82	-56.21	-13	43.21
16-QAM 1.4MHz Bandwidth Low Channel										
457.52	51.67	40	150	H	-47.46	0.55	-1.69	-45.22	-13	32.22
457.52	51.9	72	150	V	-47.23	0.55	-1.69	-44.99	-13	31.99
3421.40	42.13	233	200	H	-65.81	0.93	9.82	-56.92	-13	43.92
3421.40	42.88	276	200	V	-65.06	0.93	9.82	-56.17	-13	43.17

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
457.52	51.09	275	100	H	-48.04	0.55	-1.69	-45.8	-13	32.8
457.52	51.24	243	200	V	-47.89	0.55	-1.69	-45.65	-13	32.65
3465.00	42.19	103	150	H	-65.56	0.93	9.87	-56.62	-13	43.62
3465.00	42.51	260	100	V	-65.24	0.93	9.87	-56.3	-13	43.3
16-QAM 1.4MHz Bandwidth Middle Channel										
457.52	51.8	224	150	H	-47.33	0.55	-1.69	-45.09	-13	32.09
457.52	51.8	347	150	V	-47.33	0.55	-1.69	-45.09	-13	32.09
3465.00	41.82	233	200	H	-65.93	0.93	9.87	-56.99	-13	43.99
3465.00	42.24	262	200	V	-65.51	0.93	9.87	-56.57	-13	43.57

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth High Channel										
457.52	51.82	277	100	H	-47.31	0.55	-1.69	-45.07	-13	32.07
457.52	51.56	306	200	V	-47.57	0.55	-1.69	-45.33	-13	32.33
3508.60	41.8	15	150	H	-65.77	0.93	9.90	-56.8	-13	43.8
3508.60	41.82	76	100	V	-65.75	0.93	9.90	-56.78	-13	43.78
16-QAM 1.4MHz Bandwidth High Channel										
457.52	52	118	150	H	-47.13	0.55	-1.69	-44.89	-13	31.89
457.52	51.9	111	150	V	-47.23	0.55	-1.69	-44.99	-13	31.99
3508.60	42.09	192	200	H	-65.48	0.93	9.90	-56.51	-13	43.51
3508.60	42.39	18	200	V	-65.18	0.93	9.90	-56.21	-13	43.21

LTE Band 5:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Low Channel										
459.22	51.22	44	100	H	-48.1	0.55	-1.71	-45.84	-13	32.84
459.22	51.21	110	200	V	-48.11	0.55	-1.71	-45.85	-13	32.85
1649.40	49.09	148	150	H	-64.25	0.84	8.44	-56.65	-13	43.65
1649.40	48.8	228	100	V	-64.54	0.84	8.44	-56.94	-13	43.94
16-QAM 1.4MHz Bandwidth Low Channel										
459.22	51.55	100	150	H	-47.77	0.55	-1.71	-45.51	-13	32.51
459.22	50.41	148	150	V	-48.91	0.55	-1.71	-46.65	-13	33.65
1649.40	49.7	298	200	H	-63.64	0.84	8.44	-56.04	-13	43.04
1649.40	49.21	136	200	V	-64.13	0.84	8.44	-56.53	-13	43.53

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
459.22	51.45	9	100	H	-47.87	0.55	-1.71	-45.61	-13	32.61
459.22	51.55	98	200	V	-47.77	0.55	-1.71	-45.51	-13	32.51
1673.00	39.62	157	150	H	-63.77	0.84	8.48	-56.13	-13	43.13
1673.00	38.81	129	100	V	-64.58	0.84	8.48	-56.94	-13	43.94
16-QAM 1.4MHz Bandwidth Middle Channel										
459.22	51.25	305	150	H	-48.07	0.55	-1.71	-45.81	-13	32.81
459.22	50.85	165	150	V	-48.47	0.55	-1.71	-46.21	-13	33.21
1673.00	38.79	198	200	H	-64.6	0.84	8.48	-56.96	-13	43.96
1673.00	39.02	224	200	V	-64.37	0.84	8.48	-56.73	-13	43.73

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth High Channel										
459.22	51.4	21	100	H	-47.92	0.55	-1.71	-45.66	-13	32.66
459.22	51.94	142	200	V	-47.38	0.55	-1.71	-45.12	-13	32.12
1696.60	48.96	43	150	H	-64.05	0.84	8.51	-56.38	-13	43.38
1696.60	48.9	112	100	V	-64.11	0.84	8.51	-56.44	-13	43.44
16-QAM 1.4MHz Bandwidth High Channel										
459.22	51.44	45	150	H	-47.88	0.55	-1.71	-45.62	-13	32.62
459.22	50.85	346	150	V	-48.47	0.55	-1.71	-46.21	-13	33.21
1696.60	48.92	7	200	H	-64.09	0.84	8.51	-56.42	-13	43.42
1696.60	48.96	164	200	V	-64.05	0.84	8.51	-56.38	-13	43.38

30 MHz ~ 10 GHz:
LTE Band 12:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Low Channel										
342.82	50.15	44	100	H	-58.11	0.49	-1.81	-55.81	-13	42.81
342.82	50.05	83	200	V	-58.21	0.49	-1.81	-55.91	-13	42.91
1399.40	44.25	222	150	H	-69.92	0.82	7.92	-62.82	-13	49.82
1399.40	44.98	77	100	V	-69.19	0.82	7.92	-62.09	-13	49.09
16-QAM 1.4MHz Bandwidth Low Channel										
342.82	50.96	233	150	H	-57.3	0.49	-1.91	-54.9	-13	41.90
342.82	50.47	14	150	V	-57.79	0.49	-1.91	-55.39	-13	42.39
1399.40	44.7	37	200	H	-69.47	0.82	7.92	-62.37	-13	49.37
1399.40	44.82	303	200	V	-69.35	0.82	7.92	-62.25	-13	49.25

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
342.82	50.27	121	100	H	-57.99	0.49	-1.81	-55.69	-13	42.69
342.82	50.01	310	200	V	-58.25	0.49	-1.81	-55.95	-13	42.95
1415.00	44.83	9	150	H	-69.37	0.82	7.96	-62.23	-13	49.23
1415.00	44.9	78	100	V	-69.3	0.82	7.96	-62.16	-13	49.16
16-QAM 1.4MHz Bandwidth Middle Channel										
342.82	50.69	11	150	H	-57.57	0.49	-1.91	-55.17	-13	42.17
342.82	50.3	259	150	V	-57.96	0.49	-1.91	-55.56	-13	42.56
1415.00	44.38	244	200	H	-69.82	0.82	7.96	-62.68	-13	49.68
1415.00	44.88	295	200	V	-69.32	0.82	7.96	-62.18	-13	49.18

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth High Channel										
342.82	50.3	184	100	H	-57.96	0.49	-1.81	-55.66	-13	42.66
342.82	50.87	12	200	V	-57.39	0.49	-1.81	-55.09	-13	42.09
1430.60	44.22	94	150	H	-70.01	0.82	8	-62.83	-13	49.83
1430.60	44.43	56	100	V	-69.8	0.82	8	-62.62	-13	49.62
16-QAM 1.4MHz Bandwidth High Channel										
342.82	50.51	46	150	H	-57.75	0.49	-1.91	-55.35	-13	42.35
342.82	50.31	125	150	V	-57.95	0.49	-1.91	-55.55	-13	42.55
1430.60	44.53	14	200	H	-69.7	0.82	8	-62.52	-13	49.52
1430.60	44.9	285	200	V	-69.33	0.82	8	-62.15	-13	49.15

30 MHz ~ 10 GHz:
LTE Band 17:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Low Channel										
296.99	54.21	333	100	H	-52.66	0.46	-2.16	-50.04	-13	37.04
296.99	55.32	290	200	V	-51.55	0.46	-2.16	-48.93	-13	35.93
1413.00	55.46	54	150	H	-59.51	0.83	8.06	-52.28	-13	39.28
1413.00	56.01	18	100	V	-58.96	0.83	8.06	-51.73	-13	38.73
16-QAM 5MHz Bandwidth Low Channel										
296.99	54.69	94	150	H	-52.18	0.46	-2.16	-49.56	-13	36.56
296.99	55.09	302	150	V	-51.78	0.46	-2.16	-49.16	-13	36.16
1413.00	54.77	47	200	H	-60.2	0.83	8.06	-52.97	-13	39.97
1413.00	55.87	180	200	V	-59.1	0.83	8.06	-51.87	-13	38.87

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Middle Channel										
296.99	54.7	23	100	H	-52.17	0.46	-2.16	-49.55	-13	36.55
296.99	55.91	336	200	V	-50.96	0.46	-2.16	-48.34	-13	35.34
1420.00	55.11	253	150	H	-59.81	0.83	8.07	-52.57	-13	39.57
1420.00	56.35	200	100	V	-58.57	0.83	8.07	-51.33	-13	38.33
16-QAM 5MHz Bandwidth Middle Channel										
296.99	54.77	327	150	H	-52.1	0.46	-2.16	-49.48	-13	36.48
296.99	55.12	254	150	V	-51.75	0.46	-2.16	-49.13	-13	36.13
1420.00	55.4	90	200	H	-59.52	0.83	8.07	-52.28	-13	39.28
1420.00	55.73	139	200	V	-59.19	0.83	8.07	-51.95	-13	38.95

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth High Channel										
296.99	54.88	314	100	H	-51.99	0.46	-2.16	-49.37	-13	36.37
296.99	55.51	343	200	V	-51.36	0.46	-2.16	-48.74	-13	35.74
1427.00	55.55	55	150	H	-59.33	0.83	8.08	-52.08	-13	39.08
1427.00	56.34	160	100	V	-58.54	0.83	8.08	-51.29	-13	38.29
16-QAM 5MHz Bandwidth High Channel										
296.99	54.94	332	150	H	-51.93	0.46	-2.16	-49.31	-13	36.31
296.99	55.72	247	150	V	-51.15	0.46	-2.16	-48.53	-13	35.53
1427.00	54.69	124	200	H	-60.19	0.83	8.08	-52.94	-13	39.94
1427.00	55.93	184	200	V	-58.95	0.83	8.08	-51.7	-13	38.70

Note:
1) Absolute Level (dBm) = Submitted Level (dBm) - Cable loss (dB) + Antenna Gain (dBd/dBi)
2) Margin (dB) = Limit (dBm) - Absolute Level (dBm)

FCC § 22.917 (a); § 24.238 (a); §27.53 (g) (h)- BAND EDGES

Applicable Standards

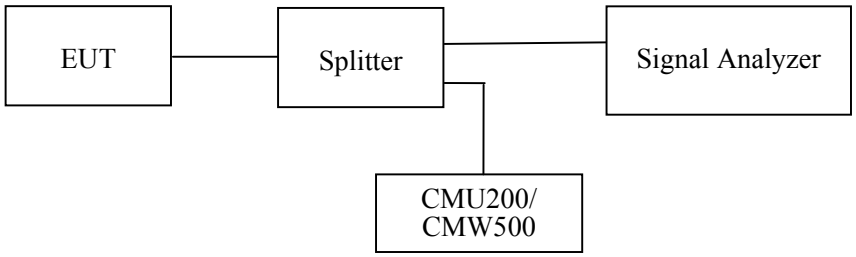
According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.
FCC §2.1051. The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or less, but at least one percent of the emission bandwidth of the fundamental emission of the transmitter, provided the measured energy is integrated over a 1 MHz bandwidth.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency.



Test Data

Environmental Conditions

Temperature:	23.4~24.1 ℃
Relative Humidity:	49~52 %
ATM Pressure:	100.5~102.1 kPa

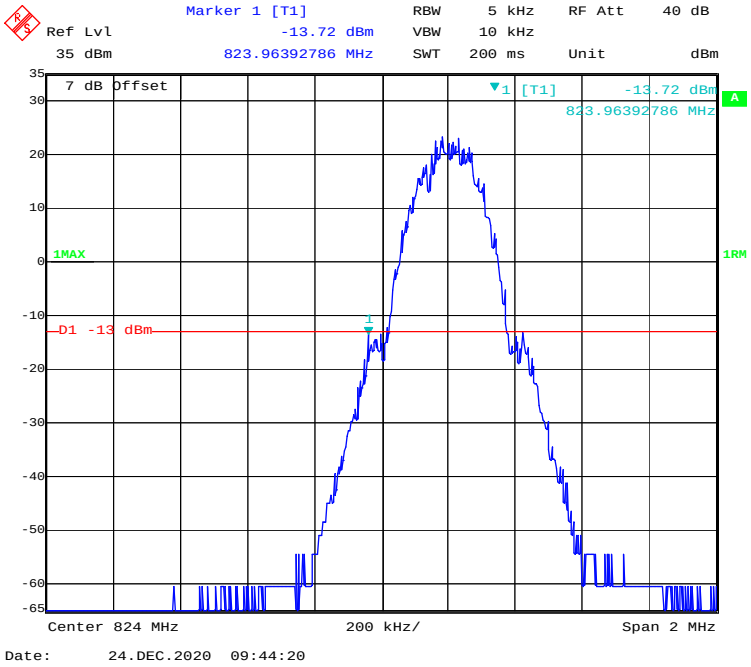
The testing was performed by Jack Jiao from 2020-12-23 to 2020-12-24.

EUT operation mode: Transmitting

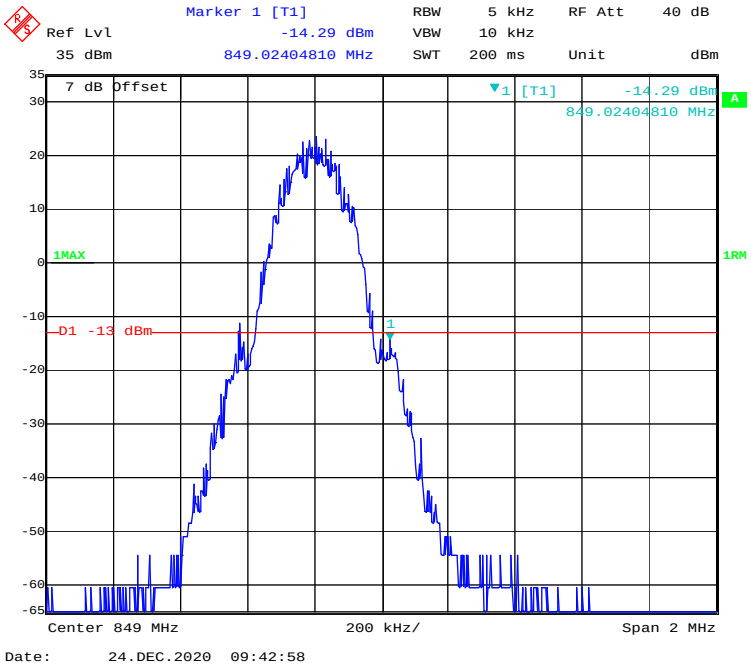
Test Result: Compliance.

GSM 850 Band:

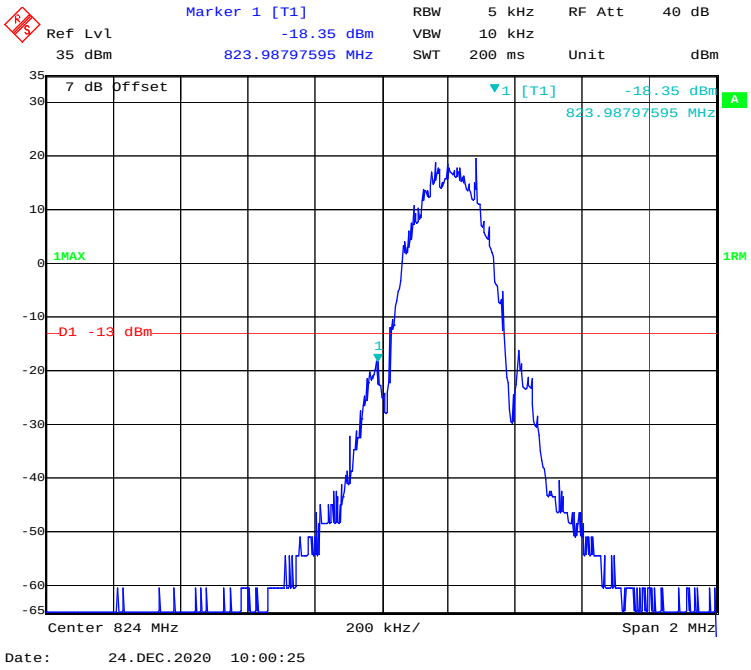
GPRS Mode, Left Band Edge



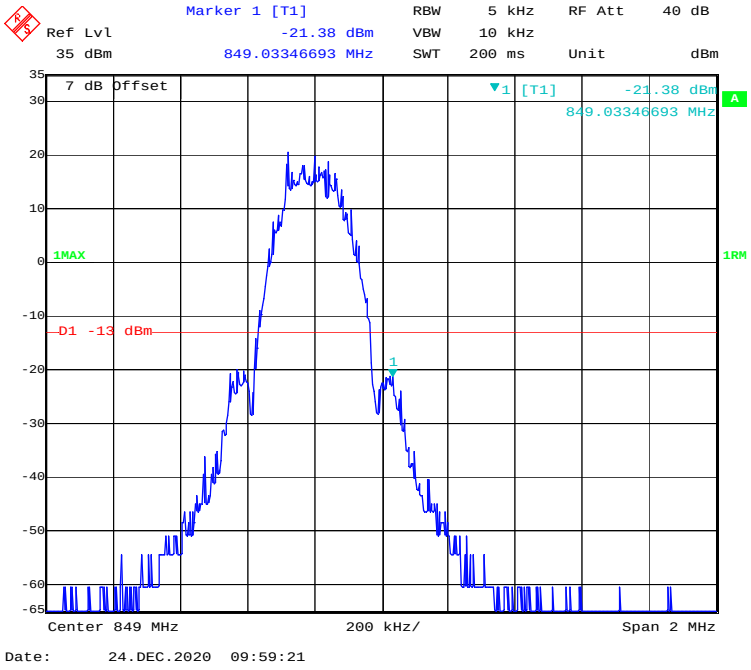
GPRS Mode, Right Band Edge



EGPRS Mode, Left Band Edge

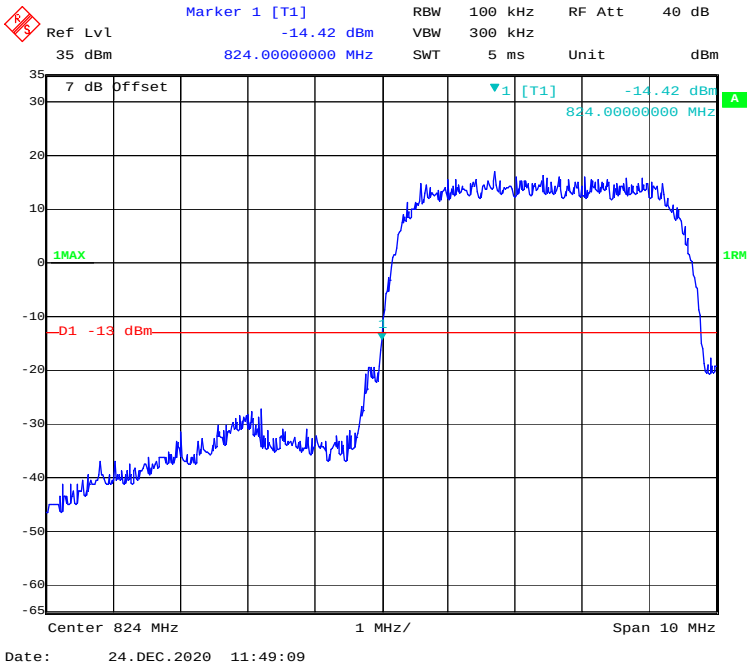


EGPRS Mode, Right Band Edge

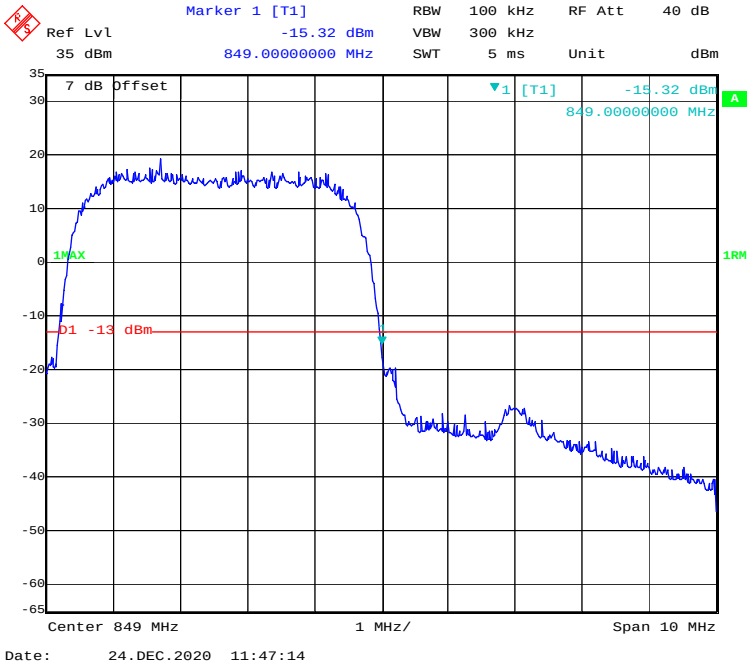


WCDMA Band V

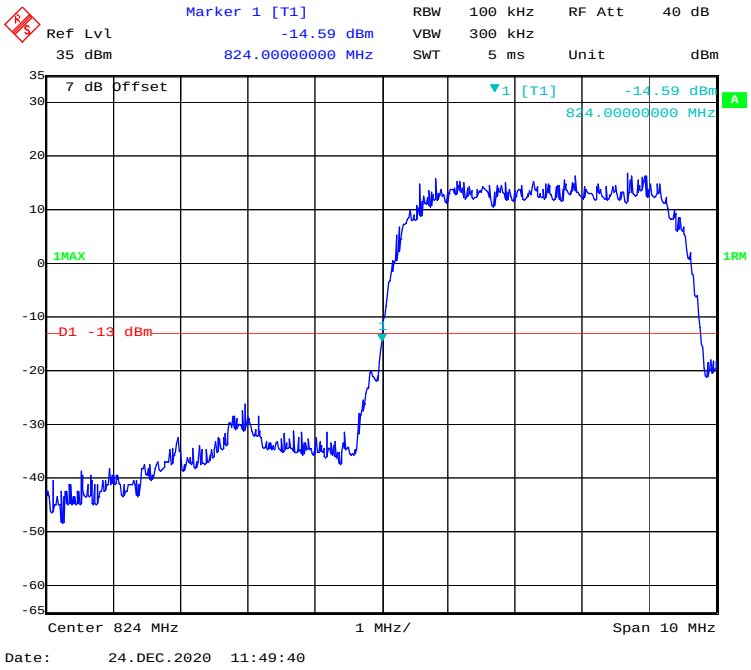
WCDMA (Rel 99) Mode, Left Band Edge



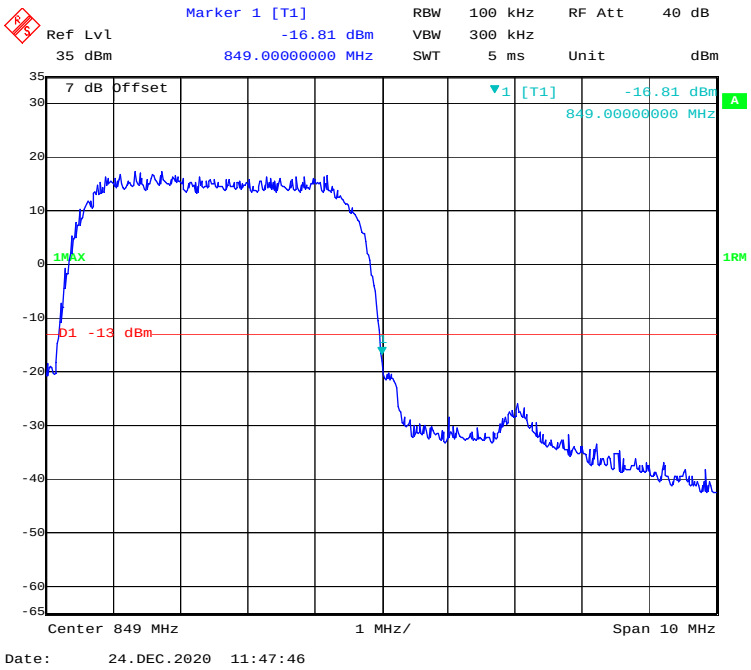
WCDMA (Rel 99) Mode, Right Band Edge



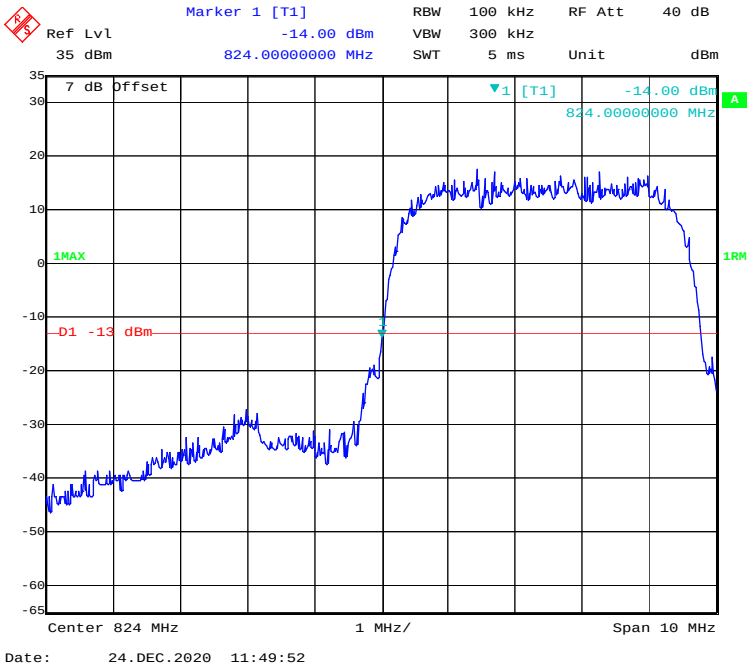
WCDMA (HSDPA) Mode, Left Band Edge



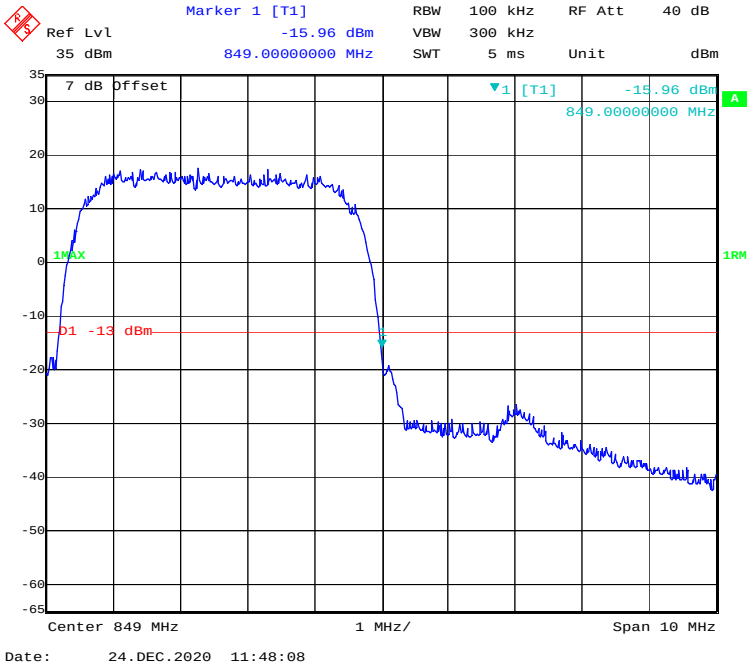
WCDMA (HSDPA) Mode, Right Band Edge



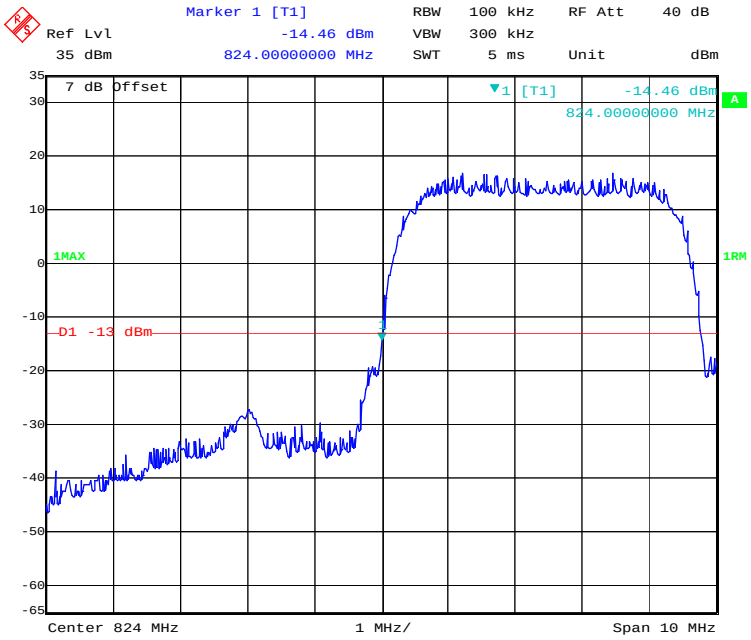
WCDMA (HSUPA) Mode, Left Band Edge



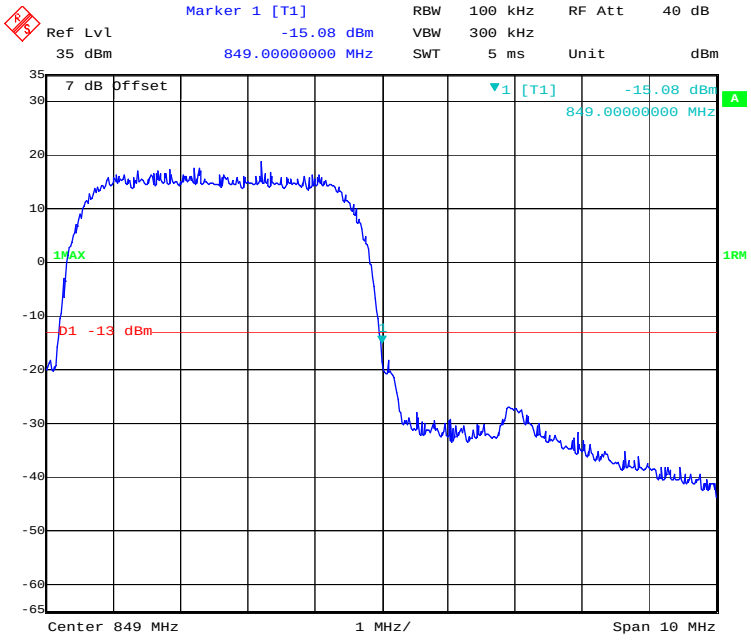
WCDMA (HSUPA) Mode, Right Band Edge



WCDMA (HSPA+) Mode, Left Band Edge

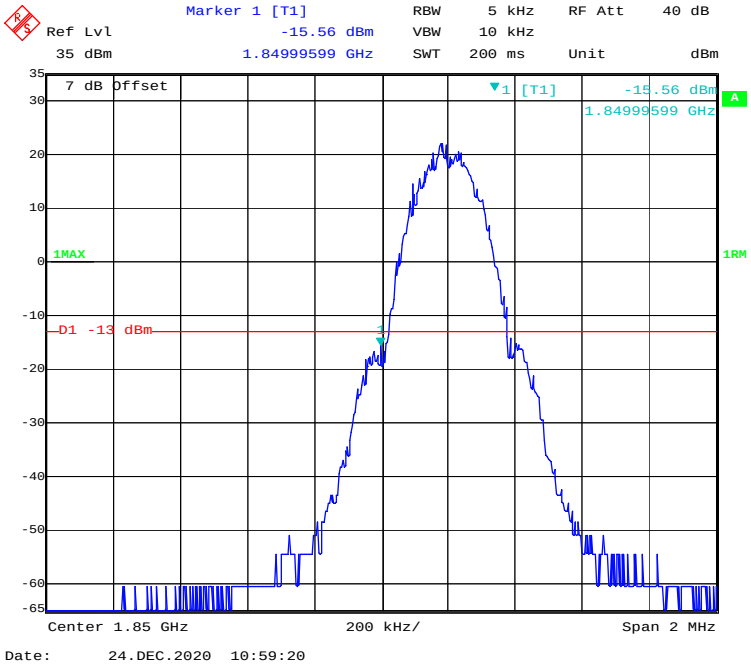


WCDMA (HSPA+) Mode, Right Band Edge

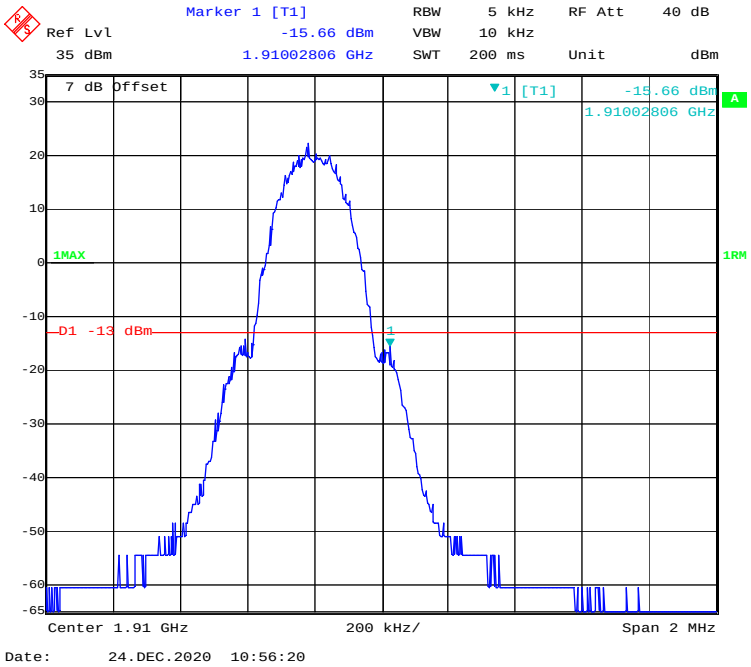


PCS 1900 Band:

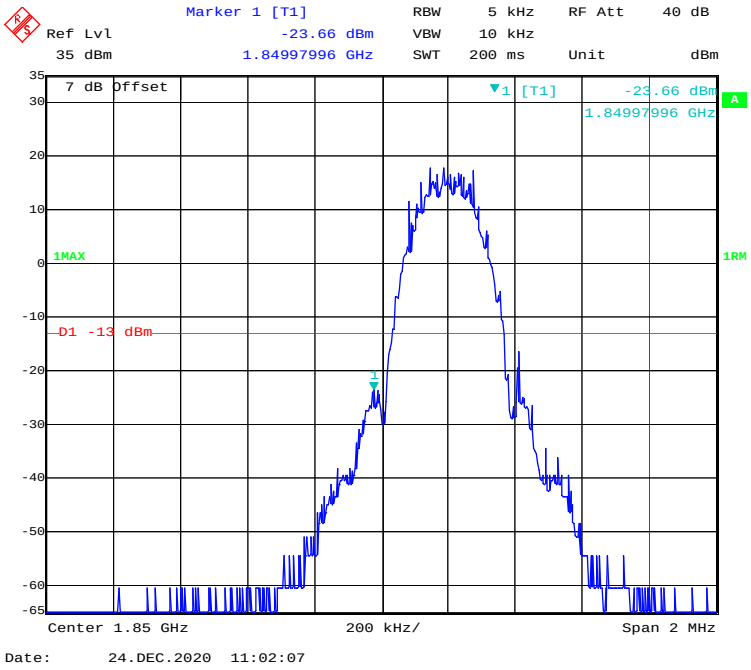
GPRS Mode, Left Band Edge



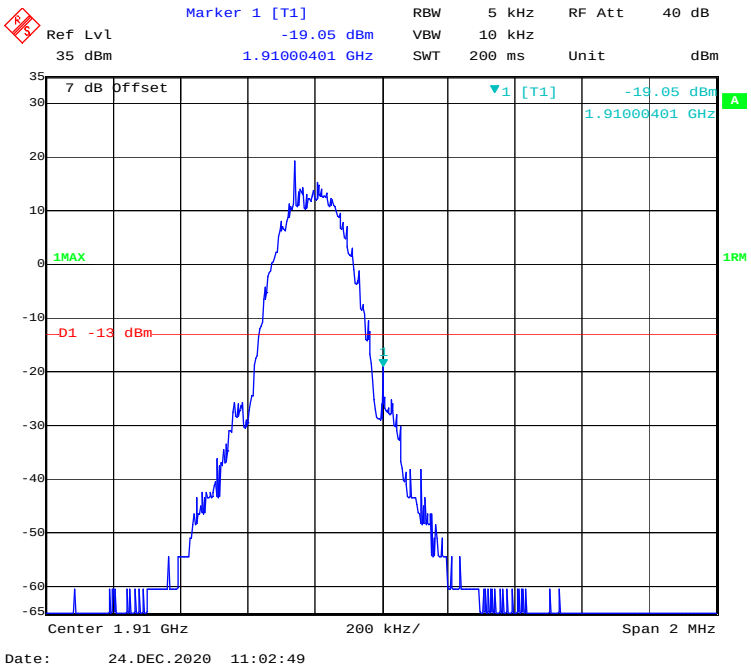
GPRS Mode, Right Band Edge



EGPRS Mode, Left Band Edge

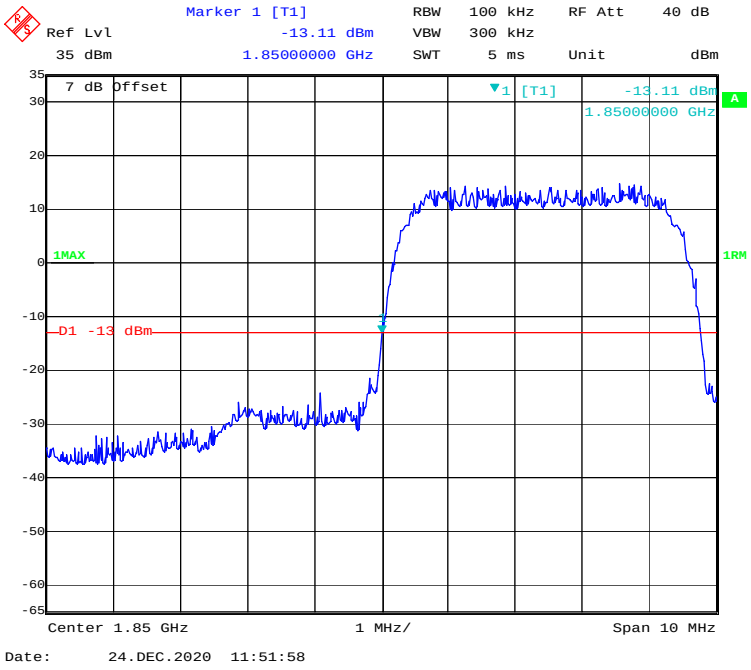


EGPRS Mode, Right Band Edge

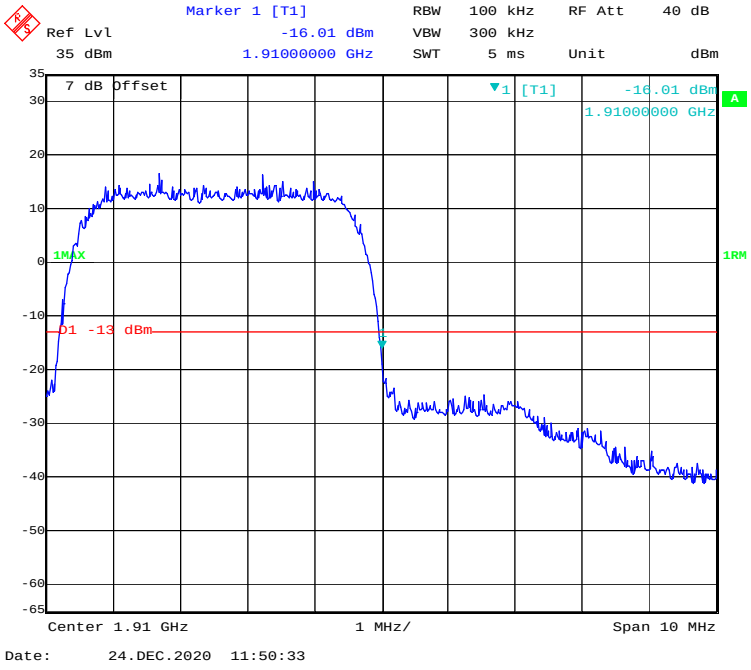


WCDMA Band II

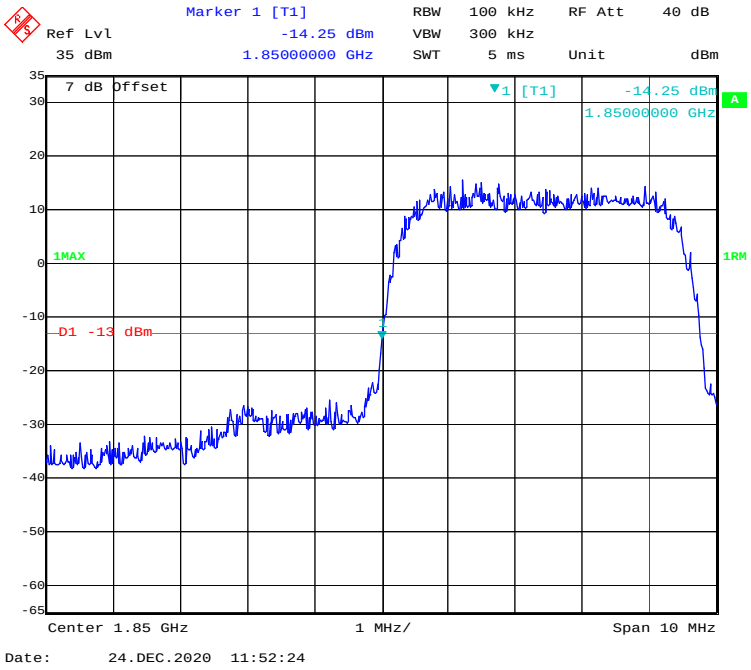
WCDMA (Rel 99) Mode, Left Band Edge



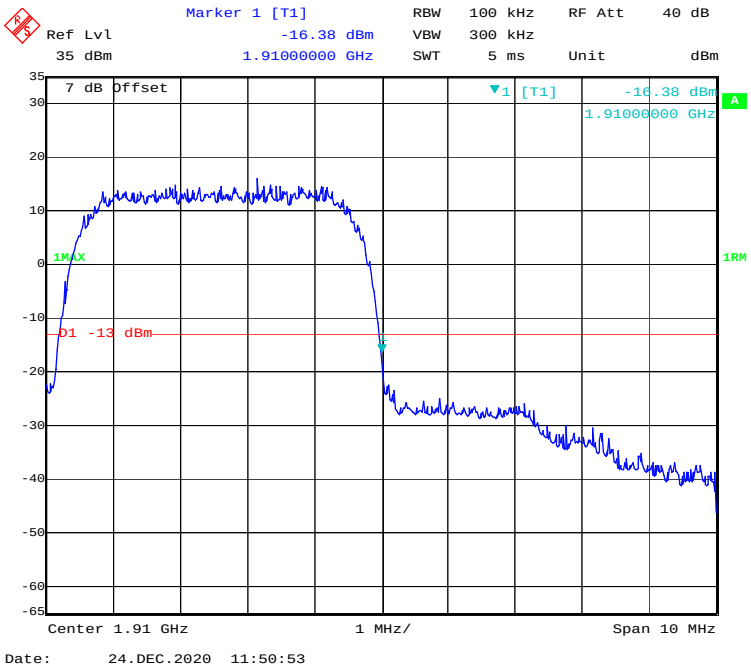
WCDMA (Rel 99) Mode, Right Band Edge



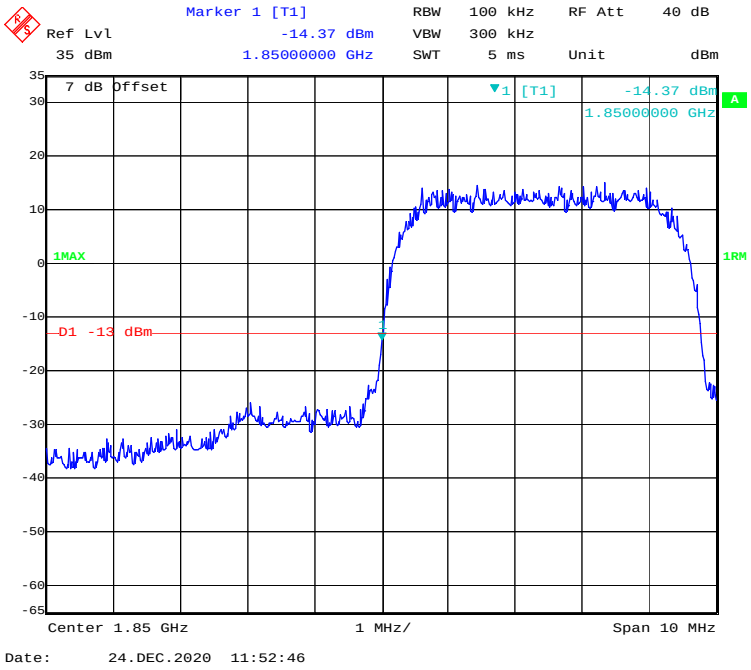
WCDMA (HSDPA) Mode, Left Band Edge



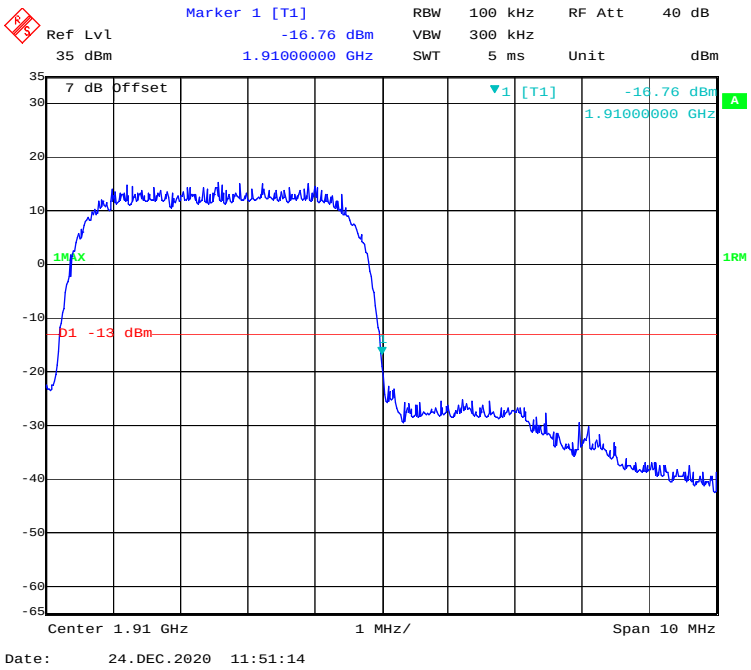
WCDMA (HSDPA) Mode, Right Band Edge



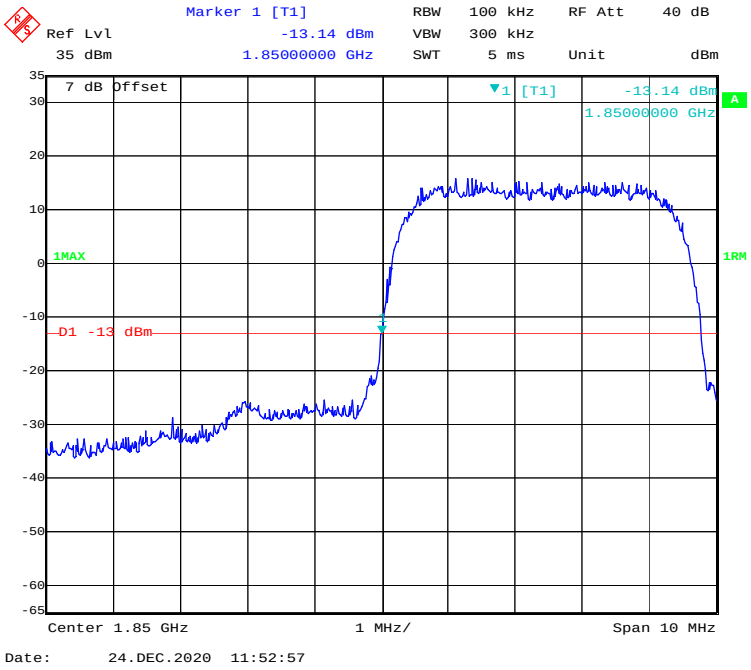
WCDMA (HSUPA) Mode, Left Band Edge



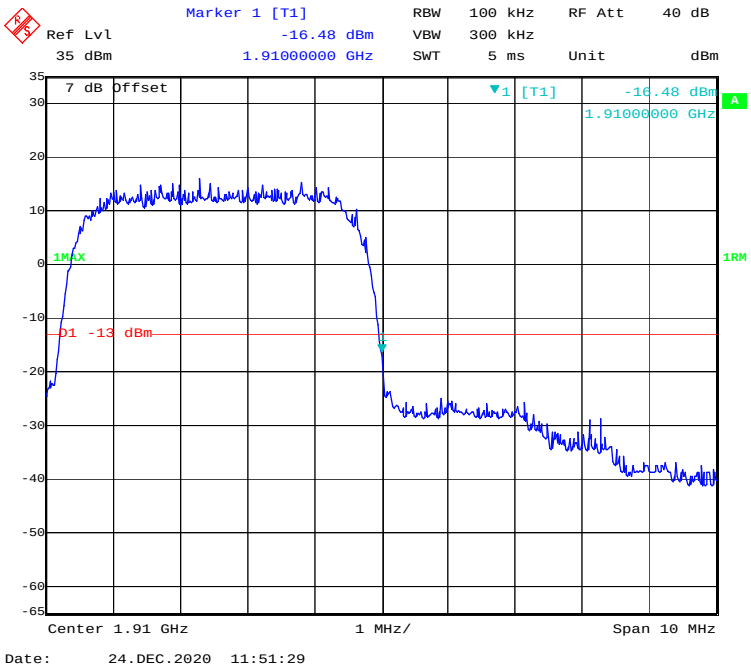
WCDMA (HSUPA) Mode, Right Band Edge



WCDMA (HSPA+) Mode, Left Band Edge

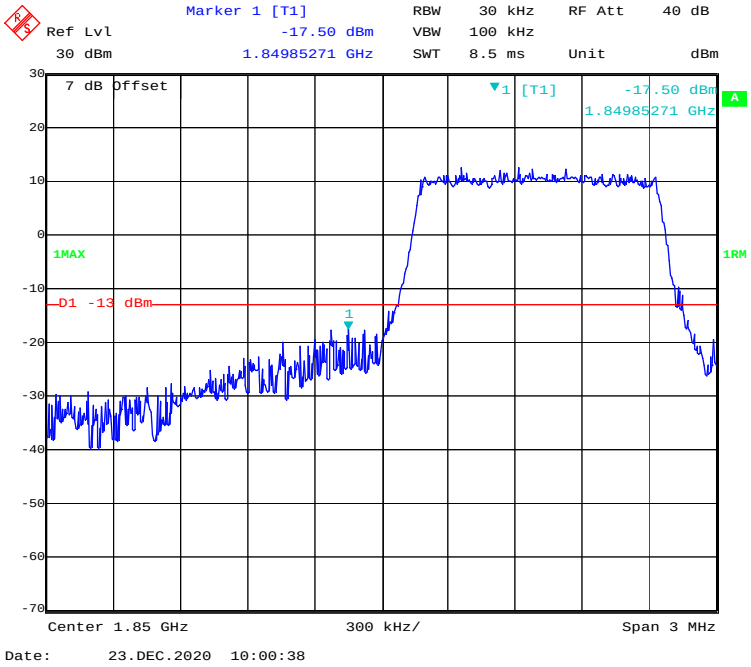


WCDMA (HSPA+) Mode, Right Band Edge

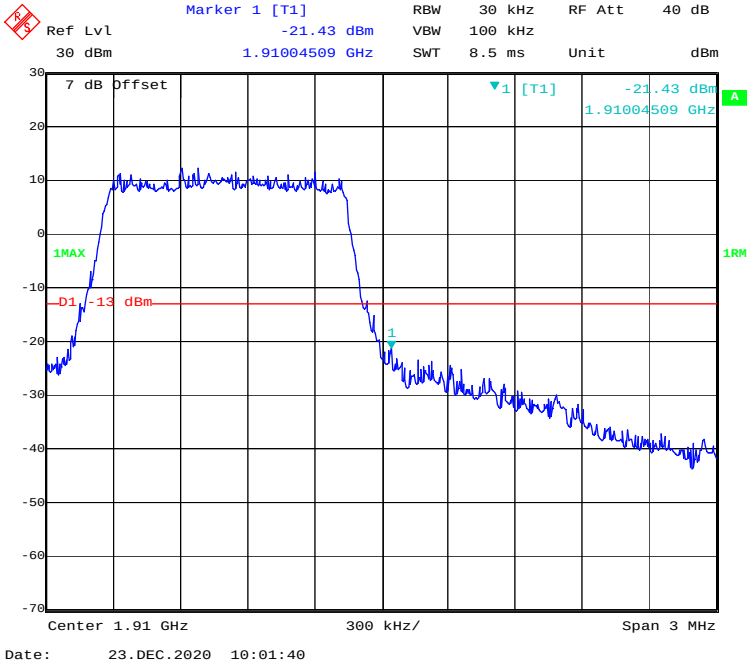


LTE Band 2:

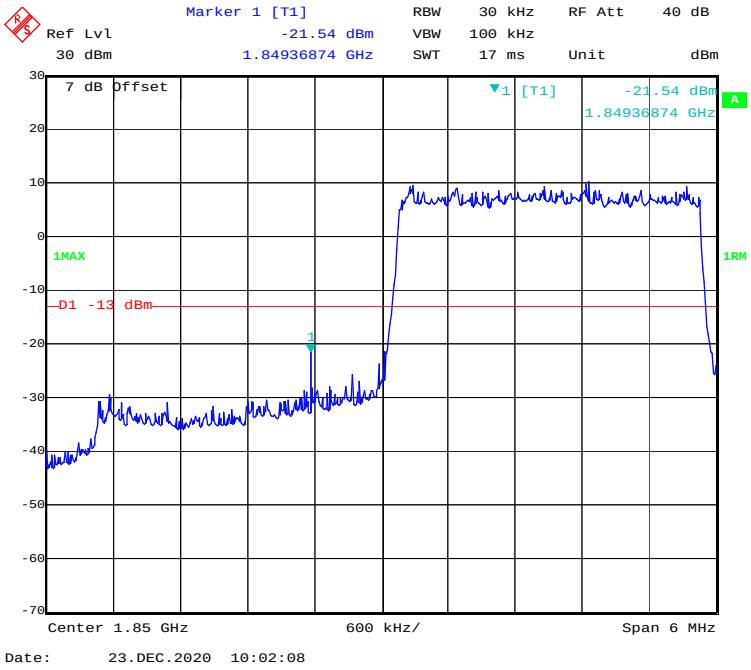
QPSK (1.4 MHz, FULL RB) - Left Band Edge



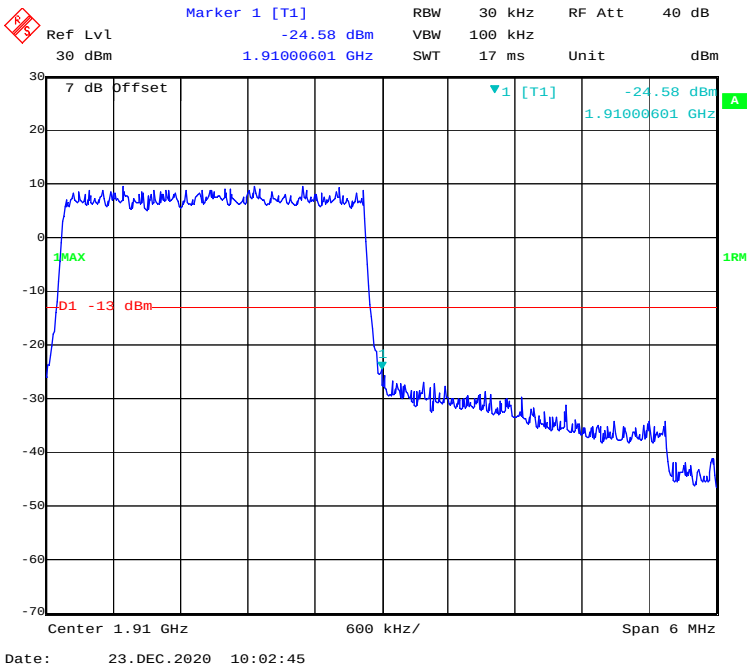
QPSK (1.4 MHz, FULL RB) - Right Band Edge



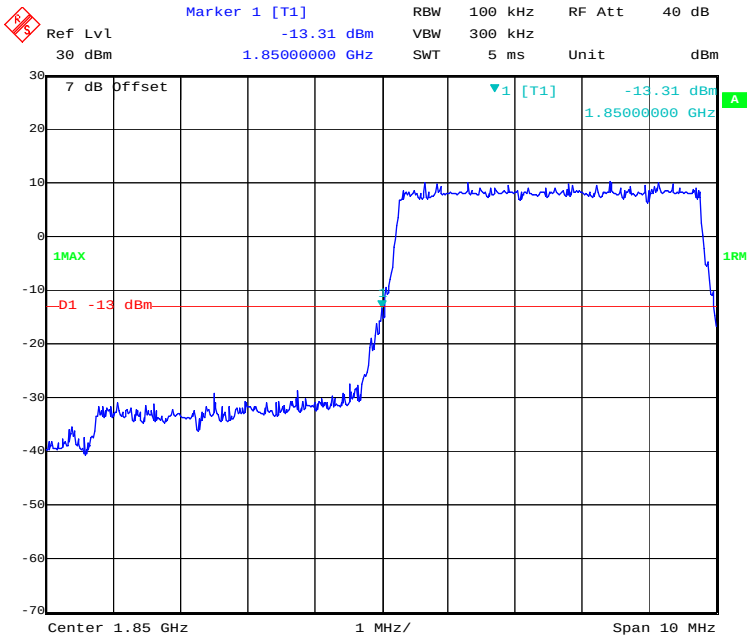
QPSK (3 MHz, FULL RB) - Left Band Edge



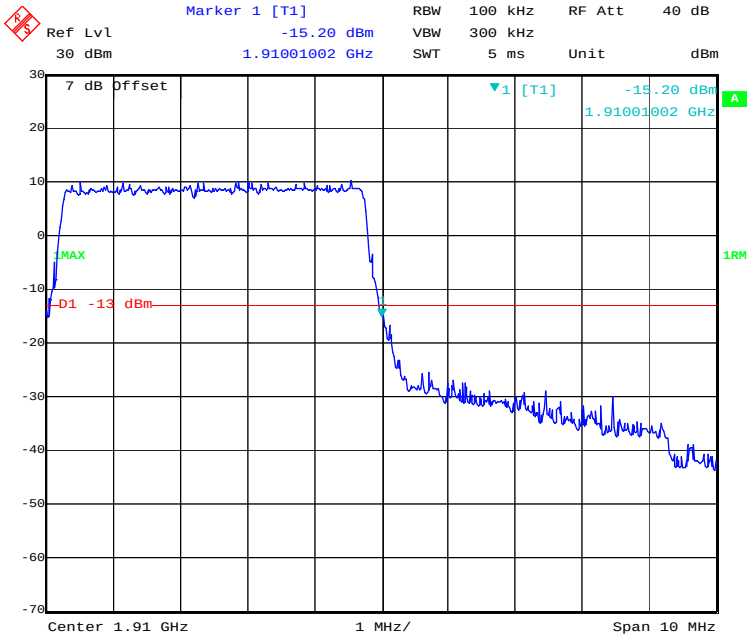
QPSK (3 MHz, FULL RB) - Right Band Edge



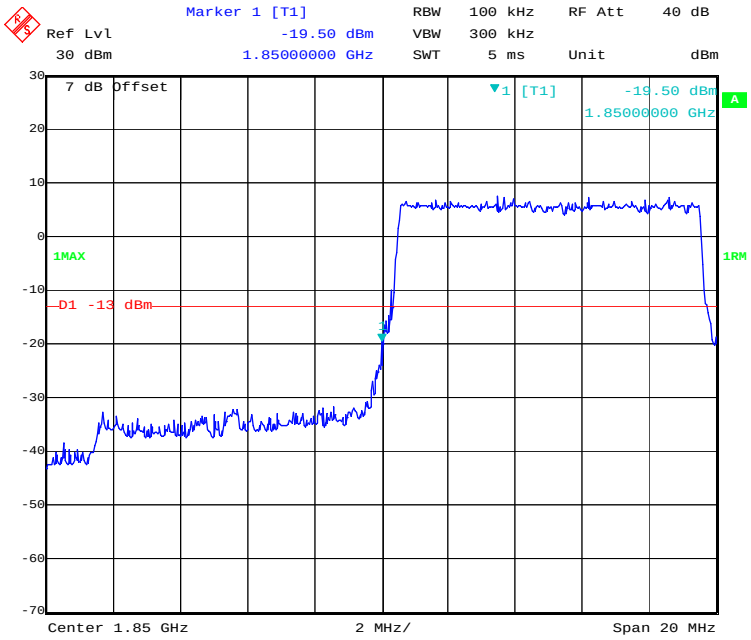
QPSK (5 MHz, FULL RB) - Left Band Edge



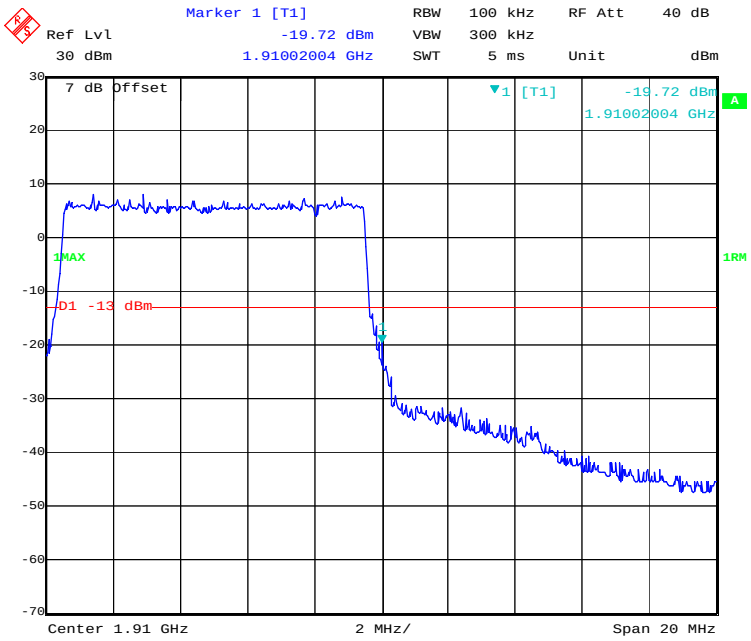
QPSK (5 MHz, FULL RB) - Right Band Edge



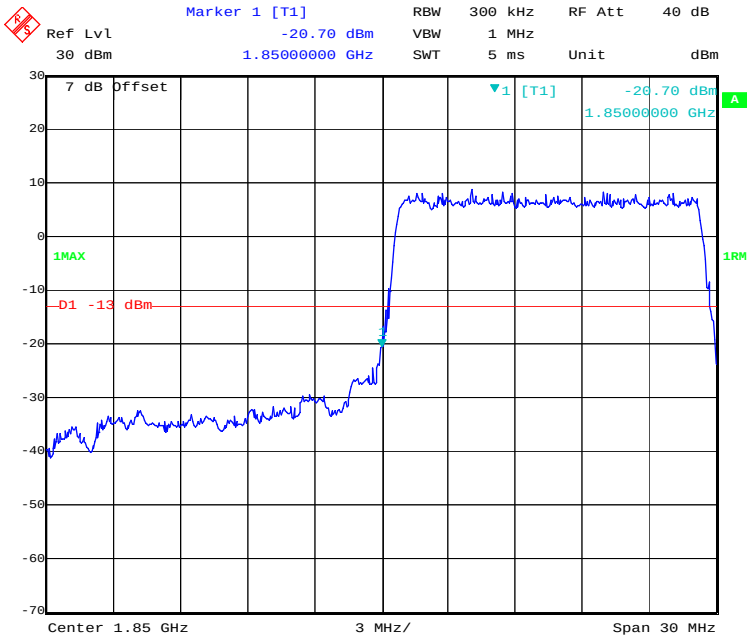
QPSK (10 MHz, FULL RB) - Left Band Edge



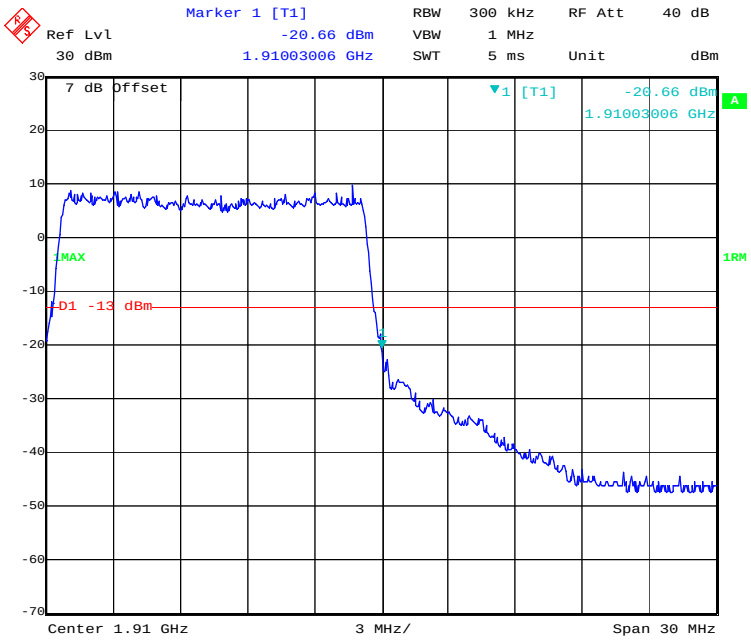
QPSK (10 MHz, FULL RB) - Right Band Edge



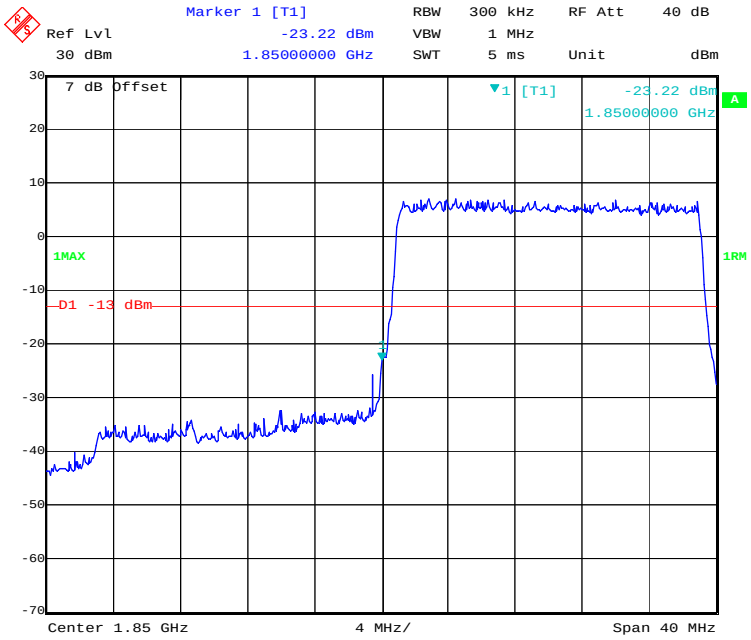
QPSK (15 MHz, FULL RB) - Left Band Edge



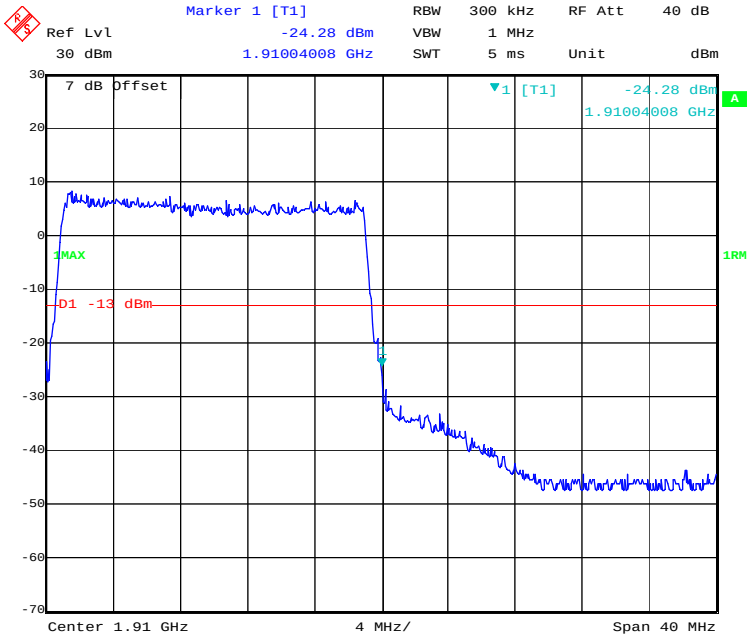
QPSK (15 MHz, FULL RB) - Right Band Edge



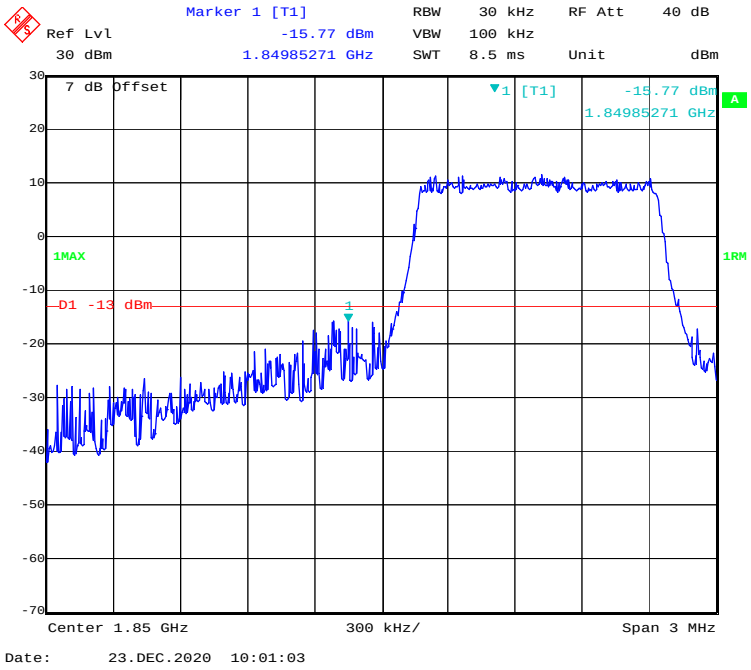
QPSK (20 MHz, FULL RB) - Left Band Edge



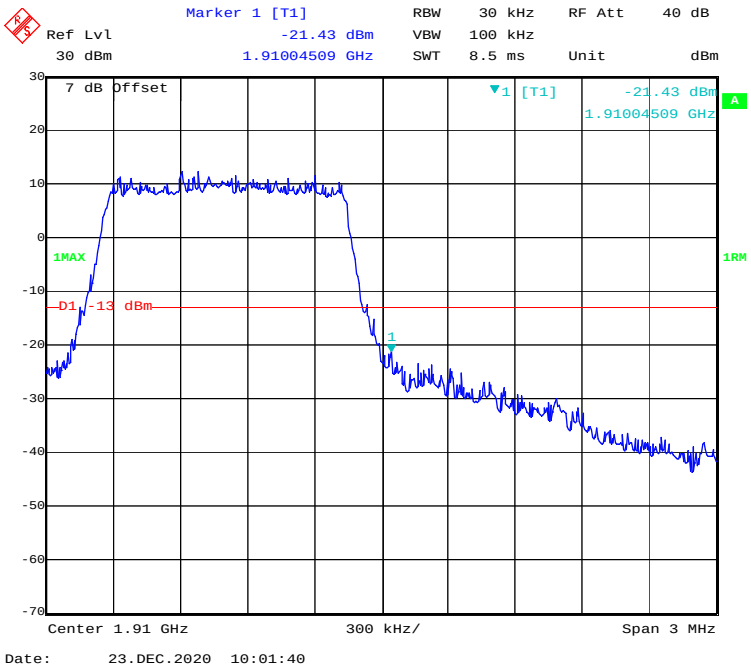
QPSK (20 MHz, FULL RB) - Right Band Edge



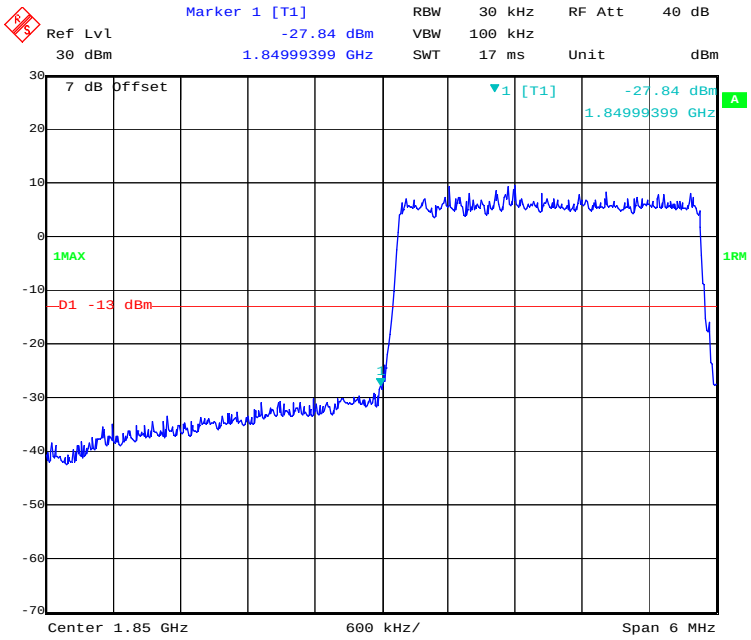
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



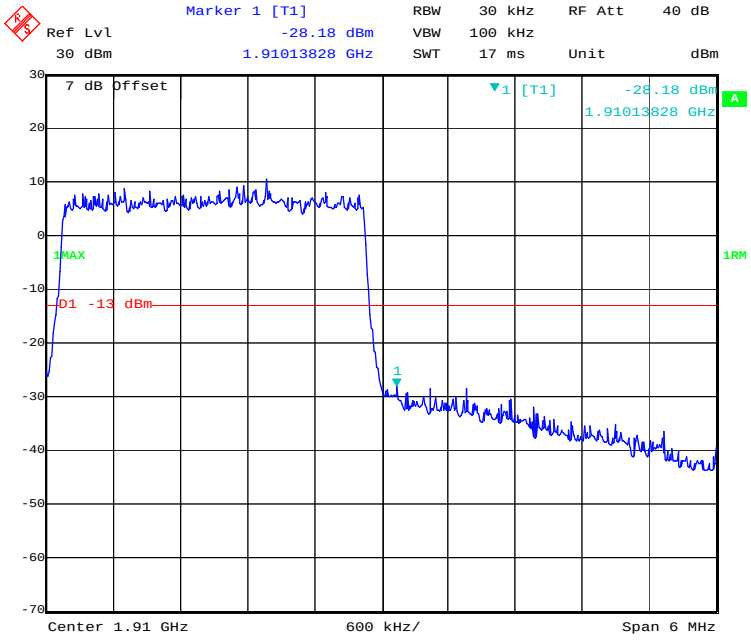
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



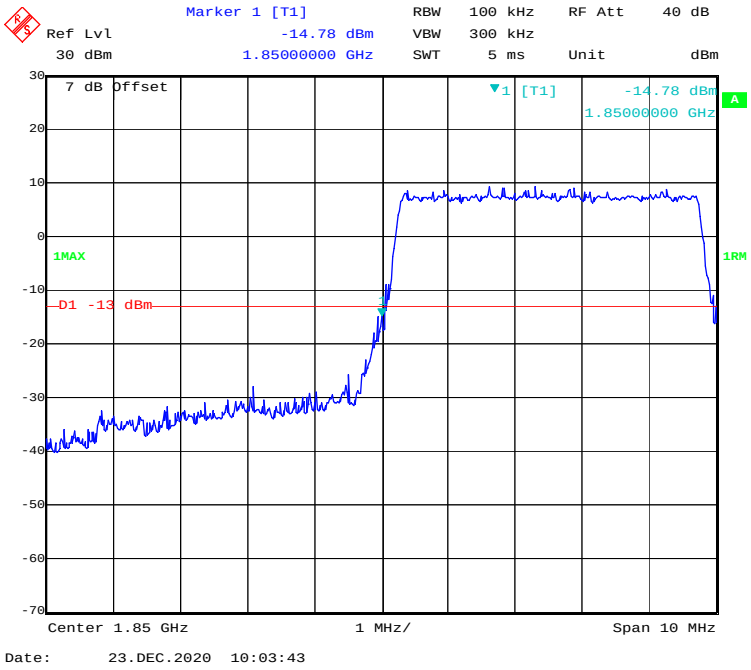
16-QAM (3 MHz, FULL RB) - Left Band Edge



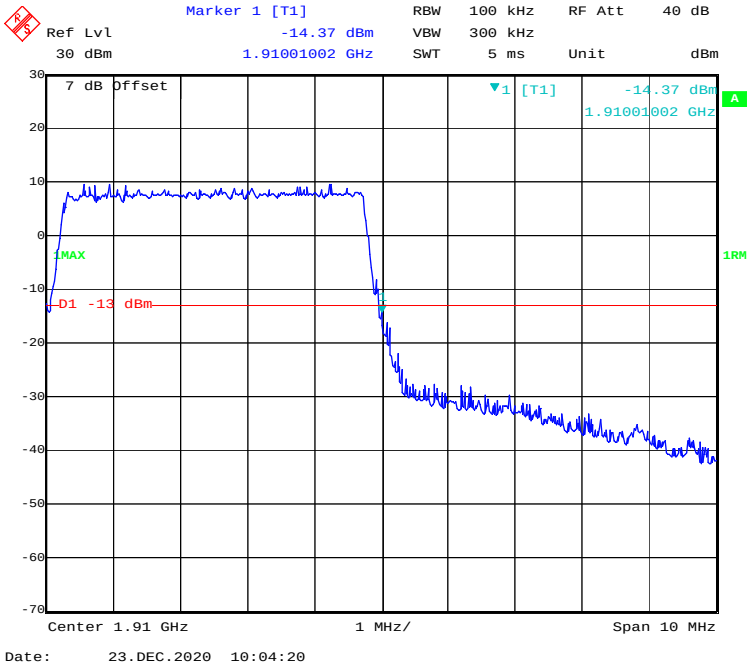
16-QAM (3 MHz, FULL RB) - Right Band Edge



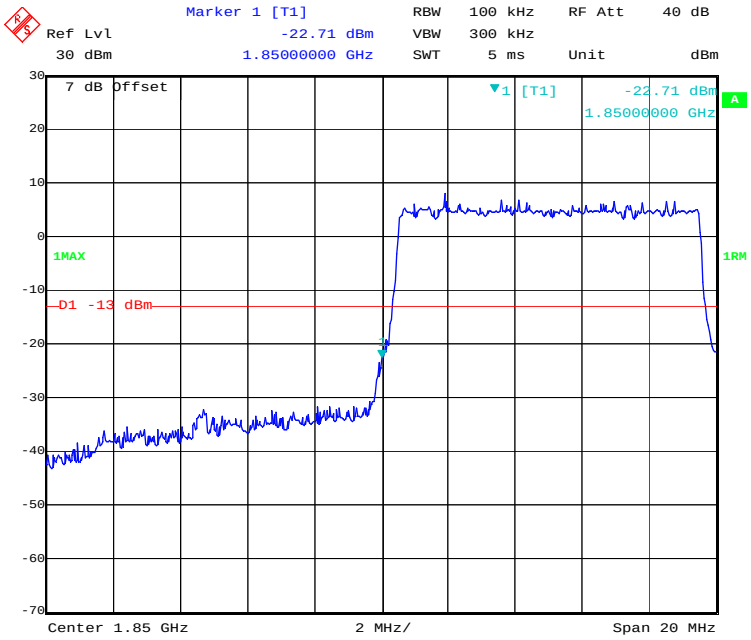
16-QAM (5 MHz, FULL RB) - Left Band Edge



16-QAM (5 MHz, FULL RB) - Right Band Edge

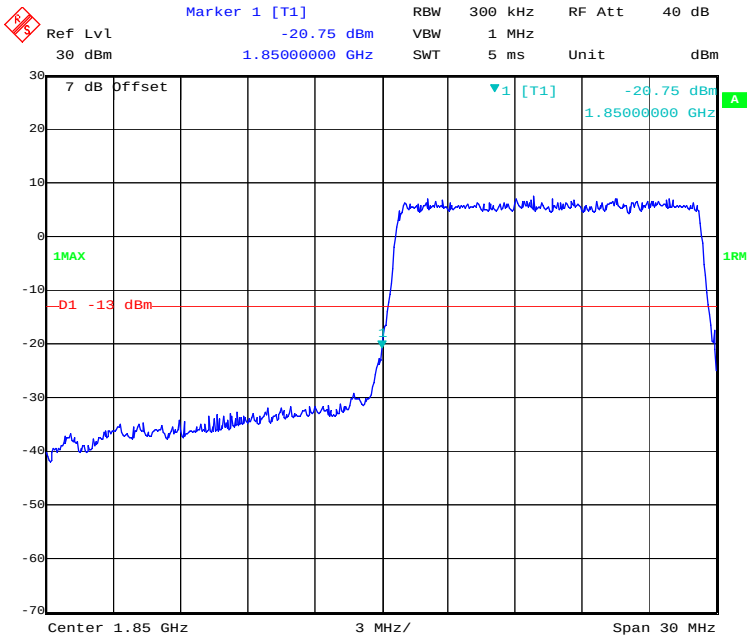


16-QAM (10 MHz, FULL RB) - Left Band Edge

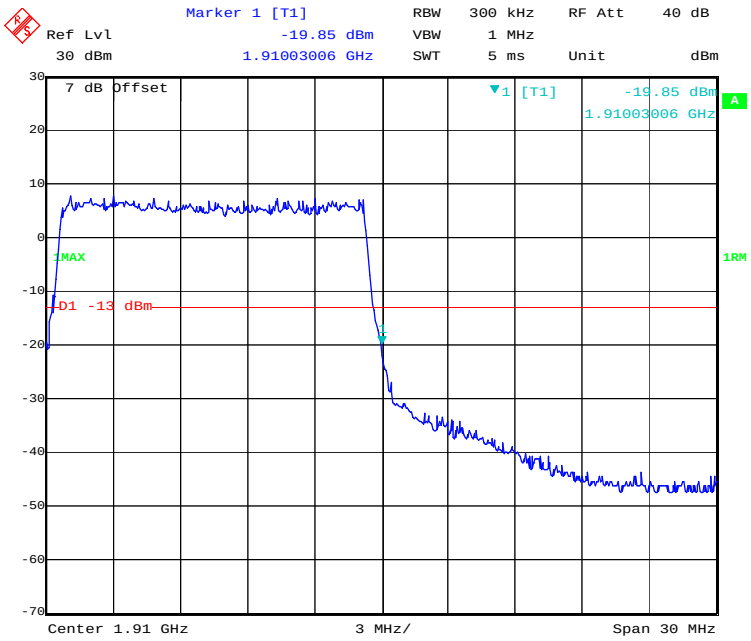


16-QAM (10 MHz, FULL RB) - Right Band Edge

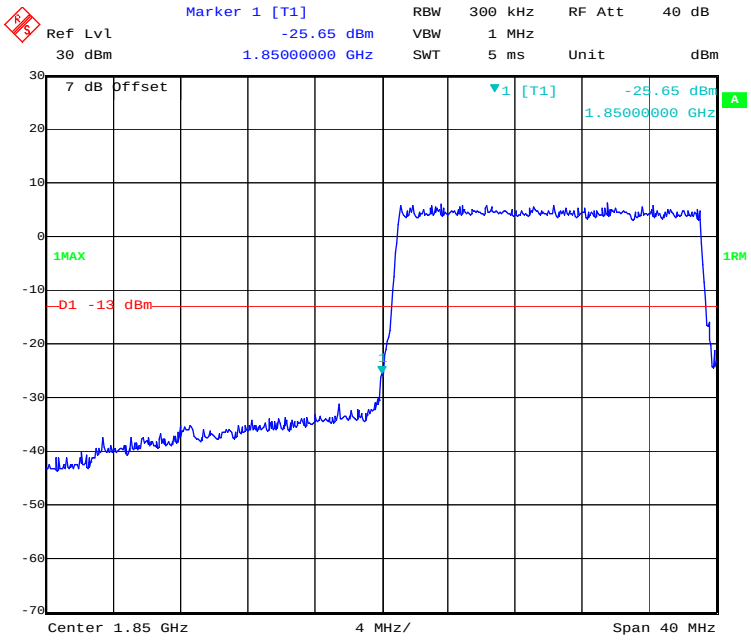
16-QAM (15 MHz, FULL RB) - Left Band Edge



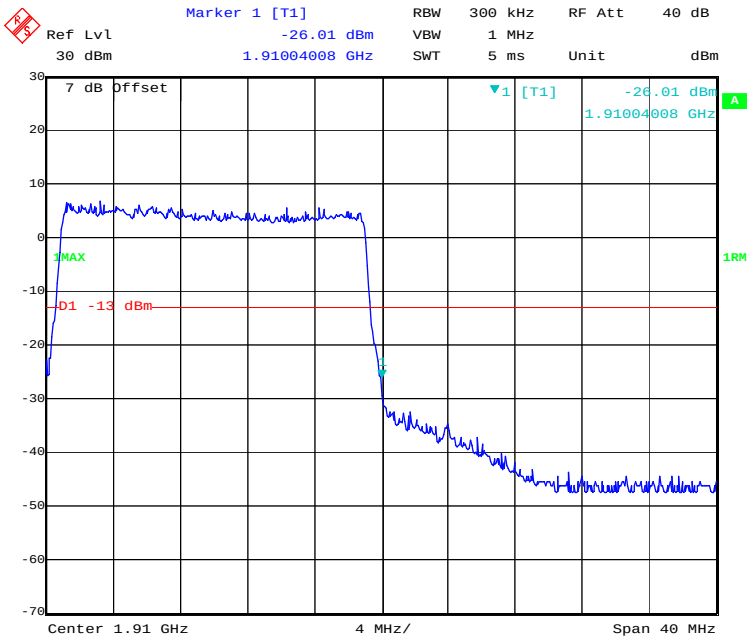
16-QAM (15 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge

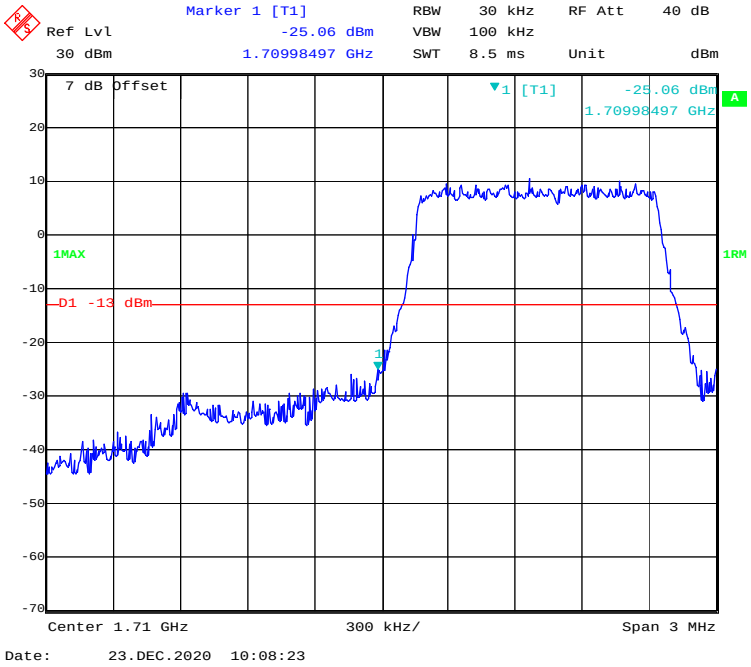


16-QAM (20 MHz, FULL RB) - Right Band Edge

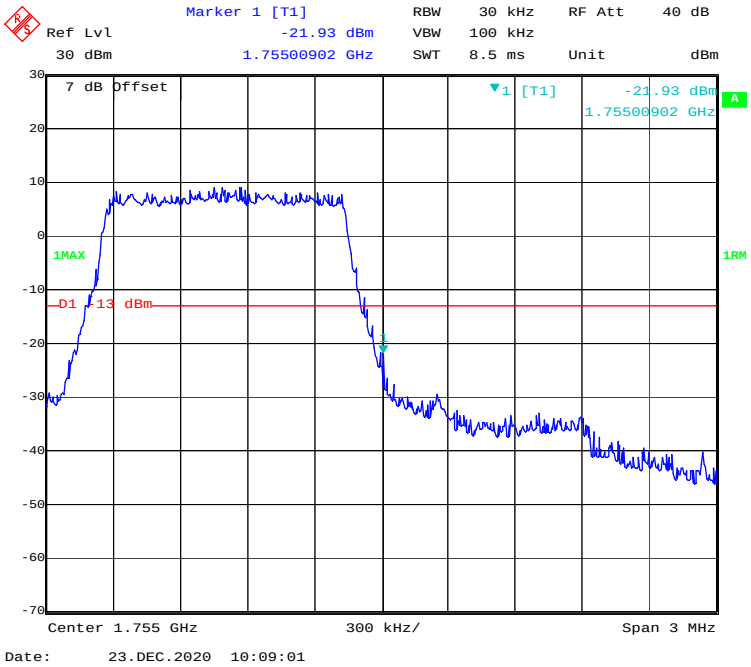


LTE Band 4:

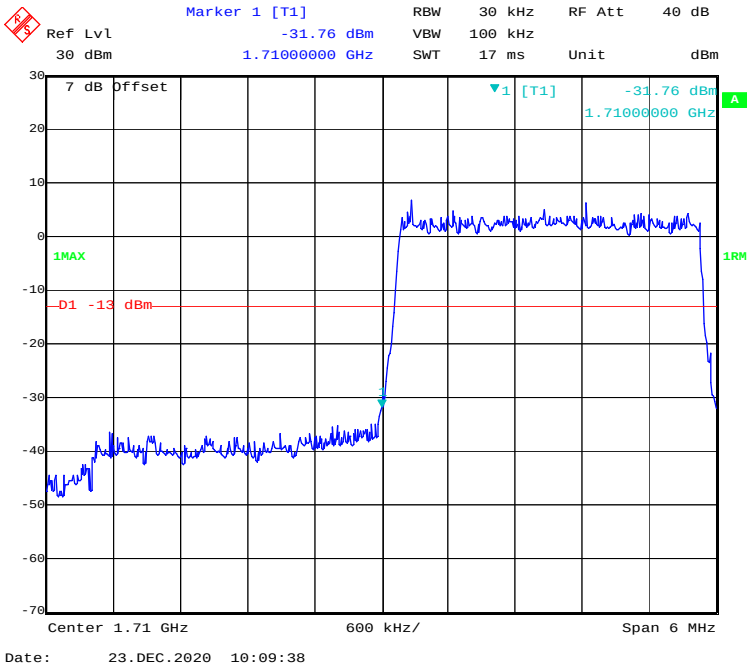
QPSK (1.4 MHz, FULL RB) - Left Band Edge



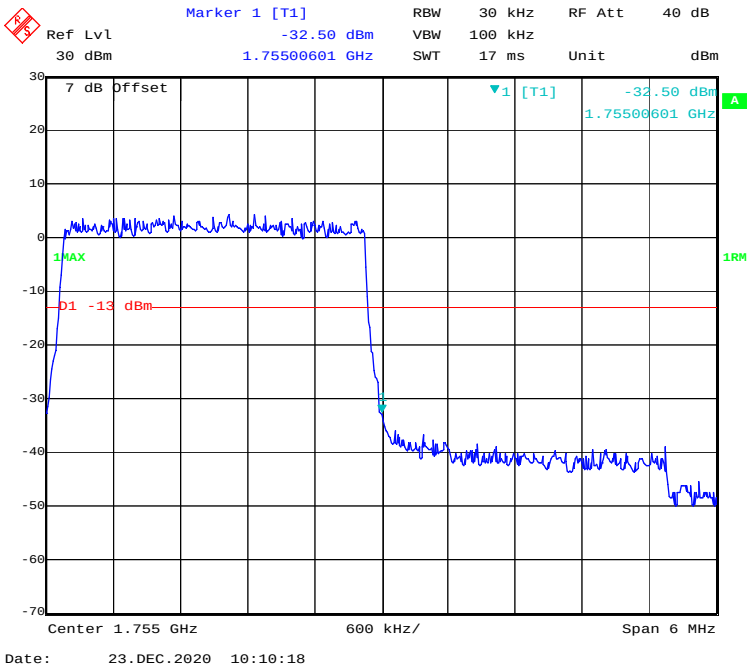
QPSK (1.4 MHz, FULL RB) - Right Band Edge



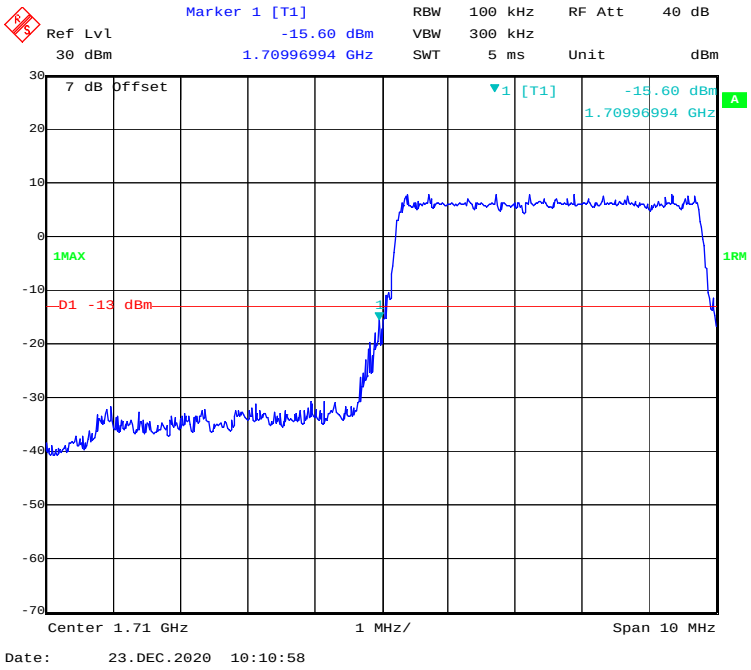
QPSK (3 MHz, FULL RB) - Left Band Edge



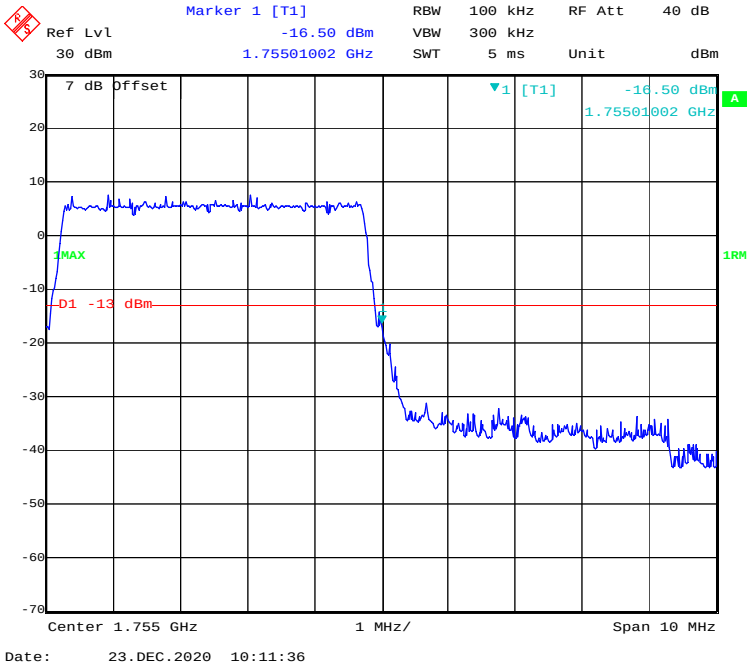
QPSK (3 MHz, FULL RB) - Right Band Edge



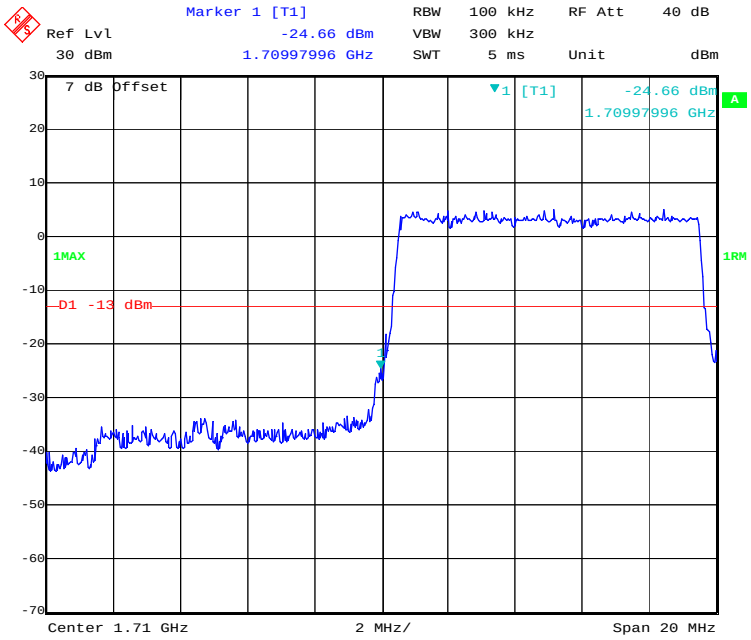
QPSK (5 MHz, FULL RB) - Left Band Edge



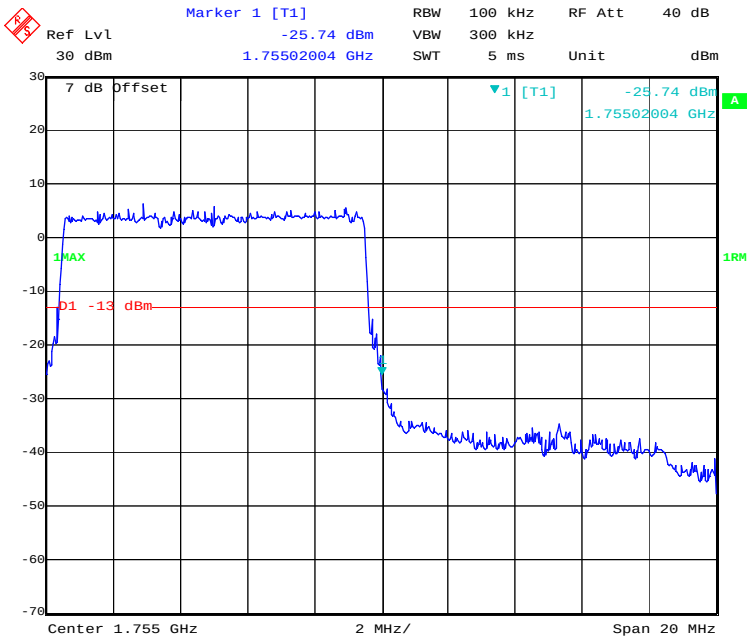
QPSK (5 MHz, FULL RB) - Right Band Edge



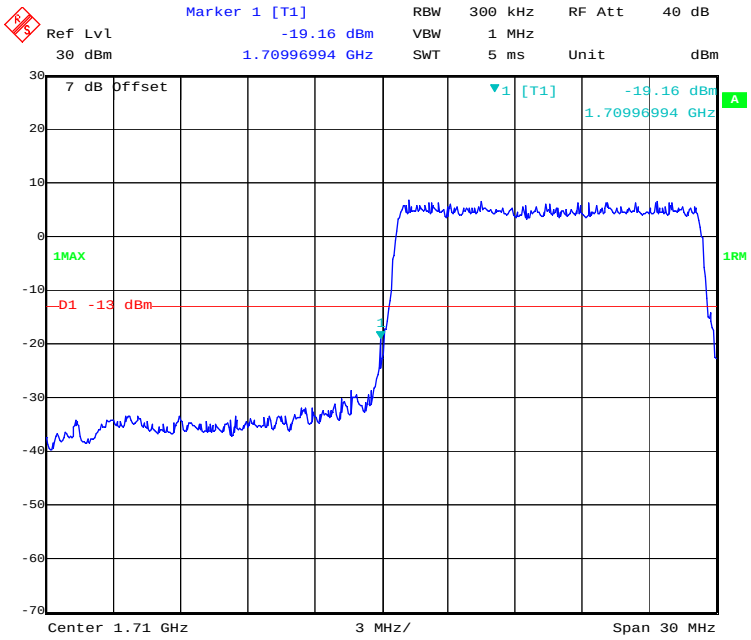
QPSK (10 MHz, FULL RB) - Left Band Edge



QPSK (10 MHz, FULL RB) - Right Band Edge

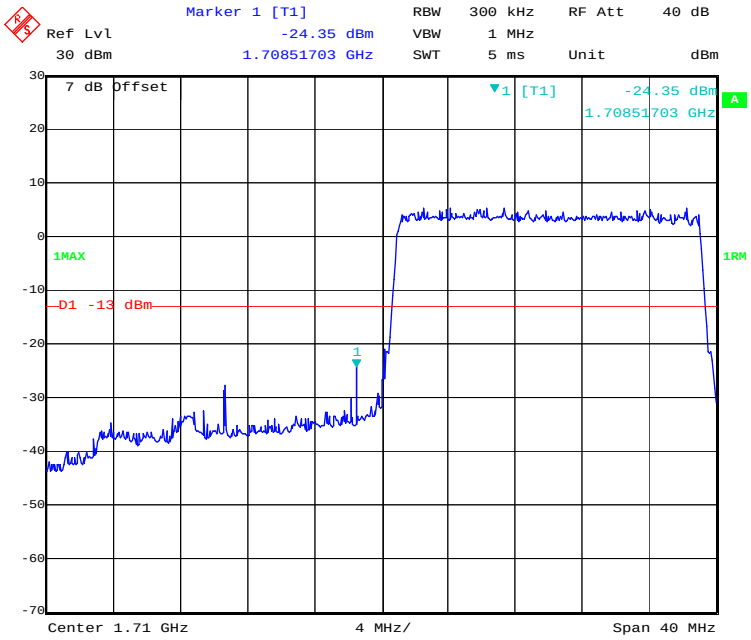


QPSK (15 MHz, FULL RB) - Left Band Edge

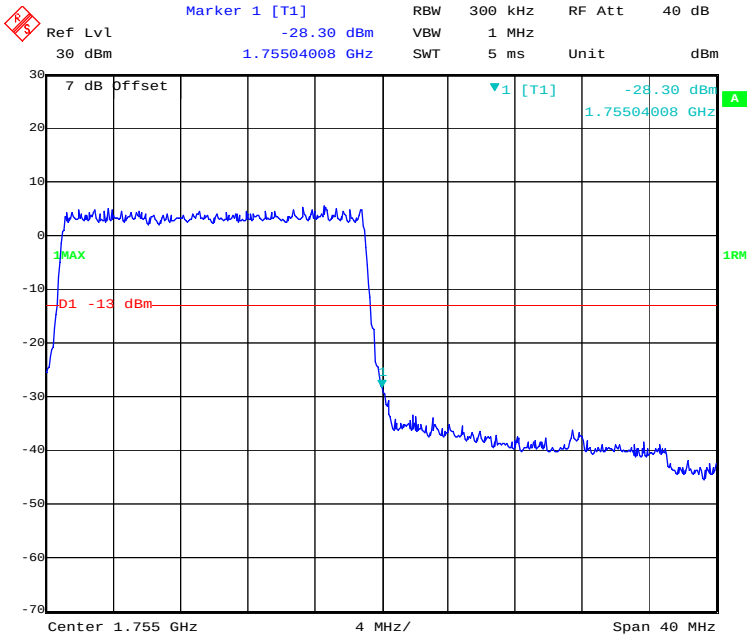


QPSK (15 MHz, FULL RB) - Right Band Edge

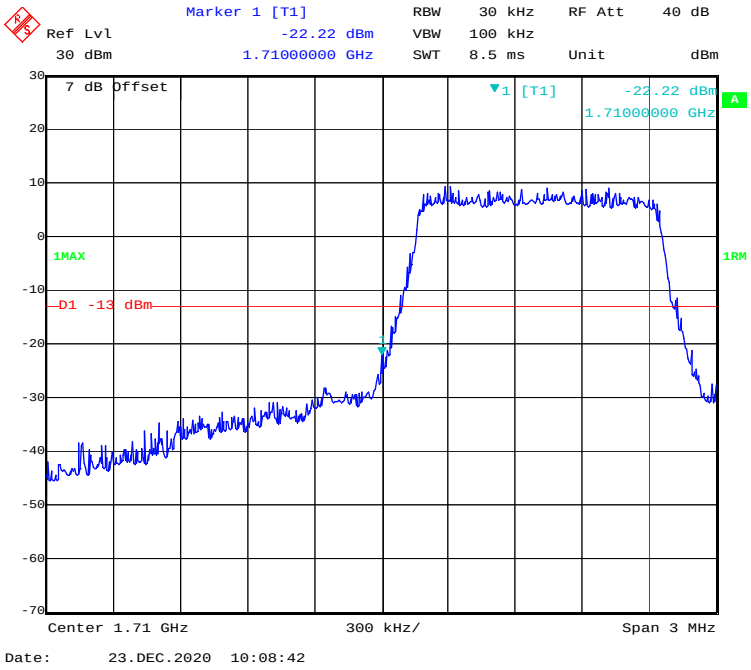
QPSK (20 MHz, FULL RB) - Left Band Edge



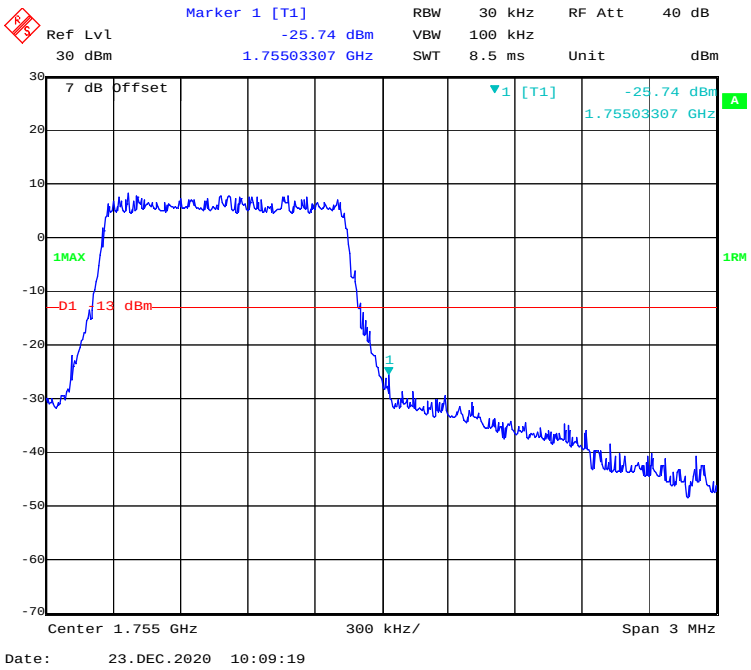
QPSK (20 MHz, FULL RB) - Right Band Edge



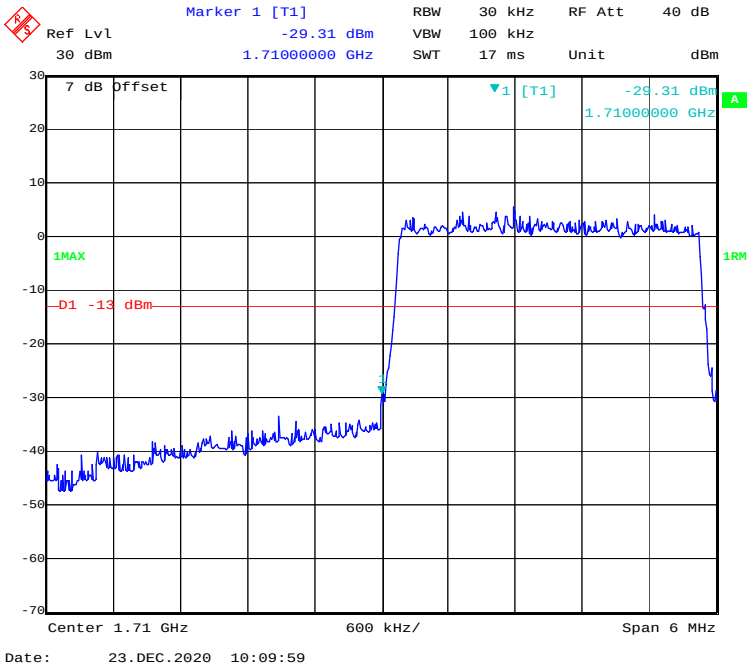
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



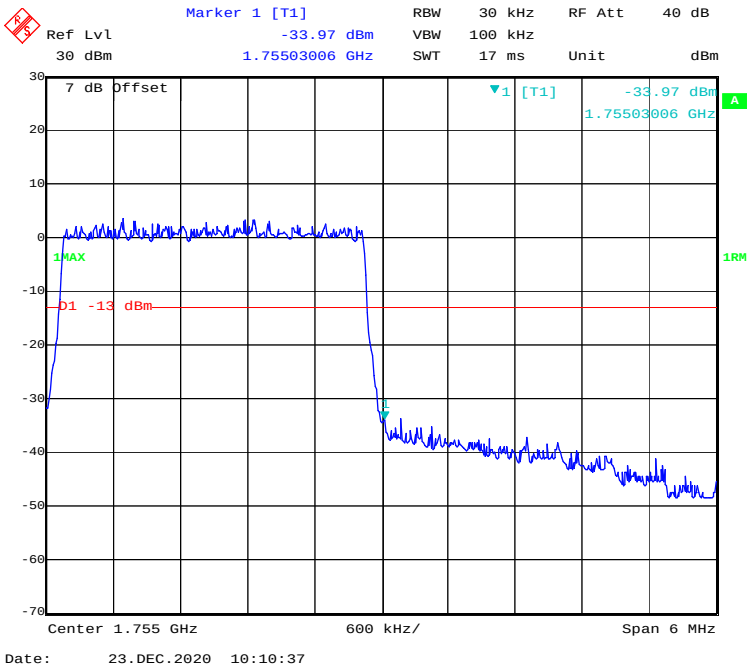
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



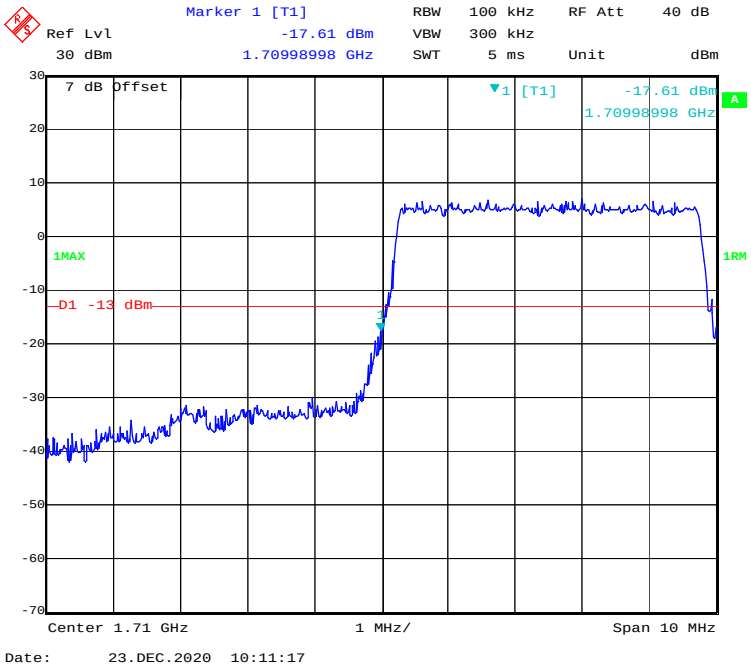
16-QAM (3 MHz, FULL RB) - Left Band Edge



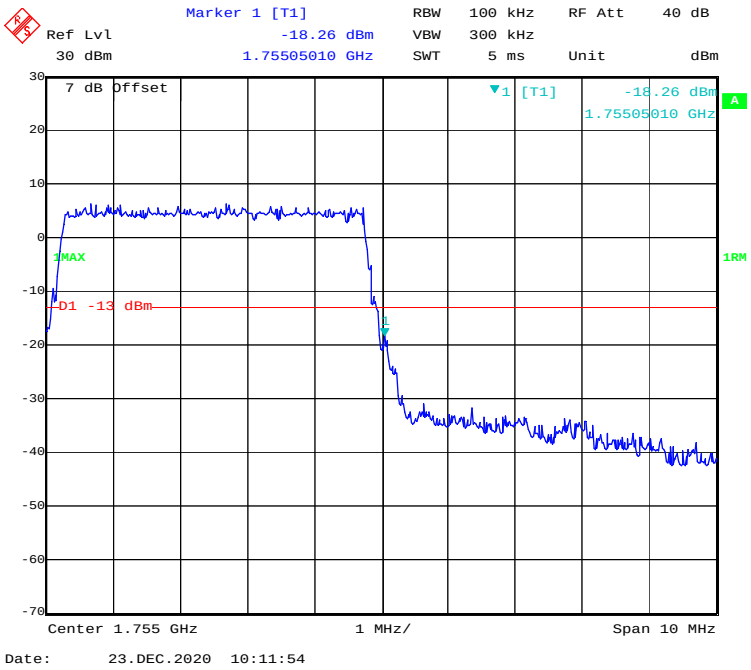
16-QAM (3 MHz, FULL RB) - Right Band Edge



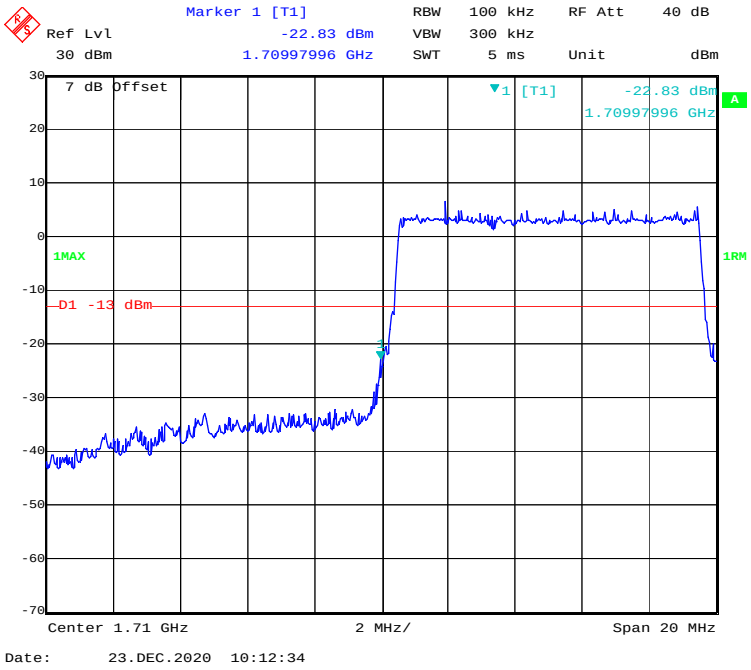
16-QAM (5 MHz, FULL RB) - Left Band Edge



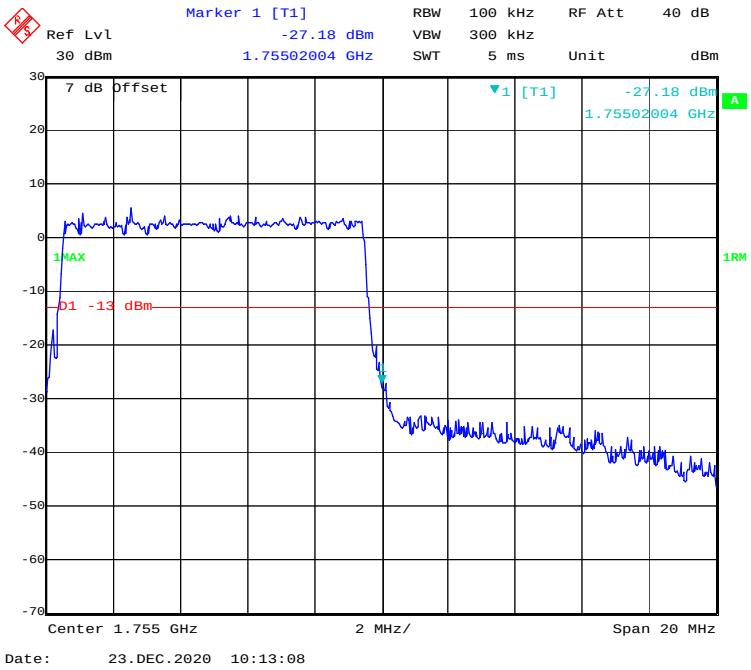
16-QAM (5 MHz, FULL RB) - Right Band Edge



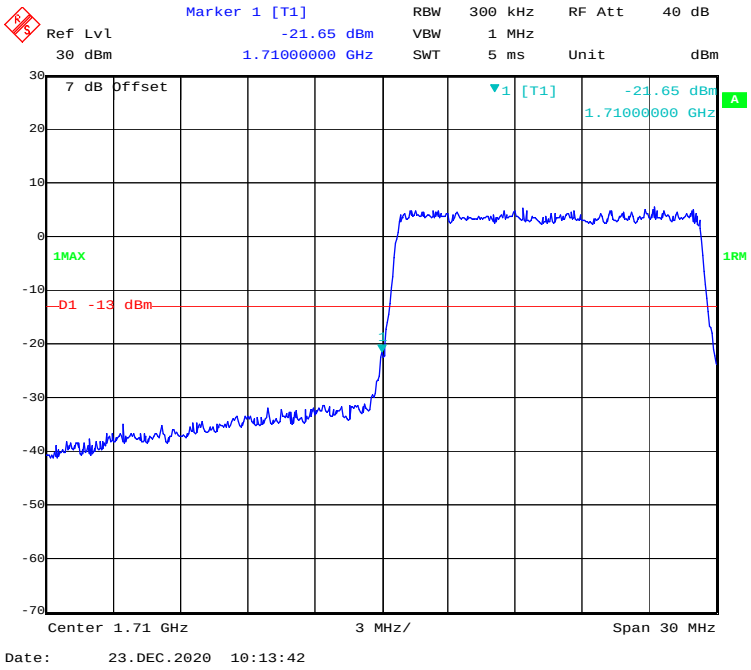
16-QAM (10 MHz, FULL RB) - Left Band Edge



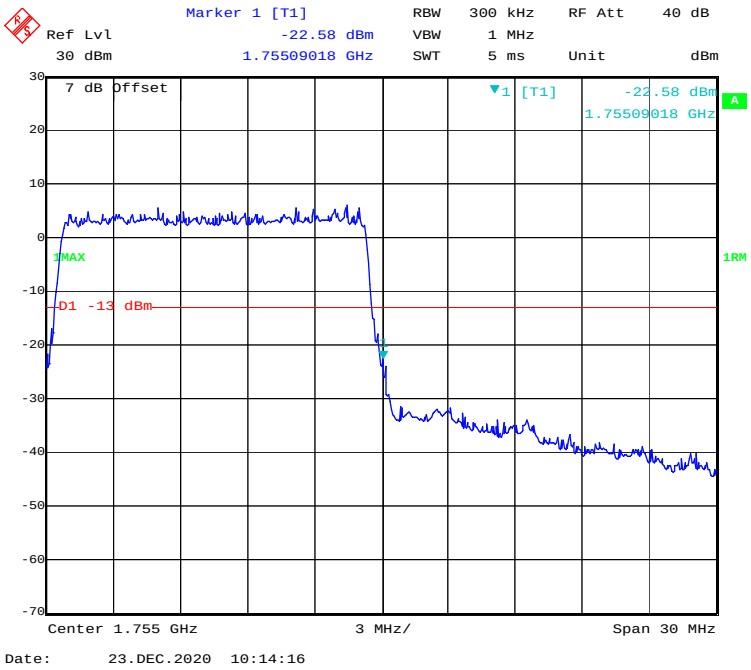
16-QAM (10 MHz, FULL RB) - Right Band Edge



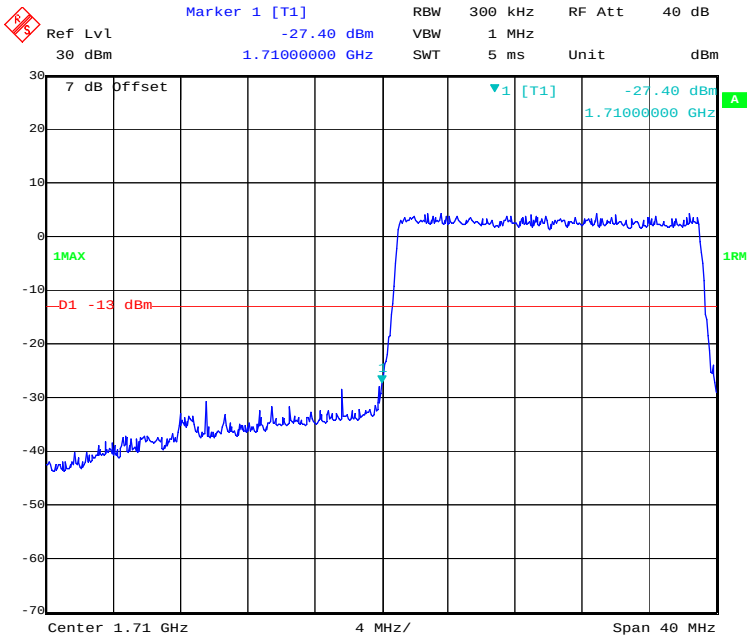
16-QAM (15 MHz, FULL RB) - Left Band Edge



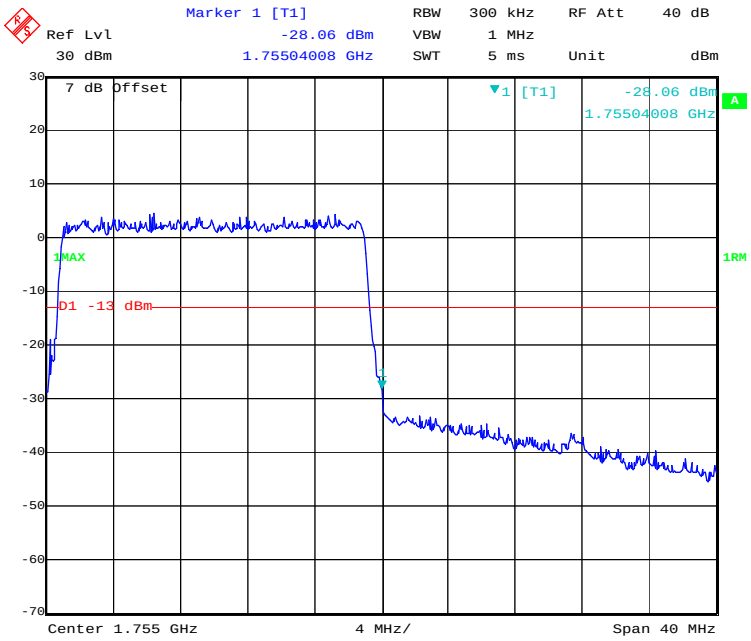
16-QAM (15 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge

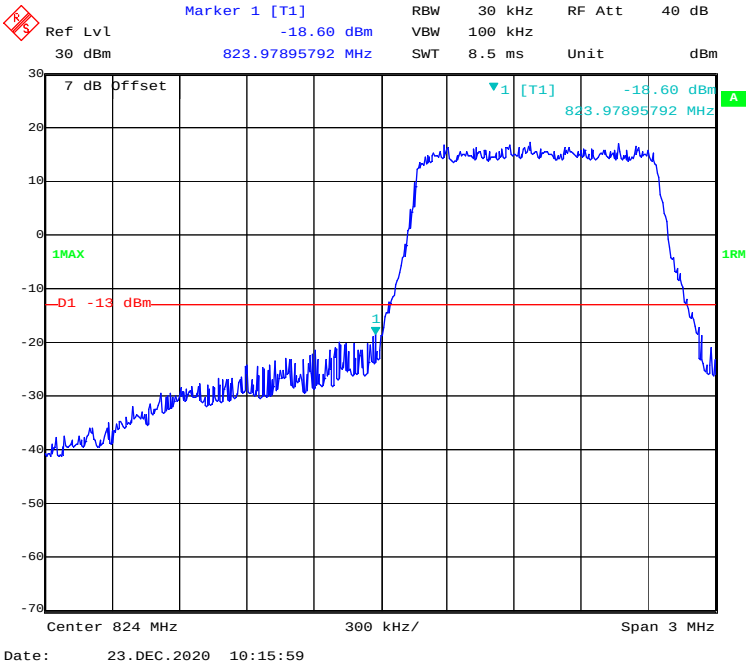


16-QAM (20 MHz, FULL RB) - Right Band Edge

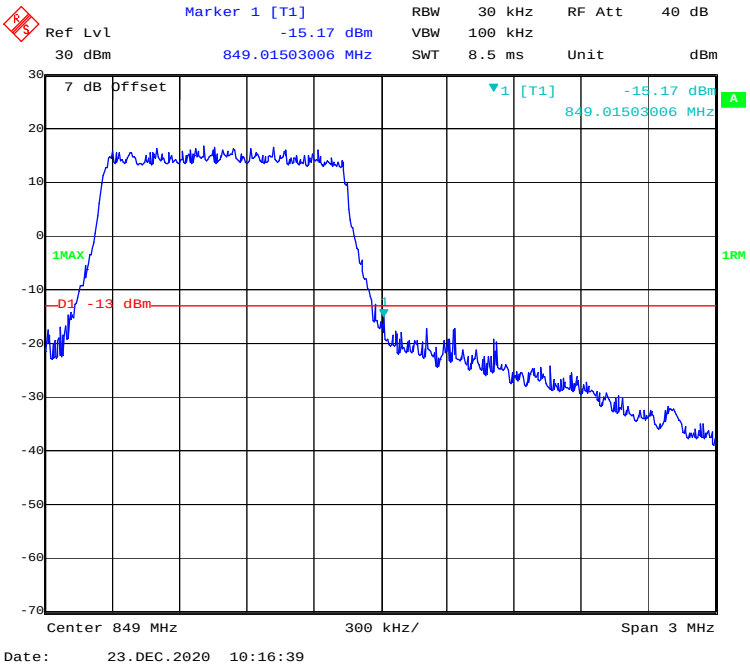


LTE Band 5:

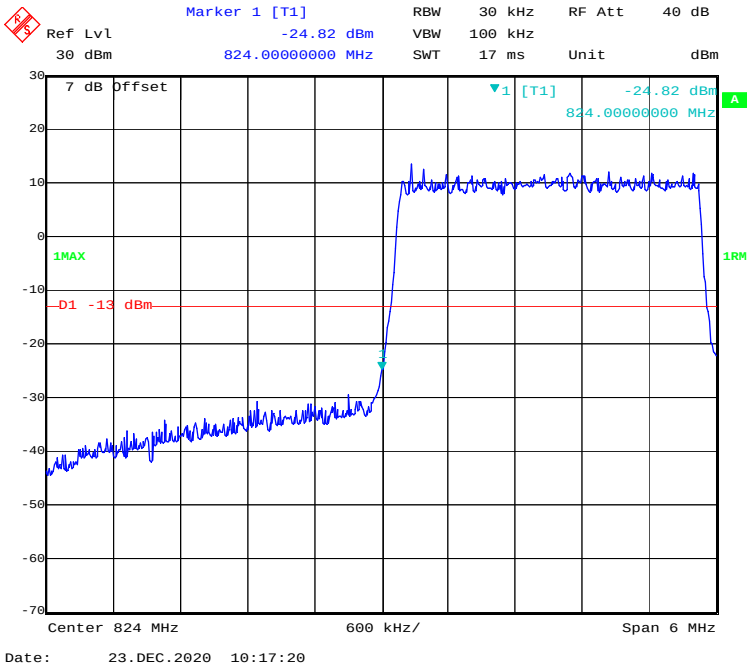
QPSK (1.4 MHz, FULL RB) - Left Band Edge



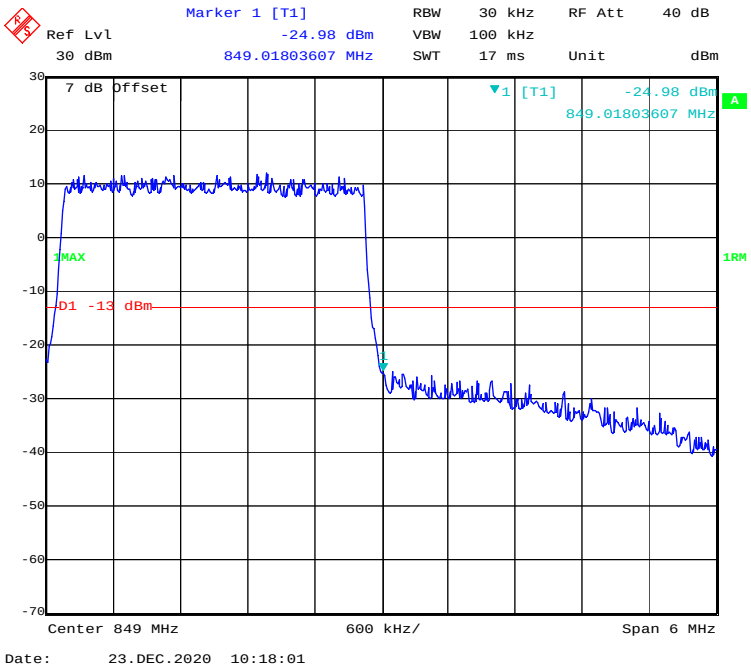
QPSK (1.4 MHz, FULL RB) - Right Band Edge



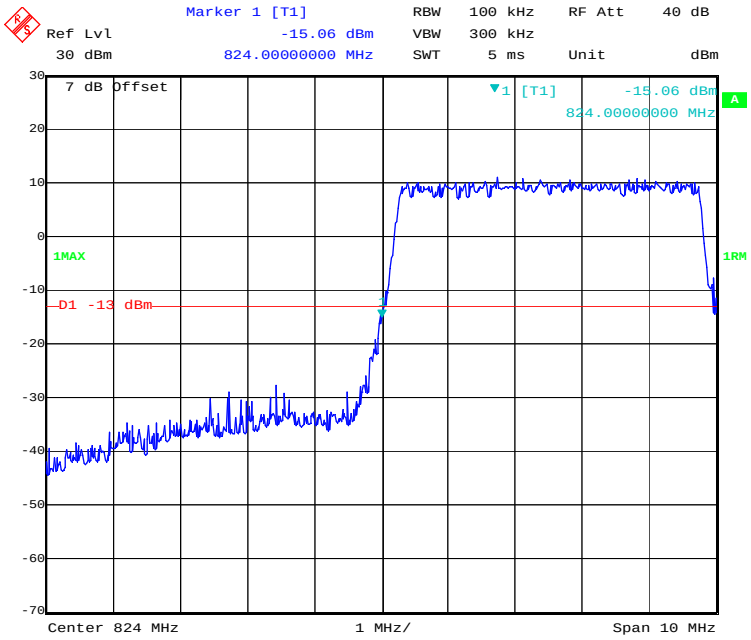
QPSK (3.0 MHz, FULL RB) - Left Band Edge



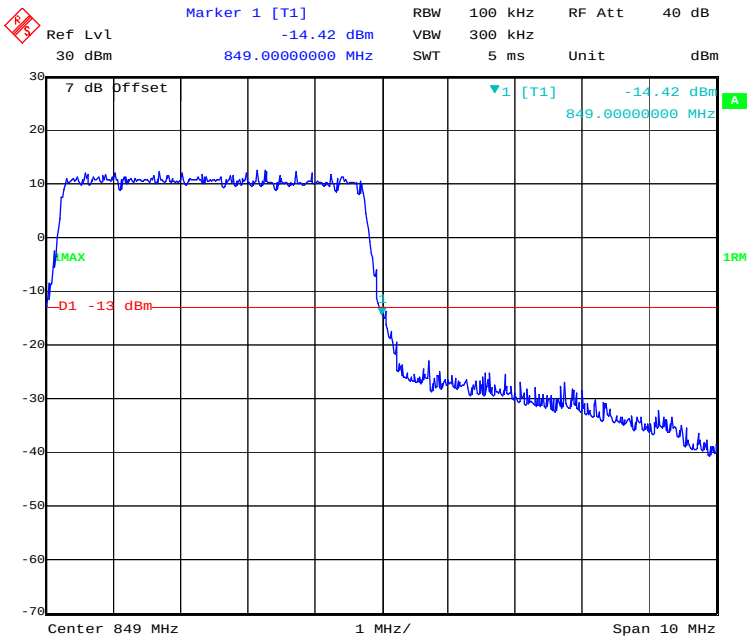
QPSK (3.0 MHz, FULL RB) - Right Band Edge



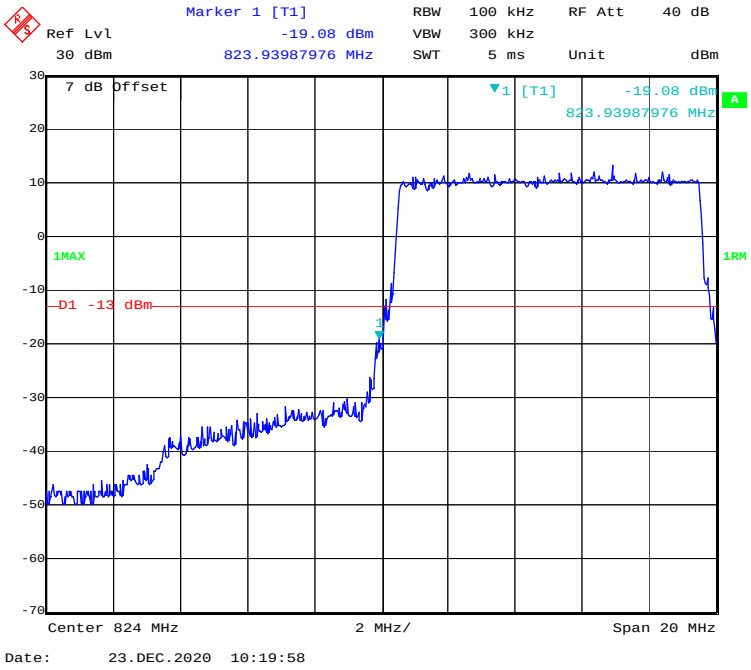
QPSK (5.0 MHz, FULL RB) - Left Band Edge



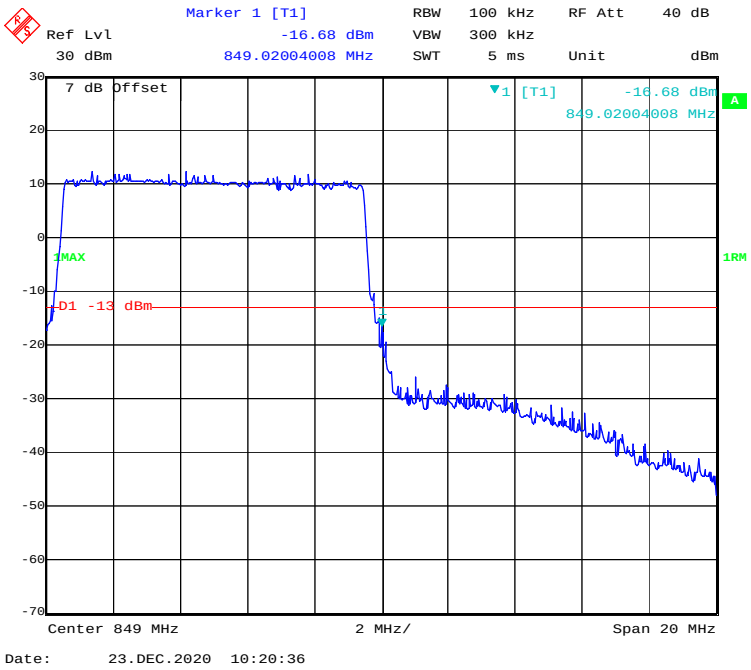
QPSK (5.0 MHz, FULL RB) - Right Band Edge



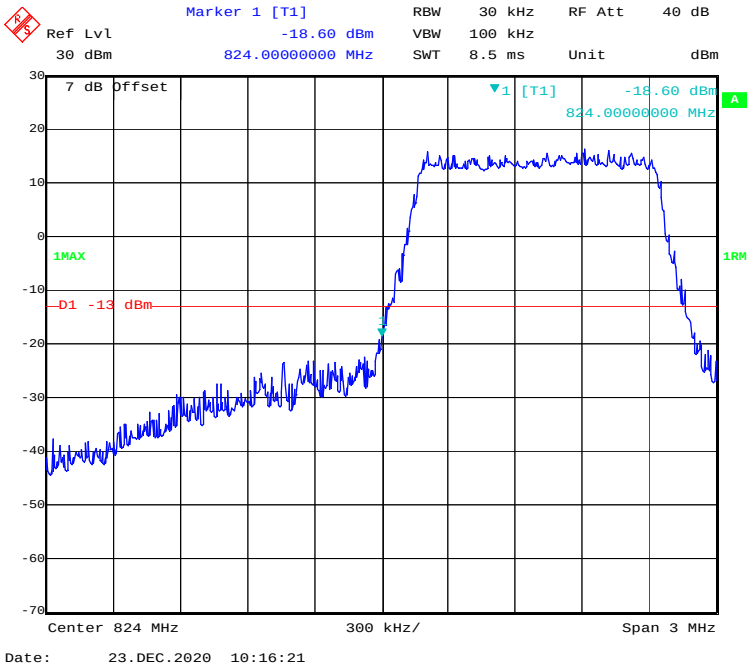
QPSK (10.0 MHz, FULL RB) - Left Band Edge



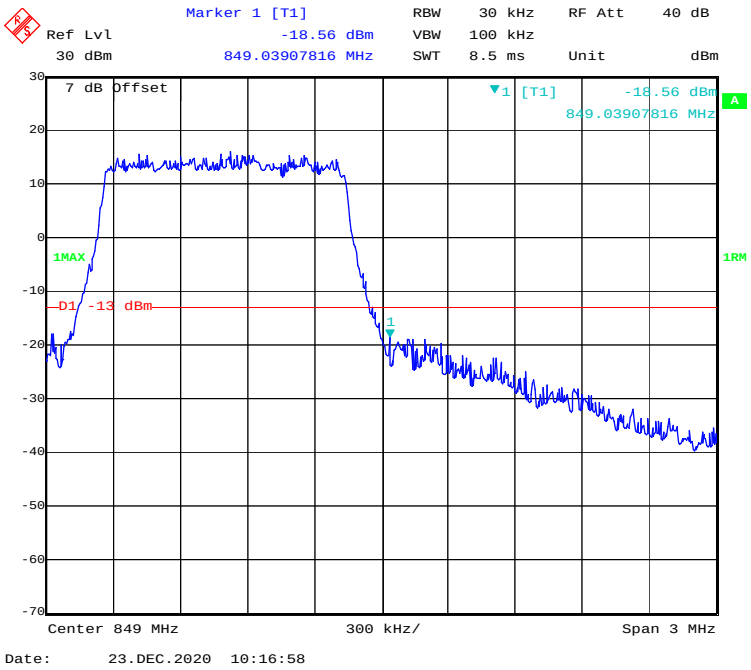
QPSK (10.0 MHz, FULL RB) - Right Band Edge



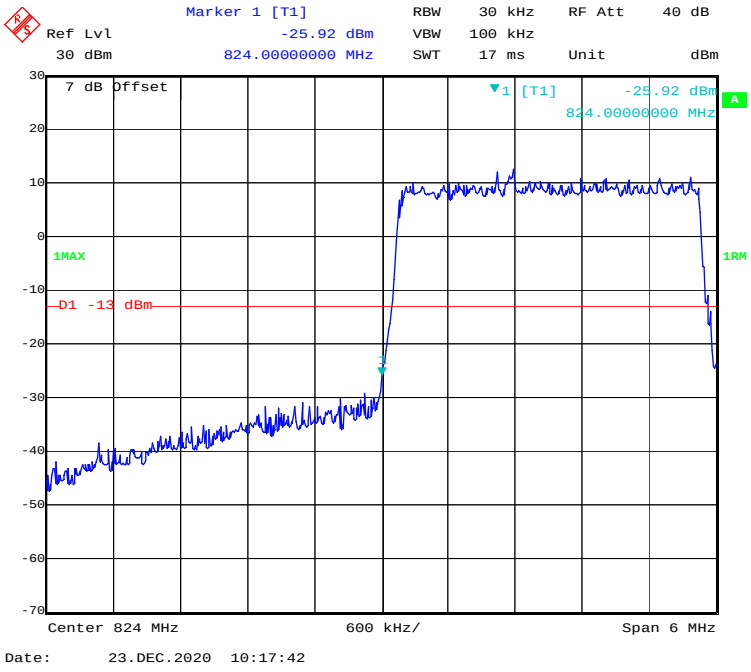
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



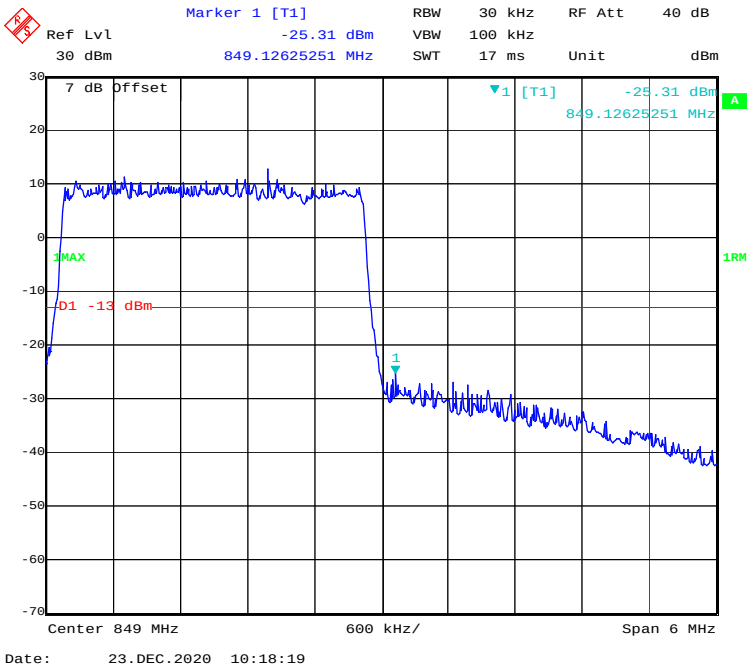
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



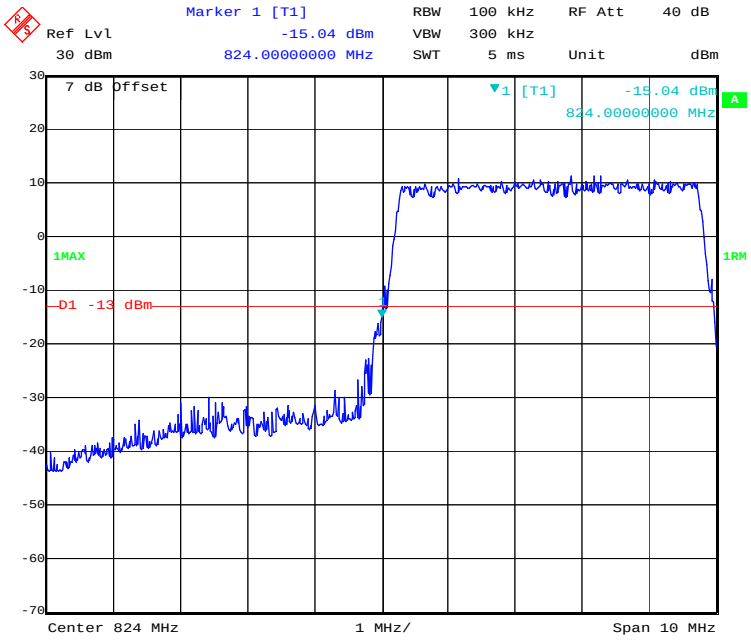
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



16-QAM (3.0 MHz, FULL RB) - Right Band Edge

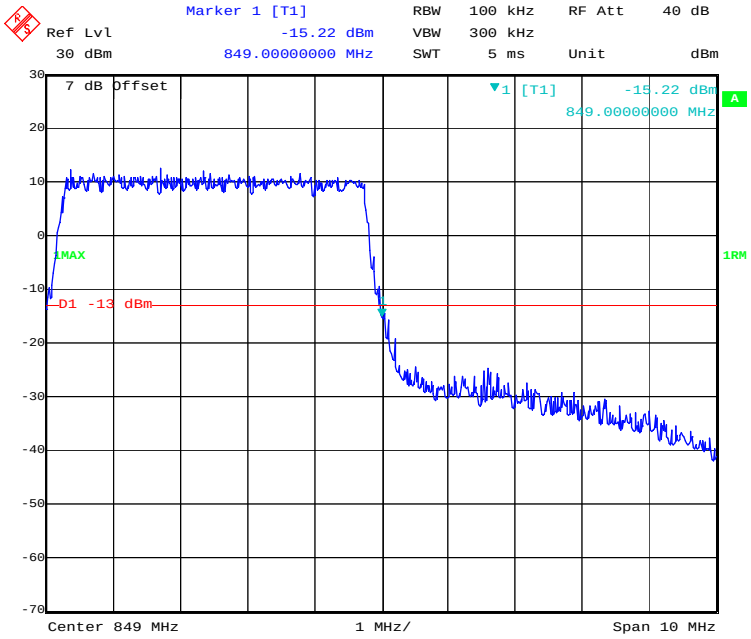


16-QAM (5.0 MHz, FULL RB) - Left Band Edge



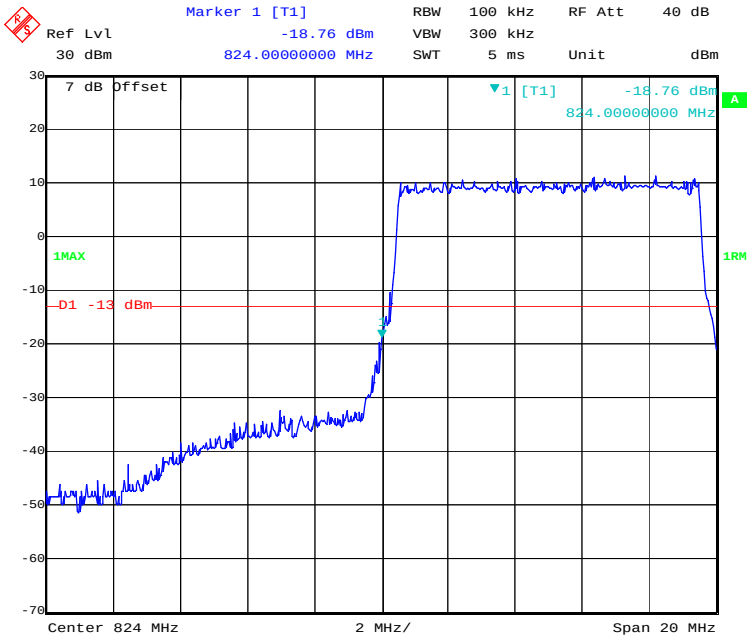
Date: 23.DEC.2020 16:31:10

16-QAM (5.0 MHz, FULL RB) - Right Band Edge



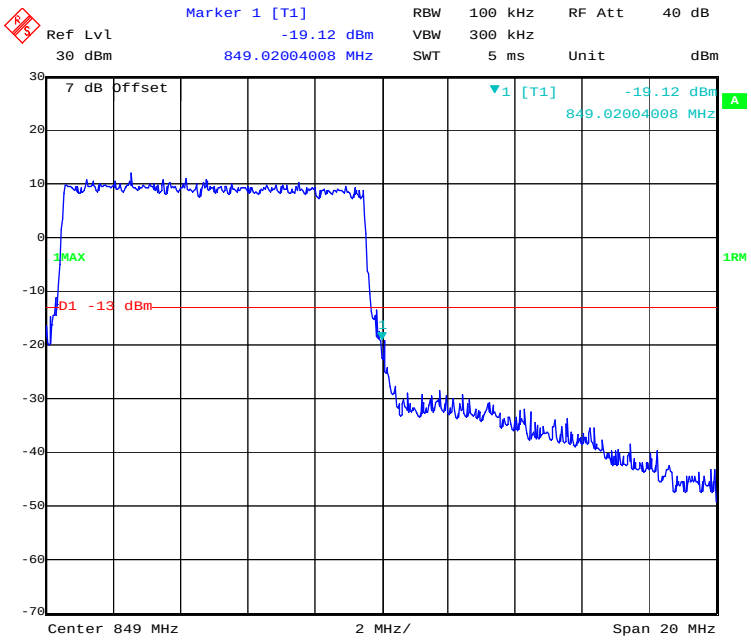
Date: 23.DEC.2020 16:29:22

16-QAM (10.0 MHz, FULL RB) - Left Band Edge



Date: 23.DEC.2020 10:20:17

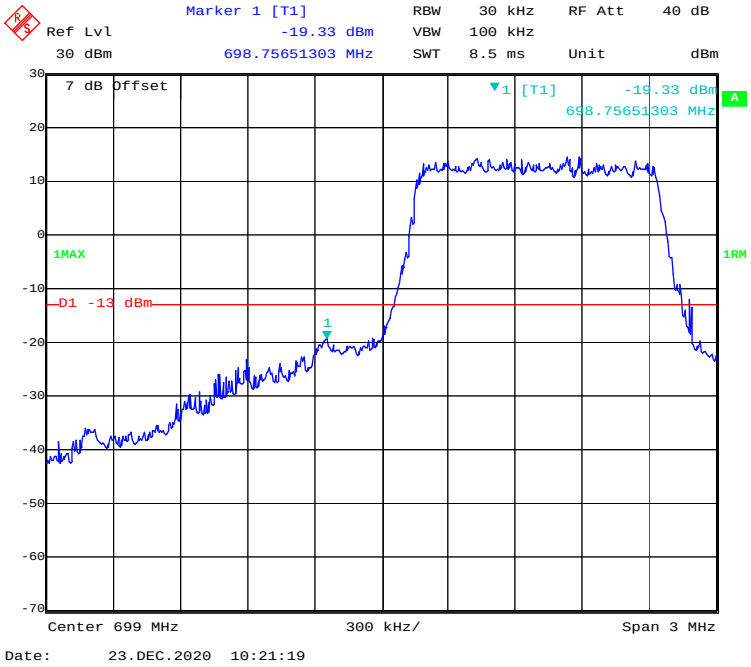
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



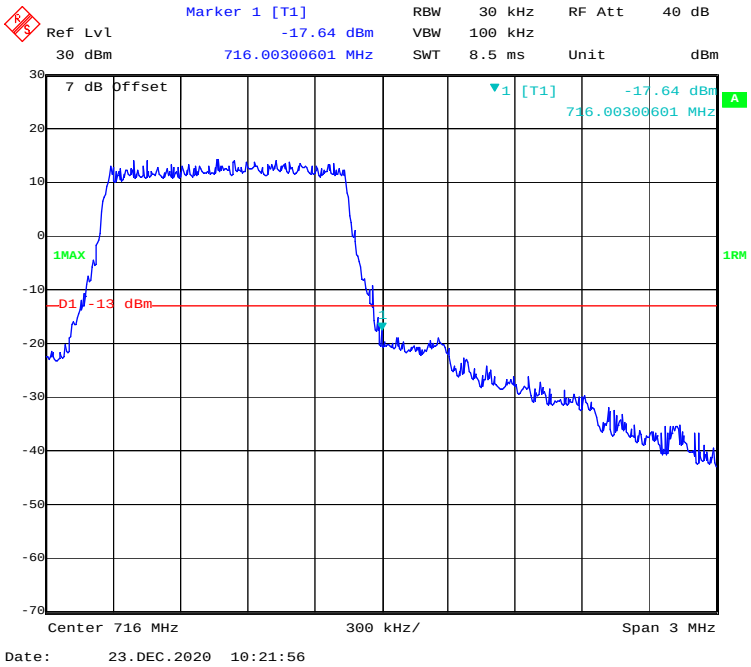
Date: 23.DEC.2020 10:20:51

LTE Band 12:

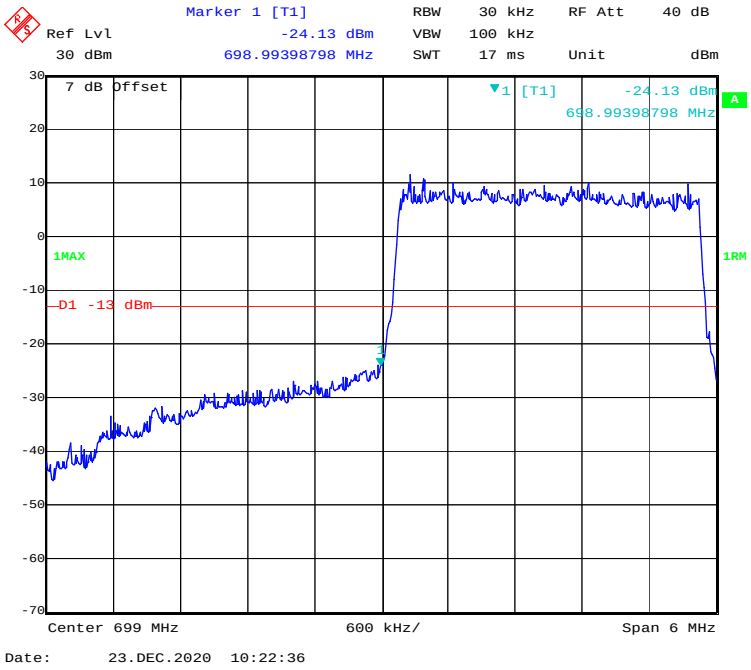
QPSK (1.4 MHz, FULL RB) - Left Band Edge



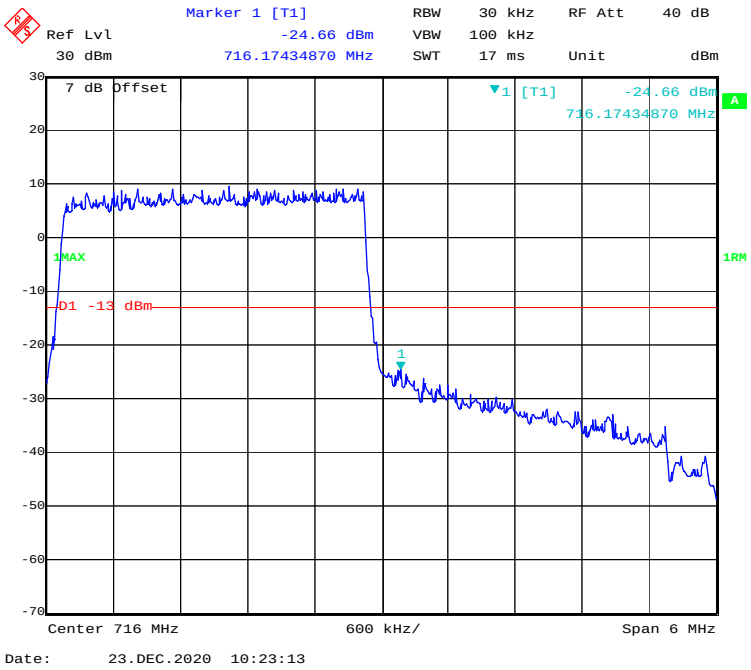
QPSK (1.4 MHz, FULL RB) - Right Band Edge



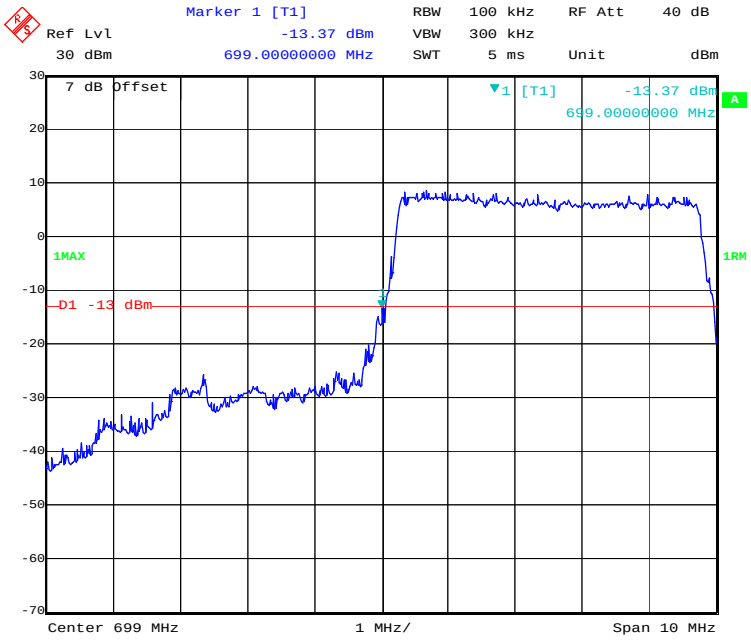
QPSK (3 MHz, FULL RB) - Left Band Edge



QPSK (3 MHz, FULL RB) - Right Band Edge

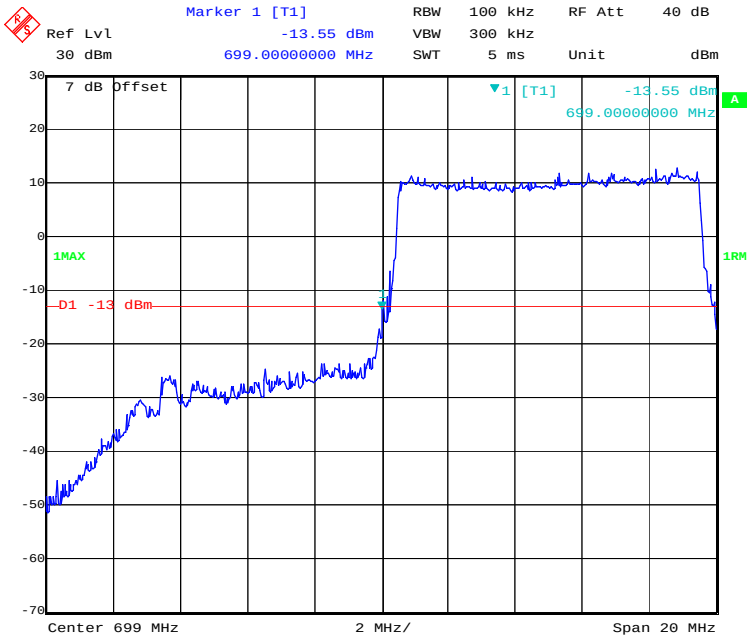


QPSK (5 MHz, FULL RB) - Left Band Edge

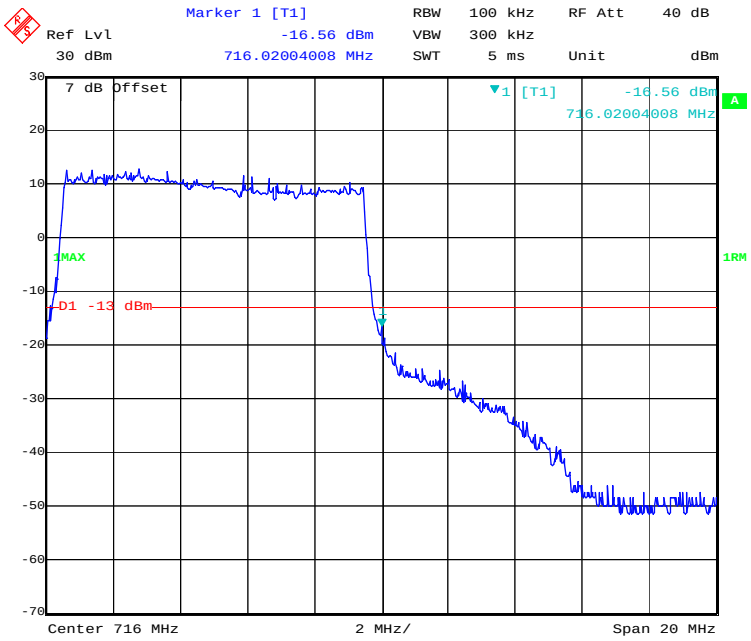


QPSK (5 MHz, FULL RB) - Right Band Edge

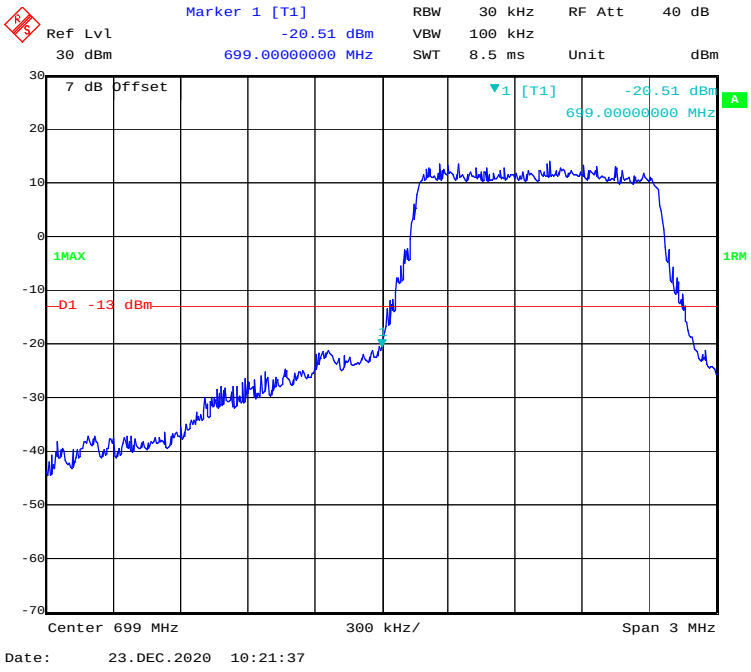
QPSK (10 MHz, FULL RB) - Left Band Edge



QPSK (10 MHz, FULL RB) - Right Band Edge

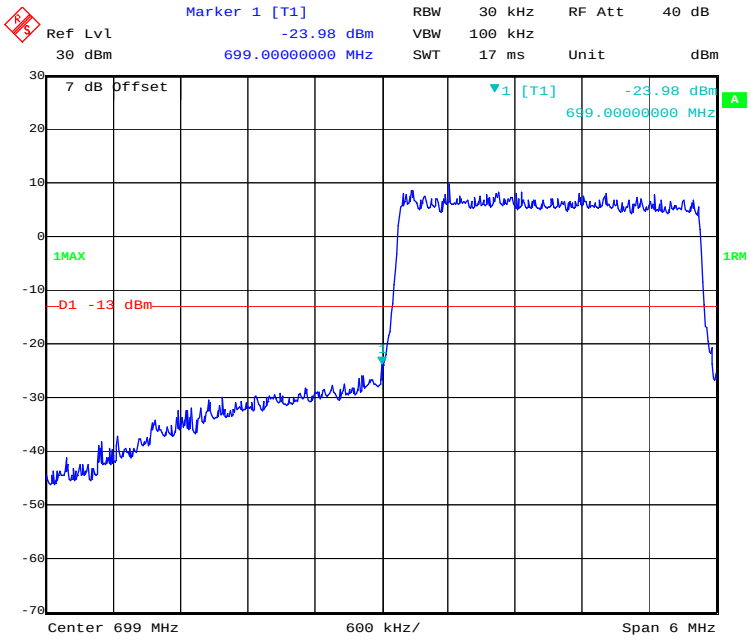


16-QAM (1.4 MHz, FULL RB) - Left Band Edge

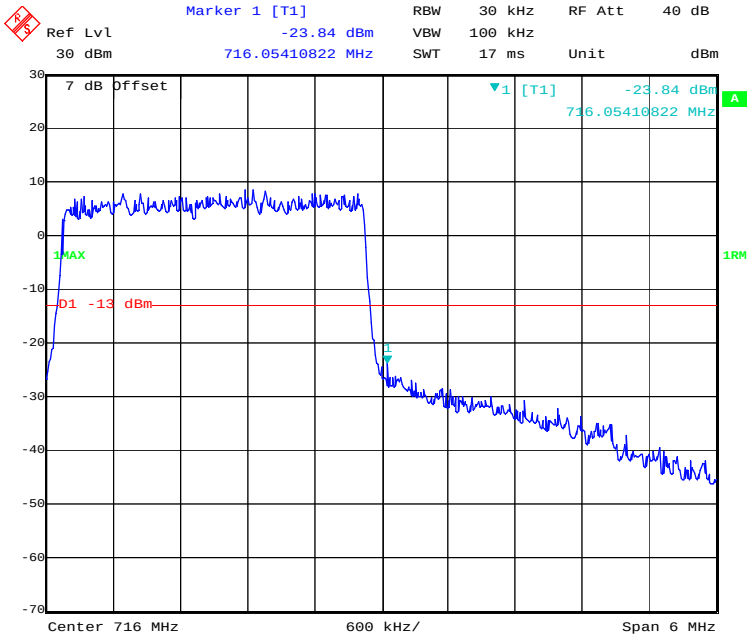


16-QAM (1.4 MHz, FULL RB) - Right Band Edge

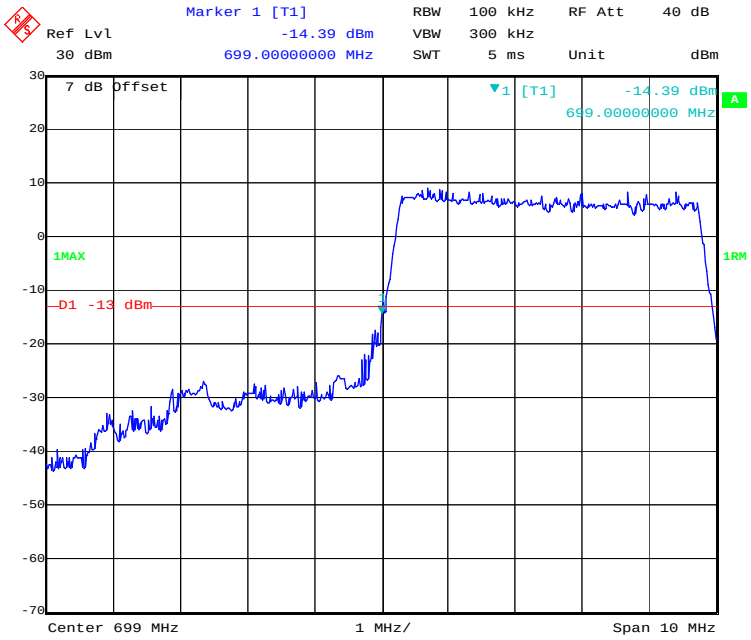
16-QAM (3 MHz, FULL RB) - Left Band Edge



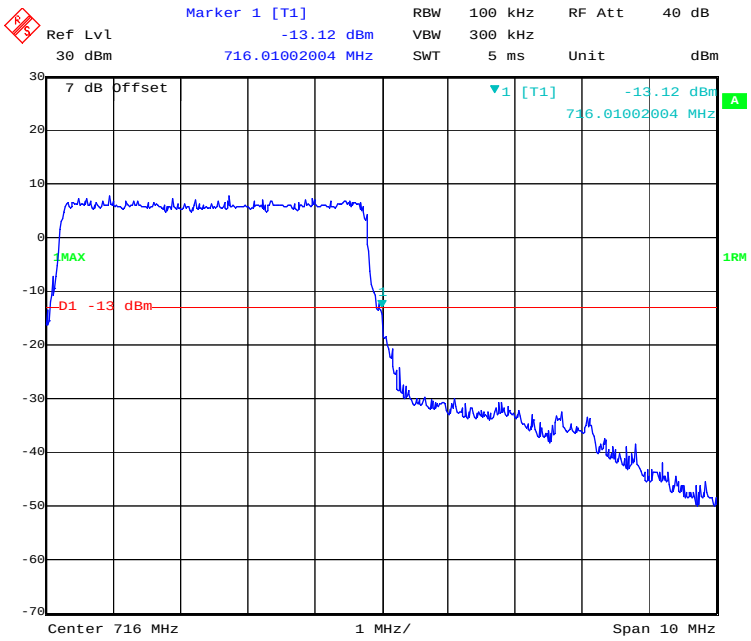
16-QAM (3 MHz, FULL RB) - Right Band Edge



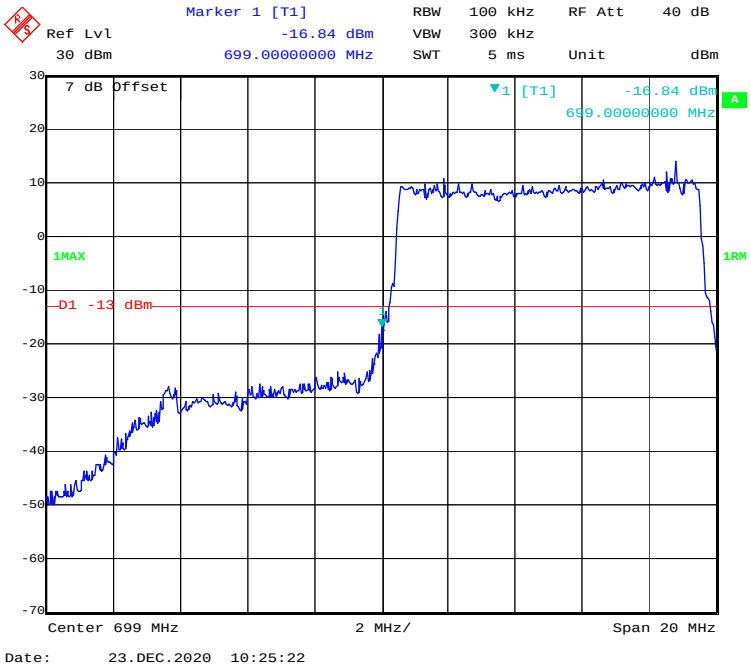
16-QAM (5 MHz, FULL RB) - Left Band Edge



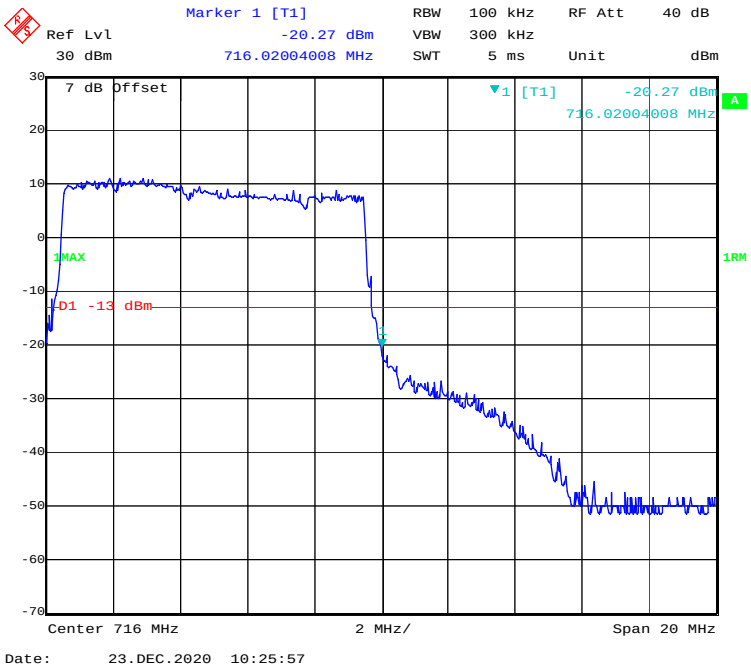
16-QAM (5 MHz, FULL RB) - Right Band Edge



16-QAM (10 MHz, FULL RB) - Left Band Edge

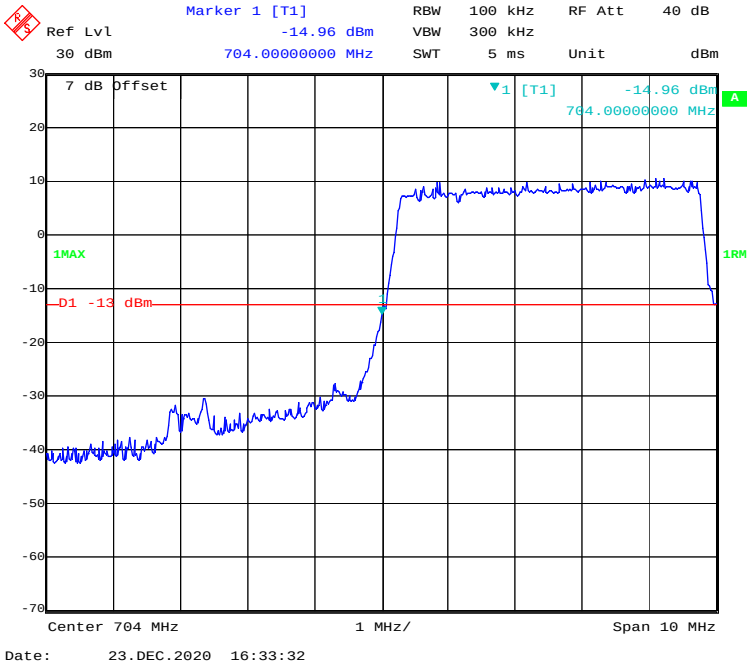


16-QAM (10 MHz, FULL RB) - Right Band Edge

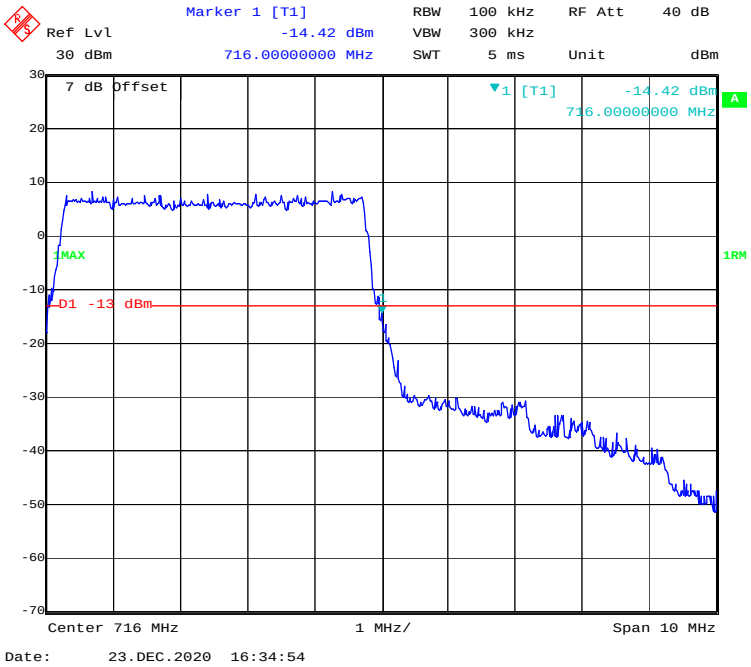


LTE Band 17:

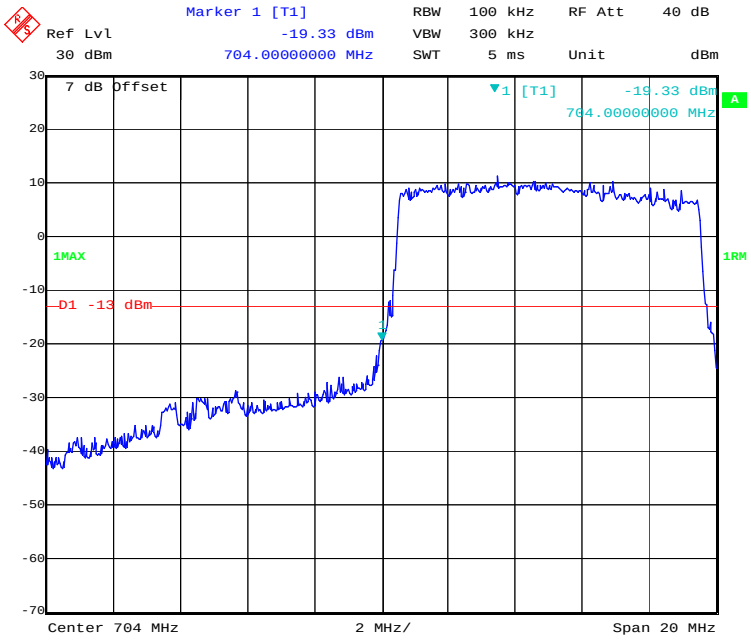
QPSK (5 MHz, FULL RB) - Left Band Edge



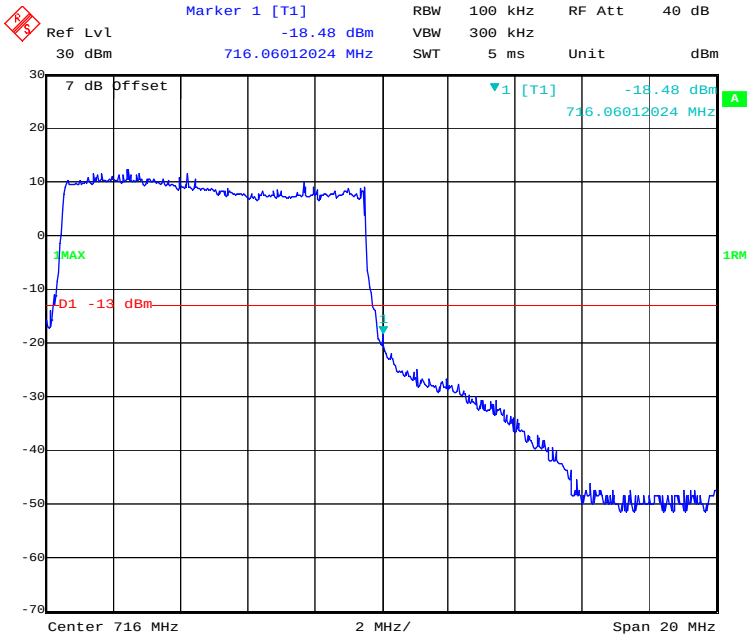
QPSK (5 MHz, FULL RB) - Right Band Edge



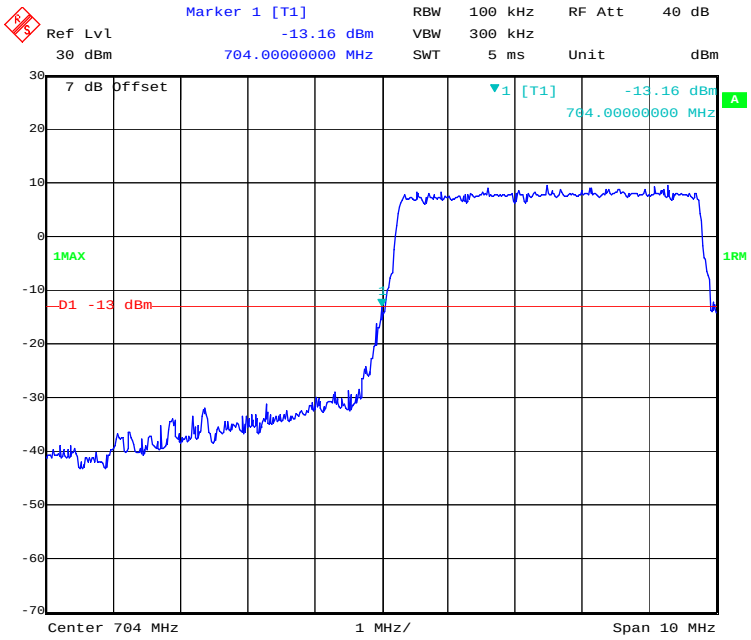
QPSK (10 MHz, FULL RB) - Left Band Edge



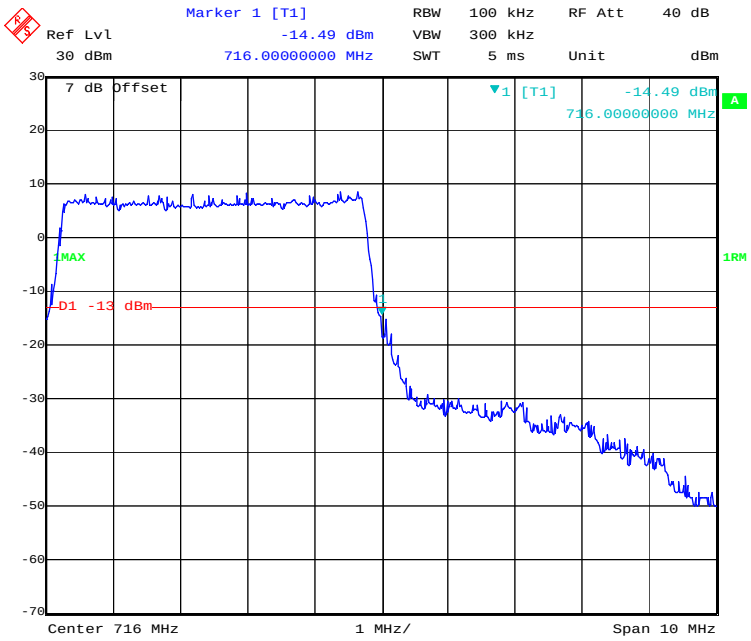
QPSK (10 MHz, FULL RB) - Right Band Edge



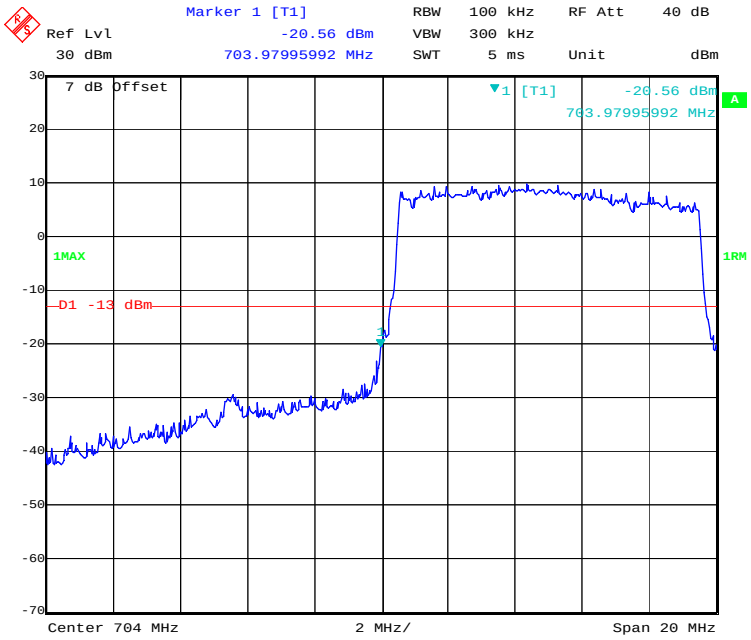
16-QAM (5 MHz, FULL RB) - Left Band Edge



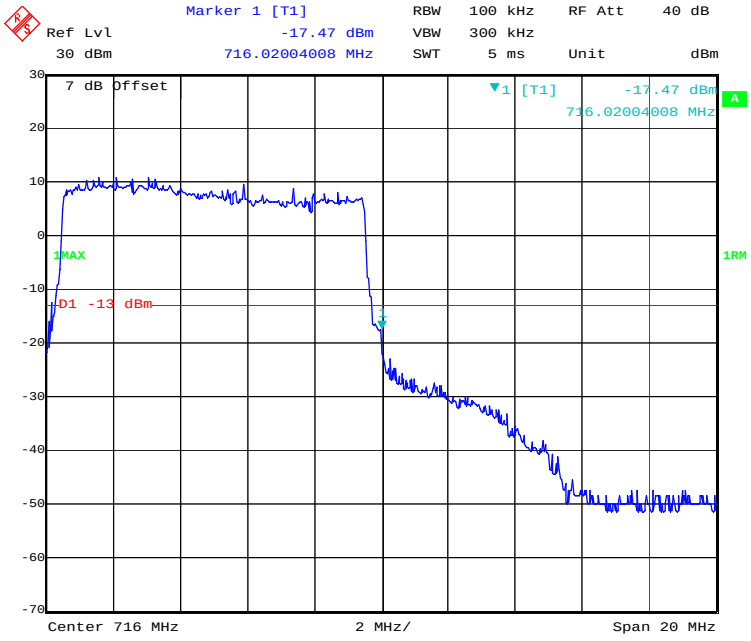
16-QAM (5 MHz, FULL RB) - Right Band Edge



16-QAM (10 MHz, FULL RB) - Left Band Edge



16-QAM (10 MHz, FULL RB) - Right Band Edge



FCC § 2.1055; § 22.355; § 24.235; §27.54 - FREQUENCY STABILITY

Applicable Standards

FCC § 2.1055, §22.355, §24.235 and §27.54.

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile > 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

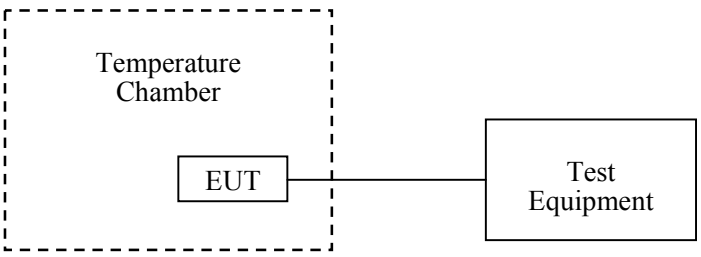
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data

Environmental Conditions

Temperature:	23.4~24.1 ℃
Relative Humidity:	49~52 %
ATM Pressure:	100.5~102.1 kPa

The testing was performed by Jack Jiao from 2020-12-24 to 2020-12-26.

EUT operation mode: Transmitting

Test Result: Compliance.

GPRS 850 Band:

GPRS Mode, Middle Channel, f_o =836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	14	0.016734	2.5
-20		17	0.020320	2.5
-10		18	0.021516	2.5
0		14	0.016734	2.5
10		15	0.017930	2.5
20		18	0.021516	2.5
30		13	0.015539	2.5
40		13	0.015539	2.5
50		13	0.015539	2.5
20	V min.= 3.42	12	0.014344	2.5
20	V max.= 4.18	16	0.019125	2.5

EGPRS Mode, Middle Channel, f_o=836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	21	0.025102	2.5
-20		15	0.017930	2.5
-10		13	0.015539	2.5
0		12	0.014344	2.5
10		20	0.023906	2.5
20		16	0.019125	2.5
30		18	0.021516	2.5
40		17	0.020320	2.5
50		21	0.025102	2.5
20	V min.= 3.42	9	0.010758	2.5
20	V max.= 4.18	16	0.019125	2.5

WCDMA Band V:

WCDMA Mode, Middle Channel, f_o = 836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	19	0.022711	2.5
-20		10	0.017930	2.5
-10		18	0.009563	2.5
0		15	0.017930	2.5
10		8	0.009563	2.5
20		16	0.019125	2.5
30		9	0.010758	2.5
40		15	0.017930	2.5
50		20	0.023906	2.5
20	V min.= 3.42	18	0.021516	2.5
20	V max.= 4.18	10	0.011953	2.5

PCS 1900 Band

GPRS Mode, Middle Channel, f_o=1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	17	0.009043	pass
-20		20	0.010638	pass
-10		17	0.009043	pass
0		20	0.010638	pass
10		22	0.011702	pass
20		12	0.006383	pass
30		14	0.007447	pass
40		12	0.006383	pass
50		12	0.006383	pass
20	V min.= 3.42	14	0.007447	pass
20	V max.= 4.18	16	0.008511	pass

EGPRS Mode, Middle Channel, f_o=1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	13	0.006915	pass
-20		14	0.007447	pass
-10		13	0.006915	pass
0		14	0.007447	pass
10		11	0.005851	pass
20		9	0.004787	pass
30		19	0.010106	pass
40		12	0.006383	pass
50		8	0.004255	pass
20	V min.= 3.42	15	0.007979	pass
20	V max.= 4.18	14	0.007447	pass

WCDMA Band II:

WCDMA Mode, Middle Channel, f_o = 1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	15	0.007979	pass
-20		13	0.006915	pass
-10		10	0.005319	pass
0		12	0.006383	pass
10		10	0.005319	pass
20		10	0.005319	pass
30		14	0.007447	pass
40		7	0.003723	pass
50		16	0.008511	pass
20	V min.= 3.42	18	0.009574	pass
20	V max.= 4.18	11	0.005851	pass

LTE Band 2:

Middle Channel, f_o=1880.0 MHz (QPSK) /Channel Bandwidth:20MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	15	0.0179	pass
-20		15	0.0179	pass
-10		18	0.0215	pass
0		10	0.0120	pass
10		12	0.0143	pass
20		18	0.0215	pass
30		6	0.0072	pass
40		10	0.0120	pass
50		16	0.0191	pass
20	V min.= 3.42	14	0.0167	pass
20	V max.= 4.18	8	0.0096	pass

Middle Channel, f_o=1880.0 MHz (16-QAM) /Channel Bandwidth:20MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	7	0.0084	pass
-20		10	0.0120	pass
-10		10	0.0120	pass
0		15	0.0179	pass
10		15	0.0179	pass
20		11	0.0132	pass
30		17	0.0203	pass
40		21	0.0251	pass
50		18	0.0215	pass
20	V min.= 3.42	8	0.0096	pass
20	V max.= 4.18	17	0.0000	pass

LTE Band 4:

Low Channel & High Channel (QPSK) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.8	1710.042	1745.966	1710	1755
-20		1710.047	1745.962	1710	1755
-10		1710.048	1745.965	1710	1755
0		1710.046	1745.969	1710	1755
10		1710.05	1745.962	1710	1755
20		1710.044	1745.965	1710	1755
30		1710.045	1745.963	1710	1755
40		1710.046	1745.967	1710	1755
50		1710.043	1745.961	1710	1755
20	V min.= 3.42	1710.046	1745.968	1710	1755
20	V max.= 4.18	1710.045	1745.966	1710	1755

Low Channel & High Channel (16-QAM) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.8	1710.041	1745.969	1710	1755
-20		1710.041	1745.97	1710	1755
-10		1710.044	1745.964	1710	1755
0		1710.048	1745.965	1710	1755
10		1710.049	1745.963	1710	1755
20		1710.048	1745.969	1710	1755
30		1710.045	1745.967	1710	1755
40		1710.048	1745.967	1710	1755
50		1710.043	1745.968	1710	1755
20	V min.= 3.42	1710.048	1745.964	1710	1755
20	V max.= 4.18	1710.048	1745.964	1710	1755

LTE Band 5:

Middle Channel, f_o = 836.5 MHz (QPSK) /Channel Bandwidth:10MHz				
Temperature	**Power Supplied**	**Frequency Error**	**Frequency Error**	**Limit**
(℃)	**(V_{DC})**	**(Hz)**	**(ppm)**	**(ppm)**
-30	3.8	13	0.0155	2.5
-20		11	0.0132	2.5
-10		15	0.0179	2.5
0		17	0.0203	2.5
10		11	0.0132	2.5
20		12	0.0143	2.5
30		21	0.0251	2.5
40		7	0.0084	2.5
50		9	0.0108	2.5
20	V min.= 3.42	11	0.0132	2.5
20	V max.= 4.18	18	0.0215	2.5

Middle Channel, f_o = 836.5 MHz (16-QAM) /Channel Bandwidth:10MHz				
Temperature	**Power Supplied**	**Frequency Error**	**Frequency Error**	**Limit**
(℃)	**(V_{DC})**	**(Hz)**	**(ppm)**	**(ppm)**
-30	3.8	10	0.0120	2.5
-20		12	0.0143	2.5
-10		13	0.0155	2.5
0		20	0.0239	2.5
10		18	0.0215	2.5
20		14	0.0167	2.5
30		15	0.0179	2.5
40		16	0.0191	2.5
50		9	0.0108	2.5
20	V min.= 3.42	12	0.0143	2.5
20	V max.= 4.18	18	0.0215	2.5

LTE Band 12:

Low Channel & High Channel (QPSK) /Channel Bandwidth:10MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.8	699.162	715.7641	699	716
-20		699.1628	715.7695	699	716
-10		699.1678	715.7699	699	716
0		699.1604	715.7622	699	716
10		699.1689	715.7692	699	716
20		699.1669	715.7634	699	716
30		699.1617	715.761	699	716
40		699.1622	715.7672	699	716
50		699.1651	715.7601	699	716
20	V min.= 3.42	699.1612	715.7618	699	716
20	V max.= 4.18	699.1656	715.7613	699	716

Low Channel & High Channel (16-QAM) /Channel Bandwidth:10MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.8	699.1645	715.7699	699	716
-20		699.1651	715.7614	699	716
-10		699.1658	715.7621	699	716
0		699.1665	715.7693	699	716
10		699.1643	715.7645	699	716
20		699.1643	715.7605	699	716
30		699.1608	715.7621	699	716
40		699.1613	715.7601	699	716
50		699.168	715.7621	699	716
20	V min.= 3.42	699.1616	715.7666	699	716
20	V max.= 4.18	699.1619	715.7697	699	716

LTE Band 17:

Low Channel & High Channel (QPSK) /Channel Bandwidth:10MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.8	704.0032	715.7602	704	716
-20		704.0073	715.7662	704	716
-10		704.0014	715.763	704	716
0		704.0037	715.7607	704	716
10		704.0053	715.7615	704	716
20		704.0095	715.7638	704	716
30		704.001	715.7684	704	716
40		704.0046	715.7658	704	716
50		704.0026	715.7653	704	716
20	V min.= 3.42	704.0014	715.7614	704	716
20	V max.= 4.18	704.0089	715.7657	704	716

Low Channel & High Channel (16-QAM) /Channel Bandwidth:10MHz					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(℃)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.8	704.0048	715.7609	704	716
-20		704.0006	715.768	704	716
-10		704.0062	715.7606	704	716
0		704.0094	715.7662	704	716
10		704.0026	715.76	704	716
20		704.0008	715.7666	704	716
30		704.005	715.7666	704	716
40		704.001	715.7661	704	716
50		704.0077	715.7684	704	716
20	V min.= 3.42	704.0023	715.7686	704	716
20	V max.= 4.18	704.0043	715.7643	704	716

Declarations

1: BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.

2: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

3: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

4: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

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