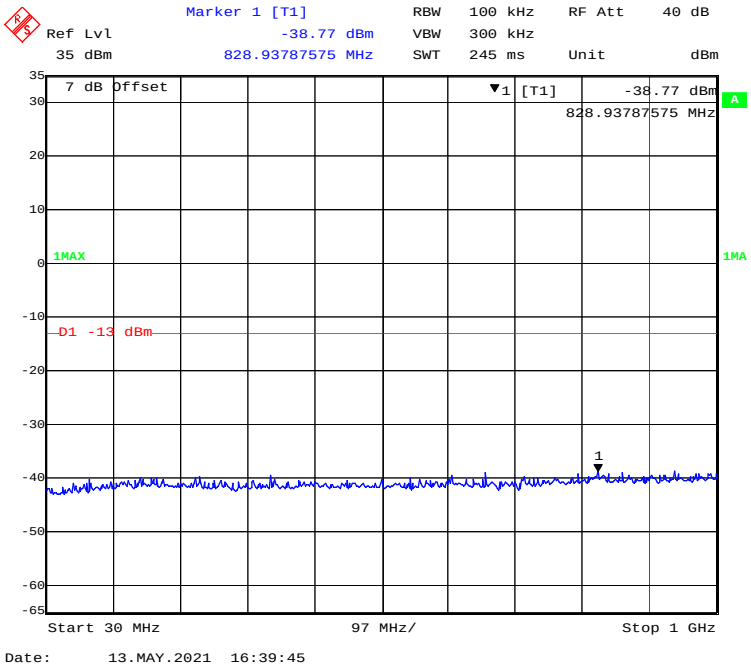
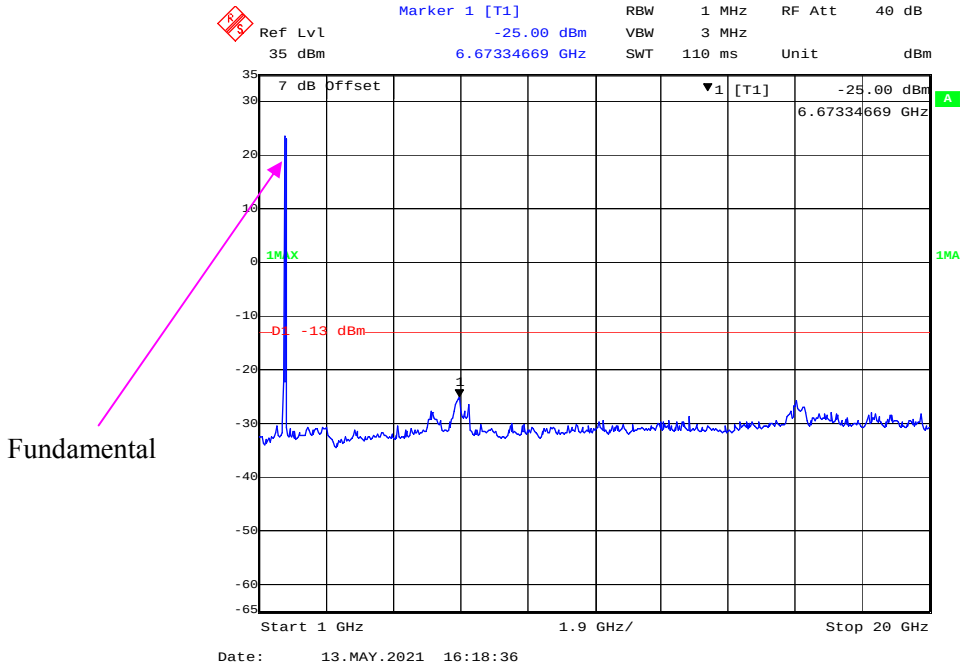
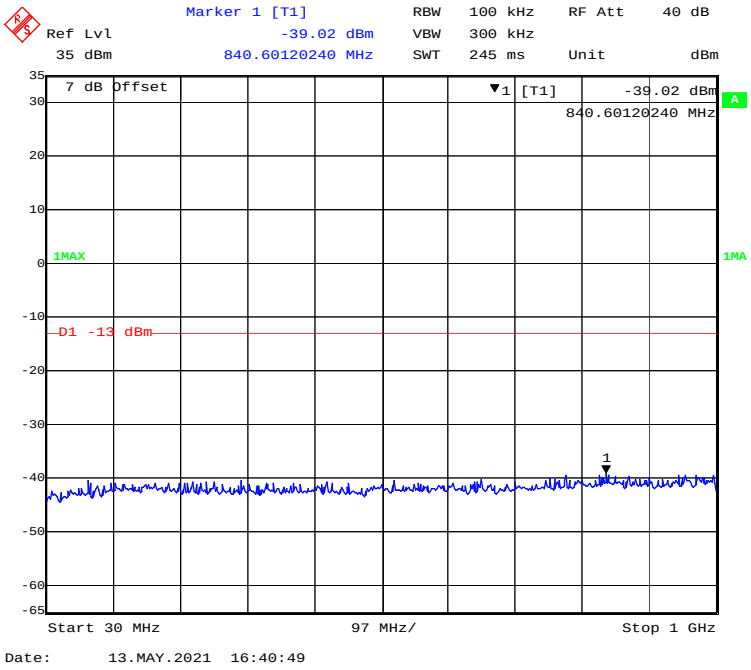
30 MHz – 1 GHz (15 MHz, 16-QAM, Middle Channel)



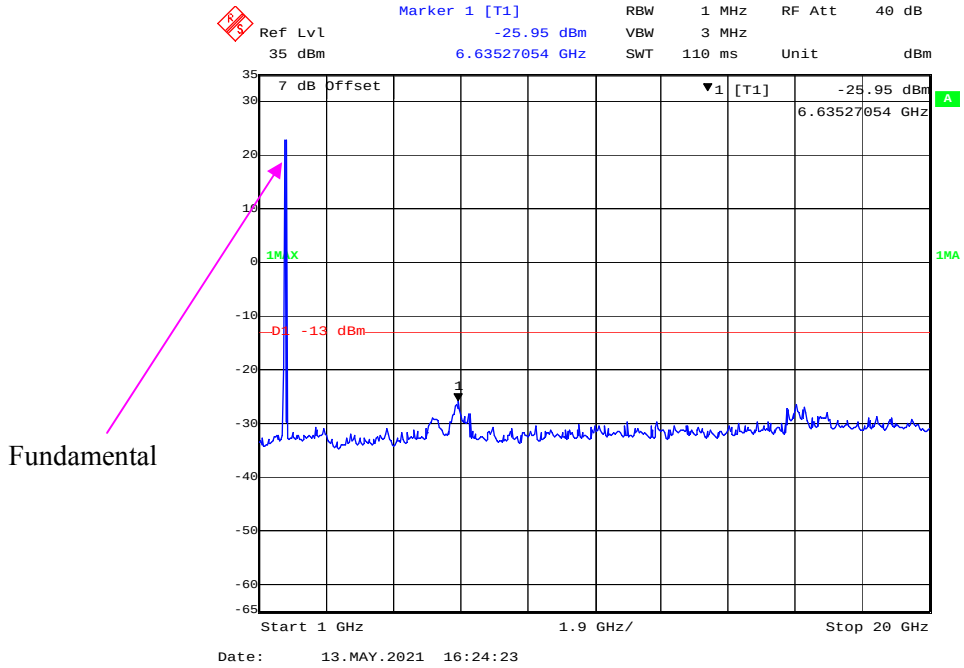
1 GHz – 20 GHz (15 MHz, 16-QAM, Middle Channel)



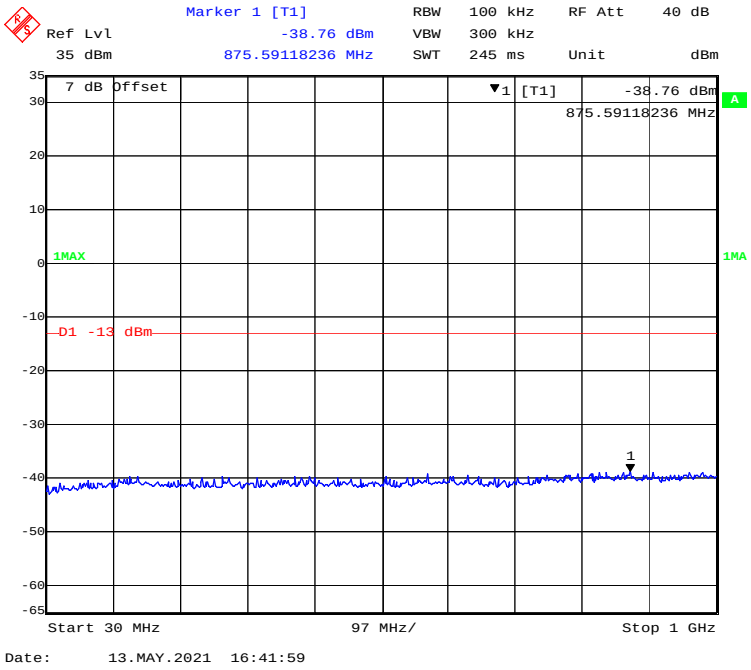
30 MHz – 1 GHz (20 MHz, QPSK, Middle Channel)



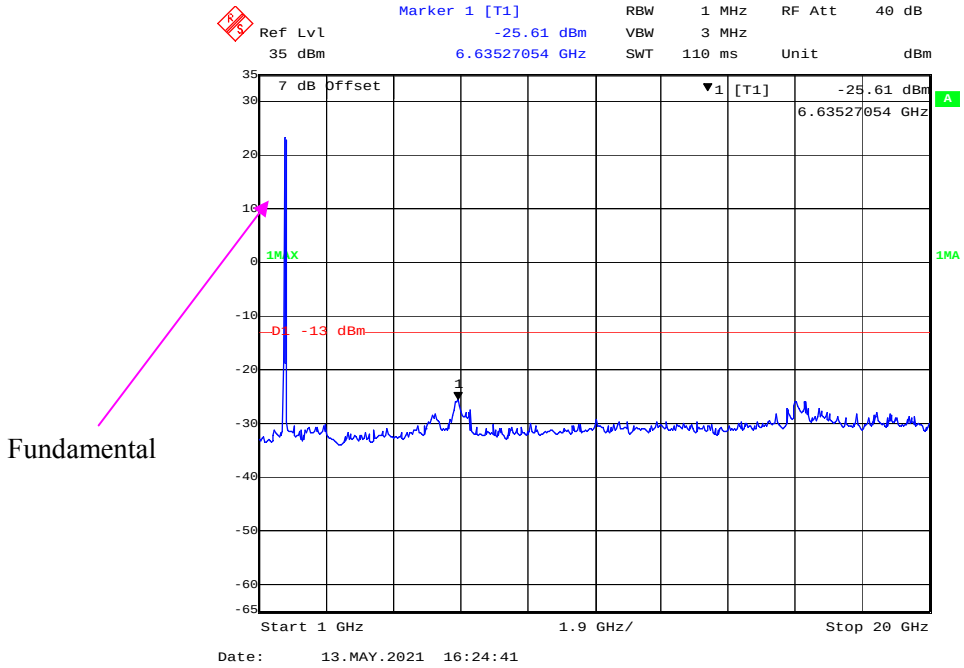
1 GHz – 20 GHz (20 MHz, QPSK, Middle Channel)



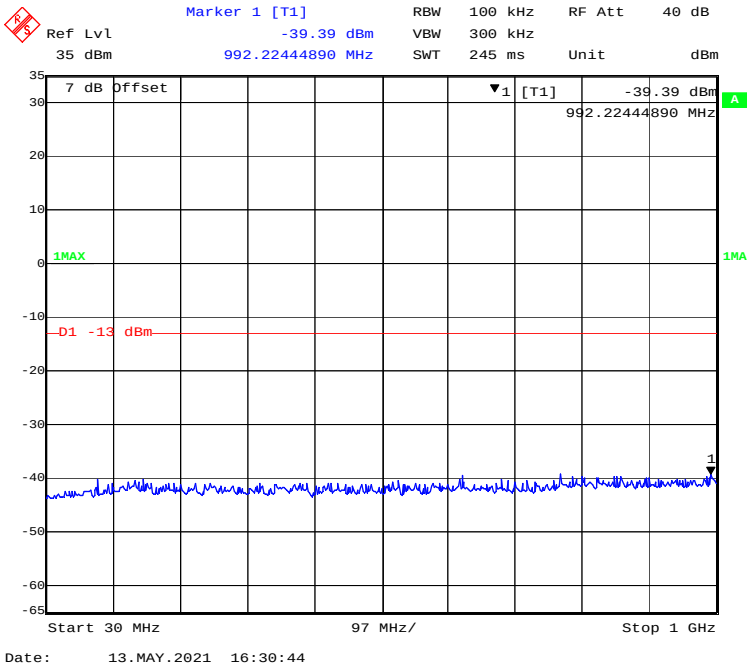
30 MHz – 1 GHz (20 MHz, 16-QAM, Middle Channel)



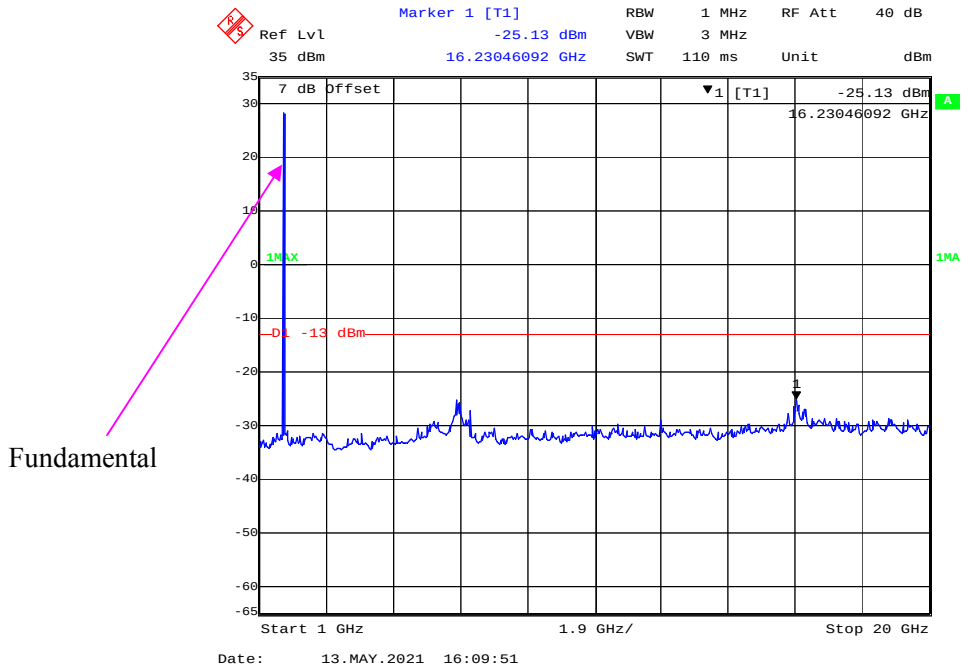
1 GHz – 20 GHz (20 MHz, 16-QAM, Middle Channel)



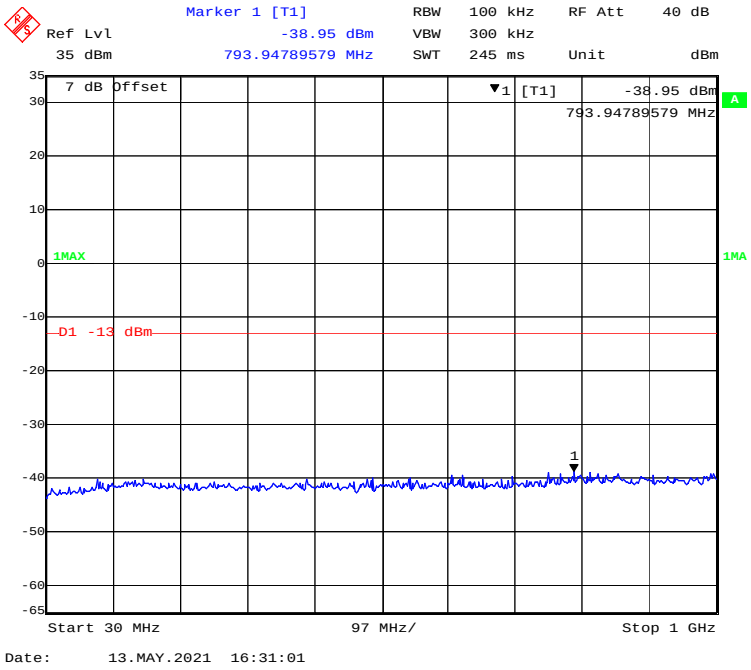
30 MHz – 1 GHz (1.4 MHz, QPSK, High Channel)



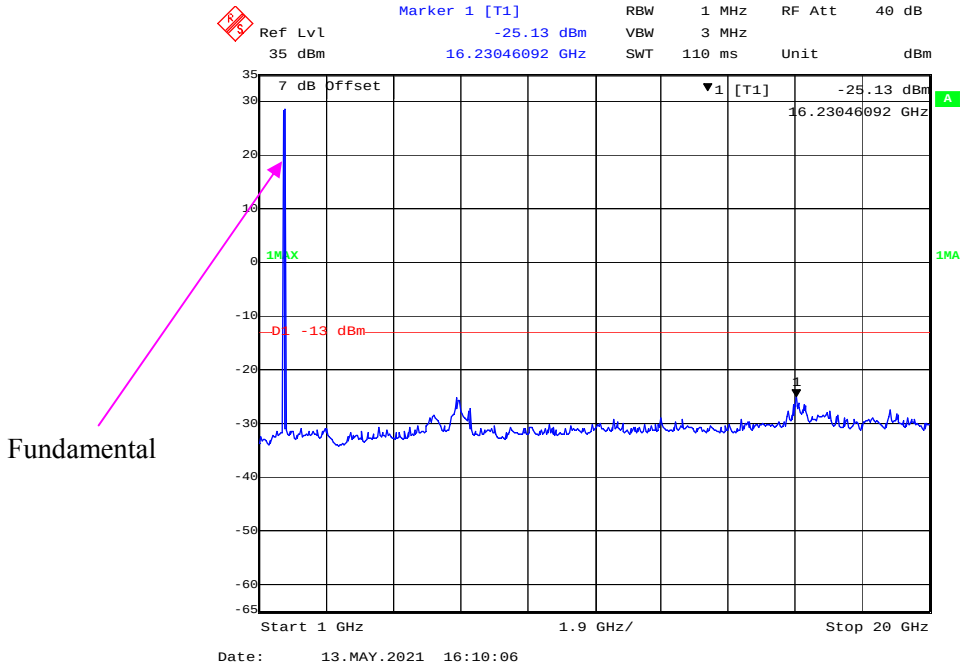
1 GHz – 20 GHz (1.4 MHz, QPSK, High Channel)



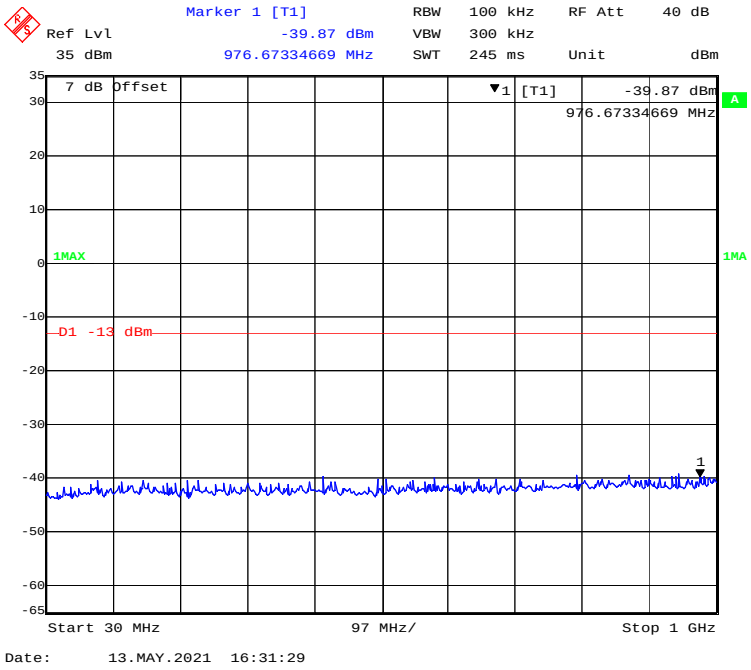
30 MHz – 1 GHz (1.4 MHz, 16-QAM, High Channel)



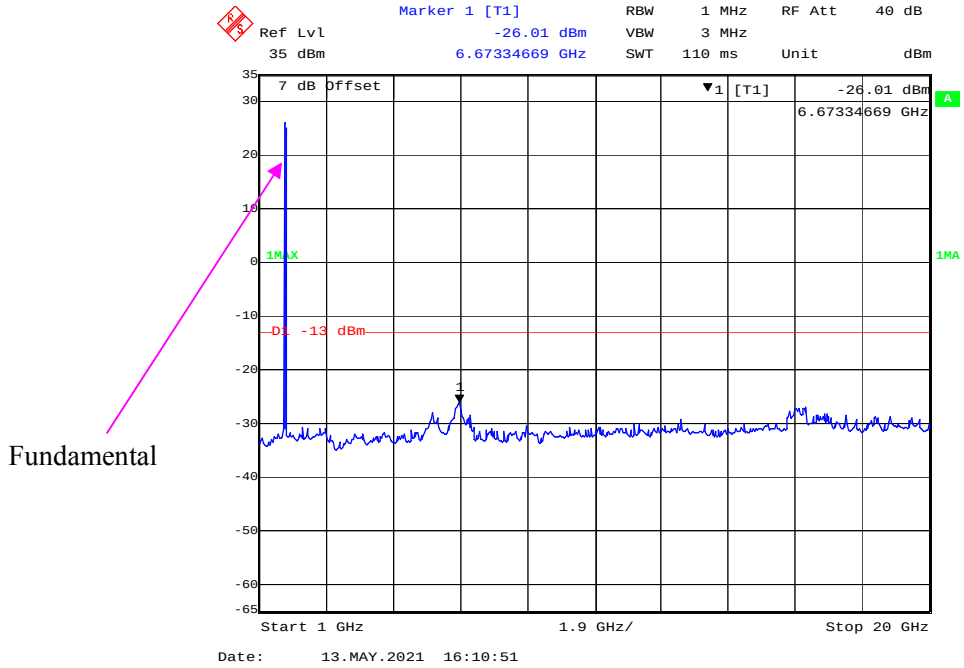
1 GHz – 20 GHz (1.4 MHz, 16-QAM, High Channel)



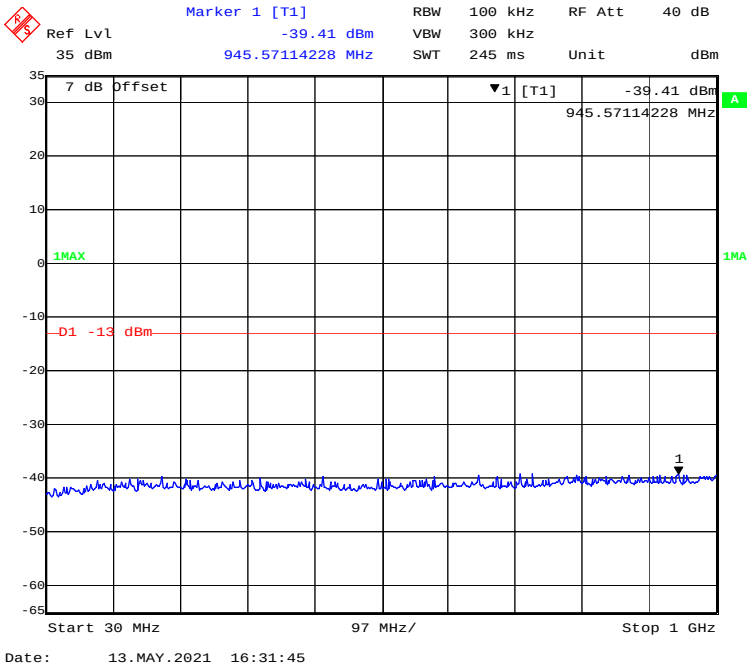
30 MHz – 1 GHz (3 MHz, QPSK, High Channel)



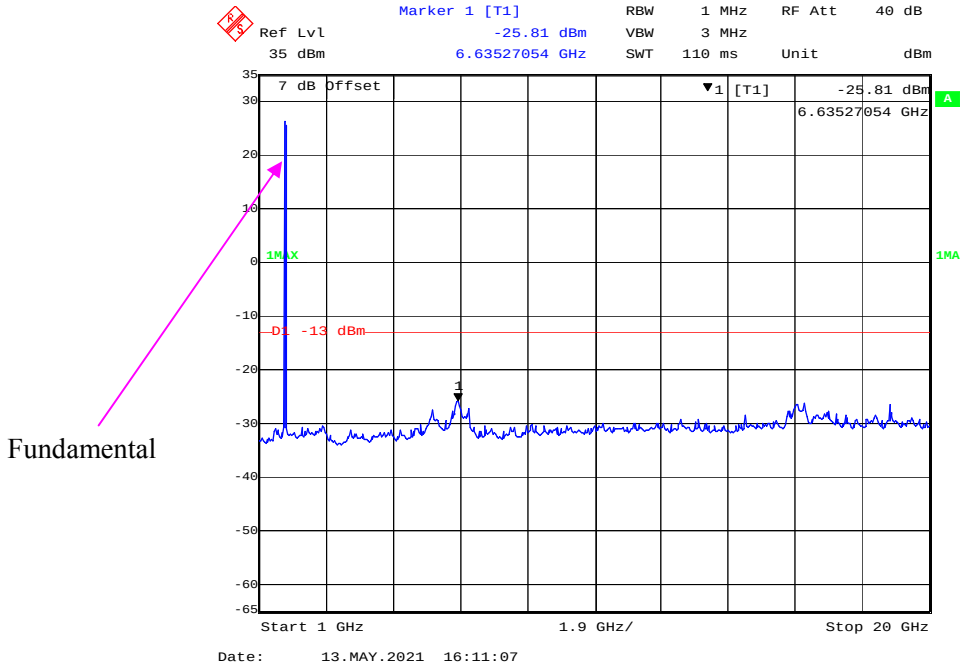
1 GHz – 20 GHz (3 MHz, QPSK, High Channel)



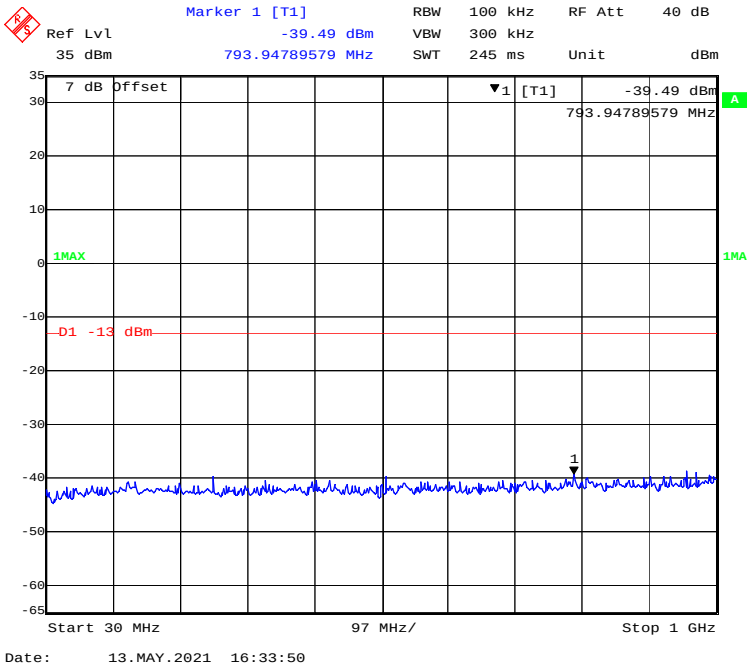
30 MHz – 1 GHz (3 MHz, 16-QAM, High Channel)



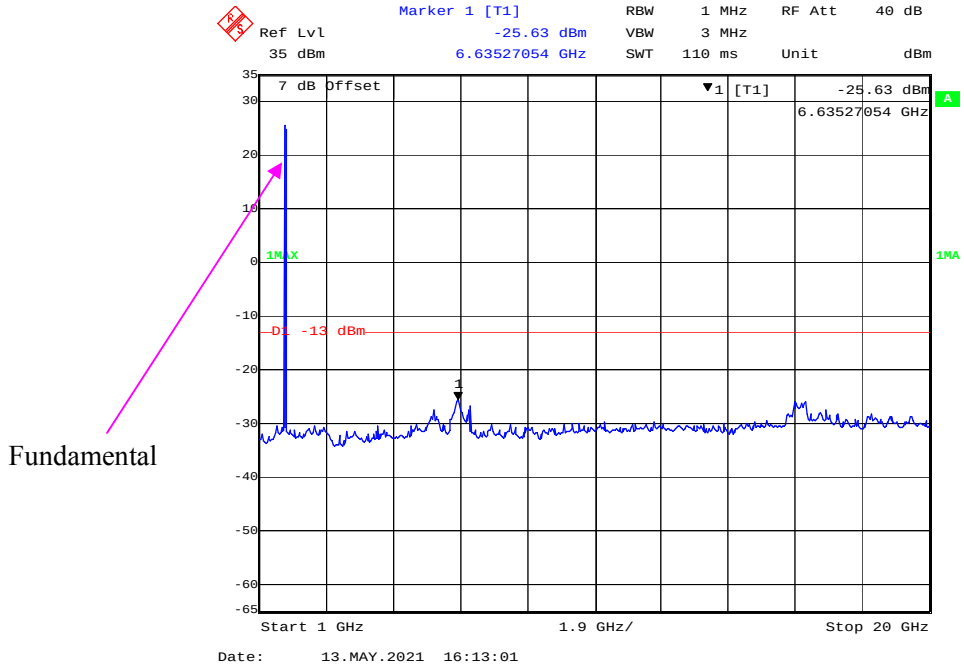
1 GHz – 20 GHz (3 MHz, 16-QAM, High Channel)



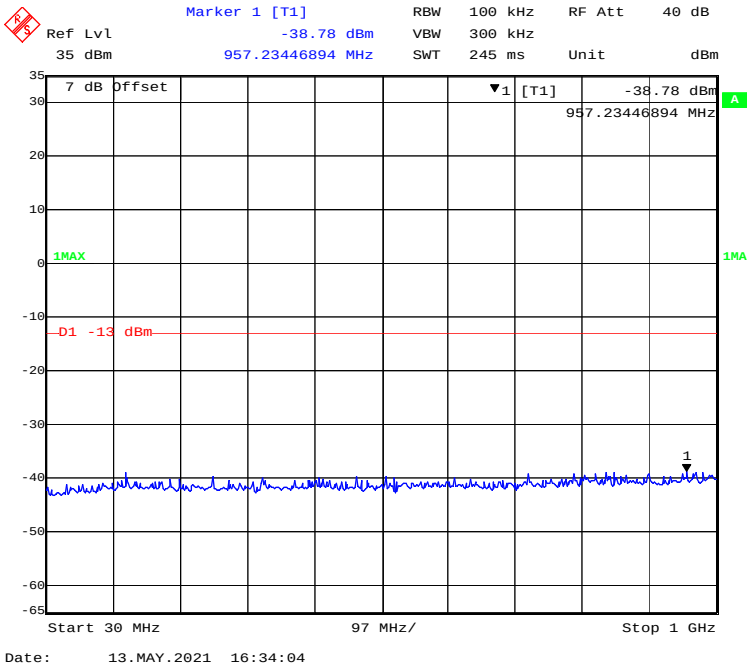
30 MHz – 1 GHz (5 MHz, QPSK, High Channel)



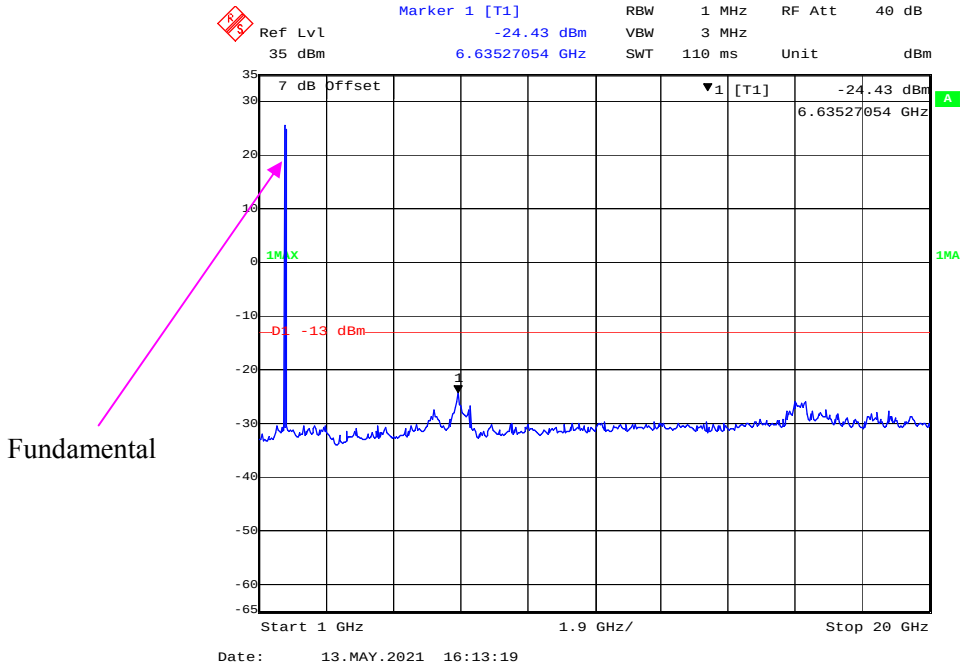
1 GHz – 20 GHz (5 MHz, QPSK, High Channel)



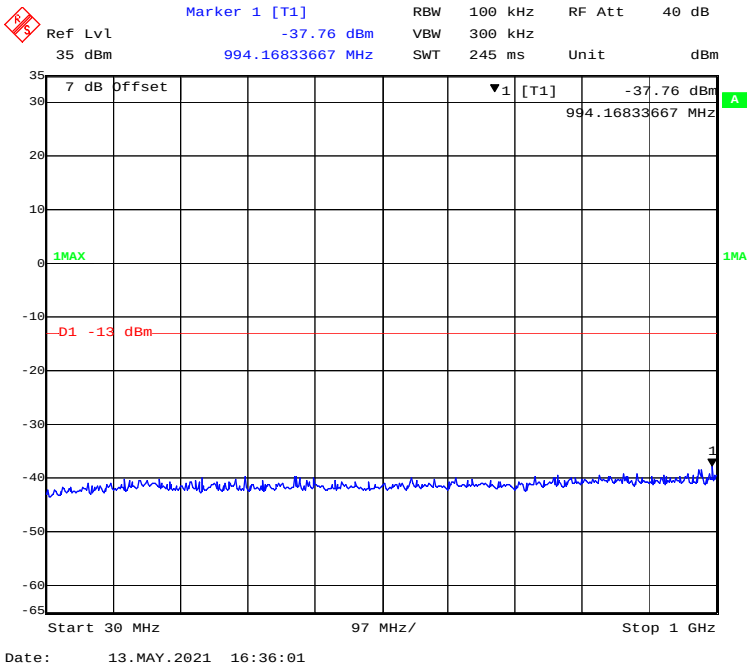
30 MHz – 1 GHz (5 MHz, 16-QAM, High Channel)



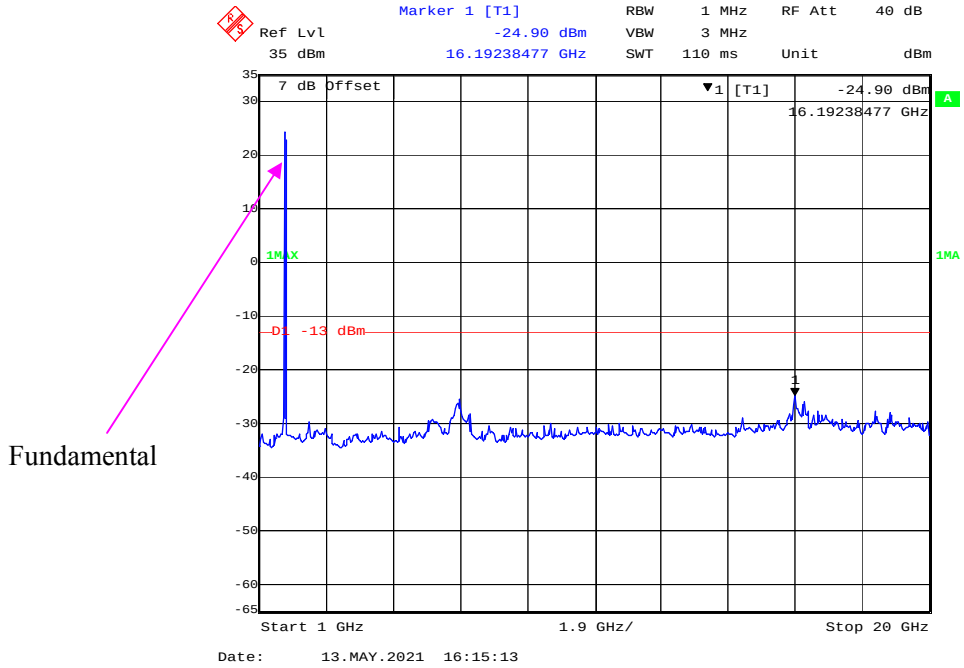
1 GHz – 20 GHz (5 MHz, 16-QAM, High Channel)



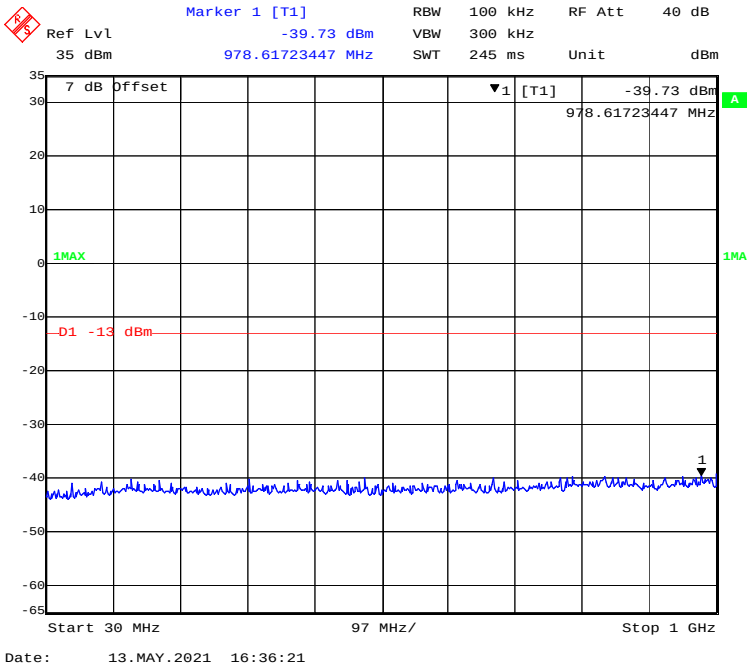
30 MHz – 1 GHz (10 MHz, QPSK, High Channel)



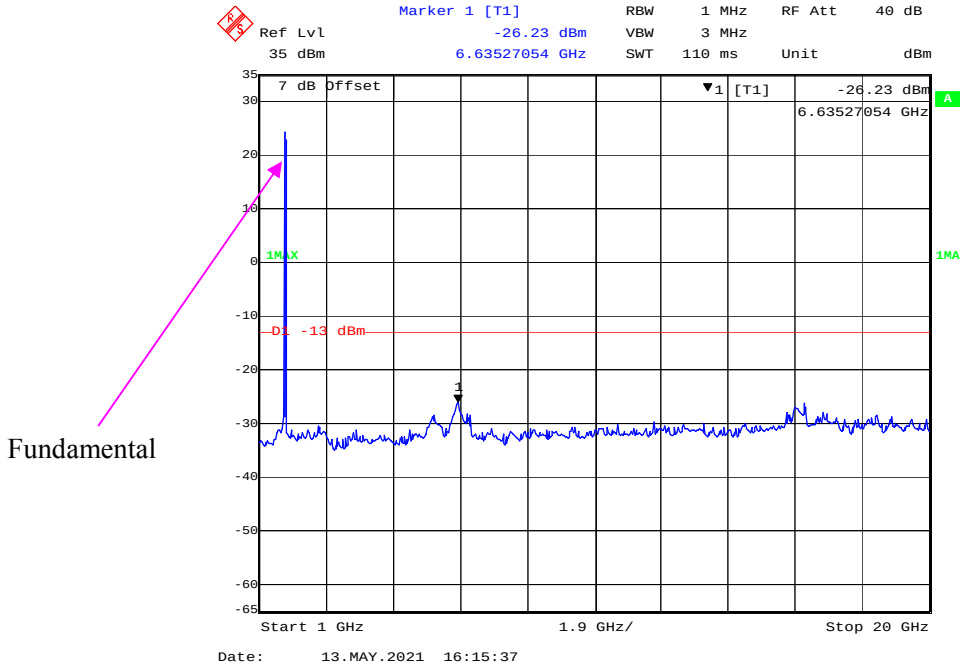
1 GHz – 20 GHz (10 MHz, QPSK, High Channel)



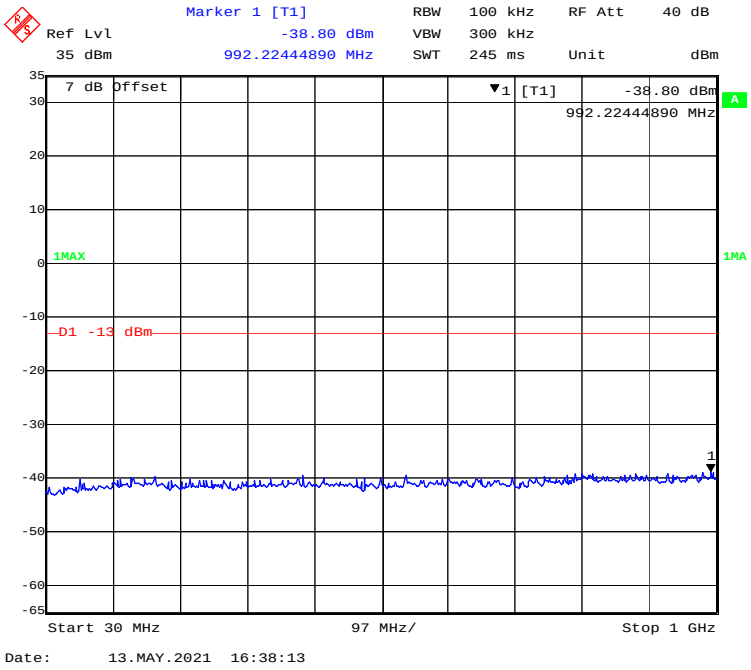
30 MHz – 1 GHz (10 MHz, 16-QAM, High Channel)



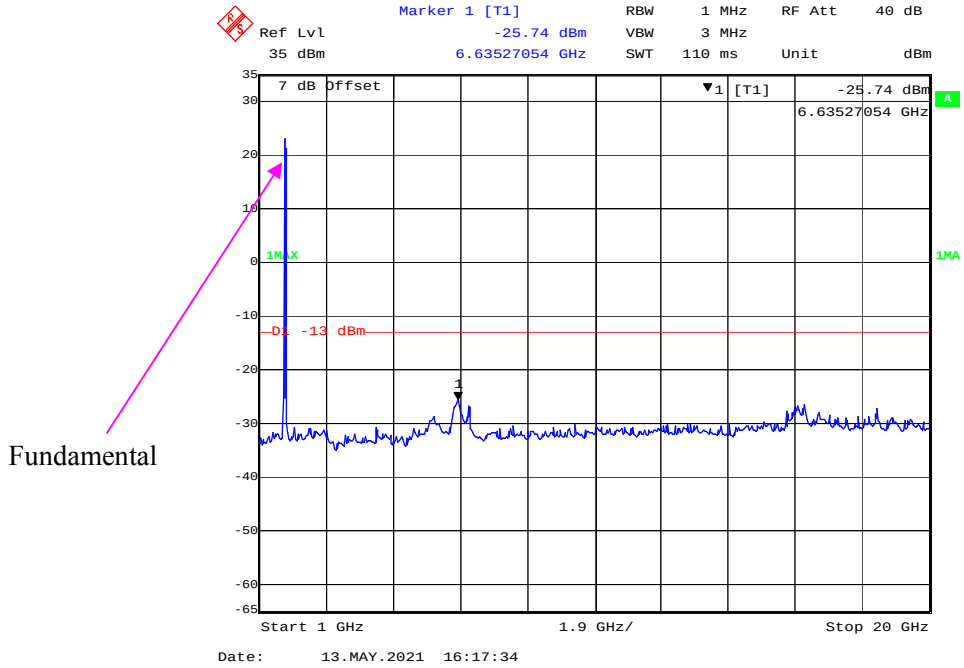
1 GHz – 20 GHz (10 MHz, 16-QAM, High Channel)



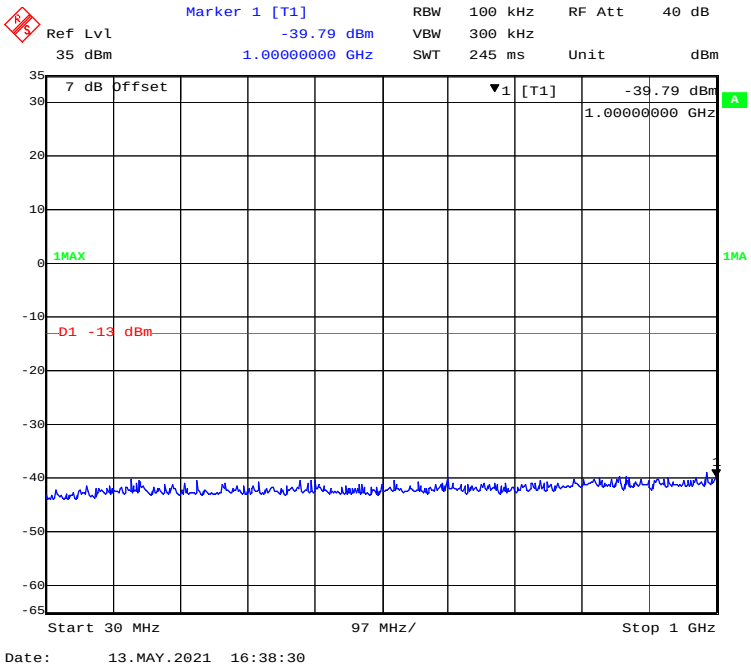
30 MHz – 1 GHz (15 MHz, QPSK, High Channel)



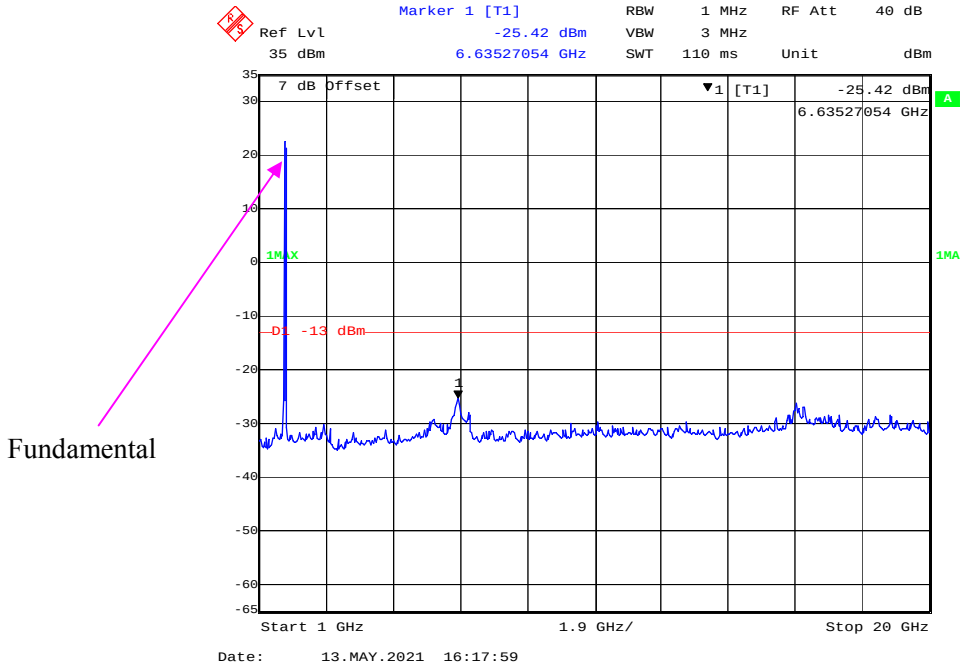
1 GHz – 20 GHz (15 MHz, QPSK, High Channel)



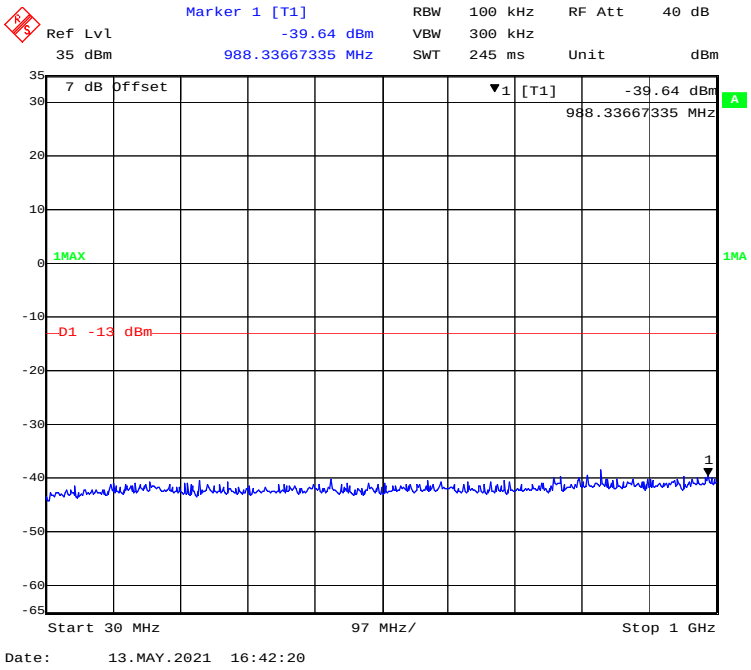
30 MHz – 1 GHz (15 MHz, 16-QAM, High Channel)



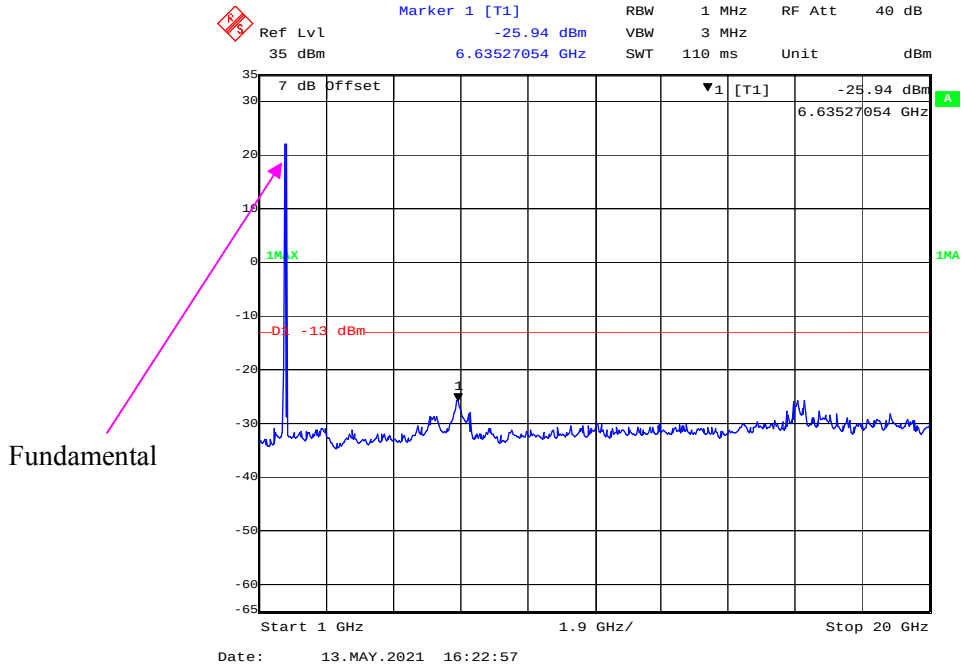
1 GHz – 20 GHz (15 MHz, 16-QAM, High Channel)



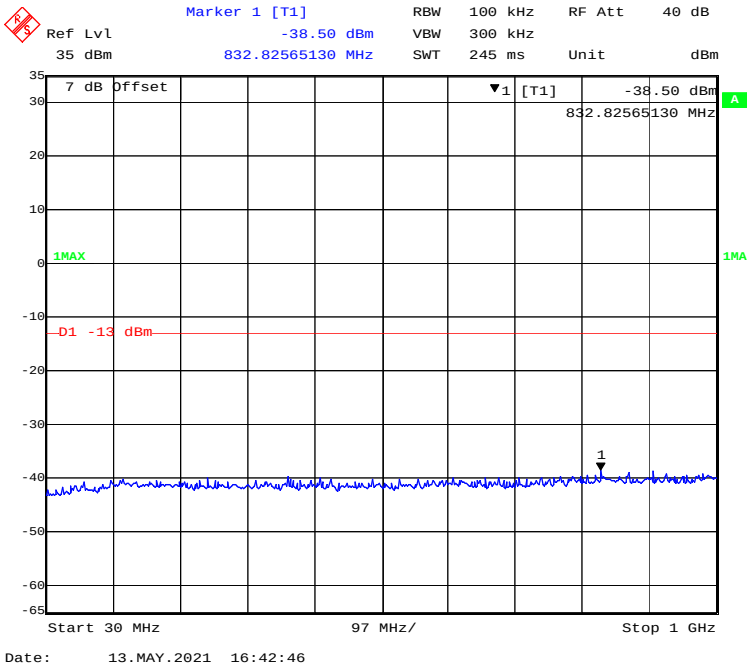
30 MHz – 1 GHz (20 MHz, QPSK, High Channel)



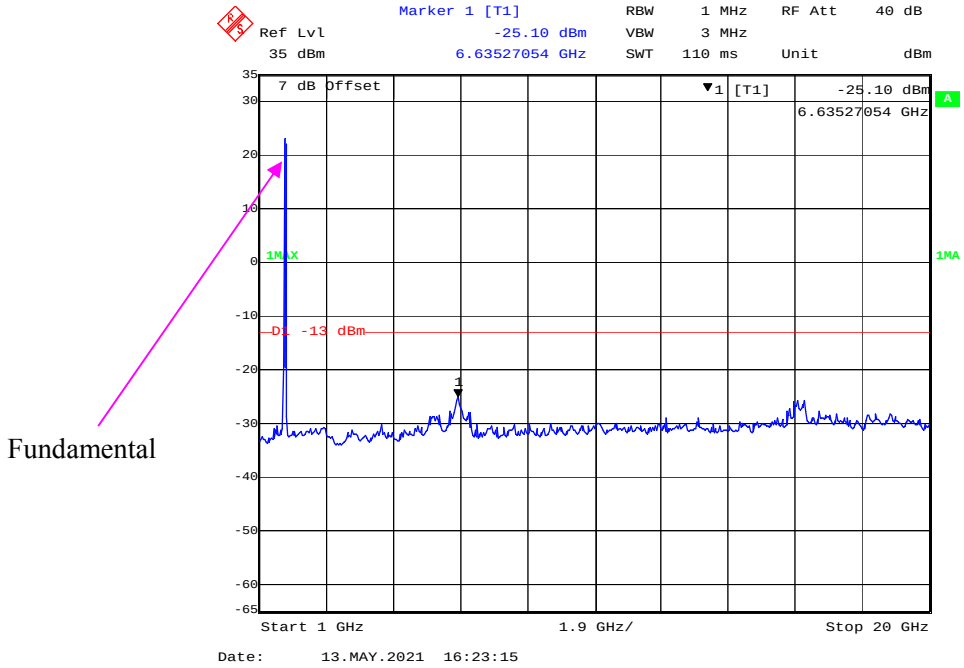
1 GHz – 20 GHz (20 MHz, QPSK, High Channel)



30 MHz – 1 GHz (20 MHz, 16-QAM, High Channel)



1 GHz – 20 GHz (20 MHz, 16-QAM, High Channel)



FCC § 2.1053; § 22.917 (a); § 24.238 (a)& §27.53 (a) (g) (h) (m); § 90.691 - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC § 2.1053, §22.917(a) and § 24.238(a), §90.691 and § 27.53(h) (m)

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.

27.53(h) (m), 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.

Rule Part 90.691 specifies that “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.

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:	24.9 ℃
Relative Humidity:	50 %
ATM Pressure:	101.9 kPa

The testing was performed by Miller Xie on 2021-05-18.

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

30 MHz ~ 10 GHz:

GSM 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										
306.23	53.24	197	150	H	-52.56	0.46	-2.1	-55.12	-13	42.12
306.23	55.51	24	150	V	-50.29	0.46	-2.1	-52.85	-13	39.85
1648.4	75.34	289	150	H	-38.01	0.84	8.44	-30.41	-13	17.41
1648.4	74.48	130	150	V	-38.87	0.84	8.44	-31.27	-13	18.27
GPRS Mode, Middle channel										
306.21	56.3	68	150	H	-49.5	0.46	-2.1	-52.06	-13	39.06
306.21	54.98	200	150	V	-50.82	0.46	-2.1	-53.38	-13	40.38
1673.2	75.01	193	150	H	-38.38	0.84	8.48	-30.74	-13	17.74
1673.2	73.36	30	150	V	-40.03	0.84	8.48	-32.39	-13	19.39
GPRS Mode, High channel										
306.28	55.4	36	150	H	-50.4	0.46	-2.1	-52.96	-13	39.96
306.28	54.89	35	150	V	-50.91	0.46	-2.1	-53.47	-13	40.47
1697.6	75.17	124	150	H	-37.84	0.84	8.52	-30.16	-13	17.16
1697.6	74.1	232	150	V	-38.91	0.84	8.52	-31.23	-13	18.23

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										
226.79	49.65	186	150	H	-57.91	0.43	-3.04	-61.38	-13	48.38
226.79	52.24	279	150	V	-55.32	0.43	-3.04	-58.79	-13	45.79
1652.80	62.56	11	100	H	-50.76	0.84	8.44	-43.16	-13	30.16
1652.80	59.9	243	100	V	-53.42	0.84	8.44	-45.82	-13	32.82
WCDMA Mode, Middle channel										
226.79	48.83	282	150	H	-58.73	0.43	-3.04	-62.2	-13	49.2
226.79	52.54	329	150	V	-55.02	0.43	-3.04	-58.49	-13	45.49
1673.20	62.21	295	100	H	-51.18	0.84	8.48	-43.54	-13	30.54
1673.20	60.29	256	100	V	-53.10	0.84	8.48	-45.46	-13	32.46
WCDMA Mode, High channel										
226.79	49.13	290	150	H	-58.43	0.43	-3.04	-61.9	-13	48.9
226.79	52.69	221	150	V	-54.87	0.43	-3.04	-58.34	-13	45.34
1693.20	63.17	143	100	H	-49.86	0.84	8.51	-42.19	-13	29.19
1693.20	59.53	140	100	V	-53.50	0.84	8.51	-45.83	-13	32.83

30 MHz ~ 20 GHz:

GPRS 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)			
GSM Mode, Low channel										
415.23	52.48	48	150	H	-51.86	0.53	-1.44	-53.83	-13	40.83
415.23	54.93	188	150	V	-49.41	0.53	-1.44	-51.38	-13	38.38
3700.4	54.73	263	150	H	-52.24	0.95	9.78	-43.41	-13	30.41
3700.4	53.28	357	150	V	-53.69	0.95	9.78	-44.86	-13	31.86
GSM Mode, Middle channel										
415.21	52.44	42	150	H	-51.9	0.53	-1.44	-53.87	-13	40.87
415.21	54.16	263	150	V	-50.18	0.53	-1.44	-52.15	-13	39.15
3760	55.05	307	150	H	-52.16	0.95	9.74	-43.37	-13	30.37
3760	53.9	180	150	V	-53.31	0.95	9.74	-44.52	-13	31.52
GSM Mode, High channel										
415.27	53.22	3	150	H	-51.12	0.53	-1.44	-53.09	-13	40.09
415.27	54.8	19	150	V	-49.54	0.53	-1.44	-51.51	-13	38.51
3819.6	54.42	238	150	H	-52.17	0.96	9.71	-43.42	-13	30.42
3819.6	53.46	74	150	V	-53.13	0.96	9.71	-44.38	-13	31.38

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										
415.22	54.16	282	150	H	-50.18	0.53	-1.44	-52.15	-13	39.15
415.22	53.89	257	150	V	-50.45	0.53	-1.44	-52.42	-13	39.42
3704.8	46.74	93	200	H	-60.22	0.95	9.78	-51.39	-13	38.39
3704.8	47.94	291	100	V	-59.02	0.95	9.78	-50.19	-13	37.19
WCDMA Mode, Middle channel										
415.22	53.05	78	150	H	-51.29	0.53	-1.44	-53.26	-13	40.26
415.22	53.19	136	150	V	-51.15	0.53	-1.44	-53.12	-13	40.12
3760	46.96	244	200	H	-59.82	0.95	9.74	-51.03	-13	38.03
3760	45.71	54	100	V	-61.07	0.95	9.74	-52.28	-13	39.28
WCDMA Mode, High channel										
415.22	53.19	233	150	H	-51.15	0.53	-1.44	-53.12	-13	40.12
415.22	52.76	287	150	V	-51.58	0.53	-1.44	-53.55	-13	40.55
3815.2	47.36	250	200	H	-59.24	0.96	9.71	-50.49	-13	37.49
3815.2	44.36	152	100	V	-62.24	0.96	9.71	-53.49	-13	40.49

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

WCDMA Band IV

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										
287.54	51.30	338	150	H	-55.64	0.46	-2.17	-58.27	-13	45.27
287.54	53.02	315	150	V	-53.92	0.46	-2.17	-56.55	-13	43.55
3430	52.87	162	200	H	-55.03	0.93	9.83	-46.13	-13	33.13
3430	53.14	104	100	V	-54.76	0.93	9.83	-45.86	-13	32.86
WCDMA Mode, Middle channel										
287.54	51.07	141	150	H	-55.87	0.46	-2.17	-58.5	-13	45.5
287.54	53.16	14	150	V	-53.78	0.46	-2.17	-56.41	-13	43.41
3465.2	53.78	276	200	H	-53.97	0.93	9.87	-45.03	-13	32.03
3465.2	52.32	246	100	V	-55.43	0.93	9.87	-46.49	-13	33.49
WCDMA Mode, High channel										
287.54	51.19	85	150	H	-55.75	0.46	-2.17	-58.38	-13	45.38
287.54	53.19	54	150	V	-53.75	0.46	-2.17	-56.38	-13	43.38
3500	51.80	189	200	H	-55.8	0.93	9.9	-46.83	-13	33.83
3500	51.44	129	100	V	-56.16	0.93	9.9	-47.19	-13	34.19

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										
266.68	47.81	233	100	H	-60.67	0.45	-2.22	-63.34	-13	50.34
266.68	47.31	260	200	V	-61.17	0.45	-2.22	-63.84	-13	50.84
3701.40	48.88	131	150	H	-58.08	0.95	9.78	-49.25	-13	36.25
3701.40	49.89	203	100	V	-57.07	0.95	9.78	-48.24	-13	35.24
16-QAM 1.4MHz Bandwidth Low Channel										
266.68	47.78	248	150	H	-60.7	0.45	-2.22	-58.03	-13	45.03
266.68	47.98	329	150	V	-60.5	0.45	-2.22	-57.83	-13	44.83
3701.40	50.47	242	200	H	-56.49	0.95	9.78	-47.66	-13	34.66
3701.40	49.36	240	200	V	-57.6	0.95	9.78	-48.77	-13	35.77

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										
266.68	47.24	132	100	H	-61.24	0.45	-2.22	-63.91	-13	50.91
266.68	48.19	102	100	V	-60.29	0.45	-2.22	-62.96	-13	49.96
3760	48.73	81	150	H	-58.05	0.95	9.74	-49.26	-13	36.26
3760	49.06	186	100	V	-57.72	0.95	9.74	-48.93	-13	35.93
16-QAM 1.4MHz Bandwidth Middle Channel										
266.68	48.14	187	150	H	-60.34	0.45	-2.22	-57.67	-13	44.67
266.68	48.12	179	150	V	-60.36	0.45	-2.22	-57.69	-13	44.69
3760	49.53	183	200	H	-57.25	0.95	9.74	-48.46	-13	35.46
3760	49.43	346	200	V	-57.35	0.95	9.74	-48.56	-13	35.56

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										
266.68	47.53	150	100	H	-60.95	0.45	-2.22	-63.62	-13	50.62
266.68	48.43	139	200	V	-60.05	0.45	-2.22	-57.38	-13	44.38
3818.60	49.08	151	150	H	-57.52	0.96	9.71	-48.77	-13	35.77
3818.60	50.06	258	100	V	-56.54	0.96	9.71	-47.79	-13	34.79
16-QAM 1.4MHz Bandwidth High Channel										
266.68	48.17	195	150	H	-60.31	0.45	-2.22	-62.98	-13	49.98
266.68	47.8	142	150	V	-60.68	0.45	-2.22	-63.35	-13	50.35
3818.60	50.44	66	200	H	-56.16	0.96	9.71	-47.41	-13	34.41
3818.60	49.41	201	200	V	-57.19	0.96	9.71	-48.44	-13	35.44

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										
241.46	46.56	327	100	H	-62.35	0.44	-2.54	-65.33	-13	52.33
241.46	46.53	135	200	V	-62.38	0.44	-2.54	-65.36	-13	52.36
3421.40	54.41	137	150	H	-53.53	0.93	9.82	-44.64	-13	31.64
3421.40	55.84	240	100	V	-52.1	0.93	9.82	-43.21	-13	30.21
16-QAM 1.4MHz Bandwidth Low Channel										
241.46	46.25	242	150	H	-62.66	0.44	-2.54	-59.68	-13	46.68
241.46	46.22	359	150	V	-62.69	0.44	-2.54	-59.71	-13	46.71
3421.40	56.25	163	200	H	-51.69	0.93	9.82	-42.8	-13	29.8
3421.40	54.8	109	200	V	-53.14	0.93	9.82	-44.25	-13	31.25

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										
241.46	46	7	100	H	-62.91	0.44	-2.54	-65.89	-13	52.89
241.46	46.7	320	200	V	-62.21	0.44	-2.54	-65.19	-13	52.19
3465	53.9	166	150	H	-53.85	0.93	9.87	-44.91	-13	31.91
3465	54.88	114	100	V	-52.87	0.93	9.87	-43.93	-13	30.93
16-QAM 1.4MHz Bandwidth Middle Channel										
241.46	46.64	86	150	H	-62.27	0.44	-2.54	-59.29	-13	46.29
241.46	46.09	54	150	V	-62.82	0.44	-2.54	-59.84	-13	46.84
3465	53.93	106	200	H	-53.82	0.93	9.87	-44.88	-13	31.88
3465	55.42	179	200	V	-52.33	0.93	9.87	-43.39	-13	30.39

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										
241.46	46.93	29	100	H	-61.98	0.44	-2.54	-64.96	-13	51.96
241.46	46.79	334	200	V	-62.12	0.44	-2.54	-65.10	-13	52.10
3508.60	54.85	184	150	H	-52.72	0.93	9.90	-43.75	-13	30.75
3508.60	55.61	240	100	V	-51.96	0.93	9.90	-42.99	-13	29.99
16-QAM 1.4MHz Bandwidth High Channel										
241.46	47.03	273	150	H	-61.88	0.44	-2.54	-64.86	-13	51.86
241.46	46.60	164	150	V	-62.31	0.44	-2.54	-65.29	-13	52.29
3508.60	56.37	192	200	H	-51.2	0.93	9.90	-42.23	-13	29.23
3508.60	54.80	33	200	V	-52.77	0.93	9.90	-43.80	-13	30.80

30 MHz ~ 10 GHz:

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										
230.06	44.7	2	100	H	-63.16	0.43	-2.93	-66.52	-13	53.52
230.06	44.4	127	200	V	-63.46	0.43	-2.93	-66.82	-13	53.82
1649.40	61.92	26	150	H	-51.42	0.84	8.44	-43.82	-13	30.82
1649.40	63.12	279	100	V	-50.22	0.84	8.44	-42.62	-13	29.62
16-QAM 1.4MHz Bandwidth Low Channel										
230.06	44.97	263	150	H	-62.89	0.43	-2.93	-66.25	-13	53.25
230.06	44.45	288	150	V	-63.41	0.43	-2.93	-66.77	-13	53.77
1649.40	63.74	175	200	H	-49.6	0.84	8.44	-42	-13	29.00
1649.40	62.08	202	200	V	-51.26	0.84	8.44	-43.66	-13	30.66

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										
230.06	44.36	299	100	H	-63.5	0.43	-2.93	-66.86	-13	53.86
230.06	44.82	95	200	V	-63.04	0.43	-2.93	-66.40	-13	53.40
1673.00	61.75	314	150	H	-51.64	0.84	8.48	-44.00	-13	31.00
1673.00	62.27	18	100	V	-51.12	0.84	8.48	-43.48	-13	30.48
16-QAM 1.4MHz Bandwidth Middle Channel										
230.06	44.6	114	150	H	-63.26	0.43	-2.93	-66.62	-13	53.62
230.06	44.45	20	150	V	-63.41	0.43	-2.93	-66.77	-13	53.77
1673.00	61.87	178	200	H	-51.52	0.84	8.48	-43.88	-13	30.88
1673.00	62.99	170	200	V	-50.40	0.84	8.48	-42.76	-13	29.76

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										
230.06	44.49	7	100	H	-63.37	0.43	-2.93	-66.73	-13	53.73
230.06	45	174	200	V	-62.86	0.43	-2.93	-66.22	-13	53.22
1696.60	61.75	213	150	H	-51.26	0.84	8.51	-43.59	-13	30.59
1696.60	63.28	7	100	V	-49.73	0.84	8.51	-42.06	-13	29.06
16-QAM 1.4MHz Bandwidth High Channel										
230.06	44.86	121	150	H	-63.00	0.43	-2.93	-66.36	-13	53.36
230.06	45.22	333	150	V	-62.64	0.43	-2.93	-66.00	-13	53.00
1696.60	63.39	350	200	H	-49.62	0.84	8.51	-41.95	-13	28.95
1696.60	61.98	100	200	V	-51.03	0.84	8.51	-43.36	-13	30.36

30MHz~26.5GHz:

LTE Band 7:

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										
231.76	45.15	281	200	H	-62.86	0.43	-2.87	-66.16	-25	41.16
231.76	45.03	227	200	V	-62.98	0.43	-2.87	-66.28	-25	41.28
5005.00	50.8	94	100	H	-55.19	1.08	10.30	-45.97	-25	20.97
5005.00	50.94	72	150	V	-55.05	1.08	10.30	-45.83	-25	20.83
16-QAM 5MHz Bandwidth Low Channel										
231.76	45.07	252	100	H	-62.94	0.43	-2.87	-66.24	-25	41.24
231.76	45.25	226	150	V	-62.76	0.43	-2.87	-66.06	-25	41.06
5005	51.12	15	150	H	-54.87	1.08	10.30	-45.65	-25	20.65
5005	51.28	150	200	V	-54.71	1.08	10.30	-45.49	-25	20.49

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										
231.76	44.54	162	200	H	-63.47	0.43	-2.87	-66.77	-25	41.77
231.76	44.87	331	200	V	-63.14	0.43	-2.87	-66.44	-25	41.44
5070	50.18	40	100	H	-55.81	1.09	10.30	-46.6	-25	21.60
5070	50.58	224	150	V	-55.41	1.09	10.30	-46.2	-25	21.20
16-QAM 5MHz Bandwidth Middle Channel										
231.76	45.50	252	100	H	-62.51	0.43	-2.87	-65.81	-25	40.81
231.76	45.31	290	150	V	-62.70	0.43	-2.87	-66.00	-25	41.00
5070	50.68	239	150	H	-55.31	1.09	10.30	-46.10	-25	21.10
5070	50.95	92	200	V	-55.04	1.09	10.30	-45.83	-25	20.83

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										
231.76	45.37	189	200	H	-62.64	0.43	-2.87	-65.94	-25	40.94
231.76	45.43	208	200	V	-62.58	0.43	-2.87	-65.88	-25	40.88
5135	50.71	103	100	H	-54.56	1.1	10.30	-45.36	-25	20.36
5135	51	87	150	V	-54.27	1.1	10.30	-45.07	-25	20.07
16-QAM 5MHz Bandwidth High Channel										
231.76	46.33	292	100	H	-61.68	0.43	-2.87	-64.98	-25	39.98
231.76	45.76	292	150	V	-62.25	0.43	-2.87	-65.55	-25	40.55
5135	50.48	255	150	H	-54.79	1.1	10.30	-45.59	-25	20.59
5135	51.57	31	200	V	-53.70	1.1	10.30	-44.50	-25	19.50

30MHz~10GHz:

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										
294.33	47.81	350	100	H	-58.64	0.46	-2.16	-61.26	-13	48.26
294.33	47.6	260	200	V	-58.85	0.46	-2.16	-61.47	-13	48.47
1399.4	69.76	21	150	H	-44.41	0.82	7.92	-37.31	-13	24.31
1399.4	70.33	146	100	V	-43.84	0.82	7.92	-36.74	-13	23.74
16-QAM 1.4MHz Bandwidth Low Channel										
223.63	48.41	335	150	H	-55.23	0.43	-3.15	-58.81	-13	45.81
223.63	48.31	220	150	V	-55.33	0.43	-3.15	-58.91	-13	45.91
1399.4	70.4	105	200	H	-43.77	0.82	7.92	-36.67	-13	23.67
1399.4	70.3	290	200	V	-43.87	0.82	7.92	-36.77	-13	23.77

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										
294.33	43.28	330	100	H	-63.17	0.46	-2.16	-60.55	-13	47.55
294.33	44.1	267	200	V	-62.35	0.46	-2.16	-59.73	-13	46.73
1415.00	68.88	327	150	H	-45.32	0.82	7.96	-38.18	-13	25.18
1415.00	69.04	49	100	V	-45.16	0.82	7.96	-38.02	-13	25.02
16-QAM 1.4MHz Bandwidth Middle Channel										
294.33	44.25	329	150	H	-62.2	0.46	-2.16	-59.58	-13	46.58
294.33	44.13	298	150	V	-62.32	0.46	-2.16	-59.70	-13	46.70
1415.00	69.68	271	200	H	-44.52	0.82	7.96	-37.38	-13	24.38
1415.00	69.82	256	200	V	-44.38	0.82	7.96	-37.24	-13	24.24

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										
294.33	43.67	347	100	H	-62.78	0.46	-2.16	-60.16	-13	47.16
294.33	43.51	181	200	V	-62.94	0.46	-2.16	-60.32	-13	47.32
1430.6	69.44	272	150	H	-44.79	0.82	8	-37.61	-13	24.61
1430.6	70.01	57	100	V	-44.22	0.82	8	-37.04	-13	24.04
16-QAM 1.4MHz Bandwidth High Channel										
294.33	43.68	260	150	H	-62.77	0.46	-2.16	-60.15	-13	47.15
294.33	43.32	175	150	V	-63.13	0.46	-2.16	-60.51	-13	47.51
1430.6	70.55	55	200	H	-43.68	0.82	8	-36.5	-13	23.50
1430.6	70.35	312	200	V	-43.88	0.82	8	-36.7	-13	23.70

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										
241.46	44.26	352	100	H	-64.65	0.44	-2.54	-67.63	-13	54.63
241.46	44.86	273	200	V	-64.05	0.44	-2.54	-67.03	-13	54.03
1413.00	64.98	218	150	H	-49.99	0.83	8.06	-42.76	-13	29.76
1413.00	65.91	264	100	V	-49.06	0.83	8.06	-41.83	-13	28.83
16-QAM 5MHz Bandwidth Low Channel										
241.46	45.42	302	100	H	-63.49	0.44	-2.54	-66.47	-13	53.47
241.46	44.46	305	200	V	-64.45	0.44	-2.54	-67.43	-13	54.43
1413.00	65.91	206	200	H	-49.06	0.83	8.06	-41.83	-13	28.83
1413.00	65.91	113	200	V	-49.06	0.83	8.06	-41.83	-13	28.83

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										
241.46	43.77	118	100	H	-65.14	0.44	-2.54	-68.12	-13	55.12
241.46	44.35	320	200	V	-64.56	0.44	-2.54	-67.54	-13	54.54
1420	64.73	335	150	H	-50.19	0.83	8.07	-42.95	-13	29.95
1420	64.97	216	100	V	-49.95	0.83	8.07	-42.71	-13	29.71
16-QAM 5MHz Bandwidth Middle Channel										
241.46	43.98	162	100	H	-64.93	0.44	-2.54	-67.91	-13	54.91
241.46	43.83	197	200	V	-65.08	0.44	-2.54	-68.06	-13	55.06
1420	65.39	137	200	H	-49.53	0.83	8.07	-42.29	-13	29.29
1420	65.75	72	200	V	-49.17	0.83	8.07	-41.93	-13	28.93

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										
241.46	44.08	117	100	H	-64.83	0.44	-2.54	-67.81	-13	54.81
241.46	43.92	70	200	V	-64.99	0.44	-2.54	-67.97	-13	54.97
1427	65.54	8	150	H	-49.34	0.83	8.08	-42.09	-13	29.09
1427	65.83	305	100	V	-49.05	0.83	8.08	-41.8	-13	28.80
16-QAM 5MHz Bandwidth High Channel										
241.46	43.85	339	100	H	-65.06	0.44	-2.54	-68.04	-13	55.04
241.46	44.03	117	200	V	-64.88	0.44	-2.54	-67.86	-13	54.86
1427	66.78	128	200	H	-48.1	0.83	8.08	-40.85	-13	27.85
1427	66.32	136	200	V	-48.56	0.83	8.08	-41.31	-13	28.31

30 MHz ~ 20 GHz:

LTE Band 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 Low Channel										
290.69	41.94	267	100	H	-64.77	0.46	-2.17	-67.4	-13	54.40
290.69	42.85	346	200	V	-63.86	0.46	-2.17	-66.49	-13	53.49
3611.4	49.56	249	150	H	-57.69	0.94	9.83	-48.8	-13	35.80
3611.4	50.16	1	100	V	-57.09	0.94	9.83	-48.2	-13	35.20
16-QAM 1.4MHz Bandwidth Low Channel										
290.69	43.15	141	100	H	-63.56	0.46	-2.17	-66.19	-13	53.19
290.69	42.72	143	200	V	-63.99	0.46	-2.17	-66.62	-13	53.62
3611.4	50.06	317	200	H	-57.19	0.94	9.83	-48.3	-13	35.30
3611.4	49.92	85	200	V	-57.33	0.94	9.83	-48.44	-13	35.44

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										
290.69	41.79	162	100	H	-64.92	0.46	-2.17	-67.55	-13	54.55
290.69	41.96	22	200	V	-64.75	0.46	-2.17	-67.38	-13	54.38
3765	48.31	321	150	H	-58.45	0.95	9.74	-49.66	-13	36.66
3765	48.38	287	100	V	-58.38	0.95	9.74	-49.59	-13	36.59
16-QAM 1.4MHz Bandwidth Middle Channel										
290.69	42.17	243	100	H	-64.54	0.46	-2.17	-67.17	-13	54.17
290.69	42.42	44	200	V	-64.29	0.46	-2.17	-66.92	-13	53.92
3765	49.22	156	200	H	-57.54	0.95	9.74	-48.75	-13	35.75
3765	49.25	29	200	V	-57.51	0.95	9.74	-48.72	-13	35.72

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										
290.69	42.69	108	100	H	-64.02	0.46	-2.17	-66.65	-13	53.65
290.69	42.21	355	200	V	-64.5	0.46	-2.17	-67.13	-13	54.13
3828.6	48.79	140	150	H	-57.77	0.96	9.7	-49.03	-13	36.03
3828.6	49.04	224	100	V	-57.52	0.96	9.7	-48.78	-13	35.78
16-QAM 1.4MHz Bandwidth High Channel										
290.69	41.98	349	100	H	-64.73	0.46	-2.17	-67.36	-13	54.36
290.69	41.81	163	200	V	-64.9	0.46	-2.17	-67.53	-13	54.53
3828.6	49.21	183	200	H	-57.35	0.96	9.7	-48.61	-13	35.61
3828.6	49.13	351	200	V	-57.43	0.96	9.7	-48.69	-13	35.69

30 MHz ~ 10 GHz:

LTE Band 26:

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										
230.67	43.33	137	100	H	-64.58	0.43	-2.91	-67.92	-13	54.92
230.67	44.26	137	200	V	-63.65	0.43	-2.91	-66.99	-13	53.99
1629.4	51.88	193	100	H	-61.59	0.84	8.41	-54.02	-13	41.02
1629.4	52.21	234	150	V	-61.26	0.84	8.41	-53.69	-13	40.69
16-QAM 1.4MHz Bandwidth Low Channel										
230.67	43.43	352	100	H	-64.48	0.43	-2.91	-67.82	-13	54.82
230.67	44.31	197	150	V	-63.6	0.43	-2.91	-40.35	-13	27.35
1629.4	53.17	156	150	H	-60.30	0.84	8.41	-52.73	-13	39.73
1629.4	52.50	227	200	V	-60.97	0.84	8.41	-53.4	-13	40.40

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										
230.67	42.73	7	100	H	-65.18	0.43	-2.91	-68.52	-13	55.52
230.67	43.04	135	200	V	-64.87	0.43	-2.91	-68.21	-13	55.21
1663	50.80	116	100	H	-62.44	0.84	8.46	-54.82	-13	41.82
1663	50.89	333	150	V	-62.35	0.84	8.46	-54.73	-13	41.73
16-QAM 1.4MHz Bandwidth Middle Channel										
230.67	43.41	36	100	H	-64.5	0.43	-2.91	-67.84	-13	54.84
230.67	43.12	119	200	V	-64.79	0.43	-2.91	-68.13	-13	55.13
1663	51.2	262	150	H	-62.04	0.84	8.46	-54.42	-13	41.42
1663	51.82	232	200	V	-61.42	0.84	8.46	-53.8	-13	40.80

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										
230.67	43.54	305	100	H	-64.37	0.43	-2.91	-67.71	-13	54.71
230.67	43.42	344	200	V	-64.49	0.43	-2.91	-67.83	-13	54.83
1696.6	51.01	317	100	H	-62.00	0.84	8.51	-54.33	-13	41.33
1696.6	51.40	224	150	V	-61.61	0.84	8.51	-53.94	-13	40.94
16-QAM 1.4MHz Bandwidth High Channel										
230.67	43.33	111	100	H	-64.58	0.43	-2.91	-67.92	-13	54.92
230.67	42.95	5	200	V	-64.96	0.43	-2.91	-68.3	-13	55.30
1696.6	52.39	6	150	H	-60.62	0.84	8.51	-52.95	-13	39.95
1696.6	51.53	140	200	V	-61.48	0.84	8.51	-53.81	-13	40.81

30 MHz ~ 26.5 GHz:

LTE Band 40(2305MHz-2315MHz):

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										
294.57	44.95	308	150	H	-61.48	0.46	-2.16	-64.10	-40	24.1
294.57	45.91	103	200	V	-60.52	0.46	-2.16	-63.14	-40	23.14
4615.00	51.27	320	100	H	-55.65	1.03	9.99	-46.69	-40	6.69
4615.00	52.59	92	100	V	-54.33	1.03	9.99	-45.37	-40	5.37
16-QAM 5MHz Bandwidth Low Channel										
294.57	45.78	184	200	H	-60.65	0.46	-2.16	-63.27	-40	23.27
294.57	45.38	266	150	V	-61.05	0.46	-2.16	-63.67	-40	23.67
4615.00	53.22	278	150	H	-53.70	1.03	9.99	-44.74	-40	4.74
4615.00	51.58	260	100	V	-55.34	1.03	9.99	-46.38	-40	6.38

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										
294.57	44.95	218	150	H	-61.48	0.46	-2.16	-64.10	-40	24.10
294.57	45.17	102	200	V	-61.26	0.46	-2.16	-63.88	-40	23.88
4620.00	51.07	20	100	H	-55.84	1.03	10.00	-46.87	-40	6.87
4620.00	51.62	328	100	V	-55.29	1.03	10.00	-46.32	-40	6.32
16-QAM 5MHz Bandwidth Middle Channel										
294.57	45.64	246	200	H	-60.79	0.46	-2.16	-63.41	-40	23.41
294.57	45.12	251	150	V	-61.31	0.46	-2.16	-63.93	-40	23.93
4620.00	51.67	162	150	H	-55.24	1.03	10.00	-46.27	-40	6.27
4620.00	51.9	348	100	V	-55.01	1.03	10.00	-46.04	-40	6.04

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										
294.57	45.03	167	150	H	-61.4	0.46	-2.16	-64.02	-40	24.02
294.57	45.45	178	200	V	-60.98	0.46	-2.16	-63.60	-40	23.6
4625.00	52.2	43	100	H	-54.7	1.04	10.00	-45.74	-40	5.74
4625.00	52.85	156	100	V	-54.05	1.04	10.00	-45.09	-40	5.09
16-QAM 5MHz Bandwidth High Channel										
294.57	46.27	281	200	H	-60.16	0.46	-2.16	-62.78	-40	22.78
294.57	45.94	167	150	V	-60.49	0.46	-2.16	-63.11	-40	23.11
4625.00	54.17	28	150	H	-52.73	1.04	10.00	-43.77	-40	3.77
4625.00	52.01	349	100	V	-54.89	1.04	10.00	-45.93	-40	5.93

LTE Band 40(2350MHz-2360MHz):

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										
294.57	46.70	154	150	H	-59.73	0.46	-2.16	-62.35	-40	22.35
294.57	46.07	178	200	V	-60.36	0.46	-2.16	-62.98	-40	22.98
4705.00	51.81	67	100	H	-54.9	1.04	10.06	-45.88	-40	5.88
4705.00	52.39	353	100	V	-54.32	1.04	10.06	-45.3	-40	5.30
16-QAM 5MHz Bandwidth Low Channel										
221.69	46.3	29	200	H	-60.13	0.46	-2.16	-62.75	-40	22.75
221.69	45.84	188	150	V	-60.59	0.46	-2.16	-63.21	-40	23.21
4705.00	53.05	64	150	H	-53.66	1.04	10.06	-44.64	-40	4.64
4705.00	52.4	310	100	V	-54.31	1.04	10.06	-45.29	-40	5.29

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										
294.57	45.79	13	150	H	-60.64	0.46	-2.16	-63.26	-40	23.26
294.57	46.47	289	200	V	-59.96	0.46	-2.16	-62.58	-40	22.58
4710.00	51.67	165	100	H	-55.03	1.05	10.07	-46.01	-40	6.01
4710.00	52.02	345	100	V	-54.68	1.05	10.07	-45.66	-40	5.66
16-QAM 5MHz Bandwidth Middle Channel										
294.57	45.99	264	200	H	-60.44	0.46	-2.16	-63.06	-40	23.06
294.57	45.88	12	150	V	-60.55	0.46	-2.16	-63.17	-40	23.17
4710.00	52.17	274	150	H	-54.53	1.05	10.07	-45.51	-40	5.51
4710.00	52.52	43	100	V	-54.18	1.05	10.07	-45.16	-40	5.16

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										
294.57	46.75	90	150	H	-59.68	0.46	-2.16	-62.30	-40	22.30
294.57	47.57	219	200	V	-58.86	0.46	-2.16	-61.48	-40	21.48
4715.00	52.73	39	100	H	-53.96	1.05	10.07	-44.94	-40	4.94
4715.00	52.6	291	100	V	-54.09	1.05	10.07	-45.07	-40	5.07
16-QAM 5MHz Bandwidth High Channel										
294.57	46.47	274	200	H	-59.96	0.46	-2.16	-62.58	-40	22.58
294.57	46.47	248	150	V	-59.96	0.46	-2.16	-62.58	-40	22.58
4715.00	53.26	257	150	H	-53.43	1.05	10.07	-44.41	-40	4.41
4715.00	52.59	10	100	V	-54.1	1.05	10.07	-45.08	-40	5.08

LTE Band 41:

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										
300.51	44.8	80	150	H	-61.21	0.46	-2.15	-63.82	-25	38.82
300.51	45.16	215	200	V	-60.85	0.46	-2.15	-63.46	-25	38.46
5115.00	49.25	307	100	H	-56.13	1.09	10.30	-46.92	-25	21.92
5115.00	50.07	98	100	V	-55.31	1.09	10.30	-46.10	-25	21.10
16-QAM 5MHz Bandwidth Low Channel										
300.51	44.99	263	200	H	-61.02	0.46	-2.15	-63.63	-25	38.63
300.51	44.95	247	150	V	-61.06	0.46	-2.15	-63.67	-25	38.67
5115.00	51.07	341	150	H	-54.31	1.09	10.30	-45.10	-25	20.10
5115.000	49.75	188	100	V	-55.63	1.09	10.30	-46.42	-25	21.42

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										
300.51	44.30	132	150	H	-61.71	0.46	-2.15	-64.32	-25	39.32
300.51	45.11	304	200	V	-60.9	0.46	-2.15	-63.51	-25	38.51
5210.00	49.20	185	100	H	-56.18	1.11	10.30	-46.99	-25	21.99
5210.00	50.01	135	100	V	-55.37	1.11	10.30	-46.18	-25	21.18
16-QAM 5MHz Bandwidth Middle Channel										
300.51	44.40	234	200	H	-61.61	0.46	-2.15	-64.22	-25	39.22
300.51	45.27	215	150	V	-60.74	0.46	-2.15	-63.35	-25	38.35
5210.00	49.97	143	150	H	-55.41	1.11	10.30	-46.22	-25	21.22
5210.00	50.37	141	100	V	-55.01	1.11	10.30	-45.82	-25	20.82

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										
300.51	44.81	297	150	H	-61.2	0.46	-2.15	-63.81	-25	38.81
300.51	45.16	56	200	V	-60.85	0.46	-2.15	-63.46	-25	38.46
5305.00	49.11	51	100	H	-55.21	1.12	10.30	-46.03	-25	21.03
5305.00	49.56	175	100	V	-54.76	1.12	10.30	-45.58	-25	20.58
16-QAM 5MHz Bandwidth High Channel										
300.51	45.23	209	200	H	-60.78	0.46	-2.15	-63.39	-25	38.39
300.51	45.24	65	150	V	-60.77	0.46	-2.15	-63.38	-25	38.38
5305.00	50.28	15	150	H	-54.04	1.12	10.30	-44.86	-25	19.86
5305.00	49.72	5	100	V	-54.6	1.12	10.30	-45.42	-25	20.42

30 MHz ~ 20 GHz:

LTE Band 66:

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										
234.55	44.24	327	150	H	-64.03	0.43	-2.78	-67.24	-13	54.24
234.55	45.46	7	200	V	-62.81	0.43	-2.78	-66.02	-13	53.02
3421.40	50.75	200	100	H	-57.19	0.93	9.82	-48.30	-13	35.30
3421.40	50.34	305	100	V	-57.6	0.93	9.82	-48.71	-13	35.71
16-QAM 1.4MHz Bandwidth Low Channel										
234.55	45.55	286	200	H	-62.72	0.43	-2.78	-65.93	-13	52.93
234.55	45.28	235	150	V	-62.99	0.43	-2.78	-66.20	-13	53.20
3421.40	51.98	185	150	H	-55.96	0.93	9.82	-47.07	-13	34.07
3421.40	51.76	183	100	V	-56.18	0.93	9.82	-47.29	-13	34.29

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										
234.55	44.23	339	150	H	-64.04	0.43	-2.78	-60.83	-13	47.83
234.55	44.57	133	200	V	-63.7	0.43	-2.78	-60.49	-13	47.49
3490	49.58	110	100	H	-58.06	0.93	9.89	-49.1	-13	36.1
3490	50.17	13	100	V	-57.47	0.93	9.89	-48.51	-13	35.51
16-QAM 1.4MHz Bandwidth Middle Channel										
234.55	44.41	127	200	H	-63.86	0.43	-2.78	-60.65	-13	47.65
234.55	44.40	172	150	V	-63.87	0.43	-2.78	-60.66	-13	47.66
3490	49.95	49	150	H	-57.69	0.93	9.89	-48.73	-13	35.73
3490	50.68	339	100	V	-56.96	0.93	9.89	-48	-13	35

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										
234.55	45	66	150	H	-63.27	0.43	-2.78	-60.06	-13	47.06
234.55	44.85	44	200	V	-63.42	0.43	-2.78	-60.21	-13	47.21
3558.6	49.79	240	100	H	-57.63	0.93	9.87	-48.69	-13	35.69
3558.6	50.82	36	100	V	-56.6	0.93	9.87	-47.66	-13	34.66
16-QAM 1.4MHz Bandwidth High Channel										
234.55	44.6	43	200	H	-63.67	0.43	-2.78	-60.46	-13	47.46
234.55	44.77	254	150	V	-63.5	0.43	-2.78	-60.29	-13	47.29
3558.6	50.97	267	150	H	-56.45	0.93	9.87	-47.51	-13	34.51
3558.6	49.91	301	100	V	-57.51	0.93	9.87	-48.57	-13	35.57

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 (a) (g) (h) (m); § 90.691 - 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.

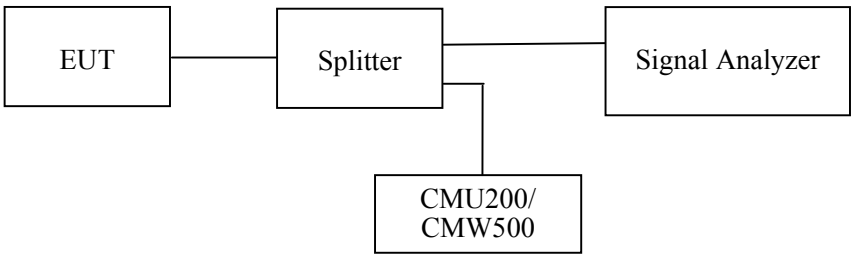
According to FCC §27.53 (h) (m), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB 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 and §90.691(a).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:	24.9~25.3 ℃
Relative Humidity:	49~50 %
ATM Pressure:	100.7~102.9 kPa

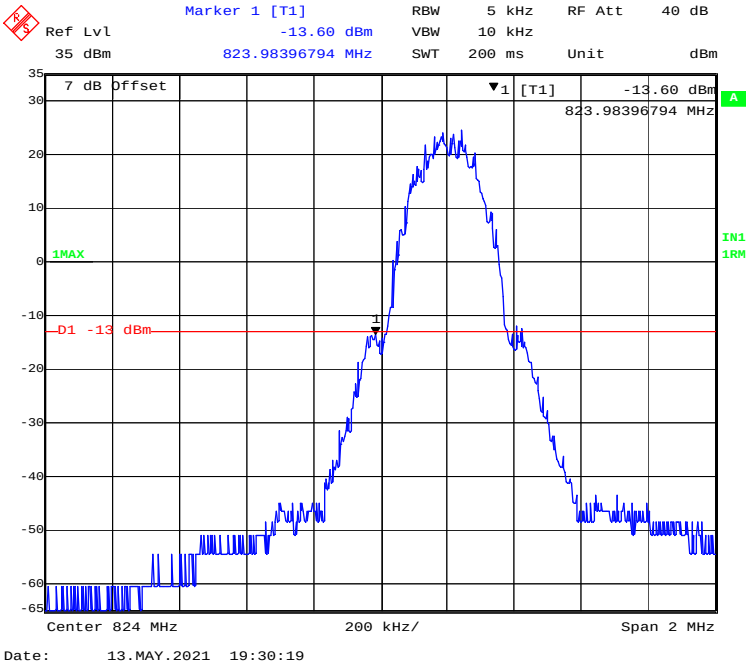
The testing was performed by Miller Xie from 2021-04-29 to 2021-06-09.

EUT operation mode: Transmitting

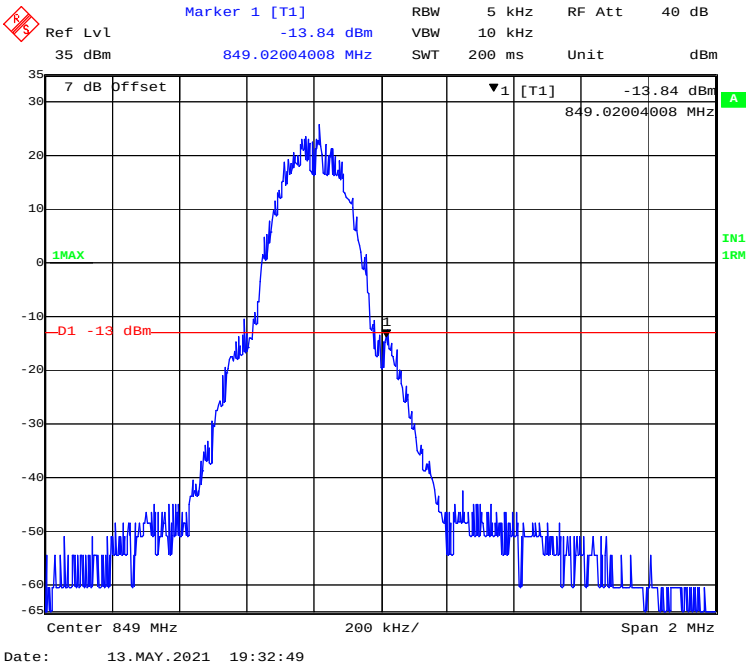
Test Result: Compliant.

GSM 850 Band:

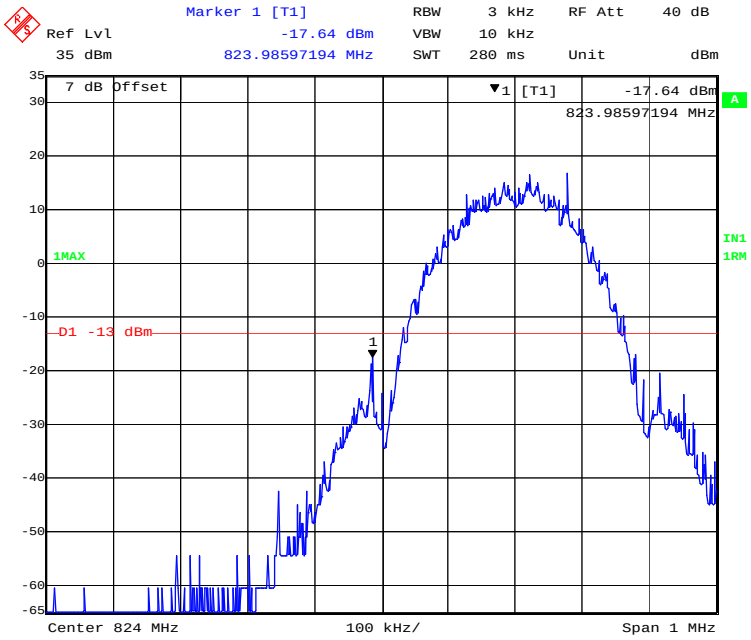
GPRS Mode, Left Band Edge



GPRS Mode, Right Band Edge



EGPRS Mode, Left Band Edge



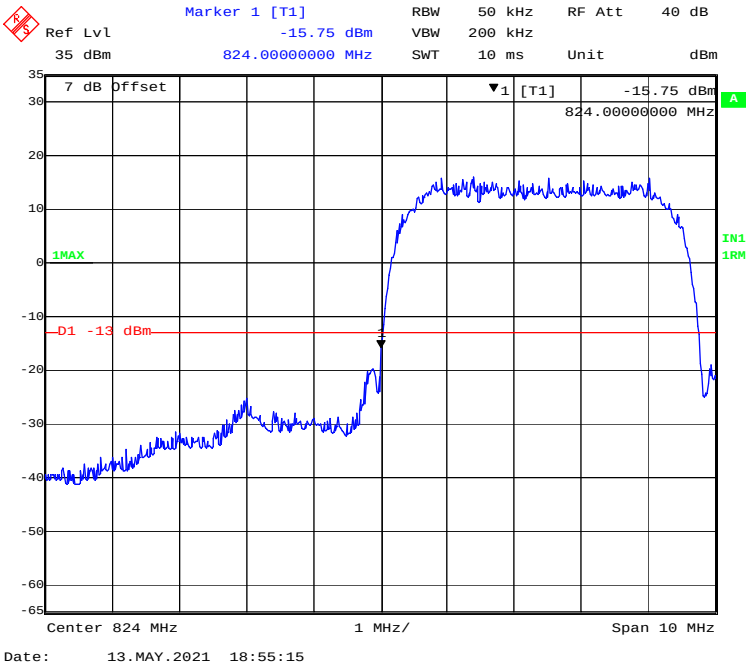
Date: 14.MAY.2021 09:19:42

EGPRS Mode, Right Band Edge

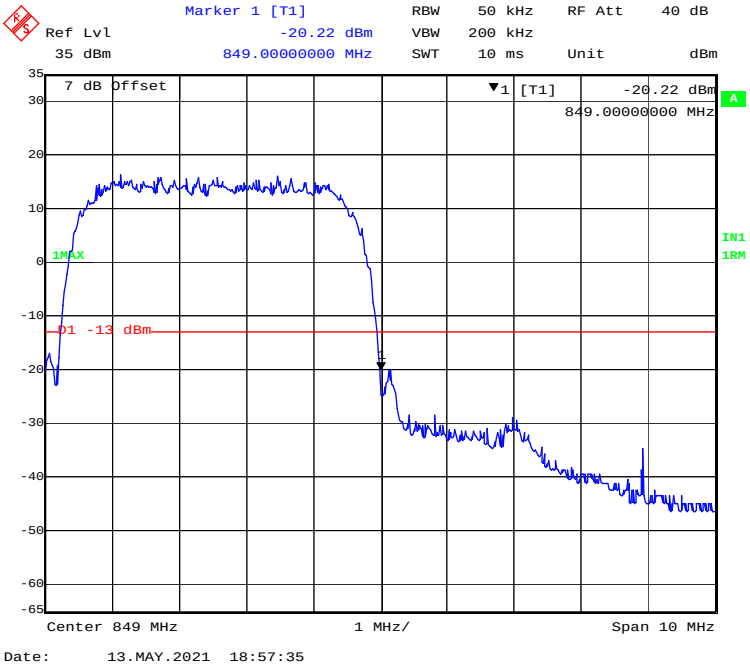
Date: 14.MAY.2021 09:18:27

WCDMA Band V

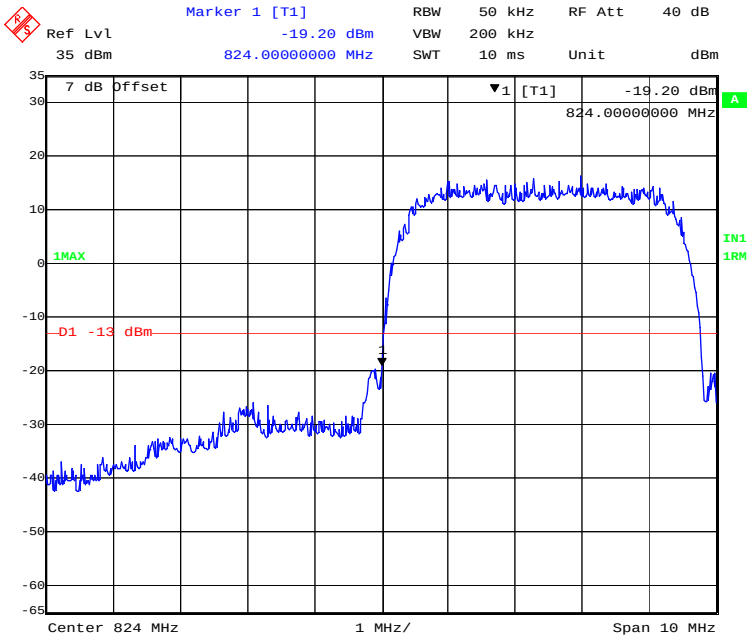
WCDMA (Rel 99) Mode, Left Band Edge



WCDMA (Rel 99) Mode, Right Band Edge

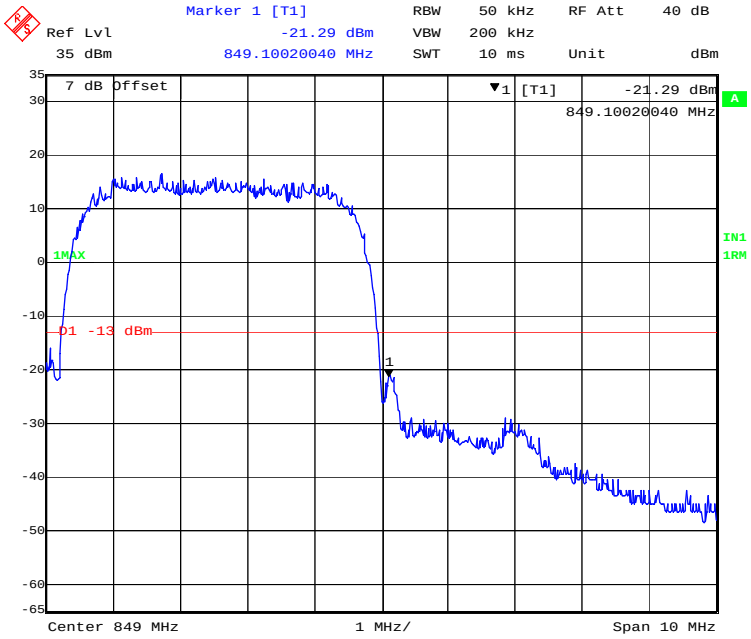


WCDMA (HSDPA) Mode, Left Band Edge



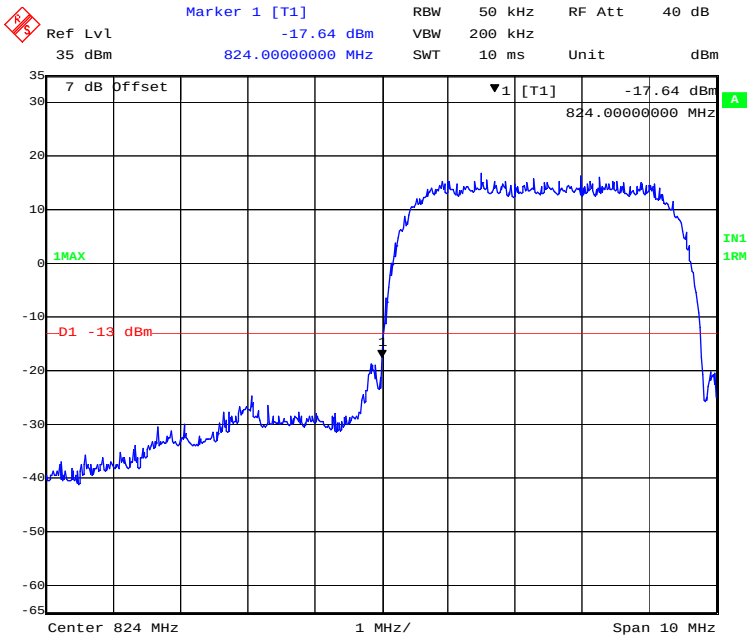
Date: 13.MAY.2021 18:55:59

WCDMA (HSDPA) Mode, Right Band Edge



Date: 13.MAY.2021 18:58:16

WCDMA (HSUPA) Mode, Left Band Edge

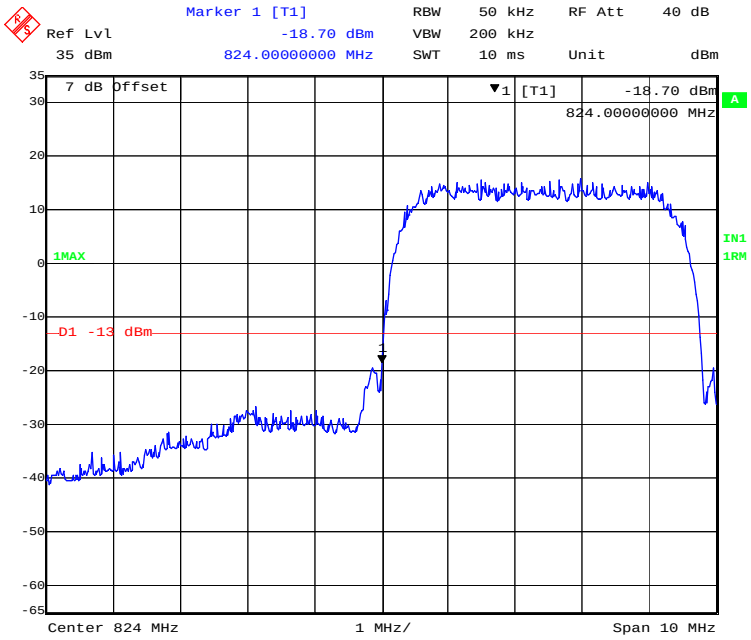


Date: 13.MAY.2021 18:56:14

WCDMA (HSUPA) Mode, Right Band Edge

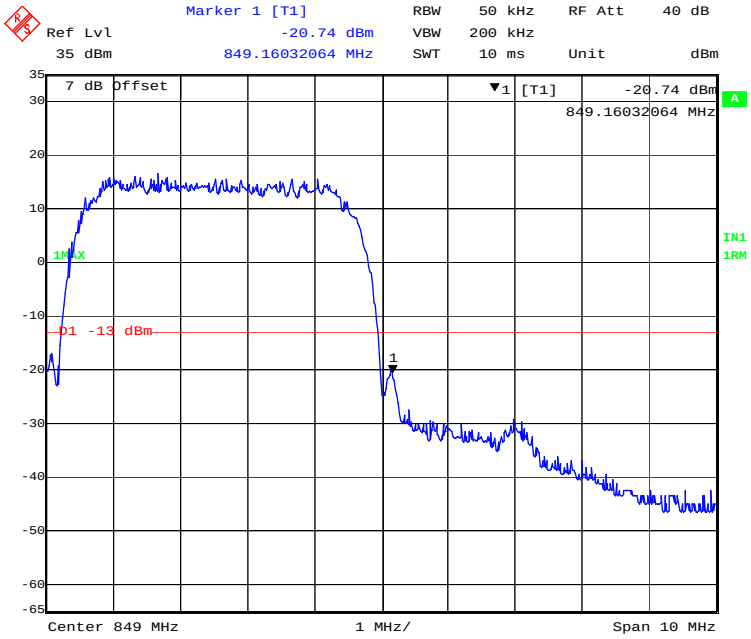
Date: 13.MAY.2021 18:58:35

WCDMA (HSPA+) Mode, Left Band Edge



Date: 13.MAY.2021 18:56:37

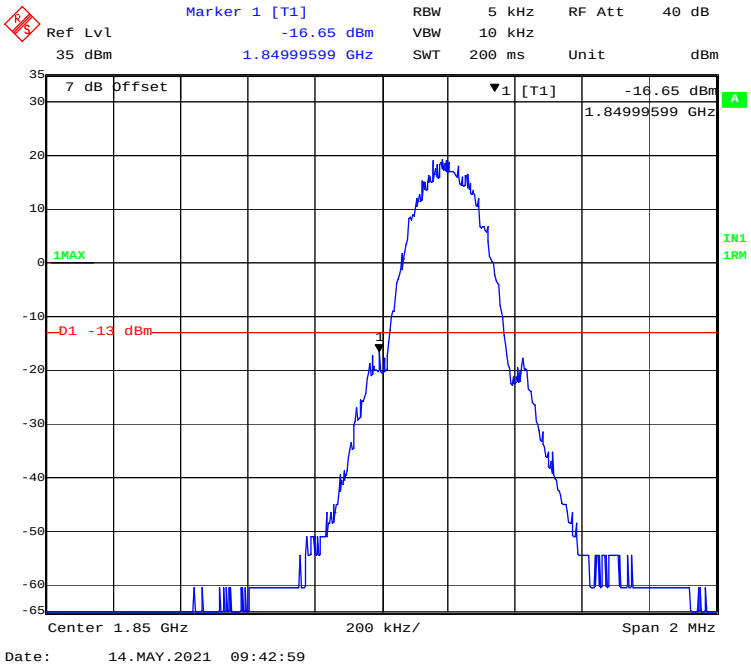
WCDMA (HSPA+) Mode, Right Band Edge



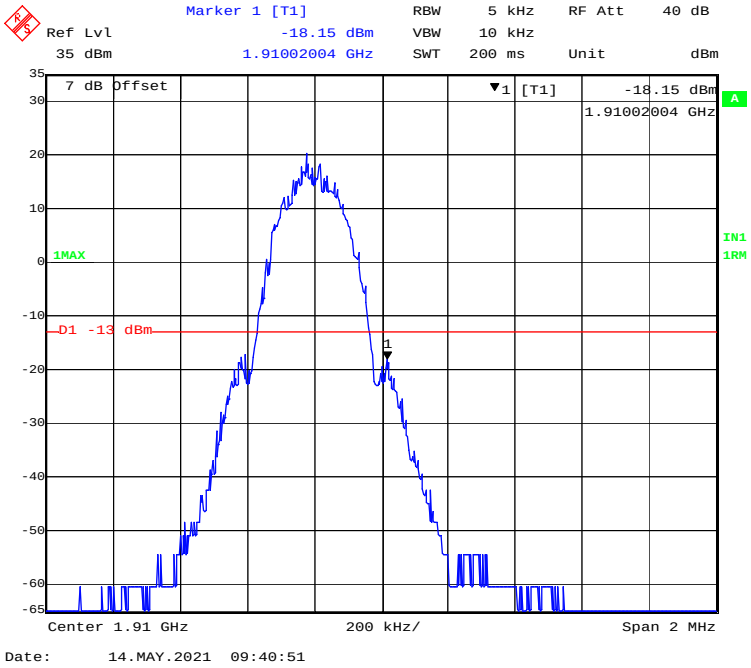
Date: 13.MAY.2021 18:58:54

PCS 1900 Band:

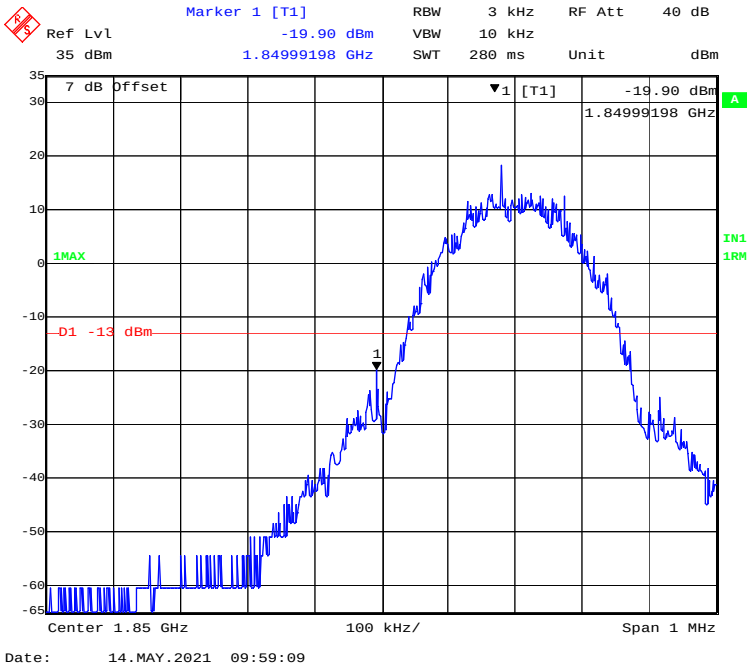
GPRS Mode, Left Band Edge



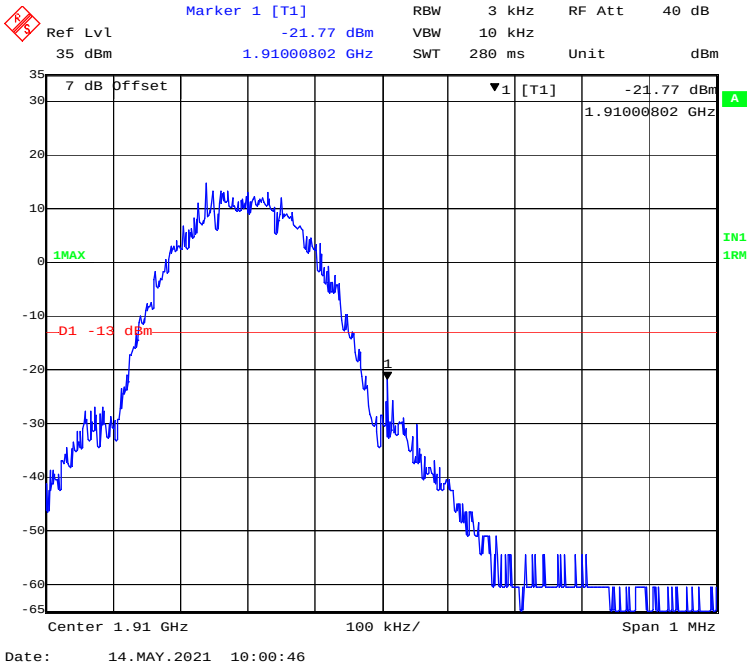
GPRS Mode, Right Band Edge



EGPRS Mode, Left Band Edge

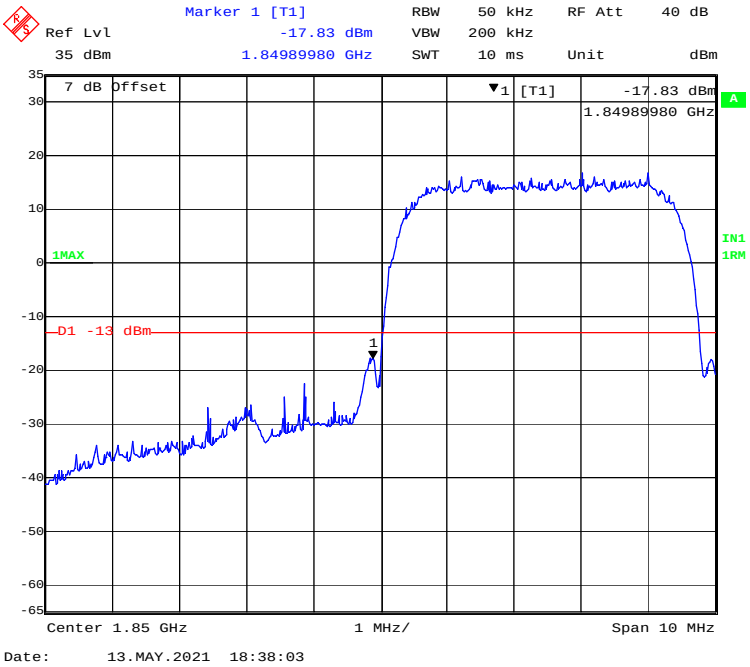


EGPRS Mode, Right Band Edge

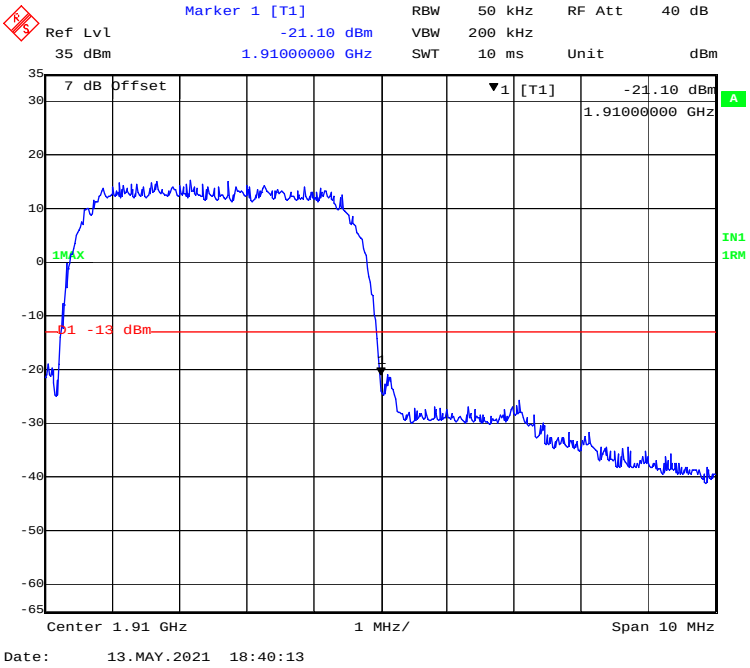


WCDMA Band II

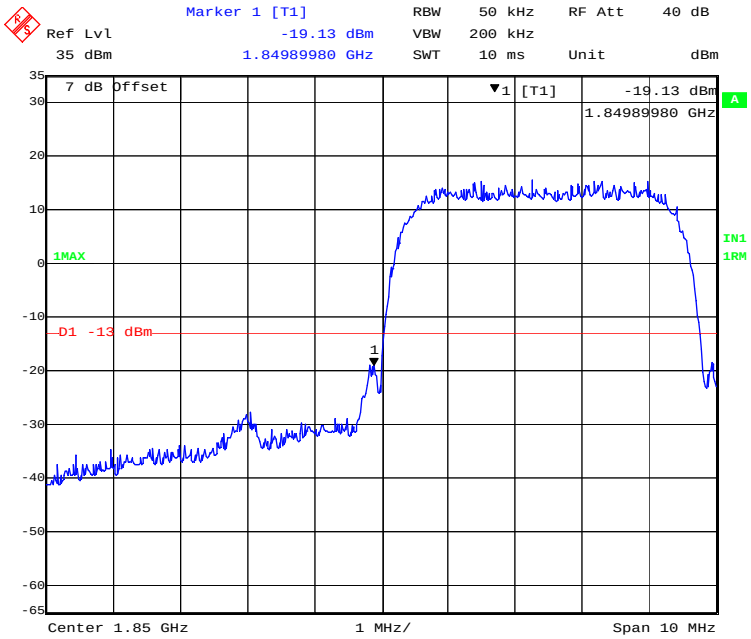
WCDMA (Rel 99) Mode, Left Band Edge



WCDMA (Rel 99) Mode, Right Band Edge

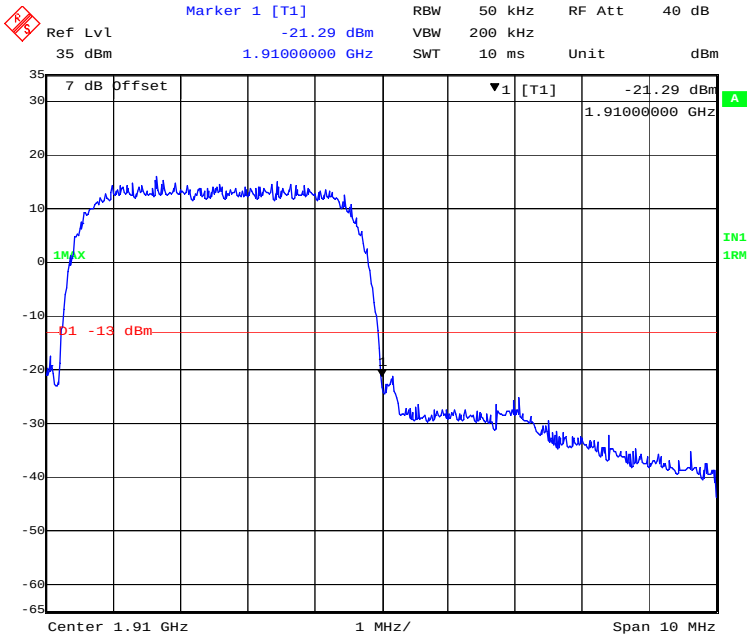


WCDMA (HSDPA) Mode, Left Band Edge



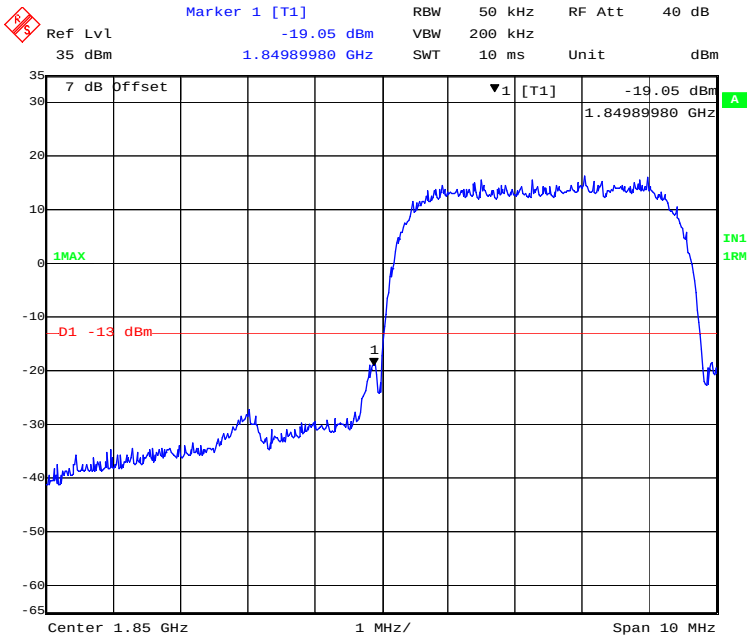
Date: 13.MAY.2021 18:38:32

WCDMA (HSDPA) Mode, Right Band Edge



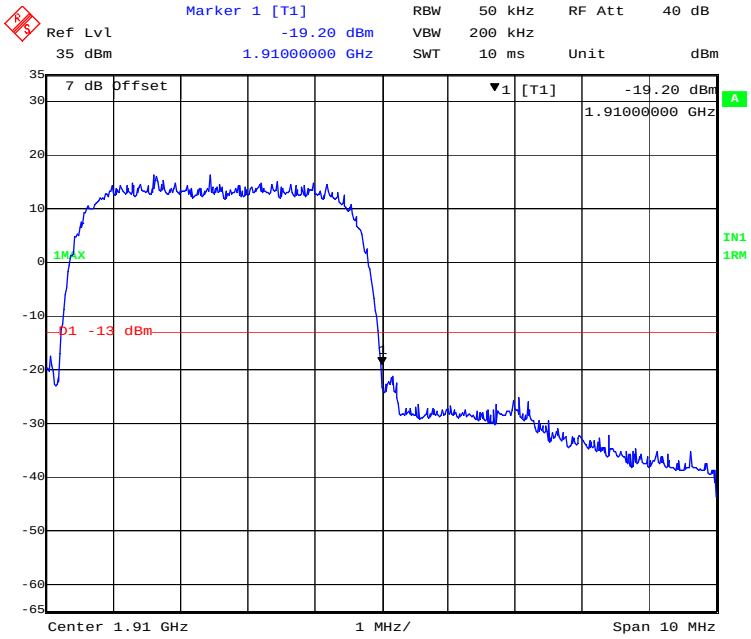
Date: 13.MAY.2021 18:41:06

WCDMA (HSUPA) Mode, Left Band Edge



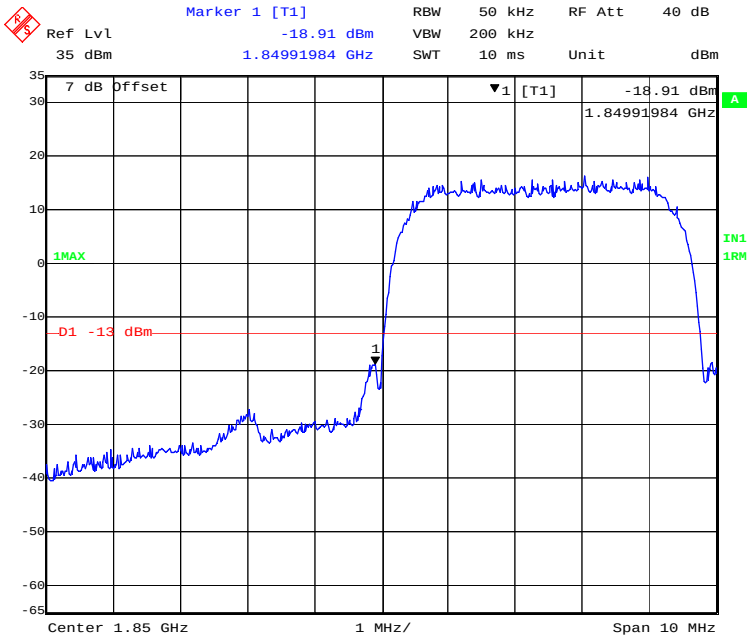
Date: 13.MAY.2021 18:38:53

WCDMA (HSUPA) Mode, Right Band Edge



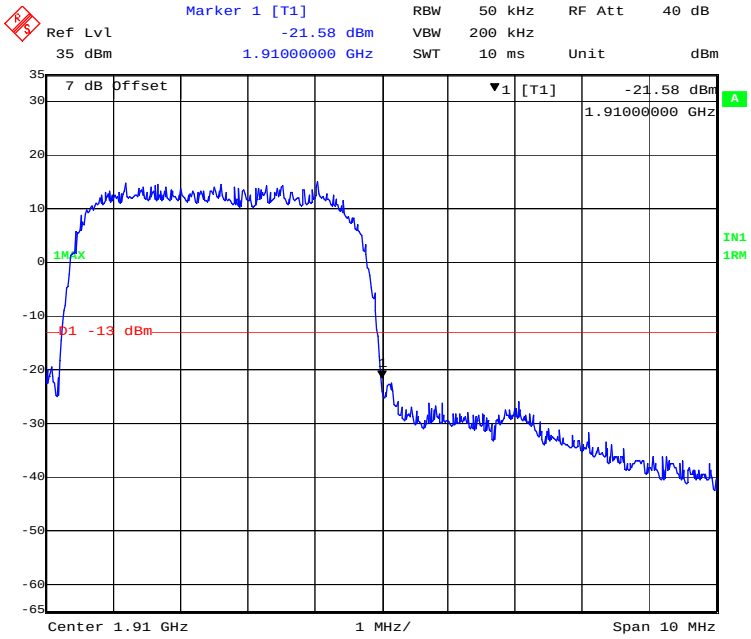
Date: 13.MAY.2021 18:41:19

WCDMA (HSPA+) Mode, Left Band Edge



Date: 13.MAY.2021 18:39:15

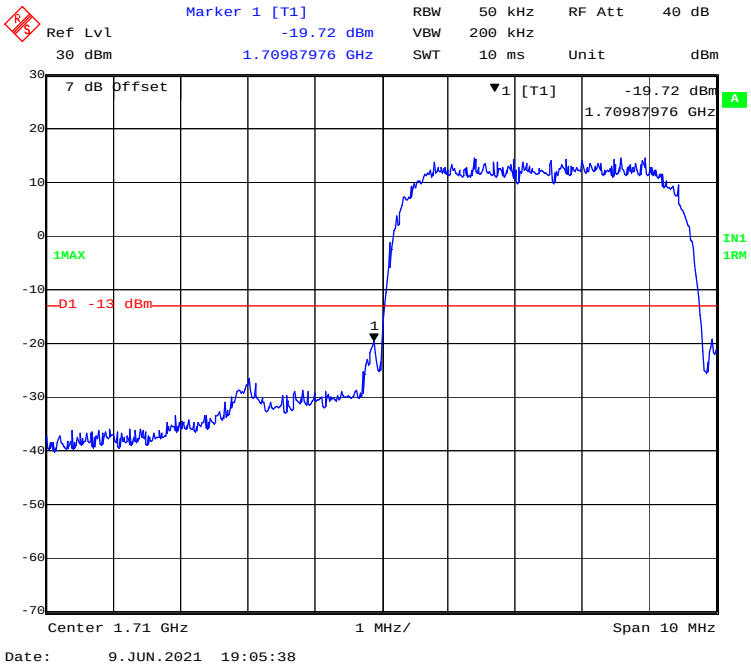
WCDMA (HSPA+) Mode, Right Band Edge



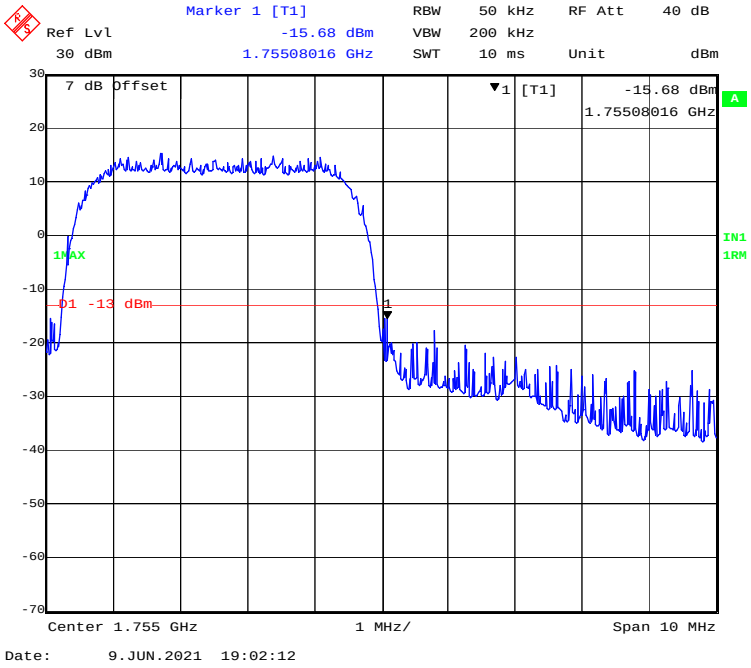
Date: 13.MAY.2021 18:41:41

WCDMA Band IV

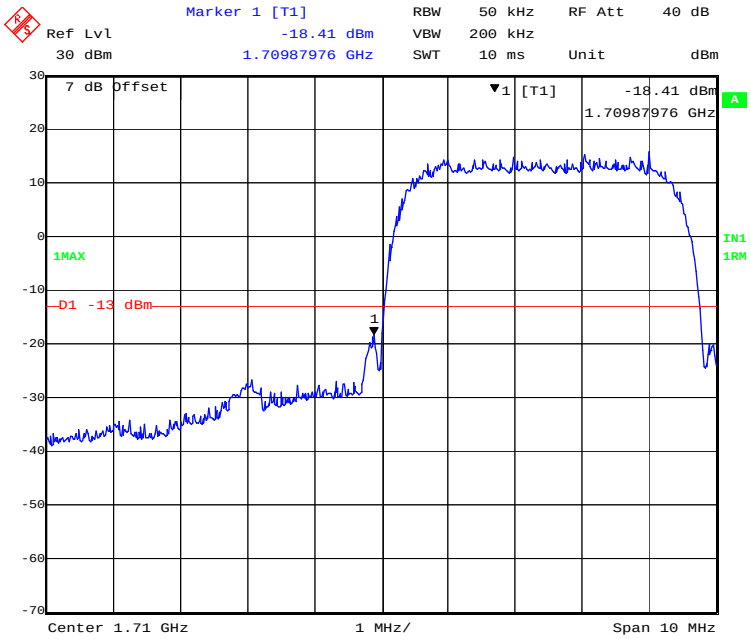
WCDMA (Rel 99) Mode, Left Band Edge



WCDMA (Rel 99) Mode, Right Band Edge

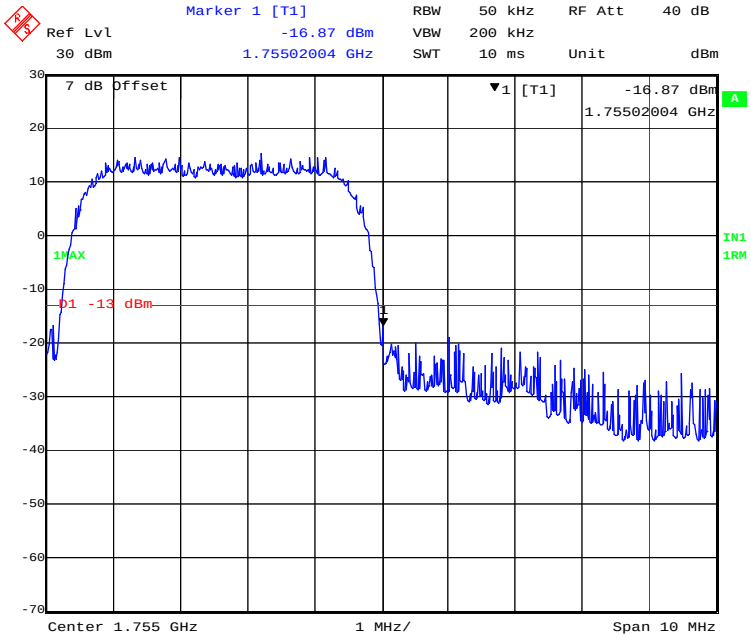


WCDMA (HSDPA) Mode, Left Band Edge



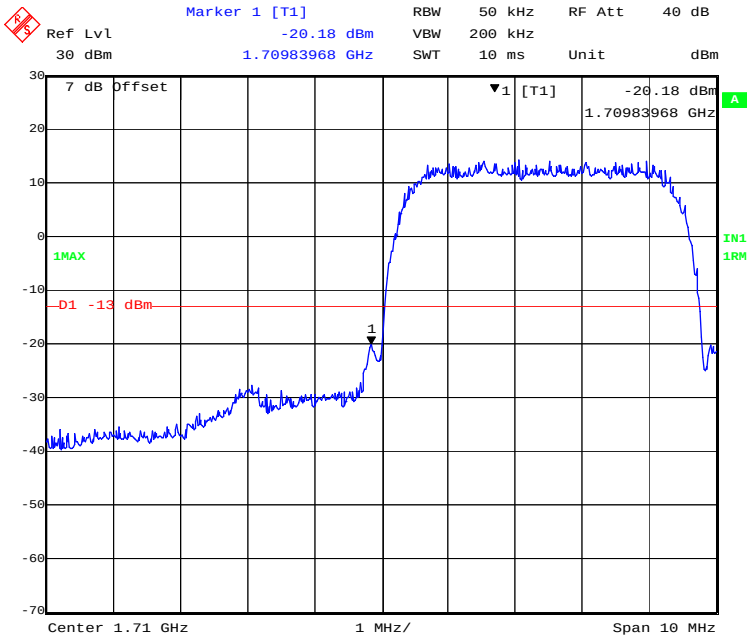
Date: 9.JUN.2021 19:07:02

WCDMA (HSDPA) Mode, Right Band Edge



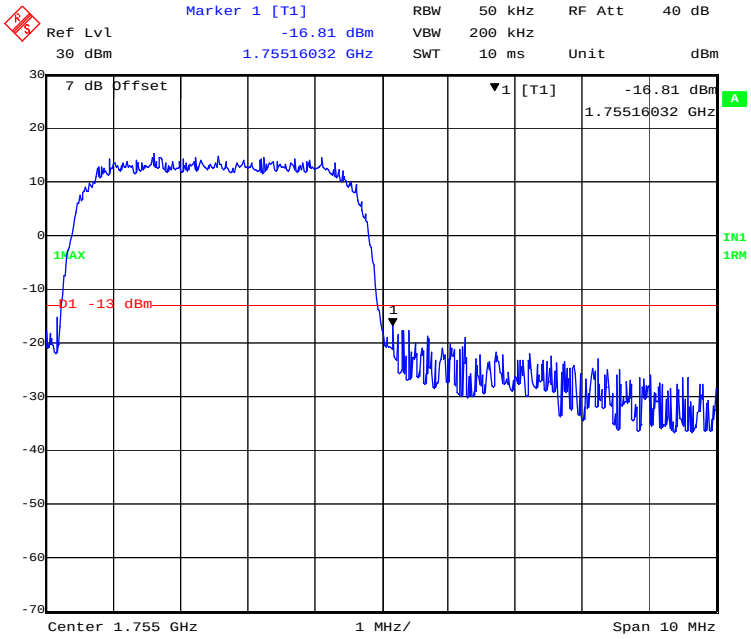
Date: 9.JUN.2021 19:03:10

WCDMA (HSUPA) Mode, Left Band Edge



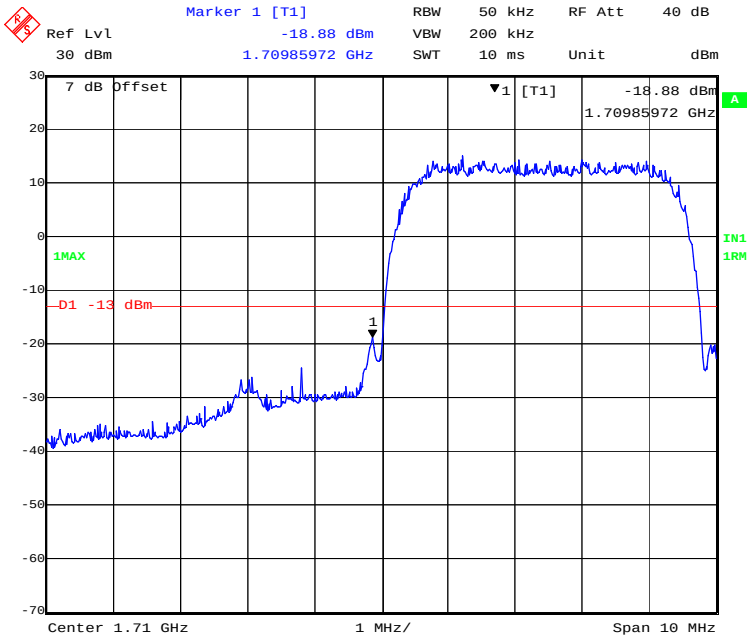
Date: 9.JUN.2021 19:07:39

WCDMA (HSUPA) Mode, Right Band Edge



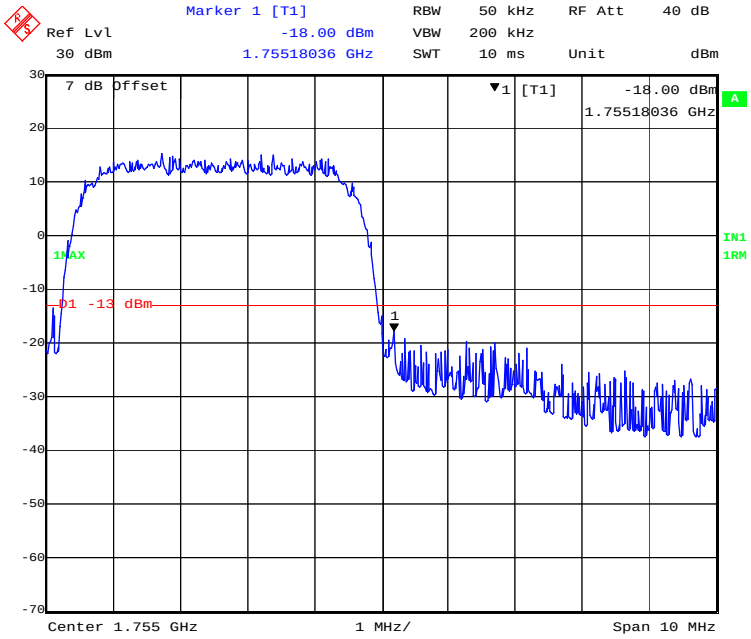
Date: 9.JUN.2021 19:03:58

WCDMA (HSPA+) Mode, Left Band Edge



Date: 9.JUN.2021 19:07:53

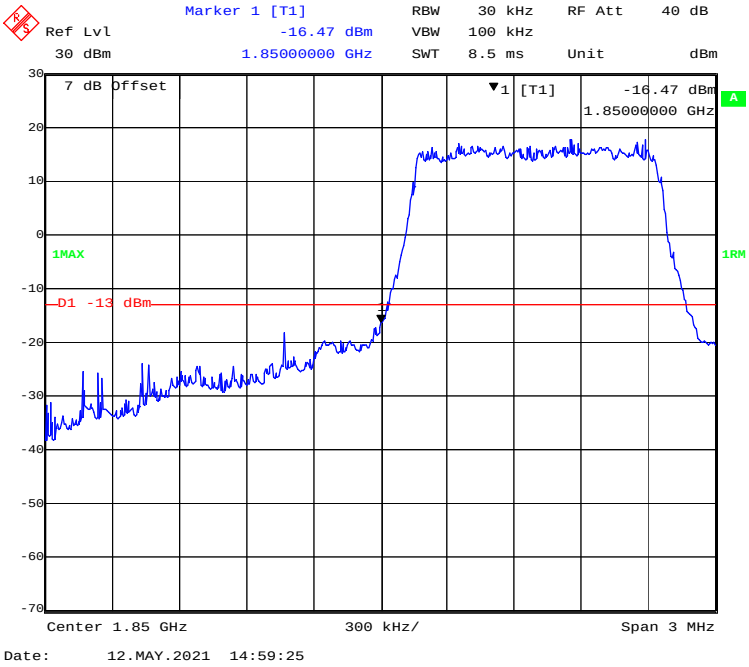
WCDMA (HSPA+) Mode, Right Band Edge



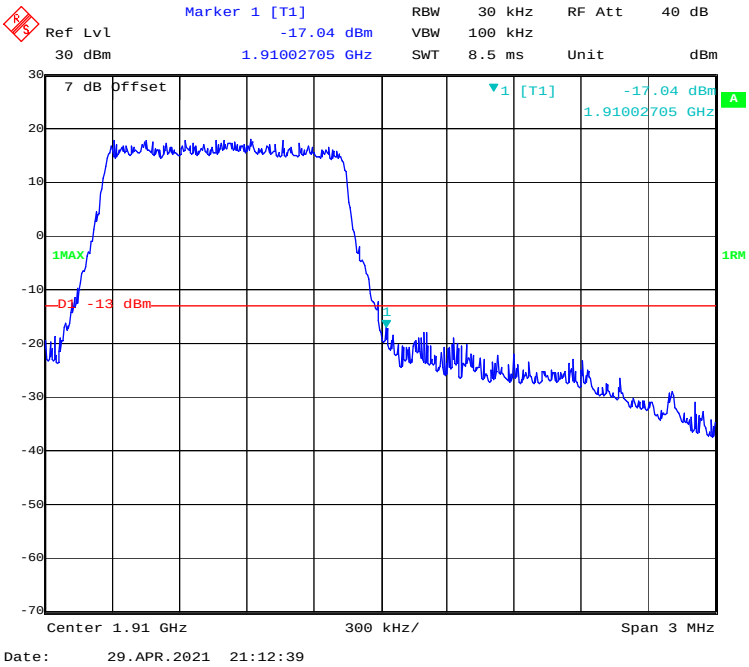
Date: 9.JUN.2021 19:04:35

LTE Band 2:

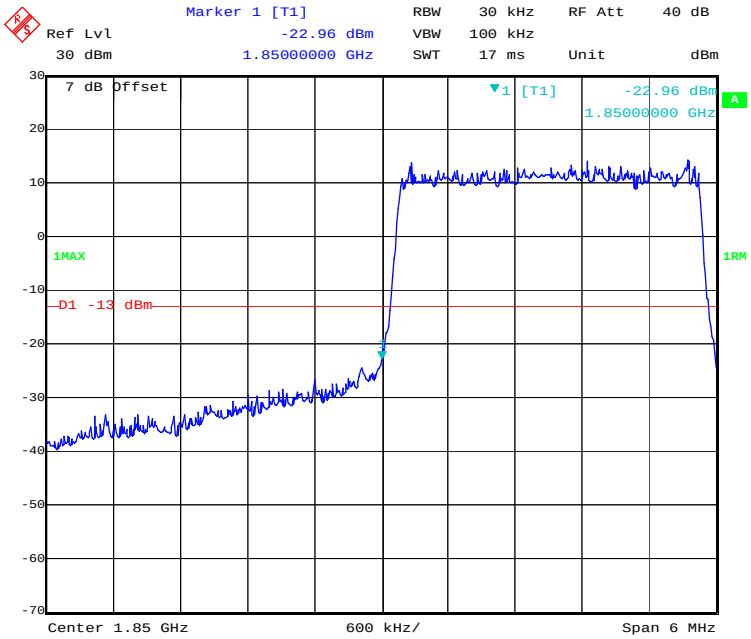
QPSK (1.4 MHz, FULL RB) - Left Band Edge



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

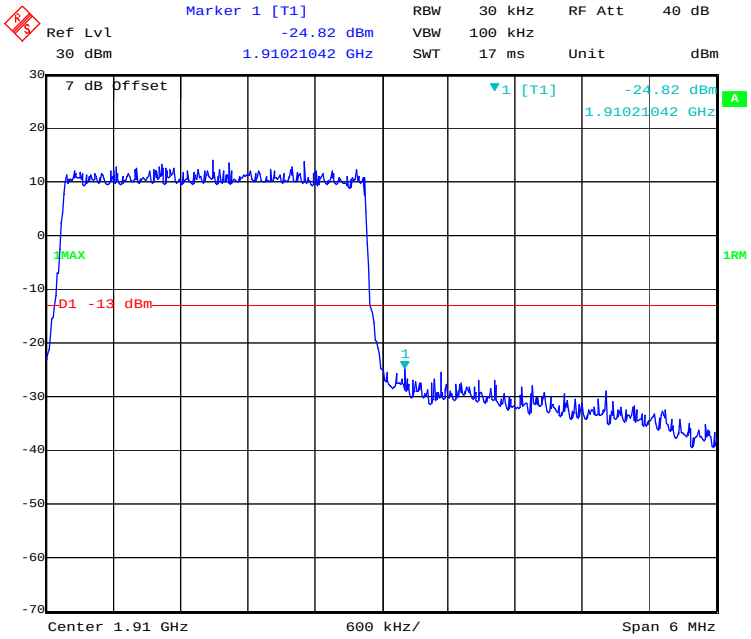


QPSK (3 MHz, FULL RB) - Left Band Edge



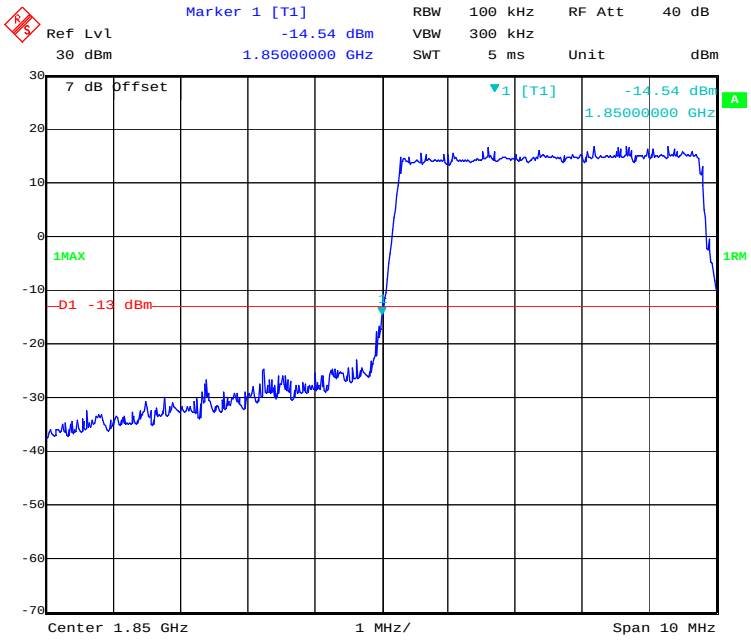
Date: 29.APR.2021 21:13:29

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



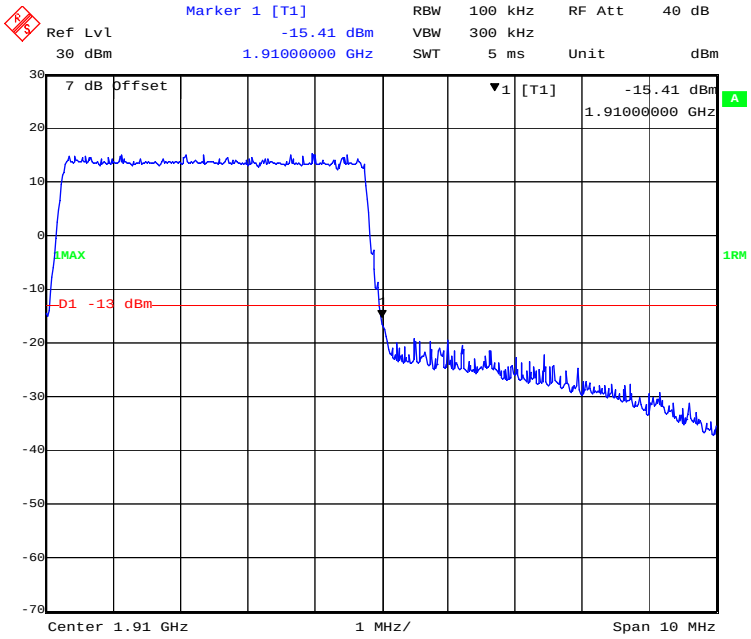
Date: 29.APR.2021 21:14:10

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



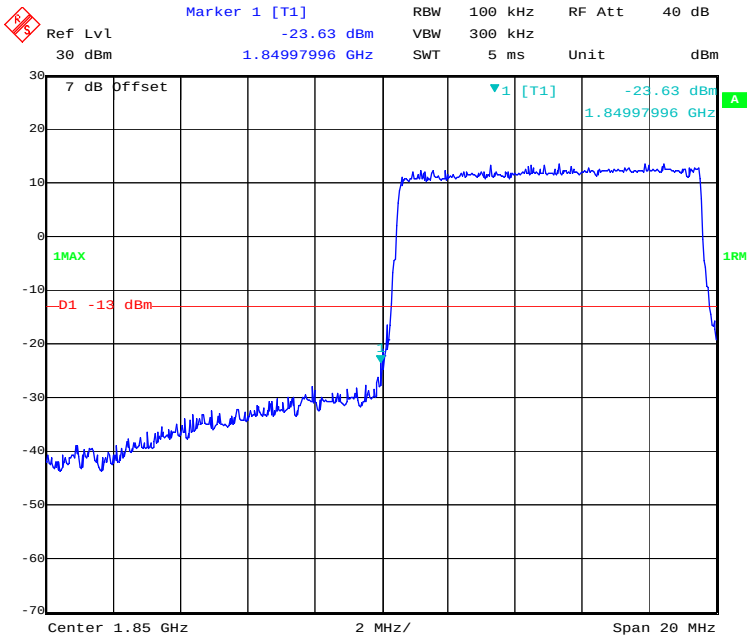
Date: 29.APR.2021 21:14:57

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



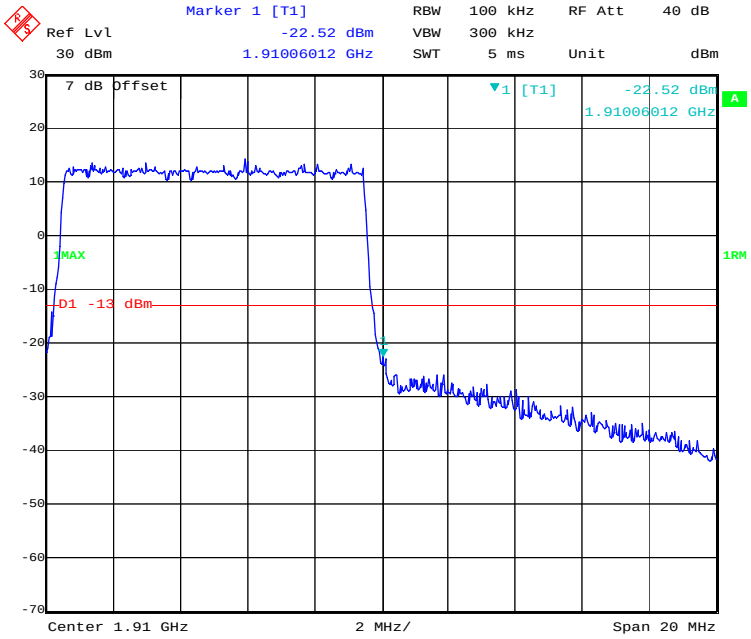
Date: 12.MAY.2021 14:55:11

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



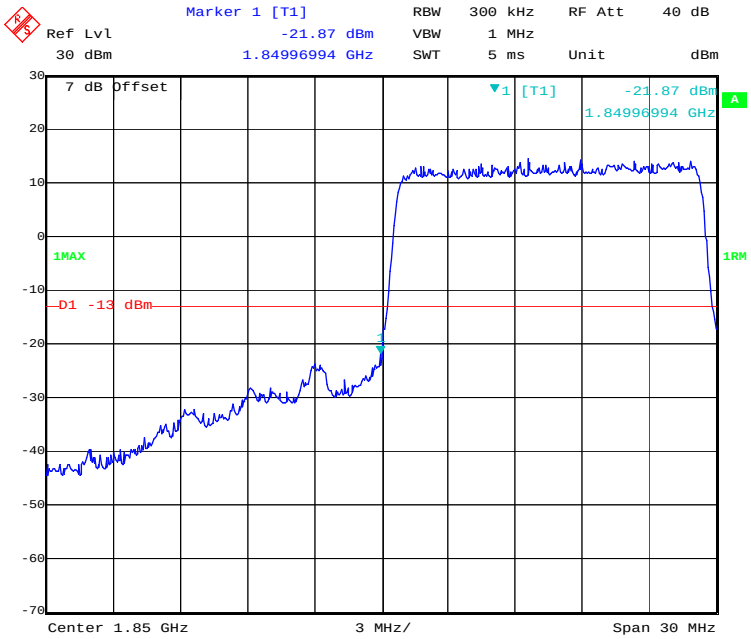
Date: 29.APR.2021 21:16:31

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



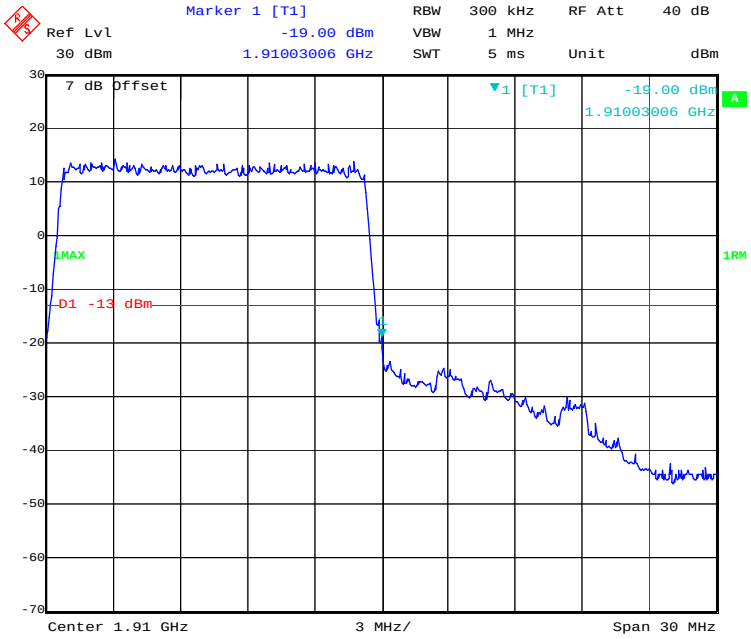
Date: 29.APR.2021 21:17:16

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



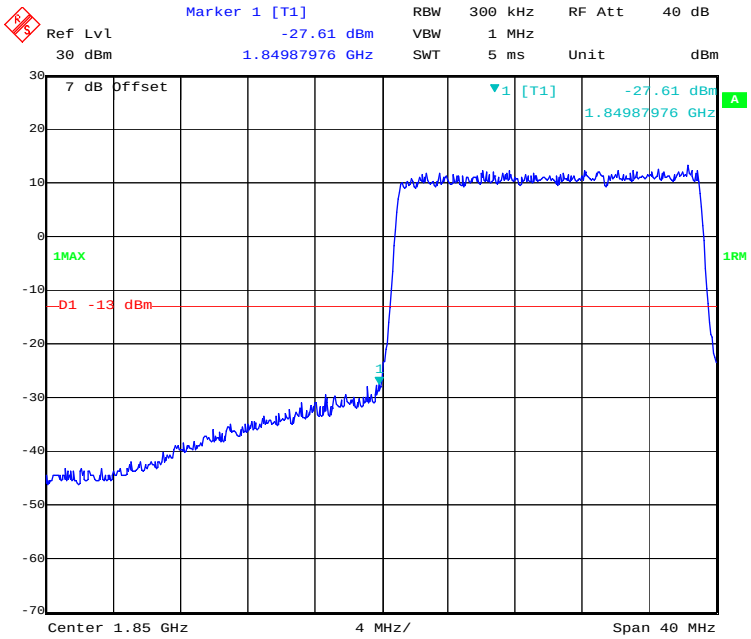
Date: 29.APR.2021 21:18:06

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



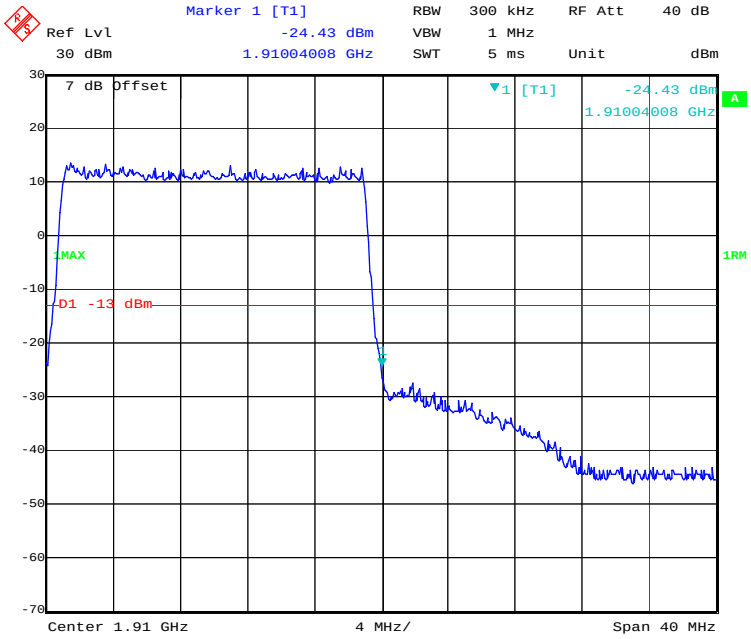
Date: 29.APR.2021 21:18:49

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



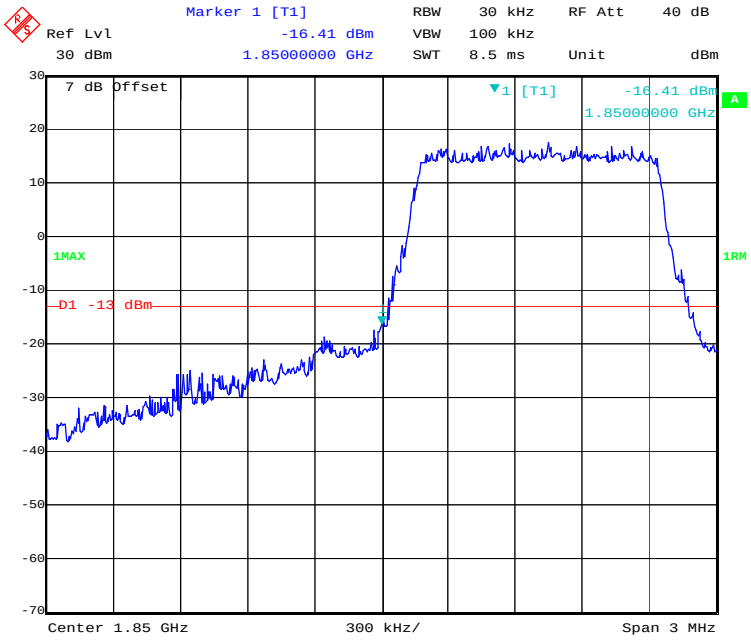
Date: 29.APR.2021 21:19:39

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



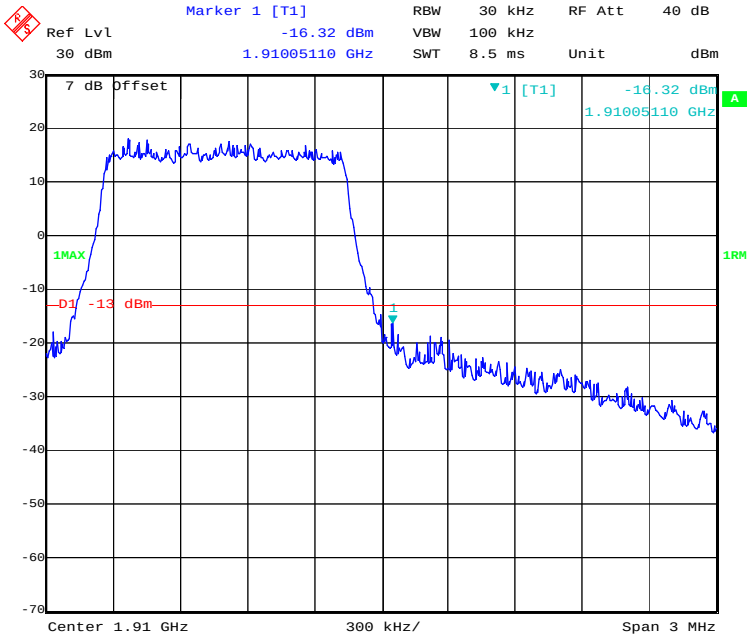
Date: 29.APR.2021 21:20:31

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



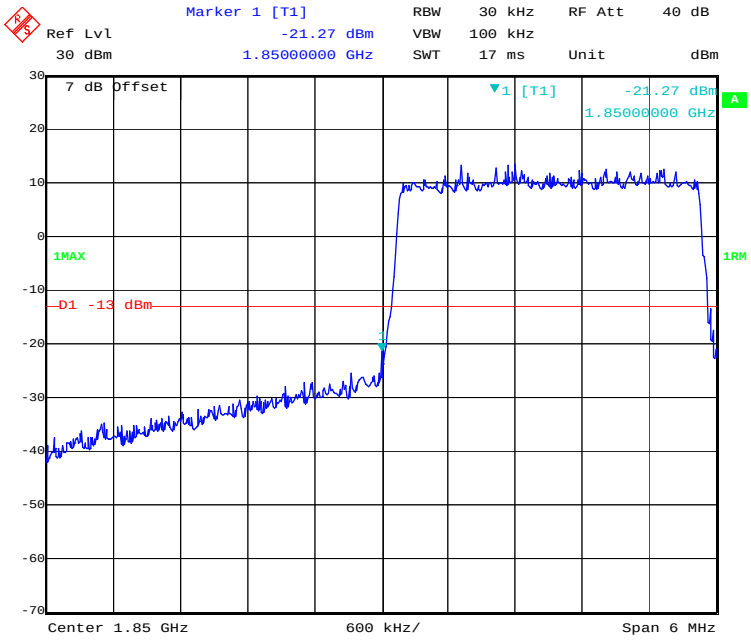
Date: 29.APR.2021 21:12:16

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



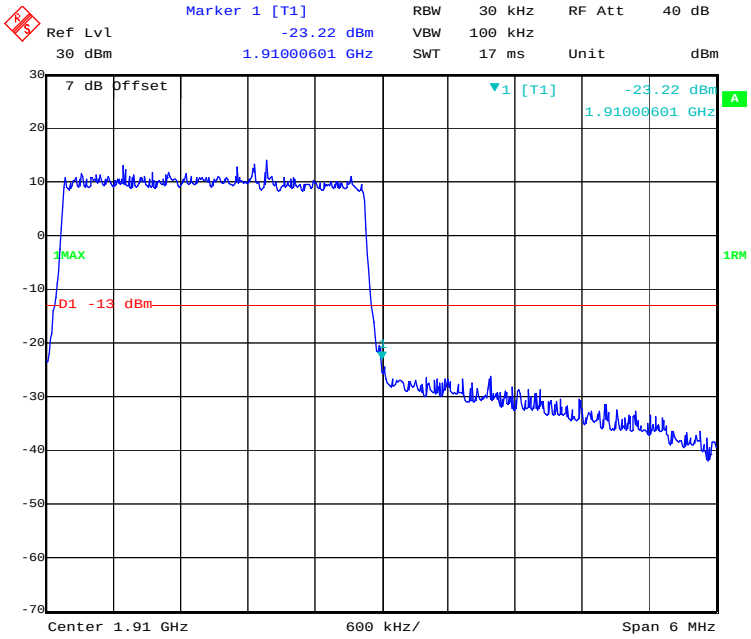
Date: 29.APR.2021 21:13:04

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



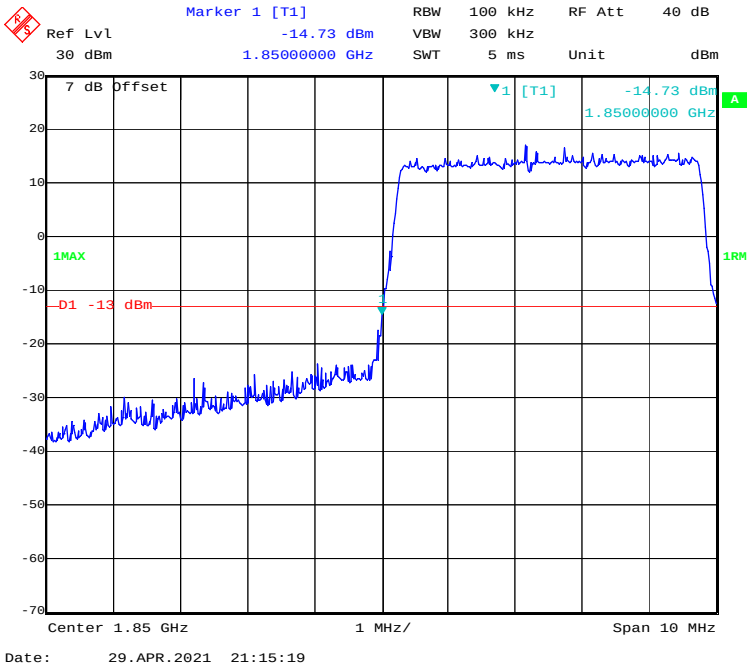
Date: 29.APR.2021 21:13:51

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

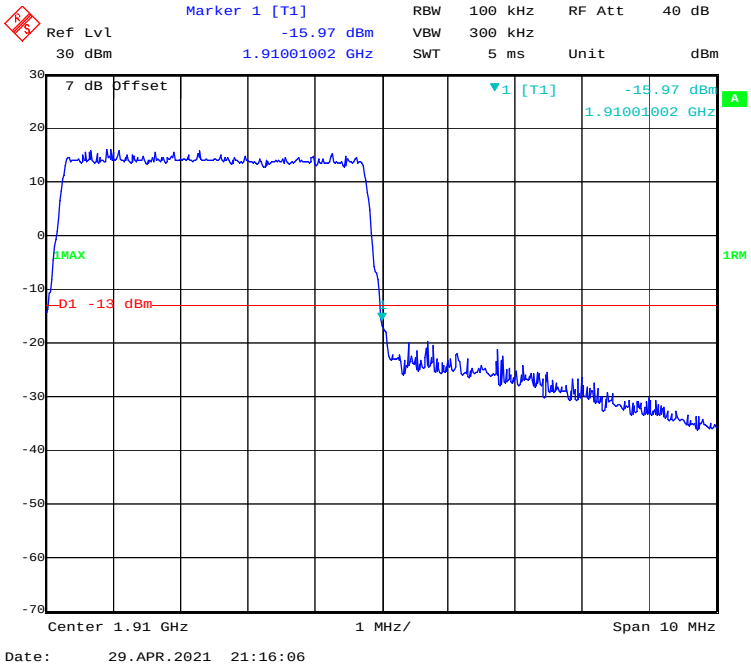


Date: 29.APR.2021 21:14:32

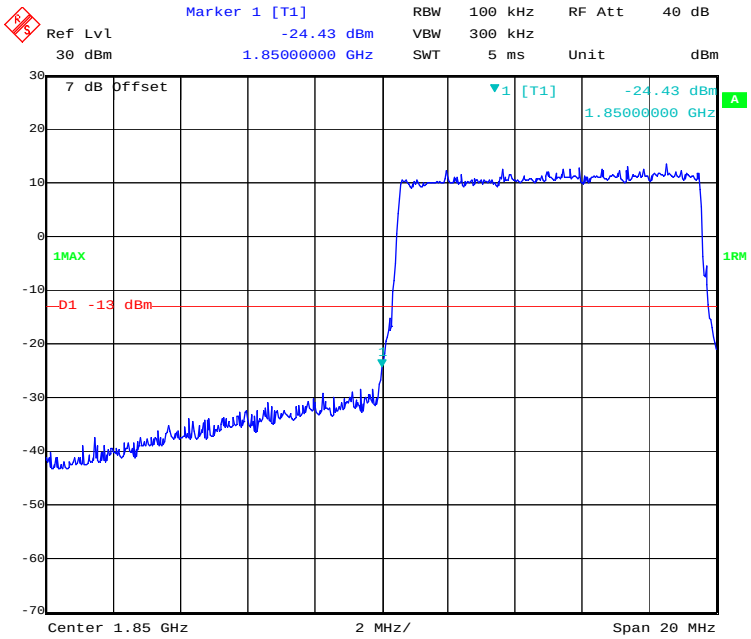
16-QAM (5 MHz, FULL RB) - Left Band Edge



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

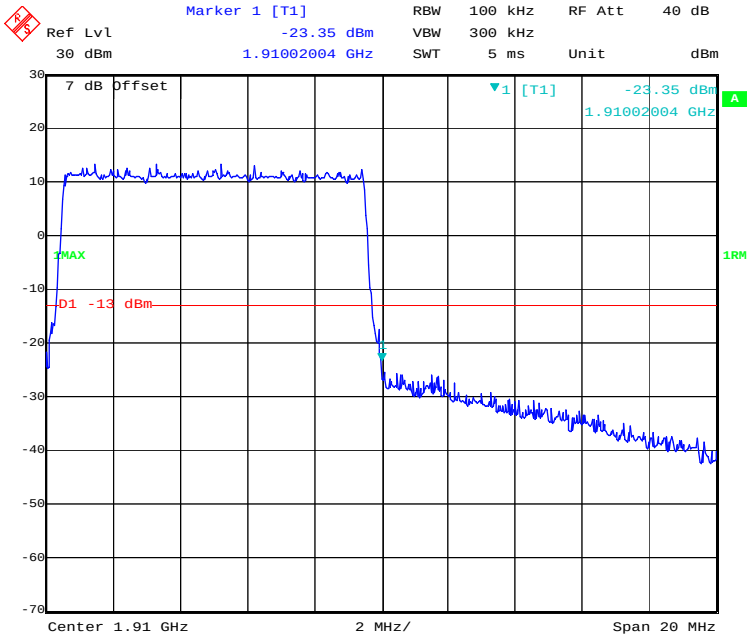


16-QAM (10 MHz, FULL RB) - Left Band Edge



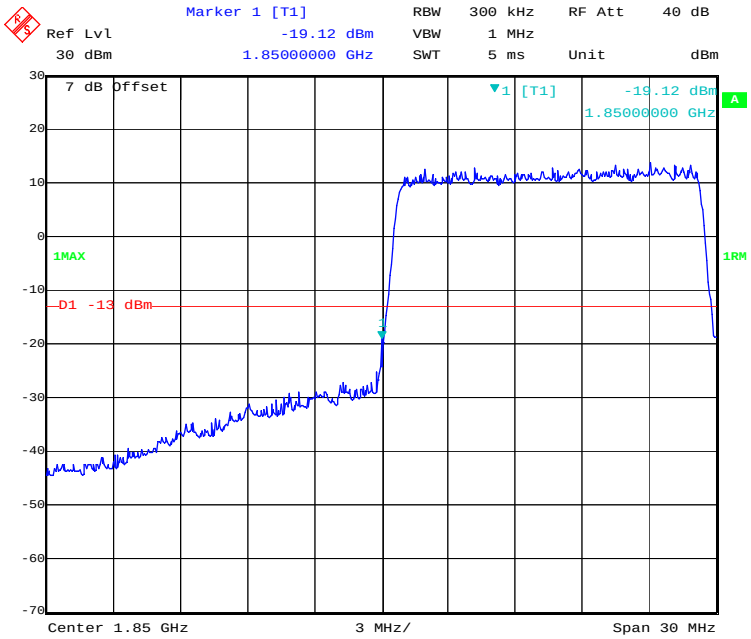
Date: 29.APR.2021 21:16:53

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



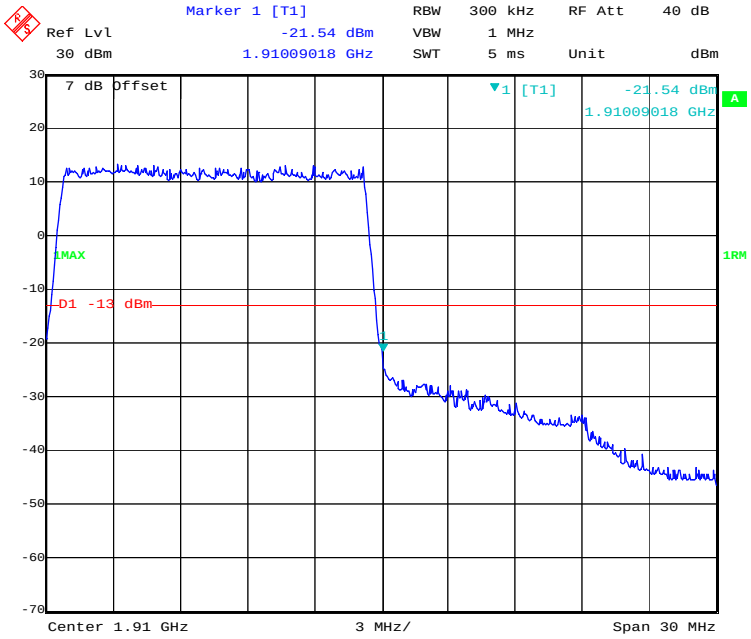
Date: 29.APR.2021 21:17:41

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



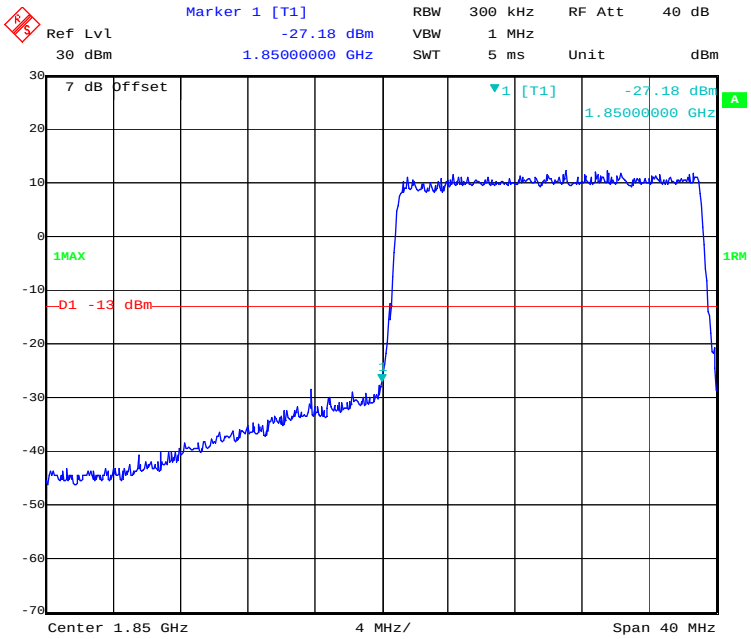
Date: 29.APR.2021 21:18:27

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



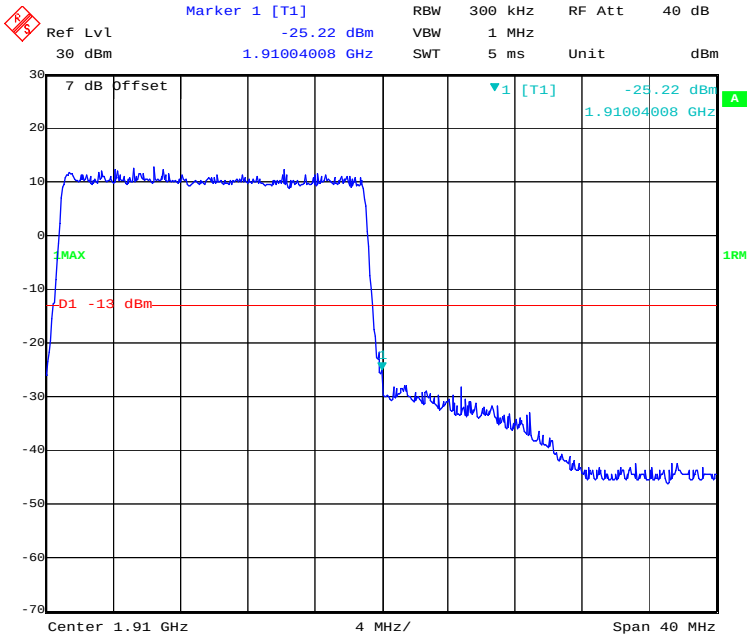
Date: 29.APR.2021 21:19:13

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



Date: 29.APR.2021 21:20:04

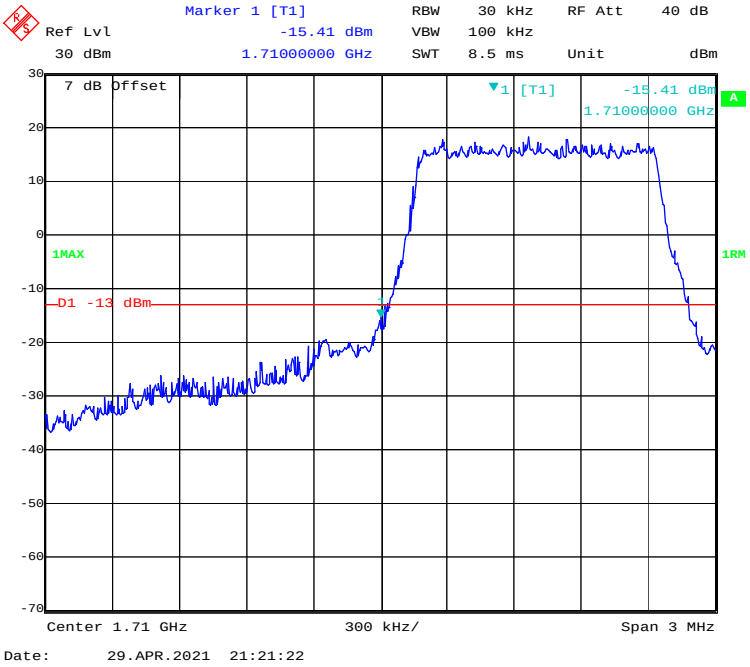
16-QAM (20 MHz, FULL RB) - Right Band Edge



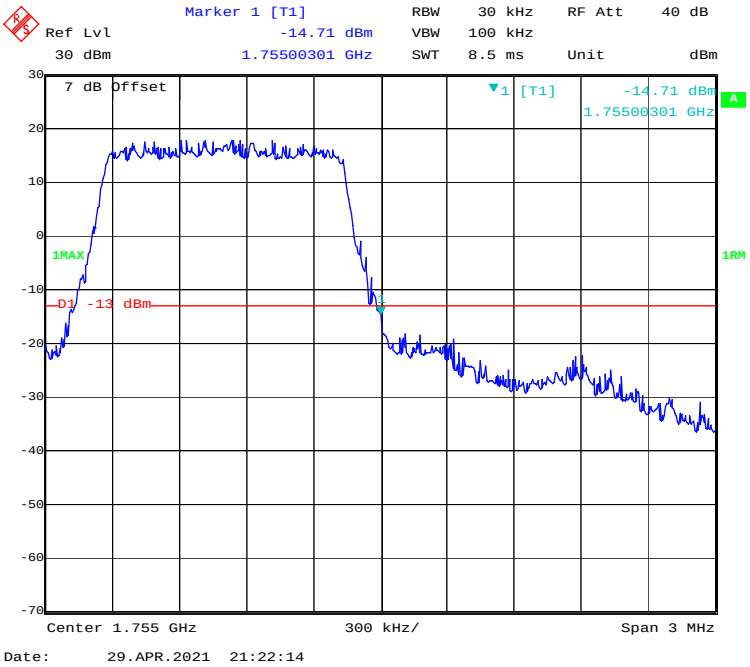
Date: 29.APR.2021 21:20:56

LTE Band 4:

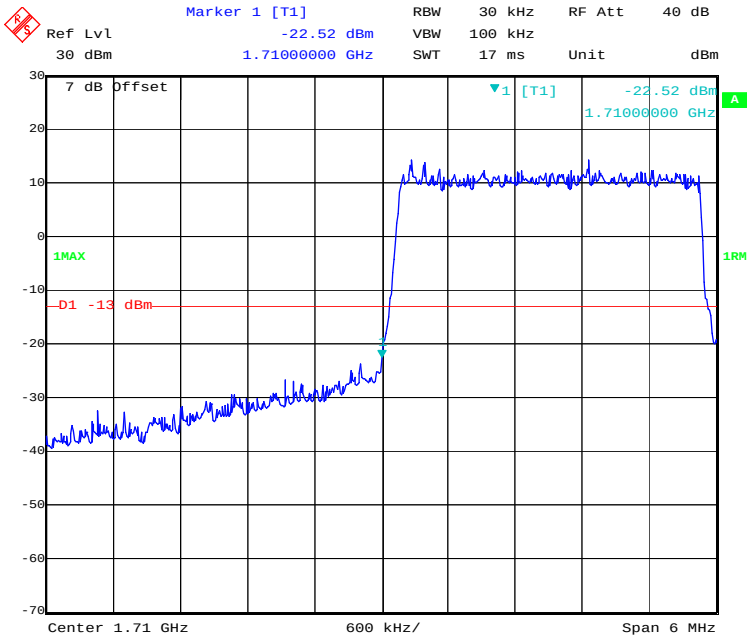
QPSK (1.4 MHz, FULL RB) - Left Band Edge



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

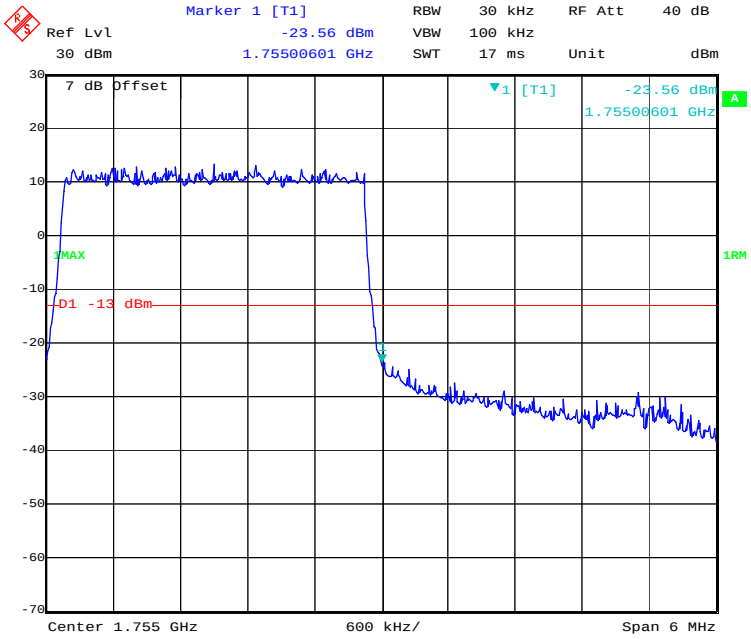


QPSK (3 MHz, FULL RB) - Left Band Edge



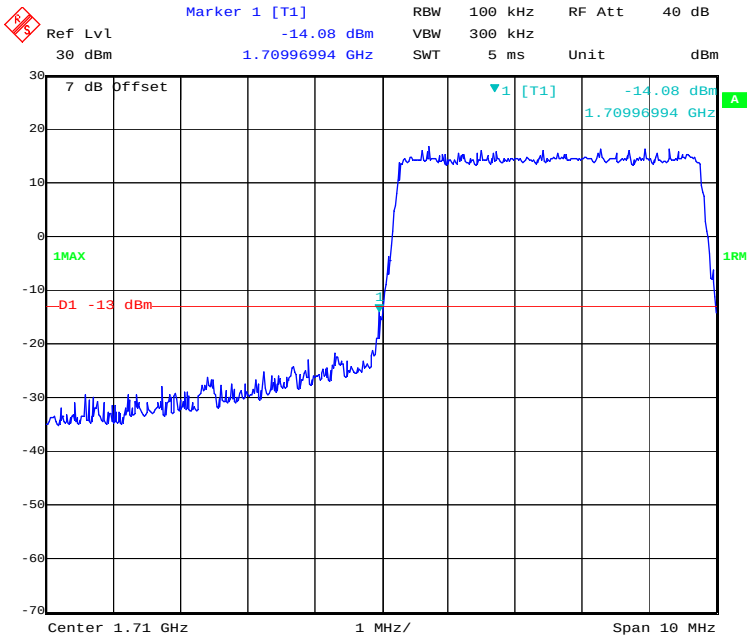
Date: 29.APR.2021 21:23:03

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



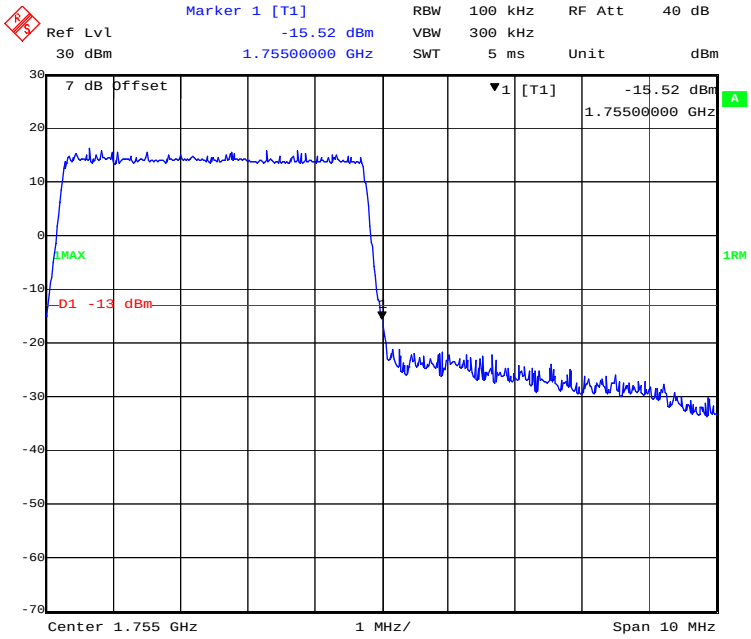
Date: 29.APR.2021 21:23:46

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



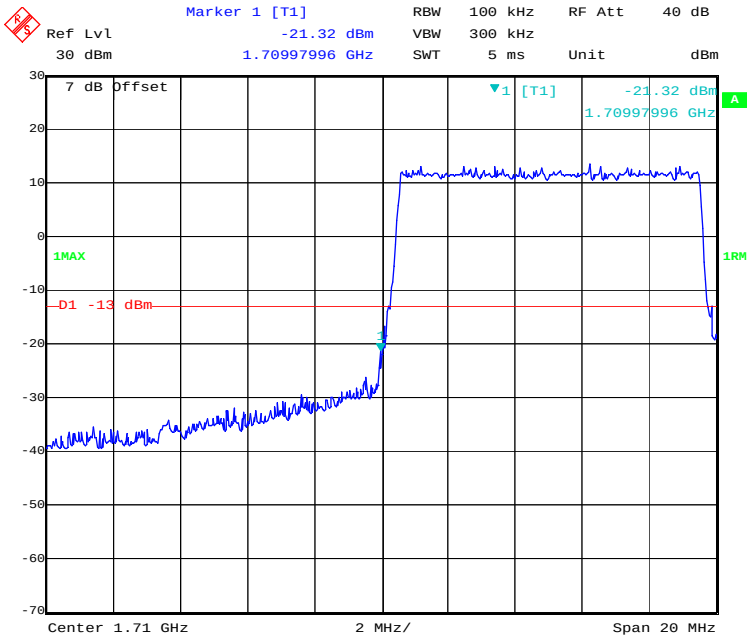
Date: 29.APR.2021 21:24:31

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



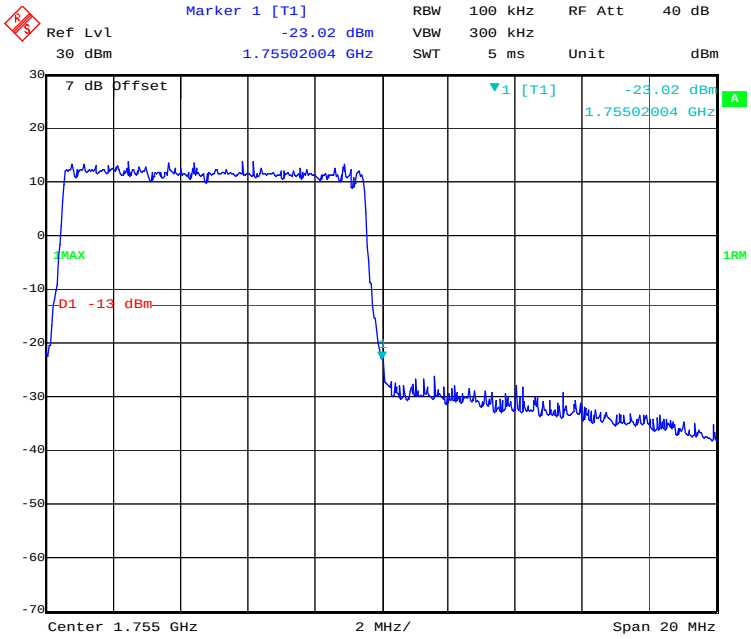
Date: 12.MAY.2021 14:57:24

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



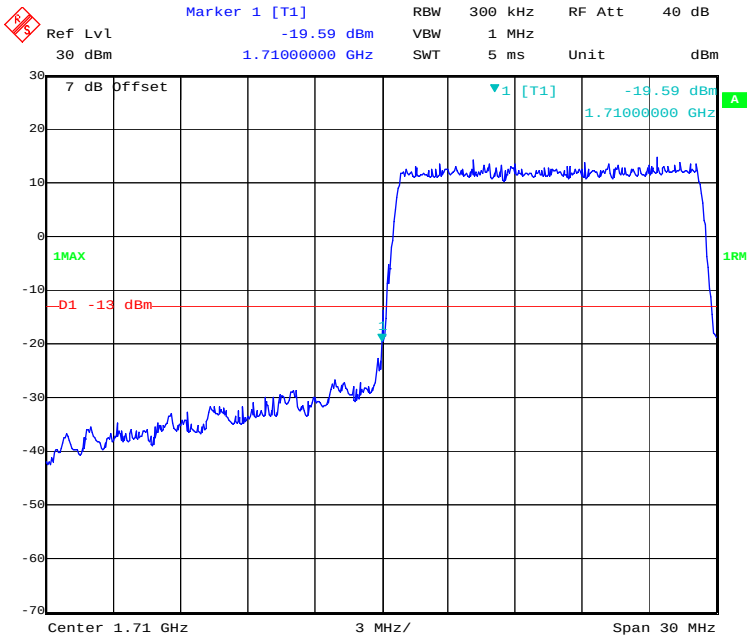
Date: 29.APR.2021 21:26:03

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



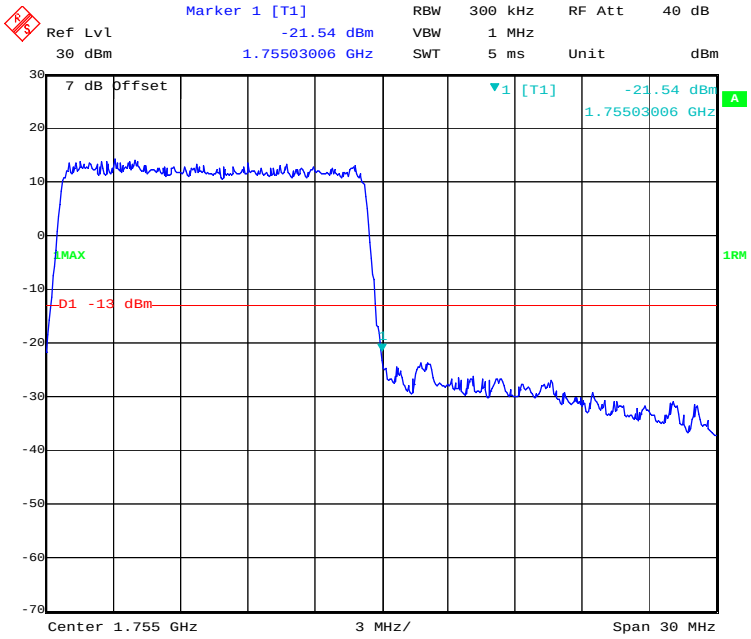
Date: 29.APR.2021 21:26:49

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



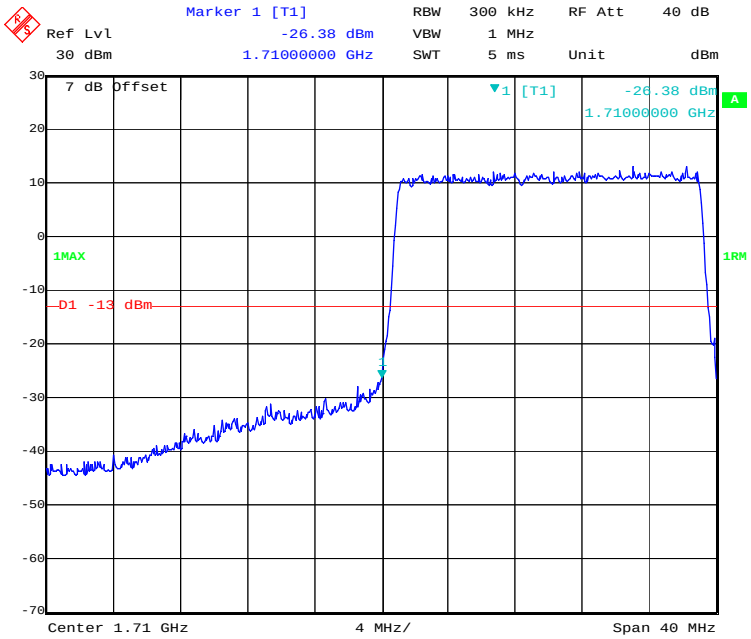
Date: 29.APR.2021 21:27:39

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



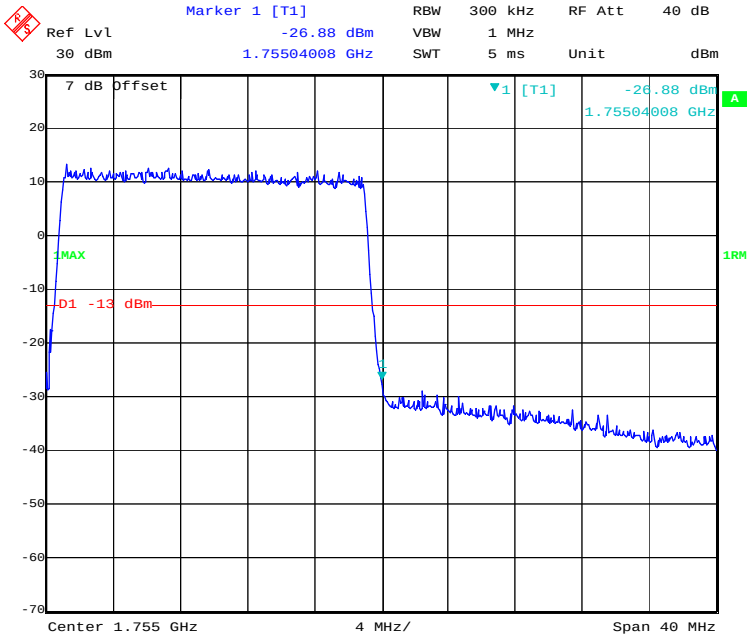
Date: 29.APR.2021 21:28:21

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



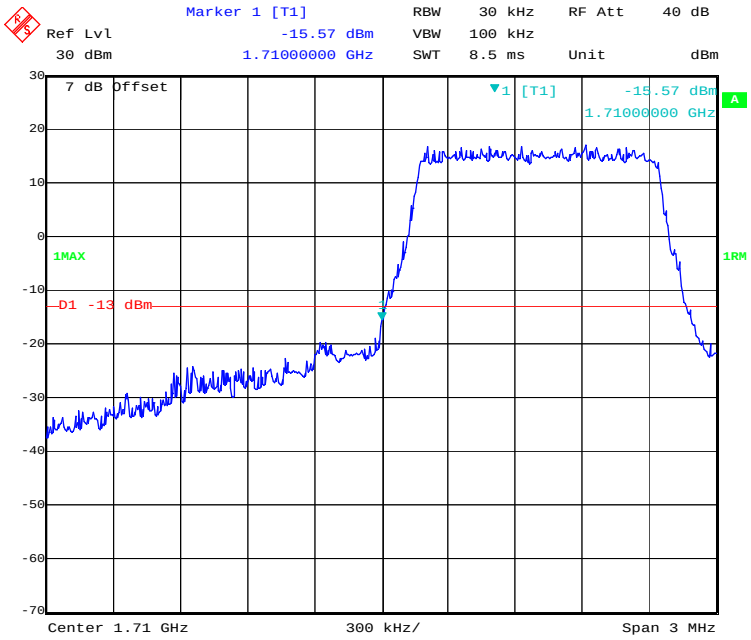
Date: 29.APR.2021 21:29:11

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



Date: 29.APR.2021 21:29:55

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

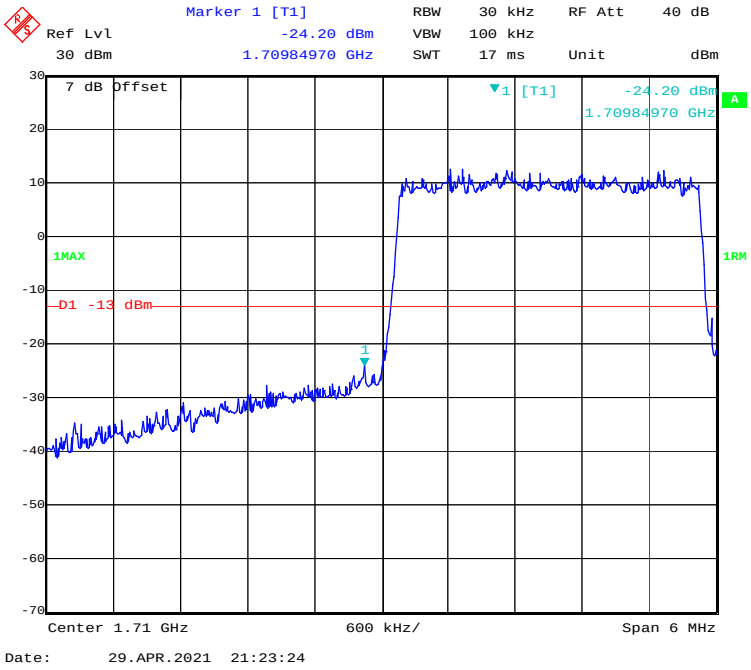


Date: 29.APR.2021 21:21:49

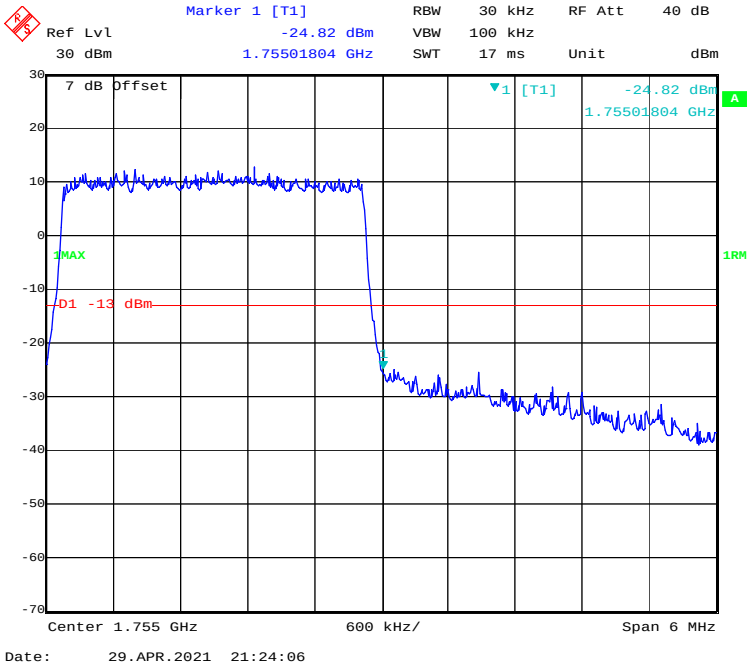
16-QAM (1.4 MHz, FULL RB) - Right Band Edge

Date: 29.APR.2021 21:22:39

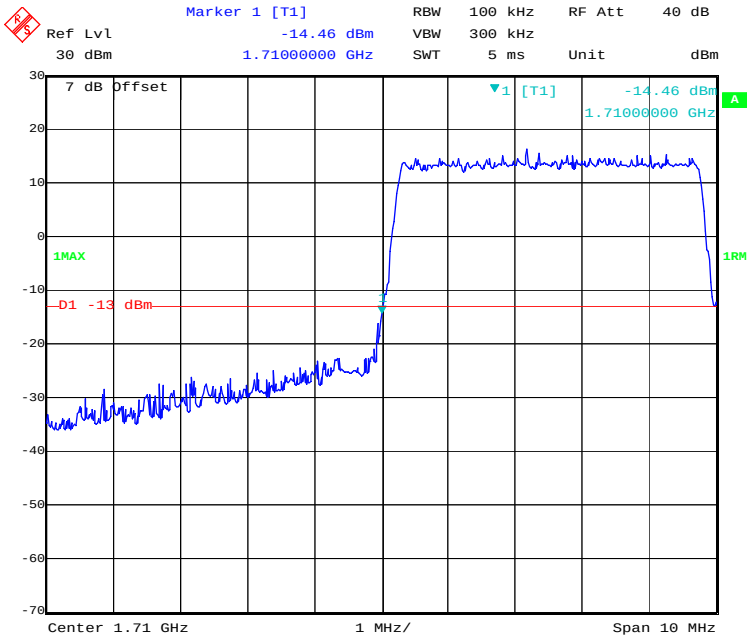
16-QAM (3 MHz, FULL RB) - Left Band Edge



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

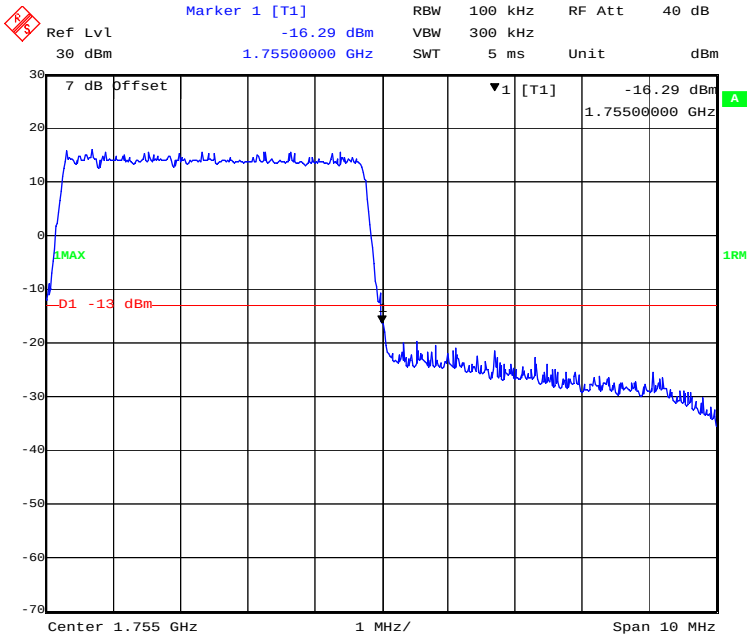


16-QAM (5 MHz, FULL RB) - Left Band Edge



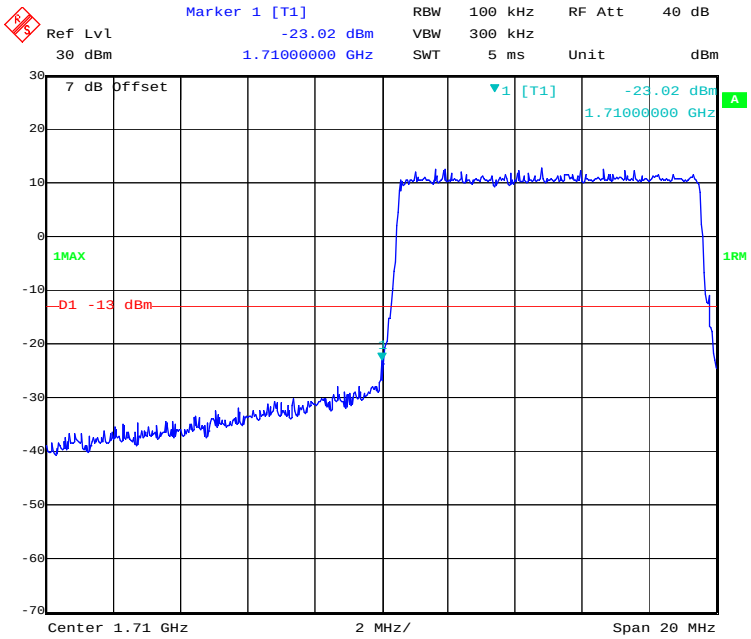
Date: 29.APR.2021 21:24:52

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



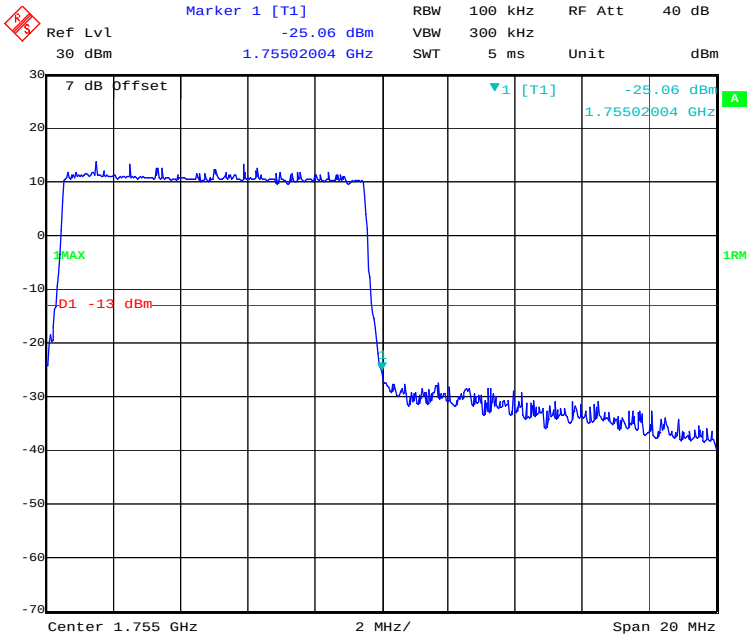
Date: 12.MAY.2021 15:00:57

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



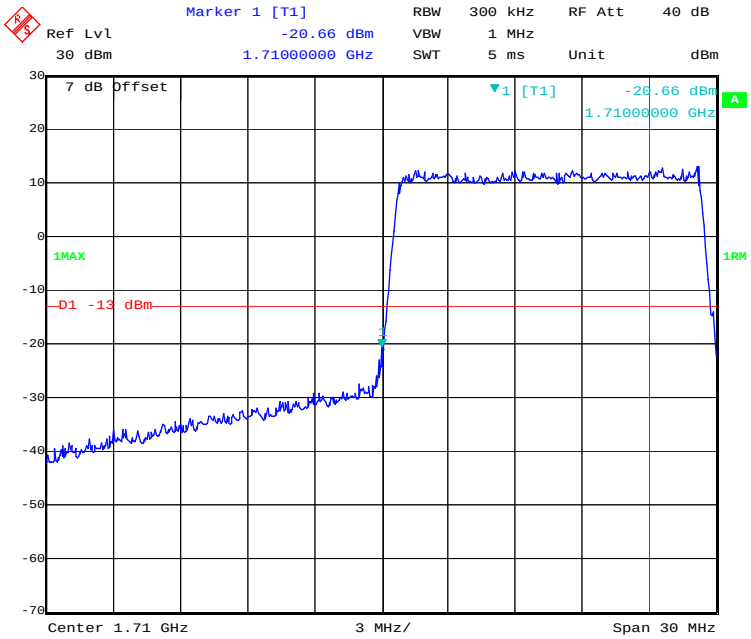
Date: 29.APR.2021 21:26:26

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



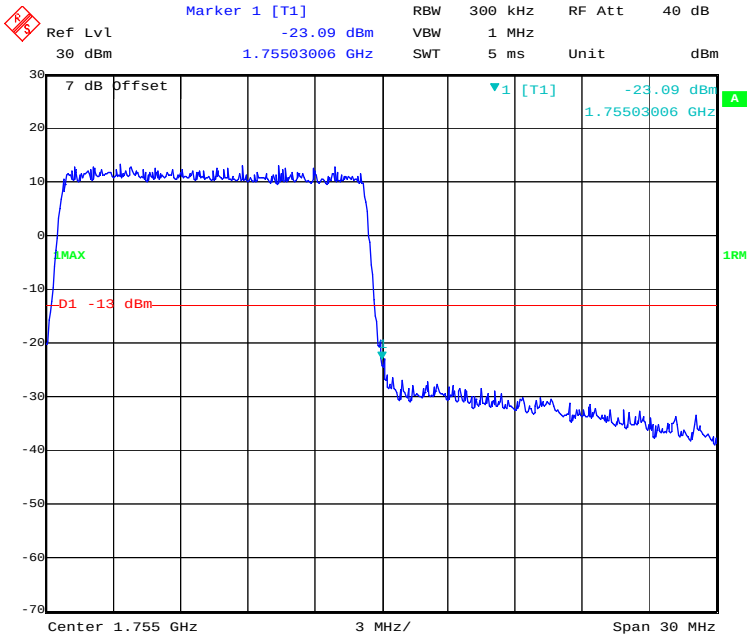
Date: 29.APR.2021 21:27:14

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



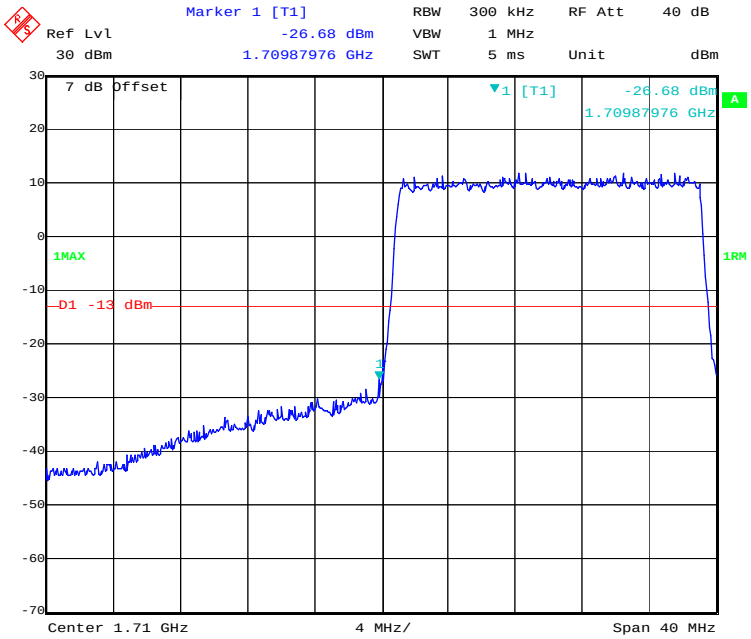
Date: 29.APR.2021 21:28:00

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



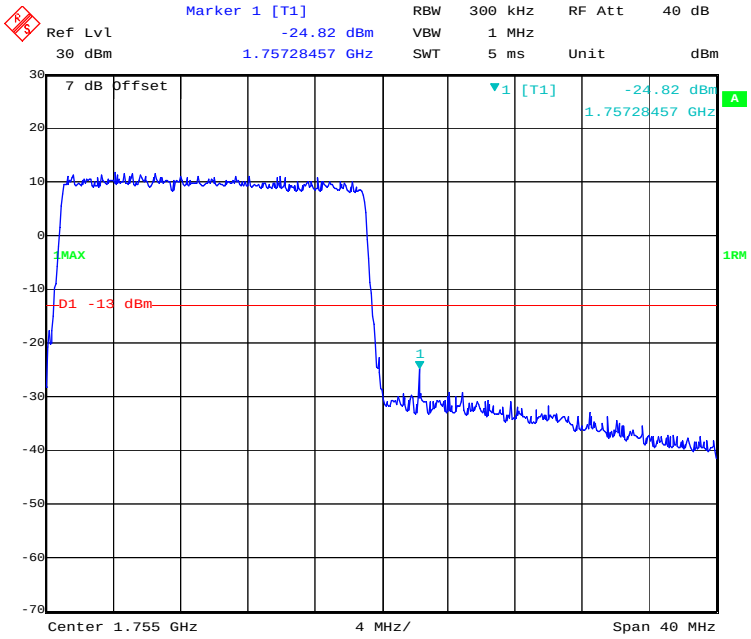
Date: 29.APR.2021 21:28:42

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



Date: 29.APR.2021 21:29:33

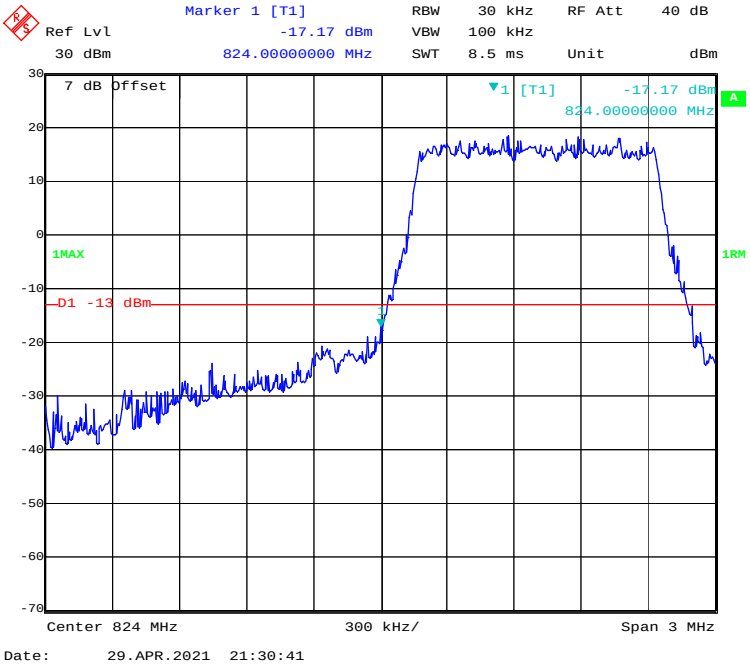
16-QAM (20 MHz, FULL RB) - Right Band Edge



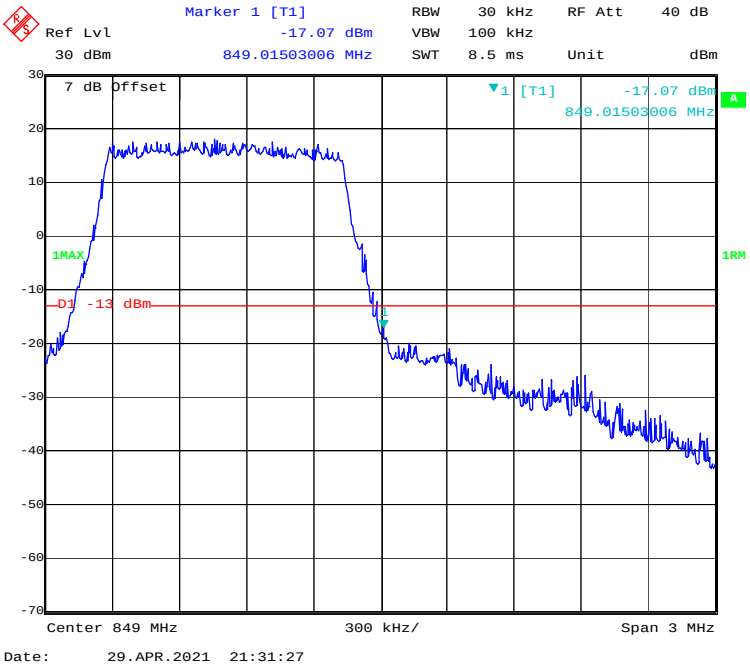
Date: 29.APR.2021 21:30:17

LTE Band 5:

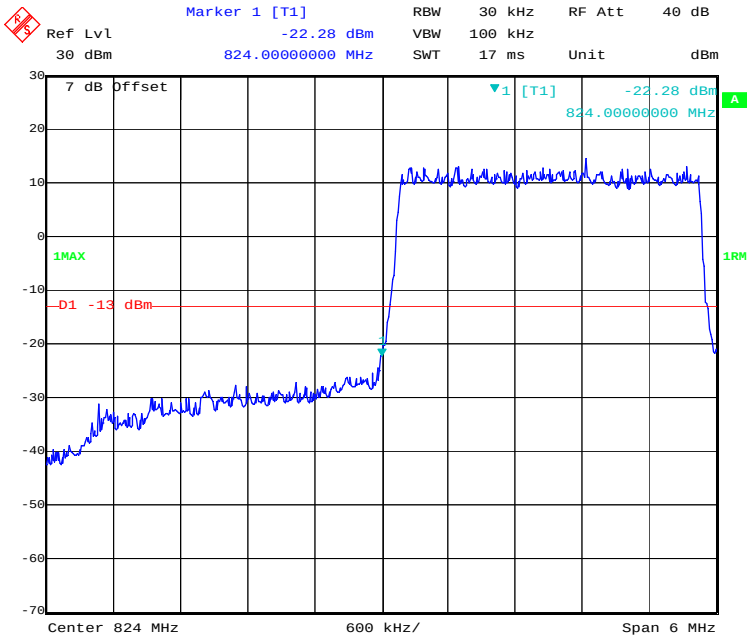
QPSK (1.4 MHz, FULL RB) - Left Band Edge



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

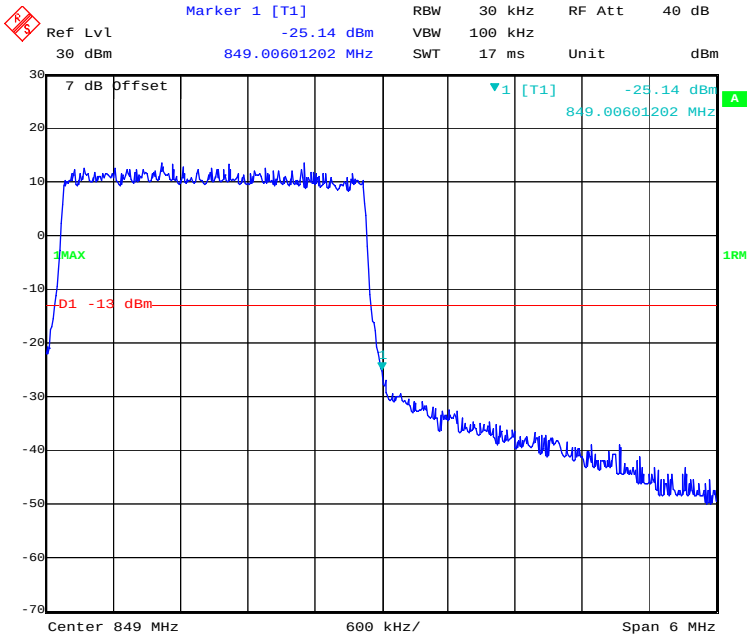


QPSK (3.0 MHz, FULL RB) - Left Band Edge



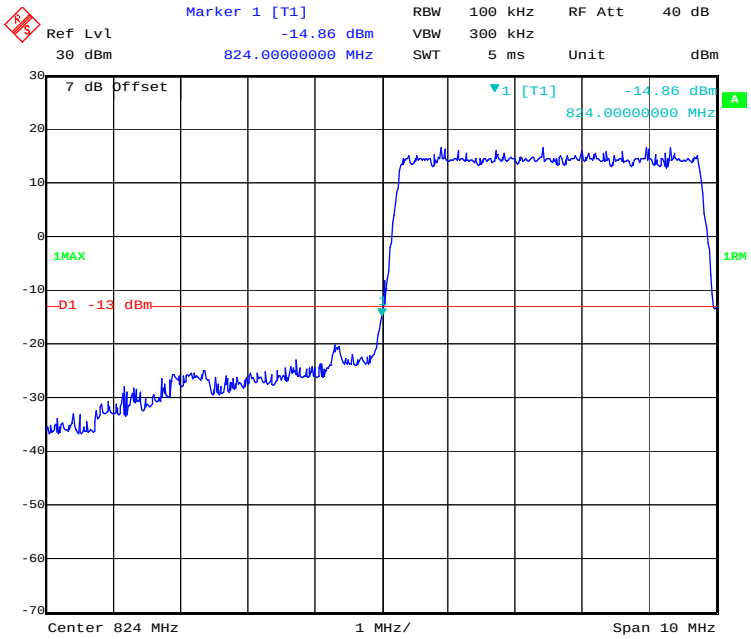
Date: 29.APR.2021 21:32:15

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



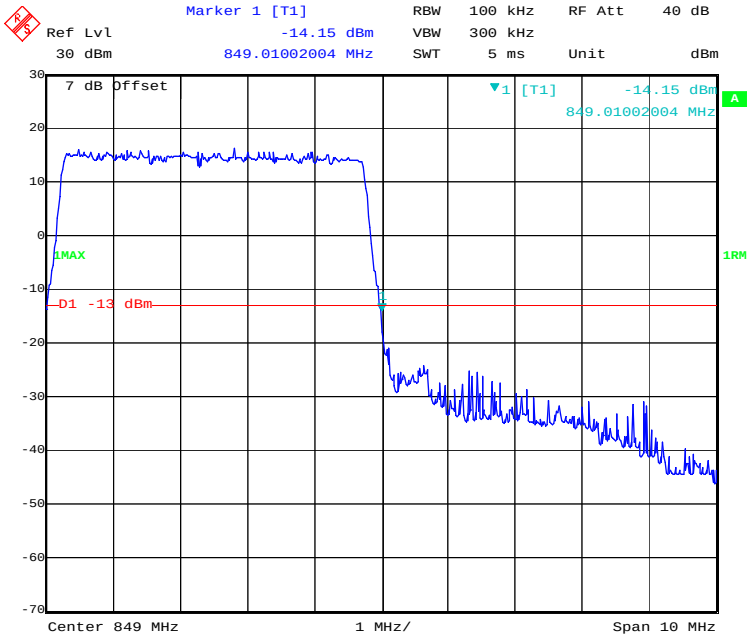
Date: 29.APR.2021 21:32:57

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



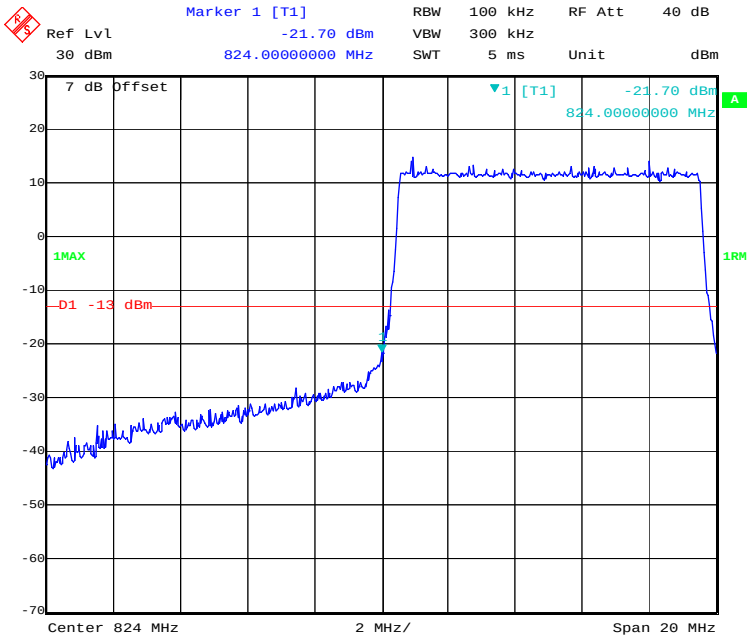
Date: 29.APR.2021 21:33:42

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



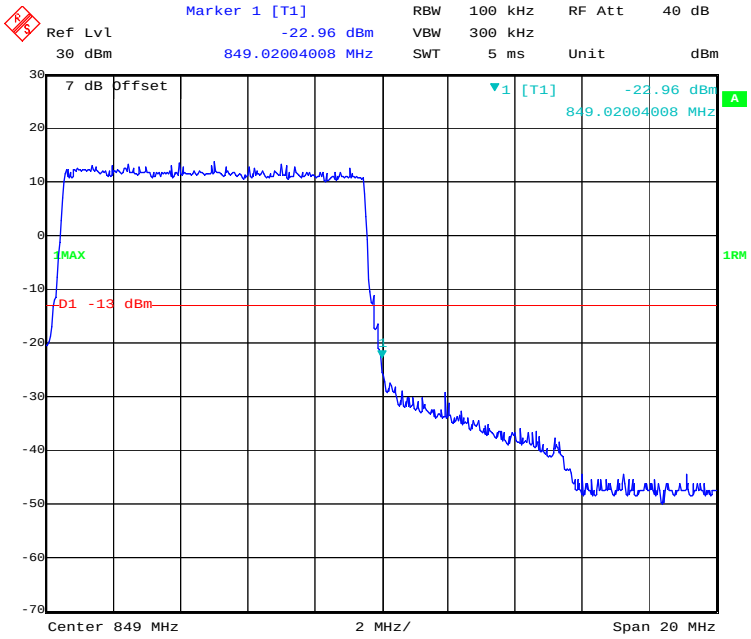
Date: 29.APR.2021 21:34:24

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



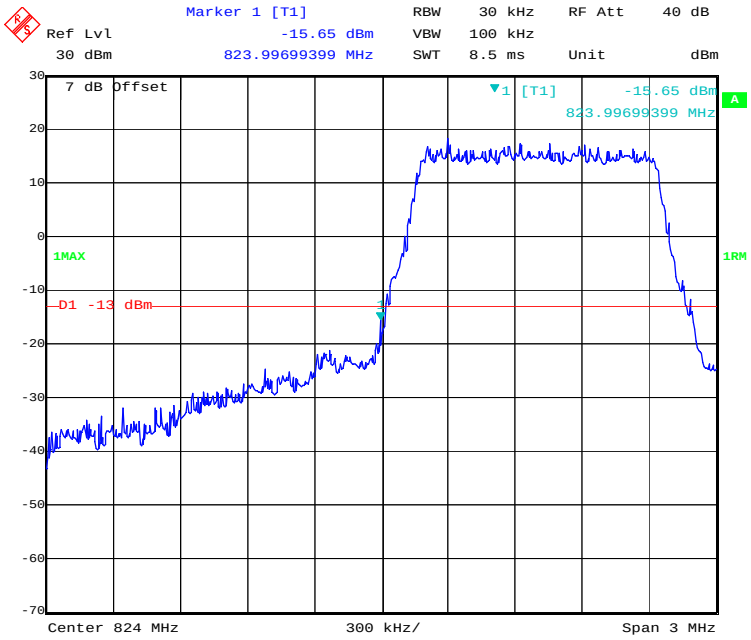
Date: 29.APR.2021 21:35:10

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



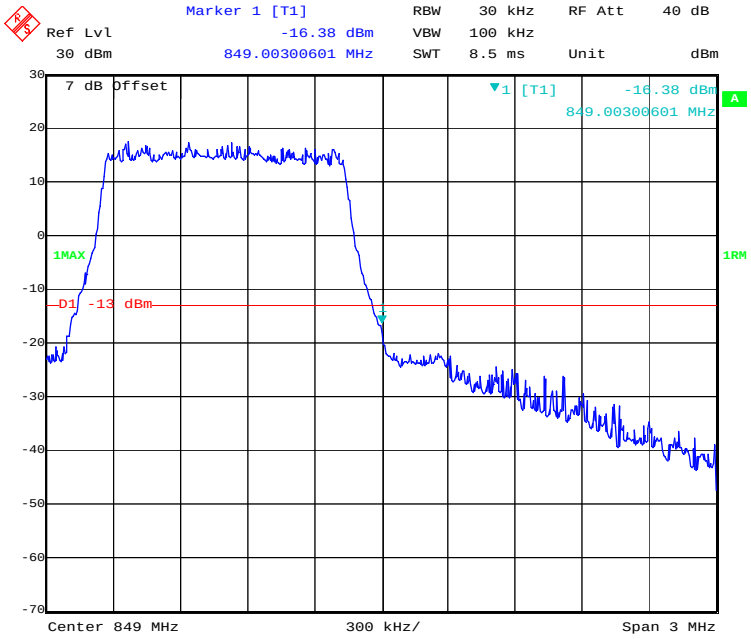
Date: 29.APR.2021 21:35:51

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



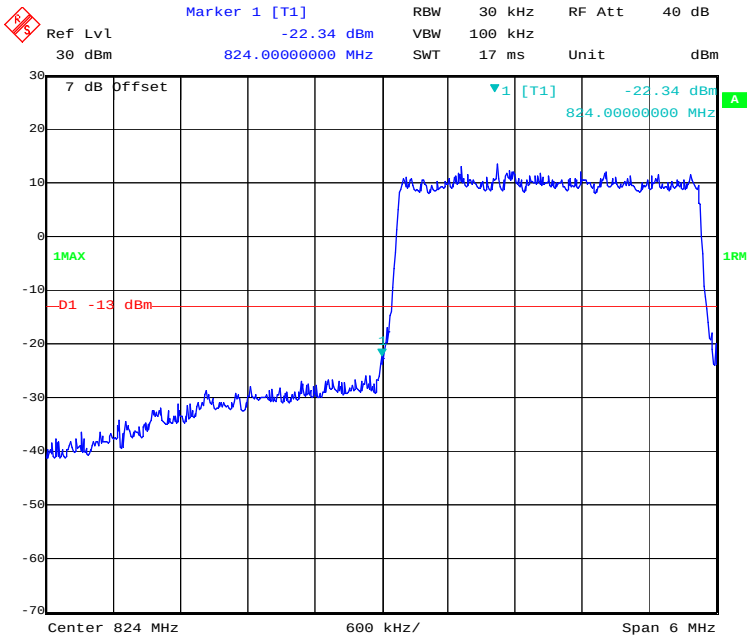
Date: 29.APR.2021 21:31:02

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



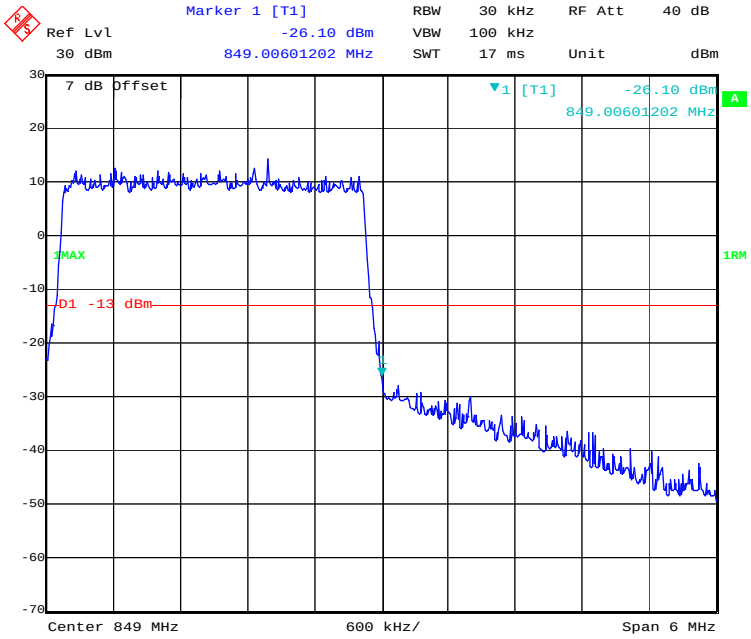
Date: 29.APR.2021 21:31:51

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



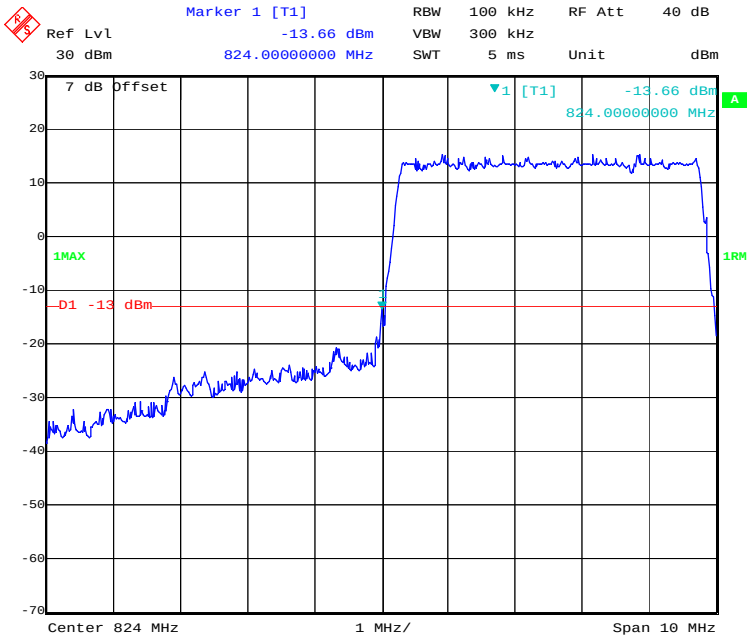
Date: 29.APR.2021 21:32:35

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



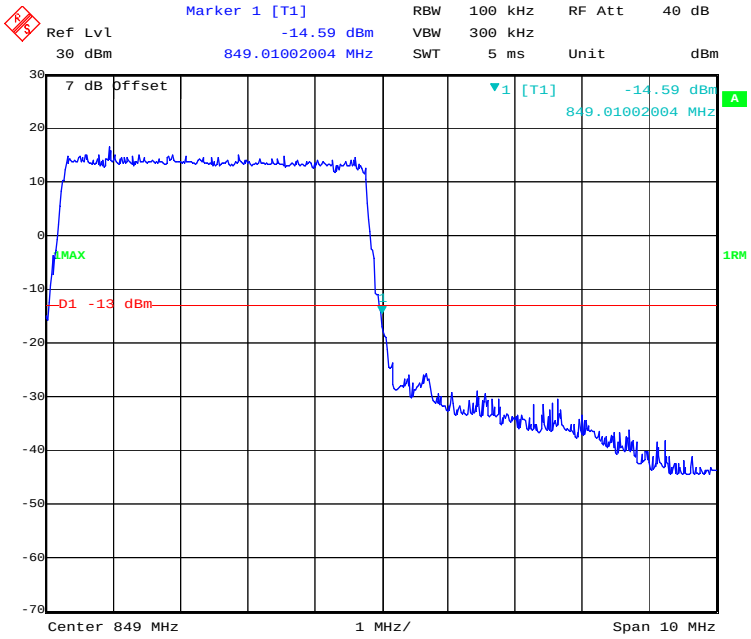
Date: 29.APR.2021 21:33:18

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



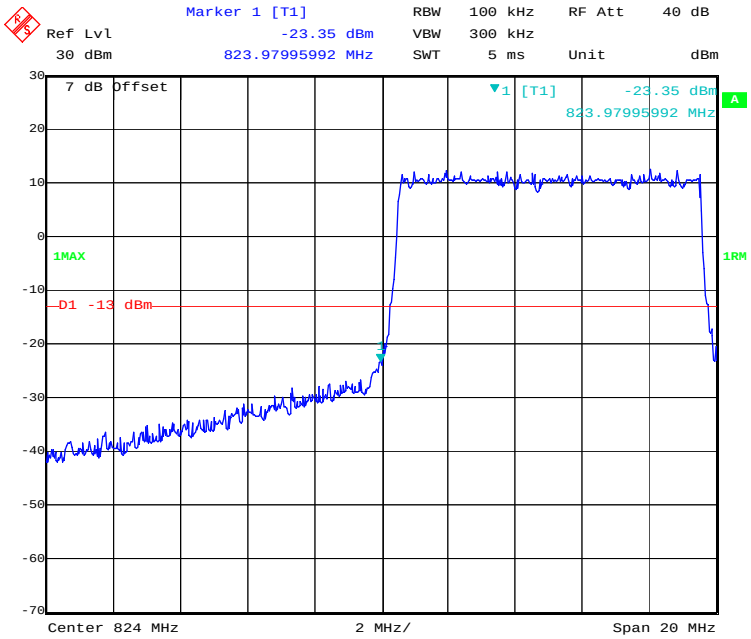
Date: 29.APR.2021 21:34:02

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



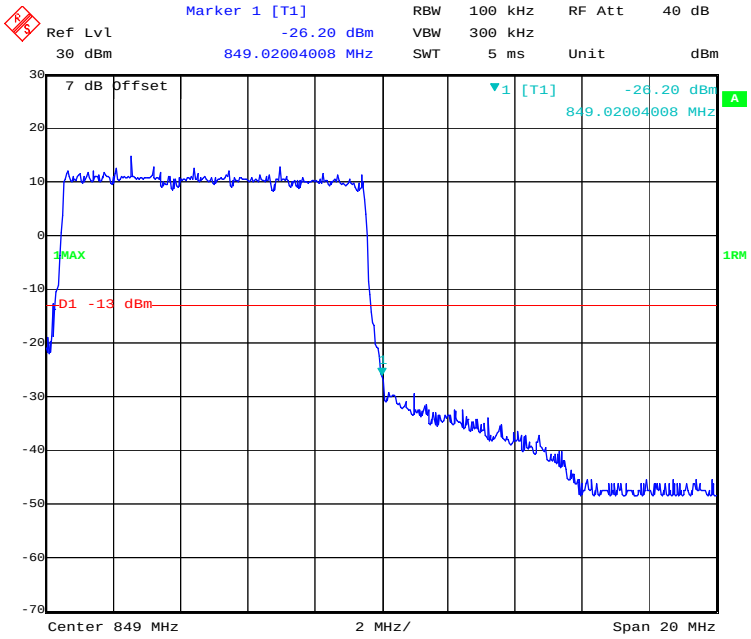
Date: 29.APR.2021 21:34:45

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



Date: 29.APR.2021 21:35:28

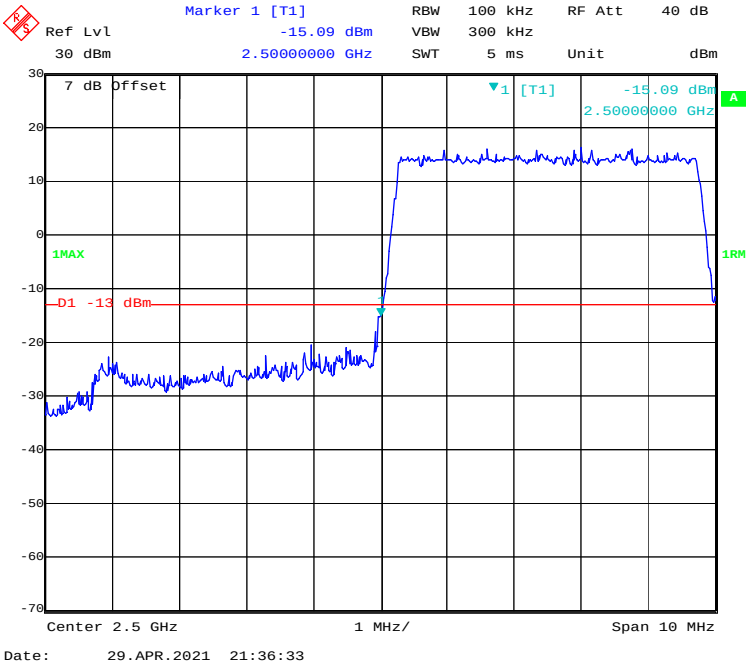
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



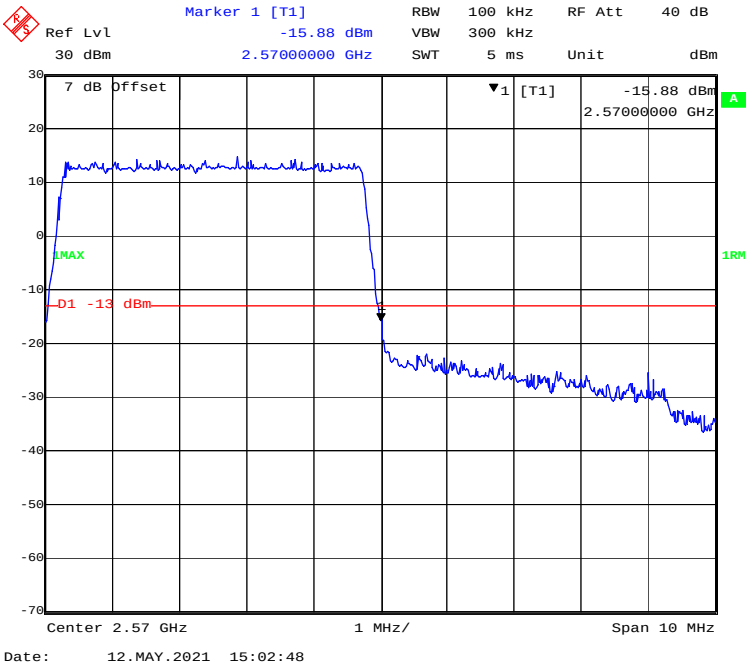
Date: 29.APR.2021 21:36:09

LTE Band 7:

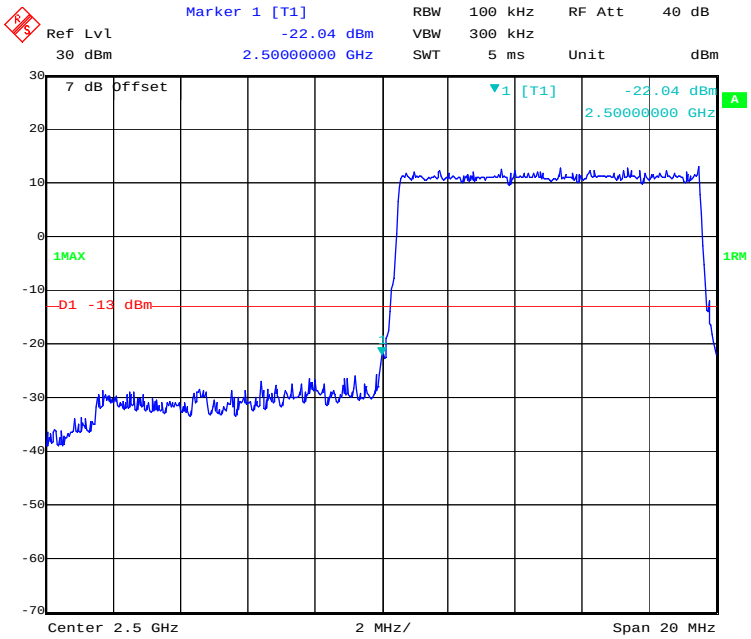
QPSK (5.0 MHz, FULL RB) - Left Band Edge



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

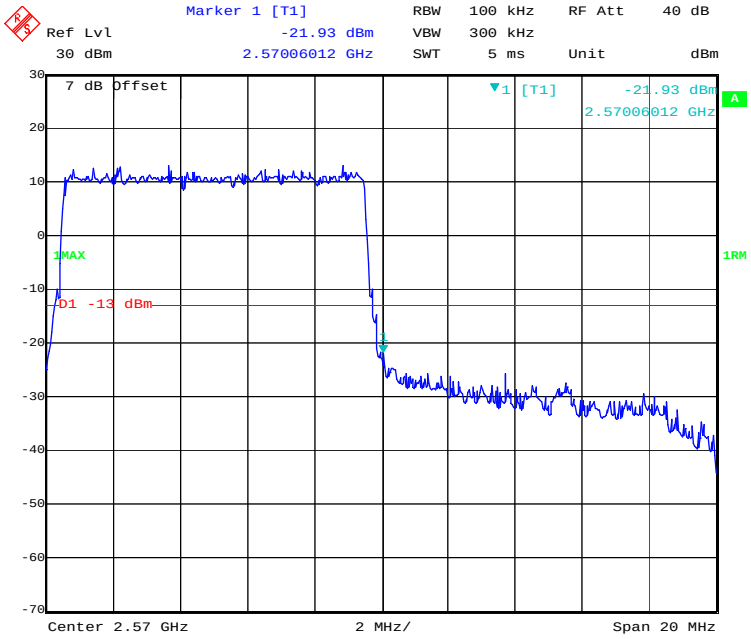


QPSK (10.0 MHz, FULL RB) - Left Band Edge



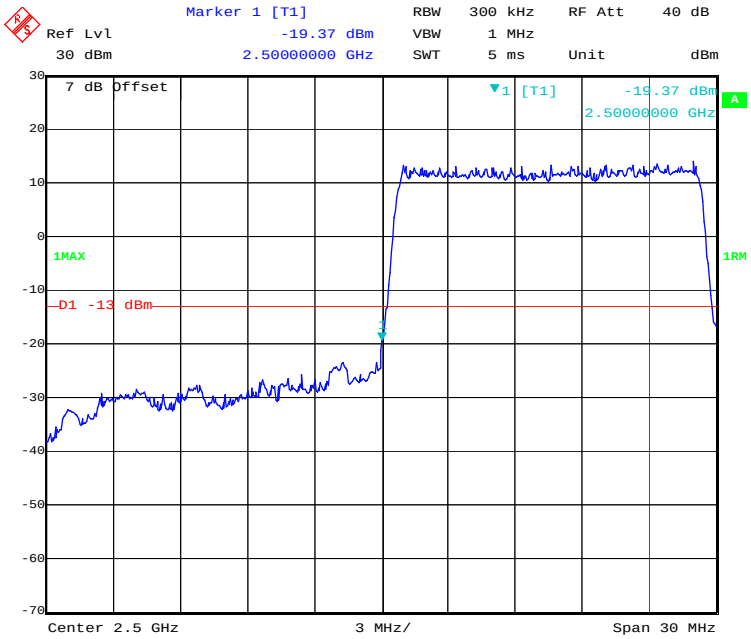
Date: 29.APR.2021 21:38:02

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



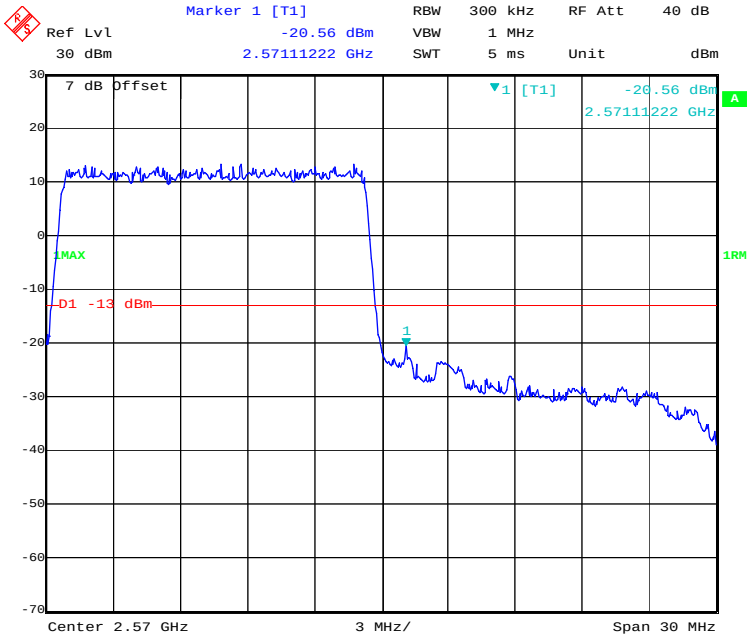
Date: 29.APR.2021 21:38:44

QPSK (15.0 MHz, FULL RB) - Left Band Edge



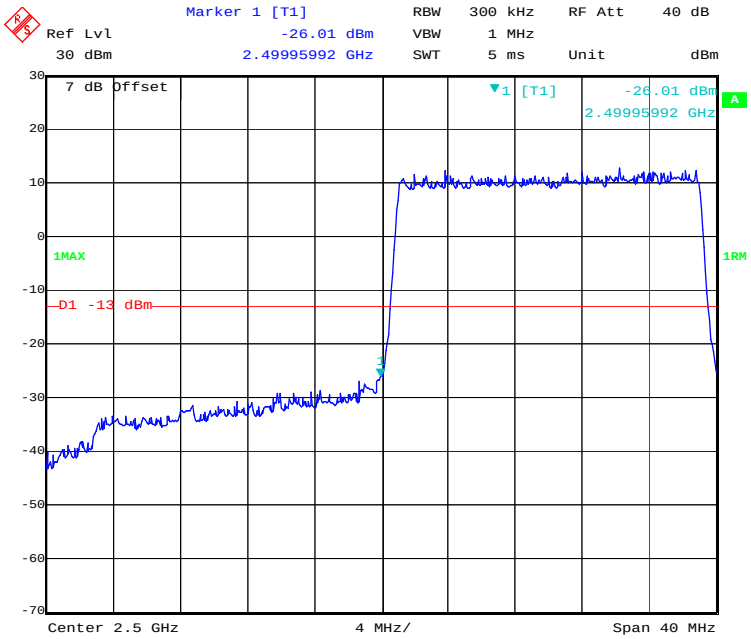
Date: 29.APR.2021 21:39:34

QPSK (15.0 MHz, FULL RB) - Right Band Edge



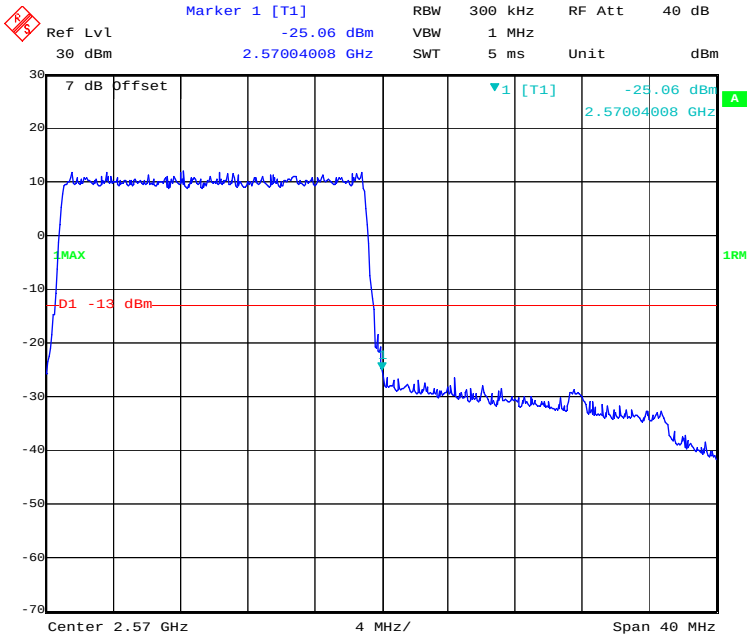
Date: 29.APR.2021 21:40:16

QPSK (20.0 MHz, FULL RB) - Left Band Edge



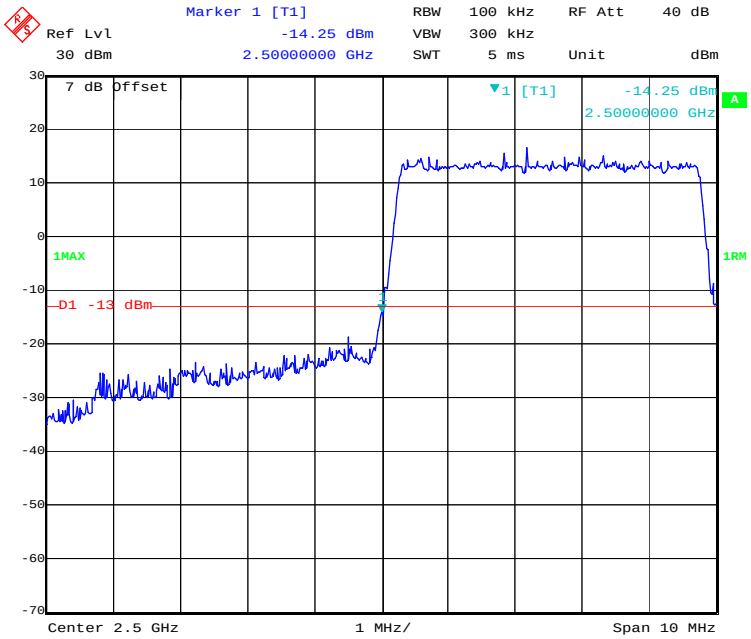
Date: 29.APR.2021 21:41:02

QPSK (20.0 MHz, FULL RB) - Right Band Edge



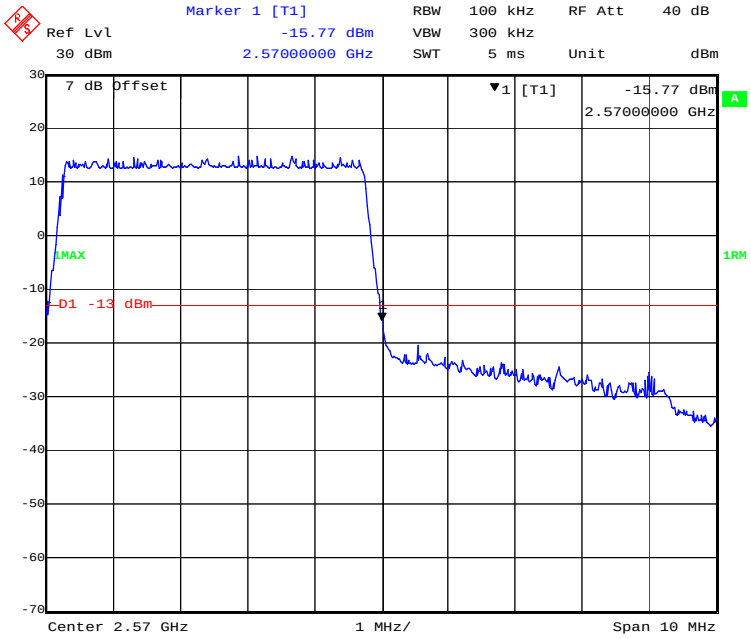
Date: 29.APR.2021 21:41:47

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



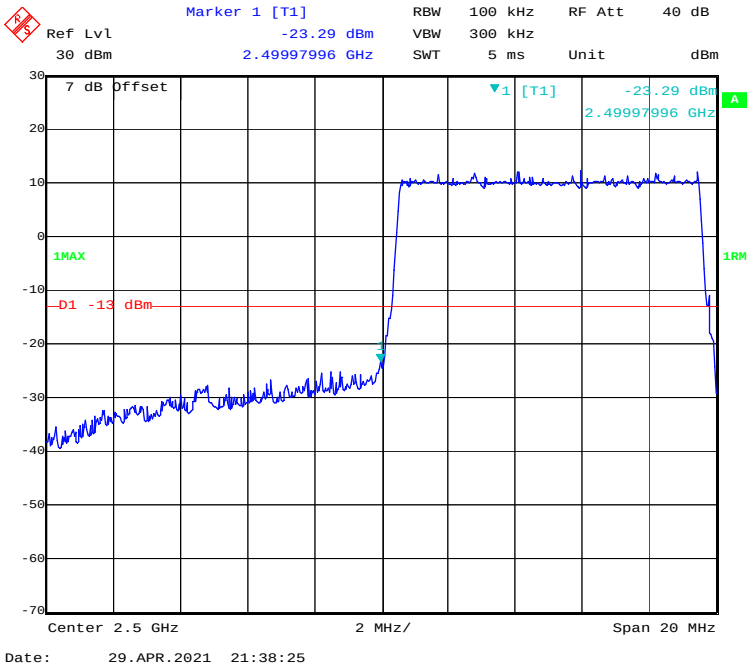
Date: 29.APR.2021 21:36:54

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

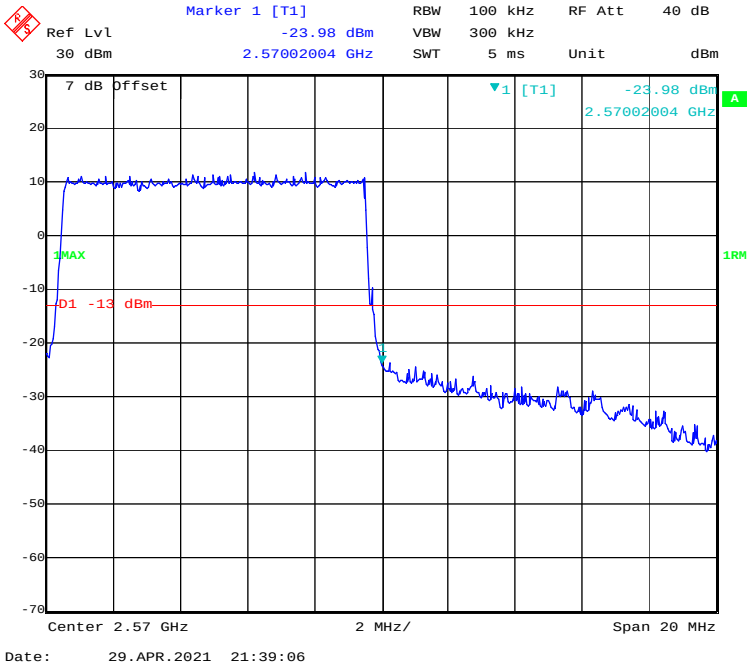


Date: 12.MAY.2021 15:03:10

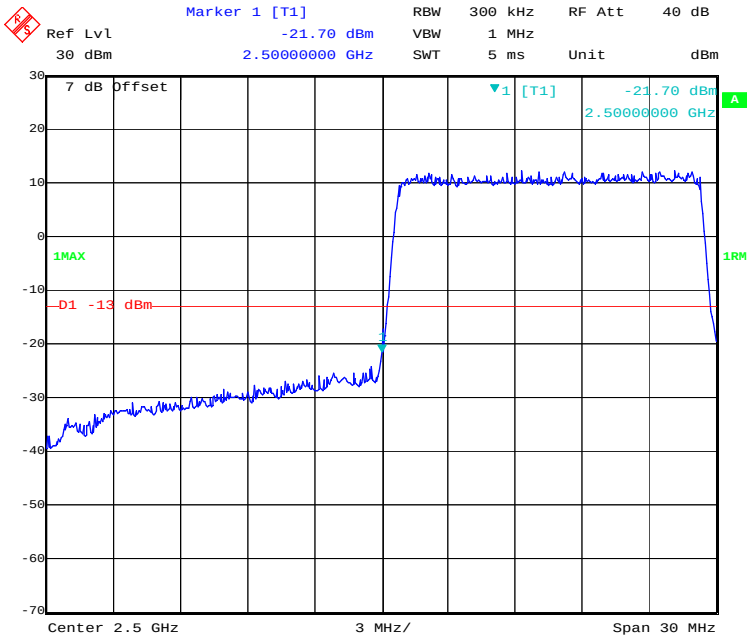
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



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

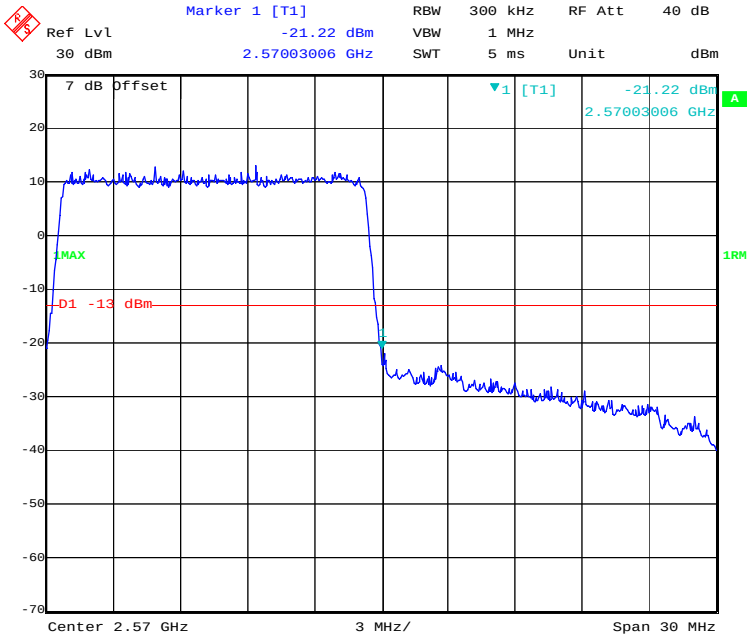


16-QAM (15.0 MHz, FULL RB) - Left Band Edge



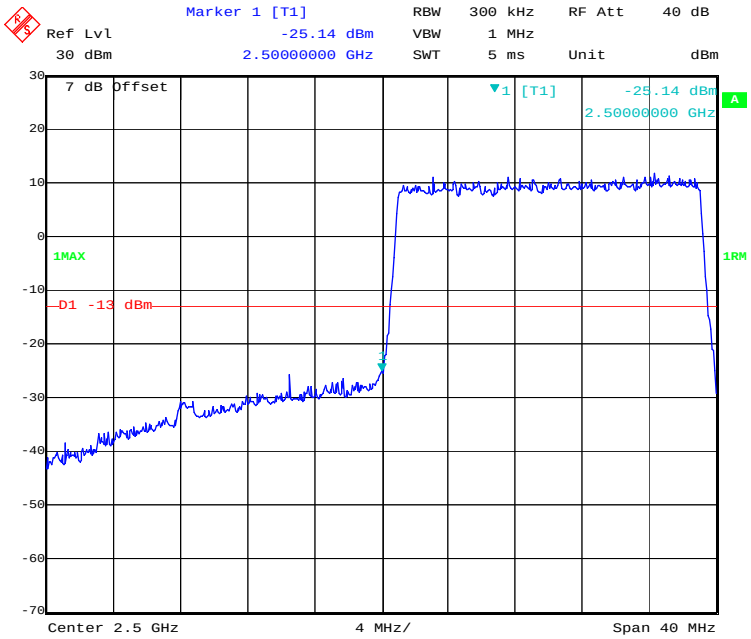
Date: 29.APR.2021 21:39:55

16-QAM (15.0 MHz, FULL RB) - Right Band Edge



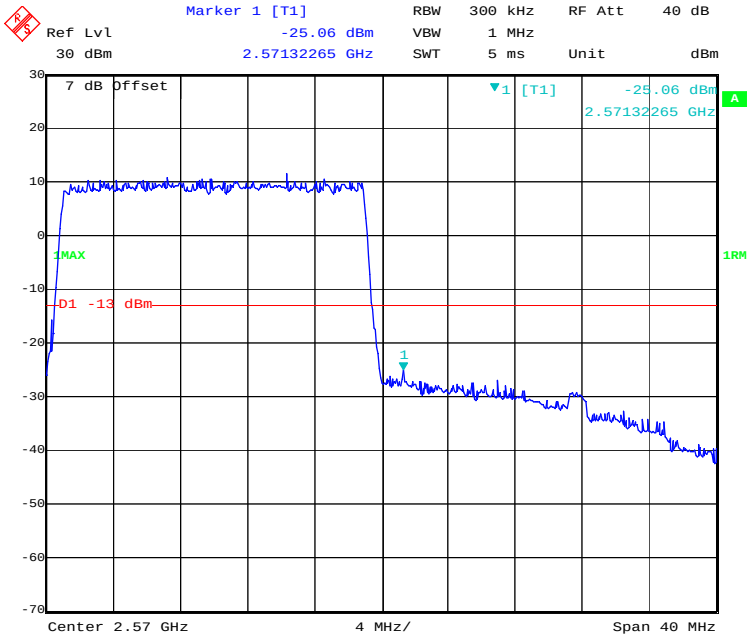
Date: 29.APR.2021 21:40:37

16-QAM (20.0 MHz, FULL RB) - Left Band Edge



Date: 29.APR.2021 21:41:24

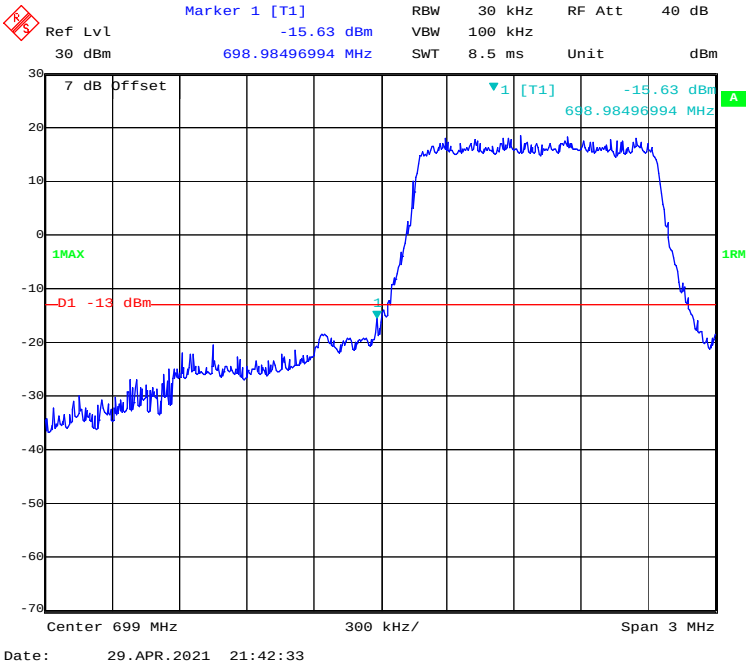
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



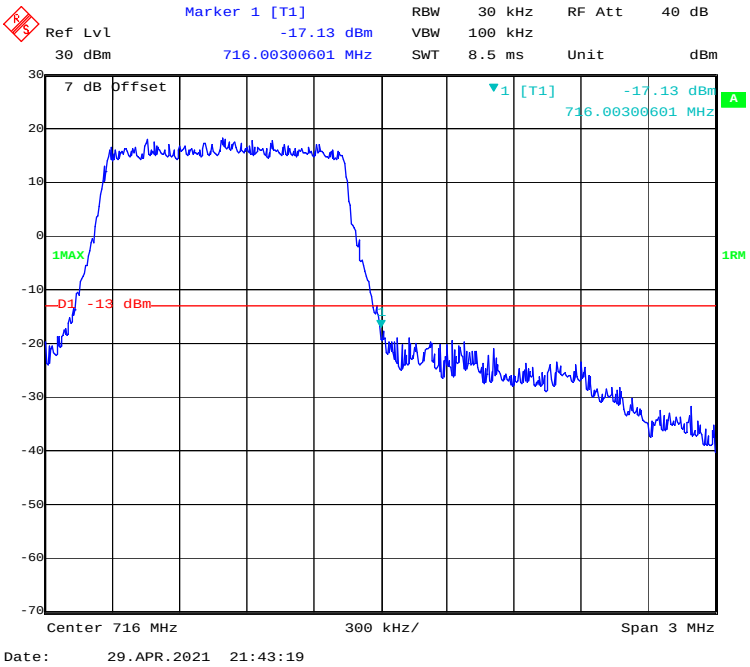
Date: 29.APR.2021 21:42:09

LTE Band 12:

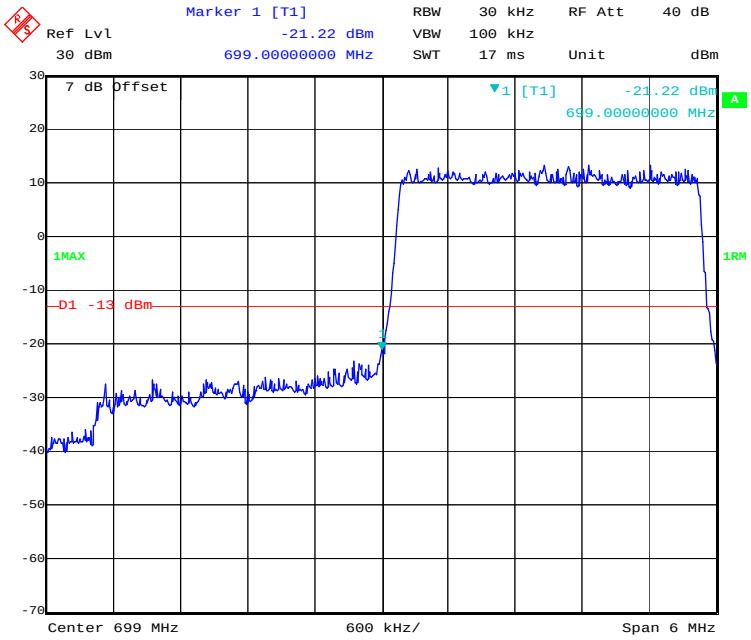
QPSK (1.4 MHz, FULL RB) - Left Band Edge



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

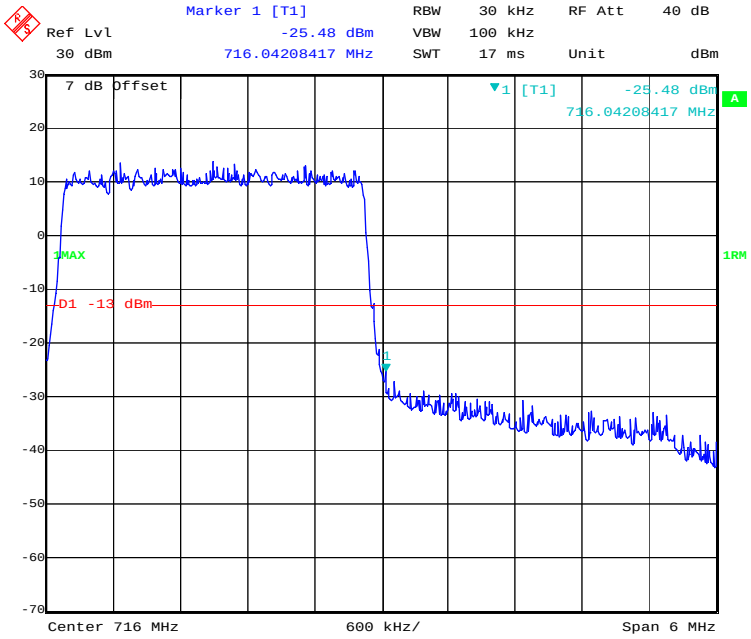


QPSK (3.0 MHz, FULL RB) - Left Band Edge



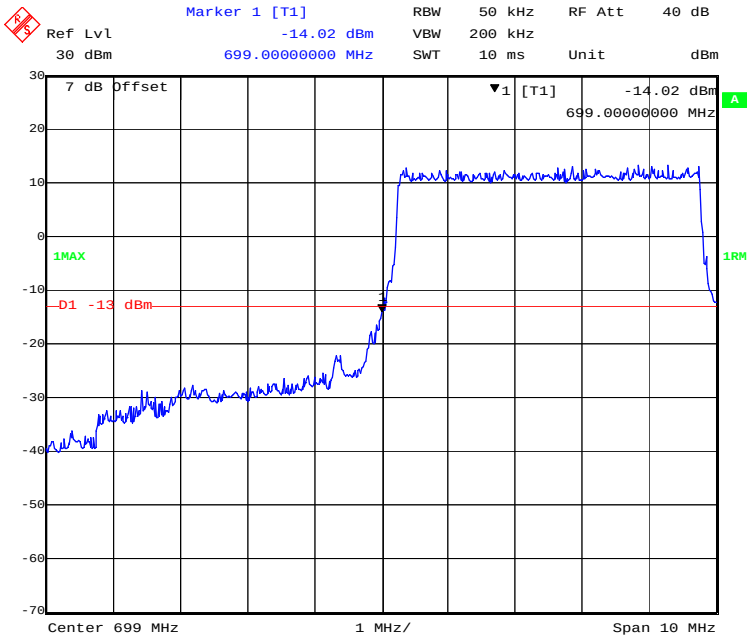
Date: 29.APR.2021 21:44:07

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



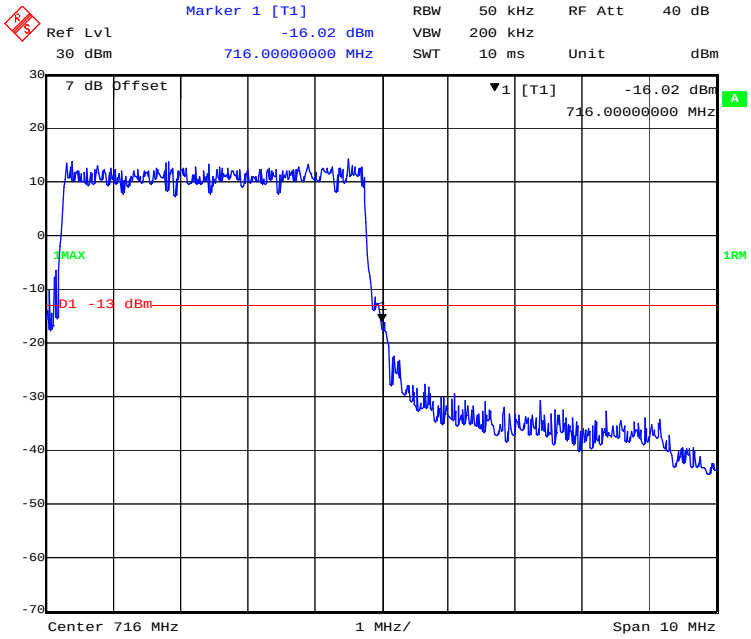
Date: 29.APR.2021 21:44:51

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



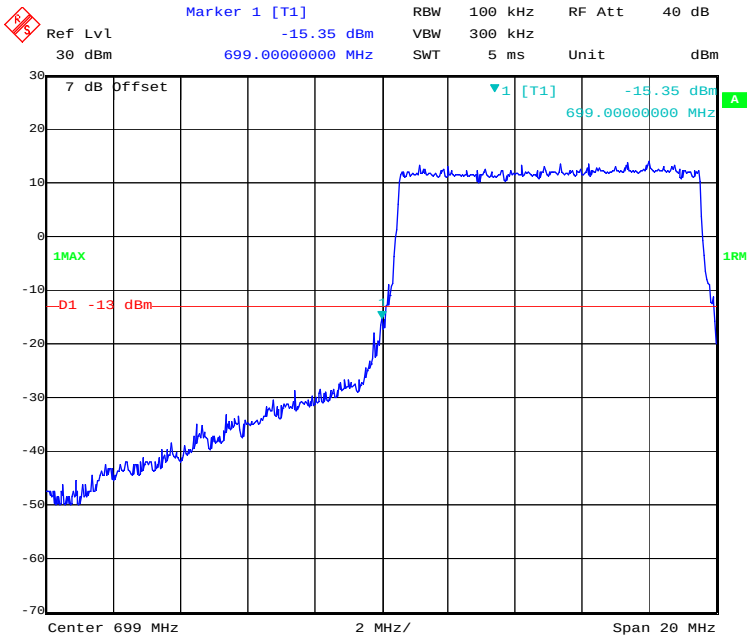
Date: 12.MAY.2021 15:13:24

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



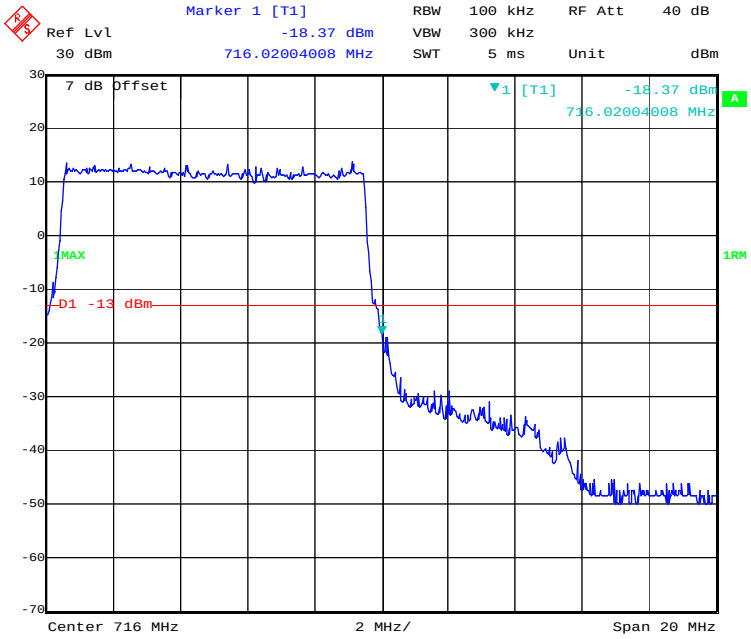
Date: 12.MAY.2021 15:34:30

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



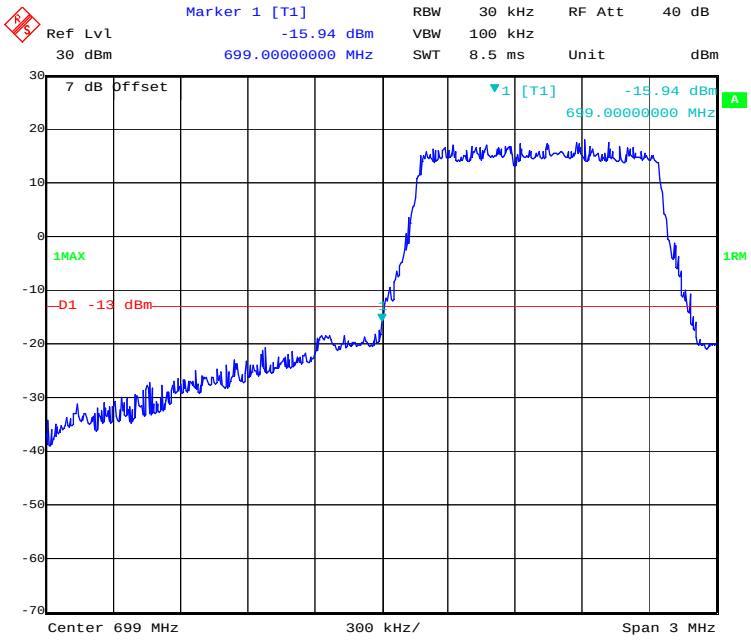
Date: 29.APR.2021 21:47:17

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



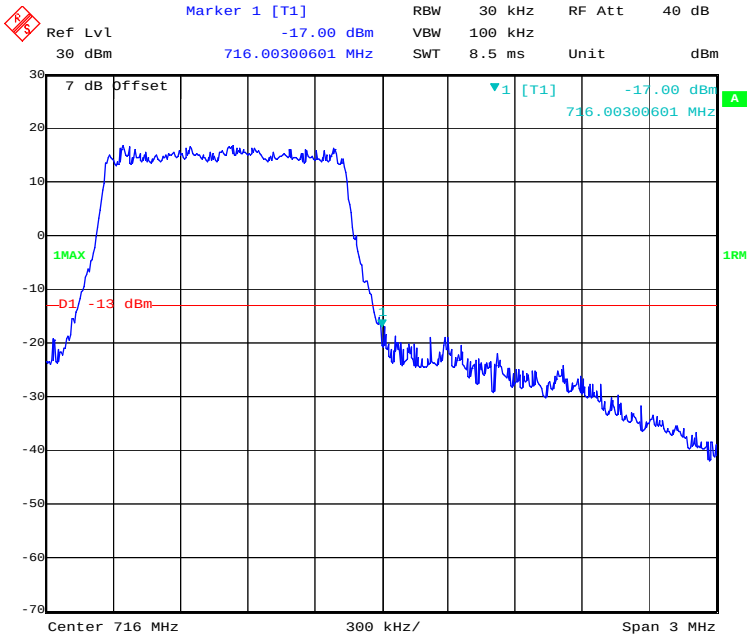
Date: 29.APR.2021 21:48:00

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



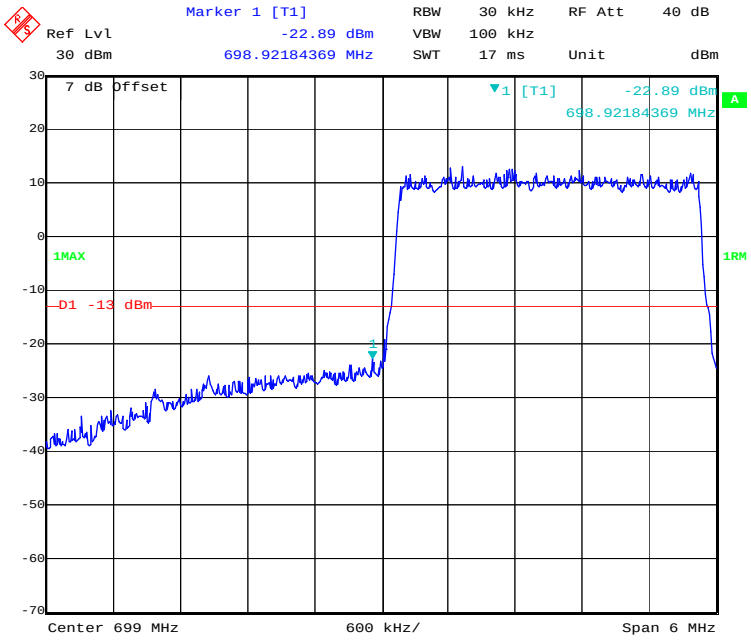
Date: 29.APR.2021 21:42:53

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



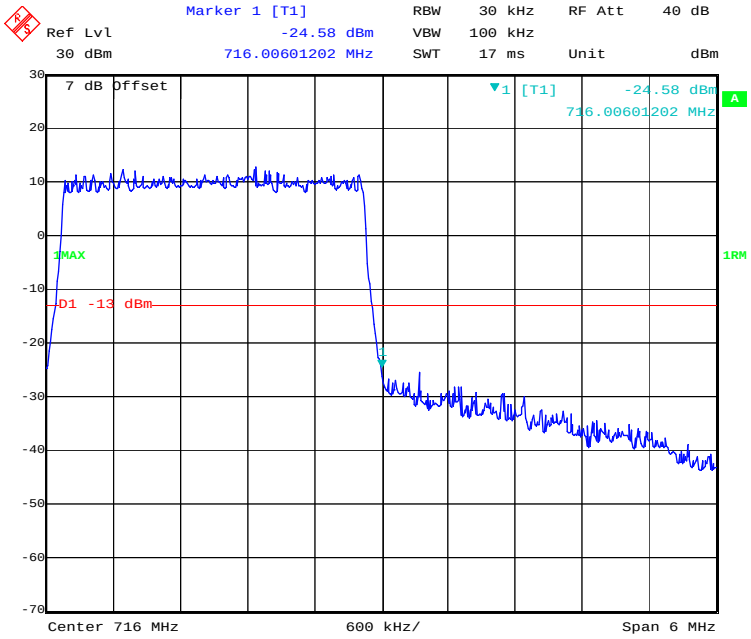
Date: 29.APR.2021 21:43:43

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



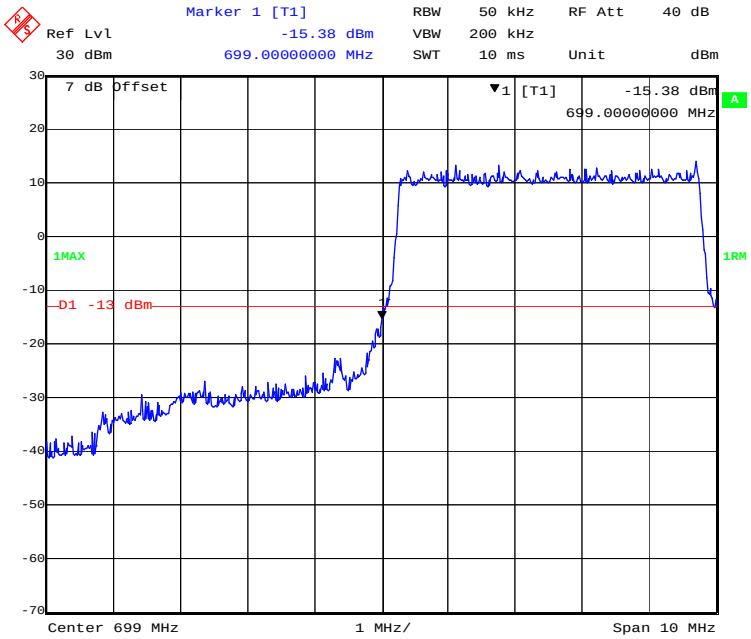
Date: 29.APR.2021 21:44:28

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



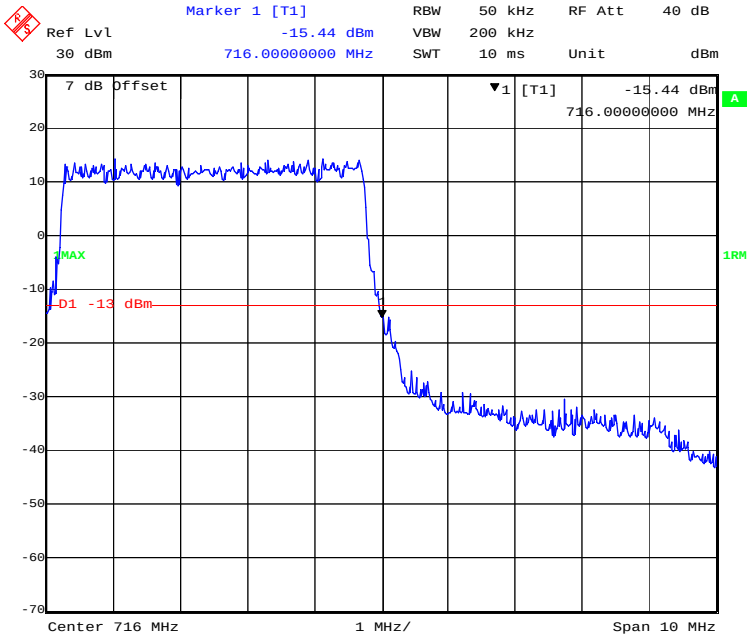
Date: 29.APR.2021 21:45:16

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



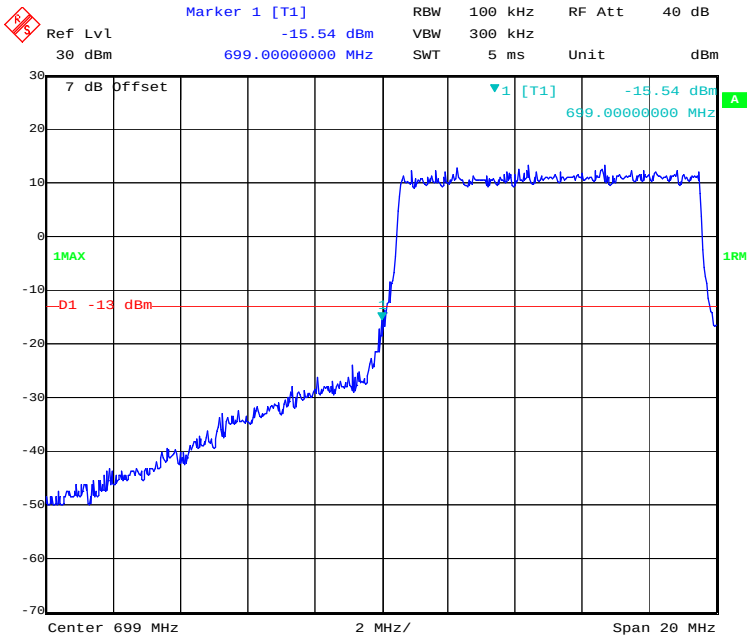
Date: 12.MAY.2021 15:14:02

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



Date: 12.MAY.2021 15:35:44

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



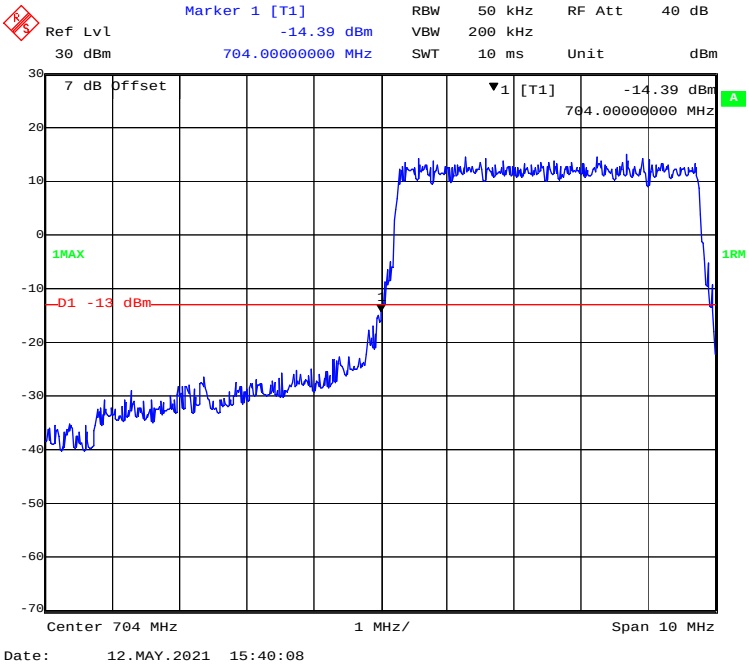
Date: 29.APR.2021 21:47:36

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

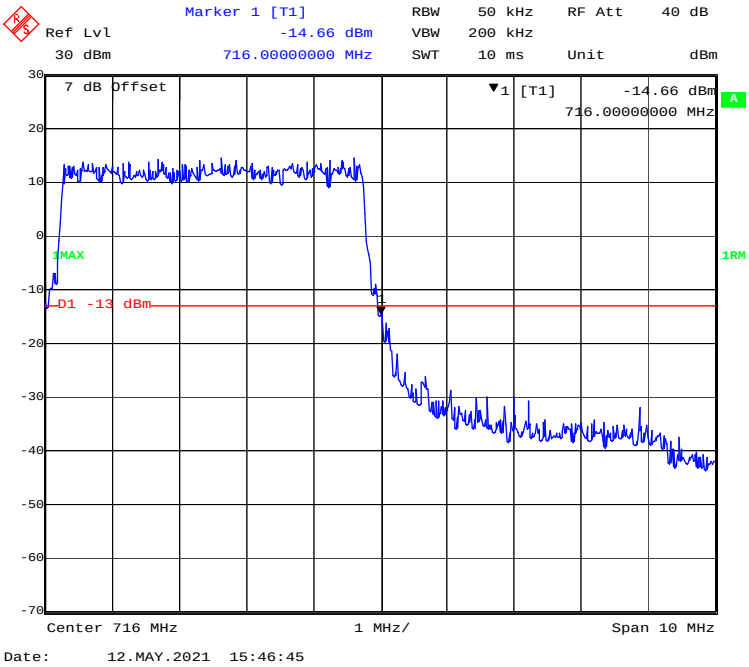
Date: 29.APR.2021 21:48:23

LTE Band 17:

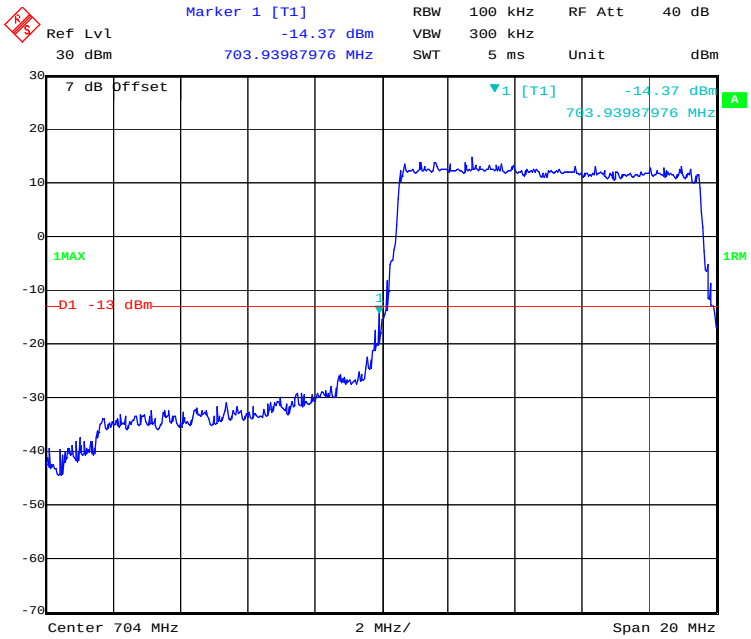
QPSK (5.0 MHz, FULL RB) - Left Band Edge



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

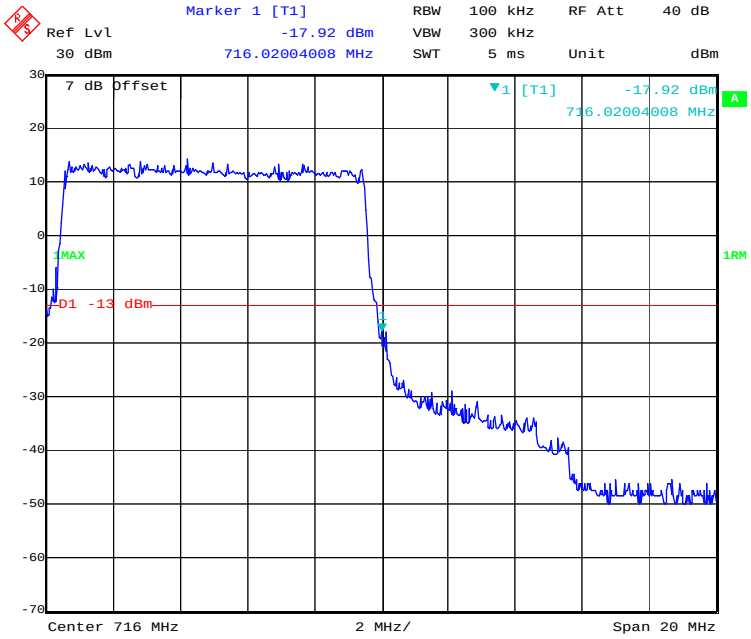


QPSK (10.0 MHz, FULL RB) - Left Band Edge



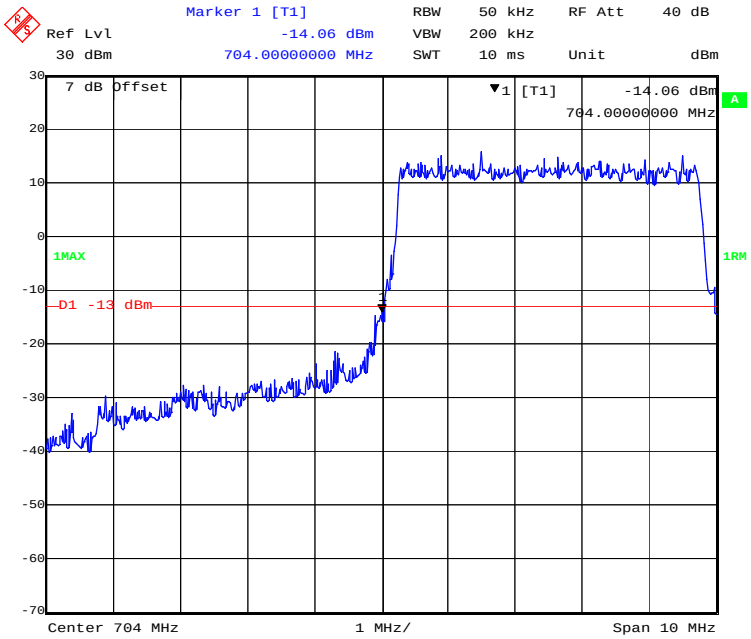
Date: 29.APR.2021 21:50:21

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



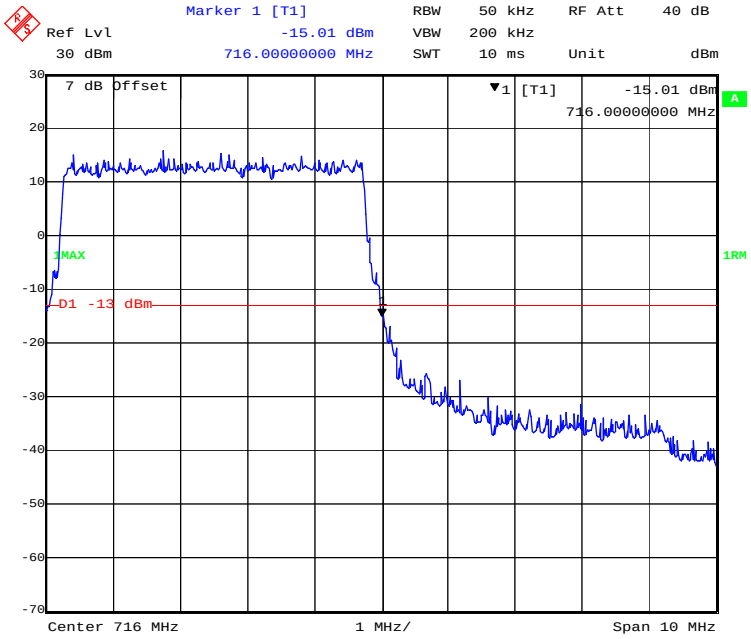
Date: 29.APR.2021 21:51:06

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



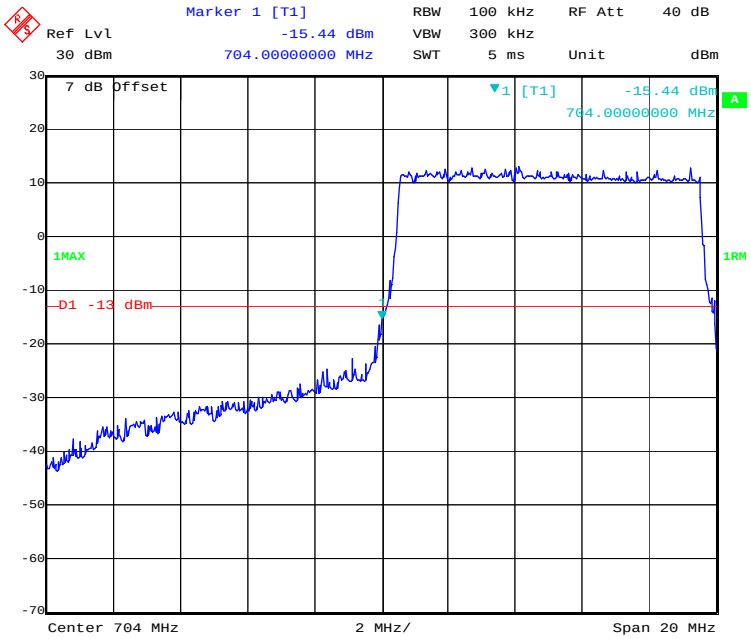
Date: 12.MAY.2021 15:44:42

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



Date: 12.MAY.2021 15:48:36

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



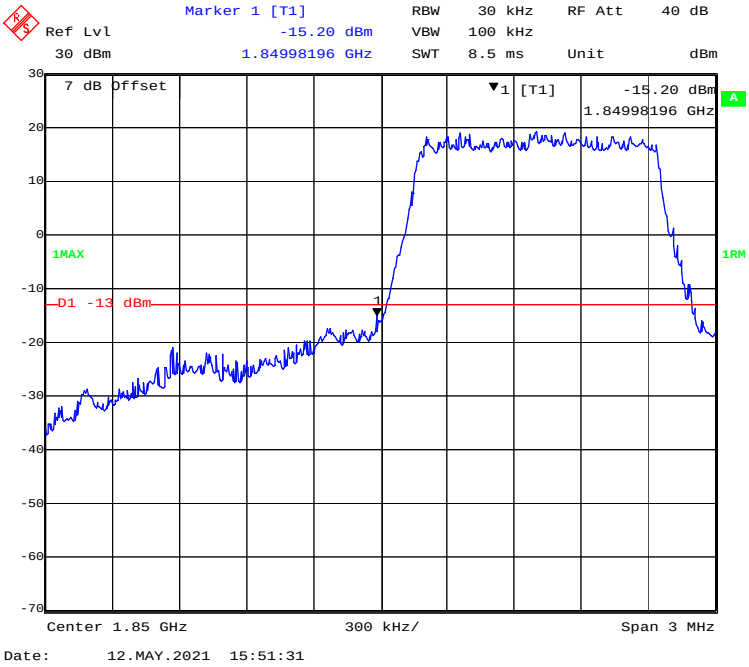
Date: 29.APR.2021 21:50:47

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

Date: 29.APR.2021 21:51:29

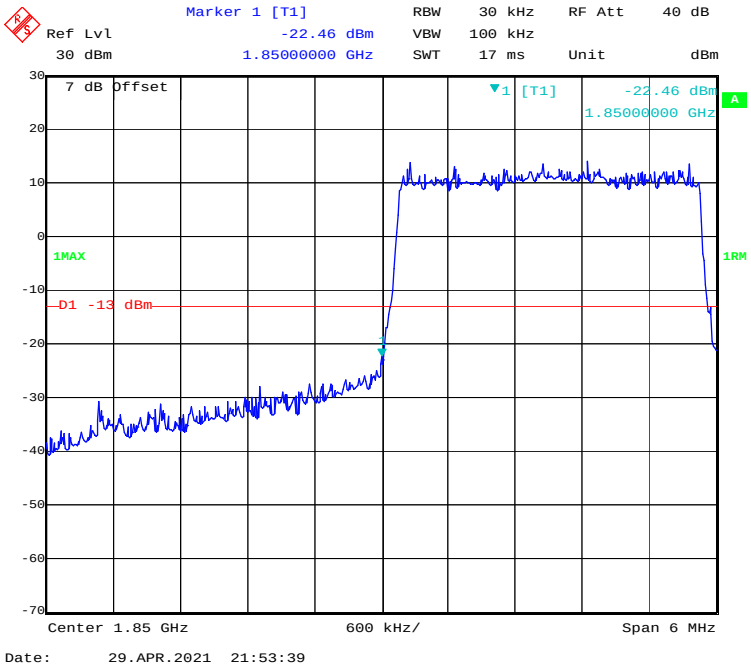
LTE Band 25:

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

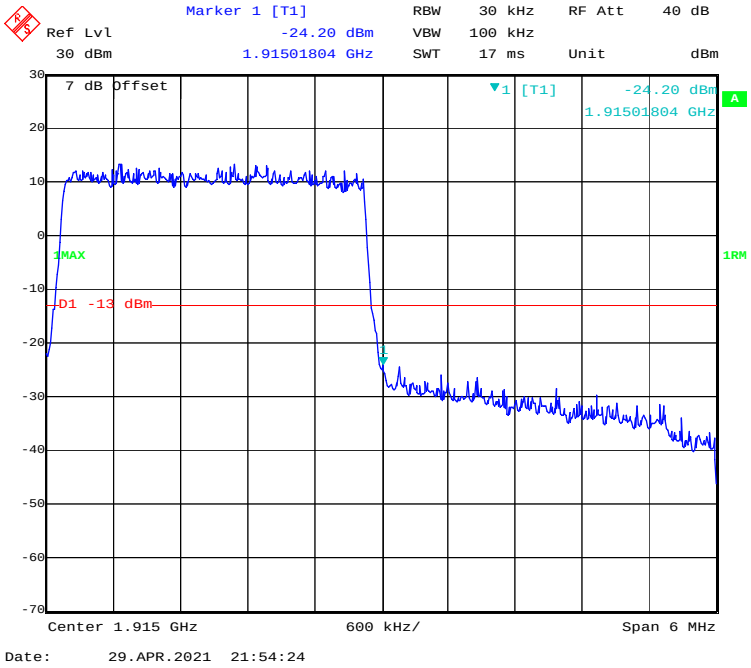


QPSK (1.4 MHz, FULL RB) - Right Band Edge

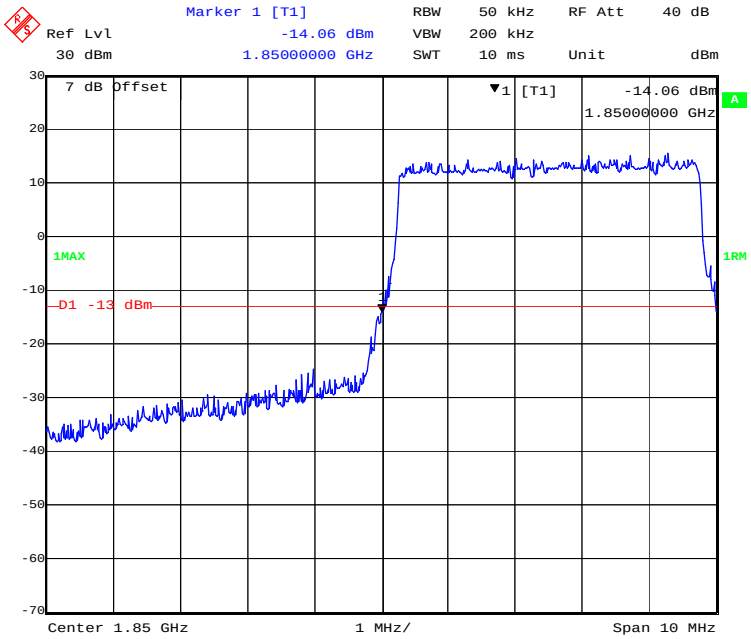
QPSK (3 MHz, FULL RB) - Left Band Edge



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

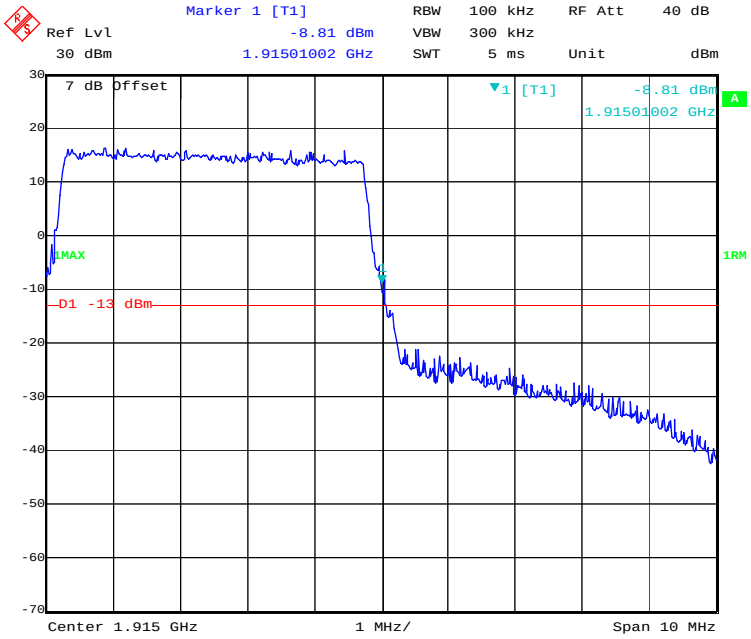


QPSK (5 MHz, FULL RB) - Left Band Edge



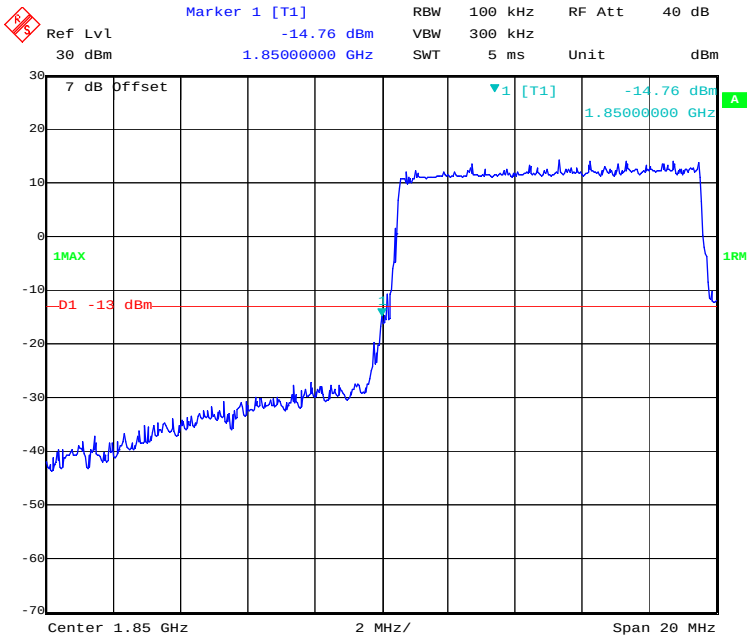
Date: 12.MAY.2021 15:54:34

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



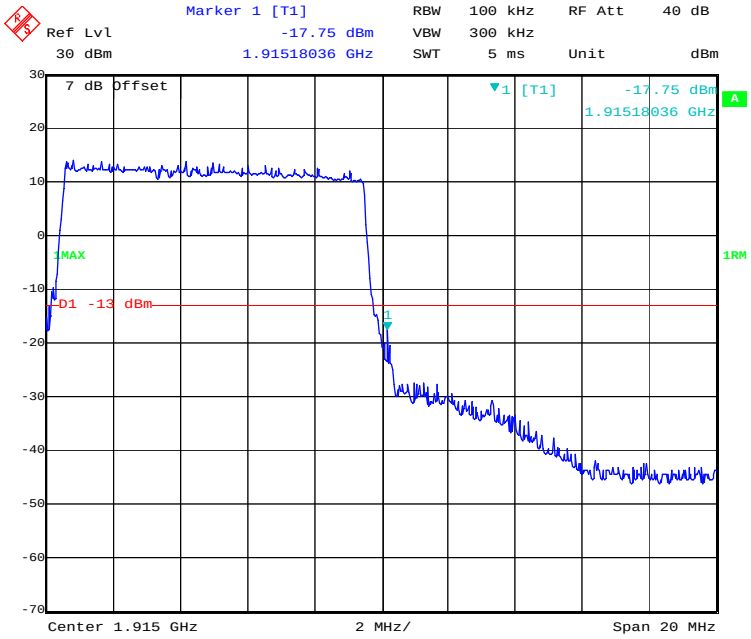
Date: 29.APR.2021 21:55:55

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



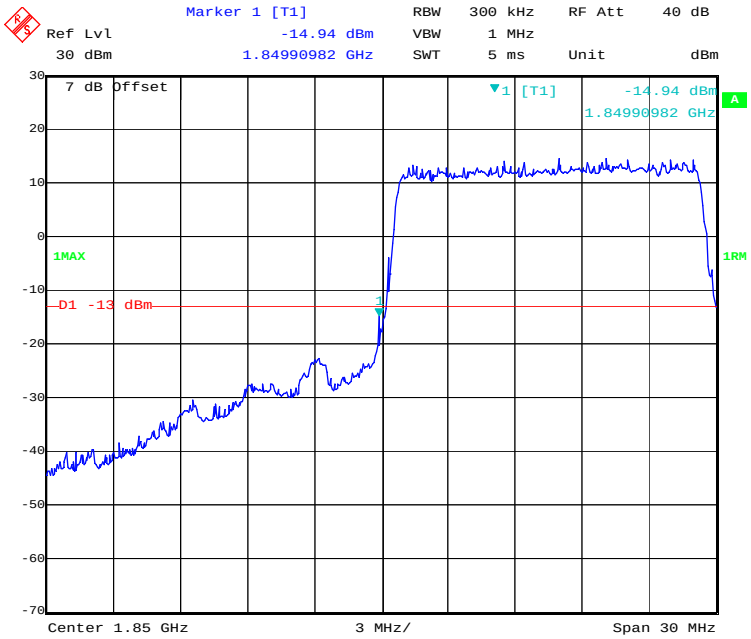
Date: 29.APR.2021 21:56:50

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



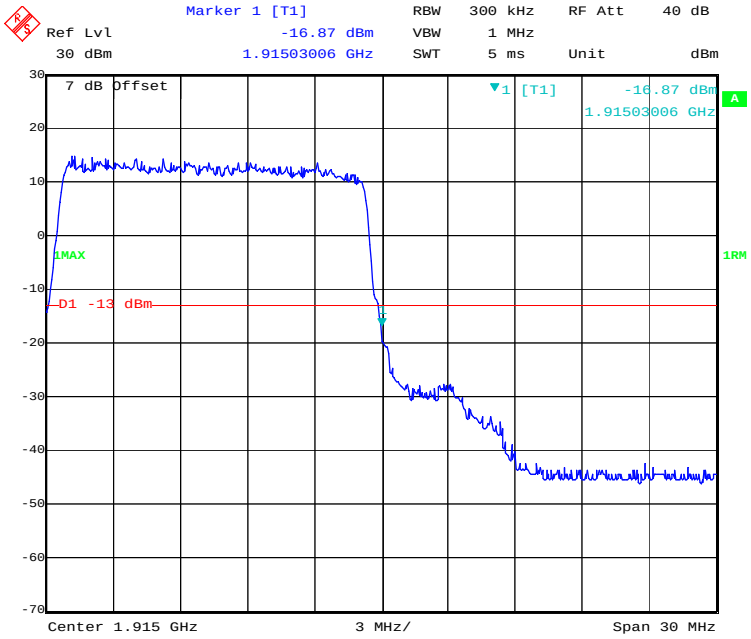
Date: 29.APR.2021 21:57:37

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



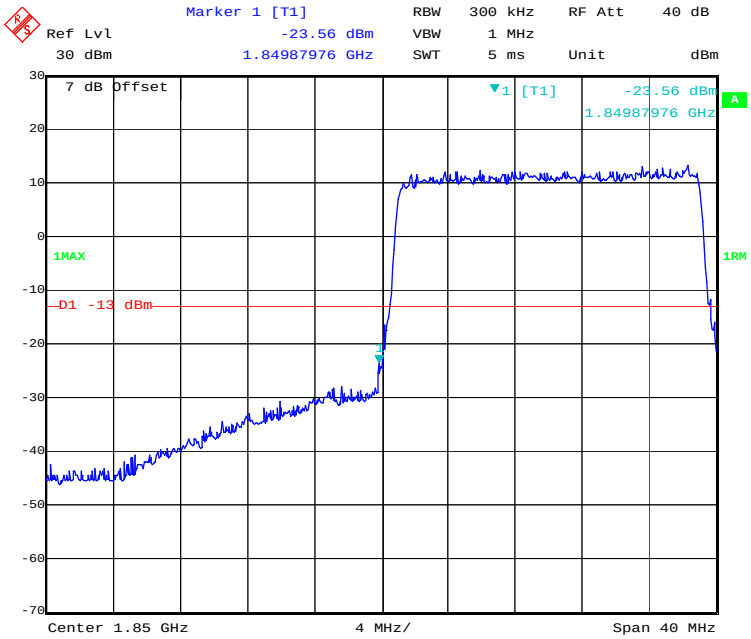
Date: 29.APR.2021 21:58:25

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



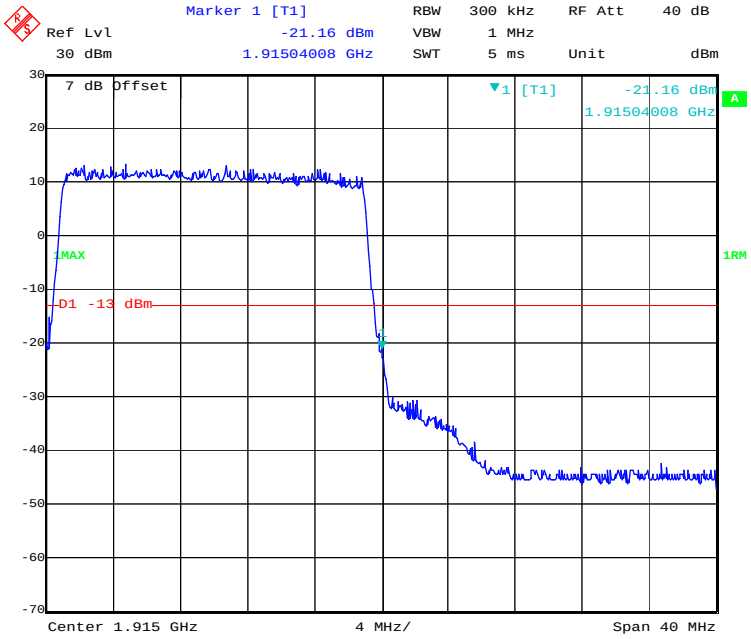
Date: 29.APR.2021 21:59:09

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



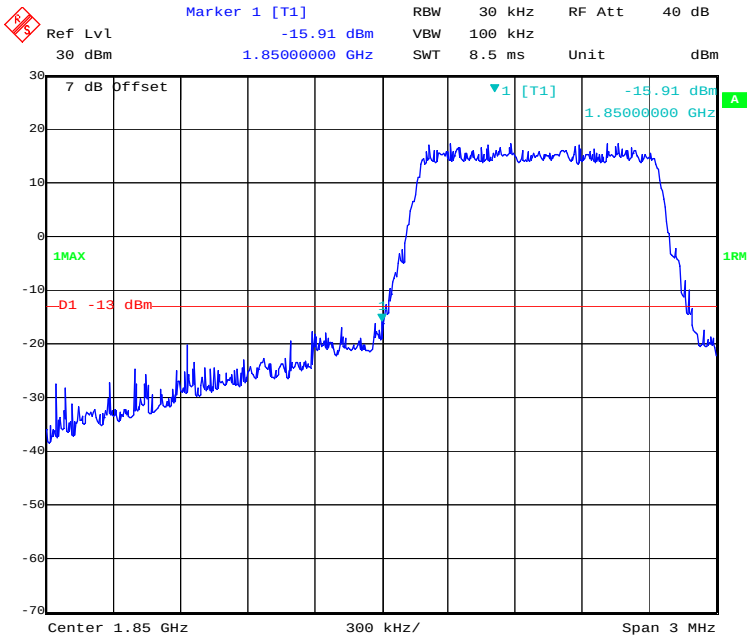
Date: 29.APR.2021 21:59:58

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



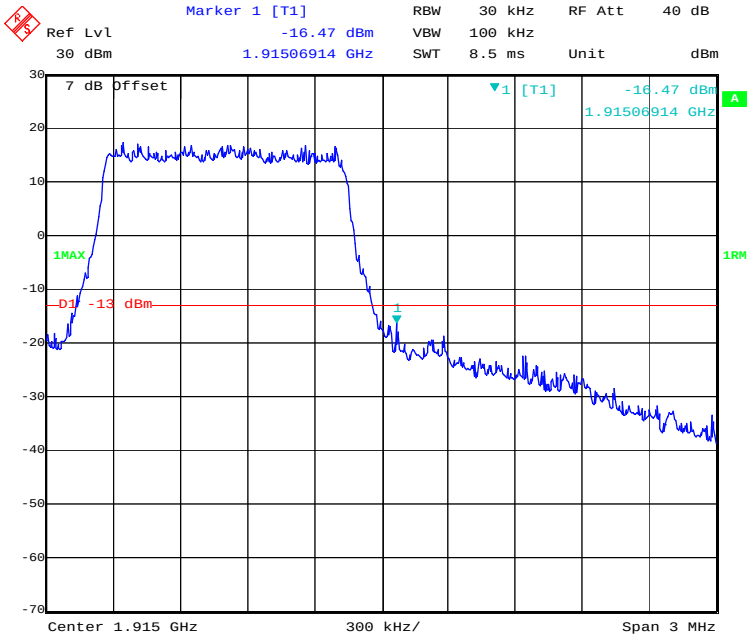
Date: 29.APR.2021 22:00:48

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



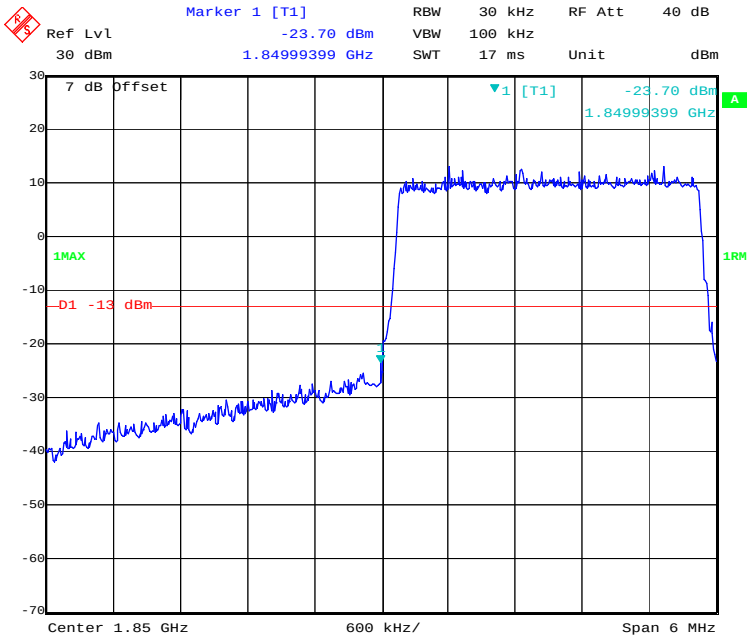
Date: 29.APR.2021 21:52:29

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



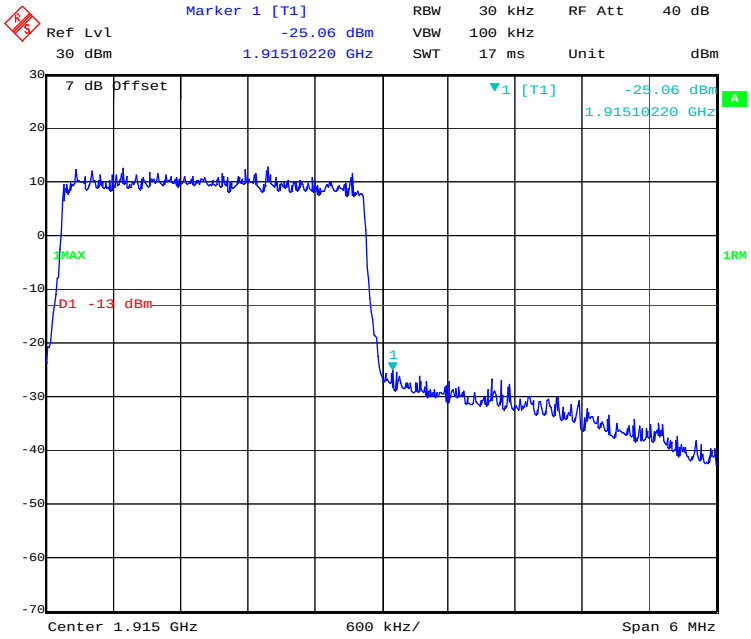
Date: 29.APR.2021 21:53:17

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



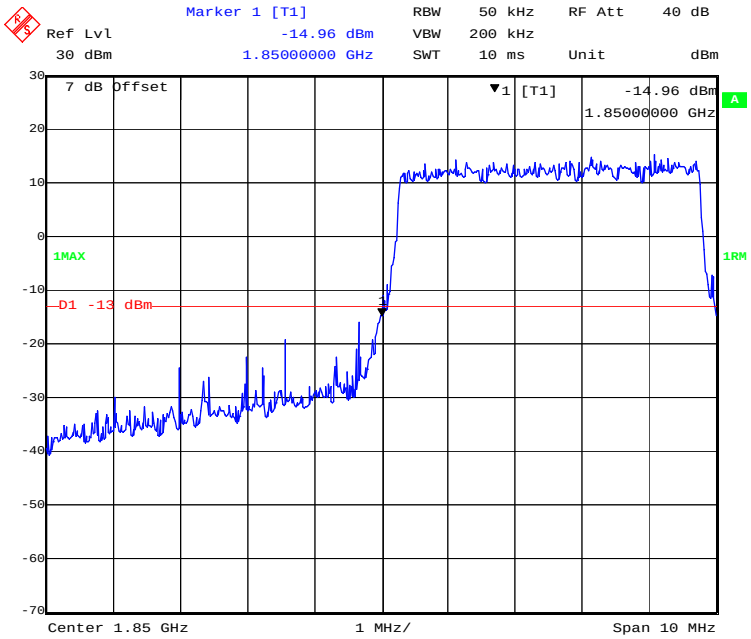
Date: 29.APR.2021 21:54:01

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



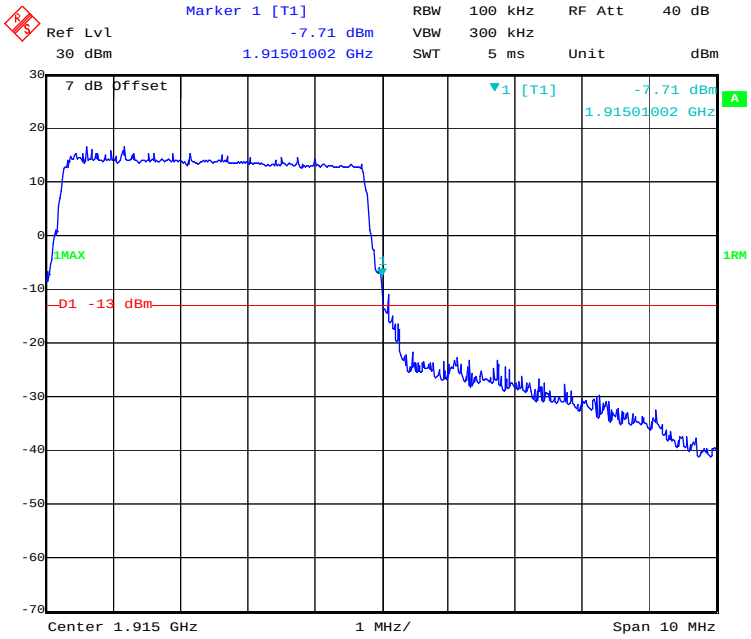
Date: 29.APR.2021 21:54:45

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



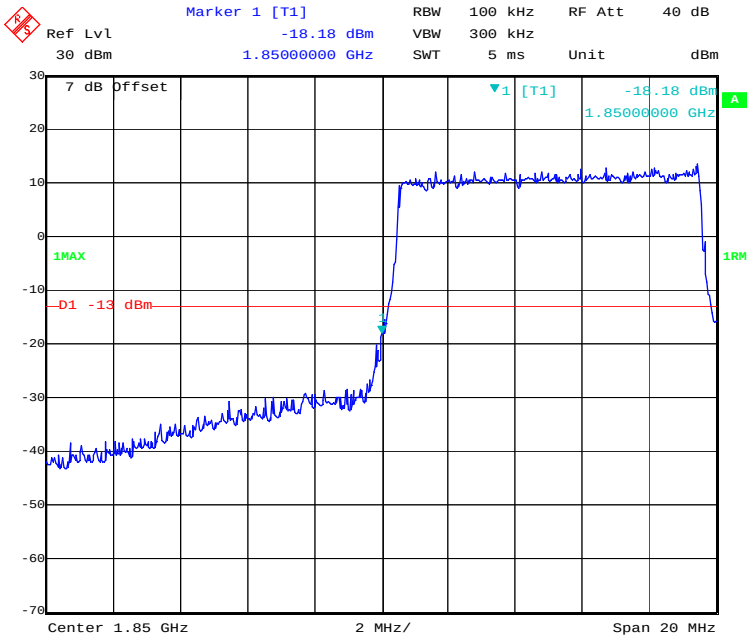
Date: 12.MAY.2021 15:55:42

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



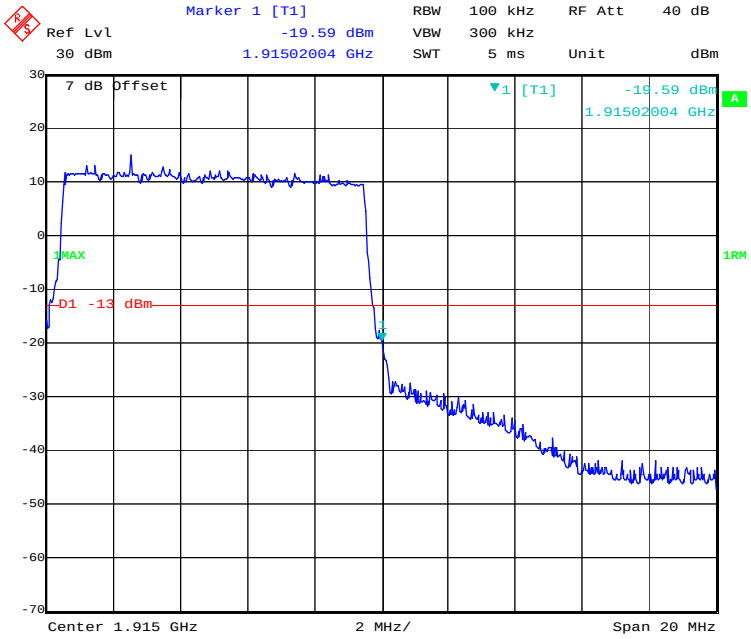
Date: 29.APR.2021 21:56:20

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



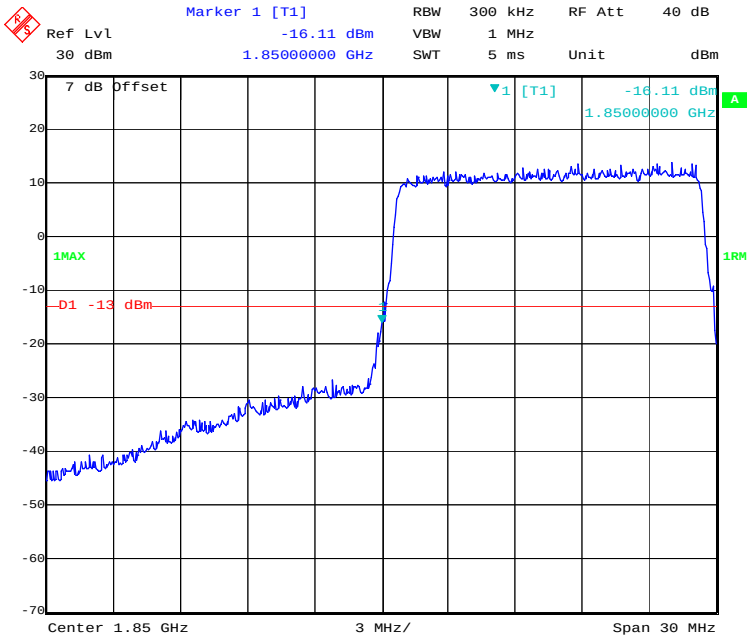
Date: 29.APR.2021 21:57:13

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



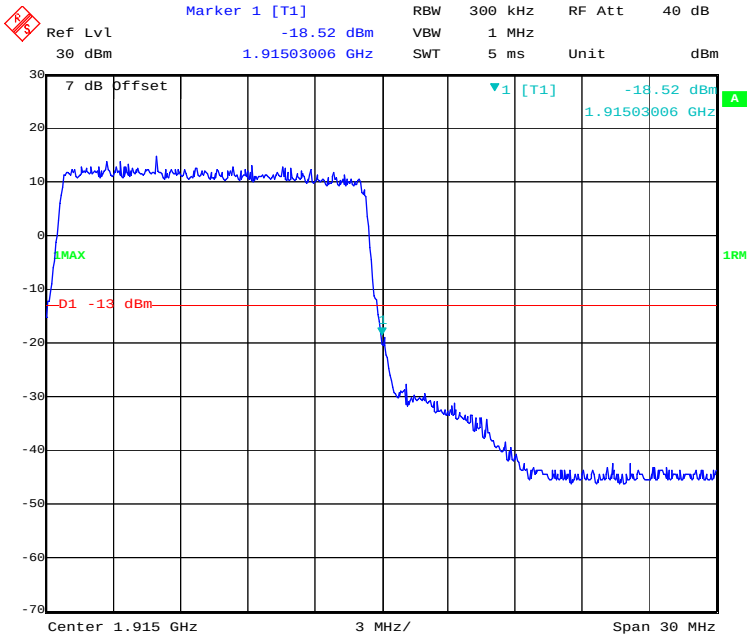
Date: 29.APR.2021 21:57:59

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



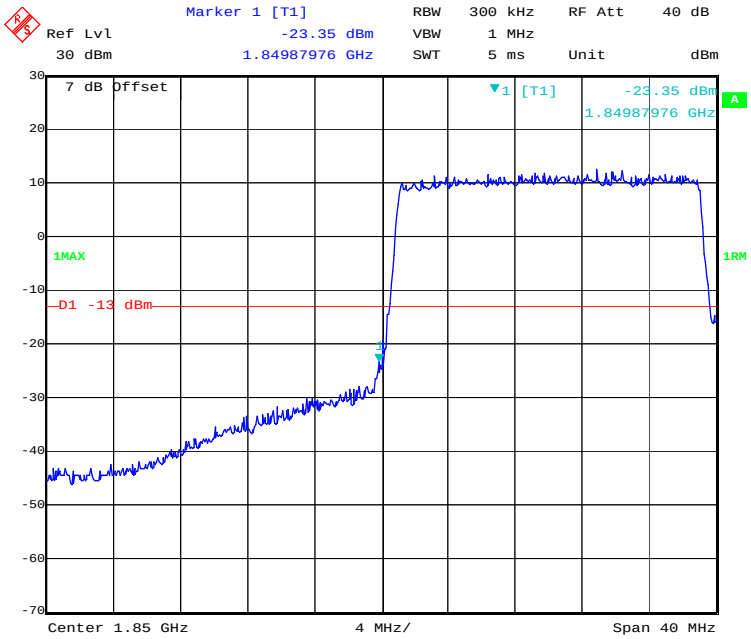
Date: 29.APR.2021 21:58:47

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



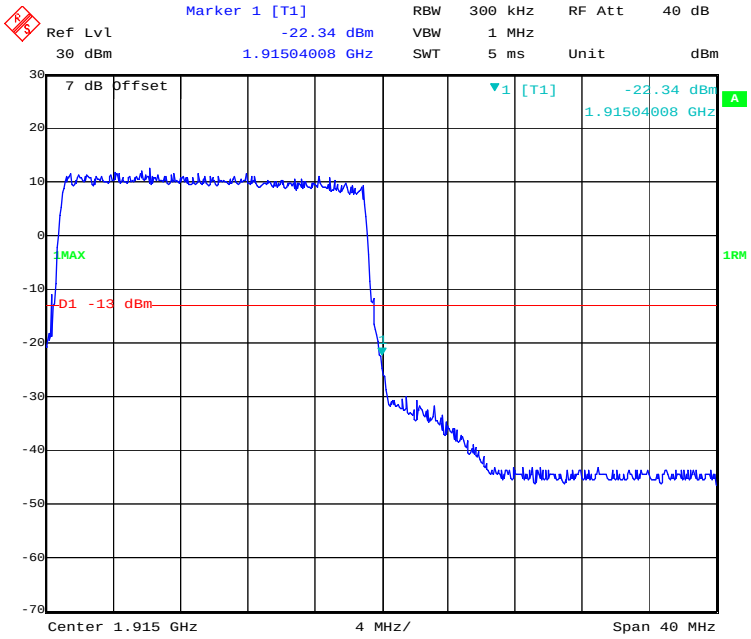
Date: 29.APR.2021 21:59:31

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



Date: 29.APR.2021 22:00:25

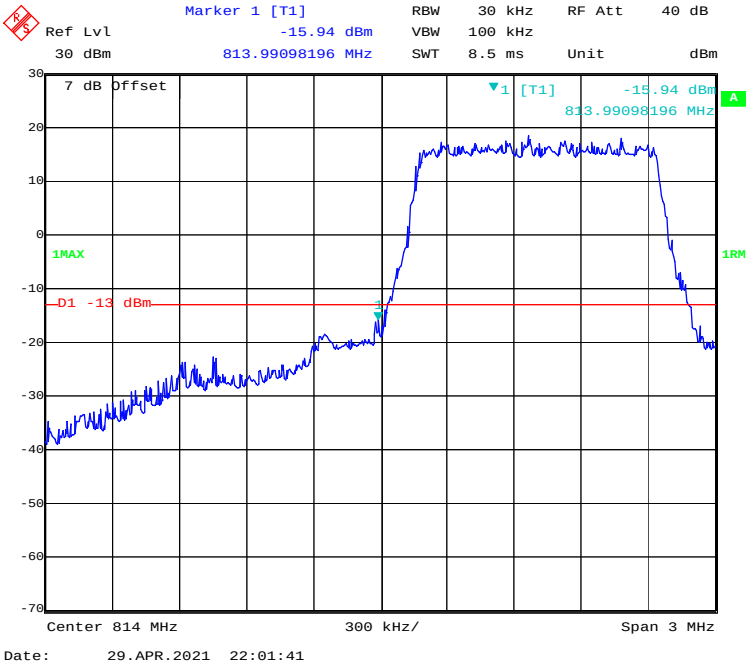
16-QAM (20 MHz, FULL RB) - Right Band Edge



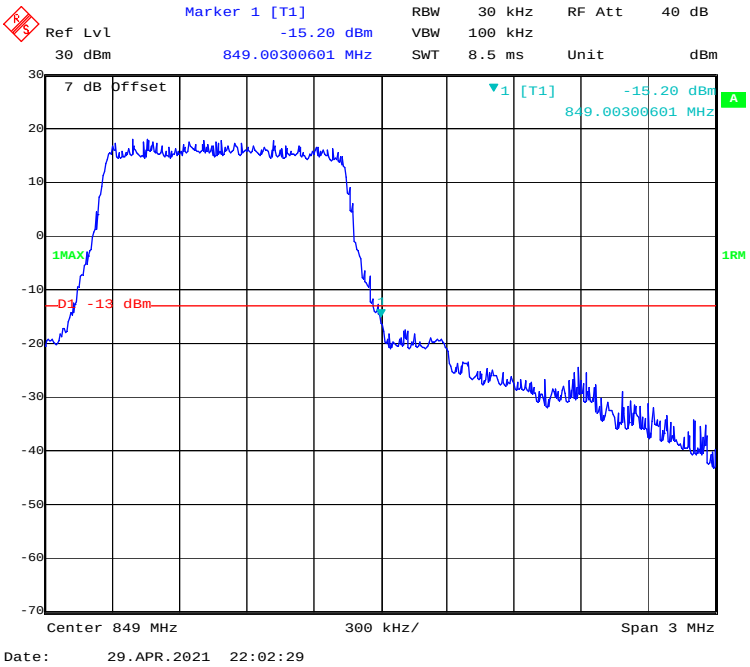
Date: 29.APR.2021 22:01:11

LTE Band 26:

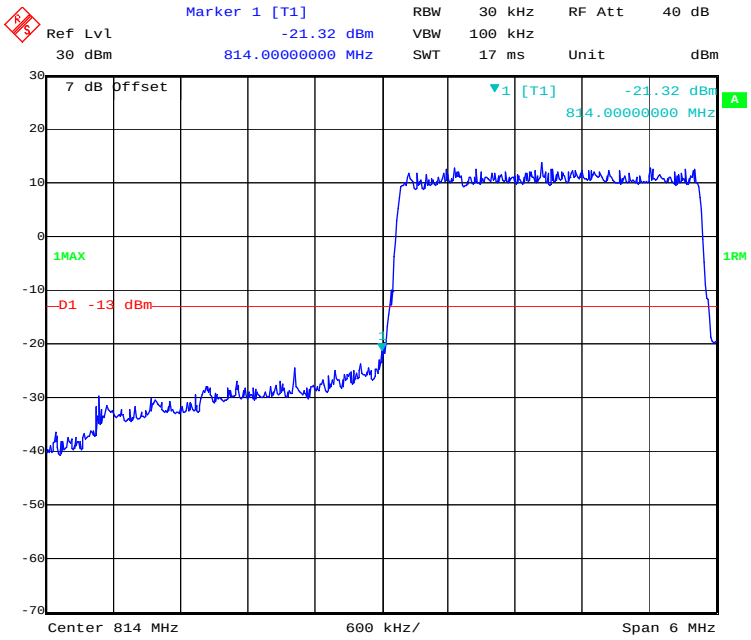
QPSK (1.4 MHz, FULL RB) - Left Band Edge



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

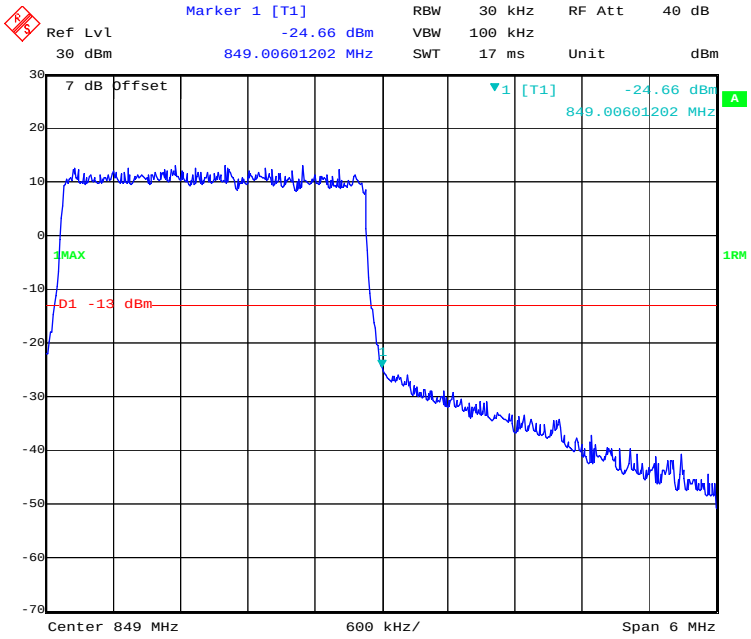


QPSK (3 MHz, FULL RB) - Left Band Edge



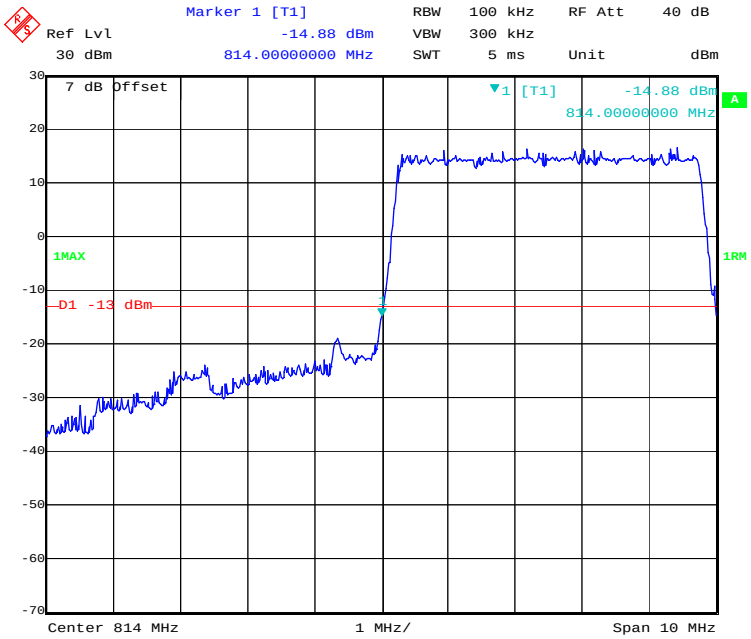
Date: 29.APR.2021 22:03:17

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



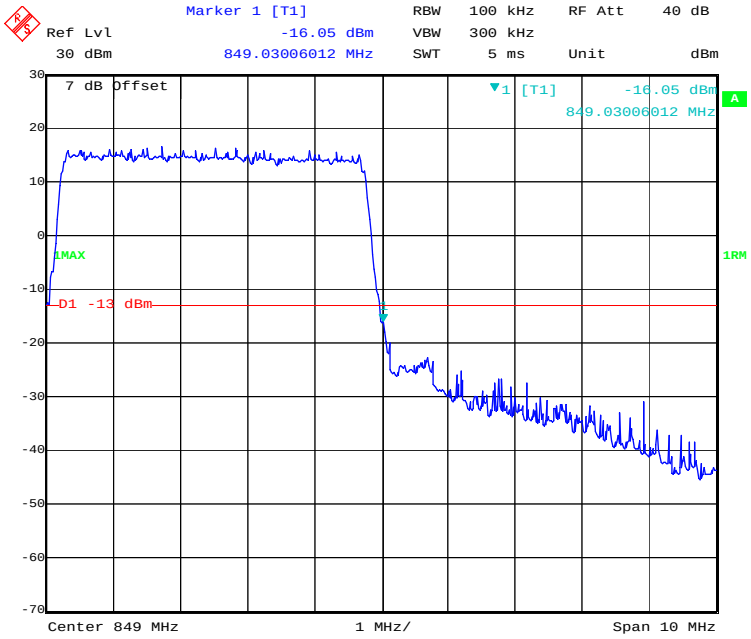
Date: 29.APR.2021 22:04:01

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



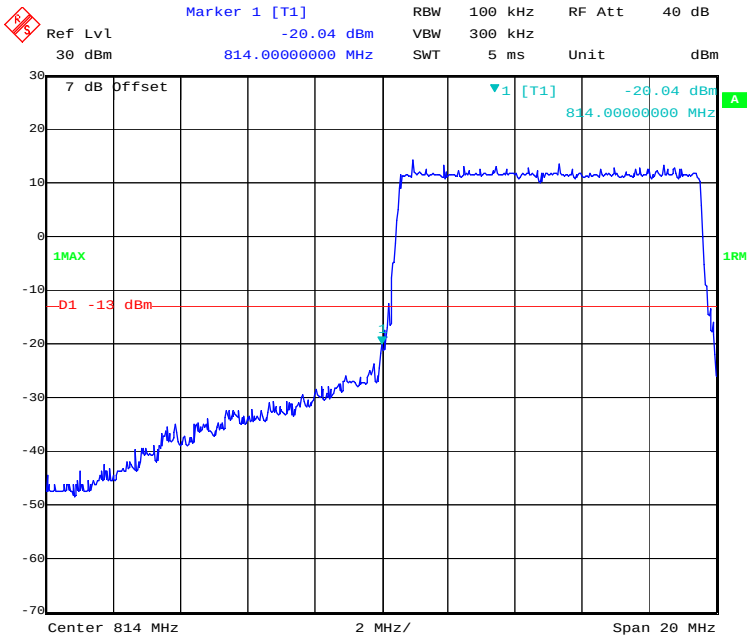
Date: 29.APR.2021 22:04:53

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



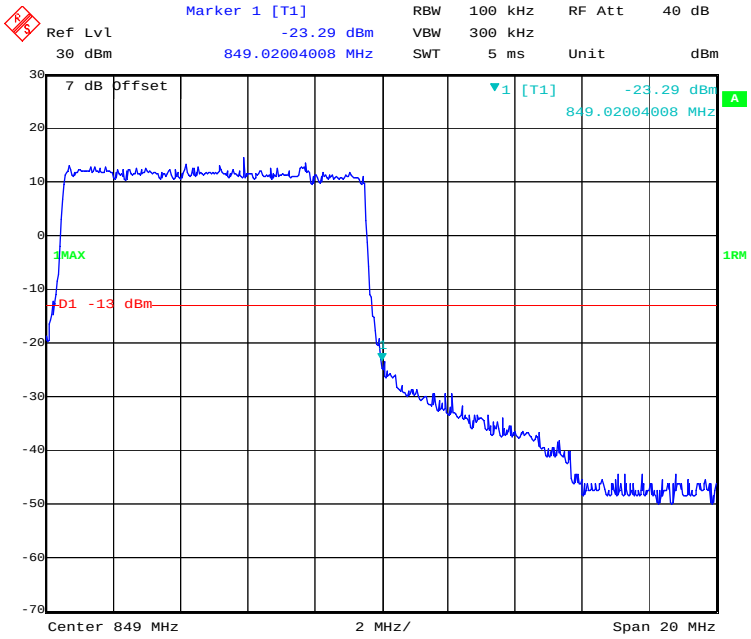
Date: 29.APR.2021 22:05:38

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



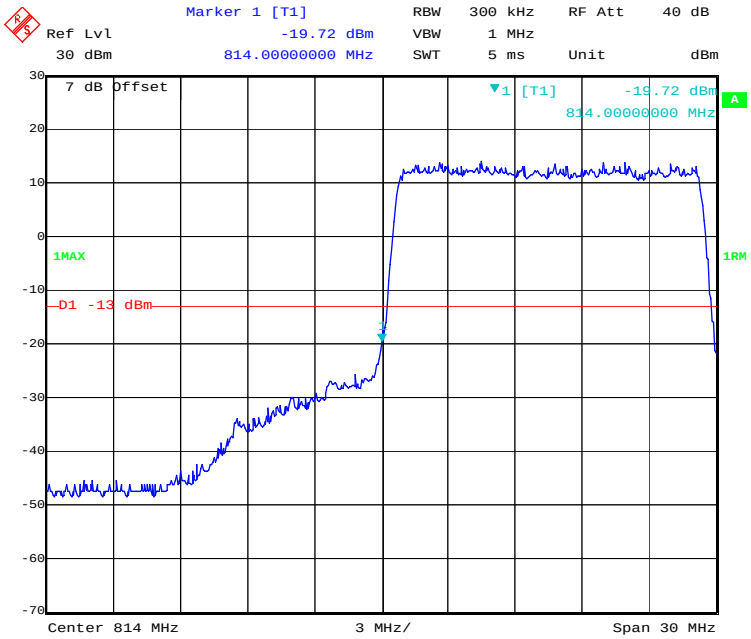
Date: 29.APR.2021 22:06:27

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



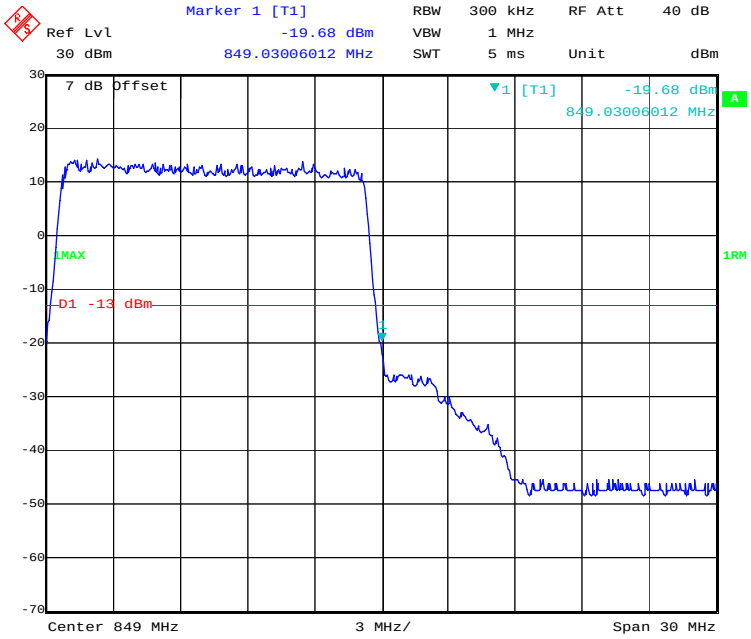
Date: 29.APR.2021 22:07:12

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



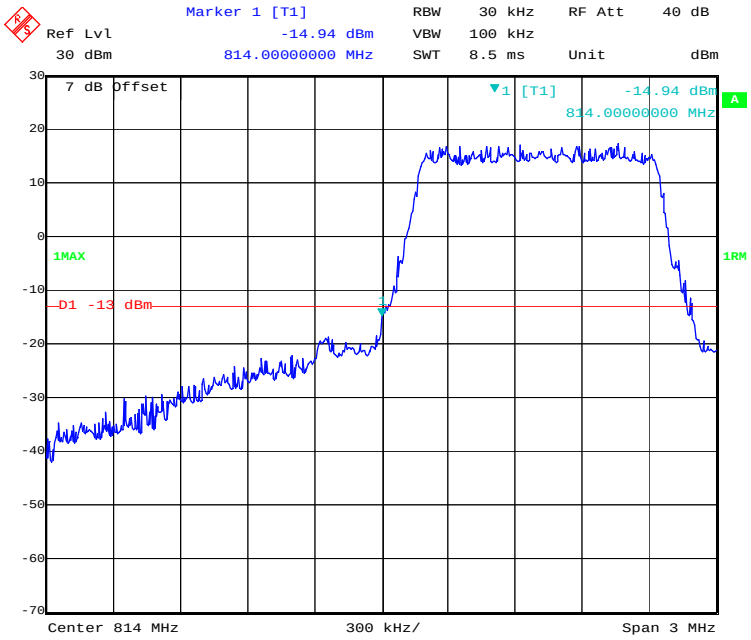
Date: 29.APR.2021 22:08:01

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



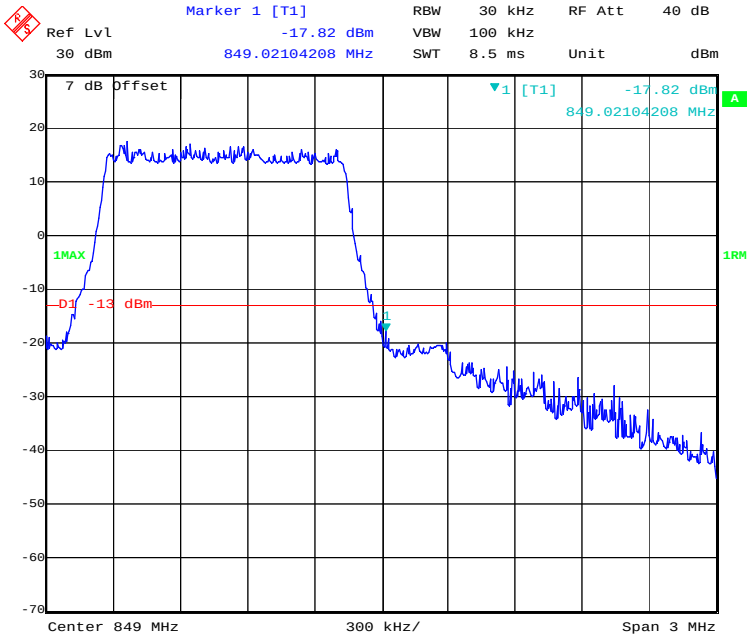
Date: 29.APR.2021 22:08:49

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



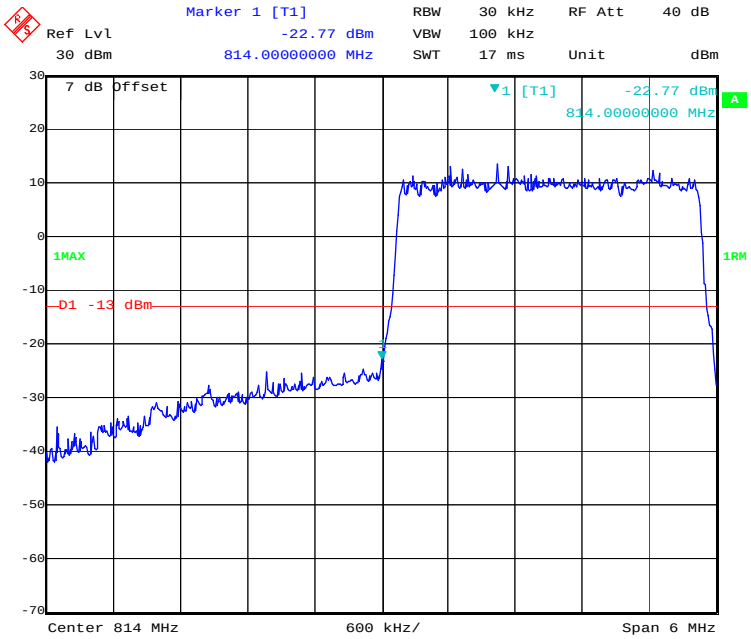
Date: 29.APR.2021 22:02:03

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



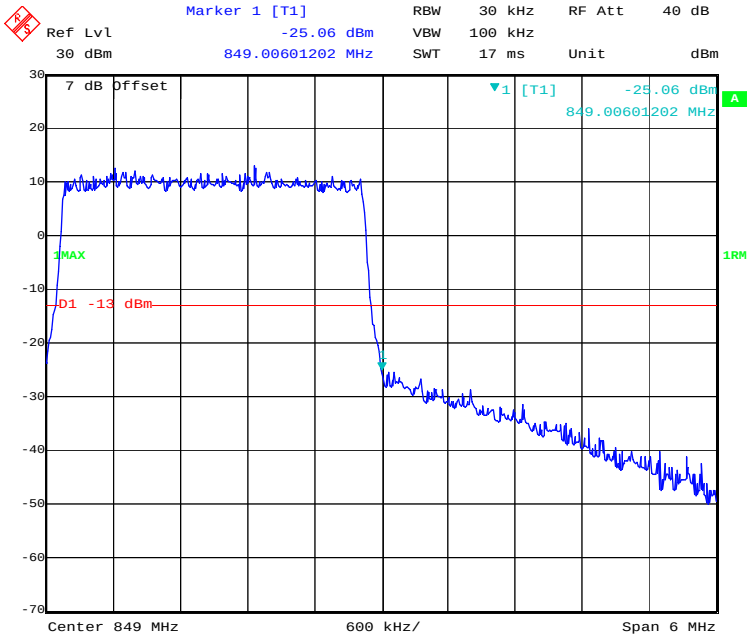
Date: 29.APR.2021 22:02:51

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



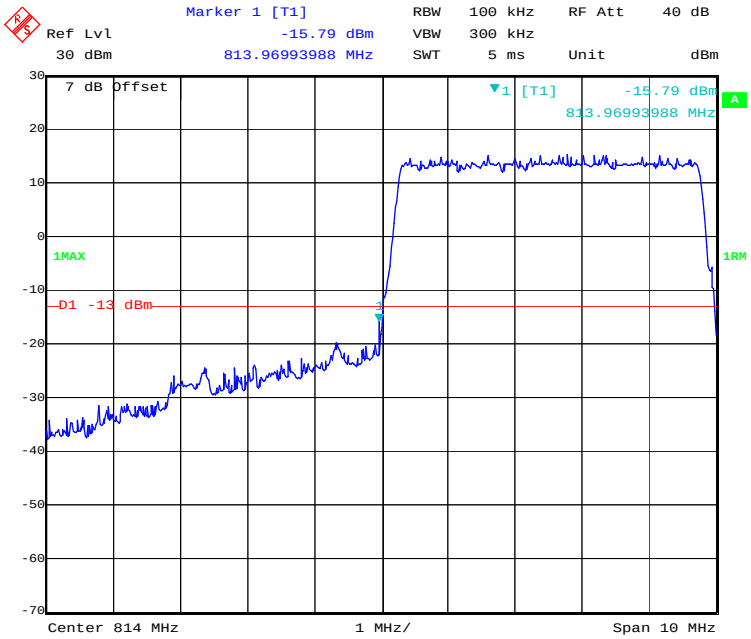
Date: 29.APR.2021 22:03:39

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



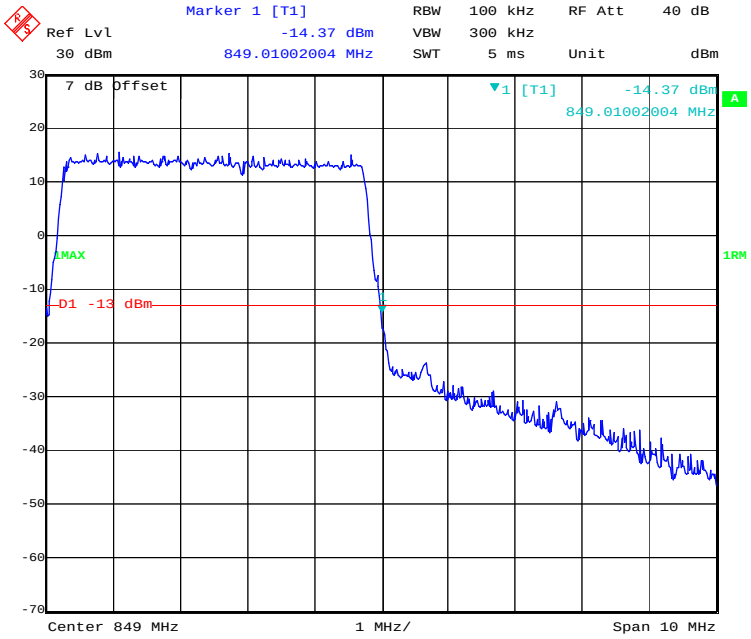
Date: 29.APR.2021 22:04:27

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



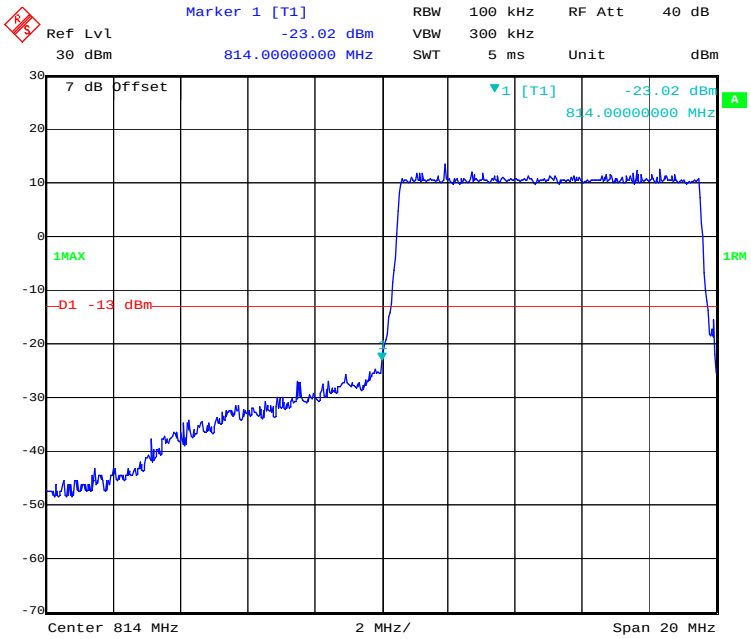
Date: 29.APR.2021 22:05:15

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



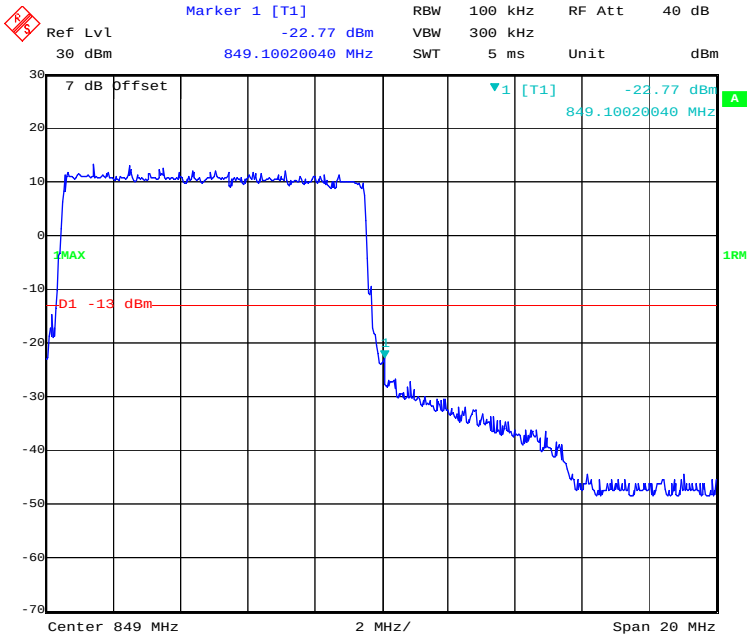
Date: 29.APR.2021 22:05:59

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



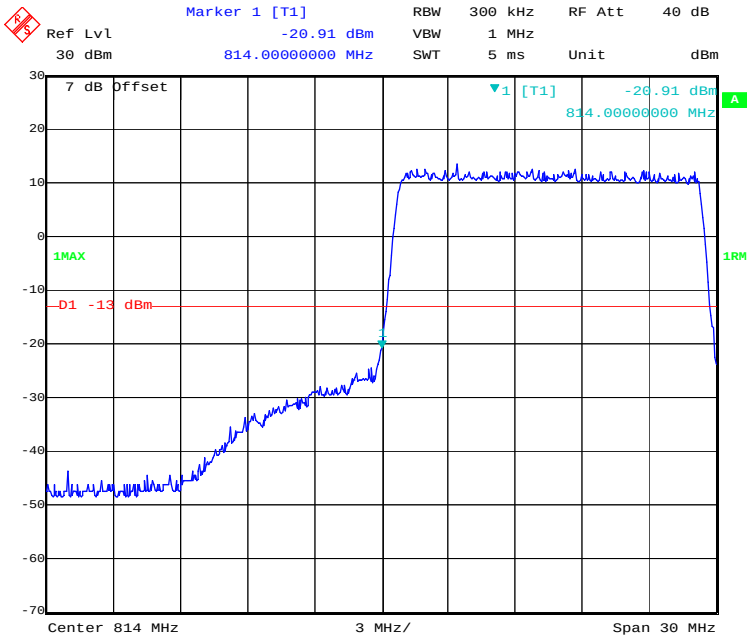
Date: 29.APR.2021 22:06:50

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



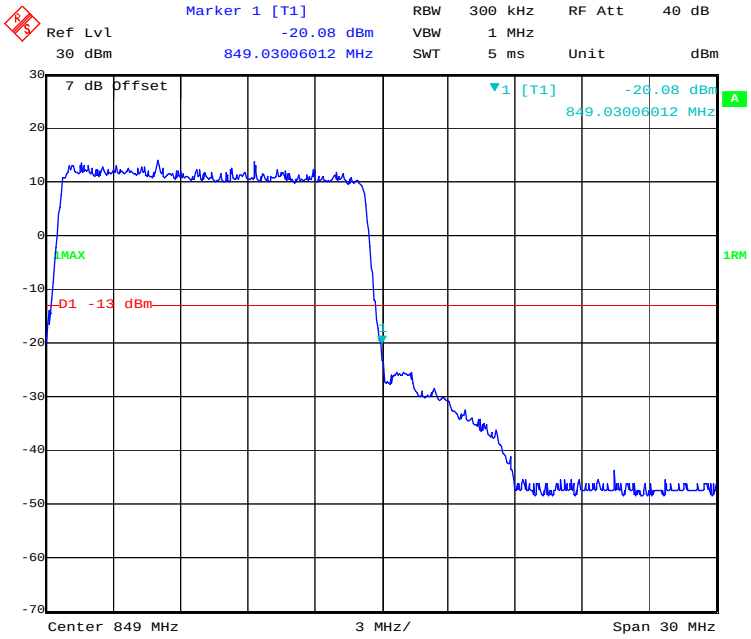
Date: 29.APR.2021 22:07:35

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



Date: 29.APR.2021 22:08:23

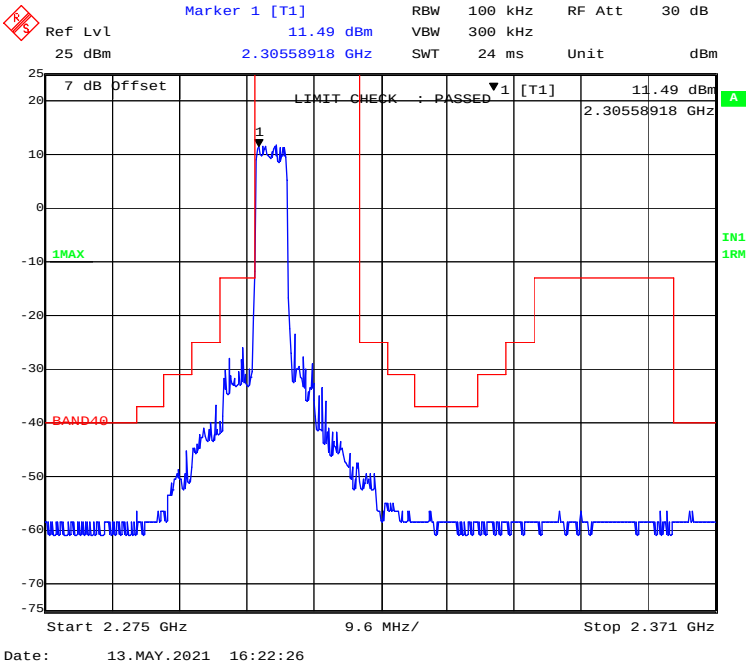
16-QAM (15 MHz, FULL RB) - Right Band Edge



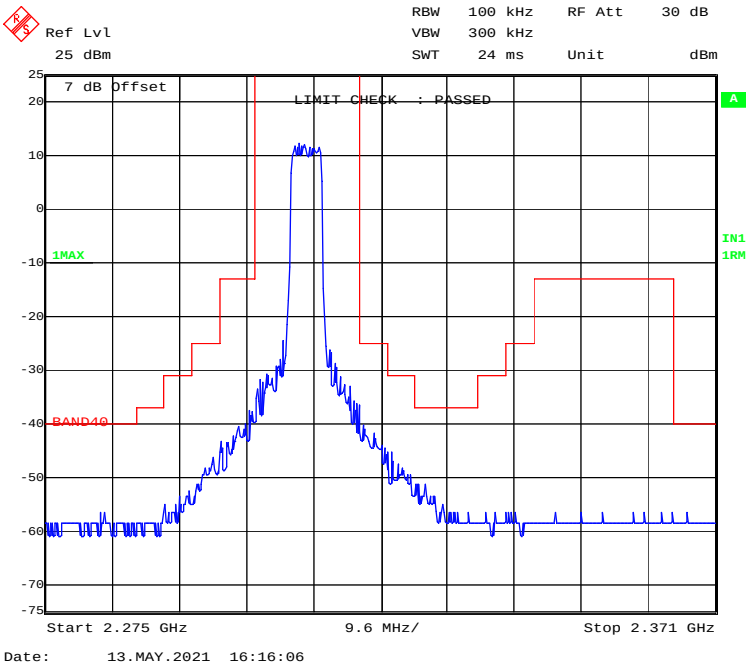
Date: 29.APR.2021 22:09:14

LTE Band 40(2305MHz-2315MHz):

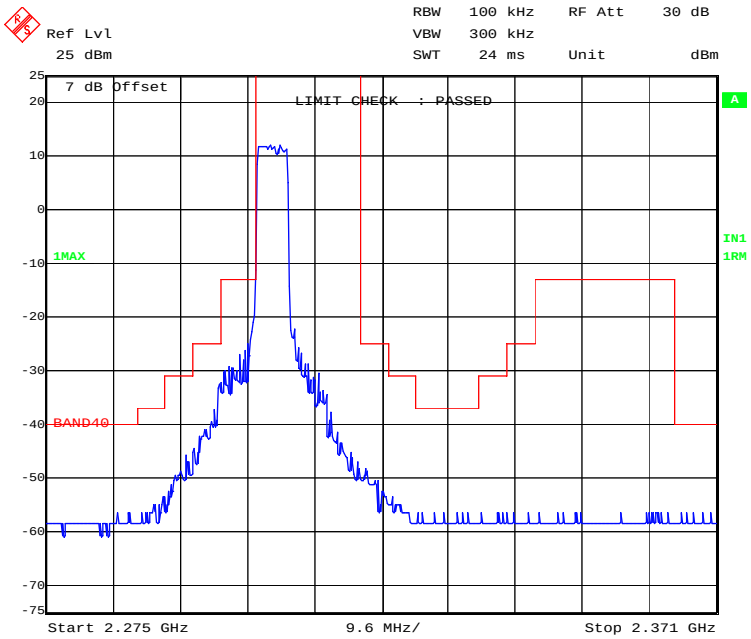
QPSK (5.0 MHz, FULL RB) - Left Band Edge



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

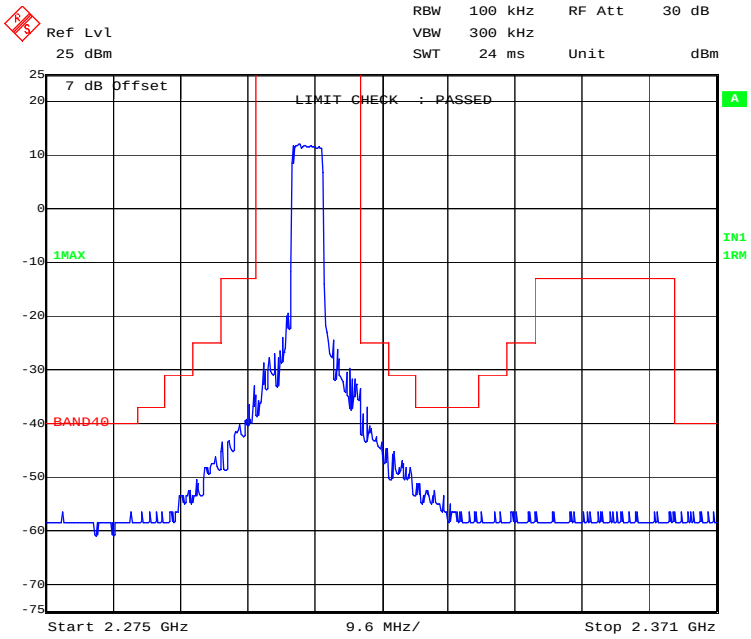


16-QAM (5.0 MHz, FULL RB) - Left Band Edge



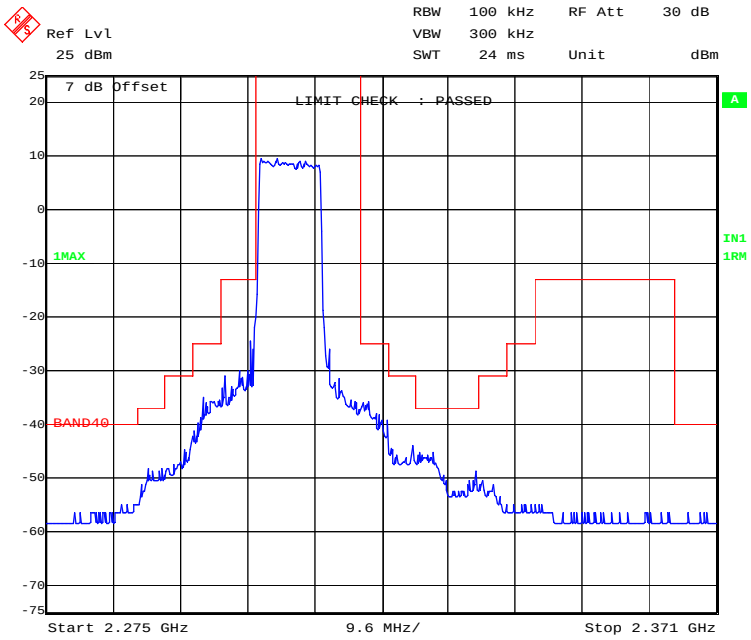
Date: 13.MAY.2021 16:23:10

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



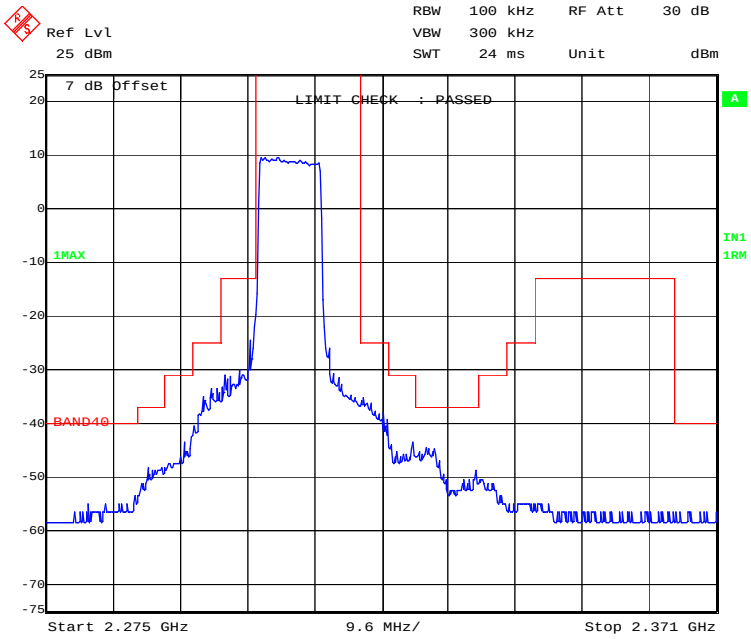
Date: 13.MAY.2021 16:04:00

QPSK (10.0 MHz, FULL RB) - Band Edge



Date: 13.MAY.2021 16:29:08

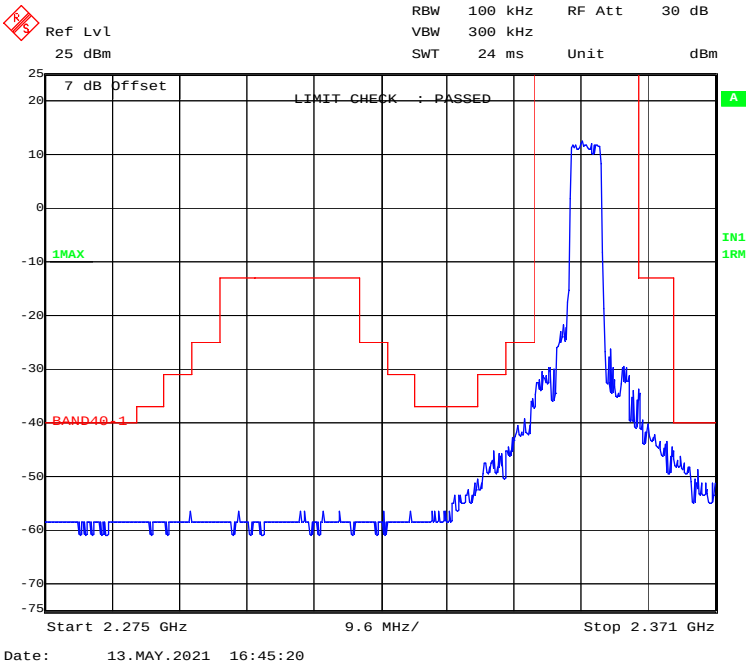
16-QAM (10.0 MHz, FULL RB) - Band Edge



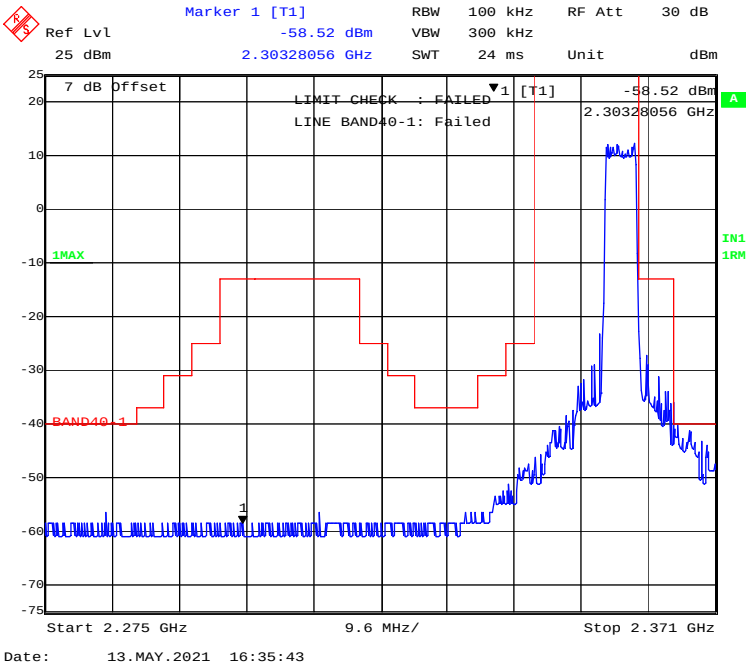
Date: 13.MAY.2021 16:29:53

LTE Band 40(2350MHz-2360MHz):

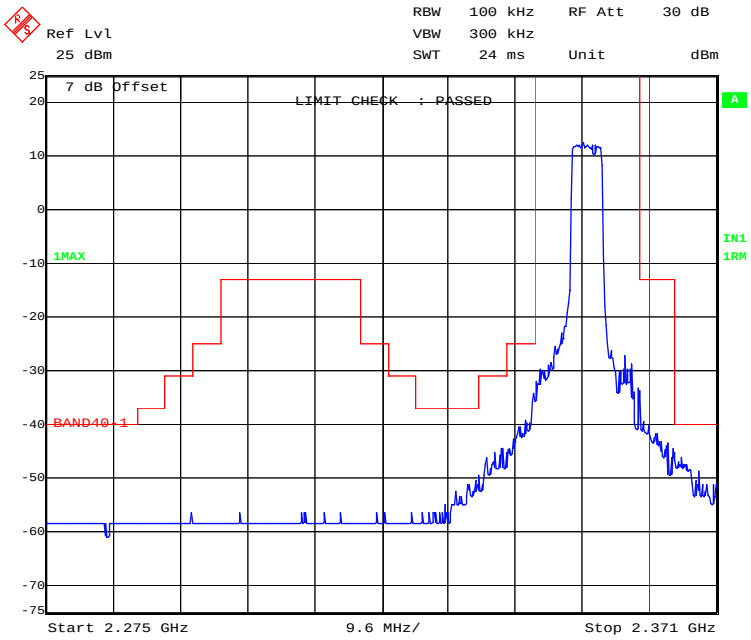
QPSK (5.0 MHz, FULL RB) - Left Band Edge



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

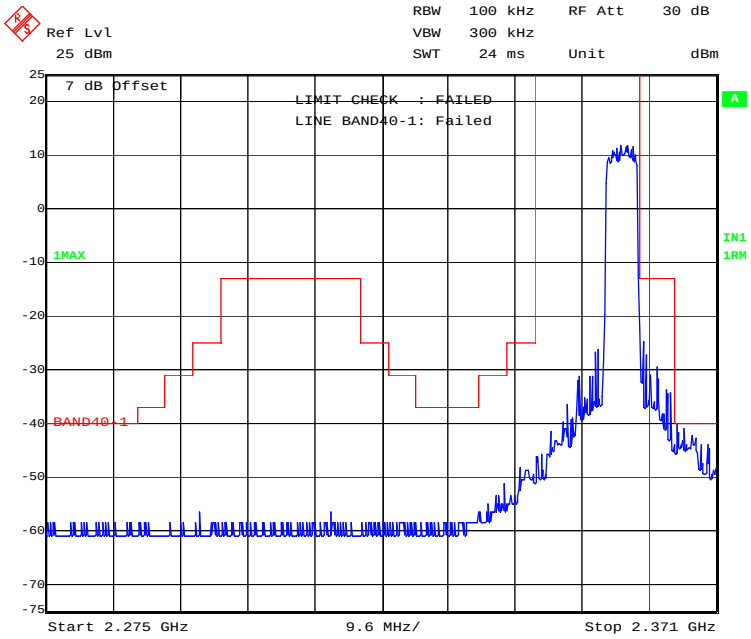


16-QAM (5.0 MHz, FULL RB) - Left Band Edge



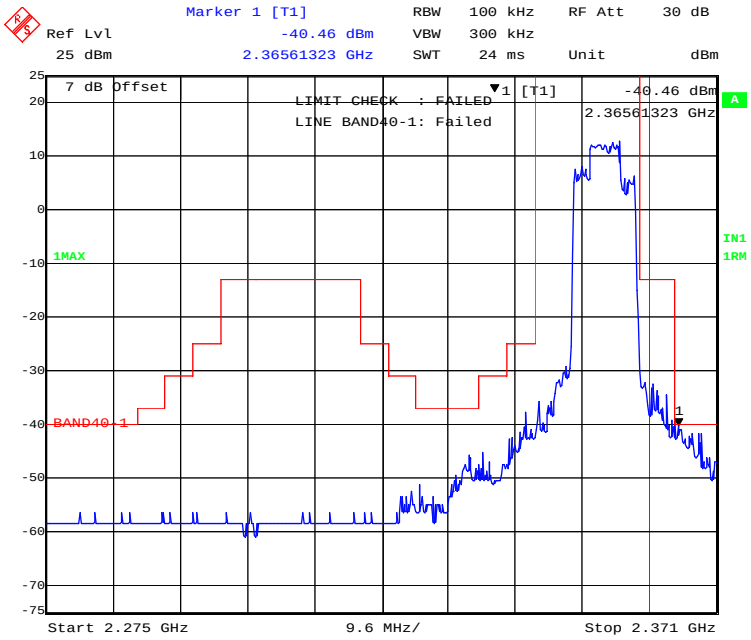
Date: 13.MAY.2021 16:45:41

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



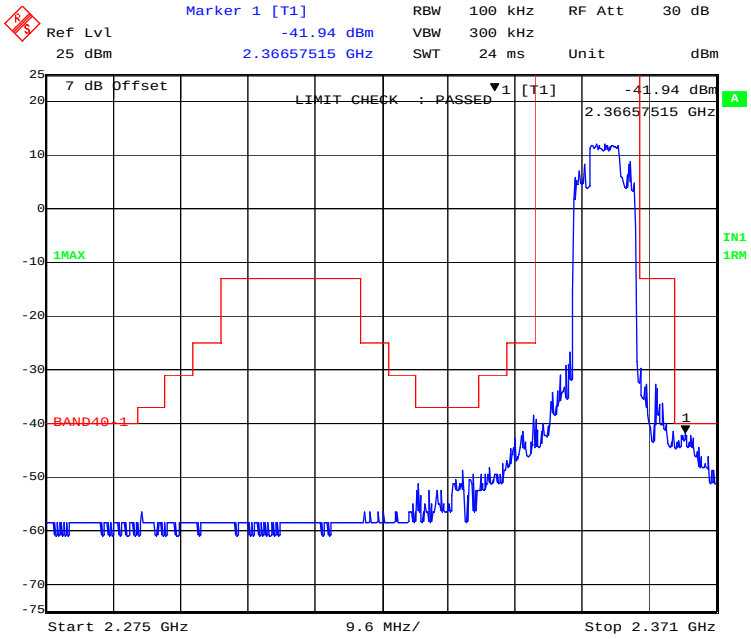
Date: 13.MAY.2021 16:38:23

QPSK (10.0 MHz, FULL RB) - Band Edge



Date: 13.MAY.2021 18:13:13

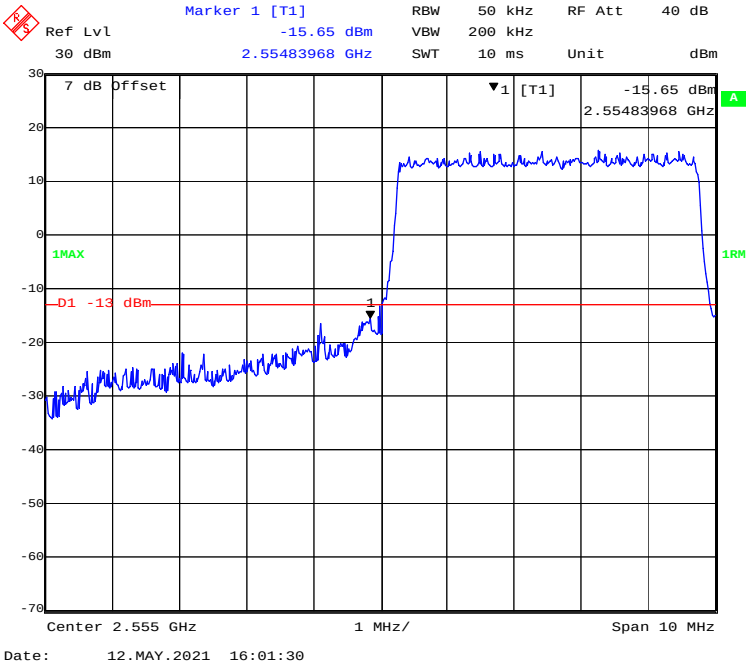
16-QAM (10.0 MHz, FULL RB) - Band Edge



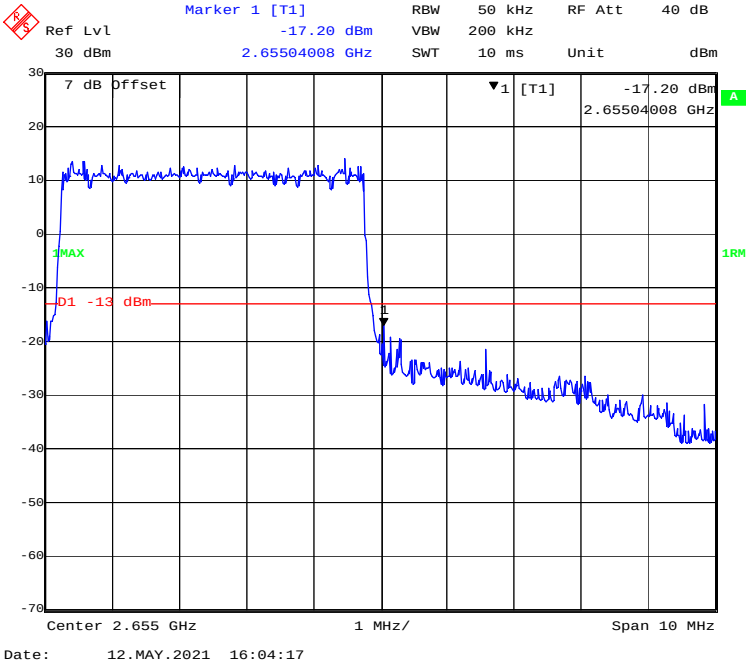
Date: 13.MAY.2021 18:16:49

LTE Band 41:

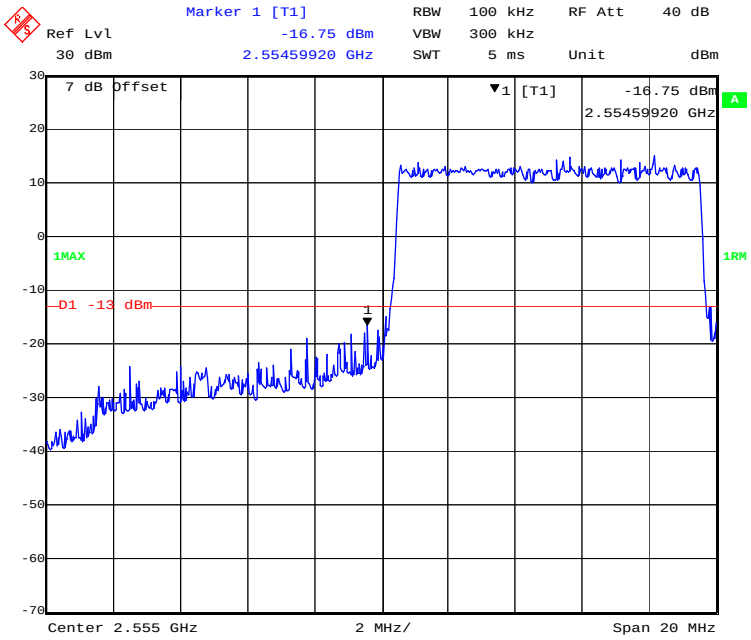
QPSK (5.0 MHz, FULL RB) - Left Band Edge



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

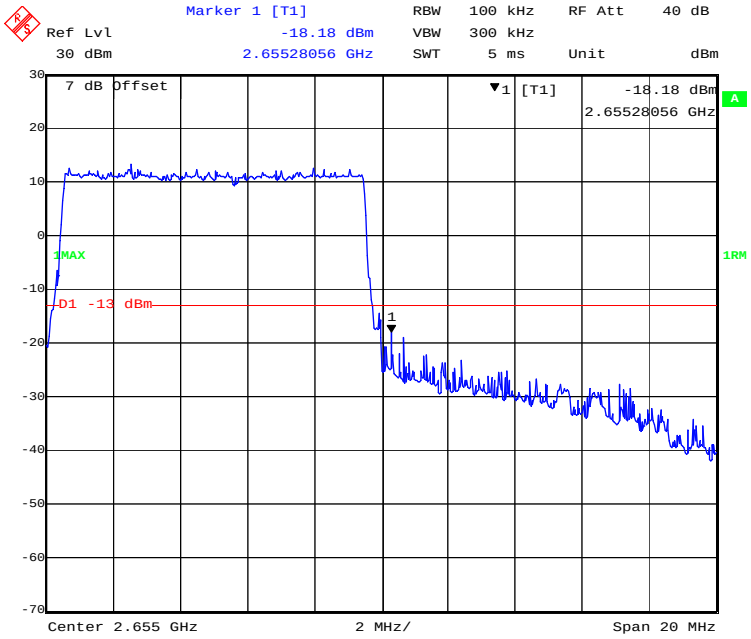


QPSK (10.0 MHz, FULL RB) - Left Band Edge



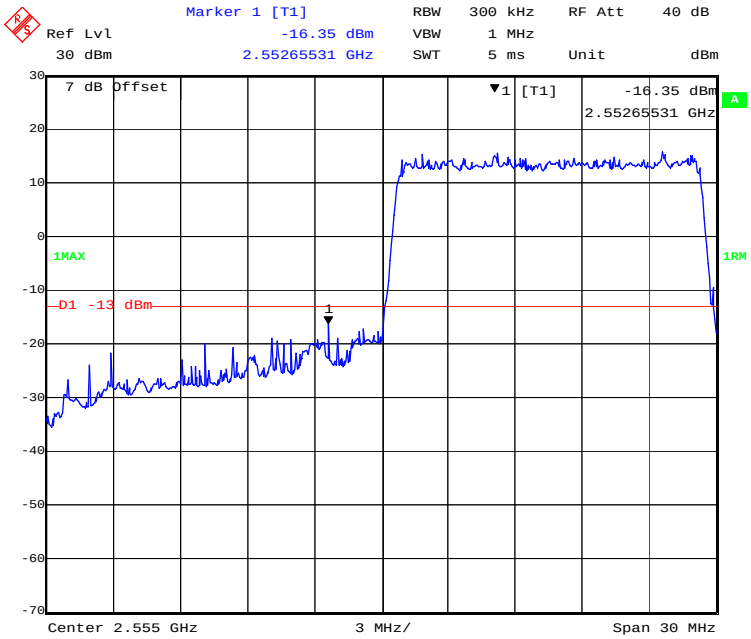
Date: 12.MAY.2021 16:18:48

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



Date: 12.MAY.2021 16:17:05

QPSK (15.0 MHz, FULL RB) - Left Band Edge

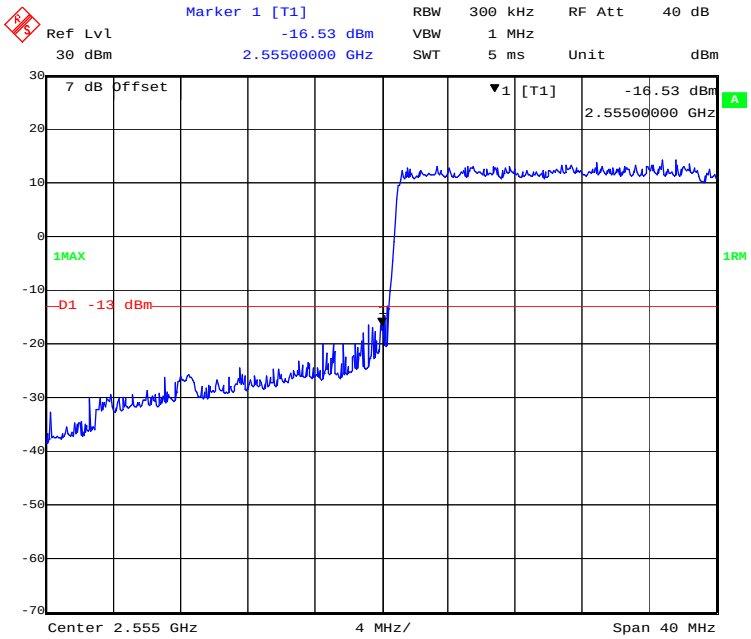


Date: 12.MAY.2021 16:21:05

QPSK (15.0 MHz, FULL RB) - Right Band Edge

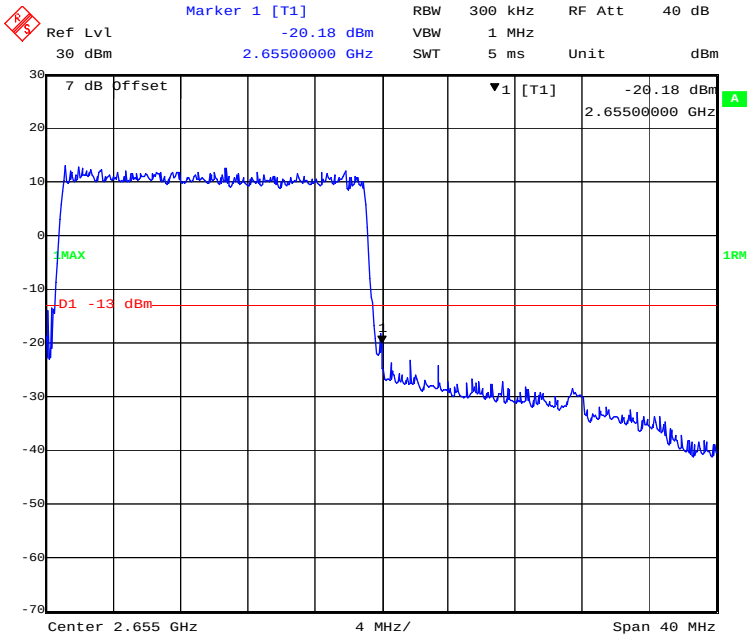
Date: 12.MAY.2021 16:22:53

QPSK (20.0 MHz, FULL RB) - Left Band Edge



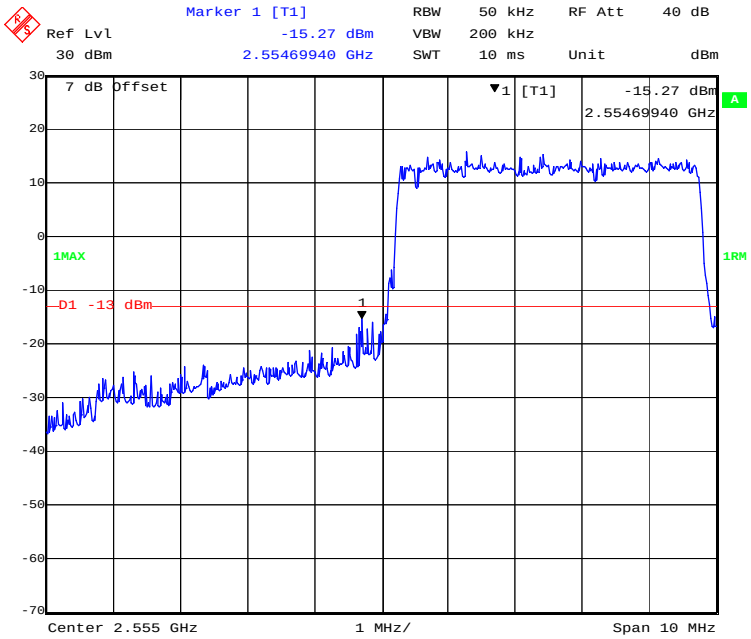
Date: 12.MAY.2021 16:27:44

QPSK (20.0 MHz, FULL RB) - Right Band Edge



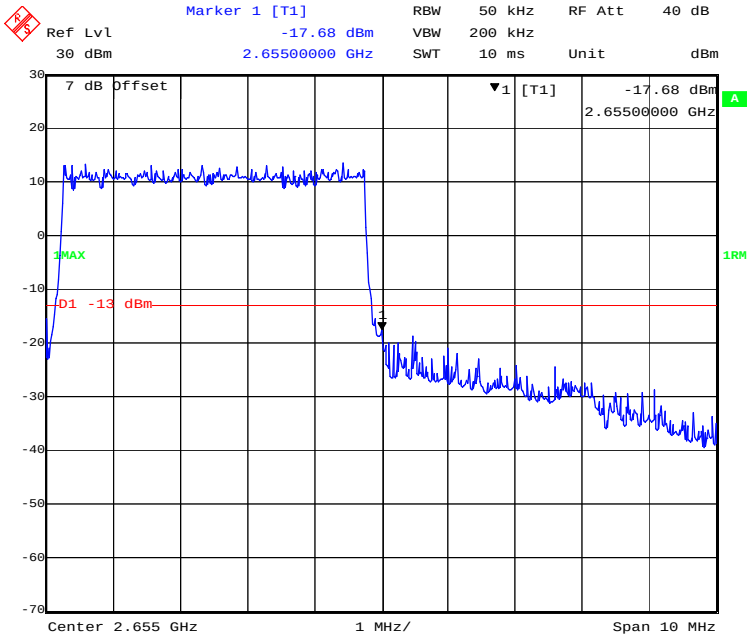
Date: 12.MAY.2021 16:29:01

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



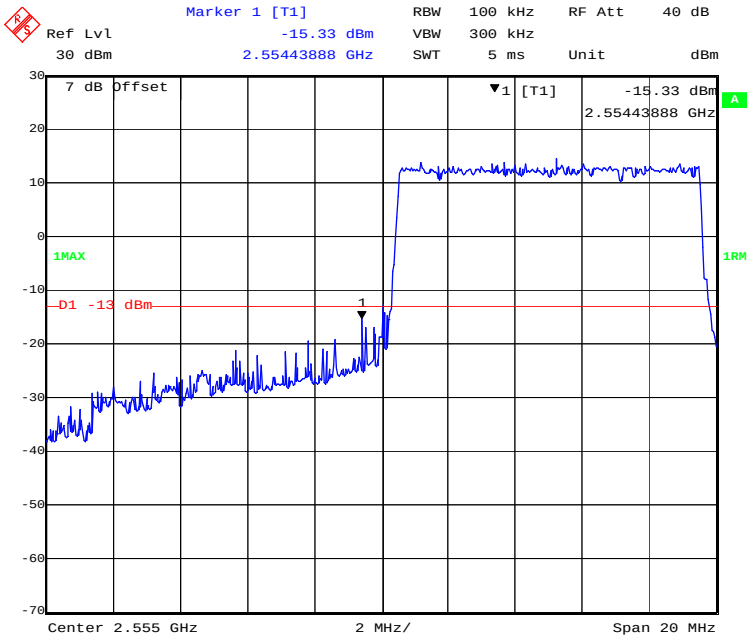
Date: 12.MAY.2021 16:02:04

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



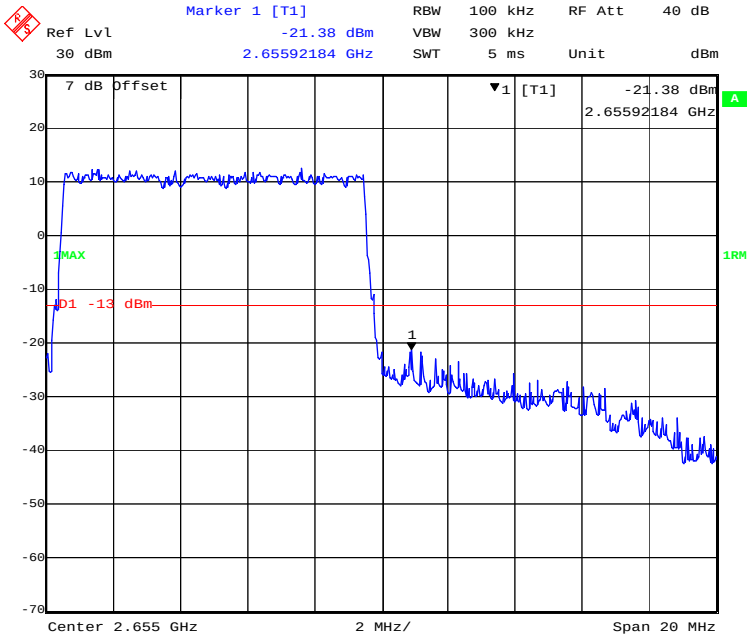
Date: 12.MAY.2021 16:04:58

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



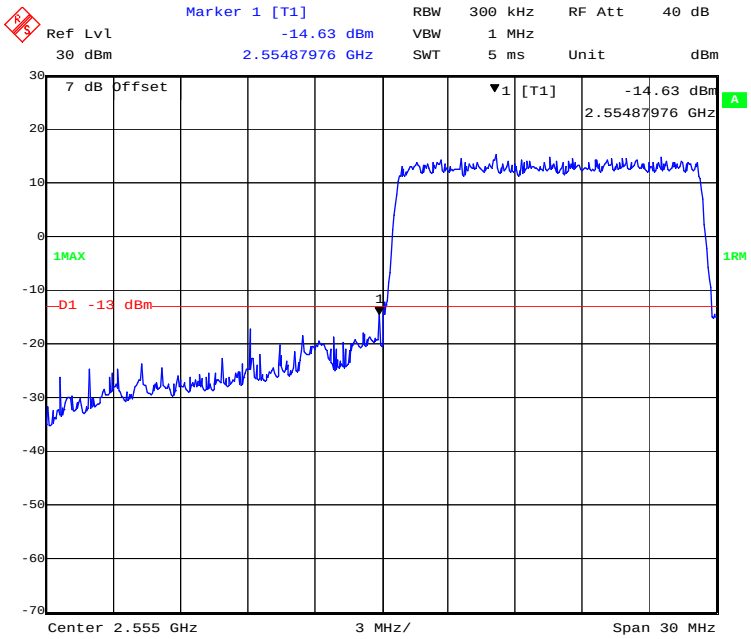
Date: 12.MAY.2021 16:19:21

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



Date: 12.MAY.2021 16:18:00

16-QAM (15.0 MHz, FULL RB) - Left Band Edge

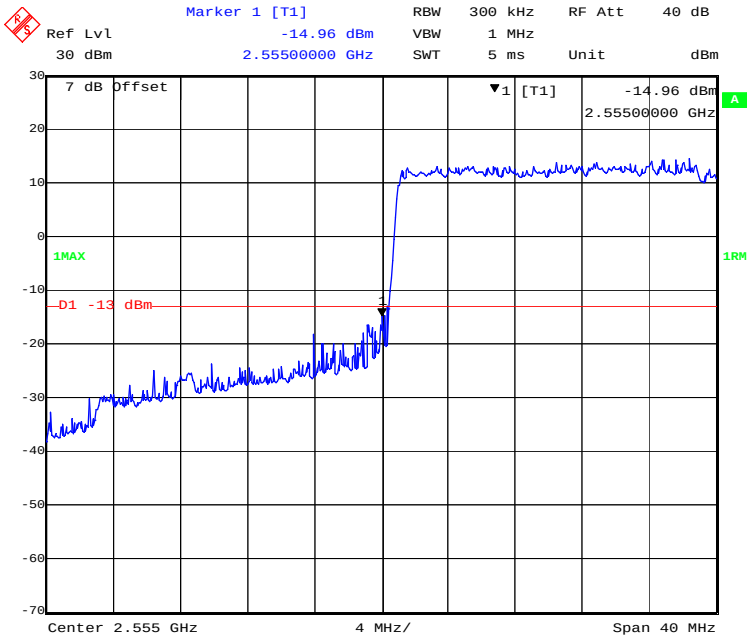


Date: 12.MAY.2021 16:21:30

16-QAM (15.0 MHz, FULL RB) - Right Band Edge

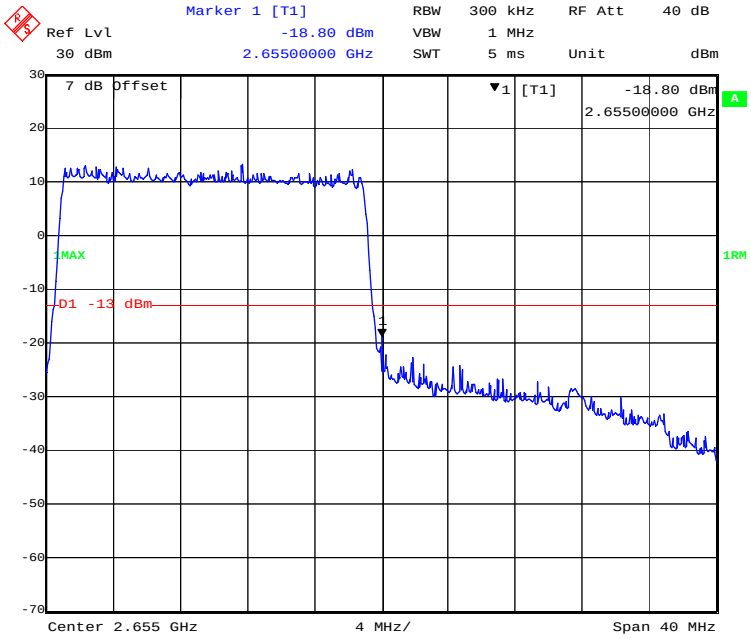
Date: 12.MAY.2021 16:24:27

16-QAM (20.0 MHz, FULL RB) - Left Band Edge



Date: 12.MAY.2021 16:28:05

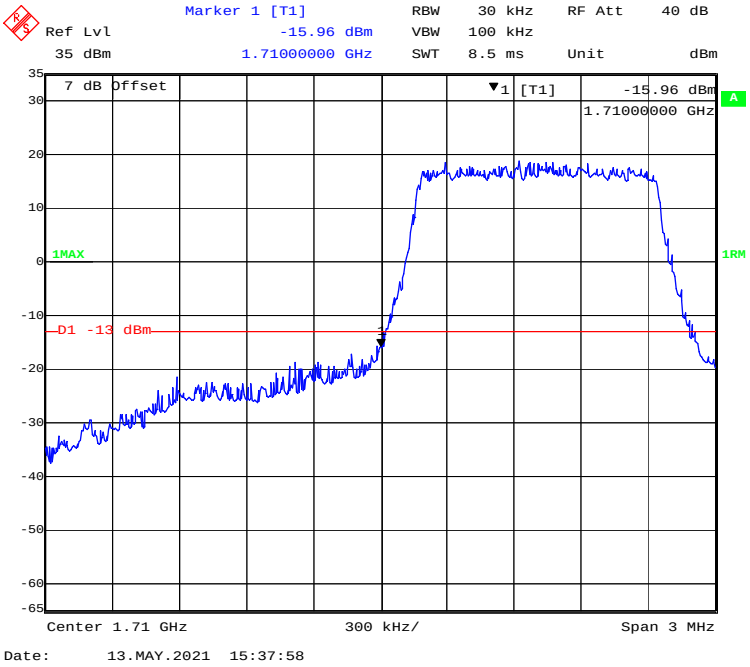
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



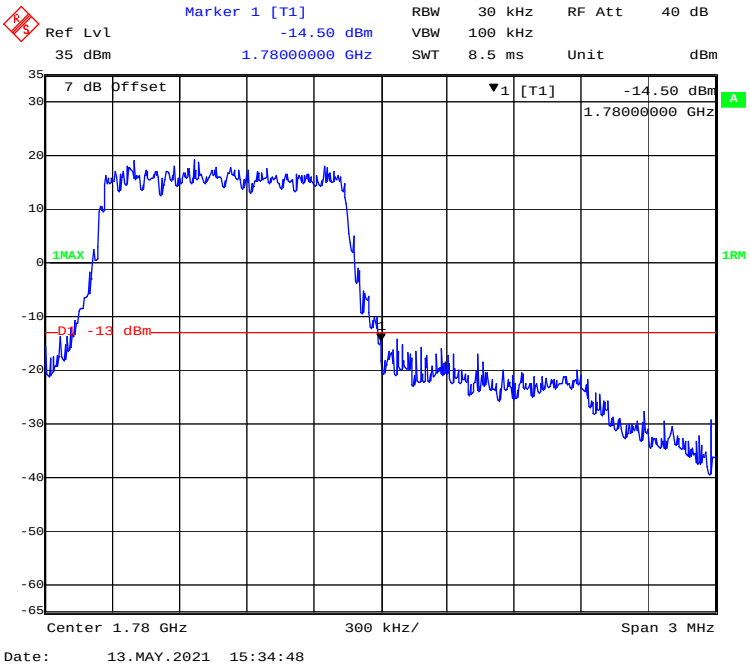
Date: 12.MAY.2021 16:29:42

LTE Band 66:

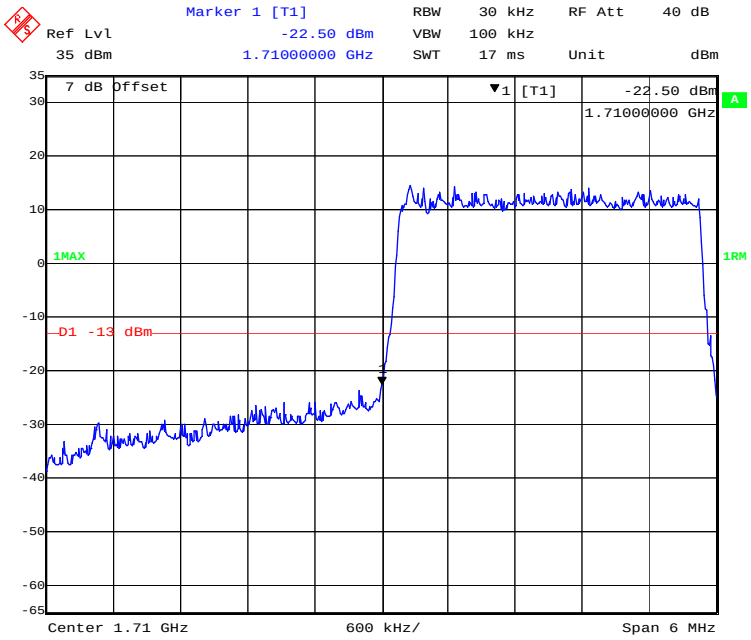
QPSK (1.4 MHz, FULL RB) - Left Band Edge



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

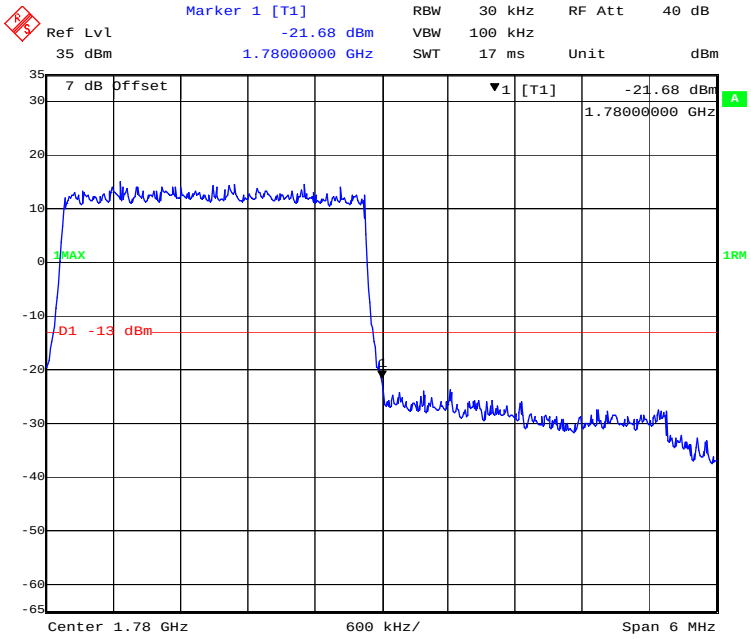


QPSK (3 MHz, FULL RB) - Left Band Edge



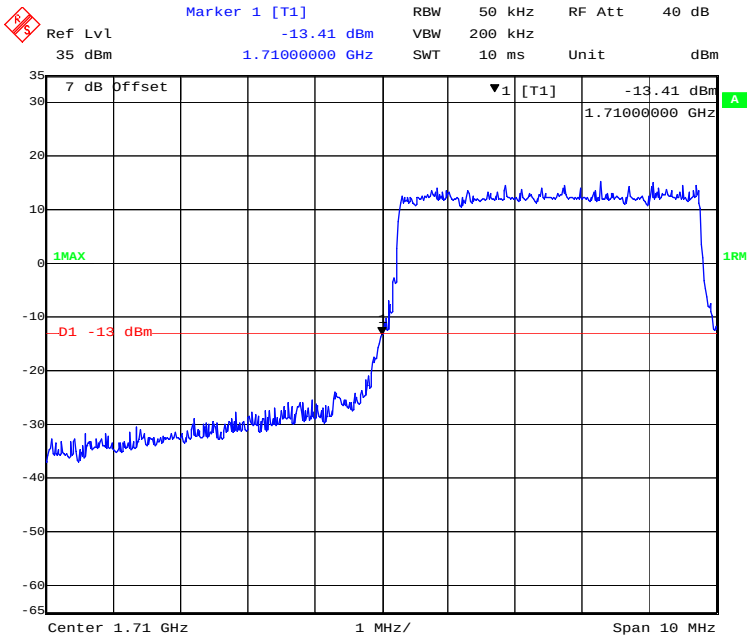
Date: 13.MAY.2021 15:41:41

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



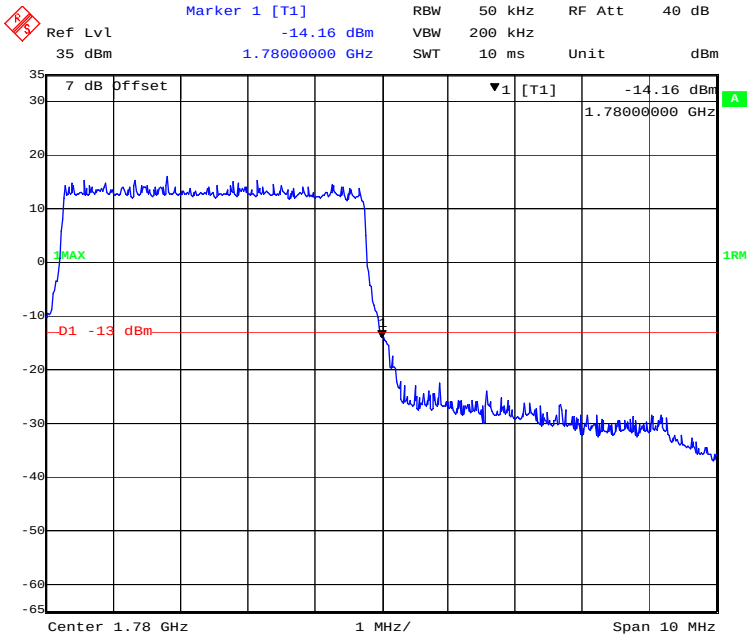
Date: 13.MAY.2021 15:53:11

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



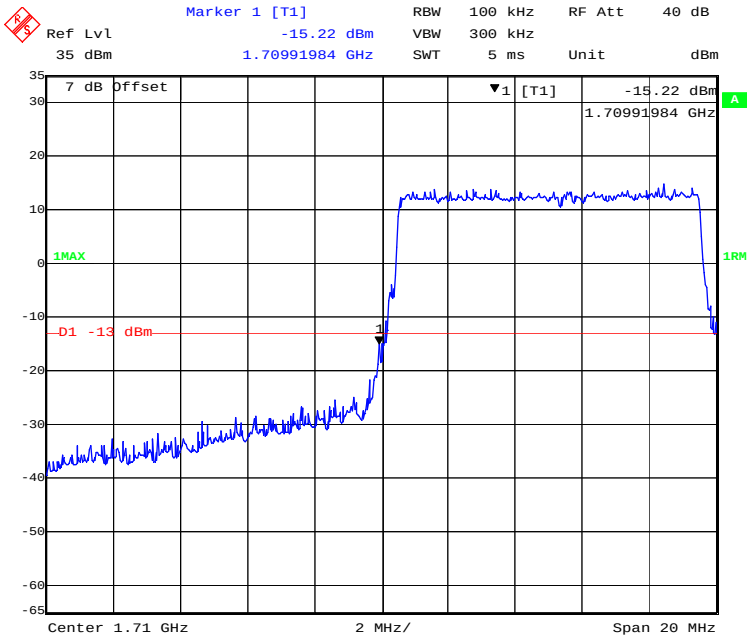
Date: 13.MAY.2021 15:43:31

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



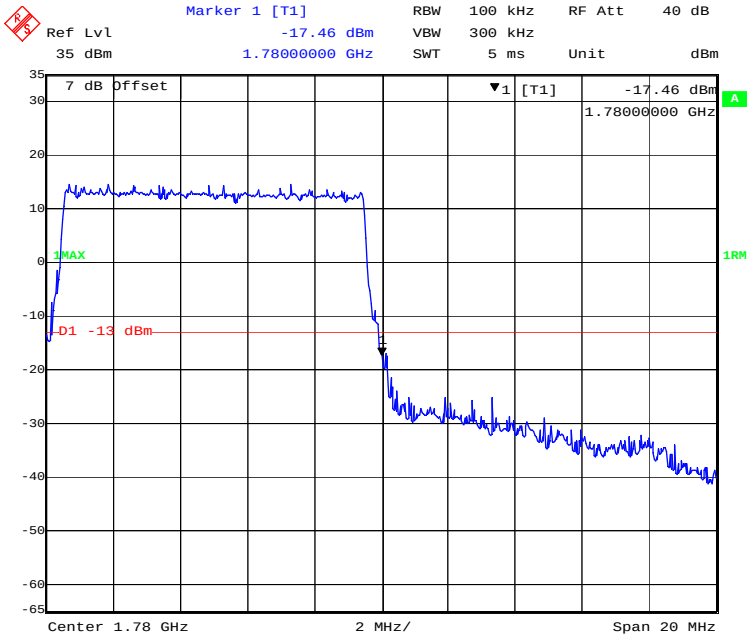
Date: 13.MAY.2021 15:55:51

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



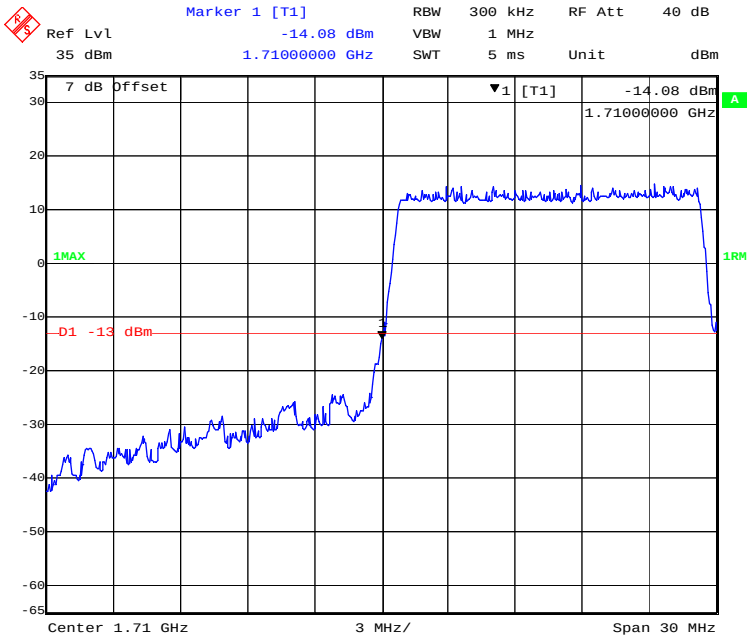
Date: 13.MAY.2021 15:45:35

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



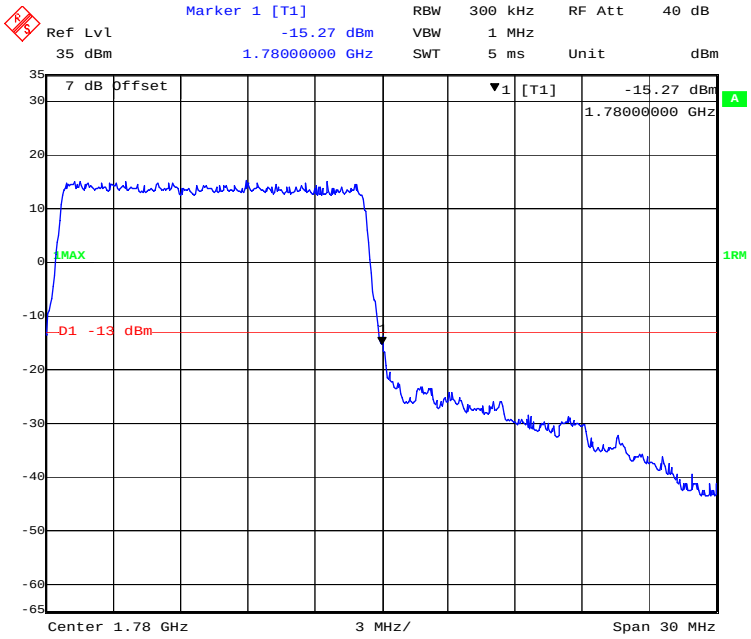
Date: 13.MAY.2021 15:59:06

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



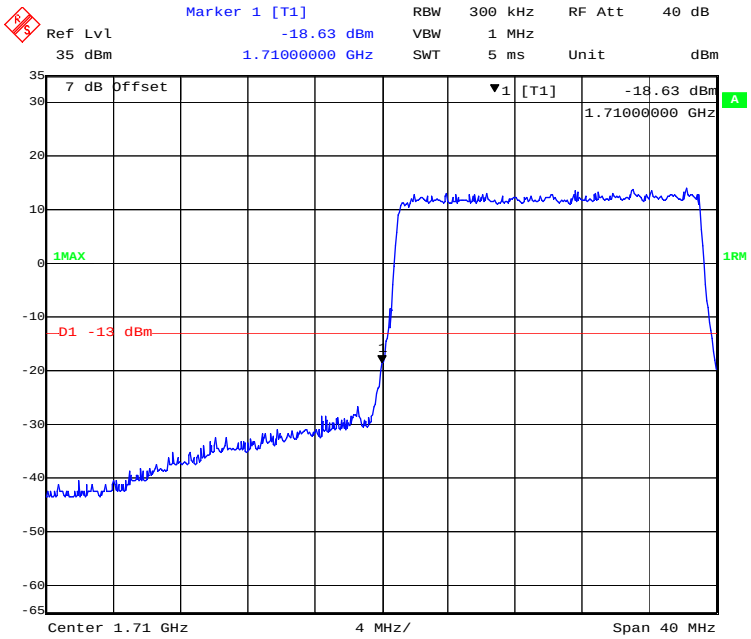
Date: 13.MAY.2021 15:47:57

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



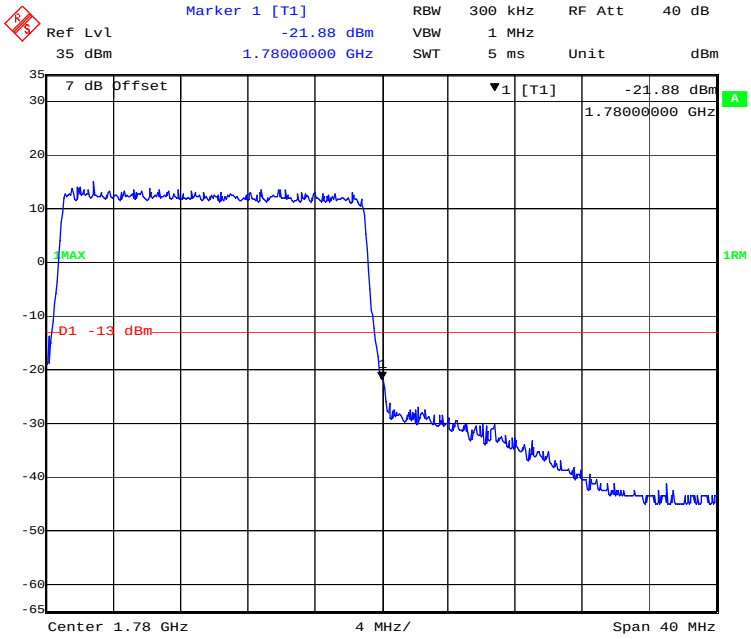
Date: 13.MAY.2021 16:00:42

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



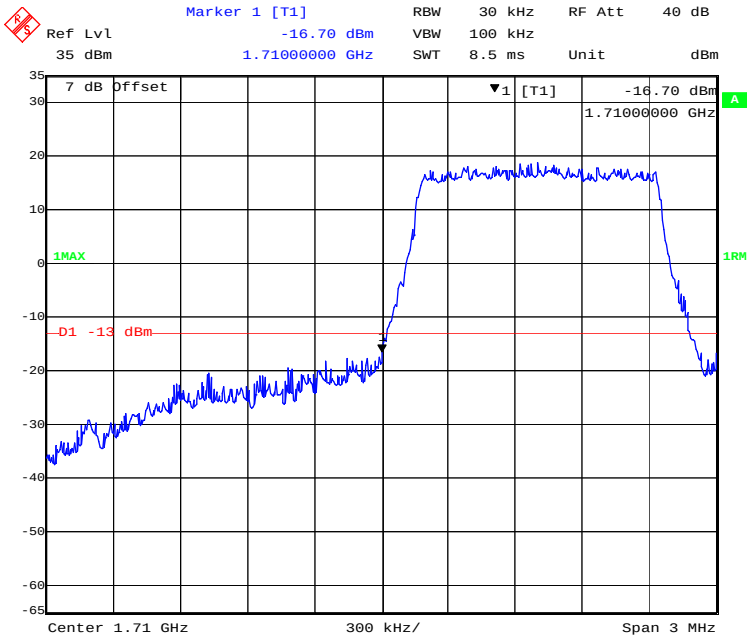
Date: 13.MAY.2021 15:50:40

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



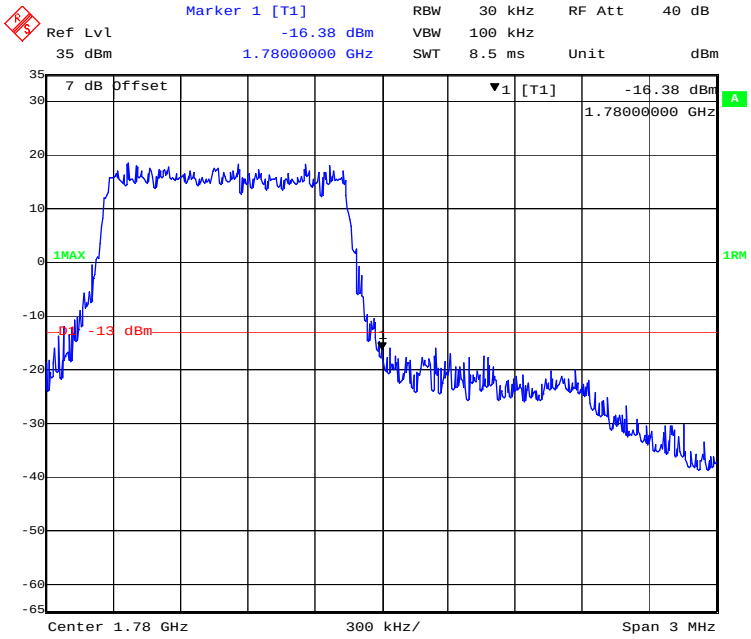
Date: 13.MAY.2021 16:02:11

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



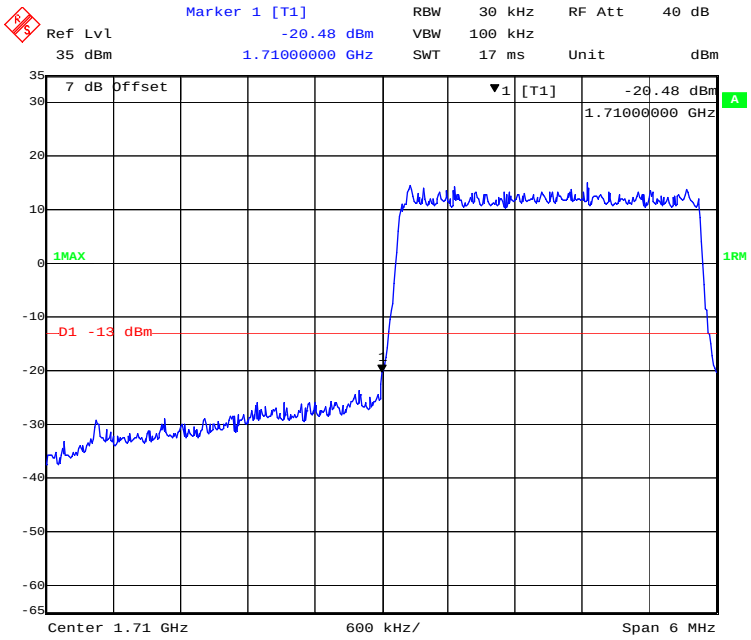
Date: 13.MAY.2021 15:39:19

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



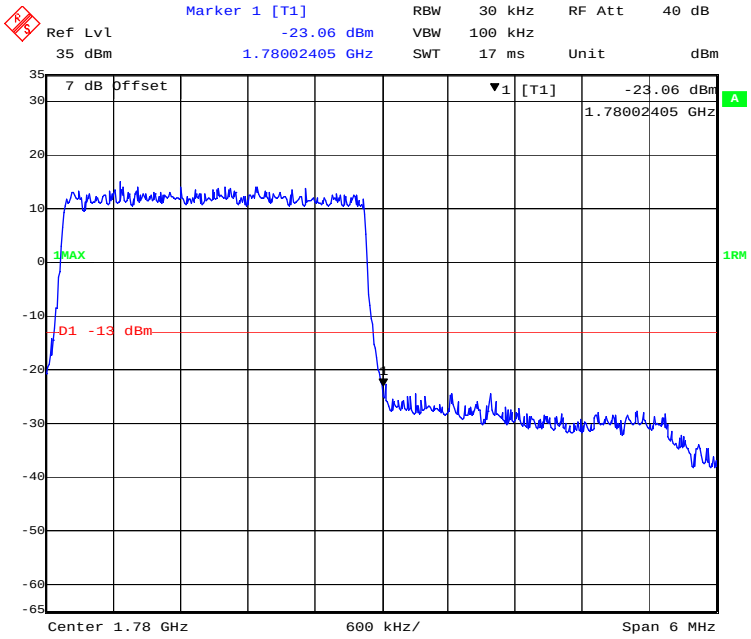
Date: 13.MAY.2021 15:36:04

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



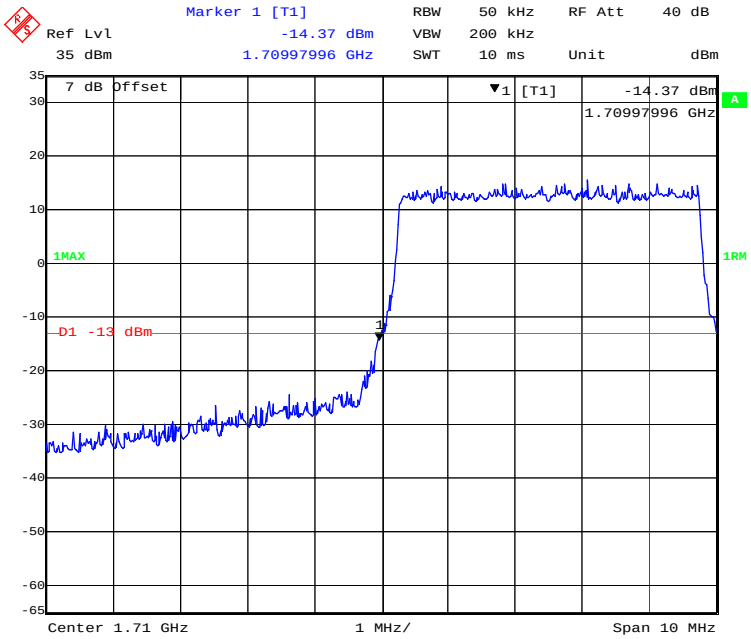
Date: 13.MAY.2021 15:41:56

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



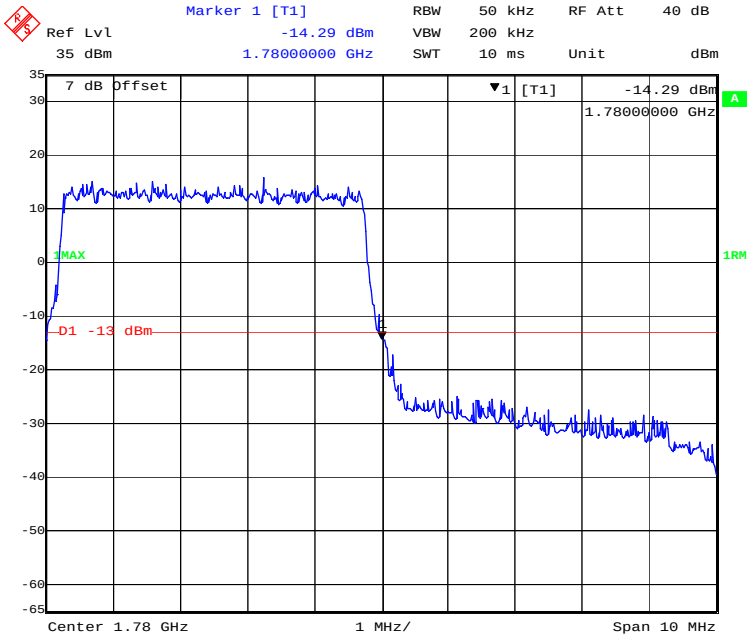
Date: 13.MAY.2021 15:53:49

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



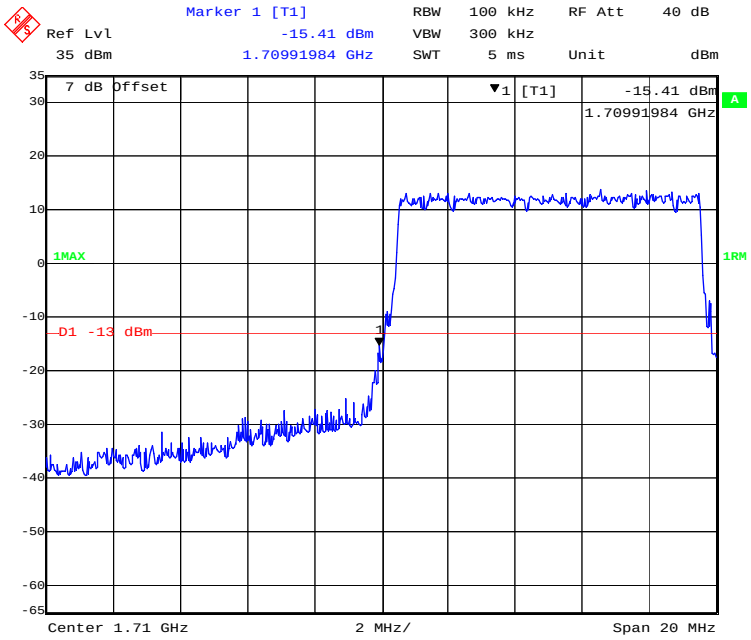
Date: 13.MAY.2021 15:44:08

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



Date: 13.MAY.2021 15:56:23

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

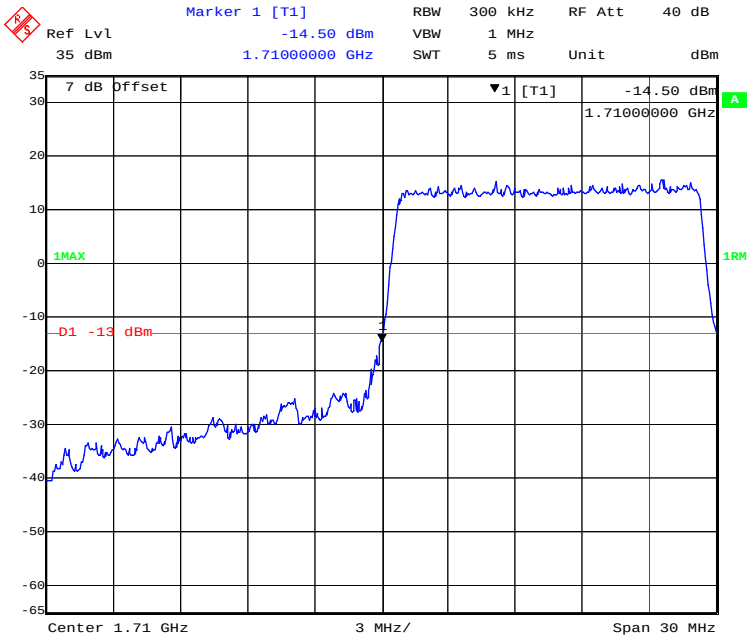


Date: 13.MAY.2021 15:45:54

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

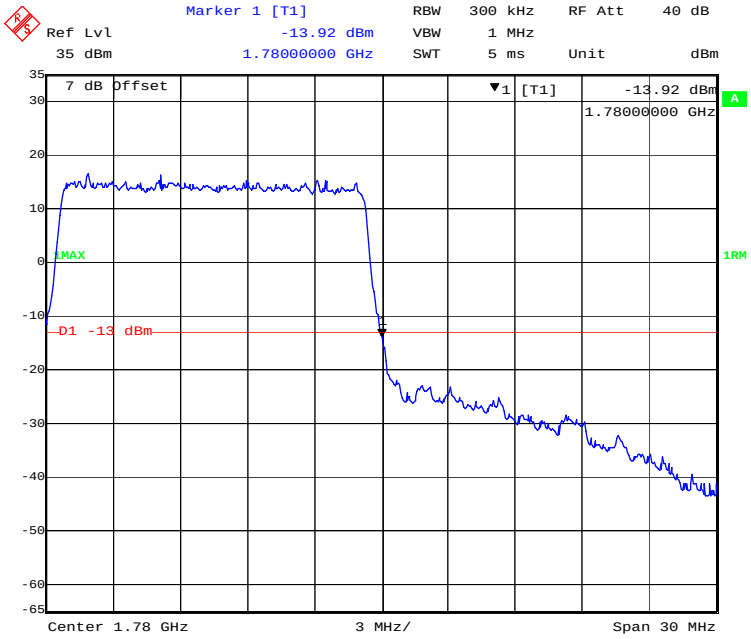
Date: 13.MAY.2021 15:59:26

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



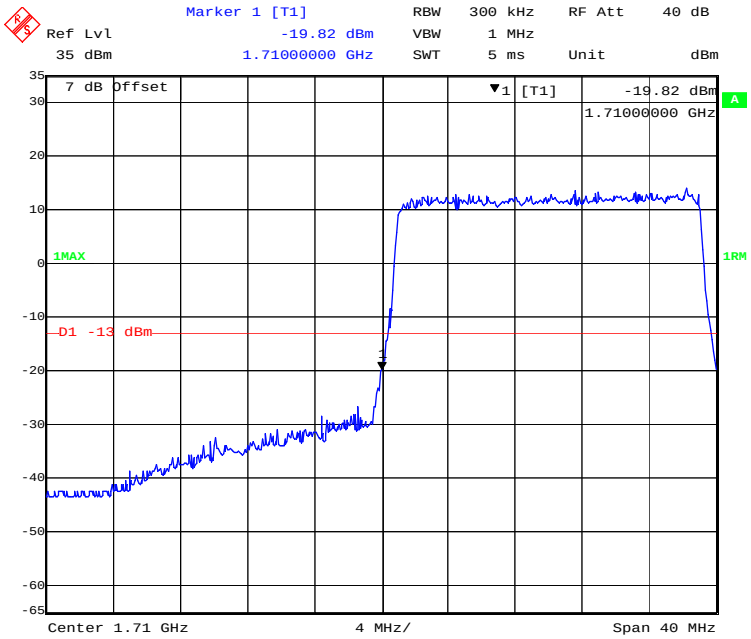
Date: 13.MAY.2021 15:48:51

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



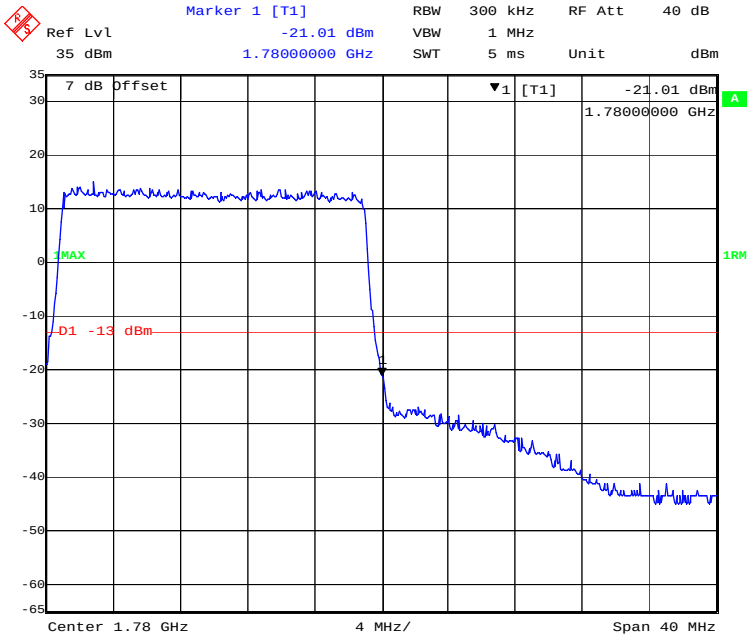
Date: 13.MAY.2021 16:01:09

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



Date: 13.MAY.2021 15:50:27

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



Date: 13.MAY.2021 16:02:26

FCC § 2.1055; § 22.355; § 24.235; §27.54; §90.213- FREQUENCY STABILITY

Applicable Standards

FCC § 2.1055, §22.355, §24.235, §27.54 and §90.213.

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

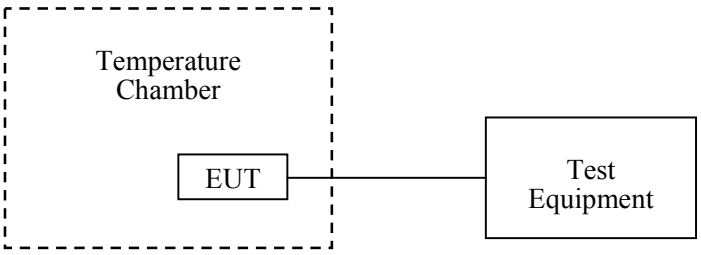
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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:	24.9 ℃
Relative Humidity:	47%
ATM Pressure:	101.2 kPa

The testing was performed by Miller Xie on 2021-05-18.

EUT operation mode: Transmitting

Test Result: Compliant.

GSM 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	7.7	15	0.01793	2.5
-20		19	0.02271	2.5
-10		9	0.01076	2.5
0		14	0.01673	2.5
10		13	0.01554	2.5
20		14	0.01673	2.5
30		6	0.00717	2.5
40		12	0.01434	2.5
50		16	0.01913	2.5
20	V min.= 6.9	15	0.01793	2.5
20	V max.= 8.5	12	0.01434	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	7.7	15	0.01793	2.5
-20		16	0.01913	2.5
-10		17	0.02032	2.5
0		13	0.01554	2.5
10		18	0.02152	2.5
20		14	0.01673	2.5
30		17	0.02032	2.5
40		13	0.01554	2.5
50		15	0.01793	2.5
20	V min.= 6.9	17	0.02032	2.5
20	V max.= 8.5	18	0.02152	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	7.7	12	0.01434	2.5
-20		11	0.01315	2.5
-10		16	0.01913	2.5
0		19	0.02271	2.5
10		15	0.01793	2.5
20		12	0.01434	2.5
30		21	0.02510	2.5
40		13	0.01554	2.5
50		10	0.01195	2.5
20	V min.= 6.9	10	0.01195	2.5
20	V max.= 8.5	12	0.01434	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	7.7	-14	-0.00745	pass
-20		-10	-0.00532	pass
-10		-14	-0.00745	pass
0		-6	-0.00319	pass
10		-18	-0.00957	pass
20		-13	-0.00691	pass
30		-15	-0.00798	pass
40		-18	-0.00957	pass
50		-11	-0.00585	pass
20	V min.= 6.9	-20	-0.01064	pass
20	V max.= 8.5	-11	-0.00585	pass

EGPRS Mode, Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	7.7	-15	-0.00798	pass
-20		-20	-0.01064	pass
-10		-11	-0.00585	pass
0		-13	-0.00691	pass
10		-20	-0.01064	pass
20		-11	-0.00585	pass
30		-13	-0.00691	pass
40		-14	-0.00745	pass
50		-11	-0.00585	pass
20	V min.= 6.9	-11	-0.00585	pass
20	V max.= 8.5	-8	-0.00426	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	7.7	28	0.014894	pass
-20		17	0.009043	pass
-10		16	0.008511	pass
0		16	0.008511	pass
10		14	0.007447	pass
20		7	0.003723	pass
30		12	0.006383	pass
40		11	0.005851	pass
50		16	0.008511	pass
20	V min.= 6.9	14	0.007447	pass
20	V max.= 8.5	19	0.010106	pass

WCDMA Band IV:

Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	7.7	1710.3962	1754.7658	1710	1755
-20		1710.3635	1754.7666	1710	1755
-10		1710.3826	1754.7672	1710	1755
0		1710.3718	1754.7689	1710	1755
10		1710.3691	1754.7665	1710	1755
20		1710.3298	1754.7637	1710	1755
30		1710.3648	1754.7654	1710	1755
40		1710.4378	1754.7637	1710	1755
50		1710.4365	1754.7626	1710	1755
20	V min.= 6.9	1710.4227	1754.7634	1710	1755
20	V max.= 8.5	1710.3456	1754.7658	1710	1755

LTE Band 2:

f_o =1880.0 MHz (QPSK)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	7.7	6	0.00319	Pass
-20		18	0.00957	Pass
-10		15	0.00798	Pass
0		12	0.00638	Pass
10		15	0.00798	Pass
20		7	0.00372	Pass
30		11	0.00585	Pass
40		13	0.00691	Pass
50		21	0.01117	Pass
20	V min.=6.9	16	0.00851	Pass
20	V max.= 8.5	14	0.00745	Pass

f_o =1880.0 MHz (16-QAM)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	7.7	12	0.00638	Pass
-20		12	0.00638	Pass
0		17	0.00904	Pass
0		9	0.00479	Pass
10		11	0.00585	Pass
20		14	0.00745	Pass
30		15	0.00798	Pass
40		12	0.00638	Pass
50		9	0.00479	Pass
20	V min.=6.9	9	0.00479	Pass
20	V max.= 8.5	15	0.00798	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	7.7	1710.0455	1754.9682	1710	1755
-20		1710.0418	1754.9683	1710	1755
-10		1710.0425	1754.9652	1710	1755
0		1710.0480	1754.9602	1710	1755
10		1710.0449	1754.9675	1710	1755
20		1710.0434	1754.9637	1710	1755
30		1710.0481	1754.9694	1710	1755
40		1710.0475	1754.9624	1710	1755
50		1710.0443	1754.9661	1710	1755
20	V min.= 6.9	1710.0419	1754.9689	1710	1755
20	V max.= 8.5	1710.0445	1754.9655	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	7.7	1710.0409	1754.9646	1710	1755
-20		1710.0498	1754.9628	1710	1755
-10		1710.0423	1754.9631	1710	1755
0		1710.0499	1754.9699	1710	1755
10		1710.0481	1754.9677	1710	1755
20		1710.0425	1754.9641	1710	1755
30		1710.0428	1754.9617	1710	1755
40		1710.0411	1754.9652	1710	1755
50		1710.0475	1754.967	1710	1755
20	V min.= 6.9	1710.0476	1754.9627	1710	1755
20	V max.= 8.5	1710.0415	1754.9613	1710	1755

LTE Band 5:

Middle Channel, f_o = 836.5 MHz (QPSK)				
Temperature	**Power Supplied**	**Frequency Error**	**Frequency Error**	**Limit**
(℃)	**(V_{DC})**	**(Hz)**	**(ppm)**	**(ppm)**
-30	7.7	15	0.0179	2.5
-20		20	0.0239	2.5
-10		19	0.0227	2.5
0		17	0.0203	2.5
10		12	0.0143	2.5
20		17	0.0203	2.5
30		8	0.0096	2.5
40		11	0.0132	2.5
50		17	0.0203	2.5
20	V min.=6.9	12	0.0143	2.5
20	V max.= 8.5	14	0.0167	2.5

Middle Channel, f_o = 836.5 MHz (16-QAM)				
Temperature	**Power Supplied**	**Frequency Error**	**Frequency Error**	**Limit**
(℃)	**(V_{DC})**	**(Hz)**	**(ppm)**	**(ppm)**
-30	7.7	15	0.0179	2.5
-20		12	0.0143	2.5
0		18	0.0215	2.5
0		20	0.0239	2.5
10		19	0.0227	2.5
20		11	0.0132	2.5
30		13	0.0155	2.5
40		13	0.0155	2.5
50		17	0.0203	2.5
20	V min.=6.9	11	0.0132	2.5
20	V max.= 8.5	17	0.0203	2.5

LTE Band 7:

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	7.7	2500.0427	2569.9516	2500	2570
-20		2500.0499	2569.9527	2500	2570
-10		2500.0409	2569.9566	2500	2570
0		2500.0402	2569.9515	2500	2570
10		2500.0429	2569.9564	2500	2570
20		2500.0498	2569.9522	2500	2570
30		2500.0411	2569.9554	2500	2570
40		2500.0448	2569.9567	2500	2570
50		2500.0444	2569.9566	2500	2570
20	V min.= 6.9	2500.0454	2569.9541	2500	2570
20	V max.= 8.5	2500.0496	2569.9551	2500	2570

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	7.7	2500.0456	2569.9569	2500	2570
-20		2500.045	2569.9579	2500	2570
-10		2500.0476	2569.954	2500	2570
0		2500.0499	2569.9562	2500	2570
10		2500.0401	2569.9581	2500	2570
20		2500.0474	2569.9531	2500	2570
30		2500.0436	2569.9573	2500	2570
40		2500.0488	2569.9543	2500	2570
50		2500.0471	2569.9534	2500	2570
20	V min.= 6.9	2500.0427	2569.9551	2500	2570
20	V max.= 8.5	2500.0448	2569.9553	2500	2570

LTE Band 12:

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	7.7	699.9548	715.9406	699	716
-20		699.9515	715.9407	699	716
-10		699.9593	715.9477	699	716
0		699.9595	715.941	699	716
10		699.9576	715.943	699	716
20		699.9538	715.9469	699	716
30		699.958	715.9421	699	716
40		699.9533	715.9497	699	716
50		699.9509	715.9448	699	716
20	V min.= 6.9	699.9573	715.9417	699	716
20	V max.= 8.5	699.9542	715.9494	699	716

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	7.7	699.9565	715.9423	699	716
-20		699.9559	715.9454	699	716
-10		699.9584	715.9453	699	716
0		699.9515	715.9433	699	716
10		699.9551	715.9401	699	716
20		699.9557	715.9486	699	716
30		699.9589	715.947	699	716
40		699.9511	715.9423	699	716
50		699.955	715.947	699	716
20	V min.= 6.9	699.9543	715.9483	699	716
20	V max.= 8.5	699.9586	715.944	699	716

LTE Band 17:

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	7.7	704.9589	715.9483	704	716
-20		704.9517	715.9469	704	716
-10		704.9555	715.9471	704	716
0		704.9573	715.9444	704	716
10		704.9559	715.9496	704	716
20		704.9552	715.9427	704	716
30		704.9562	715.9427	704	716
40		704.9562	715.9489	704	716
50		704.9504	715.9498	704	716
20	V min.= 6.9	704.9515	715.9493	704	716
20	V max.=8.5	704.9522	715.9446	704	716

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	7.7	704.9537	715.949	704	716
-20		704.9553	715.9489	704	716
-10		704.9584	715.9495	704	716
0		704.9518	715.9454	704	716
10		704.9567	715.9419	704	716
20		704.9533	715.946	704	716
30		704.9528	715.9418	704	716
40		704.9524	715.9452	704	716
50		704.9529	715.9418	704	716
20	V min.=6.9	704.9543	715.9403	704	716
20	V max.= 8.5	704.9577	715.9459	704	716

LTE Band 25:

Middle Channel, f_o =1882.5 MHz (QPSK)				
Temperature	**Power Supplied**	**Frequency Error**	**Frequency Error**	**Limit**
(℃)	**(V_{DC})**	**(Hz)**	**(ppm)**	**(ppm)**
-30	7.7	17	0.00903	2.5
-20		12	0.00637	2.5
-10		16	0.00850	2.5
0		11	0.00584	2.5
10		15	0.00797	2.5
20		16	0.00850	2.5
30		10	0.00531	2.5
40		13	0.00691	2.5
50		15	0.00797	2.5
20	V min.=6.9	16	0.00850	2.5
20	V max.= 8.5	7	0.00372	2.5

Middle Channel, fo =1882.5MHz(16-QAM)				
Temperature	**Power Supplied**	**Frequency Error**	**Frequency Error**	**Limit**
(℃)	**(V_{DC})**	**(Hz)**	**(ppm)**	**(ppm)**
-30	7.7	11	0.00584	2.5
-20		13	0.00691	2.5
0		15	0.00797	2.5
0		12	0.00637	2.5
10		19	0.01009	2.5
20		8	0.00425	2.5
30		14	0.00744	2.5
40		13	0.00691	2.5
50		14	0.00744	2.5
20	V min.=6.9	19	0.01009	2.5
20	V max.= 8.5	14	0.00744	2.5

LTE Band 26:

Middle Channel, f_o = 831.5 MHz (QPSK)				
Temperature	**Power Supplied**	**Frequency Error**	**Frequency Error**	**Limit**
(℃)	**(V_{DC})**	**(Hz)**	**(ppm)**	**(ppm)**
-30	7.7	8	0.0096	2.5
-20		12	0.0143	2.5
-10		12	0.0143	2.5
0		14	0.0167	2.5
10		15	0.0179	2.5
20		16	0.0191	2.5
30		17	0.0203	2.5
40		8	0.0096	2.5
50		11	0.0132	2.5
20	V min.=6.9	12	0.0143	2.5
20	V max.= 8.5	21	0.0251	2.5

Middle Channel, f_o = 831.5 MHz (16-QAM)				
Temperature	**Power Supplied**	**Frequency Error**	**Frequency Error**	**Limit**
(℃)	**(V_{DC})**	**(Hz)**	**(ppm)**	**(ppm)**
-30	7.7	14	0.0167	2.5
-20		14	0.0167	2.5
0		19	0.0227	2.5
0		23	0.0275	2.5
10		16	0.0191	2.5
20		9	0.0108	2.5
30		14	0.0167	2.5
40		11	0.0132	2.5
50		18	0.0215	2.5
20	V min.=6.9	10	0.0120	2.5
20	V max.= 8.5	20	0.0239	2.5

LTE Band 40(2305MHz-2315MHz):

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	7.7	2305.053	2314.9546	2305	2315
-20		2305.0501	2314.9562	2305	2315
-10		2305.0509	2314.9551	2305	2315
0		2305.0525	2314.9545	2305	2315
10		2305.0579	2314.9505	2305	2315
20		2305.0584	2314.9526	2305	2315
30		2305.052	2314.9575	2305	2315
40		2305.0584	2314.9566	2305	2315
50		2305.0554	2314.9529	2305	2315
20	V min.= 6.9	2305.0539	2314.9581	2305	2315
20	V max.= 8.5	2305.0599	2314.9515	2305	2315

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	7.7	2305.0579	2314.9574	2305	2315
-20		2305.0592	2314.9587	2305	2315
-10		2305.0569	2314.9577	2305	2315
0		2305.0521	2314.9559	2305	2315
10		2305.0524	2314.9514	2305	2315
20		2305.0502	2314.9584	2305	2315
30		2305.0533	2314.9559	2305	2315
40		2305.0557	2314.957	2305	2315
50		2305.0565	2314.9533	2305	2315
20	V min.= 6.9	2305.0505	2314.9599	2305	2315
20	V max.= 8.5	2305.0542	2314.9587	2305	2315

LTE Band 40(2350MHz-2360MHz):

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	7.7	2350.0562	2359.9558	2350	2360
-20		2350.0588	2359.953	2350	2360
-10		2350.0582	2359.9529	2350	2360
0		2350.0554	2359.9525	2350	2360
10		2350.0588	2359.9569	2350	2360
20		2350.0599	2359.9534	2350	2360
30		2350.0521	2359.9557	2350	2360
40		2350.0505	2359.959	2350	2360
50		2350.0547	2359.9599	2350	2360
20	V min.= 6.9	2350.0515	2359.9512	2350	2360
20	V max.= 8.5	2350.0549	2359.9574	2350	2360

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	7.7	2350.0521	2359.955	2350	2360
-20		2350.053	2359.956	2350	2360
-10		2350.0552	2359.9561	2350	2360
0		2350.0507	2359.9557	2350	2360
10		2350.0543	2359.9566	2350	2360
20		2350.053	2359.9506	2350	2360
30		2350.0516	2359.9516	2350	2360
40		2350.0598	2359.9544	2350	2360
50		2350.0573	2359.9506	2350	2360
20	V min.= 6.9	2350.0553	2359.9549	2350	2360
20	V max.= 8.5	2350.0507	2359.9591	2350	2360

LTE Band 41:

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	7.7	2555.054	2654.9513	2555	2655
-20		2555.0507	2654.9594	2555	2655
-10		2555.0563	2654.958	2555	2655
0		2555.0538	2654.9594	2555	2655
10		2555.0598	2654.9558	2555	2655
20		2555.0547	2654.9578	2555	2655
30		2555.0507	2654.955	2555	2655
40		2555.0568	2654.951	2555	2655
50		2555.0581	2654.9543	2555	2655
20	V min.= 6.9	2555.0556	2654.9553	2555	2655
20	V max.= 8.5	2555.0523	2654.9508	2555	2655

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	7.7	2555.054	2654.9586	2555	2655
-20		2555.0505	2654.9555	2555	2655
-10		2555.0551	2654.951	2555	2655
0		2555.0544	2654.9567	2555	2655
10		2555.0566	2654.9553	2555	2655
20		2555.0561	2654.9589	2555	2655
30		2555.0599	2654.952	2555	2655
40		2555.0522	2654.9501	2555	2655
50		2555.0512	2654.9568	2555	2655
20	V min.= 6.9	2555.0505	2654.9583	2555	2655
20	V max.= 8.5	2555.0545	2654.9584	2555	2655

LTE Band 66:

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	7.7	1710.953	1779.9548	1710	1780
-20		1710.9509	1779.9528	1710	1780
-10		1710.9557	1779.9536	1710	1780
0		1710.9533	1779.9573	1710	1780
10		1710.956	1779.9512	1710	1780
20		1710.9554	1779.9503	1710	1780
30		1710.9526	1779.9578	1710	1780
40		1710.95	1779.9576	1710	1780
50		1710.9511	1779.9512	1710	1780
20	V min.= 6.9	1710.9511	1779.9552	1710	1780
20	V max.= 8.5	1710.9515	1779.9508	1710	1780

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	7.7	1710.9536	1779.9521	1710	1780
-20		1710.9504	1779.9509	1710	1780
-10		1710.9507	1779.9587	1710	1780
0		1710.9546	1779.9505	1710	1780
10		1710.9557	1779.9501	1710	1780
20		1710.9557	1779.9557	1710	1780
30		1710.9547	1779.9506	1710	1780
40		1710.9531	1779.9554	1710	1780
50		1710.9547	1779.9541	1710	1780
20	V min.= 6.9	1710.9539	1779.9597	1710	1780
20	V max.= 8.5	1710.9549	1779.9586	1710	1780

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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