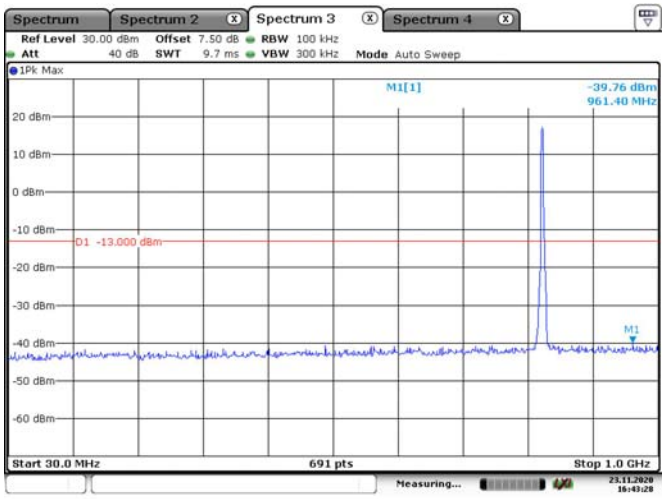
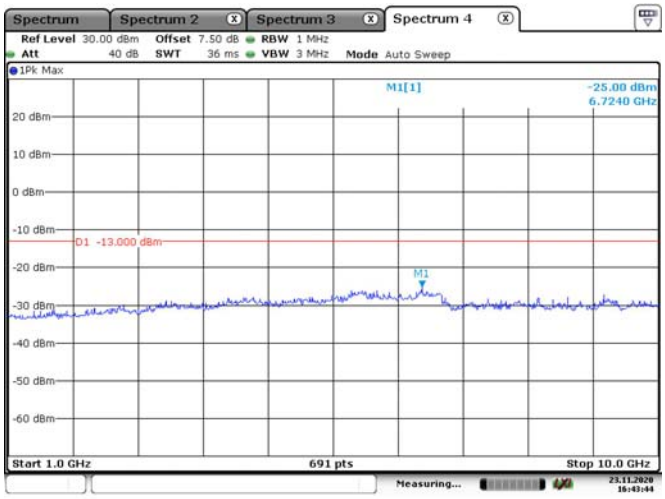
WCDMA Band V, R99, Low Channel

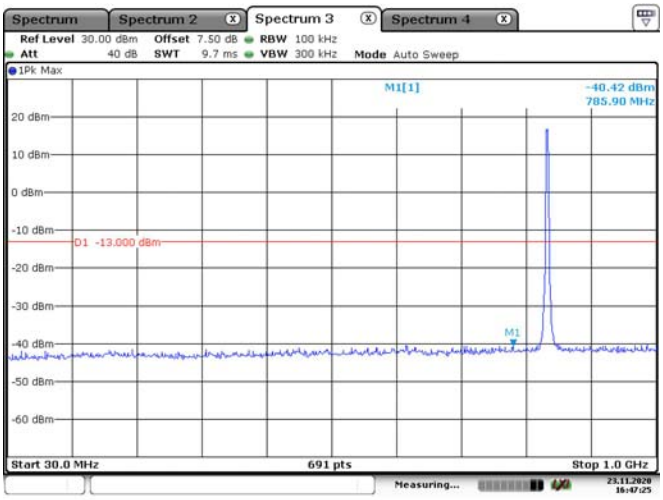


Date: 23.NOV.2020 16:43:29



Date: 23.NOV.2020 16:43:44

WCDMA Band V, R99, Middle Channel



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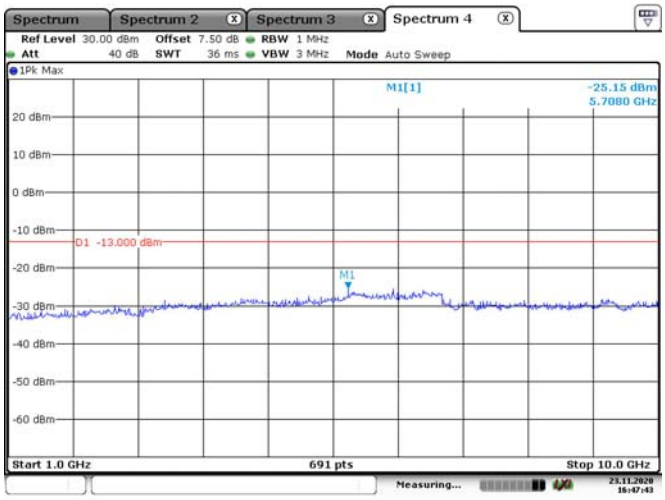

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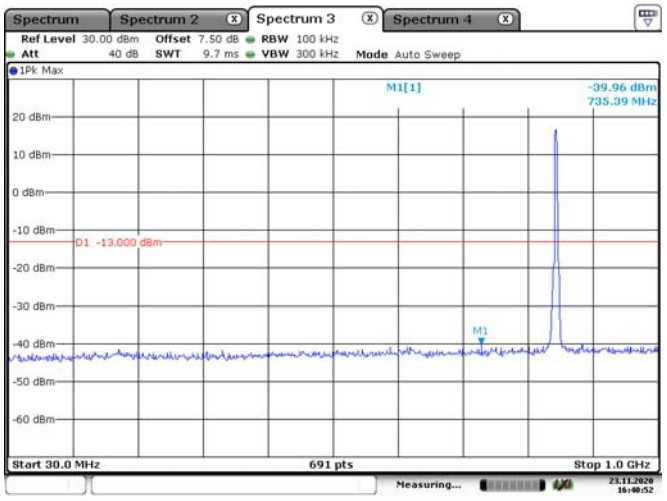
WCDMA Band V, R99, High Channel



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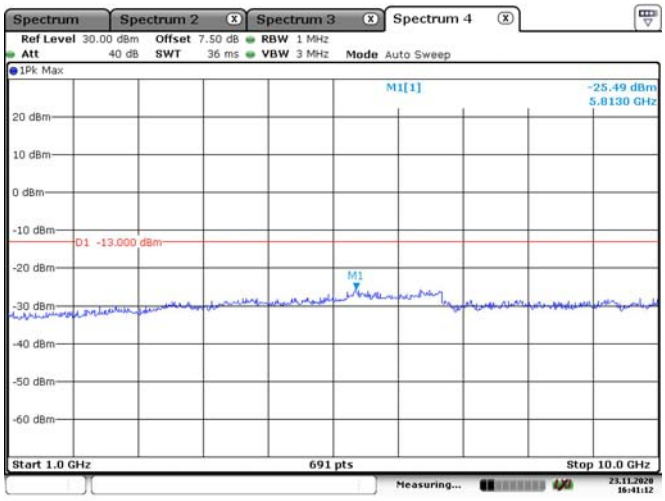
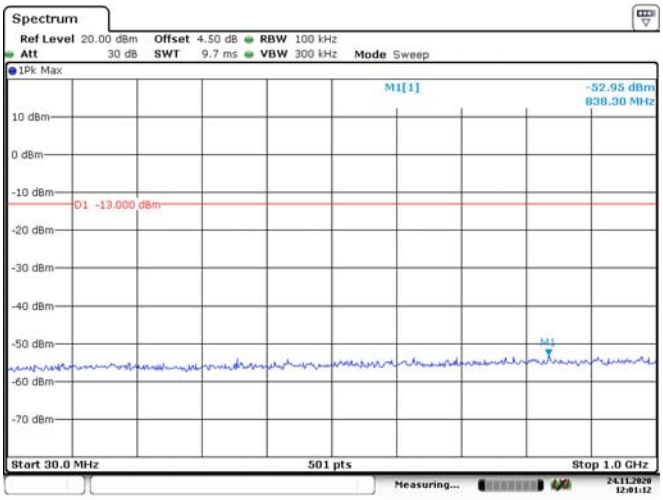
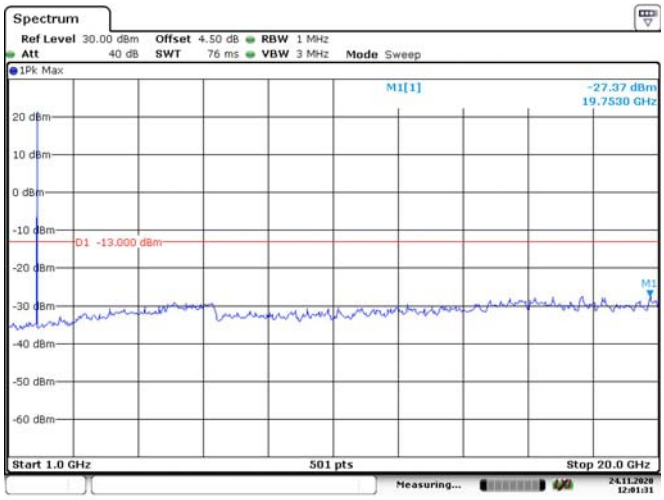


Date: 23.NOV.2020 16:41:12

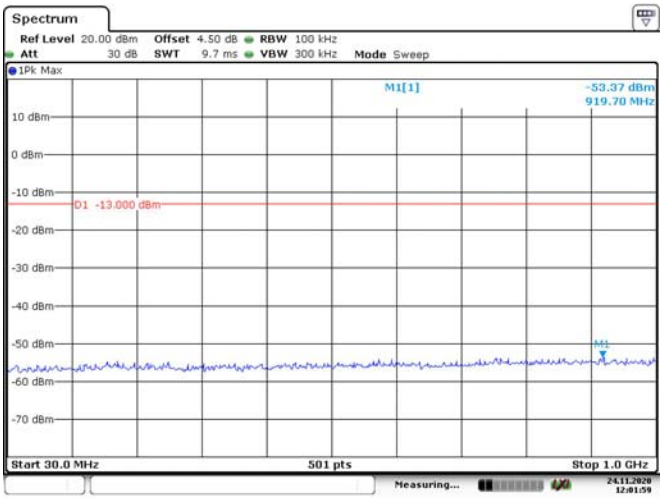
LTE Band 2:

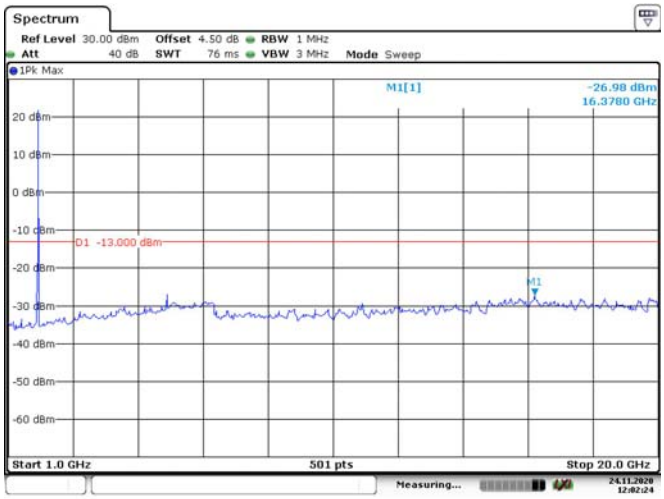
1.4M, QPSK, Low Channel



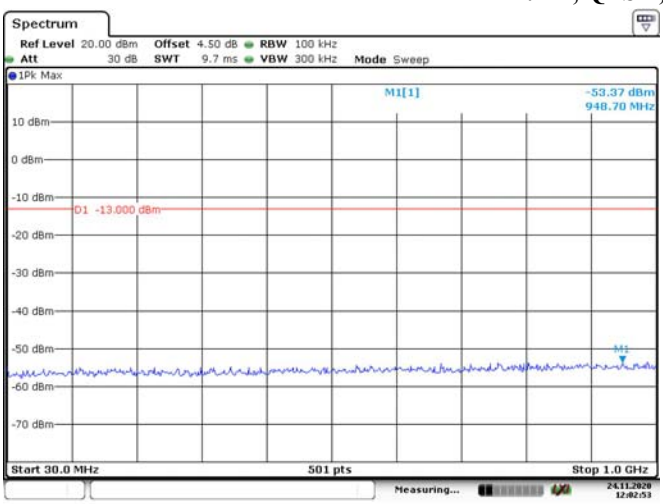


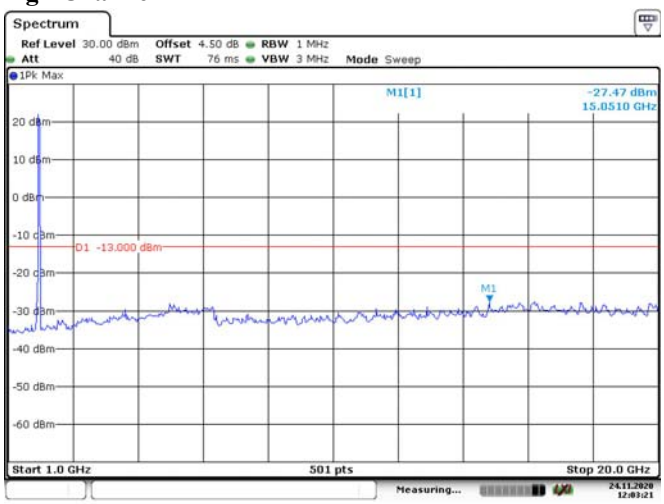
1.4M, QPSK, Middle Channel



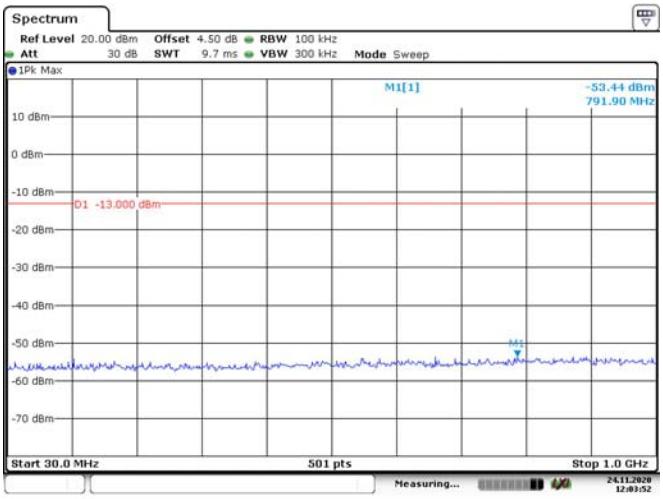


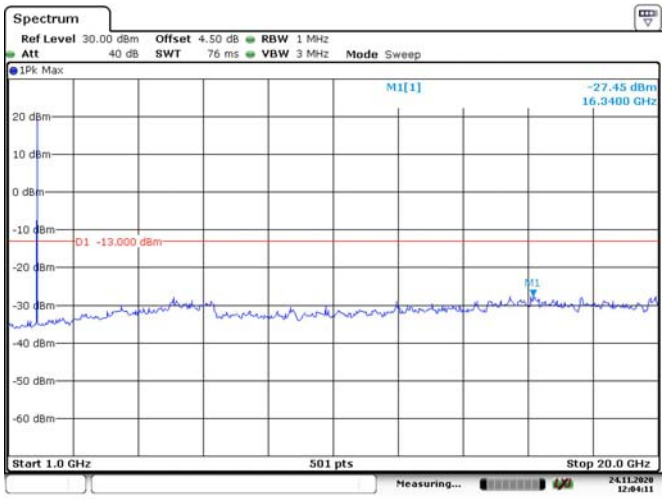
1.4M, QPSK, High Channel



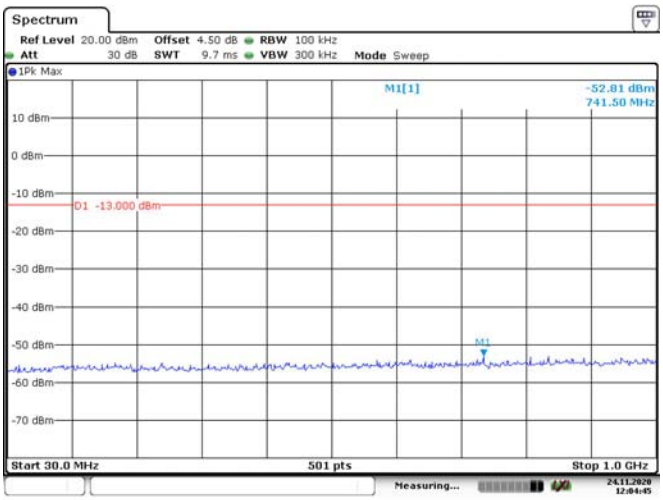


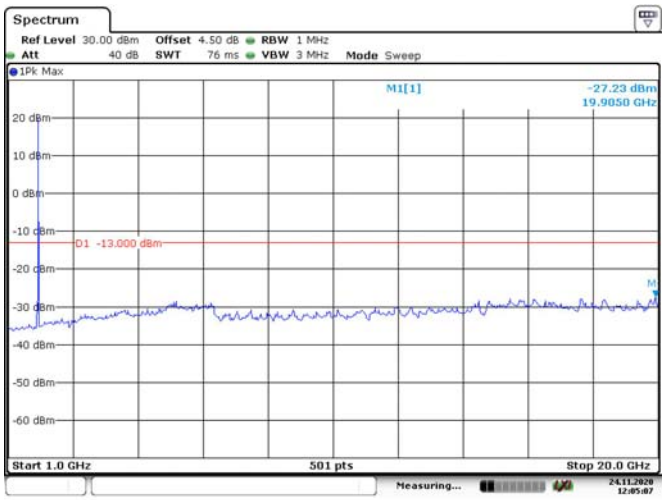
3M, QPSK, Low Channel



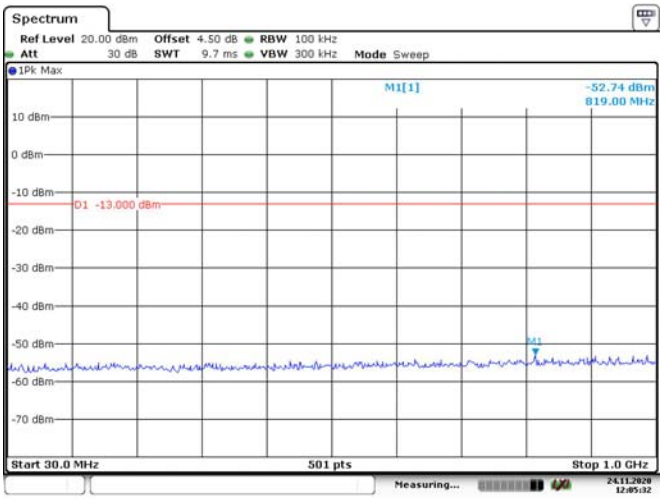


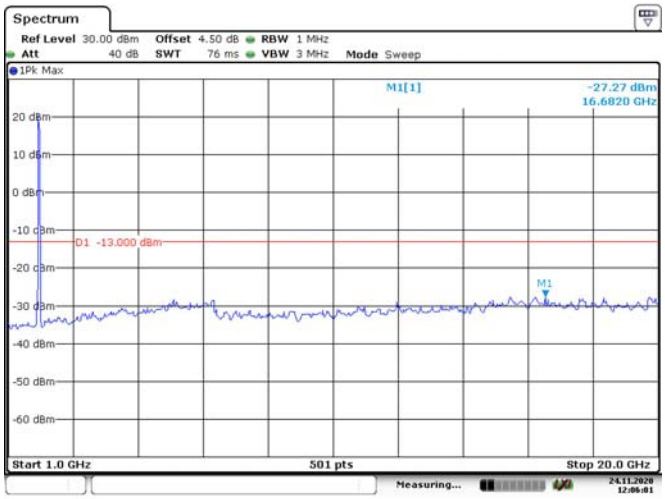
3M, QPSK, Middle Channel



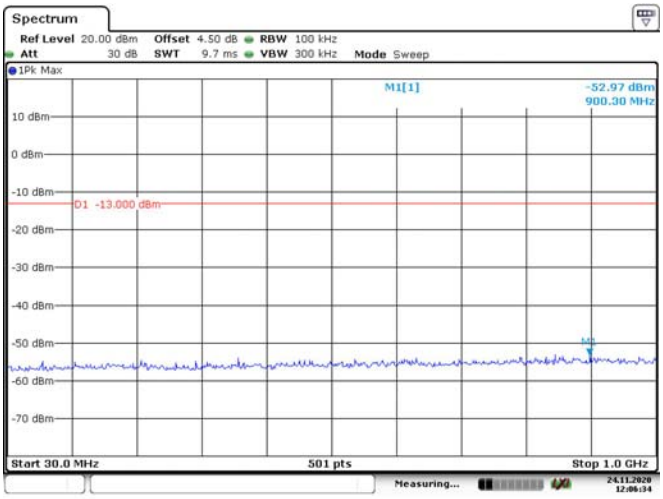


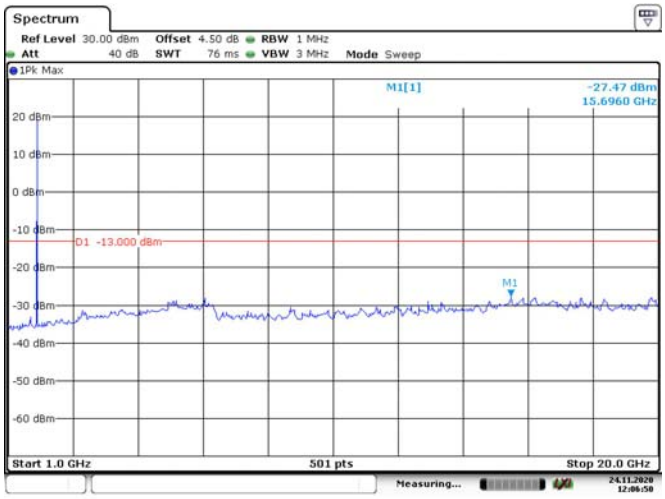
3M, QPSK, High Channel



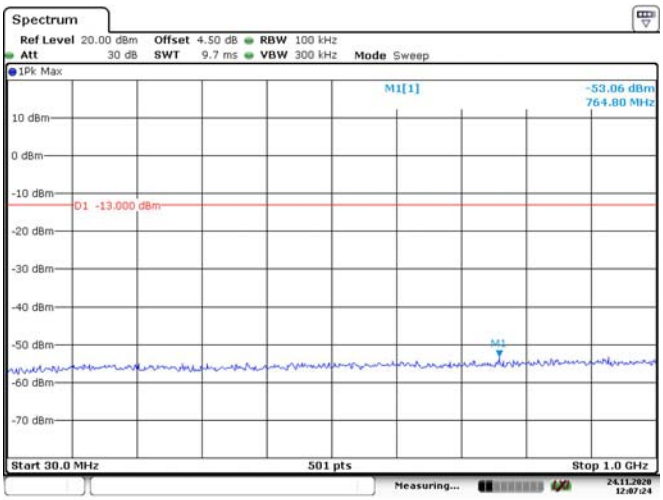


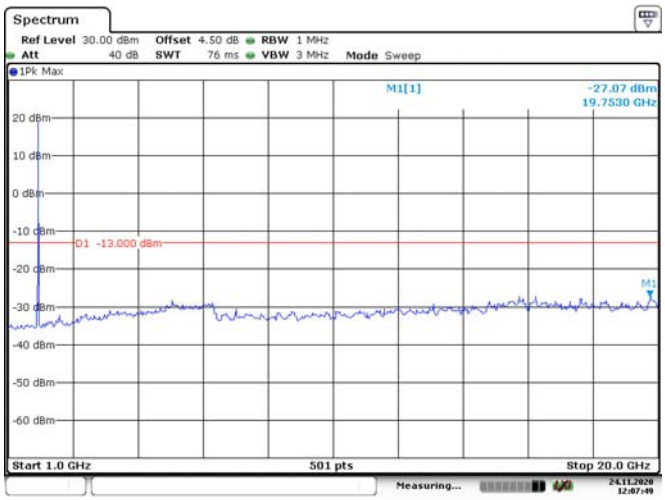
5M, QPSK, Low Channel



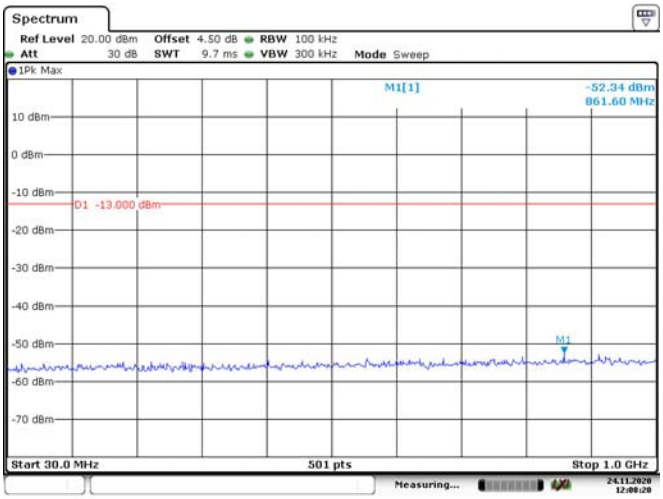


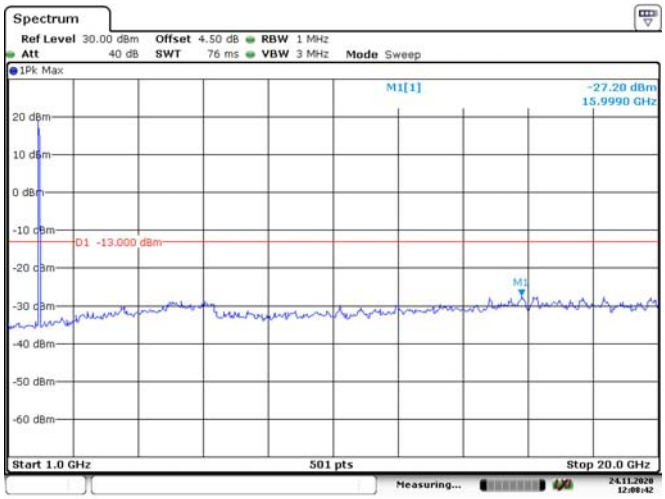
5M, QPSK, Middle Channel



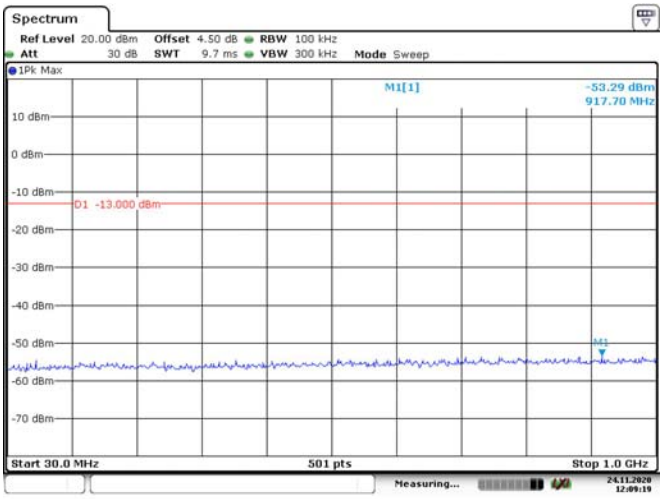


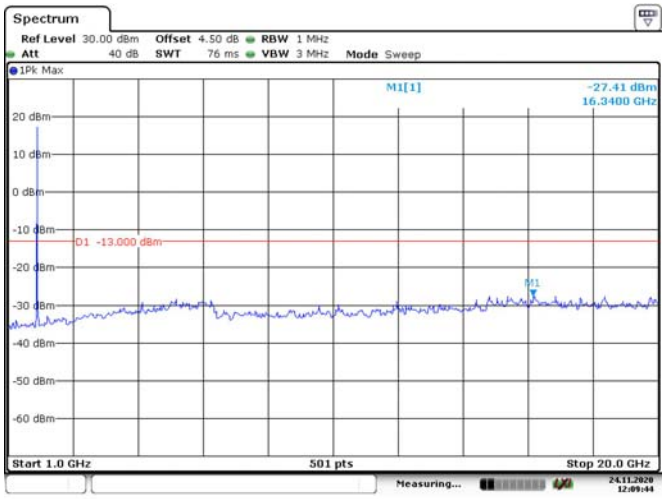
5M, QPSK, High Channel



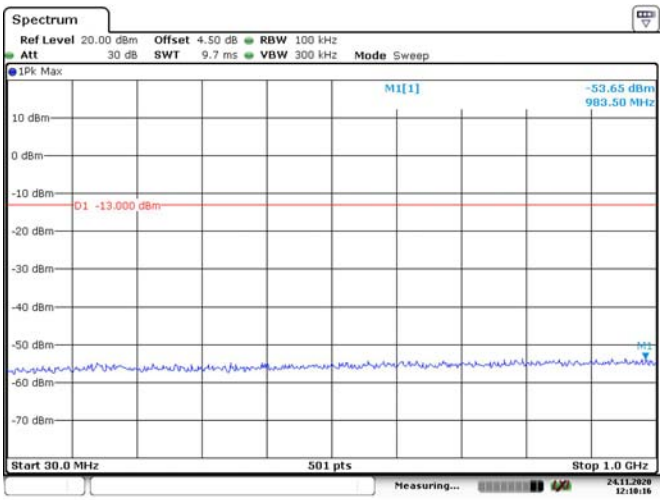


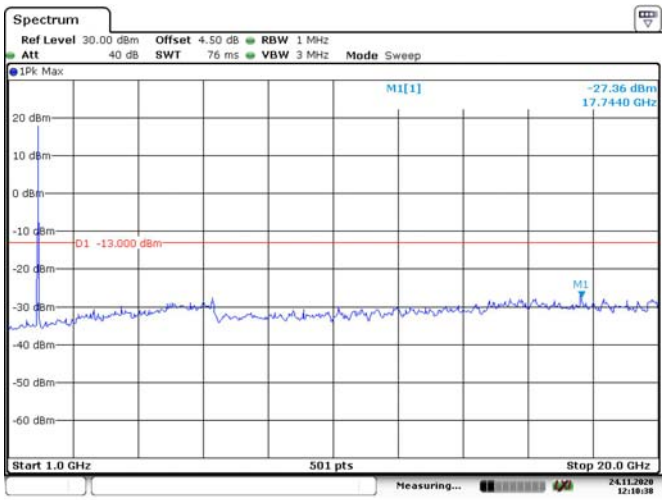
10M, QPSK, Low Channel



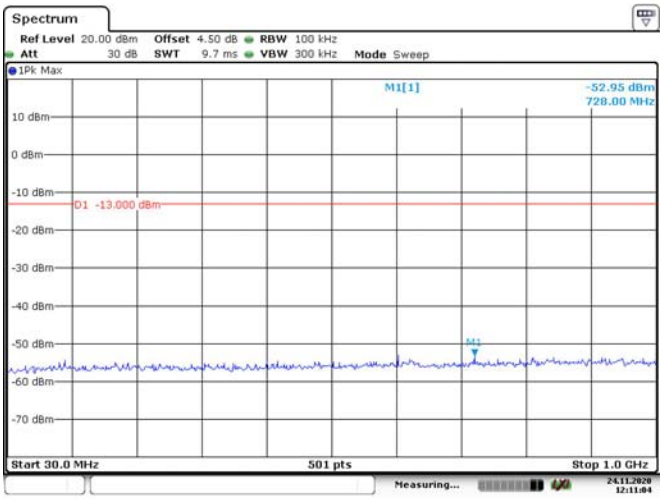


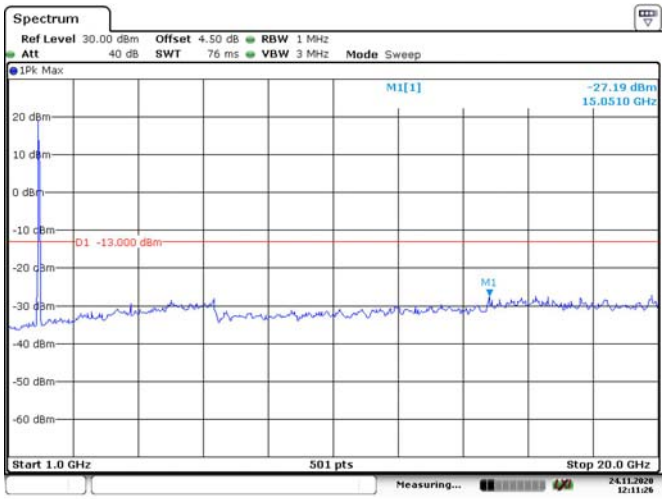
10M, QPSK, Middle Channel



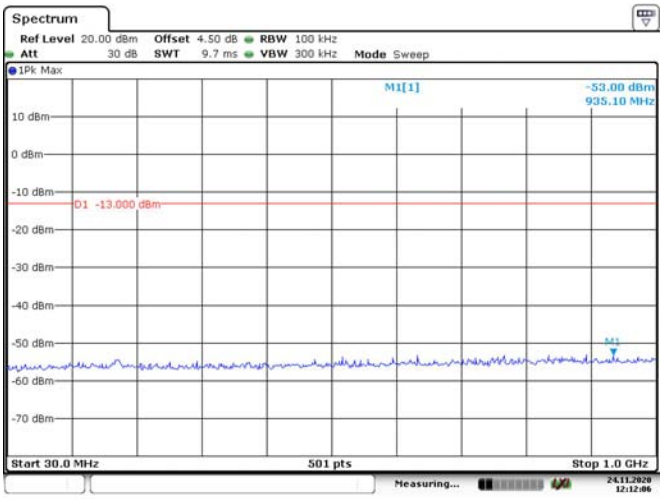


10M, QPSK, High Channel





15M, QPSK, Low Channel



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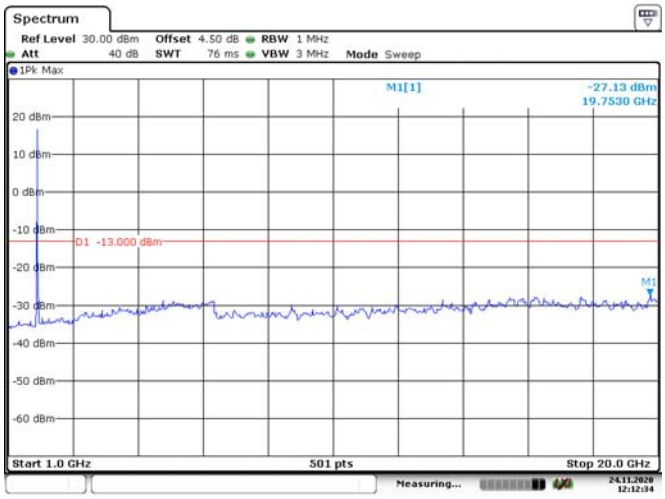
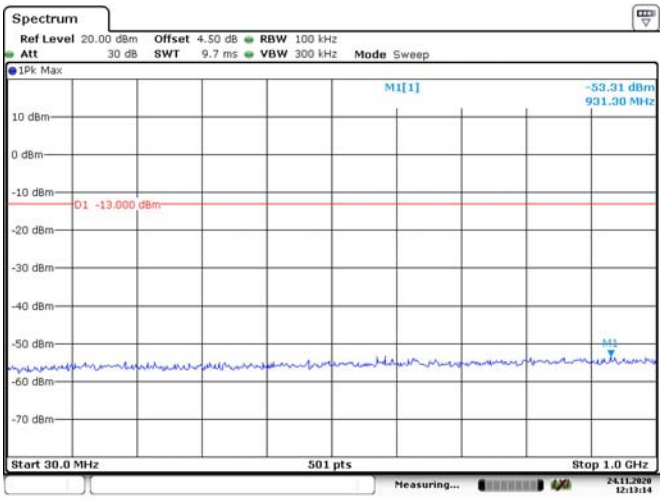


Date: 24.NOV.2020 12:12:34

15M, QPSK, Middle Channel



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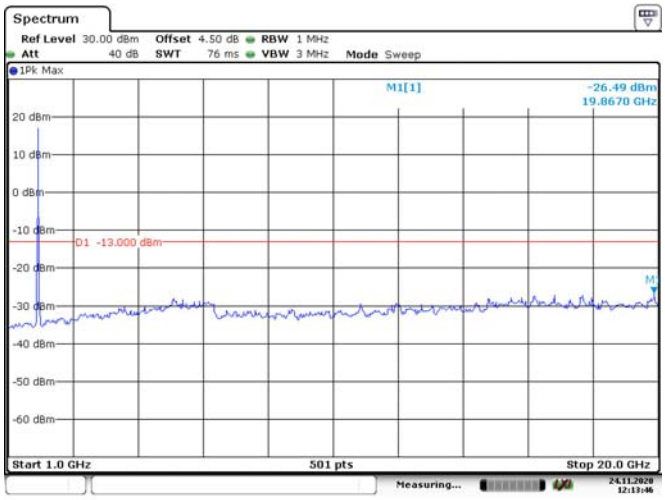
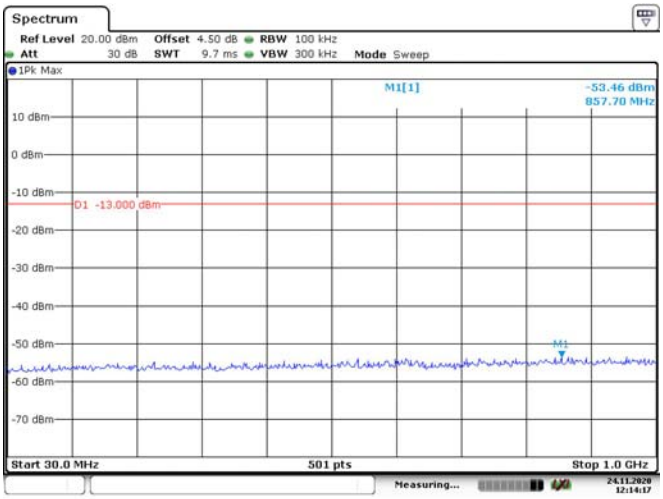


Date: 24.NOV.2020 12:13:46

15M, QPSK, High Channel



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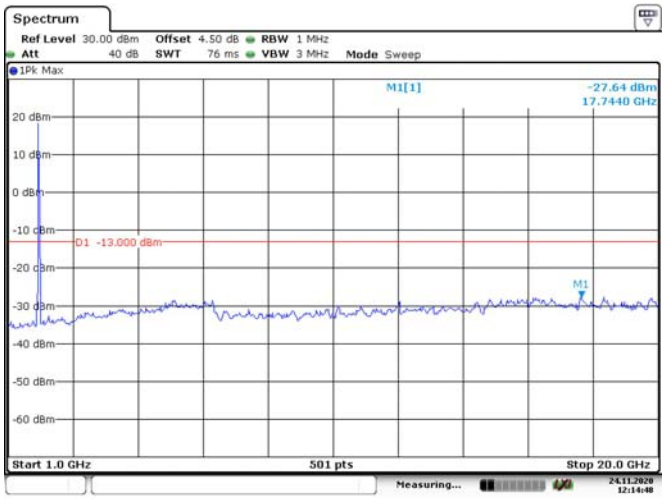

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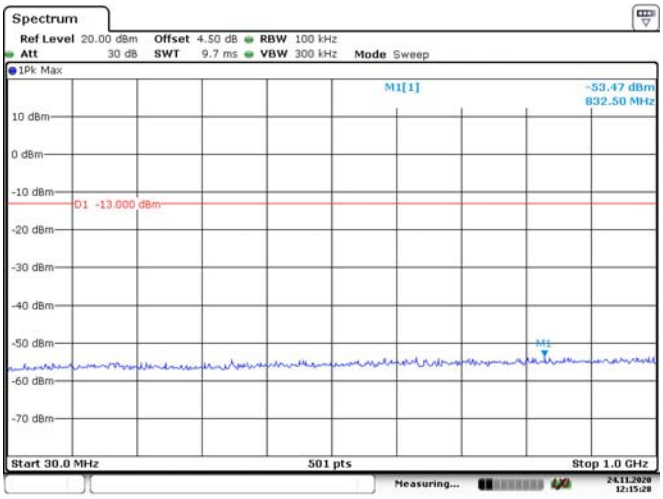
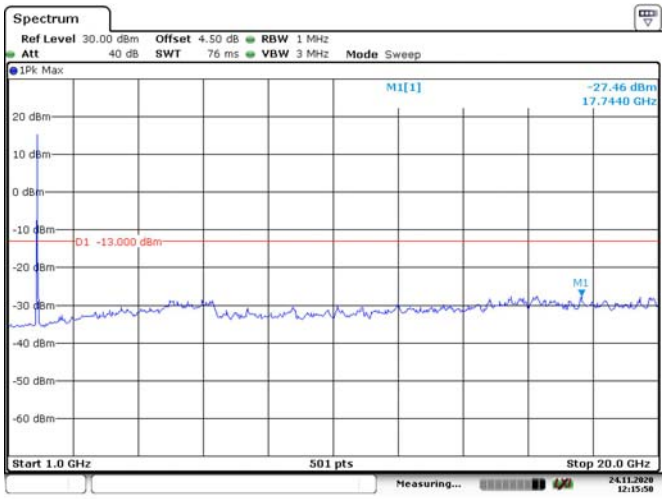
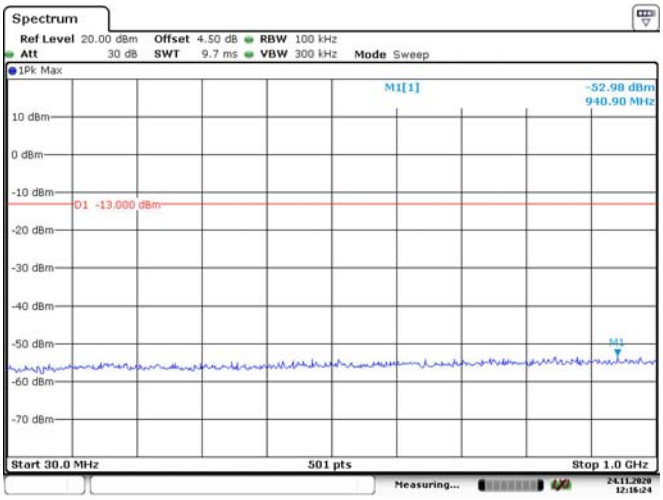
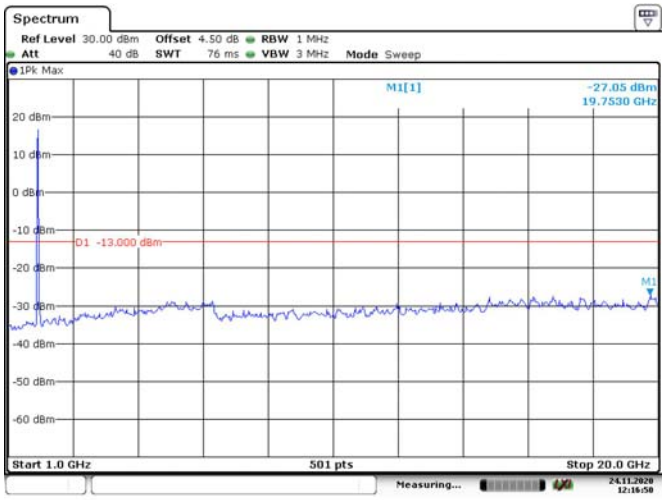
20M, QPSK, Low Channel



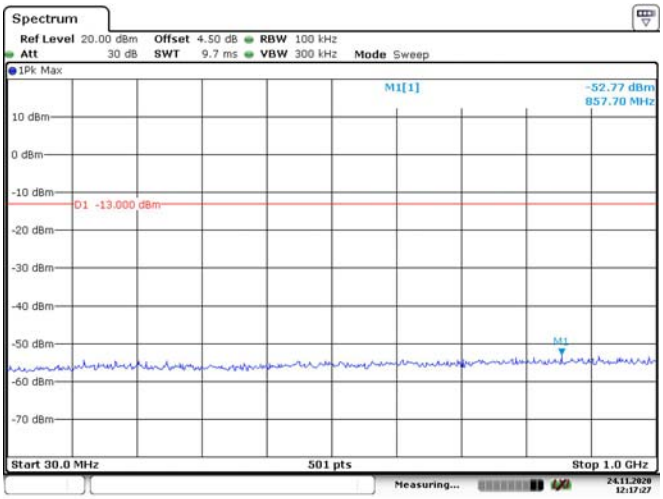


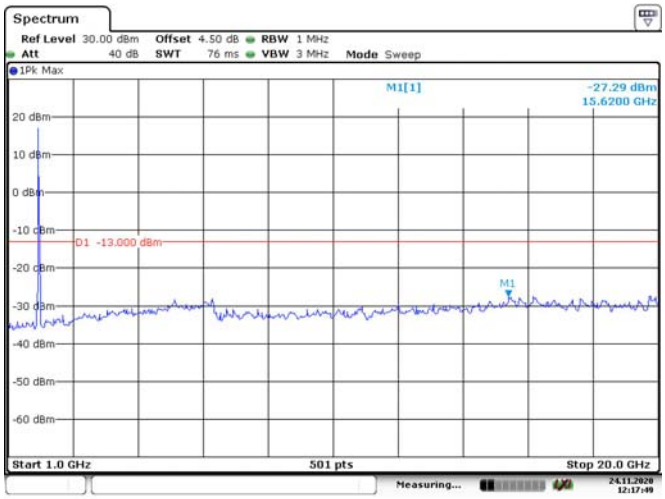
20M, QPSK, Middle Channel





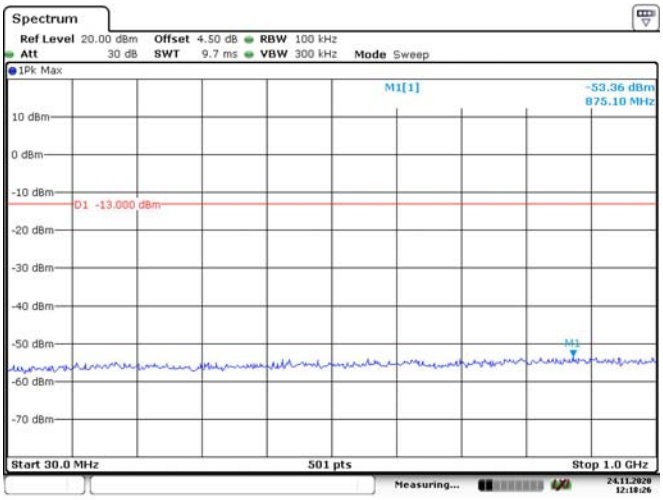
20M, QPSK, High Channel

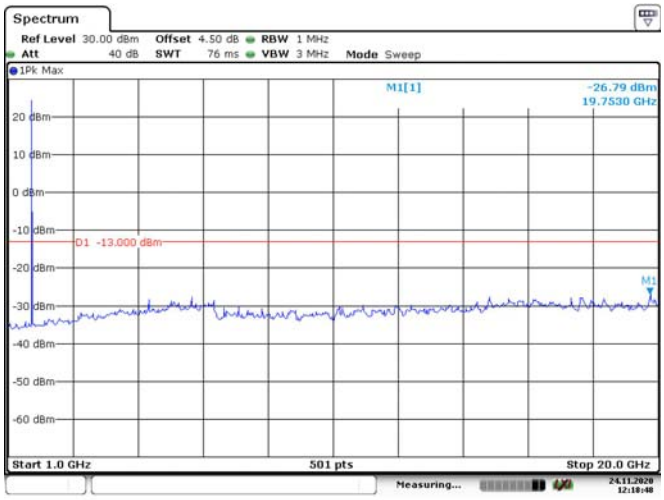




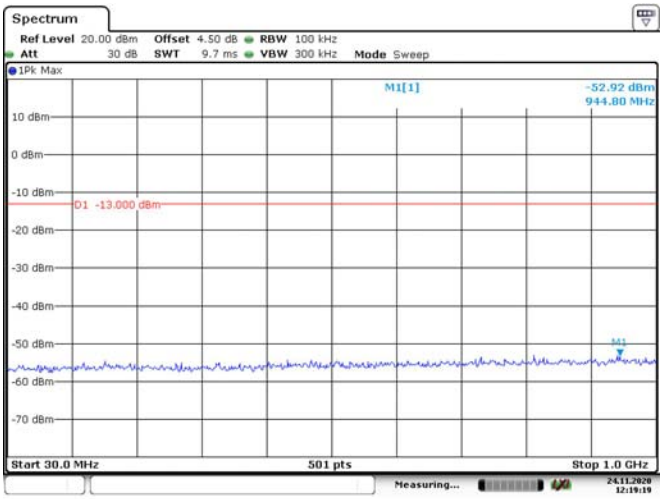
LTE Band 4:

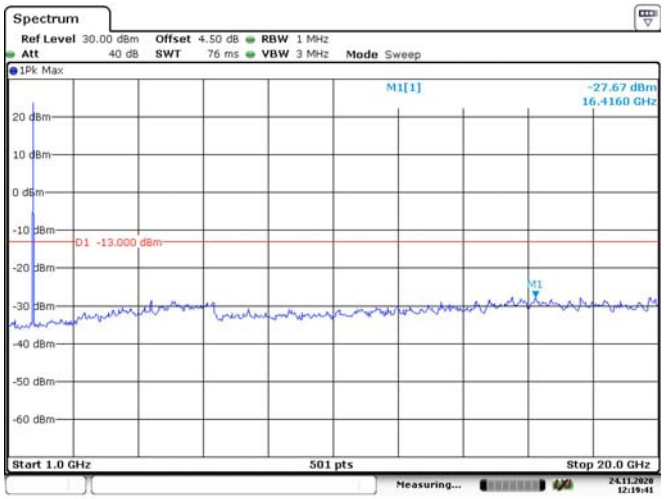
1.4M, QPSK, Low Channel



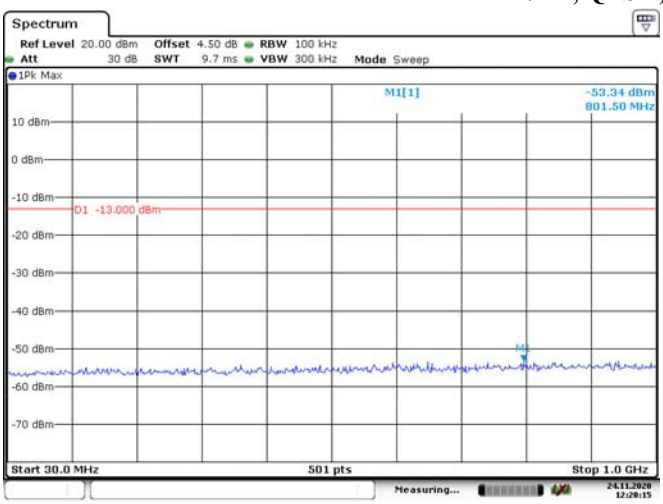


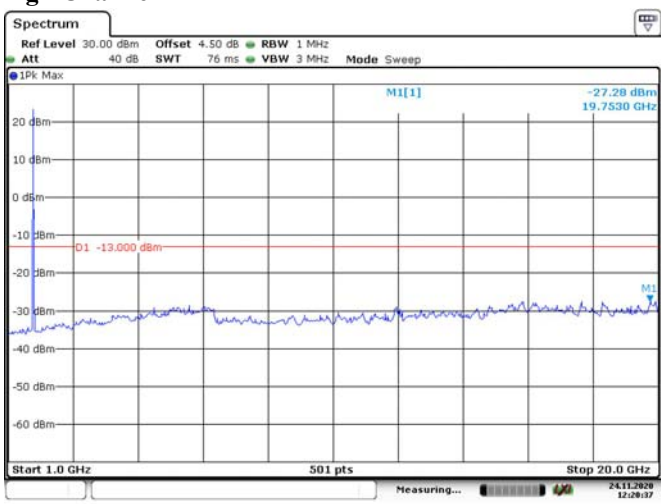
1.4M, QPSK, Middle Channel



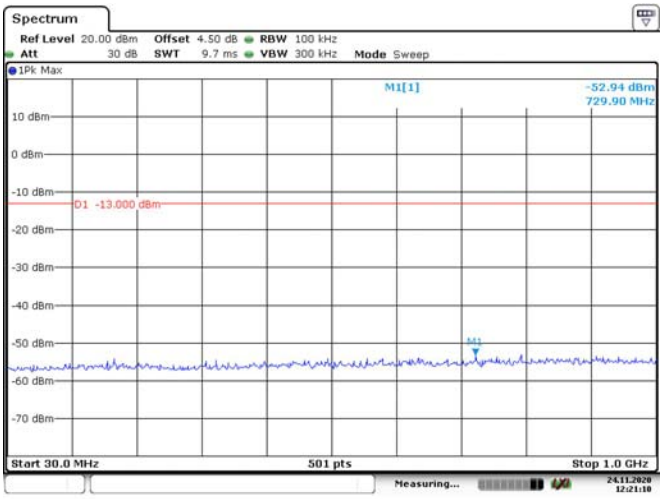


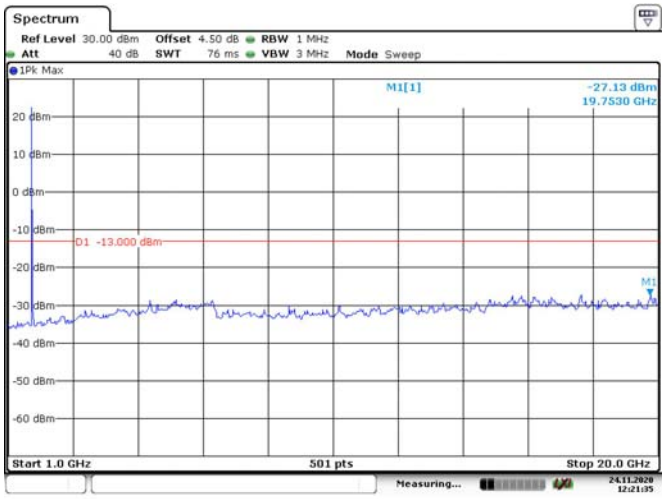
1.4M, QPSK, High Channel



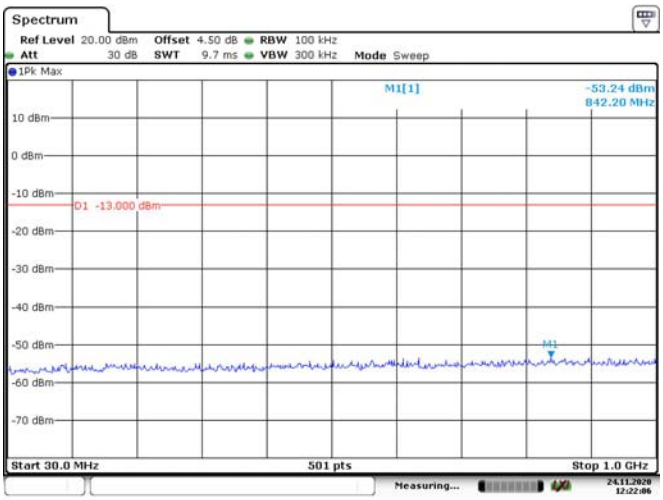


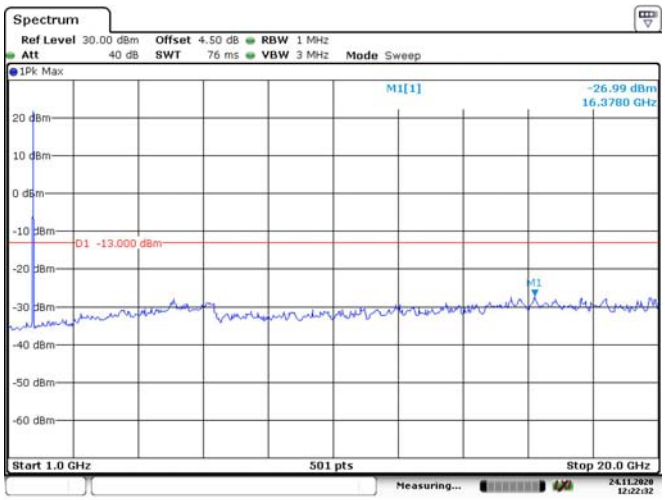
3M, QPSK, Low Channel



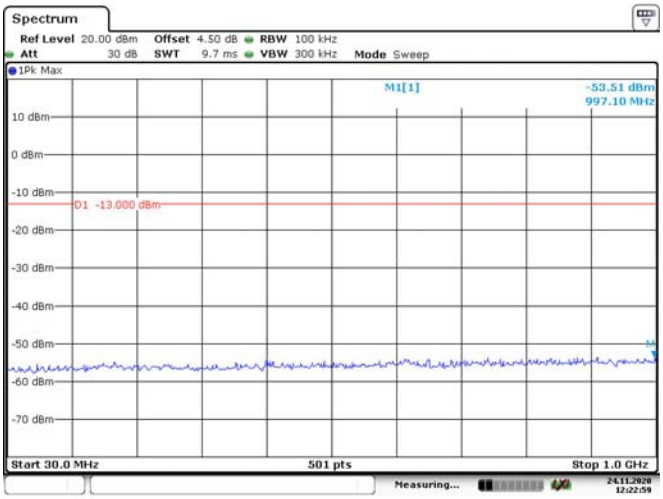


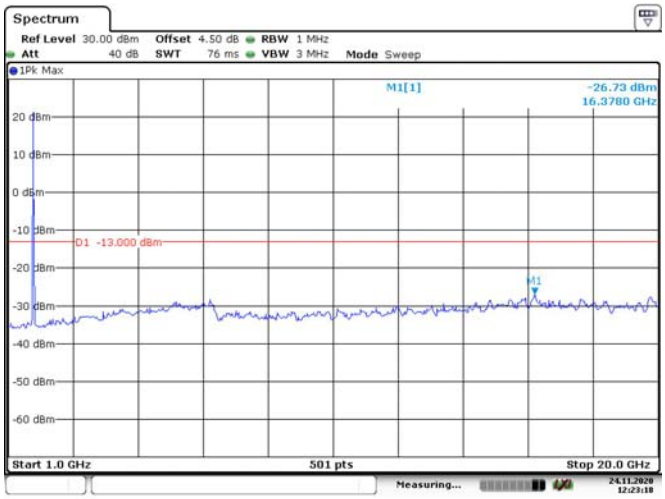
3M, QPSK, Middle Channel



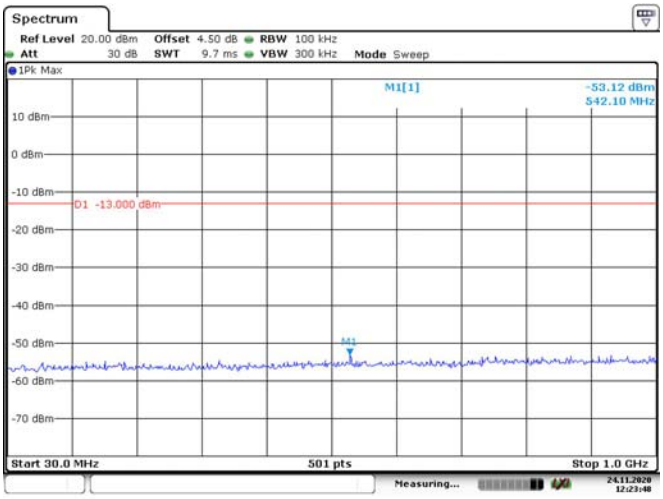


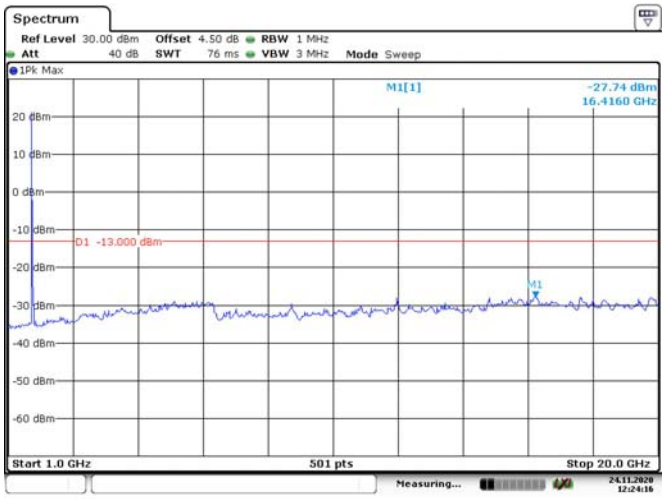
3M, QPSK, High Channel



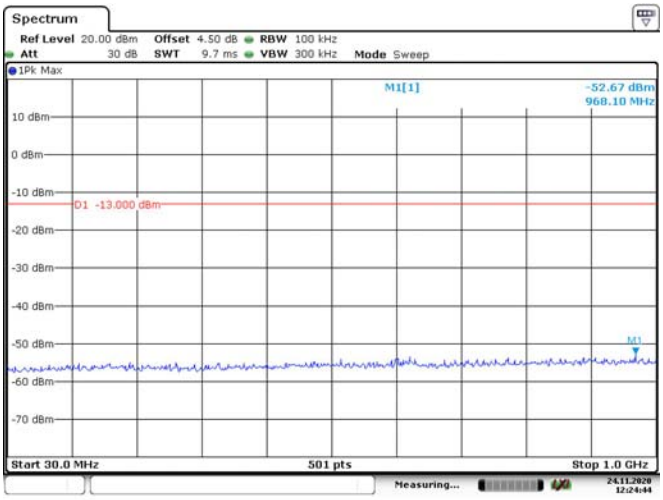


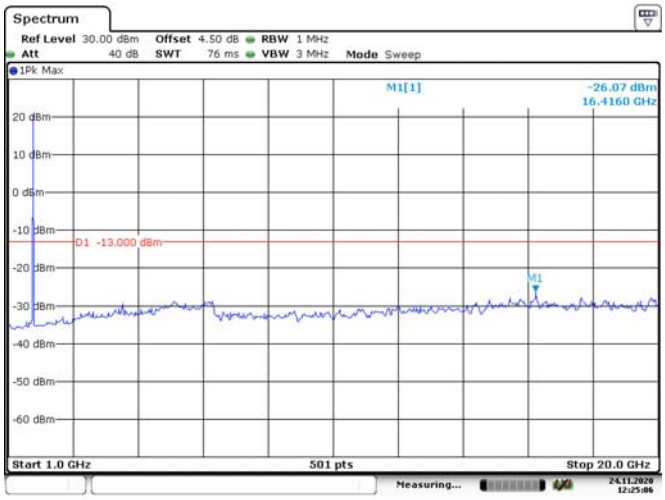
5M, QPSK, Low Channel



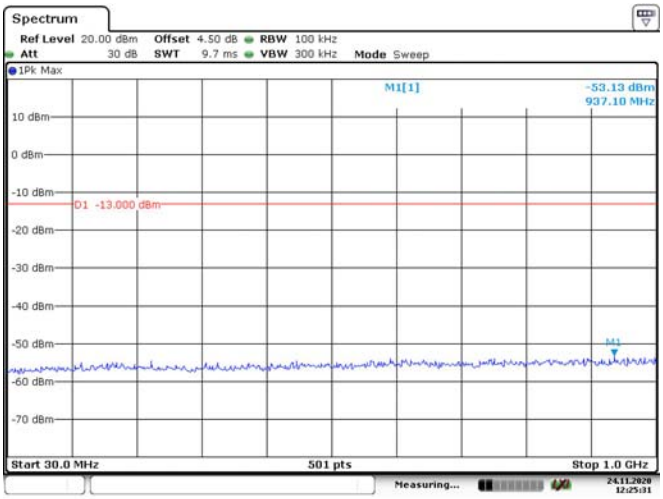


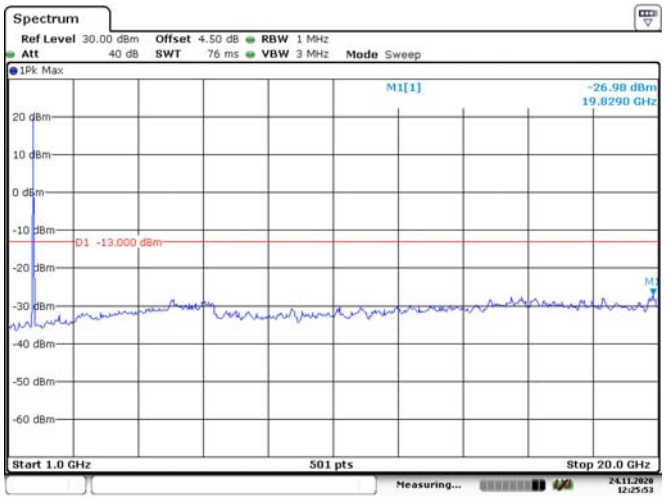
5M, QPSK, Middle Channel



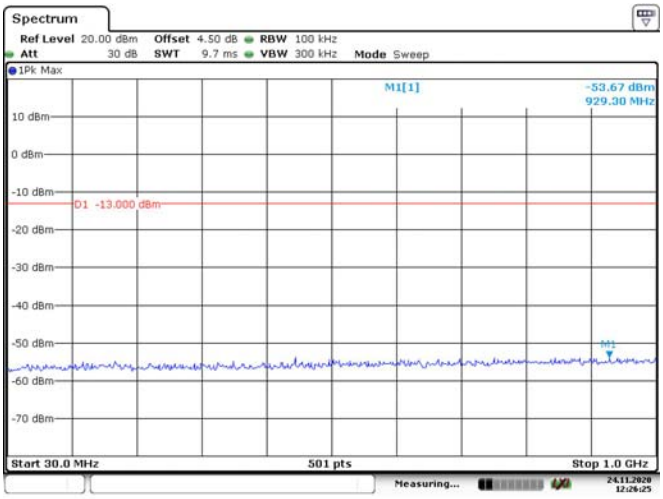


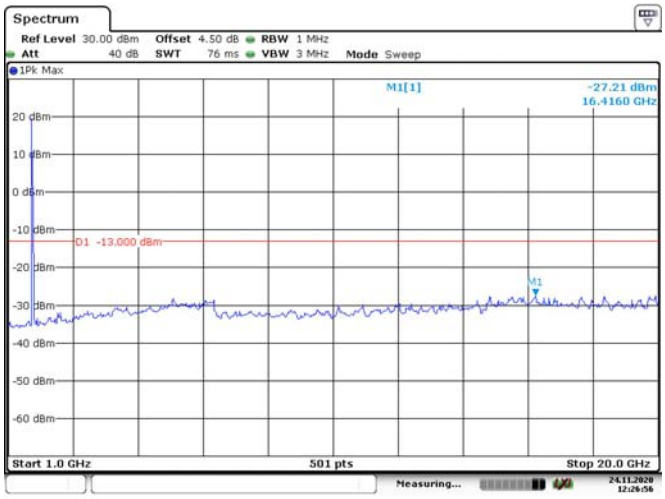
5M, QPSK, High Channel



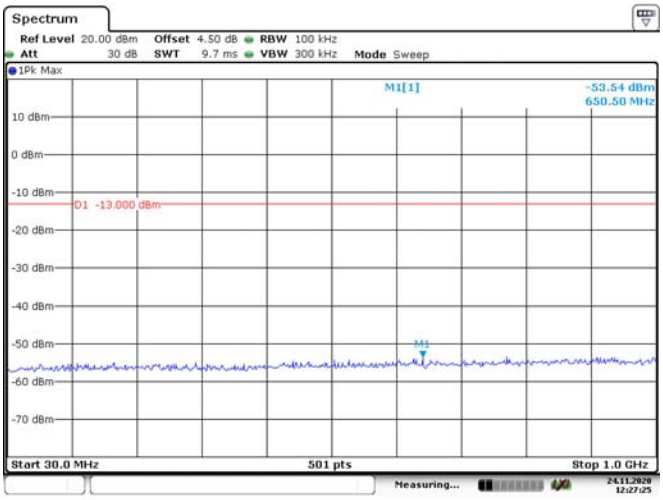


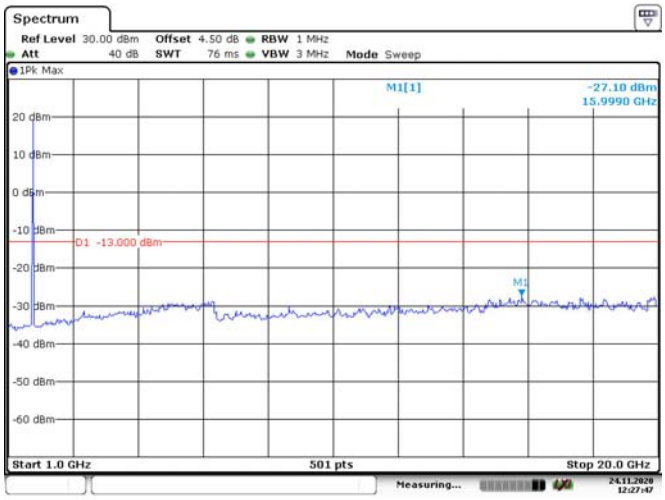
10M, QPSK, Low Channel



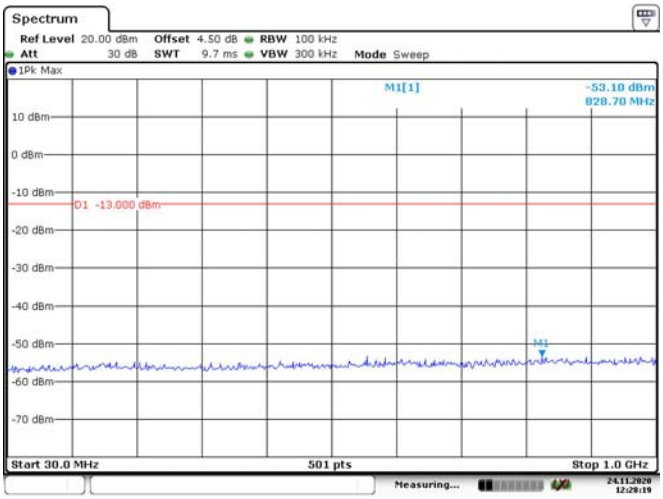


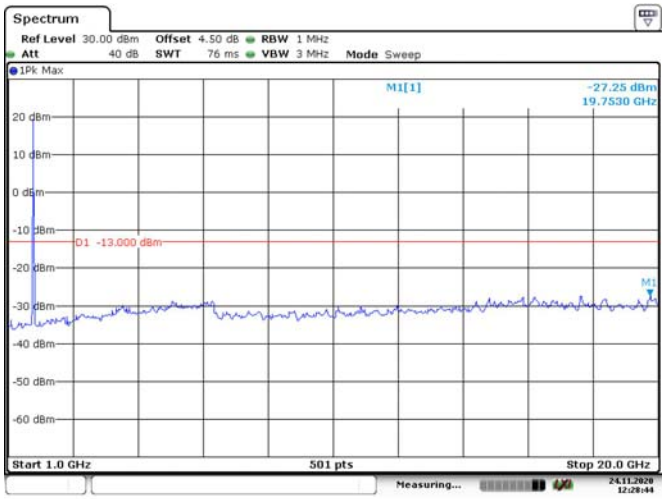
10M, QPSK, Middle Channel



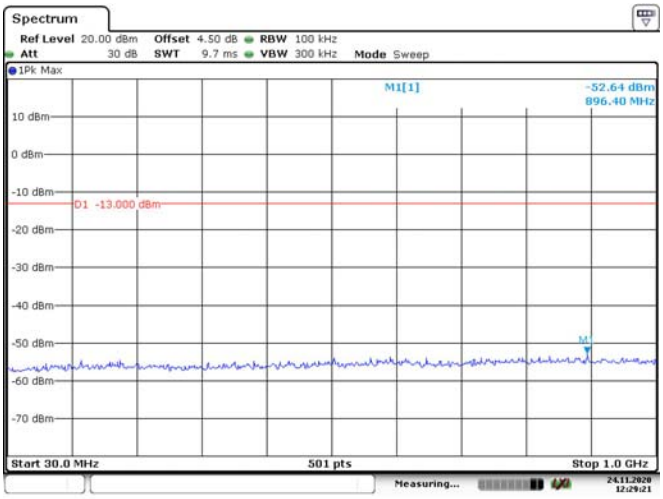


10M, QPSK, High Channel

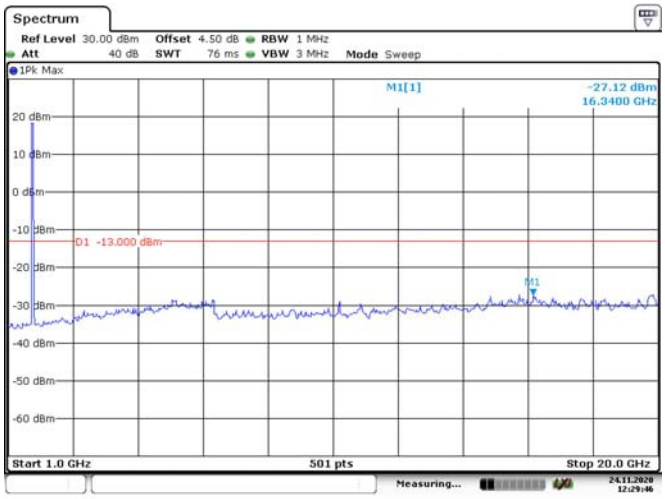




15M, QPSK, Low Channel

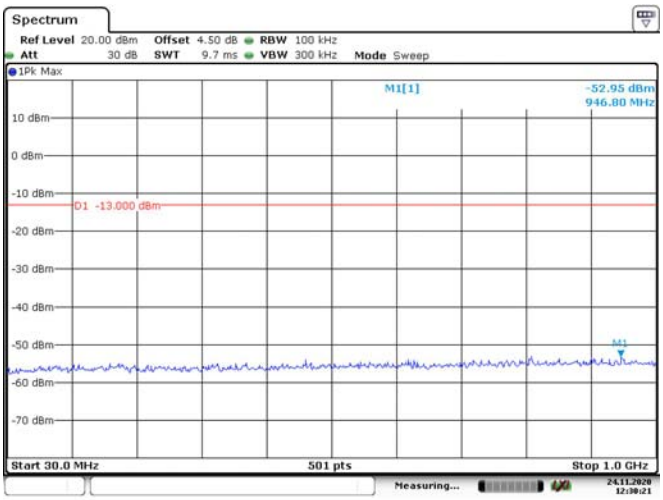


Date: 24.NOV.2020 12:29:21

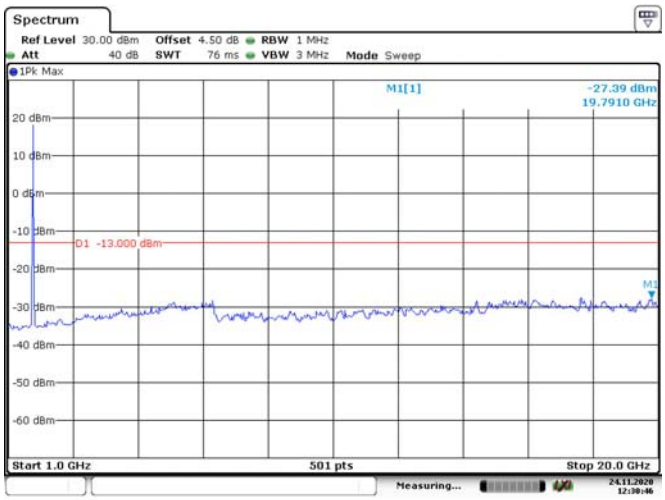


Date: 24.NOV.2020 12:29:47

15M, QPSK, Middle Channel

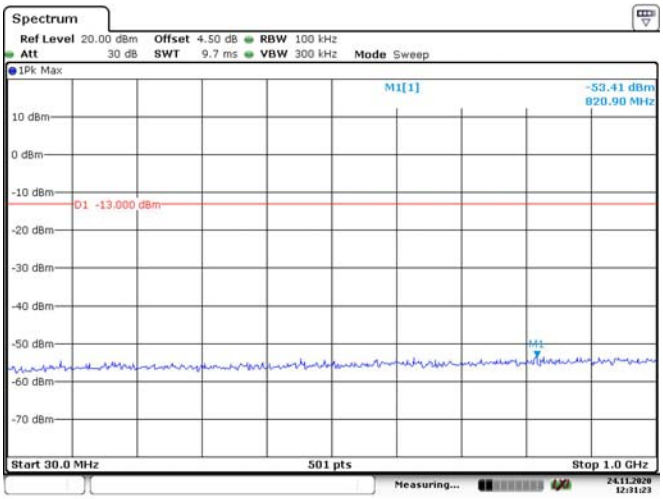


Date: 24.NOV.2020 12:30:21



Date: 24.NOV.2020 12:30:46

15M, QPSK, High Channel



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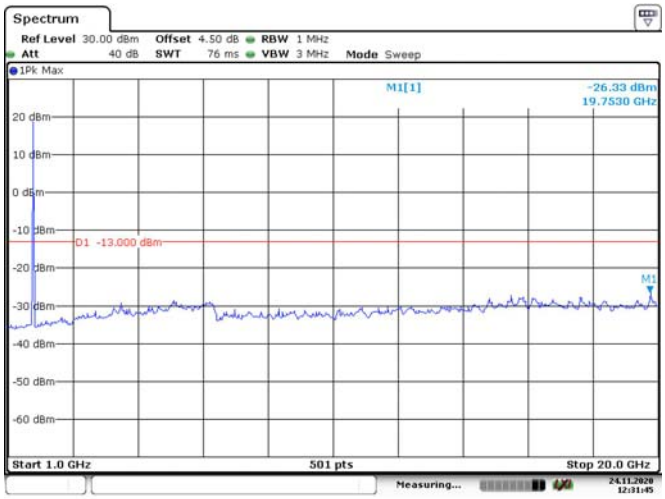
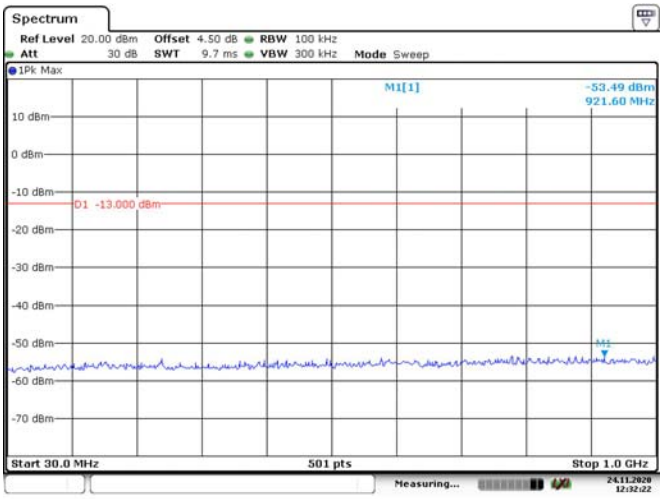
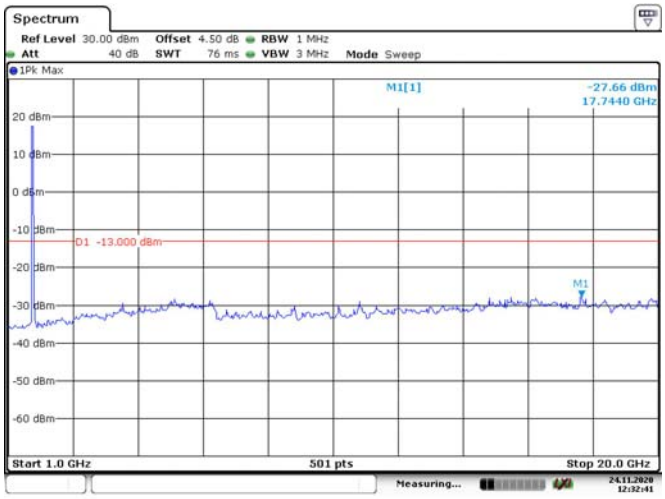


Date: 24.NOV.2020 12:31:46

20M, QPSK, Low Channel



Date: 24.NOV.2020 12:32:22



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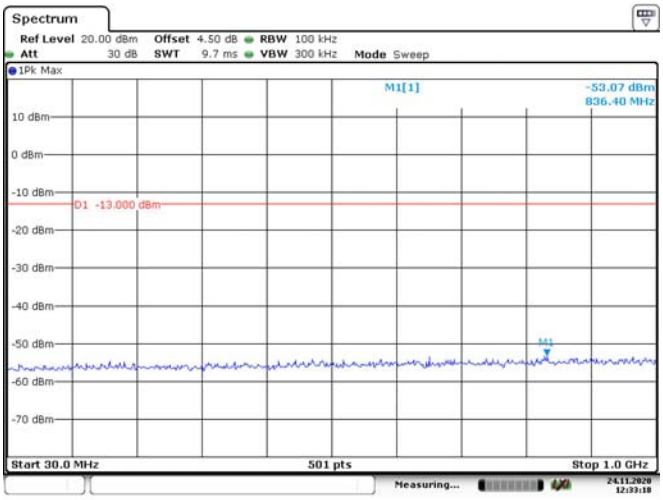
20M, QPSK, Middle Channel



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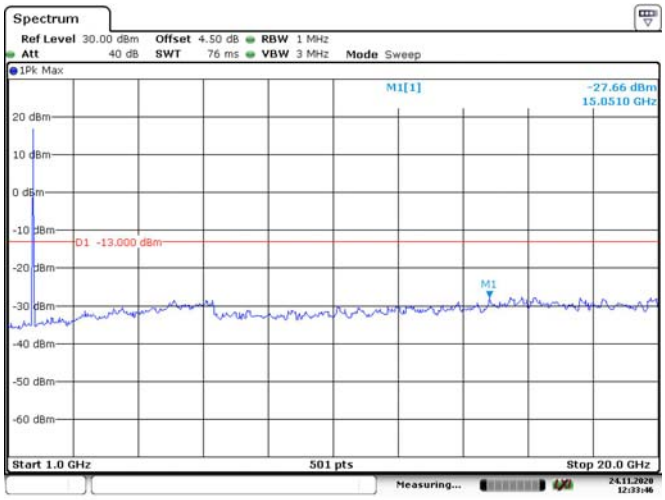

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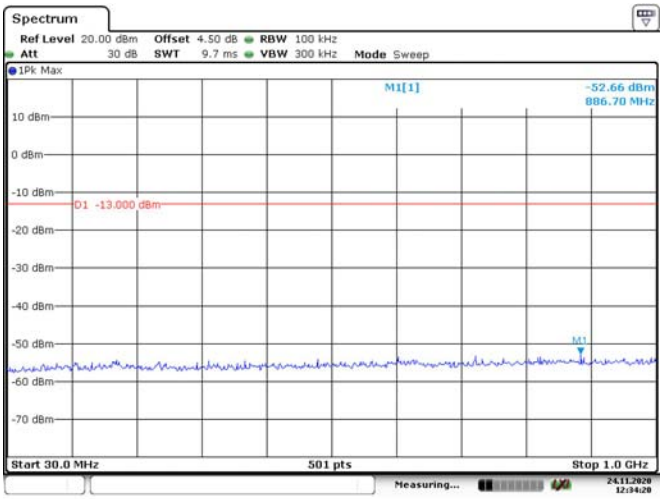
20M, QPSK, High Channel



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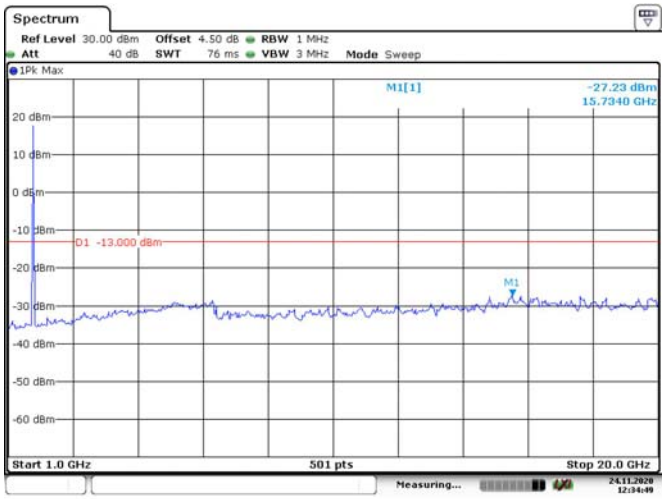


Date: 24.NOV.2020 12:34:49

FCC §2.1053, §22.917 & §24.238 & §27.53- SPURIOUS RADIATED EMISSIONS

Applicable Standard

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

Test Procedure

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

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

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

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2019-09-12	2020-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-09-24	2021-09-24
Sonoma	Amplifier	310N	185914	2020-10-13	2021-10-13
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2020-09-05	2021-09-05
Agilent	Signal Generator	E8247C	MY43321350	2019-12-10	2020-12-10
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2017-12-06	2020-12-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-2.4J2.4J-50	C-0700-02	2020-06-27	2021-06-27
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2020-09-05	2021-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2020-06-27	2021-06-27
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-02 1304	2020-12-06	2023-12-05
Sinoscite	Band-stop filter	BSF1850-1910MS-0935V2	0935V2	2020-06-16	2021-06-16
Sinoscite	Band-stop filter	BSF824-862MS-1438-001	1438001	2020-06-16	2021-06-16

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	27.7°C	21.1°C
Relative Humidity:	39 %	40 %
ATM Pressure:	100.9 kPa	102.2 kPa
Tester:	Asa Chen	Felix Wang
Test Date:	2020-09-08	2020-12-07

Test Result: Compliance.

EUT Operation Mode: Transmitting

Cellular Band (PART 22H)

30 MHz-10 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GPRS 850 Frequency:824.2MHz								
1648.40	H	58.19	-45.99	10.44	0.71	-36.26	-13.00	23.26
1648.40	V	58.89	-45.89	10.44	0.71	-36.16	-13.00	23.16
2472.60	H	49.97	-52.81	12.88	1.25	-41.18	-13.00	28.18
2472.60	V	47.98	-54.85	12.88	1.25	-43.22	-13.00	30.22
3296.80	H	42.36	-57.42	13.60	1.59	-45.41	-13.00	32.41
3296.80	V	45.91	-53.88	13.60	1.59	-41.87	-13.00	28.87
175.50	H	53.42	-57.71	0.00	0.24	-57.95	-13.00	44.95
299.66	V	47.61	-59.39	0.00	0.31	-59.70	-13.00	46.70
GPRS 850 Frequency:836.6MHz								
1673.20	H	55.65	-48.29	10.61	0.73	-38.41	-13.00	25.41
1673.20	V	56.63	-47.91	10.61	0.73	-38.03	-13.00	25.03
2509.80	H	49.36	-53.55	13.11	1.25	-41.69	-13.00	28.69
2509.80	V	46.72	-56.22	13.11	1.25	-44.36	-13.00	31.36
3346.40	H	38.17	-61.51	13.83	1.61	-49.29	-13.00	36.29
3346.40	V	43.19	-56.53	13.83	1.61	-44.31	-13.00	31.31
175.50	H	52.73	-58.40	0.00	0.24	-58.64	-13.00	45.64
299.66	V	47.40	-59.60	0.00	0.31	-59.91	-13.00	46.91
GPRS 850 Frequency:848.8MHz								
1697.60	H	54.69	-49.01	10.78	0.75	-38.98	-13.00	25.98
1697.60	V	51.49	-52.81	10.78	0.75	-42.78	-13.00	29.78
2546.40	H	47.80	-55.15	13.15	1.27	-43.27	-13.00	30.27
2546.40	V	44.76	-58.33	13.15	1.27	-46.45	-13.00	33.45
3395.20	H	38.99	-60.53	14.08	1.64	-48.09	-13.00	35.09
3395.20	V	39.07	-60.55	14.08	1.64	-48.11	-13.00	35.11
175.50	H	52.01	-59.12	0.00	0.24	-59.36	-13.00	46.36
299.66	V	47.44	-59.56	0.00	0.31	-59.87	-13.00	46.87

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
WCDMA Band 5 Frequency:826.4 MHz								
1652.80	H	37.58	-66.55	10.47	0.72	-56.80	-13.00	43.80
1652.80	V	39.93	-64.80	10.47	0.72	-55.05	-13.00	42.05
2479.20	H	37.48	-65.33	12.93	1.25	-53.65	-13.00	40.65
2479.20	V	37.21	-65.64	12.93	1.25	-53.96	-13.00	40.96
3305.60	H	36.54	-63.26	13.63	1.59	-51.22	-13.00	38.22
3305.60	V	36.87	-62.94	13.63	1.59	-50.90	-13.00	37.90
175.50	H	51.82	-59.31	0.00	0.24	-59.55	-13.00	46.55
299.66	V	47.15	-59.85	0.00	0.31	-60.16	-13.00	47.16
WCDMA Band 5 Frequency:836.6MHz								
1673.20	H	40.93	-63.01	10.61	0.73	-53.13	-13.00	40.13
1673.20	V	40.16	-64.38	10.61	0.73	-54.50	-13.00	41.50
2509.80	H	40.17	-62.74	13.11	1.25	-50.88	-13.00	37.88
2509.80	V	41.12	-61.82	13.11	1.25	-49.96	-13.00	36.96
3346.40	H	36.33	-63.35	13.83	1.61	-51.13	-13.00	38.13
3346.40	V	36.04	-63.68	13.83	1.61	-51.46	-13.00	38.46
175.50	H	51.70	-59.43	0.00	0.24	-59.67	-13.00	46.67
299.66	V	47.76	-59.24	0.00	0.31	-59.55	-13.00	46.55
WCDMA Band 5 Frequency:846.6MHz								
1693.20	H	41.02	-62.73	10.75	0.75	-52.73	-13.00	39.73
1693.20	V	42.07	-62.28	10.75	0.75	-52.28	-13.00	39.28
2539.80	H	38.62	-64.32	13.14	1.27	-52.45	-13.00	39.45
2539.80	V	36.93	-66.13	13.14	1.27	-54.26	-13.00	41.26
3386.40	H	36.69	-62.86	14.03	1.63	-50.46	-13.00	37.46
3386.40	V	36.41	-63.23	14.03	1.63	-50.83	-13.00	37.83
175.50	H	51.54	-59.59	0.00	0.24	-59.83	-13.00	46.83
299.66	V	48.18	-58.82	0.00	0.31	-59.13	-13.00	46.13

PCS Band (PART 24E)

30 MHz-20 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GPRS 1900 Frequency:1850.2MHz								
3700.40	H	42.69	-55.30	14.00	1.83	-43.13	-13.00	30.13
3700.40	V	41.87	-56.10	14.00	1.83	-43.93	-13.00	30.93
5550.60	H	43.56	-50.41	13.95	1.27	-37.73	-13.00	24.73
5550.60	V	45.32	-48.50	13.95	1.27	-35.82	-13.00	22.82
175.50	H	54.17	-56.96	0.00	0.24	-57.20	-13.00	44.20
299.66	V	46.19	-60.81	0.00	0.31	-61.12	-13.00	48.12
GPRS 1900 Frequency:1880MHz								
3760.00	H	38.17	-59.47	13.76	1.63	-47.34	-13.00	34.34
3760.00	V	38.21	-59.29	13.76	1.63	-47.16	-13.00	34.16
5640.00	H	43.28	-50.31	14.02	1.31	-37.60	-13.00	24.60
5640.00	V	44.60	-48.88	14.02	1.31	-36.17	-13.00	23.17
175.50	H	52.88	-58.25	0.00	0.24	-58.49	-13.00	45.49
299.66	V	47.14	-59.86	0.00	0.31	-60.17	-13.00	47.17
GPRS 1900 Frequency:1909.8MHz								
3819.60	H	36.89	-60.36	13.56	1.50	-48.30	-13.00	35.30
3819.60	V	37.66	-59.41	13.56	1.50	-47.35	-13.00	34.35
5729.40	H	40.37	-53.34	13.96	1.31	-40.69	-13.00	27.69
5729.40	V	43.55	-50.13	13.96	1.31	-37.48	-13.00	24.48
175.50	H	51.78	-59.35	0.00	0.24	-59.59	-13.00	46.59
299.66	V	47.47	-59.53	0.00	0.31	-59.84	-13.00	46.84

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
WCDMA Band II, Frequency:1852.4 MHz								
3704.80	H	42.39	-55.57	13.98	1.81	-43.40	-13.00	30.40
3704.80	V	43.14	-54.79	13.98	1.81	-42.62	-13.00	29.62
5557.20	H	43.57	-50.32	13.97	1.27	-37.62	-13.00	24.62
5557.20	V	42.93	-50.81	13.97	1.27	-38.11	-13.00	25.11
175.50	H	51.05	-60.08	0.00	0.24	-60.32	-13.00	47.32
299.66	V	46.96	-60.04	0.00	0.31	-60.35	-13.00	47.35
WCDMA Band II, Frequency:1880 MHz								
3760.00	H	39.62	-58.02	13.76	1.63	-45.89	-13.00	32.89
3760.00	V	42.68	-54.82	13.76	1.63	-42.69	-13.00	29.69
5640.00	H	40.15	-53.44	14.02	1.31	-40.73	-13.00	27.73
5640.00	V	35.87	-57.61	14.02	1.31	-44.90	-13.00	31.90
175.50	H	51.71	-59.42	0.00	0.24	-59.66	-13.00	46.66
299.66	V	47.25	-59.75	0.00	0.31	-60.06	-13.00	47.06
WCDMA Band II, Frequency:1907.6MHz								
3815.20	H	40.31	-56.97	13.57	1.50	-44.90	-13.00	31.90
3815.20	V	43.54	-53.56	13.57	1.50	-41.49	-13.00	28.49
5722.80	H	39.28	-54.48	13.95	1.32	-41.85	-13.00	28.85
5722.80	V	40.75	-52.97	13.95	1.32	-40.34	-13.00	27.34
175.50	H	53.02	-58.11	0.00	0.24	-58.35	-13.00	45.35
299.66	V	46.86	-60.14	0.00	0.31	-60.45	-13.00	47.45

Note:
1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
3) Margin = Limit-Absolute Level

LTE Band 2 (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:1850.7 MHz								
3701.40	H	42.24	-55.74	13.99	1.83	-43.58	-13.00	30.58
3701.40	V	43.60	-54.36	13.99	1.83	-42.20	-13.00	29.20
5552.10	H	43.17	-50.78	13.96	1.27	-38.09	-13.00	25.09
5552.10	V	46.52	-47.28	13.96	1.27	-34.59	-13.00	21.59
802.12	H	55.98	-42.49	0.00	0.49	-42.98	-13.00	29.98
37.76	V	56.10	-28.11	-25.32	0.09	-53.52	-13.00	40.52
QPSK,Frequency:1880 MHz								
3760.00	H	41.27	-56.37	13.76	1.63	-44.24	-13.00	31.24
3760.00	V	43.02	-54.48	13.76	1.63	-42.35	-13.00	29.35
5640.00	H	38.90	-54.69	14.02	1.31	-41.98	-13.00	28.98
5640.00	V	44.83	-48.65	14.02	1.31	-35.94	-13.00	22.94
802.12	H	55.42	-43.05	0.00	0.49	-43.54	-13.00	30.54
39.70	V	56.23	-30.71	-26.26	0.08	-57.05	-13.00	44.05
QPSK,Frequency:1909.3 MHz								
3818.60	H	44.03	-53.23	13.56	1.50	-41.17	-13.00	28.17
3818.60	V	44.41	-52.66	13.56	1.50	-40.60	-13.00	27.60
5727.90	H	40.61	-53.11	13.96	1.31	-40.46	-13.00	27.46
5727.90	V	42.73	-50.96	13.96	1.31	-38.31	-13.00	25.31
802.12	H	55.38	-43.09	0.00	0.49	-43.58	-13.00	30.58
38.67	V	56.98	-28.51	-25.76	0.09	-54.36	-13.00	41.36

LTE Band 4 (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:1710.7 MHz								
3421.40	H	46.26	-53.14	14.04	1.63	-40.73	-13.00	27.73
3421.40	V	44.25	-55.23	14.04	1.63	-42.82	-13.00	29.82
5132.10	H	51.59	-43.09	13.93	1.37	-30.53	-13.00	17.53
5132.10	V	52.67	-41.92	13.93	1.37	-29.36	-13.00	16.36
802.12	H	55.85	-42.62	0.00	0.49	-43.11	-13.00	30.11
39.32	V	56.67	-29.73	-26.07	0.08	-55.88	-13.00	42.88
QPSK,Frequency:1732.5 MHz								
3465.00	H	40.78	-58.41	13.91	1.62	-46.12	-13.00	33.12
3465.00	V	41.76	-57.46	13.91	1.62	-45.17	-13.00	32.17
5197.50	H	42.88	-51.81	14.00	1.52	-39.33	-13.00	26.33
5197.50	V	43.67	-51.09	14.00	1.52	-38.61	-13.00	25.61
802.12	H	56.07	-42.40	0.00	0.49	-42.89	-13.00	29.89
39.67	V	56.38	-30.52	-26.24	0.08	-56.84	-13.00	43.84
QPSK,Frequency:1754.3 MHz								
3508.60	H	43.60	-55.41	13.83	1.60	-43.18	-13.00	30.18
3508.60	V	44.13	-54.88	13.83	1.60	-42.65	-13.00	29.65
5262.90	H	40.29	-54.80	14.19	1.29	-41.90	-13.00	28.90
5262.90	V	42.23	-52.94	14.19	1.29	-40.04	-13.00	27.04
802.12	H	55.98	-42.49	0.00	0.49	-42.98	-13.00	29.98
39.78	V	56.37	-30.68	-26.29	0.08	-57.05	-13.00	44.05

Note:
1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
3) Margin = Limit-Absolute Level

FCC §22.917(a) & §24.238(a) & §27.53 - BAND EDGES

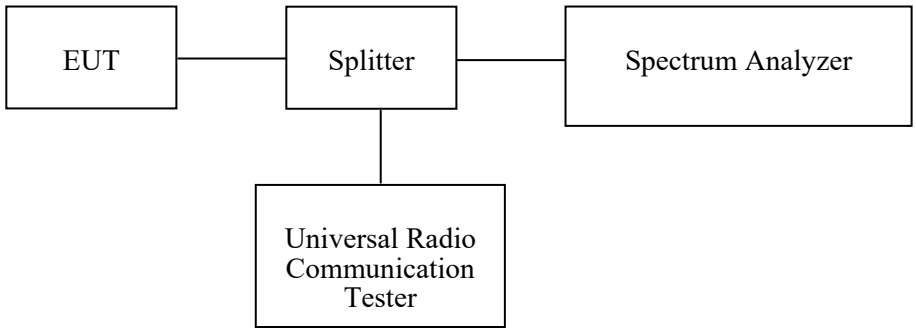
Applicable Standard

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

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2020-07-07	2021-07-07
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	Each time	N/A
Unknown	Attenuator	UNAT-3+	15529	Each time	N/A
E-Microwave	Two-way Spliter	ODP-1-6-2S	OE0120142	Each time	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

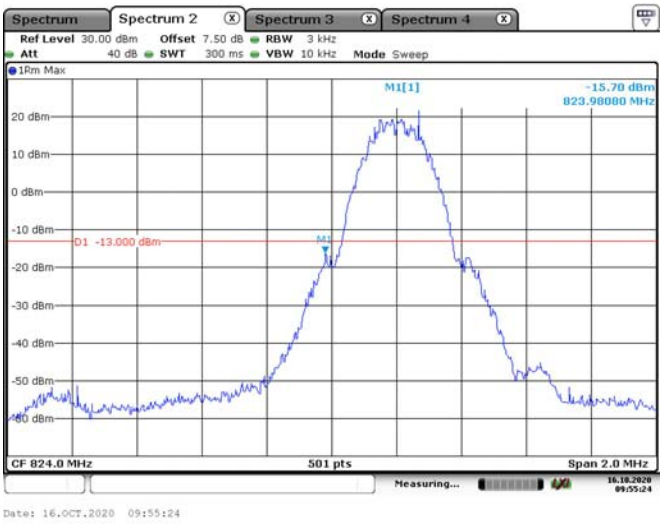
Test Data

Environmental Conditions

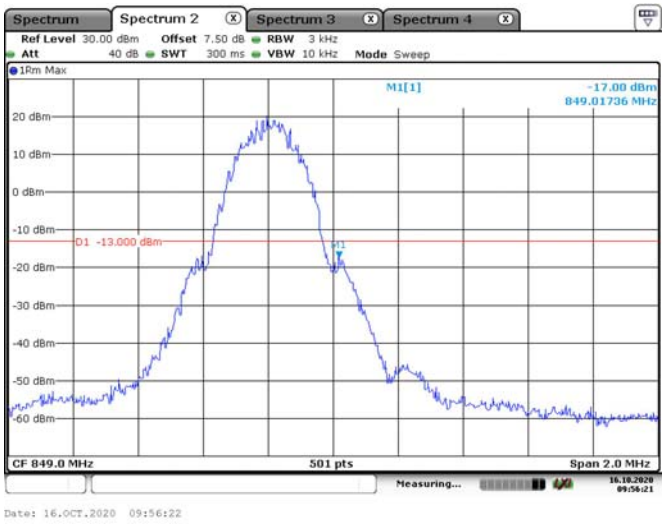
Temperature:	23.8~ 29.8 °C
Relative Humidity:	32~64%
ATM Pressure:	100.6~101.9kPa
Tester:	Rita Huang
Test Date:	2020.10.16-2020.11.24

Test Mode: Transmitting
Test Result: Compliance. Please refer to the following plots.

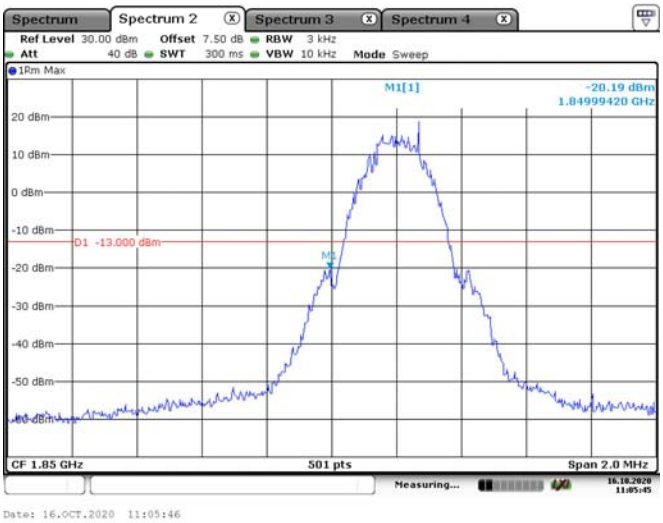
GPRS 850, Left Band Edge



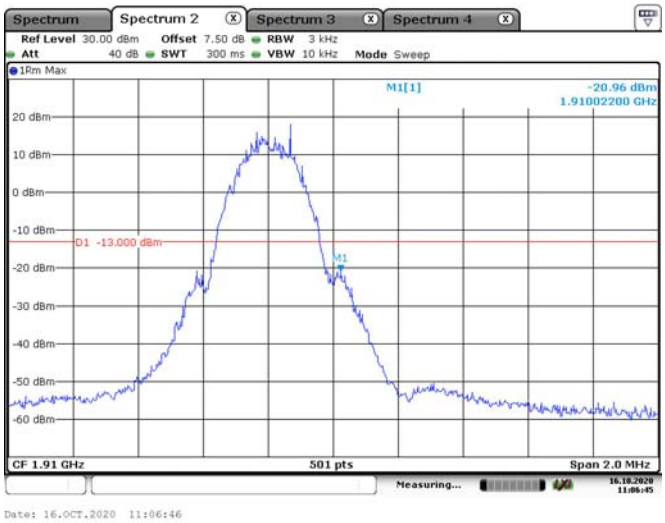
GPRS 850, Right Band Edge



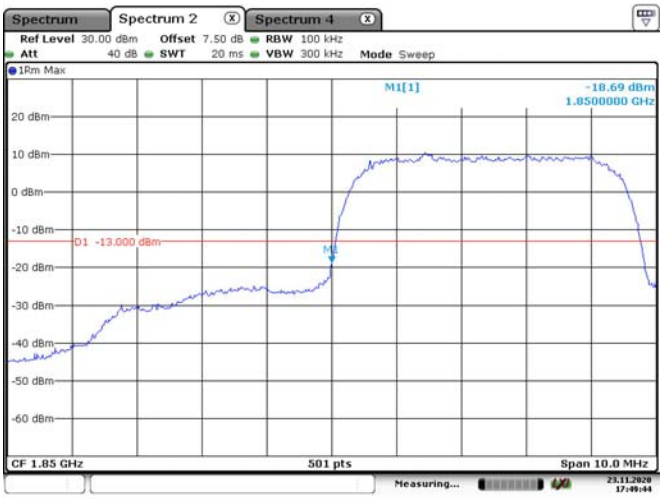
GPRS 1900, Left Band Edge



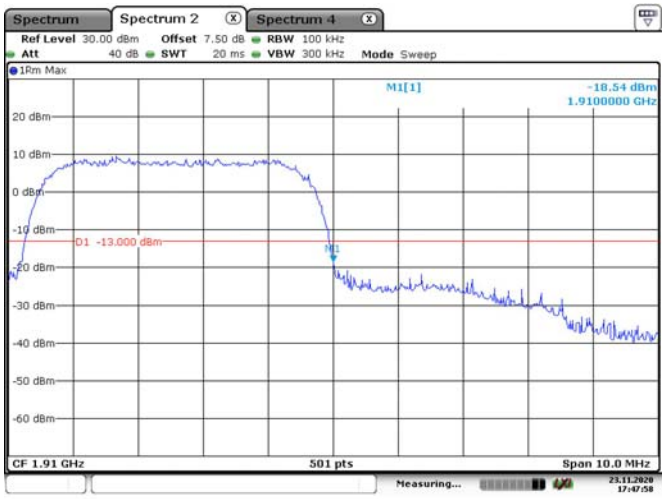
GPRS 1900, Right Band Edge



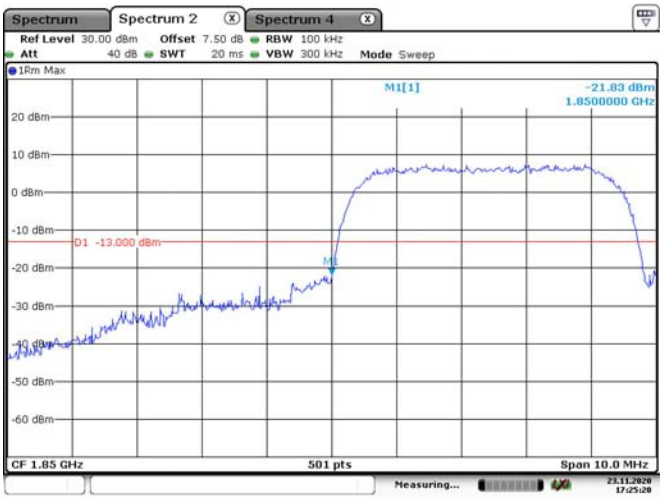
WCDMA Band II,Rel99, Left Band Edge



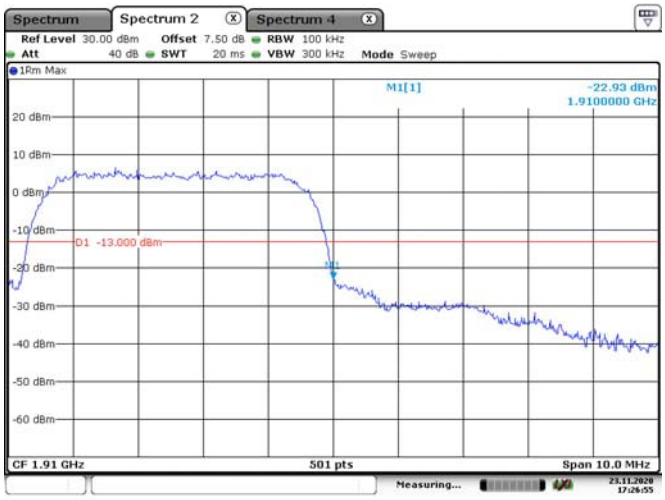
WCDMA Band II,Rel99, Right Band Edge



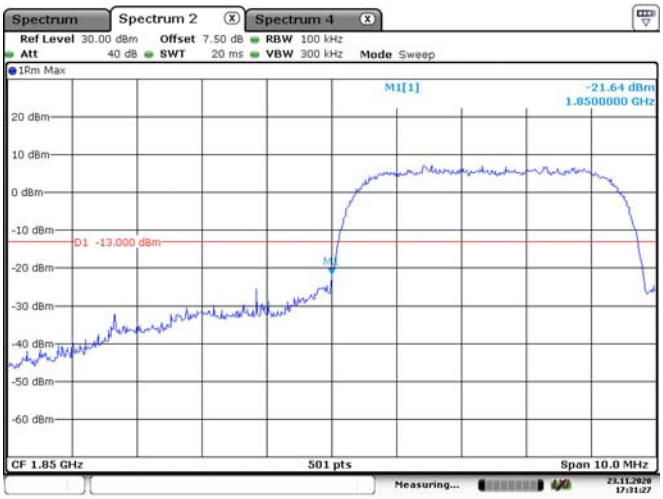
WCDMA Band II,HSDPA, Left Band Edge



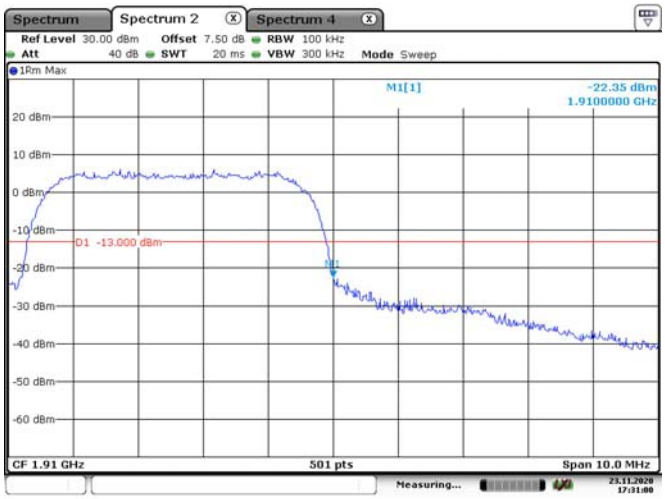
WCDMA Band II,HSDPA,Right Band Edge



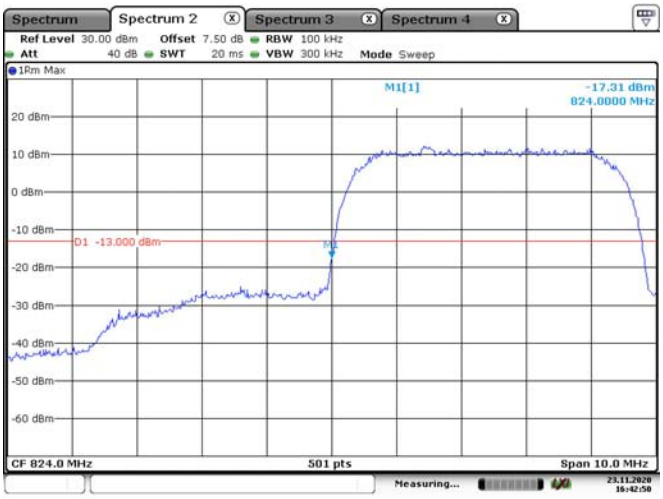
WCDMA Band II,HSUPA, Left Band Edge



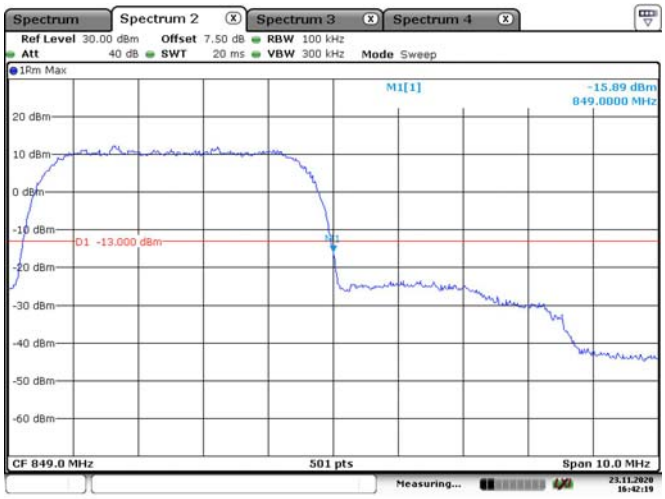
WCDMA Band II,HSUPA, Right Band Edge



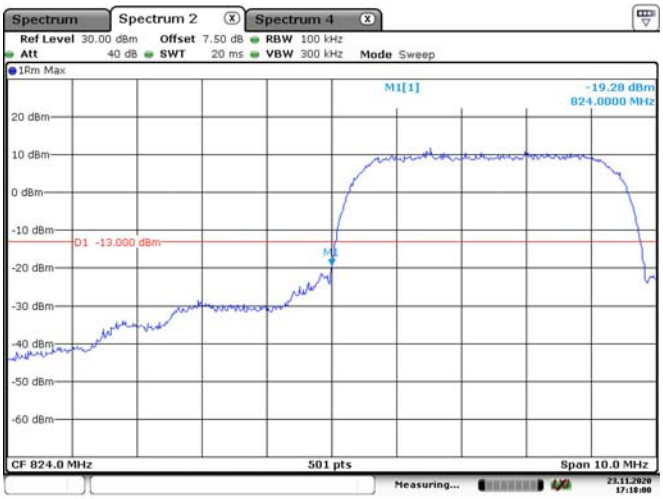
WCDMA Band V,Rel99, Left Band Edge



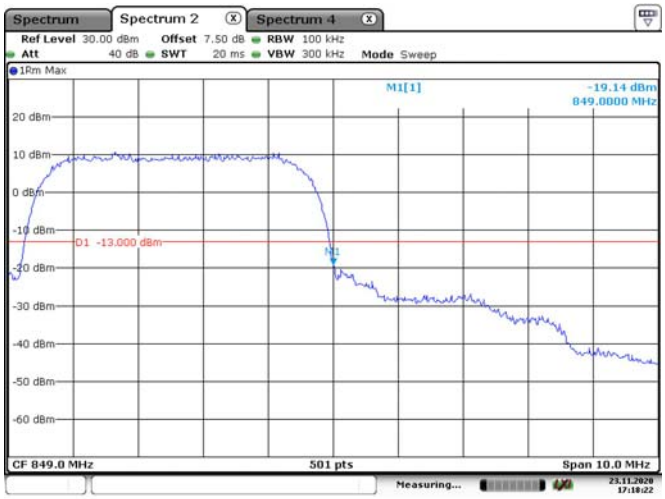
WCDMA Band V,Rel99, Right Band Edge



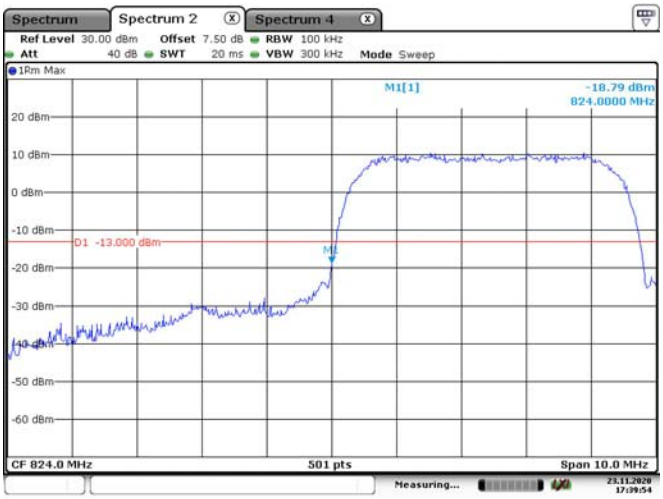
WCDMA Band V,HSDPA, Left Band Edge



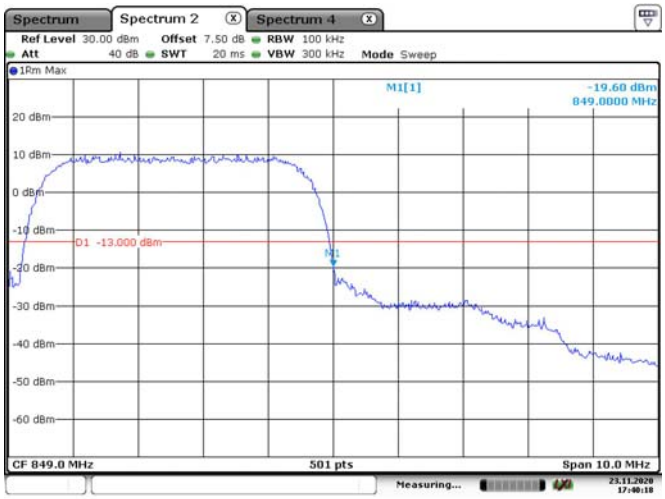
WCDMA Band V,HSDPA,Right Band Edge



WCDMA Band V,HSUPA, Left Band Edge

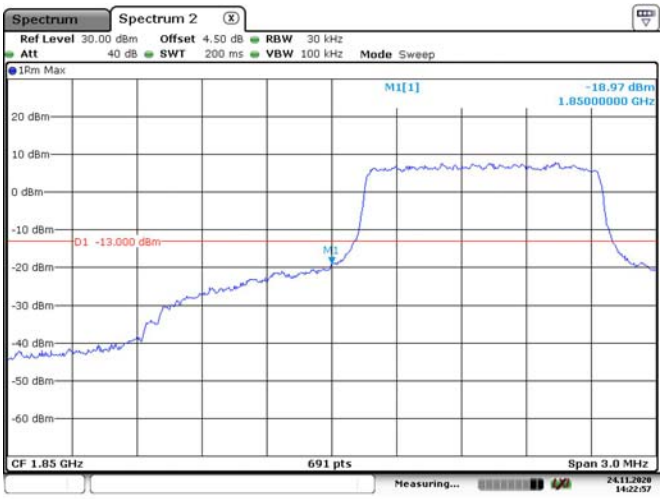


WCDMA Band V,HSUPA, Right Band Edge



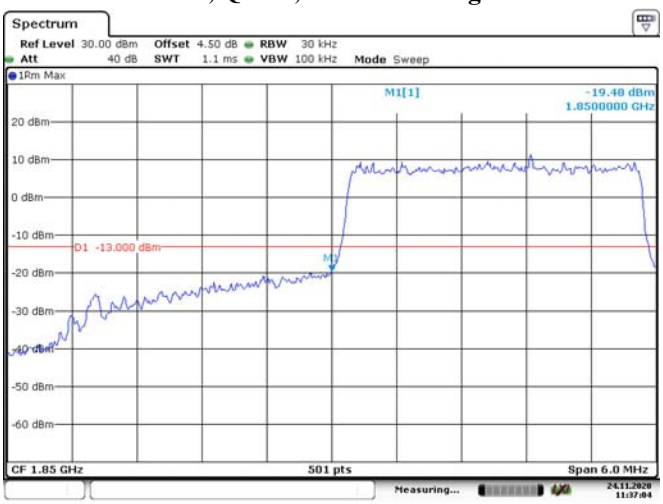
LTE Band 2:

1.4M, QPSK, Left Band Edge

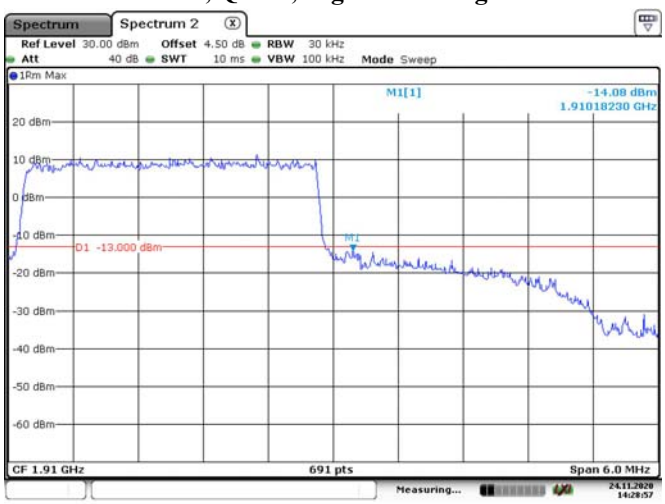


1.4M, QPSK, Right Band Edge

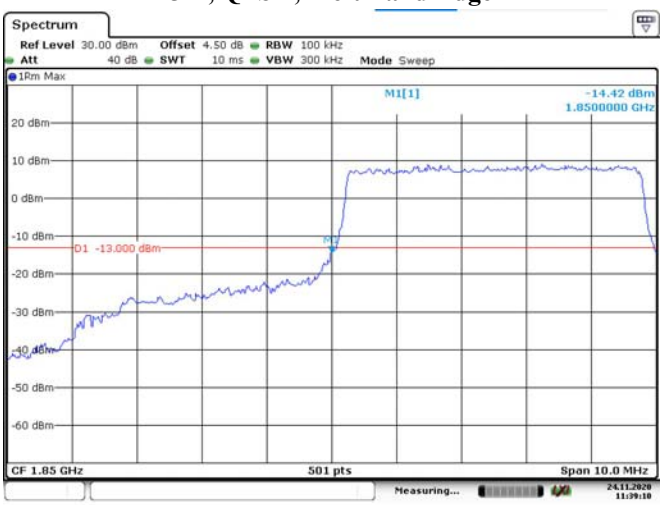
3M, QPSK, Left Band Edge



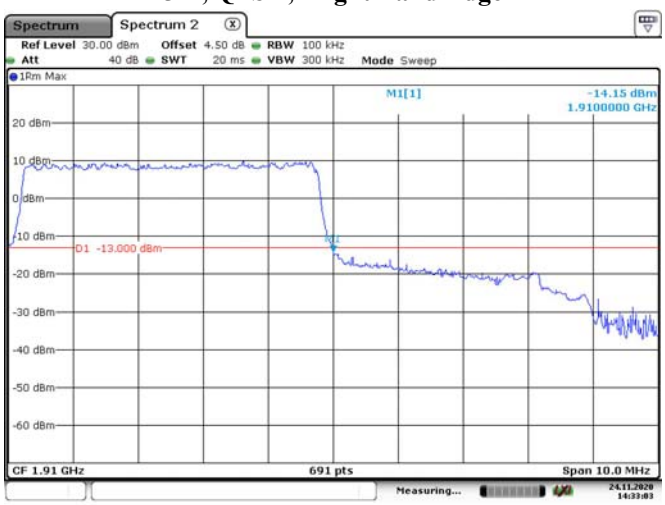
3M, QPSK, Right Band Edge



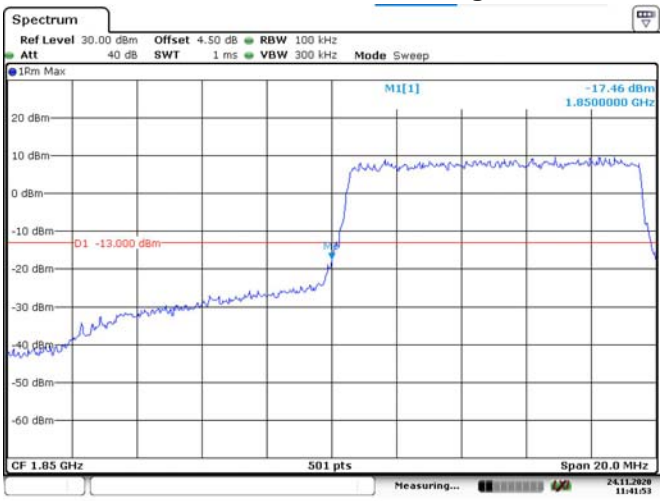
5M, QPSK, Left Band Edge



5M, QPSK, Right Band Edge

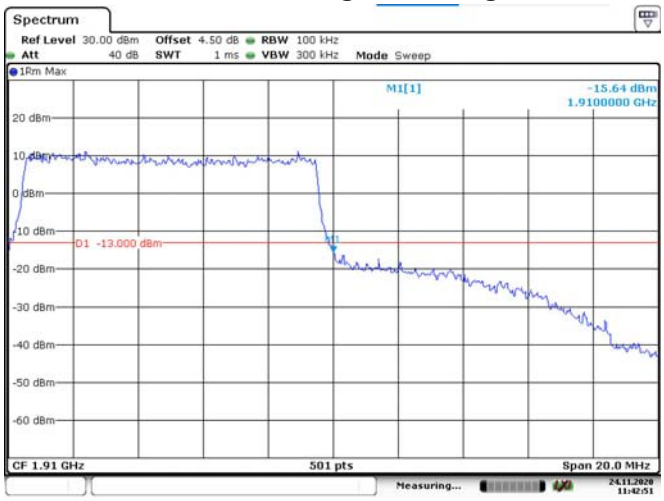


10M, QPSK, Left Band Edge



Date: 24.NOV.2020 11:41:53

10M, QPSK, Right Band Edge



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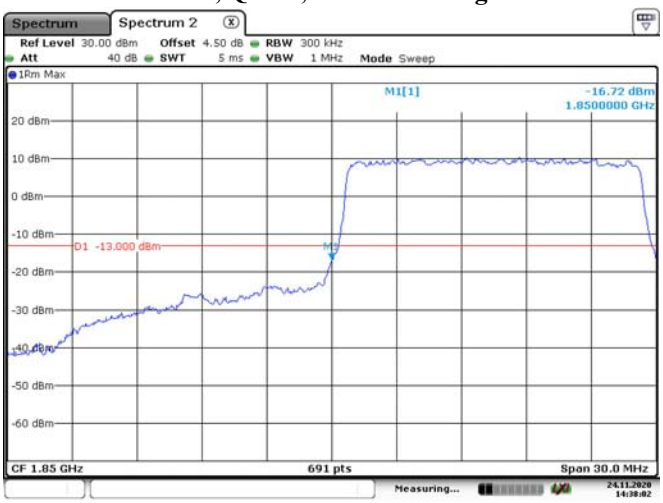
15M, QPSK, Left Band Edge



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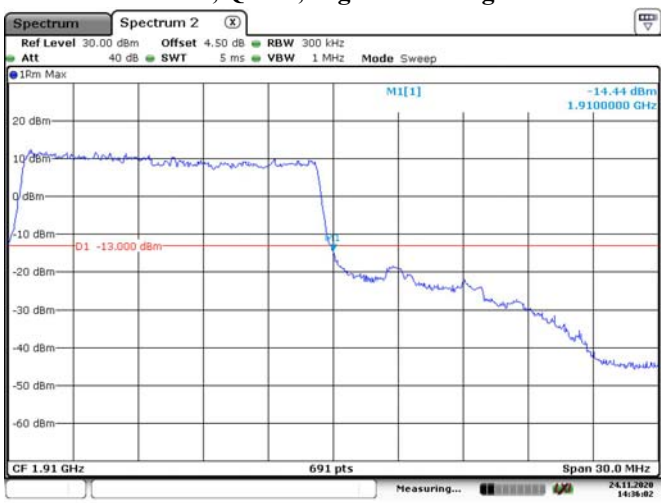
15M, QPSK, Right Band Edge



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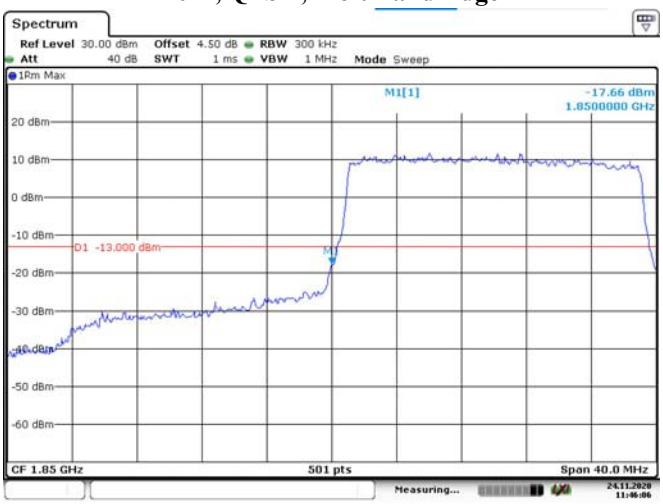
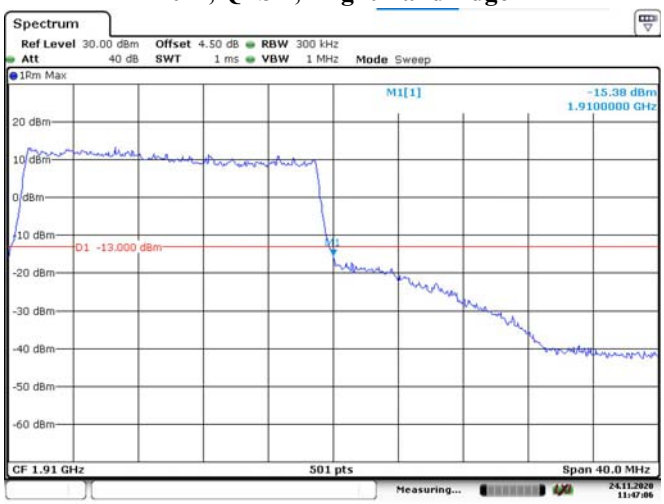
20M, QPSK, Left Band Edge



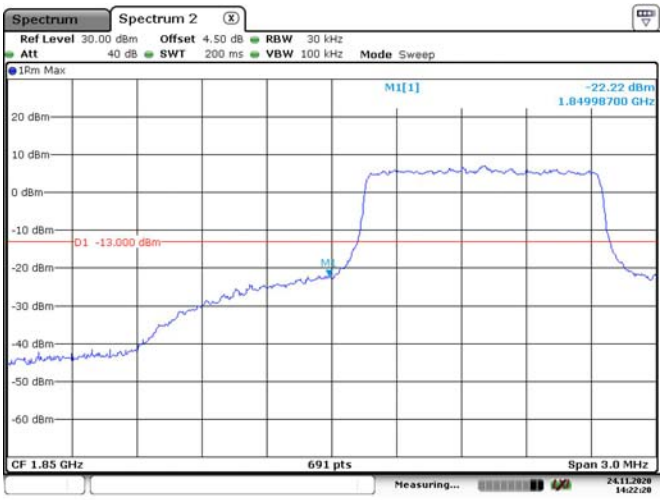
Date: 24.NOV.2020 11:46:07

20M, QPSK, Right Band Edge



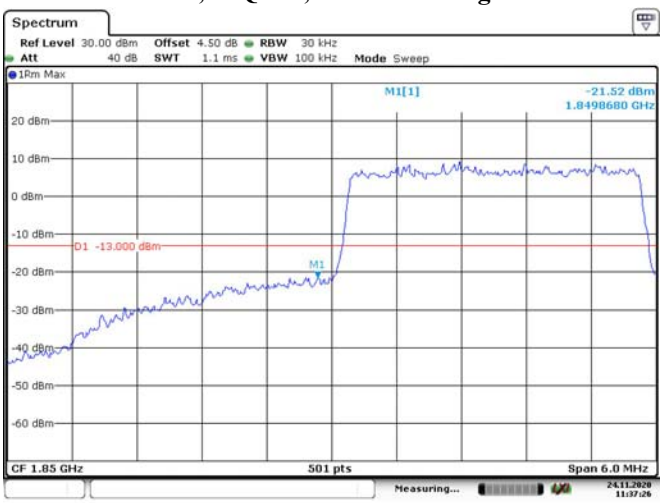
Date: 24.NOV.2020 11:47:06

1.4M, 16QAM, Left Band Edge



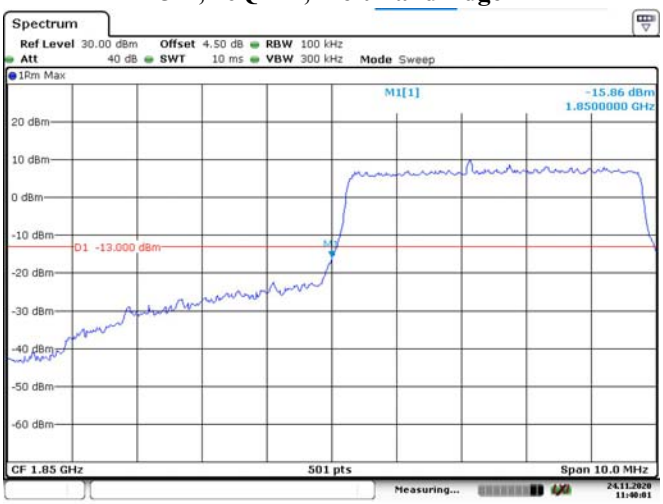
1.4M, 16QAM, Right Band Edge

3M, 16QAM, Left Band Edge

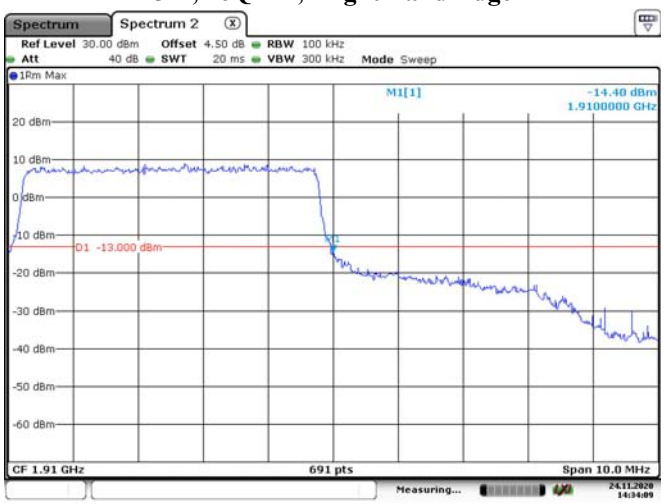


3M, 16QAM, Right Band Edge

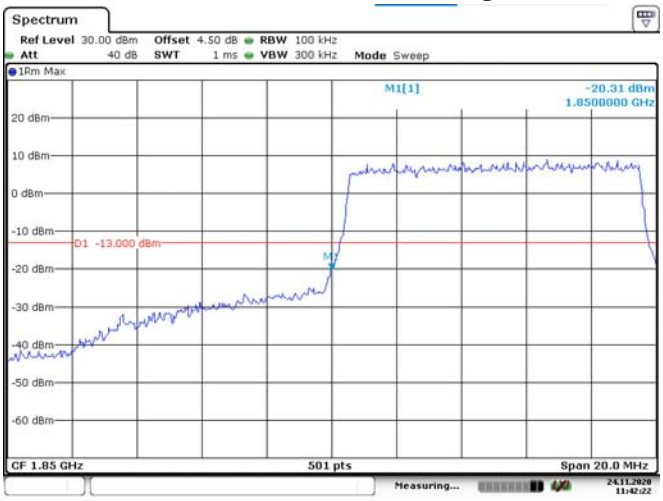
5M, 16QAM, Left Band Edge



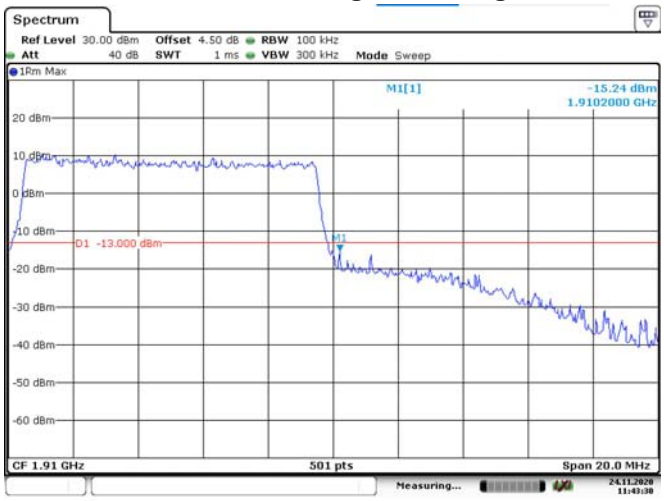
5M, 16QAM, Right Band Edge



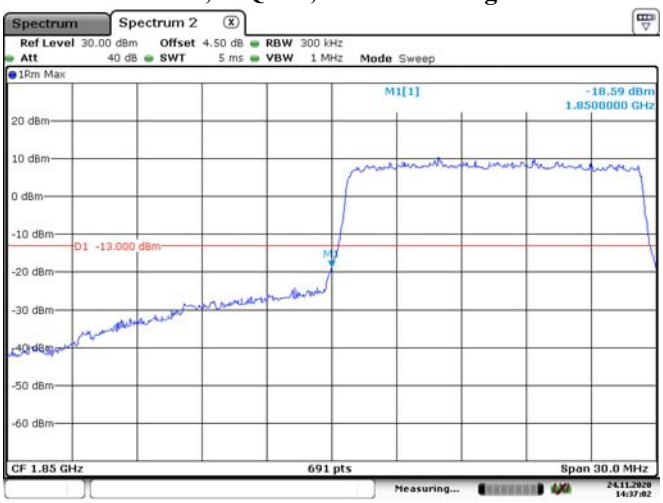
10M, 16QAM, Left Band Edge



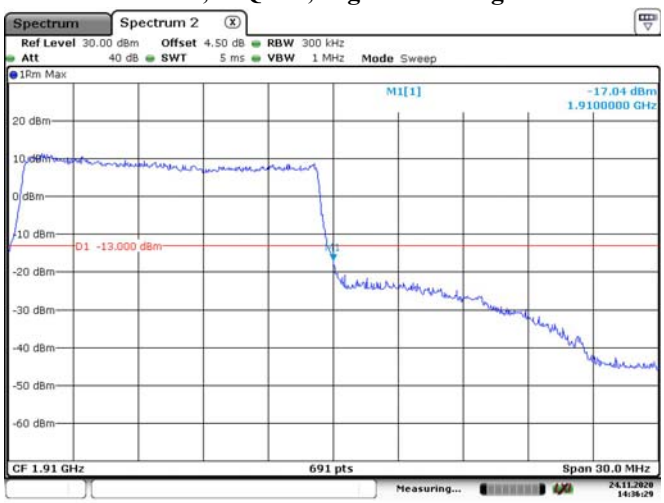
10M, 16QAM, Right Band Edge



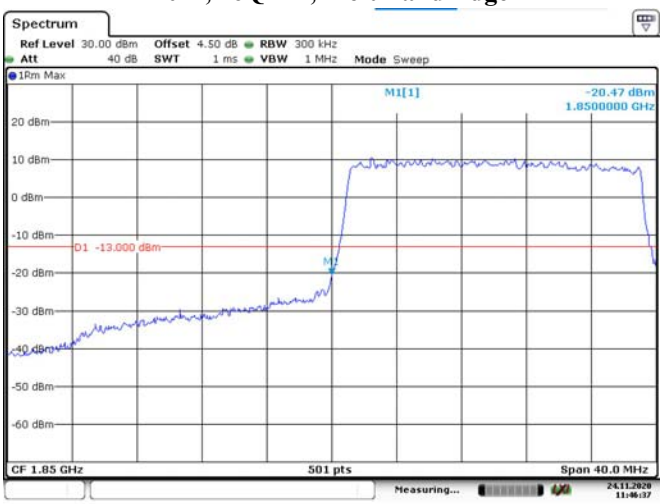
15M, 16QAM, Left Band Edge



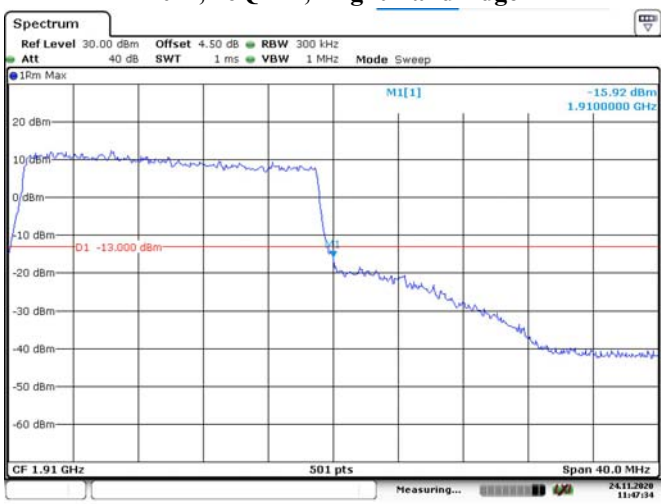
15M, 16QAM, Right Band Edge



20M, 16QAM, Left Band Edge

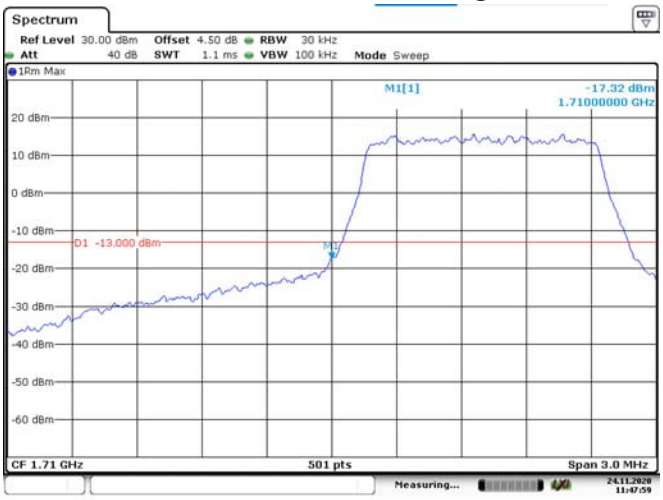


20M, 16QAM, Right Band Edge

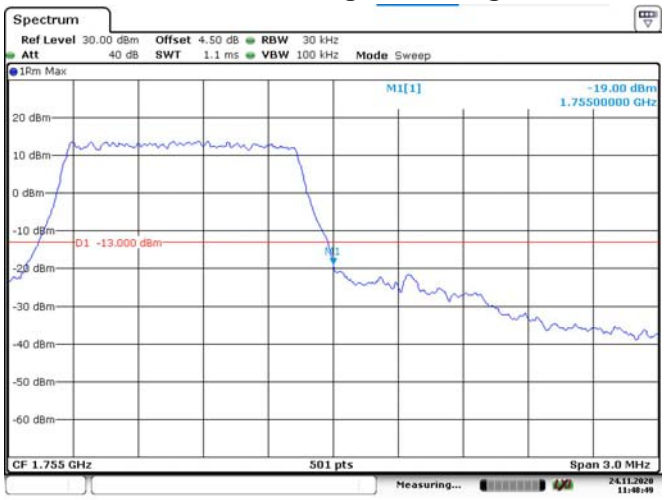


LTE Band 4:

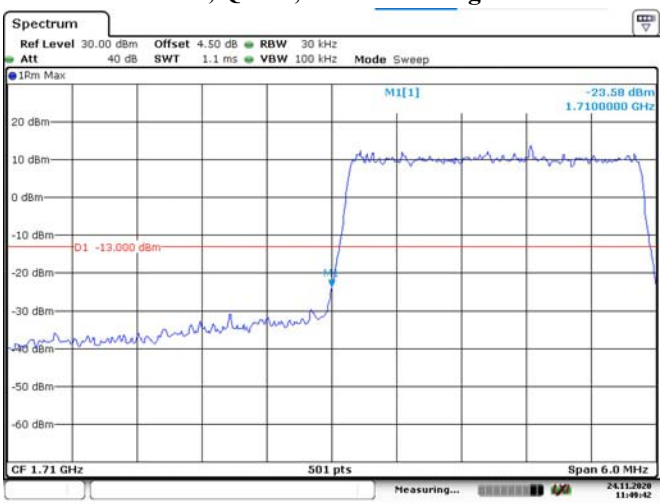
1.4M, QPSK, Left Band Edge



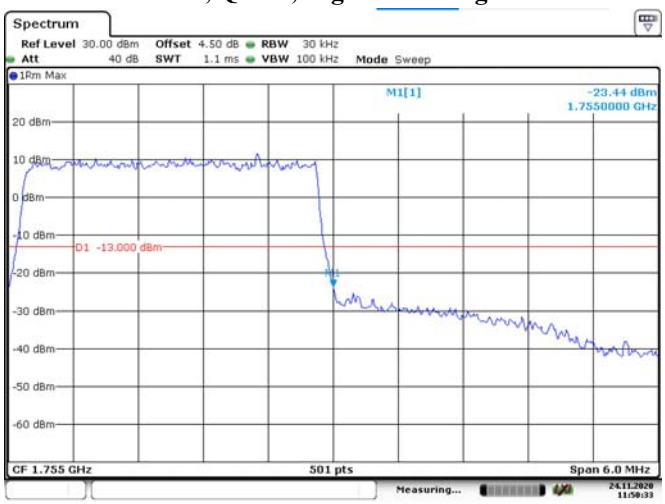
1.4M, QPSK, Right Band Edge



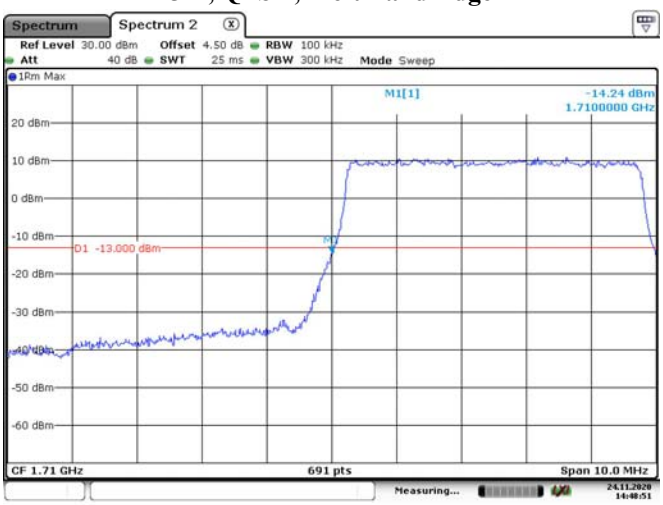
3M, QPSK, Left Band Edge



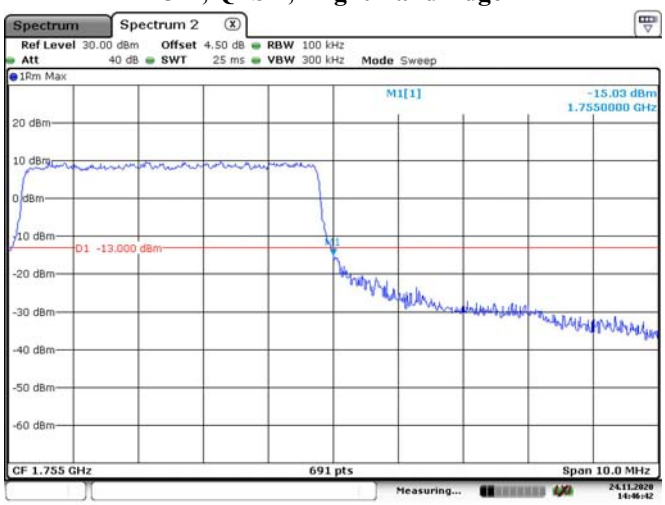
3M, QPSK, Right Band Edge



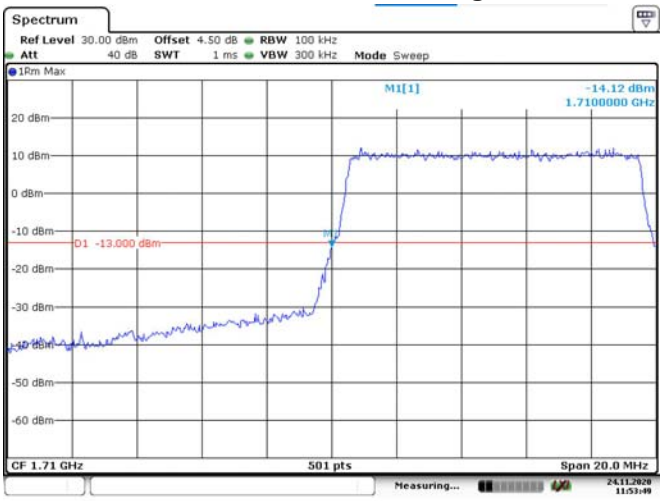
5M, QPSK, Left Band Edge



5M, QPSK, Right Band Edge



10M, QPSK, Left Band Edge



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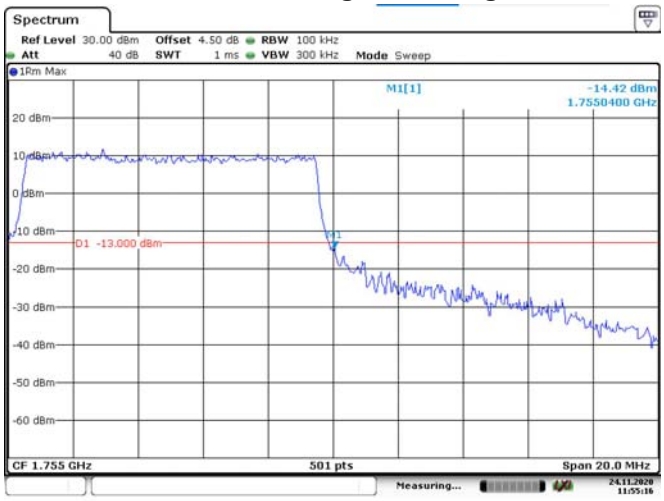
10M, QPSK, Right Band Edge



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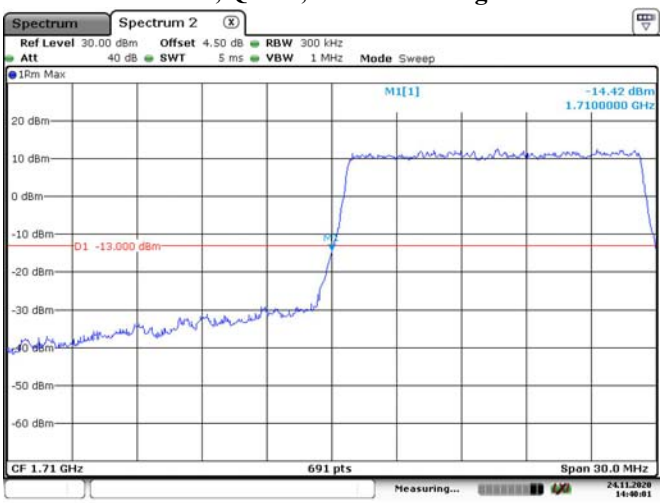
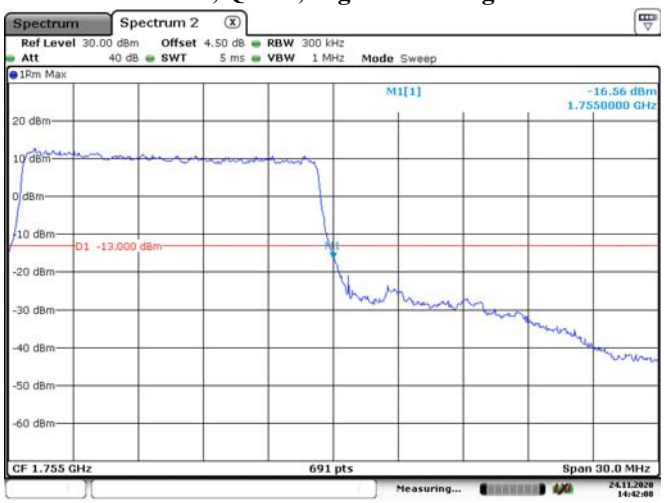
15M, QPSK, Left Band Edge



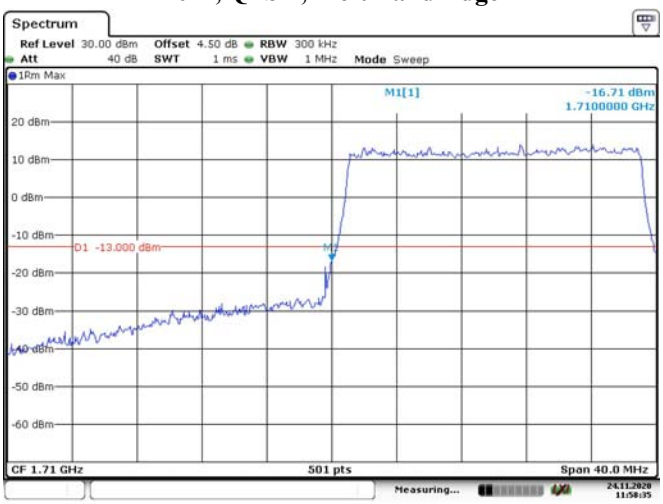
Date: 24.NOV.2020 14:40:02

15M, QPSK, Right Band Edge



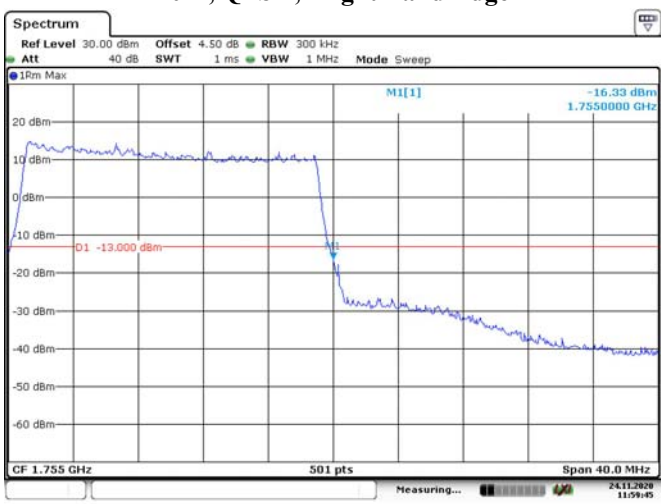
Date: 24.NOV.2020 14:42:08

20M, QPSK, Left Band Edge



Date: 24.NOV.2020 11:58:35

20M, QPSK, Right Band Edge



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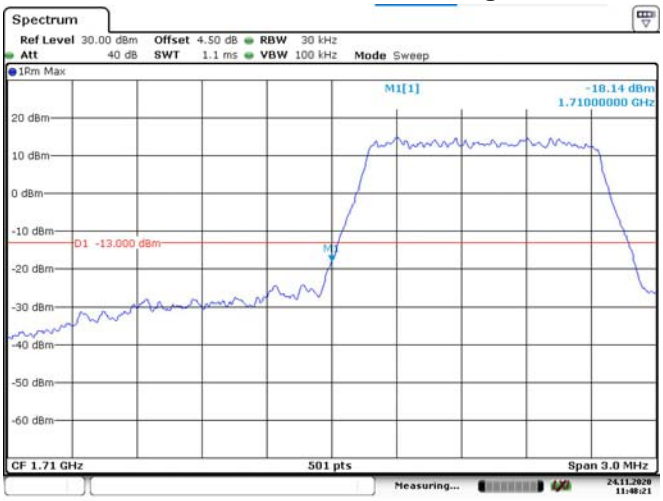
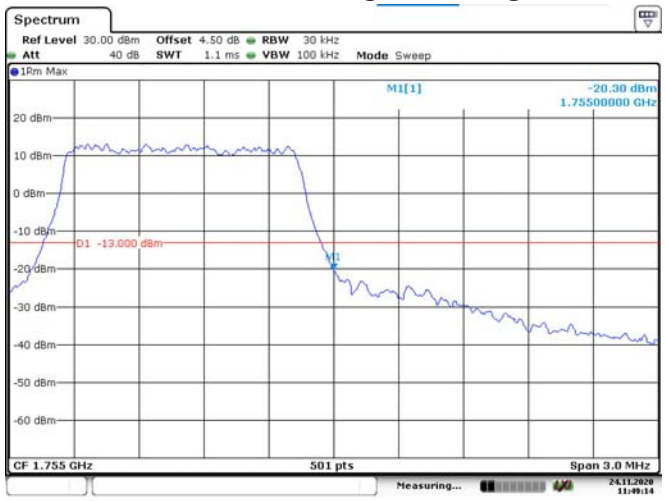
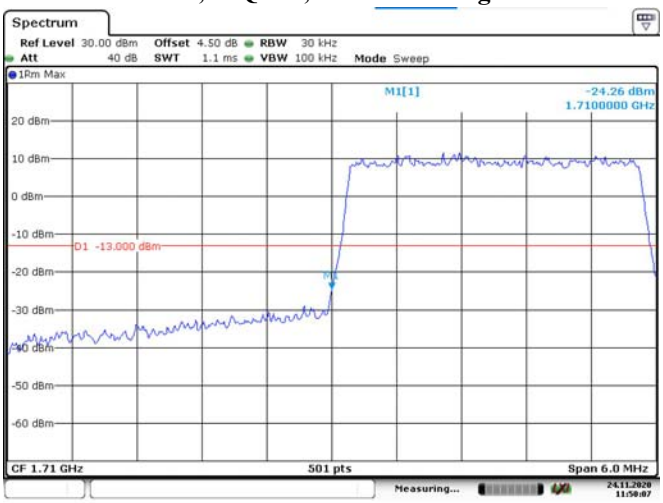
1.4M, 16QAM, Left Band Edge



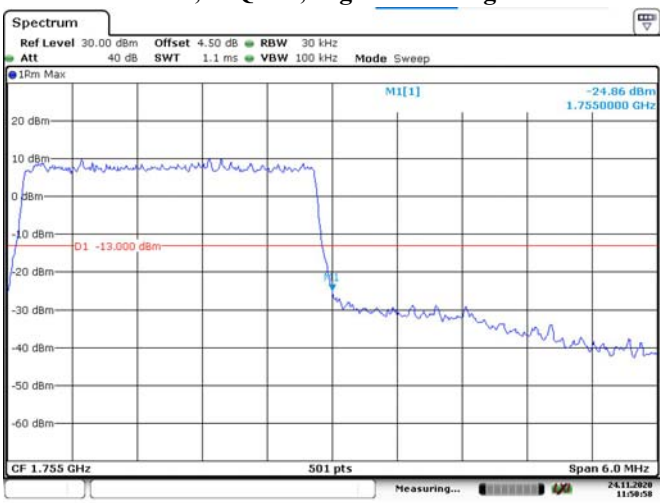
1.4M, 16QAM, Right Band Edge



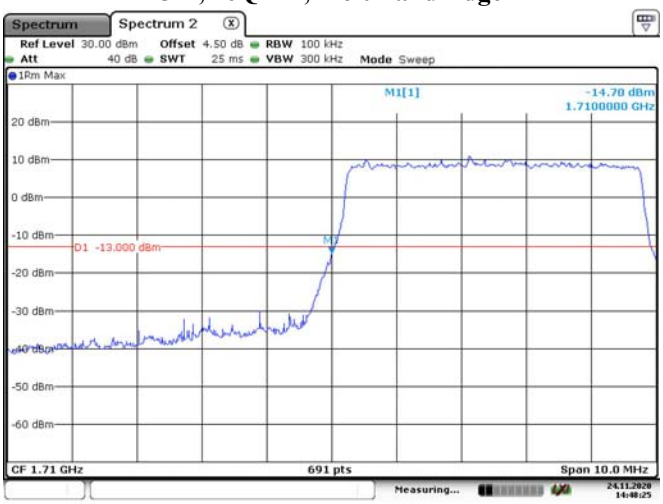
3M, 16QAM, Left Band Edge



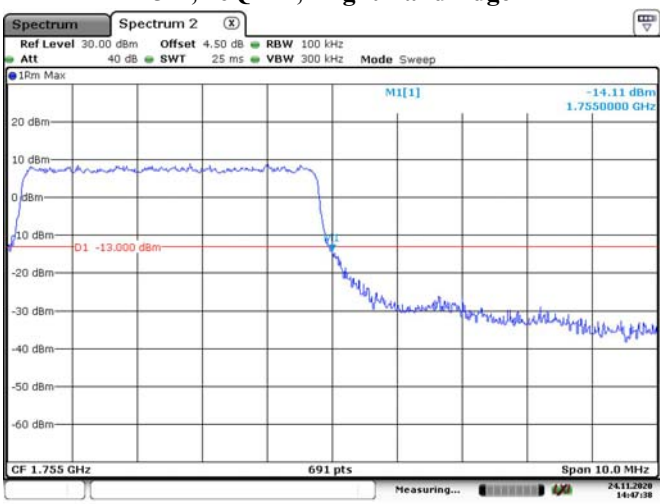
3M, 16QAM, Right Band Edge



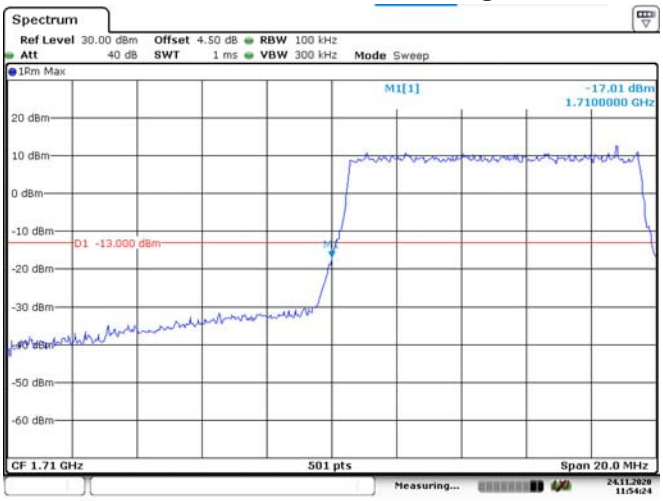
5M, 16QAM, Left Band Edge



5M, 16QAM, Right Band Edge



10M, 16QAM, Left Band Edge



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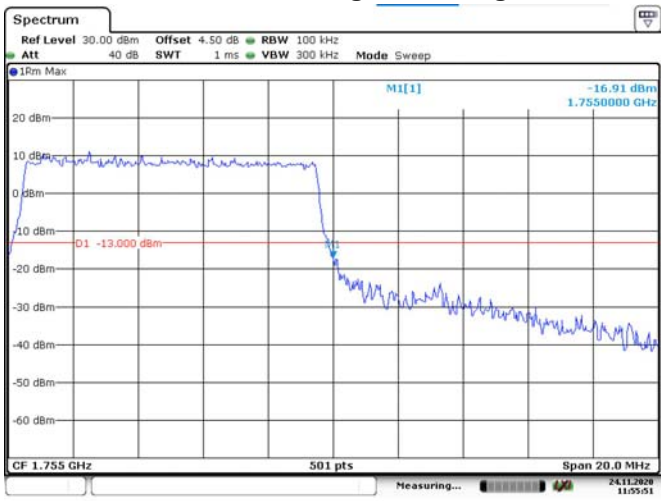
10M, 16QAM, Right Band Edge



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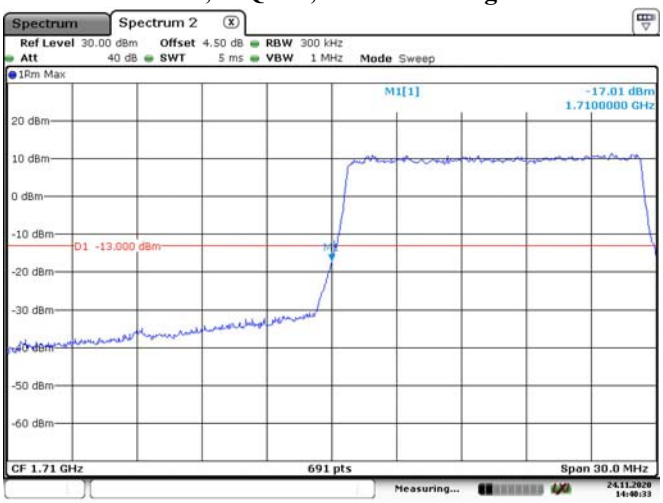
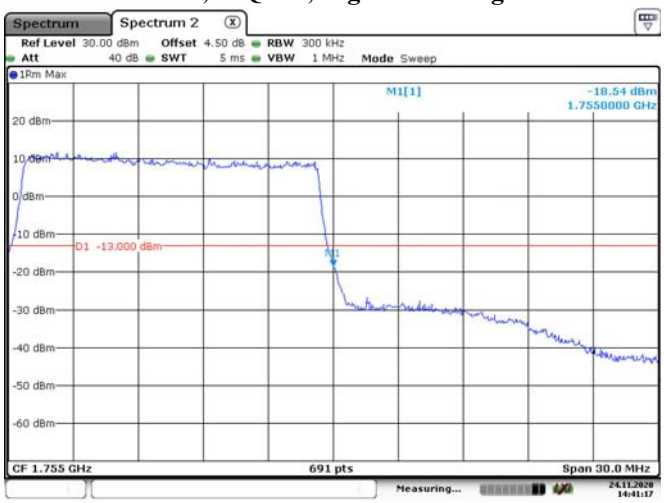
15M, 16QAM, Left Band Edge



Date: 24.NOV.2020 14:40:33

15M, 16QAM, Right Band Edge



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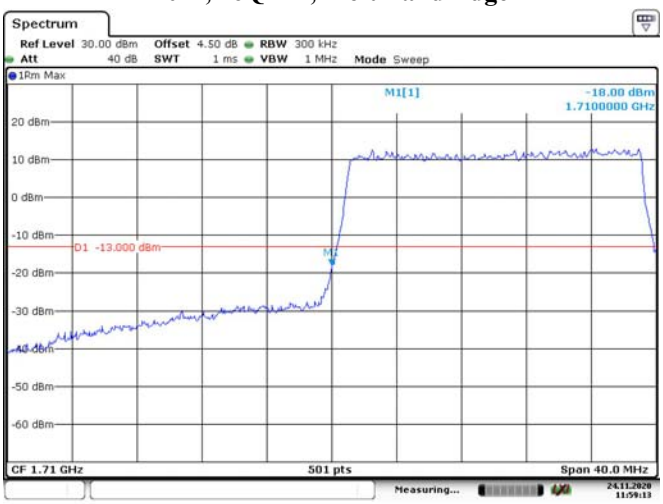
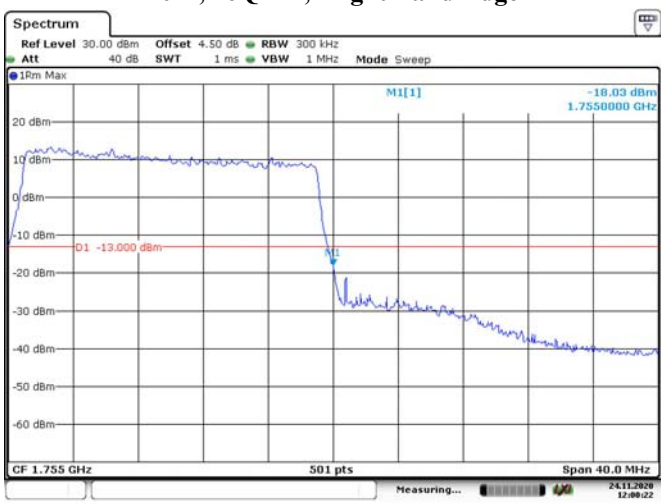
20M, 16QAM, Left Band Edge



Date: 24.NOV.2020 11:59:13

20M, 16QAM, Right Band Edge



Date: 24.NOV.2020 12:00:23

FCC §2.1055, §22.355 & §24.235 & §27.54 - FREQUENCY STABILITY

Applicable Standard

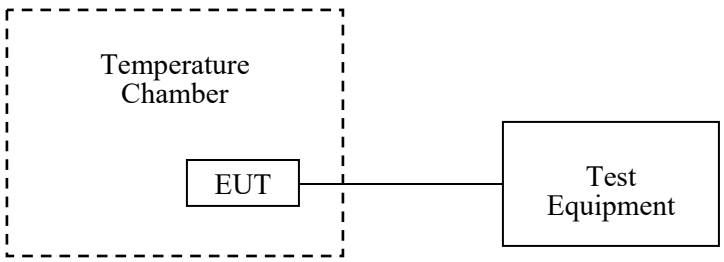
FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235, §27.54

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 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: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set from 85% to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	Each time	N/A
Unknown	Attenuator	UNAT-3+	15529	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	147473	2020-09-23	2021-09-22
R&S	Universal Radio Communication Tester	CMU200	106 891	2020-09-12	2021-09-12
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2020-03-10	2021-03-09
UNI-T	Multimeter	UT39A	M130199938	2020-07-01	2021-07-01
Pro instrument	DC Power Supply	pps3300	3300012	N/A	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	23.8~ 29.8 °C
Relative Humidity:	32~64%
ATM Pressure:	100.6~101.9kPa
Tester:	Rita Huang
Test Date:	2020.10.16-2020.11.24

Test Result: Compliance.

GMSK, Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.7	4	0.00478	2.5
-20		5	0.00598	
-10		-19	-0.02271	
0		-18	-0.02152	
10		13	0.01554	
20		12	0.01434	
30		-9	-0.01076	
40		-17	-0.02032	
50		-5	-0.00598	
20	3.5	14	0.01673	
20	4.2	3	0.00359	

GMSK, Middle Channel, f_c = 1880 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.7	-13	-0.00691	Pass
-20		12	0.00638	
-10		8	0.00426	
0		-9	-0.00479	
10		10	0.00532	
20		18	0.00957	
30		-12	-0.00638	
40		19	0.01011	
50		15	0.00798	
20	3.5	4	0.00213	
20	4.2	-11	-0.00585	

WCDMA Band II: R99

Middle Channel, f_c = 1880.0 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.7	6	0.00319	Pass
-20		19	0.01011	
-10		-1	-0.00053	
0		-19	-0.01011	
10		-10	-0.00532	
20		-16	-0.00851	
30		19	0.01011	
40		-18	-0.00957	
50		1	0.00053	
20	3.5	-3	-0.00160	
20	4.2	10	0.00532	

WCDMA Band Ⅴ: R99

Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.7	-7	-0.00837	2.5
-20		9	0.01076	
-10		-9	-0.01076	
0		11	0.01315	
10		18	0.02152	
20		-9	-0.01076	
30		-7	-0.00837	
40		-2	-0.00239	
50		16	0.01913	
20	3.5	-2	-0.00239	
20	4.2	12	0.01434	

LTE Band 2:

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 1880 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.7	-12.12	-0.0064	Pass
-20		7.78	0.0041	
-10		-6.41	-0.0034	
0		5.21	0.0028	
10		5.21	0.0028	
20		7.20	0.0038	
30		-8.84	-0.0047	
40		8.08	0.0043	
50		7.38	0.0039	
20	3.5	-6.59	-0.0035	
20	4.2	-7.08	-0.0038	

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c =1880 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.7	-10.33	-0.0055	Pass
-20		-5.29	-0.0028	
-10		-5.91	-0.0031	
0		9.61	0.0051	
10		-8.27	-0.0044	
20		-9.48	-0.005	
30		-8.17	-0.0043	
40		7.17	0.0038	
50		7.08	0.0038	
20	3.5	6.15	0.0033	
20	4.2	9.48	0.005	

LTE Band 4

QPSK, Channel Bandwidth:10MHz					
Power Supplied	**Temperature**	**F_L**	**Limit**	**F_H**	**Limit**
Vdc	**℃**	**MHz**	**MHz**	**MHz**	**MHz**
3.7	-30	1710.526800	1710	1754.508300	1755
	-20	1710.531300		1754.510700	
	-10	1710.529200		1754.511900	
	0	1710.527400		1754.513700	
	10	1710.526500		1754.508900	
	20	1710.528900		1754.511000	
	30	1710.527700		1754.513400	
	40	1710.528000		1754.510100	
	50	1710.528900		1754.509800	
3.5	20	1710.526800		1754.511300	
4.2	20	1710.527100		1754.513400	

16-QAM, Channel Bandwidth:10MHz					
Power Supplied	**Temperature**	**F_L**	**Limit**	**F_H**	**Limit**
Vdc	**℃**	**MHz**	**MHz**	**MHz**	**MHz**
3.7	-30	1710.530100	1710	1754.513700	1755
	-20	1710.527700		1754.511900	
	-10	1710.530100		1754.512500	
	0	1710.527400		1754.513100	
	10	1710.527100		1754.509800	
	20	1710.528900		1754.511000	
	30	1710.529200		1754.509200	
	40	1710.526800		1754.513100	
	50	1710.529200		1754.513400	
3.5	20	1710.529500		1754.511600	
4.2	20	1710.528600		1754.508600	

Note: The fundamental emissions stay within the authorized bands of operation based on the frequency deviation measured is small, the extreme voltage was declared by applicant.

******* END OF REPORT *******