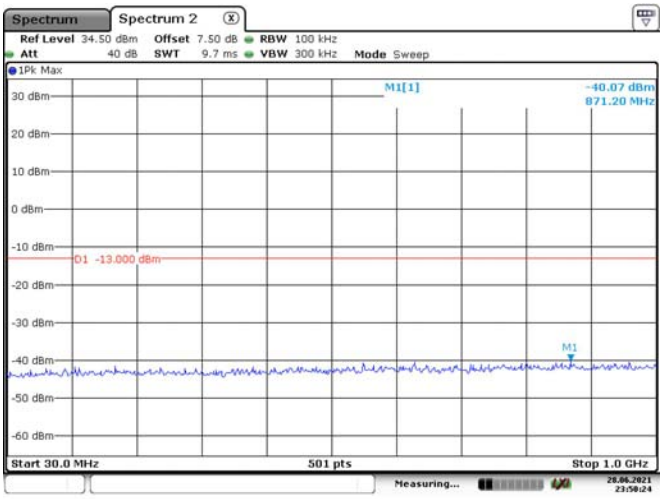
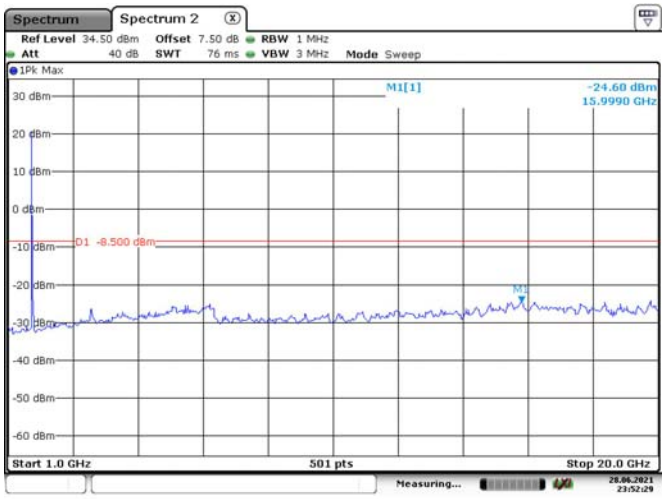
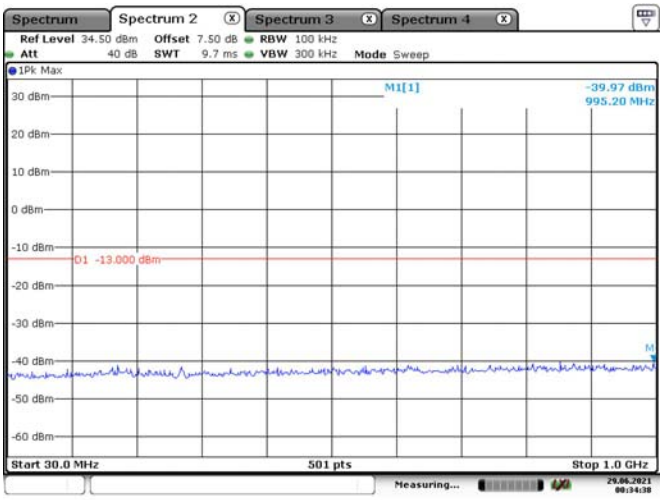
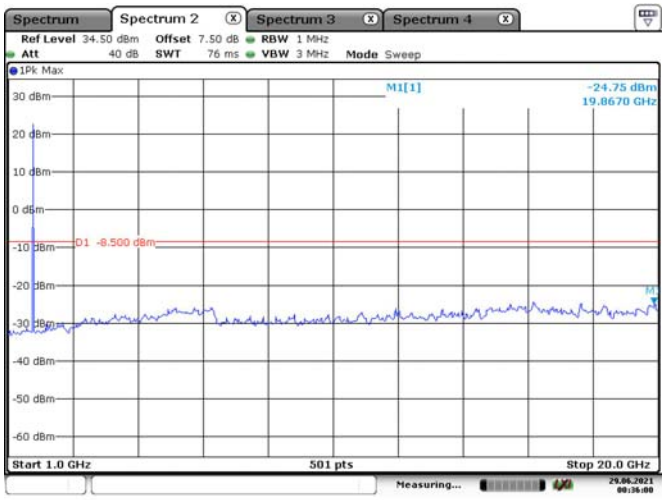
WCDMA Band IV, R99, Low Channel



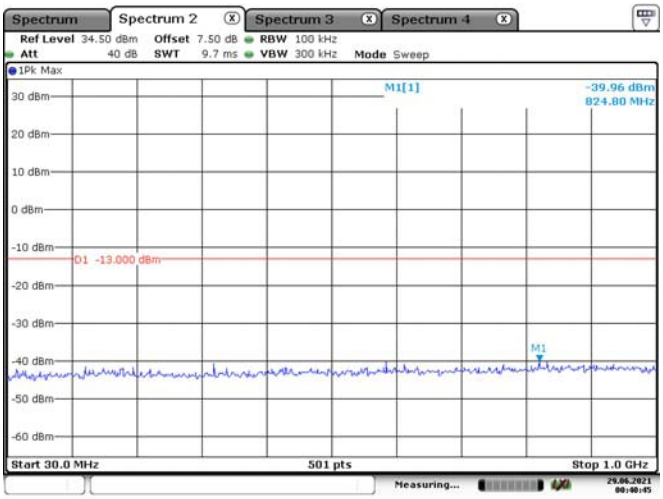


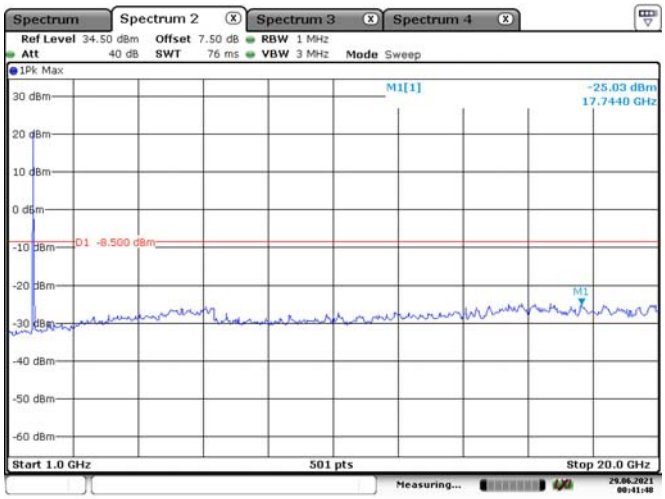
WCDMA Band IV, R99, Middle Channel



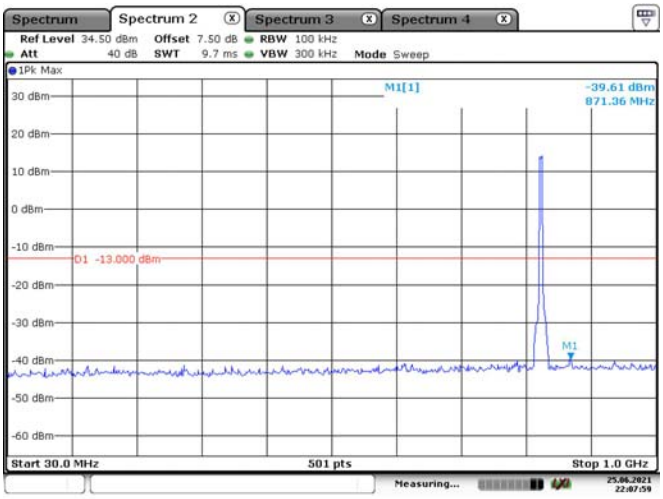


WCDMA Band IV, R99, High Channel





WCDMA Band V, R99, Low Channel



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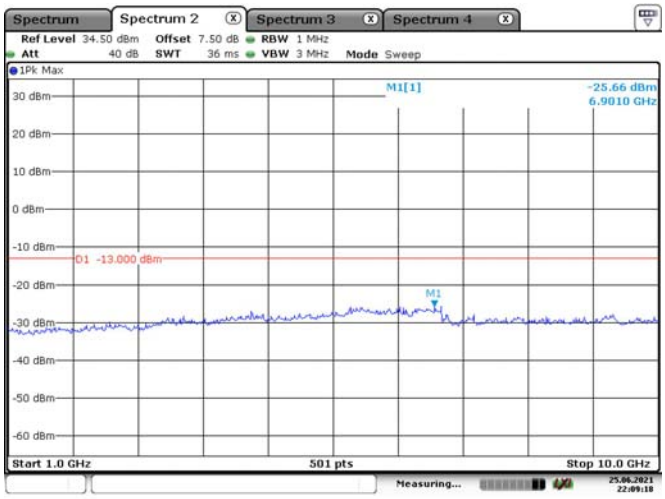
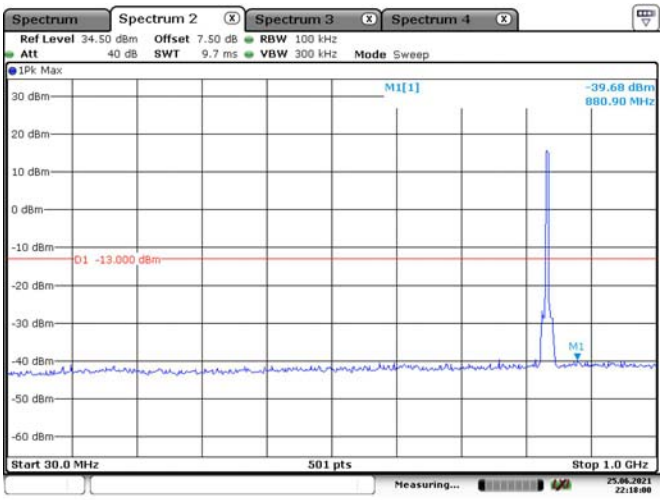


Date: 25.JUN.2021 22:09:19

WCDMA Band V, R99, Middle Channel



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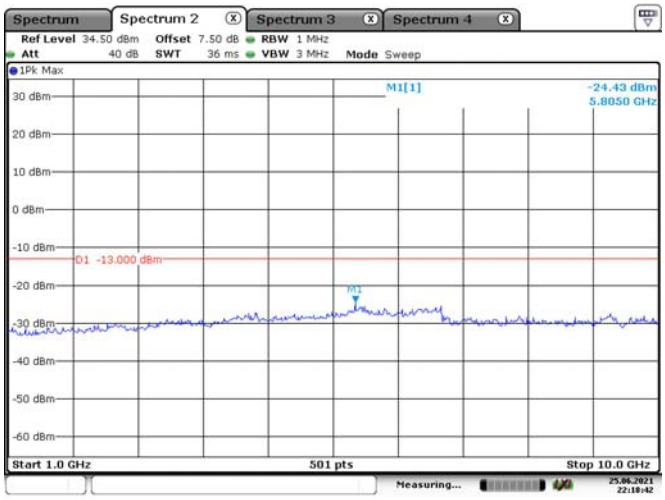

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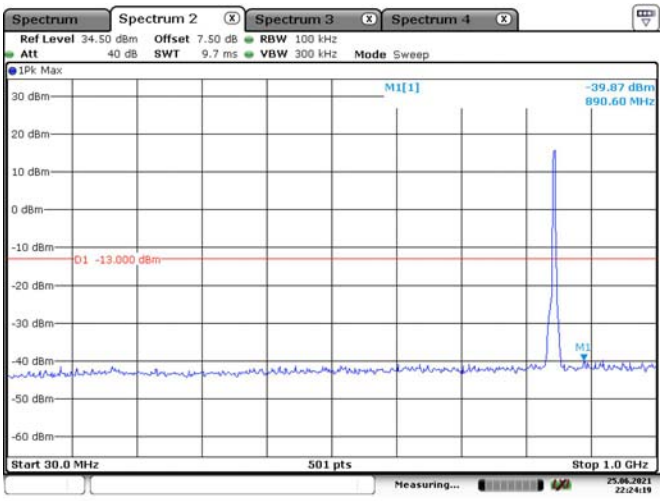
WCDMA Band V, R99, High Channel



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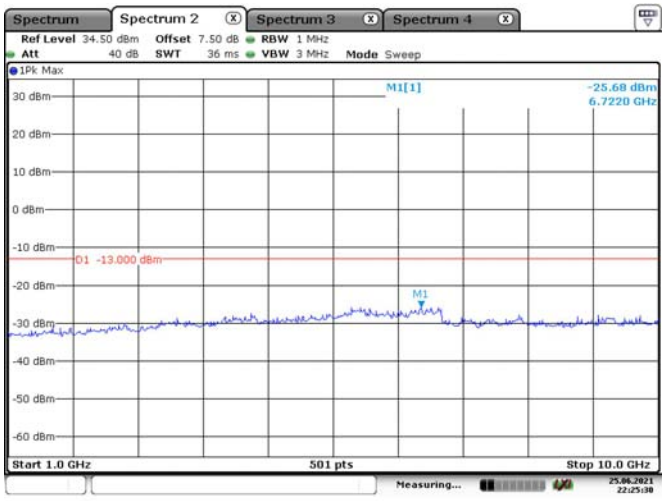
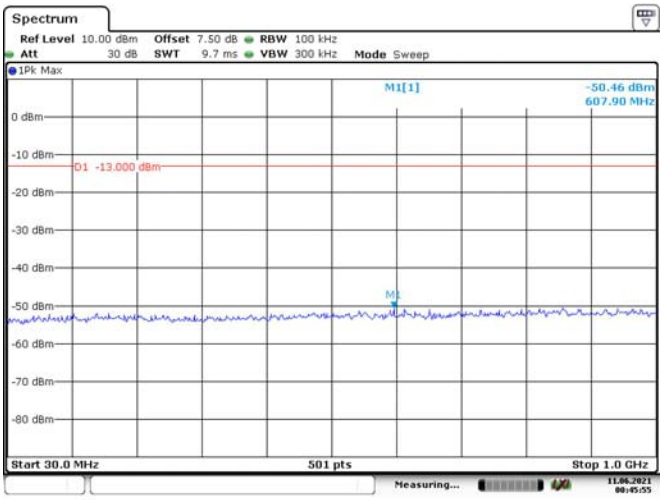
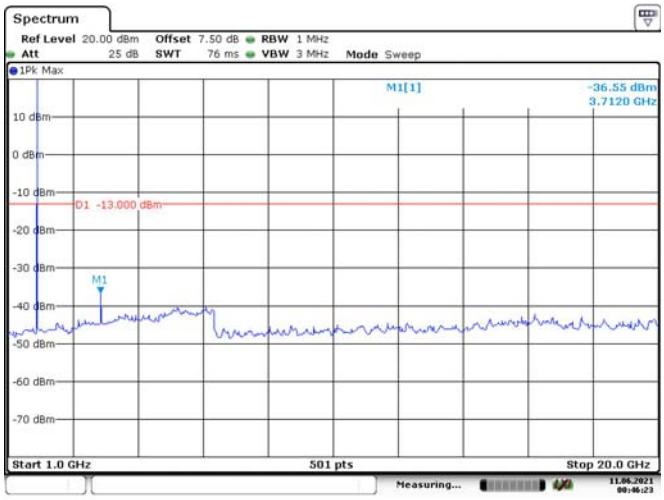


Date: 25.JUN.2021 22:25:30

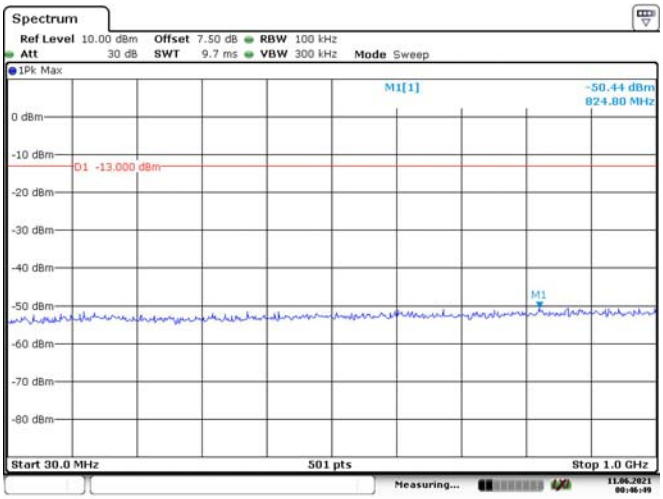
LTE Band 2:

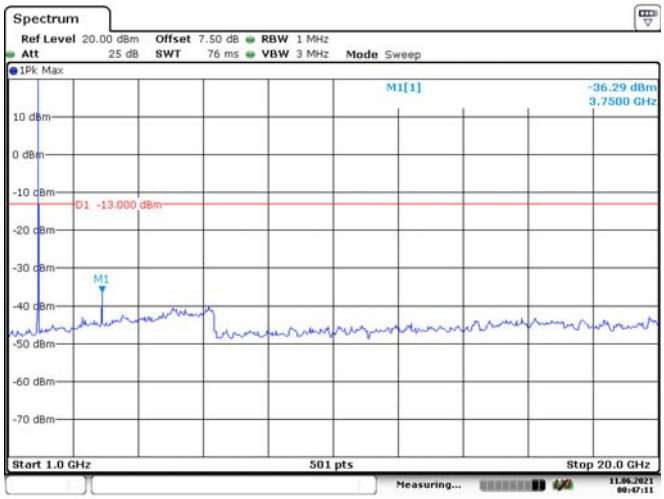
1.4M, QPSK, Low Channel



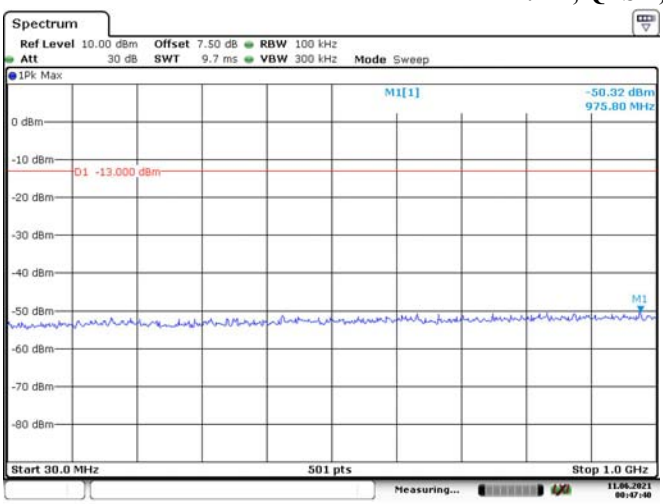


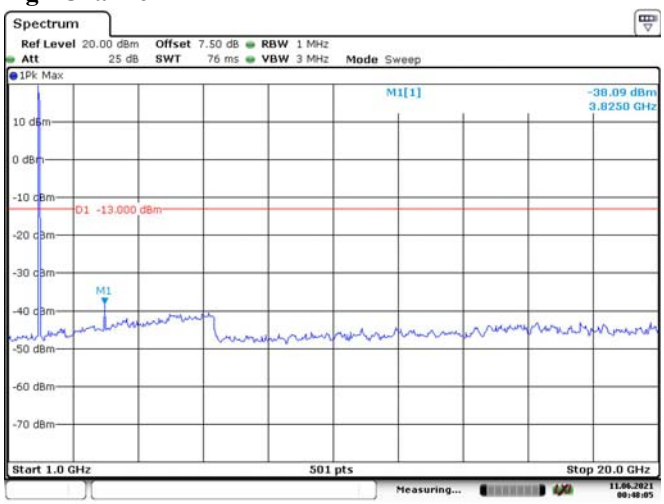
1.4M, QPSK, Middle Channel



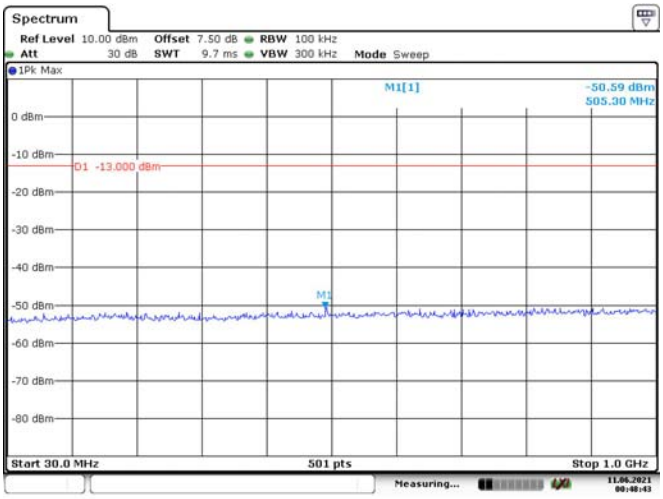


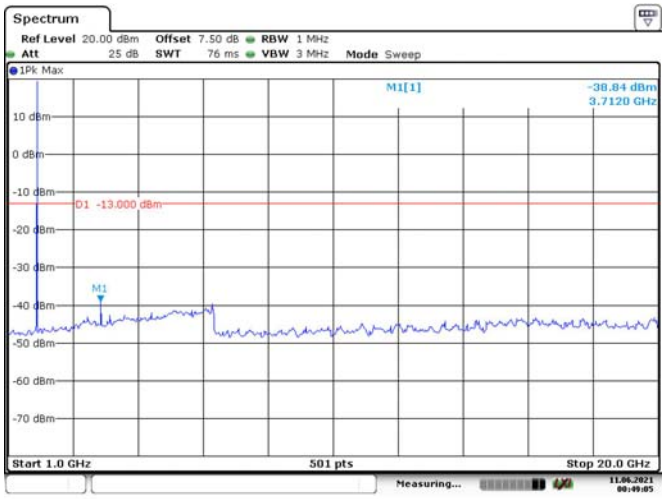
1.4M, QPSK, High Channel



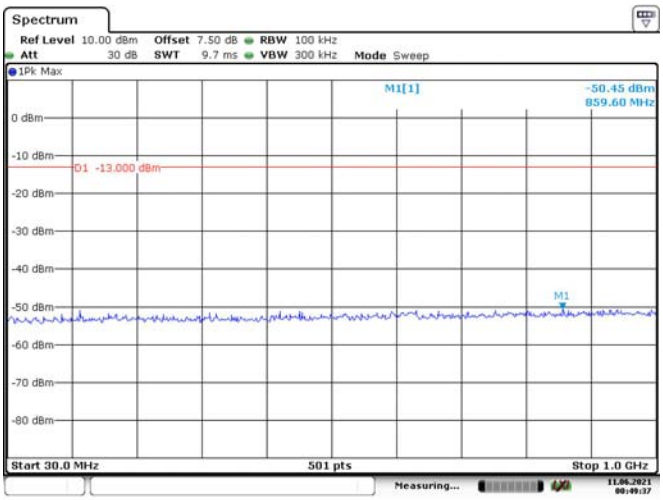


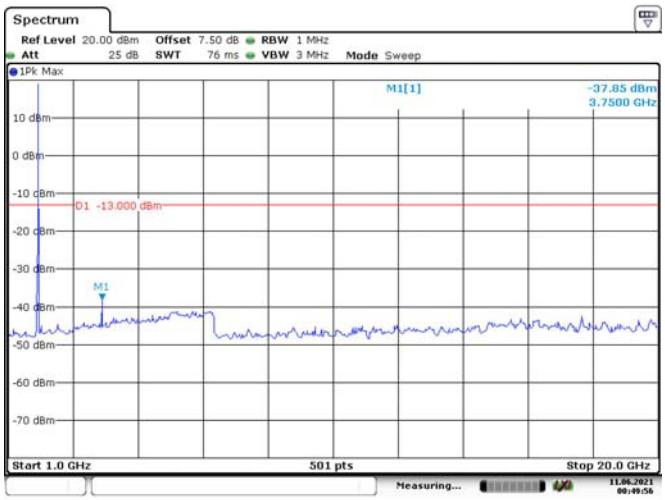
3M, QPSK, Low Channel



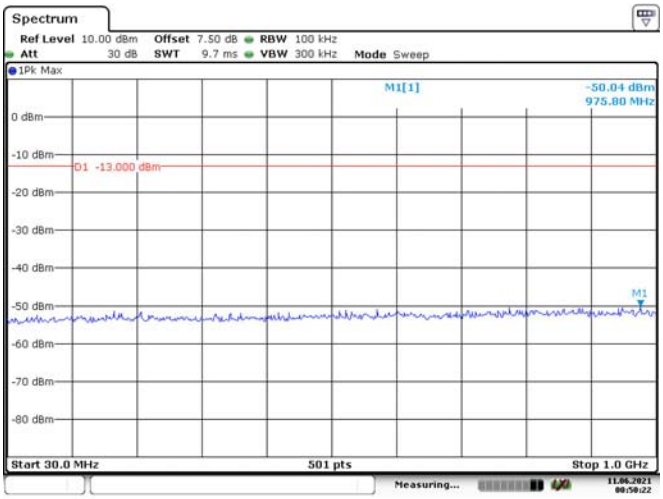


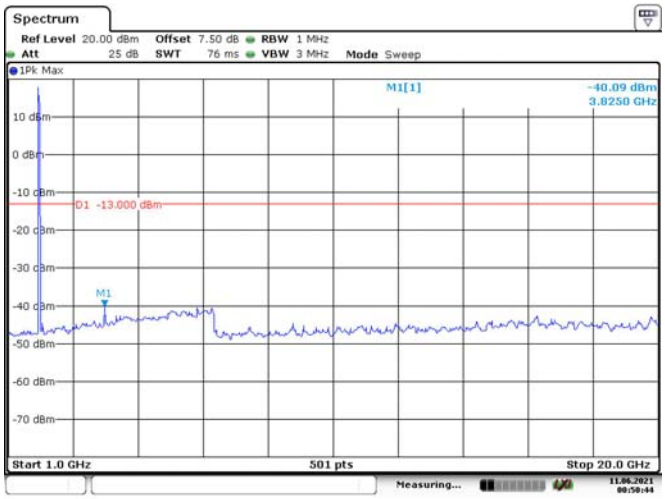
3M, QPSK, Middle Channel



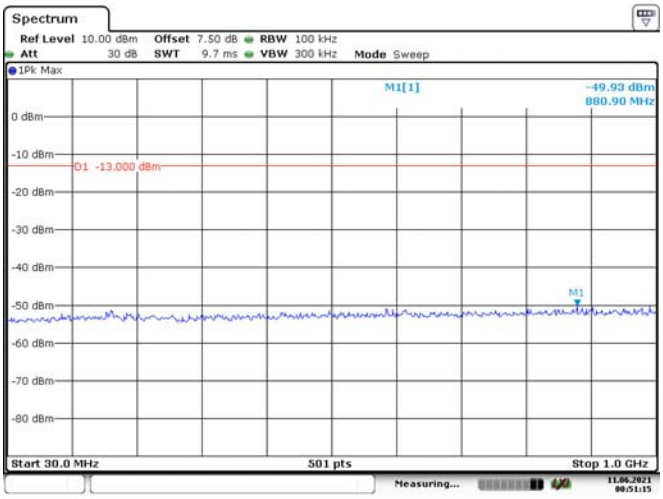


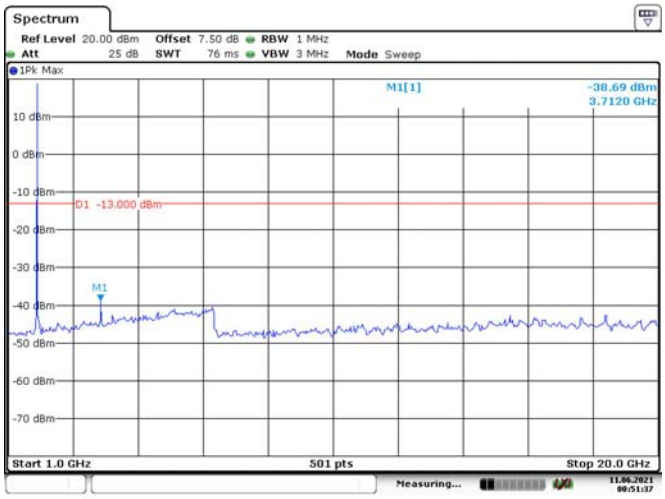
3M, QPSK, High Channel



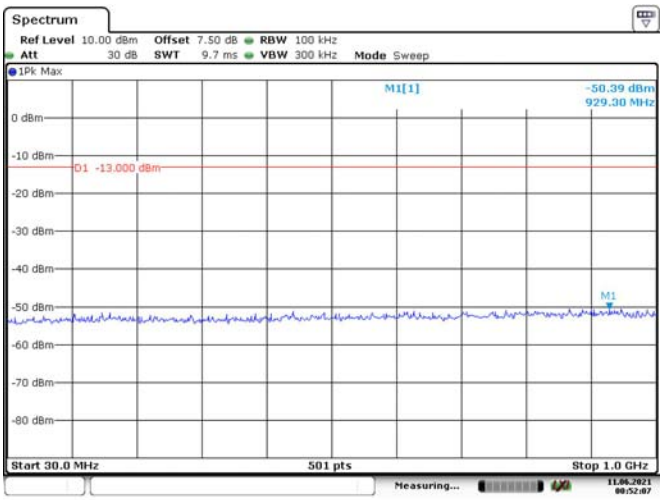


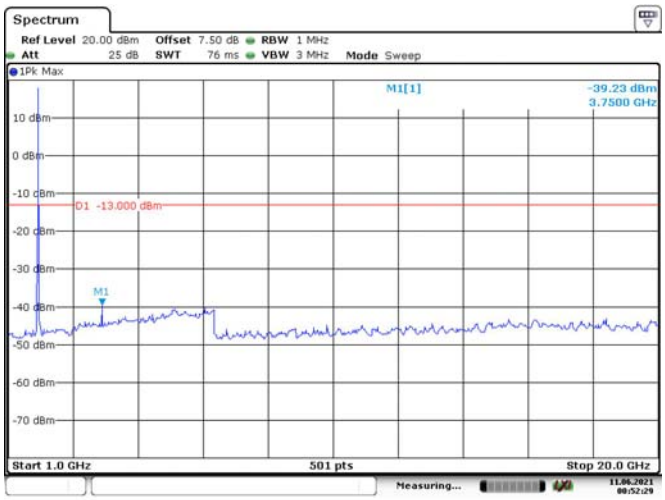
5M, QPSK, Low Channel



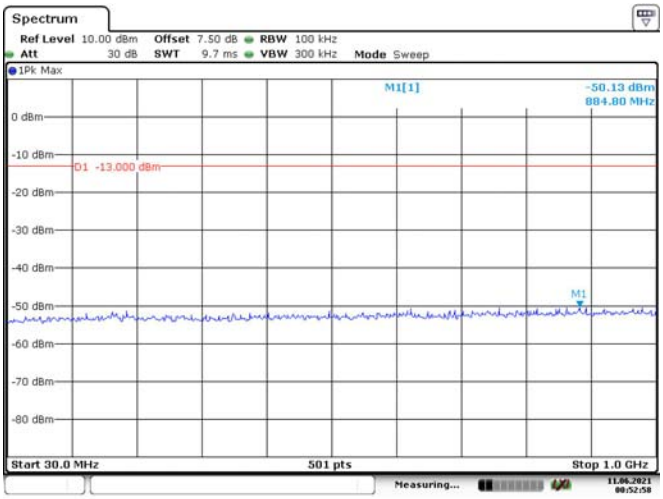


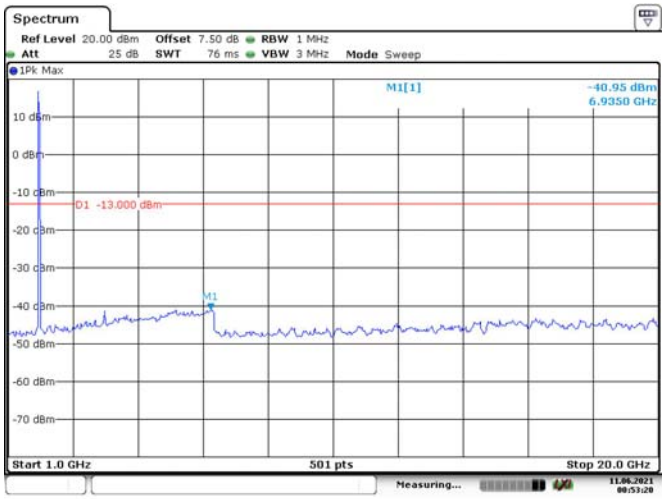
5M, QPSK, Middle Channel



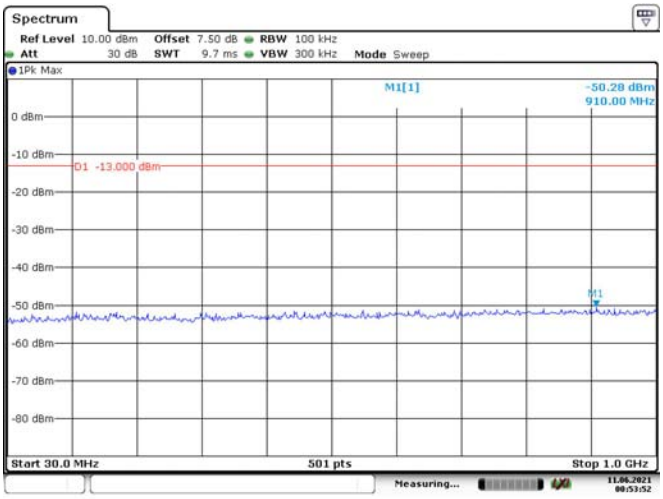


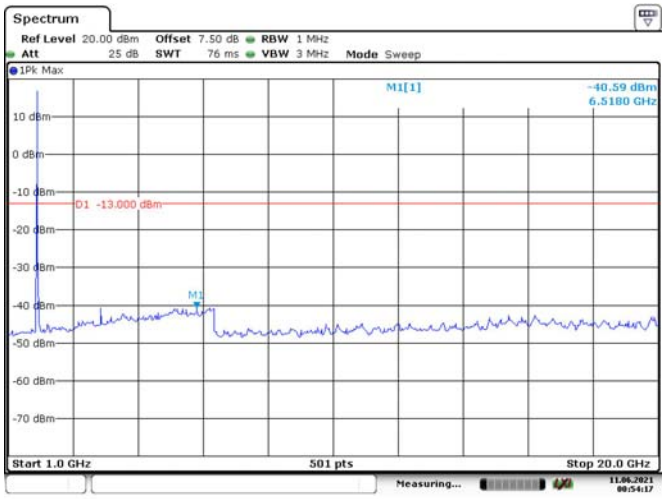
5M, QPSK, High Channel



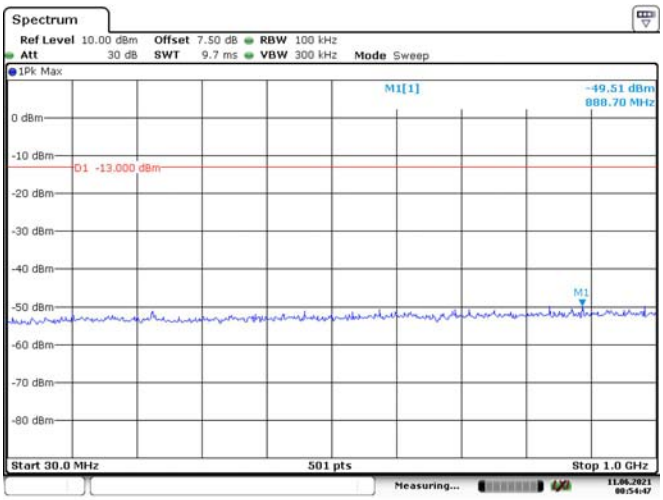


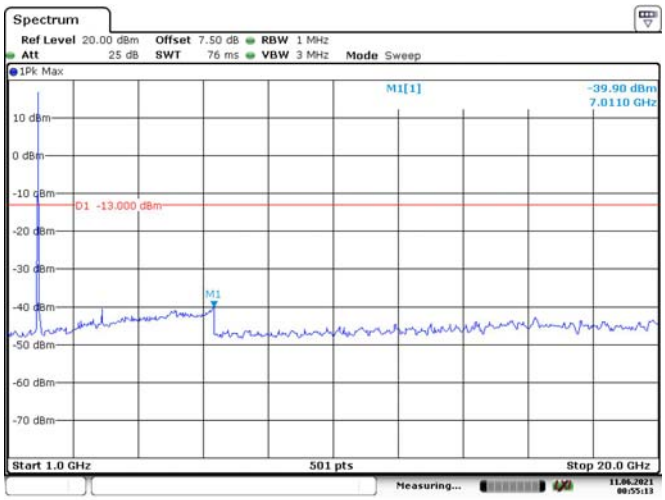
10M, QPSK, Low Channel



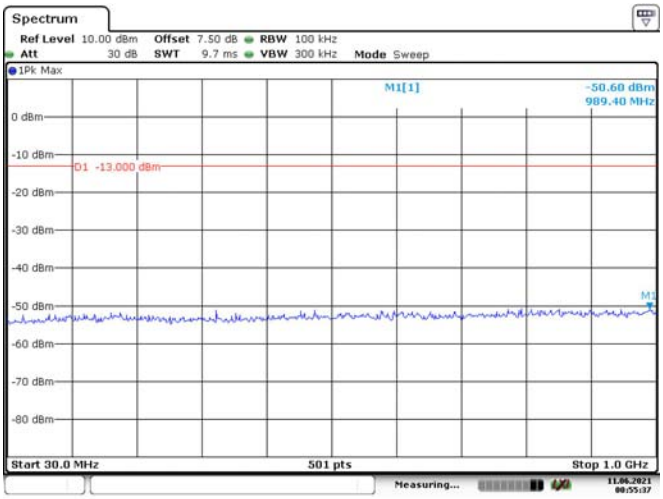


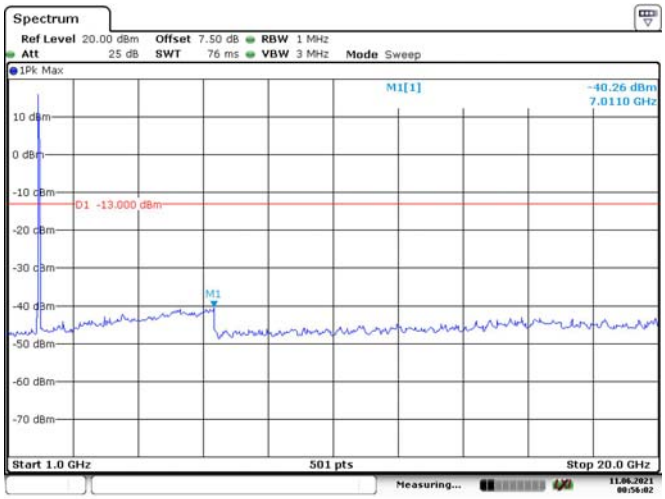
10M, QPSK, Middle Channel



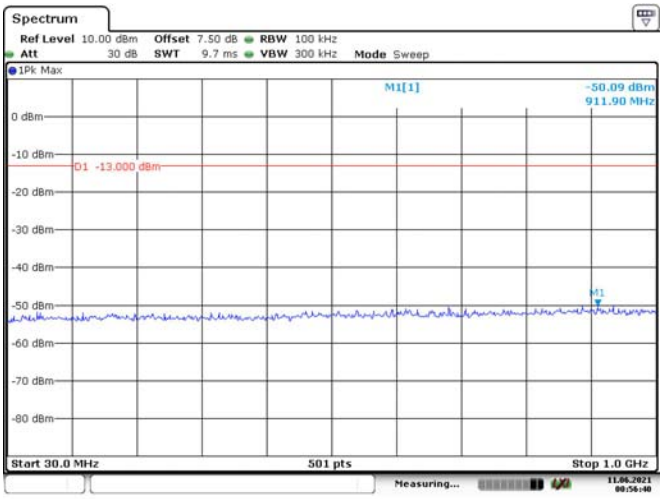


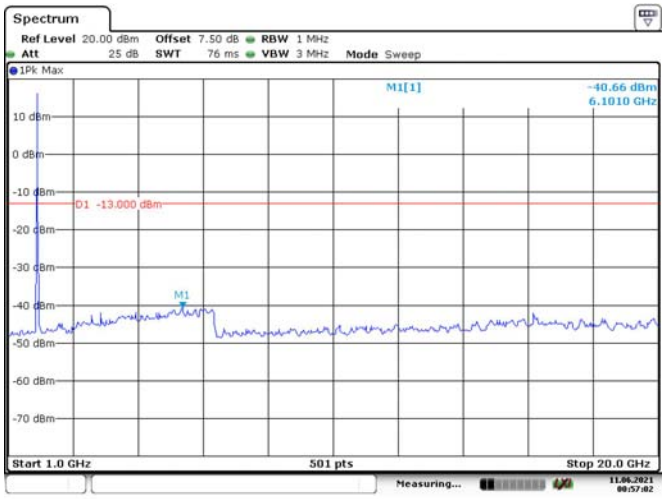
10M, QPSK, High Channel



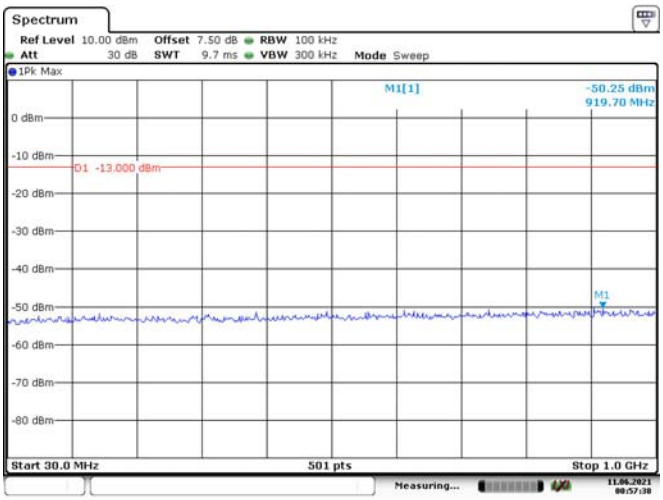


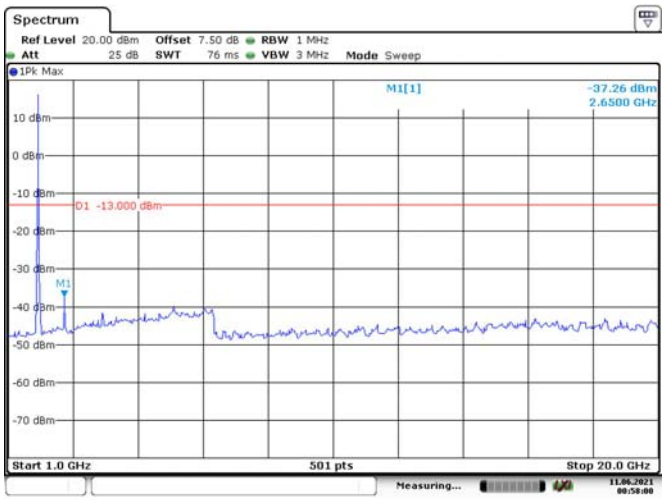
15M, QPSK, Low Channel



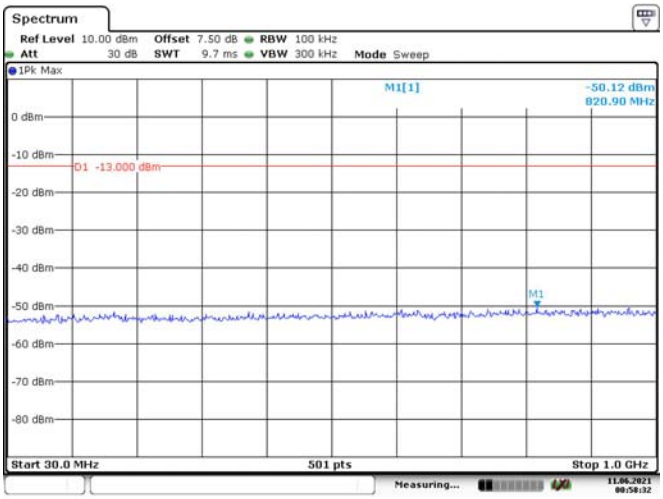


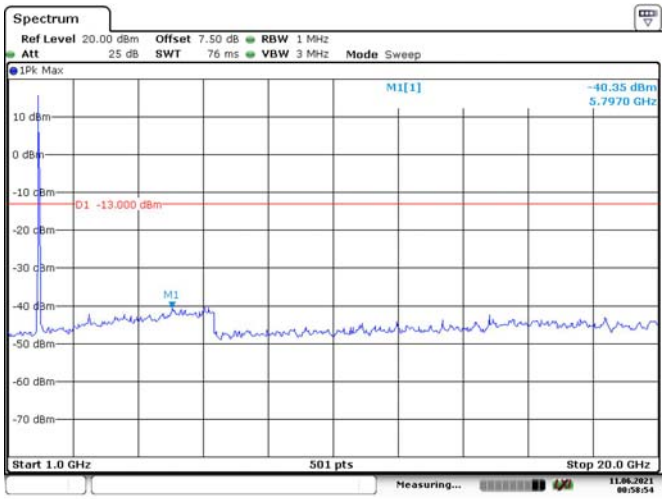
15M, QPSK, Middle Channel



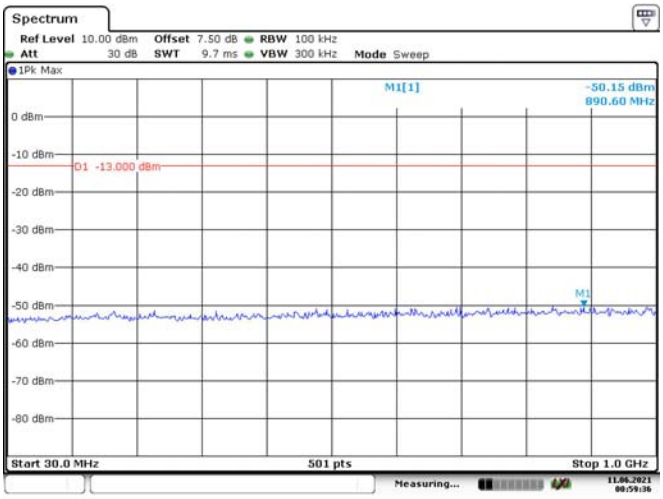


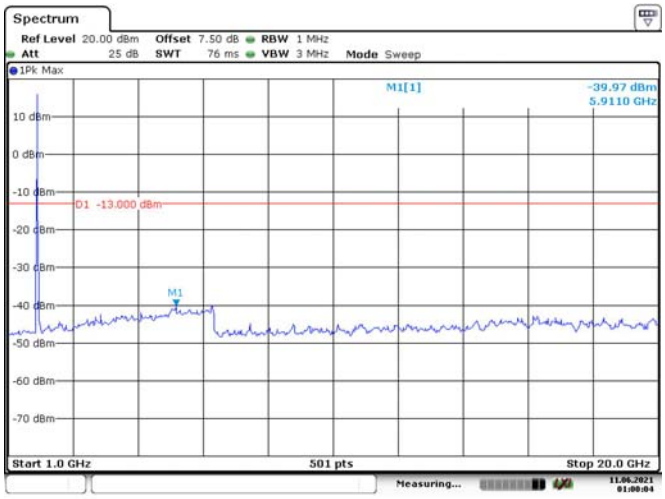
15M, QPSK, High Channel



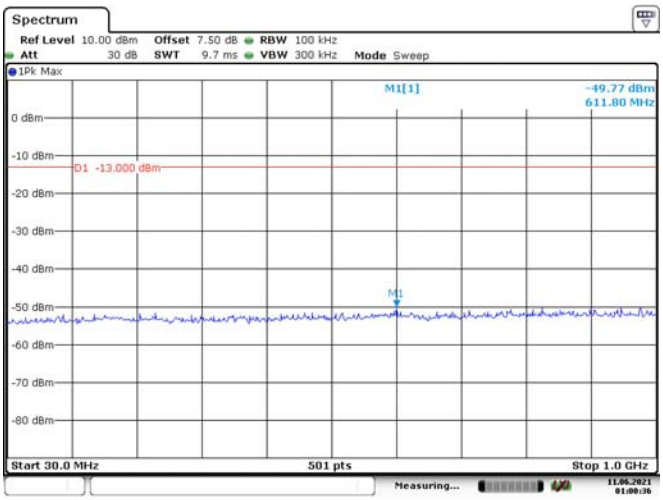


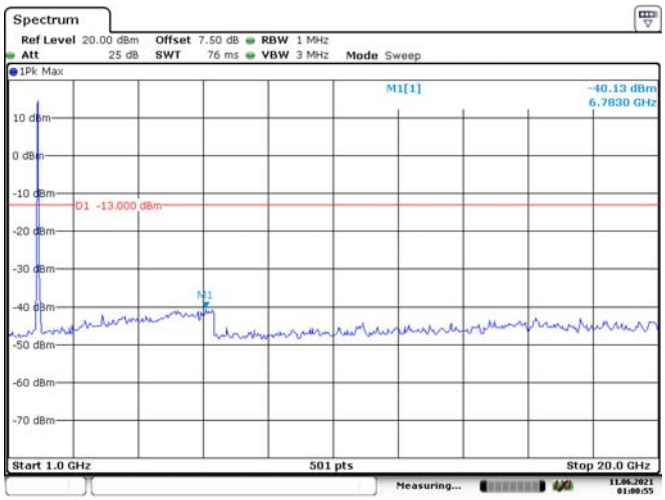
20M, QPSK, Low Channel



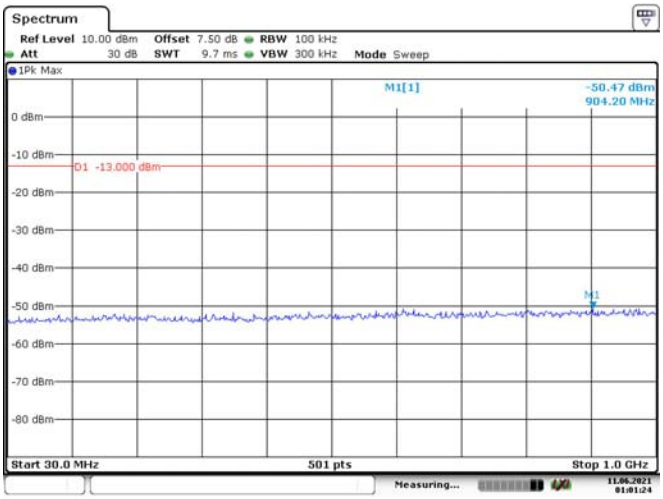


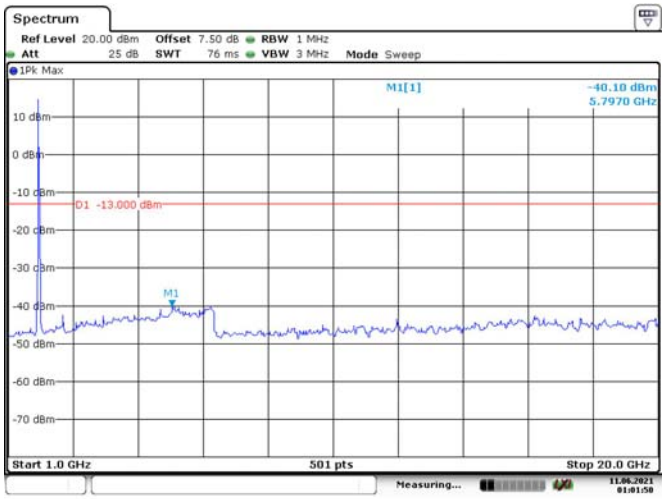
20M, QPSK, Middle Channel





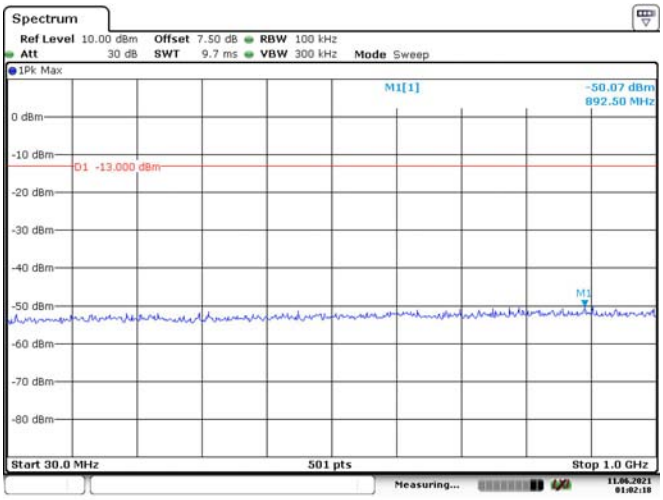
20M, QPSK, High Channel

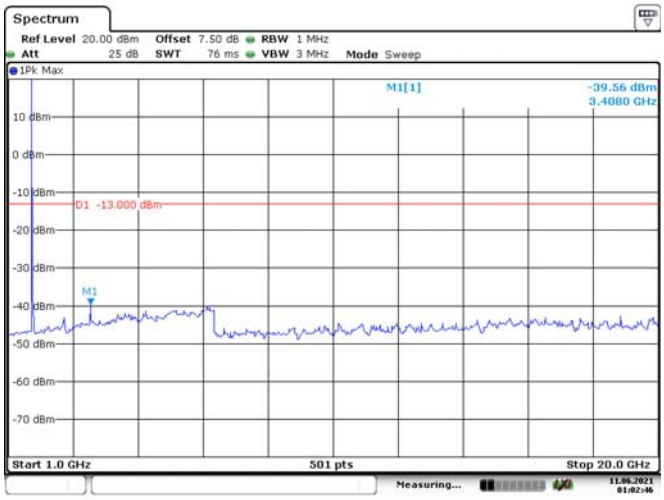




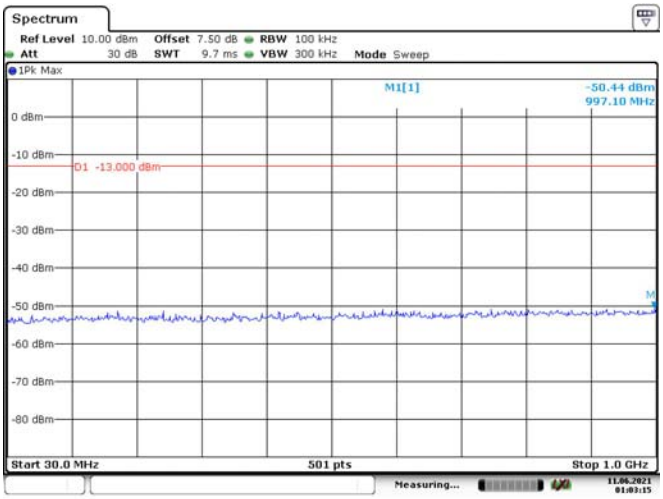
LTE Band 4:

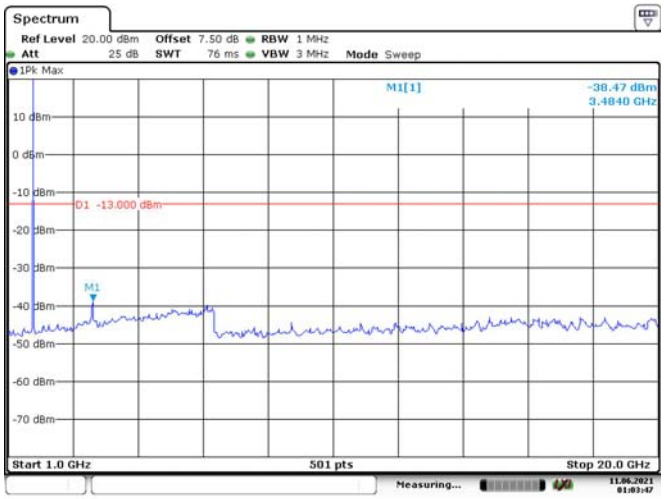
1.4M, QPSK, Low Channel



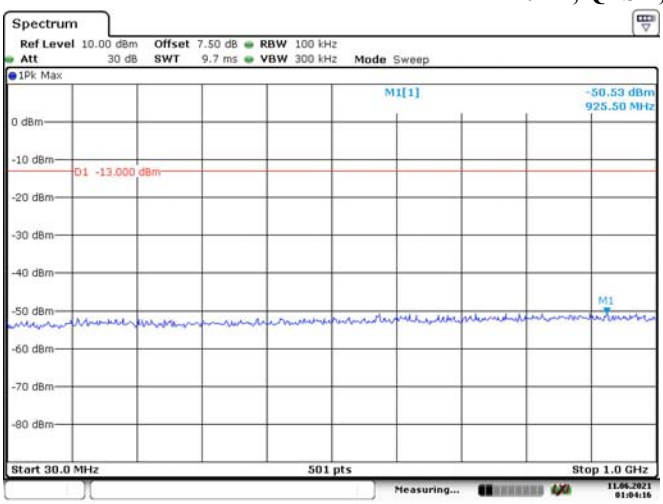


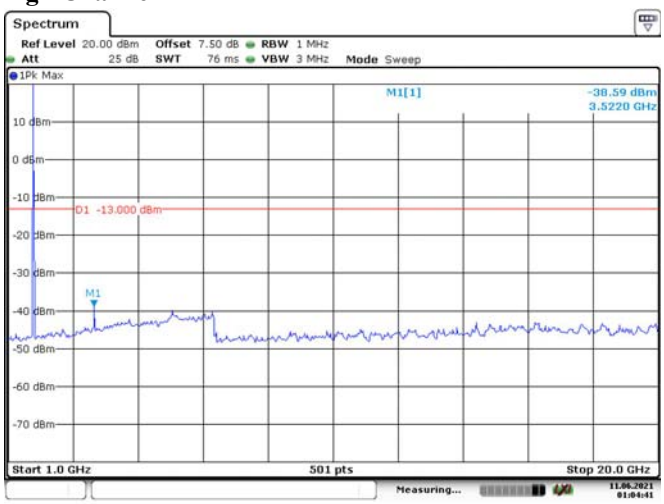
1.4M, QPSK, Middle Channel



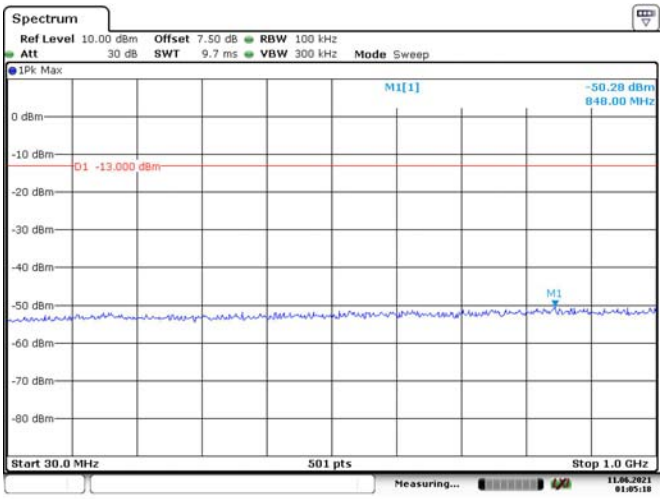


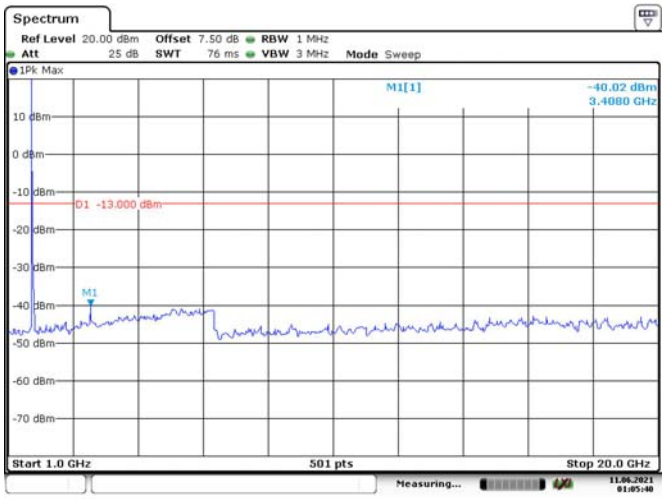
1.4M, QPSK, High Channel



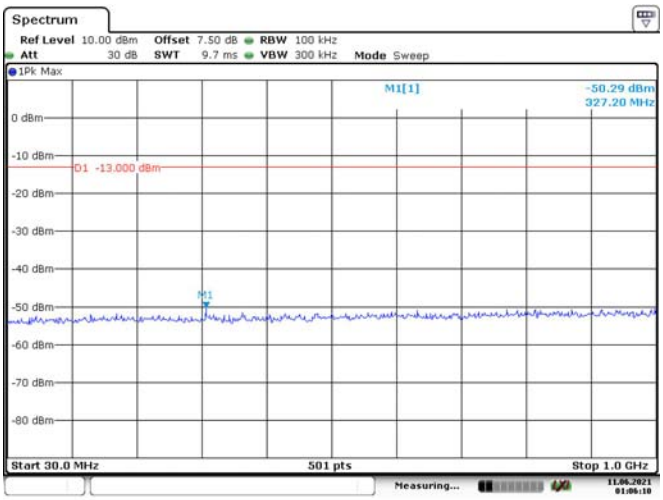


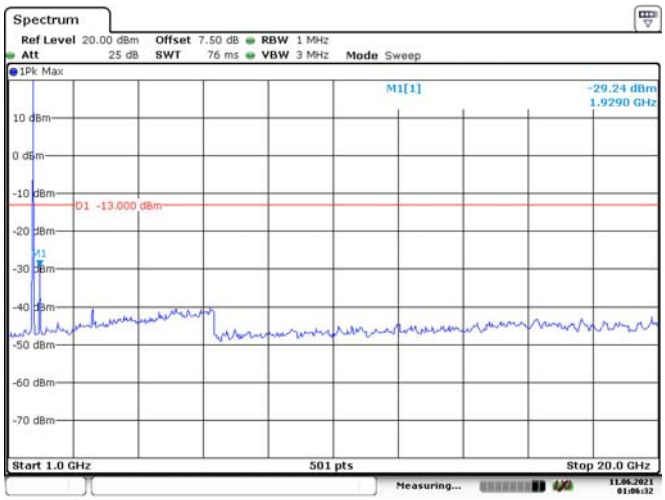
3M, QPSK, Low Channel



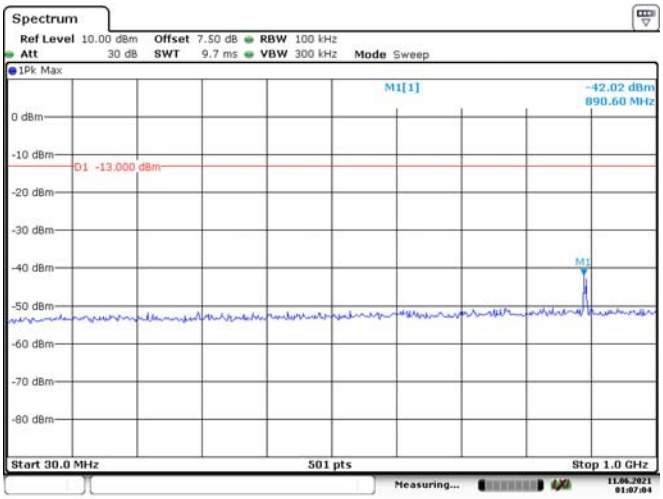


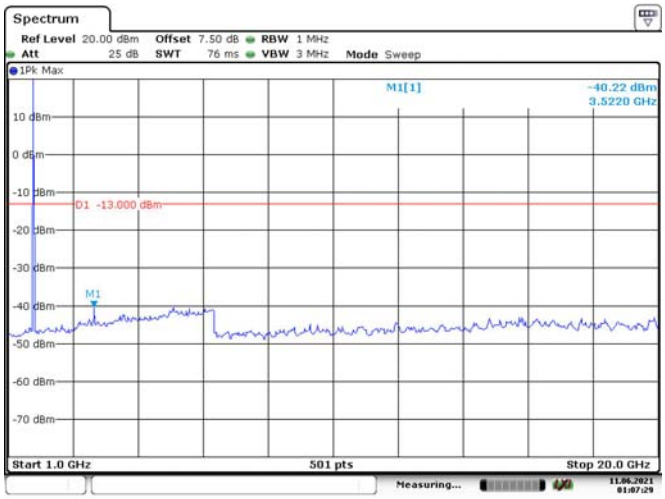
3M, QPSK, Middle Channel



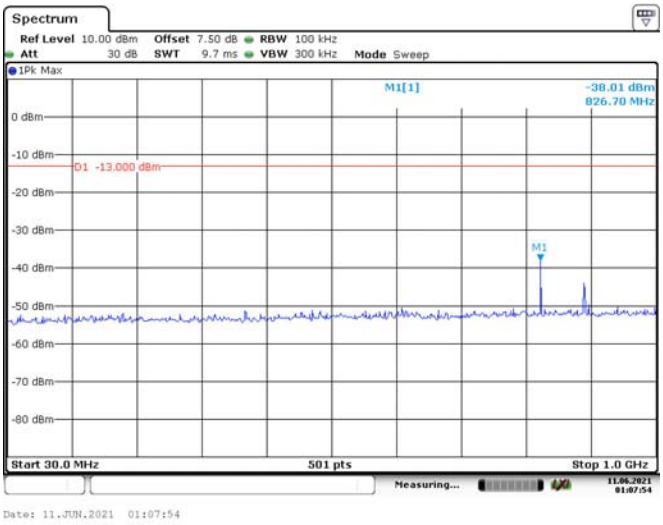


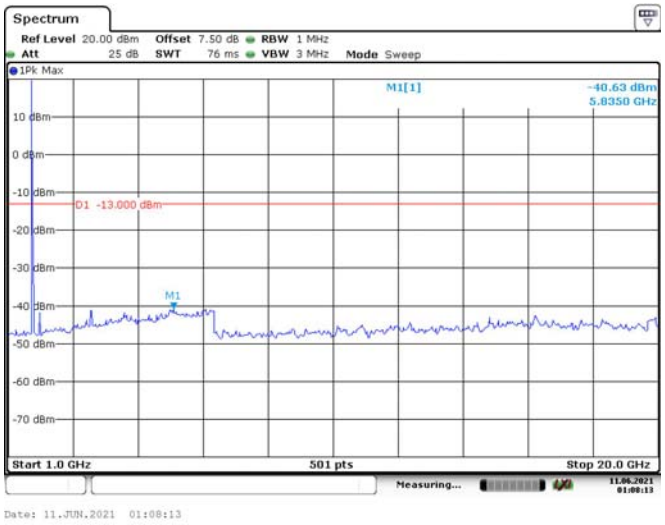
3M, QPSK, High Channel



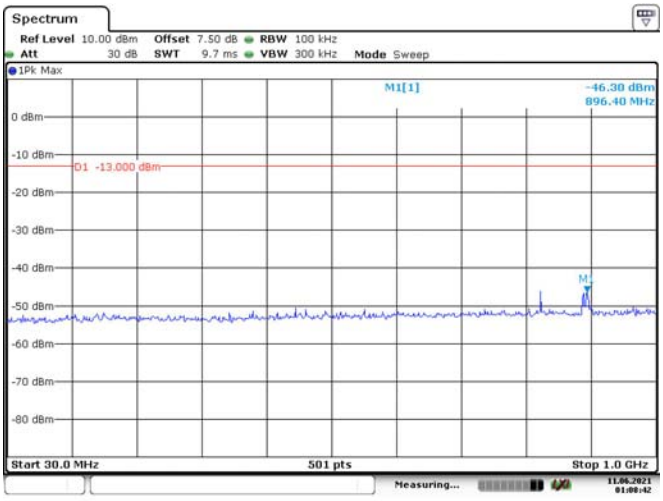


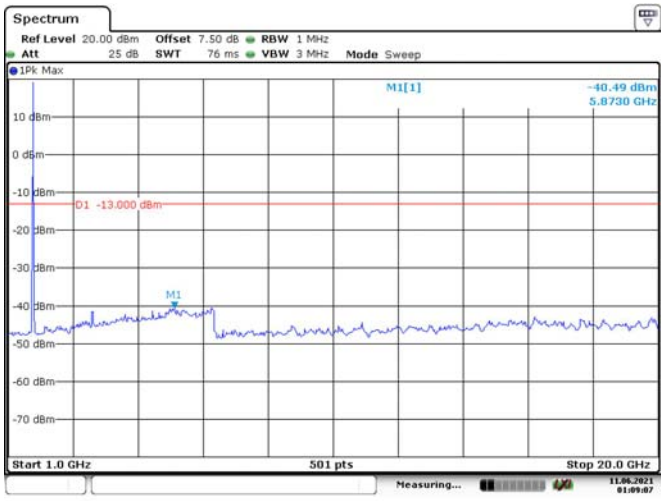
5M, QPSK, Low Channel



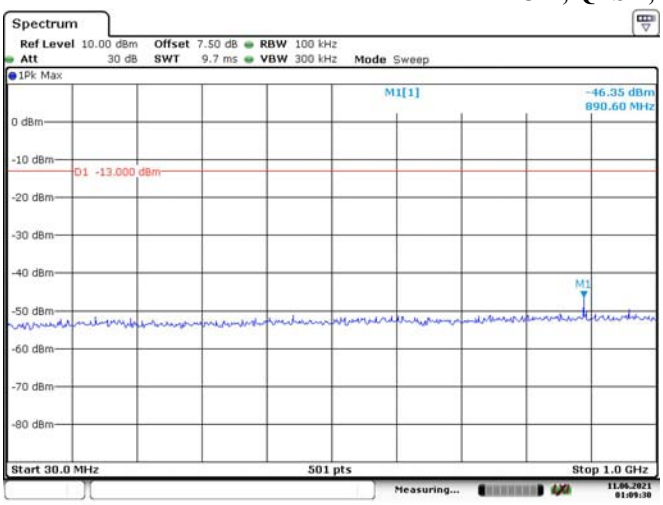


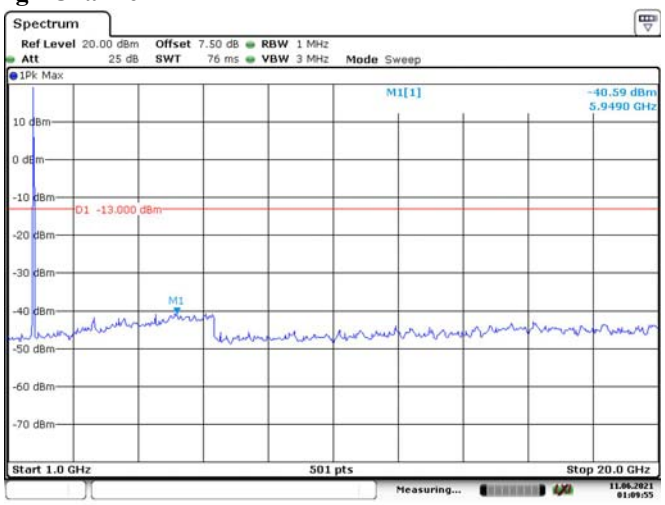
5M, QPSK, Middle Channel



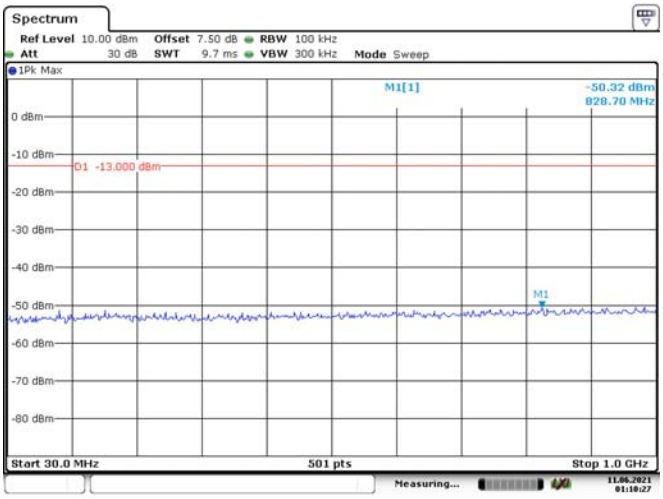


5M, QPSK, High Channel





10M, QPSK, Low Channel



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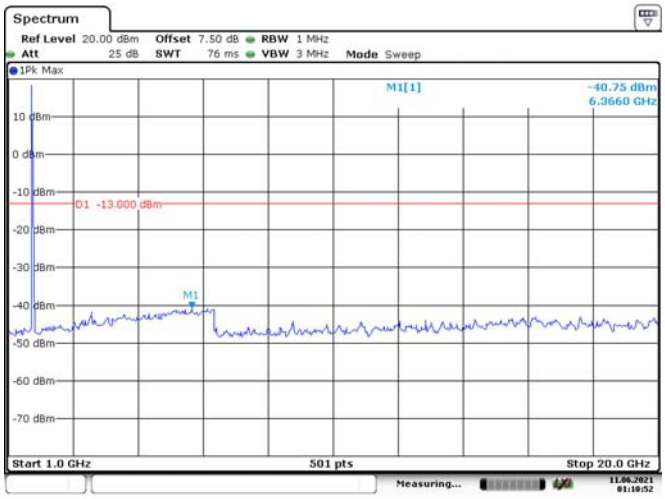

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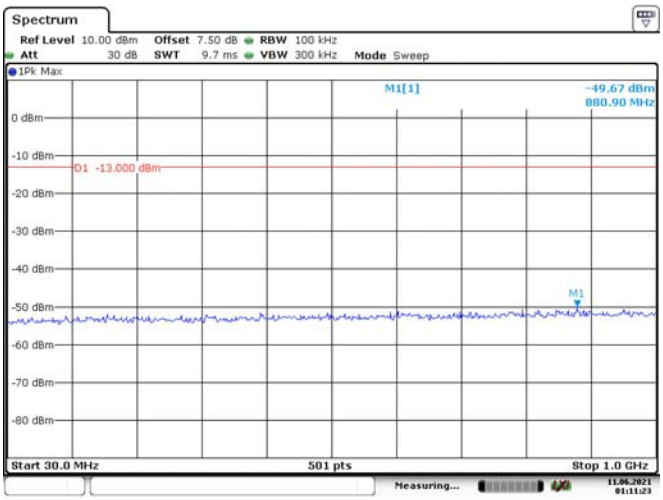
10M, QPSK, Middle Channel



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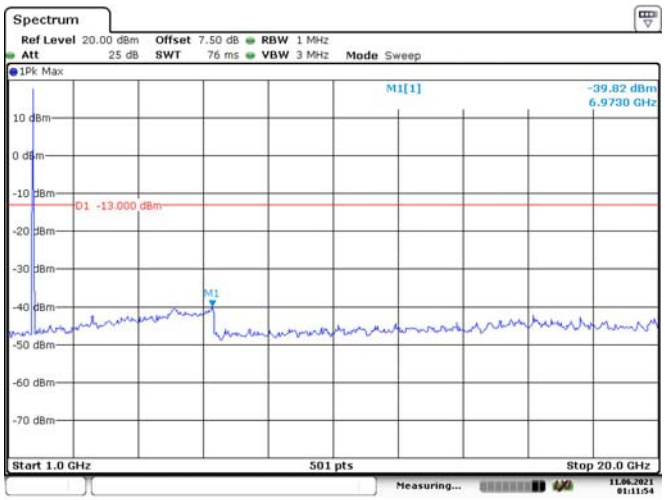

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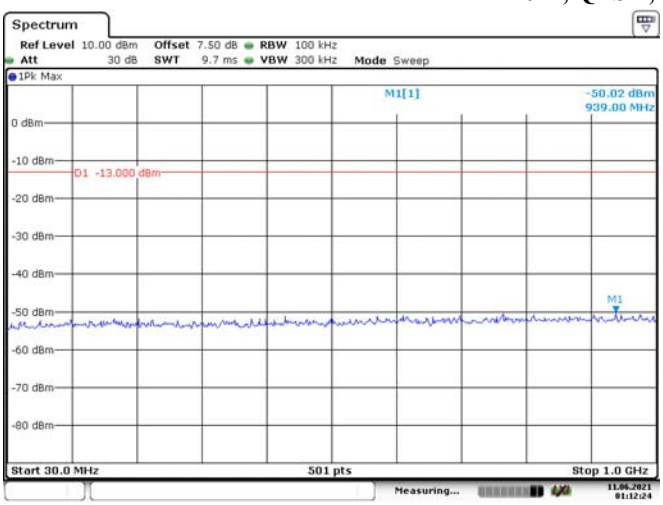
10M, QPSK, High Channel



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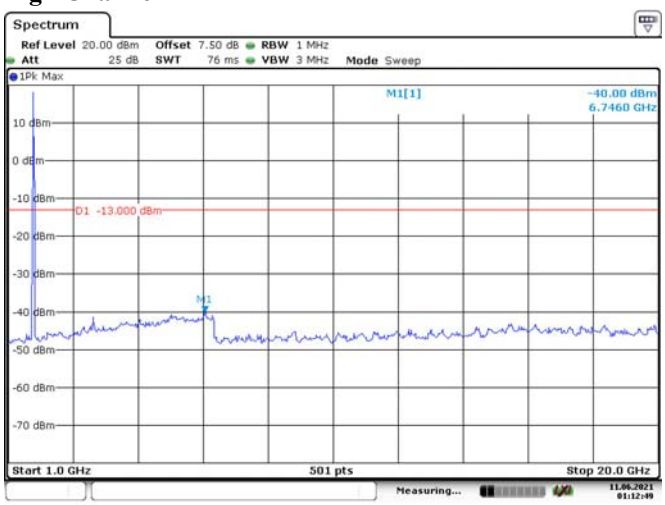

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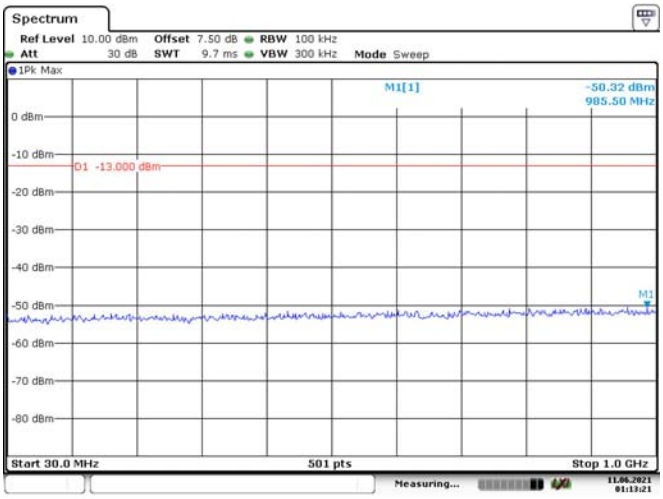
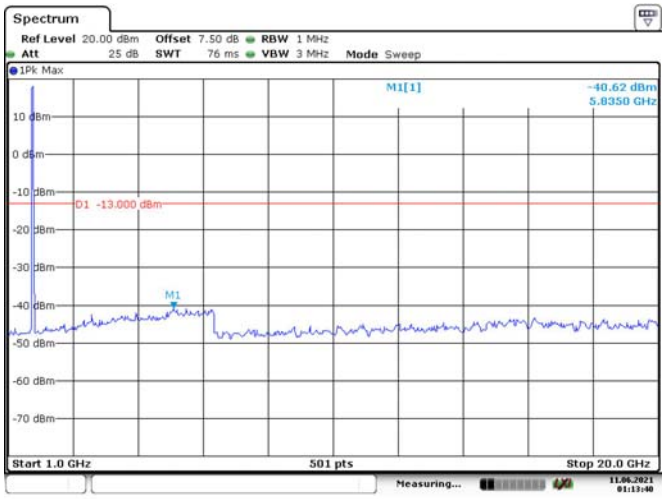
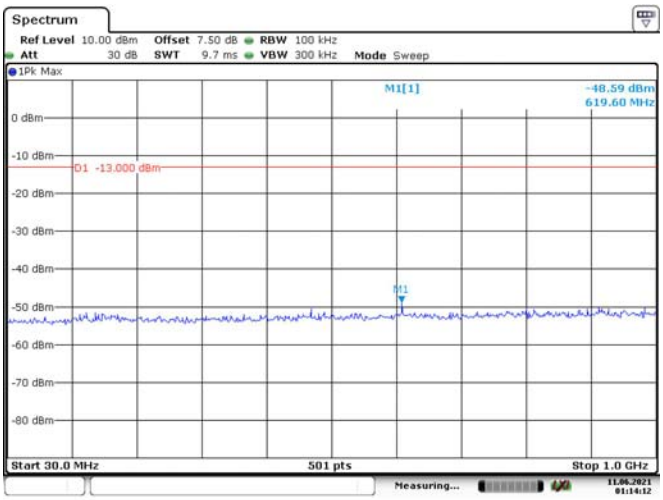
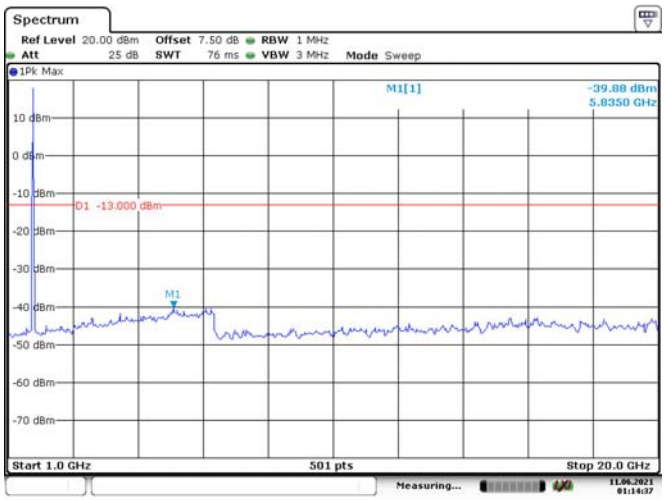
15M, QPSK, Low Channel



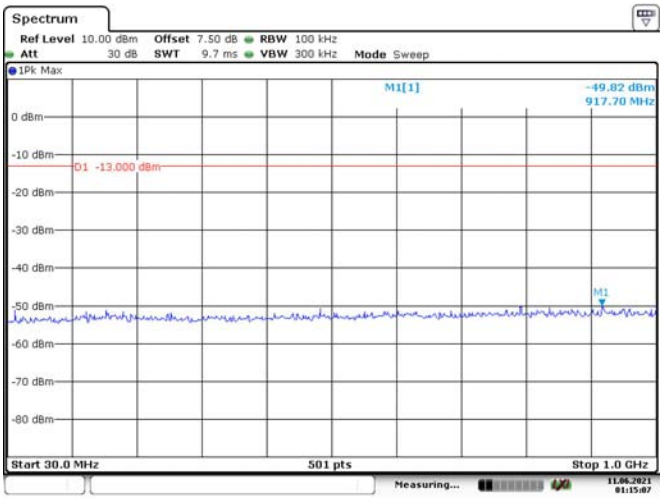


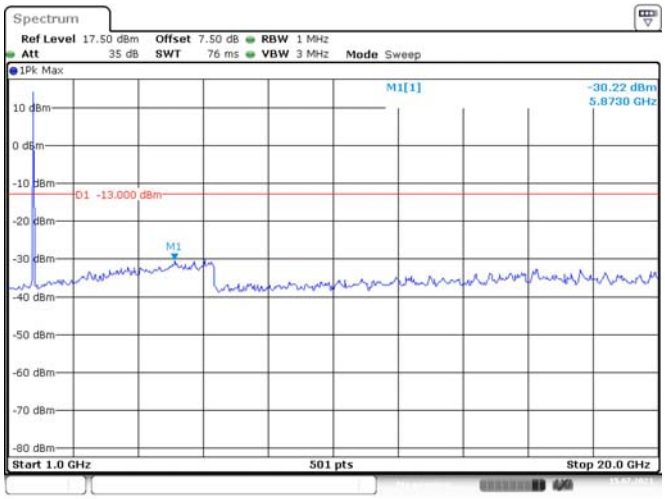
15M, QPSK, Middle Channel



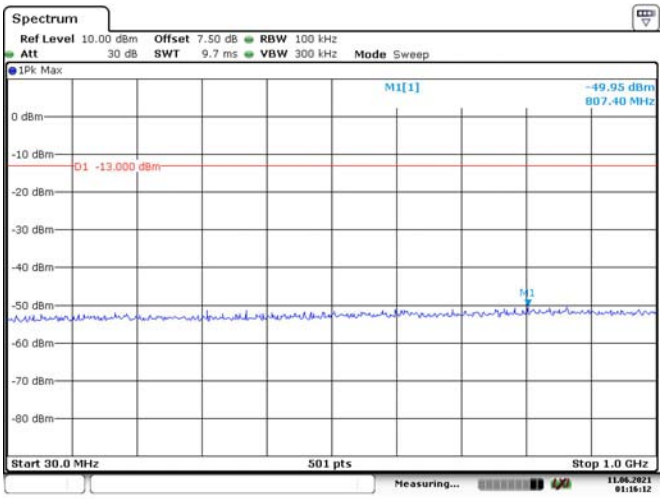


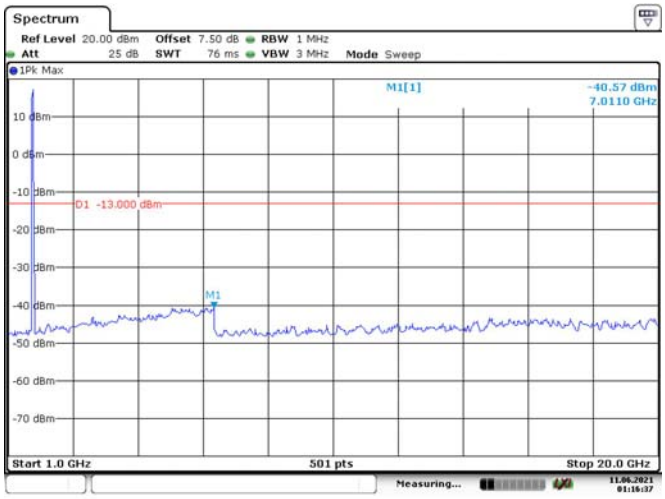
15M, QPSK, High Channel



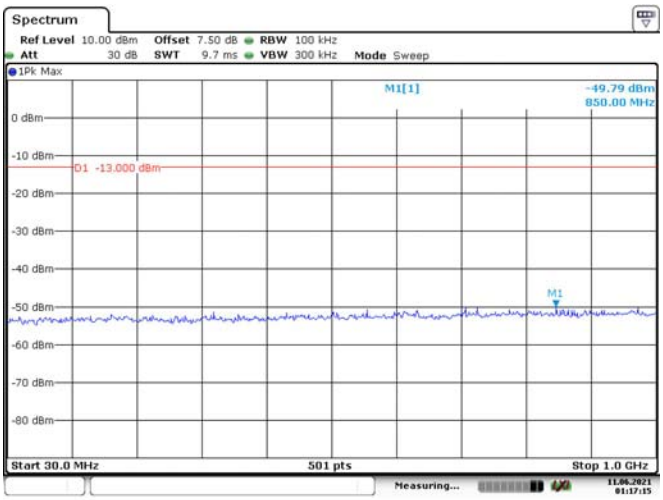


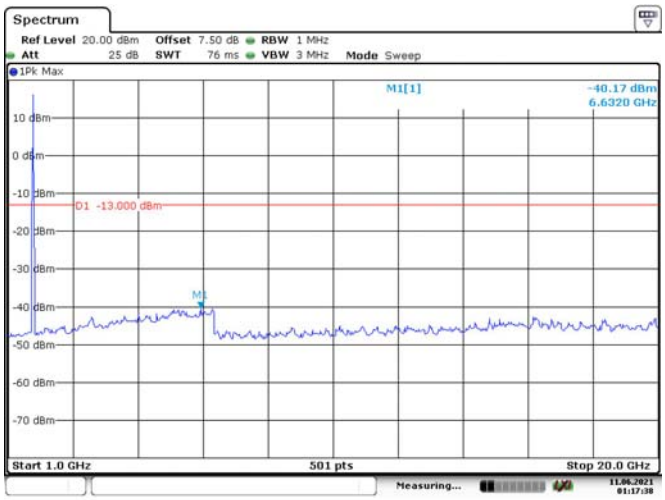
20M, QPSK, Low Channel



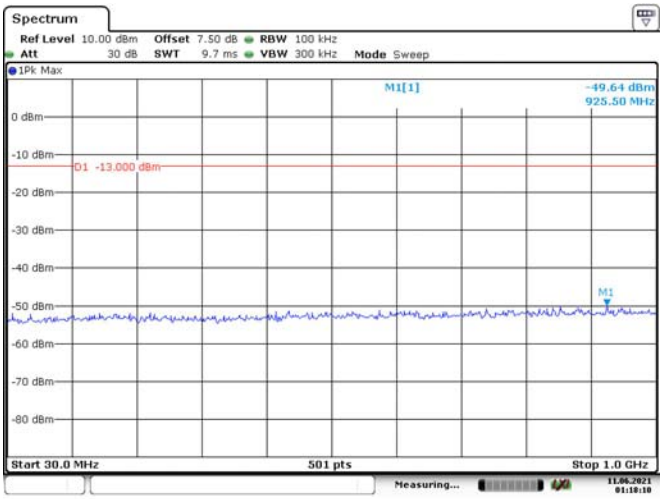


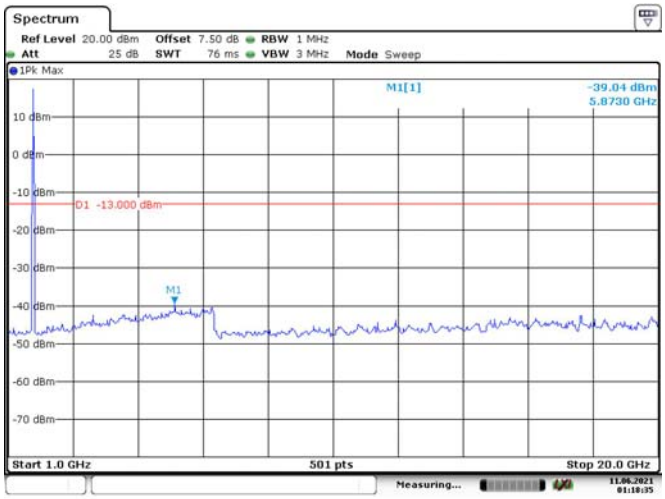
20M, QPSK, Middle Channel





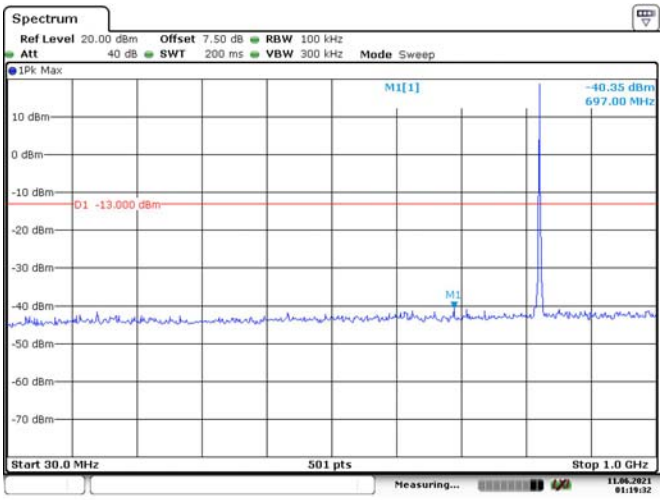
20M, QPSK, High Channel

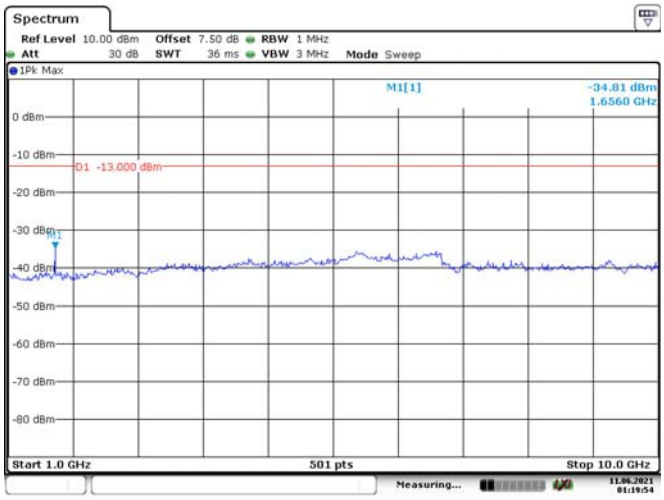




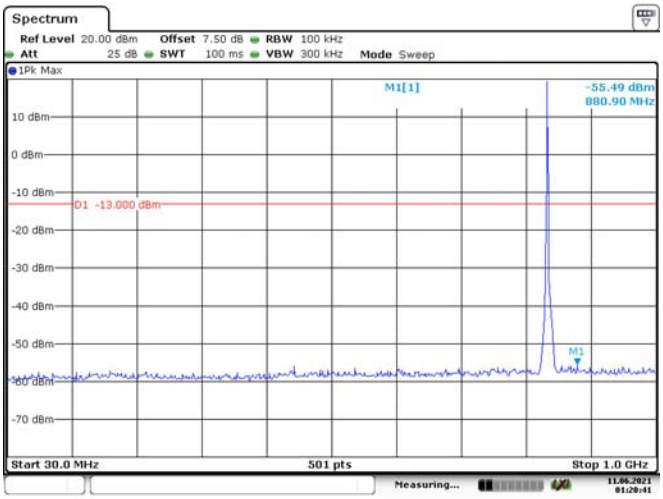
LTE Band 5:

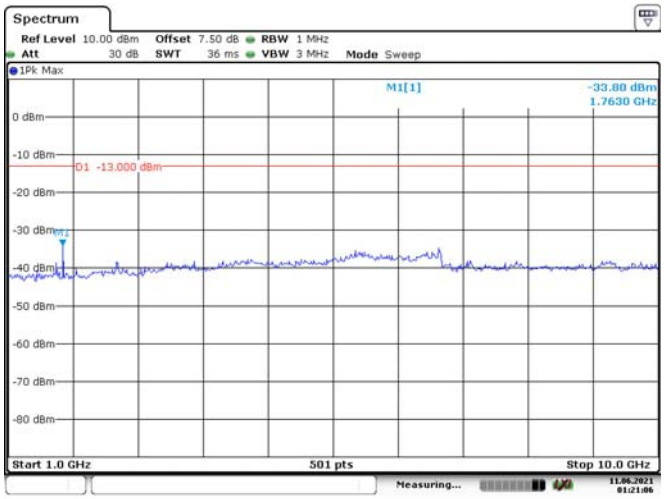
1.4M, QPSK, Low Channel



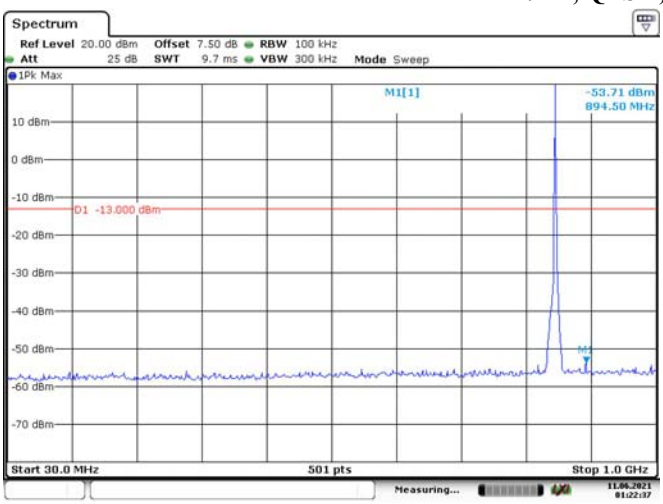


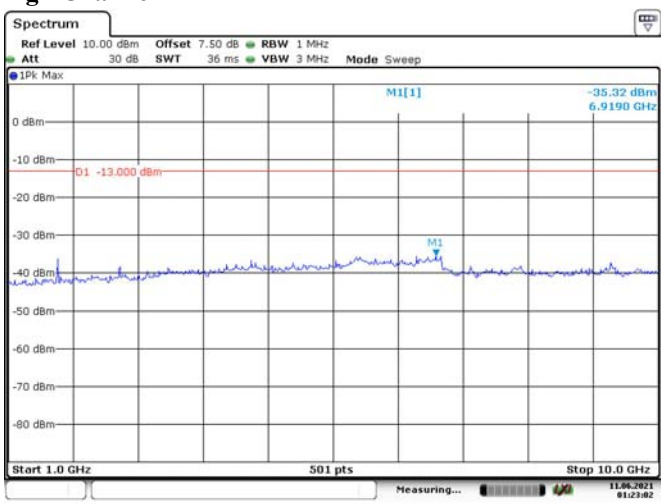
1.4M, QPSK, Middle Channel



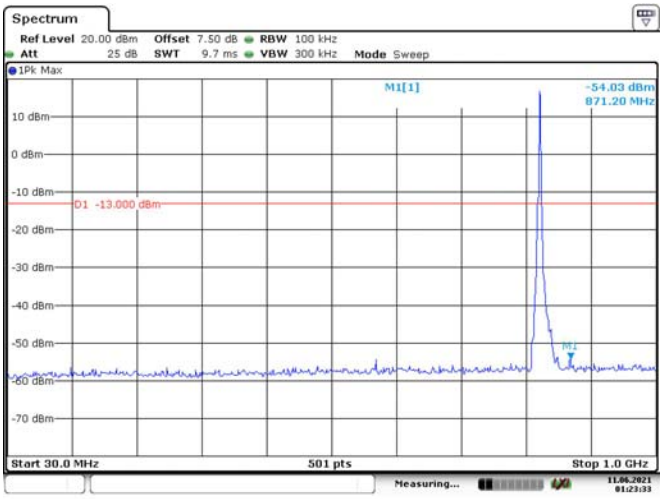


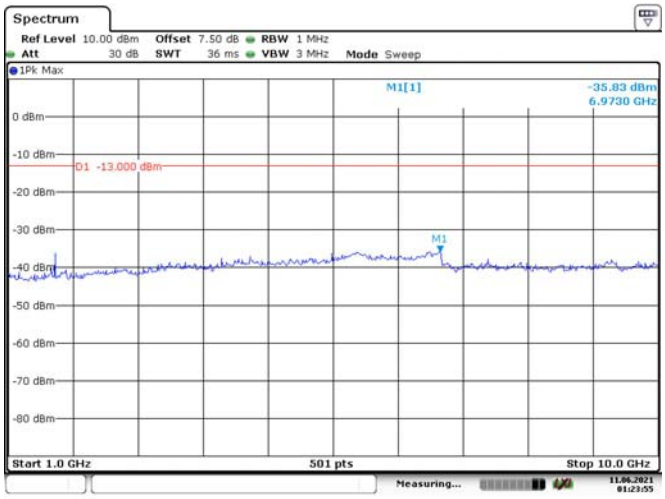
1.4M, QPSK, High Channel



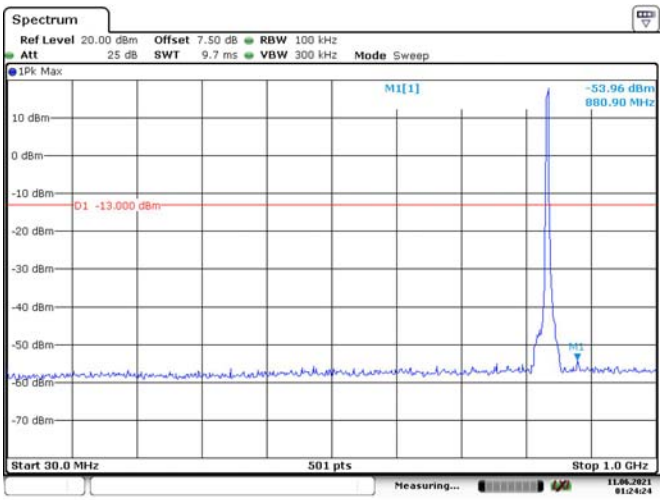


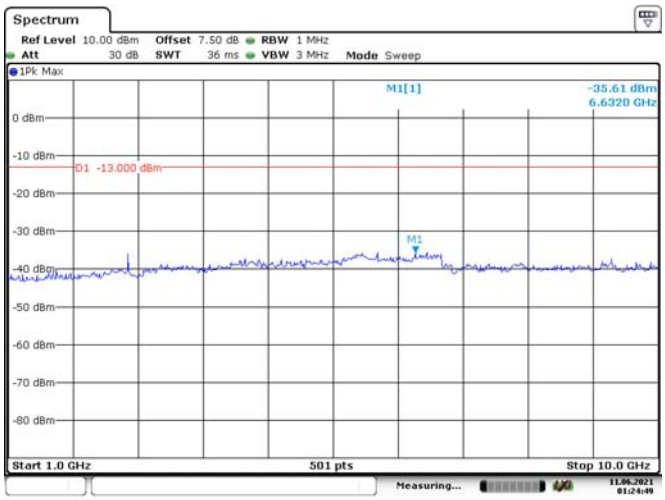
3M, QPSK, Low Channel



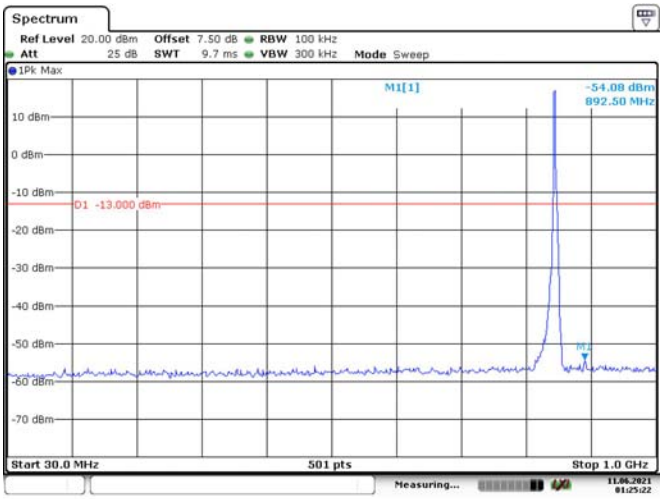


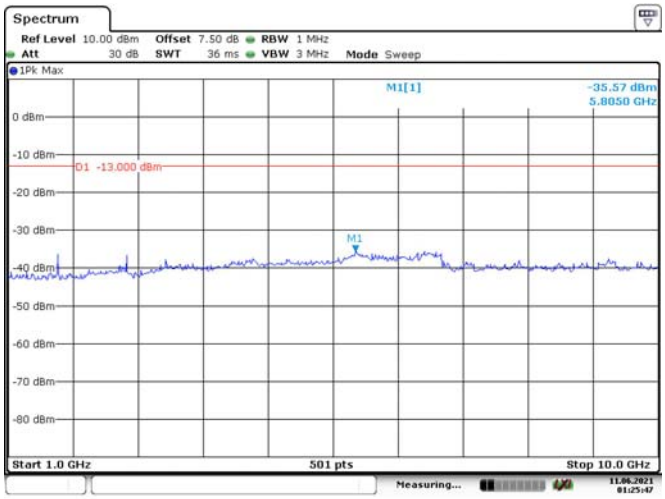
3M, QPSK, Middle Channel



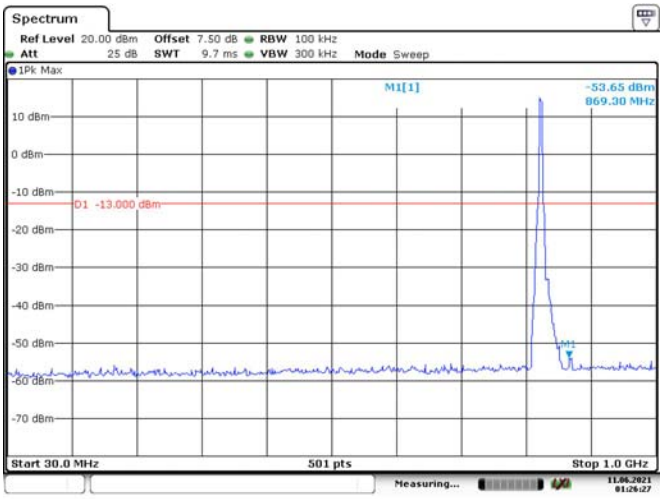


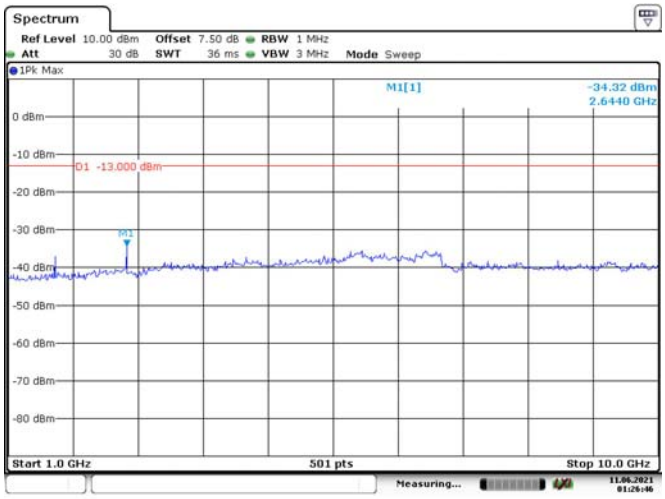
3M, QPSK, High Channel



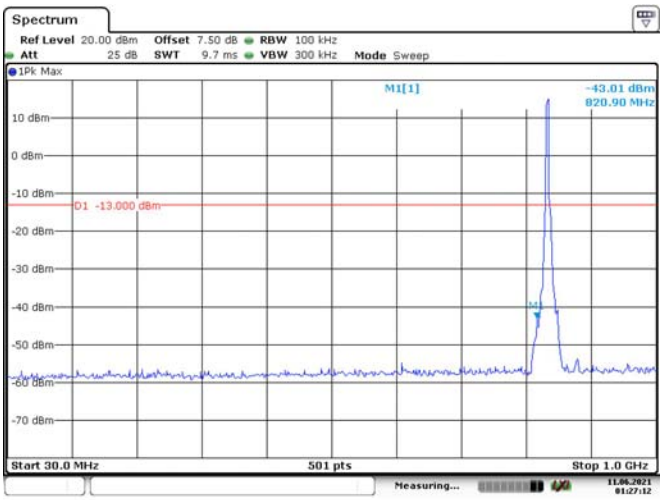


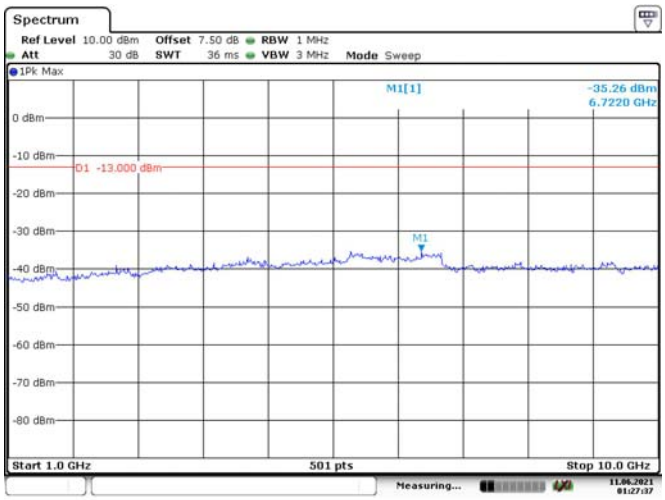
5M, QPSK, Low Channel



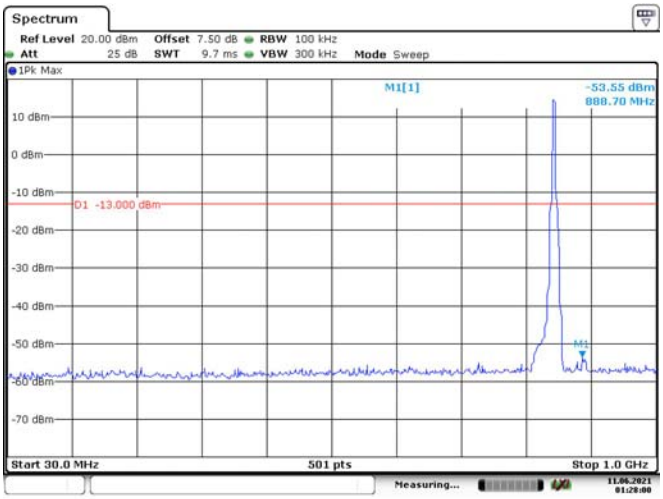


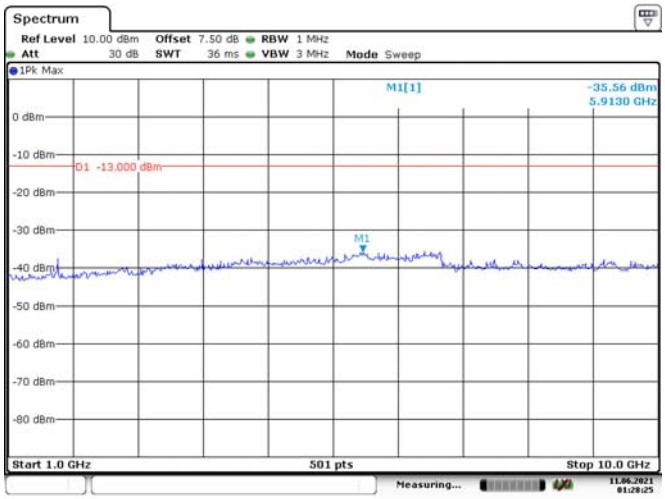
5M, QPSK, Middle Channel



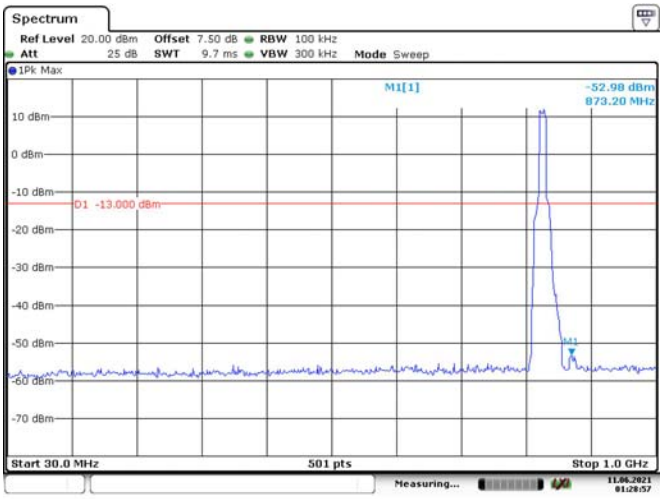


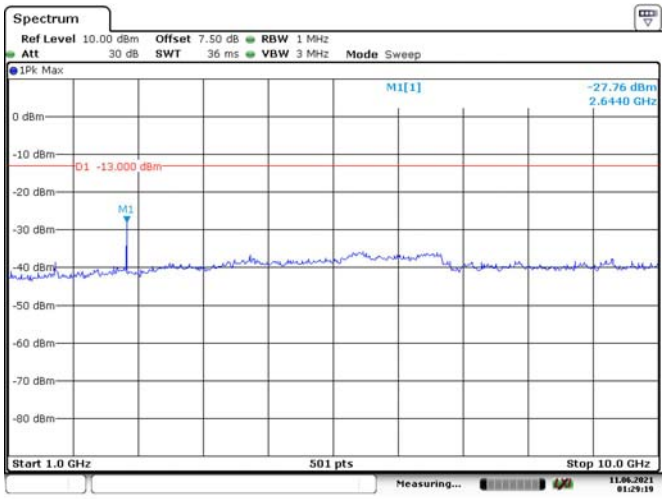
5M, QPSK, High Channel



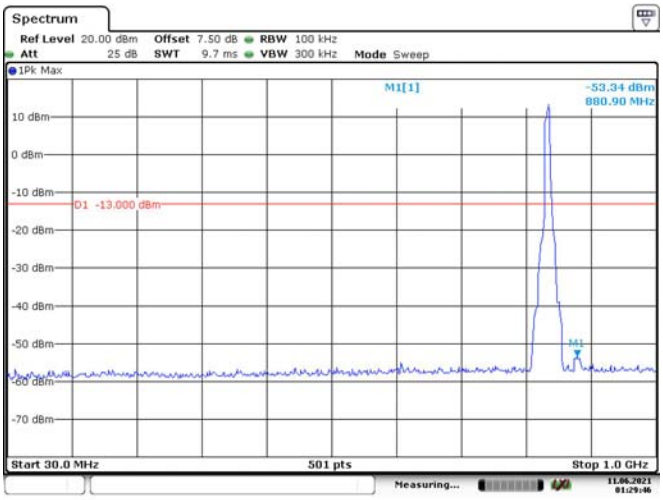


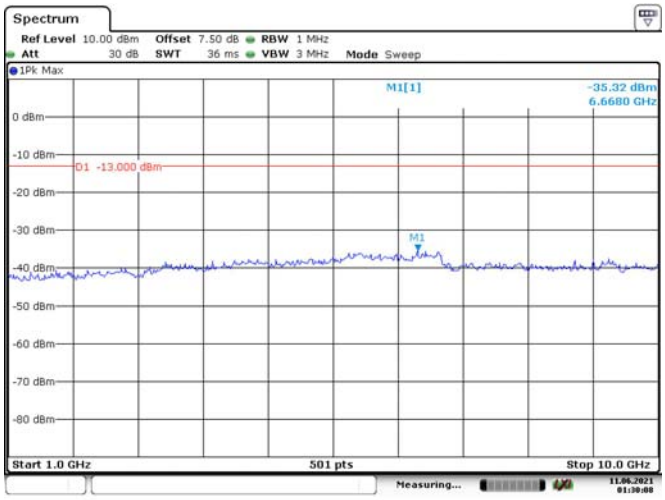
10M, QPSK, Low Channel



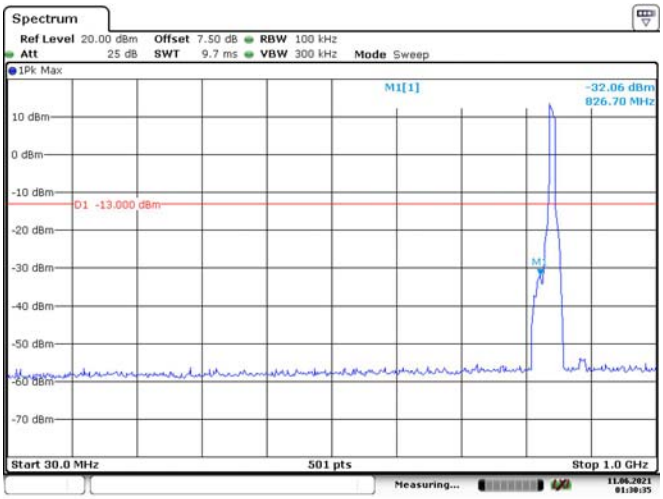


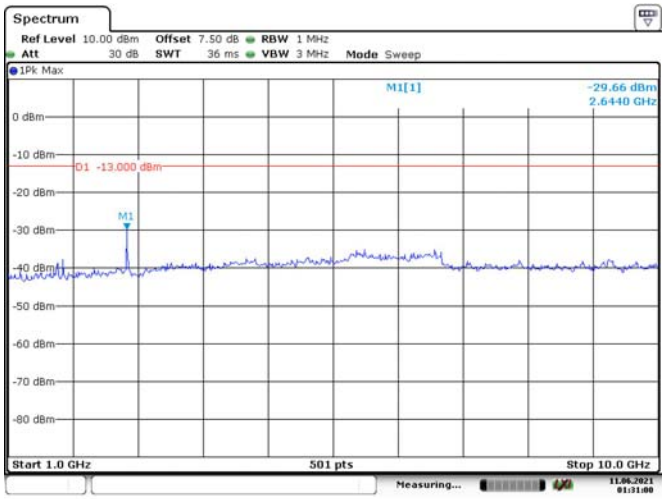
10M, QPSK, Middle Channel





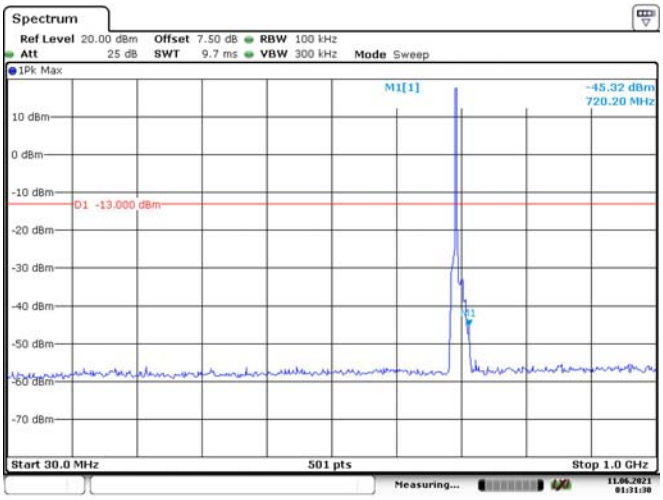
10M, QPSK, High Channel

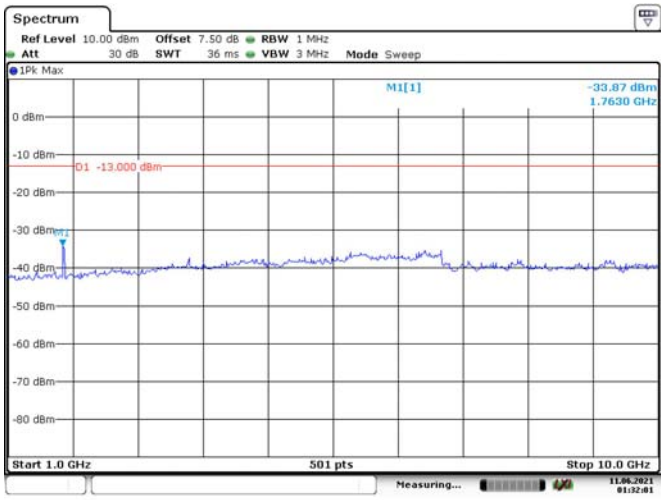




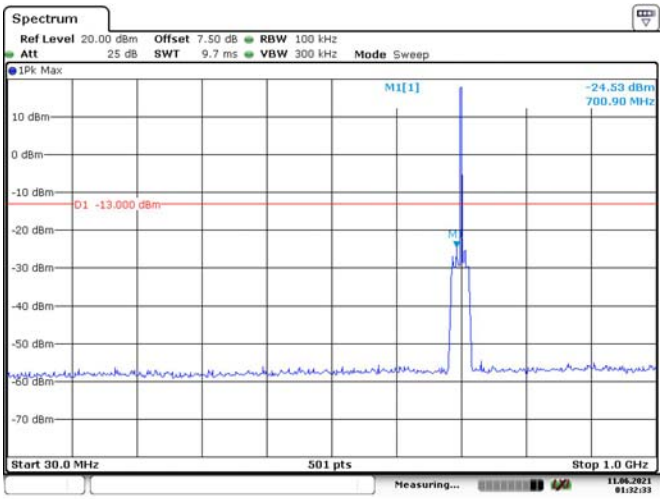
LTE Band 12:

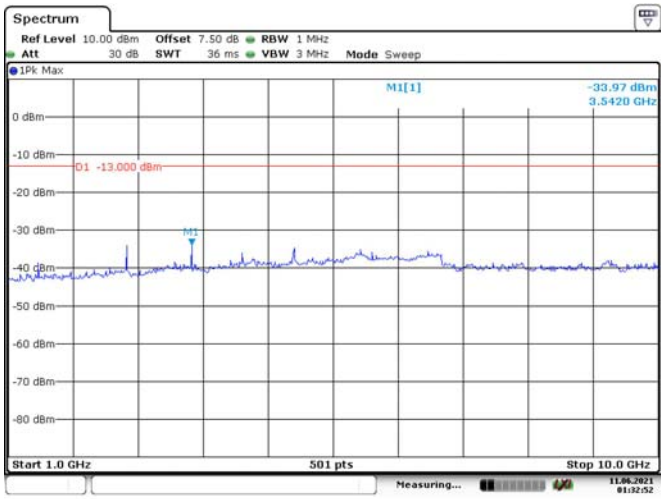
1.4M, QPSK, Low Channel



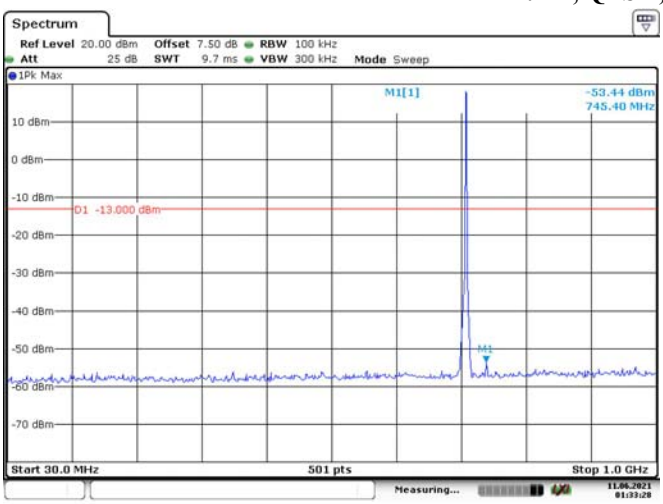


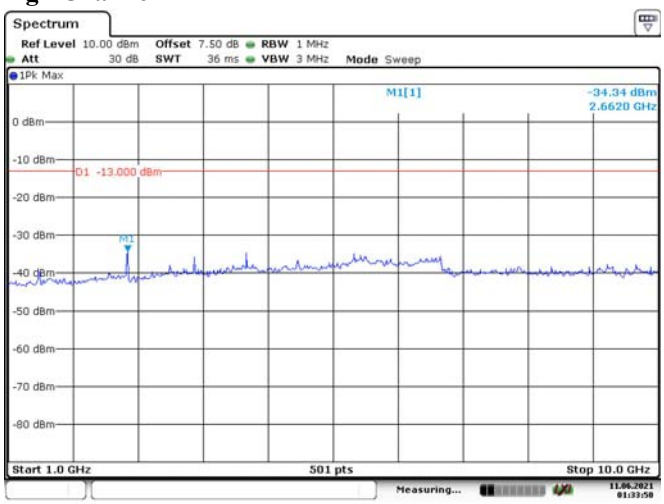
1.4M, QPSK, Middle Channel



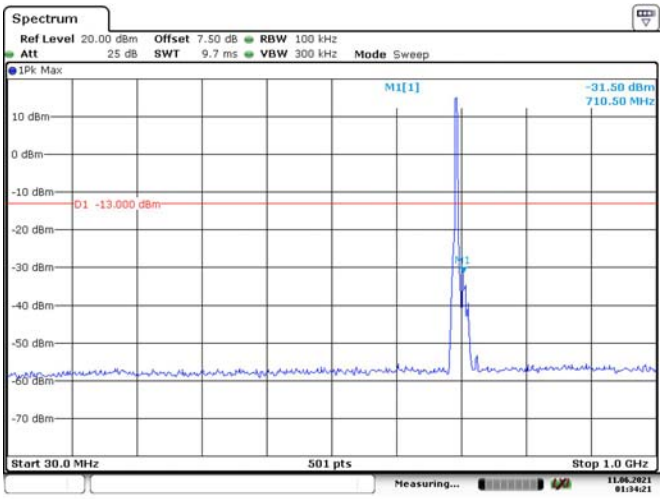


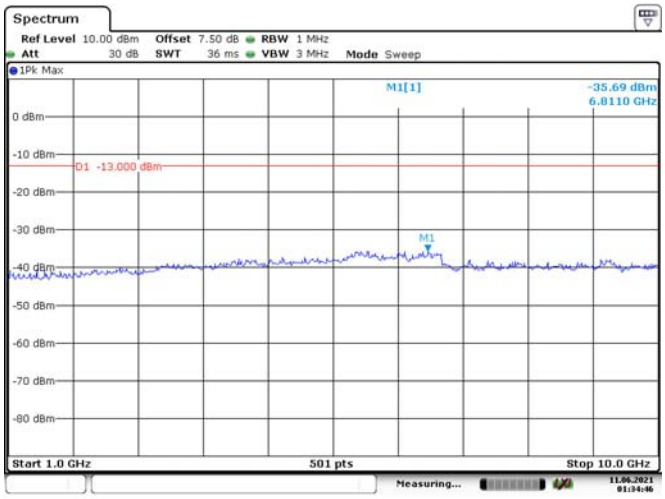
1.4M, QPSK, High Channel



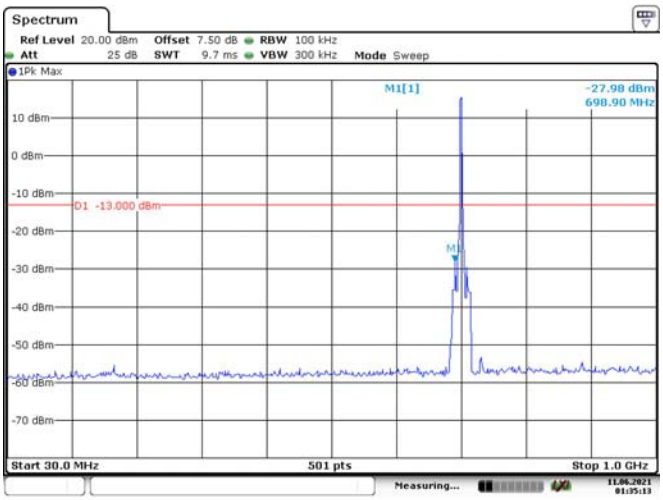


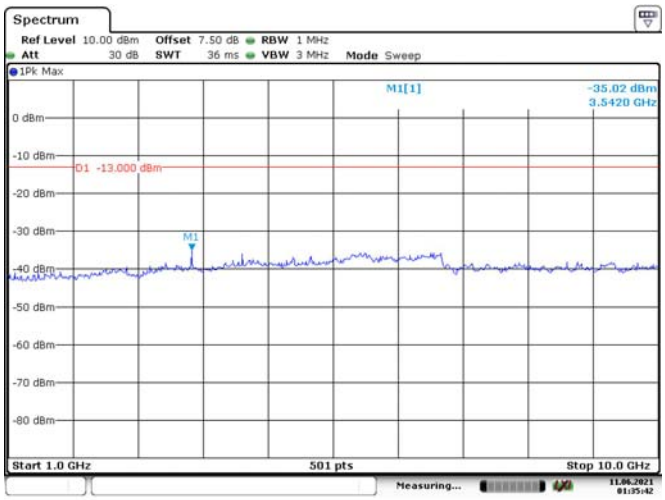
3M, QPSK, Low Channel



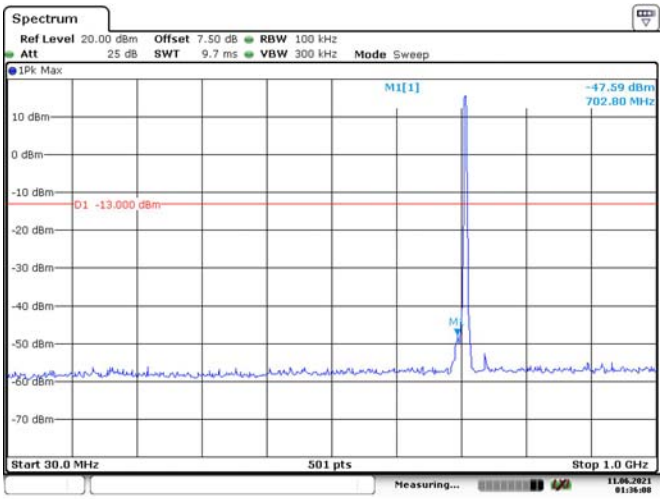


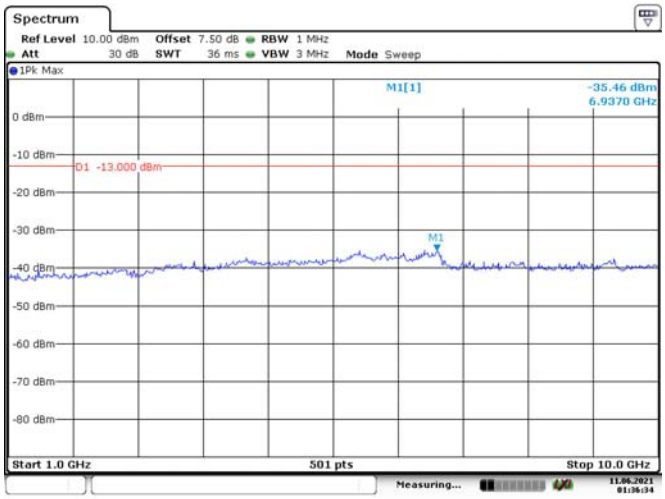
3M, QPSK, Middle Channel



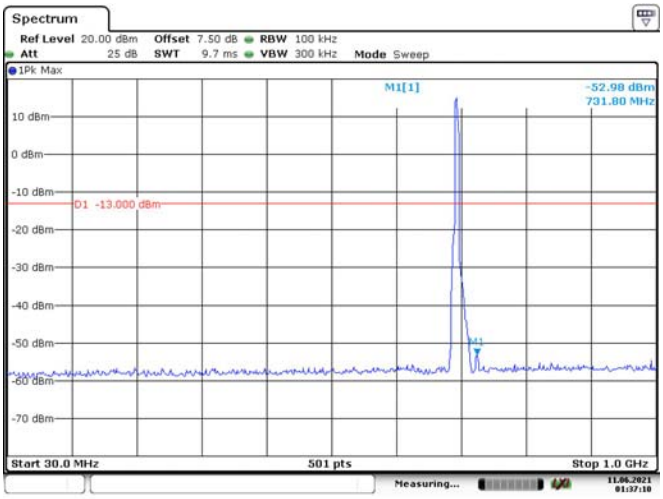


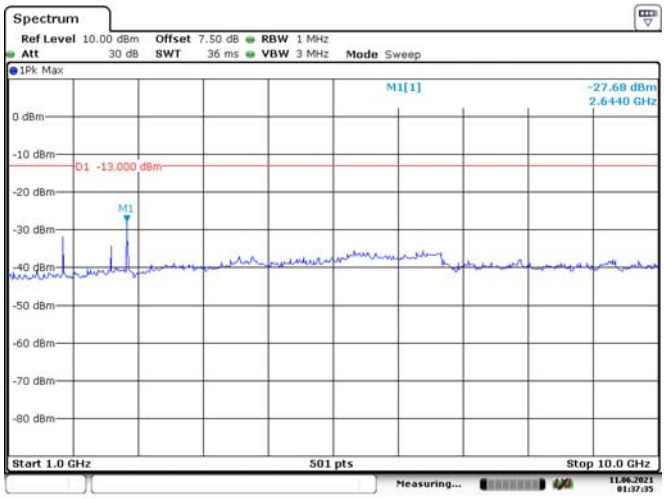
3M, QPSK, High Channel



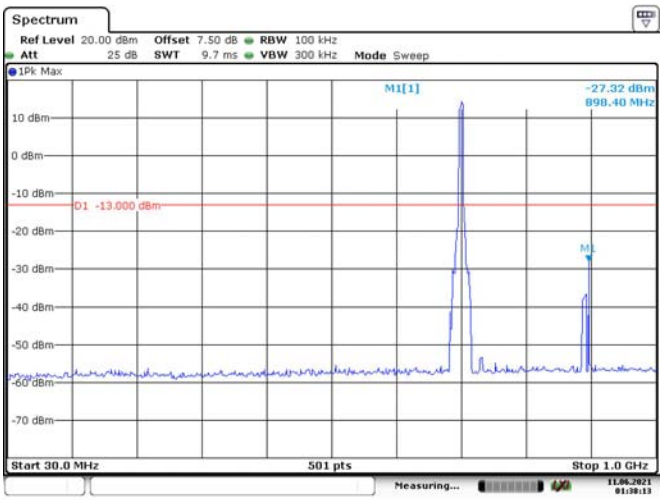


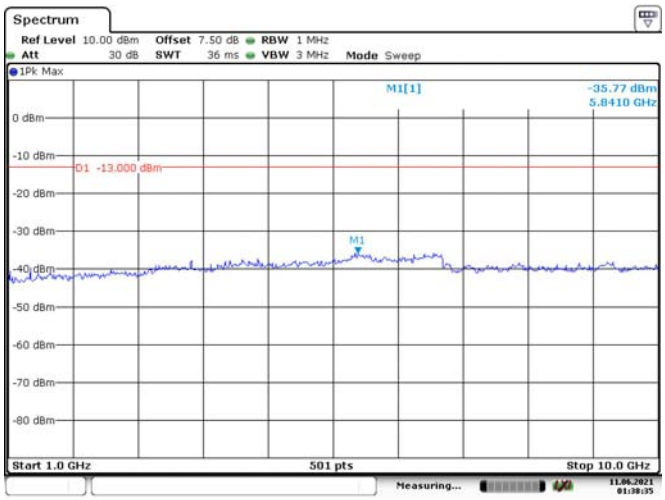
5M, QPSK, Low Channel



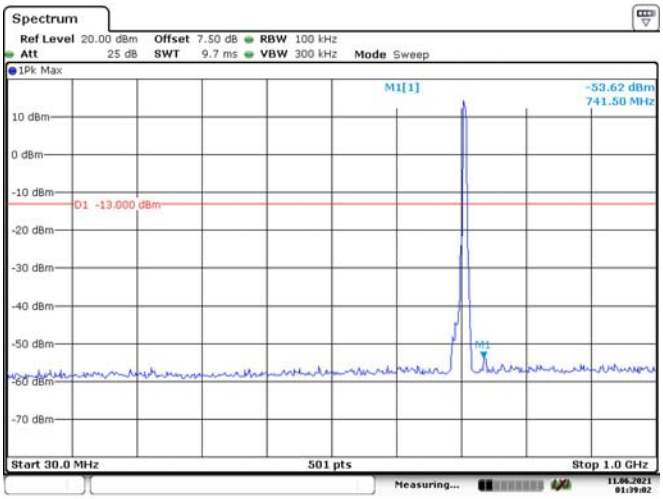


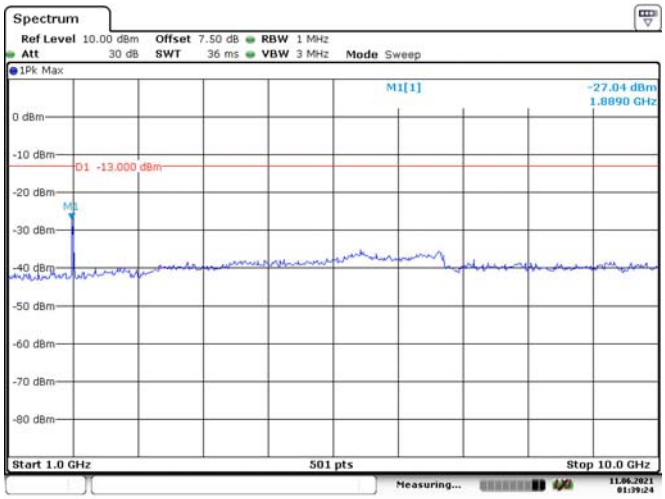
5M, QPSK, Middle Channel



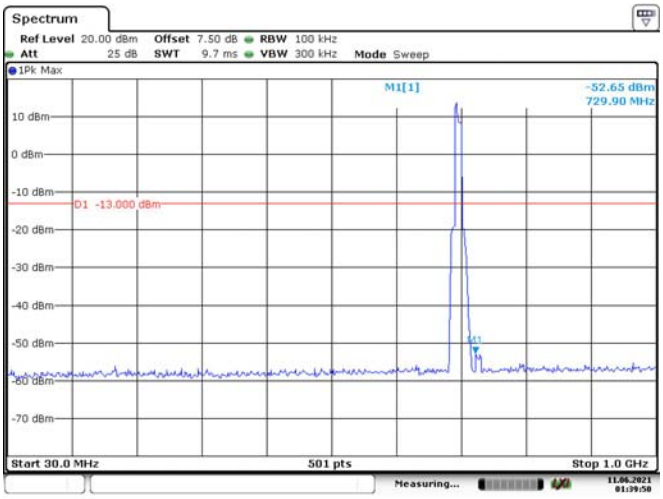


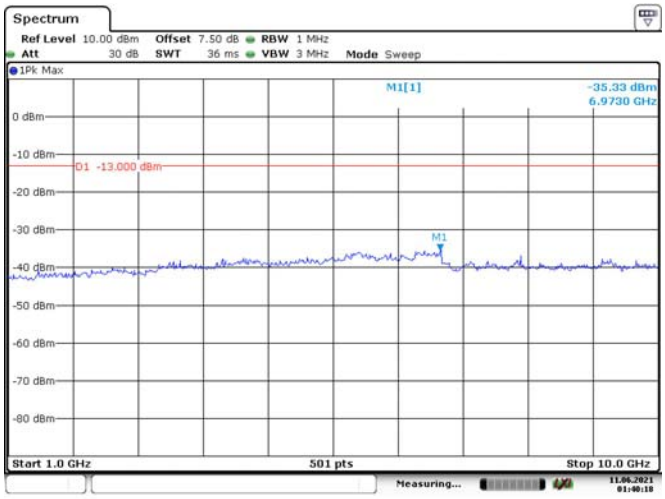
5M, QPSK, High Channel



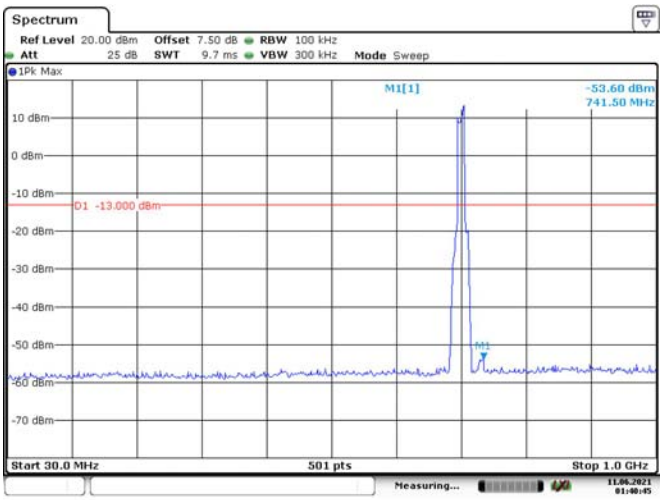


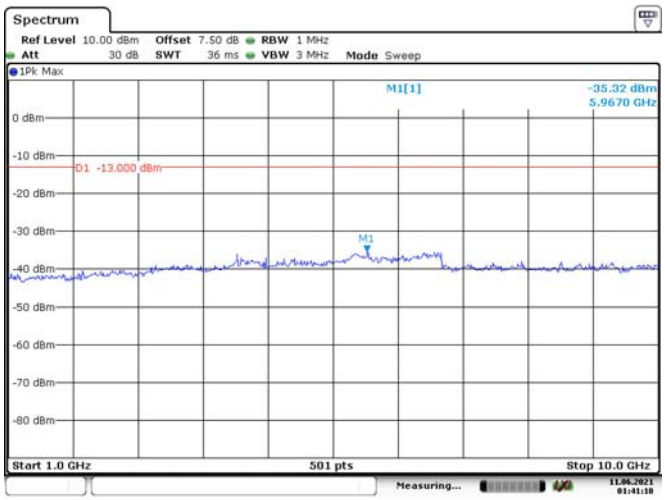
10M, QPSK, Low Channel



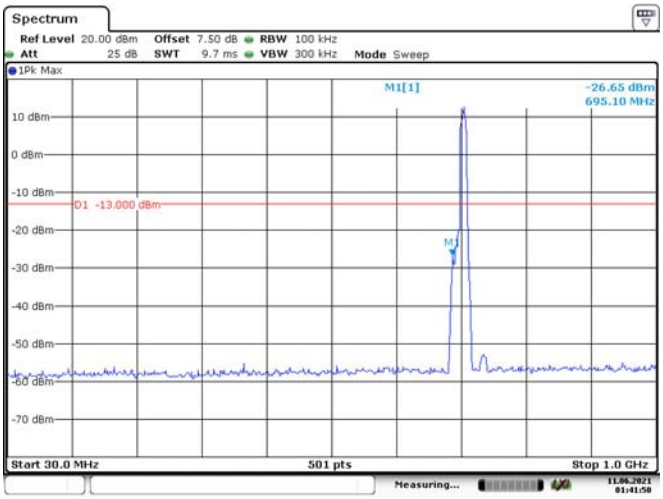


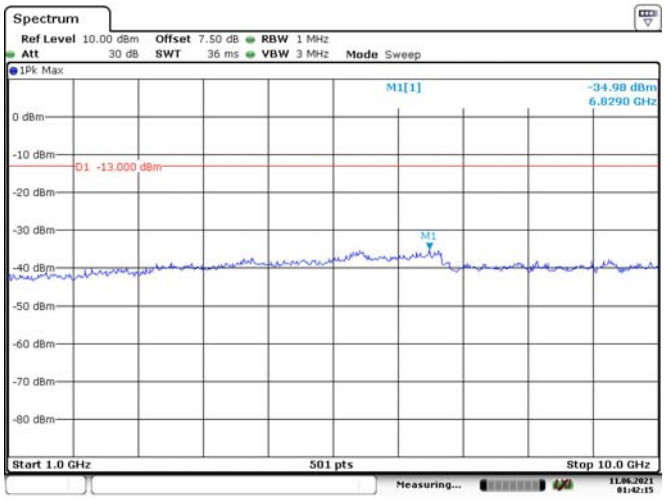
10M, QPSK, Middle Channel





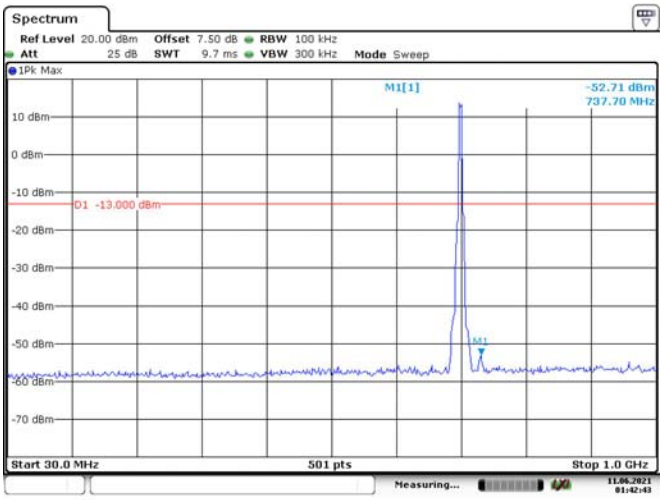
10M, QPSK, High Channel



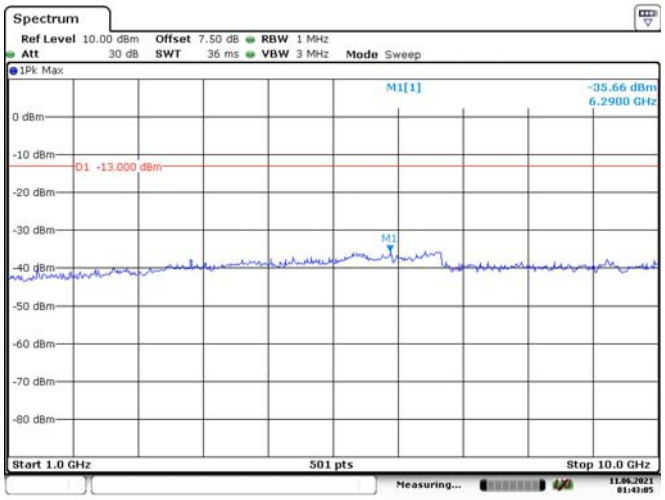


LTE Band 17:

5M, QPSK, Low Channel

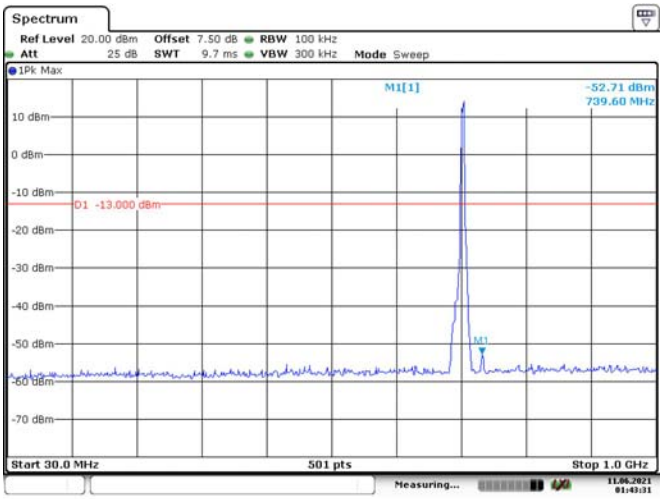


Date: 11.JUN.2021 01:42:44

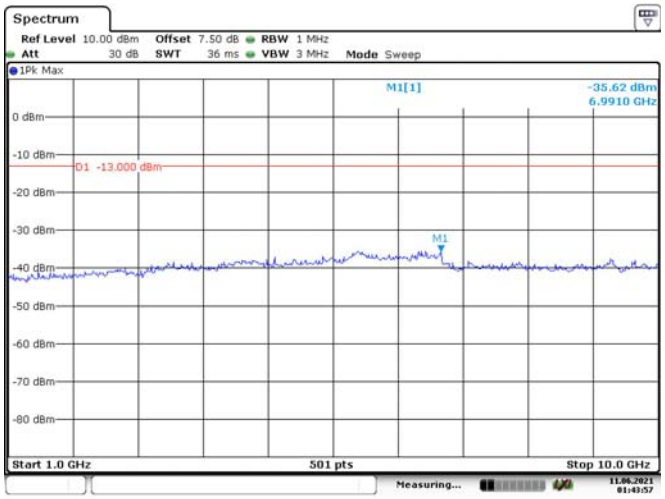


Date: 11.JUN.2021 01:43:06

5M, QPSK, Middle Channel

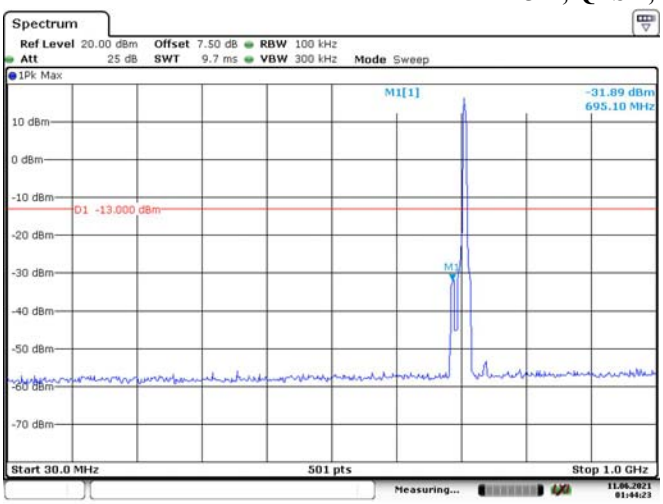


Date: 11.JUN.2021 01:43:32



Date: 11.JUN.2021 01:43:57

5M, QPSK, High Channel



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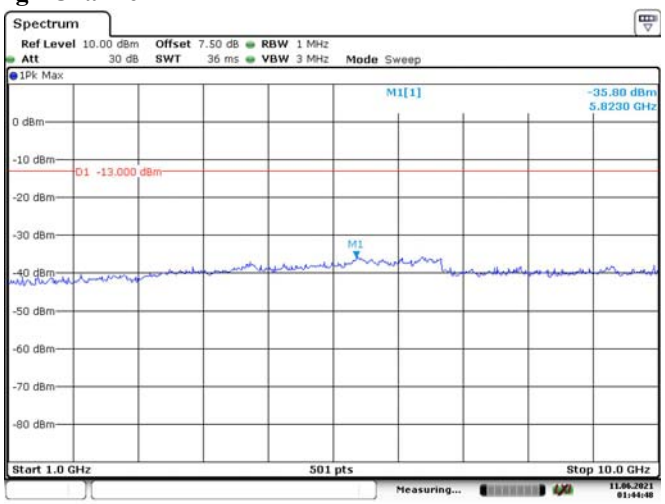
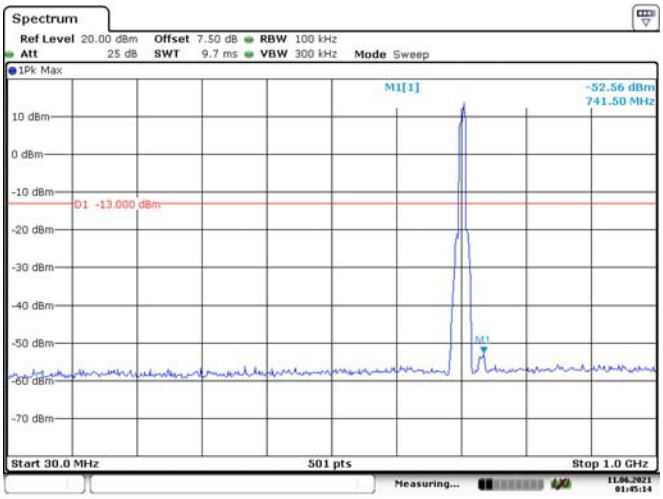
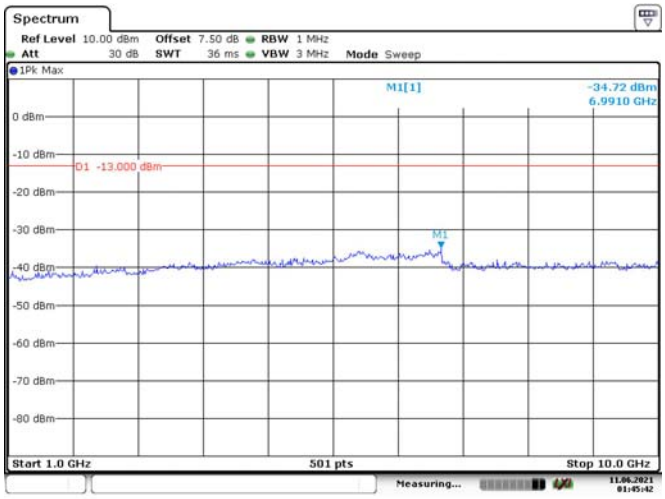


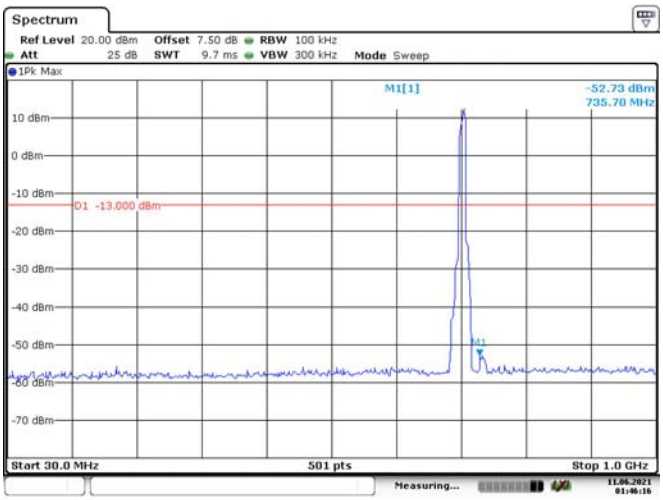
Date: 11.JUN.2021 01:44:48

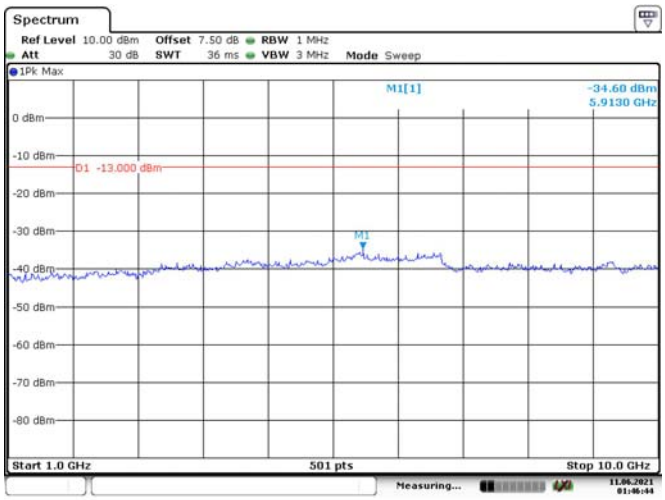
10M, QPSK, Low Channel



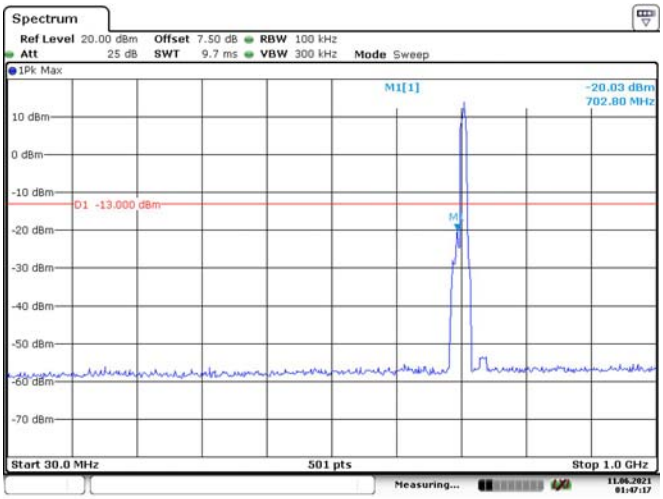


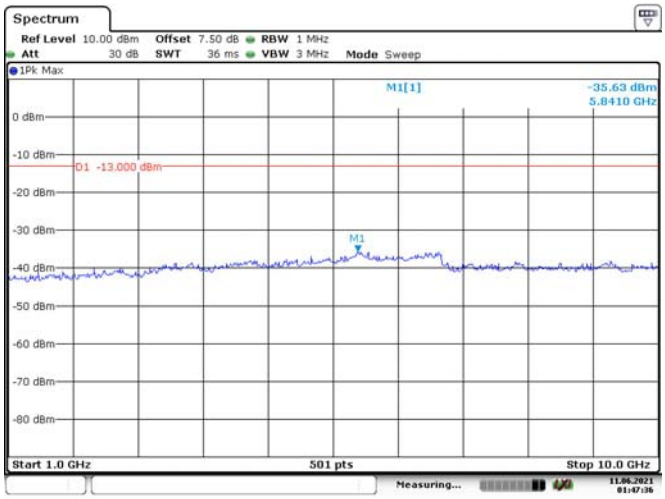
10M, QPSK, Middle Channel





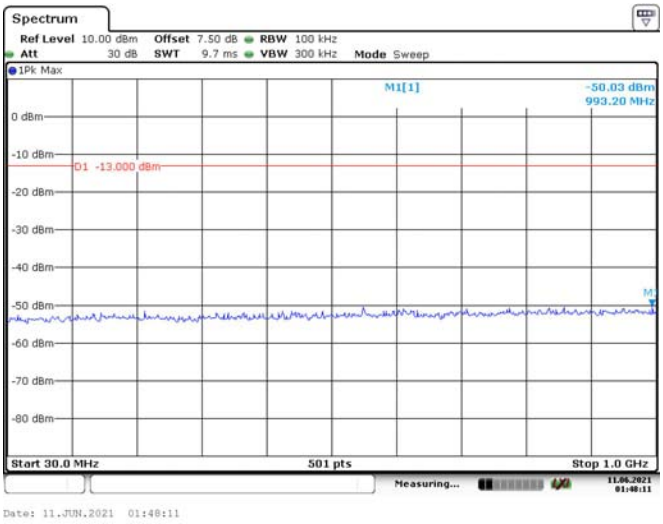
10M, QPSK, High Channel

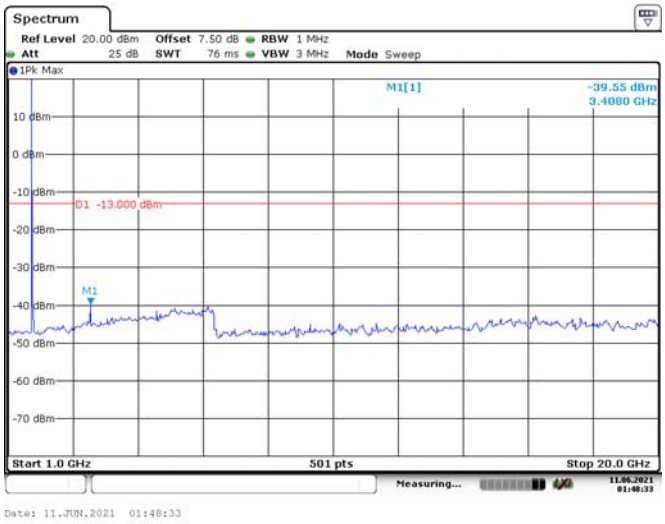




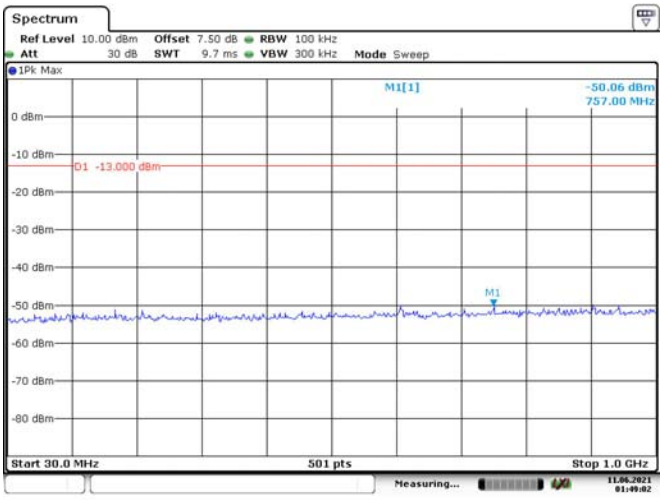
LTE Band 66:

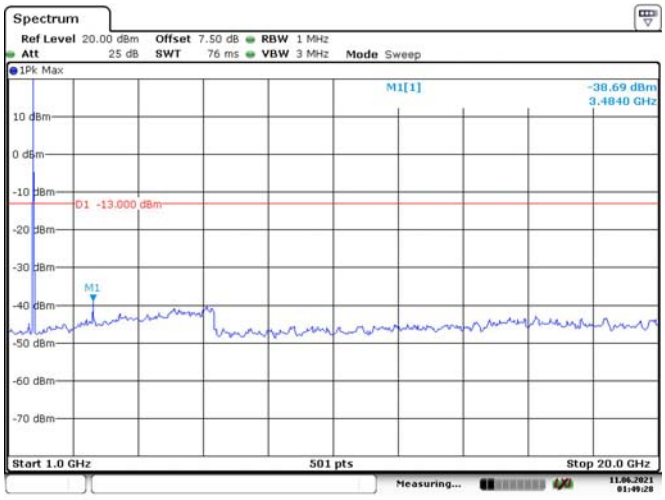
1.4M, QPSK, Low Channel



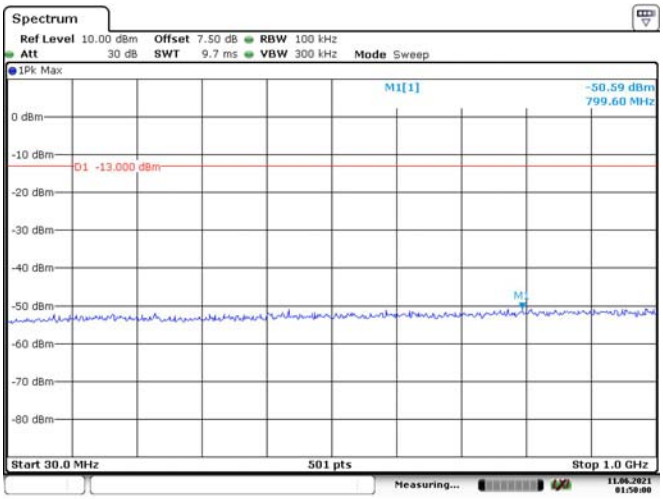


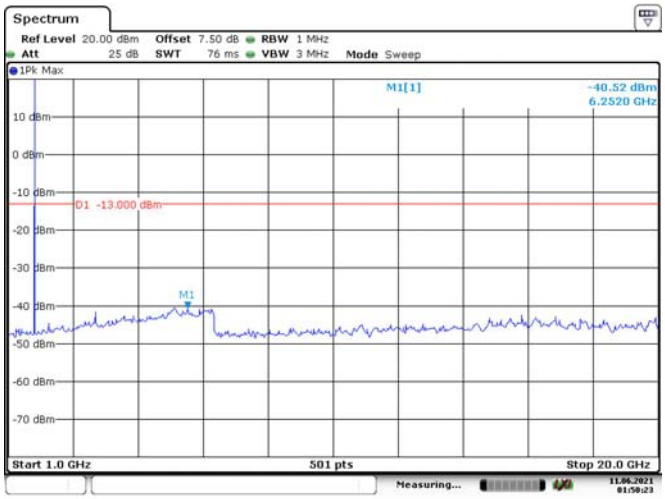
1.4M, QPSK, Middle Channel



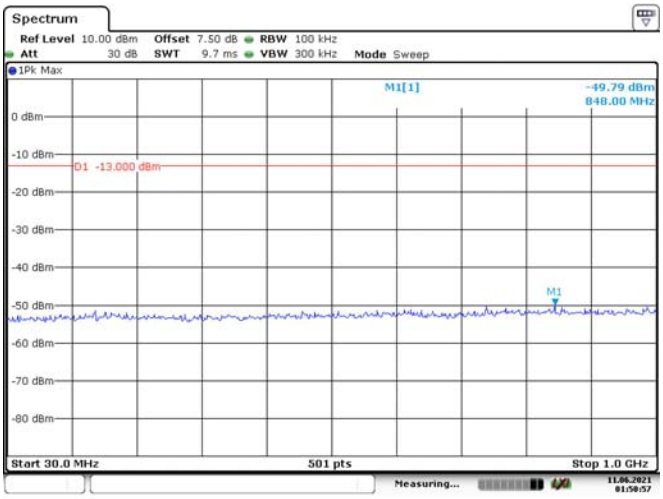


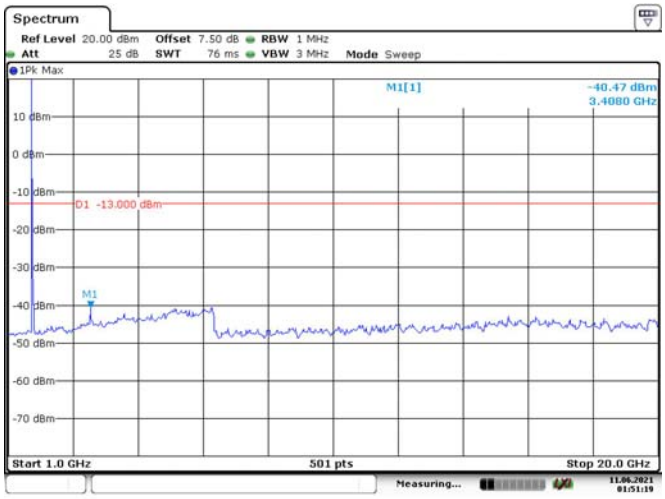
1.4M, QPSK, High Channel



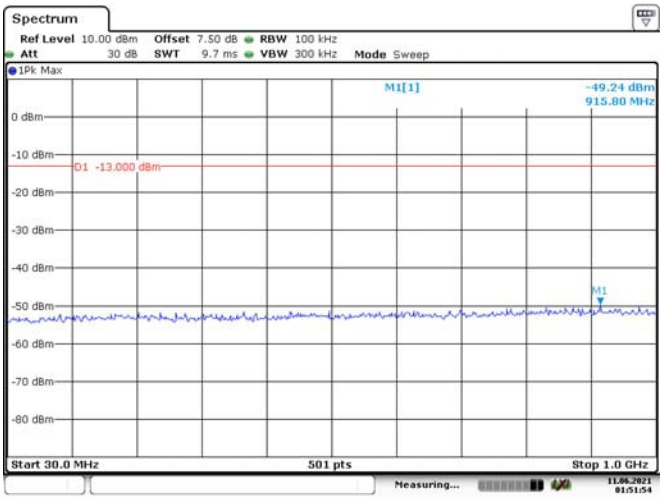


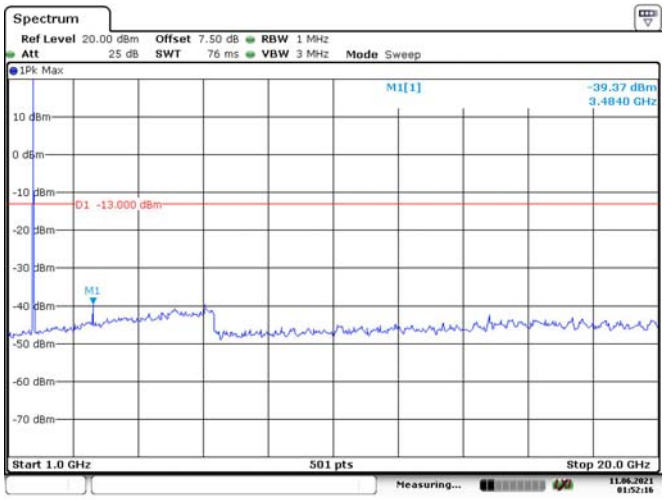
3M, QPSK, Low Channel



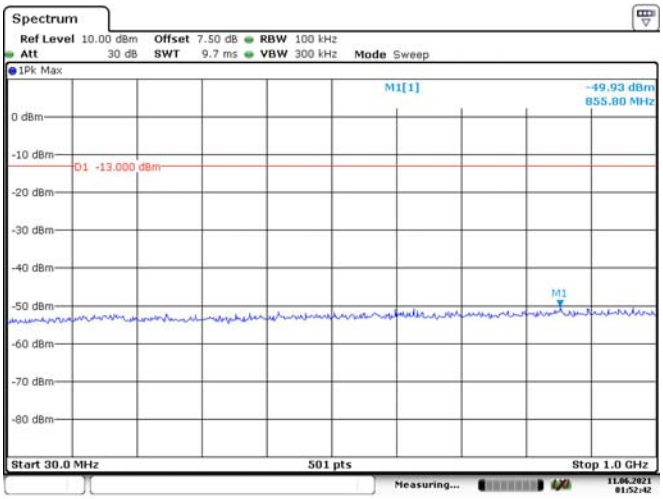


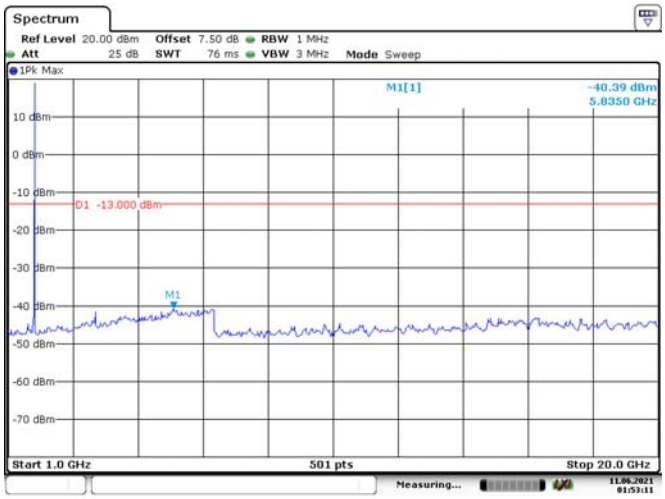
3M, QPSK, Middle Channel



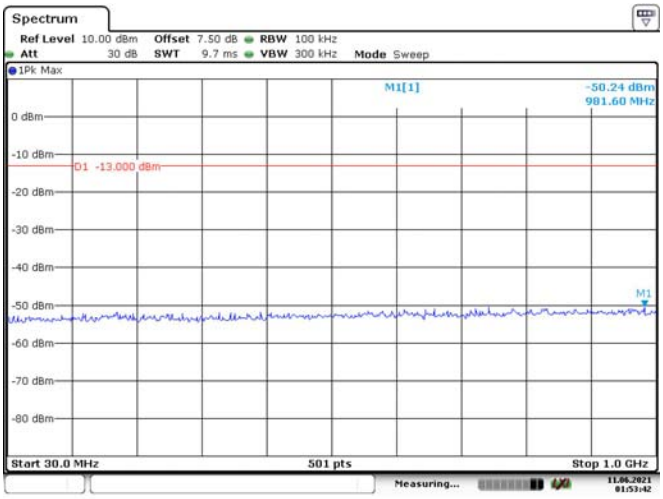


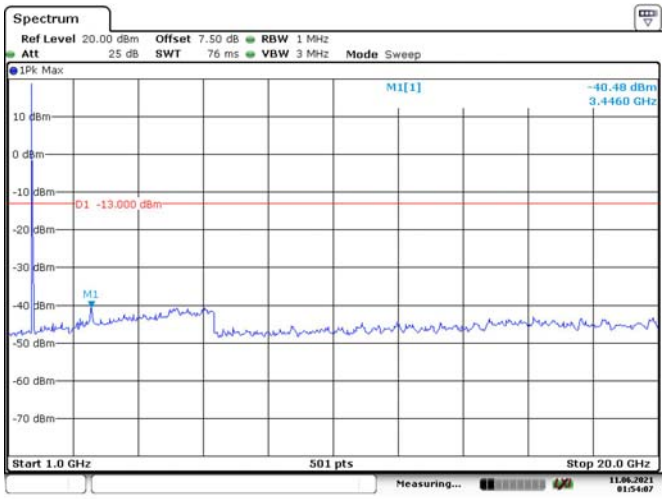
3M, QPSK, High Channel



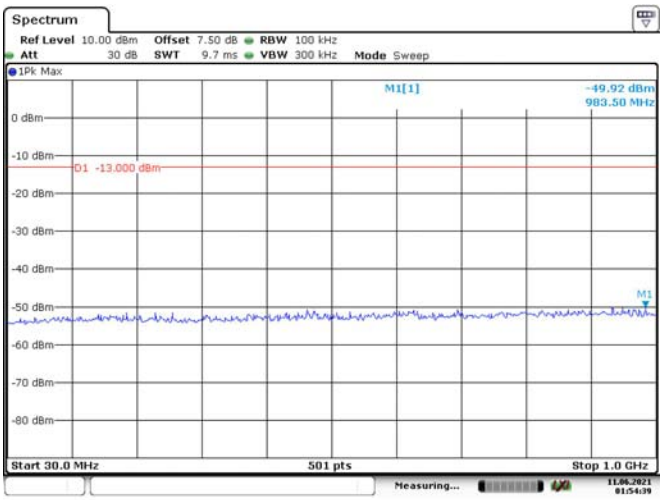


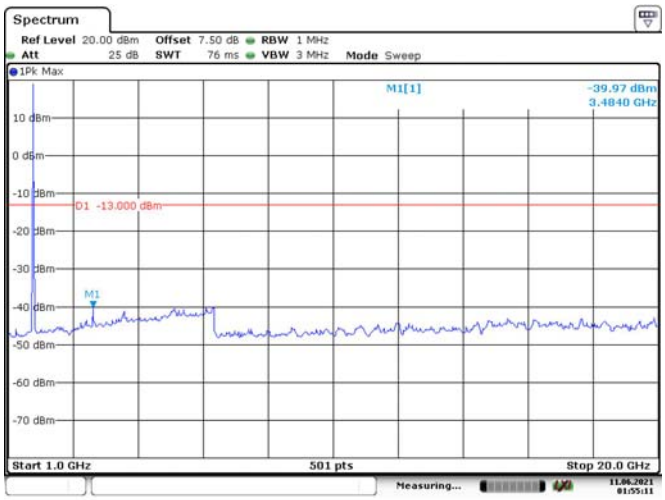
5M, QPSK, Low Channel



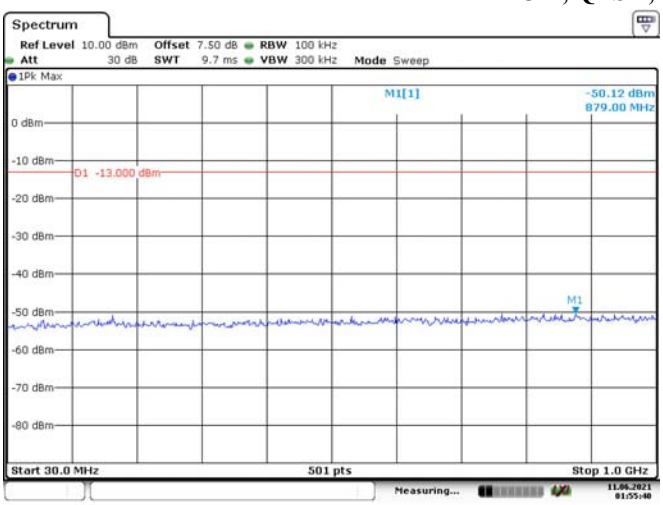


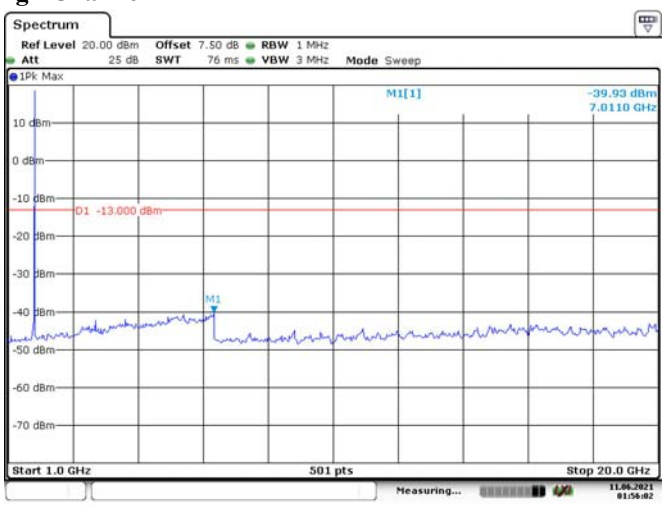
5M, QPSK, Middle Channel



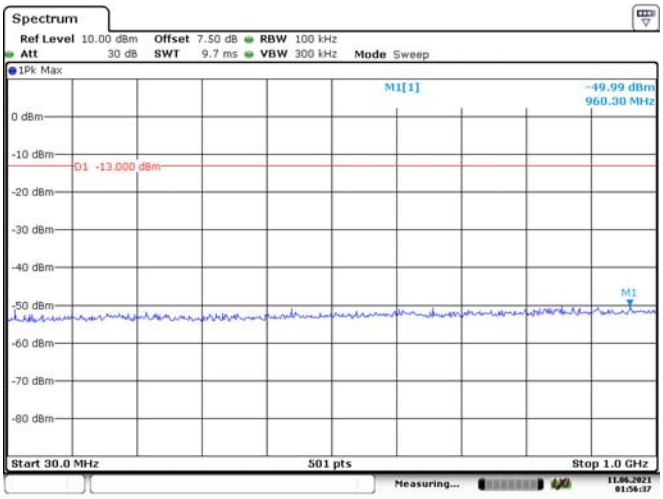


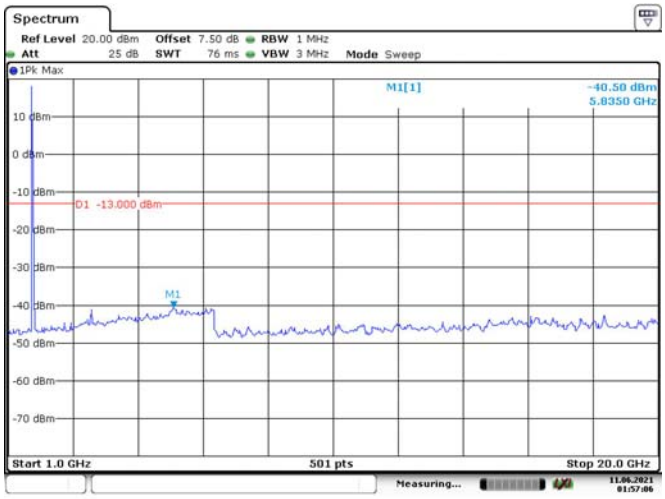
5M, QPSK, High Channel



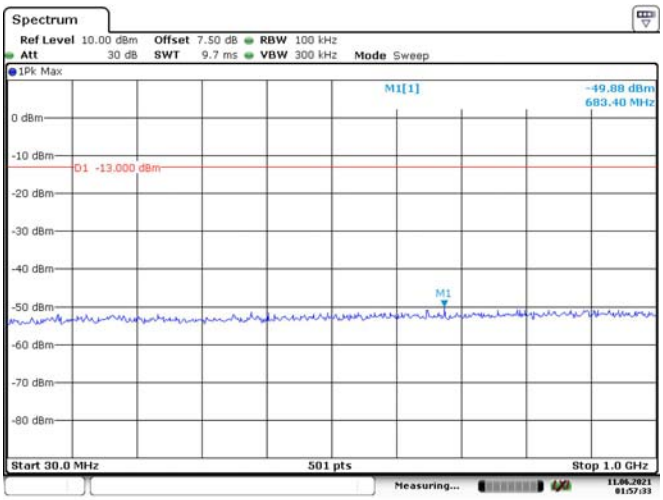


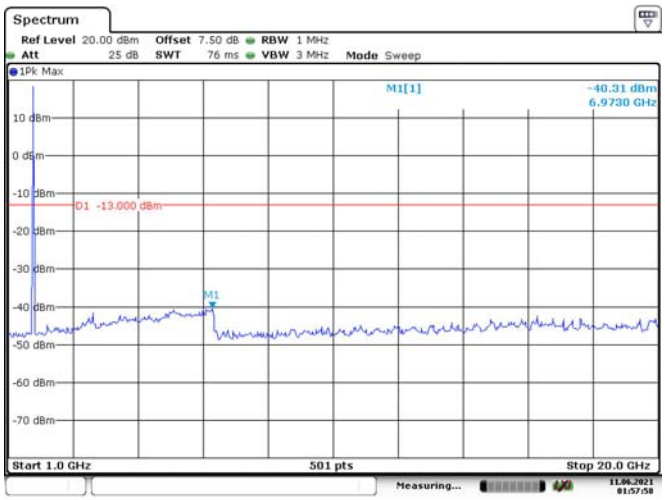
10M, QPSK, Low Channel



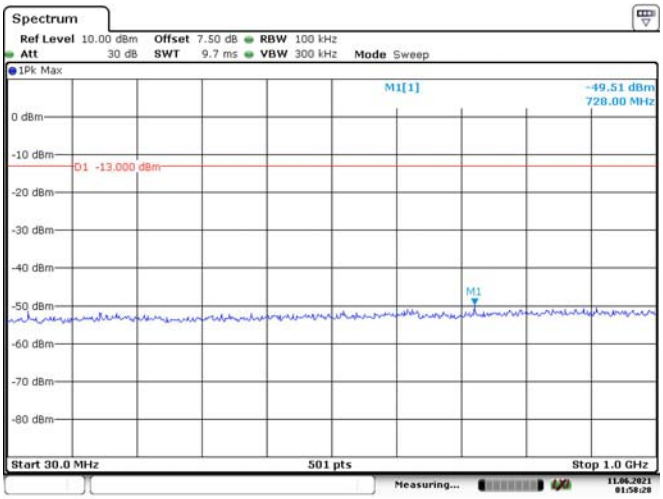


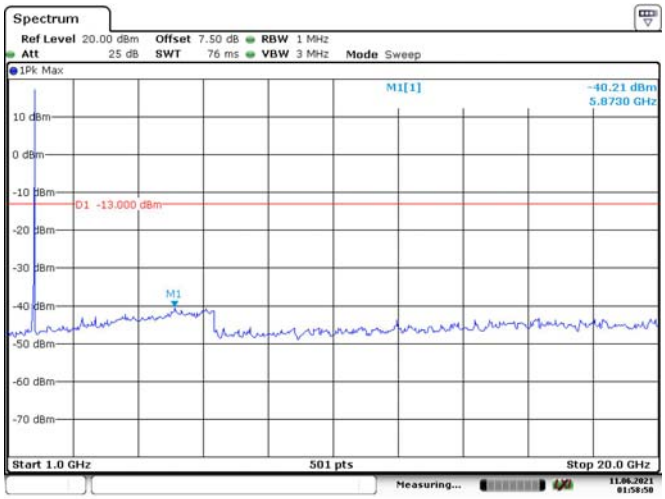
10M, QPSK, Middle Channel



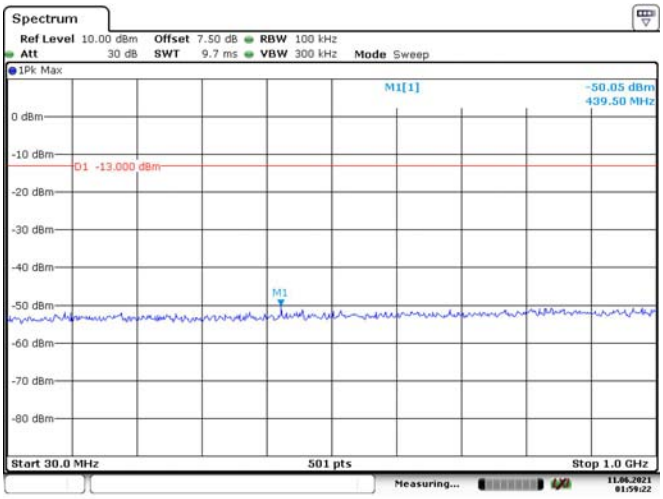


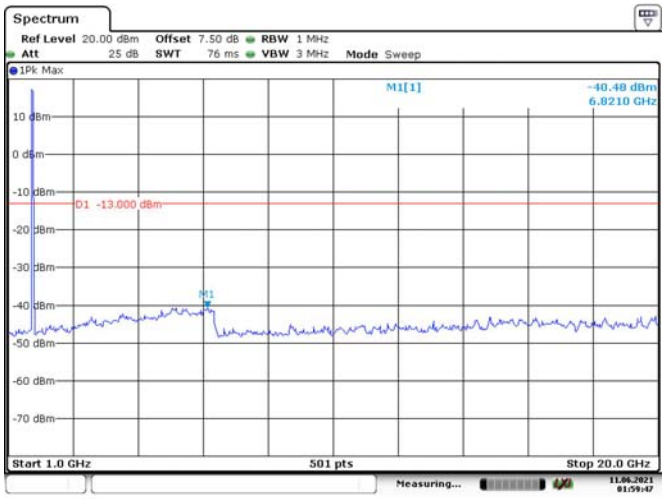
10M, QPSK, High Channel



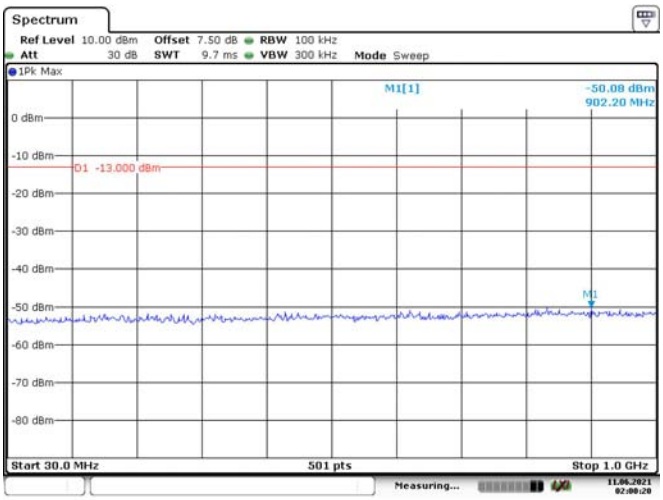


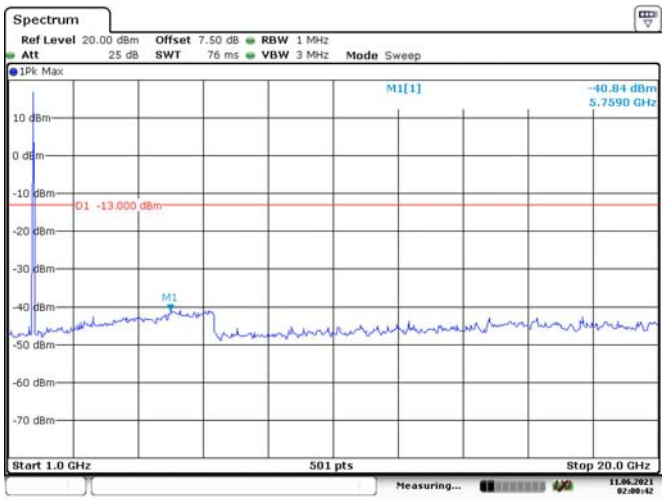
15M, QPSK, Low Channel



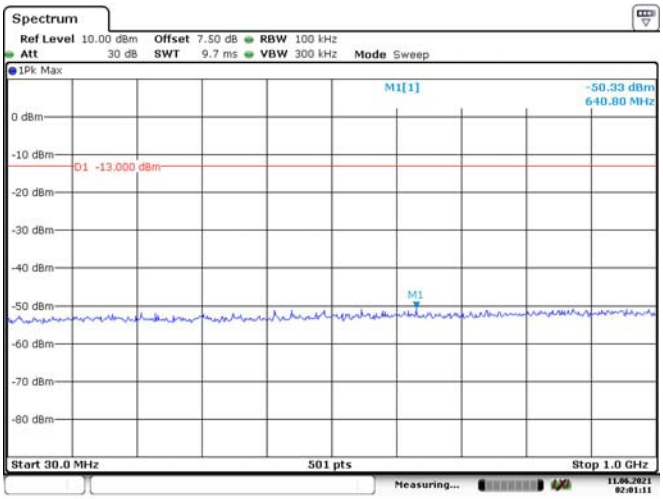


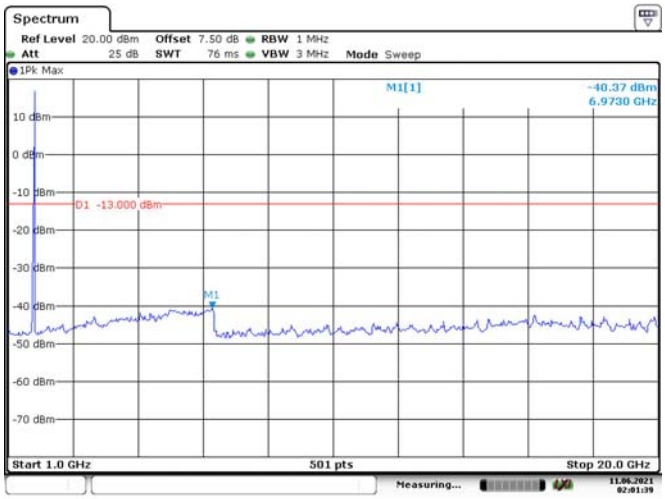
15M, QPSK, Middle Channel



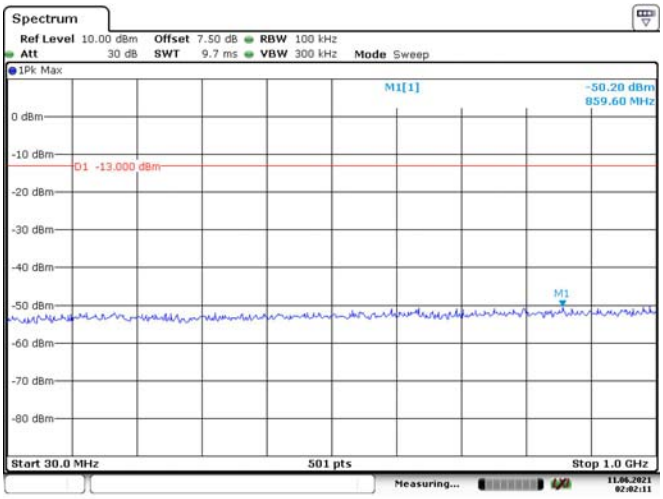


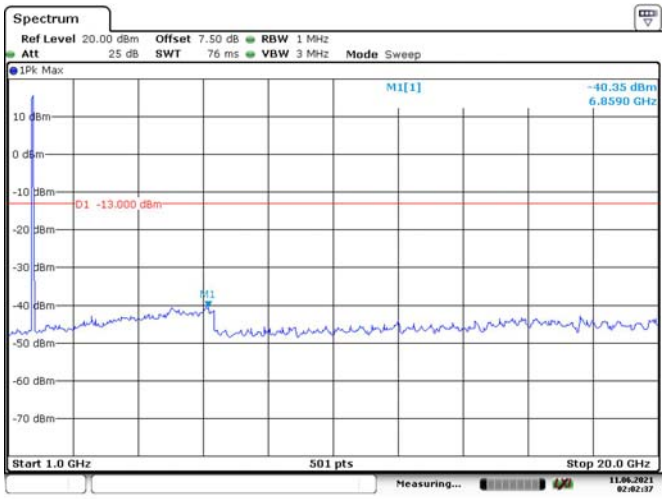
15M, QPSK, High Channel



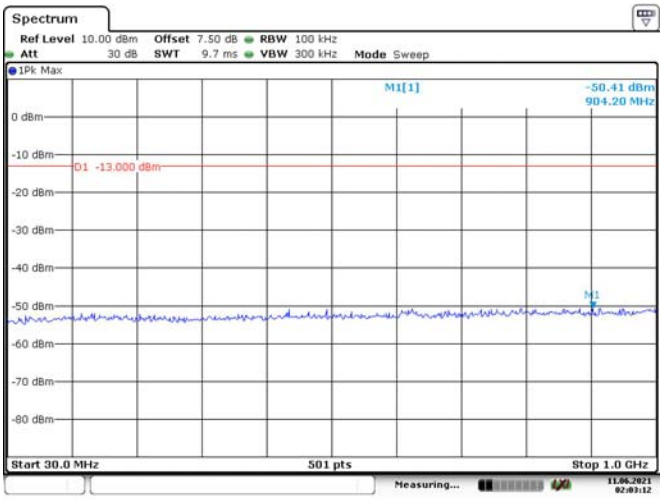


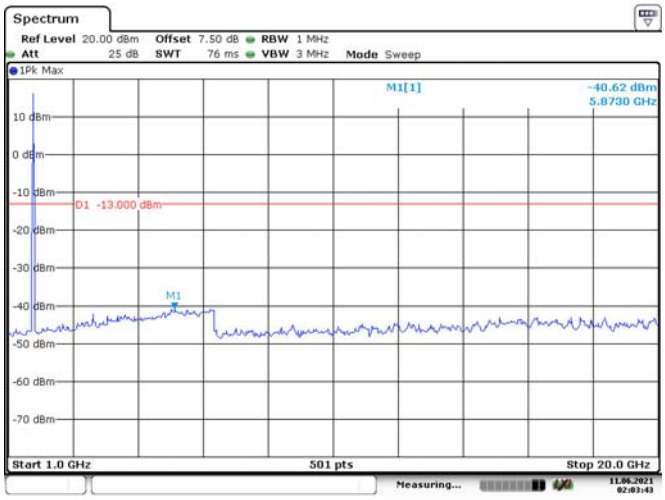
20M, QPSK, Low Channel



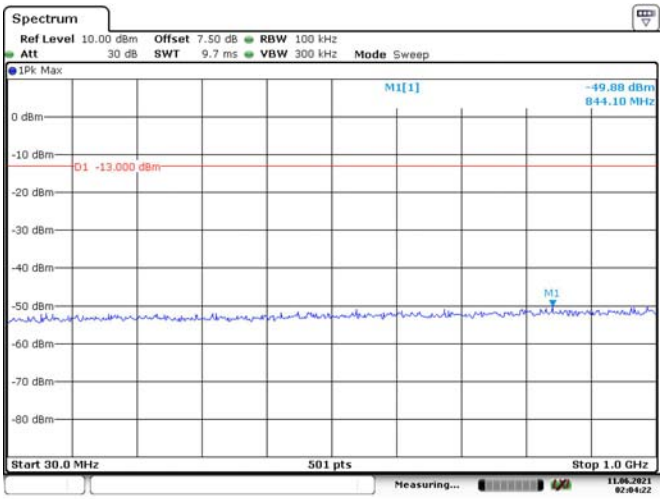


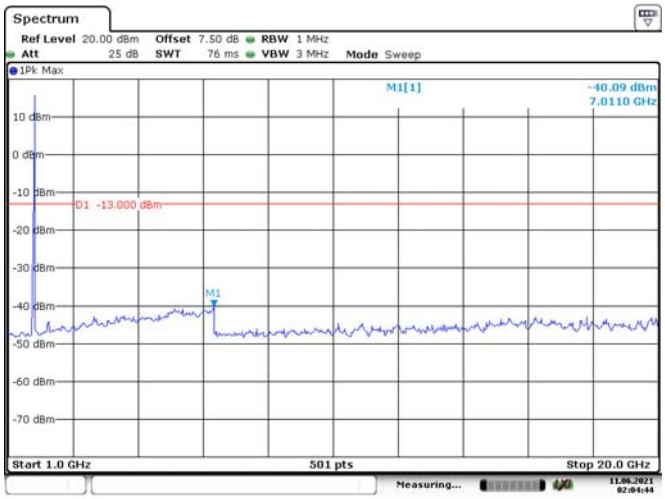
20M, QPSK, Middle Channel





20M, QPSK, High Channel





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

Applicable Standard

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

Test Procedure

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

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

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

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

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	A060611-1	2020-11-10	2023-11-10
R&S	EMI Test Receiver	ESR3	102453	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2020-05-06	2021-05-06
HP	Amplifier	8447D	2727A05902	2020-09-05	2021-09-05
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	2020-12-09	2021-12-08
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020-10-13	2023-10-12
R&S	Spectrum Analyzer	FSP 38	100478	2020-07-07	2021-07-07
HUBER+SUHNER	Coaxial Cable	SUCOFLEX 126EA	MY369/26/26EA	2020-09-25	2021-09-25
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2020-09-05	2021-09-05
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2020-12-05	2023-12-04
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2020-06-27	2021-06-27
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-02 1304	2020-12-05	2023-12-04
Sinoscite	Band-stop filter	BSF1710-1785MN-0383-003	0383003	2020-06-16	2021-06-16
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:	27.1°C	24.5°C
Relative Humidity:	54%	24%
ATM Pressure:	100.3kPa	100.5kPa
Tester:	Alex Hu	Jeremy Liang
Test Date:	2021-06-16	2021-06-08

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)			
GSM850 Frequency:824.2MHz								
1648.40	H	55.64	-49.40	10.45	1.28	-40.23	-13.00	27.23
1648.40	V	61.26	-43.71	10.45	1.28	-34.54	-13.00	21.54
2472.60	H	46.17	-57.54	12.16	1.23	-46.61	-13.00	33.61
2472.60	V	47.98	-57.07	12.16	1.23	-46.14	-13.00	33.14
3296.80	H	58.98	-43.28	12.28	1.57	-32.57	-13.00	19.57
3296.80	V	61.74	-39.59	12.28	1.57	-28.88	-13.00	15.88
796.00	H	32.89	-65.87	0.00	0.93	-66.80	-13.00	53.80
74.09	V	30.84	-84.59	-2.96	0.30	-87.85	-13.00	74.85
GSM850 Frequency:836.6MHz								
1673.20	H	60.56	-44.46	10.52	1.27	-35.21	-13.00	22.21
1673.20	V	60.68	-44.27	10.52	1.27	-35.02	-13.00	22.02
2509.80	H	47.79	-55.84	12.20	1.25	-44.89	-13.00	31.89
2509.80	V	47.21	-57.81	12.20	1.25	-46.86	-13.00	33.86
3346.40	H	58.29	-43.89	12.26	1.58	-33.21	-13.00	20.21
3346.40	V	60.83	-40.27	12.26	1.58	-29.59	-13.00	16.59
792.14	H	32.12	-66.75	0.00	0.93	-67.68	-13.00	54.68
56.65	V	33.09	-72.29	-11.84	0.22	-84.35	-13.00	71.35
GSM850 Frequency:848.8MHz								
1697.60	H	60.46	-44.54	10.59	1.26	-35.21	-13.00	22.21
1697.60	V	61.08	-43.85	10.59	1.26	-34.52	-13.00	21.52
2546.40	H	50.27	-53.30	12.22	1.26	-42.34	-13.00	29.34
2546.40	V	50.67	-54.18	12.22	1.26	-43.22	-13.00	30.22
3395.20	H	54.89	-47.20	12.24	1.59	-36.55	-13.00	23.55
3395.20	V	59.48	-41.40	12.24	1.59	-30.75	-13.00	17.75
794.00	H	33.16	-65.66	0.00	0.93	-66.59	-13.00	53.59
59.57	V	33.18	-73.95	-10.50	0.23	-84.68	-13.00	71.68

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	54.13	-50.90	10.46	1.28	-41.72	-13.00	28.72
1652.80	V	54.29	-50.68	10.46	1.28	-41.50	-13.00	28.50
2479.20	H	48.67	-55.03	12.17	1.24	-44.10	-13.00	31.10
2479.20	V	49.12	-55.93	12.17	1.24	-45.00	-13.00	32.00
3305.60	H	56.53	-45.72	12.28	1.57	-35.01	-13.00	22.01
3305.60	V	62.47	-38.82	12.28	1.57	-28.11	-13.00	15.11
64.58	H	33.69	-76.17	-7.87	0.23	-84.27	-13.00	71.27
69.29	V	32.86	-80.39	-5.38	0.24	-86.01	-13.00	73.01
WCDMA Band 5 Frequency:836.6MHz								
1673.20	H	51.53	-53.49	10.52	1.27	-44.24	-13.00	31.24
1673.20	V	52.34	-52.61	10.52	1.27	-43.36	-13.00	30.36
2509.80	H	55.35	-48.28	12.20	1.25	-37.33	-13.00	24.33
2509.80	V	56.62	-48.40	12.20	1.25	-37.45	-13.00	24.45
3346.40	H	59.68	-42.50	12.26	1.58	-31.82	-13.00	18.82
3346.40	V	61.89	-39.21	12.26	1.58	-28.53	-13.00	15.53
787.00	H	32.58	-66.43	0.00	0.93	-67.36	-13.00	54.36
73.67	V	31.26	-84.00	-3.17	0.29	-87.46	-13.00	74.46
WCDMA Band 5 Frequency:846.6MHz								
1693.20	H	51.97	-53.03	10.58	1.26	-43.71	-13.00	30.71
1693.20	V	52.94	-52.00	10.58	1.26	-42.68	-13.00	29.68
2539.80	H	55.41	-48.17	12.22	1.26	-37.21	-13.00	24.21
2539.80	V	56.23	-48.65	12.22	1.26	-37.69	-13.00	24.69
3386.40	H	59.26	-42.85	12.25	1.59	-32.19	-13.00	19.19
3386.40	V	62.54	-38.38	12.25	1.59	-27.72	-13.00	14.72
776.00	H	33.18	-66.14	0.00	0.93	-67.07	-13.00	54.07
74.65	V	30.47	-85.20	-2.68	0.31	-88.19	-13.00	75.19

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)			
GSM1900 Frequency:1850.2MHz								
3700.40	H	61.61	-39.68	12.24	1.55	-28.99	-13.00	15.99
3700.40	V	56.34	-44.37	12.24	1.55	-33.68	-13.00	20.68
5550.60	H	57.92	-38.61	12.87	1.26	-27.00	-13.00	14.00
5550.60	V	57.06	-39.86	12.87	1.26	-28.25	-13.00	15.25
46.96	H	30.18	-71.17	-17.88	0.21	-89.26	-13.00	76.26
52.77	V	31.52	-71.53	-13.63	0.22	-85.38	-13.00	72.38
GSM 1900 Frequency:1880MHz								
3760.00	H	59.79	-41.31	12.25	1.53	-30.59	-13.00	17.59
3760.00	V	57.88	-42.93	12.25	1.53	-32.21	-13.00	19.21
5640.00	H	56.58	-39.71	13.00	1.28	-27.99	-13.00	14.99
5640.00	V	56.64	-39.95	13.00	1.28	-28.23	-13.00	15.23
125.45	H	28.29	-75.81	0.00	0.32	-76.13	-13.00	63.13
60.52	V	29.68	-78.04	-10.02	0.23	-88.29	-13.00	75.29
GSM 1900 Frequency:1909.8MHz								
3819.60	H	57.62	-43.30	12.26	1.51	-32.55	-13.00	19.55
3819.60	V	57.41	-43.49	12.26	1.51	-32.74	-13.00	19.74
5729.40	H	57.78	-38.27	13.12	1.31	-26.46	-13.00	13.46
5729.40	V	57.33	-38.94	13.12	1.31	-27.13	-13.00	14.13
52.36	H	31.22	-74.13	-13.81	0.21	-88.15	-13.00	75.15
80.87	V	29.31	-88.19	0.00	0.38	-88.57	-13.00	75.57