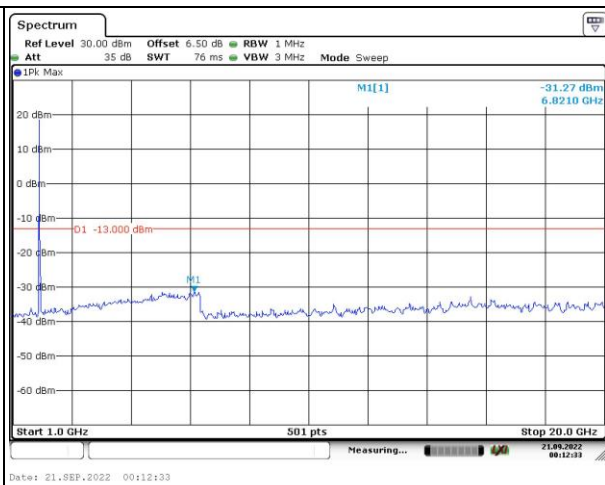
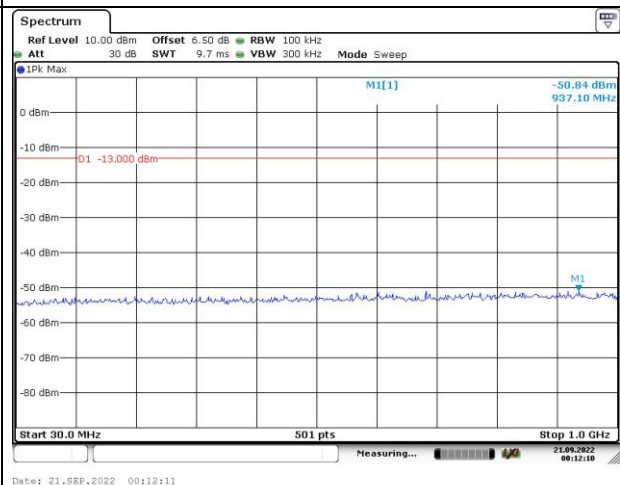


Spurious Emissions at Antenna Terminal

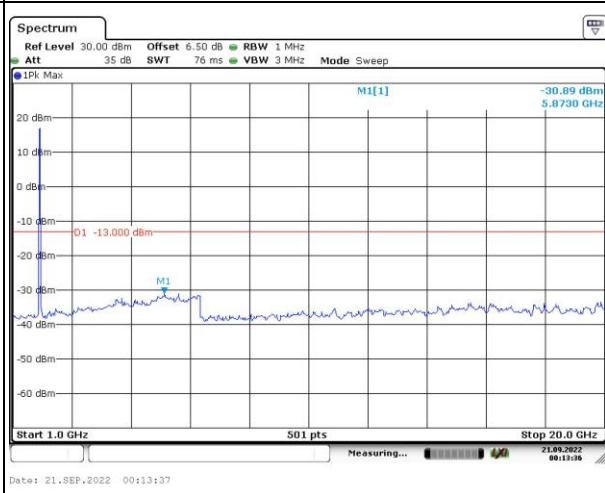
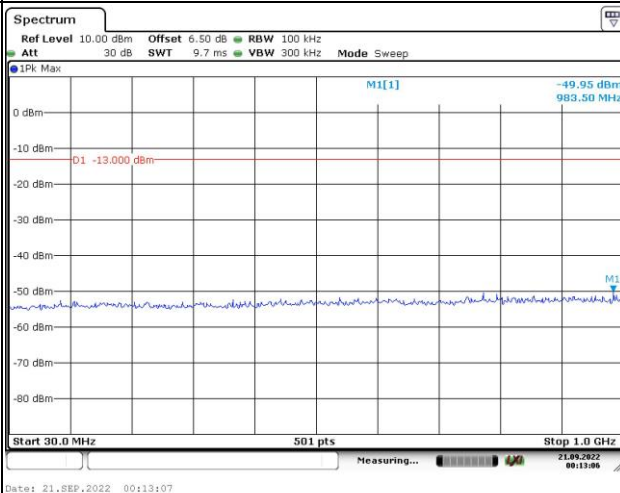
Channel

20MHz Bandwidth QPSK

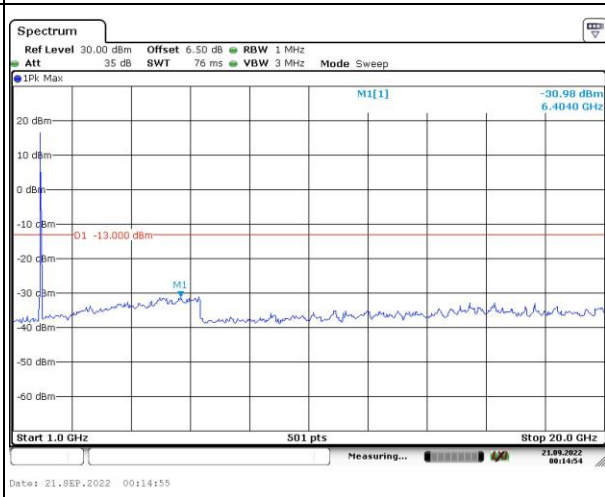
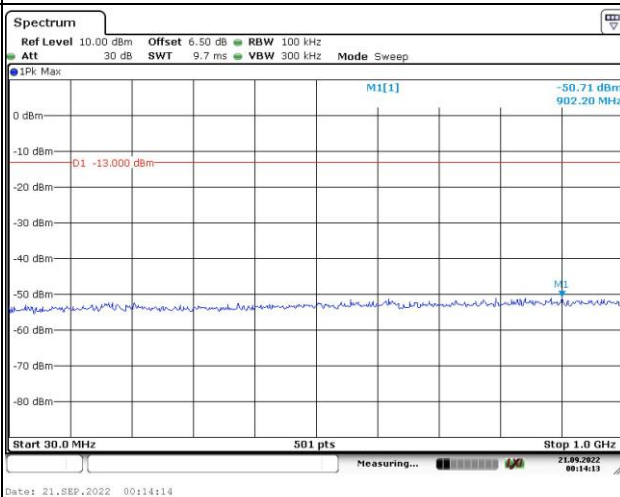
Lowest



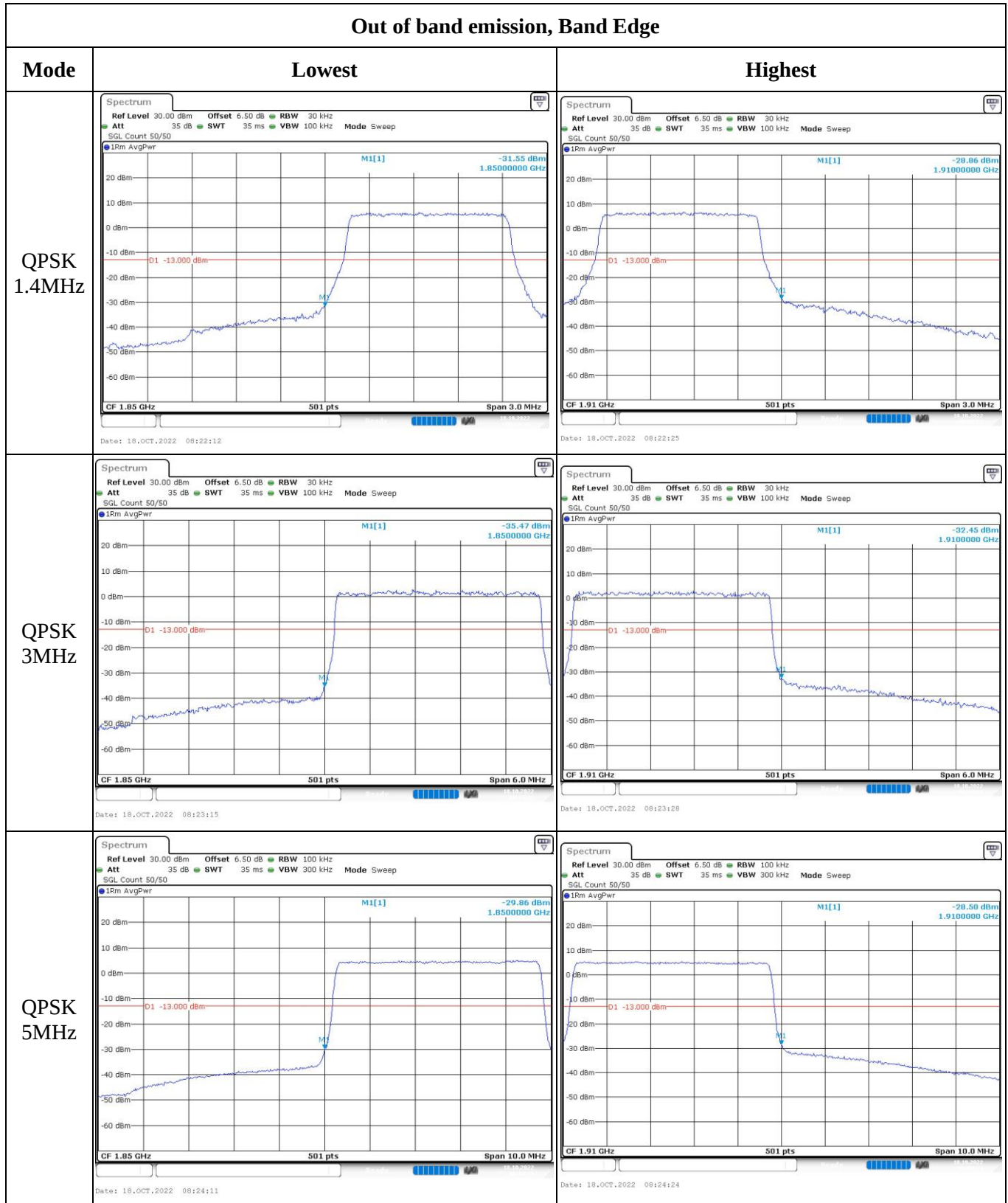
Middle



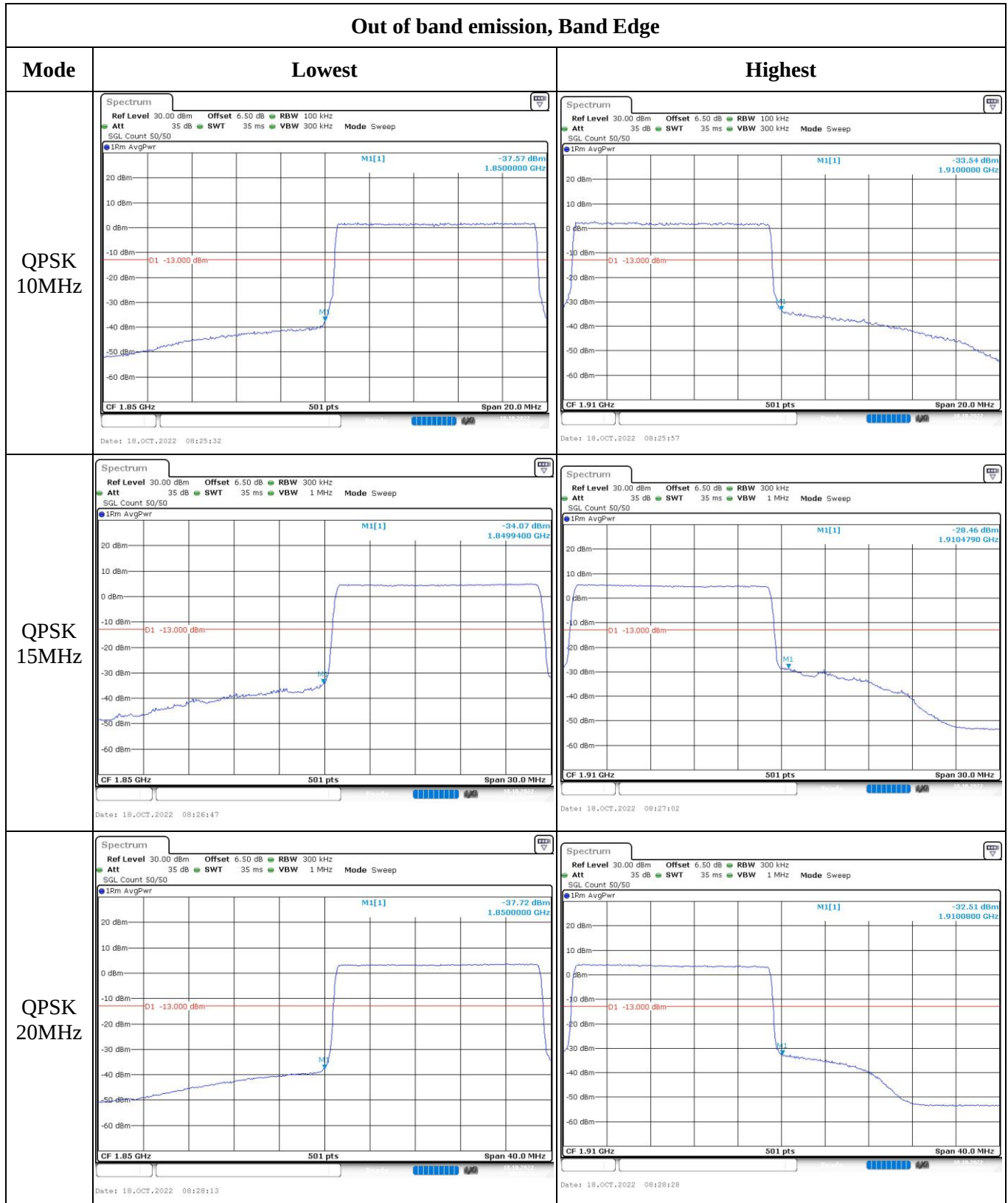
Highest



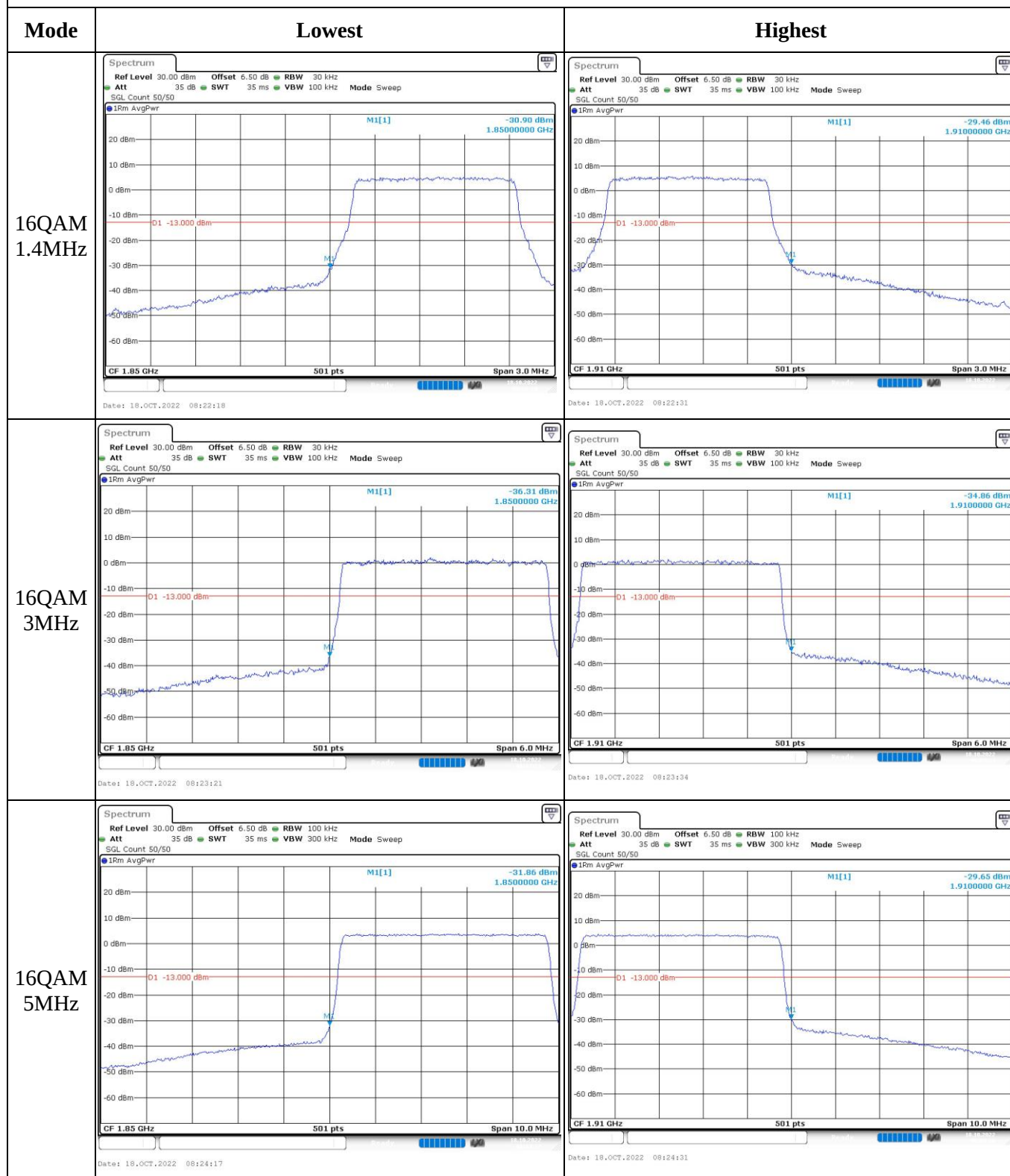
Out of band emission, Band Edge



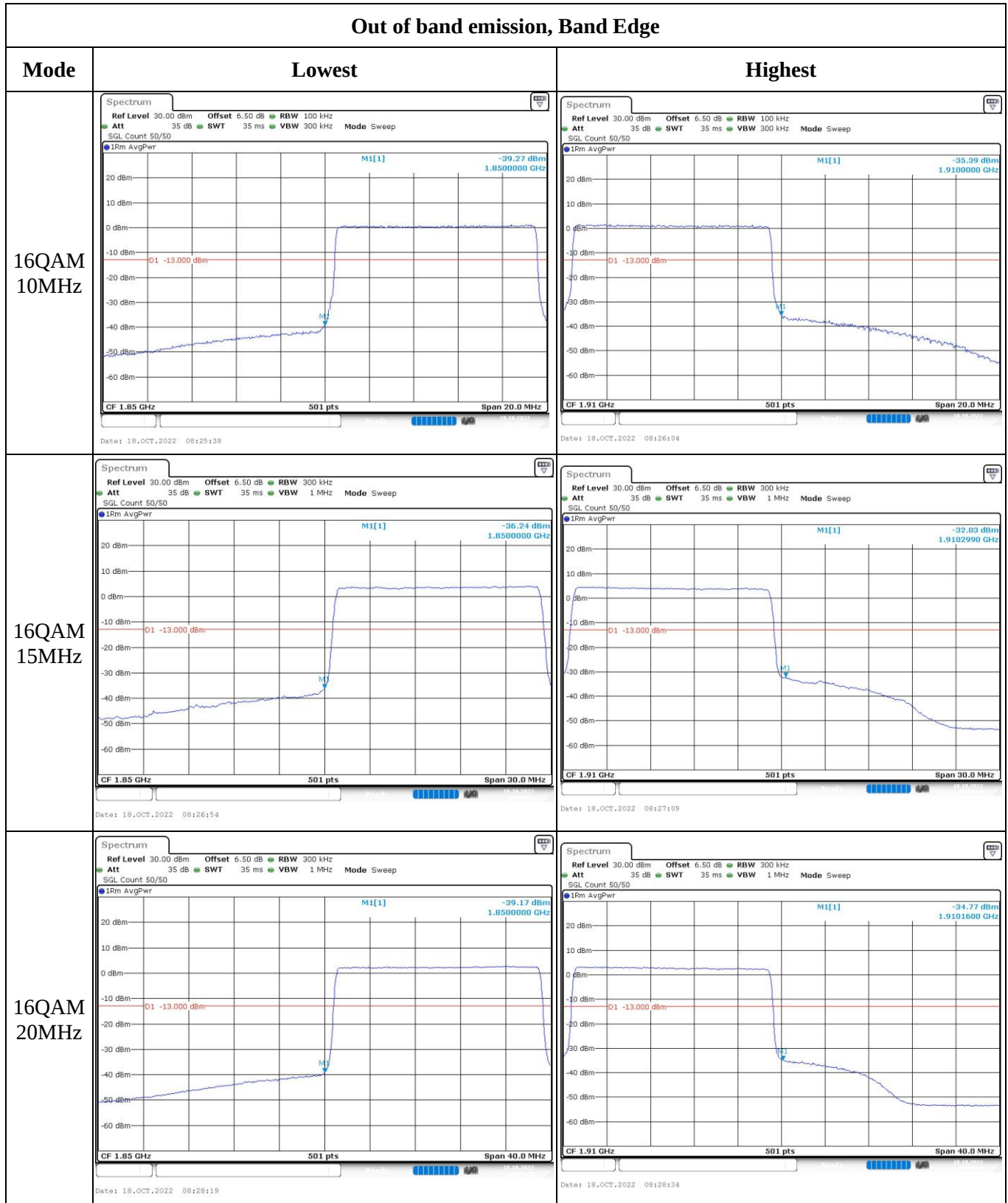
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.7 Antenna Port Test Data and Results for LTE Band 4

Serial Number:	CR22090019-RF-S1	Test Date:	2022-9-20-2022-10-18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rinka Li	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.9	Relative Humidity: (%)	48.6	ATM Pressure: (kPa)	100.2
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2022-07-15	2023-07-14
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554404	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2022-07-15	2023-07-14
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022-04-06	2023-04-05
UNI-T	Multimeter	UT39A+	C210582554	2021-09-30	2022-09-29
UNI-T	Multimeter	UT39A+	C210582554	2022-09-23	2023-09-23
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
Weinschel	Power Splitter	1515	RA914	Each time	N/A

* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

EUT Information@ LTE Band 4▲:

Antenna Gain G_T (dBi):	0.52	Path Loss L_C (dB):	0.3
Operation Voltage(V_{DC}):			
Lowest:	3.6	Normal:	3.85
		Highest:	4.4

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
1.4MHz	1710.7	1732.5	1754.3
3MHz	1711.5	1732.5	1753.5
5MHz	1712.5	1732.5	1752.5
10MHz	1715	1732.5	1750
15MHz	1717.5	1732.5	1747.5
20MHz	1720	1732.5	1745

Test Data:**FCC §2.1046; § 27.50(d)(4)****RF Output Power:**

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	21.72	21.78	21.97	22.21	30
	RB1#3	21.75	21.83	21.99		
	RB1#5	21.79	21.85	21.97		
	RB3#0	21.84	21.79	21.99		
	RB3#3	21.85	21.77	21.98		
	RB6#0	20.86	20.79	20.94		
1.4MHz 16QAM	RB1#0	21.56	20.67	21.58	21.96	30
	RB1#3	21.61	20.76	21.74		
	RB1#5	21.57	20.71	21.7		
	RB3#0	20.71	20.97	20.68		
	RB3#3	20.76	20.7	20.69		
	RB6#0	19.98	19.94	20.12		
3MHz QPSK	RB1#0	21.69	21.76	22.05	22.39	30
	RB1#8	21.69	21.77	22.17		
	RB1#14	21.6	21.8	22.16		
	RB6#0	20.72	20.84	20.85		
	RB6#9	20.68	20.87	20.92		
	RB15#0	20.76	20.85	20.95		
3MHz 16QAM	RB1#0	21.22	21.52	20.65	21.77	30
	RB1#8	21.22	21.52	20.56		
	RB1#14	21.21	21.55	20.7		
	RB6#0	19.81	19.97	20.24		
	RB6#9	19.77	20	20.27		
	RB15#0	20	19.93	20		
5MHz QPSK	RB1#0	21.9	21.77	21.81	22.18	30
	RB1#13	21.79	21.78	21.9		
	RB1#24	21.79	21.84	21.96		
	RB15#0	20.74	20.8	20.86		
	RB15#10	20.71	20.83	20.92		
	RB25#0	20.73	20.85	20.89		
5MHz 16QAM	RB1#0	20.79	20.52	20.05	21.07	30
	RB1#13	20.76	20.49	20.17		
	RB1#24	20.85	20.72	20.28		
	RB15#0	19.8	19.95	20		
	RB15#10	19.62	19.99	20.06		
	RB25#0	19.76	19.87	20.09		
10MHz QPSK	RB1#0	21.59	21.81	22.01	22.26	30
	RB1#25	21.55	21.85	21.78		
	RB1#49	21.61	21.95	22.04		

	RB25#0	20.73	20.76	20.75		
	RB25#25	20.68	20.88	20.98		
	RB50#0	20.71	20.87	20.81		
10MHz 16QAM	RB1#0	21.03	20.91	20.44	21.87	30
	RB1#25	20.98	21.51	20.22		
	RB1#49	21.02	21.65	20.44		
	RB25#0	19.79	19.96	19.98		
	RB25#25	19.9	20.05	20.22		
	RB50#0	19.89	19.98	19.9		
15MHz QPSK	RB1#0	21.57	21.79	22.06	22.28	30
	RB1#38	21.62	21.82	21.75		
	RB1#74	21.69	21.99	22.02		
	RB36#0	20.74	20.8	21.03		
	RB36#39	20.77	20.83	20.84		
	RB75#0	20.69	20.86	20.69		
15MHz 16QAM	RB1#0	21.02	20.93	21.19	21.54	30
	RB1#38	21.06	20.97	20.96		
	RB1#74	21.32	21.2	21.28		
	RB36#0	19.83	19.97	20.11		
	RB36#39	19.86	20.14	19.97		
	RB75#0	19.85	19.97	19.75		
20MHz QPSK	RB1#0	21.8	21.82	21.8	22.42	30
	RB1#50	21.75	21.93	21.95		
	RB1#99	21.91	22.2	22.05		
	RB50#0	20.59	20.71	21.07		
	RB50#50	20.71	20.9	20.84		
	RB100#0	20.7	20.85	20.96		
20MHz 16QAM	RB1#0	20.8	20.96	20.77	21.49	30
	RB1#50	20.72	20.99	20.89		
	RB1#99	20.85	21.27	20.91		
	RB50#0	19.79	20.02	20.06		
	RB50#50	19.89	20.17	19.81		
	RB100#0	19.96	19.99	19.95		

Note: EIRP= Conducted Power(dBm) - L_C(dB) + G_T(dBi)

Result:

Pass

Peak-to-average Ratio(PAR)

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
20MHz QPSK	RB1#0	4.96	4.2	3.45	13
	RB100#0	5.39	4.43	4.87	13
20MHz 16QAM	RB1#0	6	4.93	3.91	13
	RB100#0	6.23	5.42	5.8	13
				Result:	Pass

FCC §2.1049, §27.53:Occupied Bandwidth						
Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
1.4MHz QPSK	1.096	1.102	1.102	1.260	1.284	1.248
1.4MHz 16QAM	1.108	1.102	1.102	1.260	1.254	1.260
3MHz QPSK	2.707	2.695	2.695	3.000	3.012	3.024
3MHz 16QAM	2.695	2.683	2.695	3.036	3.000	3.024
5MHz QPSK	4.511	4.511	4.511	5.000	5.000	5.000
5MHz 16QAM	4.511	4.531	4.551	4.980	5.020	5.040
10MHz QPSK	8.982	8.942	8.942	9.800	9.800	9.800
10MHz 16QAM	8.942	8.942	8.942	9.320	9.840	9.760
15MHz QPSK	13.473	13.533	13.533	15.000	15.060	15.060
15MHz 16QAM	13.593	13.533	13.533	15.060	15.120	15.00
20MHz QPSK	17.964	18.044	18.044	19.600	19.840	19.600
20MHz 16QAM	17.964	17.964	18.044	19.760	19.760	18.960
Note: The test plots please refer to the Plots of Occupied Bandwidth						

FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal	
Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.

FCC §2.1051, §27.53:Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

FCC §2.1055, §27.54: Frequency Stability						
Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1710.4295	1710.00	1754.6202	1755
	-20	3.85	1710.4245	1710.00	1754.6164	1755
	-10	3.85	1710.4191	1710.00	1754.6138	1755
	0	3.85	1710.4152	1710.00	1754.6093	1755
	10	3.85	1710.4111	1710.00	1754.6059	1755
	20	3.85	1710.4058	1710.00	1754.6022	1755
	30	3.85	1710.4023	1710.00	1754.6001	1755
	40	3.85	1710.4011	1710.00	1754.6990	1755
	50	3.85	1710.4970	1710.00	1754.6957	1755
Frequency Stability vs. Voltage	20	3.6	1710.4953	1710.00	1754.6954	1755
	20	4.4	1710.4913	1710.00	1754.6907	1755
					Result:	Pass

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1710.4197	1710.00	1754.6203	1755
	-20	3.85	1710.4185	1710.00	1754.6197	1755
	-10	3.85	1710.4134	1710.00	1754.6149	1755
	0	3.85	1710.4120	1710.00	1754.6112	1755
	10	3.85	1710.4064	1710.00	1754.6069	1755
	20	3.85	1710.4058	1710.00	1754.6022	1755
	30	3.85	1710.4030	1710.00	1754.6982	1755
	40	3.85	1710.4993	1710.00	1754.6949	1755
	50	3.85	1710.4986	1710.00	1754.6912	1755
Frequency Stability vs. Voltage	20	3.6	1710.4960	1710.00	1754.6884	1755
	20	4.4	1710.4932	1710.00	1754.6852	1755
					Result:	Pass

Test Plots(Note:6.5dB is the Insertion loss of the RF cable, coaxial tee connector and DC Block, which was offset into the Spectrum Analyzer):

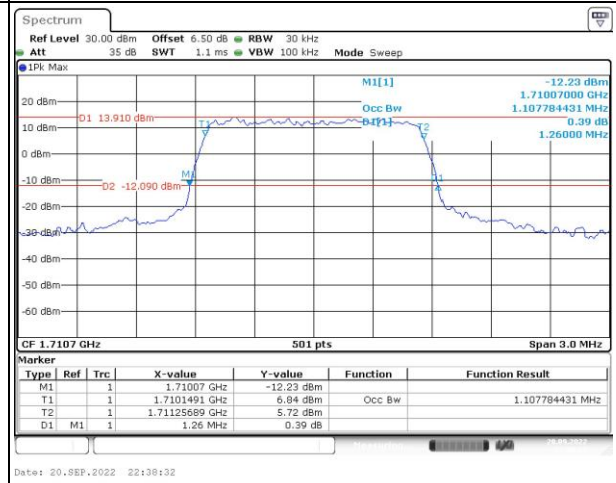
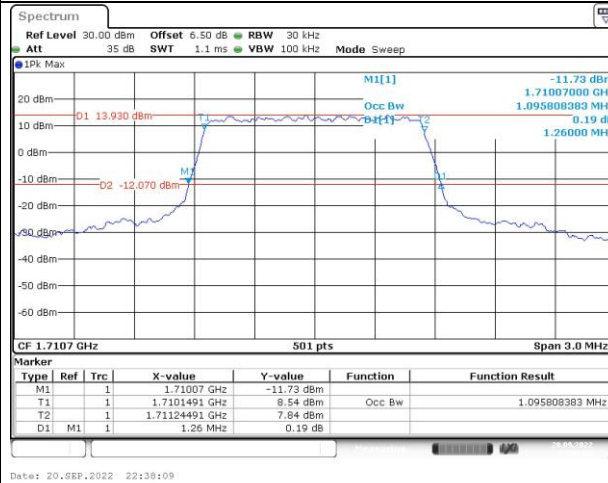
Occupied Bandwidth

Channel

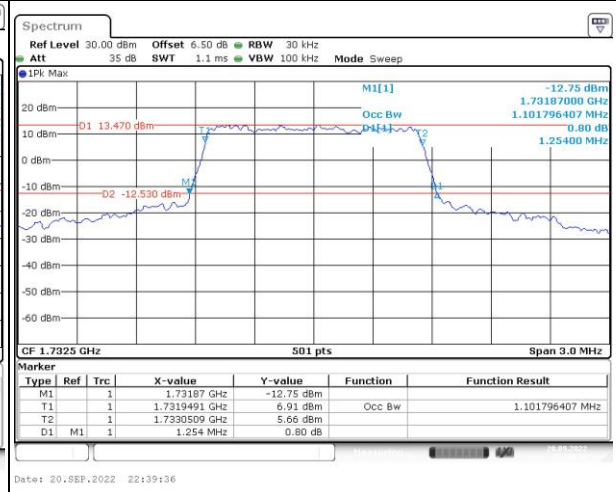
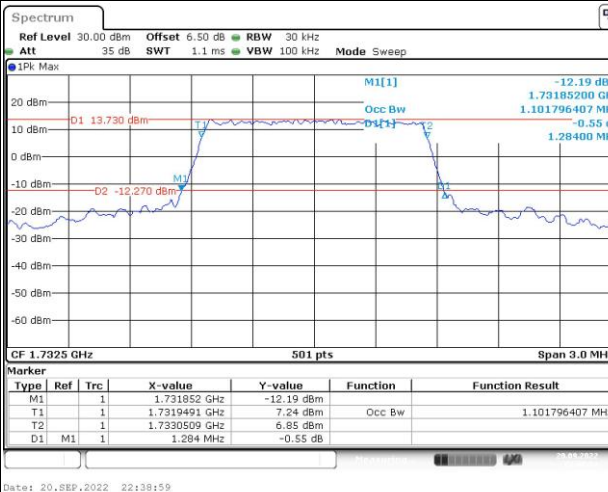
1.4MHz Bandwidth QPSK

1.4MHz Bandwidth 16QAM

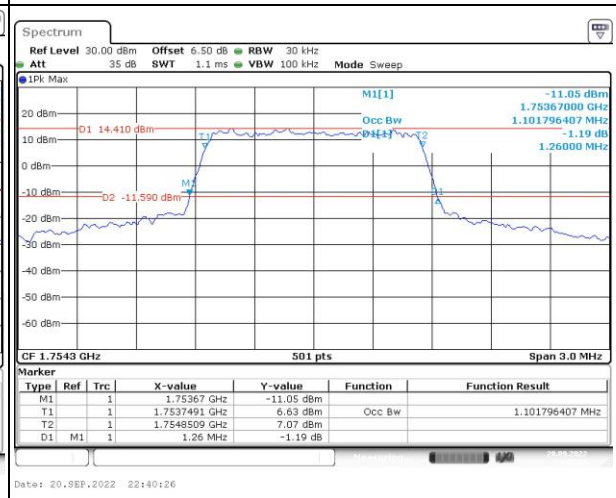
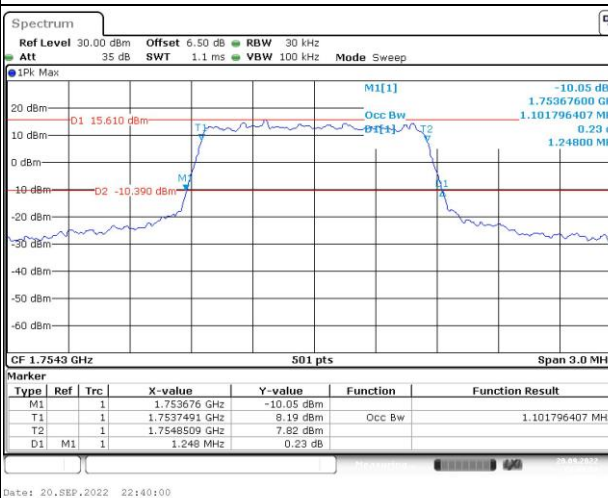
Lowest



Middle



Highest



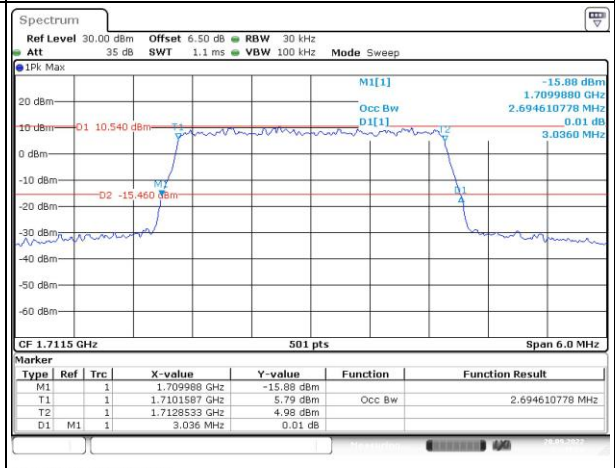
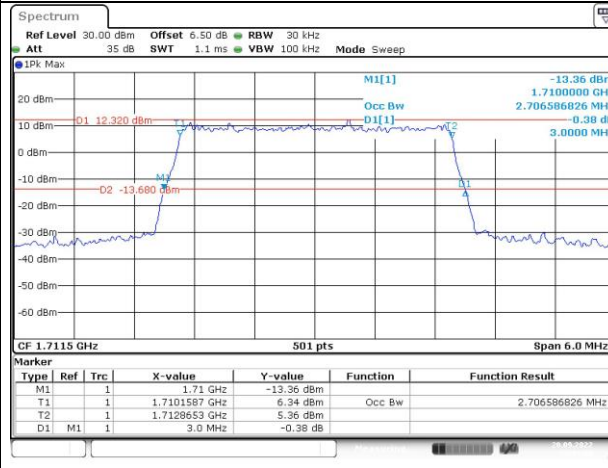
Occupied Bandwidth

Channel

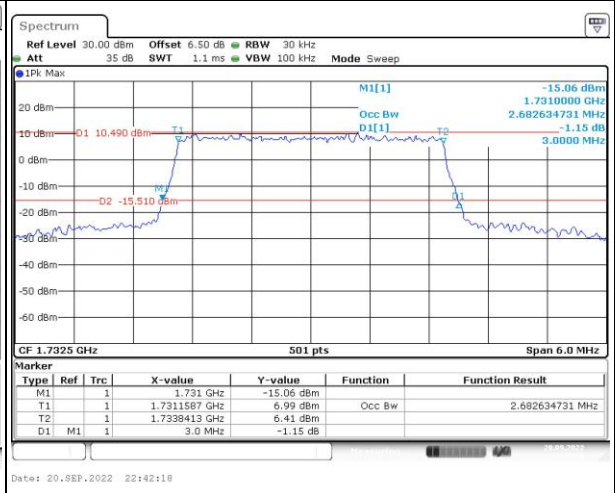
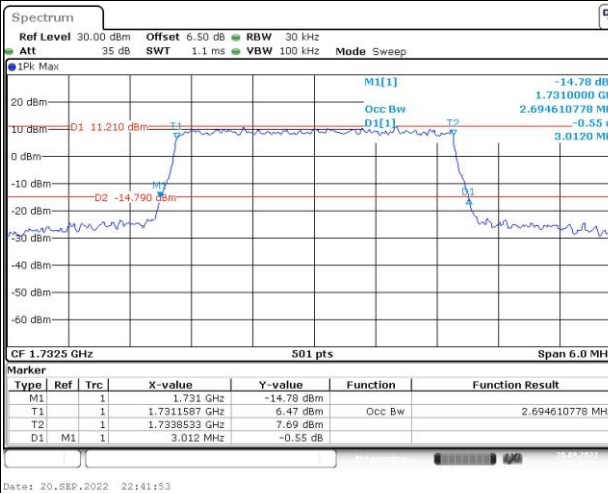
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

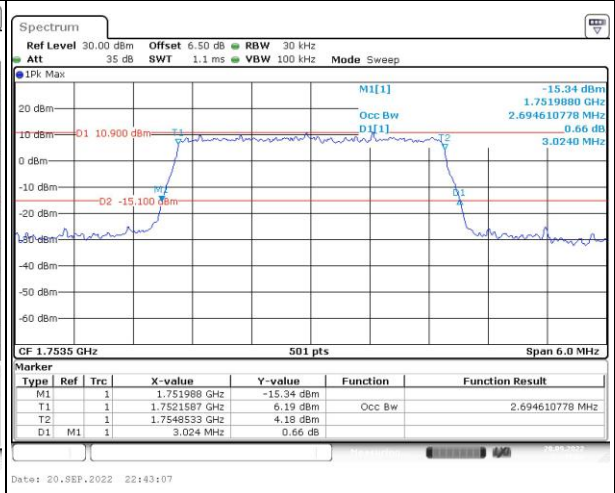
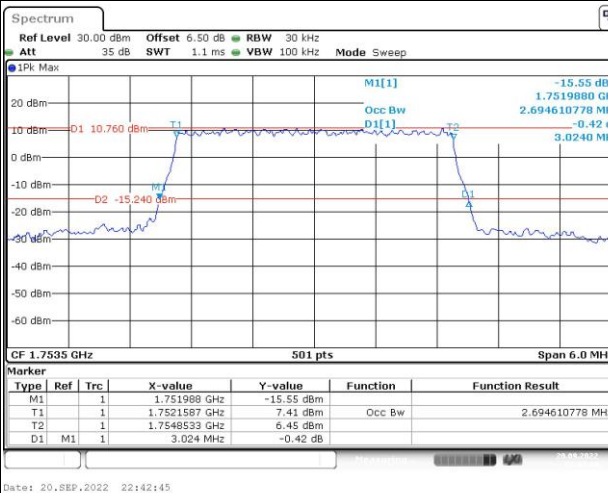
Lowest



Middle



Highest



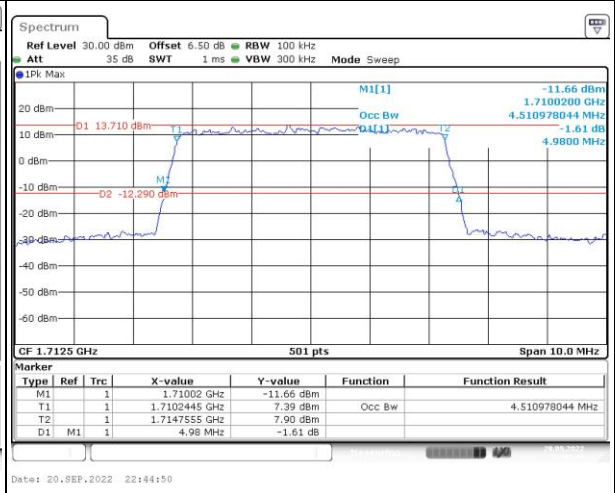
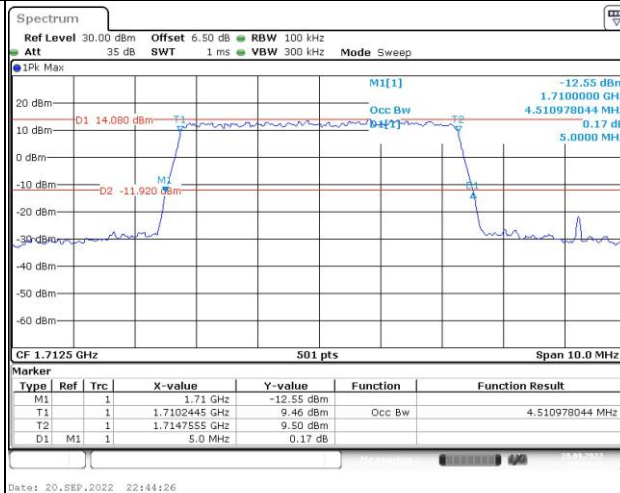
Occupied Bandwidth

Channel

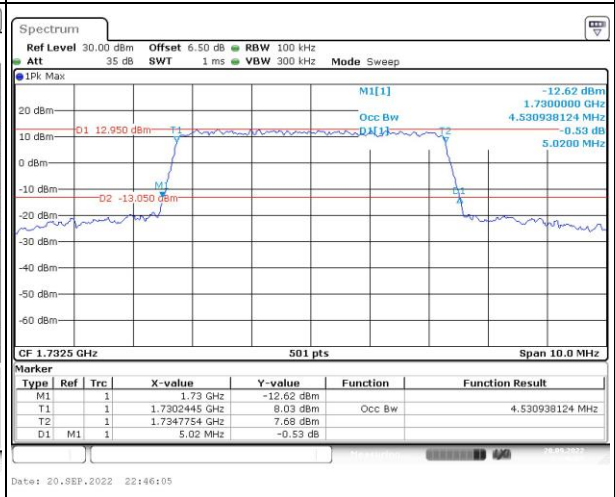
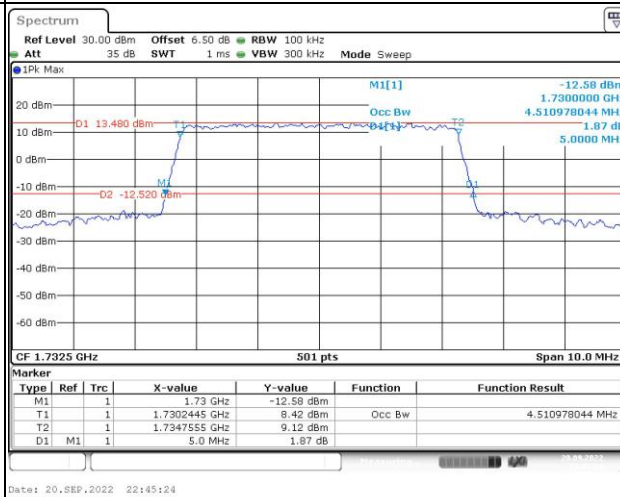
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

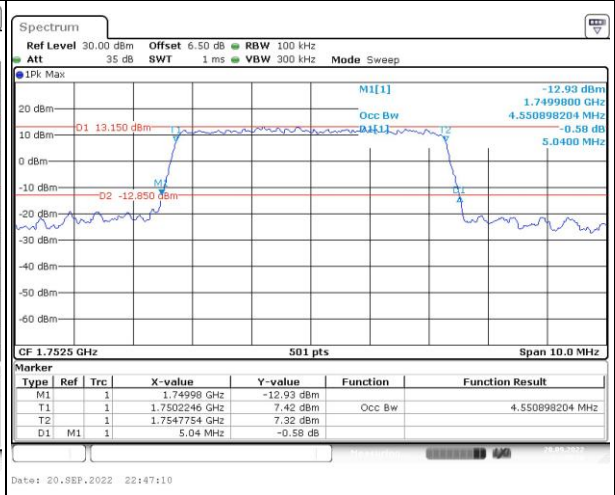
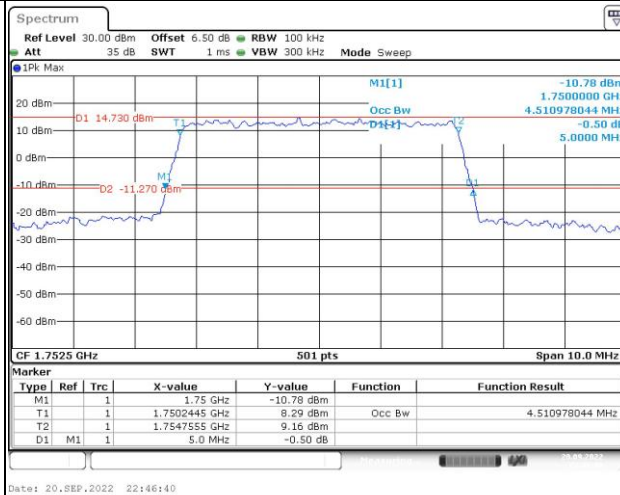
Lowest



Middle



Highest



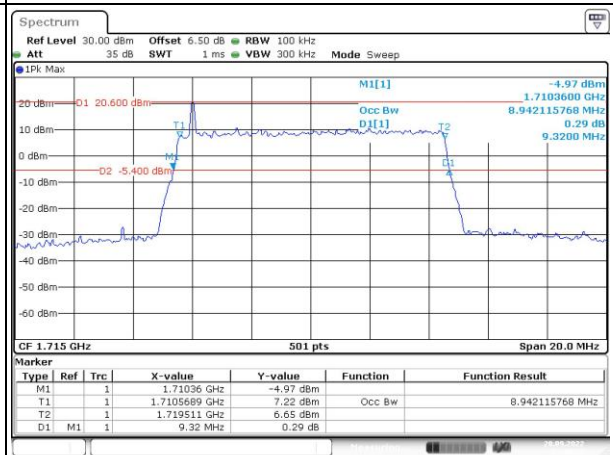
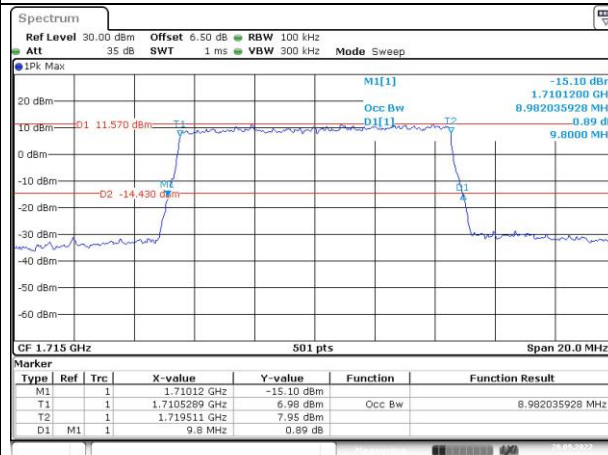
Occupied Bandwidth

Channel

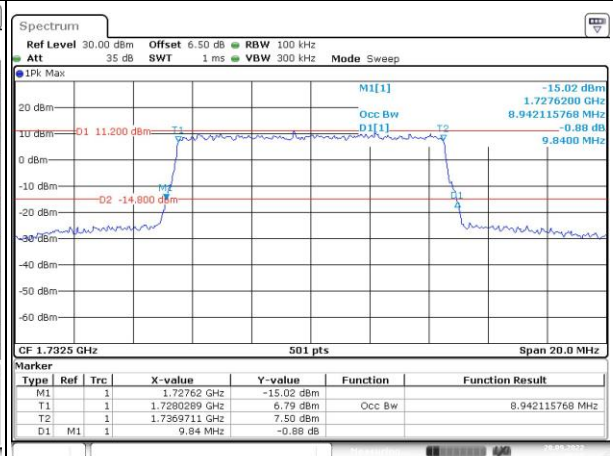
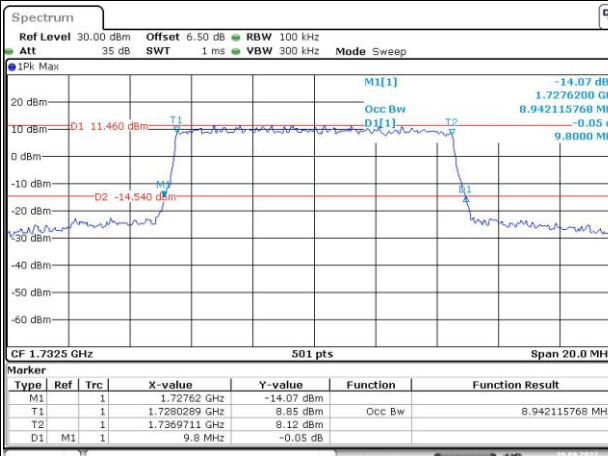
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

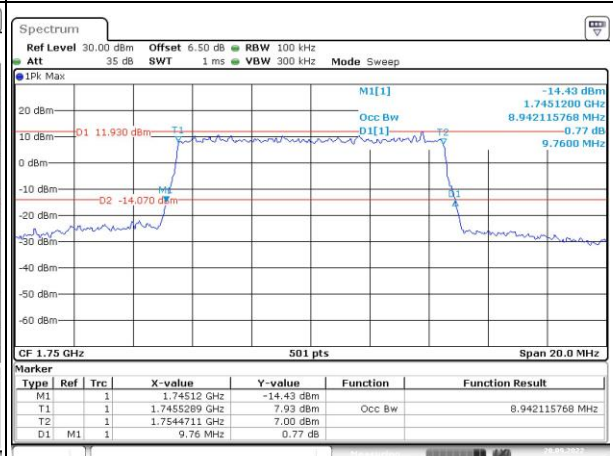
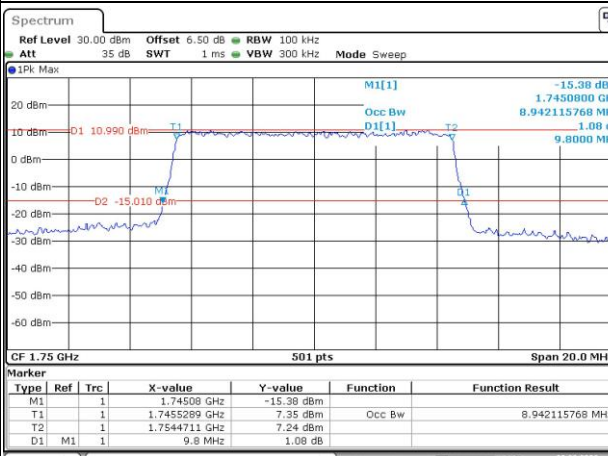
Lowest



Middle



Highest



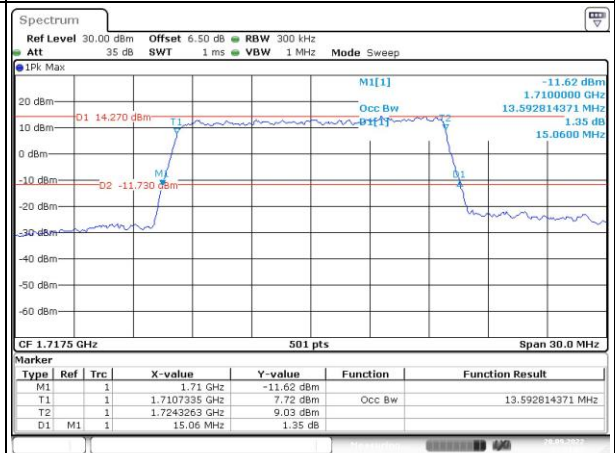
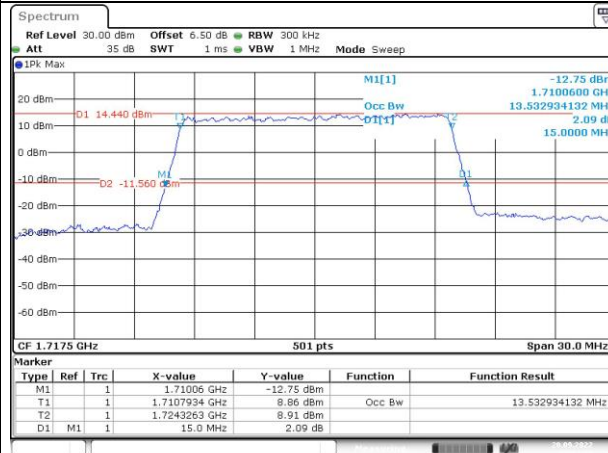
Occupied Bandwidth

Channel

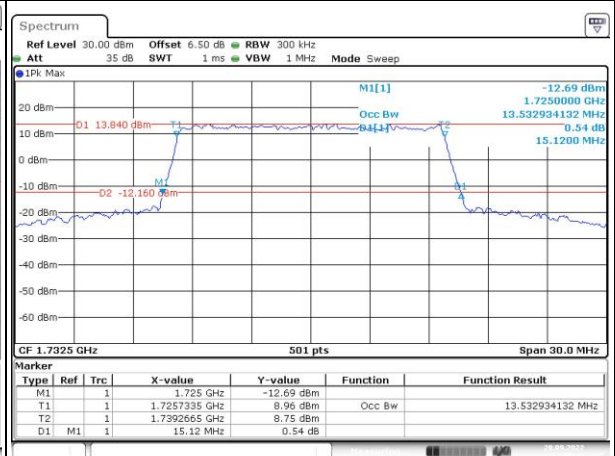
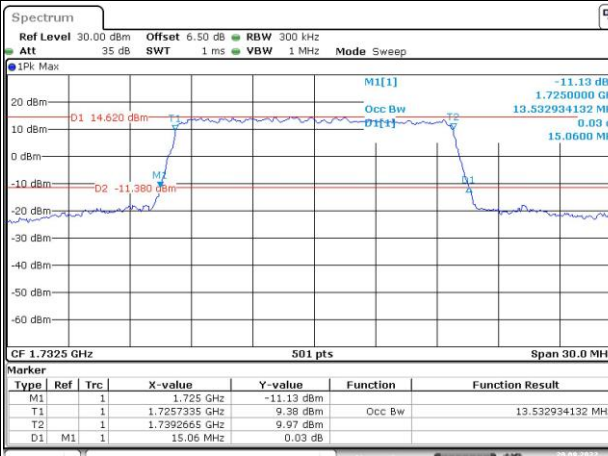
15MHz Bandwidth QPSK

15MHz Bandwidth 16QAM

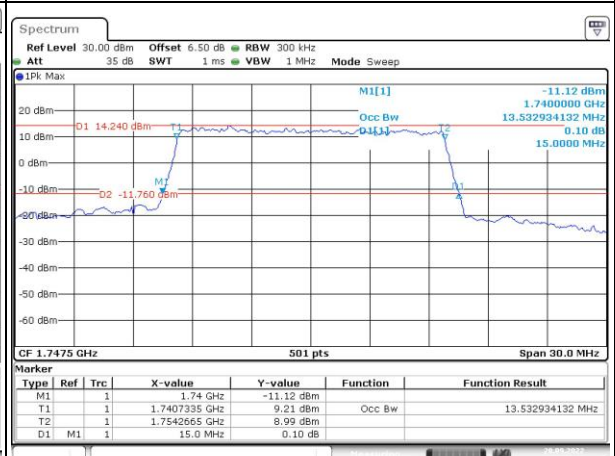
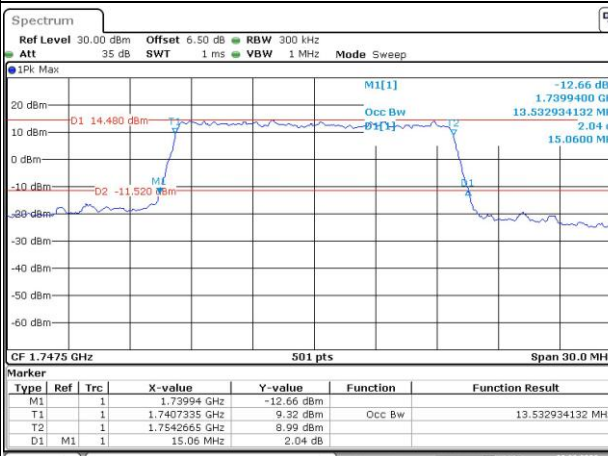
Lowest



Middle



Highest



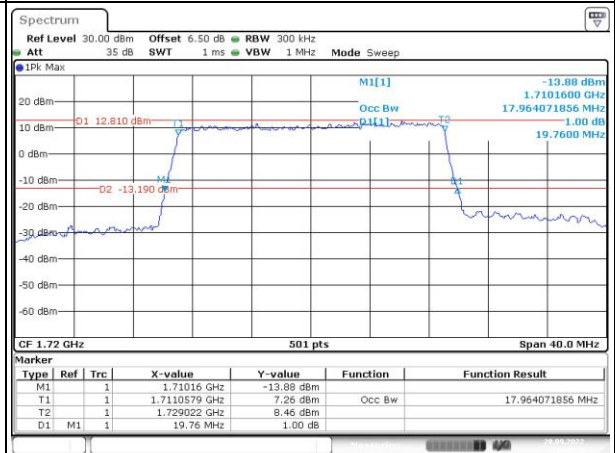
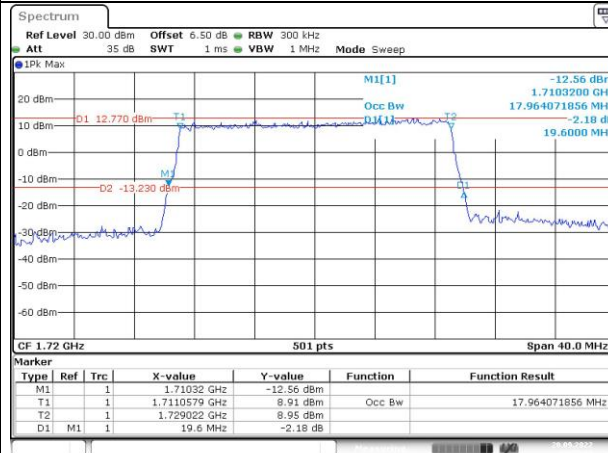
Occupied Bandwidth

Channel

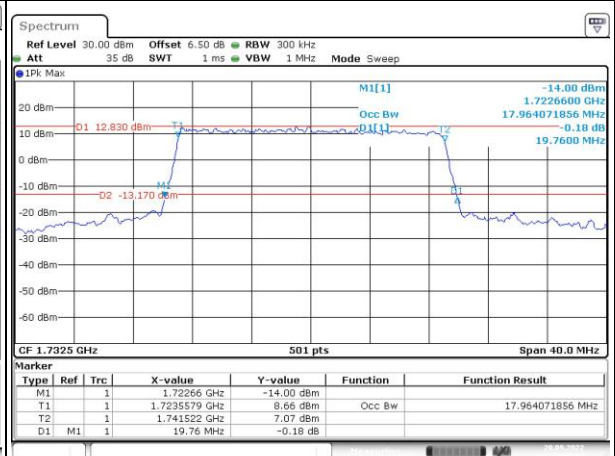
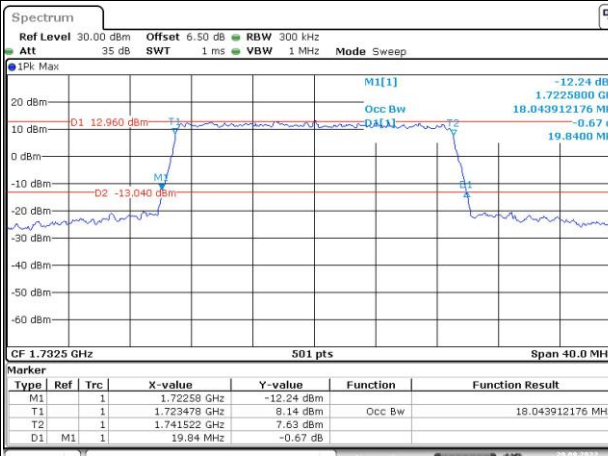
20MHz Bandwidth QPSK

20MHz Bandwidth 16QAM

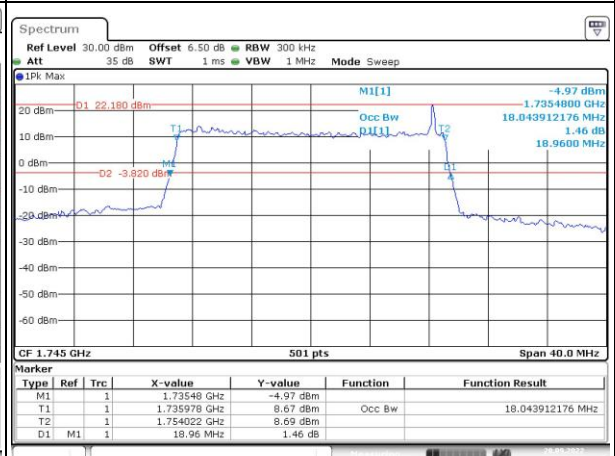
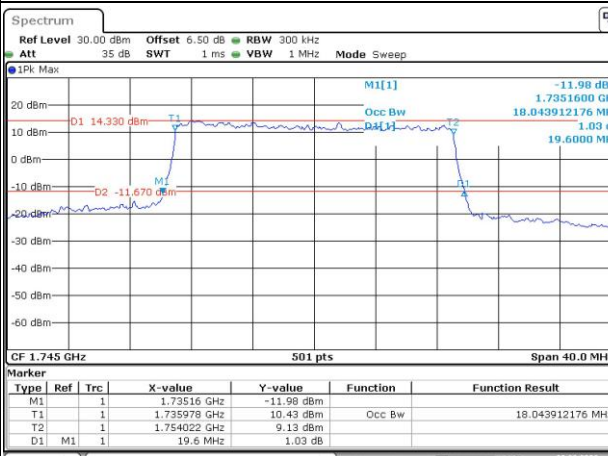
Lowest



Middle



Highest

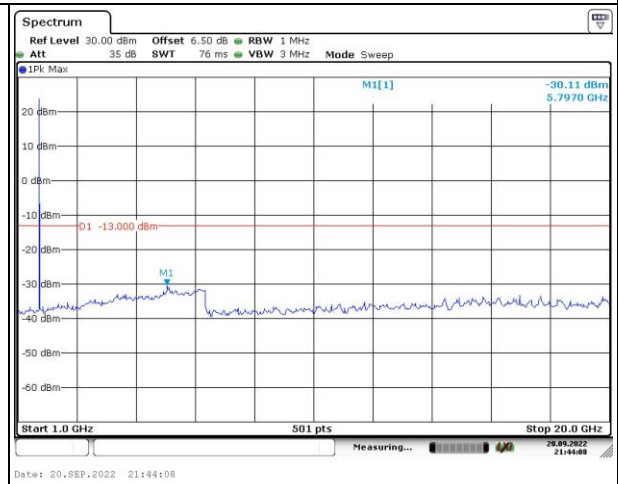
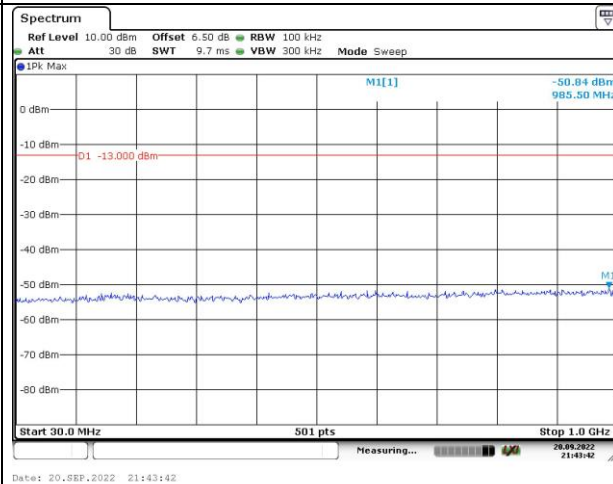


Spurious Emissions at Antenna Terminal

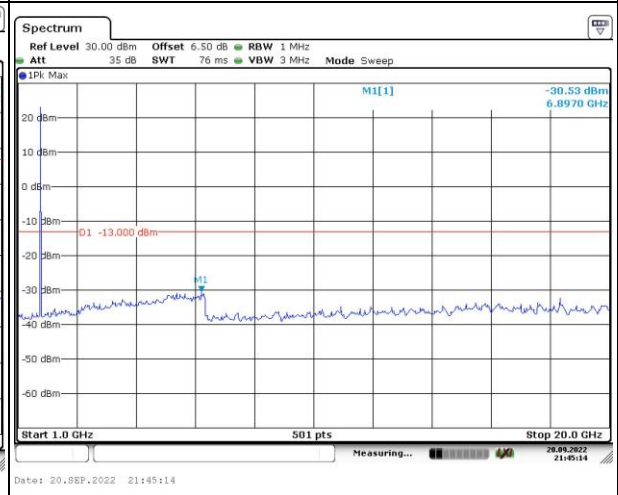
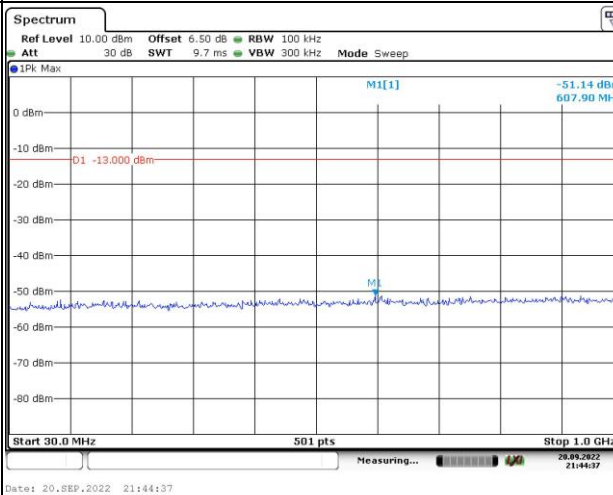
Channel

1.4MHz Bandwidth QPSK

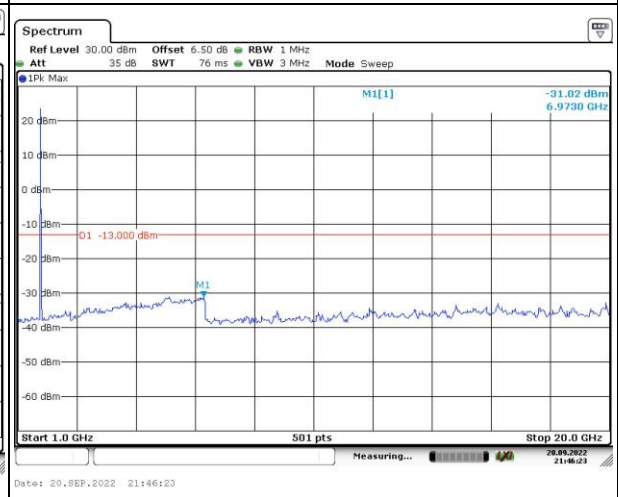
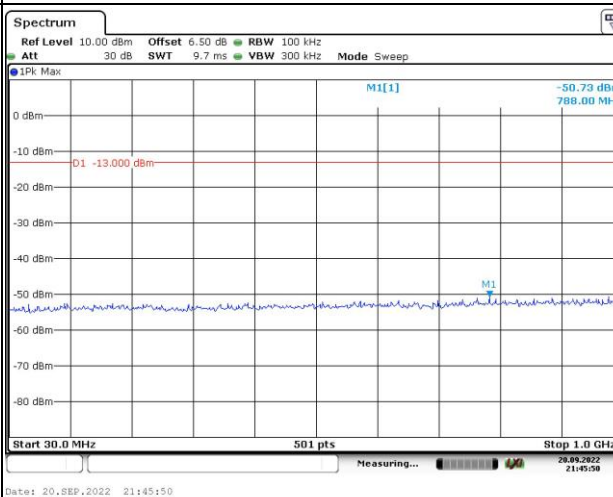
Lowest



Middle



Highest

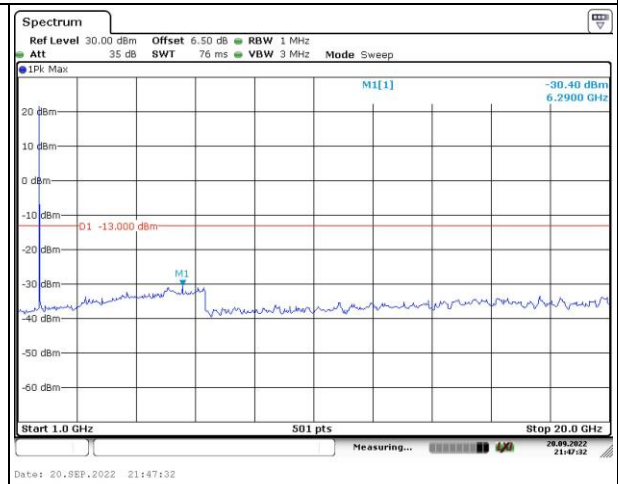
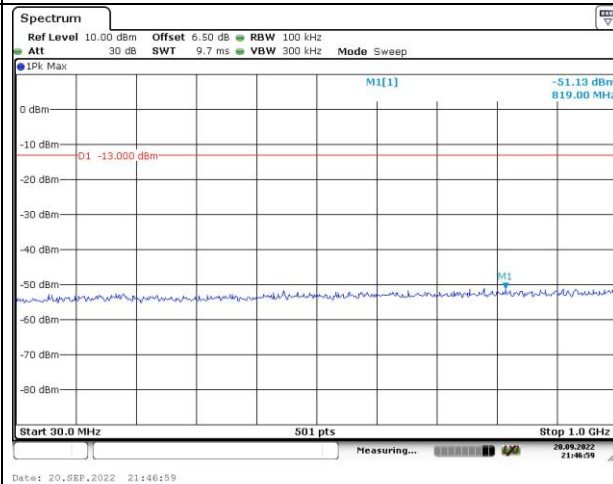


Spurious Emissions at Antenna Terminal

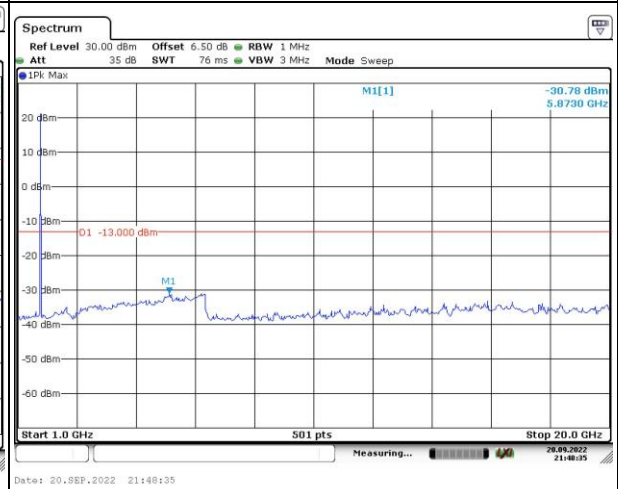
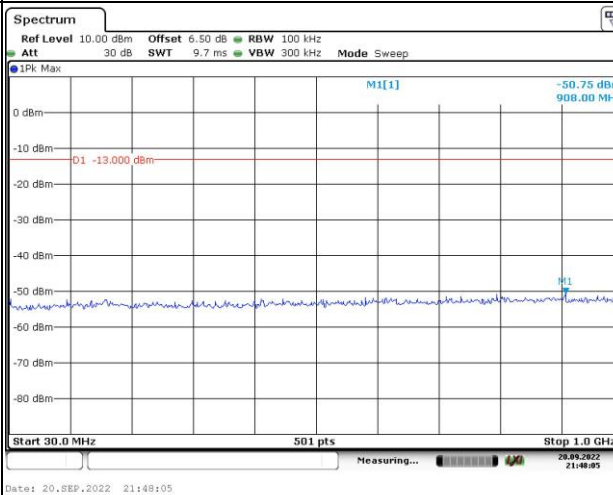
Channel

3MHz Bandwidth QPSK

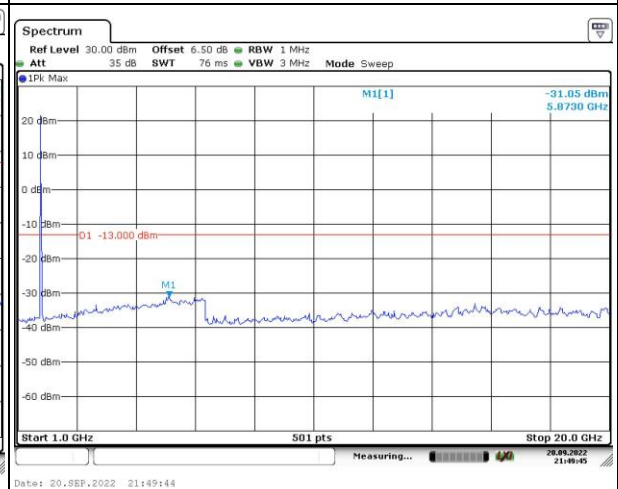
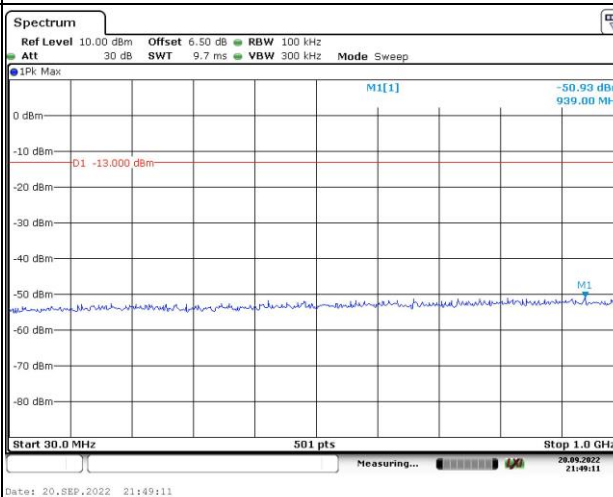
Lowest



Middle



Highest

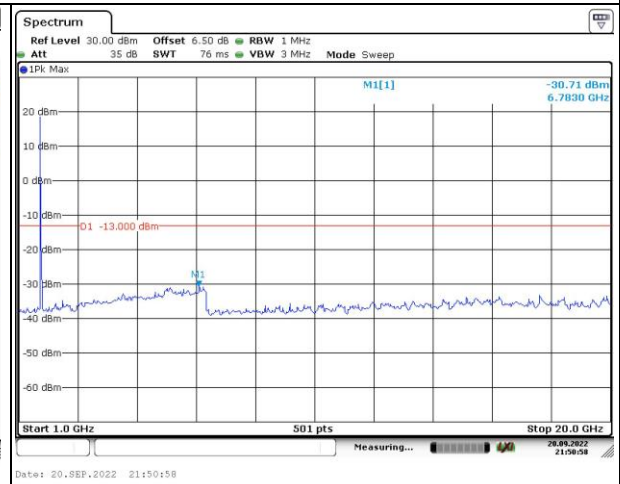
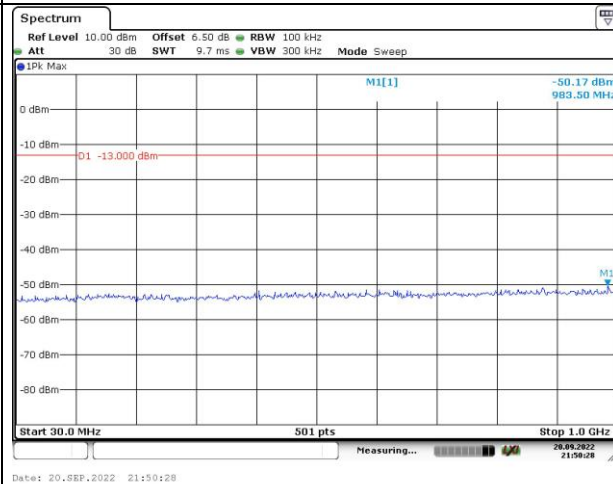


Spurious Emissions at Antenna Terminal

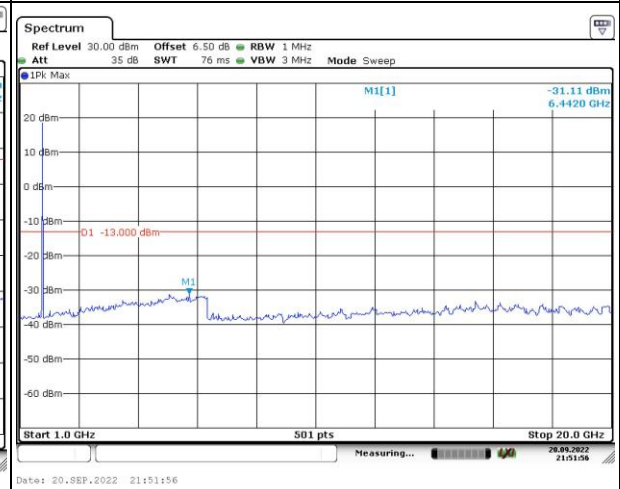
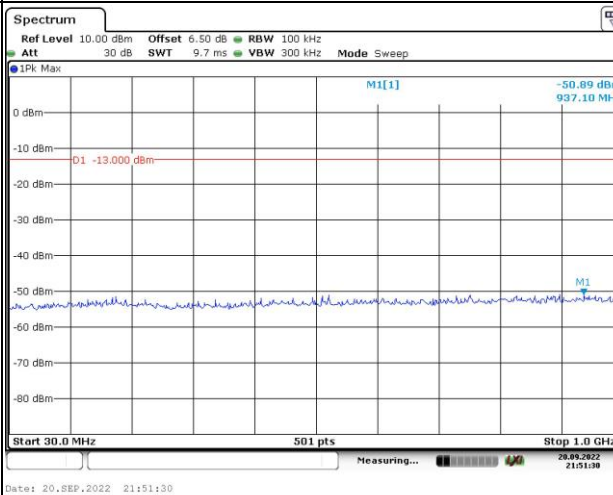
Channel

5MHz Bandwidth QPSK

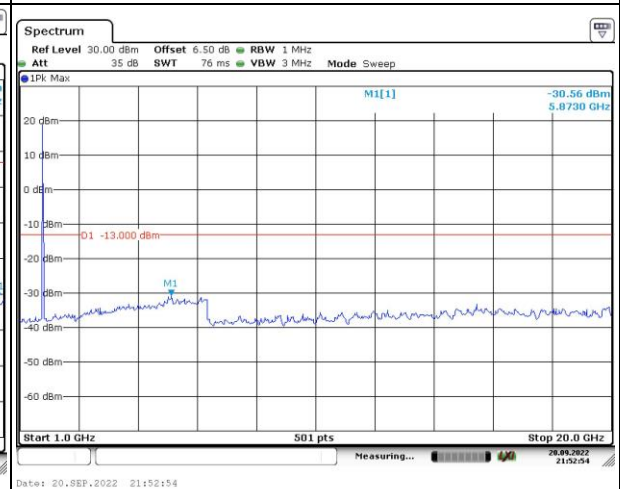
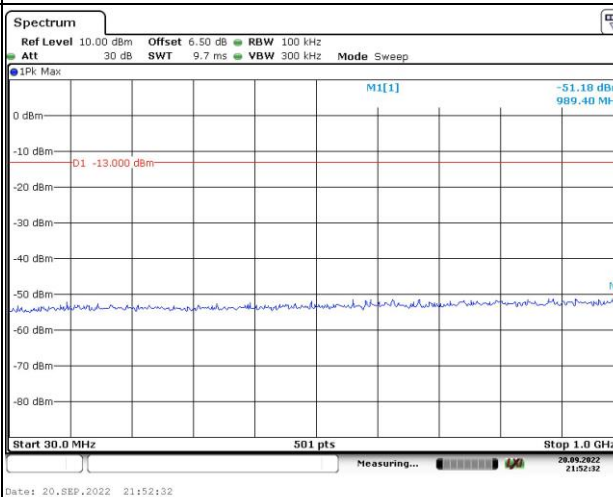
Lowest



Middle



Highest

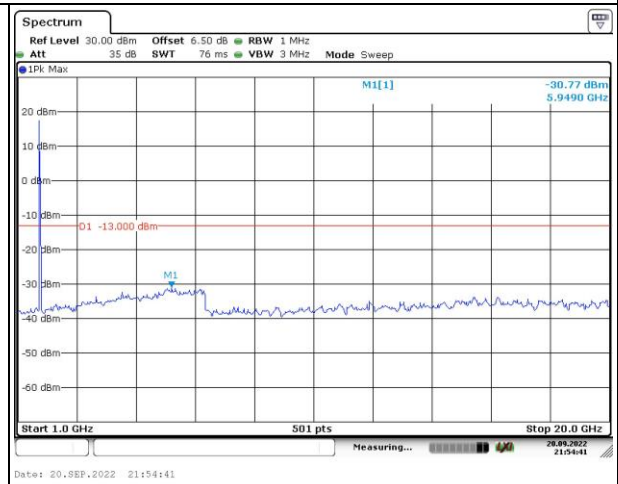
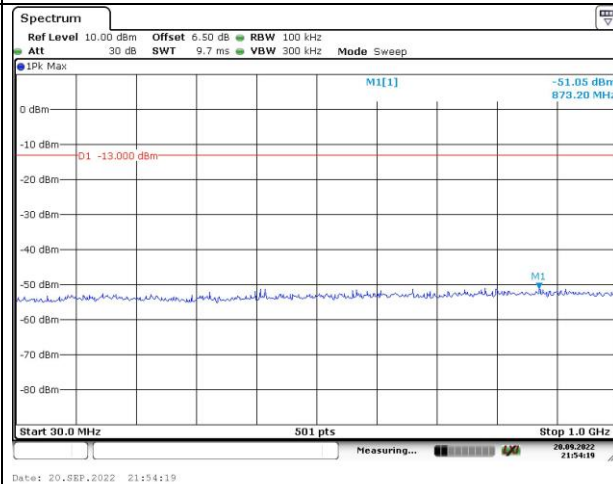


Spurious Emissions at Antenna Terminal

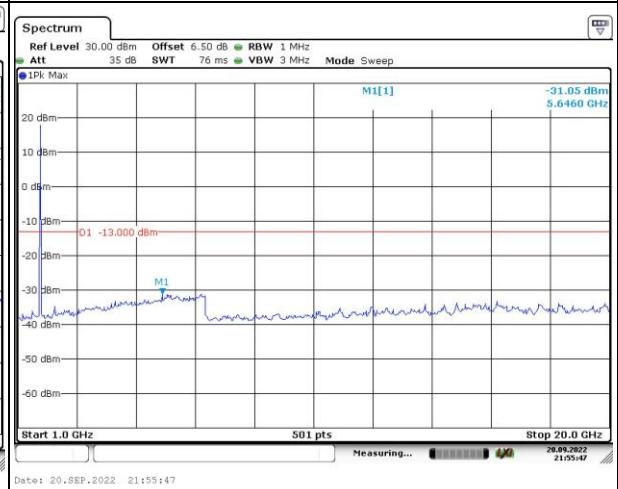
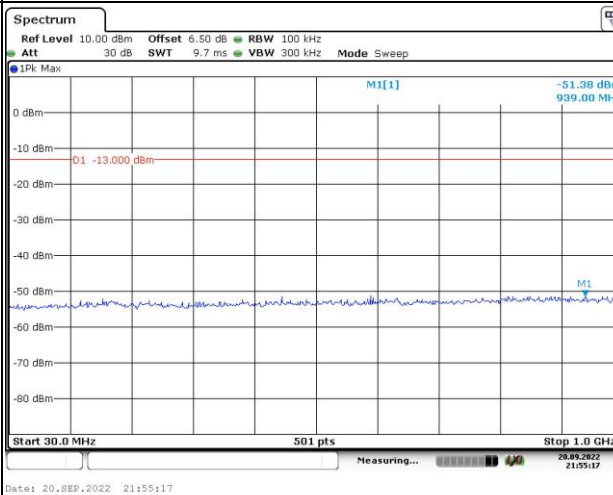
Channel

10MHz Bandwidth QPSK

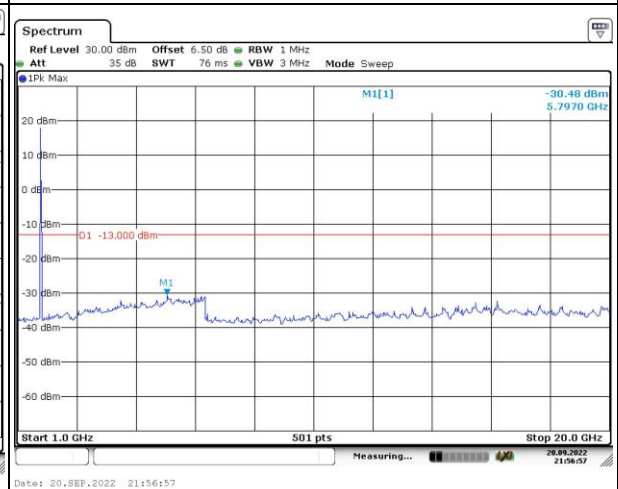
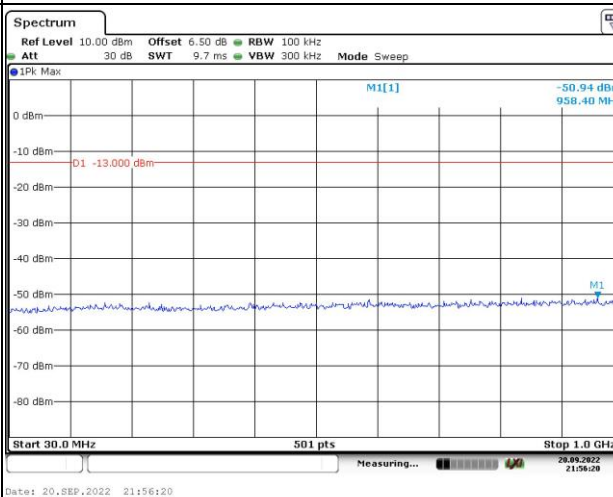
Lowest



Middle



Highest

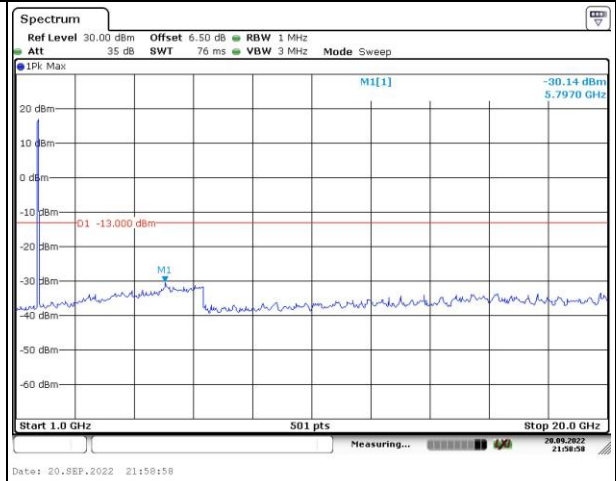
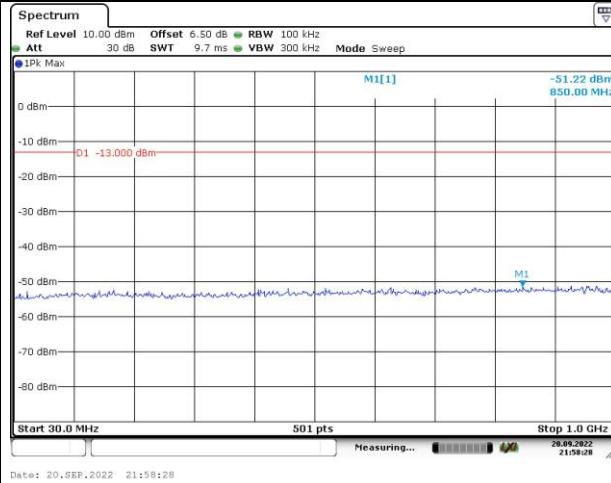


Spurious Emissions at Antenna Terminal

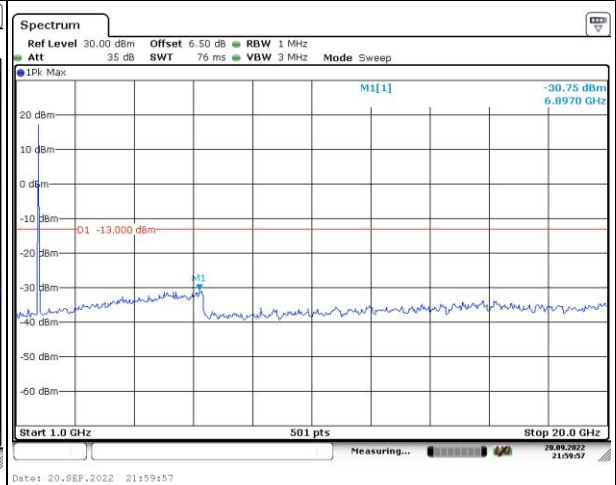
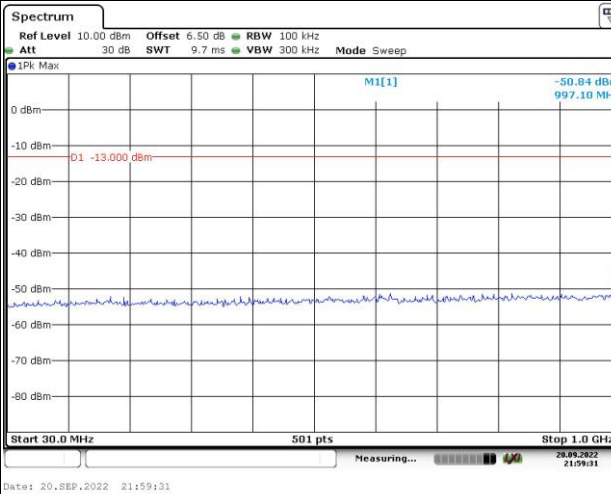
Channel

15MHz Bandwidth QPSK

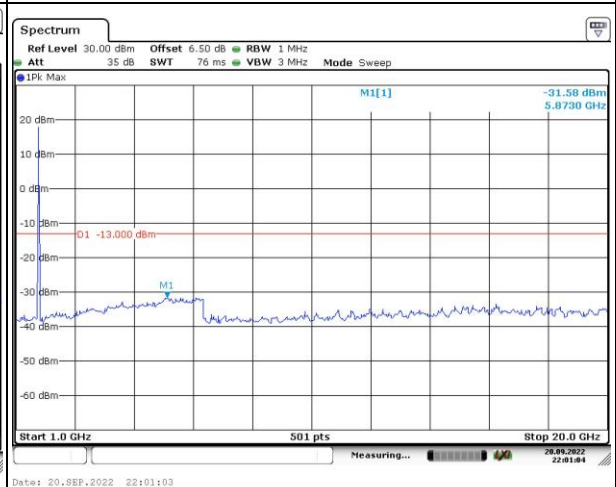
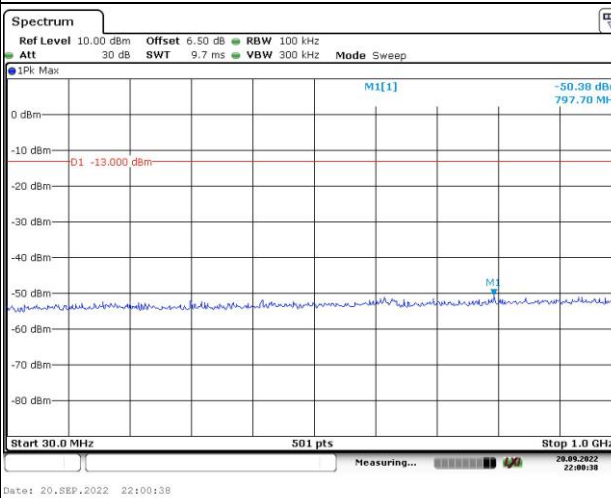
Lowest



Middle



Highest

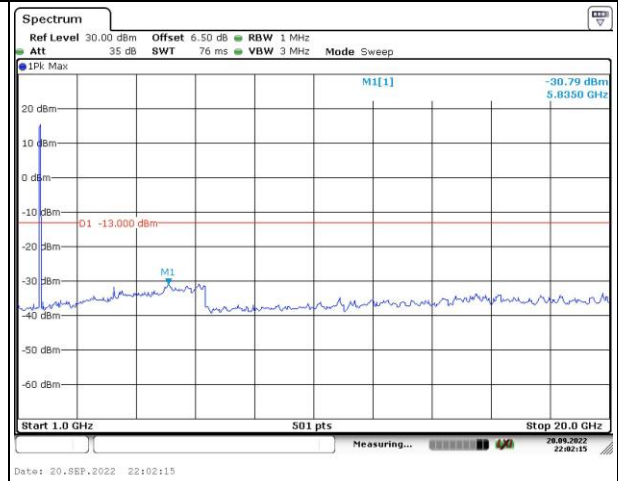
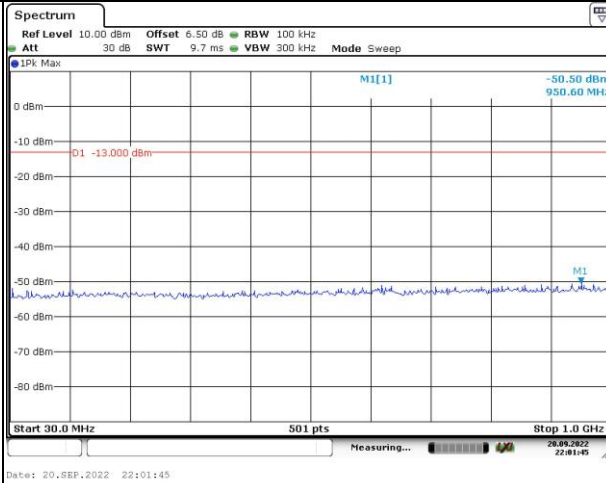


Spurious Emissions at Antenna Terminal

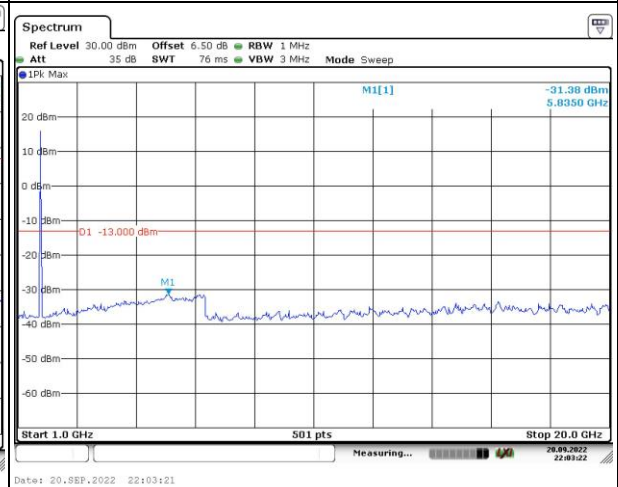
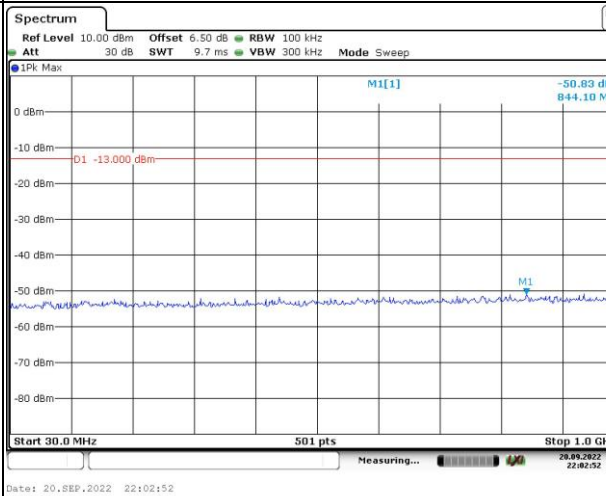
Channel

20MHz Bandwidth QPSK

Lowest



Middle



Highest

