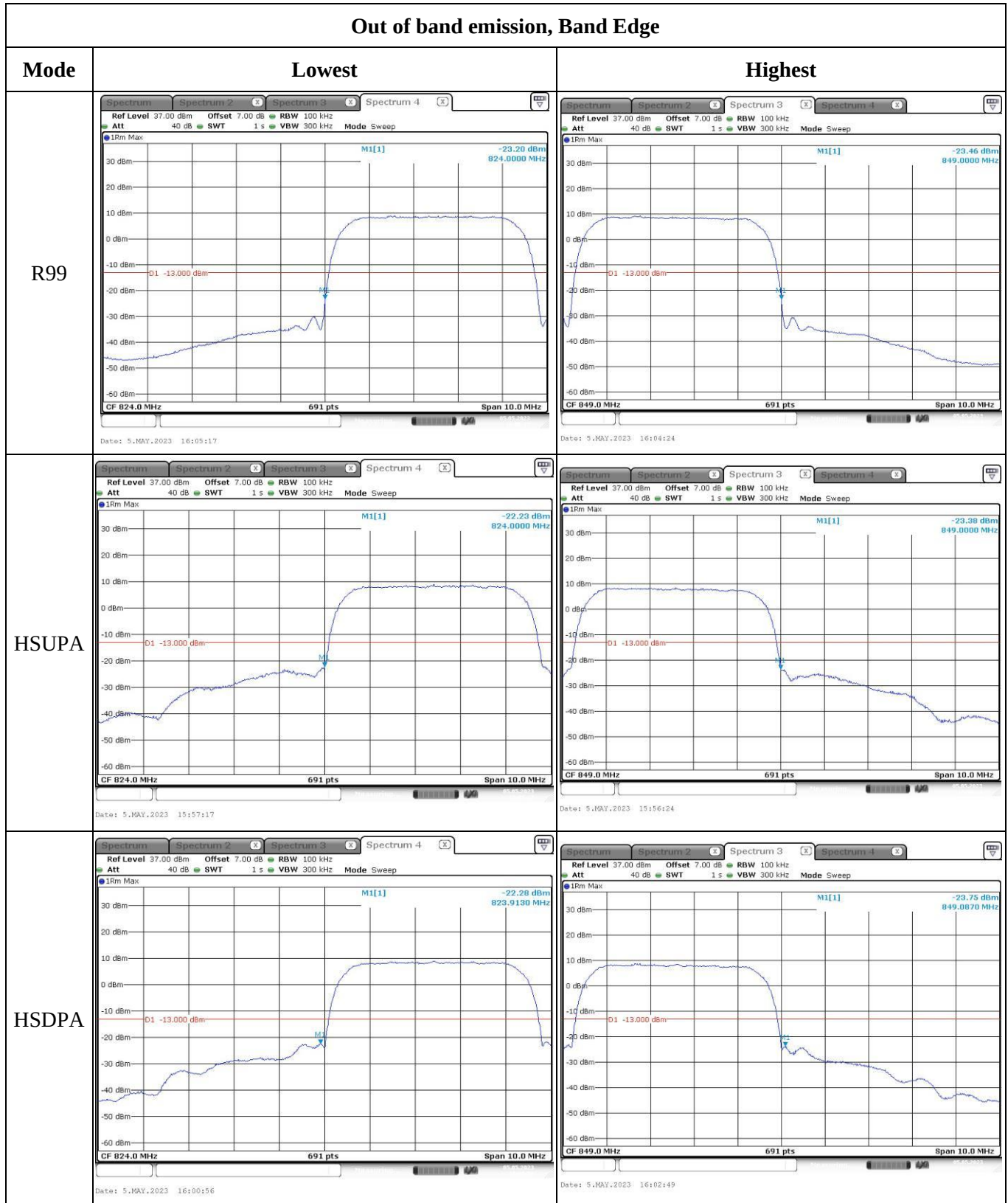


Out of band emission, Band Edge



4.6 Antenna Port Test Data and Results for LTE Band 2

Serial Number:	24YP_4	Test Date:	2023/04/20~2023/04/21
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	22.2~25.8	Relative Humidity: (%)	42~52	ATM Pressure: (kPa)	99.8~102.2
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101943	2022/7/25	2023/7/24
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS413	SS413001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Power Splitter	1515	RA914	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2022/7/15	2023/7/14
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022/9/29	2023/9/28
UNI-T	Multimeter	UT39A+	C210582554	2022/7/15	2023/7/14
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	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).

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
1.4MHz	1850.7	1880	1909.3
3MHz	1851.5	1880	1908.5
5MHz	1852.5	1880	1907.5
10MHz	1855	1880	1905
15MHz	1857.5	1880	1902.5
20MHz	1860	1880	1900

Test Data:**FCC §2.1046; §24.232****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	22.43	22.62	22.17	23.45	33
	RB1#3	22.43	22.58	22.17		
	RB1#5	22.47	22.63	22.15		
	RB3#0	22.59	22.51	22.26		
	RB3#3	22.64	22.51	22.24		
	RB6#0	21.58	21.4	21.32		
1.4MHz 16QAM	RB1#0	21.35	21.87	21.92	22.75	33
	RB1#3	21.39	21.88	21.94		
	RB1#5	21.4	21.94	21.91		
	RB3#0	21.75	21.51	21.07		
	RB3#3	21.75	21.57	21.14		
	RB6#0	20.85	20.73	20.34		
3MHz QPSK	RB1#0	22.48	22.46	22.15	23.33	33
	RB1#8	22.49	22.41	22.14		
	RB1#14	22.52	22.44	22.13		
	RB6#0	21.62	21.5	21.18		
	RB6#9	21.62	21.55	21.23		
	RB15#0	21.54	21.48	21.15		
3MHz 16QAM	RB1#0	22.33	21.25	21.64	23.14	33
	RB1#8	22.26	21.22	21.66		
	RB1#14	21.67	21.19	21.64		
	RB6#0	20.78	20.51	20.26		
	RB6#9	20.88	20.48	20.2		
	RB15#0	20.68	20.64	20.44		
5MHz QPSK	RB1#0	22.61	22.47	22.21	23.51	33
	RB1#13	22.69	22.43	22.18		
	RB1#24	22.7	22.43	22.13		
	RB15#0	21.56	21.47	21.26		
	RB15#10	21.61	21.37	21.25		
	RB25#0	21.56	21.54	21.15		
5MHz 16QAM	RB1#0	21.71	21.16	20.46	22.61	33
	RB1#13	21.8	21.15	20.48		
	RB1#24	21.79	21.24	20.46		
	RB15#0	20.5	20.64	20.42		
	RB15#10	20.57	20.59	20.36		
	RB25#0	20.72	20.5	20.45		

10MHz QPSK	RB1#0	22.59	22.57	22.15	23.48	33
	RB1#25	22.67	22.49	22.12		
	RB1#49	22.66	22.47	22.21		
	RB25#0	21.54	21.5	21.33		
	RB25#25	21.67	21.46	21.24		
	RB50#0	21.54	21.49	21.3		
10MHz 16QAM	RB1#0	21.74	20.99	21.7	22.59	33
	RB1#25	21.72	21.36	21.69		
	RB1#49	21.78	21.3	21.77		
	RB25#0	20.85	20.78	20.35		
	RB25#25	20.82	20.74	20.4		
	RB50#0	20.82	20.7	20.4		
15MHz QPSK	RB1#0	22.64	22.46	22.19	23.54	33
	RB1#38	22.67	22.46	22.16		
	RB1#74	22.73	22.37	22.24		
	RB36#0	21.59	21.58	21.3		
	RB36#39	21.65	21.57	21.21		
	RB75#0	21.64	21.49	21.35		
15MHz 16QAM	RB1#0	21.73	21.89	21.59	22.73	33
	RB1#38	21.83	21.92	21.56		
	RB1#74	21.82	21.86	21.62		
	RB36#0	20.82	20.63	20.49		
	RB36#39	20.83	20.6	20.47		
	RB75#0	20.78	20.67	20.47		
20MHz QPSK	RB1#0	22.66	22.63	22.35	23.61	33
	RB1#50	22.78	22.58	22.45		
	RB1#99	22.8	22.54	22.4		
	RB50#0	21.62	21.51	21.25		
	RB50#50	21.67	21.51	21.24		
	RB100#0	21.69	21.49	21.26		
20MHz 16QAM	RB1#0	21.63	22.28	21.45	23.11	33
	RB1#50	21.67	22.27	21.35		
	RB1#99	21.68	22.3	21.38		
	RB50#0	20.72	20.75	20.55		
	RB50#50	20.8	20.67	20.43		
	RB100#0	20.71	20.7	20.46		

Note: EIRP=Conducted Power(dBm) - Lc(dB) + Gt(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	4.55	3.86	3.42	13
	RB100#0	5.04	4.75	4.35	13
20MHz 16QAM	RB1#0	5.36	4.81	4.32	13
	RB100#0	5.91	5.68	5.25	13
				Result:	Pass

FCC §2.1049, §24.238: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	1.102	1.102	1.096	1.26	1.26	1.242
1.4MHz 16QAM	1.096	1.102	1.114	1.254	1.254	1.278
3MHz QPSK	2.695	2.695	2.707	3.012	3.024	3.012
3MHz 16QAM	2.683	2.683	2.695	3	3.024	3.012
5MHz QPSK	4.511	4.511	4.511	5	5	5
5MHz 16QAM	4.551	4.551	4.531	5.02	5.04	5
10MHz QPSK	8.942	8.942	8.982	9.8	9.8	9.8
10MHz 16QAM	8.982	8.942	8.942	9.84	9.88	9.8
15MHz QPSK	13.473	13.533	13.533	15	15.06	15.06
15MHz 16QAM	13.473	13.533	13.533	14.46	15.06	15
20MHz QPSK	17.884	18.044	17.884	18.96	19.92	19.04
20MHz 16QAM	17.964	17.964	18.044	19.04	19.76	19.68
Note: The test plots please refer to the Plots of Occupied Bandwidth						

FCC §2.1051, §24.238 (a):Spurious Emissions at Antenna Terminal	
Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.

FCC §2.1051, §24.238 (a):Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

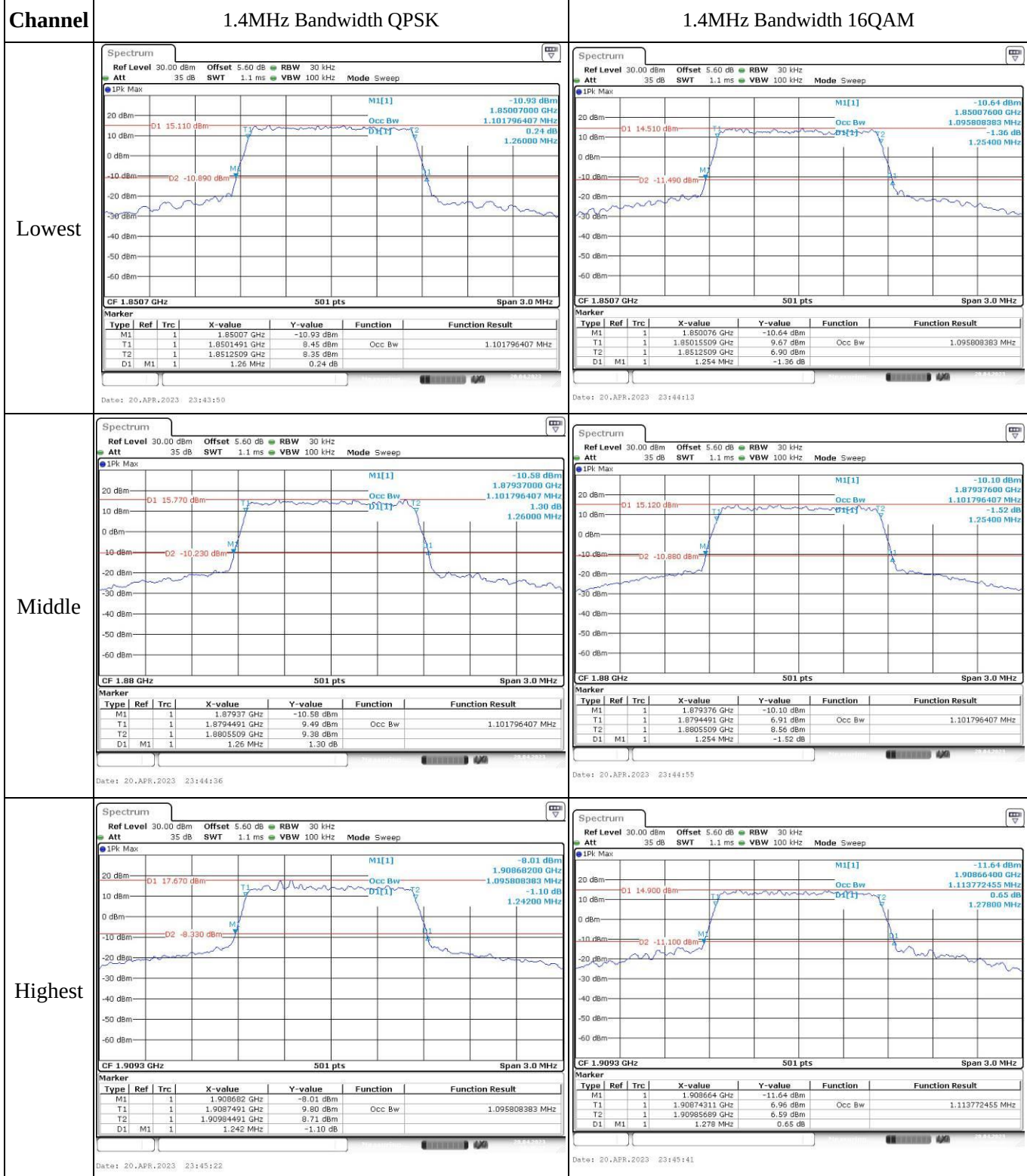
FCC §2.1055, §24.235: Frequency Stability

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	1851.087	1850.000	1908.953	1910.000
	-20	3.85	1851.095	1850.000	1908.986	1910.000
	-10	3.85	1851.151	1850.000	1908.989	1910.000
	0	3.85	1851.152	1850.000	1908.974	1910.000
	10	3.85	1851.141	1850.000	1908.931	1910.000
	20	3.85	1851.138	1850.000	1908.942	1910.000
	30	3.85	1851.155	1850.000	1908.917	1910.000
	40	3.85	1851.157	1850.000	1908.924	1910.000
	50	3.85	1851.094	1850.000	1908.956	1910.000
Frequency Stability vs. Voltage	20	3.6	1851.139	1850.000	1908.992	1910.000
	20	4.4	1851.154	1850.000	1908.903	1910.000
					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	1851.022	1850.000	1909.060	1910.000
	-20	3.85	1851.033	1850.000	1909.042	1910.000
	-10	3.85	1851.064	1850.000	1909.089	1910.000
	0	3.85	1851.081	1850.000	1909.052	1910.000
	10	3.85	1851.088	1850.000	1909.026	1910.000
	20	3.85	1851.058	1850.000	1909.022	1910.000
	30	3.85	1851.052	1850.000	1909.001	1910.000
	40	3.85	1851.008	1850.000	1909.019	1910.000
	50	3.85	1851.076	1850.000	1909.069	1910.000
Frequency Stability vs. Voltage	20	3.6	1851.061	1850.000	1909.076	1910.000
	20	4.4	1851.036	1850.000	1909.038	1910.000
					Result:	Pass

Test Plots(Note: The 5.6dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer):

Occupied Bandwidth



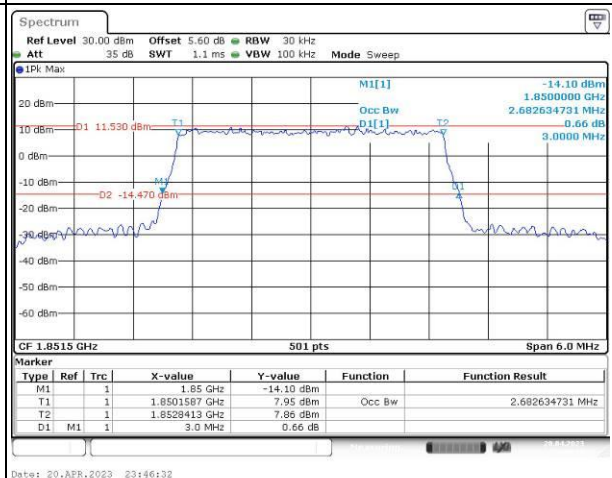
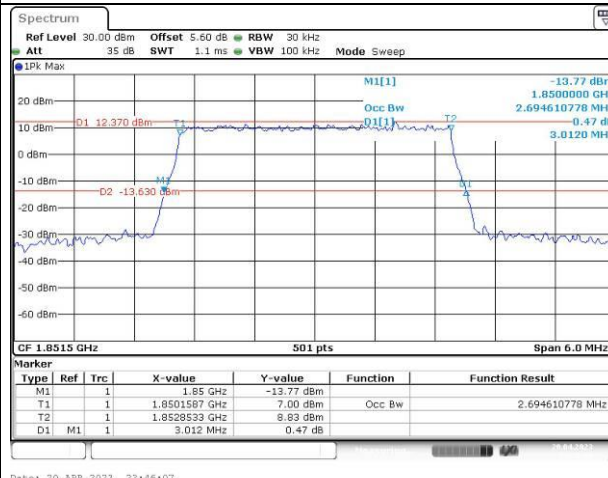
Occupied Bandwidth

Channel

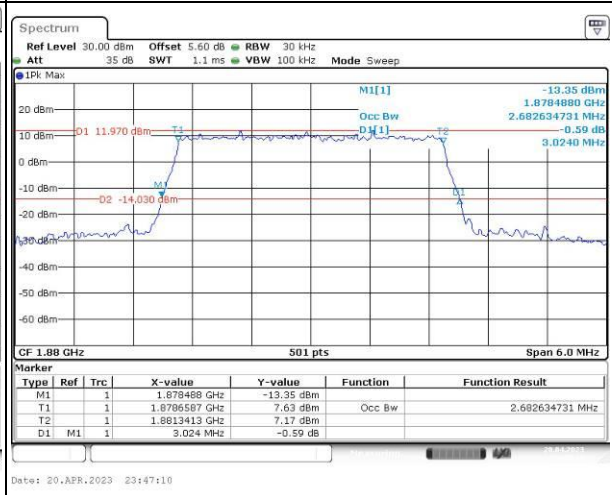
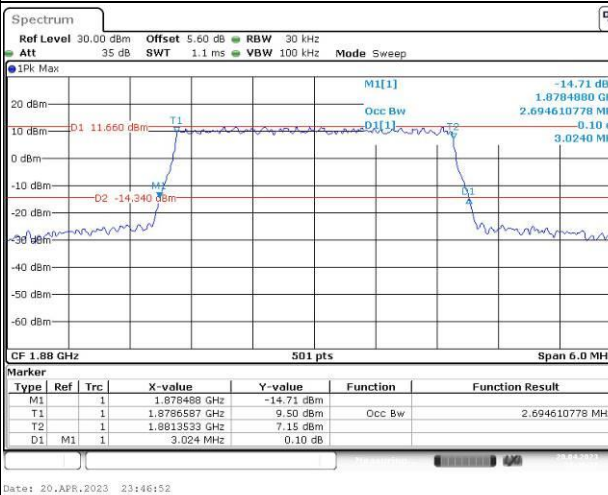
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

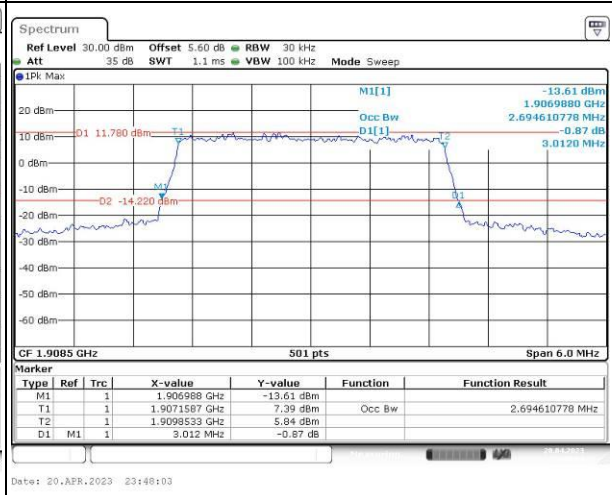
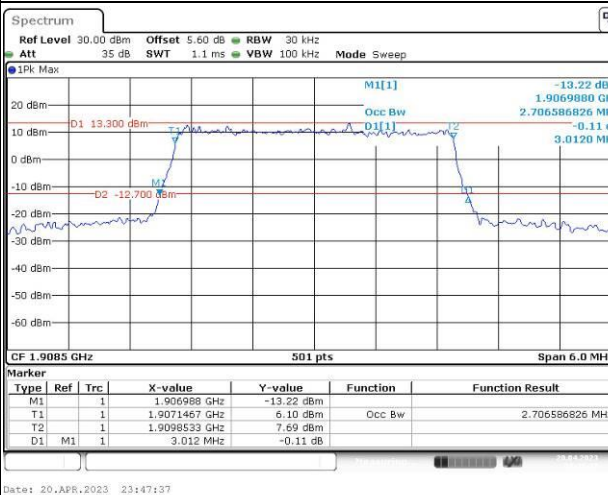
Lowest



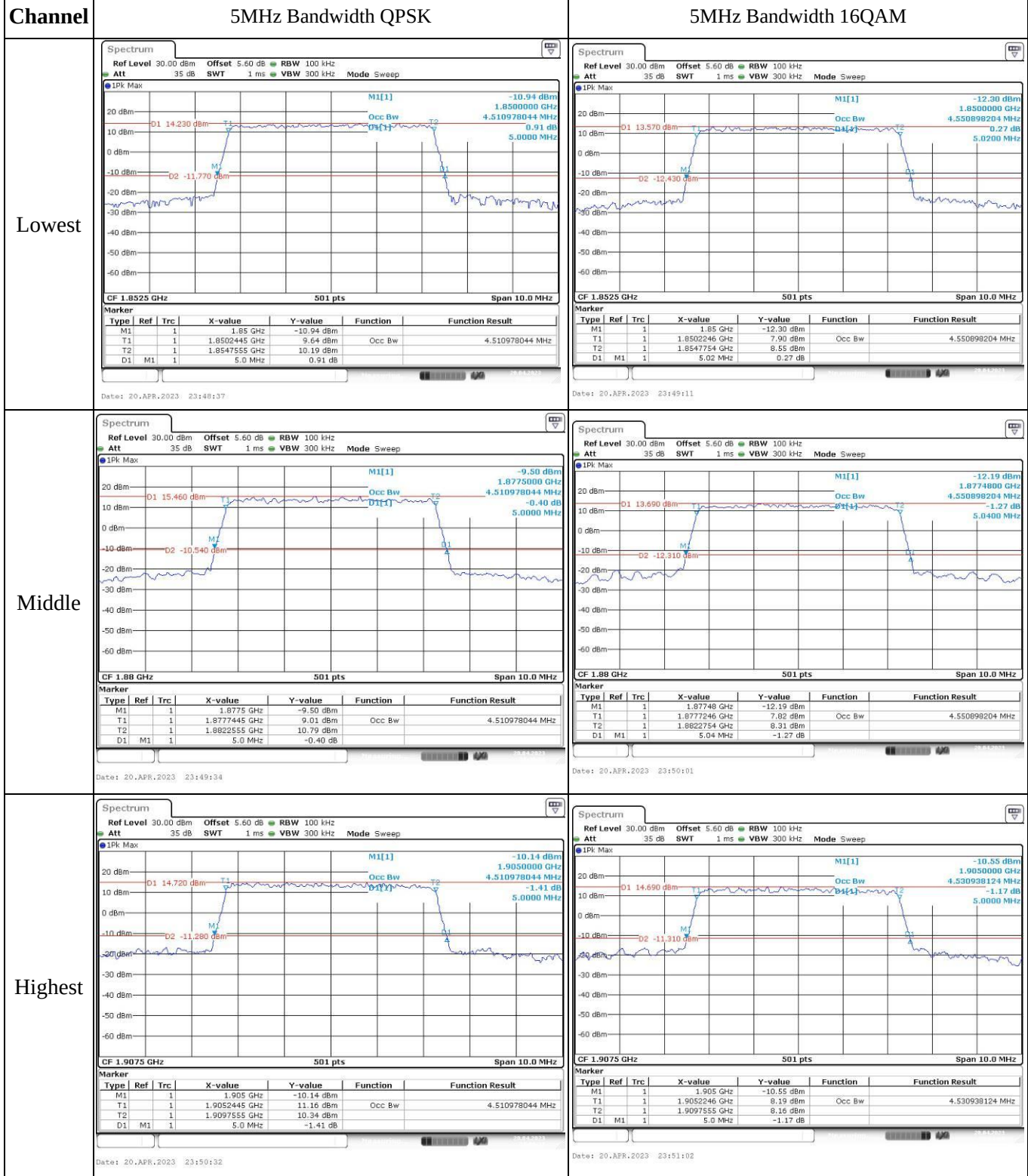
Middle



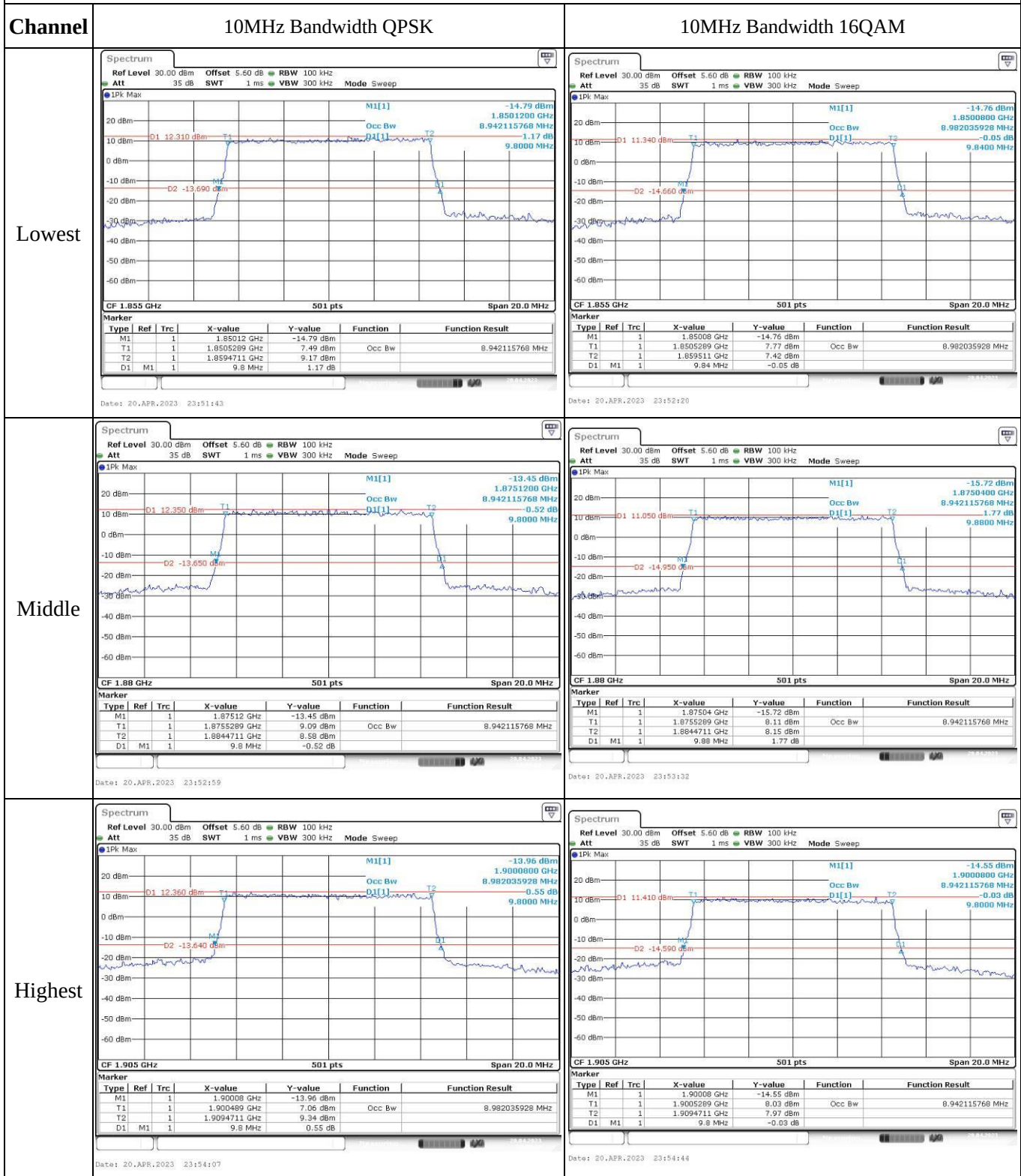
Highest



Occupied Bandwidth



Occupied Bandwidth



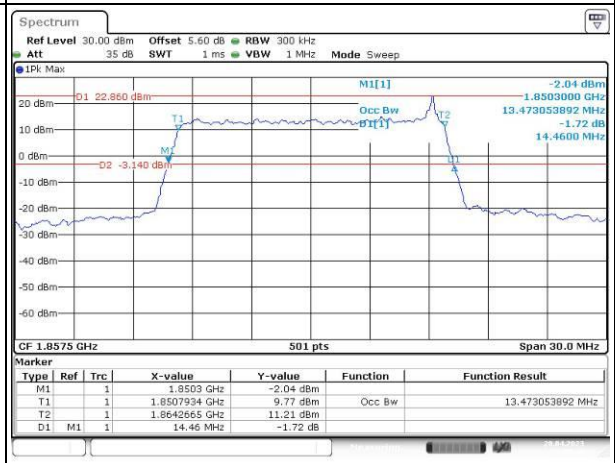
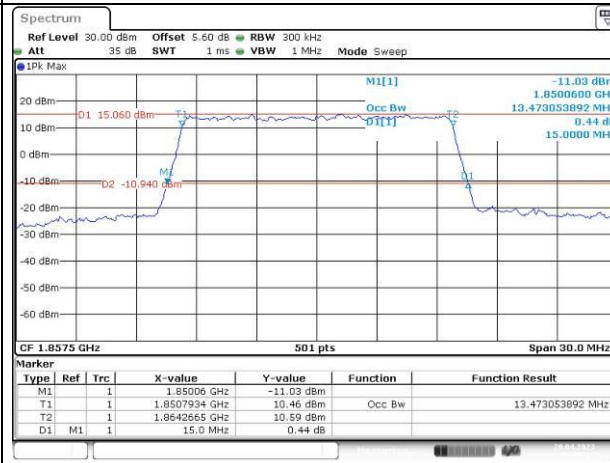
Occupied Bandwidth

Channel

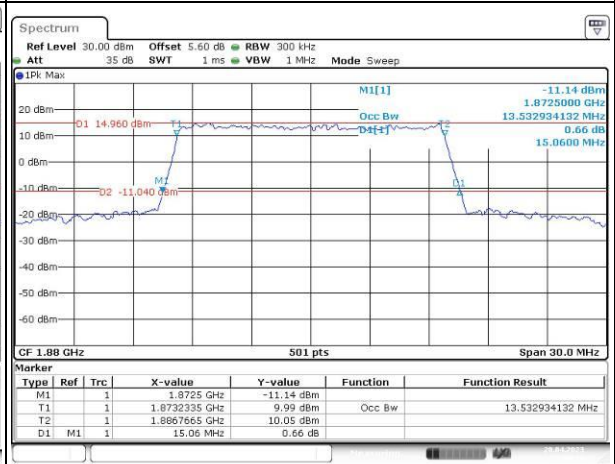
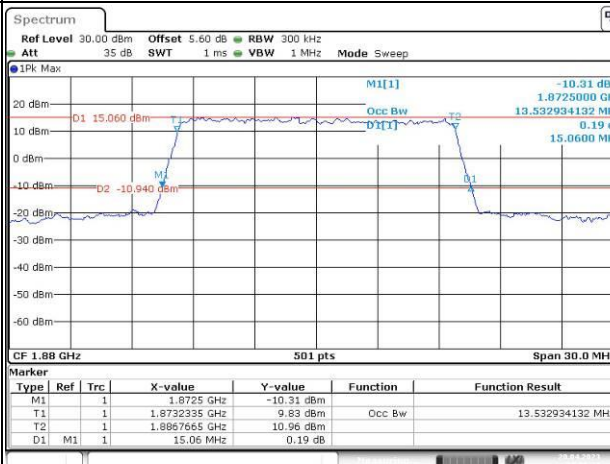
15MHz Bandwidth QPSK

15MHz Bandwidth 16QAM

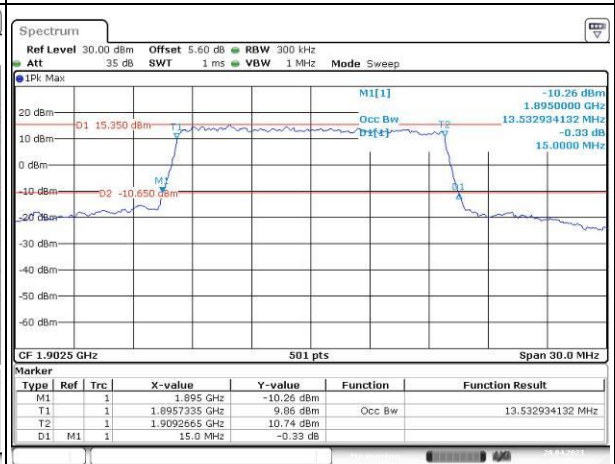
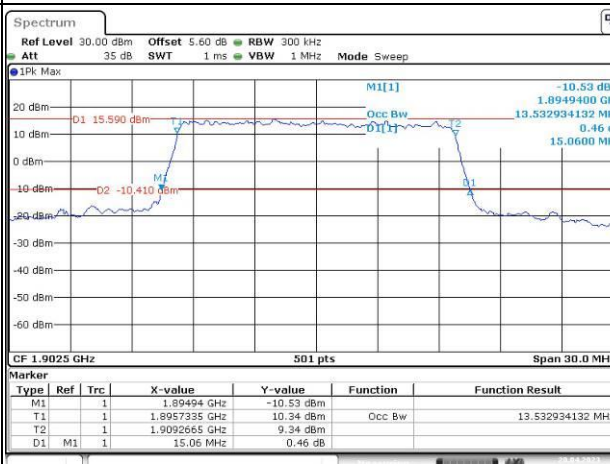
Lowest



Middle



Highest



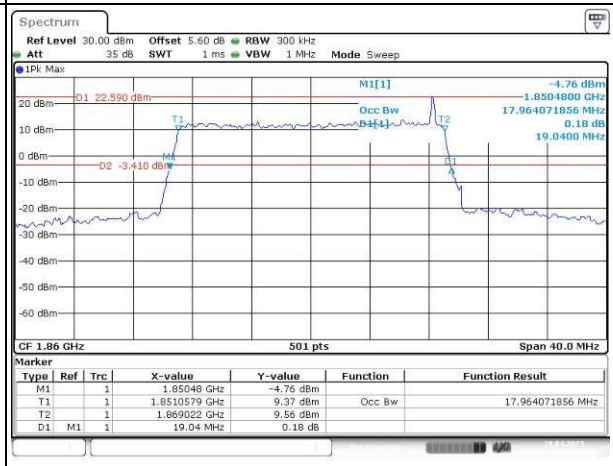
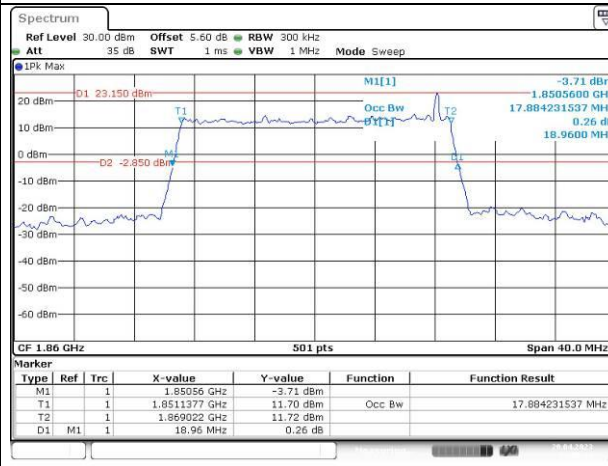
Occupied Bandwidth

Channel

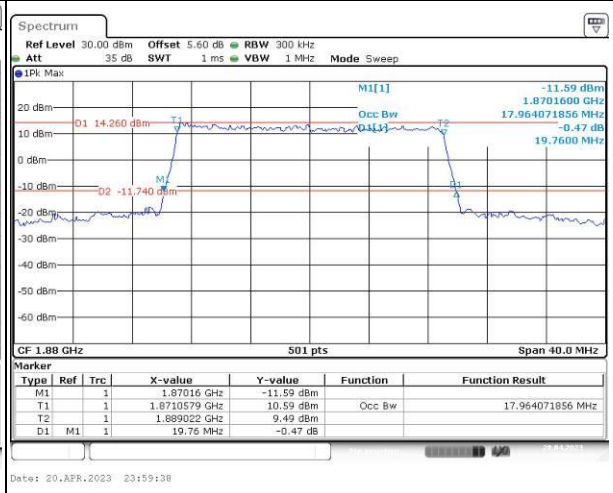
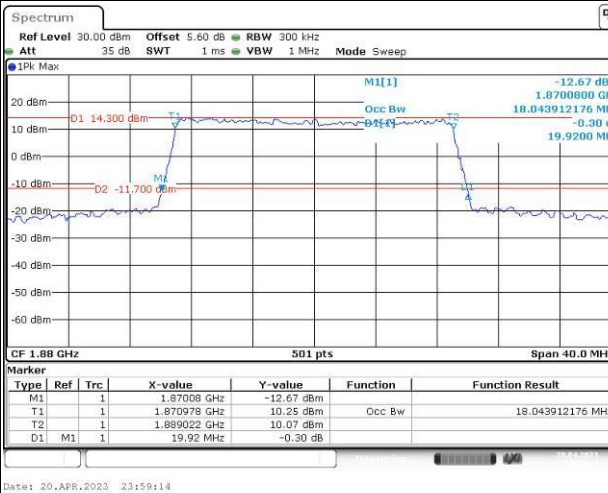
20MHz Bandwidth QPSK

20MHz Bandwidth 16QAM

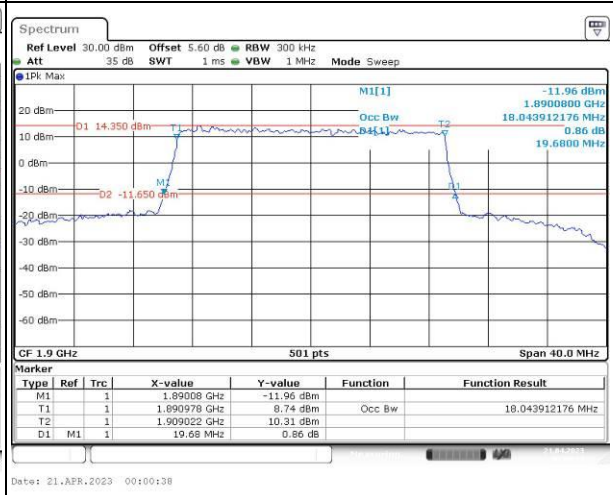
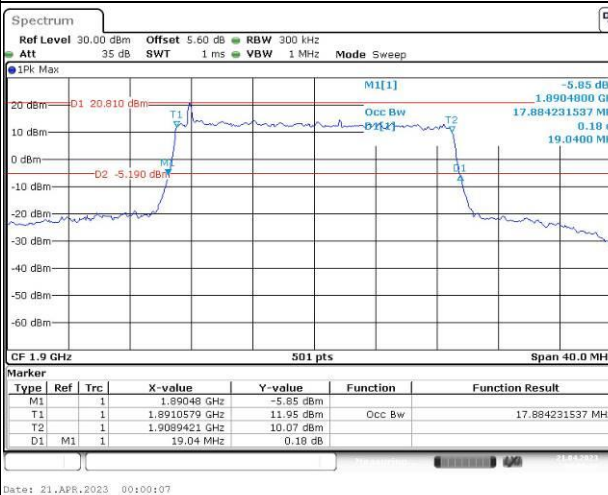
Lowest



Middle



Highest

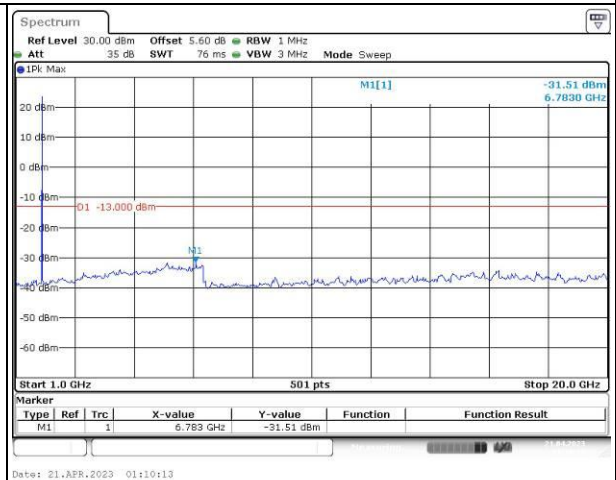
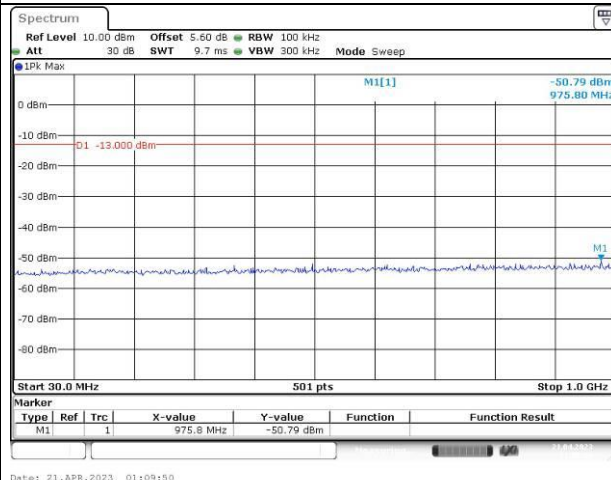


Spurious Emissions at Antenna Terminal

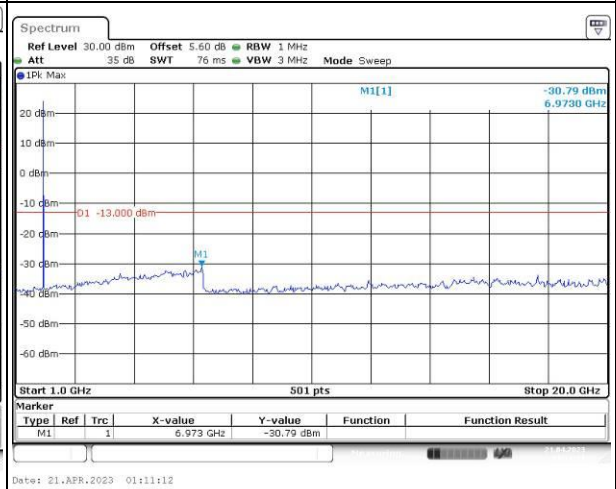
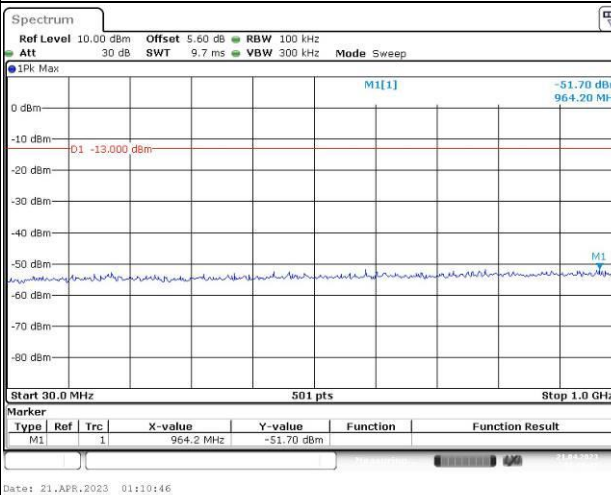
Channel

1.4MHz Bandwidth QPSK

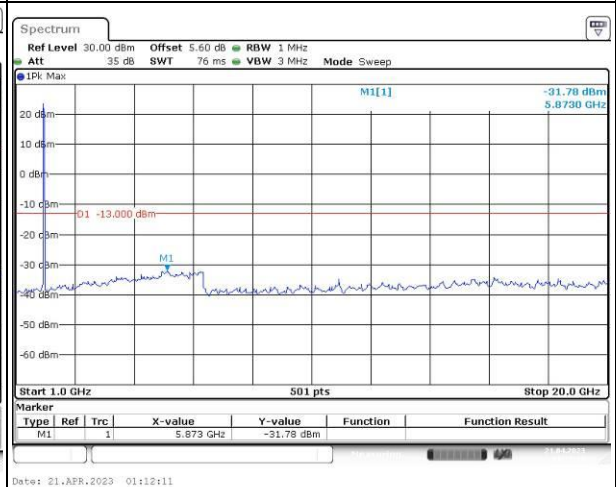
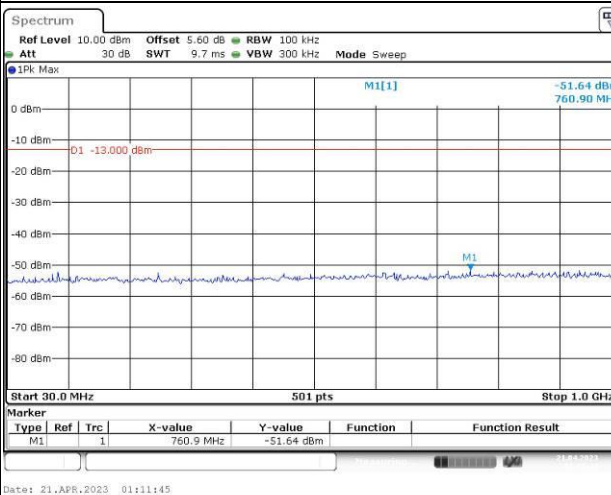
Lowest



Middle



Highest

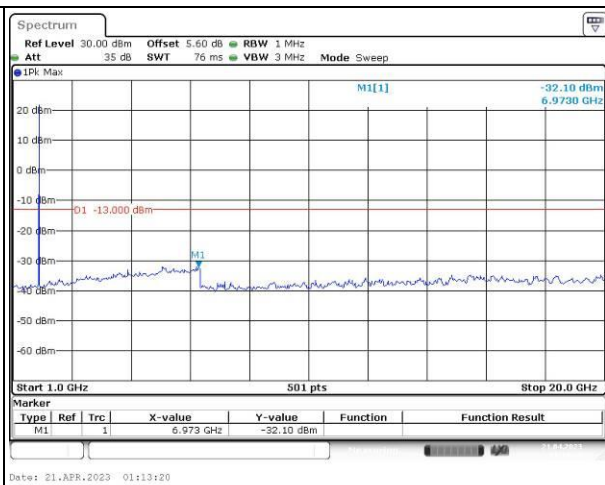
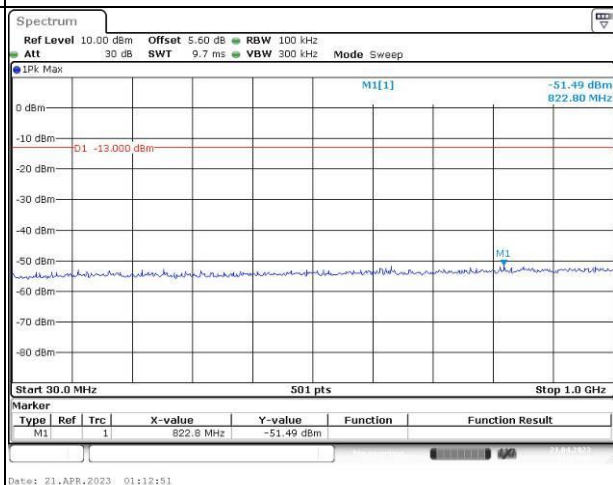


Spurious Emissions at Antenna Terminal

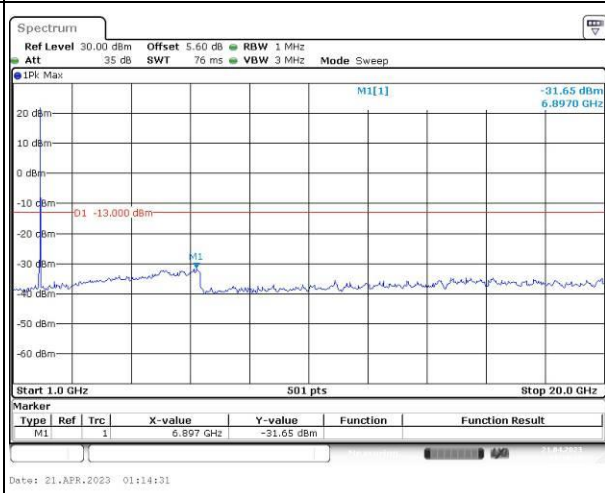
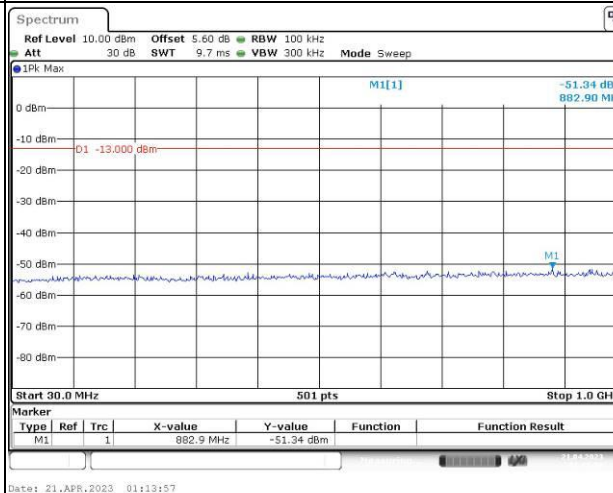
Channel

3MHz Bandwidth QPSK

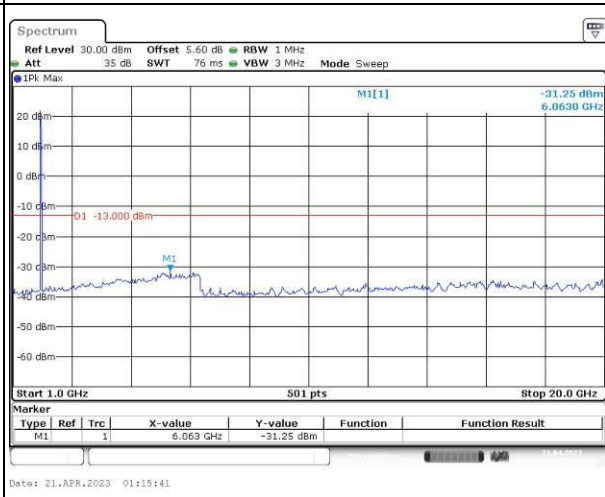
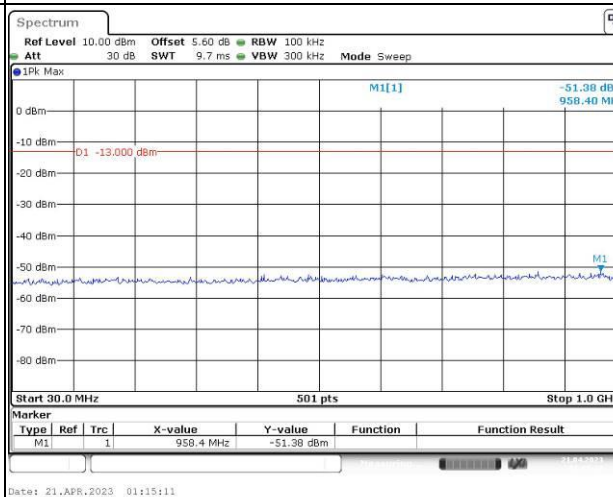
Lowest



Middle



Highest

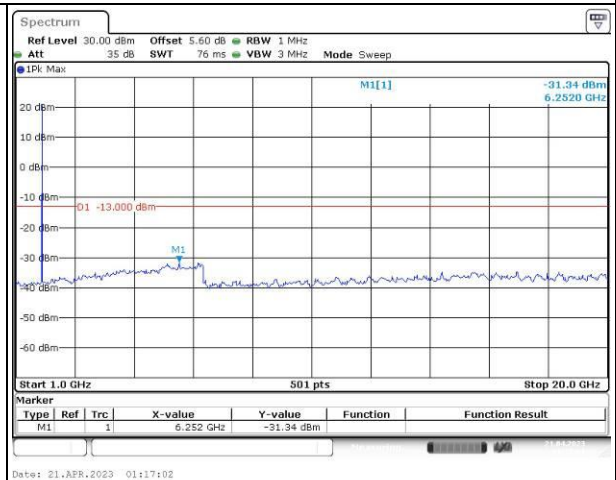
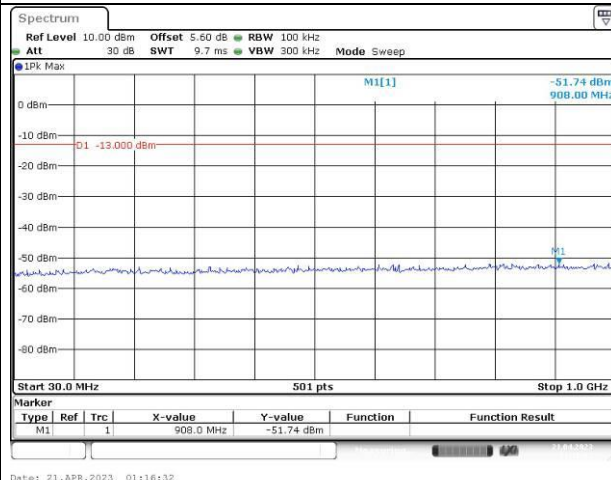


Spurious Emissions at Antenna Terminal

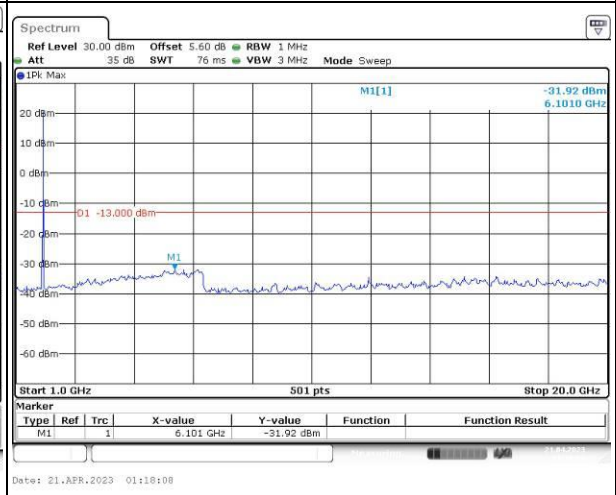
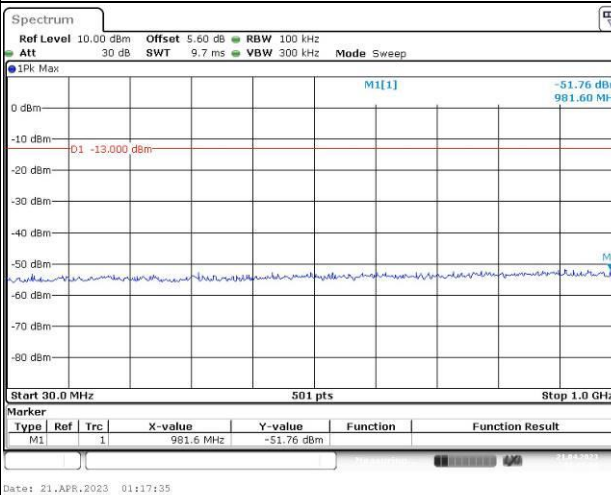
Channel

5MHz Bandwidth QPSK

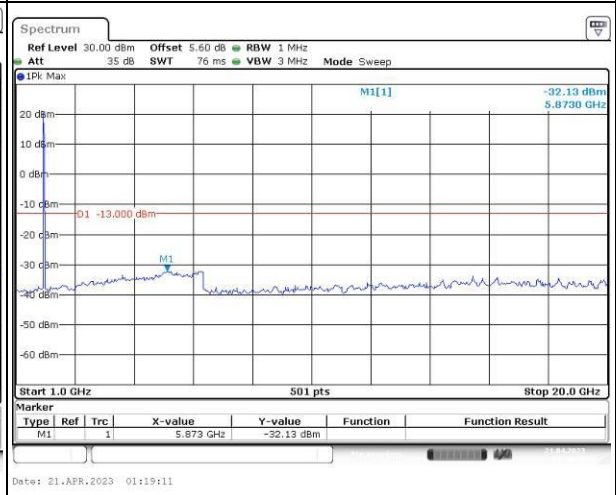
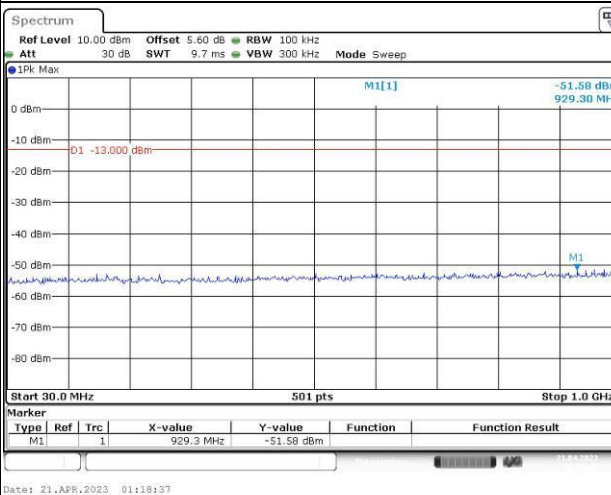
Lowest



Middle



Highest

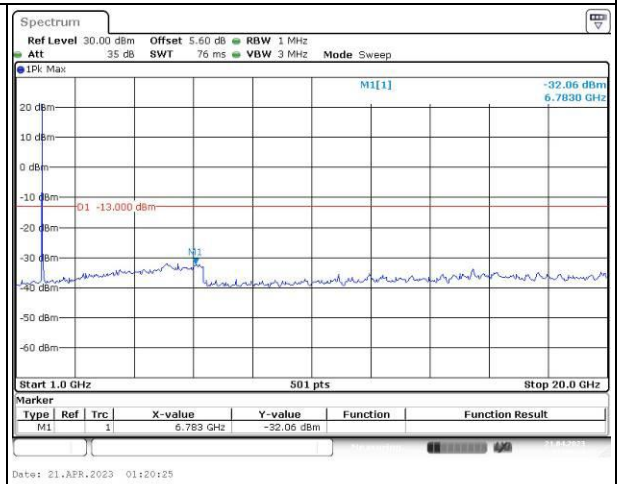
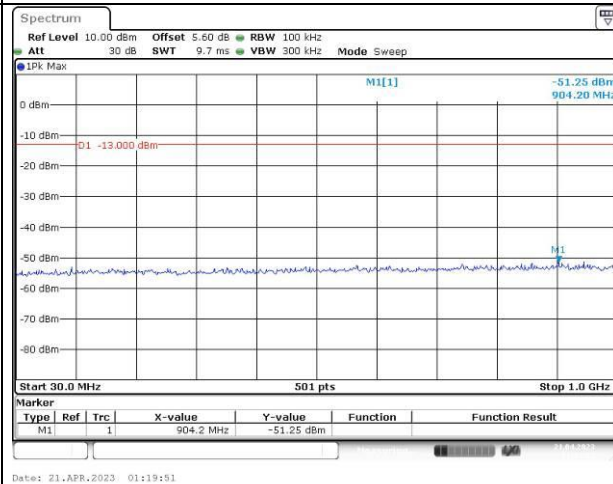


Spurious Emissions at Antenna Terminal

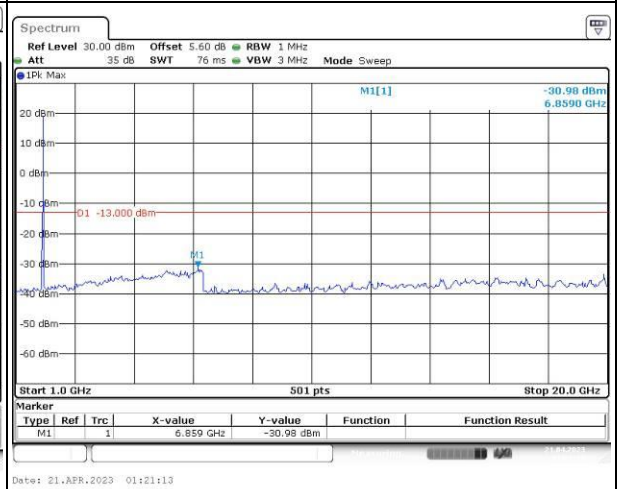
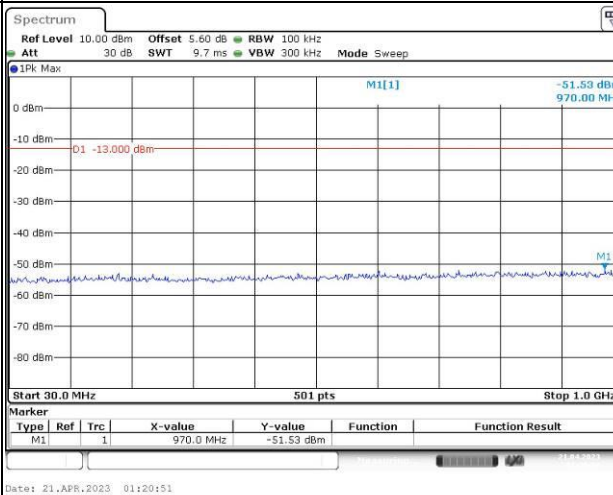
Channel

10MHz Bandwidth QPSK

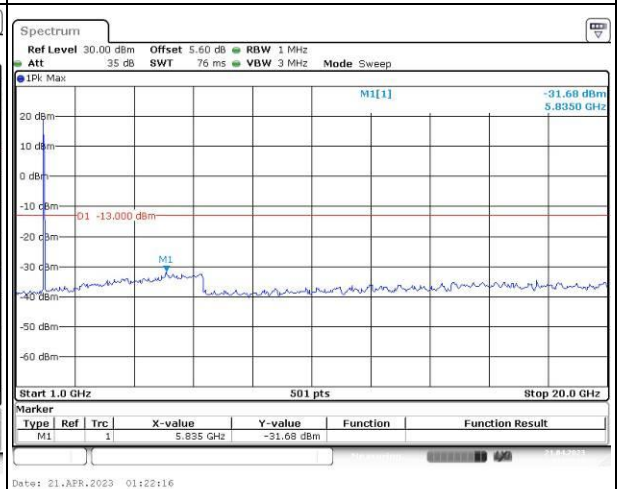
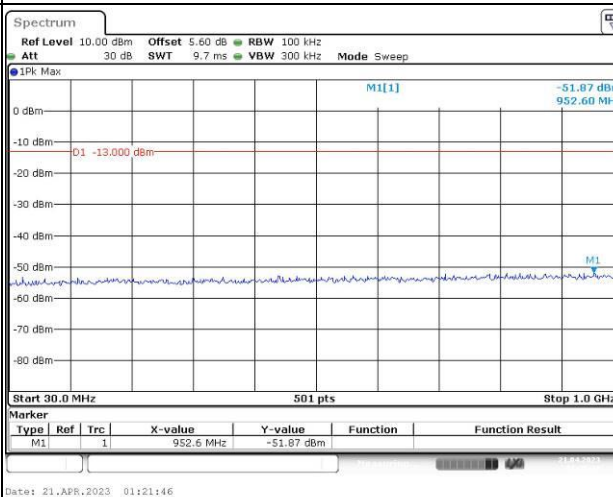
Lowest



Middle



Highest

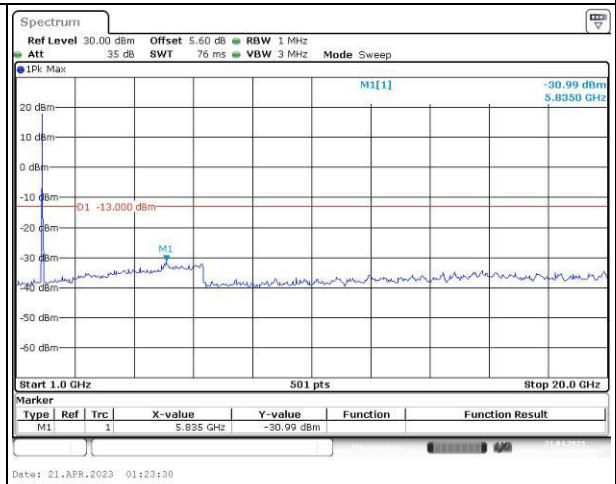
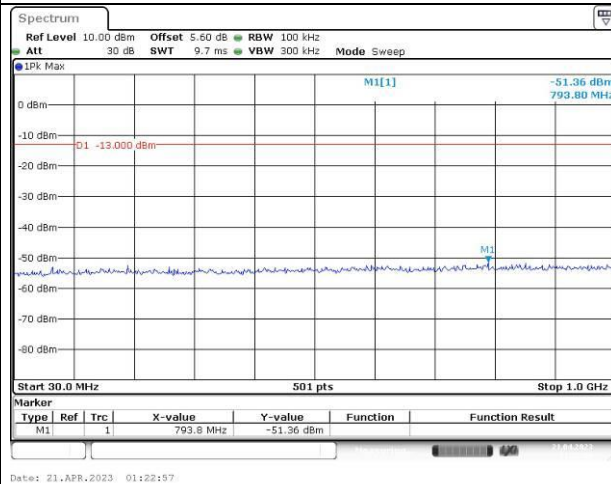


Spurious Emissions at Antenna Terminal

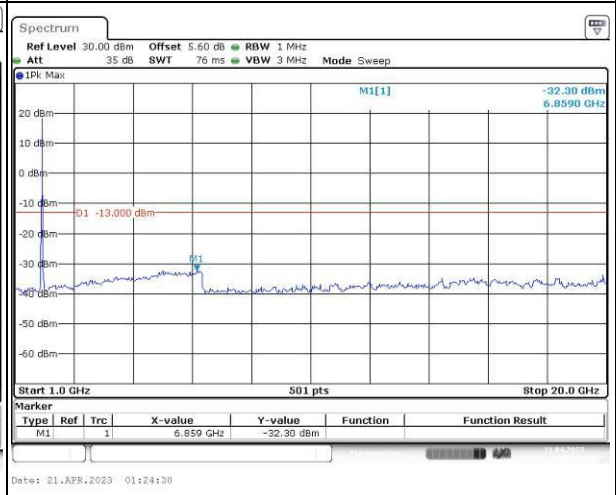
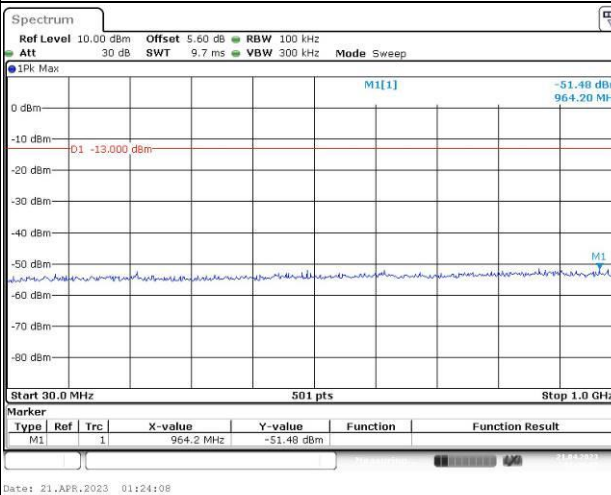
Channel

15MHz Bandwidth QPSK

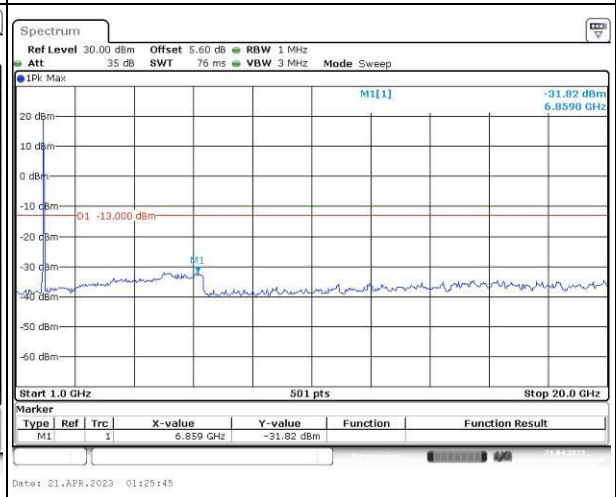
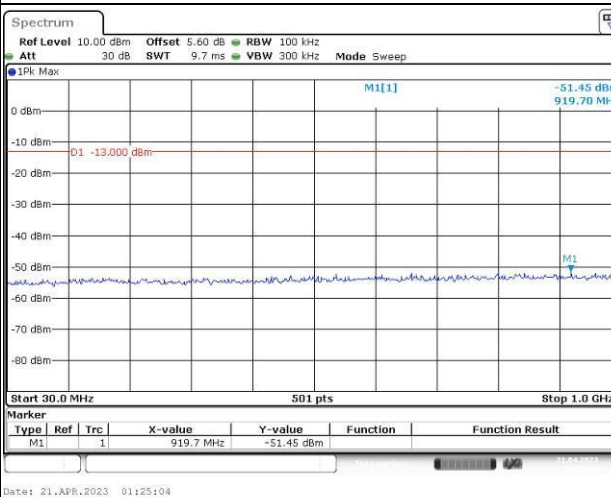
Lowest



Middle



Highest

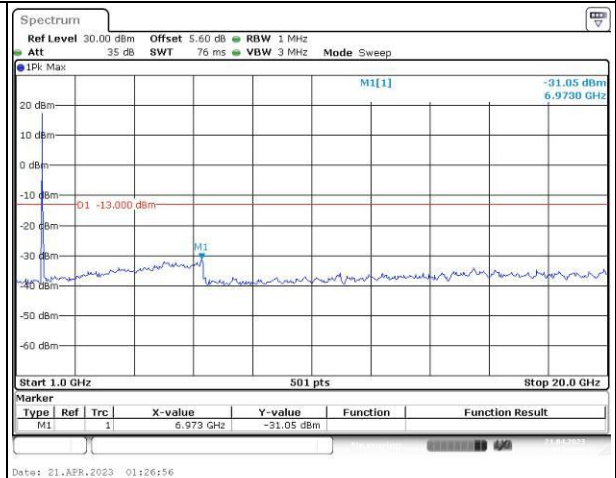
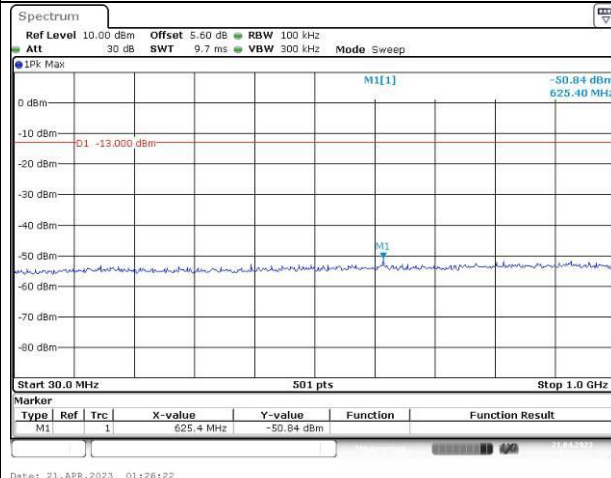


Spurious Emissions at Antenna Terminal

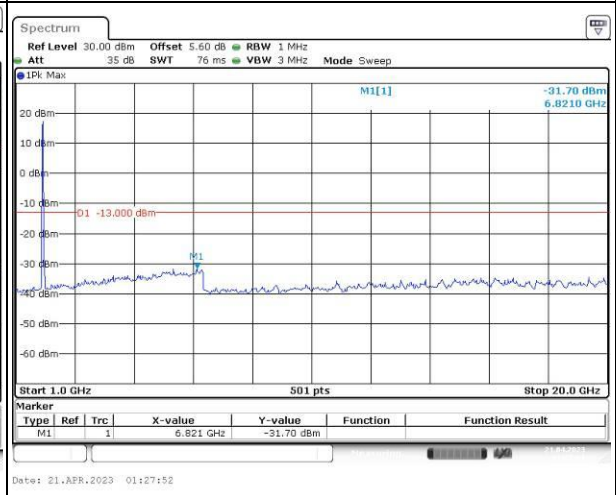
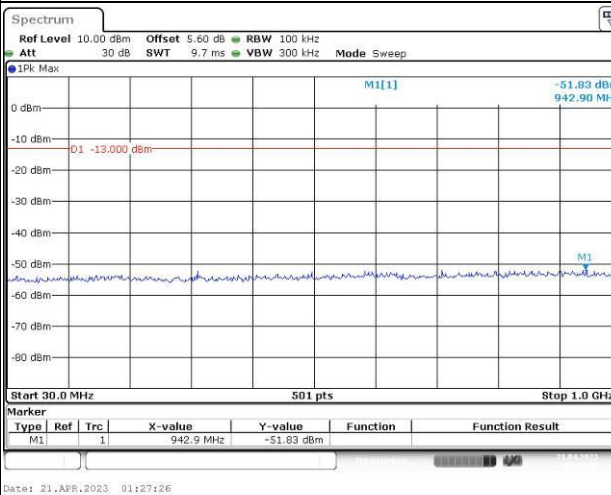
Channel

20MHz Bandwidth QPSK

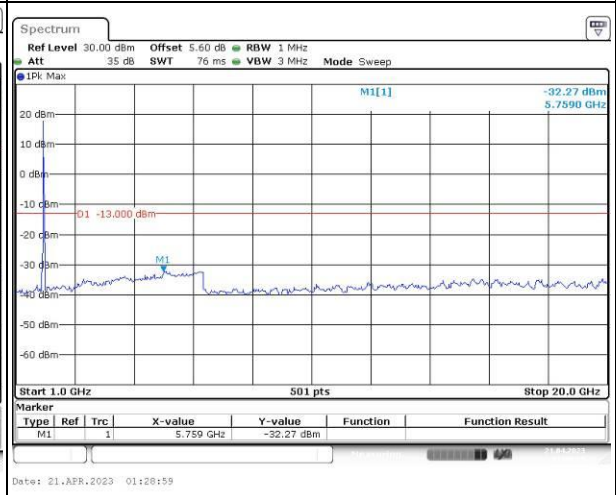
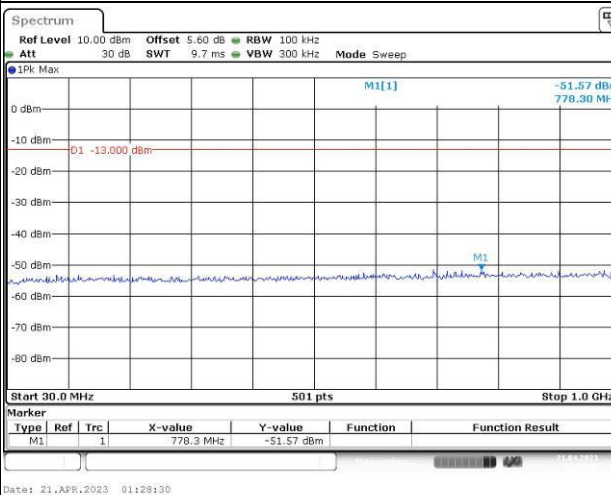
Lowest



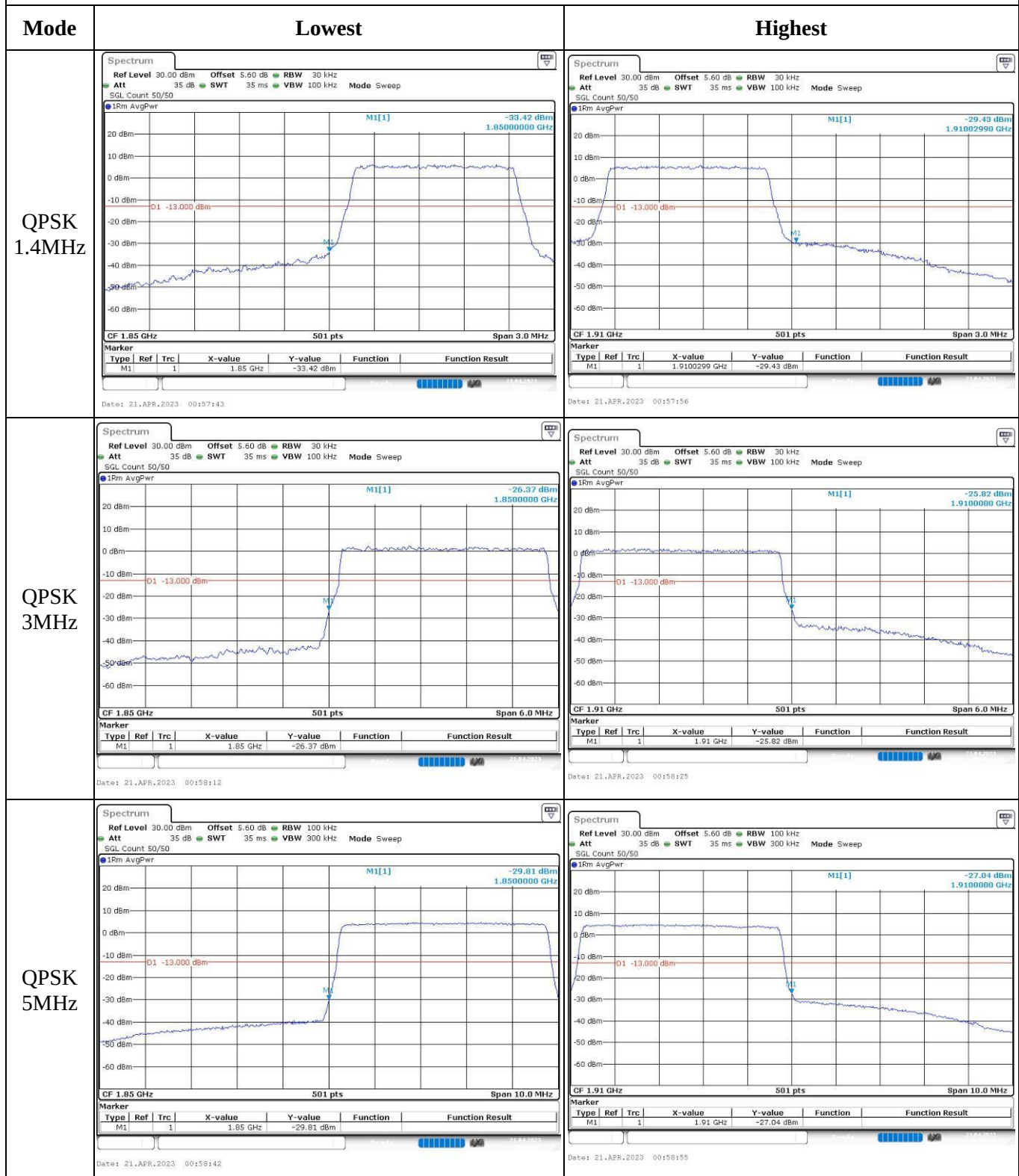
Middle



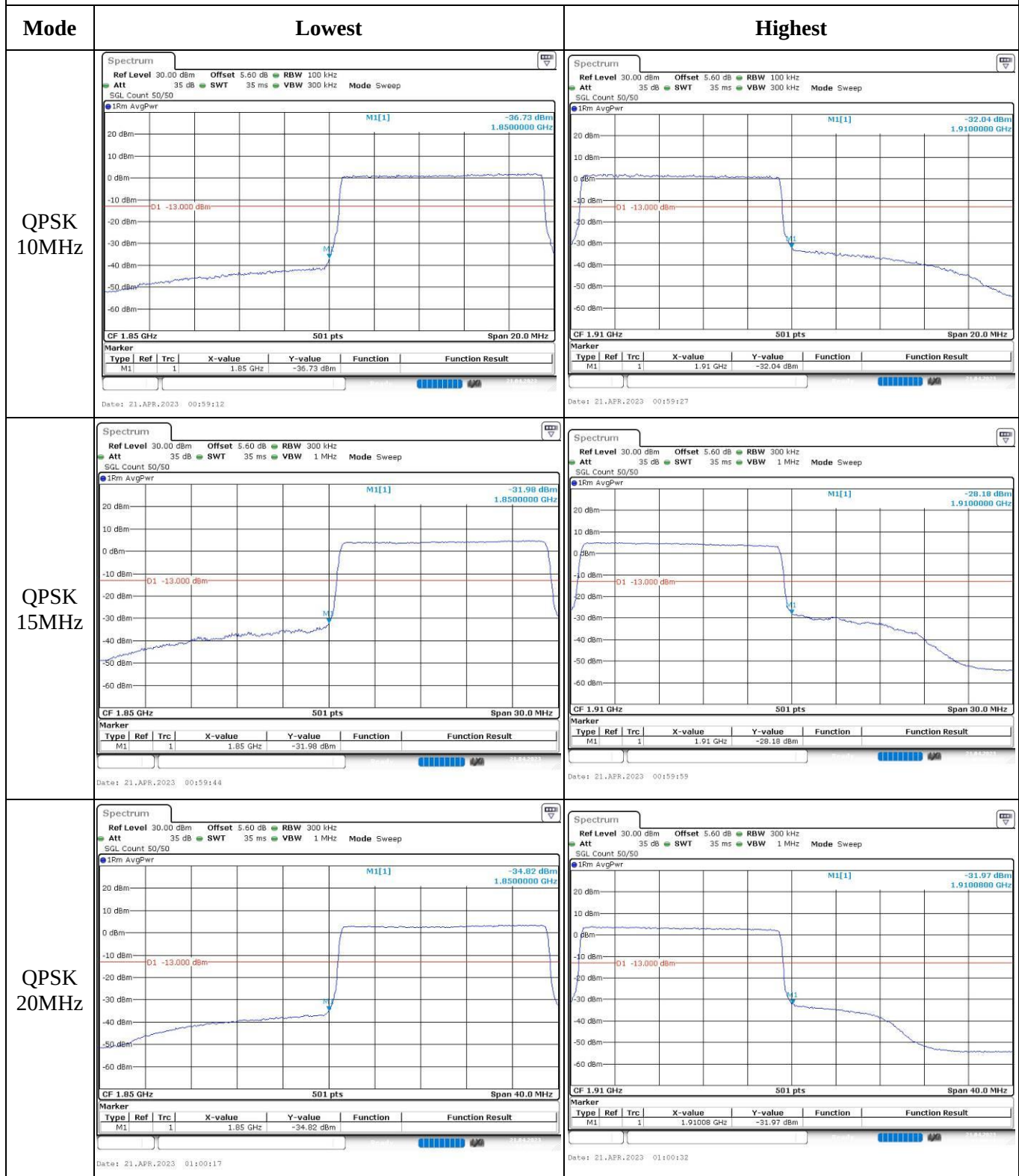
Highest



Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge

