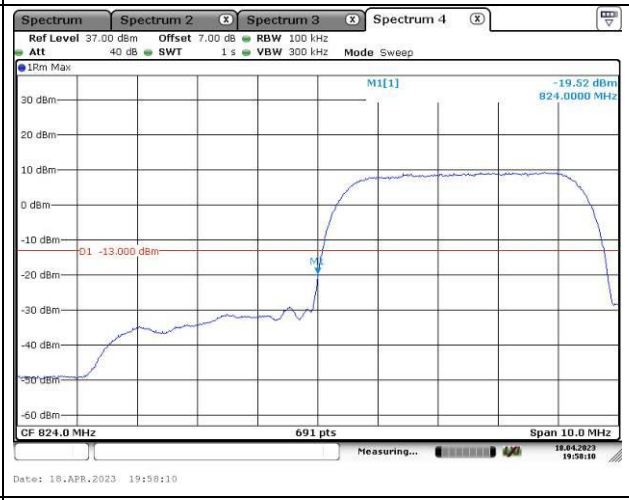
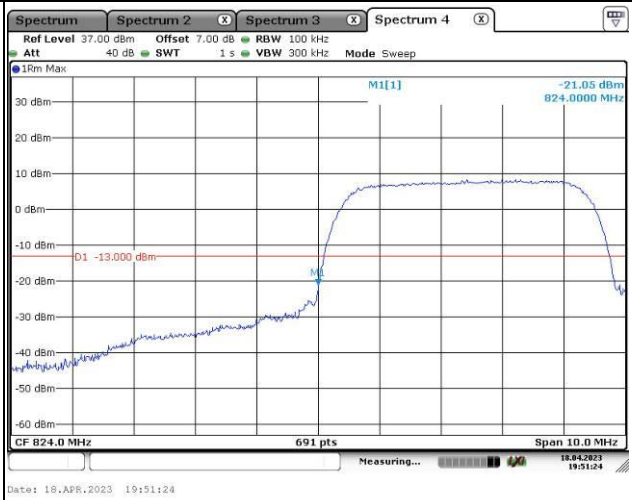
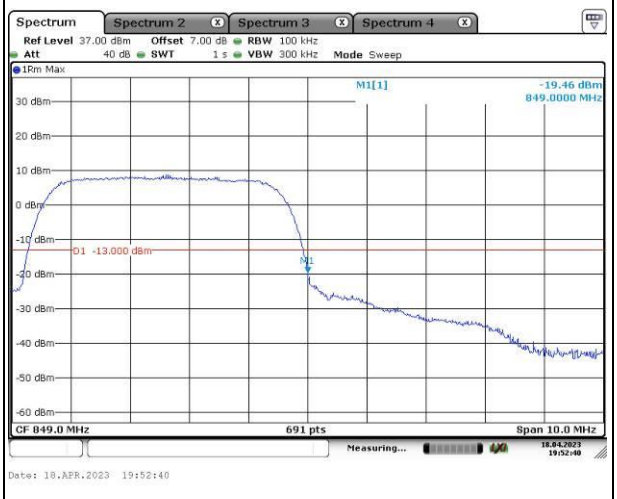
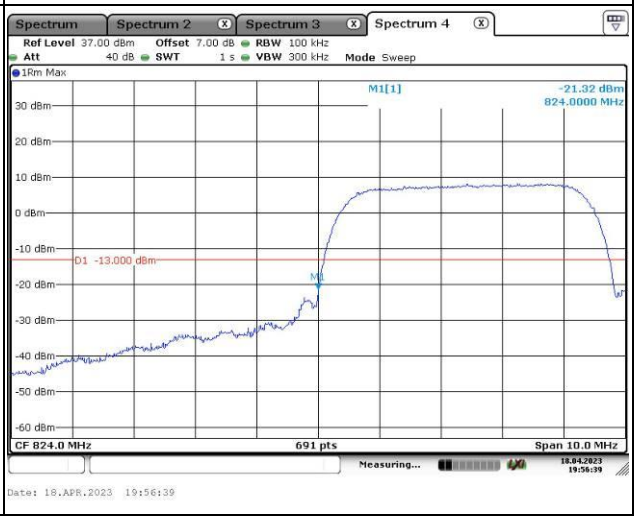
Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
R99		
HSUPA		
HSDPA		

4.6 Antenna Port Test Data and Results for LTE Band 2

Serial Number:	223V-1	Test Date:	2023/04/10~2023/04/19
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	22.6~24.5	Relative Humidity: (%)	38~51	ATM Pressure: (kPa)	100.7~102.1

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2022/7/15	2023/7/14
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	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	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
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	20.73	20.97	20.19	23.53	33
	RB1#3	20.76	21.23	20.32		
	RB1#5	20.73	21.07	20.16		
	RB3#0	20.81	21.19	20.31		
	RB3#3	20.82	21.03	20.19		
	RB6#0	19.76	20.1	19.21		
1.4MHz 16QAM	RB1#0	20.1	20.38	19.26	23.01	33
	RB1#3	20.37	20.61	19.09		
	RB1#5	20.15	20.71	18.93		
	RB3#0	19.63	20.32	19.24		
	RB3#3	19.71	20.08	19.23		
	RB6#0	18.79	18.98	18.25		
3MHz QPSK	RB1#0	20.94	21.16	20.19	23.46	33
	RB1#8	20.68	21.05	20.38		
	RB1#14	20.88	20.98	20.58		
	RB6#0	19.74	20.06	19.23		
	RB6#9	19.82	19.96	19.17		
	RB15#0	19.75	20.03	19.33		
3MHz 16QAM	RB1#0	20.13	20.28	19.09	23.06	33
	RB1#8	19.6	20.3	18.78		
	RB1#14	20.13	20.76	18.72		
	RB6#0	18.67	19.27	18.57		
	RB6#9	18.76	19.22	18.04		
	RB15#0	18.7	19.32	18.39		
5MHz QPSK	RB1#0	20.86	20.89	20.49	23.33	33
	RB1#13	20.82	21.03	20.05		
	RB1#24	20.83	20.79	19.95		
	RB15#0	19.71	20.15	19.11		
	RB15#10	19.71	19.96	19.13		
	RB25#0	19.63	20.12	19.12		
5MHz 16QAM	RB1#0	19.21	20.35	19.17	22.65	33
	RB1#13	19.06	20.16	18.82		
	RB1#24	19.83	20.18	18.79		
	RB15#0	18.53	18.89	18.22		
	RB15#10	18.85	18.7	18.15		
	RB25#0	18.8	18.81	18.26		
10MHz QPSK	RB1#0	20.71	20.99	20.84	23.57	33
	RB1#25	21.22	21.14	20.39		
	RB1#49	21.27	20.85	20.09		

	RB25#0	19.74	20.22	19.51		
	RB25#25	19.94	20	19.26		
	RB50#0	19.8	20.07	19.32		
10MHz 16QAM	RB1#0	19.37	20.27	20.19	22.7	33
	RB1#25	19.71	20.4	19.88		
	RB1#49	19.92	19.96	19.78		
	RB25#0	18.98	18.94	18.68		
	RB25#25	19.25	18.8	18.08		
	RB50#0	18.91	19.12	18.5		
15MHz QPSK	RB1#0	20.86	20.91	20.65	23.77	33
	RB1#38	21.37	20.88	20.37		
	RB1#74	21.47	20.75	20.17		
	RB36#0	19.72	20.09	19.52		
	RB36#39	20.01	19.88	19.25		
	RB75#0	19.85	20.07	19.45		
15MHz 16QAM	RB1#0	20.22	20.61	19.77	22.91	33
	RB1#38	20.43	20.49	19.28		
	RB1#74	20.47	20.43	18.65		
	RB36#0	18.8	19.38	18.66		
	RB36#39	19.16	18.81	17.96		
	RB75#0	18.92	19.22	18.49		
20MHz QPSK	RB1#0	20.67	20.84	20.96	23.44	33
	RB1#50	21.14	20.83	21.07		
	RB1#99	20.85	20.58	20.4		
	RB50#0	19.83	20.09	19.49		
	RB50#50	20.13	19.87	19.26		
	RB100#0	19.91	19.92	19.46		
20MHz 16QAM	RB1#0	20.51	20.44	19.65	23.1	33
	RB1#50	20.8	20.5	19.44		
	RB1#99	20.47	19.99	18.48		
	RB50#0	18.68	19.09	18.64		
	RB50#50	19.01	18.86	18.32		
	RB100#0	18.9	18.95	18.53		
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	4.67	4.41	5.22	13
	RB100#0	4.06	4.09	4.17	13
20MHz 16QAM	RB1#0	5.77	5.33	6.41	13
	RB100#0	5.86	5.86	5.94	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	1.108	1.102	1.108	1.284	1.302	1.326
1.4MHz 16QAM	1.102	1.108	1.096	1.314	1.32	1.296
3MHz QPSK	2.695	2.695	2.683	2.94	2.94	2.964
3MHz 16QAM	2.695	2.683	2.683	2.952	2.976	2.952
5MHz QPSK	4.531	4.511	4.511	5.02	5.04	5
5MHz 16QAM	4.511	4.551	4.511	5.02	5.04	5.06
10MHz QPSK	8.942	8.942	8.942	9.8	9.8	9.72
10MHz 16QAM	8.942	8.942	8.942	9.72	9.72	9.68
15MHz QPSK	13.473	13.413	13.413	14.94	14.76	14.7
15MHz 16QAM	13.473	13.413	13.413	14.82	14.76	14.7
20MHz QPSK	17.884	17.884	17.884	19.28	19.36	19.52
20MHz 16QAM	17.884	17.884	17.804	19.52	19.44	19.28
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.**

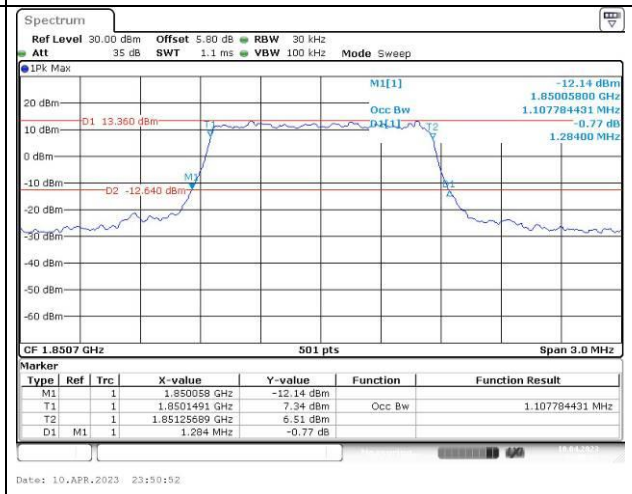
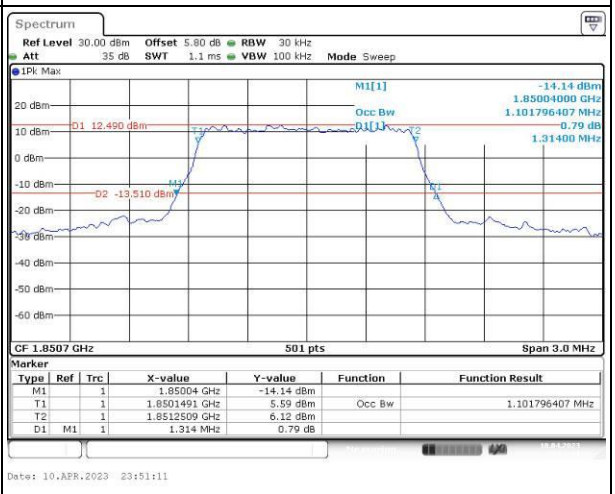
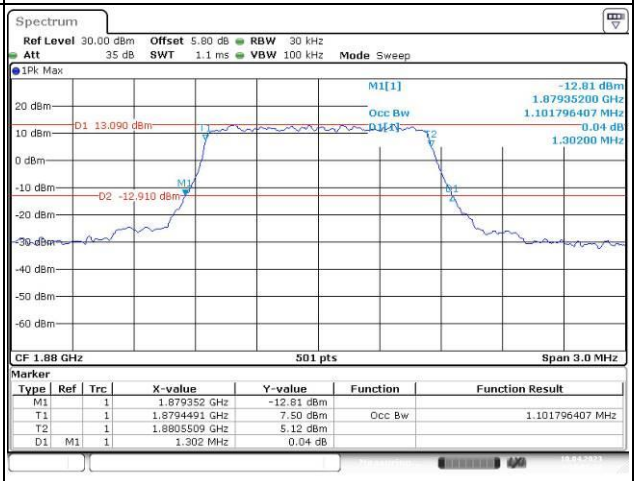
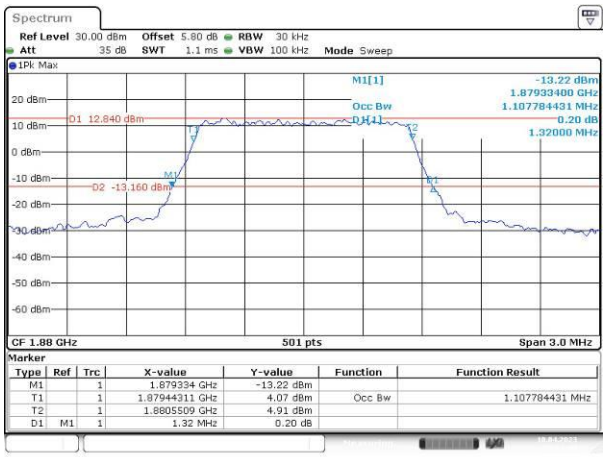
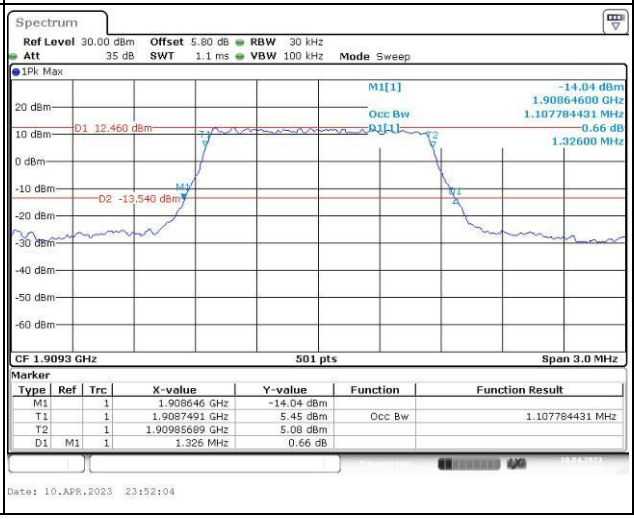
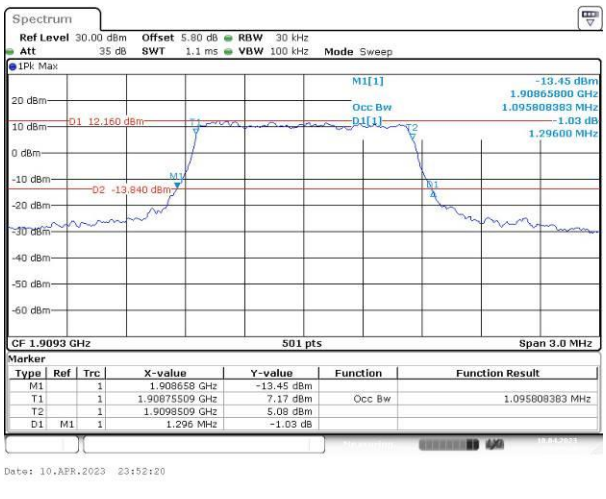
FCC §2.1051, §24.238 (a):Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

FCC §2.1055, §24.235: Frequency Stability

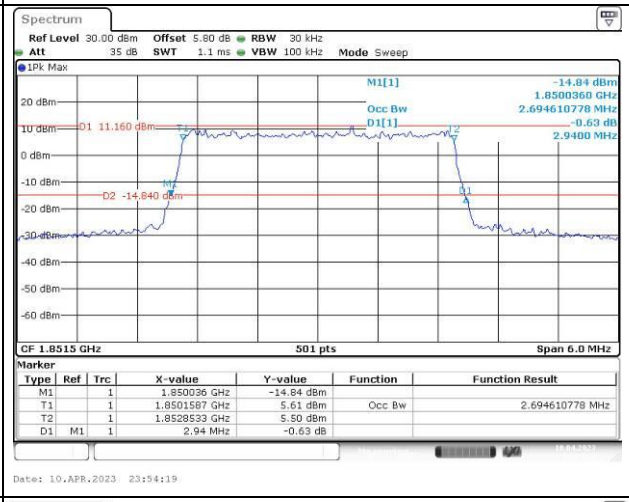
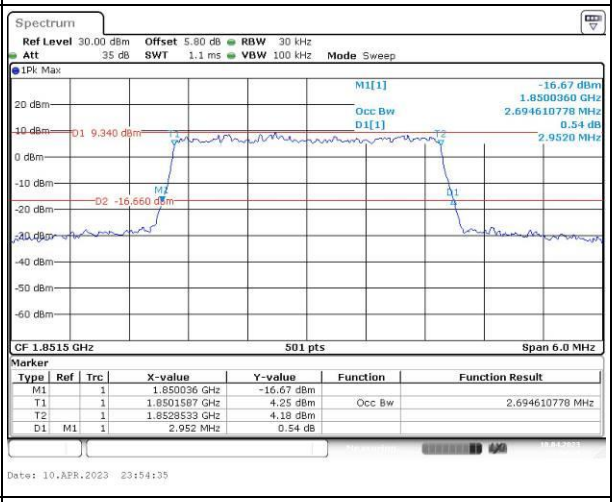
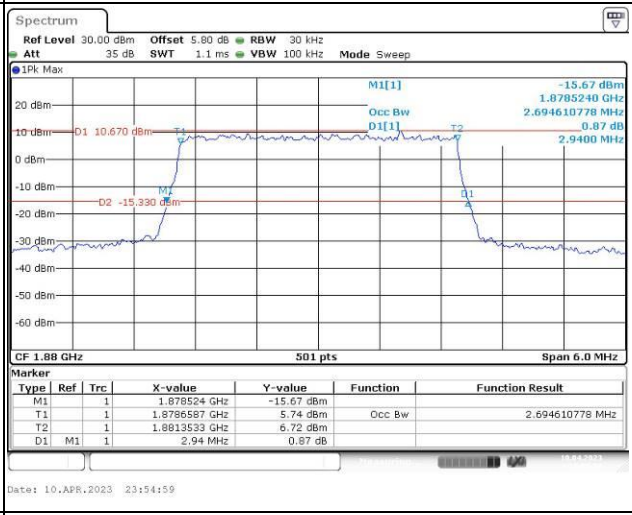
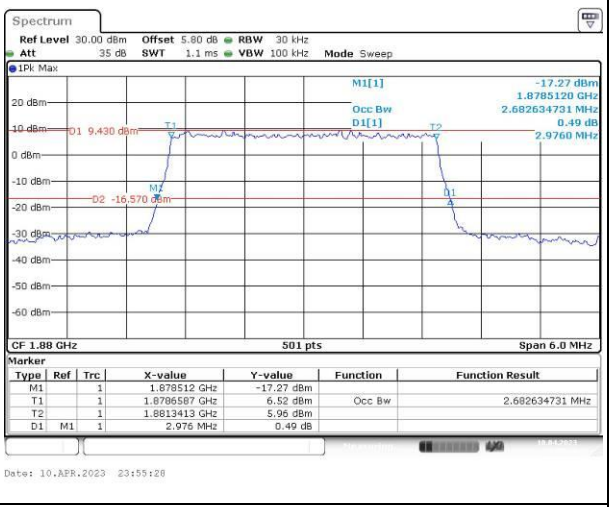
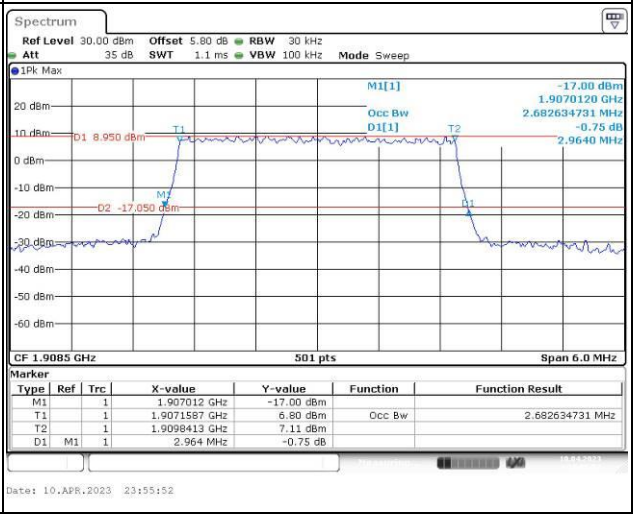
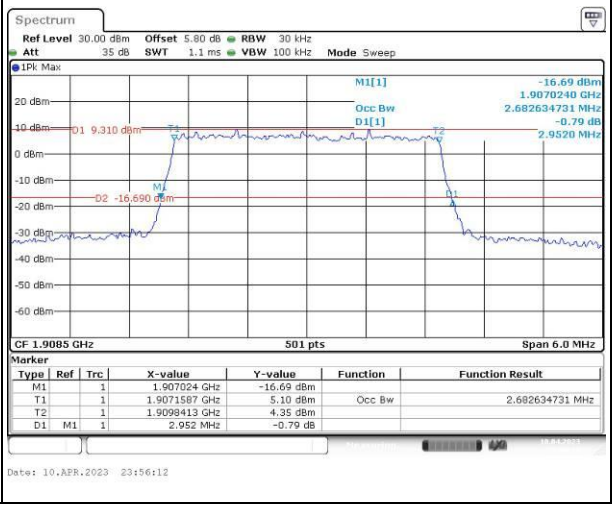
Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	24	1851.062	1850.000	1908.970	1910.000
	-20	24	1851.067	1850.000	1908.947	1910.000
	-10	24	1851.093	1850.000	1908.935	1910.000
	0	24	1851.021	1850.000	1908.919	1910.000
	10	24	1851.097	1850.000	1908.924	1910.000
	20	24	1851.058	1850.000	1908.942	1910.000
	30	24	1851.003	1850.000	1908.937	1910.000
	40	24	1851.012	1850.000	1908.902	1910.000
	50	24	1851.041	1850.000	1908.915	1910.000
Frequency Stability vs. Voltage	20	9	1851.020	1850.000	1908.941	1910.000
	20	40	1851.072	1850.000	1908.910	1910.000
					Result:	**Pass**

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	24	1851.137	1850.000	1908.942	1910.000
	-20	24	1851.139	1850.000	1908.959	1910.000
	-10	24	1851.166	1850.000	1908.989	1910.000
	0	24	1851.115	1850.000	1908.963	1910.000
	10	24	1851.104	1850.000	1908.955	1910.000
	20	24	1851.138	1850.000	1908.942	1910.000
	30	24	1851.154	1850.000	1908.963	1910.000
	40	24	1851.098	1850.000	1908.929	1910.000
	50	24	1851.123	1850.000	1908.919	1910.000
Frequency Stability vs. Voltage	20	9	1851.104	1850.000	1908.974	1910.000
	20	40	1851.111	1850.000	1908.977	1910.000
					Result:	**Pass**

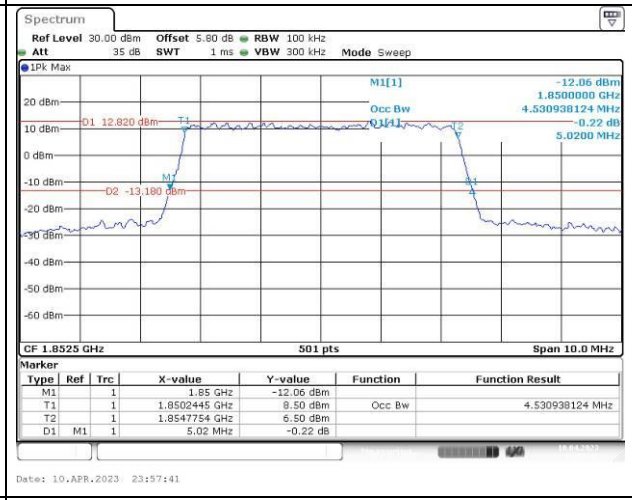
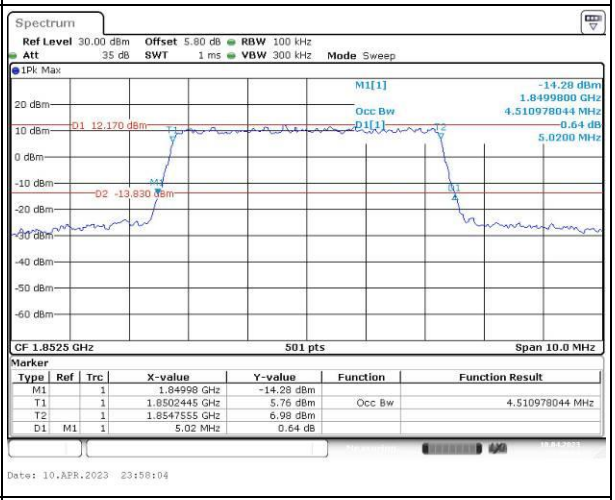
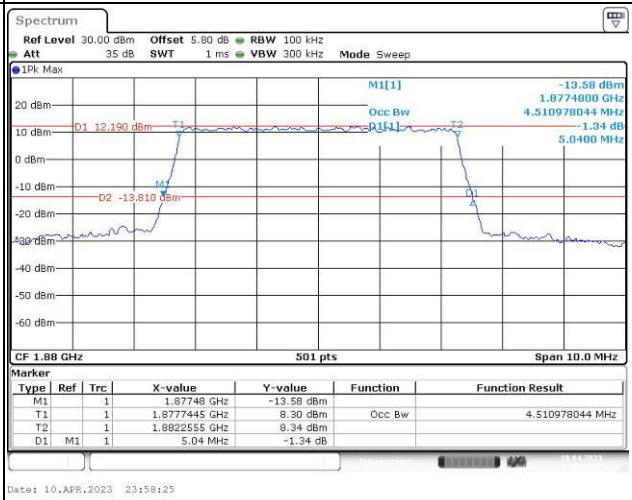
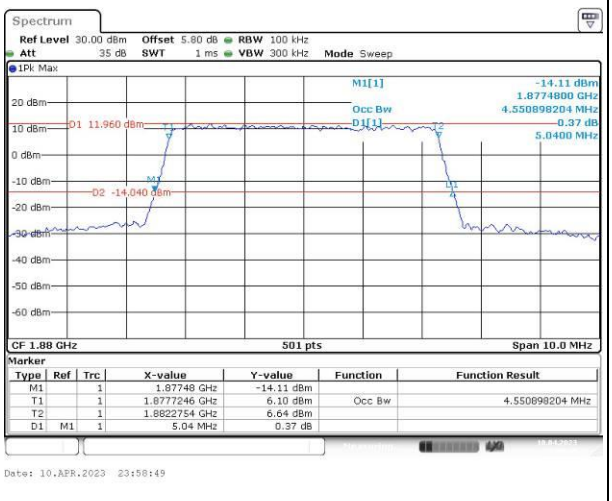
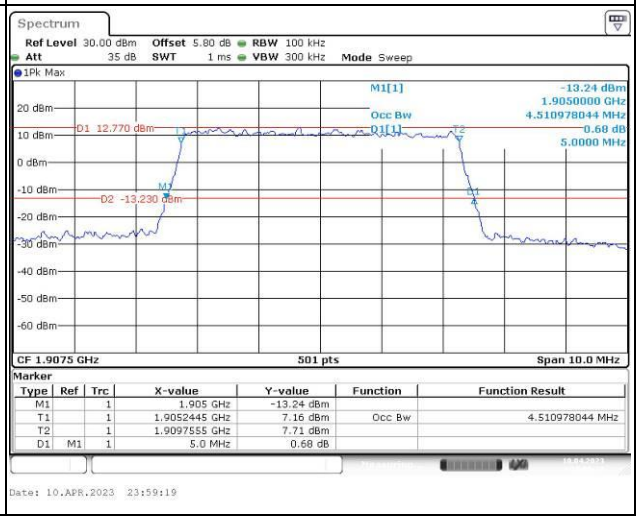
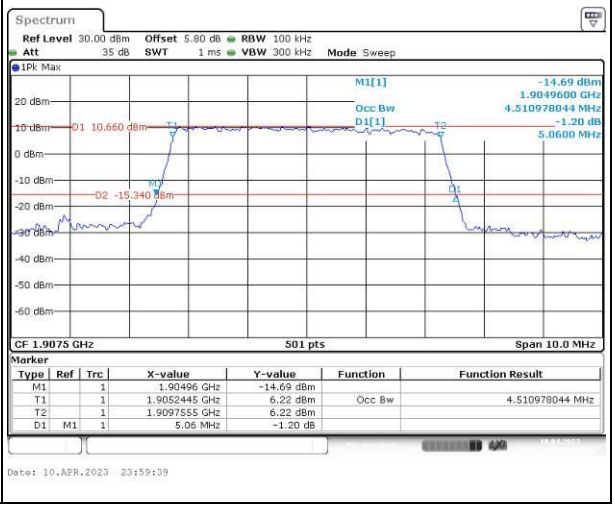
Test Plots(Note: The 5.8dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer)**:**

Occupied Bandwidth		
Channel	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

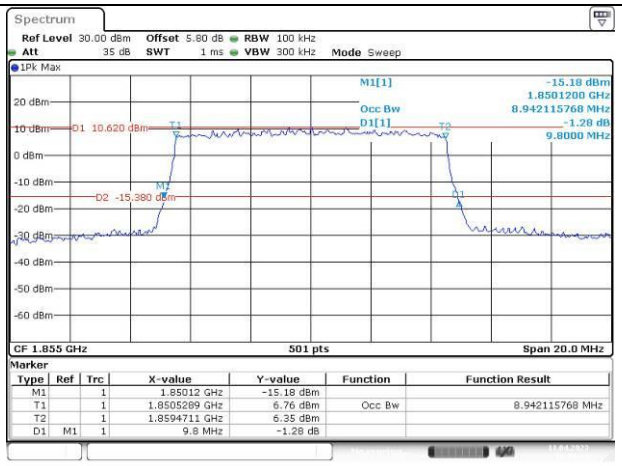
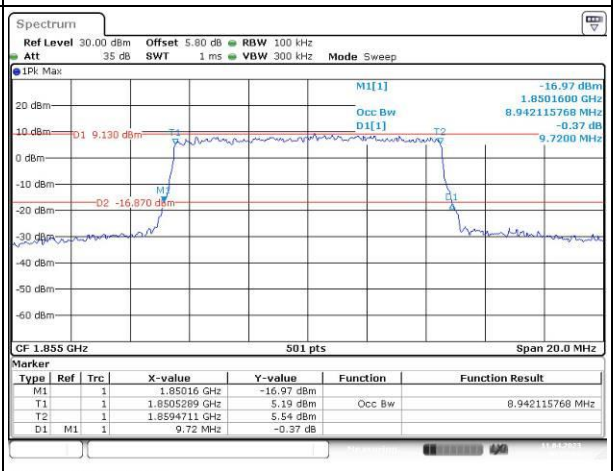
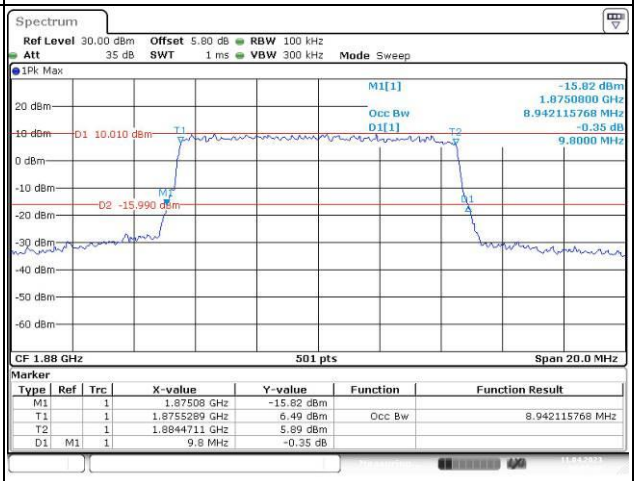
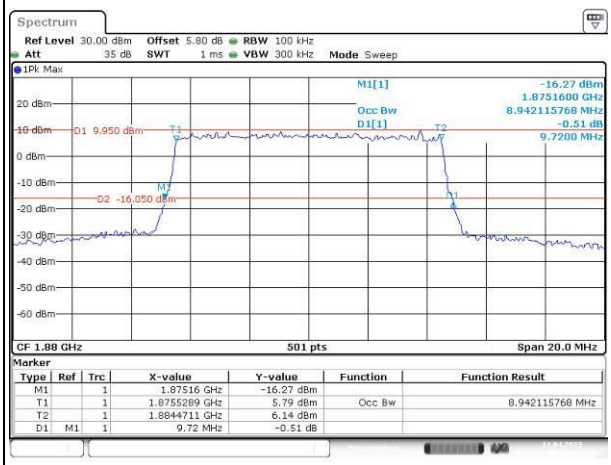
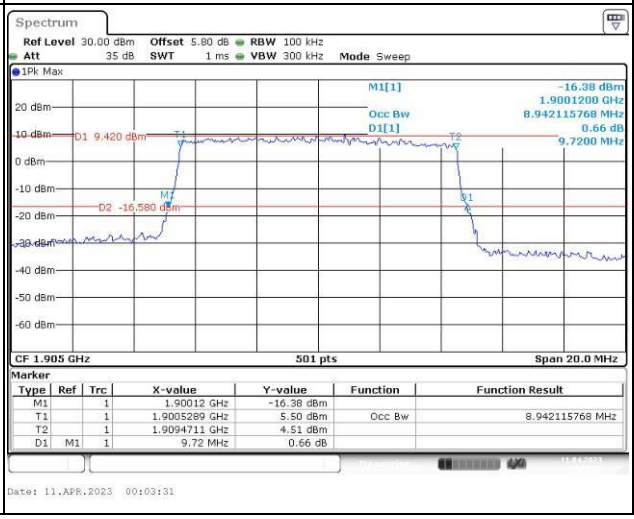
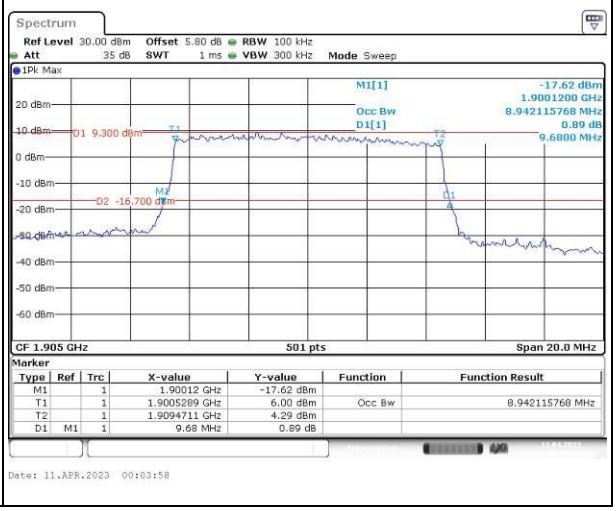
Occupied Bandwidth

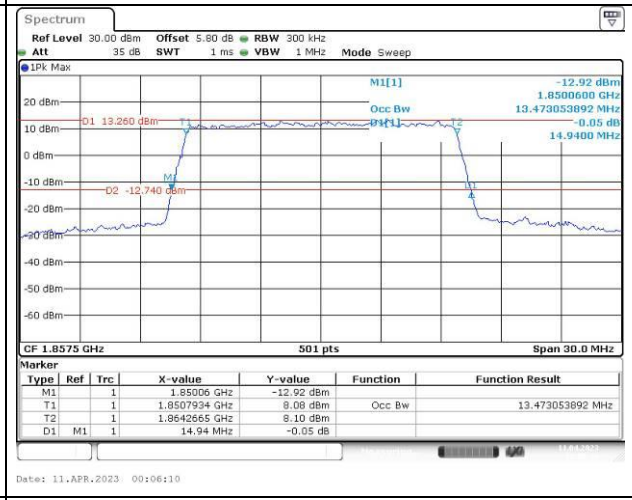
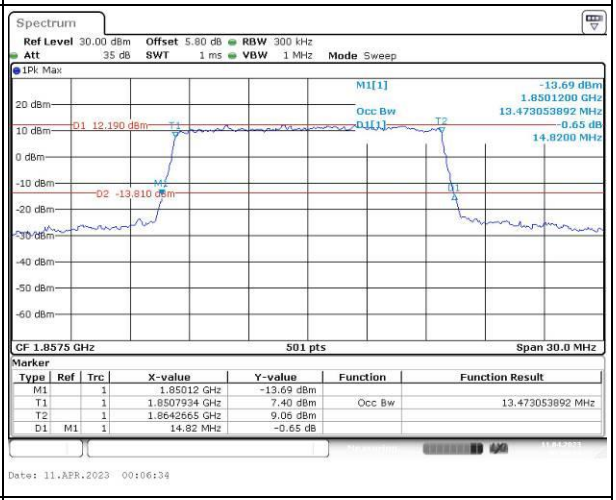
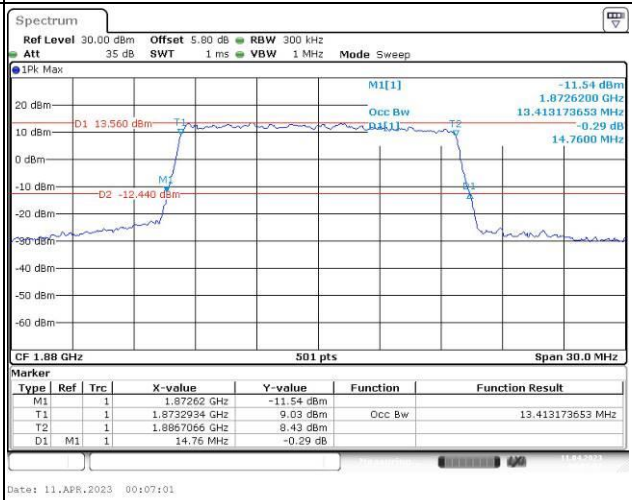
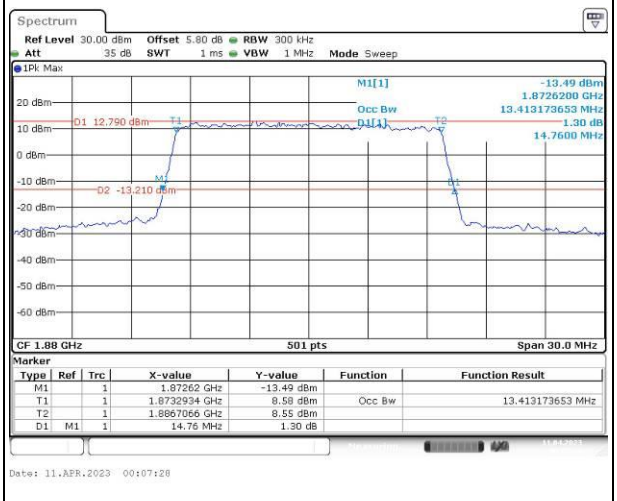
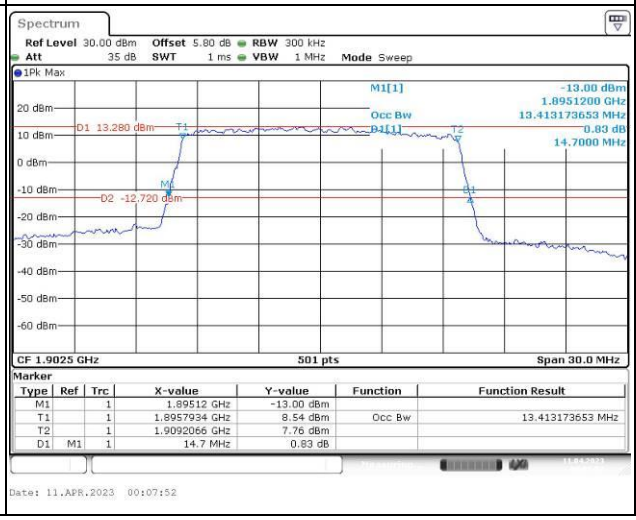
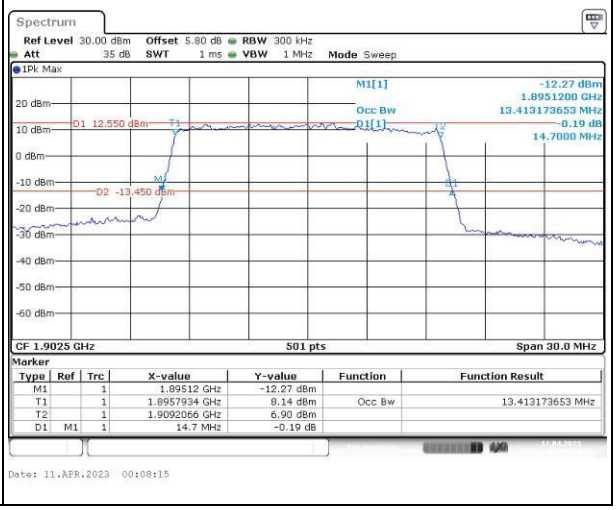
Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Occupied Bandwidth

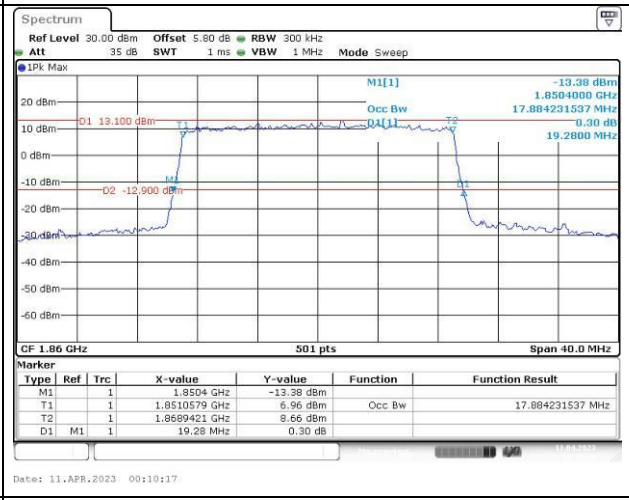
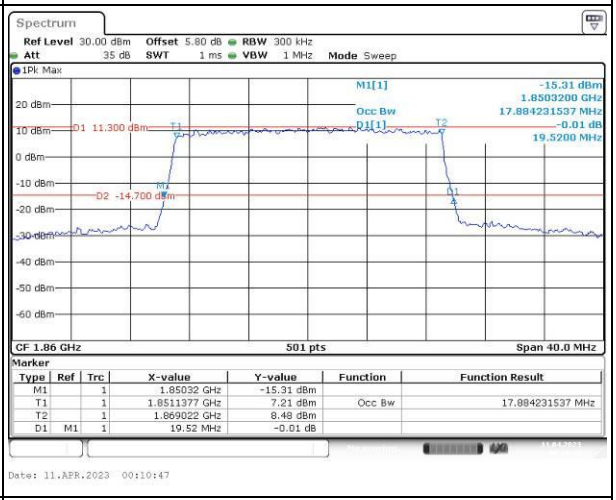
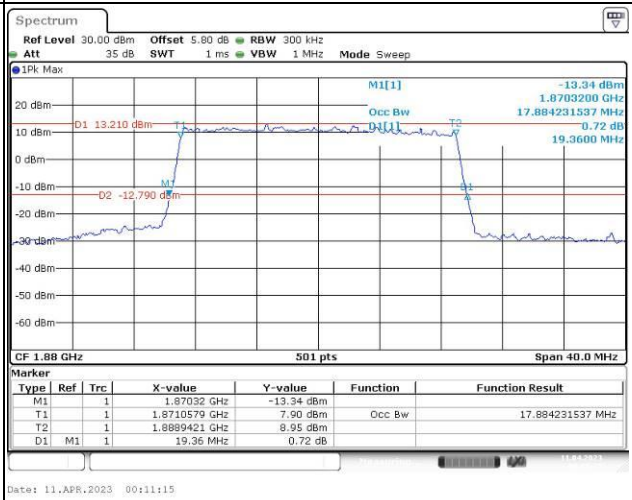
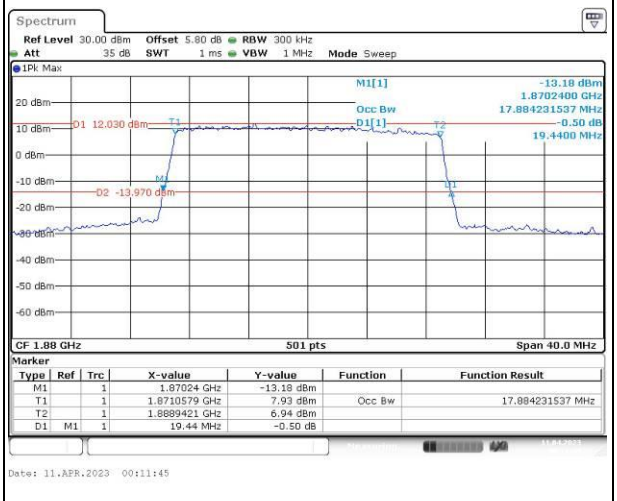
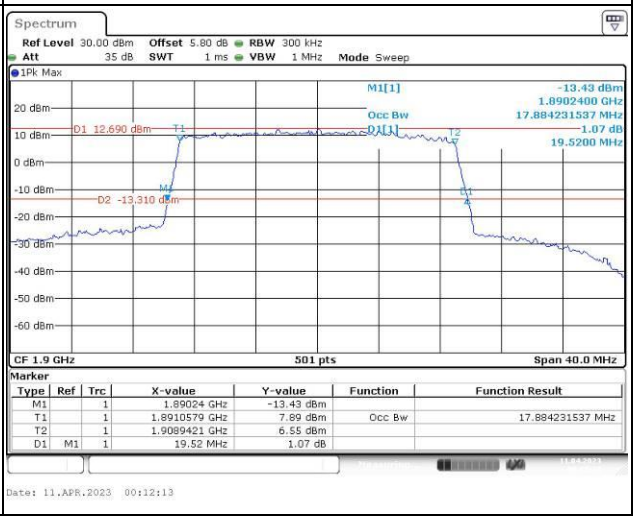
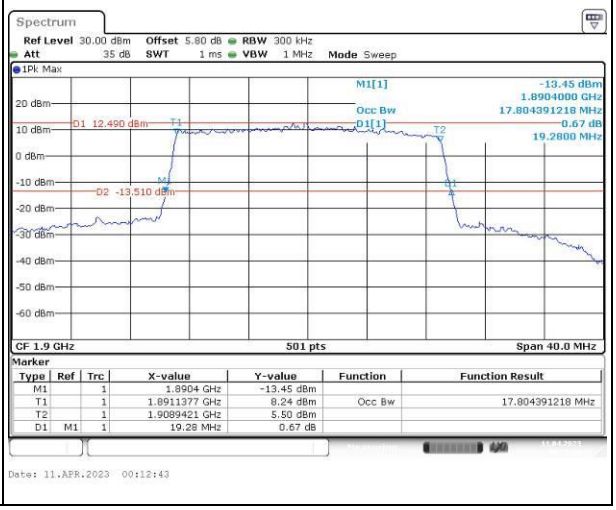
Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

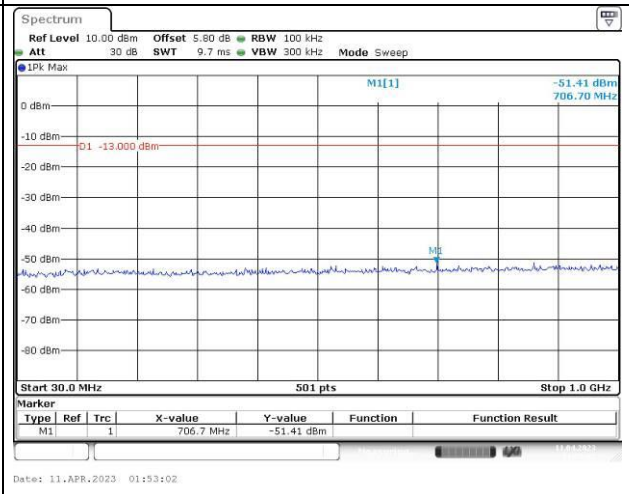
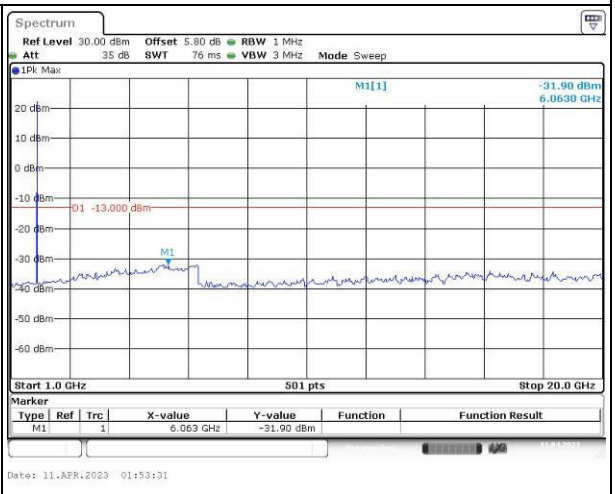
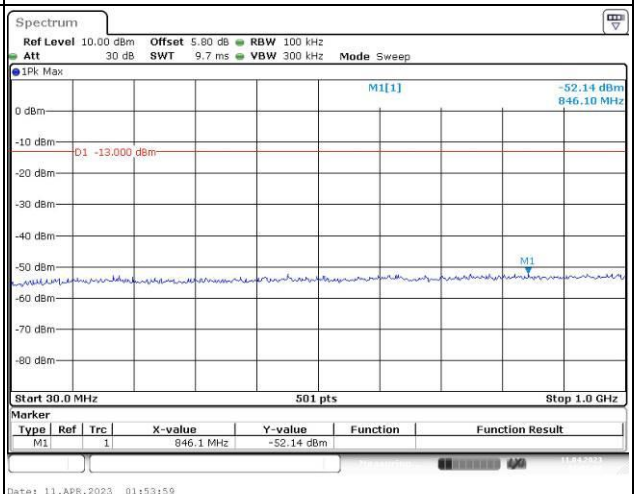
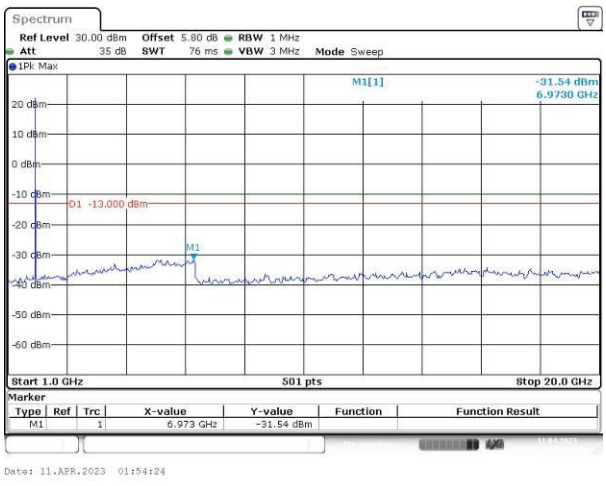
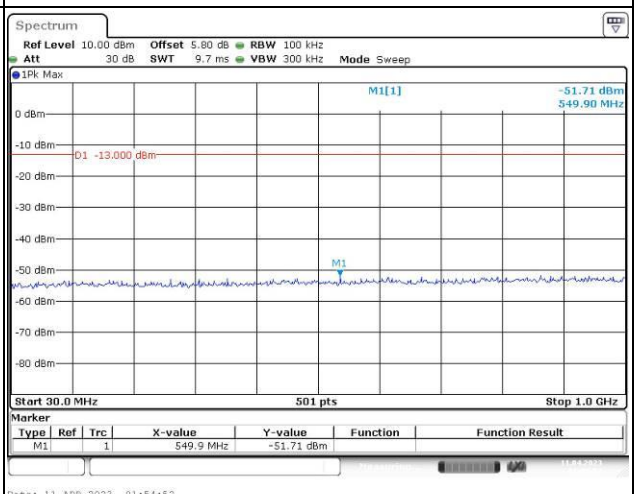
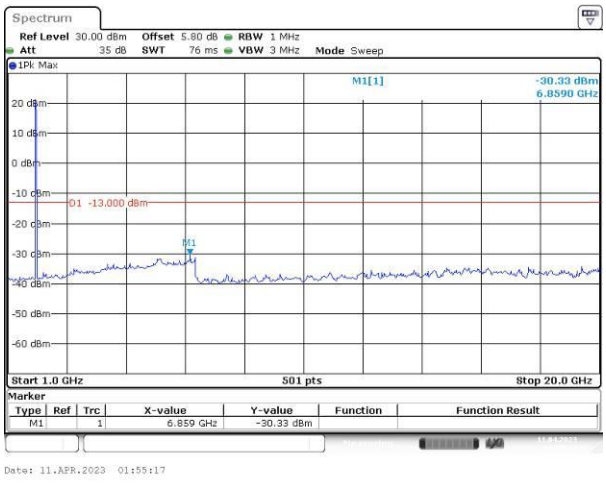
Occupied Bandwidth

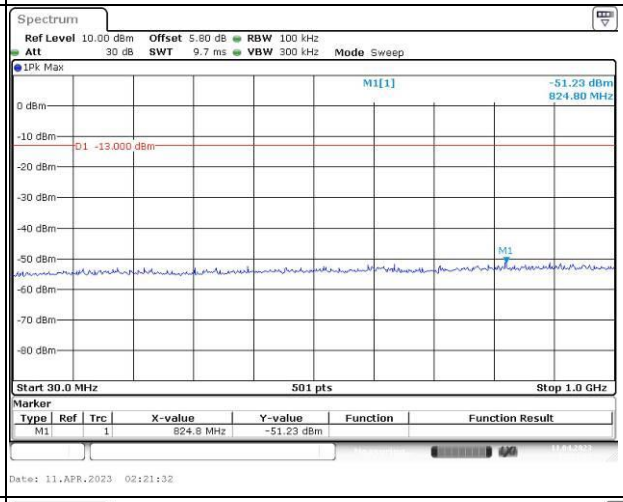
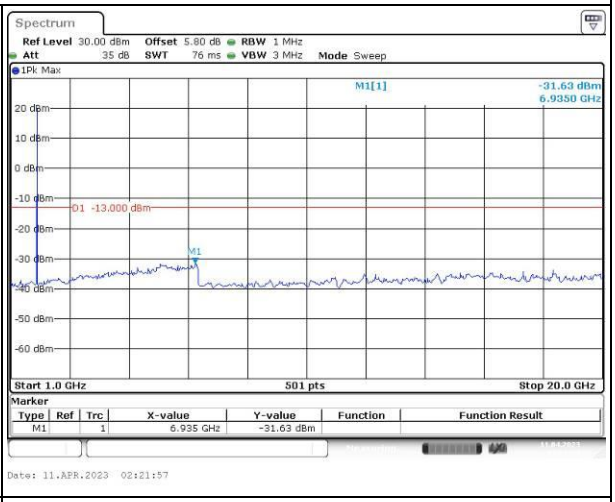
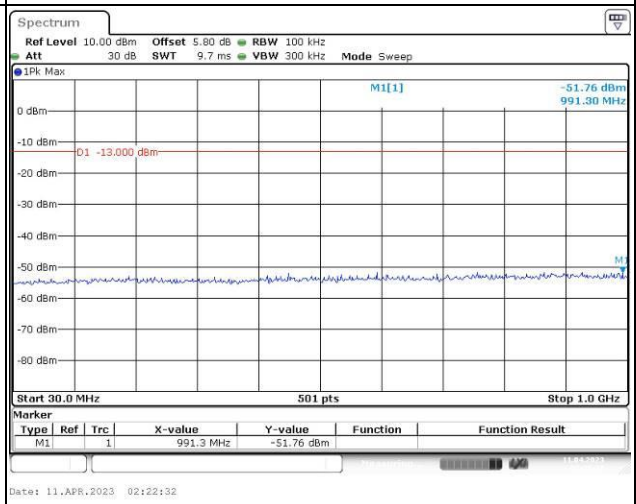
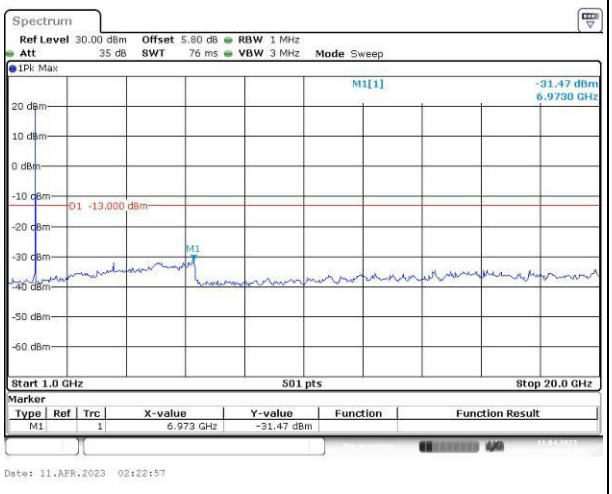
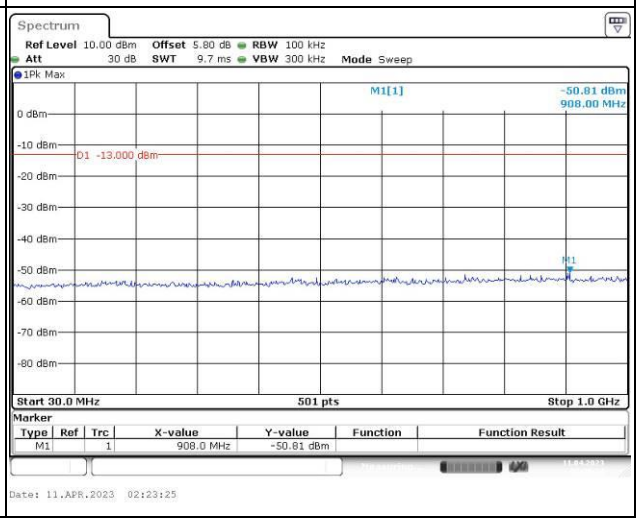
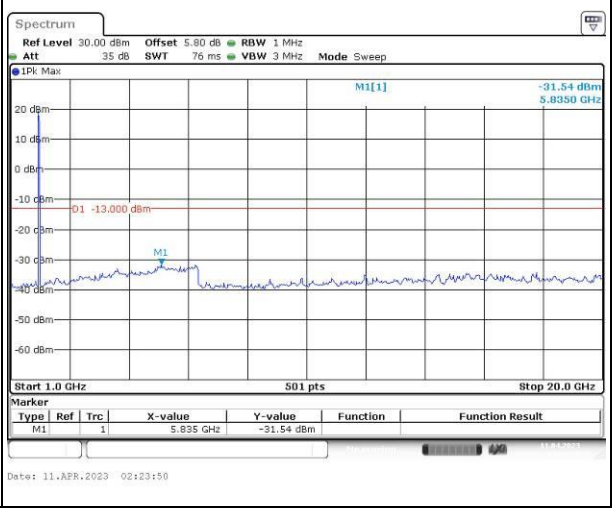
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

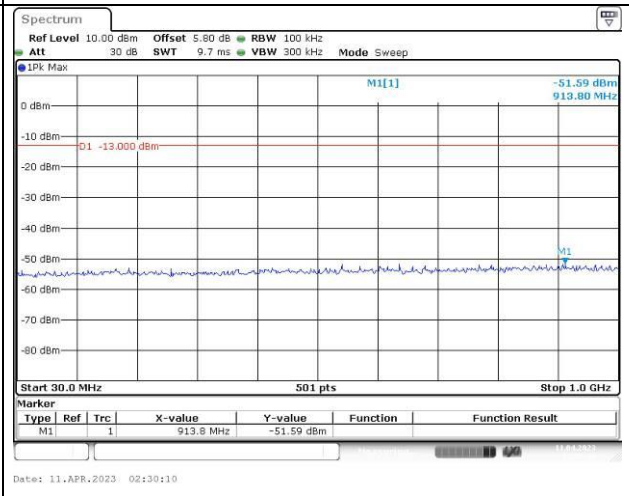
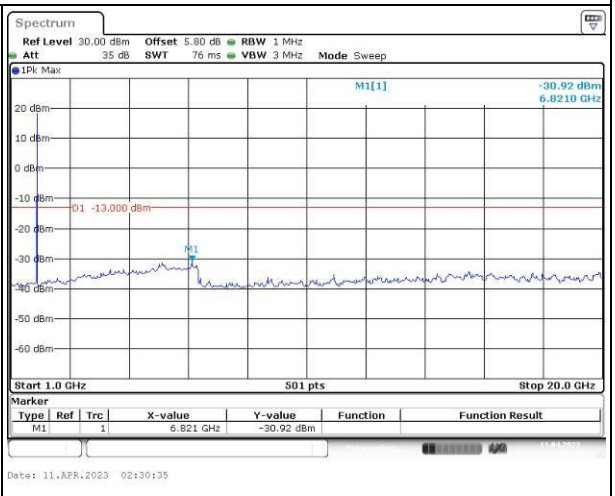
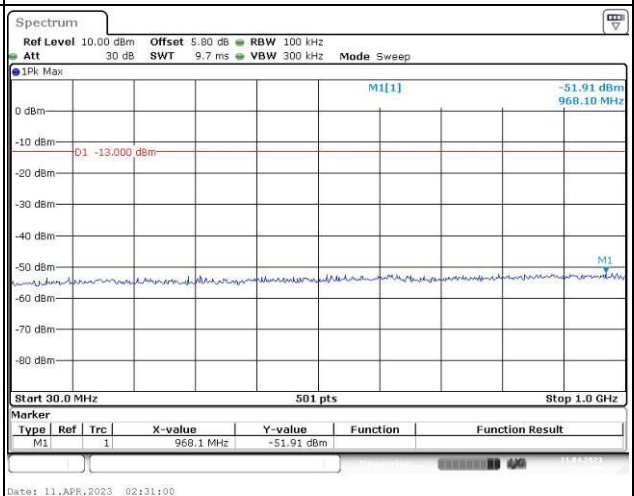
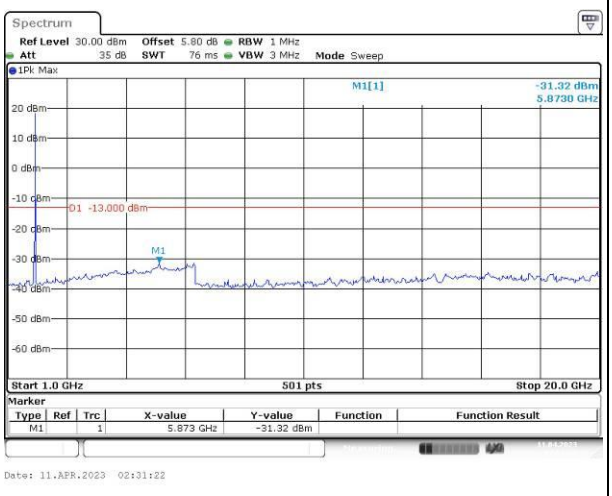
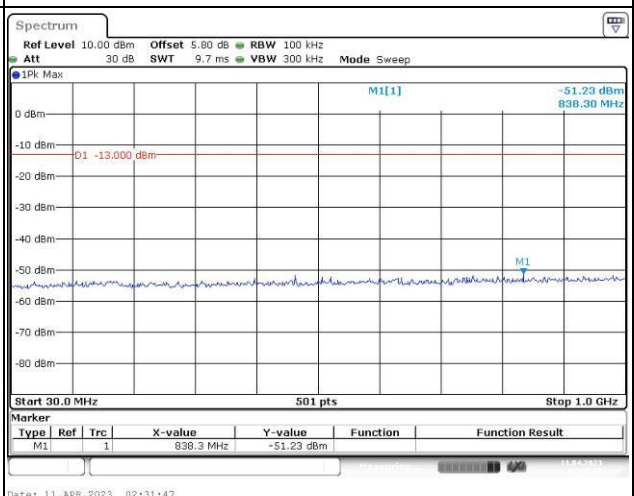
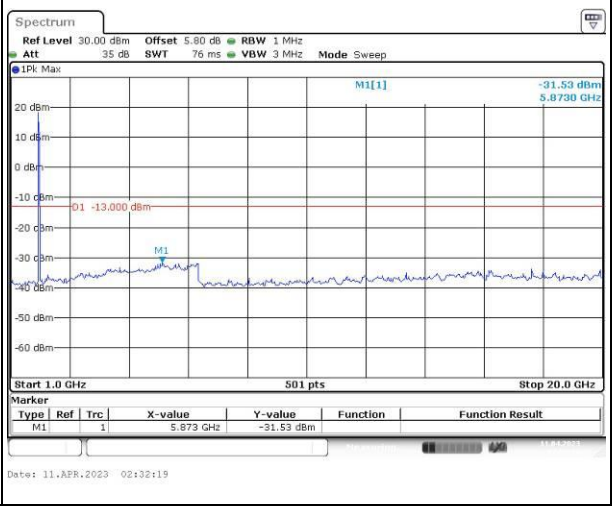
Occupied Bandwidth		
Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

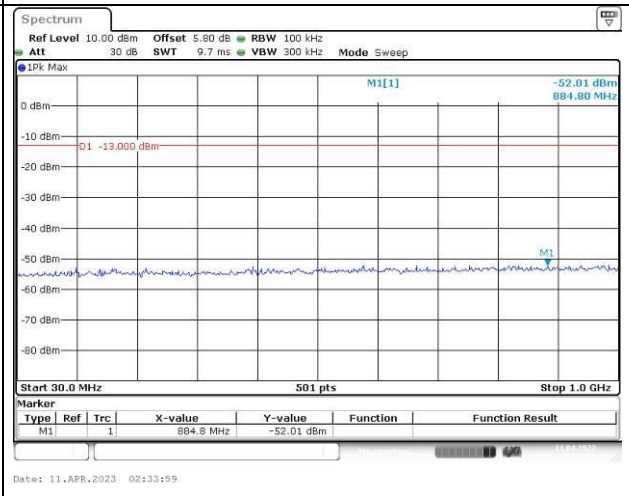
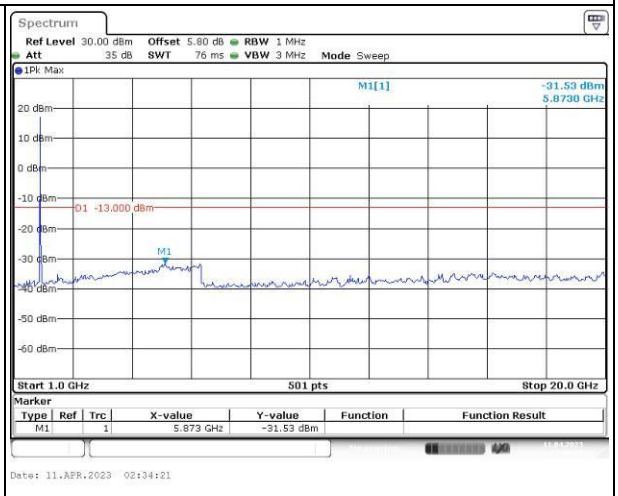
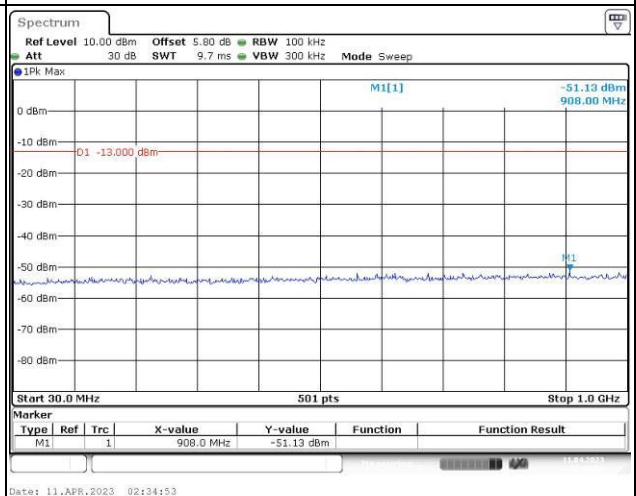
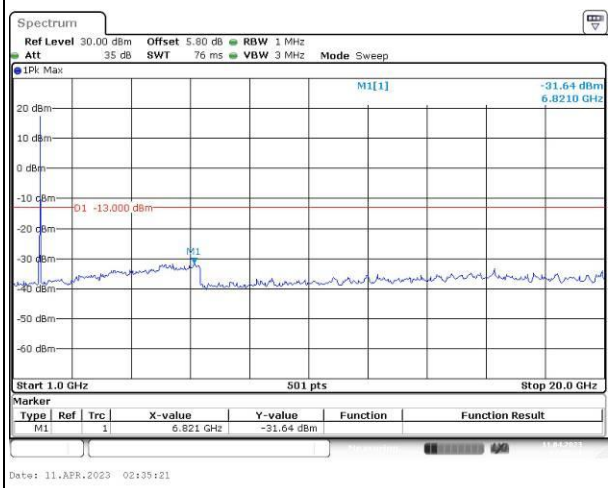
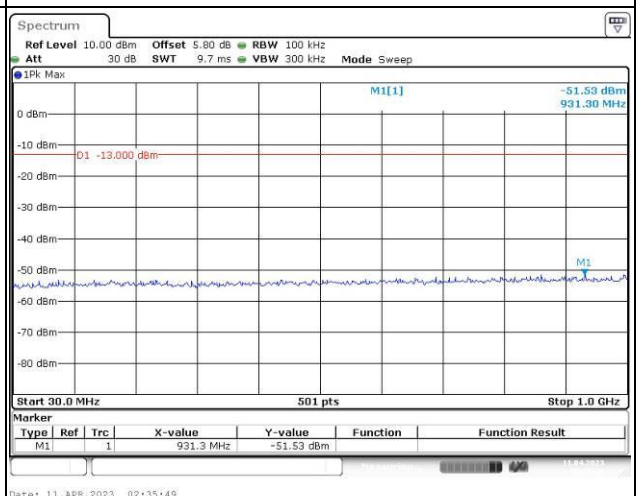
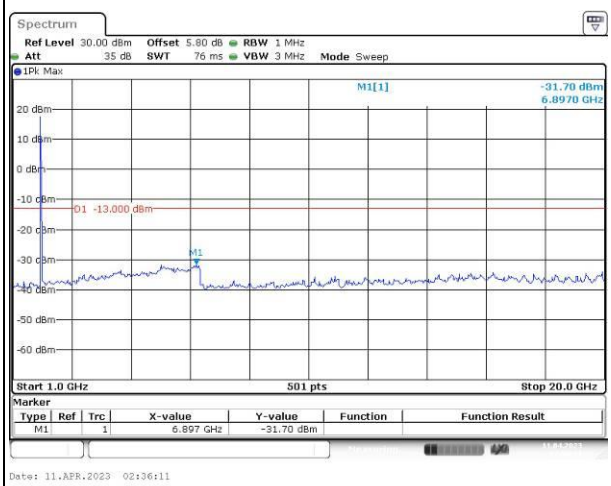
Occupied Bandwidth

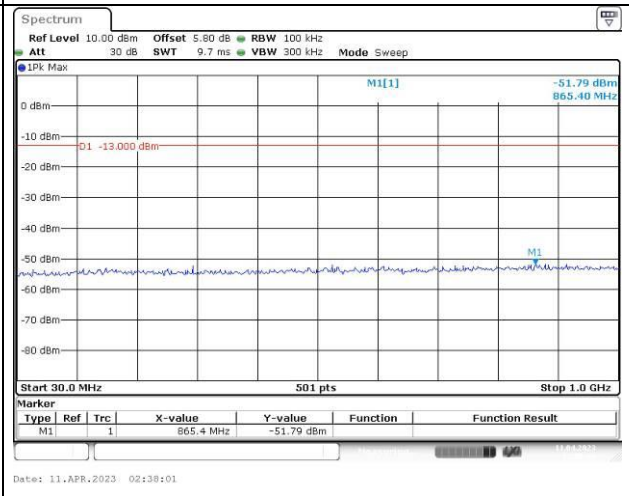
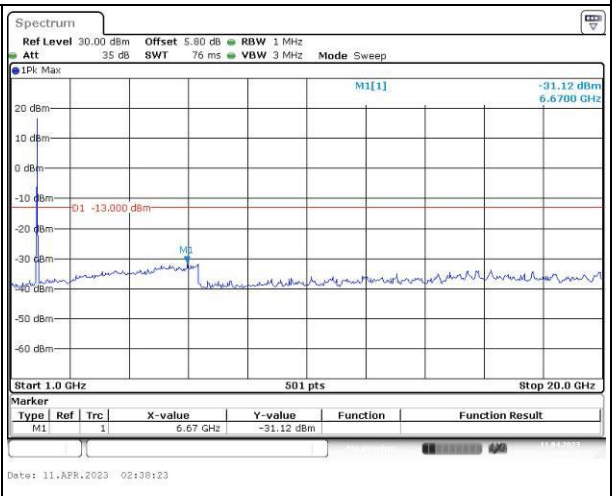
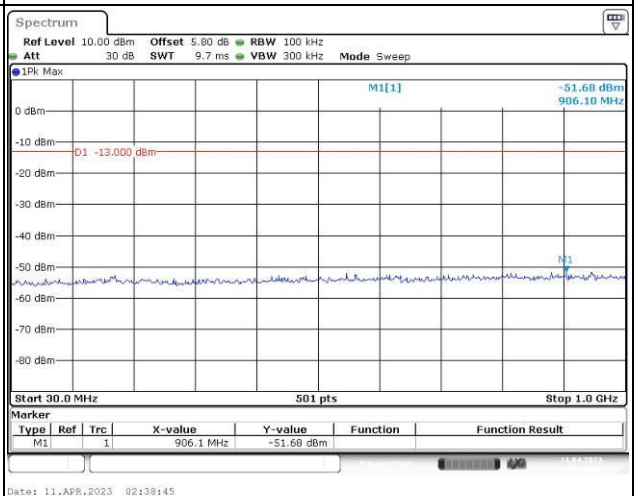
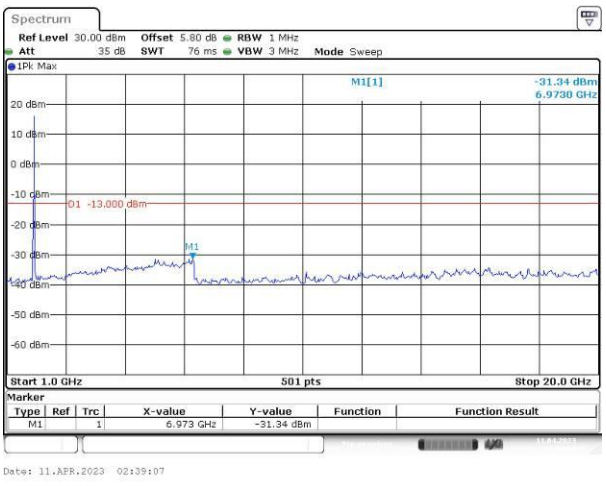
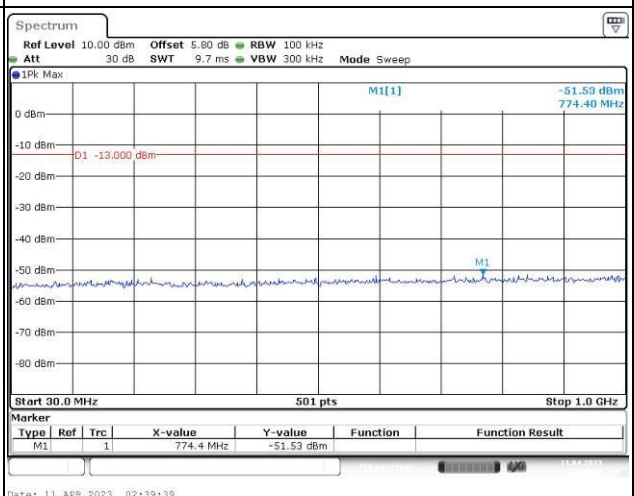
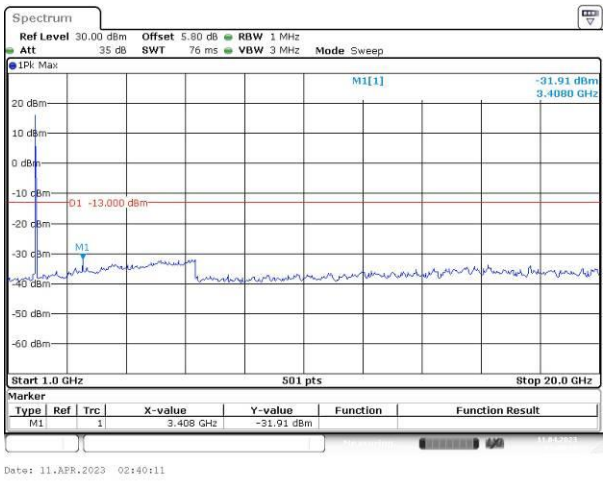
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

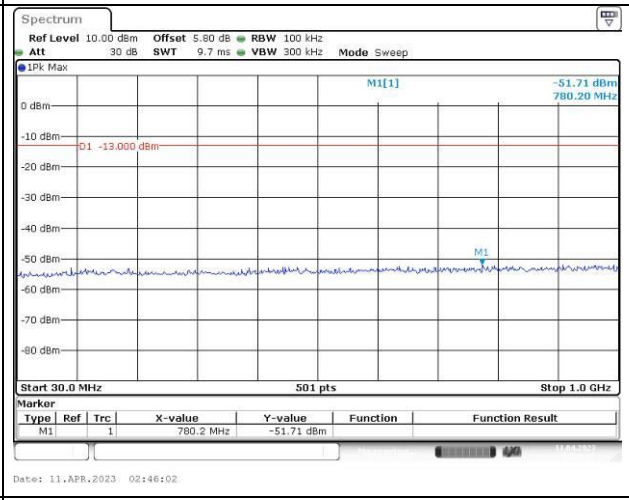
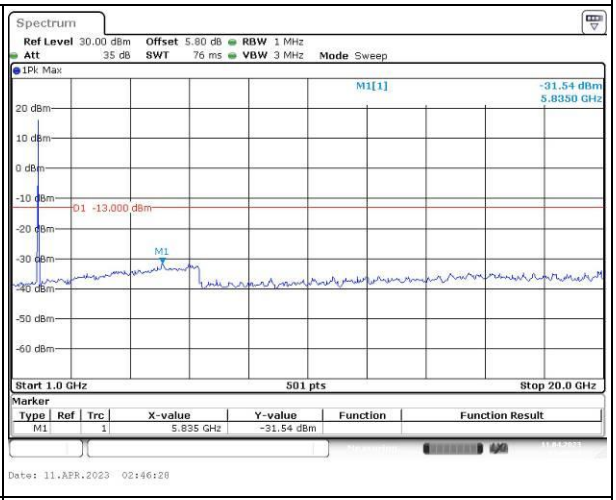
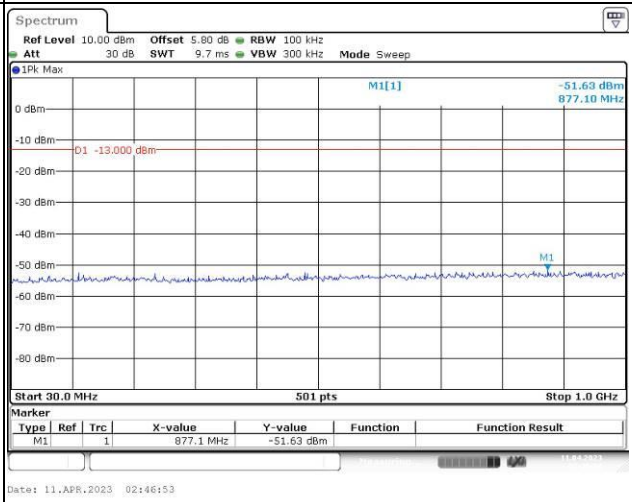
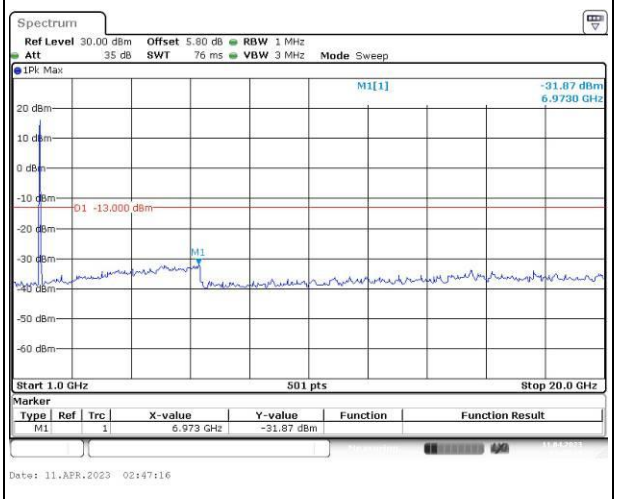
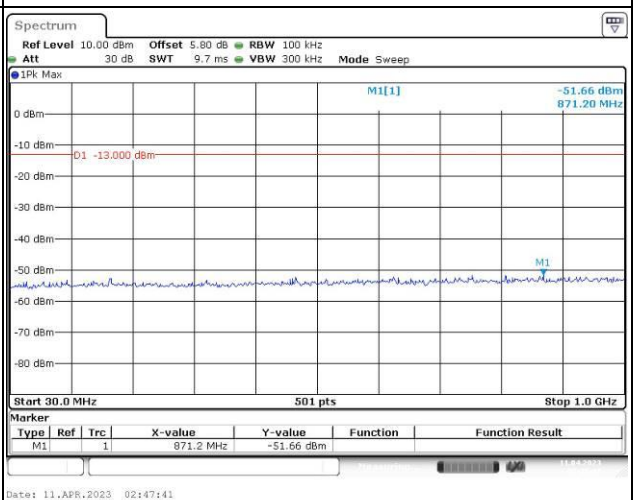
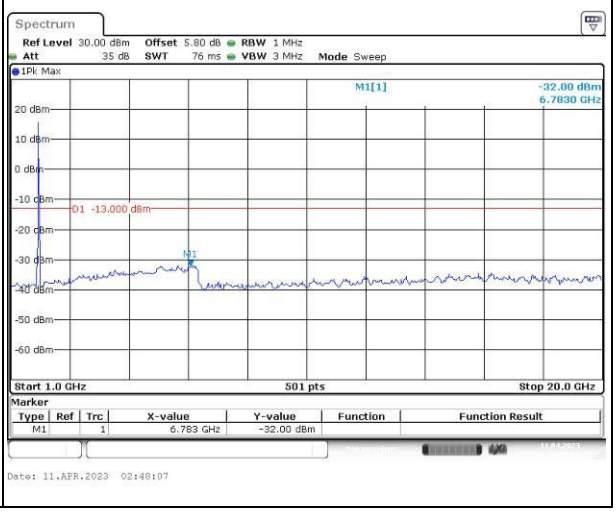
Spurious Emissions at Antenna Terminal		
Channel	**1.4MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

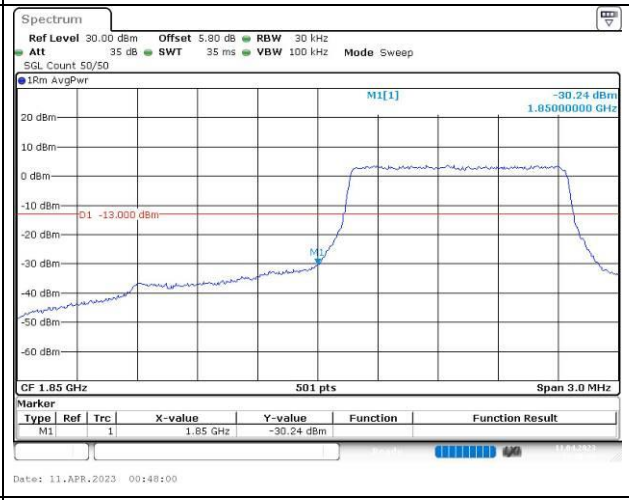
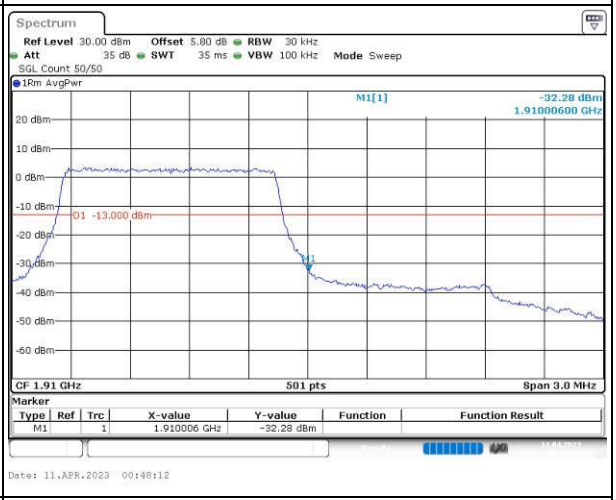
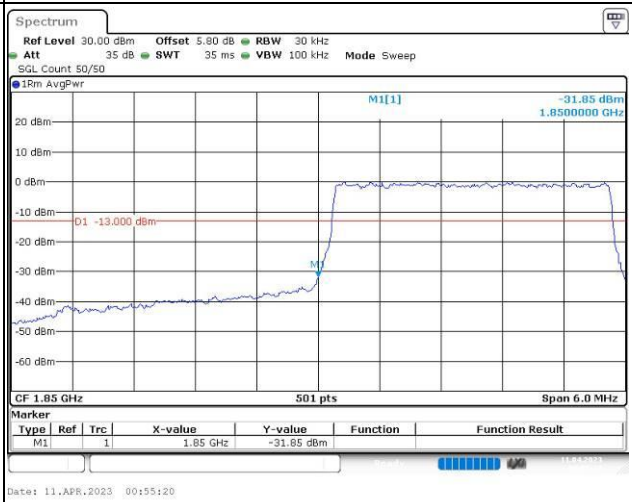
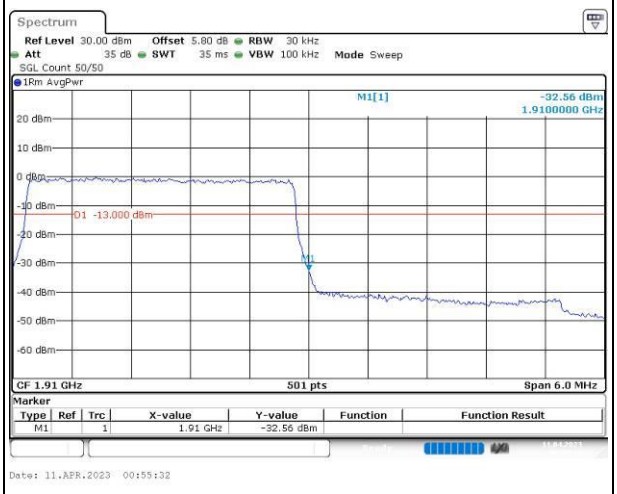
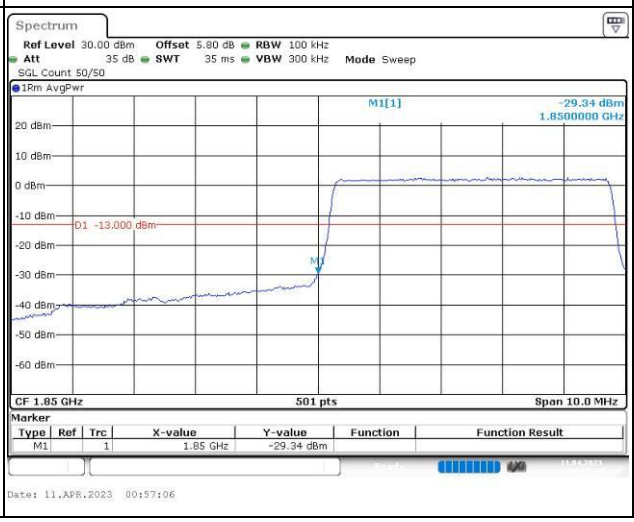
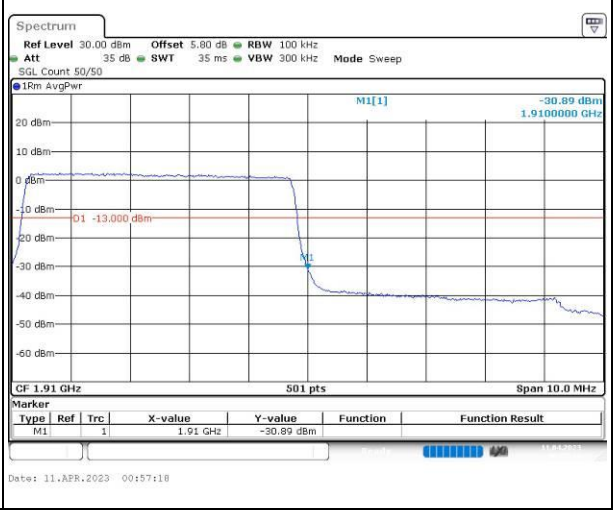
Spurious Emissions at Antenna Terminal		
Channel	**3MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

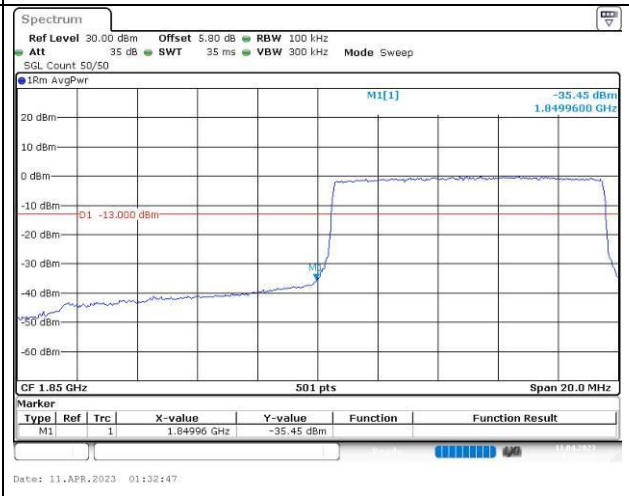
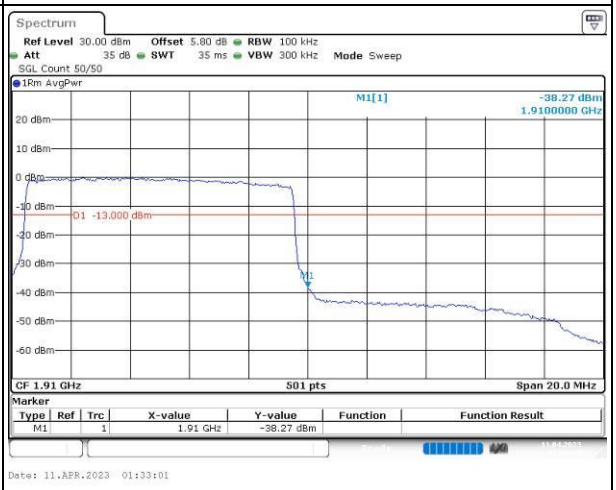
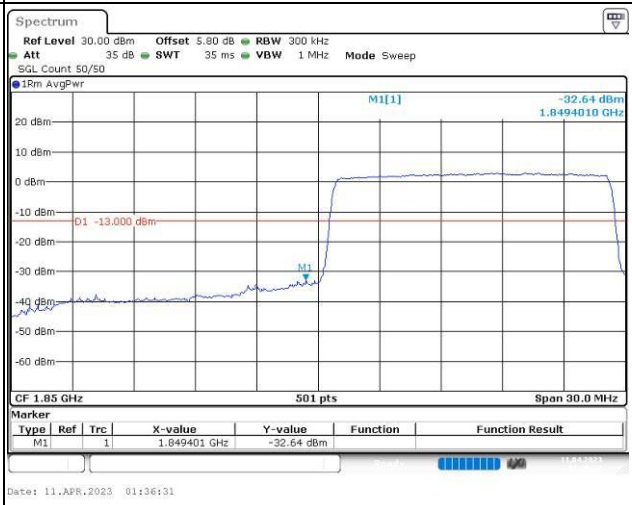
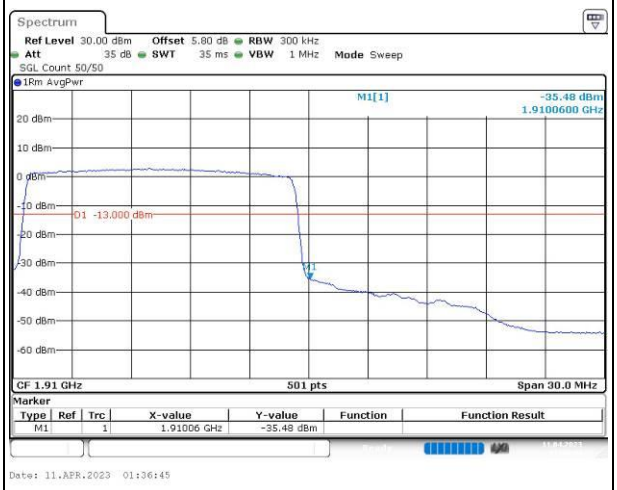
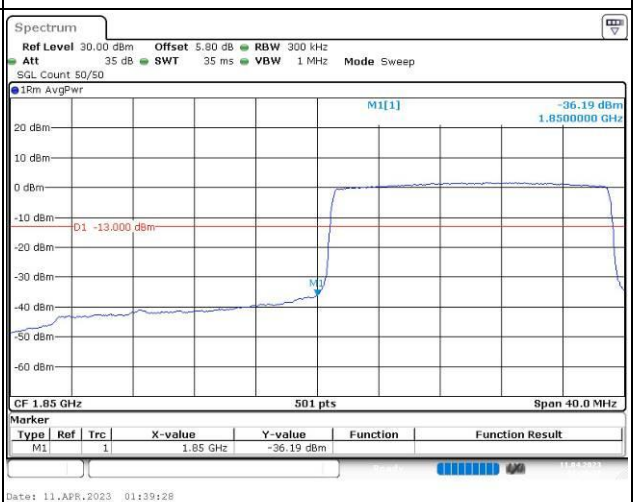
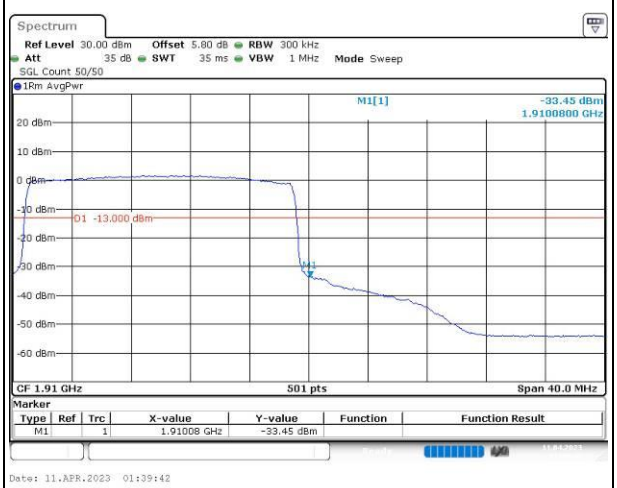
Spurious Emissions at Antenna Terminal		
Channel	**5MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

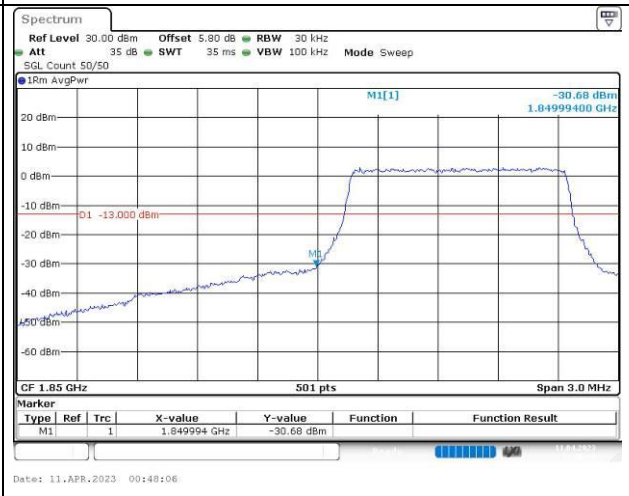
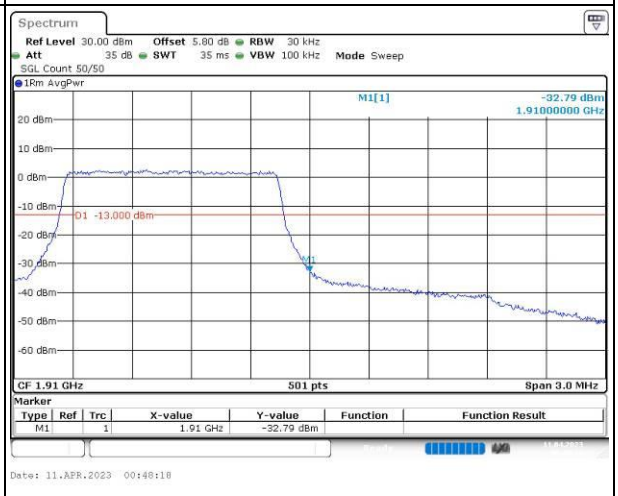
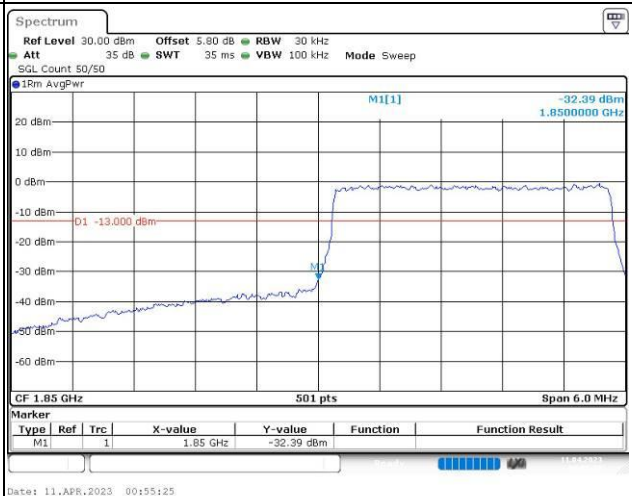
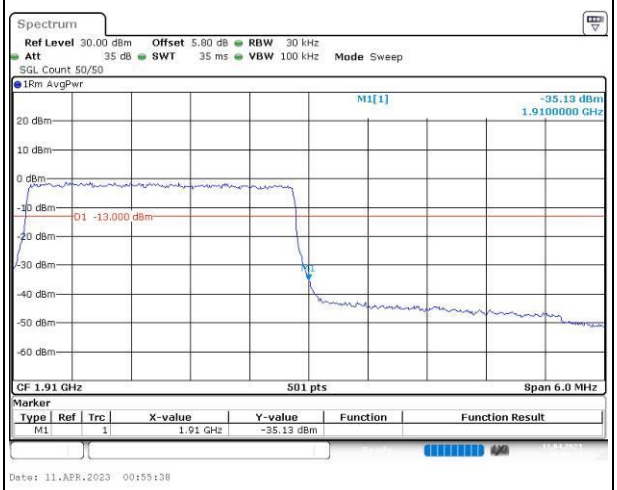
Spurious Emissions at Antenna Terminal		
Channel	**10MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal		
Channel	**15MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal		
Channel	**20MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 1.4MHz		
QPSK 3MHz		
QPSK 5MHz		

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 10MHz		
QPSK 15MHz		
QPSK 20MHz		

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
16QAM 1.4MHz		
16QAM 3MHz		
16QAM 5MHz