

Test Plots:

Occupied Bandwidth

Channel	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest	Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep 1Pk Max 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 1.7107 GHz 501 pts Span 3.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 1.710052 GHz -9.24 dBm T1 1 1.7101491 GHz 10.90 dBm Occ Bw 1.101796407 MHz T2 1 1.7112509 GHz 9.09 dBm D1 M1 1 1.314 MHz 0.34 dB Measuring... 31.AUG.2022 02:34:47 Date: 31.AUG.2022 02:34:48	Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep 1Pk Max 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 1.7107 GHz 501 pts Span 3.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 1.71004000 GHz -9.22 dBm T1 1 1.7101491 GHz 8.74 dBm Occ Bw 1.101796407 MHz T2 1 1.7112509 GHz 7.75 dBm D1 M1 1 1.32 MHz 0.13 dB Measuring... 31.AUG.2022 02:35:17 Date: 31.AUG.2022 02:35:18
Middle	Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep 1Pk Max 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 1.7325 GHz 501 pts Span 3.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 1.731852 GHz -8.14 dBm T1 1 1.7319491 GHz 9.86 dBm Occ Bw 1.107784431 MHz T2 1 1.7330509 GHz 9.24 dBm D1 M1 1 1.314 MHz -0.72 dB Measuring... 31.AUG.2022 02:35:52 Date: 31.AUG.2022 02:35:52	Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep 1Pk Max 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 1.7325 GHz 501 pts Span 3.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 1.73184000 GHz -9.26 dBm T1 1 1.7319509 GHz 11.30 dBm Occ Bw 1.095808383 MHz T2 1 1.7330509 GHz 8.54 dBm D1 M1 1 1.308 MHz -0.87 dB Measuring... 31.AUG.2022 02:36:19 Date: 31.AUG.2022 02:36:19
Highest	Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep 1Pk Max 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 1.7543 GHz 501 pts Span 3.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 1.75364000 GHz -8.65 dBm T1 1 1.7537491 GHz 11.55 dBm Occ Bw 1.101796407 MHz T2 1 1.7548509 GHz 11.46 dBm D1 M1 1 1.302 MHz 0.66 dB Measuring... 31.AUG.2022 02:36:53 Date: 31.AUG.2022 02:36:53	Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep 1Pk Max 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 1.7543 GHz 501 pts Span 3.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 1.75365200 GHz -8.57 dBm T1 1 1.7537509 GHz 10.61 dBm Occ Bw 1.095808383 MHz T2 1 1.7548509 GHz 9.68 dBm D1 M1 1 1.29 MHz -0.15 dB Measuring... 31.AUG.2022 02:37:20 Date: 31.AUG.2022 02:37:20

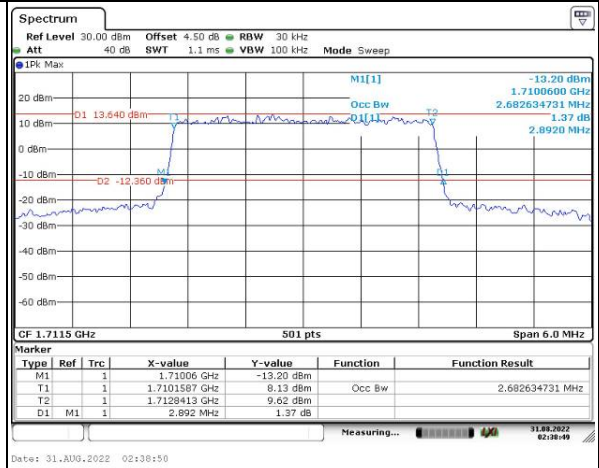
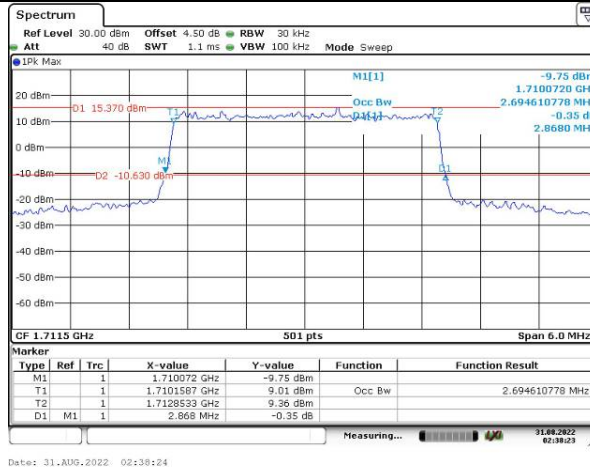
Occupied Bandwidth

Channel

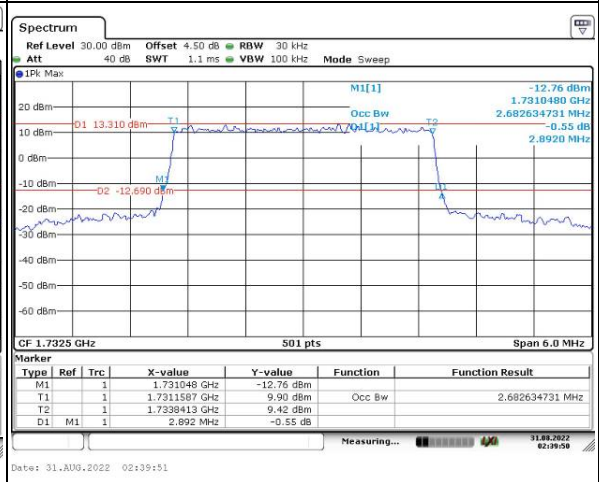
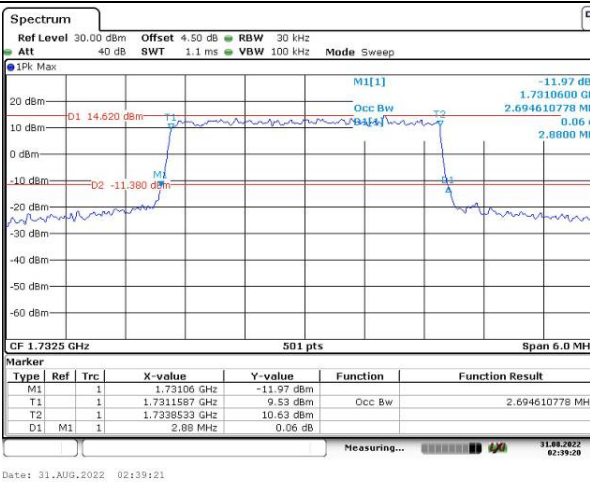
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

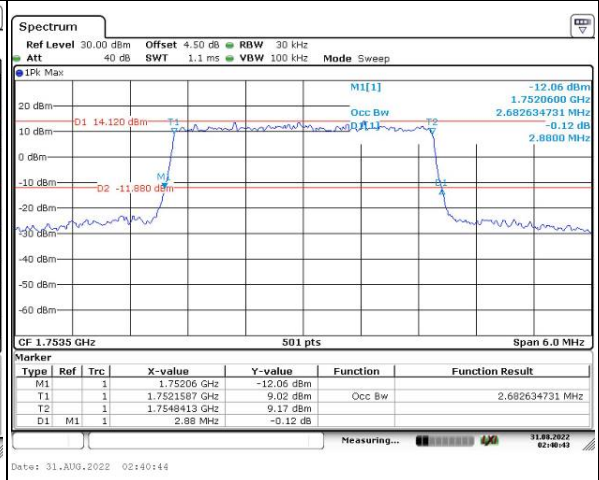
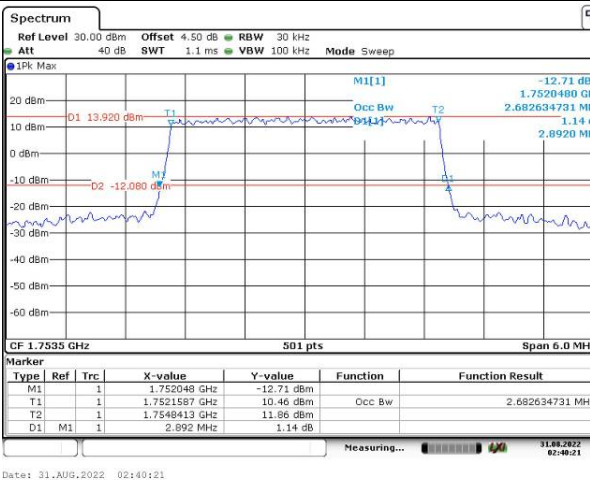
Lowest



Middle



Highest



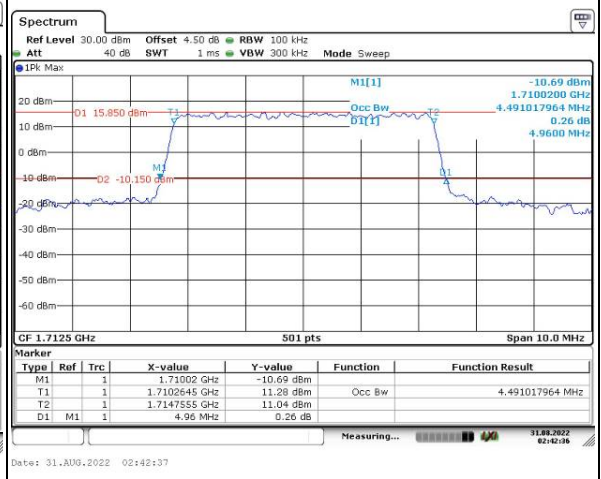
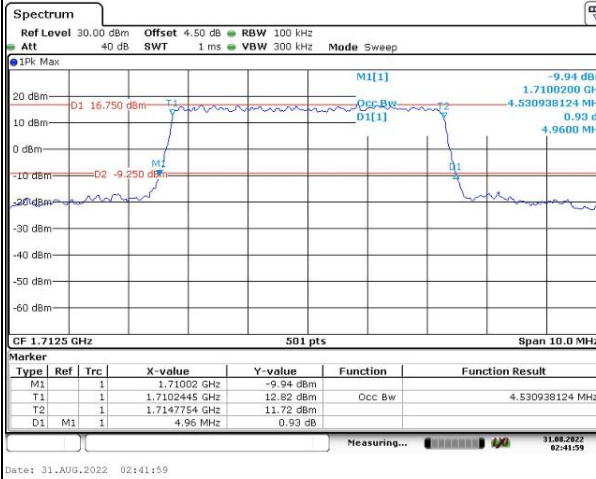
Occupied Bandwidth

Channel

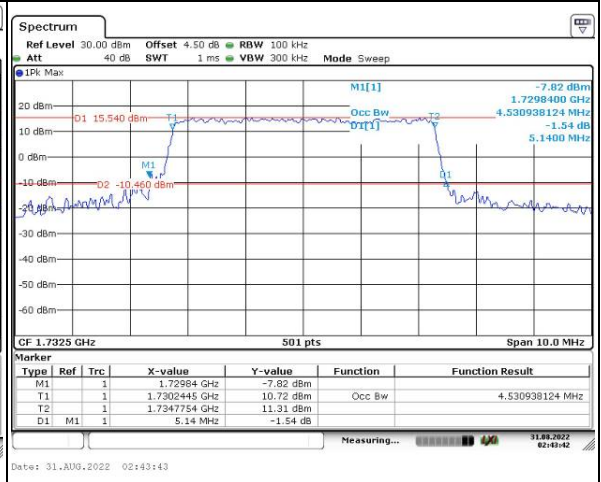
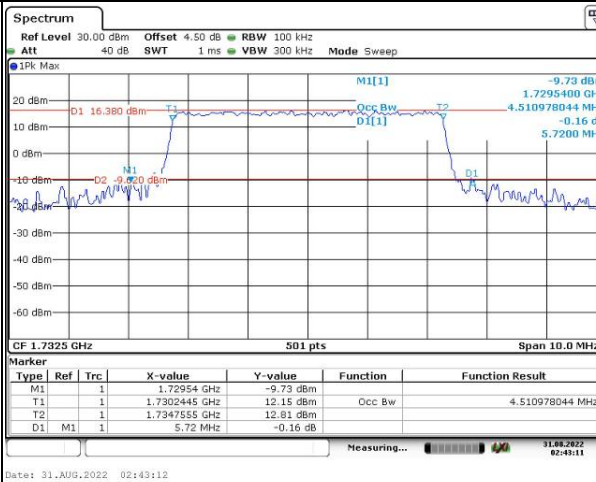
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

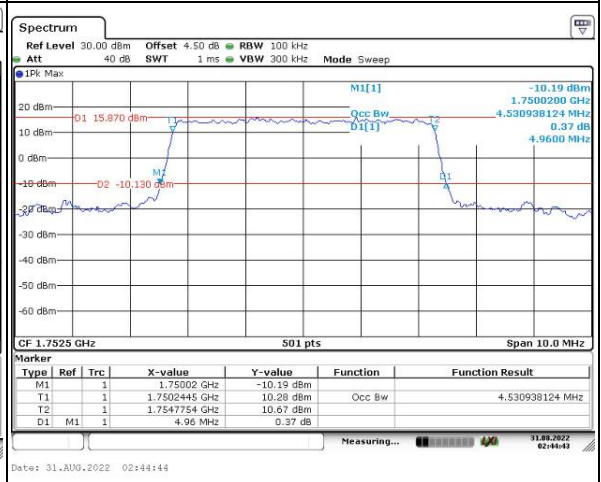
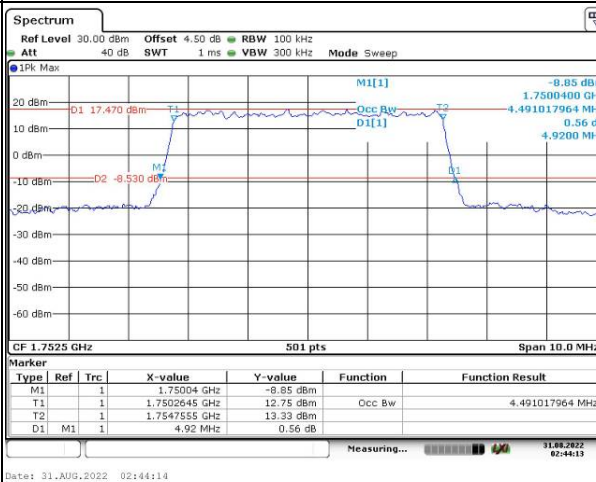
Lowest



Middle



Highest



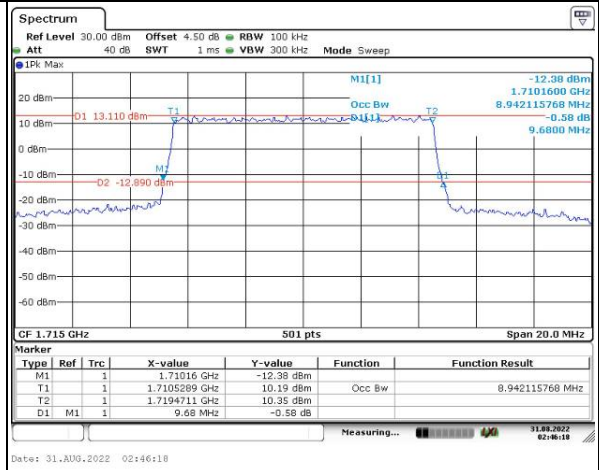
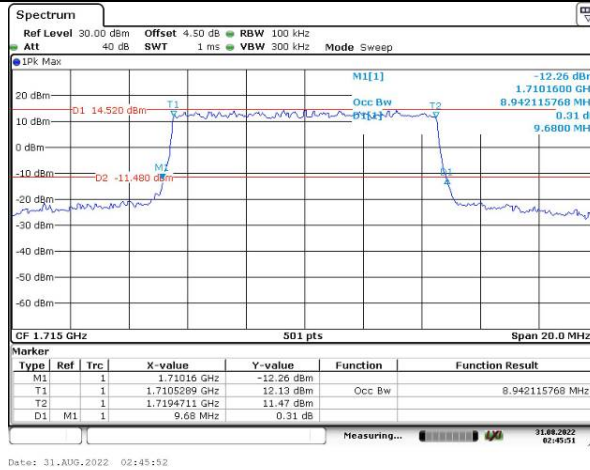
Occupied Bandwidth

Channel

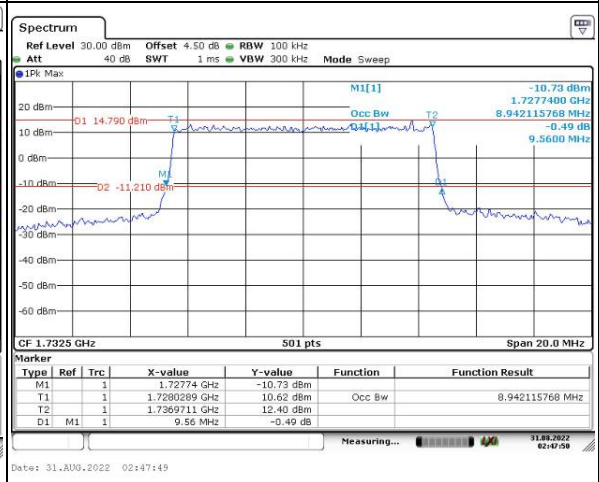
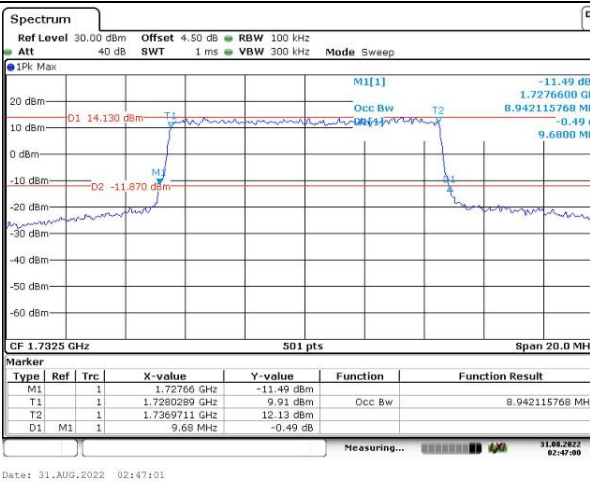
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

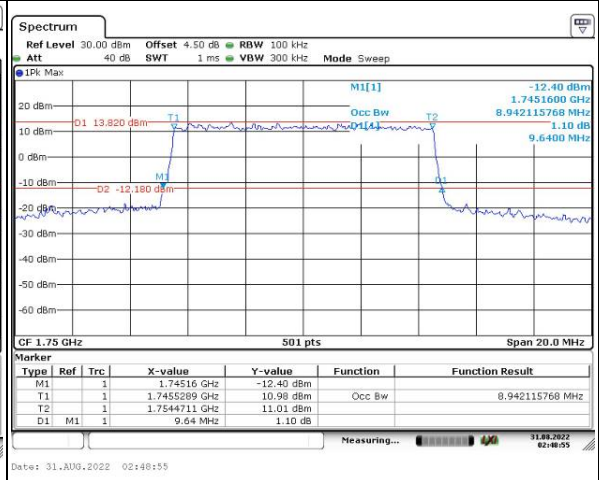
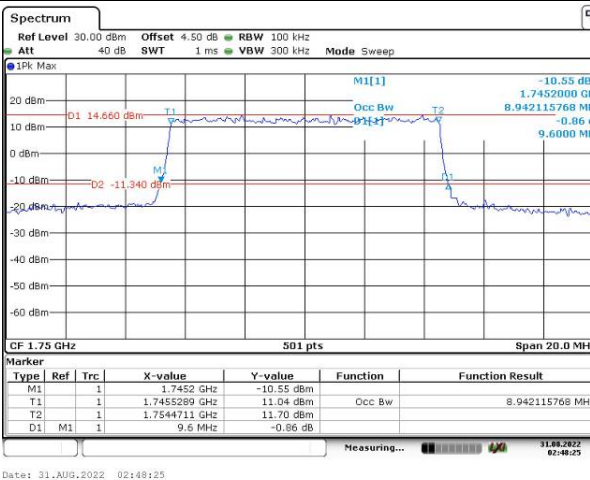
Lowest



Middle



Highest



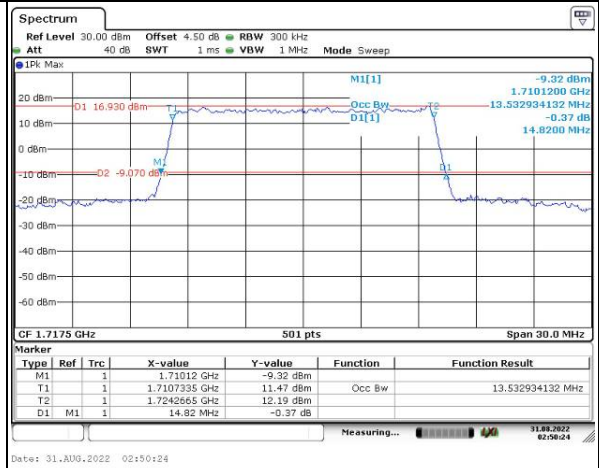
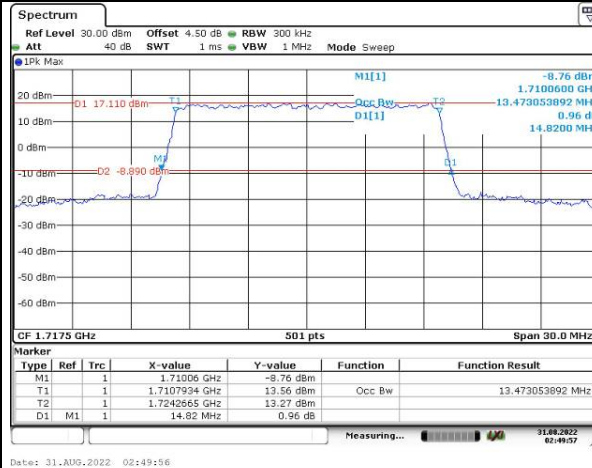
Occupied Bandwidth

Channel

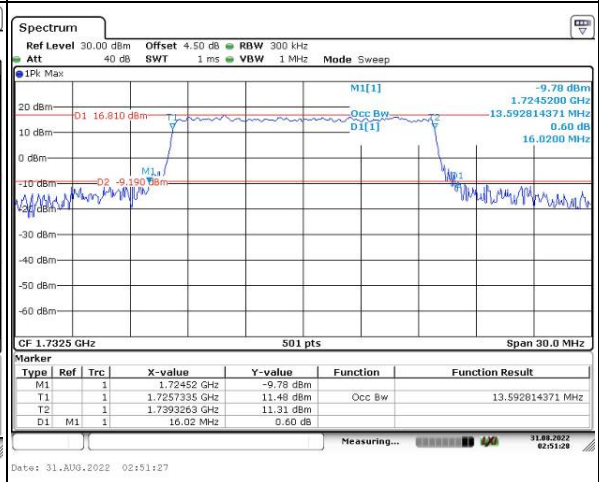
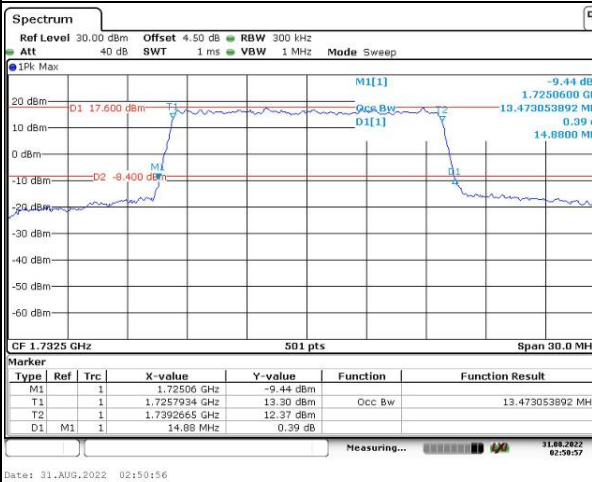
15MHz Bandwidth QPSK

15MHz Bandwidth 16QAM

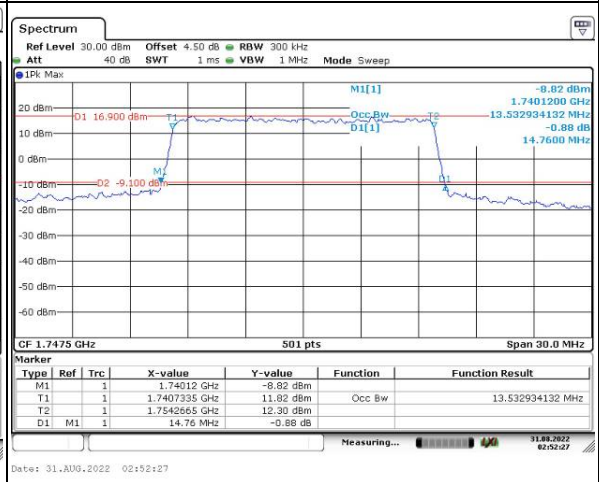
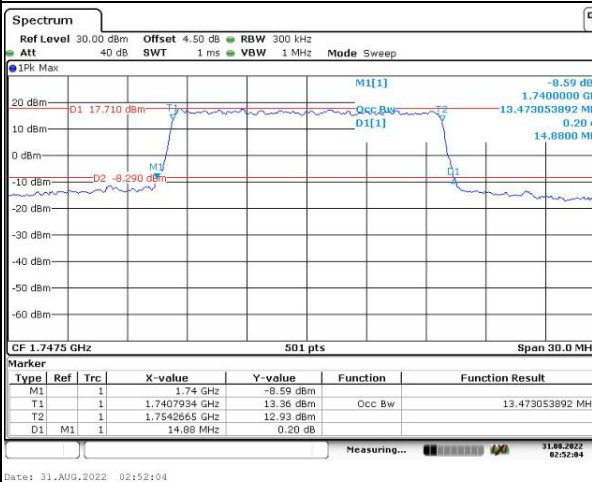
Lowest



Middle



Highest



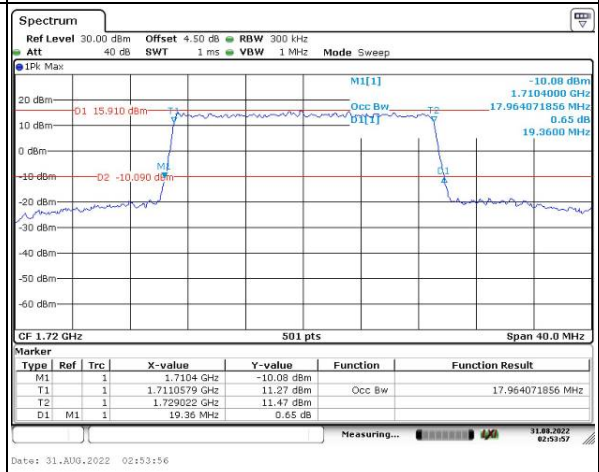
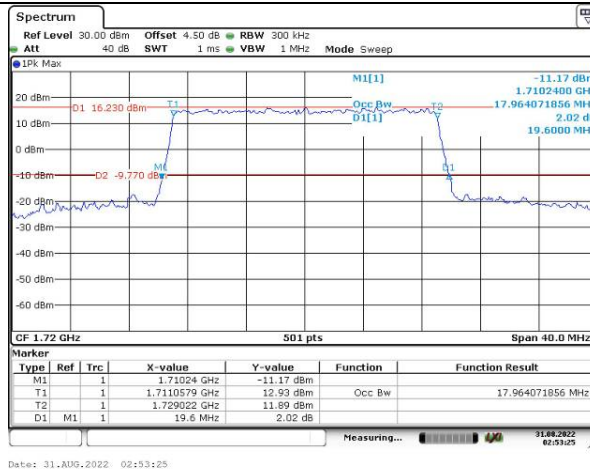
Occupied Bandwidth

Channel

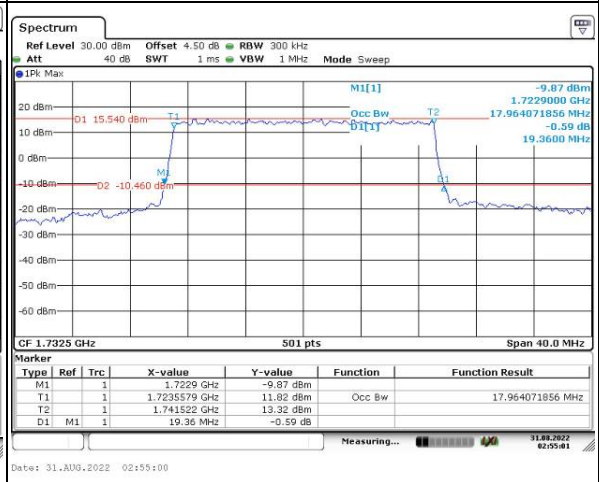
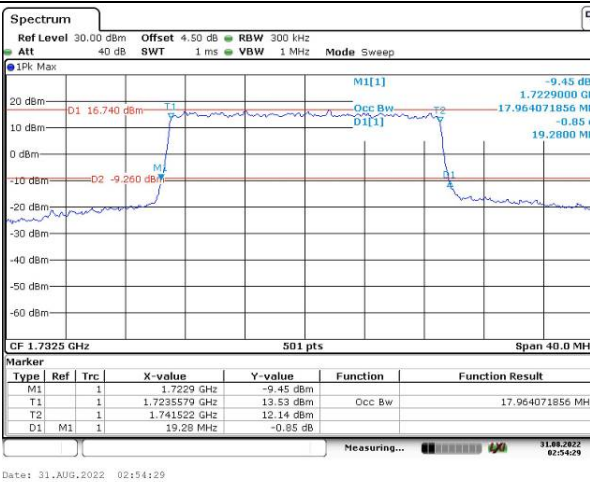
20MHz Bandwidth QPSK

20MHz Bandwidth 16QAM

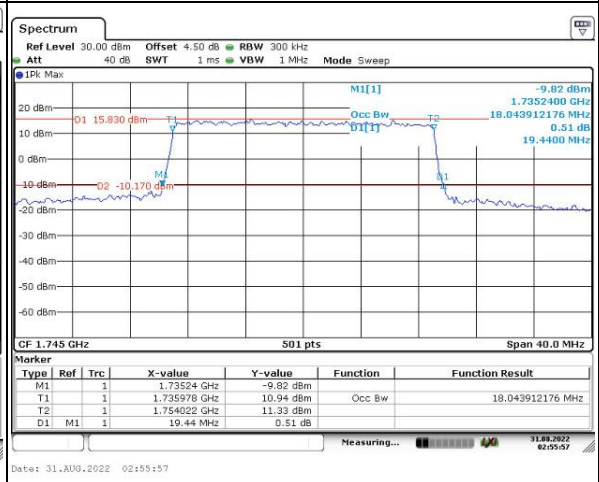
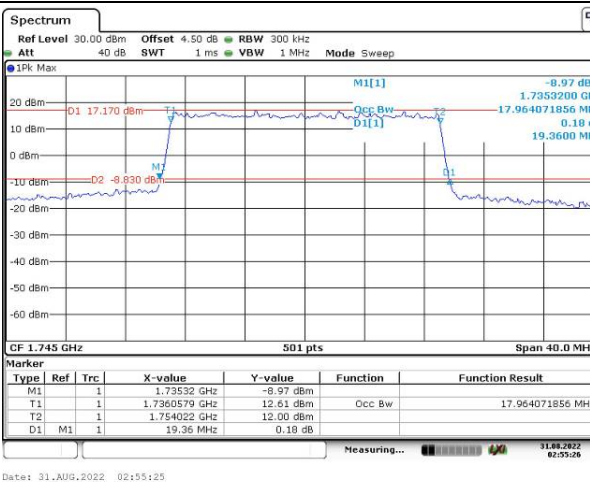
Lowest



Middle



Highest

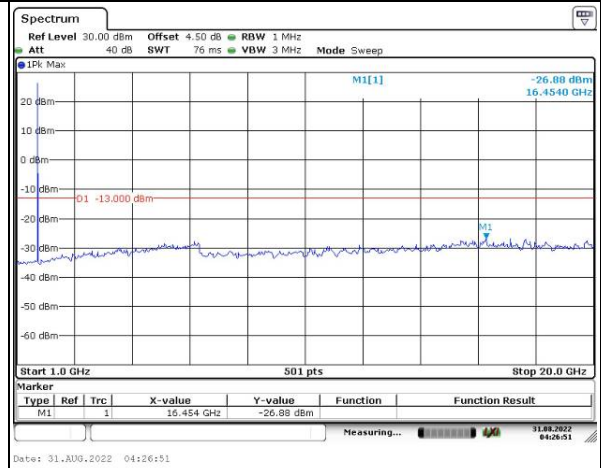
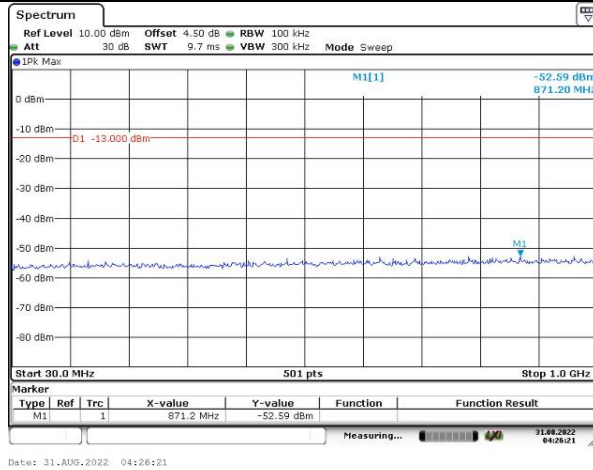


Spurious Emissions at Antenna Terminal

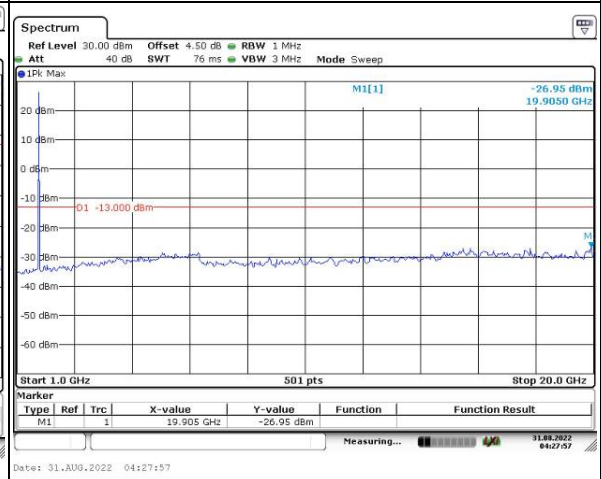
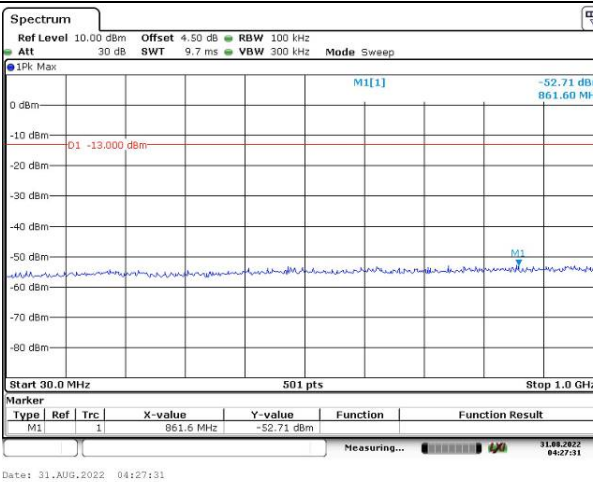
Channel

1.4MHz Bandwidth QPSK

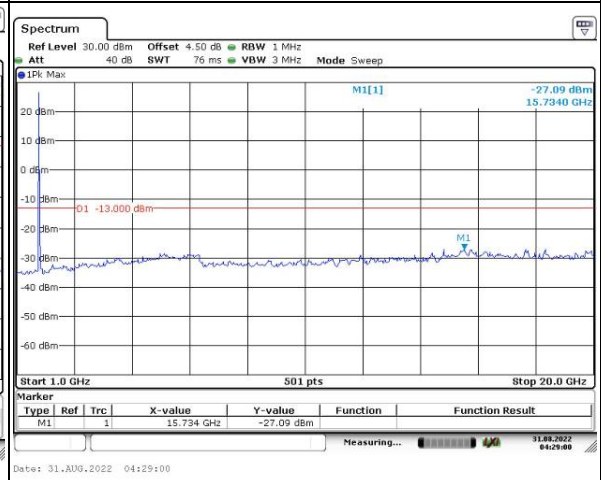
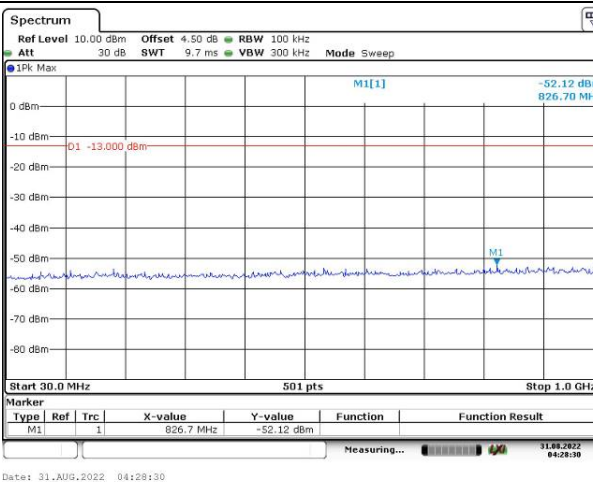
Lowest



Middle



Highest

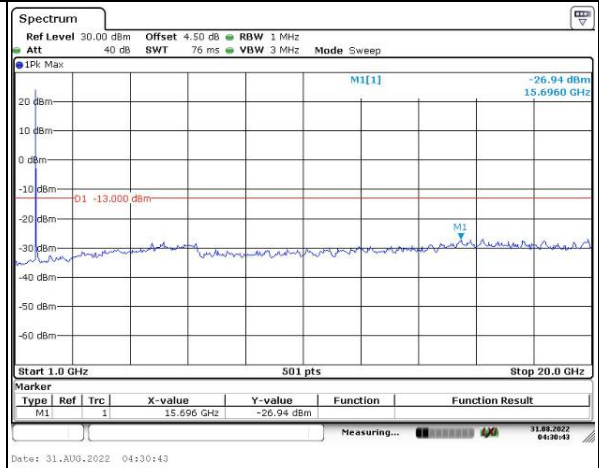
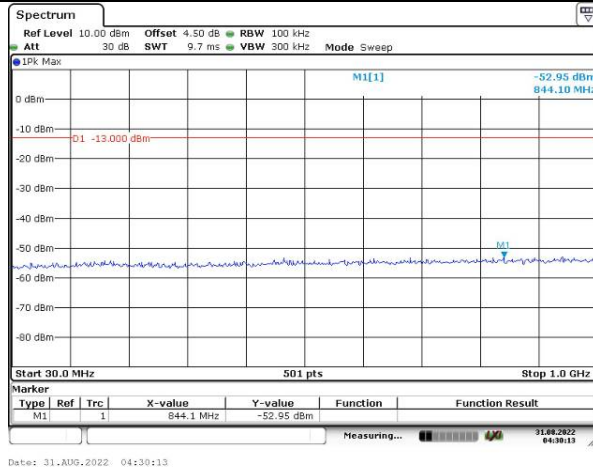


Spurious Emissions at Antenna Terminal

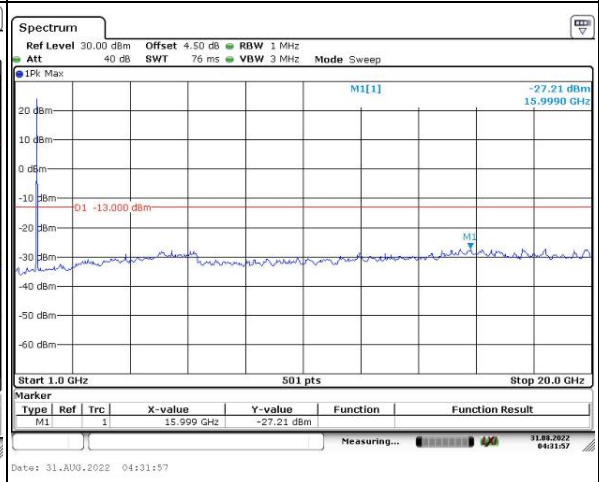
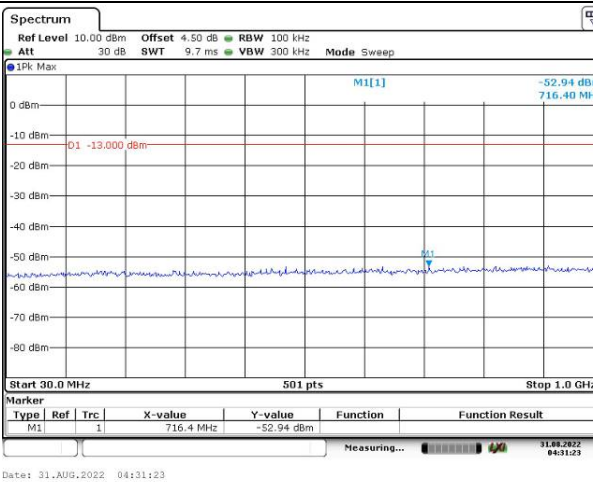
Channel

3MHz Bandwidth QPSK

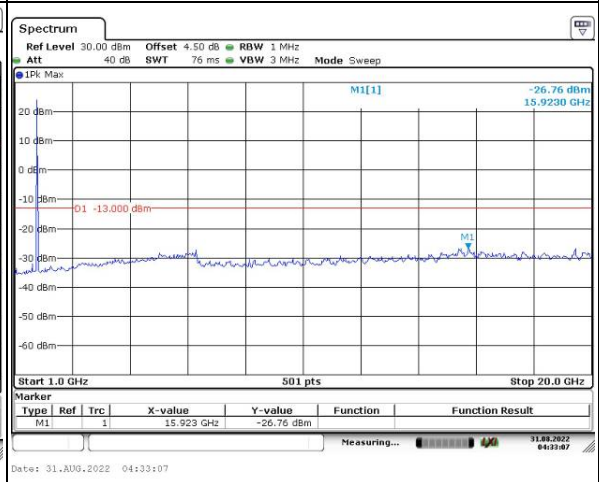
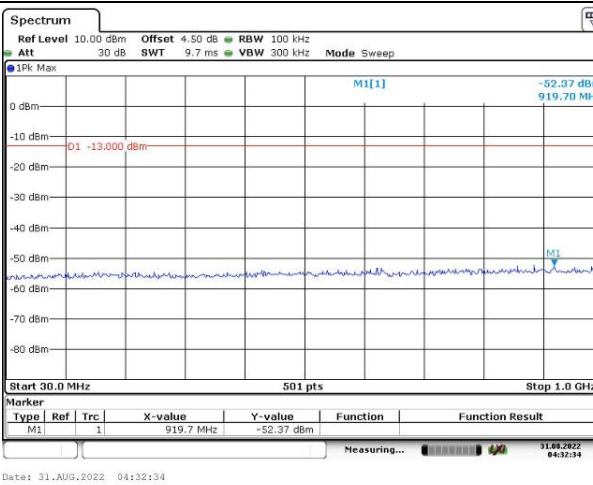
Lowest



Middle



Highest

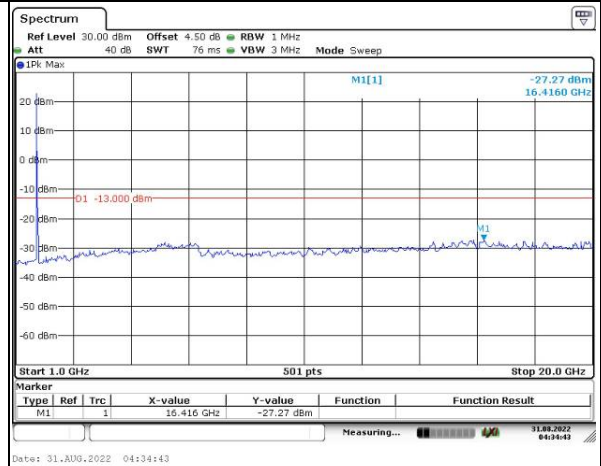
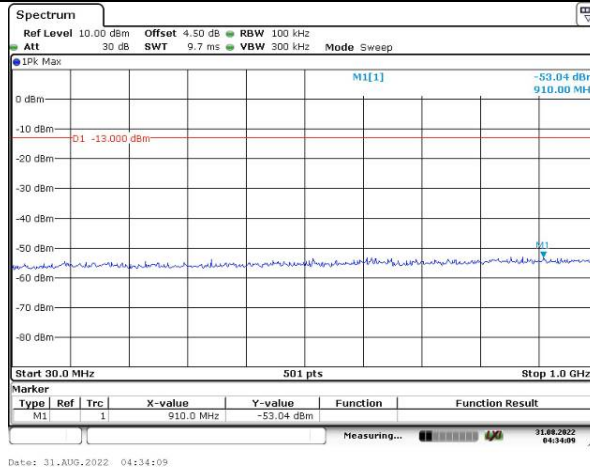


Spurious Emissions at Antenna Terminal

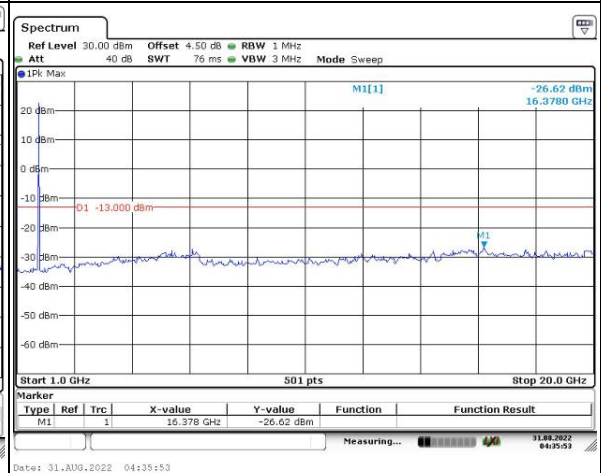
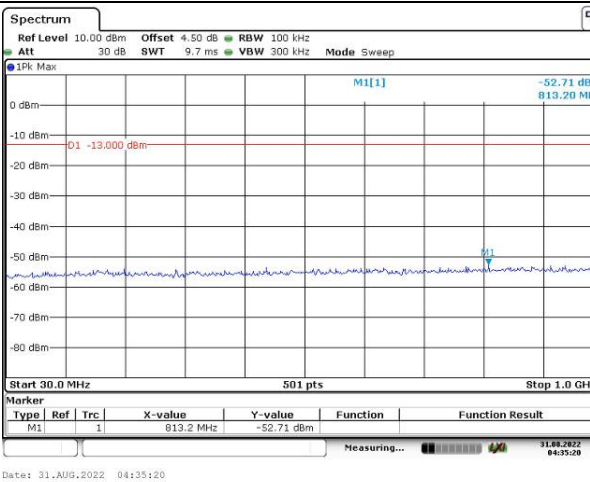
Channel

5MHz Bandwidth QPSK

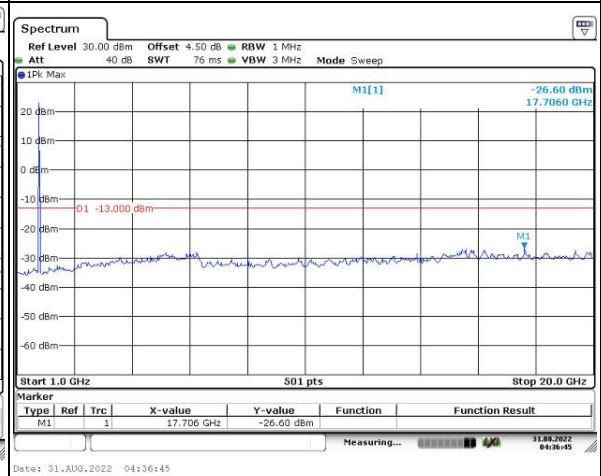
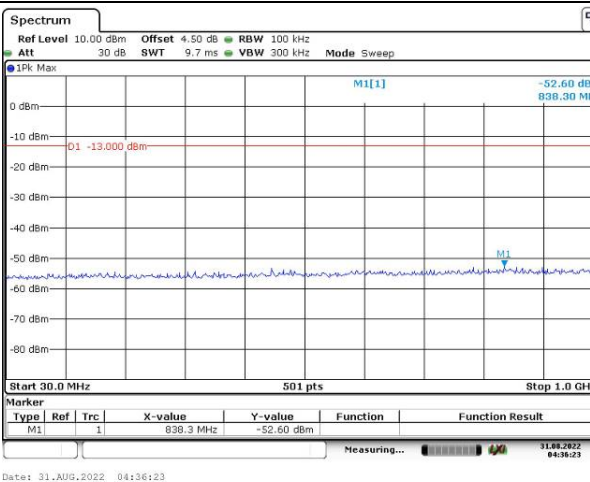
Lowest



Middle



Highest

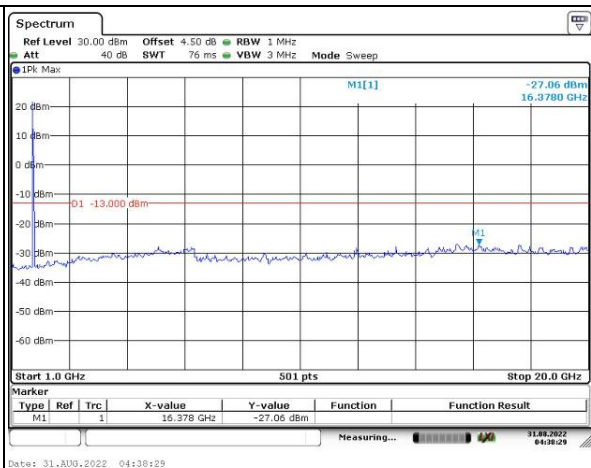
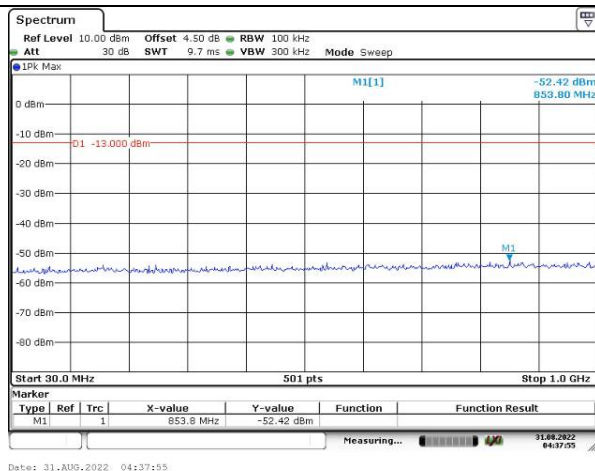


Spurious Emissions at Antenna Terminal

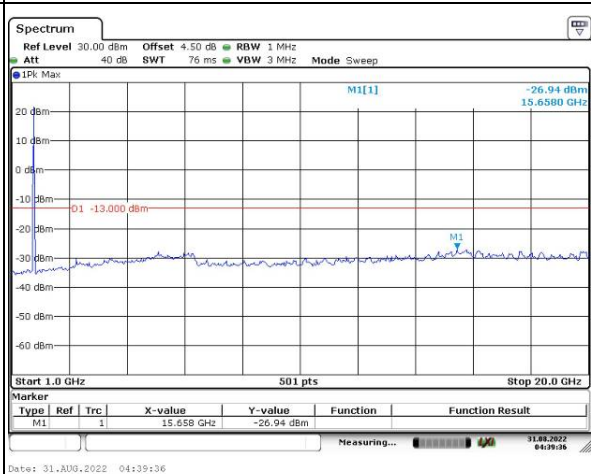
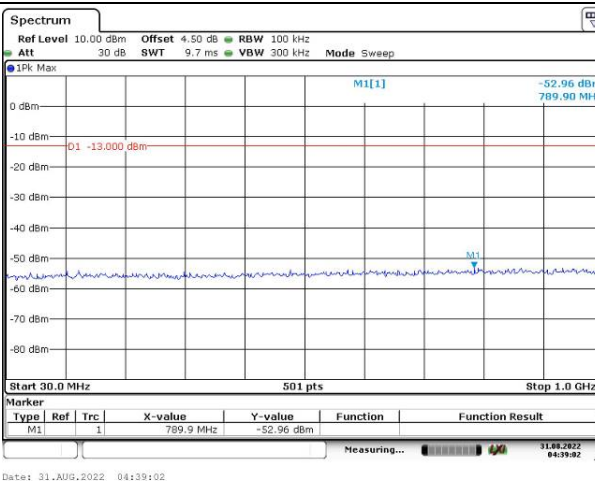
Channel

10MHz Bandwidth QPSK

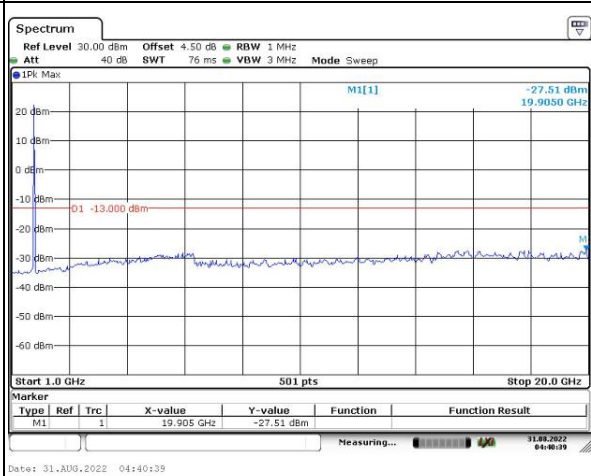
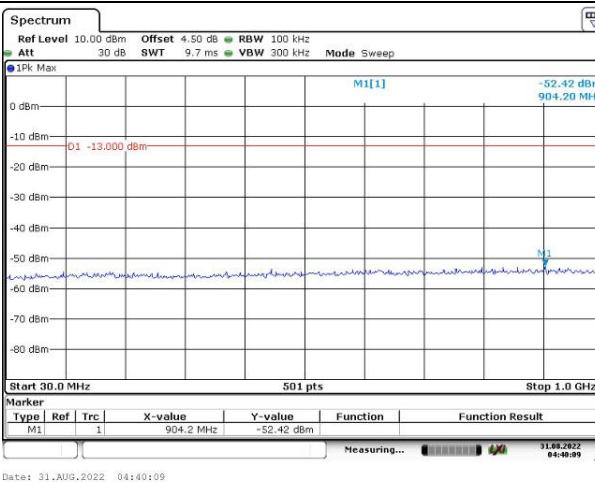
Lowest



Middle



Highest

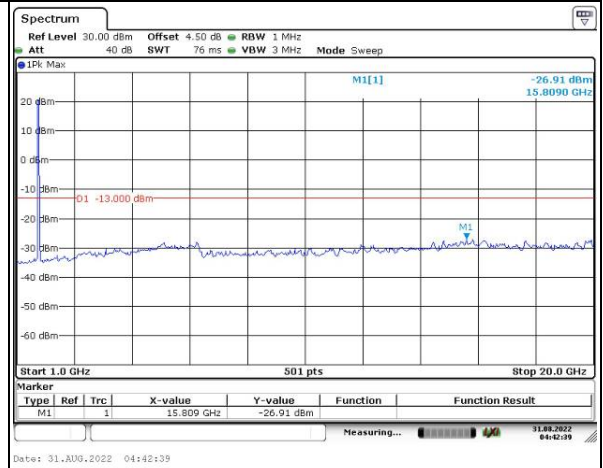
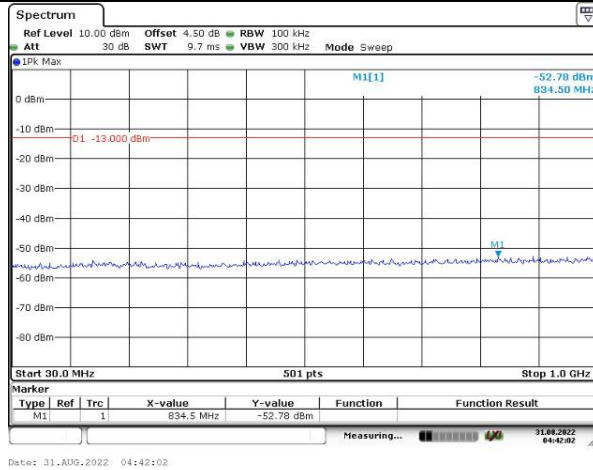


Spurious Emissions at Antenna Terminal

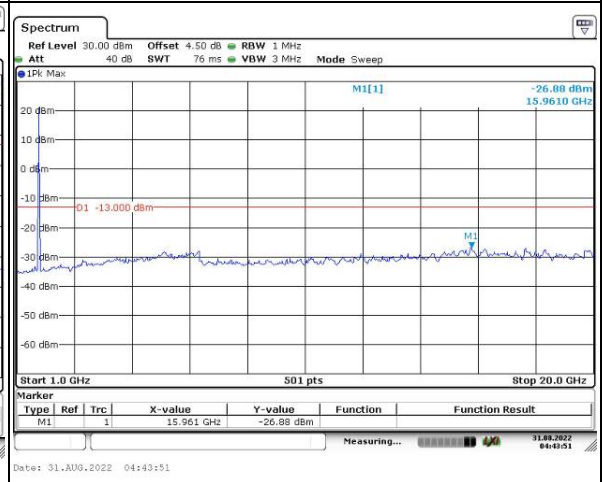
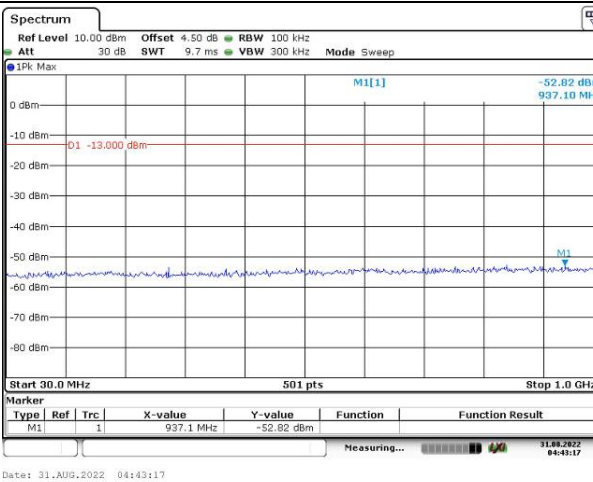
Channel

15MHz Bandwidth QPSK

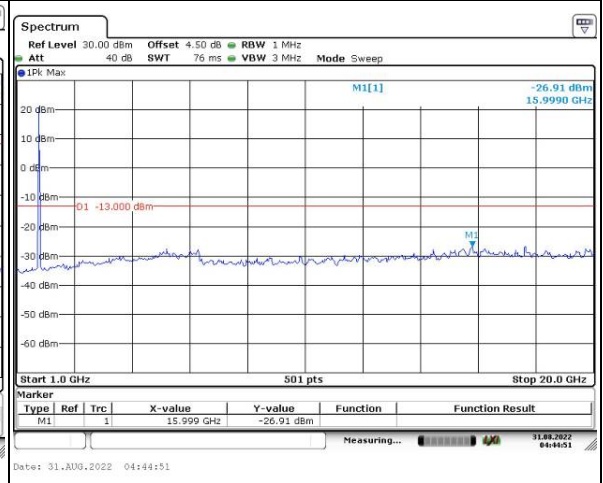
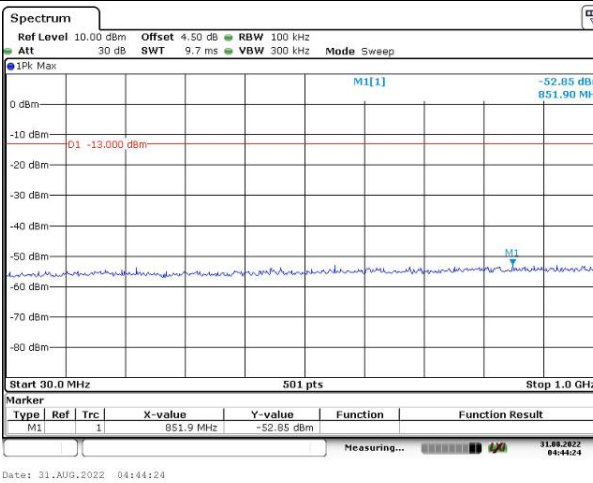
Lowest



Middle



Highest

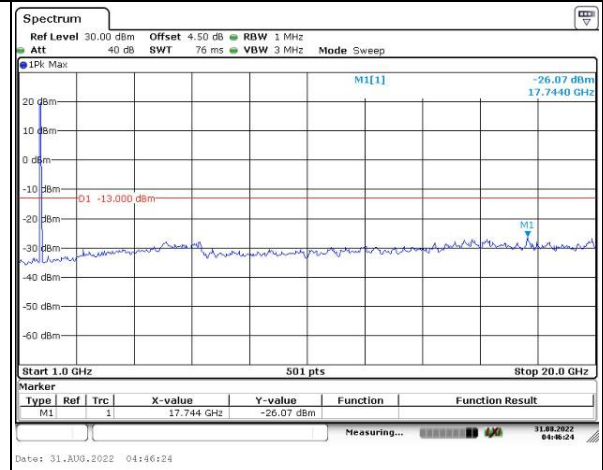
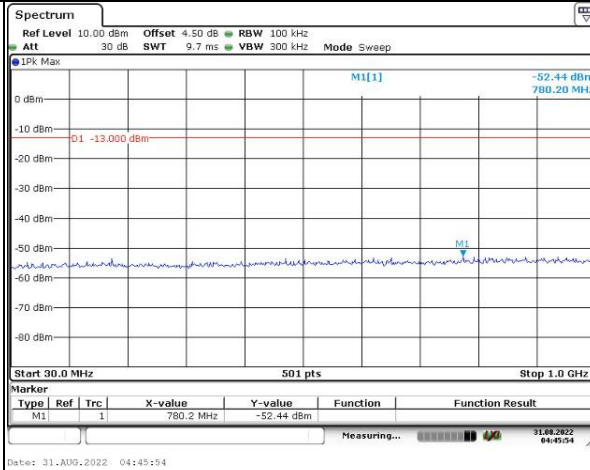


Spurious Emissions at Antenna Terminal

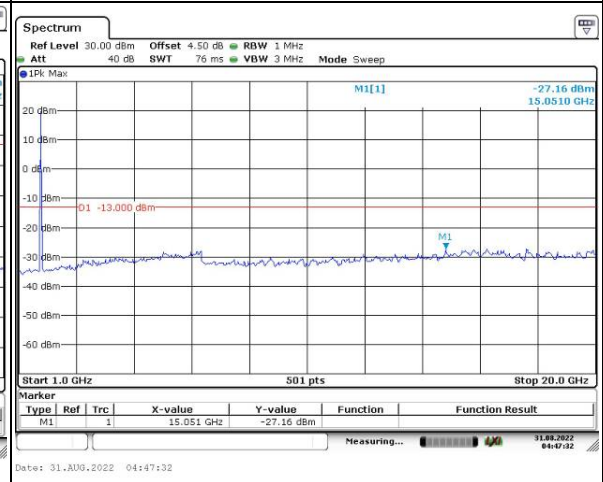
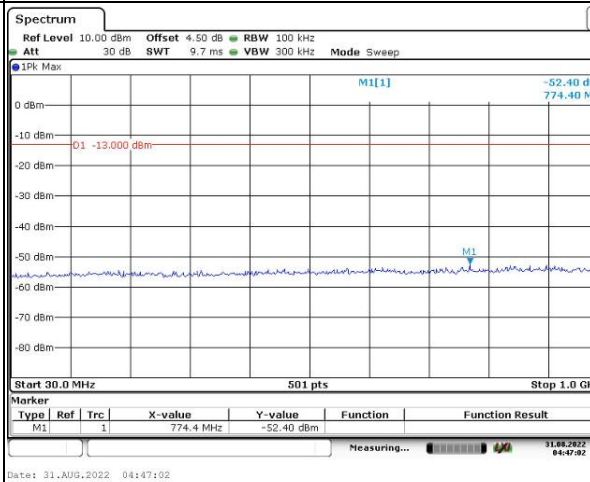
Channel

20MHz Bandwidth QPSK

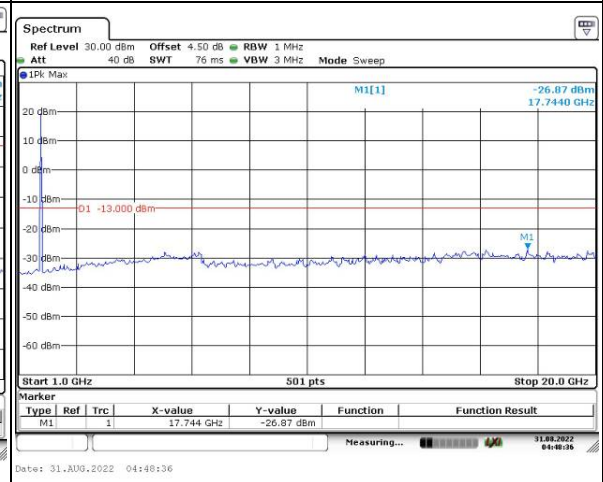
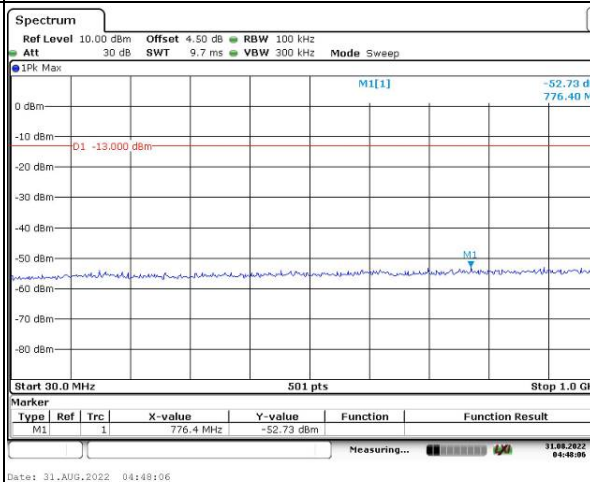
Lowest



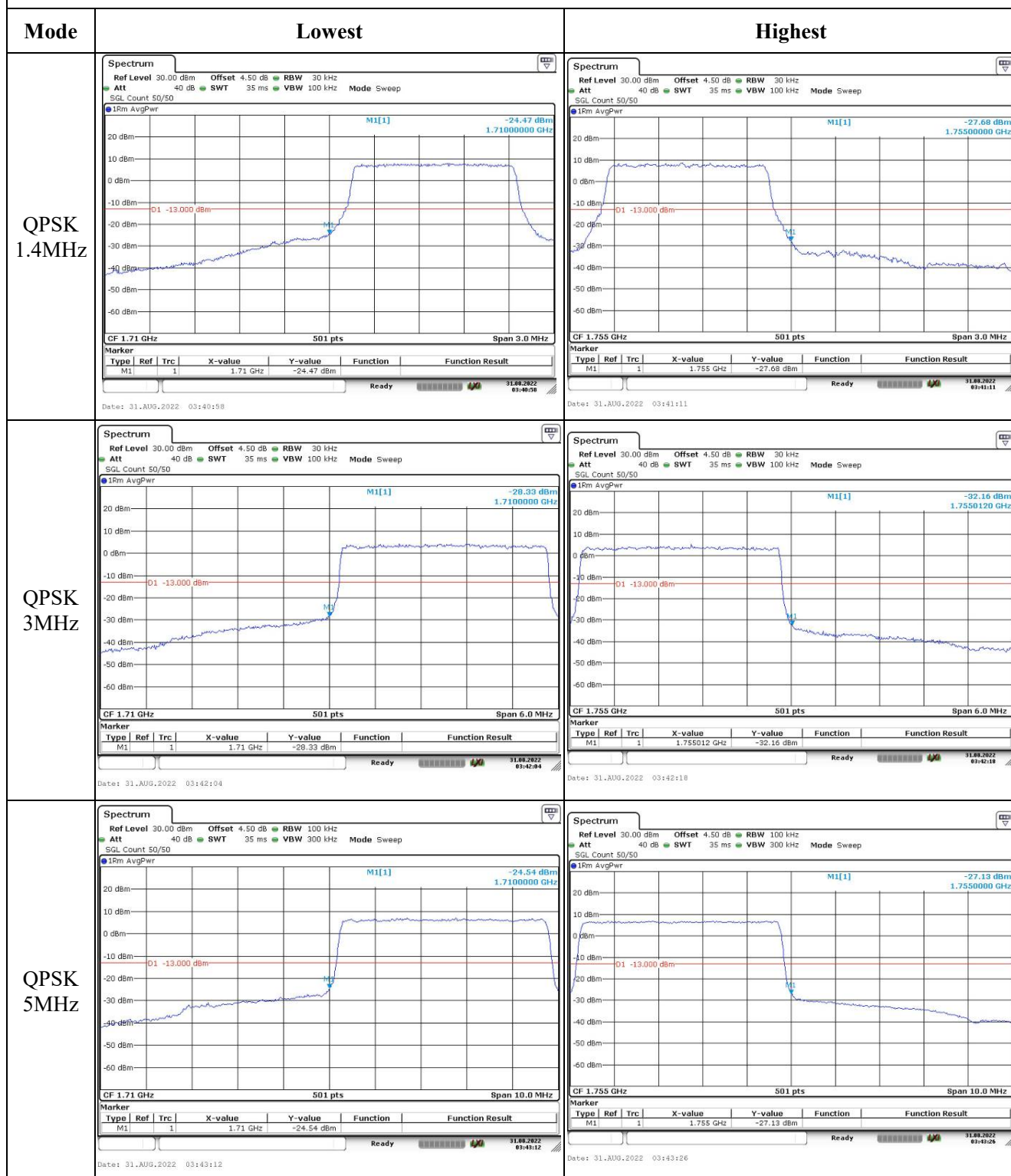
Middle



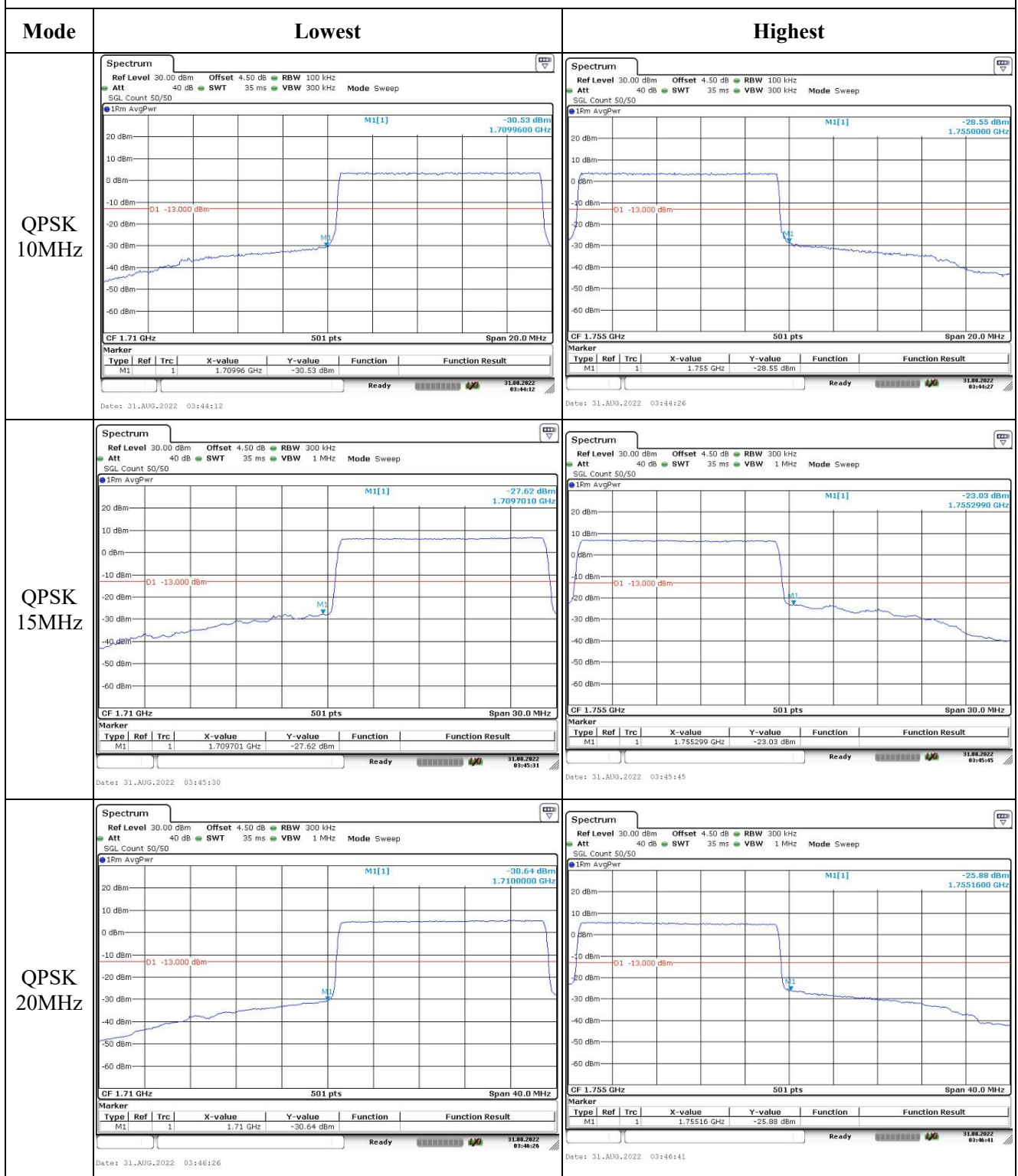
Highest



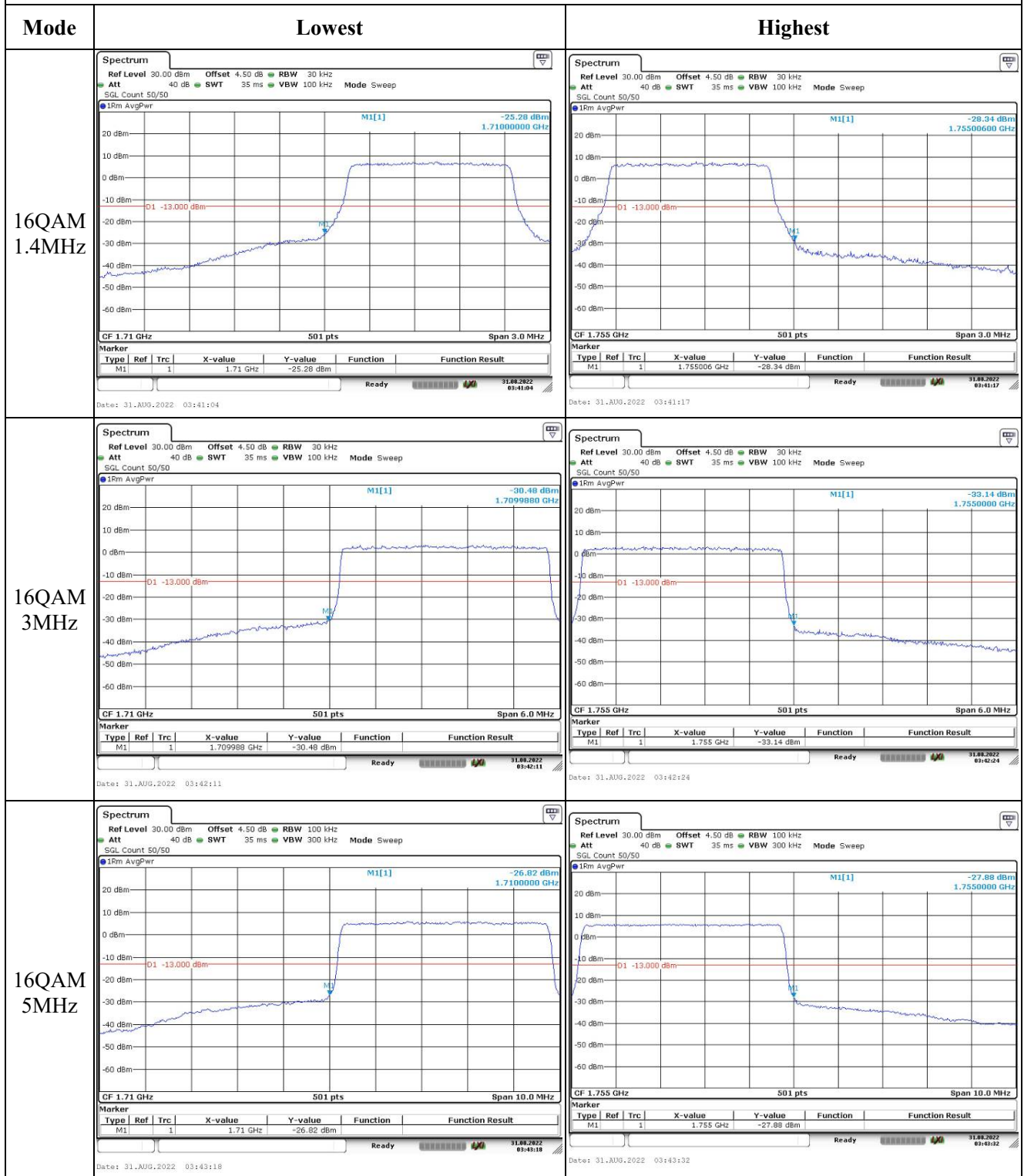
Out of band emission, Band Edge



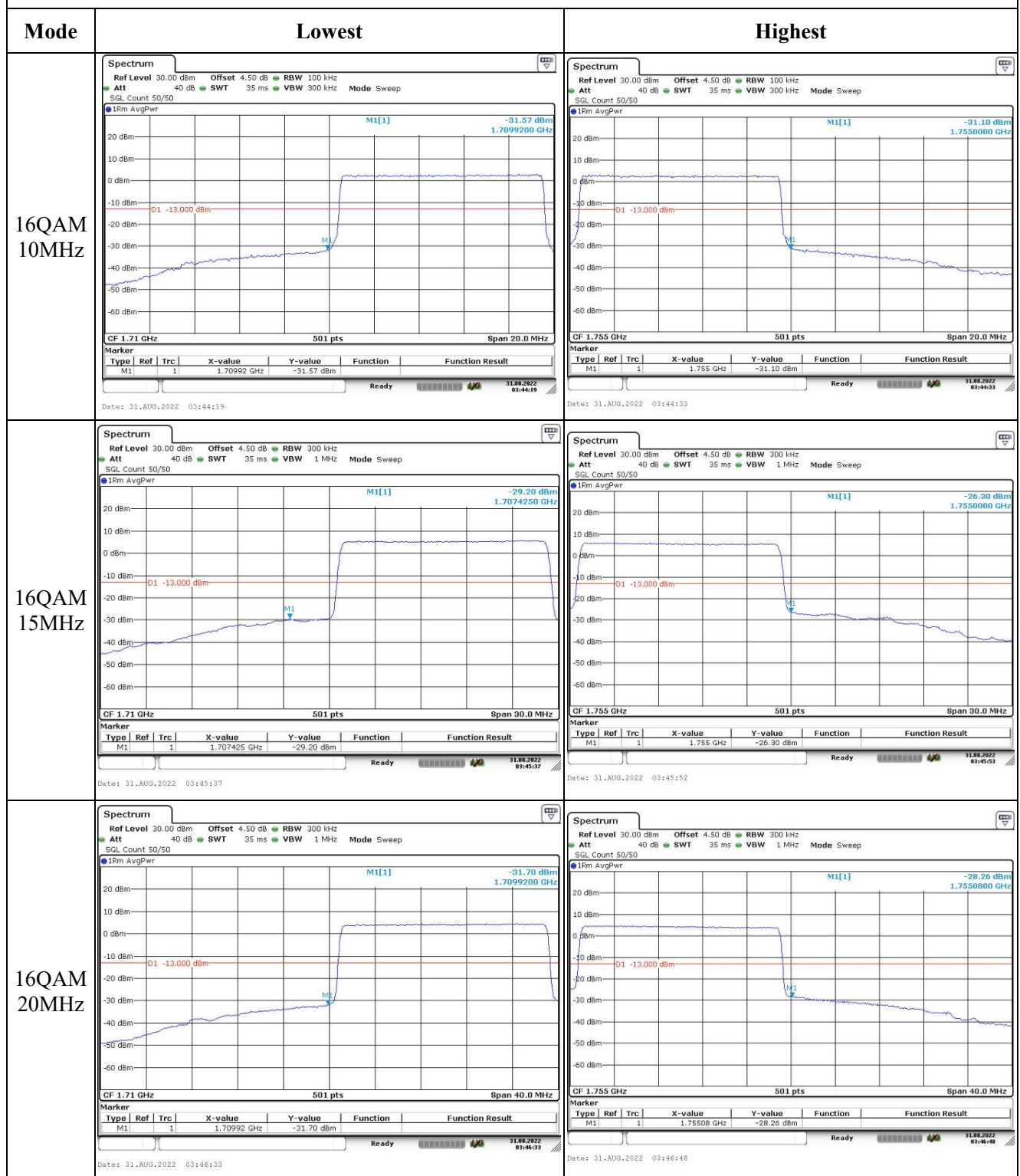
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.8 Antenna Port Test Data and Results for LTE Band 5

Serial Number:	CR22090005-RF-S1	Test Date:	2022-08-30~2022-08-31
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chan	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.1~25.8	Relative Humidity: (%)	52~60	ATM Pressure: (kPa)	100.1~100.8
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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
YINSAIGE	Coaxial Cable	SS402	SJ0100004	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554404	Each time	N/A
Unknown	Coaxial tee connector	Unknown	2204006	Each time	N/A
Weinschel	Coaxial Attenuators	53-20-34	LN751	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
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).

EUT Information@ LTE Band 5▲:

Antenna Gain (dBi):	0.5	Antenna Gain (dBd):	-1.65	Cable Loss (dB):	0.3
Operation Voltage(V _{DC}):					
Lowest:	3.3	Normal:	3.85	Highest:	4.4

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
1.4MHz	824.7	836.5	848.3
3MHz	825.5	836.5	847.5
5MHz	826.5	836.5	846.5
10MHz	829	836.5	844

Test Data:**FCC§2.1046;§ 22.913 (a)****RF Output Power:**

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	23.75	23.75	23.64	21.99	38.45
	RB1#3	23.94	23.92	23.91		
	RB1#5	23.77	23.77	23.7		
	RB3#0	23.85	23.79	23.82		
	RB3#3	23.82	23.8	23.85		
	RB6#0	22.84	22.9	22.84		
1.4MHz 16QAM	RB1#0	22.75	22.9	22.74	21.1	38.45
	RB1#3	22.84	23.05	22.99		
	RB1#5	22.72	22.9	22.81		
	RB3#0	22.99	22.77	22.93		
	RB3#3	22.96	22.79	22.9		
	RB6#0	21.85	21.88	21.8		
3MHz QPSK	RB1#0	23.78	23.81	23.82	21.88	38.45
	RB1#8	23.76	23.83	23.72		
	RB1#14	23.76	23.8	23.78		
	RB6#0	22.8	22.85	22.74		
	RB6#9	22.77	22.85	22.8		
	RB15#0	22.83	22.81	22.83		
3MHz 16QAM	RB1#0	23.34	23.02	22.84	21.39	38.45
	RB1#8	23.3	22.97	22.82		
	RB1#14	23.26	22.91	22.8		
	RB6#0	21.85	21.8	21.73		
	RB6#9	21.83	21.85	21.77		
	RB15#0	21.82	21.76	21.88		
5MHz QPSK	RB1#0	23.68	23.7	23.74	21.91	38.45
	RB1#13	23.86	23.85	23.83		
	RB1#24	23.71	23.68	23.68		
	RB15#0	22.82	22.86	22.83		
	RB15#10	22.85	22.85	22.86		
	RB25#0	22.78	22.78	22.8		
5MHz 16QAM	RB1#0	22.79	22.66	22.96	21.25	38.45
	RB1#13	22.94	22.75	23.2		
	RB1#24	22.81	22.62	23.02		
	RB15#0	21.8	21.88	21.79		
	RB15#10	21.78	21.82	21.85		
	RB25#0	21.78	21.84	21.81		
10MHz QPSK	RB1#0	23.79	23.83	23.8	22.01	38.45
	RB1#25	23.96	23.95	23.93		

	RB1#49	23.83	23.83	23.8		
	RB25#0	22.83	22.89	22.92		
	RB25#25	22.93	22.84	22.88		
	RB50#0	22.88	22.85	22.89		
10MHz 16QAM	RB1#0	22.81	23.42	22.91	21.52	38.45
	RB1#25	22.98	23.47	23.06		
	RB1#49	22.88	23.28	23.01		
	RB25#0	21.88	21.93	21.89		
	RB25#25	21.97	21.87	21.93		
	RB50#0	21.89	21.83	21.87		
Note: ERP=Conducted Power(dBm) - L _C (dB) + G _T (dBd)						
					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	
10MHz QPSK	RB1#0	4.72	4.75	4.23	13
	RB50#0	5.01	5.07	4.61	13
10MHz 16QAM	RB1#0	5.68	5.83	5.07	13
	RB50#0	5.83	6.2	5.42	13
Result:					Pass

FCC §2.1049, §22.905: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	1.32	1.29	1.302
1.4MHz 16QAM	1.096	1.102	1.096	1.29	1.296	1.314
3MHz QPSK	2.683	2.683	2.683	2.892	2.868	2.868
3MHz 16QAM	2.683	2.671	2.683	2.88	2.892	2.88
5MHz QPSK	4.511	4.491	4.511	4.94	4.94	4.94
5MHz 16QAM	4.531	4.511	4.511	4.94	5.14	4.96
10MHz QPSK	8.942	8.942	8.982	9.6	9.6	9.68
10MHz 16QAM	8.982	8.942	8.942	9.6	9.64	9.68
Note: The test plots please refer to the Plots of Occupied Bandwidth						

FCC §2.1051, §22.917(a):Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
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FCC §2.1051, §22.917(a):Out of band emission, Band Edge

Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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FCC §2.1055, §22.355: Frequency Stability

Test Mode:	10 MHz QPSK		Test Channel:	836.5	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.85	-3.2	-0.004	2.5
	-20	3.85	-6.97	-0.008	2.5
	-10	3.85	-5.5	-0.007	2.5
	0	3.85	6.06	0.007	2.5
	10	3.85	9.8	0.012	2.5
	20	3.85	5.03	0.006	2.5
	30	3.85	-6.62	-0.008	2.5
	40	3.85	-8.73	-0.010	2.5
	50	3.85	-7.05	-0.008	2.5
Frequency Stability vs. Voltage	20	3.3	8.99	0.011	2.5
	20	4.4	-7.17	-0.009	2.5
Result:				Pass	

Test Mode:	10 MHz 16QAM		Test Channel:	836.5	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.85	-6.48	-0.008	2.5
	-20	3.85	8.1	0.010	2.5
	-10	3.85	-8.59	-0.010	2.5
	0	3.85	9.33	0.011	2.5
	10	3.85	-6.94	-0.008	2.5
	20	3.85	7.54	0.009	2.5
	30	3.85	6.43	0.008	2.5
	40	3.85	-6.17	-0.007	2.5
	50	3.85	-6.44	-0.008	2.5
Frequency Stability vs. Voltage	20	3.3	6.34	0.008	2.5
	20	4.4	-6.89	-0.008	2.5
Result:				Pass	

Test Plots:

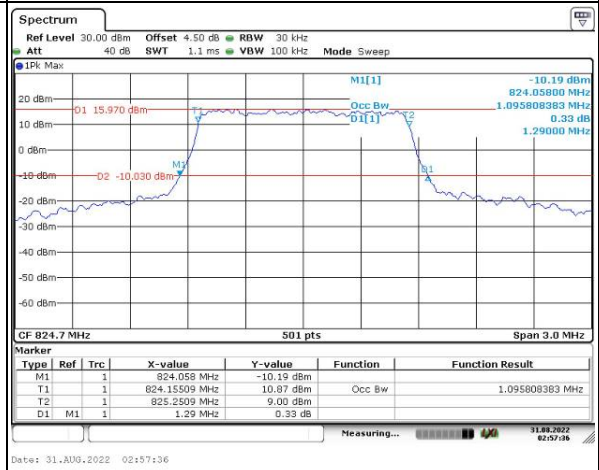
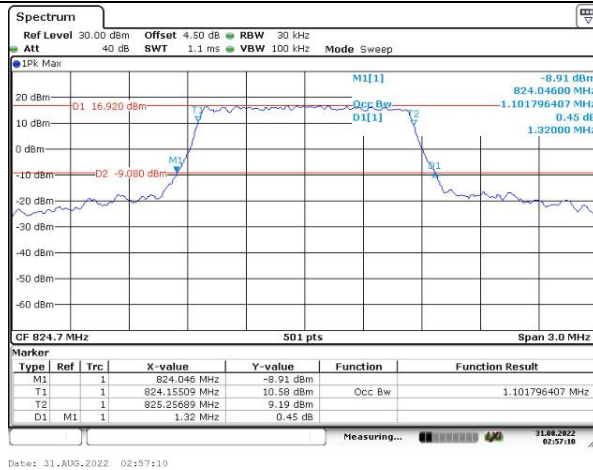
Occupied Bandwidth

Channel

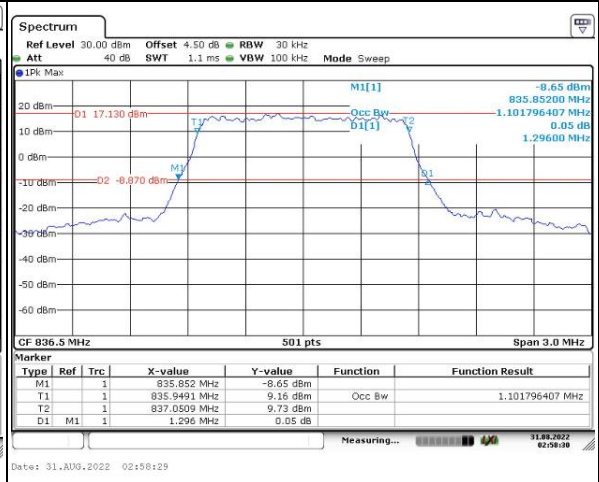
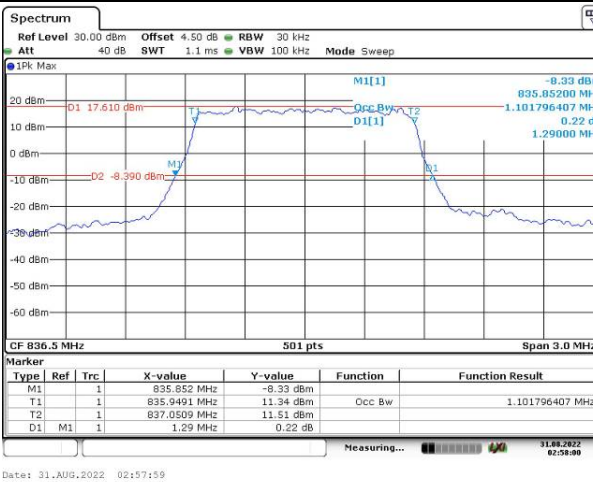
1.4MHz Bandwidth QPSK

1.4MHz Bandwidth 16QAM

Lowest



Middle



Highest

