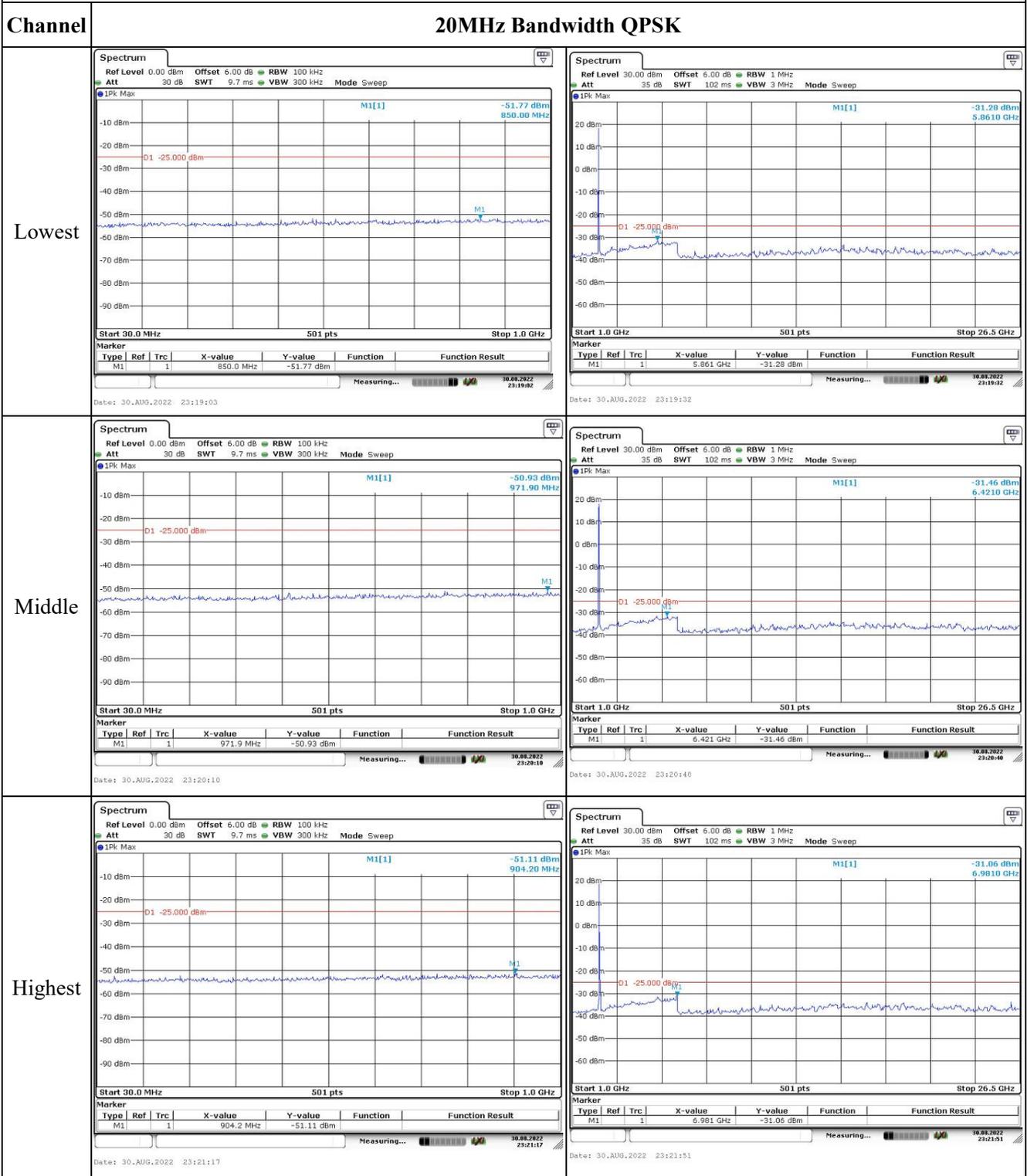
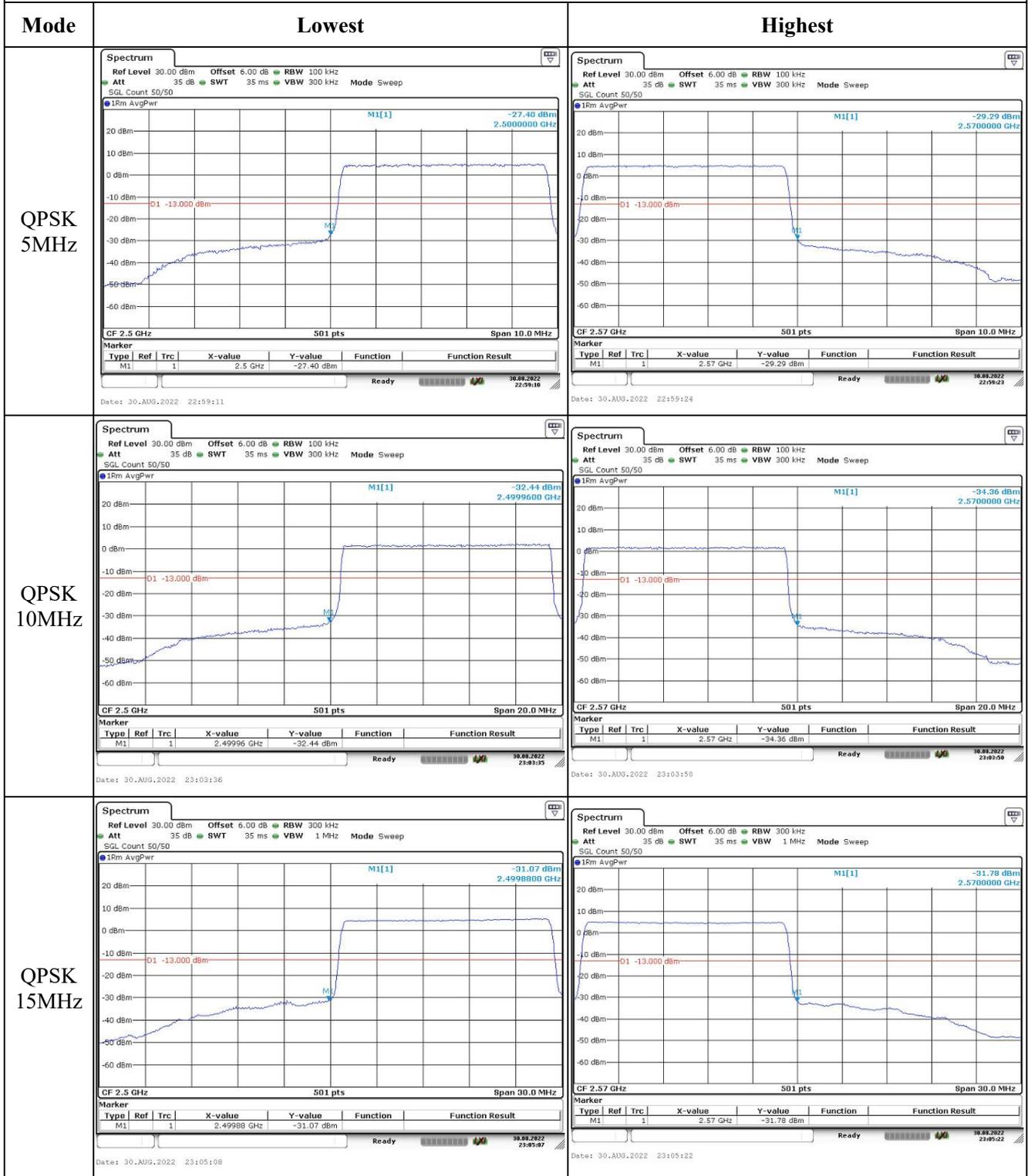


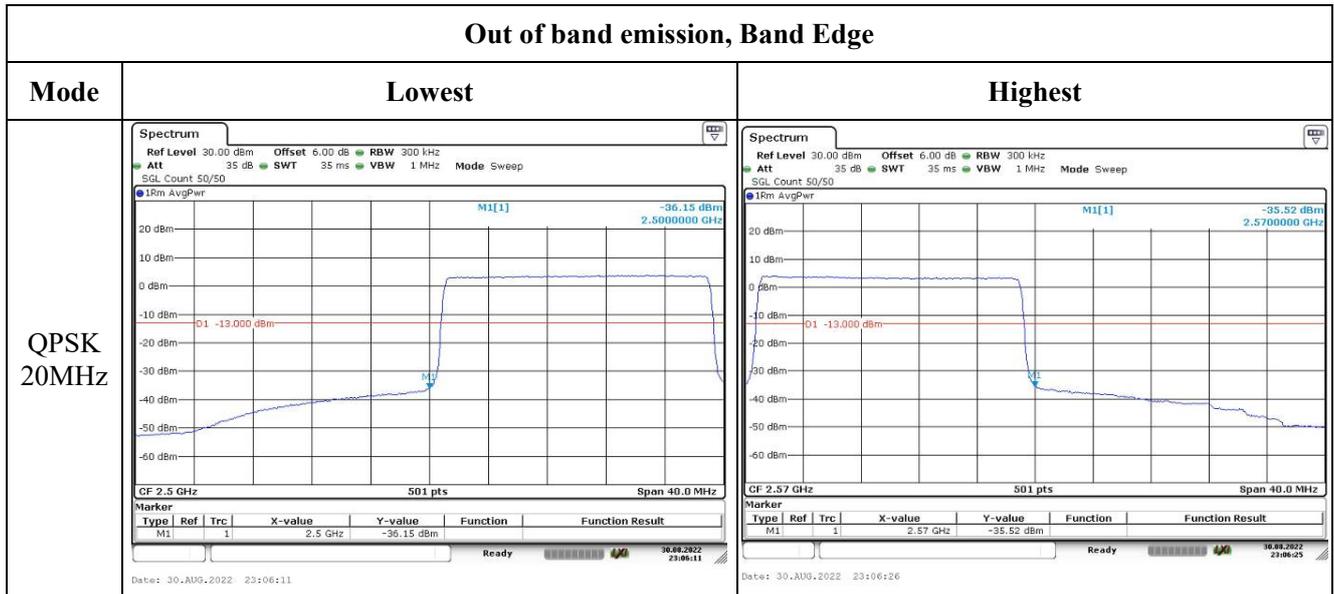
Spurious Emissions at Antenna Terminal



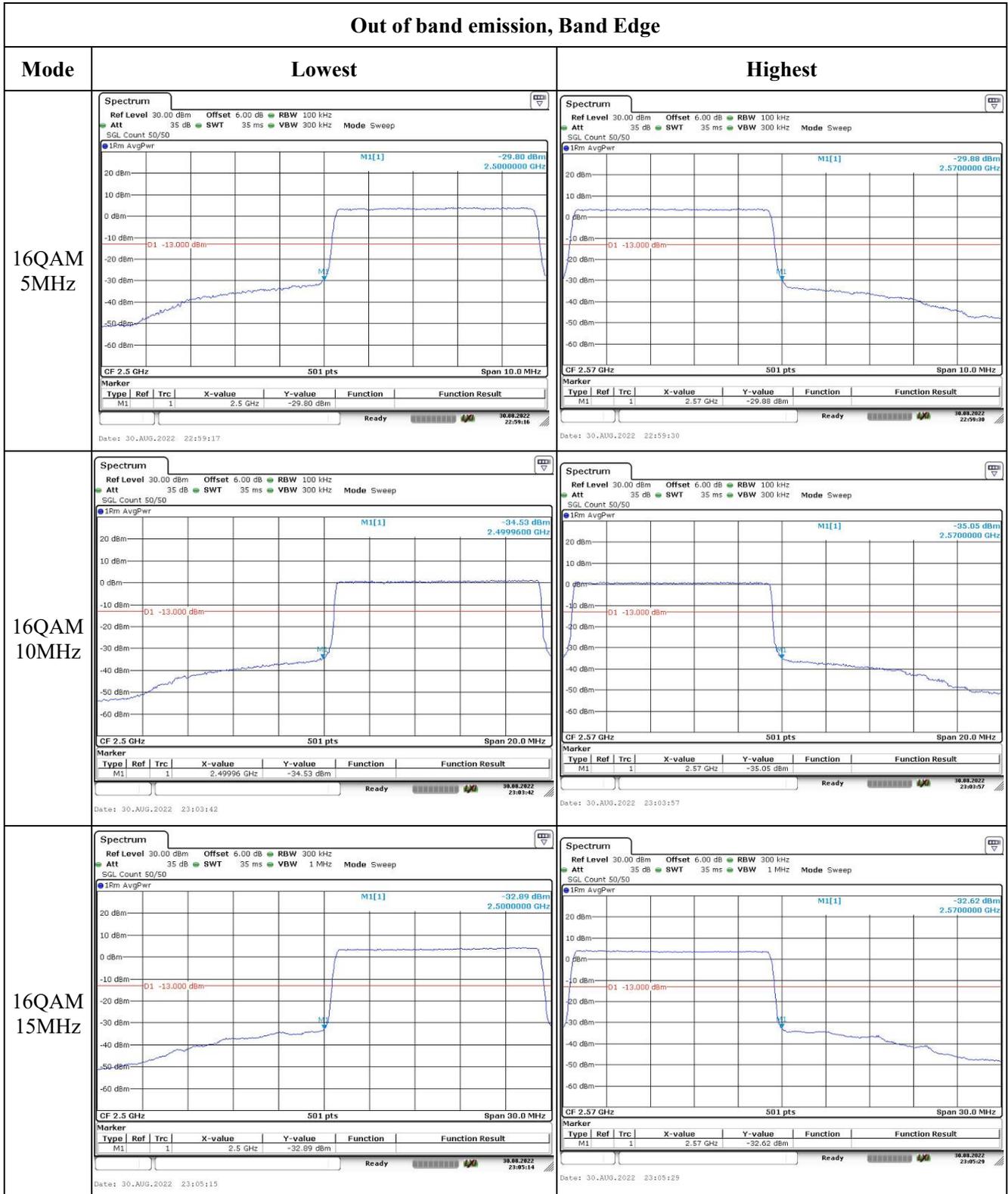
Out of band emission, Band Edge



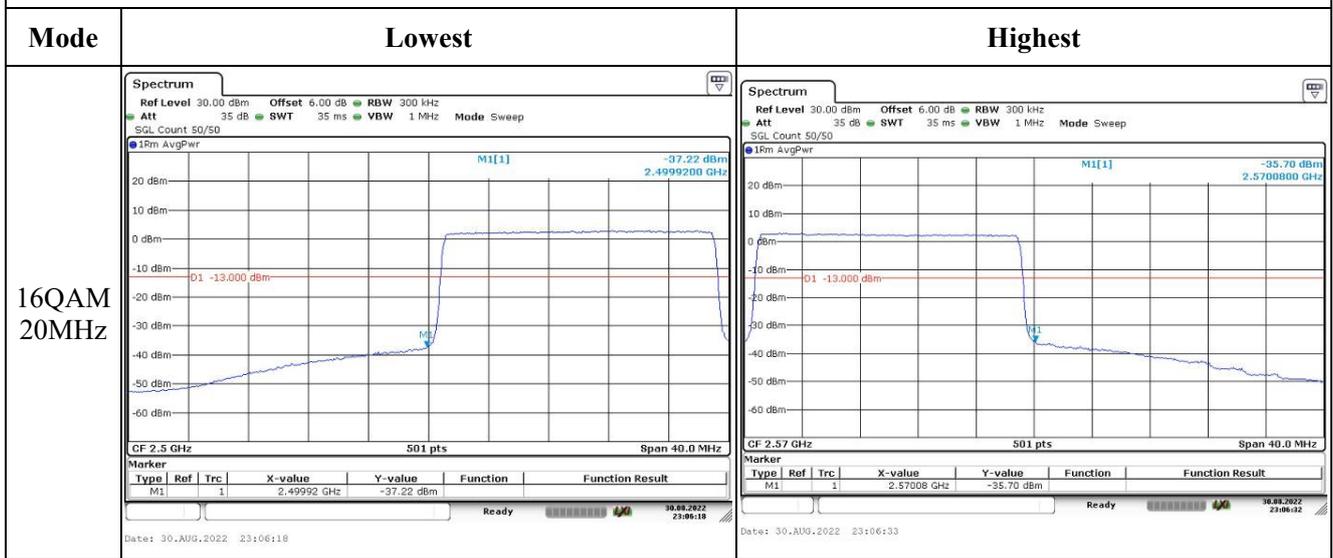
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.10 Antenna Port Test Data and Results for LTE Band 12

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 12▲:

Antenna Gain (dBi):	0.3	Antenna Gain (dBd):	-1.85	Cable Loss (dB):	0.2
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	699.7	707.5	715.3
3MHz	700.5	707.5	714.5
5MHz	701.5	707.5	713.5
10MHz	704	707.5	711

Test Data:**FCC§2.1046;§ 27.50(c) (10)****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	23.46	23.49	23.46	21.61	34.77
	RB1#3	23.64	23.62	23.66		
	RB1#5	23.5	23.48	23.5		
	RB3#0	23.51	23.45	23.52		
	RB3#3	23.56	23.49	23.53		
	RB6#0	22.55	22.57	22.55		
1.4MHz 16QAM	RB1#0	22.45	22.38	22.55	20.69	34.77
	RB1#3	22.64	22.55	22.74		
	RB1#5	22.48	22.41	22.51		
	RB3#0	22.58	22.53	22.41		
	RB3#3	22.58	22.56	22.42		
	RB6#0	21.54	21.54	21.56		
3MHz QPSK	RB1#0	23.55	23.52	23.54	21.54	34.77
	RB1#8	23.52	23.53	23.59		
	RB1#14	23.52	23.57	23.59		
	RB6#0	22.47	22.55	22.51		
	RB6#9	22.55	22.56	22.57		
	RB15#0	22.54	22.5	22.51		
3MHz 16QAM	RB1#0	23.06	22.59	22.5	21.01	34.77
	RB1#8	23.03	22.6	22.47		
	RB1#14	23	22.63	22.49		
	RB6#0	21.57	21.52	21.48		
	RB6#9	21.57	21.56	21.46		
	RB15#0	21.58	21.42	21.56		
5MHz QPSK	RB1#0	23.46	23.45	23.38	21.5	34.77
	RB1#13	23.55	23.54	23.53		
	RB1#24	23.48	23.48	23.45		
	RB15#0	22.44	22.51	22.47		
	RB15#10	22.6	22.49	22.54		
	RB25#0	22.47	22.48	22.47		
5MHz 16QAM	RB1#0	22.32	22.62	22.47	20.69	34.77
	RB1#13	22.42	22.74	22.56		
	RB1#24	22.31	22.7	22.47		
	RB15#0	21.49	21.49	21.5		
	RB15#10	21.61	21.44	21.54		
	RB25#0	21.53	21.46	21.51		
10MHz QPSK	RB1#0	23.44	23.45	23.52	21.7	34.77
	RB1#25	23.65	23.75	23.74		

	RB1#49	23.6	23.56	23.61		
	RB25#0	22.41	22.61	22.59		
	RB25#25	22.52	22.59	22.61		
	RB50#0	22.43	22.53	22.59		
10MHz 16QAM	RB1#0	23.01	22.58	22.45	21.16	34.77
	RB1#25	23.21	22.75	22.65		
	RB1#49	22.98	22.64	22.55		
	RB25#0	21.49	21.57	21.65		
	RB25#25	21.54	21.6	21.67		
	RB50#0	21.46	21.53	21.58		

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	5.42	3.62	3.97	13
	RB50#0	4.81	4.87	4.58	13
10MHz 16QAM	RB1#0	6.35	4.38	4.72	13
	RB50#0	5.62	5.8	5.71	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	1.102	1.102	1.108	1.314	1.296	1.356
1.4MHz 16QAM	1.096	1.096	1.108	1.284	1.284	1.332
3MHz QPSK	2.683	2.683	2.683	2.88	2.88	2.892
3MHz 16QAM	2.671	2.683	2.695	2.868	2.892	2.892
5MHz QPSK	4.491	4.531	4.511	5.12	5.22	5.16
5MHz 16QAM	4.531	4.531	4.531	5.16	5.2	5.12
10MHz QPSK	8.942	9.022	8.942	9.8	10.16	9.76
10MHz 16QAM	8.942	8.982	8.982	9.88	9.8	9.88

Note: The test plots please refer to the Plots of Occupied Bandwidth

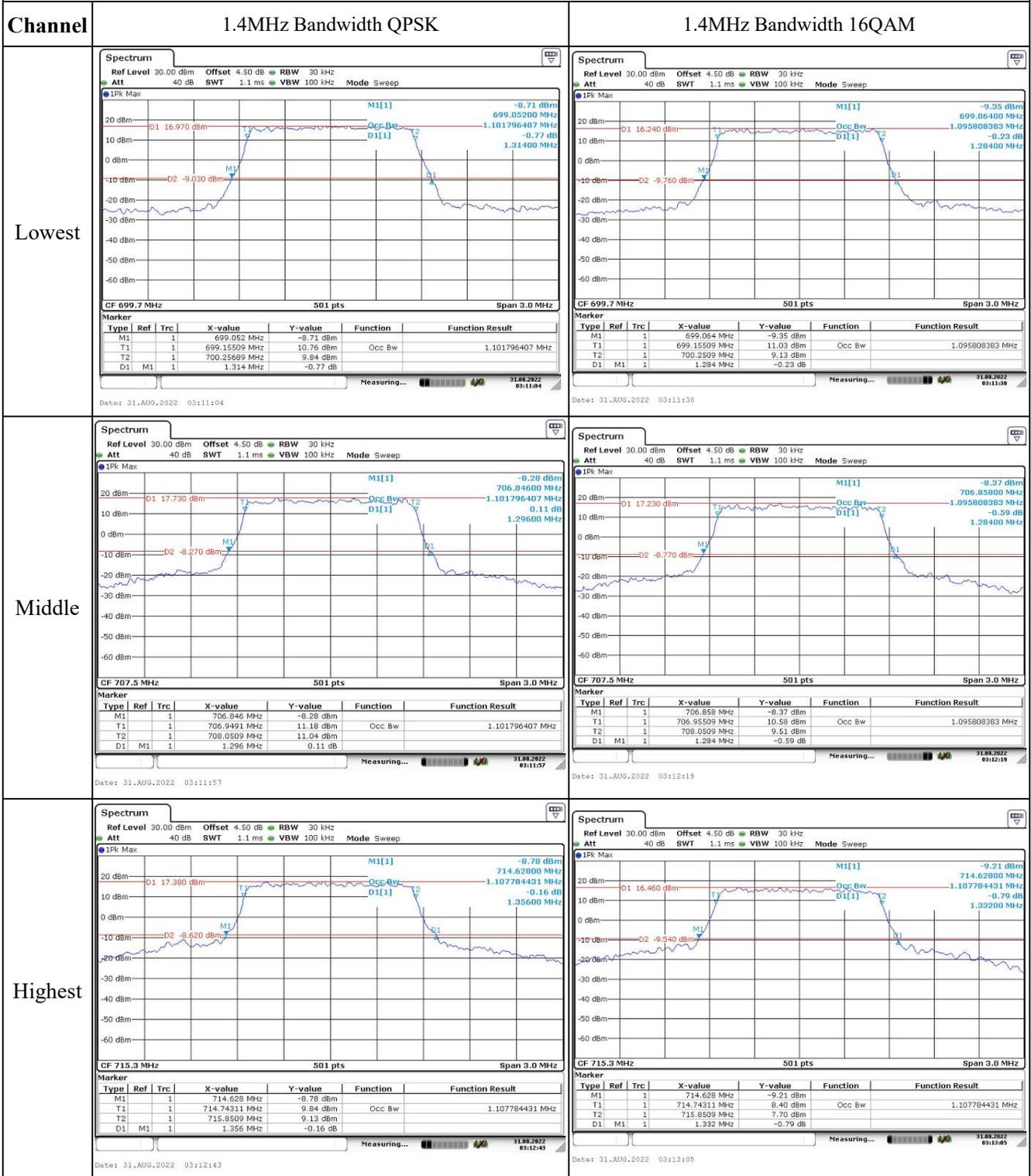
FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal**Result: Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.****FCC §2.1051, §27.53:Out of band emission, Band Edge****Result: Pass, Please refer to the test plots of Out of band emission, Band Edge.****FCC §2.1055, §27.54: Frequency Stability**

Test Mode:	10M 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	699.528	699.00	715.463	716.00
	-20	3.85	699.552	699.00	715.542	716.00
	-10	3.85	699.486	699.00	715.530	716.00
	0	3.85	699.559	699.00	715.472	716.00
	10	3.85	699.503	699.00	715.517	716.00
	20	3.85	699.529	699.00	715.471	716.00
	30	3.85	699.514	699.00	715.538	716.00
	40	3.85	699.546	699.00	715.473	716.00
Frequency Stability vs. Voltage	20	3.3	699.489	699.00	715.534	716.00
	20	4.4	699.536	699.00	715.495	716.00
Result:					Pass	

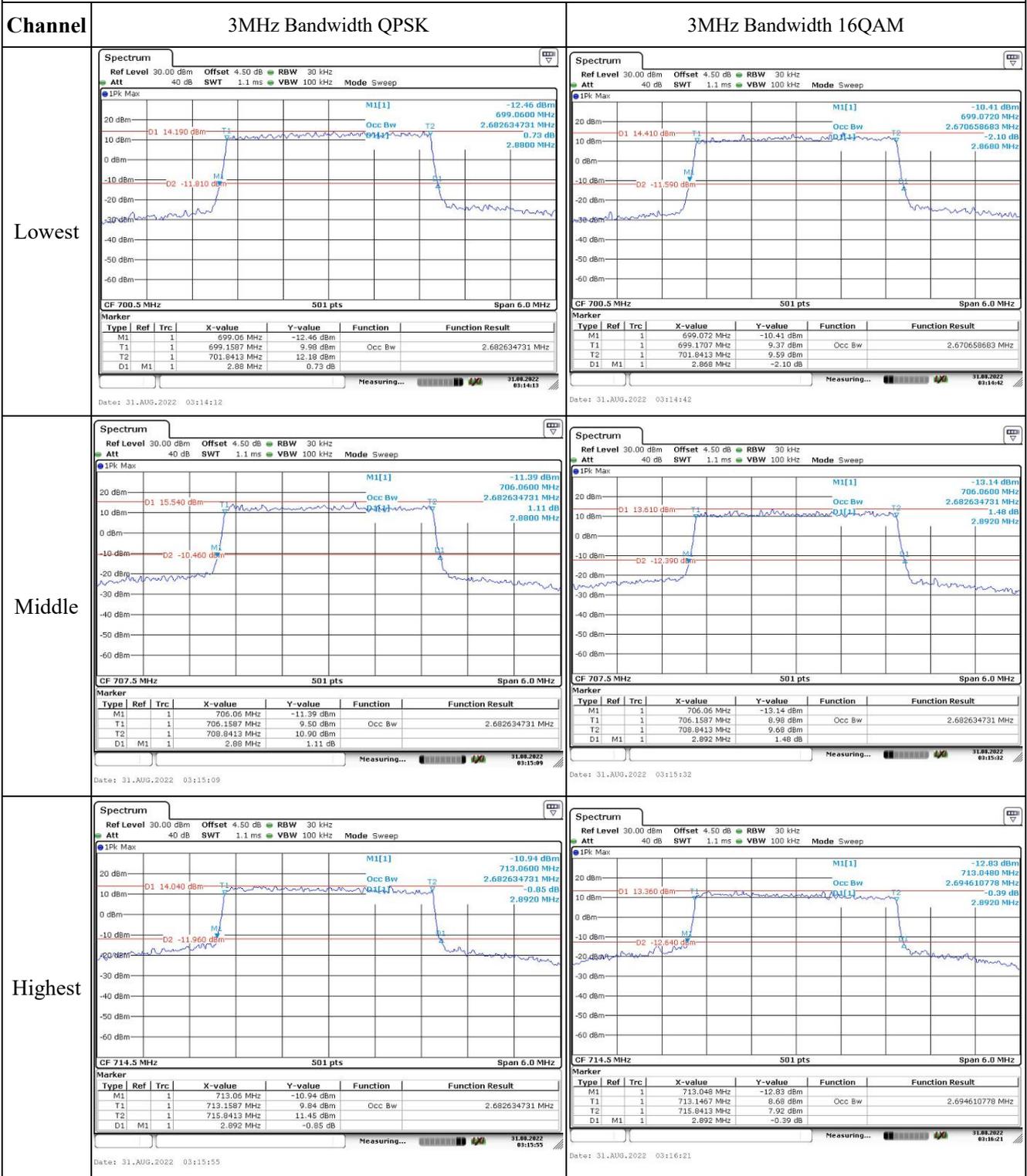
Test Mode:	10M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	699.528	699.00	715.481	716.00
	-20	3.85	699.555	699.00	715.549	716.00
	-10	3.85	699.534	699.00	715.529	716.00
	0	3.85	699.520	699.00	715.548	716.00
	10	3.85	699.568	699.00	715.527	716.00
	20	3.85	699.529	699.00	715.511	716.00
	30	3.85	699.527	699.00	715.504	716.00
	40	3.85	699.565	699.00	715.518	716.00
Frequency Stability vs. Voltage	20	3.3	699.534	699.00	715.572	716.00
	20	4.4	699.504	699.00	715.524	716.00
Result:					Pass	

Test Plots:

Occupied Bandwidth



Occupied Bandwidth



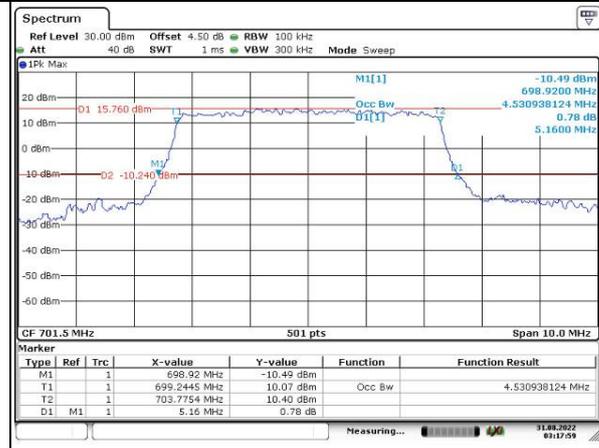
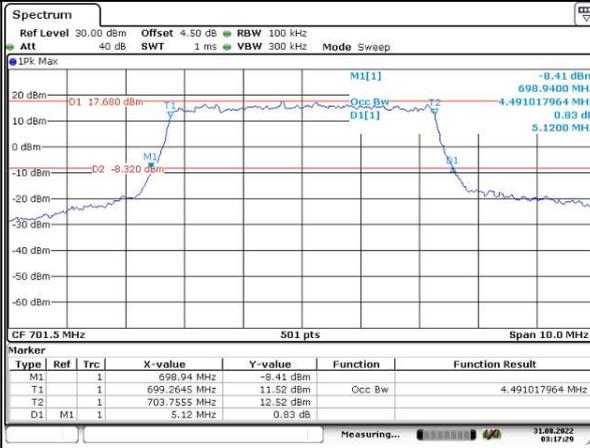
Occupied Bandwidth

Channel

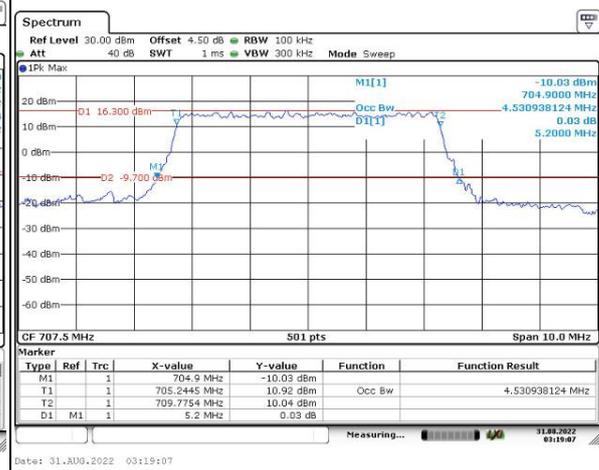
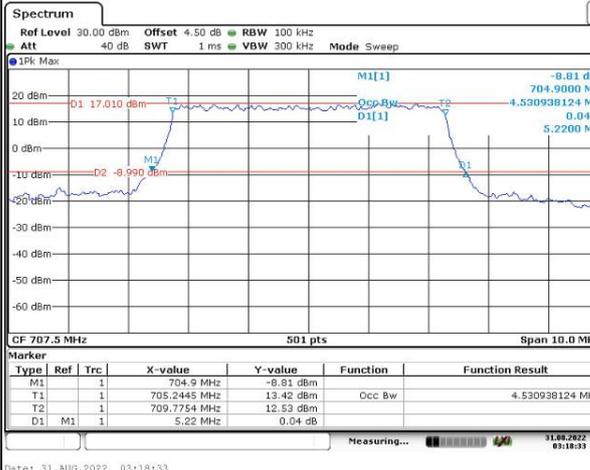
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

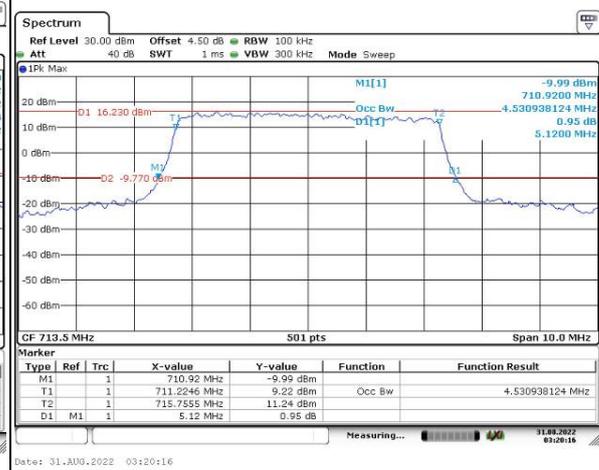
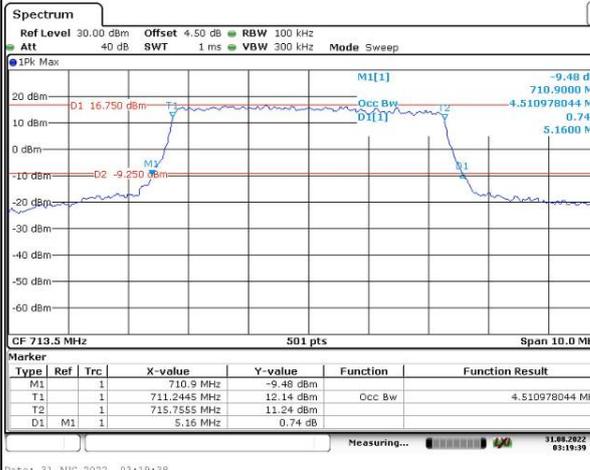
Lowest



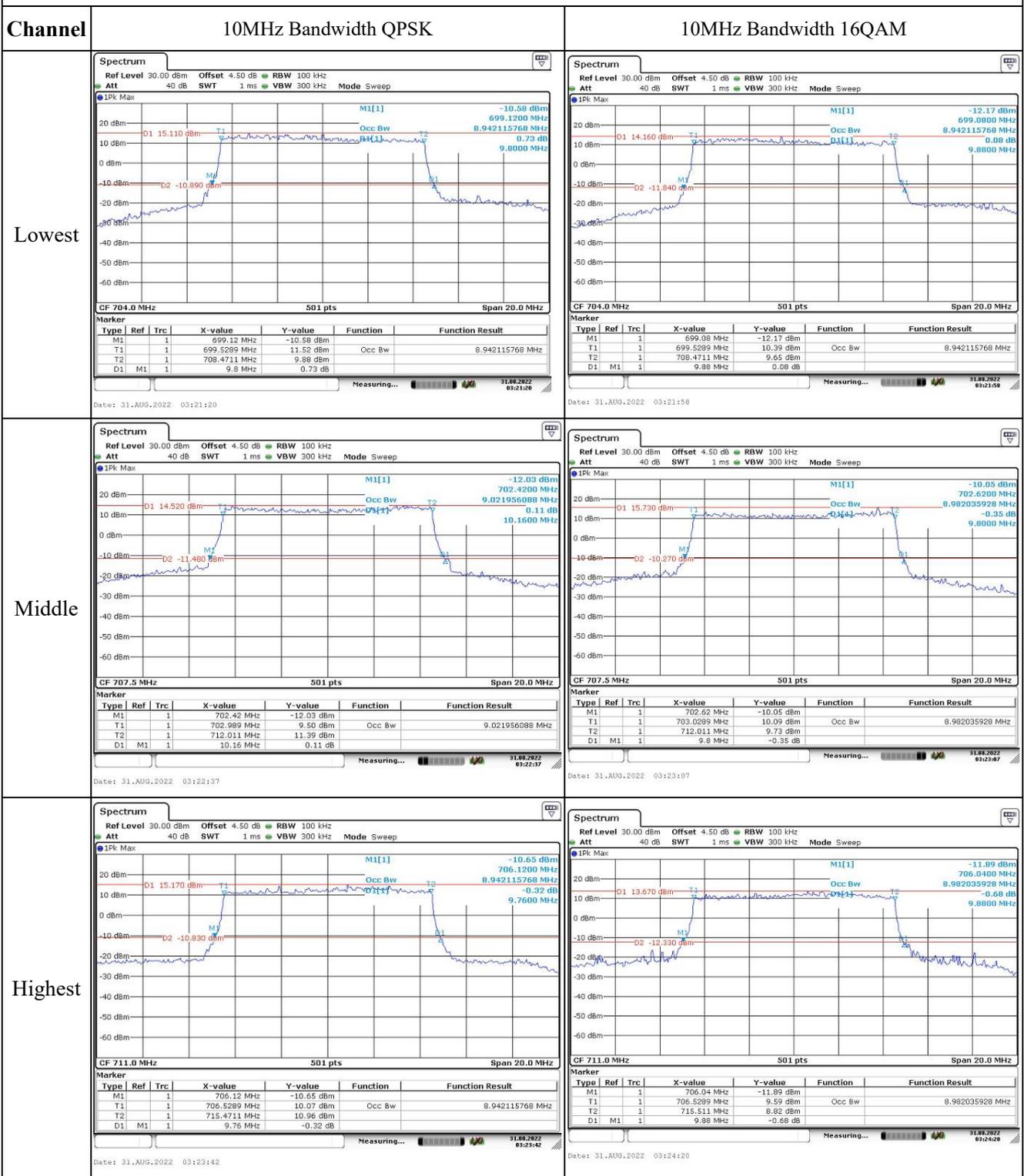
Middle



Highest



Occupied Bandwidth

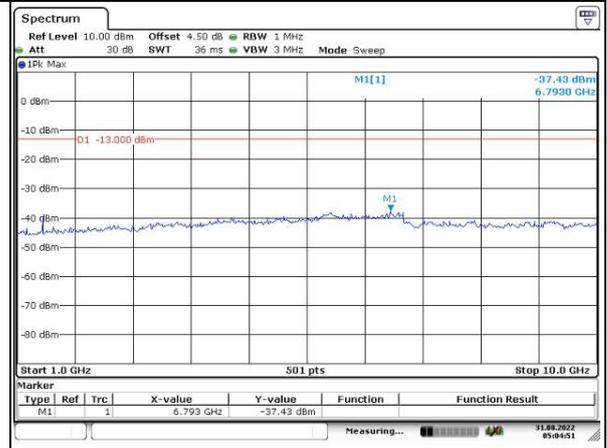
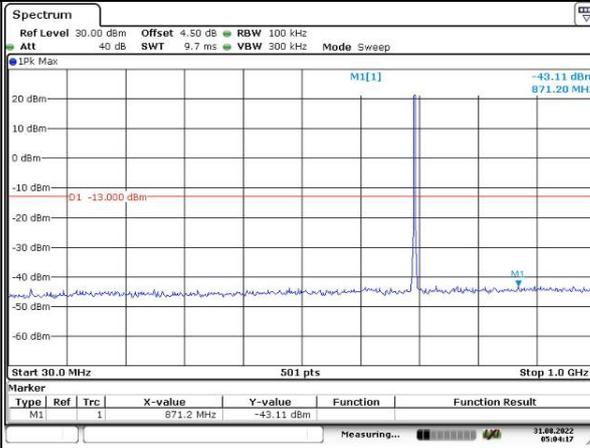


Spurious Emissions at Antenna Terminal

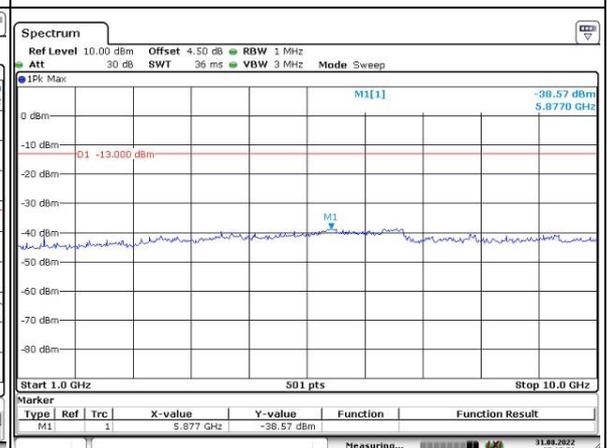
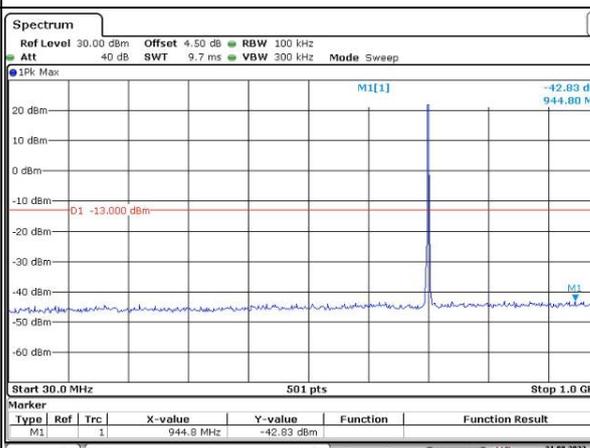
Channel

1.4MHz Bandwidth QPSK

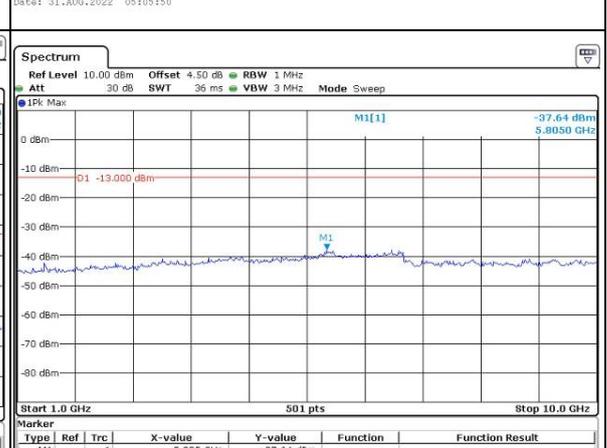
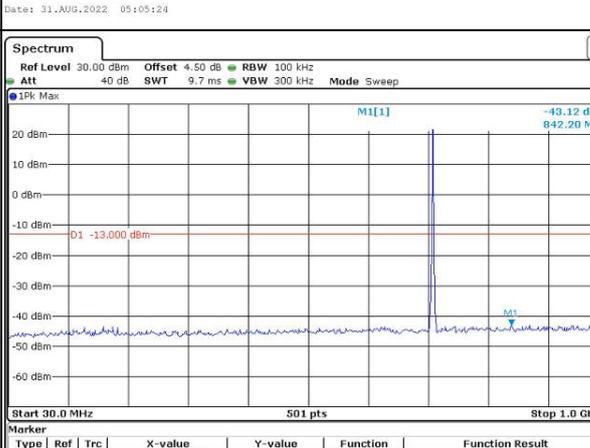
Lowest



Middle



Highest

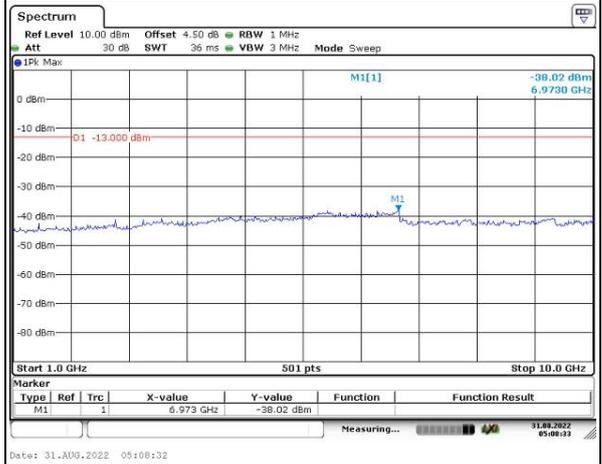
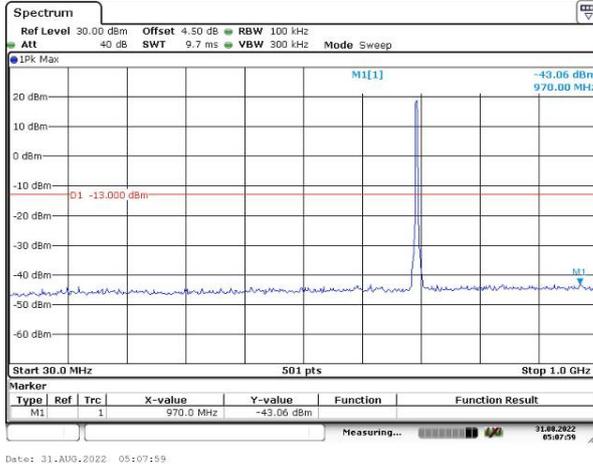


Spurious Emissions at Antenna Terminal

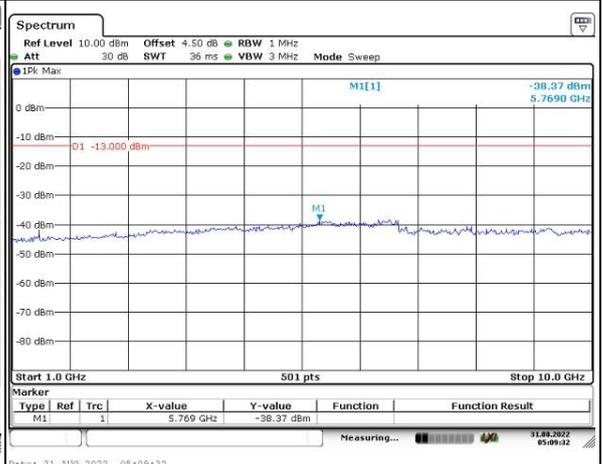
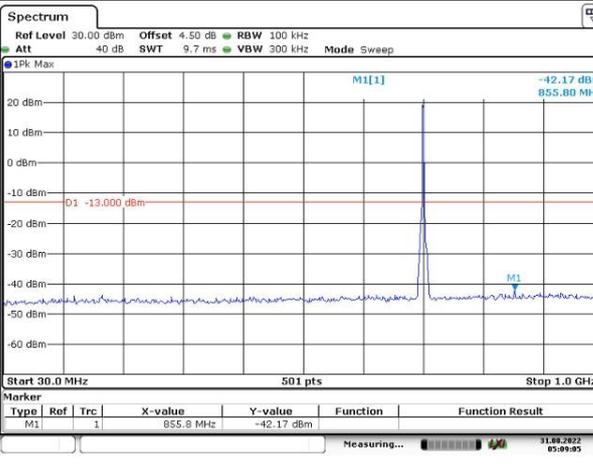
Channel

3MHz Bandwidth QPSK

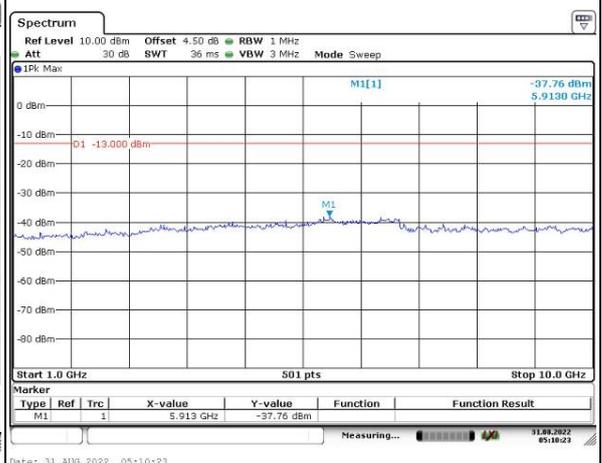
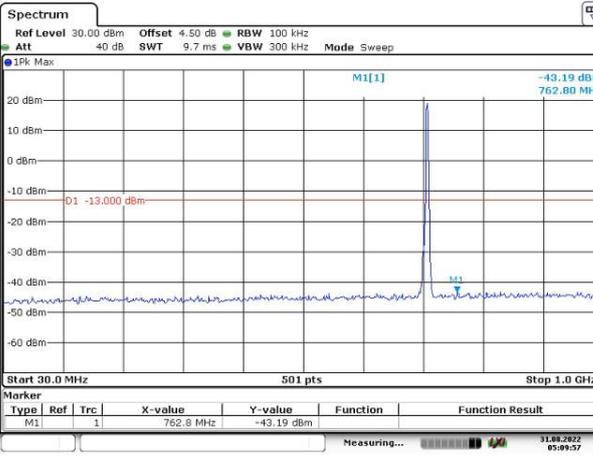
Lowest



Middle



Highest

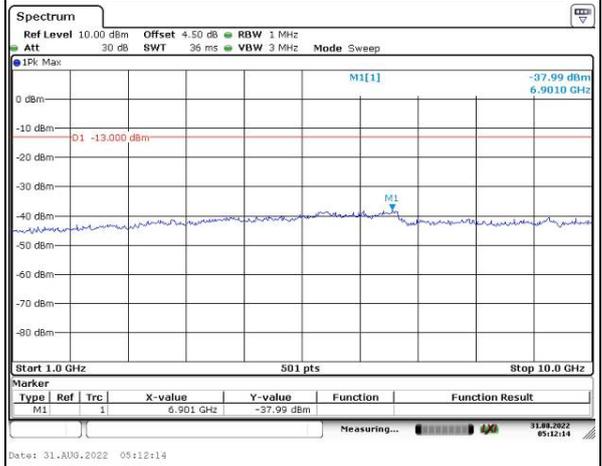
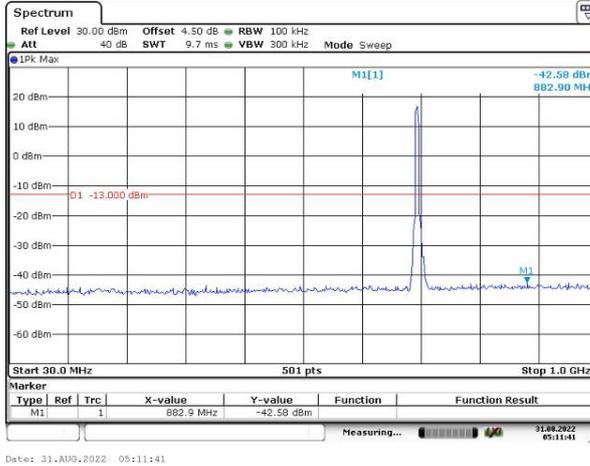


Spurious Emissions at Antenna Terminal

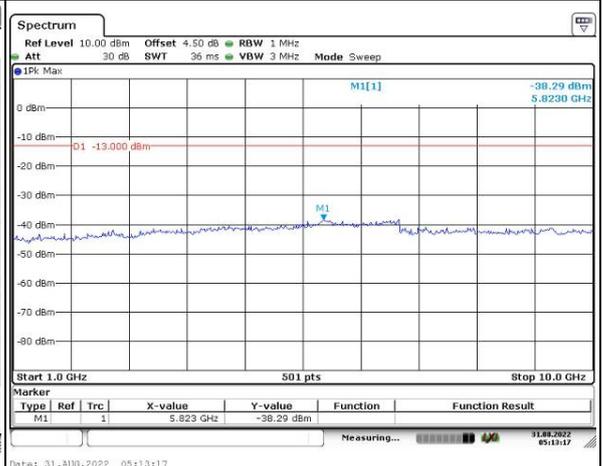
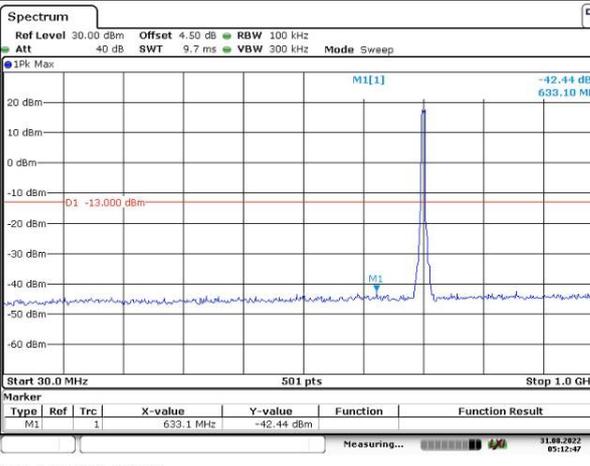
Channel

5MHz Bandwidth QPSK

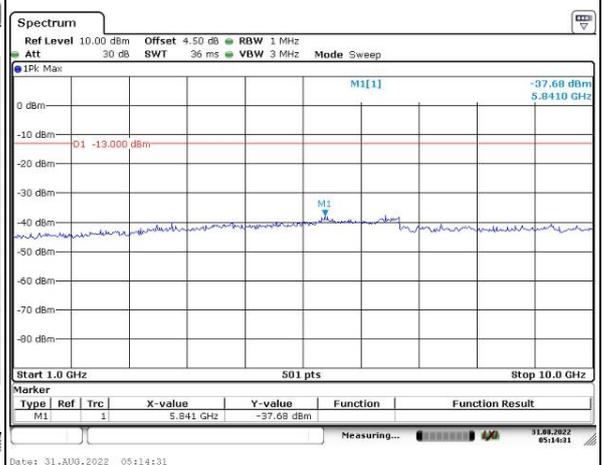
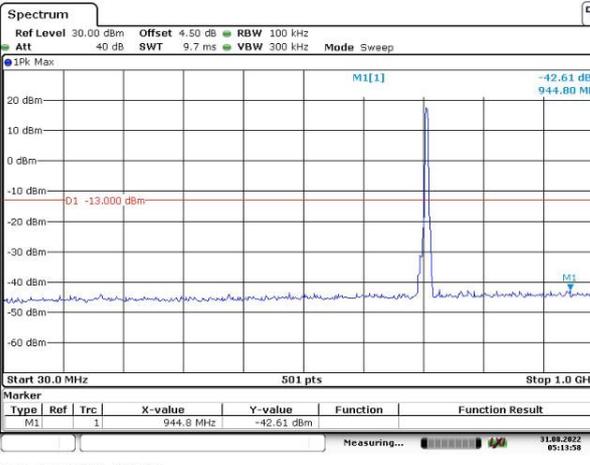
Lowest



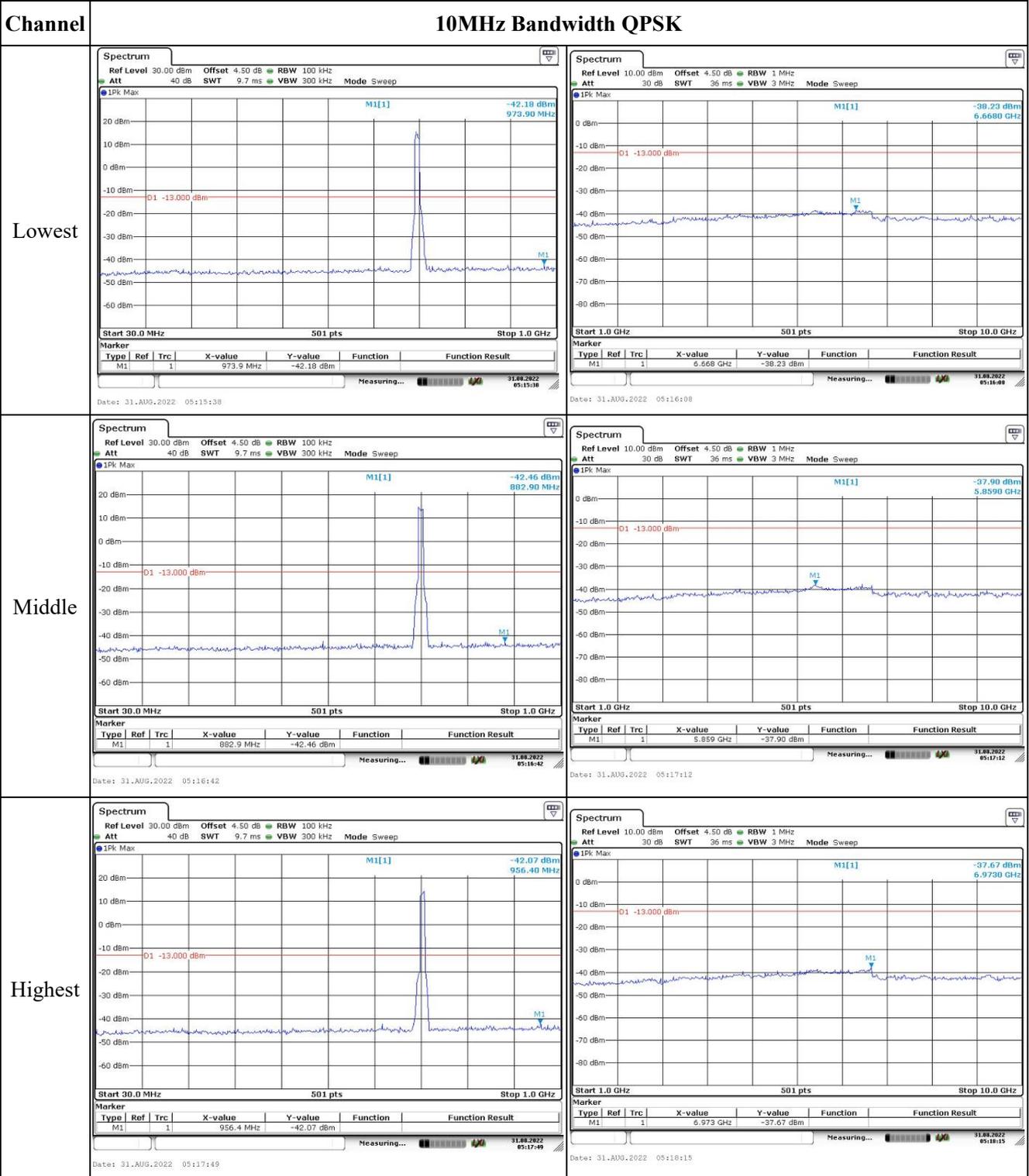
Middle



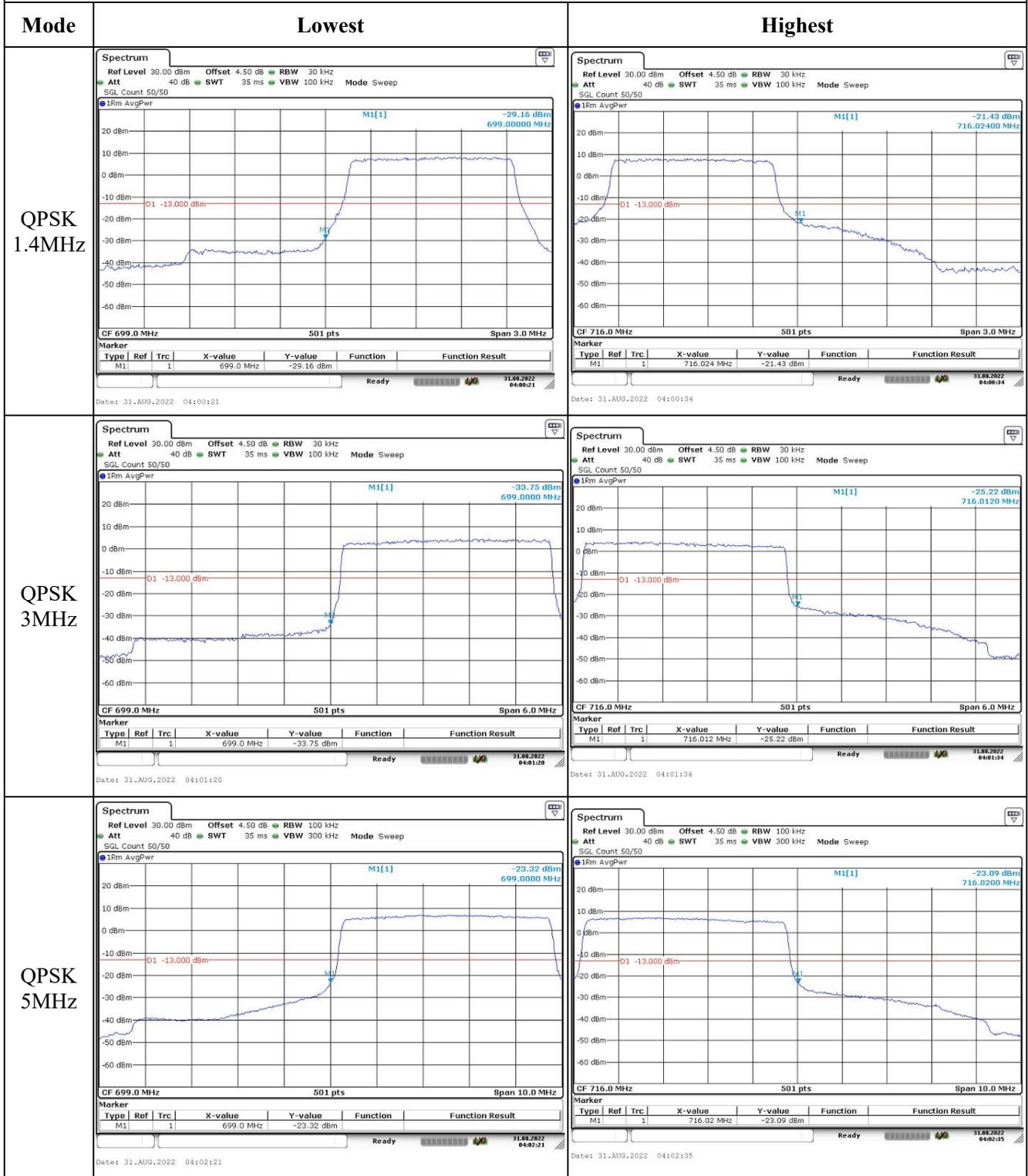
Highest



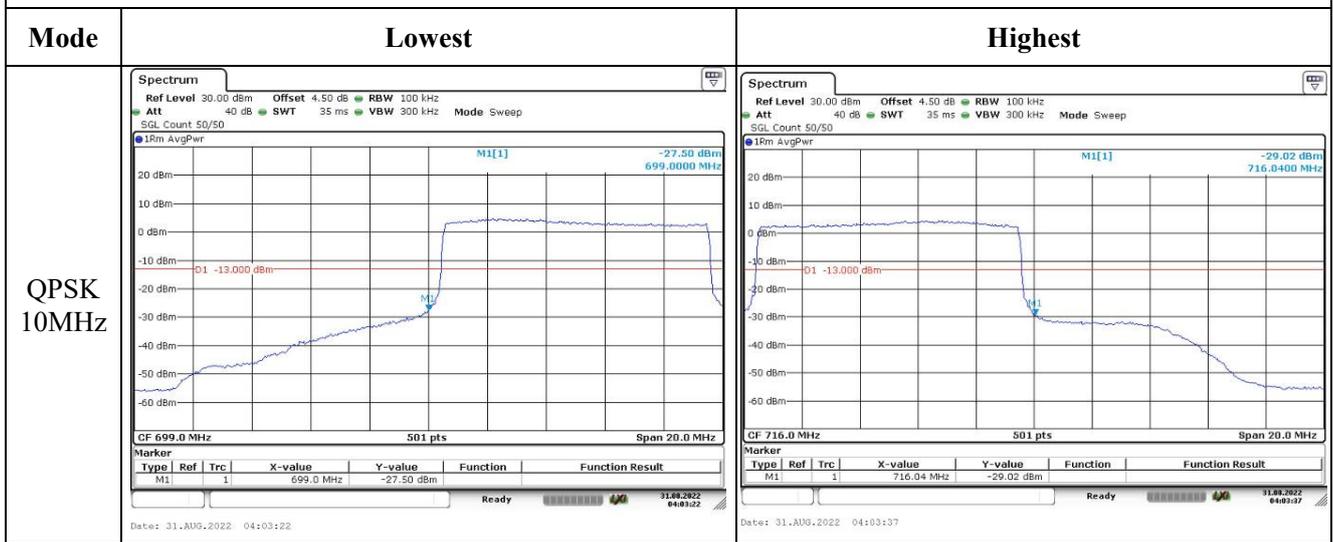
Spurious Emissions at Antenna Terminal



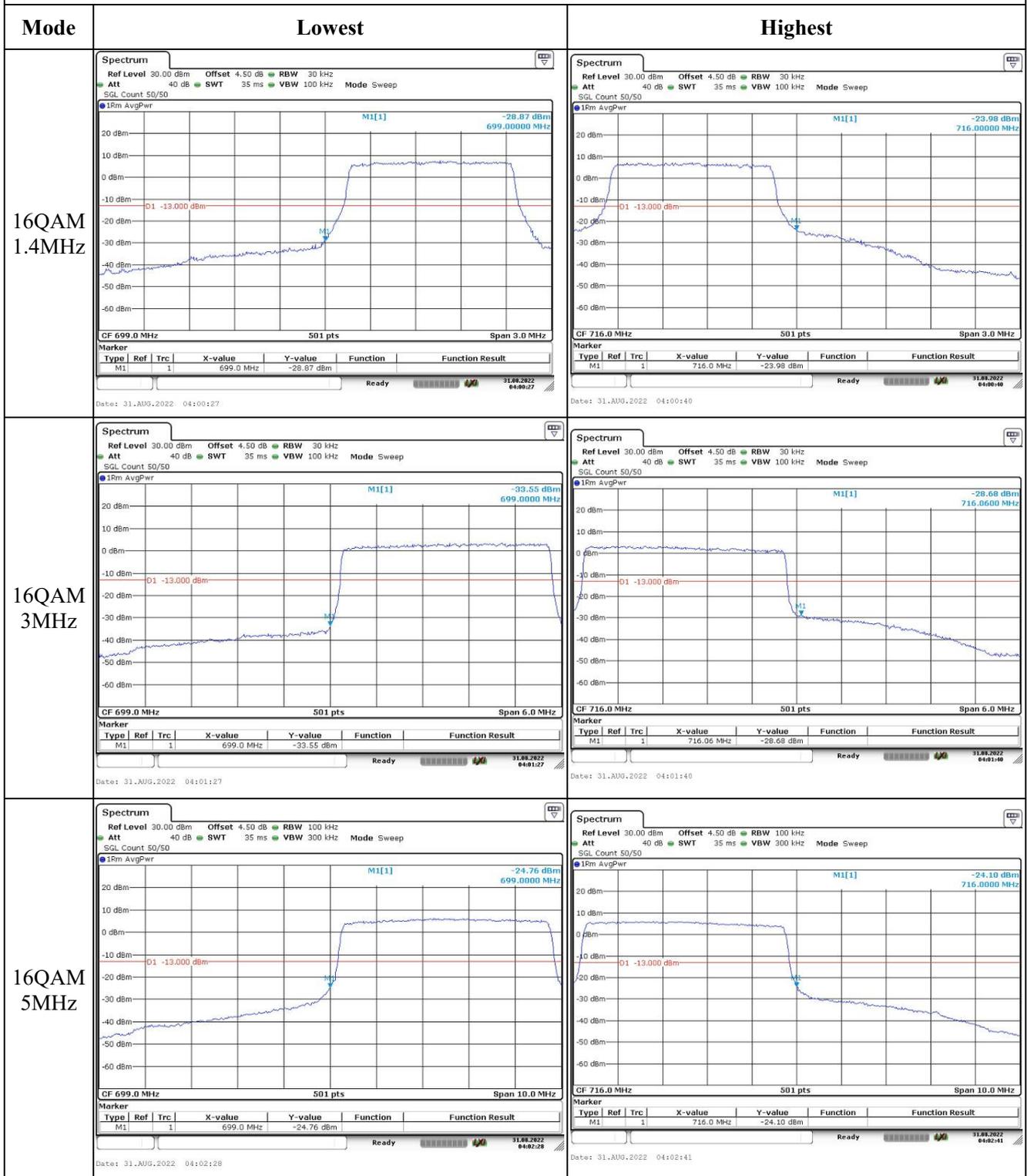
Out of band emission, Band Edge



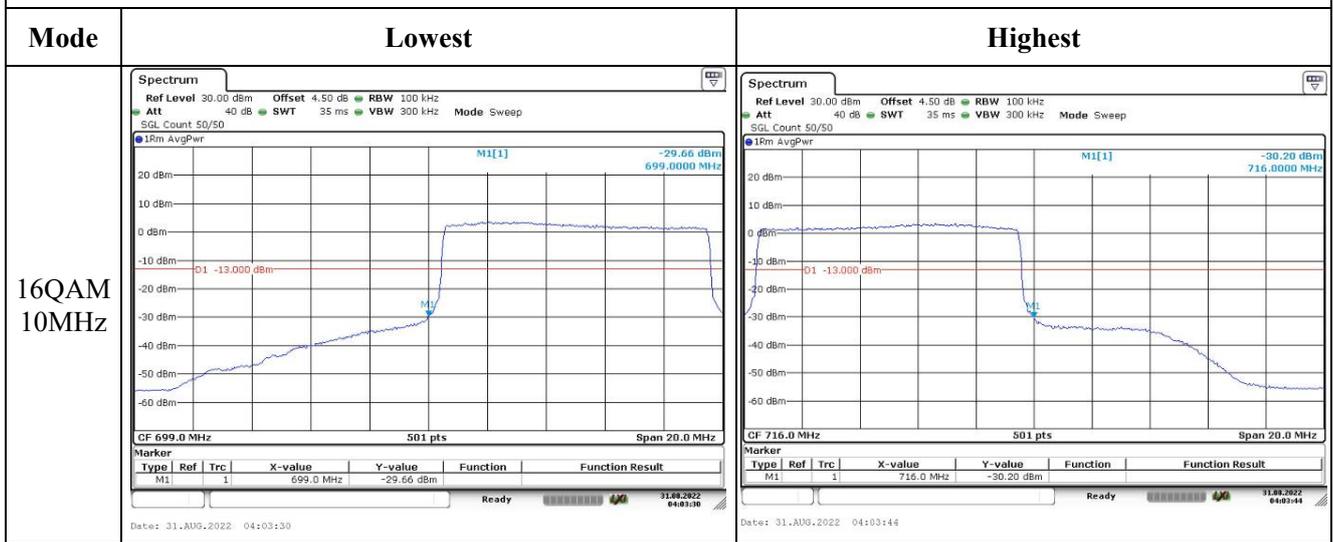
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.11 Antenna Port Test Data and Results for LTE Band 17

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 17▲:

Antenna Gain (dBi):	0.3	Antenna Gain (dBd):	-1.85	Cable Loss (dB):	0.2
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)
5MHz	706.5	710	713.5
10MHz	709	710	711

Test Data:**FCC§2.1046;§ 27.50(c) (10)****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		
5MHz QPSK	RB1#0	24.04	24.07	23.93	22.1	34.77
	RB1#13	24.1	24.03	23.95		
	RB1#24	24.15	24.02	24.01		
	RB15#0	22.9	23.17	23.09		
	RB15#10	23.21	23.12	23.05		
	RB25#0	22.88	23.14	23.08		
5MHz 16QAM	RB1#0	22.32	23.09	22.79	21.12	34.77
	RB1#13	22.14	23.17	22.68		
	RB1#24	22.42	23.09	22.76		
	RB15#0	22.26	22.2	22.21		
	RB15#10	22.37	22.21	22.25		
	RB25#0	22.29	22.34	22.05		
10MHz QPSK	RB1#0	23.95	24.18	23.95	22.21	34.77
	RB1#25	23.93	24.26	23.97		
	RB1#49	24.02	24.23	24.06		
	RB25#0	22.82	23.14	23.03		
	RB25#25	23.13	23.07	23.08		
	RB50#0	23.14	23.2	23.1		
10MHz 16QAM	RB1#0	23.39	22.43	22.94	21.34	34.77
	RB1#25	23.22	22.7	23.16		
	RB1#49	23.37	22.7	23.21		
	RB25#0	22.24	22.35	22.22		
	RB25#25	22.2	22.28	22.24		
	RB50#0	22.34	22.29	22.38		
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	5.59	5.54	5.04	13
	RB50#0	5.1	5.22	5.36	13
10MHz 16QAM	RB1#0	6.84	6.38	6.2	13
	RB50#0	6.06	6.23	6.26	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
5MHz QPSK	4.511	4.491	4.511	4.98	4.98	5.02
5MHz 16QAM	4.491	4.511	4.571	5	4.98	5.04
10MHz QPSK	8.942	8.942	8.942	9.64	9.72	9.72
10MHz 16QAM	8.942	8.902	8.942	9.68	9.72	9.72

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.

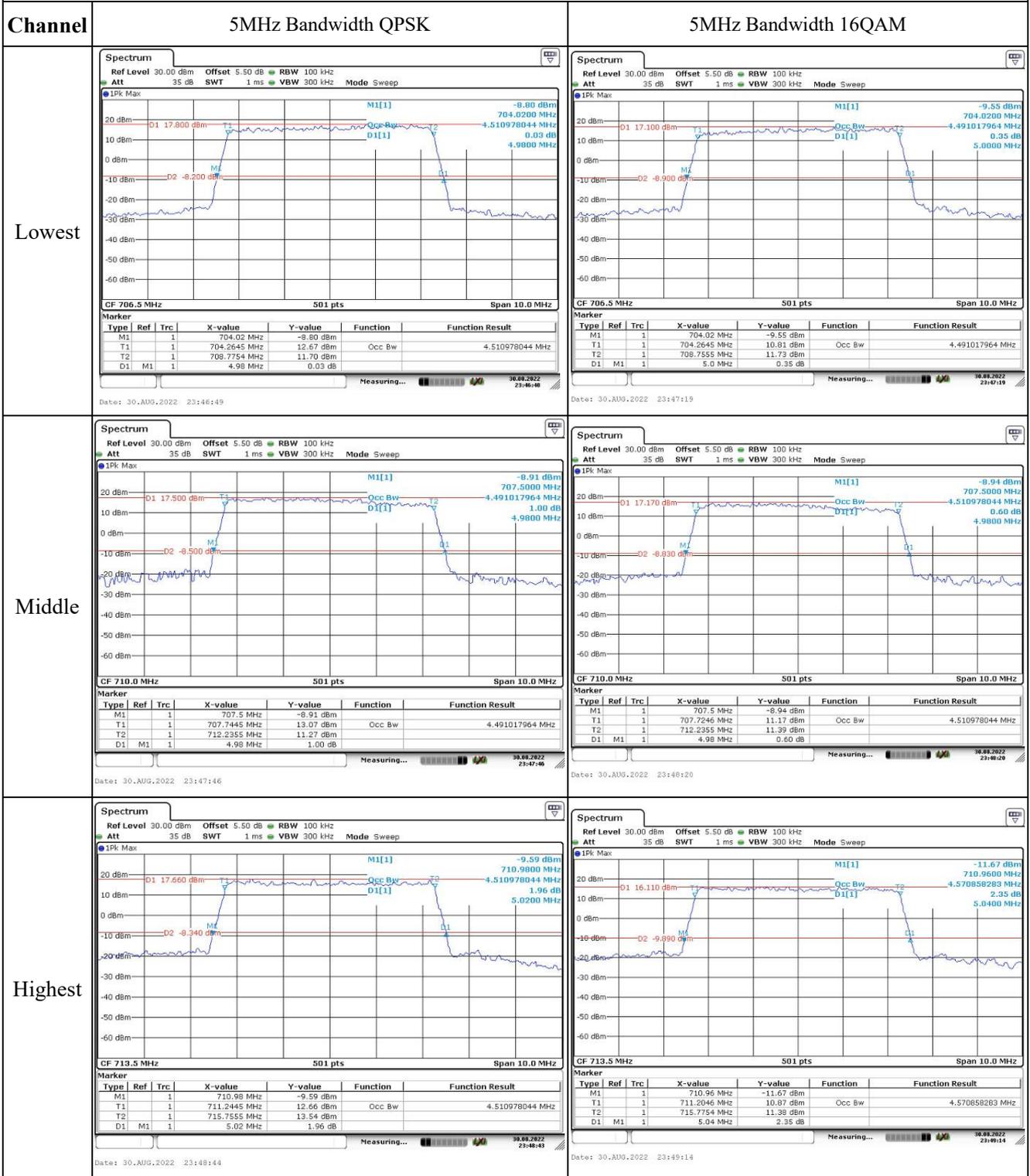
FCC §2.1051, §27.53:Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

FCC §2.1055, §27.54: Frequency Stability						
Test Mode:	10M 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	704.552	704.00	715.484	716.00
	-20	3.85	704.504	704.00	715.525	716.00
	-10	3.85	704.555	704.00	715.512	716.00
	0	3.85	704.550	704.00	715.471	716.00
	10	3.85	704.560	704.00	715.464	716.00
	20	3.85	704.529	704.00	715.471	716.00
	30	3.85	704.576	704.00	715.434	716.00
	40	3.85	704.489	704.00	715.473	716.00
Frequency Stability vs. Voltage	20	3.3	704.562	704.00	715.526	716.00
	20	4.4	704.562	704.00	715.451	716.00
					Result:	Pass

Test Mode:	10M 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	704.554	704.00	715.522	716.00
	-20	3.85	704.489	704.00	715.442	716.00
	-10	3.85	704.490	704.00	715.447	716.00
	0	3.85	704.569	704.00	715.506	716.00
	10	3.85	704.573	704.00	715.454	716.00
	20	3.85	704.529	704.00	715.471	716.00
	30	3.85	704.498	704.00	715.507	716.00
	40	3.85	704.521	704.00	715.489	716.00
	50	3.85	704.563	704.00	715.483	716.00
Frequency Stability vs. Voltage	20	3.3	704.502	704.00	715.480	716.00
	20	4.4	704.558	704.00	715.513	716.00
					Result:	Pass

Test Plots:

Occupied Bandwidth



Occupied Bandwidth

