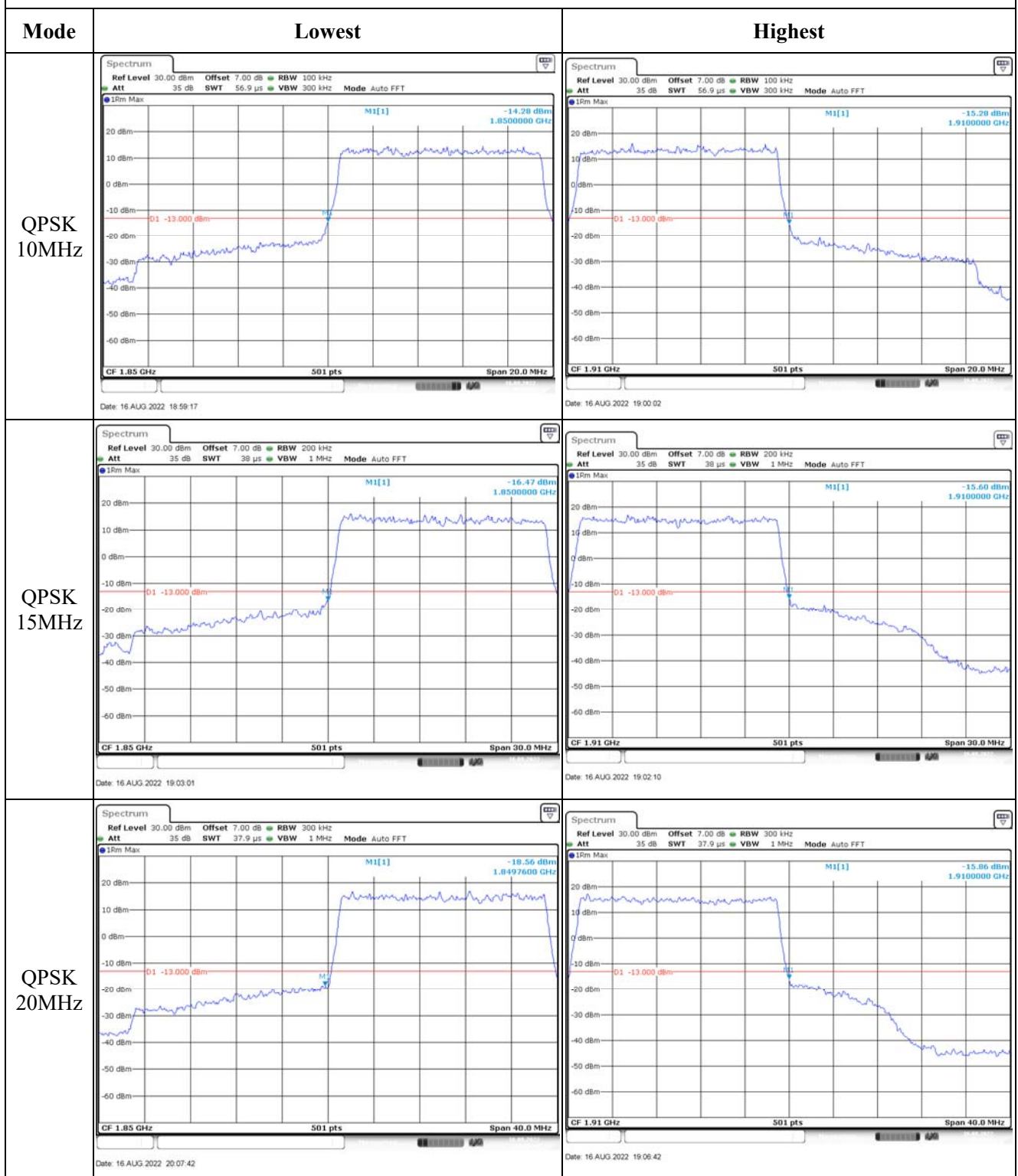
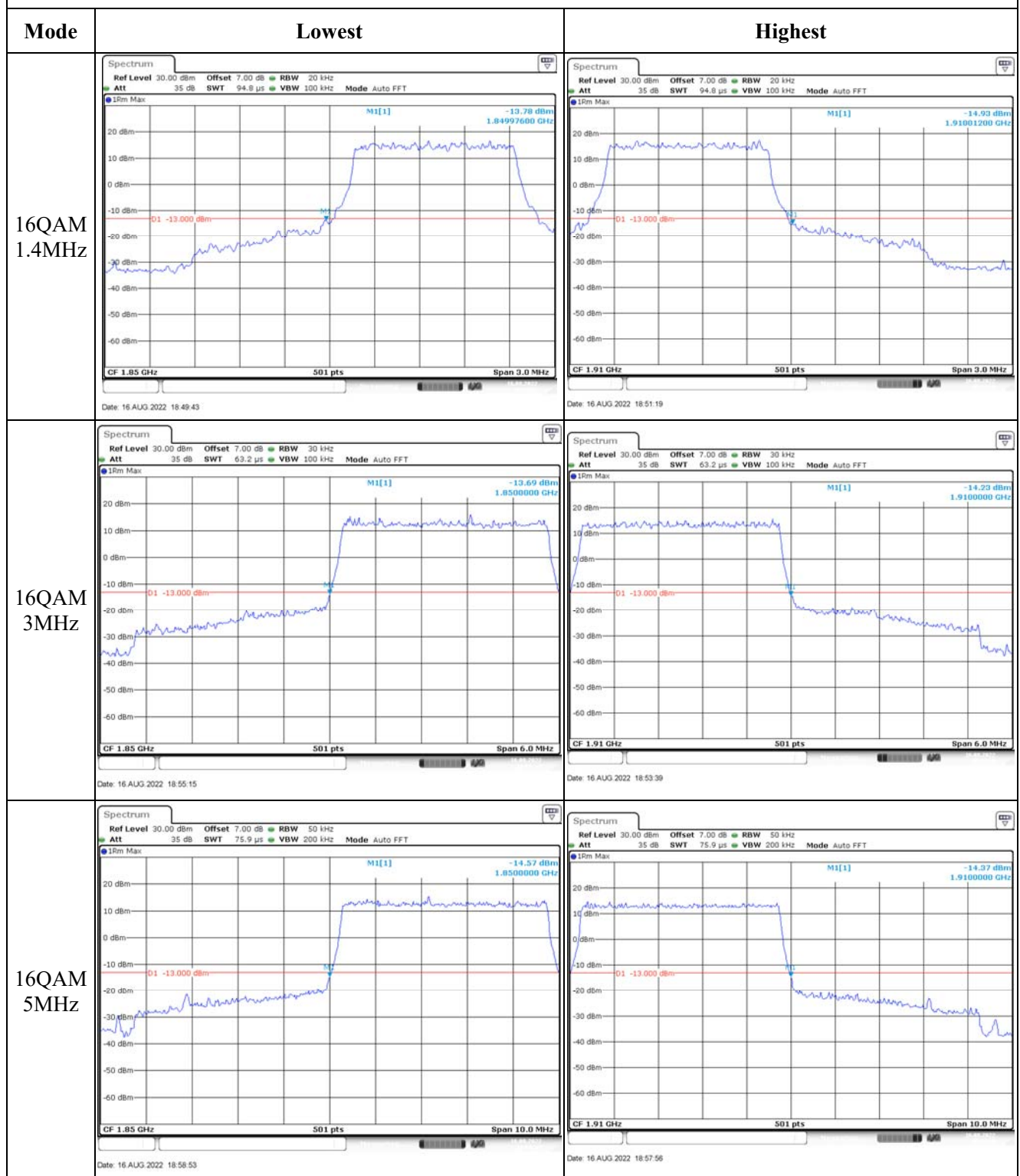


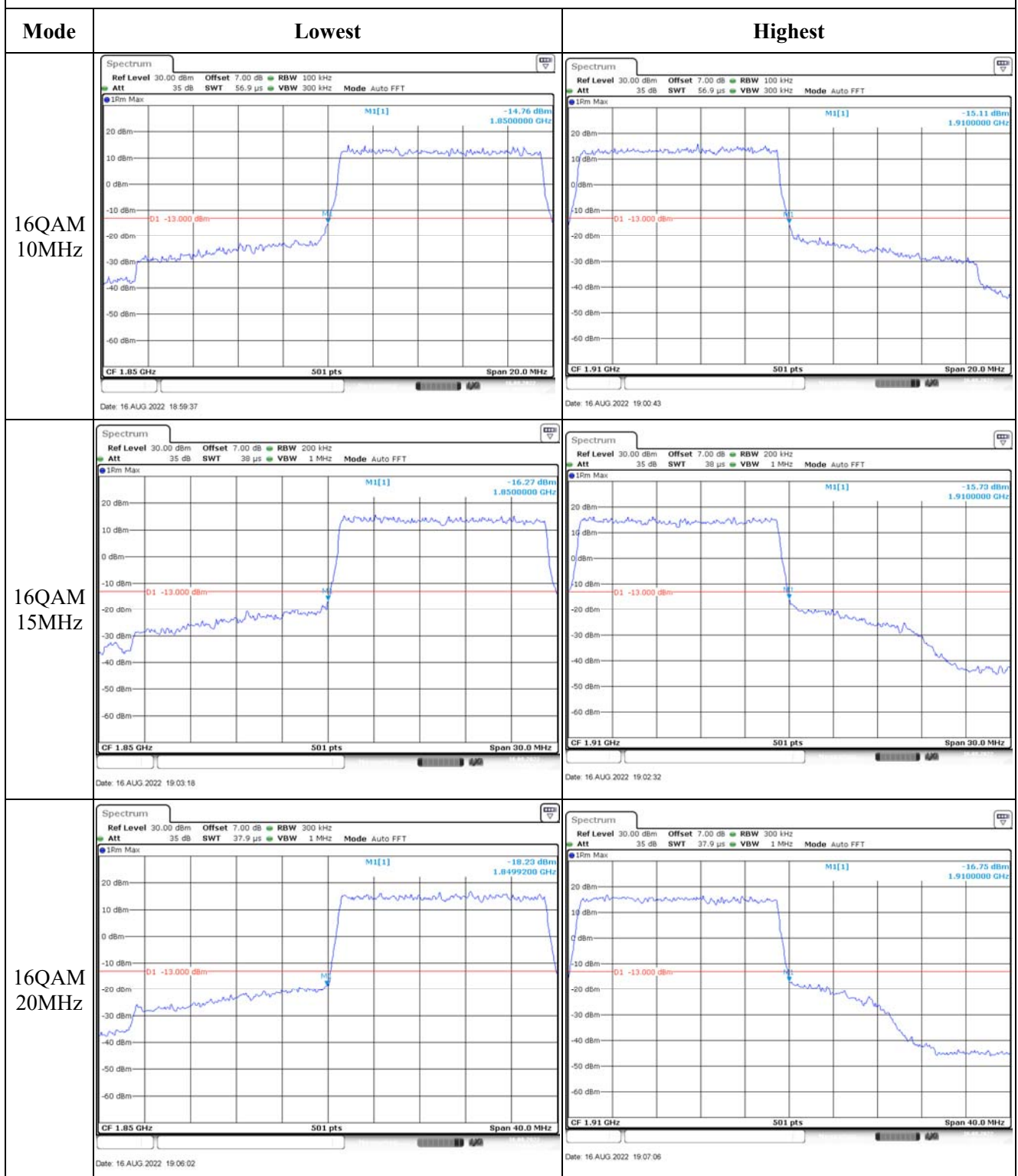
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.4 Antenna Port Test Data and Results for LTE Band 4

Serial Number:	CR220050077-RF-S1	Test Date:	2022/7/5~2022/8/16
Test Site:	RF	Test Mode:	Transmitting
Tester:	Ted Min	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	24.5~26.7	Relative Humidity: (%)	51~58	ATM Pressure: (kPa)	100.1~100.3
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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	2021-10-10	2022-10-09
R&S	Wideband Radio Communication Tester	CMW500	149218	2021-07-21	2022-07-20
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
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Unknown	Coaxial tee connector	Unknown	2204006	Each time	N/A
Unknown	RF Cable	Unknown	RF Cable 004	Each time	N/A
HuiXunDa	DC Block	SMA-JK 18G	DCB181108042	Each time	N/A
Weinschel	Coaxial Attenuators	53-20-34	LN751	Each time	N/A

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

EUT Information@ LTE Band 4▲:

Antenna Gain (dBi):	2.38	Path Loss L _C (dB):	0.5
Operation Voltage(V _{DC}):			
Lowest:	6.66	Normal:	7.4
		Highest:	8.14

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
1.4MHz	1710.7	1732.5	1754.3
3MHz	1711.5	1732.5	1753.5
5MHz	1712.5	1732.5	1752.5
10MHz	1715	1732.5	1750

15MHz	1717.5	1732.5	1747.5
20MHz	1720	1732.5	1745

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

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	21.94	21.95	22.06	24.05	30
	RB1#3	21.92	22.07	22.16		
	RB1#5	21.96	22.09	22.17		
	RB3#0	21.8	21.9	22		
	RB3#3	21.9	21.9	22.03		
	RB6#0	21.45	21.52	21.54		
1.4MHz 16QAM	RB1#0	21.54	21.58	21.56	23.79	30
	RB1#3	21.52	21.62	21.58		
	RB1#5	21.78	21.81	21.91		
	RB3#0	21.64	21.67	21.84		
	RB3#3	21.75	21.84	21.9		
	RB6#0	21.41	21.55	21.57		
3MHz QPSK	RB1#0	21.86	21.91	21.93	23.9	30
	RB1#8	21.89	21.94	21.93		
	RB1#14	21.93	22.02	21.96		
	RB6#0	21.88	21.98	21.78		
	RB6#9	21.9	21.94	21.8		
	RB15#0	21.54	21.59	21.38		
3MHz 16QAM	RB1#0	21.5	21.61	21.44	23.66	30
	RB1#8	21.63	21.65	21.4		
	RB1#14	21.69	21.78	21.54		
	RB6#0	21.54	21.61	21.51		
	RB6#9	21.6	21.7	21.76		
	RB15#0	21.31	21.39	21.45		
5MHz QPSK	RB1#0	21.96	21.86	21.95	23.97	30
	RB1#13	22	21.95	22.01		
	RB1#24	22.09	21.96	22.08		
	RB15#0	22	21.81	21.94		
	RB15#10	22.01	21.93	21.93		
	RB25#0	21.67	21.53	21.61		
5MHz 16QAM	RB1#0	21.68	21.47	21.47	23.58	30
	RB1#13	21.7	21.61	21.53		
	RB1#24	21.67	21.62	21.61		
	RB15#0	21.52	21.48	21.47		
	RB15#10	21.49	21.5	21.51		

	RB25#0	21.22	21.22	21.14		
10MHz QPSK	RB1#0	21.91	21.96	21.86	23.98	30
	RB1#25	22.01	21.94	21.97		
	RB1#49	22.1	21.97	21.95		
	RB25#0	21.94	21.94	21.9		
	RB25#25	21.93	22.05	21.88		
	RB50#0	21.62	21.67	21.59		
10MHz 16QAM	RB1#0	21.54	21.58	21.51	23.66	30
	RB1#25	21.51	21.71	21.57		
	RB1#49	21.63	21.78	21.59		
	RB25#0	21.51	21.62	21.49		
	RB25#25	21.49	21.6	21.54		
	RB50#0	21.27	21.31	21.11		
15MHz QPSK	RB1#0	21.89	21.94	21.99	24.05	30
	RB1#38	21.99	22.04	22.12		
	RB1#74	22.02	22.12	22.17		
	RB36#0	22.01	22.07	22.06		
	RB36#39	21.98	21.96	22.03		
	RB75#0	21.62	21.85	21.7		
15MHz 16QAM	RB1#0	21.68	21.84	21.66	23.72	30
	RB1#38	21.72	21.81	21.69		
	RB1#74	21.78	21.76	21.64		
	RB36#0	21.64	21.58	21.46		
	RB36#39	21.77	21.58	21.47		
	RB75#0	21.26	21.24	21.13		
20MHz QPSK	RB1#0	21.96	22.01	22.1	24.05	30
	RB1#50	22.03	22.01	22.08		
	RB1#99	22.11	22.01	22.17		
	RB50#0	22.04	21.99	21.94		
	RB50#50	22.1	22.02	21.99		
	RB100#0	21.65	21.7	21.62		
20MHz 16QAM	RB1#0	21.78	21.57	21.51	23.71	30
	RB1#50	21.76	21.72	21.51		
	RB1#99	21.83	21.72	21.63		
	RB50#0	21.78	21.71	21.52		
	RB50#50	21.75	21.83	21.59		
	RB100#0	21.38	21.41	21.28		
Note: EIRP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(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	3.26	3.31	3.28	13
	RB100#0	5.11	5.21	5.16	13
20MHz 16QAM	RB1#0	4.21	4.26	4.22	13
	RB100#0	6.39	6.27	6.31	13
Result:					Pass

FCC §2.1049, §27.53:Occupied Bandwidth						
Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
1.4MHz QPSK	1.096	1.102	1.102	1.314	1.326	1.296
1.4MHz 16QAM	1.102	1.096	1.102	1.314	1.296	1.332
3MHz QPSK	2.695	2.695	2.683	2.952	2.94	2.964
3MHz 16QAM	2.695	2.683	2.683	2.964	2.952	2.964
5MHz QPSK	4.531	4.511	4.511	5.04	5.08	5.08
5MHz 16QAM	4.511	4.551	4.551	5.04	5.04	5.08
10MHz QPSK	8.942	8.942	8.942	9.84	9.8	9.8
10MHz 16QAM	8.942	8.942	8.942	9.68	9.72	9.72
15MHz QPSK	13.533	13.533	13.533	14.94	14.82	14.88
15MHz 16QAM	13.533	13.533	13.533	14.76	14.82	14.88
20MHz QPSK	17.964	17.884	17.964	19.44	19.44	19.6
20MHz 16QAM	17.964	17.964	17.964	19.52	19.6	19.44
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.
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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.
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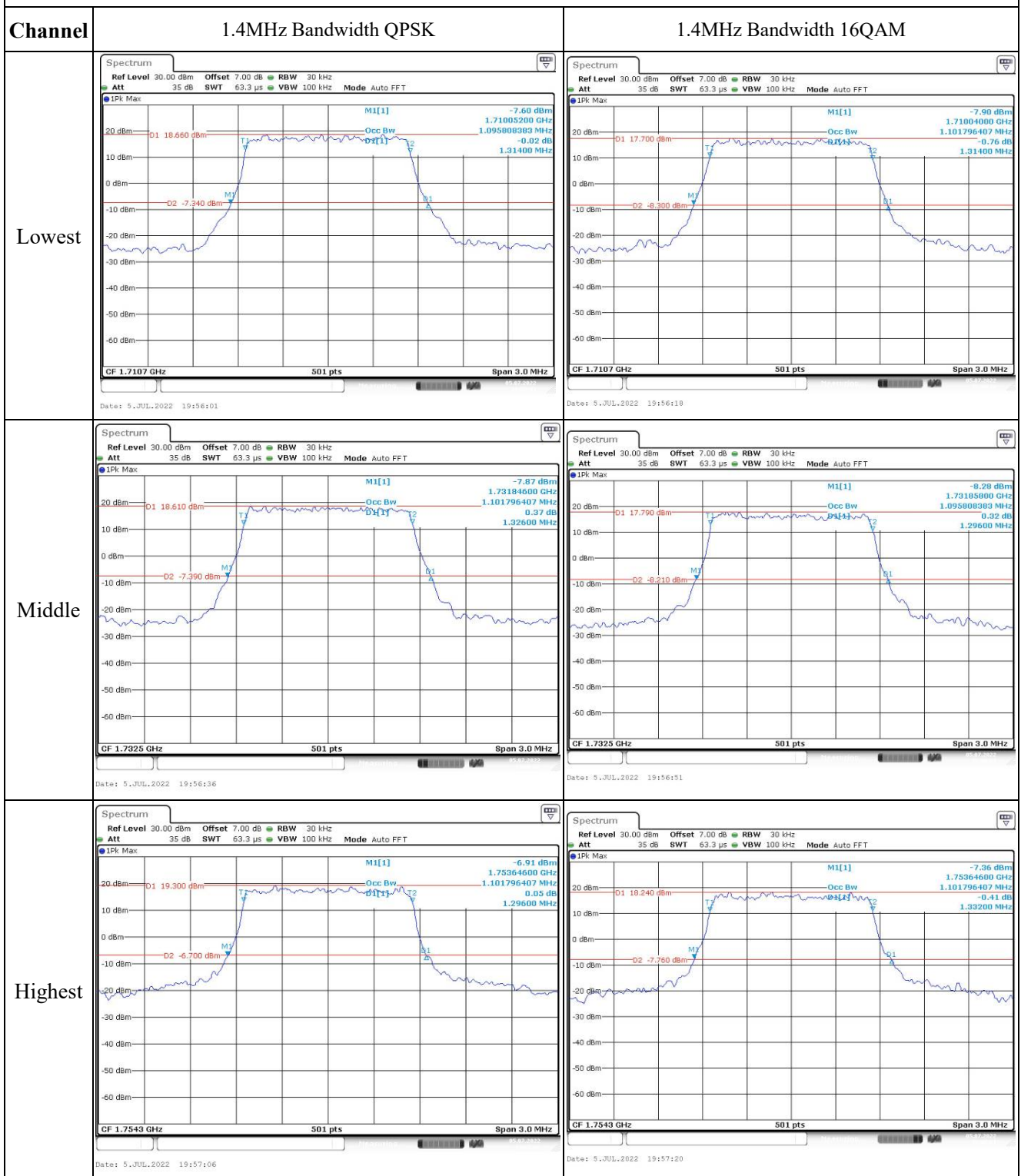
FCC §2.1055, §27.54: Frequency Stability

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	7.4	1710.233	1710.00	1754.885	1755
	-20	7.4	1710.350	1710.00	1754.889	1755
	-10	7.4	1710.283	1710.00	1754.830	1755
	0	7.4	1710.362	1710.00	1754.799	1755
	10	7.4	1710.313	1710.00	1754.775	1755
	20	7.4	1710.283	1710.00	1754.862	1755
	30	7.4	1710.410	1710.00	1754.898	1755
	40	7.4	1710.228	1710.00	1754.732	1755
	50	7.4	1710.326	1710.00	1754.715	1755
Frequency Stability vs. Voltage	20	6.66	1710.223	1710.00	1754.875	1755
	20	8.14	1710.295	1710.00	1754.857	1755
Result:					Pass	

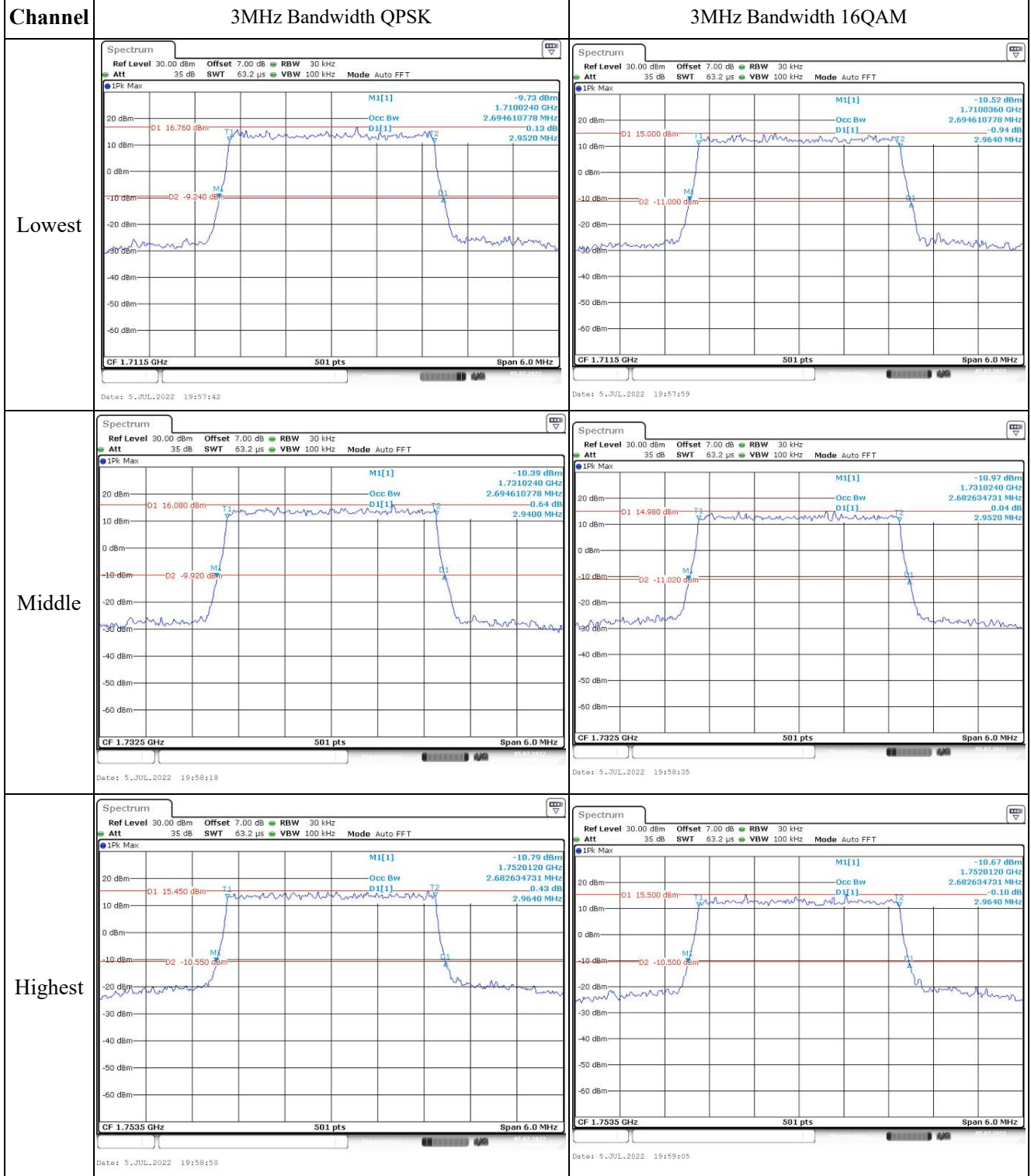
Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	7.4	1710.371	1710.00	1754.906	1755
	-20	7.4	1710.376	1710.00	1754.881	1755
	-10	7.4	1710.331	1710.00	1754.727	1755
	0	7.4	1710.267	1710.00	1754.831	1755
	10	7.4	1710.286	1710.00	1754.798	1755
	20	7.4	1710.406	1710.00	1754.904	1755
	30	7.4	1710.319	1710.00	1754.743	1755
	40	7.4	1710.244	1710.00	1754.822	1755
	50	7.4	1710.345	1710.00	1754.762	1755
Frequency Stability vs. Voltage	20	6.66	1710.248	1710.00	1754.761	1755
	20	8.14	1710.324	1710.00	1754.839	1755
Result:					Pass	

Test Plots:

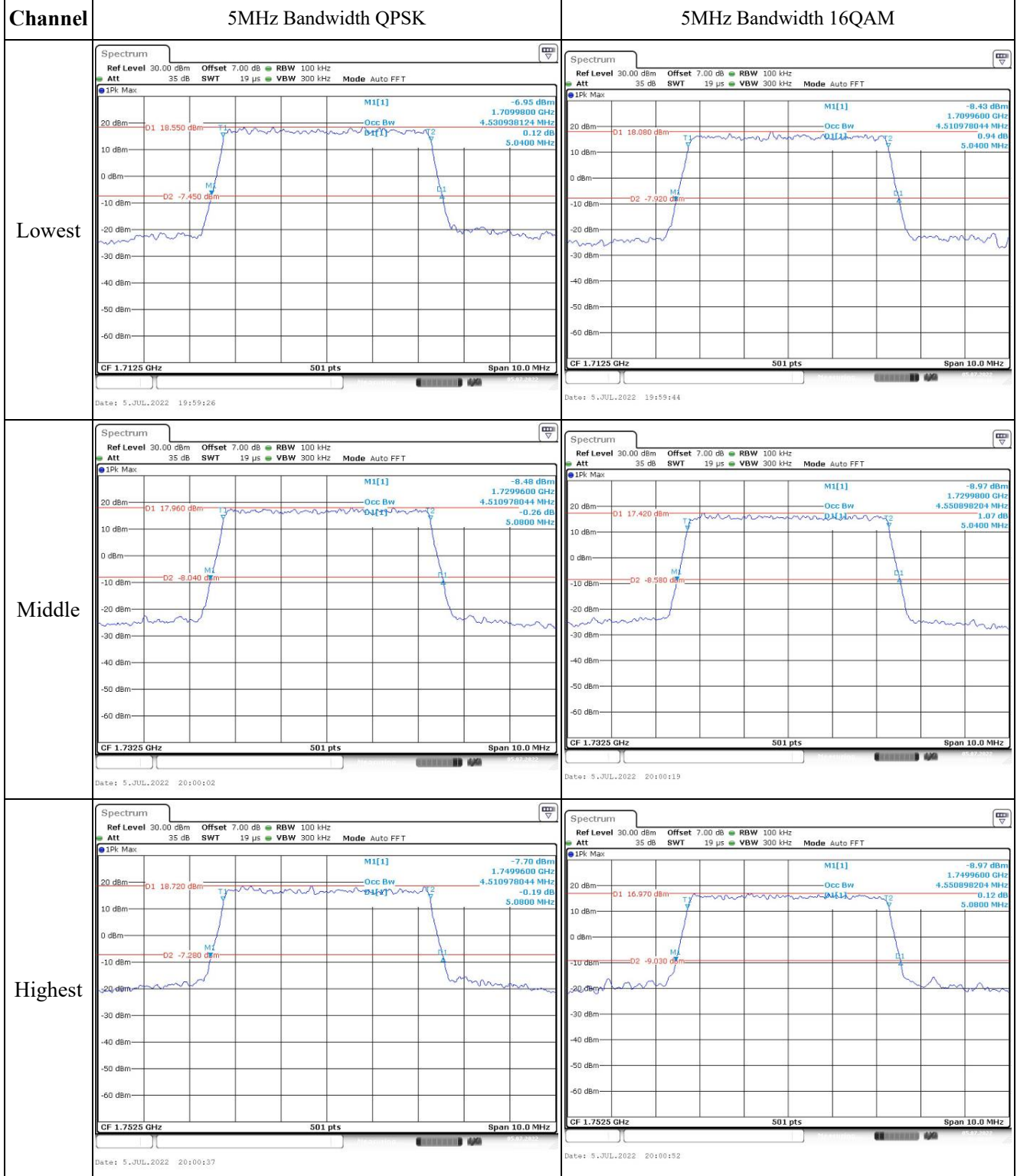
Occupied Bandwidth



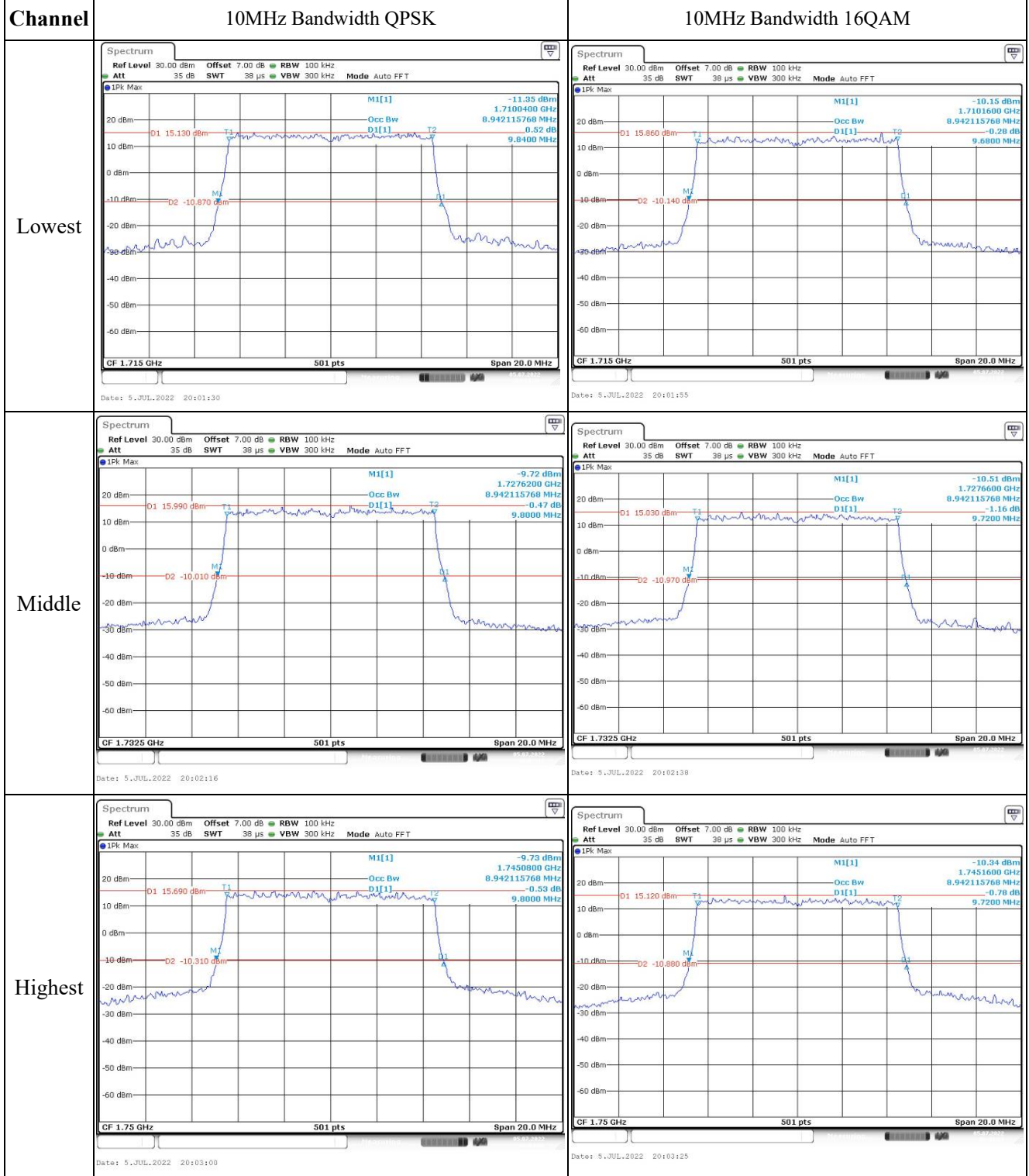
Occupied Bandwidth



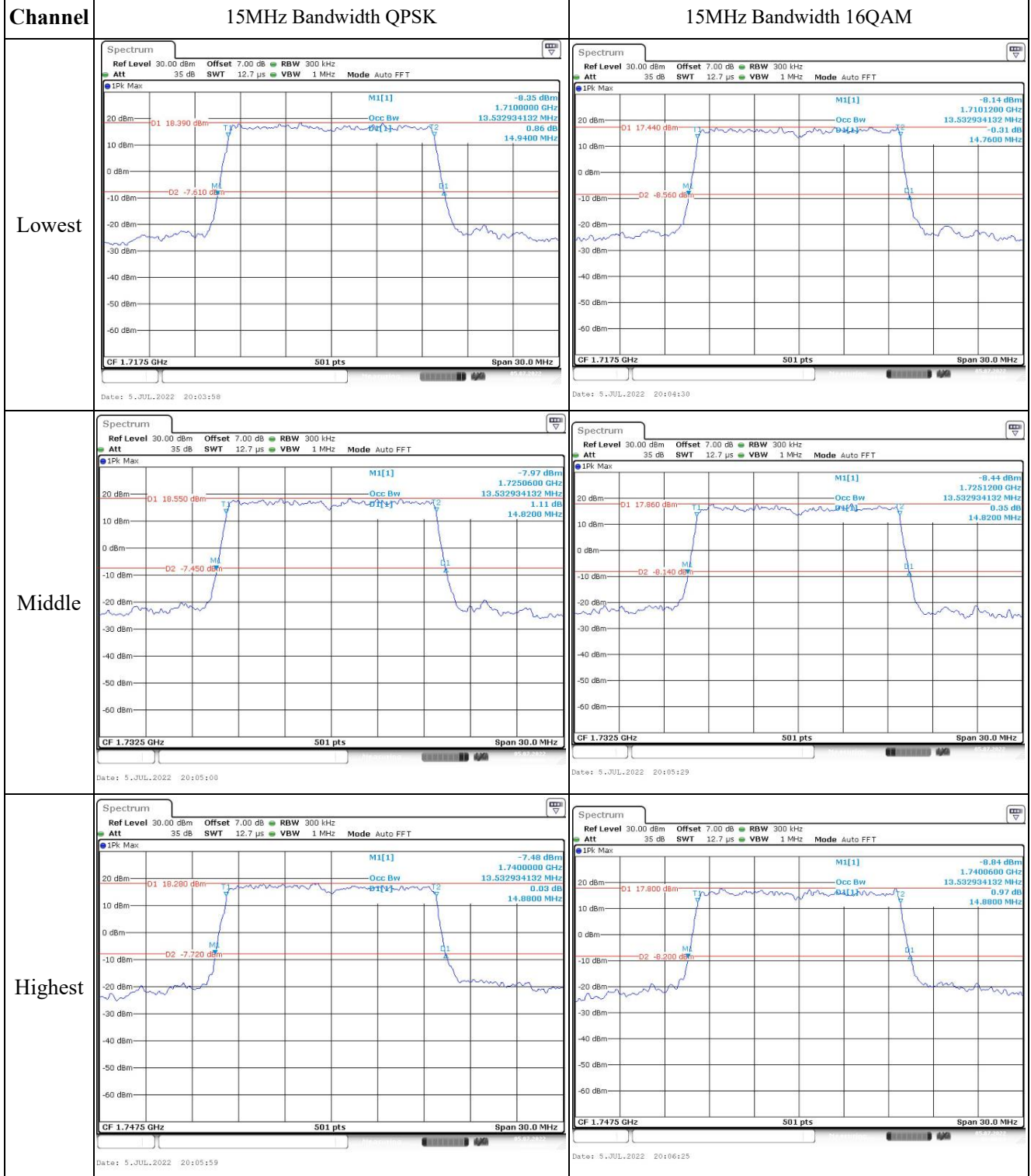
Occupied Bandwidth



Occupied Bandwidth



Occupied Bandwidth



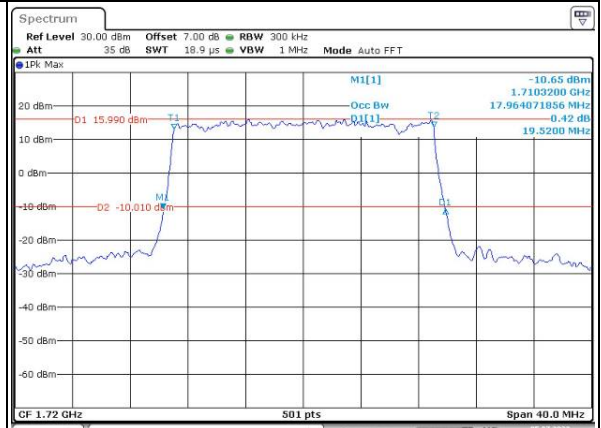
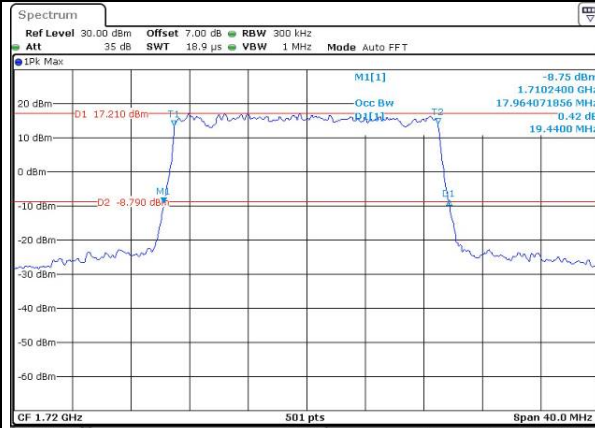
Occupied Bandwidth

Channel

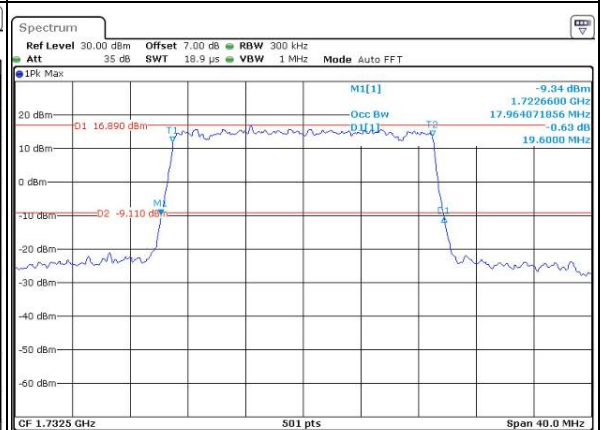
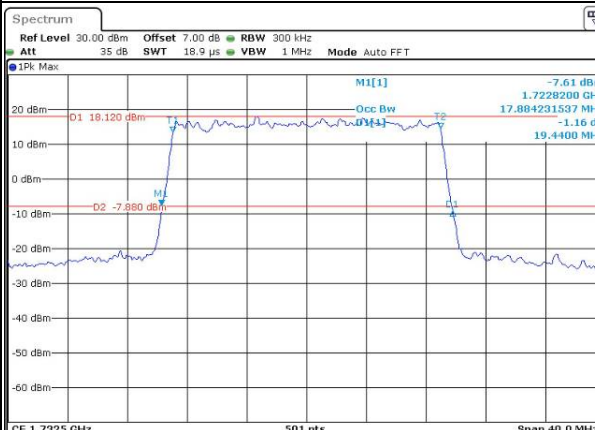
20MHz Bandwidth QPSK

20MHz Bandwidth 16QAM

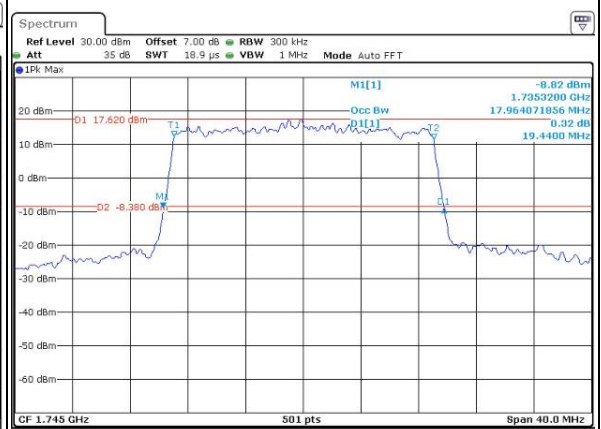
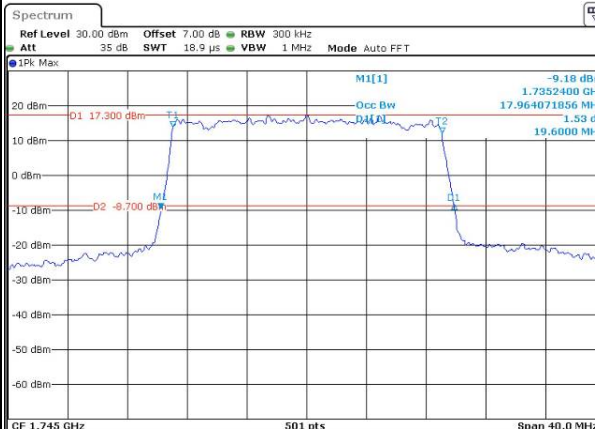
Lowest



Middle



Highest

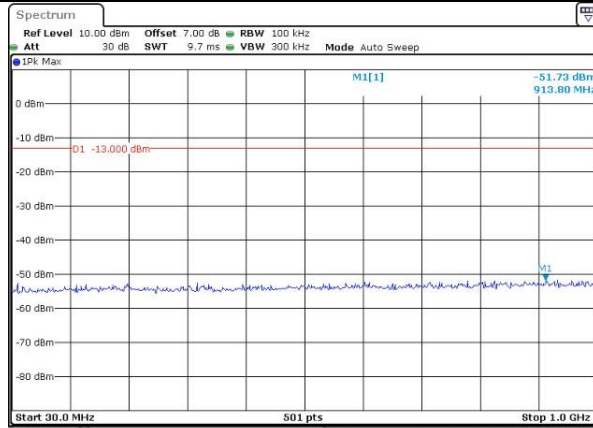


Spurious Emissions at Antenna Terminal

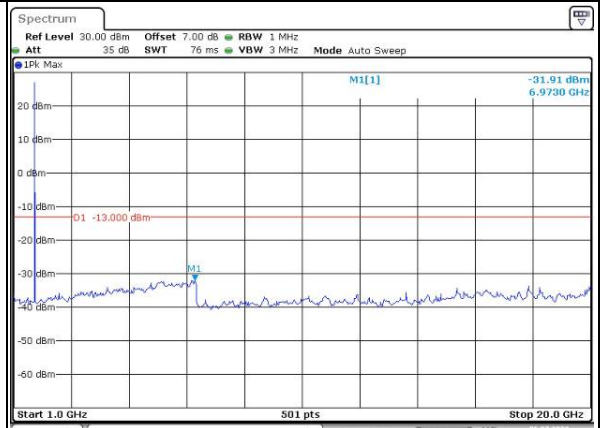
Channel

1.4MHz Bandwidth QPSK

Lowest

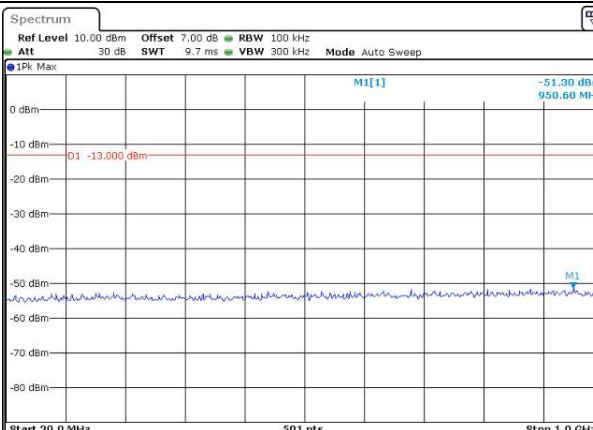


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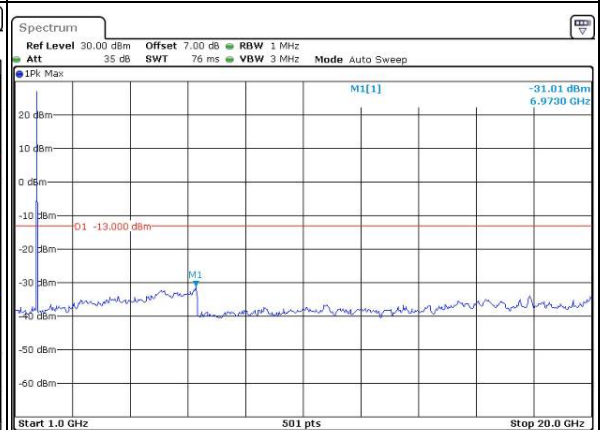


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Middle

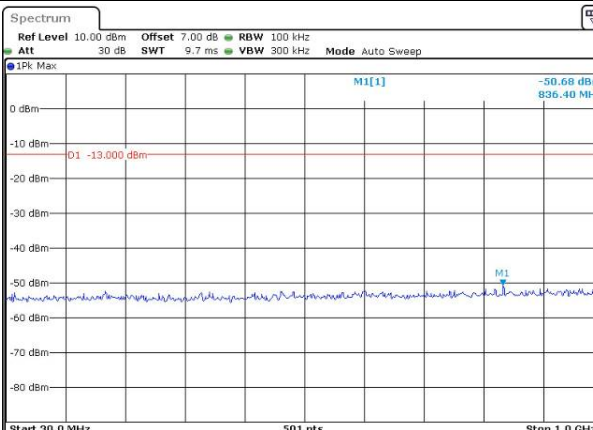


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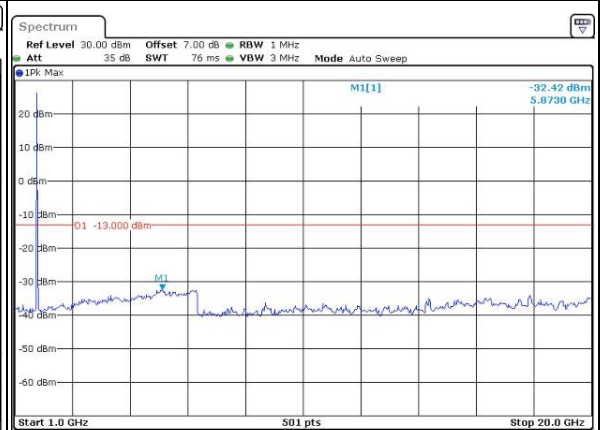


Date: 6.JUL.2022 13:35:20

Highest



Date: 6.JUL.2022 13:35:46



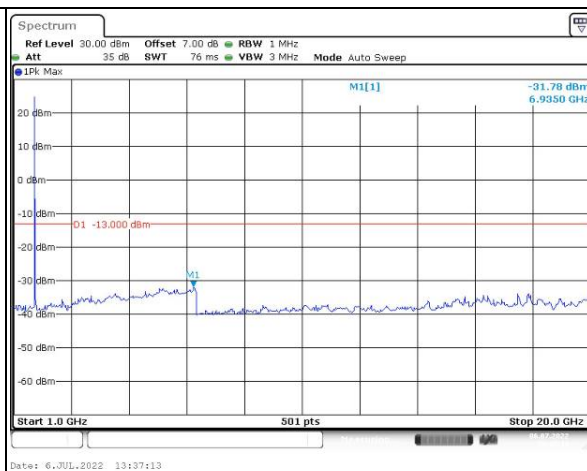
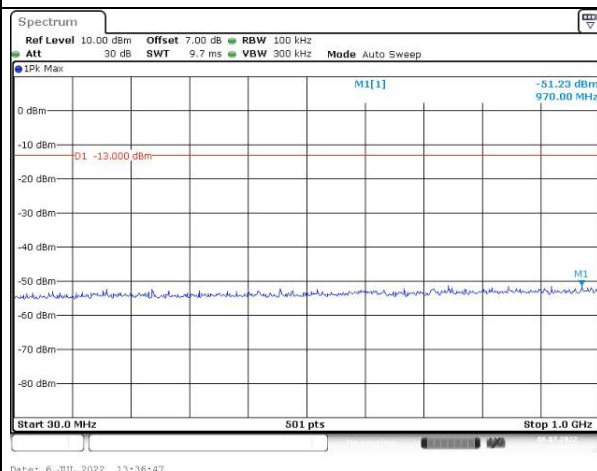
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Spurious Emissions at Antenna Terminal

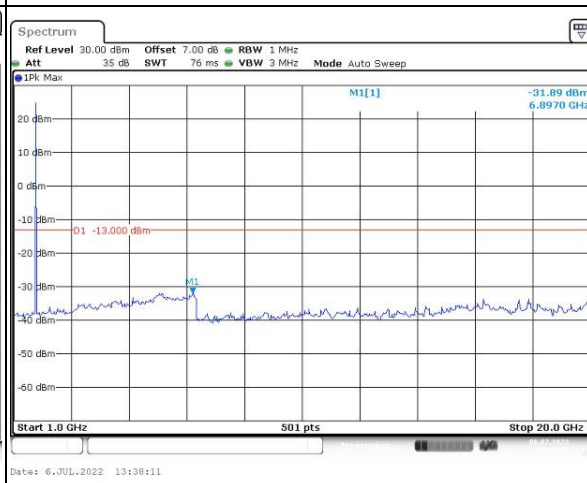
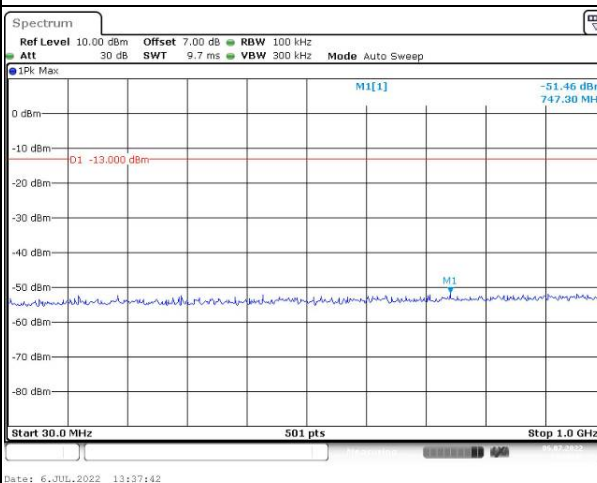
Channel

3MHz Bandwidth QPSK

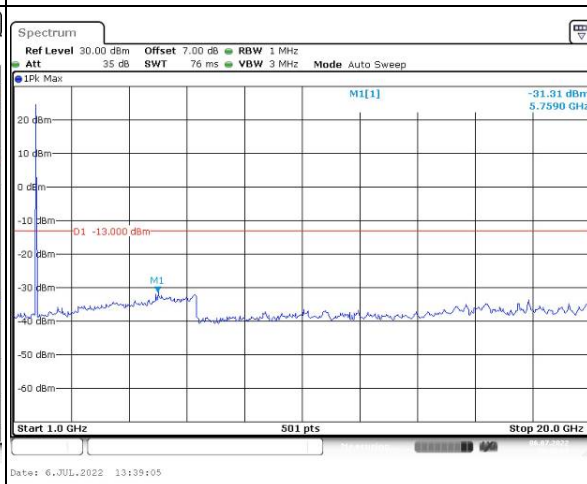
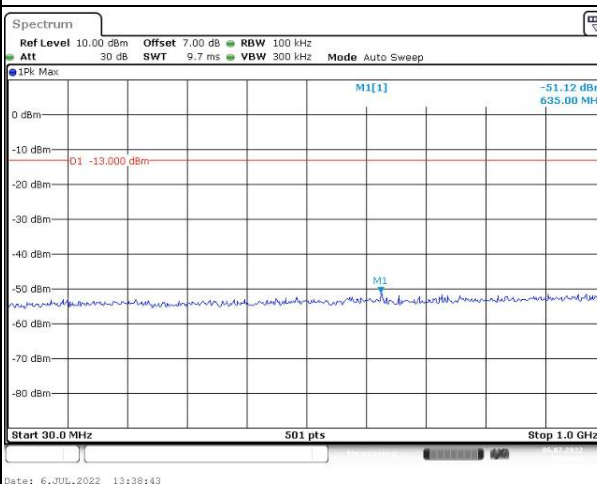
Lowest



Middle



Highest

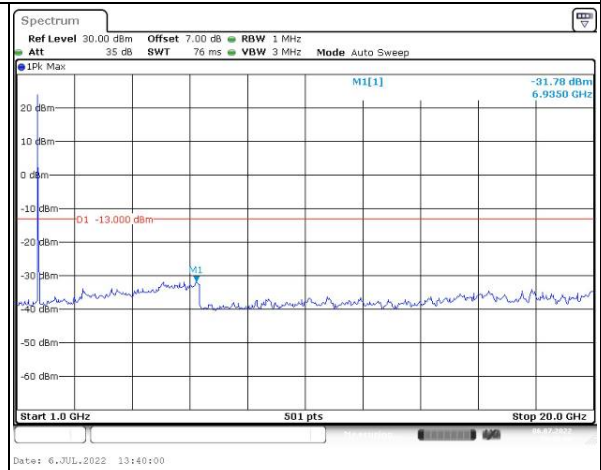
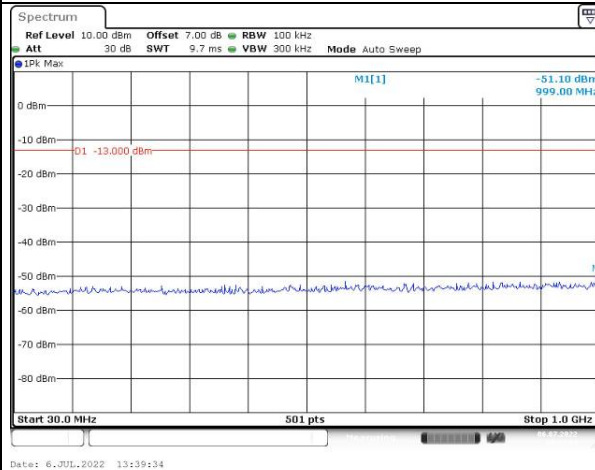


Spurious Emissions at Antenna Terminal

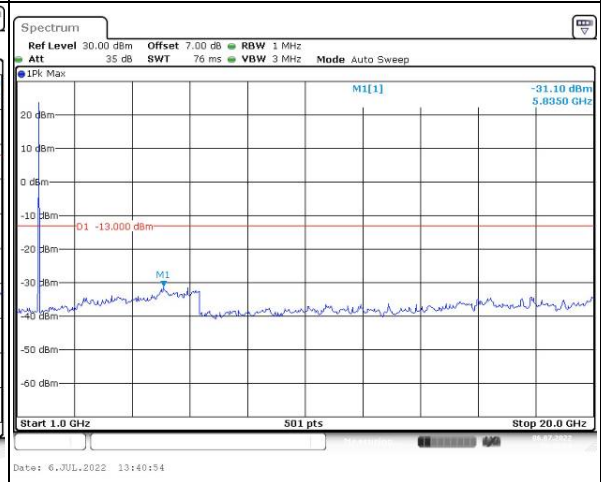
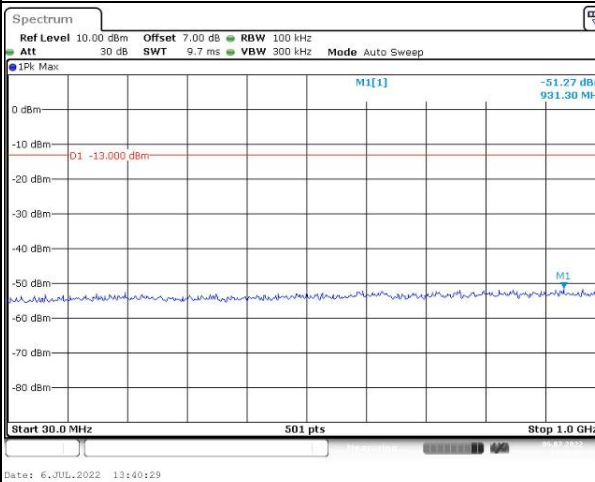
Channel

5MHz Bandwidth QPSK

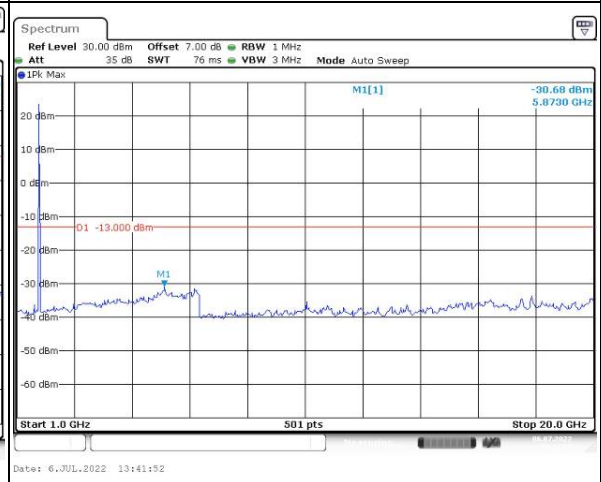
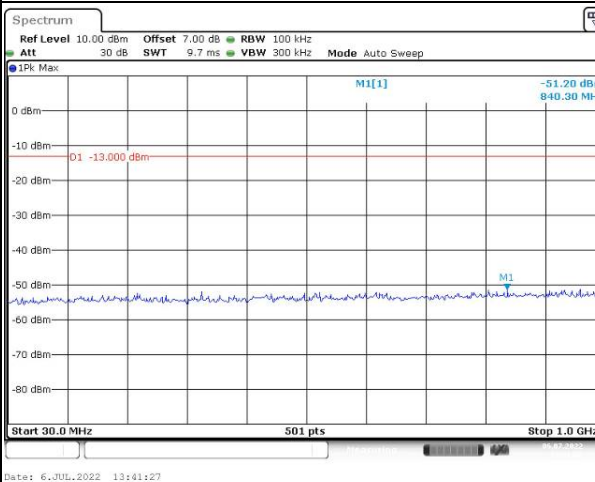
Lowest



Middle



Highest

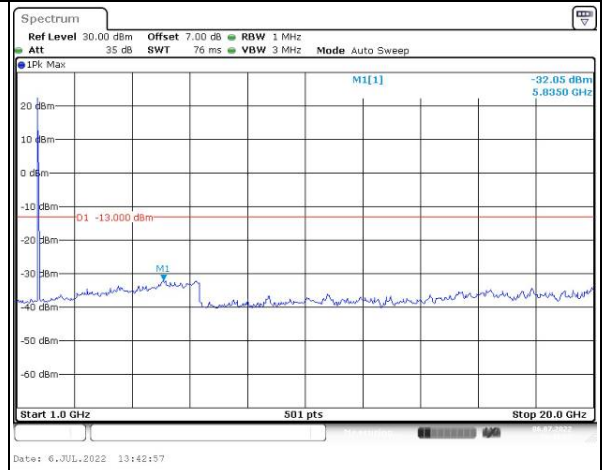
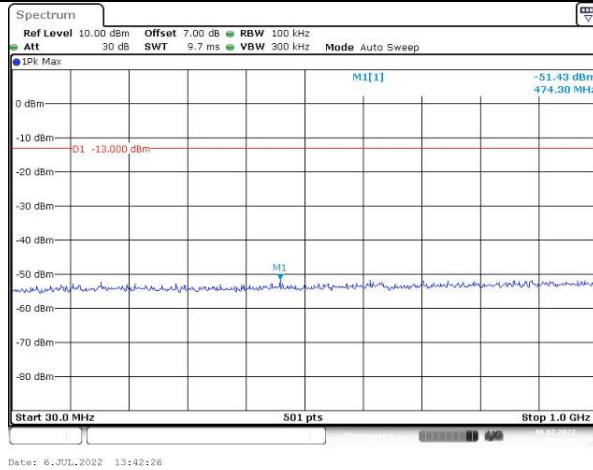


Spurious Emissions at Antenna Terminal

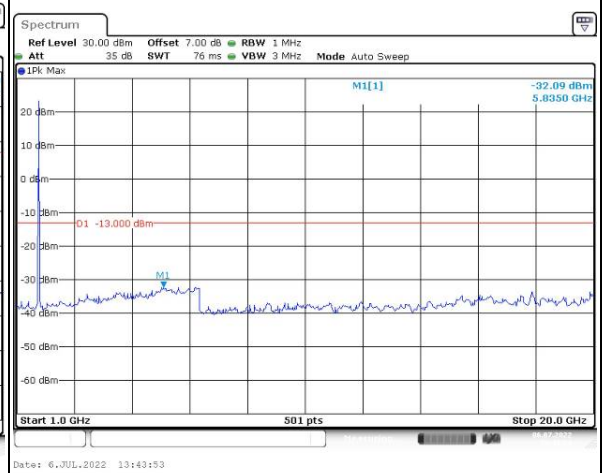
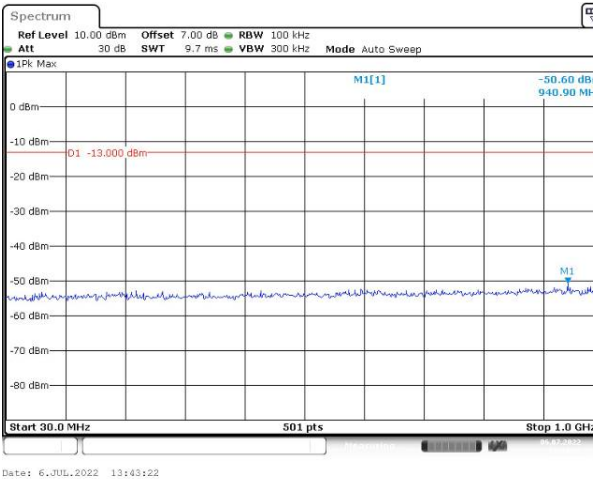
Channel

10MHz Bandwidth QPSK

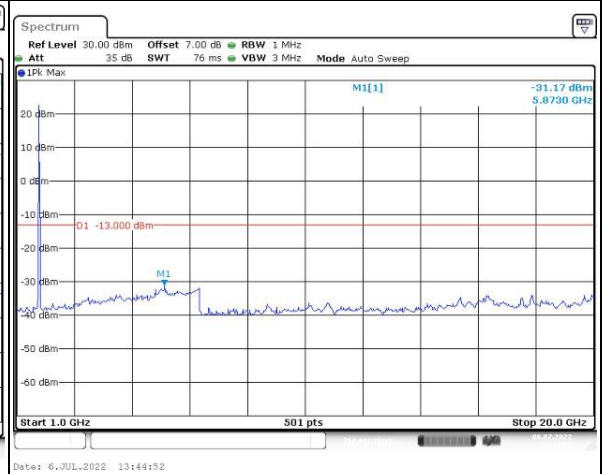
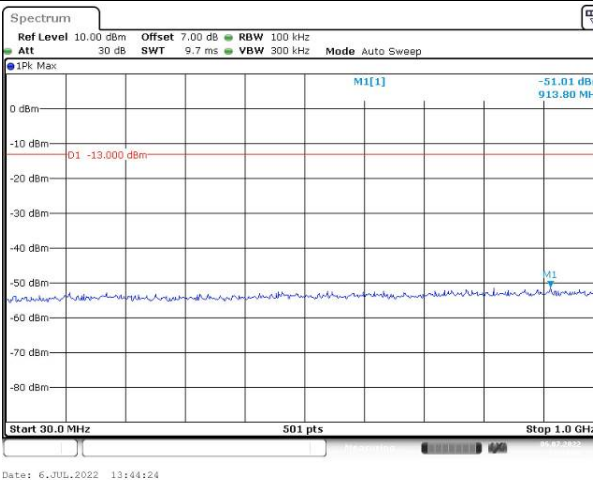
Lowest



Middle



Highest

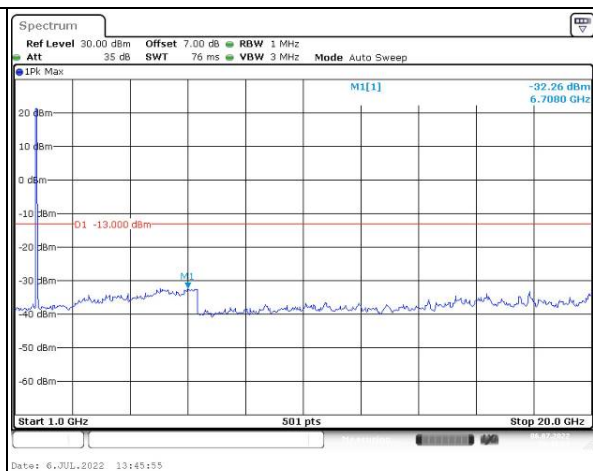
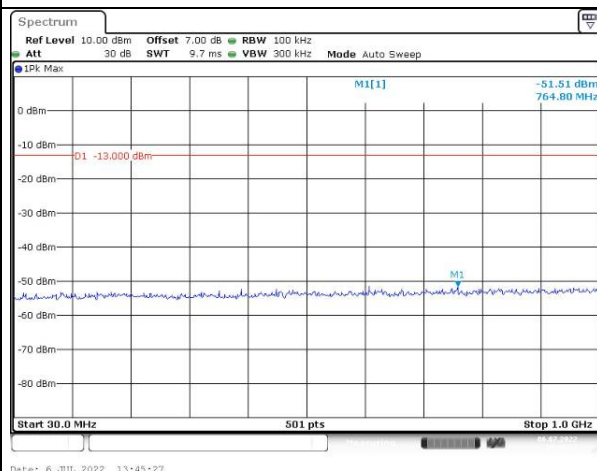


Spurious Emissions at Antenna Terminal

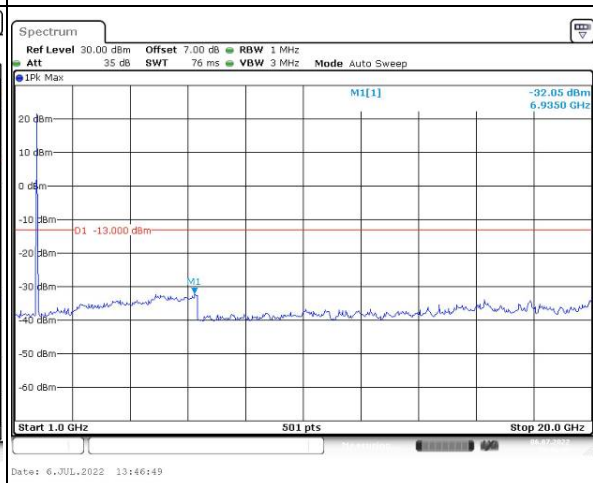
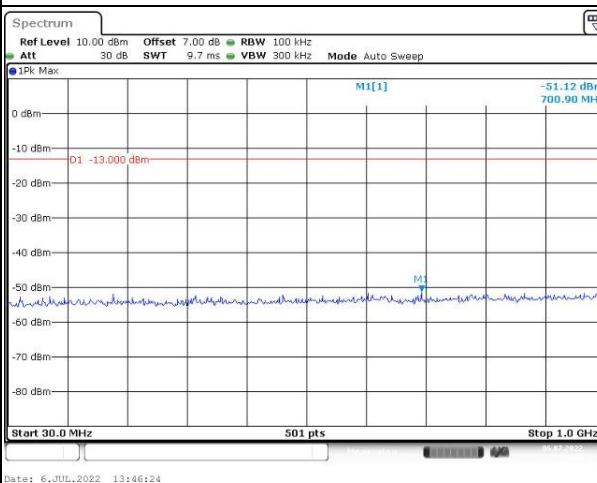
Channel

15MHz Bandwidth QPSK

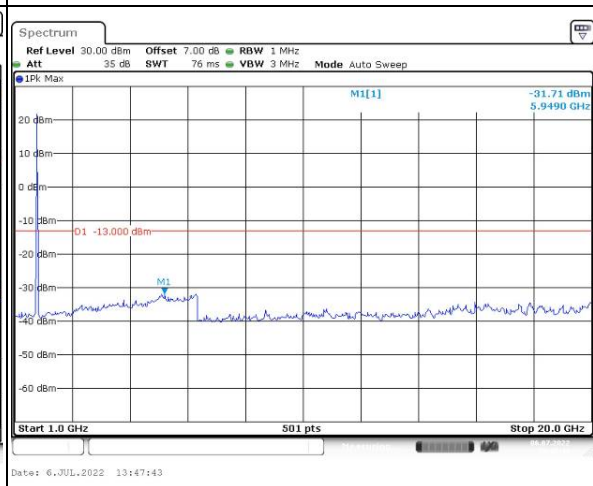
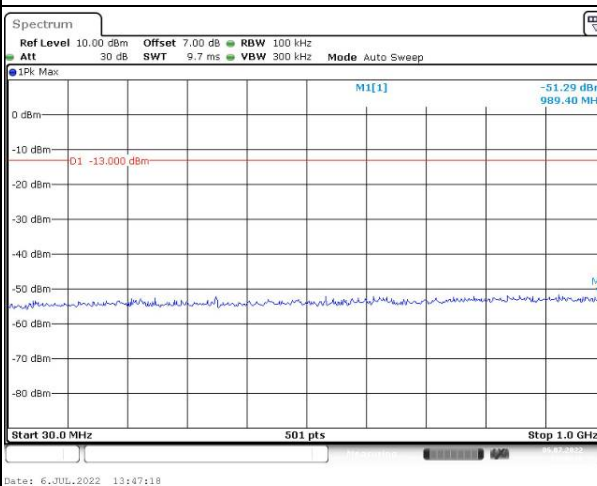
Lowest



Middle



Highest

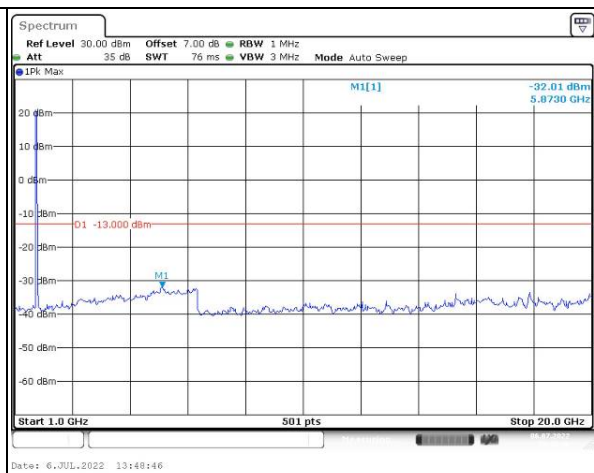
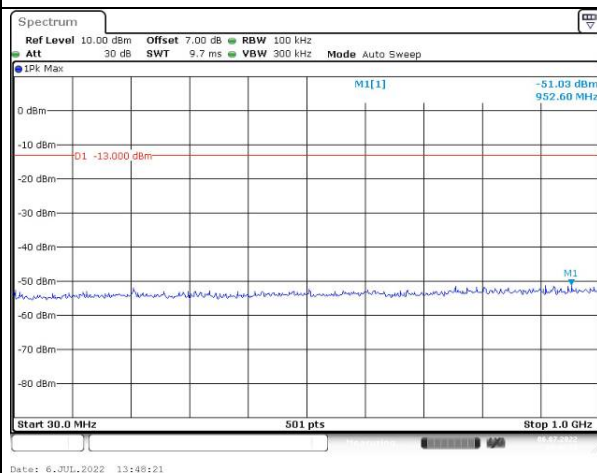


Spurious Emissions at Antenna Terminal

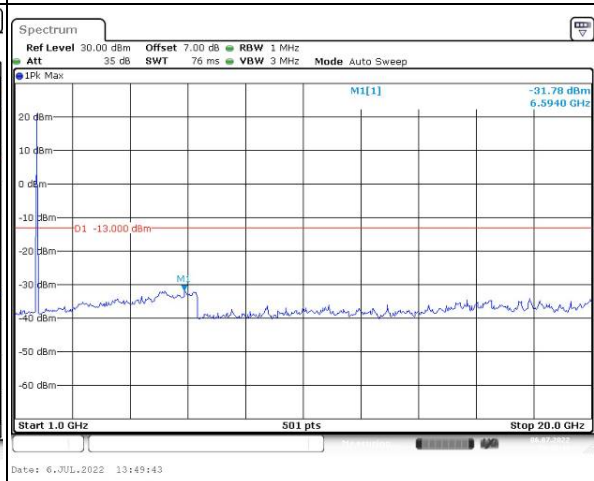
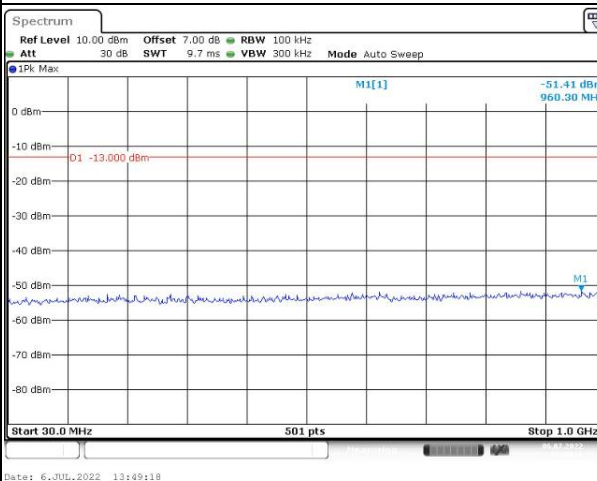
Channel

20MHz Bandwidth QPSK

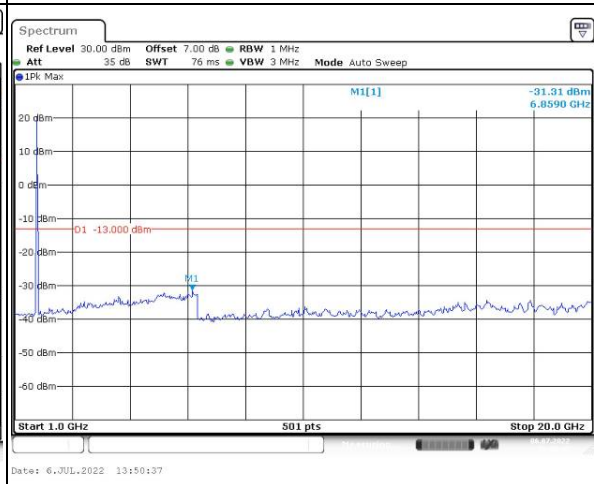
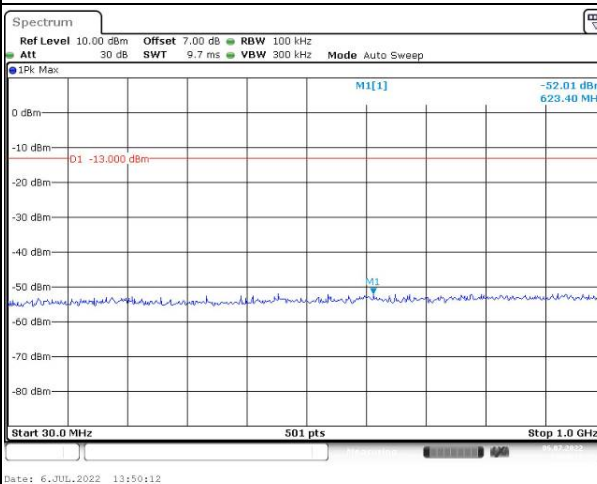
Lowest



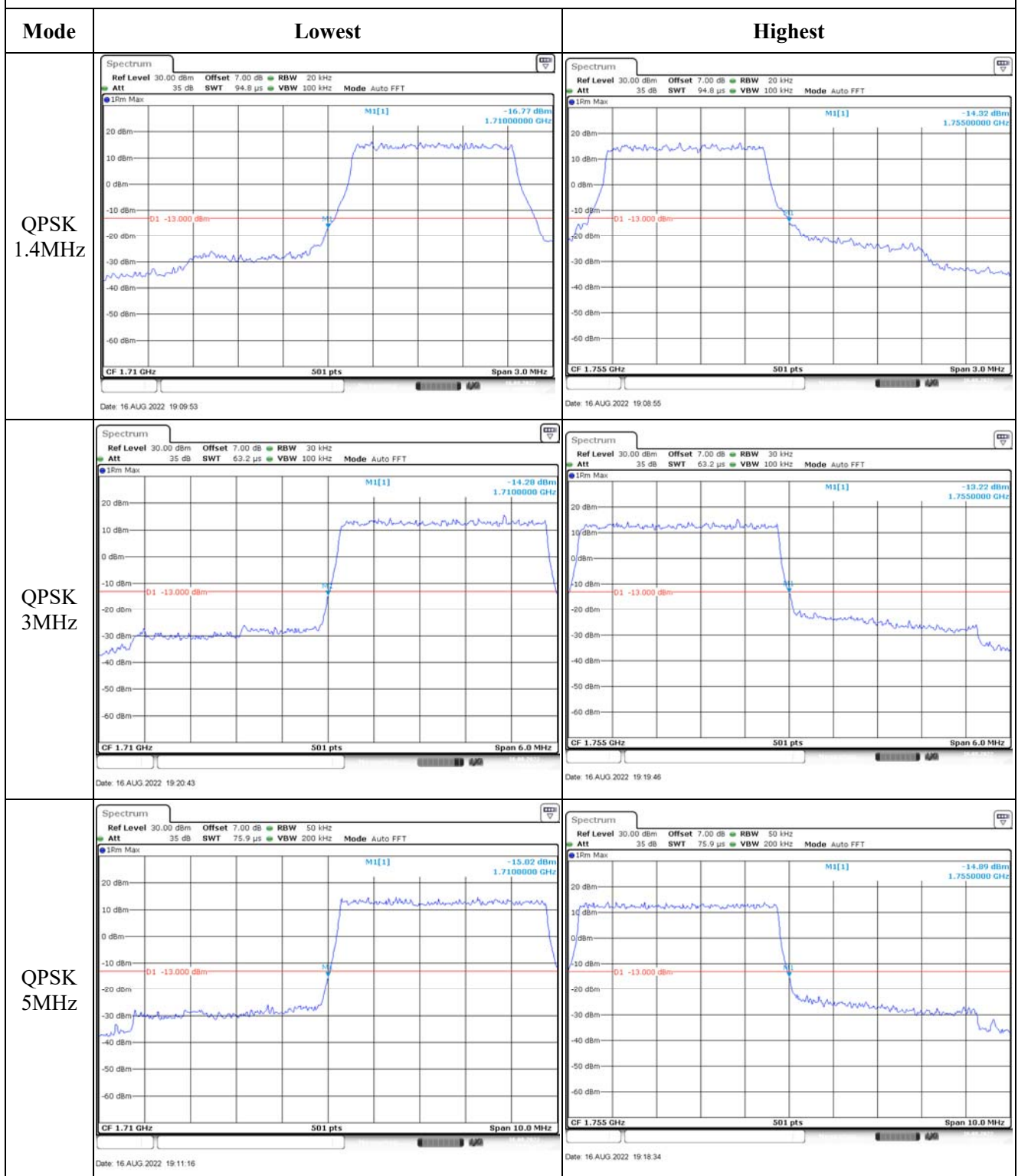
Middle



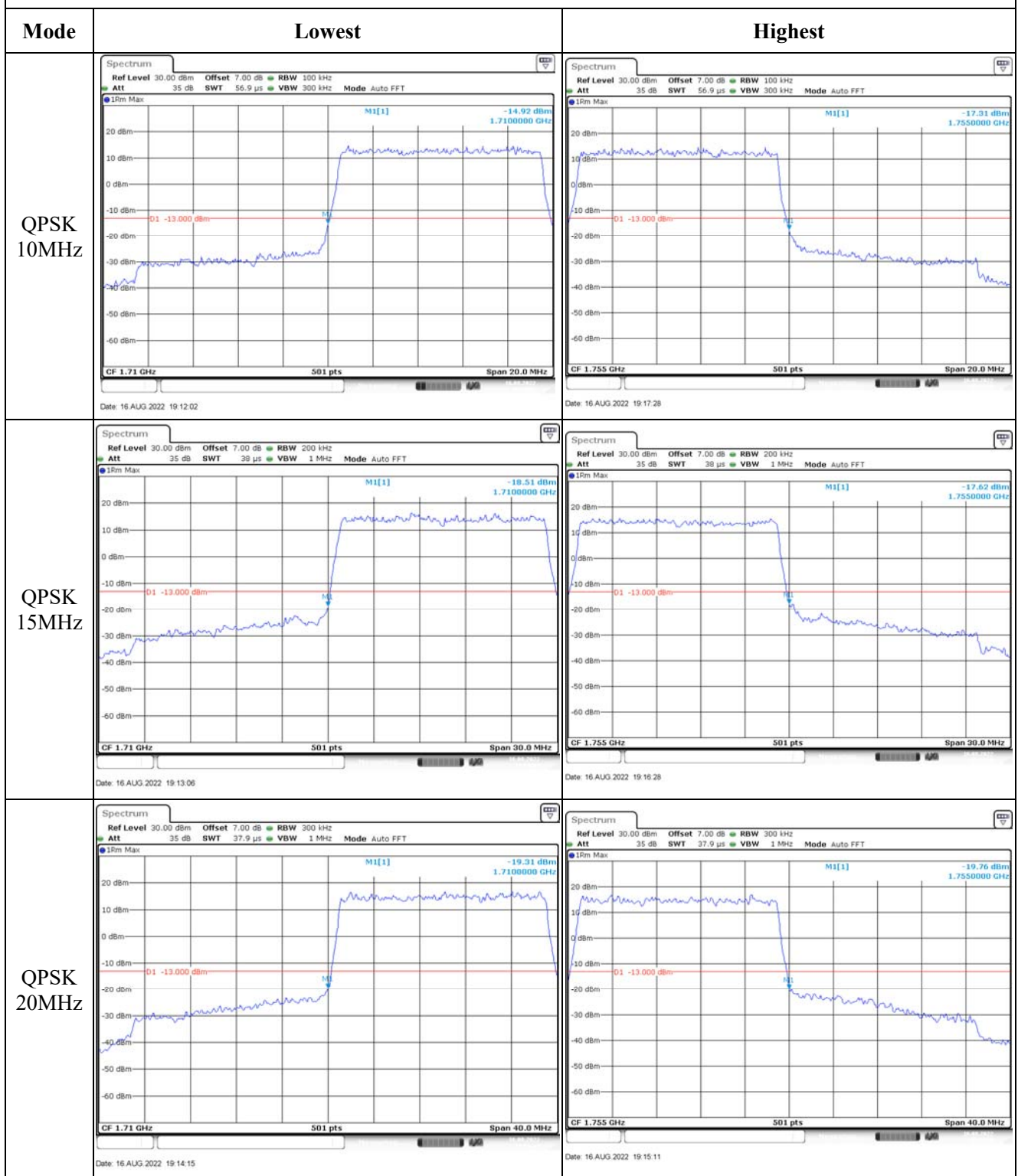
Highest



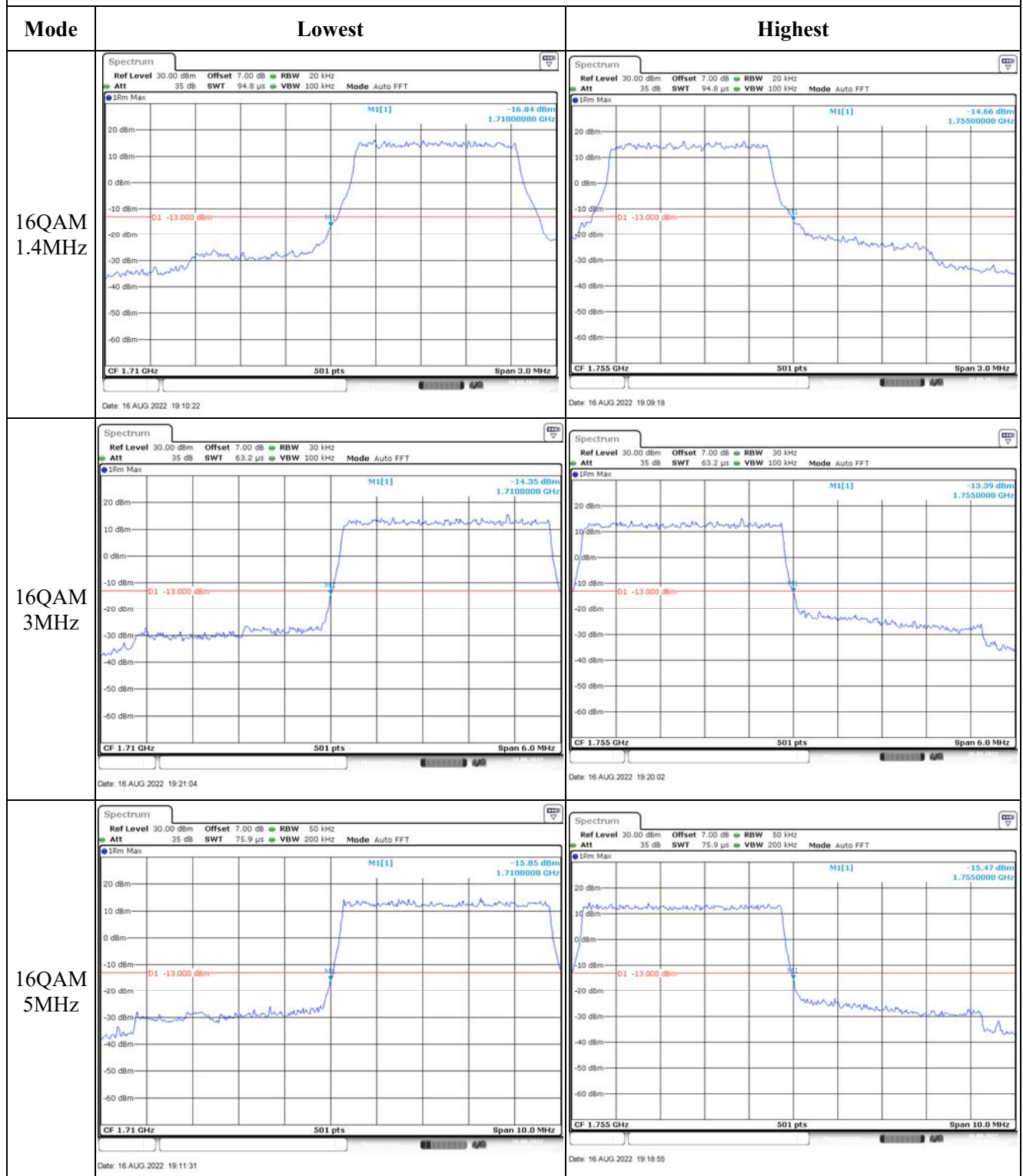
Out of band emission, Band Edge



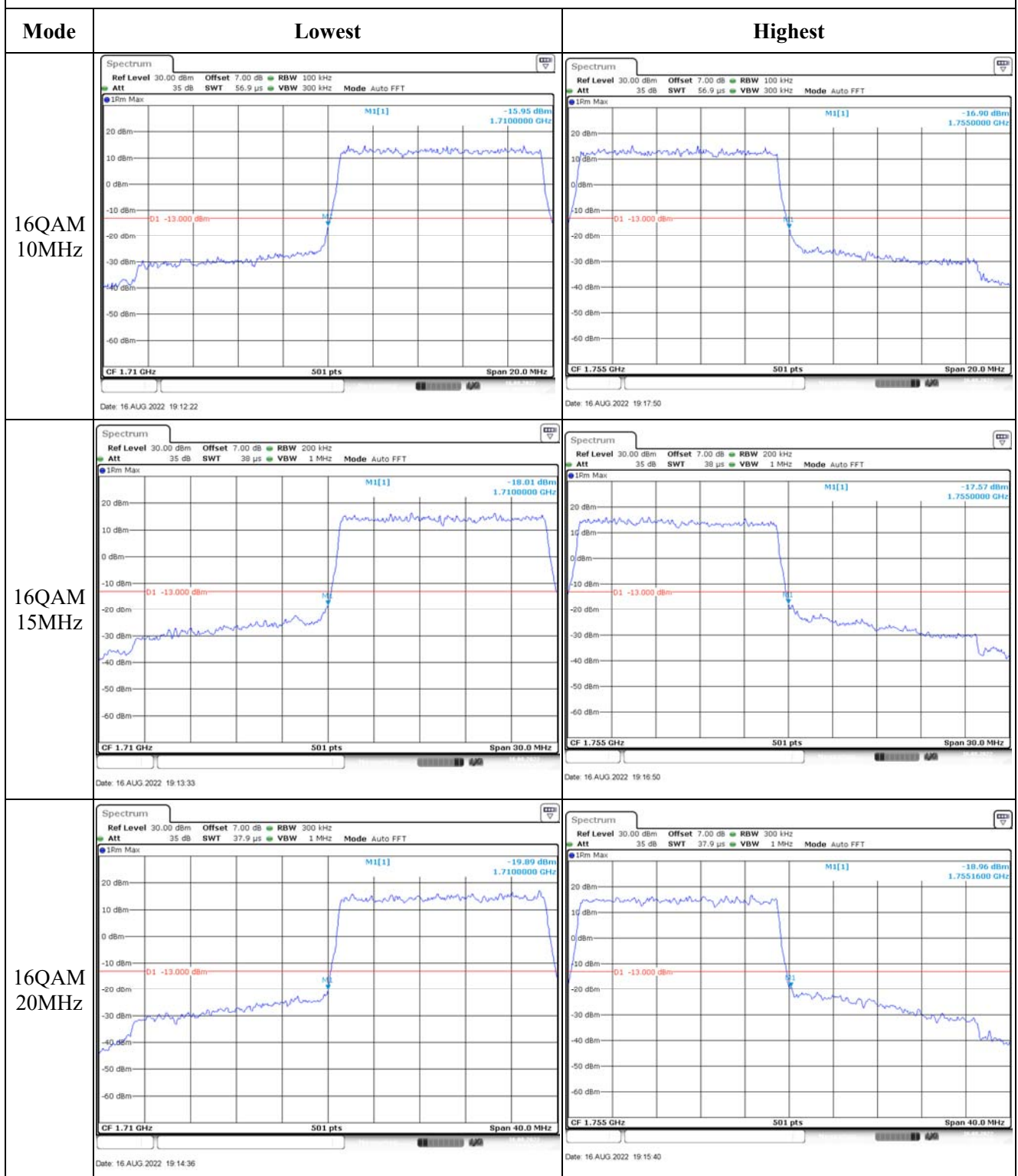
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.5 Antenna Port Test Data and Results for LTE Band 5

Serial Number:	CR220050077-RF-S1	Test Date:	2022/7/8~2022/8/16
Test Site:	RF	Test Mode:	Transmitting
Tester:	Ted Min	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	24.5~26.7	Relative Humidity: (%)	51~58	ATM Pressure: (kPa)	100.1~100.3
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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	2021-10-10	2022-10-09
R&S	Wideband Radio Communication Tester	CMW500	149218	2021-07-21	2022-07-20
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
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Unknown	Coaxial tee connector	Unknown	2204006	Each time	N/A
Unknown	RF Cable	Unknown	RF Cable 004	Each time	N/A
HuiXunDa	DC Block	SMA-JK 18G	DCB181108042	Each time	N/A
Weinschel	Coaxial Attenuators	53-20-34	LN751	Each time	N/A

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

EUT Information@ LTE Band 5▲:

Antenna Gain (dBi):	-1.9	Antenna Gain (dBd):	-4.05	Path Loss L _C (dB):	0.3
Operation Voltage(V _{DC}):					
Lowest:	6.66	Normal:	7.4	Highest:	8.14

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	22.16	22.18	22.1	17.98	38.45
	RB1#3	22.29	22.2	22.23		
	RB1#5	22.33	22.15	22.19		
	RB3#0	22.19	22.08	22.04		
	RB3#3	22.21	22.12	22.03		
	RB6#0	21.86	21.84	21.81		
1.4MHz 16QAM	RB1#0	21.81	21.64	21.74	17.6	38.45
	RB1#3	21.87	21.67	21.76		
	RB1#5	21.95	21.86	21.84		
	RB3#0	21.76	21.75	21.71		
	RB3#3	21.79	21.66	21.74		
	RB6#0	21.42	21.31	21.35		
3MHz QPSK	RB1#0	21.98	21.97	22.03	17.84	38.45
	RB1#8	22.06	22.11	22.06		
	RB1#14	22.17	22.06	22.19		
	RB6#0	21.98	21.98	22.12		
	RB6#9	22.04	22.1	22.17		
	RB15#0	21.74	21.61	21.82		
3MHz 16QAM	RB1#0	21.67	21.71	21.68	17.58	38.45
	RB1#8	21.6	21.69	21.67		
	RB1#14	21.93	21.86	21.89		
	RB6#0	21.53	21.71	21.61		
	RB6#9	21.55	21.78	21.65		
	RB15#0	21.22	21.31	21.36		
5MHz QPSK	RB1#0	22.05	22.07	22.1	17.94	38.45
	RB1#13	22.12	22.14	22.17		
	RB1#24	22.15	22.2	22.29		
	RB15#0	22.03	22.13	22.13		
	RB15#10	22.1	22.11	22.13		
	RB25#0	21.67	21.83	21.83		
5MHz 16QAM	RB1#0	21.66	21.8	21.64	17.57	38.45
	RB1#13	21.69	21.89	21.67		
	RB1#24	21.83	21.92	21.78		
	RB15#0	21.8	21.73	21.75		
	RB15#10	21.73	21.69	21.74		
	RB25#0	21.54	21.52	21.36		
10MHz QPSK	RB1#0	22.12	22.1	22.13	17.99	38.45
	RB1#25	22.2	22.19	22.12		

	RB1#49	22.34	22.27	22.23		
	RB25#0	22.14	22.07	22.05		
	RB25#25	22.14	22.14	22.05		
	RB50#0	21.88	21.74	21.75		
10MHz 16QAM	RB1#0	21.76	21.83	21.63	17.58	38.45
	RB1#25	21.89	21.8	21.71		
	RB1#49	21.89	21.93	21.69		
	RB25#0	21.69	21.86	21.62		
	RB25#25	21.74	21.91	21.6		
	RB50#0	21.45	21.62	21.41		
Note: ERP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(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	3.22	3.23	3.41	13
	RB50#0	5.16	5.19	5.24	13
10MHz 16QAM	RB1#0	4.21	4.26	4.31	13
	RB50#0	6.39	6.34	6.35	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	1.102	1.338	1.32	1.284
1.4MHz 16QAM	1.102	1.096	1.102	1.32	1.296	1.296
3MHz QPSK	2.695	2.695	2.683	2.964	2.94	2.952
3MHz 16QAM	2.695	2.683	2.683	2.964	2.964	2.964
5MHz QPSK	4.531	4.511	4.511	5.06	5.06	5.04
5MHz 16QAM	4.511	4.551	4.551	5.02	5.04	5.06
10MHz QPSK	8.982	8.942	8.982	9.84	9.72	9.76
10MHz 16QAM	8.942	8.942	8.982	9.72	9.76	9.8
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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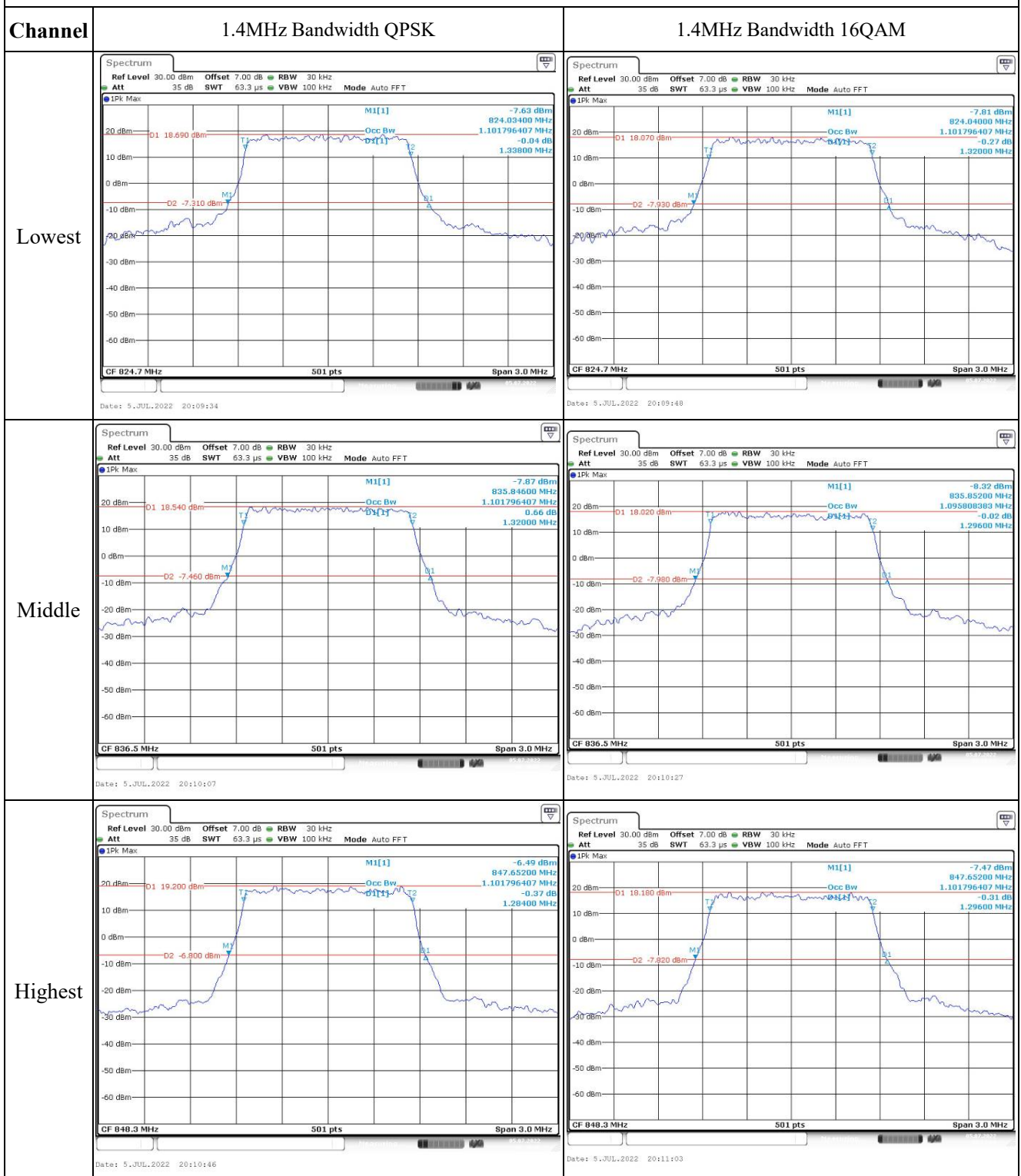
FCC §2.1055, §22.355: Frequency Stability

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	7.4	6	0.007	2.5
	-20	7.4	11	0.013	2.5
	-10	7.4	16	0.019	2.5
	0	7.4	8	0.010	2.5
	10	7.4	3	0.004	2.5
	20	7.4	-3	-0.004	2.5
	30	7.4	-7	-0.008	2.5
	40	7.4	1	0.001	2.5
	50	7.4	8	0.010	2.5
Frequency Stability vs. Voltage	20	6.66	11	0.013	2.5
	20	8.14	6	0.007	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	7.4	8	0.010	2.5
	-20	7.4	11	0.013	2.5
	-10	7.4	6	0.007	2.5
	0	7.4	2	0.002	2.5
	10	7.4	-4	-0.005	2.5
	20	7.4	-1	-0.001	2.5
	30	7.4	6	0.007	2.5
	40	7.4	13	0.016	2.5
	50	7.4	11	0.013	2.5
Frequency Stability vs. Voltage	20	6.66	7	0.008	2.5
	20	8.14	12	0.014	2.5
Result:					Pass

Test Plots:

Occupied Bandwidth



Occupied Bandwidth

