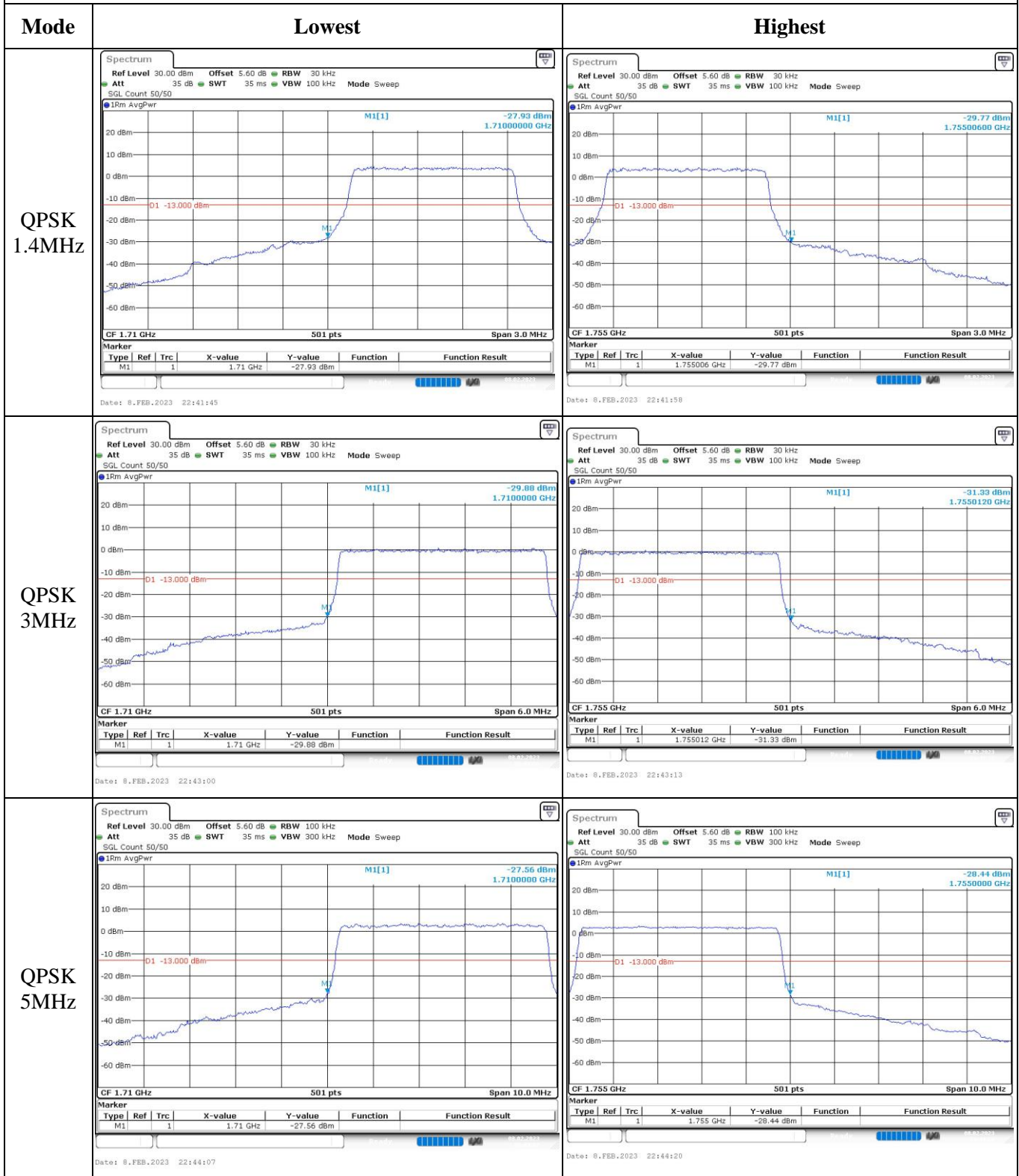
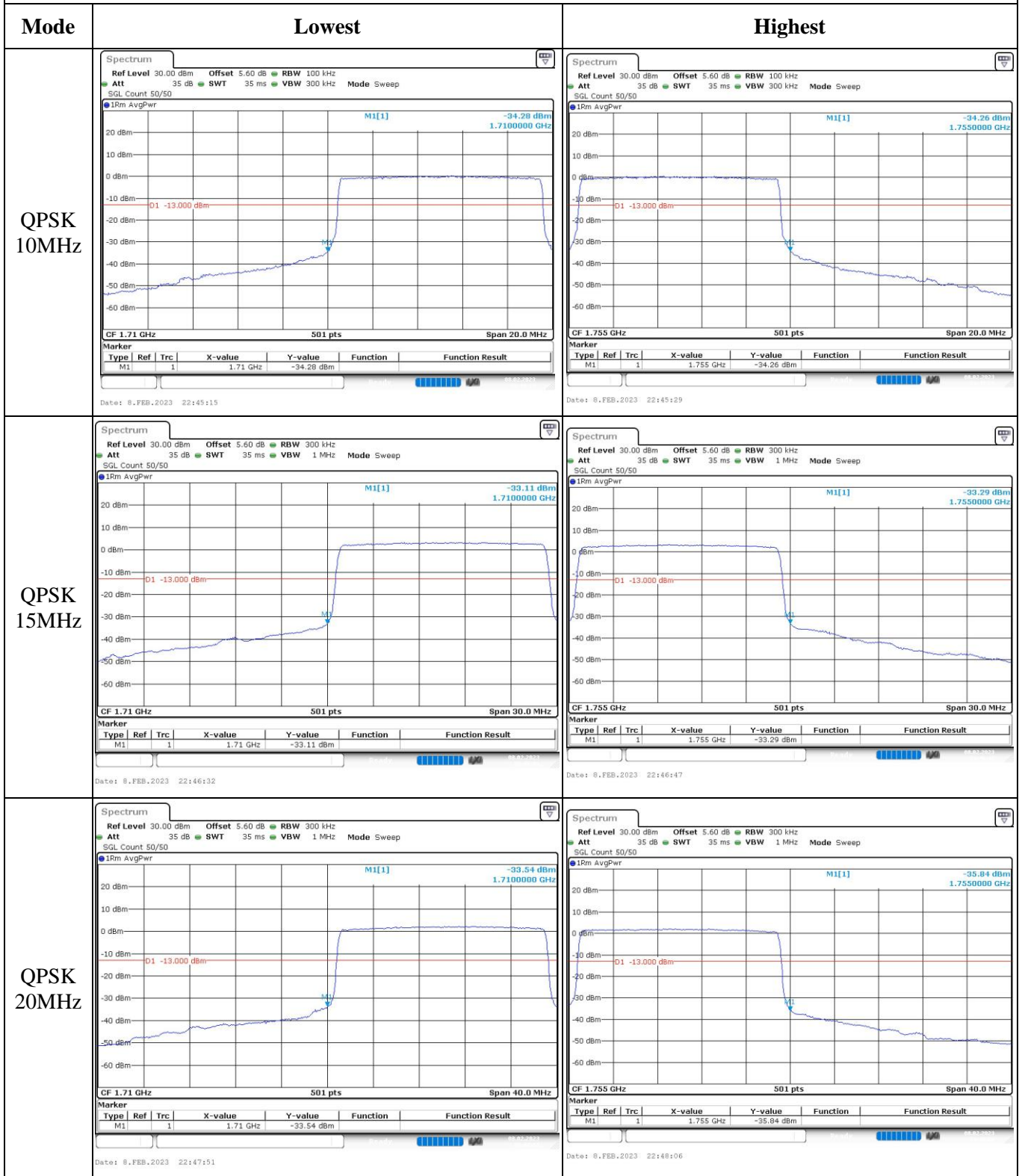


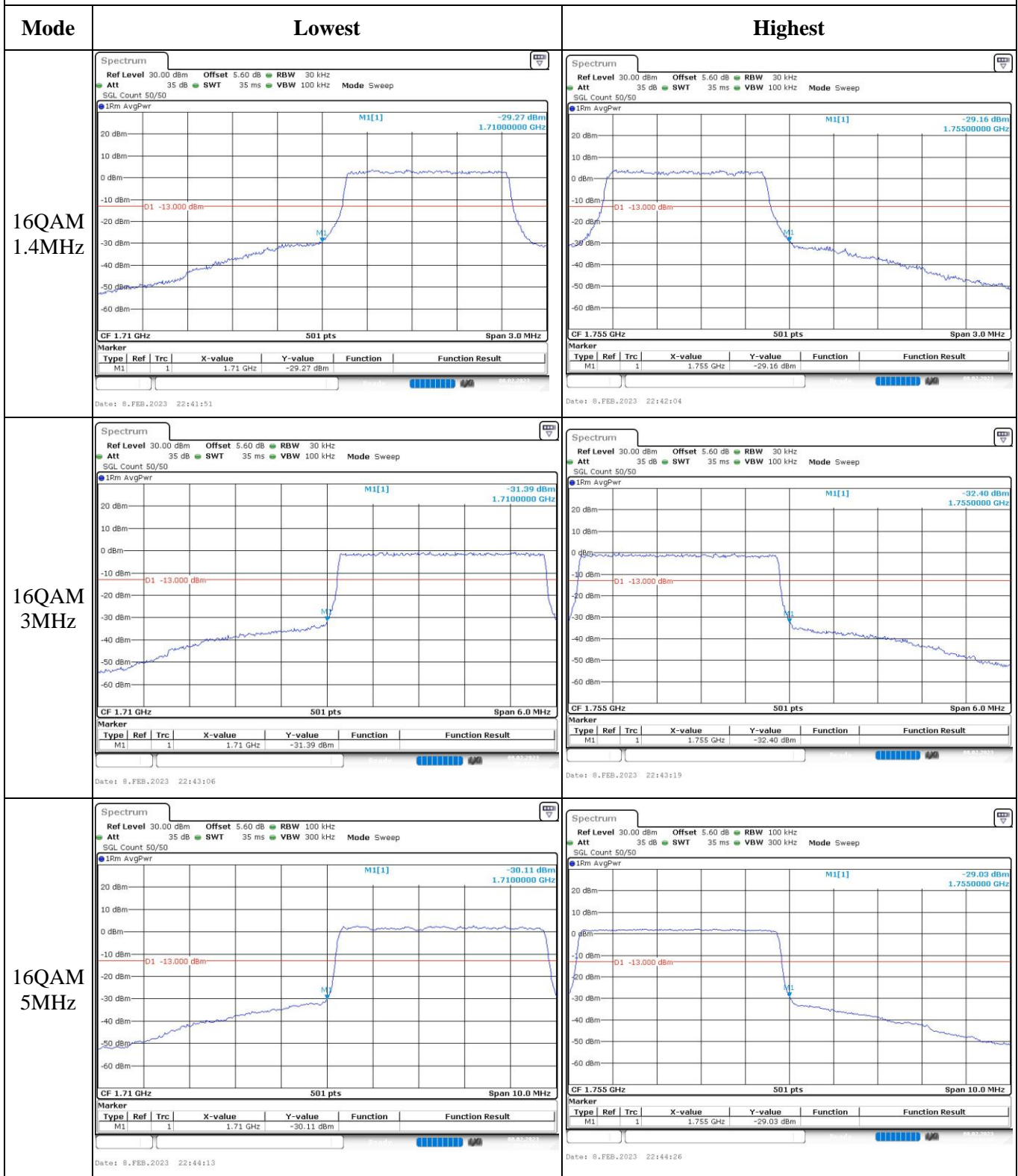
Out of band emission, Band Edge



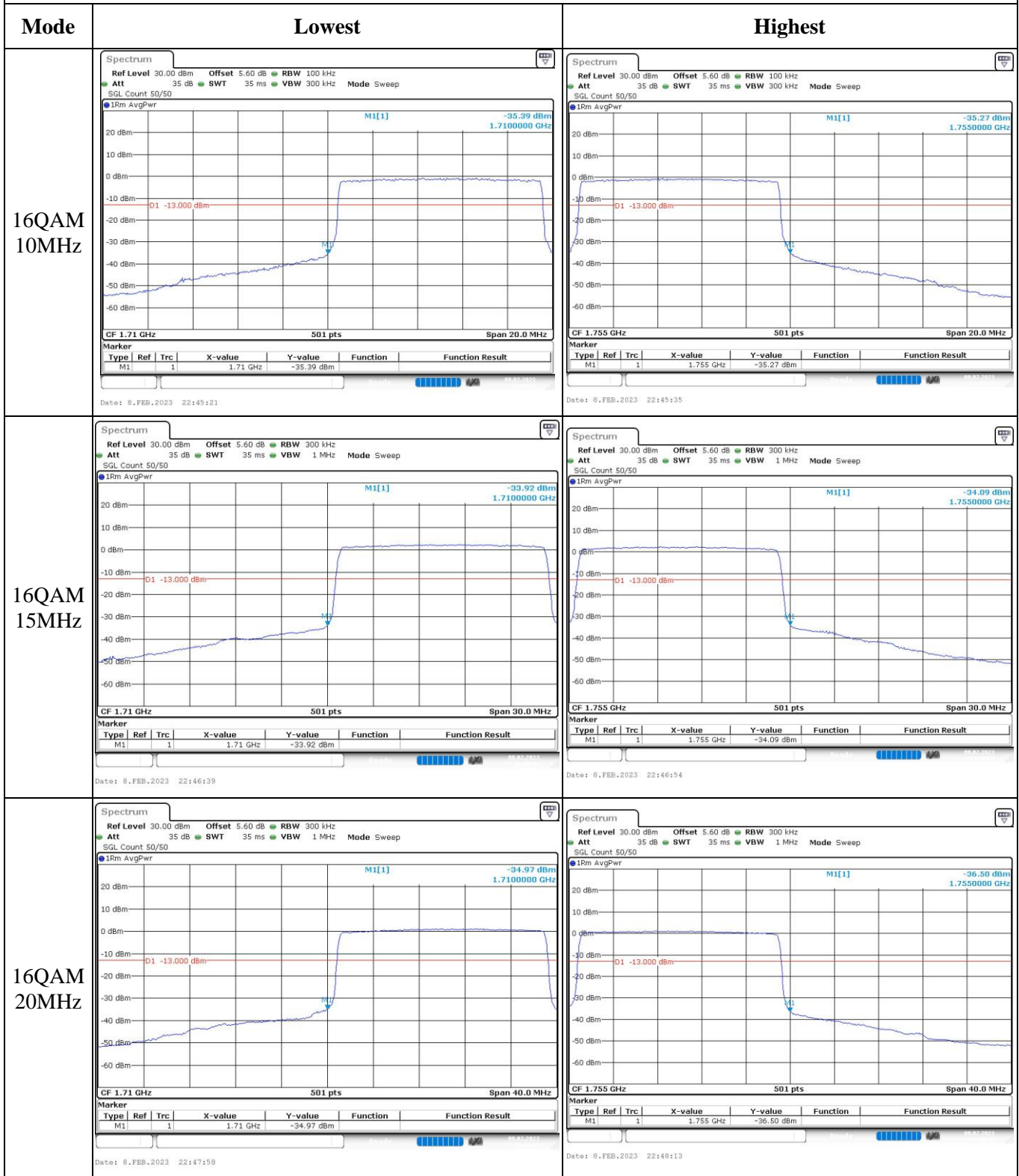
Out of band emission, Band Edge



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:	1ZO9	Test Date:	2023/2/8~2023/2/21
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	21.1~24.2	Relative Humidity: (%)	39~53	ATM Pressure: (kPa)	101.2~102.1
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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	2022/7/15	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	2022/04/06	2023/04/05
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022/09/29	2023/09/28
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28

* 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	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	23.27	23.51	23.48	22.57	38.45
	RB1#3	23.52	23.58	23.22		
	RB1#5	23.33	23.55	23.2		
	RB3#0	23.49	23.45	23.31		
	RB3#3	23.55	23.41	23.54		
	RB6#0	22.47	22.44	22.39		
1.4MHz 16QAM	RB1#0	22.03	22.64	22.73	21.9	38.45
	RB1#3	22.17	22.63	22.79		
	RB1#5	21.94	22.46	22.91		
	RB3#0	22.32	22.43	22.65		
	RB3#3	22.3	22.5	22.63		
	RB6#0	21.3	21.42	21.31		
3MHz QPSK	RB1#0	23.72	23.5	23.57	22.71	38.45
	RB1#8	23.33	23.32	23.4		
	RB1#14	23.5	23.46	23.64		
	RB6#0	22.44	22.43	22.34		
	RB6#9	22.46	22.5	22.45		
	RB15#0	22.45	22.5	22.42		
3MHz 16QAM	RB1#0	22.26	22.56	22.85	22.14	38.45
	RB1#8	21.95	22.32	23.06		
	RB1#14	22.2	22.59	23.15		
	RB6#0	21.21	21.29	21.42		
	RB6#9	21.33	21.43	21.47		
	RB15#0	21.45	21.33	21.26		
5MHz QPSK	RB1#0	23.28	23.21	23.12	22.47	38.45
	RB1#13	23.26	23.2	22.89		
	RB1#24	23.33	23.2	23.48		
	RB15#0	22.22	22.35	22.08		
	RB15#10	22.37	22.36	22.12		
	RB25#0	22.29	22.38	22.32		
5MHz 16QAM	RB1#0	21.9	21.38	22.49	21.63	38.45
	RB1#13	21.56	21.48	22.55		
	RB1#24	21.82	21.67	22.64		
	RB15#0	21.09	21.38	20.85		
	RB15#10	21.35	21.3	21.1		
	RB25#0	21.19	21.42	21.23		
10MHz QPSK	RB1#0	23.32	23.31	23.26	22.4	38.45

	RB1#25	23.25	23.35	23.18		
	RB1#49	23.4	23.27	23.41		
	RB25#0	22.33	22.34	22.12		
	RB25#25	22.36	22.42	22.37		
	RB50#0	22.3	22.46	22.18		
10MHz 16QAM	RB1#0	22.45	23.4	21.97	22.39	38.45
	RB1#25	22.62	22.63	22.13		
	RB1#49	22.76	22.68	22.42		
	RB25#0	21.27	21.16	21.16		
	RB25#25	21.22	21.17	21.47		
	RB50#0	21.22	21.32	21.18		

Note:

ERP= Conducted Power(dBm) - Lc(dB) + Gr(dBd)

Gr(dBd)=Gr(dBi)-2.15

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	4.35	4.46	4.49	13
	RB50#0	4.9	4.72	4.9	13
10MHz 16QAM	RB1#0	5.04	5.39	5.45	13
	RB50#0	5.97	5.83	5.94	13
Result:					Pass

FCC §2.1049, §2.905: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	1.108	1.108	1.102	1.314	1.29	1.308
1.4MHz 16QAM	1.096	1.102	1.108	1.302	1.314	1.32
3MHz QPSK	2.683	2.695	2.695	2.952	2.952	2.94
3MHz 16QAM	2.683	2.695	2.683	2.94	2.964	2.952
5MHz QPSK	4.491	4.531	4.511	4.98	5.02	5.04
5MHz 16QAM	4.531	4.511	4.531	5.06	5.02	5.04
10MHz QPSK	8.942	8.942	8.942	9.76	9.76	9.8
10MHz 16QAM	8.942	8.942	8.942	9.72	9.72	9.72

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

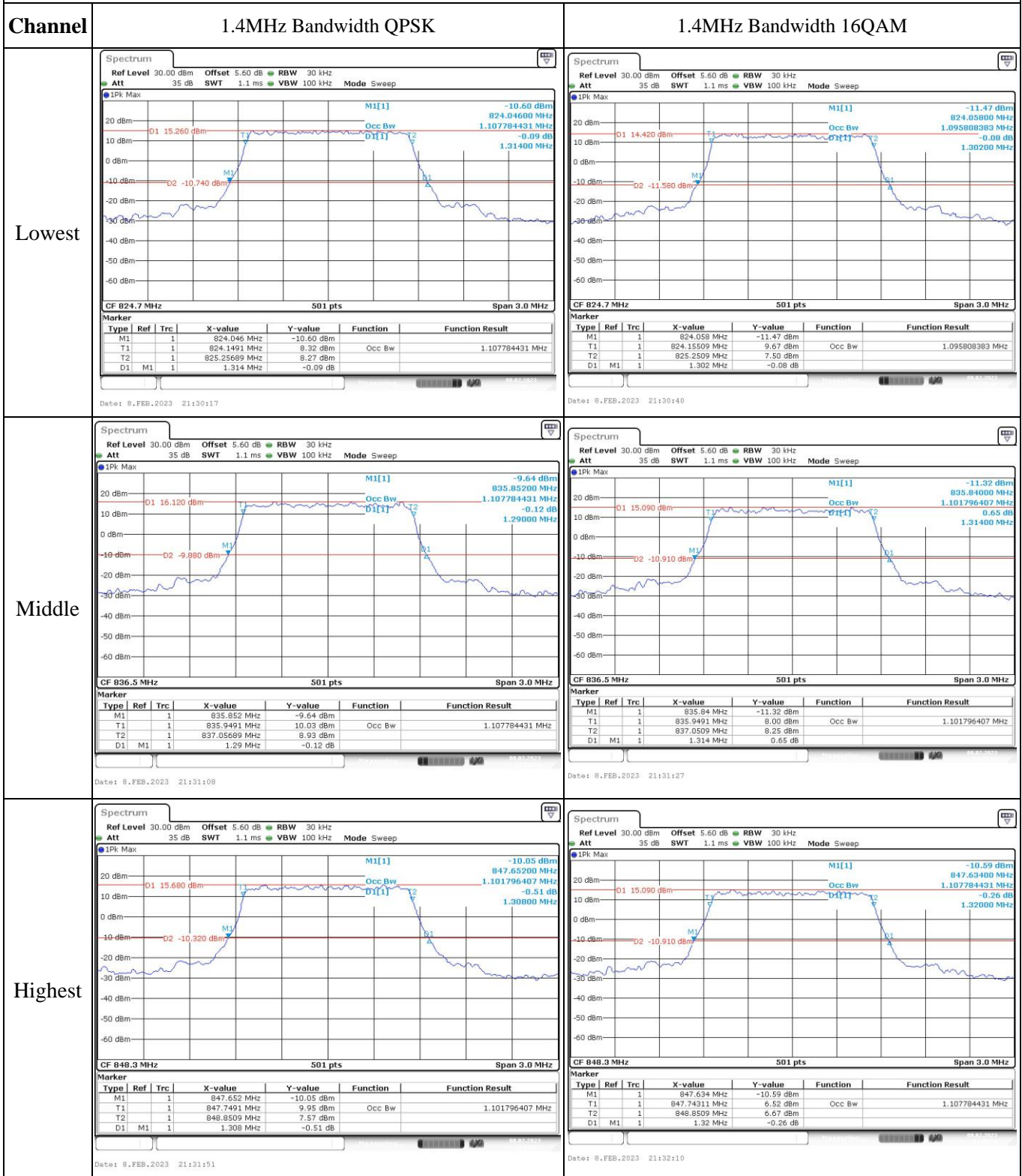
FCC §2.1051, §22.917(a):Spurious Emissions at Antenna Terminal**Result:** Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**FCC §2.1051, §22.917(a):Out of band emission, Band Edge****Result:** Pass, Please refer to the test plots of Out of band emission, Band Edge.**FCC §2.1055, §22.355: Frequency Stability**

Test Modulation:	10 MHz QPSK		Test Channel:	836.5	MHz
Test Item	Temperature (°C)	Voltage (V _{AC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	24	-0.4	0.000	2.5
	-20	24	-6.97	-0.008	2.5
	-10	24	-5.5	-0.007	2.5
	0	24	6.06	0.007	2.5
	10	24	9.8	0.012	2.5
	20	24	5.03	0.006	2.5
	30	24	-6.62	-0.008	2.5
	40	24	-8.73	-0.010	2.5
Frequency Stability vs. Voltage	20	15	8.99	0.011	2.5
	20	30	-7.17	-0.009	2.5
				Result:	Pass

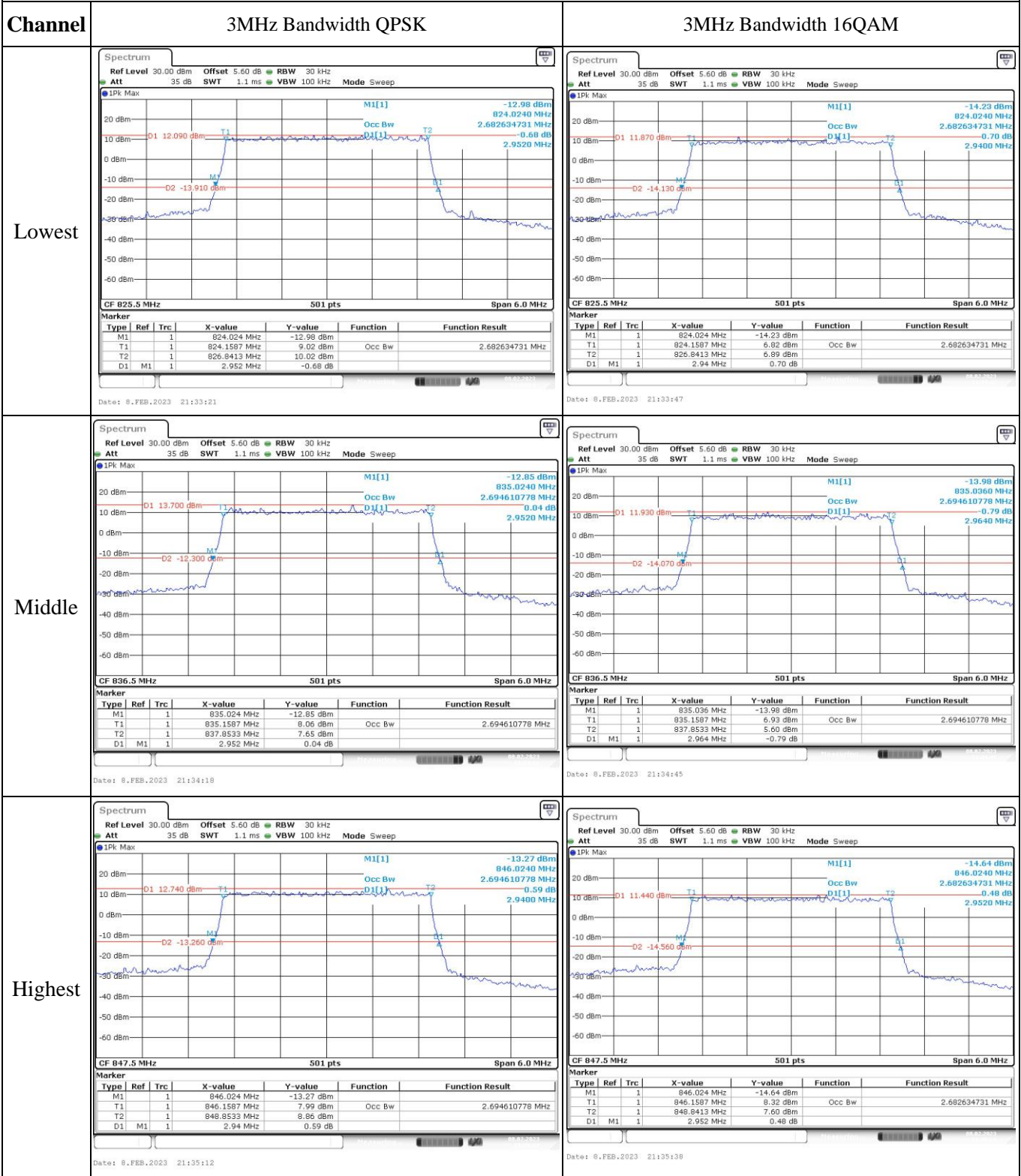
Test Modulation:	10 MHz 16QAM		Test Channel:	836.5	MHz
Test Item	Temperature (°C)	Voltage (V _{AC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	24	0.4	0.000	2.5
	-20	24	8.1	0.010	2.5
	-10	24	-8.59	-0.010	2.5
	0	24	9.33	0.011	2.5
	10	24	-6.94	-0.008	2.5
	20	24	7.54	0.009	2.5
	30	24	6.43	0.008	2.5
	40	24	-6.17	-0.007	2.5
Frequency Stability vs. Voltage	20	15	6.34	0.008	2.5
	20	30	-6.89	-0.008	2.5
				Result:	Pass

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

Occupied Bandwidth



Occupied Bandwidth



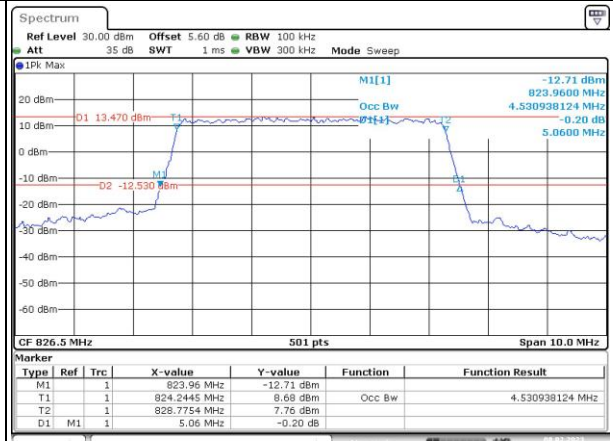
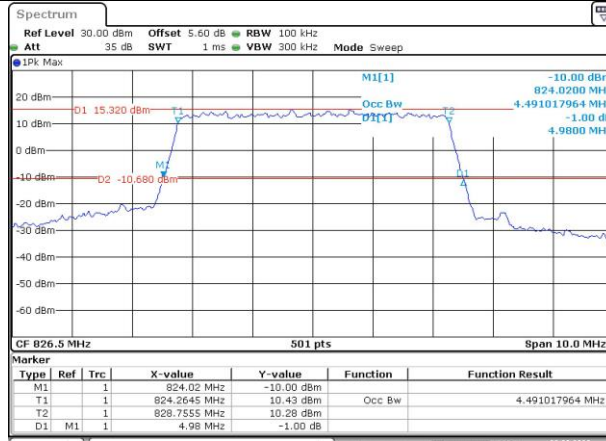
Occupied Bandwidth

Channel

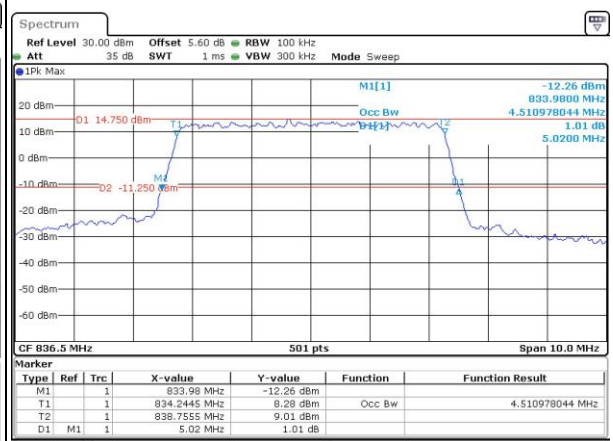
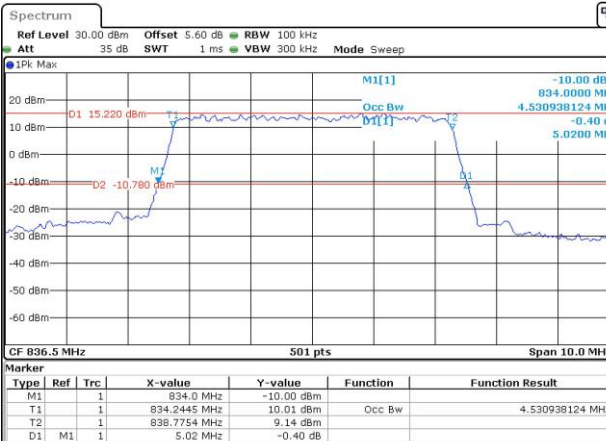
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

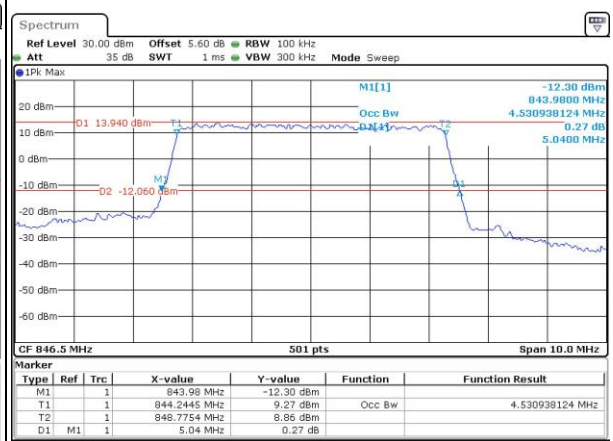
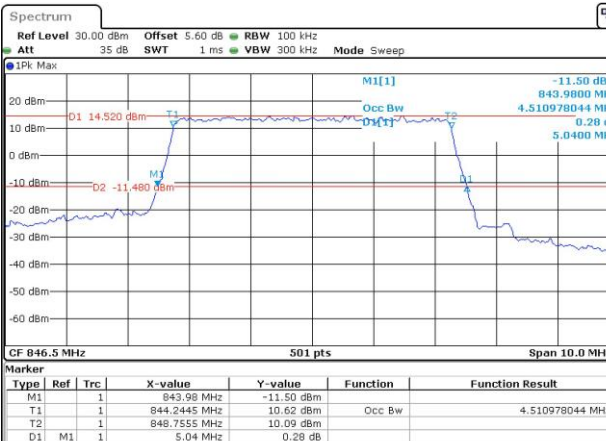
Lowest



Middle



Highest



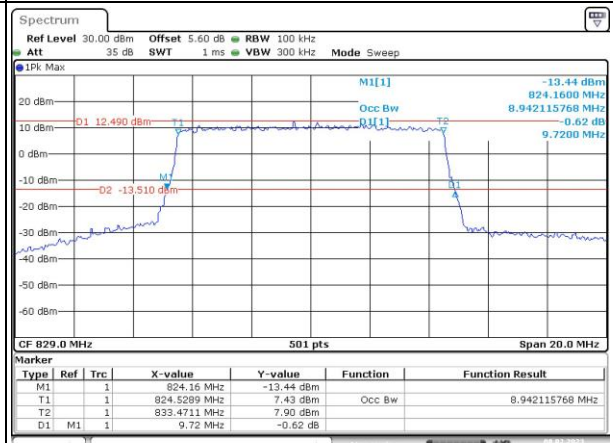
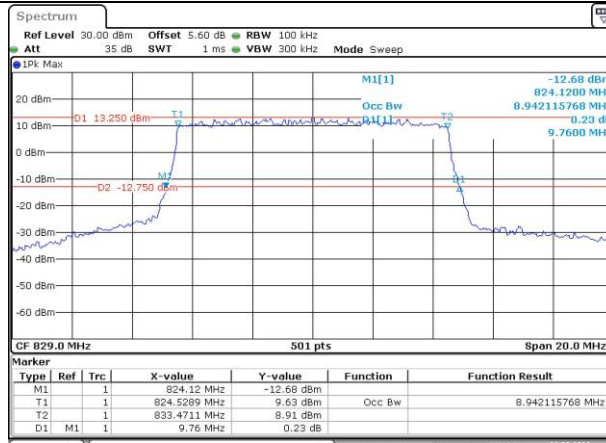
Occupied Bandwidth

Channel

10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

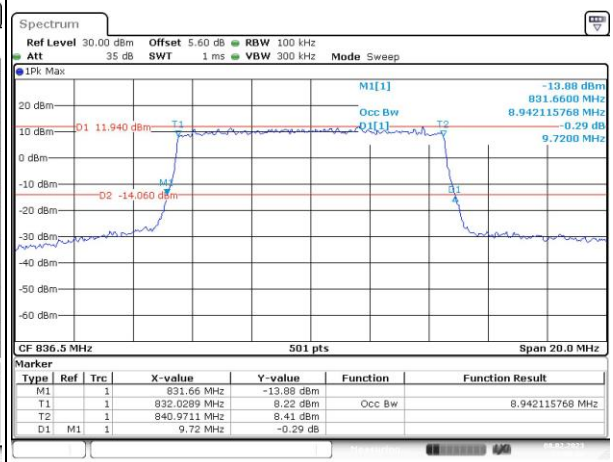
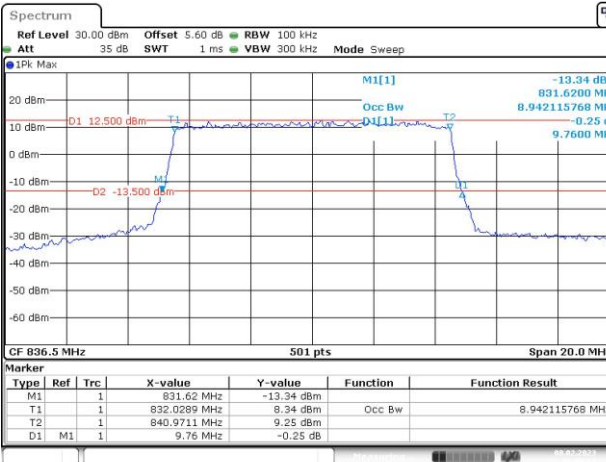
Lowest



Date: 8.FEB.2023 22:07:53

Date: 8.FEB.2023 22:08:24

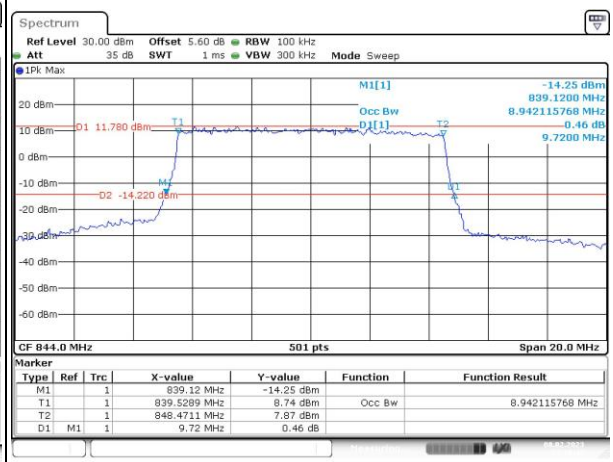
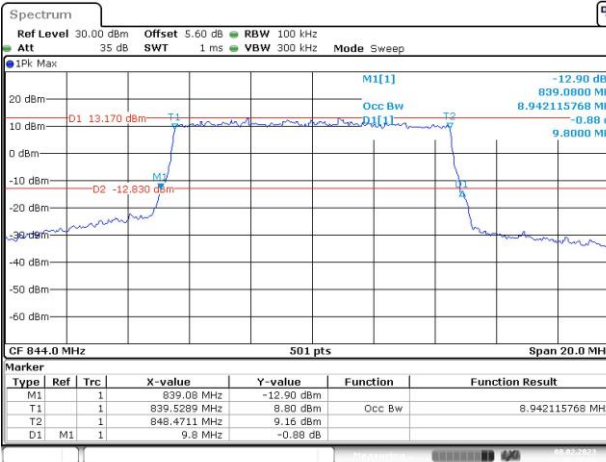
Middle



Date: 8.FEB.2023 22:09:01

Date: 8.FEB.2023 22:09:16

Highest



Date: 8.FEB.2023 22:10:08

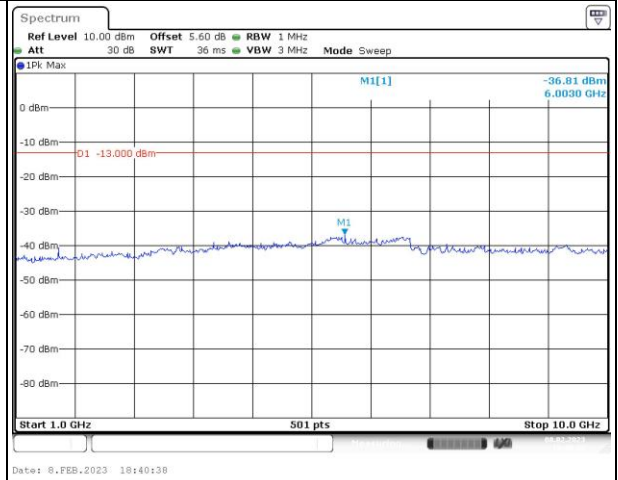
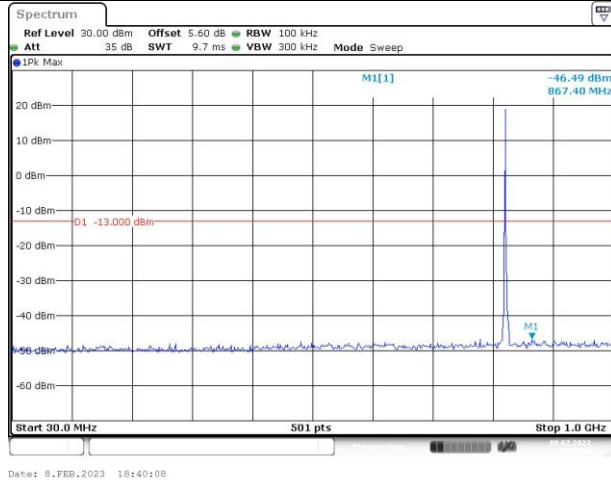
Date: 8.FEB.2023 22:10:43

Spurious Emissions at Antenna Terminal

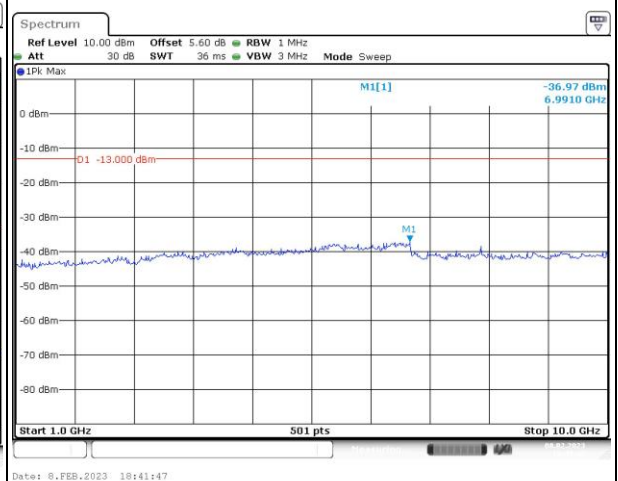
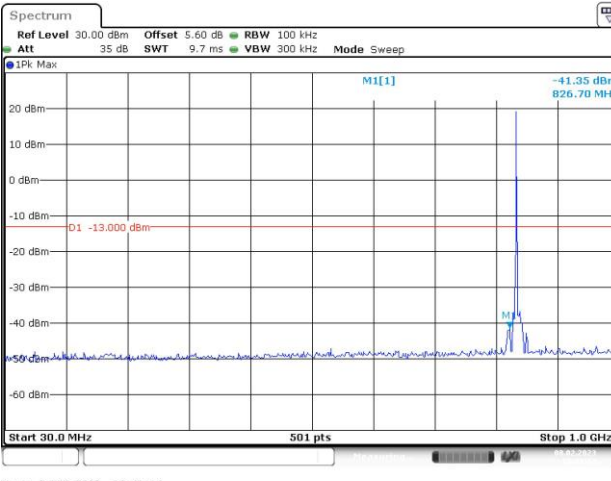
Channel

1.4MHz Bandwidth QPSK

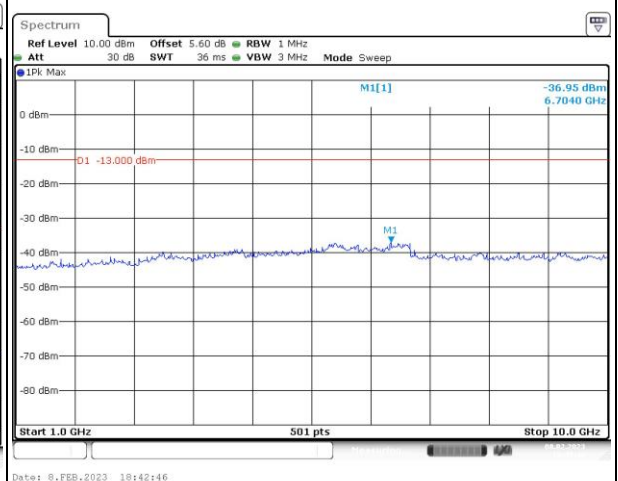
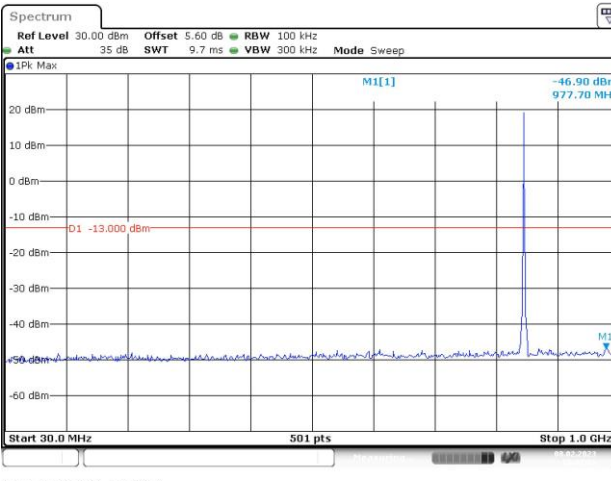
Lowest



Middle



Highest

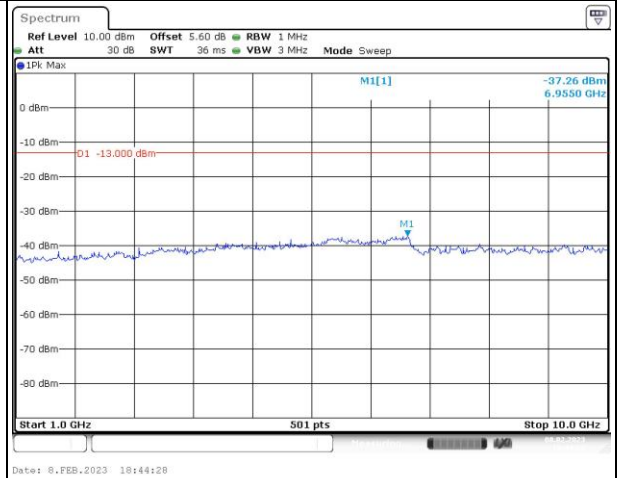
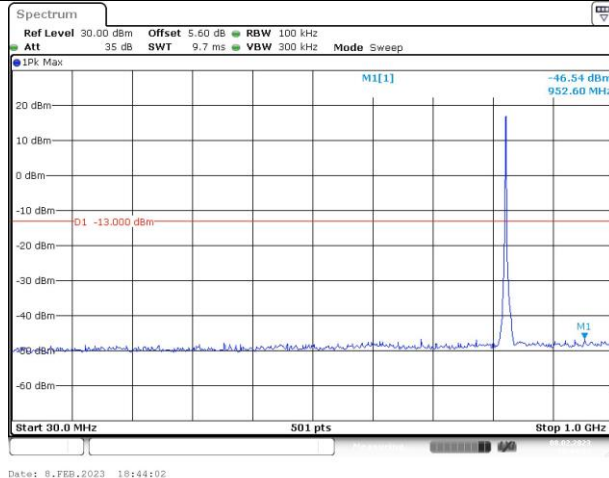


Spurious Emissions at Antenna Terminal

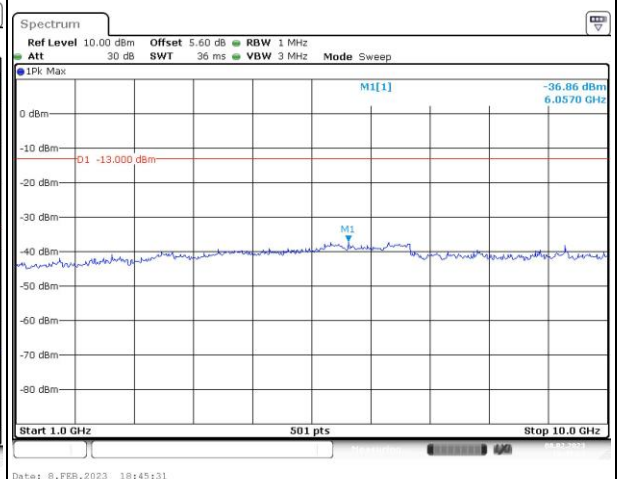
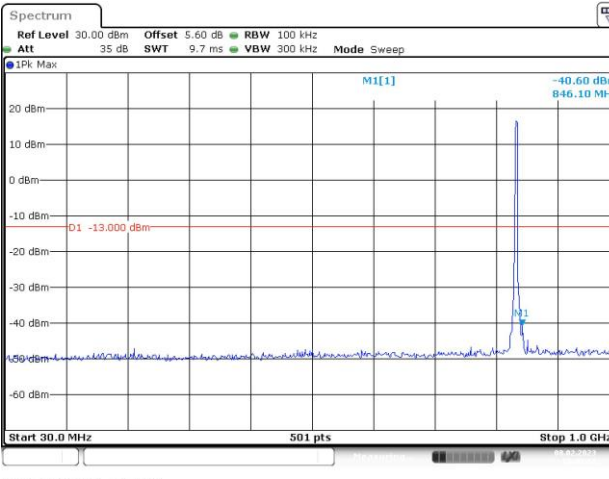
Channel

3MHz Bandwidth QPSK

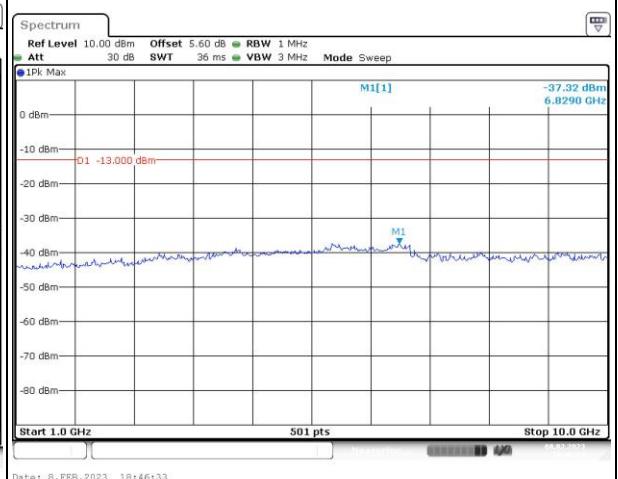
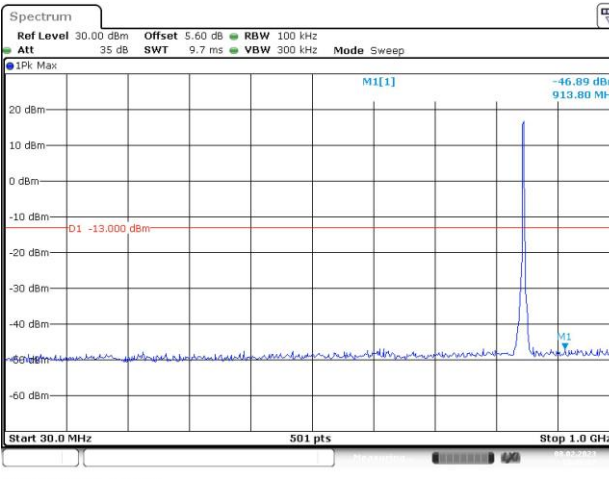
Lowest



Middle



Highest

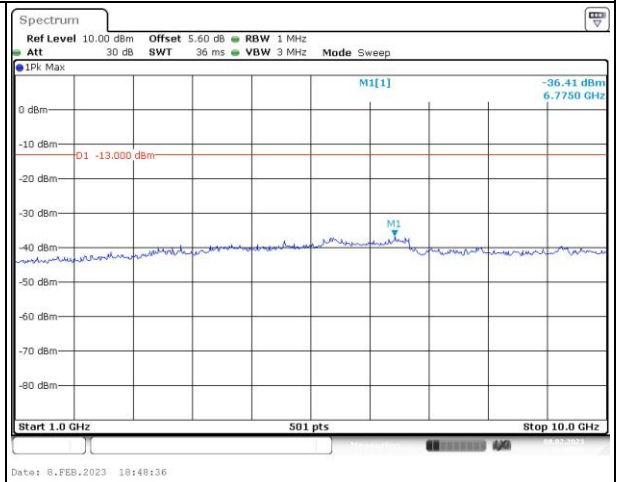
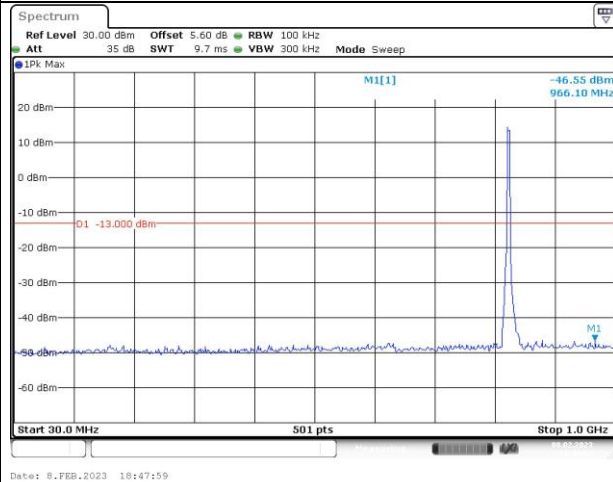


Spurious Emissions at Antenna Terminal

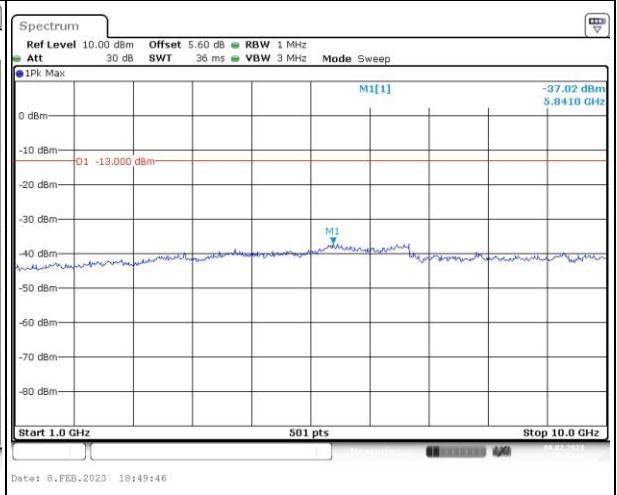
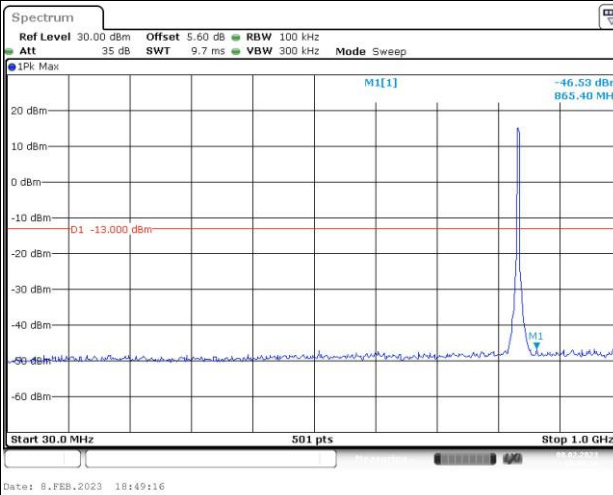
Channel

5MHz Bandwidth QPSK

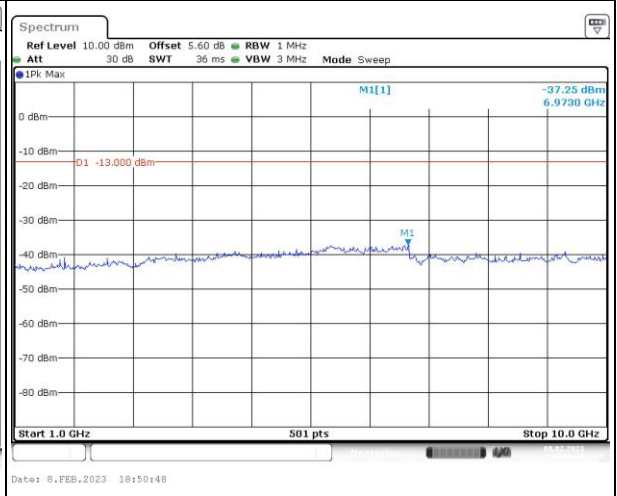
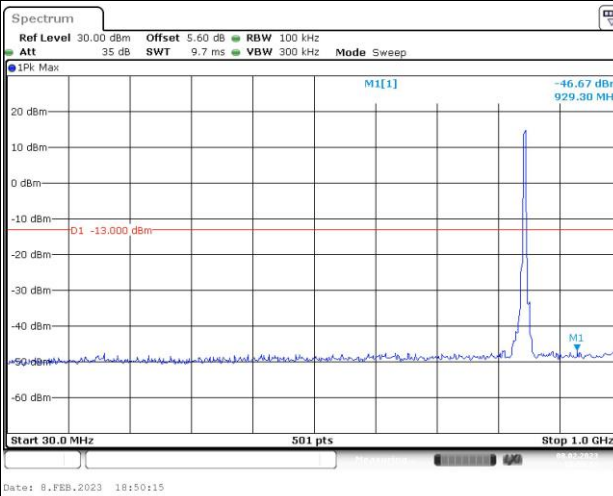
Lowest



Middle



Highest

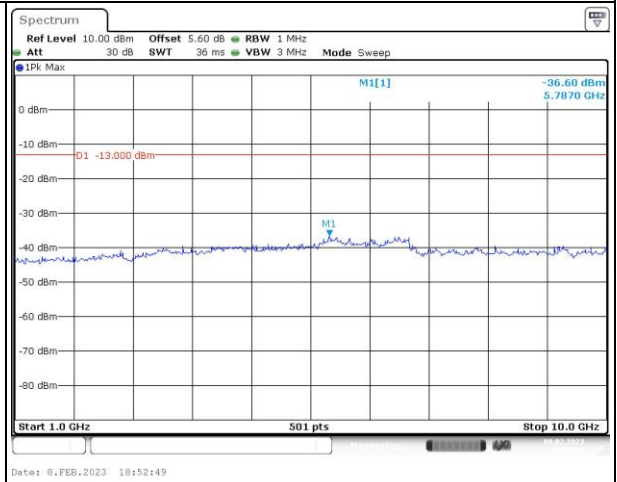
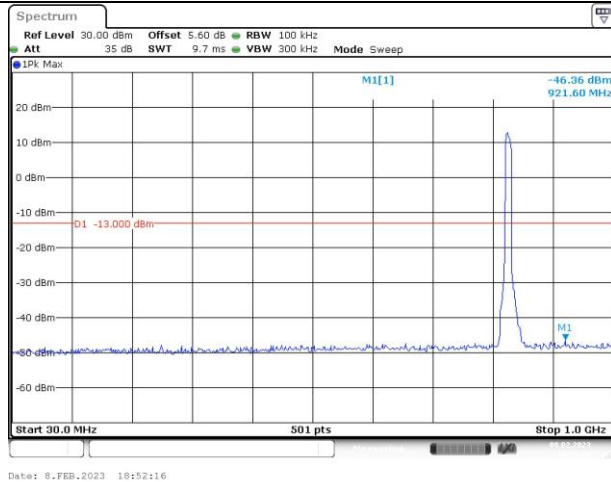


Spurious Emissions at Antenna Terminal

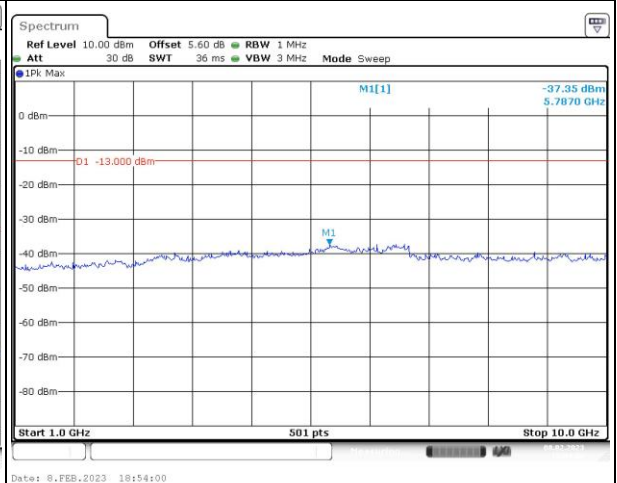
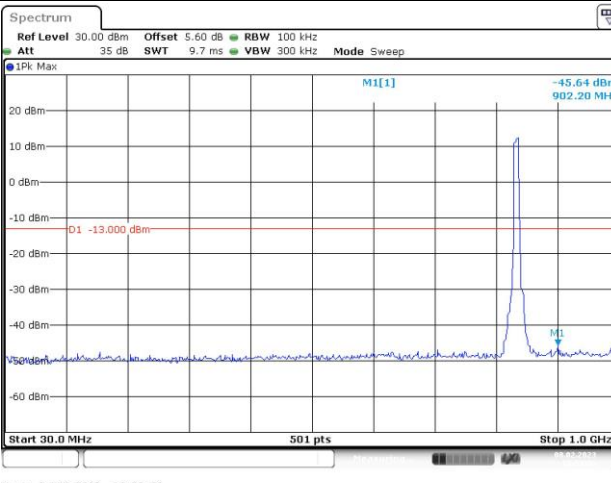
Channel

10MHz Bandwidth QPSK

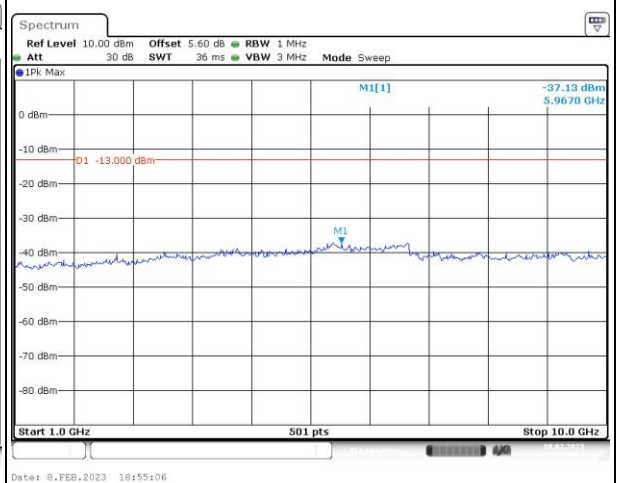
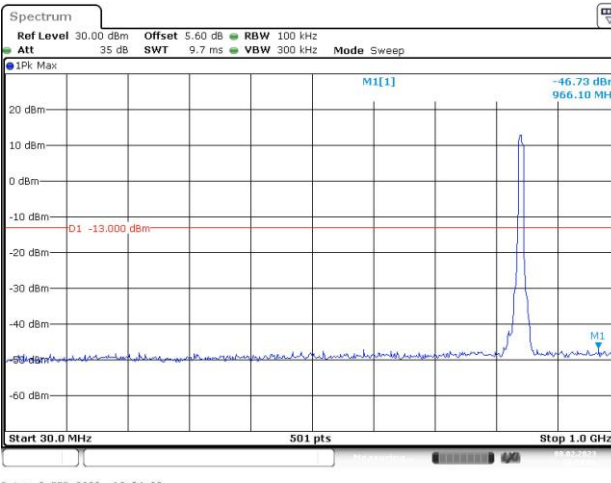
Lowest



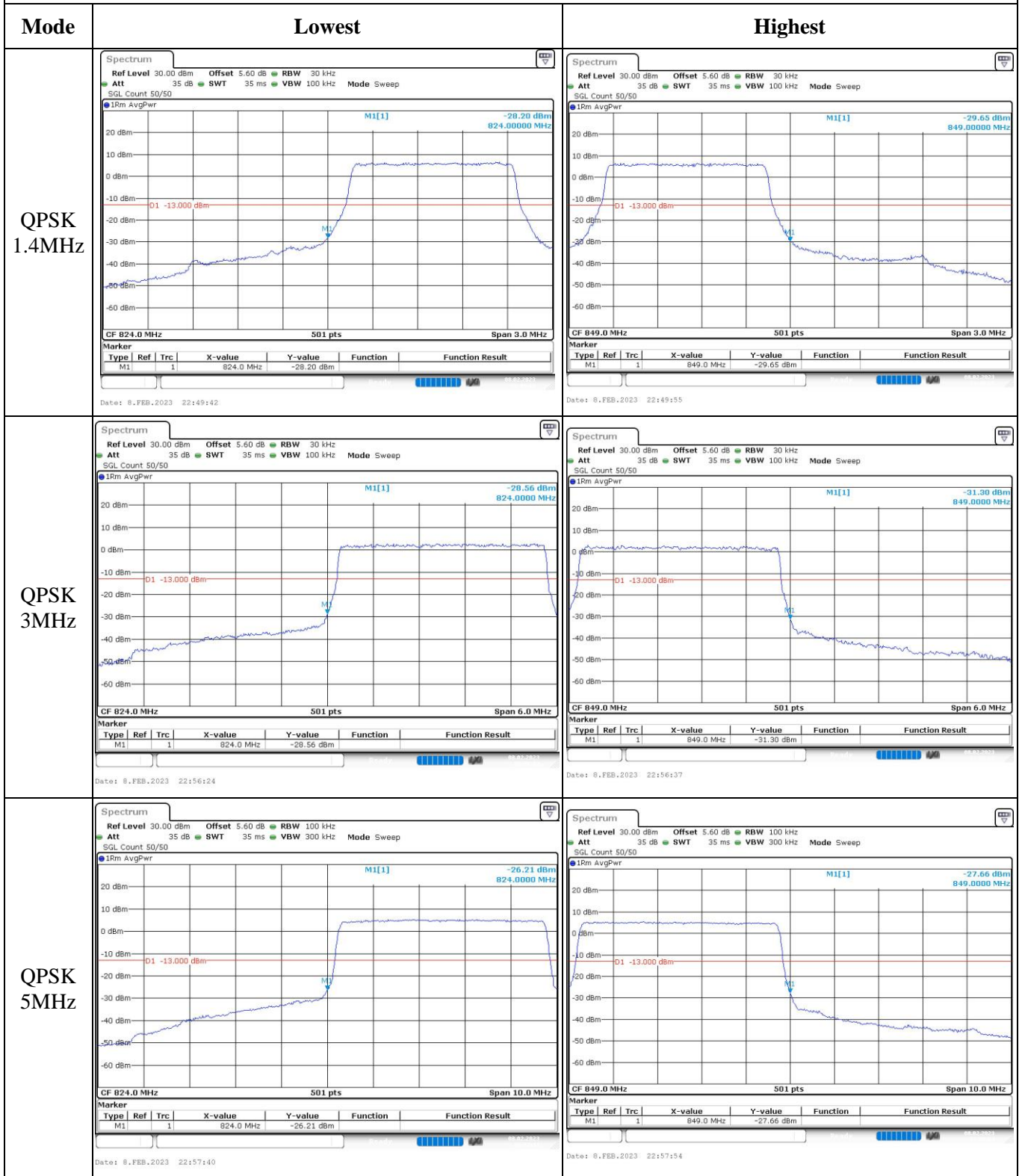
Middle



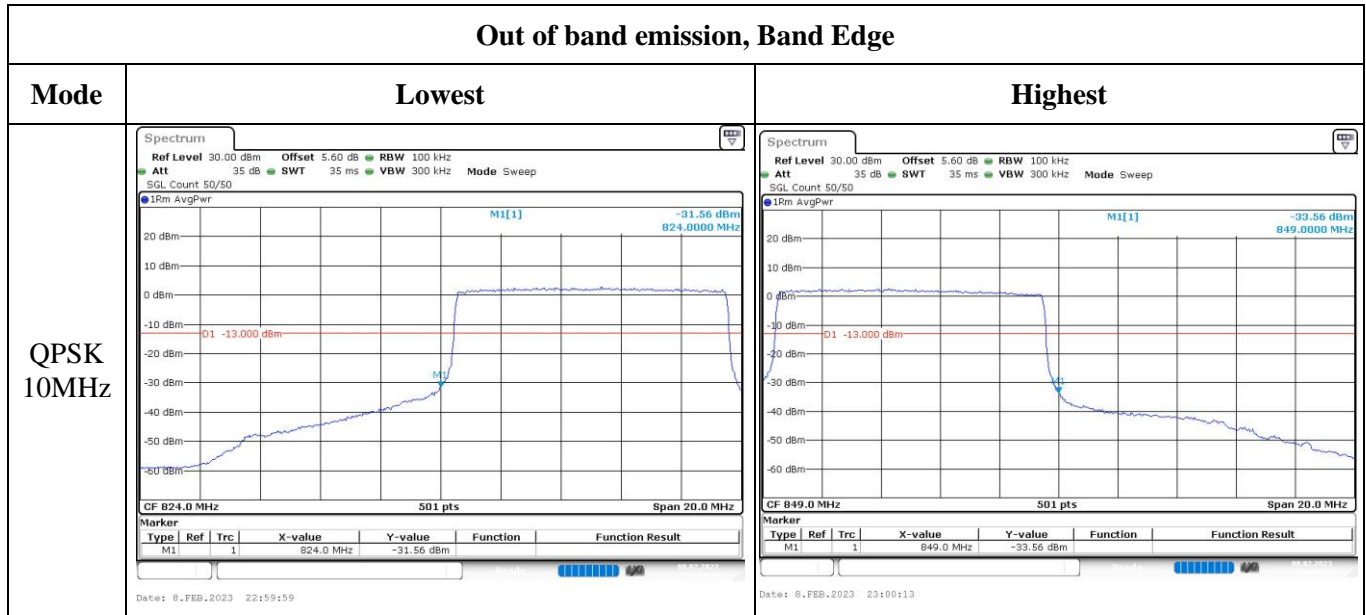
Highest



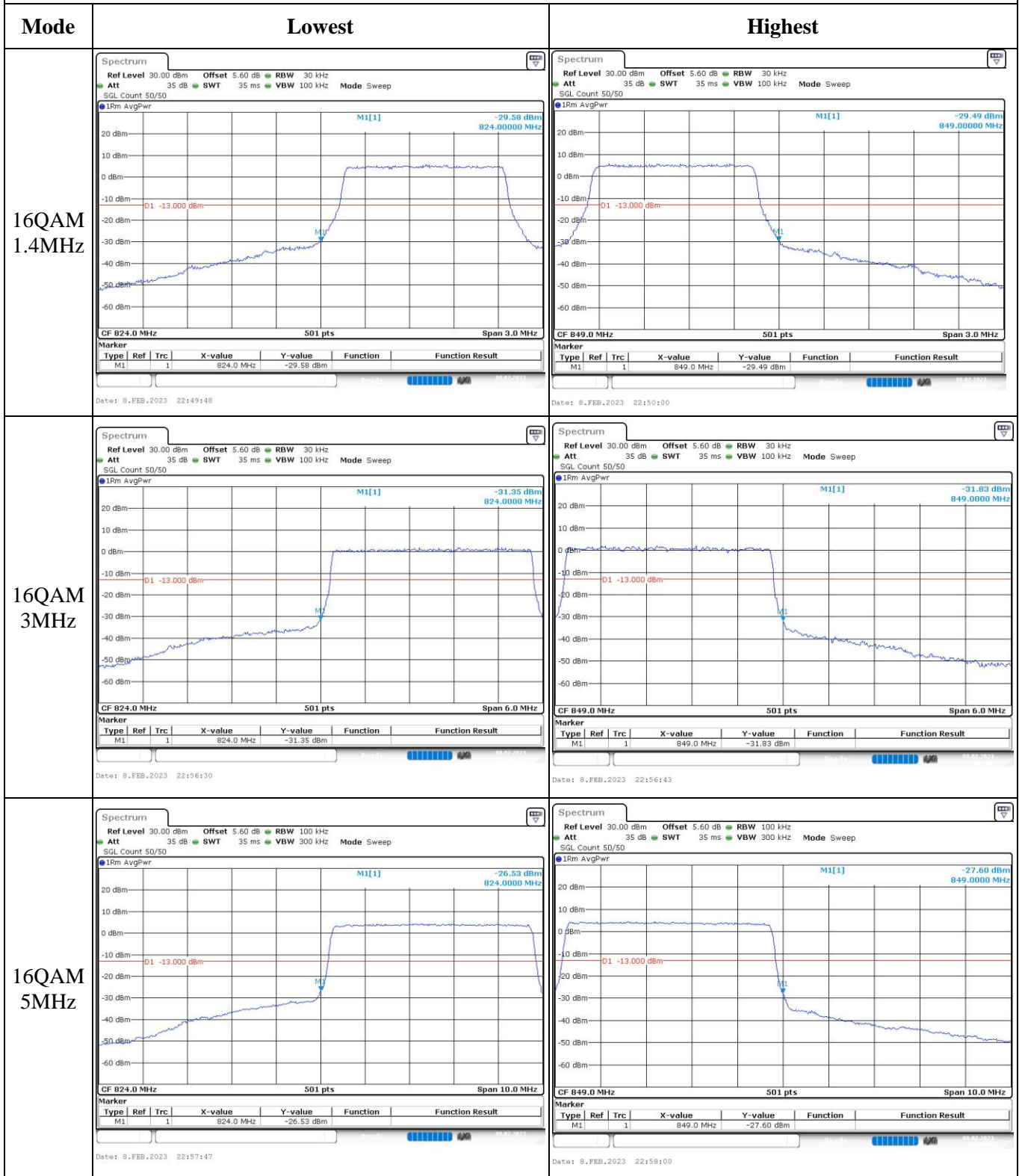
Out of band emission, Band Edge



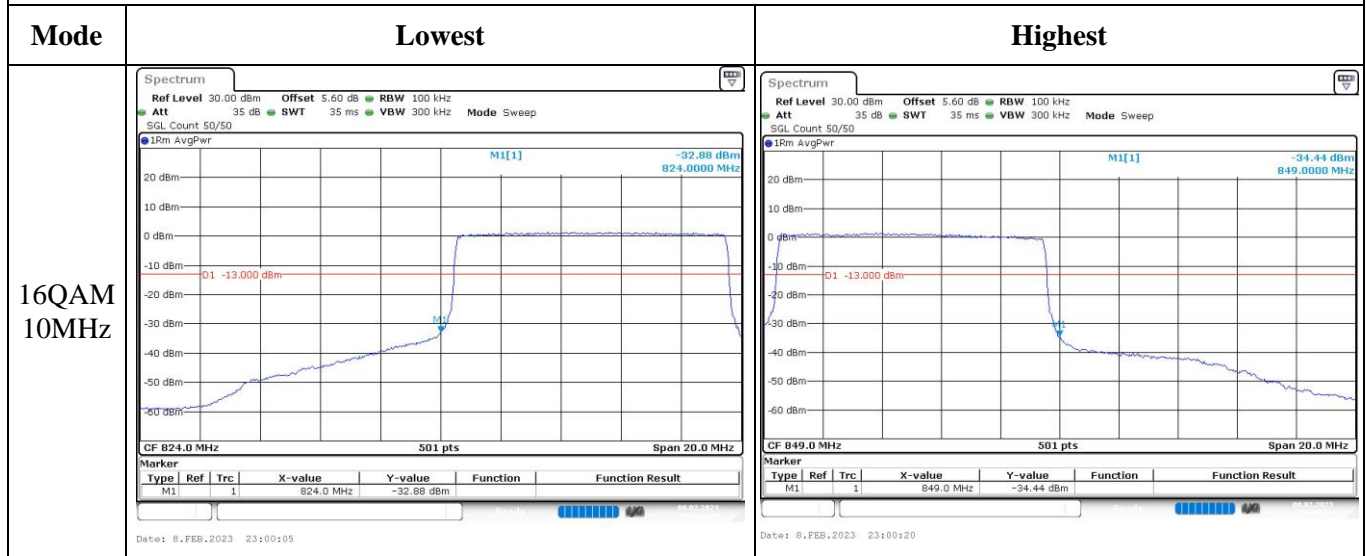
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.9 Antenna Port Test Data and Results for LTE Band 7

Serial Number:	1ZO9	Test Date:	2023/2/8~2023/2/21
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	21.1~24.2	Relative Humidity: (%)	39~53	ATM Pressure: (kPa)	101.2~102.1
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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	2022/7/15	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	2022/04/06	2023/04/05
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022/09/29	2023/09/28
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28

* 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)
5MHz	2502.5	2535	2567.5
10MHz	2505	2535	2565
15MHz	2507.5	2535	2562.5
20MHz	2510	2535	2560

Test Data:

FCC §2.1046; § 27.50(h)(2)						
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		
5MHz QPSK	RB1#0	23	22.89	22.87	25.52	33
	RB1#13	23.01	22.98	22.74		
	RB1#24	22.93	22.99	22.74		
	RB15#0	22.19	21.89	21.83		
	RB15#10	22.24	21.89	21.8		
	RB25#0	22.22	21.86	21.83		
5MHz 16QAM	RB1#0	22.47	21.46	21.43	25.03	33
	RB1#13	22.46	21.8	21.4		
	RB1#24	22.52	21.66	21.03		
	RB15#0	20.93	20.85	20.82		
	RB15#10	21.18	20.96	20.67		
	RB25#0	21.23	20.94	20.86		
10MHz QPSK	RB1#0	23	22.74	22.85	25.88	33
	RB1#25	23.33	22.93	22.85		
	RB1#49	23.37	22.97	22.72		
	RB25#0	22.05	21.84	21.93		
	RB25#25	22.17	21.83	21.83		
	RB50#0	22.13	21.76	21.87		
10MHz 16QAM	RB1#0	22.04	22.13	22.33	24.85	33
	RB1#25	21.93	22.33	22.34		
	RB1#49	21.56	22.12	22.19		
	RB25#0	21.3	20.64	20.8		
	RB25#25	21.36	20.92	20.65		
	RB50#0	21.07	20.73	20.73		
15MHz QPSK	RB1#0	22.85	22.63	22.74	25.36	33
	RB1#38	22.81	22.65	22.6		
	RB1#74	22.66	22.7	22.67		
	RB36#0	22	21.63	21.81		
	RB36#39	21.99	21.77	21.7		
	RB75#0	21.89	21.69	21.75		
15MHz 16QAM	RB1#0	21.93	22.08	22.2	24.71	33
	RB1#38	21.96	21.97	22.19		
	RB1#74	21.38	21.94	22.14		
	RB36#0	20.74	20.61	20.75		
	RB36#39	20.93	20.56	20.48		
	RB75#0	20.84	20.59	20.59		
20MHz QPSK	RB1#0	22.74	22.85	22.54	25.62	33

	RB1#50	23.11	22.97	22.8		
	RB1#99	22.62	23	22.47		
	RB50#0	21.99	21.54	21.82		
	RB50#50	21.85	21.69	21.81		
	RB100#0	21.83	21.65	21.8		
20MHz 16QAM	RB1#0	22.3	21.73	22.34	25.01	33
	RB1#50	22.46	21.63	22.5		
	RB1#99	22.01	21.78	22.02		
	RB50#0	20.95	20.51	20.64		
	RB50#50	20.81	20.65	20.57		
	RB100#0	20.98	20.56	20.67		
Note: EIRP=Conducted Power(dBm) - Lc(dB) + Gr(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	4.61	4.67	4.7	13	
	RB100#0	4.12	4	4	13	
20MHz 16QAM	RB1#0	5.86	4.99	5.36	13	
	RB100#0	5.86	5.74	5.74	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	5.02	5	5.04
5MHz 16QAM	4.531	4.531	4.491	5.04	5.04	5.02
10MHz QPSK	8.902	8.942	8.942	9.64	9.72	9.8
10MHz 16QAM	8.942	8.942	8.942	9.72	9.72	9.68
15MHz QPSK	13.473	13.413	13.473	14.88	14.82	14.94
15MHz 16QAM	13.473	13.473	13.473	14.76	14.76	14.88
20MHz QPSK	17.804	17.964	17.884	19.28	19.6	19.36
20MHz 16QAM	17.884	17.884	17.964	19.36	19.44	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 _{AC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	24	2501.096	2500.00	2568.935	2570
	-20	24	2501.126	2500.00	2568.935	2570
	-10	24	2501.101	2500.00	2568.981	2570
	0	24	2501.158	2500.00	2568.914	2570
	10	24	2501.065	2500.00	2568.998	2570
	20	24	2501.138	2500.00	2568.942	2570
	30	24	2501.066	2500.00	2568.930	2570
	40	24	2501.145	2500.00	2568.916	2570
Frequency Stability vs. Voltage	20	12	2501.156	2500.00	2568.991	2570
	20	48	2501.140	2500.00	2568.938	2570
					Result:	Pass

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{AC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	24	2501.056	2500.00	2569.031	2570
	-20	24	2501.008	2500.00	2569.047	2570
	-10	24	2501.095	2500.00	2569.064	2570
	0	24	2501.048	2500.00	2569.095	2570
	10	24	2501.025	2500.00	2569.065	2570
	20	24	2501.058	2500.00	2569.022	2570
	30	24	2501.007	2500.00	2569.039	2570
	40	24	2501.065	2500.00	2569.030	2570
Frequency Stability vs. Voltage	20	15	2501.030	2500.00	2569.086	2570
	20	30	2501.032	2500.00	2569.010	2570
					Result:	Pass

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

