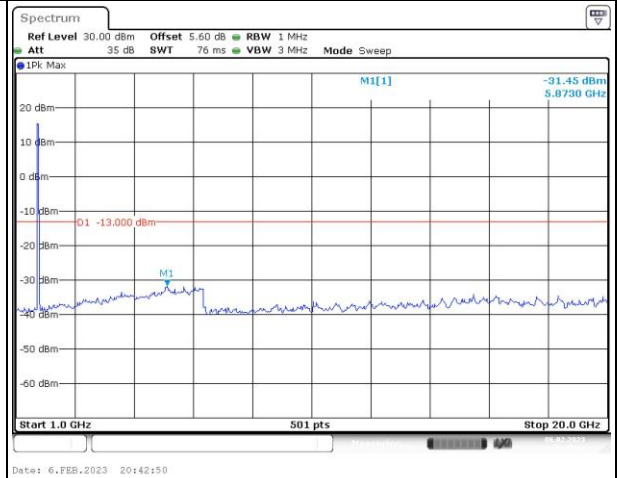
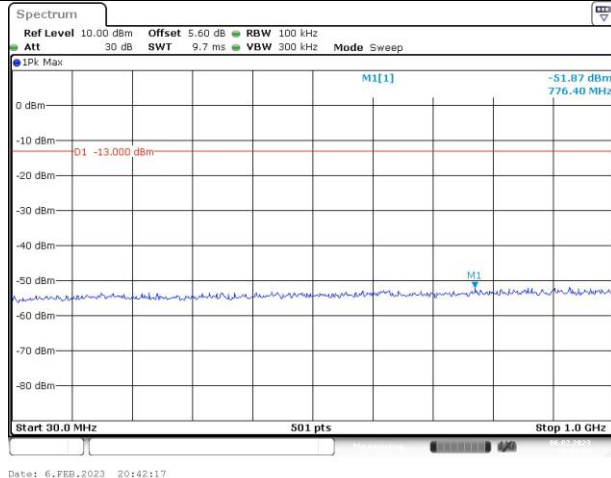


Spurious Emissions at Antenna Terminal

Channel

20MHz Bandwidth QPSK

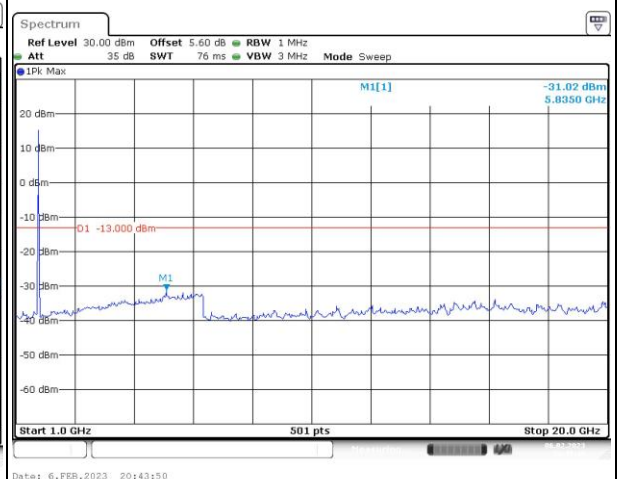
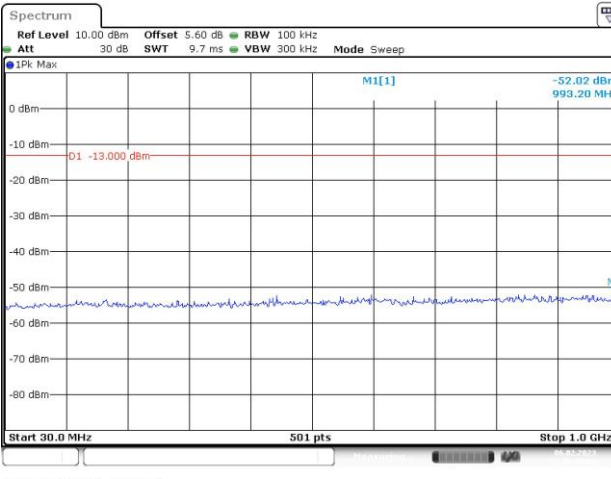
Lowest



Date: 6.FEB.2023 20:42:17

Date: 6.FEB.2023 20:42:50

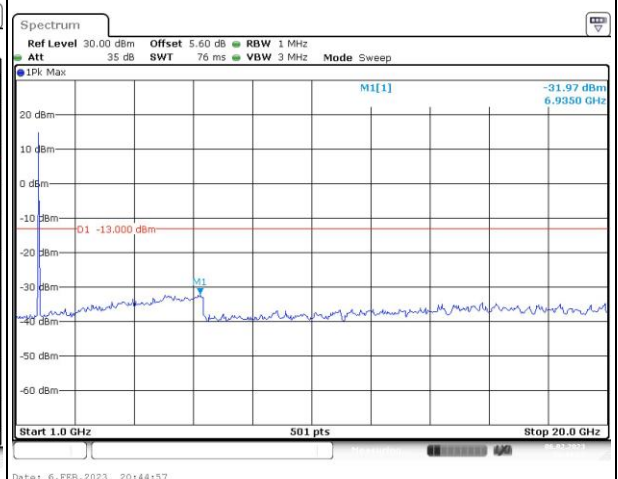
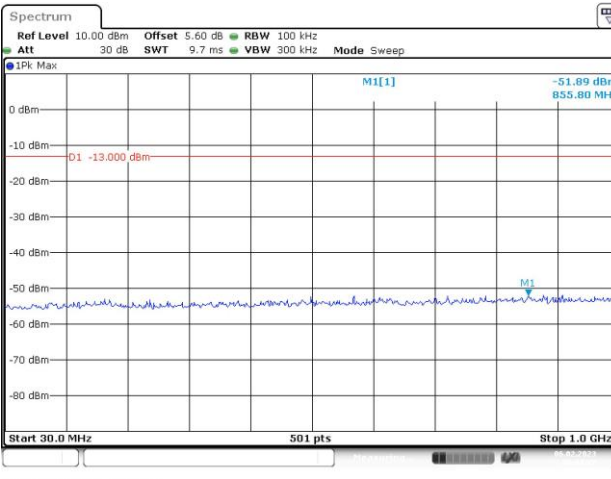
Middle



Date: 6.FEB.2023 20:43:20

Date: 6.FEB.2023 20:43:50

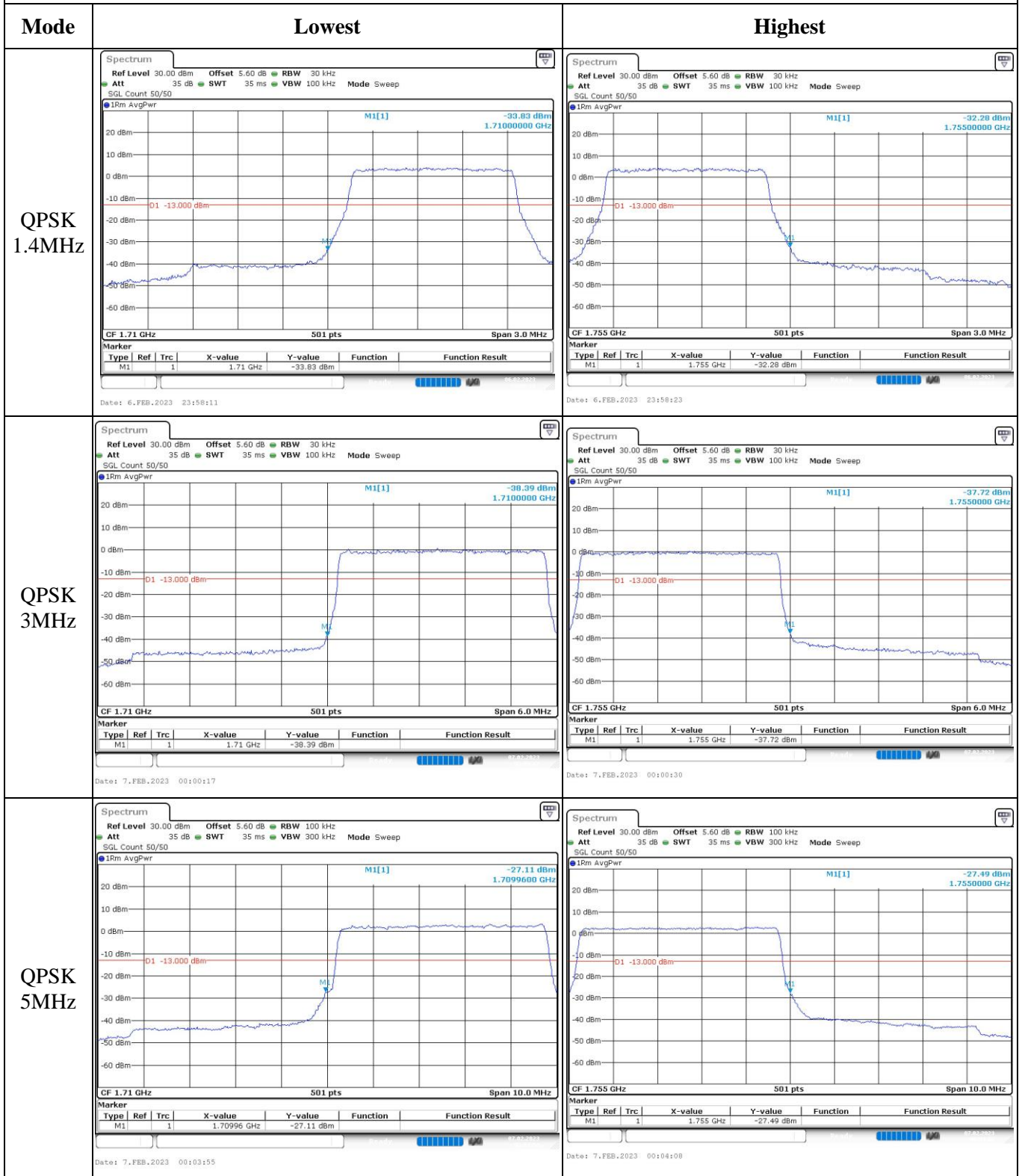
Highest



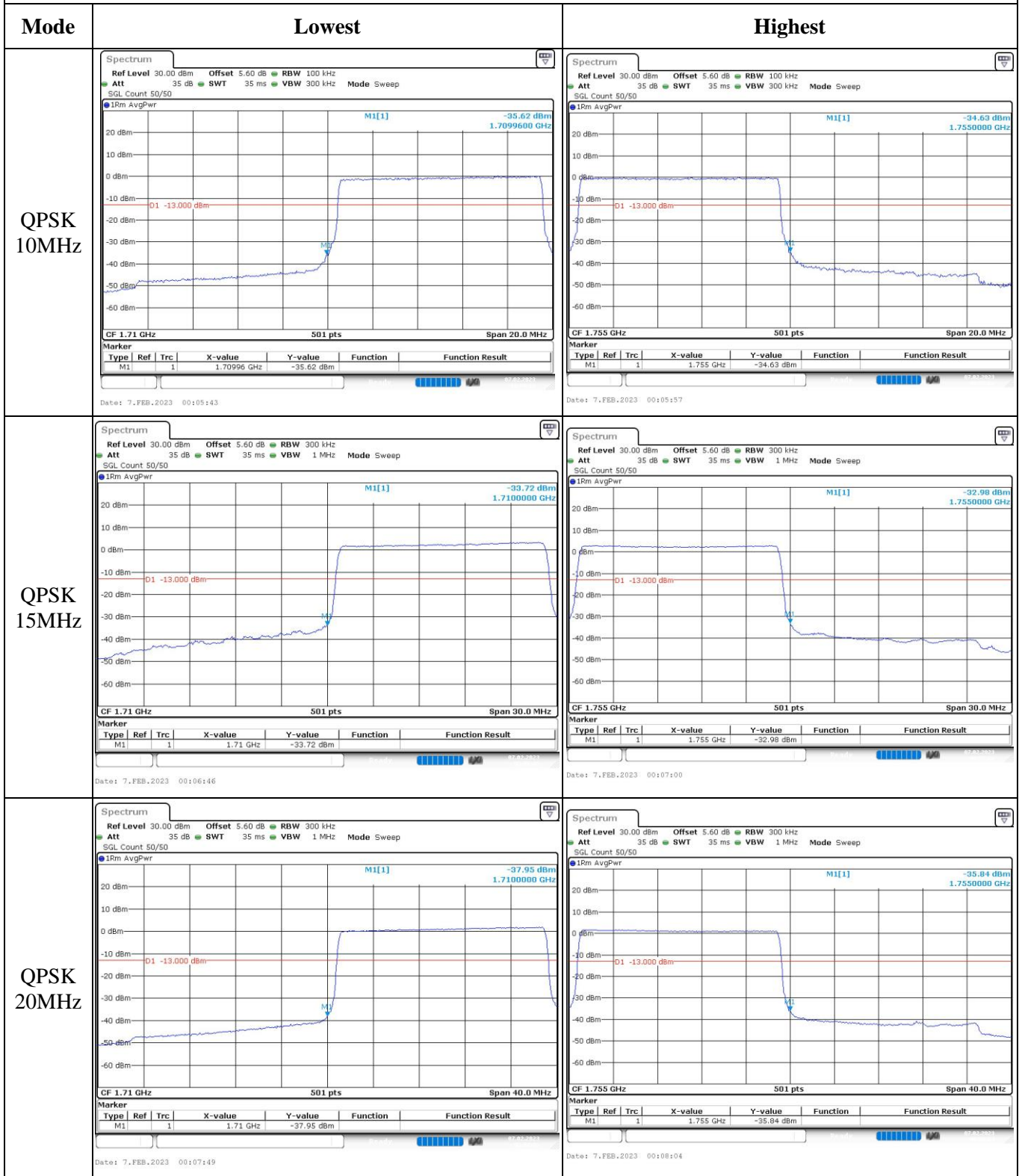
Date: 6.FEB.2023 20:44:27

Date: 6.FEB.2023 20:44:57

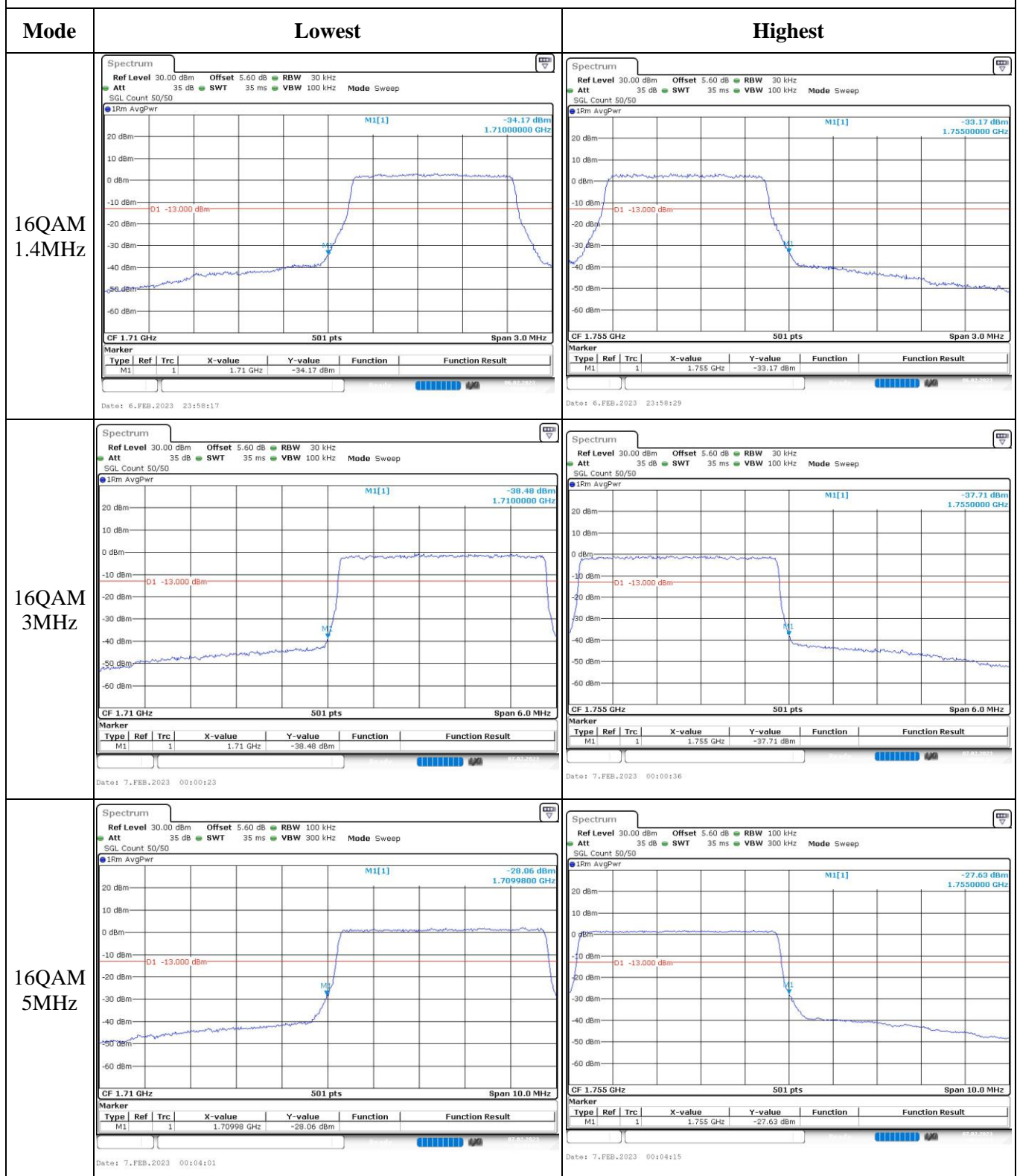
Out of band emission, Band Edge



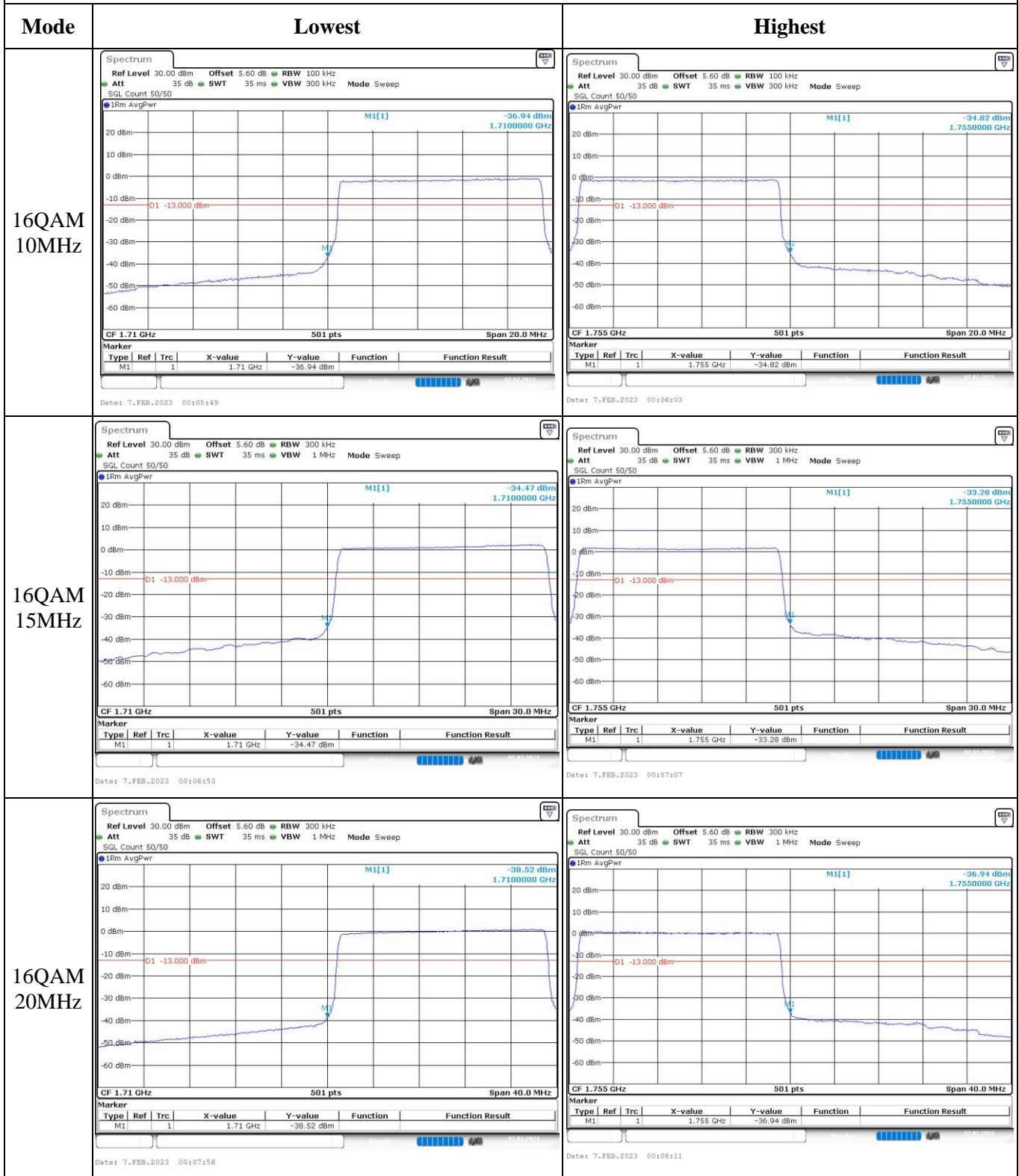
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.8 Antenna Port Test Data and Results for LTE Band 12

Serial Number:	1ZWQ	Test Date:	2023/2/6~2023/2/11
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	21.3~24.8	Relative Humidity: (%)	41~56	ATM Pressure: (kPa)	100.8~102.1
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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	2022-07-15	2023-07-14
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	2022-07-15	2023-07-14
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

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

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
1.4MHz	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	21.56	21.11	21.05	16.39	34.77
	RB1#3	21.76	21.26	21.27		
	RB1#5	21.29	21.15	21.12		
	RB3#0	21.13	21.16	21.17		
	RB3#3	21.2	21.23	21.21		
	RB6#0	20.12	20.18	20.16		
1.4MHz 16QAM	RB1#0	20.05	20.09	20.14	15.05	34.77
	RB1#3	20.29	20.23	20.35		
	RB1#5	20.05	20.12	20.21		
	RB3#0	20.27	20.42	20.17		
	RB3#3	20.27	20.4	20.27		
	RB6#0	19.11	19.23	19.28		
3MHz QPSK	RB1#0	21.68	21.18	21.13	16.32	34.77
	RB1#8	21.69	21.15	21.19		
	RB1#14	21.37	21.14	21.16		
	RB6#0	20.33	20.13	20.13		
	RB6#9	20.13	20.23	20.13		
	RB15#0	20.15	20.18	20.15		
3MHz 16QAM	RB1#0	20.19	20.79	20.28	15.42	34.77
	RB1#8	20.17	20.73	20.28		
	RB1#14	20.14	20.72	20.29		
	RB6#0	19.13	19.25	19.24		
	RB6#9	19.11	19.29	19.2		
	RB15#0	19.27	19.32	19.19		
5MHz QPSK	RB1#0	21.52	21.04	21.06	16.41	34.77
	RB1#13	21.78	21.27	21.27		
	RB1#24	21.37	21.13	21.12		
	RB15#0	20.34	20.18	20.12		
	RB15#10	20.15	20.32	20.1		
	RB25#0	20.2	20.24	20.08		
5MHz 16QAM	RB1#0	20.12	19.91	20.32	15.22	34.77
	RB1#13	20.33	20.12	20.59		
	RB1#24	20.16	20.01	20.37		
	RB15#0	19.41	19.26	19.15		
	RB15#10	19.21	19.39	19.11		
	RB25#0	19.26	19.26	19.11		
10MHz QPSK	RB1#0	21.63	21.09	21.12	16.46	34.77
	RB1#25	21.83	21.31	21.31		
	RB1#49	21.72	21.15	21.22		

	RB25#0	20.92	20.24	20.03		
	RB25#25	20.76	20.47	20.21		
	RB50#0	20.88	20.37	20.15		
10MHz 16QAM	RB1#0	20.43	20.67	20.26	15.56	34.77
	RB1#25	20.55	20.93	20.52		
	RB1#49	20.2	20.72	20.32		
	RB25#0	19.59	19.31	19.15		
	RB25#25	19.39	19.54	19.28		
	RB50#0	19.42	19.37	19.16		

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	5.71	5.51	5.62	13
	RB50#0	5.65	5.57	5.39	13
10MHz 16QAM	RB1#0	6.64	6.06	6.52	13
	RB50#0	6.49	6.41	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
1.4MHz QPSK	1.102	1.096	1.102	1.29	1.296	1.32
1.4MHz 16QAM	1.102	1.102	1.09	1.296	1.326	1.29
3MHz QPSK	2.683	2.683	2.683	2.88	2.88	2.868
3MHz 16QAM	2.671	2.683	2.683	2.88	2.88	2.892
5MHz QPSK	4.511	4.531	4.511	5.16	5.16	5.18
5MHz 16QAM	4.551	4.531	4.531	5.24	5.18	5.18
10MHz QPSK	8.982	8.982	8.982	9.88	9.96	9.92
10MHz 16QAM	8.982	8.982	8.982	9.84	9.92	9.84

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

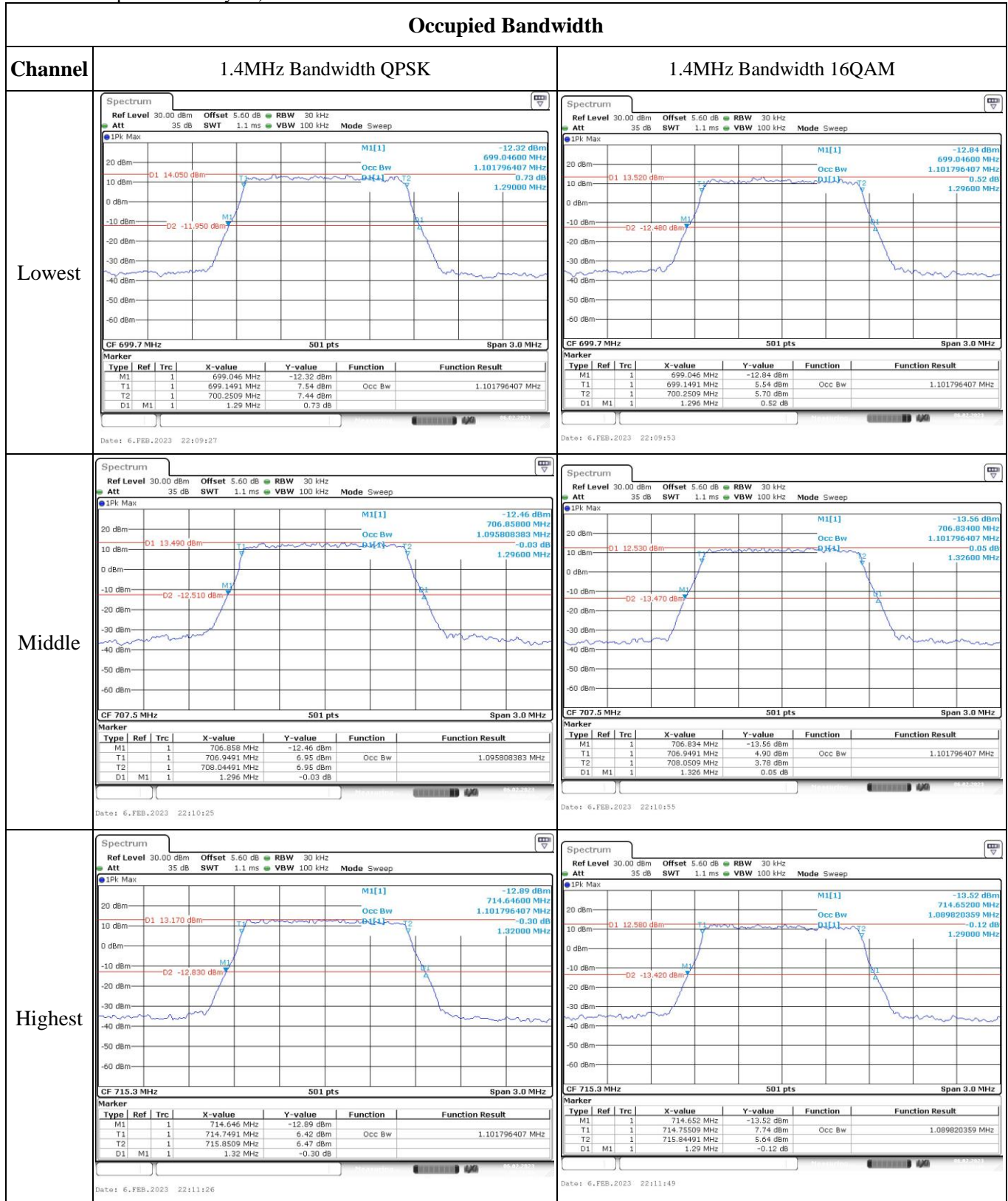
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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FCC §2.1055, §27.54: Frequency Stability

Test Mode:	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	3.8	699.462	699.00	715.508	716.00
	-20	3.8	699.481	699.00	715.548	716.00
	-10	3.8	699.462	699.00	715.500	716.00
	0	3.8	699.464	699.00	715.561	716.00
	10	3.8	699.425	699.00	715.568	716.00
	20	3.8	699.489	699.00	715.511	716.00
	30	3.8	699.512	699.00	715.513	716.00
	40	3.8	699.429	699.00	715.581	716.00
Frequency Stability vs. Voltage	20	3.45	699.420	699.00	715.528	716.00
	20	4.4	699.434	699.00	715.573	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	3.8	699.432	699.00	715.593	716.00
	-20	3.8	699.457	699.00	715.512	716.00
	-10	3.8	699.422	699.00	715.548	716.00
	0	3.8	699.483	699.00	715.522	716.00
	10	3.8	699.428	699.00	715.525	716.00
	20	3.8	699.489	699.00	715.511	716.00
	30	3.8	699.494	699.00	715.506	716.00
	40	3.8	699.469	699.00	715.520	716.00
Frequency Stability vs. Voltage	20	3.45	699.478	699.00	715.501	716.00
	20	4.4	699.515	699.00	715.577	716.00
					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):



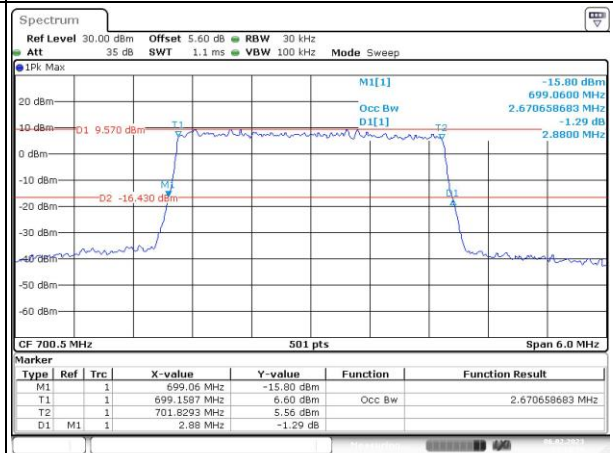
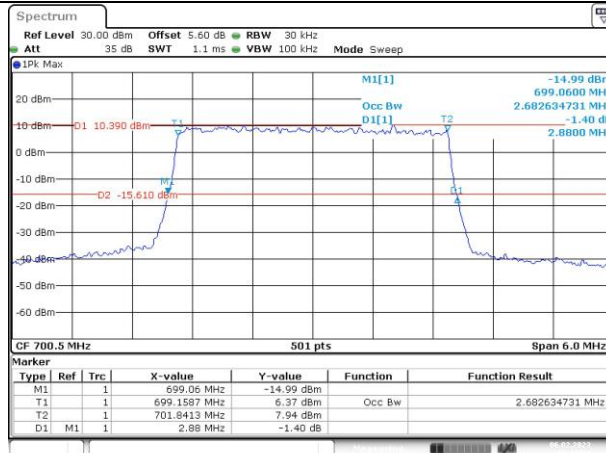
Occupied Bandwidth

Channel

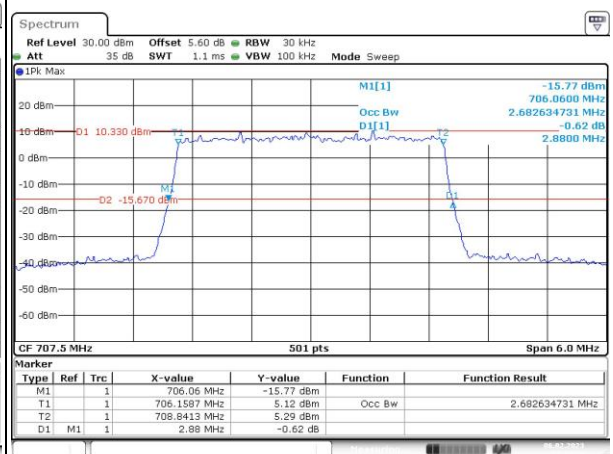
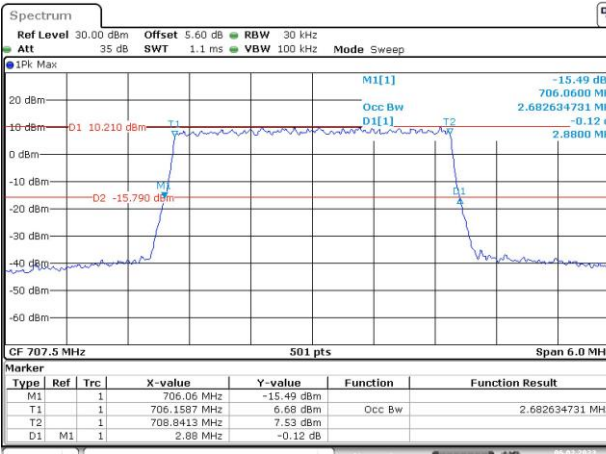
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

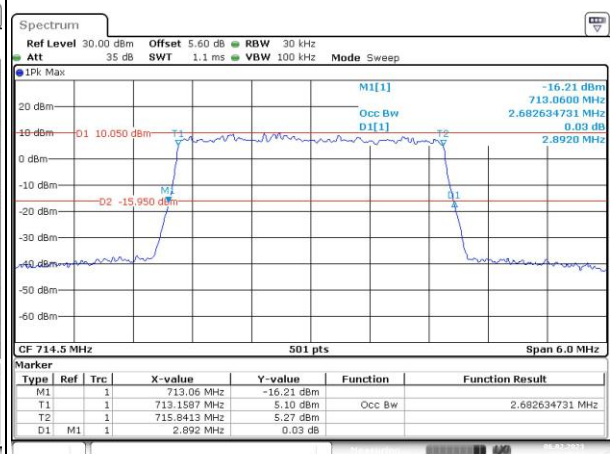
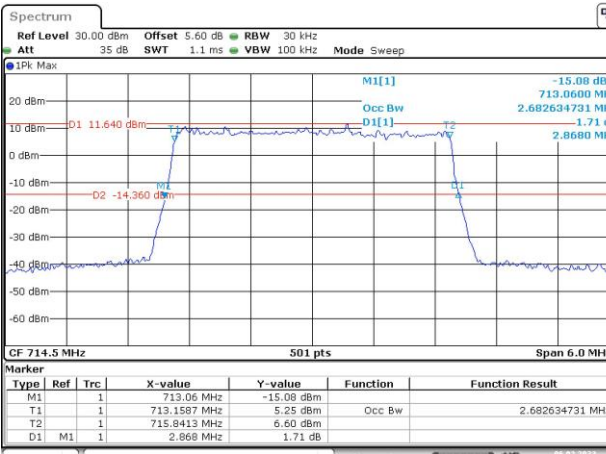
Lowest



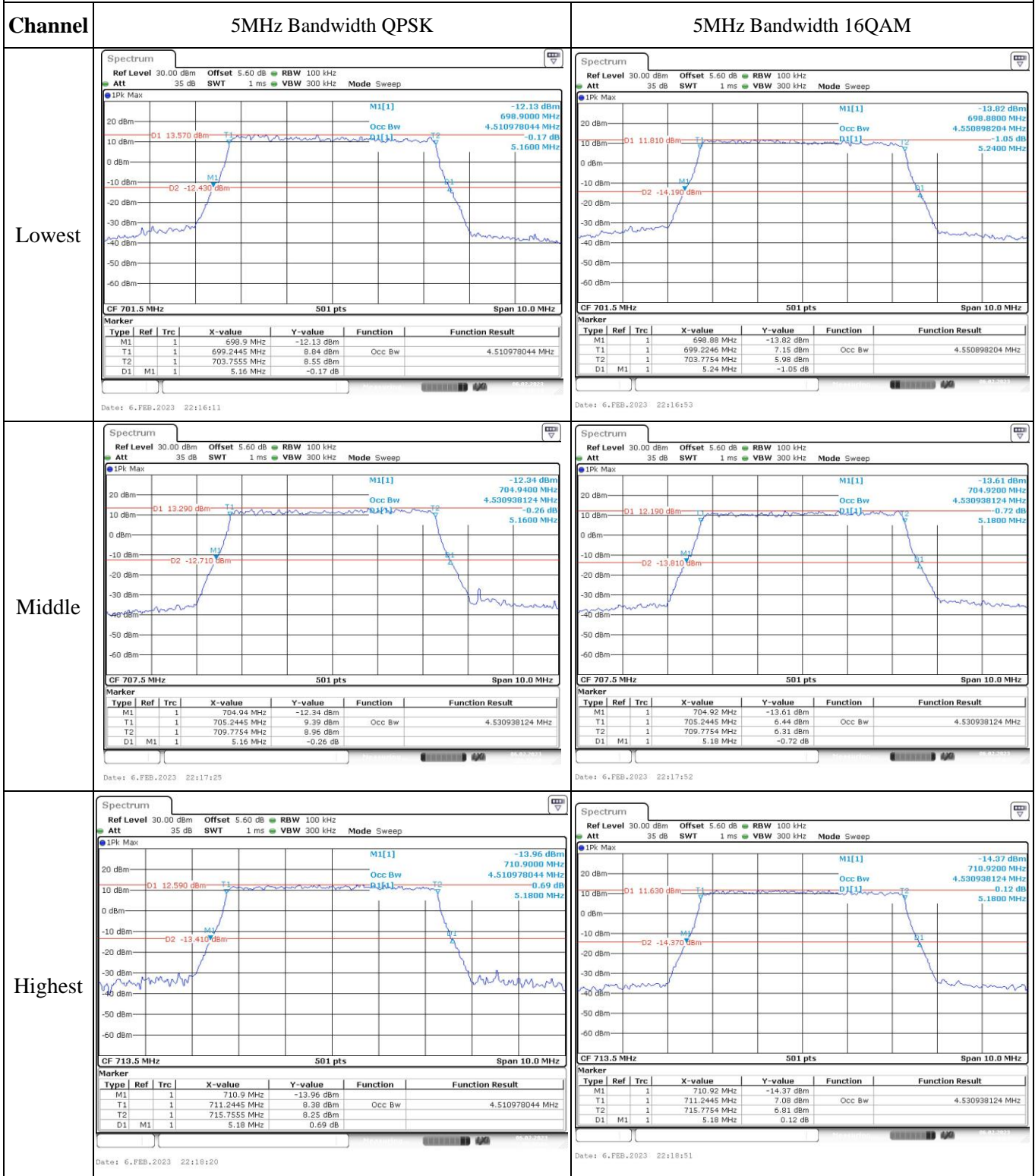
Middle



Highest



Occupied Bandwidth



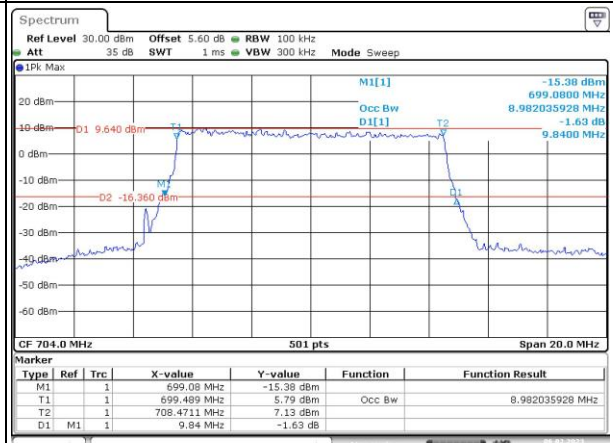
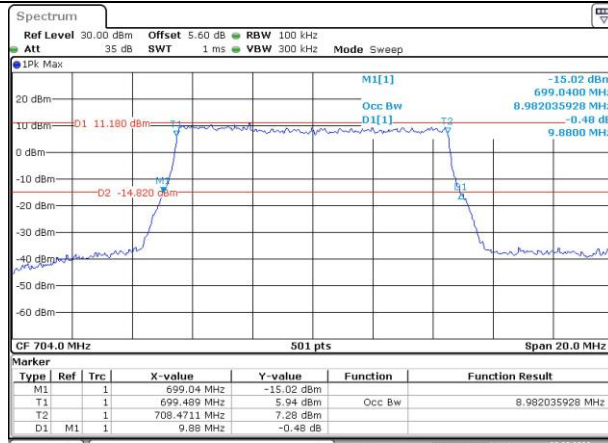
Occupied Bandwidth

Channel

10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

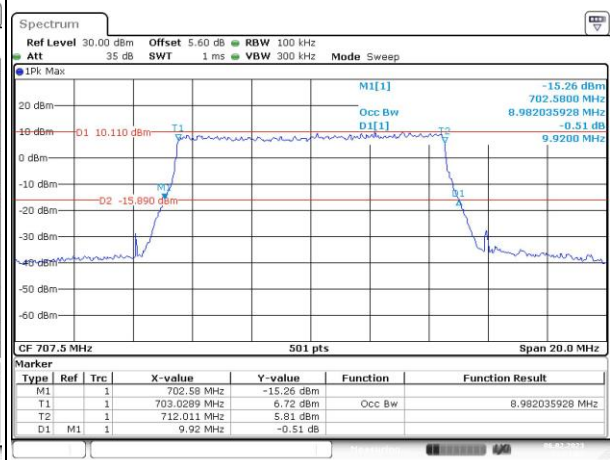
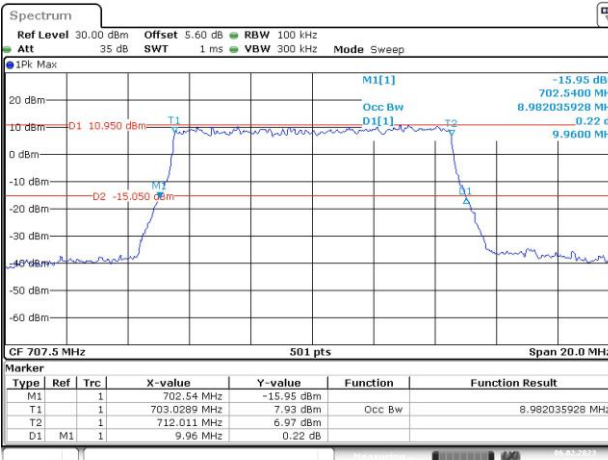
Lowest



Date: 6.FEB.2023 22:20:04

Date: 6.FEB.2023 22:20:39

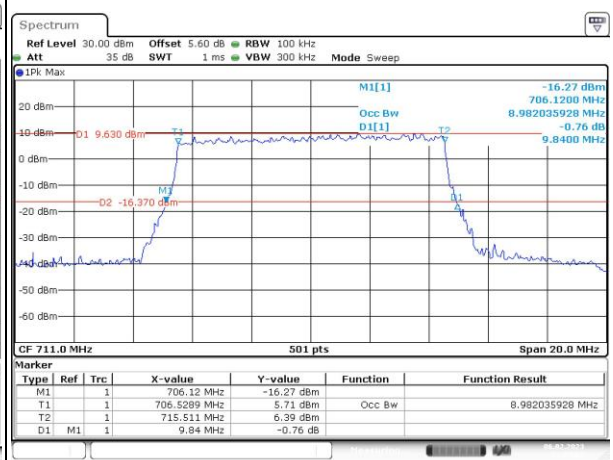
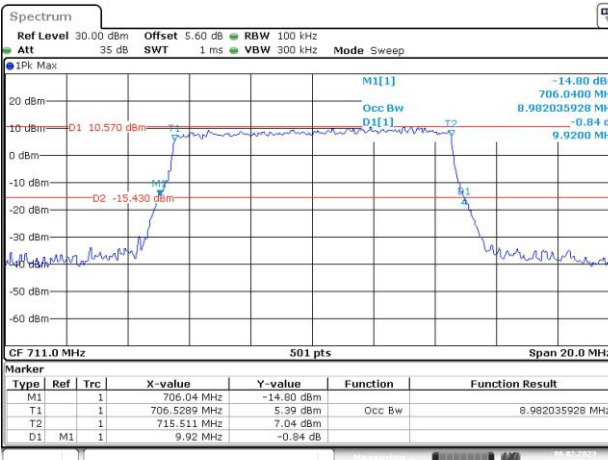
Middle



Date: 6.FEB.2023 22:21:14

Date: 6.FEB.2023 22:21:53

Highest



Date: 6.FEB.2023 22:22:33

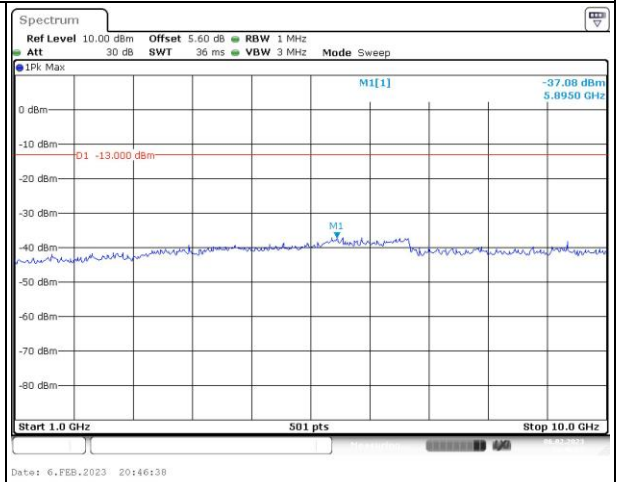
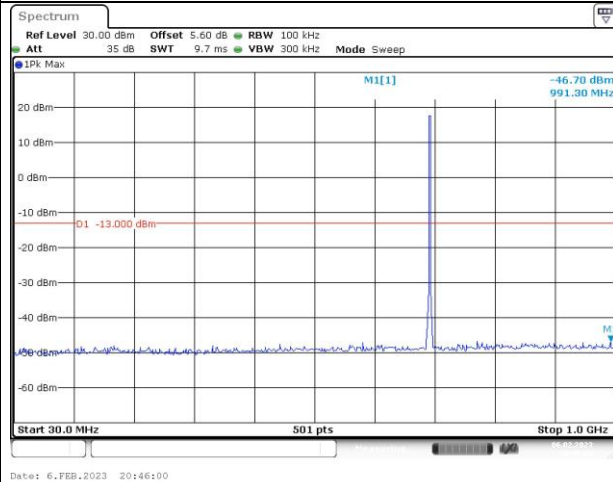
Date: 6.FEB.2023 22:23:08

Spurious Emissions at Antenna Terminal

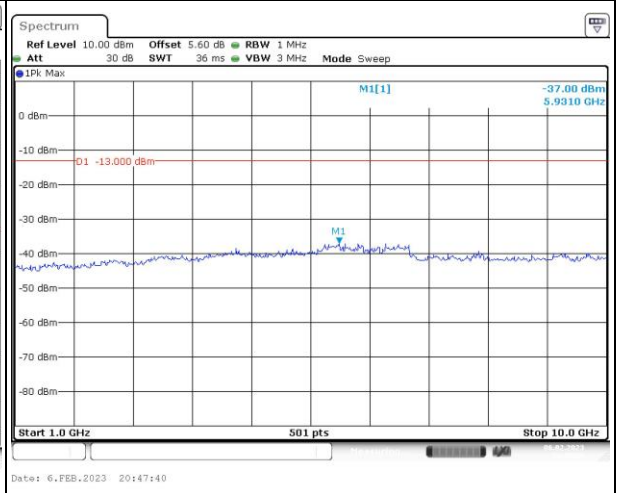
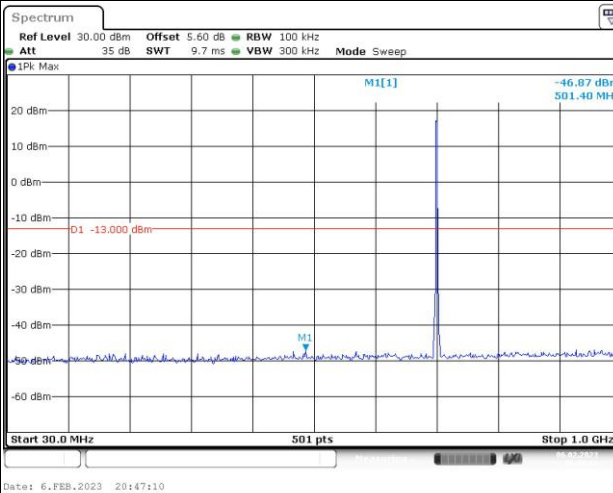
Channel

1.4MHz Bandwidth QPSK

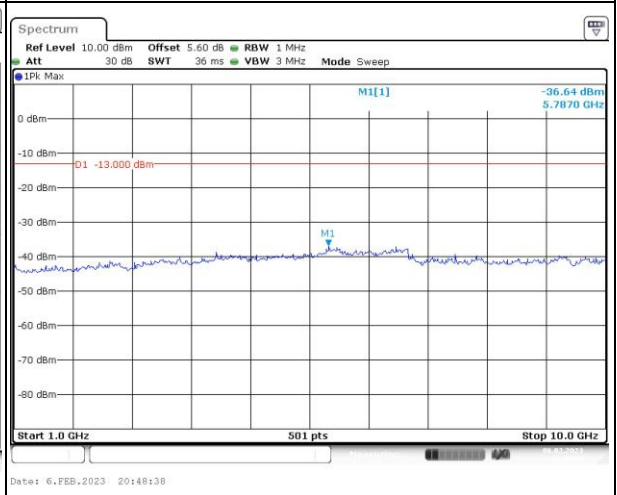
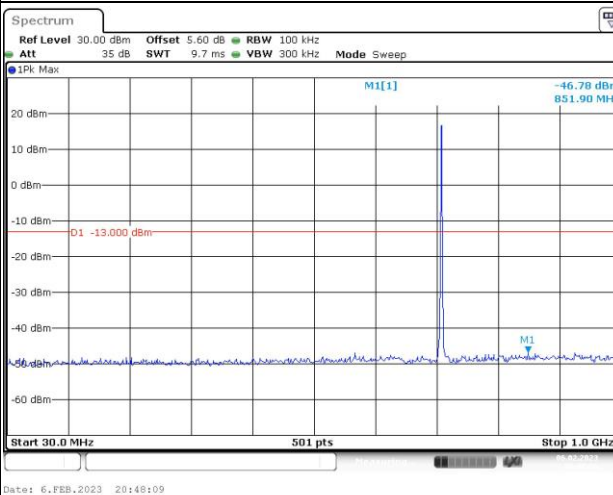
Lowest



Middle



Highest

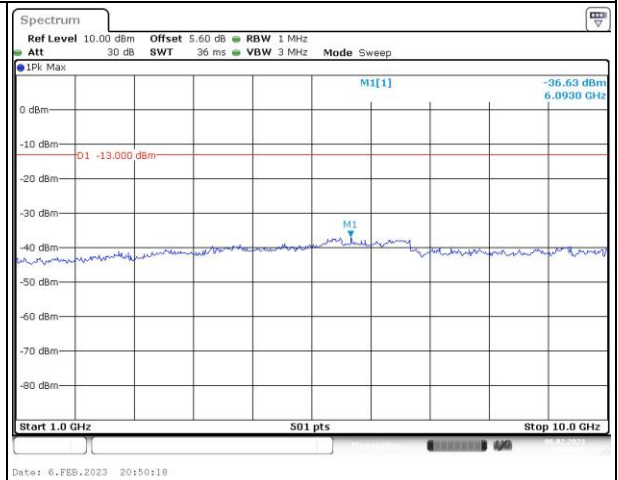
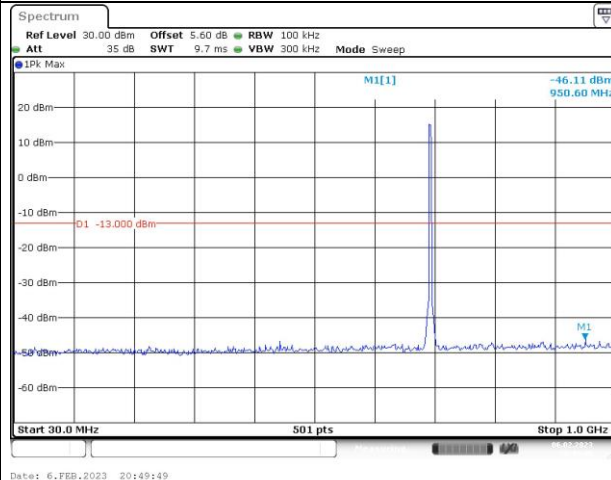


Spurious Emissions at Antenna Terminal

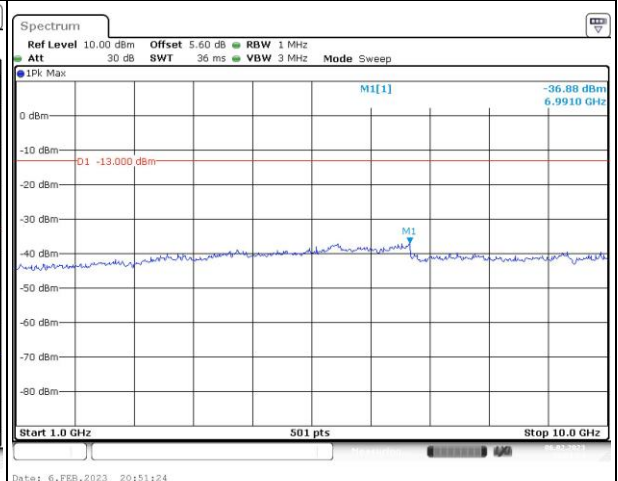
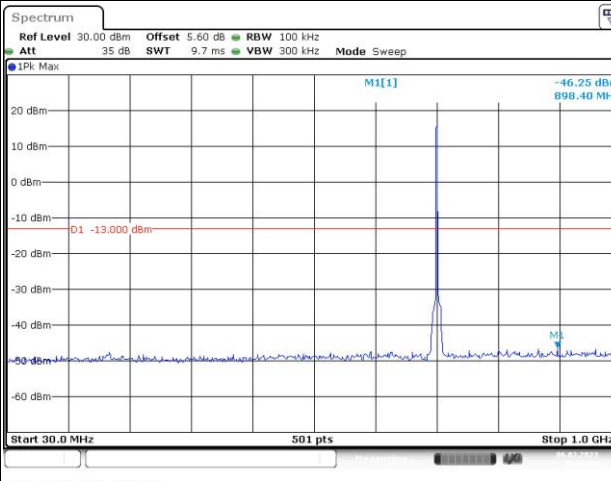
Channel

3MHz Bandwidth QPSK

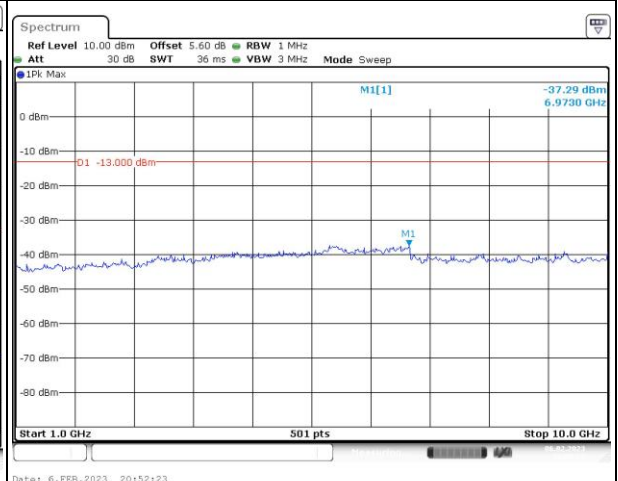
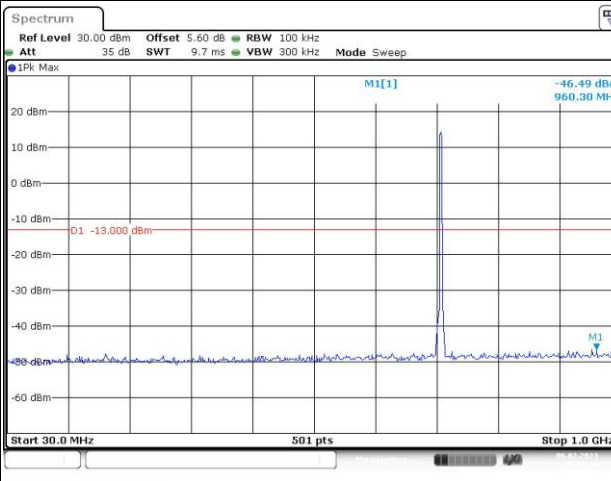
Lowest



Middle



Highest

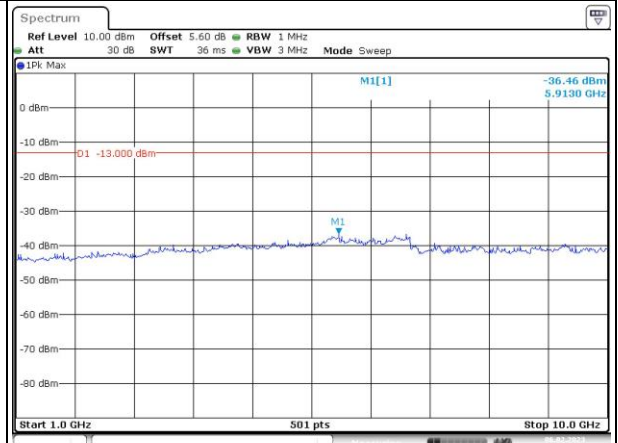
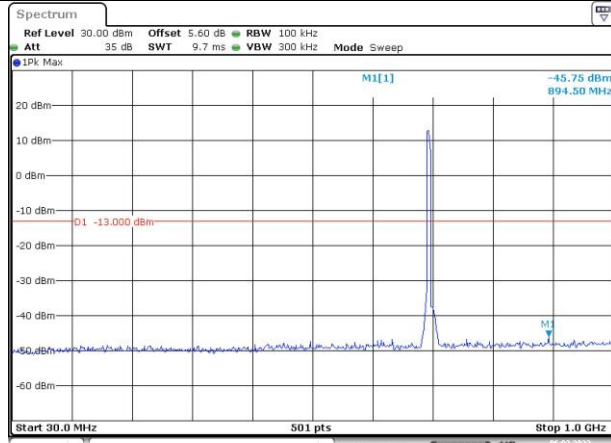


Spurious Emissions at Antenna Terminal

Channel

5MHz Bandwidth QPSK

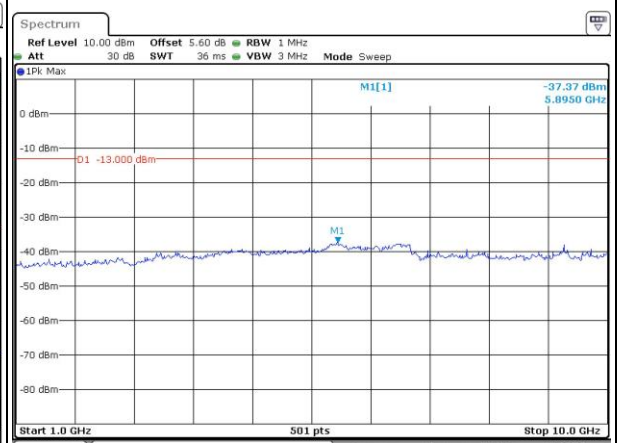
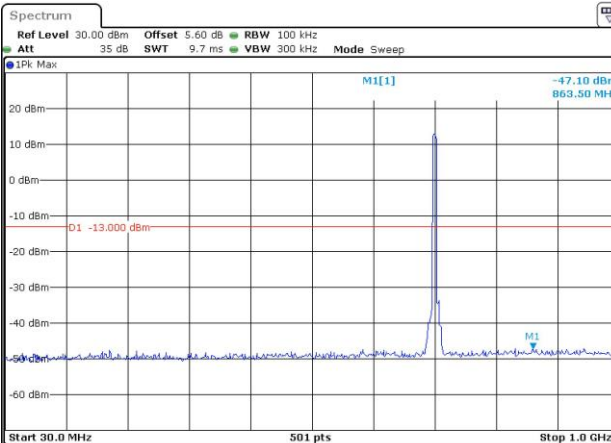
Lowest



Date: 6.FEB.2023 20:53:25

Date: 6.FEB.2023 20:54:02

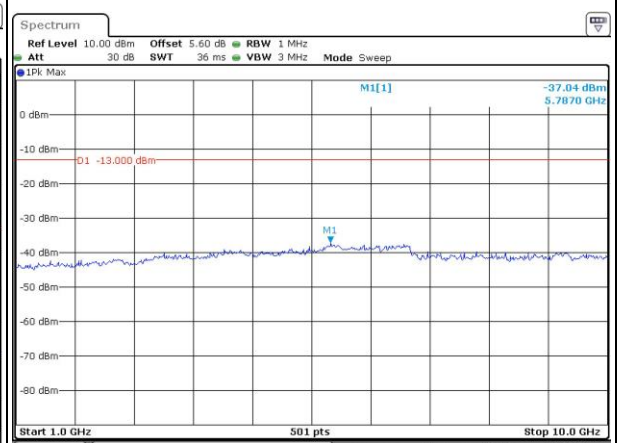
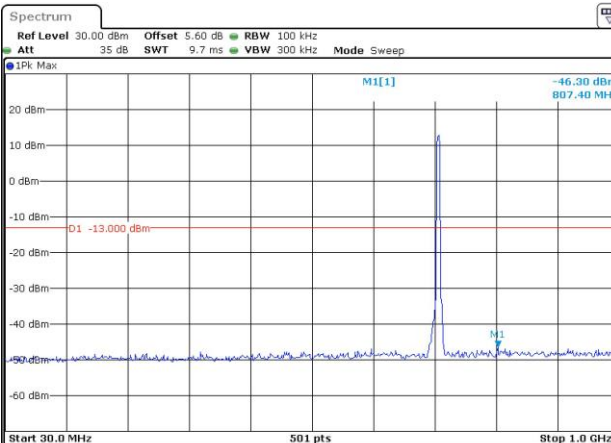
Middle



Date: 6.FEB.2023 20:54:35

Date: 6.FEB.2023 20:55:05

Highest



Date: 6.FEB.2023 20:55:41

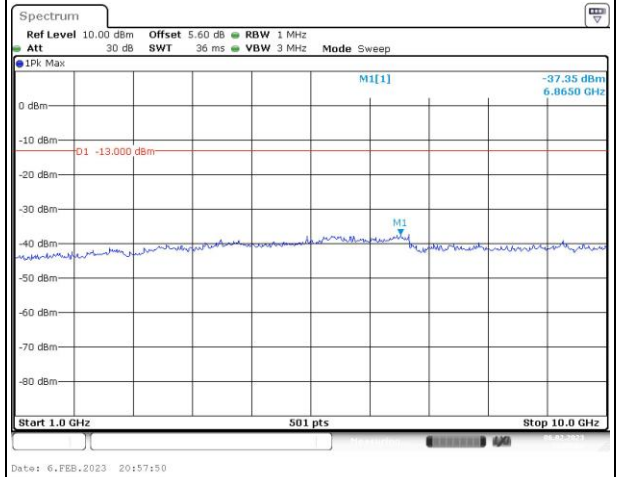
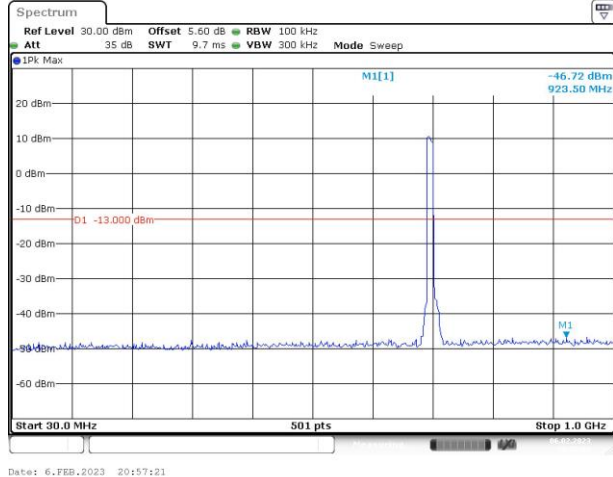
Date: 6.FEB.2023 20:56:14

Spurious Emissions at Antenna Terminal

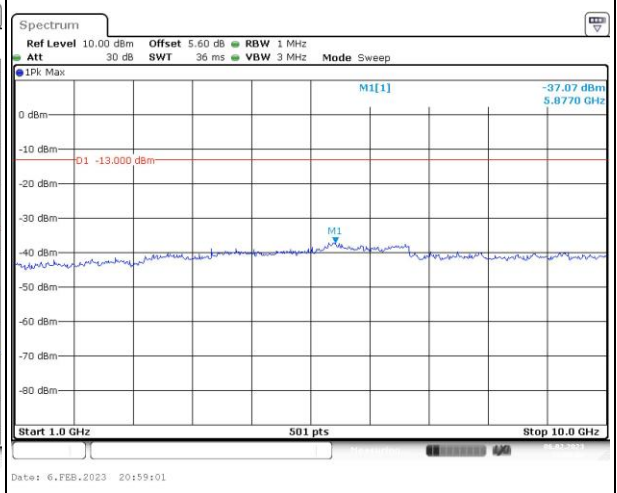
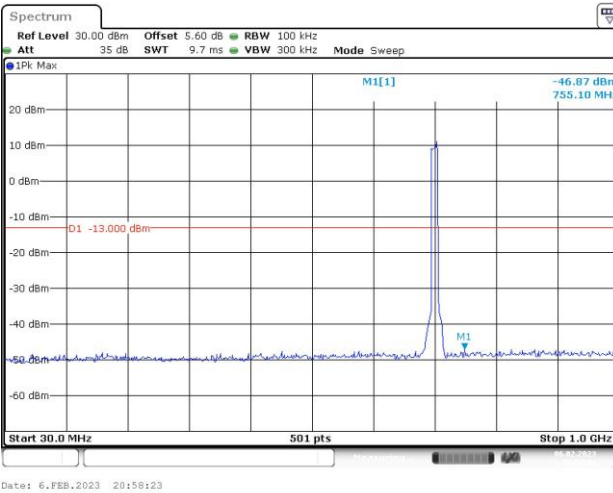
Channel

10MHz Bandwidth QPSK

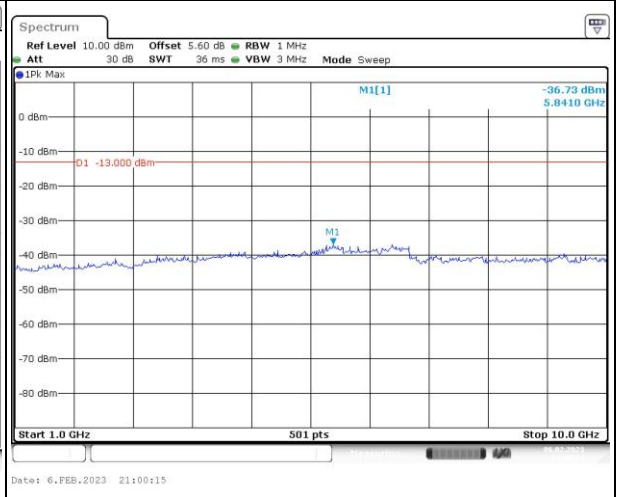
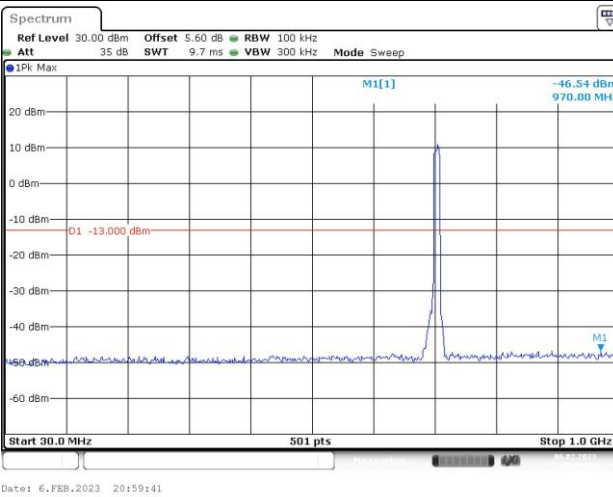
Lowest



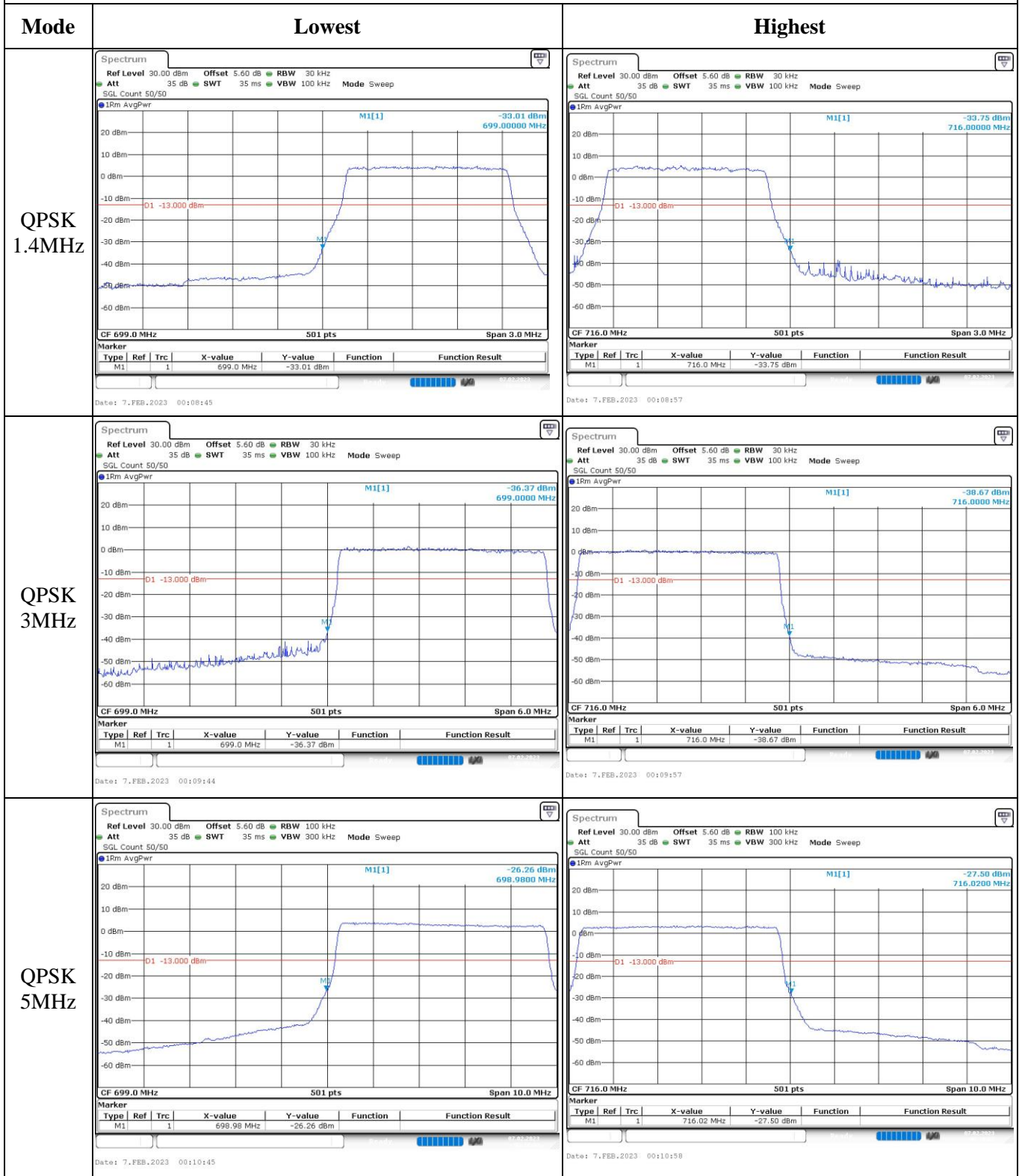
Middle



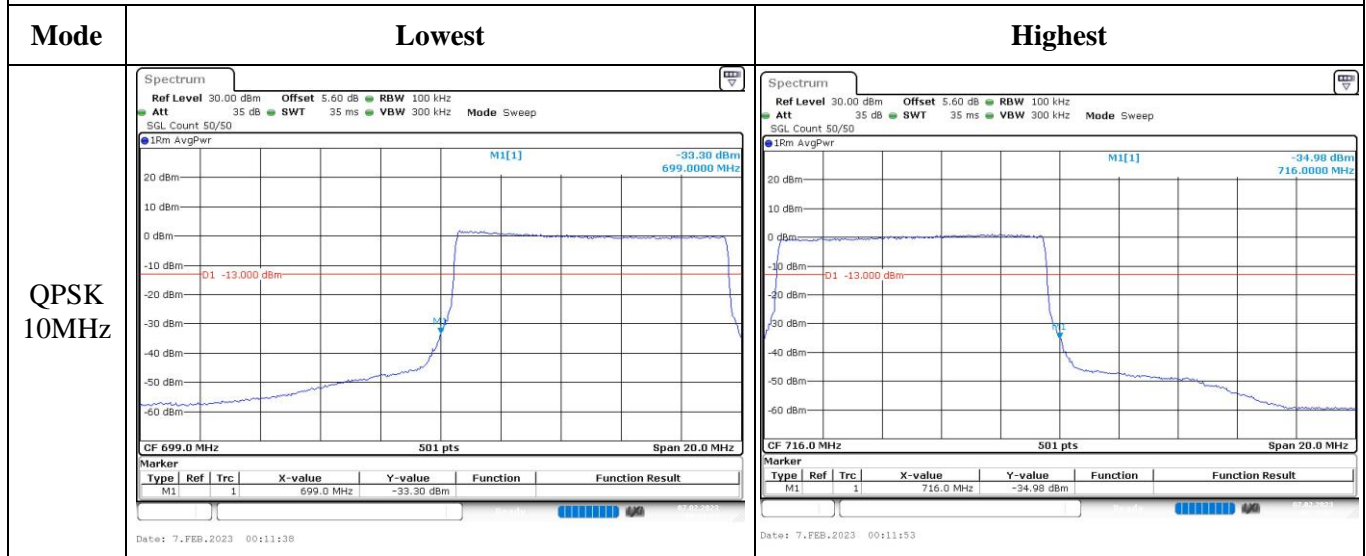
Highest



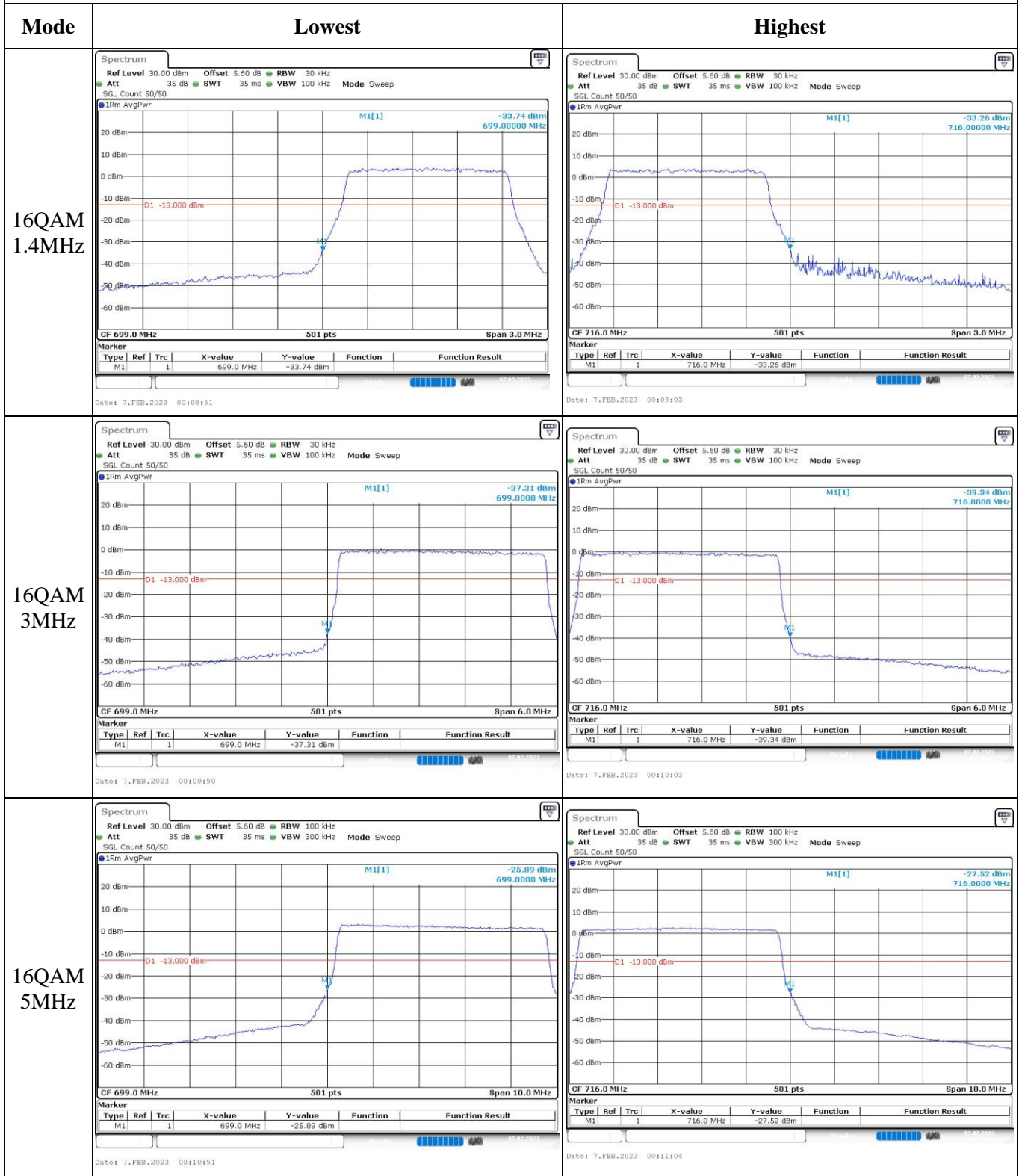
Out of band emission, Band Edge



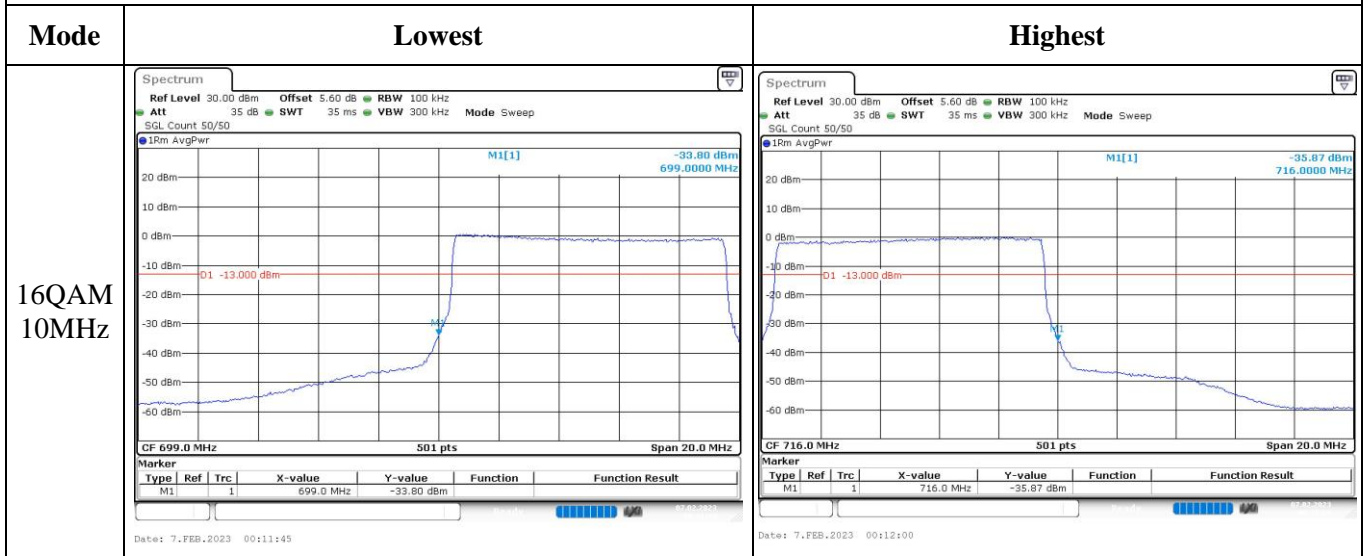
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.9 Antenna Port Test Data and Results for LTE Band 66

Serial Number:	1ZWQ	Test Date:	2023/2/6~2023/2/11
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	21.3~24.8	Relative Humidity: (%)	41~56	ATM Pressure: (kPa)	100.8~102.1
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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	2022-07-15	2023-07-14
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	2022-07-15	2023-07-14
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

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

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
1.4MHz	1710.7	1745	1779.3
3MHz	1711.5	1745	1778.5
5MHz	1712.5	1745	1777.5
10MHz	1715	1745	1775
15MHz	1717.5	1745	1772.5
20MHz	1720	1745	1770

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	21.76	21.68	21.7	19.56	30
	RB1#3	21.97	21.88	21.84		
	RB1#5	21.79	21.68	21.71		
	RB3#0	21.89	21.9	21.78		
	RB3#3	21.82	21.86	21.8		
	RB6#0	20.9	20.82	20.78		
1.4MHz 16QAM	RB1#0	20.9	20.73	20.71	18.76	30
	RB1#3	21.17	20.96	20.9		
	RB1#5	20.97	20.78	20.73		
	RB3#0	20.9	20.93	21.01		
	RB3#3	20.93	20.92	21.05		
	RB6#0	19.91	19.71	19.79		
3MHz QPSK	RB1#0	22.23	21.69	21.71	19.82	30
	RB1#8	21.84	21.67	21.73		
	RB1#14	21.82	21.7	21.71		
	RB6#0	20.78	20.74	20.73		
	RB6#9	20.75	20.72	20.68		
	RB15#0	20.85	20.77	20.76		
3MHz 16QAM	RB1#0	20.92	21.35	20.9	18.94	30
	RB1#8	20.85	21.33	20.93		
	RB1#14	20.78	21.34	20.88		
	RB6#0	19.75	19.79	19.77		
	RB6#9	19.73	19.77	19.76		
	RB15#0	19.89	19.84	19.67		
5MHz QPSK	RB1#0	21.82	21.66	21.67	19.41	30
	RB1#13	21.81	21.79	21.76		
	RB1#24	21.74	21.66	21.62		
	RB15#0	20.84	20.77	20.82		
	RB15#10	20.9	20.78	20.72		
	RB25#0	20.86	20.76	20.76		
5MHz 16QAM	RB1#0	20.81	20.58	20.97	18.68	30
	RB1#13	20.9	20.72	21.09		
	RB1#24	20.8	20.59	20.97		
	RB15#0	19.86	19.83	19.78		
	RB15#10	19.91	19.81	19.71		
	RB25#0	19.85	19.82	19.76		
10MHz QPSK	RB1#0	22.21	22.15	22.19	20	30
	RB1#25	22.41	22.35	22.4		
	RB1#49	22.22	22.22	22.17		

	RB25#0	21.23	21.27	21.26		
	RB25#25	21.38	21.25	21.15		
	RB50#0	21.32	21.28	21.23		
10MHz 16QAM	RB1#0	21.79	21.25	21.19	19.5	30
	RB1#25	21.91	21.51	21.38		
	RB1#49	21.73	21.33	21.17		
	RB25#0	20.34	20.34	20.37		
	RB25#25	20.44	20.34	20.29		
	RB50#0	20.34	20.33	20.27		
15MHz QPSK	RB1#0	22.14	22.11	21.85	19.9	30
	RB1#38	22.31	22.27	22.16		
	RB1#74	22.15	22.13	22.01		
	RB36#0	21.27	21.23	21.28		
	RB36#39	21.39	21.26	21.23		
	RB75#0	21.37	21.29	21.27		
15MHz 16QAM	RB1#0	21.32	21.55	21.46	19.24	30
	RB1#38	21.37	21.65	21.61		
	RB1#74	21.29	21.55	21.28		
	RB36#0	20.31	20.26	20.29		
	RB36#39	20.42	20.26	20.24		
	RB75#0	20.37	20.28	20.23		
20MHz QPSK	RB1#0	22.07	21.42	21.44	20.01	30
	RB1#50	22.42	21.83	21.87		
	RB1#99	21.56	21.44	21.47		
	RB50#0	20.82	20.85	20.65		
	RB50#50	20.98	20.78	20.65		
	RB100#0	20.79	20.82	20.65		
20MHz 16QAM	RB1#0	20.8	20.99	20.77	19.04	30
	RB1#50	21.18	21.45	21.17		
	RB1#99	20.74	21.04	20.79		
	RB50#0	19.68	19.8	19.63		
	RB50#50	19.84	19.76	19.61		
	RB100#0	19.78	19.81	19.66		

Note: EIRP=Conducted Power(dBm) - Lc(dB) + G_T(dBi)

Result:

Pass

Peak-to-average Ratio(PAR)					
Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
20MHz QPSK	RB1#0	4.93	5.3	4.78	13
	RB100#0	4	4.35	4.06	13
20MHz 16QAM	RB1#0	6	5.86	5.57	13
	RB100#0	5.71	5.97	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
1.4MHz QPSK	1.102	1.108	1.102	1.314	1.29	1.326
1.4MHz 16QAM	1.096	1.096	1.102	1.29	1.296	1.326
3MHz QPSK	2.695	2.683	2.683	2.88	2.892	2.88
3MHz 16QAM	2.683	2.683	2.683	2.892	2.88	2.892
5MHz QPSK	4.531	4.531	4.531	5.2	5.18	5.2
5MHz 16QAM	4.531	4.551	4.531	5.2	5.24	5.18
10MHz QPSK	8.982	8.942	8.982	9.84	9.92	10
10MHz 16QAM	8.982	8.942	8.942	9.96	9.92	9.76
15MHz QPSK	13.473	13.533	13.533	15.12	15.9	15.3
15MHz 16QAM	13.533	13.533	13.533	15.12	15.24	15.06
20MHz QPSK	17.884	18.044	17.964	19.6	20.08	19.6
20MHz 16QAM	17.964	17.964	17.964	19.84	19.76	19.68

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:	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	3.8	1710.895	1710.00	1779.102	1780
	-20	3.8	1710.826	1710.00	1779.107	1780
	-10	3.8	1710.837	1710.00	1779.163	1780
	0	3.8	1710.890	1710.00	1779.114	1780
	10	3.8	1710.846	1710.00	1779.153	1780
	20	3.8	1710.838	1710.00	1779.122	1780
	30	3.8	1710.838	1710.00	1779.142	1780
	40	3.8	1710.890	1710.00	1779.149	1780
Frequency Stability vs. Voltage	20	3.45	1710.899	1710.00	1779.107	1780
	20	4.4	1710.869	1710.00	1779.131	1780
					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	3.8	1710.827	1710.00	1779.194	1780
	-20	3.8	1710.800	1710.00	1779.177	1780
	-10	3.8	1710.801	1710.00	1779.195	1780
	0	3.8	1710.899	1710.00	1779.121	1780
	10	3.8	1710.859	1710.00	1779.179	1780
	20	3.8	1710.858	1710.00	1779.122	1780
	30	3.8	1710.833	1710.00	1779.115	1780
	40	3.8	1710.820	1710.00	1779.117	1780
Frequency Stability vs. Voltage	20	3.45	1710.837	1710.00	1779.124	1780
	20	4.4	1710.837	1710.00	1779.151	1780
					Result:	Pass