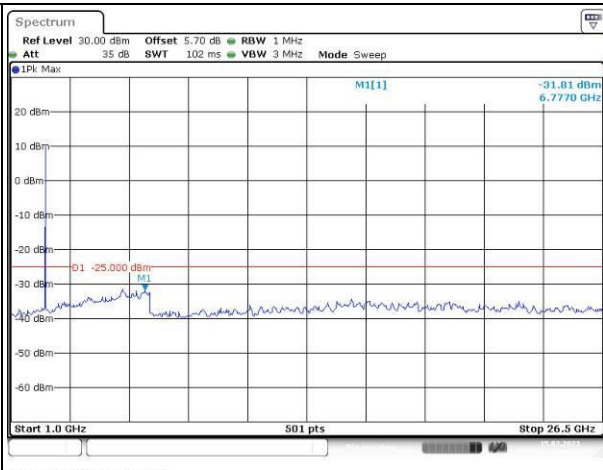
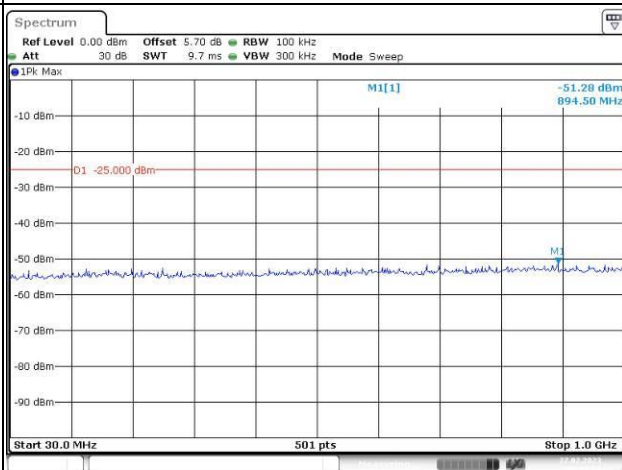


Spurious Emissions at Antenna Terminal

Channel

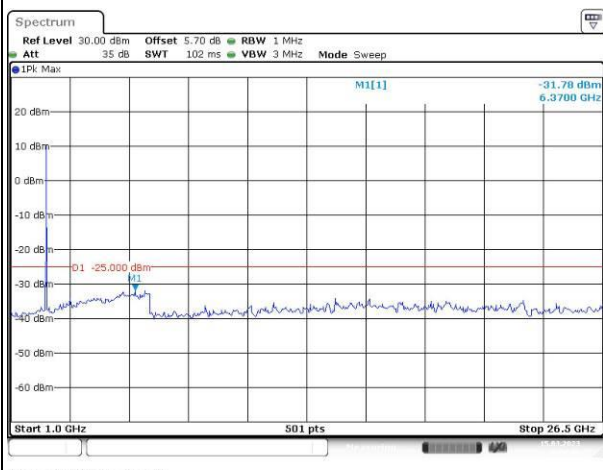
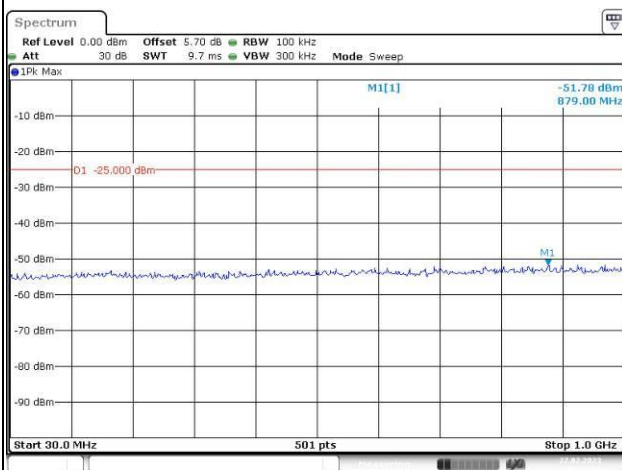
10MHz Bandwidth QPSK

Lowest



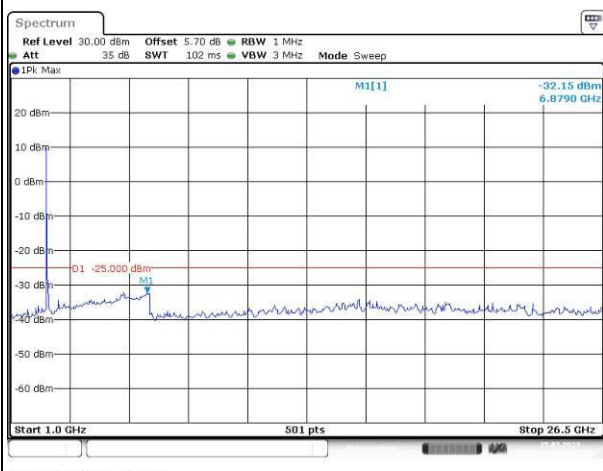
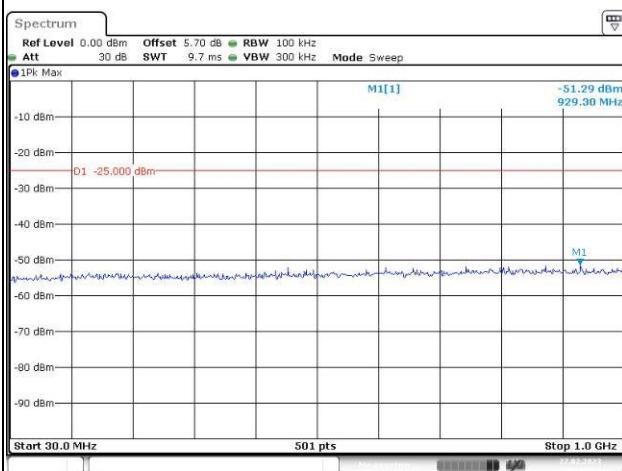
Date: 15.MAR.2023 10:03:20

Middle



Date: 15.MAR.2023 10:04:03

Highest



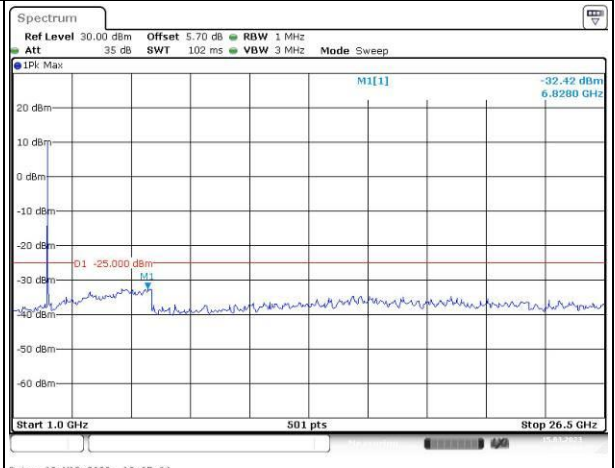
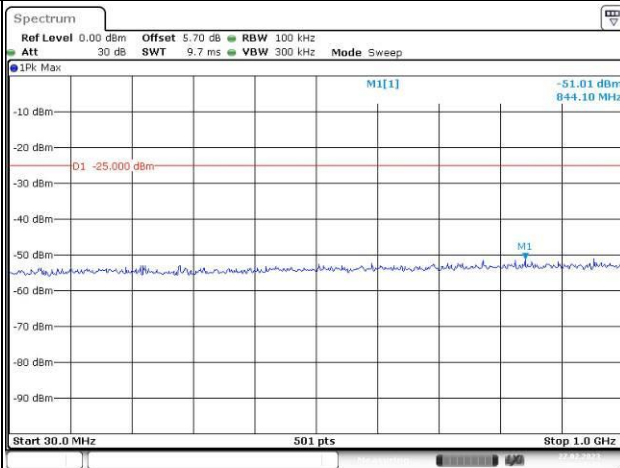
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Spurious Emissions at Antenna Terminal

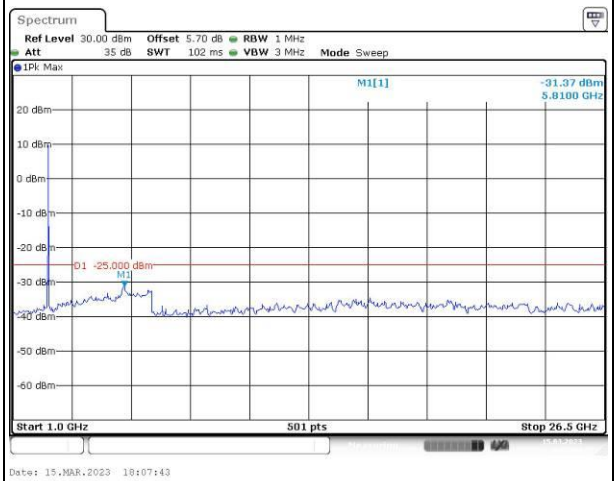
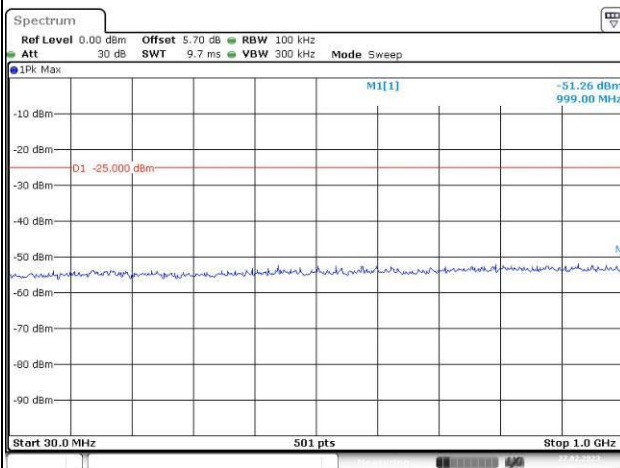
Channel

15MHz Bandwidth QPSK

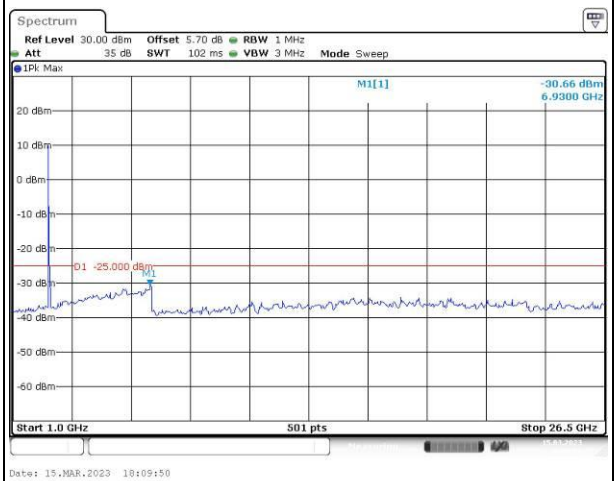
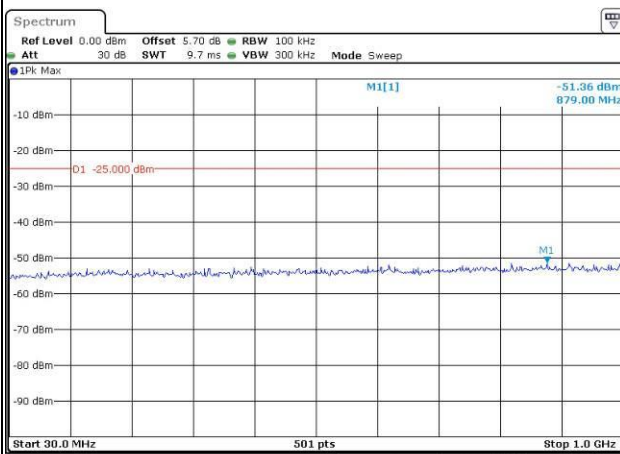
Lowest



Middle



Highest

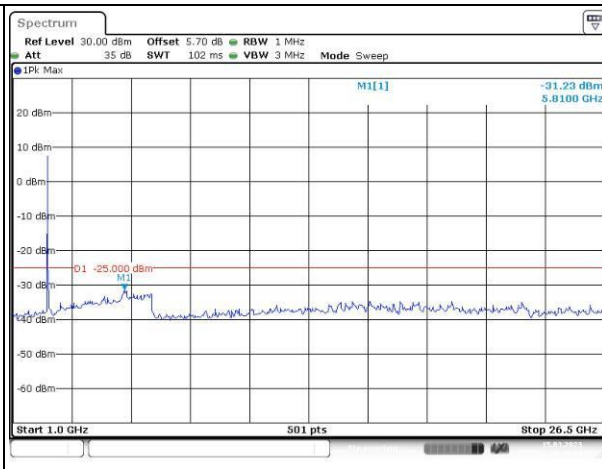
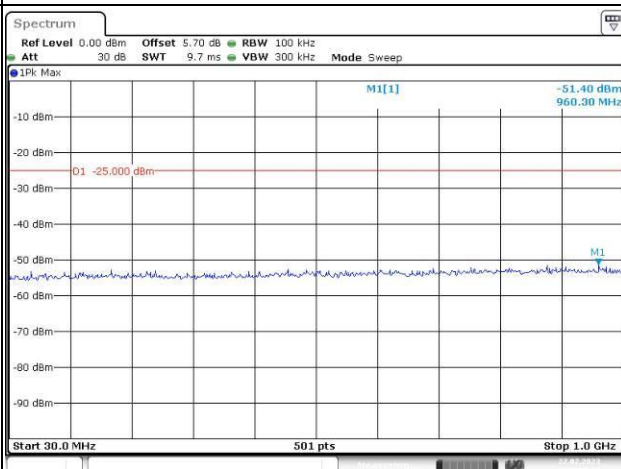


Spurious Emissions at Antenna Terminal

Channel

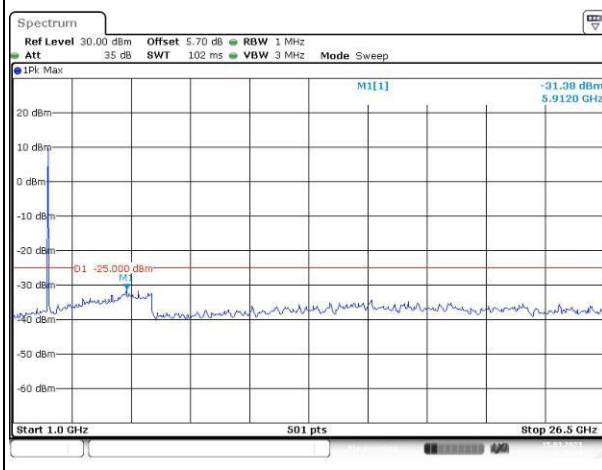
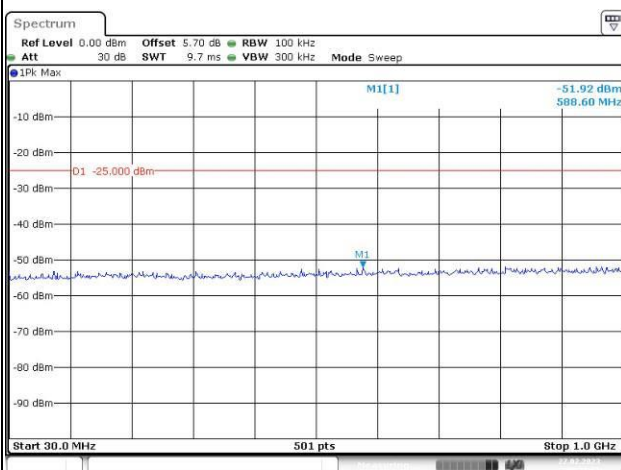
20MHz Bandwidth QPSK

Lowest



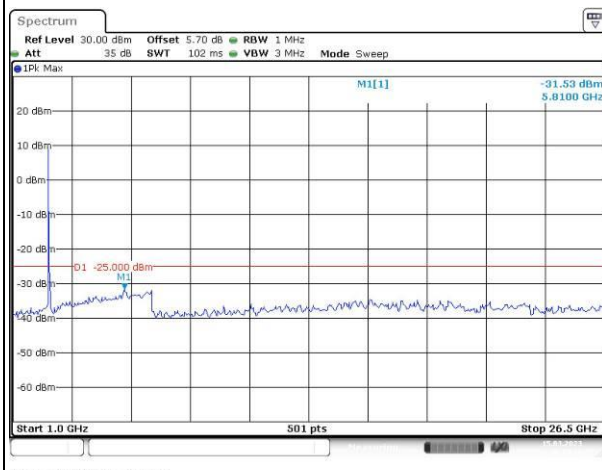
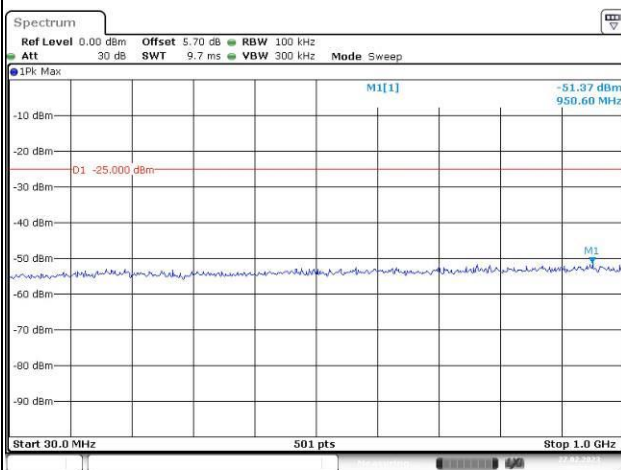
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Middle



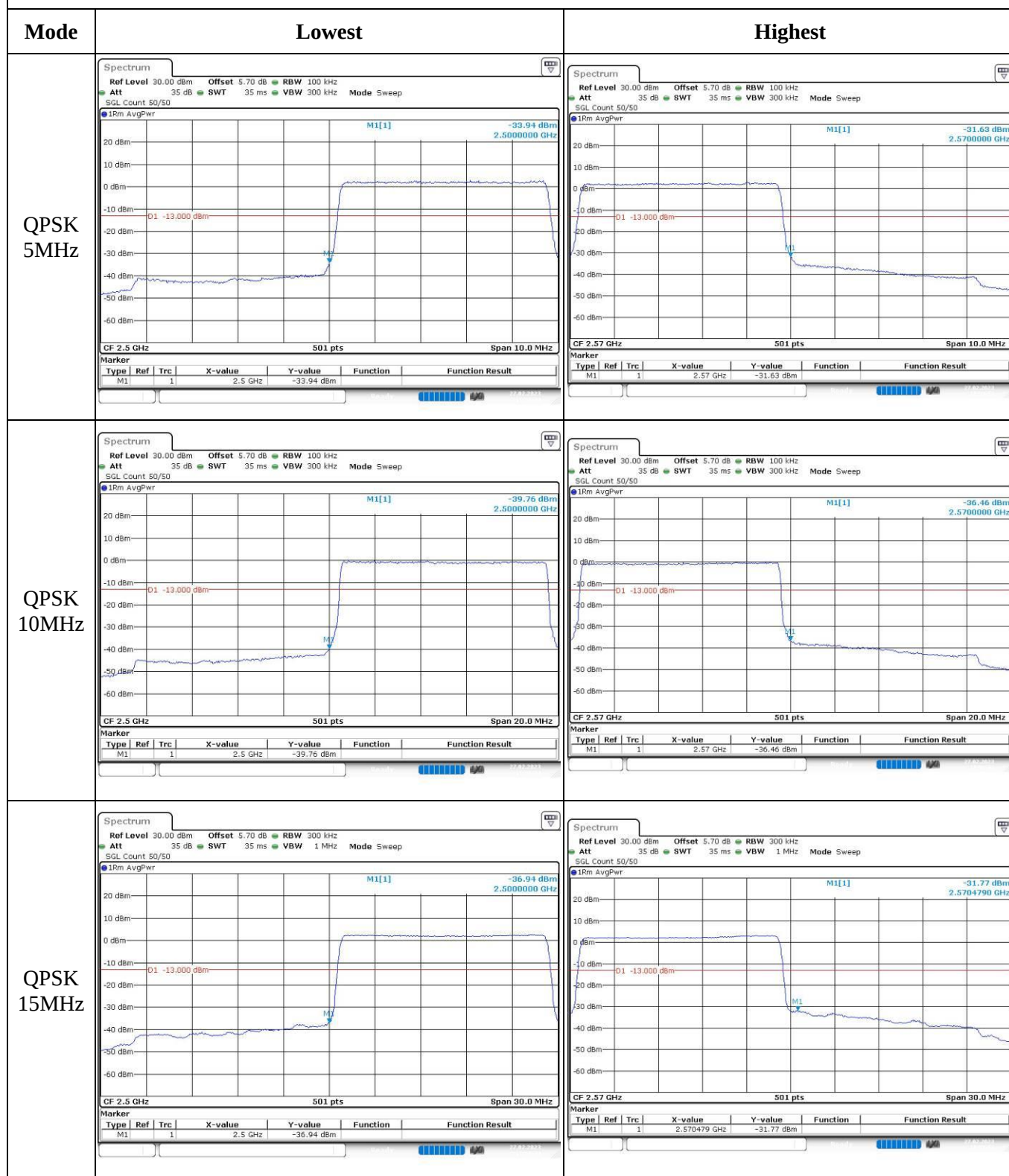
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Highest

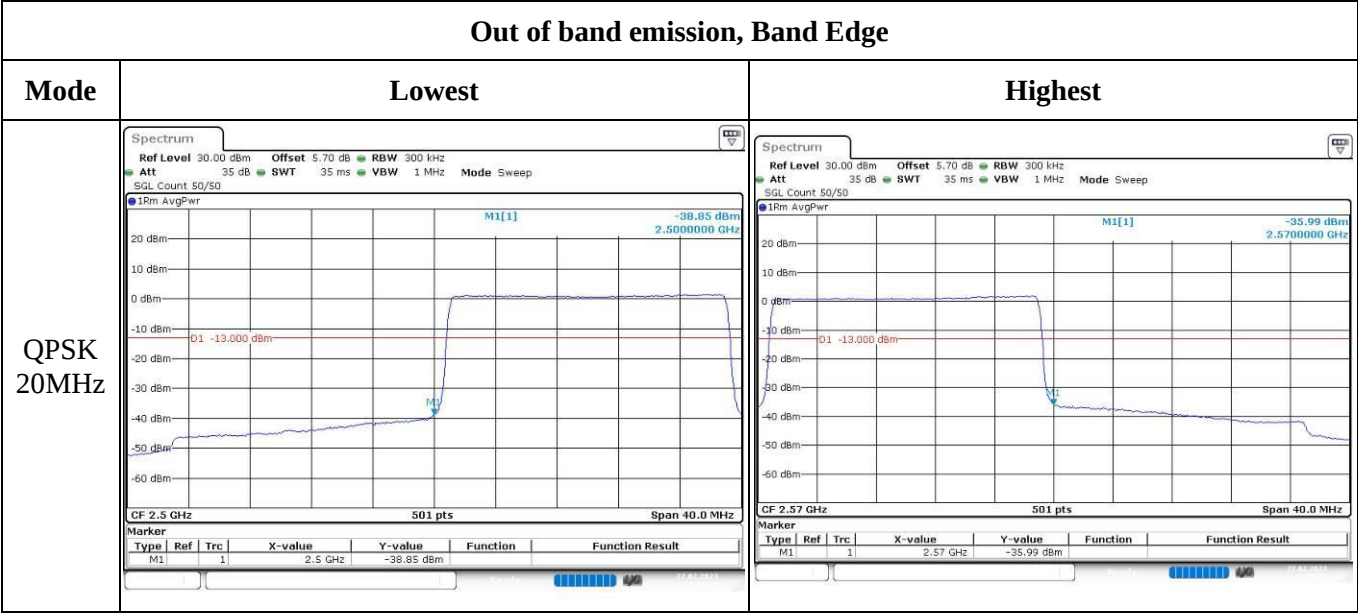


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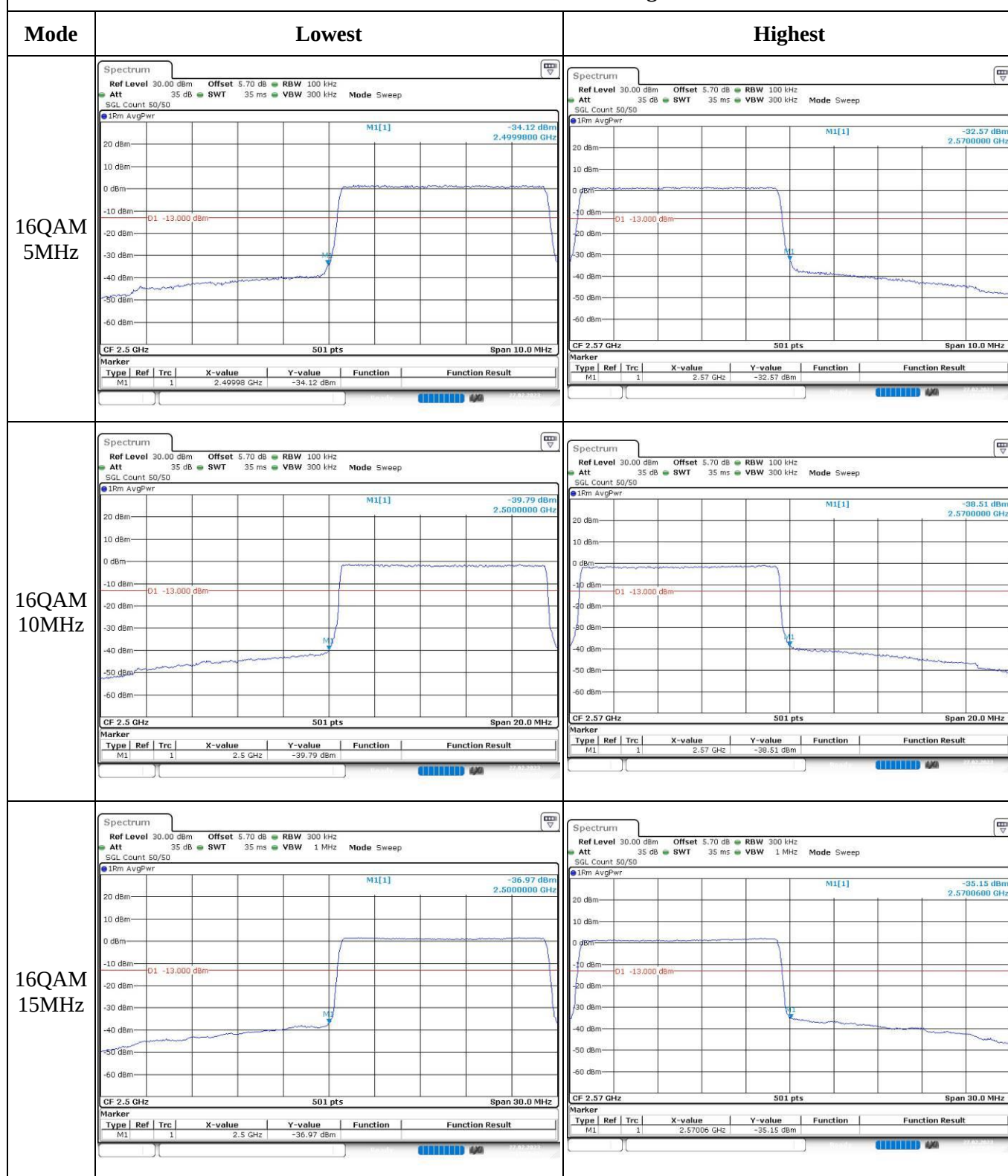
Out of band emission, Band Edge



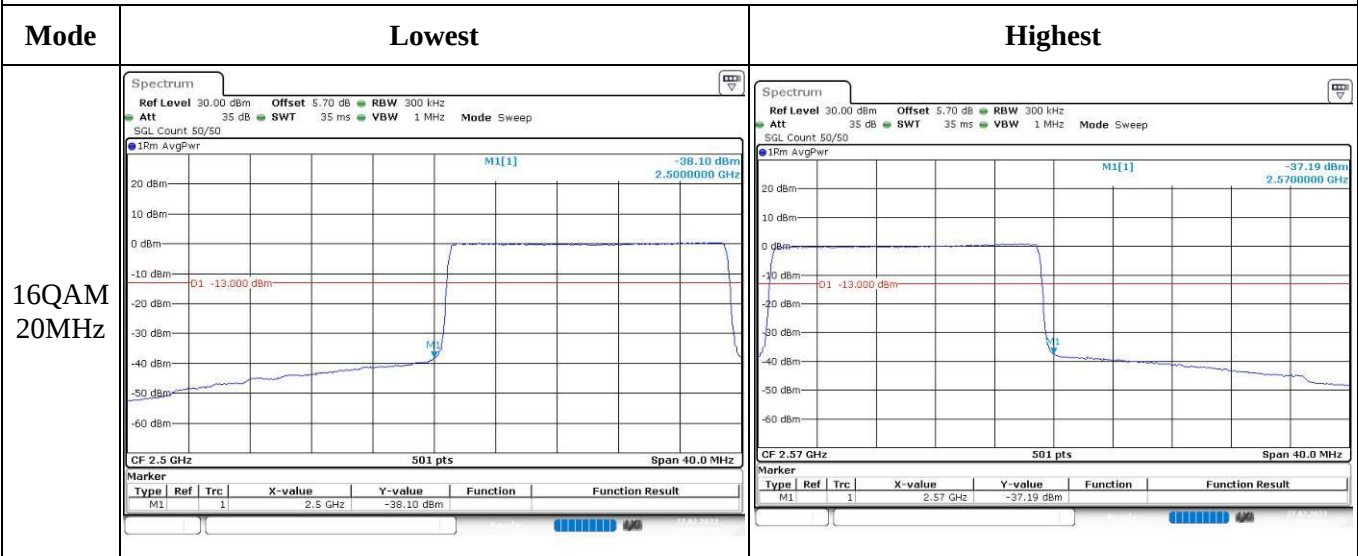
Out of band emission, Band Edge



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:	2295	Test Date:	2023/02/27~2023/03/16
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	23.2~23.4	Relative Humidity: (%)	36~38	ATM Pressure: (kPa)	101.2~102.3
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	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	N/A	N/A
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	2022-07-15	2023-07-14

* 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:**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	19.02	19.65	19.53	15.19	34.77
	RB1#3	19.03	19.39	19.54		
	RB1#5	19.51	19.24	19.4		
	RB3#0	19.13	19.46	19.81		
	RB3#3	19.75	19.1	19.71		
	RB6#0	19.59	19.39	19.34		
1.4MHz 16QAM	RB1#0	19.52	19.67	19.05	15.1	34.77
	RB1#3	19.12	19.58	19.66		
	RB1#5	19.22	19.14	19.53		
	RB3#0	19.32	19.66	19.24		
	RB3#3	19.5	19.36	19.02		
	RB6#0	19.09	19.31	19.72		
3MHz QPSK	RB1#0	19.52	19.37	19.02	15.2	34.77
	RB1#8	19.06	19.8	19.52		
	RB1#14	19.44	19.04	19.49		
	RB6#0	19.68	19.07	19.14		
	RB6#9	19.58	19.03	19.52		
	RB15#0	19.07	19.29	19.82		
3MHz 16QAM	RB1#0	19.28	19.49	19.47	15.14	34.77
	RB1#8	19.63	19.45	19.11		
	RB1#14	19.57	19.24	19.54		
	RB6#0	19.28	19.67	19.76		
	RB6#9	19.75	19.52	19.31		
	RB15#0	19.56	19.43	19.54		
5MHz QPSK	RB1#0	19.01	19.4	19.23	15.27	34.77
	RB1#13	19.55	19.42	19.11		
	RB1#24	19.13	19.75	19.66		
	RB15#0	19.66	19.6	19.3		
	RB15#10	19.4	19.11	19.82		
	RB25#0	19.25	19.89	19.53		
5MHz 16QAM	RB1#0	19.91	19.75	19.92	15.3	34.77
	RB1#13	19.78	19.89	19.85		
	RB1#24	19.26	19.74	19.63		
	RB15#0	19.07	19.17	19.14		
	RB15#10	19.58	19.72	19.84		
	RB25#0	19.74	19.68	19.65		

10MHz QPSK	RB1#0	19.62	19.82	19.85	15.24	34.77
	RB1#25	19.11	19.64	19.05		
	RB1#49	19.64	19.32	19.17		
	RB25#0	19.08	19.81	19.85		
	RB25#25	19.68	19.33	19.28		
	RB50#0	19.45	19	19.86		
10MHz 16QAM	RB1#0	19.16	19.61	19.76	15.25	34.77
	RB1#25	19.87	19.84	19.69		
	RB1#49	19.42	19.61	19.37		
	RB25#0	19.27	19.06	19.33		
	RB25#25	19.83	19.2	19.65		
	RB50#0	19.03	19.5	19.24		

Note:

ERP= Conducted Power(dBm) - Lc(dB) + G_T(dBd)G_T(dBd)=G_T(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	5.28	5.13	5.42	13
	RB50#0	5.28	5.28	5.22	13
10MHz 16QAM	RB1#0	6.26	5.71	6.29	13
	RB50#0	6.17	6.17	6.09	13
				Result:	Pass

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	1.302	1.314	1.29
1.4MHz 16QAM	1.096	1.09	1.102	1.326	1.296	1.296
3MHz QPSK	2.683	2.683	2.683	2.868	2.88	2.88
3MHz 16QAM	2.683	2.683	2.683	2.88	2.88	2.892
5MHz QPSK	4.531	4.511	4.511	5.2	5.18	5.16
5MHz 16QAM	4.511	4.551	4.551	5.16	5.22	5.18
10MHz QPSK	8.942	8.942	8.942	9.88	9.96	10
10MHz 16QAM	8.942	8.942	8.982	9.84	9.96	9.84

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

Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
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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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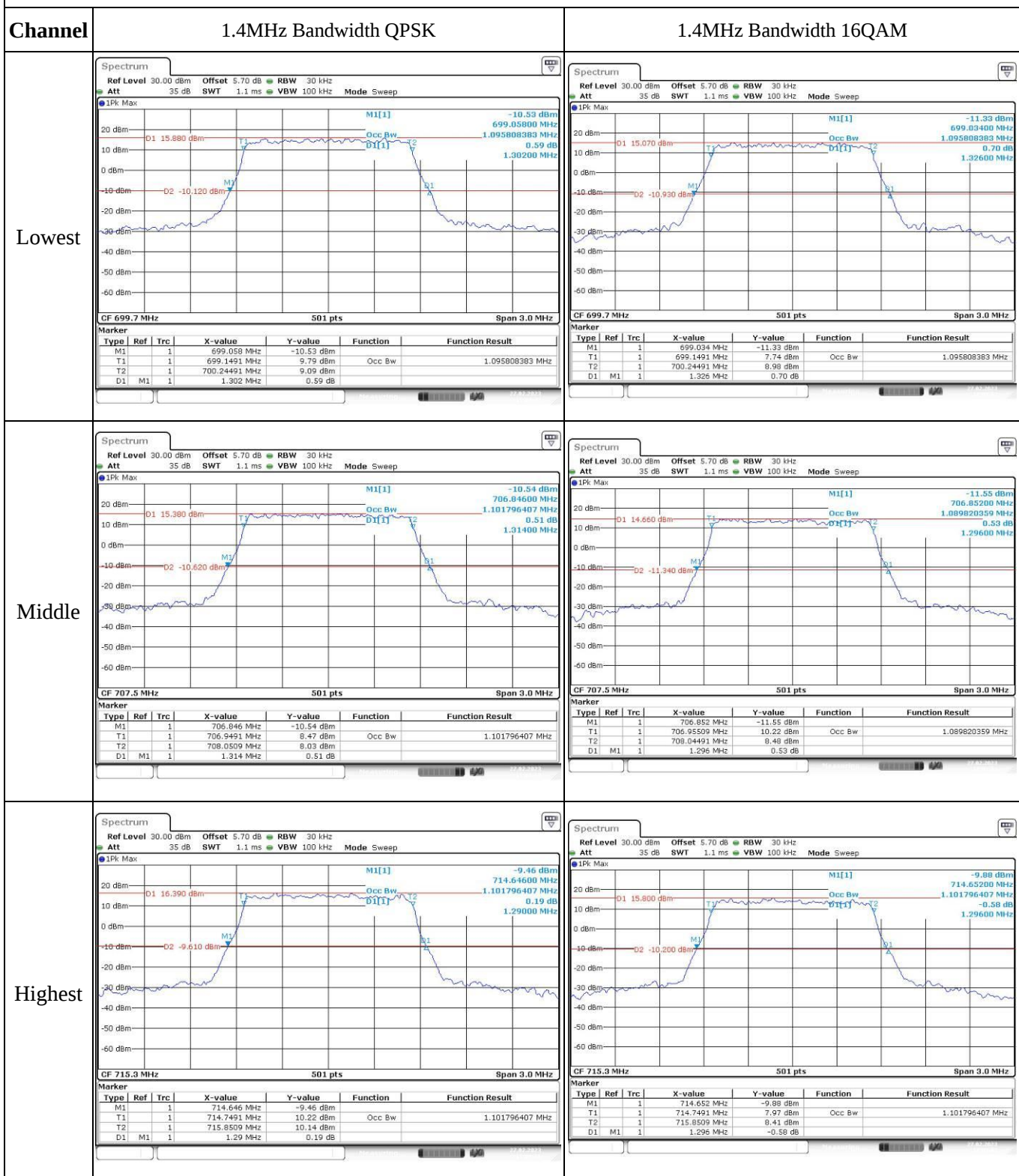
Frequency Stability

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	699.516	699.00	715.504	716.00
	-20	3.8	699.598	699.00	715.456	716.00
	-10	3.8	699.570	699.00	715.457	716.00
	0	3.8	699.558	699.00	715.548	716.00
	10	3.8	699.586	699.00	715.528	716.00
	20	3.8	699.529	699.00	715.471	716.00
	30	3.8	699.524	699.00	715.550	716.00
	40	3.8	699.585	699.00	715.550	716.00
	50	3.8	699.542	699.00	715.541	716.00
Frequency Stability vs. Voltage	20	3.45	699.528	699.00	715.485	716.00
	20	4.35	699.597	699.00	715.482	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	699.550	699.00	715.511	716.00
	-20	3.8	699.523	699.00	715.579	716.00
	-10	3.8	699.504	699.00	715.535	716.00
	0	3.8	699.523	699.00	715.574	716.00
	10	3.8	699.538	699.00	715.544	716.00
	20	3.8	699.529	699.00	715.511	716.00
	30	3.8	699.560	699.00	715.542	716.00
	40	3.8	699.573	699.00	715.539	716.00
	50	3.8	699.556	699.00	715.537	716.00
Frequency Stability vs. Voltage	20	3.45	699.570	699.00	715.561	716.00
	20	4.35	699.529	699.00	715.542	716.00
					Result:	Pass

Test Plots(Note: The 5.7dB is the Insertion loss of the RF cable, Coaxial tee connector and DC Block, which was offset into the Spectrum Analyzer):

Occupied Bandwidth



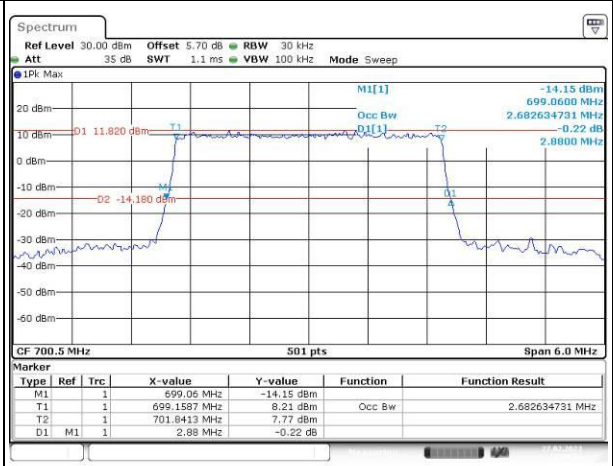
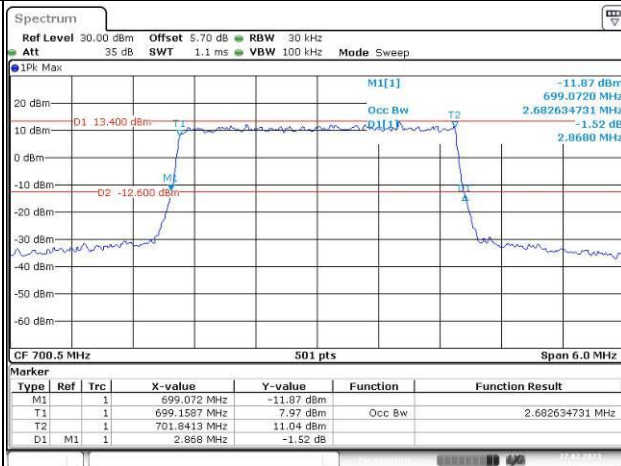
Occupied Bandwidth

Channel

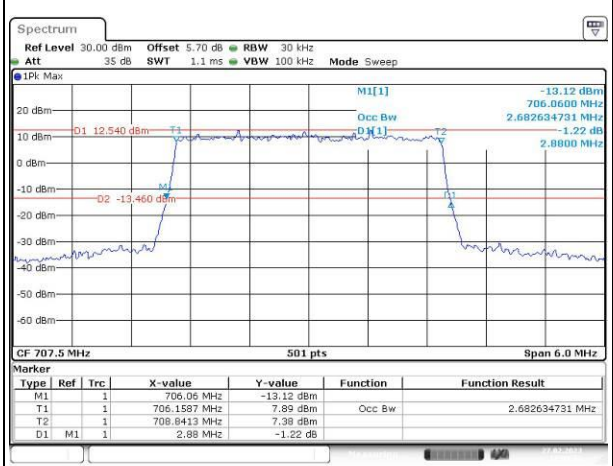
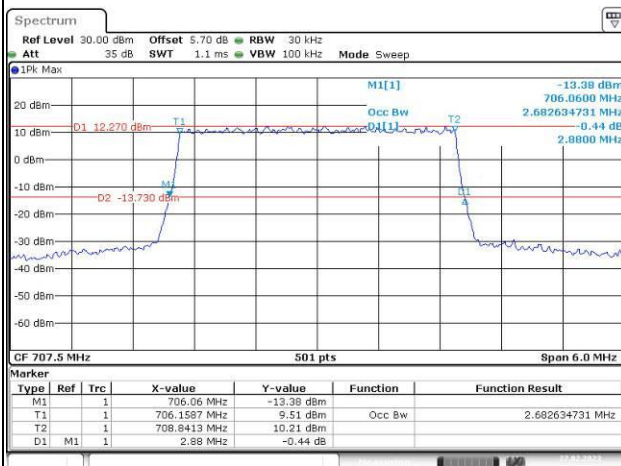
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

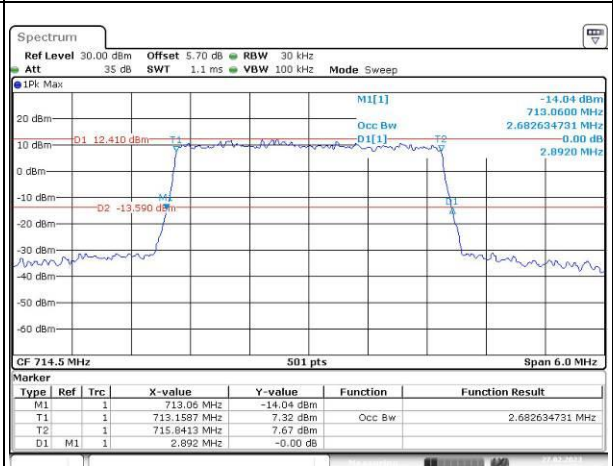
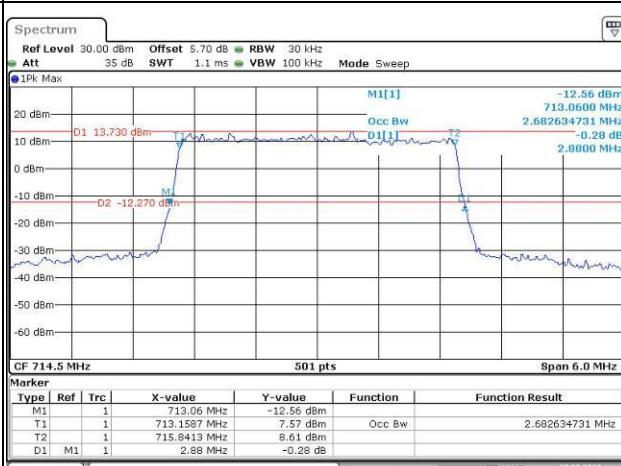
Lowest



Middle



Highest



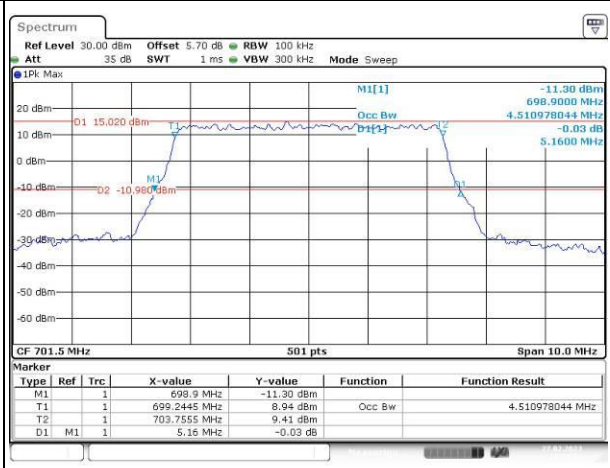
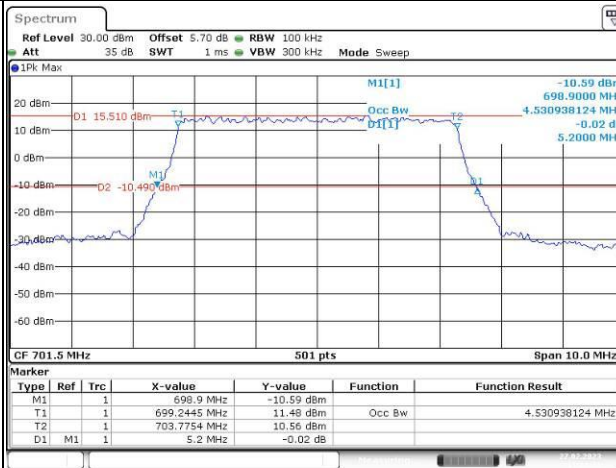
Occupied Bandwidth

Channel

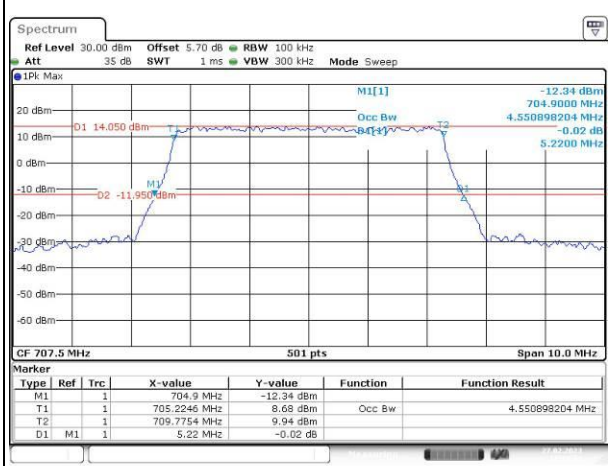
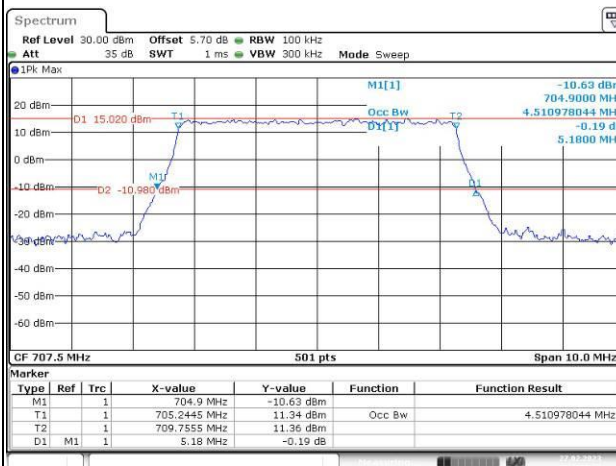
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

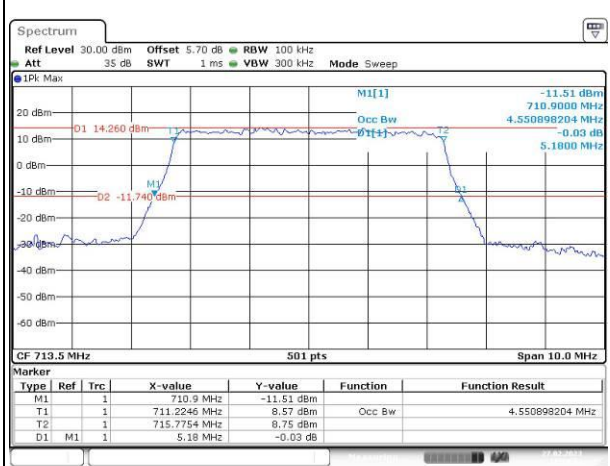
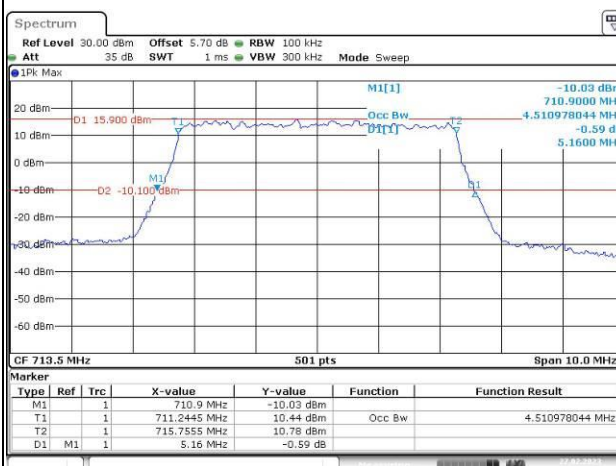
Lowest



Middle



Highest



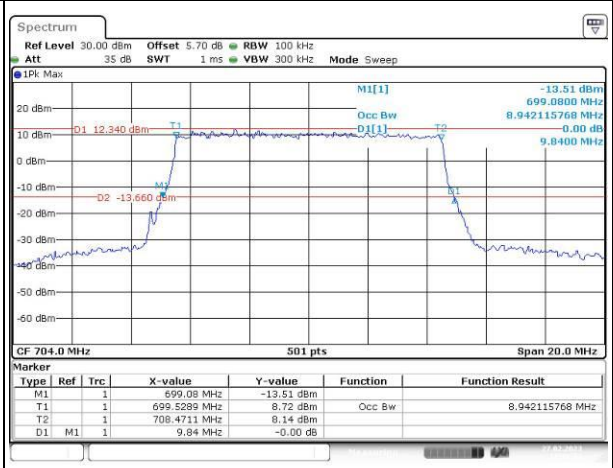
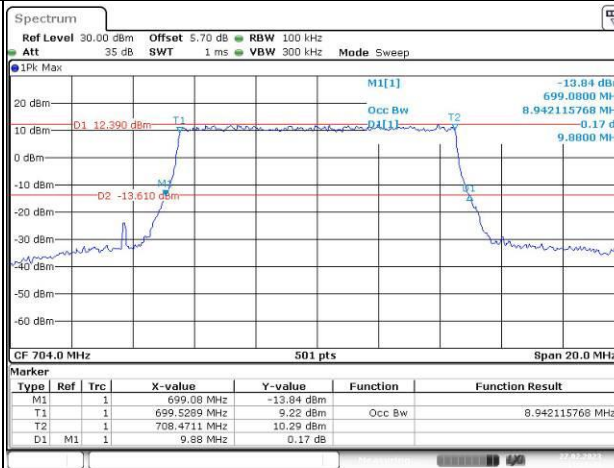
Occupied Bandwidth

Channel

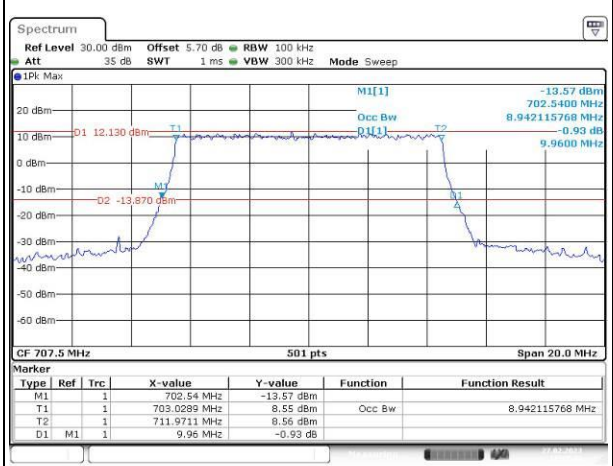
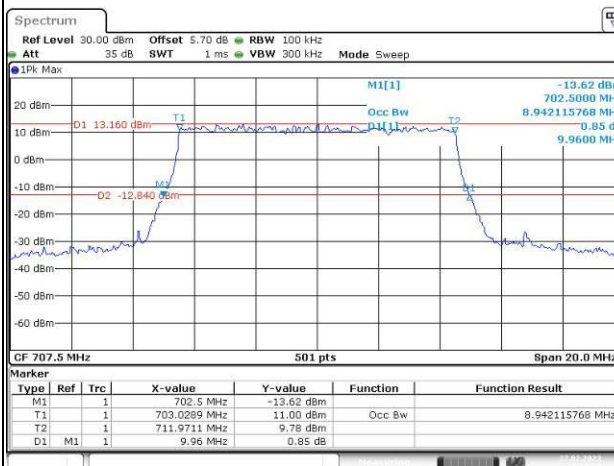
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

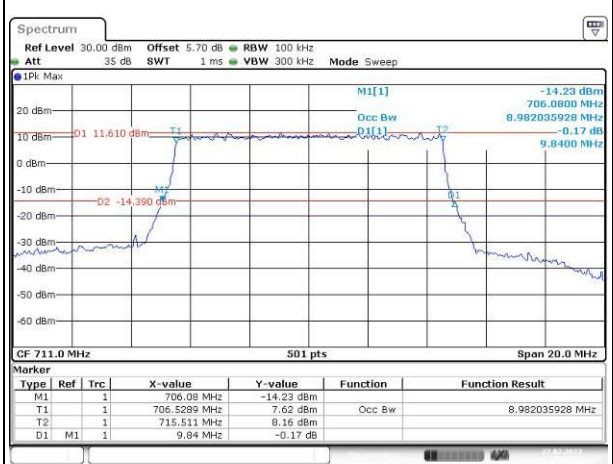
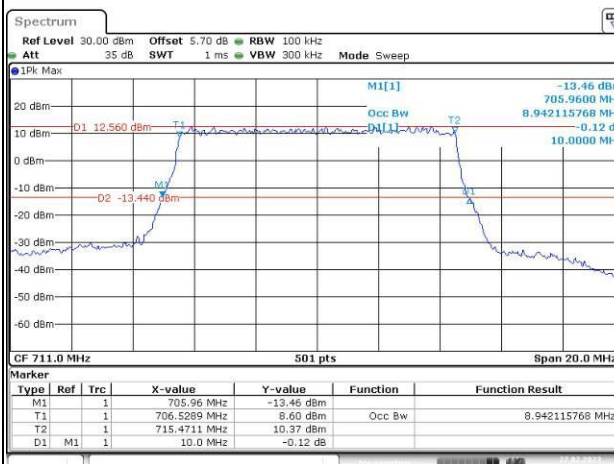
Lowest



Middle



Highest

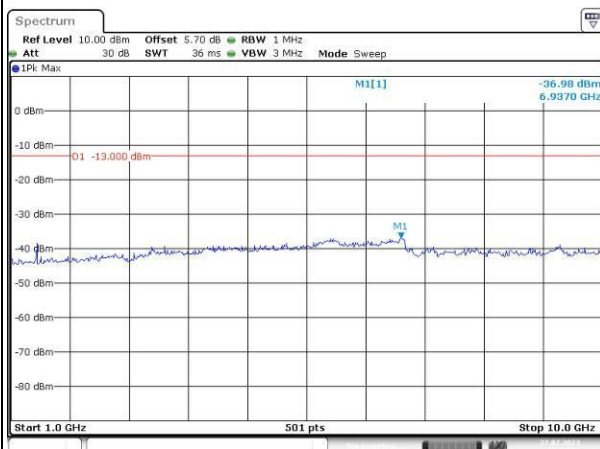
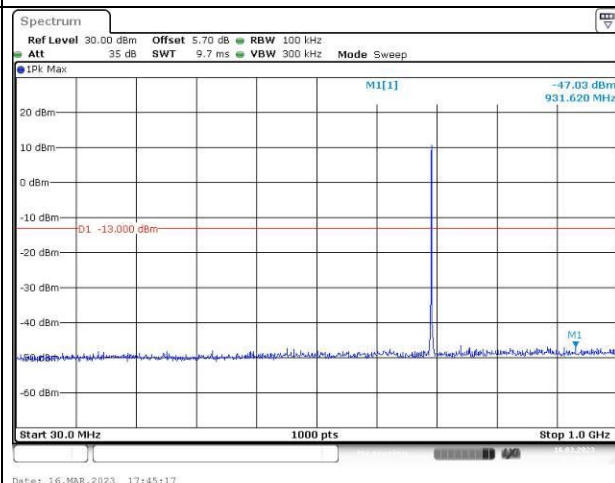


Spurious Emissions at Antenna Terminal

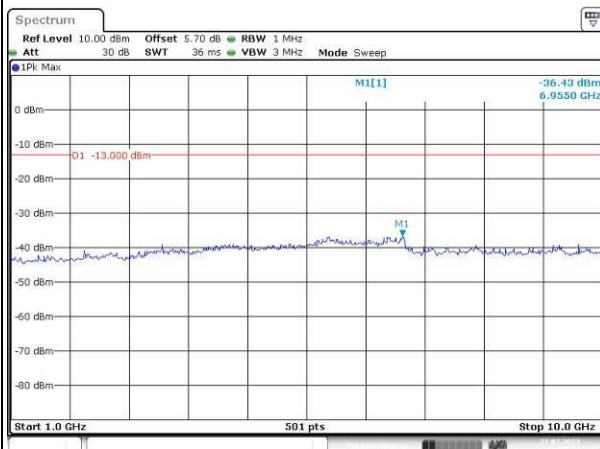
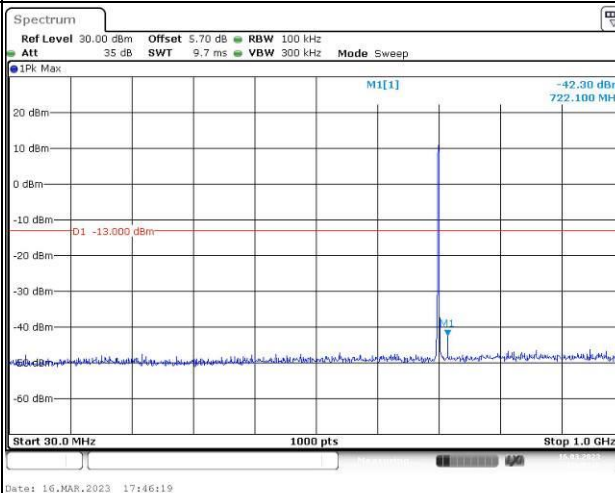
Channel

1.4MHz Bandwidth QPSK

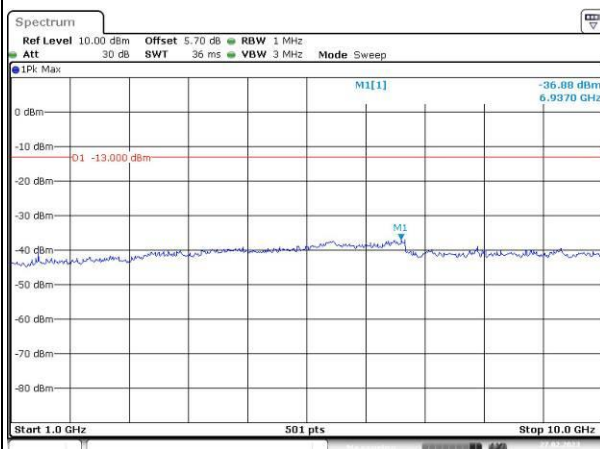
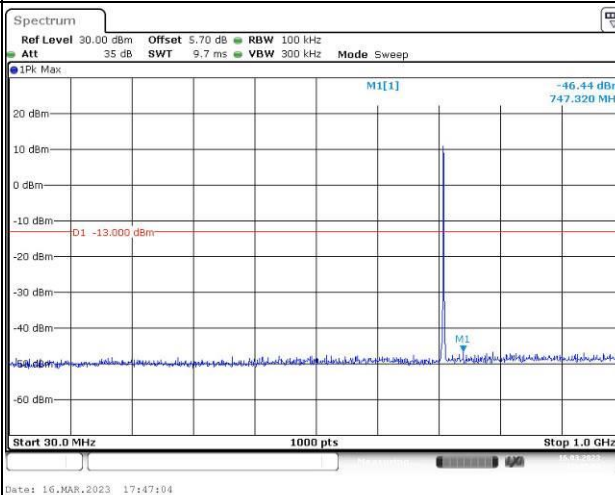
Lowest



Middle



Highest

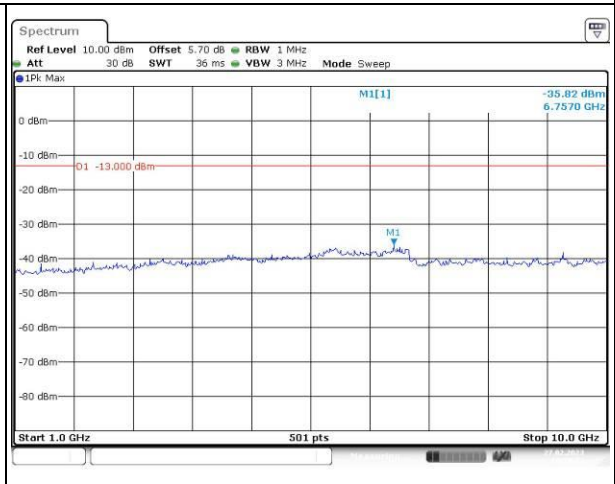
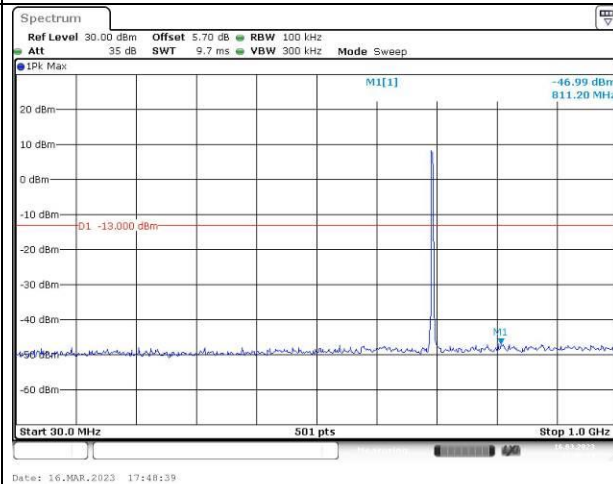


Spurious Emissions at Antenna Terminal

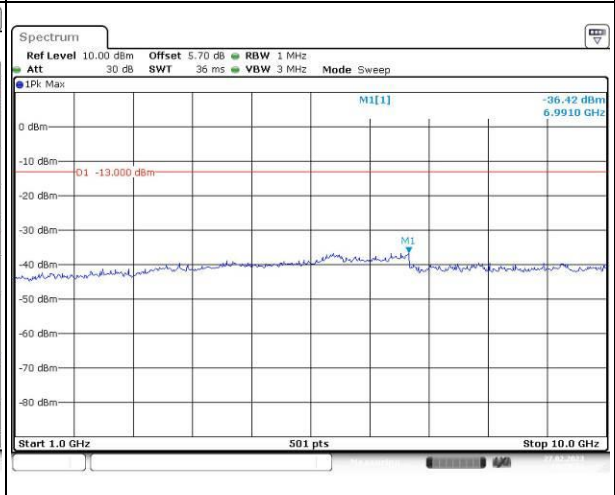
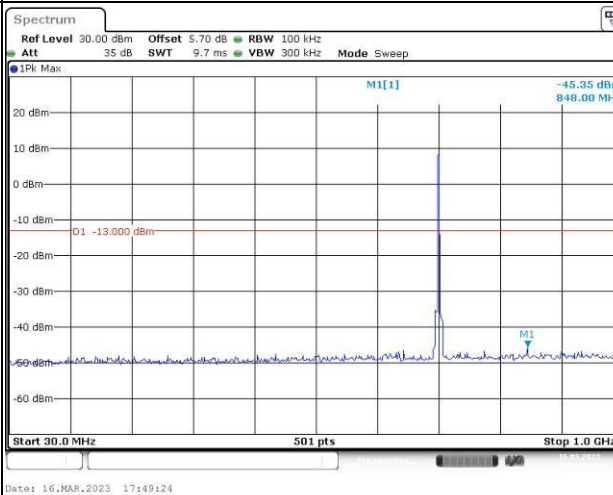
Channel

3MHz Bandwidth QPSK

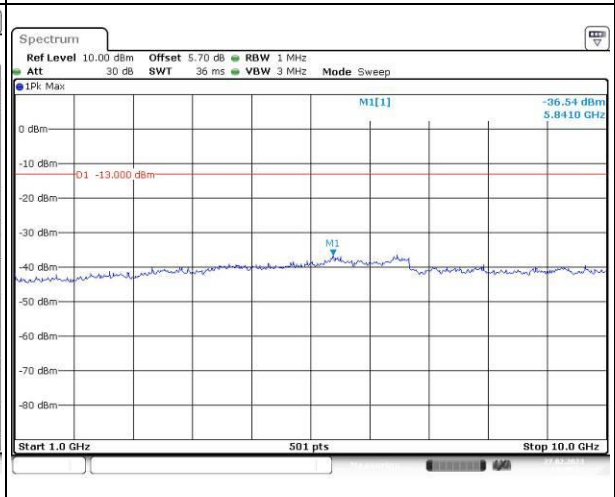
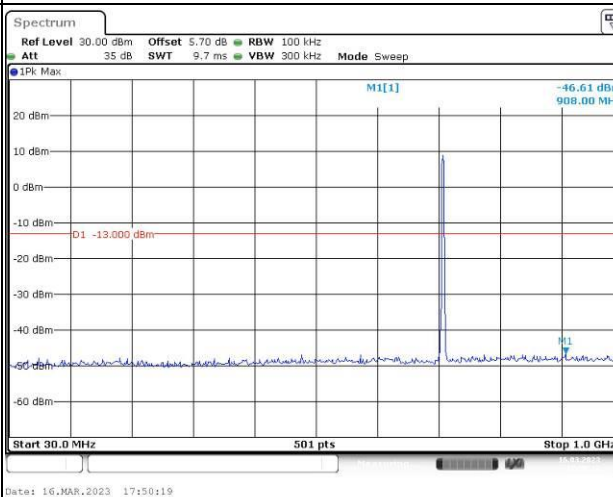
Lowest



Middle



Highest

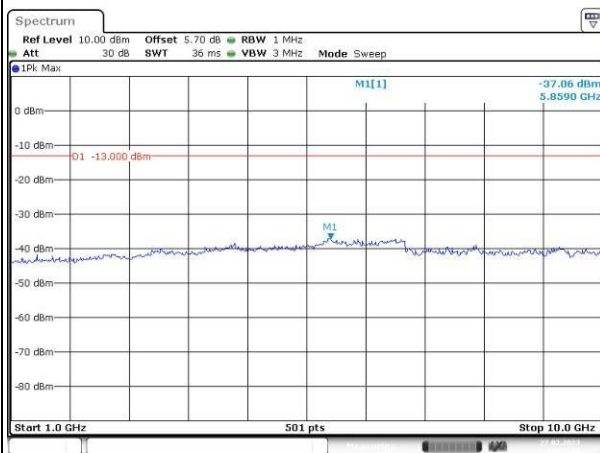
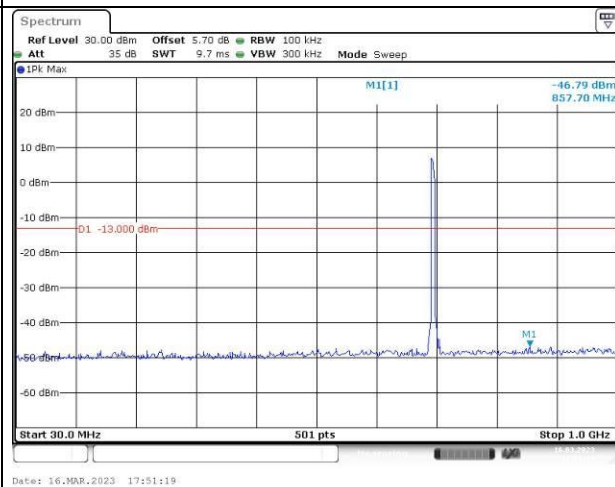


Spurious Emissions at Antenna Terminal

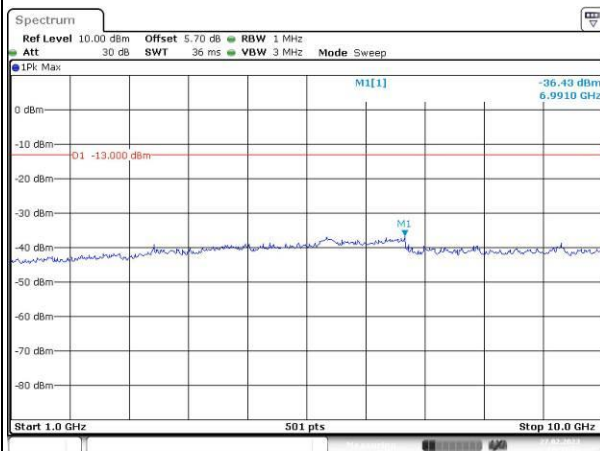
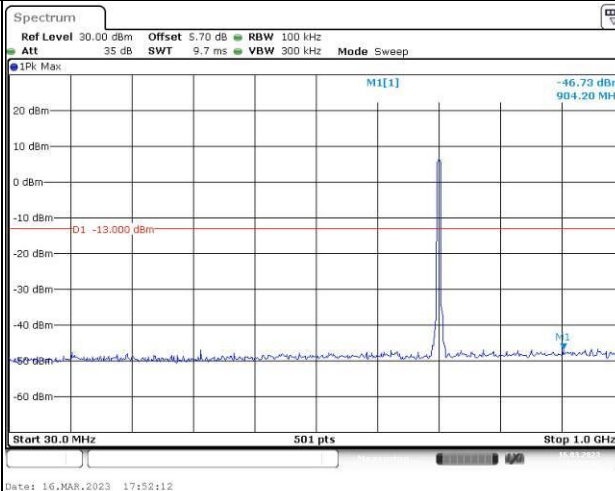
Channel

5MHz Bandwidth QPSK

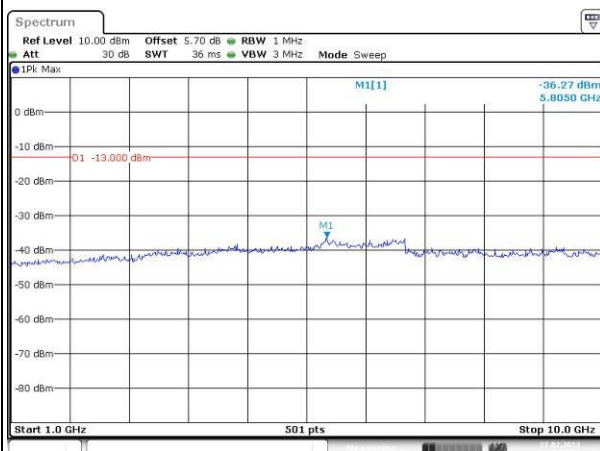
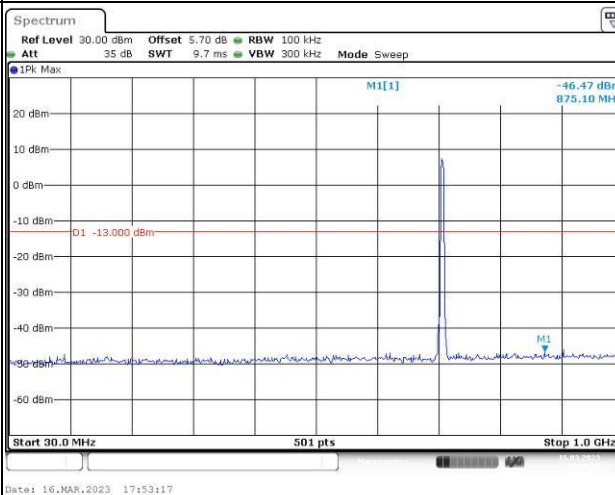
Lowest



Middle



Highest

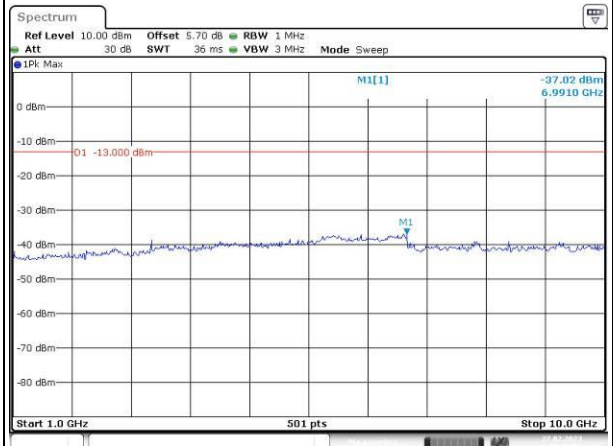
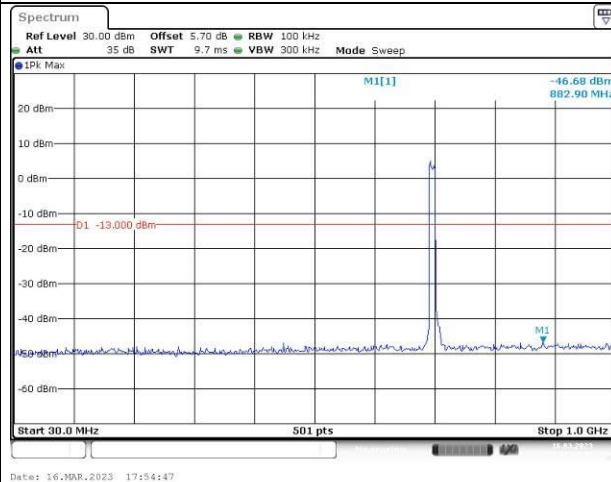


Spurious Emissions at Antenna Terminal

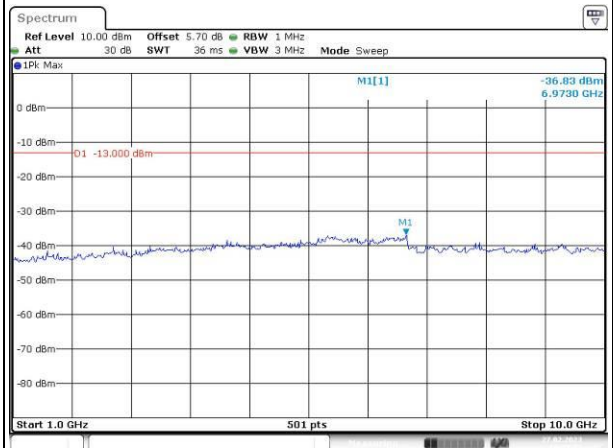
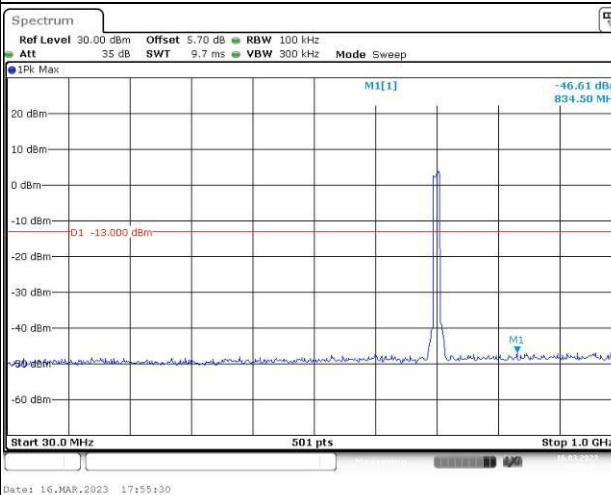
Channel

10MHz Bandwidth QPSK

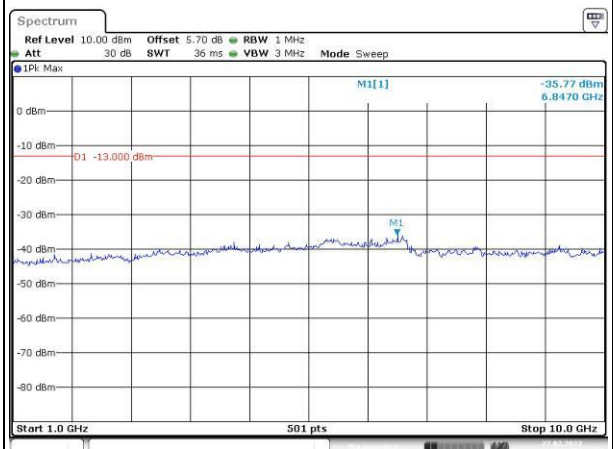
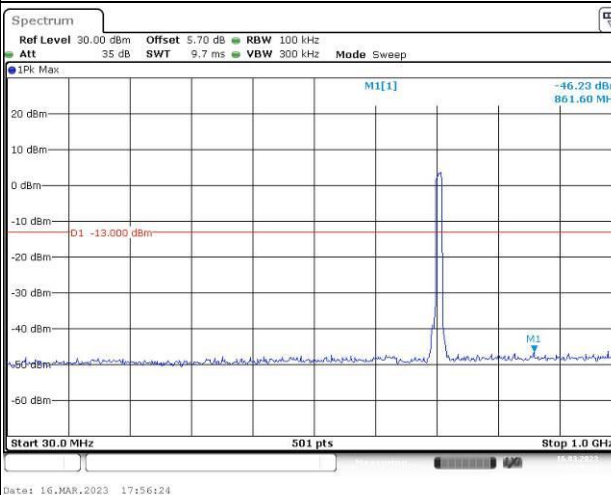
Lowest



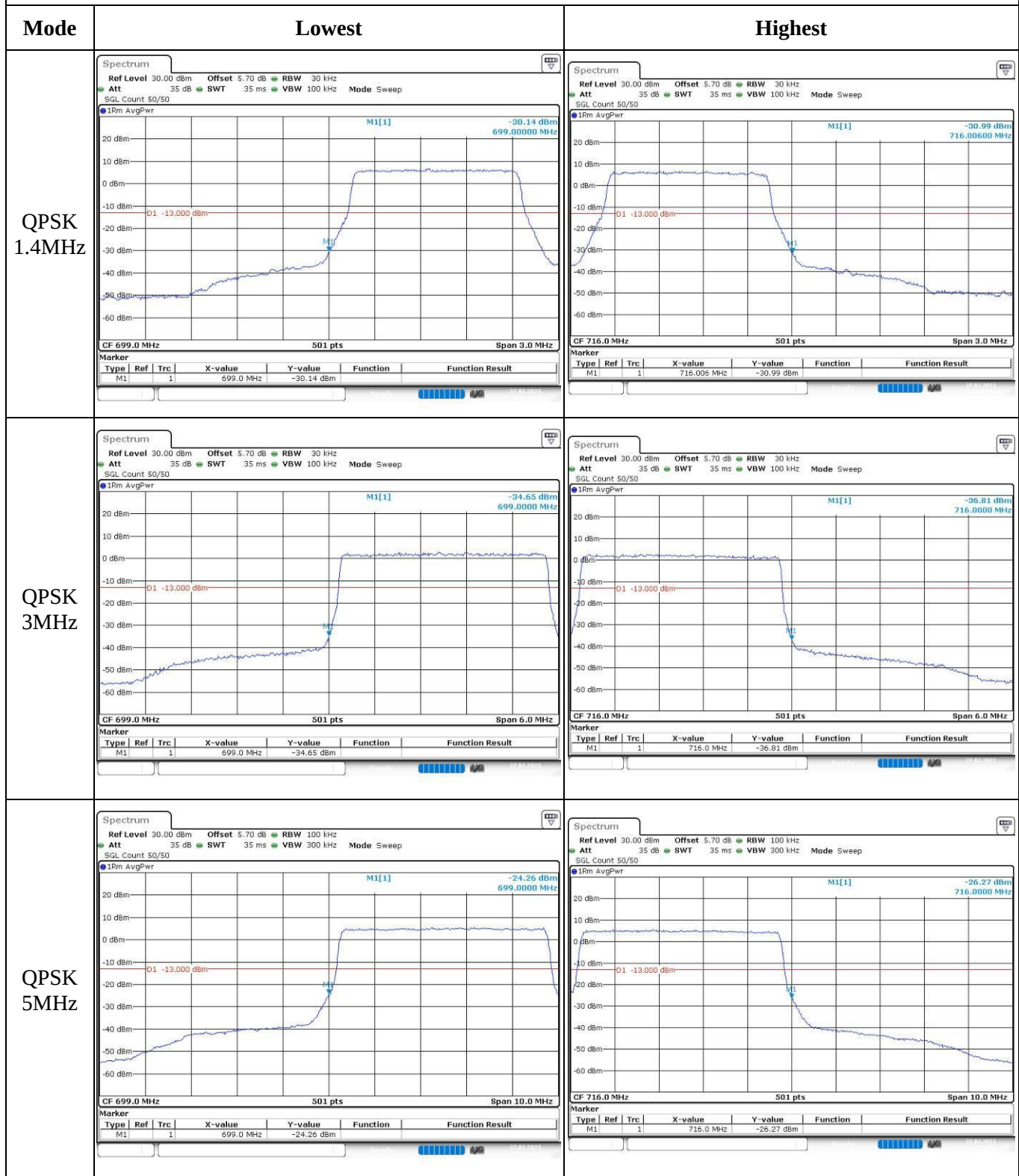
Middle



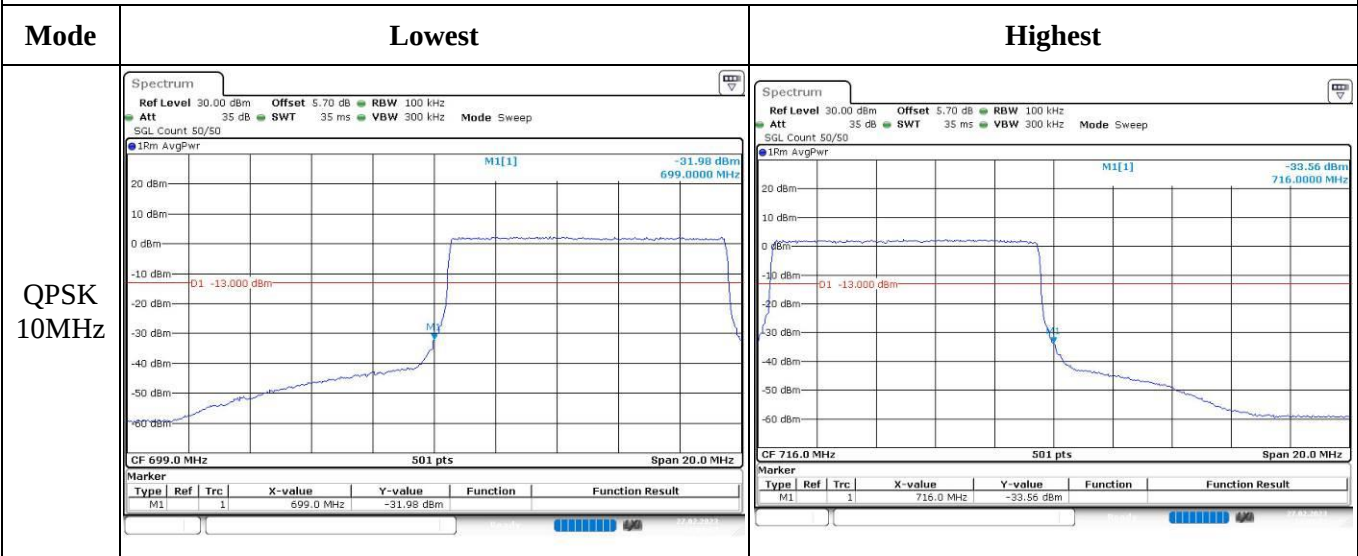
Highest



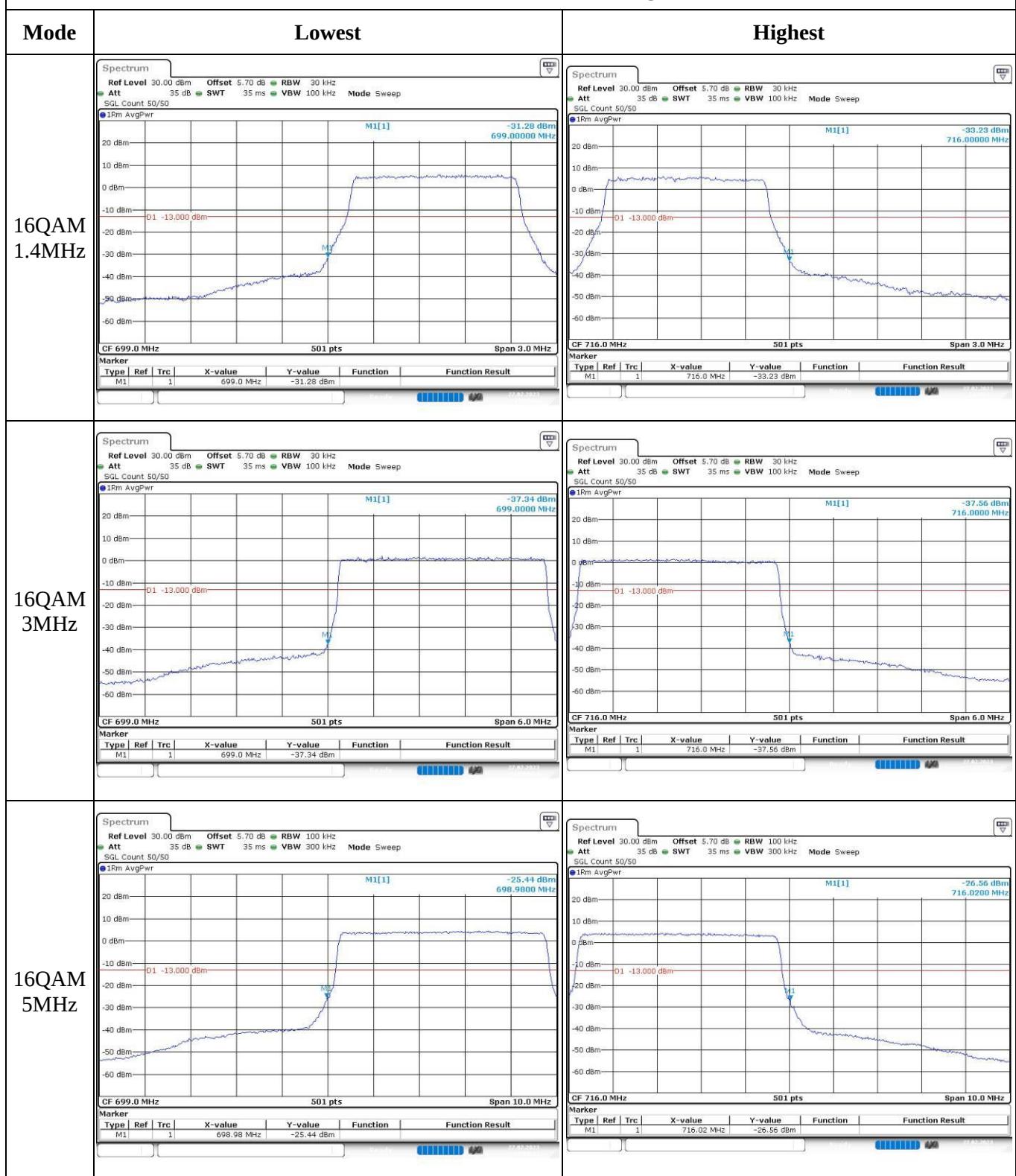
Out of band emission, Band Edge



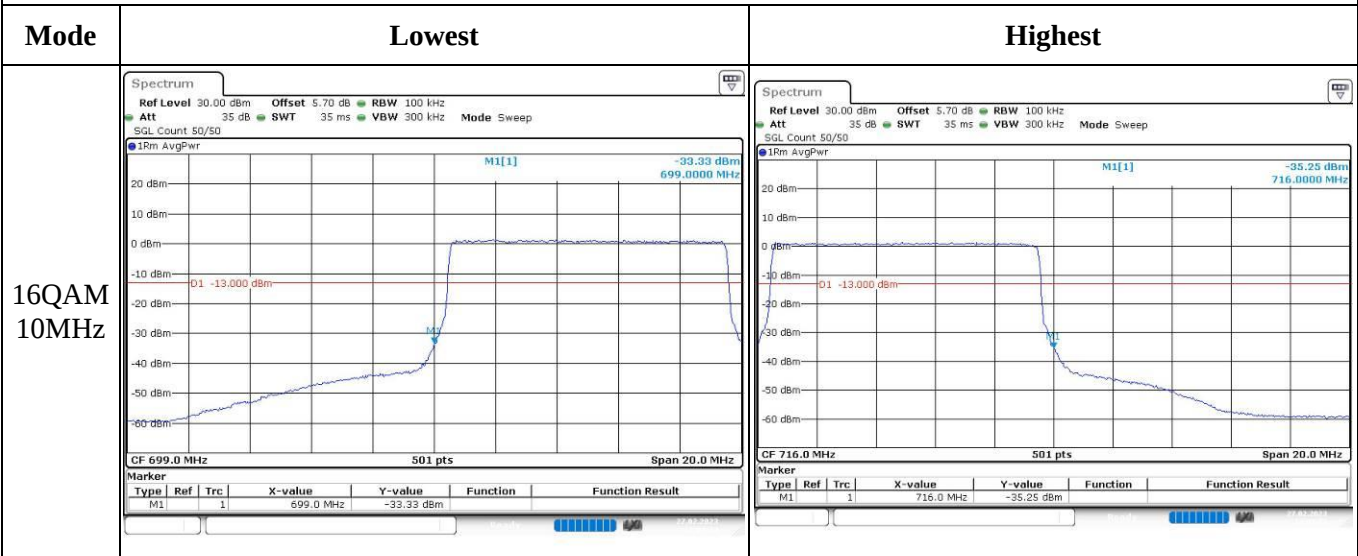
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.9 Antenna Port Test Data and Results for LTE Band 41

Serial Number:	2295	Test Date:	2023/02/27~2023/04/04
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	23.2~24.1	Relative Humidity: (%)	33~36	ATM Pressure: (kPa)	101.1~102.3
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	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	N/A	N/A
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	2022/07/15	2023/07/14

* 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 For FCC (MHz)	Lowest Frequency (MHz) For RSS-199	Middle Frequency (MHz)	Highest Frequency (MHz)
5MHz	2498.5	2502.5	2593	2687.5
10MHz	2501	2505	2593	2685
15MHz	2503.5	2507.5	2593	2682.5
20MHz	2506	2510	2593	2680

Test Data:**RF Output Power:**

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)				Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel For FCC	Lowest Channel For RSS-199	Middle Channel	Highest Channel		
5MHz QPSK	RB1#0	17.36	17.44	17.49	17.07	19.58	33
	RB1#13	17.05	17.5	17.47	17.3		
	RB1#24	17.02	17.35	17.36	17.97		
	RB15#0	17.7	16.42	17.95	17.17		
	RB15#10	17.78	16.54	17.49	17.38		
	RB25#0	17.44	16.48	17.67	17.61		
5MHz 16QAM	RB1#0	17.21	16.51	17.28	17.83	19.49	33
	RB1#13	17.6	16.59	17.56	17.01		
	RB1#24	17.03	16.44	17.03	17.48		
	RB15#0	17.21	15.45	17.65	17.65		
	RB15#10	17.52	15.56	17.01	17.33		
	RB25#0	17.22	15.53	17.55	17.88		
10MHz QPSK	RB1#0	17.19	17.58	17.26	17.46	19.55	33
	RB1#25	17.82	17.75	17.04	17.06		
	RB1#49	17.43	17.43	17.94	17.62		
	RB25#0	17.6	16.47	17.73	17.81		
	RB25#25	17.41	16.53	17.57	17.81		
	RB50#0	17.61	16.56	17.12	17.7		
10MHz 16QAM	RB1#0	17.69	16.84	17.33	17.91	19.52	33
	RB1#25	17.71	16.98	17.31	17.43		
	RB1#49	17.91	16.68	17.58	17.83		
	RB25#0	17.58	15.46	17.66	17.77		
	RB25#25	17.65	15.53	17.79	17.56		
	RB50#0	17.36	15.66	17.39	17.61		
15MHz QPSK	RB1#0	17.31	17.5	17.48	17.69	19.44	33
	RB1#38	17.65	17.48	17.83	17.55		
	RB1#74	17.4	17.03	17.45	17.72		
	RB36#0	17.81	16.48	17.28	17.79		
	RB36#39	17.39	16.38	17.29	17.54		
	RB75#0	17.29	16.42	17.76	17.79		
15MHz 16QAM	RB1#0	17.45	16.69	17.36	17.62	19.42	33
	RB1#38	17.75	16.71	17.44	17.78		
	RB1#74	17.79	16.54	17.81	17.73		
	RB36#0	17.75	15.41	17.28	17.75		
	RB36#39	17.75	15.36	17.62	17.3		
	RB75#0	17.41	15.32	17.37	17.61		

20MHz QPSK	RB1#0	17.31	17.28	17.5	17.48	19.42	33
	RB1#50	17.25	17.68	17.26	17.37		
	RB1#99	17.42	16.97	17.37	17.45		
	RB50#0	17.69	16.3	17.81	17.76		
	RB50#50	17.31	15.95	17.37	17.32		
	RB100#0	17.3	16.12	17.64	17.49		
20MHz 16QAM	RB1#0	17.42	16.41	17.26	17.3	19.42	33
	RB1#50	17.33	16.75	17.39	17.49		
	RB1#99	17.46	16.08	17.33	17.78		
	RB50#0	17.54	15.28	17.64	17.81		
	RB50#50	17.35	14.88	17.49	17.64		
	RB100#0	17.35	15.11	17.58	17.76		
Note: EIRP=Conducted Power(dBm) - Lc(dB) + Gt(dBi)							
					Result:		Pass

Peak-to-average Ratio(PAR)						
Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)				Limit (dB)
		Lowest Channel For FCC	Lowest Channel For ISED	Middle Channel	Highest Channel	
20MHz QPSK	RB1#0	7.68	7.32	8.99	9.13	13
	RB100#0	8.26	8.44	8.43	8.32	13
20MHz 16QAM	RB1#0	9.25	9.43	9.71	9.71	13
	RB100#0	9.86	9.84	9.94	9.83	13
					Result:	Pass

Occupied Bandwidth								
Operation Mode	99% Occupied Bandwidth (MHz)				26 dB Occupied Bandwidth (MHz)			
	Lowest Channel For FCC	Lowest Channel For RSS-199	Middle channel	Highest Channel	Lowest Channel For FCC	Lowest Channel For RSS-199	Middle channel	Highest Channel
5MHz QPSK	4.491	4.531	4.531	4.511	4.96	4.92	5.08	5.28
5MHz 16QAM	4.511	4.491	4.491	4.511	5.14	5.02	5.18	4.98
10MHz QPSK	8.982	8.942	8.942	8.942	9.68	9.68	9.68	9.96
10MHz 16QAM	8.982	8.982	8.942	8.942	9.52	9.48	9.56	10.24
15MHz QPSK	13.473	13.473	13.593	13.473	15.78	15.06	15.66	15.72
15MHz 16QAM	13.593	13.473	13.593	13.593	16.38	15.54	17.04	16.2
20MHz QPSK	17.964	17.964	17.964	17.964	19.68	19.28	19.92	20.08
20MHz 16QAM	17.964	17.884	17.964	17.964	20.08	19.6	20.56	19.44
Note: The test plots please refer to the Plots of Occupied Bandwidth								

Spurious Emissions at Antenna Terminal	
Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.

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

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 for FCC (MHz)		Lower Edge for RSS-199 (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.8	2496.4481	2496.00	2500.4526	2500.00	2689.6029	2690
	-20	3.8	2496.4082	2496.00	2500.4557	2500.00	2689.6068	2690
	-10	3.8	2496.4018	2496.00	2500.4543	2500.00	2689.6054	2690
	0	3.8	2496.4007	2496.00	2500.4543	2500.00	2689.6047	2690
	10	3.8	2496.4013	2496.00	2500.4553	2500.00	2689.6088	2690
	20	3.8	2496.4058	2496.00	2500.4515	2500.00	2689.6022	2690
	30	3.8	2496.4053	2496.00	2500.4556	2500.00	2689.6024	2690
	40	3.8	2496.4037	2496.00	2500.4565	2500.00	2689.6065	2690
	50	3.8	2496.4095	2496.00	2500.4527	2500.00	2689.6099	2690
Frequency Stability vs. Voltage	20	3.45	2496.4093	2496.00	2500.4553	2500.00	2689.6098	2690
	20	4.35	2496.4046	2496.00	2500.4551	2500.00	2689.6038	2690
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 for FCC (MHz)		Lower Edge for RSS-199 (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.8	2496.4040	2496.00	2500.4554	2500.00	2689.6024	2690
	-20	3.8	2496.4065	2496.00	2500.4559	2500.00	2689.6023	2690
	-10	3.8	2496.4079	2496.00	2500.4534	2500.00	2689.6042	2690
	0	3.8	2496.4061	2496.00	2500.4547	2500.00	2689.6008	2690
	10	3.8	2496.4018	2496.00	2500.4559	2500.00	2689.6009	2690
	20	3.8	2496.4058	2496.00	2500.4565	2500.00	2689.6022	2690
	30	3.8	2496.4016	2496.00	2500.4542	2500.00	2689.6079	2690
	40	3.8	2496.4086	2496.00	2500.4563	2500.00	2689.6021	2690
	50	3.8	2496.4052	2496.00	2500.4557	2500.00	2689.6042	2690
Frequency Stability vs. Voltage	20	3.45	2496.4091	2496.00	2500.4565	2500.00	2689.6094	2690
	20	4.35	2496.4043	2496.00	2500.4559	2500.00	2689.6010	2690
Result:							Pass	