

4.6 Antenna Port Test Data and Results for LTE Band 2

Serial Number:	294A-2	Test Date:	2023/9/13
Test Site:	RF	Test Mode:	Transmitting
Tester:	Ken Tang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.6	Relative Humidity: (%)	57	ATM Pressure: (kPa)	101
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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	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
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	1850.7	1880	1909.3
3MHz	1851.5	1880	1908.5
5MHz	1852.5	1880	1907.5
10MHz	1855	1880	1905
15MHz	1857.5	1880	1902.5
20MHz	1860	1880	1900

Test Data:**FCC§2.1046;§ 24.232****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	21.15	21.04	20.91	19.45	33
	RB1#3	21.15	21.15	20.78		
	RB1#5	21.09	21.05	20.8		
	RB3#0	21.15	20.99	20.94		
	RB3#3	21.07	21.04	20.85		
	RB6#0	20.21	20.17	19.98		
1.4MHz 16QAM	RB1#0	20.31	20.23	20.16	18.79	33
	RB1#3	20.49	20.27	20.17		
	RB1#5	20.31	20.12	20.02		
	RB3#0	20.33	20.24	19.97		
	RB3#3	20.33	20.28	20.01		
	RB6#0	19.29	19.13	19.06		
3MHz QPSK	RB1#0	21.23	21.17	21.03	19.53	33
	RB1#8	21.19	21.12	20.97		
	RB1#14	21.11	21.05	20.82		
	RB6#0	20.38	20.21	20.11		
	RB6#9	20.22	20.15	20.02		
	RB15#0	20.27	20.12	20.04		
3MHz 16QAM	RB1#0	20.38	20.3	20.61	18.93	33
	RB1#8	20.31	20.31	20.63		
	RB1#14	20.25	20.18	20.44		
	RB6#0	19.37	19.28	19.22		
	RB6#9	19.25	19.26	19.11		
	RB15#0	19.36	19.16	19.13		
5MHz QPSK	RB1#0	21.19	21.06	21.01	19.5	33
	RB1#13	21.2	21.08	21.02		
	RB1#24	21.14	21.02	20.97		
	RB15#0	20.32	20.19	20.12		
	RB15#10	20.21	20.22	20.01		
	RB25#0	20.28	20.13	20.09		
5MHz 16QAM	RB1#0	20.37	20.11	20.2	19.69	33
	RB1#13	20.4	20.08	20.14		
	RB1#24	20.3	20.11	20.08		
	RB15#0	19.41	19.23	21.39		
	RB15#10	19.34	19.25	20.38		
	RB25#0	20.13	19.21	20.47		

Page 64 of 309

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	6.17	6.98	9.43	13
	RB100#0	7.57	8.93	7.69	13
20MHz 16QAM	RB1#0	7.35	8	8.27	13
	RB100#0	9.76	8.87	8.65	13
Result:					Pass

FCC §2.1049, §24.238: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	1.084	1.078	1.09	1.206	1.212	1.21
1.4MHz 16QAM	1.084	1.078	1.078	1.218	1.200	1.212
3MHz QPSK	2.683	2.695	2.683	2.952	2.940	2.964
3MHz 16QAM	2.683	2.683	2.683	2.964	2.964	2.952
5MHz QPSK	4.511	4.511	4.511	5.020	5.000	5.000
5MHz 16QAM	4.511	4.531	4.511	4.980	5.000	5.000
10MHz QPSK	8.942	8.982	8.982	9.720	9.640	9.760
10MHz 16QAM	8.942	8.982	8.942	9.680	9.680	9.680
15MHz QPSK	13.473	13.473	13.473	14.760	14.640	14.760
15MHz 16QAM	13.533	13.533	13.533	14.760	14.700	14.700
20MHz QPSK	18.044	17.884	17.884	19.360	19.360	19.440
20MHz 16QAM	17.964	17.964	17.884	19.360	19.360	19.200
Note: The test plots please refer to the Plots of Occupied Bandwidth						

FCC §2.1051, § 24.238 (a):Spurious Emissions at Antenna Terminal	
Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.

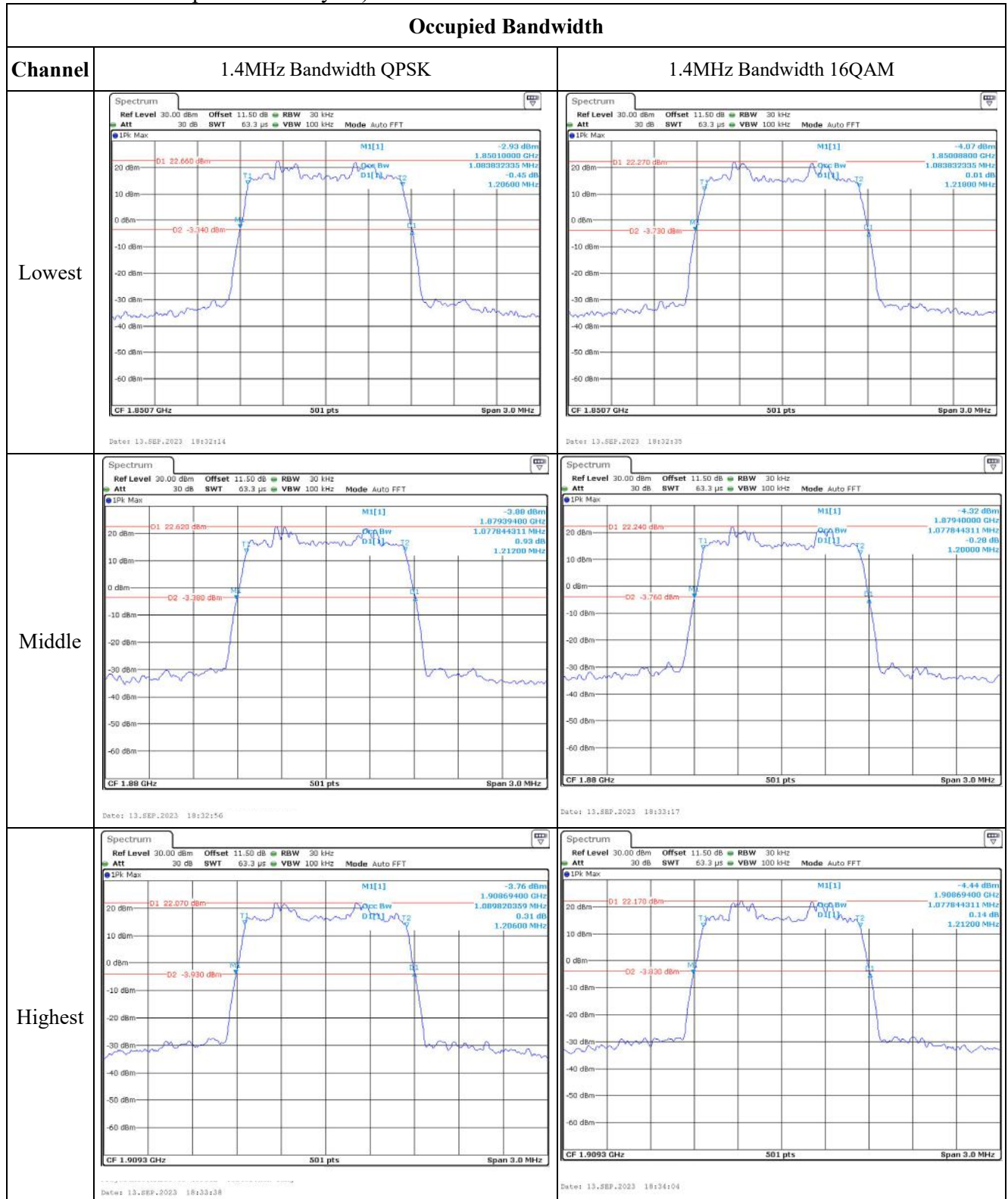
FCC §2.1051, § 24.238 (a):Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

FCC §2.1055, §24.235: 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	3.85	1850.010	1850.000	1909.999	1910.000
	-20	3.85	1850.029	1850.000	1909.978	1910.000
	-10	3.85	1850.007	1850.000	1909.999	1910.000
	0	3.85	1850.010	1850.000	1909.970	1910.000
	10	3.85	1850.015	1850.000	1909.981	1910.000
	20	3.85	1850.026	1850.000	1909.992	1910.000
	30	3.85	1850.002	1850.000	1909.999	1910.000
	40	3.85	1850.017	1850.000	1909.977	1910.000
	50	3.85	1850.003	1850.000	1909.975	1910.000
Frequency Stability vs. Voltage	20	3.66	1850.004	1850.000	1909.987	1910.000
	20	4.24	1850.006	1850.000	1909.330	1910.000
					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	3.85	1850.015	1850.000	1909.975	1910.000
	-20	3.85	1850.018	1850.000	1909.978	1910.000
	-10	3.85	1850.023	1850.000	1909.973	1910.000
	0	3.85	1850.021	1850.000	1909.982	1910.000
	10	3.85	1850.017	1850.000	1909.992	1910.000
	20	3.85	1850.017	1850.000	1909.973	1910.000
	30	3.85	1850.028	1850.000	1909.990	1910.000
	40	3.85	1850.010	1850.000	1909.978	1910.000
	50	3.85	1850.017	1850.000	1909.994	1910.000
Frequency Stability vs. Voltage	20	3.66	1850.010	1850.000	1909.993	1910.000
	20	4.24	1850.014	1850.000	1909.995	1910.000
					Result:	Pass

Test Plots(Note: The 11.5 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):



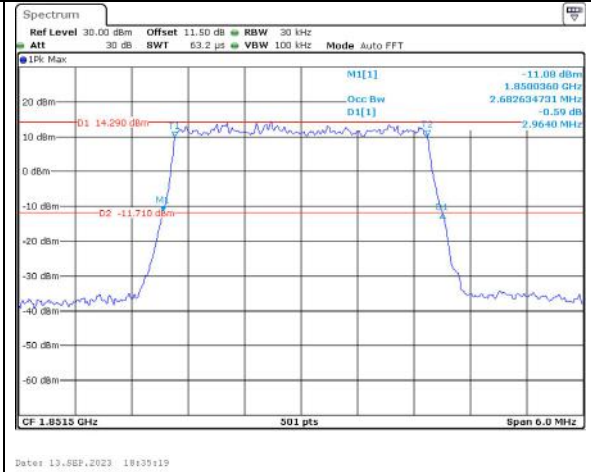
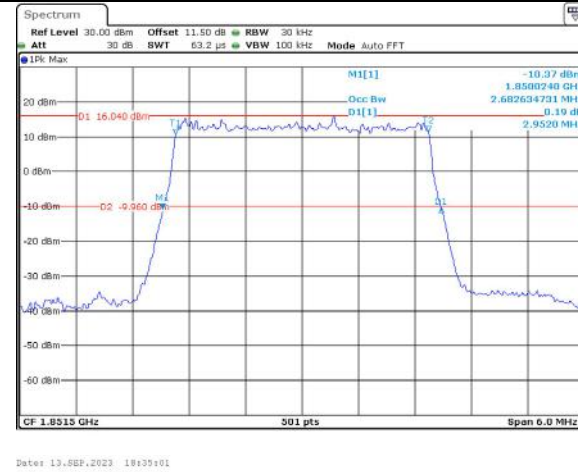
Occupied Bandwidth

Channel

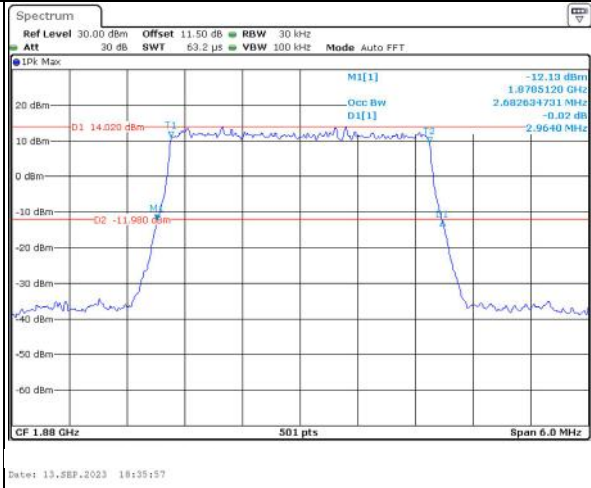
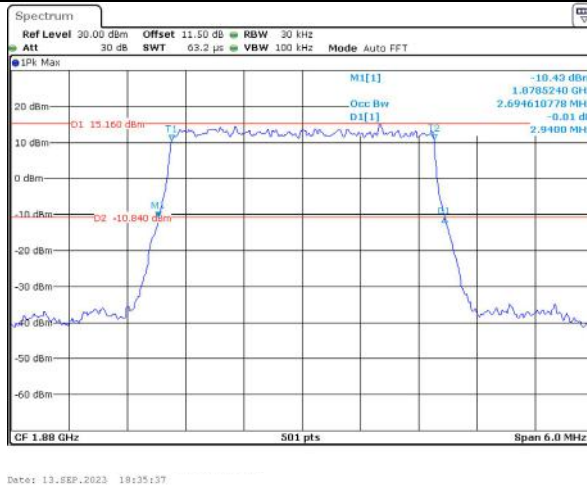
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

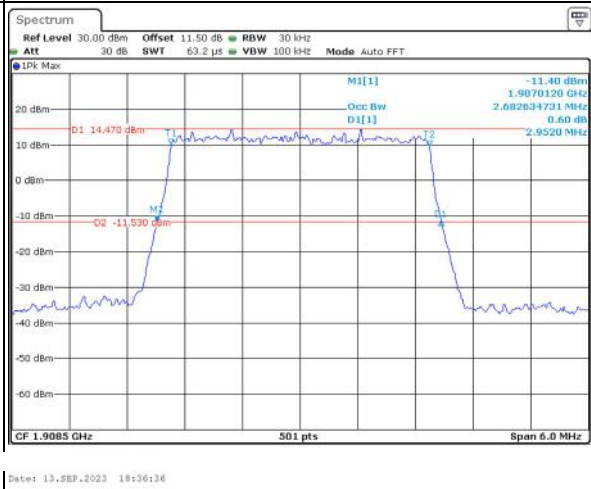
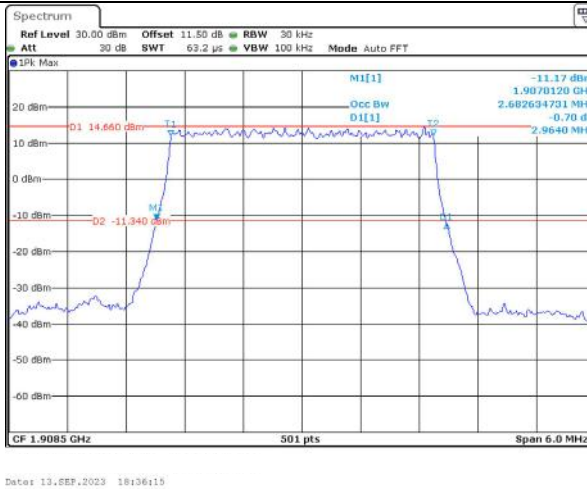
Lowest



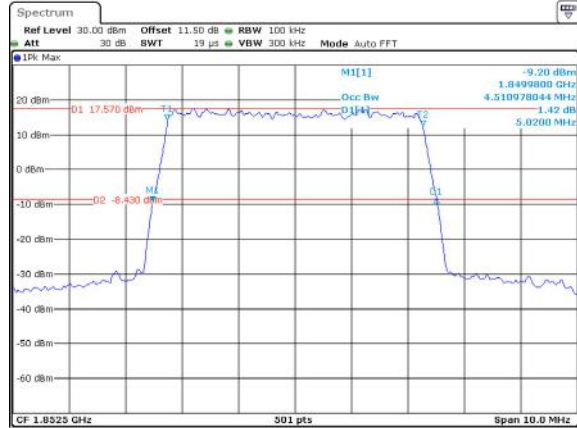
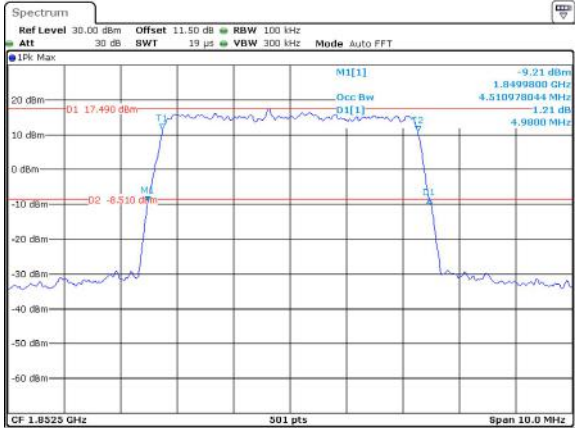
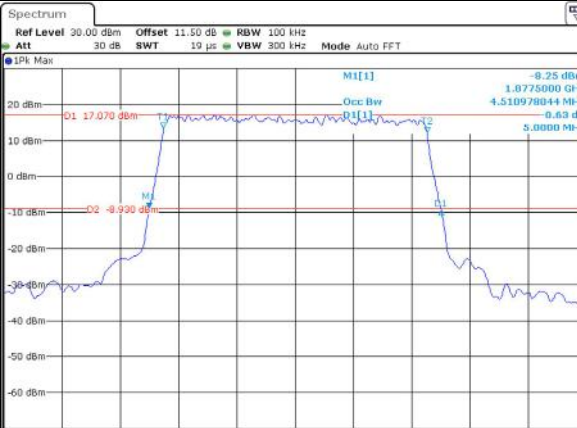
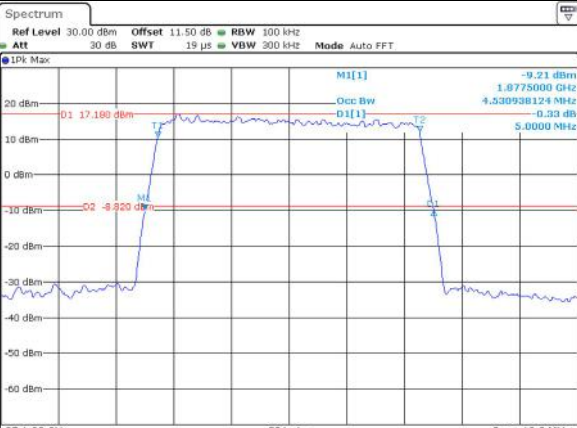
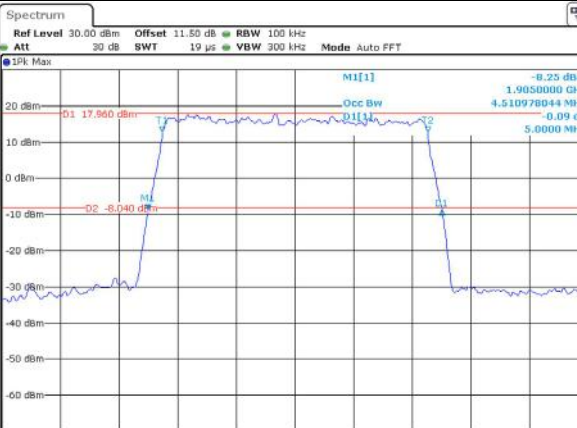
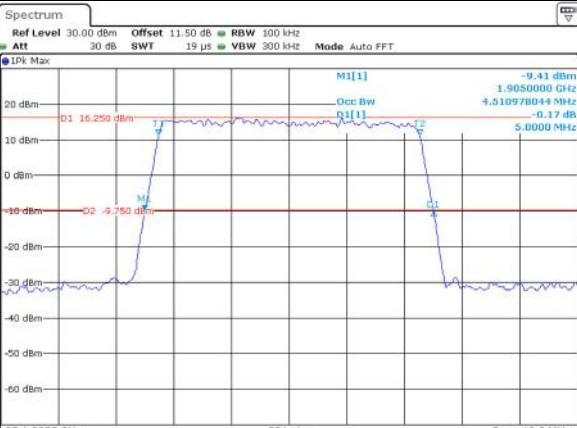
Middle



Highest



Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -9.20 dBm Occ Bw 5.0200 MHz D1[1] 1.8499800 GHz CF 1.8525 GHz 501 pts Span 10.0 MHz Date: 13. SEP. 2023 18:38:40	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -9.21 dBm Occ Bw 4.9800 MHz D1[1] 1.8499800 GHz CF 1.8525 GHz 501 pts Span 10.0 MHz Date: 13. SEP. 2023 18:39:01
Middle	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -8.25 dBm Occ Bw 5.0000 MHz D1[1] 1.8775000 GHz CF 1.88 GHz 501 pts Span 10.0 MHz Date: 13. SEP. 2023 18:39:19	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -9.21 dBm Occ Bw 5.0000 MHz D1[1] 1.8775000 GHz CF 1.88 GHz 501 pts Span 10.0 MHz Date: 13. SEP. 2023 18:39:16
Highest	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -8.25 dBm Occ Bw 5.0000 MHz D1[1] 1.9050000 GHz CF 1.9075 GHz 501 pts Span 10.0 MHz Date: 13. SEP. 2023 18:40:01	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -9.41 dBm Occ Bw 5.0000 MHz D1[1] 1.9050000 GHz CF 1.9075 GHz 501 pts Span 10.0 MHz Date: 13. SEP. 2023 18:40:22

Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10k Max M1[1] -10.77 dBm 1.8501600 GHz 8.942115768 MHz 0.11 dB D1[1] -11.39 dBm 1.8502000 GHz 8.942115768 MHz -1.57 dB CF 1.855 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 18:43:00	Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10k Max M1[1] -10.77 dBm 1.8501600 GHz 8.942115768 MHz 0.11 dB D1[1] -11.39 dBm 1.8502000 GHz 8.942115768 MHz -1.57 dB CF 1.855 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 18:43:27
Middle	Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10k Max M1[1] -9.09 dBm 1.8751600 GHz 8.982035928 MHz -1.61 dB D1[1] -11.70 dBm 1.8751200 GHz 8.982035928 MHz 0.76 dB CF 1.88 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 18:44:04	Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10k Max M1[1] -9.09 dBm 1.8751600 GHz 8.982035928 MHz -1.61 dB D1[1] -11.70 dBm 1.8751200 GHz 8.982035928 MHz 0.76 dB CF 1.88 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 18:44:34
Highest	Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10k Max M1[1] -10.62 dBm 1.9000800 GHz 8.9602035928 MHz -0.54 dB D1[1] -10.94 dBm 1.9001600 GHz 8.942115768 MHz -1.35 dB CF 1.905 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 18:44:59	Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10k Max M1[1] -10.62 dBm 1.9000800 GHz 8.9602035928 MHz -0.54 dB D1[1] -10.94 dBm 1.9001600 GHz 8.942115768 MHz -1.35 dB CF 1.905 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 18:45:26

Occupied Bandwidth

Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

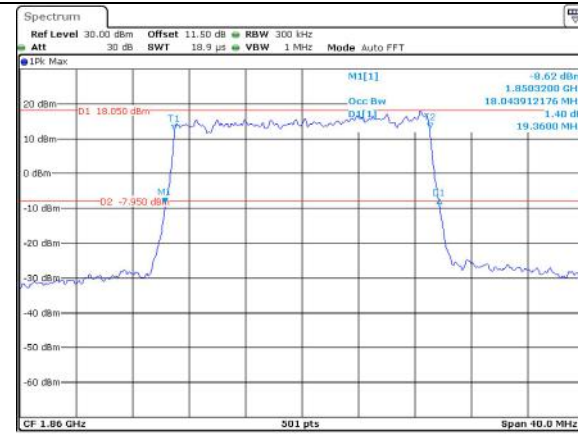
Occupied Bandwidth

Channel

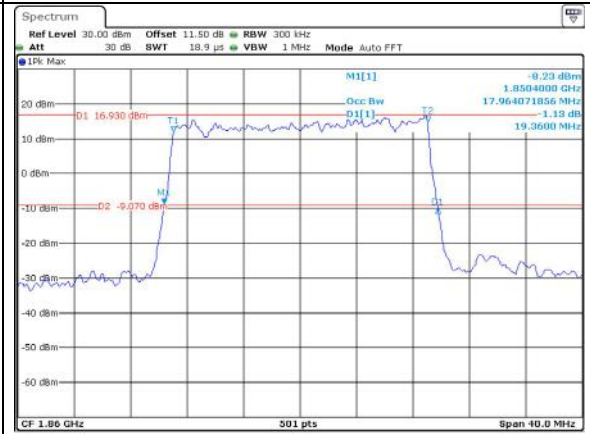
20MHz Bandwidth QPSK

20MHz Bandwidth 16QAM

Lowest

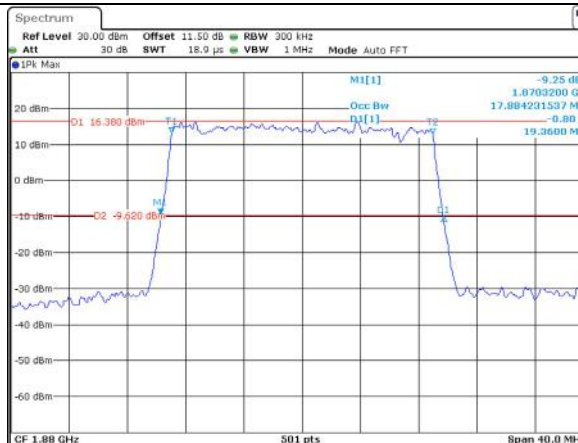


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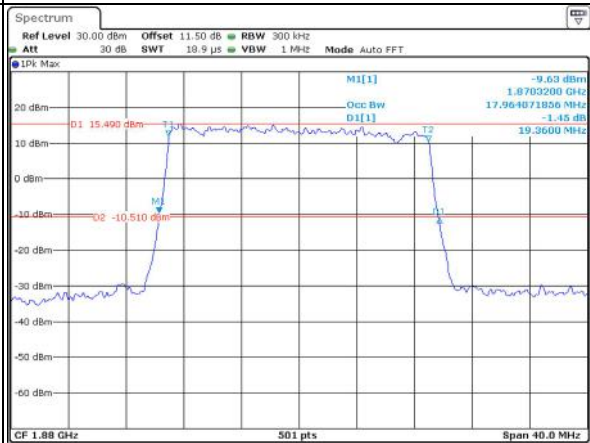


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Middle

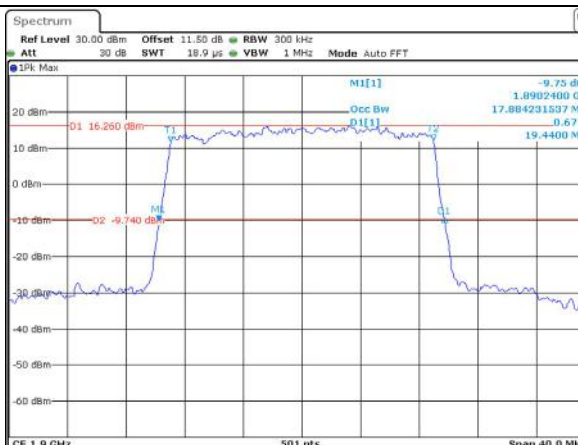


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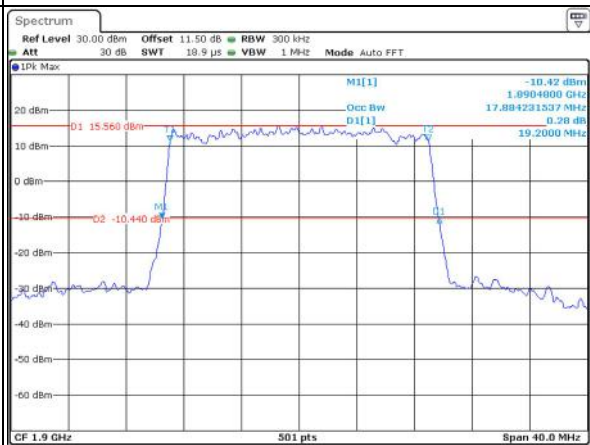


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Highest



Date: 13.SEP.2023 18:55:44



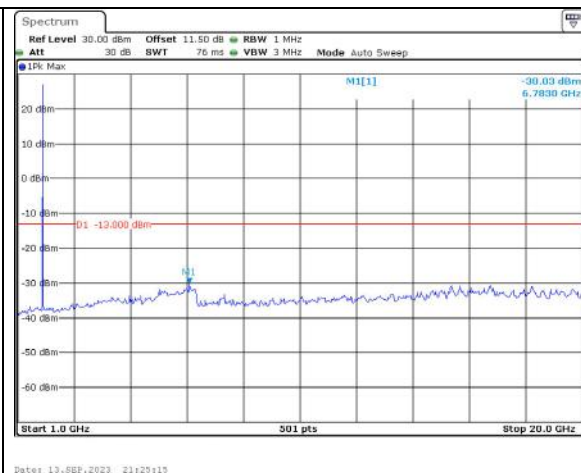
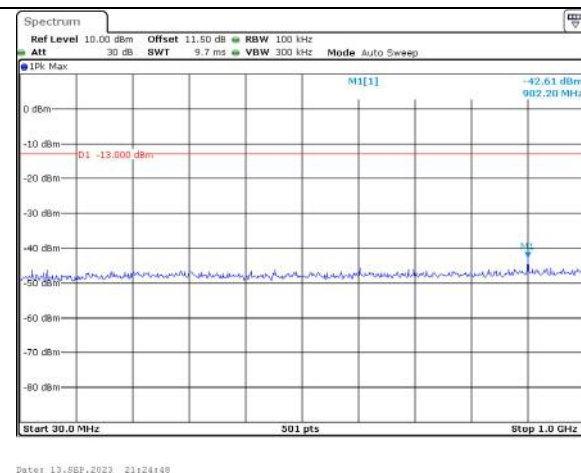
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Spurious Emissions at Antenna Terminal

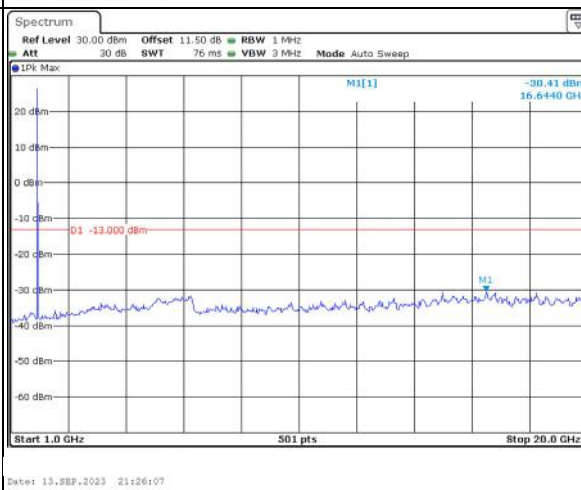
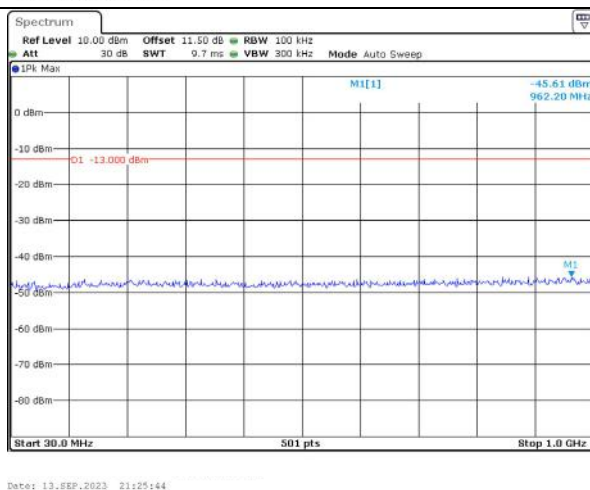
Channel

1.4MHz Bandwidth QPSK

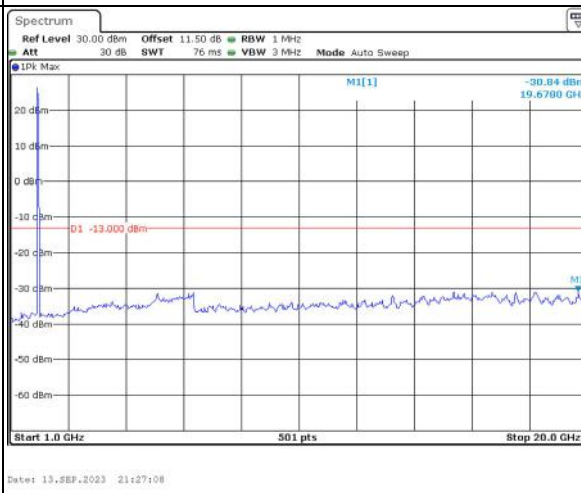
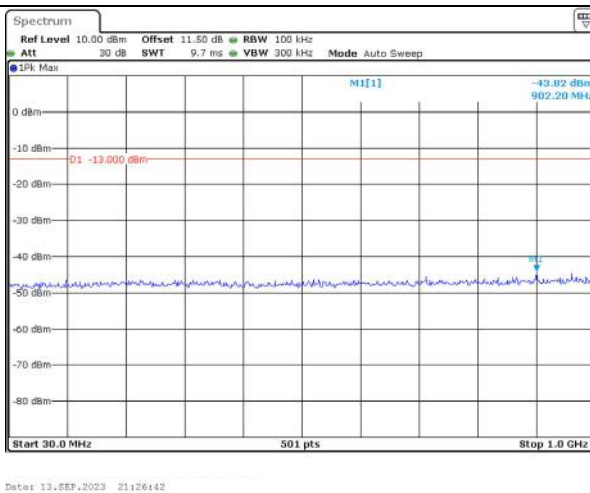
Lowest



Middle



Highest

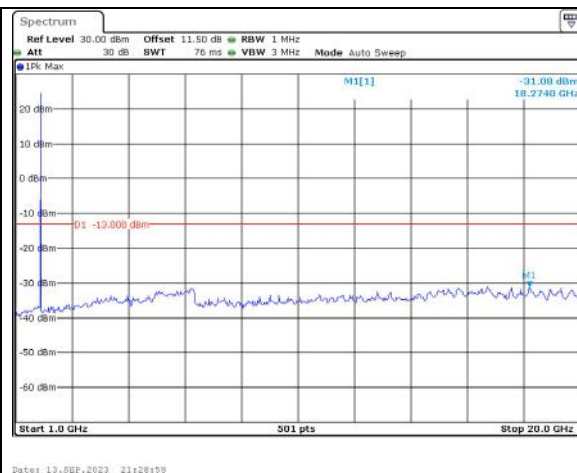
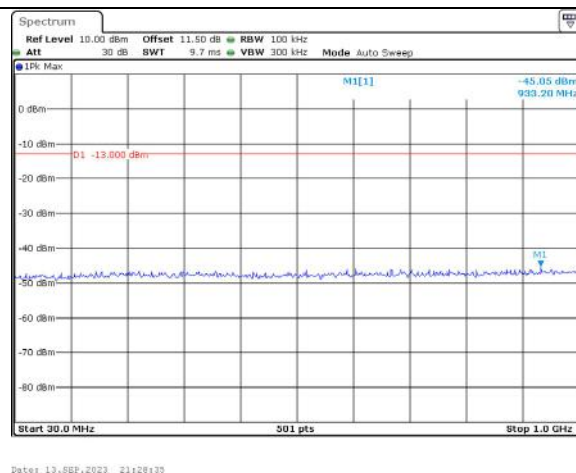


Spurious Emissions at Antenna Terminal

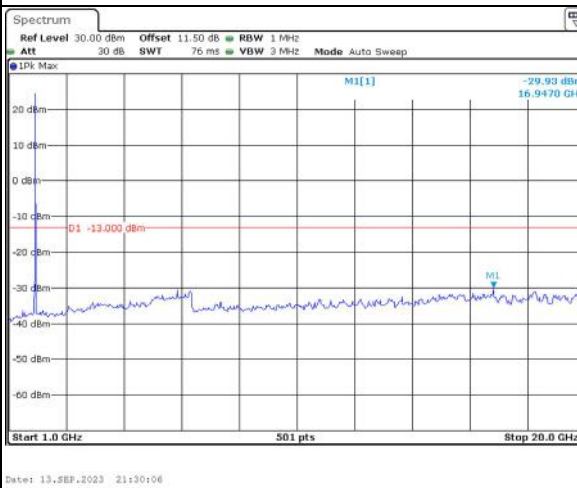
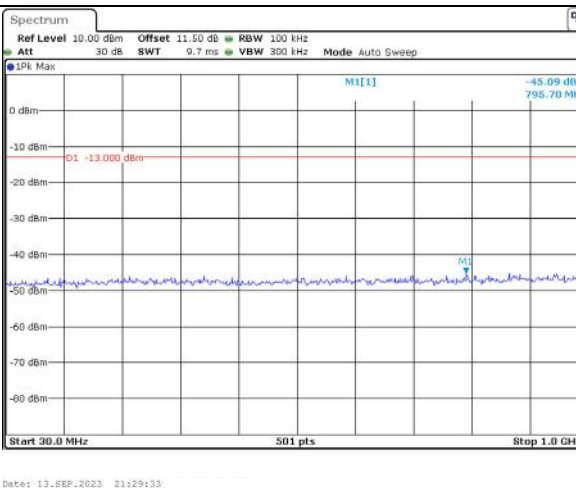
Channel

3MHz Bandwidth QPSK

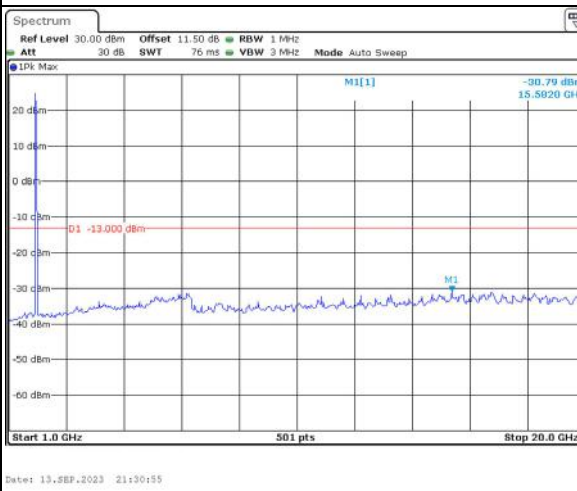
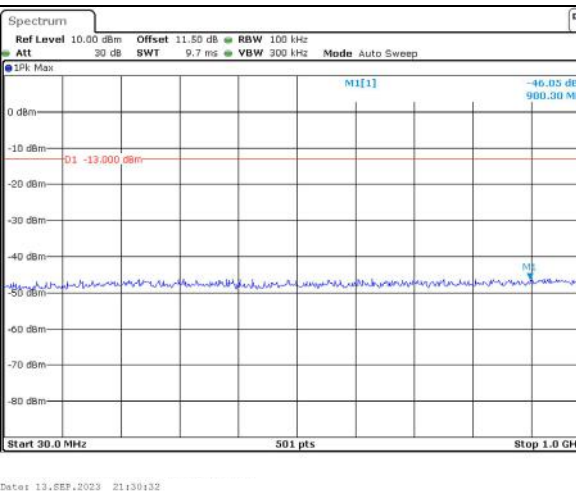
Lowest



Middle



Highest

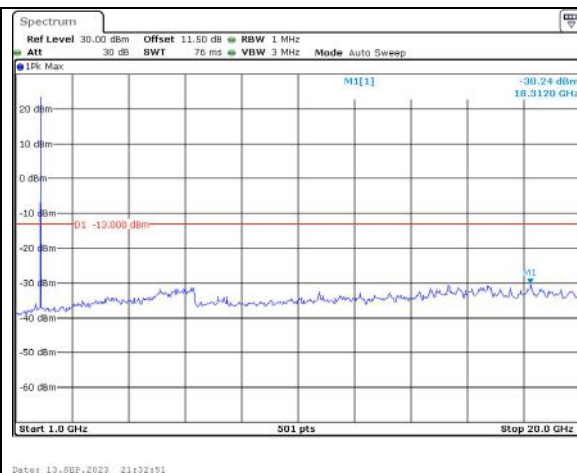
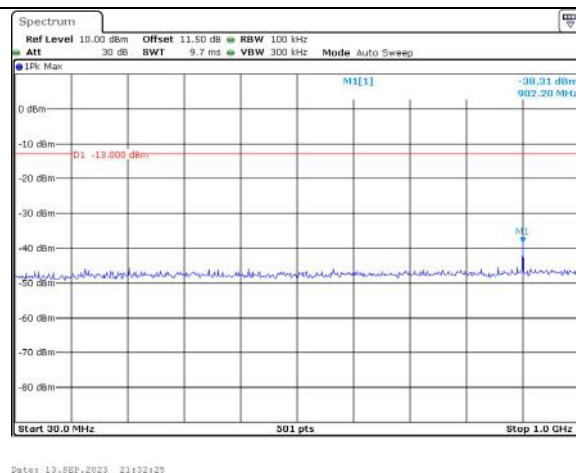


Spurious Emissions at Antenna Terminal

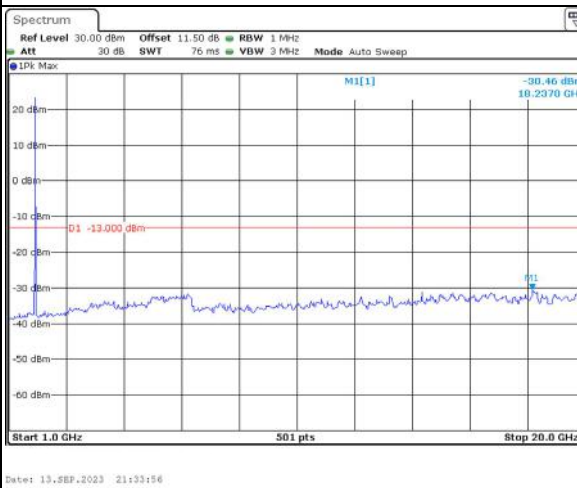
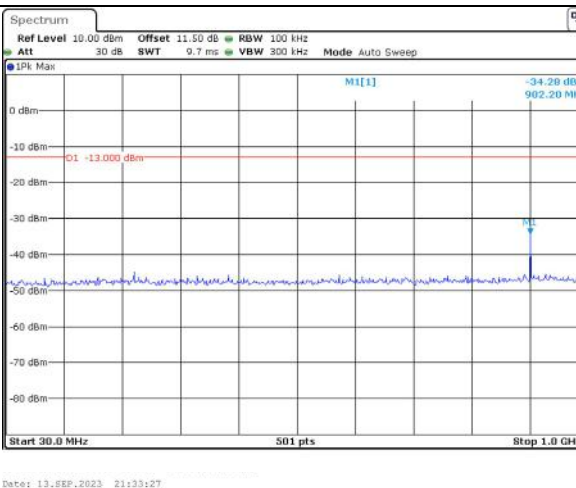
Channel

5MHz Bandwidth QPSK

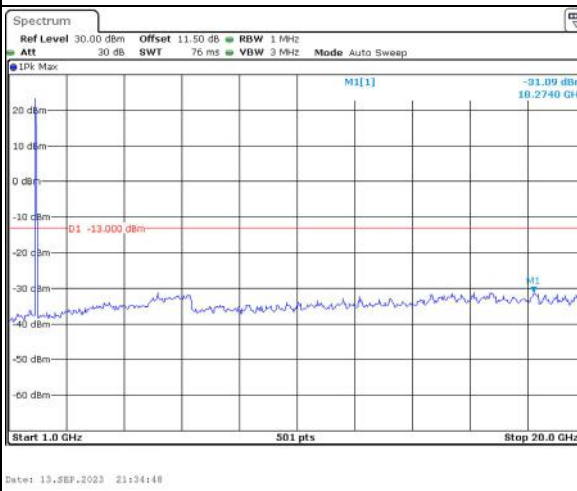
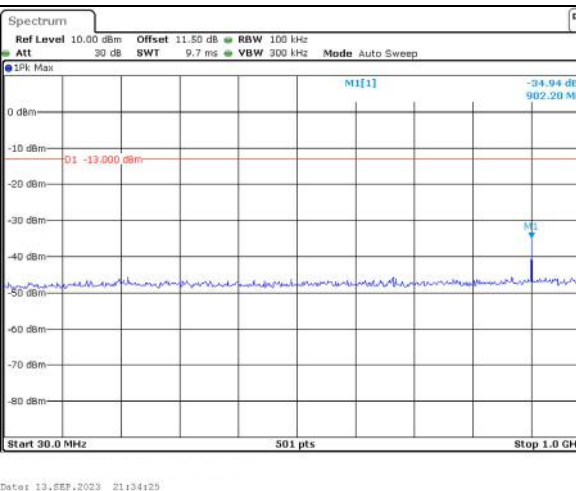
Lowest



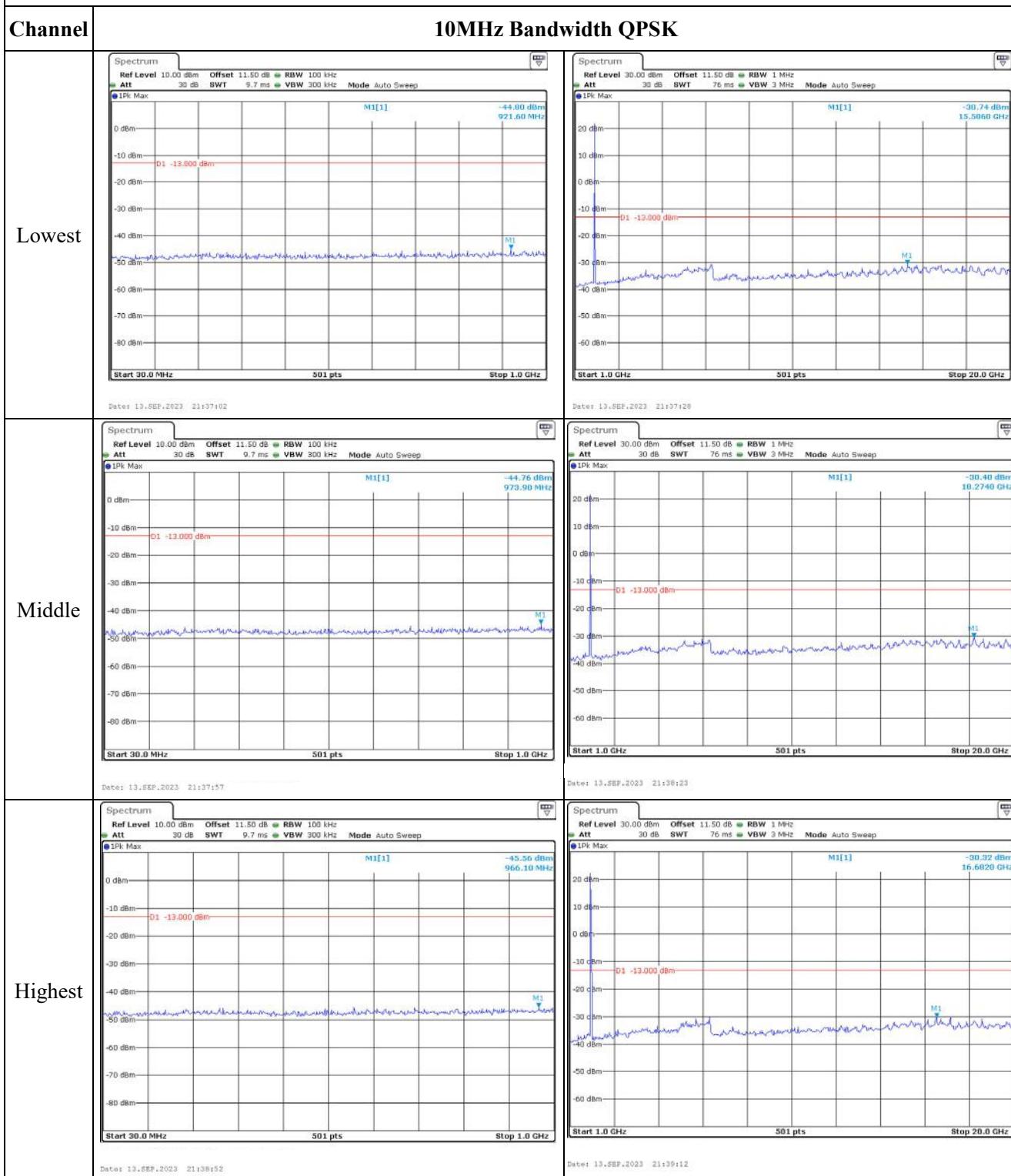
Middle



Highest



Spurious Emissions at Antenna Terminal

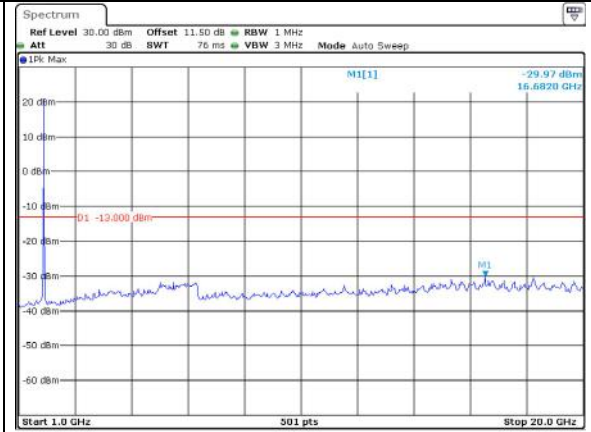
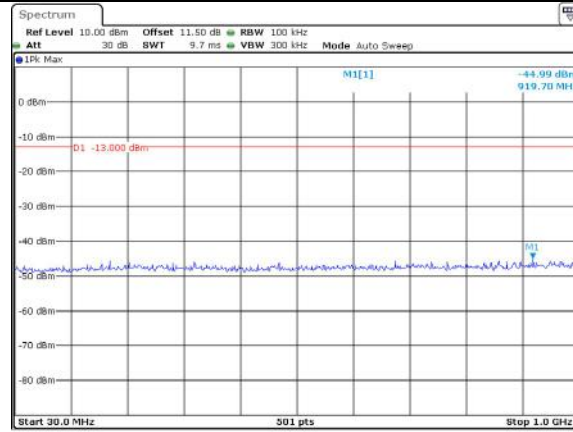


Spurious Emissions at Antenna Terminal

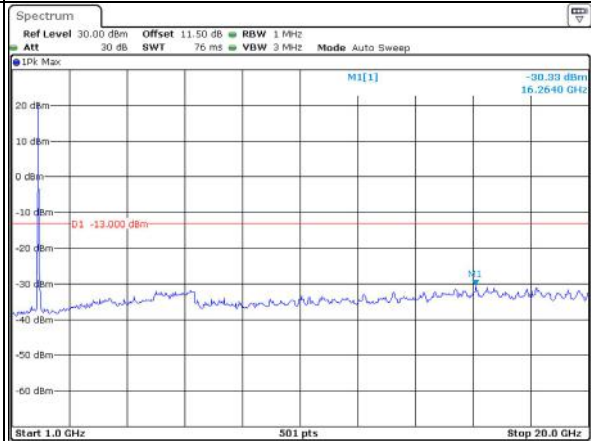
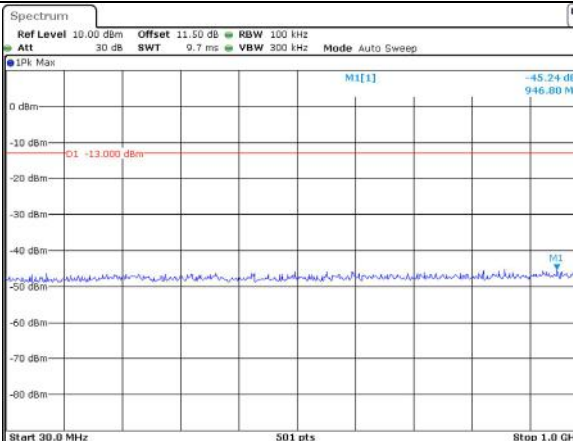
Channel

15MHz Bandwidth QPSK

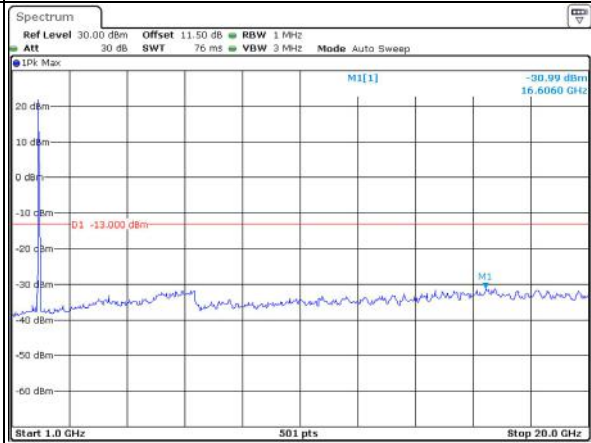
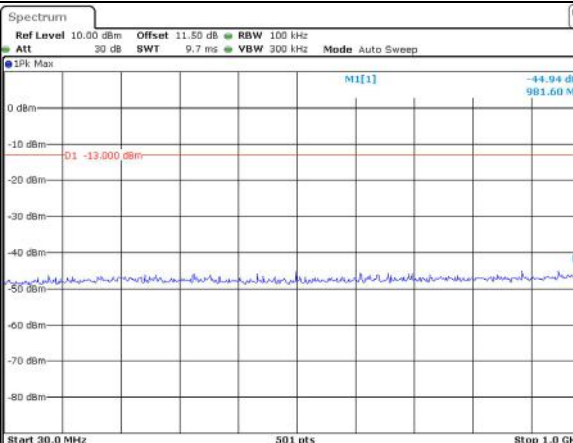
Lowest



Middle



Highest

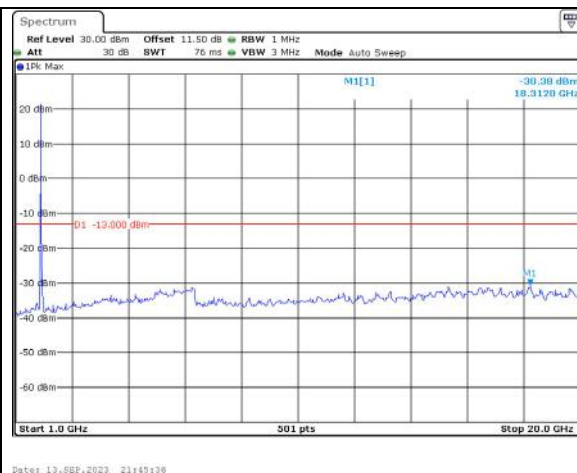
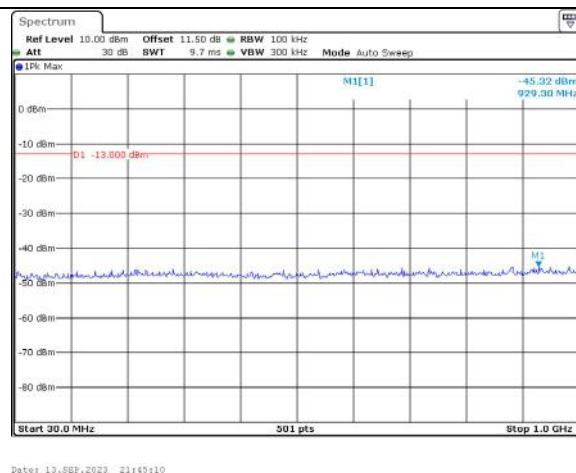


Spurious Emissions at Antenna Terminal

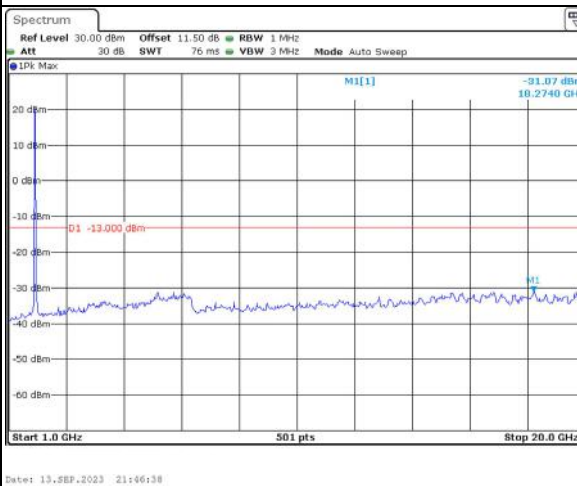
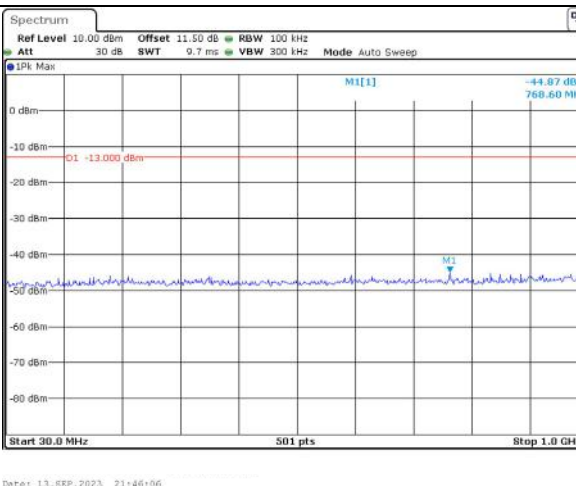
Channel

20MHz Bandwidth QPSK

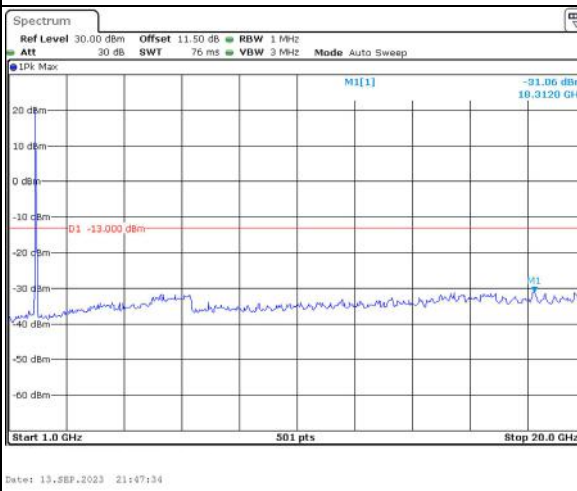
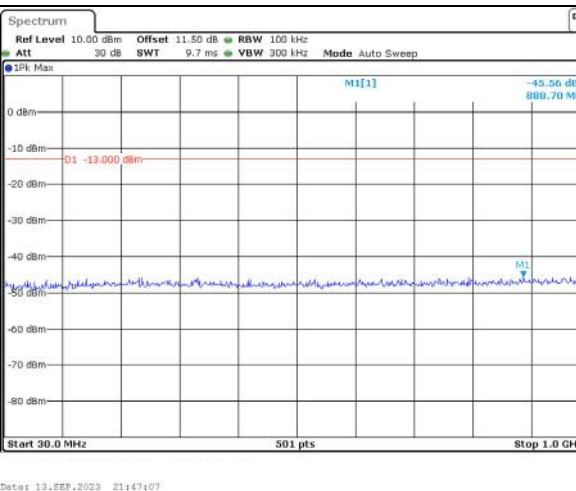
Lowest



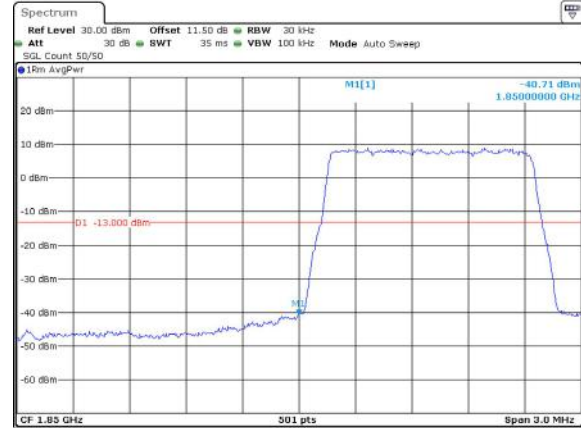
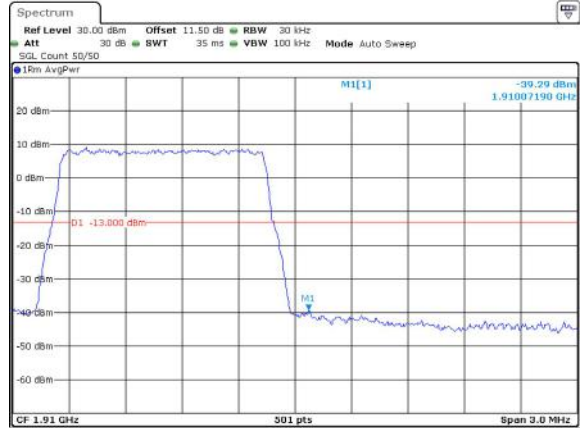
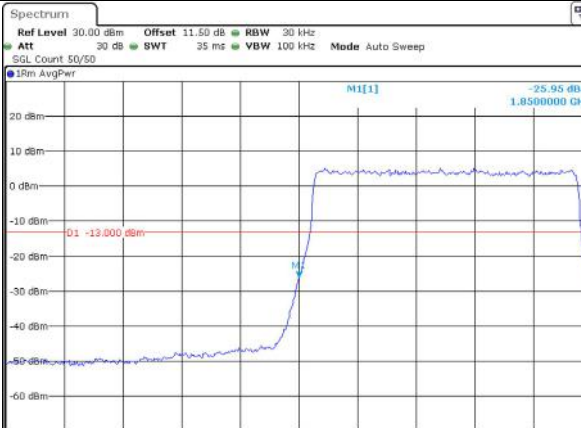
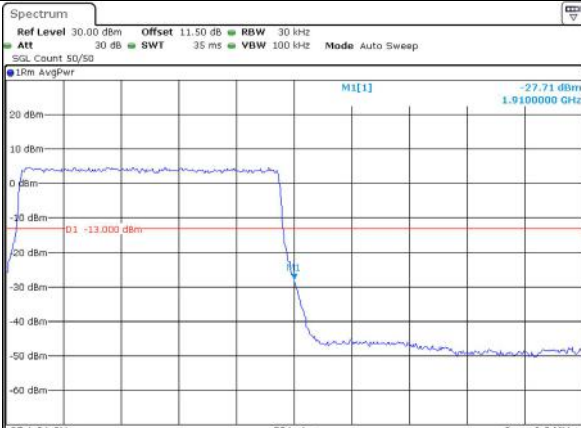
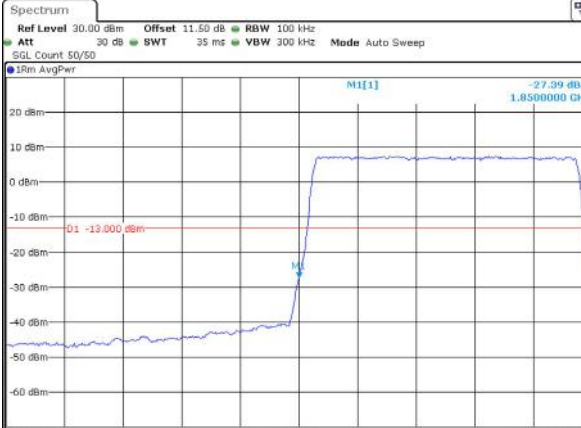
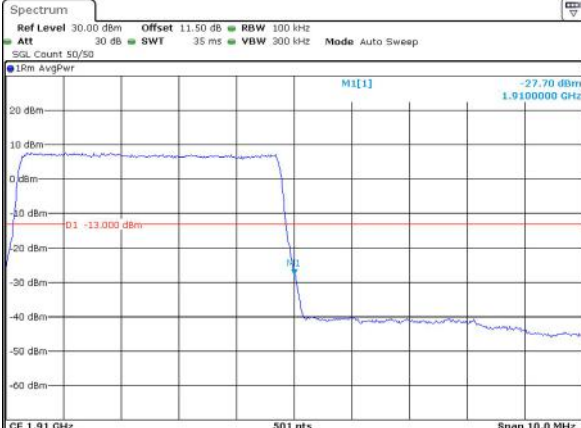
Middle



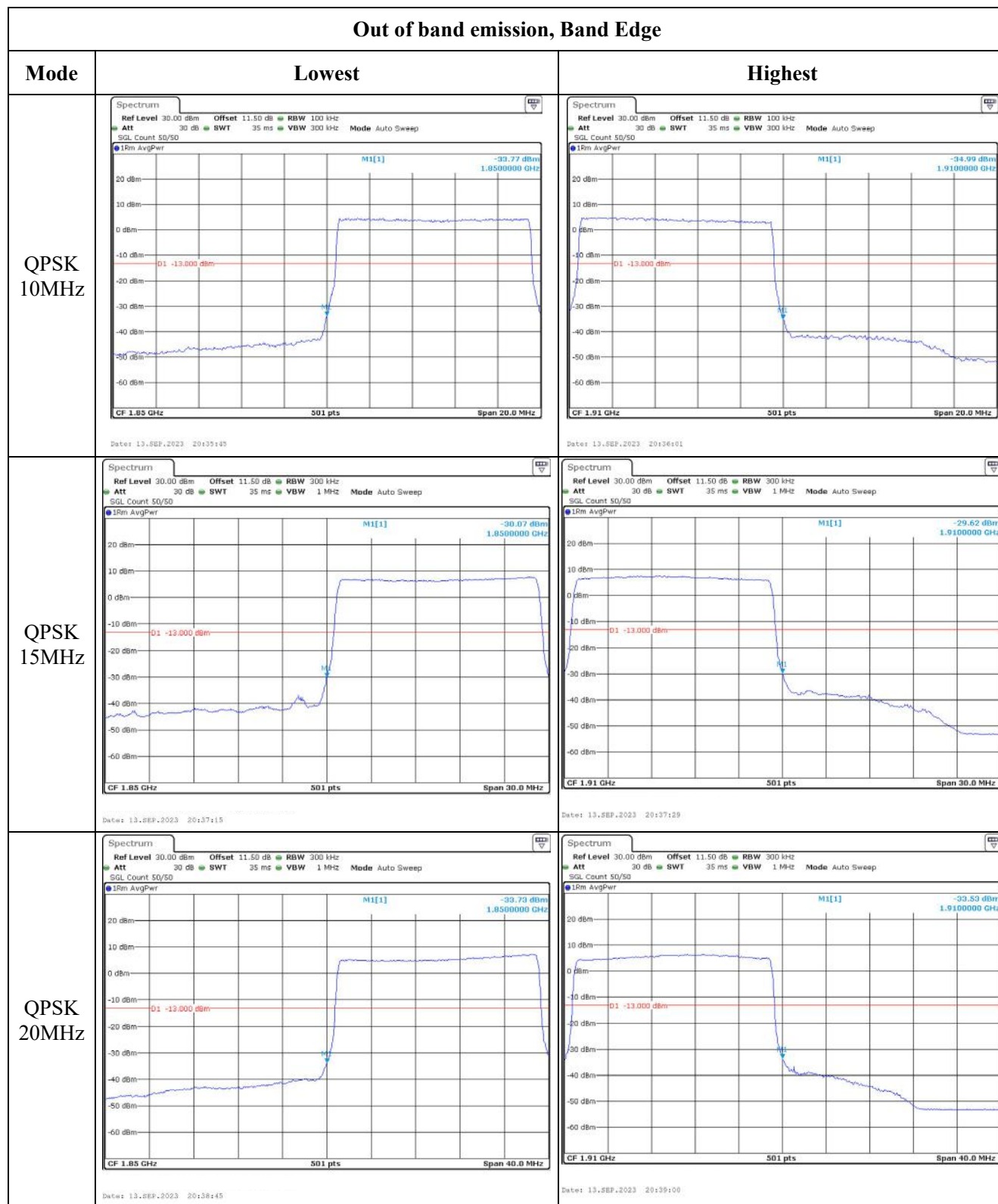
Highest



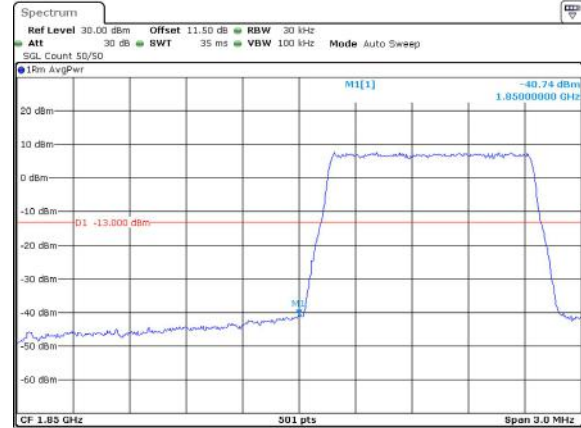
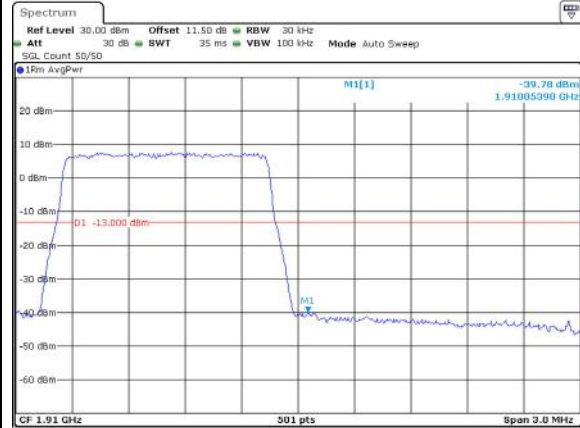
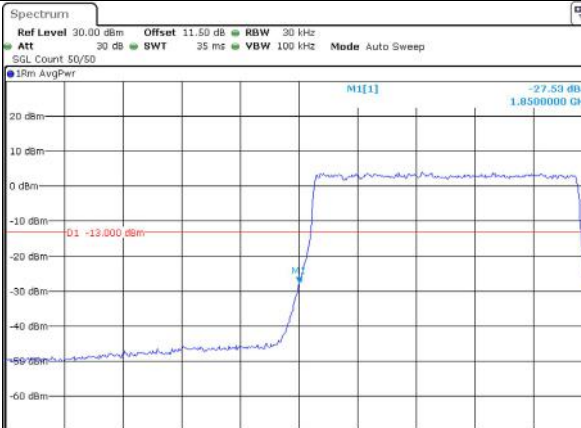
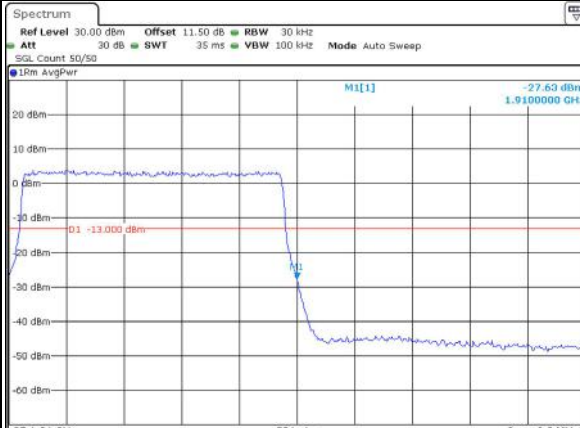
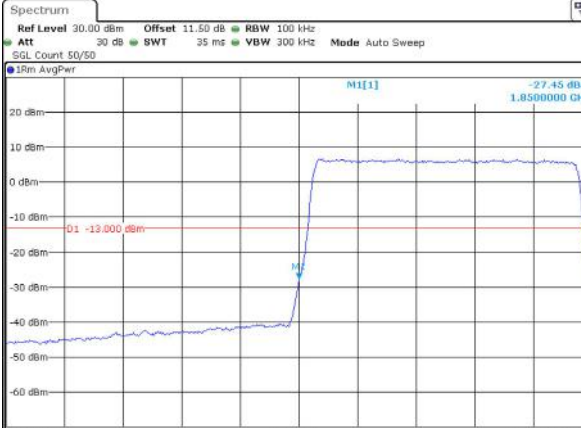
Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -40.71 dBm 1.8500000 GHz CF 1.85 GHz 501 pts Span 6.0 MHz Date: 13. SEP. 2023 20:29:10	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -39.29 dBm 1.91007190 GHz CF 1.91 GHz 501 pts Span 6.0 MHz Date: 13. SEP. 2023 20:29:12
QPSK 3MHz	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -25.95 dBm 1.8500000 GHz CF 1.85 GHz 501 pts Span 6.0 MHz Date: 13. SEP. 2023 20:31:13	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -27.71 dBm 1.9100000 GHz CF 1.91 GHz 501 pts Span 6.0 MHz Date: 13. SEP. 2023 20:31:27
QPSK 5MHz	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -27.39 dBm 1.8500000 GHz CF 1.85 GHz 501 pts Span 10.0 MHz Date: 13. SEP. 2023 20:33:25	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -27.70 dBm 1.9100000 GHz CF 1.91 GHz 501 pts Span 10.0 MHz Date: 13. SEP. 2023 20:33:41

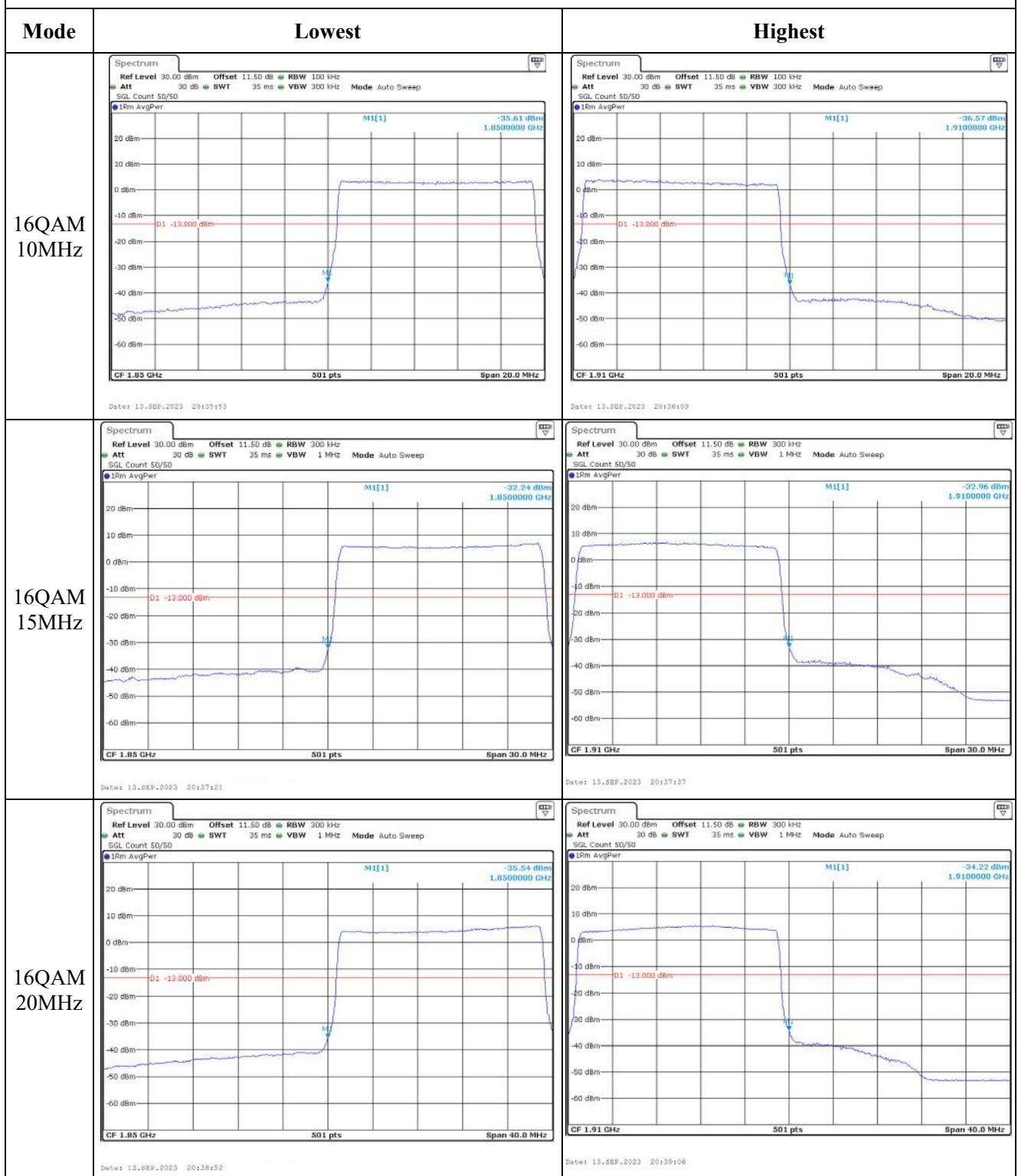
Out of band emission, Band Edge



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz		
16QAM 3MHz		
16QAM 5MHz		

Out of band emission, Band Edge



4.7 Antenna Port Test Data and Results for LTE Band 4

Serial Number:	294A-2	Test Date:	2023/9/13
Test Site:	RF	Test Mode:	Transmitting
Tester:	Ken Tang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.6	Relative Humidity: (%)	57	ATM Pressure: (kPa)	101
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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	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
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	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	22.66	22.31	22.22	21.26	30
	RB1#3	22.65	22.3	22.25		
	RB1#5	22.59	22.28	22.25		
	RB3#0	22.64	22.34	22.18		
	RB3#3	22.59	22.27	22.17		
	RB6#0	21.68	21.38	21.28		
1.4MHz 16QAM	RB1#0	21.82	21.35	21.24	20.52	30
	RB1#3	21.92	21.47	21.29		
	RB1#5	21.79	21.39	21.24		
	RB3#0	21.75	21.34	21.49		
	RB3#3	21.75	21.32	21.48		
	RB6#0	20.31	20.64	20.3		
3MHz QPSK	RB1#0	22.47	22.39	22.27	21.07	30
	RB1#8	22.45	22.43	22.33		
	RB1#14	22.38	22.41	22.3		
	RB6#0	21.51	21.41	21.25		
	RB6#9	21.49	21.39	21.33		
	RB15#0	21.47	21.37	21.21		
3MHz 16QAM	RB1#0	21.47	21.57	21.32	20.18	30
	RB1#8	21.54	21.58	21.44		
	RB1#14	21.45	21.47	21.35		
	RB6#0	20.57	20.46	20.36		
	RB6#9	20.53	20.47	20.46		
	RB15#0	20.51	20.42	20.16		
5MHz QPSK	RB1#0	22.49	22.38	22.31	21.13	30
	RB1#13	22.53	22.4	22.33		
	RB1#24	22.49	22.36	22.32		
	RB15#0	21.49	21.37	21.35		
	RB15#10	21.5	21.37	21.3		
	RB25#0	21.51	21.42	21.36		
5MHz 16QAM	RB1#0	21.98	21.6	21.53	20.64	30
	RB1#13	22.04	21.63	21.59		
	RB1#24	21.93	21.58	21.55		
	RB15#0	20.6	20.33	20.42		
	RB15#10	20.61	20.37	20.42		
	RB25#0	20.48	20.41	20.43		
10MHz QPSK	RB1#0	22.42	22.27	22.3	21.02	30

	RB1#25	22.41	22.35	22.32		
	RB1#49	22.36	22.37	22.26		
	RB25#0	21.38	21.34	21.32		
	RB25#25	21.45	21.43	21.35		
	RB50#0	21.45	21.42	21.26		
10MHz 16QAM	RB1#0	21.42	21.47	21.35	20.17	30
	RB1#25	21.45	21.57	21.38		
	RB1#49	21.38	21.54	21.44		
	RB25#0	20.52	20.37	20.27		
	RB25#25	20.53	20.43	20.28		
	RB50#0	20.42	20.44	20.27		
15MHz QPSK	RB1#0	22.27	22.03	22.13	20.87	30
	RB1#38	22.2	22.17	22.12		
	RB1#74	22.12	22.16	22.14		
	RB36#0	21.37	21.16	21.18		
	RB36#39	21.28	21.25	21.23		
	RB75#0	21.33	21.29	21.22		
15MHz 16QAM	RB1#0	21.53	21.62	21.43	20.28	30
	RB1#38	21.43	21.68	21.38		
	RB1#74	21.38	21.67	21.39		
	RB36#0	20.38	20.16	20.2		
	RB36#39	20.32	20.28	20.28		
	RB75#0	20.35	20.21	20.25		
20MHz QPSK	RB1#0	22.26	22.18	22.14	20.86	30
	RB1#50	22.17	22.19	22.09		
	RB1#99	22.15	22.24	22.14		
	RB50#0	21.23	21.19	21.24		
	RB50#50	21.25	21.29	21.27		
	RB100#0	21.31	21.33	21.2		
20MHz 16QAM	RB1#0	21.54	21.46	21.65	20.30	30
	RB1#50	21.45	21.41	21.63		
	RB1#99	21.39	21.55	21.7		
	RB50#0	20.31	20.17	20.29		
	RB50#50	20.22	20.29	20.28		
	RB100#0	20.36	20.3	20.21		
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	8.10	8.66	6.01	13
	RB100#0	6.68	8.92	6.59	13
20MHz 16QAM	RB1#0	8.32	8.75	9.47	13
	RB100#0	9.96	7.78	7.37	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	1.078	1.096	1.084	1.206	1.212	1.212
1.4MHz 16QAM	1.072	1.078	1.09	1.200	1.212	1.22
3MHz QPSK	2.683	2.695	2.683	2.952	2.940	2.964
3MHz 16QAM	2.683	2.683	2.683	2.976	2.964	2.952
5MHz QPSK	4.511	4.511	4.511	4.980	5.020	5.000
5MHz 16QAM	4.511	4.531	4.511	4.980	5.020	5.020
10MHz QPSK	8.982	8.942	8.982	9.720	9.640	9.720
10MHz 16QAM	8.942	8.982	8.982	9.600	9.720	9.720
15MHz QPSK	13.533	13.473	13.473	14.820	14.640	14.820
15MHz 16QAM	13.533	13.533	13.473	14.700	14.760	14.700
20MHz QPSK	17.964	17.884	17.964	19.440	19.440	19.440
20MHz 16QAM	17.964	17.884	17.884	19.440	19.520	19.440
Note: The test plots please refer to the Plots of Occupied Bandwidth						

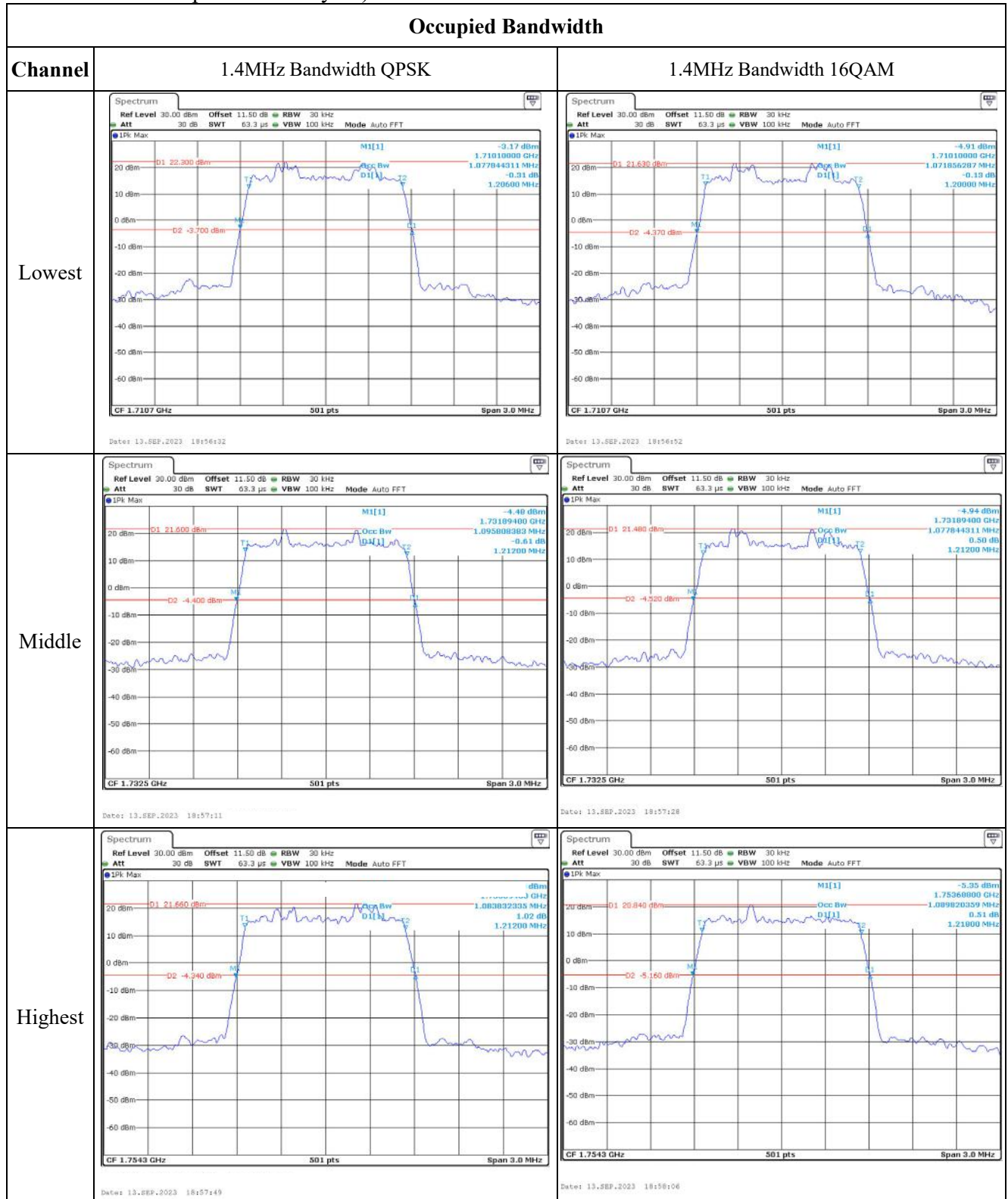
FCC §2.1051, § 27.53:Spurious Emissions at Antenna Terminal	
Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.

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	3.85	1710.019	1710.00	1754.971	1755
	-20	3.85	1710.004	1710.00	1754.987	1755
	-10	3.85	1710.009	1710.00	1754.992	1755
	0	3.85	1710.005	1710.00	1754.995	1755
	10	3.85	1710.008	1710.00	1754.992	1755
	20	3.85	1710.024	1710.00	1754.983	1755
	30	3.85	1710.029	1710.00	1754.988	1755
	40	3.85	1710.005	1710.00	1754.984	1755
	50	3.85	1710.015	1710.00	1754.995	1755
Frequency Stability vs. Voltage	20	3.66	1710.014	1710.00	1754.973	1755
	20	4.24	1710.015	1710.00	1754.993	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	3.85	1710.016	1710.00	1754.989	1755
	-20	3.85	1710.023	1710.00	1754.980	1755
	-10	3.85	1710.030	1710.00	1754.994	1755
	0	3.85	1710.003	1710.00	1754.991	1755
	10	3.85	1710.023	1710.00	1754.993	1755
	20	3.85	1710.014	1710.00	1754.997	1755
	30	3.85	1710.023	1710.00	1754.980	1755
	40	3.85	1710.013	1710.00	1754.992	1755
	50	3.85	1710.030	1710.00	1754.979	1755
Frequency Stability vs. Voltage	20	3.66	1710.028	1710.00	1754.983	1755
	20	4.24	1710.008	1710.00	1754.985	1755
					Result:	Pass

Test Plots(Note: The 11.5 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):



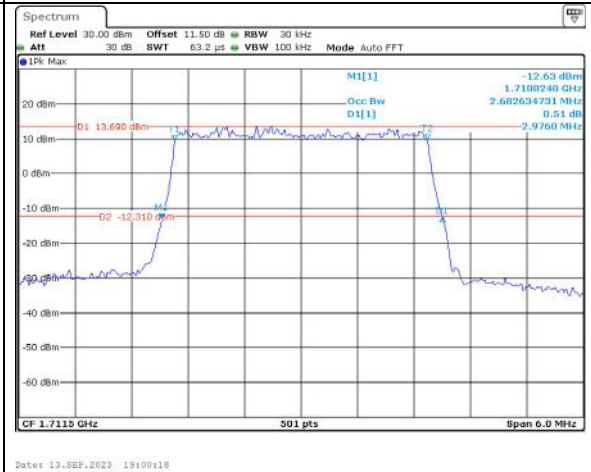
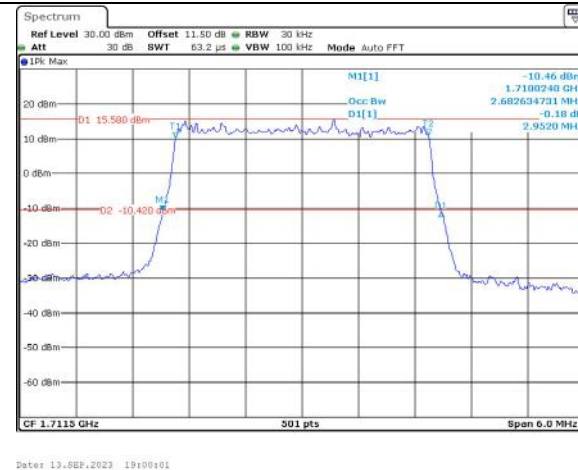
Occupied Bandwidth

Channel

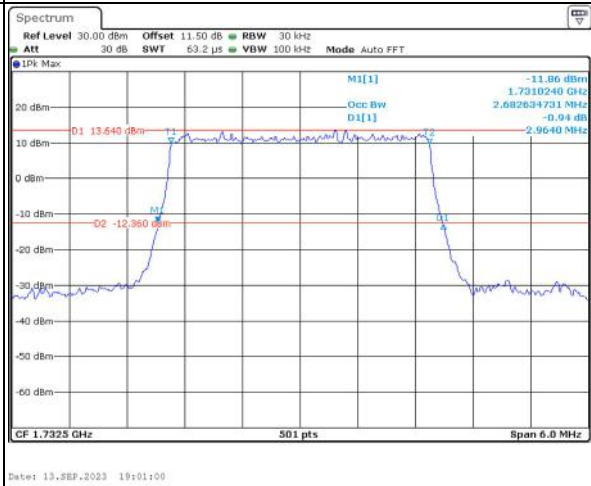
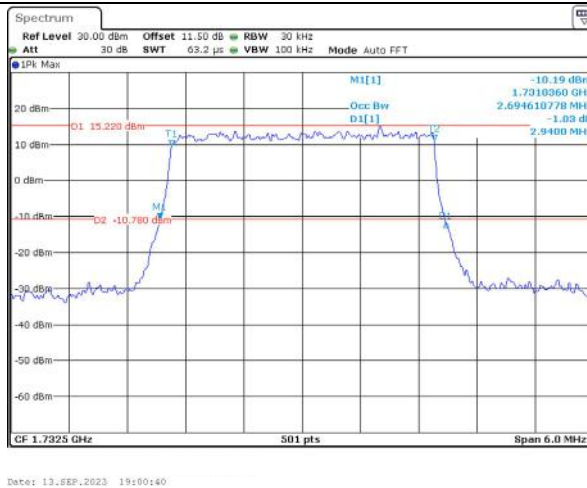
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

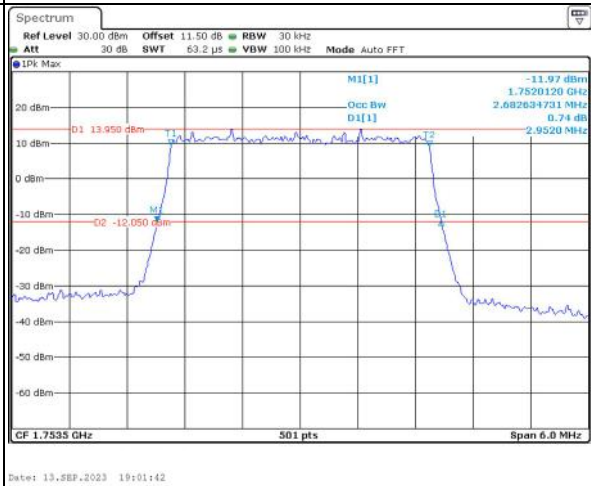
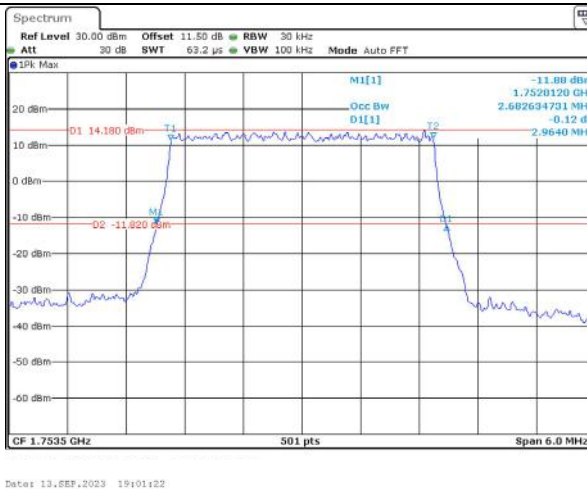
Lowest



Middle



Highest



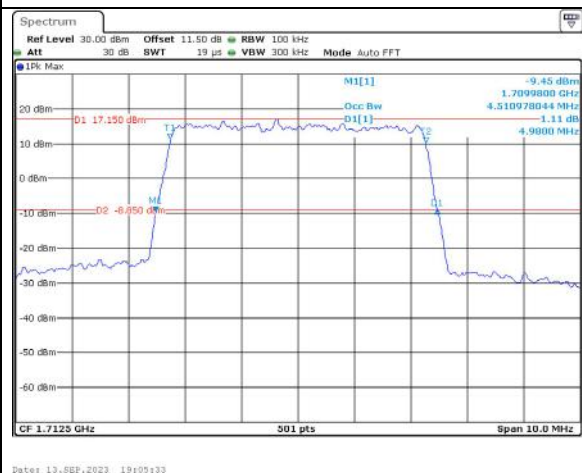
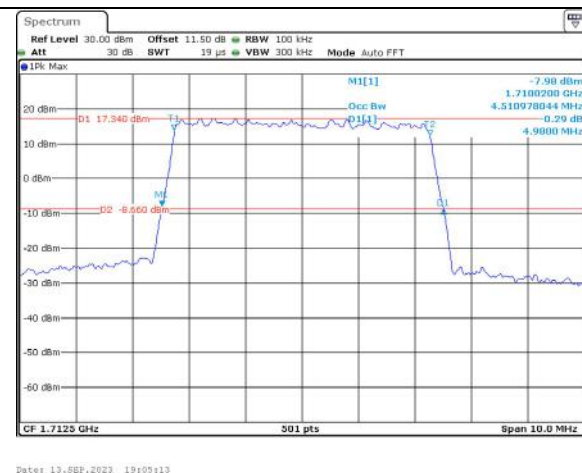
Occupied Bandwidth

Channel

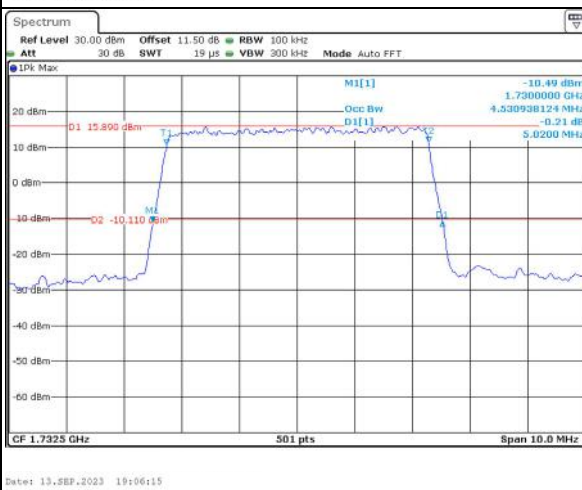
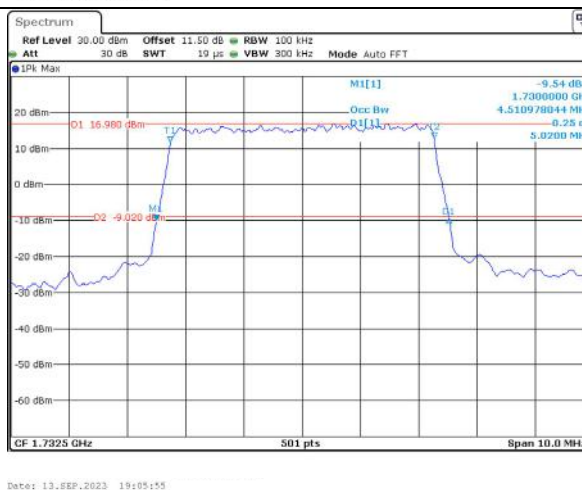
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

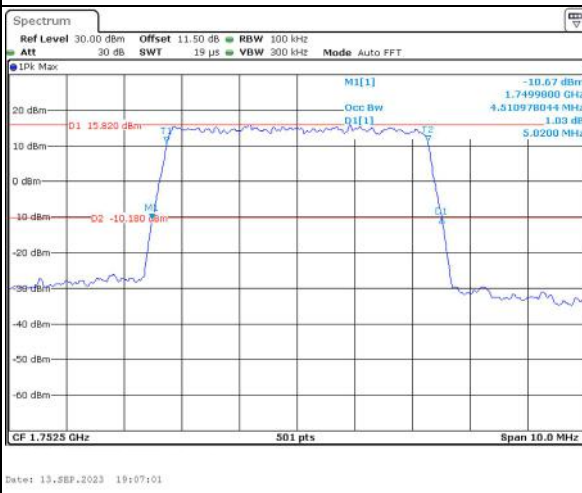
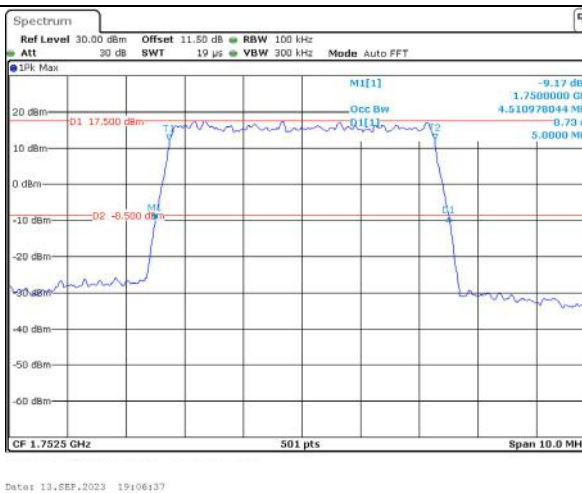
Lowest



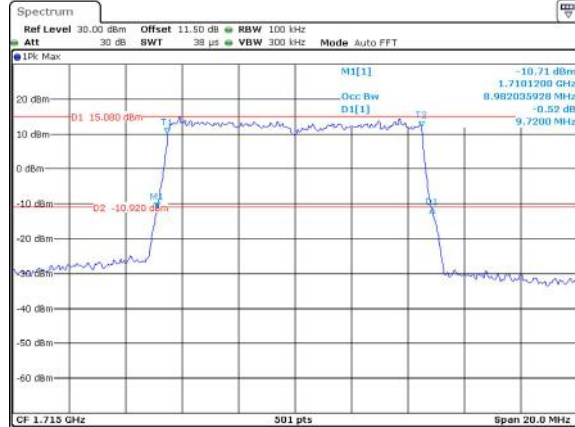
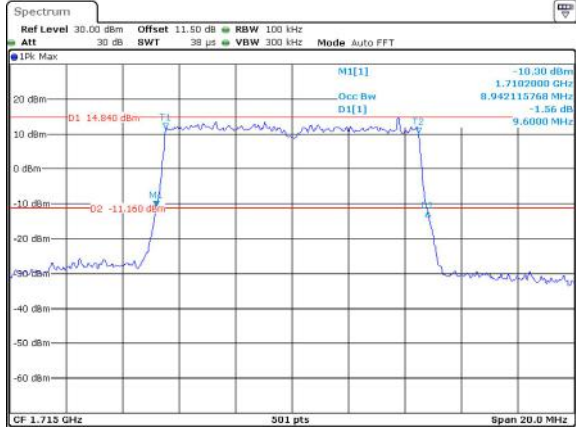
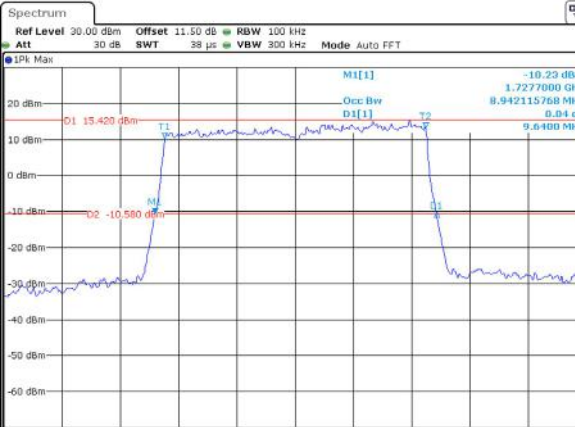
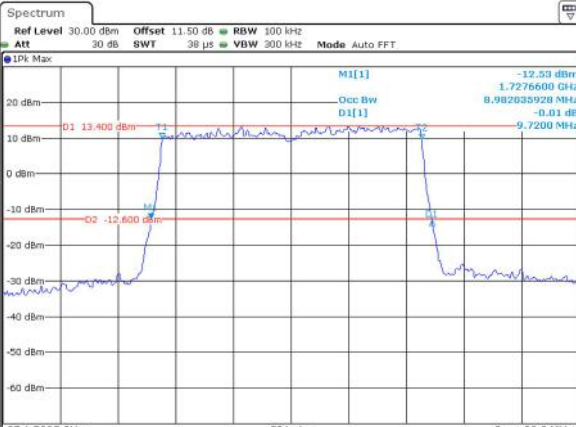
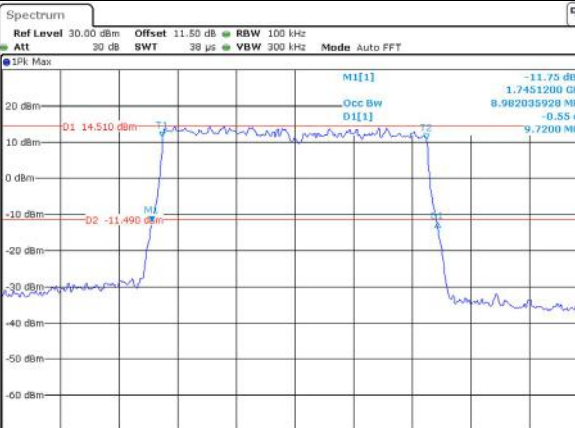
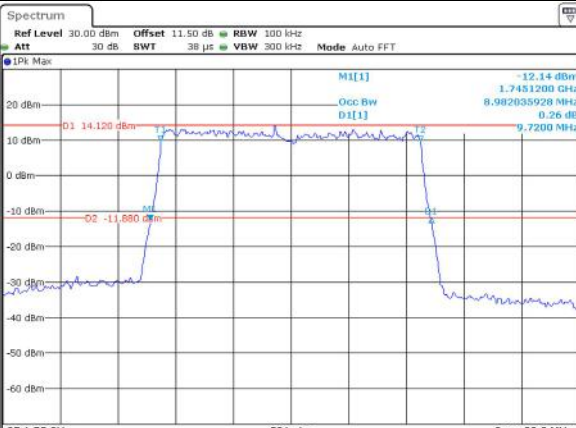
Middle



Highest



Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10K Max M1[1] -10.71 dBm 1.7101200 GHz Occ Bw 8.982035928 MHz D1[1] -0.52 dB 9.7200 MHz D1 15.000 dBm D2 -10.000 dBm CF 1.715 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 19:09:25	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10K Max M1[1] -10.30 dBm 1.7102000 GHz Occ Bw 8.942115768 MHz D1[1] -1.56 dB 9.6000 MHz D1 14.840 dBm D2 -11.160 dBm CF 1.715 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 19:09:49
Middle	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10K Max M1[1] -10.23 dBm 1.7277000 GHz Occ Bw 8.942115768 MHz D1[1] 0.04 dB 9.6400 MHz D1 15.420 dBm D2 -10.580 dBm CF 1.7325 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 19:10:20	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10K Max M1[1] -12.53 dBm 1.7276600 GHz Occ Bw 8.982035928 MHz D1[1] -0.01 dB 9.7200 MHz D1 13.400 dBm D2 -12.600 dBm CF 1.7325 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 19:10:50
Highest	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10K Max M1[1] -11.75 dBm 1.7451200 GHz Occ Bw 8.982035928 MHz D1[1] -0.55 dB 9.7200 MHz D1 14.510 dBm D2 -11.490 dBm CF 1.75 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 19:11:18	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT 10K Max M1[1] -12.14 dBm 1.7451200 GHz Occ Bw 8.982035928 MHz D1[1] 0.26 dB 9.7200 MHz D1 14.120 dBm D2 -11.680 dBm CF 1.75 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 19:11:45

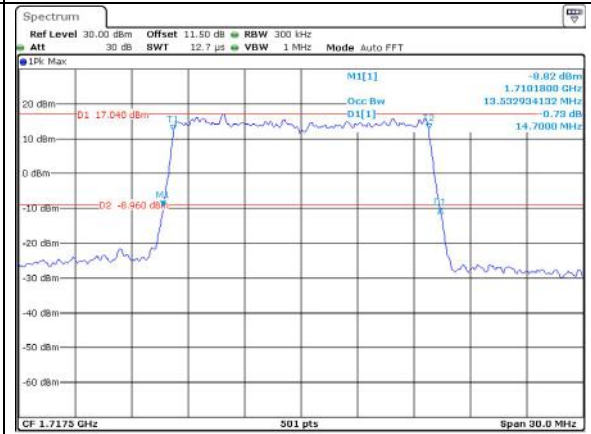
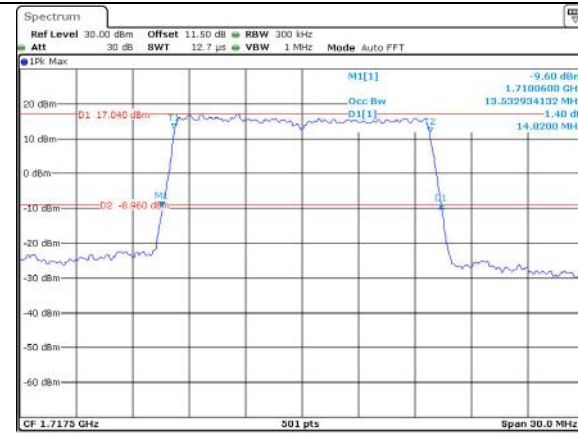
Occupied Bandwidth

Channel

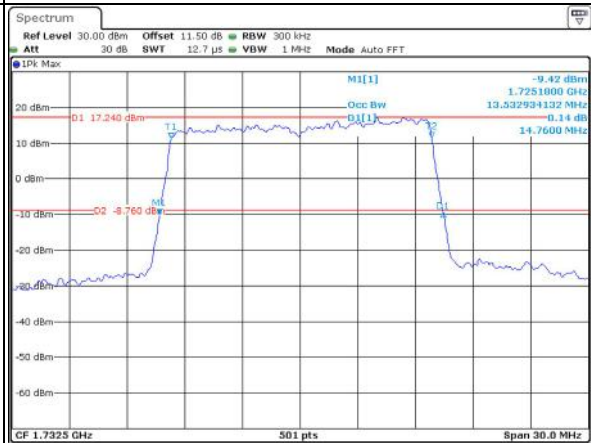
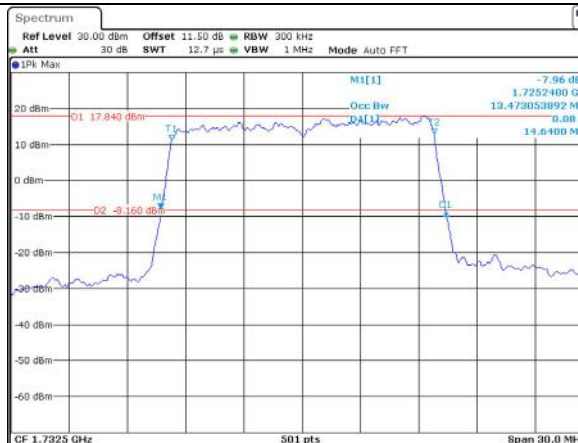
15MHz Bandwidth QPSK

15MHz Bandwidth 16QAM

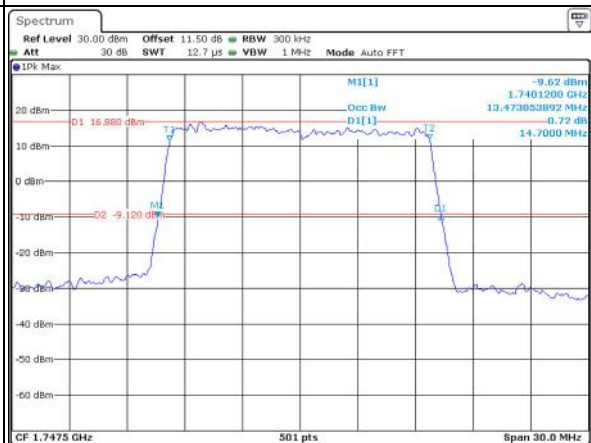
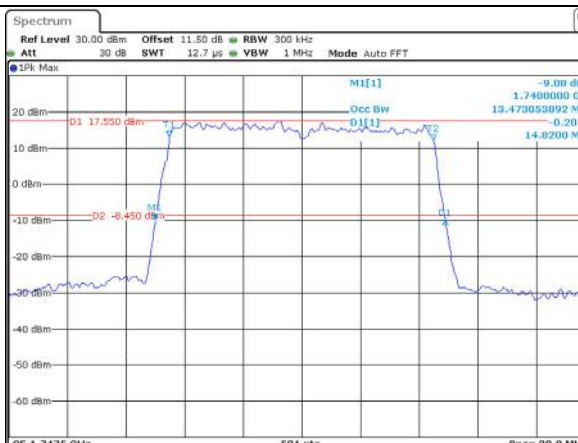
Lowest



Middle



Highest



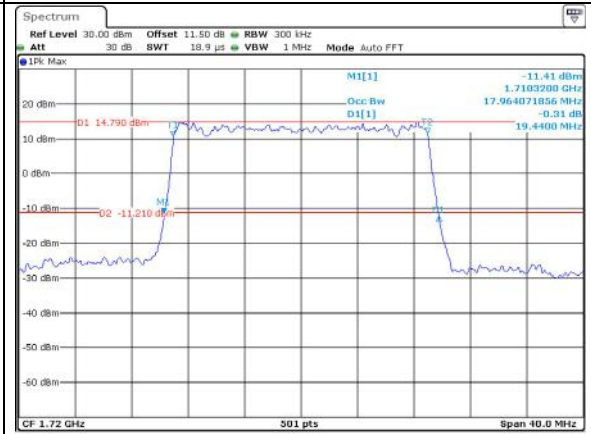
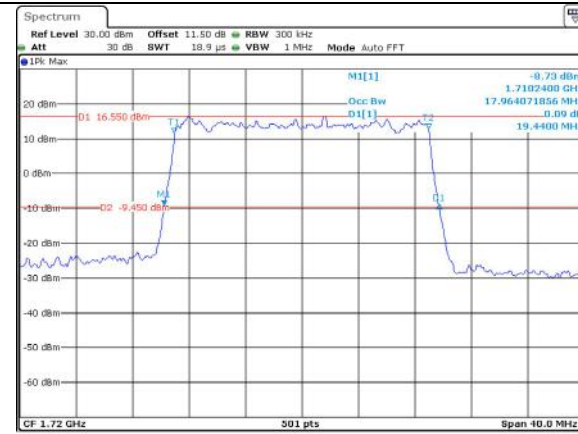
Occupied Bandwidth

Channel

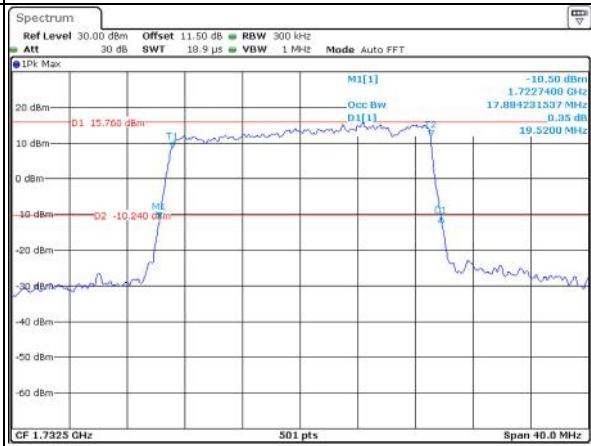
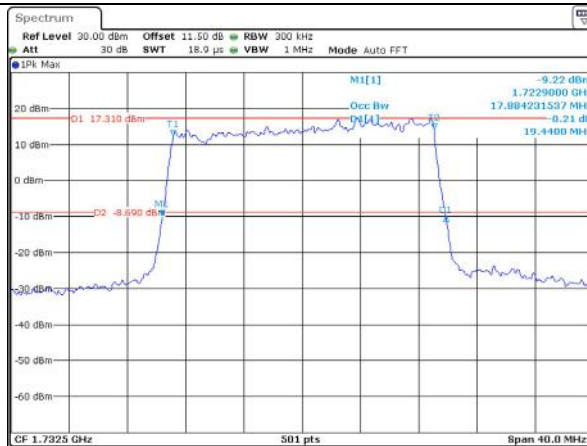
20MHz Bandwidth QPSK

20MHz Bandwidth 16QAM

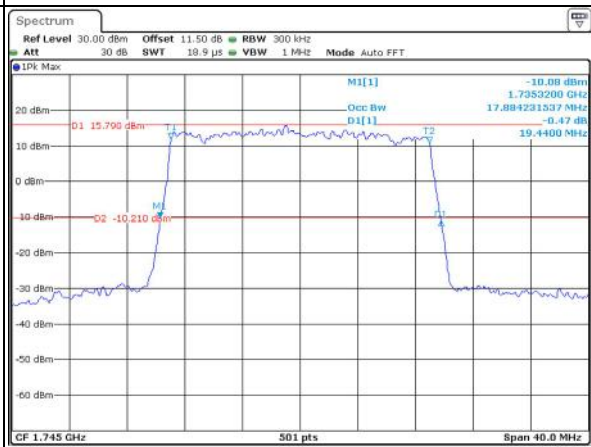
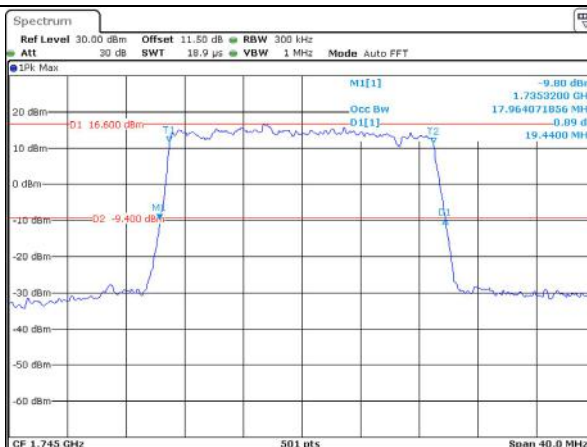
Lowest



Middle



Highest

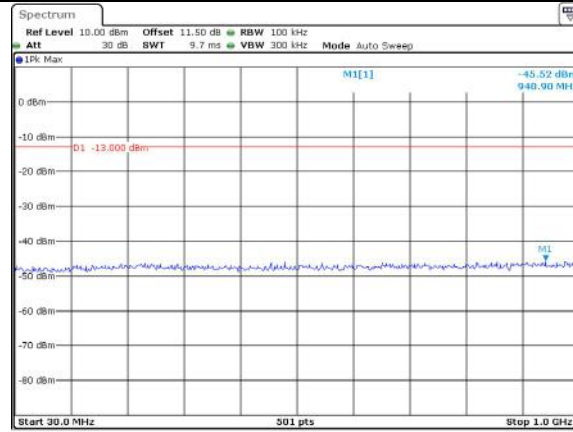


Spurious Emissions at Antenna Terminal

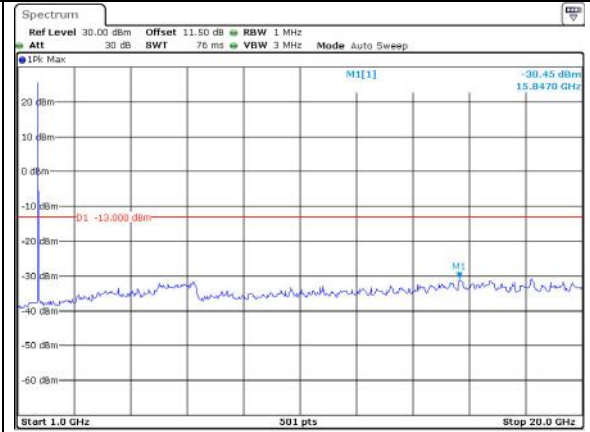
Channel

1.4MHz Bandwidth QPSK

Lowest

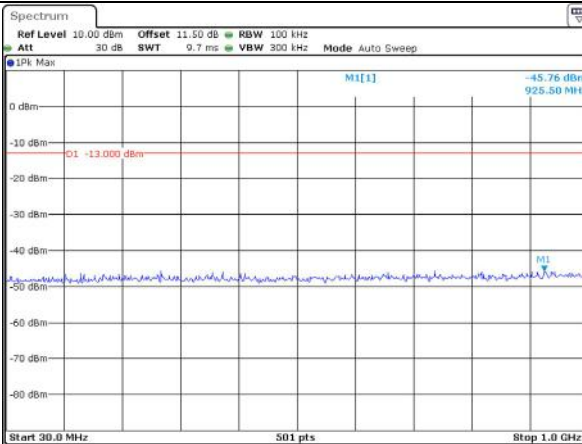


Date: 13,SEP,2023 21:49:16

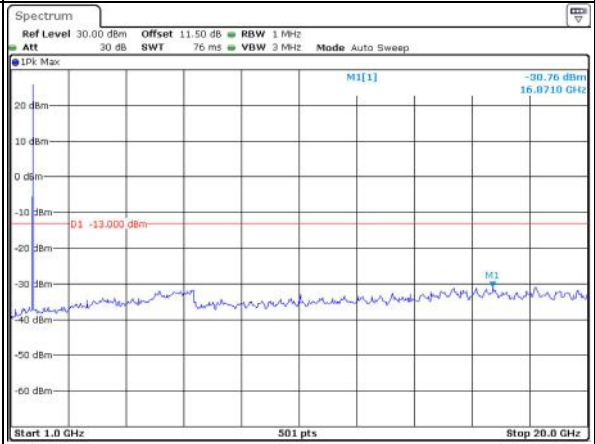


Date: 13,SEP,2023 21:49:39

Middle

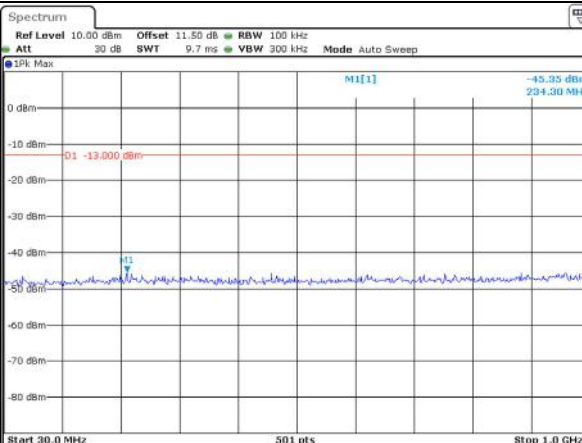


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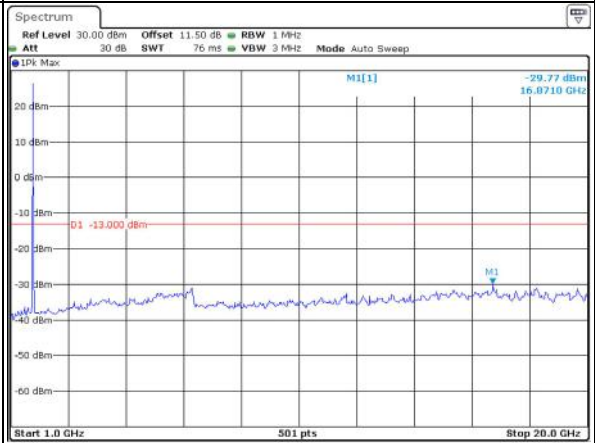


Date: 13,SEP,2023 21:49:31

Highest



Date: 13,SEP,2023 21:49:54



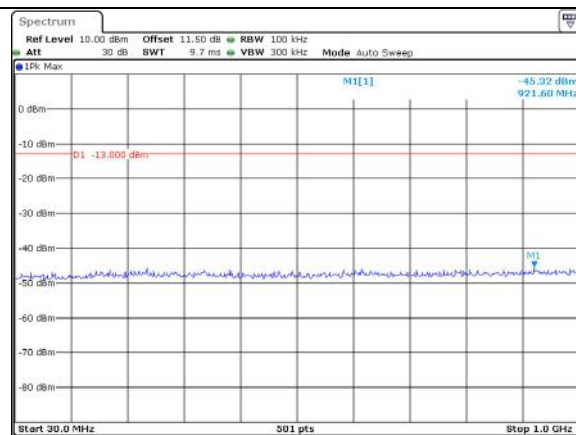
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Spurious Emissions at Antenna Terminal

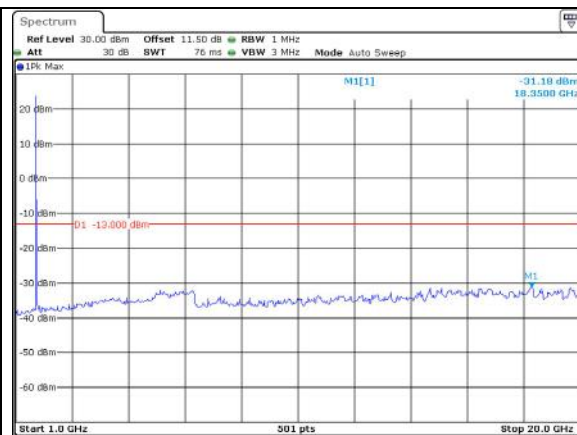
Channel

3MHz Bandwidth QPSK

Lowest

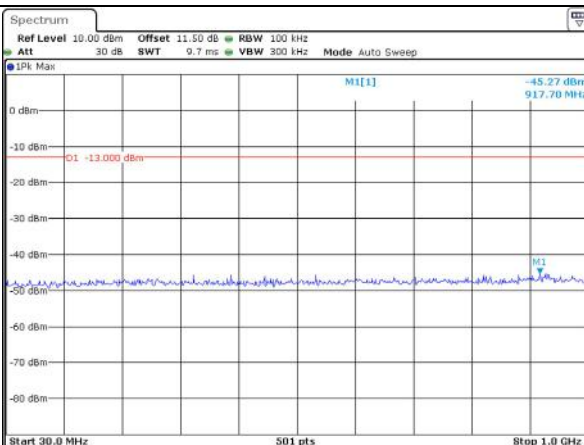


Date: 13.SEP.2023 21:51:42

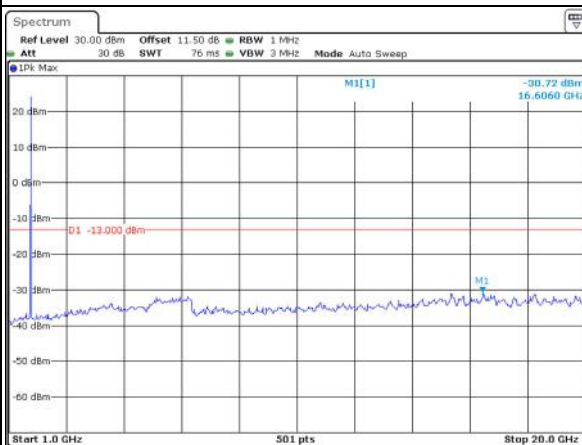


Date: 13.SEP.2023 21:52:05

Middle

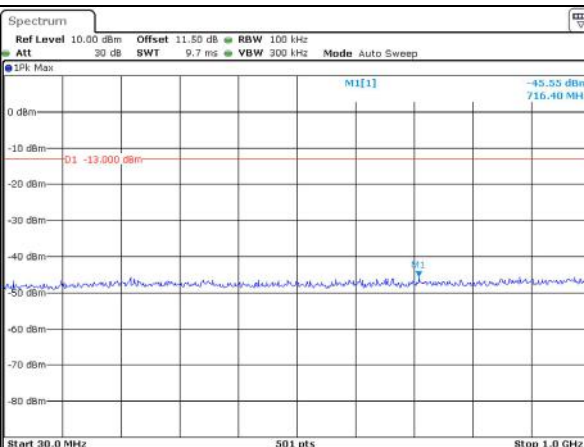


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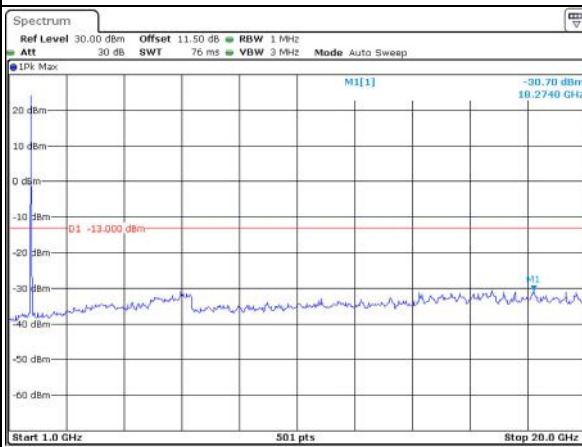


Date: 13.SEP.2023 21:52:50

Highest



Date: 13.SEP.2023 21:53:19



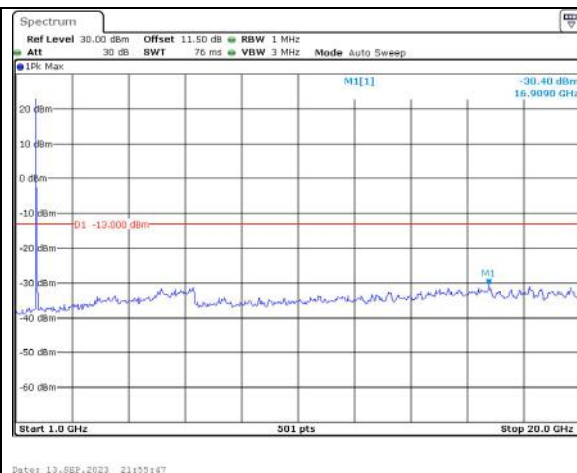
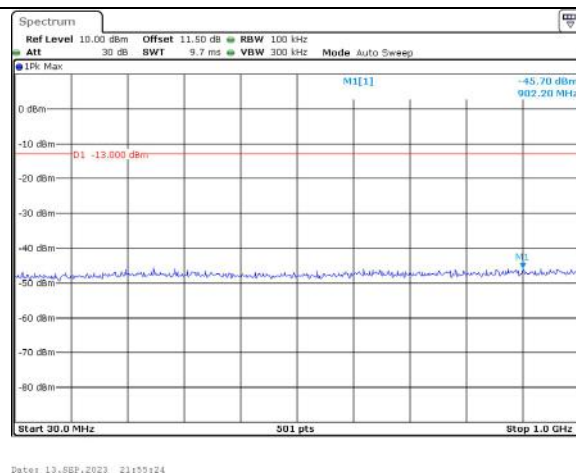
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Spurious Emissions at Antenna Terminal

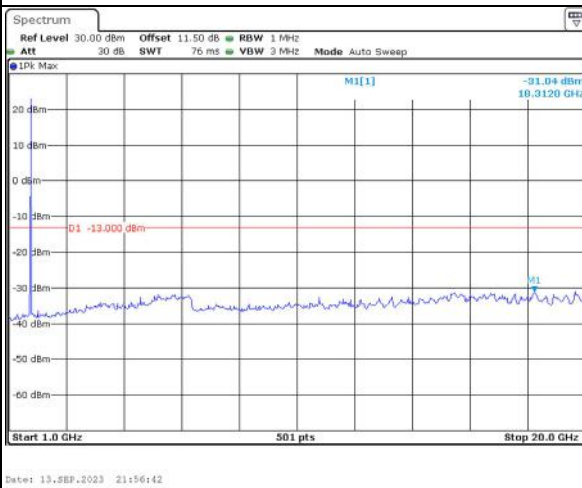
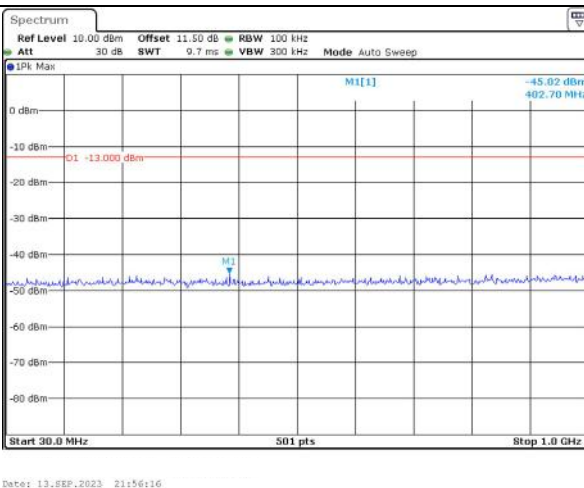
Channel

5MHz Bandwidth QPSK

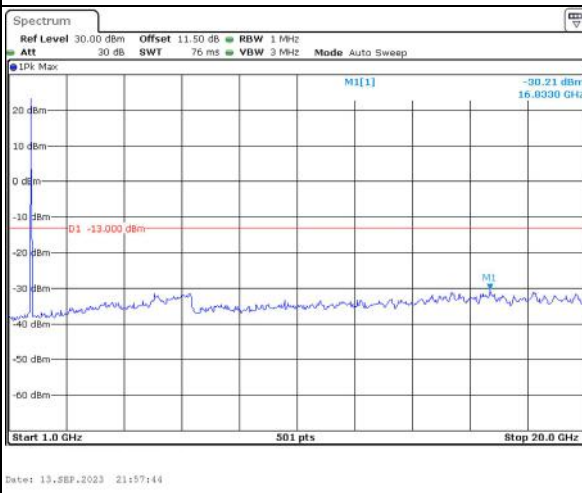
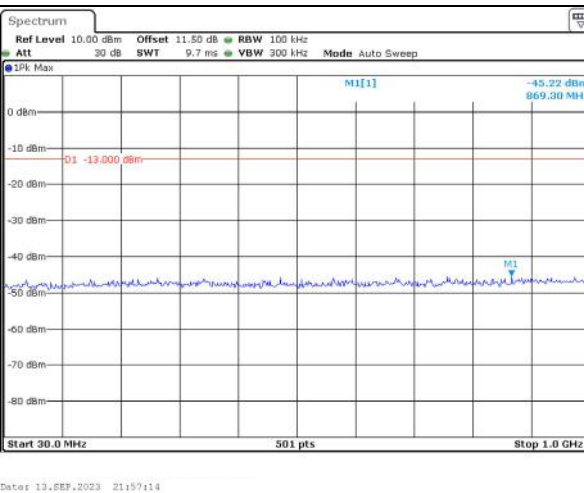
Lowest



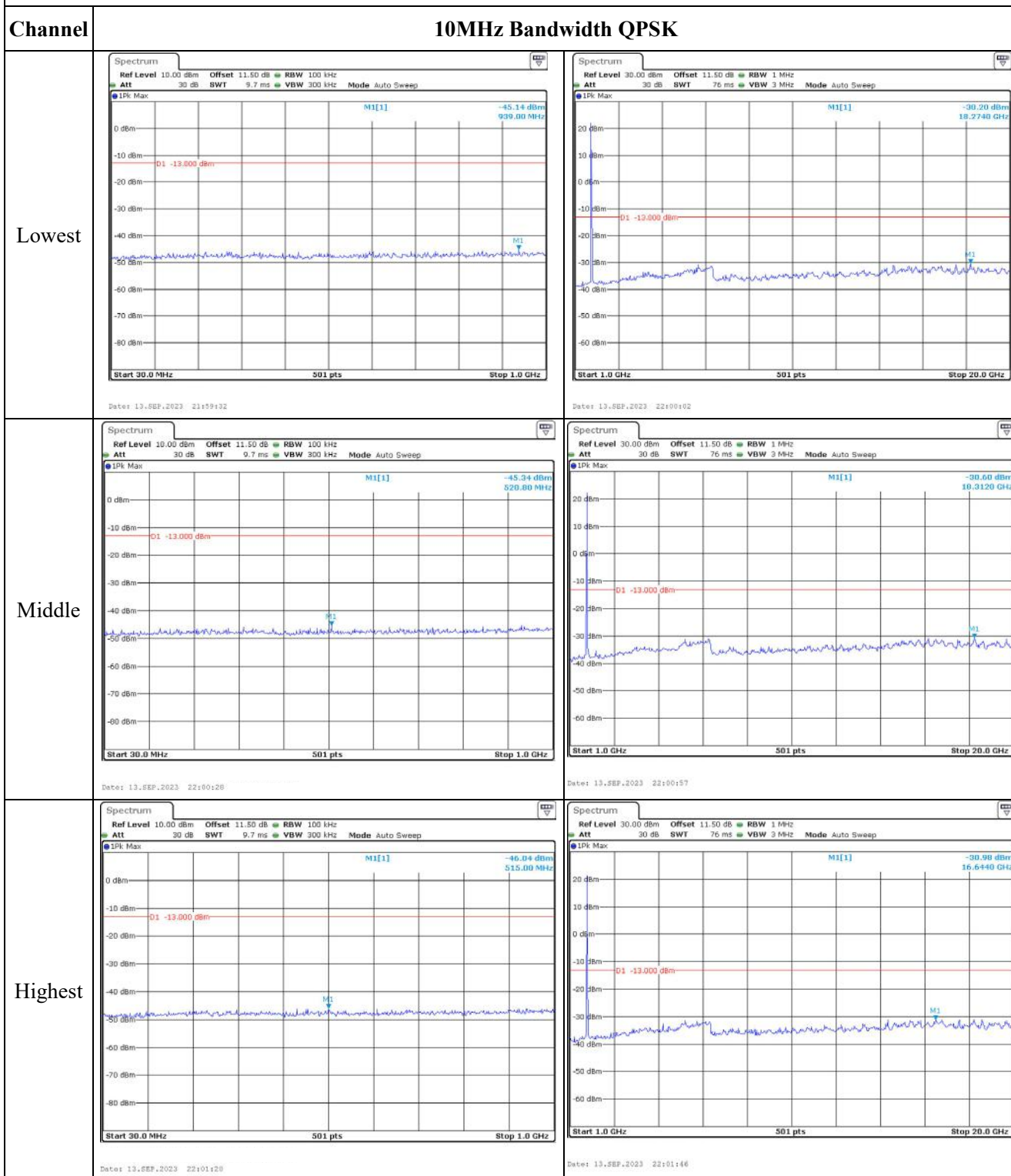
Middle



Highest



Spurious Emissions at Antenna Terminal

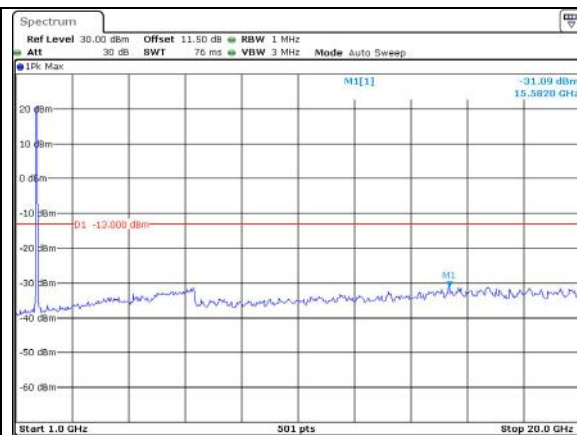
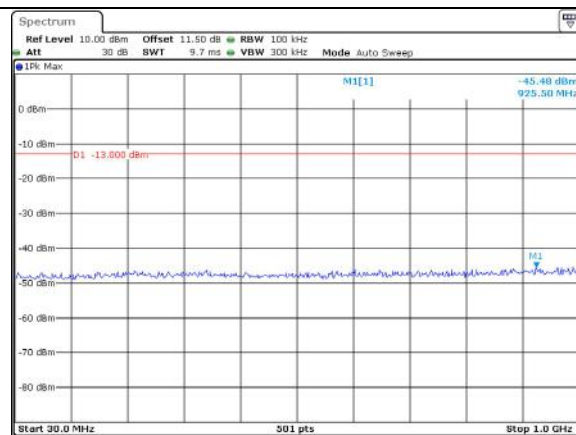


Spurious Emissions at Antenna Terminal

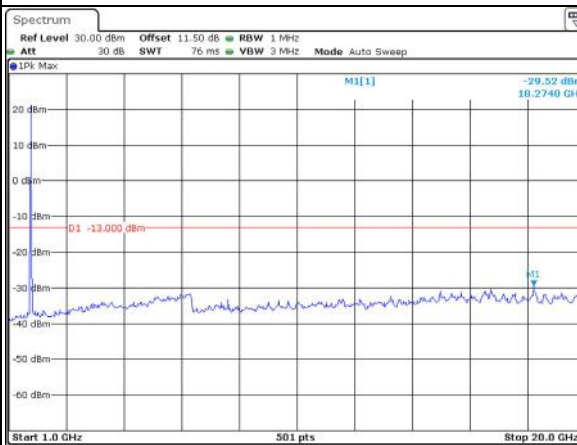
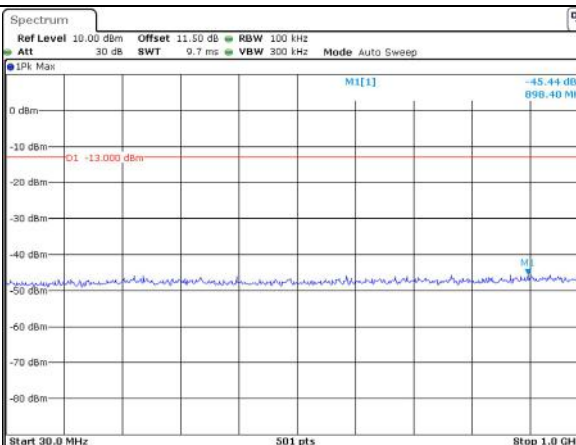
Channel

15MHz Bandwidth QPSK

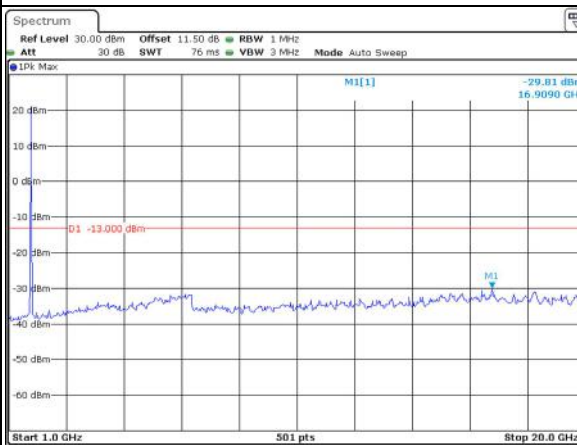
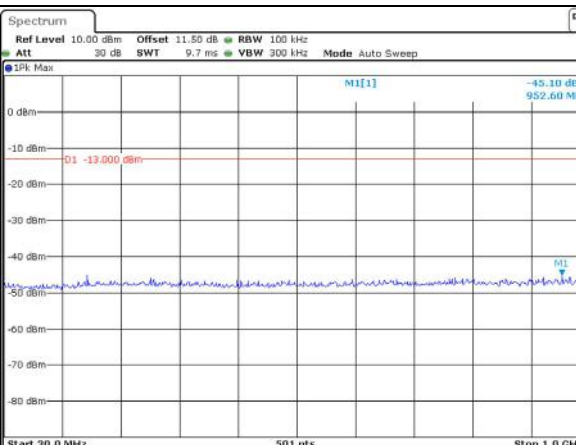
Lowest



Middle



Highest

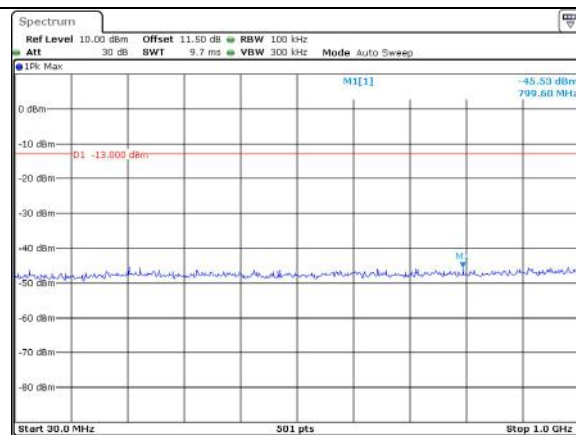


Spurious Emissions at Antenna Terminal

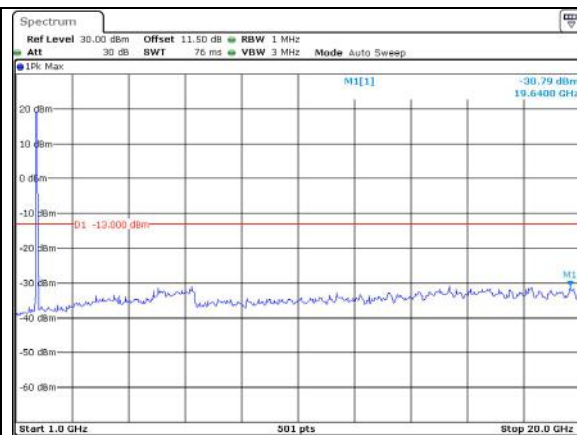
Channel

20MHz Bandwidth QPSK

Lowest

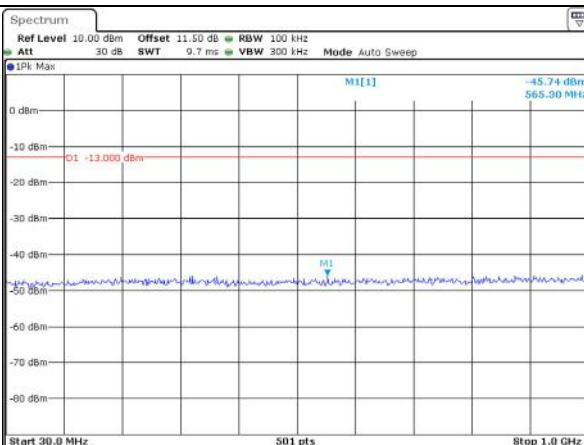


Date: 13.SEP.2023 22:07:14

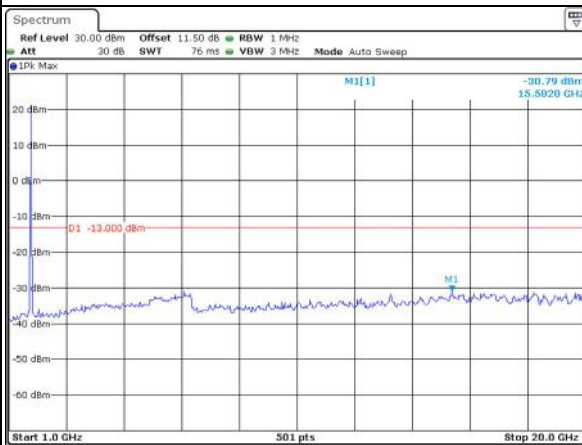


Date: 13.SEP.2023 22:07:40

Middle

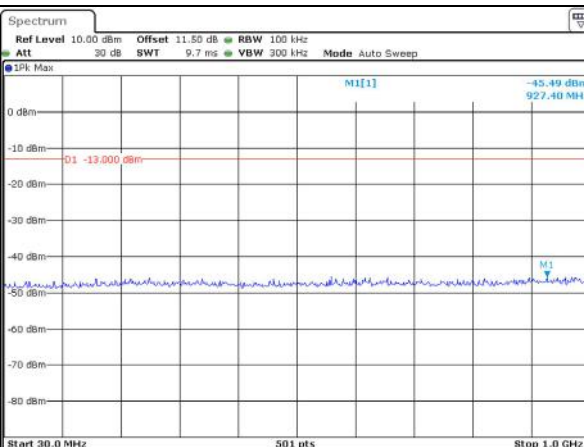


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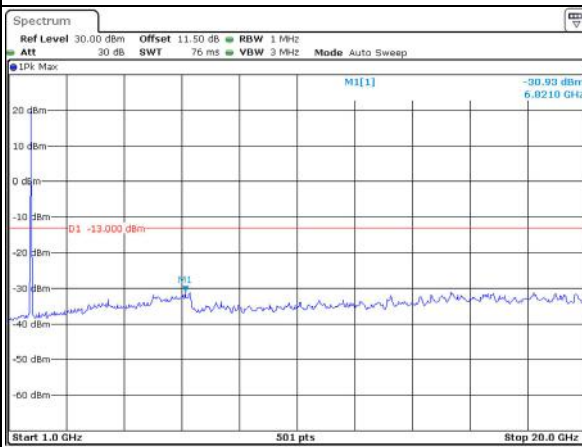


Date: 13.SEP.2023 22:08:38

Highest

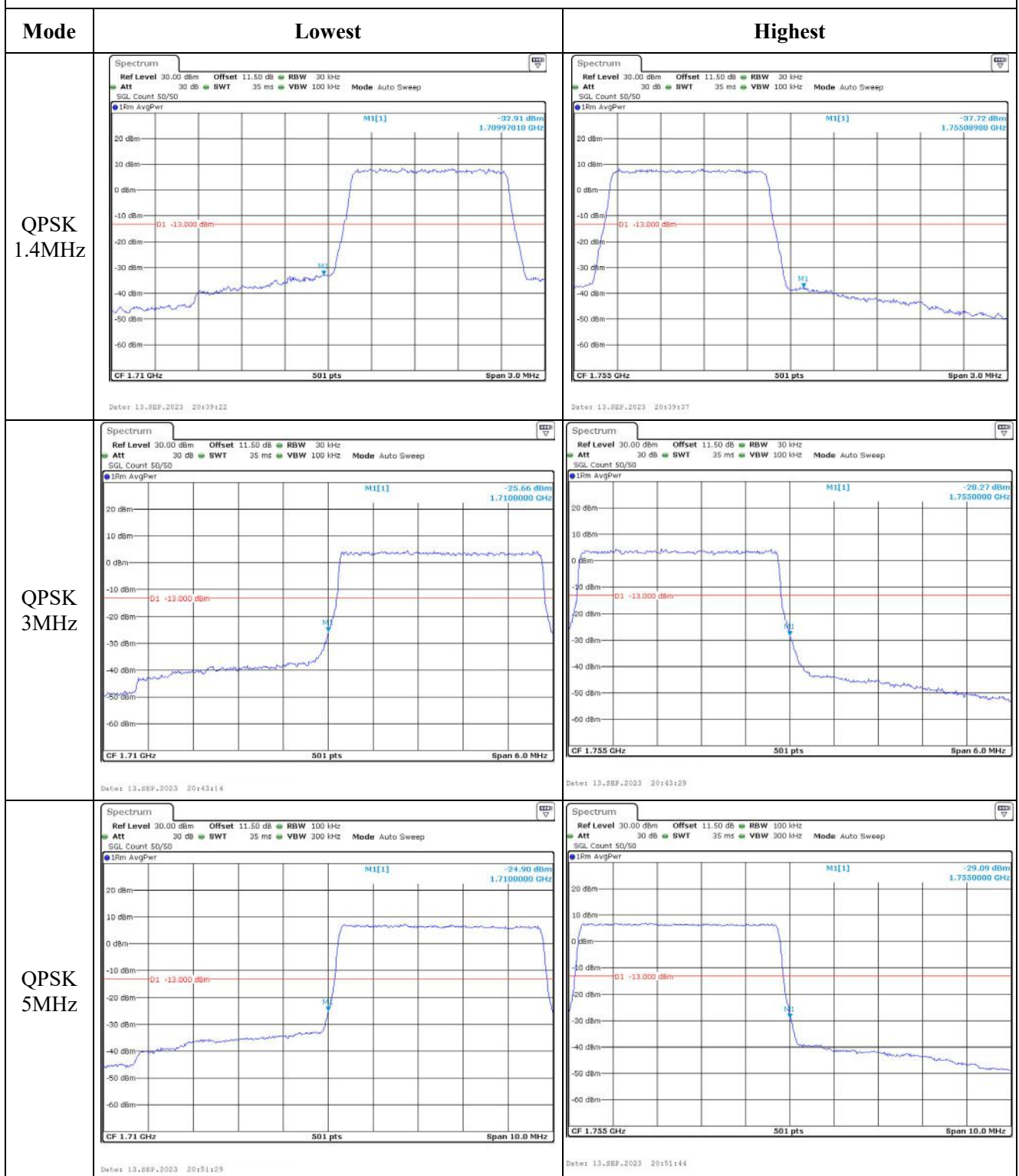


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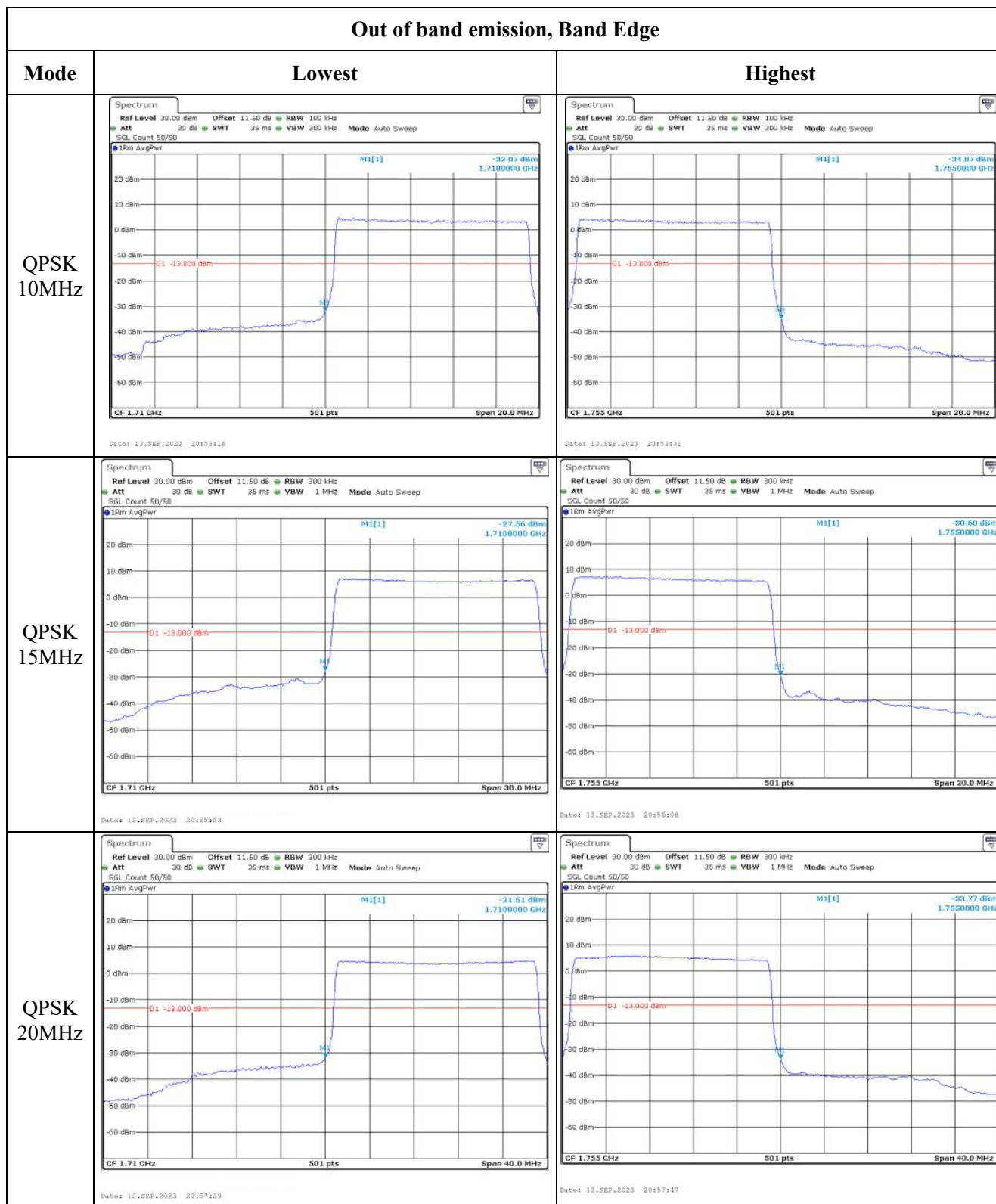


Date: 13.SEP.2023 22:09:42

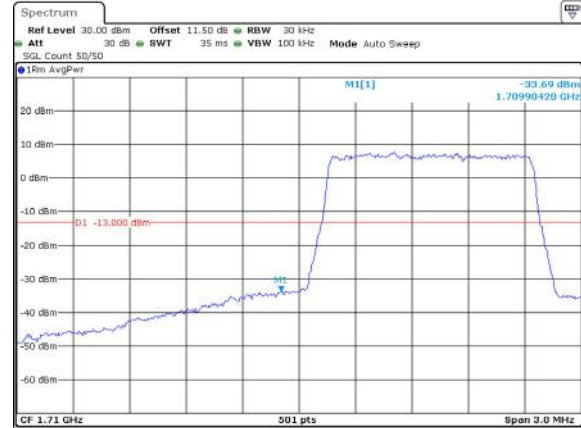
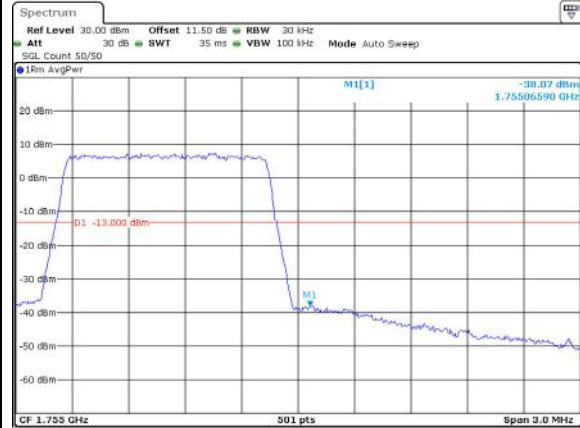
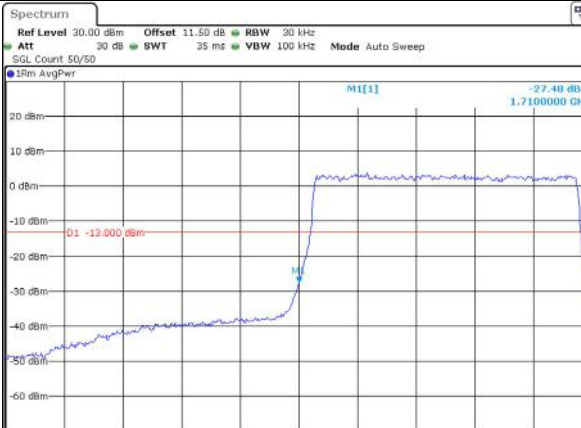
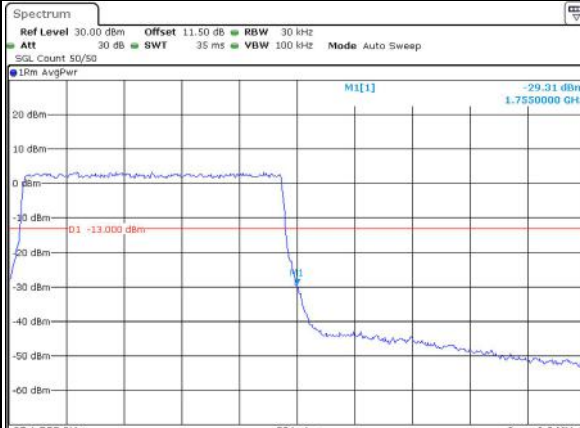
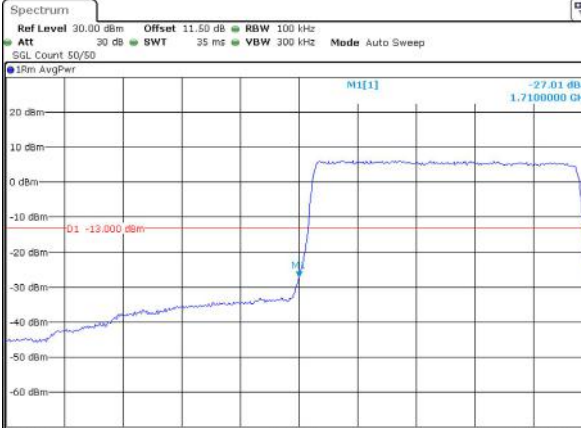
Out of band emission, Band Edge



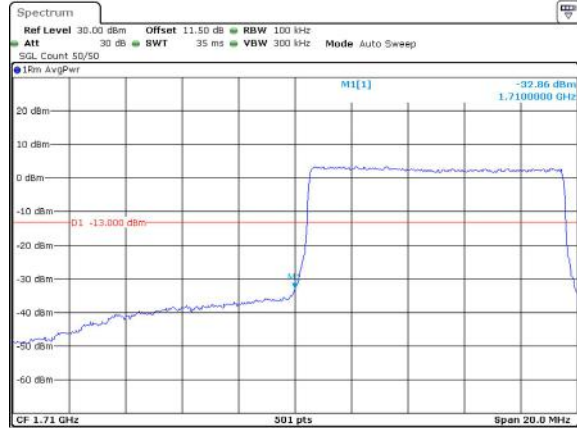
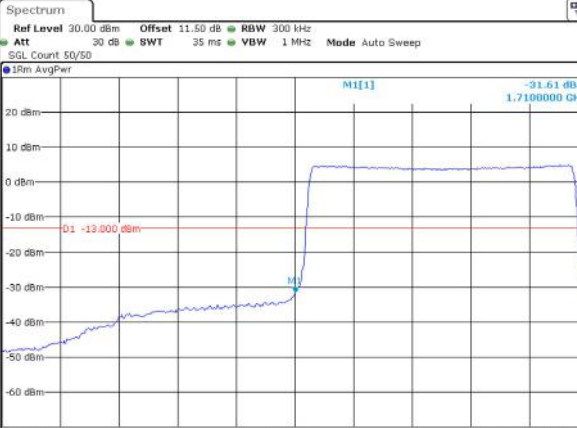
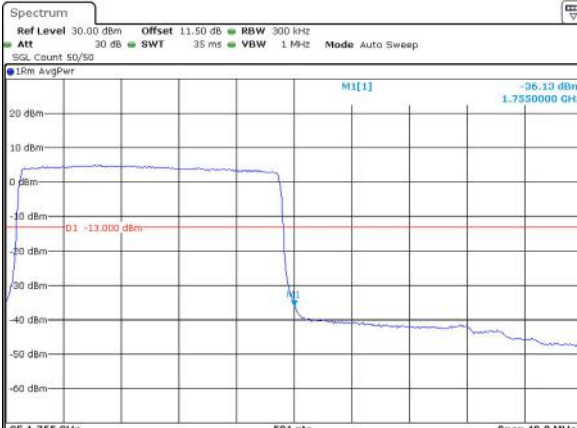
Out of band emission, Band Edge



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -33.69 dBm 1.70990420 GHz CF 1.71 GHz 501 pts Span 3.0 MHz Date: 13.SEP.2023 20:39:29	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -38.07 dBm 1.75506590 GHz CF 1.755 GHz 501 pts Span 3.0 MHz Date: 13.SEP.2023 20:39:44
16QAM 3MHz	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -27.40 dBm 1.71000000 GHz CF 1.71 GHz 501 pts Span 6.0 MHz Date: 13.SEP.2023 20:43:21	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -29.31 dBm 1.75500000 GHz CF 1.755 GHz 501 pts Span 6.0 MHz Date: 13.SEP.2023 20:43:36
16QAM 5MHz	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -27.01 dBm 1.71000000 GHz CF 1.71 GHz 501 pts Span 10.0 MHz Date: 13.SEP.2023 20:51:36	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -27.01 dBm 1.75500000 GHz CF 1.755 GHz 501 pts Span 10.0 MHz Date: 13.SEP.2023 20:51:51

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 10MHz	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -32.86 dBm 1.7100000 GHz CF 1.71 GHz 501 pts Span 20.0 MHz Date: 13. SEP. 2023 20:53:23	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -35.92 dBm 1.7550000 GHz CF 1.755 GHz 501 pts Span 20.0 MHz Date: 13. SEP. 2023 20:53:30
16QAM 15MHz	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 35 ms VBW 1 MHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -31.03 dBm 1.7100000 GHz CF 1.71 GHz 501 pts Span 30.0 MHz Date: 13. SEP. 2023 20:56:00	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 35 ms VBW 1 MHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -33.15 dBm 1.7550000 GHz CF 1.755 GHz 501 pts Span 30.0 MHz Date: 13. SEP. 2023 20:56:15
16QAM 20MHz	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 35 ms VBW 1 MHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -31.61 dBm 1.7100000 GHz CF 1.71 GHz 501 pts Span 40.0 MHz Date: 13. SEP. 2023 20:57:39	 Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 35 ms VBW 1 MHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPer M1[1] -36.19 dBm 1.7550000 GHz CF 1.755 GHz 501 pts Span 40.0 MHz Date: 13. SEP. 2023 20:57:53

4.8 Antenna Port Test Data and Results for LTE Band 5

Serial Number:	294A-2	Test Date:	2023/9/13-2023/9/14
Test Site:	RF	Test Mode:	Transmitting
Tester:	Ken Tang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.6~26.7	Relative Humidity: (%)	53~57	ATM Pressure: (kPa)	100.6~101
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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	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
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	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	23.82	23.75	23.71	18.14	38.45
	RB1#3	23.85	24.09	23.76		
	RB1#5	23.86	23.81	23.67		
	RB3#0	23.78	23.77	23.73		
	RB3#3	23.84	23.76	23.67		
	RB6#0	22.85	22.87	22.71		
1.4MHz 16QAM	RB1#0	22.96	22.87	22.84	17.18	38.45
	RB1#3	22.96	23.13	23.04		
	RB1#5	22.99	22.85	22.96		
	RB3#0	22.93	22.95	22.74		
	RB3#3	22.94	23.04	22.71		
	RB6#0	21.93	21.91	21.85		
3MHz QPSK	RB1#0	23.96	23.92	23.80	18.02	38.45
	RB1#8	23.97	23.91	23.80		
	RB1#14	23.93	23.88	23.75		
	RB6#0	22.90	22.86	22.80		
	RB6#9	22.92	22.92	22.87		
	RB15#0	22.98	22.88	22.71		
3MHz 16QAM	RB1#0	23.09	22.96	23.49	17.62	38.45
	RB1#8	23.14	22.90	23.57		
	RB1#14	23.03	22.93	23.38		
	RB6#0	21.94	21.77	21.90		
	RB6#9	22.04	21.94	21.99		
	RB15#0	21.88	21.97	21.84		
5MHz QPSK	RB1#0	23.99	23.94	23.82	18.04	38.45
	RB1#13	23.97	23.90	23.89		
	RB1#24	23.99	23.88	23.79		
	RB15#0	23.02	22.90	22.80		
	RB15#10	22.97	22.99	22.88		
	RB25#0	22.96	22.94	22.83		
5MHz 16QAM	RB1#0	23.16	22.90	23.11	17.22	38.45
	RB1#13	23.13	23.03	23.17		
	RB1#24	23.17	22.92	23.12		
	RB15#0	22.06	21.94	21.81		
	RB15#10	22.02	22.00	21.87		
	RB25#0	22.03	22.03	21.82		
10MHz QPSK	RB1#0	23.92	23.90	23.86	17.97	38.45

	RB1#25	23.87	23.86	23.81		
	RB1#49	23.86	23.84	23.76		
	RB25#0	22.96	22.92	22.90		
	RB25#25	22.95	22.96	22.88		
	RB50#0	23.03	22.92	22.90		
	RB1#0	22.90	23.66	23.09		
10MHz 16QAM	RB1#25	22.97	23.59	22.97	17.71	38.45
	RB1#49	22.93	23.52	22.98		
	RB25#0	22.01	21.96	21.92		
	RB25#25	22.04	22.01	21.92		
	RB50#0	22.02	21.89	21.93		

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	6.21	8.40	7.20	13
	RB50#0	7.03	9.12	9.93	13
10MHz 16QAM	RB1#0	9.52	6.92	6.85	13
	RB50#0	9.72	6.15	8.52	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	1.212	1.248	1.22	1.212	1.248	1.22
1.4MHz 16QAM	1.22	1.224	1.21	1.22	1.224	1.21
3MHz QPSK	2.952	2.976	2.952	2.952	2.976	2.952
3MHz 16QAM	2.964	2.940	2.964	2.964	2.940	2.964
5MHz QPSK	5.000	4.960	5.020	5.000	4.960	5.020
5MHz 16QAM	5.000	5.060	4.980	5.000	5.060	4.980
10MHz QPSK	9.640	9.680	9.720	9.640	9.680	9.720
10MHz 16QAM	9.640	9.720	9.640	9.640	9.720	9.640

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

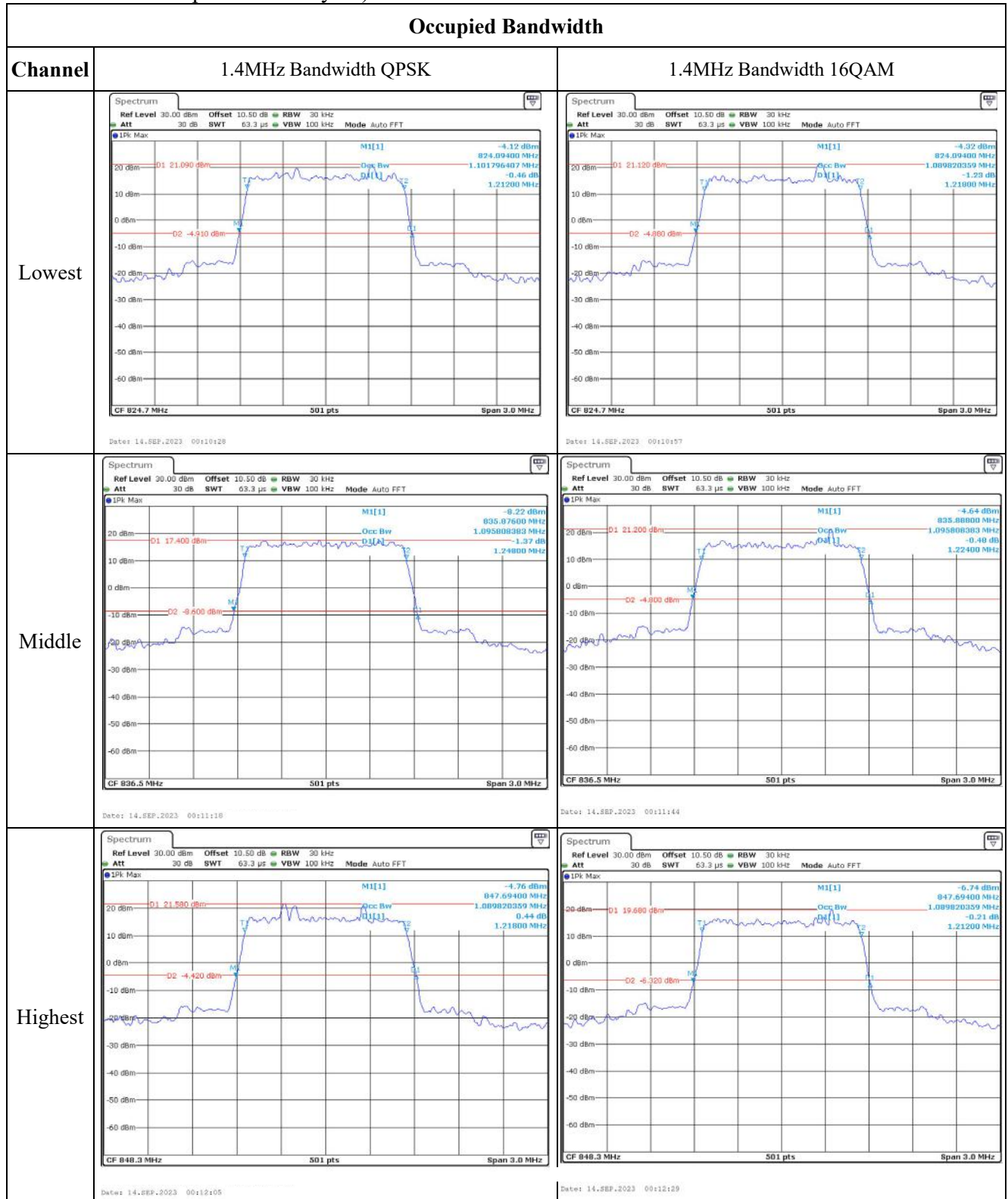
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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FCC §2.1055, §22.355: Frequency Stability

Test Modulation:	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	3.85	115.833	0.138	2.5
	-20	3.85	116.092	0.139	2.5
	-10	3.85	114.567	0.137	2.5
	0	3.85	110.608	0.132	2.5
	10	3.85	113.261	0.135	2.5
	20	3.85	113.367	0.136	2.5
	30	3.85	113.638	0.136	2.5
	40	3.85	103.178	0.123	2.5
	50	3.85	119.921	0.143	2.5
Frequency Stability vs. Voltage	20	3.66	116.238	0.139	2.5
	20	4.24	112.681	0.135	2.5
				Result:	Pass

Test Modulation:	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	3.85	110.391	0.132	2.5
	-20	3.85	107.483	0.128	2.5
	-10	3.85	118.074	0.141	2.5
	0	3.85	102.456	0.122	2.5
	10	3.85	108.886	0.130	2.5
	20	3.85	109.729	0.131	2.5
	30	3.85	111.327	0.133	2.5
	40	3.85	108.051	0.129	2.5
	50	3.85	110.360	0.132	2.5
Frequency Stability vs. Voltage	20	3.66	114.692	0.137	2.5
	20	4.24	107.978	0.129	2.5
				Result:	Pass

Test Plots(Note: The 10.5 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):



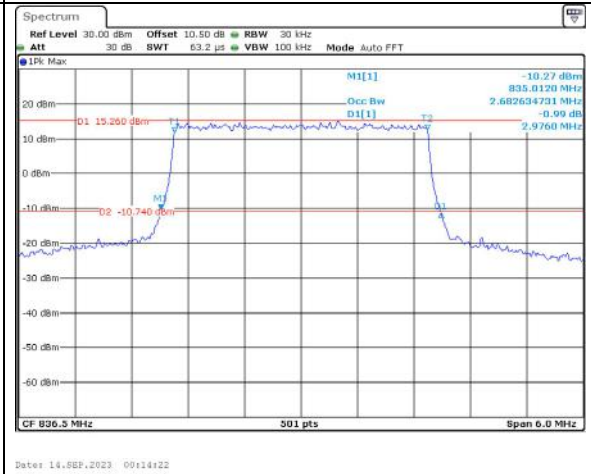
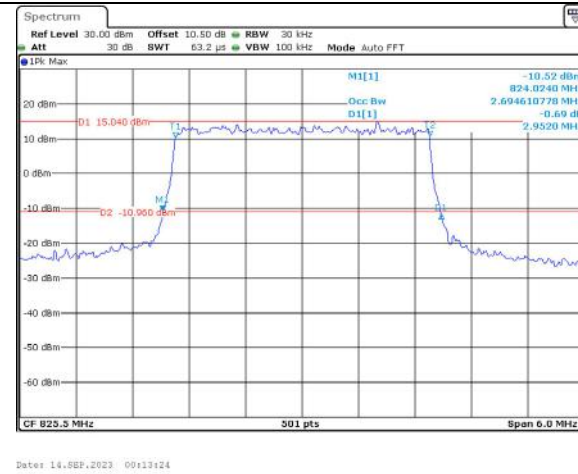
Occupied Bandwidth

Channel

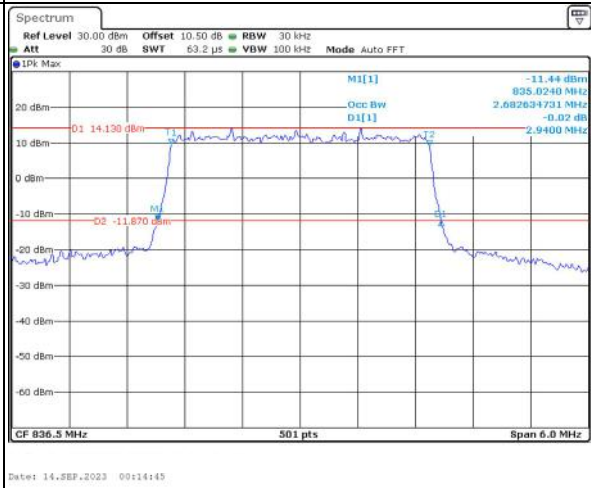
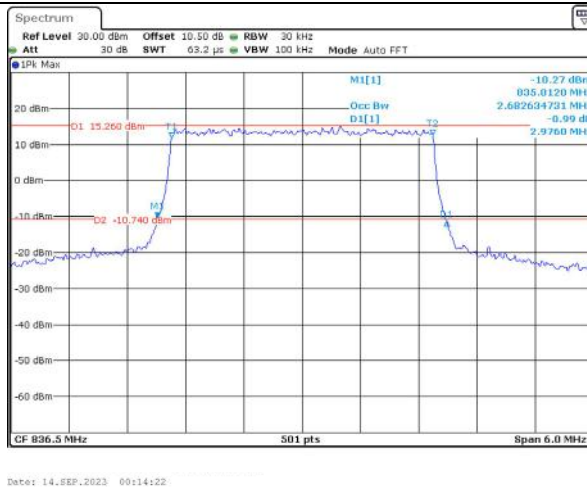
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

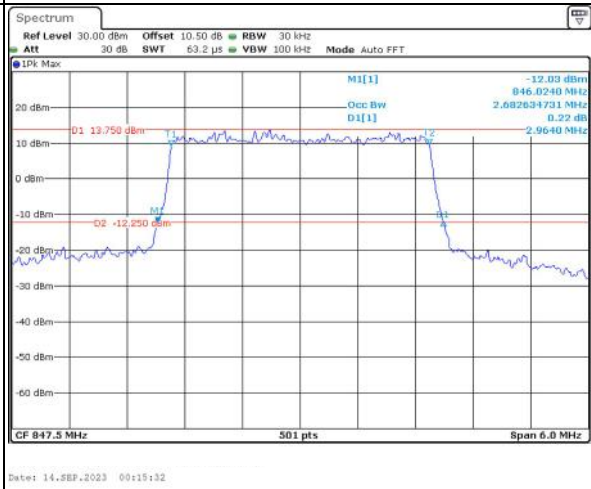
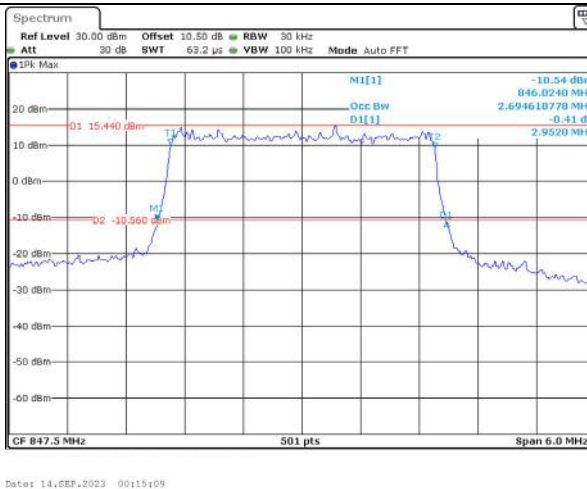
Lowest



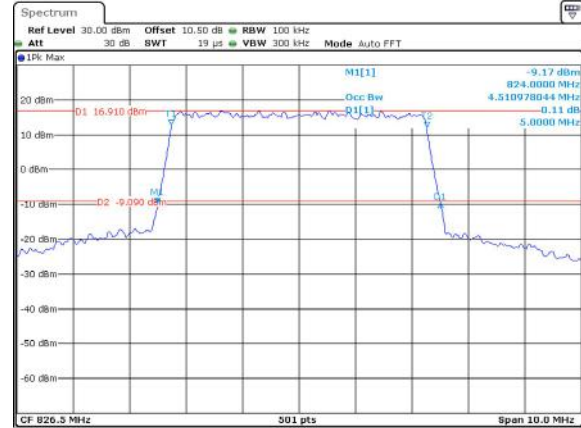
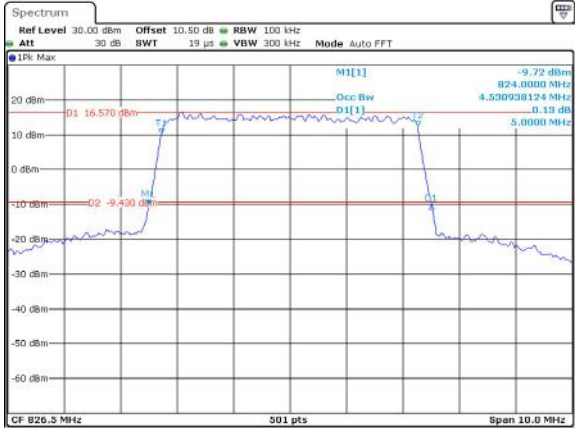
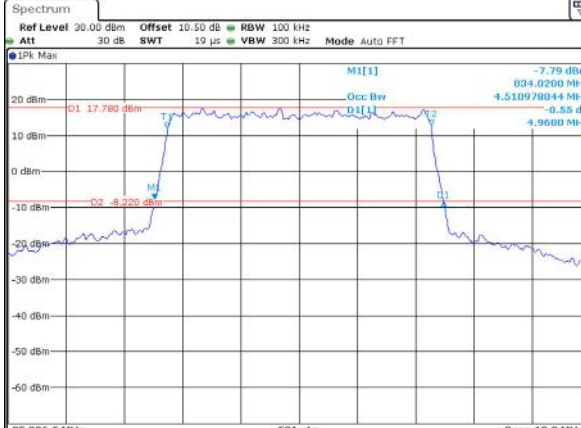
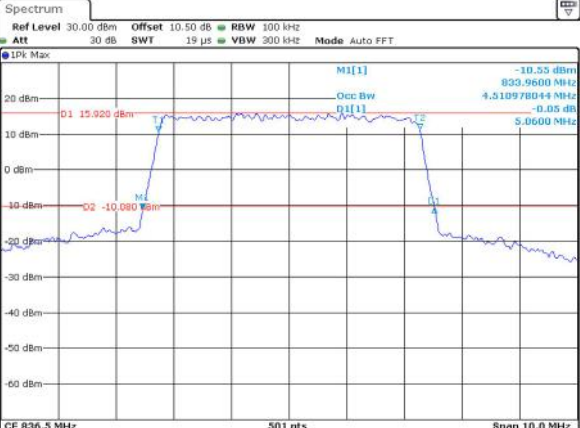
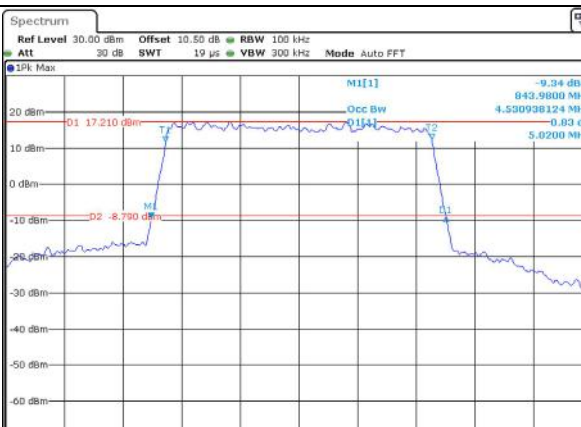
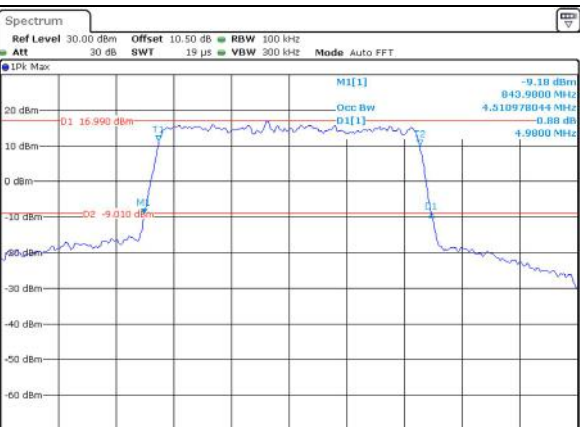
Middle



Highest



Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	 Spectrum Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -9.17 dBm Occ Bw 5.0000 MHz D1[1] 4.510978044 MHz D2 -9.090 dBm CF 826.5 MHz 501 pts Span 10.0 MHz Date: 14.SEP.2023 00:16:43	 Spectrum Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -9.72 dBm Occ Bw 5.0000 MHz D1[1] 4.530938124 MHz D2 -9.430 dBm CF 826.5 MHz 501 pts Span 10.0 MHz Date: 14.SEP.2023 00:17:06
Middle	 Spectrum Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -7.79 dBm Occ Bw 4.9600 MHz D1[1] 4.510978044 MHz D2 -8.220 dBm CF 836.5 MHz 501 pts Span 10.0 MHz Date: 14.SEP.2023 00:17:30	 Spectrum Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -10.53 dBm Occ Bw 5.0600 MHz D1[1] 4.510978044 MHz D2 -10.080 dBm CF 836.5 MHz 501 pts Span 10.0 MHz Date: 14.SEP.2023 00:17:54
Highest	 Spectrum Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -9.34 dBm Occ Bw 5.0200 MHz D1[1] 4.530938124 MHz D2 -8.790 dBm CF 846.5 MHz 501 pts Span 10.0 MHz Date: 14.SEP.2023 00:18:24	 Spectrum Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT IPK Max M1[1] -9.38 dBm Occ Bw 4.9800 MHz D1[1] 4.530938124 MHz D2 -9.030 dBm CF 846.5 MHz 501 pts Span 10.0 MHz Date: 14.SEP.2023 00:18:53

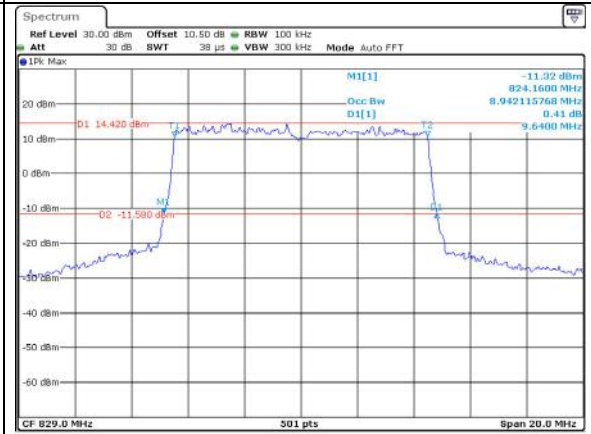
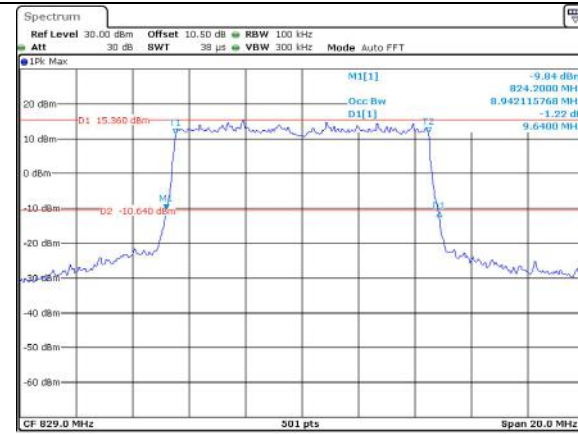
Occupied Bandwidth

Channel

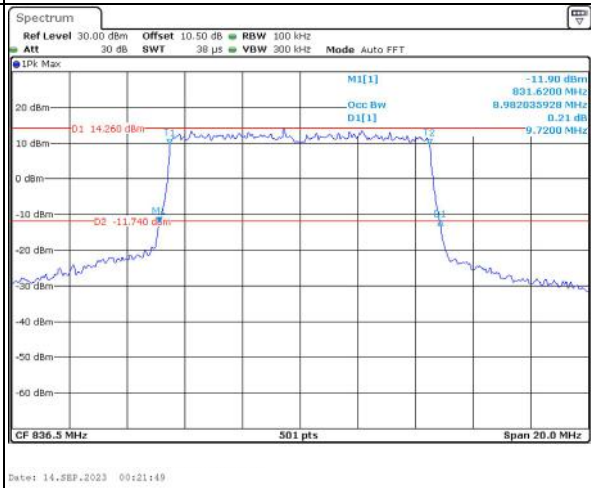
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

Lowest



Middle



Highest

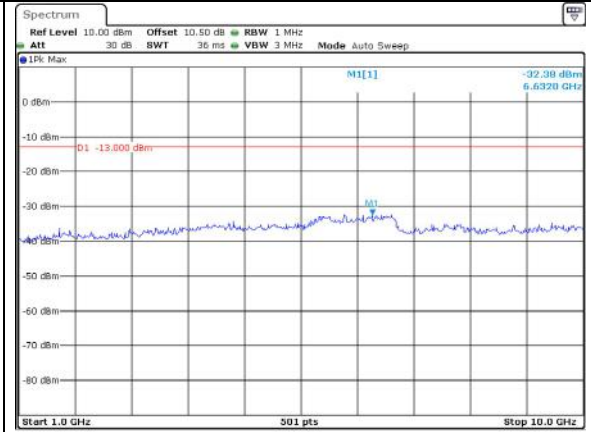
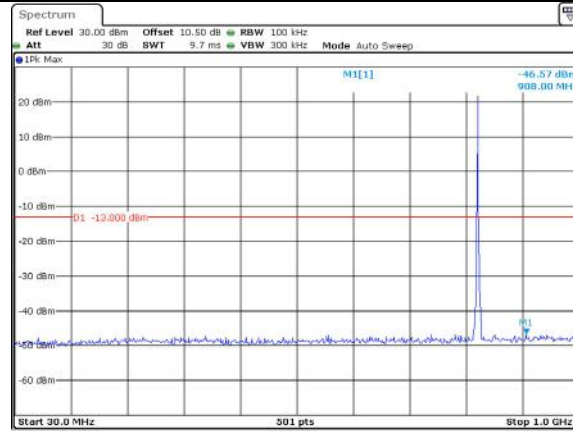


Spurious Emissions at Antenna Terminal

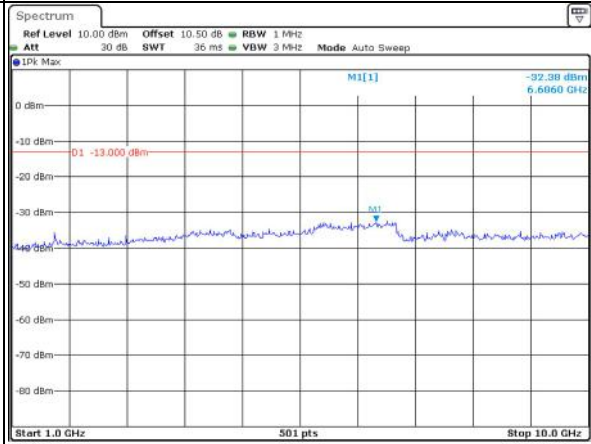
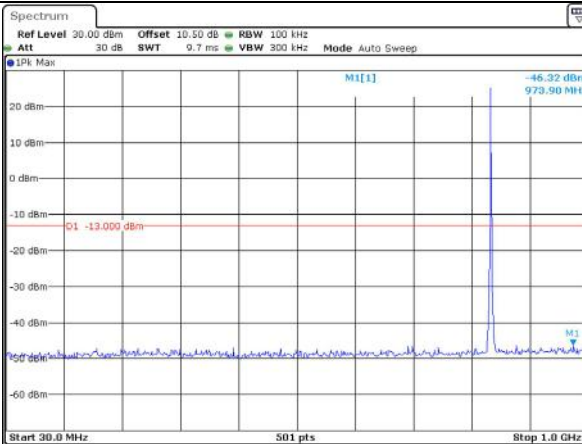
Channel

1.4MHz Bandwidth QPSK

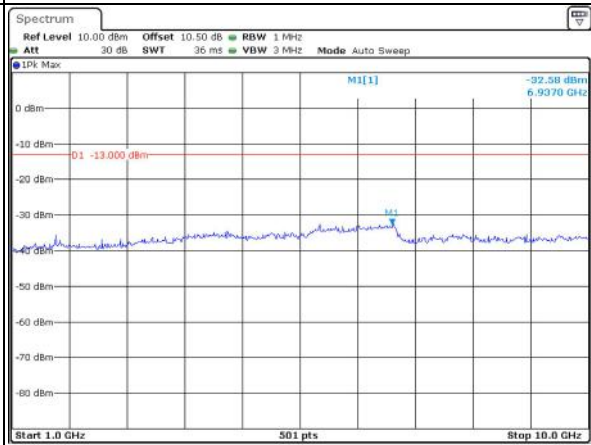
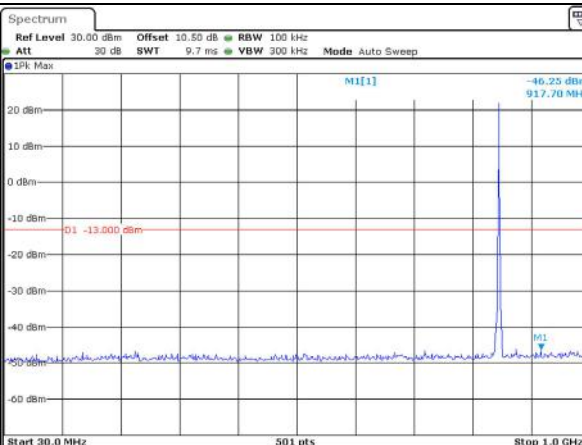
Lowest



Middle



Highest

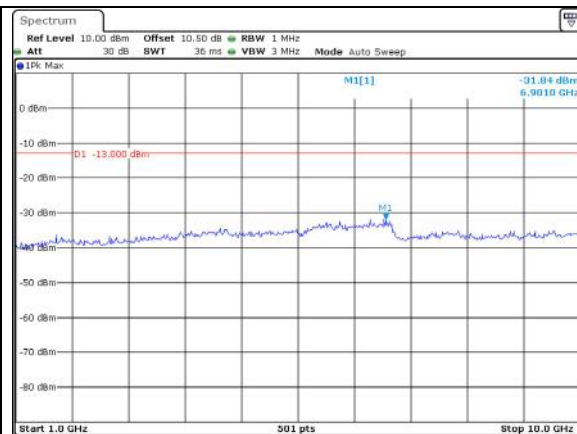
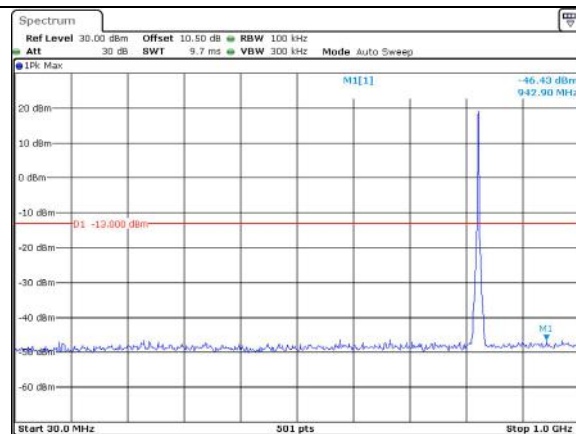


Spurious Emissions at Antenna Terminal

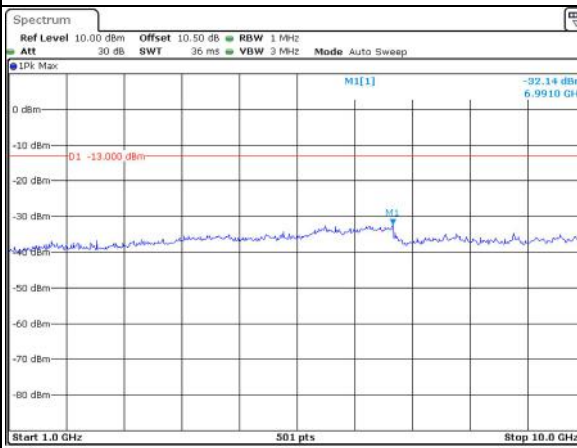
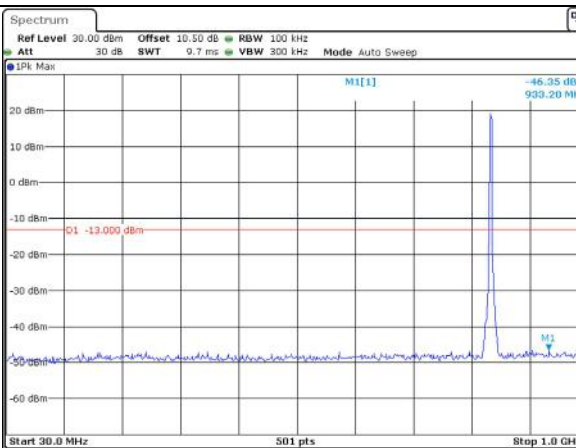
Channel

3MHz Bandwidth QPSK

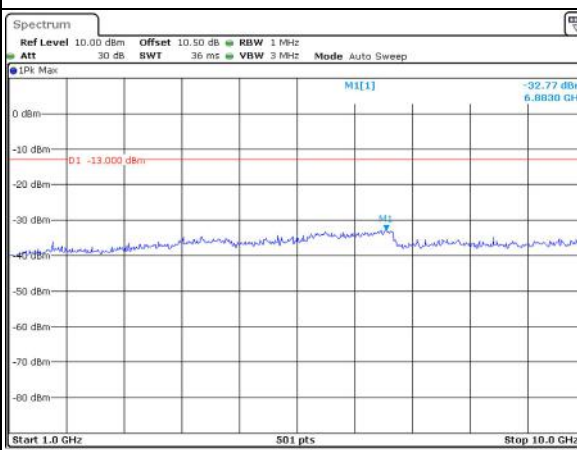
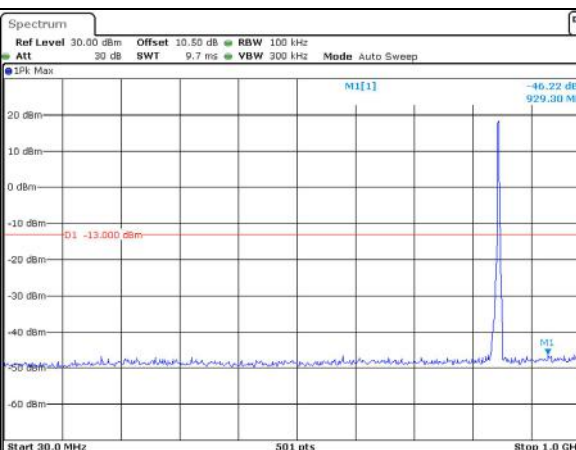
Lowest



Middle



Highest

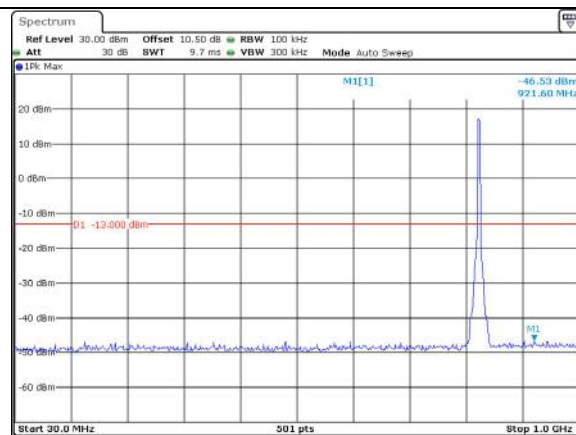


Spurious Emissions at Antenna Terminal

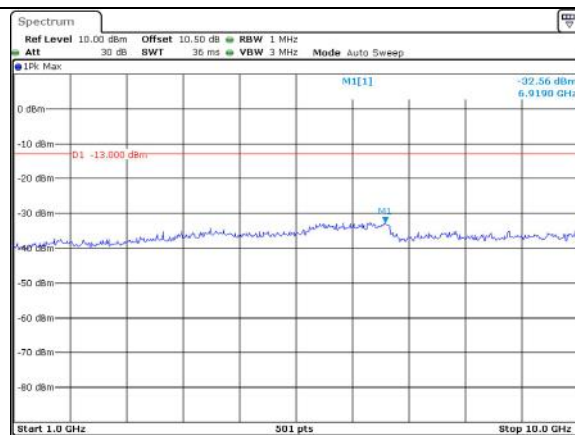
Channel

5MHz Bandwidth QPSK

Lowest

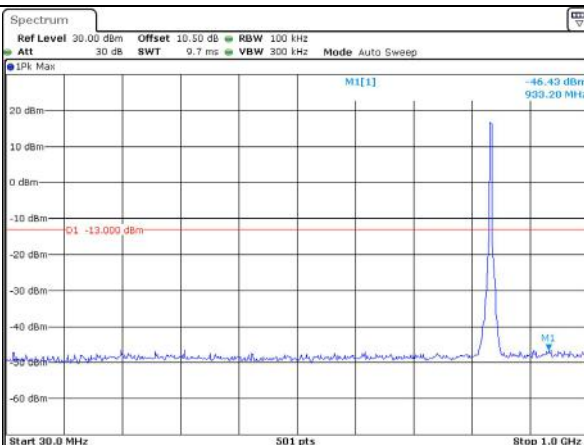


Date: 14.SEP.2023 01:06:38

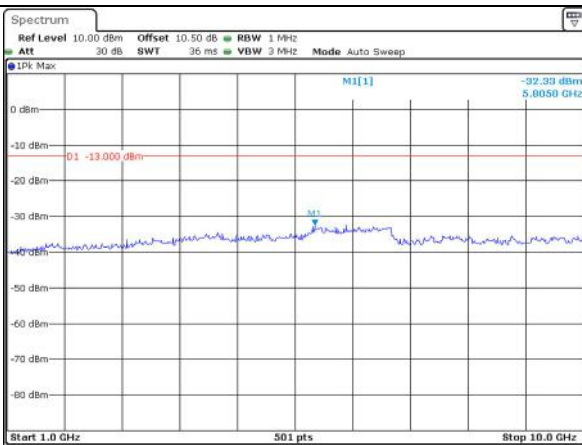


Date: 14.SEP.2023 01:07:01

Middle

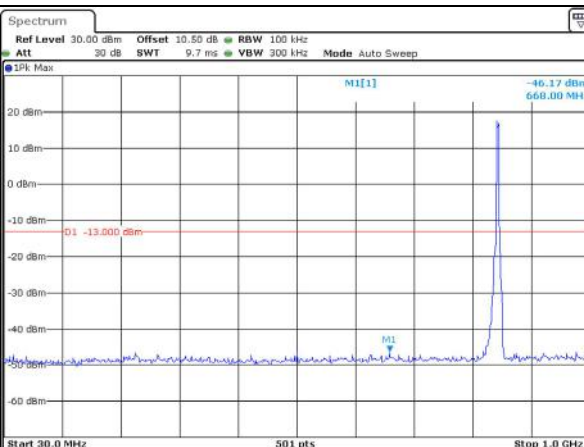


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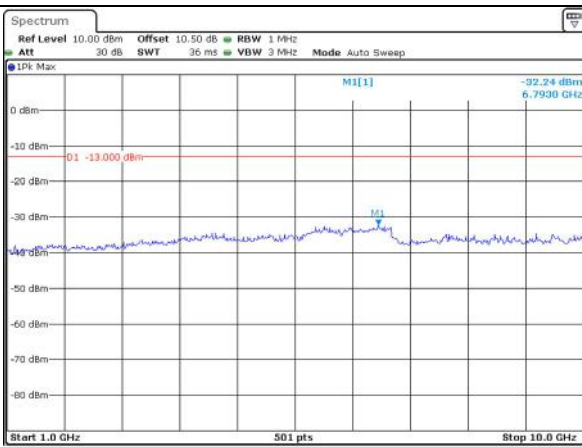


Date: 14.SEP.2023 01:07:53

Highest

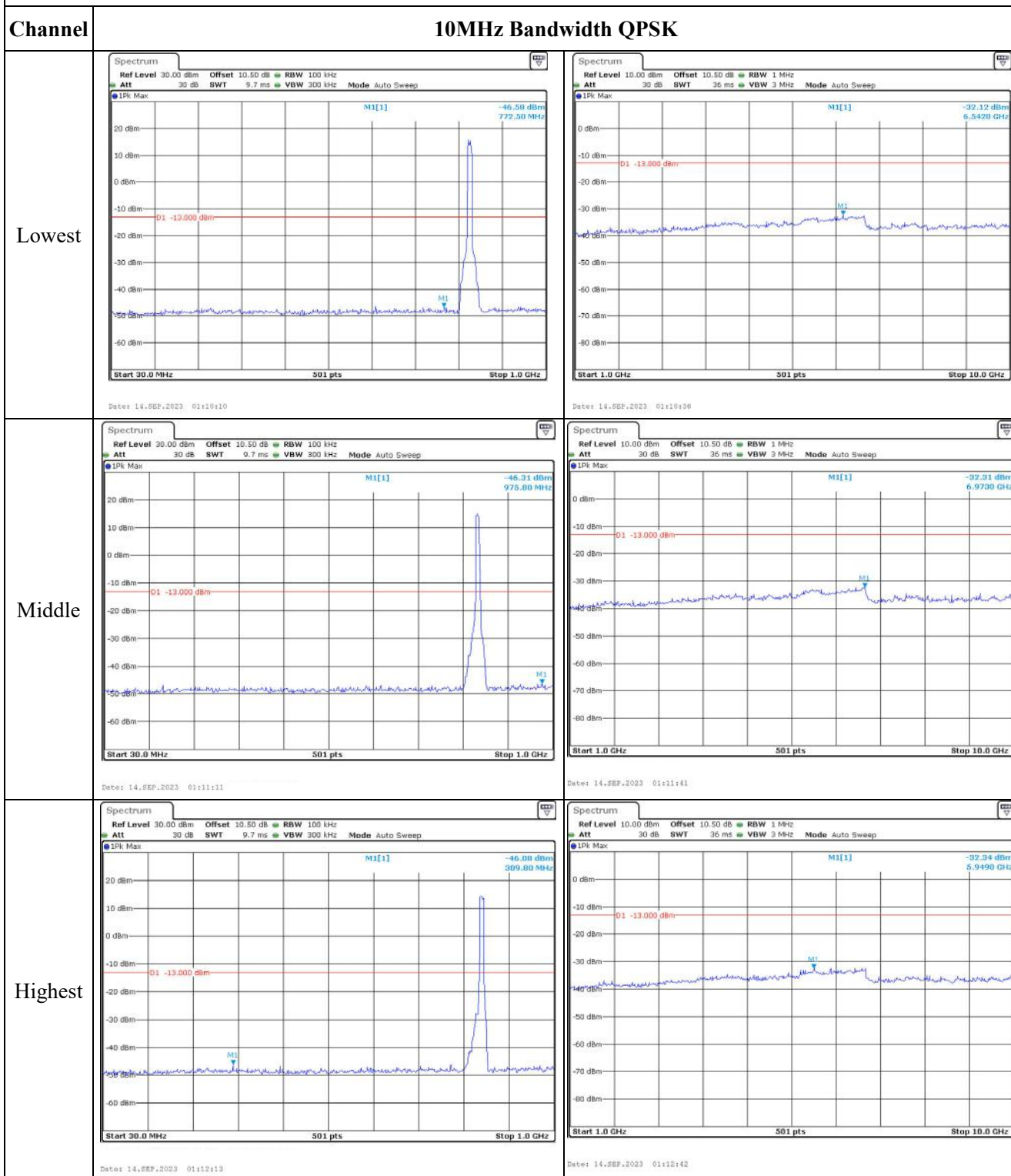


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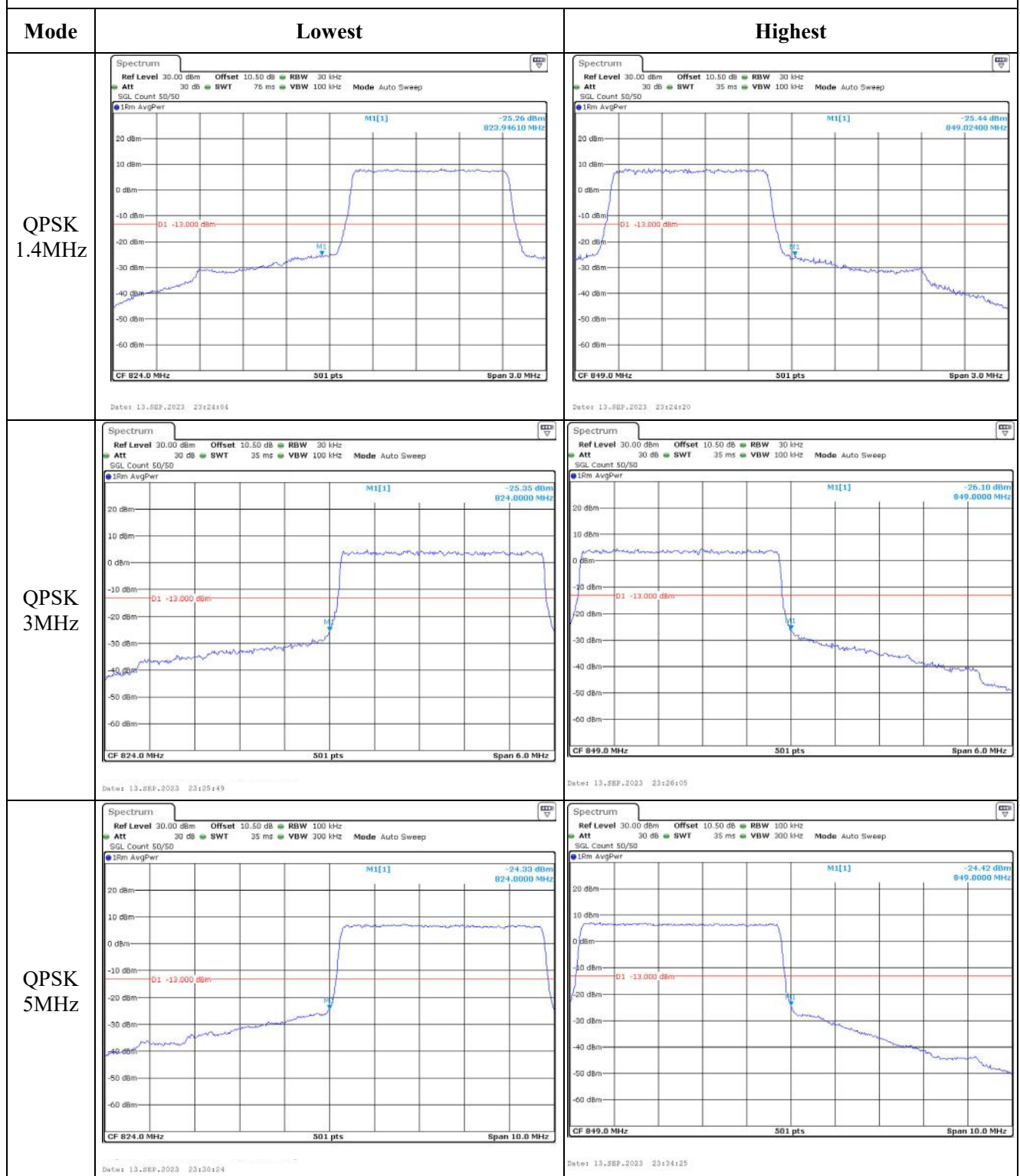


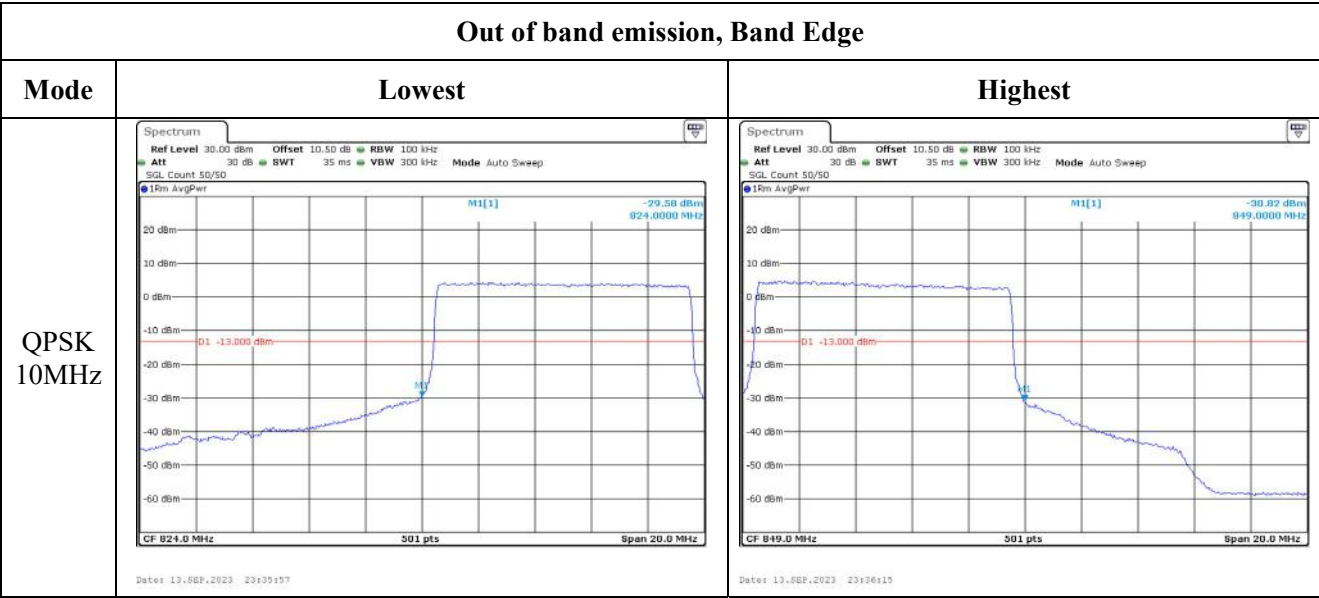
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Spurious Emissions at Antenna Terminal

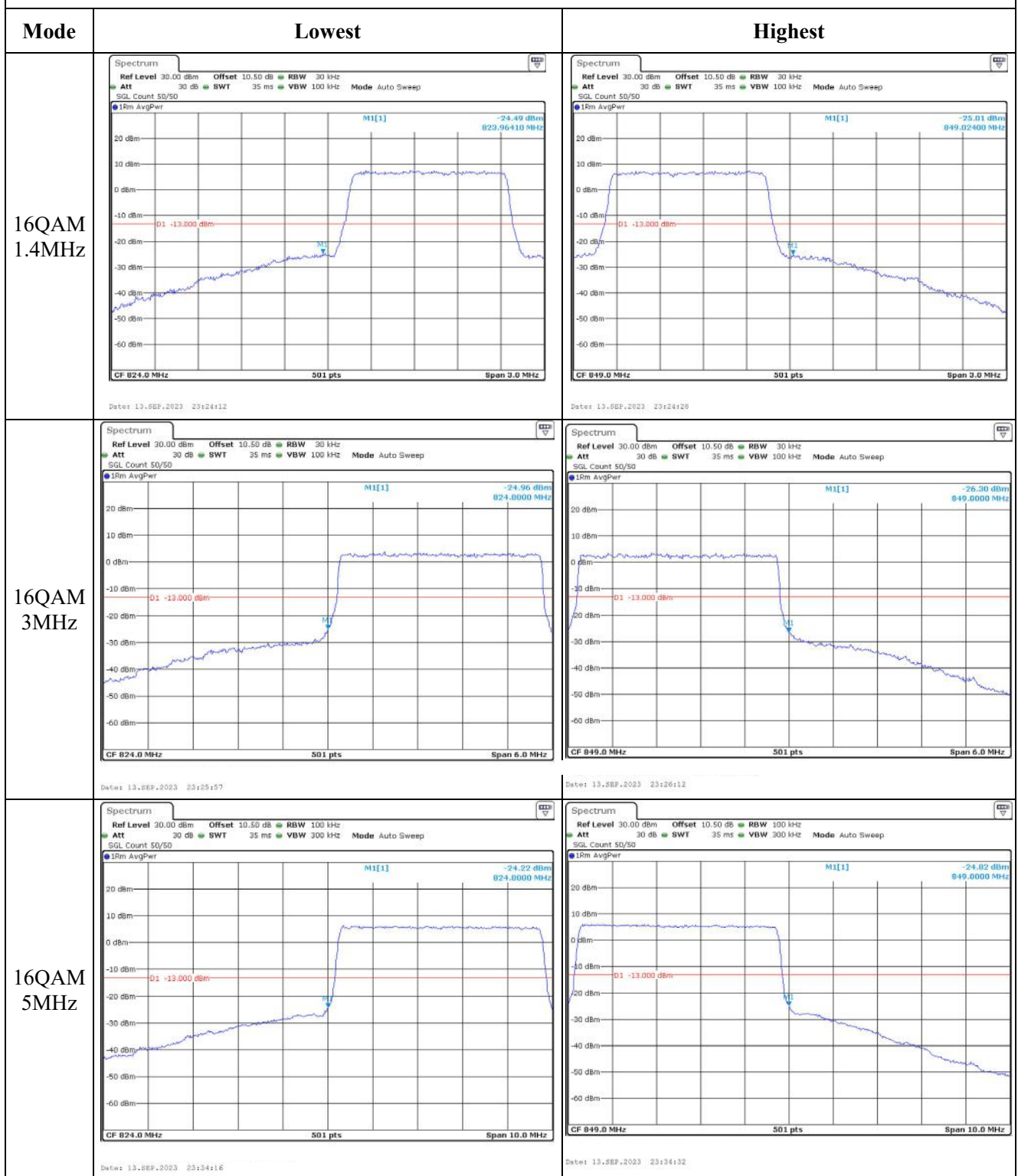


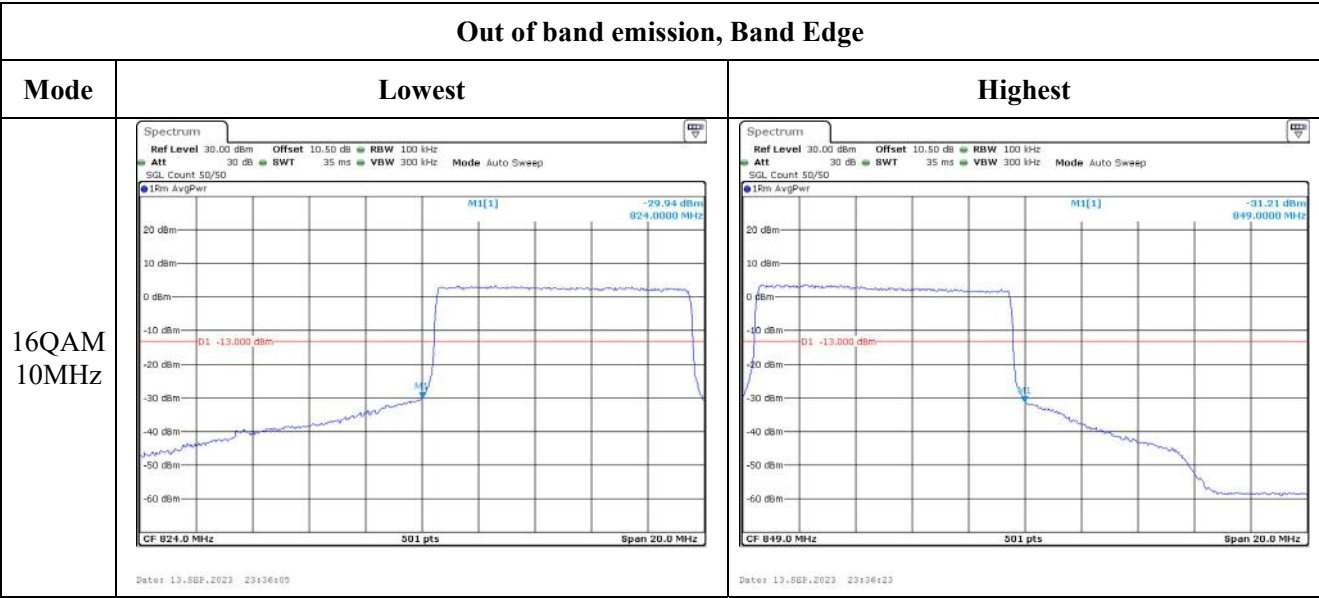
Out of band emission, Band Edge





Out of band emission, Band Edge





4.9 Antenna Port Test Data and Results for LTE Band 7

Serial Number:	294A-2	Test Date:	2023/9/13-2023/9/27
Test Site:	RF	Test Mode:	Transmitting
Tester:	Ken Tang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.6~28.4	Relative Humidity: (%)	57~58	ATM Pressure: (kPa)	100.2~101
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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	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
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)
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	22.02	22.16	22.36	21.38	33
	RB1#13	22.12	22.26	22.43		
	RB1#24	22.11	22.23	22.41		
	RB15#0	21.14	21.17	21.40		
	RB15#10	21.20	21.32	21.49		
	RB25#0	21.16	21.27	21.48		
5MHz 16QAM	RB1#0	21.30	21.45	21.59	20.68	33
	RB1#13	21.40	21.58	21.73		
	RB1#24	21.37	21.59	21.64		
	RB15#0	20.16	20.14	20.43		
	RB15#10	20.23	20.30	20.48		
	RB25#0	20.16	20.33	20.49		
10MHz QPSK	RB1#0	22.07	22.12	22.36	21.43	33
	RB1#25	22.11	22.19	22.41		
	RB1#49	22.15	22.24	22.48		
	RB25#0	21.14	21.19	21.41		
	RB25#25	21.16	21.28	21.49		
	RB50#0	21.20	21.28	21.44		
10MHz 16QAM	RB1#0	21.20	21.43	21.75	20.80	33
	RB1#25	21.30	21.55	21.77		
	RB1#49	21.32	21.53	21.85		
	RB25#0	20.23	20.25	20.47		
	RB25#25	20.23	20.32	20.58		
	RB50#0	20.19	20.26	20.44		
15MHz QPSK	RB1#0	21.89	21.87	22.12	21.16	33
	RB1#38	21.97	21.93	22.17		
	RB1#74	22.01	21.98	22.21		
	RB36#0	20.93	21.04	21.26		
	RB36#39	21.04	21.15	21.35		
	RB75#0	21.05	21.15	21.26		
15MHz 16QAM	RB1#0	21.10	21.49	21.49	20.56	33
	RB1#38	21.25	21.55	21.57		
	RB1#74	21.27	21.61	21.59		
	RB36#0	19.93	20.04	20.33		
	RB36#39	20.05	20.15	20.39		
	RB75#0	20.08	20.15	20.29		
20MHz QPSK	RB1#0	21.82	21.91	22.08	21.19	33

	RB1#50	21.90	21.94	22.17		
	RB1#99	22.03	22.02	22.24		
	RB50#0	20.95	21.06	21.25		
	RB50#50	21.06	21.15	21.33		
	RB100#0	21.09	21.17	21.29		
20MHz 16QAM	RB1#0	21.13	21.40	21.44	20.47	33
	RB1#50	21.14	21.43	21.46		
	RB1#99	21.24	21.52	21.52		
	RB50#0	19.95	20.10	20.25		
	RB50#50	20.06	20.21	20.37		
	RB100#0	20.08	20.15	20.29		

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	9.96	7.95	9.60	13
	RB100#0	6.01	8.67	9.07	13
20MHz 16QAM	RB1#0	8.28	6.80	9.58	13
	RB100#0	6.31	9.92	8.00	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	4.511	4.511	5.000	5.000	5.000
5MHz 16QAM	4.531	4.511	4.511	5.020	4.980	5.000
10MHz QPSK	8.942	8.942	8.942	9.720	9.720	9.680
10MHz 16QAM	8.942	8.942	8.942	9.720	9.680	9.680
15MHz QPSK	13.473	13.533	13.533	14.760	14.760	14.820
15MHz 16QAM	13.533	13.533	13.473	14.700	14.700	14.760
20MHz QPSK	17.964	17.964	18.044	19.280	19.360	19.440
20MHz 16QAM	17.964	17.964	17.964	19.520	19.680	19.360

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