

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	2500.008	2500.00	2569.982	2570
	-20	3.85	2500.016	2500.00	2569.999	2570
	-10	3.85	2500.027	2500.00	2569.986	2570
	0	3.85	2500.021	2500.00	2569.997	2570
	10	3.85	2500.027	2500.00	2569.986	2570
	20	3.85	2500.003	2500.00	2569.979	2570
	30	3.85	2500.001	2500.00	2569.974	2570
	40	3.85	2500.021	2500.00	2569.972	2570
	50	3.85	2500.017	2500.00	2569.990	2570
Frequency Stability vs. Voltage	20	3.66	2500.021	2500.00	2569.986	2570
	20	4.24	2500.026	2500.00	2569.979	2570
					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	2500.015	2500.00	2569.993	2570
	-20	3.85	2500.011	2500.00	2569.988	2570
	-10	3.85	2500.021	2500.00	2569.971	2570
	0	3.85	2500.023	2500.00	2569.995	2570
	10	3.85	2500.003	2500.00	2569.974	2570
	20	3.85	2500.005	2500.00	2569.985	2570
	30	3.85	2500.005	2500.00	2569.974	2570
	40	3.85	2500.017	2500.00	2569.993	2570
	50	3.85	2500.011	2500.00	2569.981	2570
Frequency Stability vs. Voltage	20	3.66	2500.004	2500.00	2569.983	2570
	20	4.24	2500.018	2500.00	2569.995	2570
					Result:	Pass

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

Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Occupied Bandwidth

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

Occupied Bandwidth

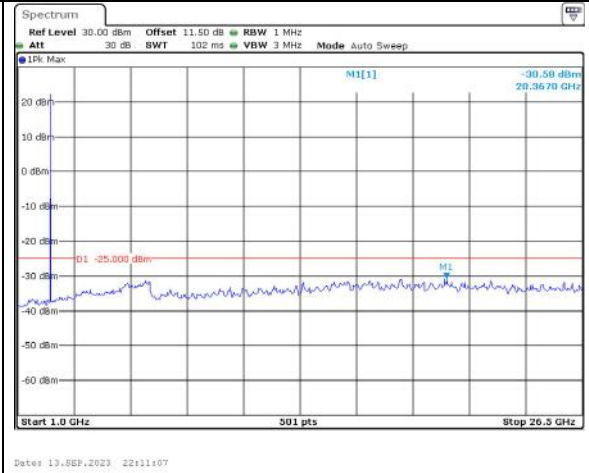
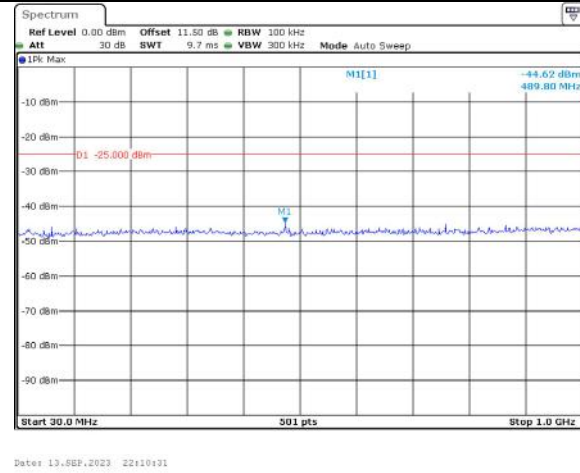
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal

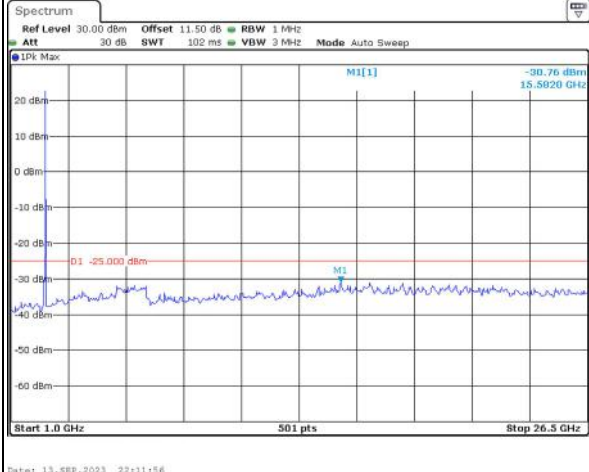
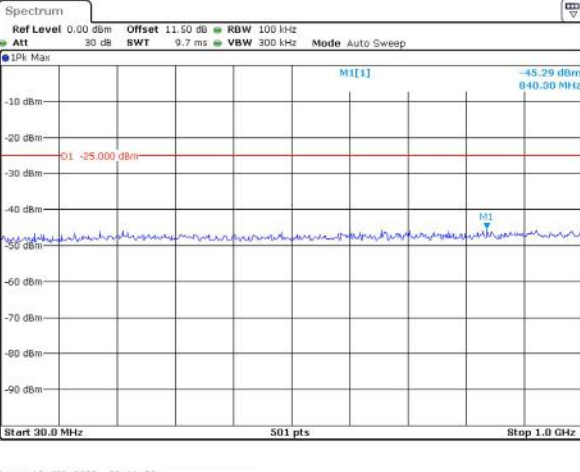
Channel

5MHz Bandwidth QPSK

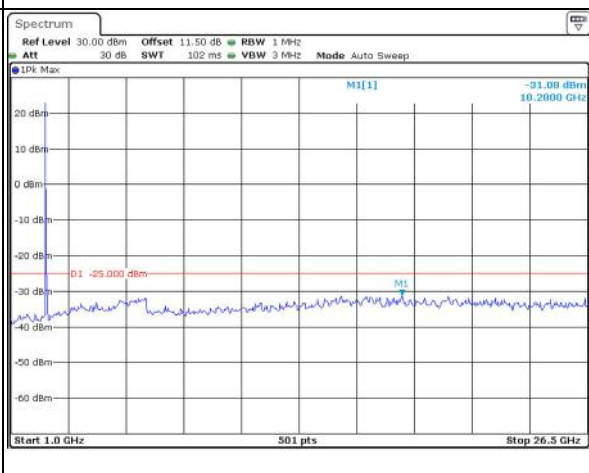
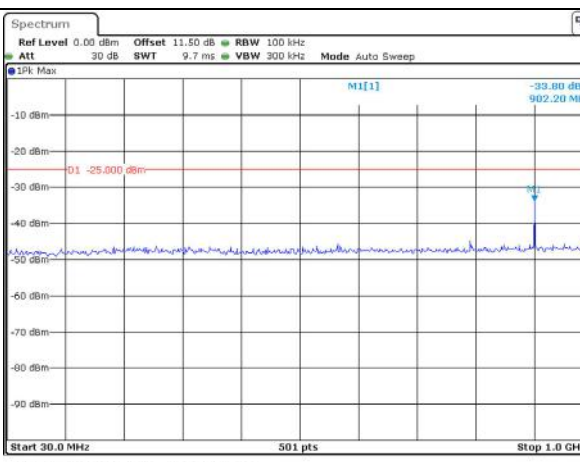
Lowest



Middle



Highest



Spurious Emissions at Antenna Terminal

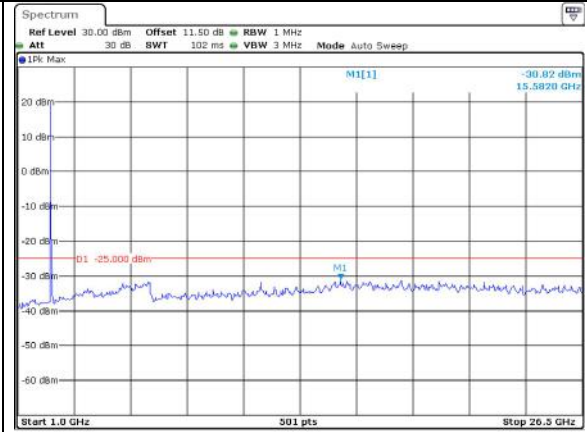
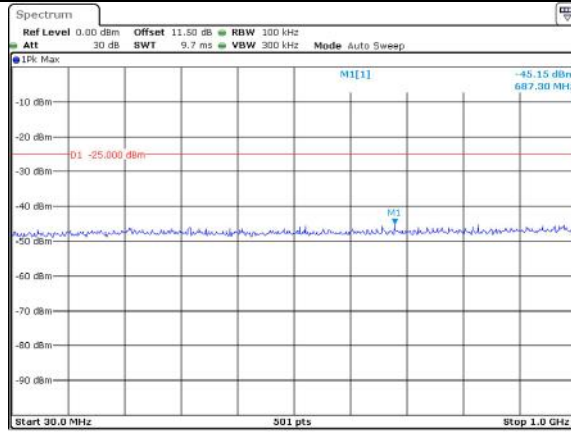
Channel	10MHz Bandwidth QPSK	
Lowest	<p>Ref Level 0.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep IPk Max M1[1] -45.50 dBm 755.10 MHz -25.000 dBm Start 30.0 MHz 501 pts Stop 1.0 GHz Date: 13_SEP_2023 22:14:23</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep IPk Max M1[1] -31.20 dBm 15.5870 GHz -25.000 dBm Start 1.0 GHz 501 pts Stop 26.5 GHz Date: 13_SEP_2023 22:14:45</p>
Middle	<p>Ref Level 0.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep IPk Max M1[1] -45.26 dBm 857.70 MHz -25.000 dBm Start 30.0 MHz 501 pts Stop 1.0 GHz Date: 13_SEP_2023 22:15:17</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep IPk Max M1[1] -30.82 dBm 18.9310 GHz -25.000 dBm Start 1.0 GHz 501 pts Stop 26.5 GHz Date: 13_SEP_2023 22:15:43</p>
Highest	<p>Ref Level 0.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep IPk Max M1[1] -45.76 dBm 586.60 MHz -25.000 dBm Start 30.0 MHz 501 pts Stop 1.0 GHz Date: 13_SEP_2023 22:16:09</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep IPk Max M1[1] -30.47 dBm 25.9660 GHz -25.000 dBm Start 1.0 GHz 501 pts Stop 26.5 GHz Date: 13_SEP_2023 22:16:36</p>

Spurious Emissions at Antenna Terminal

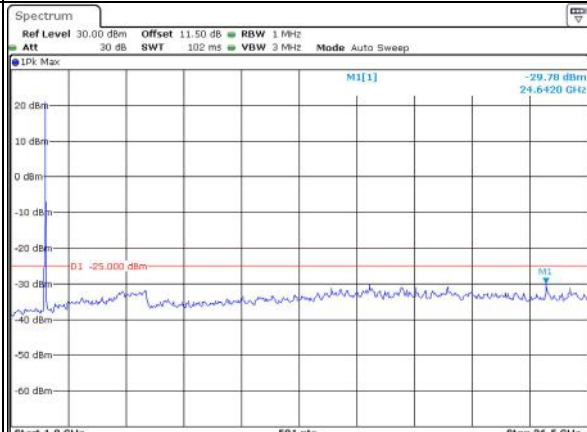
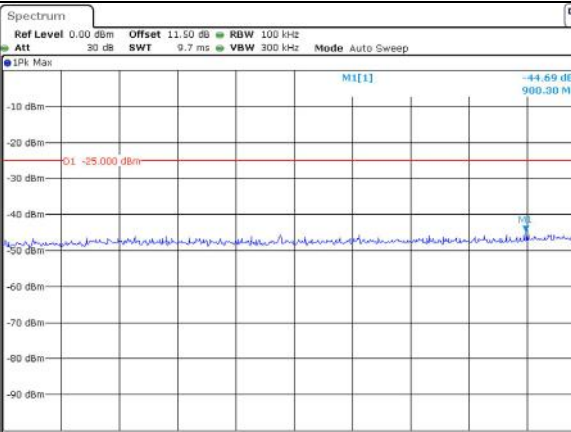
Channel

15MHz Bandwidth QPSK

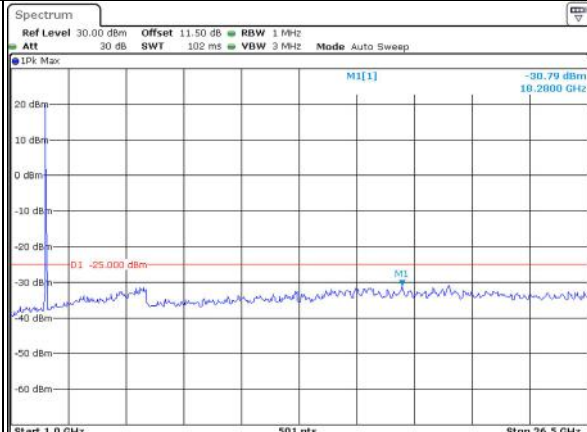
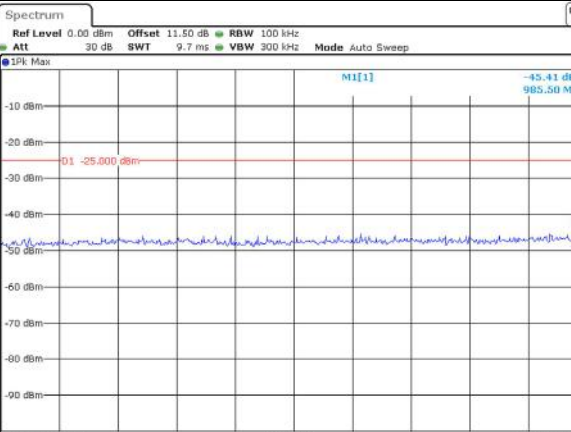
Lowest



Middle



Highest

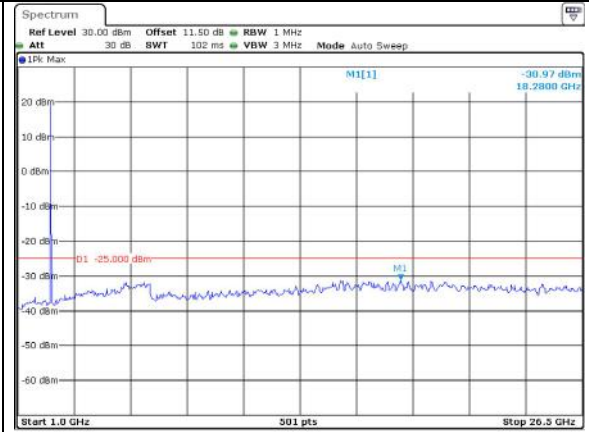
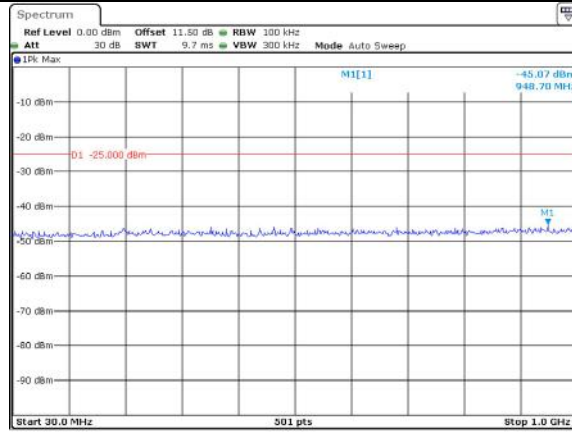


Spurious Emissions at Antenna Terminal

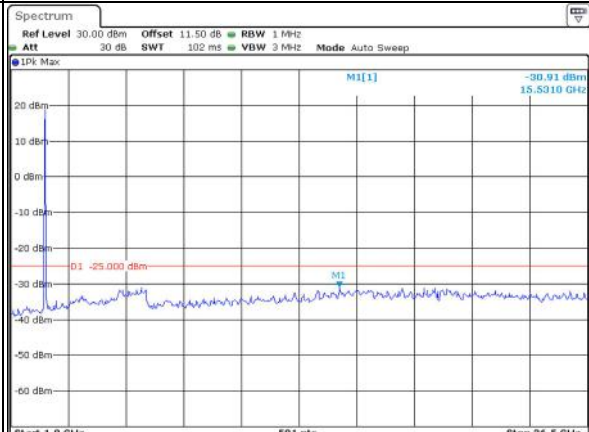
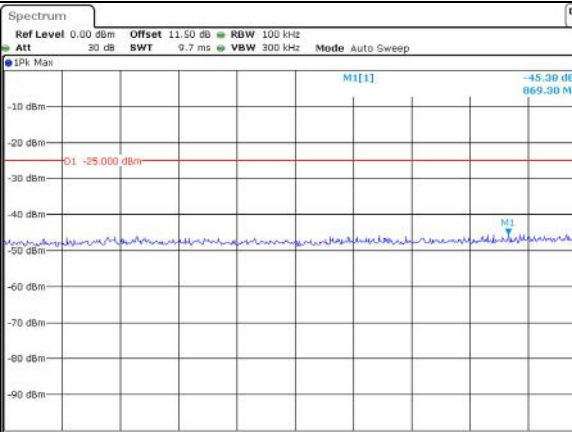
Channel

20MHz Bandwidth QPSK

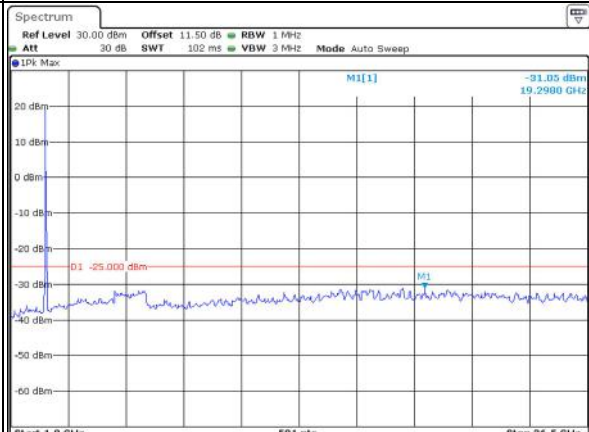
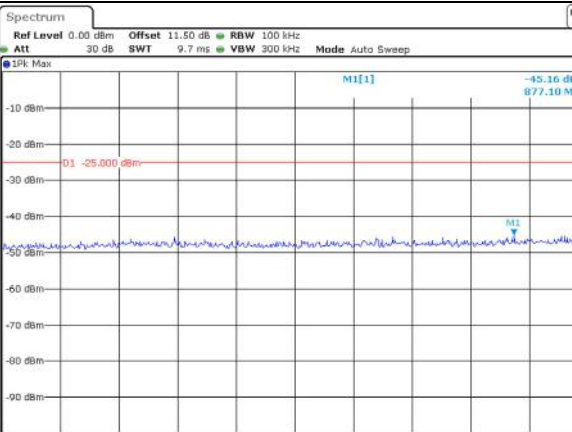
Lowest



Middle



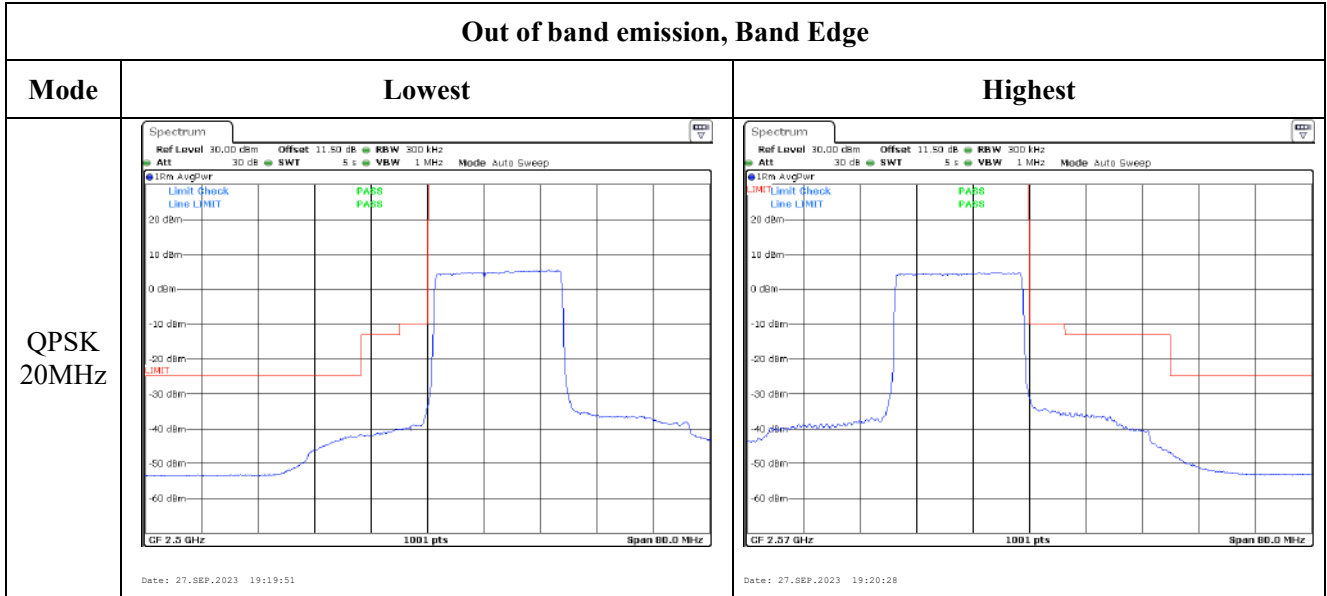
Highest



Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 5MHz		
QPSK 10MHz		
QPSK 15MHz		

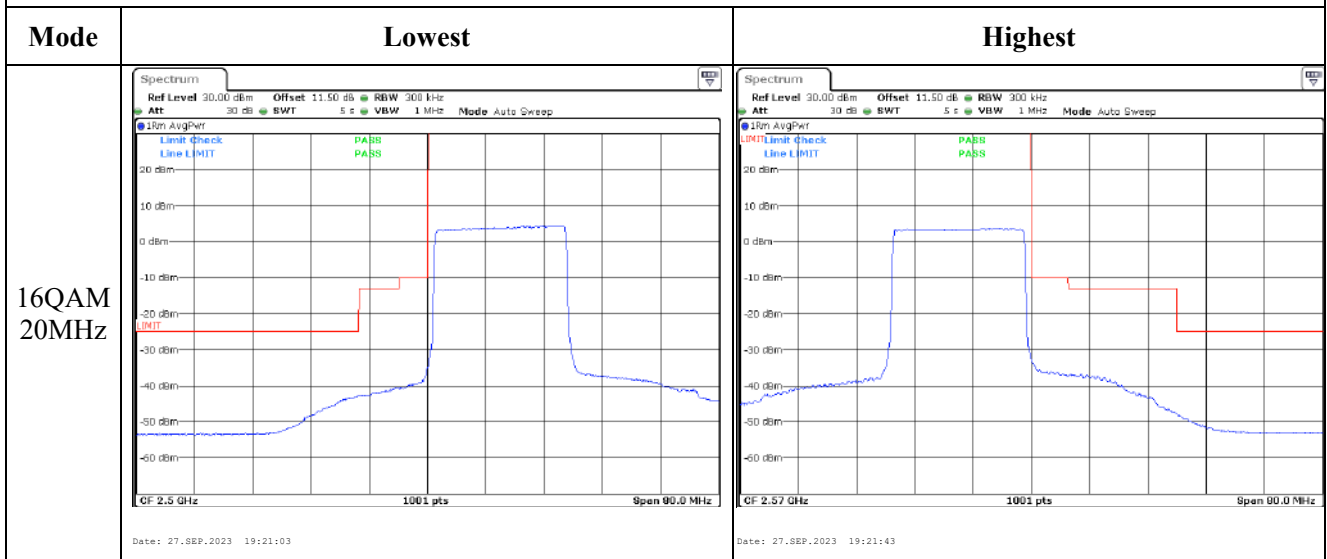
Out of band emission, Band Edge



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 5MHz		
16QAM 10MHz		
16QAM 15MHz		

Out of band emission, Band Edge



4.10 Antenna Port Test Data and Results for LTE Band 12

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
Mini-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	699.7	707.5	715.3
3MHz	700.5	707.5	714.5
5MHz	701.5	707.5	713.5
10MHz	704	707.5	711

Test Data:

FCC§2.1046;§ 27.50(c) (10)						
RF Output Power:						
Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	23.79	23.78	23.75	18.84	34.77
	RB1#3	23.88	23.89	23.75		
	RB1#5	23.81	23.76	23.65		
	RB3#0	23.86	23.78	23.70		
	RB3#3	23.80	23.77	23.68		
	RB6#0	22.87	22.80	22.79		
1.4MHz 16QAM	RB1#0	23.11	23.01	22.90	18.12	34.77
	RB1#3	23.17	23.02	22.93		
	RB1#5	22.99	23.03	22.76		
	RB3#0	22.89	22.95	22.89		
	RB3#3	22.83	22.92	22.98		
	RB6#0	21.90	21.83	21.88		
3MHz QPSK	RB1#0	23.91	23.93	23.83	18.88	34.77
	RB1#8	23.91	23.87	23.85		
	RB1#14	23.86	23.91	23.79		
	RB6#0	22.96	22.90	22.78		
	RB6#9	22.95	22.90	22.87		
	RB15#0	23.03	22.96	22.79		
3MHz 16QAM	RB1#0	23.47	23.10	22.94	18.64	34.77
	RB1#8	23.69	23.07	22.87		
	RB1#14	23.65	23.01	22.92		
	RB6#0	22.05	21.96	21.90		
	RB6#9	22.06	21.93	21.92		
	RB15#0	22.03	21.92	21.86		
5MHz QPSK	RB1#0	23.94	23.89	23.93	18.93	34.77
	RB1#13	23.98	23.91	23.90		
	RB1#24	23.95	23.82	23.74		
	RB15#0	22.95	22.93	22.87		
	RB15#10	22.98	22.96	22.88		
	RB25#0	22.96	22.94	22.85		
5MHz 16QAM	RB1#0	22.97	22.81	23.21	18.20	34.77
	RB1#13	23.20	22.89	23.25		
	RB1#24	23.08	22.77	23.16		
	RB15#0	21.96	21.93	21.83		
	RB15#10	22.03	21.96	21.85		
	RB25#0	22.02	22.04	21.80		
10MHz QPSK	RB1#0	23.99	23.99	23.95	18.94	34.77

	RB1#25	23.97	23.78	23.91		
	RB1#49	23.87	23.85	23.80		
	RB25#0	22.90	22.88	22.87		
	RB25#25	22.97	22.97	22.93		
	RB50#0	23.02	22.98	22.86		
10MHz 16QAM	RB1#0	23.63	23.17	23.11	18.60	34.77
	RB1#25	23.65	23.05	22.97		
	RB1#49	23.55	23.07	22.94		
	RB25#0	21.96	21.95	21.99		
	RB25#25	22.02	21.98	21.98		
	RB50#0	21.94	21.97	21.88		

Note:

ERP= Conducted Power(dBm) - Lc(dB) + G_T(dBd)G_T(dBd)=G_T(dBi)-2.15

Result:	Pass
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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	9.44	9.70	9.22	13
	RB50#0	9.94	9.93	6.30	13
10MHz 16QAM	RB1#0	6.17	9.76	8.18	13
	RB50#0	7.54	9.87	9.10	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	1.084	1.09	1.084	1.212	1.21	1.206
1.4MHz 16QAM	1.084	1.078	1.078	1.200	1.212	1.212
3MHz QPSK	2.695	2.683	2.683	2.952	2.964	2.952
3MHz 16QAM	2.683	2.683	2.683	2.964	2.940	2.976
5MHz QPSK	4.511	4.511	4.511	5.000	5.000	5.000
5MHz 16QAM	4.531	4.511	4.511	5.020	5.020	4.960
10MHz QPSK	8.942	8.942	8.982	9.640	9.680	9.720
10MHz 16QAM	8.942	8.942	8.942	9.680	9.640	9.600

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

FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal

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

FCC §2.1055, §27.54: Frequency Stability						
Test Mode:	10M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	699.009	699.00	715.970	716.00
	-20	3.85	699.008	699.00	715.988	716.00
	-10	3.85	699.012	699.00	715.984	716.00
	0	3.85	699.002	699.00	715.985	716.00
	10	3.85	699.023	699.00	715.985	716.00
	20	3.85	699.013	699.00	715.976	716.00
	30	3.85	699.027	699.00	715.993	716.00
	40	3.85	699.001	699.00	715.999	716.00
Frequency Stability vs. Voltage	20	3.66	699.009	699.00	715.988	716.00
	20	4.24	699.008	699.00	715.976	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	3.85	699.028	699.00	715.984	716.00
	-20	3.85	699.024	699.00	715.976	716.00
	-10	3.85	699.018	699.00	715.971	716.00
	0	3.85	699.012	699.00	715.991	716.00
	10	3.85	699.009	699.00	715.971	716.00
	20	3.85	699.017	699.00	715.989	716.00
	30	3.85	699.002	699.00	715.992	716.00
	40	3.85	699.020	699.00	715.989	716.00
	50	3.85	699.030	699.00	715.972	716.00
Frequency Stability vs. Voltage	20	3.66	699.003	699.00	715.996	716.00
	20	4.24	699.023	699.00	715.972	716.00
					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	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest	<p>CF 699.7 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:23:37</p>	<p>CF 699.7 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:24:03</p>
Middle	<p>CF 707.5 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:24:21</p>	<p>CF 707.5 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:24:44</p>
Highest	<p>CF 715.3 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:25:08</p>	<p>CF 715.3 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:25:31</p>

Occupied Bandwidth

Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT</p> <p>IPk Max: -9.45 dBm M1[1]: 4.510978044 MHz Occ Bw: 5.0000 MHz D1: 17.290 dBm D2: -8.710 dBm</p> <p>CF 701.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:29:24</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT</p> <p>IPk Max: -10.17 dBm M1[1]: 4.530938124 MHz Occ Bw: 5.0200 MHz D1: 16.380 dBm D2: -9.620 dBm</p> <p>CF 701.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:29:54</p>
Middle	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT</p> <p>IPk Max: -8.74 dBm M1[1]: 4.510978044 MHz Occ Bw: 5.0000 MHz D1: 17.990 dBm D2: -8.010 dBm</p> <p>CF 707.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:30:18</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT</p> <p>IPk Max: -9.38 dBm M1[1]: 4.510978044 MHz Occ Bw: 5.0200 MHz D1: 16.280 dBm D2: -8.750 dBm</p> <p>CF 707.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:30:51</p>
Highest	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT</p> <p>IPk Max: -7.85 dBm M1[1]: 4.510978044 MHz Occ Bw: 5.0000 MHz D1: 17.780 dBm D2: -8.220 dBm</p> <p>CF 713.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:31:15</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 19 μs VBW 300 kHz Mode Auto FFT</p> <p>IPk Max: -8.26 dBm M1[1]: 4.510978044 MHz Occ Bw: 4.9600 MHz D1: 17.580 dBm D2: -8.400 dBm</p> <p>CF 713.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:31:38</p>

Occupied Bandwidth

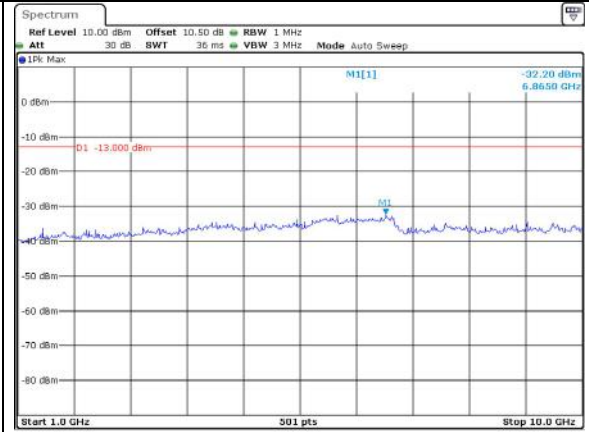
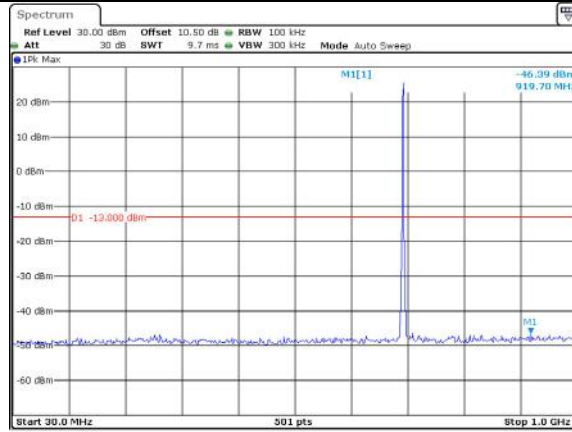
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -9.29 dBm 699.7000 MHz Occ Bw 8.942115768 MHz D1[1] -1.14 dB 9.6400 MHz</p> <p>D1 15.620 dBm D2 -10.380 dBm</p> <p>CF 704.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:32:56</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -11.75 dBm 699.1600 MHz Occ Bw 8.942115768 MHz D1[1] 0.03 dB 9.6800 MHz</p> <p>D1 14.360 dBm D2 -11.640 dBm</p> <p>CF 704.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:33:31</p>
Middle	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -10.85 dBm 702.6600 MHz Occ Bw 8.942115768 MHz D1[1] 0.29 dB 9.6800 MHz</p> <p>D1 15.140 dBm D2 -10.860 dBm</p> <p>CF 707.5 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:34:14</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -10.91 dBm 702.6600 MHz Occ Bw 8.942115768 MHz D1[1] 0.19 dB 9.6400 MHz</p> <p>D1 14.510 dBm D2 -11.490 dBm</p> <p>CF 707.5 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:34:56</p>
Highest	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -10.35 dBm 706.1200 MHz Occ Bw 8.982035928 MHz D1[1] -0.91 dB 9.7200 MHz</p> <p>D1 14.900 dBm D2 -11.100 dBm</p> <p>CF 711.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:35:42</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -10.24 dBm 706.2000 MHz Occ Bw 8.942115768 MHz D1[1] -0.14 dB 9.6000 MHz</p> <p>D1 14.980 dBm D2 -11.020 dBm</p> <p>CF 711.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:36:21</p>

Spurious Emissions at Antenna Terminal

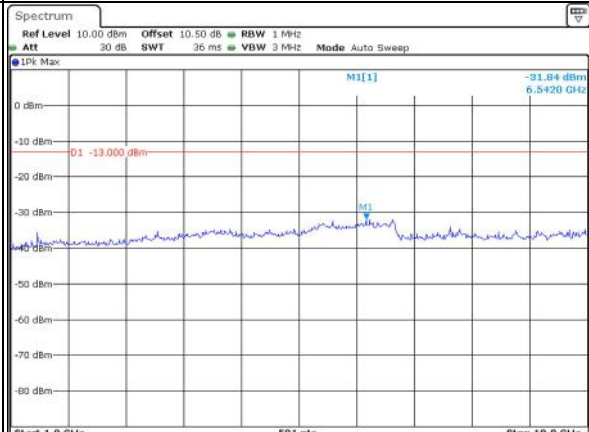
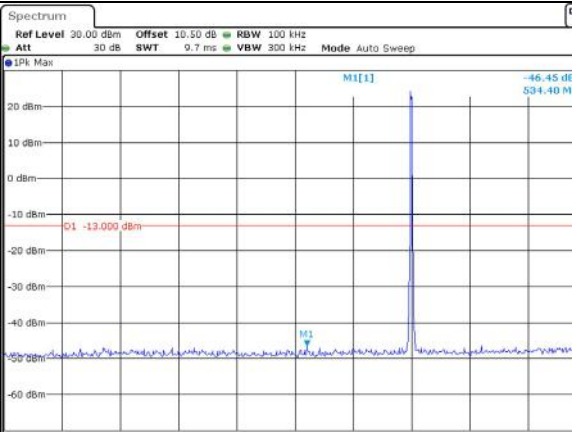
Channel

1.4MHz Bandwidth QPSK

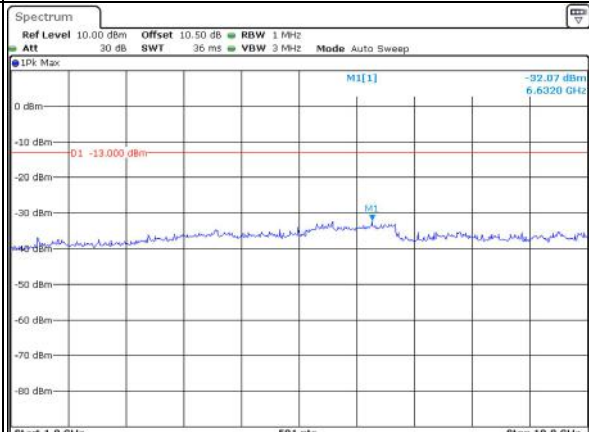
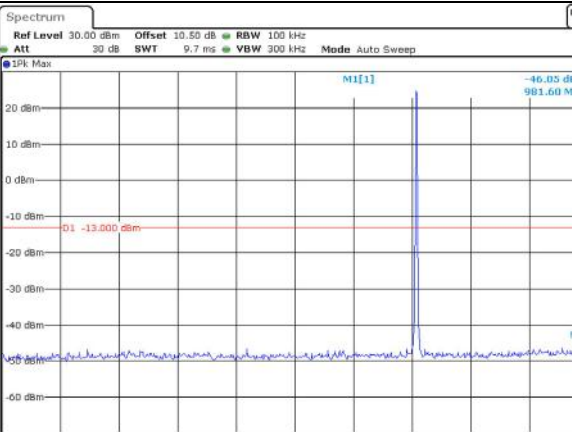
Lowest



Middle



Highest

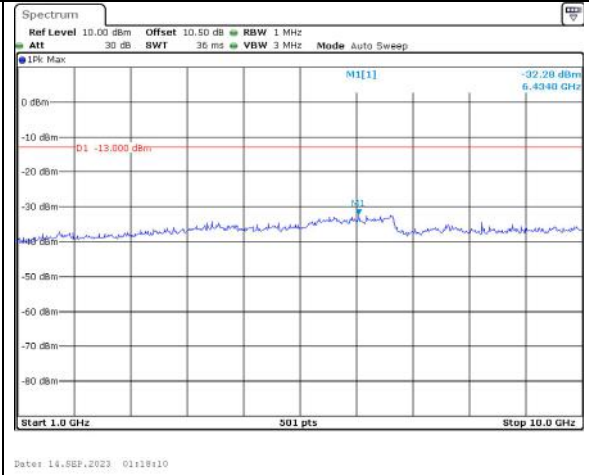
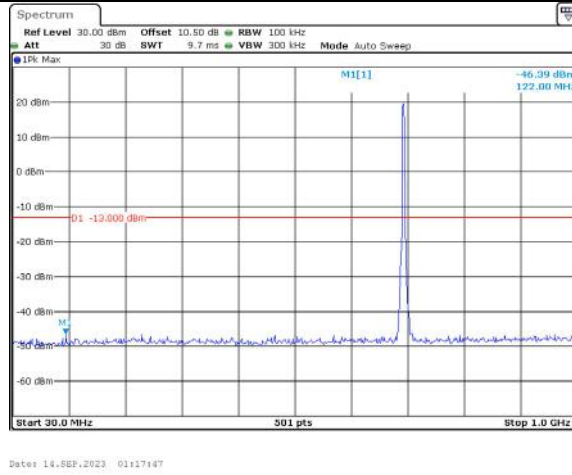


Spurious Emissions at Antenna Terminal

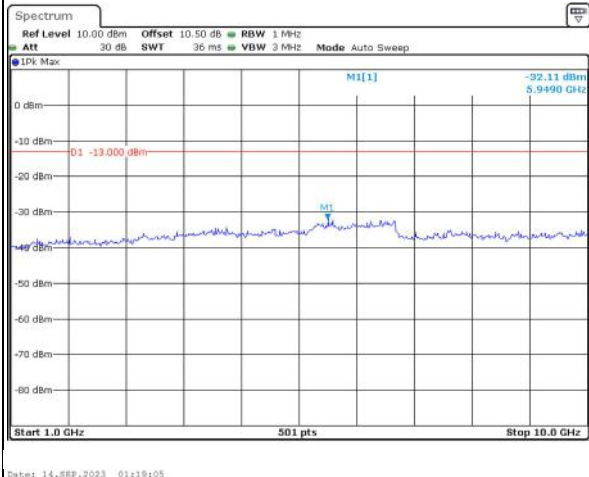
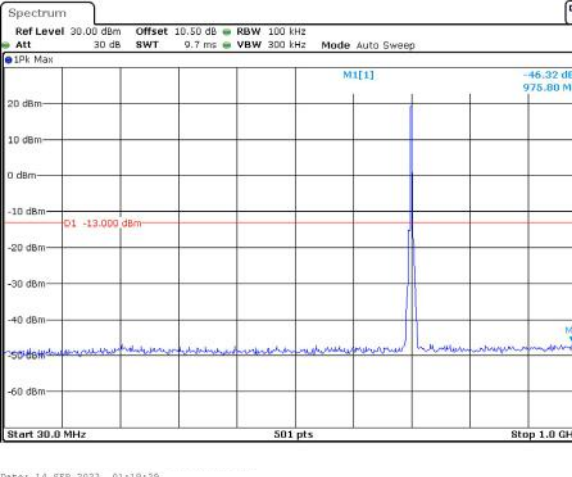
Channel

3MHz Bandwidth QPSK

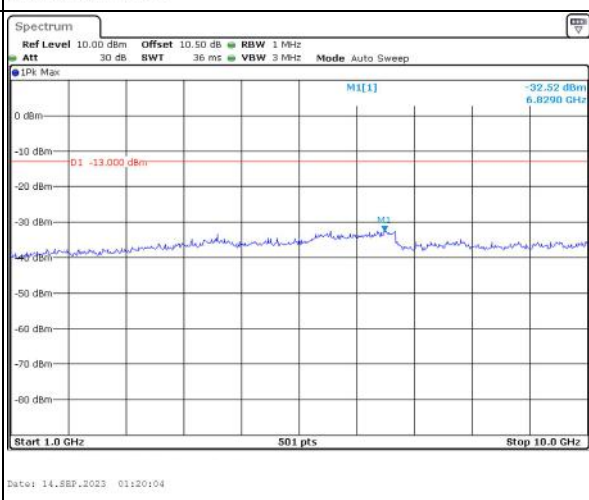
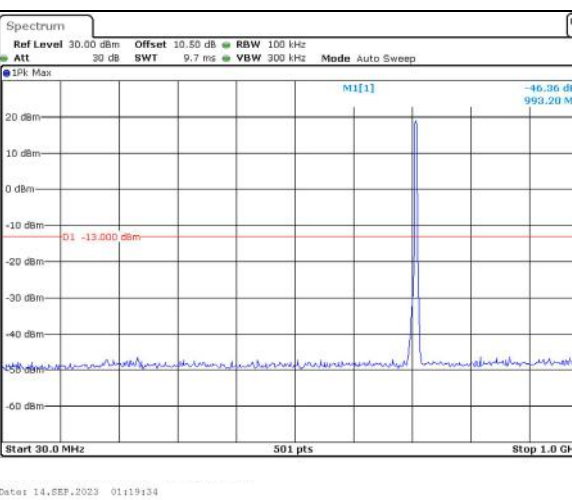
Lowest



Middle



Highest

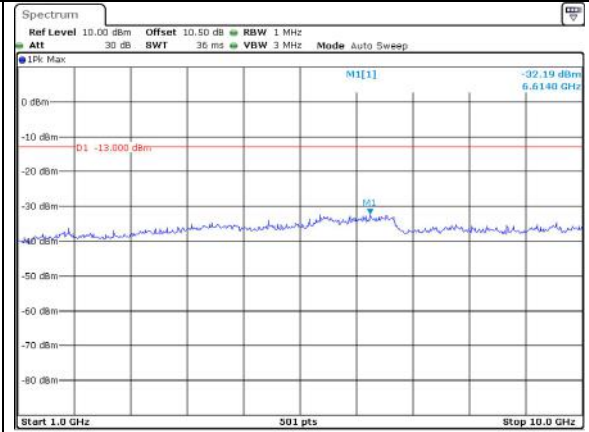
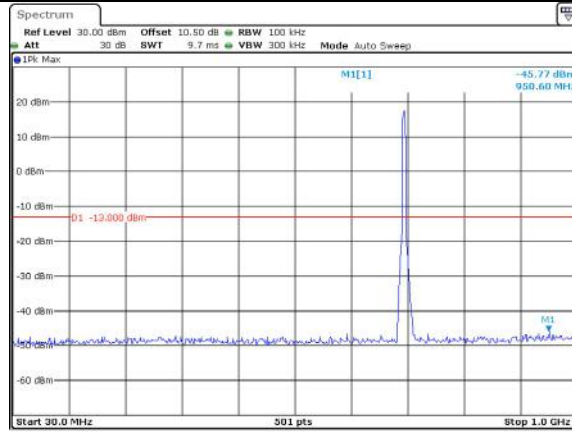


Spurious Emissions at Antenna Terminal

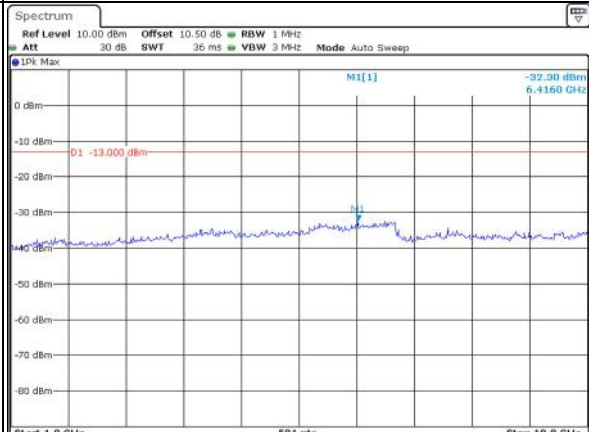
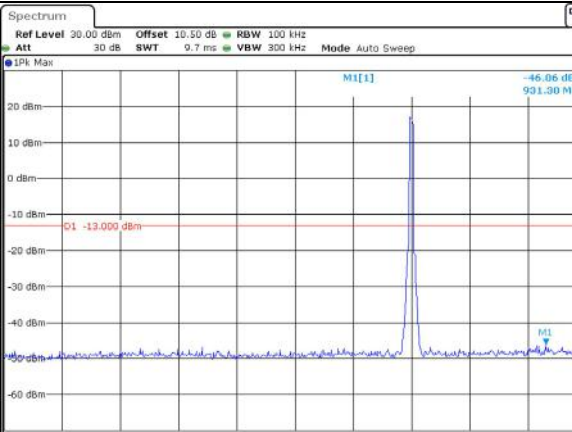
Channel

5MHz Bandwidth QPSK

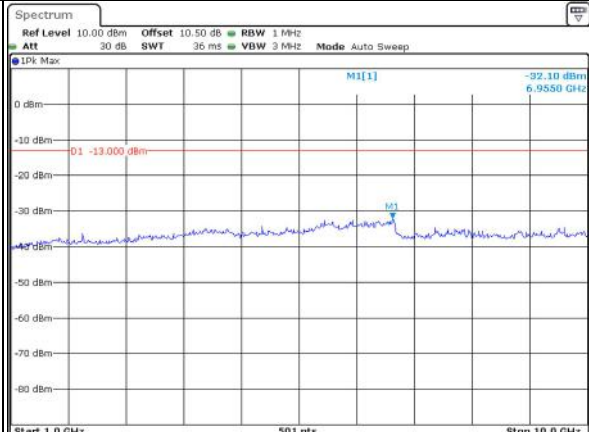
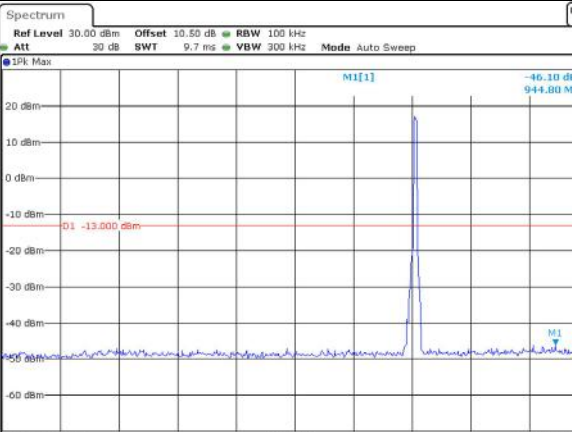
Lowest



Middle



Highest

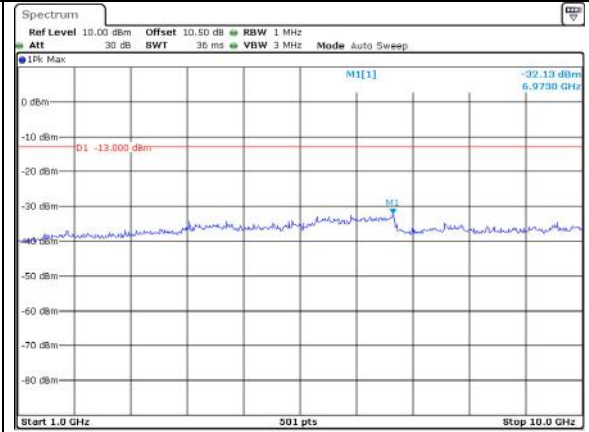
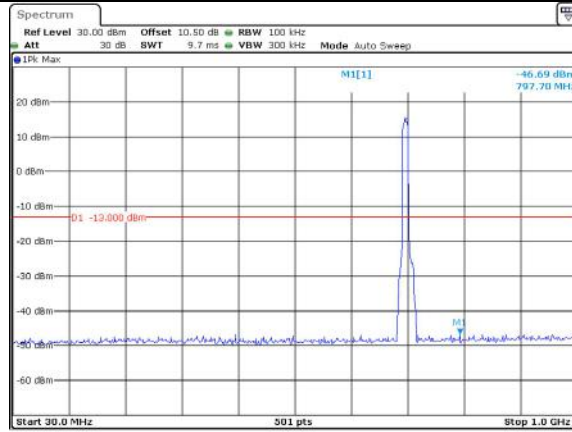


Spurious Emissions at Antenna Terminal

Channel

10MHz Bandwidth QPSK

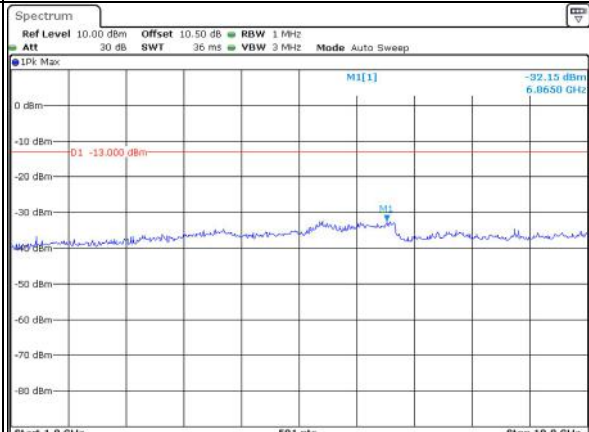
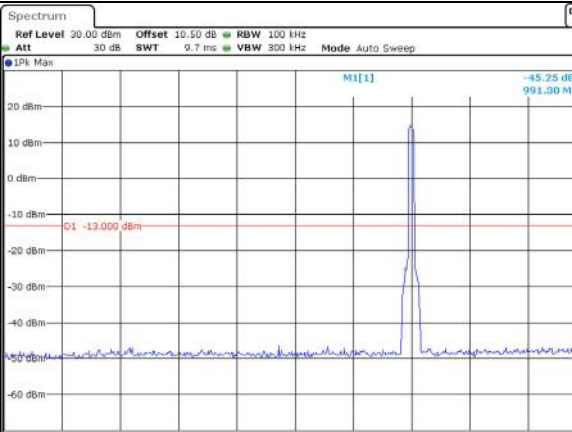
Lowest



Date: 14.SEP.2023 01:24:39

Date: 14.SEP.2023 01:24:59

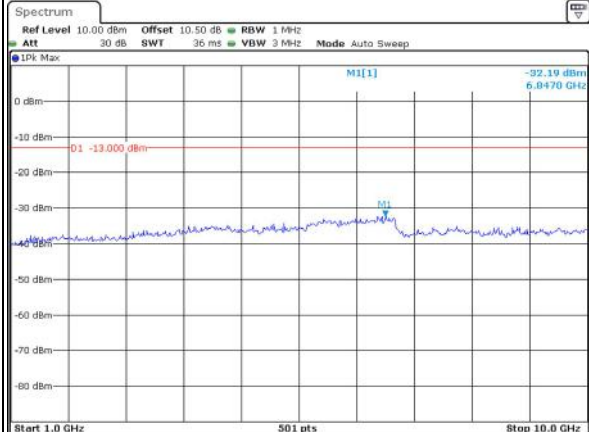
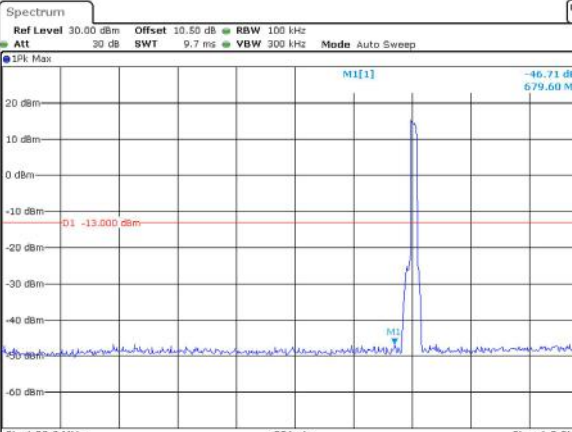
Middle



Date: 14.SEP.2023 01:25:26

Date: 14.SEP.2023 01:25:49

Highest



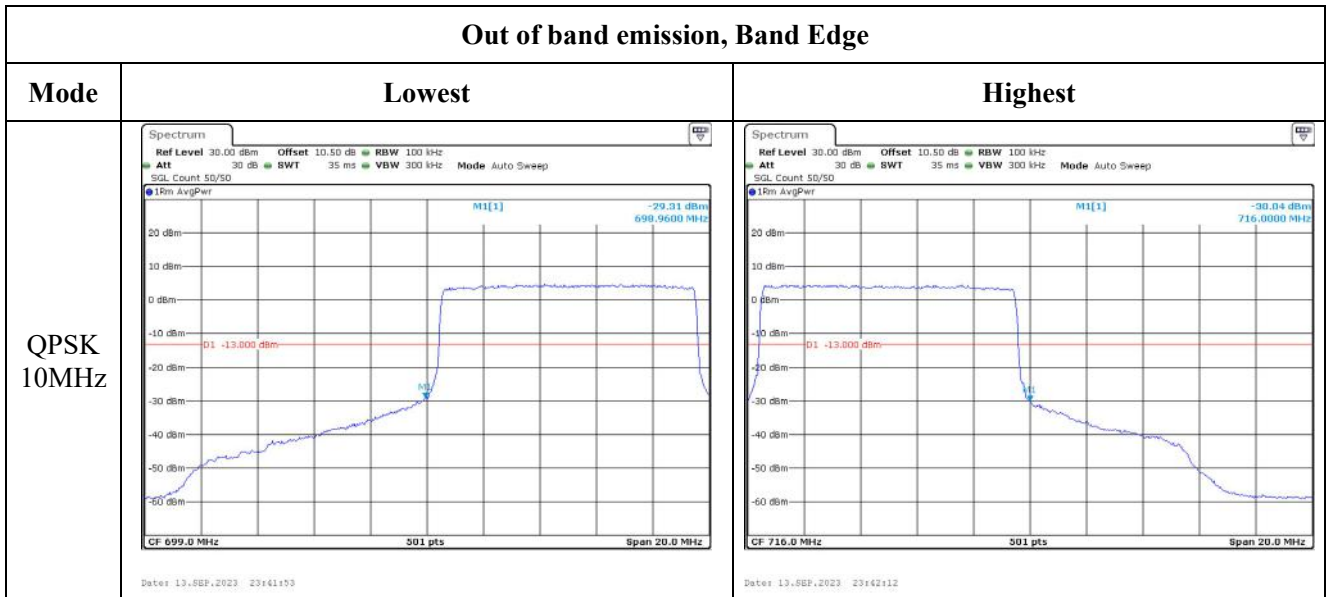
Date: 14.SEP.2023 01:26:15

Date: 14.SEP.2023 01:26:38

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz		
QPSK 3MHz		
QPSK 5MHz		

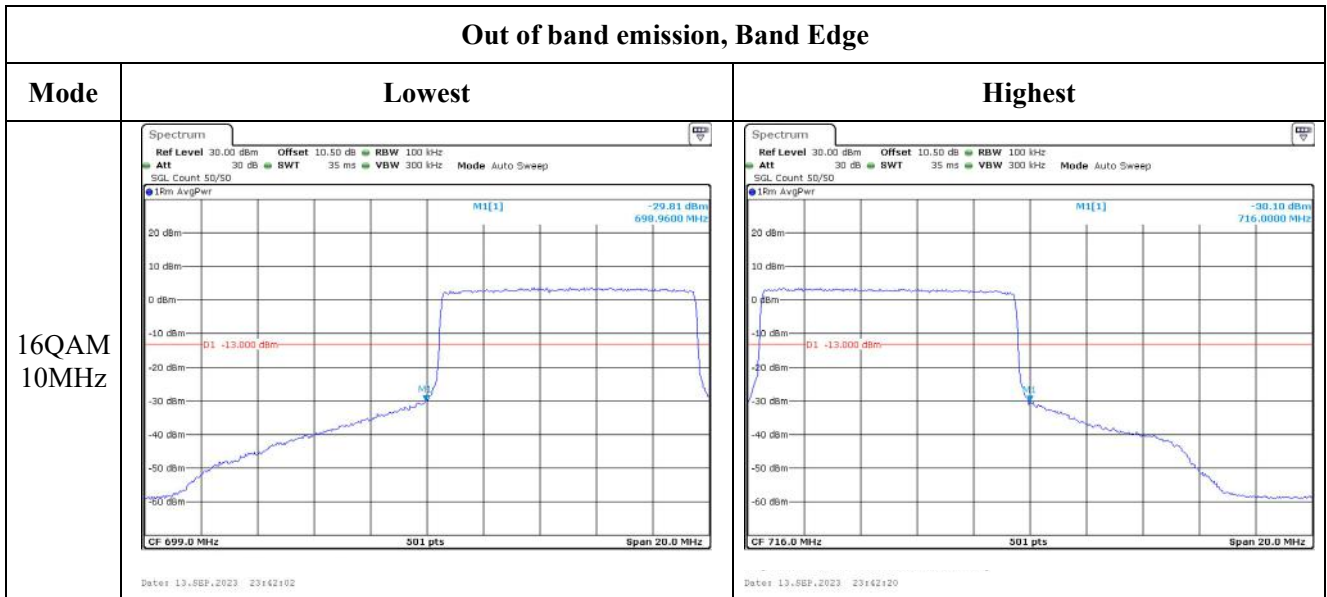
Out of band emission, Band Edge



Out of band emission, Band Edge

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

Out of band emission, Band Edge



4.11 Antenna Port Test Data and Results for LTE Band 13

Serial Number:	294A-2	Test Date:	2023/9/14-2023/12/25
Test Site:	RF	Test Mode:	Transmitting
Tester:	Ken Tang	Test Result:	

Environmental Conditions:

Temperature: (°C)	26.7~28.4	Relative Humidity: (%)	53~58	ATM Pressure: (kPa)	100.2~100.6
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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
UNI-T	Multimeter	UT39A+	C210582554	2023/9/28	2024/9/27
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	779.5	/	784.5
10MHz	/	782	/

Test Data:

FCC§2.1046;§ 27.50(c) (10)						
RF Output Power:						
Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
5MHz QPSK	RB1#0	23.84	/	23.83	18.54	34.77
	RB1#13	23.89	/	23.85		
	RB1#24	23.87	/	23.82		
	RB15#0	22.79	/	22.89		
	RB15#10	22.88	/	22.93		
	RB25#0	22.90	/	22.84		
5MHz 16QAM	RB1#0	23.11	/	22.97	17.87	34.77
	RB1#13	23.22	/	22.97		
	RB1#24	23.16	/	22.98		
	RB15#0	21.78	/	21.89		
	RB15#10	21.89	/	21.97		
	RB25#0	21.87	/	21.93		
10MHz QPSK	RB1#0	/	23.81	/	18.49	34.77
	RB1#25	/	23.84	/		
	RB1#49	/	23.78	/		
	RB25#0	/	22.85	/		
	RB25#25	/	22.91	/		
	RB50#0	/	22.92	/		
10MHz 16QAM	RB1#0	/	22.73	/	17.48	34.77
	RB1#25	/	22.78	/		
	RB1#49	/	22.83	/		
	RB25#0	/	21.93	/		
	RB25#25	/	21.92	/		
	RB50#0	/	22.00	/		

Note:

ERP= Conducted Power(dBm) - Lc(dB) + G_T(dBd)G_T(dBd)=G_T(dBi)-2.15

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	/	9.21	/	13	
	RB50#0	/	6.36	/	13	
10MHz 16QAM	RB1#0	/	5.22	/	13	
	RB50#0	/	6.69	/	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	/	4.531	5	/	5
5MHz 16QAM	4.511	/	4.511	5	/	4.98
10MHz QPSK	/	8.942	/	/	9.72	/
10MHz 16QAM	/	8.942	/	/	9.68	/

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

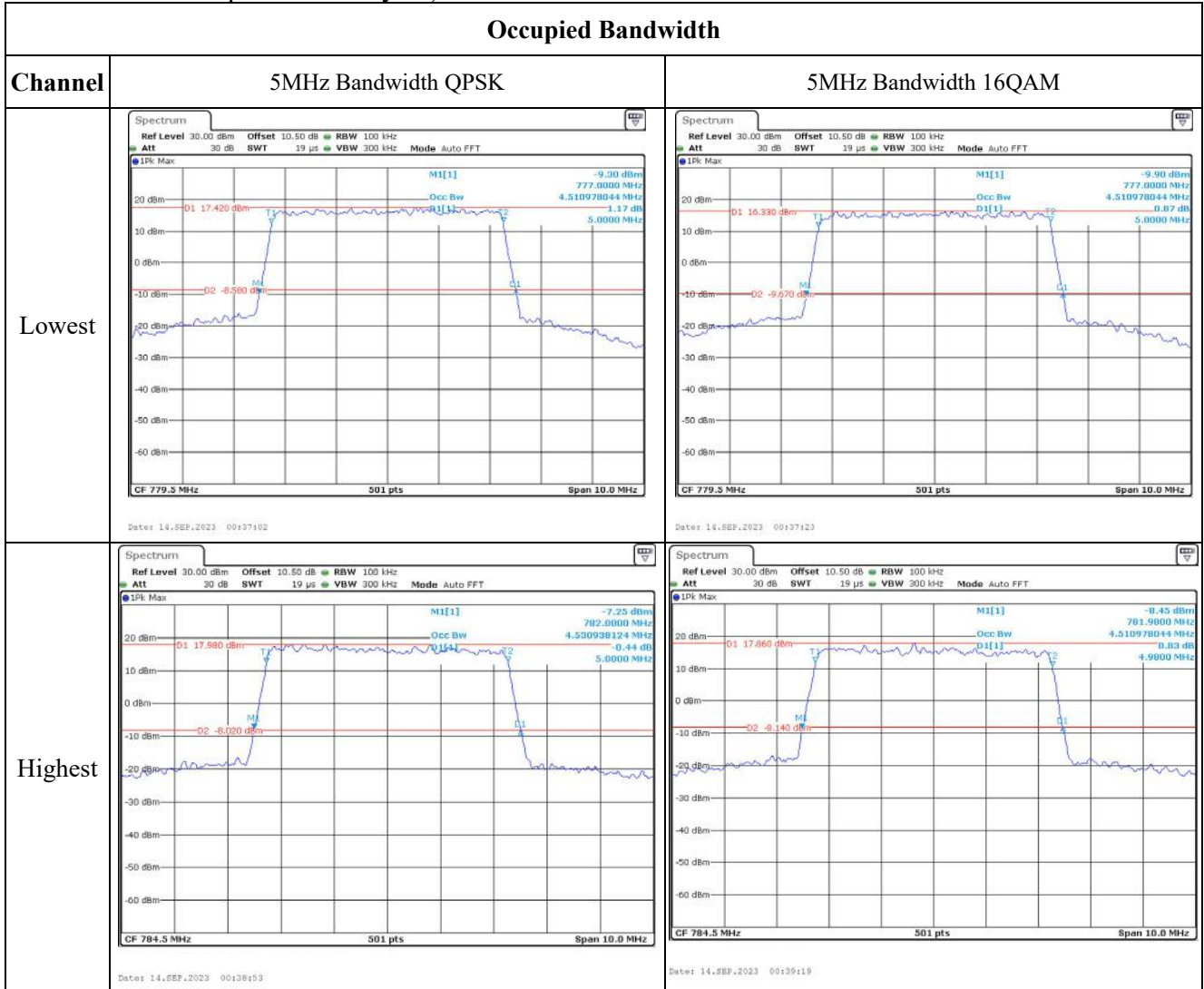
FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal	
Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.

FCC §2.1051, §27.53:Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

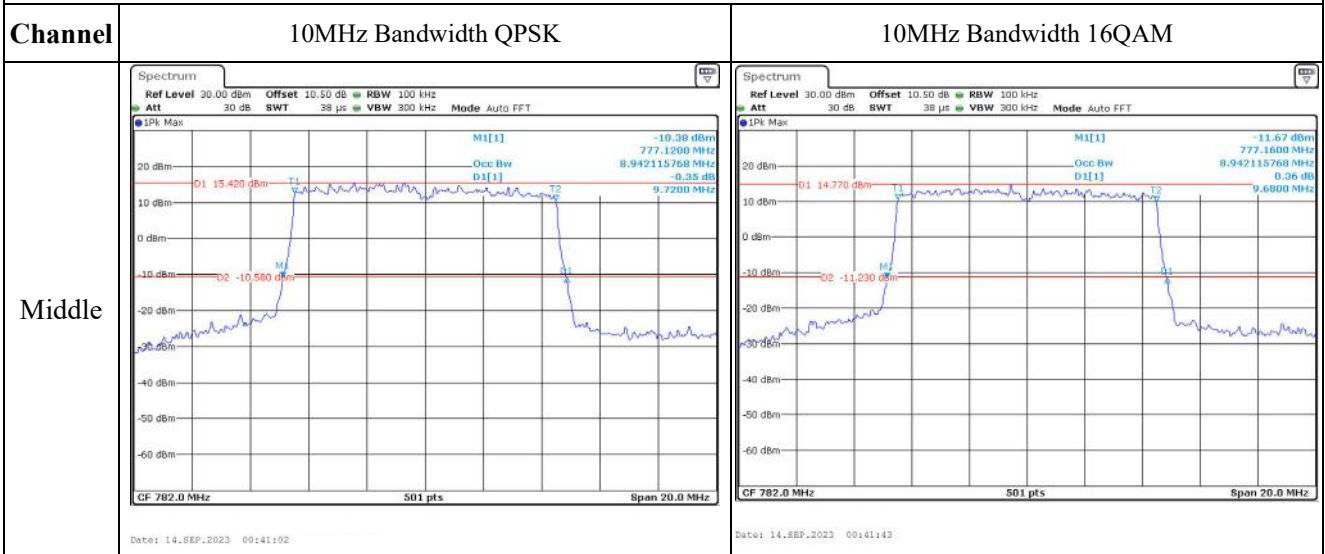
FCC §2.1055, §27.54: Frequency Stability						
Test Mode:	10M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	777.018	777.00	786.986	787.00
	-20	3.85	777.028	777.00	786.990	787.00
	-10	3.85	777.014	777.00	786.972	787.00
	0	3.85	777.017	777.00	786.971	787.00
	10	3.85	777.016	777.00	786.993	787.00
	20	3.85	777.025	777.00	786.999	787.00
	30	3.85	777.017	777.00	786.972	787.00
	40	3.85	777.020	777.00	786.978	787.00
Frequency Stability vs. Voltage	20	3.66	777.003	777.00	786.998	787.00
	20	4.24	777.027	777.00	786.999	787.00
					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	3.85	777.004	777.00	786.980	787.00
	-20	3.85	777.029	777.00	786.993	787.00
	-10	3.85	777.008	777.00	786.982	787.00
	0	3.85	777.025	777.00	786.977	787.00
	10	3.85	777.008	777.00	786.986	787.00
	20	3.85	777.012	777.00	786.980	787.00
	30	3.85	777.001	777.00	786.979	787.00
	40	3.85	777.019	777.00	786.983	787.00
	50	3.85	777.001	777.00	786.986	787.00
Frequency Stability vs. Voltage	20	3.66	777.001	777.00	786.982	787.00
	20	4.24	777.006	777.00	786.984	787.00
					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

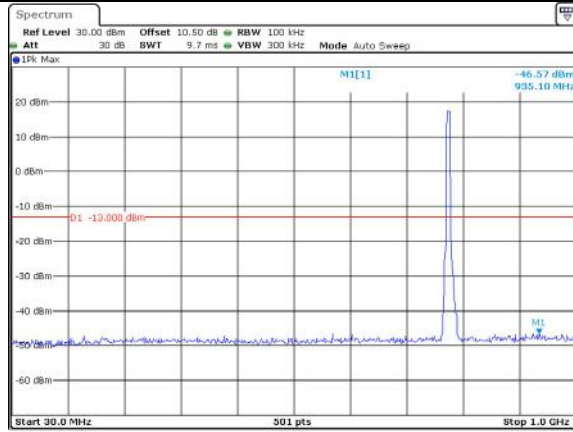


Spurious Emissions at Antenna Terminal

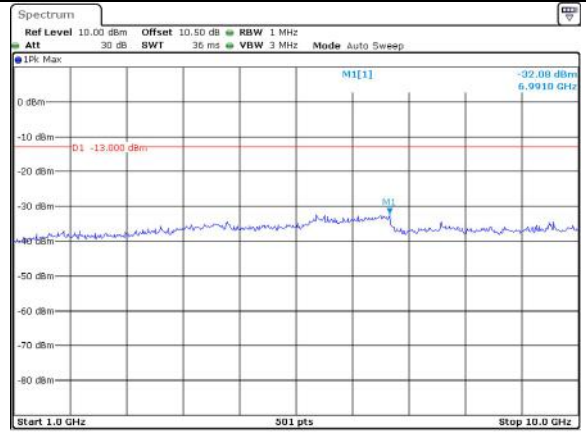
Channel

5MHz Bandwidth QPSK

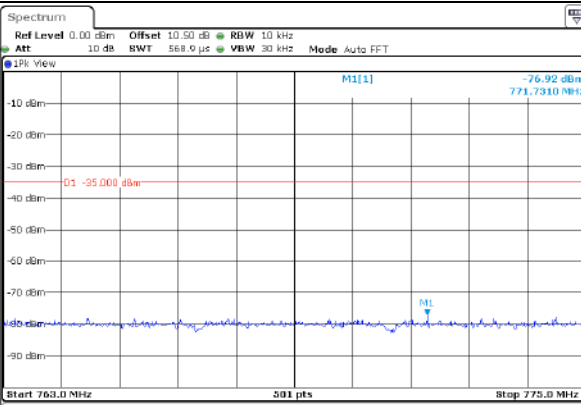
Lowest



Date: 14, SEP, 2023 01:27:12

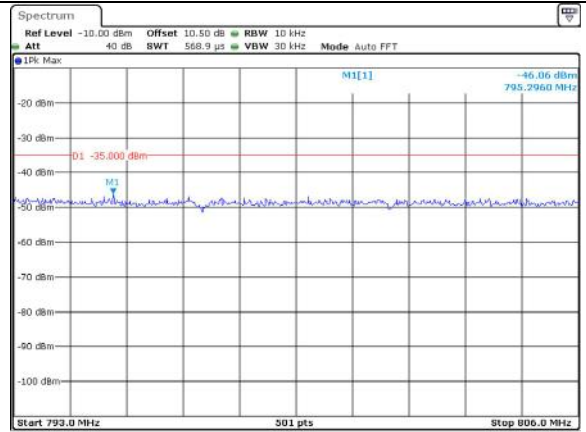


Date: 14, SEP, 2023 01:27:38

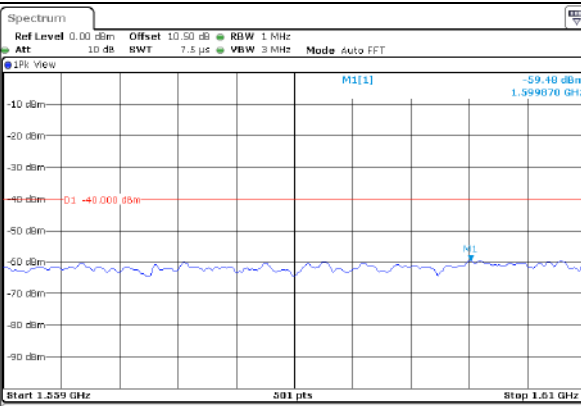


Date: 25, DEC, 2023 20:12:47

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1		771.731 MHz	-76.92 dBm		



Date: 14, SEP, 2023 01:28:31



Date: 25, DEC, 2023 20:08:11

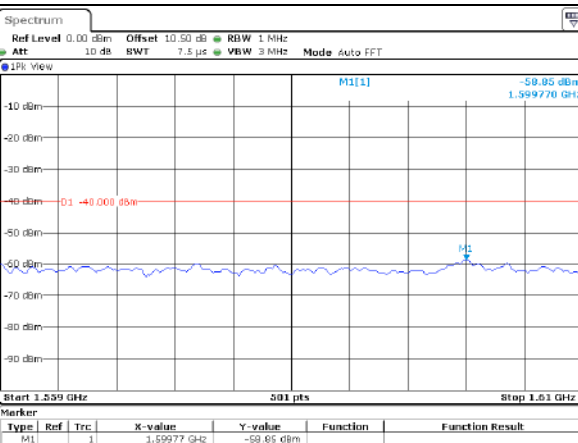
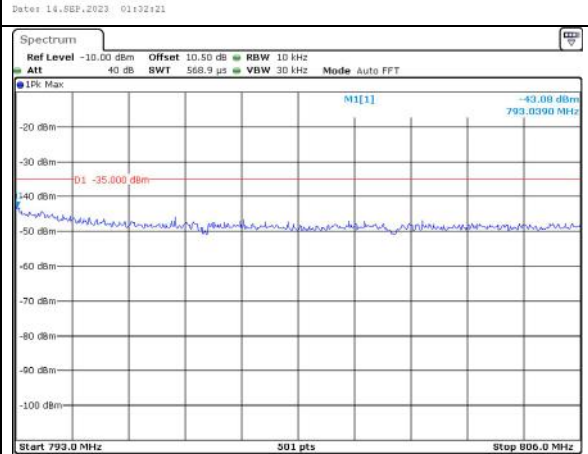
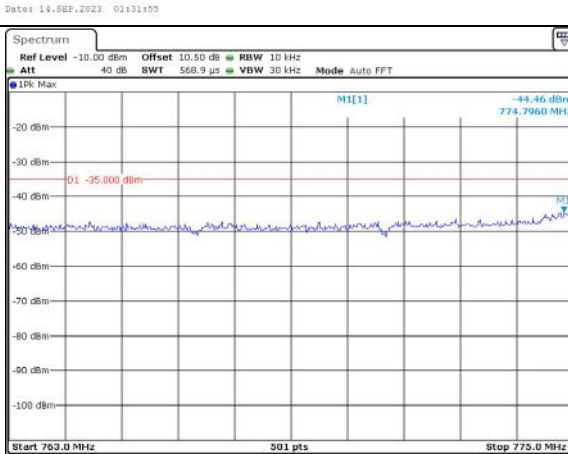
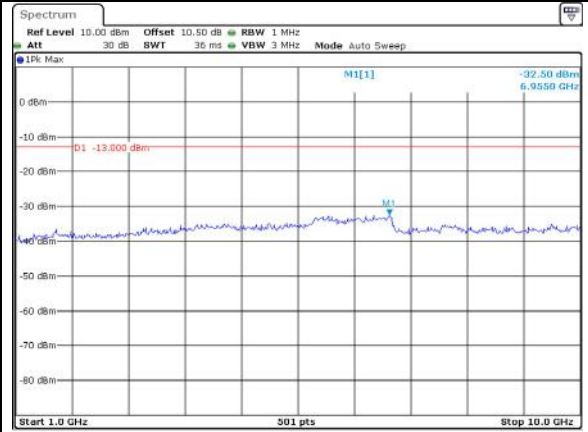
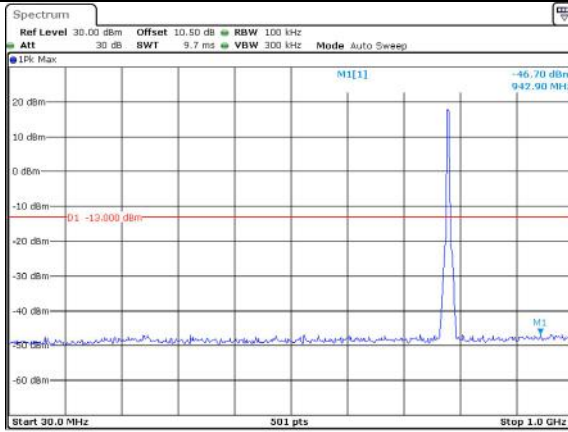
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1		1.59987 GHz	-59.48 dBm		

Spurious Emissions at Antenna Terminal

Channel

5MHz Bandwidth QPSK

Highest

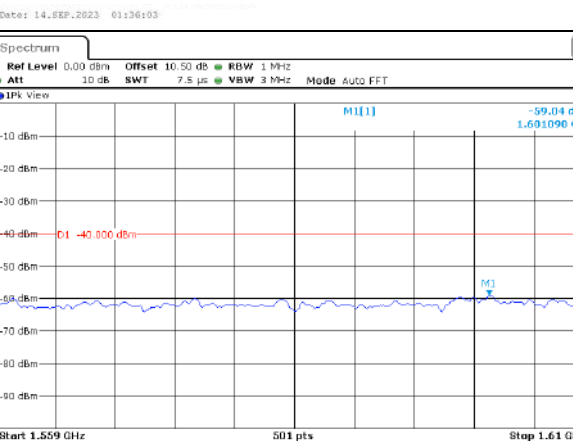
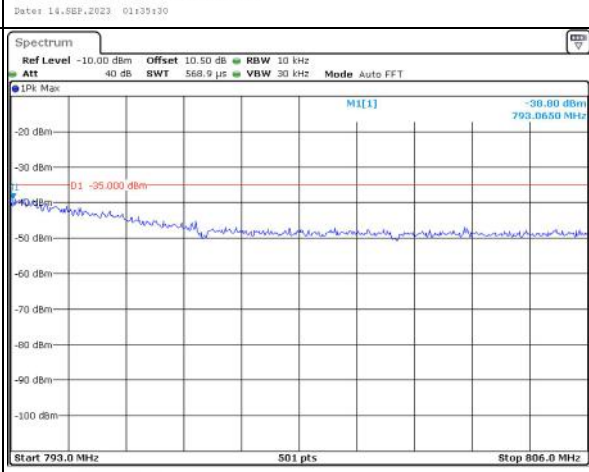
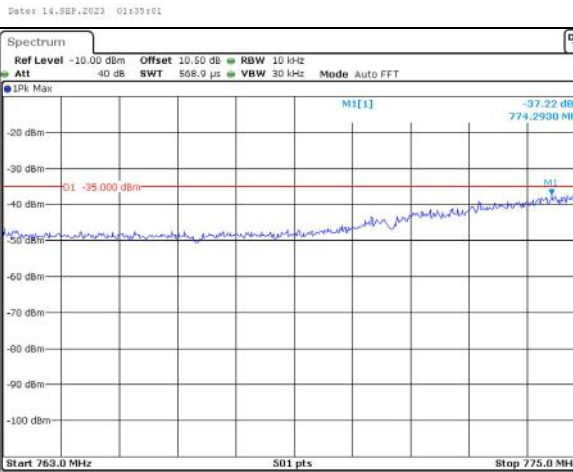
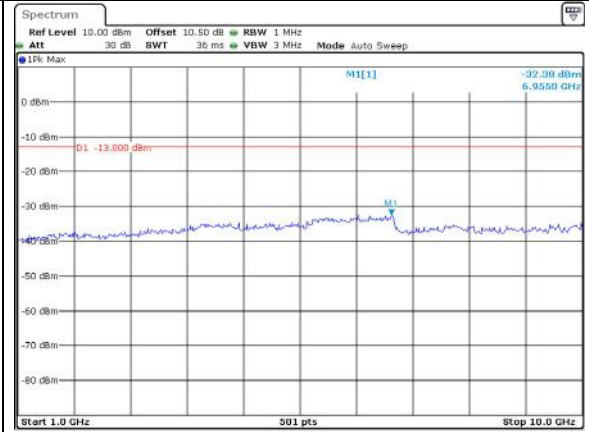
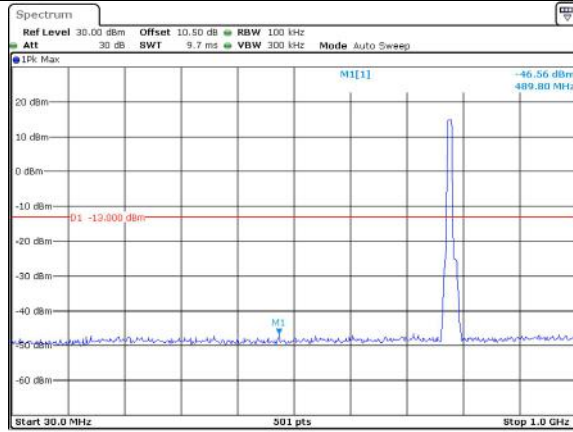


Spurious Emissions at Antenna Terminal

Channel

10MHz Bandwidth QPSK

Middle



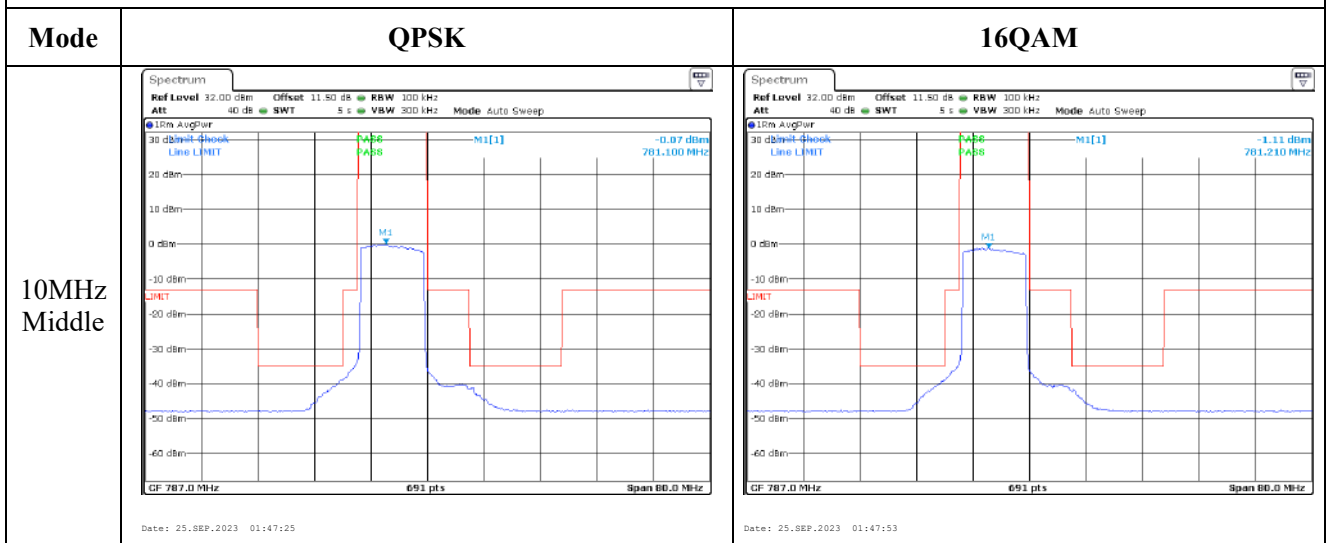
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1			1	1.60109 GHz	-59.04 dBm		

Date: 25. DEC. 2023 20:09:01

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 5MHz		
16QAM 5MHz		

Out of band emission, Band Edge



4.12 Antenna Port Test Data and Results for LTE Band 17

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

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)
5MHz	706.5	710	713.5
10MHz	709	710	711

Test Data:**FCC§2.1046;§ 27.50(c) (10)****RF Output Power:**

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
5MHz QPSK	RB1#0	24.04	24.05	24.09	19.04	34.77
	RB1#13	23.94	24.02	24.02		
	RB1#24	23.90	23.98	23.84		
	RB15#0	23.03	23.09	23.06		
	RB15#10	23.00	23.02	23.02		
	RB25#0	23.08	22.99	23.05		
5MHz 16QAM	RB1#0	23.36	23.13	23.00	18.31	34.77
	RB1#13	23.32	23.15	23.07		
	RB1#24	23.19	23.08	22.79		
	RB15#0	22.02	22.10	22.10		
	RB15#10	22.05	22.06	22.06		
	RB25#0	22.06	22.09	22.15		
10MHz QPSK	RB1#0	23.97	23.99	24.07	19.02	34.77
	RB1#25	23.91	23.97	23.96		
	RB1#49	23.95	23.89	23.91		
	RB25#0	23.06	23.03	23.06		
	RB25#25	23.01	23.04	23.02		
	RB50#0	23.01	23.01	23.04		
10MHz 16QAM	RB1#0	23.20	23.22	23.79	18.74	34.77
	RB1#25	23.10	23.02	23.76		
	RB1#49	23.17	22.91	23.65		
	RB25#0	22.10	22.18	22.14		
	RB25#25	22.08	22.13	22.08		
	RB50#0	22.00	22.05	22.04		

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	7.44	9.42	9.84	13
	RB50#0	7.66	9.98	7.77	13
10MHz 16QAM	RB1#0	7.59	7.08	7.11	13
	RB50#0	8.87	9.16	7.66	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	4.980	5.020
5MHz 16QAM	4.511	4.511	4.511	5.000	5.040	5.000
10MHz QPSK	8.942	8.942	8.942	9.680	9.720	9.680
10MHz 16QAM	8.982	8.942	8.942	9.720	9.600	9.640
Note: The test plots please refer to the Plots of Occupied Bandwidth						

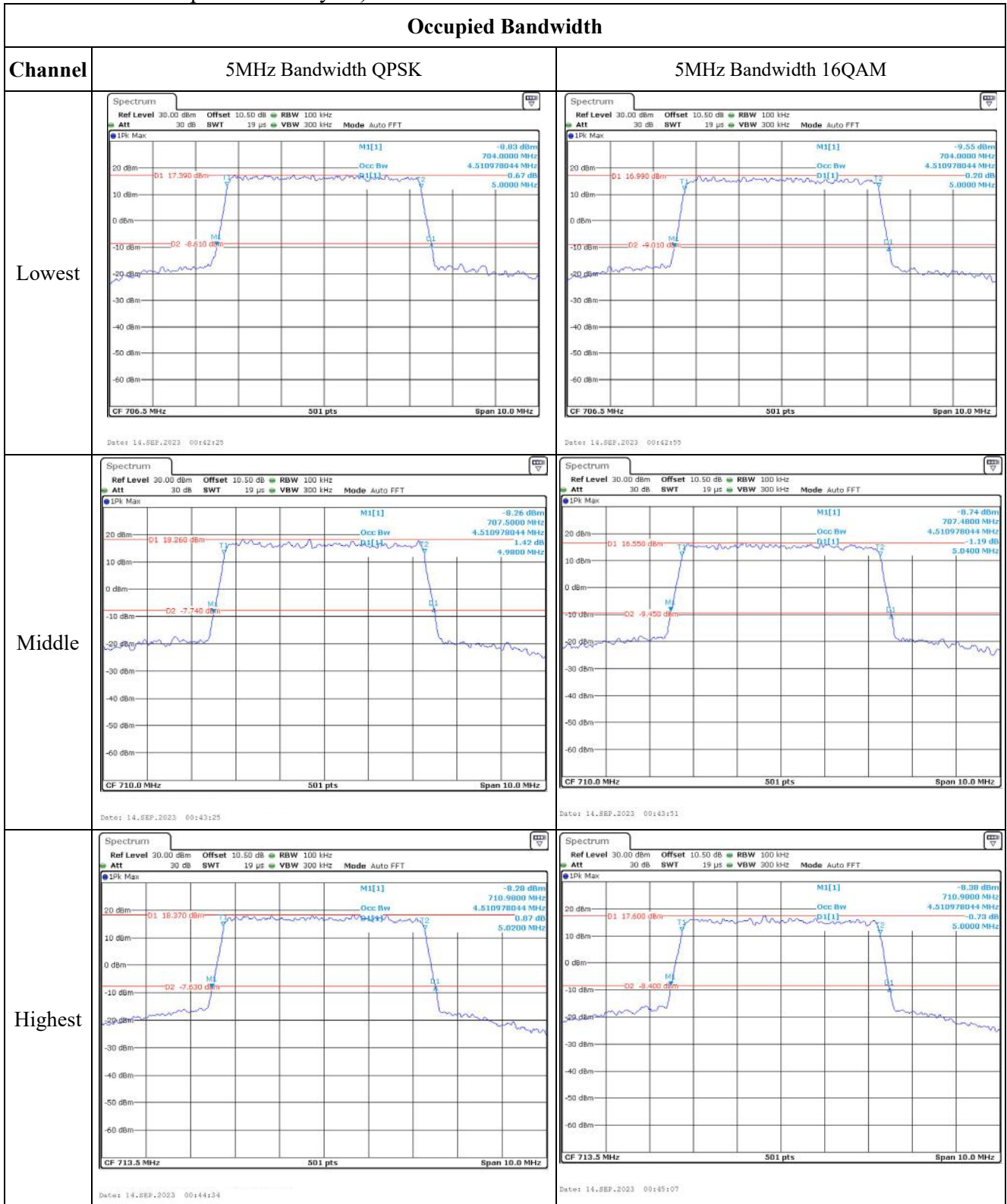
FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal	
Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.

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:	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	3.85	704.022	704.00	715.997	716.00
	-20	3.85	704.029	704.00	715.975	716.00
	-10	3.85	704.007	704.00	715.972	716.00
	0	3.85	704.024	704.00	715.986	716.00
	10	3.85	704.021	704.00	715.973	716.00
	20	3.85	704.023	704.00	715.983	716.00
	30	3.85	704.026	704.00	715.979	716.00
	40	3.85	704.013	704.00	715.999	716.00
	50	3.85	704.006	704.00	715.994	716.00
Frequency Stability vs. Voltage	20	3.66	704.018	704.00	715.986	716.00
	20	4.24	704.004	704.00	715.999	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	3.85	704.011	704.00	715.993	716.00
	-20	3.85	704.008	704.00	715.982	716.00
	-10	3.85	704.014	704.00	715.995	716.00
	0	3.85	704.020	704.00	715.984	716.00
	10	3.85	704.019	704.00	715.982	716.00
	20	3.85	704.003	704.00	715.998	716.00
	30	3.85	704.016	704.00	715.998	716.00
	40	3.85	704.027	704.00	715.993	716.00
	50	3.85	704.007	704.00	715.991	716.00
Frequency Stability vs. Voltage	20	3.66	704.026	704.00	715.980	716.00
	20	4.24	704.014	704.00	715.980	716.00
					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

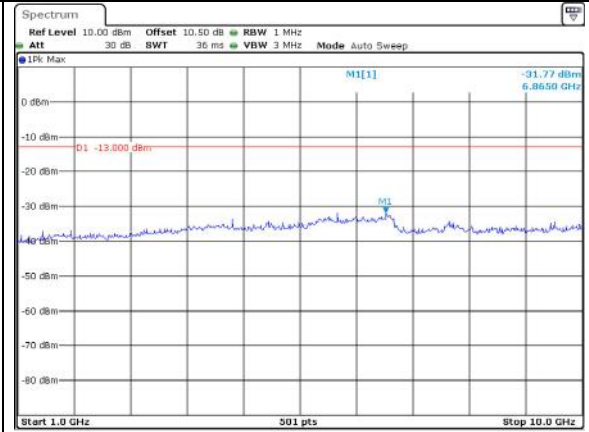
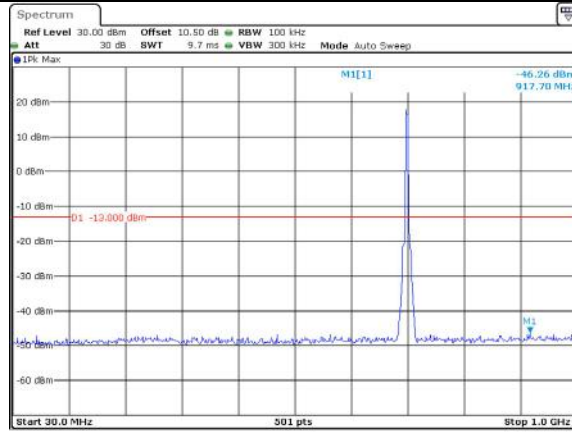
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>MI[1] -9.94 dBm 704.1600 MHz -Occ Bw 8.942115768 MHz -0.45 dB D1[1] -19.320 dBm D2 -10.680 dBm</p> <p>CF 709.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:05:29</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>MI[1] -12.62 dBm 704.1200 MHz -Occ Bw 8.982035928 MHz 1.53 dB D1[1] -14.150 dBm D2 -11.640 dBm</p> <p>CF 709.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:06:01</p>
Middle	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>MI[1] -10.63 dBm 705.1200 MHz -Occ Bw 8.942115768 MHz -0.39 dB D1[1] -14.800 dBm D2 -11.200 dBm</p> <p>CF 710.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:06:35</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>MI[1] -10.95 dBm 705.2000 MHz -Occ Bw 8.942115768 MHz 0.15 dB D1[1] -15.200 dBm D2 -10.720 dBm</p> <p>CF 710.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:07:04</p>
Highest	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>MI[1] -10.55 dBm 706.1600 MHz -Occ Bw 8.942115768 MHz -0.07 dB D1[1] -15.760 dBm D2 -10.240 dBm</p> <p>CF 711.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:07:41</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>MI[1] -10.95 dBm 706.1600 MHz -Occ Bw 8.942115768 MHz 0.06 dB D1[1] -14.860 dBm D2 -11.340 dBm</p> <p>CF 711.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:08:10</p>

Spurious Emissions at Antenna Terminal

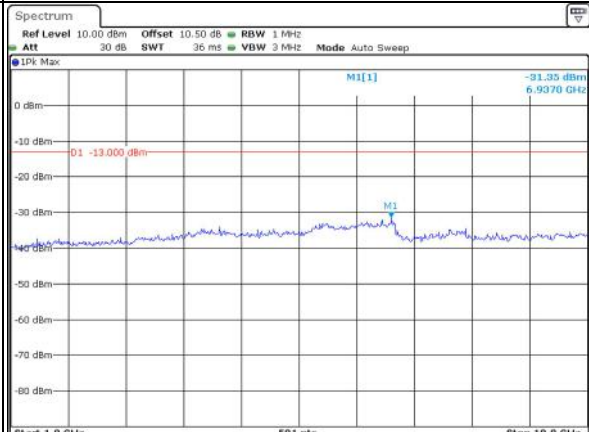
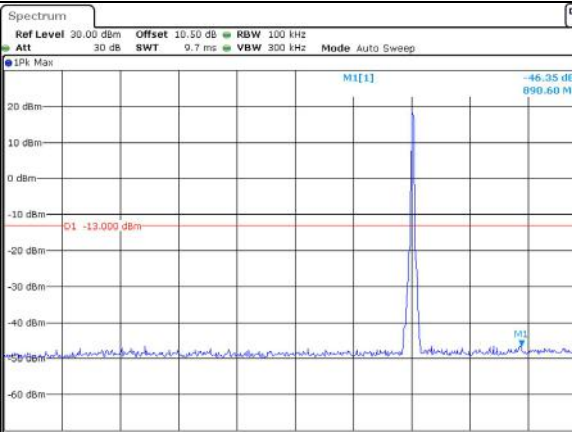
Channel

5MHz Bandwidth QPSK

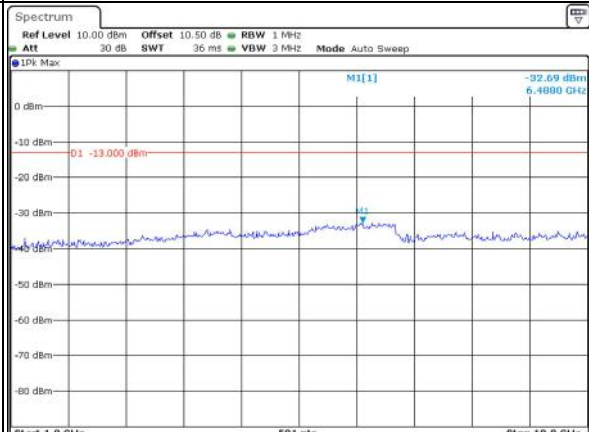
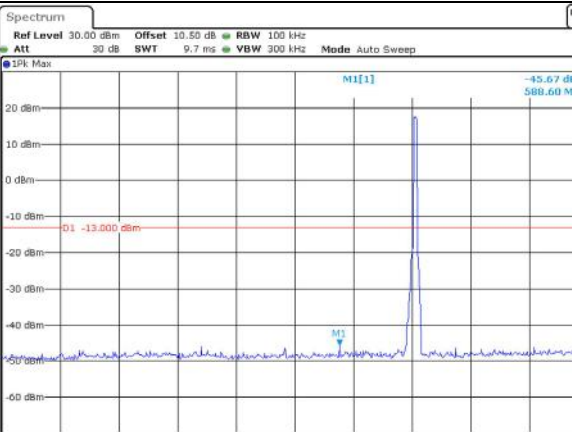
Lowest



Middle



Highest



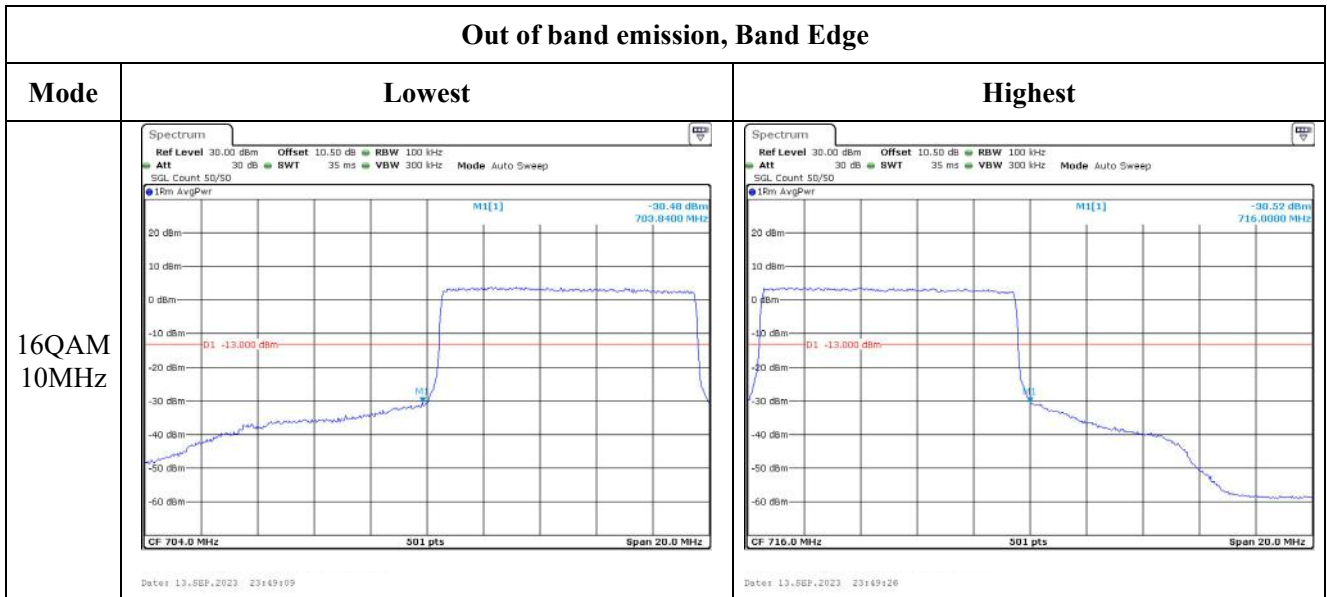
Spurious Emissions at Antenna Terminal

Channel	10MHz Bandwidth QPSK	
Lowest	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -46.24 dBm 743.30 MHz</p> <p>01 -13.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>Date: 14.SEP.2023 01:40:35</p>	<p>Ref Level 10.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 36 ms VBW 3 MHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -32.62 dBm 6.9370 GHz</p> <p>01 -13.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 10.0 GHz</p> <p>Date: 14.SEP.2023 01:41:01</p>
Middle	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -46.44 dBm 840.30 MHz</p> <p>01 -13.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>Date: 14.SEP.2023 01:41:24</p>	<p>Ref Level 10.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 36 ms VBW 3 MHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -31.69 dBm 6.9910 GHz</p> <p>01 -13.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 10.0 GHz</p> <p>Date: 14.SEP.2023 01:41:47</p>
Highest	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -46.24 dBm 962.20 MHz</p> <p>01 -13.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>Date: 14.SEP.2023 01:42:20</p>	<p>Ref Level 10.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 36 ms VBW 3 MHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -32.05 dBm 6.9190 GHz</p> <p>01 -13.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 10.0 GHz</p> <p>Date: 14.SEP.2023 01:42:49</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 5MHz	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -22.96 dBm 704.0000 MHz CF 704.0 MHz 501 pts Span 10.0 MHz Date: 13_SEP_2023 23:47:31</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -24.11 dBm 716.0000 MHz CF 716.0 MHz 501 pts Span 10.0 MHz Date: 13_SEP_2023 23:47:47</p>
QPSK 10MHz	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -30.90 dBm 704.0000 MHz CF 704.0 MHz 501 pts Span 20.0 MHz Date: 13_SEP_2023 23:49:01</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -30.23 dBm 716.0000 MHz CF 716.0 MHz 501 pts Span 20.0 MHz Date: 13_SEP_2023 23:49:18</p>
16QAM 5MHz	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -23.62 dBm 704.0000 MHz CF 704.0 MHz 501 pts Span 10.0 MHz Date: 13_SEP_2023 23:47:39</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -24.59 dBm 716.0000 MHz CF 716.0 MHz 501 pts Span 10.0 MHz Date: 13_SEP_2023 23:47:54</p>

Out of band emission, Band Edge



4.14 Antenna Port Test Data and Results for LTE Band 26

Serial Number:	294A-2	Test Date:	2023/9/14-2024/01/11
Test Site:	RF	Test Mode:	Transmitting
Tester:	Ken Tang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	26.7~28.4	Relative Humidity: (%)	53~58	ATM Pressure: (kPa)	100.2~100.6
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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
UNI-T	Multimeter	UT39A+	C210582554	2023/9/28	2024/9/27
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 For 90S (MHz)	Highest Frequency For 90S (MHz)	Channel Cross 90S and 22H	Lowest Frequency For 22H (MHz)	Middle Frequency For 22H (MHz)	Highest Frequency For 22H (MHz)
1.4MHz	814.7	823.3	824	824.7	831.5	848.3
3MHz	815.5	822.5	824	825.5	831.5	847.5
5MHz	816.5	821.5	824	826.5	831.5	846.5
10MHz	819	/	824	829	831.5	844
15MHz	821.5	/	824	831.5	836.5	841.5

Note: 15MHz bandwidth 821.5MHz cross Rules 90S and 22H.

4.14.1 Test Data for Part 90S:**FCC§2.1046; § 90.635****RF Output Power:**

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel For 90S	Highest Channel For 90S	Cross Channel		
1.4MHz QPSK	RB1#0	23.96	23.85	23.75	18.02	50
	RB1#3	23.93	23.97	23.84		
	RB1#5	23.89	23.88	23.78		
	RB3#0	23.89	23.85	23.68		
	RB3#3	23.88	23.85	23.76		
	RB6#0	22.92	22.83	22.77		
1.4MHz 16QAM	RB1#0	23.15	23.08	22.82	17.29	50
	RB1#3	23.16	23.24	22.85		
	RB1#5	23.18	23.03	22.92		
	RB3#0	23.10	22.86	22.87		
	RB3#3	23.10	22.87	22.87		
	RB6#0	21.99	21.91	21.82		
3MHz QPSK	RB1#0	24.02	23.90	23.84	18.11	50
	RB1#8	24.06	23.97	23.84		
	RB1#14	23.98	23.90	23.70		
	RB6#0	23.03	22.93	22.93		
	RB6#9	23.01	22.99	22.88		
	RB15#0	23.05	22.93	22.89		
3MHz 16QAM	RB1#0	23.13	23.02	23.47	17.66	50
	RB1#8	23.23	22.98	23.61		
	RB1#14	23.16	22.96	23.40		
	RB6#0	22.12	21.89	22.01		
	RB6#9	22.15	22.05	21.97		
	RB15#0	21.95	21.97	22.01		
5MHz QPSK	RB1#0	24.04	23.96	23.89	18.09	50
	RB1#13	24.03	23.98	23.88		
	RB1#24	23.96	23.99	23.78		
	RB15#0	23.05	22.94	22.95		
	RB15#10	23.01	23.02	22.92		
	RB25#0	23.02	22.92	22.92		
5MHz 16QAM	RB1#0	23.29	23.12	22.84	17.34	50
	RB1#13	23.25	23.17	22.96		
	RB1#24	23.27	23.11	22.78		
	RB15#0	21.99	21.94	21.98		
	RB15#10	21.98	22.06	21.94		
	RB25#0	21.99	22.00	22.02		
10MHz QPSK	RB1#0	23.78	/	23.79	17.84	50

	RB1#25	23.77	/	23.67		
	RB1#49	23.68	/	23.78		
	RB25#0	22.95	/	22.97		
	RB25#25	23.26	/	23.21		
	RB50#0	22.94	/	23.22		
10MHz 16QAM	RB1#0	23.27	/	23.23	17.49	50
	RB1#25	23.44	/	23.31		
	RB1#49	23.13	/	23.25		
	RB25#0	22.20	/	22.07		
	RB25#25	22.06	/	22.22		
	RB50#0	22.11	/	22.24		
15MHz QPSK	RB1#0	23.76	/	23.64	17.94	50
	RB1#38	23.68	/	23.69		
	RB1#74	23.83	/	23.89		
	RB36#0	23.15	/	22.95		
	RB36#39	23.04	/	23.21		
	RB75#0	23.13	/	23.08		
15MHz 16QAM	RB1#0	23.21	/	23.23	17.47	50
	RB1#38	23.42	/	23.40		
	RB1#74	23.20	/	23.31		
	RB36#0	21.98	/	22.22		
	RB36#39	22.34	/	22.33		
	RB75#0	22.24	/	22.18		

Note:

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

Gr(dBd)=Gr(dBi)-2.15

Result:**Pass****FCC §2.1049, §90.209: Occupied Bandwidth**

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Lowest For 90S	Highest For 90S	Cross	Lowest For 90S	Highest For 90S	Cross
1.4MHz QPSK	1.102	1.084	1.084	1.242	1.218	1.204
1.4MHz 16QAM	1.09	1.078	1.096	1.21	1.188	1.252
3MHz QPSK	2.695	2.695	2.695	2.952	2.952	2.946
3MHz 16QAM	2.683	2.695	2.683	2.964	2.976	2.982
5MHz QPSK	4.511	4.511	4.511	5.000	5.000	5.010
5MHz 16QAM	4.511	4.511	4.511	5.020	4.980	4.990
10MHz QPSK	8.942	/	8.942	9.720	/	9.701
10MHz 16QAM	8.942	/	8.942	9.680	/	9.621
15MHz QPSK	13.487	/	13.533	14.356	/	14.85
15MHz 16QAM	13.487	/	13.533	14.416	/	14.671

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

FCC §2.1051, §90.691: Spurious Emissions at Antenna Terminal

Result:	Pass, please refer to the test plots of Spurious Emissions at Antenna Terminal.
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FCC §2.1051, §90.691: Out of band emission, Band Edge**Result:** Pass, please refer to the test plots of Out of band emission, Band Edge.**FCC §2.1055, §90.213: Frequency Stability**

Test Modulation:	15 MHz QPSK		Test Channel:	821.5	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.85	115.38	0.139	2.5
	-20	3.85	112.419	0.135	2.5
	-10	3.85	110.699	0.133	2.5
	0	3.85	114.758	0.138	2.5
	10	3.85	116.488	0.140	2.5
	20	3.85	116.159	0.140	2.5
	30	3.85	115.338	0.139	2.5
	40	3.85	100.135	0.120	2.5
Frequency Stability vs. Voltage	20	3.66	110.681	0.133	2.5
	20	4.24	108.039	0.130	2.5
Result:				Pass	

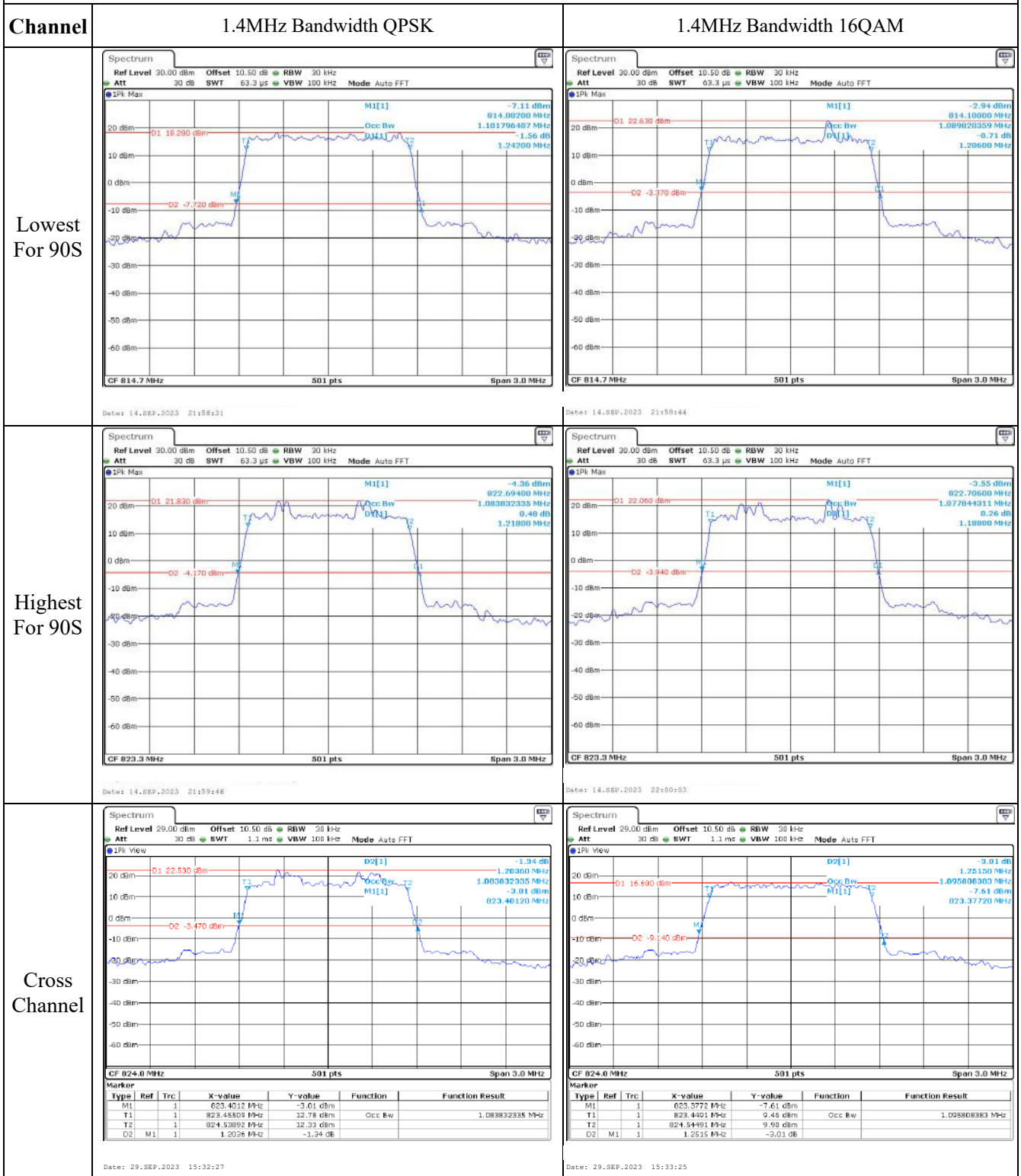
FCC §2.1055, §90.213: Frequency Stability

Test Modulation:	15 MHz 16QAM		Test Channel:	821.5	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.85	100.829	0.121	2.5
	-20	3.85	118.642	0.143	2.5
	-10	3.85	105.235	0.127	2.5
	0	3.85	115.138	0.138	2.5
	10	3.85	101.542	0.122	2.5
	20	3.85	107.249	0.129	2.5
	30	3.85	102.629	0.123	2.5
	40	3.85	105.595	0.127	2.5
Frequency Stability vs. Voltage	20	3.66	115.176	0.139	2.5
	20	4.24	119.772	0.144	2.5
Result:				Pass	

4.14.2 Test Plots for Part 90S:

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

Occupied Bandwidth



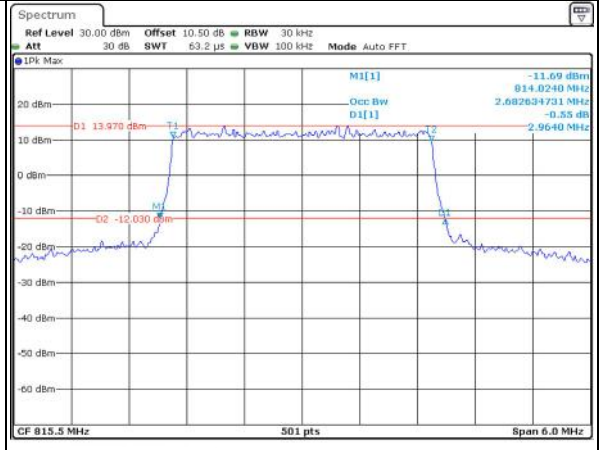
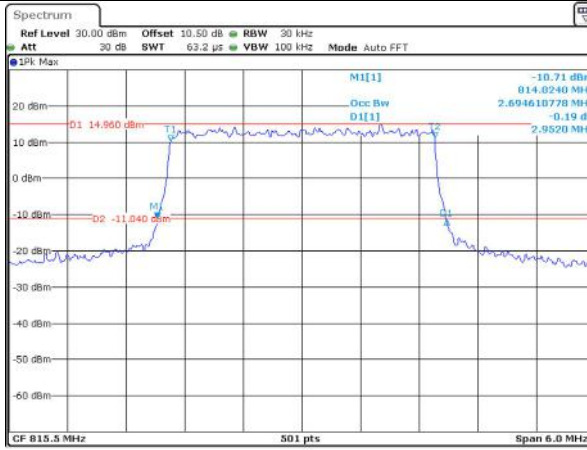
Occupied Bandwidth

Channel

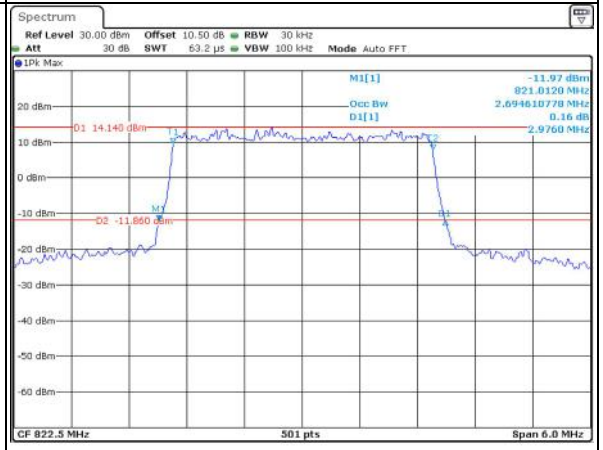
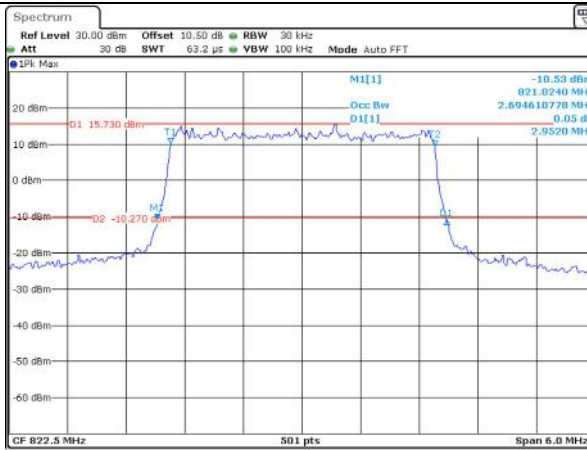
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

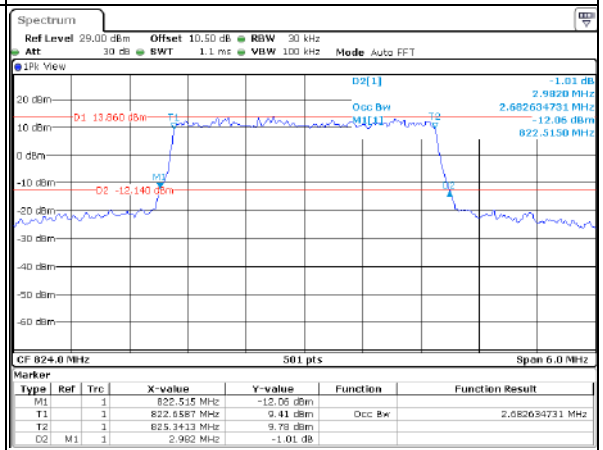
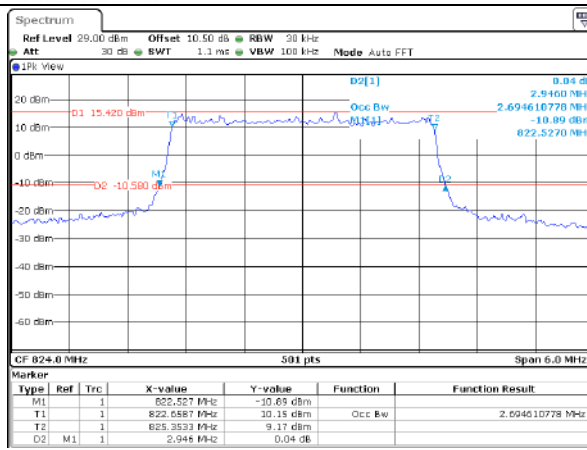
Lowest For 90S



Highest For 90S



Cross Channel



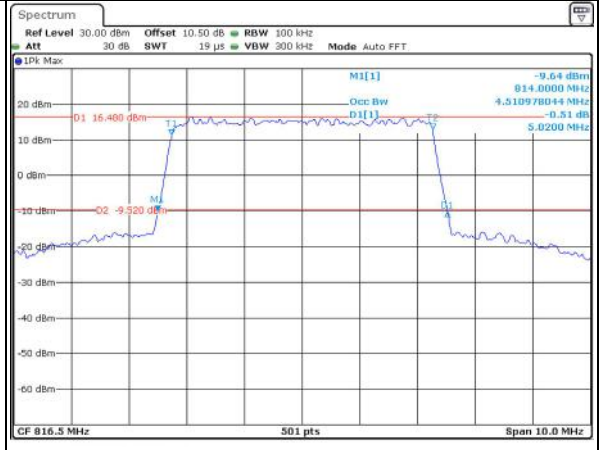
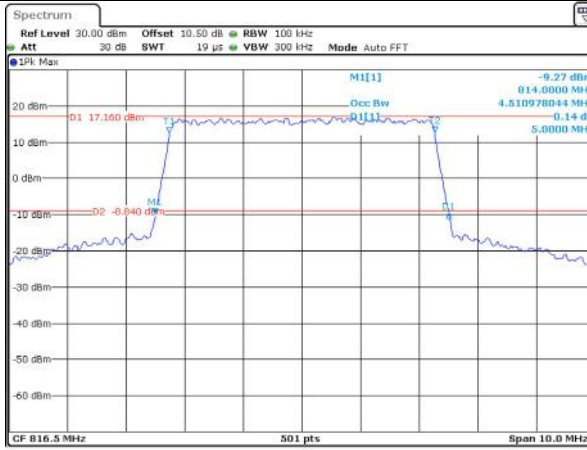
Occupied Bandwidth

Channel

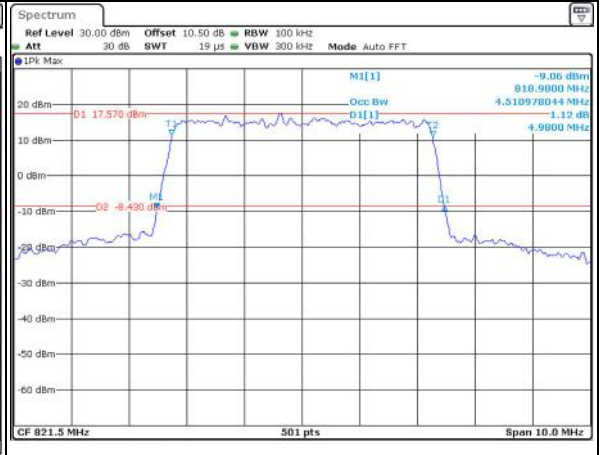
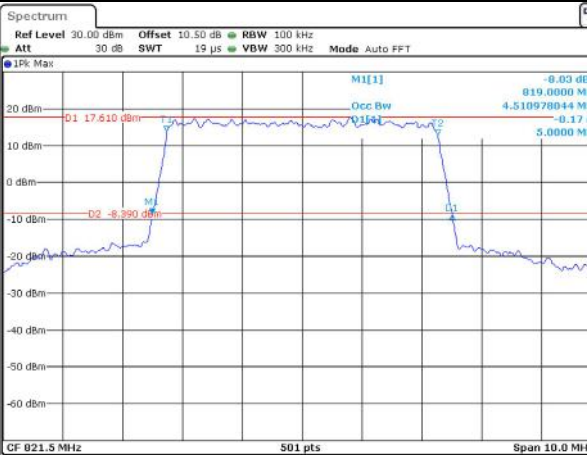
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

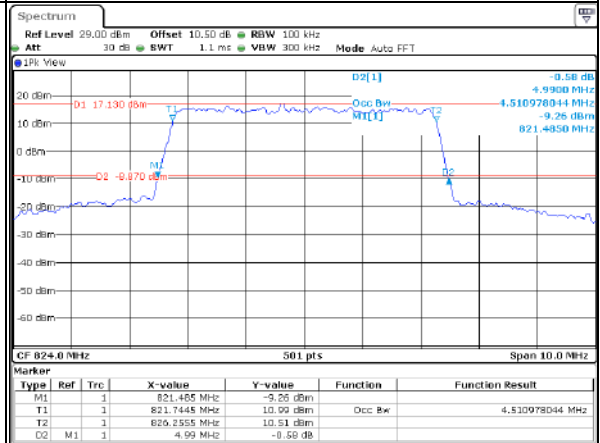
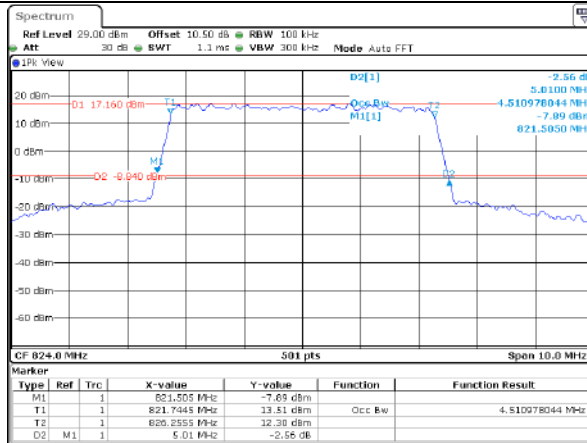
Lowest For 90S



Highest For 90S



Cross Channel



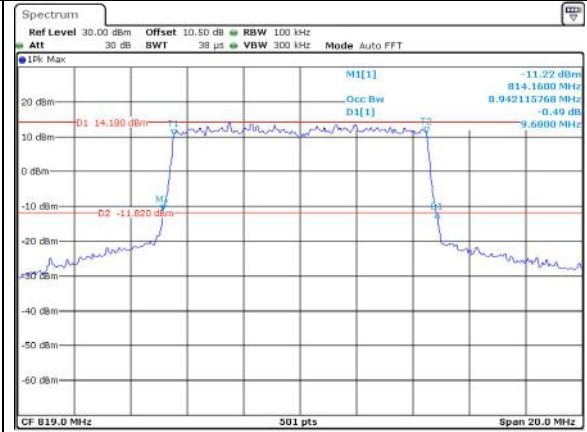
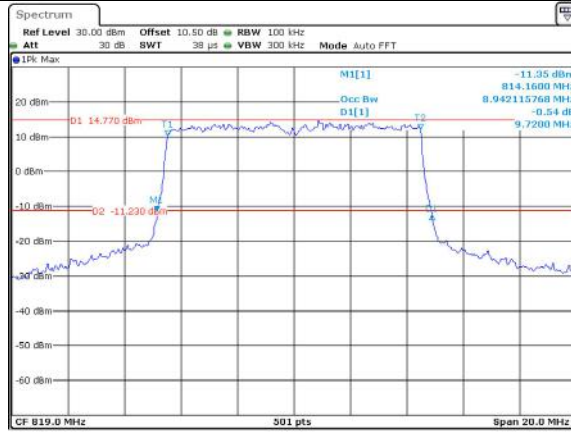
Occupied Bandwidth

Channel

10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

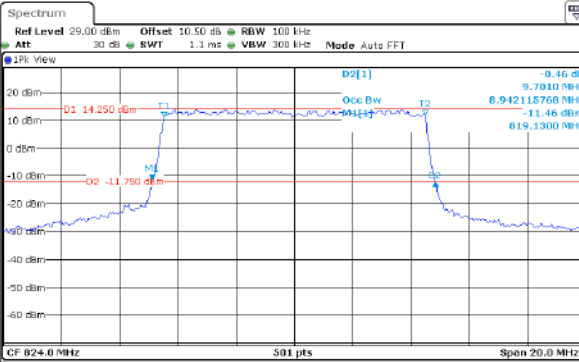
Lowest For 90S



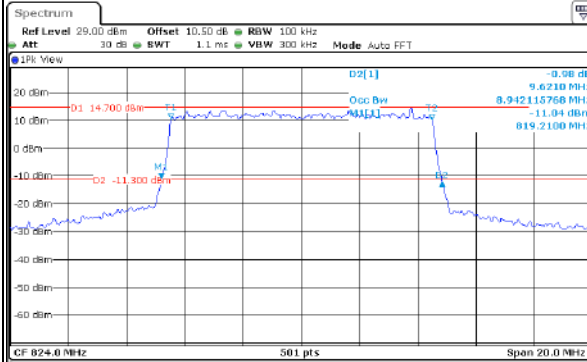
Date: 14.SEP.2023 22:04:37

Date: 14.SEP.2023 22:05:10

Cross Channel



Date: 29.SEP.2023 15:42:54



Date: 29.SEP.2023 15:41:55

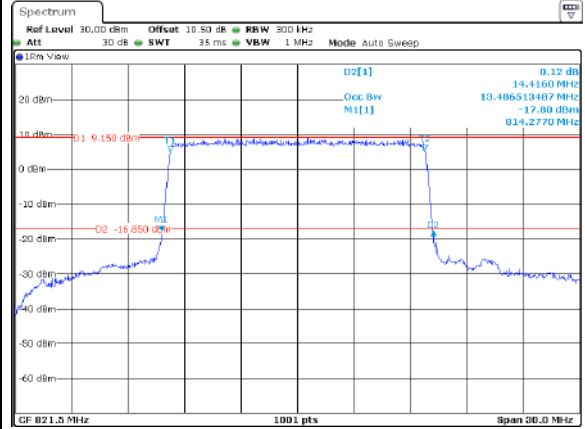
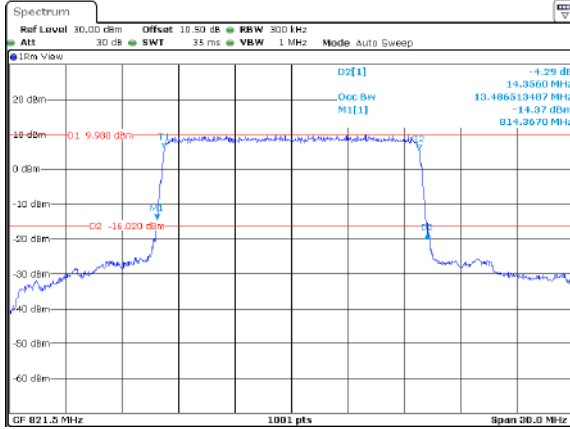
Occupied Bandwidth

Channel

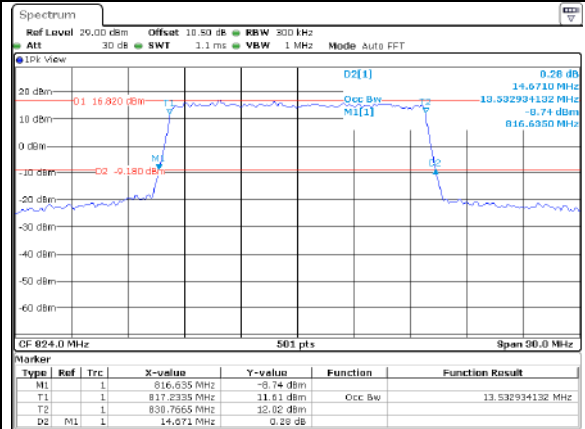
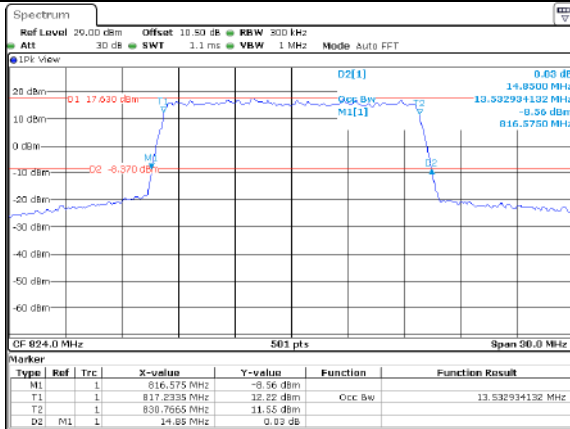
15MHz Bandwidth QPSK

15MHz Bandwidth 16QAM

Middle For 90S



Cross Channel

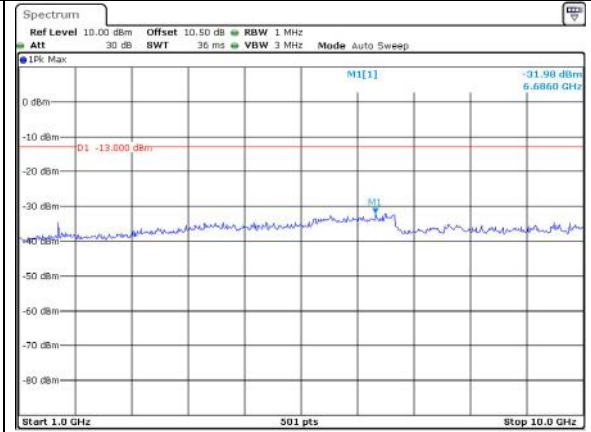
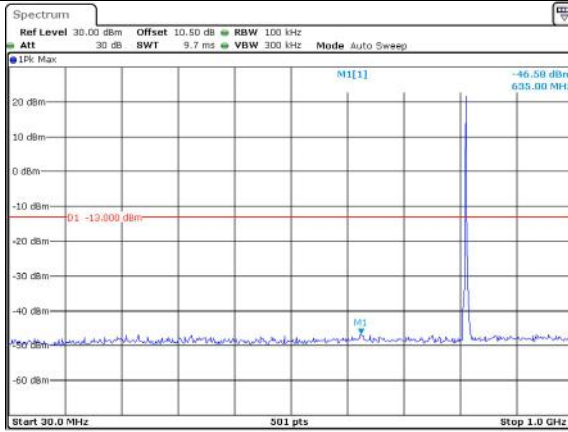


Spurious Emissions at Antenna Terminal

Channel

1.4MHz Bandwidth QPSK

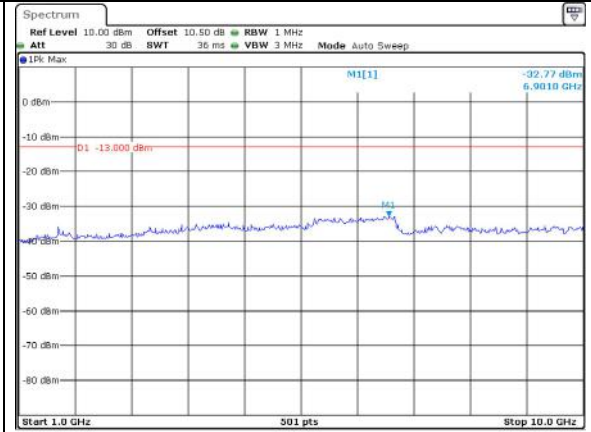
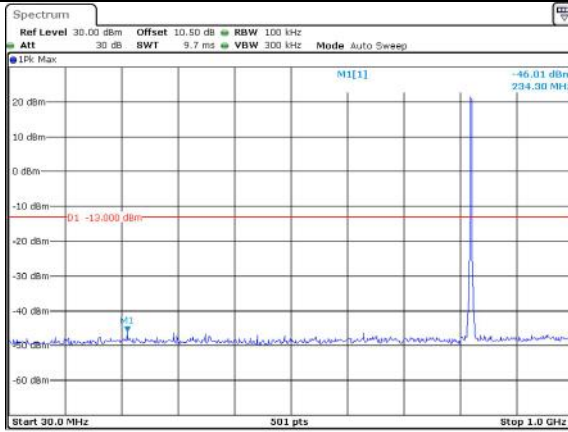
Lowest For 90S



Date: 14_SEP,2023 22:07:40

Date: 14_SEP,2023 22:08:06

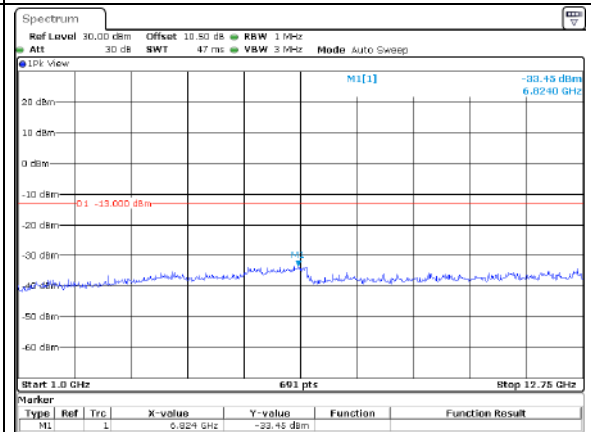
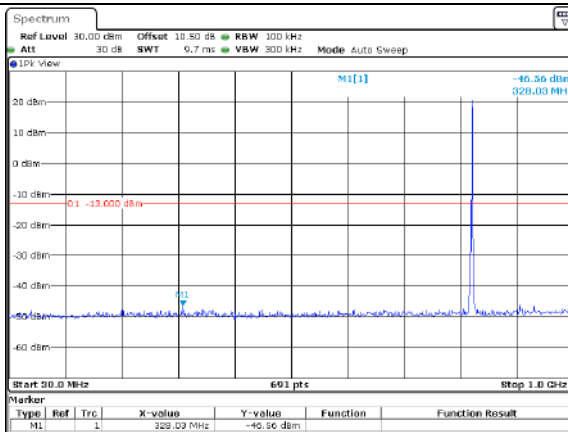
Highest For 90S



Date: 14_SEP,2023 22:09:39

Date: 14_SEP,2023 22:10:02

Cross Channel



Date: 29_SEP,2023 14:27:23

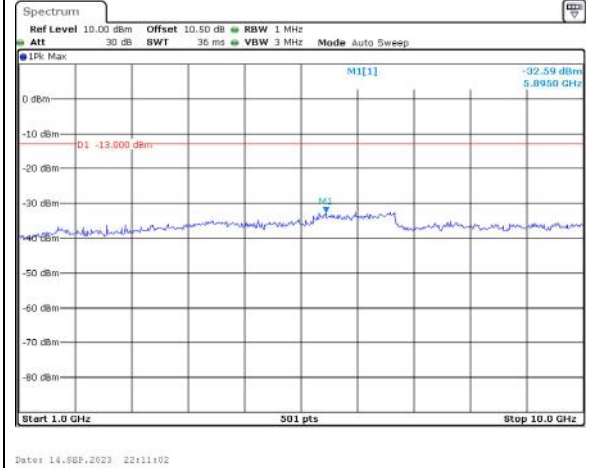
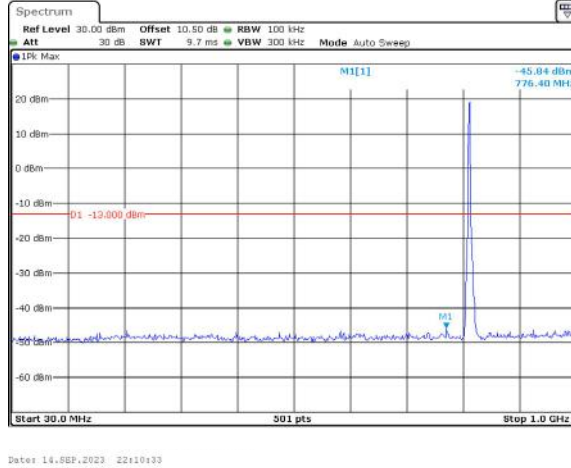
Date: 29_SEP,2023 14:32:46

Spurious Emissions at Antenna Terminal

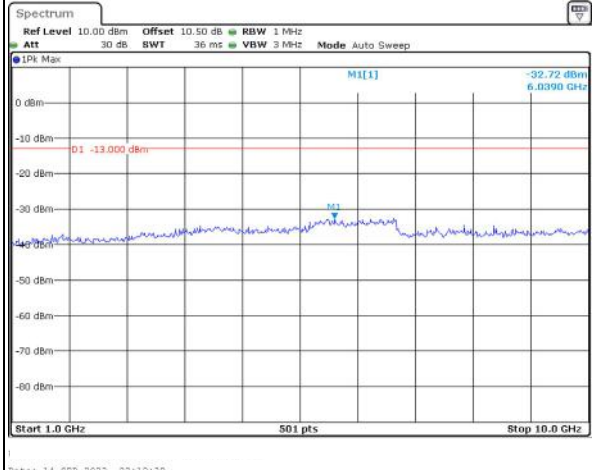
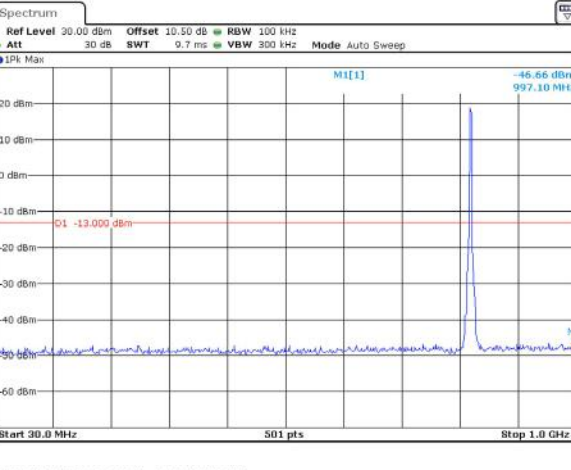
Channel

3MHz Bandwidth QPSK

Lowest For 90S



Highest For 90S



Cross Channel

