

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
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	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		

10MHz QPSK	RB1#0	22.42	22.32	22.36	20.72	33
	RB1#25	22.3	22.39	22.3		
	RB1#49	22.26	22.31	22.29		
	RB25#0	21.58	21.4	21.34		
	RB25#25	21.48	21.44	21.37		
	RB50#0	21.52	21.37	21.4		
10MHz 16QAM	RB1#0	21.72	21.47	21.47	20.02	33
	RB1#25	21.56	21.43	21.4		
	RB1#49	21.39	21.4	21.37		
	RB25#0	20.69	20.6	20.52		
	RB25#25	20.6	20.58	20.58		
	RB50#0	20.55	20.47	20.42		
15MHz QPSK	RB1#0	22.33	22.23	22.22	20.63	33
	RB1#38	22.23	22.19	22.16		
	RB1#74	22.22	22.21	22.19		
	RB36#0	21.43	21.31	21.23		
	RB36#39	21.36	21.33	21.31		
	RB75#0	21.39	21.3	21.34		
15MHz 16QAM	RB1#0	22.04	21.49	21.69	20.34	33
	RB1#38	21.92	21.5	21.64		
	RB1#74	21.93	21.52	21.65		
	RB36#0	20.52	20.35	20.33		
	RB36#39	20.43	20.41	20.38		
	RB75#0	20.49	20.28	20.32		
20MHz QPSK	RB1#0	22.4	22.22	22.19	20.71	33
	RB1#50	22.22	22.41	22.09		
	RB1#99	22.29	22.28	22.16		
	RB50#0	21.48	21.31	21.31		
	RB50#50	21.42	21.37	21.3		
	RB100#0	21.44	21.32	21.29		
20MHz 16QAM	RB1#0	21.63	21.56	21.82	20.14	33
	RB1#50	21.5	21.55	21.84		
	RB1#99	21.46	21.58	21.81		
	RB50#0	20.51	20.33	20.31		
	RB50#50	20.41	20.37	20.4		
	RB100#0	20.5	20.38	20.33		
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	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	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.3 μs VBW 100 kHz Mode Auto FFT</p> <p>IPk Max: 22.660 dBm M1[1]: -2.93 dBm, 1.85010000 GHz, 1.850892335 MHz, -0.45 dB, 1.20600 MHz</p> <p>O2: -3.740 dBm</p> <p>CF 1.8507 GHz 501 pts Span 3.0 MHz</p> <p>Date: 13_SEP_2023 18:32:14</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.3 μs VBW 100 kHz Mode Auto FFT</p> <p>IPk Max: 22.270 dBm M1[1]: -4.07 dBm, 1.85080000 GHz, 1.850892335 MHz, 0.01 dB, 1.21800 MHz</p> <p>O2: -3.730 dBm</p> <p>CF 1.8507 GHz 501 pts Span 3.0 MHz</p> <p>Date: 13_SEP_2023 18:32:35</p>
Middle	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.3 μs VBW 100 kHz Mode Auto FFT</p> <p>IPk Max: 22.620 dBm M1[1]: -3.88 dBm, 1.87909400 GHz, 1.877844311 MHz, 0.93 dB, 1.21200 MHz</p> <p>O2: -3.360 dBm</p> <p>CF 1.88 GHz 501 pts Span 3.0 MHz</p> <p>Date: 13_SEP_2023 18:32:56</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.3 μs VBW 100 kHz Mode Auto FFT</p> <p>IPk Max: 22.240 dBm M1[1]: -4.32 dBm, 1.87940000 GHz, 1.877844311 MHz, -0.28 dB, 1.20000 MHz</p> <p>O2: -3.760 dBm</p> <p>CF 1.88 GHz 501 pts Span 3.0 MHz</p> <p>Date: 13_SEP_2023 18:33:17</p>
Highest	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.3 μs VBW 100 kHz Mode Auto FFT</p> <p>IPk Max: 22.070 dBm M1[1]: -3.76 dBm, 1.90869400 GHz, 1.898203359 MHz, 0.31 dB, 1.20600 MHz</p> <p>O2: -3.930 dBm</p> <p>CF 1.9093 GHz 501 pts Span 3.0 MHz</p> <p>Date: 13_SEP_2023 18:33:38</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.3 μs VBW 100 kHz Mode Auto FFT</p> <p>IPk Max: 22.170 dBm M1[1]: -4.44 dBm, 1.90869400 GHz, 1.898203359 MHz, 0.14 dB, 1.21200 MHz</p> <p>O2: -3.930 dBm</p> <p>CF 1.9093 GHz 501 pts Span 3.0 MHz</p> <p>Date: 13_SEP_2023 18:33:04</p>

Occupied Bandwidth

Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.2 μs VBW 100 kHz Mode Auto FFT</p> <p>M1[1] -10.37 dBm 1.8500240 GHz Occ Bw 2.682634731 MHz D1[1] -0.19 dB 2.9520 MHz</p> <p>D1 16.040 dBm D2 -9.960 dBm</p> <p>CF 1.8515 GHz 501 pts Span 6.0 MHz</p> <p>Date: 13_SEP_2023 18:35:01</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.2 μs VBW 100 kHz Mode Auto FFT</p> <p>M1[1] -11.00 dBm 1.8500360 GHz Occ Bw 2.682634731 MHz D1[1] -0.59 dB 2.9640 MHz</p> <p>D1 14.290 dBm D2 -11.710 dBm</p> <p>CF 1.8515 GHz 501 pts Span 6.0 MHz</p> <p>Date: 13_SEP_2023 18:35:19</p>
Middle	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.2 μs VBW 100 kHz Mode Auto FFT</p> <p>M1[1] -10.43 dBm 1.8795240 GHz Occ Bw 2.694610778 MHz D1[1] -0.61 dB 2.9480 MHz</p> <p>D1 15.160 dBm D2 -10.840 dBm</p> <p>CF 1.88 GHz 501 pts Span 6.0 MHz</p> <p>Date: 13_SEP_2023 18:35:37</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.2 μs VBW 100 kHz Mode Auto FFT</p> <p>M1[1] -12.13 dBm 1.8795120 GHz Occ Bw 2.682634731 MHz D1[1] -0.02 dB 2.9640 MHz</p> <p>D1 14.020 dBm D2 -11.980 dBm</p> <p>CF 1.88 GHz 501 pts Span 6.0 MHz</p> <p>Date: 13_SEP_2023 18:35:57</p>
Highest	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.2 μs VBW 100 kHz Mode Auto FFT</p> <p>M1[1] -11.17 dBm 1.9070120 GHz Occ Bw 2.682634731 MHz D1[1] -0.70 dB 2.9640 MHz</p> <p>D1 14.660 dBm D2 -11.340 dBm</p> <p>CF 1.9085 GHz 501 pts Span 6.0 MHz</p> <p>Date: 13_SEP_2023 18:36:15</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 63.2 μs VBW 100 kHz Mode Auto FFT</p> <p>M1[1] -11.40 dBm 1.9070120 GHz Occ Bw 2.682634731 MHz D1[1] 0.60 dB 2.9520 MHz</p> <p>D1 14.470 dBm D2 -11.530 dBm</p> <p>CF 1.9085 GHz 501 pts Span 6.0 MHz</p> <p>Date: 13_SEP_2023 18:36:36</p>

Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	<p>CF 1.8525 GHz 501 pts Span 10.0 MHz</p> <p>Date: 13.SEP.2023 18:38:40</p>	<p>CF 1.8525 GHz 501 pts Span 10.0 MHz</p> <p>Date: 13.SEP.2023 18:39:01</p>
Middle	<p>CF 1.88 GHz 501 pts Span 10.0 MHz</p> <p>Date: 13.SEP.2023 18:39:19</p>	<p>CF 1.88 GHz 501 pts Span 10.0 MHz</p> <p>Date: 13.SEP.2023 18:39:36</p>
Highest	<p>CF 1.9075 GHz 501 pts Span 10.0 MHz</p> <p>Date: 13.SEP.2023 18:40:01</p>	<p>CF 1.9075 GHz 501 pts Span 10.0 MHz</p> <p>Date: 13.SEP.2023 18:40:22</p>

Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>CF 1.855 GHz 501 pts Span 20.0 MHz</p>	<p>CF 1.855 GHz 501 pts Span 20.0 MHz</p>
Middle	<p>CF 1.88 GHz 501 pts Span 20.0 MHz</p>	<p>CF 1.88 GHz 501 pts Span 20.0 MHz</p>
Highest	<p>CF 1.905 GHz 501 pts Span 20.0 MHz</p>	<p>CF 1.905 GHz 501 pts Span 20.0 MHz</p>

Occupied Bandwidth

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

Occupied Bandwidth

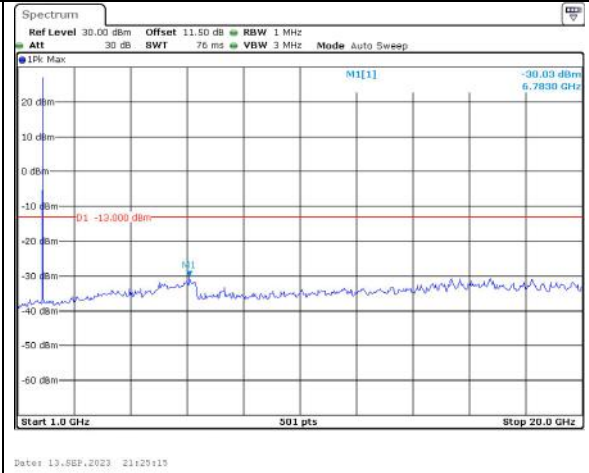
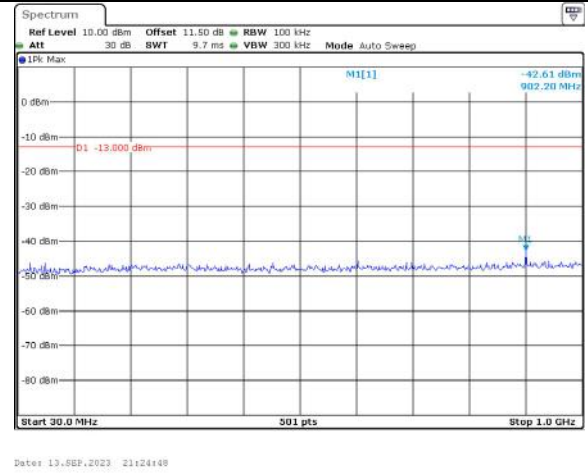
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal

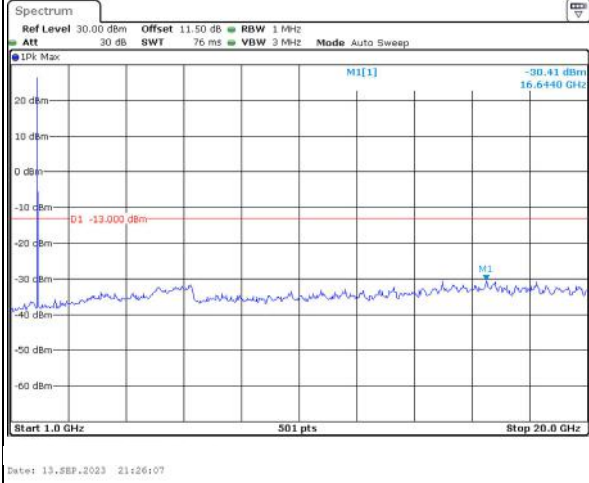
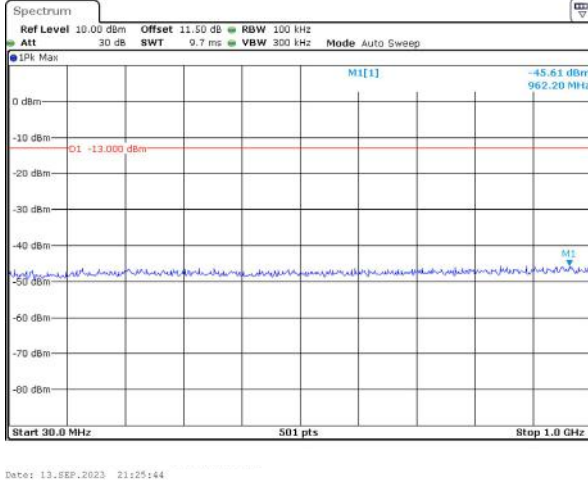
Channel

1.4MHz Bandwidth QPSK

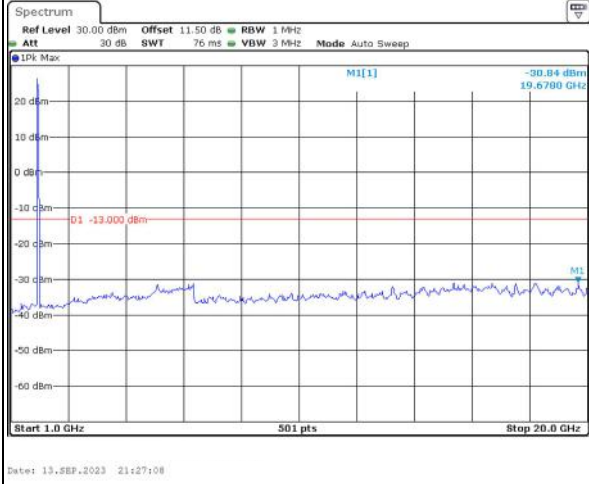
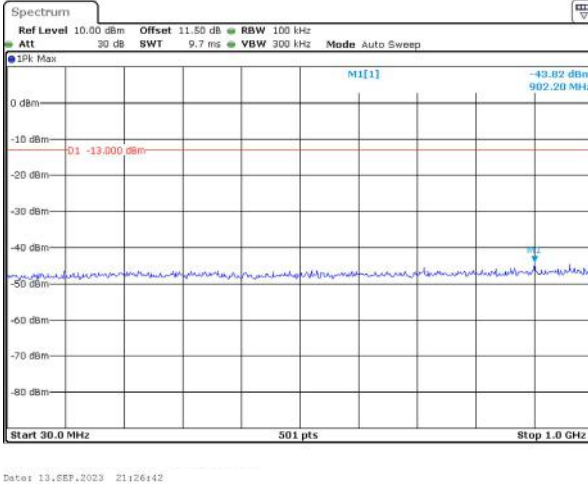
Lowest



Middle



Highest

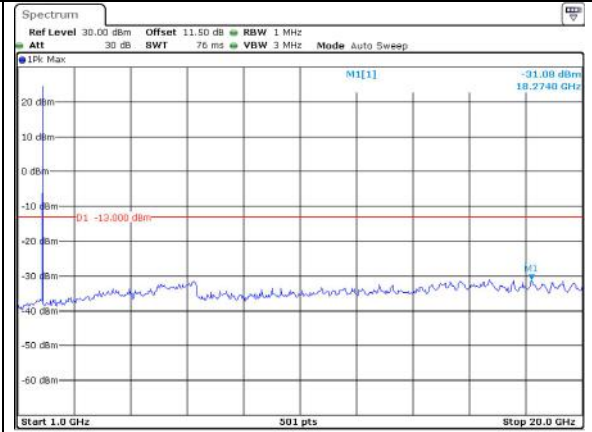
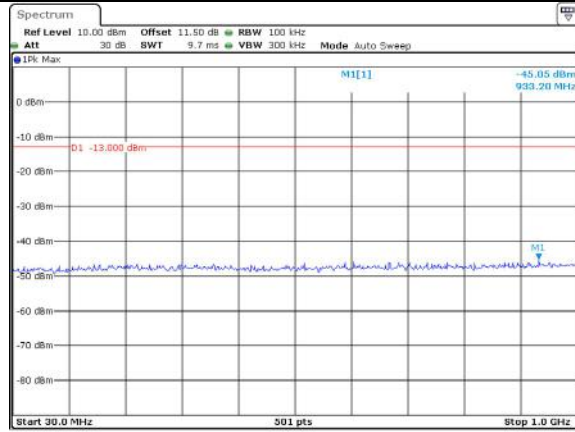


Spurious Emissions at Antenna Terminal

Channel

3MHz Bandwidth QPSK

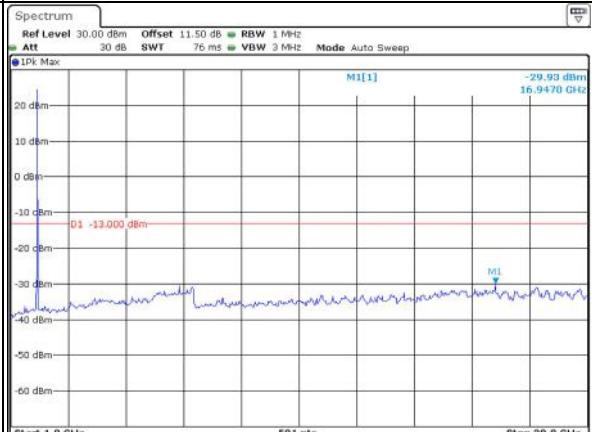
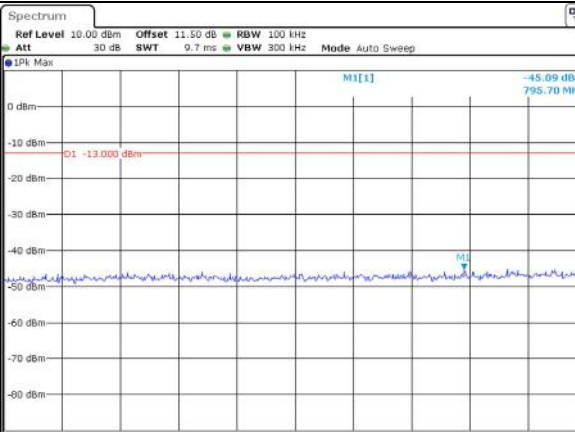
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Date: 13_SEP_2023 21:28:39

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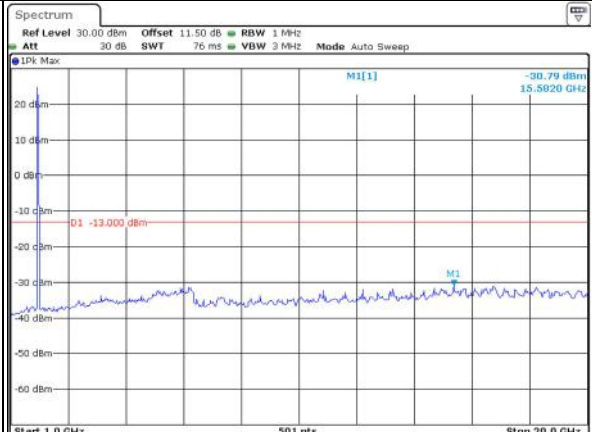
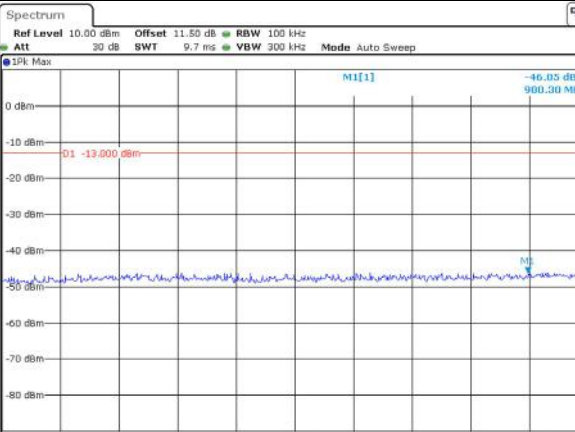
Middle



Date: 13_SEP_2023 21:29:33

Date: 13_SEP_2023 21:30:06

Highest



Date: 13_SEP_2023 21:30:32

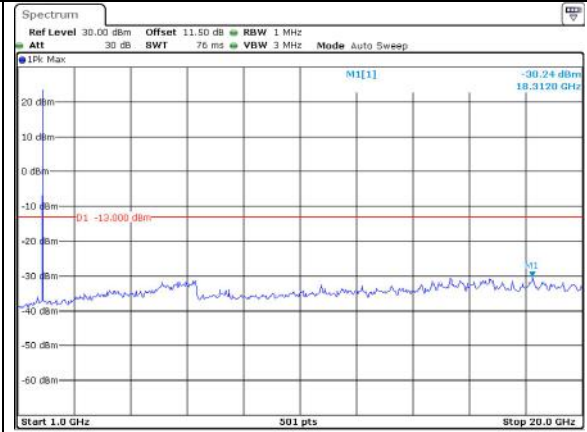
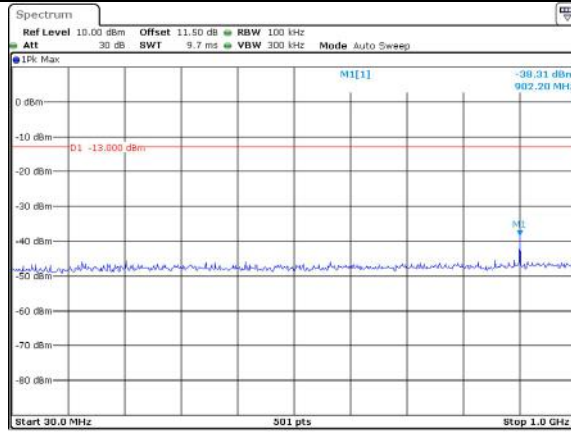
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Spurious Emissions at Antenna Terminal

Channel

5MHz Bandwidth QPSK

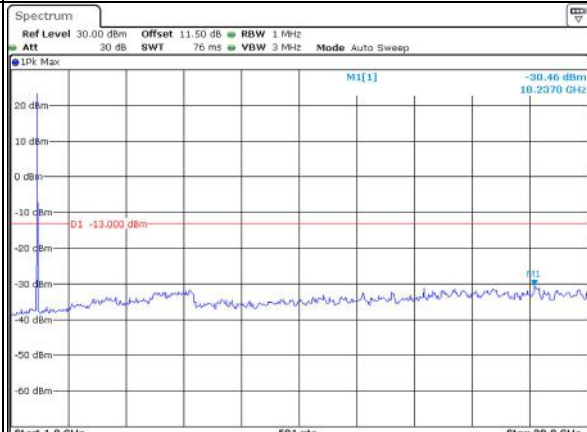
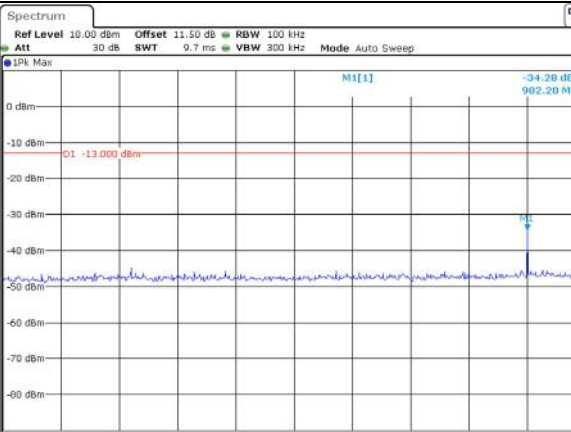
Lowest



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Date: 13_SEP.2023 21:32:51

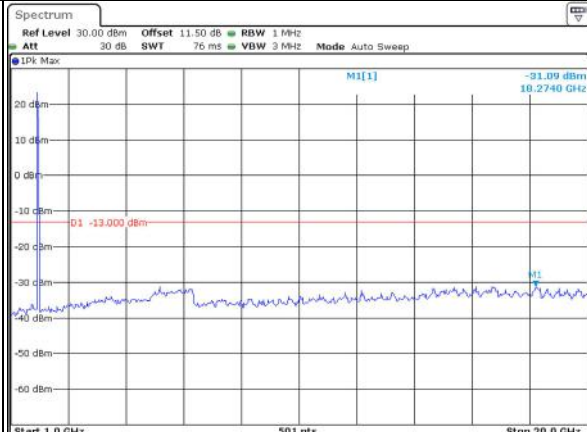
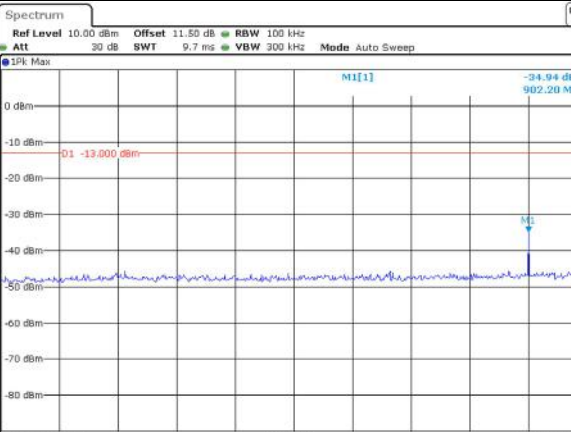
Middle



Date: 13_SEP.2023 21:33:27

Date: 13_SEP.2023 21:33:56

Highest



Date: 13_SEP.2023 21:34:25

Date: 13_SEP.2023 21:34:48

Spurious Emissions at Antenna Terminal

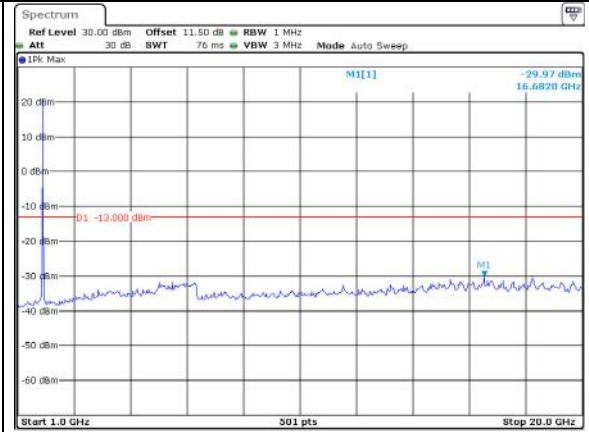
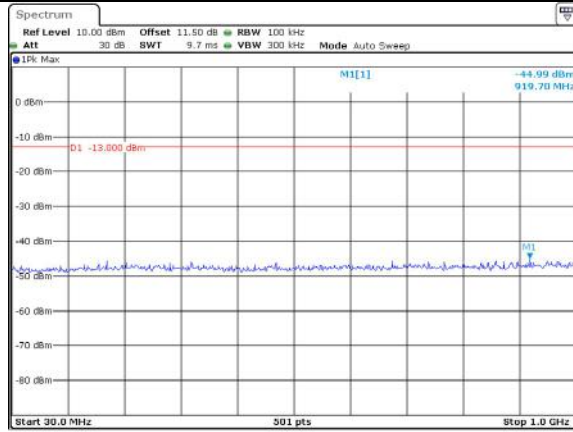
Channel	10MHz Bandwidth QPSK	
Lowest	<p>Spectrum Ref Level 10.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep IPk Max M1[1] -44.80 dBm 921.60 MHz D1 -13.000 dBm Start 30.0 MHz 501 pts Stop 1.0 GHz Date: 13_SEP.2023 21:37:02</p>	<p>Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 1 MHz Att 30 dB SWT 76 ms VBW 3 MHz Mode Auto Sweep IPk Max M1[1] -30.74 dBm 15.5060 GHz D1 -13.000 dBm Start 1.0 GHz 501 pts Stop 20.0 GHz Date: 13_SEP.2023 21:37:28</p>
Middle	<p>Spectrum Ref Level 10.00 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] -44.76 dBm 979.90 MHz D1 -13.000 dBm Start 30.0 MHz 501 pts Stop 1.0 GHz Date: 13_SEP.2023 21:37:57</p>	<p>Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 1 MHz Att 30 dB SWT 76 ms VBW 3 MHz Mode Auto Sweep IPk Max M1[1] -30.40 dBm 18.2740 GHz D1 -13.000 dBm Start 1.0 GHz 501 pts Stop 20.0 GHz Date: 13_SEP.2023 21:38:23</p>
Highest	<p>Spectrum Ref Level 10.00 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] -45.56 dBm 966.10 MHz D1 -13.000 dBm Start 30.0 MHz 501 pts Stop 1.0 GHz Date: 13_SEP.2023 21:38:52</p>	<p>Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 1 MHz Att 30 dB SWT 76 ms VBW 3 MHz Mode Auto Sweep IPk Max M1[1] -30.32 dBm 16.6820 GHz D1 -13.000 dBm Start 1.0 GHz 501 pts Stop 20.0 GHz Date: 13_SEP.2023 21:39:12</p>

Spurious Emissions at Antenna Terminal

Channel

15MHz Bandwidth QPSK

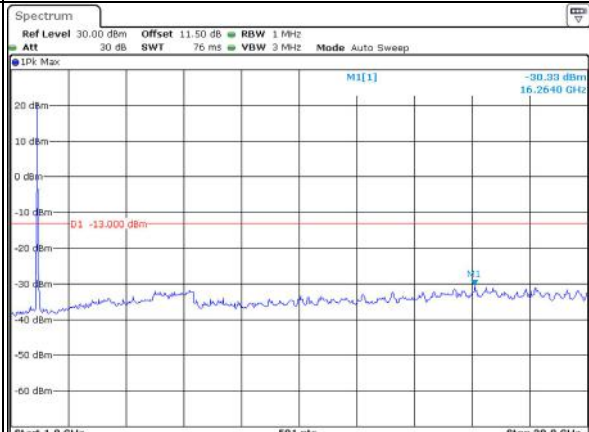
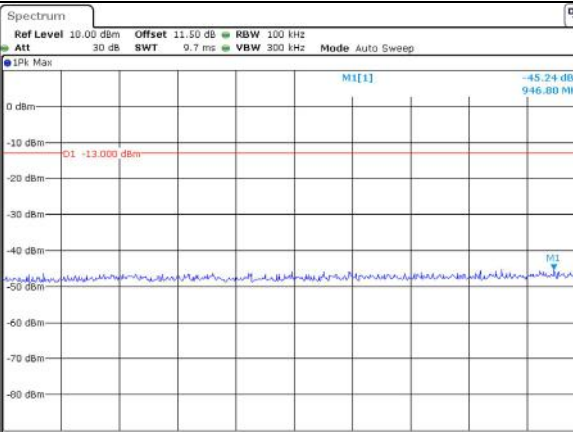
Lowest



Date: 13_SEP.2023 21:40:30

Date: 13_SEP.2023 21:40:57

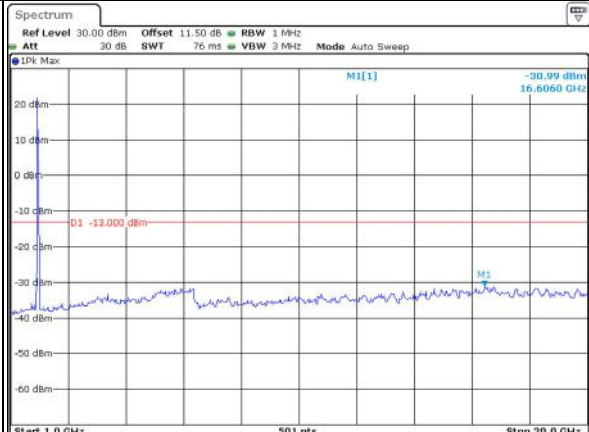
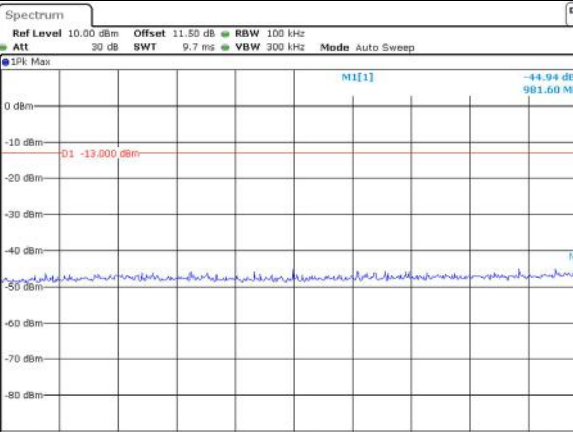
Middle



Date: 13_SEP.2023 21:41:29

Date: 13_SEP.2023 21:41:55

Highest



Date: 13_SEP.2023 21:42:27

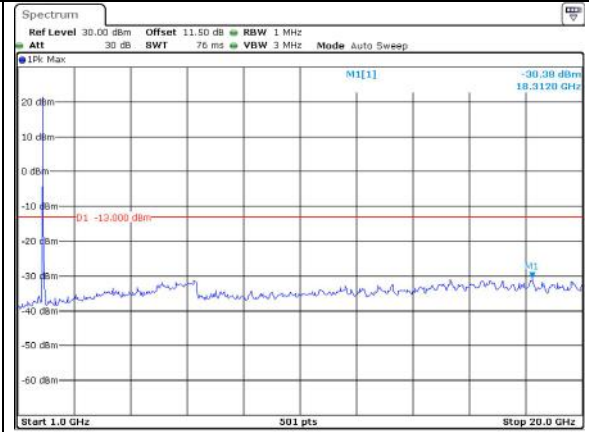
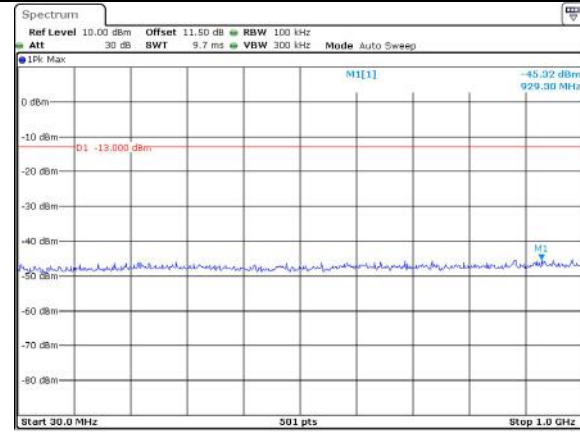
Date: 13_SEP.2023 21:42:53

Spurious Emissions at Antenna Terminal

Channel

20MHz Bandwidth QPSK

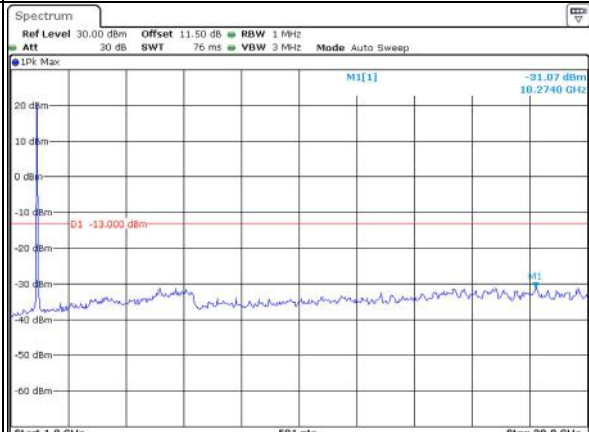
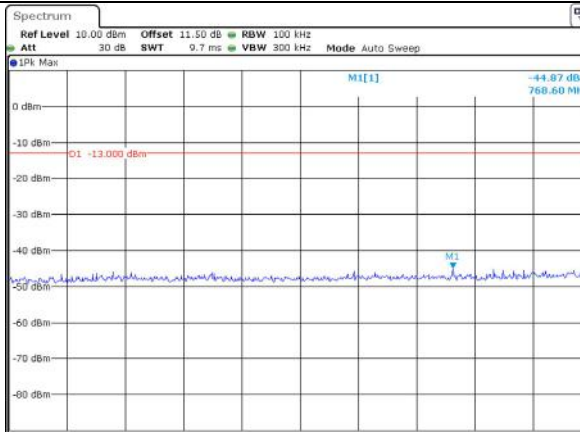
Lowest



Date: 13_SEP.2023 21:45:10

Date: 13_SEP.2023 21:45:36

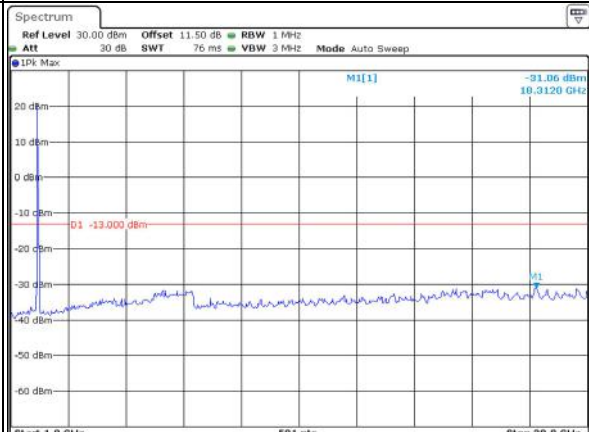
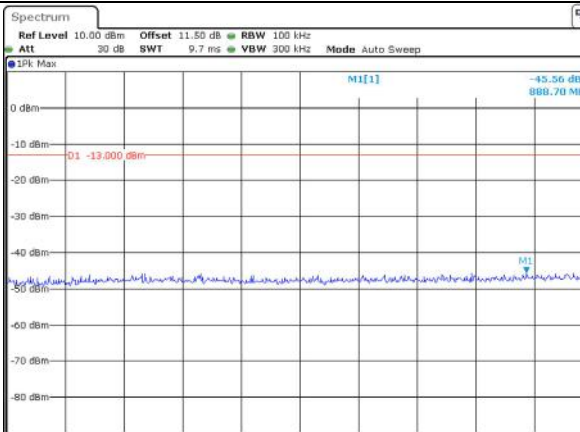
Middle



Date: 13_SEP.2023 21:46:06

Date: 13_SEP.2023 21:46:38

Highest



Date: 13_SEP.2023 21:47:07

Date: 13_SEP.2023 21:47:34

Out of band emission, Band Edge

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

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 10MHz	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -39.77 dBm 1.8500000 GHz CF 1.85 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 20:35:45</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -34.99 dBm 1.9100000 GHz CF 1.91 GHz 501 pts Span 20.0 MHz Date: 13.SEP.2023 20:36:01</p>
QPSK 15MHz	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 35 ms VBW 1 MHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -30.07 dBm 1.8500000 GHz CF 1.85 GHz 501 pts Span 30.0 MHz Date: 13.SEP.2023 20:37:15</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 35 ms VBW 1 MHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -29.62 dBm 1.9100000 GHz CF 1.91 GHz 501 pts Span 30.0 MHz Date: 13.SEP.2023 20:37:29</p>
QPSK 20MHz	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 35 ms VBW 1 MHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -33.73 dBm 1.8500000 GHz CF 1.85 GHz 501 pts Span 40.0 MHz Date: 13.SEP.2023 20:38:45</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 35 ms VBW 1 MHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -30.53 dBm 1.9100000 GHz CF 1.91 GHz 501 pts Span 40.0 MHz Date: 13.SEP.2023 20:39:00</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -40.74 dBm 1.8500000 GHz CF 1.85 GHz 501 pts Span 3.0 MHz Date: 13.SEP.2023 20:29:44</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -39.78 dBm 1.91005390 GHz CF 1.91 GHz 501 pts Span 3.0 MHz Date: 13.SEP.2023 20:29:59</p>
16QAM 3MHz	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -27.50 dBm 1.8500000 GHz CF 1.85 GHz 501 pts Span 6.0 MHz Date: 13.SEP.2023 20:31:19</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -27.60 dBm 1.9100000 GHz CF 1.91 GHz 501 pts Span 6.0 MHz Date: 13.SEP.2023 20:31:34</p>
16QAM 5MHz	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -27.45 dBm 1.8500000 GHz CF 1.85 GHz 501 pts Span 10.0 MHz Date: 13.SEP.2023 20:33:33</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -29.60 dBm 1.9100000 GHz CF 1.91 GHz 501 pts Span 10.0 MHz Date: 13.SEP.2023 20:33:48</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 10MHz		
16QAM 15MHz		
16QAM 20MHz		

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
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	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	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

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	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -10.71 dBm 1.7101200 GHz Occ Bw 8.982035928 MHz D1[1] -0.52 dB 9.7200 MHz</p> <p>D1 15.080 dBm D2 -10.920 dBm</p> <p>CF 1.715 GHz 501 pts Span 20.0 MHz</p> <p>Date: 13_SEP_2023 19:09:29</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -10.30 dBm 1.7102000 GHz Occ Bw 8.942115768 MHz D1[1] -1.56 dB 9.6000 MHz</p> <p>D1 14.840 dBm D2 -11.160 dBm</p> <p>CF 1.715 GHz 501 pts Span 20.0 MHz</p> <p>Date: 13_SEP_2023 19:09:49</p>
Middle	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -10.23 dBm 1.7277000 GHz Occ Bw 8.942115768 MHz D1[1] 0.04 dB 9.6400 MHz</p> <p>D1 15.420 dBm D2 -10.580 dBm</p> <p>CF 1.7325 GHz 501 pts Span 20.0 MHz</p> <p>Date: 13_SEP_2023 19:10:20</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -12.53 dBm 1.7276600 GHz Occ Bw 8.982035928 MHz D1[1] -0.01 dB 9.7200 MHz</p> <p>D1 13.400 dBm D2 -12.600 dBm</p> <p>CF 1.7325 GHz 501 pts Span 20.0 MHz</p> <p>Date: 13_SEP_2023 19:10:50</p>
Highest	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -11.75 dBm 1.7451200 GHz Occ Bw 8.982035928 MHz D1[1] -0.55 dB 9.7200 MHz</p> <p>D1 14.510 dBm D2 -11.490 dBm</p> <p>CF 1.75 GHz 501 pts Span 20.0 MHz</p> <p>Date: 13_SEP_2023 19:11:18</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -12.14 dBm 1.7451200 GHz Occ Bw 8.982035928 MHz D1[1] 0.26 dB 9.7200 MHz</p> <p>D1 14.120 dBm D2 -11.680 dBm</p> <p>CF 1.75 GHz 501 pts Span 20.0 MHz</p> <p>Date: 13_SEP_2023 19:11:45</p>

Occupied Bandwidth

Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 12.7 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max M1[1] -9.60 dBm 1.7100600 GHz Occ Bw 13.532934132 MHz D1[1] -1.40 dB 14.8200 MHz D2 -8.960 dBm</p> <p>CF 1.7175 GHz 501 pts Span 30.0 MHz</p> <p>Date: 13_SEP_2023 19:14:15</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 12.7 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max M1[1] -9.82 dBm 1.7101000 GHz Occ Bw 13.532934132 MHz D1[1] -0.79 dB 14.7000 MHz D2 -8.960 dBm</p> <p>CF 1.7175 GHz 501 pts Span 30.0 MHz</p> <p>Date: 13_SEP_2023 19:14:36</p>
Middle	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 12.7 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max M1[1] -7.96 dBm 1.7252400 GHz Occ Bw 13.473053892 MHz D1[1] -0.88 dB 14.6400 MHz D2 -8.160 dBm</p> <p>CF 1.7325 GHz 501 pts Span 30.0 MHz</p> <p>Date: 13_SEP_2023 19:15:07</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 12.7 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max M1[1] -9.42 dBm 1.7251000 GHz Occ Bw 13.473053892 MHz D1[1] -0.14 dB 14.7600 MHz D2 -8.760 dBm</p> <p>CF 1.7325 GHz 501 pts Span 30.0 MHz</p> <p>Date: 13_SEP_2023 19:15:31</p>
Highest	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 12.7 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max M1[1] -9.00 dBm 1.7400000 GHz Occ Bw 13.473053892 MHz D1[1] -0.20 dB 14.8200 MHz D2 -8.450 dBm</p> <p>CF 1.7475 GHz 501 pts Span 30.0 MHz</p> <p>Date: 13_SEP_2023 19:16:22</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 12.7 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max M1[1] -9.62 dBm 1.7401200 GHz Occ Bw 13.473053892 MHz D1[1] -0.72 dB 14.7000 MHz D2 -9.120 dBm</p> <p>CF 1.7475 GHz 501 pts Span 30.0 MHz</p> <p>Date: 13_SEP_2023 19:16:50</p>

Occupied Bandwidth

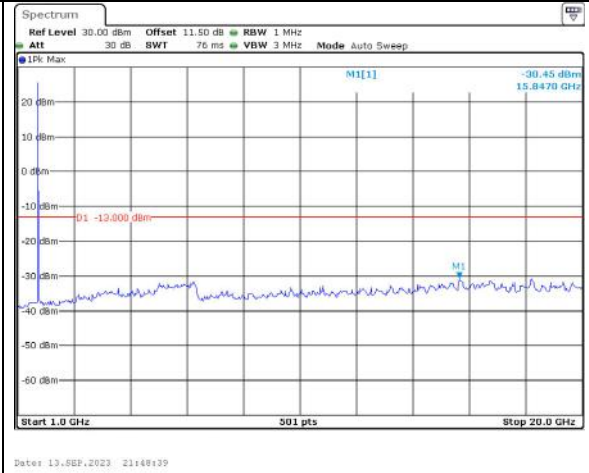
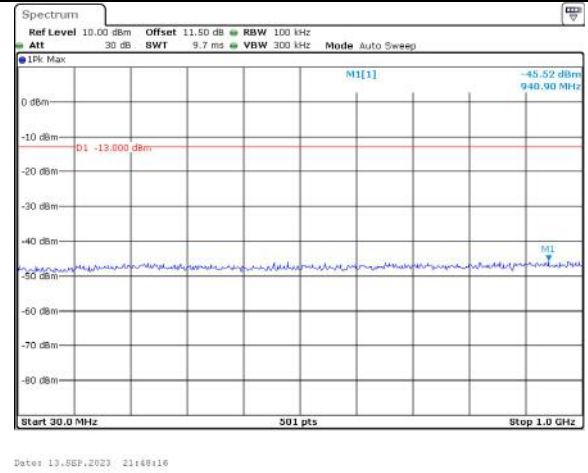
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 18.9 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max: -8.73 dBm M1[1]: 1.71029000 GHz Occ Bw: 17.964071856 MHz D1[1]: -0.09 dB 19.4400 MHz</p> <p>CF 1.72 GHz 501 pts Span 40.0 MHz</p> <p>Date: 13.SEP.2023 19:18:19</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 18.9 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max: -11.41 dBm M1[1]: 1.71029000 GHz Occ Bw: 17.964071856 MHz D1[1]: -0.31 dB 19.4400 MHz</p> <p>CF 1.72 GHz 501 pts Span 40.0 MHz</p> <p>Date: 13.SEP.2023 19:18:43</p>
Middle	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 18.9 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max: -9.22 dBm M1[1]: 1.72299000 GHz Occ Bw: 17.884231537 MHz D1[1]: -0.21 dB 19.4400 MHz</p> <p>CF 1.7325 GHz 501 pts Span 40.0 MHz</p> <p>Date: 13.SEP.2023 19:19:12</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 18.9 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max: -10.50 dBm M1[1]: 1.72274000 GHz Occ Bw: 17.884231537 MHz D1[1]: -0.35 dB 19.5200 MHz</p> <p>CF 1.7325 GHz 501 pts Span 40.0 MHz</p> <p>Date: 13.SEP.2023 19:19:42</p>
Highest	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 18.9 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max: -9.80 dBm M1[1]: 1.73532000 GHz Occ Bw: 17.964071856 MHz D1[1]: -0.99 dB 19.4400 MHz</p> <p>CF 1.745 GHz 501 pts Span 40.0 MHz</p> <p>Date: 13.SEP.2023 19:20:17</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 300 kHz Att 30 dB SWT 18.9 μs VBW 1 MHz Mode Auto FFT</p> <p>IPk Max: -10.50 dBm M1[1]: 1.73532000 GHz Occ Bw: 17.964071856 MHz D1[1]: -0.47 dB 19.4400 MHz</p> <p>CF 1.745 GHz 501 pts Span 40.0 MHz</p> <p>Date: 13.SEP.2023 19:20:45</p>

Spurious Emissions at Antenna Terminal

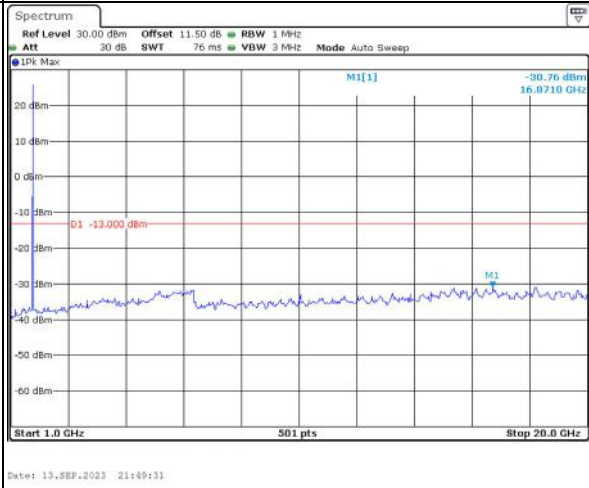
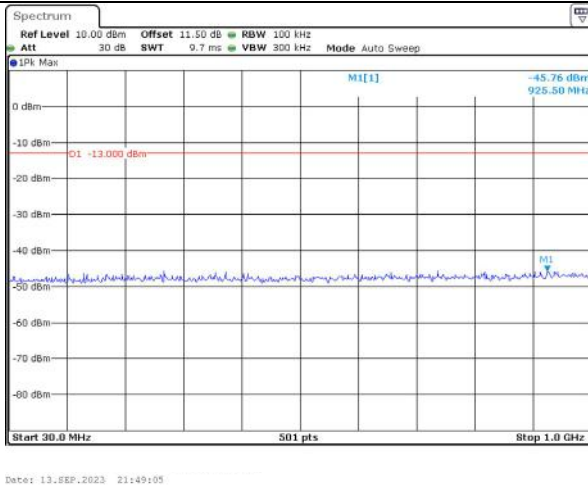
Channel

1.4MHz Bandwidth QPSK

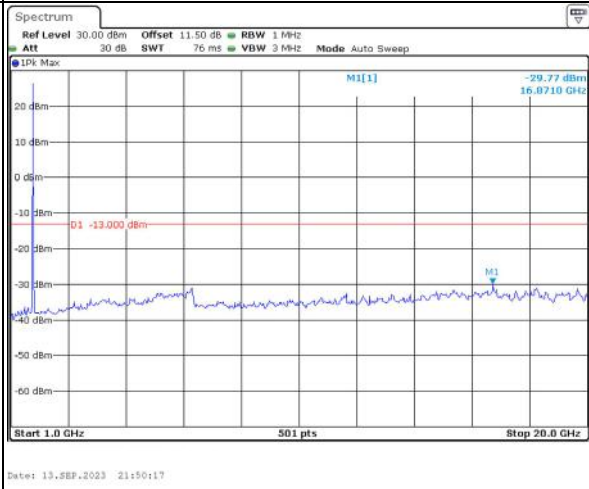
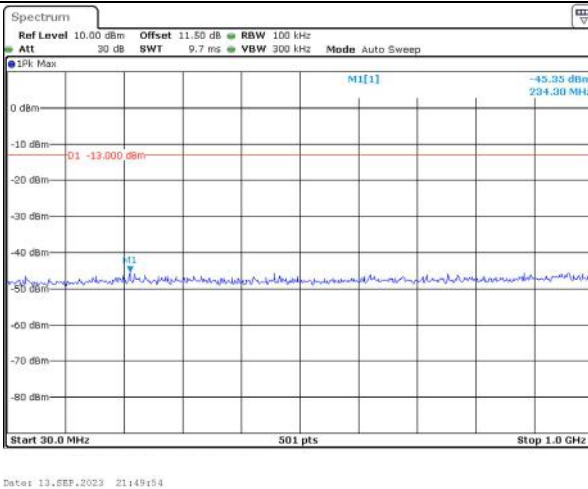
Lowest



Middle



Highest

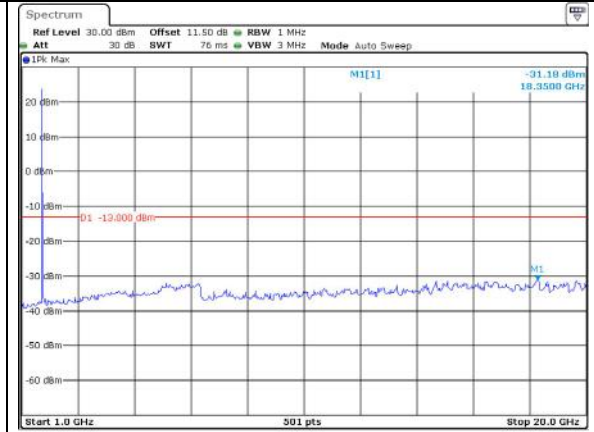
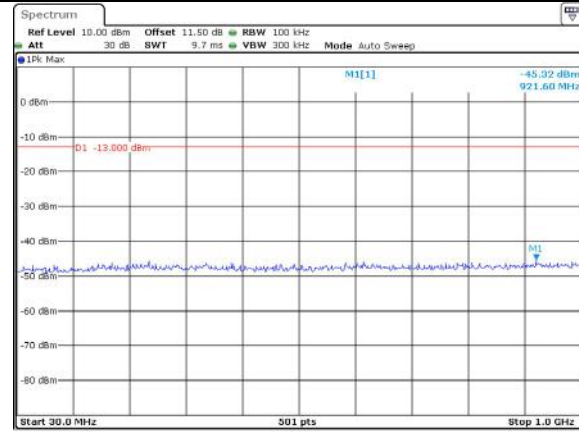


Spurious Emissions at Antenna Terminal

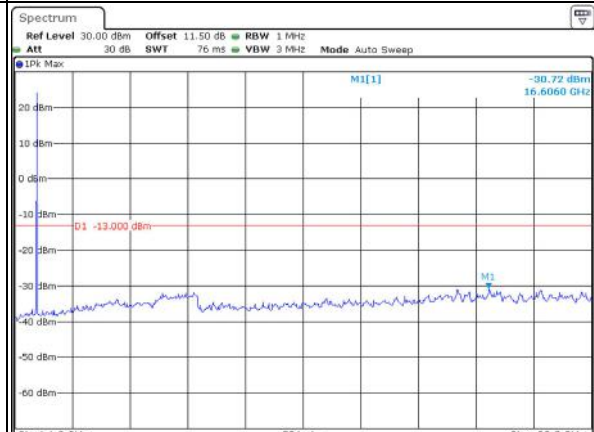
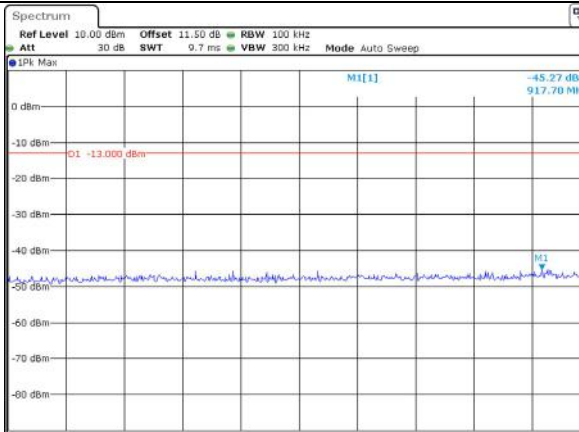
Channel

3MHz Bandwidth QPSK

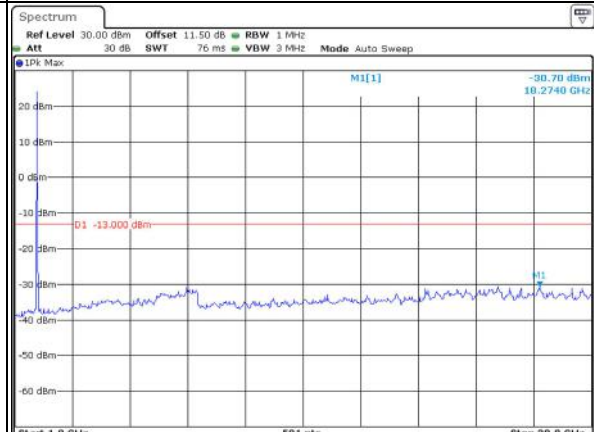
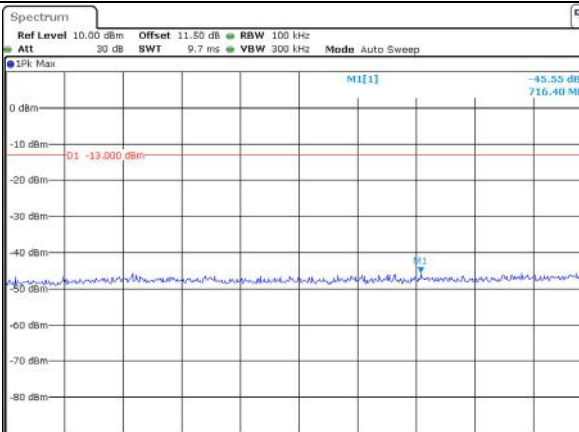
Lowest



Middle



Highest

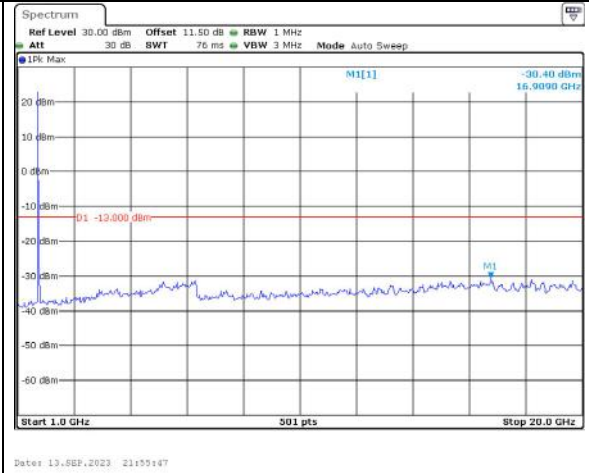
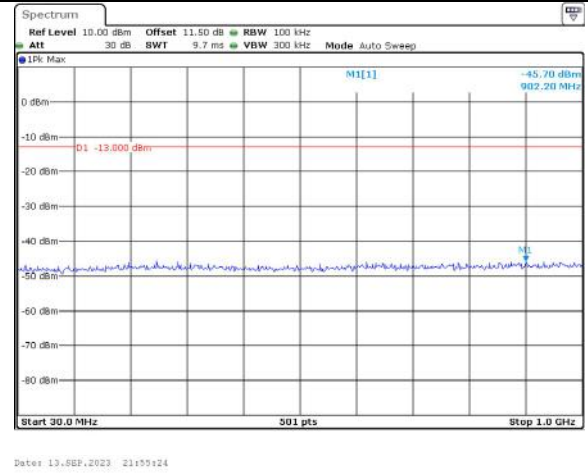


Spurious Emissions at Antenna Terminal

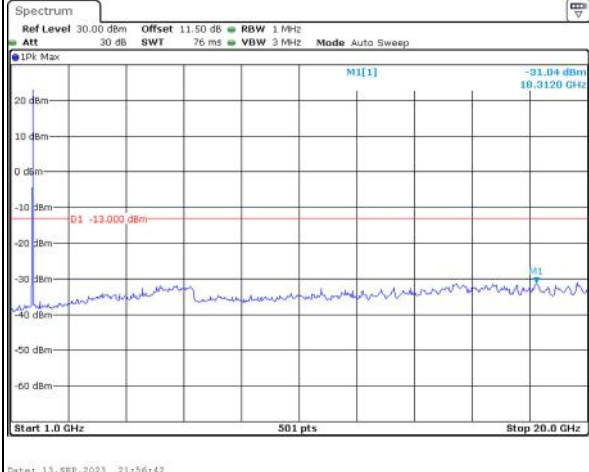
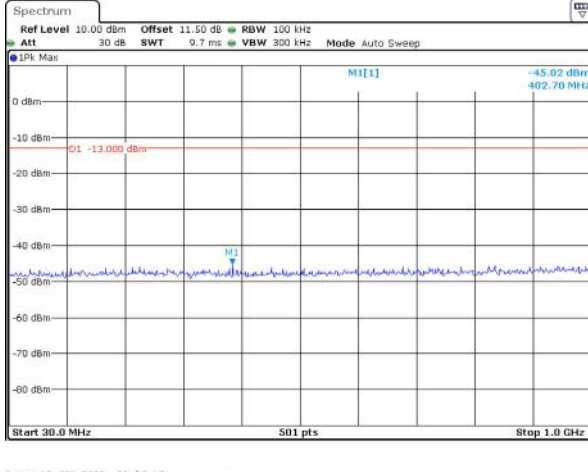
Channel

5MHz Bandwidth QPSK

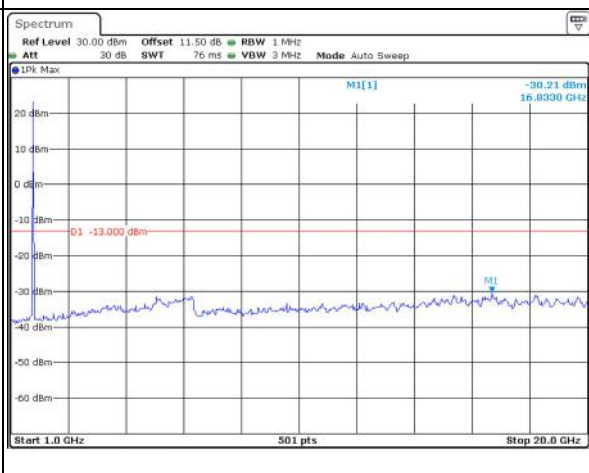
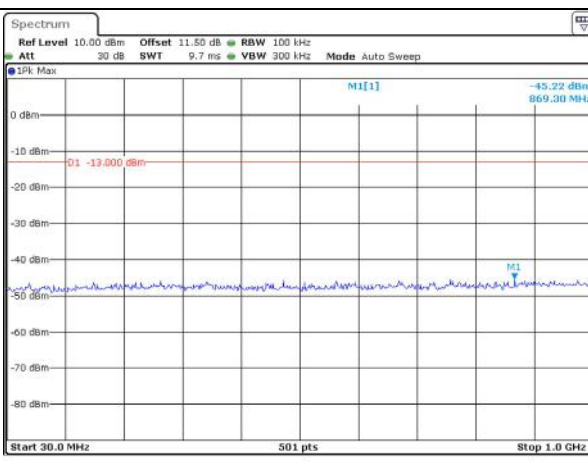
Lowest



Middle



Highest



Spurious Emissions at Antenna Terminal

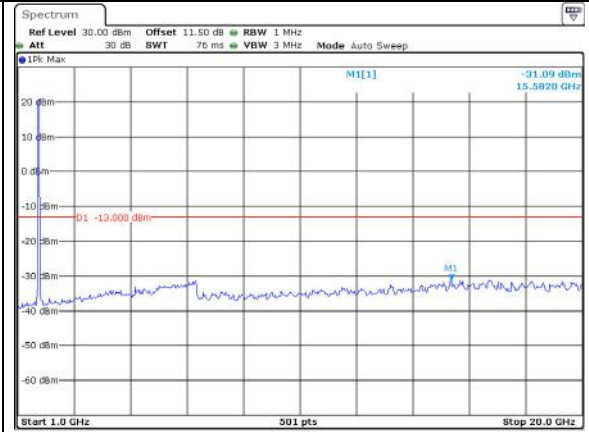
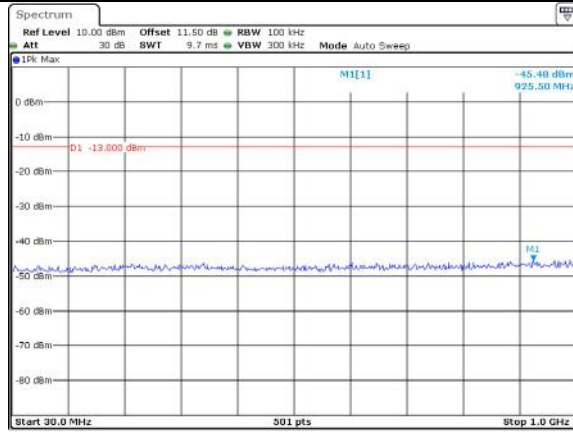
Channel	10MHz Bandwidth QPSK	
Lowest	<p>Spectrum Ref Level 10.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep IPk Max M1[1] -45.14 dBm 939.00 MHz -13.000 dBm Start 30.0 MHz 501 pts Stop 1.0 GHz Date: 13_SEP.2023 21:59:32</p>	<p>Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 1 MHz Att 30 dB SWT 76 ms VBW 3 MHz Mode Auto Sweep IPk Max M1[1] -30.20 dBm 18.2740 GHz -13.000 dBm Start 1.0 GHz 501 pts Stop 20.0 GHz Date: 13_SEP.2023 22:00:02</p>
Middle	<p>Spectrum Ref Level 10.00 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] -45.34 dBm 320.00 MHz -13.000 dBm Start 30.0 MHz 501 pts Stop 1.0 GHz Date: 13_SEP.2023 22:00:28</p>	<p>Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 1 MHz Att 30 dB SWT 76 ms VBW 3 MHz Mode Auto Sweep IPk Max M1[1] -30.60 dBm 18.3120 GHz -13.000 dBm Start 1.0 GHz 501 pts Stop 20.0 GHz Date: 13_SEP.2023 22:00:57</p>
Highest	<p>Spectrum Ref Level 10.00 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] -46.04 dBm 515.00 MHz -13.000 dBm Start 30.0 MHz 501 pts Stop 1.0 GHz Date: 13_SEP.2023 22:01:20</p>	<p>Spectrum Ref Level 30.00 dBm Offset 11.50 dB RBW 1 MHz Att 30 dB SWT 76 ms VBW 3 MHz Mode Auto Sweep IPk Max M1[1] -30.98 dBm 16.6440 GHz -13.000 dBm Start 1.0 GHz 501 pts Stop 20.0 GHz Date: 13_SEP.2023 22:01:46</p>

Spurious Emissions at Antenna Terminal

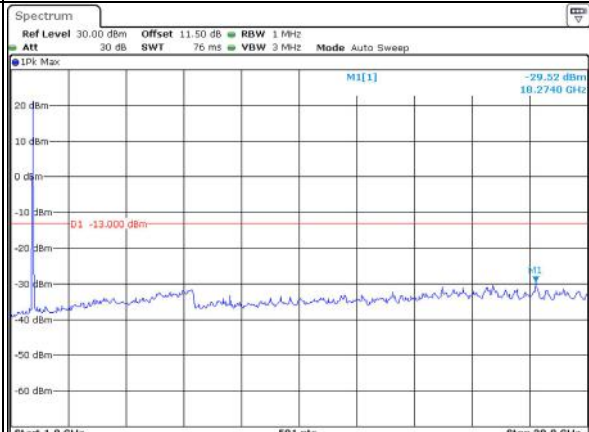
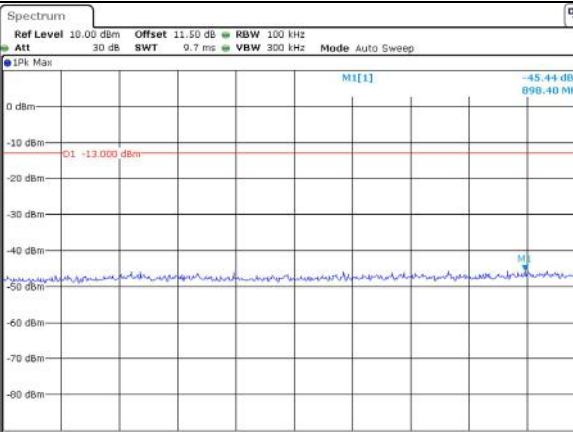
Channel

15MHz Bandwidth QPSK

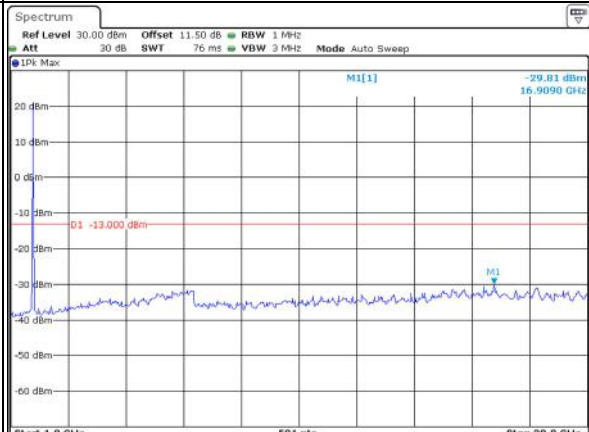
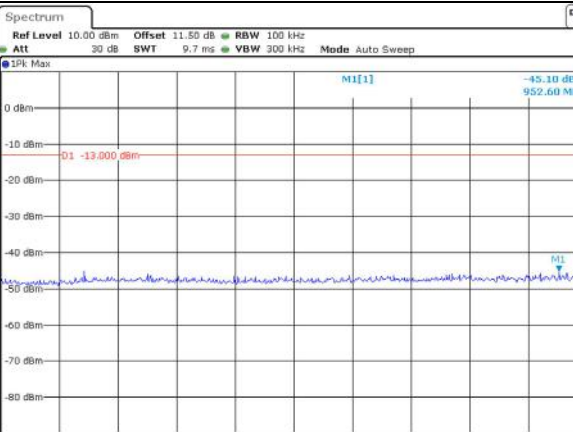
Lowest



Middle



Highest

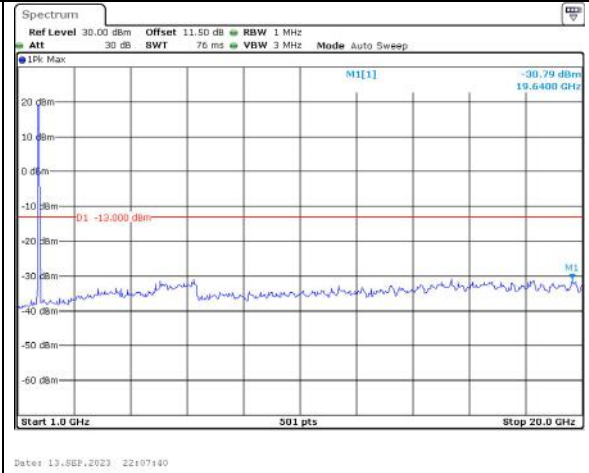
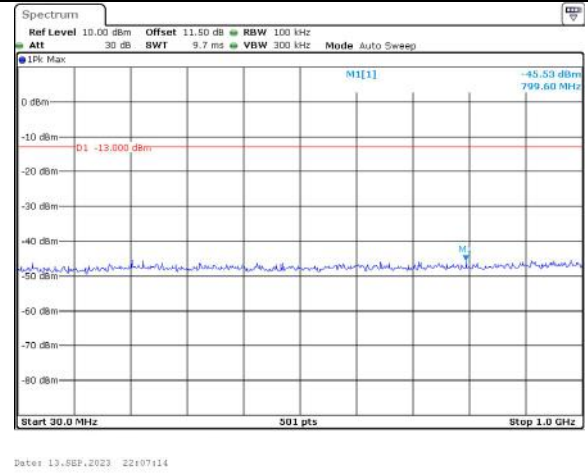


Spurious Emissions at Antenna Terminal

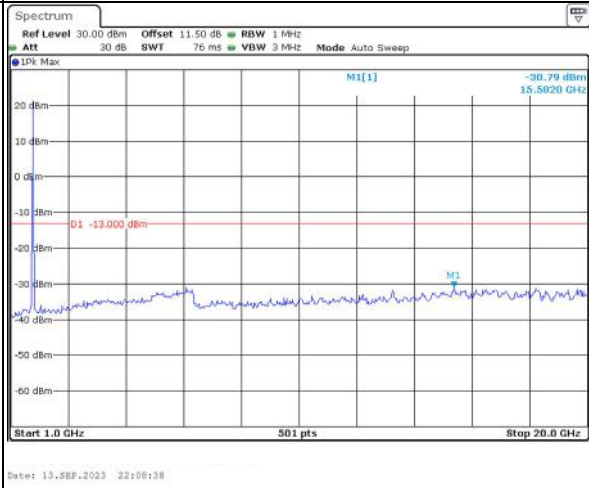
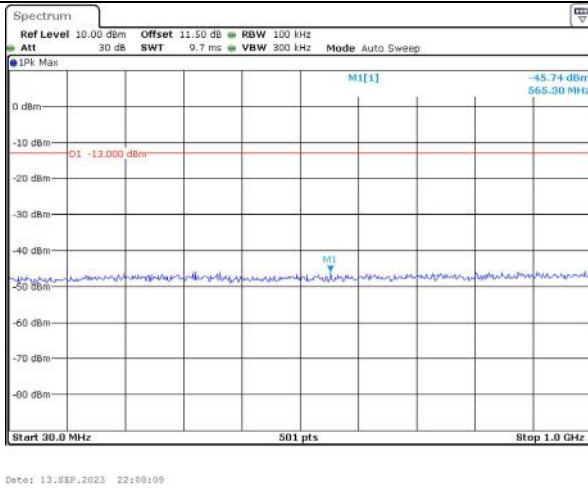
Channel

20MHz Bandwidth QPSK

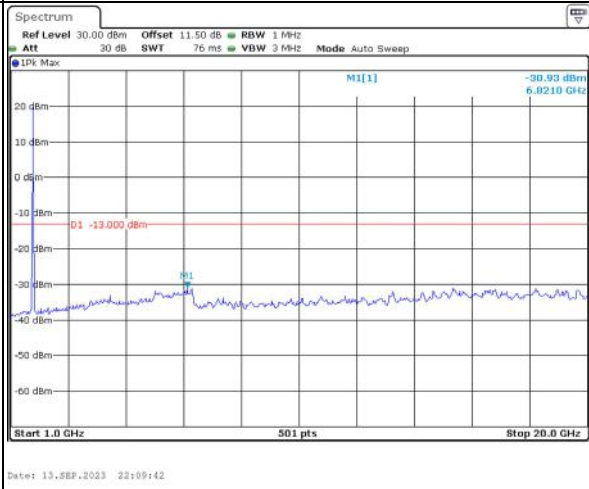
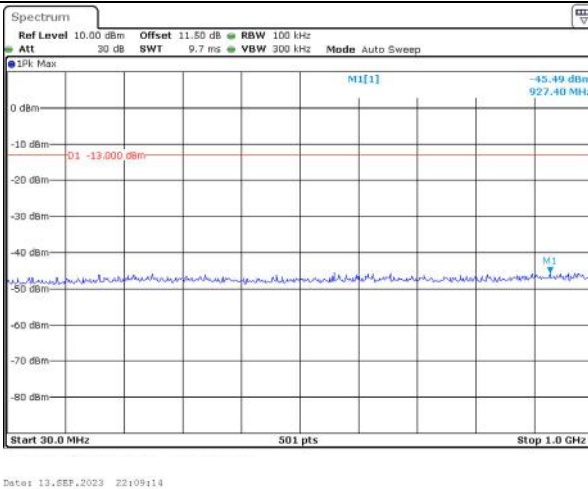
Lowest



Middle



Highest



Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -32.91 dBm 1.70997010 GHz CF 1.71 GHz 501 pts Span 3.0 MHz Date: 13.SEP.2023 20:39:22</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -37.72 dBm 1.75500900 GHz CF 1.755 GHz 501 pts Span 3.0 MHz Date: 13.SEP.2023 20:39:37</p>
QPSK 3MHz	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -25.66 dBm 1.71000000 GHz CF 1.71 GHz 501 pts Span 6.0 MHz Date: 13.SEP.2023 20:43:14</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -29.27 dBm 1.75500000 GHz CF 1.755 GHz 501 pts Span 6.0 MHz Date: 13.SEP.2023 20:43:29</p>
QPSK 5MHz	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -24.90 dBm 1.71000000 GHz CF 1.71 GHz 501 pts Span 10.0 MHz Date: 13.SEP.2023 20:51:29</p>	<p>Ref Level 30.00 dBm Offset 11.50 dB RBW 100 kHz Att 30 dB SWT 35 ms VBW 300 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -29.09 dBm 1.75500000 GHz CF 1.755 GHz 501 pts Span 10.0 MHz Date: 13.SEP.2023 20:51:44</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 10MHz		
QPSK 15MHz		
QPSK 20MHz		

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz	<p>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 AvgPwr 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</p>	<p>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 AvgPwr 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</p>
16QAM 3MHz	<p>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 AvgPwr 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</p>	<p>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 AvgPwr 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</p>
16QAM 5MHz	<p>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 AvgPwr 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</p>	<p>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 AvgPwr 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</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 10MHz	<p>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 AvgPwr 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</p>	<p>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 AvgPwr M1[1] -35.92 dBm 1.7550000 GHz CF 1.755 GHz 501 pts Span 20.0 MHz Date: 13. SEP. 2023 20:53:38</p>
16QAM 15MHz	<p>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 AvgPwr M1[1] -30.03 dBm 1.7100000 GHz CF 1.71 GHz 501 pts Span 30.0 MHz Date: 13. SEP. 2023 20:56:00</p>	<p>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 AvgPwr 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</p>
16QAM 20MHz	<p>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 AvgPwr 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</p>	<p>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 AvgPwr M1[1] -36.13 dBm 1.7550000 GHz CF 1.755 GHz 501 pts Span 40.0 MHz Date: 13. SEP. 2023 20:57:53</p>

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
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	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		
10MHz 16QAM	RB1#0	22.90	23.66	23.09	17.71	38.45
	RB1#25	22.97	23.59	22.97		
	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.

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
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
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	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest	<p>CF 824.7 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:10:28</p>	<p>CF 824.7 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:10:57</p>
Middle	<p>CF 836.5 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:11:18</p>	<p>CF 836.5 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:11:44</p>
Highest	<p>CF 848.3 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:12:05</p>	<p>CF 848.3 MHz 501 pts Span 3.0 MHz</p> <p>Date: 14.SEP.2023 00:12:29</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 M1[1] -9.17 dBm 824.0000 MHz Occ Bw 5.0000 MHz D1[1] -0.11 dB D2 -9.000 dBm</p> <p>CF 826.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:16:43</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 M1[1] -9.72 dBm 824.0000 MHz Occ Bw 5.0000 MHz D1[1] -0.13 dB D2 -9.430 dBm</p> <p>CF 826.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:17:06</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 M1[1] -7.79 dBm 834.0200 MHz Occ Bw 4.9600 MHz D1[1] -0.55 dB D2 -8.220 dBm</p> <p>CF 836.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:17:30</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 M1[1] -10.55 dBm 834.9600 MHz Occ Bw 5.0600 MHz D1[1] -0.05 dB D2 -10.080 dBm</p> <p>CF 836.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:17:54</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 M1[1] -9.24 dBm 843.9800 MHz Occ Bw 5.0200 MHz D1[1] -0.83 dB D2 -8.790 dBm</p> <p>CF 846.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:18:24</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 M1[1] -9.30 dBm 843.9800 MHz Occ Bw 4.9800 MHz D1[1] -0.88 dB D2 -9.030 dBm</p> <p>CF 846.5 MHz 501 pts Span 10.0 MHz</p> <p>Date: 14.SEP.2023 00:18:53</p>

Occupied Bandwidth

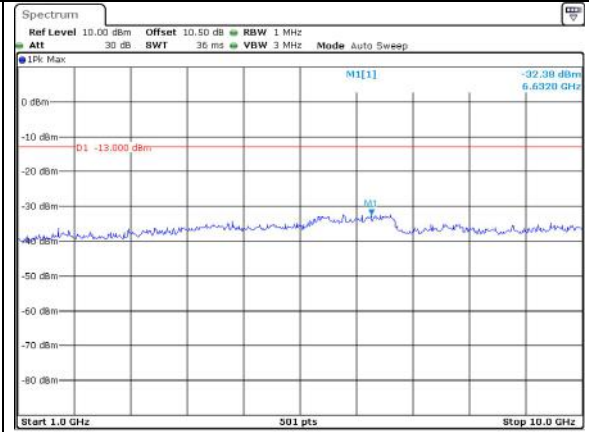
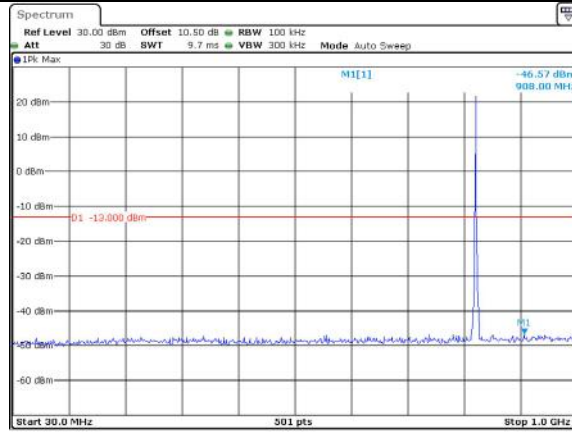
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 38 μs VBW 300 kHz Mode Auto FFT</p> <p>M1[1] -9.84 dBm 824.2000 MHz Occ Bw 8.942115768 MHz D1[1] -1.22 dB 9.6400 MHz</p> <p>D1 15.360 dBm D2 -10.640 dBm</p> <p>CF 829.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:20:04</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] -11.32 dBm 824.1600 MHz Occ Bw 8.942115768 MHz D1[1] -0.41 dB 9.6400 MHz</p> <p>D1 14.420 dBm D2 -11.580 dBm</p> <p>CF 829.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:20:34</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] -10.80 dBm 831.6200 MHz Occ Bw 8.942115768 MHz D1[1] -0.15 dB 9.6800 MHz</p> <p>D1 14.400 dBm D2 -11.510 dBm</p> <p>CF 836.5 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:21:08</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] -11.90 dBm 831.6000 MHz Occ Bw 8.982035928 MHz D1[1] -0.21 dB 9.7200 MHz</p> <p>D1 14.260 dBm D2 -11.740 dBm</p> <p>CF 836.5 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:21:49</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] -11.04 dBm 839.1200 MHz Occ Bw 8.982035928 MHz D1[1] -0.82 dB 9.7200 MHz</p> <p>D1 14.650 dBm D2 -11.350 dBm</p> <p>CF 844.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:22:23</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] -11.52 dBm 839.1600 MHz Occ Bw 8.942115768 MHz D1[1] 0.38 dB 9.6400 MHz</p> <p>D1 14.190 dBm D2 -11.810 dBm</p> <p>CF 844.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 14.SEP.2023 00:23:02</p>

Spurious Emissions at Antenna Terminal

Channel

1.4MHz Bandwidth QPSK

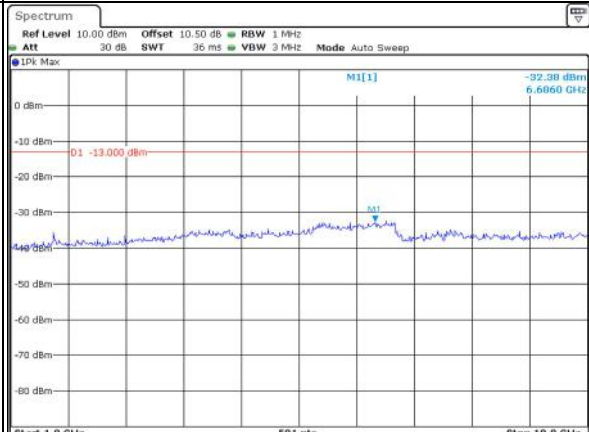
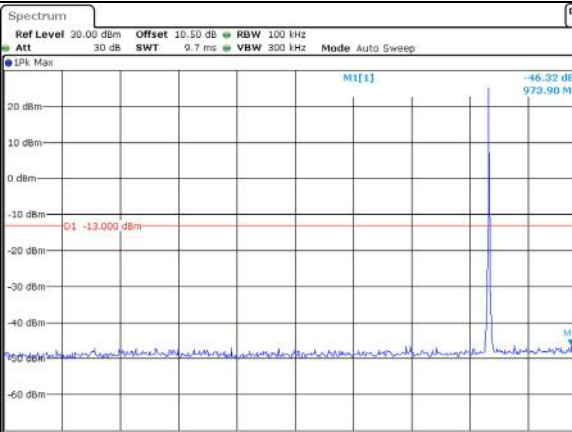
Lowest



Date: 14.SEP.2023 00:59:06

Date: 14.SEP.2023 00:59:32

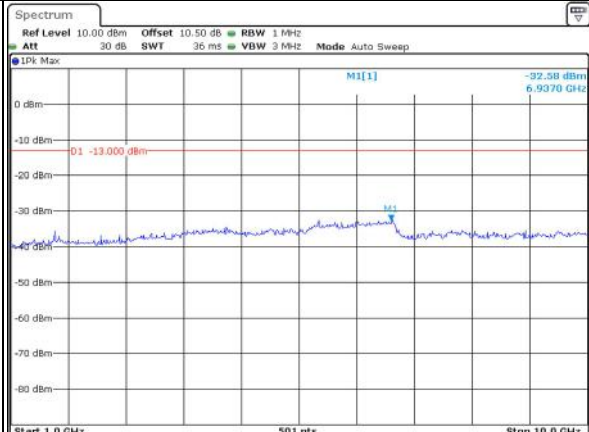
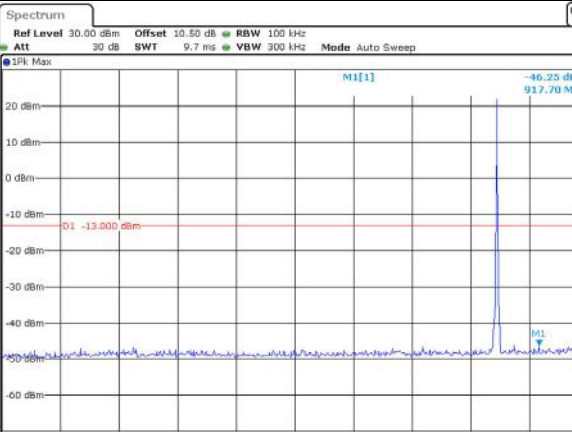
Middle



Date: 14.SEP.2023 01:00:56

Date: 14.SEP.2023 01:00:18

Highest



Date: 14.SEP.2023 01:00:56

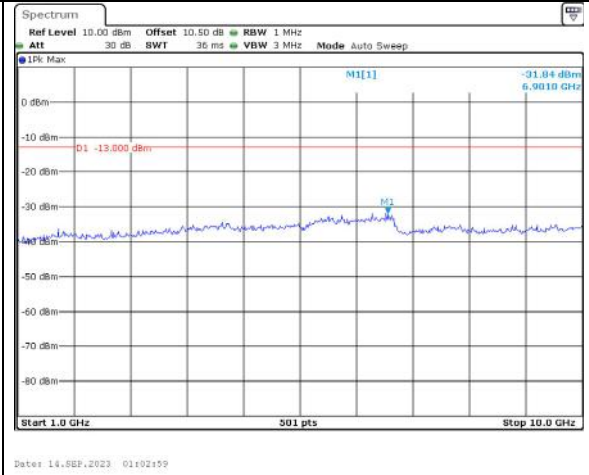
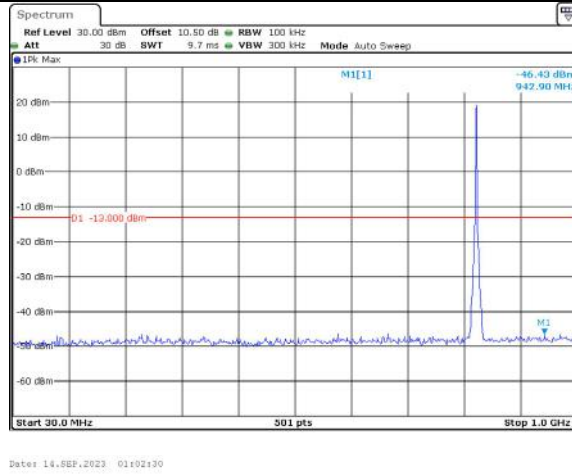
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Spurious Emissions at Antenna Terminal

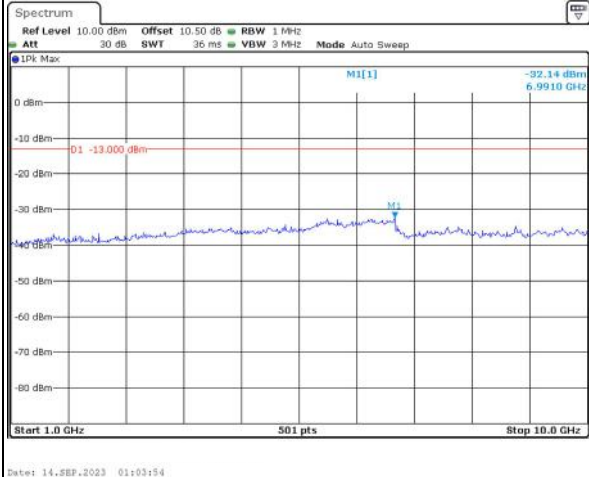
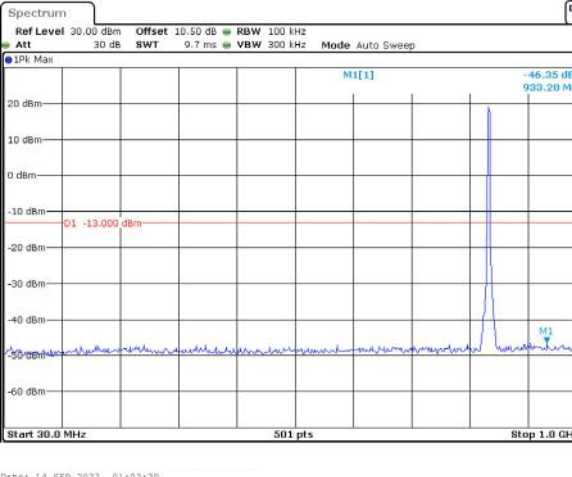
Channel

3MHz Bandwidth QPSK

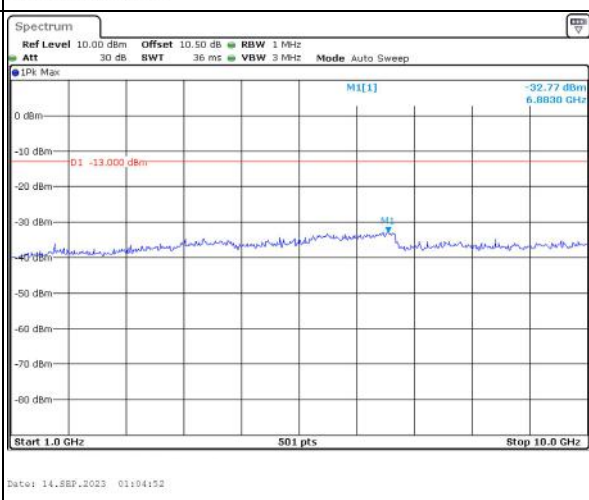
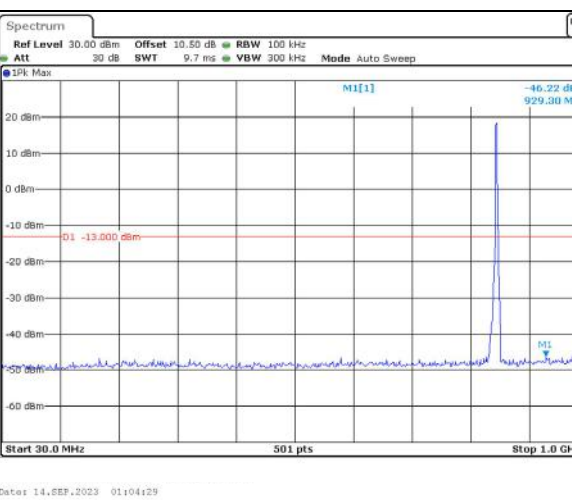
Lowest



Middle



Highest

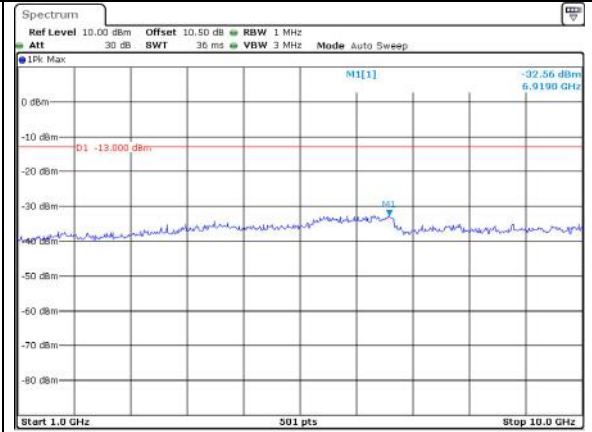
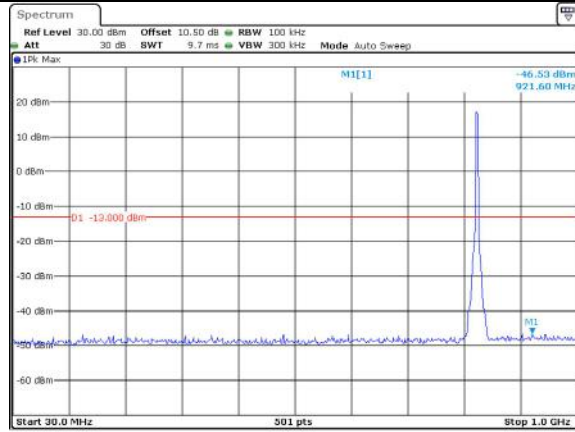


Spurious Emissions at Antenna Terminal

Channel

5MHz Bandwidth QPSK

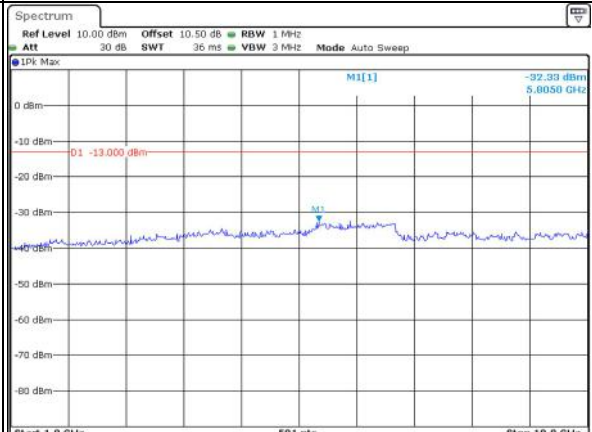
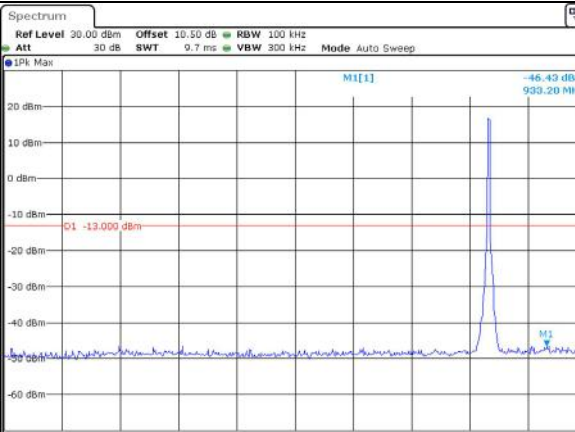
Lowest



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

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

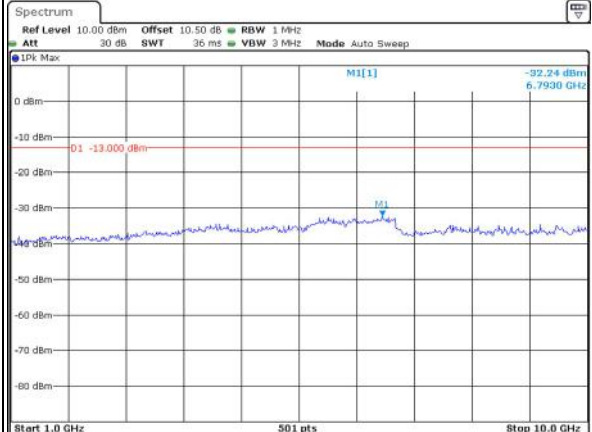
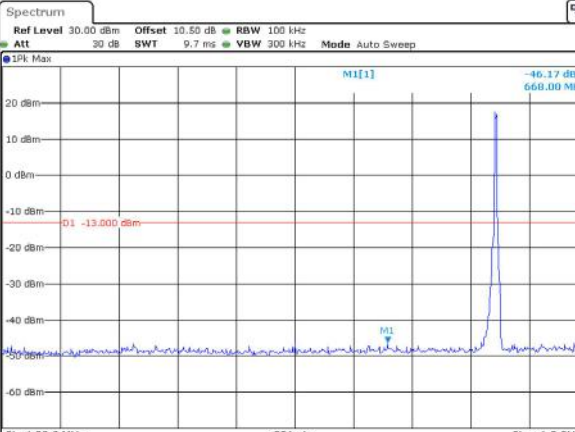
Middle



Date: 14.SEP.2023 01:07:30

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

Highest



Date: 14.SEP.2023 01:08:22

Date: 14.SEP.2023 01:08:48

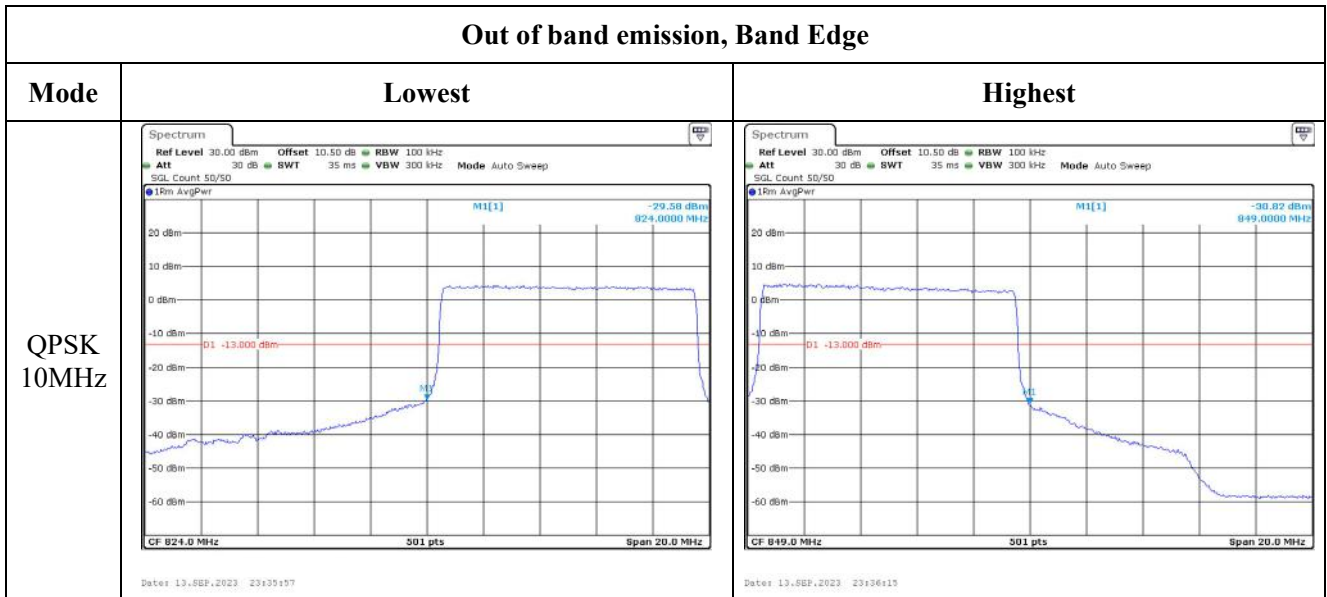
Spurious Emissions at Antenna Terminal

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>Peak: M1[1] -46.50 dBm @ 772.50 MHz Reference: D1 -13.000 dBm</p> <p>Date: 14.SEP.2023 01:10:10</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>Peak: M1[1] -32.12 dBm @ 6.5420 GHz Reference: D1 -13.000 dBm</p> <p>Date: 14.SEP.2023 01:10:36</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>Peak: M1[1] -46.31 dBm @ 975.00 MHz Reference: D1 -13.000 dBm</p> <p>Date: 14.SEP.2023 01:11:11</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>Peak: M1[1] -32.31 dBm @ 6.9730 GHz Reference: D1 -13.000 dBm</p> <p>Date: 14.SEP.2023 01:11:41</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>Peak: M1[1] -46.08 dBm @ 309.00 MHz Reference: D1 -13.000 dBm</p> <p>Date: 14.SEP.2023 01:12:13</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>Peak: M1[1] -32.34 dBm @ 5.9490 GHz Reference: D1 -13.000 dBm</p> <p>Date: 14.SEP.2023 01:12:42</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 30 kHz Att 30 dB SWT 76 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -25.26 dBm 823.94610 MHz CF 824.0 MHz 501 pts Span 3.0 MHz Date: 13_SEP.2023 23:24:04</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -25.44 dBm 849.02400 MHz CF 849.0 MHz 501 pts Span 3.0 MHz Date: 13_SEP.2023 23:24:20</p>
QPSK 3MHz	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -25.35 dBm 824.80000 MHz CF 824.0 MHz 501 pts Span 6.0 MHz Date: 13_SEP.2023 23:25:49</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SGL Count 50/50 1Rm AvgPwr M1[1] -26.10 dBm 849.00000 MHz CF 849.0 MHz 501 pts Span 6.0 MHz Date: 13_SEP.2023 23:26:05</p>
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] -24.33 dBm 824.80000 MHz CF 824.0 MHz 501 pts Span 10.0 MHz Date: 13_SEP.2023 23:30:24</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] -24.42 dBm 849.00000 MHz CF 849.0 MHz 501 pts Span 10.0 MHz Date: 13_SEP.2023 23:34:25</p>

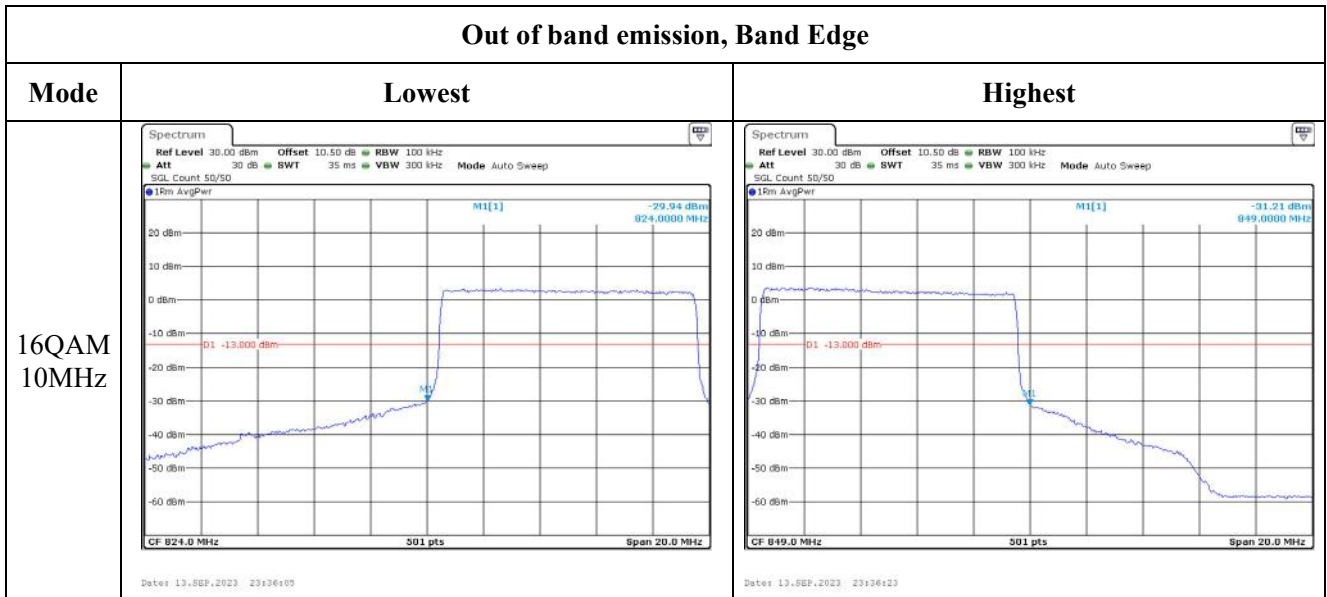
Out of band emission, Band Edge



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPwr M1[1] -24.49 dBm 823.96410 MHz CF 824.0 MHz 501 pts Span 3.0 MHz Date: 13_SEP_2023 23:24:12</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPwr M1[1] -25.01 dBm 849.02400 MHz CF 849.0 MHz 501 pts Span 3.0 MHz Date: 13_SEP_2023 23:24:28</p>
16QAM 3MHz	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPwr M1[1] -24.96 dBm 824.80000 MHz CF 824.0 MHz 501 pts Span 6.0 MHz Date: 13_SEP_2023 23:25:57</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 30 kHz Att 30 dB SWT 35 ms VBW 100 kHz Mode Auto Sweep SQL Count 50/50 1Rm AvgPwr M1[1] -26.30 dBm 849.80000 MHz CF 849.0 MHz 501 pts Span 6.0 MHz Date: 13_SEP_2023 23:26:12</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 SQL Count 50/50 1Rm AvgPwr M1[1] -24.22 dBm 824.80000 MHz CF 824.0 MHz 501 pts Span 10.0 MHz Date: 13_SEP_2023 23:34:16</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 SQL Count 50/50 1Rm AvgPwr M1[1] -24.82 dBm 849.80000 MHz CF 849.0 MHz 501 pts Span 10.0 MHz Date: 13_SEP_2023 23:34:32</p>

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
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)
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