

Out of band emission, Band Edge

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

Out of band emission, Band Edge

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

4.6 Antenna Port Test Data and Results for LTE Band 4

Serial Number:	CR22030001-RF-S1	Test Date:	2022-03-09~2022-03-15
Test Site:	RF	Test Mode:	Transmitting
Tester:	Le Qiao	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	23.7	Relative Humidity: (%)	46	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	Spectrum Analyzer	101474	2021-07-22	2022-07-21
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Coaxial Attenuators	53-20-34	LN751	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2021-07-22	2022-07-21
BACL	TEMP&HUMI Test Chamber	BTH-150	30026	2021-07-22	2022-07-22
UNI-T	Multimeter	UT39A+	C210582554	2021-09-30	2022-09-30
E-Microwave	Two-way Splitter	ODP-1-6	OE0120176	Each Time	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).

EUT Information@ LTE Band 4▲:

Antenna Gain (dBi):	0.82	Cable Loss (dB):	0.1
Operation Voltage(V _{DC}):			
Lowest:	3.6	Normal:	3.85
		Highest:	4.4

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	22.67	22.65	22.84	23.56	30
	RB1#3	22.64	22.70	22.79		
	RB1#5	22.69	22.70	22.79		
	RB3#0	22.65	22.68	22.75		
	RB3#3	22.70	22.72	22.67		
	RB6#0	21.70	21.68	21.55		
1.4MHz 16QAM	RB1#0	22.33	22.39	21.80	23.13	30
	RB1#3	22.34	22.41	21.64		
	RB1#5	22.41	22.34	21.73		
	RB3#0	21.76	21.62	21.75		
	RB3#3	21.80	21.65	21.64		
	RB6#0	21.41	21.34	21.00		
3MHz QPSK	RB1#0	22.62	22.61	22.77	23.54	30
	RB1#8	22.62	22.65	22.79		
	RB1#14	22.66	22.72	22.82		
	RB6#0	21.67	21.72	21.71		
	RB6#9	21.62	21.68	21.67		
	RB15#0	21.60	21.70	21.54		
3MHz 16QAM	RB1#0	21.85	22.45	21.66	23.17	30
	RB1#8	21.91	22.39	21.67		
	RB1#14	21.92	22.43	21.72		
	RB6#0	21.30	20.99	21.00		
	RB6#9	20.79	21.37	20.97		
	RB15#0	21.29	21.30	20.86		
5MHz QPSK	RB1#0	22.68	22.75	22.57	23.47	30
	RB1#13	22.70	22.64	22.44		
	RB1#24	22.69	22.74	22.41		
	RB15#0	21.72	21.75	21.67		
	RB15#10	21.84	21.64	21.69		
	RB25#0	21.72	21.64	21.74		
5MHz 16QAM	RB1#0	20.80	21.84	21.69	22.56	30
	RB1#13	20.73	21.76	21.58		
	RB1#24	20.80	21.84	21.62		
	RB15#0	21.28	20.60	20.51		
	RB15#10	20.89	21.20	20.65		
	RB25#0	20.89	21.14	20.85		

10MHz QPSK	RB1#0	22.56	22.72	22.68	23.58	30
	RB1#25	22.52	22.61	22.86		
	RB1#49	22.74	22.80	22.77		
	RB25#0	21.53	21.58	21.68		
	RB25#25	21.61	21.67	21.58		
	RB50#0	21.62	21.81	21.87		
10MHz 16QAM	RB1#0	21.82	21.86	21.13	22.71	30
	RB1#25	21.89	21.85	21.27		
	RB1#49	21.92	21.99	21.08		
	RB25#0	20.85	20.93	20.86		
	RB25#25	20.86	20.74	20.86		
	RB50#0	20.76	21.52	20.92		
15MHz QPSK	RB1#0	22.55	22.63	22.72	23.49	30
	RB1#38	22.59	22.64	22.77		
	RB1#74	22.56	22.71	22.76		
	RB36#0	21.72	21.64	21.74		
	RB36#39	21.61	21.58	21.60		
	RB75#0	21.60	21.35	21.60		
15MHz 16QAM	RB1#0	21.81	22.36	21.96	23.17	30
	RB1#38	21.94	22.45	22.03		
	RB1#74	21.80	22.37	21.95		
	RB36#0	20.77	20.77	20.73		
	RB36#39	20.81	20.74	20.71		
	RB75#0	20.81	21.38	20.95		
20MHz QPSK	RB1#0	22.71	22.67	22.70	23.5	30
	RB1#50	22.72	22.73	22.68		
	RB1#99	22.73	22.77	22.78		
	RB50#0	21.61	21.82	21.63		
	RB50#50	21.57	21.59	21.88		
	RB100#0	21.58	21.90	21.59		
20MHz 16QAM	RB1#0	22.38	21.67	22.17	23.16	30
	RB1#50	22.41	21.69	22.32		
	RB1#99	22.44	21.72	22.27		
	RB50#0	20.73	20.85	20.62		
	RB50#50	20.76	21.03	21.00		
	RB100#0	20.88	21.18	20.64		

Note: EIRP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(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	5.83	5.65	5.54	13
	RB100#0	5.42	5.57	5.39	13
20MHz 16QAM	RB1#0	6.96	6.49	6.23	13
	RB100#0	6.32	6.38	6.23	13
Result:					Pass

FCC §2.1049, §27.53:Occupied Bandwidth						
Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
1.4MHz QPSK	1.102	1.102	1.102	1.254	1.260	1.260
1.4MHz 16QAM	1.108	1.090	1.090	1.266	1.248	1.236
3MHz QPSK	2.707	2.695	2.683	3.000	3.000	3.000
3MHz 16QAM	2.695	2.683	2.695	3.012	3.000	3.012
5MHz QPSK	4.531	4.511	4.511	5.000	5.000	4.980
5MHz 16QAM	4.511	4.551	4.551	5.000	5.020	5.000
10MHz QPSK	8.981	8.942	8.942	9.760	9.760	9.760
10MHz 16QAM	8.942	8.981	8.942	9.720	9.840	9.840
15MHz QPSK	13.473	13.533	13.473	15.000	14.940	15.060
15MHz 16QAM	13.473	13.533	13.473	15.000	15.120	15.000
20MHz QPSK	17.884	17.964	17.964	19.440	19.680	19.760
20MHz 16QAM	17.964	18.044	17.964	19.680	19.840	19.680

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.

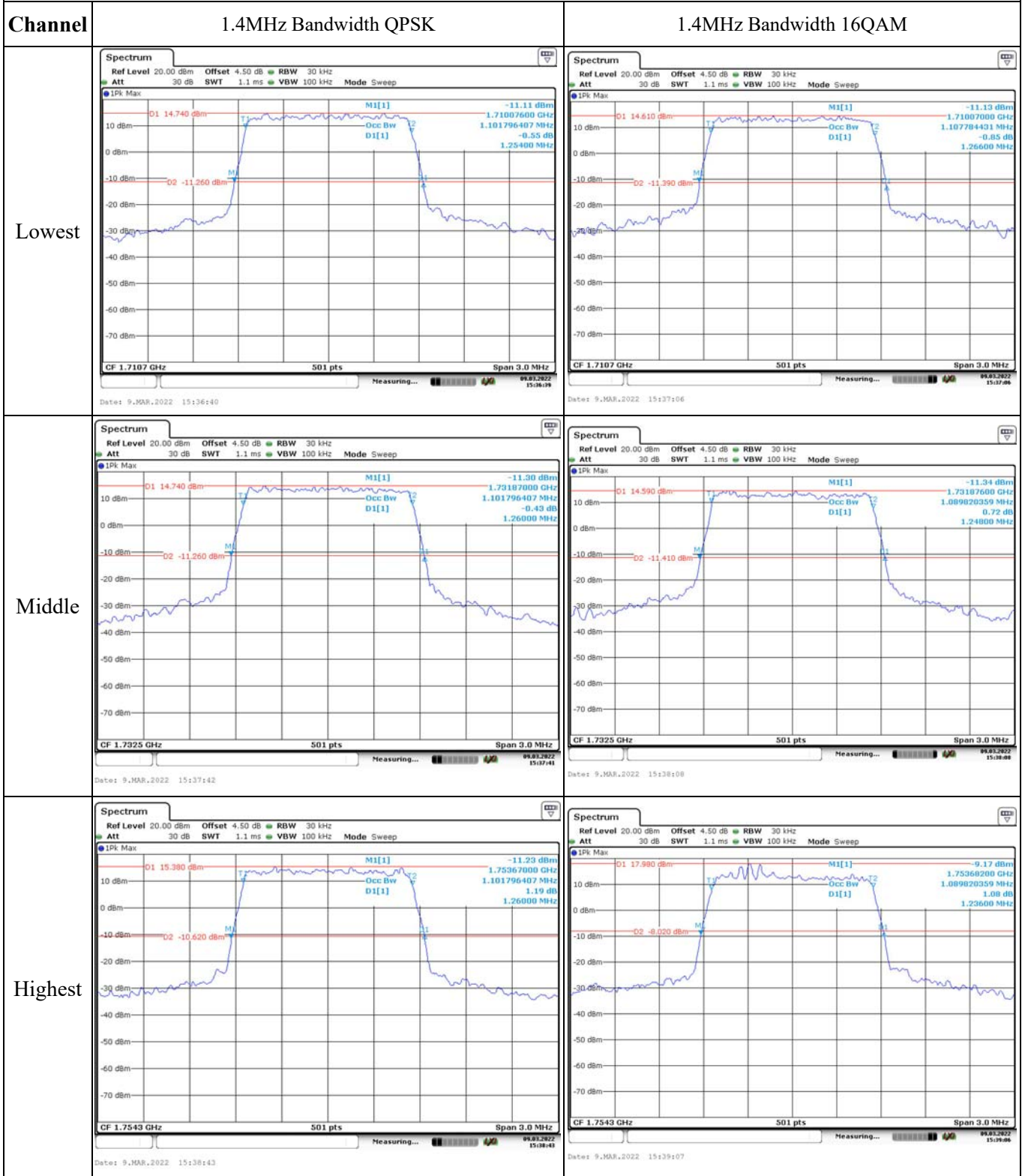
FCC §2.1051, § 27.53:Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

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	1710.529	1710.00	1754.471	1755
	-20	3.85	1710.525	1710.00	1754.472	1755
	-10	3.85	1710.529	1710.00	1754.471	1755
	0	3.85	1710.524	1710.00	1754.473	1755
	10	3.85	1710.528	1710.00	1754.474	1755
	20	3.85	1710.529	1710.00	1754.471	1755
	30	3.85	1710.522	1710.00	1754.475	1755
	40	3.85	1710.529	1710.00	1754.471	1755
	50	3.85	1710.526	1710.00	1754.472	1755
Frequency Stability vs. Voltage	20	3.6	1710.529	1710.00	1754.471	1755
	20	4.4	1710.528	1710.00	1754.473	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	1710.529	1710.00	1754.471	1755
	-20	3.85	1710.528	1710.00	1754.475	1755
	-10	3.85	1710.529	1710.00	1754.471	1755
	0	3.85	1710.527	1710.00	1754.472	1755
	10	3.85	1710.526	1710.00	1754.472	1755
	20	3.85	1710.529	1710.00	1754.471	1755
	30	3.85	1710.525	1710.00	1754.474	1755
	40	3.85	1710.529	1710.00	1754.471	1755
	50	3.85	1710.527	1710.00	1754.476	1755
Frequency Stability vs. Voltage	20	3.6	1710.529	1710.00	1754.471	1755
	20	4.4	1710.524	1710.00	1754.475	1755
Result:					Pass	

Test Plots:

Occupied Bandwidth



Occupied Bandwidth

Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 30 kHz Att 30 dB SWT 1.1 ms VBW 100 kHz Mode Sweep IPk Max -13.35 dBm 1.7110000 GHz 2.706586826 MHz 0.40 dB 3.0000 MHz D1 12.920 dBm D2 -13.080 dBm M1[1] D1[1] CF 1.7115 GHz 501 pts Span 6.0 MHz Measuring... 99.83.2922 15:39:31 Date: 9_MAR.2022 15:39:32</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 30 kHz Att 30 dB SWT 1.1 ms VBW 100 kHz Mode Sweep IPk Max -13.40 dBm 1.7100000 GHz 2.694618778 MHz -0.16 dB 3.0120 MHz D1 11.820 dBm D2 -14.180 dBm M1[1] D1[1] CF 1.7115 GHz 501 pts Span 6.0 MHz Measuring... 99.83.2927 15:39:52 Date: 9_MAR.2022 15:39:52</p>
Middle	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 30 kHz Att 30 dB SWT 1.1 ms VBW 100 kHz Mode Sweep IPk Max -13.80 dBm 1.7310000 GHz 2.694610778 MHz 0.69 dB 3.0000 MHz D1 12.390 dBm D2 -13.610 dBm M1[1] D1[1] CF 1.7325 GHz 501 pts Span 6.0 MHz Measuring... 99.83.2927 15:40:17 Date: 9_MAR.2022 15:40:18</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 30 kHz Att 30 dB SWT 1.1 ms VBW 100 kHz Mode Sweep IPk Max -14.75 dBm 1.7310000 GHz 2.682634731 MHz 0.59 dB 3.0000 MHz D1 11.720 dBm D2 -14.280 dBm M1[1] D1[1] CF 1.7325 GHz 501 pts Span 6.0 MHz Measuring... 99.83.2927 15:40:37 Date: 9_MAR.2022 15:40:38</p>
Highest	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 30 kHz Att 30 dB SWT 1.1 ms VBW 100 kHz Mode Sweep IPk Max -14.30 dBm 1.7520000 GHz 2.682634731 MHz 0.23 dB 3.0000 MHz D1 11.410 dBm D2 -14.590 dBm M1[1] D1[1] CF 1.7535 GHz 501 pts Span 6.0 MHz Measuring... 99.83.2927 15:41:06 Date: 9_MAR.2022 15:41:06</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 30 kHz Att 30 dB SWT 1.1 ms VBW 100 kHz Mode Sweep IPk Max -14.35 dBm 1.7519880 GHz 2.694618778 MHz 0.26 dB 3.0120 MHz D1 11.570 dBm D2 -14.430 dBm M1[1] D1[1] CF 1.7535 GHz 501 pts Span 6.0 MHz Measuring... 99.83.2927 15:41:27 Date: 9_MAR.2022 15:41:27</p>

Occupied Bandwidth

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

Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep IPk Max -14.70 dBm 1.7101200 GHz 0.982035920 MHz 1.35 dB 9.7600 MHz D1 12.410 dBm D2 -13.590 dBm MI[1] D1[1] CF 1.715 GHz 501 pts Span 20.0 MHz Date: 9_MAR.2022 15:45:04</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep IPk Max -12.69 dBm 1.7101600 GHz 0.942115760 MHz -0.22 dB 9.7200 MHz D1 12.900 dBm D2 -13.100 dBm MI[1] D1[1] CF 1.715 GHz 501 pts Span 20.0 MHz Date: 9_MAR.2022 15:45:34</p>
Middle	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep IPk Max -12.77 dBm 1.7276200 GHz 0.942115760 MHz -1.24 dB 9.7600 MHz D1 12.360 dBm D2 -13.640 dBm MI[1] D1[1] CF 1.7325 GHz 501 pts Span 20.0 MHz Date: 9_MAR.2022 15:46:13</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep IPk Max -14.40 dBm 1.7275400 GHz 0.982035920 MHz 0.06 dB 9.8400 MHz D1 11.310 dBm D2 -14.690 dBm MI[1] D1[1] CF 1.7325 GHz 501 pts Span 20.0 MHz Date: 9_MAR.2022 15:46:41</p>
Highest	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep IPk Max -14.56 dBm 1.7451200 GHz 0.942115760 MHz 0.69 dB 9.7600 MHz D1 12.270 dBm D2 -13.730 dBm MI[1] D1[1] CF 1.75 GHz 501 pts Span 20.0 MHz Date: 9_MAR.2022 15:47:11</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep IPk Max -15.24 dBm 1.7450800 GHz 0.942115760 MHz 0.14 dB 9.8400 MHz D1 10.740 dBm D2 -15.260 dBm MI[1] D1[1] CF 1.75 GHz 501 pts Span 20.0 MHz Date: 9_MAR.2022 15:47:45</p>

Occupied Bandwidth

Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep</p> <p>D1 15.250 dBm MI[1] -11.24 dBm 1.7100000 GHz Occ Bw 13.473053892 MHz D1[1] 15.0000 MHz</p> <p>D2 -10.750 dBm</p> <p>CF 1.7175 GHz 501 pts Span 30.0 MHz</p> <p>Date: 9_MAR.2022 15:48:19</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep</p> <p>D1 14.400 dBm MI[1] -11.54 dBm 1.7100600 GHz Occ Bw 13.473053892 MHz D1[1] 15.0000 MHz</p> <p>D2 -11.600 dBm</p> <p>CF 1.7175 GHz 501 pts Span 30.0 MHz</p> <p>Date: 9_MAR.2022 15:48:52</p>
Middle	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep</p> <p>D1 15.640 dBm MI[1] -9.63 dBm 1.7250600 GHz Occ Bw 13.532934132 MHz D1[1] 14.9400 MHz</p> <p>D2 -10.360 dBm</p> <p>CF 1.7325 GHz 501 pts Span 30.0 MHz</p> <p>Date: 9_MAR.2022 15:49:24</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep</p> <p>D1 15.970 dBm MI[1] -10.66 dBm 1.7240800 GHz Occ Bw 13.532934132 MHz D1[1] 15.3200 MHz</p> <p>D2 -10.430 dBm</p> <p>CF 1.7325 GHz 501 pts Span 30.0 MHz</p> <p>Date: 9_MAR.2022 15:49:51</p>
Highest	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep</p> <p>D1 14.530 dBm MI[1] -11.96 dBm 1.7400000 GHz Occ Bw 13.473053892 MHz D1[1] 15.0600 MHz</p> <p>D2 -11.470 dBm</p> <p>CF 1.7475 GHz 501 pts Span 30.0 MHz</p> <p>Date: 9_MAR.2022 15:50:20</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep</p> <p>D1 14.370 dBm MI[1] -11.65 dBm 1.7400600 GHz Occ Bw 13.473053892 MHz D1[1] 15.0000 MHz</p> <p>D2 -11.630 dBm</p> <p>CF 1.7475 GHz 501 pts Span 30.0 MHz</p> <p>Date: 9_MAR.2022 15:50:47</p>

Occupied Bandwidth

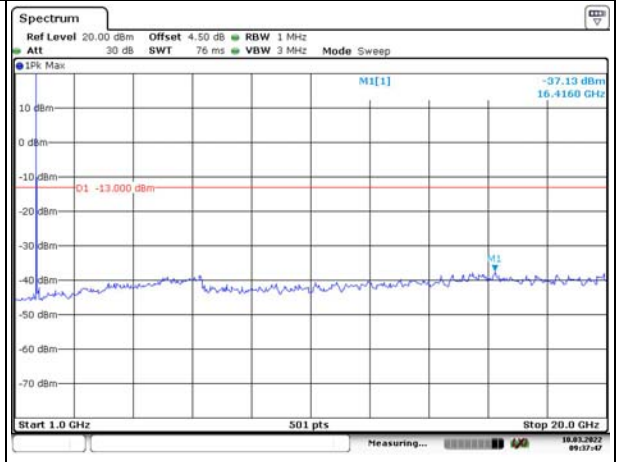
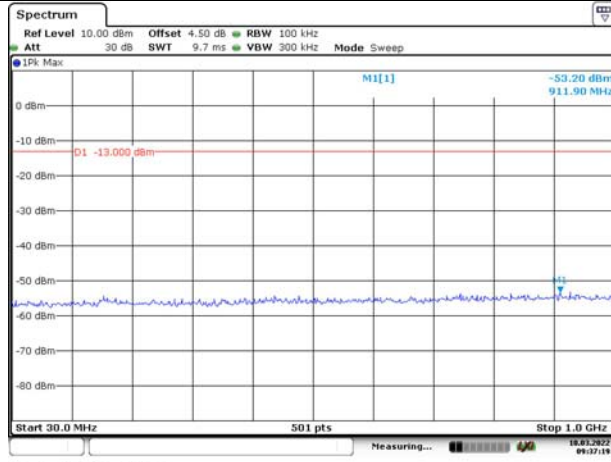
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 14.930 dBm M1[1] -10.77 dBm 1.7103200 GHz Occ BW 17.084231537 MHz D1[1] -0.21 dB 19.4400 MHz CF 1.72 GHz 501 pts Span 40.0 MHz Measuring... 9.03.2022 15:51:51 Date: 9.MAR.2022 15:51:51</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 12.850 dBm M1[1] -12.54 dBm 1.7101600 GHz Occ BW 17.964071856 MHz D1[1] -1.63 dB 19.6800 MHz CF 1.72 GHz 501 pts Span 40.0 MHz Measuring... 9.03.2022 15:51:58 Date: 9.MAR.2022 15:51:58</p>
Middle	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 14.530 dBm M1[1] -11.04 dBm 1.7227400 GHz Occ BW 17.964071856 MHz D1[1] -0.60 dB 19.6800 MHz CF 1.7225 GHz 501 pts Span 40.0 MHz Measuring... 9.03.2022 15:52:16 Date: 9.MAR.2022 15:52:16</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 13.350 dBm M1[1] -11.74 dBm 1.7225800 GHz Occ BW 18.043912176 MHz D1[1] -0.59 dB 19.8400 MHz CF 1.7225 GHz 501 pts Span 40.0 MHz Measuring... 9.03.2022 15:53:06 Date: 9.MAR.2022 15:53:06</p>
Highest	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 14.120 dBm M1[1] -10.96 dBm 1.7352400 GHz Occ BW 17.964071856 MHz D1[1] -1.61 dB 19.7600 MHz CF 1.745 GHz 501 pts Span 40.0 MHz Measuring... 9.03.2022 15:53:18 Date: 9.MAR.2022 15:53:18</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 13.150 dBm M1[1] -13.36 dBm 1.7352400 GHz Occ BW 17.964071856 MHz D1[1] 0.56 dB 19.8800 MHz CF 1.745 GHz 501 pts Span 40.0 MHz Measuring... 9.03.2022 15:54:08 Date: 9.MAR.2022 15:54:08</p>

Spurious Emissions at Antenna Terminal

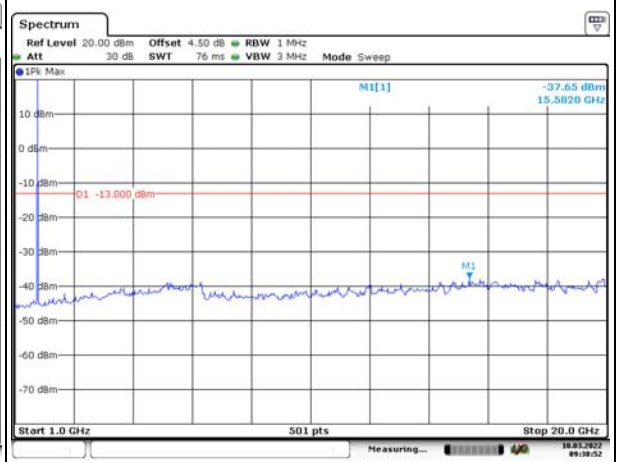
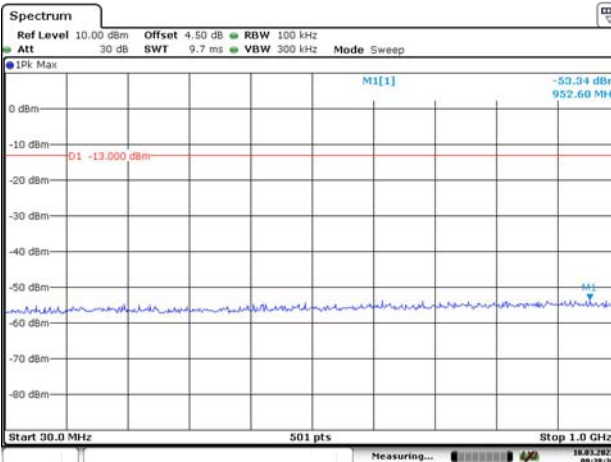
Channel

1.4MHz Bandwidth QPSK

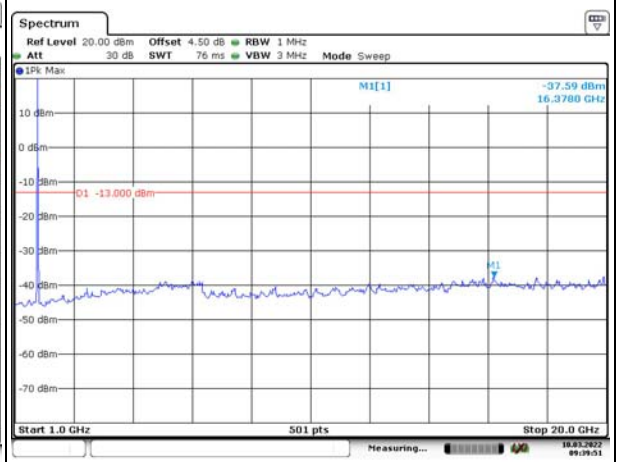
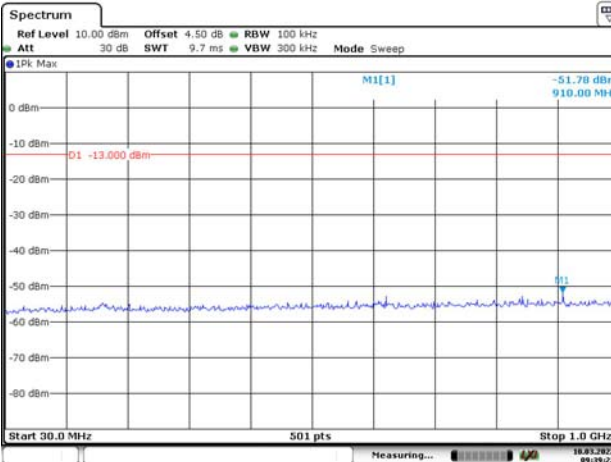
Lowest



Middle



Highest

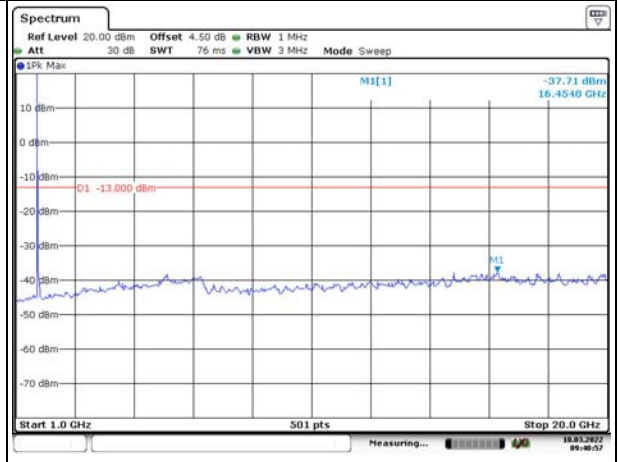
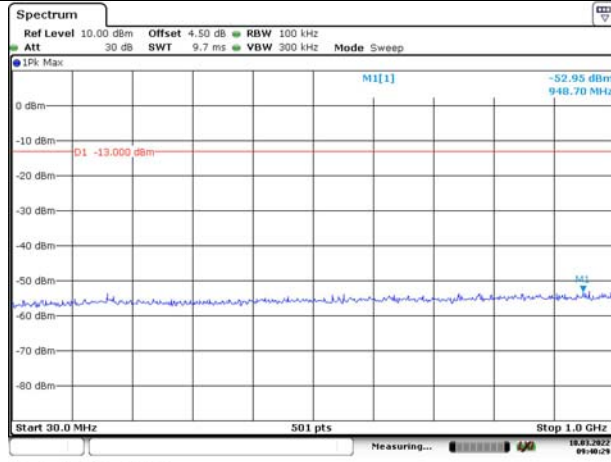


Spurious Emissions at Antenna Terminal

Channel

3MHz Bandwidth QPSK

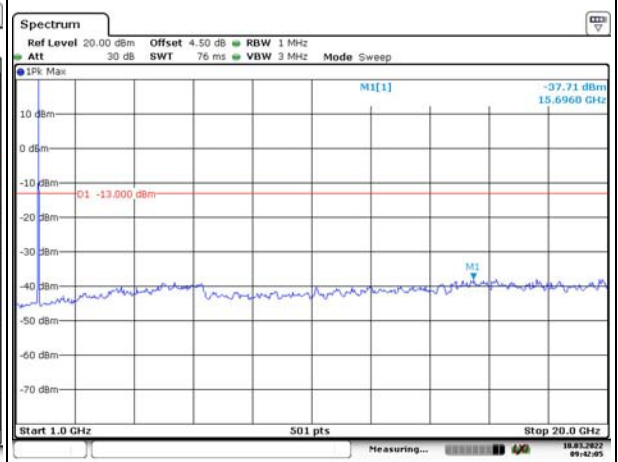
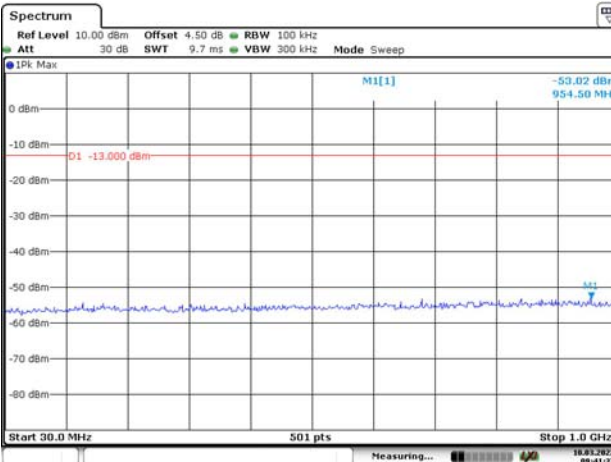
Lowest



Date: 10.MAR.2022 09:40:29

Date: 10.MAR.2022 09:40:58

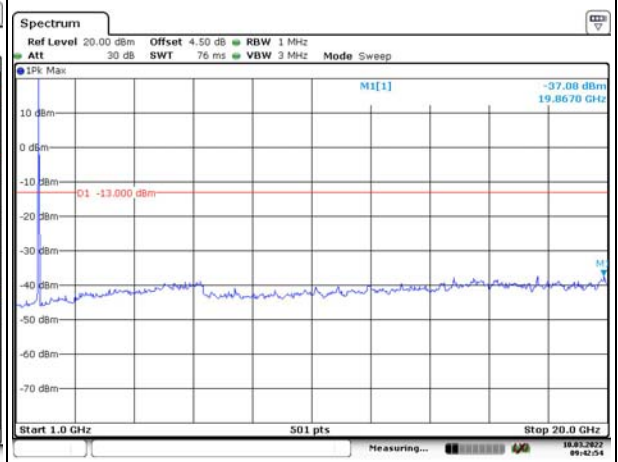
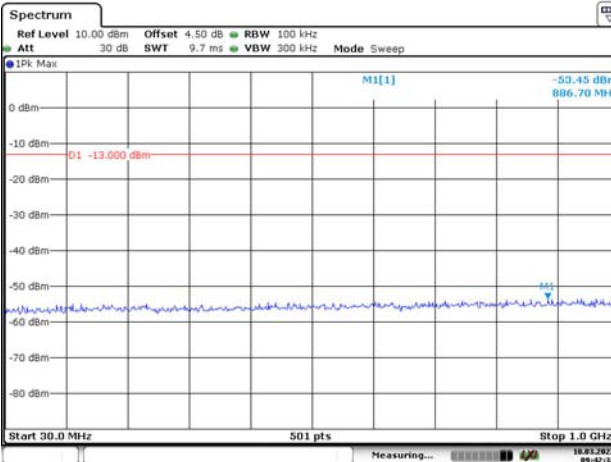
Middle



Date: 10.MAR.2022 09:41:37

Date: 10.MAR.2022 09:42:05

Highest



Date: 10.MAR.2022 09:42:32

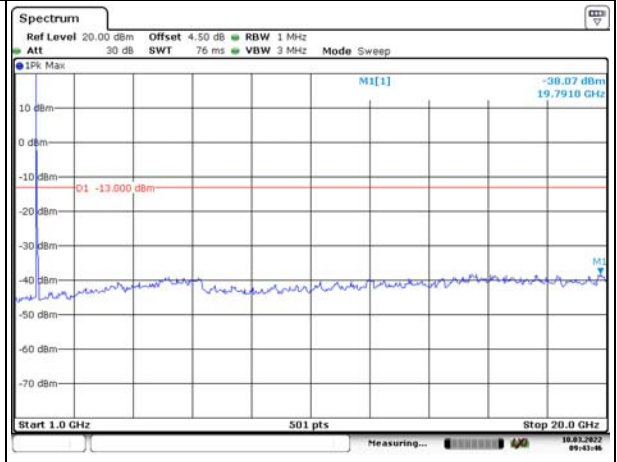
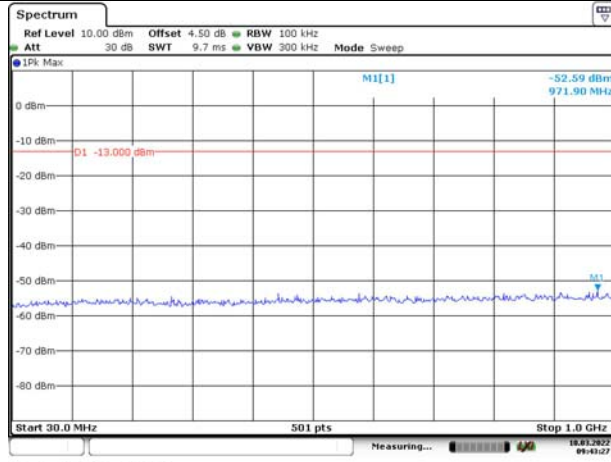
Date: 10.MAR.2022 09:42:55

Spurious Emissions at Antenna Terminal

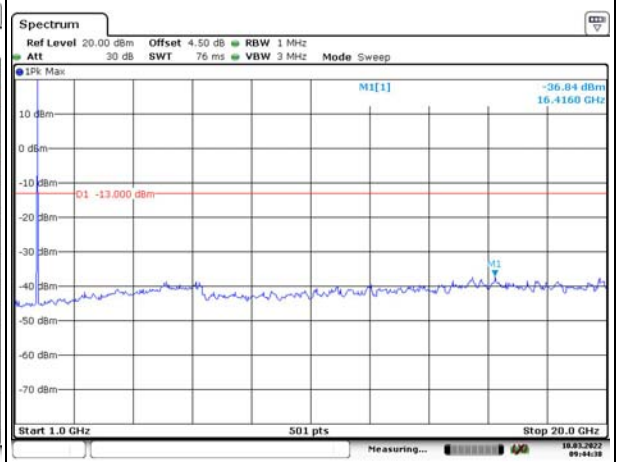
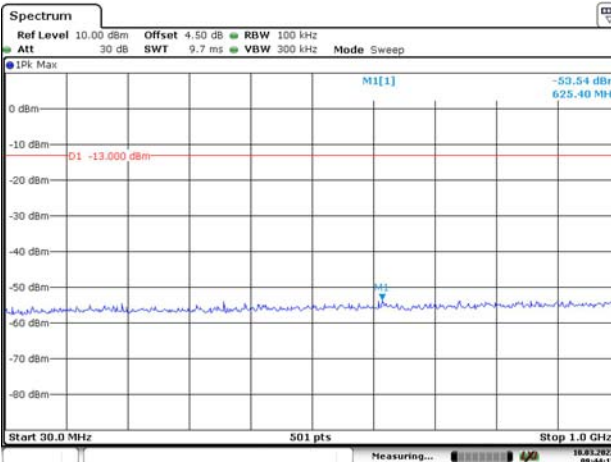
Channel

5MHz Bandwidth QPSK

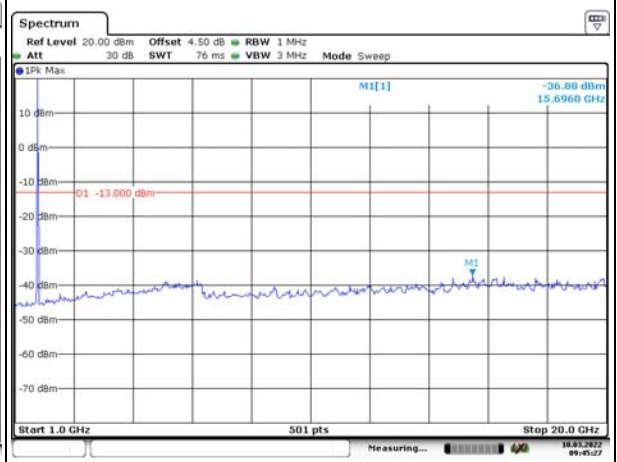
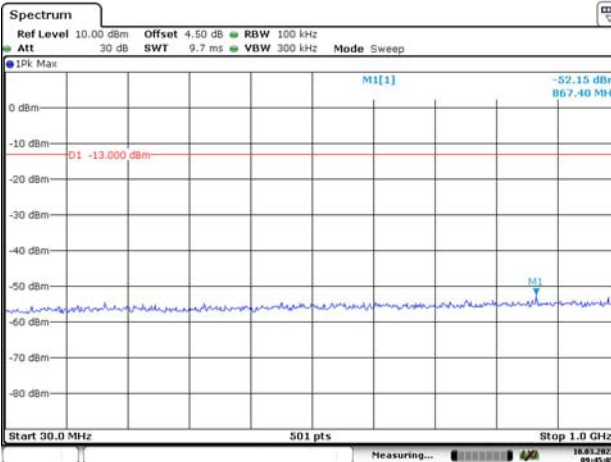
Lowest



Middle



Highest

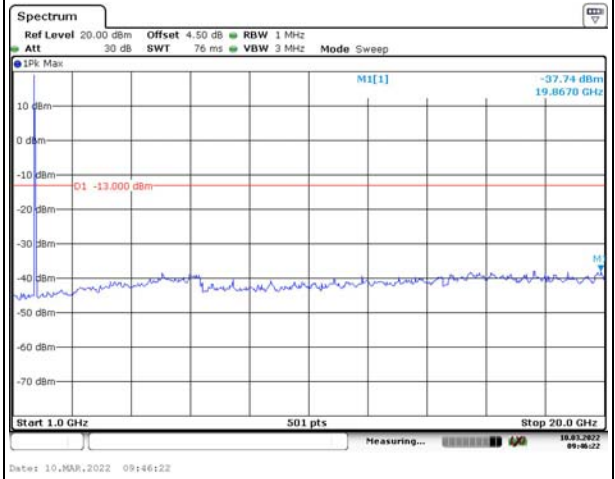
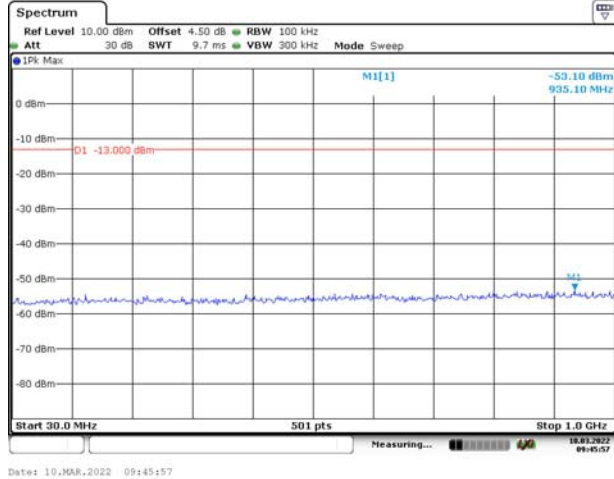


Spurious Emissions at Antenna Terminal

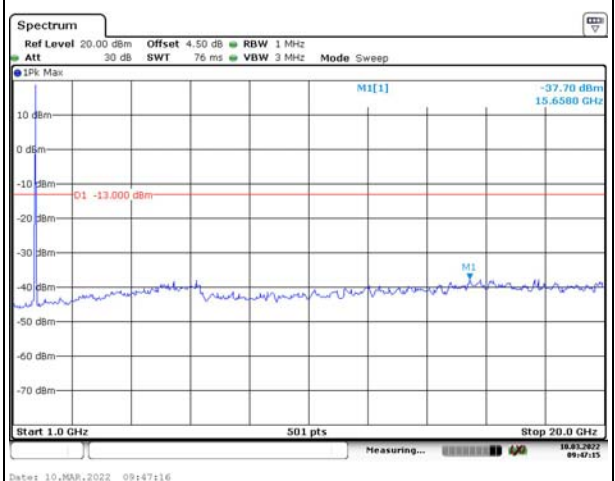
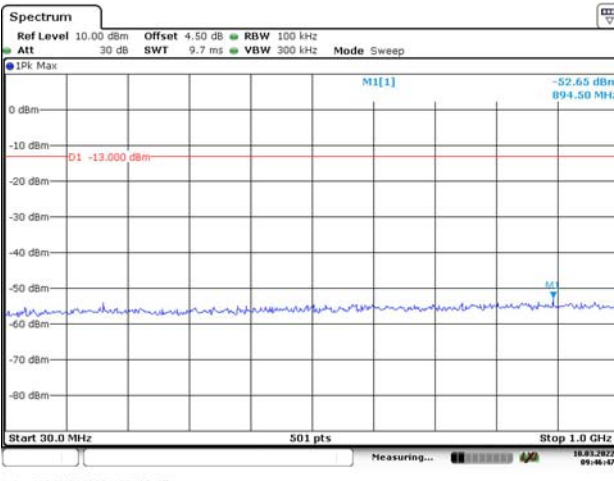
Channel

10MHz Bandwidth QPSK

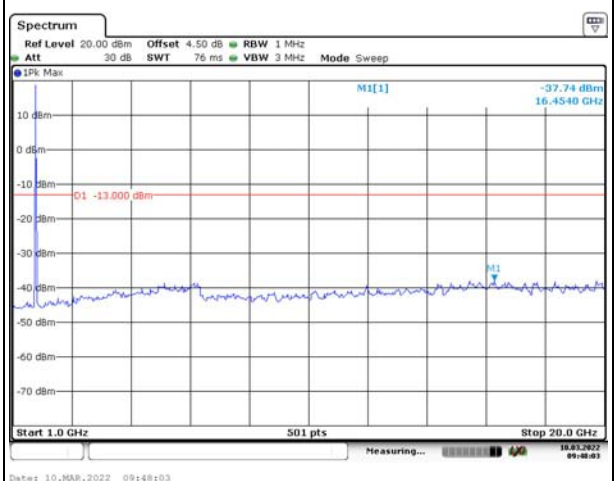
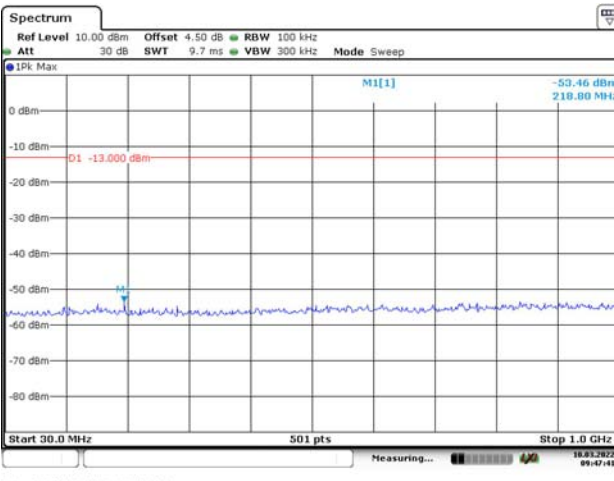
Lowest



Middle



Highest

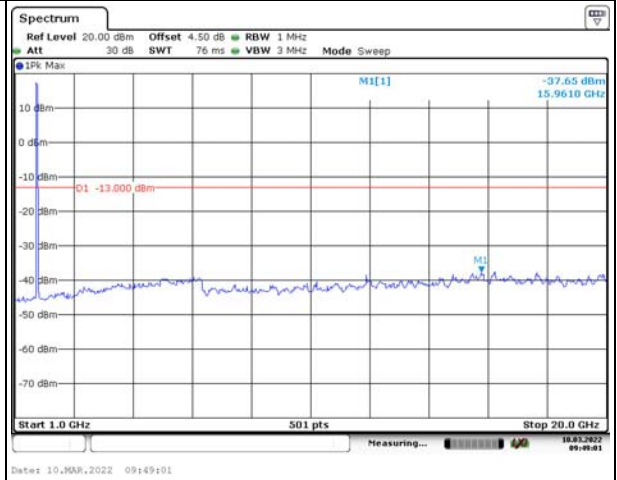
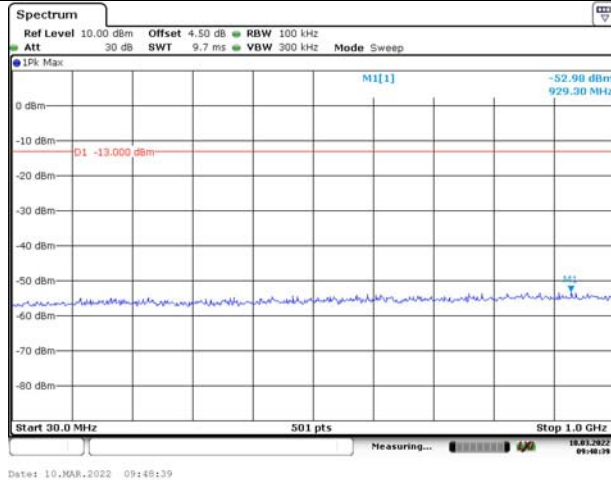


Spurious Emissions at Antenna Terminal

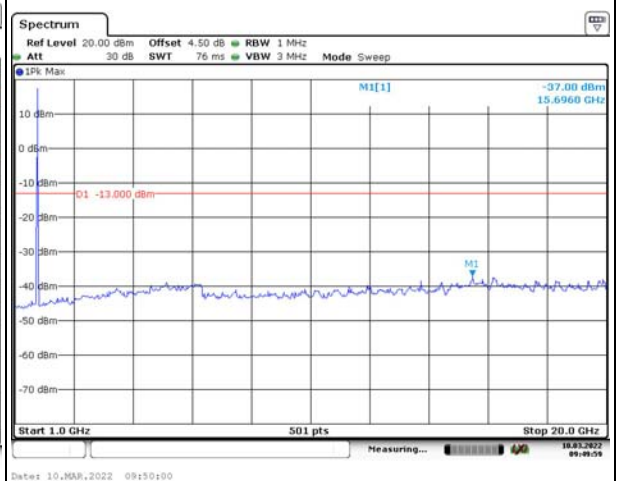
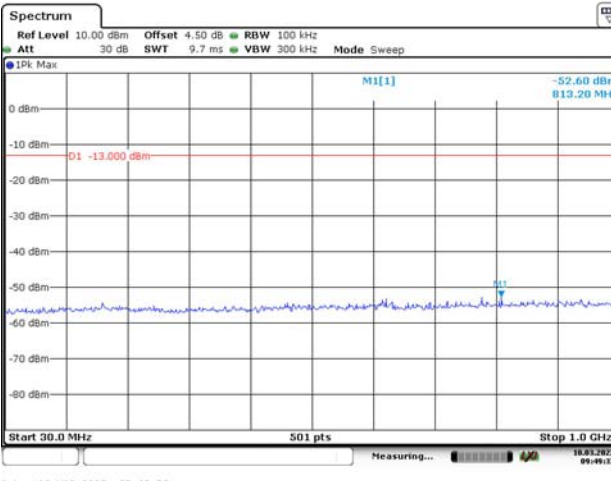
Channel

15MHz Bandwidth QPSK

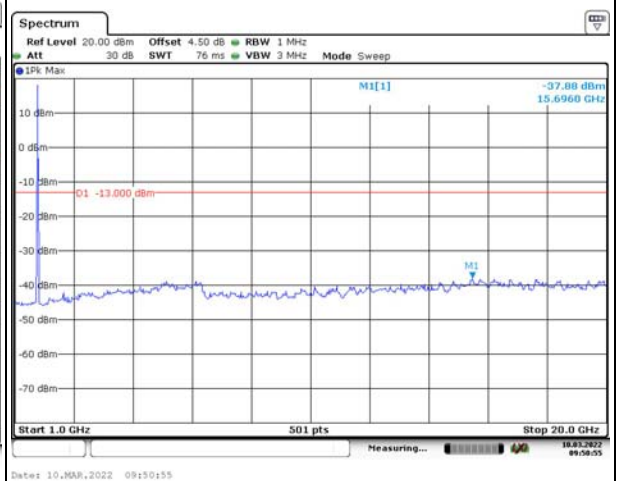
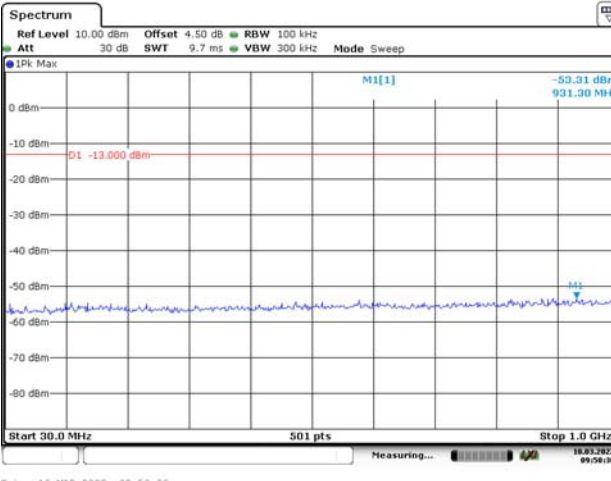
Lowest



Middle



Highest



Spurious Emissions at Antenna Terminal

Channel	20MHz Bandwidth QPSK	
Lowest	<p>Ref Level 10.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Sweep</p> <p>IPk Max MI[1] -53.67 dBm 619.60 MHz</p> <p>-13.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>Date: 10.MAR.2022 09:52:18</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 1 MHz Att 30 dB SWT 76 ms VBW 3 MHz Mode Sweep</p> <p>IPk Max MI[1] -37.46 dBm 15.6960 GHz</p> <p>-13.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 20.0 GHz</p> <p>Date: 10.MAR.2022 09:52:49</p>
	<p>Ref Level 10.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Sweep</p> <p>IPk Max MI[1] -53.33 dBm 964.20 MHz</p> <p>-13.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>Date: 10.MAR.2022 09:53:23</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 1 MHz Att 30 dB SWT 76 ms VBW 3 MHz Mode Sweep</p> <p>IPk Max MI[1] -36.08 dBm 17.7060 GHz</p> <p>-13.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 20.0 GHz</p> <p>Date: 10.MAR.2022 09:53:49</p>
Highest	<p>Ref Level 10.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Sweep</p> <p>IPk Max MI[1] -50.47 dBm 904.20 MHz</p> <p>-13.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>Date: 10.MAR.2022 09:54:15</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 1 MHz Att 30 dB SWT 76 ms VBW 3 MHz Mode Sweep</p> <p>IPk Max MI[1] -37.60 dBm 15.6960 GHz</p> <p>-13.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 20.0 GHz</p> <p>Date: 10.MAR.2022 09:54:47</p>

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		
QPSK 15MHz		
QPSK 20MHz		

Out of band emission, Band Edge

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

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 7

Serial Number:	CR22030001-RF-S1	Test Date:	2022-03-09~2022-03-15
Test Site:	RF	Test Mode:	Transmitting
Tester:	Le Qiao	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	23.7	Relative Humidity: (%)	46	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	Spectrum Analyzer	101474	2021-07-22	2022-07-21
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Coaxial Attenuators	53-20-34	LN751	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2021-07-22	2022-07-21
BACL	TEMP&HUMI Test Chamber	BTH-150	30026	2021-07-22	2022-07-22
UNI-T	Multimeter	UT39A+	C210582554	2021-09-30	2022-09-30
E-Microwave	Two-way Splitter	ODP-1-6	OE0120176	Each Time	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).

EUT Information@ LTE Band 7▲:

Antenna Gain (dBi):	-0.42	Antenna Gain (dBi):	0.1
Operation Voltage(V _{DC}):			
Lowest:	3.6	Normal:	3.85
		Highest:	4.4

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	22.55	22.50	22.48	22.03	33
	RB1#13	22.52	22.53	22.49		
	RB1#24	22.47	22.52	22.54		
	RB15#0	21.43	21.47	21.52		
	RB15#10	21.55	21.46	21.57		
	RB25#0	21.51	21.50	21.59		
5MHz 16QAM	RB1#0	20.73	21.20	21.60	21.08	33
	RB1#13	20.77	21.27	21.59		
	RB1#24	20.84	21.26	21.55		
	RB15#0	20.64	20.81	20.41		
	RB15#10	20.65	20.75	20.51		
	RB25#0	20.72	20.84	20.57		
10MHz QPSK	RB1#0	22.29	-15.62	22.53	22.09	33
	RB1#25	22.33	-15.11	22.61		
	RB1#49	22.33	-15.37	22.56		
	RB25#0	21.32	21.44	21.59		
	RB25#25	21.53	21.41	21.65		
	RB50#0	21.54	21.47	21.49		
10MHz 16QAM	RB1#0	21.88	22.20	21.01	21.68	33
	RB1#25	21.76	22.11	20.98		
	RB1#49	21.84	22.16	21.26		
	RB25#0	20.50	20.59	20.73		
	RB25#25	20.49	20.57	20.78		
	RB50#0	20.59	20.96	20.64		
15MHz QPSK	RB1#0	22.36	22.41	22.57	22.1	33
	RB1#38	22.34	22.36	22.59		
	RB1#74	22.36	22.54	22.62		
	RB36#0	21.40	21.49	21.45		
	RB36#39	21.39	21.52	21.47		
	RB75#0	21.54	21.56	21.58		
15MHz 16QAM	RB1#0	21.80	21.83	21.77	21.4	33
	RB1#38	21.72	21.83	21.87		
	RB1#74	21.77	21.88	21.92		
	RB36#0	20.53	20.65	20.59		
	RB36#39	20.63	20.59	20.67		
	RB75#0	20.54	20.94	20.58		

20MHz QPSK	RB1#0	22.44	22.55	22.51	22.17	33
	RB1#50	22.43	22.55	22.58		
	RB1#99	22.50	22.68	22.69		
	RB50#0	21.38	21.44	21.30		
	RB50#50	21.43	21.44	21.47		
	RB100#0	21.53	21.43	21.47		
20MHz 16QAM	RB1#0	21.40	21.73	21.98	21.66	33
	RB1#50	21.42	21.70	22.16		
	RB1#99	21.48	21.81	22.18		
	RB50#0	20.57	20.63	20.53		
	RB50#50	20.60	20.51	20.63		
	RB100#0	20.99	20.88	20.67		
Note: EIRP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(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	5.07	4.99	5.28	13	
	RB100#0	5.33	5.33	5.25	13	
20MHz 16QAM	RB1#0	5.68	6.38	5.59	13	
	RB100#0	6.17	5.97	6.06	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	5.040	4.980
5MHz 16QAM	4.511	4.551	4.531	5.000	5.020	5.000
10MHz QPSK	8.981	8.942	8.942	9.800	9.800	9.800
10MHz 16QAM	8.942	8.981	8.942	9.760	9.800	9.800
15MHz QPSK	13.533	13.473	13.533	15.060	15.060	15.120
15MHz 16QAM	13.533	13.533	13.533	15.000	15.120	15.060
20MHz QPSK	17.964	17.964	18.044	19.600	19.680	19.840
20MHz 16QAM	18.044	18.044	17.964	19.760	19.840	19.760
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.

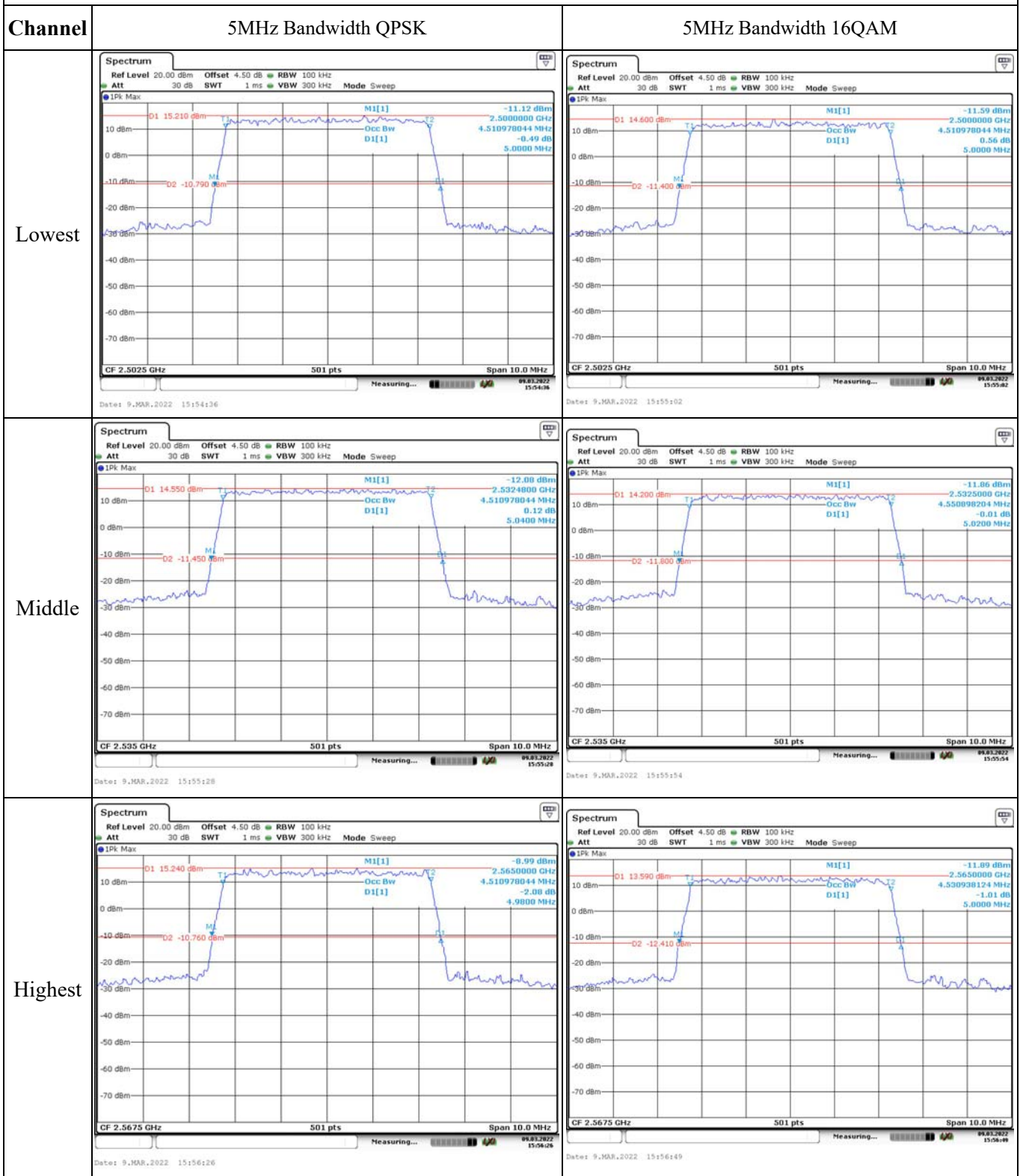
FCC §2.1051, § 27.53:Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

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	2500.529	2500.00	2569.471	2570
	-20	3.85	2500.528	2500.00	2569.472	2570
	-10	3.85	2500.529	2500.00	2569.471	2570
	0	3.85	2500.530	2500.00	2569.473	2570
	10	3.85	2500.524	2500.00	2569.475	2570
	20	3.85	2500.529	2500.00	2569.471	2570
	30	3.85	2500.525	2500.00	2569.476	2570
	40	3.85	2500.529	2500.00	2569.471	2570
Frequency Stability vs. Voltage	20	3.6	2500.529	2500.00	2569.471	2570
	20	4.4	2500.521	2500.00	2569.475	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	2500.529	2500.00	2569.471	2570
	-20	3.85	2500.528	2500.00	2569.472	2570
	-10	3.85	2500.529	2500.00	2569.471	2570
	0	3.85	2500.527	2500.00	2569.474	2570
	10	3.85	2500.526	2500.00	2569.477	2570
	20	3.85	2500.529	2500.00	2569.471	2570
	30	3.85	2500.528	2500.00	2569.472	2570
	40	3.85	2500.529	2500.00	2569.471	2570
Frequency Stability vs. Voltage	20	3.6	2500.529	2500.00	2569.471	2570
	20	4.4	2500.521	2500.00	2569.477	2570
					Result:	Pass

Test Plots:

Occupied Bandwidth



Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>MI[1] -13.70 dBm 2.5001200 GHz D1[1] -0.28 dB 9.8000 MHz</p> <p>CF 2.505 GHz 501 pts Span 20.0 MHz</p> <p>Date: 9_MAR.2022 15:57:28</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>MI[1] -14.26 dBm 2.5001200 GHz D1[1] 2.24 dB 9.7600 MHz</p> <p>CF 2.505 GHz 501 pts Span 20.0 MHz</p> <p>Date: 9_MAR.2022 15:57:52</p>
Middle	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>MI[1] -13.02 dBm 2.5001200 GHz D1[1] 0.69 dB 9.8000 MHz</p> <p>CF 2.535 GHz 501 pts Span 20.0 MHz</p> <p>Date: 9_MAR.2022 15:58:25</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>MI[1] -14.61 dBm 2.5000800 GHz D1[1] 1.13 dB 9.8000 MHz</p> <p>CF 2.535 GHz 501 pts Span 20.0 MHz</p> <p>Date: 9_MAR.2022 15:58:50</p>
Highest	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>MI[1] -14.19 dBm 2.5601200 GHz D1[1] 0.13 dB 9.8000 MHz</p> <p>CF 2.565 GHz 501 pts Span 20.0 MHz</p> <p>Date: 9_MAR.2022 15:59:26</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>MI[1] -13.77 dBm 2.5601200 GHz D1[1] -0.58 dB 9.8000 MHz</p> <p>CF 2.565 GHz 501 pts Span 20.0 MHz</p> <p>Date: 9_MAR.2022 15:59:50</p>

Occupied Bandwidth

Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 15.940 dBm MI[1] -9.86 dBm 2.5000000 GHz Occ Bw 13.532934132 MHz D1[1] -0.72 dB 15.0600 MHz CF 2.5075 GHz 501 pts Span 30.0 MHz Measuring... 99.83.2927 16:00:21 Date: 9_MAR.2022 16:00:21</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 14.450 dBm MI[1] -10.33 dBm 2.5000000 GHz Occ Bw 13.532934132 MHz D1[1] -0.96 dB 15.0000 MHz CF 2.5075 GHz 501 pts Span 30.0 MHz Measuring... 99.83.2927 16:00:45 Date: 9_MAR.2022 16:00:45</p>
Middle	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 15.510 dBm MI[1] -10.65 dBm 2.5275000 GHz Occ Bw 13.473053892 MHz D1[1] 0.50 dB 15.0600 MHz CF 2.535 GHz 501 pts Span 30.0 MHz Measuring... 99.83.2927 16:01:14 Date: 9_MAR.2022 16:01:14</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 15.180 dBm MI[1] -11.10 dBm 2.5274400 GHz Occ Bw 13.5200 MHz D1[1] 0.53 dB 15.1200 MHz CF 2.535 GHz 501 pts Span 30.0 MHz Measuring... 99.83.2927 16:01:38 Date: 9_MAR.2022 16:01:38</p>
Highest	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 15.320 dBm MI[1] -11.61 dBm 2.5549400 GHz Occ Bw 13.532934132 MHz D1[1] 1.40 dB 15.1200 MHz CF 2.5625 GHz 501 pts Span 30.0 MHz Measuring... 99.83.2927 16:02:09 Date: 9_MAR.2022 16:02:09</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 14.920 dBm MI[1] -10.19 dBm 2.5550000 GHz Occ Bw 13.532934132 MHz D1[1] -0.23 dB 15.0600 MHz CF 2.5625 GHz 501 pts Span 30.0 MHz Measuring... 99.83.2927 16:02:39 Date: 9_MAR.2022 16:02:39</p>

Occupied Bandwidth

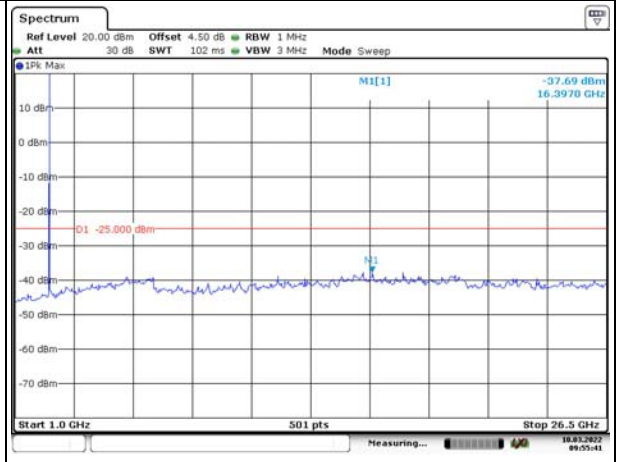
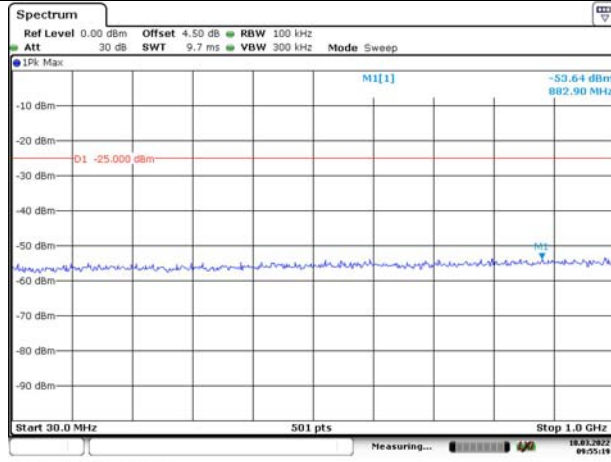
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 14.970 dBm MI[1] -11.56 dBm 2.5002400 GHz Occ Bw 17.964071856 MHz D1[1] 0.93 dB 19.6080 MHz D2 -11.030 dBm CF 2.51 GHz 501 pts Span 40.0 MHz Measuring... 99.83.2927 16:03:14 Date: 9_MAR.2022 16:03:14</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 14.200 dBm MI[1] -11.97 dBm 2.5001600 GHz Occ Bw 18.043912176 MHz D1[1] -0.68 dB 19.7600 MHz D2 -11.800 dBm CF 2.51 GHz 501 pts Span 40.0 MHz Measuring... 99.83.2927 16:03:18 Date: 9_MAR.2022 16:03:18</p>
Middle	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 15.230 dBm MI[1] -10.73 dBm 2.5252400 GHz Occ Bw 17.964071856 MHz D1[1] -1.25 dB 19.6080 MHz D2 -10.770 dBm CF 2.535 GHz 501 pts Span 40.0 MHz Measuring... 99.83.2927 16:04:18 Date: 9_MAR.2022 16:04:10</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 14.440 dBm MI[1] -11.57 dBm 2.5250800 GHz Occ Bw 18.043912176 MHz D1[1] -0.17 dB 19.8400 MHz D2 -11.560 dBm CF 2.535 GHz 501 pts Span 40.0 MHz Measuring... 99.83.2927 16:04:17 Date: 9_MAR.2022 16:04:17</p>
Highest	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 14.230 dBm MI[1] -12.11 dBm 2.5500800 GHz Occ Bw 18.043912176 MHz D1[1] -0.16 dB 19.8400 MHz D2 -11.770 dBm CF 2.56 GHz 501 pts Span 40.0 MHz Measuring... 99.83.2927 16:05:09 Date: 9_MAR.2022 16:05:09</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep IPk Max D1 14.070 dBm MI[1] -11.35 dBm 2.5501600 GHz Occ Bw 17.964071856 MHz D1[1] -0.75 dB 19.7600 MHz D2 -11.930 dBm CF 2.56 GHz 501 pts Span 40.0 MHz Measuring... 99.83.2927 16:05:16 Date: 9_MAR.2022 16:05:16</p>

Spurious Emissions at Antenna Terminal

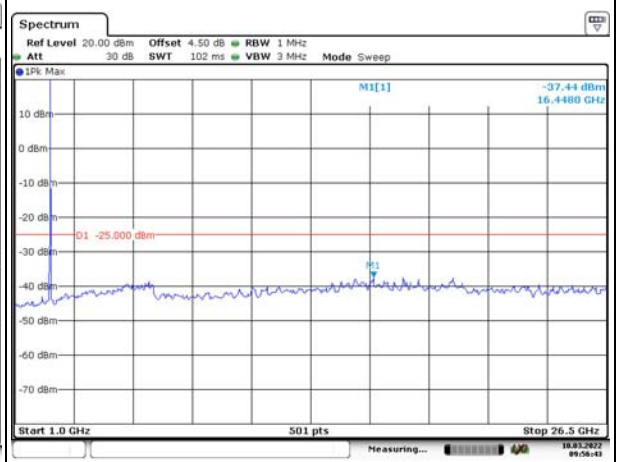
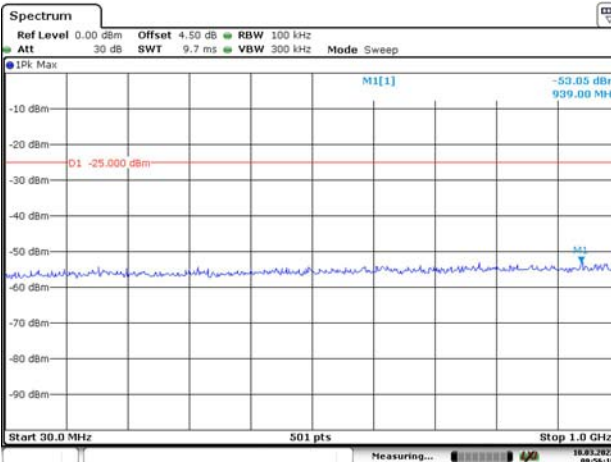
Channel

5MHz Bandwidth QPSK

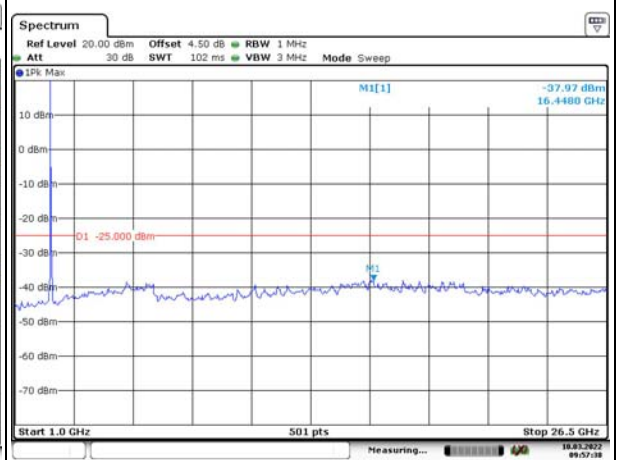
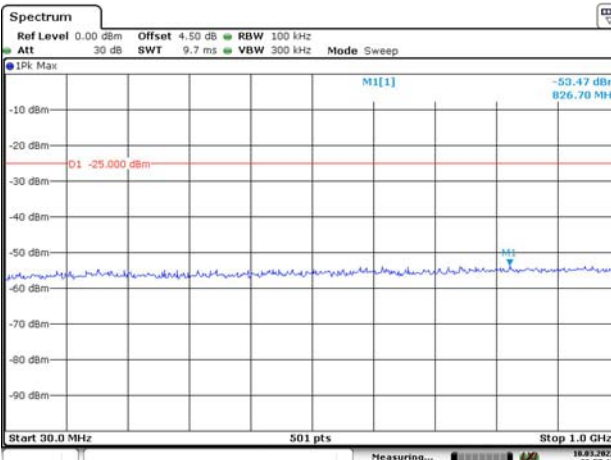
Lowest



Middle



Highest

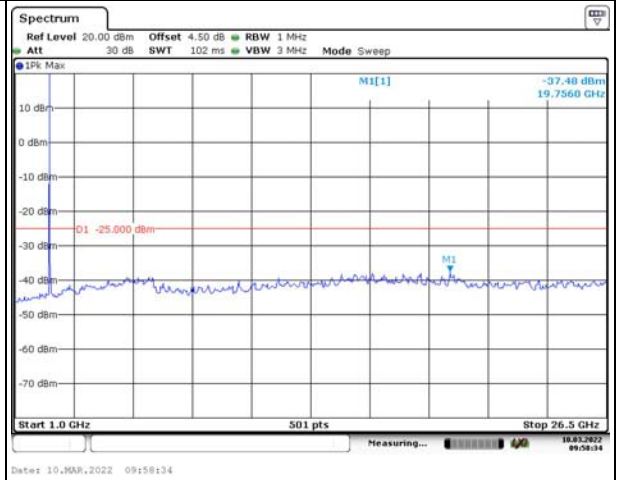
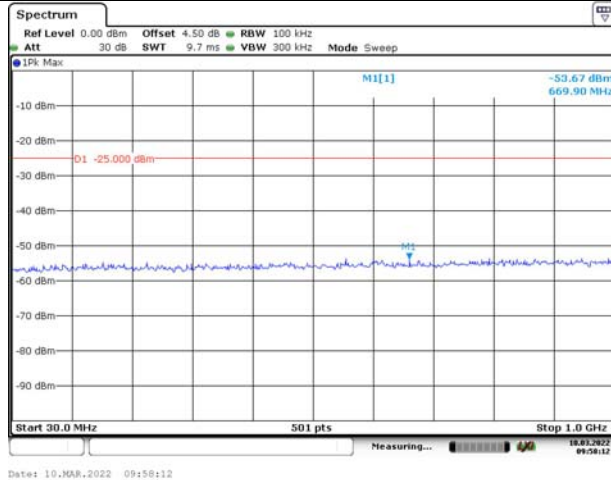


Spurious Emissions at Antenna Terminal

Channel

10MHz Bandwidth QPSK

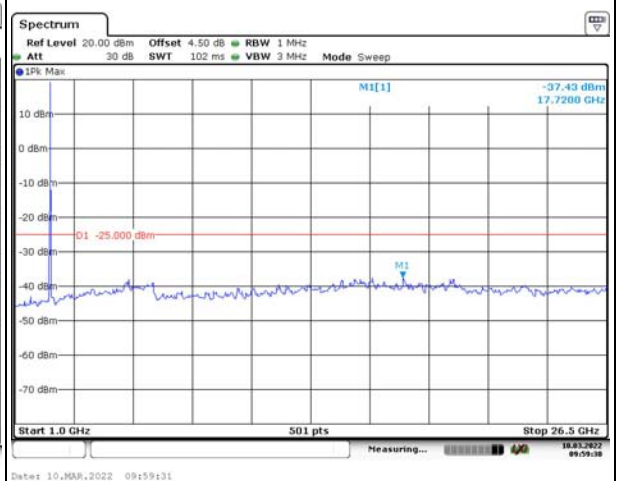
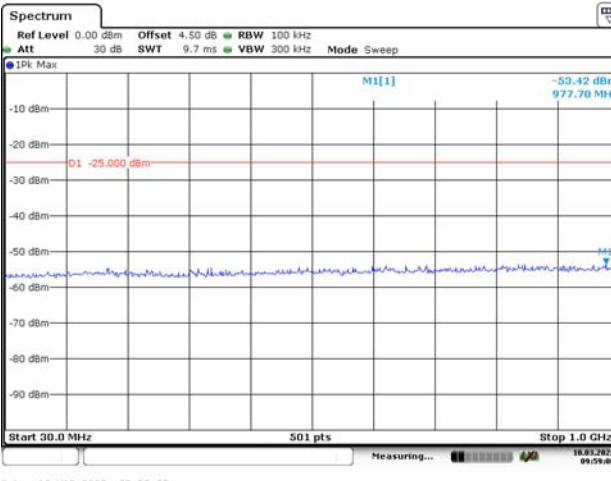
Lowest



Date: 10.MAR.2022 09:58:12

Date: 10.MAR.2022 09:58:14

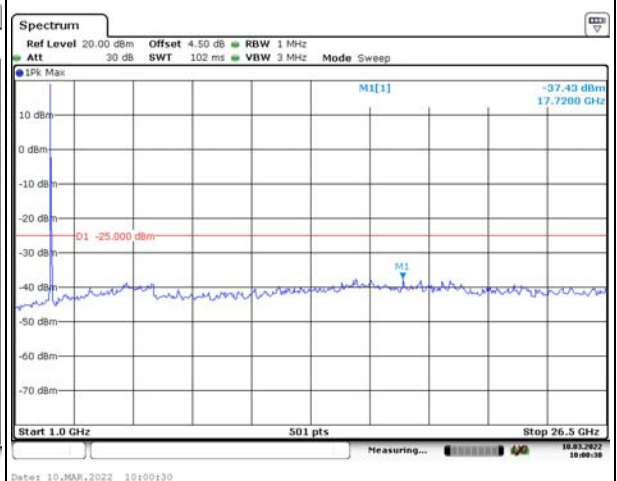
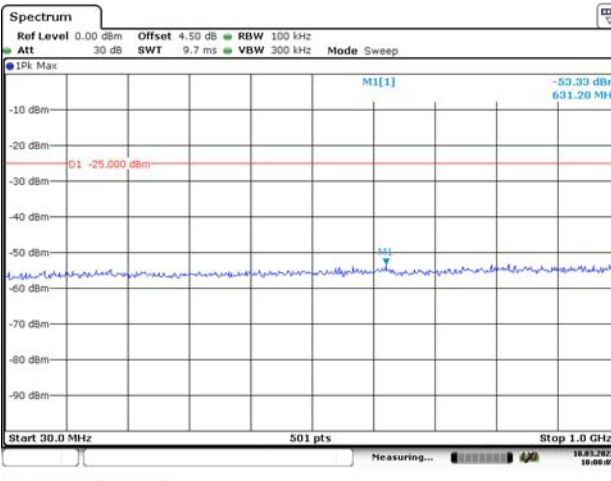
Middle



Date: 10.MAR.2022 09:59:09

Date: 10.MAR.2022 09:59:11

Highest



Date: 10.MAR.2022 10:00:05

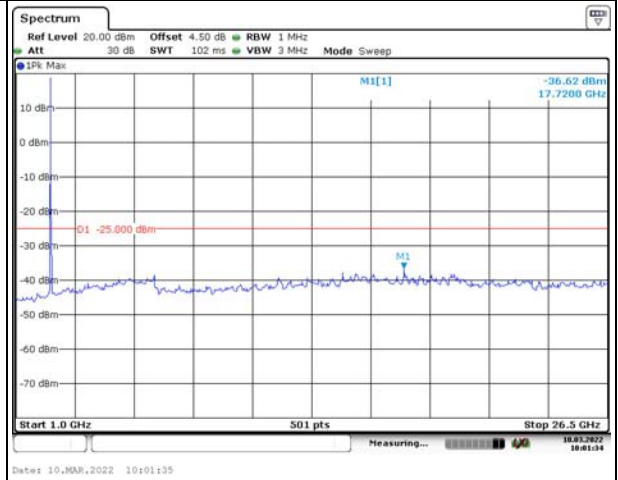
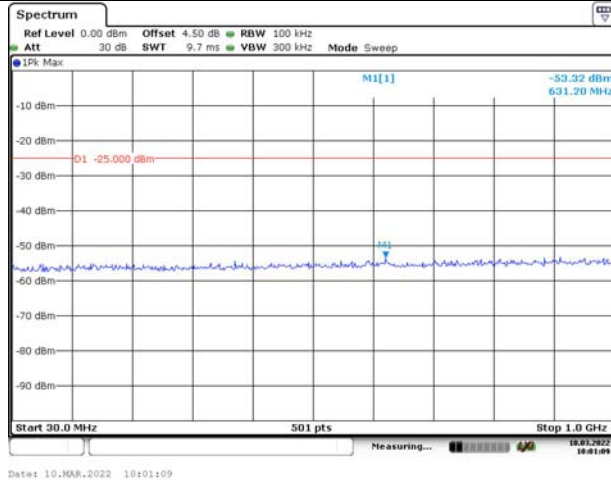
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Spurious Emissions at Antenna Terminal

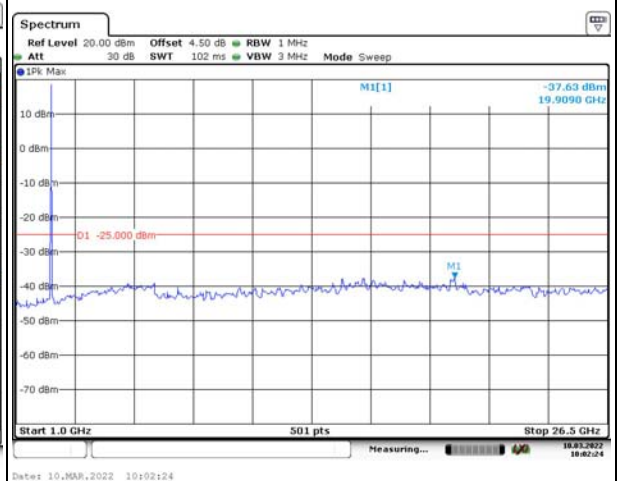
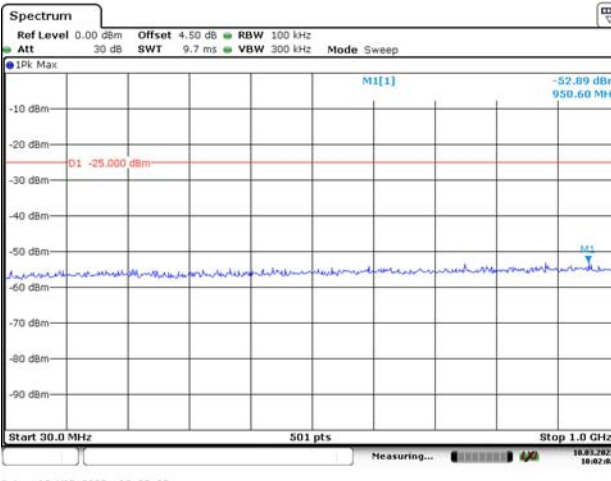
Channel

15MHz Bandwidth QPSK

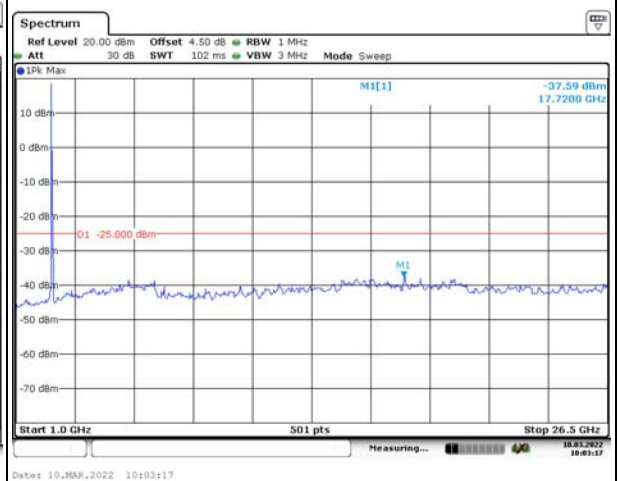
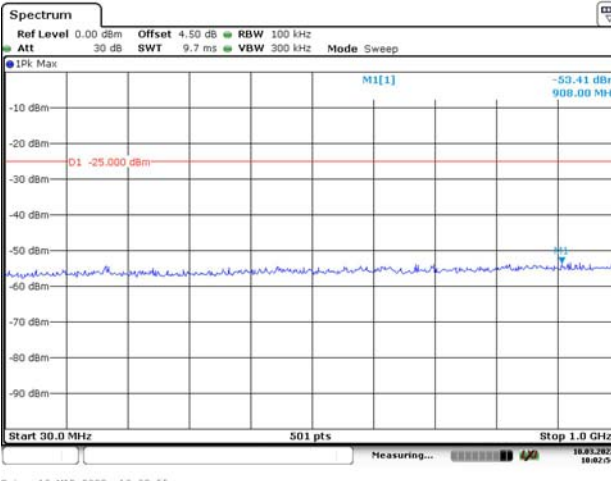
Lowest



Middle



Highest

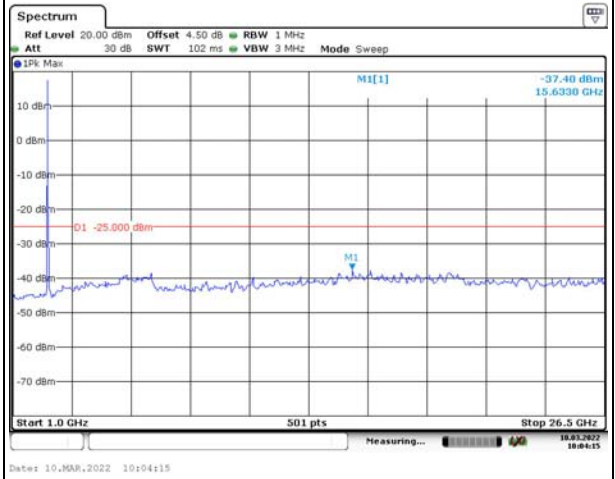
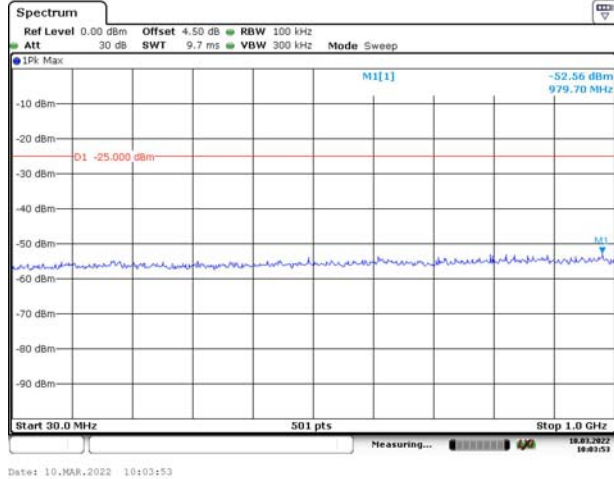


Spurious Emissions at Antenna Terminal

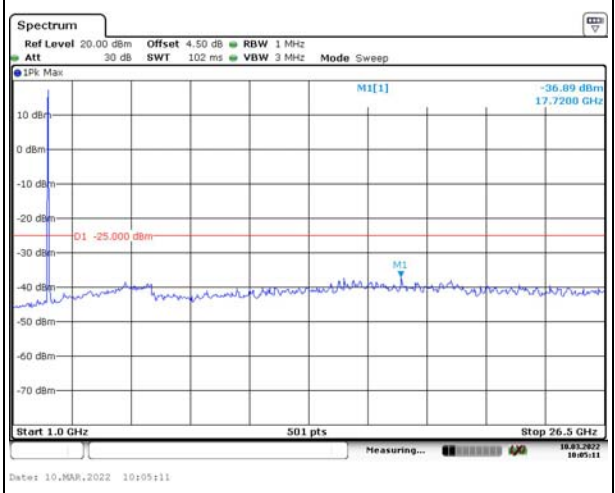
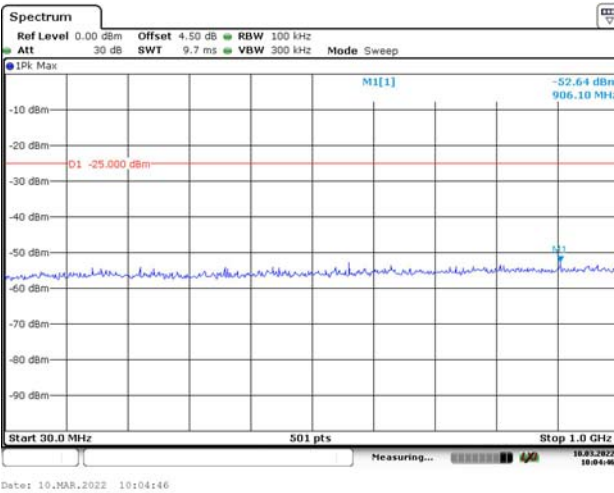
Channel

20MHz Bandwidth QPSK

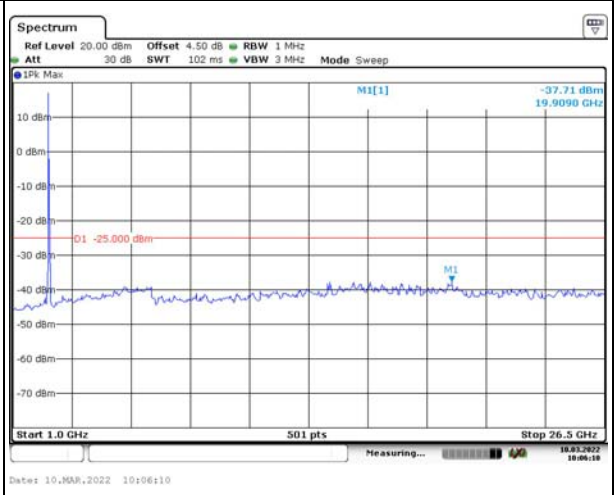
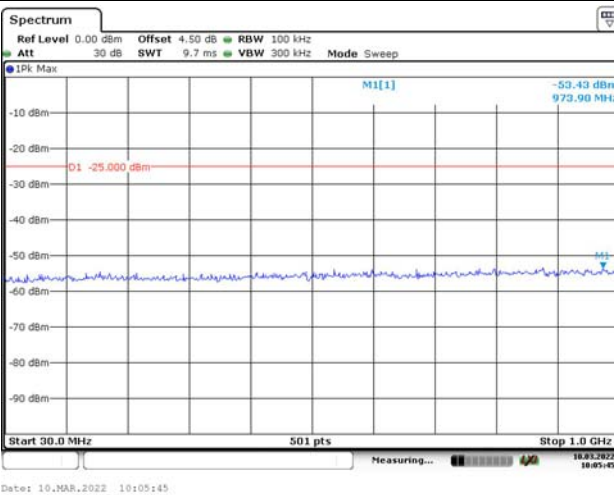
Lowest



Middle



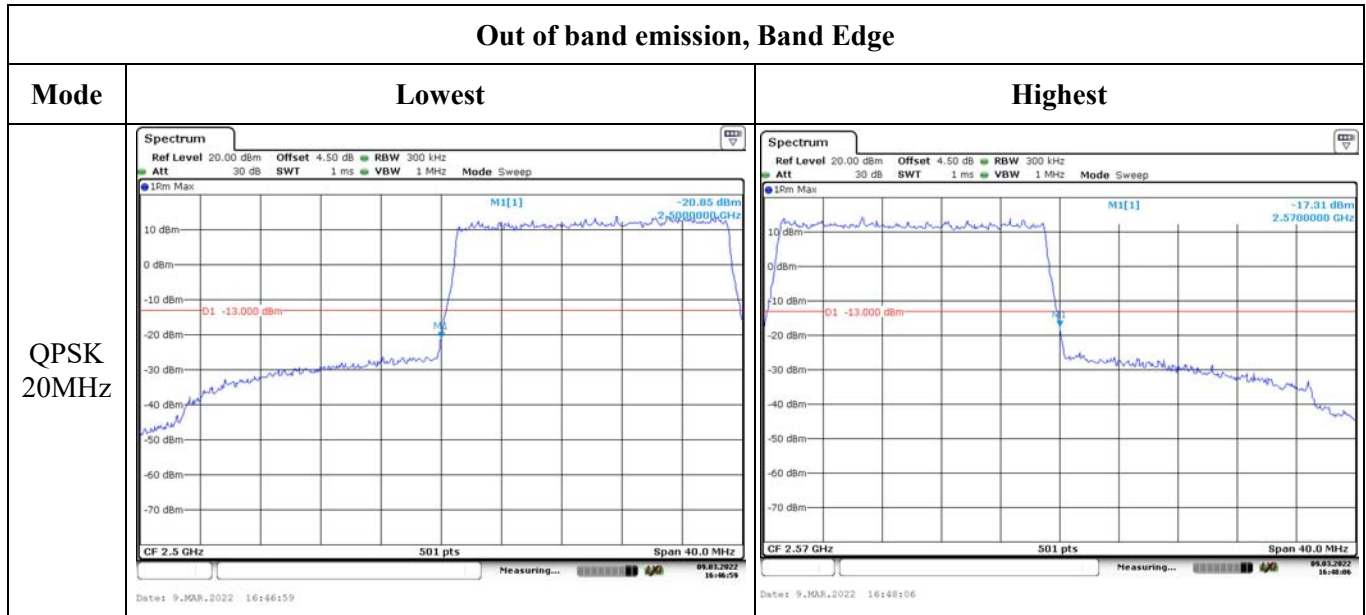
Highest



Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 5MHz	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 20 ms VBW 300 kHz Mode Sweep 12m Max MI[1] -19.44 dBm 2.5000000 GHz D1 -13.000 dBm CF 2.5 GHz 501 pts Span 10.0 MHz Date: 9_MAR_2022 16:40:56</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 20 ms VBW 300 kHz Mode Sweep 12m Max MI[1] -20.05 dBm 2.5700000 GHz D1 -13.000 dBm CF 2.57 GHz 501 pts Span 10.0 MHz Date: 9_MAR_2022 16:41:58</p>
QPSK 10MHz	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep 12m Max MI[1] -21.55 dBm 2.5000000 GHz D1 -13.000 dBm CF 2.5 GHz 501 pts Span 20.0 MHz Date: 9_MAR_2022 16:42:48</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep 12m Max MI[1] -20.38 dBm 2.5700000 GHz D1 -13.000 dBm CF 2.57 GHz 501 pts Span 20.0 MHz Date: 9_MAR_2022 16:43:41</p>
QPSK 15MHz	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 20 ms VBW 1 MHz Mode Sweep 12m Max MI[1] -23.68 dBm 2.5000000 GHz D1 -13.000 dBm CF 2.5 GHz 501 pts Span 30.0 MHz Date: 9_MAR_2022 16:44:52</p>	<p>Spectrum Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 20 ms VBW 1 MHz Mode Sweep 12m Max MI[1] -23.63 dBm 2.5700000 GHz D1 -13.000 dBm CF 2.57 GHz 501 pts Span 30.0 MHz Date: 9_MAR_2022 16:45:56</p>

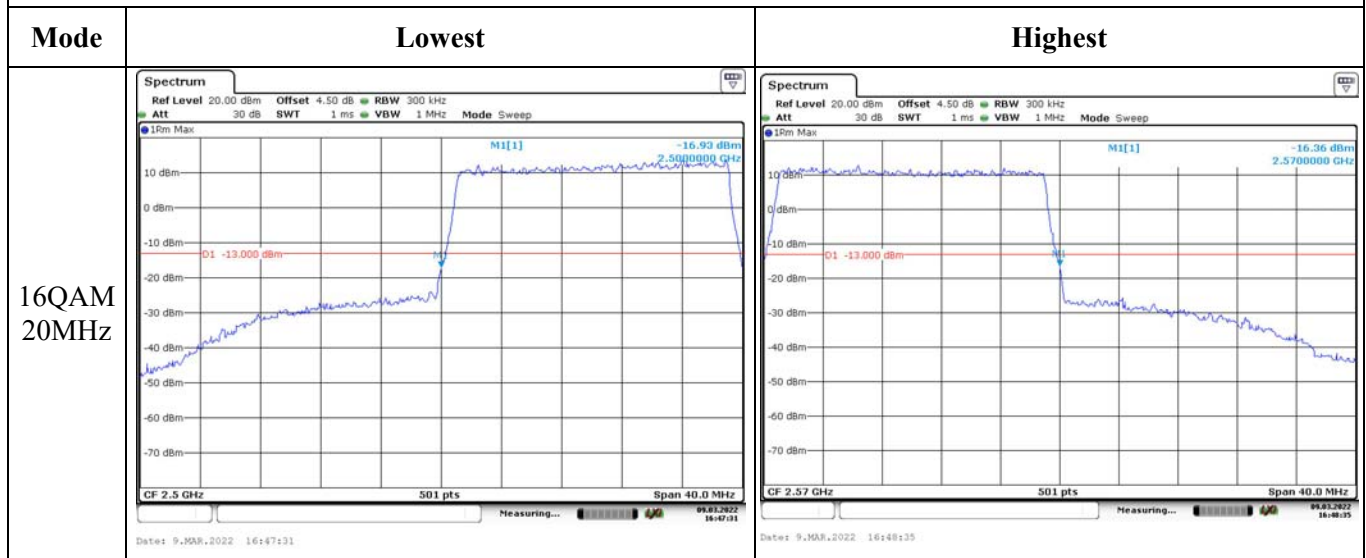
Out of band emission, Band Edge



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 5MHz	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 20 ms VBW 300 kHz Mode Sweep MI[1] -21.30 dBm 2.500000 GHz D1 -13.000 dBm CF 2.5 GHz 501 pts Span 10.0 MHz Date: 9_MAR_2022 16:41:30</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 20 ms VBW 300 kHz Mode Sweep MI[1] -20.62 dBm 2.570000 GHz D1 -13.000 dBm CF 2.57 GHz 501 pts Span 10.0 MHz Date: 9_MAR_2022 16:42:11</p>
16QAM 10MHz	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep MI[1] -20.65 dBm 2.500000 GHz D1 -13.000 dBm CF 2.5 GHz 501 pts Span 20.0 MHz Date: 9_MAR_2022 16:43:09</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep MI[1] -21.23 dBm 2.570000 GHz D1 -13.000 dBm CF 2.57 GHz 501 pts Span 20.0 MHz Date: 9_MAR_2022 16:44:12</p>
16QAM 15MHz	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 20 ms VBW 1 MHz Mode Sweep MI[1] -25.38 dBm 2.500000 GHz D1 -13.000 dBm CF 2.5 GHz 501 pts Span 30.0 MHz Date: 9_MAR_2022 16:45:23</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 20 ms VBW 1 MHz Mode Sweep MI[1] -23.78 dBm 2.570000 GHz D1 -13.000 dBm CF 2.57 GHz 501 pts Span 30.0 MHz Date: 9_MAR_2022 16:46:28</p>

Out of band emission, Band Edge



4.8 Radiated Spurious Emissions

Serial Number:	CR22030001-RF-S1	Test Date:	2022-03-08
Test Site:	966-2, 966-1	Test Mode:	Transmitting
Tester:	Great Qiao, Carl Liang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	19.8	Relative Humidity: (%)	57	ATM Pressure: (kPa)	101.3
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB6	A082520-5	2020-10-19	2023-10-18
R&S	EMI Test Receiver	ESR3	102724	2021-07-22	2022-07-21
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2021-07-18	2022-07-17
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2021-07-18	2022-07-17
Sonoma	Amplifier	310N	186165	2021-07-18	2022-07-17
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
MICRO-COAX	Coaxial Cable	UFA210B-0-0720-300300	99G1448	2021-07-25	2022-07-24
Agilent	Signal Generator	E8247C	MY43321350	2021-04-25	2022-04-24
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020-10-13	2023-10-12
PASTERNAK	Horn Antenna	PE9852/2F-20	112002	2021-02-05	2024-02-04
R&S	Spectrum Analyzer	FSV40	101591	2021-07-22	2022-07-21
MICRO-COAX	Coaxial Cable	UFA210A-1-1200-70U300	217423-008	2021-08-08	2022-08-07
MICRO-COAX	Coaxial Cable	UFA210A-1-2362-300300	235780-001	2021-08-08	2022-08-07
MICRO-COAX	Coaxial Cable	UFB142A-1-2362-200200	235772-001	2021-08-08	2022-08-07
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2021-11-10	2022-11-09
AH	Preamplifier	PAM-1840VH	190	2021-11-20	2022-11-19
AH	Double Ridge Guide Horn Antenna	SAS-571	1396	2021-10-18	2023-10-17
PASTERNAK	Horn Antenna	PE9852/2F-20	112001	2021-02-05	2024-02-04
MICRO-COAX	Coaxial Cable	UFA210B-0-0720-300300	99G1448	2021-07-25	2022-07-24
Mini Circuits	High Pass Filter	VHF-6010+	31119	2021-08-08	2022-08-07
Mini Circuits	High Pass Filter	VHF-3100+	31251	2021-08-08	2022-08-07

* 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 Data:

Please refer to the below table and plots.

Note: The device can be mounted in multiple orientations, test was performed with X,Y, Z Axis according to C63.26 figure 5, the worst orientation was photographed and it's data was recorded.

Cellular Band (PART 22H)**30 MHz-10 GHz:**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM 850 Frequency:824.2MHz								
878.32	H	44.44	-55.52	0.00	0.59	-56.11	-13.00	43.11
774.16	V	52.49	-46.91	0.00	0.55	-47.46	-13.00	34.46
1648.40	H	42.12	-62.21	8.68	0.80	-54.33	-13.00	41.33
1648.40	V	40.61	-63.80	8.68	0.80	-55.92	-13.00	42.92
2472.60	H	41.75	-59.03	9.38	1.00	-50.65	-13.00	37.65
2472.60	V	39.08	-61.65	9.38	1.00	-53.27	-13.00	40.27
3296.80	H	39.84	-56.84	10.32	1.15	-47.67	-13.00	34.67
3296.80	V	40.72	-55.72	10.32	1.15	-46.55	-13.00	33.55
GSM 850 Frequency:836.6MHz								
890.73	H	47.42	-52.16	0.00	0.64	-52.80	-13.00	39.80
875.10	V	52.17	-44.84	0.00	0.60	-45.44	-13.00	32.44
1673.20	H	39.47	-64.84	8.71	0.85	-56.98	-13.00	43.98
1673.20	V	35.95	-68.46	8.71	0.85	-60.60	-13.00	47.60
2509.80	H	42.62	-57.99	9.42	1.01	-49.58	-13.00	36.58
2509.80	V	41.61	-59.01	9.42	1.01	-50.60	-13.00	37.60
3346.40	H	39.33	-57.84	10.34	1.16	-48.66	-13.00	35.66
3346.40	V	39.40	-57.63	10.34	1.16	-48.45	-13.00	35.45
GSM 850 Frequency:848.8MHz								
903.31	H	47.67	-51.53	0.00	0.58	-52.11	-13.00	39.11
903.31	V	55.42	-40.94	0.00	0.58	-41.52	-13.00	28.52
1697.60	H	40.30	-63.99	8.74	0.90	-56.15	-13.00	43.15
1697.60	V	36.80	-67.62	8.74	0.90	-59.78	-13.00	46.78
2546.40	H	41.14	-59.19	9.47	1.01	-50.73	-13.00	37.73
2546.40	V	40.42	-59.86	9.47	1.01	-51.40	-13.00	38.40
3395.20	H	37.63	-60.06	10.36	1.19	-50.89	-13.00	37.89
3395.20	V	37.59	-60.07	10.36	1.19	-50.90	-13.00	37.90

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
WCDMA Band 5 Frequency:826.4 MHz								
102.00	H	31.38	-80.96	0.00	0.19	-81.15	-13.00	68.15
79.80	V	44.39	-64.07	-0.10	0.16	-64.33	-13.00	51.33
1652.80	H	36.12	-68.21	8.68	0.81	-60.34	-13.00	47.34
1652.80	V	37.14	-67.27	8.68	0.81	-59.40	-13.00	46.40
2479.20	H	35.49	-65.27	9.39	1.01	-56.89	-13.00	43.89
2479.20	V	36.00	-64.73	9.39	1.01	-56.35	-13.00	43.35
3305.60	H	35.84	-60.89	10.32	1.15	-51.72	-13.00	38.72
3305.60	V	35.27	-61.23	10.32	1.15	-52.06	-13.00	39.06
WCDMA Band 5 Frequency:836.6MHz								
80.08	H	35.30	-74.51	0.00	0.16	-74.67	-13.00	61.67
80.08	V	40.69	-67.90	0.00	0.16	-68.06	-13.00	55.06
1673.20	H	36.33	-67.98	8.71	0.85	-60.12	-13.00	47.12
1673.20	V	37.19	-67.22	8.71	0.85	-59.36	-13.00	46.36
2509.80	H	35.94	-64.67	9.42	1.01	-56.26	-13.00	43.26
2509.80	V	35.36	-65.26	9.42	1.01	-56.85	-13.00	43.85
3346.40	H	34.89	-62.28	10.34	1.16	-53.10	-13.00	40.10
3346.40	V	34.50	-62.53	10.34	1.16	-53.35	-13.00	40.35
WCDMA Band 5 Frequency:846.6MHz								
80.08	H	32.83	-76.98	0.00	0.16	-77.14	-13.00	64.14
79.80	V	44.76	-63.70	-0.10	0.16	-63.96	-13.00	50.96
1693.20	H	36.79	-67.51	8.73	0.89	-59.67	-13.00	46.67
1693.20	V	36.60	-67.82	8.73	0.89	-59.98	-13.00	46.98
2539.80	H	35.07	-65.31	9.46	1.01	-56.86	-13.00	43.86
2539.80	V	34.65	-65.69	9.46	1.01	-57.24	-13.00	44.24
3386.40	H	35.01	-62.58	10.35	1.18	-53.41	-13.00	40.41
3386.40	V	34.37	-63.17	10.35	1.18	-54.00	-13.00	41.00

PCS Band (PART 24E)

30 MHz-20 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM 1900 Frequency:1850.2MHz								
673.04	H	30.89	-73.77	0.00	0.50	-74.27	-13.00	61.27
48.33	V	34.38	-65.20	-16.54	0.12	-81.86	-13.00	68.86
3700.40	H	38.27	-59.05	10.60	1.25	-49.70	-13.00	36.70
3700.40	V	36.35	-60.95	10.60	1.25	-51.60	-13.00	38.60
5550.60	H	35.78	-57.48	11.44	1.49	-47.53	-13.00	34.53
5550.60	V	36.10	-57.00	11.44	1.49	-47.05	-13.00	34.05
GSM 1900 Frequency:1880MHz								
890.73	H	30.37	-69.21	0.00	0.64	-69.85	-13.00	56.85
48.33	V	35.37	-64.21	-16.54	0.12	-80.87	-13.00	67.87
3760.00	H	35.54	-60.87	10.66	1.24	-51.45	-13.00	38.45
3760.00	V	35.88	-60.41	10.66	1.24	-50.99	-13.00	37.99
5640.00	H	36.77	-56.68	11.33	1.54	-46.89	-13.00	33.89
5640.00	V	35.43	-57.90	11.33	1.54	-48.11	-13.00	35.11
GSM 1900 Frequency:1909.8MHz								
49.01	H	31.17	-68.00	-15.87	0.12	-83.99	-13.00	70.99
48.50	V	34.57	-65.18	-16.37	0.12	-81.67	-13.00	68.67
3819.60	H	37.13	-58.73	10.72	1.29	-49.30	-13.00	36.30
3819.60	V	36.26	-59.46	10.72	1.29	-50.03	-13.00	37.03
5729.40	H	36.98	-56.50	11.22	1.59	-46.87	-13.00	33.87
5729.40	V	35.26	-58.10	11.22	1.59	-48.47	-13.00	35.47

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
WCDMA Band II, Frequency:1852.4 MHz								
79.80	H	34.86	-74.80	-0.10	0.16	-75.06	-13.00	62.06
79.80	V	43.68	-64.78	-0.10	0.16	-65.04	-13.00	52.04
3704.80	H	42.98	-54.28	10.60	1.25	-44.93	-13.00	31.93
3704.80	V	41.18	-56.05	10.60	1.25	-46.70	-13.00	33.70
5557.20	H	35.06	-58.22	11.43	1.49	-48.28	-13.00	35.28
5557.20	V	35.15	-57.98	11.43	1.49	-48.04	-13.00	35.04
WCDMA Band II, Frequency:1880 MHz								
79.91	H	34.67	-75.06	-0.05	0.16	-75.27	-13.00	62.27
79.91	V	44.25	-64.28	-0.05	0.16	-64.49	-13.00	51.49
3760.00	H	44.05	-52.36	10.66	1.24	-42.94	-13.00	29.94
3760.00	V	41.91	-54.38	10.66	1.24	-44.96	-13.00	31.96
5640.00	H	35.13	-58.32	11.33	1.54	-48.53	-13.00	35.53
5640.00	V	34.79	-58.54	11.33	1.54	-48.75	-13.00	35.75
WCDMA Band II, Frequency:1907.6MHz								
79.91	H	34.59	-75.14	-0.05	0.16	-75.35	-13.00	62.35
66.34	V	38.93	-64.92	-6.94	0.15	-72.01	-13.00	59.01
3815.20	H	42.75	-53.10	10.72	1.29	-43.67	-13.00	30.67
3815.20	V	41.64	-54.05	10.72	1.29	-44.62	-13.00	31.62
5722.80	H	34.87	-58.62	11.23	1.58	-48.97	-13.00	35.97
5722.80	V	34.66	-58.69	11.23	1.58	-49.04	-13.00	36.04

LTE Bands:**LTE Band 2 (30MHz-20GHz):**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency: 1850.7 MHz								
79.80	H	31.90	-77.76	-0.10	0.16	-78.02	-13.00	65.02
79.80	V	44.05	-64.41	-0.10	0.16	-64.67	-13.00	51.67
3701.40	H	45.45	-51.86	10.60	1.25	-42.51	-13.00	29.51
3701.40	V	44.30	-52.99	10.60	1.25	-43.64	-13.00	30.64
5552.10	H	34.85	-58.42	11.44	1.49	-48.47	-13.00	35.47
5552.10	V	34.26	-58.84	11.44	1.49	-48.89	-13.00	35.89
QPSK, Frequency: 1880 MHz								
80.08	H	32.25	-77.56	0.00	0.16	-77.72	-13.00	64.72
79.80	V	44.32	-64.14	-0.10	0.16	-64.40	-13.00	51.40
3760.00	H	45.74	-50.67	10.66	1.24	-41.25	-13.00	28.25
3760.00	V	44.79	-51.50	10.66	1.24	-42.08	-13.00	29.08
5640.00	H	34.98	-58.47	11.33	1.54	-48.68	-13.00	35.68
5640.00	V	35.42	-57.91	11.33	1.54	-48.12	-13.00	35.12
QPSK, Frequency: 1909.3 MHz								
80.08	H	31.63	-78.18	0.00	0.16	-78.34	-13.00	65.34
80.08	V	41.66	-66.93	0.00	0.16	-67.09	-13.00	54.09
3818.60	H	44.86	-51.00	10.72	1.29	-41.57	-13.00	28.57
3818.60	V	43.72	-51.99	10.72	1.29	-42.56	-13.00	29.56
5727.90	H	35.68	-57.80	11.23	1.59	-48.16	-13.00	35.16
5727.90	V	36.30	-57.06	11.23	1.59	-47.42	-13.00	34.42

LTE Band 4 (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency: 1710.7 MHz								
80.08	H	31.65	-78.16	0.00	0.16	-78.32	-13.00	65.32
65.11	V	50.11	-54.16	-7.59	0.14	-61.89	-13.00	48.89
3421.40	H	36.25	-61.51	10.37	1.17	-52.31	-13.00	39.31
3421.40	V	36.21	-61.52	10.37	1.17	-52.32	-13.00	39.32
5132.10	H	35.11	-58.46	11.28	1.47	-48.65	-13.00	35.65
5132.10	V	34.49	-58.97	11.28	1.47	-49.16	-13.00	36.16
QPSK, Frequency: 1732.5 MHz								
80.08	H	32.49	-77.32	0.00	0.16	-77.48	-13.00	64.48
79.80	V	44.06	-64.40	-0.10	0.16	-64.66	-13.00	51.66
3465.00	H	36.94	-60.87	10.39	1.15	-51.63	-13.00	38.63
3465.00	V	36.29	-61.48	10.39	1.15	-52.24	-13.00	39.24
5197.50	H	34.83	-59.30	11.32	1.44	-49.42	-13.00	36.42
5197.50	V	35.67	-58.31	11.32	1.44	-48.43	-13.00	35.43
QPSK, Frequency: 1754.3 MHz								
79.80	H	30.39	-79.27	-0.10	0.16	-79.53	-13.00	66.53
80.08	V	43.47	-65.12	0.00	0.16	-65.28	-13.00	52.28
3505.20	H	35.45	-62.38	10.41	1.18	-53.15	-13.00	40.15
3505.20	V	34.98	-62.79	10.41	1.18	-53.56	-13.00	40.56
5257.80	H	35.19	-58.54	11.35	1.47	-48.66	-13.00	35.66
5257.80	V	34.92	-58.59	11.35	1.47	-48.71	-13.00	35.71

LTE Band 7(30MHz-26.5GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency: 2502.5MHz								
434.06	H	59.99	-48.42	0.00	0.41	-48.83	-25.00	23.83
99.87	V	55.63	-51.43	0.00	0.19	-51.62	-25.00	26.62
5005.00	H	35.02	-57.94	11.20	1.47	-48.21	-25.00	23.21
5005.00	V	38.74	-54.08	11.20	1.47	-44.35	-25.00	19.35
7507.50	H	33.38	-56.41	10.90	1.95	-47.46	-25.00	22.46
7507.50	V	33.42	-56.87	10.90	1.95	-47.92	-25.00	22.92
QPSK, Frequency: 2535MHz								
138.87	H	64.60	-47.69	0.00	0.22	-47.91	-25.00	22.91
56.99	V	58.49	-46.08	-11.68	0.14	-57.90	-25.00	32.90
5070.00	H	34.83	-58.36	11.24	1.47	-48.59	-25.00	23.59
5070.00	V	35.47	-57.62	11.24	1.47	-47.85	-25.00	22.85
7605.00	H	34.08	-55.39	10.88	2.01	-46.52	-25.00	21.52
7605.00	V	34.21	-55.98	10.88	2.01	-47.11	-25.00	22.11
QPSK, Frequency: 2567.5MHz								
434.06	H	61.16	-47.25	0.00	0.41	-47.66	-25.00	22.66
501.18	V	56.63	-46.07	0.00	0.45	-46.52	-25.00	21.52
5135.00	H	35.13	-58.47	11.28	1.47	-48.66	-25.00	23.66
5135.00	V	34.98	-58.51	11.28	1.47	-48.70	-25.00	23.70
7702.50	H	33.80	-55.72	10.86	1.97	-46.83	-25.00	21.83
7702.50	V	34.28	-55.90	10.86	1.97	-47.01	-25.00	22.01

Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

******* END OF REPORT *******