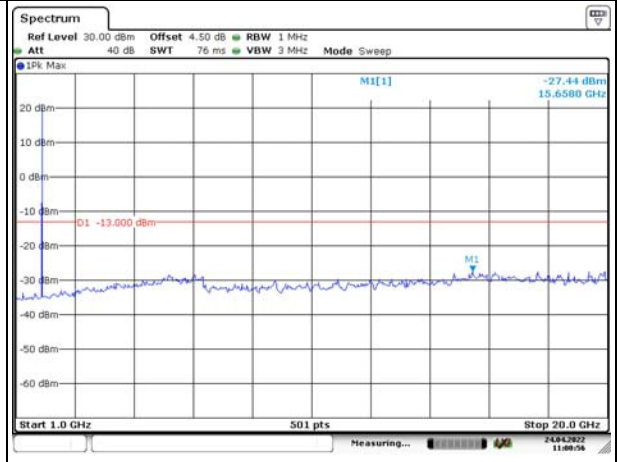
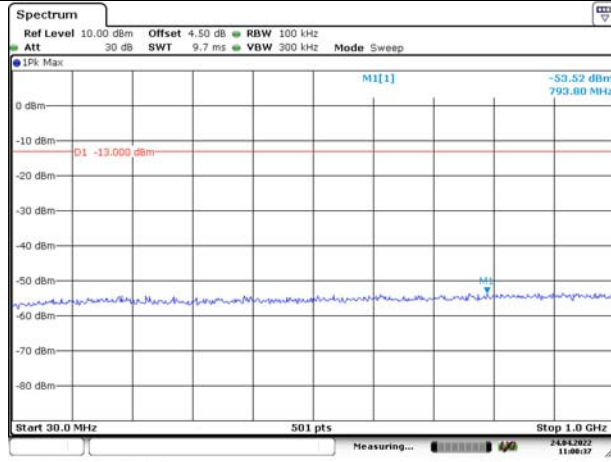


Spurious Emissions at Antenna Terminal

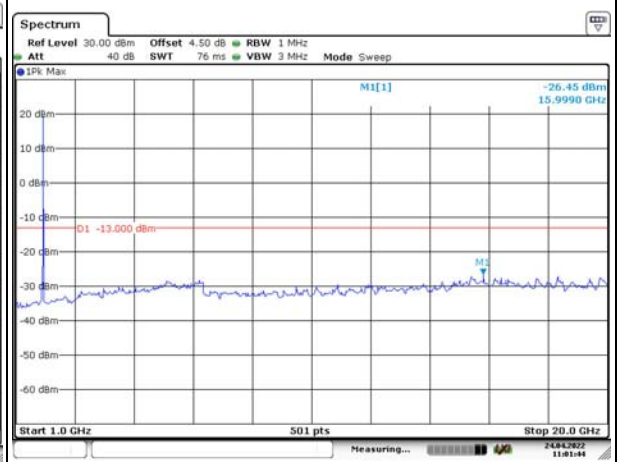
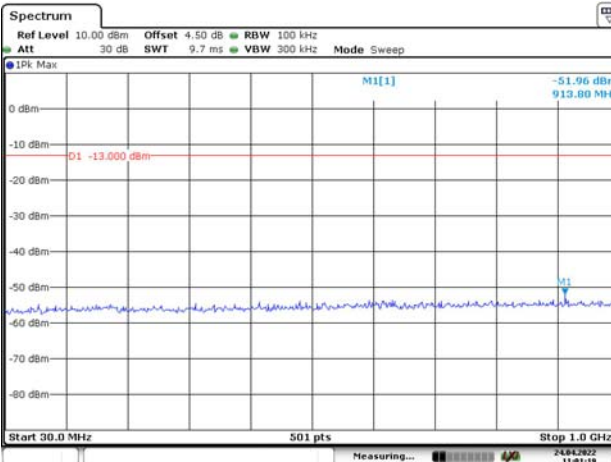
Channel

5MHz Bandwidth QPSK

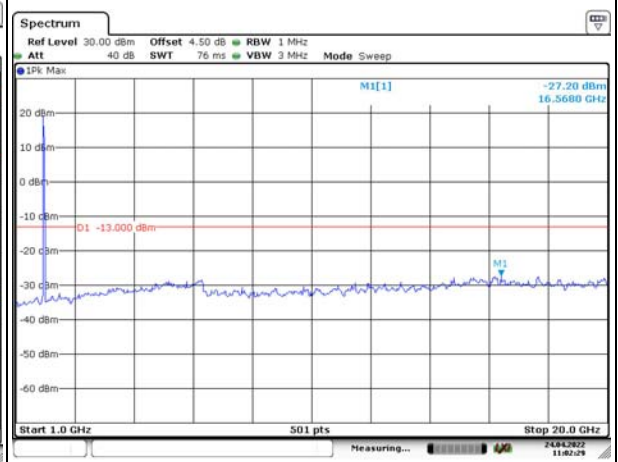
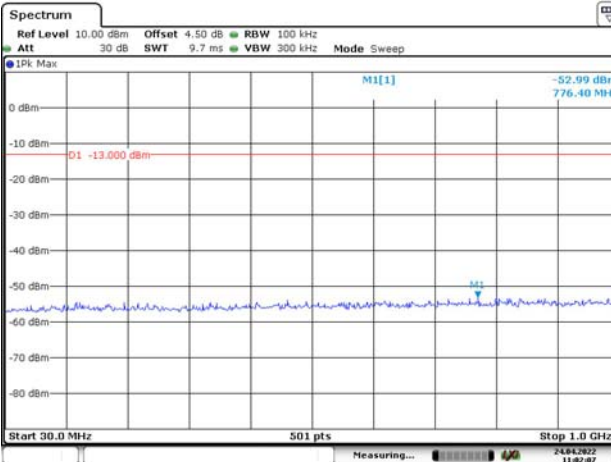
Lowest



Middle



Highest

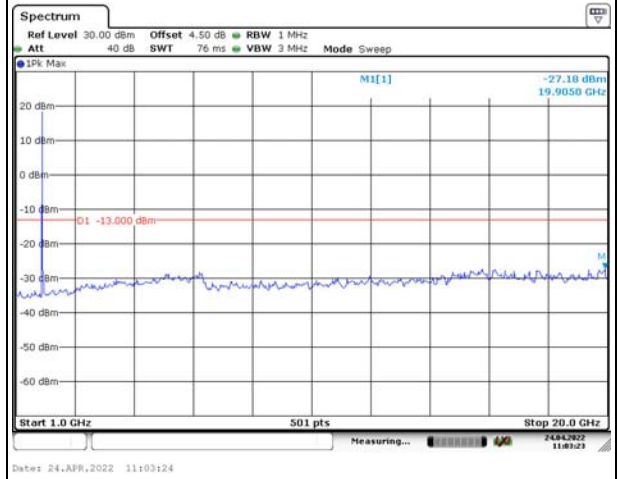
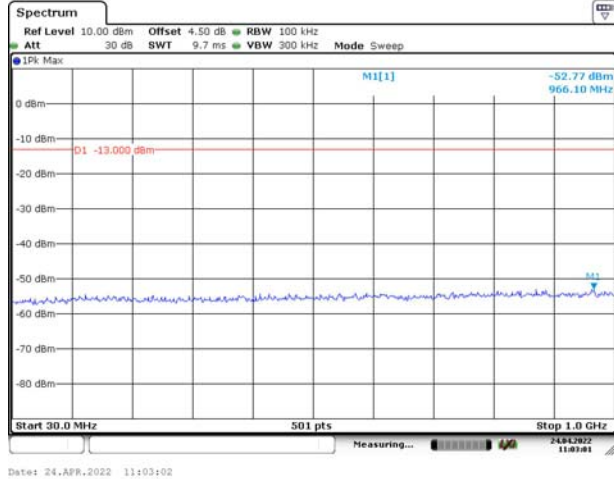


Spurious Emissions at Antenna Terminal

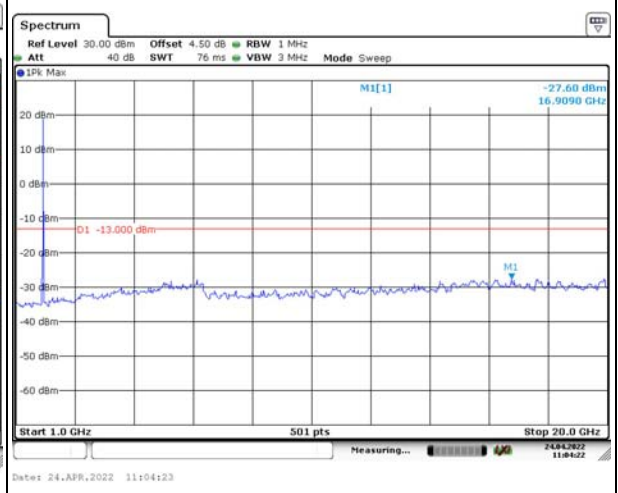
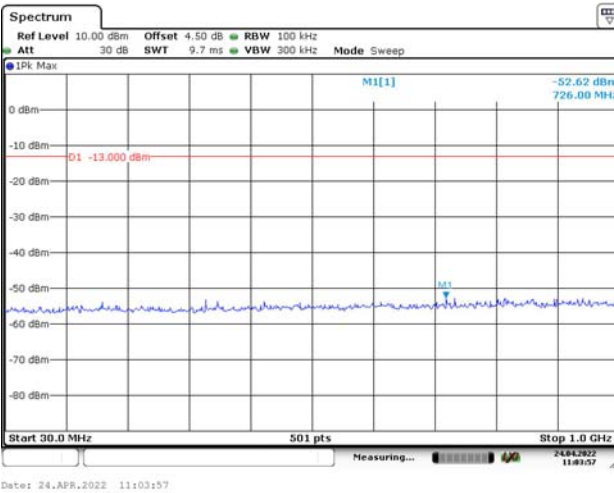
Channel

10MHz Bandwidth QPSK

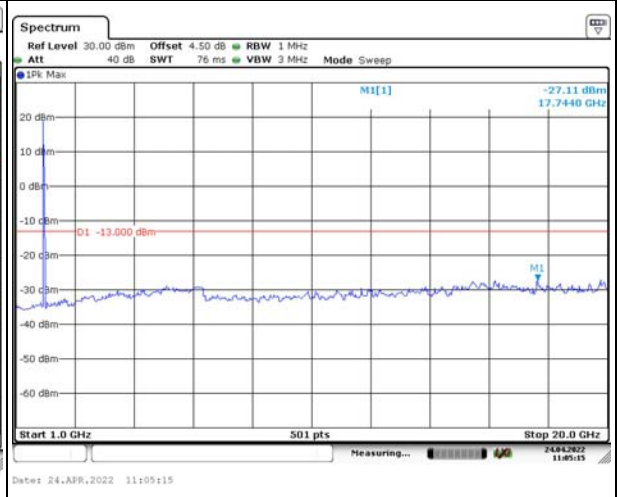
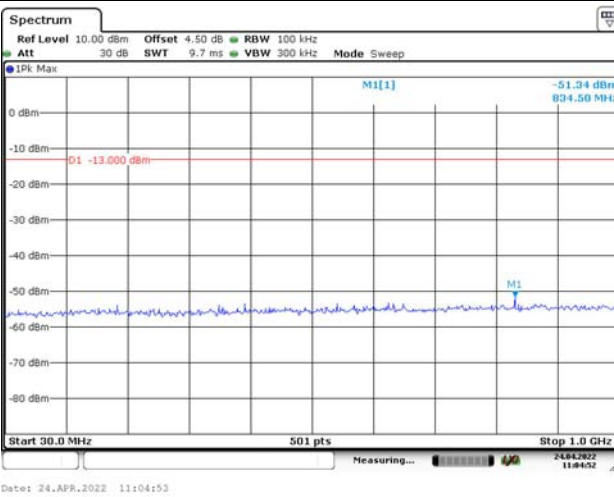
Lowest



Middle



Highest

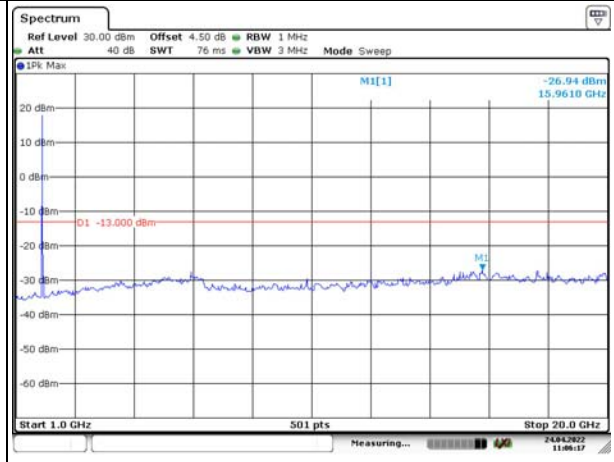
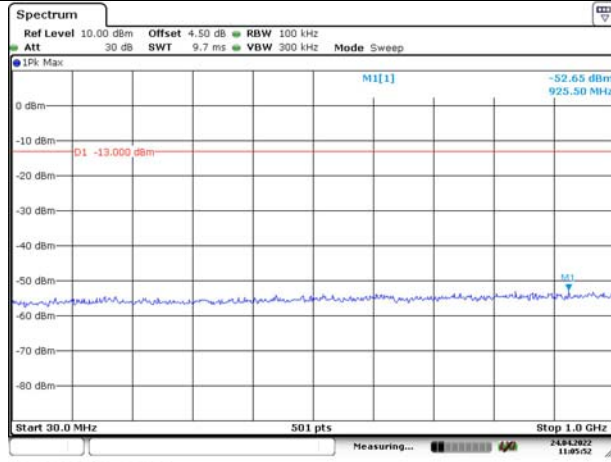


Spurious Emissions at Antenna Terminal

Channel

15MHz Bandwidth QPSK

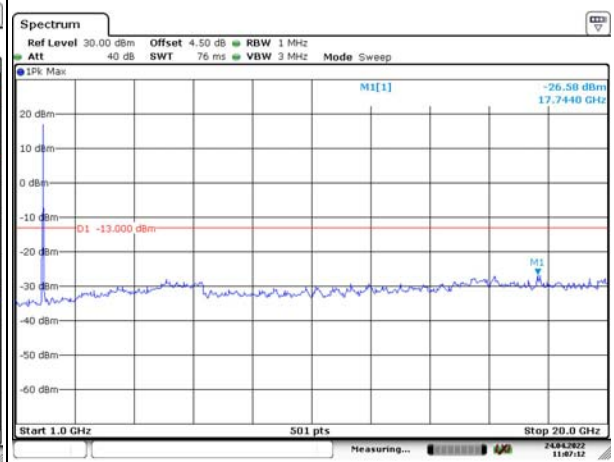
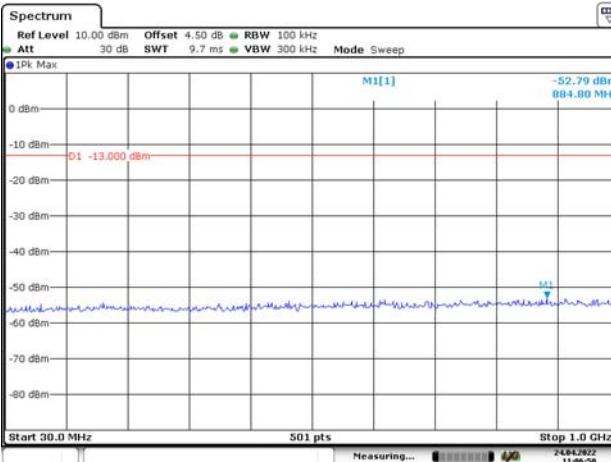
Lowest



Date: 24.APR.2022 11:05:53

Date: 24.APR.2022 11:06:18

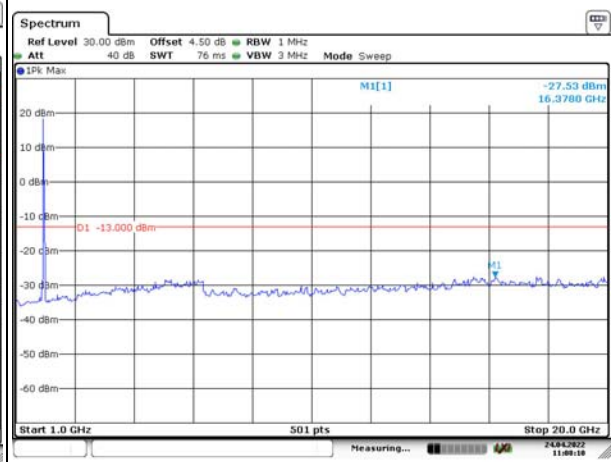
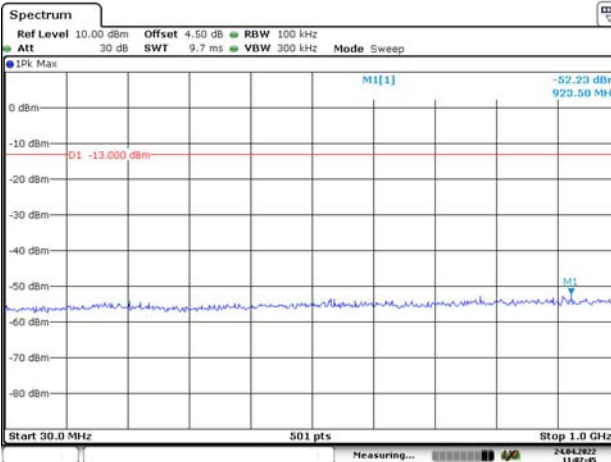
Middle



Date: 24.APR.2022 11:06:51

Date: 24.APR.2022 11:07:13

Highest



Date: 24.APR.2022 11:07:45

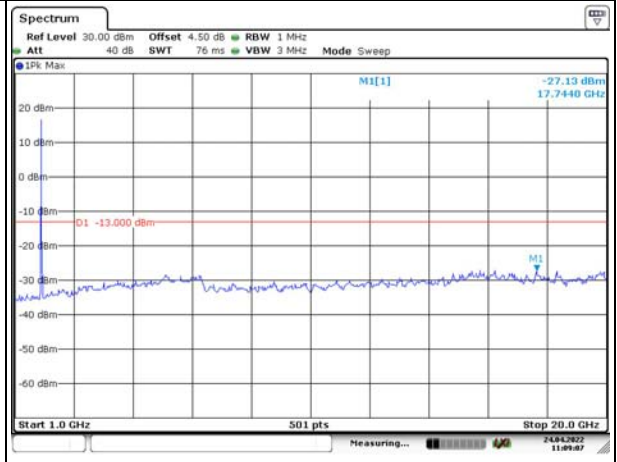
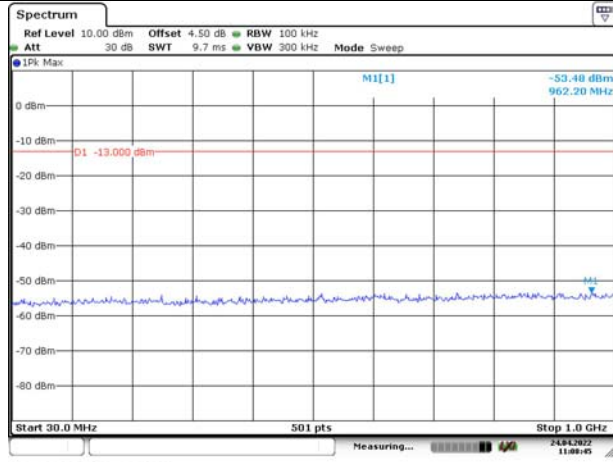
Date: 24.APR.2022 11:08:11

Spurious Emissions at Antenna Terminal

Channel

20MHz Bandwidth QPSK

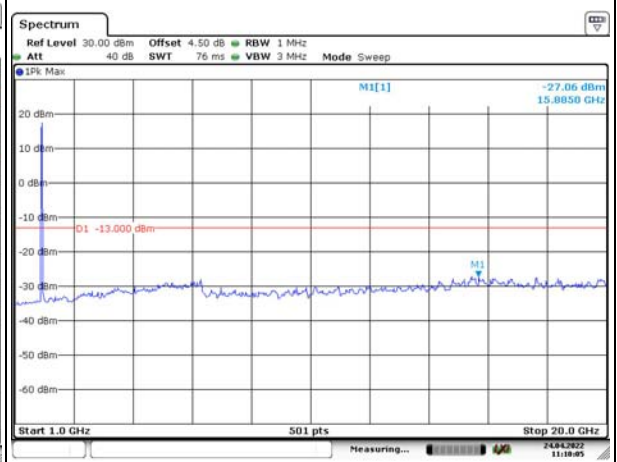
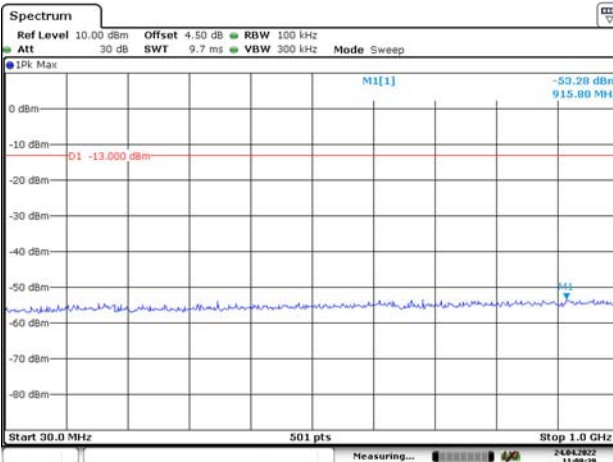
Lowest



Date: 24.APR.2022 11:09:45

Date: 24.APR.2022 11:09:08

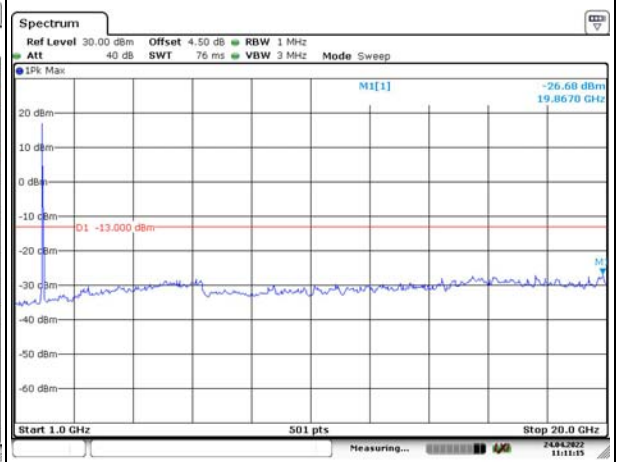
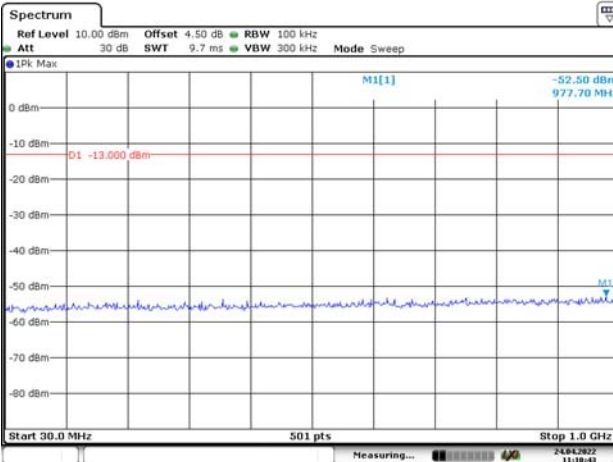
Middle



Date: 24.APR.2022 11:09:39

Date: 24.APR.2022 11:10:05

Highest



Date: 24.APR.2022 11:10:44

Date: 24.APR.2022 11:11:16

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep MI[1] -14.40 dBm 1.84993210 GHz D1 -13.000 dBm CF 1.85 GHz 501 pts Span 3.0 MHz Date: 24.APR.2022 13:31:07</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep MI[1] -20.85 dBm 1.91000000 GHz D1 -13.000 dBm CF 1.91 GHz 501 pts Span 3.0 MHz Date: 24.APR.2022 13:37:19</p>
QPSK 3MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep MI[1] -24.73 dBm 1.85000000 GHz D1 -13.000 dBm CF 1.85 GHz 501 pts Span 6.0 MHz Date: 24.APR.2022 13:38:03</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep MI[1] -24.17 dBm 1.91000000 GHz D1 -13.000 dBm CF 1.91 GHz 501 pts Span 6.0 MHz Date: 24.APR.2022 13:38:47</p>
QPSK 5MHz	<p>Ref Level 34.50 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 100 ms VBW 300 kHz Mode Sweep MI[1] -21.10 dBm 1.85000000 GHz D1 -13.000 dBm CF 1.85 GHz 691 pts Span 10.0 MHz Date: 27.APR.2022 15:20:19</p>	<p>Ref Level 34.50 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 100 ms VBW 300 kHz Mode Sweep MI[1] -20.66 dBm 1.91000000 GHz D1 -13.000 dBm CF 1.91 GHz 691 pts Span 10.0 MHz Date: 27.APR.2022 15:23:41</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		
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 4

Serial Number:	CR22040010-RF-S1	Test Date:	2022-04-24~2022-05-17
Test Site:	RF	Test Mode:	Transmitting
Tester:	Ada Yan	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	27.3~28.6	Relative Humidity:	46~56	ATM Pressure:	100.7~100.8
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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	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):	0.6	Cable Loss (dB):	1.0
Operation Voltage(V _{DC}):			
Lowest:	3.6	Normal:	3.8
		Highest:	4.3

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	18.05	19.68	19.55	19.44	30
	RB1#3	18.83	19.84	19.73		
	RB1#5	18.35	19.66	19.53		
	RB3#0	18.03	19.73	19.52		
	RB3#3	18.34	19.75	19.56		
	RB6#0	18.15	18.68	18.63		
1.4MHz 16QAM	RB1#0	17.55	18.64	18.58	18.53	30
	RB1#3	18.36	18.86	18.80		
	RB1#5	17.85	18.61	18.56		
	RB3#0	17.00	18.93	18.47		
	RB3#3	17.36	18.86	18.46		
	RB6#0	17.17	17.76	17.60		
3MHz QPSK	RB1#0	20.21	19.79	19.71	19.81	30
	RB1#8	20.09	19.80	19.71		
	RB1#14	20.02	19.80	19.69		
	RB6#0	19.19	18.72	18.65		
	RB6#9	19.06	18.70	18.64		
	RB15#0	19.10	18.75	18.62		
3MHz 16QAM	RB1#0	19.61	18.85	18.64	19.21	30
	RB1#8	19.50	18.86	18.58		
	RB1#14	19.48	18.86	18.55		
	RB6#0	18.24	17.79	17.62		
	RB6#9	18.12	17.83	17.56		
	RB15#0	18.23	17.79	17.67		
5MHz QPSK	RB1#0	20.01	19.65	19.52	19.63	30
	RB1#13	20.03	19.77	19.64		
	RB1#24	19.87	19.59	19.49		
	RB15#0	19.07	18.67	18.59		
	RB15#10	18.95	18.64	18.54		
	RB25#0	18.97	18.68	18.52		
5MHz 16QAM	RB1#0	18.85	18.91	18.51	18.61	30
	RB1#13	18.90	19.01	18.56		
	RB1#24	18.73	18.86	18.46		
	RB15#0	18.14	17.69	17.63		
	RB15#10	18.00	17.68	17.58		
	RB25#0	18.06	17.71	17.57		

10MHz QPSK	RB1#0	20.09	19.64	19.55	19.78	30
	RB1#25	20.18	19.83	19.78		
	RB1#49	19.91	19.47	19.48		
	RB25#0	19.08	18.74	18.63		
	RB25#25	18.91	18.73	18.56		
	RB50#0	19.03	18.72	18.58		
10MHz 16QAM	RB1#0	18.99	19.24	18.64	19.05	30
	RB1#25	19.08	19.45	18.83		
	RB1#49	18.85	19.05	18.56		
	RB25#0	18.20	17.83	17.67		
	RB25#25	18.08	17.82	17.61		
	RB50#0	18.13	17.75	17.59		
15MHz QPSK	RB1#0	19.86	19.55	19.06	19.53	30
	RB1#38	19.93	19.65	19.58		
	RB1#74	19.56	19.24	19.36		
	RB36#0	19.02	18.60	18.34		
	RB36#39	18.80	18.55	18.55		
	RB75#0	18.94	18.59	18.49		
15MHz 16QAM	RB1#0	19.25	18.64	18.43	19.05	30
	RB1#38	19.45	18.75	18.87		
	RB1#74	19.13	18.32	18.59		
	RB36#0	18.02	17.70	17.41		
	RB36#39	17.86	17.67	17.58		
	RB75#0	17.91	17.67	17.46		
20MHz QPSK	RB1#0	19.73	19.56	19.23	19.67	30
	RB1#50	20.07	19.83	19.69		
	RB1#99	19.42	18.97	19.21		
	RB50#0	19.07	18.71	18.32		
	RB50#50	18.78	18.62	18.58		
	RB100#0	18.93	18.67	18.48		
20MHz 16QAM	RB1#0	18.93	18.71	18.75	18.92	30
	RB1#50	19.32	19.08	19.13		
	RB1#99	18.69	18.12	18.69		
	RB50#0	18.12	17.74	17.39		
	RB50#50	17.82	17.64	17.58		
	RB100#0	18.03	17.72	17.48		

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	4.35	6.17	5.28	13
	RB100#0	4.90	5.36	4.93	13
20MHz 16QAM	RB1#0	5.19	6.55	6.17	13
	RB100#0	5.86	6.35	5.80	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	1.098	1.102	1.102	1.311	1.314	1.326
1.4MHz 16QAM	1.098	1.102	1.096	1.329	1.326	1.302
3MHz QPSK	2.695	2.695	2.683	2.880	2.892	2.892
3MHz 16QAM	2.683	2.683	2.683	2.892	2.880	2.880
5MHz QPSK	4.531	4.511	4.511	5.240	5.160	5.200
5MHz 16QAM	4.511	4.551	4.551	5.160	5.180	5.220
10MHz QPSK	8.942	8.981	8.981	9.920	9.960	9.880
10MHz 16QAM	8.981	8.981	8.981	9.920	9.840	9.920
15MHz QPSK	13.533	13.473	13.533	15.240	15.360	15.420
15MHz 16QAM	13.533	13.593	13.533	15.120	15.240	15.180
20MHz QPSK	18.044	18.044	17.964	20.000	19.840	19.840
20MHz 16QAM	18.044	18.044	18.044	19.760	19.840	19.920

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.

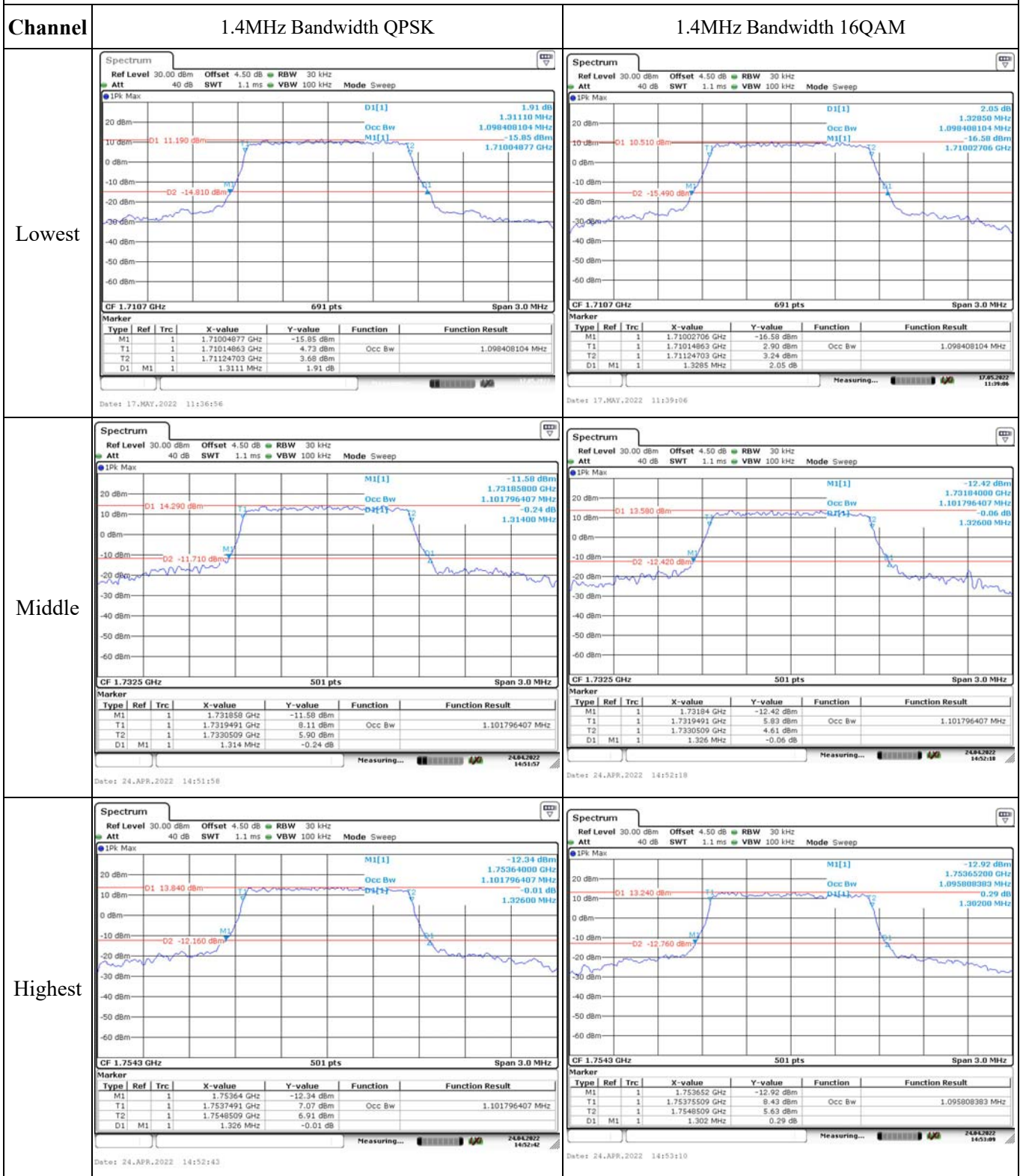
FCC §2.1051, § 27.53:Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

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	3.8	1710.881	1710.00	1754.923	1755
	-20	3.8	1710.893	1710.00	1754.916	1755
	-10	3.8	1710.890	1710.00	1754.915	1755
	0	3.8	1710.883	1710.00	1754.916	1755
	10	3.8	1710.890	1710.00	1754.917	1755
	20	3.8	1710.890	1710.00	1754.916	1755
	30	3.8	1710.895	1710.00	1754.928	1755
	40	3.8	1710.893	1710.00	1754.914	1755
Frequency Stability vs. Voltage	20	3.6	1710.888	1710.00	1754.916	1755
	20	4.3	1710.896	1710.00	1754.917	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	3.8	1710.768	1710.00	1754.933	1755
	-20	3.8	1710.763	1710.00	1754.976	1755
	-10	3.8	1710.765	1710.00	1754.925	1755
	0	3.8	1710.758	1710.00	1754.936	1755
	10	3.8	1710.763	1710.00	1754.943	1755
	20	3.8	1710.763	1710.00	1754.966	1755
	30	3.8	1710.757	1710.00	1754.977	1755
	40	3.8	1710.768	1710.00	1754.923	1755
Frequency Stability vs. Voltage	20	3.6	1710.764	1710.00	1754.941	1755
	20	4.3	1710.755	1710.00	1754.934	1755
					Result:	Pass

Test Plots:

Occupied Bandwidth



Occupied Bandwidth

Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM																																																																						
Lowest	<p>Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>IPk Max M1[1] -13.68 dBm 1.710060 GHz Occ Bw 2.694610778 MHz D1[1] 12.970 dBm D2 -13.030 dBm 2.8800 MHz</p> <p>CF 1.7115 GHz 501 pts Span 6.0 MHz</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-value</th> <th>Y-value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>1.71006 GHz</td> <td>-13.68 dBm</td> <td></td> <td></td> </tr> <tr> <td>T1</td> <td>1</td> <td></td> <td>1.7101587 GHz</td> <td>6.33 dBm</td> <td>Occ Bw</td> <td>2.694610778 MHz</td> </tr> <tr> <td>T2</td> <td>1</td> <td></td> <td>1.7128533 GHz</td> <td>6.92 dBm</td> <td></td> <td></td> </tr> <tr> <td>D1</td> <td>M1</td> <td>1</td> <td>2.88 MHz</td> <td>1.15 dB</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 24.APR.2022 14:53:26</p>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		1.71006 GHz	-13.68 dBm			T1	1		1.7101587 GHz	6.33 dBm	Occ Bw	2.694610778 MHz	T2	1		1.7128533 GHz	6.92 dBm			D1	M1	1	2.88 MHz	1.15 dB			<p>Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>IPk Max M1[1] -15.16 dBm 1.710060 GHz Occ Bw 2.682634731 MHz D1[1] 11.620 dBm D2 -14.980 dBm 2.8920 MHz</p> <p>CF 1.7115 GHz 501 pts Span 6.0 MHz</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Ref</th> <th>Trc</th> <th>X-value</th> <th>Y-value</th> <th>Function</th> <th>Function Result</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>1</td> <td></td> <td>1.71006 GHz</td> <td>-15.16 dBm</td> <td></td> <td></td> </tr> <tr> <td>T1</td> <td>1</td> <td></td> <td>1.7101587 GHz</td> <td>5.99 dBm</td> <td>Occ Bw</td> <td>2.682634731 MHz</td> </tr> <tr> <td>T2</td> <td>1</td> <td></td> <td>1.7128413 GHz</td> <td>7.28 dBm</td> <td></td> <td></td> </tr> <tr> <td>D1</td> <td>M1</td> <td>1</td> <td>2.892 MHz</td> <td>0.45 dB</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 24.APR.2022 14:54:00</p>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		1.71006 GHz	-15.16 dBm			T1	1		1.7101587 GHz	5.99 dBm	Occ Bw	2.682634731 MHz	T2	1		1.7128413 GHz	7.28 dBm			D1	M1	1	2.892 MHz	0.45 dB		
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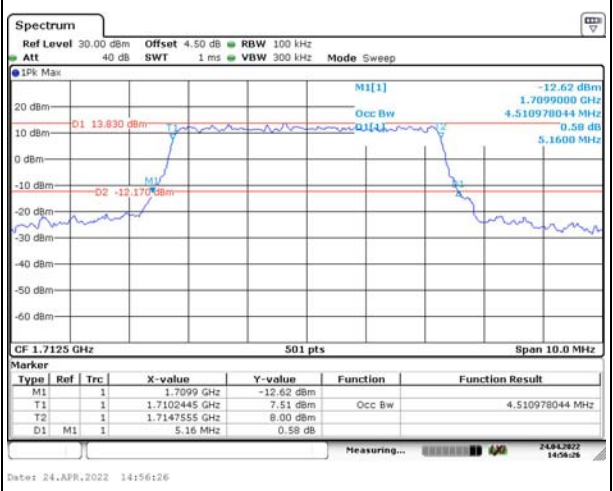
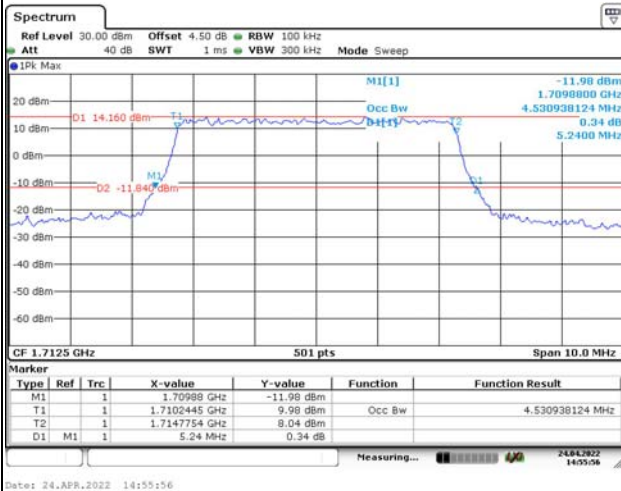
Occupied Bandwidth

Channel

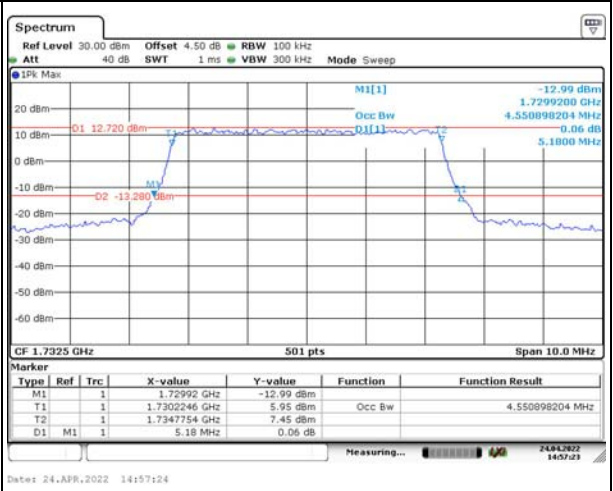
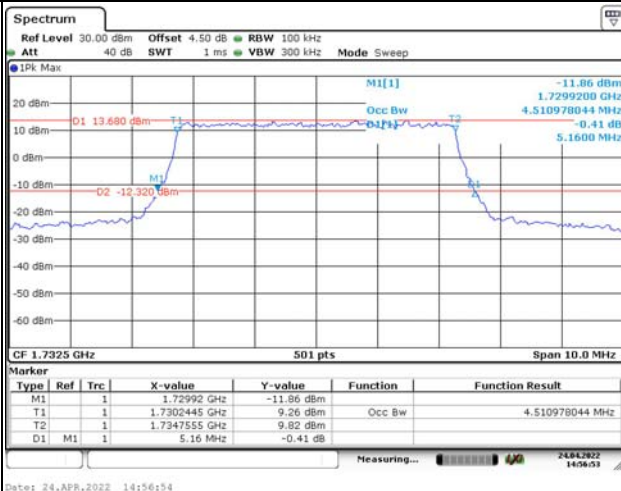
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

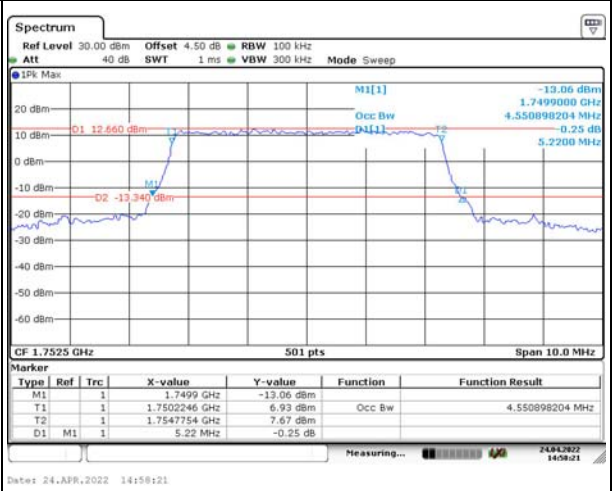
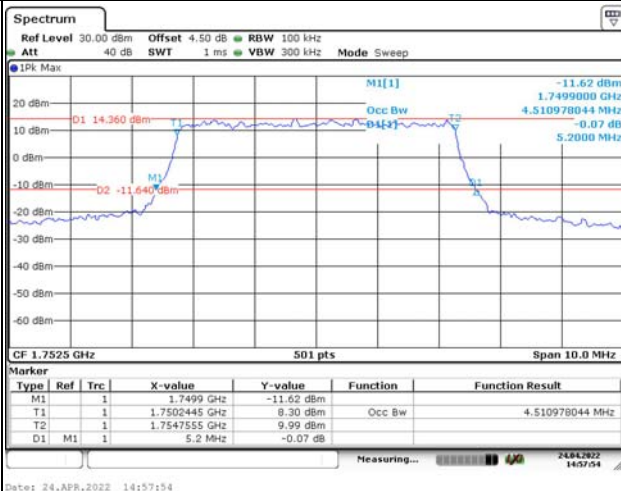
Lowest



Middle



Highest



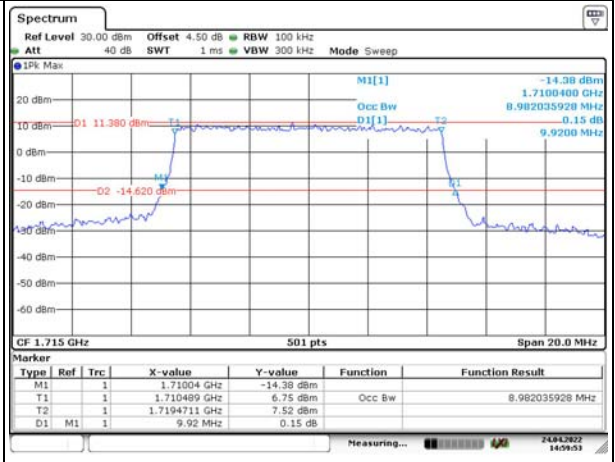
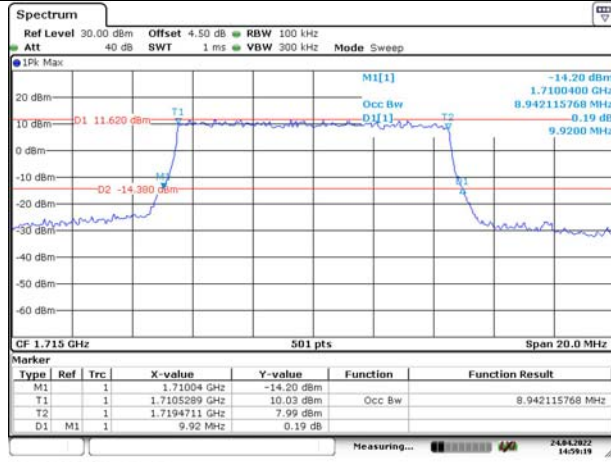
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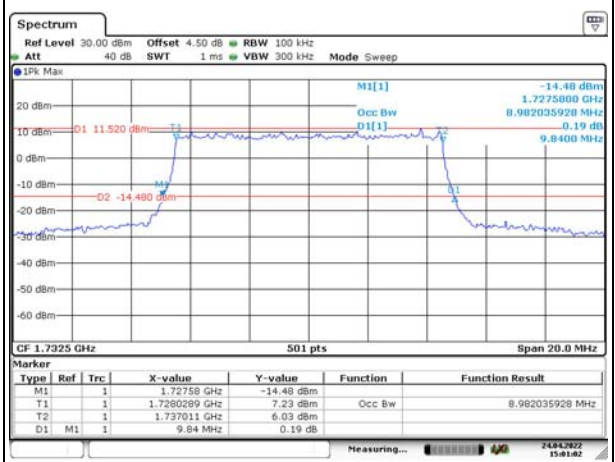
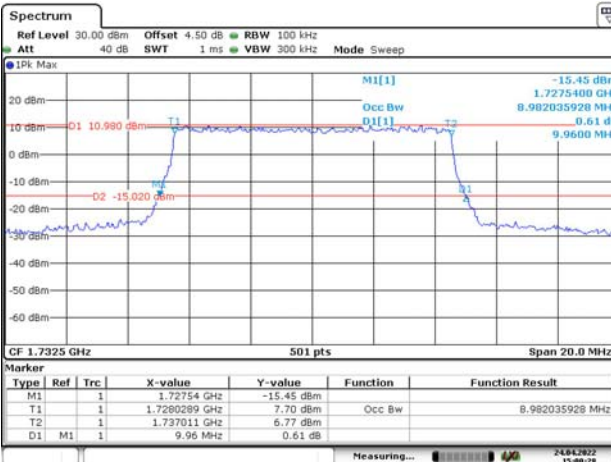
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

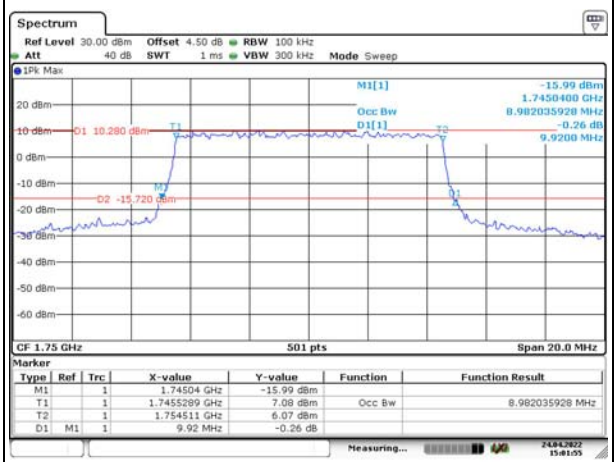
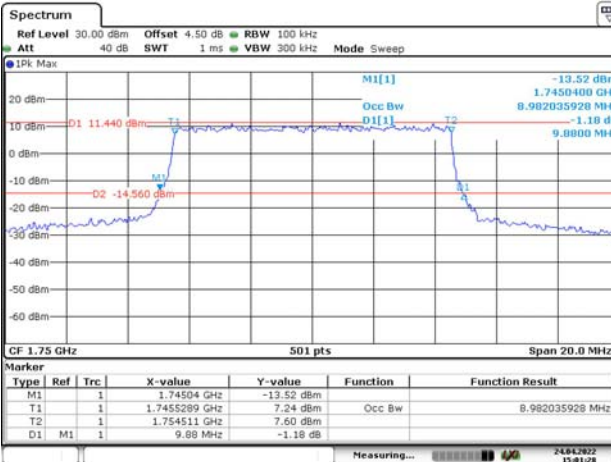
Lowest



Middle



Highest



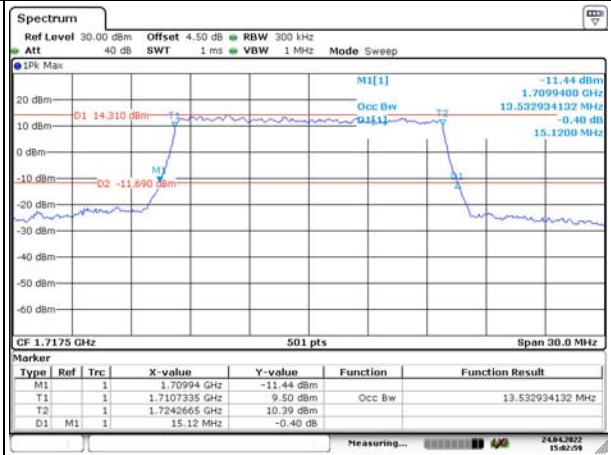
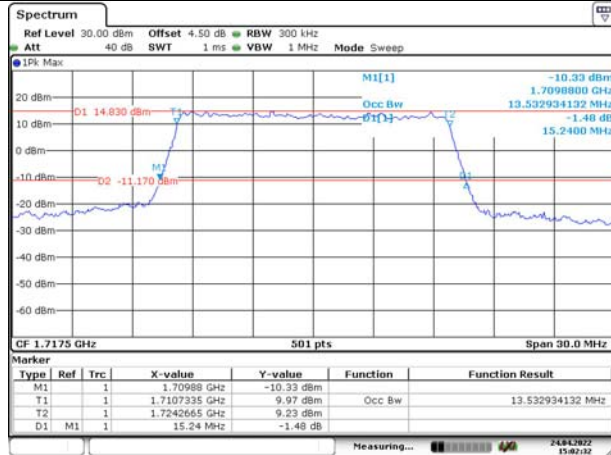
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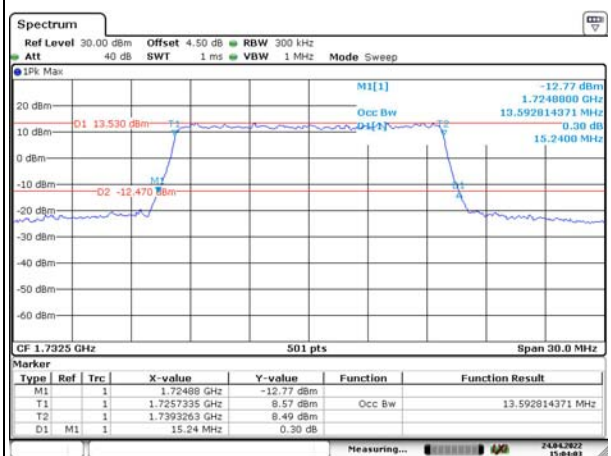
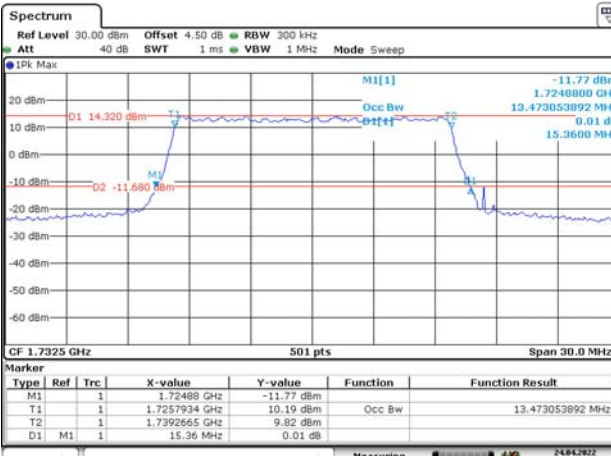
15MHz Bandwidth QPSK

15MHz Bandwidth 16QAM

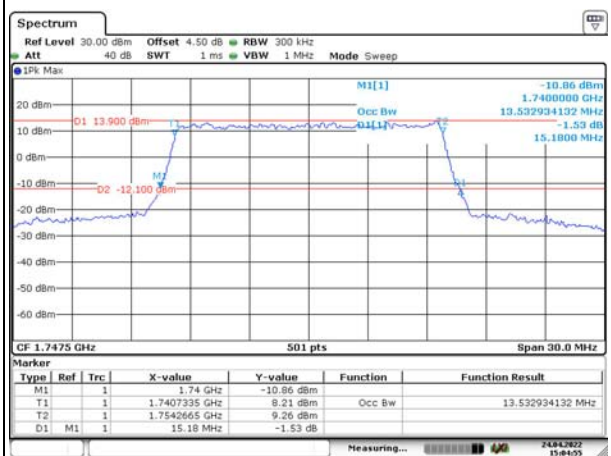
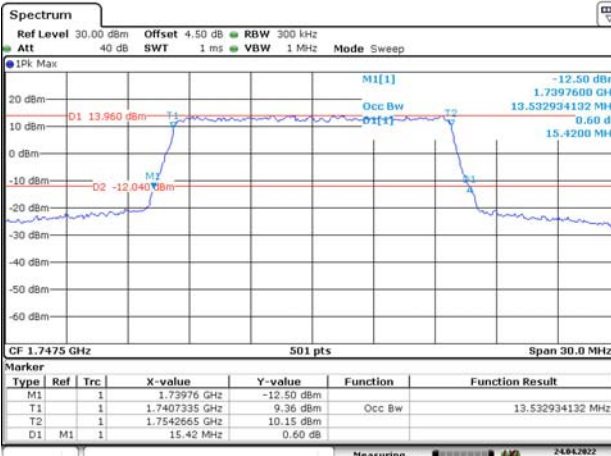
Lowest



Middle



Highest



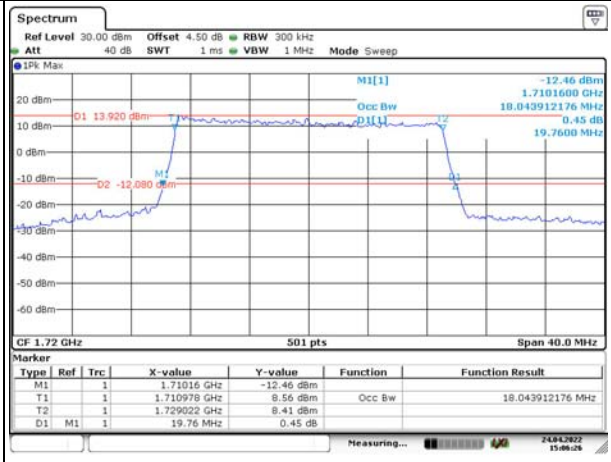
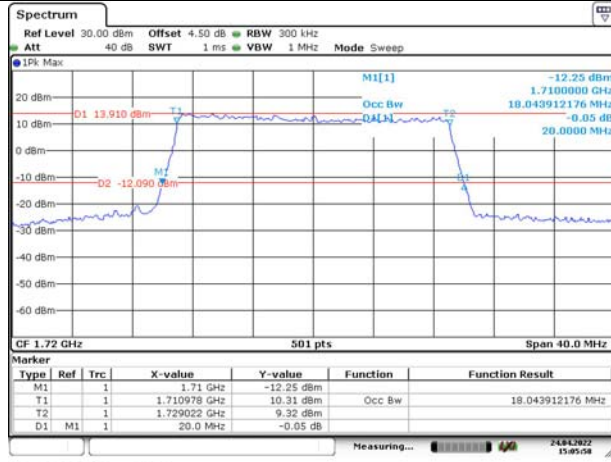
Occupied Bandwidth

Channel

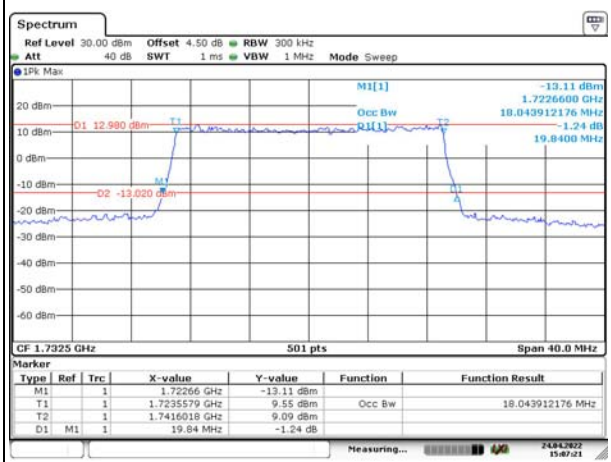
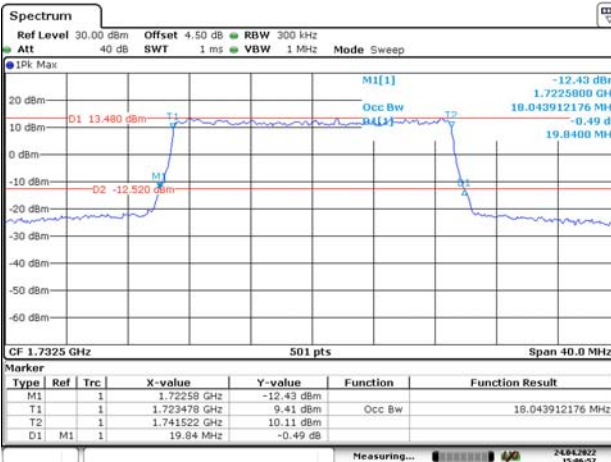
20MHz Bandwidth QPSK

20MHz Bandwidth 16QAM

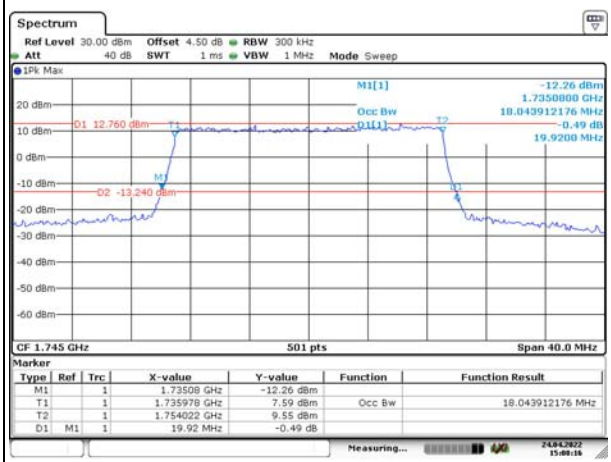
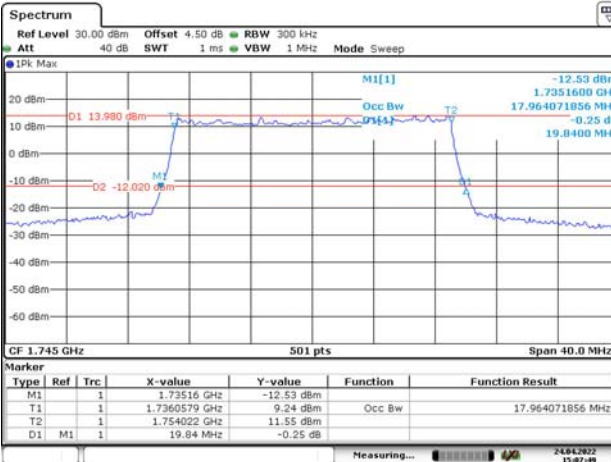
Lowest



Middle



Highest

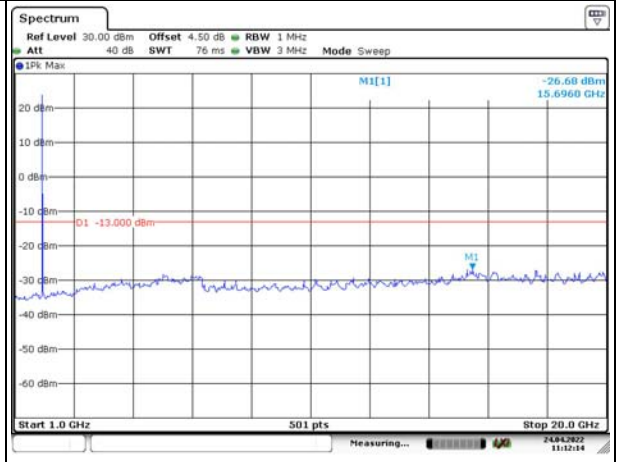
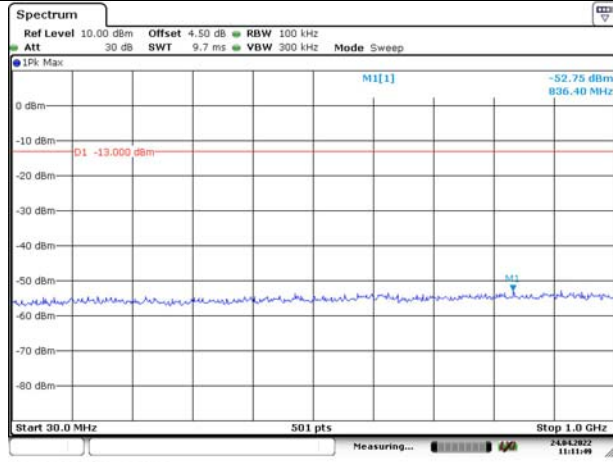


Spurious Emissions at Antenna Terminal

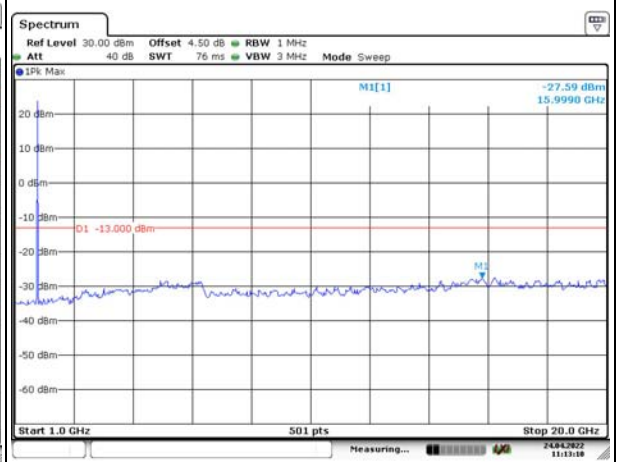
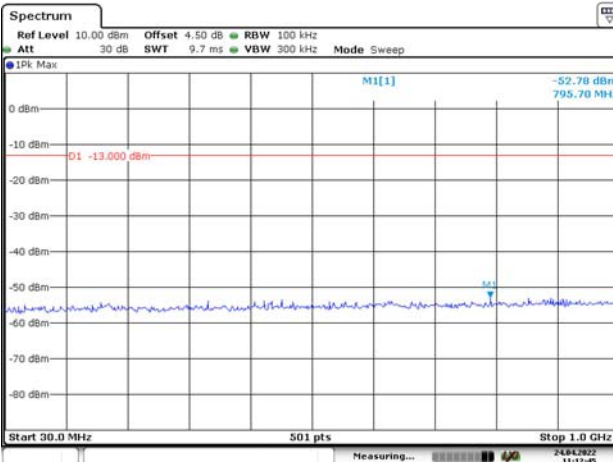
Channel

1.4MHz Bandwidth QPSK

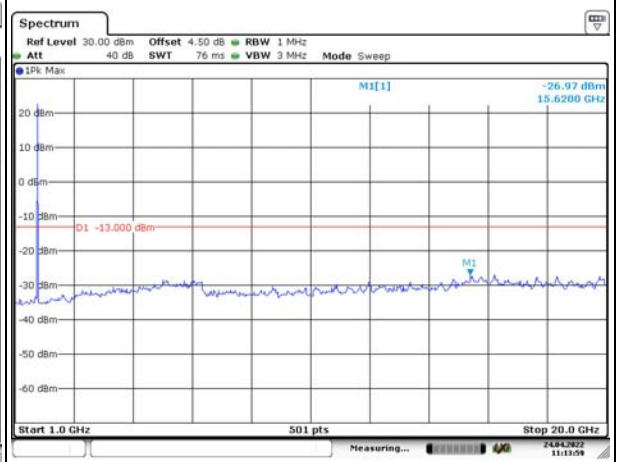
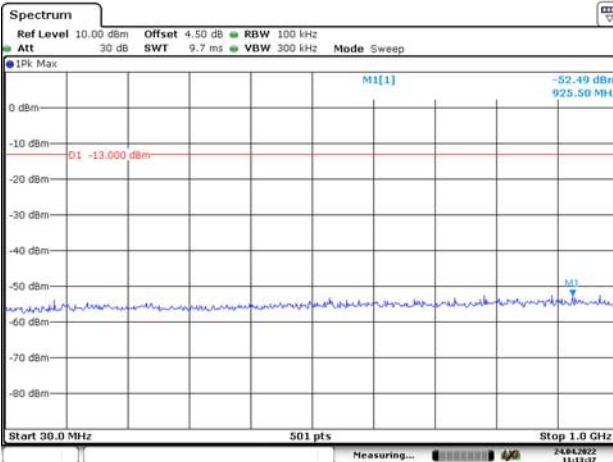
Lowest



Middle



Highest

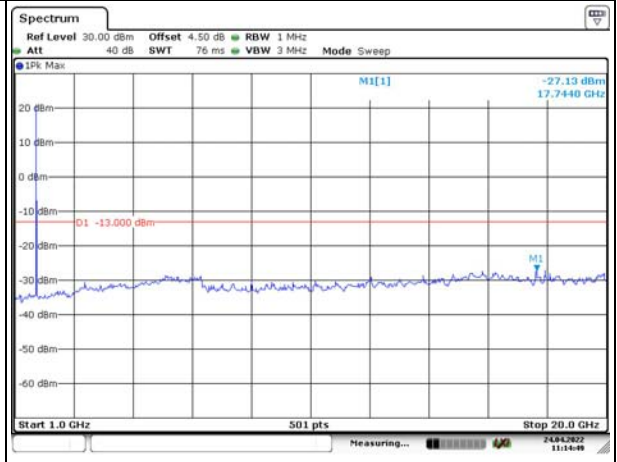
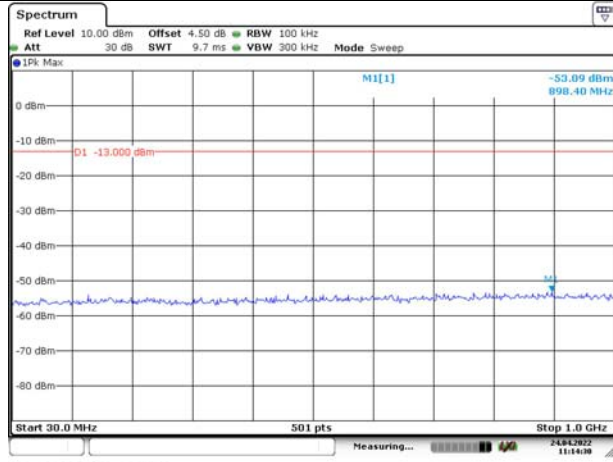


Spurious Emissions at Antenna Terminal

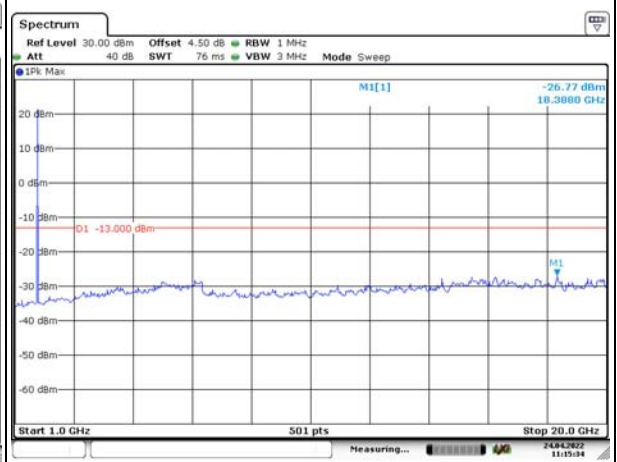
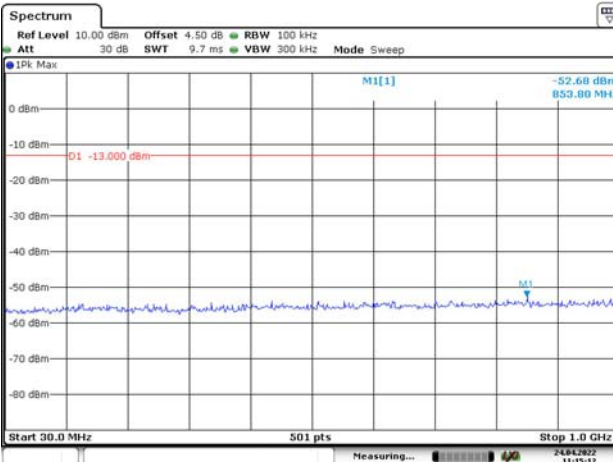
Channel

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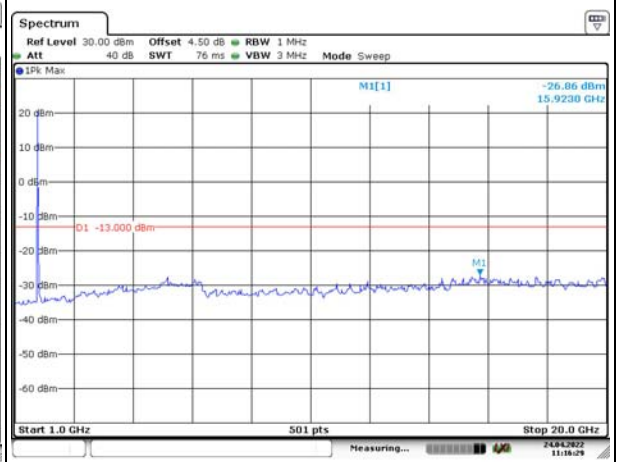
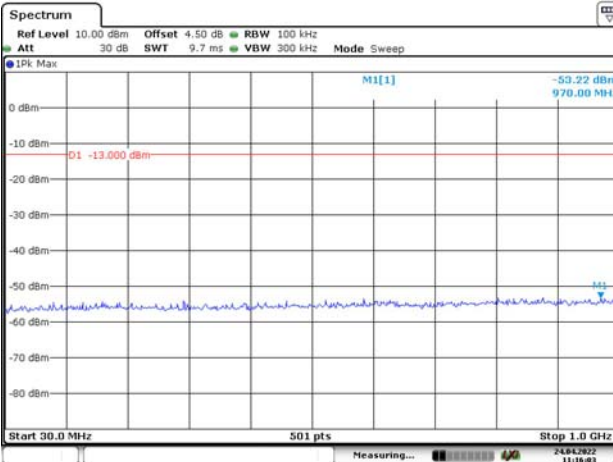
Lowest



Middle



Highest

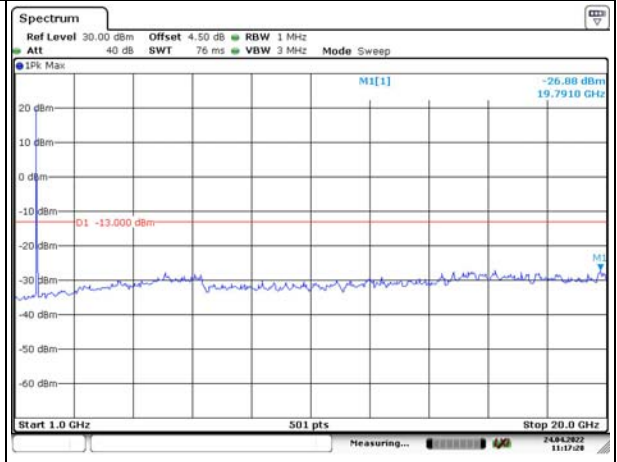
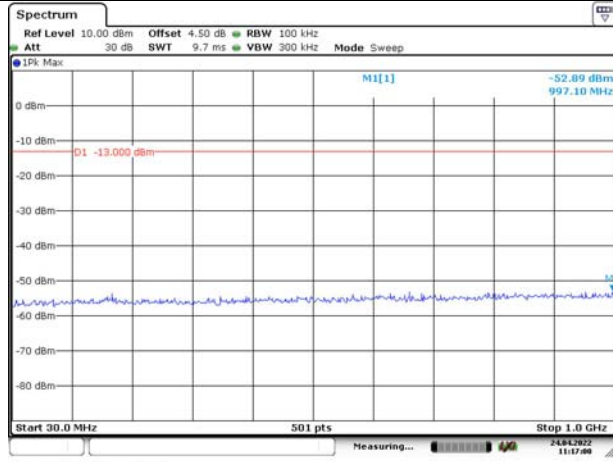


Spurious Emissions at Antenna Terminal

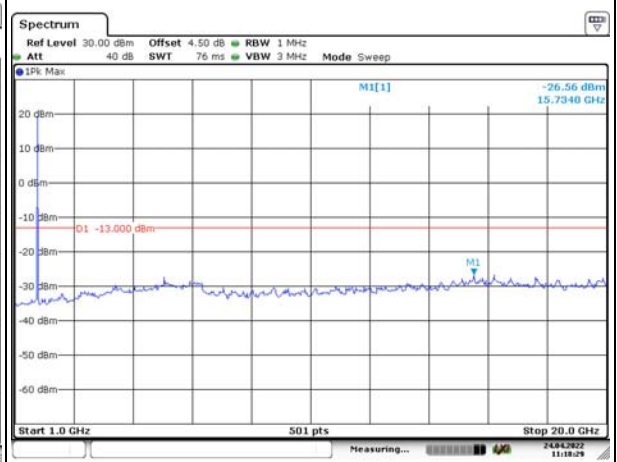
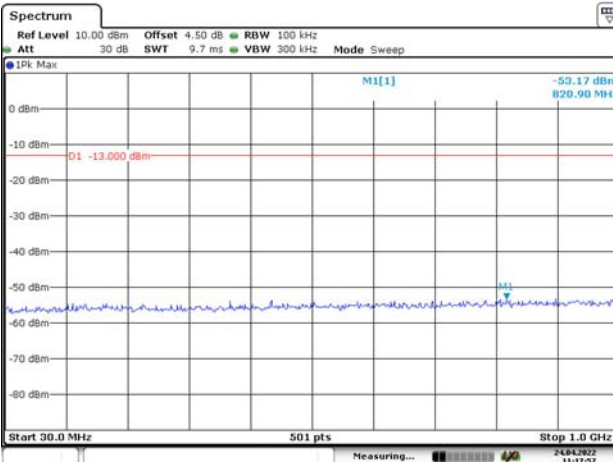
Channel

5MHz Bandwidth QPSK

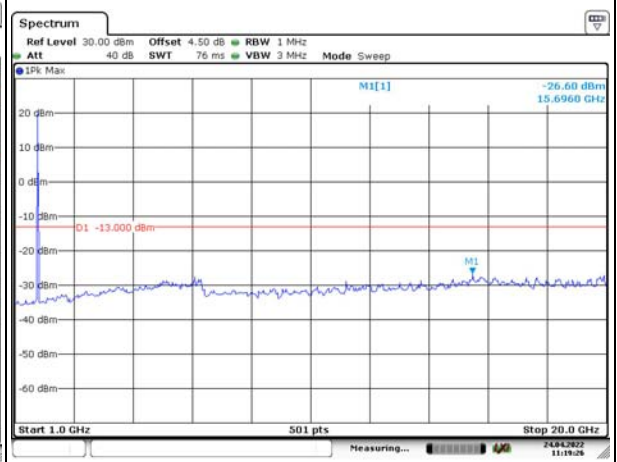
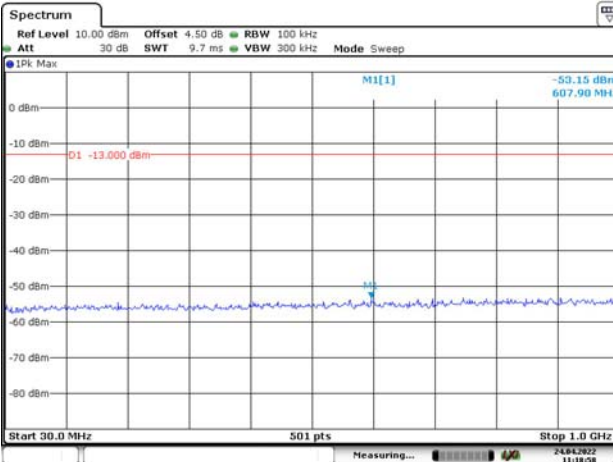
Lowest



Middle



Highest

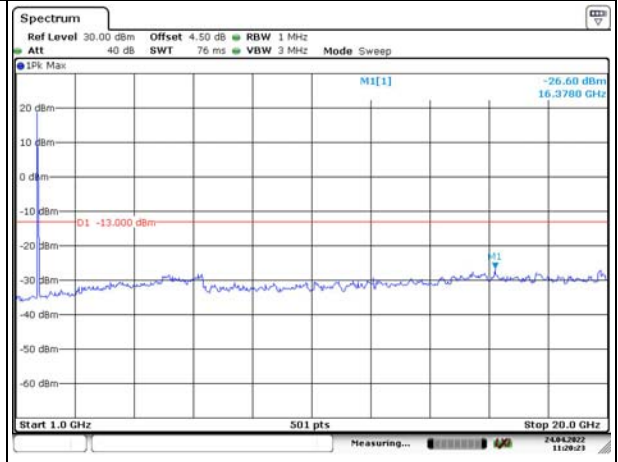
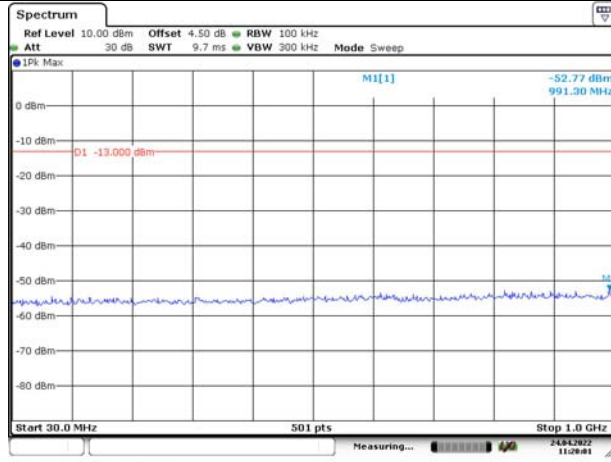


Spurious Emissions at Antenna Terminal

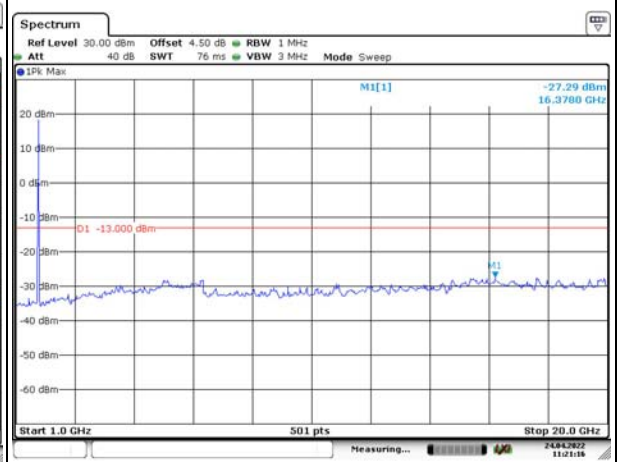
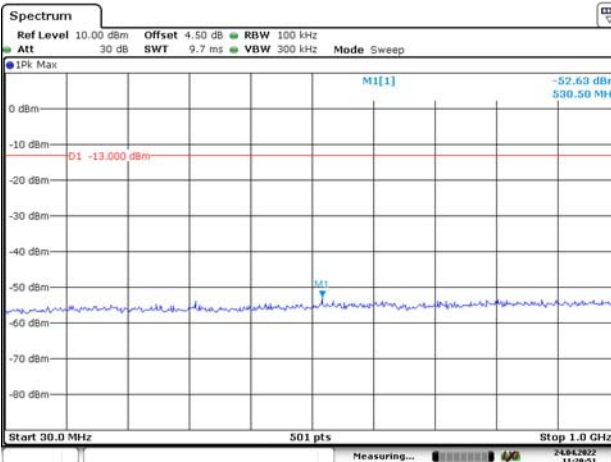
Channel

10MHz Bandwidth QPSK

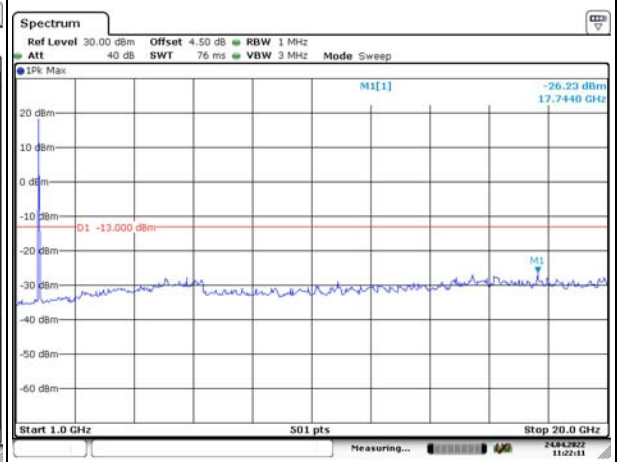
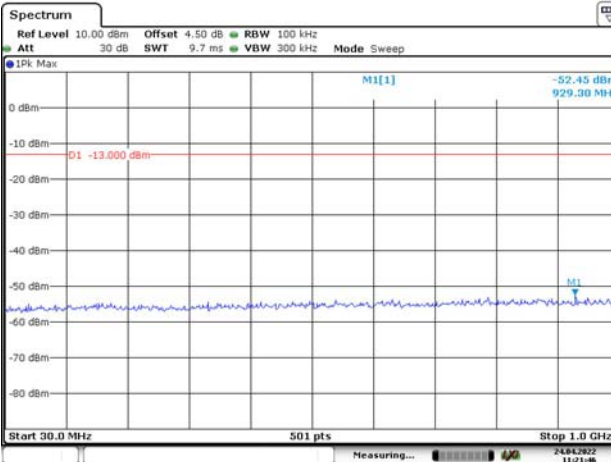
Lowest



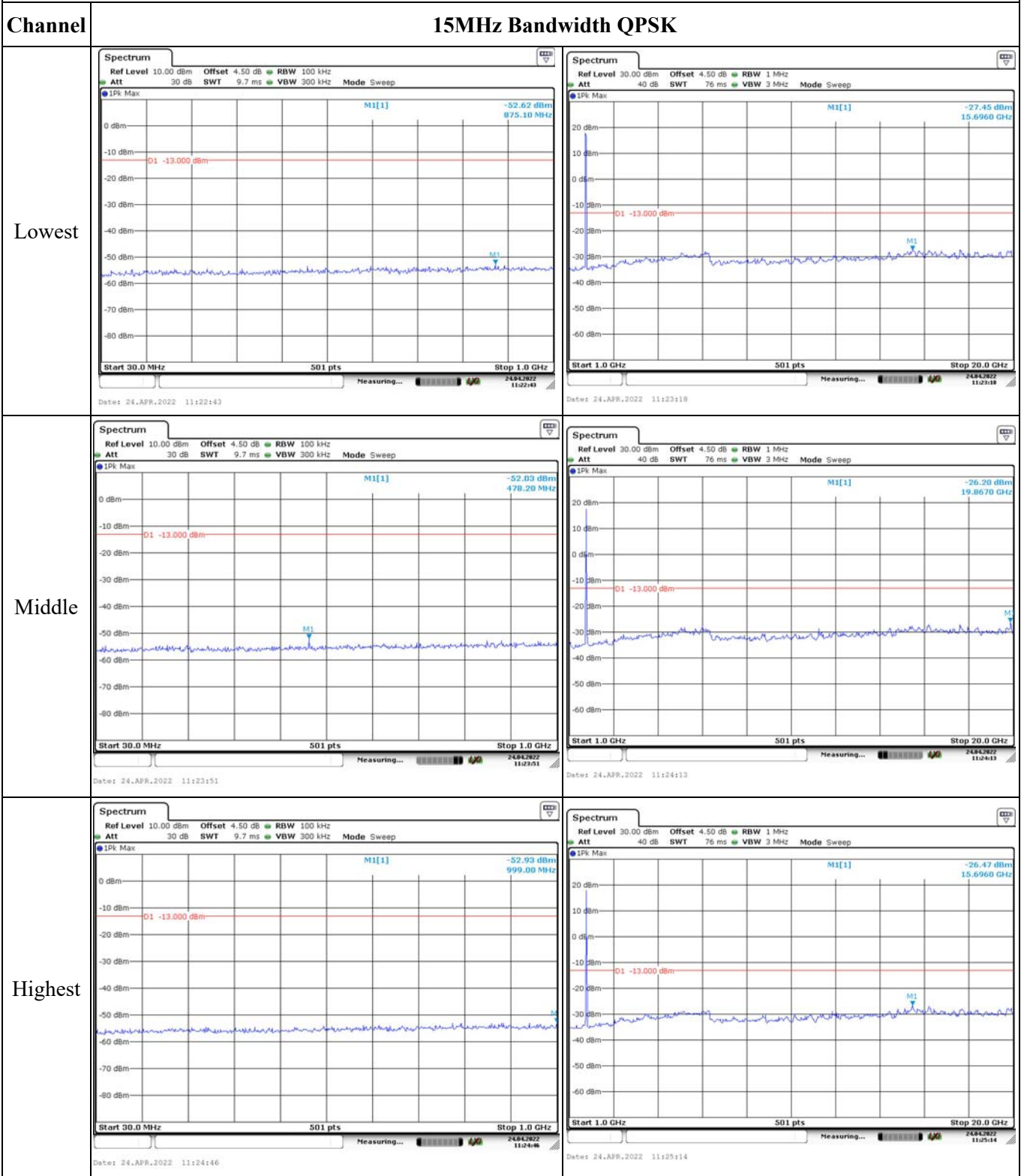
Middle



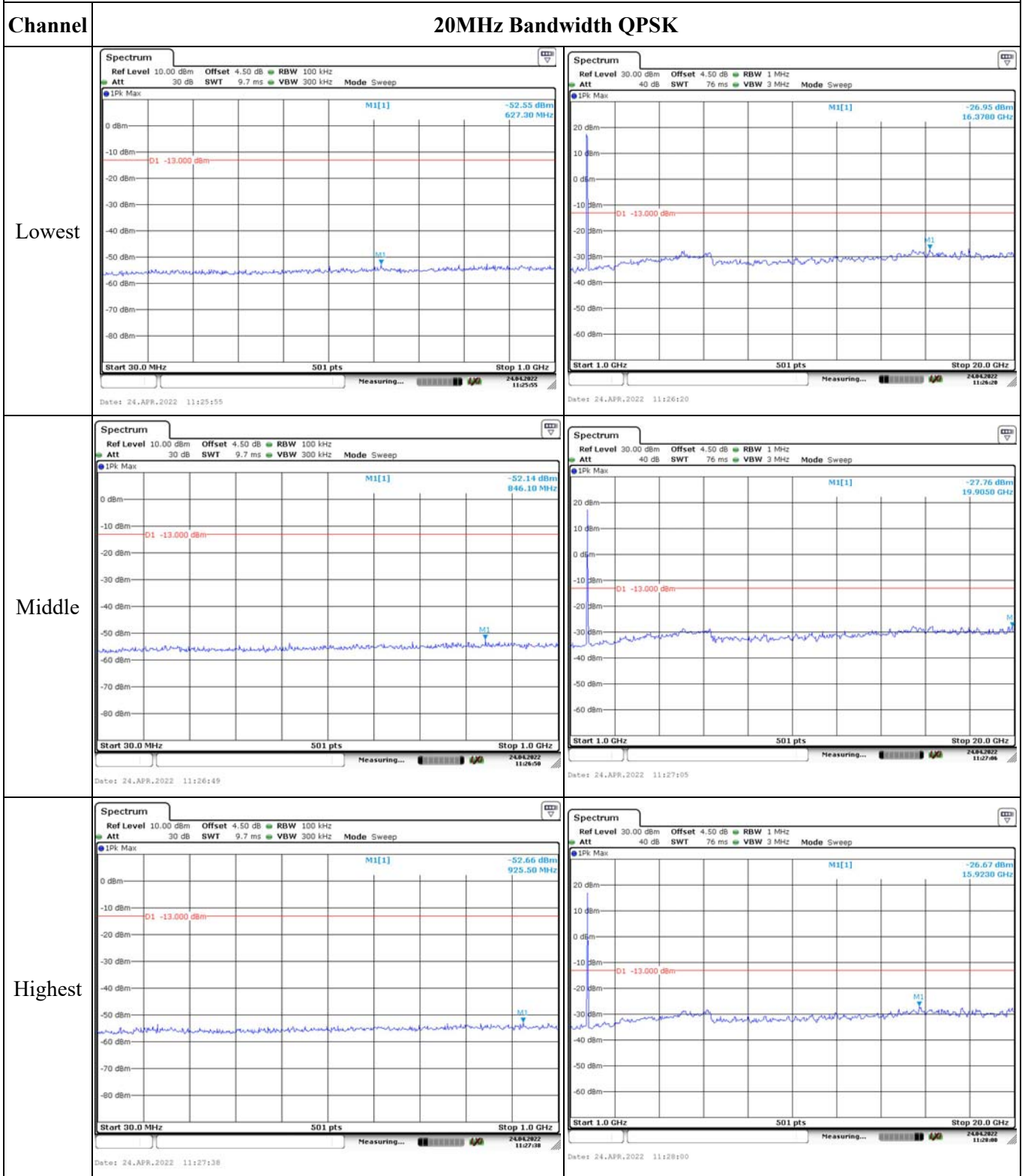
Highest



Spurious Emissions at Antenna Terminal



Spurious Emissions at Antenna Terminal



Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	<p>Ref Level 34.50 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -19.85 dBm 1.7100000 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.71 GHz 691 pts Span 3.0 MHz</p> <p>Date: 27.APR.2022 15:32:48</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -16.81 dBm 1.7550000 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.755 GHz 501 pts Span 3.0 MHz</p> <p>Date: 24.APR.2022 13:48:26</p>
QPSK 3MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -21.79 dBm 1.7100000 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.71 GHz 501 pts Span 6.0 MHz</p> <p>Date: 24.APR.2022 13:49:11</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -21.13 dBm 1.7551000 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.755 GHz 501 pts Span 6.0 MHz</p> <p>Date: 24.APR.2022 13:49:49</p>
QPSK 5MHz	<p>Ref Level 34.50 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 100 ms VBW 300 kHz Mode Sweep</p> <p>1Rm Max M1[1] -24.65 dBm 1.7100000 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.71 GHz 691 pts Span 10.0 MHz</p> <p>Date: 27.APR.2022 15:35:43</p>	<p>Ref Level 34.50 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 100 ms VBW 300 kHz Mode Sweep</p> <p>1Rm Max M1[1] -26.97 dBm 1.7550000 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.755 GHz 691 pts Span 10.0 MHz</p> <p>Date: 27.APR.2022 15:38:43</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		
16QAM 3MHz		
16QAM 5MHz		

Out of band emission, Band Edge

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

4.8 Antenna Port Test Data and Results for LTE Band 5

Serial Number:	CR22040010-RF-S1	Test Date:	2022-04-24~2022-05-17
Test Site:	RF	Test Mode:	Transmitting
Tester:	Ada Yan	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	27.3~28.6	Relative Humidity:	46~56	ATM Pressure:	100.7~100.8
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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	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 5▲:

Antenna Gain (dBi):	0.3	Antenna Gain (dBd):	-1.85	Cable Loss (dB):	1
Operation Voltage(V _{DC}):					
Lowest:	3.6	Normal:	3.8	Highest:	4.3

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	19.88	19.90	19.97	17.3	38.45
	RB1#3	18.06	20.14	20.15		
	RB1#5	17.88	19.96	20.02		
	RB3#0	17.96	20.03	19.97		
	RB3#3	18.04	20.02	20.05		
	RB6#0	17.90	18.97	19.01		
1.4MHz 16QAM	RB1#0	17.89	18.94	19.05	16.41	38.45
	RB1#3	18.10	19.08	19.26		
	RB1#5	18.06	18.95	19.11		
	RB3#0	18.11	19.21	19.00		
	RB3#3	18.00	19.22	19.07		
	RB6#0	17.98	18.01	18.14		
3MHz QPSK	RB1#0	20.01	20.09	20.04	17.24	38.45
	RB1#8	20.03	20.09	20.08		
	RB1#14	20.02	20.07	20.07		
	RB6#0	18.96	18.99	19.02		
	RB6#9	18.98	18.98	19.03		
	RB15#0	19.01	19.03	19.06		
3MHz 16QAM	RB1#0	19.59	19.18	19.06	16.77	38.45
	RB1#8	19.59	19.21	19.05		
	RB1#14	19.62	19.19	19.05		
	RB6#0	18.09	18.08	18.01		
	RB6#9	18.13	18.11	18.01		
	RB15#0	18.12	18.06	18.16		
5MHz QPSK	RB1#0	19.85	19.85	19.85	17.21	38.45
	RB1#13	19.99	20.06	20.01		
	RB1#24	19.89	19.87	19.93		
	RB15#0	18.92	18.96	19.07		
	RB15#10	18.96	18.93	18.91		
	RB25#0	18.93	18.94	18.94		
5MHz 16QAM	RB1#0	18.73	19.14	18.92	16.47	38.45
	RB1#13	18.87	19.32	19.05		
	RB1#24	18.78	19.16	18.98		
	RB15#0	18.03	17.98	18.15		
	RB15#10	18.04	17.98	18.02		
	RB25#0	18.06	18.00	18.06		

10MHz QPSK	RB1#0	19.85	19.85	19.90	17.32	38.45
	RB1#25	20.06	20.17	20.10		
	RB1#49	19.83	19.95	19.95		
	RB25#0	18.99	18.99	19.03		
	RB25#25	18.96	18.97	18.90		
	RB50#0	18.99	19.02	19.00		
10MHz 16QAM	RB1#0	19.45	18.96	18.88	16.86	38.45
	RB1#25	19.71	19.34	19.00		
	RB1#49	19.46	19.02	18.97		
	RB25#0	18.10	18.10	18.18		
	RB25#25	18.08	18.08	18.08		
	RB50#0	18.09	18.12	18.09		
Note: ERP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(dBd)						
					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	3.59	3.51	4.35	13
	RB50#0	4.41	4.81	4.35	13
10MHz 16QAM	RB1#0	4.38	4.38	5.33	13
	RB50#0	5.48	5.91	5.39	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	1.102	1.102	1.108	1.288	1.290	1.656
1.4MHz 16QAM	1.102	1.102	1.108	1.290	1.290	1.422
3MHz QPSK	2.683	2.683	2.683	2.868	2.880	3.000
3MHz 16QAM	2.683	2.683	2.683	2.892	2.880	2.892
5MHz QPSK	4.531	4.511	4.511	5.200	5.200	5.240
5MHz 16QAM	4.511	4.551	4.551	5.180	5.180	5.260
10MHz QPSK	8.942	8.942	8.981	10.080	9.880	9.880
10MHz 16QAM	8.942	8.942	8.981	9.800	9.960	9.840
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.

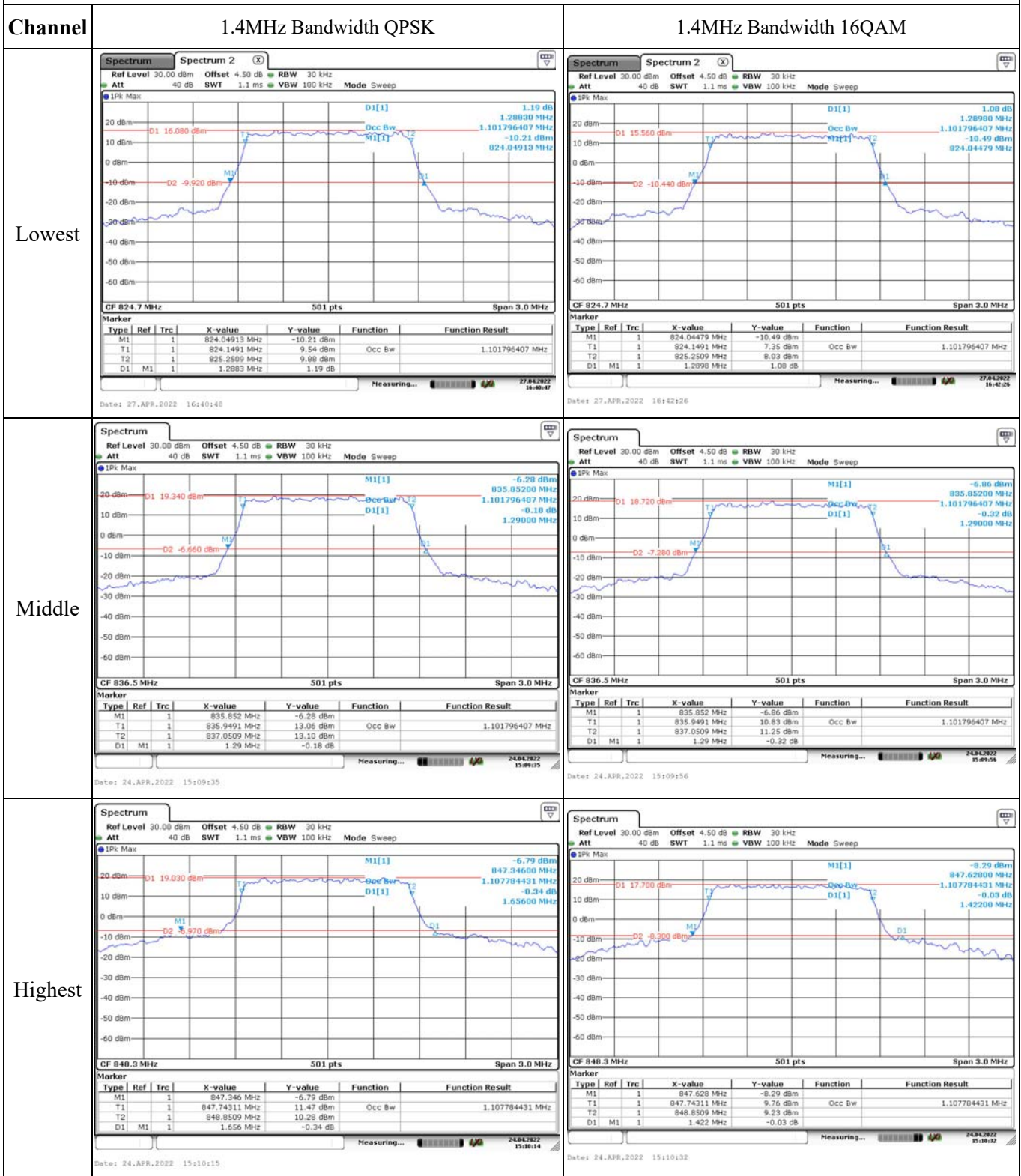
FCC §2.1051, §22.917(a):Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

FCC §2.1055, §22.355: Frequency Stability					
Test Mode:	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	3.8	-4	-0.005	2.5
	-20	3.8	3	0.004	2.5
	-10	3.8	4	0.005	2.5
	0	3.8	-6	-0.007	2.5
	10	3.8	-7	-0.008	2.5
	20	3.8	-2	-0.002	2.5
	30	3.8	3	0.004	2.5
	40	3.8	2	0.002	2.5
Frequency Stability vs. Voltage	20	3.6	-3	-0.004	2.5
	20	4.3	5	0.006	2.5
				Result:	Pass

Test Mode:	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	3.8	2	0.002	2.5
	-20	3.8	3	0.004	2.5
	-10	3.8	-5	-0.006	2.5
	0	3.8	-8	-0.010	2.5
	10	3.8	7	0.008	2.5
	20	3.8	-7	-0.008	2.5
	30	3.8	4	0.005	2.5
	40	3.8	2	0.002	2.5
Frequency Stability vs. Voltage	20	3.6	2	0.002	2.5
	20	4.3	-4	-0.005	2.5
				Result:	Pass

Test Plots:

Occupied Bandwidth



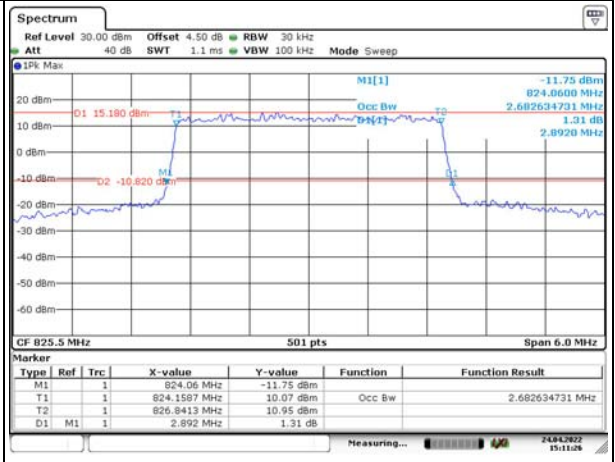
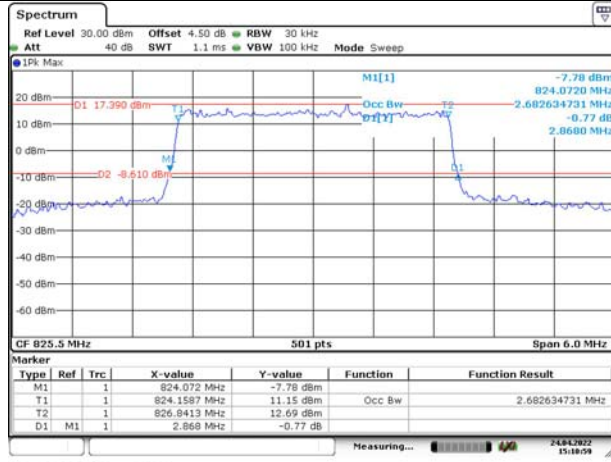
Occupied Bandwidth

Channel

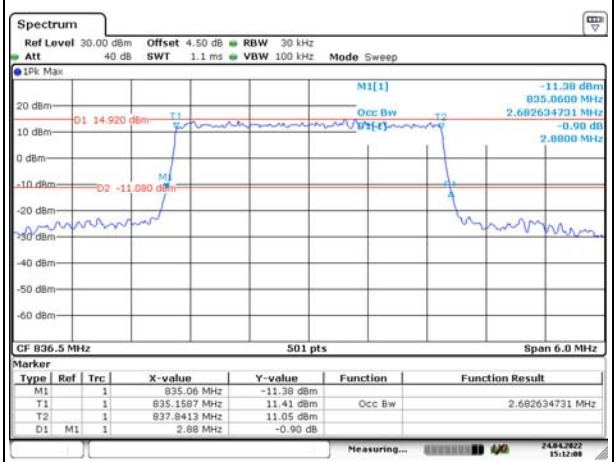
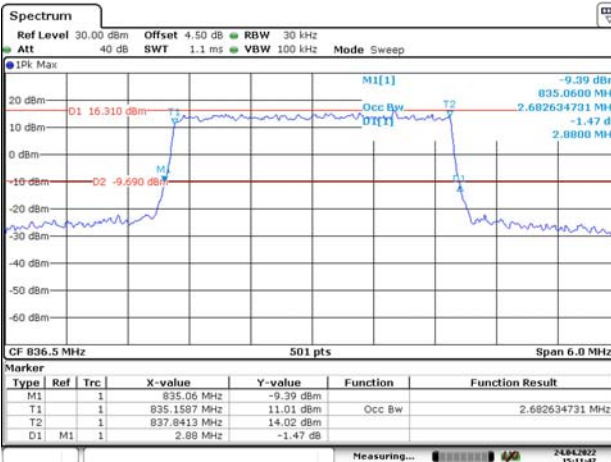
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

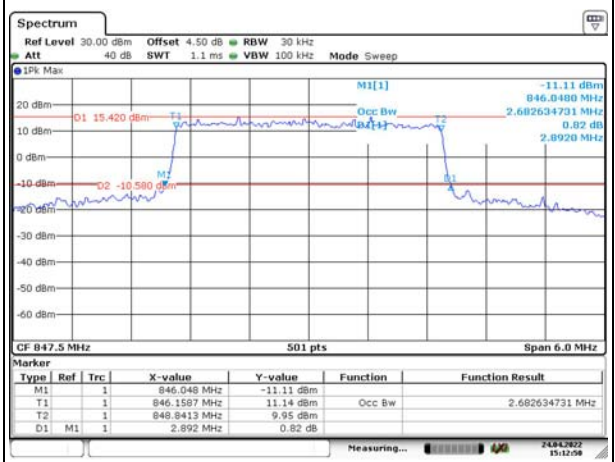
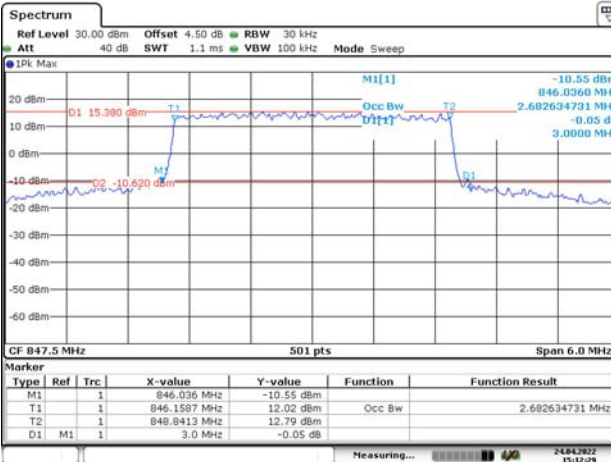
Lowest



Middle



Highest



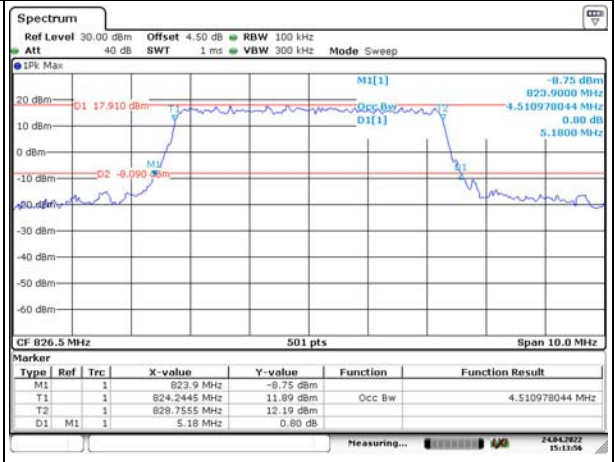
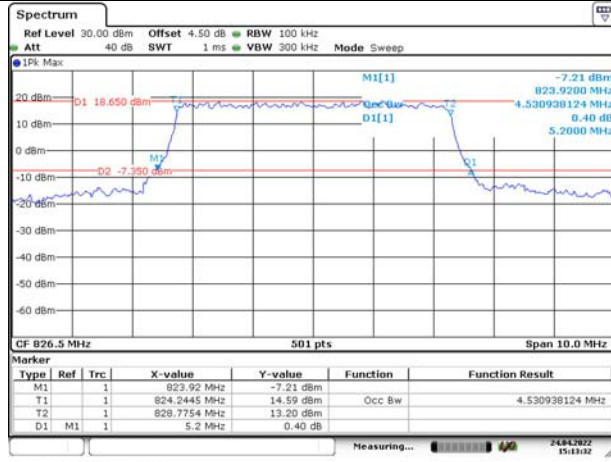
Occupied Bandwidth

Channel

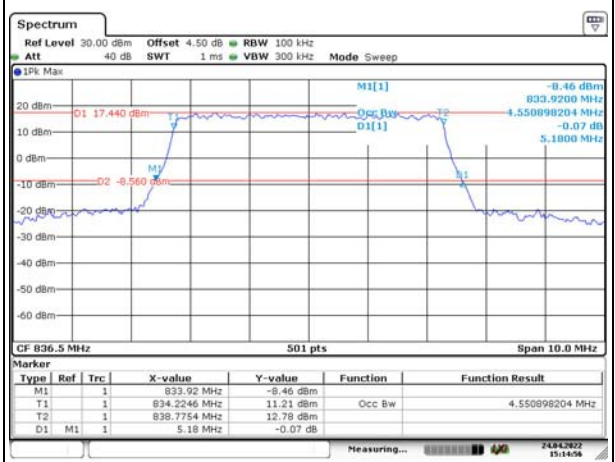
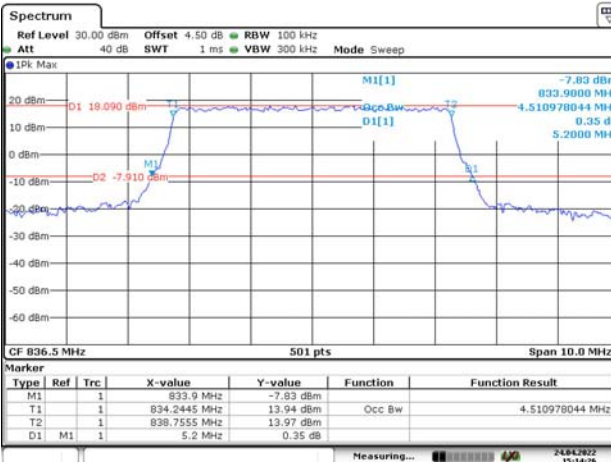
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

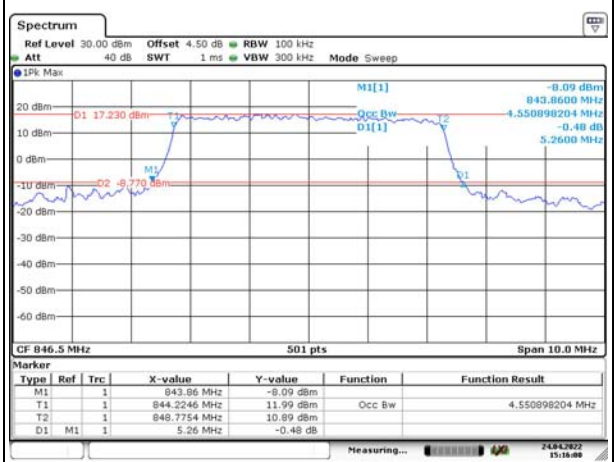
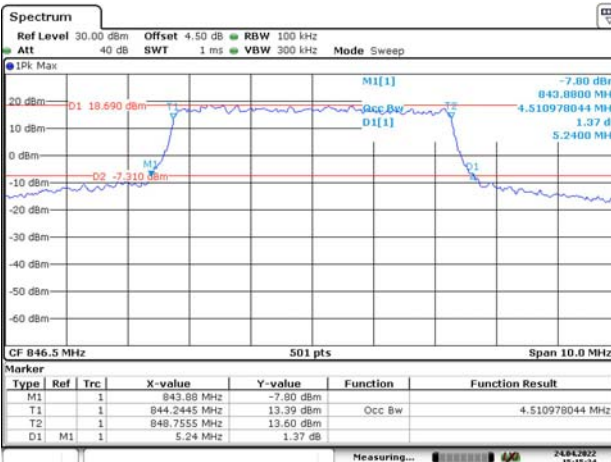
Lowest



Middle



Highest



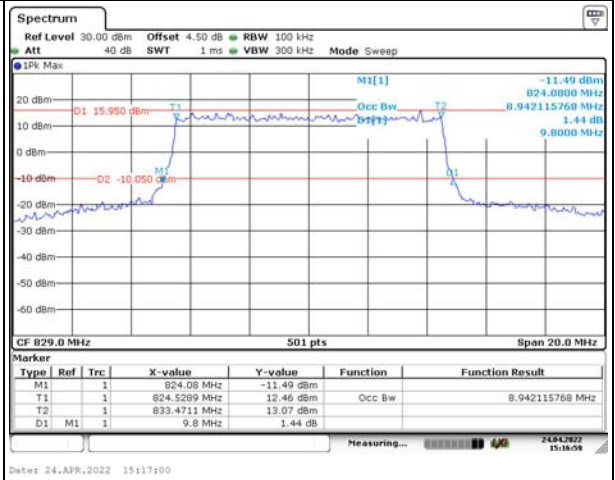
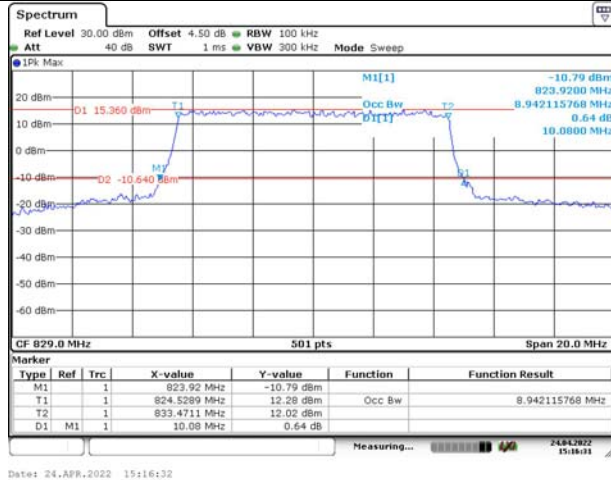
Occupied Bandwidth

Channel

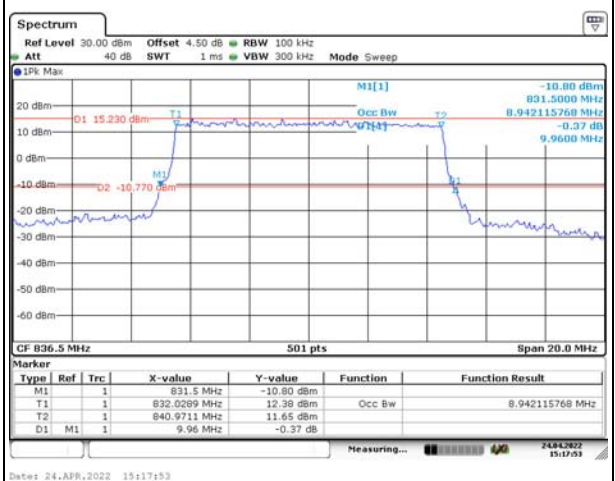
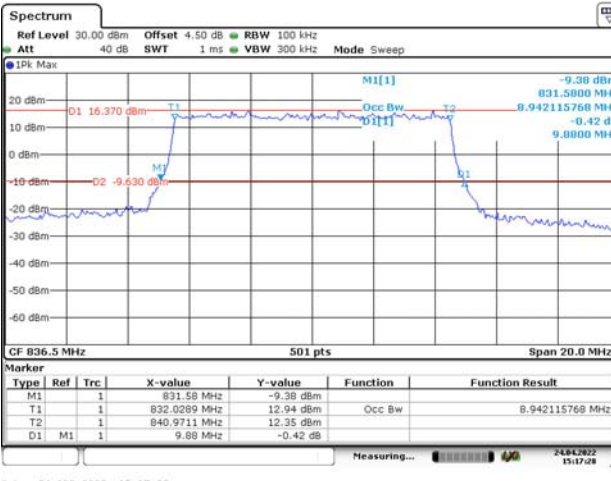
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

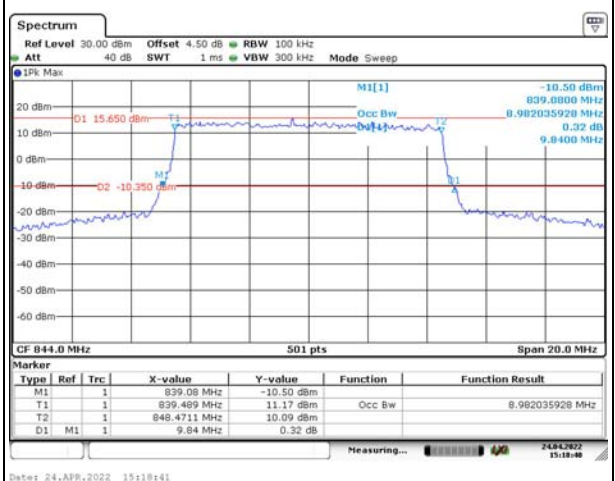
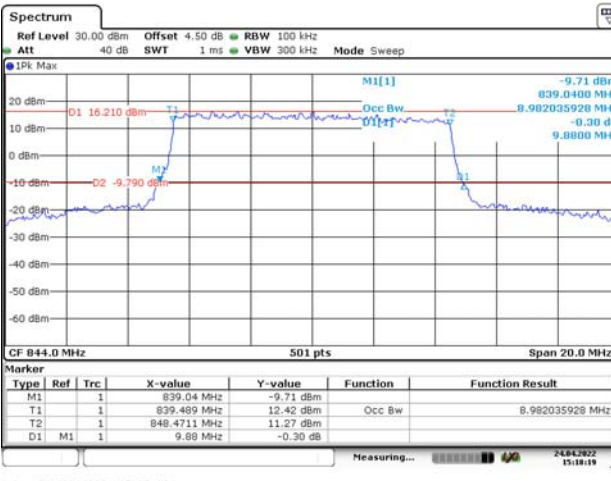
Lowest



Middle



Highest

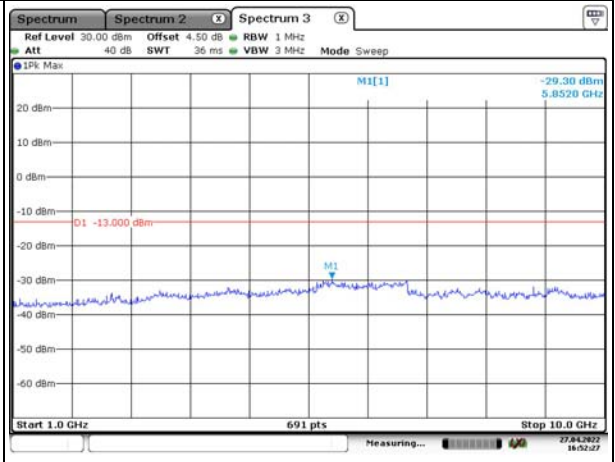
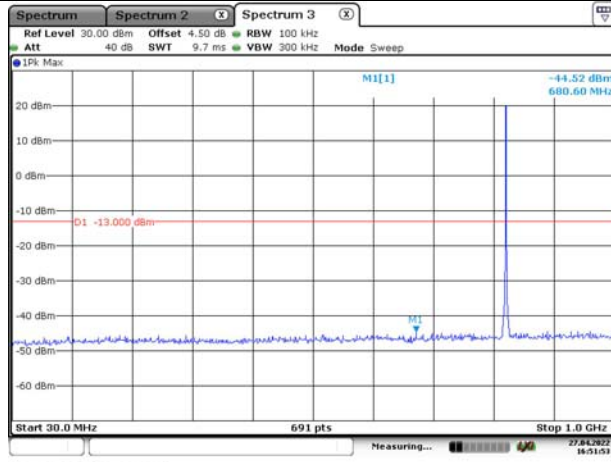


Spurious Emissions at Antenna Terminal

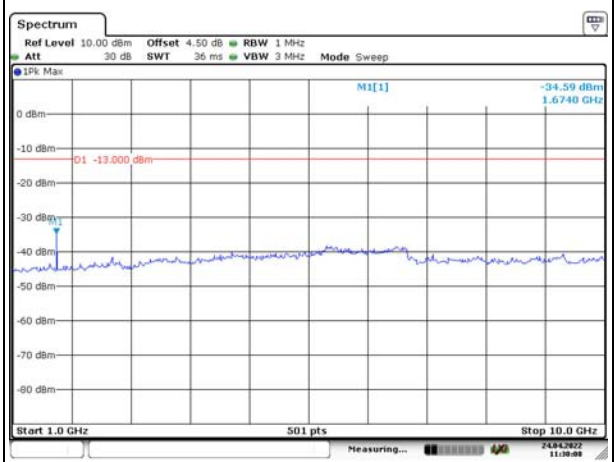
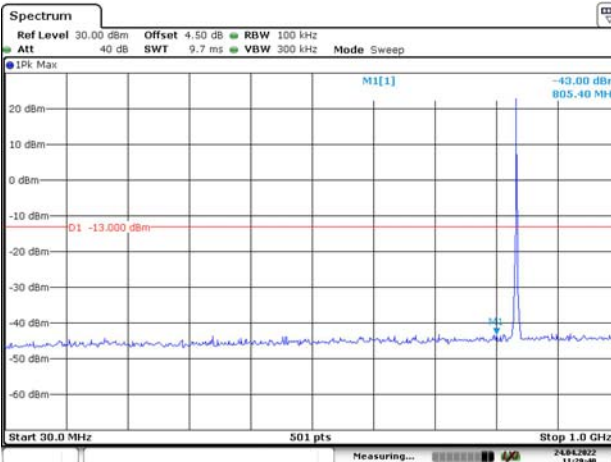
Channel

1.4MHz Bandwidth QPSK

Lowest



Middle



Highest

