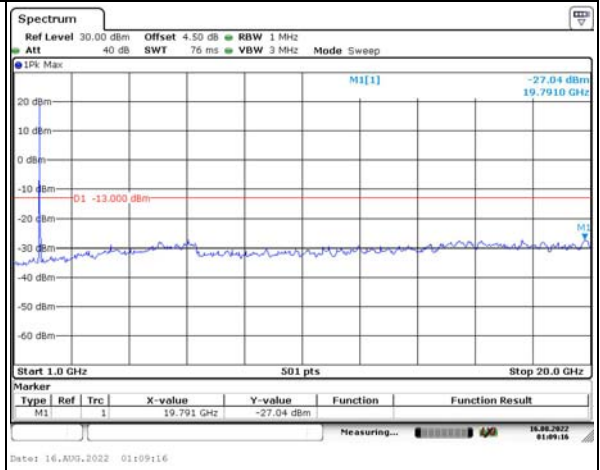
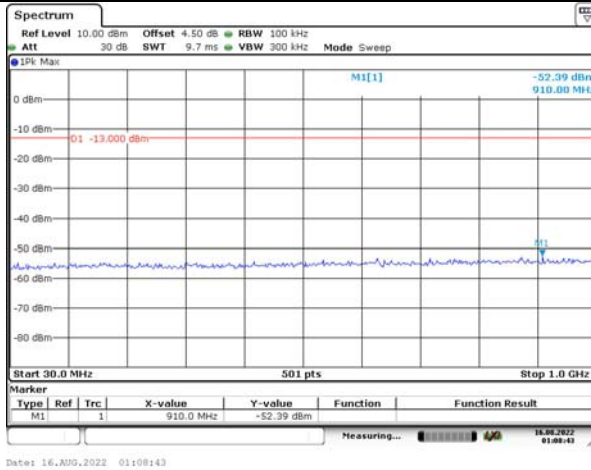


Spurious Emissions at Antenna Terminal

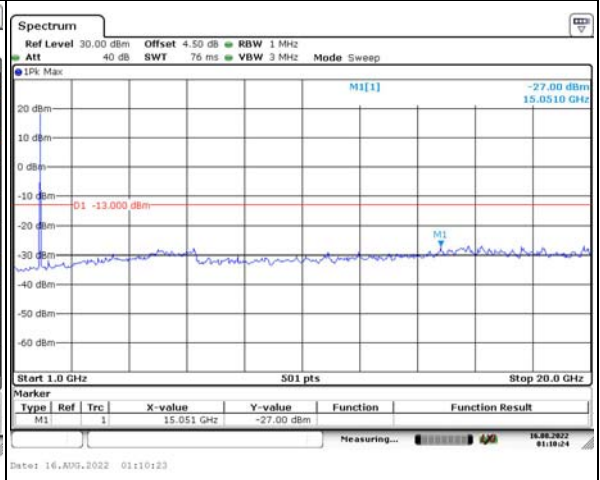
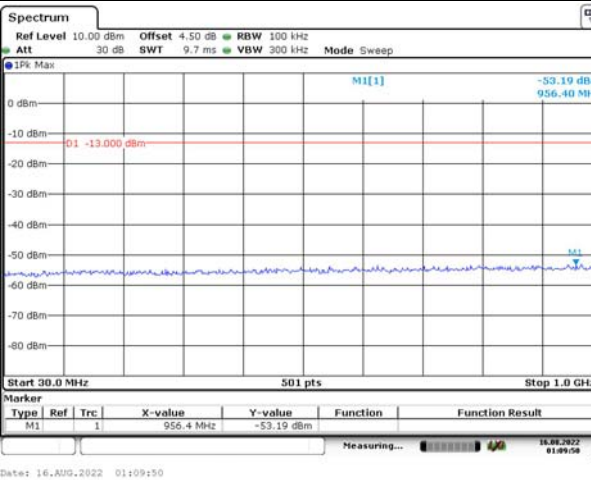
Channel

15MHz Bandwidth QPSK

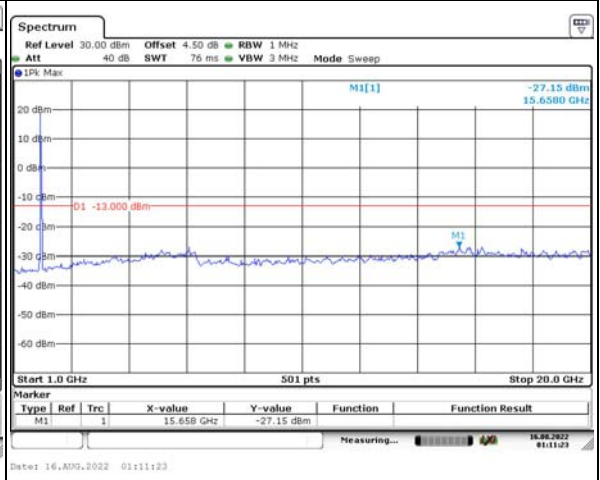
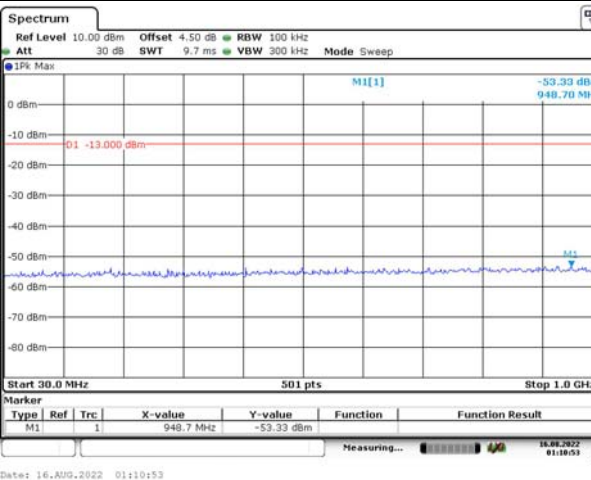
Lowest



Middle



Highest

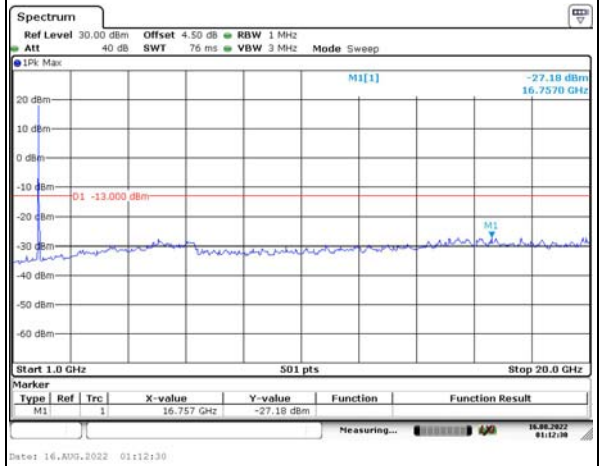
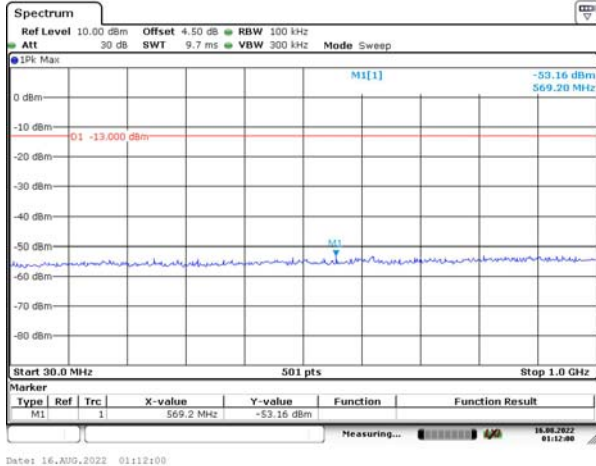


Spurious Emissions at Antenna Terminal

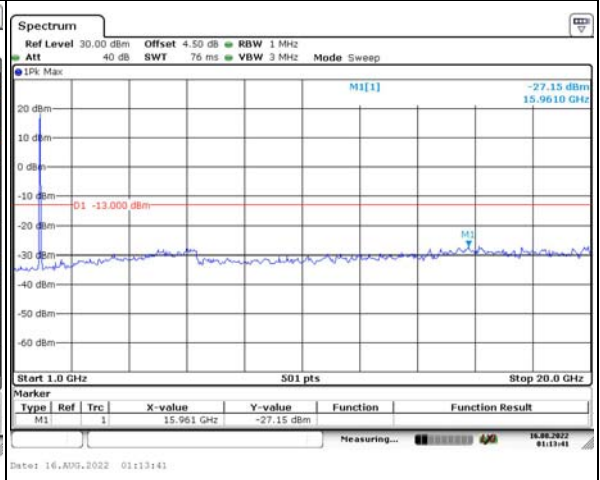
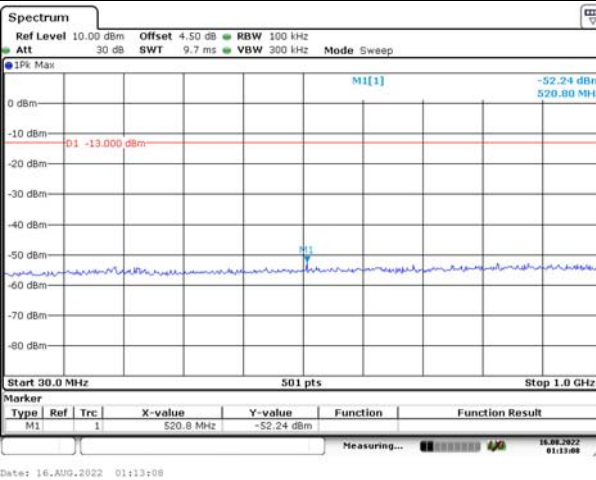
Channel

20MHz Bandwidth QPSK

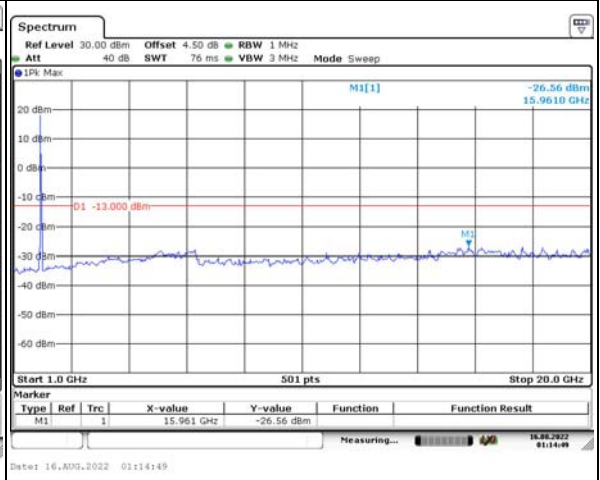
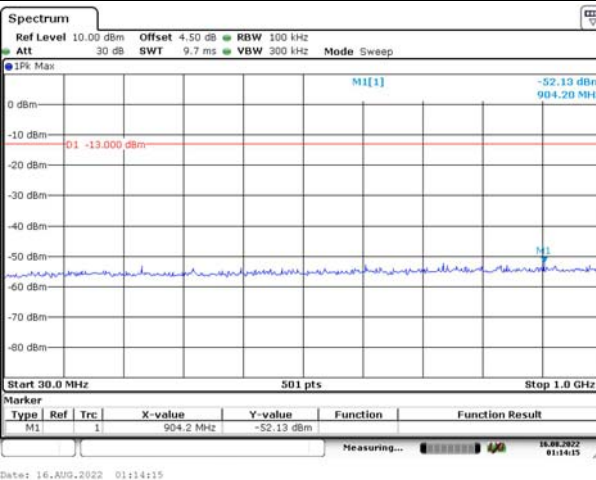
Lowest



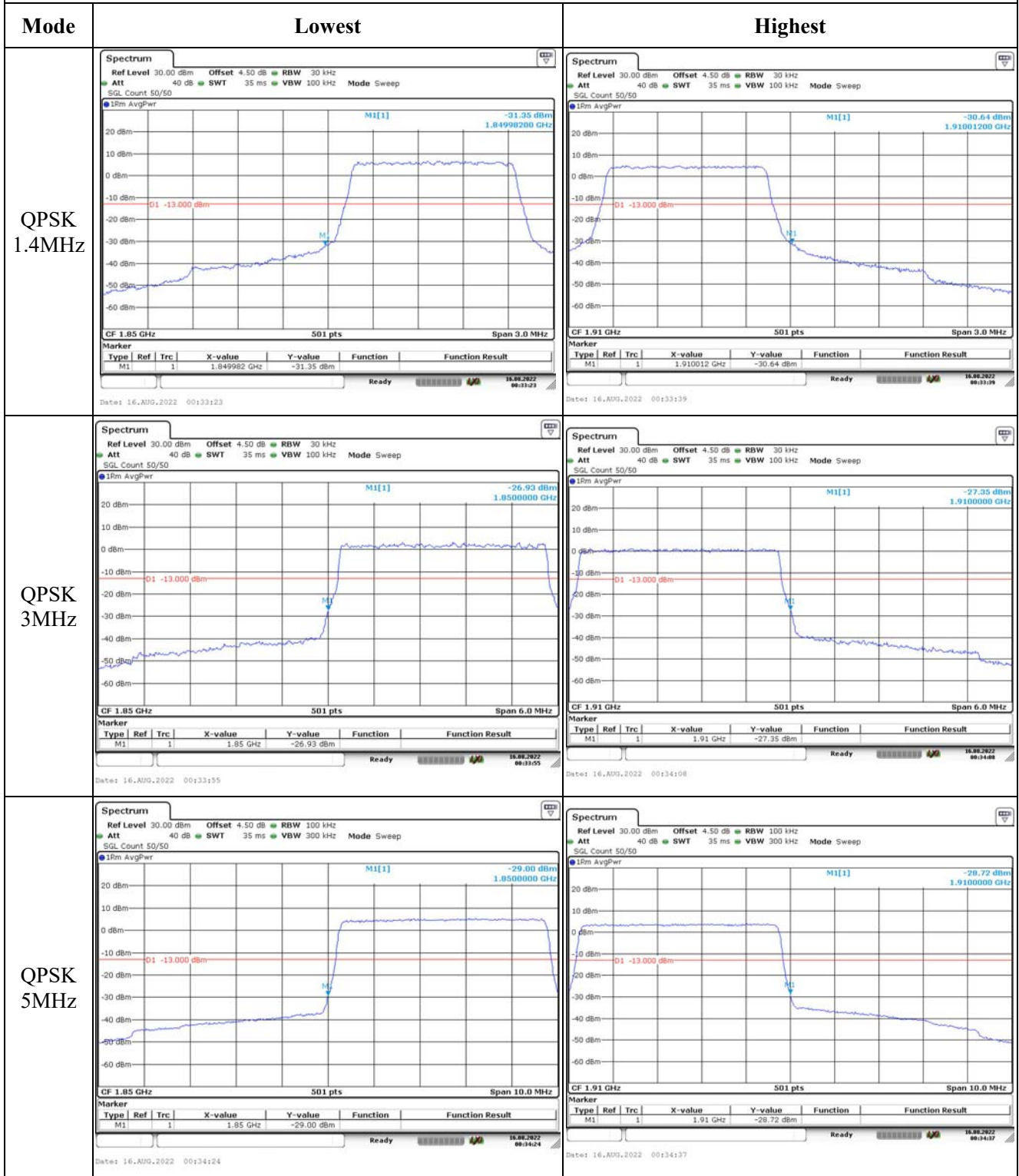
Middle



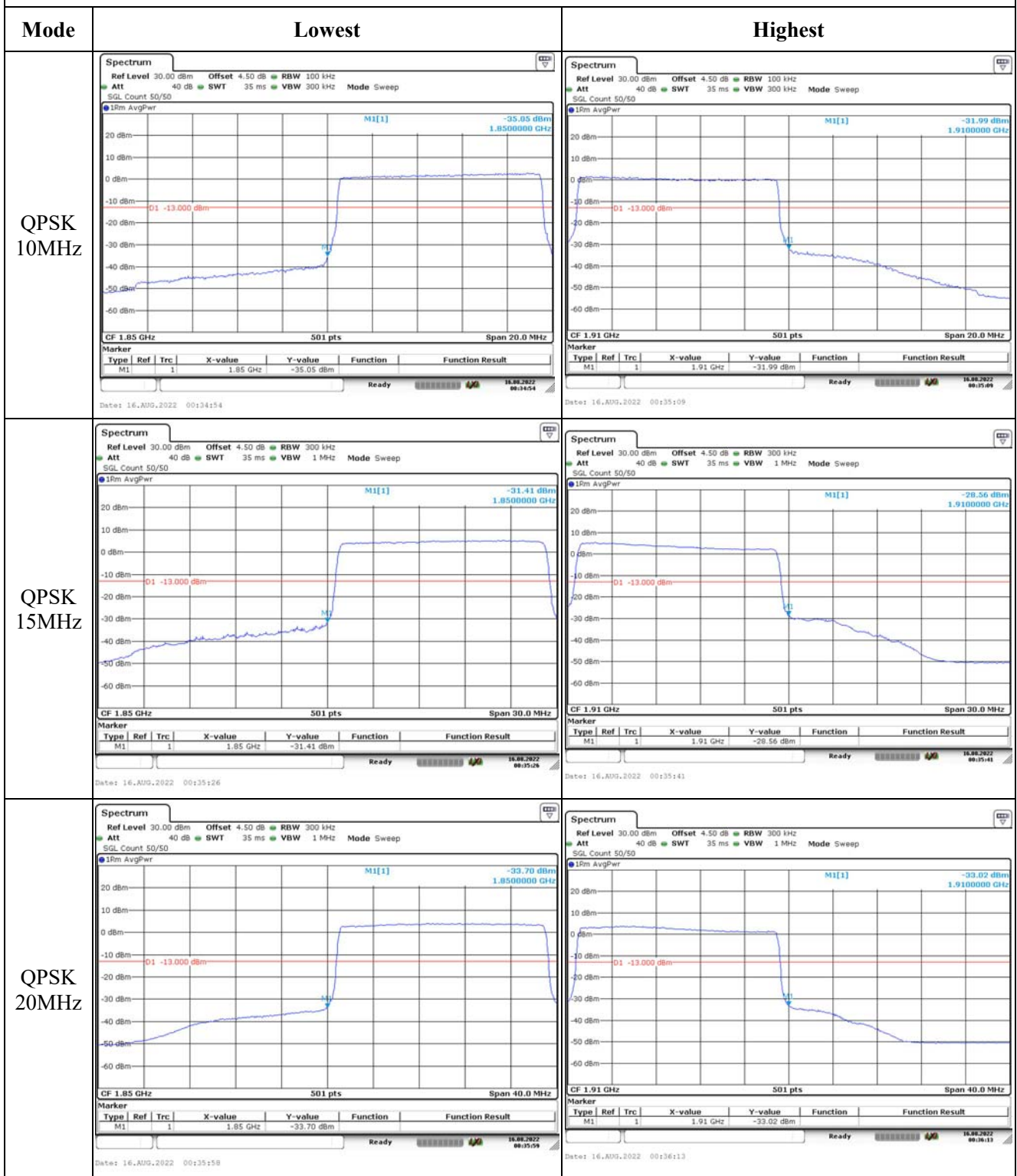
Highest



Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge

Mode	Lowest	Highest																																
16QAM 1.4MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 35 ms VBW 100 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr</p> <p>CF 1.85 GHz 501 pts Span 3.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td>1.85 GHz</td> <td>-32.12 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:33:29</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1			1.85 GHz	-32.12 dBm			<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 35 ms VBW 100 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr</p> <p>CF 1.91 GHz 501 pts Span 3.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td>1.91 GHz</td> <td>-30.74 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:33:45</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1			1.91 GHz	-30.74 dBm		
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1	1			1.85 GHz	-32.12 dBm																													
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1	1			1.91 GHz	-30.74 dBm																													
16QAM 3MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 35 ms VBW 100 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr</p> <p>CF 1.85 GHz 501 pts Span 6.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td>1.85 GHz</td> <td>-26.64 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:34:01</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1			1.85 GHz	-26.64 dBm			<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 35 ms VBW 100 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr</p> <p>CF 1.91 GHz 501 pts Span 6.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td>1.91 GHz</td> <td>-28.28 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:34:14</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1			1.91 GHz	-28.28 dBm		
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1	1			1.85 GHz	-26.64 dBm																													
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1	1			1.91 GHz	-28.28 dBm																													
16QAM 5MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 35 ms VBW 300 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr</p> <p>CF 1.85 GHz 501 pts Span 10.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td>1.85 GHz</td> <td>-29.18 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:34:30</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1			1.85 GHz	-29.18 dBm			<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 35 ms VBW 300 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr</p> <p>CF 1.91 GHz 501 pts Span 10.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td>1.91 GHz</td> <td>-29.11 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:34:44</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1			1.91 GHz	-29.11 dBm		
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1	1			1.85 GHz	-29.18 dBm																													
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1	1			1.91 GHz	-29.11 dBm																													

Out of band emission, Band Edge

Mode	Lowest	Highest																																
16QAM 10MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 35 ms VBW 300 kHz Mode Sweep SGL Count 50/50 15m AvgPwr</p> <p>CF 1.85 GHz 501 pts Span 20.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td></td> <td>1</td> <td>1.85 GHz</td> <td>-36.53 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:35:01</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1			1	1.85 GHz	-36.53 dBm			<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 35 ms VBW 300 kHz Mode Sweep SGL Count 50/50 15m AvgPwr</p> <p>CF 1.91 GHz 501 pts Span 20.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td></td> <td>1</td> <td>1.91 GHz</td> <td>-33.72 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:35:15</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1			1	1.91 GHz	-33.72 dBm		
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1			1	1.85 GHz	-36.53 dBm																													
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1			1	1.91 GHz	-33.72 dBm																													
16QAM 15MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz Att 40 dB SWT 35 ms VBW 1 MHz Mode Sweep SGL Count 50/50 15m AvgPwr</p> <p>CF 1.85 GHz 501 pts Span 30.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td></td> <td>1</td> <td>1.85 GHz</td> <td>-32.48 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:35:33</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1			1	1.85 GHz	-32.48 dBm			<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz Att 40 dB SWT 35 ms VBW 1 MHz Mode Sweep SGL Count 50/50 15m AvgPwr</p> <p>CF 1.91 GHz 501 pts Span 30.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td></td> <td>1</td> <td>1.91 GHz</td> <td>-30.39 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:35:47</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1			1	1.91 GHz	-30.39 dBm		
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1			1	1.85 GHz	-32.48 dBm																													
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1			1	1.91 GHz	-30.39 dBm																													
16QAM 20MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz Att 40 dB SWT 35 ms VBW 1 MHz Mode Sweep SGL Count 50/50 15m AvgPwr</p> <p>CF 1.85 GHz 501 pts Span 40.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td></td> <td>1</td> <td>1.85 GHz</td> <td>-35.18 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:36:05</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1			1	1.85 GHz	-35.18 dBm			<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz Att 40 dB SWT 35 ms VBW 1 MHz Mode Sweep SGL Count 50/50 15m AvgPwr</p> <p>CF 1.91 GHz 501 pts Span 40.0 MHz</p> <table border="1"> <thead> <tr> <th>Marker</th> <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></td> <td></td> <td>1</td> <td>1.91 GHz</td> <td>-33.65 dBm</td> <td></td> <td></td> </tr> </tbody> </table> <p>Date: 16.AUG.2022 00:36:21</p>	Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1			1	1.91 GHz	-33.65 dBm		
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1			1	1.85 GHz	-35.18 dBm																													
Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result																											
M1			1	1.91 GHz	-33.65 dBm																													

4.7 Antenna Port Test Data and Results for LTE Band 4

Serial Number:	CR22080013-RF-S1	Test Date:	2022-08-13~2022-08-25
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.1~25.9	Relative Humidity: (%)	52~63	ATM Pressure: (kPa)	99.9~100.8
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2022-07-15	2023-07-14
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554404	Each time	N/A
Weinschel	Coaxial Attenuators	53-20-34	LN751	Each time	N/A
Unknown	Coaxial tee connector	Unknown	2204004	Each time	N/A
Unknown	RF Cable	Unknown	RF Cable 003	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2022-07-15	2023-07-14
UNI-T	Multimeter	UT39A+	C210582554	2021-09-30	2022-09-29
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022-04-06	2023-04-05

* 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):	0.54	Path Loss L _C (dB):	0.4
Operation Voltage(V _{DC}):			
Lowest:	3.5	Normal:	3.8
		Highest:	4.35

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
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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	22.53	22.47	22.48	22.82	30
	RB1#3	22.49	22.37	22.46		
	RB1#5	22.54	22.36	22.48		
	RB3#0	22.59	22.52	22.34		
	RB3#3	22.68	22.48	22.37		
	RB6#0	21.53	21.44	21.29		
1.4MHz 16QAM	RB1#0	21.74	22.13	21.39	22.27	30
	RB1#3	21.69	22.13	21.46		
	RB1#5	21.69	22.1	21.43		
	RB3#0	21.81	21.54	21.33		
	RB3#3	21.82	21.55	21.31		
	RB6#0	20.8	20.7	20.71		
3MHz QPSK	RB1#0	22.48	22.49	22.15	22.67	30
	RB1#8	22.46	22.42	22.13		
	RB1#14	22.53	22.43	22.1		
	RB6#0	21.57	21.5	21.25		
	RB6#9	21.68	21.49	21.3		
	RB15#0	21.47	21.36	21.31		
3MHz 16QAM	RB1#0	22.21	21.33	21.54	22.45	30
	RB1#8	22.2	21.24	21.44		
	RB1#14	22.31	21.26	21.44		
	RB6#0	20.79	20.78	20.41		
	RB6#9	20.82	20.78	20.36		
	RB15#0	20.65	20.57	20.46		
5MHz QPSK	RB1#0	22.63	22.44	22.34	22.87	30
	RB1#13	22.67	22.39	22.3		
	RB1#24	22.73	22.38	22.35		
	RB15#0	21.54	21.6	21.39		
	RB15#10	21.66	21.37	21.44		
	RB25#0	21.58	21.4	21.36		
5MHz 16QAM	RB1#0	21.75	21.18	20.58	21.99	30
	RB1#13	21.84	21.13	20.67		
	RB1#24	21.85	21.21	20.69		
	RB15#0	20.61	20.64	20.55		
	RB15#10	20.61	20.62	20.49		
	RB25#0	20.71	20.4	20.56		
10MHz QPSK	RB1#0	22.52	22.49	22.31	22.69	30

	RB1#25	22.5	22.47	22.34		
	RB1#49	22.55	22.4	22.34		
	RB25#0	21.58	21.55	21.32		
	RB25#25	21.52	21.46	21.21		
	RB50#0	21.52	21.51	21.5		
10MHz 16QAM	RB1#0	21.69	21.01	21.69	21.88	30
	RB1#25	21.71	20.94	21.74		
	RB1#49	21.71	20.96	21.67		
	RB25#0	20.79	20.69	20.48		
	RB25#25	20.82	20.65	20.43		
	RB50#0	20.7	20.61	20.64		
15MHz QPSK	RB1#0	22.5	22.46	22.36	22.67	30
	RB1#38	22.51	22.32	22.32		
	RB1#74	22.53	22.32	22.36		
	RB36#0	21.48	21.49	21.39		
	RB36#39	21.54	21.45	21.37		
	RB75#0	21.55	21.48	21.28		
15MHz 16QAM	RB1#0	21.66	21.92	21.71	22.06	30
	RB1#38	21.75	21.91	21.66		
	RB1#74	21.71	21.89	21.73		
	RB36#0	20.69	20.57	20.63		
	RB36#39	20.71	20.56	20.67		
	RB75#0	20.75	20.56	20.45		
20MHz QPSK	RB1#0	22.64	22.49	22.48	22.79	30
	RB1#50	22.65	22.43	22.49		
	RB1#99	22.65	22.45	22.47		
	RB50#0	21.48	21.56	21.37		
	RB50#50	21.48	21.48	21.42		
	RB100#0	21.59	21.41	21.39		
20MHz 16QAM	RB1#0	21.53	22.12	21	22.34	30
	RB1#50	21.56	22.19	21		
	RB1#99	21.55	22.2	21.02		
	RB50#0	20.71	20.66	20.59		
	RB50#50	20.66	20.55	20.68		
	RB100#0	20.62	20.64	20.48		

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	3.28	3.51	5.01	13
	RB100#0	3.68	4.93	4.87	13
20MHz 16QAM	RB1#0	4.32	4.41	5.83	13
	RB100#0	4.61	5.86	5.83	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	1.108	1.102	1.102	1.266	1.260	1.272
1.4MHz 16QAM	1.108	1.108	1.102	1.266	1.254	1.260
3MHz QPSK	2.707	2.695	2.695	3.000	3.012	3.000
3MHz 16QAM	2.695	2.695	2.695	3.012	3.024	3.036
5MHz QPSK	4.531	4.511	4.531	5.020	5.000	5.020
5MHz 16QAM	4.531	4.551	4.511	5.020	5.040	5.000
10MHz QPSK	8.982	8.942	8.982	9.960	9.800	9.800
10MHz 16QAM	8.942	8.942	8.982	10.160	9.840	9.760
15MHz QPSK	13.473	13.533	13.533	15.360	15.120	15.060
15MHz 16QAM	13.533	13.533	13.533	15.420	15.060	15.060
20MHz QPSK	17.964	18.044	17.964	19.680	19.840	19.680
20MHz 16QAM	17.964	18.044	18.044	19.840	19.680	19.760

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

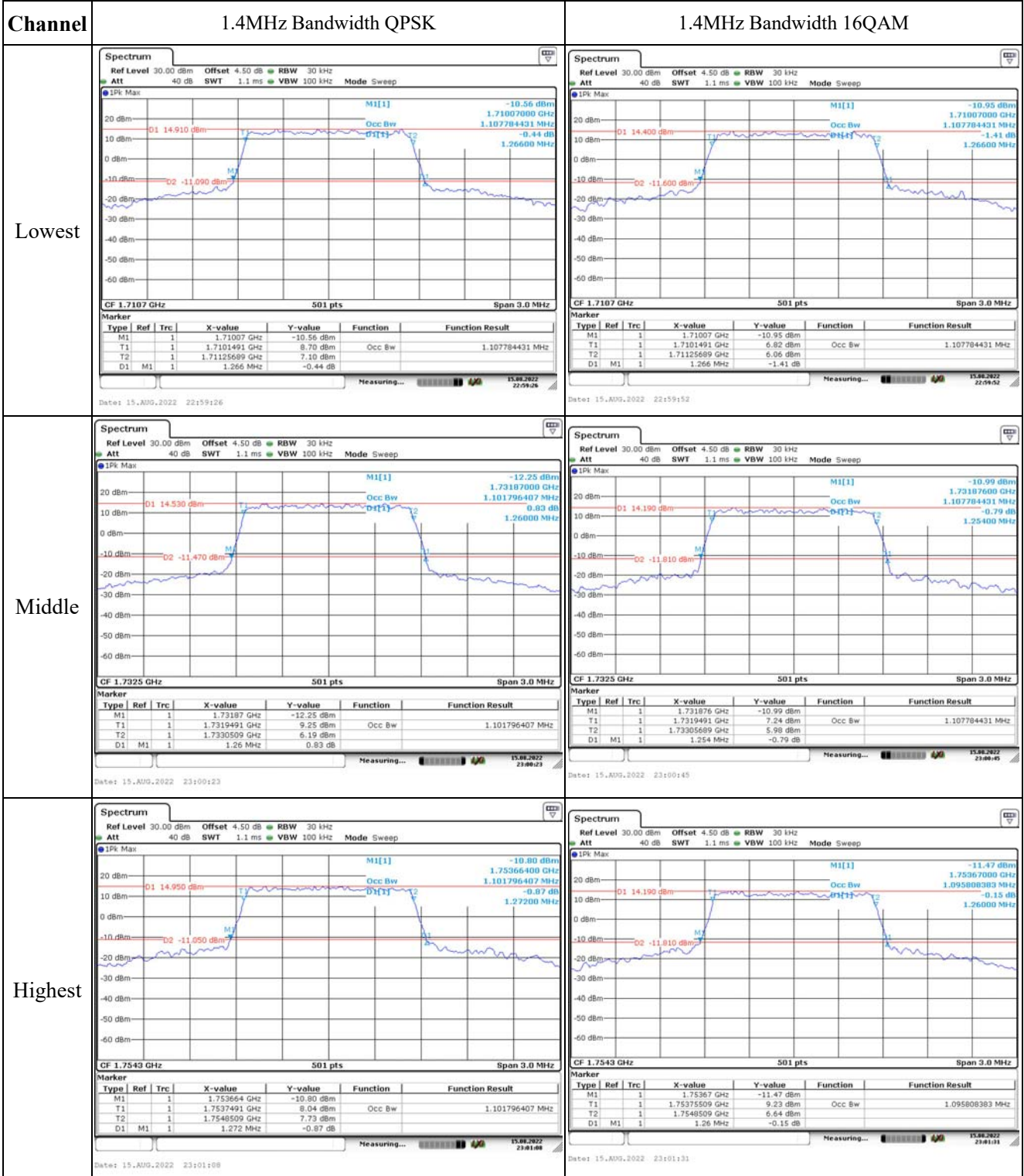
FCC §2.1051, § 27.53:Spurious Emissions at Antenna Terminal**Result: Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.****FCC §2.1051, § 27.53:Out of band emission, Band Edge****Result: Pass, Please refer to the test plots of Out of band emission, Band Edge.****FCC §2.1055, §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	3.8	1711.089	1710.00	1754.063	1755
	-20	3.8	1711.043	1710.00	1754.002	1755
	-10	3.8	1711.049	1710.00	1754.018	1755
	0	3.8	1711.014	1710.00	1754.061	1755
	10	3.8	1711.049	1710.00	1754.097	1755
	20	3.8	1711.058	1710.00	1754.022	1755
	30	3.8	1711.013	1710.00	1754.003	1755
	40	3.8	1711.009	1710.00	1754.075	1755
Frequency Stability vs. Voltage	20	3.5	1711.004	1710.00	1754.083	1755
	20	4.35	1711.093	1710.00	1754.083	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	1711.079	1710.00	1754.146	1755
	-20	3.8	1711.017	1710.00	1754.057	1755
	-10	3.8	1711.048	1710.00	1754.056	1755
	0	3.8	1711.073	1710.00	1754.114	1755
	10	3.8	1711.096	1710.00	1754.094	1755
	20	3.8	1711.058	1710.00	1754.102	1755
	30	3.8	1711.016	1710.00	1754.128	1755
	40	3.8	1711.054	1710.00	1754.096	1755
Frequency Stability vs. Voltage	20	3.5	1711.001	1710.00	1754.139	1755
	20	4.35	1711.004	1710.00	1754.110	1755
					Result:	Pass

Test Plots:

Occupied Bandwidth



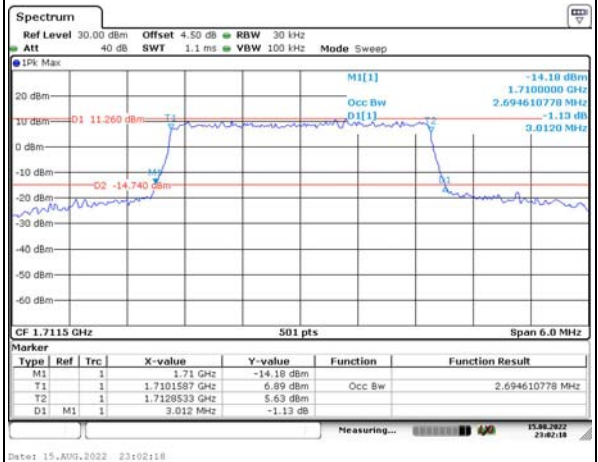
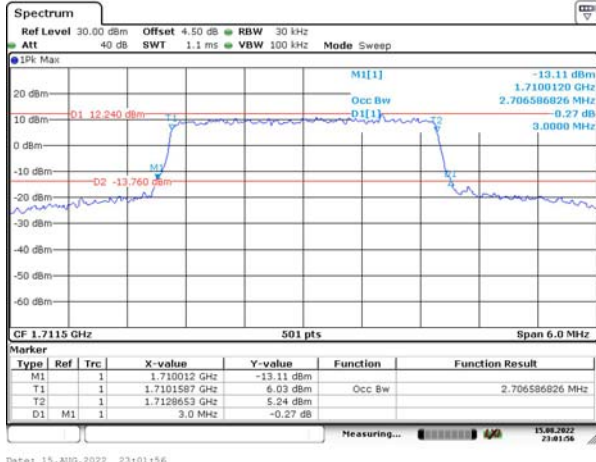
Occupied Bandwidth

Channel

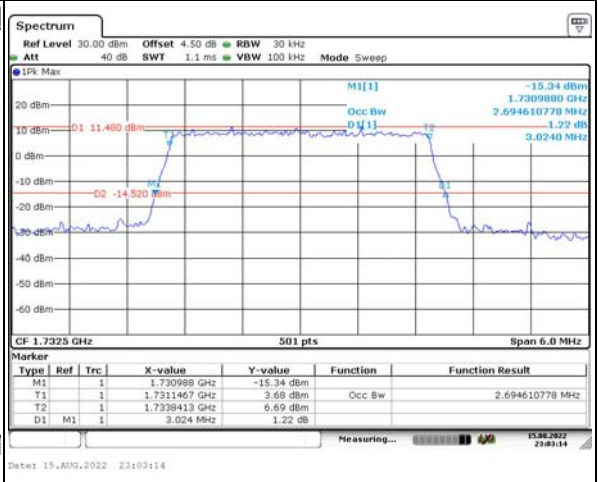
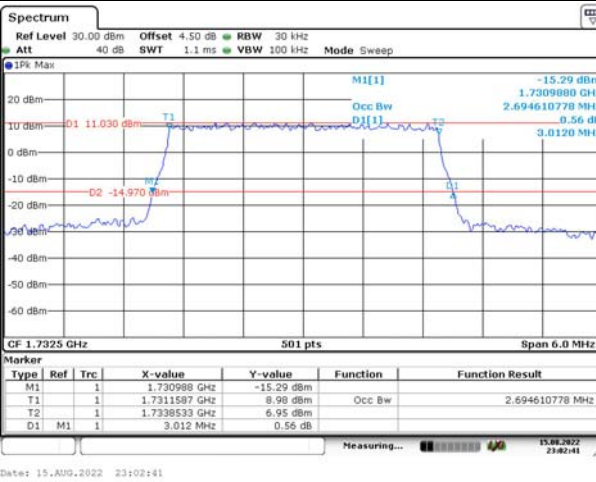
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

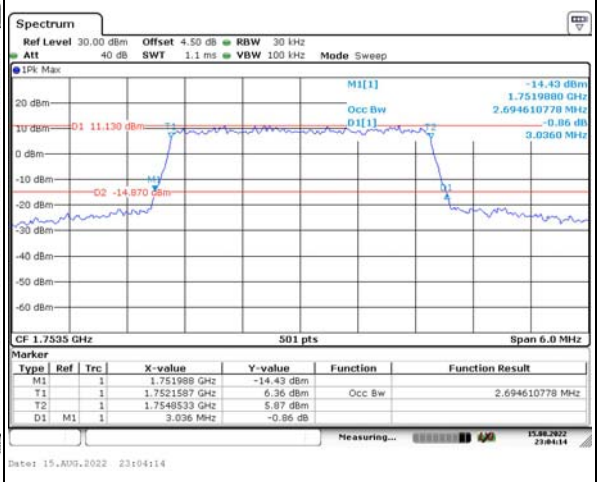
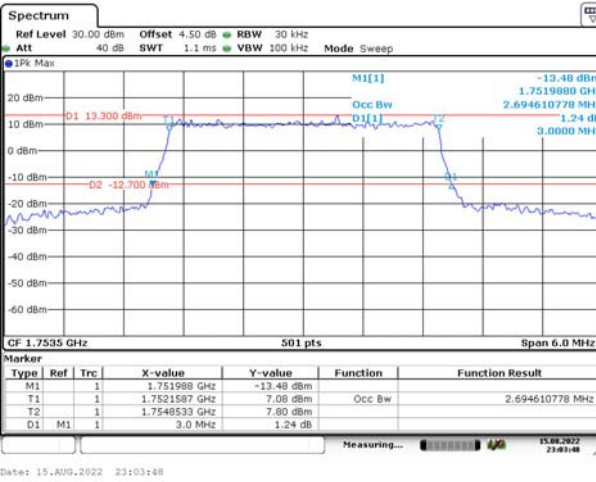
Lowest



Middle



Highest



Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM																																																																						
Lowest	<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>1.71 GHz</td> <td>-12.29 dBm</td> <td></td> <td></td> </tr> <tr> <td>T1</td> <td>1</td> <td></td> <td>1.7102445 GHz</td> <td>8.54 dBm</td> <td>Occ Bw</td> <td>4.530938124 MHz</td> </tr> <tr> <td>T2</td> <td>1</td> <td></td> <td>1.7147754 GHz</td> <td>8.23 dBm</td> <td></td> <td></td> </tr> <tr> <td>D1</td> <td>M1</td> <td>1</td> <td>5.02 MHz</td> <td>1.36 dB</td> <td></td> <td></td> </tr> </tbody> </table>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		1.71 GHz	-12.29 dBm			T1	1		1.7102445 GHz	8.54 dBm	Occ Bw	4.530938124 MHz	T2	1		1.7147754 GHz	8.23 dBm			D1	M1	1	5.02 MHz	1.36 dB			<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>1.71 GHz</td> <td>-13.04 dBm</td> <td></td> <td></td> </tr> <tr> <td>T1</td> <td>1</td> <td></td> <td>1.7102445 GHz</td> <td>7.26 dBm</td> <td>Occ Bw</td> <td>4.530938124 MHz</td> </tr> <tr> <td>T2</td> <td>1</td> <td></td> <td>1.7147754 GHz</td> <td>8.61 dBm</td> <td></td> <td></td> </tr> <tr> <td>D1</td> <td>M1</td> <td>1</td> <td>5.02 MHz</td> <td>1.15 dB</td> <td></td> <td></td> </tr> </tbody> </table>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		1.71 GHz	-13.04 dBm			T1	1		1.7102445 GHz	7.26 dBm	Occ Bw	4.530938124 MHz	T2	1		1.7147754 GHz	8.61 dBm			D1	M1	1	5.02 MHz	1.15 dB		
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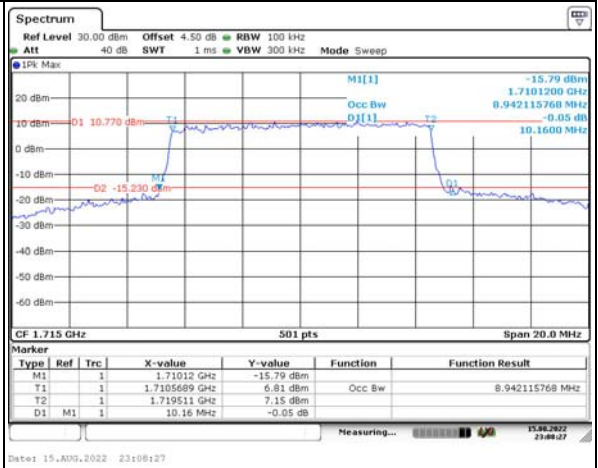
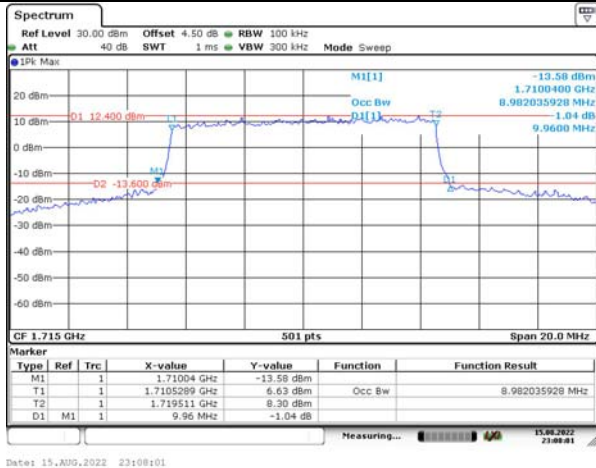
Occupied Bandwidth

Channel

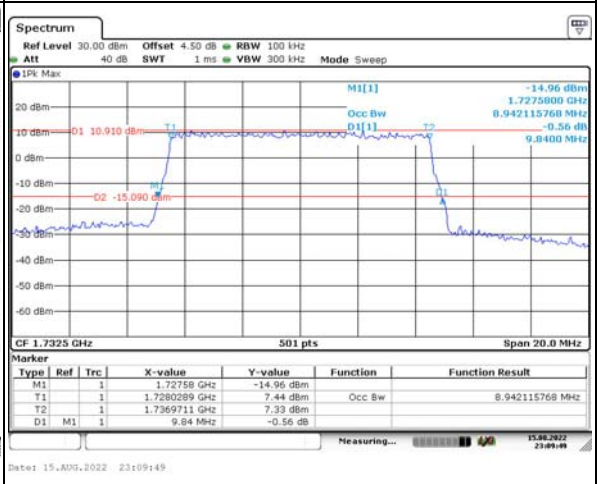
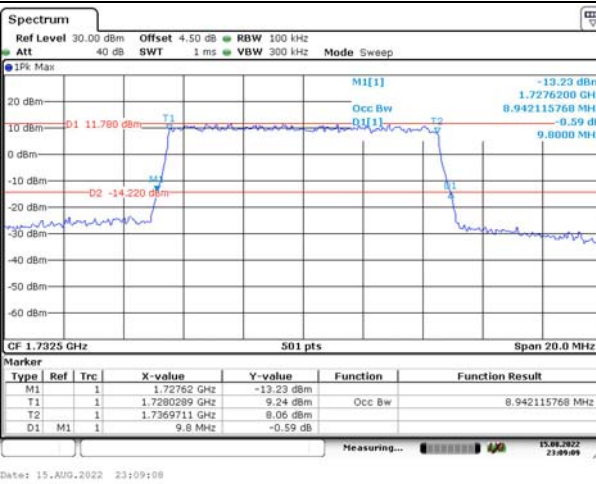
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

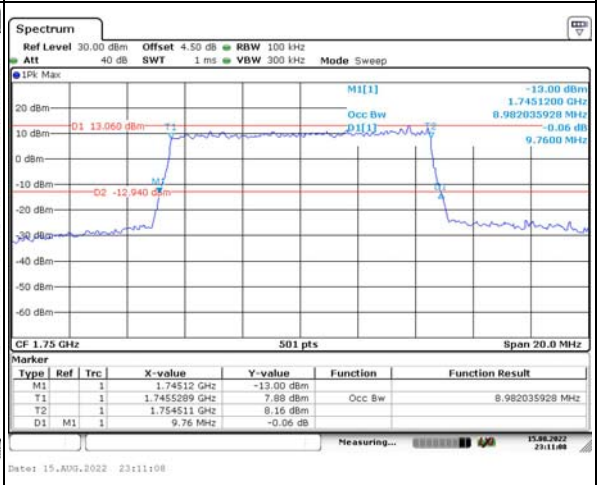
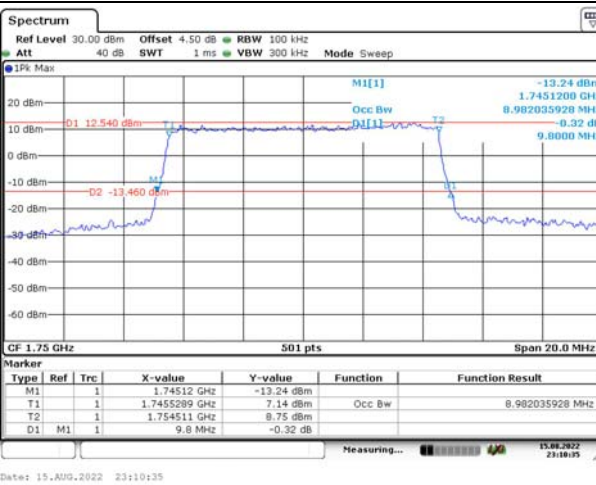
Lowest



Middle



Highest



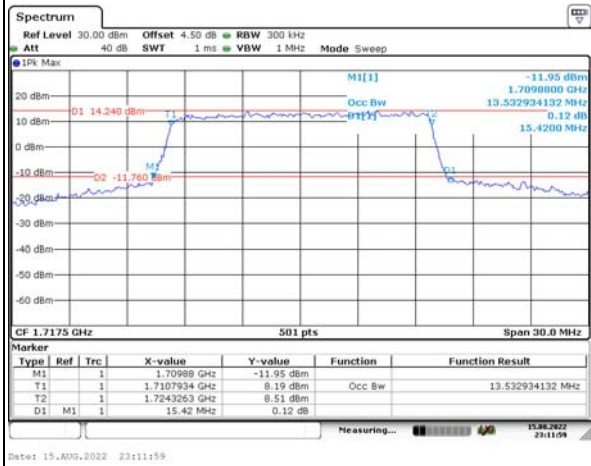
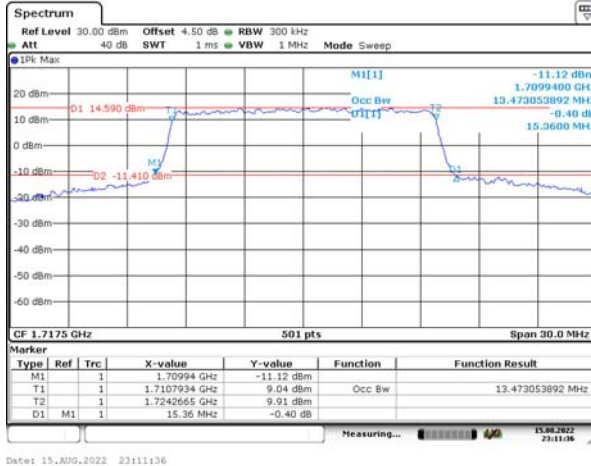
Occupied Bandwidth

Channel

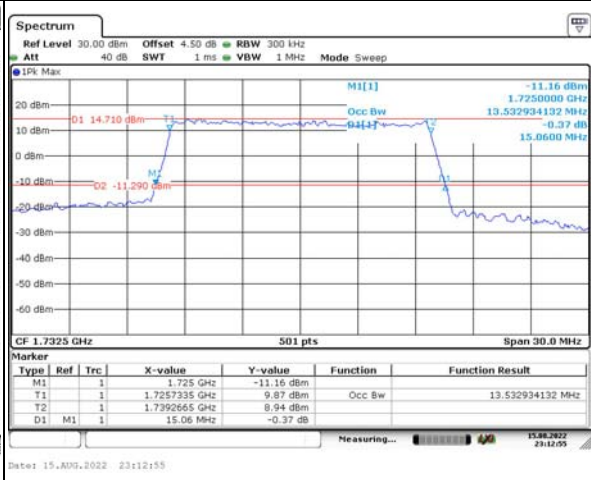
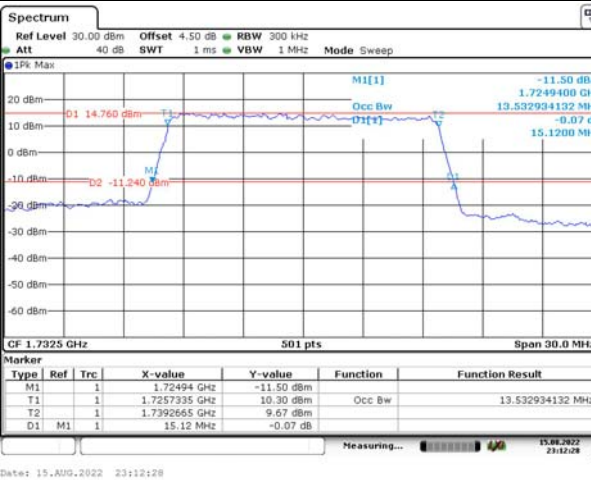
15MHz Bandwidth QPSK

15MHz Bandwidth 16QAM

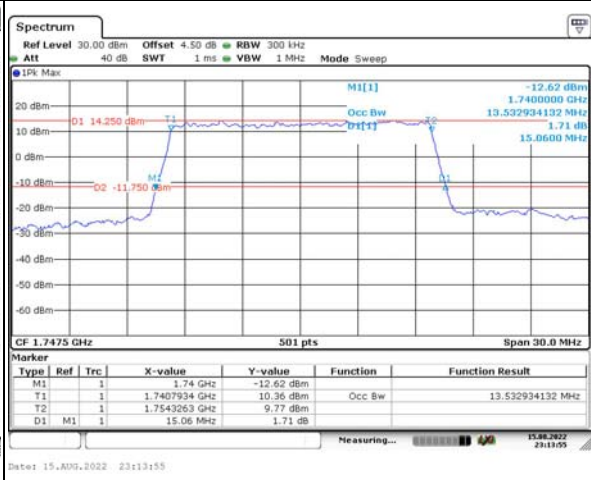
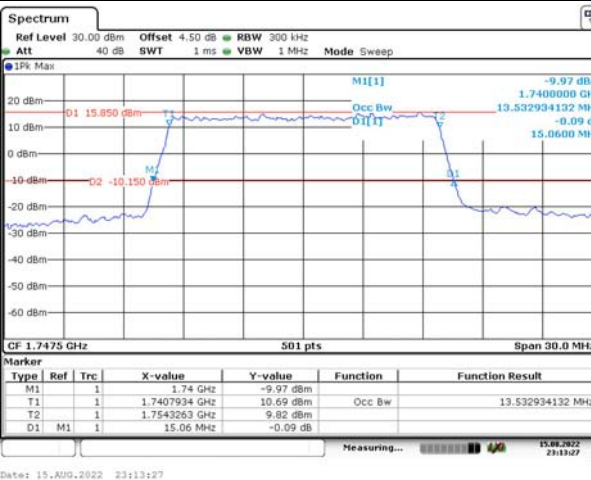
Lowest



Middle



Highest



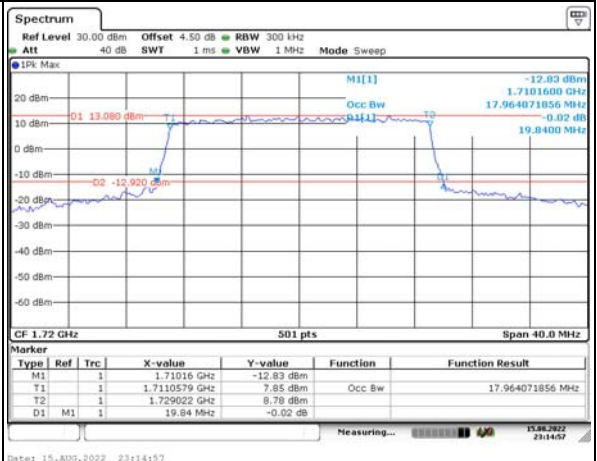
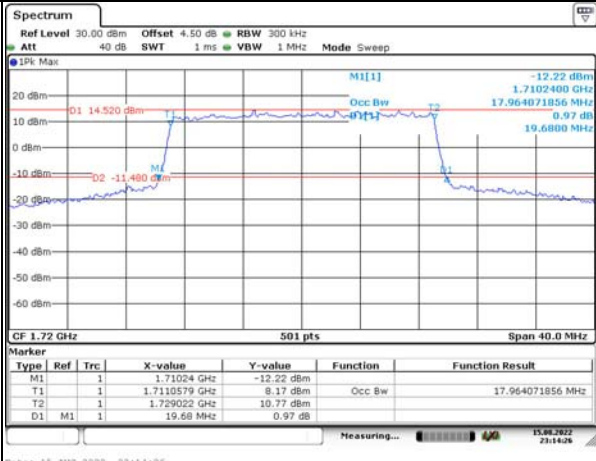
Occupied Bandwidth

Channel

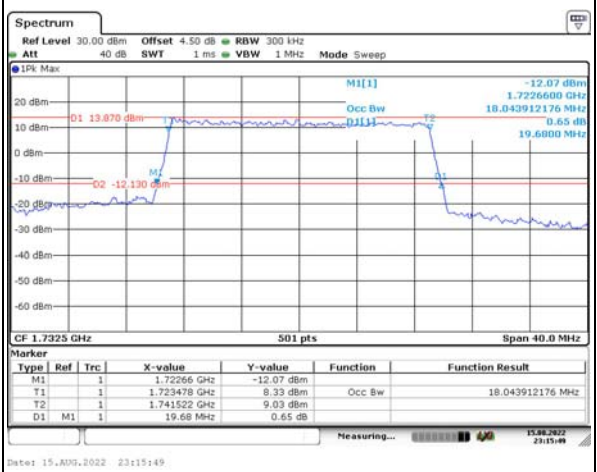
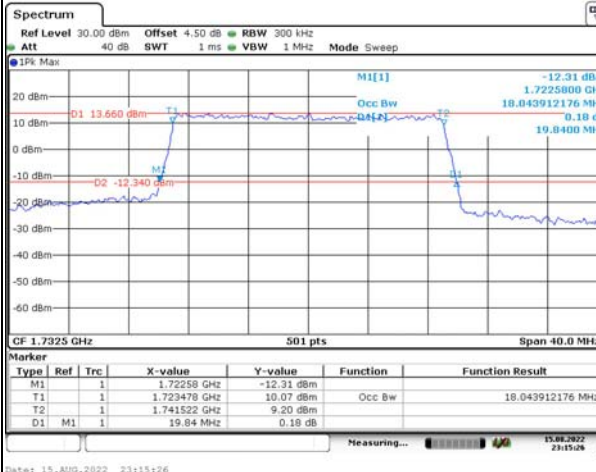
20MHz Bandwidth QPSK

20MHz Bandwidth 16QAM

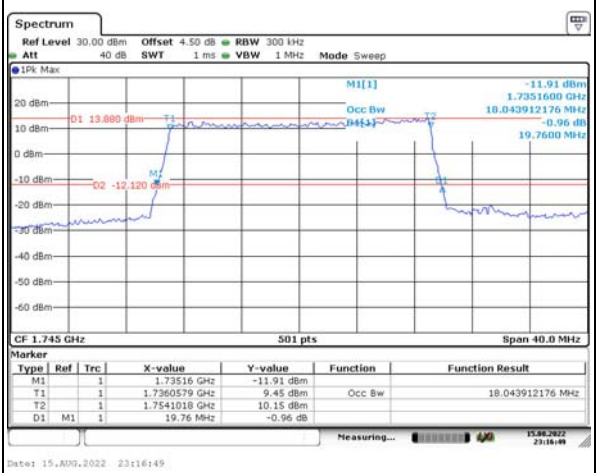
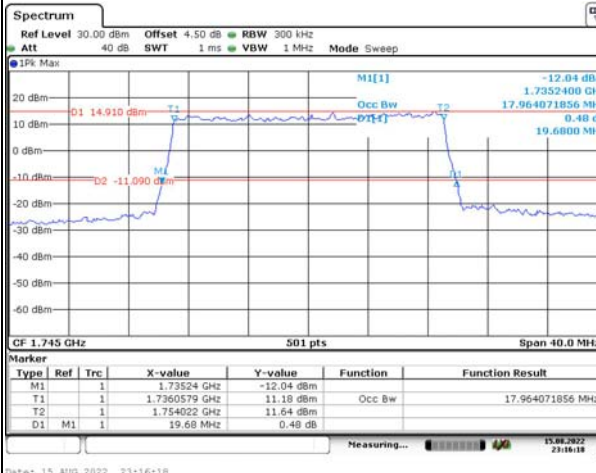
Lowest



Middle



Highest

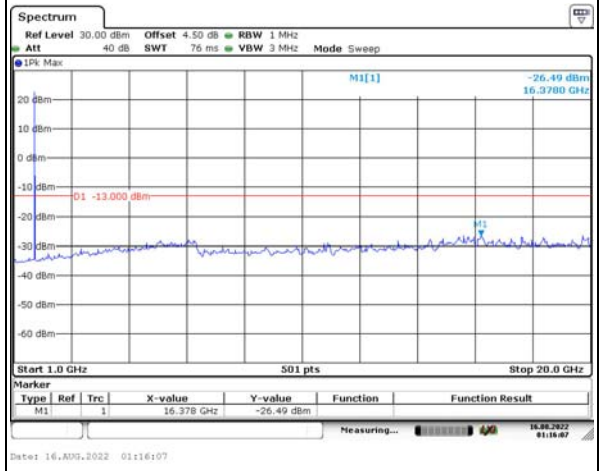
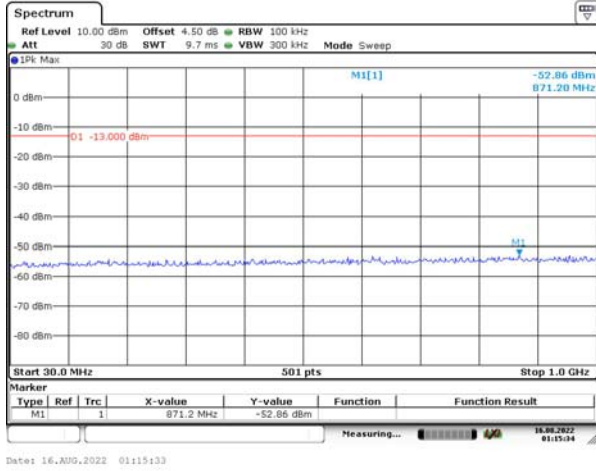


Spurious Emissions at Antenna Terminal

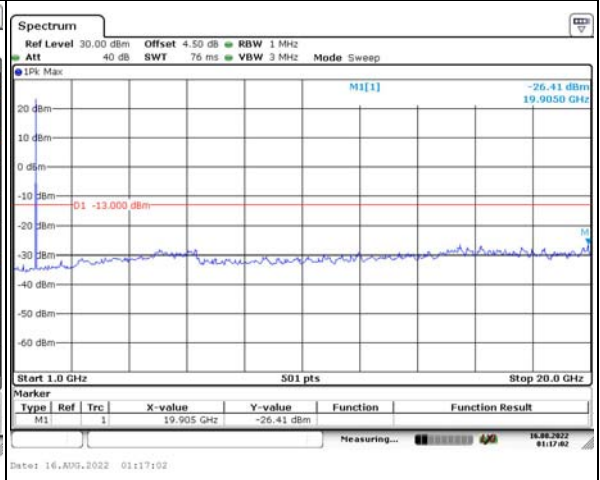
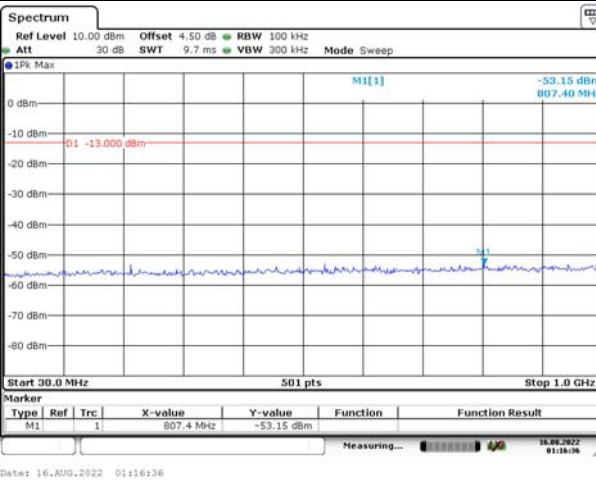
Channel

1.4MHz Bandwidth QPSK

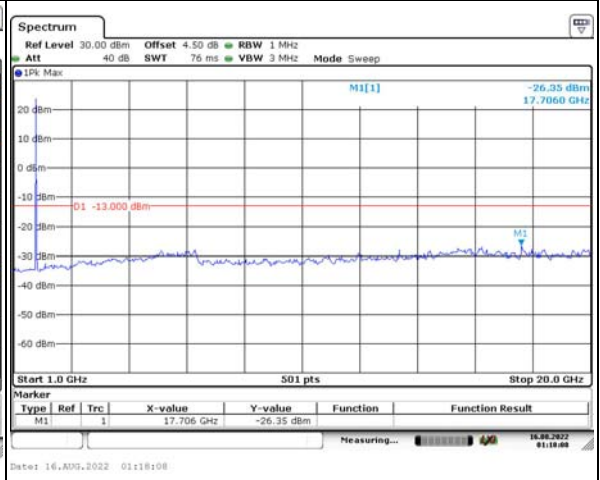
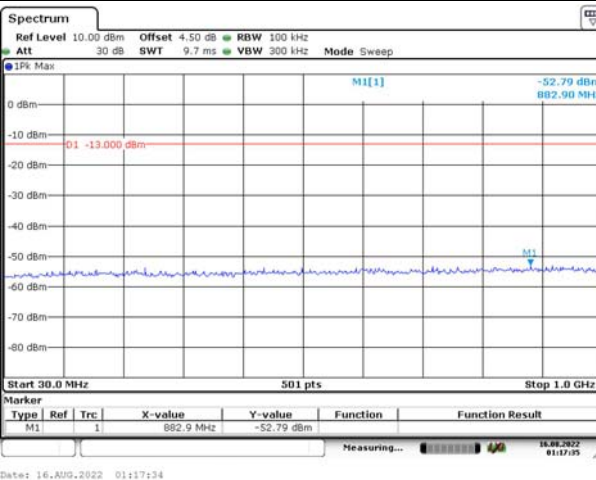
Lowest



Middle



Highest

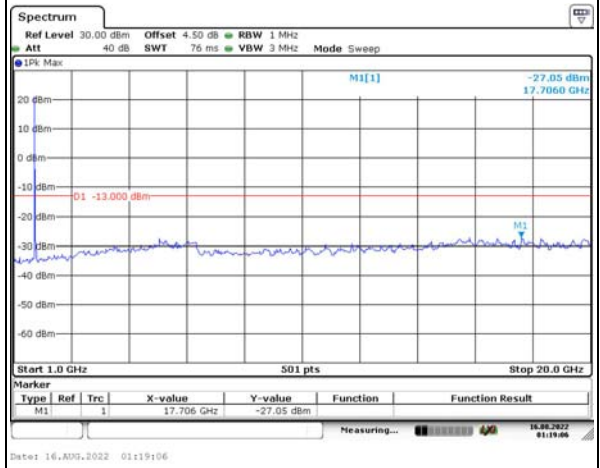
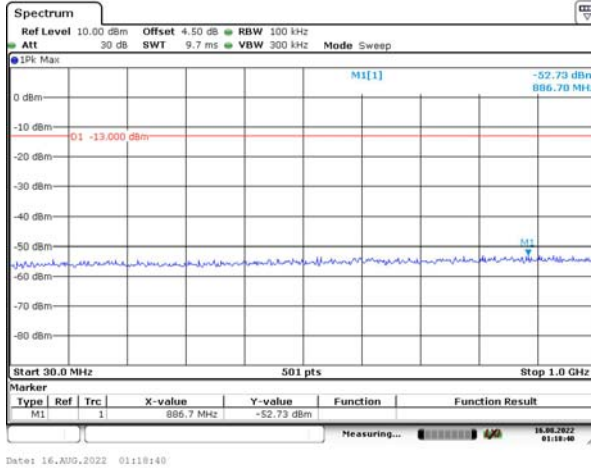


Spurious Emissions at Antenna Terminal

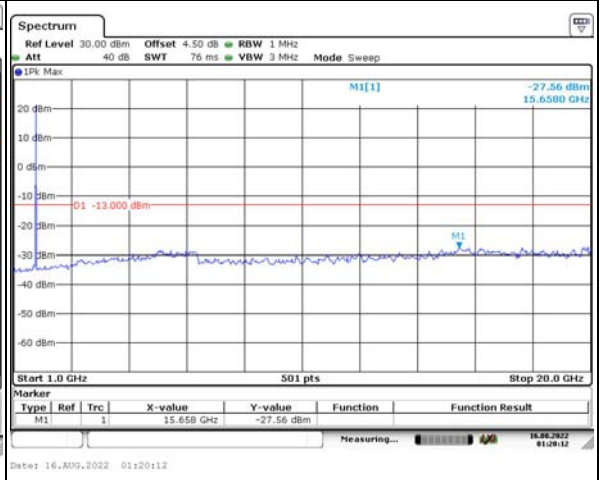
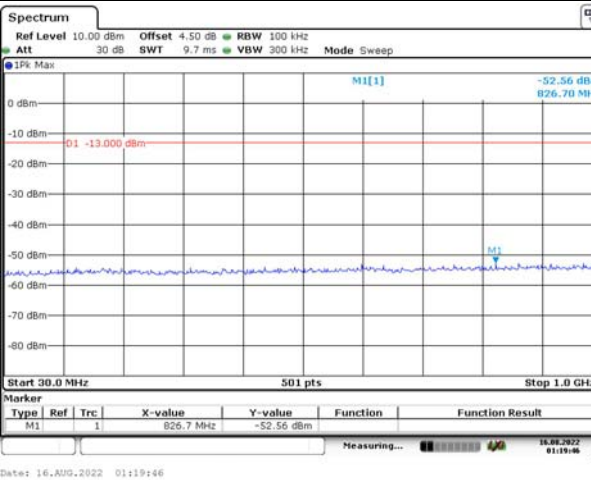
Channel

3MHz Bandwidth QPSK

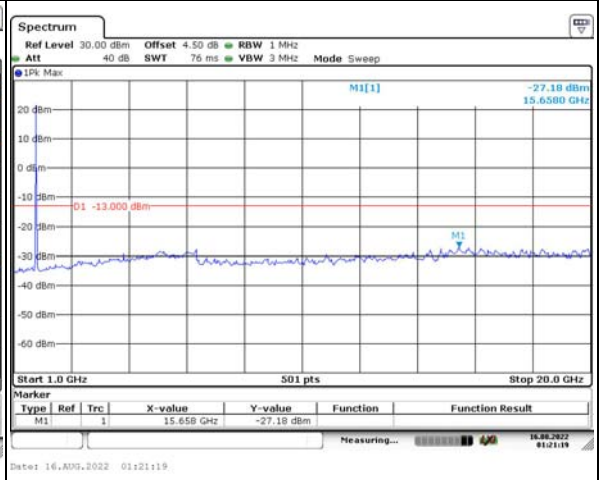
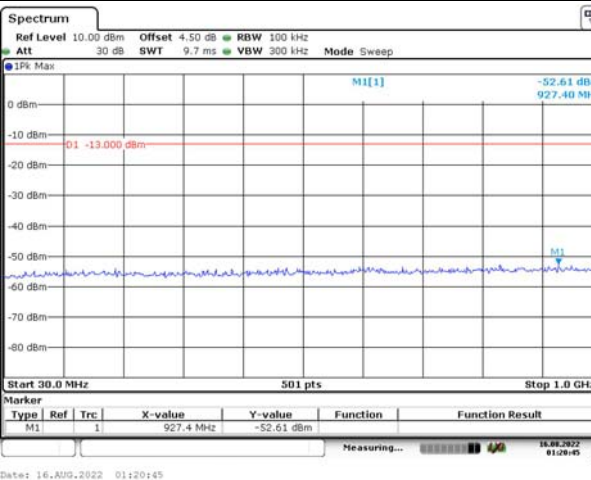
Lowest



Middle



Highest

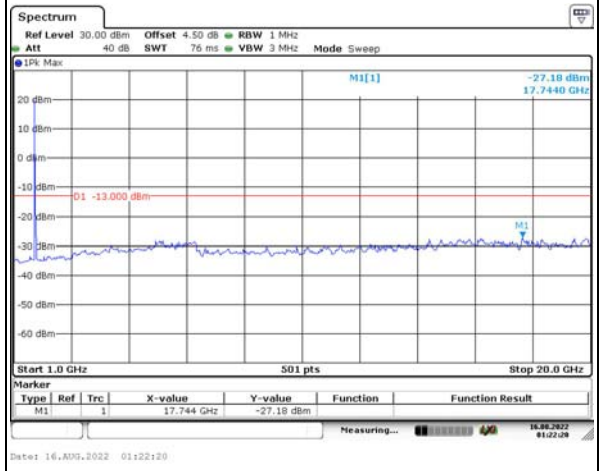
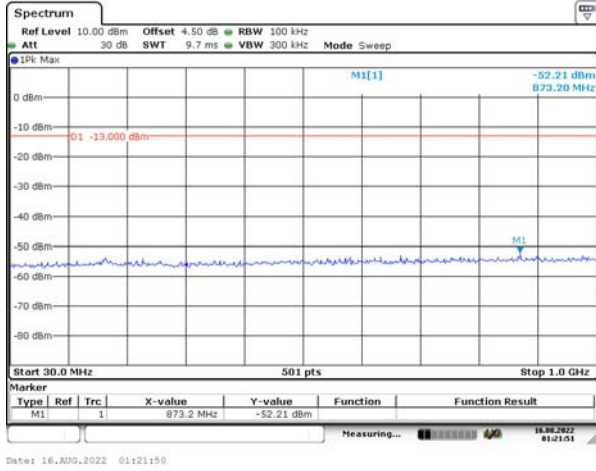


Spurious Emissions at Antenna Terminal

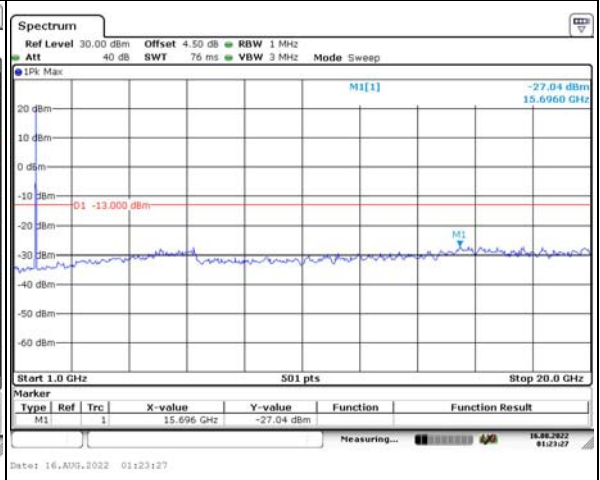
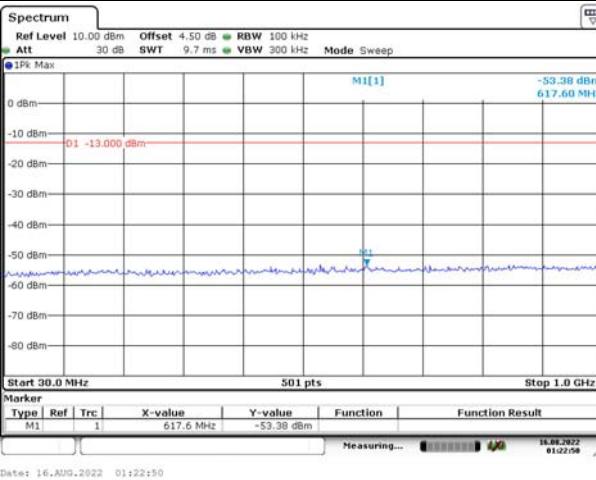
Channel

5MHz Bandwidth QPSK

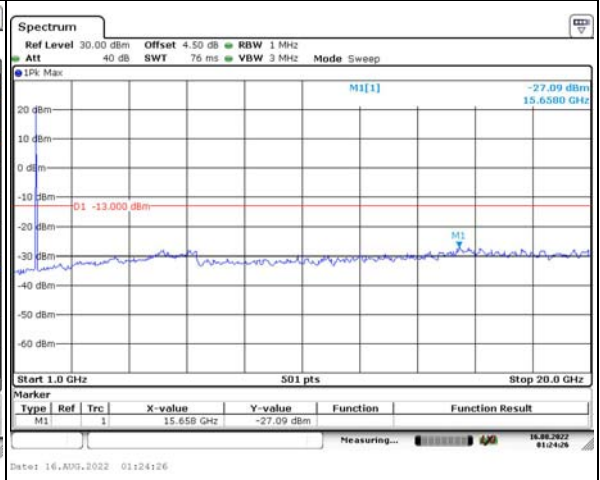
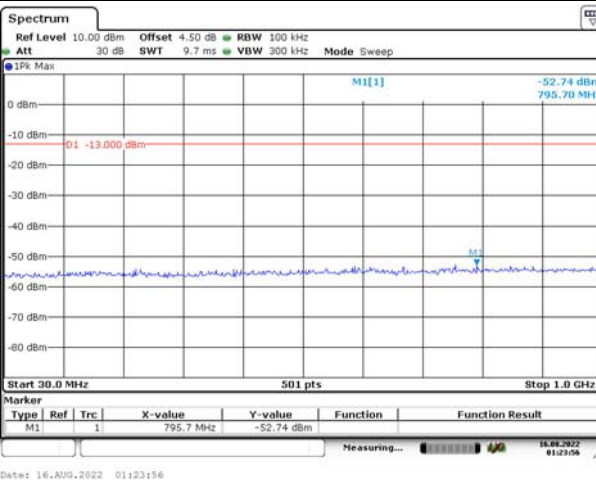
Lowest



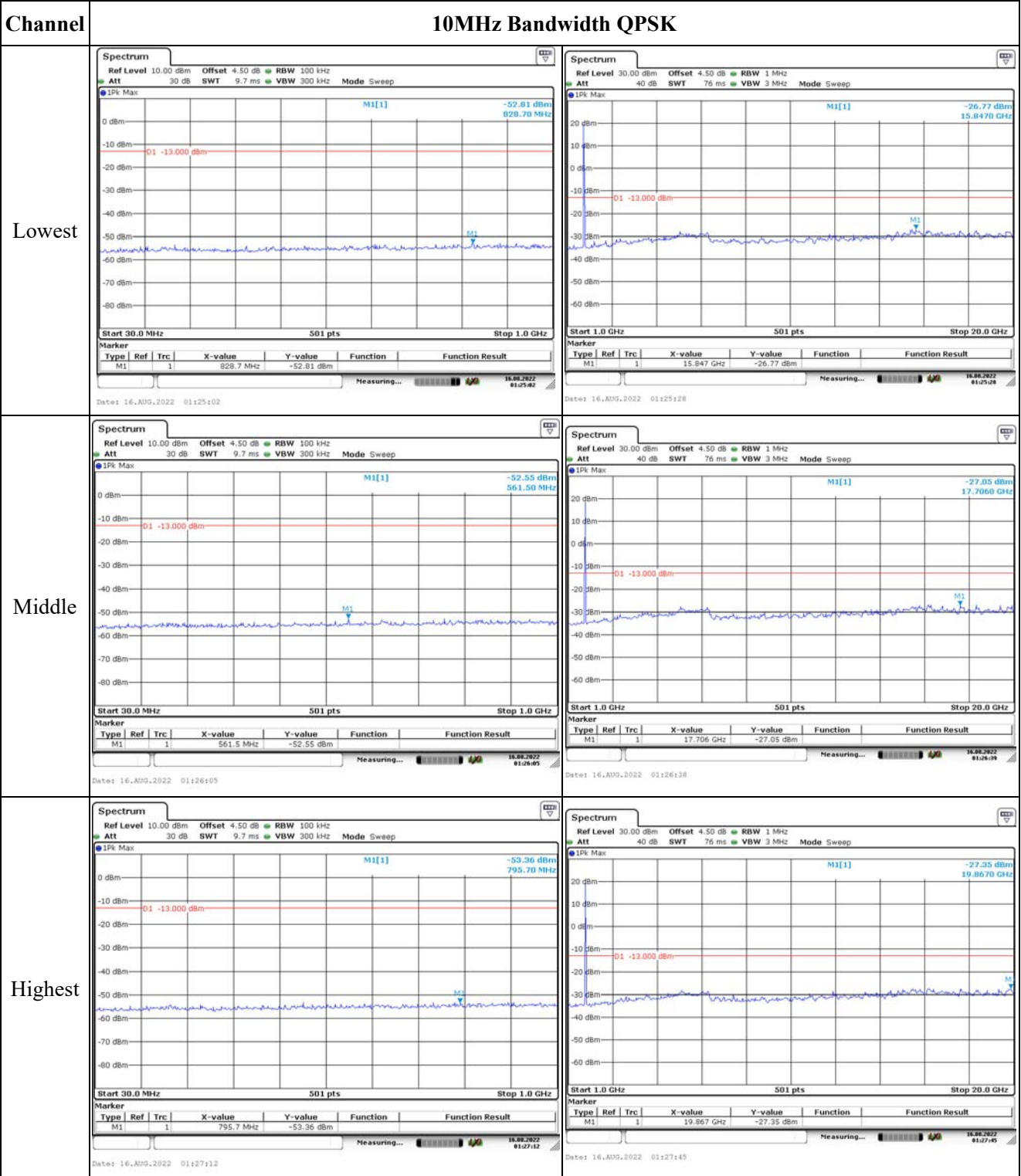
Middle



Highest



Spurious Emissions at Antenna Terminal

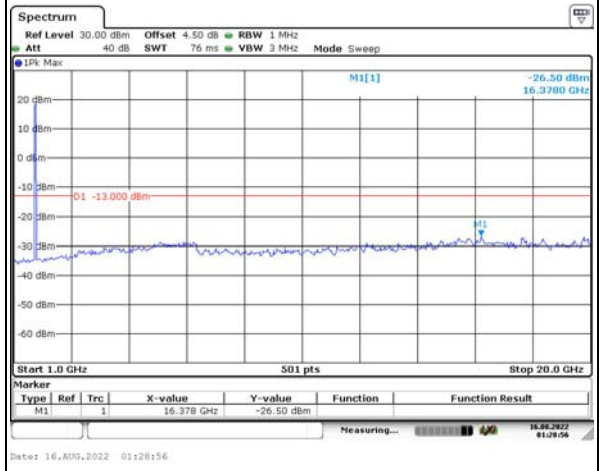
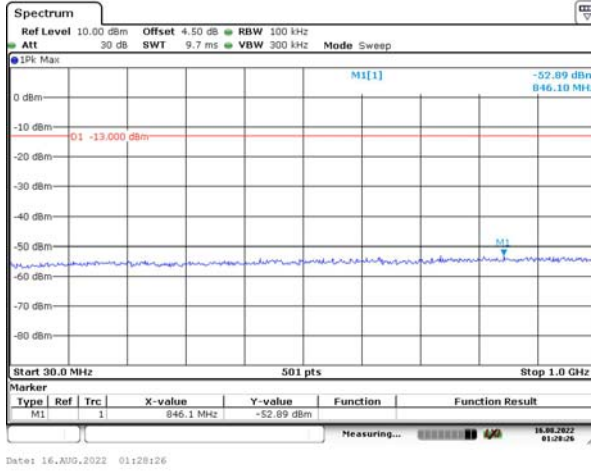


Spurious Emissions at Antenna Terminal

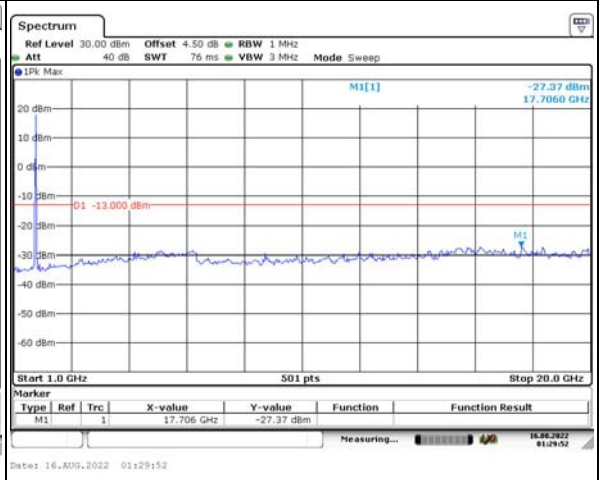
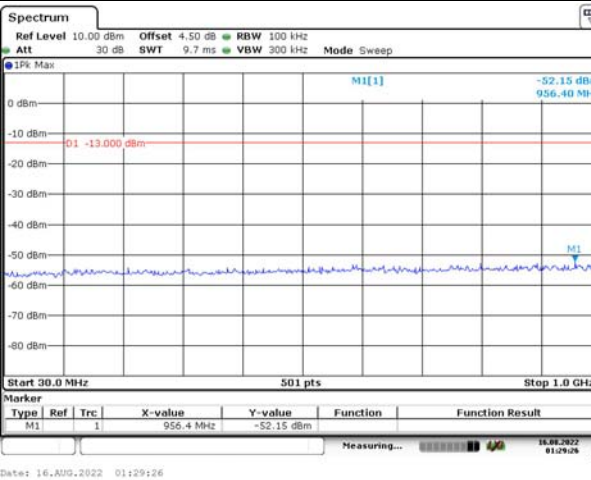
Channel

15MHz Bandwidth QPSK

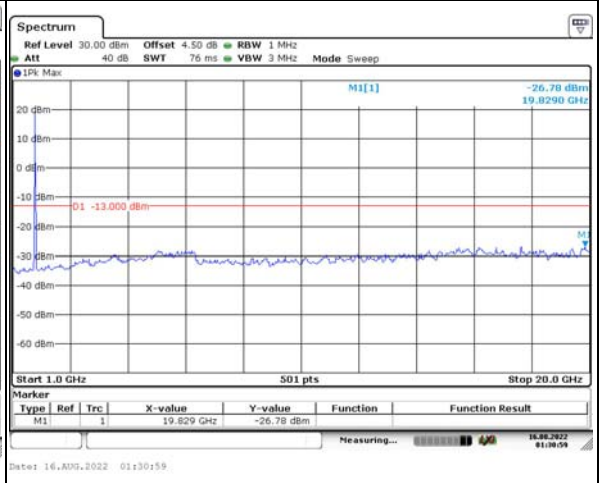
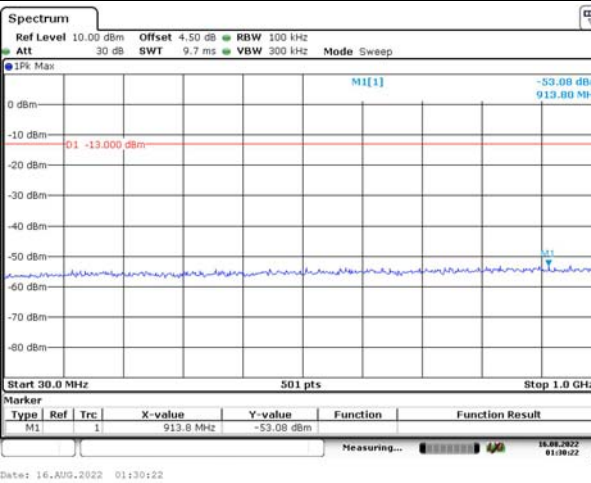
Lowest



Middle



Highest

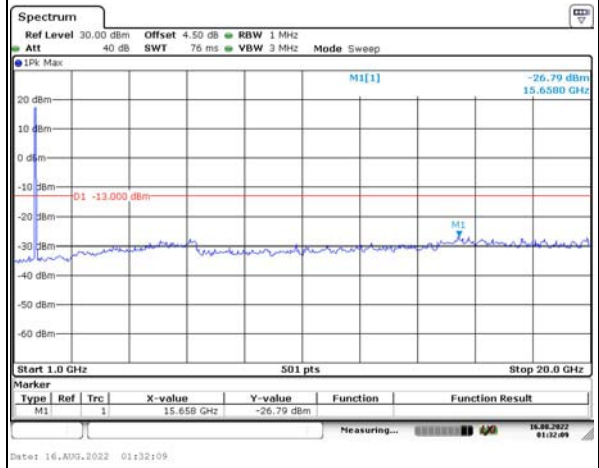
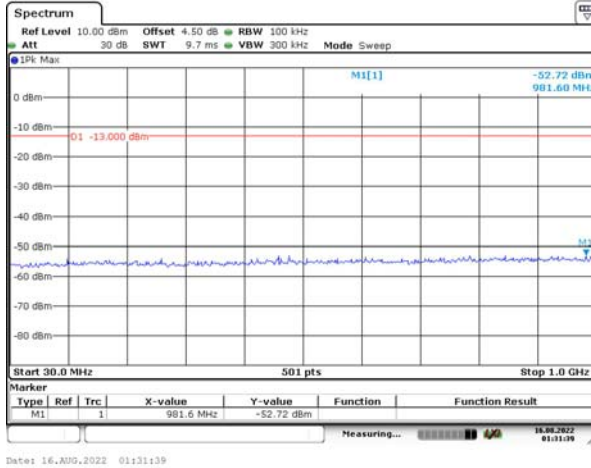


Spurious Emissions at Antenna Terminal

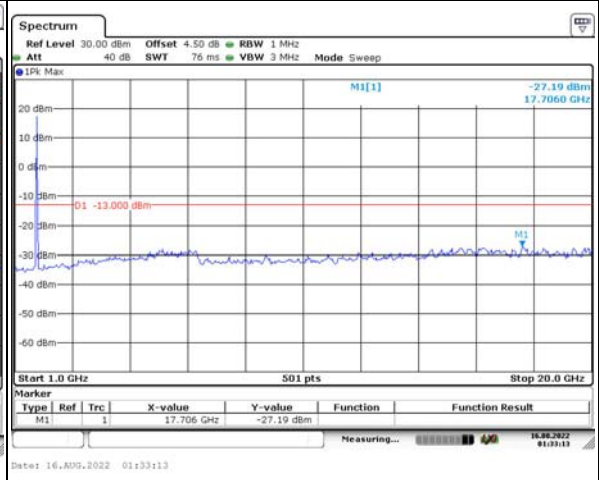
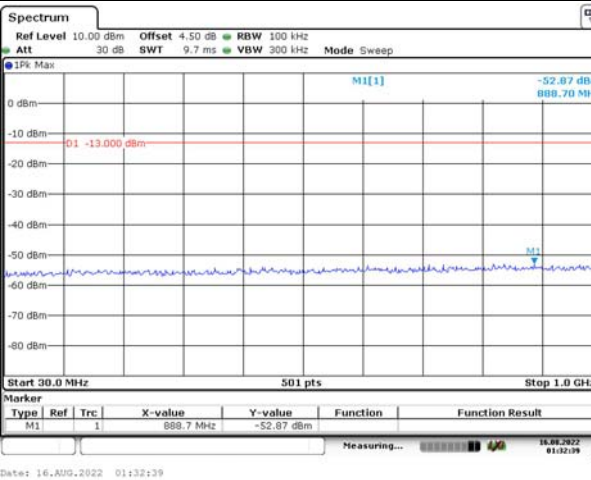
Channel

20MHz Bandwidth QPSK

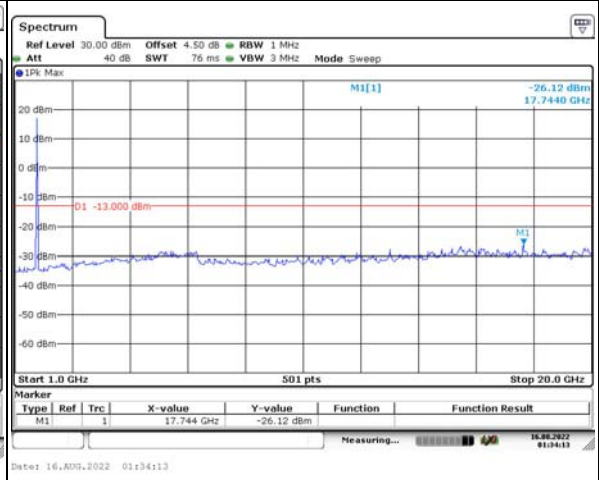
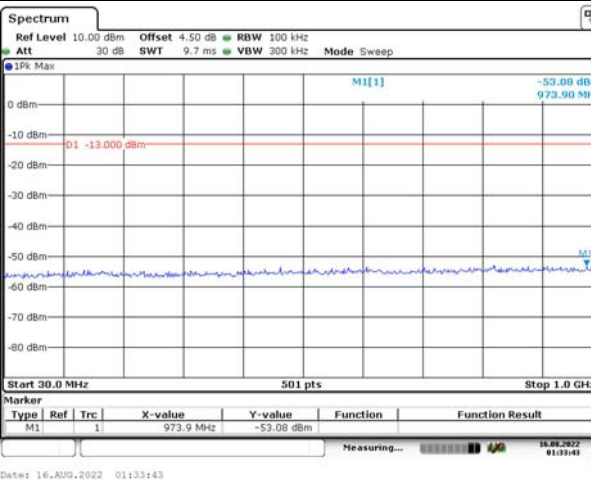
Lowest



Middle



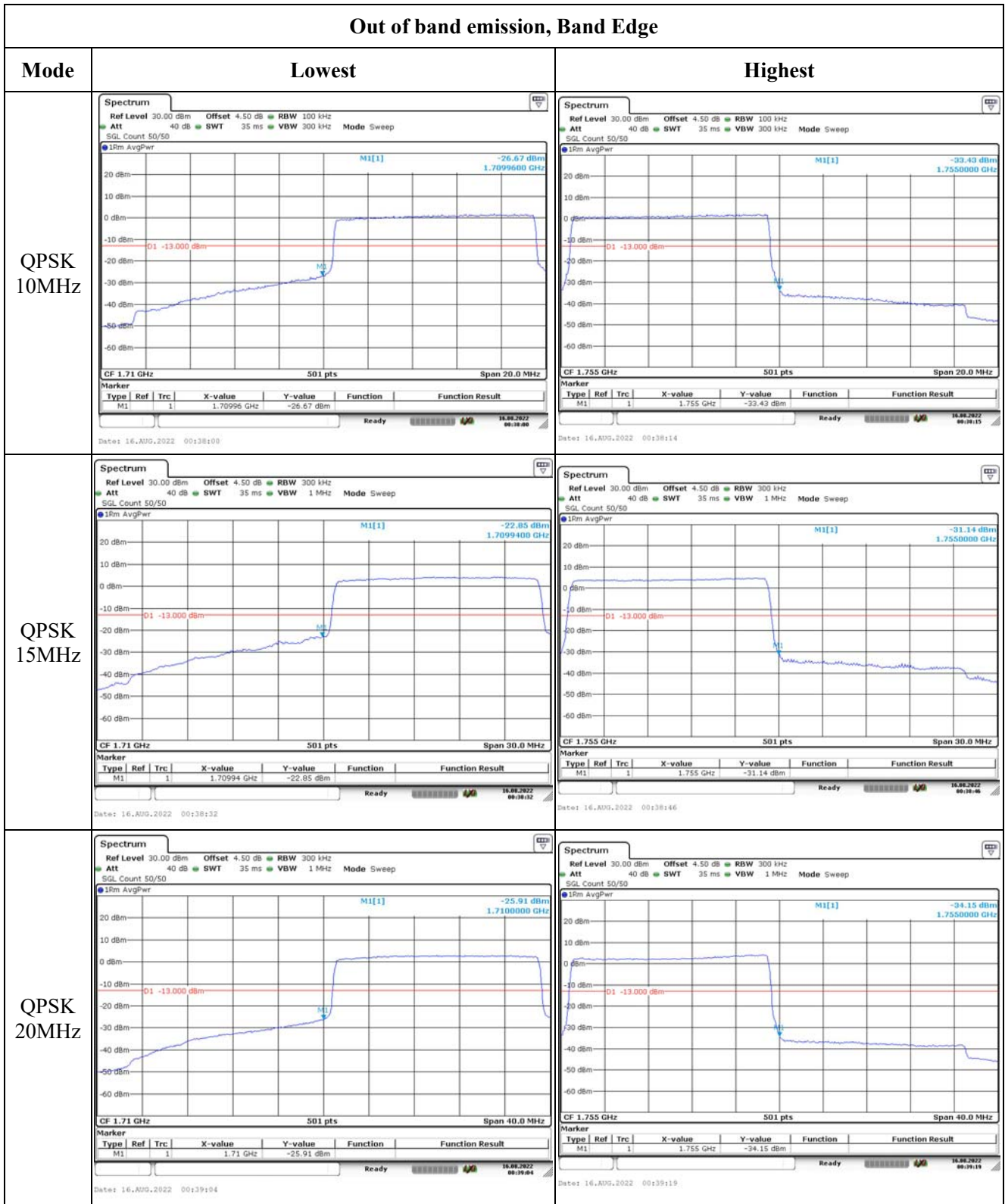
Highest



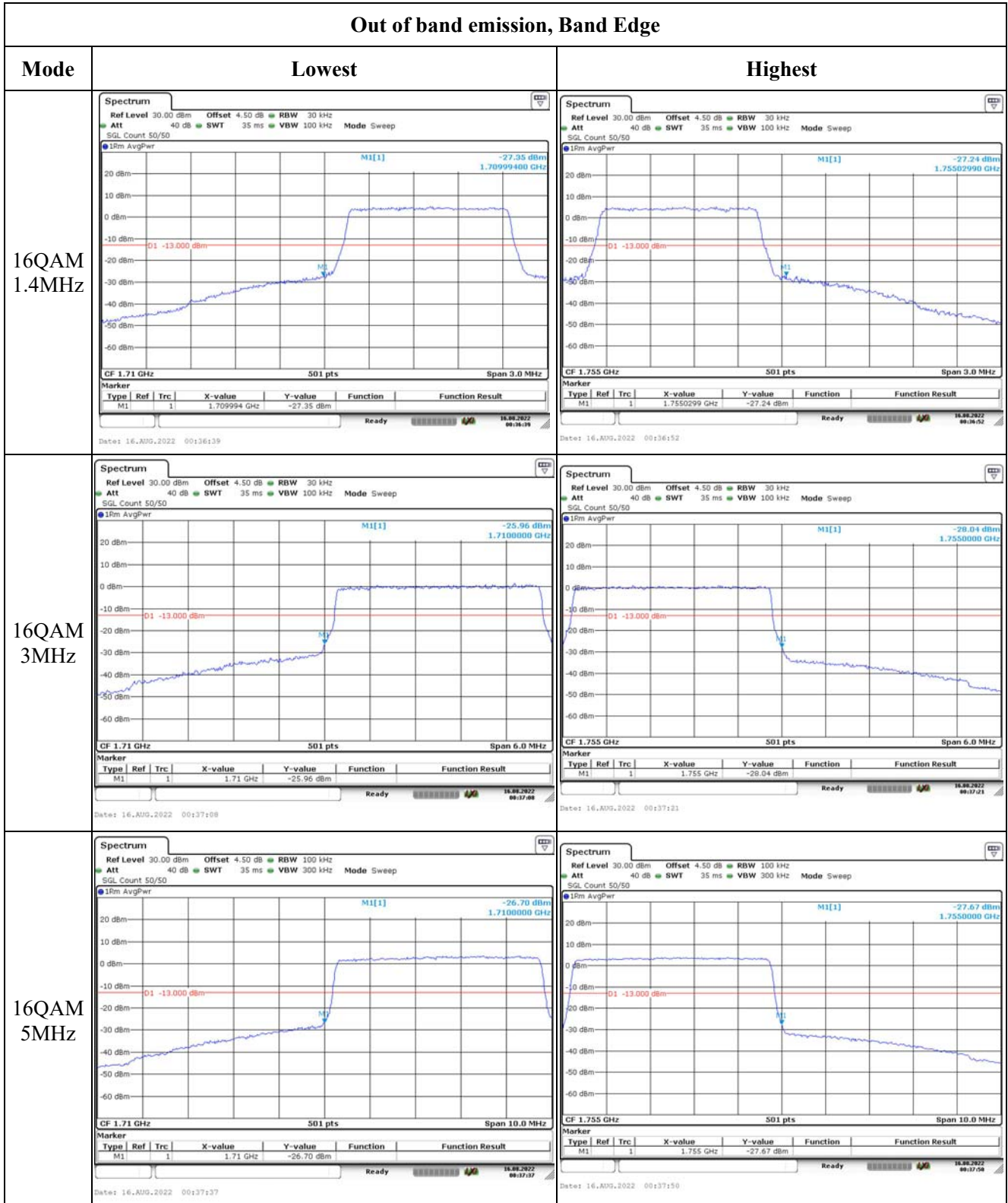
Out of band emission, Band Edge

Mode	Lowest	Highest																												
QPSK 1.4MHz	<p> Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 35 ms VBW 100 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr M1[1] -25.28 dBm 1.70995810 GHz 01 -13.000 dBm CF 1.71 GHz 501 pts Span 3.0 MHz Marker <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>1.70995810 GHz</td> <td>-25.28 dBm</td> <td></td> <td></td> </tr> </tbody> </table> Ready 16.AUG.2022 00:16:03 Date: 16.AUG.2022 00:16:13 </p>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		1.70995810 GHz	-25.28 dBm			<p> Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 35 ms VBW 100 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr M1[1] -26.59 dBm 1.75502990 GHz 01 -13.000 dBm CF 1.755 GHz 501 pts Span 3.0 MHz Marker <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>1.75502990 GHz</td> <td>-26.59 dBm</td> <td></td> <td></td> </tr> </tbody> </table> Ready 16.AUG.2022 00:16:06 Date: 16.AUG.2022 00:16:16 </p>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		1.75502990 GHz	-26.59 dBm		
Type	Ref	Trc	X-value	Y-value	Function	Function Result																								
M1	1		1.70995810 GHz	-25.28 dBm																										
Type	Ref	Trc	X-value	Y-value	Function	Function Result																								
M1	1		1.75502990 GHz	-26.59 dBm																										
QPSK 3MHz	<p> Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 35 ms VBW 100 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr M1[1] -26.03 dBm 1.71008000 GHz 01 -13.000 dBm CF 1.71 GHz 501 pts Span 6.0 MHz Marker <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>1.71 GHz</td> <td>-26.03 dBm</td> <td></td> <td></td> </tr> </tbody> </table> Ready 16.AUG.2022 00:17:01 Date: 16.AUG.2022 00:17:01 </p>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		1.71 GHz	-26.03 dBm			<p> Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 35 ms VBW 100 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr M1[1] -24.92 dBm 1.75500000 GHz 01 -13.000 dBm CF 1.755 GHz 501 pts Span 6.0 MHz Marker <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>1.755 GHz</td> <td>-24.92 dBm</td> <td></td> <td></td> </tr> </tbody> </table> Ready 16.AUG.2022 00:17:15 Date: 16.AUG.2022 00:17:15 </p>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		1.755 GHz	-24.92 dBm		
Type	Ref	Trc	X-value	Y-value	Function	Function Result																								
M1	1		1.71 GHz	-26.03 dBm																										
Type	Ref	Trc	X-value	Y-value	Function	Function Result																								
M1	1		1.755 GHz	-24.92 dBm																										
QPSK 5MHz	<p> Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 35 ms VBW 300 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr M1[1] -24.26 dBm 1.70998000 GHz 01 -13.000 dBm CF 1.71 GHz 501 pts Span 10.0 MHz Marker <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>1.709980 GHz</td> <td>-24.26 dBm</td> <td></td> <td></td> </tr> </tbody> </table> Ready 16.AUG.2022 00:17:08 Date: 16.AUG.2022 00:17:30 </p>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		1.709980 GHz	-24.26 dBm			<p> Spectrum Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 35 ms VBW 300 kHz Mode Sweep SGL Count 50/50 1Pm AvgPwr M1[1] -26.91 dBm 1.75500000 GHz 01 -13.000 dBm CF 1.755 GHz 501 pts Span 10.0 MHz Marker <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>1.755 GHz</td> <td>-26.91 dBm</td> <td></td> <td></td> </tr> </tbody> </table> Ready 16.AUG.2022 00:17:44 Date: 16.AUG.2022 00:17:44 </p>	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		1.755 GHz	-26.91 dBm		
Type	Ref	Trc	X-value	Y-value	Function	Function Result																								
M1	1		1.709980 GHz	-24.26 dBm																										
Type	Ref	Trc	X-value	Y-value	Function	Function Result																								
M1	1		1.755 GHz	-26.91 dBm																										

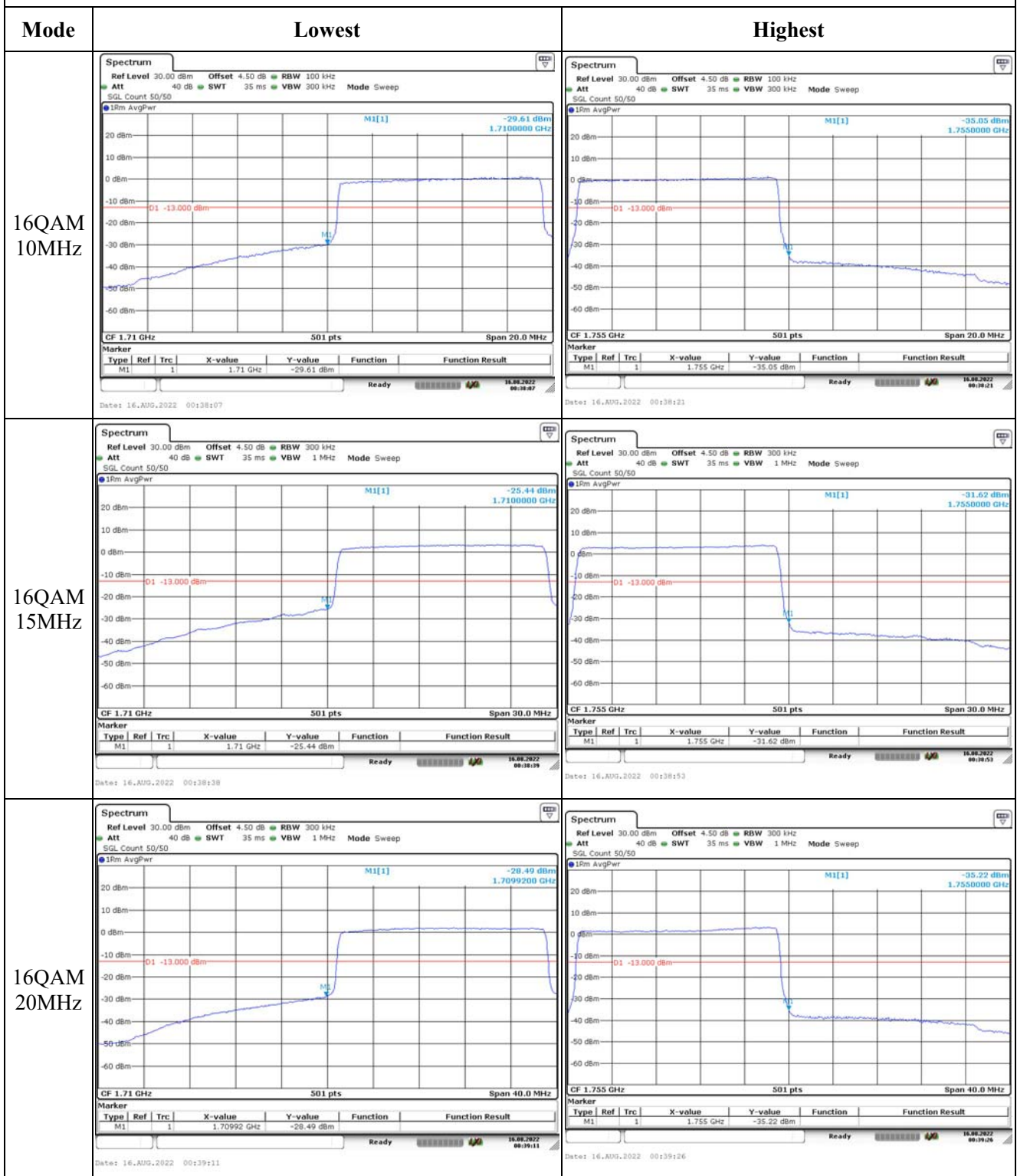
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.8 Antenna Port Test Data and Results for LTE Band 5

Serial Number:	CR22080013-RF-S1	Test Date:	2022-08-13~2022-08-25
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.1~25.9	Relative Humidity: (%)	52~63	ATM Pressure: (kPa)	99.9~100.8
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2022-07-15	2023-07-14
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554404	Each time	N/A
Weinschel	Coaxial Attenuators	53-20-34	LN751	Each time	N/A
Unknown	Coaxial tee connector	Unknown	2204004	Each time	N/A
Unknown	RF Cable	Unknown	RF Cable 003	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2022-07-15	2023-07-14
UNI-T	Multimeter	UT39A+	C210582554	2021-09-30	2022-09-29
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022-04-06	2023-04-05

* 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):	0.31	Antenna Gain (dBd):	-1.84	Path Loss L _C (dB):	0.3
Operation Voltage(V _{DC}):					
Lowest:	3.5	Normal:	3.8	Highest:	4.35

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	22.71	22.83	22.99	20.91	38.45
	RB1#3	22.73	22.85	22.77		
	RB1#5	22.76	22.83	22.8		
	RB3#0	22.87	22.97	23.05		
	RB3#3	22.83	22.96	22.91		
	RB6#0	21.83	21.84	21.77		
1.4MHz 16QAM	RB1#0	22.49	22.22	22.89	20.75	38.45
	RB1#3	22.45	22.36	22.44		
	RB1#5	22.5	22.38	22.43		
	RB3#0	21.83	21.97	21.89		
	RB3#3	21.76	22.01	21.53		
	RB6#0	21.08	21.23	20.77		
3MHz QPSK	RB1#0	22.81	22.92	22.95	20.85	38.45
	RB1#8	22.75	22.95	22.99		
	RB1#14	22.76	22.98	22.76		
	RB6#0	21.93	21.85	22.06		
	RB6#9	22.11	21.98	21.72		
	RB15#0	21.88	21.95	22.06		
3MHz 16QAM	RB1#0	22.44	21.56	22.29	20.52	38.45
	RB1#8	22.47	21.64	22.27		
	RB1#14	22.66	21.56	21.88		
	RB6#0	21.12	21.26	21.04		
	RB6#9	21.16	21.27	20.85		
	RB15#0	21.04	21.05	21.1		
5MHz QPSK	RB1#0	22.8	22.88	22.88	20.98	38.45
	RB1#13	22.98	22.8	23.12		
	RB1#24	22.98	22.89	22.85		
	RB15#0	21.9	21.91	21.74		
	RB15#10	22.03	22	22.06		
	RB25#0	22.08	21.93	22.03		
5MHz 16QAM	RB1#0	21.99	21.52	20.92	20.03	38.45
	RB1#13	22.14	21.52	21.2		
	RB1#24	22.17	21.59	21.06		
	RB15#0	21.03	21.1	20.95		
	RB15#10	21.01	21.12	21.1		
	RB25#0	21.09	20.99	21.16		
10MHz QPSK	RB1#0	22.88	22.79	22.81	20.86	38.45
	RB1#25	22.97	22.88	22.75		

	RB1#49	22.99	23	22.84		
	RB25#0	22.02	21.98	21.94		
	RB25#25	21.95	21.93	22.16		
	RB50#0	22.14	21.84	21.95		
10MHz 16QAM	RB1#0	22.01	21.28	22.01	20.04	38.45
	RB1#25	22.18	21.53	21.99		
	RB1#49	22.07	21.44	21.98		
	RB25#0	21.18	21.22	20.93		
	RB25#25	21.02	21.05	21.09		
	RB50#0	21.12	21.06	21.19		

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	4.46	3.28	3.39	13
	RB50#0	4.49	4.20	4.46	13
10MHz 16QAM	RB1#0	5.54	4.23	4.58	13
	RB50#0	5.48	5.19	5.45	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	1.108	1.102	1.260	1.284	1.284
1.4MHz 16QAM	1.102	1.114	1.096	1.260	1.284	1.266
3MHz QPSK	2.695	2.707	2.707	2.988	3.048	3.012
3MHz 16QAM	2.683	2.695	2.695	3.000	3.024	3.024
5MHz QPSK	4.511	4.511	4.531	5.020	5.020	5.000
5MHz 16QAM	4.531	4.551	4.511	5.020	5.040	5.000
10MHz QPSK	8.942	8.982	8.942	9.760	9.920	9.840
10MHz 16QAM	8.982	8.982	8.942	9.800	9.880	9.760

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

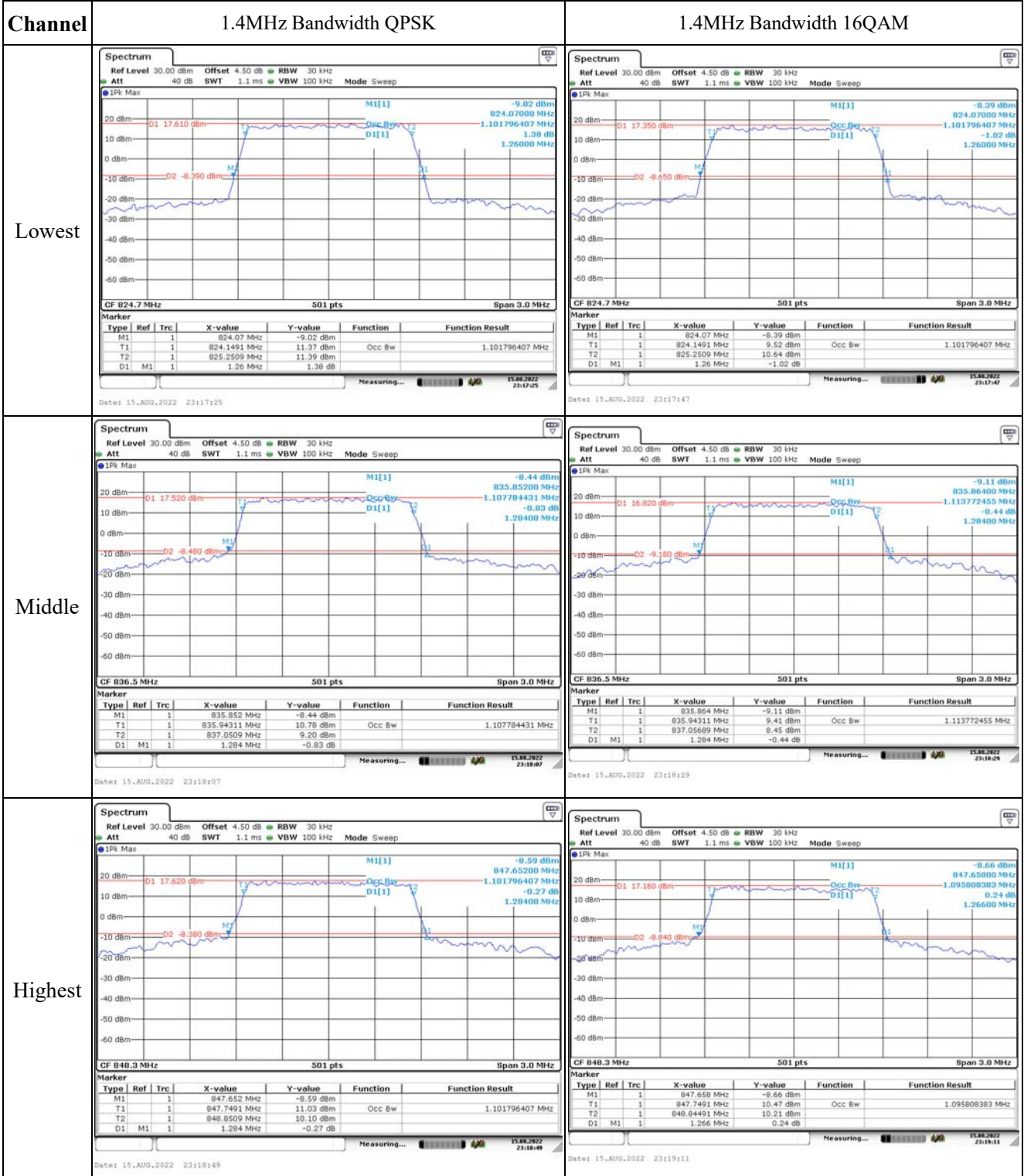
FCC §2.1051, §22.917(a):Spurious Emissions at Antenna Terminal**Result:** Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**FCC §2.1051, §22.917(a):Out of band emission, Band Edge****Result:** Pass, Please refer to the test plots of Out of band emission, Band Edge.**FCC §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	5.42	0.006	2.5
	-20	3.8	-6.97	-0.008	2.5
	-10	3.8	-5.5	-0.007	2.5
	0	3.8	6.06	0.007	2.5
	10	3.8	9.8	0.012	2.5
	20	3.8	5.03	0.006	2.5
	30	3.8	-6.62	-0.008	2.5
	40	3.8	-8.73	-0.010	2.5
	50	3.8	-7.05	-0.008	2.5
Frequency Stability vs. Voltage	20	3.5	8.99	0.011	2.5
	20	4.35	-7.17	-0.009	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	2.06	0.002	2.5
	-20	3.8	8.1	0.010	2.5
	-10	3.8	-8.59	-0.010	2.5
	0	3.8	9.33	0.011	2.5
	10	3.8	-6.94	-0.008	2.5
	20	3.8	7.54	0.009	2.5
	30	3.8	6.43	0.008	2.5
	40	3.8	-6.17	-0.007	2.5
	50	3.8	-6.44	-0.008	2.5
Frequency Stability vs. Voltage	20	3.5	6.34	0.008	2.5
	20	4.35	-6.89	-0.008	2.5
Result:				Pass	

Test Plots:

Occupied Bandwidth



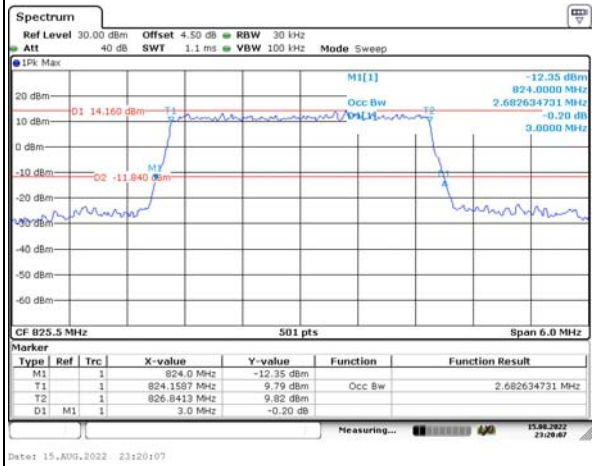
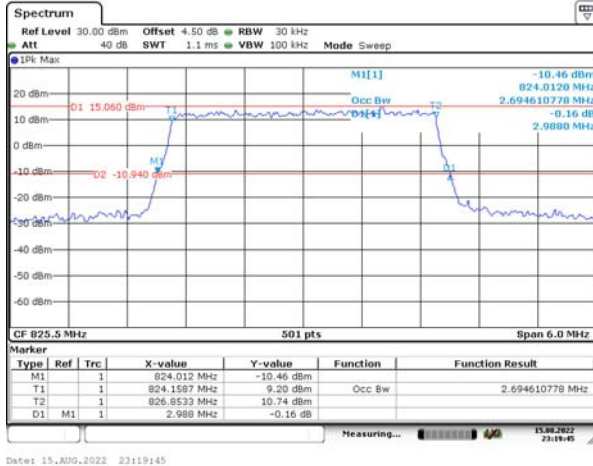
Occupied Bandwidth

Channel

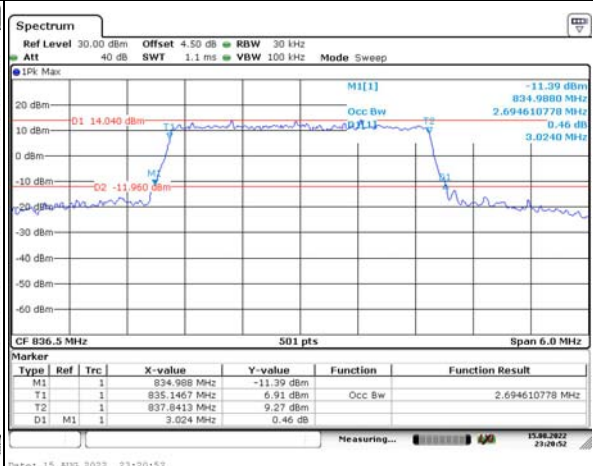
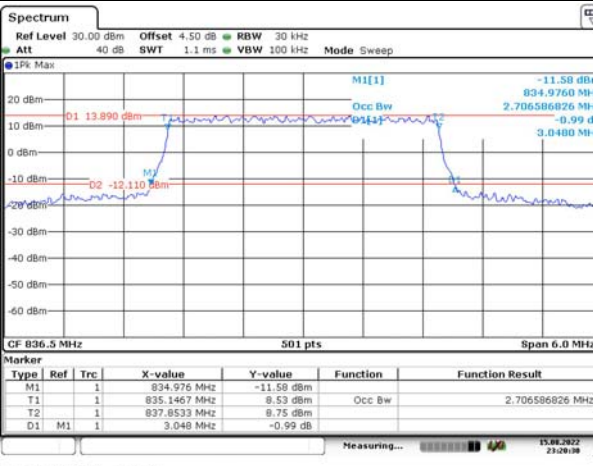
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

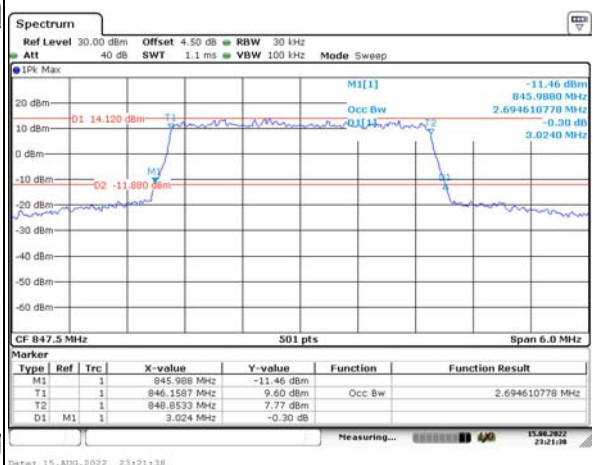
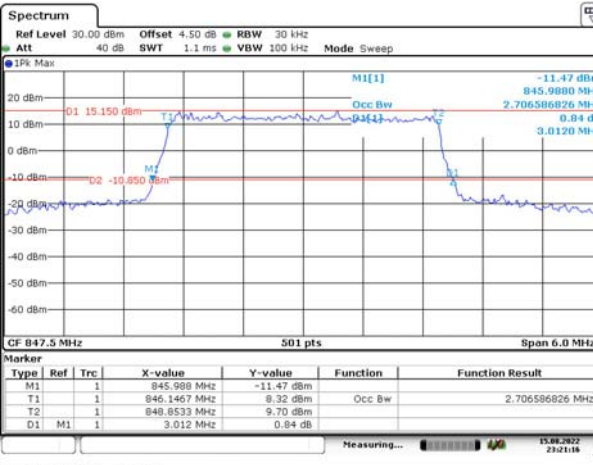
Lowest



Middle



Highest



Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM																																																																																
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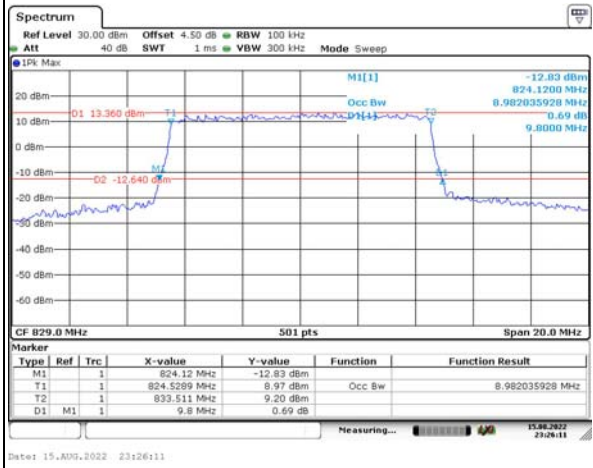
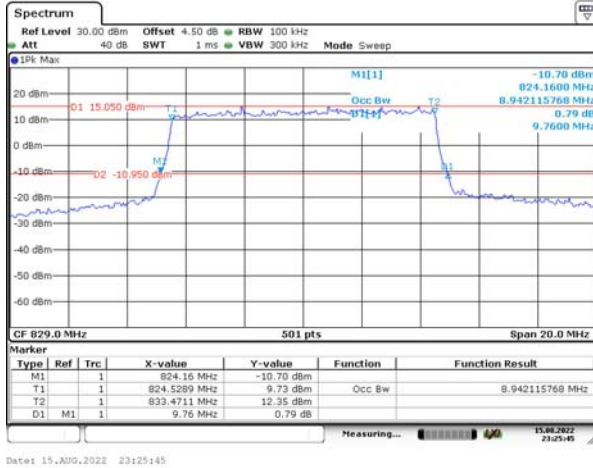
Occupied Bandwidth

Channel

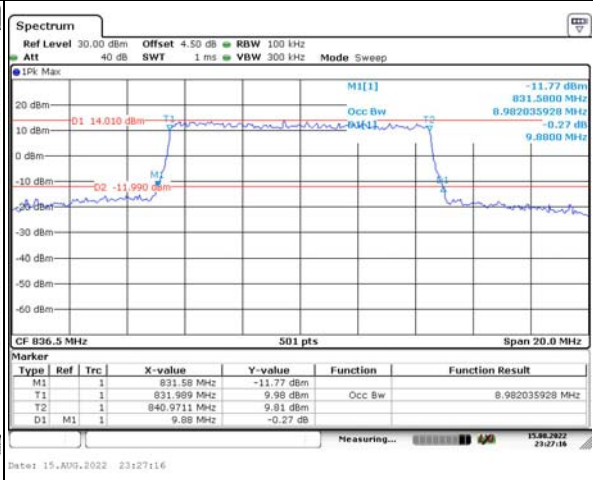
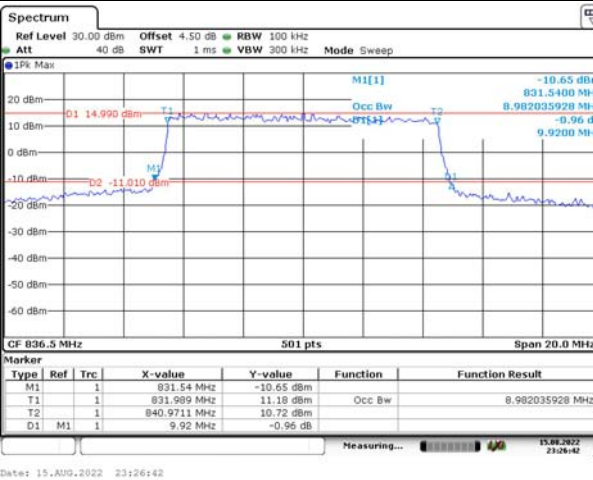
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

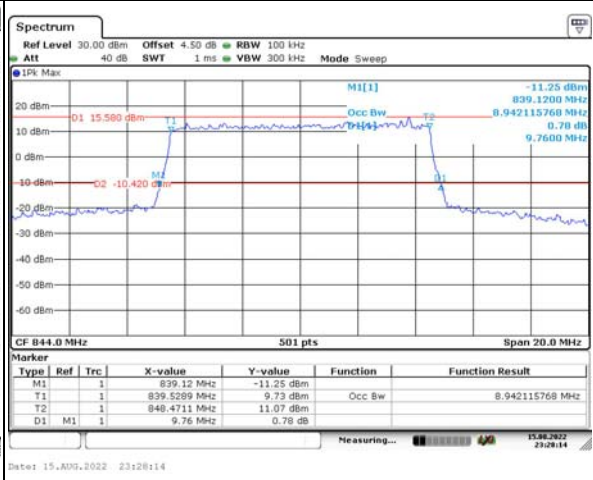
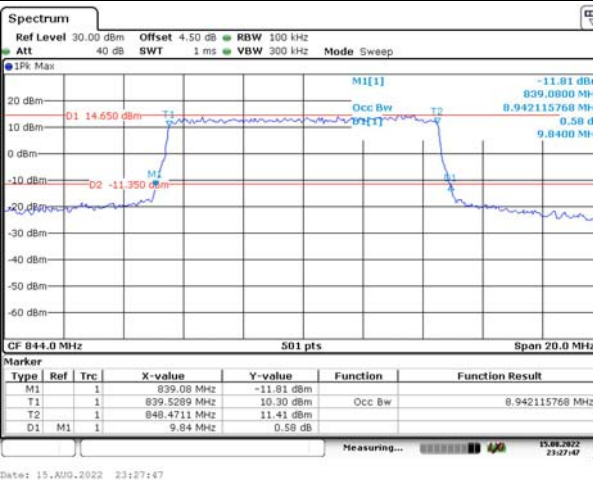
Lowest



Middle



Highest

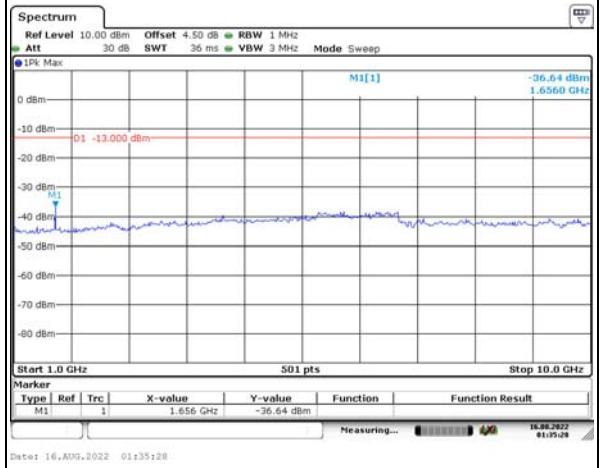
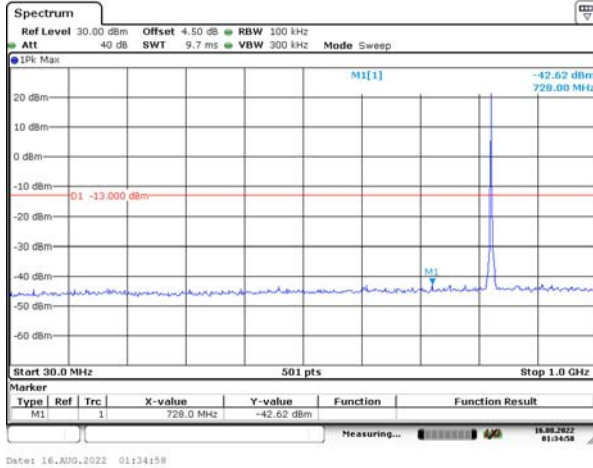


Spurious Emissions at Antenna Terminal

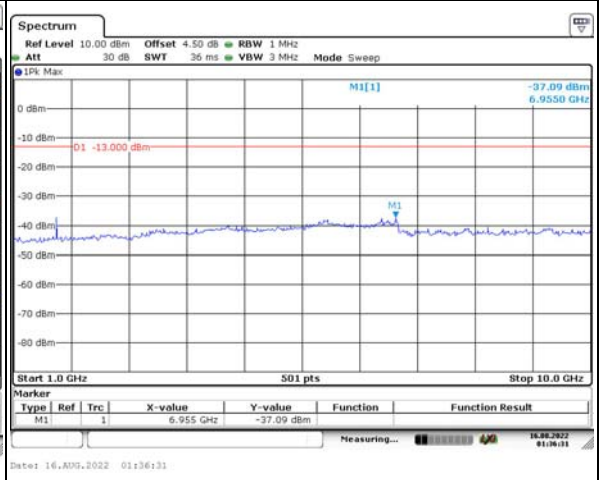
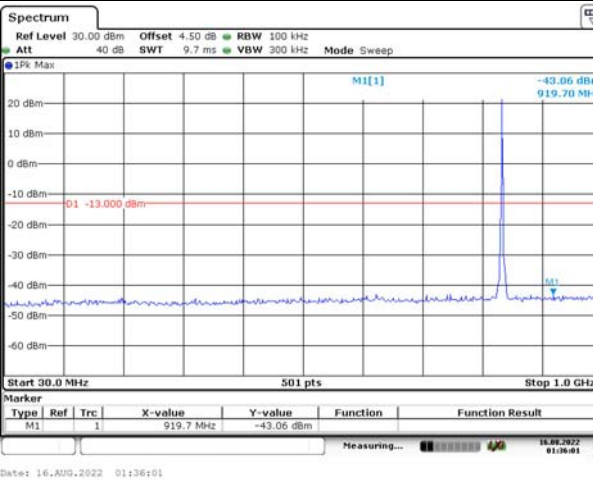
Channel

1.4MHz Bandwidth QPSK

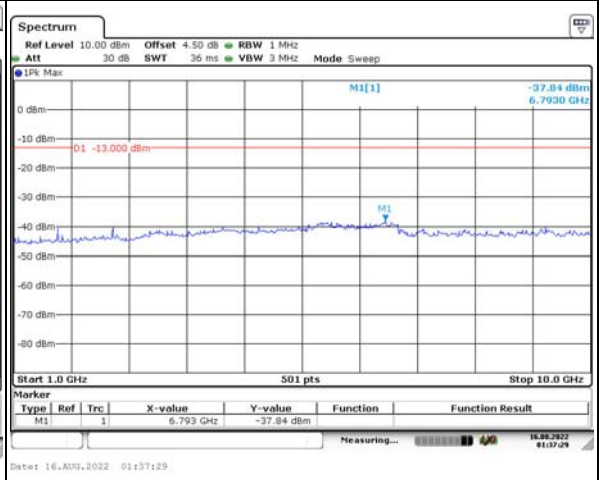
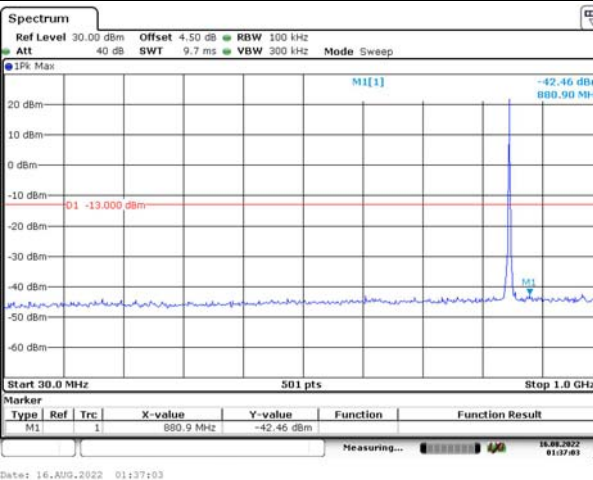
Lowest



Middle



Highest

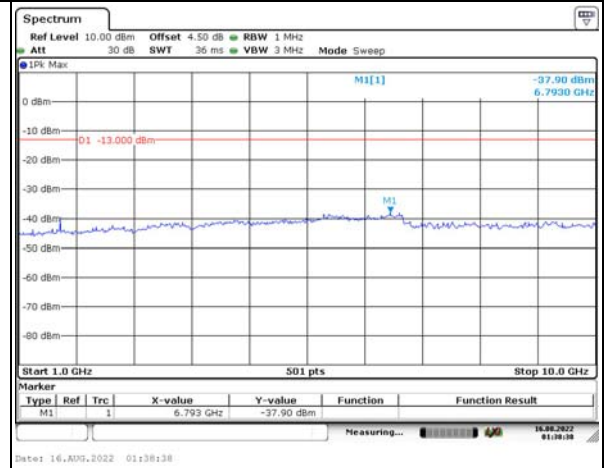
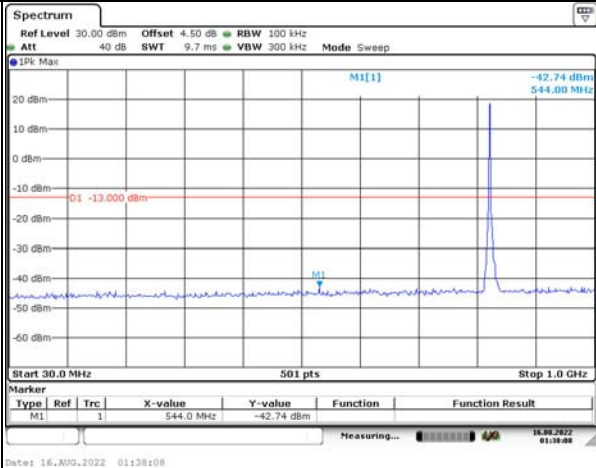


Spurious Emissions at Antenna Terminal

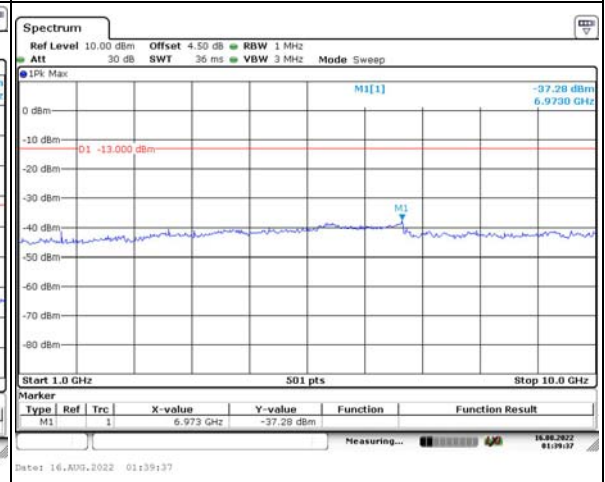
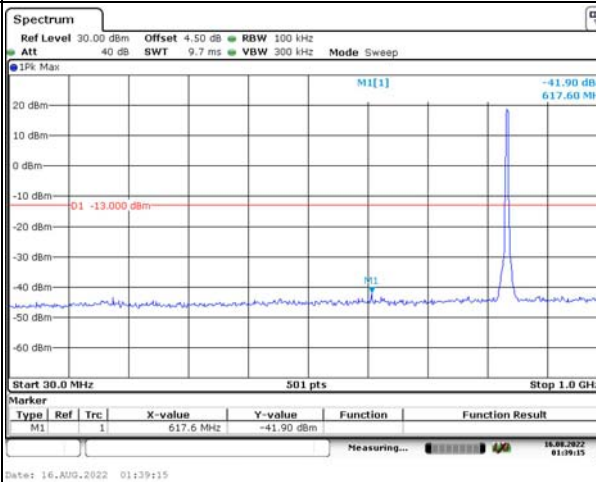
Channel

3MHz Bandwidth QPSK

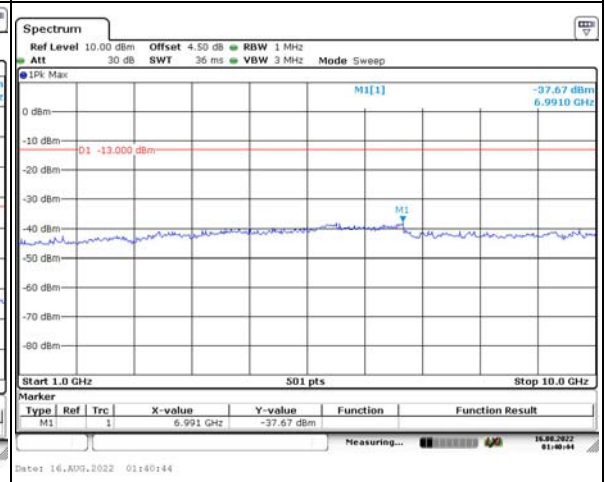
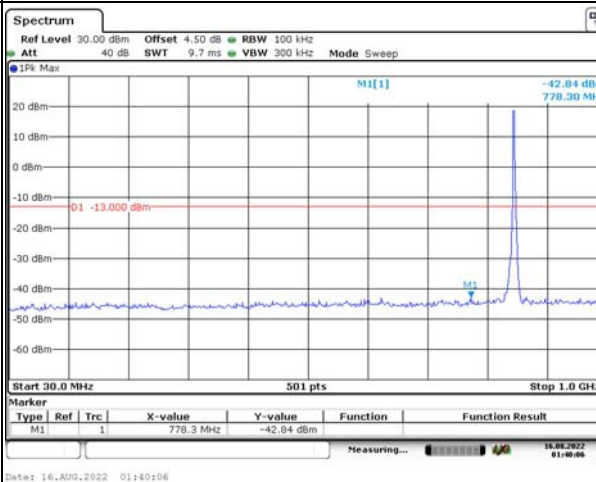
Lowest



Middle



Highest

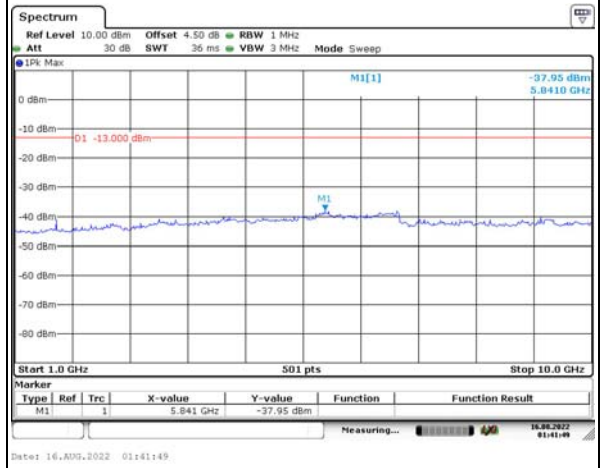
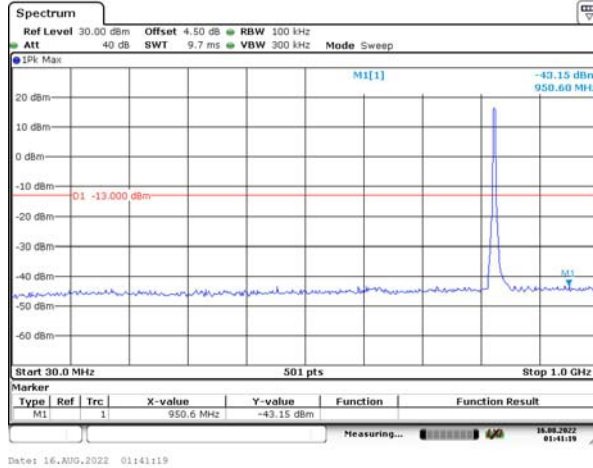


Spurious Emissions at Antenna Terminal

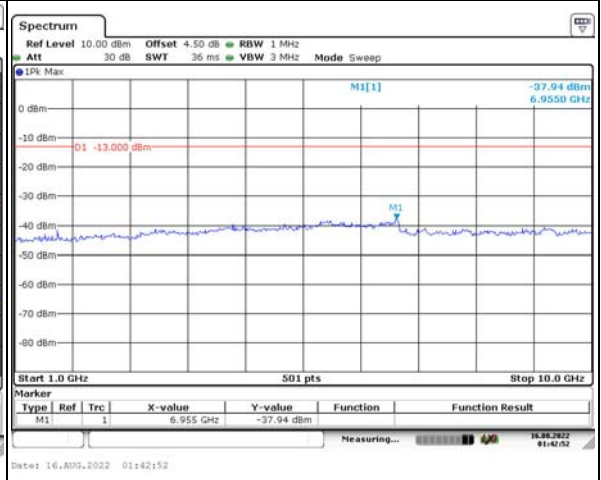
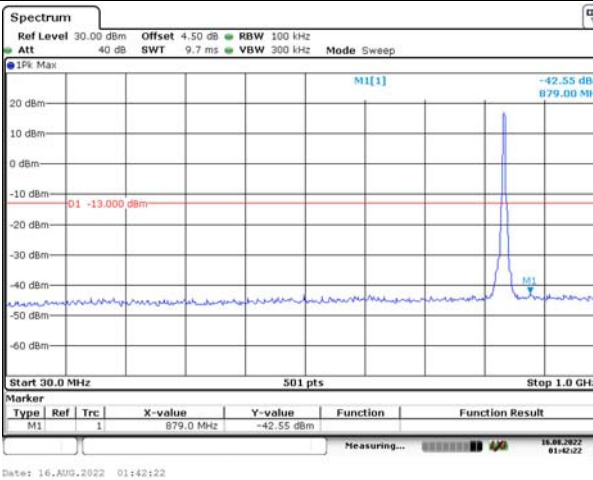
Channel

5MHz Bandwidth QPSK

Lowest



Middle



Highest

