

Occupied Bandwidth

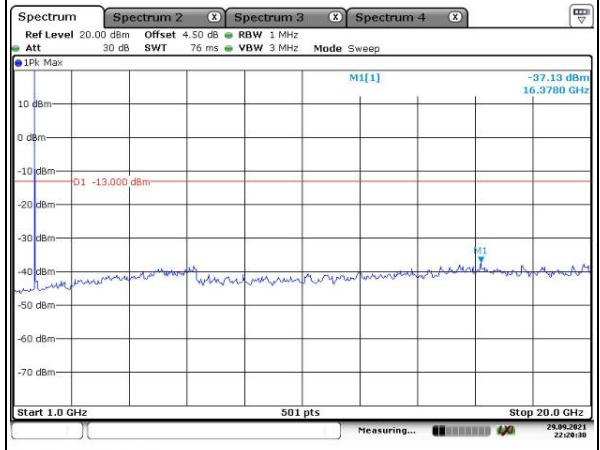
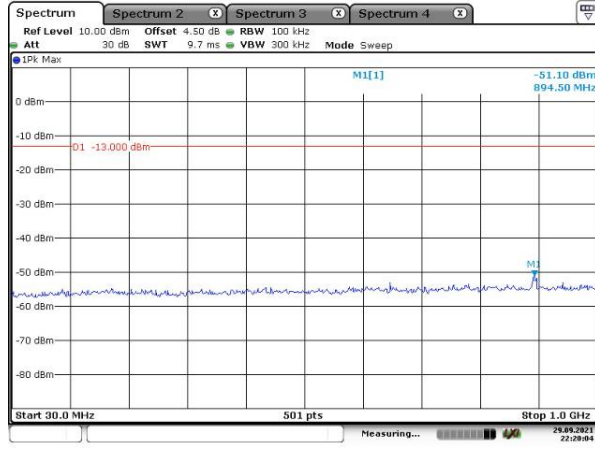
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 14.990 dBm M1[1] -11.22 dBm 1.7103200 GHz -Occ Bw 17.964071856 MHz 0.18 dB D1[1] 19.5200 MHz CF 1.72 GHz 501 pts Span 40.0 MHz Date: 29_SEP.2021 20:12:58</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 13.610 dBm M1[1] -13.07 dBm 1.7101600 GHz -Occ Bw 18.043912176 MHz 1.43 dB D1[1] 19.6800 MHz CF 1.72 GHz 501 pts Span 40.0 MHz Date: 29_SEP.2021 20:13:28</p>
Middle	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 15.170 dBm M1[1] -10.85 dBm 1.7227400 GHz -Occ Bw 17.964071856 MHz -0.96 dB D1[1] 19.6800 MHz CF 1.7325 GHz 501 pts Span 40.0 MHz Date: 29_SEP.2021 20:14:02</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 13.930 dBm M1[1] -11.98 dBm 1.7251600 GHz -Occ Bw 18.043912176 MHz 0.59 dB D1[1] 19.8400 MHz CF 1.7325 GHz 501 pts Span 40.0 MHz Date: 29_SEP.2021 20:14:38</p>
Highest	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 14.330 dBm M1[1] -11.05 dBm 1.7351600 GHz -Occ Bw 17.964071856 MHz 0.46 dB D1[1] 19.7600 MHz CF 1.745 GHz 501 pts Span 40.0 MHz Date: 29_SEP.2021 20:15:09</p>	<p>Ref Level 20.00 dBm Offset 4.50 dB RBW 300 kHz Att 30 dB SWT 1 ms VBW 1 MHz Mode Sweep 1Pk Max D1 13.510 dBm M1[1] -12.57 dBm 1.7351600 GHz -Occ Bw 18.043912176 MHz -0.87 dB D1[1] 19.8400 MHz CF 1.745 GHz 501 pts Span 40.0 MHz Date: 29_SEP.2021 20:15:40</p>

Spurious Emissions at Antenna Terminal

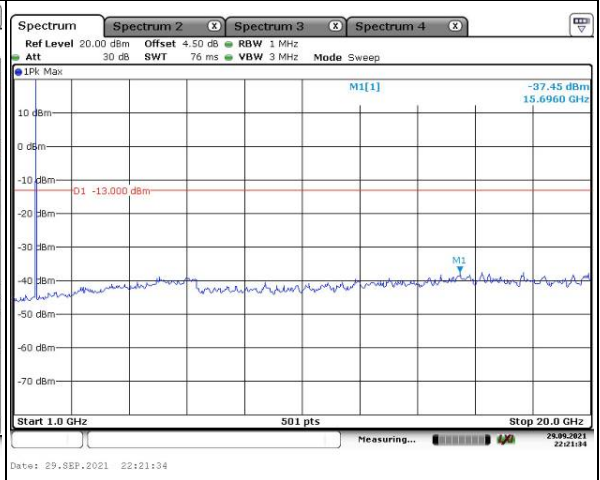
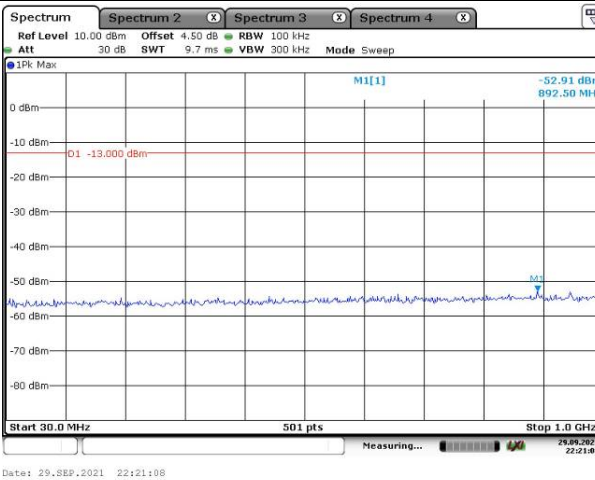
Channel

1.4MHz Bandwidth QPSK

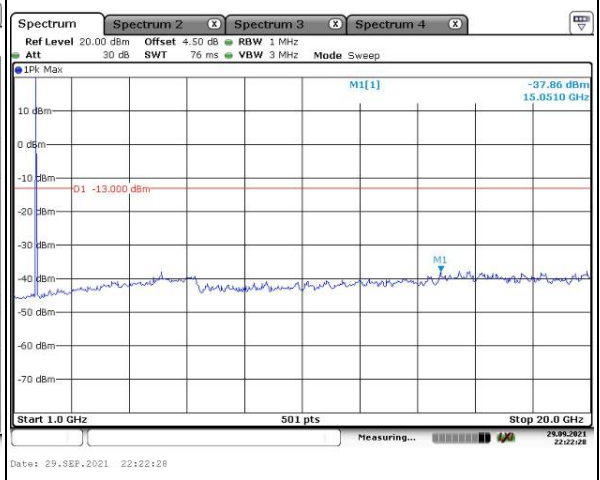
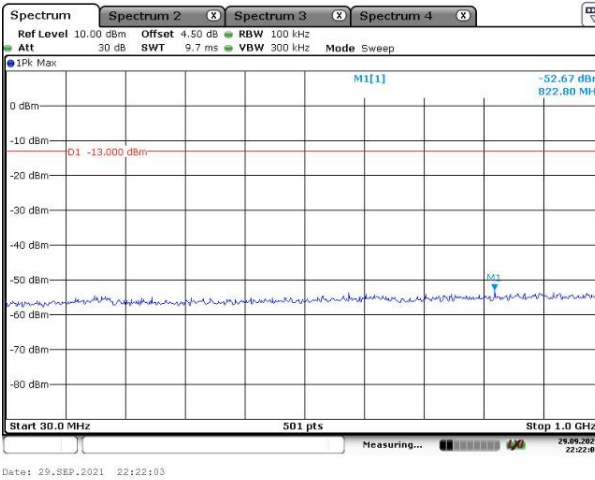
Lowest



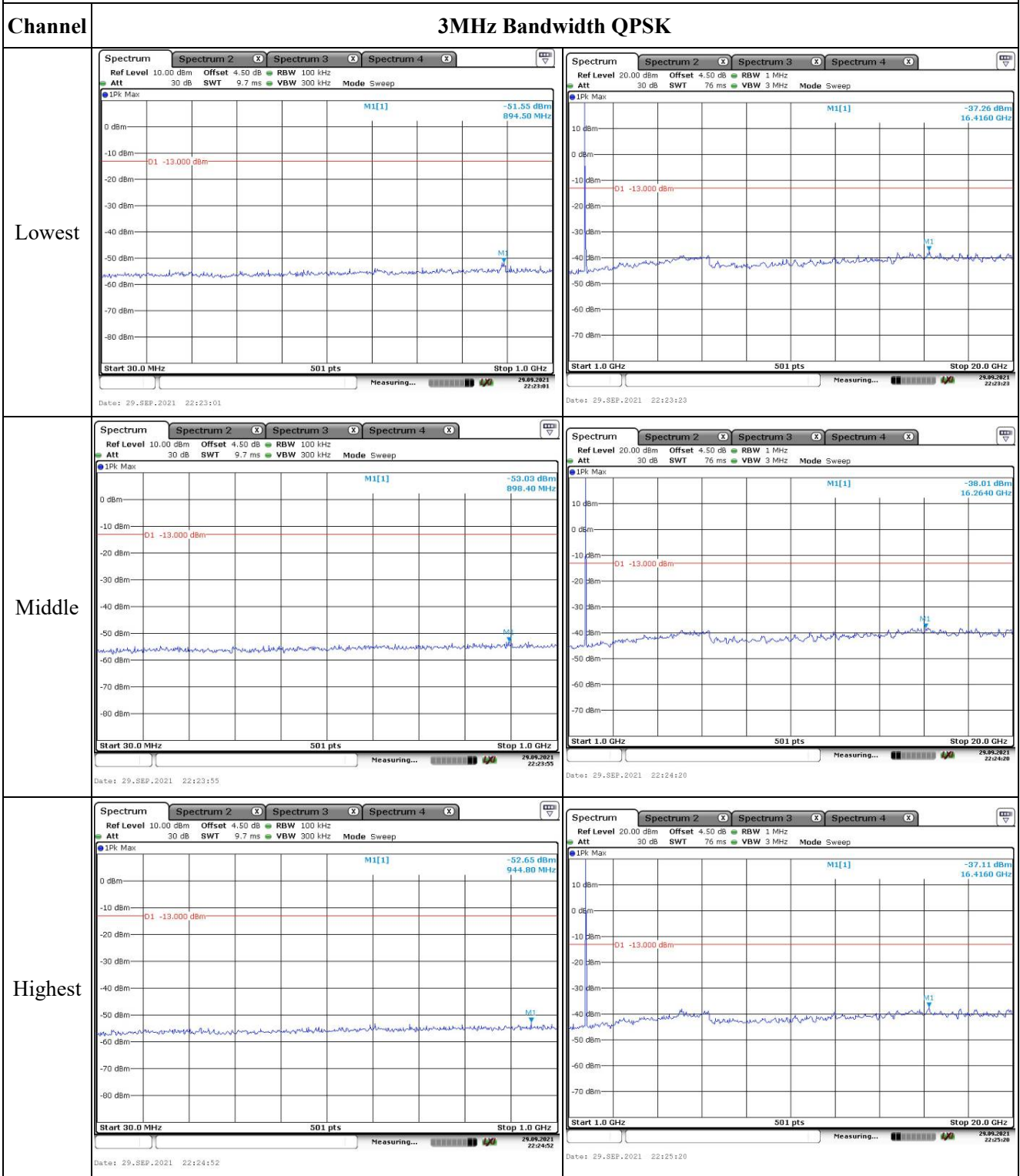
Middle



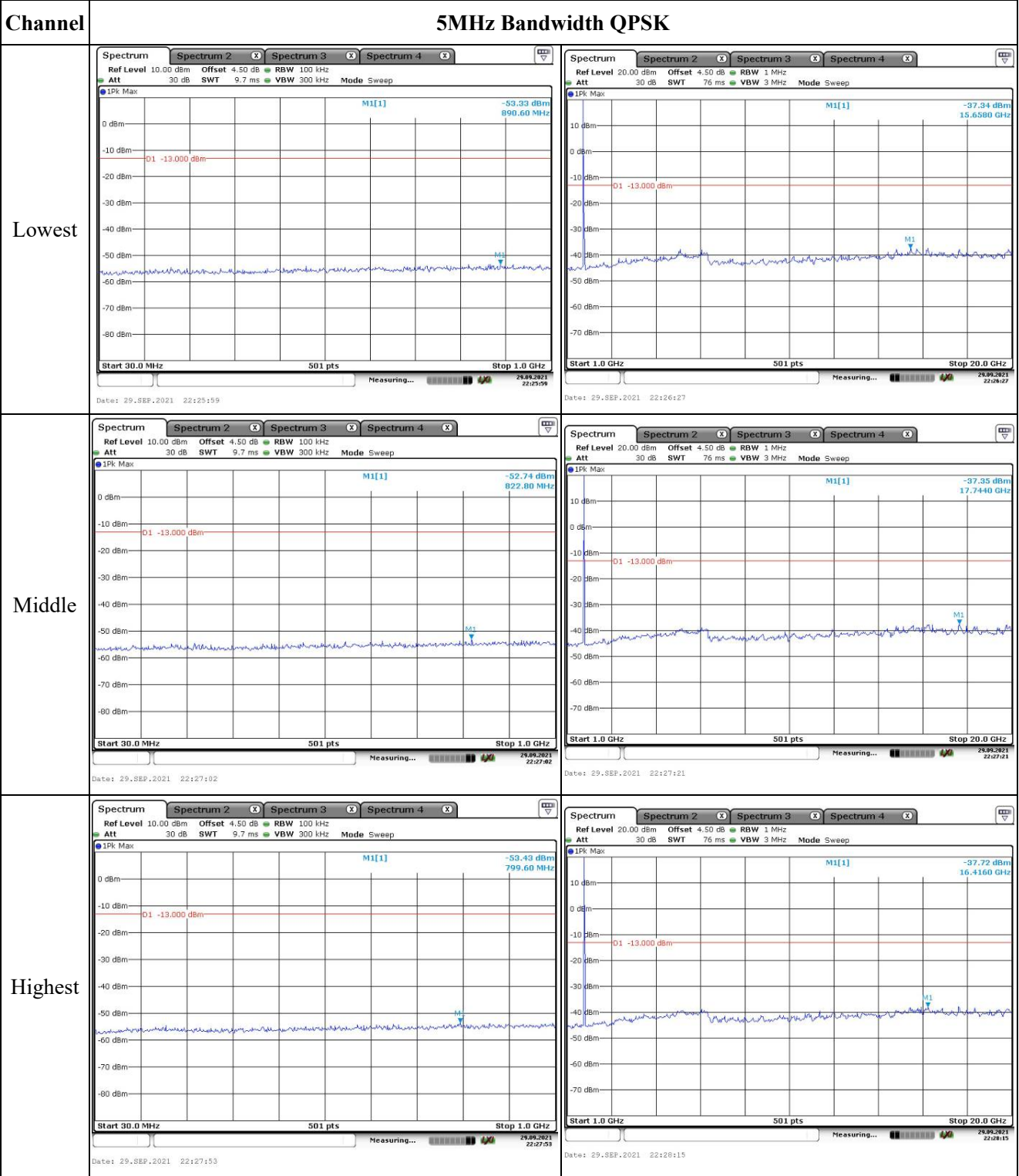
Highest



Spurious Emissions at Antenna Terminal



Spurious Emissions at Antenna Terminal

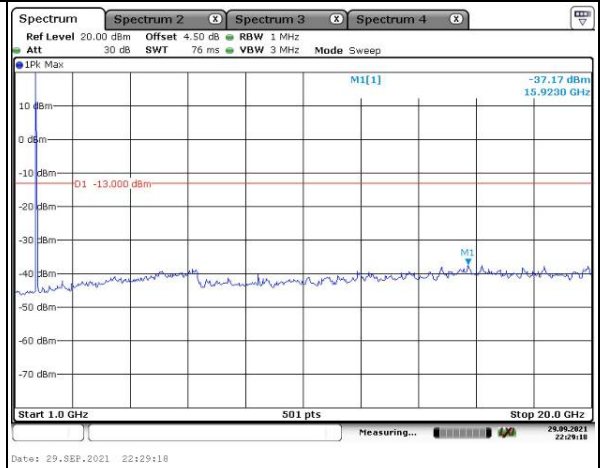
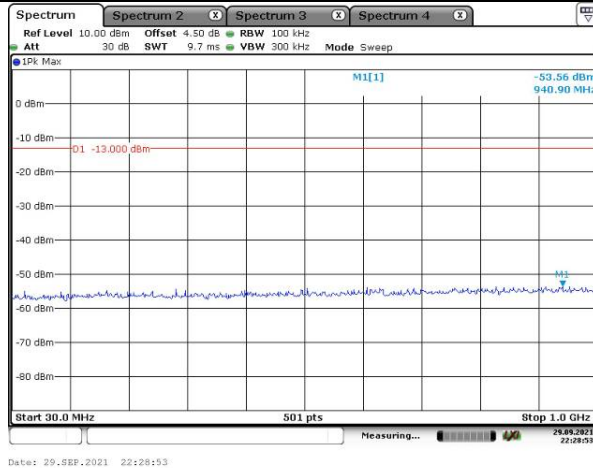


Spurious Emissions at Antenna Terminal

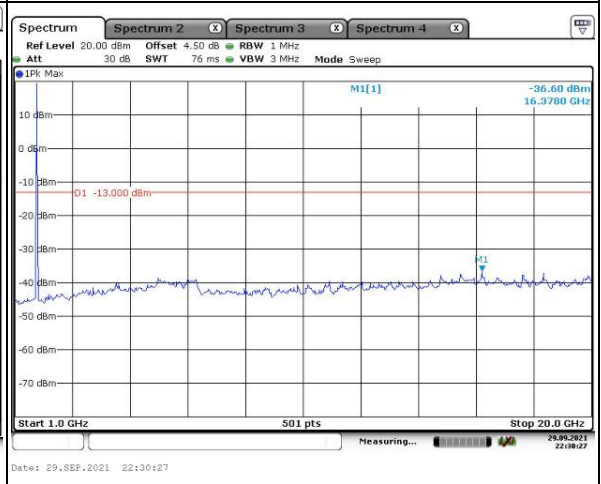
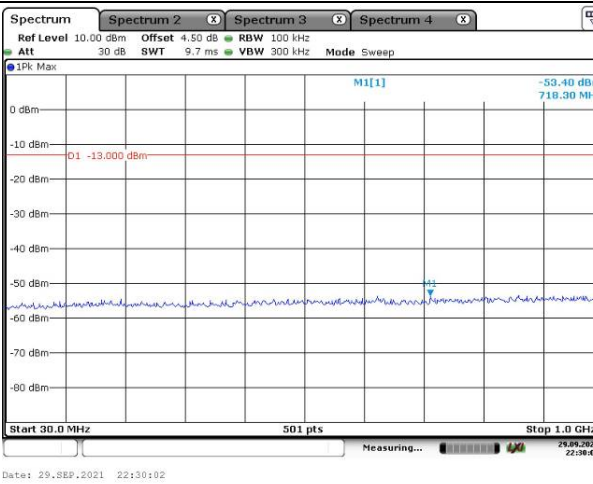
Channel

10MHz Bandwidth QPSK

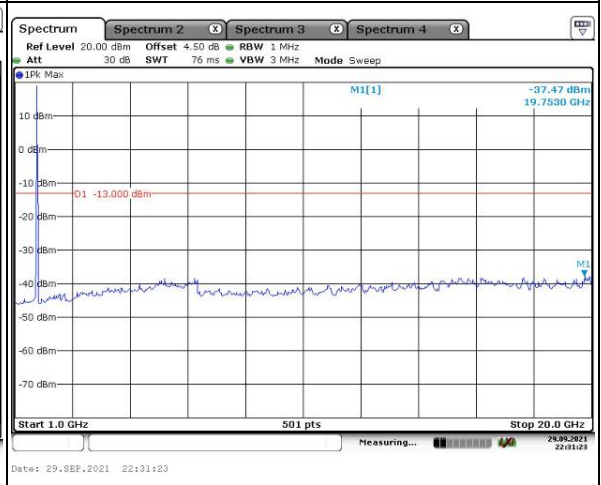
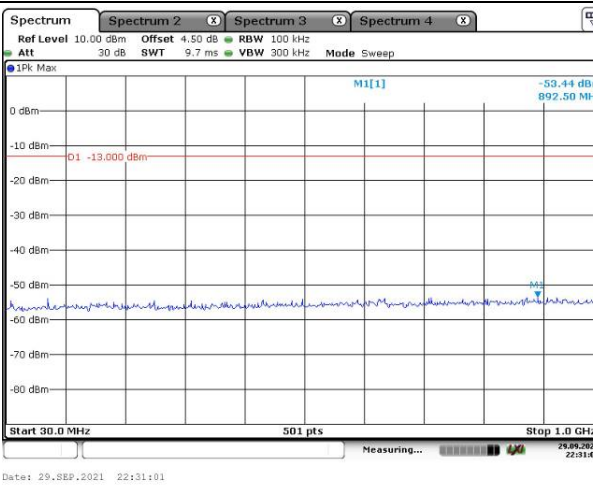
Lowest



Middle



Highest

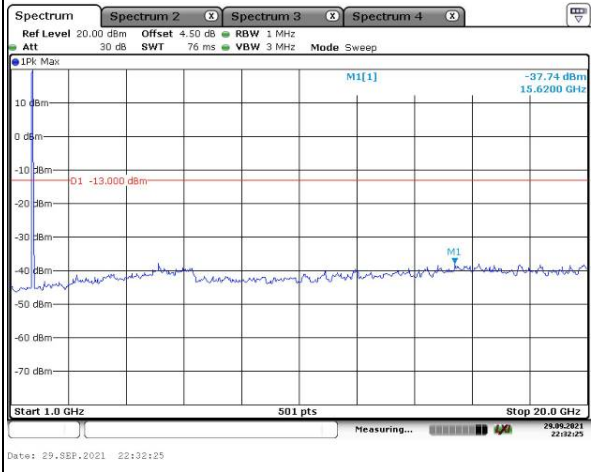
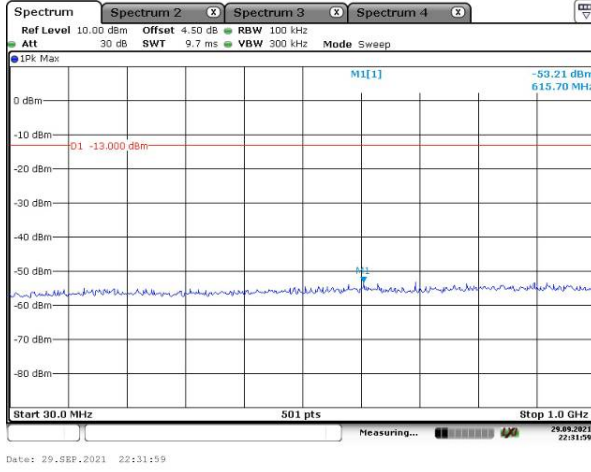


Spurious Emissions at Antenna Terminal

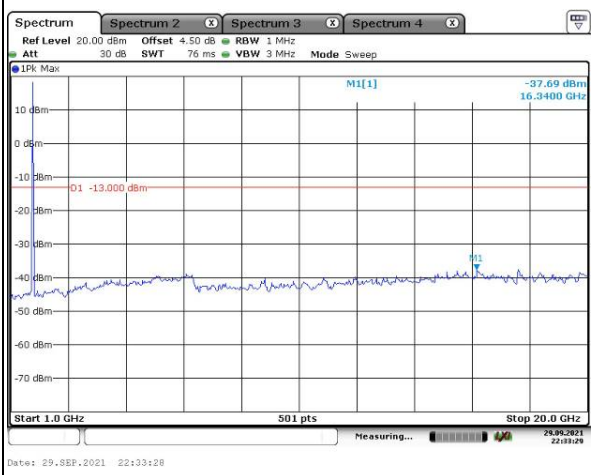
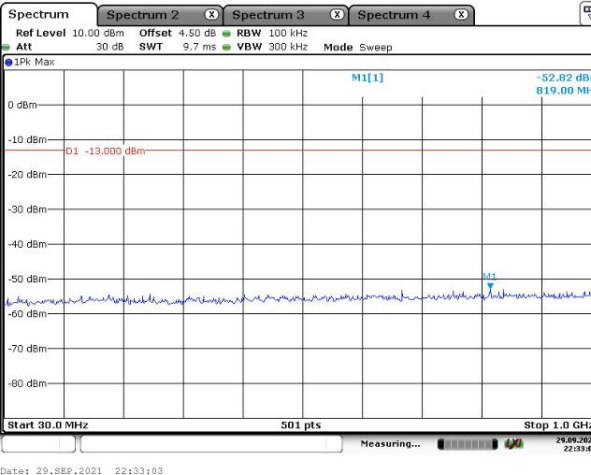
Channel

15MHz Bandwidth QPSK

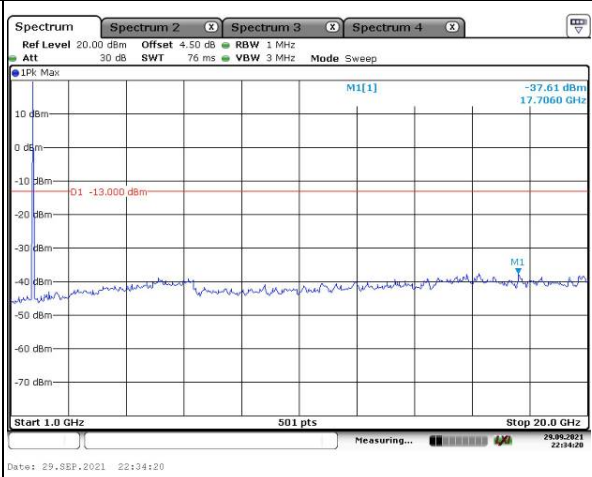
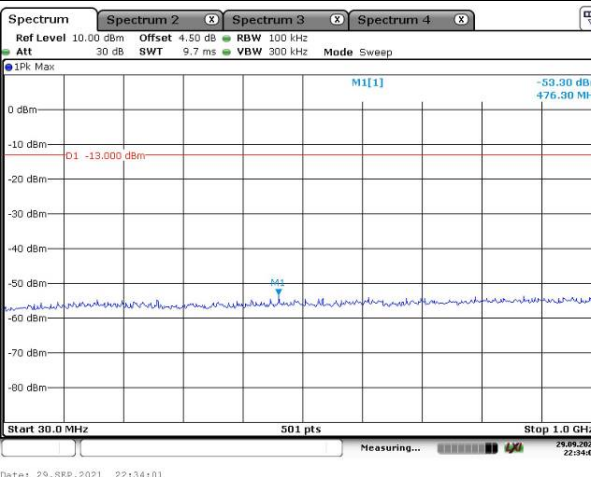
Lowest



Middle



Highest

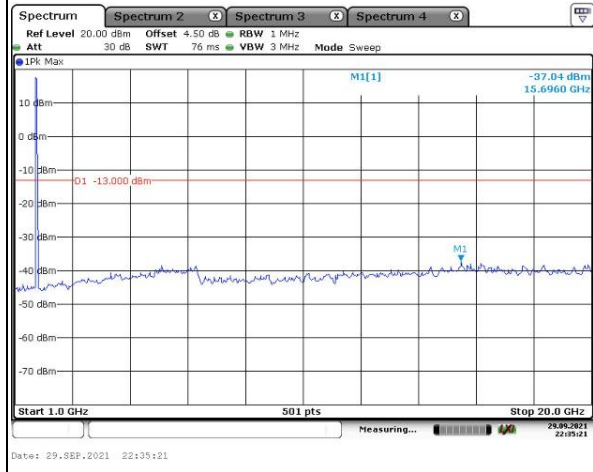
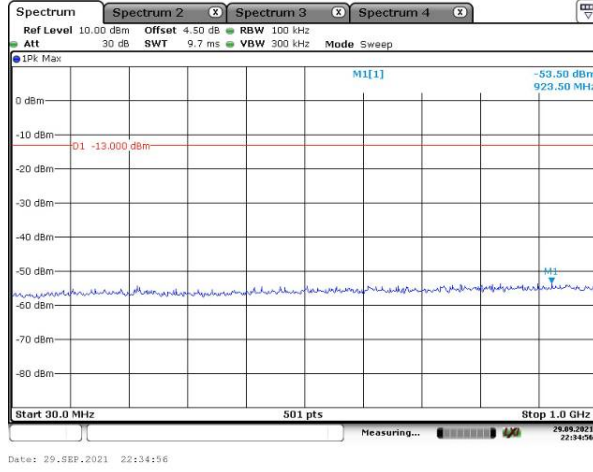


Spurious Emissions at Antenna Terminal

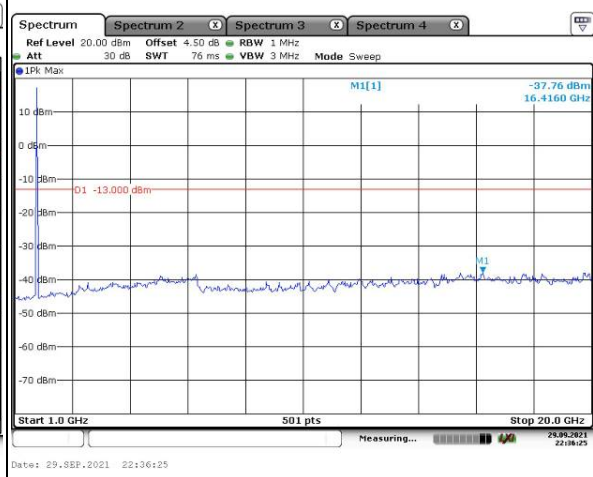
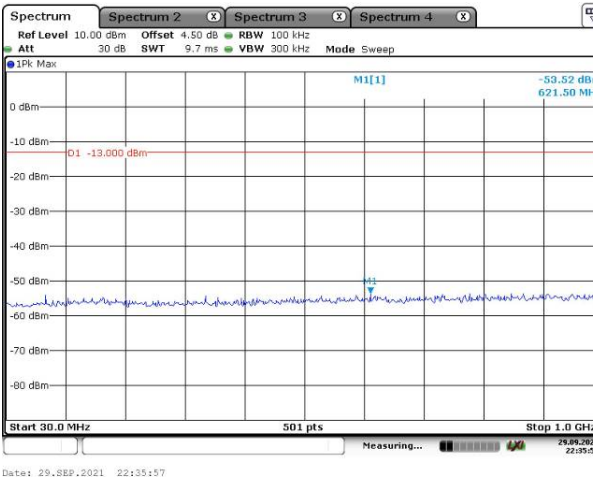
Channel

20MHz Bandwidth QPSK

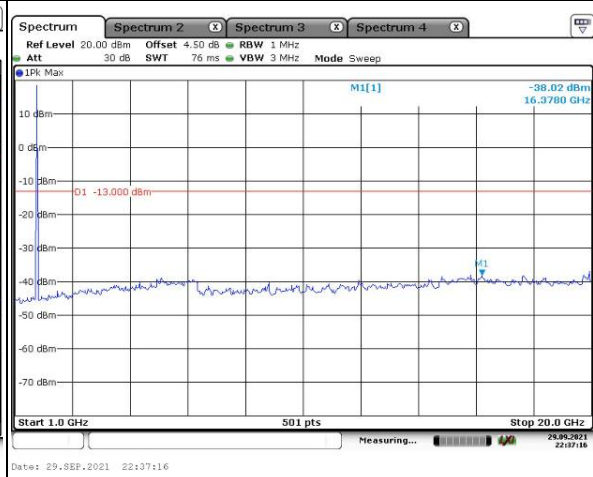
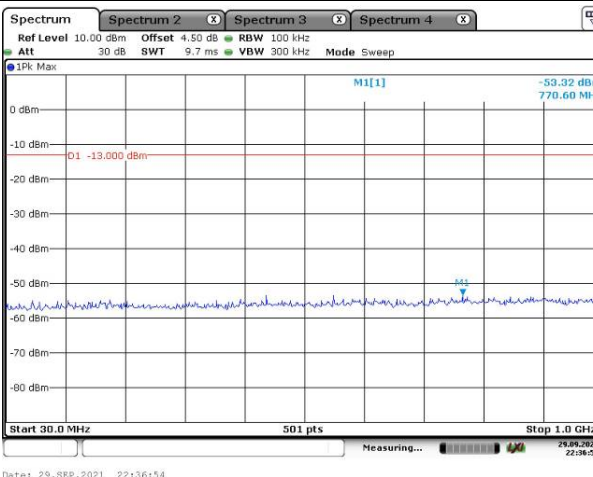
Lowest



Middle



Highest



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</p> <p>M1[1] -27.61 dBm 1.70994610 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.71 GHz 501 pts Span 3.0 MHz</p> <p>Date: 23.NOV.2021 19:50:40</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>M1[1] -20.50 dBm 1.75510100 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.755 GHz 501 pts Span 3.0 MHz</p> <p>Date: 23.NOV.2021 19:51:37</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>M1[1] -17.41 dBm 1.71000000 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.71 GHz 501 pts Span 6.0 MHz</p> <p>Date: 23.NOV.2021 19:52:26</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>M1[1] -14.65 dBm 1.75500000 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.755 GHz 501 pts Span 6.0 MHz</p> <p>Date: 23.NOV.2021 19:53:13</p>
QPSK 5MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>M1[1] -16.20 dBm 1.71000000 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.71 GHz 501 pts Span 10.0 MHz</p> <p>Date: 23.NOV.2021 19:54:16</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>M1[1] -14.54 dBm 1.75500000 GHz</p> <p>D1 -13.000 dBm</p> <p>CF 1.755 GHz 501 pts Span 10.0 MHz</p> <p>Date: 23.NOV.2021 19:55:12</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	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep M1[1] -24.45 dBm 1.7100000 GHz D1 -13.000 dBm CF 1.71 GHz 501 pts Span 20.0 MHz Date: 23.NOV.2021 19:56:35</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep M1[1] -21.33 dBm 1.7550000 GHz D1 -13.000 dBm CF 1.755 GHz 501 pts Span 20.0 MHz Date: 23.NOV.2021 19:57:30</p>
16QAM 15MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz Att 40 dB SWT 1 ms VBW 1 MHz Mode Sweep M1[1] -18.11 dBm 1.7100000 GHz D1 -13.000 dBm CF 1.71 GHz 501 pts Span 30.0 MHz Date: 23.NOV.2021 19:58:36</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz Att 40 dB SWT 1 ms VBW 1 MHz Mode Sweep M1[1] -14.65 dBm 1.7550000 GHz D1 -13.000 dBm CF 1.755 GHz 501 pts Span 30.0 MHz Date: 23.NOV.2021 19:59:33</p>
16QAM 20MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz Att 40 dB SWT 1 ms VBW 1 MHz Mode Sweep M1[1] -21.70 dBm 1.7100000 GHz D1 -13.000 dBm CF 1.71 GHz 501 pts Span 40.0 MHz Date: 23.NOV.2021 20:03:11</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 300 kHz Att 40 dB SWT 1 ms VBW 1 MHz Mode Sweep M1[1] -18.17 dBm 1.7550000 GHz D1 -13.000 dBm CF 1.755 GHz 501 pts Span 40.0 MHz Date: 23.NOV.2021 20:04:11</p>

4.7 Antenna Port Test Data and Results for LTE Band 5:

Serial Number:	CR21090101-RF-S3/16	Test Date:	2021/09/29~2021/11/23
Test Site:	RF	Test Mode:	Transmitting
Tester:	Thor Lei	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	22.2~28.3	Relative Humidity: (%)	35~42	Temperature: (°C)	22.2~28.3
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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	2021/7/22	2022/7/21
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
BACL	TEMP&HUMI Test Chamber	BTH-150	30026	2021/7/22	2022/7/22
UNI-T	Multimeter	UT39A+	C210582554	2021/9/30	2022/9/30
E-Microwave	Two-way Splitter	ODP-1-6	OE0120176	Each Time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2021/7/22	2022/7/21

* 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):	0.46	Antenna Gain (dBd):	-1.69	Cable Loss (dB):	0.2
Operation Voltage(V _{DC}):					
Lowest:	3.5	Normal:	3.7	Highest:	4.2

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	22.99	22.96	23.01	21.23	38.45
	RB1#3	23	22.89	22.97		
	RB1#5	22.99	22.93	23.06		
	RB3#0	23.02	23.12	23.12		
	RB3#3	23	23.08	23.1		
	RB6#0	22.03	22.02	22.06		
1.4MHz 16QAM	RB1#0	22.18	22.66	21.85	20.83	38.45
	RB1#3	22.15	22.72	21.88		
	RB1#5	22.16	22.66	21.85		
	RB3#0	21.96	21.97	22.12		
	RB3#3	22.02	21.97	22.2		
	RB6#0	21.07	21.05	21.33		
3MHz QPSK	RB1#0	22.93	22.91	23.11	21.22	38.45
	RB1#8	22.89	22.92	23.08		
	RB1#14	22.85	22.96	23.1		
	RB6#0	22.01	21.95	22.07		
	RB6#9	21.93	22.02	21.96		
	RB15#0	21.97	22.02	22.09		
3MHz 16QAM	RB1#0	22.22	22.65	21.8	20.8	38.45
	RB1#8	22.15	22.66	21.73		
	RB1#14	22.11	22.69	21.81		
	RB6#0	21.21	21.44	21.26		
	RB6#9	21.02	21.07	21.26		
	RB15#0	21.06	21.07	21.1		
5MHz QPSK	RB1#0	22.89	23.05	22.94	21.17	38.45
	RB1#13	22.93	23.03	22.92		
	RB1#24	22.89	23.06	22.97		
	RB15#0	22.01	21.95	21.97		
	RB15#10	22.08	22.11	21.98		
	RB25#0	21.9	22.04	22.09		
5MHz 16QAM	RB1#0	21.36	22.23	21.64	20.34	38.45
	RB1#13	21.18	22.1	21.72		
	RB1#24	21.33	22.16	21.68		
	RB15#0	21.18	21.32	21.44		
	RB15#10	21.06	20.98	21.16		
	RB25#0	21.17	21.07	21.05		
10MHz QPSK	RB1#0	22.86	22.87	23	21.15	38.45
	RB1#25	22.88	23.04	22.99		
	RB1#49	22.9	22.99	22.99		

	RB25#0	22.08	22	22.04		
	RB25#25	22.07	22.12	22.04		
	RB50#0	22.07	22.13	21.91		
10MHz 16QAM	RB1#0	22.25	21.8	22.25	20.4	38.45
	RB1#25	22.21	21.87	22.23		
	RB1#49	22.18	21.86	22.29		
	RB25#0	21.05	21.69	21.05		
	RB25#25	21.1	21.35	21.18		
	RB50#0	21.13	21.15	21.49		

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	4.96	5.8	4.38	13
	RB50#0	5.51	5.04	5.22	13
10MHz 16QAM	RB1#0	5.57	7.65	5.51	13
	RB50#0	6.49	5.94	5.91	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	1.096	1.102	1.096	1.260	1.254	1.26
1.4MHz 16QAM	1.102	1.096	1.102	1.260	1.248	1.26
3MHz QPSK	2.695	2.695	2.695	3.000	2.988	3.012
3MHz 16QAM	2.695	2.695	2.683	3.012	3.012	3.024
5MHz QPSK	4.531	4.511	4.491	4.980	5.000	4.980
5MHz 16QAM	4.531	4.511	4.551	4.980	5.020	5.000
10MHz QPSK	8.982	8.942	8.942	9.720	9.720	9.800
10MHz 16QAM	8.982	8.942	8.942	9.720	9.800	9.880

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.
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FCC §2.1051, §22.917(a):Out of band emission, Band Edge

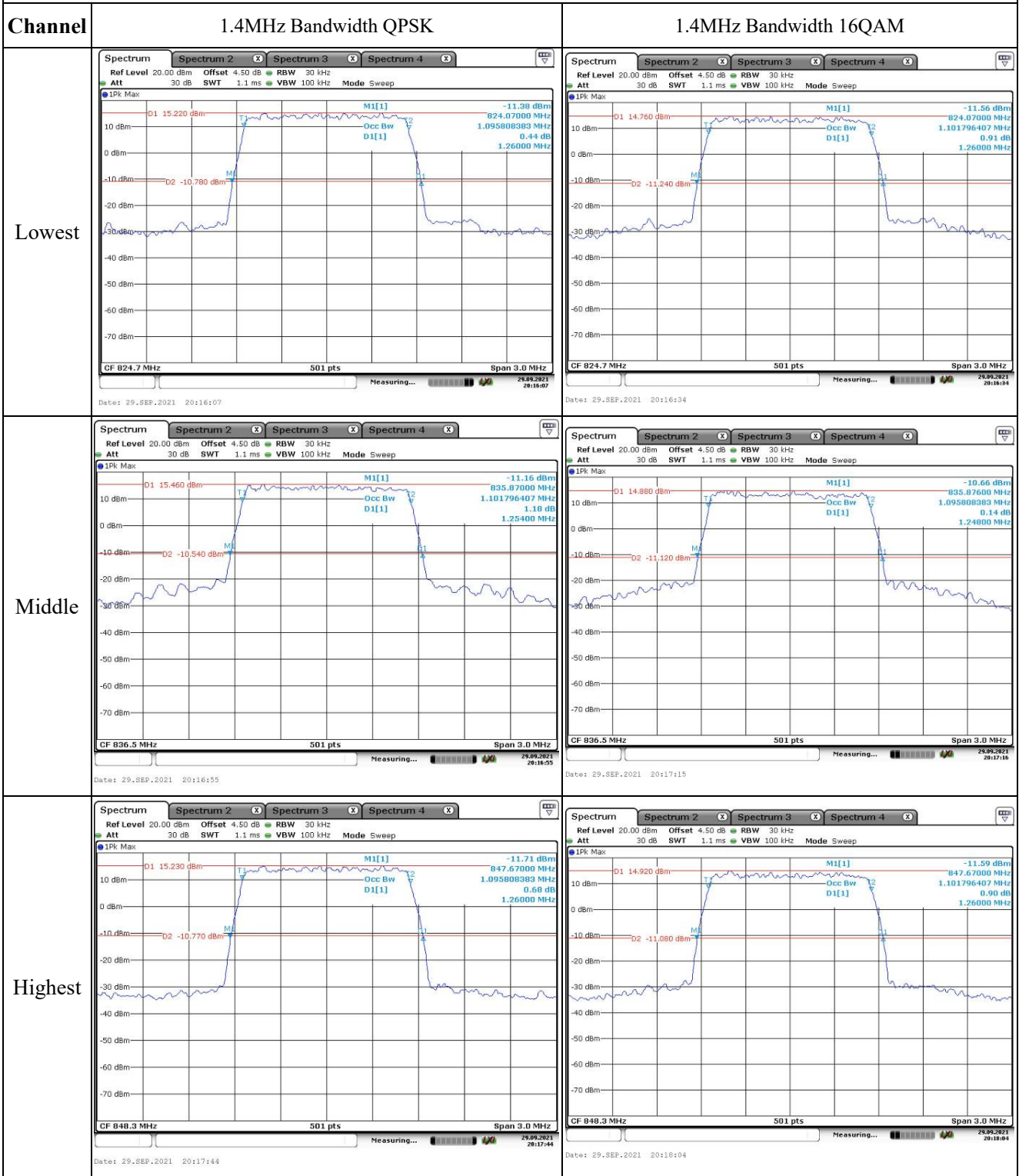
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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FCC §2.1055, §22.355: Frequency Stability					
Test Mode:	10 MHz QPSK		Test Channel:	836.5	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.7	13.63	0.02	Pass
	-20	3.7	8.55	0.01	Pass
	-10	3.7	-7.95	-0.01	Pass
	0	3.7	-7.35	-0.01	Pass
	10	3.7	9.27	0.01	Pass
	20	3.7	7.93	0.01	Pass
	30	3.7	-7.13	-0.01	Pass
	40	3.7	5.47	0.01	Pass
	50	3.7	8.61	0.01	Pass
Frequency Stability vs. Voltage	20	3.5	9.05	0.01	Pass
	20	4.2	6.37	0.01	Pass
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	3.7	7.77	0.01	Pass
	-20	3.7	7.46	0.01	Pass
	-10	3.7	-9.71	-0.01	Pass
	0	3.7	8.61	0.01	Pass
	10	3.7	9.49	0.01	Pass
	20	3.7	8.08	0.01	Pass
	30	3.7	5.61	0.01	Pass
	40	3.7	-9.83	-0.01	Pass
	50	3.7	-8.22	-0.01	Pass
Frequency Stability vs. Voltage	20	3.5	5.66	0.01	Pass
	20	4.2	7.36	0.01	Pass
Result:				Pass	

Test Plots:

Occupied Bandwidth



Occupied Bandwidth

Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest	<p>CF 825.5 MHz 501 pts Span 6.0 MHz</p>	<p>CF 825.5 MHz 501 pts Span 6.0 MHz</p>
Middle	<p>CF 836.5 MHz 501 pts Span 6.0 MHz</p>	<p>CF 836.5 MHz 501 pts Span 6.0 MHz</p>
Highest	<p>CF 847.5 MHz 501 pts Span 6.0 MHz</p>	<p>CF 847.5 MHz 501 pts Span 6.0 MHz</p>

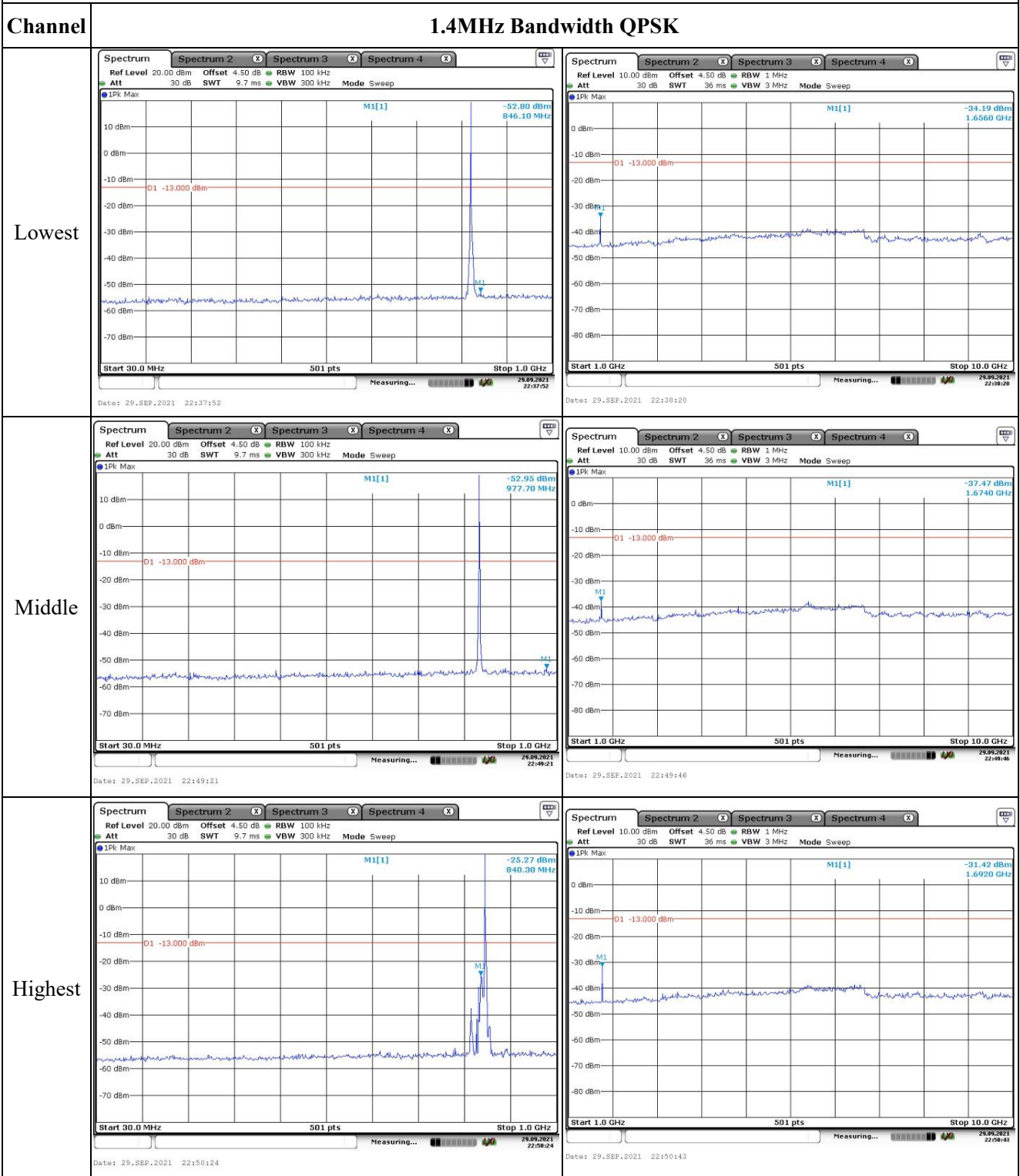
Occupied Bandwidth

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

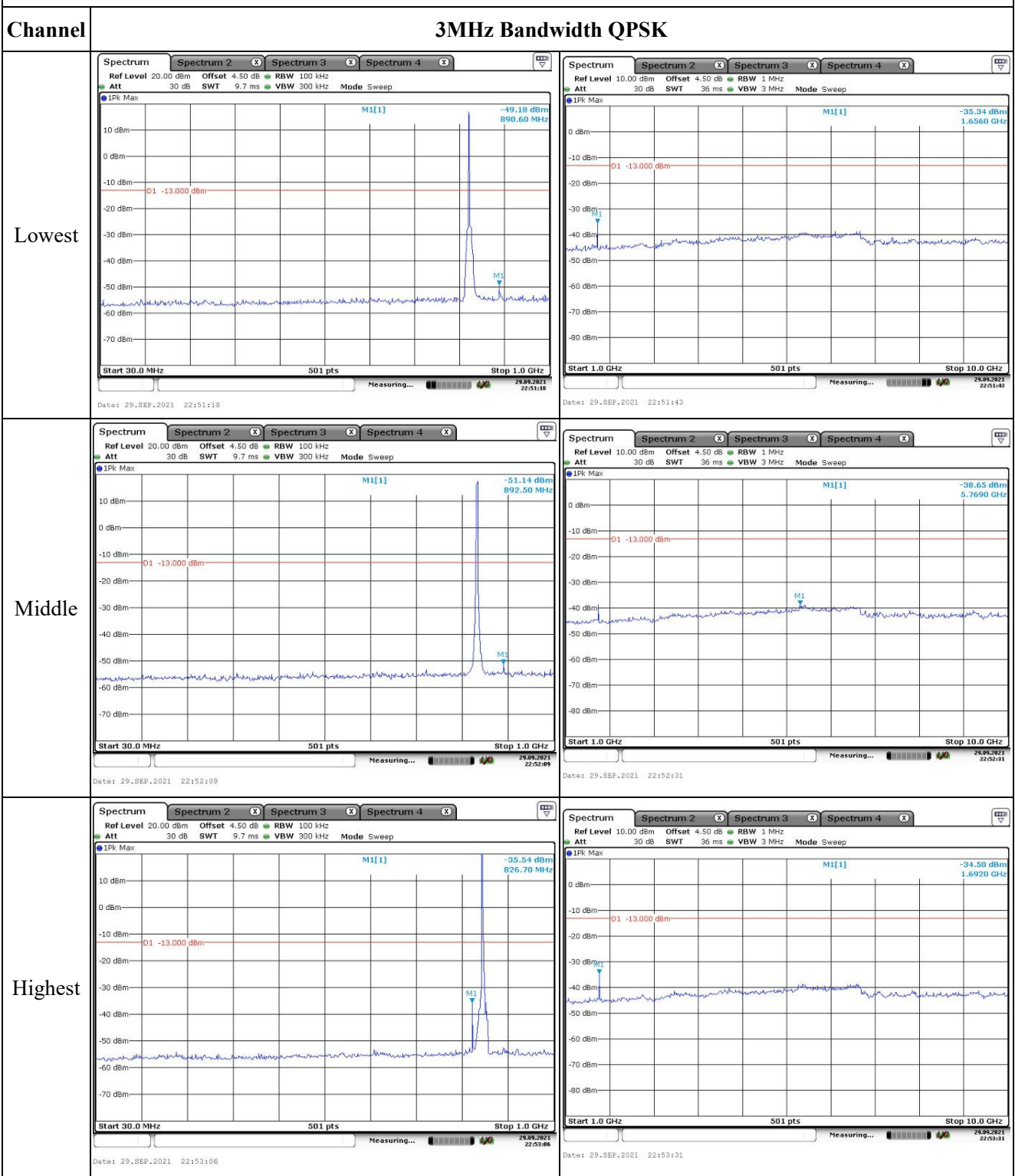
Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>10MHz Bandwidth QPSK</p> <p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>1Pk Max</p> <p>M1[1] -12.26 dBm 824.2000 MHz D1[1] -0.49 dB 8.982035929 MHz</p> <p>D2 -12.440 dBm</p> <p>CF 829.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 29_SEP.2021 20:24:23</p>	<p>10MHz Bandwidth 16QAM</p> <p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>1Pk Max</p> <p>M1[1] -11.86 dBm 824.1600 MHz D1[1] -0.64 dB 8.982035929 MHz</p> <p>D2 -11.590 dBm</p> <p>CF 829.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 29_SEP.2021 20:24:49</p>
Middle	<p>10MHz Bandwidth QPSK</p> <p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>1Pk Max</p> <p>M1[1] -13.73 dBm 831.6200 MHz D1[1] 1.03 dB 8.942115768 MHz</p> <p>D2 -12.530 dBm</p> <p>CF 836.5 MHz 501 pts Span 20.0 MHz</p> <p>Date: 29_SEP.2021 20:25:19</p>	<p>10MHz Bandwidth 16QAM</p> <p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>1Pk Max</p> <p>M1[1] -15.76 dBm 831.5800 MHz D1[1] 1.11 dB 8.942115768 MHz</p> <p>D2 -14.310 dBm</p> <p>CF 836.5 MHz 501 pts Span 20.0 MHz</p> <p>Date: 29_SEP.2021 20:25:54</p>
Highest	<p>10MHz Bandwidth QPSK</p> <p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>1Pk Max</p> <p>M1[1] -13.70 dBm 839.1200 MHz D1[1] 0.36 dB 8.942115768 MHz</p> <p>D2 -13.640 dBm</p> <p>CF 844.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 29_SEP.2021 20:26:30</p>	<p>10MHz Bandwidth 16QAM</p> <p>Ref Level 20.00 dBm Offset 4.50 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>1Pk Max</p> <p>M1[1] -14.84 dBm 839.0800 MHz D1[1] 1.19 dB 8.942115768 MHz</p> <p>D2 -14.120 dBm</p> <p>CF 844.0 MHz 501 pts Span 20.0 MHz</p> <p>Date: 29_SEP.2021 20:27:01</p>

Spurious Emissions at Antenna Terminal



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