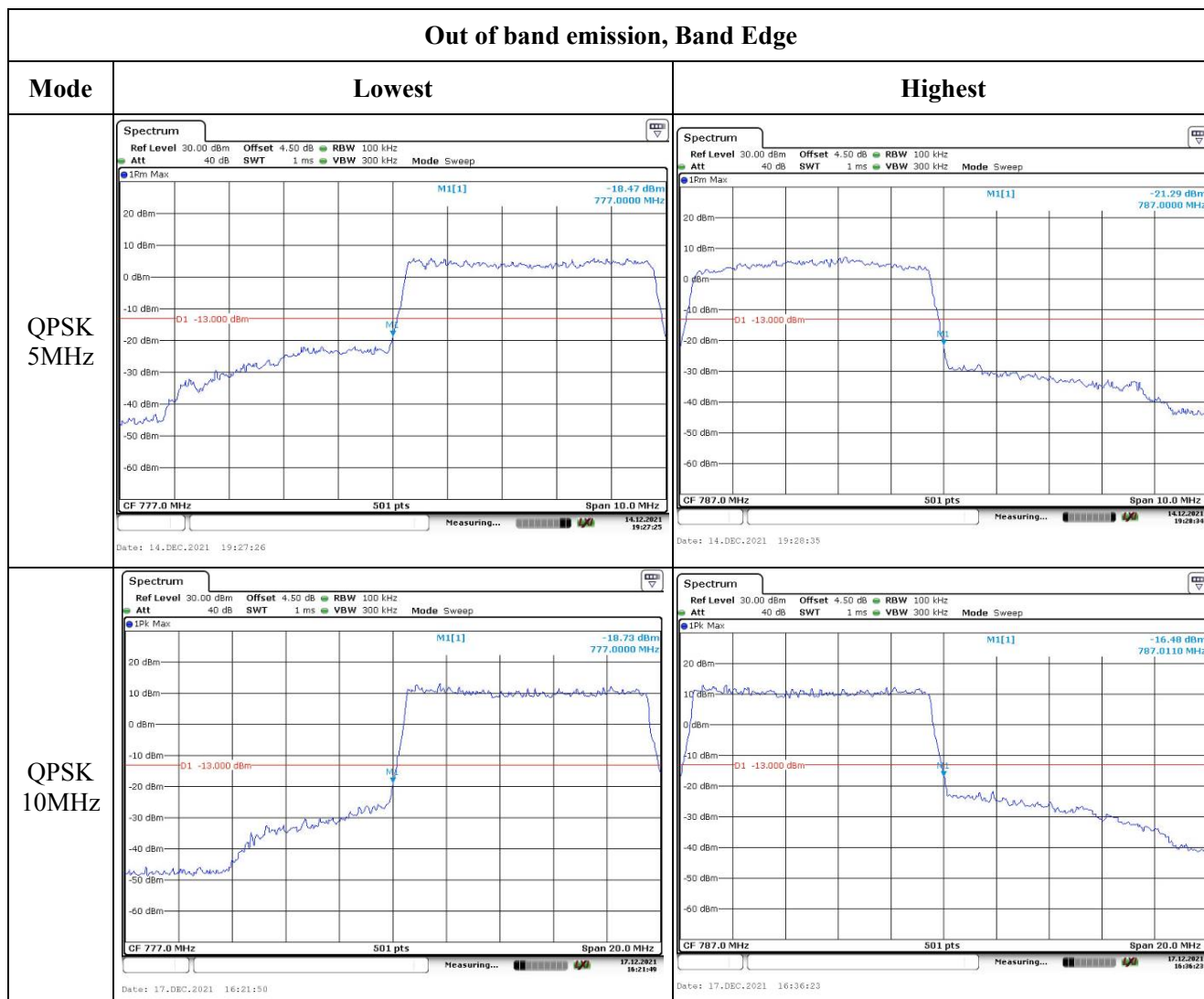
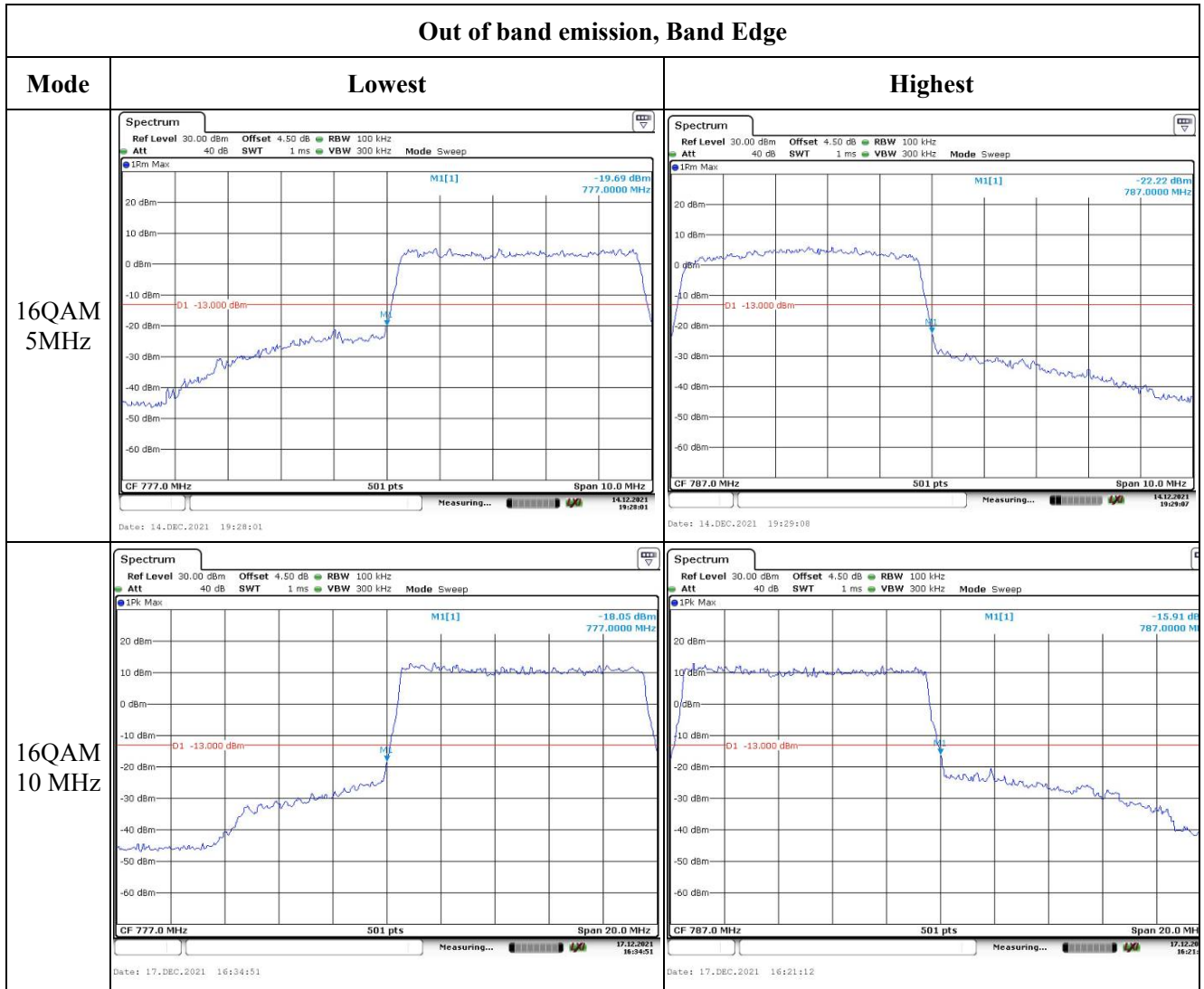


Out of band emission, Band Edge



Out of band emission, Band Edge



4.11 Antenna Port Test Data and Results for LTE Band 17

Serial Number:	CR21110023-RF-S1	Test Date:	2021-11-29~2022-01-06
Test Site:	RF	Test Mode:	Transmitting
Tester:	Wolf Mo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	22.1~25.9	Relative Humidity: (%)	60~66	ATM Pressure: (kPa)	101.2~101.4
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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
R&S	Wideband Radio Communication Tester	CMW500	149218	2021/7/22	2022/7/21
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

* 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 17▲:

Antenna Gain (dBi):	0.17	Antenna Gain (dBd):	-1.98	Cable Loss (dB):	0
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)
5MHz	706.5	710	713.5
10MHz	709	710	711

Test Data:**FCC§2.1046;§ 27.50(c) (10)****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		
5MHz QPSK	RB1#0	23.19	22.92	22.84	21.21	34.77
	RB1#13	22.90	22.97	22.97		
	RB1#24	23.13	22.97	22.75		
	RB15#0	22.08	21.91	21.87		
	RB15#10	22.45	21.97	22.25		
	RB25#0	22.02	21.91	22.25		
5MHz 16QAM	RB1#0	21.24	22.30	21.39	20.32	34.77
	RB1#13	20.96	21.91	21.76		
	RB1#24	21.53	21.83	21.64		
	RB15#0	21.41	21.03	20.96		
	RB15#10	21.44	21.08	21.47		
	RB25#0	21.43	21.29	21.39		
10MHz QPSK	RB1#0	22.95	22.80	23.07	21.36	34.77
	RB1#25	22.96	23.06	23.34		
	RB1#49	23.05	23.12	23.19		
	RB25#0	22.04	22.41	22.40		
	RB25#25	21.93	21.93	22.29		
	RB50#0	22.29	21.98	22.07		
10MHz 16QAM	RB1#0	22.14	22.08	21.35	20.59	34.77
	RB1#25	22.39	22.15	21.62		
	RB1#49	22.23	22.57	21.66		
	RB25#0	21.40	21.41	21.52		
	RB25#25	21.05	21.15	21.57		
	RB50#0	21.45	21.24	21.15		

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	6.03	5.57	5.68	13
	RB50#0	5.57	5.57	5.68	13
10MHz 16QAM	RB1#0	6.64	6.41	7.48	13
	RB50#0	6.58	6.61	6.52	13
				Result:	Pass

FCC §2.1049, §27.53:Occupied Bandwidth						
Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
5MHz QPSK	4.511	4.511	4.511	4.980	5.000	5.020
5MHz 16QAM	4.511	4.531	4.531	4.980	5.020	5.020
10MHz QPSK	8.942	8.942	8.942	9.760	9.760	9.760
10MHz 16QAM	8.942	8.981	8.942	9.760	9.800	9.760
Note: The test plots please refer to the Plots of Occupied Bandwidth						

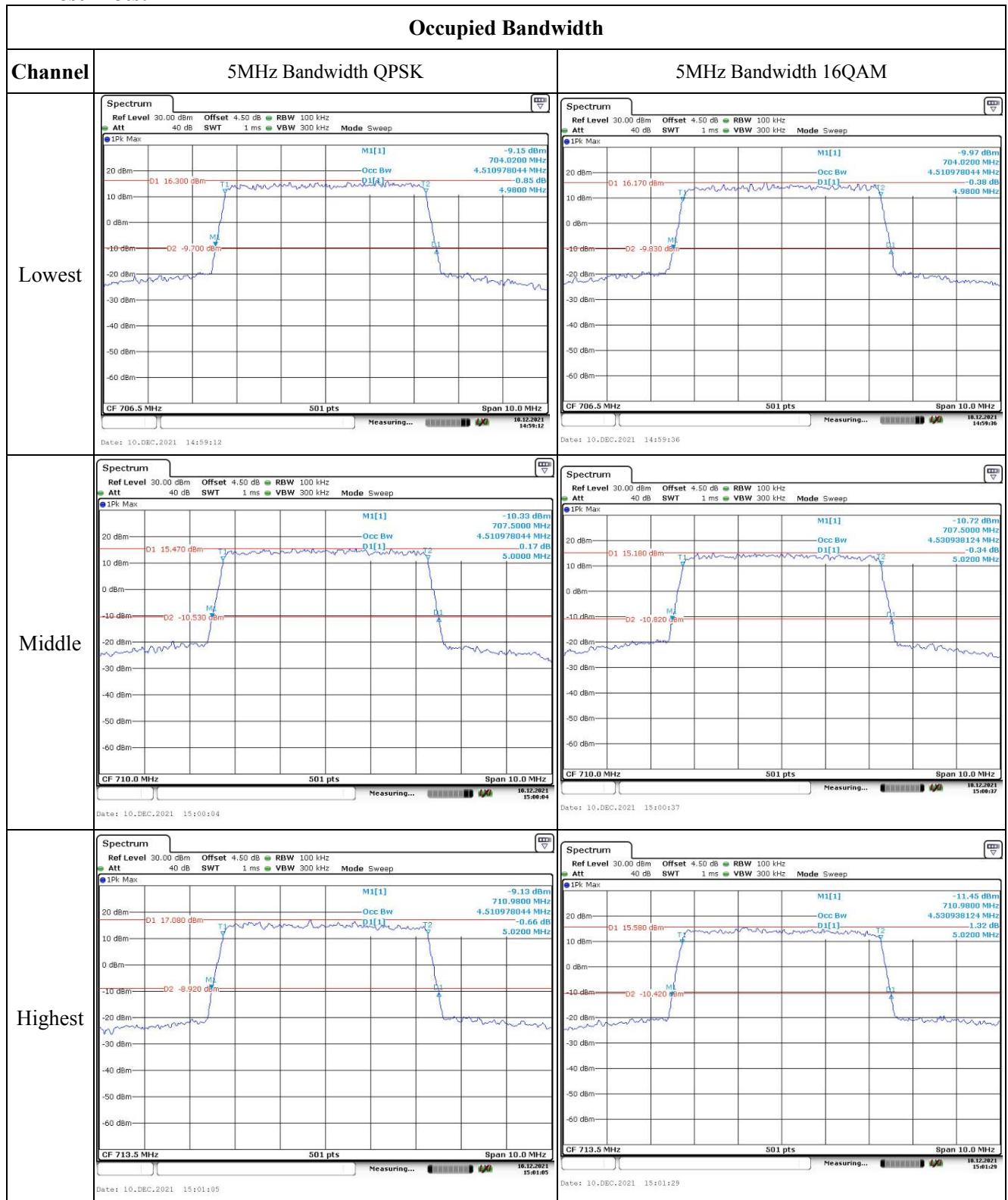
FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal	
Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.

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:	10M 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	3.7	704.529	704.00	715.471	716.00
	-20	3.7	704.527	704.00	715.479	716.00
	-10	3.7	704.526	704.00	715.471	716.00
	0	3.7	704.529	704.00	715.475	716.00
	10	3.7	704.529	704.00	715.471	716.00
	20	3.7	704.529	704.00	715.471	716.00
	30	3.7	704.523	704.00	715.473	716.00
	40	3.7	704.522	704.00	715.472	716.00
	50	3.7	704.529	704.00	715.471	716.00
Frequency Stability vs. Voltage	20	3.5	704.520	704.00	715.470	716.00
	20	4.2	704.521	704.00	715.471	716.00
					Result:	Pass

Test Mode:	10M 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	3.7	704.529	704.00	715.471	716.00
	-20	3.7	704.527	704.00	715.479	716.00
	-10	3.7	704.526	704.00	715.471	716.00
	0	3.7	704.524	704.00	715.475	716.00
	10	3.7	704.529	704.00	715.471	716.00
	20	3.7	704.529	704.00	715.471	716.00
	30	3.7	704.523	704.00	715.473	716.00
	40	3.7	704.522	704.00	715.472	716.00
	50	3.7	704.521	704.00	715.470	716.00
Frequency Stability vs. Voltage	20	3.5	704.520	704.00	715.470	716.00
	20	4.2	704.521	704.00	715.471	716.00
					Result:	Pass

Test Plots:



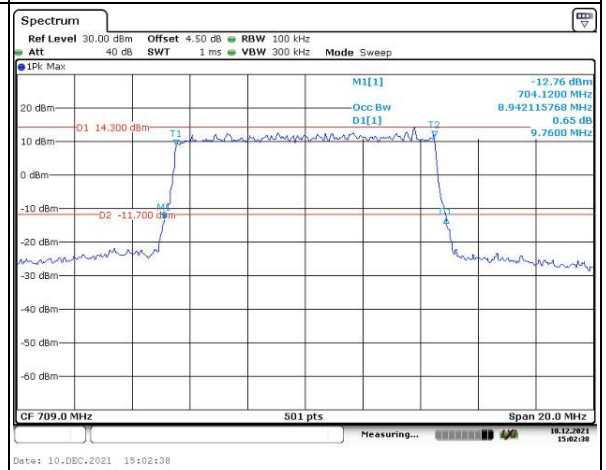
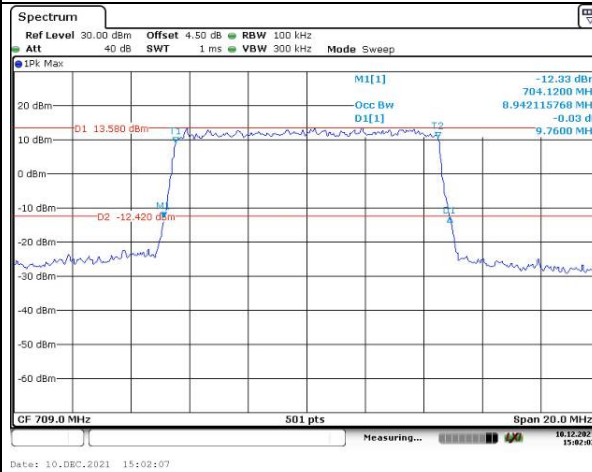
Occupied Bandwidth

Channel

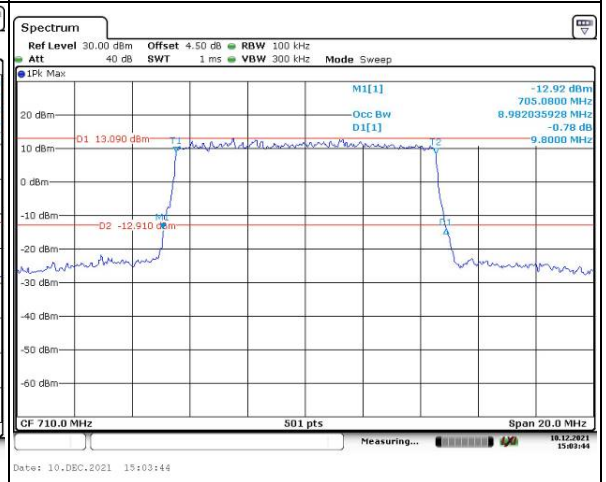
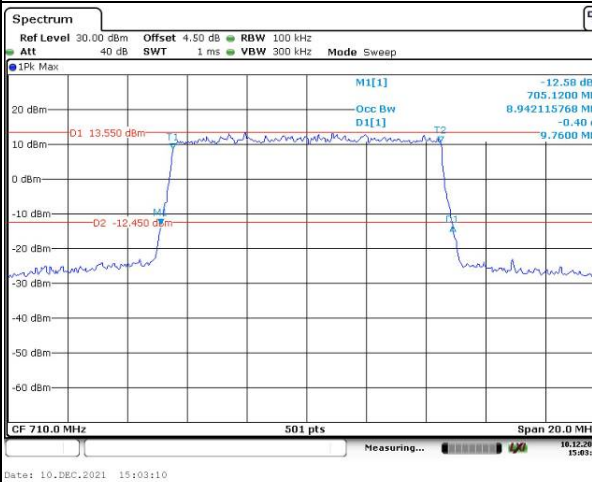
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

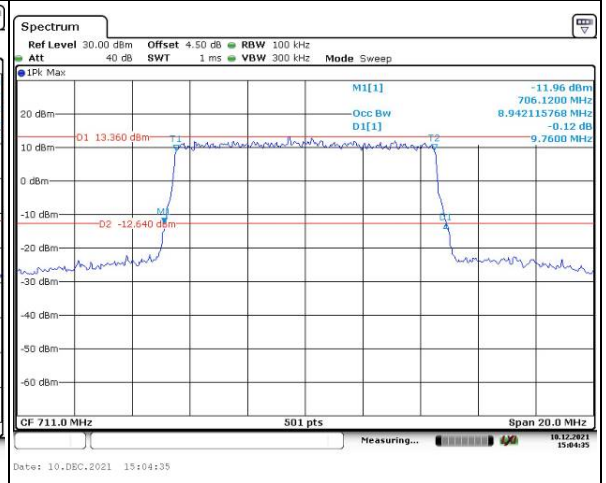
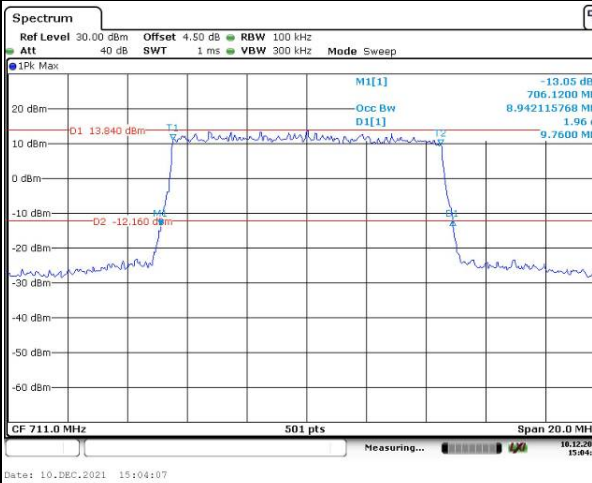
Lowest



Middle



Highest

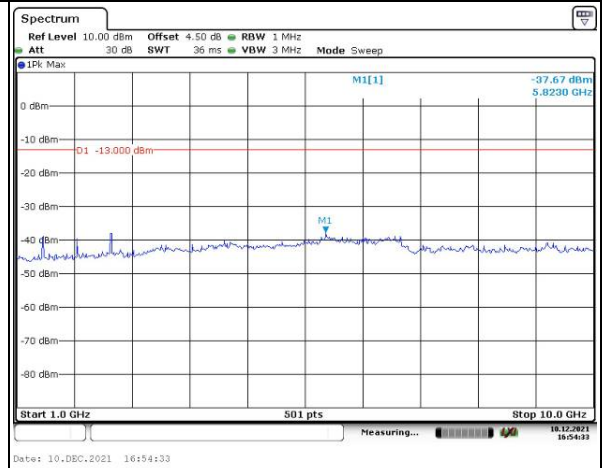
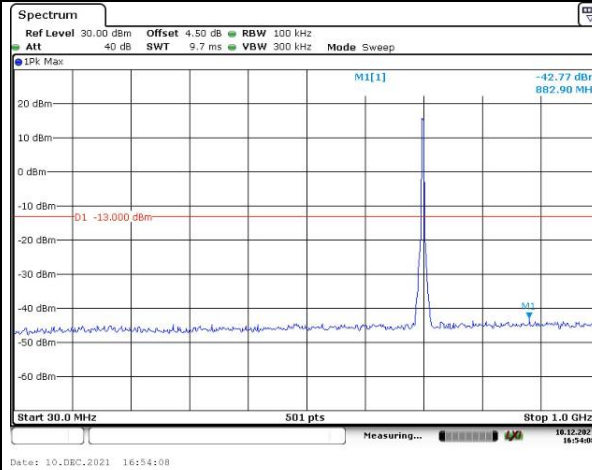


Spurious Emissions at Antenna Terminal

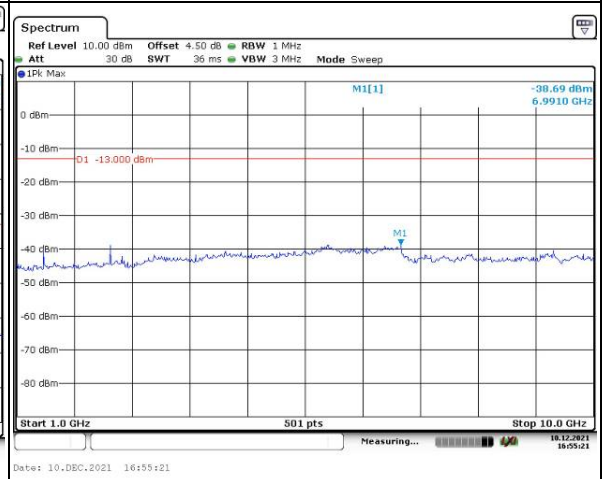
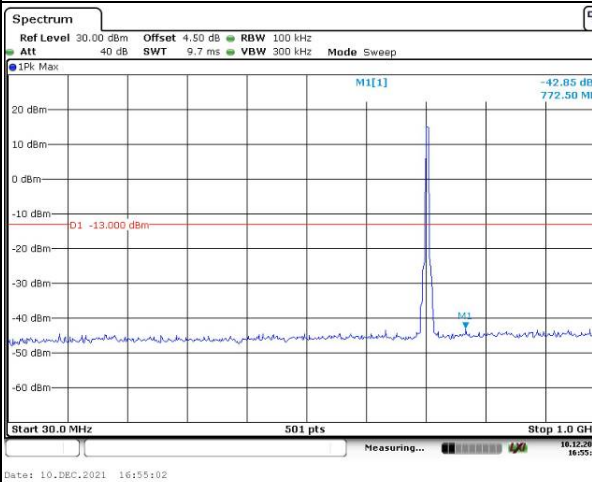
Channel

5MHz Bandwidth QPSK

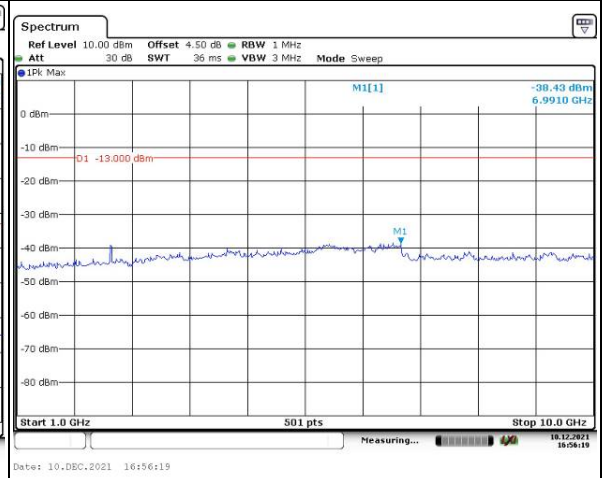
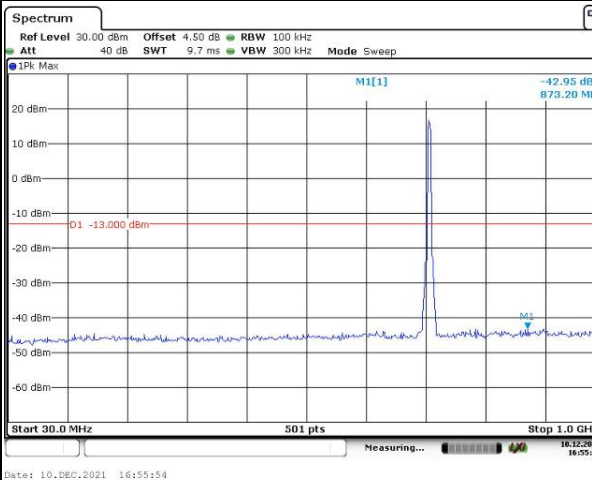
Lowest



Middle



Highest

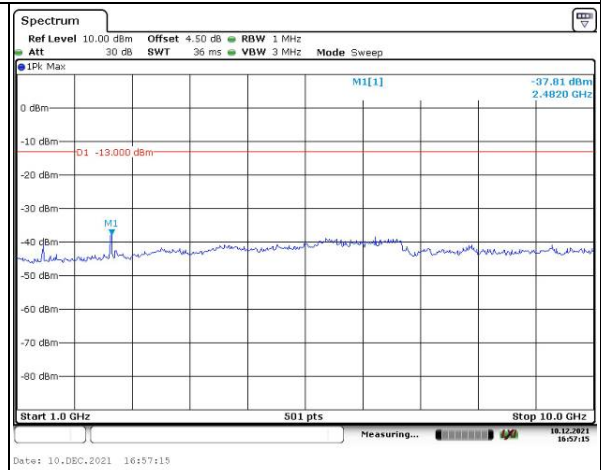
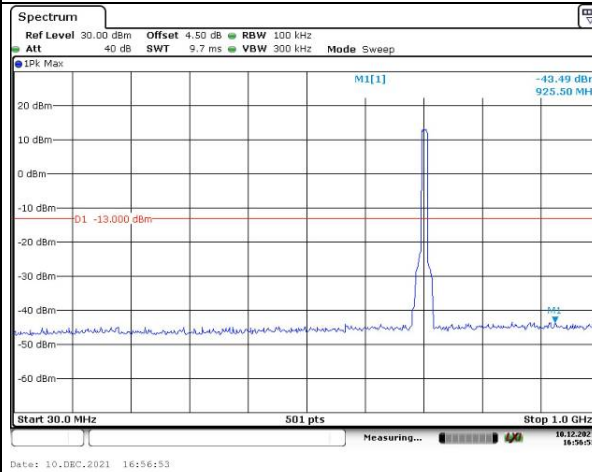


Spurious Emissions at Antenna Terminal

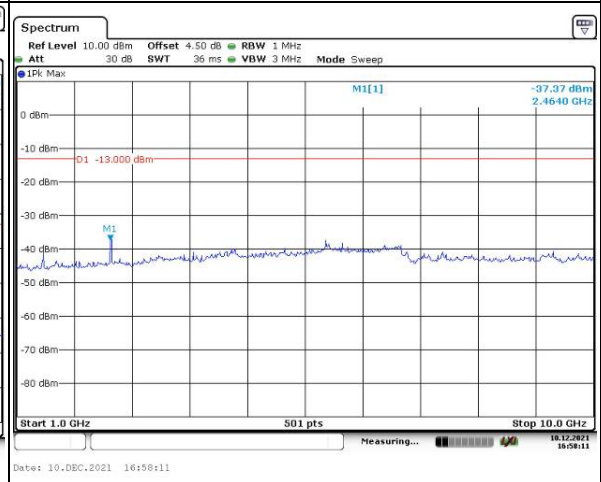
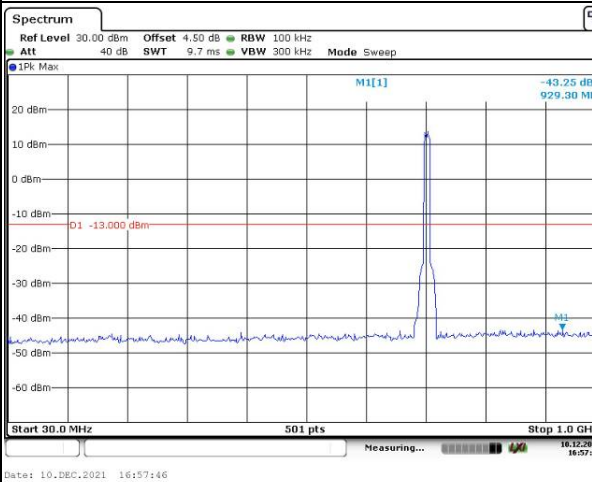
Channel

10MHz Bandwidth QPSK

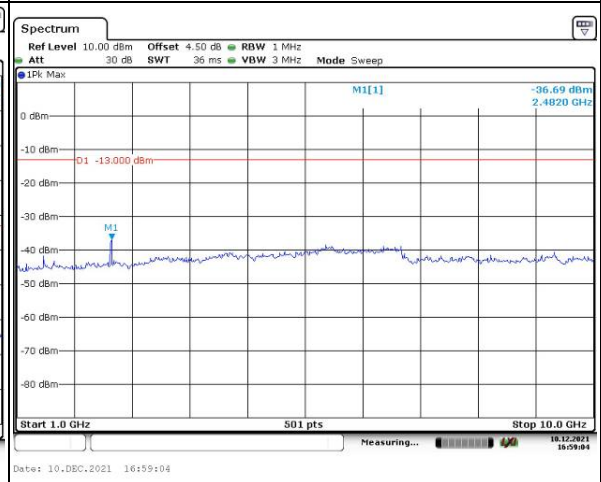
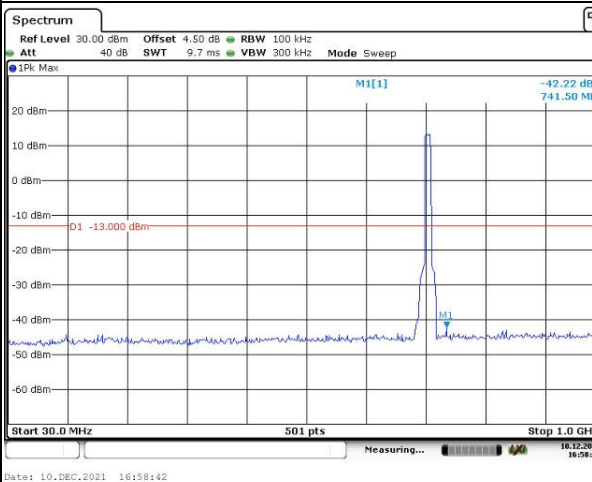
Lowest



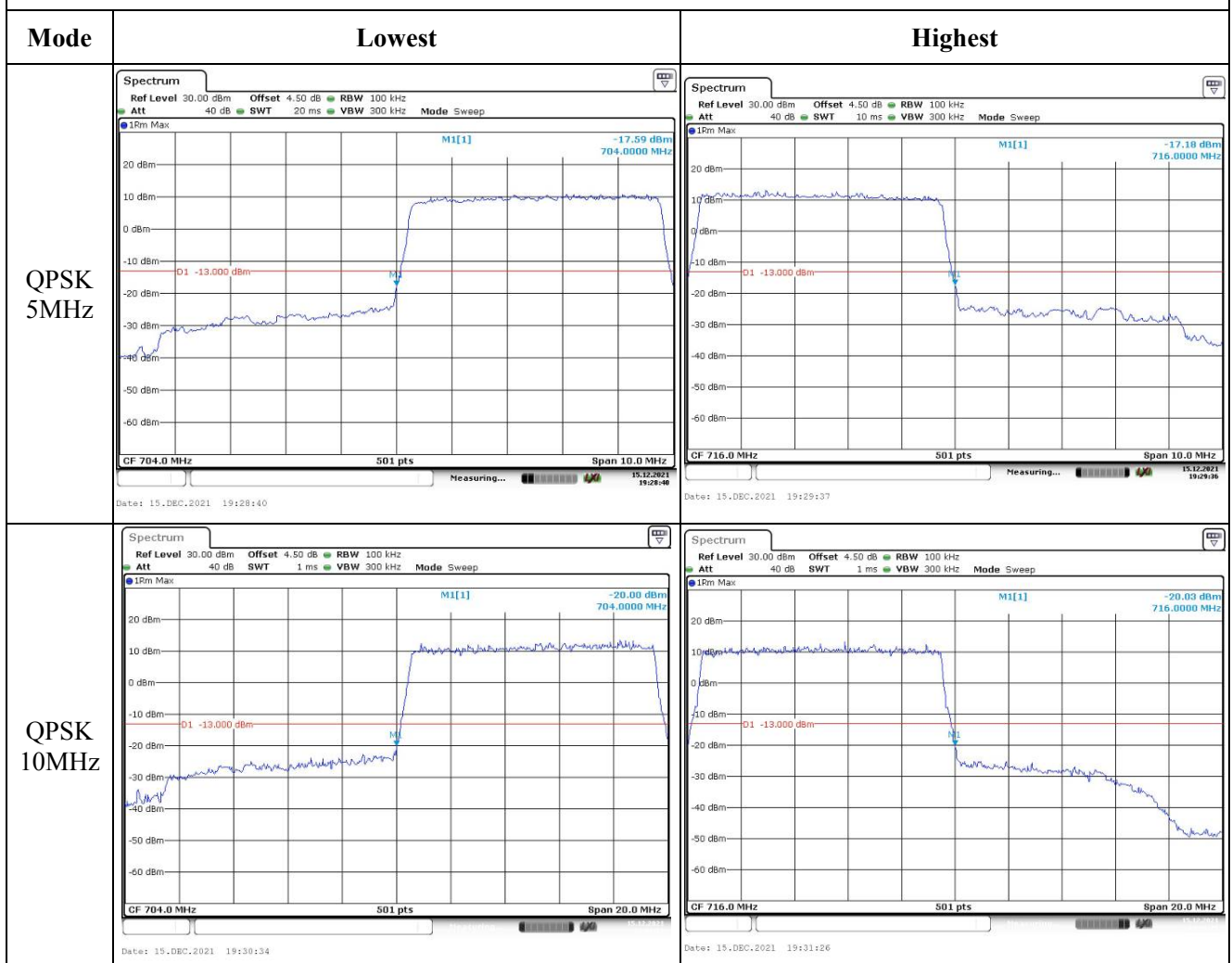
Middle



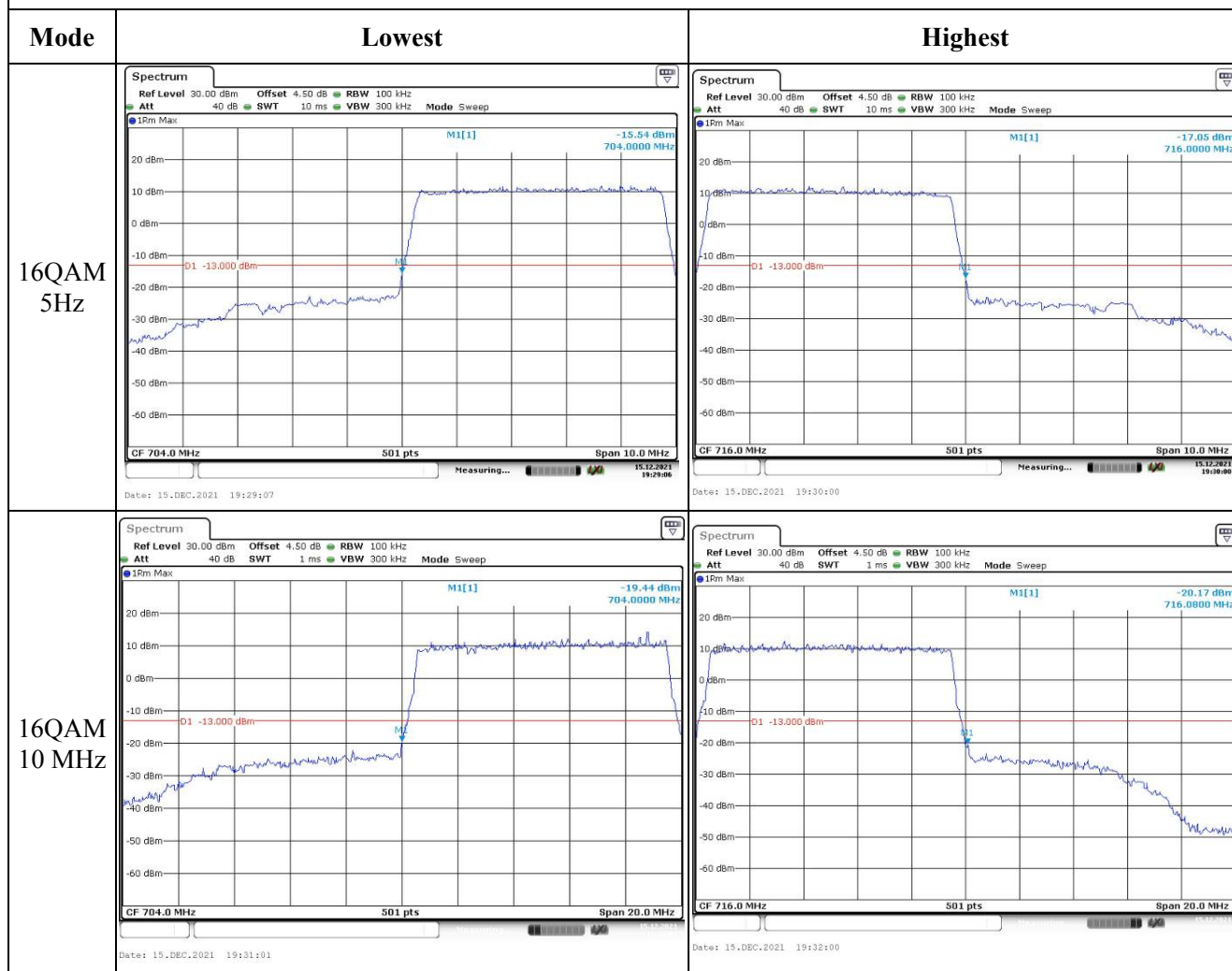
Highest



Out of band emission, Band Edge



Out of band emission, Band Edge



4.12 Antenna Port Test Data and Results for LTE Band 66

Serial Number:	CR21110023-RF-S1	Test Date:	2021-11-29~2022-01-06
Test Site:	RF	Test Mode:	Transmitting
Tester:	Wolf Mo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	22.1~25.9	Relative Humidity: (%)	60~66	ATM Pressure: (kPa)	101.2~101.4
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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
R&S	Wideband Radio Communication Tester	CMW500	149218	2021/7/22	2022/7/21
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

* 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 66▲:

Antenna Gain (dBi):	0.47	Cable Loss (dB):	0
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	1710.7	1745	1779.3
3MHz	1711.5	1745	1778.5
5MHz	1712.5	1745	1777.5
10MHz	1715	1745	1775
15MHz	1717.5	1745	1772.5
20MHz	1720	1745	1770

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	20.53	20.68	19.85	21.27	30
	RB1#3	20.60	20.70	19.90		
	RB1#5	20.58	20.70	19.88		
	RB3#0	20.56	20.59	20.74		
	RB3#3	20.58	20.63	20.80		
	RB6#0	19.52	19.67	19.82		
1.4MHz 16QAM	RB1#0	20.22	19.73	20.40	20.94	30
	RB1#3	20.27	19.75	20.47		
	RB1#5	20.22	19.77	20.45		
	RB3#0	19.70	19.62	19.68		
	RB3#3	19.74	19.64	19.94		
	RB6#0	18.94	19.17	19.15		
3MHz QPSK	RB1#0	20.47	20.52	20.80	21.27	30
	RB1#8	20.46	20.46	20.80		
	RB1#14	20.47	20.46	20.75		
	RB6#0	19.59	19.65	19.84		
	RB6#9	19.51	19.68	19.85		
	RB15#0	19.50	19.62	19.80		
3MHz 16QAM	RB1#0	20.00	20.37	19.59	20.9	30
	RB1#8	19.96	20.37	19.59		
	RB1#14	19.89	20.43	19.53		
	RB6#0	18.61	18.87	19.17		
	RB6#9	18.71	18.89	19.22		
	RB15#0	18.81	18.95	19.03		
5MHz QPSK	RB1#0	20.51	20.79	20.69	21.3	30
	RB1#13	20.56	20.72	20.74		
	RB1#24	20.48	20.83	20.68		
	RB15#0	19.58	19.69	19.78		
	RB15#10	19.52	19.70	19.74		
	RB25#0	19.61	19.62	19.83		
5MHz 16QAM	RB1#0	18.83	19.80	19.50	20.35	30
	RB1#13	18.87	19.82	19.52		
	RB1#24	18.85	19.88	19.56		
	RB15#0	18.88	18.74	19.01		
	RB15#10	18.87	18.74	19.00		
	RB25#0	18.86	18.87	18.82		
10MHz QPSK	RB1#0	20.39	20.54	20.72	21.27	30
	RB1#25	20.54	20.52	20.77		

	RB1#49	20.52	20.57	20.80		
	RB25#0	19.50	19.70	19.77		
	RB25#25	19.52	19.67	19.89		
	RB50#0	19.51	19.57	19.82		
10MHz 16QAM	RB1#0	19.70	20.25	19.25	20.78	30
	RB1#25	19.76	20.28	19.28		
	RB1#49	19.82	20.31	19.32		
	RB25#0	18.81	18.89	19.10		
	RB25#25	18.80	18.98	19.05		
	RB50#0	18.81	18.94	19.01		
15MHz QPSK	RB1#0	20.40	20.51	20.65	21.26	30
	RB1#38	20.48	20.49	20.71		
	RB1#74	20.48	20.56	20.79		
	RB36#0	19.52	19.50	19.72		
	RB36#39	19.61	19.73	19.72		
	RB75#0	19.56	19.55	19.78		
15MHz 16QAM	RB1#0	19.71	20.22	19.91	20.79	30
	RB1#38	19.80	20.27	20.05		
	RB1#74	19.82	20.32	20.09		
	RB36#0	18.91	18.88	18.94		
	RB36#39	18.88	18.95	19.03		
	RB75#0	18.85	18.88	18.89		
20MHz QPSK	RB1#0	20.60	20.48	20.65	21.29	30
	RB1#50	20.71	20.58	20.69		
	RB1#99	20.79	20.67	20.82		
	RB50#0	19.58	19.55	19.67		
	RB50#50	19.70	19.64	19.74		
	RB100#0	19.71	19.75	19.81		
20MHz 16QAM	RB1#0	19.50	20.30	20.47	21.02	30
	RB1#50	19.59	20.29	20.44		
	RB1#99	19.56	20.39	20.55		
	RB50#0	18.84	19.01	18.87		
	RB50#50	18.85	19.04	18.98		
	RB100#0	18.76	18.90	19.05		
Note: EIRP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(dBi)						
					Result:	Pass

Peak-to-average Ratio(PAR)					
Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
20MHz QPSK	RB1#0	5.83	5.28	4.41	13
	RB100#0	5.36	5.33	4.93	13
20MHz 16QAM	RB1#0	7.01	5.94	5.36	13
	RB100#0	6.23	6.17	5.91	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	1.096	1.102	1.098	1.260	1.260	1.259
1.4MHz 16QAM	1.098	1.108	1.108	1.263	1.260	1.260
3MHz QPSK	2.695	2.695	2.683	3.000	3.000	3.024
3MHz 16QAM	2.695	2.695	2.695	3.012	3.000	3.024
5MHz QPSK	4.511	4.511	4.511	5.000	5.000	4.980
5MHz 16QAM	4.511	4.531	4.551	5.000	5.020	5.000
10MHz QPSK	8.982	8.942	8.942	9.800	9.800	9.760
10MHz 16QAM	8.982	8.982	8.942	9.720	9.840	9.840
15MHz QPSK	13.533	13.473	13.473	15.060	15.060	15.120
15MHz 16QAM	13.533	13.533	13.533	15.060	15.120	15.060
20MHz QPSK	18.044	17.964	17.964	19.520	19.680	19.840
20MHz 16QAM	18.044	18.044	17.964	19.680	19.840	19.680
Note: The test plots please refer to the Plots of Occupied Bandwidth						

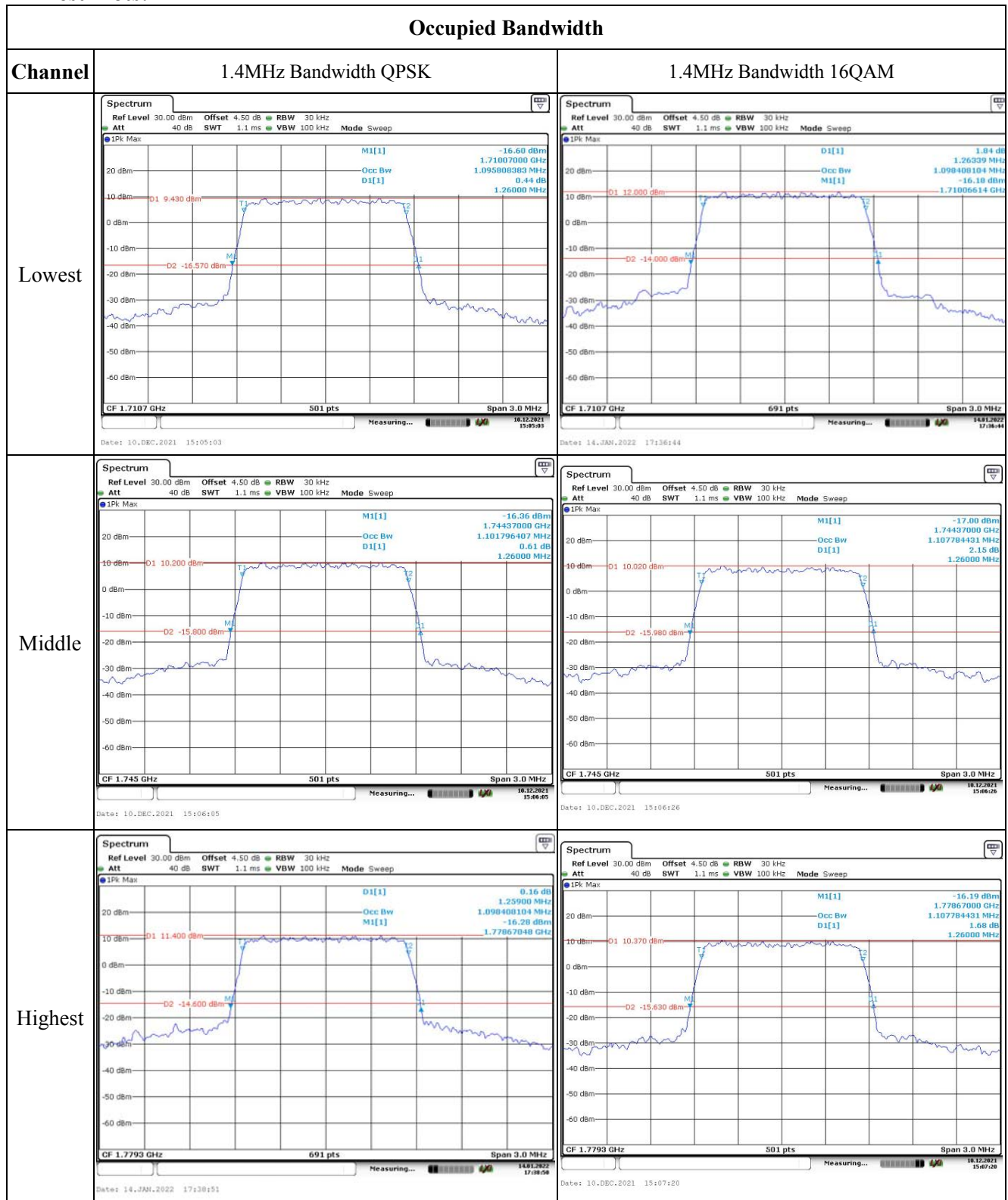
FCC §2.1051, § 27.53:Spurious Emissions at Antenna Terminal	
Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.

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

FCC §2.1055, §27.54: Frequency Stability						
Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.7	1710.529	1710.00	1779.511	1780
	-20	3.7	1710.522	1710.00	1779.511	1780
	-10	3.7	1710.529	1710.00	1779.512	1780
	0	3.7	1710.526	1710.00	1779.511	1780
	10	3.7	1710.525	1710.00	1779.514	1780
	20	3.7	1710.529	1710.00	1779.511	1780
	30	3.7	1710.529	1710.00	1779.513	1780
	40	3.7	1710.528	1710.00	1779.511	1780
	50	3.7	1710.527	1710.00	1779.510	1780
Frequency Stability vs. Voltage	20	3.5	1710.529	1710.00	1779.511	1780
	20	4.2	1710.524	1710.00	1779.510	1780
					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	3.7	1710.529	1710.00	1779.511	1780
	-20	3.7	1710.522	1710.00	1779.510	1780
	-10	3.7	1710.529	1710.00	1779.512	1780
	0	3.7	1710.526	1710.00	1779.511	1780
	10	3.7	1710.525	1710.00	1779.514	1780
	20	3.7	1710.529	1710.00	1779.511	1780
	30	3.7	1710.527	1710.00	1779.513	1780
	40	3.7	1710.528	1710.00	1779.511	1780
	50	3.7	1710.527	1710.00	1779.510	1780
Frequency Stability vs. Voltage	20	3.5	1710.529	1710.00	1779.511	1780
	20	4.2	1710.524	1710.00	1779.510	1780
					Result:	Pass

Test Plots:



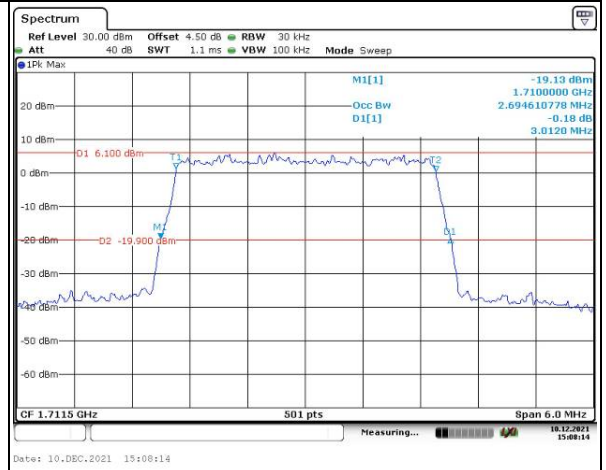
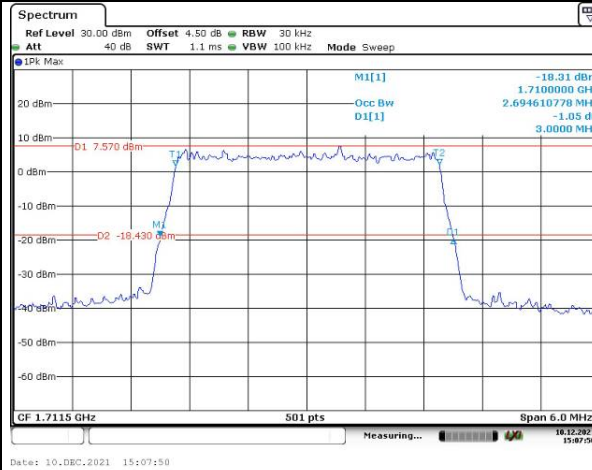
Occupied Bandwidth

Channel

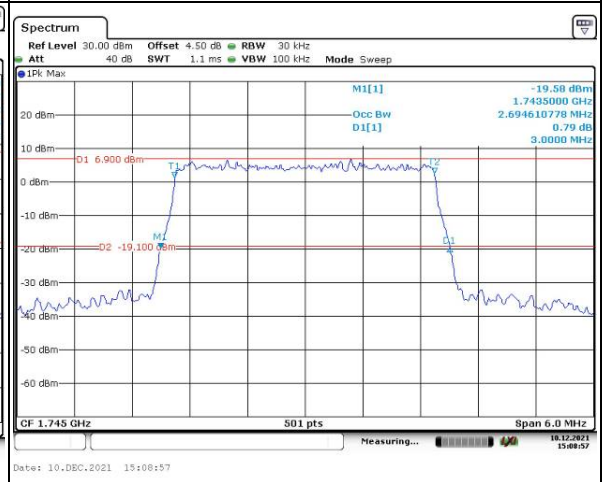
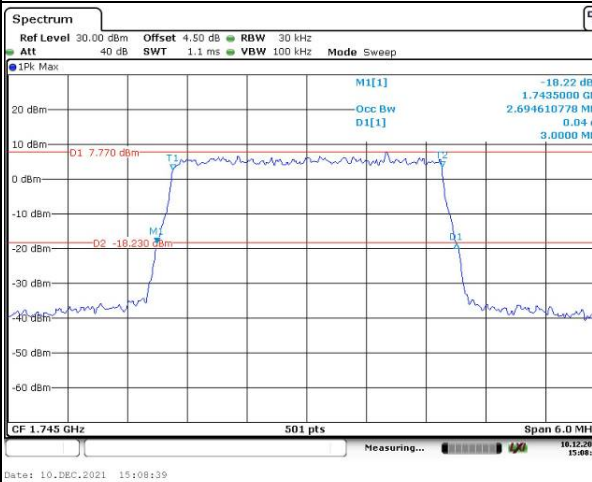
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

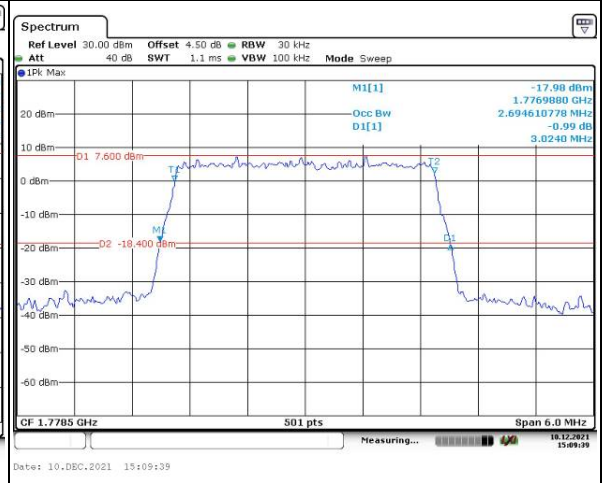
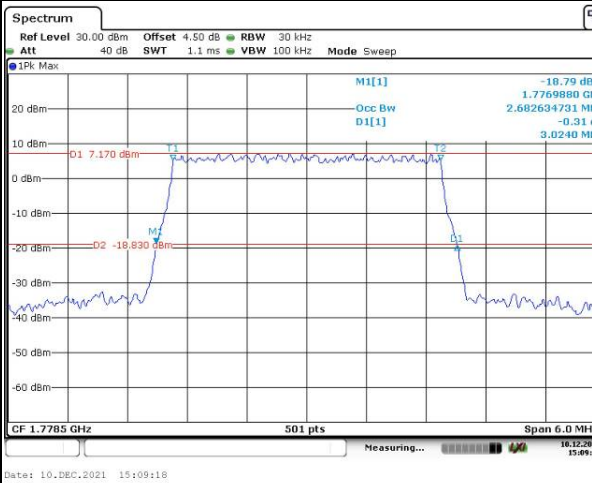
Lowest



Middle



Highest



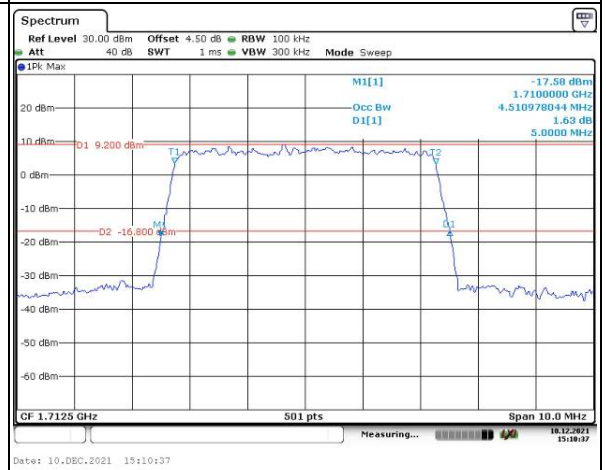
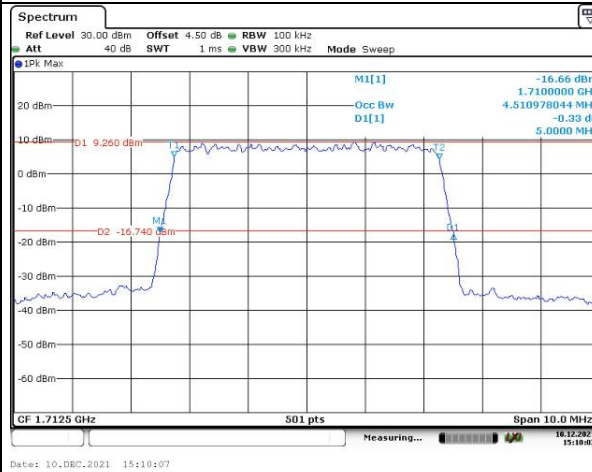
Occupied Bandwidth

Channel

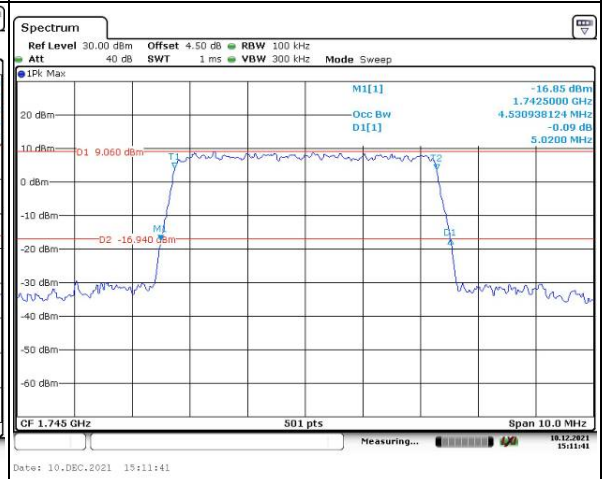
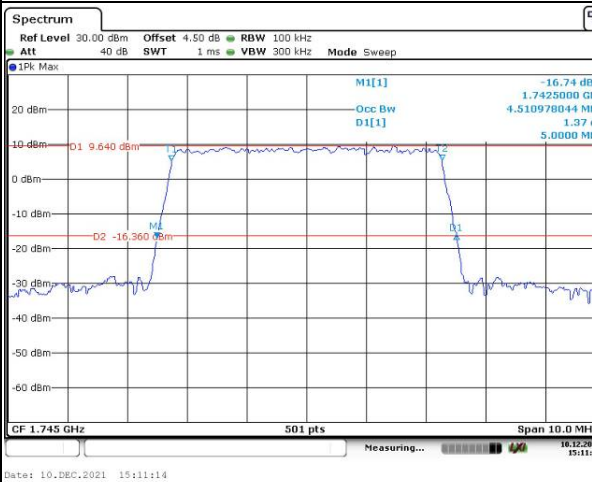
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

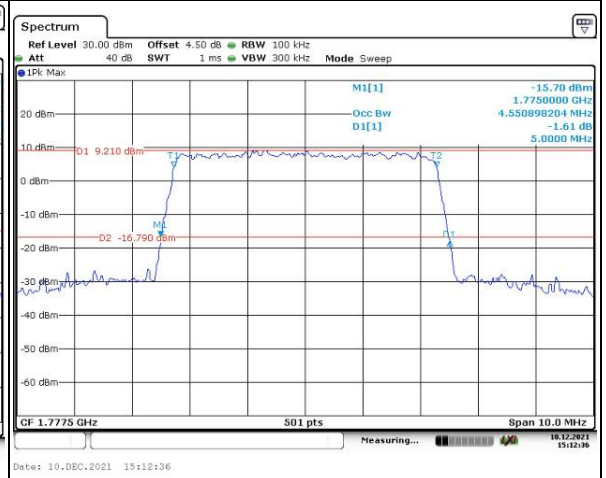
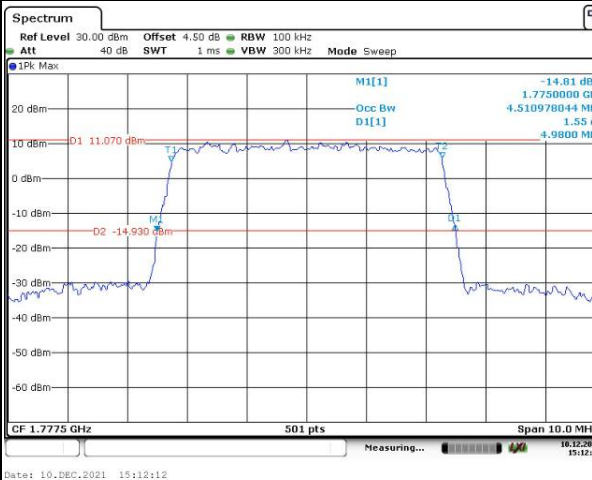
Lowest



Middle



Highest



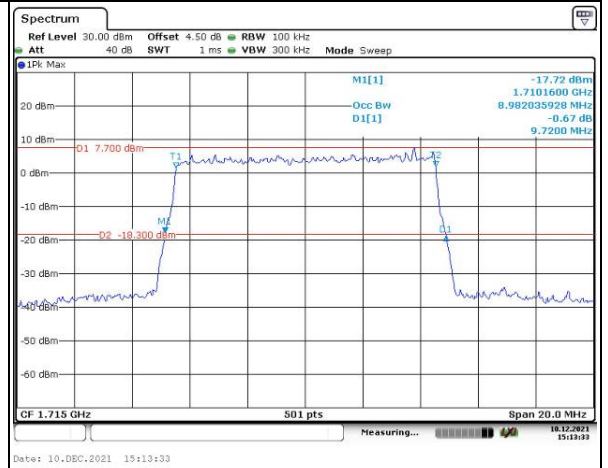
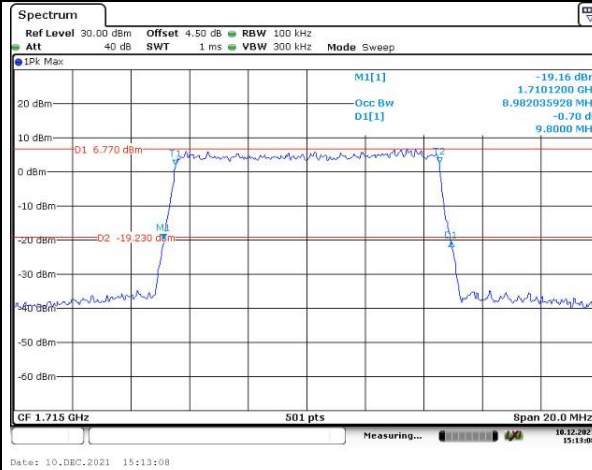
Occupied Bandwidth

Channel

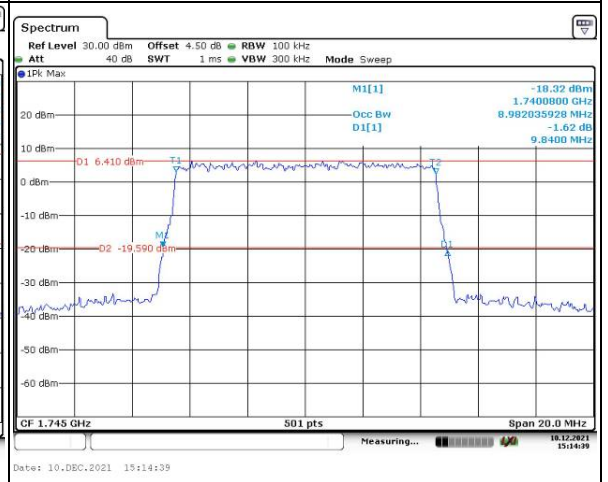
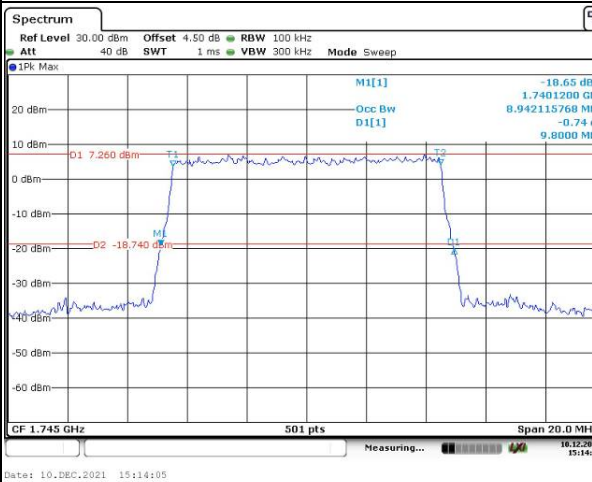
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

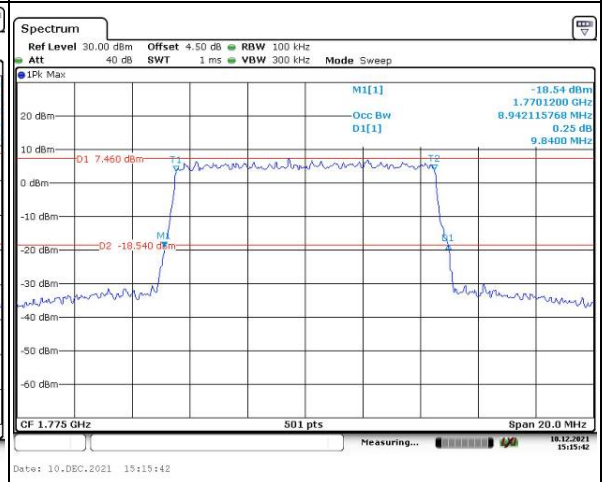
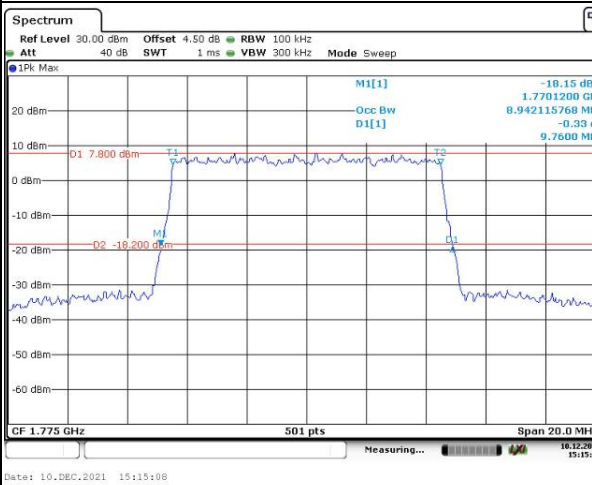
Lowest



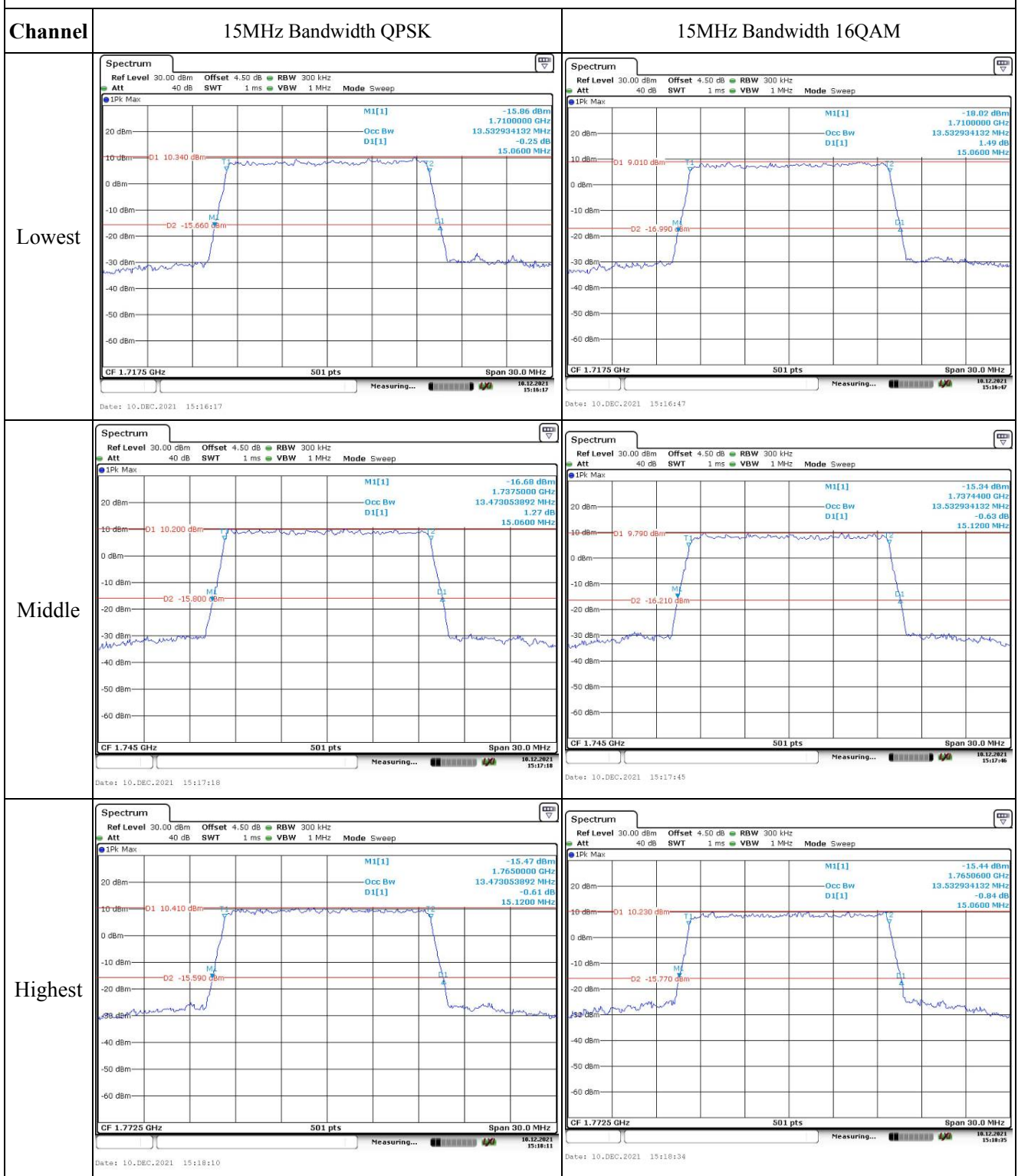
Middle



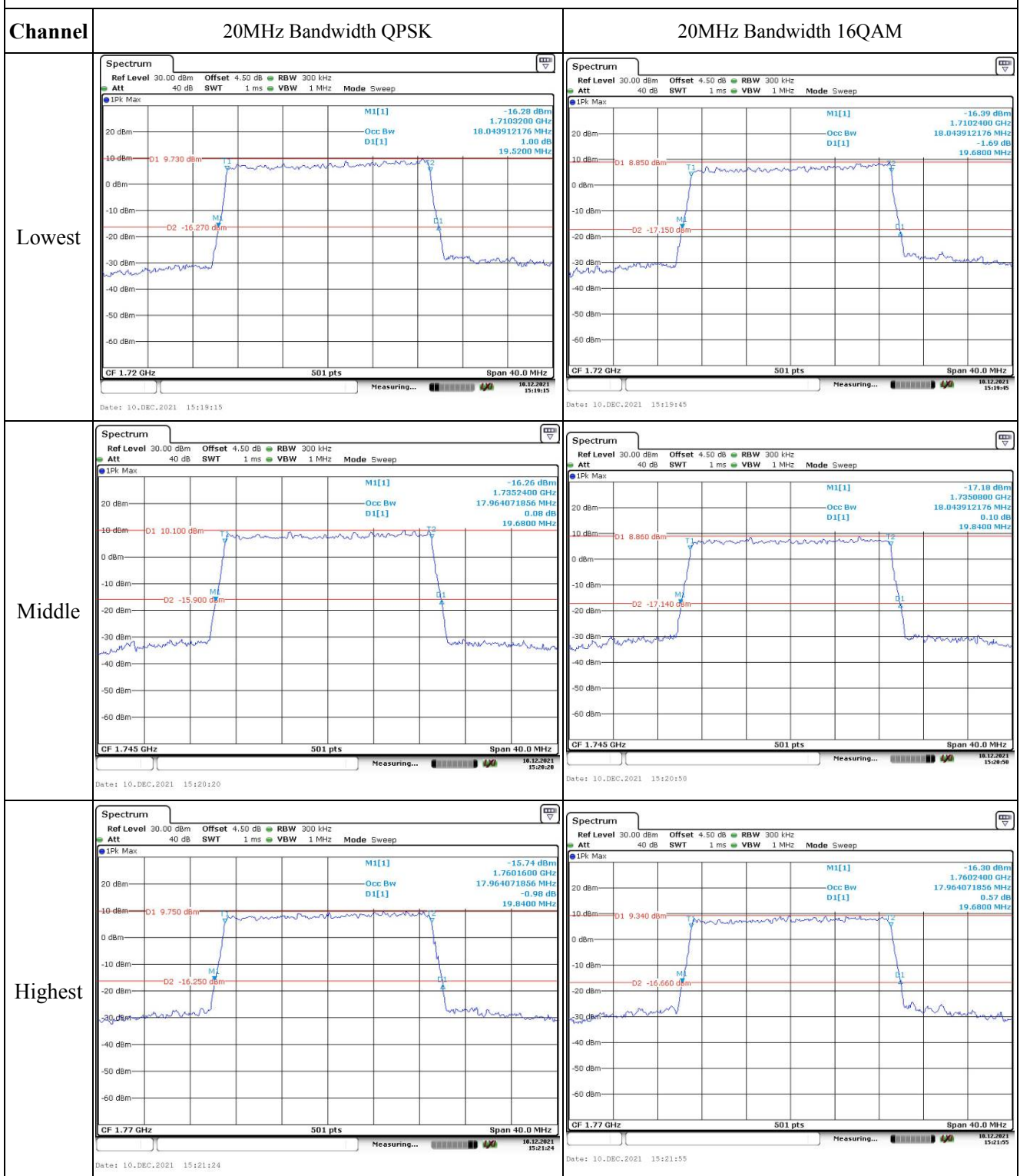
Highest



Occupied Bandwidth



Occupied Bandwidth

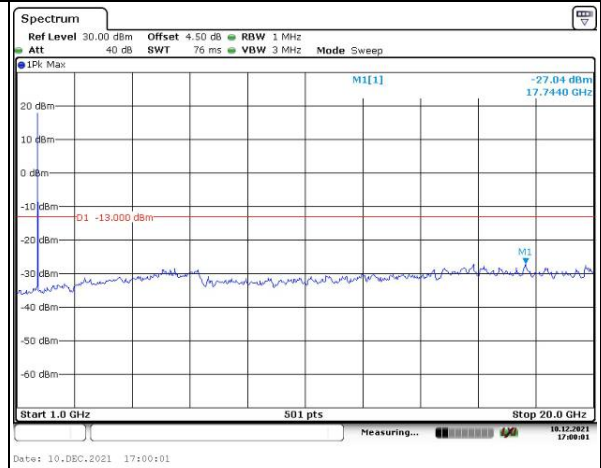
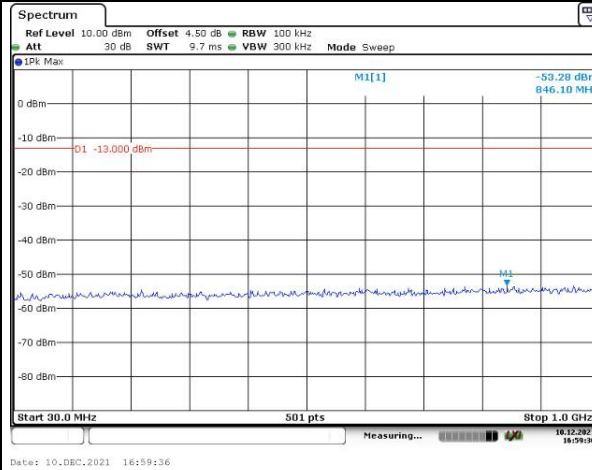


Spurious Emissions at Antenna Terminal

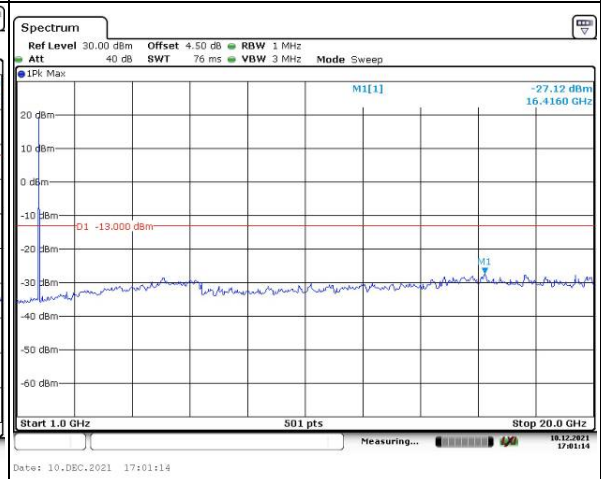
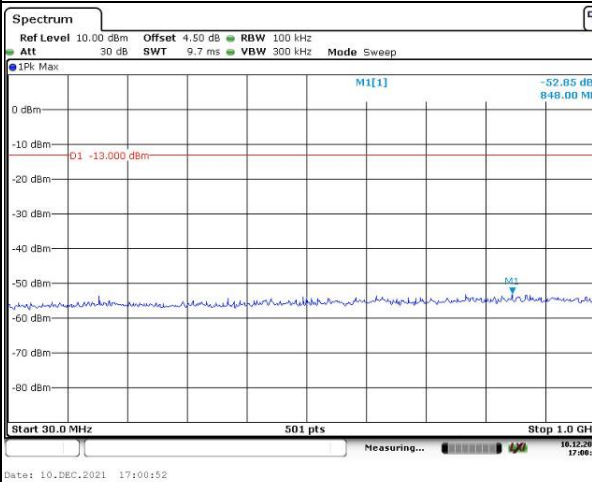
Channel

1.4MHz Bandwidth QPSK

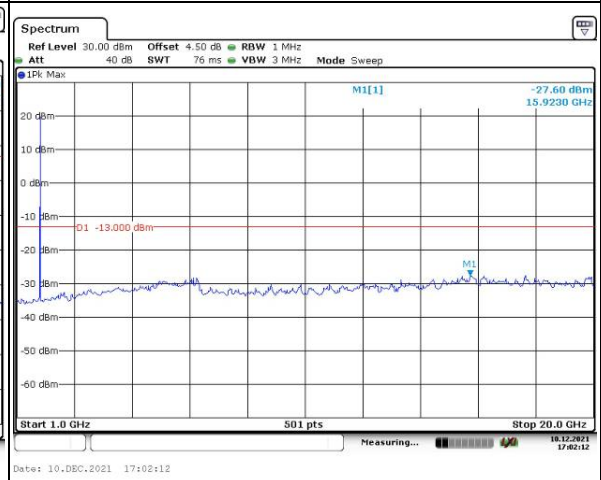
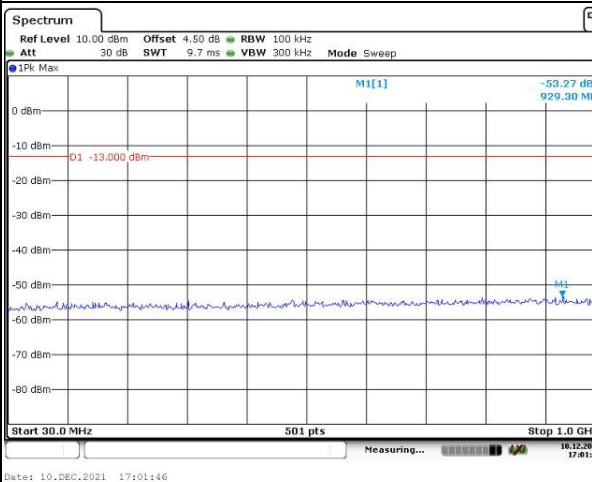
Lowest



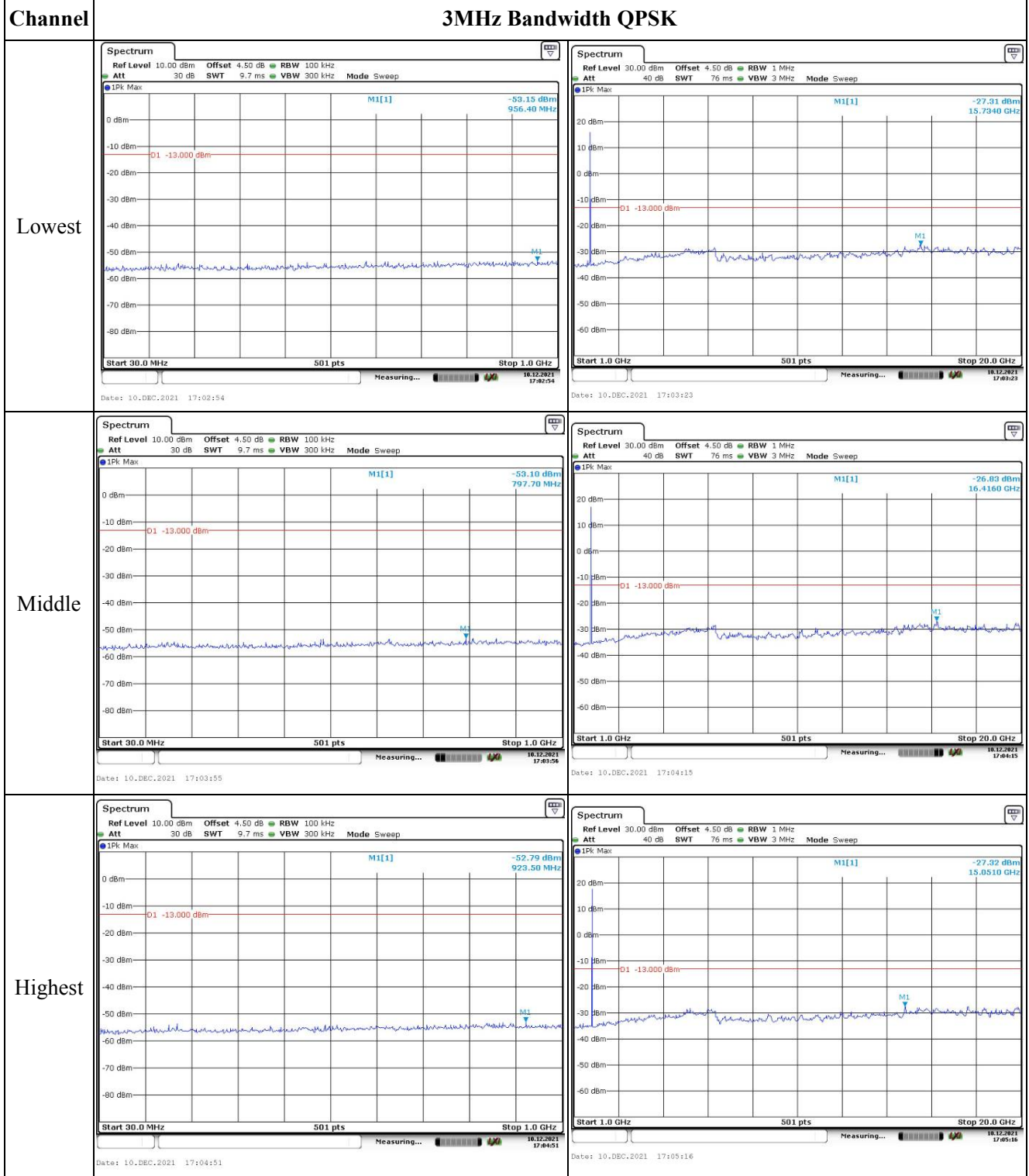
Middle



Highest



Spurious Emissions at Antenna Terminal

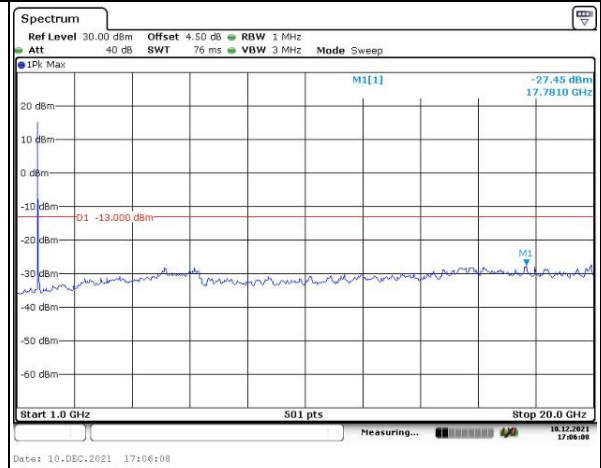
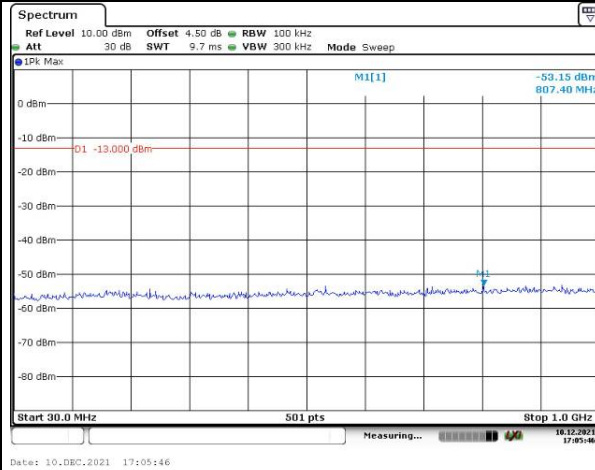


Spurious Emissions at Antenna Terminal

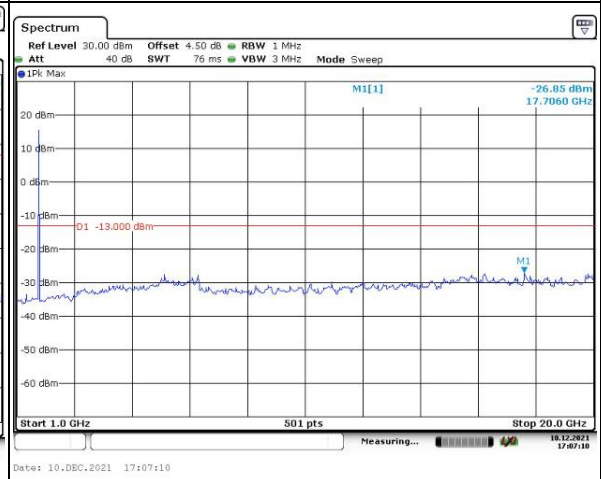
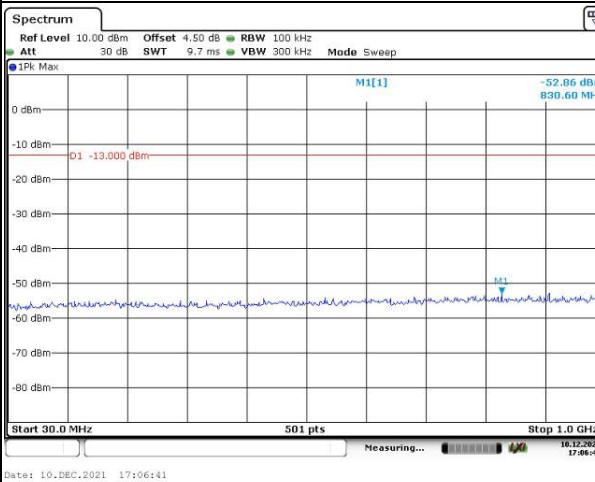
Channel

5MHz Bandwidth QPSK

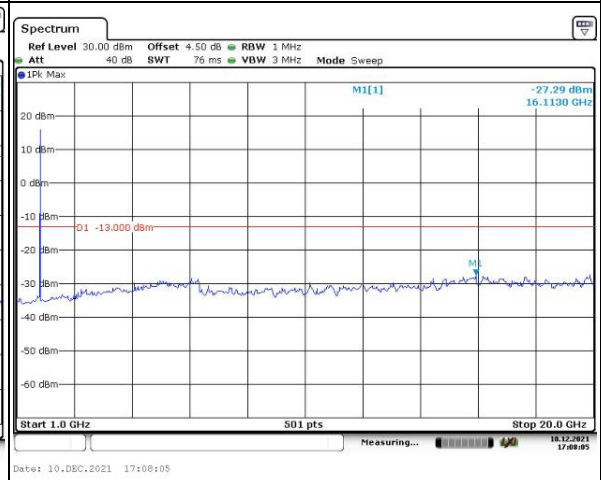
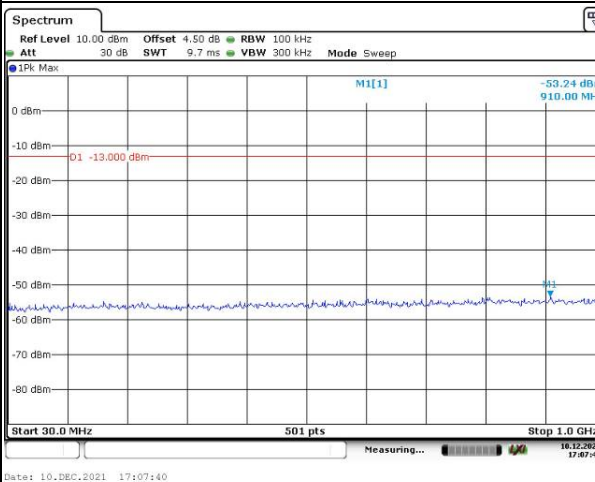
Lowest



Middle



Highest

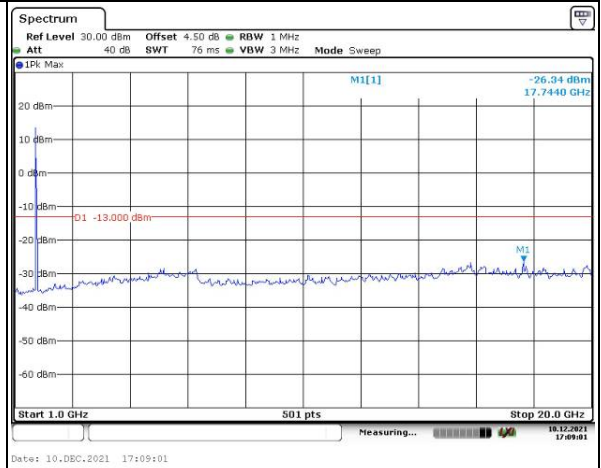
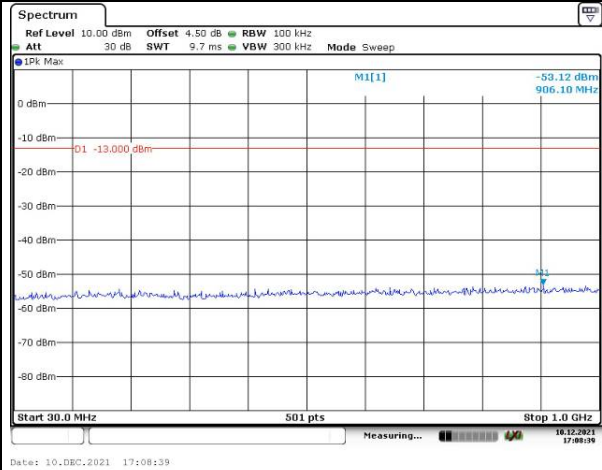


Spurious Emissions at Antenna Terminal

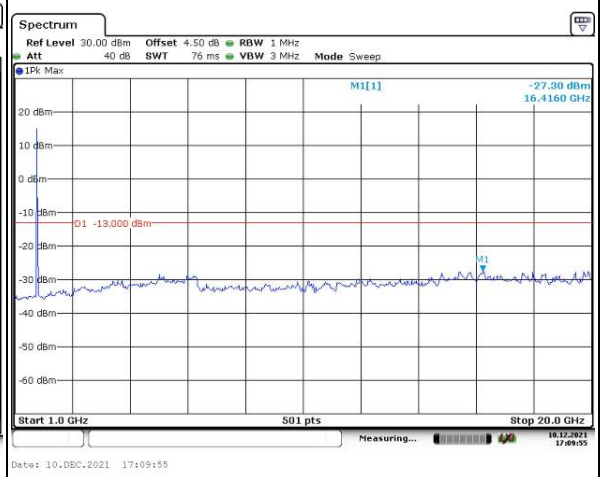
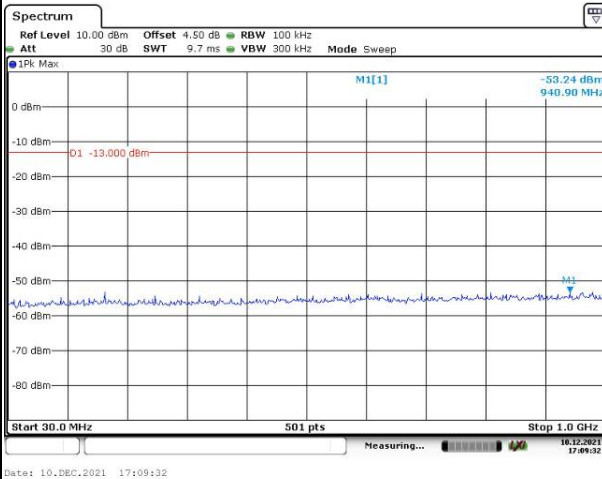
Channel

10MHz Bandwidth QPSK

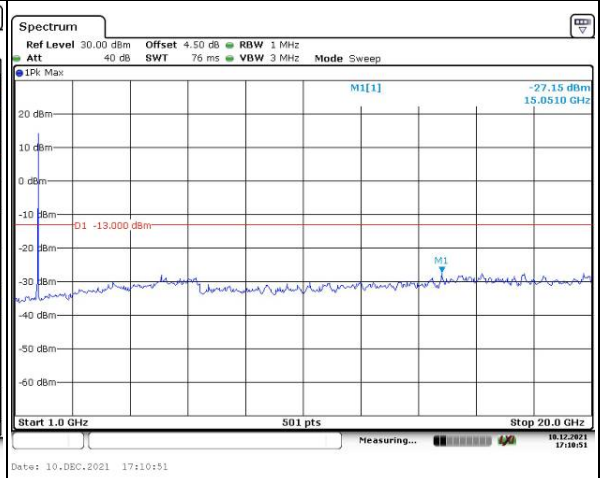
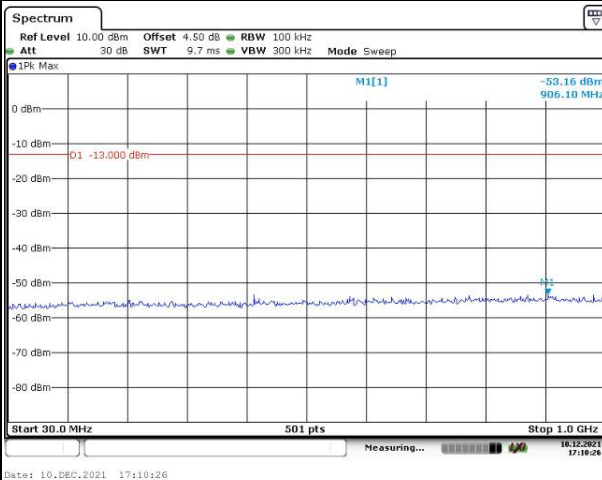
Lowest



Middle



Highest

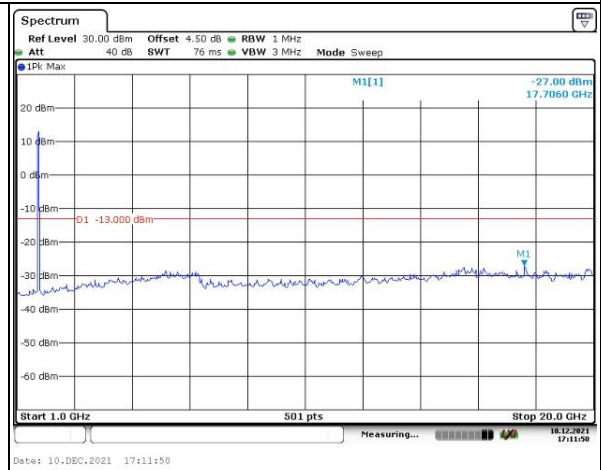
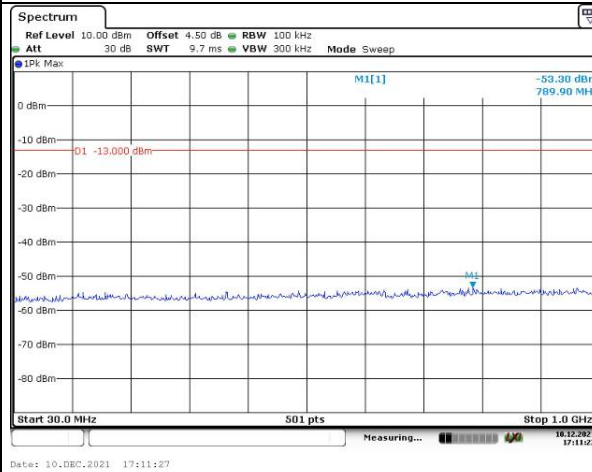


Spurious Emissions at Antenna Terminal

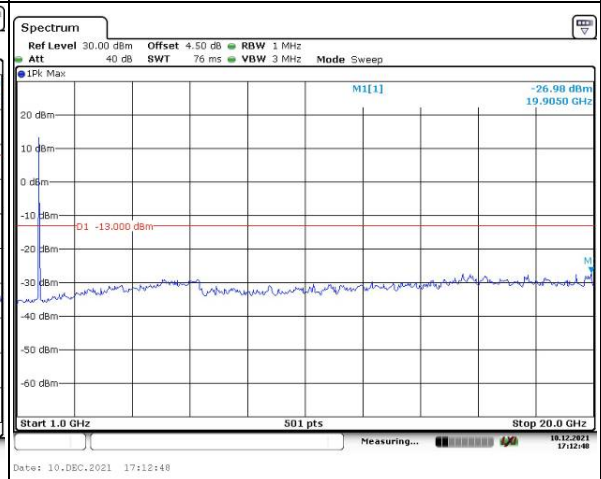
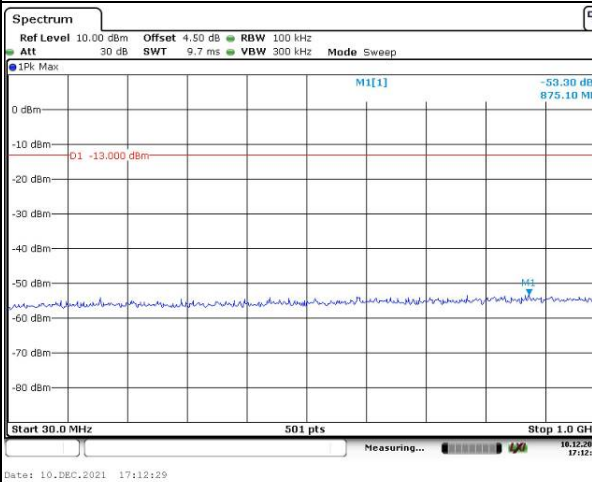
Channel

15MHz Bandwidth QPSK

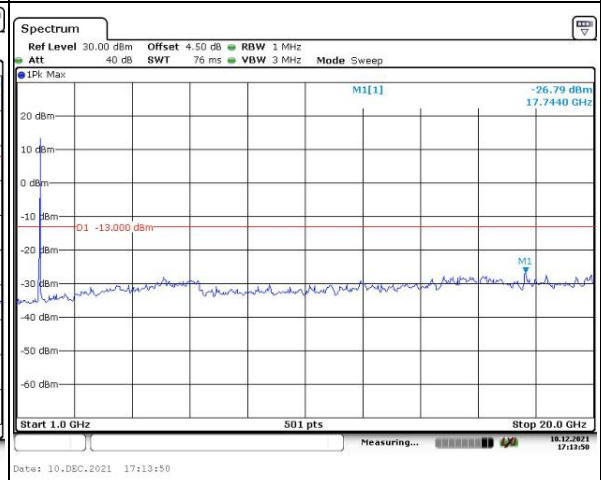
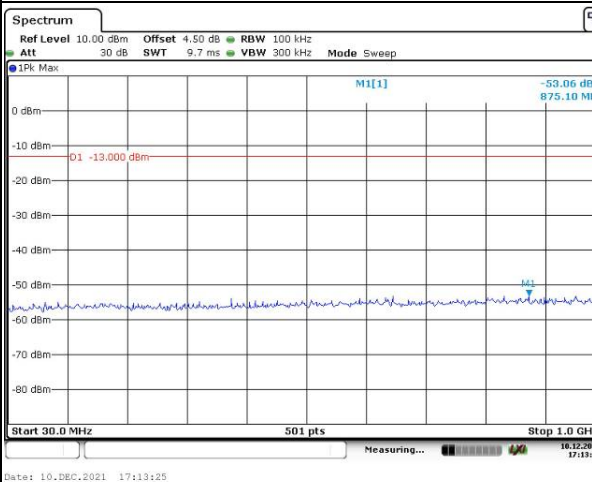
Lowest



Middle



Highest

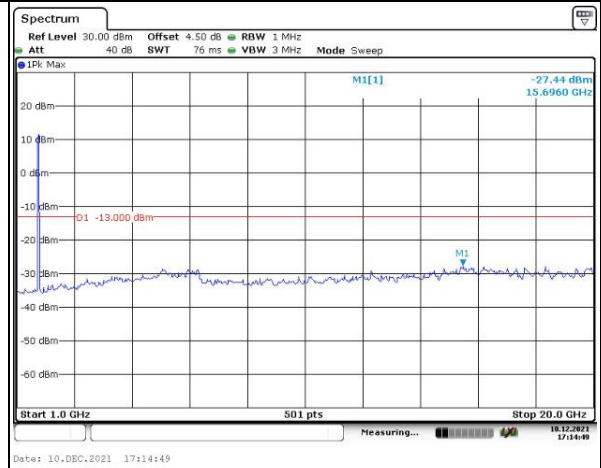
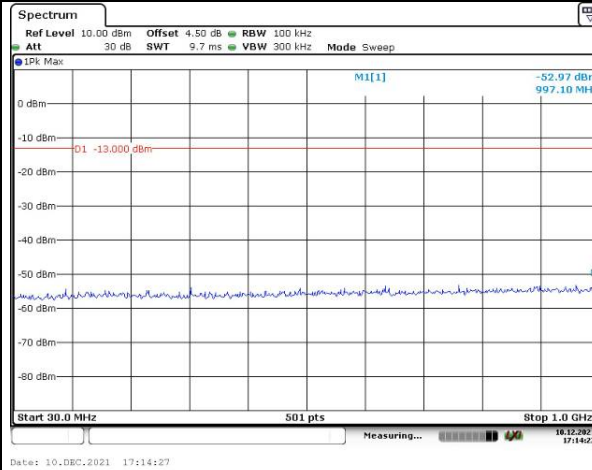


Spurious Emissions at Antenna Terminal

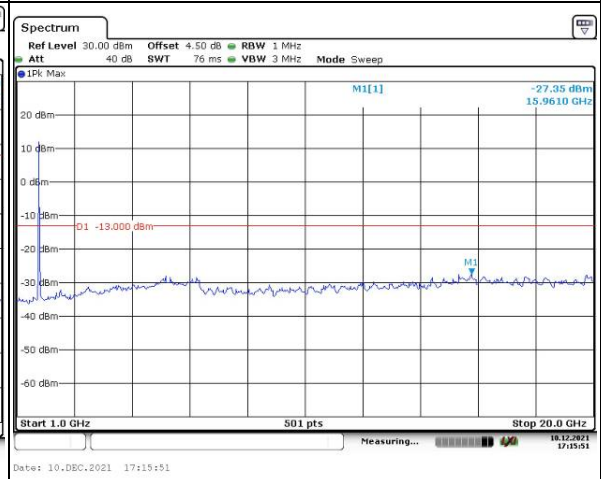
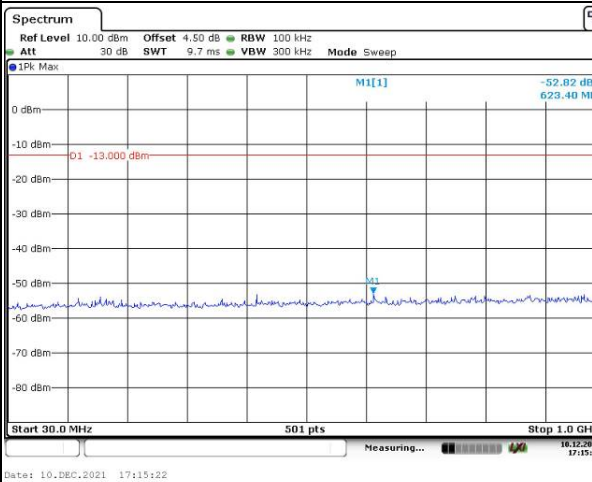
Channel

20MHz Bandwidth QPSK

Lowest



Middle



Highest

