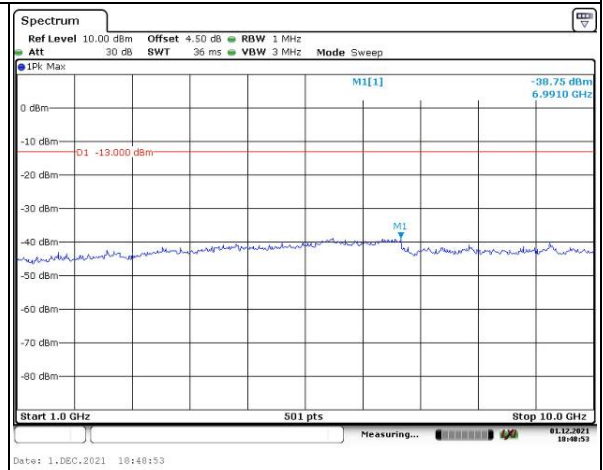
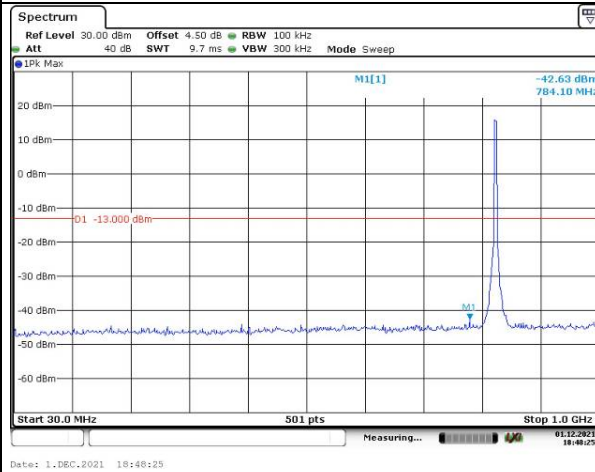


Spurious Emissions at Antenna Terminal

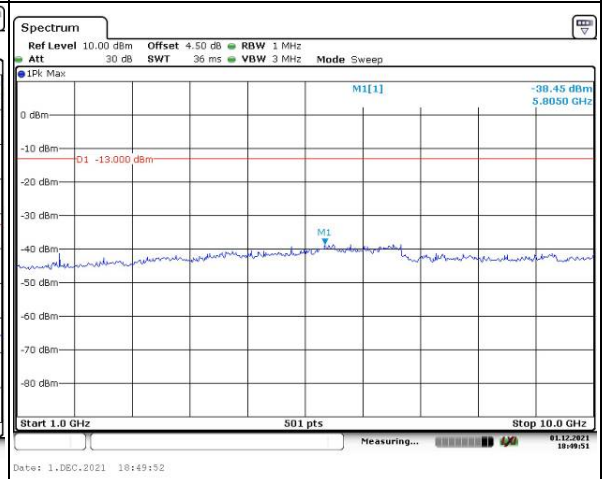
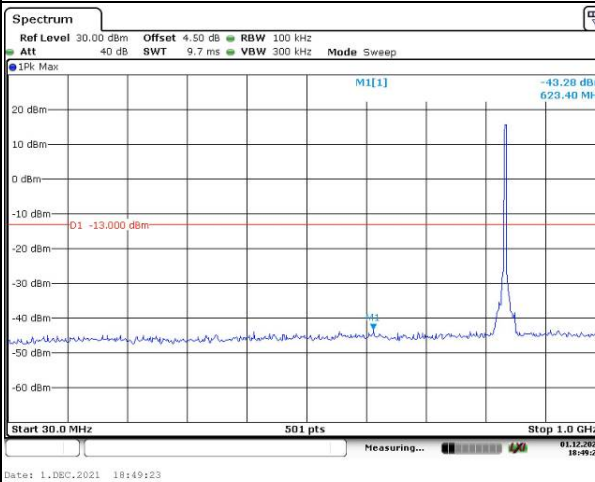
Channel

5MHz Bandwidth QPSK

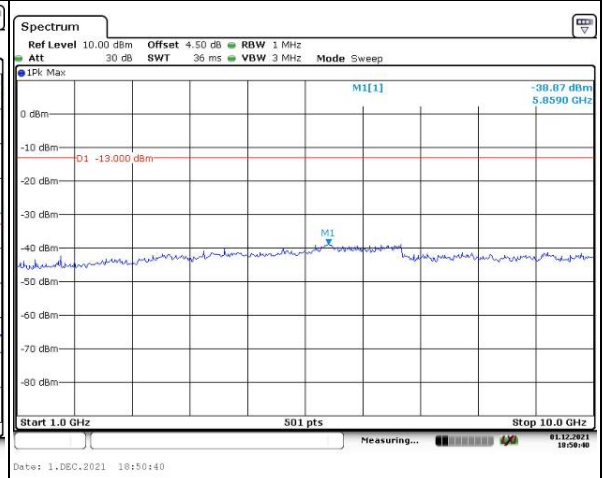
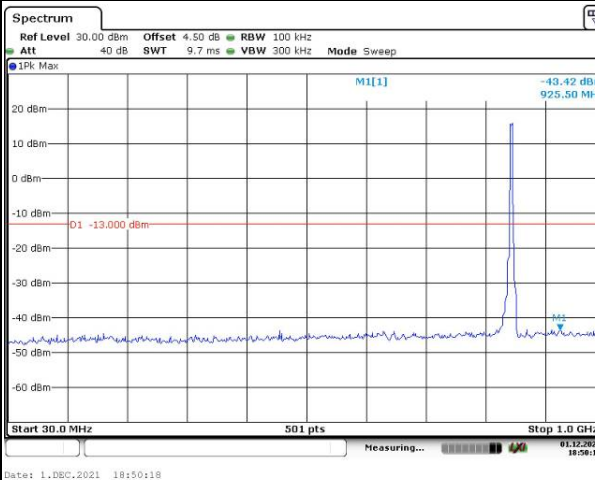
Lowest



Middle



Highest

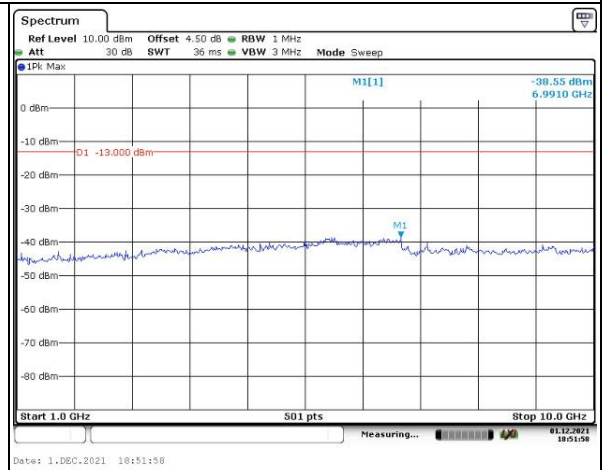
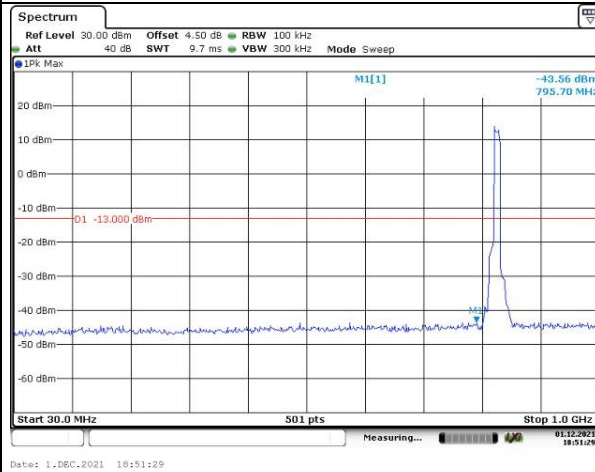


Spurious Emissions at Antenna Terminal

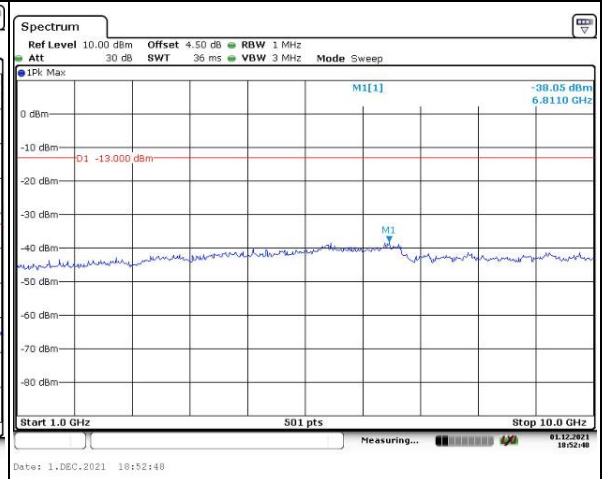
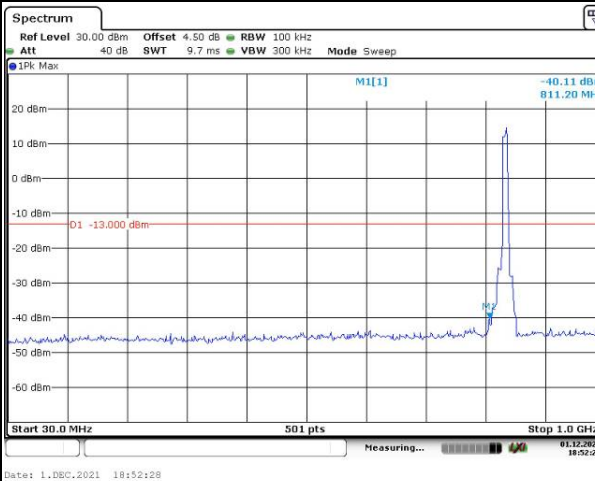
Channel

10MHz Bandwidth QPSK

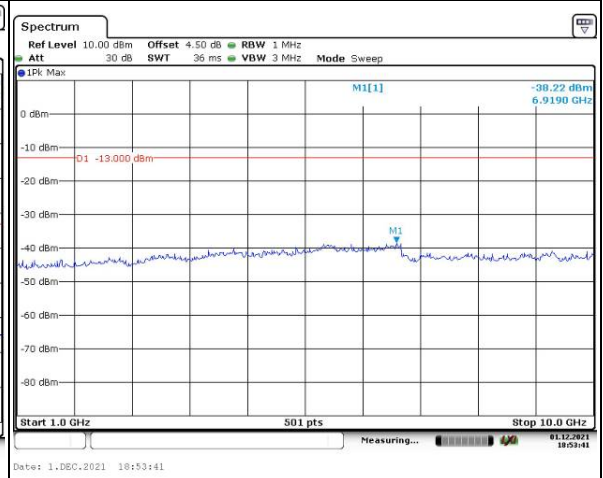
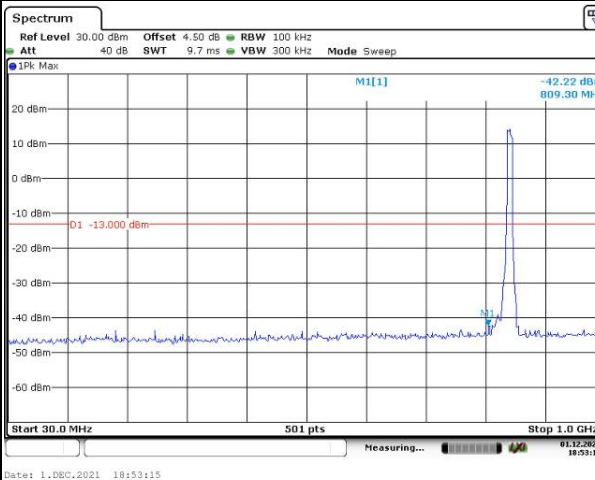
Lowest



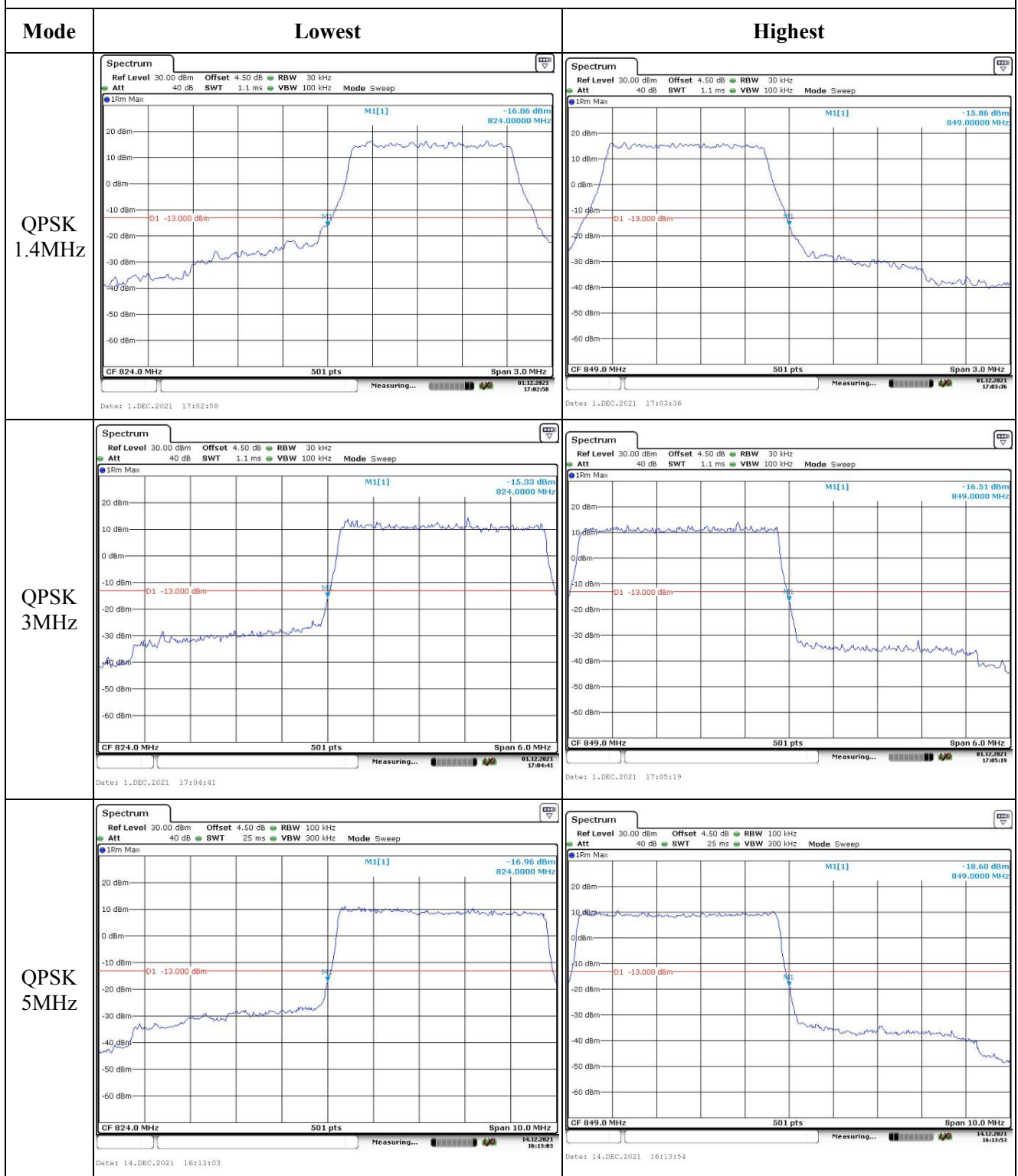
Middle



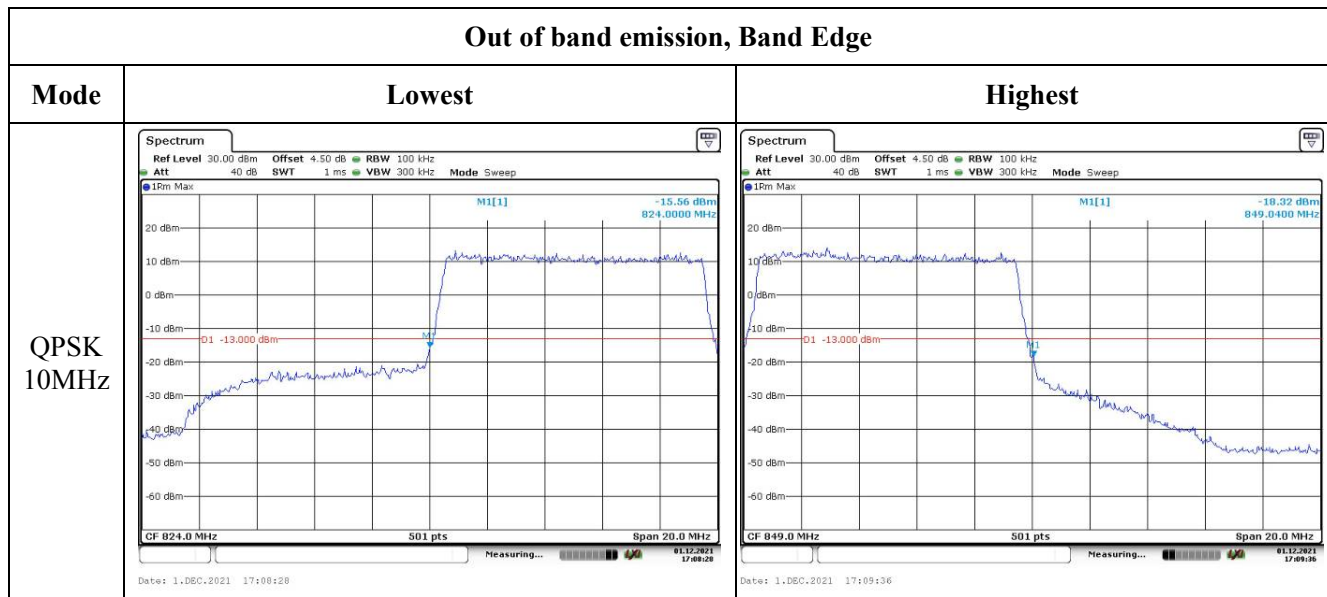
Highest



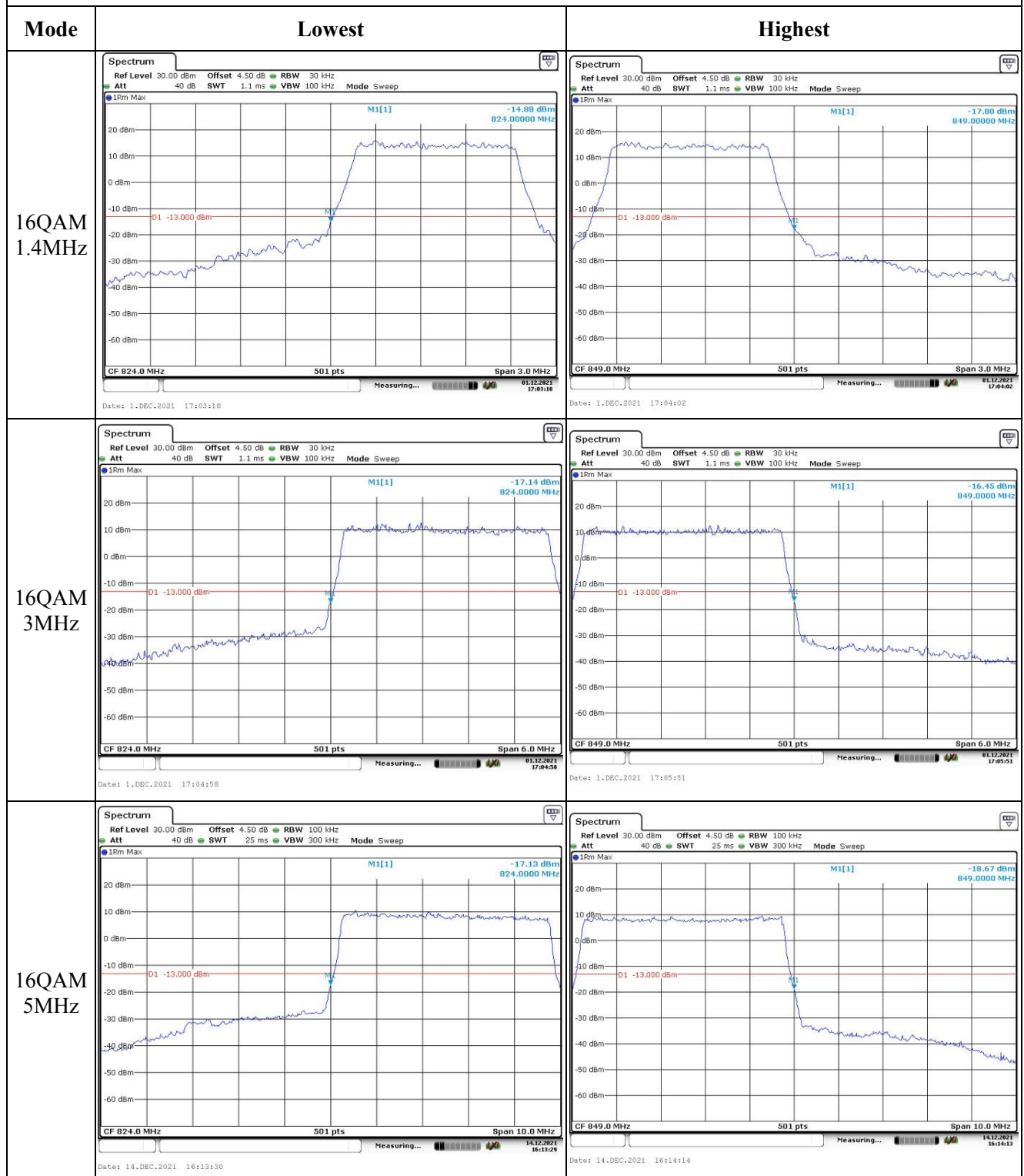
Out of band emission, Band Edge



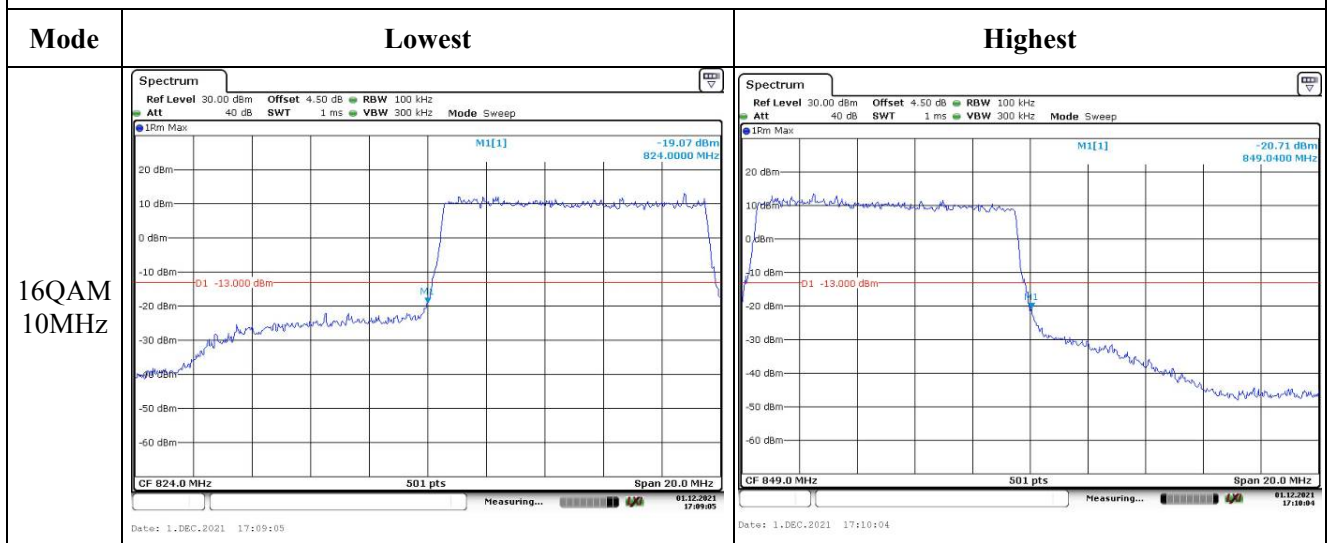
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.9 Antenna Port Test Data and Results for LTE Band 7:

Serial Number:	CR21110087-S1	Test Date:	2021/12/01~2021/12/14
Test Site:	RF	Test Mode:	Transmitting
Tester:	Wolf Mo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	22.3~22.7	Relative Humidity: (%)	31~44	ATM Pressure: (kPa)	101.5~101.9
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	Spectrum Analyzer	101474	2021/7/22	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
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D09	N/A	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 7▲:

Antenna Gain (dBi):	1	Cable Loss (dB):	0.5
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	2502.5	2535	2567.5
10MHz	2505	2535	2565
15MHz	2507.5	2535	2562.5
20MHz	2510	2535	2560

Test Data:**FCC§2.1046;§ 27.50(h)(2)****RF Output Power:**

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
5MHz QPSK	RB1#0	22.03	22.38	21.95	23.01	33
	RB1#13	21.95	22.13	22.12		
	RB1#24	22.17	22.51	22.23		
	RB15#0	21.42	21.27	21.27		
	RB15#10	21.26	21.28	21.29		
	RB25#0	21.36	21.27	21.30		
5MHz 16QAM	RB1#0	21.28	21.50	21.17	22	33
	RB1#13	20.45	21.15	20.67		
	RB1#24	20.54	21.38	20.83		
	RB15#0	20.54	20.02	20.18		
	RB15#10	20.46	20.14	20.11		
	RB25#0	20.66	20.35	20.22		
10MHz QPSK	RB1#0	22.49	22.51	22.29	23.01	33
	RB1#25	22.21	22.50	22.11		
	RB1#49	22.23	22.40	22.20		
	RB25#0	21.38	21.42	21.28		
	RB25#25	21.15	21.34	21.31		
	RB50#0	21.28	21.43	21.41		
10MHz 16QAM	RB1#0	21.59	21.77	21.38	22.27	33
	RB1#25	21.26	21.46	21.30		
	RB1#49	21.03	21.33	21.31		
	RB25#0	20.41	20.55	20.45		
	RB25#25	20.10	20.35	20.29		
	RB50#0	20.28	20.36	20.43		
15MHz QPSK	RB1#0	22.42	22.53	22.24	23.03	33
	RB1#38	22.10	22.25	22.17		
	RB1#74	22.34	22.25	22.50		
	RB36#0	21.30	21.34	21.32		
	RB36#39	21.16	21.39	21.33		
	RB75#0	21.24	21.40	21.31		
15MHz 16QAM	RB1#0	21.51	22.11	21.62	22.61	33
	RB1#38	21.06	21.41	21.44		
	RB1#74	21.24	21.93	21.65		
	RB36#0	20.43	20.44	20.23		
	RB36#39	20.17	20.37	20.38		
	RB75#0	20.36	20.41	20.31		

20MHz QPSK	RB1#0	22.52	22.50	22.30	23.13	33
	RB1#50	22.28	22.63	22.21		
	RB1#99	22.40	22.53	22.61		
	RB50#0	21.34	21.42	21.18		
	RB50#50	21.21	21.37	21.36		
	RB100#0	21.34	21.45	21.26		
20MHz 16QAM	RB1#0	21.34	22.05	22.33	22.83	33
	RB1#50	21.19	21.56	22.27		
	RB1#99	21.47	21.02	21.87		
	RB50#0	20.50	20.42	20.01		
	RB50#50	20.28	20.36	20.16		
	RB100#0	20.35	20.46	20.30		
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	3.71	4.32	4.20	13
	RB100#0	4.58	4.90	4.64	13
20MHz 16QAM	RB1#0	4.67	5.51	5.07	13
	RB100#0	5.57	5.86	5.68	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	4.531	4.511	4.511	5.060	5.060	5.040
5MHz 16QAM	4.511	4.551	4.531	5.000	5.060	5.080
10MHz QPSK	8.942	8.942	8.942	9.800	9.760	9.760
10MHz 16QAM	8.942	8.942	8.981	9.720	9.800	9.720
15MHz QPSK	13.533	13.473	13.473	14.760	14.700	14.700
15MHz 16QAM	13.533	13.533	13.473	14.700	14.700	14.700
20MHz QPSK	17.964	17.884	17.964	19.360	19.440	19.520
20MHz 16QAM	17.964	17.884	17.884	19.440	19.360	19.600

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.
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FCC §2.1051, § 27.53: Out of band emission, Band Edge

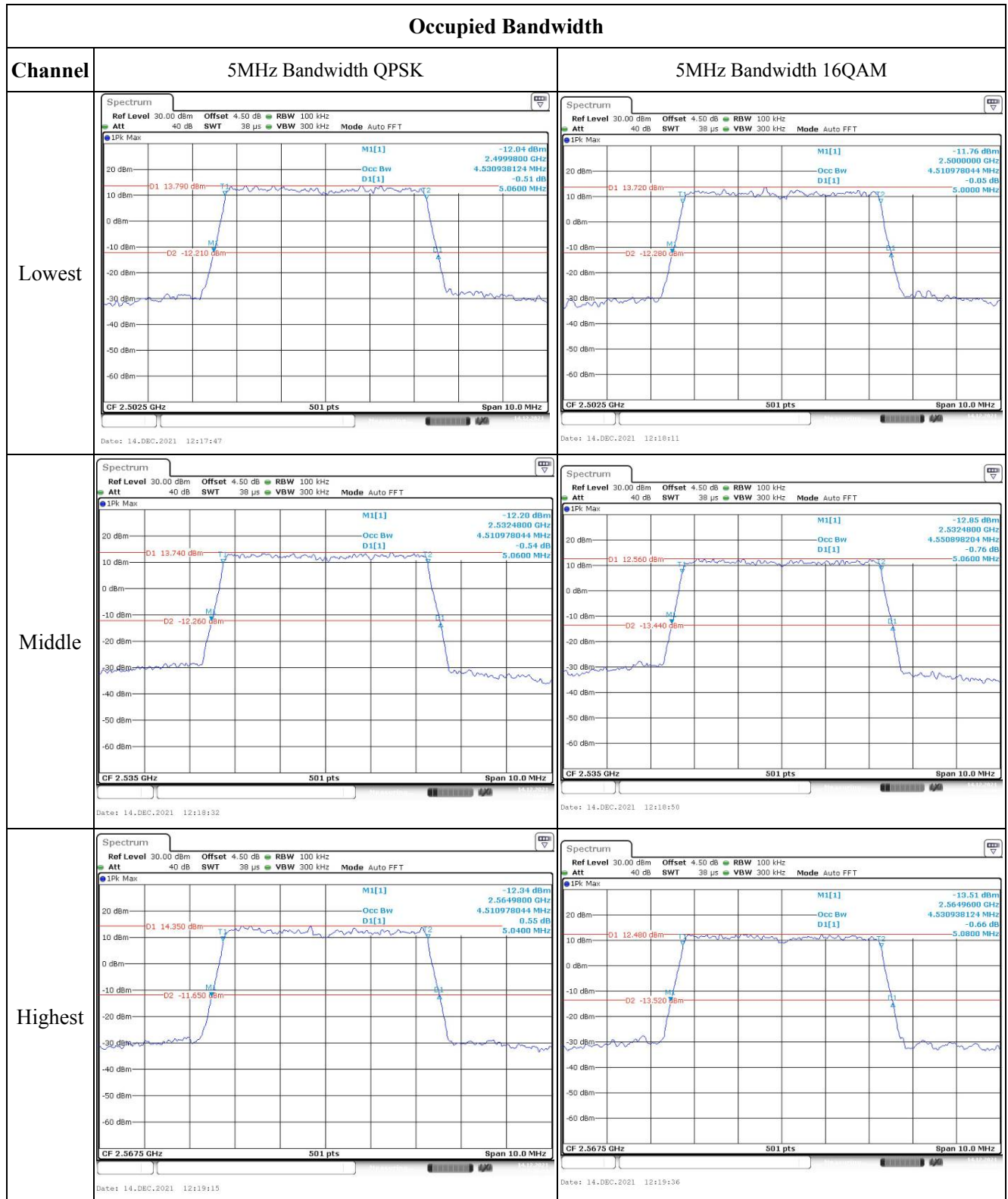
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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FCC §2.1055, §27.54: Frequency Stability

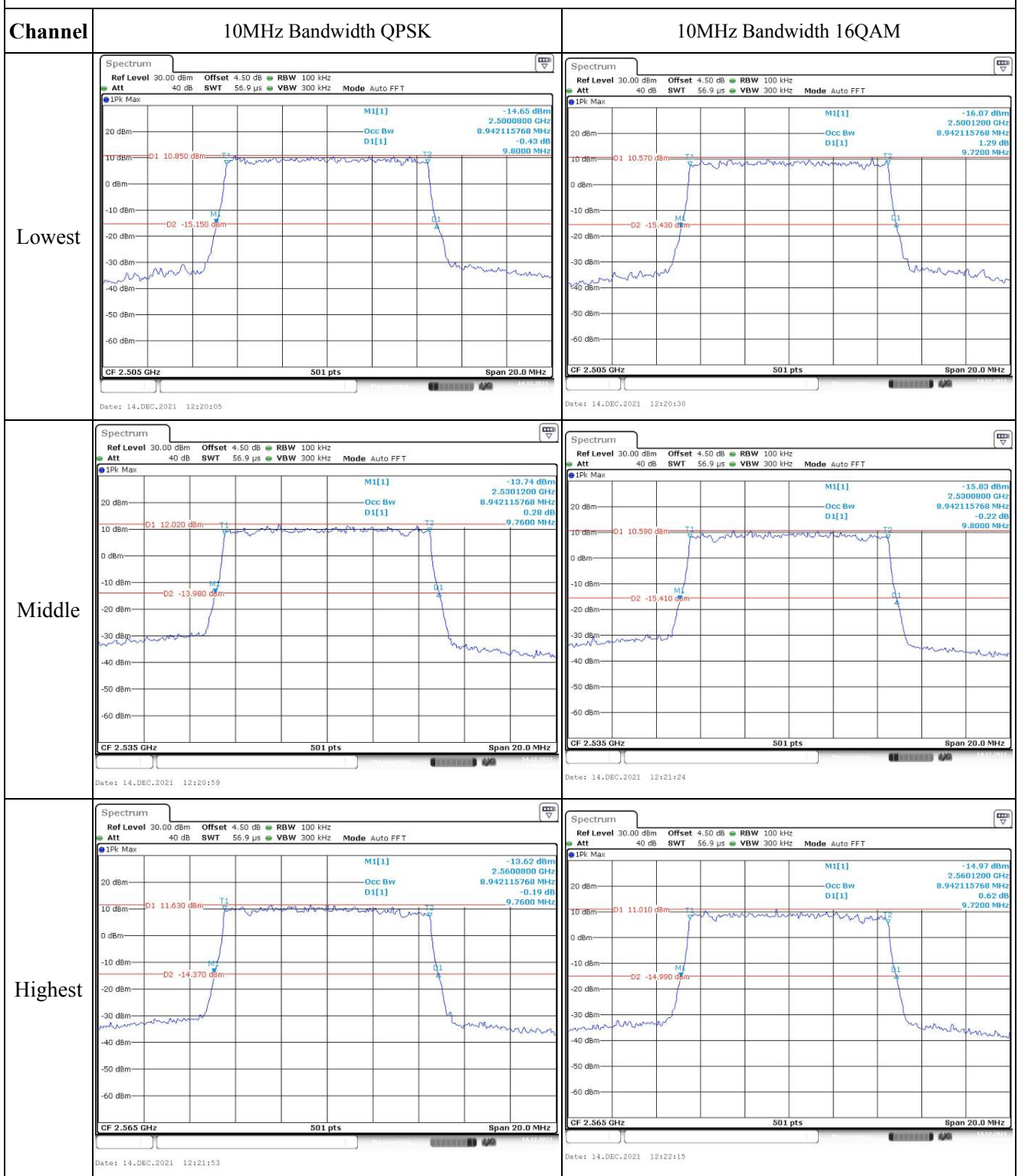
Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge, Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.7	2500.528	2500.00	2569.470	2570
	-20	3.7	2500.528	2500.00	2569.470	2570
	-10	3.7	2500.529	2500.00	2569.471	2570
	0	3.7	2500.529	2500.00	2569.471	2570
	10	3.7	2500.528	2500.00	2569.472	2570
	20	3.7	2500.529	2500.00	2569.471	2570
	30	3.7	2500.529	2500.00	2569.471	2570
	40	3.7	2500.527	2500.00	2569.472	2570
	50	3.7	2500.529	2500.00	2569.471	2570
Frequency Stability vs. Voltage	20	3.5	2500.529	2500.00	2569.470	2570
	20	4.2	2500.527	2500.00	2569.471	2570
Result:					Pass	

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge, Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.7	2500.528	2500.00	2569.470	2570
	-20	3.7	2500.528	2500.00	2569.470	2570
	-10	3.7	2500.529	2500.00	2569.471	2570
	0	3.7	2500.529	2500.00	2569.471	2570
	10	3.7	2500.528	2500.00	2569.472	2570
	20	3.7	2500.529	2500.00	2569.471	2570
	30	3.7	2500.529	2500.00	2569.471	2570
	40	3.7	2500.527	2500.00	2569.472	2570
	50	3.7	2500.529	2500.00	2569.471	2570
Frequency Stability vs. Voltage	20	3.5	2500.529	2500.00	2569.470	2570
	20	4.2	2500.527	2500.00	2569.471	2570
Result:					Pass	

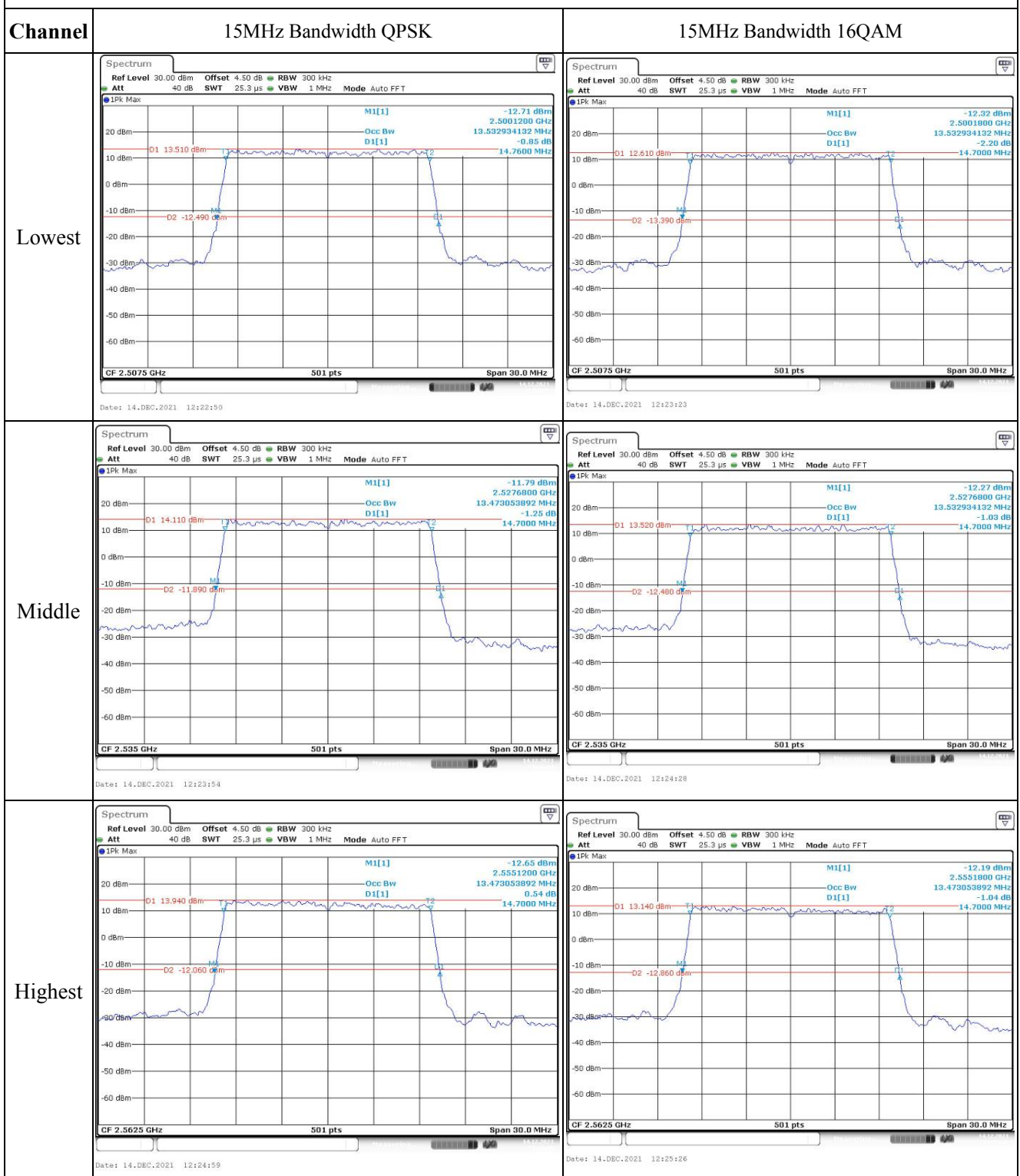
Test Plots:



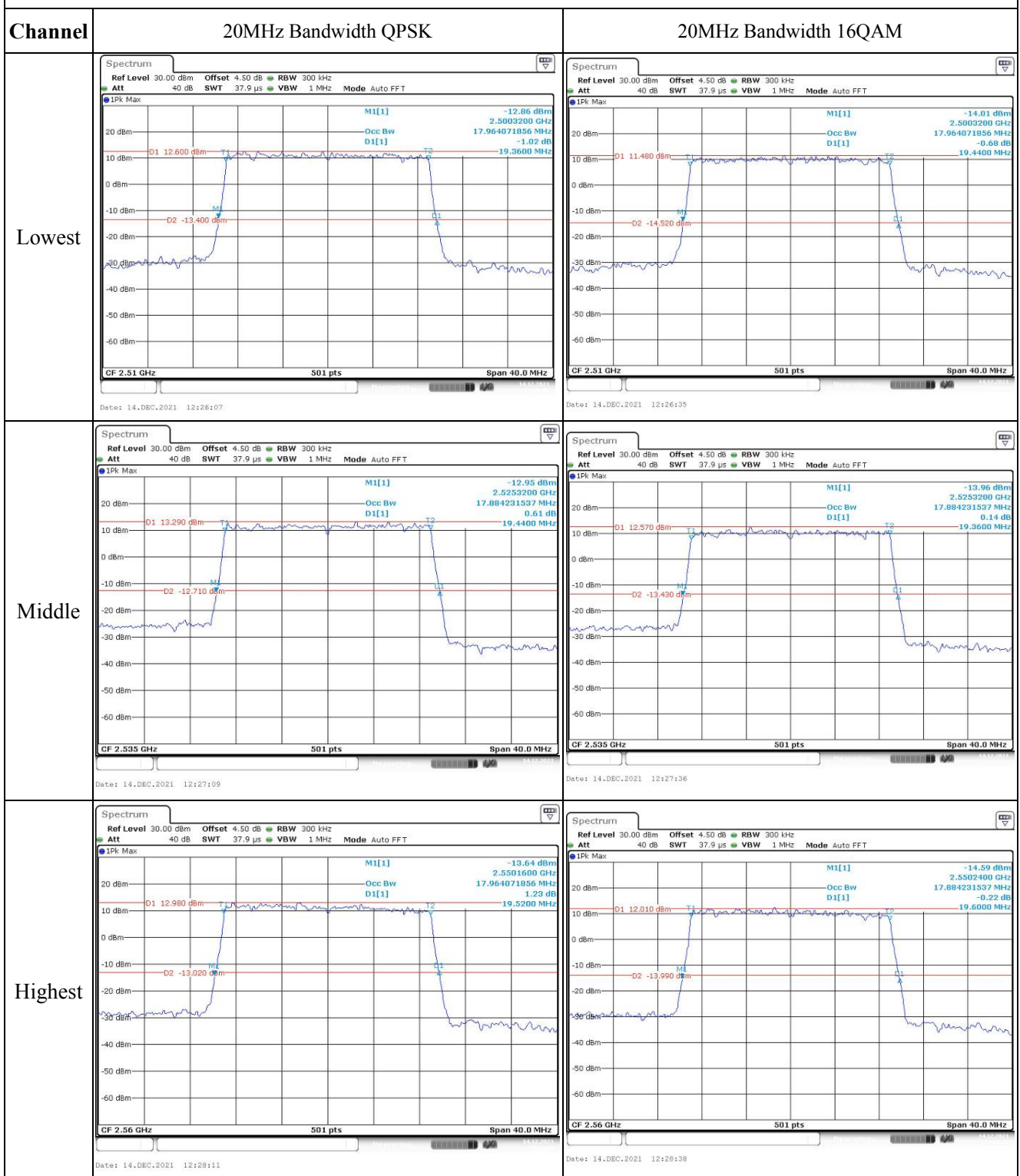
Occupied Bandwidth



Occupied Bandwidth



Occupied Bandwidth

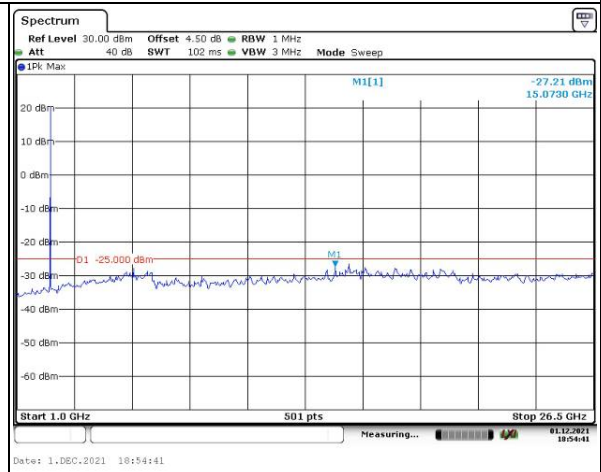
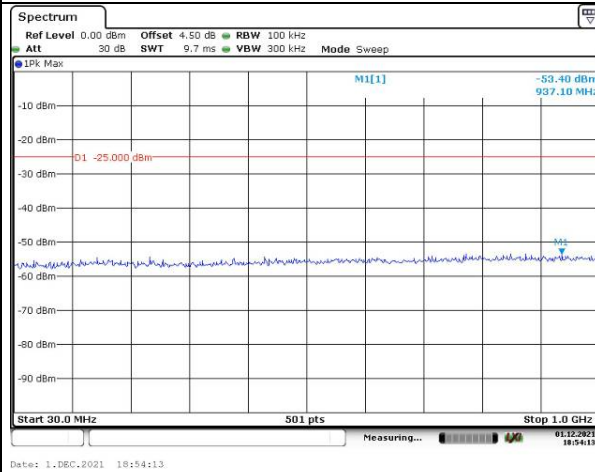


Spurious Emissions at Antenna Terminal

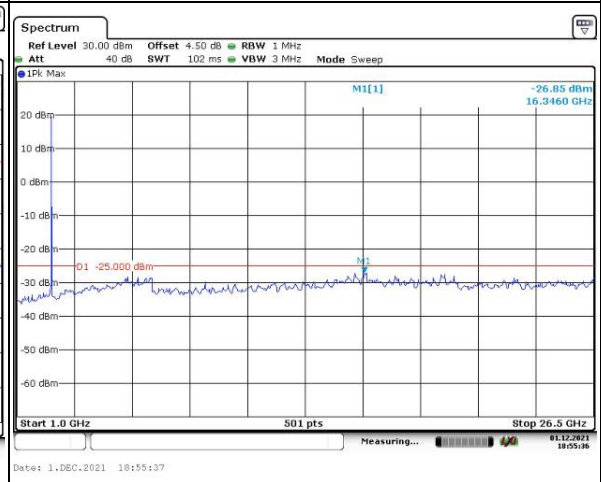
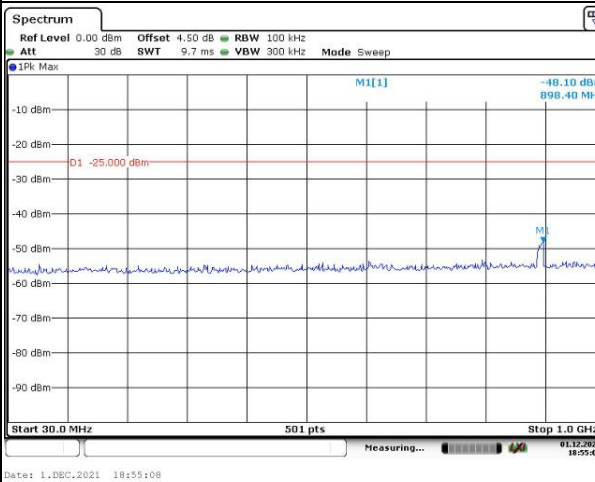
Channel

5MHz Bandwidth QPSK

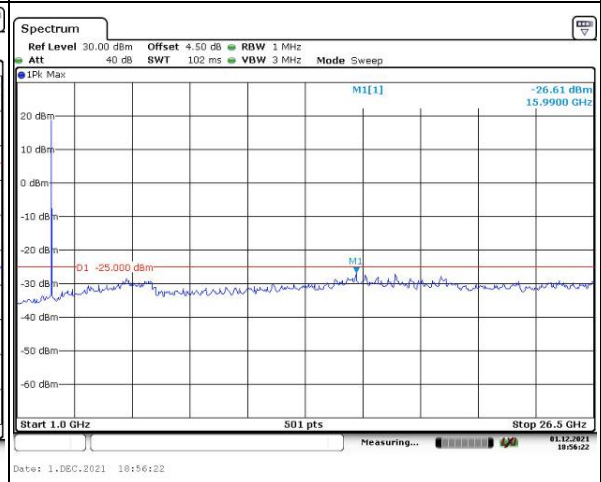
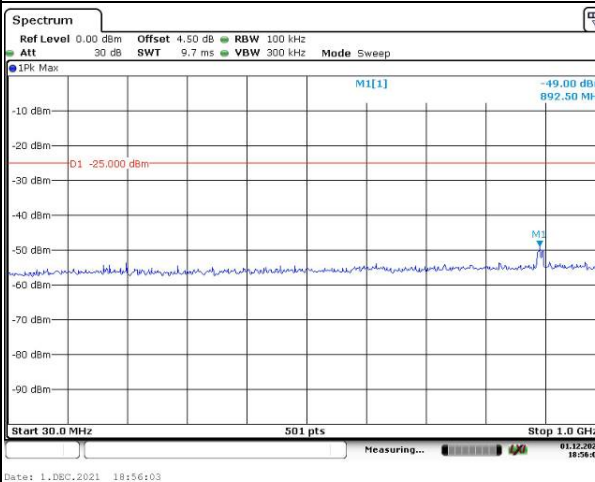
Lowest



Middle



Highest

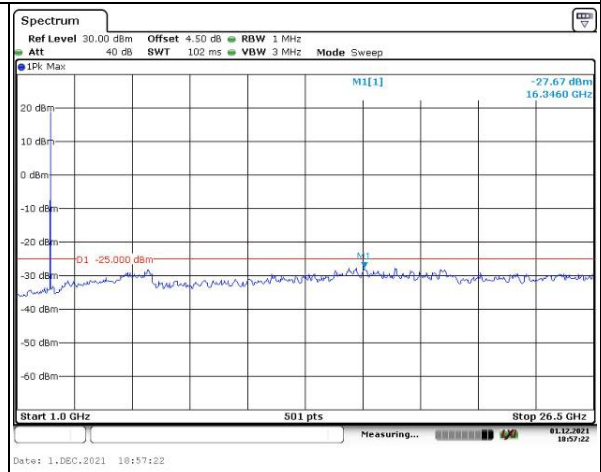
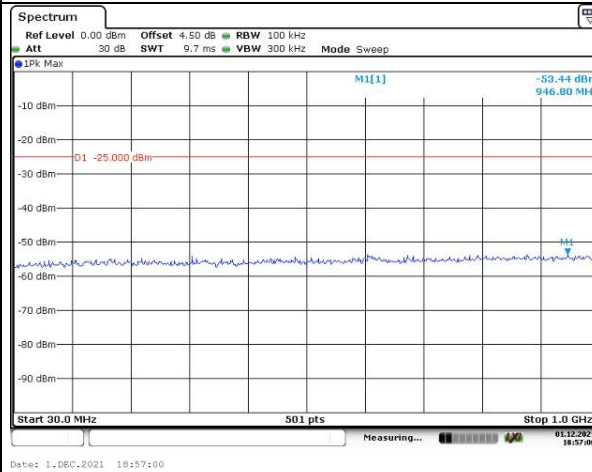


Spurious Emissions at Antenna Terminal

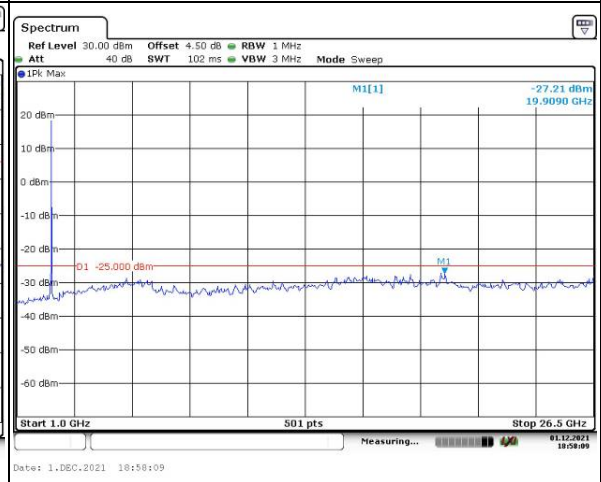
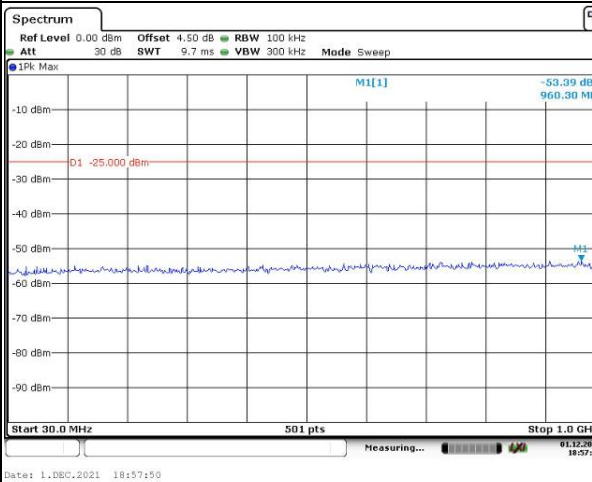
Channel

10MHz Bandwidth QPSK

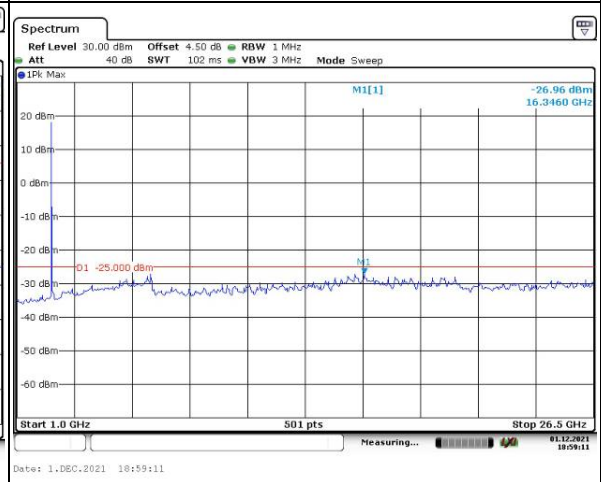
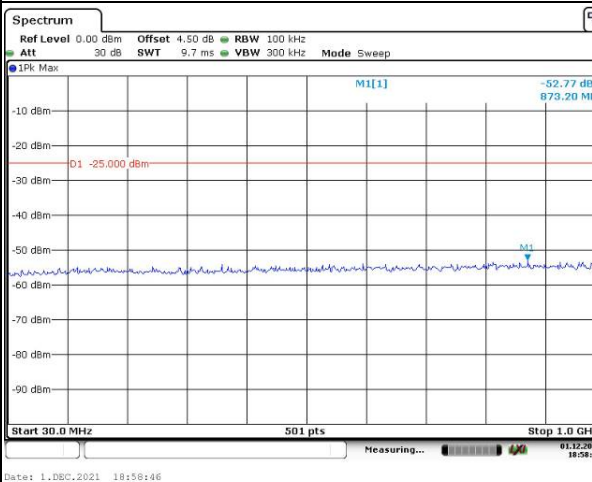
Lowest



Middle



Highest

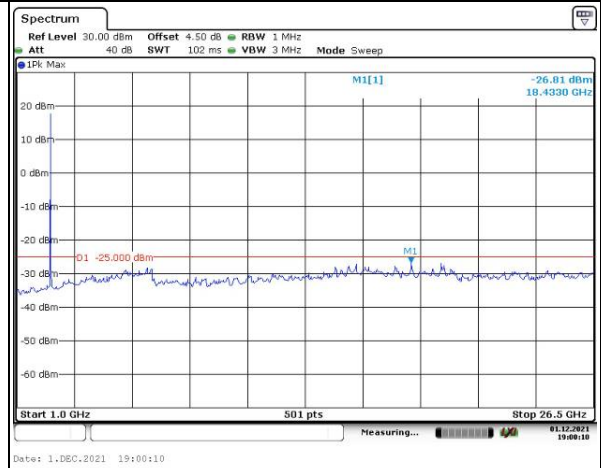
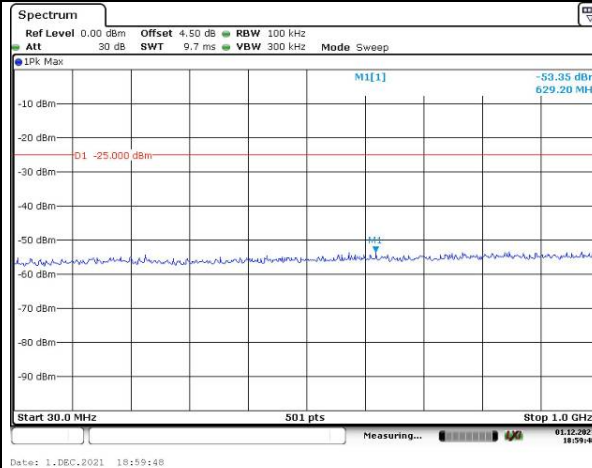


Spurious Emissions at Antenna Terminal

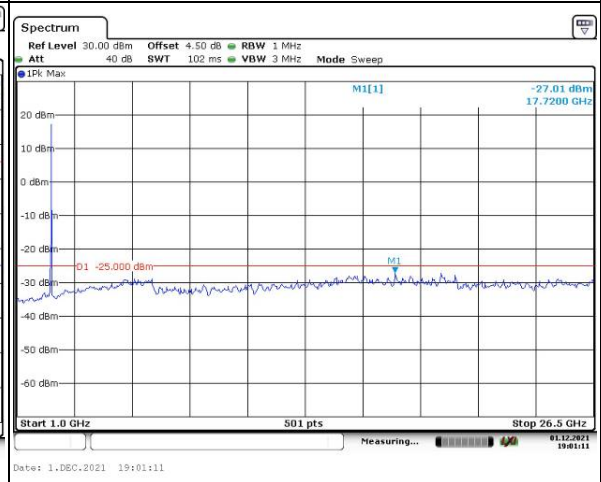
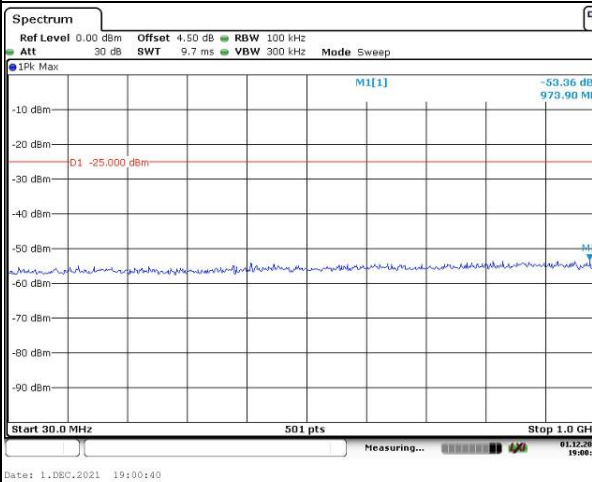
Channel

15MHz Bandwidth QPSK

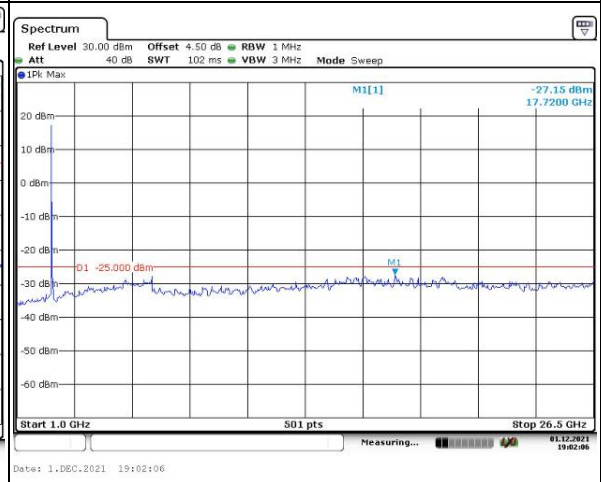
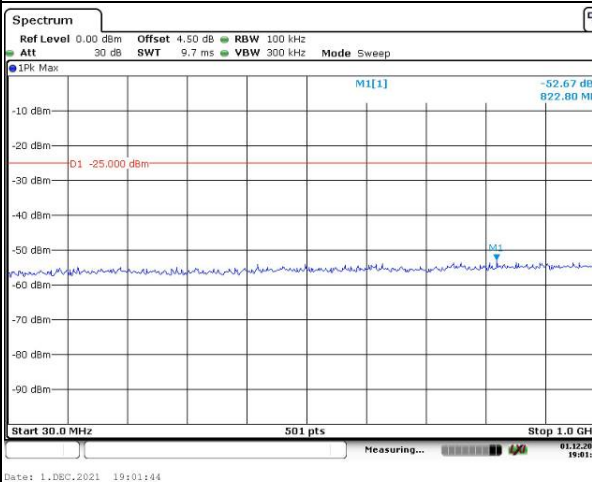
Lowest



Middle



Highest

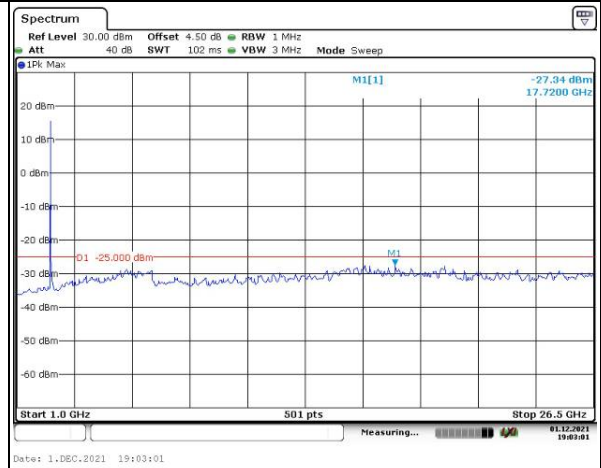
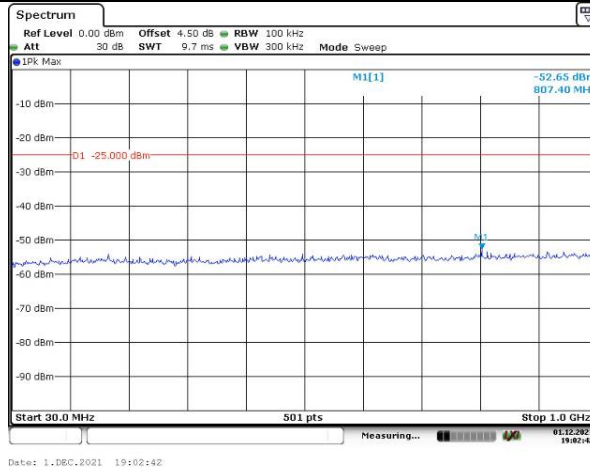


Spurious Emissions at Antenna Terminal

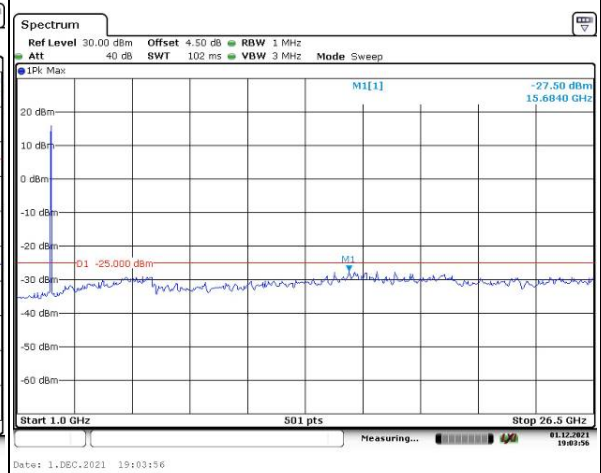
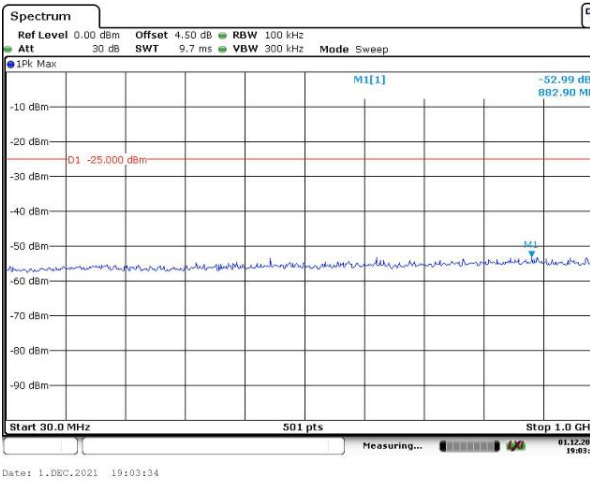
Channel

20MHz Bandwidth QPSK

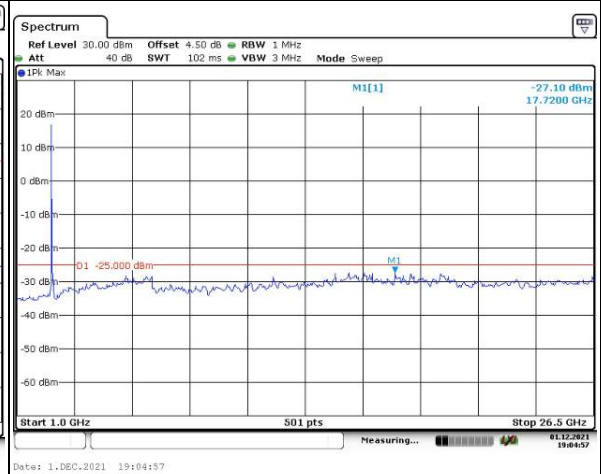
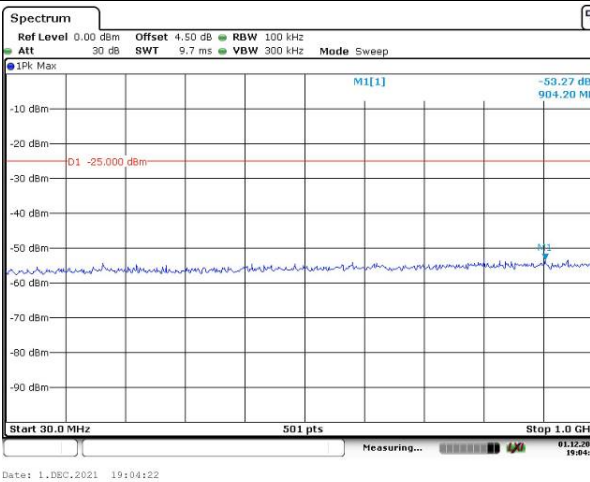
Lowest



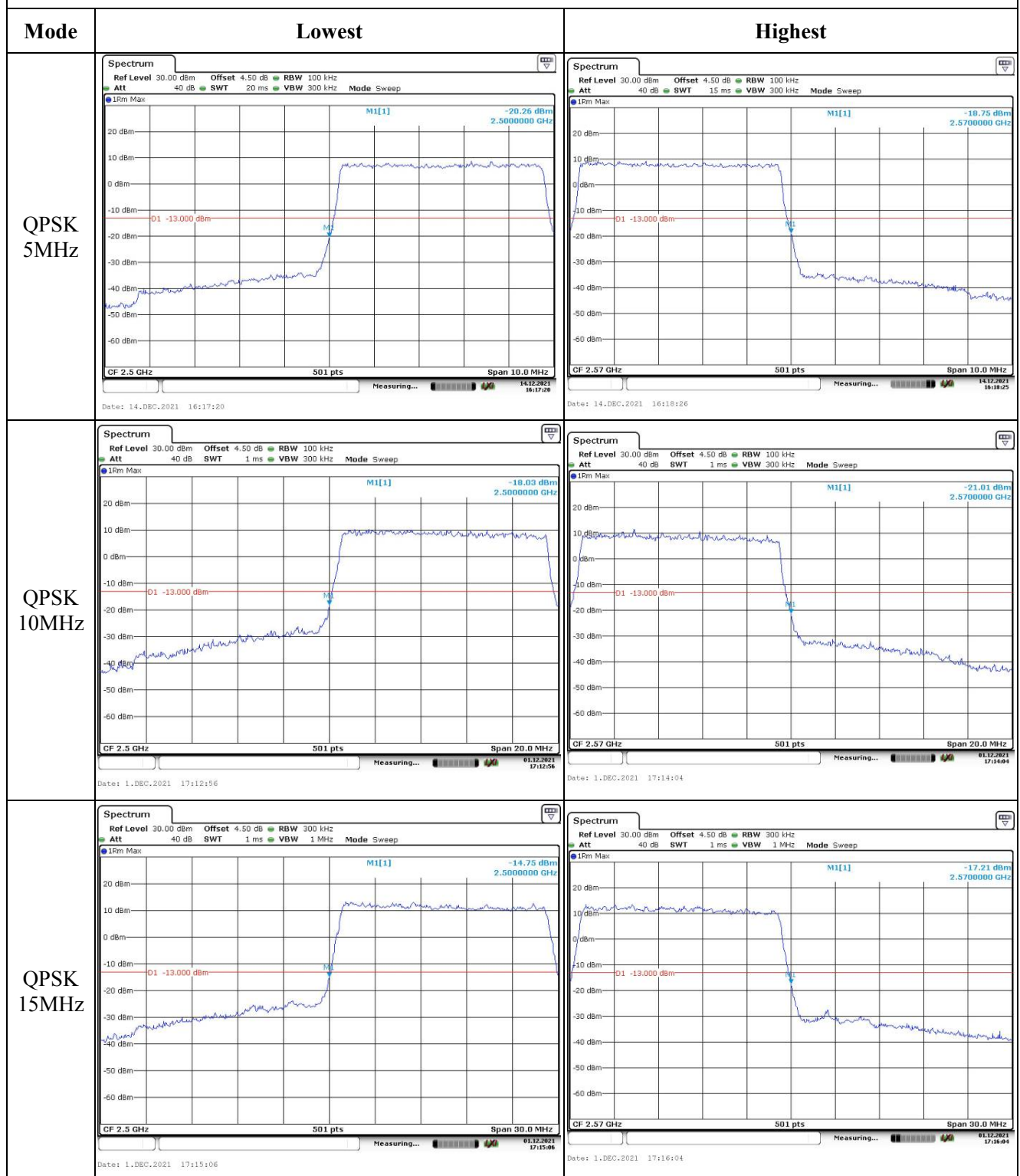
Middle



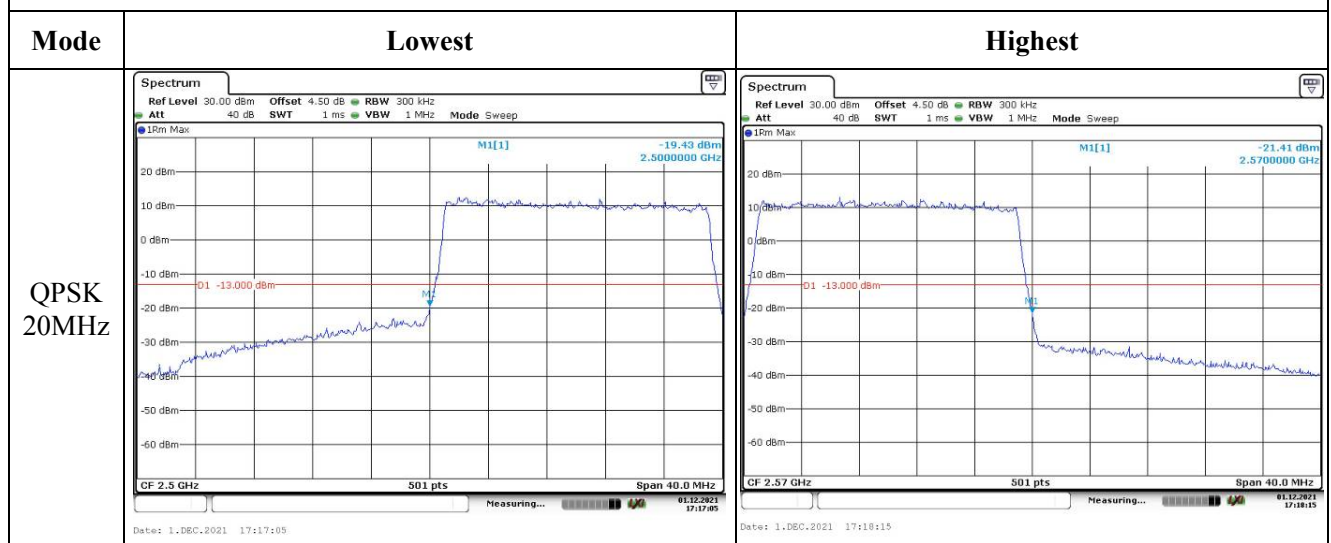
Highest



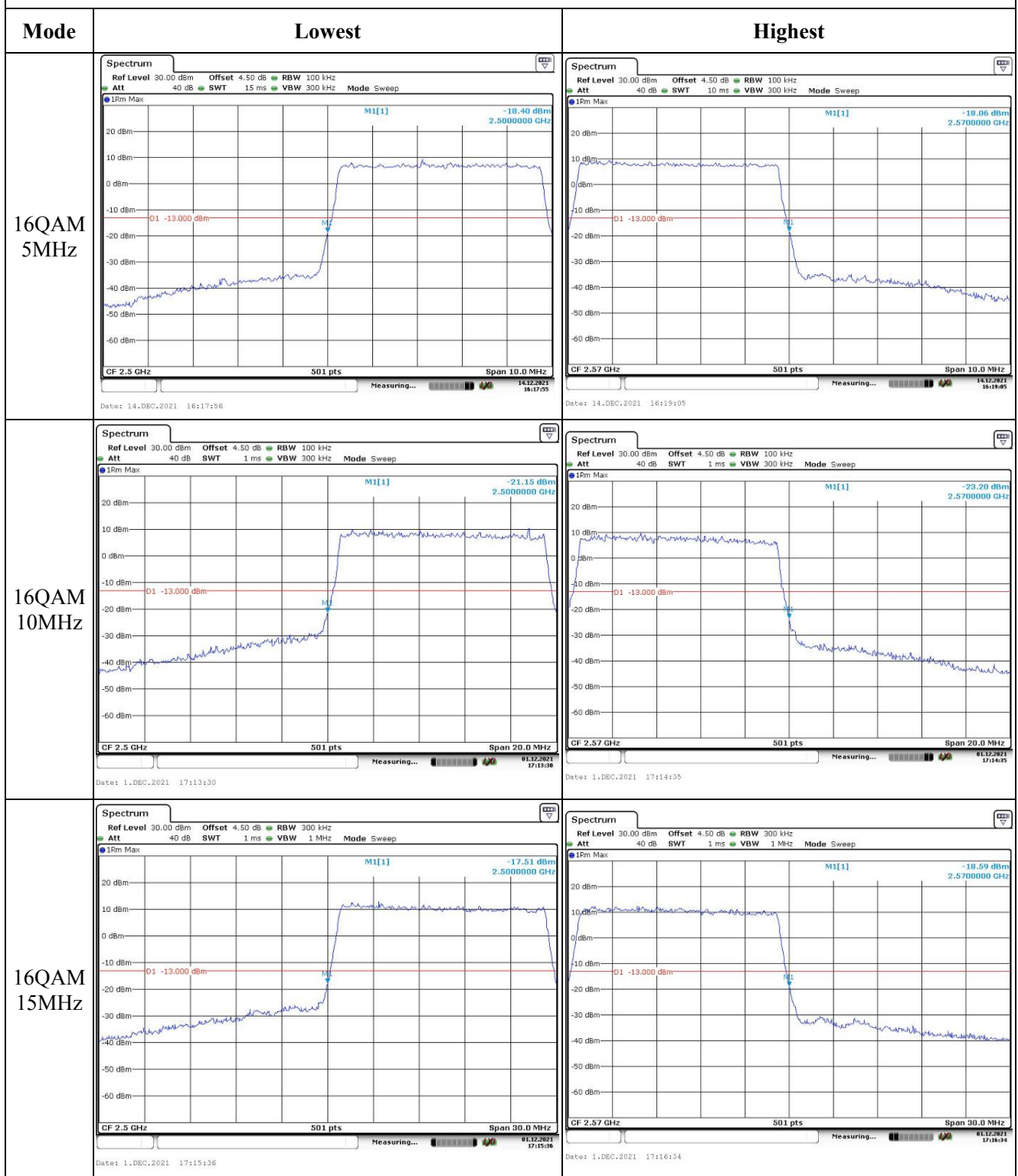
Out of band emission, Band Edge



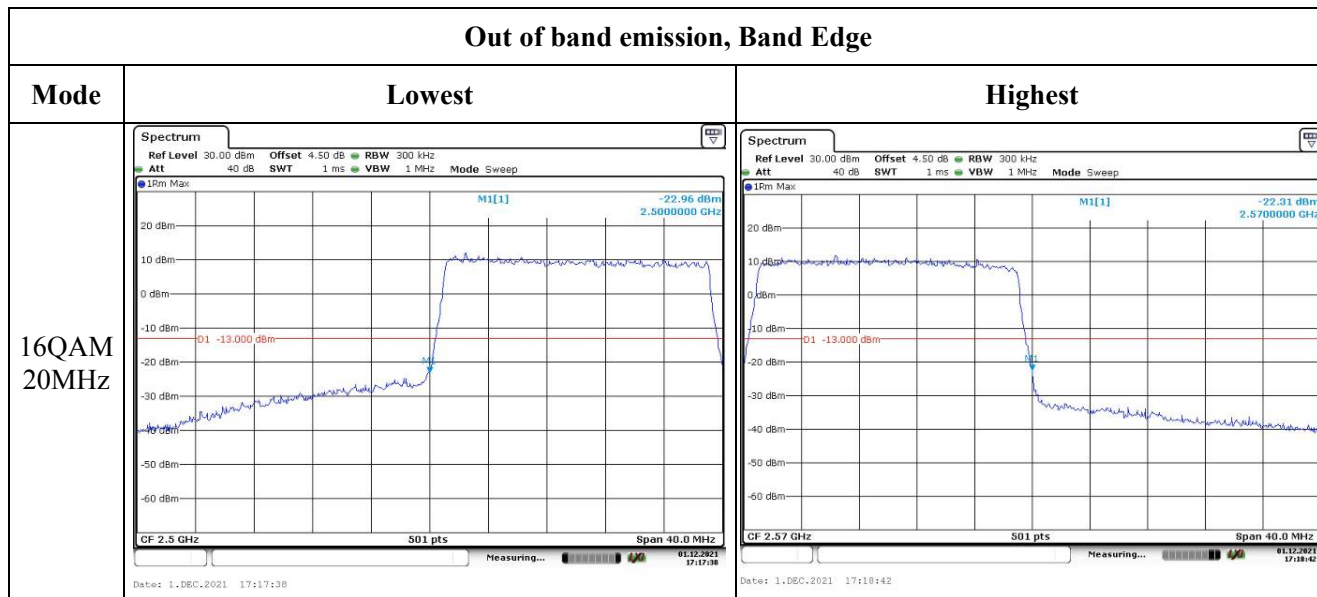
Out of band emission, Band Edge



Out of band emission, Band Edge



Out of band emission, Band Edge



4.10 Antenna Port Test Data and Results for LTE Band 12:

Serial Number:	CR21110087-S1	Test Date:	2021/12/01~2021/12/14
Test Site:	RF	Test Mode:	Transmitting
Tester:	Wolf Mo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	22.3~22.7	Relative Humidity: (%)	31~44	ATM Pressure: (kPa)	101.5~101.9
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	Spectrum Analyzer	101474	2021/7/22	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
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D09	N/A	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 12▲:

Antenna Gain (dBi):	3	Antenna Gain (dBd):	0.85	Cable Loss (dB):	0.1
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	699.7	707.5	715.3
3MHz	700.5	707.5	714.5
5MHz	701.5	707.5	713.5
10MHz	704	707.5	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		
1.4MHz QPSK	RB1#0	23.56	23.69	23.28	24.46	34.77
	RB1#3	23.56	23.71	23.46		
	RB1#5	23.66	23.63	23.54		
	RB3#0	23.67	23.68	23.30		
	RB3#3	23.62	23.56	23.55		
	RB6#0	22.66	22.59	22.45		
1.4MHz 16QAM	RB1#0	22.94	22.62	22.12	23.9	34.77
	RB1#3	23.15	22.67	22.44		
	RB1#5	22.99	22.68	22.54		
	RB3#0	22.87	22.38	22.05		
	RB3#3	22.76	22.32	22.23		
	RB6#0	21.82	21.31	21.55		
3MHz QPSK	RB1#0	23.50	23.64	23.27	24.41	34.77
	RB1#8	23.52	23.66	23.21		
	RB1#14	23.48	23.57	23.50		
	RB6#0	22.76	22.61	22.59		
	RB6#9	22.51	22.62	22.68		
	RB15#0	22.71	22.56	22.62		
3MHz 16QAM	RB1#0	23.40	23.07	22.41	24.15	34.77
	RB1#8	22.73	22.70	22.25		
	RB1#14	22.51	22.52	22.54		
	RB6#0	21.62	21.42	21.62		
	RB6#9	21.33	21.69	21.71		
	RB15#0	21.73	21.67	21.47		
5MHz QPSK	RB1#0	23.40	23.45	23.30	24.36	34.77
	RB1#13	23.11	23.42	23.39		
	RB1#24	23.41	23.61	23.37		
	RB15#0	22.72	22.46	22.58		
	RB15#10	22.56	22.60	22.56		
	RB25#0	22.64	22.45	22.58		
5MHz 16QAM	RB1#0	21.91	22.60	22.46	23.46	34.77
	RB1#13	21.43	22.39	22.16		
	RB1#24	21.74	22.71	22.33		
	RB15#0	21.67	21.15	21.57		
	RB15#10	21.42	21.31	21.42		
	RB25#0	21.74	21.26	21.47		

10MHz QPSK	RB1#0	23.49	23.76	23.60	24.51	34.77
	RB1#25	23.75	23.73	23.55		
	RB1#49	23.64	23.26	23.49		
	RB25#0	22.55	22.56	22.70		
	RB25#25	22.67	22.55	22.62		
	RB50#0	22.57	22.54	22.69		
10MHz 16QAM	RB1#0	22.82	22.58	22.39	23.93	34.77
	RB1#25	22.73	23.18	22.51		
	RB1#49	22.62	22.63	22.16		
	RB25#0	21.47	21.53	21.82		
	RB25#25	21.65	21.61	21.64		
	RB50#0	21.47	21.59	21.76		

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	4.41	4.93	4.96	13
	RB50#0	5.51	5.19	5.13	13
10MHz 16QAM	RB1#0	5.39	6.12	6.00	13
	RB50#0	6.43	6.29	6.14	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	1.108	1.302	1.314	1.284
1.4MHz 16QAM	1.102	1.096	1.102	1.314	1.296	1.302
3MHz QPSK	2.695	2.695	2.695	2.940	2.940	2.952
3MHz 16QAM	2.683	2.683	2.683	2.964	2.964	2.964
5MHz QPSK	4.551	4.511	4.511	5.060	5.020	5.020
5MHz 16QAM	4.531	4.531	4.531	5.000	5.060	5.080
10MHz QPSK	9.022	8.901	8.942	9.760	9.680	9.720
10MHz 16QAM	8.981	8.942	8.942	9.640	9.640	9.720

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.
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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.
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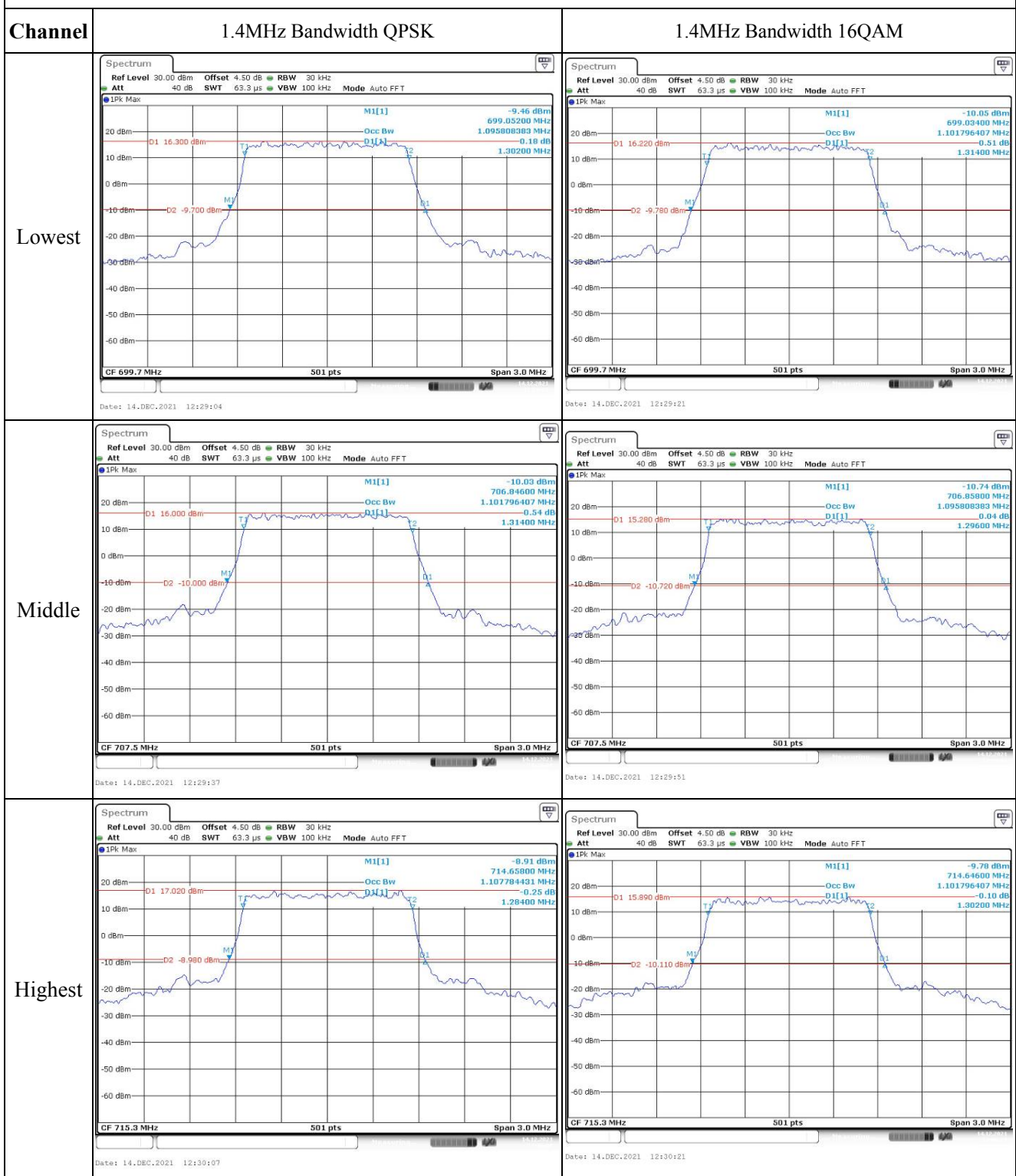
FCC §2.1055, §27.54: Frequency Stability

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	699.528	699.00	715.470	716.00
	-20	3.7	699.528	699.00	715.470	716.00
	-10	3.7	699.529	699.00	715.471	716.00
	0	3.7	699.529	699.00	715.471	716.00
	10	3.7	699.527	699.00	715.472	716.00
	20	3.7	699.529	699.00	715.471	716.00
	30	3.7	699.529	699.00	715.471	716.00
	40	3.7	699.529	699.00	715.472	716.00
	50	3.7	699.527	699.00	715.471	716.00
Frequency Stability vs. Voltage	20	3.5	699.529	699.00	715.471	716.00
	20	4.2	699.529	699.00	715.472	716.00
Result:					Pass	

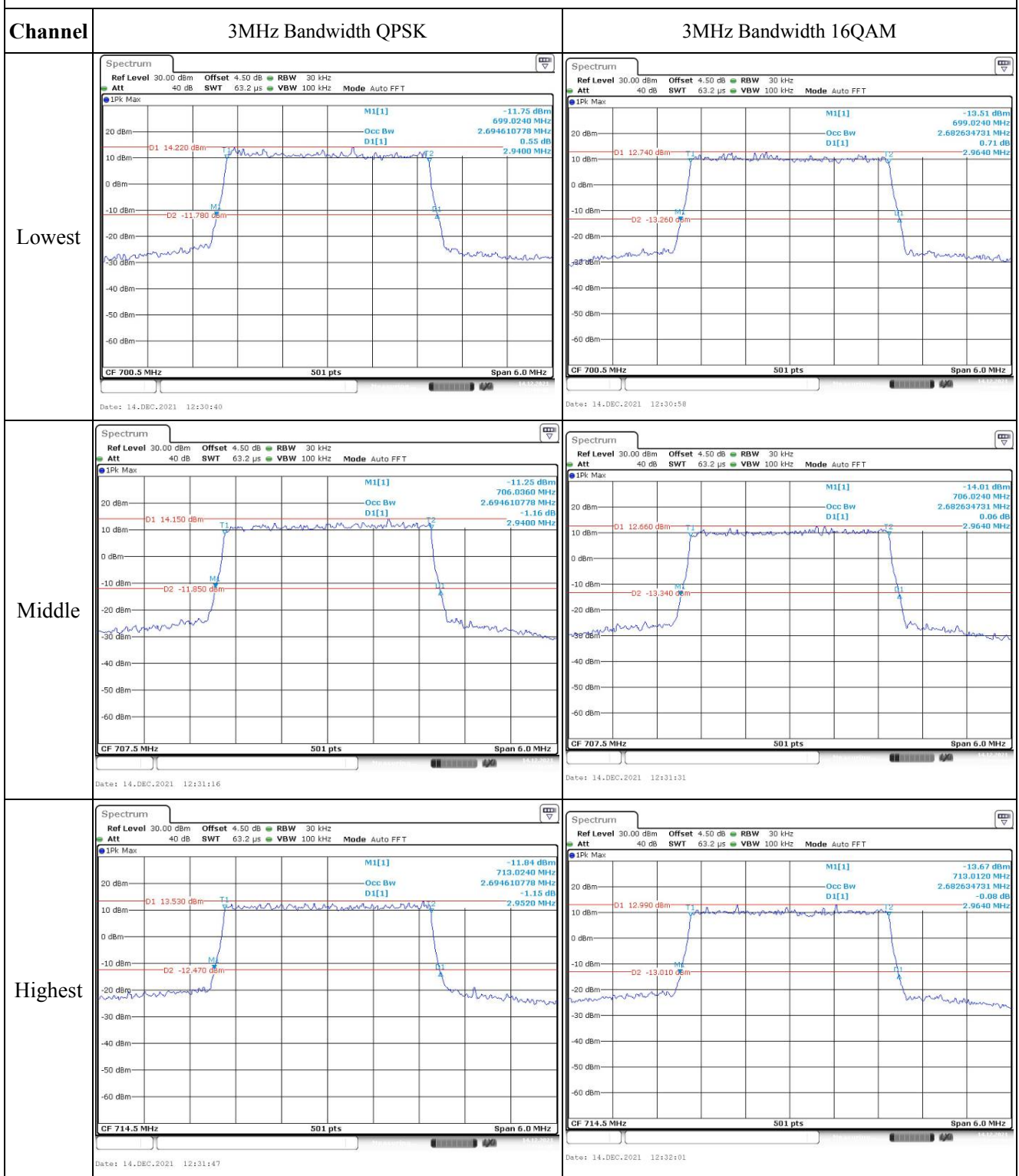
Test Mode:	10M 16QAM	Test Channel: Lowest for Lower Edge, Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.7	699.528	699.00	715.470	716.00
	-20	3.7	699.528	699.00	715.470	716.00
	-10	3.7	699.529	699.00	715.471	716.00
	0	3.7	699.529	699.00	715.471	716.00
	10	3.7	699.527	699.00	715.472	716.00
	20	3.7	699.529	699.00	715.471	716.00
	30	3.7	699.529	699.00	715.471	716.00
	40	3.7	699.529	699.00	715.472	716.00
	50	3.7	699.527	699.00	715.471	716.00
Frequency Stability vs. Voltage	20	3.5	699.529	699.00	715.471	716.00
	20	4.2	699.529	699.00	715.472	716.00
Result:					Pass	

Test Plots:

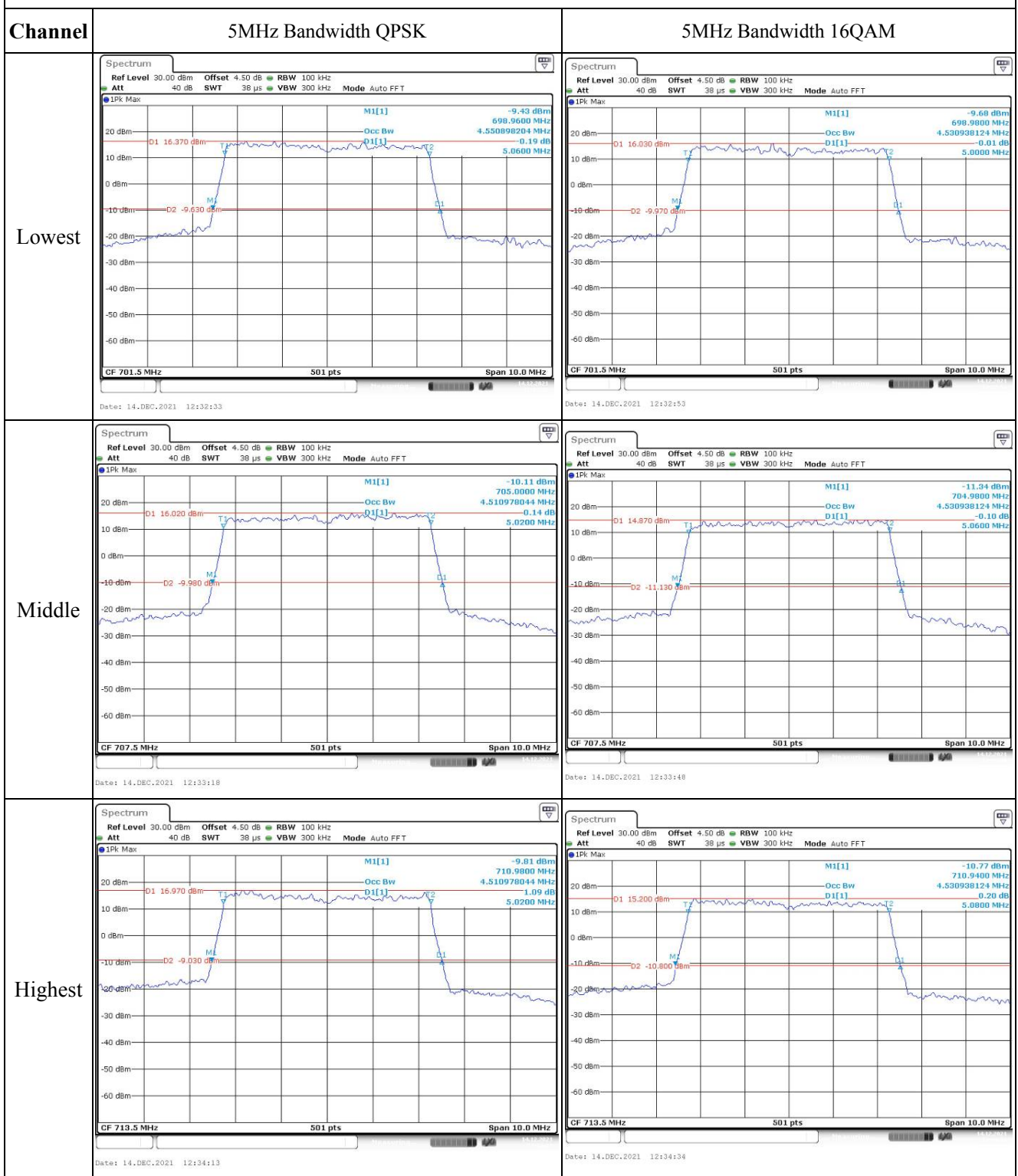
Occupied Bandwidth



Occupied Bandwidth



Occupied Bandwidth



Occupied Bandwidth

