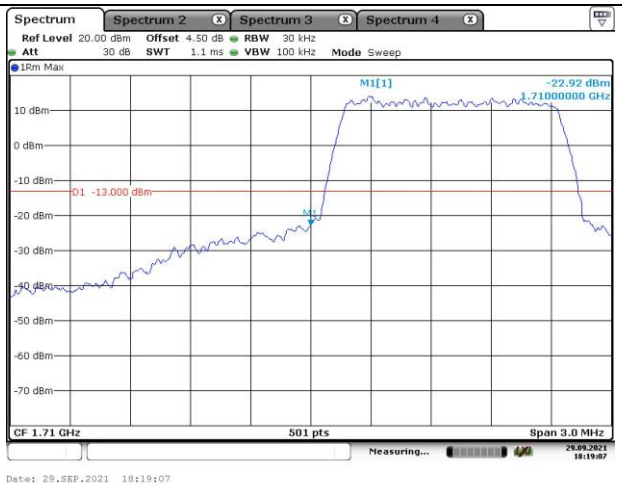
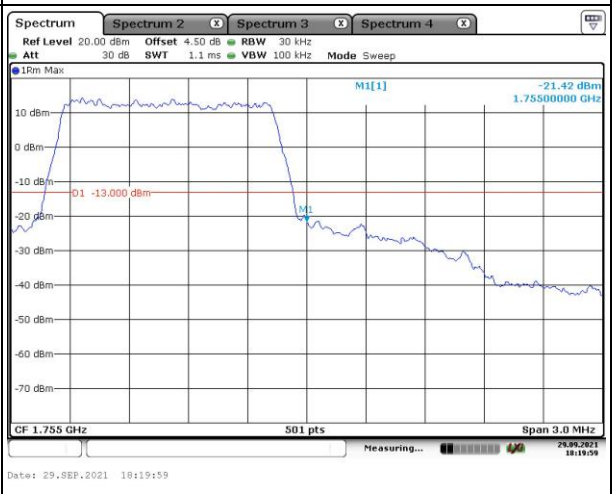
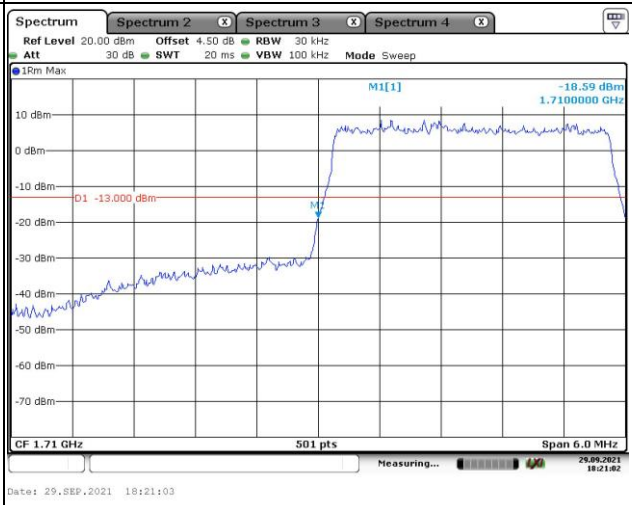
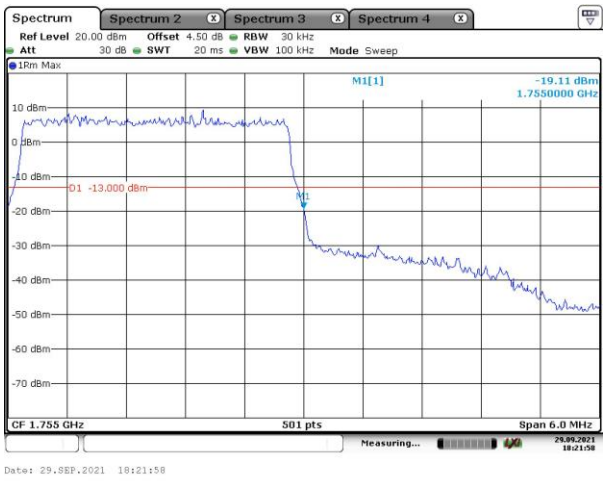
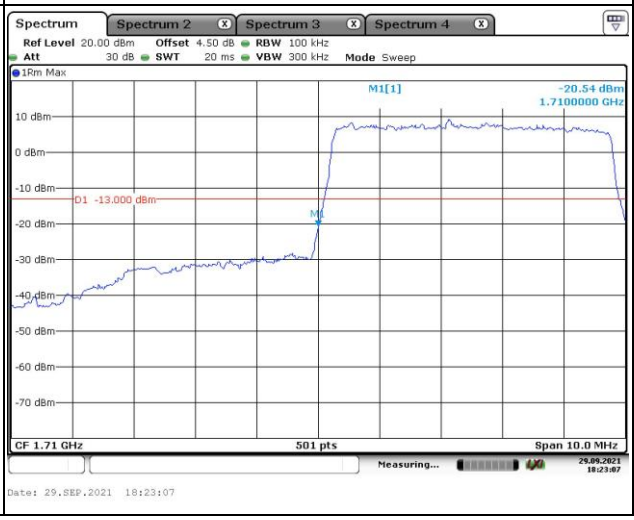
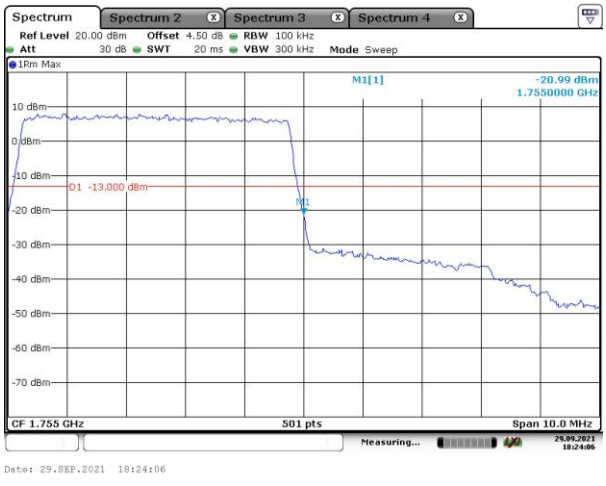
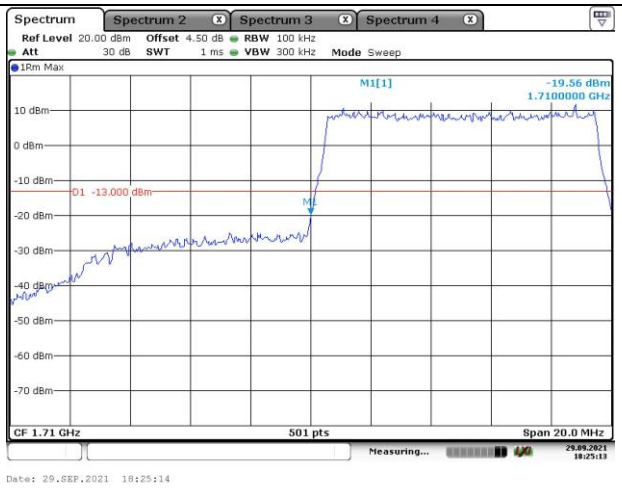
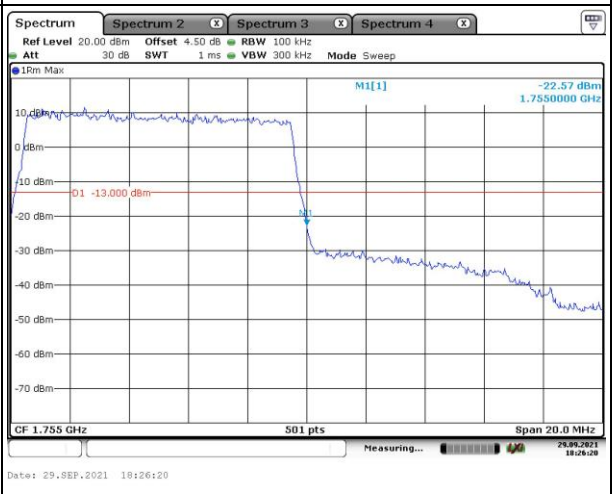
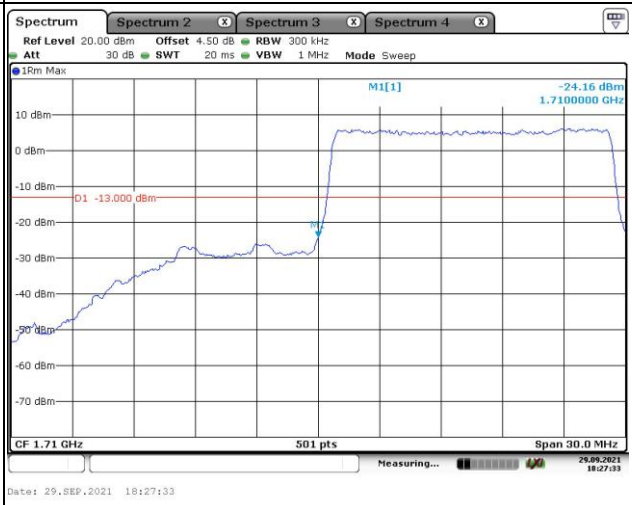
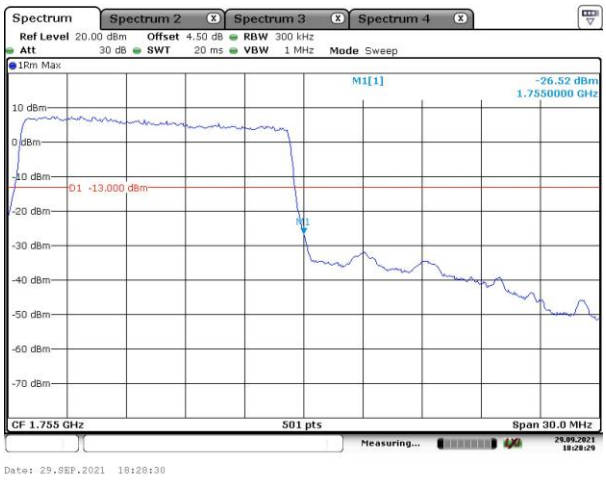
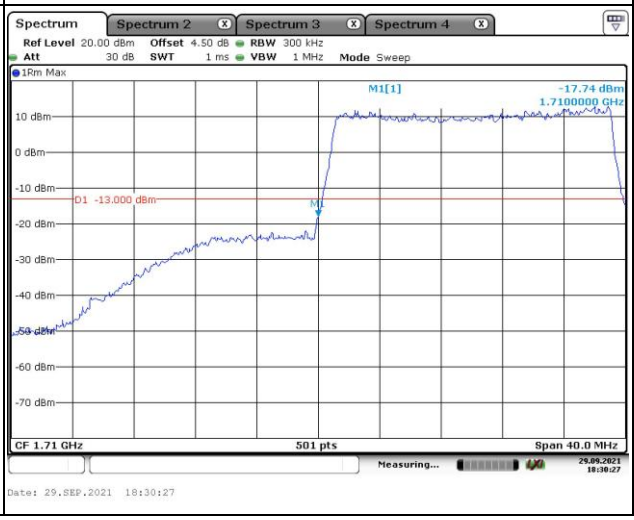
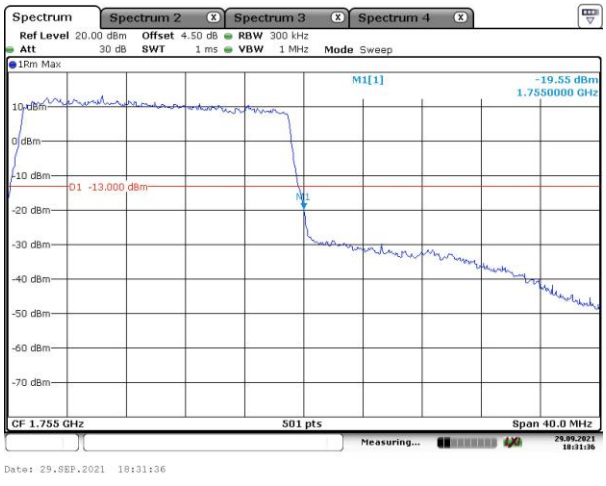
Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
16QAM 1.4MHz		
16QAM 3MHz		
16QAM 5MHz		

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
16QAM 10MHz		
16QAM 15MHz		
16QAM 20MHz		

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

Serial Number:	CR21090060-RF-S1/2	Test Date:	2021/9/29~2021/10/21
Test Site:	RF	Test Mode:	Transmitting
Tester:	Le qiao	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	25.9~28.1	Relative Humidity: (%)	51~60	ATM Pressure: (kPa)	100.2~100.4

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
ZHAOXIN	DC Power Supply	RXN-6010D	21R60	N/A	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2021/7/22	2022/7/21
Mini-Circuits	DC Block	BLK-18-S+	1554403	2021/8/8	2022/8/7
BACL	TEMP&HUMI Test Chamber	BTH-150	30026	2021/7/22	2022/7/22
UNI-T	Multimeter	UT39A+	C210582554	2021/8/30	2022/8/30
E-Microwave	Two-way Spliter	ODP-1-6	OE0120176	Each Time	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

EUT Information@ LTE Band 5▲:					
Antenna Gain (dBi):	1	Antenna Gain (dBd):	-1.15	Cable Loss (dB):	0.2
Operation Voltage(V_{DC}):					
Lowest:	3.5	Normal:	3.8	Highest:	4.3

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
1.4MHz	824.7	836.5	848.3
3MHz	825.5	836.5	847.5
5MHz	826.5	836.5	846.5
10MHz	829	836.5	844

Test Data:

FCC §2.1046; § 22.913 (a)						
RF Output Power:						
Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	22.49	22.38	22.31	21.17	38.45
	RB1#3	22.41	22.45	22.33		
	RB1#5	22.4	22.41	22.34		
	RB3#0	22.52	22.49	22.41		
	RB3#3	22.41	22.48	22.43		
	RB6#0	21.41	21.67	21.32		
1.4MHz 16QAM	RB1#0	21.8	22.11	21.35	20.78	38.45
	RB1#3	21.87	22.12	21.04		
	RB1#5	21.84	22.13	21.08		
	RB3#0	21.37	21.49	21.82		
	RB3#3	21.25	21.4	21.37		
	RB6#0	20.49	20.6	20.92		
3MHz QPSK	RB1#0	22.32	22.41	22.39	21.13	38.45
	RB1#8	22.33	22.43	22.42		
	RB1#14	22.33	22.48	22.37		
	RB6#0	21.43	21.53	21.68		
	RB6#9	21.73	21.57	21.35		
	RB15#0	21.39	21.6	21.68		
3MHz 16QAM	RB1#0	21.43	22.09	21.33	20.79	38.45
	RB1#8	21.3	22.14	21.3		
	RB1#14	21.71	22.14	21.03		
	RB6#0	20.55	20.72	20.92		
	RB6#9	20.75	20.5	20.93		
	RB15#0	20.55	20.61	20.68		
5MHz QPSK	RB1#0	22.35	22.41	22.38	21.21	38.45
	RB1#13	22.31	22.56	22.29		
	RB1#24	22.26	22.41	22.33		
	RB15#0	21.4	21.39	21.37		
	RB15#10	21.64	21.59	21.73		
	RB25#0	21.62	21.61	21.77		
5MHz 16QAM	RB1#0	20.49	21.61	21.01	20.33	38.45
	RB1#13	20.77	21.68	21.25		
	RB1#24	20.64	21.61	21.09		
	RB15#0	20.51	20.64	20.76		
	RB15#10	20.68	20.5	20.72		
	RB25#0	20.74	20.61	20.65		
10MHz QPSK	RB1#0	22.45	22.49	22.29	21.23	38.45
	RB1#25	22.39	22.57	22.4		
	RB1#49	22.43	22.58	22.33		

	RB25#0	21.72	21.42	21.62		
	RB25#25	21.43	21.68	21.74		
	RB50#0	21.28	21.62	21.34		
10MHz 16QAM	RB1#0	21.66	21.59	20.95	20.5	38.45
	RB1#25	21.66	21.71	20.93		
	RB1#49	21.75	21.85	20.92		
	RB25#0	20.67	20.79	20.78		
	RB25#25	20.72	20.57	20.84		
	RB50#0	20.65	20.7	20.71		
					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	5.51	5.86	5.19	13
	RB50#0	5.39	5.62	5.33	13
10MHz 16QAM	RB1#0	6.03	6.2	6.32	13
	RB50#0	6.23	6.67	6.32	13
				Result:	**Pass**

FCC §2.1049, §22.905:Occupied Bandwidth

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
1.4MHz QPSK	1.102	1.102	1.102	1.248	1.26	1.26
1.4MHz 16QAM	1.102	1.09	1.102	1.26	1.254	1.26
3MHz QPSK	2.695	2.695	2.683	2.976	2.988	3.024
3MHz 16QAM	2.695	2.683	2.695	3.012	3.012	3.012
5MHz QPSK	4.511	4.511	4.511	5	5.02	4.98
5MHz 16QAM	4.511	4.531	4.531	5	5.04	5
10MHz QPSK	8.942	8.981	8.942	9.72	9.72	9.76
10MHz 16QAM	8.942	8.981	8.942	9.8	9.84	9.84
Note: The test plots please refer to the Plots of Occupied Bandwidth						

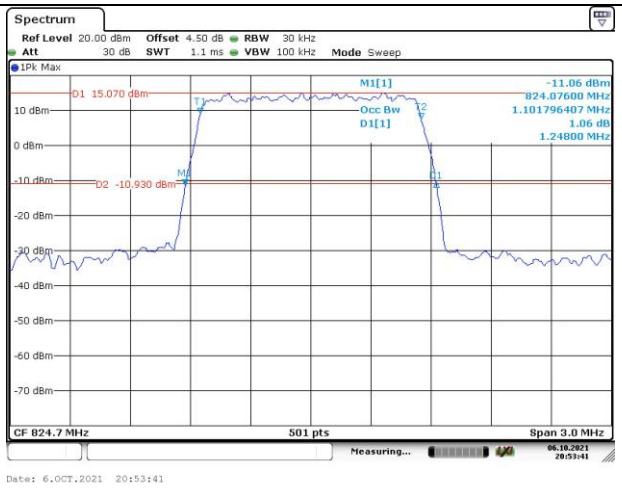
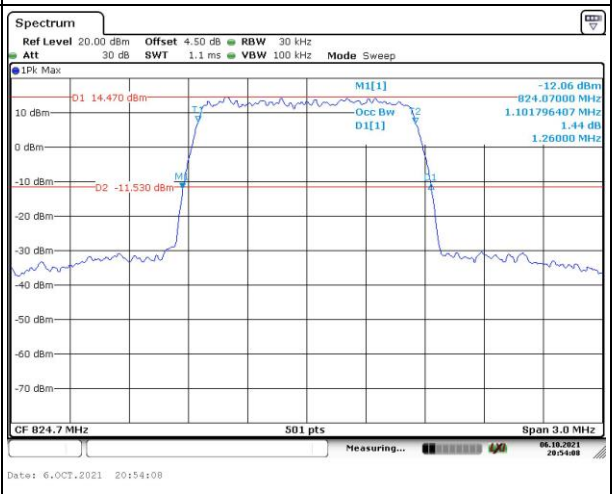
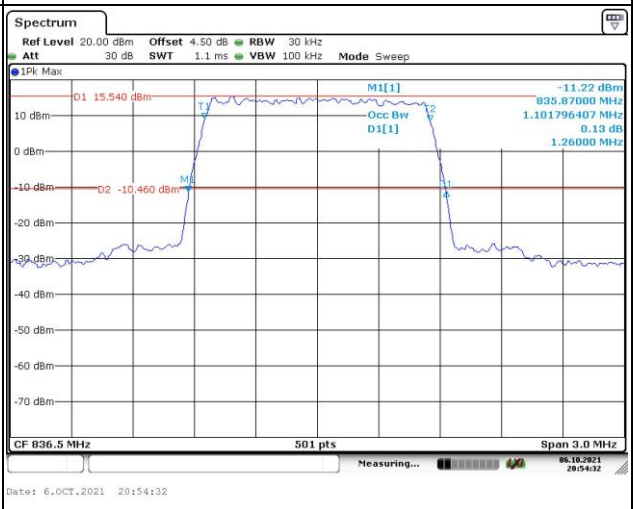
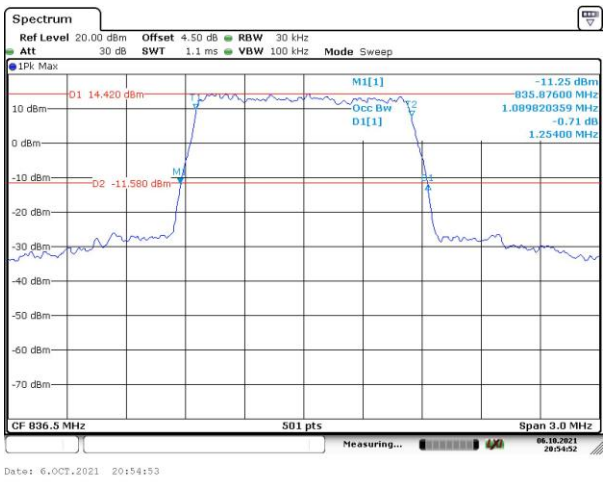
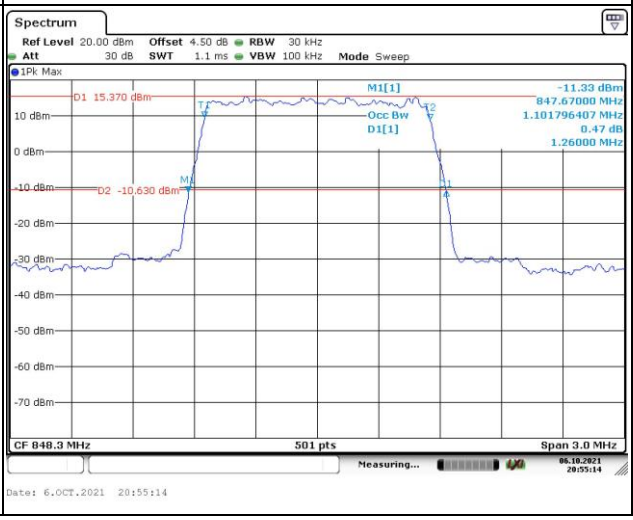
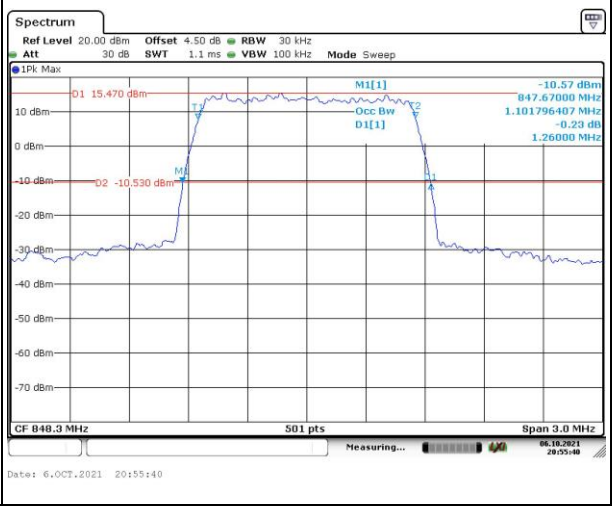
FCC §2.1051, §22.917(a):Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

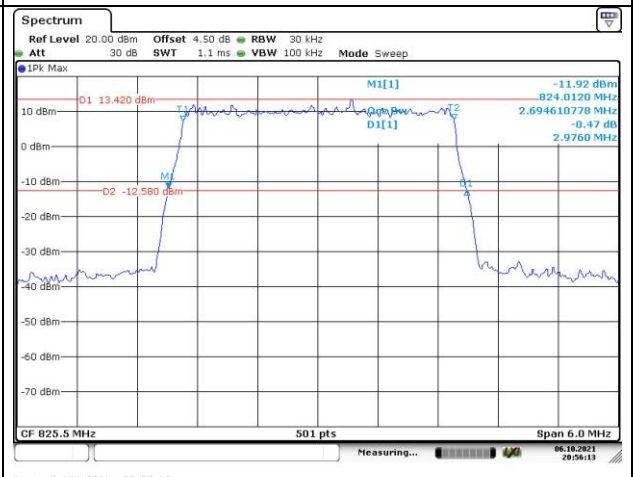
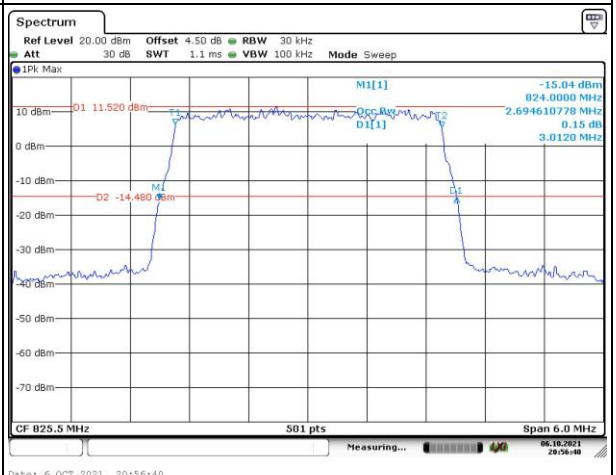
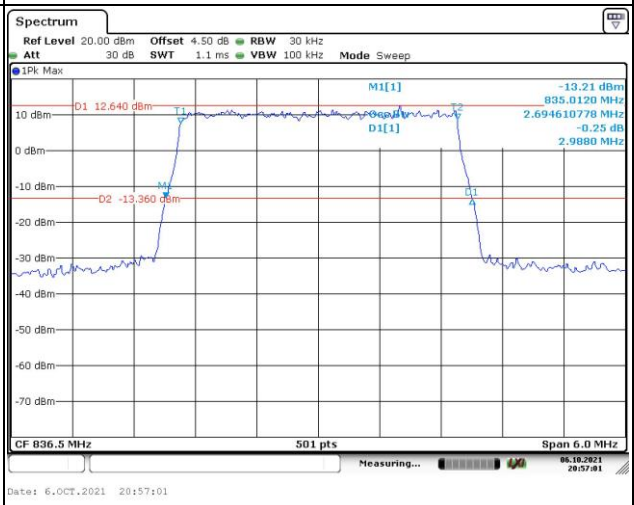
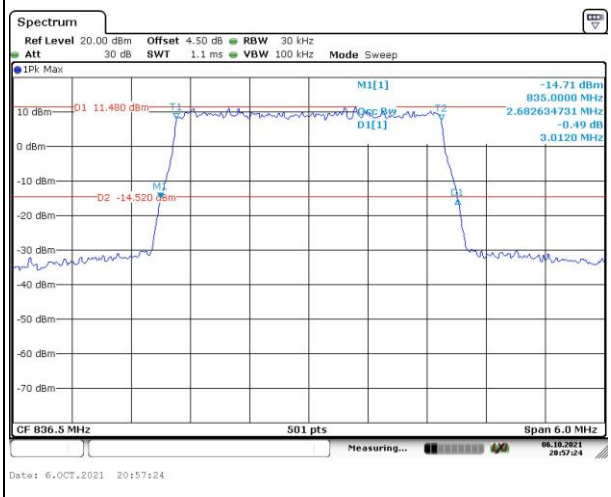
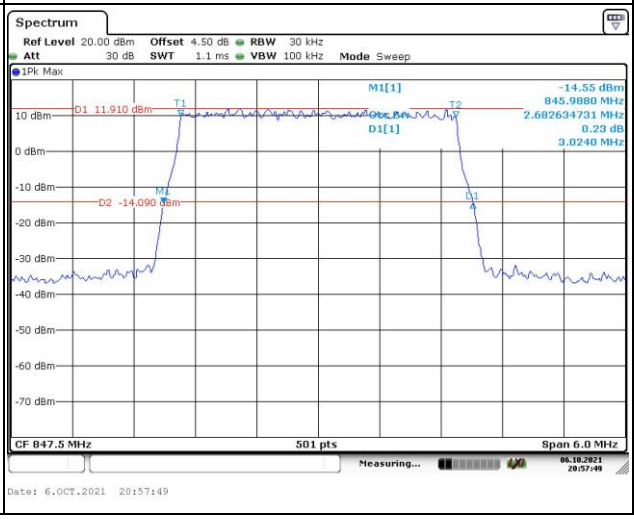
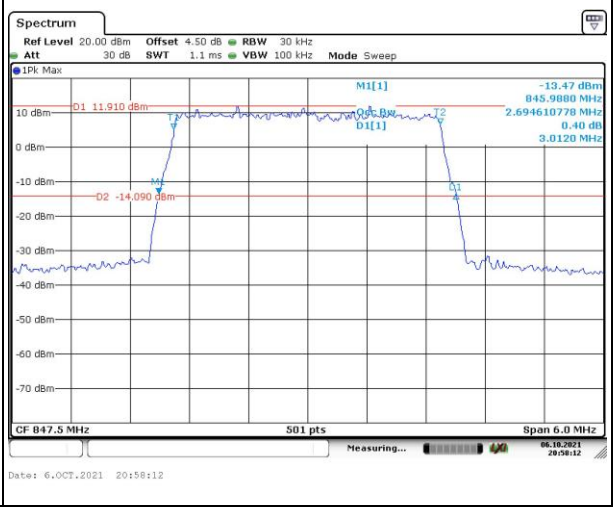
FCC §2.1051, §22.917(a):Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

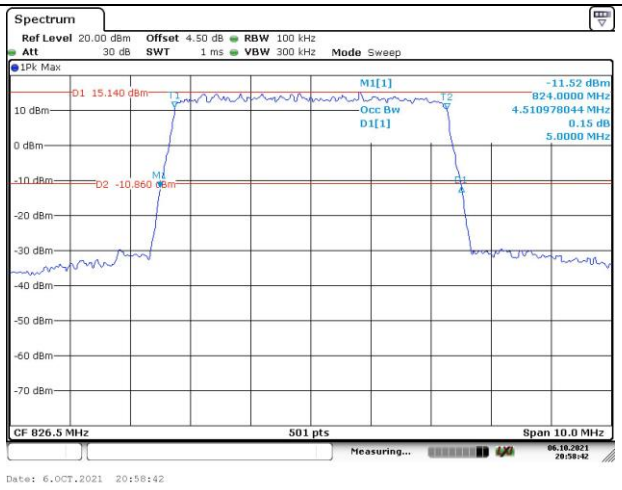
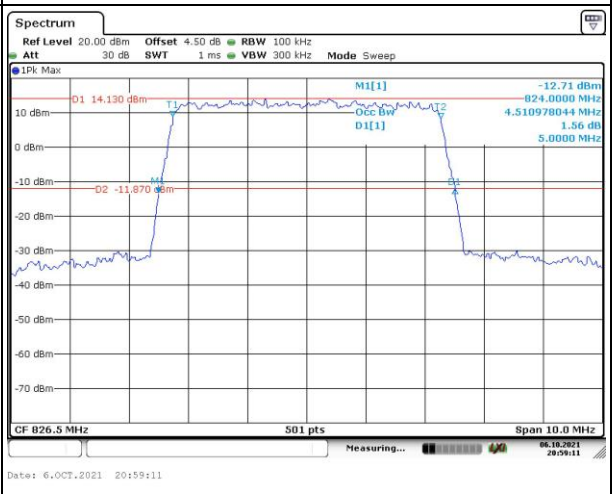
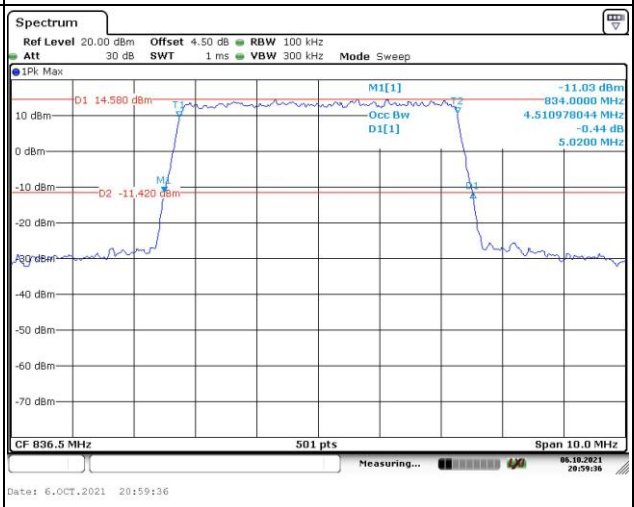
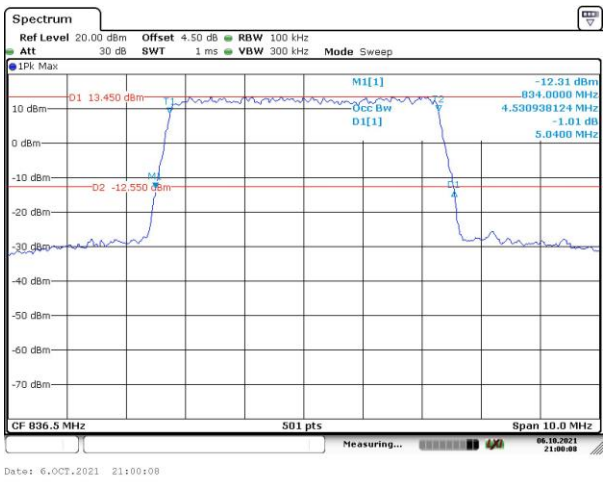
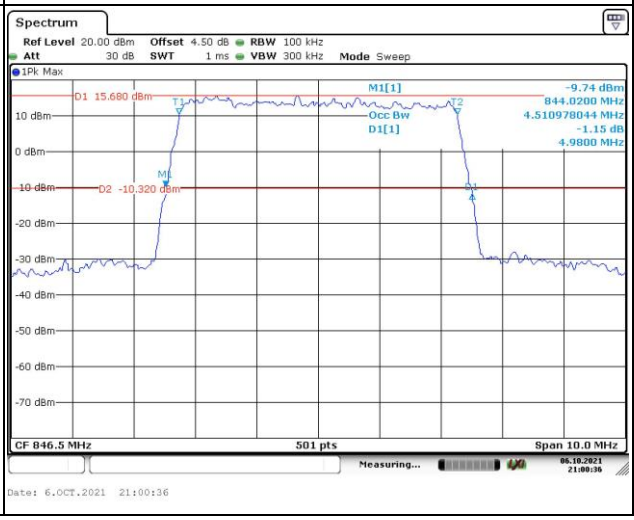
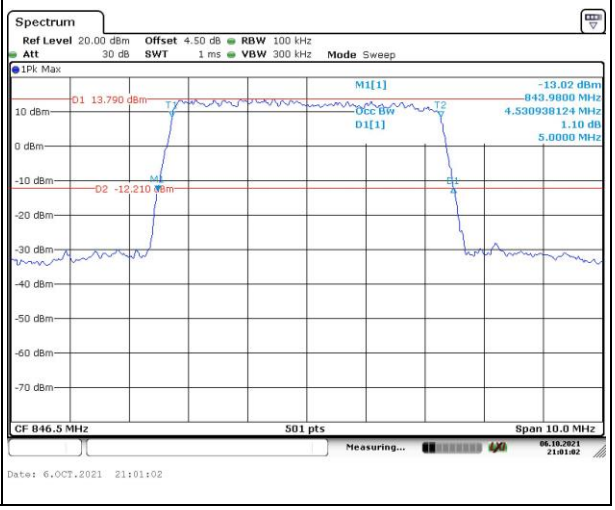
FCC §2.1055, §22.355: Frequency Stability					
Test Mode:	10 MHz QPSK		Test Channel:	836.5	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.8	0.04	0.00	Pass
	-20	3.8	6.61	0.01	Pass
	-10	3.8	-6.95	-0.01	Pass
	0	3.8	5.5	0.01	Pass
	10	3.8	-8.86	-0.01	Pass
	20	3.8	-8.56	-0.01	Pass
	30	3.8	6.71	0.01	Pass
	40	3.8	6.01	0.01	Pass
	50	3.8	-8.19	-0.01	Pass
Frequency Stability vs. Voltage	20	3.5	-7.41	-0.01	Pass
	20	4.3	8.27	0.01	Pass
				Result:	**Pass**

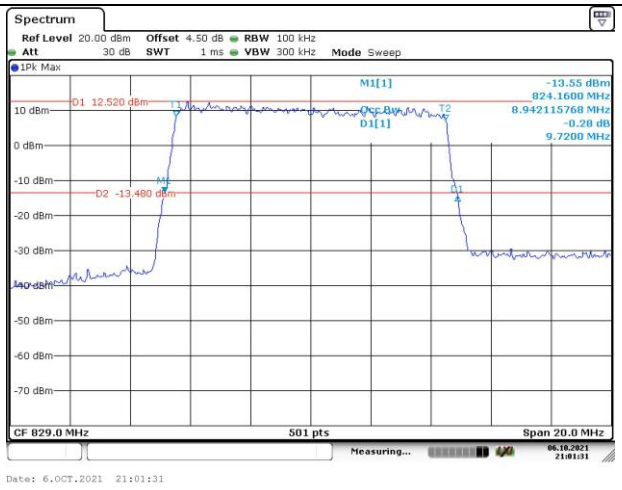
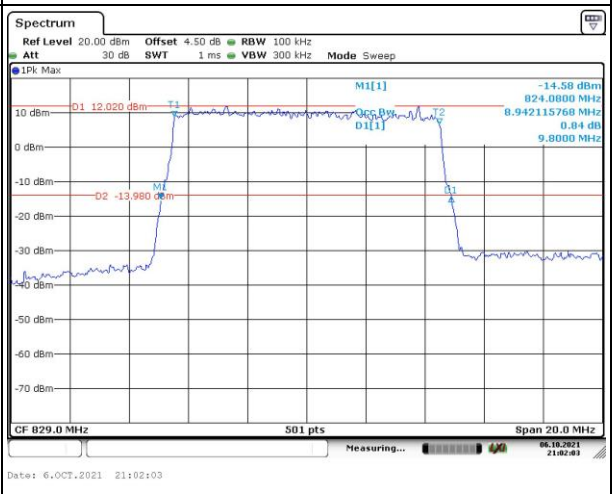
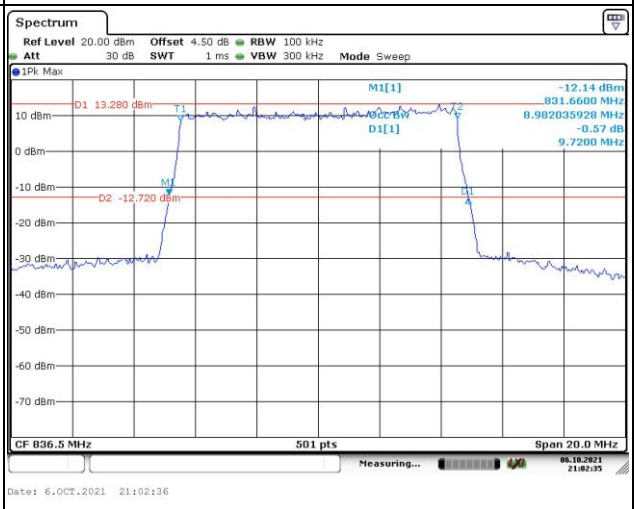
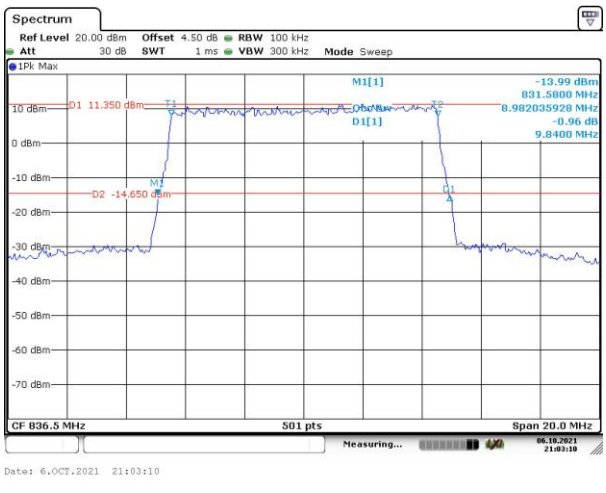
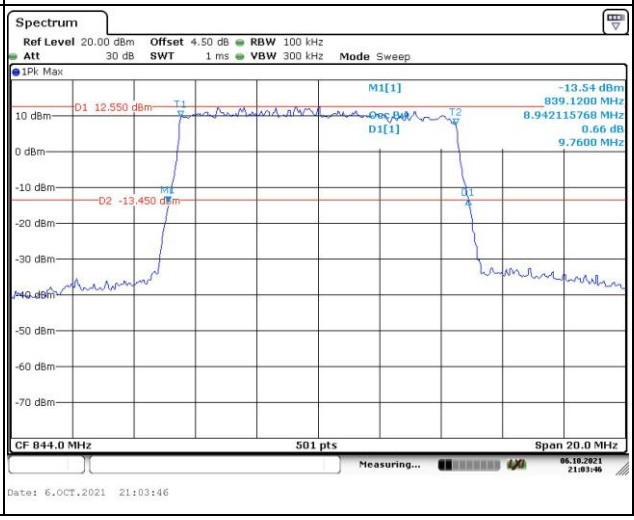
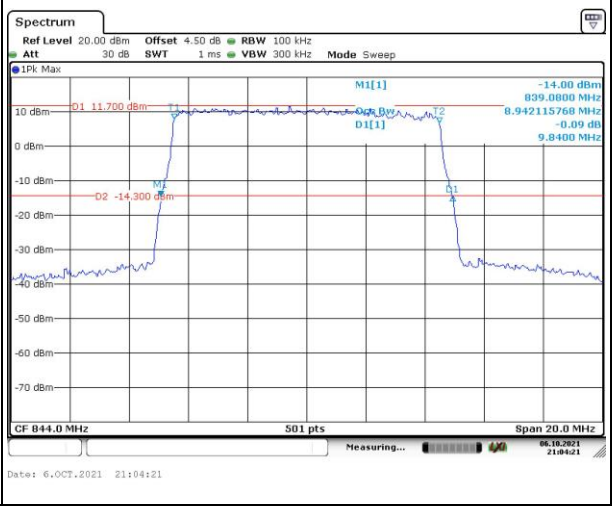
Test Mode:	10 MHz 16QAM		Test Channel:	836.5	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.8	-2.53	0.00	Pass
	-20	3.8	-6.59	-0.01	Pass
	-10	3.8	-6.61	-0.01	Pass
	0	3.8	-5.59	-0.01	Pass
	10	3.8	-7.53	-0.01	Pass
	20	3.8	-6.98	-0.01	Pass
	30	3.8	5.35	0.01	Pass
	40	3.8	-8.4	-0.01	Pass
	50	3.8	8.53	0.01	Pass
Frequency Stability vs. Voltage	20	3.5	-6.52	-0.01	Pass
	20	4.3	7.39	0.01	Pass
				Result:	**Pass**

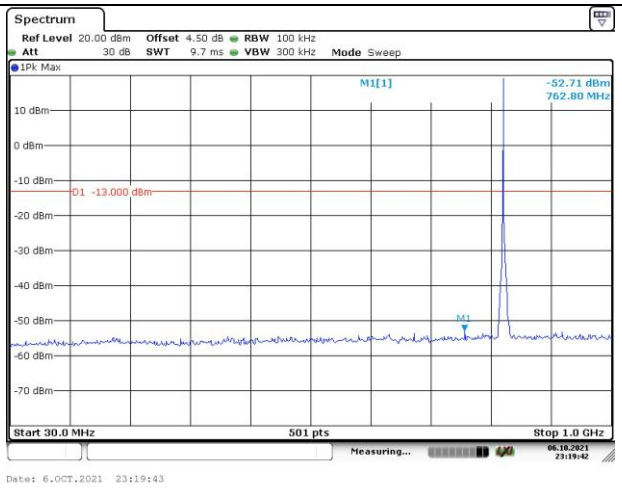
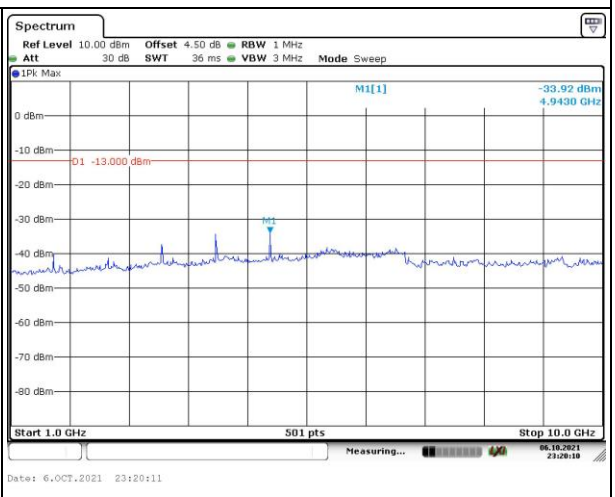
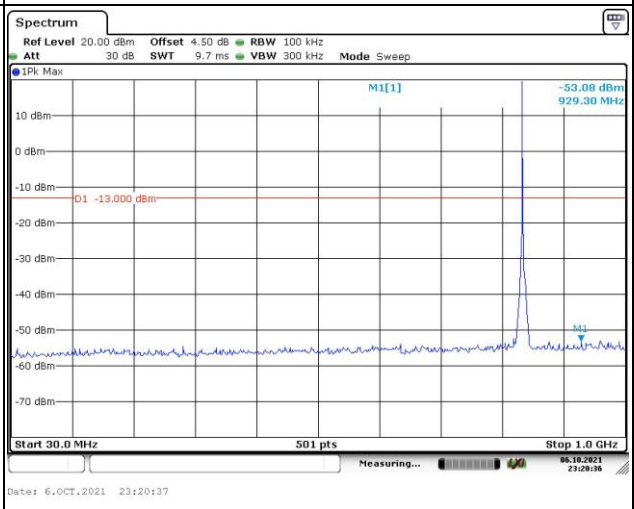
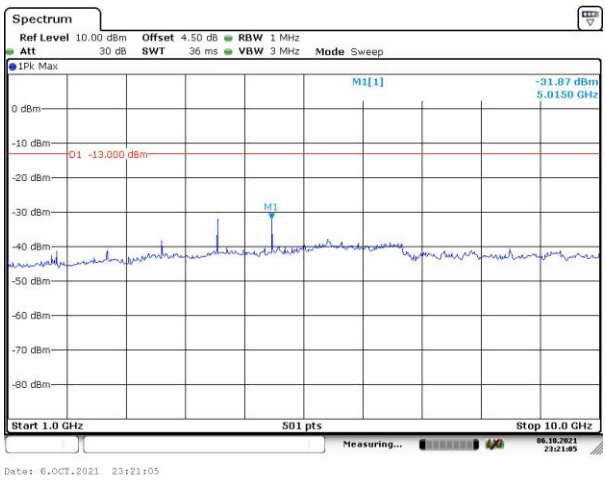
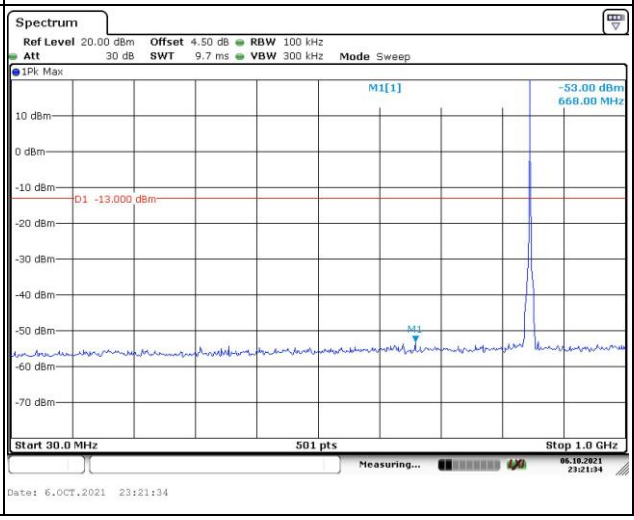
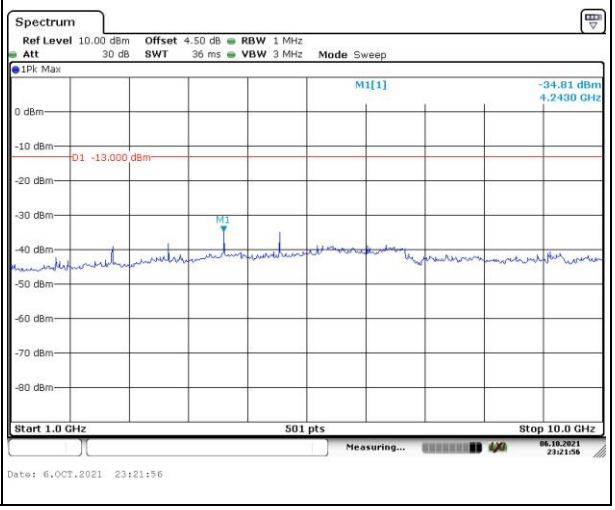
Test Plots:

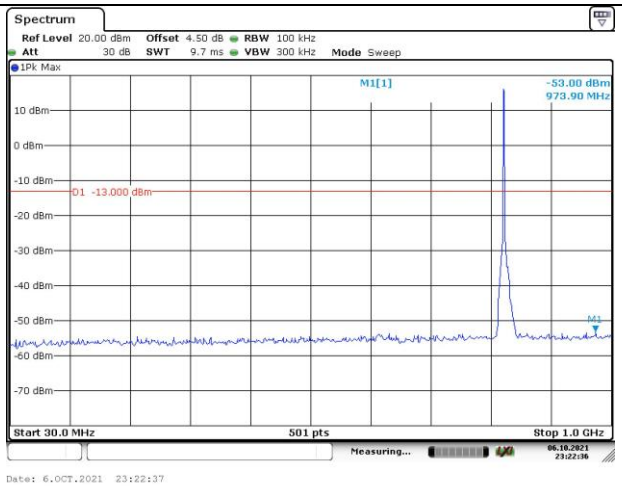
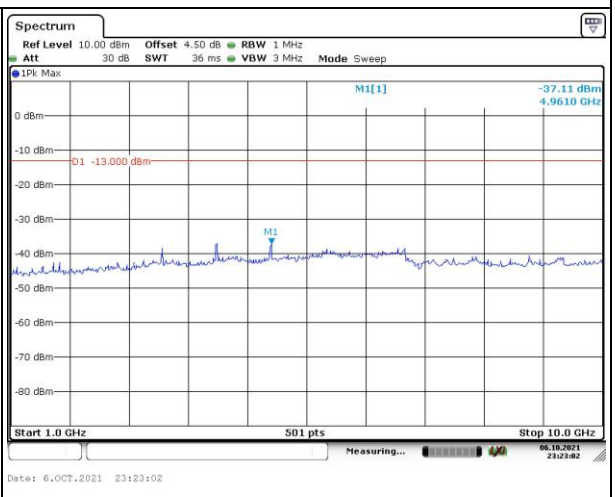
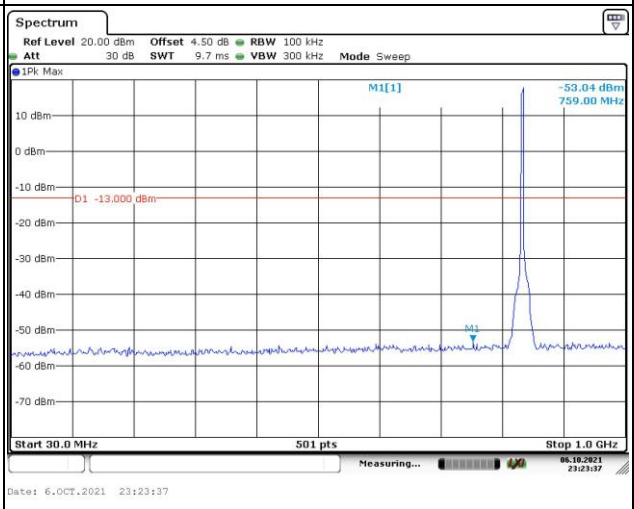
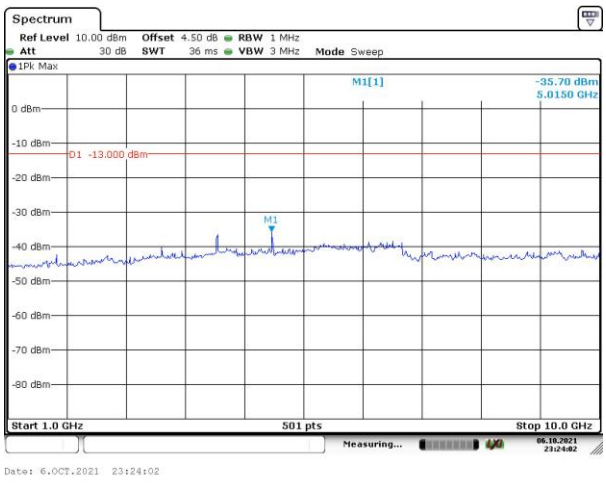
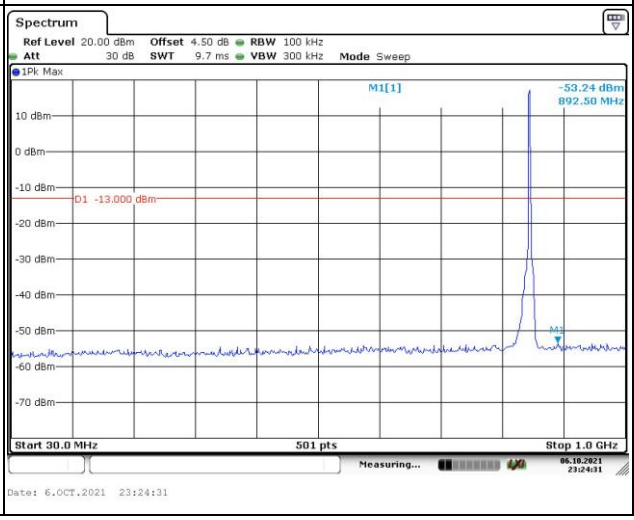
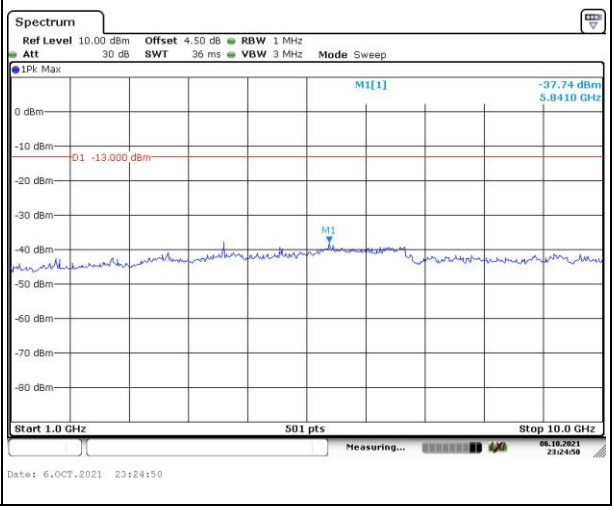
Occupied Bandwidth		
Channel	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

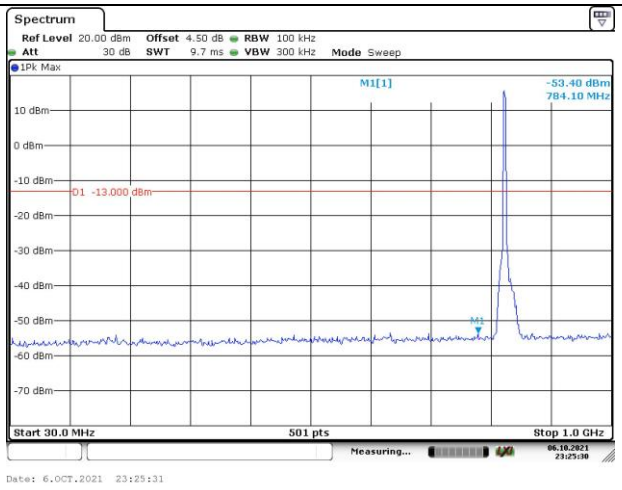
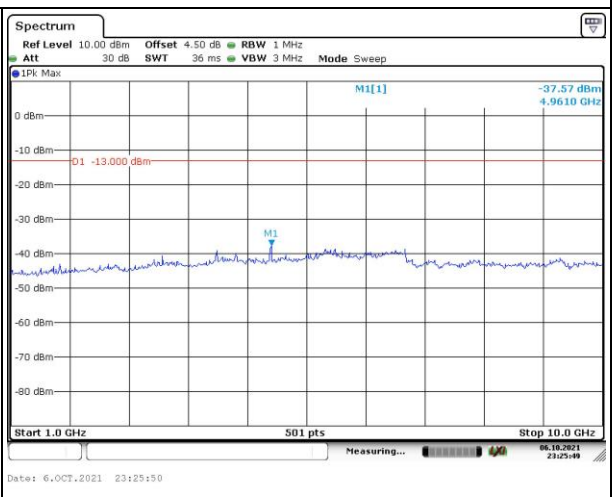
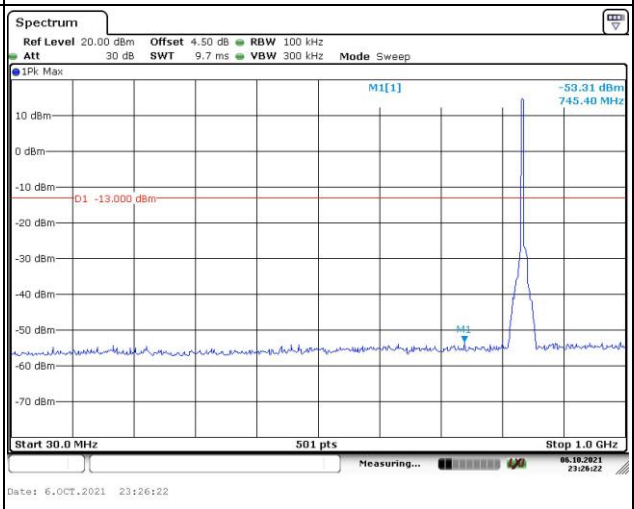
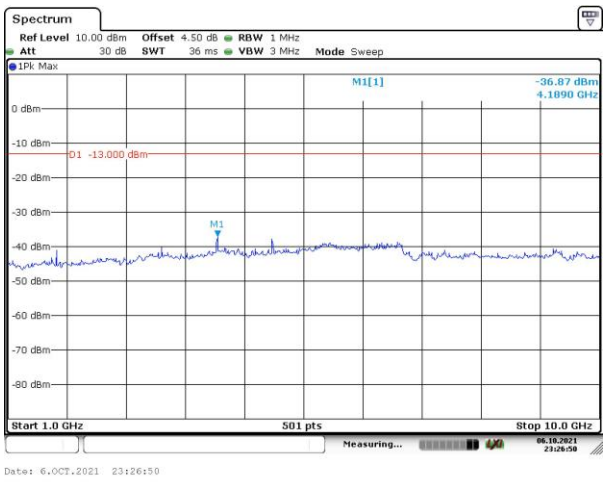
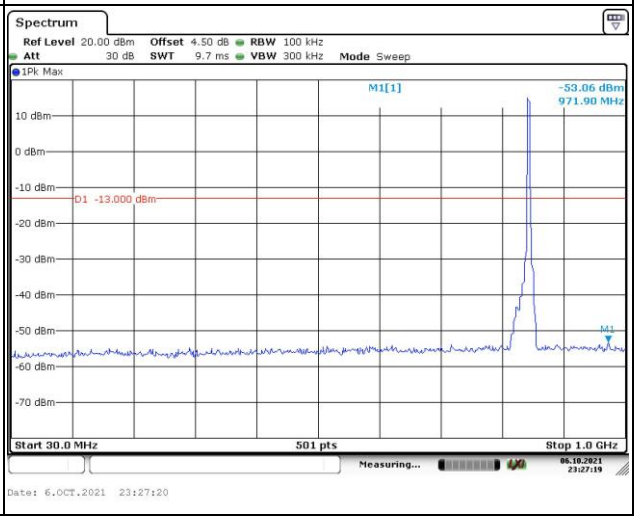
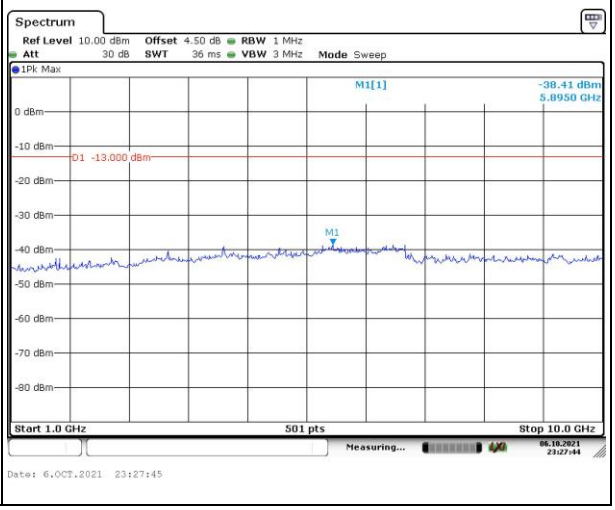
Occupied Bandwidth		
Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

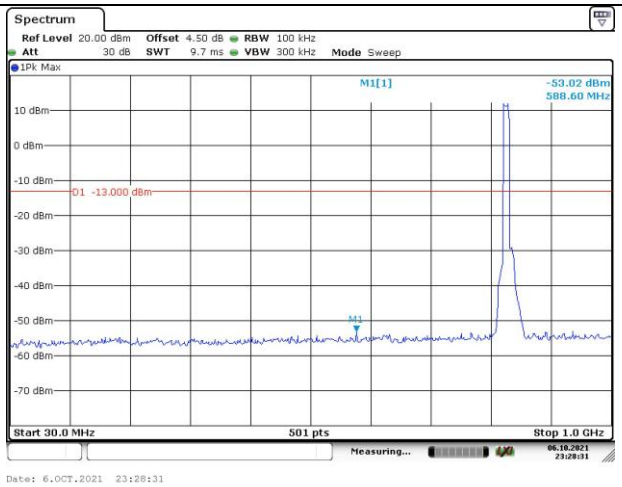
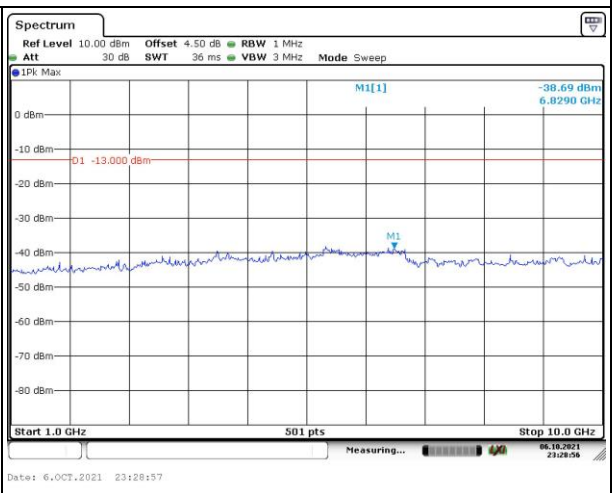
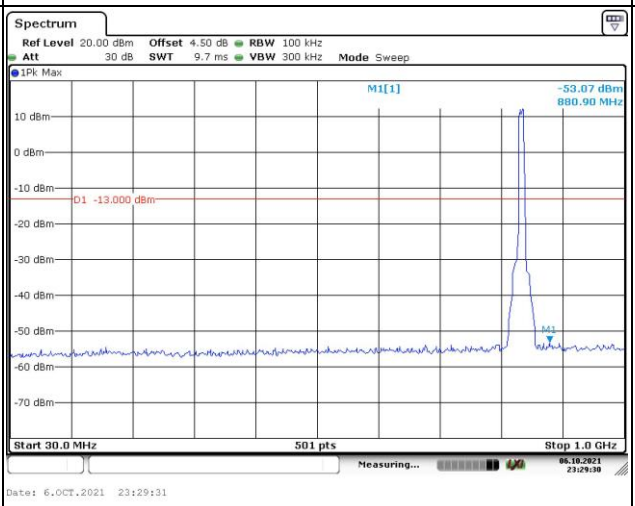
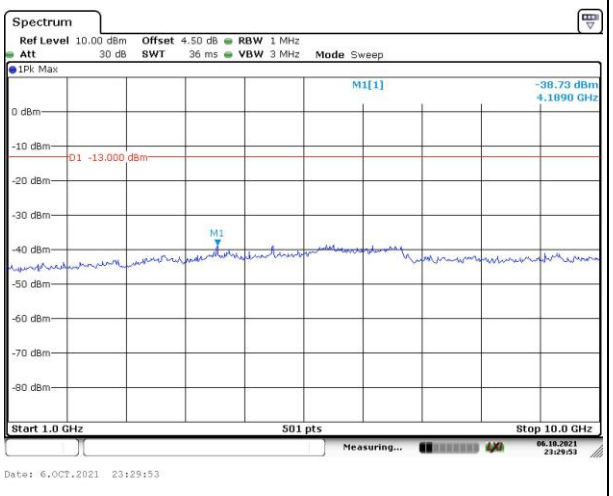
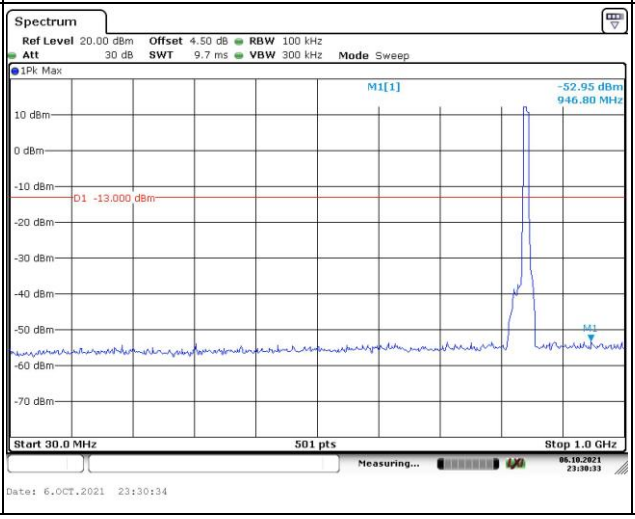
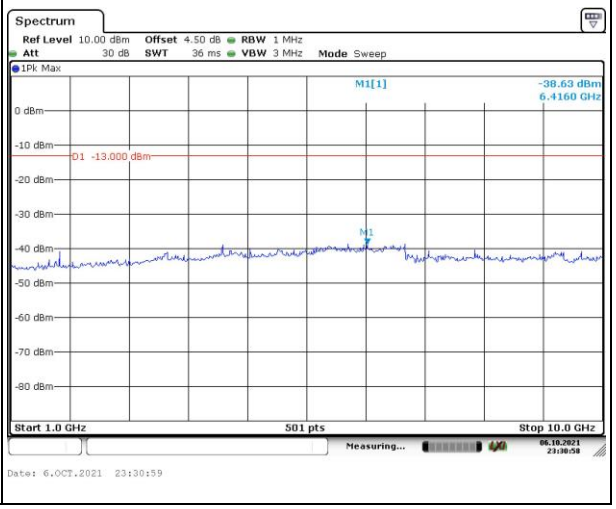
Occupied Bandwidth		
Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

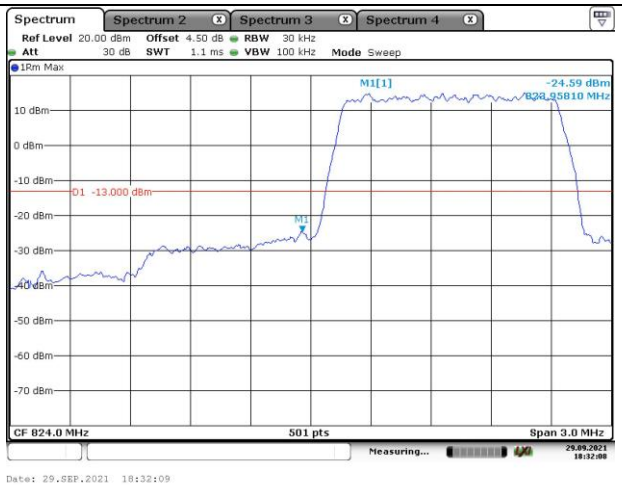
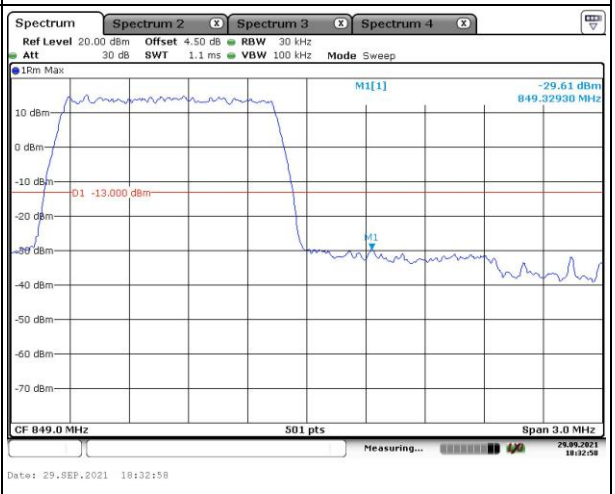
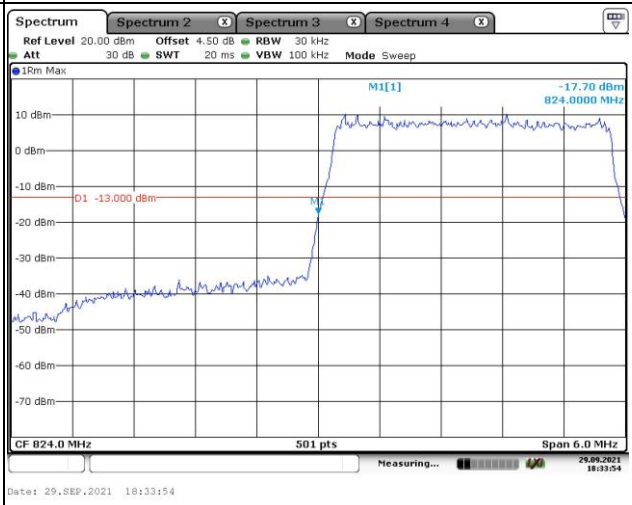
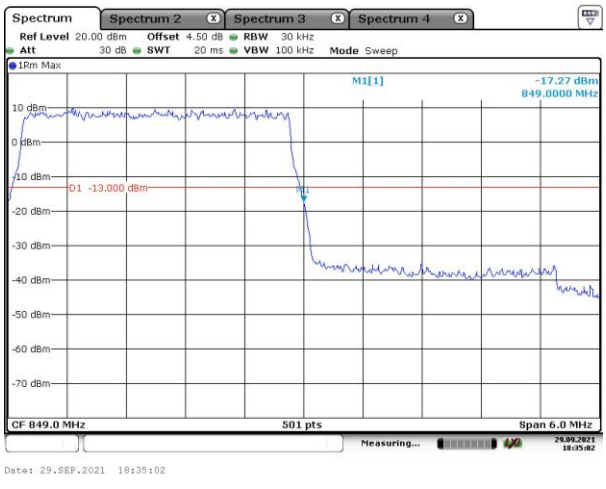
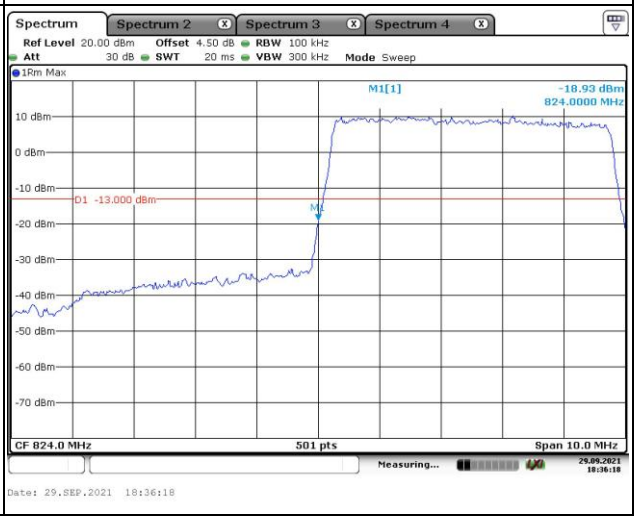
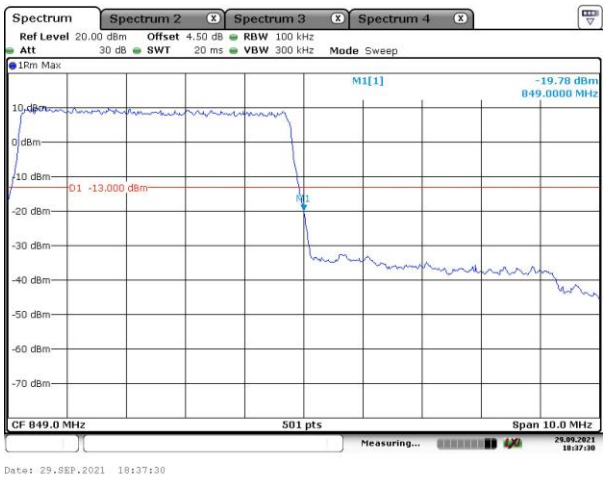
Occupied Bandwidth		
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

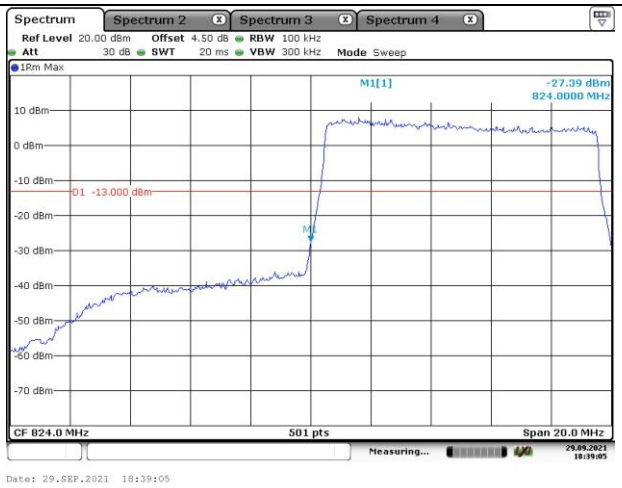
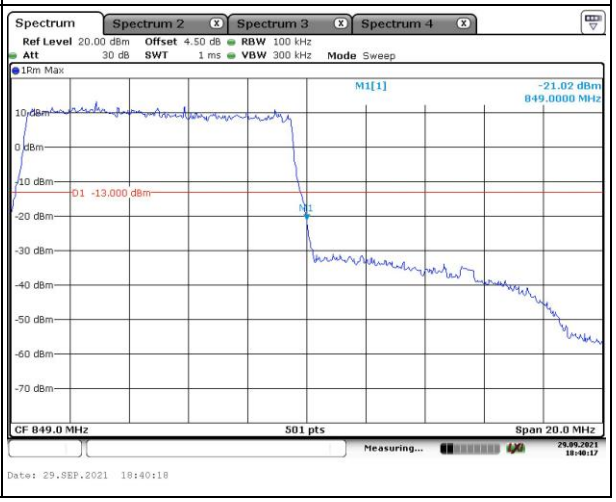
Spurious Emissions at Antenna Terminal		
Channel	**1.4MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

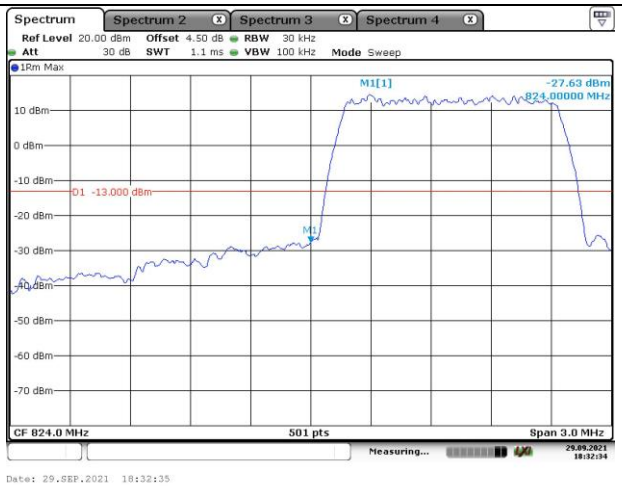
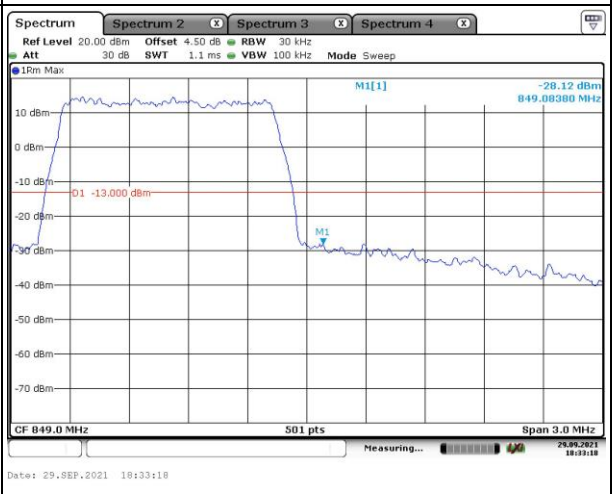
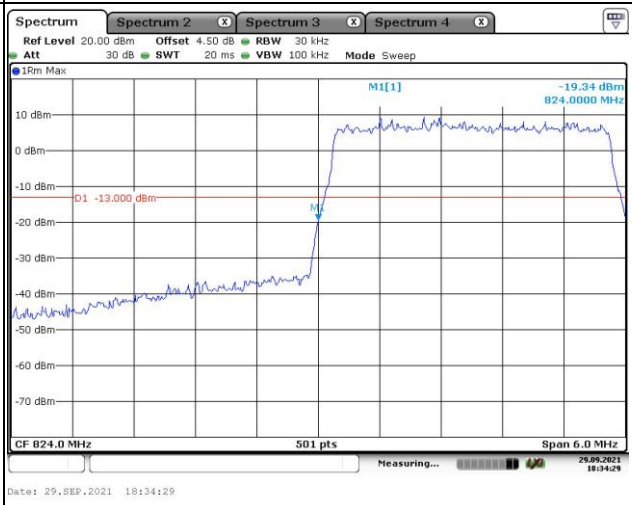
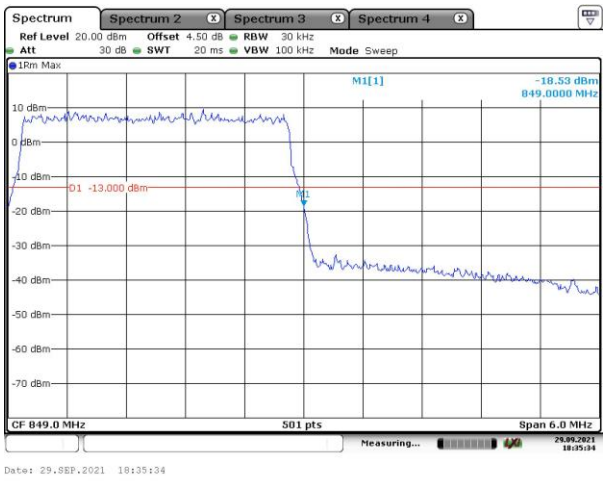
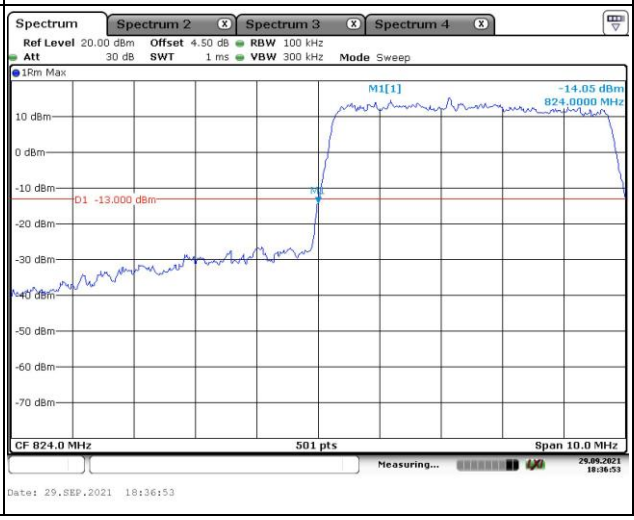
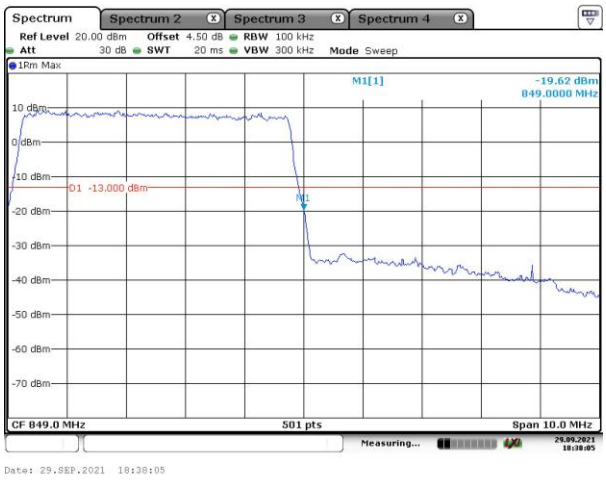
Spurious Emissions at Antenna Terminal		
Channel	**3MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

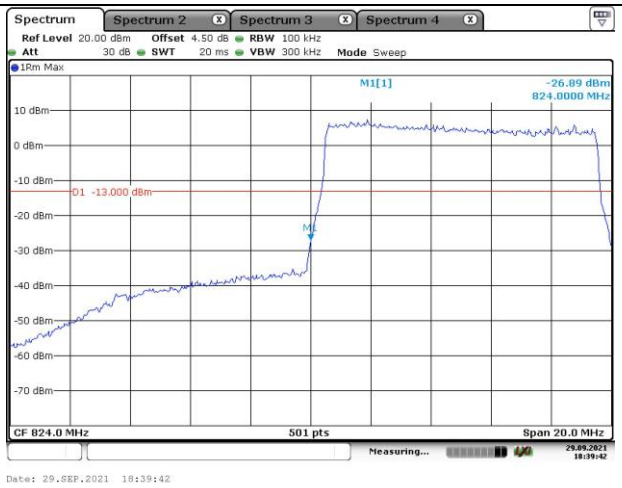
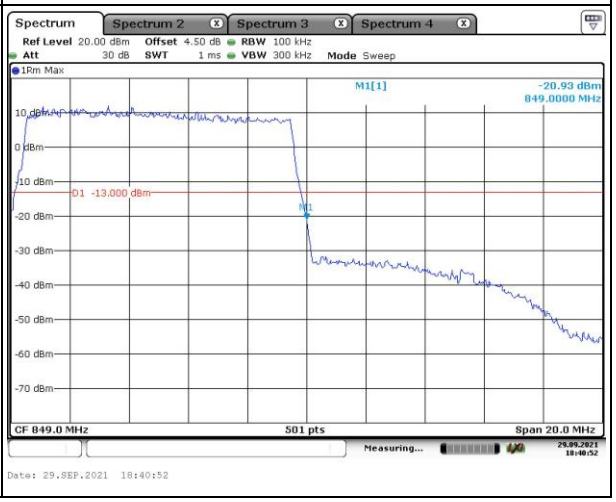
Spurious Emissions at Antenna Terminal		
Channel	**5MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal		
Channel	**10MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 1.4MHz		
QPSK 3MHz		
QPSK 5MHz		

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 10MHz		

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		

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

Serial Number:	CR21090060-RF-S1/2	Test Date:	2021/9/29~2021/10/21
Test Site:	RF	Test Mode:	Transmitting
Tester:	Le qiao	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	25.9~28.1	Relative Humidity: (%)	51~60	ATM Pressure: (kPa)	100.2~100.4

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
R&S	Wideband Radio Communication Tester	CMW500	149218	2021/7/22	2022/7/21
Mini-Circuits	DC Block	BLK-18-S+	1554403	2021/8/8	2022/8/7
ZHAOXIN	DC Power Supply	RXN-6010D	21R60	N/A	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150	30026	2021/7/22	2022/7/22
UNI-T	Multimeter	UT39A+	C210582554	2021/8/30	2022/8/30
E-Microwave	Two-way Spliter	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):	0.6
Operation Voltage(V_{DC}):					
Lowest:	3.5	Normal:	3.8	Highest:	4.3

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	21.89	21.76	21.78	22.29	33
	RB1#13	21.84	21.8	21.59		
	RB1#24	21.83	21.78	21.68		
	RB15#0	20.87	20.78	20.83		
	RB15#10	20.73	20.81	20.84		
	RB25#0	20.87	20.77	20.81		
5MHz 16QAM	RB1#0	20.07	20.71	20.46	21.33	33
	RB1#13	20.04	20.93	20.38		
	RB1#24	20.03	20.82	20.4		
	RB15#0	19.93	19.73	19.91		
	RB15#10	20.34	19.79	19.88		
	RB25#0	20.42	19.9	19.74		
10MHz QPSK	RB1#0	21.7	21.78	21.83	22.44	33
	RB1#25	21.76	21.73	22.04		
	RB1#49	21.82	21.77	21.87		
	RB25#0	20.77	20.82	20.85		
	RB25#25	20.87	20.8	20.85		
	RB50#0	20.81	20.87	20.96		
10MHz 16QAM	RB1#0	20.95	21	20.28	21.45	33
	RB1#25	20.96	20.99	20.48		
	RB1#49	21.05	21.02	20.29		
	RB25#0	20.29	20.37	19.96		
	RB25#25	19.94	20.02	19.96		
	RB50#0	20.04	20	20.02		
15MHz QPSK	RB1#0	21.76	21.78	21.7	22.21	33
	RB1#38	21.77	21.73	21.64		
	RB1#74	21.81	21.79	21.72		
	RB36#0	20.77	20.71	20.79		
	RB36#39	20.83	20.86	20.76		
	RB75#0	20.81	20.77	20.82		
15MHz 16QAM	RB1#0	21.23	21.16	21.18	21.95	33
	RB1#38	21.23	21.16	21.55		
	RB1#74	21.24	21.04	21.51		
	RB36#0	19.97	19.9	19.86		
	RB36#39	20.03	20	19.86		
	RB75#0	20.01	19.88	19.79		
20MHz QPSK	RB1#0	21.81	21.86	21.84	22.29	33
	RB1#50	21.83	21.85	21.83		
	RB1#99	21.85	21.87	21.89		

	RB50#0	20.82	20.88	20.87		
	RB50#50	20.72	20.78	20.92		
	RB100#0	20.76	20.92	20.78		
20MHz 16QAM	RB1#0	20.68	21.45	20.96	21.85	33
	RB1#50	20.71	21.42	21.04		
	RB1#99	20.69	21.4	20.99		
	RB50#0	19.94	19.94	19.91		
	RB50#50	19.94	19.88	20.08		
	RB100#0	19.8	19.9	19.82		
					Result:	**Pass**

Peak-to-average Ratio(PAR)

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
20MHz QPSK	RB1#0	4.17	5.42	4.75	13
	RB100#0	4.9	5.19	5.16	13
20MHz 16QAM	RB1#0	5.25	6.03	5.88	13
	RB100#0	5.83	6.03	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
5MHz QPSK	4.531	4.511	4.511	5	5.02	5
5MHz 16QAM	4.511	4.551	4.551	5.02	5	5.02
10MHz QPSK	8.981	8.942	8.942	9.8	9.8	9.8
10MHz 16QAM	8.942	8.981	8.942	9.8	9.8	9.84
15MHz QPSK	13.473	13.473	13.533	15.06	15.12	15.12
15MHz 16QAM	13.533	13.533	13.533	15.06	15.12	15.06
20MHz QPSK	17.964	17.964	18.044	19.68	19.68	19.84
20MHz 16QAM	17.964	18.044	17.964	19.76	19.84	19.76
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.**

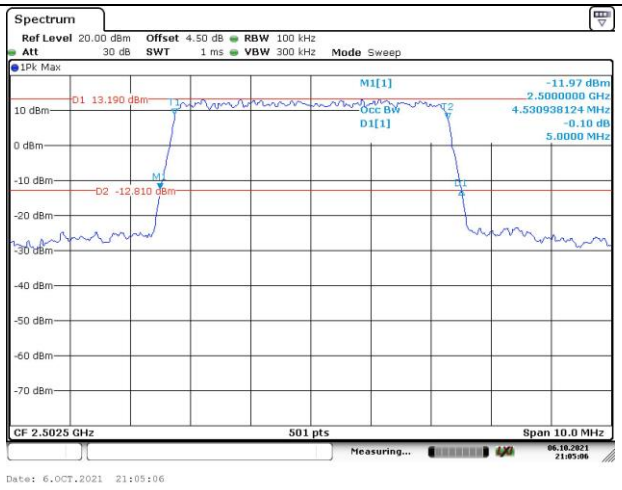
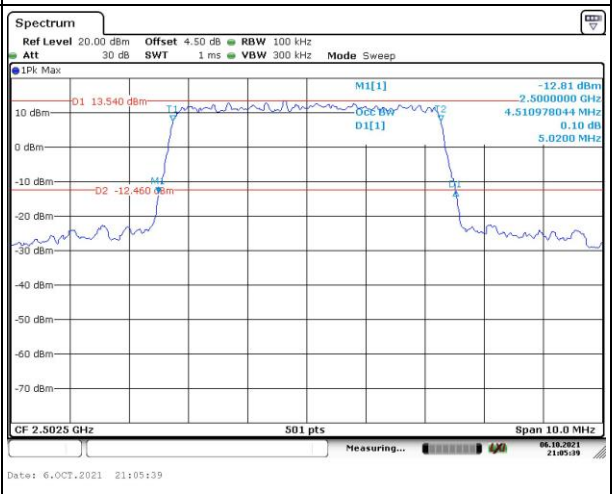
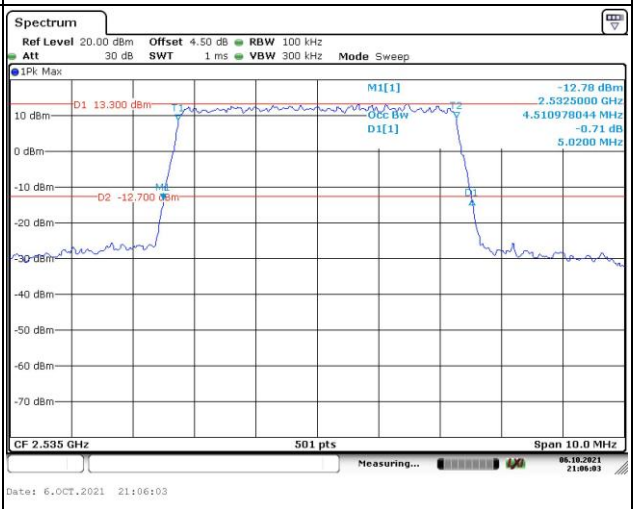
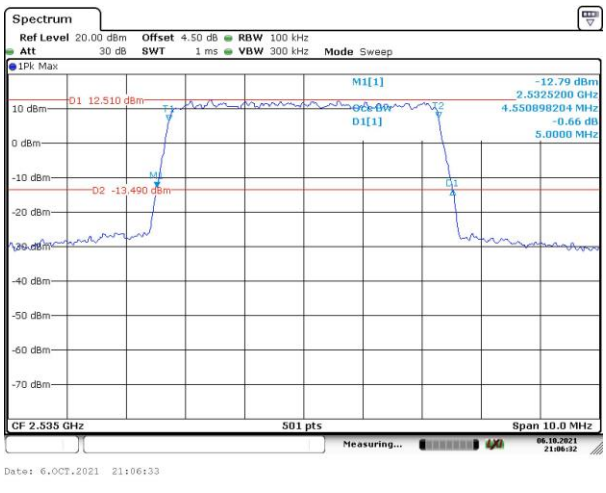
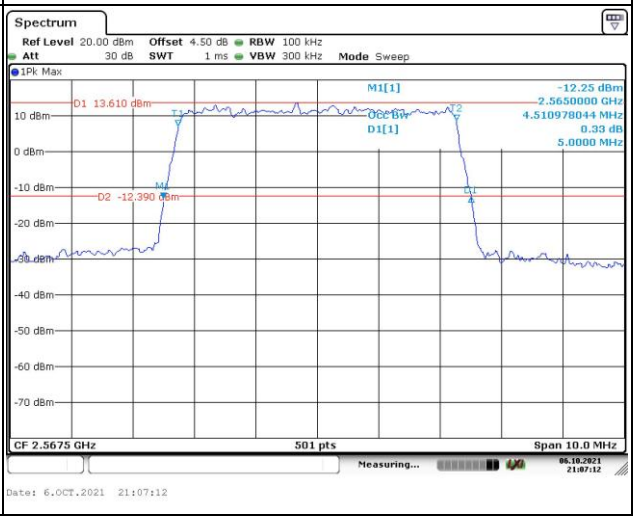
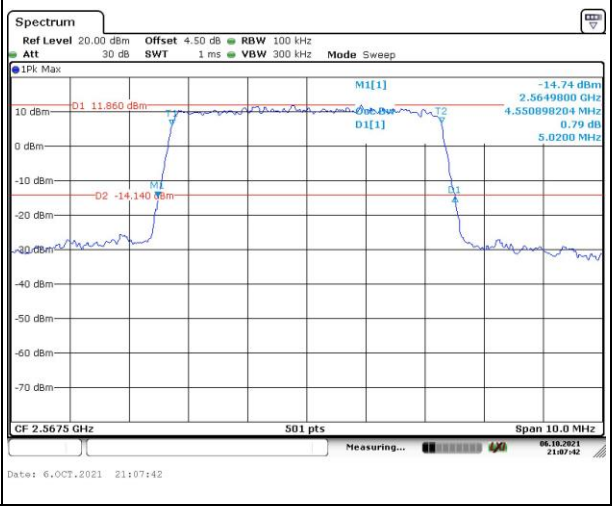
FCC §2.1051, §27.53:Out of band emission, Band Edge

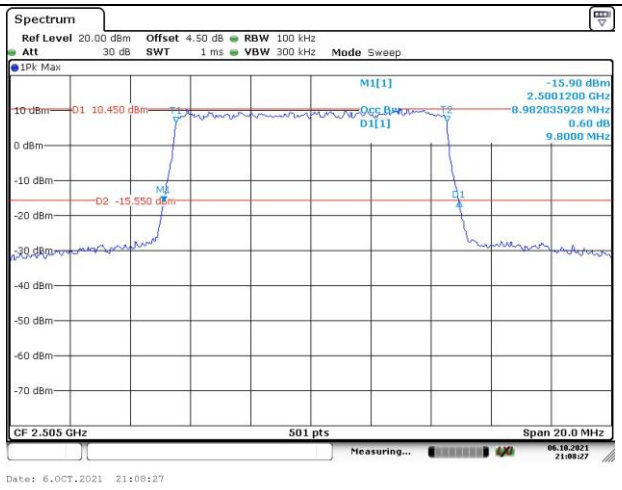
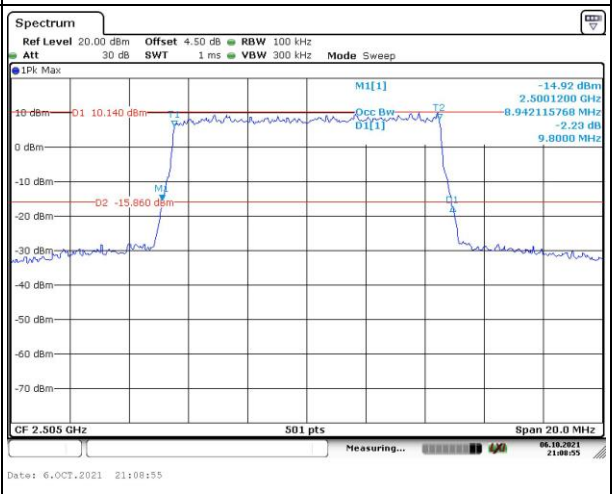
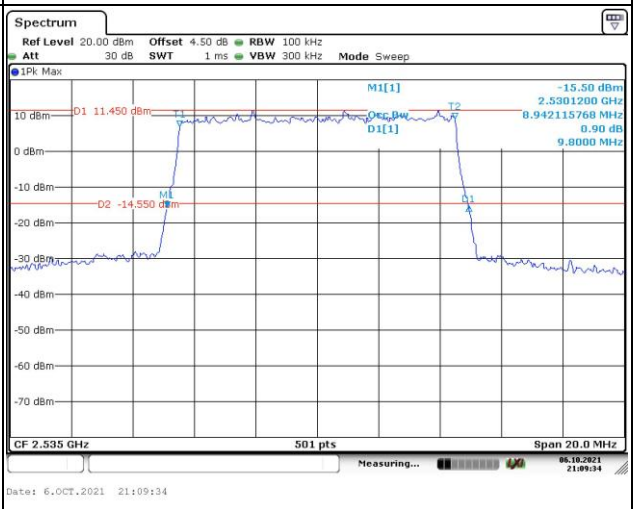
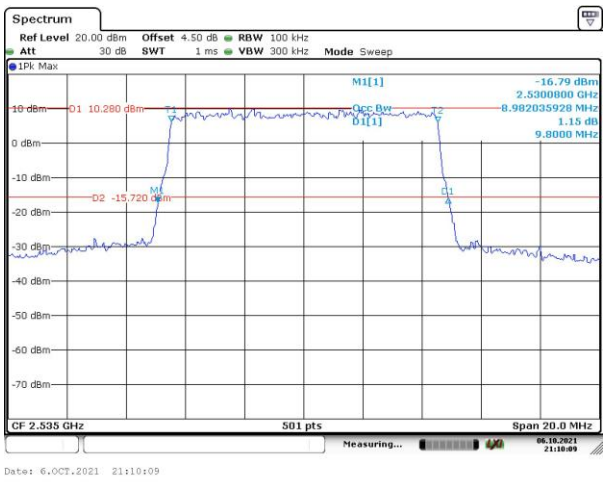
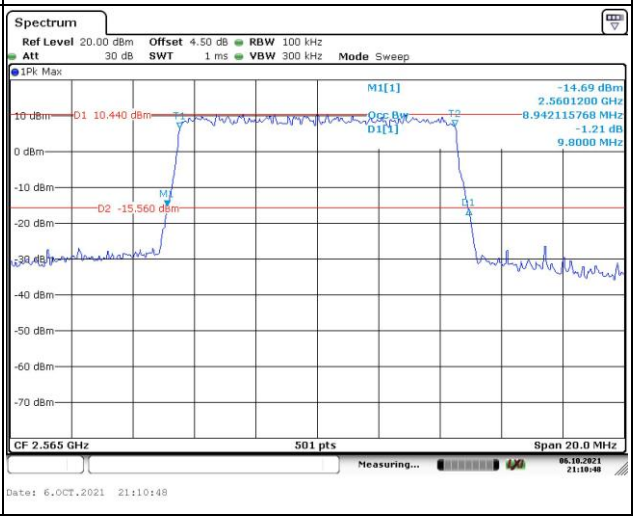
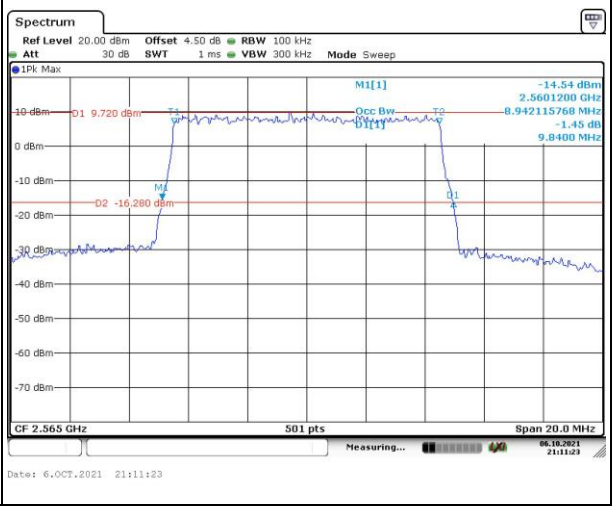
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

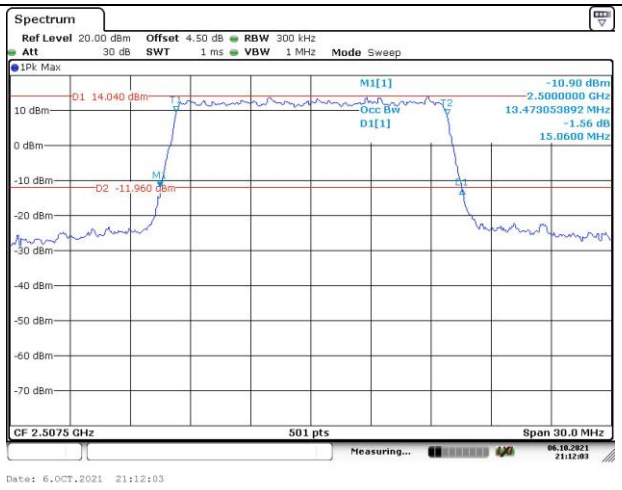
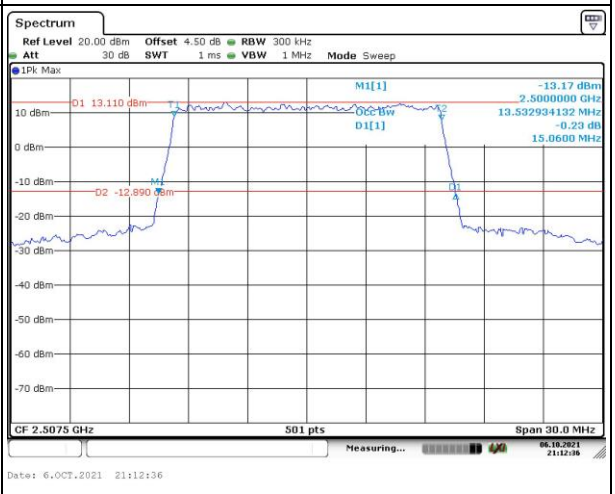
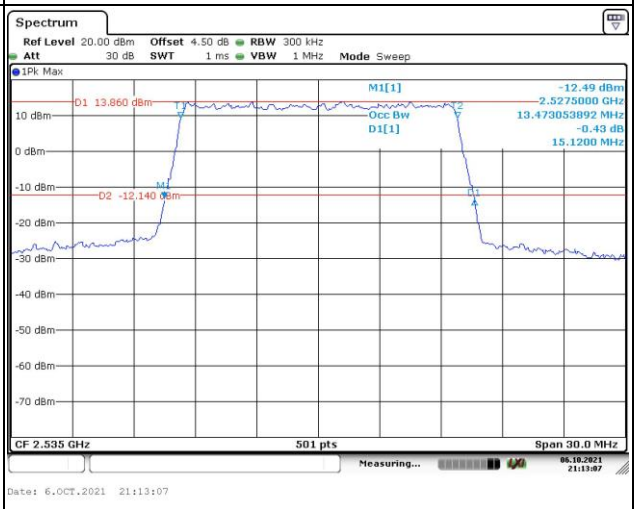
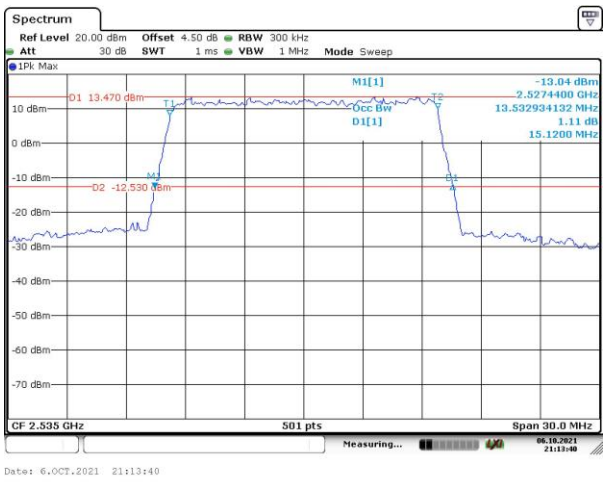
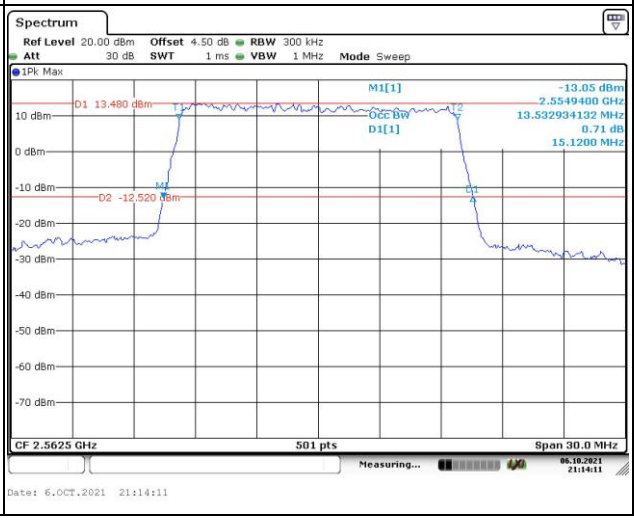
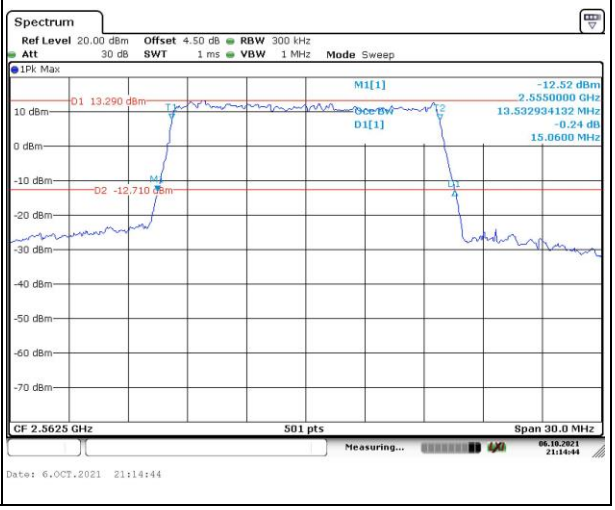
FCC §2.1055, §27.54: Frequency Stability						
Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.8	2500.3292	2500.00	2569.3416	2570
	-20	3.8	2500.6584	2500.00	2569.7531	2570
	-10	3.8	2500.3292	2500.00	2569.5062	2570
	0	3.8	2500.4115	2500.00	2569.9177	2570
	10	3.8	2500.3292	2500.00	2569.5885	2570
	20	3.8	2500.5289	2500.00	2569.511	2570
	30	3.8	2500.1646	2500.00	2569.8354	2570
	40	3.8	2500.6584	2500.00	2569.7531	2570
	50	3.8	2500.5761	2500.00	2569.7531	2570
Frequency Stability vs. Voltage	20	3.5	2500.1646	2500.00	2569.4239	2570
	20	4.3	2500.0823	2500.00	2569.8354	2570
					Result:	**Pass**

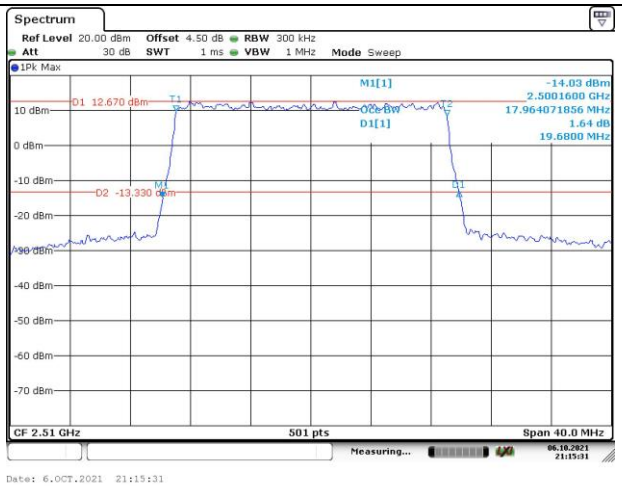
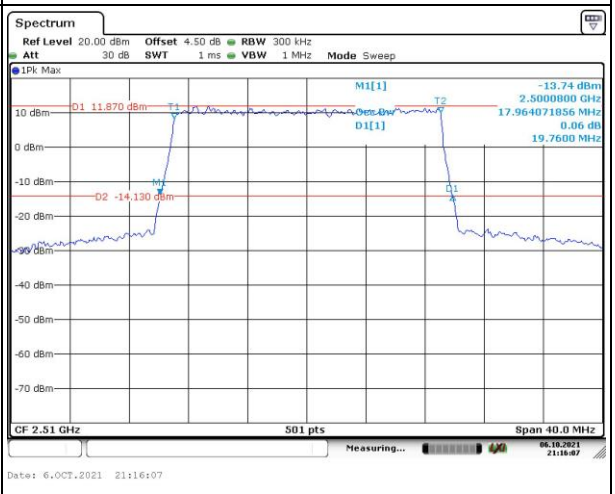
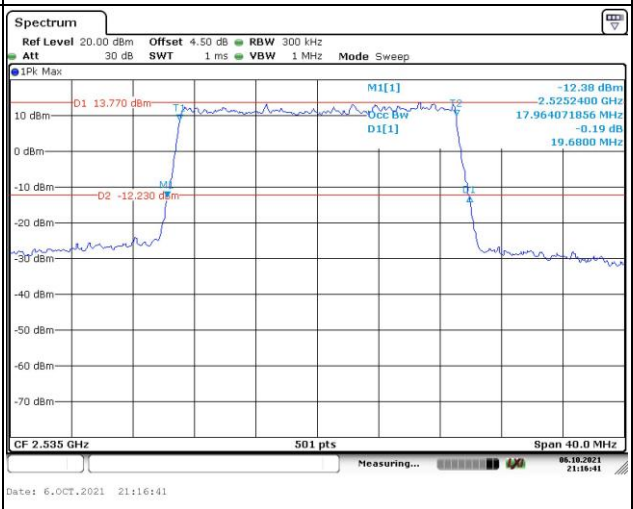
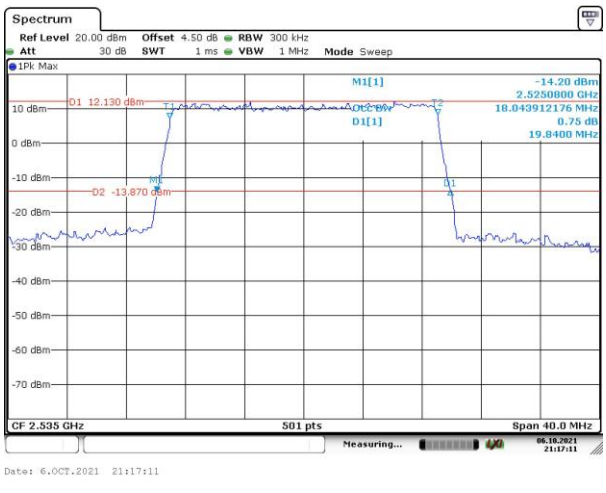
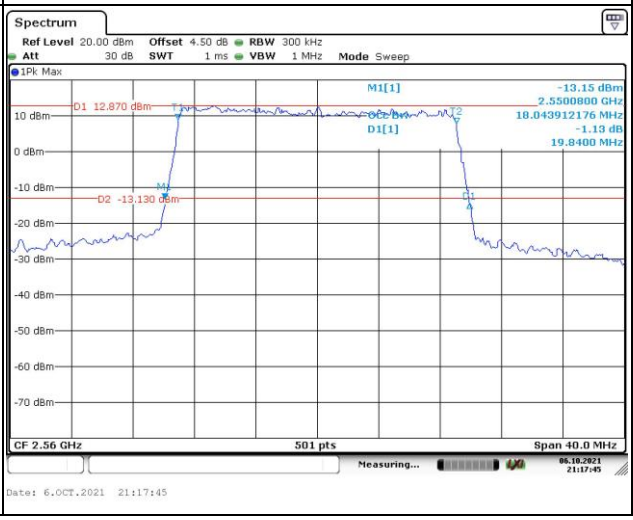
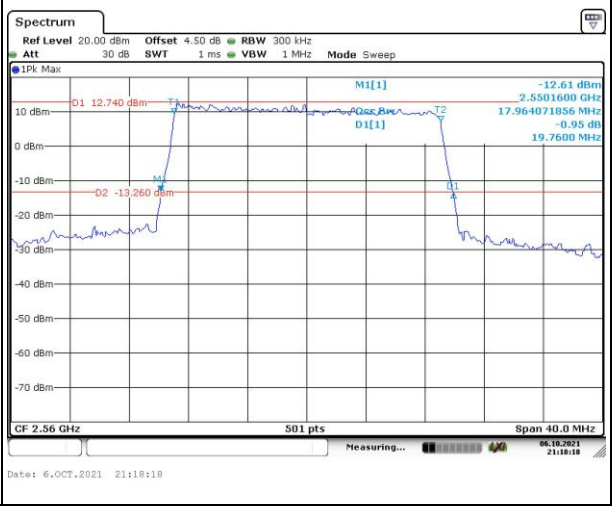
Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.8	2500.4115	2500.00	2569.9177	2570
	-20	3.8	2500.1646	2500.00	2569.4239	2570
	-10	3.8	2500.1646	2500.00	2569.9177	2570
	0	3.8	2500.7407	2500.00	2569.9177	2570
	10	3.8	2500.4115	2500.00	2569.2593	2570
	20	3.8	2500.5289	2500.00	2569.4711	2570
	30	3.8	2500.3292	2500.00	2569.5062	2570
	40	3.8	2500.1646	2500.00	2569.5885	2570
	50	3.8	2500.6584	2500.00	2569.5885	2570
Frequency Stability vs. Voltage	20	3.5	2500.1646	2500.00	2569.6708	2570
	20	4.3	2500.3292	2500.00	2569.5062	2570
					Result:	**Pass**

Test Plots:

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		
Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Occupied Bandwidth		
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest		
Middle		
Highest