4.8 Antenna Port Test Data and Results for LTE Band 5

Serial Number:	2CGM-1	Test Date:	2023/11/7-2023/11/8
Test Site:	RF	Test Mode:	Transmitting
Tester:	Hale Li	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	24.9-25.1	Relative Humidity: (%)	48-53	ATM Pressure: (kPa)	101

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200120	2023/4/18	2024/4/17
zhuoxiang	Coaxial Cable	211001	Each time	N/A	N/A
Minl-Clrcuits	Power Splitter	S F448201619	Each time	N/A	N/A
eastsheep	Coaxial Attenuator	21060301	Each time	N/A	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2023/9/29	2024/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30

** 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).*

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	22.62	23.01	23.22	14.28	38.45
	RB1#3	22.74	23.06	23.28		
	RB1#5	22.72	22.95	23.20		
	RB3#0	22.75	23.08	23.32		
	RB3#3	22.84	23.12	23.28		
	RB6#0	21.85	22.20	22.42		
1.4MHz 16QAM	RB1#0	21.65	21.97	22.29	13.34	38.45
	RB1#3	21.76	22.05	22.38		
	RB1#5	21.71	21.97	22.29		
	RB3#0	21.83	22.27	22.23		
	RB3#3	21.93	22.30	22.23		
	RB6#0	20.79	21.20	21.44		
3MHz QPSK	RB1#0	22.46	22.81	23.07	14.12	38.45
	RB1#8	22.72	22.91	23.16		
	RB1#14	22.64	22.90	23.08		
	RB6#0	21.70	22.01	22.29		
	RB6#9	21.87	22.09	22.21		
	RB15#0	21.80	22.07	22.25		
3MHz 16QAM	RB1#0	21.53	22.39	22.17	13.43	38.45
	RB1#8	21.77	22.47	22.26		
	RB1#14	21.70	22.36	22.16		
	RB6#0	20.64	21.10	21.30		
	RB6#9	20.80	21.11	21.26		
	RB15#0	20.80	21.07	21.16		
5MHz QPSK	RB1#0	22.73	23.09	23.26	14.39	38.45
	RB1#13	23.06	23.25	23.43		
	RB1#24	22.95	23.15	23.28		
	RB15#0	21.89	22.14	22.39		
	RB15#10	22.02	22.11	22.18		
	RB25#0	21.98	22.12	22.27		
5MHz 16QAM	RB1#0	21.83	21.96	22.51	13.67	38.45
	RB1#13	22.15	22.09	22.71		
	RB1#24	21.99	22.02	22.54		
	RB15#0	20.90	21.13	21.35		
	RB15#10	20.99	21.15	21.14		
	RB25#0	20.99	21.20	21.29		
10MHz QPSK	RB1#0	22.82	23.05	23.17	14.31	38.45

	RB1#25	23.08	23.17	23.33		
	RB1#49	23.08	23.21	23.35		
	RB25#0	21.91	21.99	22.18		
	RB25#25	22.02	22.08	22.16		
	RB50#0	21.96	22.09	22.18		
10MHz 16QAM	RB1#0	21.80	22.65	22.34	13.71	38.45
	RB1#25	22.06	22.75	22.45		
	RB1#49	22.05	22.75	22.43		
	RB25#0	21.00	21.07	21.25		
	RB25#25	21.12	21.19	21.15		
	RB50#0	21.00	21.11	21.19		
Note: ERP= Conducted Power(dBm) - L_C(dB) + G_T(dBd) G_T(dBd)=G_T(dBi)-2.15						
					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	5.22	5.13	4.87	13
	RB50#0	5.58	5.61	5.38	13
10MHz 16QAM	RB1#0	6.09	6.35	6.28	13
	RB50#0	6.51	6.44	6.38	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	1.104	1.110	1.110	1.296	1.302	1.284
1.4MHz 16QAM	1.104	1.098	1.104	1.302	1.284	1.278
3MHz QPSK	2.688	2.688	2.688	2.940	2.916	2.940
3MHz 16QAM	2.688	2.676	2.688	2.940	2.964	2.952
5MHz QPSK	4.500	4.540	4.500	4.900	4.940	4.960
5MHz 16QAM	4.540	4.520	4.540	4.960	4.900	4.940
10MHz QPSK	8.960	8.960	8.920	9.600	9.640	9.520
10MHz 16QAM	8.960	8.960	8.920	9.640	9.520	9.520
Note: The test plots please refer to the Plots of Occupied Bandwidth						

FCC §2.1051, §22.917(a):Spurious Emissions at Antenna Terminal

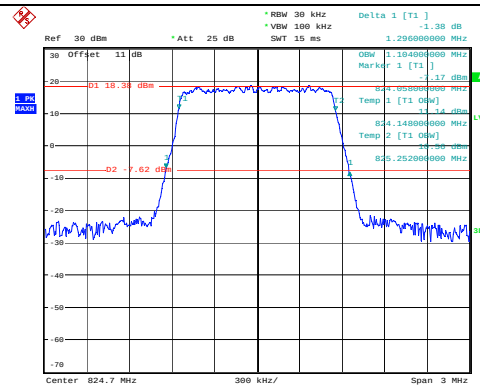
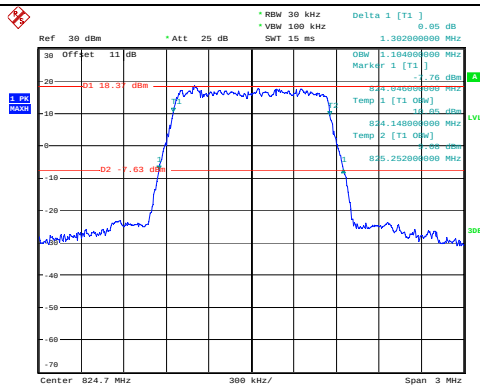
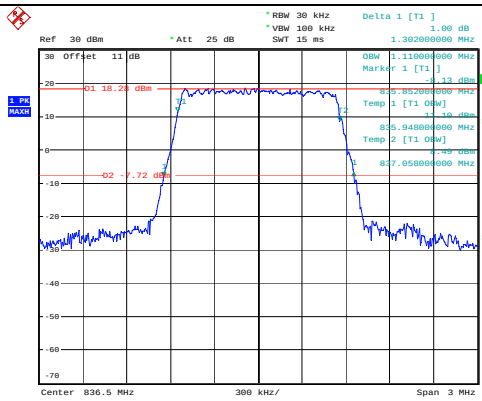
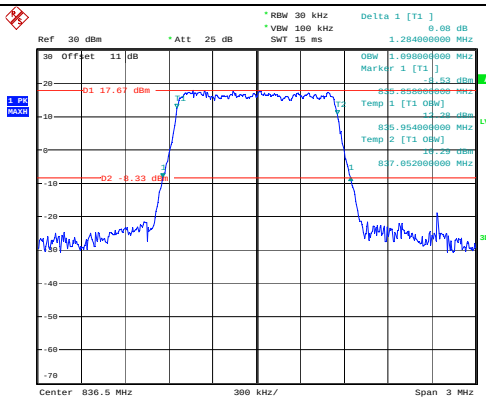
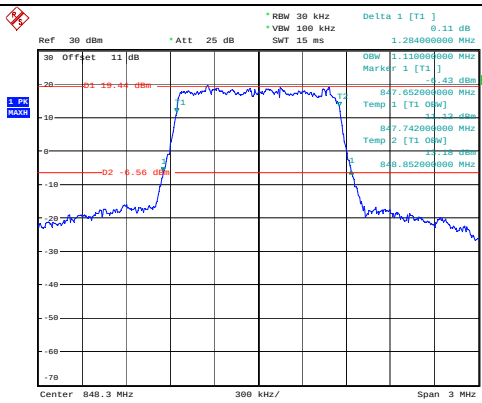
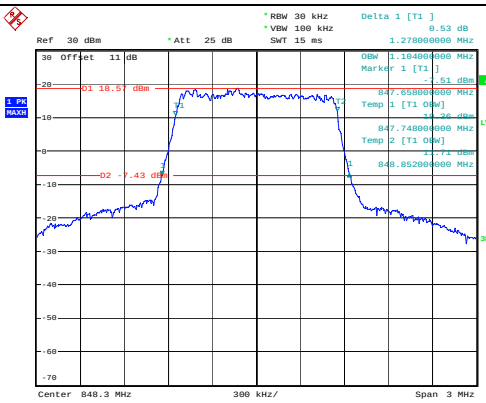
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

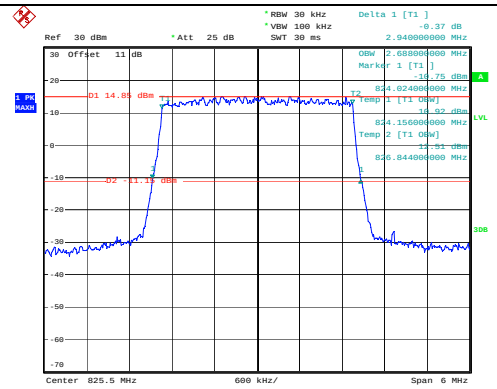
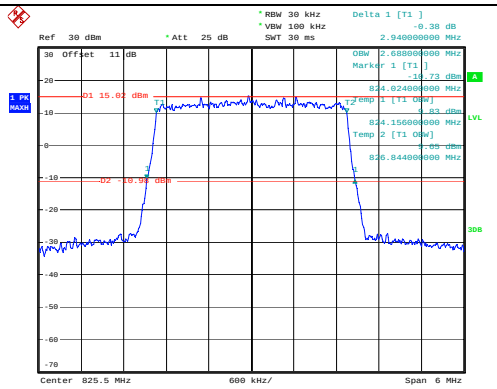
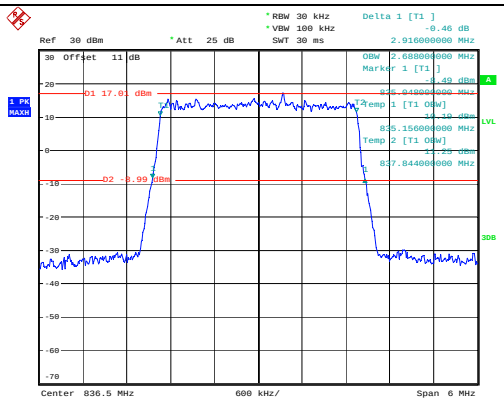
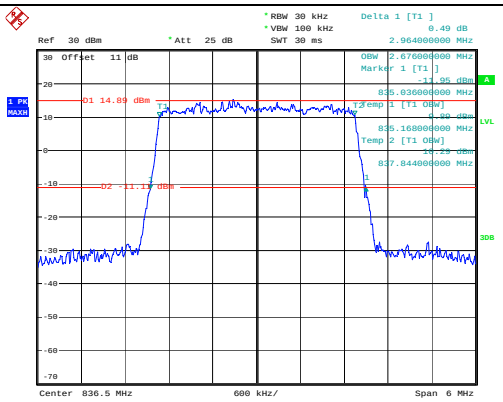
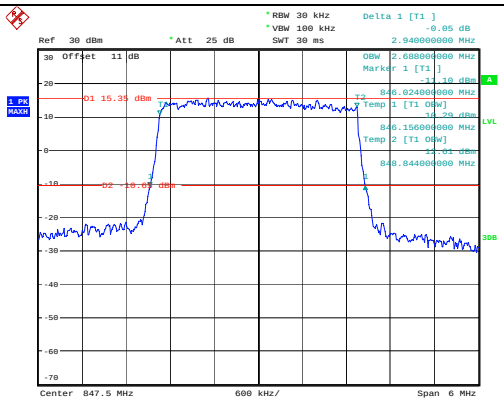
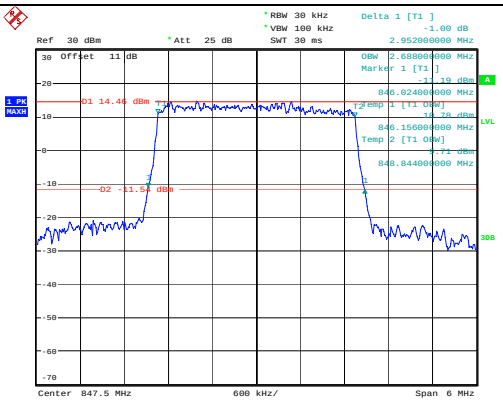
FCC §2.1051, §22.917(a):Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

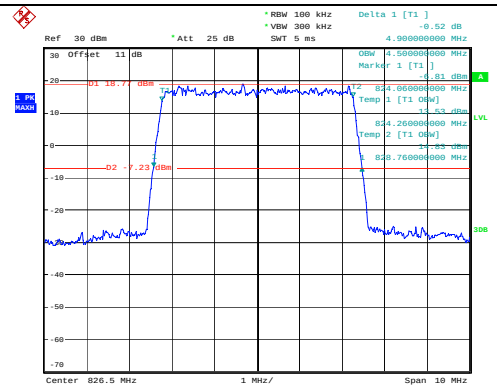
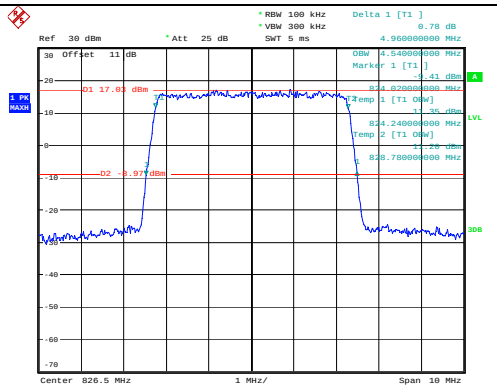
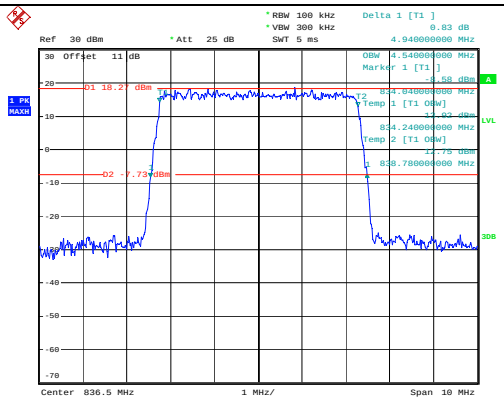
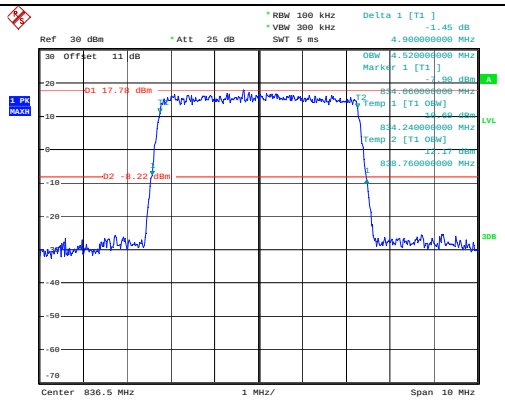
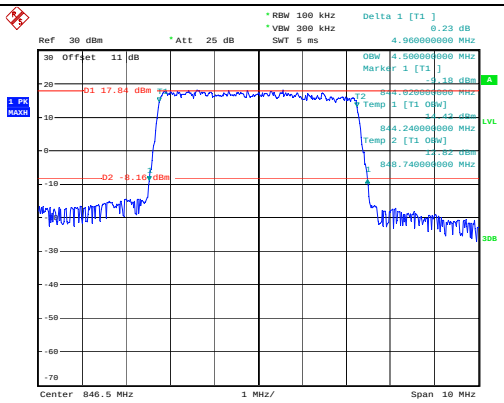
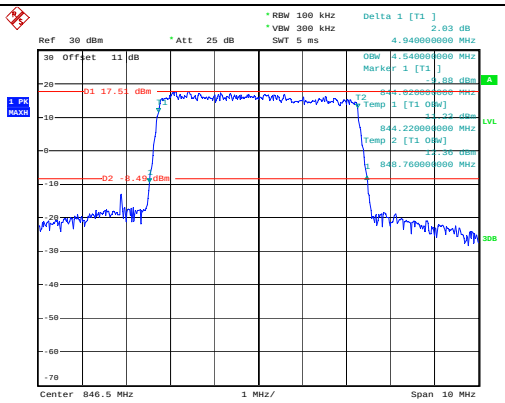
FCC §2.1055, §22.355: Frequency Stability					
Test Modulation:	10 MHz QPSK		Test Channel:	836.5	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.91	6.47	0.008	2.5
	-20	3.91	2.61	0.003	2.5
	-10	3.91	-5.45	-0.007	2.5
	0	3.91	-7.43	-0.009	2.5
	10	3.91	-2.21	-0.003	2.5
	20	3.91	-7.58	-0.009	2.5
	30	3.91	-6.02	-0.007	2.5
	40	3.91	-6.76	-0.008	2.5
	50	3.91	-4.86	-0.006	2.5
Frequency Stability vs. Voltage	20	3.45	-4.31	-0.005	2.5
	20	4.5	-3.99	-0.005	2.5
				Result:	**Pass**

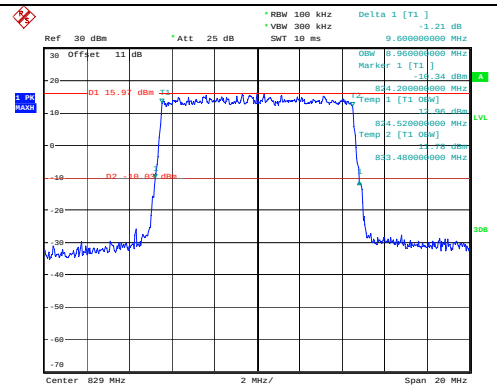
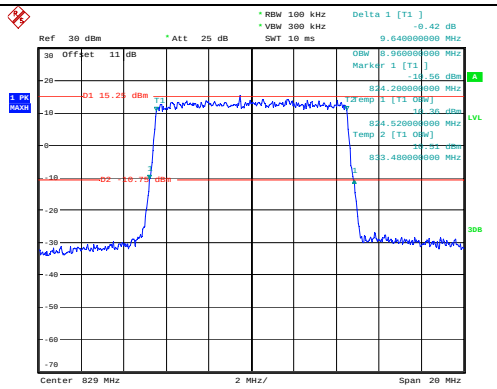
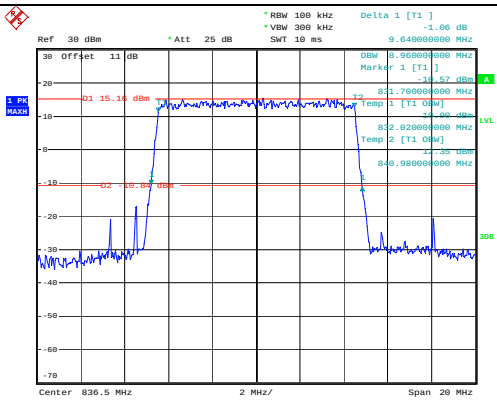
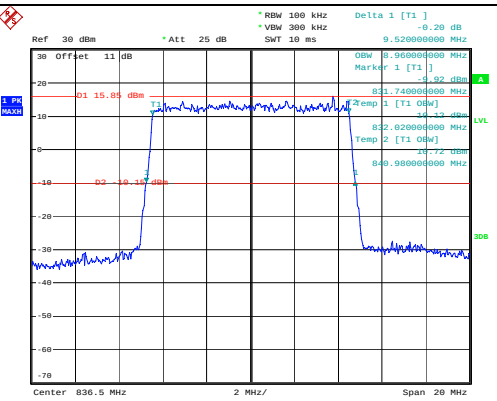
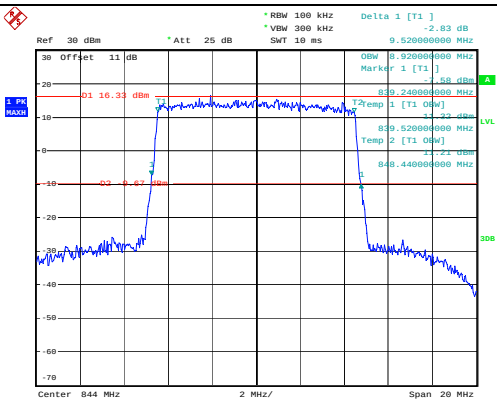
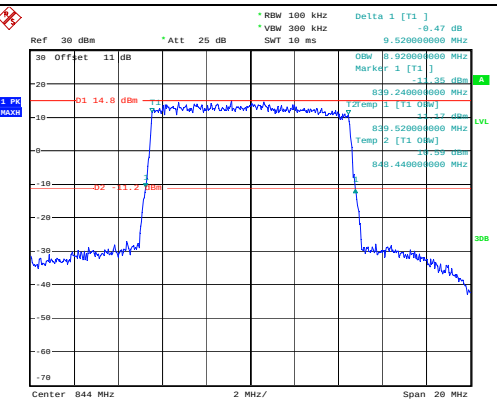
Test Modulation:	10 MHz 16QAM		Test Channel:	836.5	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.91	8.53	0.010	2.5
	-20	3.91	3.06	0.004	2.5
	-10	3.91	-1.74	-0.002	2.5
	0	3.91	2.24	0.003	2.5
	10	3.91	4.16	0.005	2.5
	20	3.91	-4.55	-0.005	2.5
	30	3.91	-0.30	0.000	2.5
	40	3.91	1.89	0.002	2.5
	50	3.91	-4.35	-0.005	2.5
Frequency Stability vs. Voltage	20	3.45	-4.10	-0.005	2.5
	20	4.5	-3.99	-0.005	2.5
				Result:	**Pass**

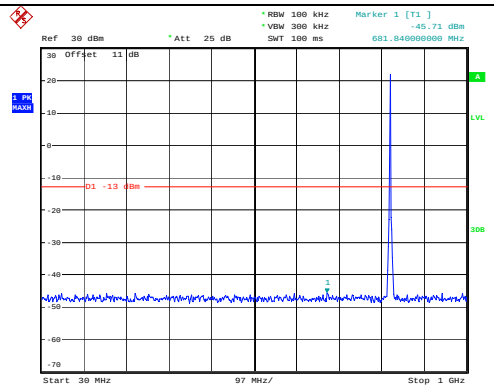
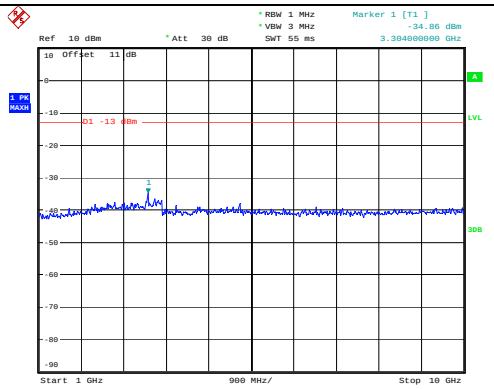
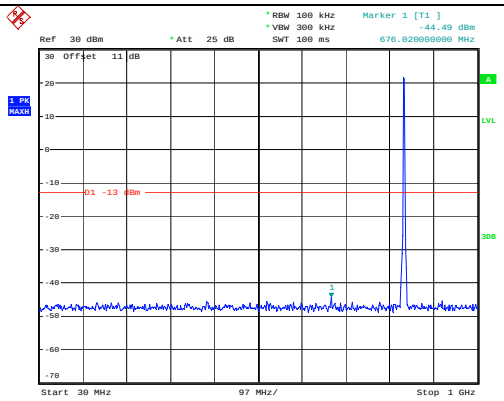
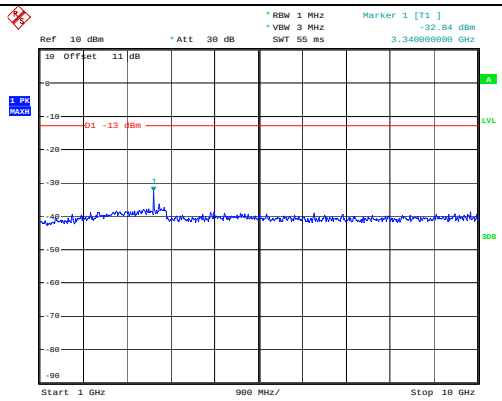
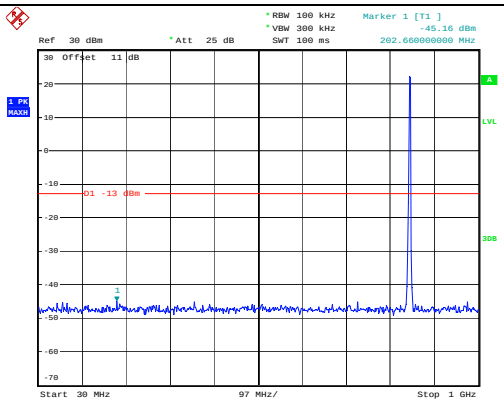
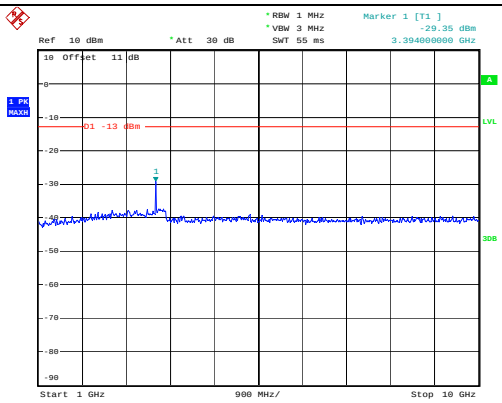
Test Plots (Note: The 11.0 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):

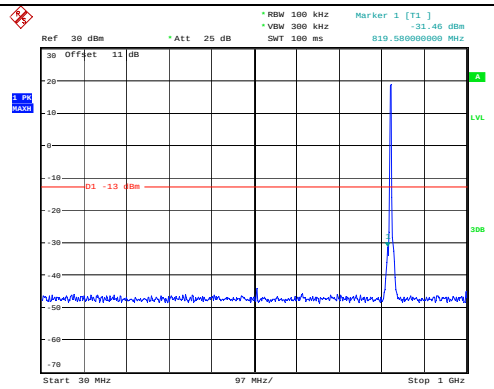
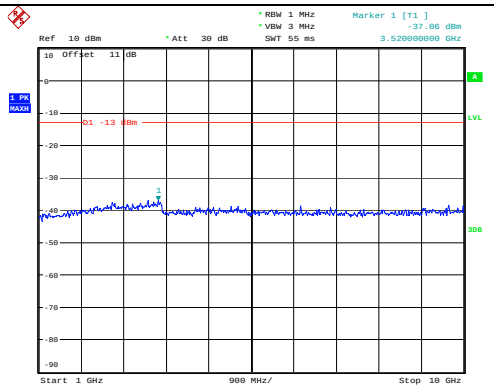
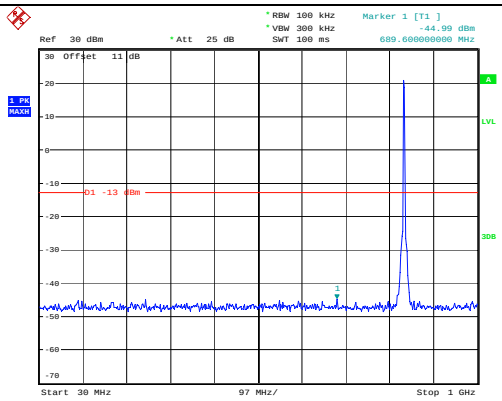
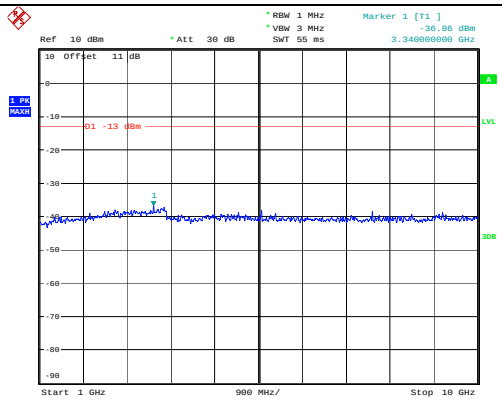
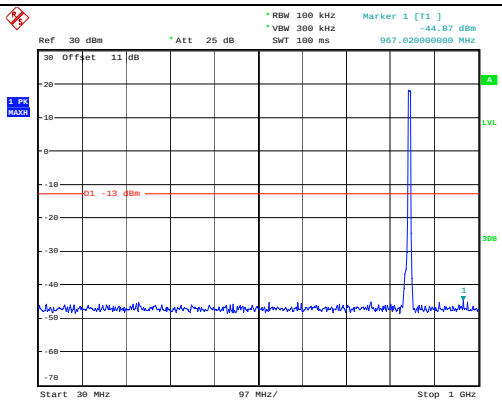
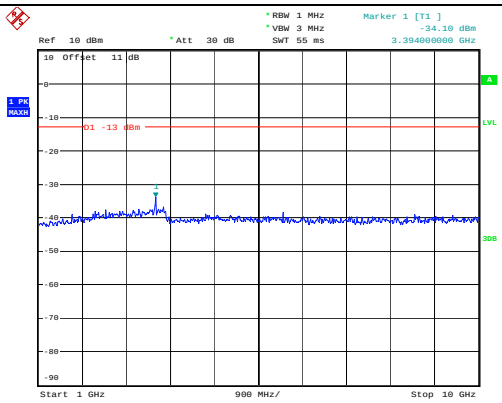
Occupied Bandwidth		
Channel	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

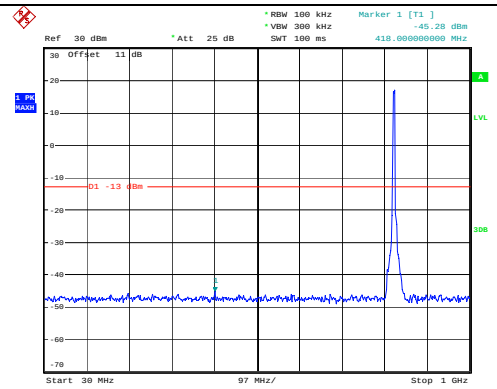
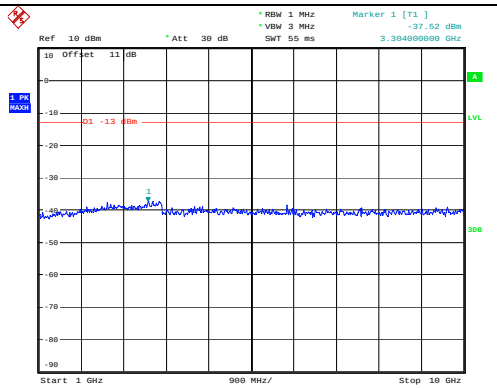
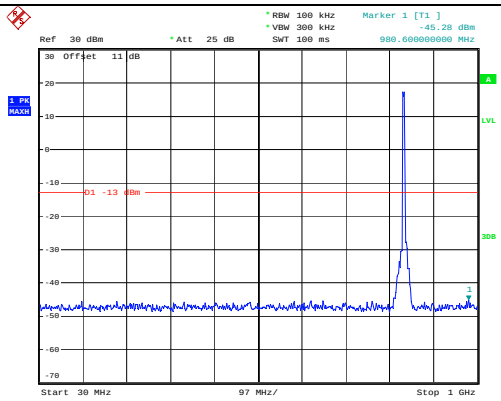
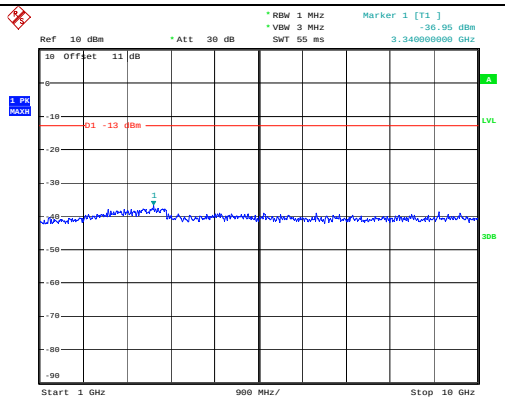
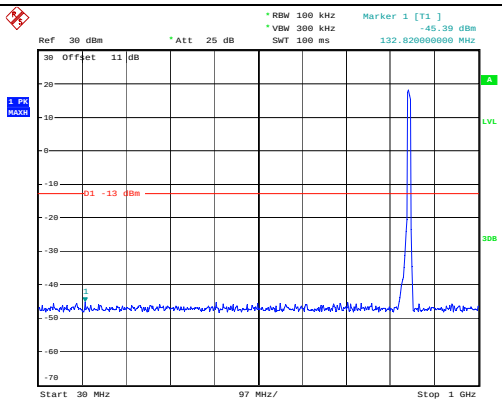
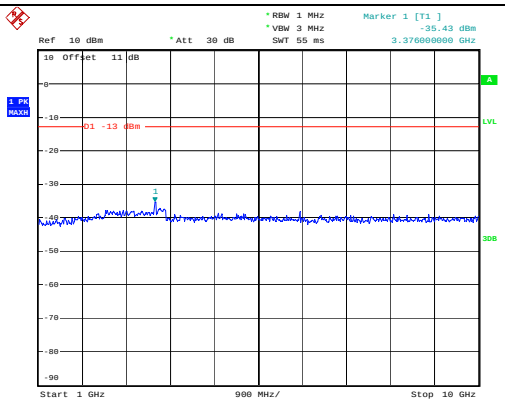
Occupied Bandwidth		
Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 21:57:54	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 21:58:14
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 21:58:46	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 21:59:09
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 21:59:30	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 21:59:58

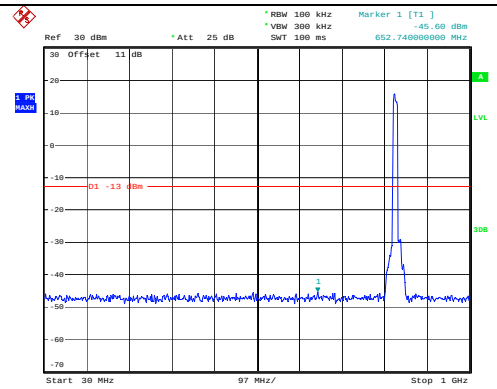
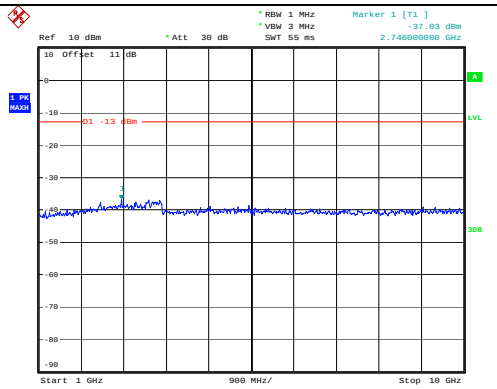
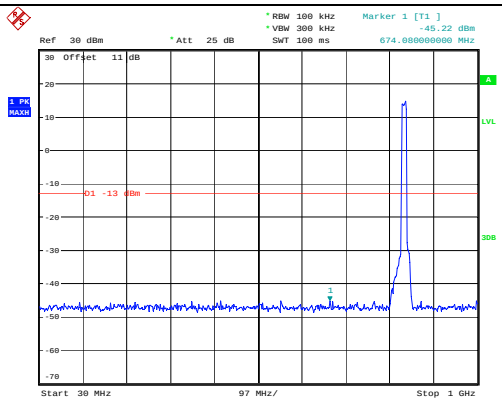
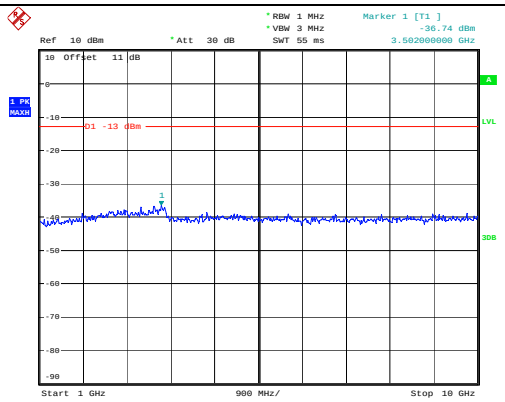
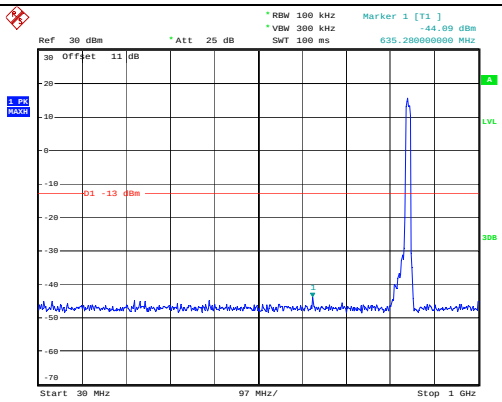
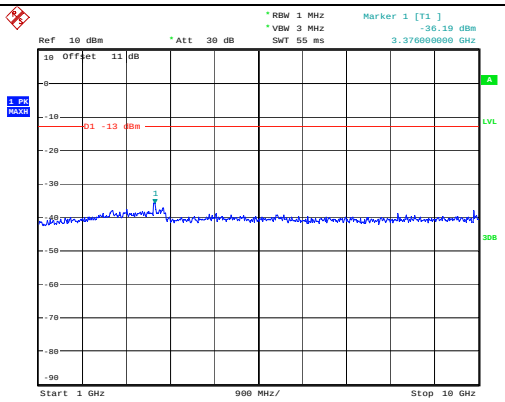
Occupied Bandwidth		
Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:01:02	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:01:26
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:01:55	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:02:19
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:02:53	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:03:23

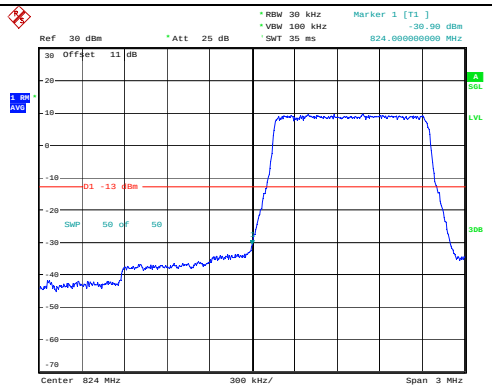
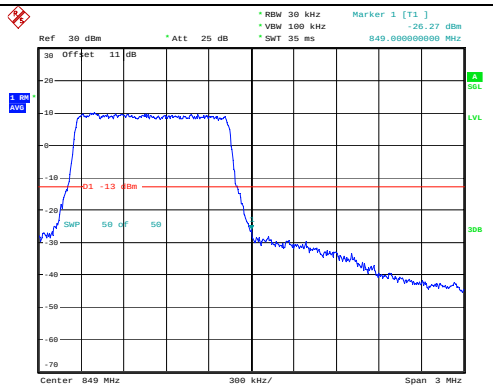
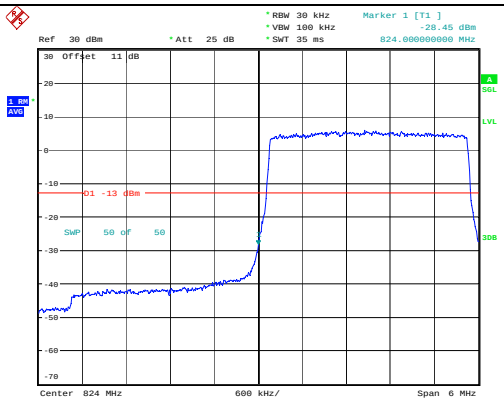
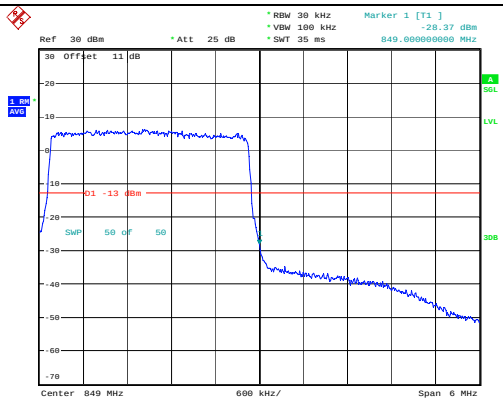
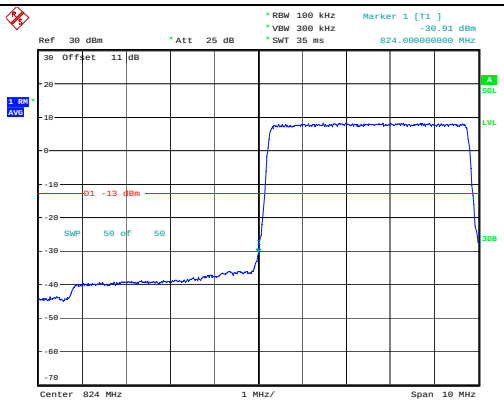
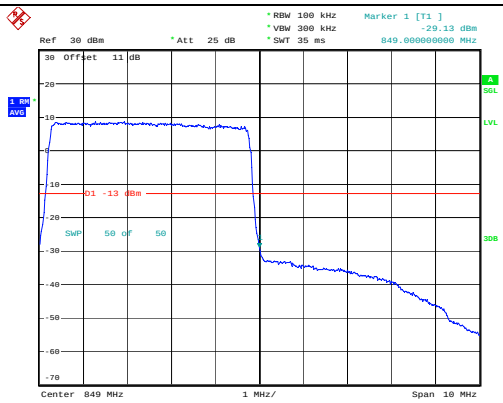
Occupied Bandwidth		
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

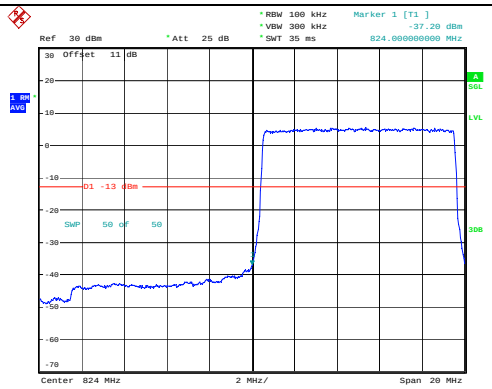
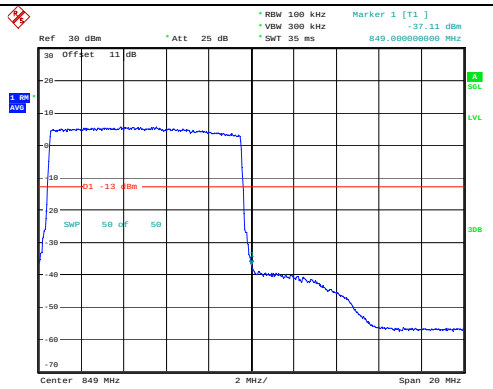
Spurious Emissions at Antenna Terminal	
Channel	**1.4MHz Bandwidth QPSK**
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:47:11  ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:47:21
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:48:17  ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:48:28
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:49:14  ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:49:24

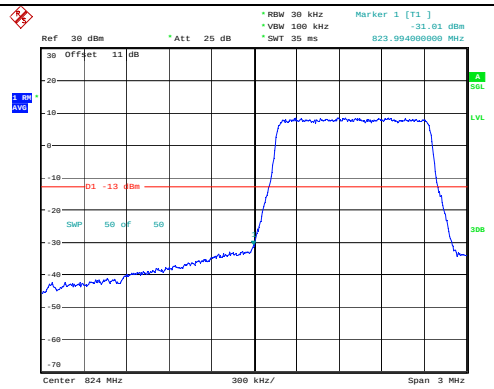
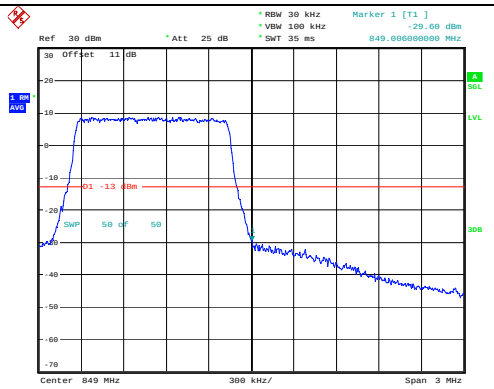
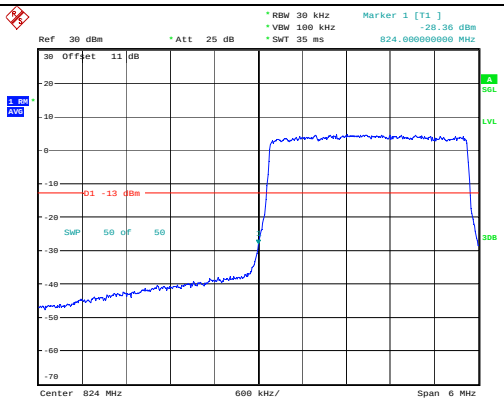
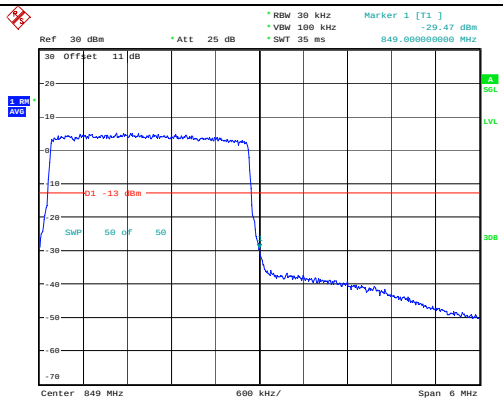
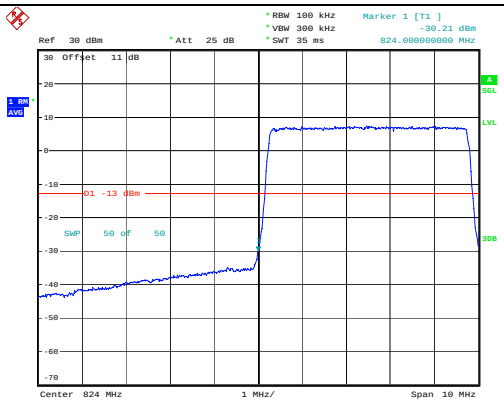
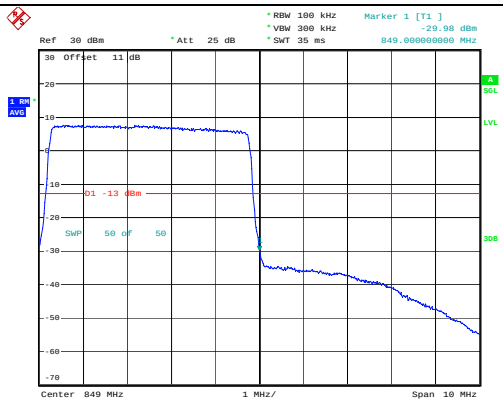
Spurious Emissions at Antenna Terminal		
Channel	**3MHz Bandwidth QPSK**	
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:50:03	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:50:13
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:50:28	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:50:39
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:50:54	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:51:04

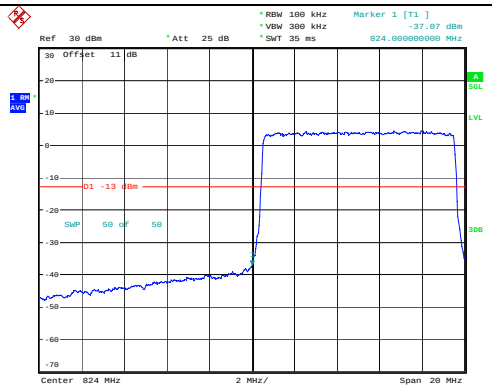
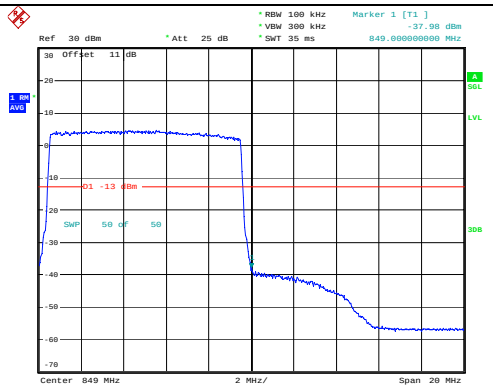
Spurious Emissions at Antenna Terminal	
Channel	**5MHz Bandwidth QPSK**
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:52:08
	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:52:18
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:52:31
	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:52:41
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:52:57
	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:53:10

Spurious Emissions at Antenna Terminal		
Channel	**10MHz Bandwidth QPSK**	
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:54:14	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:54:24
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:54:39	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:54:50
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:55:05	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:55:15

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 1.4MHz	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:37:38	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:38:48
QPSK 3MHz	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:39:27	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:39:40
QPSK 5MHz	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:40:30	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:40:44

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:	2CGM-1	Test Date:	2023/11/22-2023/12/4
Test Site:	RF	Test Mode:	Transmitting
Tester:	Hale Li, Rod Luo	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	25.7-26.6	Relative Humidity: (%)	57-61	ATM Pressure: (kPa)	101

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200120	2023/4/18	2024/4/17
zhuoxiang	Coaxial Cable	211001	Each time	N/A	N/A
Minl-Clrcuits	Power Splitter	S F448201619	Each time	N/A	N/A
eastsheep	Coaxial Attenuator	21060301	Each time	N/A	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2023/9/29	2024/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30

** 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).*

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	20.11	20.03	20.13	19.43	33
	RB1#13	20.26	20.18	20.31		
	RB1#24	20.12	19.99	20.15		
	RB15#0	19.11	19.04	19.21		
	RB15#10	19.25	19.08	19.19		
	RB25#0	19.16	19.05	19.20		
5MHz 16QAM	RB1#0	19.17	18.89	19.38	18.7	33
	RB1#13	19.32	19.07	19.58		
	RB1#24	19.15	18.91	19.42		
	RB15#0	18.20	18.15	18.20		
	RB15#10	18.29	18.20	18.19		
	RB25#0	18.24	18.17	18.21		
10MHz QPSK	RB1#0	20.19	20.10	20.11	19.36	33
	RB1#25	20.24	20.17	20.22		
	RB1#49	20.18	20.12	20.19		
	RB25#0	19.01	19.03	19.15		
	RB25#25	19.21	19.11	19.18		
	RB50#0	19.16	19.11	19.18		
10MHz 16QAM	RB1#0	19.32	19.09	19.73	18.94	33
	RB1#25	19.38	19.16	19.82		
	RB1#49	19.30	19.10	19.73		
	RB25#0	18.11	18.17	18.27		
	RB25#25	18.29	18.27	18.30		
	RB50#0	18.20	18.18	18.28		
15MHz QPSK	RB1#0	20.10	20.09	20.07	19.39	33
	RB1#38	20.26	20.17	20.27		
	RB1#74	20.03	20.06	20.16		
	RB36#0	19.05	19.05	19.15		
	RB36#39	19.19	19.13	19.19		
	RB75#0	19.15	19.08	19.18		
15MHz 16QAM	RB1#0	19.71	19.19	19.48	18.97	33
	RB1#38	19.85	19.27	19.68		
	RB1#74	19.66	19.18	19.51		
	RB36#0	18.11	18.11	18.19		
	RB36#39	18.21	18.20	18.24		
	RB75#0	18.17	18.15	18.18		
20MHz QPSK	RB1#0	20.00	20.00	20.01	19.42	33

	RB1#50	20.25	20.21	20.30		
	RB1#99	19.90	19.98	20.10		
	RB50#0	19.02	18.95	19.15		
	RB50#50	19.10	19.10	19.13		
	RB100#0	19.05	19.04	19.15		
20MHz 16QAM	RB1#0	19.56	19.28	19.21	18.93	33
	RB1#50	19.81	19.53	19.49		
	RB1#99	19.51	19.25	19.25		
	RB50#0	18.04	17.98	18.21		
	RB50#50	18.17	18.11	18.18		
	RB100#0	18.11	18.09	18.21		
Note: EIRP=Conducted Power(dBm) - L_C(dB) + G_T(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	8.62	8.53	8.69	13
	RB100#0	6.41	6.51	6.38	13
20MHz 16QAM	RB1#0	8.56	8.62	8.72	13
	RB100#0	7.15	7.12	7.21	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	4.520	4.520	4.520	4.940	4.900	4.940
5MHz 16QAM	4.520	4.520	4.500	4.940	4.940	4.920
10MHz QPSK	8.960	9.000	8.960	9.640	9.680	9.600
10MHz 16QAM	8.960	8.960	8.960	9.640	9.600	9.600
15MHz QPSK	13.440	13.560	13.560	14.640	14.820	14.520
15MHz 16QAM	13.500	13.500	13.560	14.700	14.760	14.820
20MHz QPSK	17.920	18.000	17.920	19.360	19.520	19.360
20MHz 16QAM	17.920	17.920	18.000	19.440	19.360	19.440
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

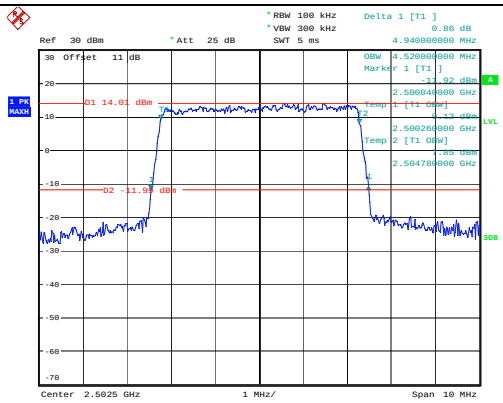
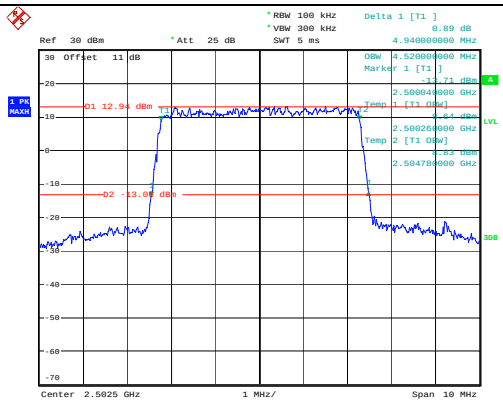
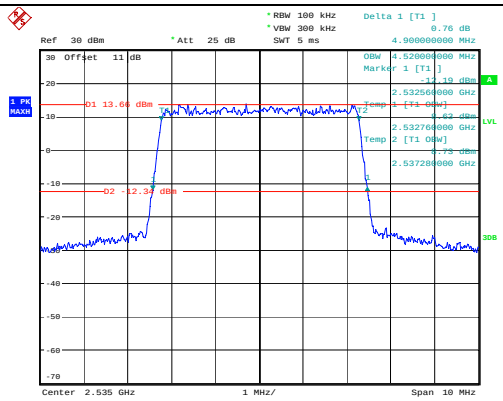
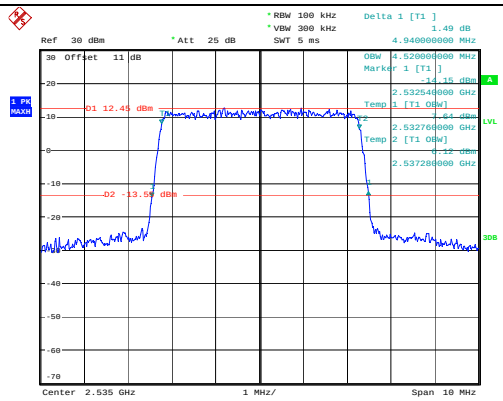
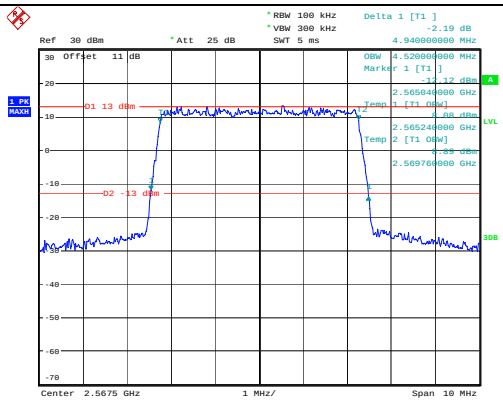
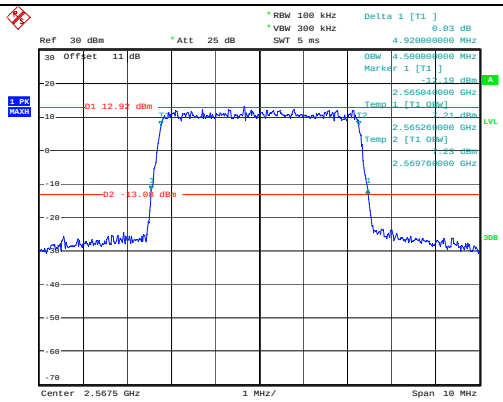
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

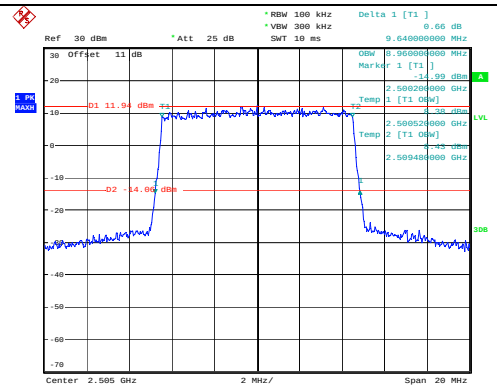
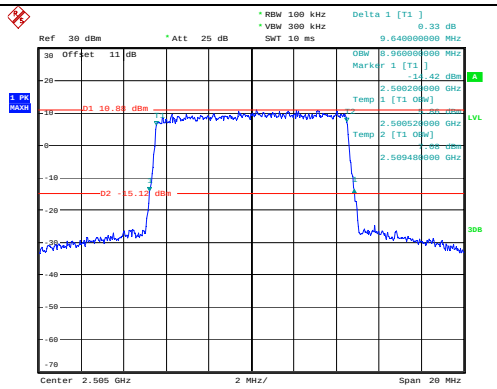
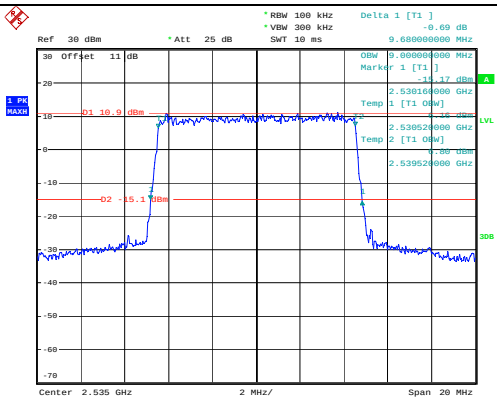
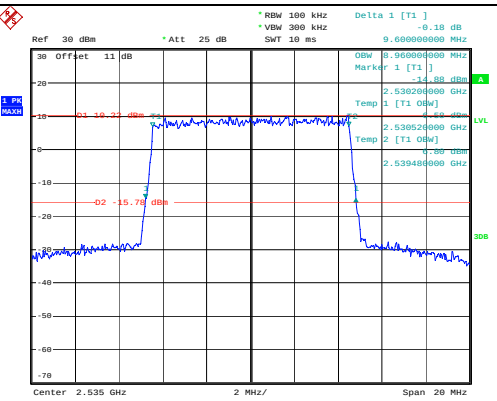
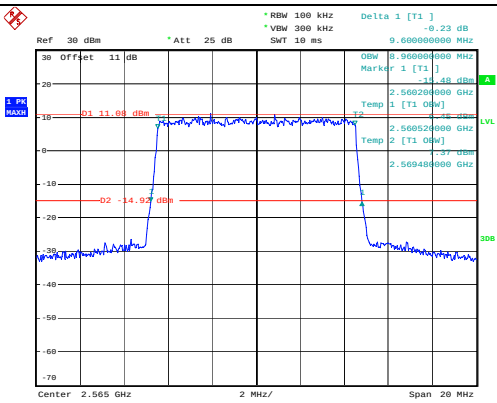
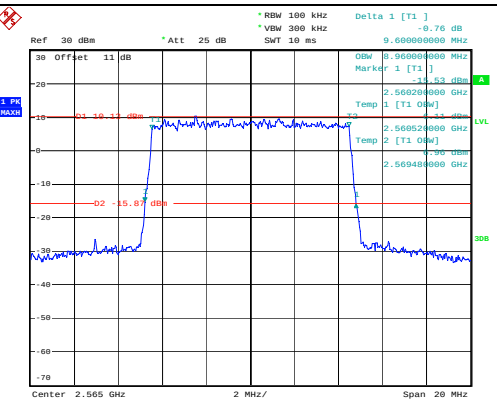
FCC §2.1055, §27.54: Frequency Stability

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	3.91	2500.022	2500.00	2569.976	2570
	-20	3.91	2500.021	2500.00	2569.971	2570
	-10	3.91	2500.020	2500.00	2569.976	2570
	0	3.91	2500.023	2500.00	2569.974	2570
	10	3.91	2500.020	2500.00	2569.974	2570
	20	3.91	2500.023	2500.00	2569.977	2570
	30	3.91	2500.021	2500.00	2569.978	2570
	40	3.91	2500.024	2500.00	2569.973	2570
	50	3.91	2500.024	2500.00	2569.975	2570
Frequency Stability vs. Voltage	20	3.45	2500.021	2500.00	2569.973	2570
	20	4.5	2500.020	2500.00	2569.972	2570
					Result:	**Pass**

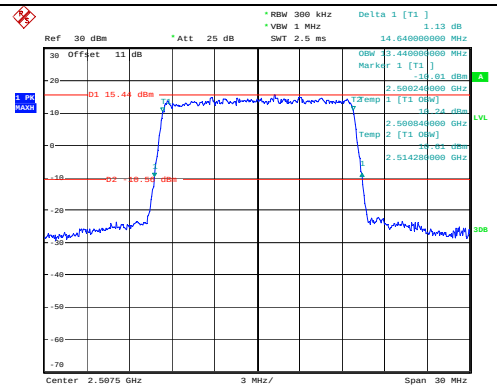
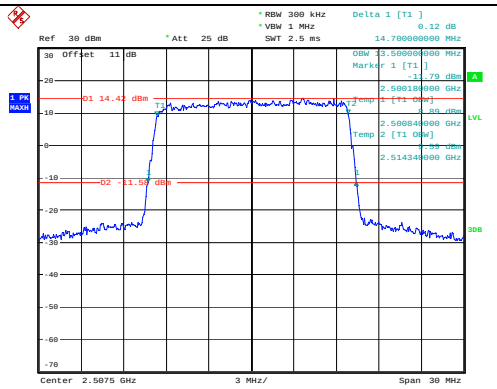
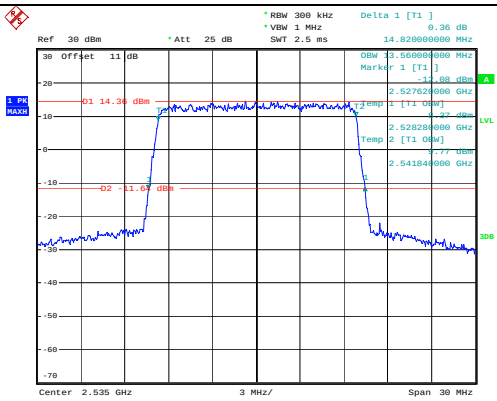
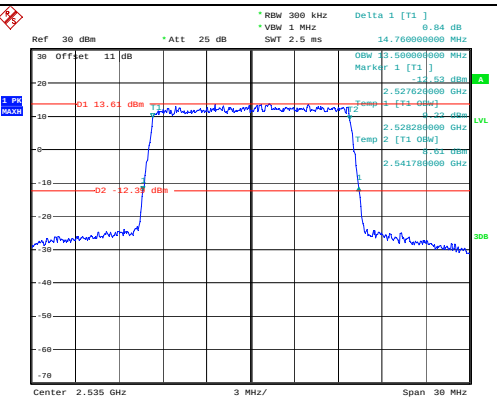
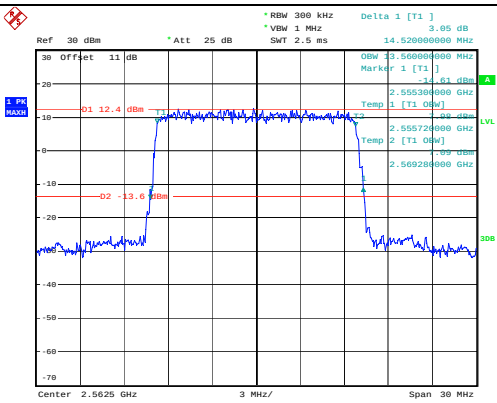
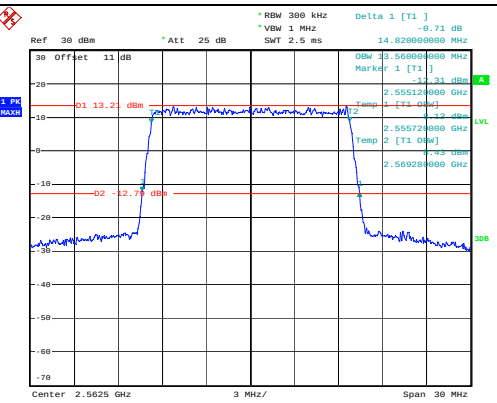
Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	2500.024	2500.00	2569.988	2570
	-20	3.91	2500.018	2500.00	2569.991	2570
	-10	3.91	2500.023	2500.00	2569.985	2570
	0	3.91	2500.024	2500.00	2569.989	2570
	10	3.91	2500.021	2500.00	2569.987	2570
	20	3.91	2500.018	2500.00	2569.990	2570
	30	3.91	2500.025	2500.00	2569.991	2570
	40	3.91	2500.022	2500.00	2569.986	2570
	50	3.91	2500.020	2500.00	2569.985	2570
Frequency Stability vs. Voltage	20	3.45	2500.020	2500.00	2569.989	2570
	20	4.5	2500.018	2500.00	2569.985	2570
					Result:	**Pass**

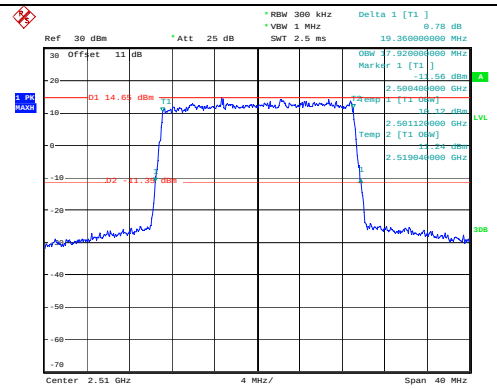
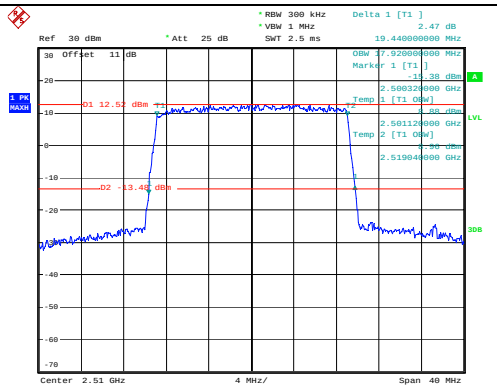
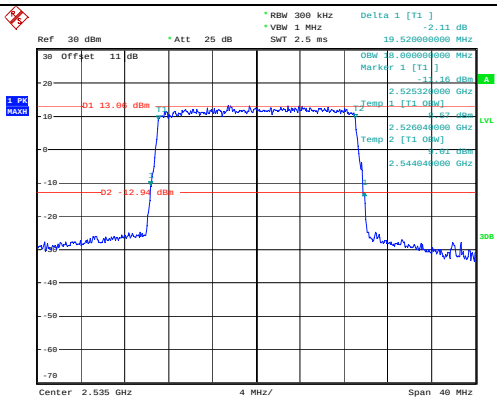
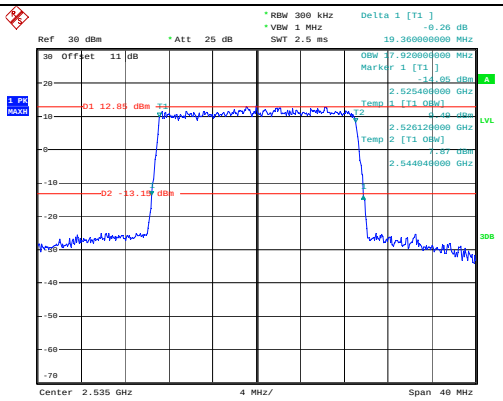
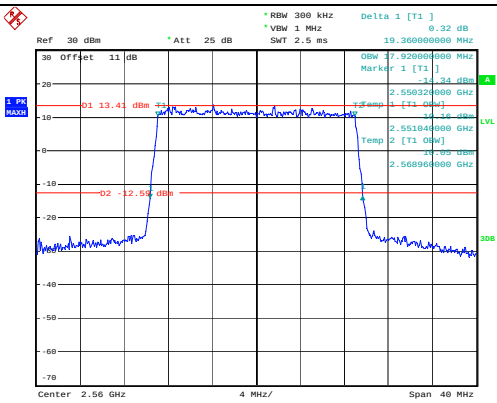
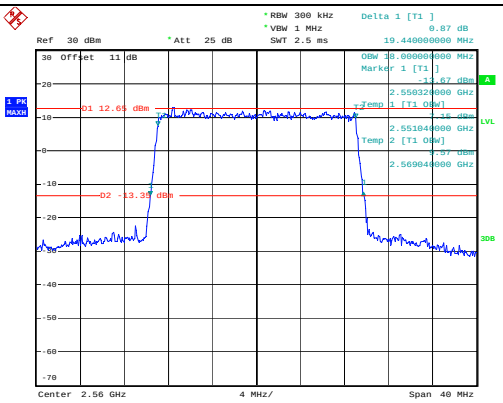
Test Plots (Note: The 11.0dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer)**:**

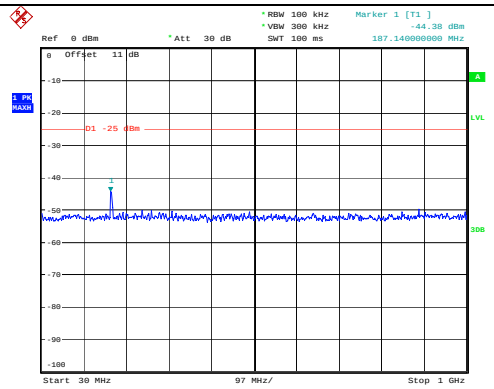
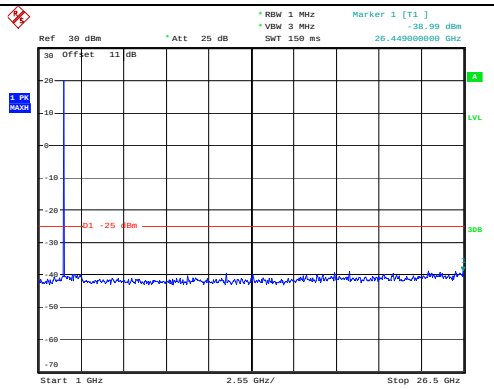
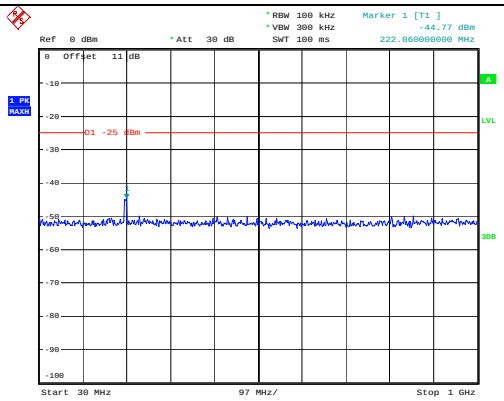
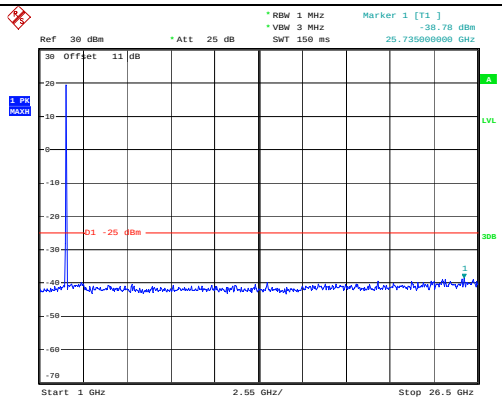
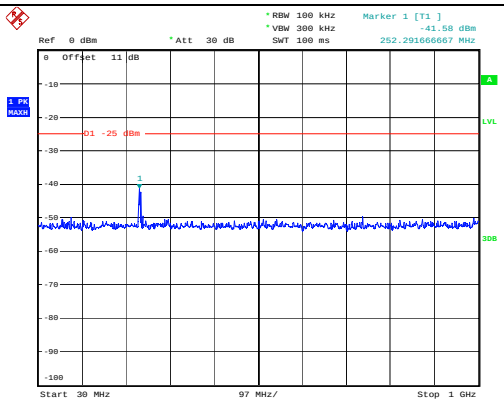
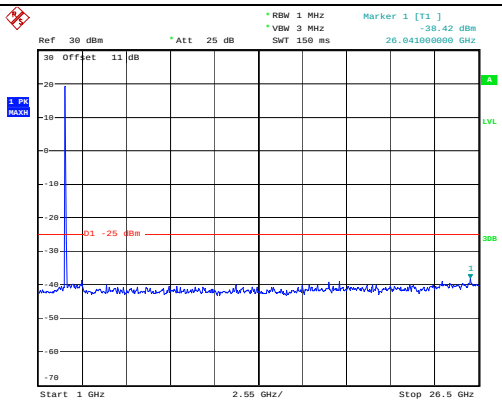
Occupied Bandwidth		
Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 22:57:30	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 22:57:54
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 22:58:15	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 22:58:35
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 22:58:56	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 22:59:20

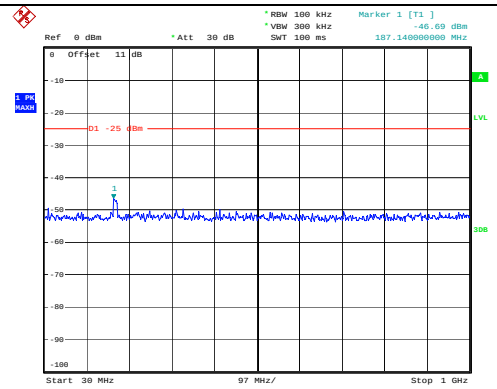
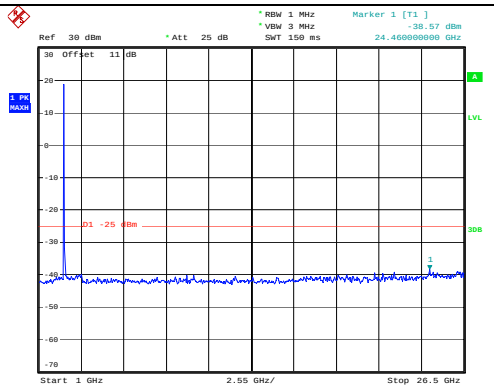
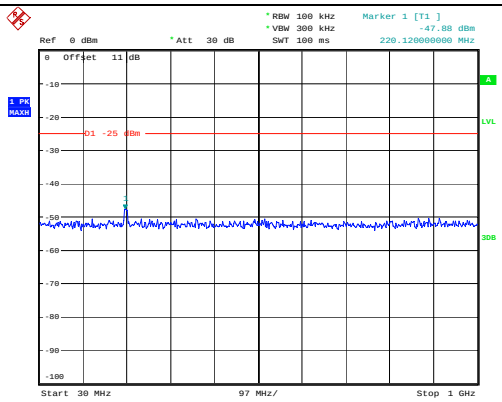
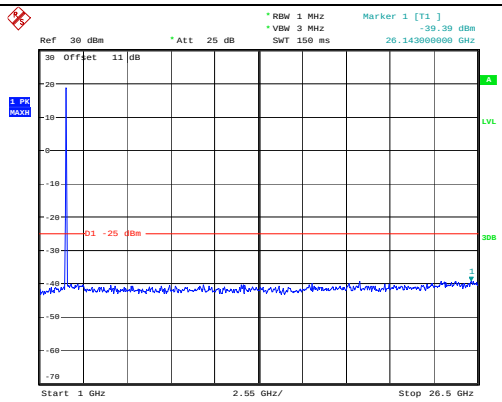
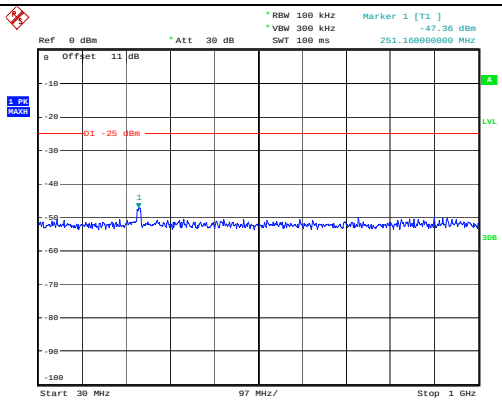
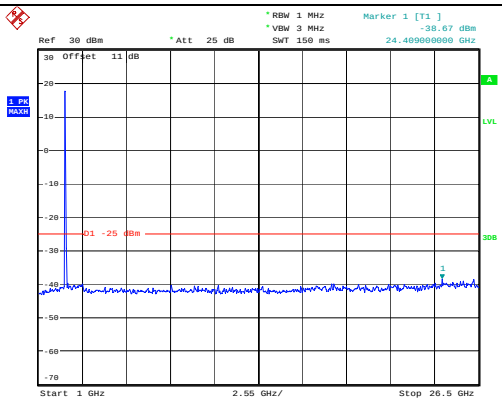
Occupied Bandwidth		
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:00:15	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:00:41
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:01:03	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:01:23
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:01:47	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:02:14

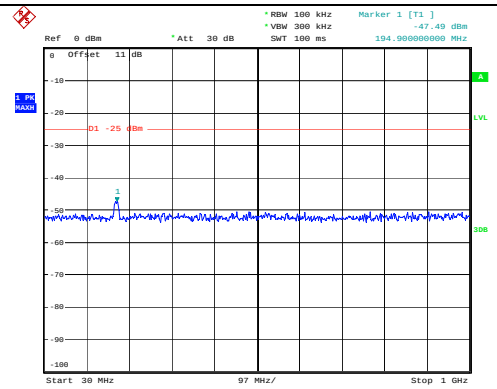
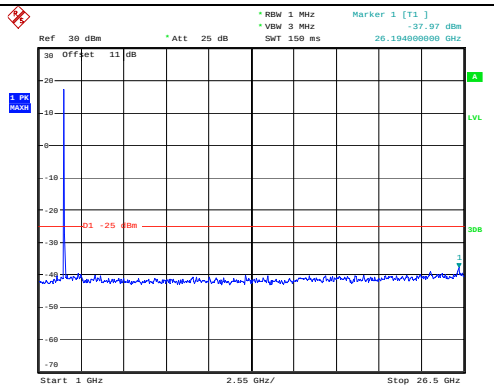
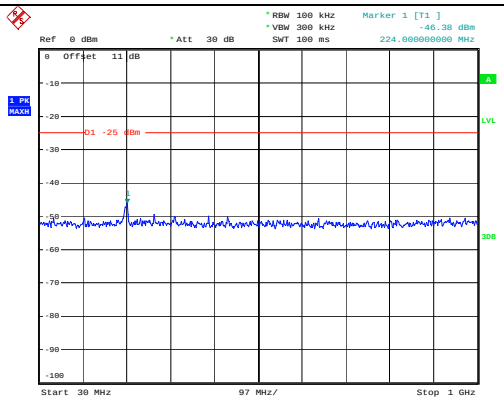
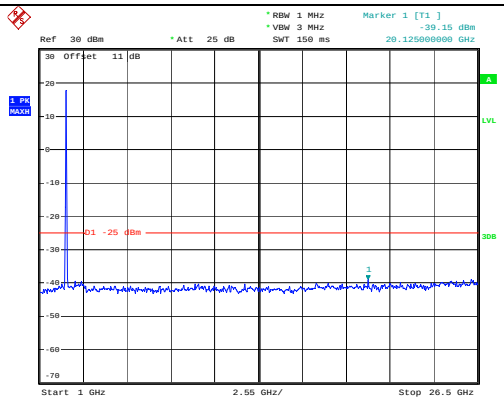
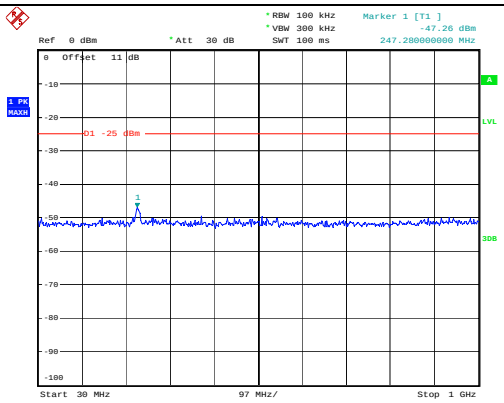
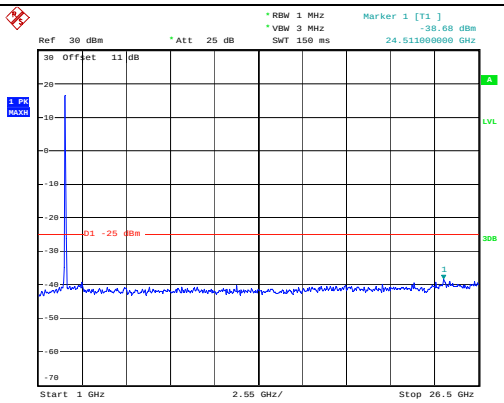
Occupied Bandwidth

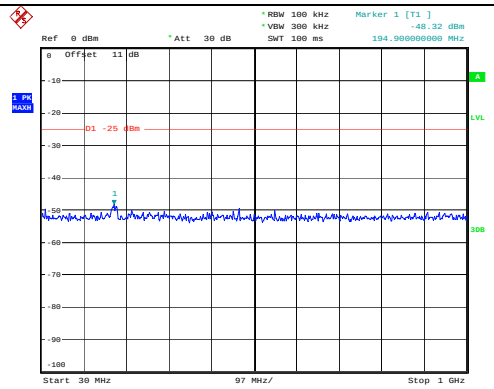
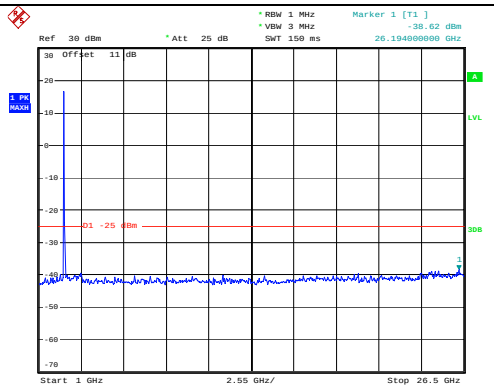
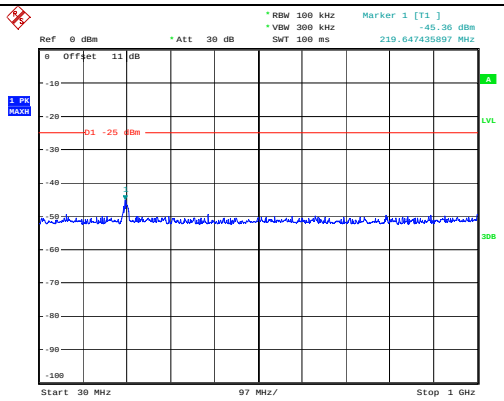
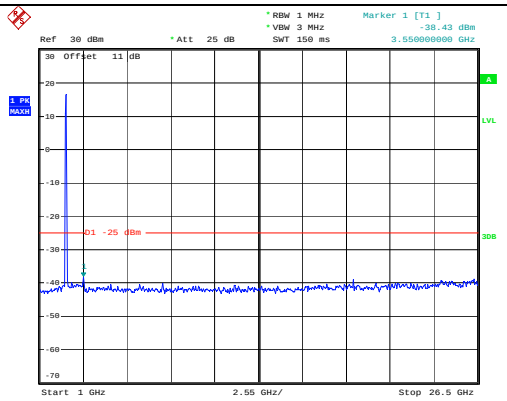
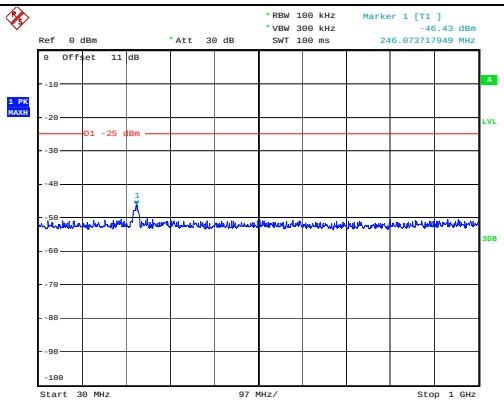
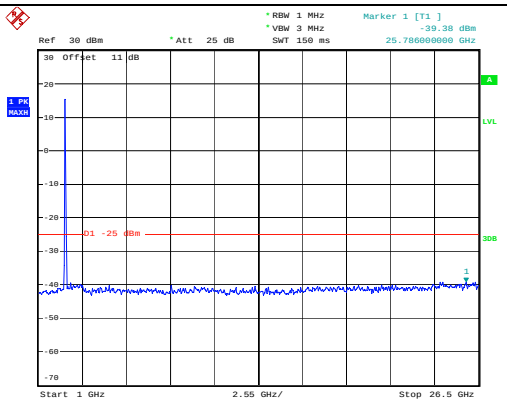
Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

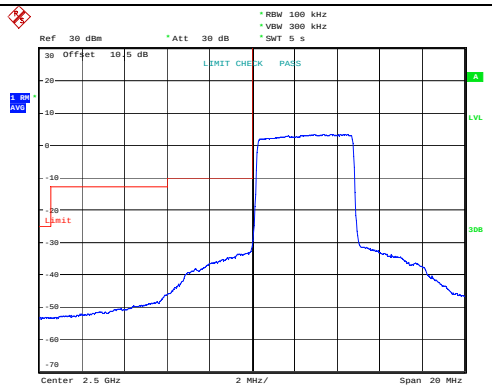
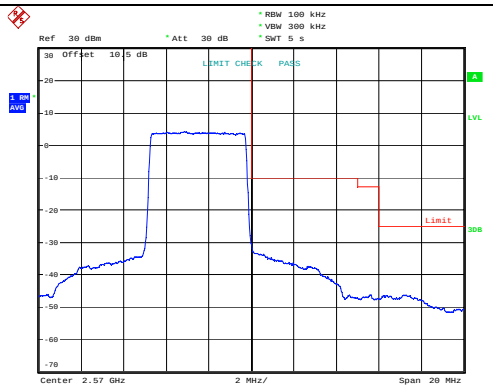
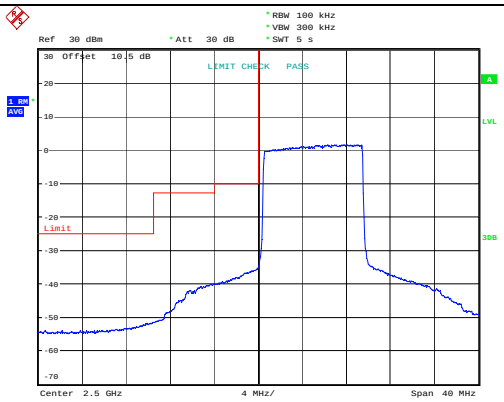
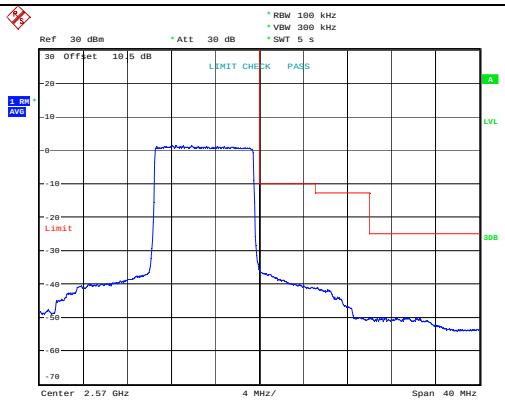
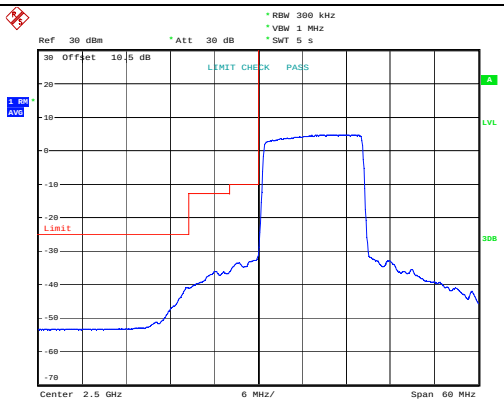
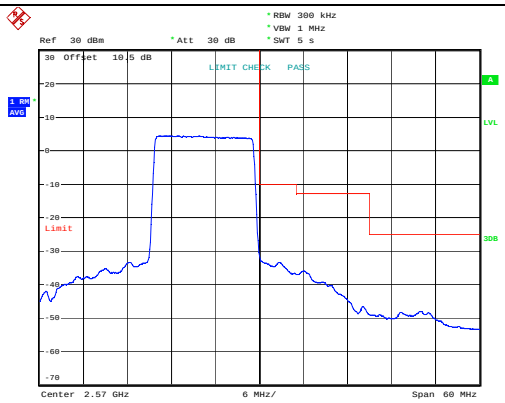
Occupied Bandwidth		
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:08:22	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:08:48
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:09:12	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:09:37
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:10:01	 ProjectNo.:CR231061288 Tester:Hale Li Date: 22.NOV.2023 23:10:26

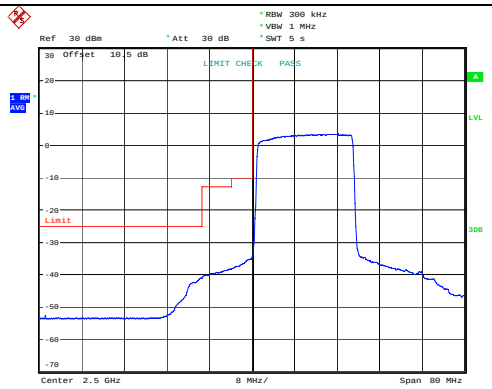
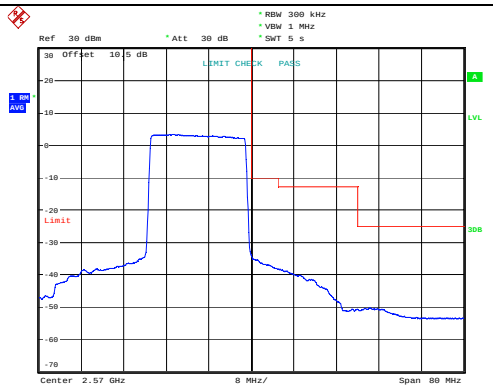
Spurious Emissions at Antenna Terminal		
Channel	**5MHz Bandwidth QPSK**	
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:03:08	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:03:19
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:03:34	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:03:44
Highest	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 18:25:41	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:04:40

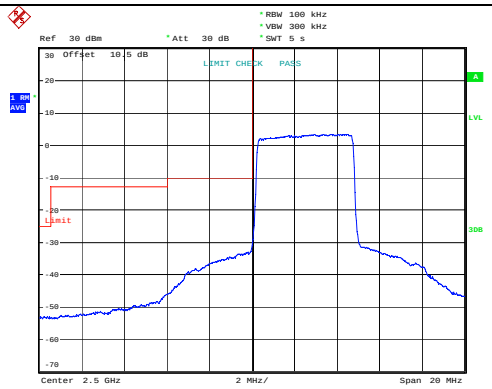
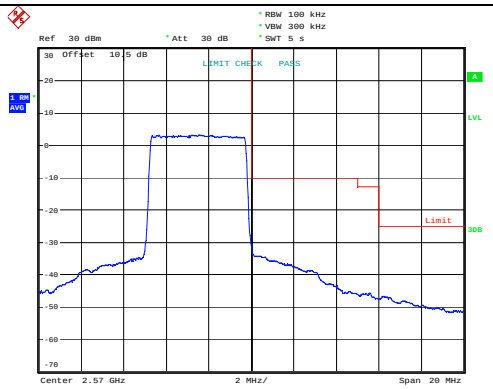
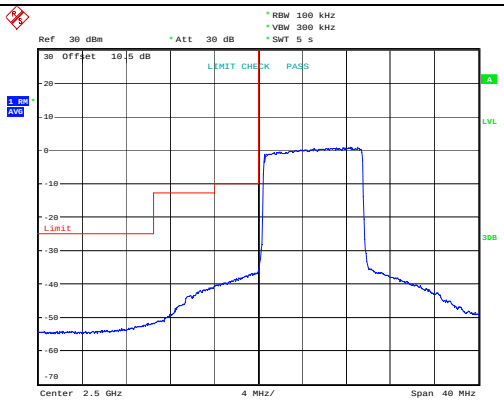
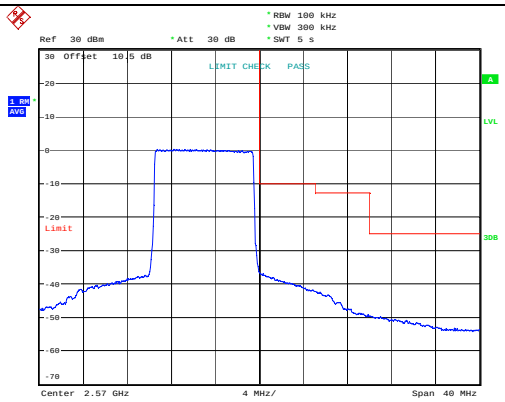
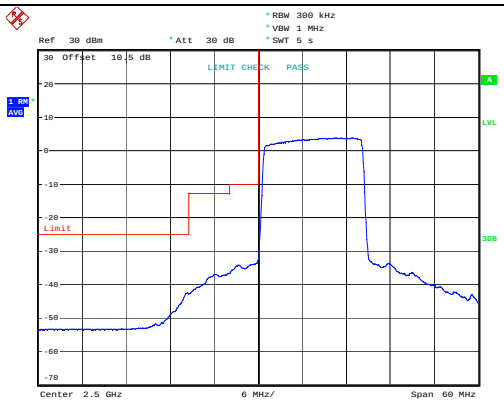
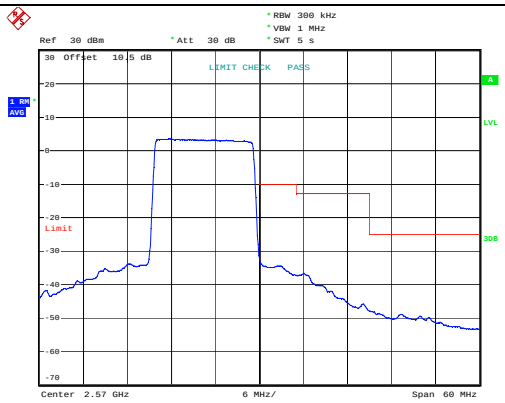
Spurious Emissions at Antenna Terminal		
Channel	**10MHz Bandwidth QPSK**	
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:05:28	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:05:38
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:06:06	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:06:17
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:06:29	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:06:39

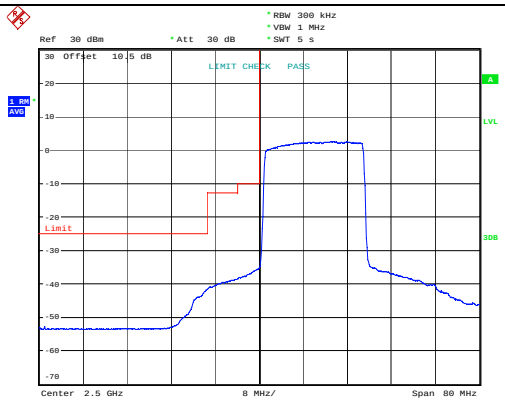
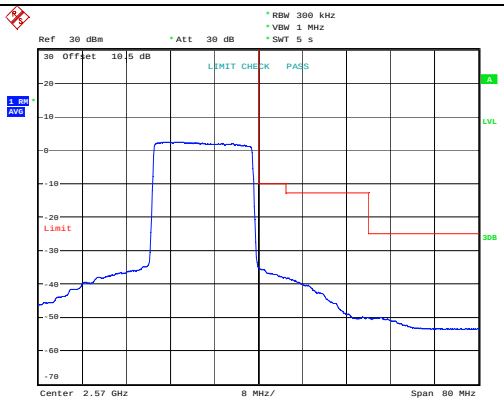
Spurious Emissions at Antenna Terminal	
Channel	**15MHz Bandwidth QPSK**
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:07:27	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:07:37
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:07:49	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:07:59
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:08:27	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:08:38

Spurious Emissions at Antenna Terminal		
Channel	**20MHz Bandwidth QPSK**	
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:09:28	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:09:38
Middle	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 18:22:43	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:10:03
Highest	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 18:23:51	 ProjectNo.:CR231061288 Tester:Hale Li Date: 23.NOV.2023 00:10:28

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 5MHz	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 17:00:10	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 16:40:08
QPSK 10MHz	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 16:45:19	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 16:45:50
QPSK 15MHz	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 16:48:05	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 16:48:50

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 20MHz	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 17:07:23	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 17:07:59

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
16QAM 5MHz	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 16:40:43	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 17:03:52
16QAM 10MHz	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 16:46:23	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 16:46:58
16QAM 15MHz	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 17:06:02	 ProjectNo.:CR231061288-RF Tester:Rod Luo Date: 4.DEC.2023 16:52:03

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

4.10 Antenna Port Test Data and Results for LTE Band 12

Serial Number:	2CGM-1	Test Date:	2023/11/7-2023/11/30
Test Site:	RF	Test Mode:	Transmitting
Tester:	Hale Li	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	24.9-26.6	Relative Humidity: (%)	48-54	ATM Pressure: (kPa)	101

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200120	2023/4/18	2024/4/17
zhuoxiang	Coaxial Cable	211001	Each time	N/A	N/A
Minl-Clrcuits	Power Splitter	S F448201619	Each time	N/A	N/A
eastsheep	Coaxial Attenuator	21060301	Each time	N/A	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2023/9/29	2024/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30

** 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).*

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	22.50	22.39	22.32	12.56	34.77
	RB1#3	22.60	22.50	22.37		
	RB1#5	22.60	22.39	22.31		
	RB3#0	22.66	22.56	22.46		
	RB3#3	22.64	22.58	22.45		
	RB6#0	21.71	21.61	21.48		
1.4MHz 16QAM	RB1#0	21.66	21.48	21.31	11.64	34.77
	RB1#3	21.74	21.56	21.39		
	RB1#5	21.65	21.44	21.27		
	RB3#0	21.66	21.65	21.62		
	RB3#3	21.63	21.64	21.63		
	RB6#0	20.85	20.63	20.61		
3MHz QPSK	RB1#0	22.38	22.32	22.28	12.39	34.77
	RB1#8	22.49	22.38	22.40		
	RB1#14	22.37	22.29	22.22		
	RB6#0	21.59	21.50	21.41		
	RB6#9	21.59	21.53	21.43		
	RB15#0	21.60	21.54	21.46		
3MHz 16QAM	RB1#0	21.46	21.94	21.39	11.93	34.77
	RB1#8	21.52	22.03	21.43		
	RB1#14	21.47	21.81	21.37		
	RB6#0	20.65	20.65	20.52		
	RB6#9	20.60	20.66	20.54		
	RB15#0	20.72	20.67	20.45		
5MHz QPSK	RB1#0	22.69	22.60	22.51	12.69	34.77
	RB1#13	22.79	22.75	22.65		
	RB1#24	22.63	22.57	22.47		
	RB15#0	21.71	21.62	21.63		
	RB15#10	21.69	21.59	21.52		
	RB25#0	21.71	21.61	21.56		
5MHz 16QAM	RB1#0	21.73	21.54	21.82	11.8	34.77
	RB1#13	21.82	21.61	21.90		
	RB1#24	21.70	21.48	21.72		
	RB15#0	20.79	20.76	20.67		
	RB15#10	20.79	20.69	20.54		
	RB25#0	20.82	20.77	20.72		

10MHz QPSK	RB1#0	22.75	22.70	22.73	12.66	34.77
	RB1#25	22.76	22.69	22.64		
	RB1#49	22.63	22.60	22.58		
	RB25#0	21.65	21.57	21.58		
	RB25#25	21.73	21.50	21.50		
	RB50#0	21.72	21.56	21.61		
10MHz 16QAM	RB1#0	21.76	22.28	21.85	12.18	34.77
	RB1#25	21.75	22.28	21.79		
	RB1#49	21.66	22.13	21.71		
	RB25#0	20.85	20.71	20.70		
	RB25#25	20.89	20.66	20.62		
	RB50#0	20.84	20.60	20.66		

Note:
ERP= Conducted Power(dBm) - L_C(dB) + G_T(dBd)
G_T(dBd)=G_T(dBi)-2.15

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	4.65	4.94	5.29	13
	RB50#0	5.64	5.58	5.51	13
10MHz 16QAM	RB1#0	5.51	6.25	6.22	13
	RB50#0	6.57	6.54	6.47	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	1.104	1.104	1.110	1.290	1.290	1.302
1.4MHz 16QAM	1.104	1.110	1.104	1.290	1.314	1.284
3MHz QPSK	2.687	2.687	2.700	2.940	2.916	2.940
3MHz 16QAM	2.687	2.687	2.687	2.928	2.952	2.952
5MHz QPSK	4.500	4.520	4.520	4.920	4.920	4.960
5MHz 16QAM	4.520	4.500	4.520	4.960	4.900	4.960
10MHz QPSK	8.960	8.960	8.960	9.680	9.640	9.600
10MHz 16QAM	8.960	8.920	8.960	9.640	9.560	9.560

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

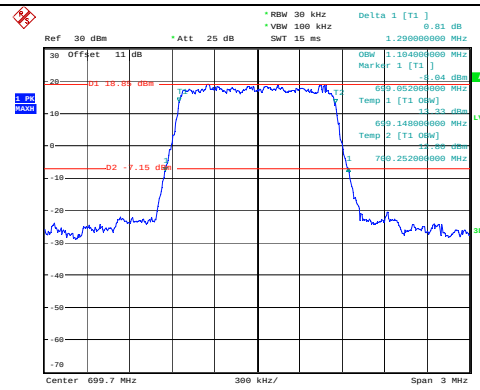
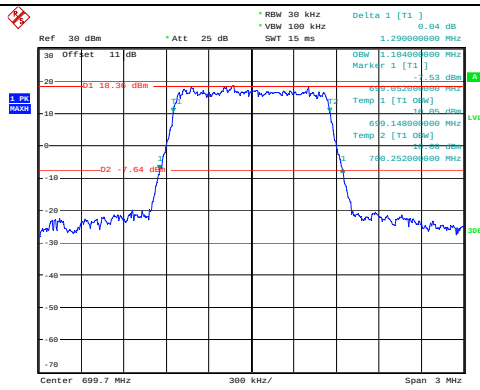
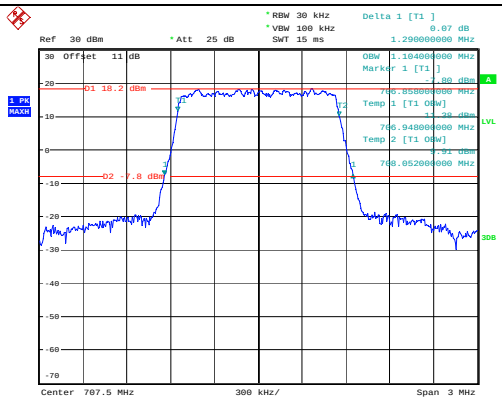
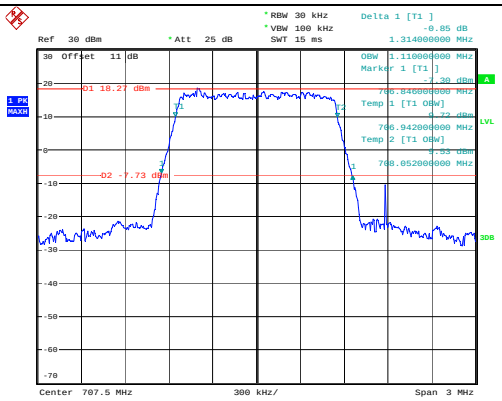
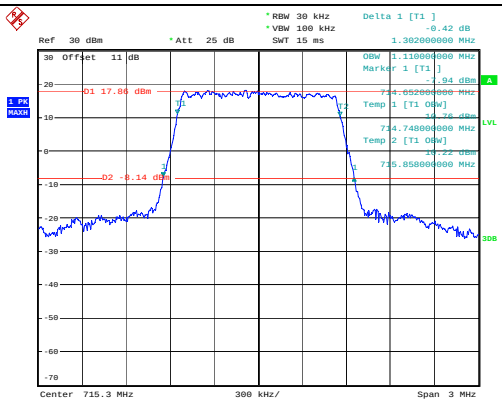
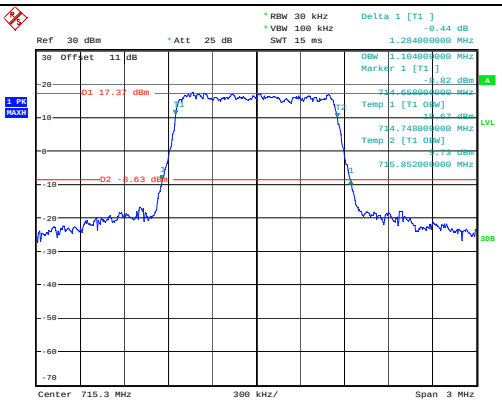
FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

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.**

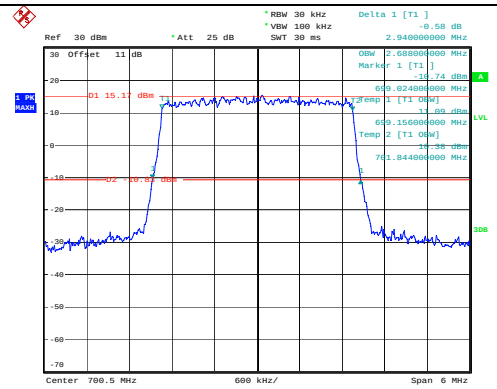
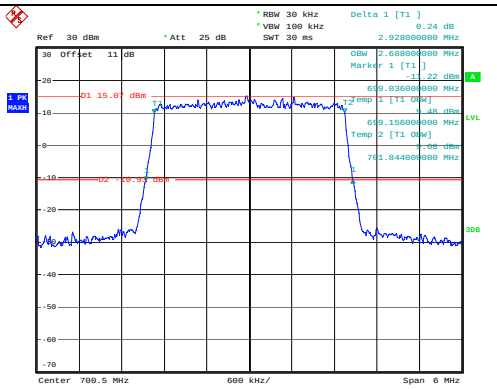
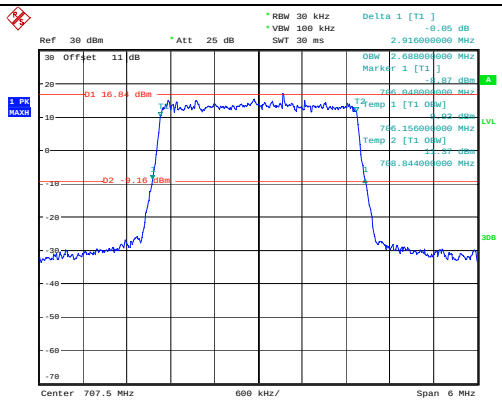
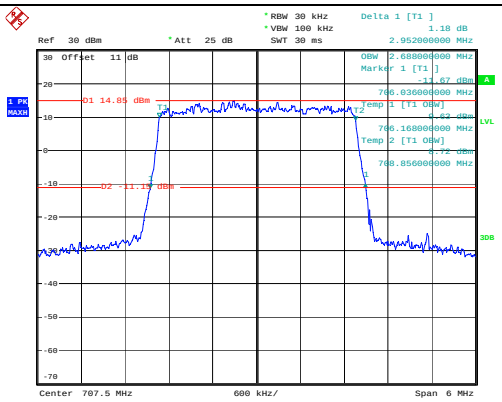
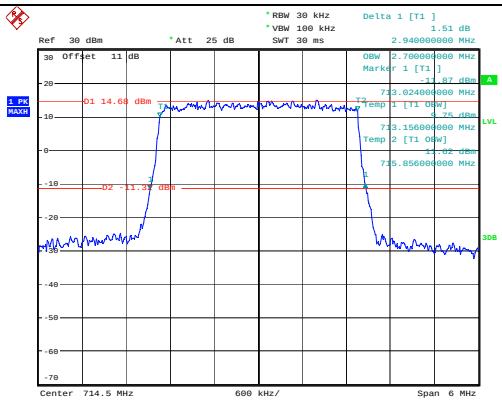
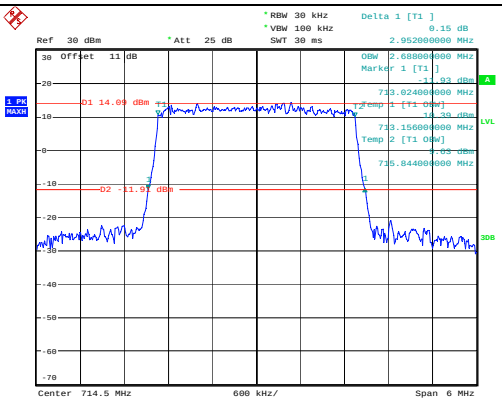
FCC §2.1055, §27.54: Frequency Stability						
Test Mode:	10M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	699.021	699.00	715.945	716.00
	-20	3.91	699.023	699.00	715.949	716.00
	-10	3.91	699.025	699.00	715.945	716.00
	0	3.91	699.019	699.00	715.949	716.00
	10	3.91	699.021	699.00	715.945	716.00
	20	3.91	699.019	699.00	715.947	716.00
	30	3.91	699.025	699.00	715.947	716.00
	40	3.91	699.025	699.00	715.942	716.00
	50	3.91	699.023	699.00	715.949	716.00
Frequency Stability vs. Voltage	20	3.45	699.024	699.00	715.942	716.00
	20	4.5	699.023	699.00	715.944	716.00
					Result:	**Pass**

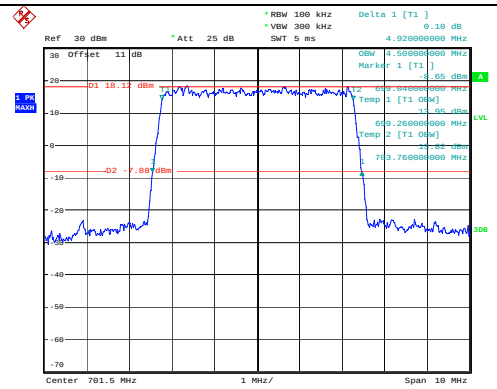
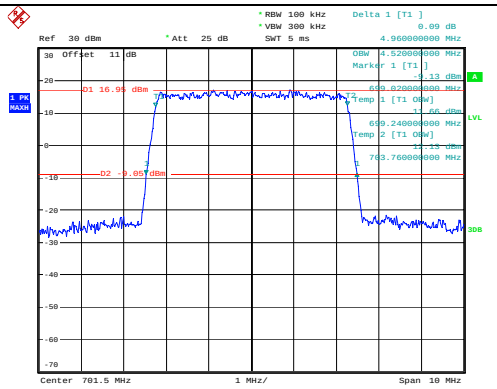
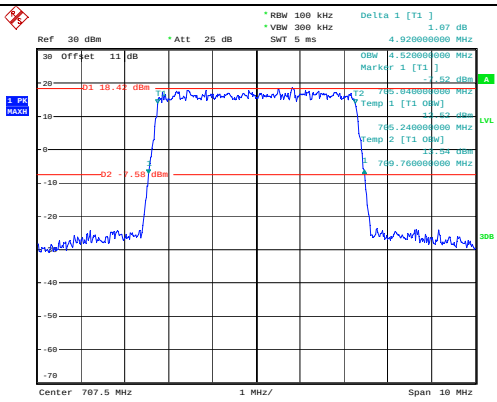
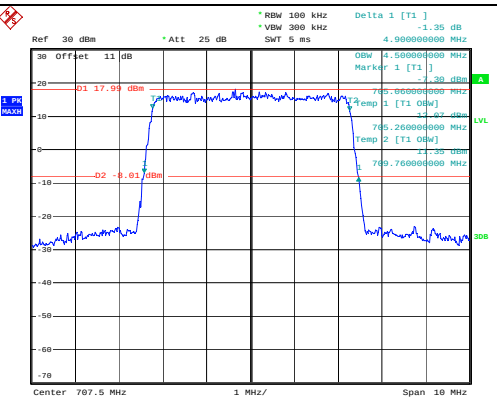
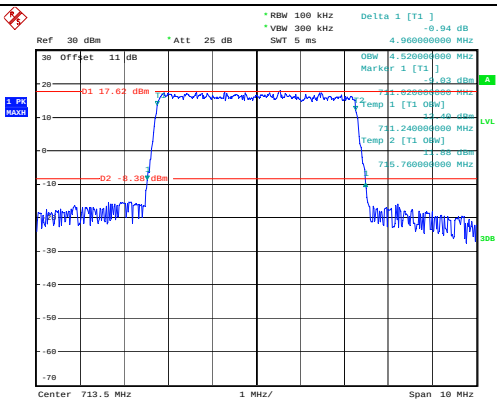
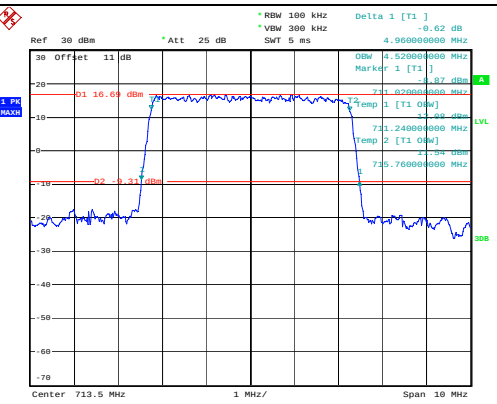
Test Mode:	10M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	699.016	699.00	715.965	716.00
	-20	3.91	699.021	699.00	715.964	716.00
	-10	3.91	699.022	699.00	715.965	716.00
	0	3.91	699.018	699.00	715.965	716.00
	10	3.91	699.019	699.00	715.967	716.00
	20	3.91	699.020	699.00	715.967	716.00
	30	3.91	699.016	699.00	715.967	716.00
	40	3.91	699.016	699.00	715.967	716.00
	50	3.91	699.016	699.00	715.966	716.00
Frequency Stability vs. Voltage	20	3.45	699.017	699.00	715.965	716.00
	20	4.5	699.016	699.00	715.970	716.00
					Result:	**Pass**

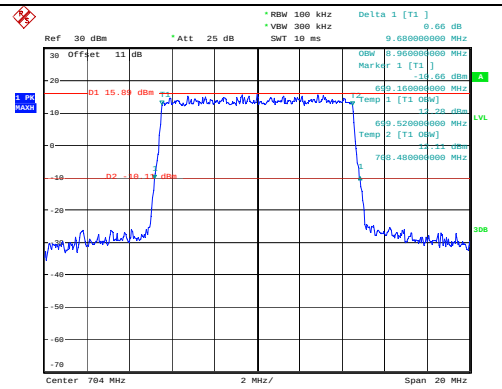
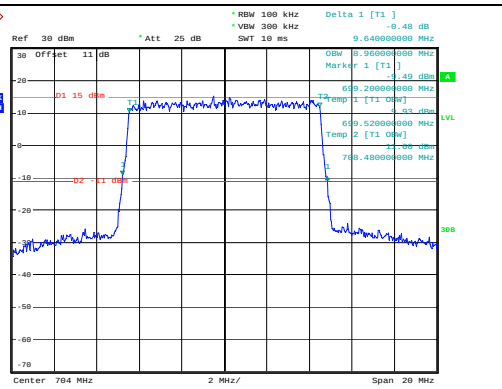
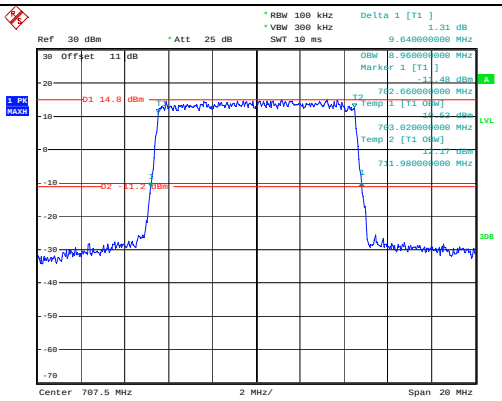
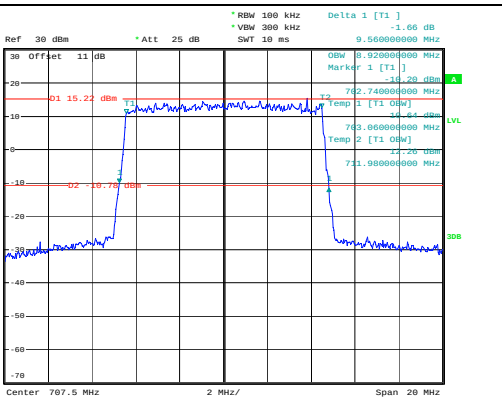
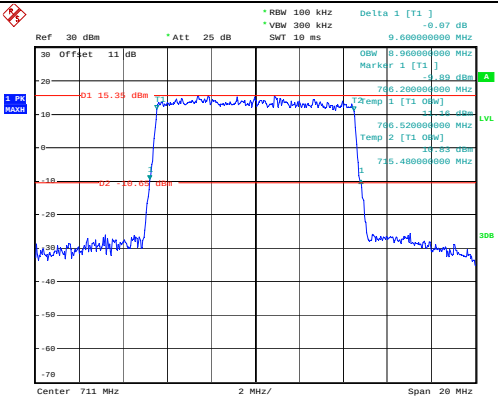
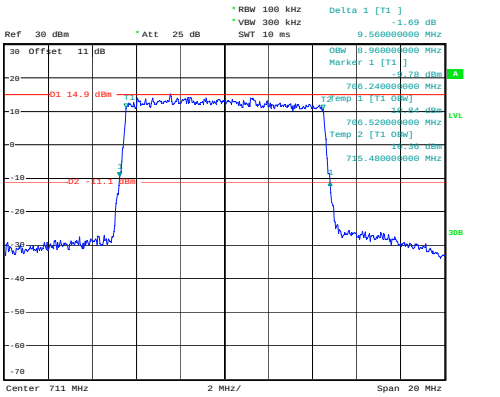
Test Plots (Note: The 11.0 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):

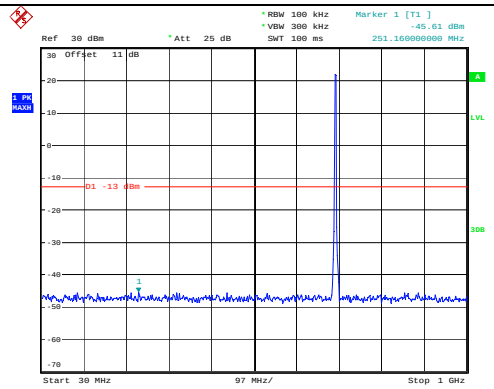
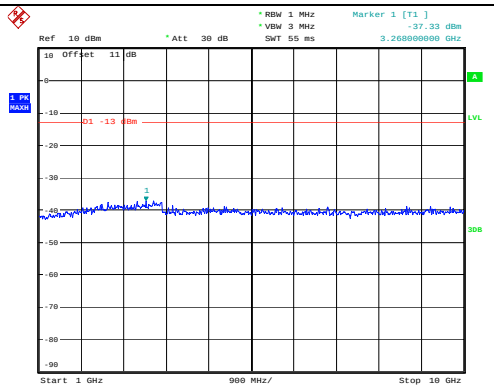
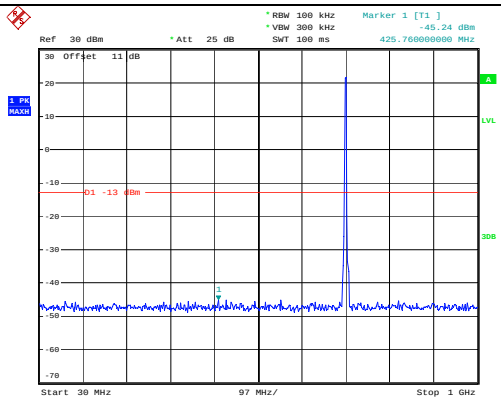
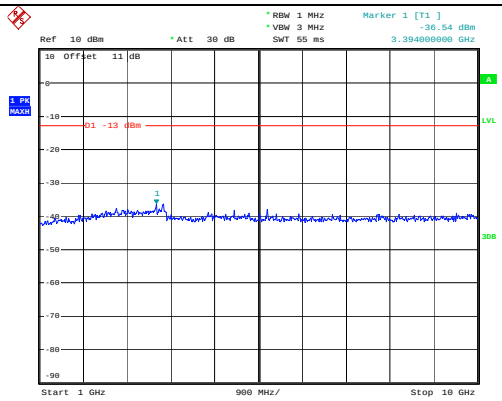
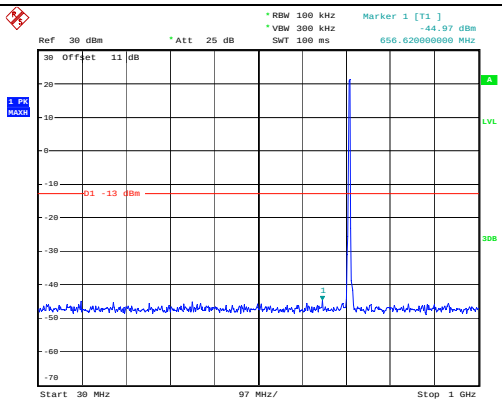
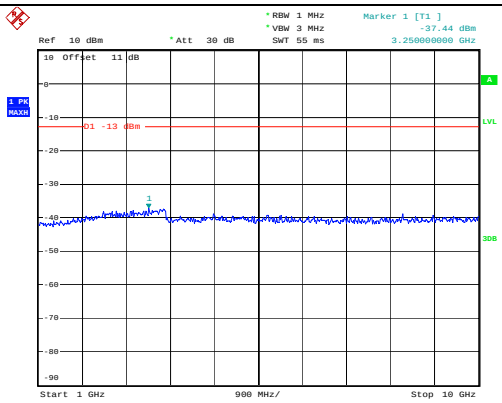
Occupied Bandwidth		
Channel	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

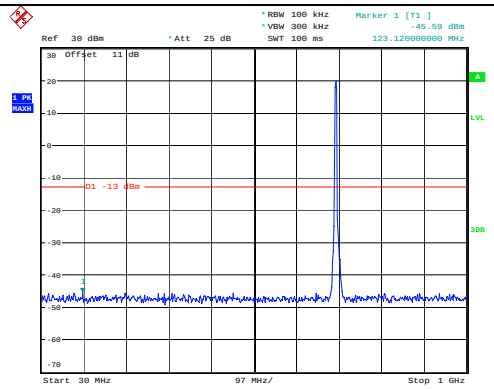
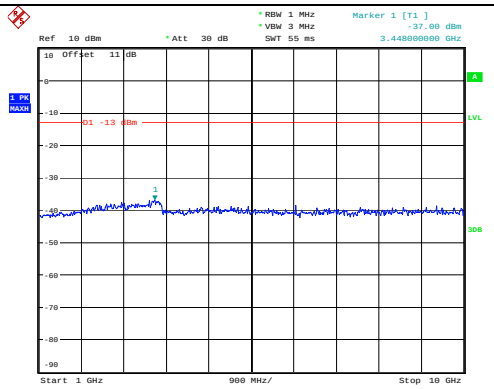
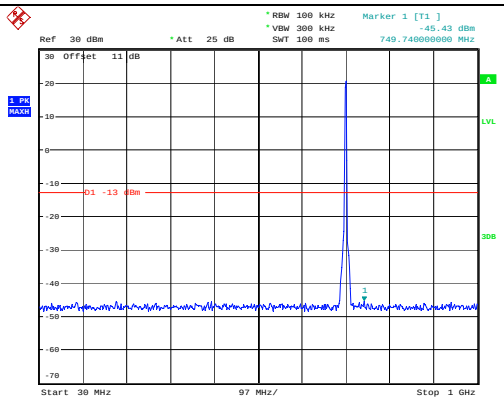
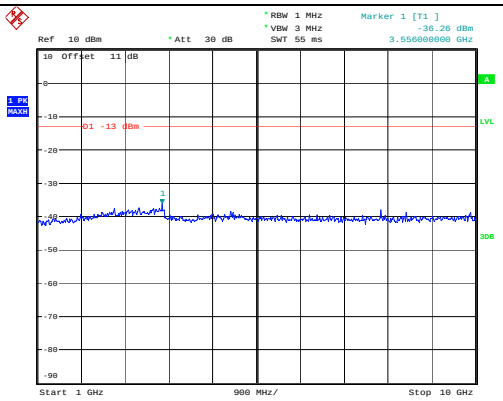
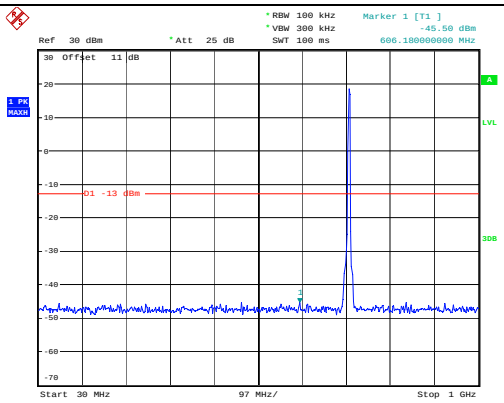
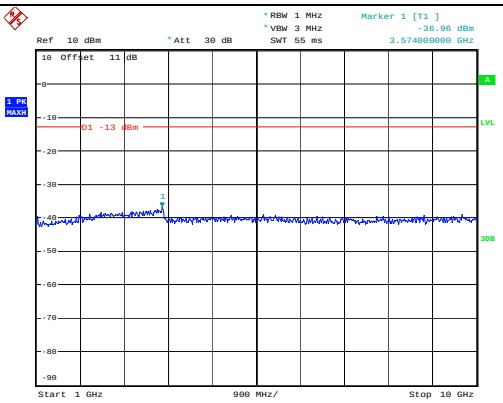
Occupied Bandwidth

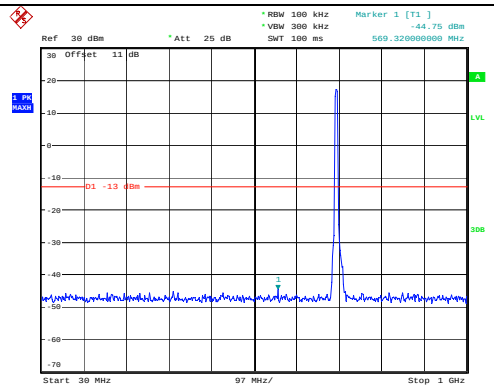
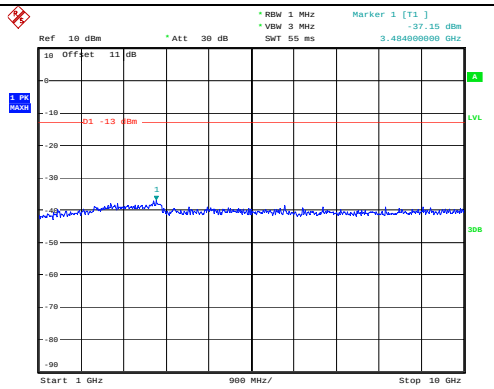
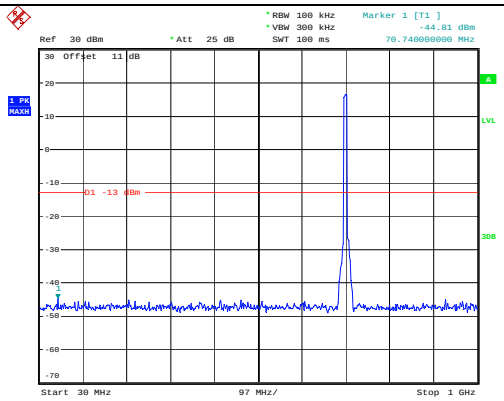
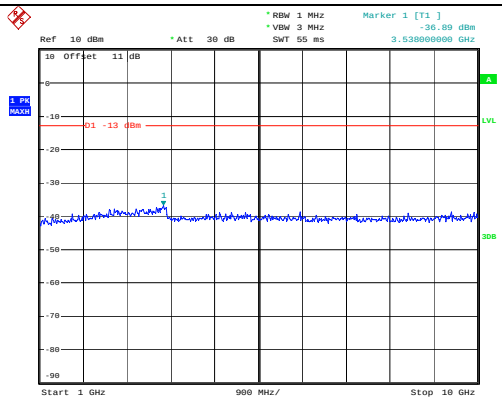
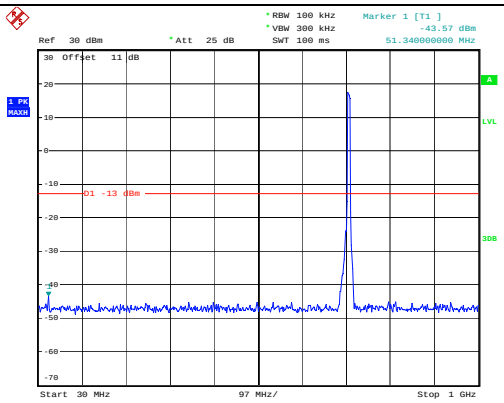
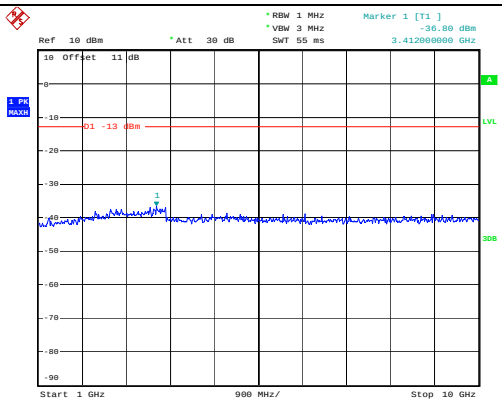
Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:10:50	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:11:13
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:11:34	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:11:54
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:12:15	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:12:35

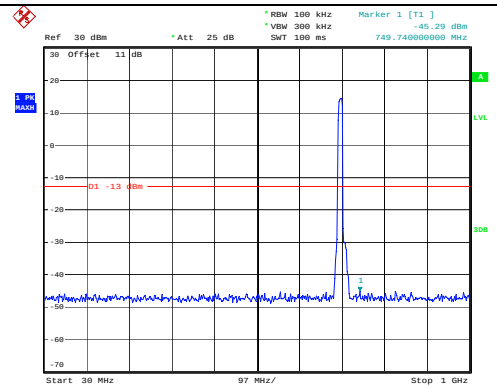
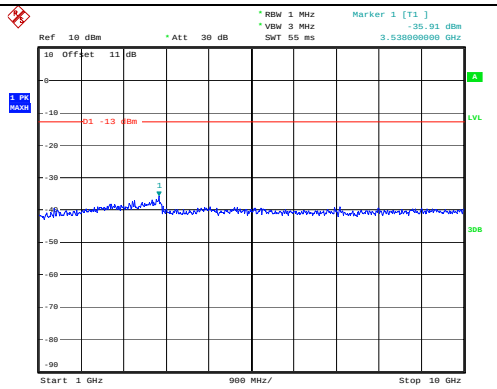
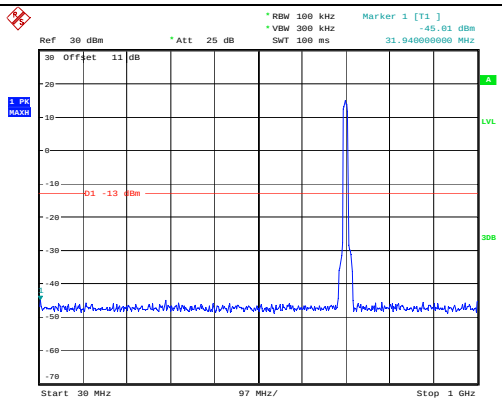
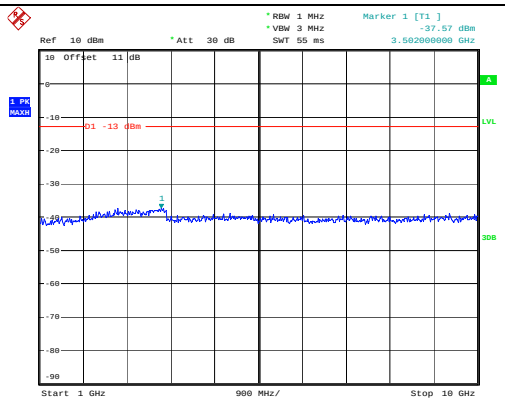
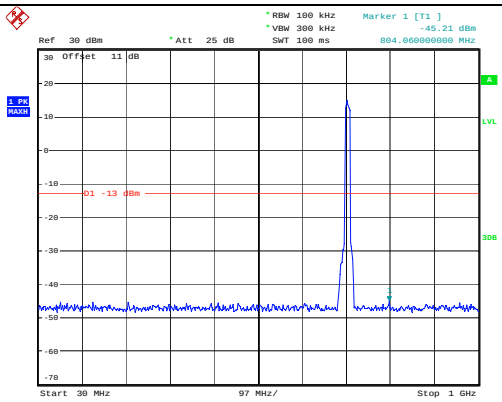
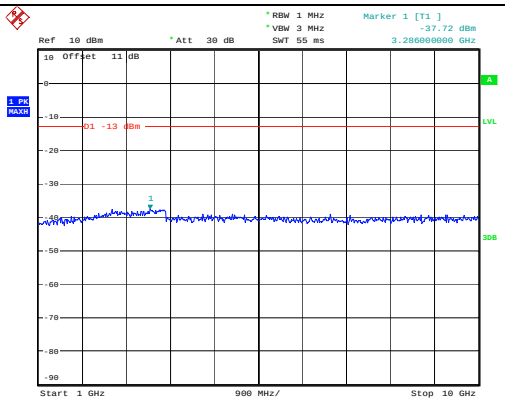
Occupied Bandwidth		
Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:13:58	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:14:28
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:14:52	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:15:22
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:15:43	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:18:18

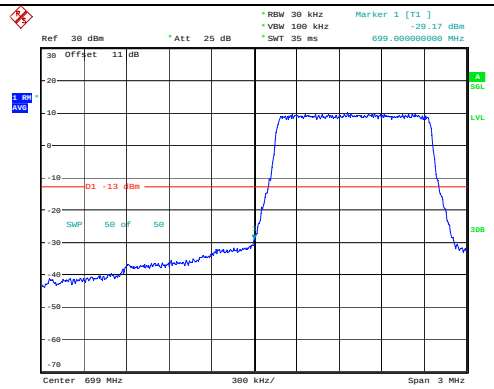
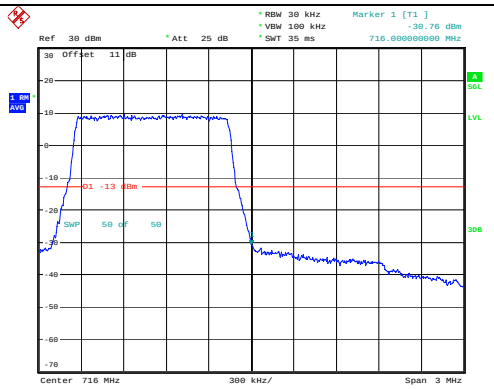
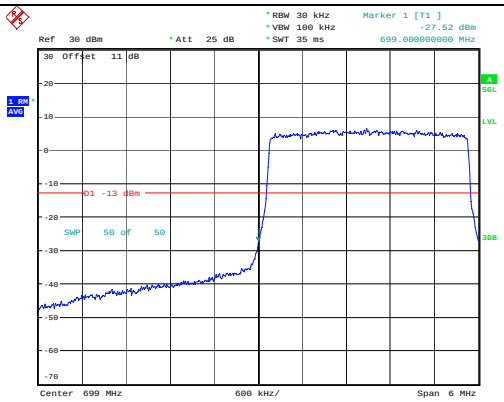
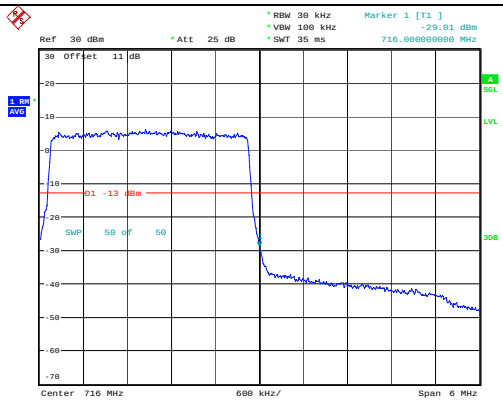
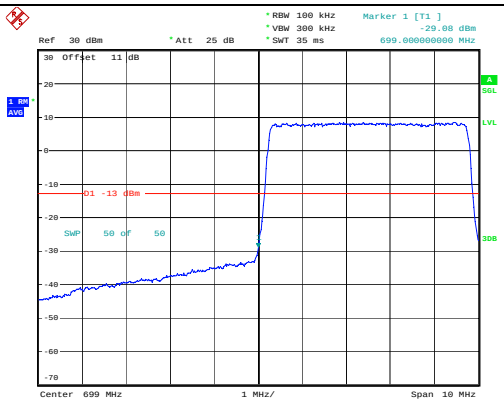
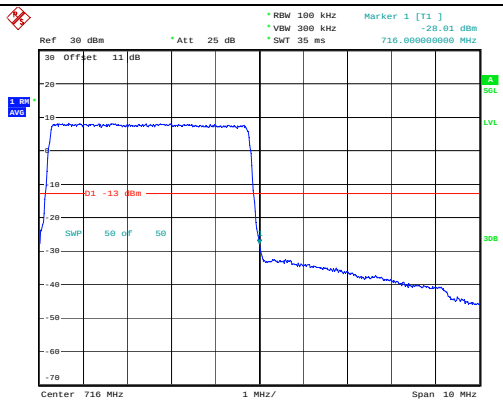
Occupied Bandwidth		
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:20:13	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:20:34
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:20:58	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:21:24
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:21:52	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:22:15

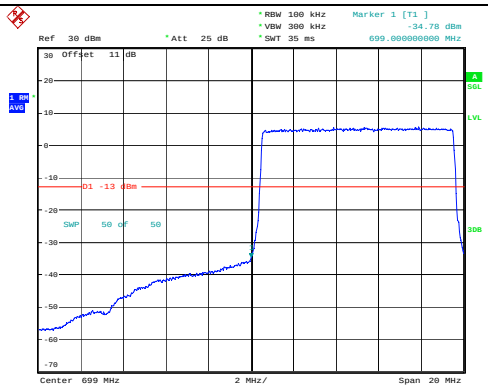
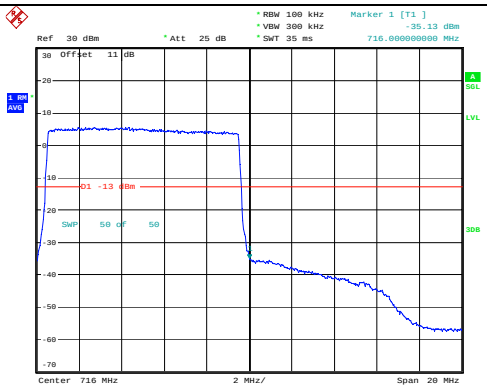
Spurious Emissions at Antenna Terminal		
Channel	**1.4MHz Bandwidth QPSK**	
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:56:24	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:56:34
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:57:30	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:57:40
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:57:53	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:58:03

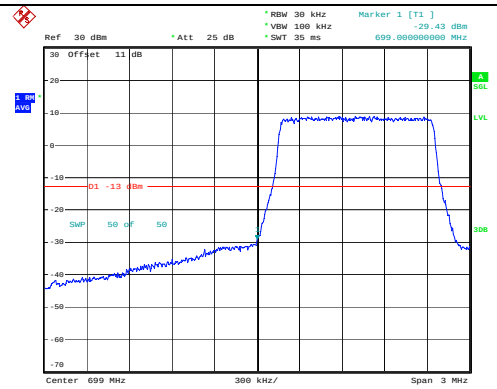
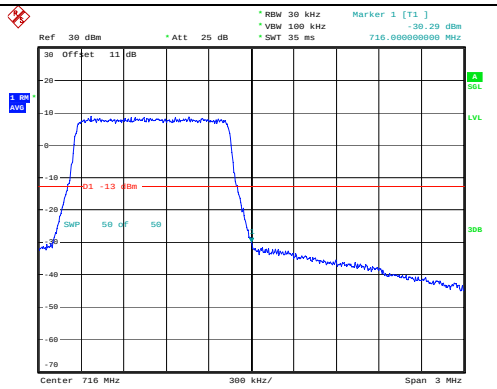
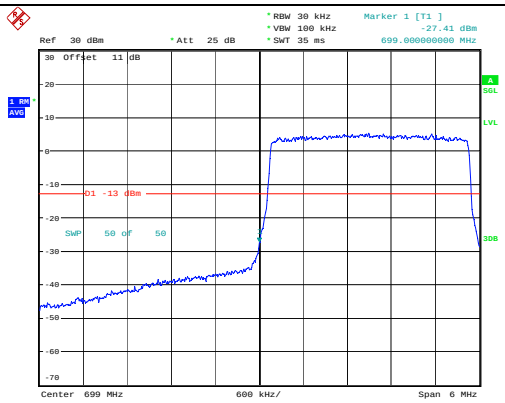
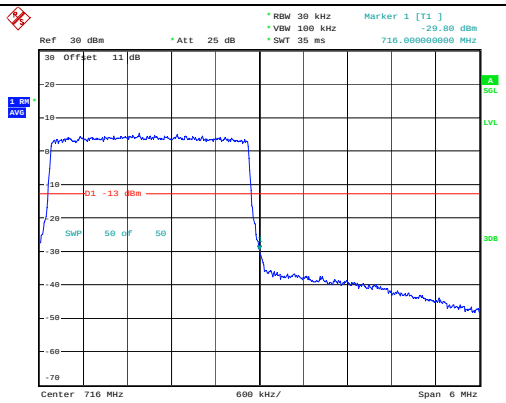
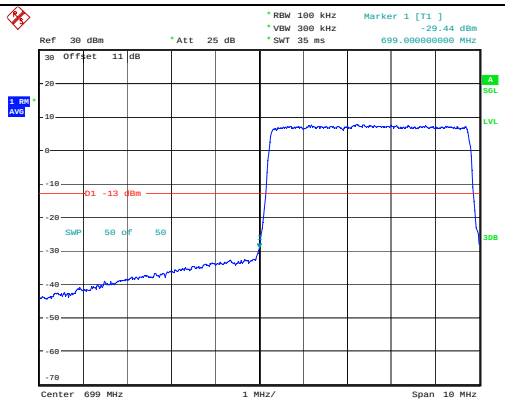
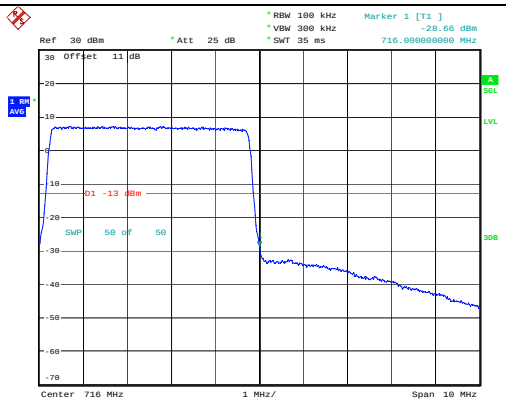
Spurious Emissions at Antenna Terminal		
Channel	**3MHz Bandwidth QPSK**	
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:58:42	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:58:55
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:59:11	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:59:21
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:59:33	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 23:59:43

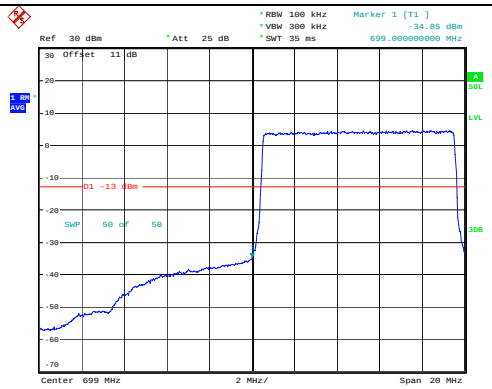
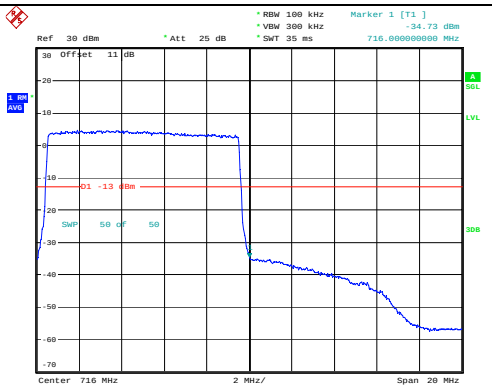
Spurious Emissions at Antenna Terminal		
Channel	**5MHz Bandwidth QPSK**	
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:00:22	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:00:32
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:00:45	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:00:55
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:01:11	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:01:21

Spurious Emissions at Antenna Terminal		
Channel	**10MHz Bandwidth QPSK**	
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:01:59	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:02:10
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:02:22	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:02:32
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:02:48	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:02:58

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		

4.11 Antenna Port Test Data and Results for LTE Band 13

Serial Number:	2CGM-1	Test Date:	2023/11/7-2023/11/30
Test Site:	RF	Test Mode:	Transmitting
Tester:	Hale Li	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	24.9-26.6	Relative Humidity: (%)	48-54	ATM Pressure: (kPa)	101

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200120	2023/4/18	2024/4/17
zhuoxiang	Coaxial Cable	211001	Each time	N/A	N/A
Minl-Clrcuits	Power Splitter	S F448201619	Each time	N/A	N/A
eastsheep	Coaxial Attenuator	21060301	Each time	N/A	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2023/9/29	2024/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30

** 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).*

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
5MHz	779.5	/	784.5
10MHz	/	782	/

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	23.03	/	23.11	13.14	34.77
	RB1#13	23.24	/	23.22		
	RB1#24	23.12	/	23.09		
	RB15#0	22.07	/	22.14		
	RB15#10	22.10	/	22.17		
	RB25#0	22.05	/	22.14		
5MHz 16QAM	RB1#0	22.26	/	21.90	12.31	34.77
	RB1#13	22.41	/	22.08		
	RB1#24	22.29	/	22.00		
	RB15#0	21.04	/	21.17		
	RB15#10	21.03	/	21.19		
	RB25#0	21.04	/	21.21		
10MHz QPSK	RB1#0	/	23.13	/	13.14	34.77
	RB1#25	/	23.21	/		
	RB1#49	/	23.24	/		
	RB25#0	/	22.02	/		
	RB25#25	/	22.12	/		
	RB50#0	/	22.11	/		
10MHz 16QAM	RB1#0	/	22.20	/	12.21	34.77
	RB1#25	/	22.28	/		
	RB1#49	/	22.31	/		
	RB25#0	/	21.08	/		
	RB25#25	/	21.16	/		
	RB50#0	/	21.08	/		

Note:
ERP= Conducted Power(dBm) - L_C(dB) + G_T(dBd)
G_T(dBd)=G_T(dBi)-2.15

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	/	4.17	/	13
	RB50#0	/	5.26	/	13
10MHz 16QAM	RB1#0	/	5.38	/	13
	RB50#0	/	6.15	/	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	4.500	/	4.520	4.900	/	4.960
5MHz 16QAM	4.540	/	4.540	4.940	/	4.940
10MHz QPSK	/	8.960	/	/	9.600	/
10MHz 16QAM	/	8.960	/	/	9.640	/
Note: The test plots please refer to the Plots of Occupied Bandwidth						

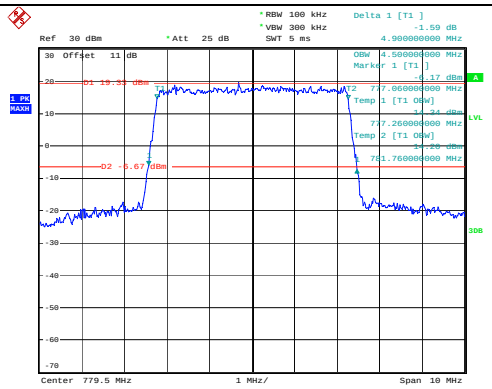
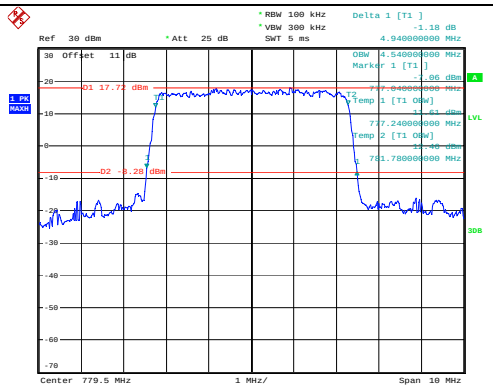
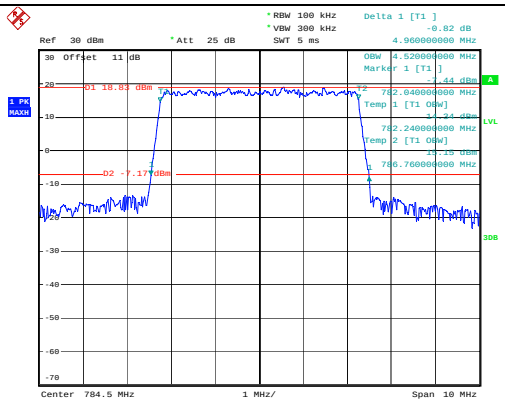
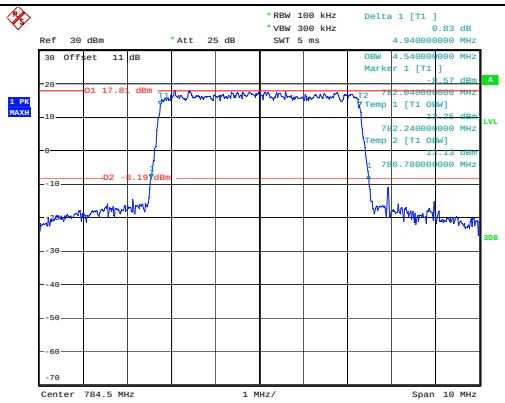
FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

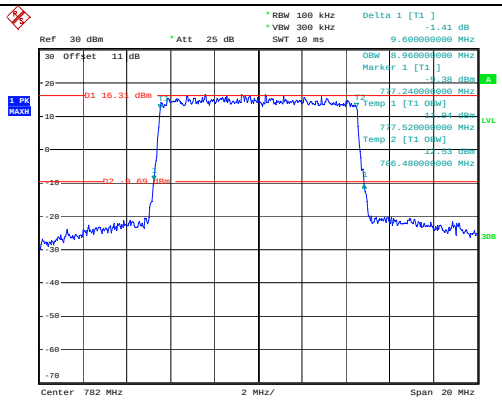
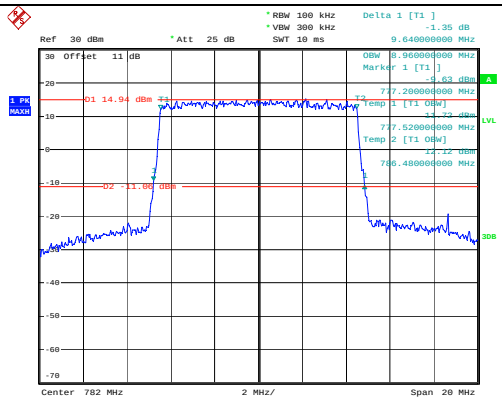
FCC §2.1051, §27.53:Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

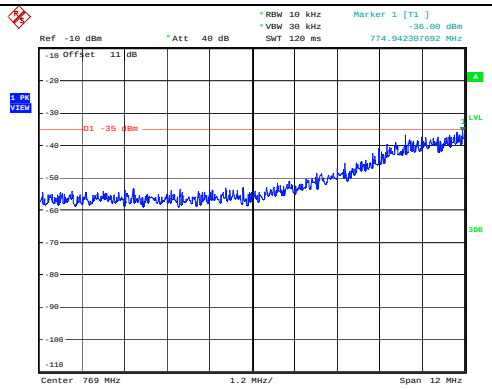
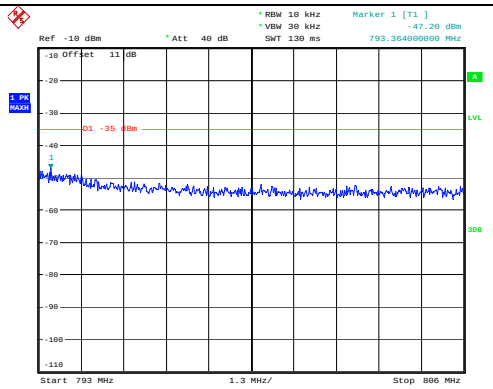
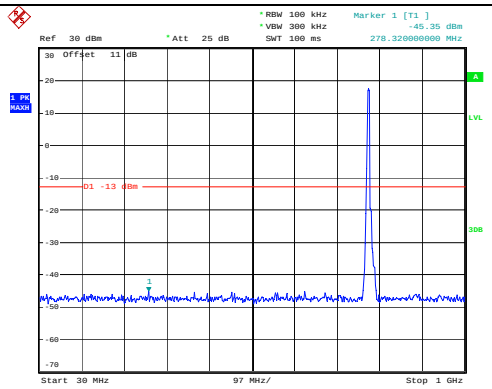
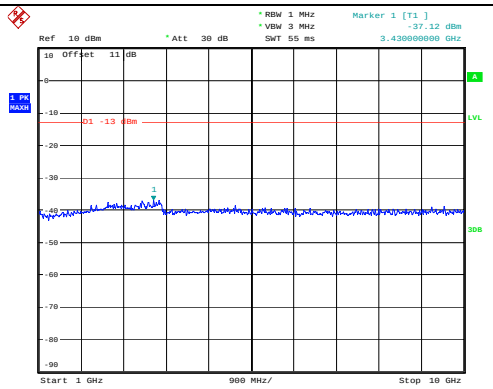
FCC §2.1055, §27.54: Frequency Stability						
Test Mode:	10M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	777.023	777.00	786.975	787.00
	-20	3.91	777.023	777.00	786.971	787.00
	-10	3.91	777.021	777.00	786.969	787.00
	0	3.91	777.021	777.00	786.969	787.00
	10	3.91	777.019	777.00	786.972	787.00
	20	3.91	777.024	777.00	786.970	787.00
	30	3.91	777.023	777.00	786.971	787.00
	40	3.91	777.017	777.00	786.971	787.00
	50	3.91	777.018	777.00	786.973	787.00
Frequency Stability vs. Voltage	20	3.45	777.018	777.00	786.973	787.00
	20	4.5	777.018	777.00	786.971	787.00
					Result:	**Pass**

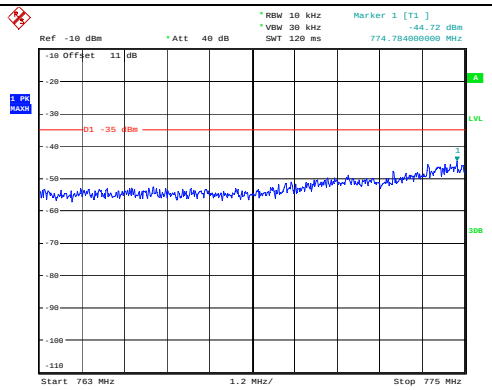
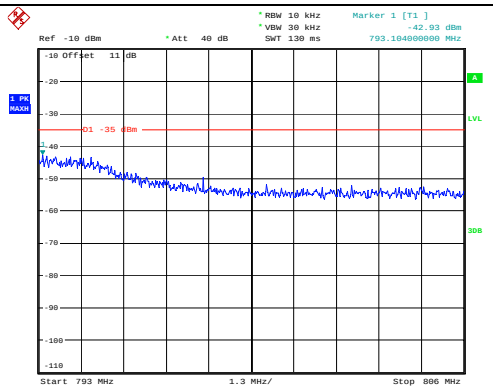
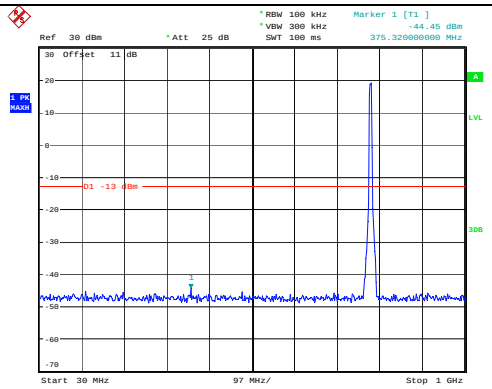
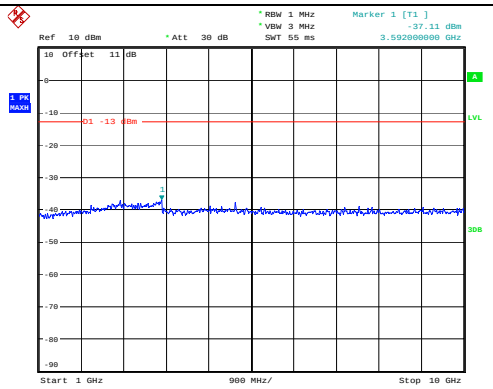
Test Mode:	10M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	777.017	777.00	786.976	787.00
	-20	3.91	777.018	777.00	786.974	787.00
	-10	3.91	777.019	777.00	786.969	787.00
	0	3.91	777.018	777.00	786.969	787.00
	10	3.91	777.021	777.00	786.979	787.00
	20	3.91	777.020	777.00	786.970	787.00
	30	3.91	777.021	777.00	786.970	787.00
	40	3.91	777.016	777.00	786.971	787.00
	50	3.91	777.017	777.00	786.969	787.00
Frequency Stability vs. Voltage	20	3.45	777.017	777.00	786.973	787.00
	20	4.5	777.022	777.00	786.970	787.00
					Result:	**Pass**

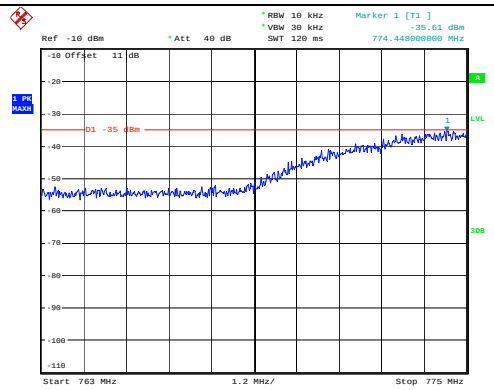
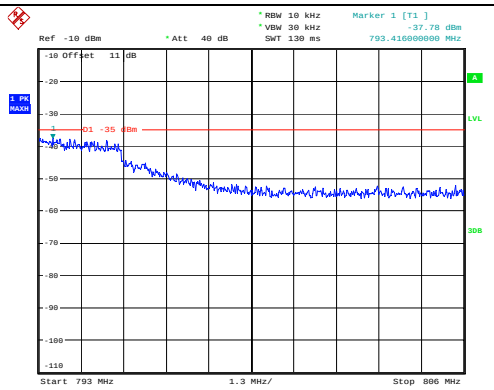
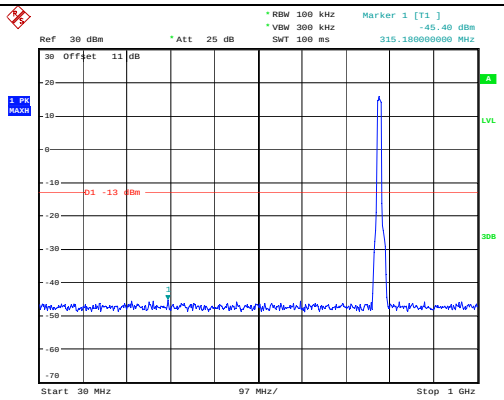
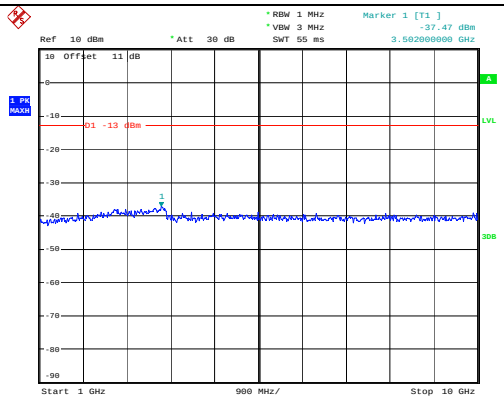
Test Plots(Note: The 10.5 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):

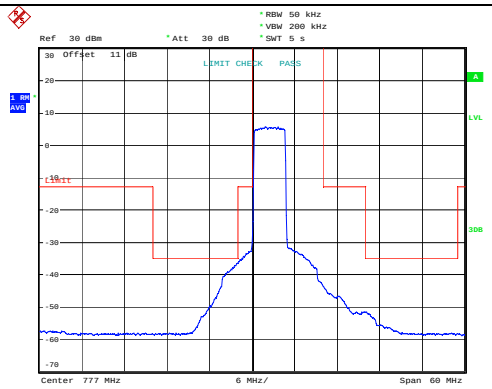
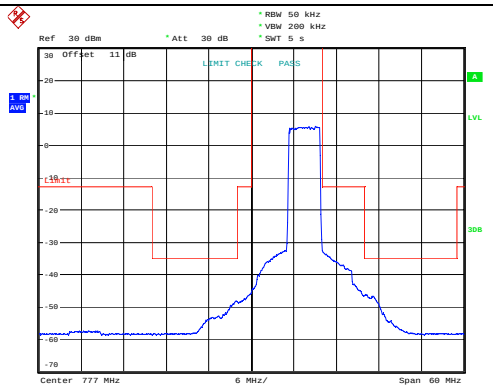
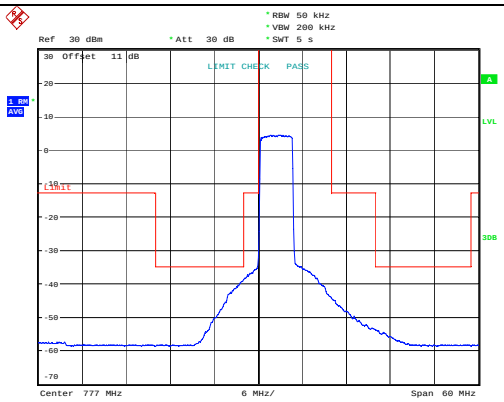
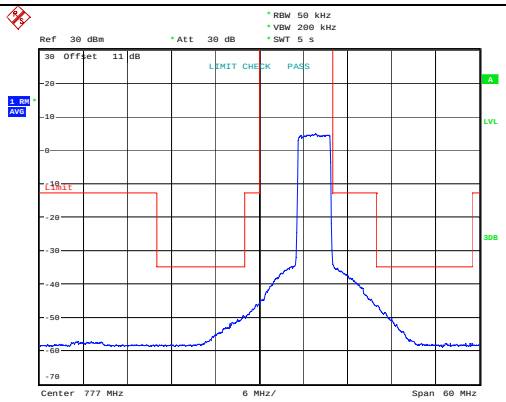
Occupied Bandwidth		
Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:23:25	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:23:58
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:25:32	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:25:58

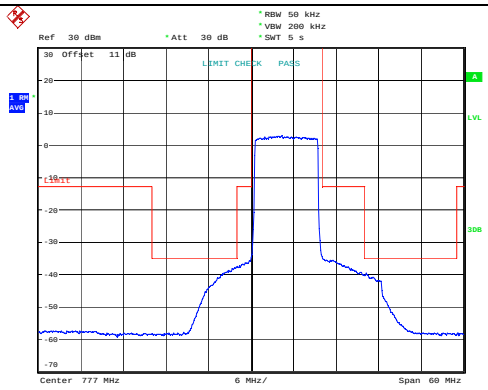
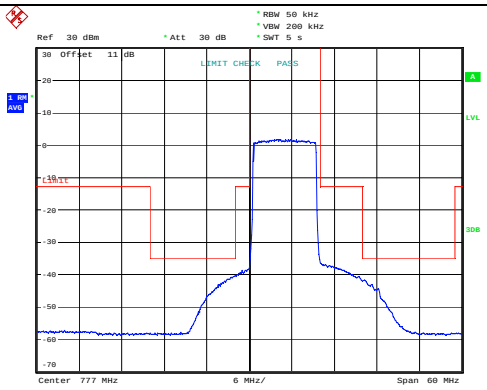
Occupied Bandwidth		
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Middle		

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

Spurious Emissions at Antenna Terminal		
Channel	**5MHz Bandwidth QPSK**	
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:06:08	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:06:21
	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:05:48	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:05:58

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

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 5MHz	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 09:59:47	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:01:58
16QAM 5MHz	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:03:31	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:02:54

Out of band emission, Band Edge		
Mode	**QPSK**	**16QAM**
10MHz Middle		

4.12 Antenna Port Test Data and Results for LTE Band 17

Serial Number:	2CGM-1	Test Date:	2023/11/7-2023/11/22
Test Site:	RF	Test Mode:	Transmitting
Tester:	Hale Li	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	24.9-25.7	Relative Humidity: (%)	48-55	ATM Pressure: (kPa)	101

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200120	2023/4/18	2024/4/17
zhuoxiang	Coaxial Cable	211001	Each time	N/A	N/A
Minl-Clrcuits	Power Splitter	S F448201619	Each time	N/A	N/A
eastsheep	Coaxial Attenuator	21060301	Each time	N/A	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2023/9/29	2024/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30

** 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).*

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	22.74	22.57	22.57	12.72	34.77
	RB1#13	22.82	22.70	22.65		
	RB1#24	22.65	22.57	22.51		
	RB15#0	21.65	21.67	21.67		
	RB15#10	21.72	21.59	21.57		
	RB25#0	21.70	21.59	21.59		
5MHz 16QAM	RB1#0	22.00	21.71	21.44	11.97	34.77
	RB1#13	22.07	21.76	21.56		
	RB1#24	21.88	21.63	21.40		
	RB15#0	20.70	20.81	20.75		
	RB15#10	20.74	20.66	20.63		
	RB25#0	20.77	20.73	20.77		
10MHz QPSK	RB1#0	22.74	22.73	22.74	12.64	34.77
	RB1#25	22.72	22.71	22.68		
	RB1#49	22.62	22.61	22.60		
	RB25#0	21.57	21.60	21.65		
	RB25#25	21.46	21.47	21.56		
	RB50#0	21.54	21.56	21.61		
10MHz 16QAM	RB1#0	21.76	22.33	21.87	12.23	34.77
	RB1#25	21.72	22.22	21.81		
	RB1#49	21.63	22.12	21.75		
	RB25#0	20.74	20.71	20.78		
	RB25#25	20.63	20.66	20.61		
	RB50#0	20.63	20.63	20.68		

Note: ERP= Conducted Power(dBm) - L_C(dB) + G_T(dBd)
G_T(dBd)=G_T(dBi)-2.15

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	4.94	4.87	5.03	13
	RB50#0	5.45	5.45	5.64	13
10MHz 16QAM	RB1#0	6.09	5.87	5.80	13
	RB50#0	6.47	6.41	6.47	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	4.500	4.520	4.520	4.920	4.940	4.940
5MHz 16QAM	4.520	4.500	4.520	4.940	4.920	4.940
10MHz QPSK	8.960	8.960	8.960	9.760	9.640	9.600
10MHz 16QAM	8.960	8.960	8.960	9.600	9.520	9.600
Note: The test plots please refer to the Plots of Occupied Bandwidth						

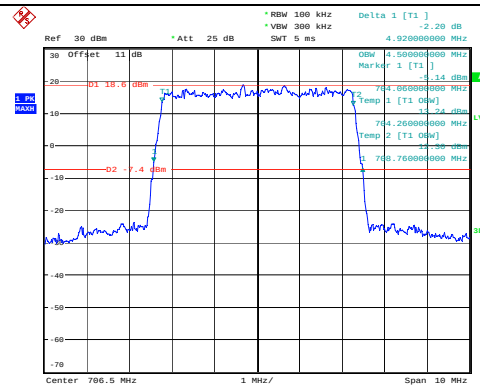
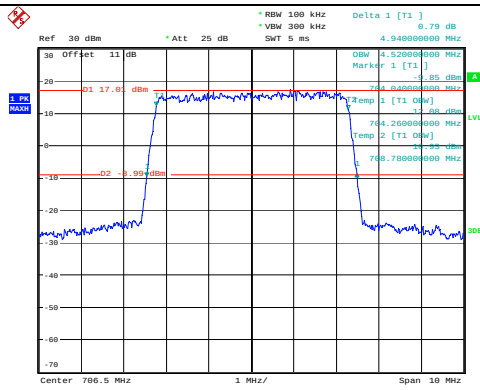
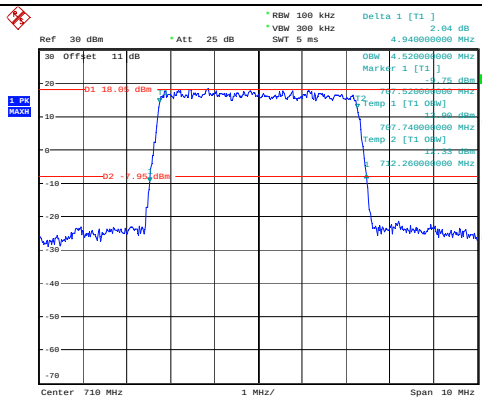
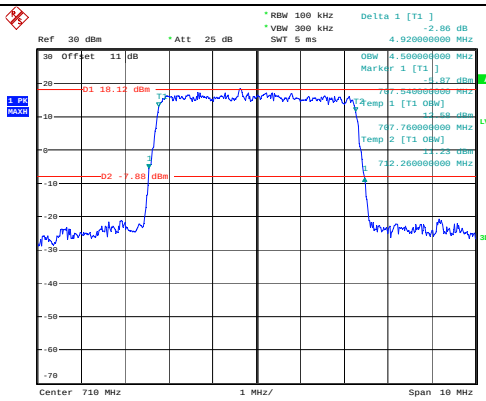
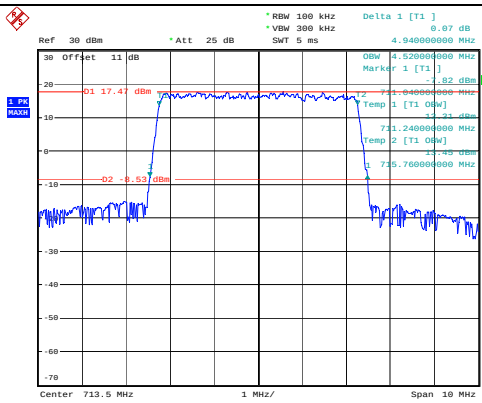
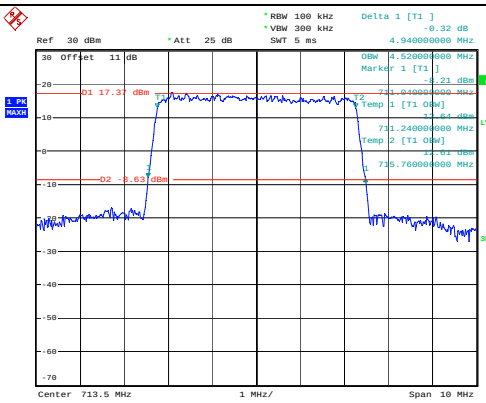
FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

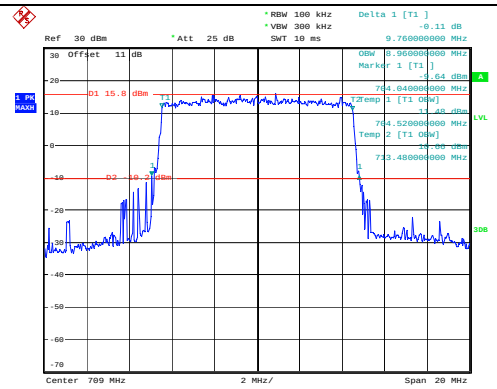
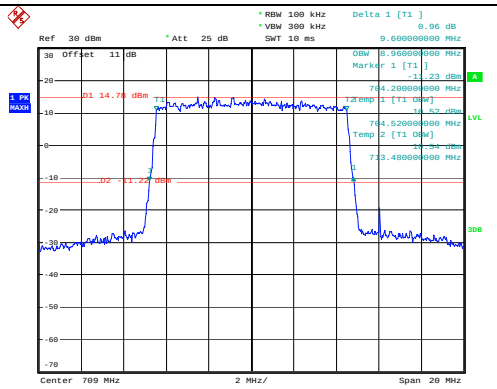
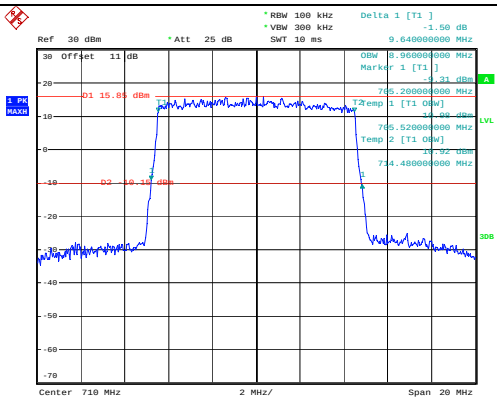
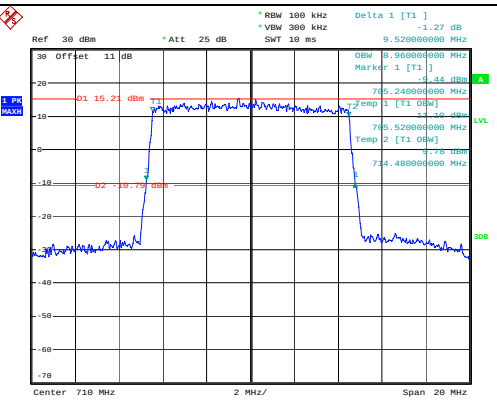
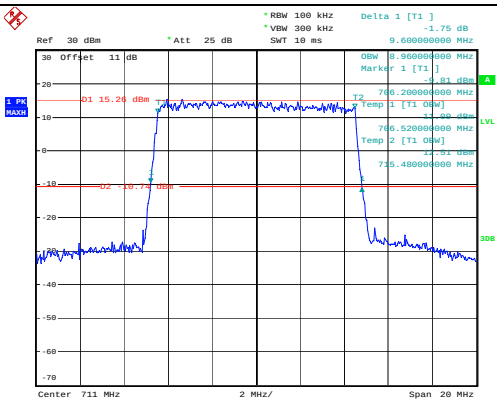
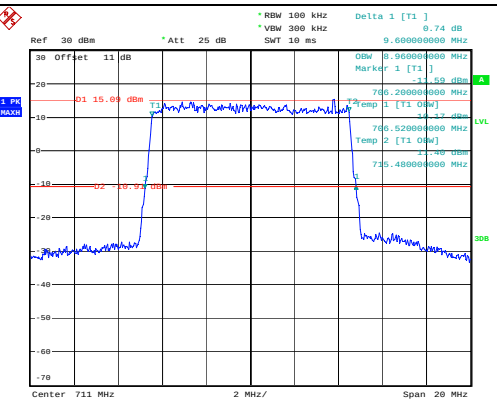
FCC §2.1051, §27.53:Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

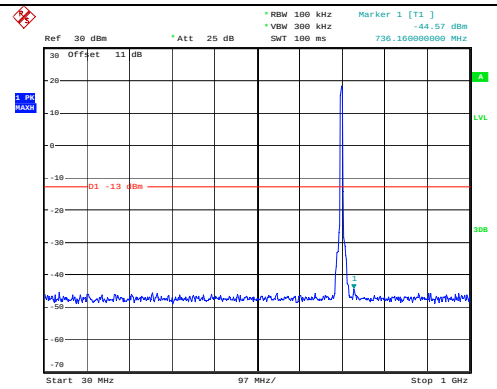
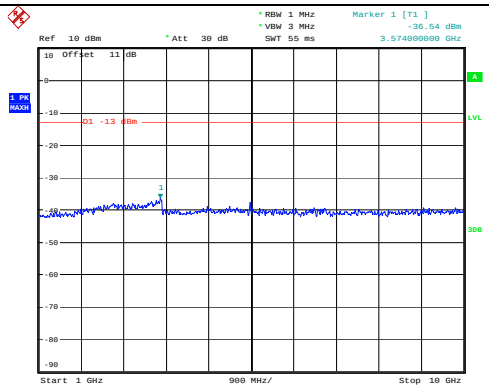
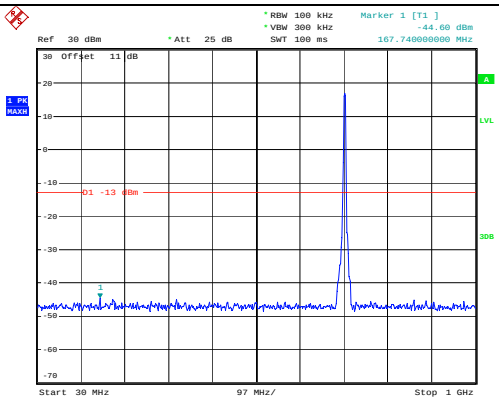
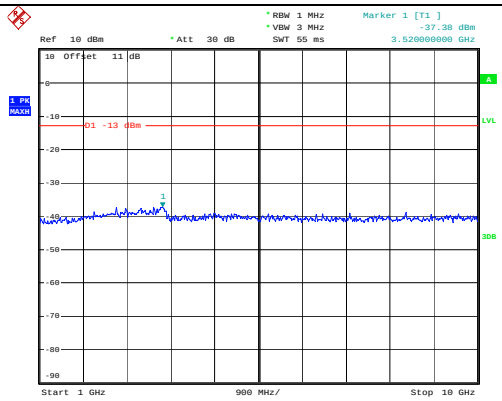
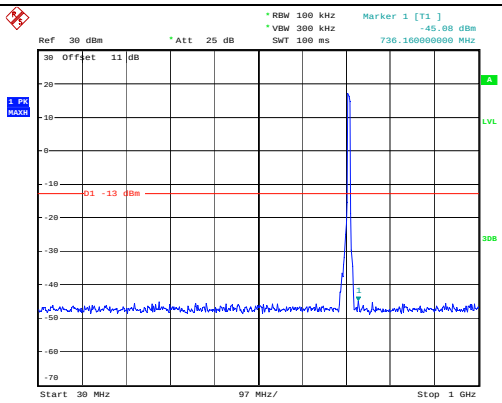
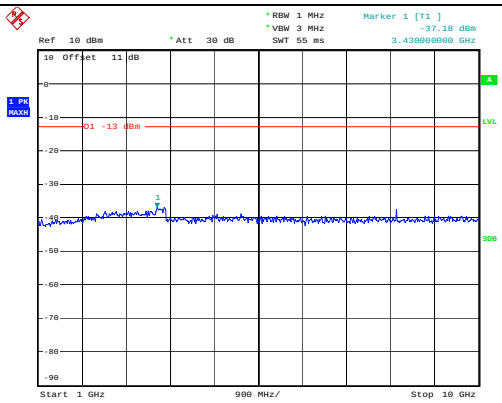
FCC §2.1055, §27.54: Frequency Stability						
Test Mode:	10M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	704.028	704.00	715.955	716.00
	-20	3.91	704.030	704.00	715.953	716.00
	-10	3.91	704.027	704.00	715.953	716.00
	0	3.91	704.023	704.00	715.955	716.00
	10	3.91	704.026	704.00	715.952	716.00
	20	3.91	704.028	704.00	715.956	716.00
	30	3.91	704.028	704.00	715.951	716.00
	40	3.91	704.028	704.00	715.956	716.00
	50	3.91	704.029	704.00	715.949	716.00
Frequency Stability vs. Voltage	20	3.45	704.029	704.00	715.950	716.00
	20	4.5	704.023	704.00	715.952	716.00
					Result:	**Pass**

Test Mode:	10M 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	3.91	704.027	704.00	715.951	716.00
	-20	3.91	704.027	704.00	715.956	716.00
	-10	3.91	704.024	704.00	715.950	716.00
	0	3.91	704.024	704.00	715.952	716.00
	10	3.91	704.027	704.00	715.959	716.00
	20	3.91	704.024	704.00	715.951	716.00
	30	3.91	704.031	704.00	715.954	716.00
	40	3.91	704.025	704.00	715.956	716.00
	50	3.91	704.028	704.00	715.949	716.00
Frequency Stability vs. Voltage	20	3.45	704.028	704.00	715.954	716.00
	20	4.5	704.030	704.00	715.951	716.00
					Result:	**Pass**

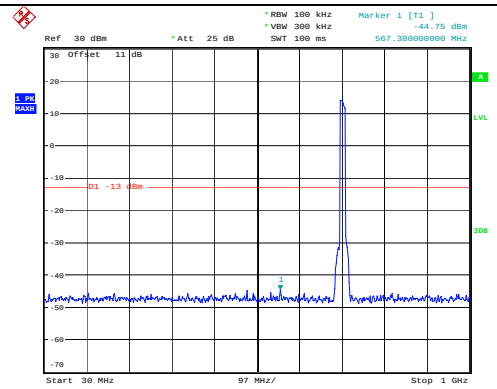
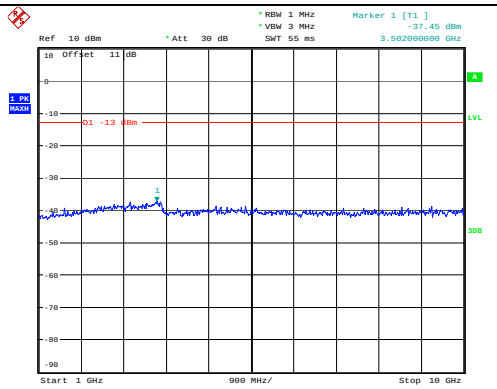
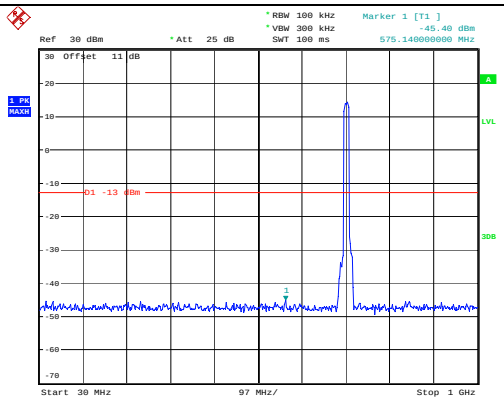
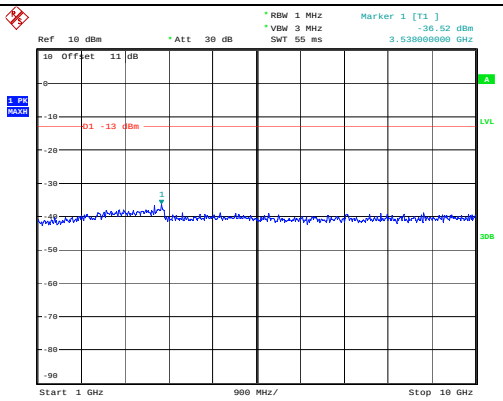
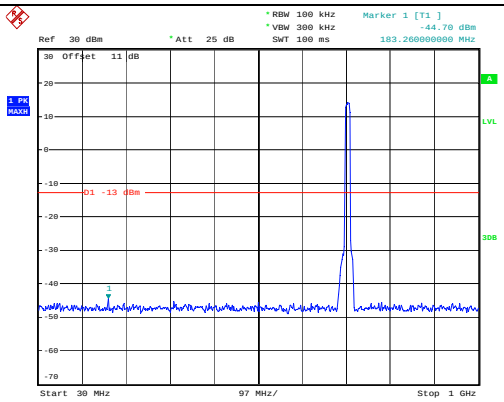
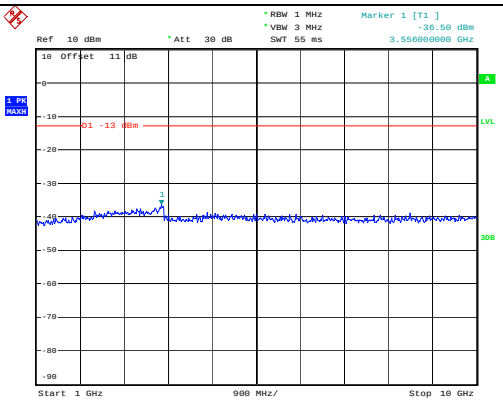
Test Plots (Note: The 11.0 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):

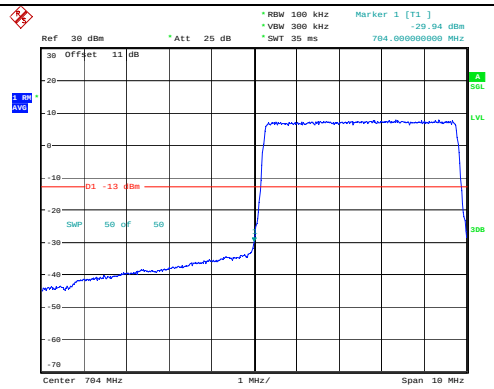
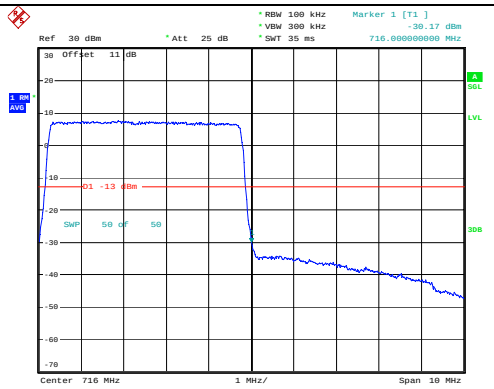
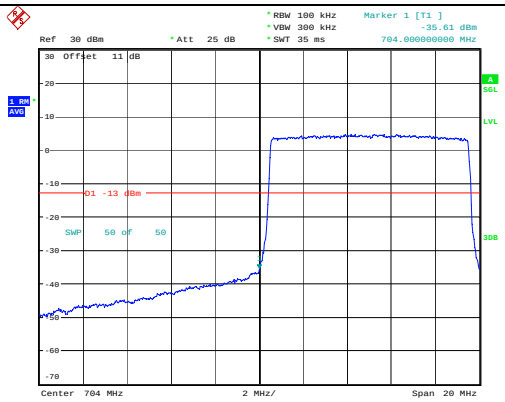
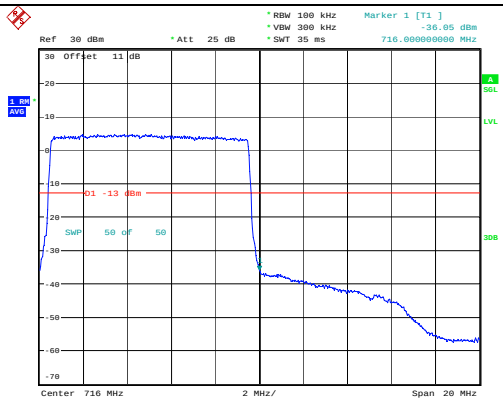
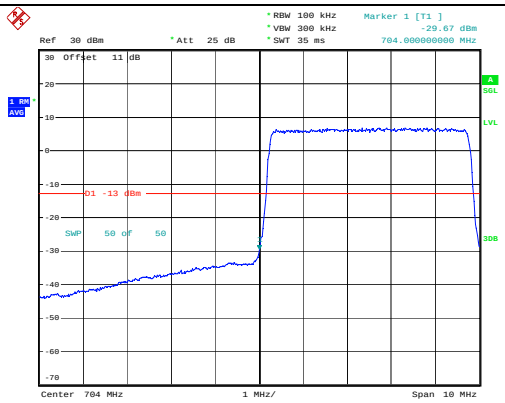
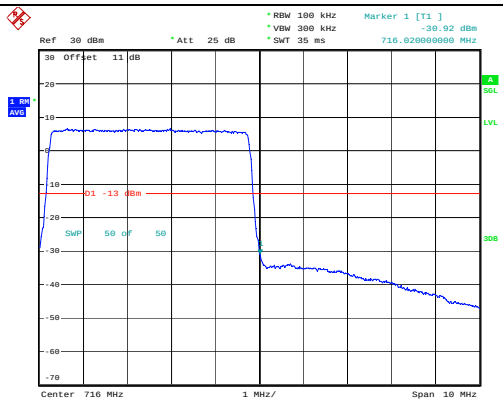
Occupied Bandwidth		
Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:28:33	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:28:57
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:29:21	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:29:45
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:30:12	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:30:39

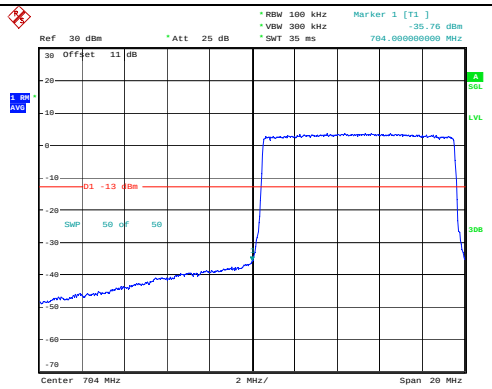
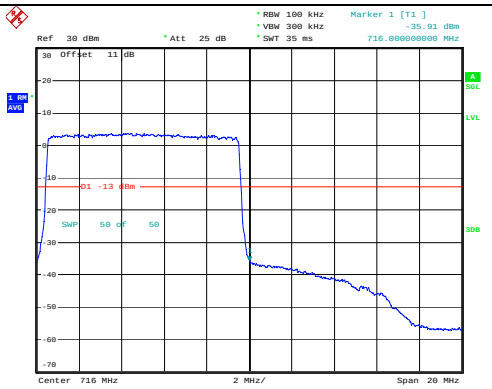
Occupied Bandwidth		
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:32:15	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:32:39
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:33:03	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:33:30
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:33:54	 ProjectNo.:CR231061288 Tester:Hale Li Date: 7.NOV.2023 22:34:21

Spurious Emissions at Antenna Terminal		
Channel	**5MHz Bandwidth QPSK**	
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:08:45	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:08:55
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:09:11	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:09:21
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:09:33	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:09:43

Spurious Emissions at Antenna Terminal

Channel	10MHz Bandwidth QPSK	
Lowest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:10:22	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:10:33
Middle	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:10:45	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:10:55
Highest	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:11:08	 ProjectNo.:CR231061288 Tester:Hale Li Date: 8.NOV.2023 00:11:18

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 5MHz		
QPSK 10MHz		
16QAM 5MHz		

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

4.13 Antenna Port Test Data and Results for LTE Band 26

Serial Number:	2CGM-1	Test Date:	2023/11/9-2023/12/5
Test Site:	RF	Test Mode:	Transmitting
Tester:	Hale Li, Rod Luo	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	24.9-25.7	Relative Humidity: (%)	48-51	ATM Pressure: (kPa)	101

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200120	2023/4/18	2024/4/17
zhuoxiang	Coaxial Cable	211001	Each time	N/A	N/A
Minl-Clrcuits	Power Splitter	S F448201619	Each time	N/A	N/A
eastsheep	Coaxial Attenuator	21060301	Each time	N/A	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2023/9/29	2024/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30

** 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).*

Test Frequency for Each Mode:

Operation Bandwidth	Lowest Frequency For 90S (MHz)	Highest Frequency For 90S (MHz)	Channel Cross 90S and 22H	Lowest Frequency For 22H (MHz)	Middle Frequency For 22H (MHz)	Highest Frequency For 22H (MHz)
1.4MHz	814.7	823.3	824	824.7	831.5	848.3
3MHz	815.5	822.5	824	825.5	831.5	847.5
5MHz	816.5	821.5	824	826.5	831.5	846.5
10MHz	819	/	824	829	831.5	844
15MHz	821.5	/	824	831.5	836.5	841.5

Note: 15MHz bandwidth 821.5MHz cross Rules 90S and 22H.

4.13.1 Test Data for Part 90S:

FCC§2.1046; § 90.635

RF Output Power:

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel For 90S	Highest Channel For 90S	Cross Channel		
1.4MHz QPSK	RB1#0	22.66	22.76	23.08	14.18	50
	RB1#3	22.69	22.86	23.17		
	RB1#5	22.64	22.79	23.13		
	RB3#0	22.73	22.88	23.22		
	RB3#3	22.73	22.89	23.19		
	RB6#0	21.82	21.97	22.27		
1.4MHz 16QAM	RB1#0	21.70	21.80	22.04	13.33	50
	RB1#3	21.81	21.84	22.14		
	RB1#5	21.69	21.78	22.04		
	RB3#0	21.67	21.99	22.35		
	RB3#3	21.70	21.96	22.37		
	RB6#0	20.88	20.91	21.29		
3MHz QPSK	RB1#0	22.54	22.69	22.97	14.03	50
	RB1#8	22.65	22.77	23.07		
	RB1#14	22.53	22.69	23.01		
	RB6#0	21.62	21.85	22.19		
	RB6#9	21.73	21.88	22.15		
	RB15#0	21.66	21.86	22.16		
3MHz 16QAM	RB1#0	21.52	22.30	22.08	13.27	50
	RB1#8	21.62	22.31	22.17		
	RB1#14	21.47	22.21	22.10		
	RB6#0	20.65	20.97	21.16		
	RB6#9	20.65	20.88	21.24		
	RB15#0	20.70	20.90	21.09		
5MHz QPSK	RB1#0	22.77	22.95	23.17	14.28	50
	RB1#13	22.87	23.08	23.32		
	RB1#24	22.76	22.96	23.23		
	RB15#0	21.75	21.92	22.26		
	RB15#10	21.83	21.99	22.10		
	RB25#0	21.83	21.92	22.18		
5MHz 16QAM	RB1#0	21.83	21.81	22.42	13.53	50
	RB1#13	21.93	21.88	22.57		
	RB1#24	21.87	21.89	22.46		
	RB15#0	20.80	20.98	21.25		
	RB15#10	20.84	21.03	21.11		
	RB25#0	20.87	20.98	21.21		
10MHz QPSK	RB1#0	22.85	/	23.16	14.28	50

	RB1#25	22.88	/	23.28		
	RB1#49	22.88	/	23.32		
	RB25#0	21.73	/	22.15		
	RB25#25	21.83	/	22.10		
	RB50#0	21.76	/	22.14		
10MHz 16QAM	RB1#0	21.84	/	22.30	13.42	50
	RB1#25	21.84	/	22.39		
	RB1#49	21.87	/	22.46		
	RB25#0	20.84	/	21.15		
	RB25#25	20.96	/	21.12		
	RB50#0	20.84	/	21.14		
15MHz QPSK	RB1#0	22.75	/	23.02	14.26	50
	RB1#38	22.95	/	23.27		
	RB1#74	22.93	/	23.30		
	RB36#0	21.75	/	22.09		
	RB36#39	21.92	/	22.17		
	RB75#0	21.86	/	22.19		
15MHz 16QAM	RB1#0	22.16	/	22.10	13.33	50
	RB1#38	22.35	/	22.35		
	RB1#74	22.31	/	22.37		
	RB36#0	20.77	/	21.09		
	RB36#39	20.92	/	21.17		
	RB75#0	20.82	/	21.13		

Note:
ERP= Conducted Power(dBm) - L_C(dB) + G_T(dBd)
G_T(dBd)=G_T(dBi)-2.15

Result:	**Pass**

FCC §2.1049, §90.209: Occupied Bandwidth

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Lowest For 90S	Highest For 90S	Cross	Lowest For 90S	Highest For 90S	Cross
1.4MHz QPSK	1.116	1.110	1.104	1.278	1.308	1.284
1.4MHz 16QAM	1.104	1.098	1.098	1.290	1.278	1.296
3MHz QPSK	2.688	2.688	2.688	2.928	2.928	2.916
3MHz 16QAM	2.688	2.688	2.688	2.940	2.940	2.940
5MHz QPSK	4.520	4.520	4.500	4.940	4.920	4.880
5MHz 16QAM	4.520	4.500	4.520	4.940	4.940	4.960
10MHz QPSK	8.960	/	8.960	9.560	/	9.600
10MHz 16QAM	8.960	/	8.960	9.520	/	9.640
15MHz QPSK	13.500	/	13.560	14.880	/	14.760
15MHz 16QAM	13.500	/	13.500	14.760	/	14.760

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

FCC §2.1051, §90.691: Spurious Emissions at Antenna Terminal

Result:	**Pass, please refer to the test plots of Spurious Emissions at Antenna Terminal.**

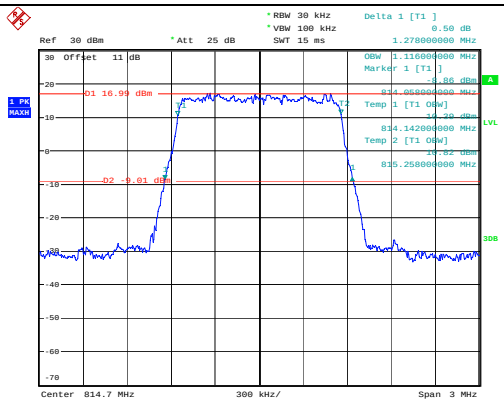
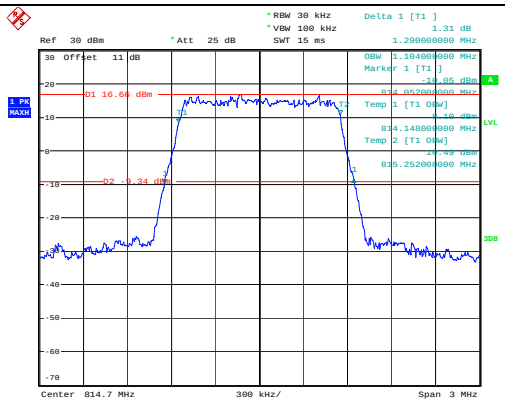
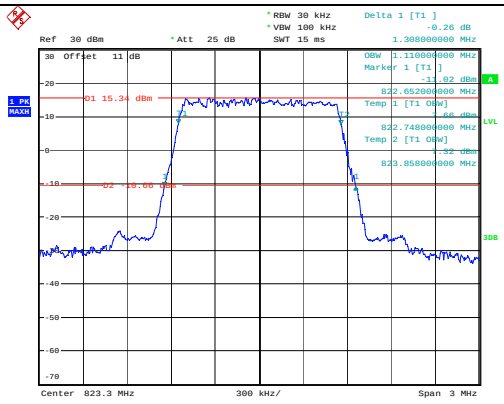
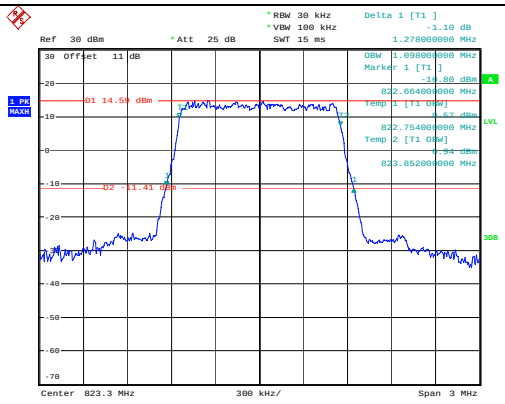
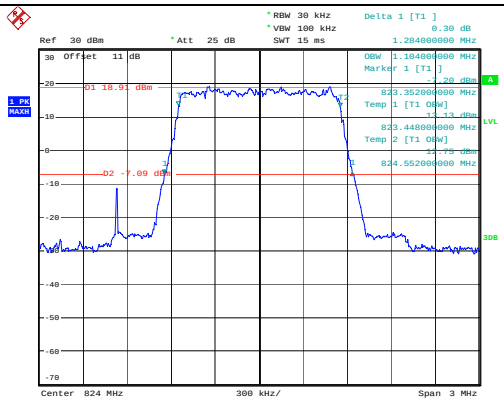
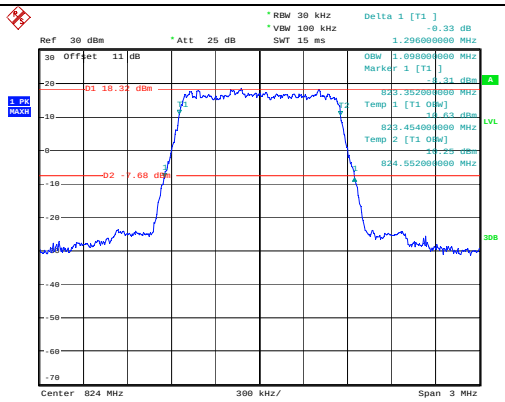
FCC §2.1051, §90.691: Out of band emission, Band Edge	
Result:	**Pass, please refer to the test plots of Out of band emission, Band Edge.**

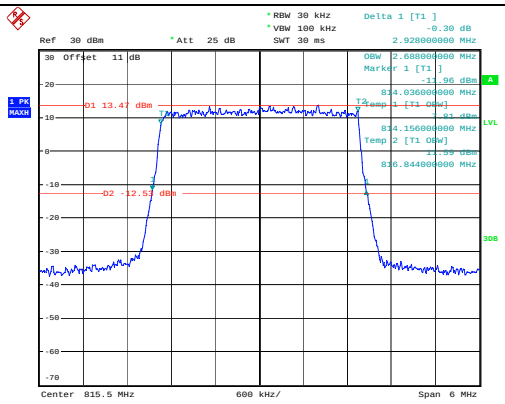
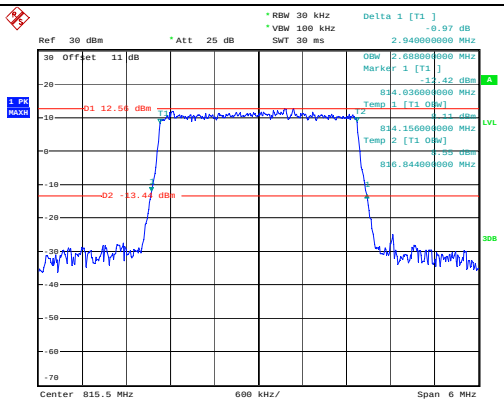
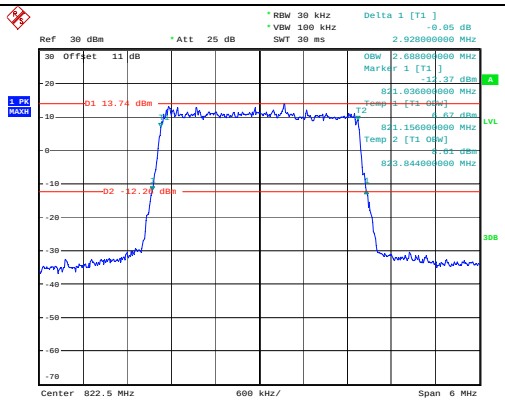
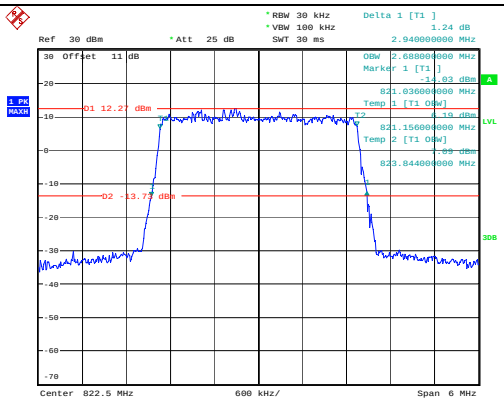
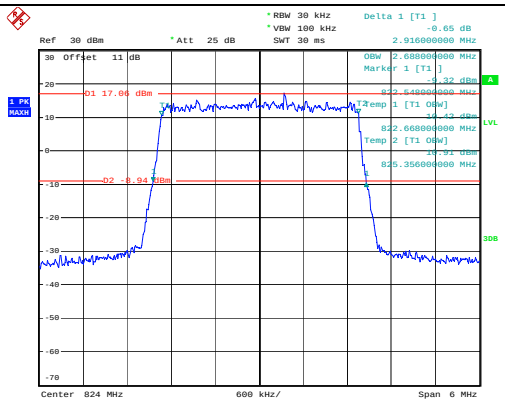
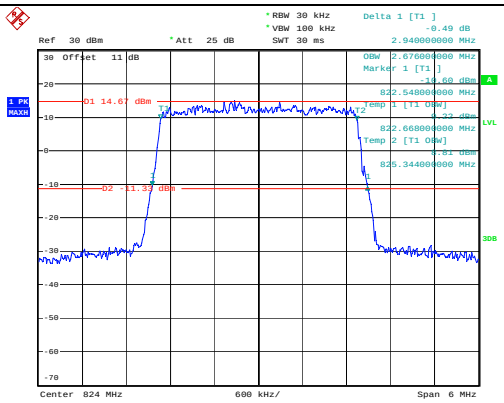
FCC §2.1055, §90.213: Frequency Stability					
Test Modulation:	15 MHz QPSK		Test Channel:	821.5	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.91	12.89	0.016	2.5
	-20	3.91	6.69	0.008	2.5
	-10	3.91	-2.87	-0.003	2.5
	0	3.91	-10.41	-0.013	2.5
	10	3.91	-0.89	-0.001	2.5
	20	3.91	-10.12	-0.012	2.5
	30	3.91	-8.21	-0.010	2.5
	40	3.91	-4.28	-0.005	2.5
	50	3.91	-7.67	-0.009	2.5
Frequency Stability vs. Voltage	20	3.45	-7.24	-0.009	2.5
	20	4.5	-6.83	-0.008	2.5
				Result:	**Pass**

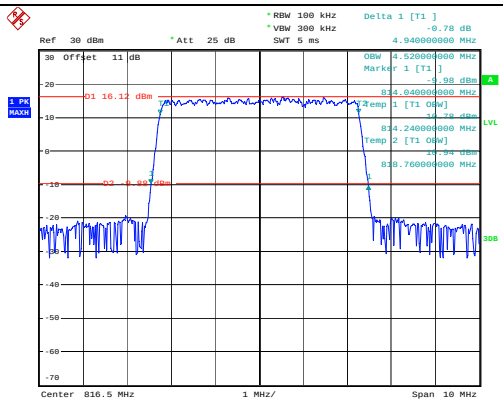
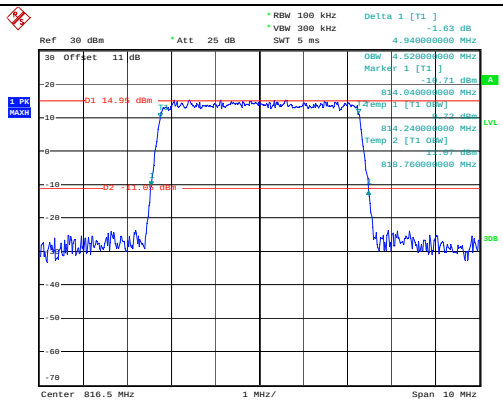
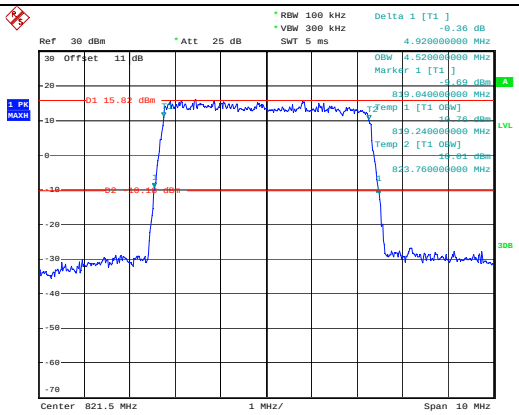
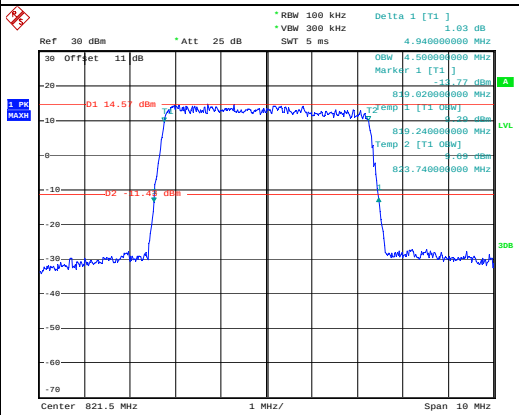
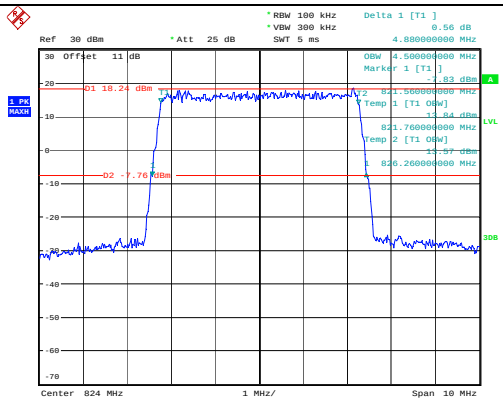
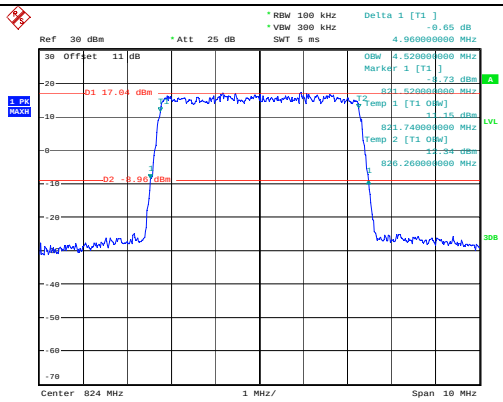
FCC §2.1055, §90.213: Frequency Stability					
Test Modulation:	15 MHz 16QAM		Test Channel:	821.5	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.91	7.06	0.009	2.5
	-20	3.91	2.32	0.003	2.5
	-10	3.91	-1.72	-0.002	2.5
	0	3.91	-2.80	-0.003	2.5
	10	3.91	-4.05	-0.005	2.5
	20	3.91	-10.77	-0.013	2.5
	30	3.91	-6.70	-0.008	2.5
	40	3.91	-5.57	-0.007	2.5
	50	3.91	-7.36	-0.009	2.5
Frequency Stability vs. Voltage	20	3.45	-7.24	-0.009	2.5
	20	4.5	-6.96	-0.008	2.5
				Result:	**Pass**

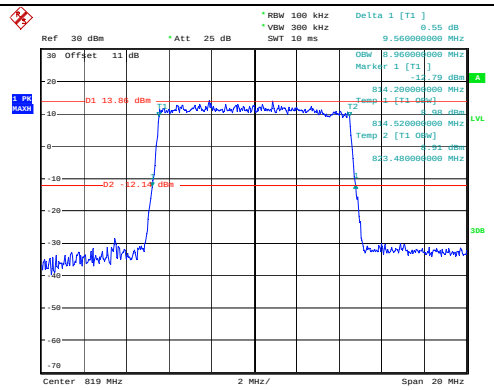
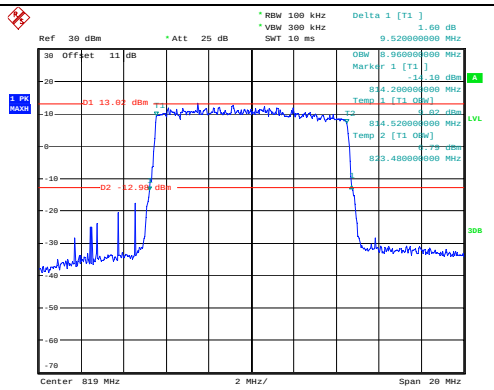
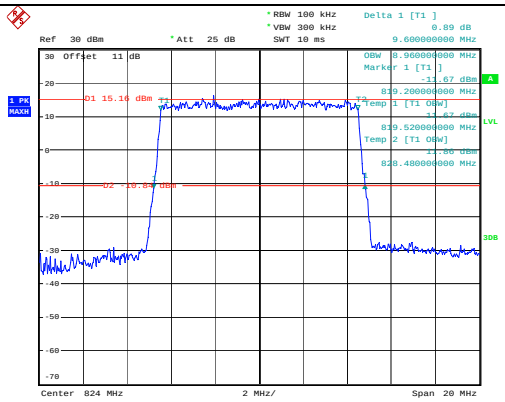
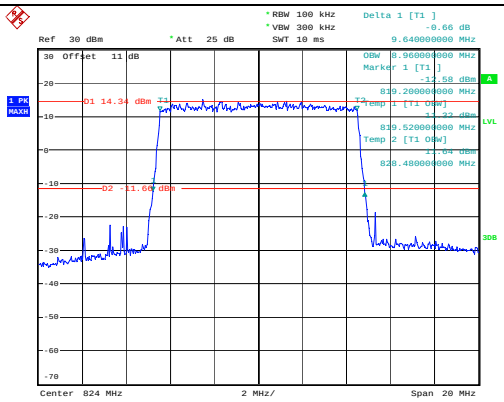
4.13.2 Test Plots for Part 90S:

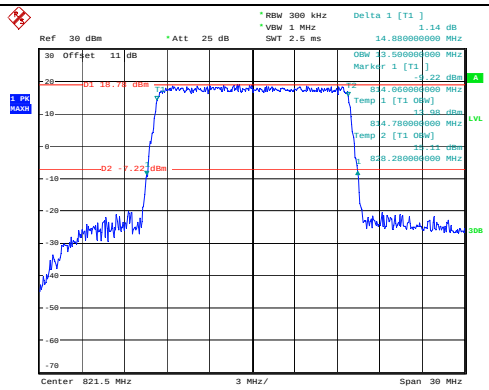
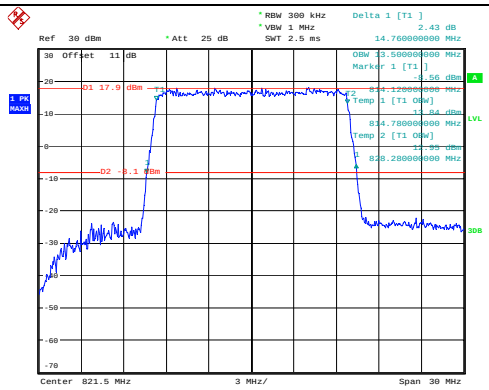
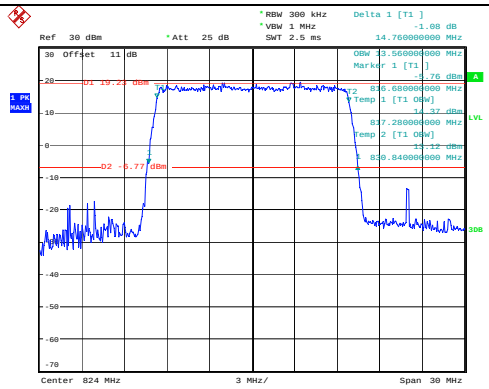
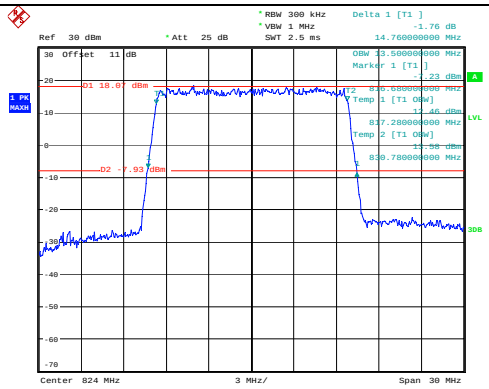
(Note: The 11.0dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer):

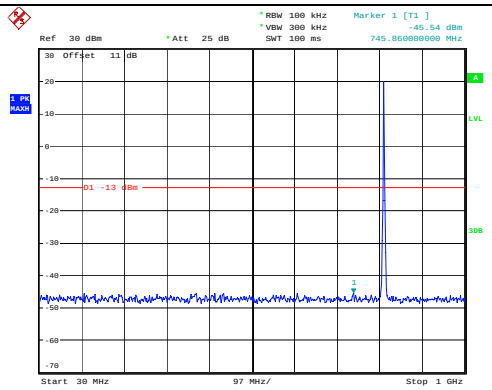
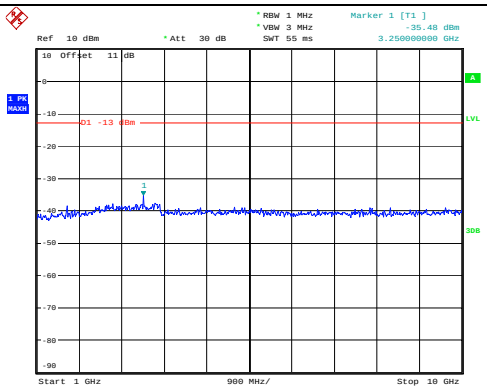
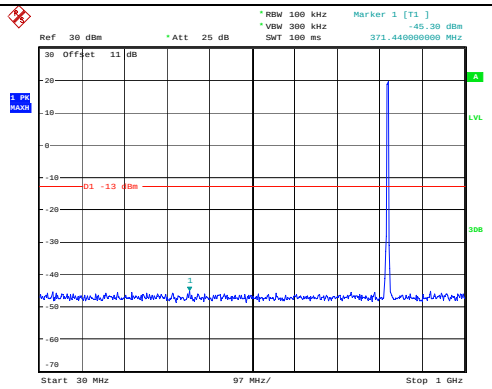
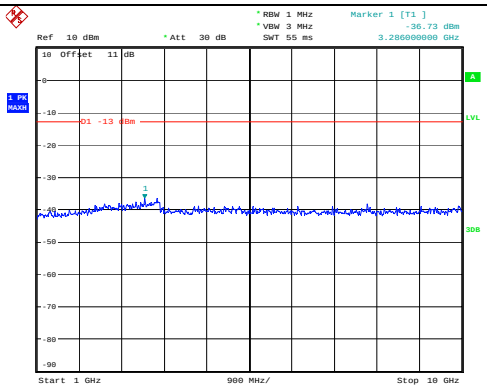
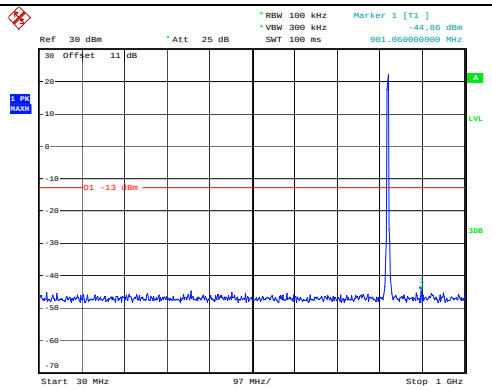
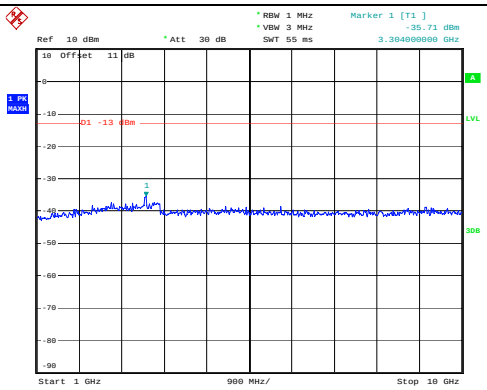
Occupied Bandwidth		
Channel	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest For 90S		
Highest For 90S		
Cross Channel		

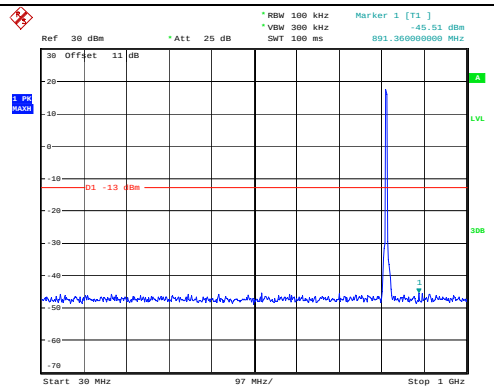
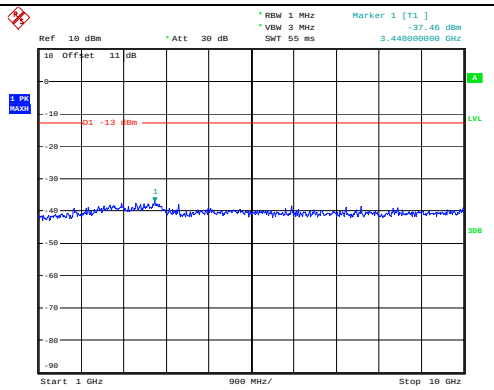
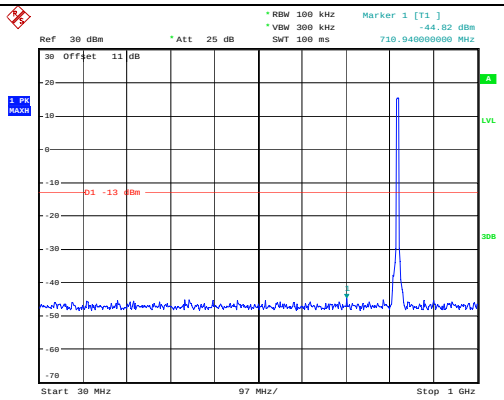
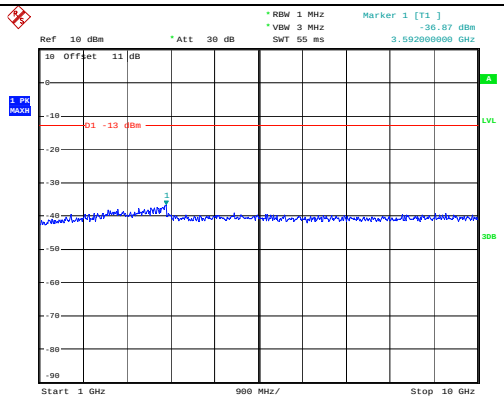
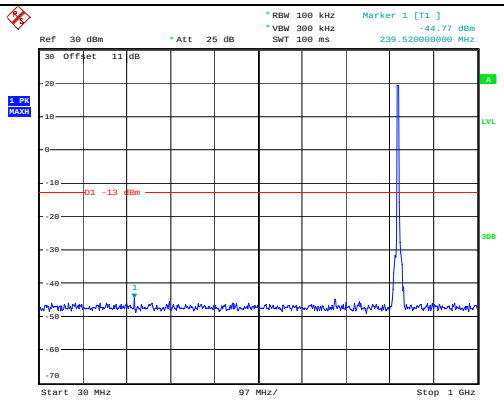
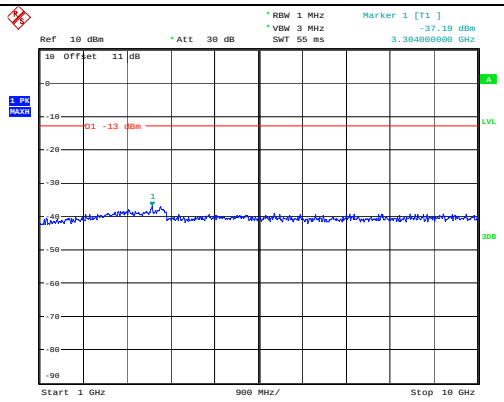
Occupied Bandwidth		
Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest For 90S		
Highest For 90S		
Cross Channel		

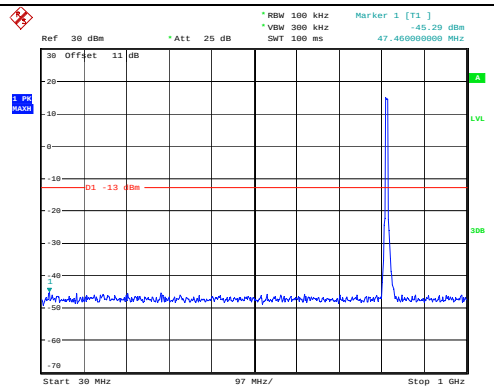
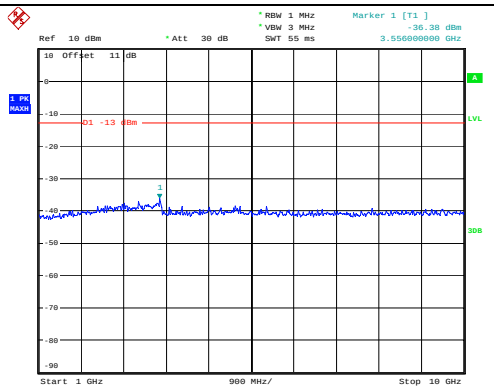
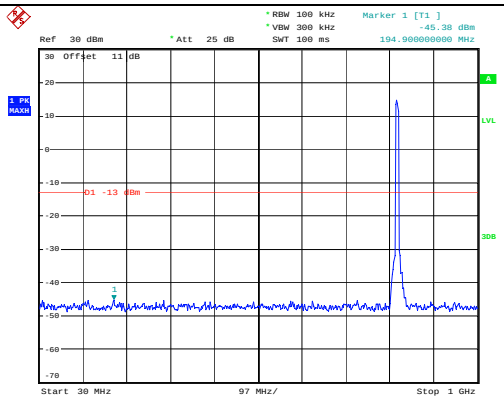
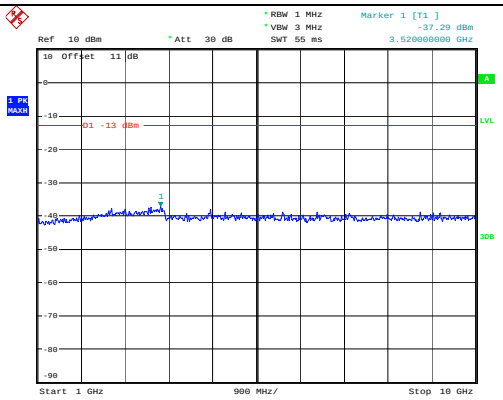
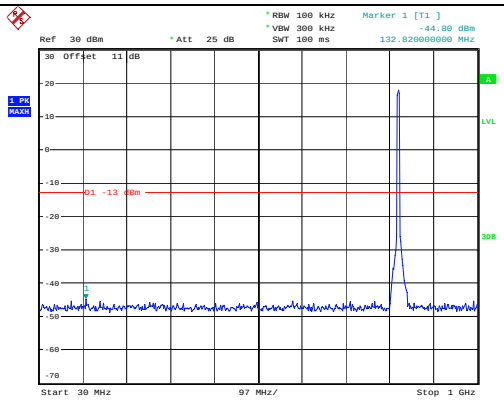
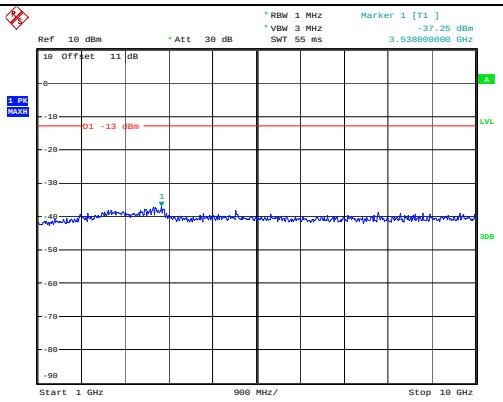
Occupied Bandwidth		
Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest For 90S		
Highest For 90S		
Cross Channel		

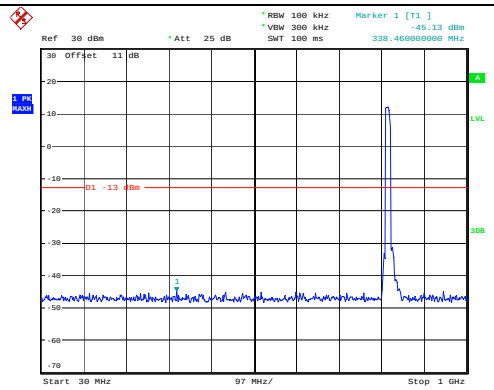
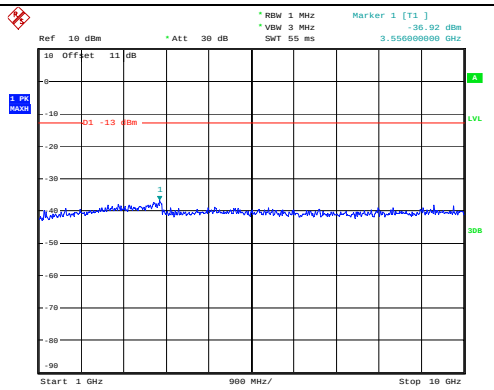
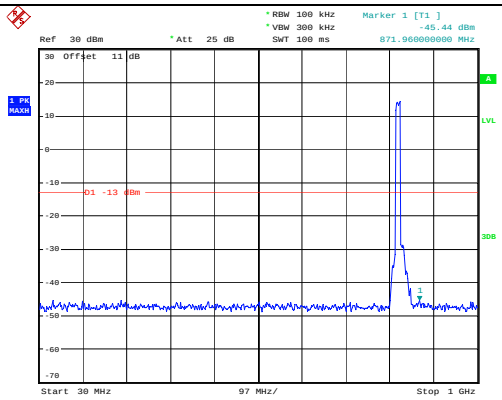
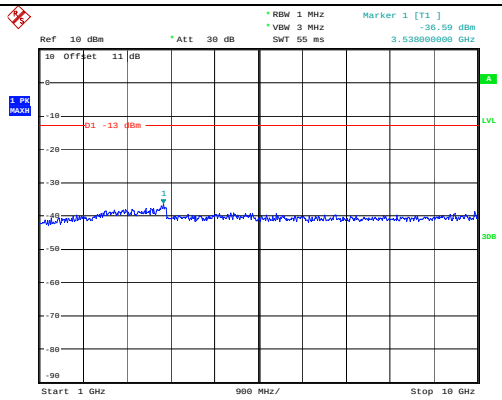
Occupied Bandwidth		
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:21:39	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:21:53
Cross Channel	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:17:13	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:17:41

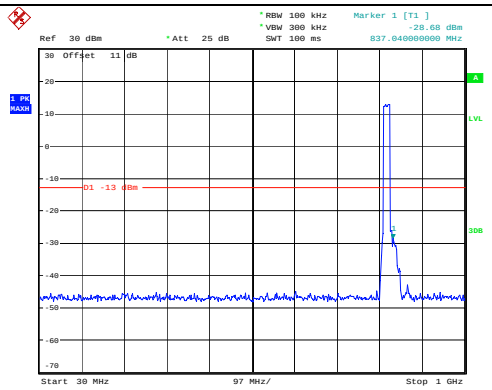
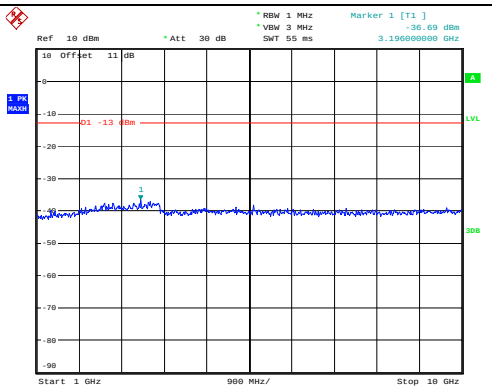
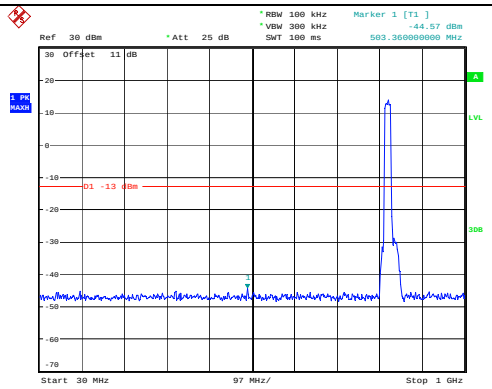
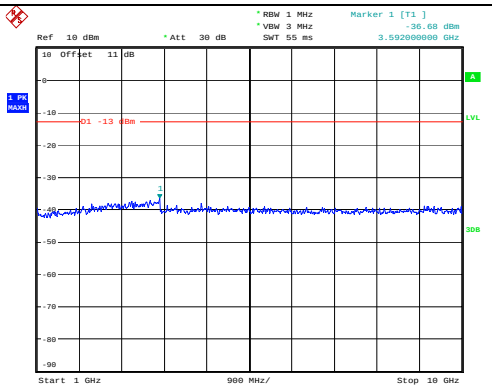
Occupied Bandwidth		
Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Middle For 90S	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:27:05	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:27:21
Cross Channel	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:27:42	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:27:55

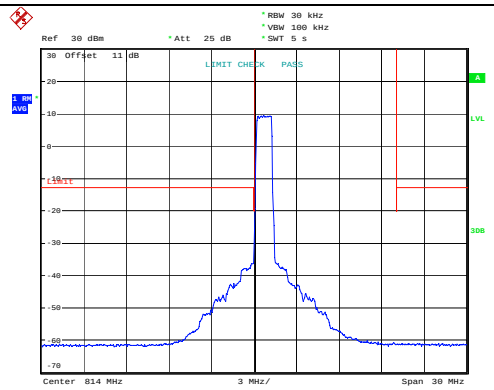
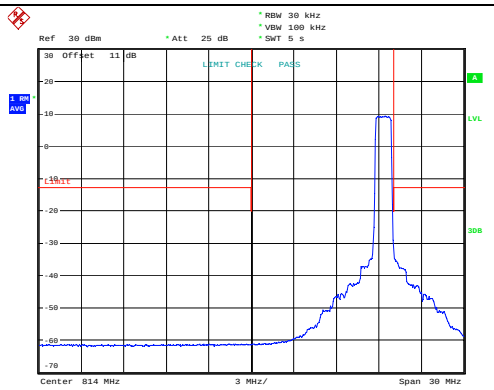
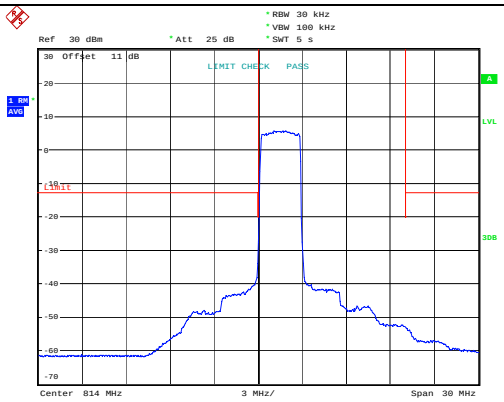
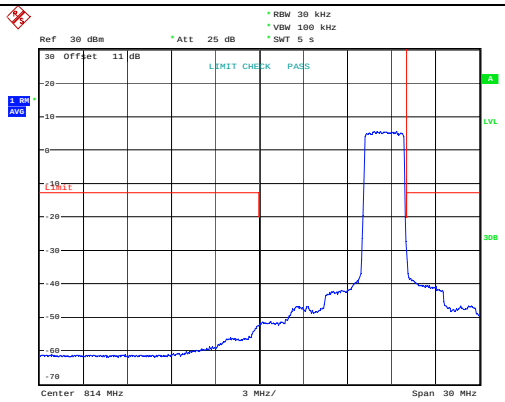
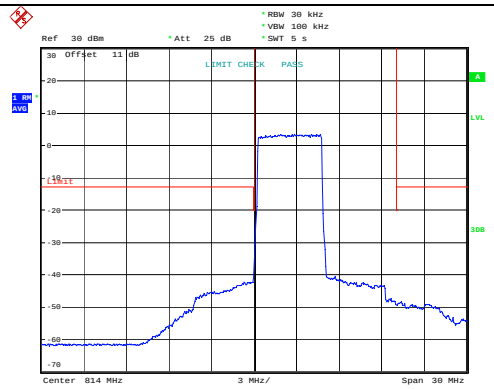
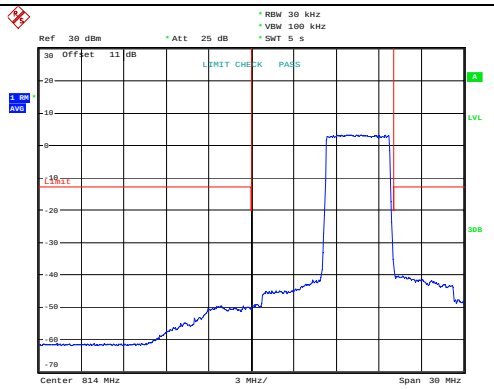
Spurious Emissions at Antenna Terminal		
Channel	**1.4MHz Bandwidth QPSK**	
Lowest For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:29:21	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:29:32
Highest For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:30:11	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:30:21
Cross Channel	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:34:32	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:34:42

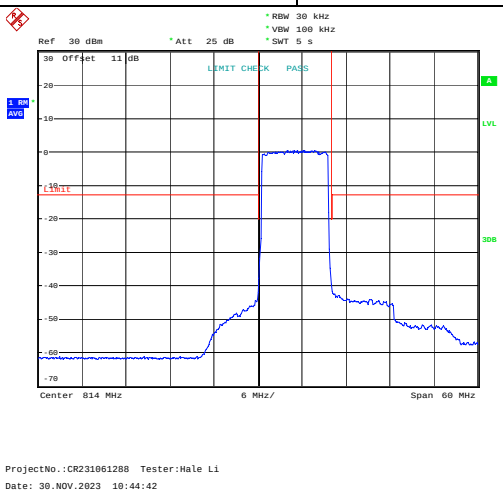
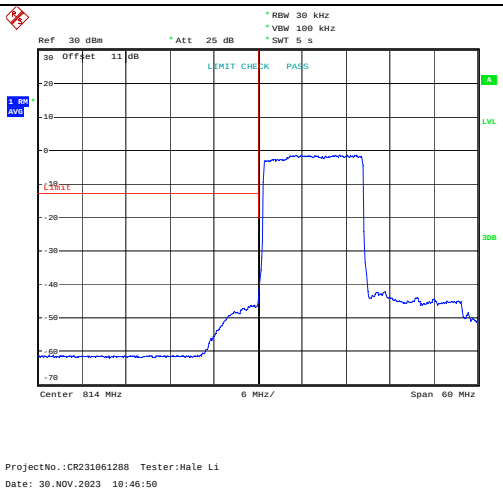
Spurious Emissions at Antenna Terminal		
Channel	**3MHz Bandwidth QPSK**	
Lowest For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:30:37	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:30:47
Highest For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:31:30	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:31:40
Cross Channel	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:36:15	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:36:26

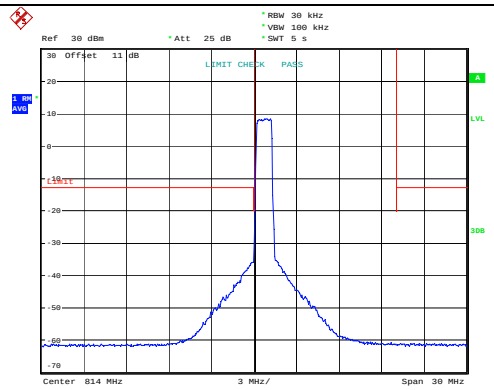
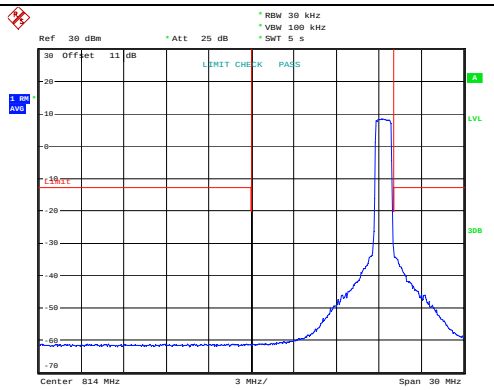
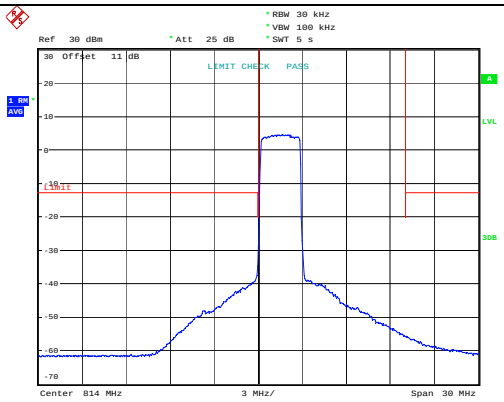
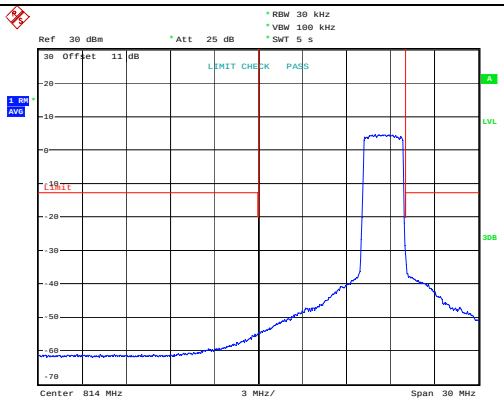
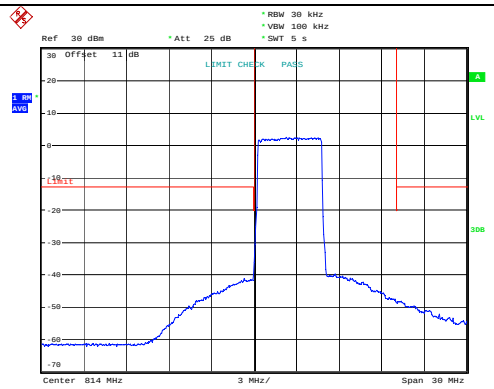
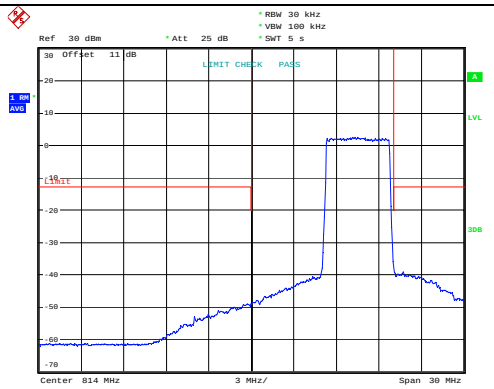
Spurious Emissions at Antenna Terminal		
Channel	**5MHz Bandwidth QPSK**	
Lowest For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:31:56	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:32:06
Highest For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:32:43	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:32:53
Cross Channel	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:37:46	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:37:56

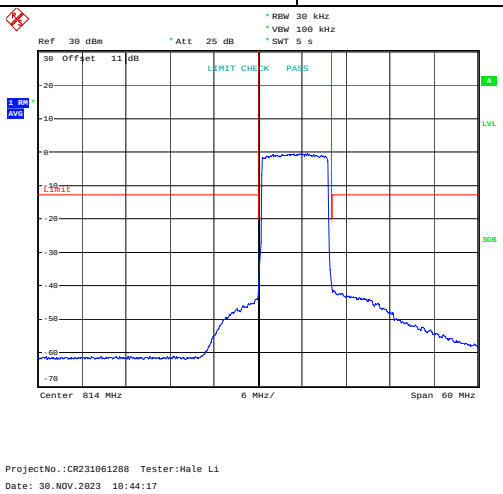
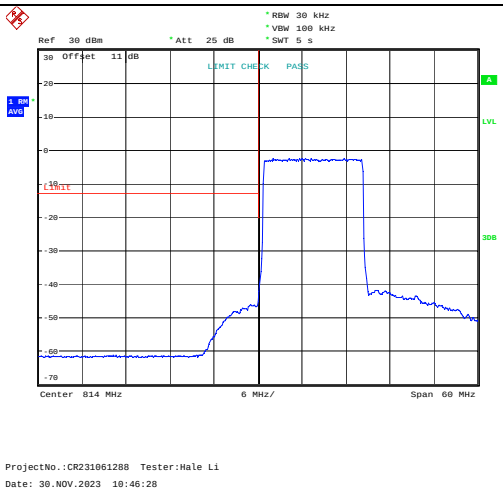
Spurious Emissions at Antenna Terminal		
Channel	**10MHz Bandwidth QPSK**	
Lowest For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:33:13	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 22:33:23
Cross Channel	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:39:15	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:39:27

Spurious Emissions at Antenna Terminal		
Channel	**15MHz Bandwidth QPSK**	
Lowest For 90S	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:40:32	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:40:54
Cross Channel	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:41:23	 ProjectNo.:CR231061288 Tester:Rod Luo Date: 5.DEC.2023 17:41:44

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 1.4MHz For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:33:37	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:35:39
QPSK 3MHz For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:37:43	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:39:07
QPSK 5MHz For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:41:16	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:43:02

Out of band emission, Band Edge		
Mode		
QPSK 10MHz For 90S		
QPSK 15MHz Across 90S and 22H		

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
16QAM 1.4MHz For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:32:52	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:34:55
16QAM 3MHz For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:37:10	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:38:32
16QAM 5MHz For 90S	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:40:11	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:42:20

Out of band emission, Band Edge		
Mode		
16QAM 10MHz For 90S		
16QAM 15MHz Across 90S and 22H		

4.13.3 Test Data for Part 22H:

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 Frequency For 22H	Middle Frequency For 22H	Highest Frequency For 22H		
1.4MHz QPSK	RB1#0	24.55	24.73	24.9	15.91	38.45
	RB1#3	24.51	24.69	24.86		
	RB1#5	24.61	24.77	24.92		
	RB3#0	24.6	24.78	24.95		
	RB3#3	23.65	23.85	24.01		
	RB6#0	23.49	23.74	23.79		
1.4MHz 16QAM	RB1#0	23.54	23.82	23.89	15.65	38.45
	RB1#3	23.49	23.77	23.87		
	RB1#5	23.75	23.73	23.96		
	RB3#0	23.76	23.76	23.98		
	RB3#3	22.71	22.89	22.92		
	RB6#0	24.38	24.49	24.69		
3MHz QPSK	RB1#0	24.47	24.6	24.81	15.77	38.45
	RB1#8	24.34	24.5	24.7		
	RB1#14	23.49	23.75	23.9		
	RB6#0	23.5	23.72	23.88		
	RB6#9	23.51	23.78	23.88		
	RB15#0	23.37	24.14	23.77		
3MHz 16QAM	RB1#0	23.48	24.14	23.92	15.87	38.45
	RB1#8	23.41	23.99	23.83		
	RB1#14	22.53	22.82	22.9		
	RB6#0	22.48	22.82	22.94		
	RB6#9	22.6	22.8	22.8		
	RB15#0	24.6	24.79	24.91		
5MHz QPSK	RB1#0	24.79	24.94	25.07	16.03	38.45
	RB1#13	24.68	24.84	24.99		
	RB1#24	23.68	23.83	24.05		
	RB15#0	23.69	23.84	23.85		
	RB15#10	23.66	23.81	23.94		
	RB25#0	23.69	23.6	24.14		
5MHz 16QAM	RB1#0	23.85	23.76	24.31	15.87	38.45
	RB1#13	23.75	23.71	24.23		
	RB1#24	22.74	22.85	23.02		
	RB15#0	22.73	22.88	22.86		
	RB15#10	22.78	22.9	22.95		
	RB25#0	24.67	24.78	24.91		

10MHz QPSK	RB1#0	24.81	24.85	24.98	15.99	38.45
	RB1#25	24.82	24.95	25.03		
	RB1#49	23.66	23.77	23.88		
	RB25#0	23.72	23.88	23.82		
	RB25#25	23.66	23.84	23.86		
	RB50#0	23.67	24.32	24.03		
10MHz 16QAM	RB1#0	23.77	24.44	24.14	15.75	38.45
	RB1#25	23.76	24.5	24.16		
	RB1#49	22.71	22.84	22.89		
	RB25#0	22.81	23.02	22.84		
	RB25#25	22.71	22.87	22.83		
	RB50#0	24.66	24.64	24.79		
15MHz QPSK	RB1#0	24.86	24.87	24.99	15.96	38.45
	RB1#38	24.86	24.94	25		
	RB1#74	23.73	23.75	23.81		
	RB36#0	23.79	23.94	23.87		
	RB36#39	23.8	23.88	23.87		
	RB75#0	24.04	24.27	23.95		
15MHz 16QAM	RB1#0	24.18	24.44	24.1	15.41	38.45
	RB1#38	24.17	24.45	24.09		
	RB1#74	22.72	22.78	22.86		
	RB36#0	22.81	22.95	22.85		
	RB36#39	22.77	22.9	22.85		
	RB75#0	22.55	22.76	22.90		

Note:
ERP= Conducted Power(dBm) - L_C(dB) + G_T(dBd)
G_T(dBd)=G_T(dBi)-2.15

Result:	**Pass**

Peak-to-average Ratio (PAR)

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Frequency For 22H	Middle Frequency For 22H	Highest Frequency For 22H	
15MHz QPSK	RB1#0	8.24	8.37	8.33	13
	RB75#0	5.74	5.87	5.87	13
15MHz 16QAM	RB1#0	8.21	8.3	8.27	13
	RB75#0	6.73	6.67	6.86	13
				Result:	**Pass**

FCC §2.1049, §22.905: Occupied Bandwidth						
Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Lowest For 22H	Middle For 22H	Highest For 22H	Lowest For 22H	Middle For 22H	Highest For 22H
1.4MHz QPSK	1.110	1.104	1.104	1.308	1.284	1.296
1.4MHz 16QAM	1.098	1.098	1.110	1.284	1.296	1.302
3MHz QPSK	2.687	2.676	2.687	2.940	2.916	2.940
3MHz 16QAM	2.687	2.687	2.687	2.940	2.964	2.952
5MHz QPSK	4.520	4.500	4.520	4.940	4.900	4.940
5MHz 16QAM	4.540	4.500	4.500	4.940	4.940	4.940
10MHz QPSK	8.960	8.960	8.960	9.520	9.640	9.600
10MHz 16QAM	8.920	8.960	8.960	9.560	9.600	9.520
15MHz QPSK	13.500	13.500	13.440	14.700	14.820	14.760
15MHz 16QAM	13.500	13.500	13.440	14.700	14.820	14.760
Note: The test plots please refer to the Plots of Occupied Bandwidth						

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

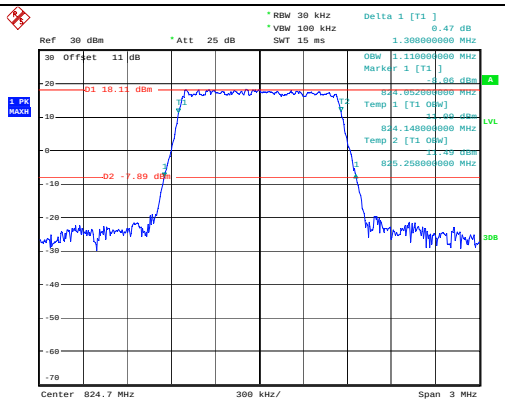
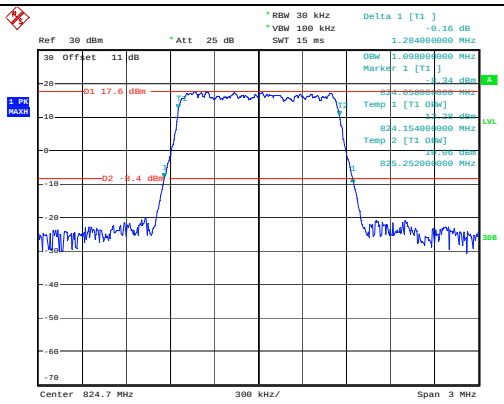
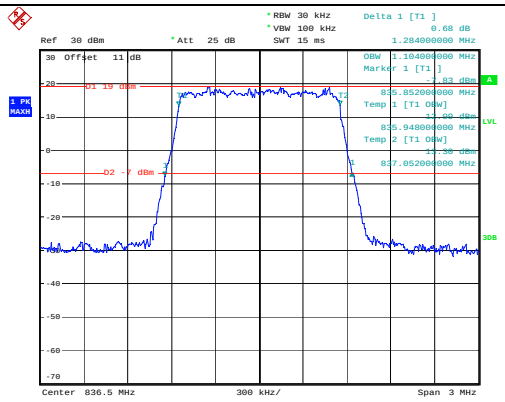
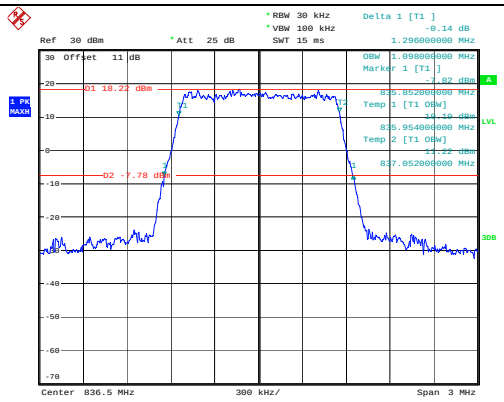
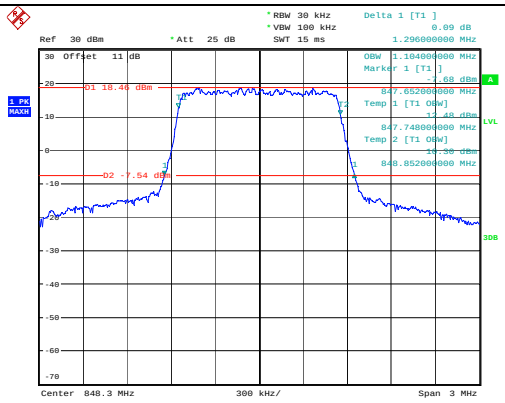
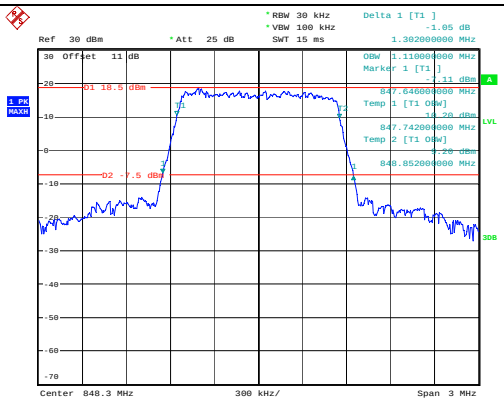
FCC §2.1051, §22.917(a): Out of band emission, Band Edge	
Result:	**Pass, please refer to the test plots of Out of band emission, Band Edge.**

FCC §2.1055, §22.355: Frequency Stability					
Test Modulation:	15 MHz QPSK		Test Channel:	831.5	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.91	9.95	0.012	2.5
	-20	3.91	3.14	0.004	2.5
	-10	3.91	-2.99	-0.004	2.5
	0	3.91	3.98	0.005	2.5
	10	3.91	-1.12	-0.001	2.5
	20	3.91	3.35	0.004	2.5
	30	3.91	2.99	0.004	2.5
	40	3.91	1.15	0.001	2.5
	50	3.91	-0.35	0.000	2.5
Frequency Stability vs. Voltage	20	3.45	-0.33	0.000	2.5
	20	4.5	0.38	0.000	2.5
				Result:	**Pass**

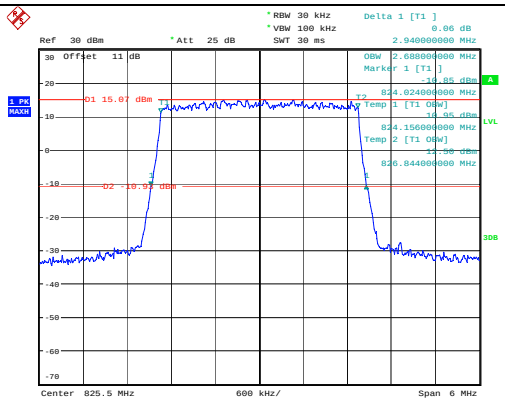
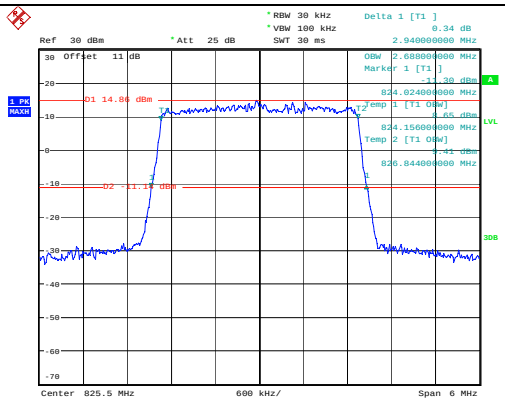
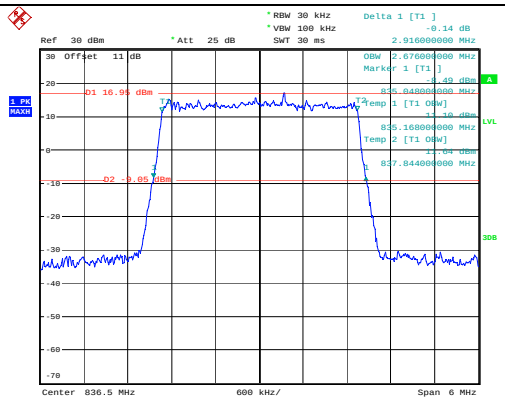
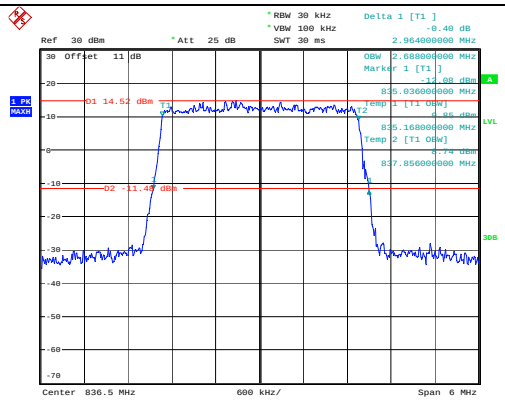
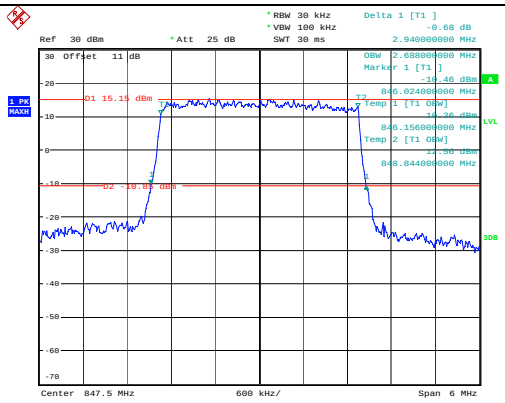
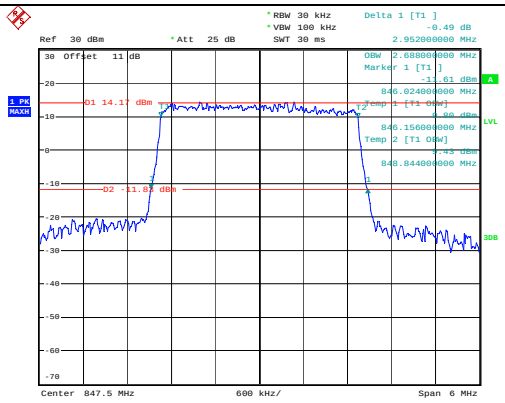
FCC §2.1055, §22.355: Frequency Stability					
Test Modulation:	15 MHz 16QAM		Test Channel:	831.5	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.91	17.62	0.021	2.5
	-20	3.91	8.69	0.010	2.5
	-10	3.91	3.19	0.004	2.5
	0	3.91	-0.14	0.000	2.5
	10	3.91	2.47	0.003	2.5
	20	3.91	1.19	0.001	2.5
	30	3.91	1.49	0.002	2.5
	40	3.91	-2.96	-0.004	2.5
	50	3.91	4.55	0.005	2.5
Frequency Stability vs. Voltage	20	3.45	4.85	0.006	2.5
	20	4.5	4.89	0.006	2.5
				Result:	**Pass**

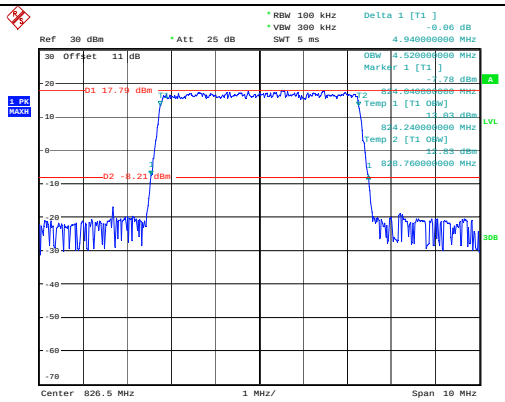
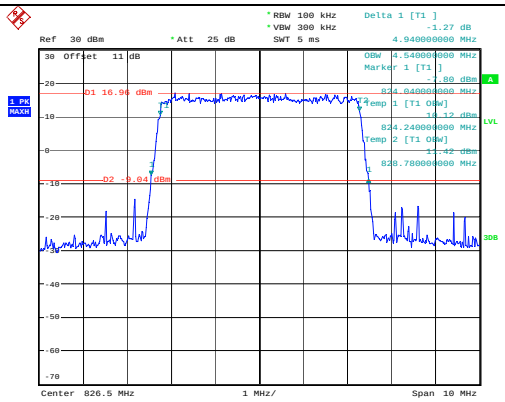
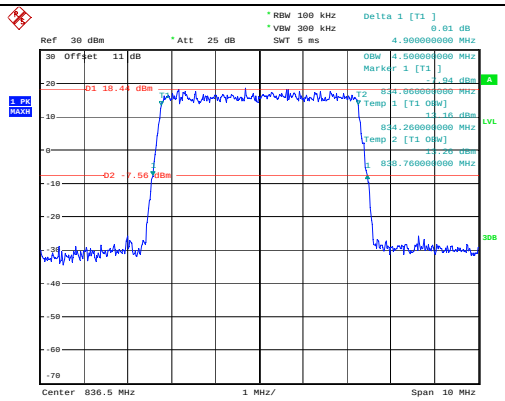
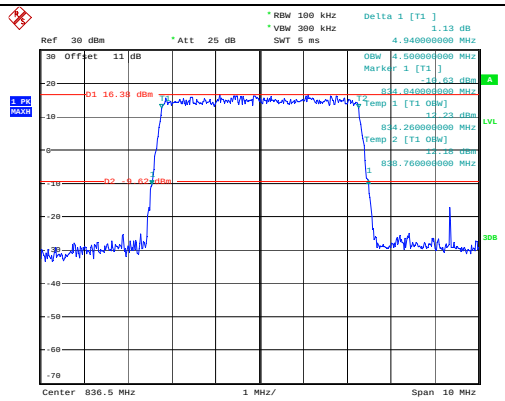
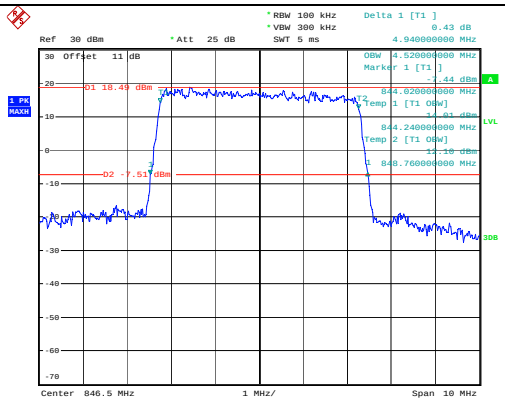
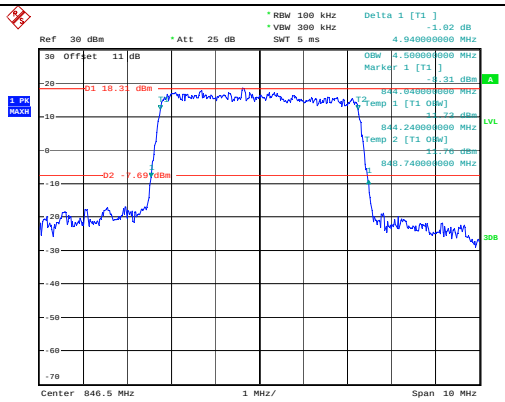
4.13.4 Test Plots for Part 22H:

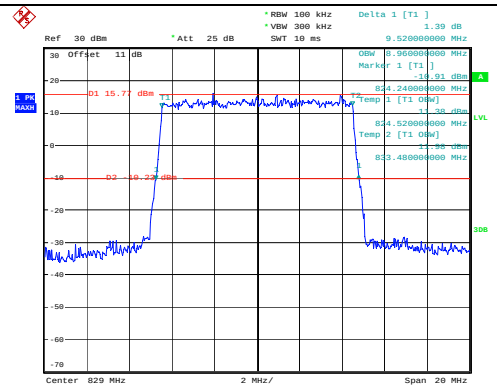
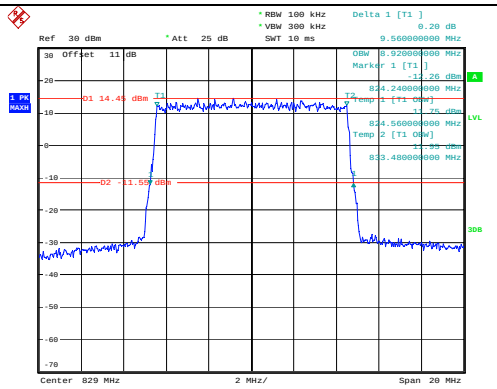
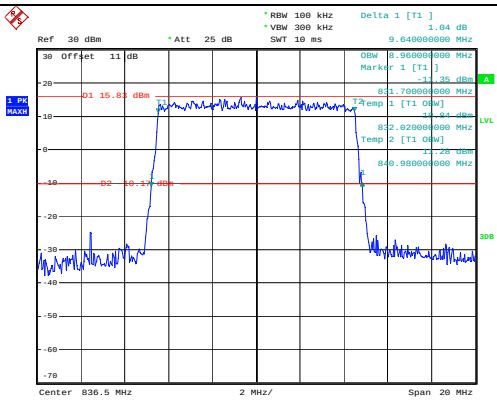
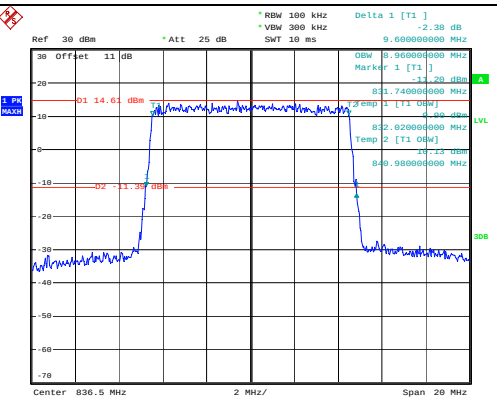
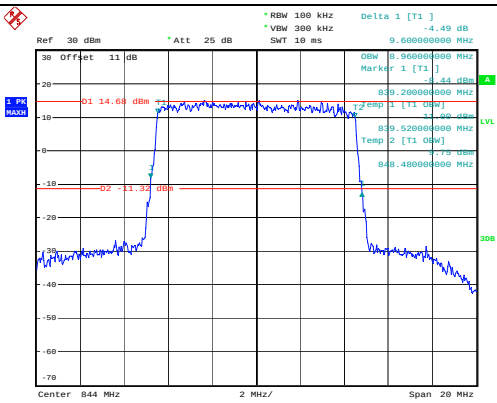
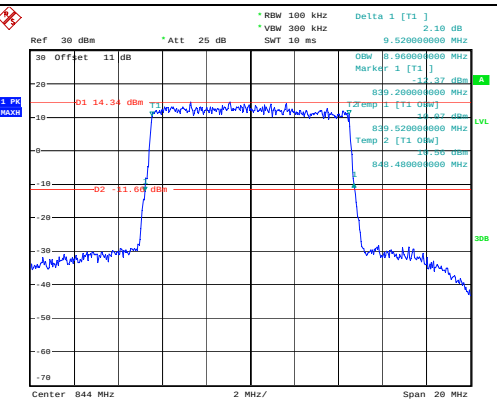
(Note: The 11.0dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer):

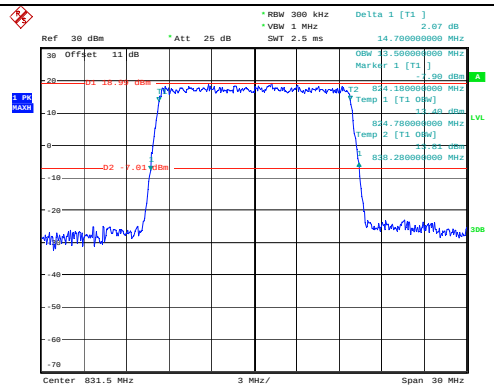
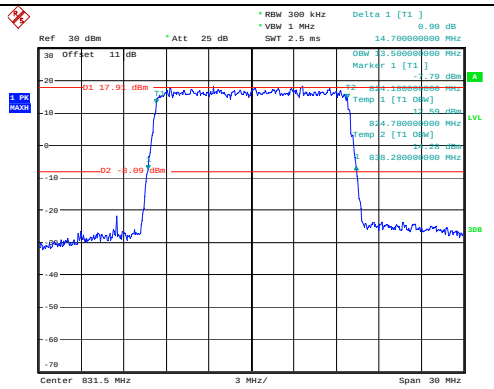
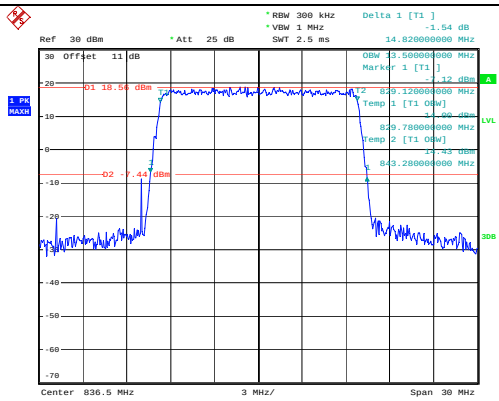
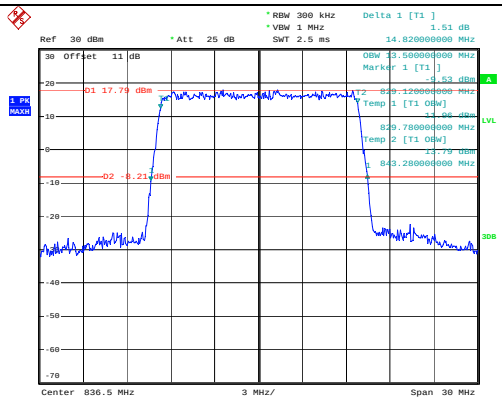
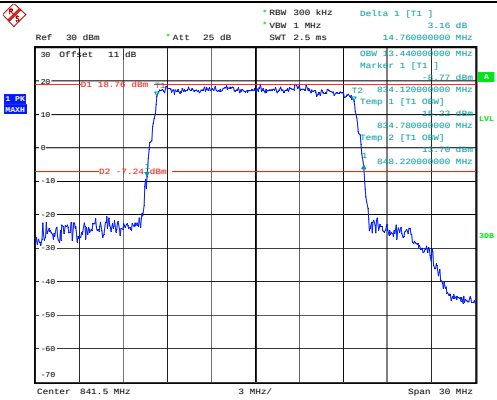
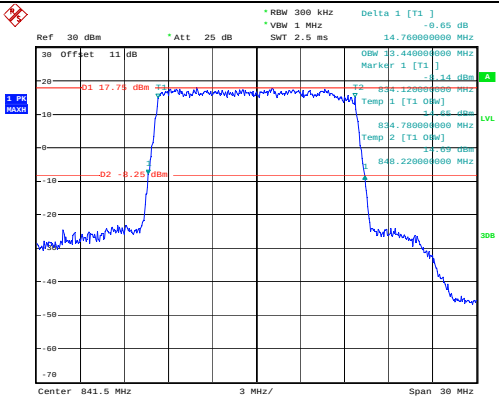
Occupied Bandwidth		
Channel	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest For 22H		
Middle For 22H		
Highest For 22H		

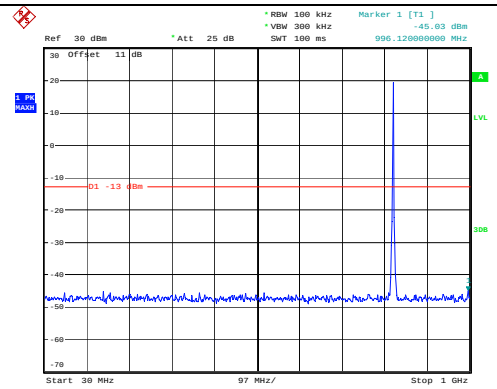
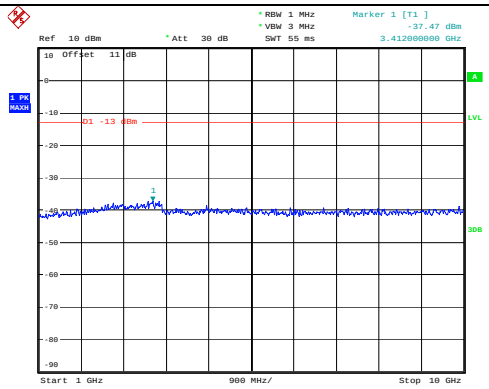
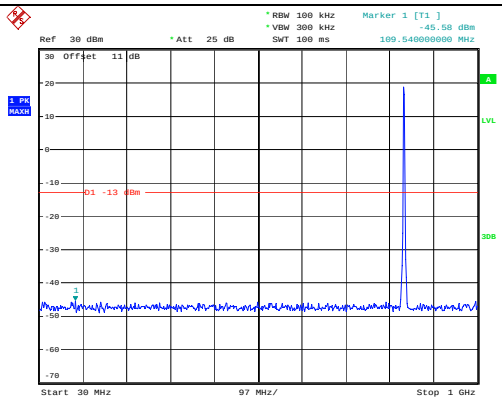
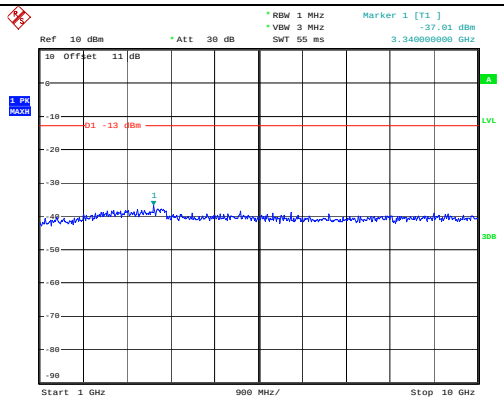
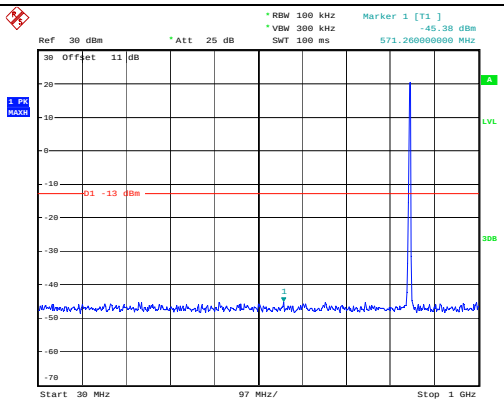
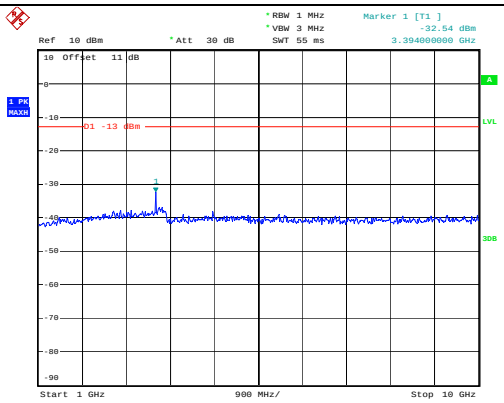
Occupied Bandwidth

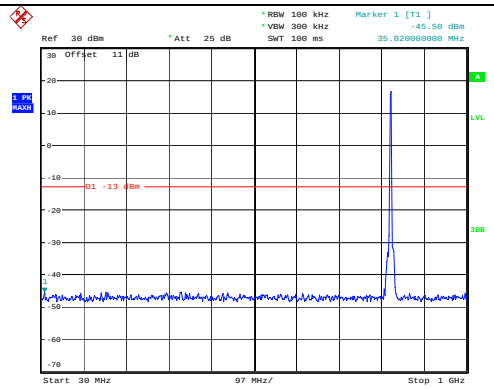
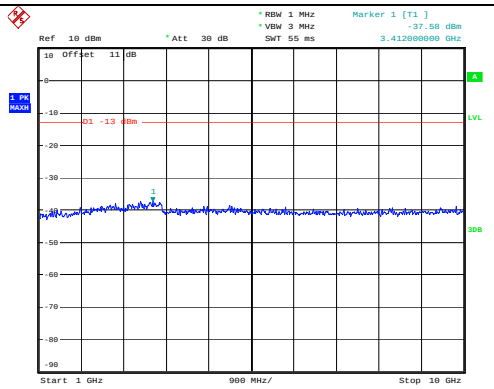
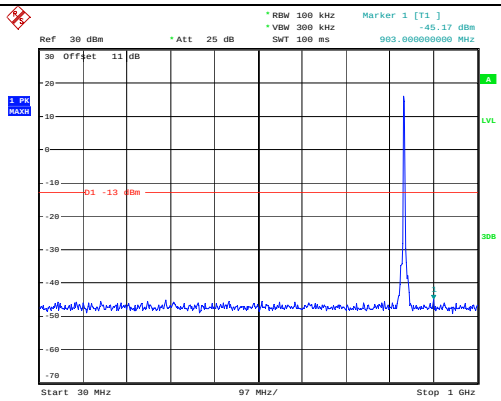
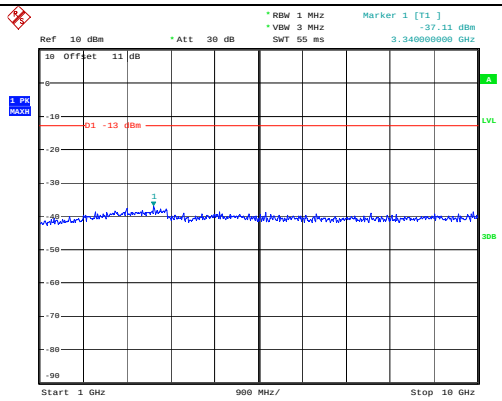
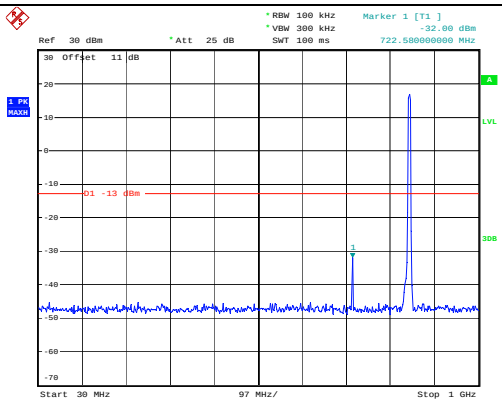
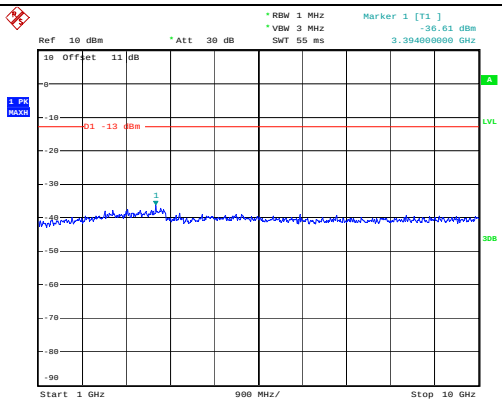
Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:09:11	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:09:27
Middle For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:09:54	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:10:13
Highest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:10:34	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:10:56

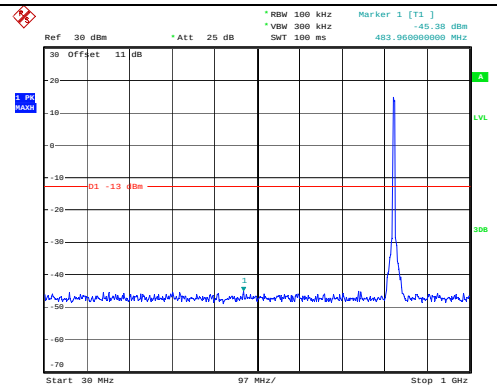
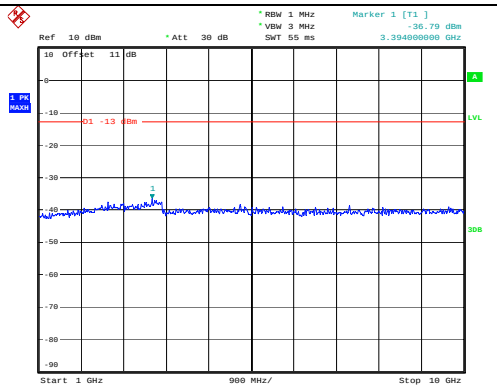
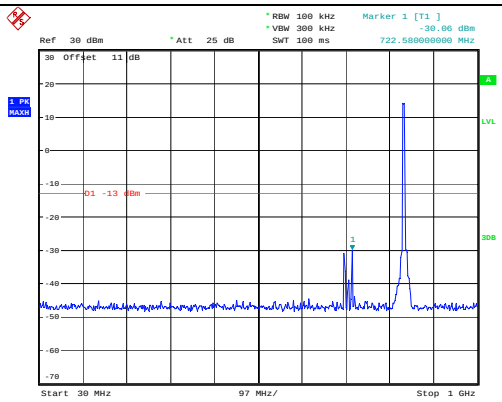
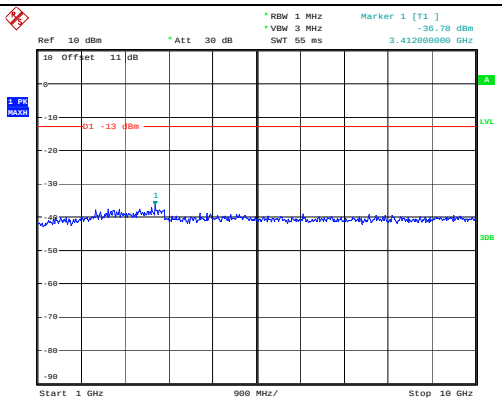
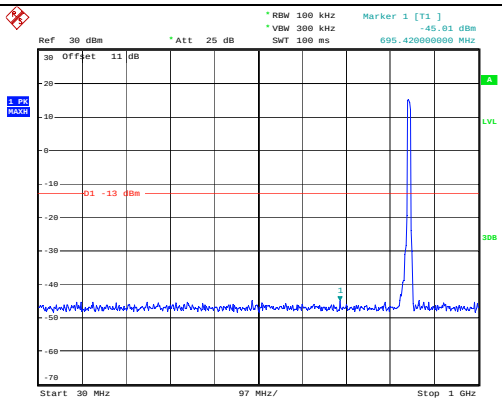
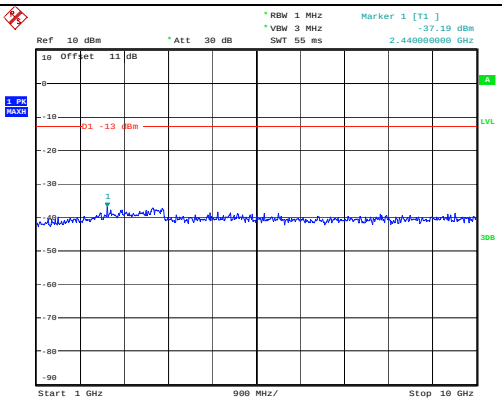
Occupied Bandwidth		
Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:17:31	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:17:48
Middle For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:18:05	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:18:22
Highest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:18:42	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:19:05

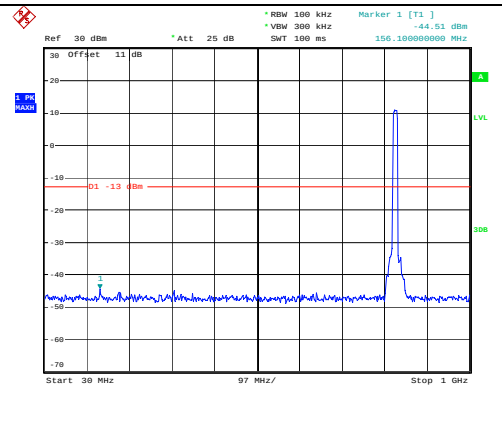
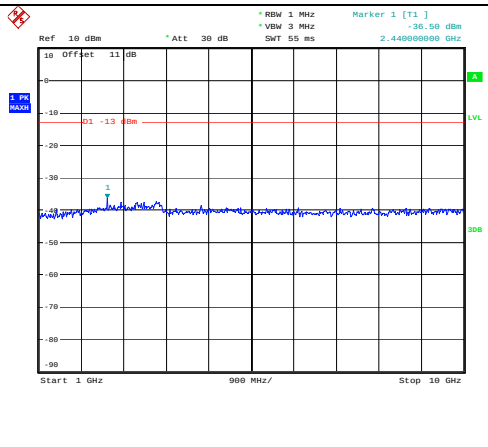
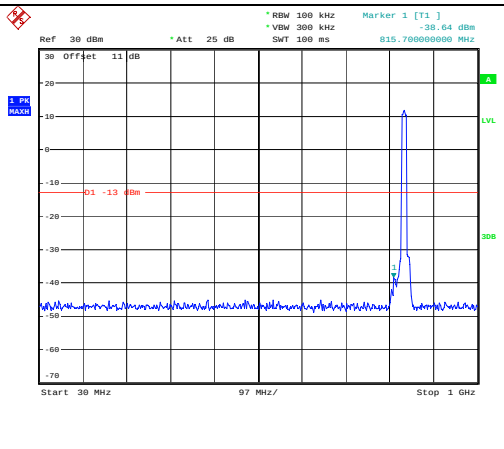
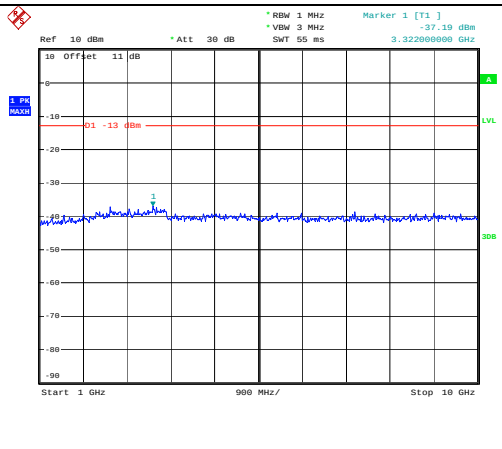
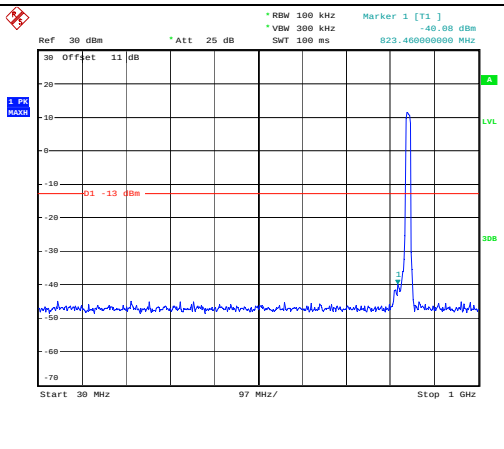
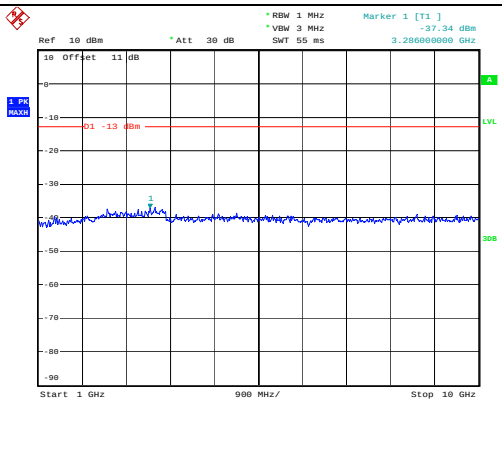
Occupied Bandwidth		
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:20:11	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:20:27
Middle For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:20:45	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:21:04
Highest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:21:21	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:21:38

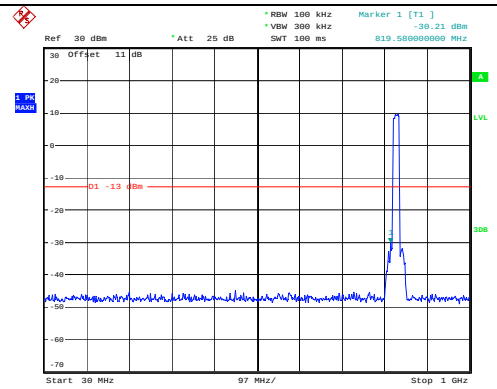
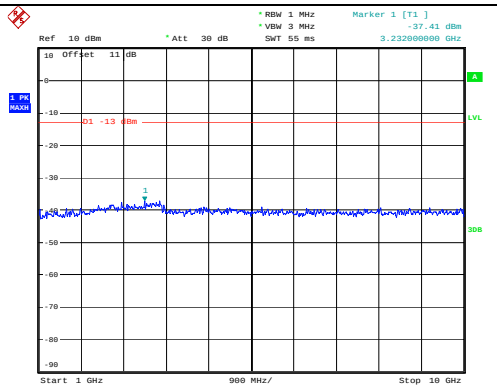
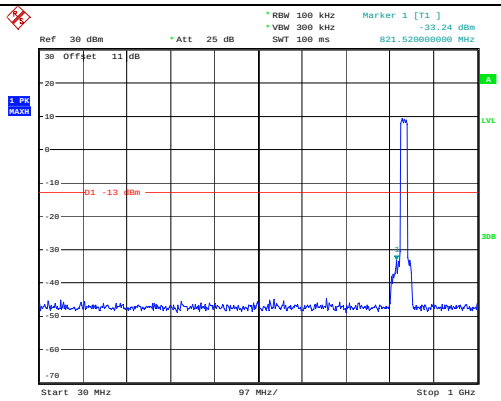
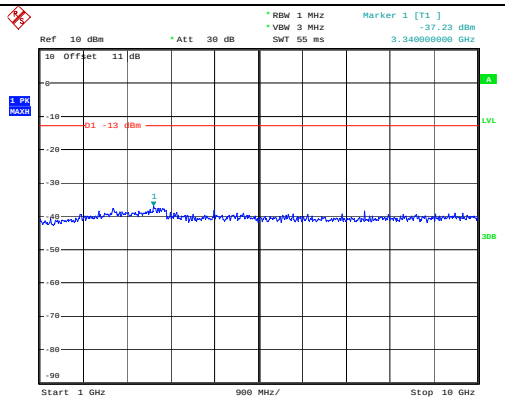
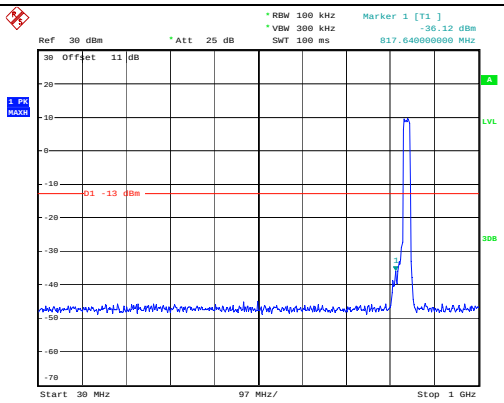
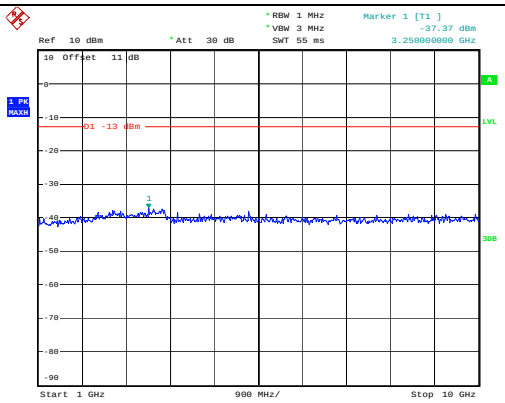
Occupied Bandwidth		
Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:22:58	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:23:15
Middle For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:23:32	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:23:49
Highest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:24:06	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:24:23

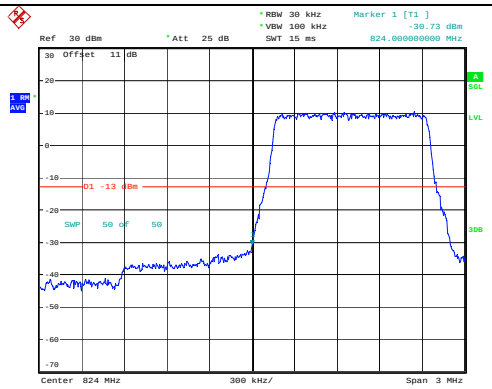
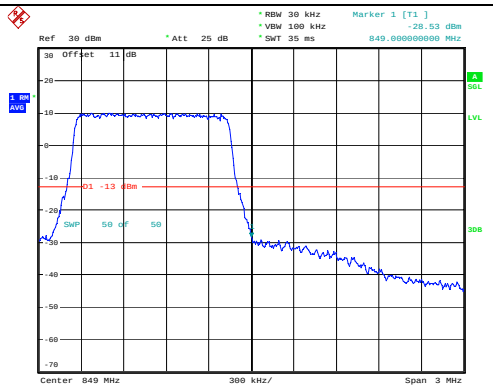
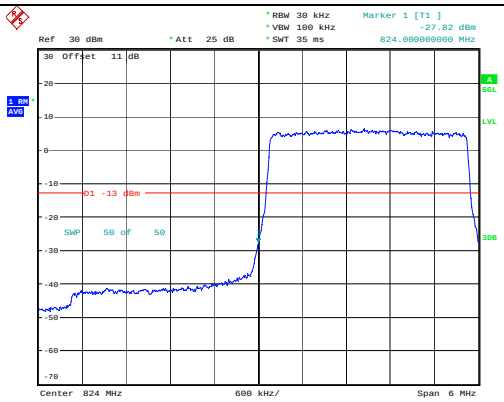
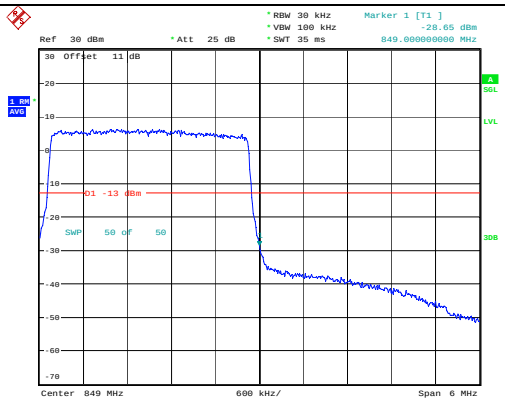
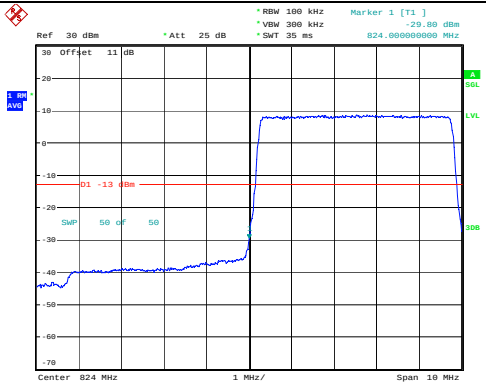
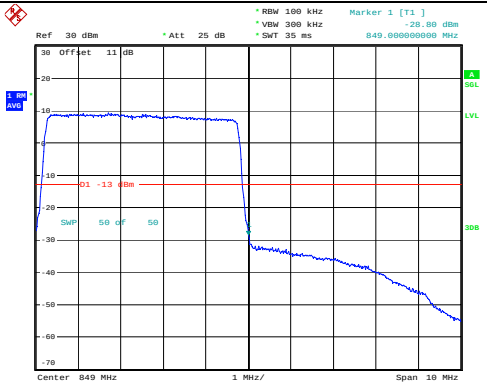
Spurious Emissions at Antenna Terminal		
Channel	**1.4MHz Bandwidth QPSK**	
Lowest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:36:27	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:36:37
Middle For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:36:49	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:37:00
Highest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:37:15	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:37:26

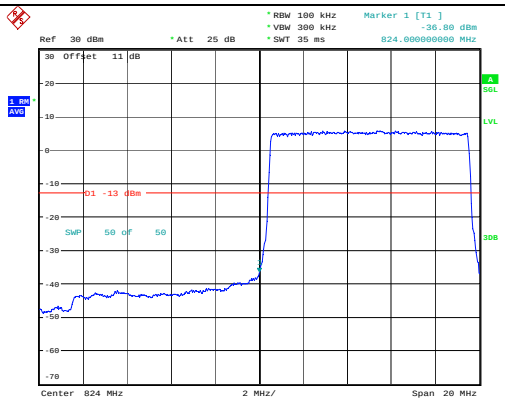
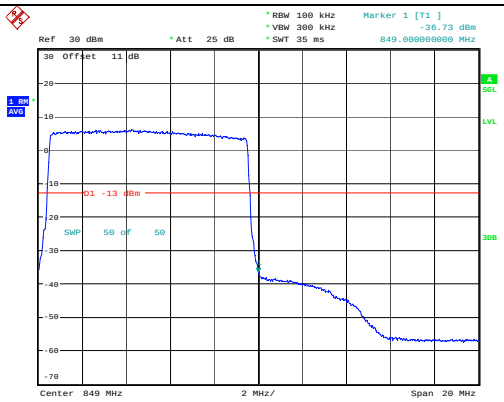
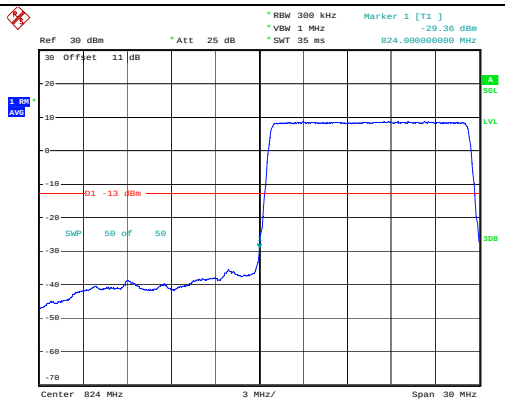
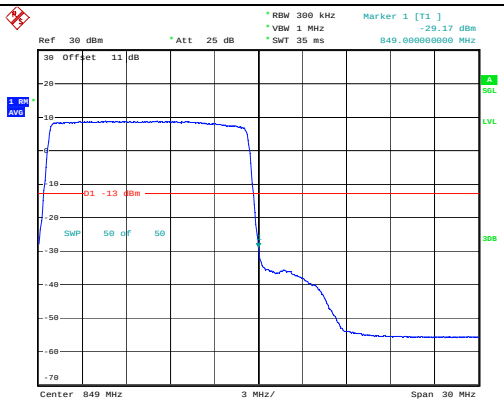
Spurious Emissions at Antenna Terminal	
Channel	**3MHz Bandwidth QPSK**
Lowest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:57:07  ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:57:17
Middle For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:57:30  ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:57:41
Highest For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:57:54  ProjectNo.:CR231061288 Tester:Hale Li Date: 9.NOV.2023 21:58:04

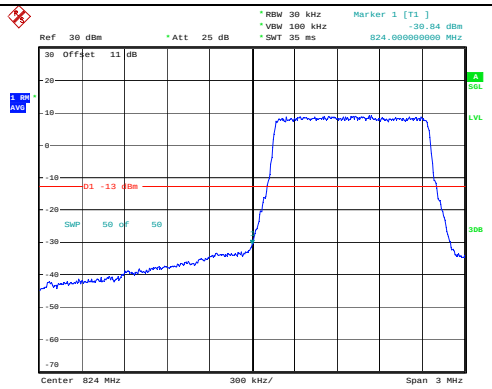
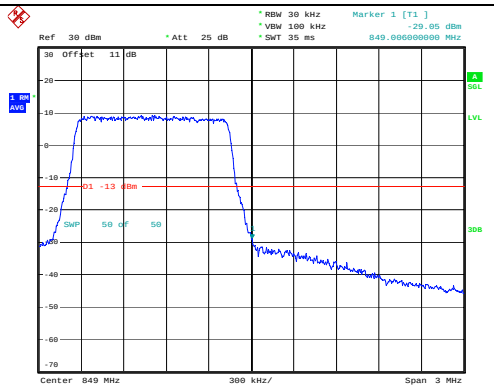
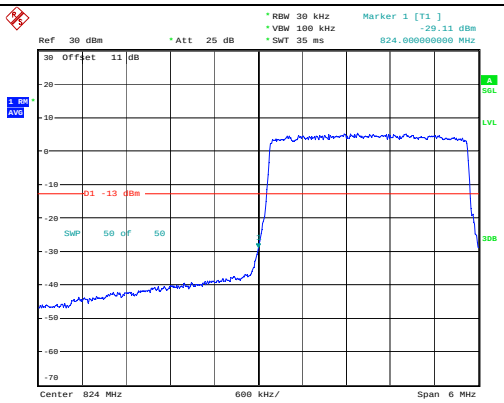
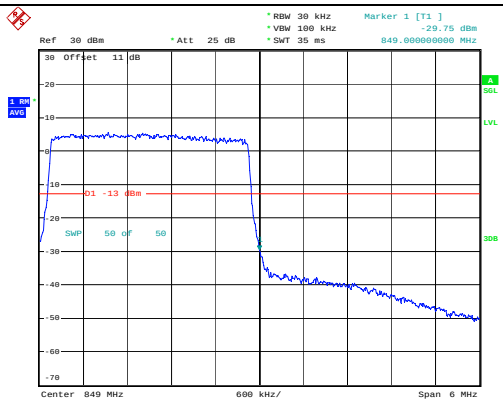
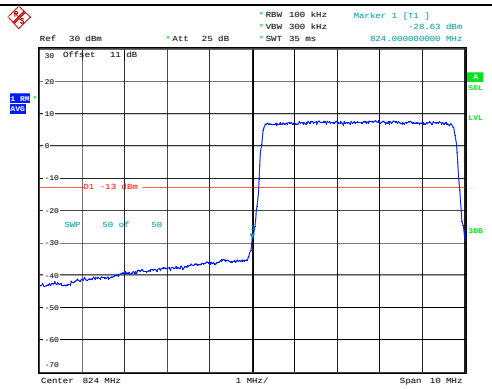
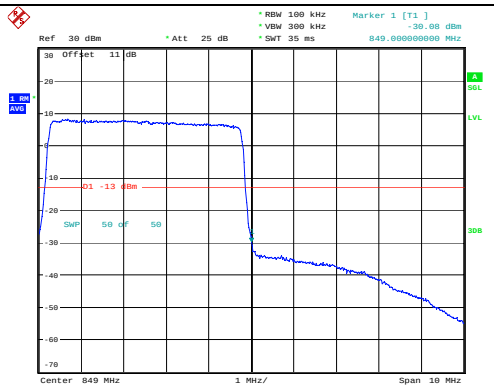
Spurious Emissions at Antenna Terminal	
Channel	**5MHz Bandwidth QPSK**
Lowest For 22H	 
Middle For 22H	 
Highest For 22H	 

Spurious Emissions at Antenna Terminal		
Channel	**10MHz Bandwidth QPSK**	
Lowest For 22H		
Middle For 22H		
Highest For 22H		

Spurious Emissions at Antenna Terminal	
Channel	**15MHz Bandwidth QPSK**
Lowest For 22H	 
Middle For 22H	 
Highest For 22H	 

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 1.4MHz For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 10:59:58	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 11:00:11
QPSK 3MHz For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 11:02:37	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 11:02:50
QPSK 5MHz For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 11:03:41	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 11:03:54

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
QPSK 10MHz For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 11:04:44	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 11:04:59
QPSK 15MHz For 22H	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 11:05:48	 ProjectNo.:CR231061288 Tester:Hale Li Date: 30.NOV.2023 11:06:01

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
16QAM 1.4MHz For 22H		
16QAM 3MHz For 22H		
16QAM 5MHz For 22H