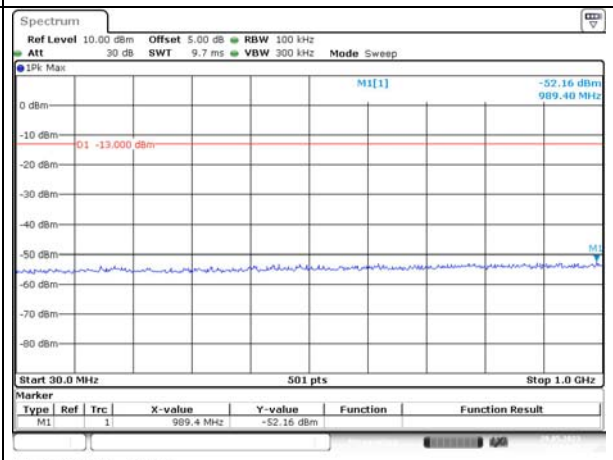
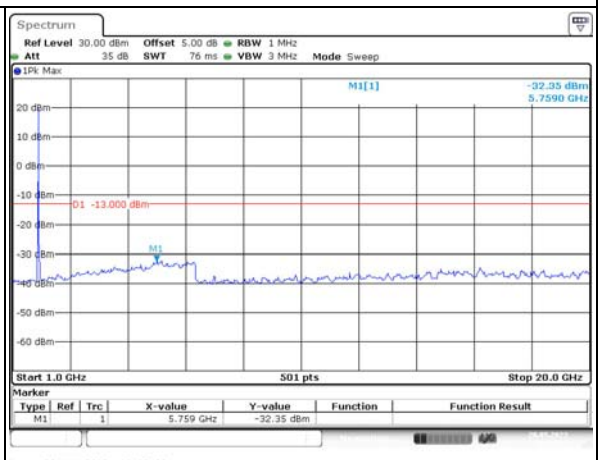
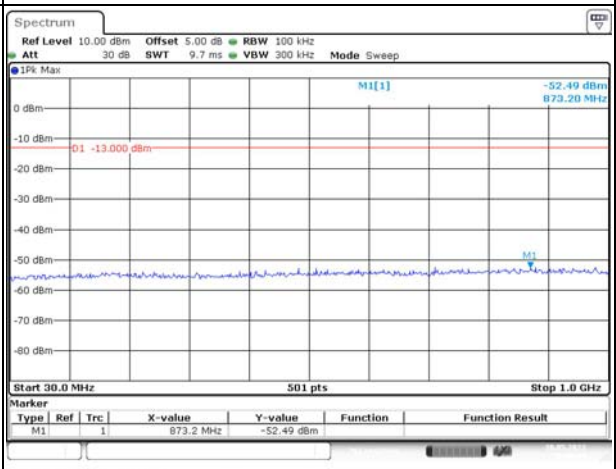
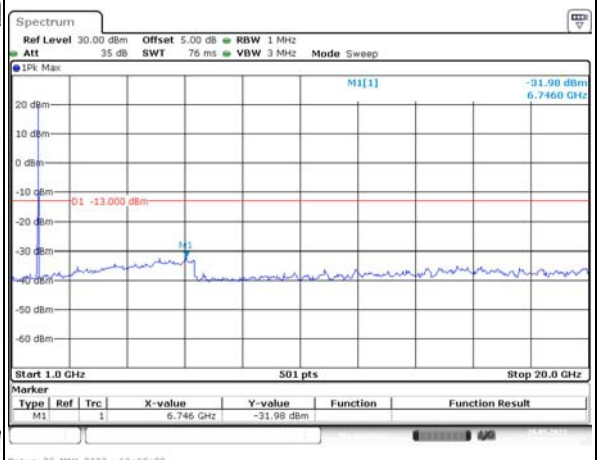
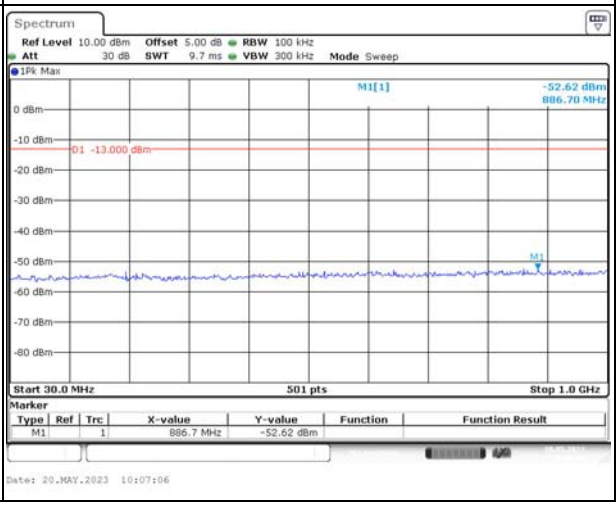
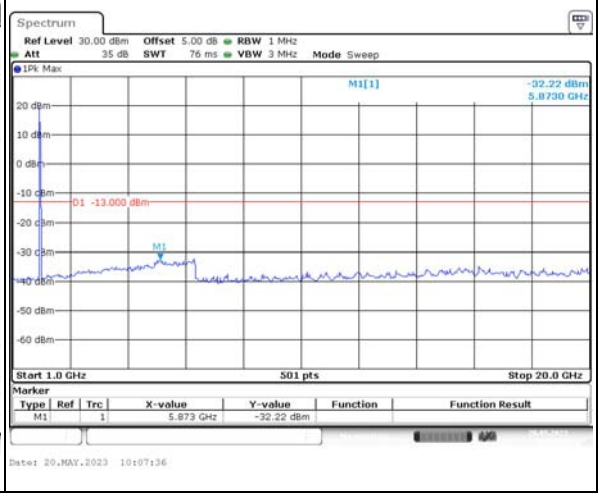
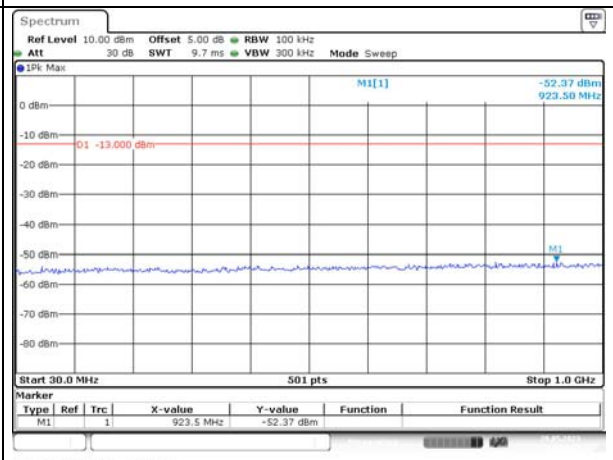
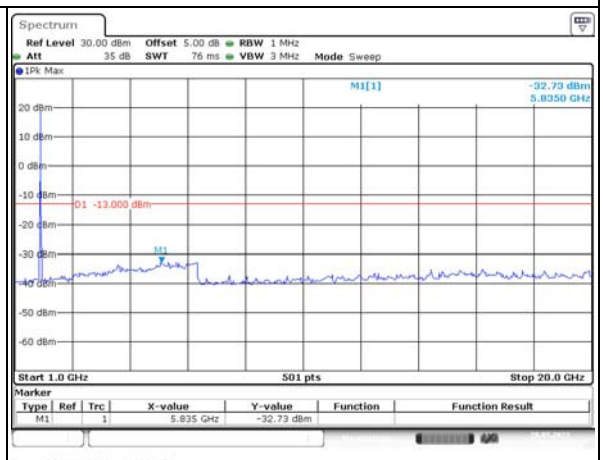
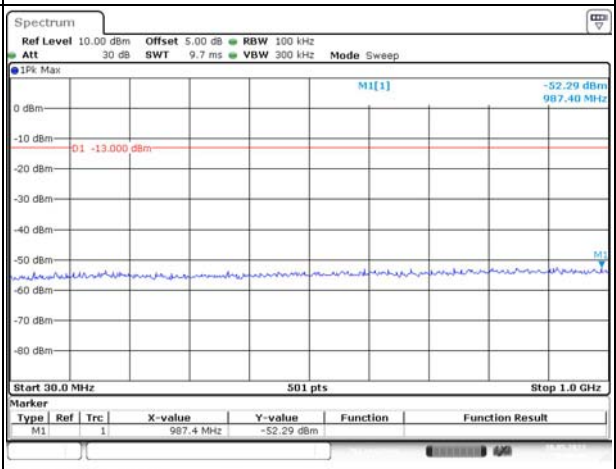
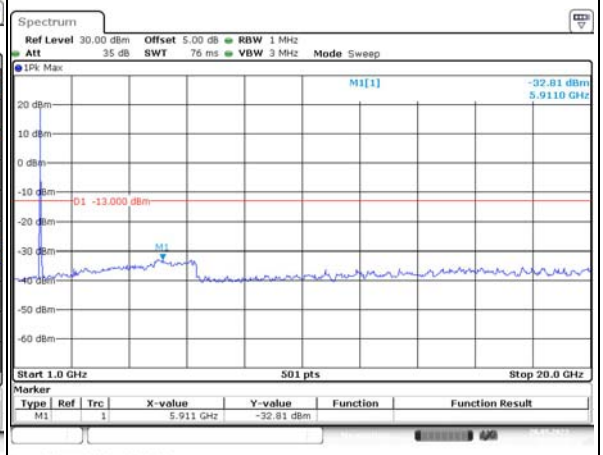
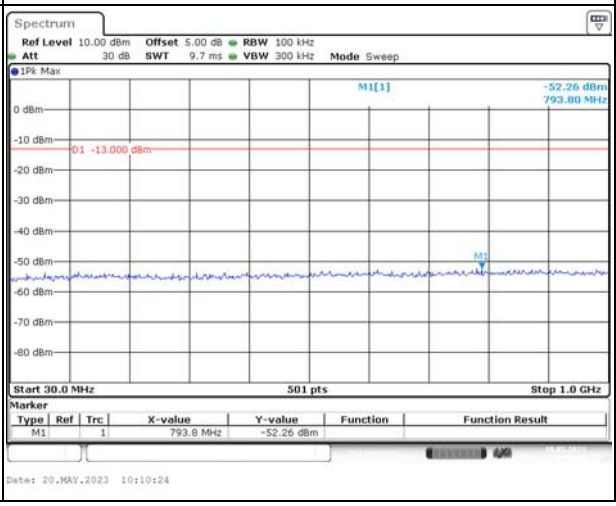
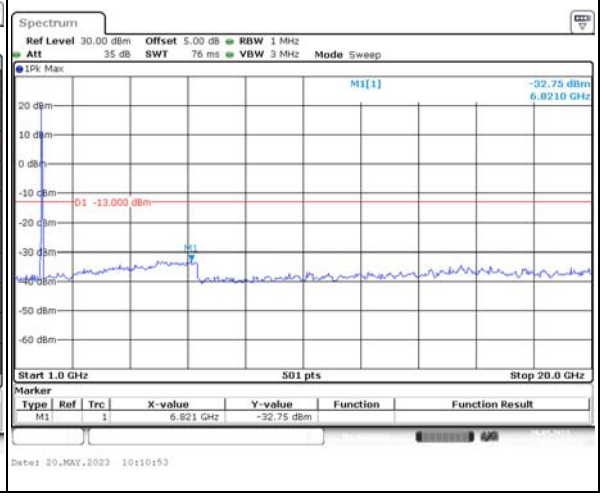
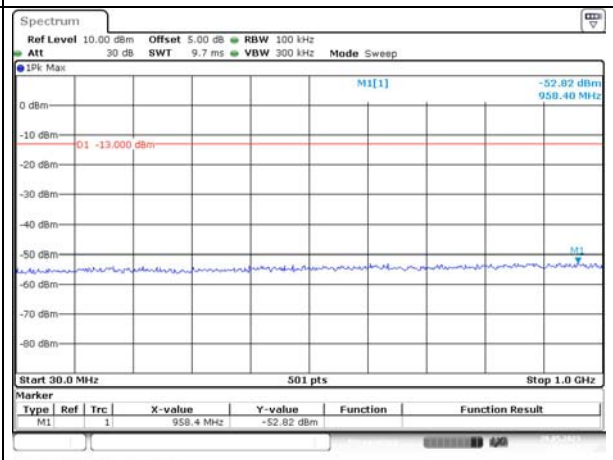
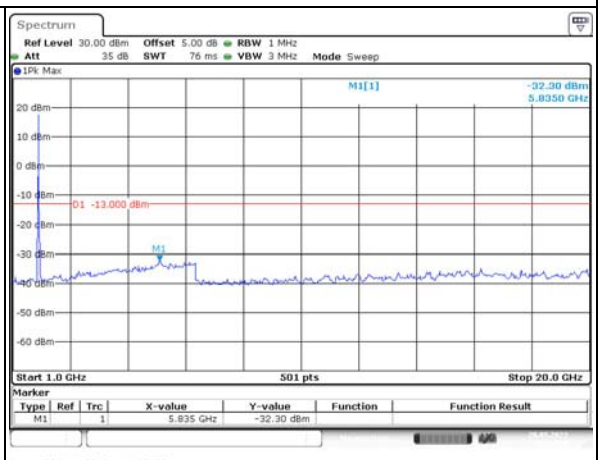
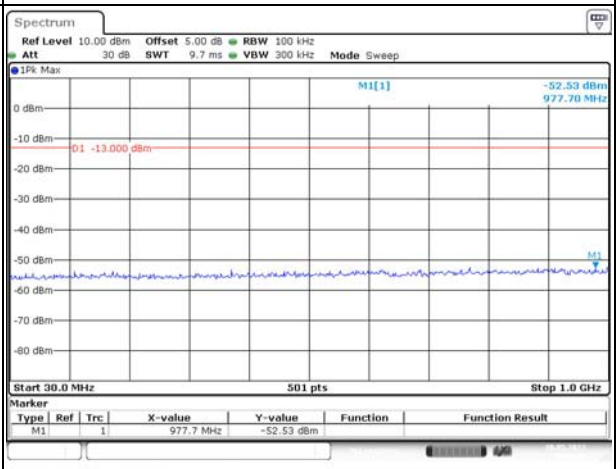
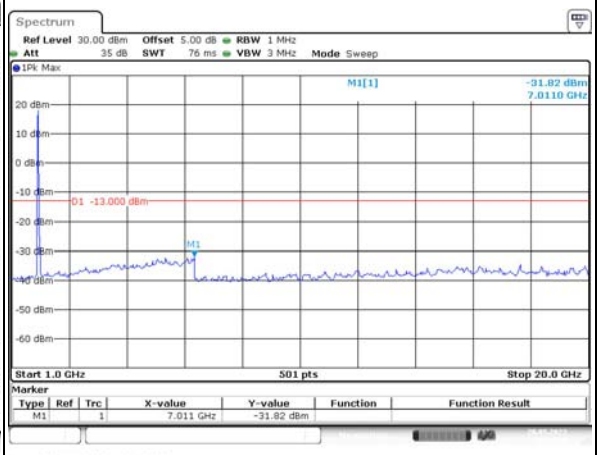
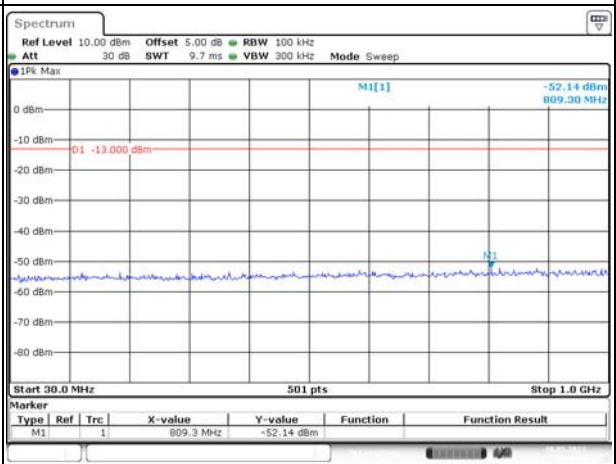
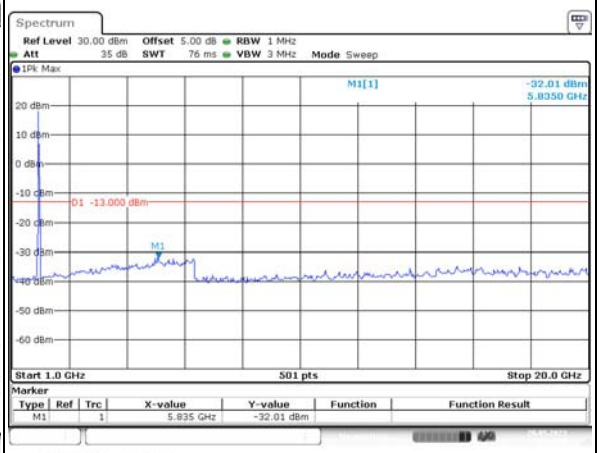
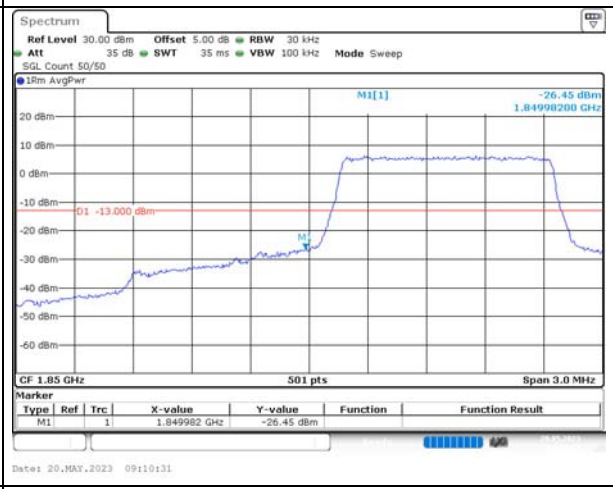
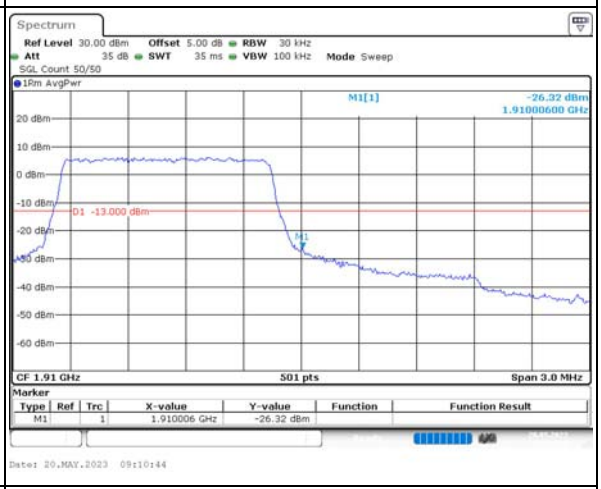
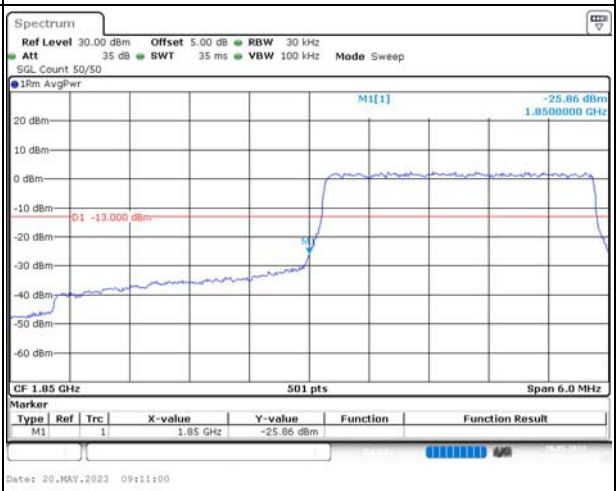
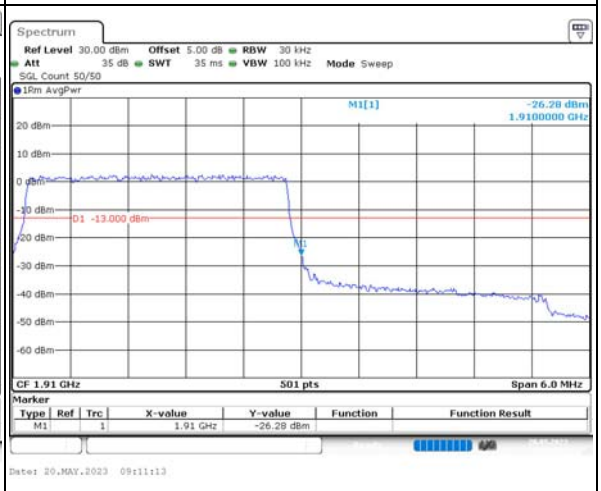
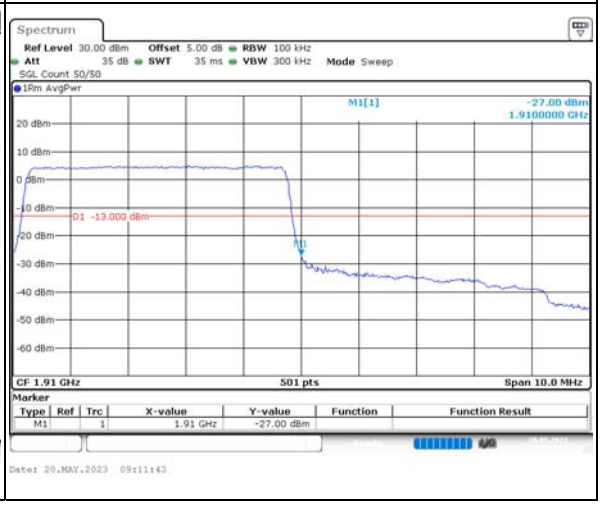
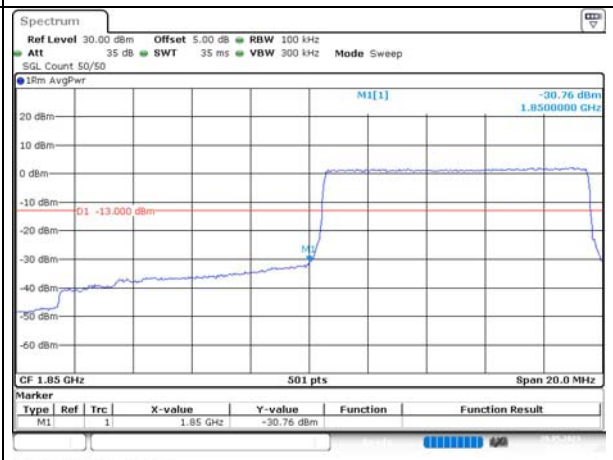
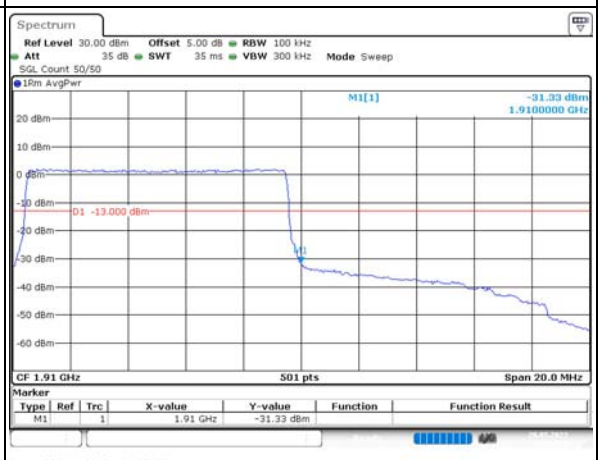
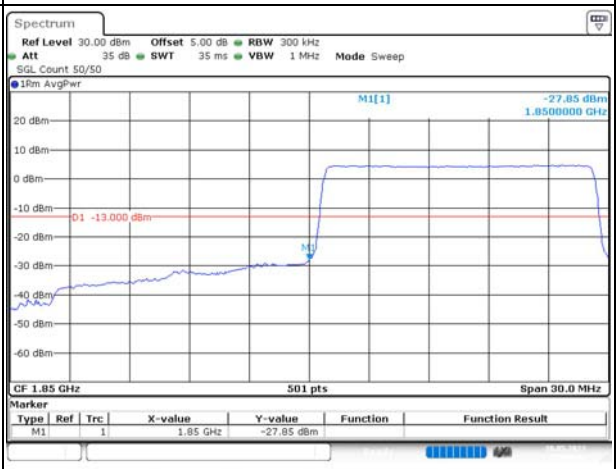
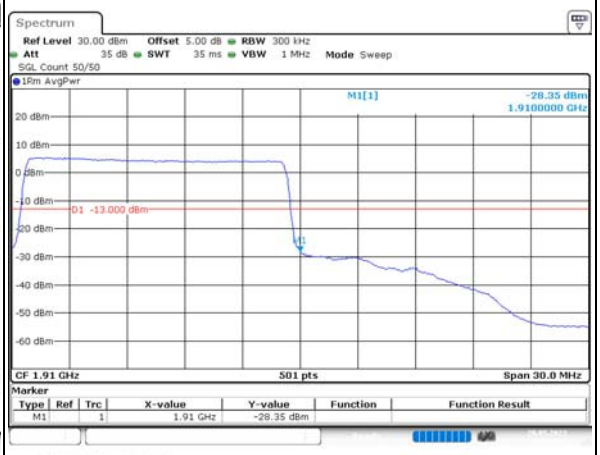
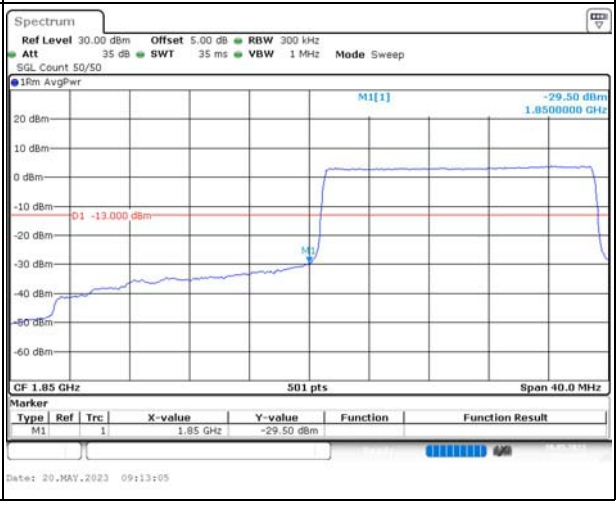
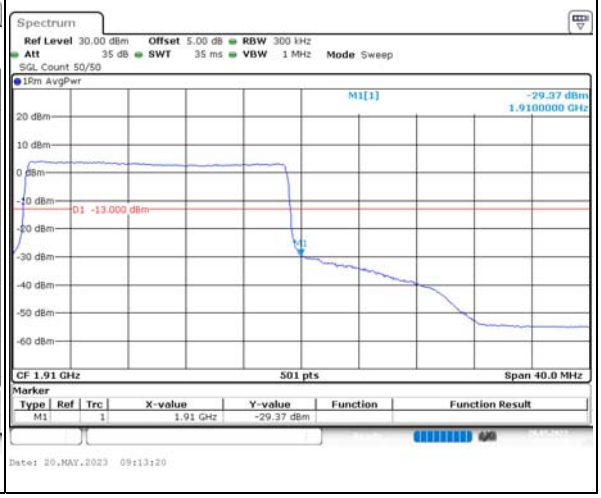
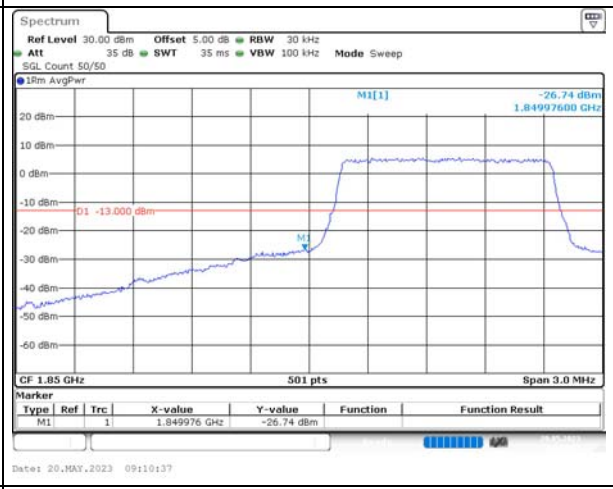
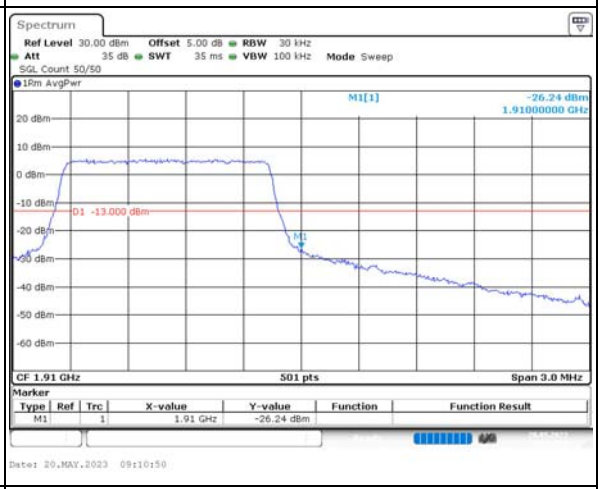
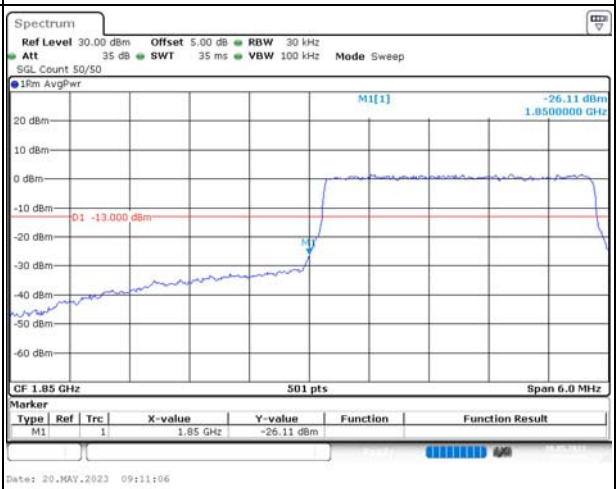
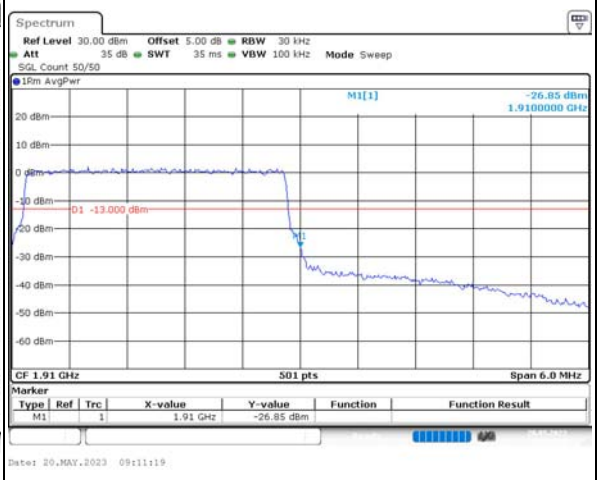
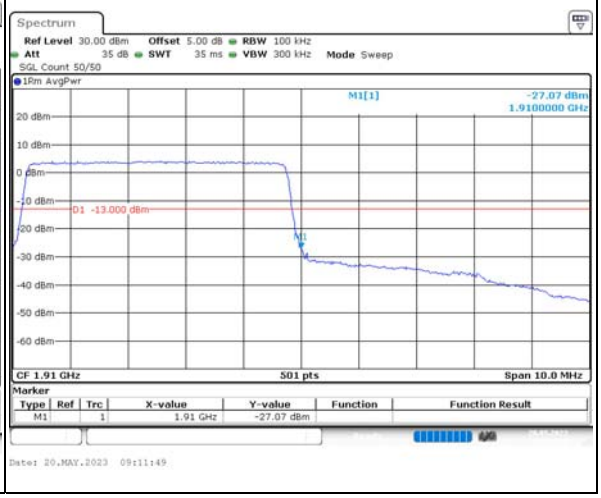
Spurious Emissions at Antenna Terminal		
Channel	**10MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

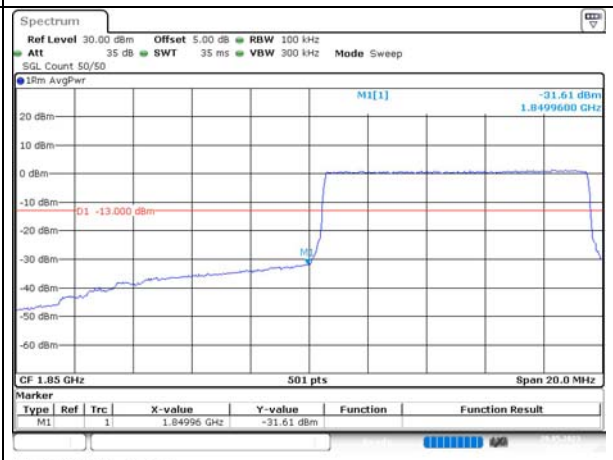
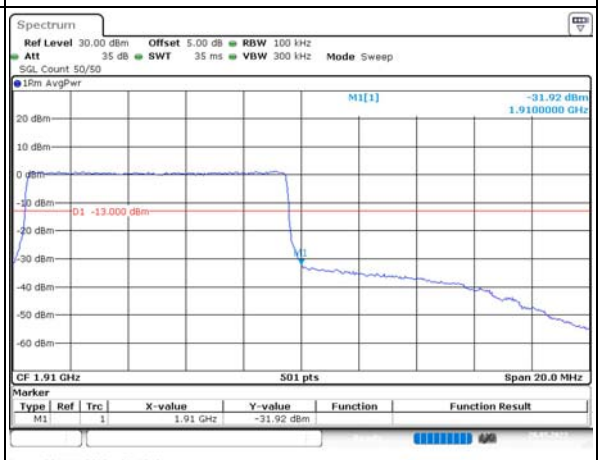
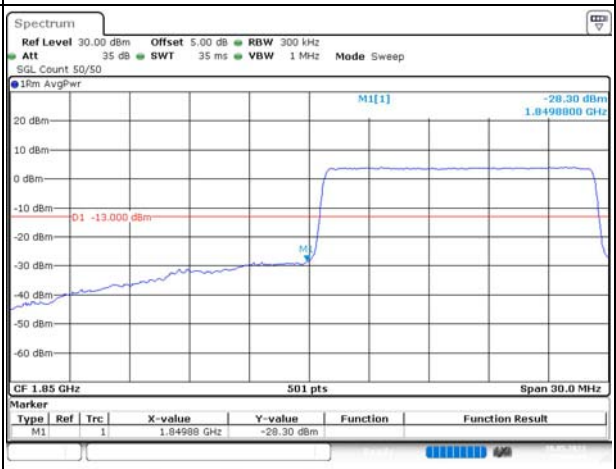
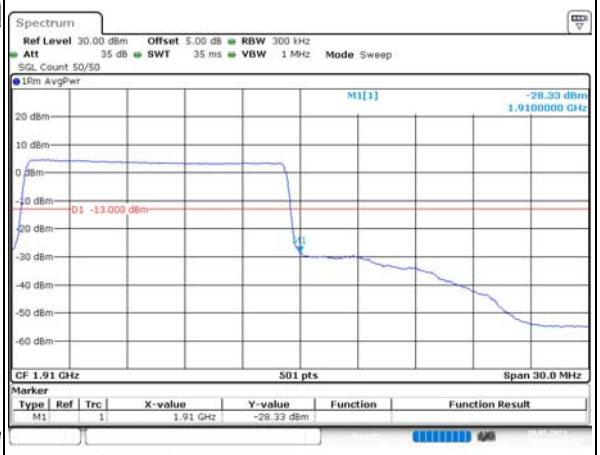
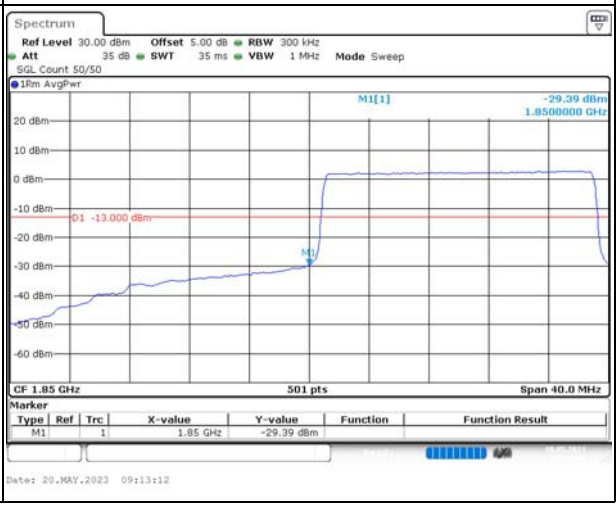
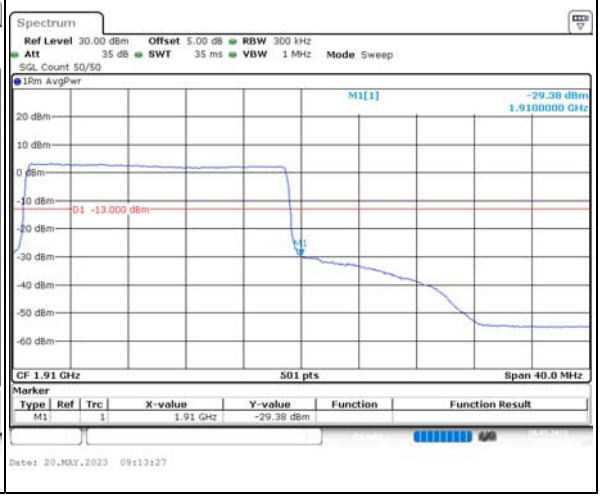
Spurious Emissions at Antenna Terminal		
Channel	**15MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal		
Channel	**20MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

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

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

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

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

4.7 Antenna Port Test Data and Results for LTE Band 4

Serial Number:	25TU-1	Test Date:	2023/05/20~2023/06/20
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	22.3~26.8	Relative Humidity: (%)	39~59	ATM Pressure: (kPa)	100.1~102.3

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2022/07/15	2023/07/14
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Power Splitter	1515	RA914	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2022/07/15	2023/07/14
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022/09/29	2023/09/28
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

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

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
1.4MHz	1710.7	1732.5	1754.3
3MHz	1711.5	1732.5	1753.5
5MHz	1712.5	1732.5	1752.5
10MHz	1715	1732.5	1750
15MHz	1717.5	1732.5	1747.5
20MHz	1720	1732.5	1745

Test Data:

FCC§2.1046;§ 27.50(d)(4)

RF Output Power:

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	23.74	23.85	23.61	25.41	30
	RB1#3	23.74	23.90	23.59		
	RB1#5	23.72	23.91	23.56		
	RB3#0	23.82	23.89	23.59		
	RB3#3	23.76	23.80	23.5		
	RB6#0	22.88	22.94	22.54		
1.4MHz 16QAM	RB1#0	23.51	22.37	22.91	25.03	30
	RB1#3	23.52	22.40	22.84		
	RB1#5	23.53	22.49	22.92		
	RB3#0	22.65	22.88	22.27		
	RB3#3	22.74	22.83	22.25		
	RB6#0	21.94	21.98	21.75		
3MHz QPSK	RB1#0	23.69	23.71	23.50	25.30	30
	RB1#8	23.75	23.78	23.51		
	RB1#14	23.77	23.80	23.46		
	RB6#0	22.79	23.00	22.49		
	RB6#9	22.85	22.86	22.52		
	RB15#0	22.73	22.88	22.60		
3MHz 16QAM	RB1#0	23.52	22.67	22.74	25.08	30
	RB1#8	23.50	22.67	22.64		
	RB1#14	23.58	22.62	22.69		
	RB6#0	21.96	22.26	21.68		
	RB6#9	22.01	22.21	21.66		
	RB15#0	21.94	22.12	21.78		
5MHz QPSK	RB1#0	23.89	23.81	23.64	25.39	30
	RB1#13	23.81	23.88	23.58		
	RB1#24	23.85	23.83	23.62		
	RB15#0	22.74	22.92	22.65		
	RB15#10	22.8	22.94	22.59		
	RB25#0	22.81	22.85	22.58		
5MHz 16QAM	RB1#0	22.99	22.62	21.93	24.55	30
	RB1#13	23.00	22.59	21.87		
	RB1#24	23.05	22.66	21.91		
	RB15#0	21.84	22.19	21.81		
	RB15#10	21.88	22.04	21.81		
	RB25#0	21.93	21.97	21.88		
10MHz QPSK	RB1#0	23.82	23.88	23.63	25.50	30
	RB1#25	23.91	23.85	23.62		
	RB1#49	24.00	23.91	23.51		

	RB25#0	22.71	22.97	22.68		
	RB25#25	22.87	22.94	22.69		
	RB50#0	22.88	22.84	22.69		
10MHz 16QAM	RB1#0	22.96	22.35	23.07	24.61	30
	RB1#25	23.01	22.40	23.03		
	RB1#49	23.11	22.32	22.89		
	RB25#0	22.03	22.21	21.89		
	RB25#25	22.16	22.20	21.74		
	RB50#0	22.10	22.07	21.95		
15MHz QPSK	RB1#0	23.83	23.83	23.73	25.62	30
	RB1#38	23.92	23.81	23.61		
	RB1#74	24.12	23.73	23.50		
	RB36#0	22.84	22.94	22.81		
	RB36#39	23.08	22.81	22.61		
	RB75#0	22.93	22.88	22.66		
15MHz 16QAM	RB1#0	22.87	23.36	23.12	24.87	30
	RB1#38	23.13	23.37	23.04		
	RB1#74	23.29	23.27	22.95		
	RB36#0	22.04	22.08	21.98		
	RB36#39	22.26	22.00	21.92		
	RB75#0	22.12	22.02	21.95		
20MHz QPSK	RB1#0	23.83	24.06	24.10	25.62	30
	RB1#50	24.06	23.90	24.02		
	RB1#99	24.12	23.85	23.80		
	RB50#0	22.90	22.97	22.87		
	RB50#50	23.04	22.85	22.61		
	RB100#0	22.98	22.91	22.62		
20MHz 16QAM	RB1#0	22.82	23.95	22.57	25.45	30
	RB1#50	22.98	23.81	22.48		
	RB1#99	23.06	23.67	22.41		
	RB50#0	21.96	22.06	21.96		
	RB50#50	22.14	22.06	21.87		
	RB100#0	22.12	22.07	21.79		
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	
10MHz QPSK	RB1#0	5.07	5.28	5.65	13
	RB50#0	5.04	5.57	5.3	13
10MHz 16QAM	RB1#0	5.77	6.23	6.58	13
	RB50#0	6	6.46	6.2	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	1.102	1.102	1.102	1.326	1.284	1.284
1.4MHz 16QAM	1.096	1.102	1.108	1.308	1.332	1.296
3MHz QPSK	2.707	2.695	2.695	3.048	3.012	3.012
3MHz 16QAM	2.695	2.707	2.695	3.060	3.072	3.012
5MHz QPSK	4.531	4.531	4.531	5.220	5.340	5.280
5MHz 16QAM	4.551	4.571	4.531	5.460	5.340	5.320
10MHz QPSK	8.942	8.942	8.982	9.800	9.880	9.840
10MHz 16QAM	8.982	8.982	8.982	10.000	9.920	9.840
15MHz QPSK	13.473	13.533	13.593	15.540	15.960	15.540
15MHz 16QAM	13.533	13.533	13.593	15.300	15.000	15.180
20MHz QPSK	17.884	18.044	18.044	19.840	19.520	20.000
20MHz 16QAM	17.964	18.044	18.124	19.840	20.160	20.240
Note: The test plots please refer to the Plots of Occupied Bandwidth						

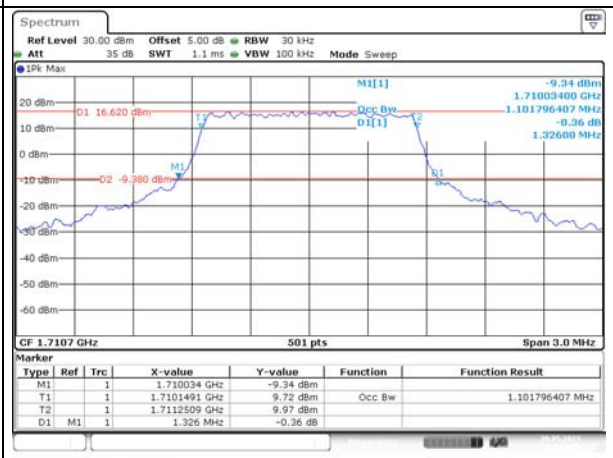
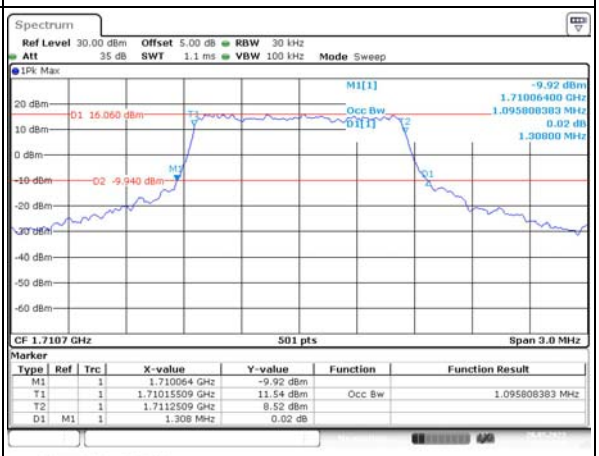
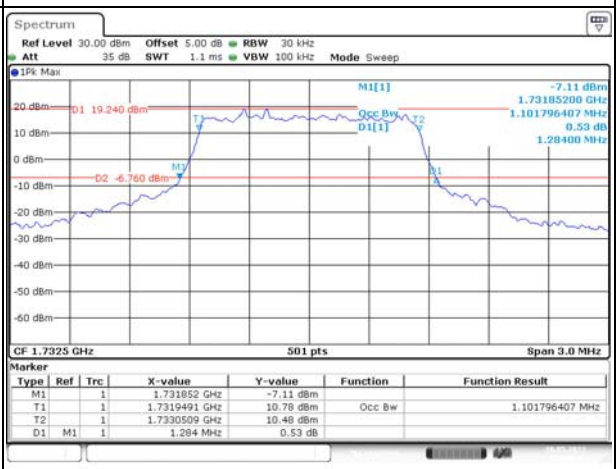
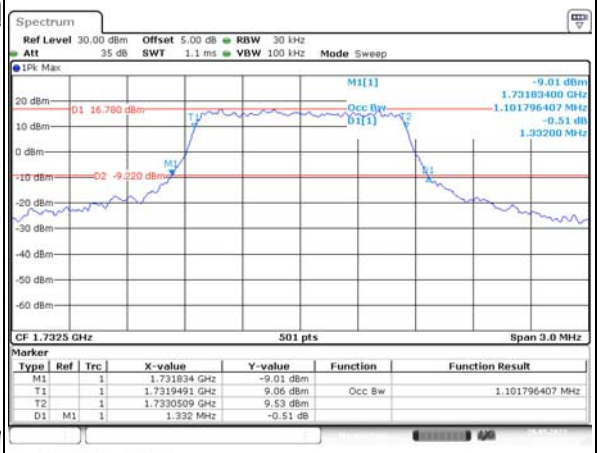
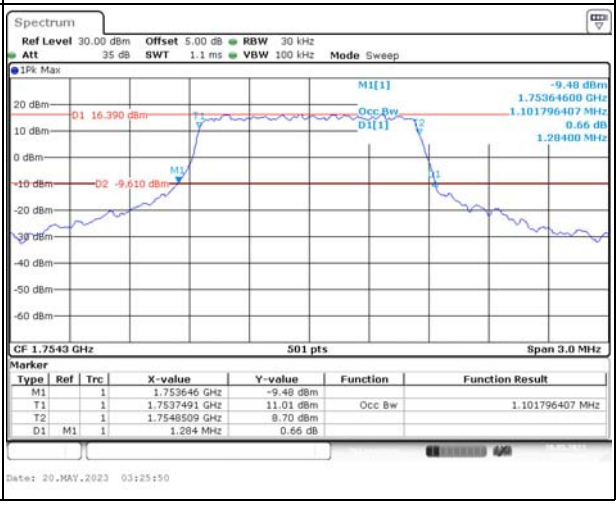
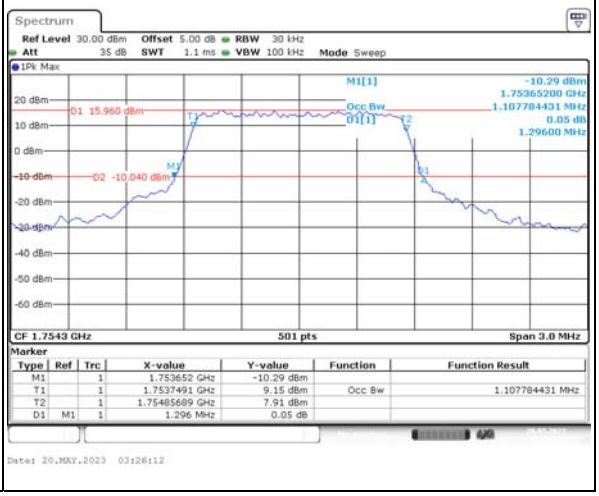
FCC §2.1051, § 27.53:Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

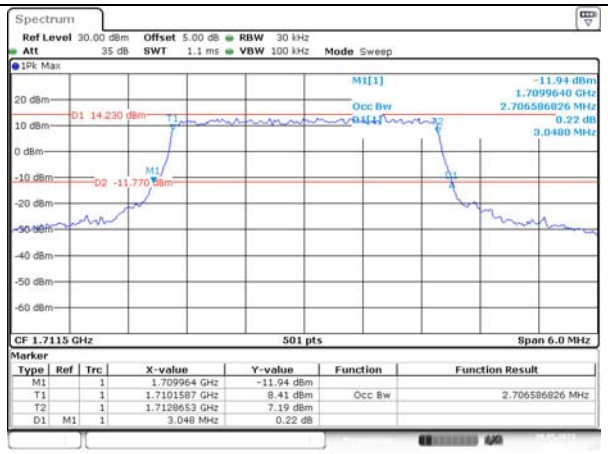
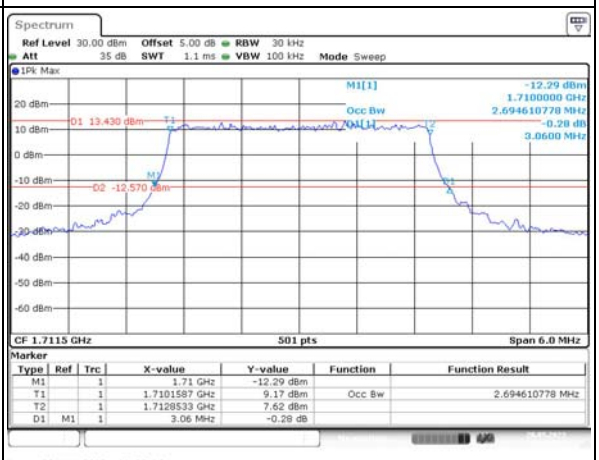
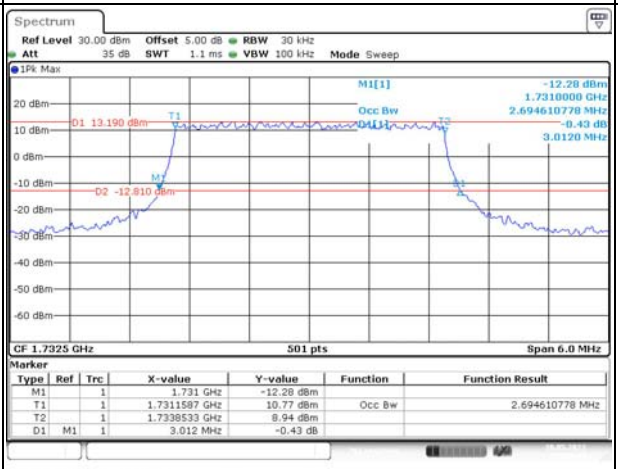
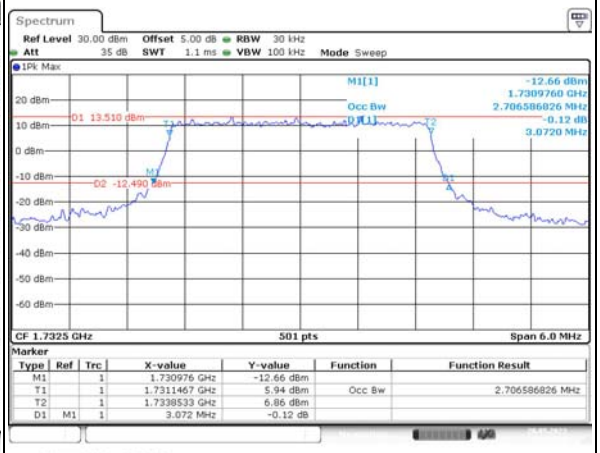
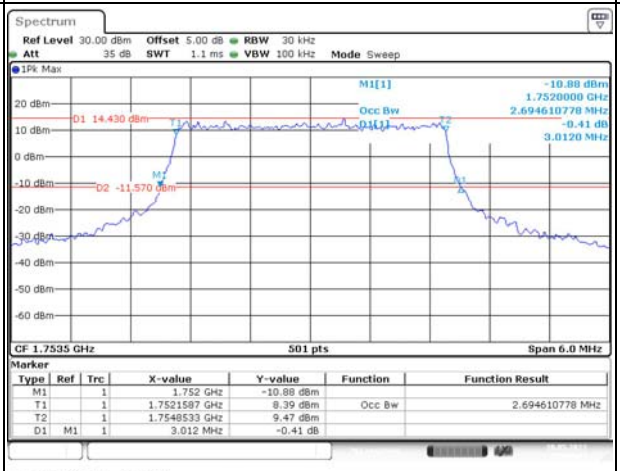
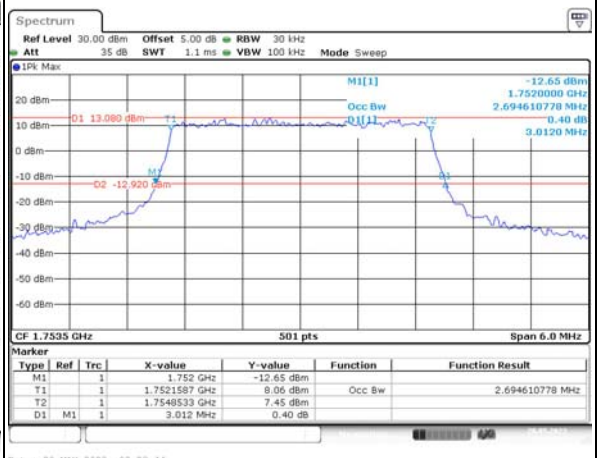
FCC §2.1051, § 27.53:Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

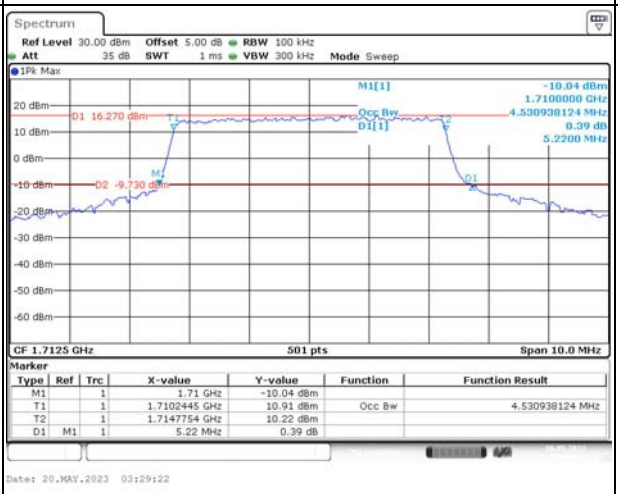
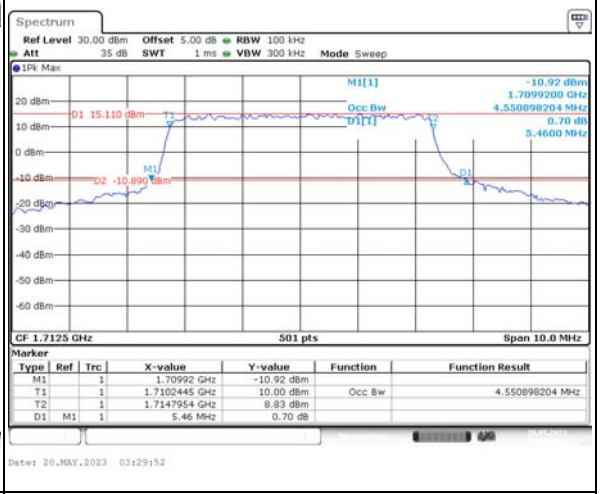
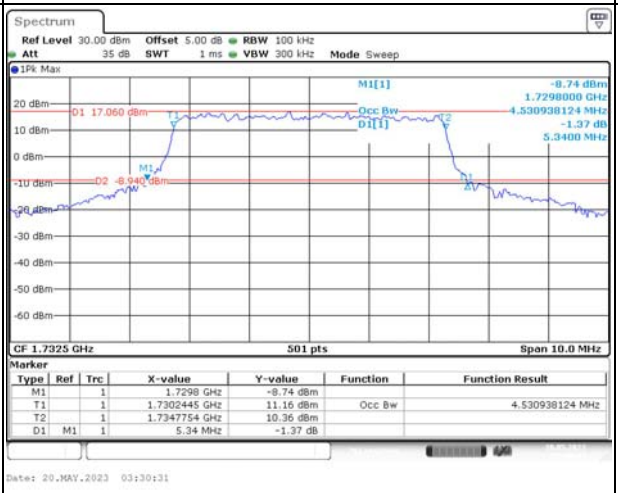
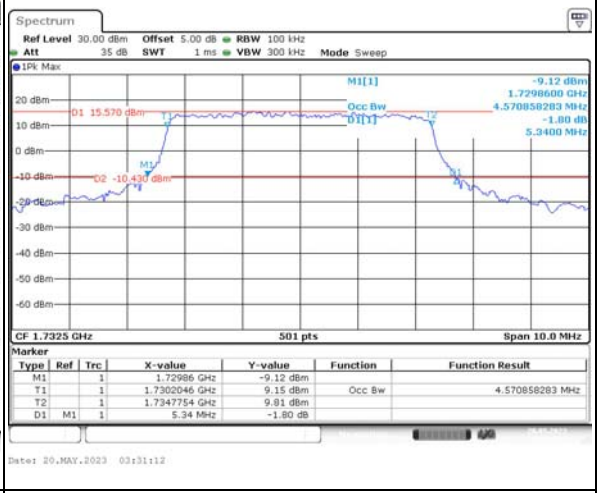
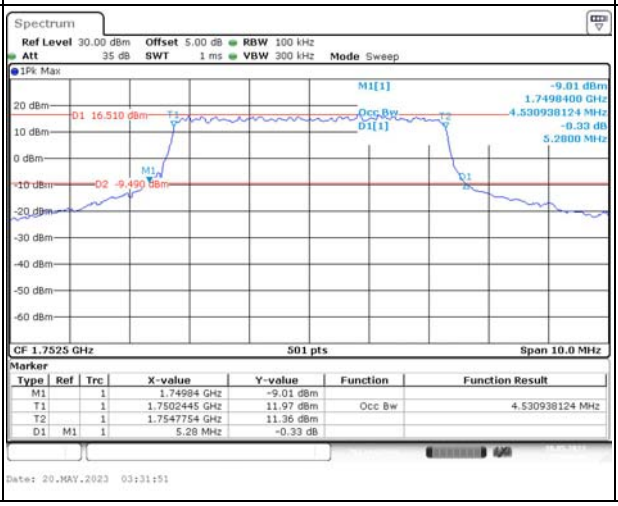
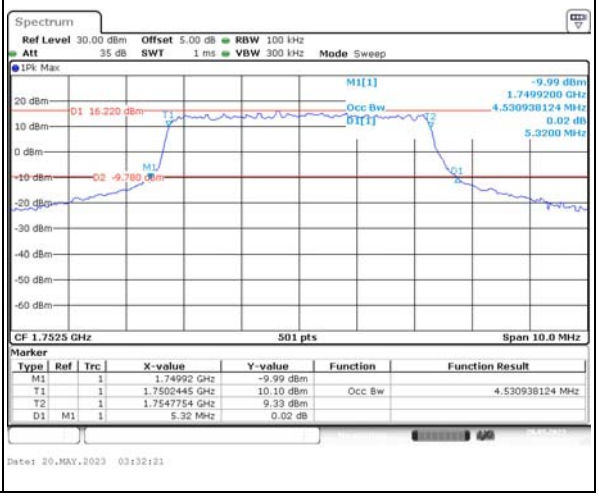
FCC §2.1055, §27.54: Frequency Stability						
Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1711.161	1710.00	1754.081	1755
	-20	3.85	1711.180	1710.00	1754.065	1755
	-10	3.85	1711.197	1710.00	1754.043	1755
	0	3.85	1711.165	1710.00	1754.052	1755
	10	3.85	1711.134	1710.00	1754.039	1755
	20	3.85	1711.138	1710.00	1754.022	1755
	30	3.85	1711.144	1710.00	1754.053	1755
	40	3.85	1711.138	1710.00	1754.055	1755
	50	3.85	1711.171	1710.00	1754.031	1755
Frequency Stability vs. Voltage	20	3.5	1711.190	1710.00	1754.041	1755
	20	4.4	1711.162	1710.00	1754.041	1755
					Result:	**Pass**

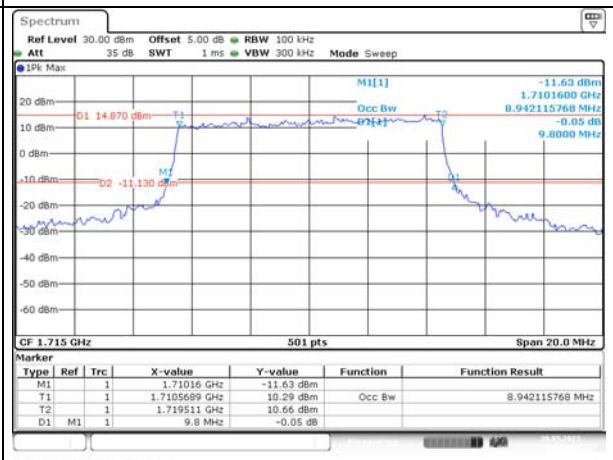
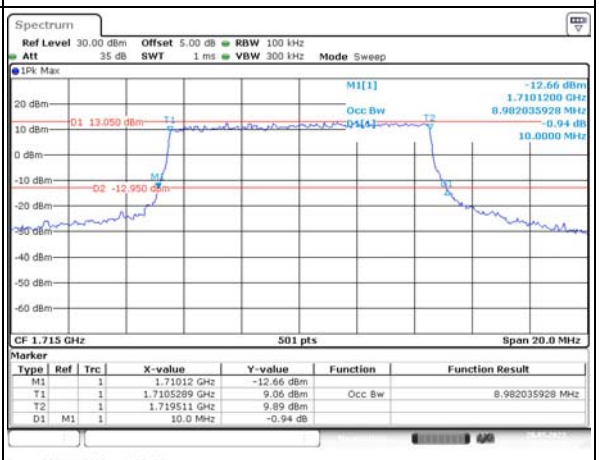
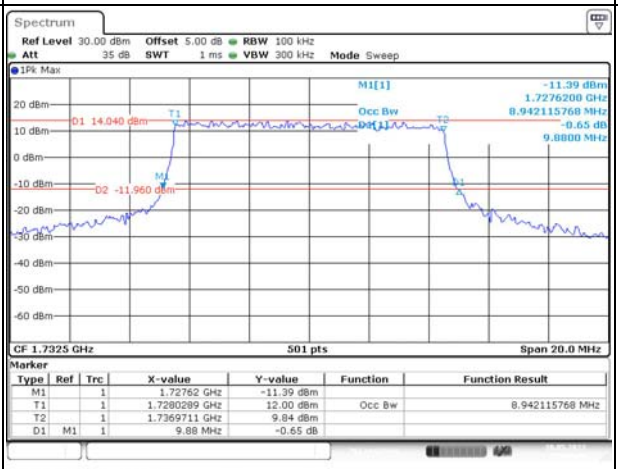
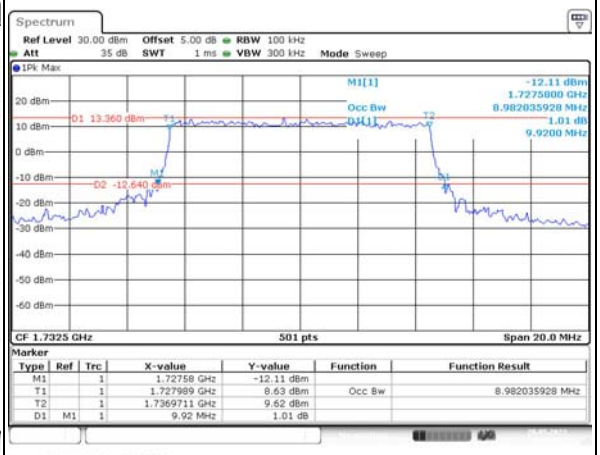
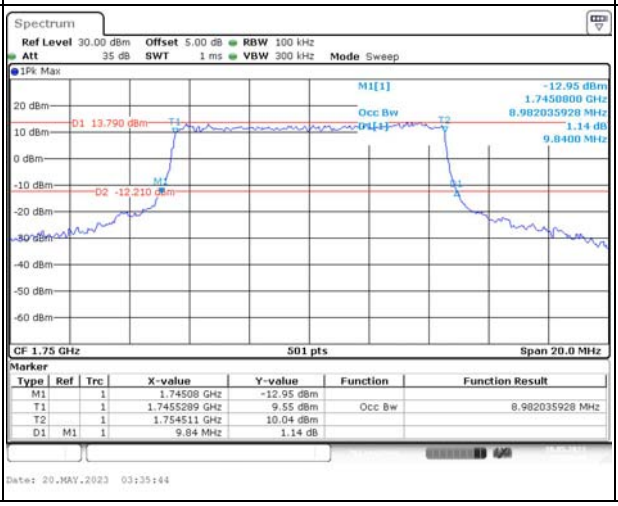
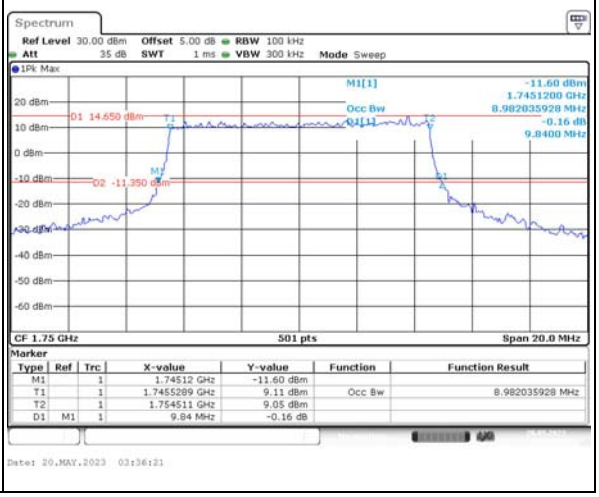
Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1711.023	1710.00	1754.089	1755
	-20	3.85	1711.072	1710.00	1754.157	1755
	-10	3.85	1711.016	1710.00	1754.085	1755
	0	3.85	1711.073	1710.00	1754.089	1755
	10	3.85	1711.058	1710.00	1754.152	1755
	20	3.85	1711.058	1710.00	1754.102	1755
	30	3.85	1711.023	1710.00	1754.084	1755
	40	3.85	1711.058	1710.00	1754.097	1755
	50	3.85	1711.092	1710.00	1754.161	1755
Frequency Stability vs. Voltage	20	3.5	1711.042	1710.00	1754.121	1755
	20	4.4	1711.073	1710.00	1754.169	1755
					Result:	**Pass**

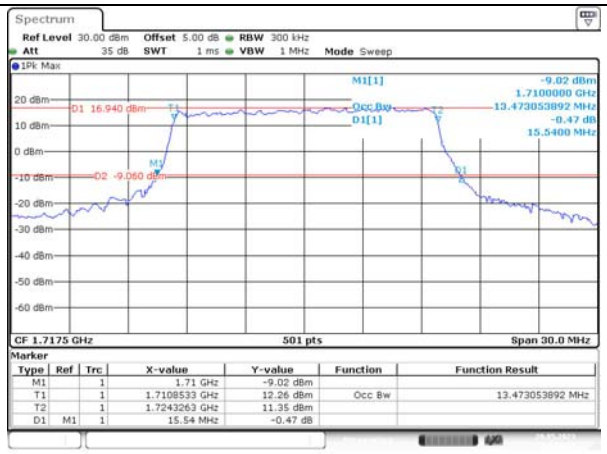
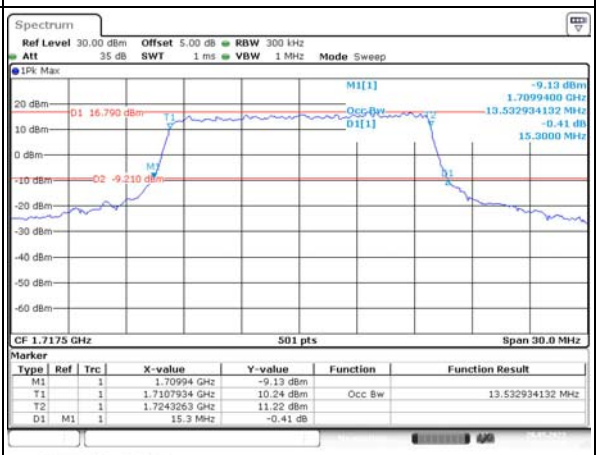
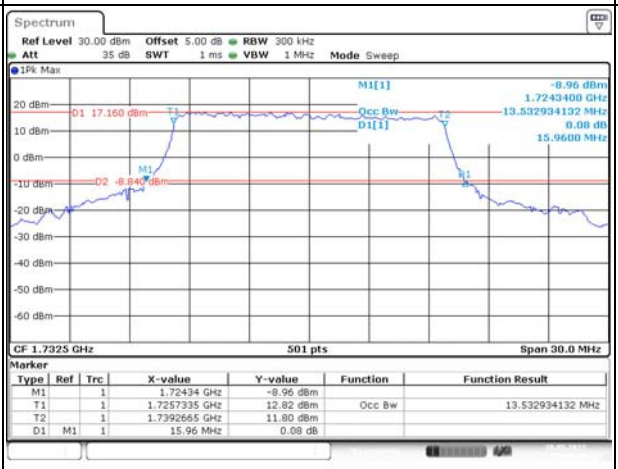
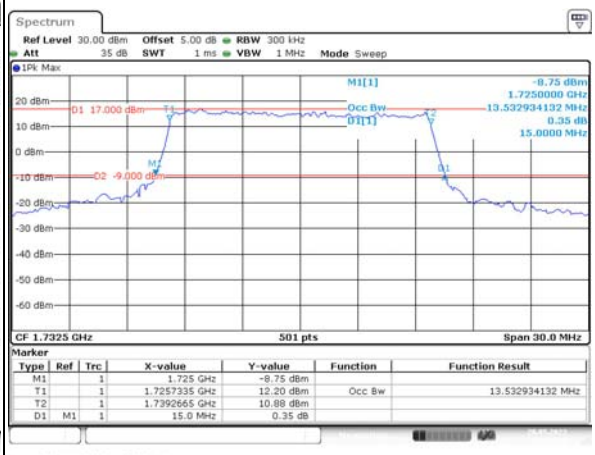
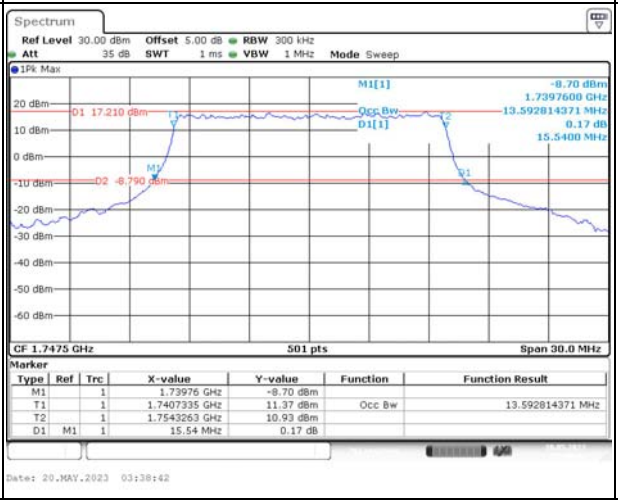
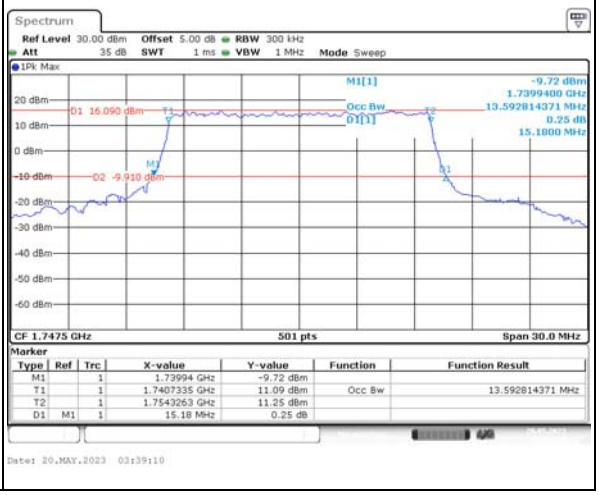
Test Plots(Note: The 5.0dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer)**:**

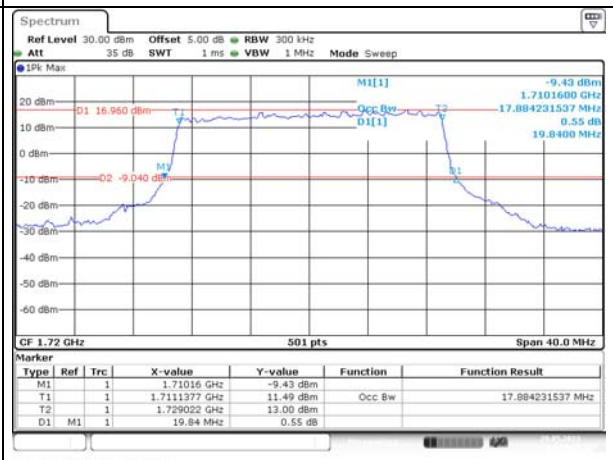
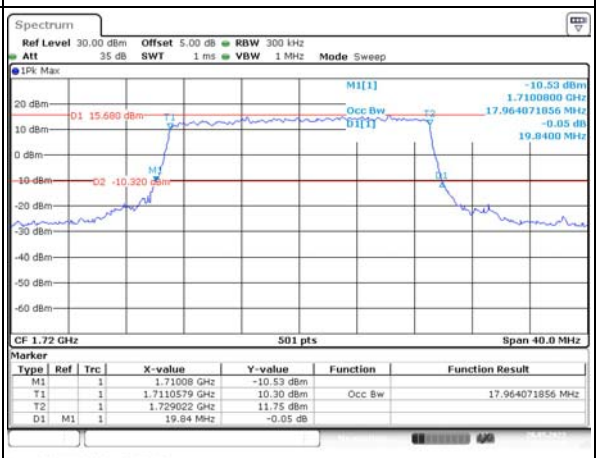
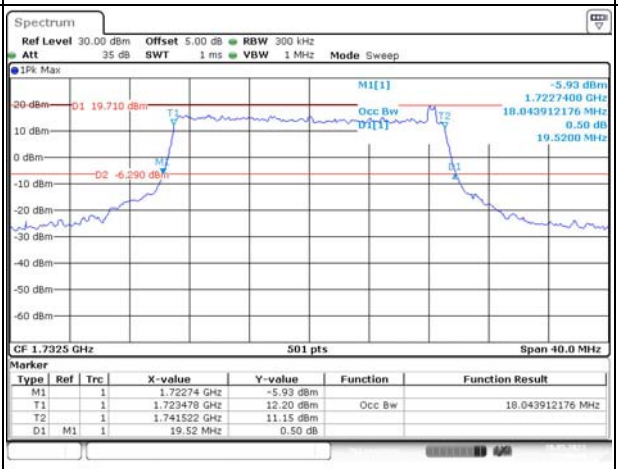
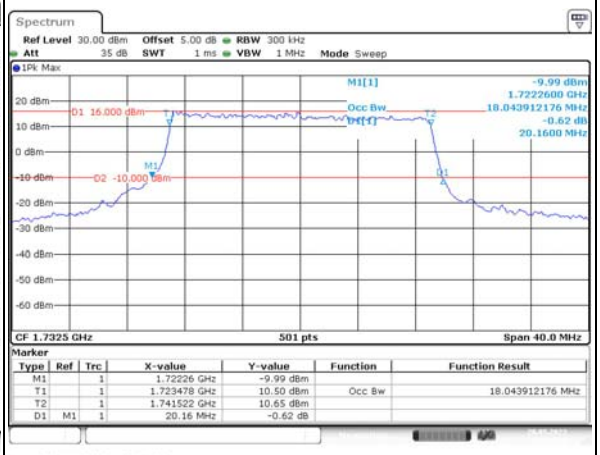
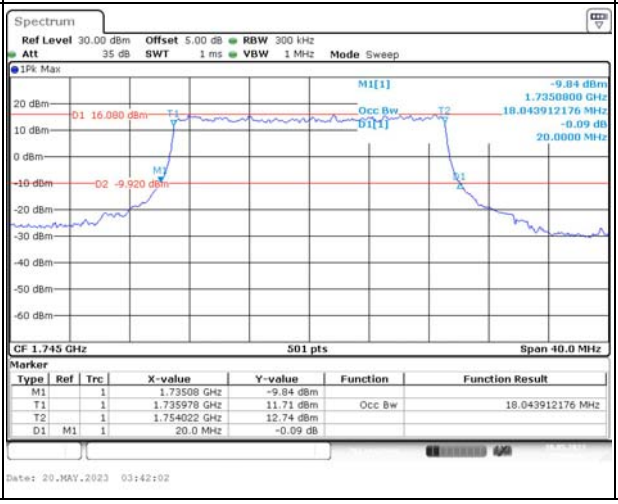
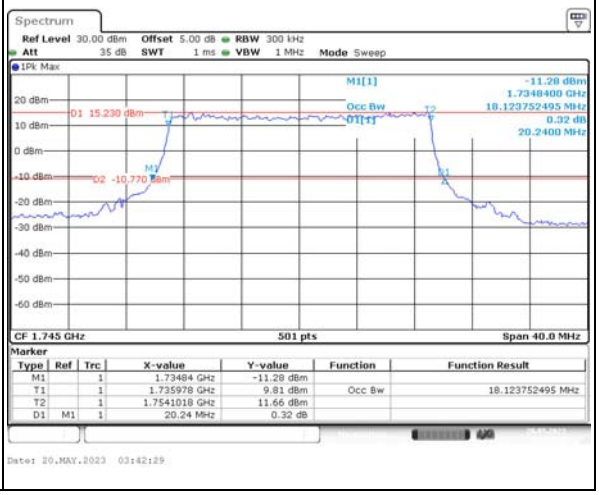
Occupied Bandwidth		
Channel	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

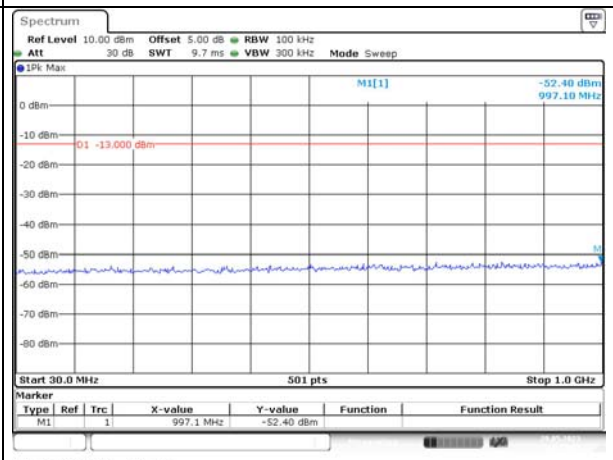
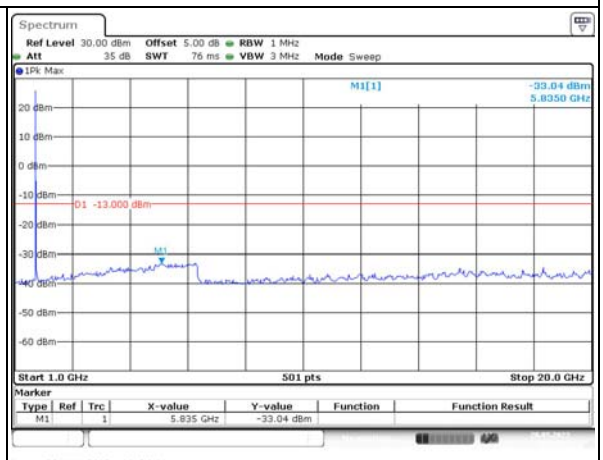
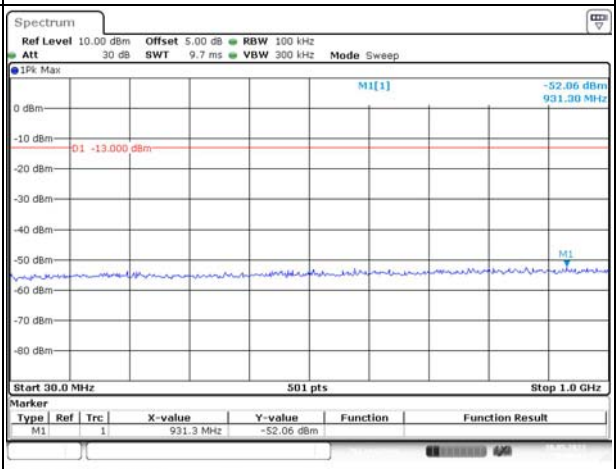
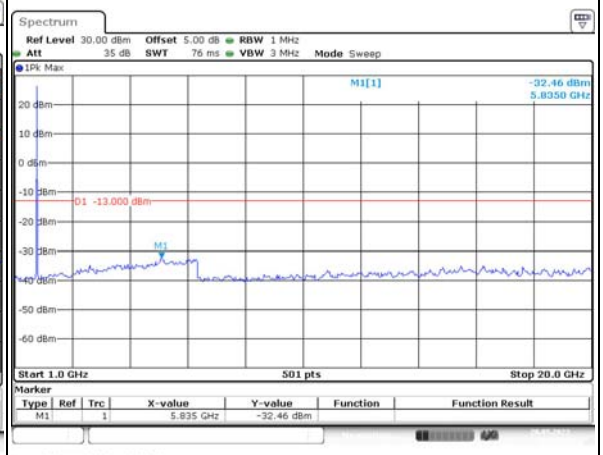
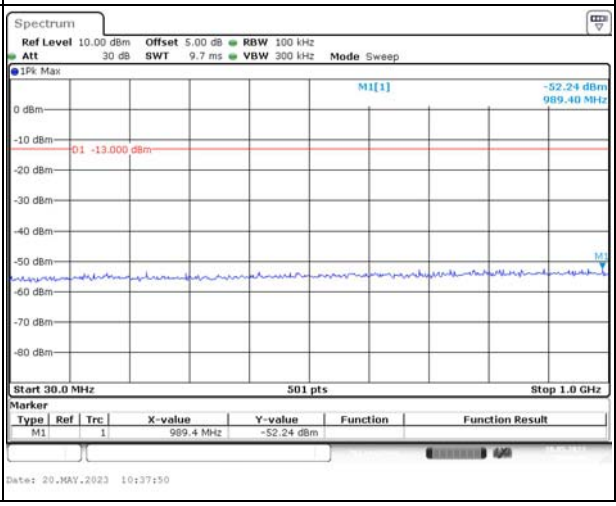
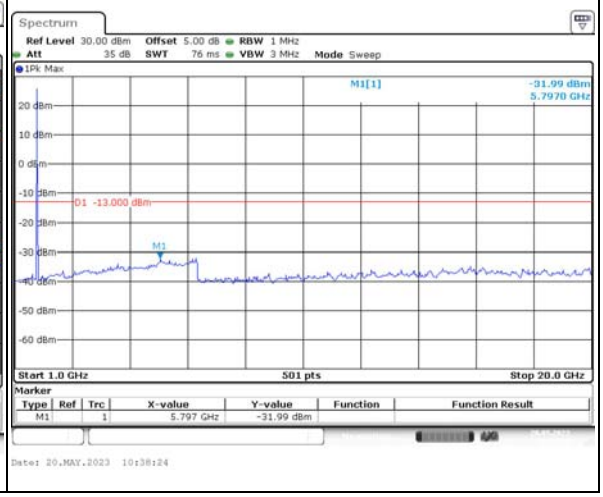
Occupied Bandwidth		
Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

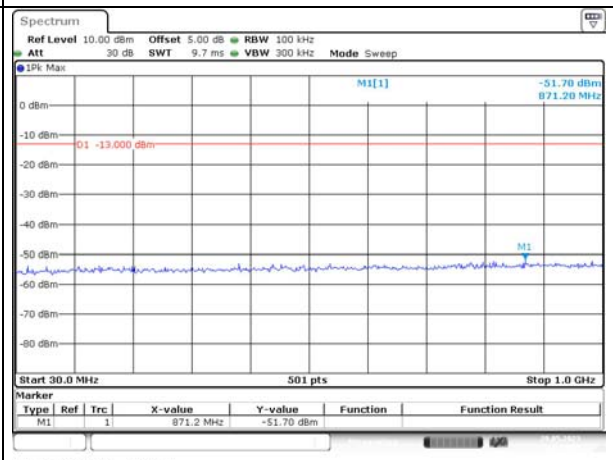
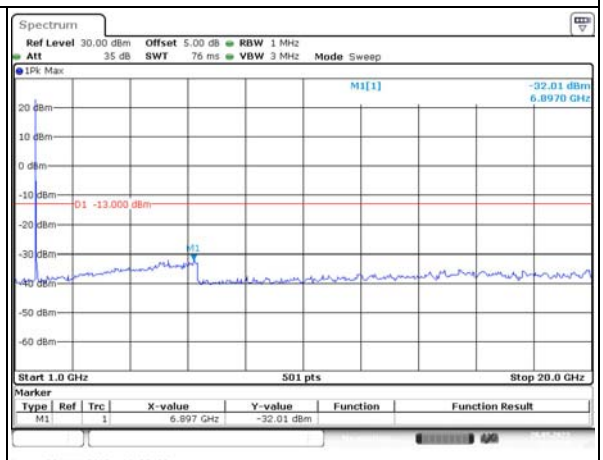
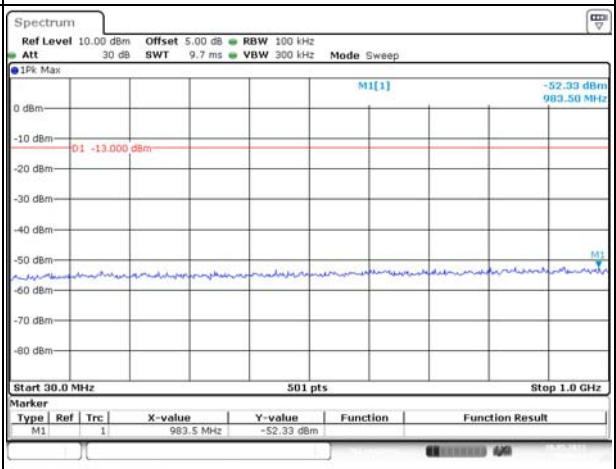
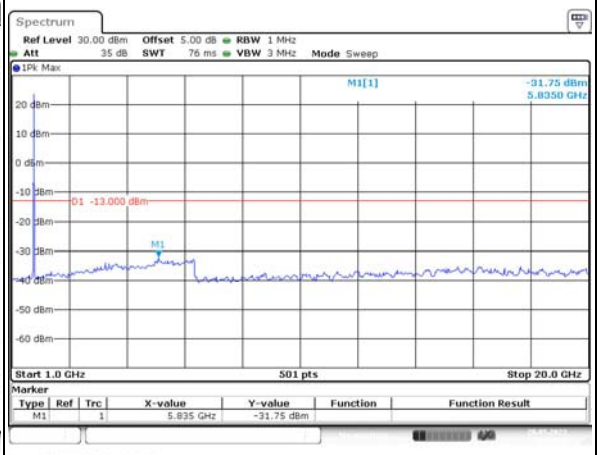
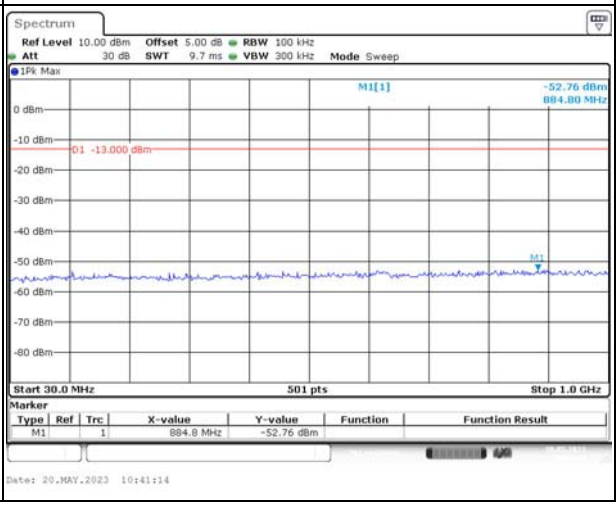
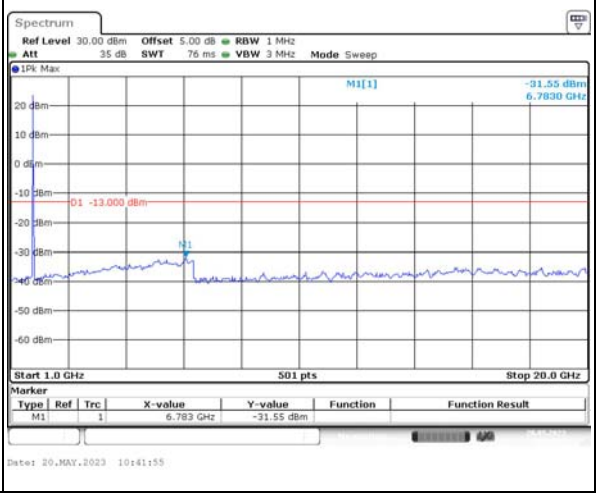
Occupied Bandwidth		
Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

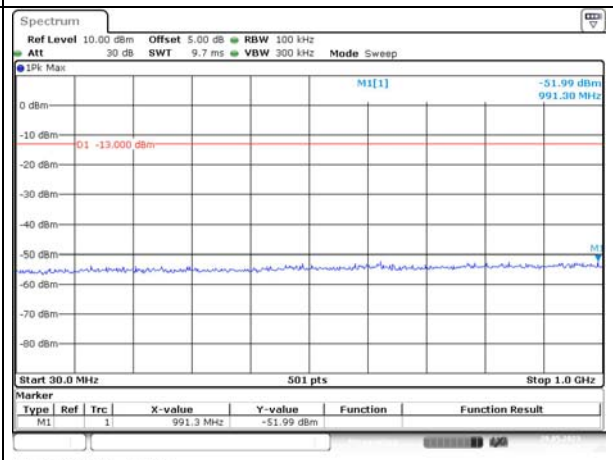
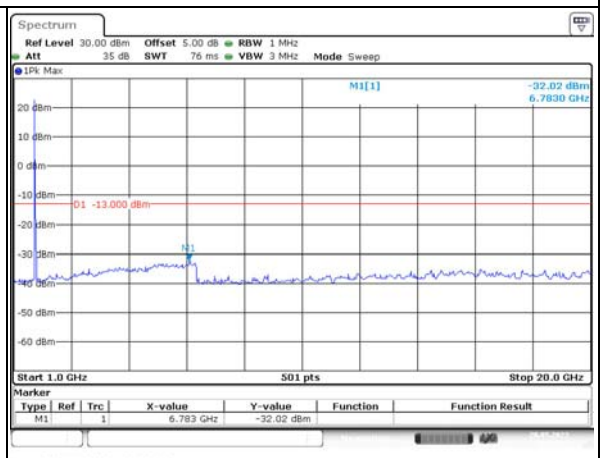
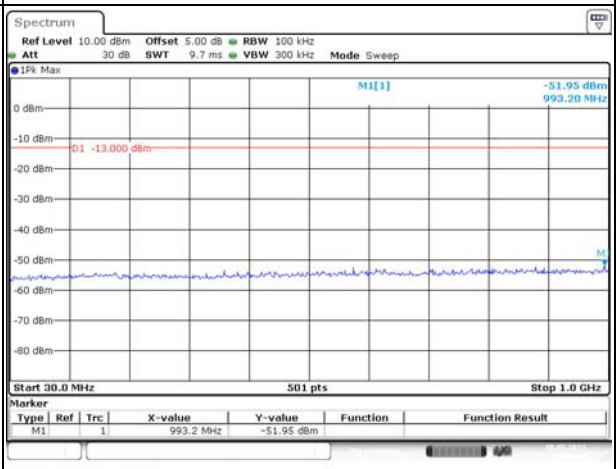
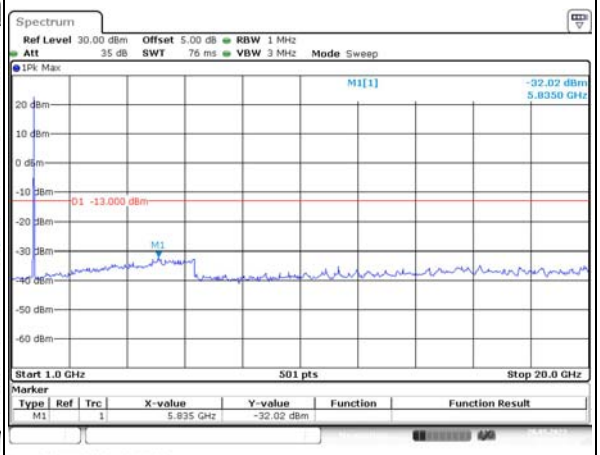
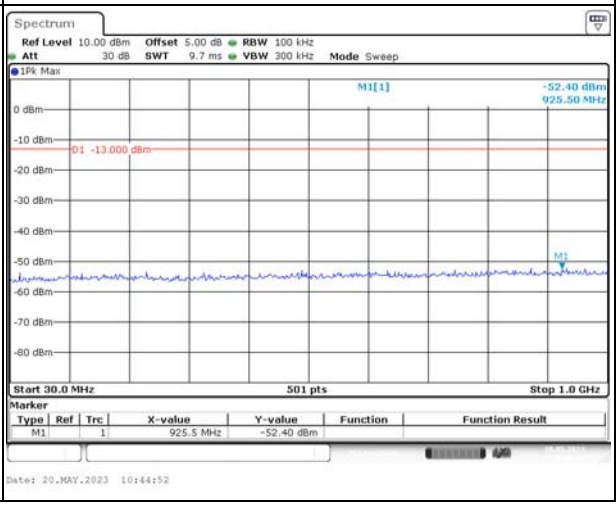
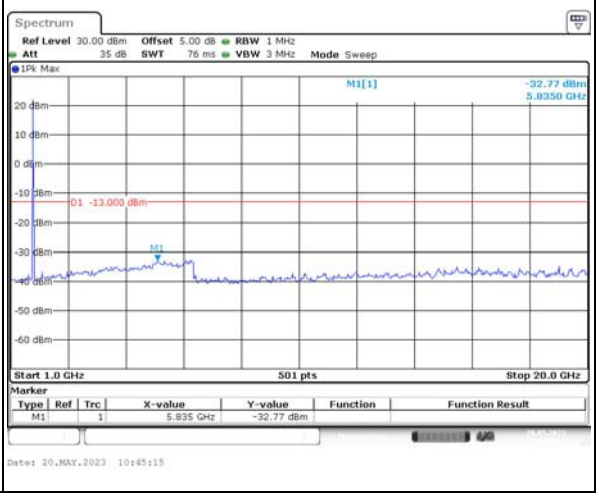
Occupied Bandwidth		
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

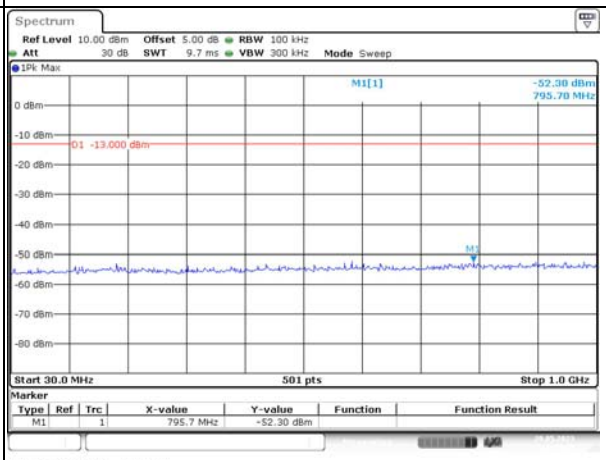
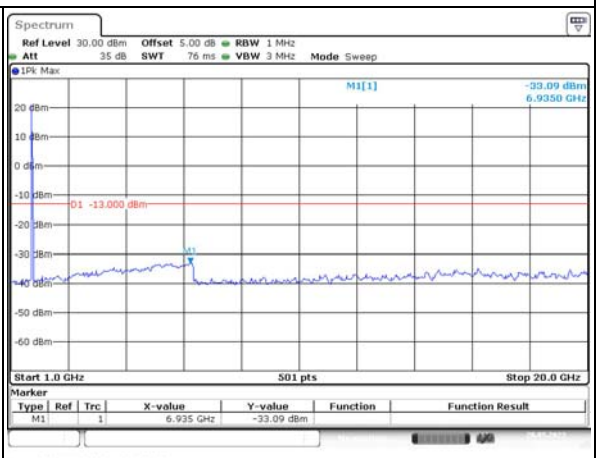
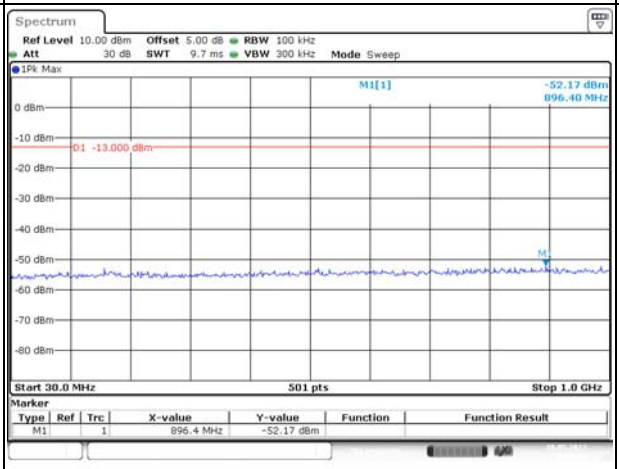
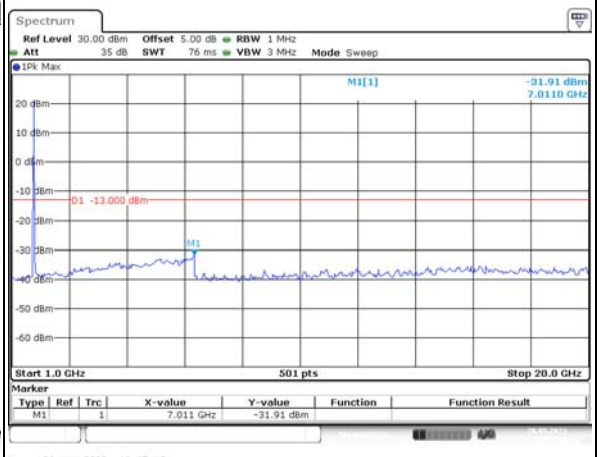
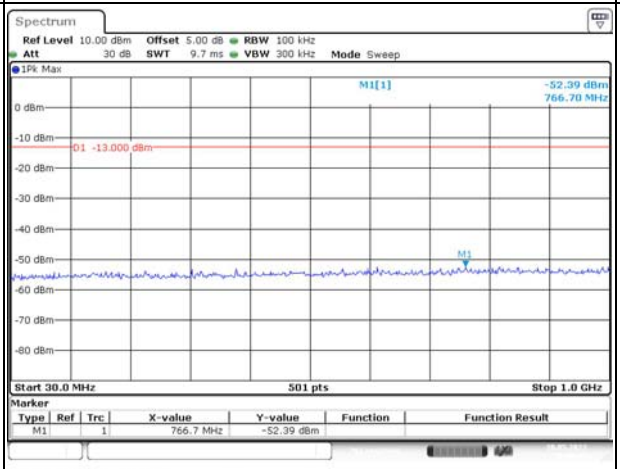
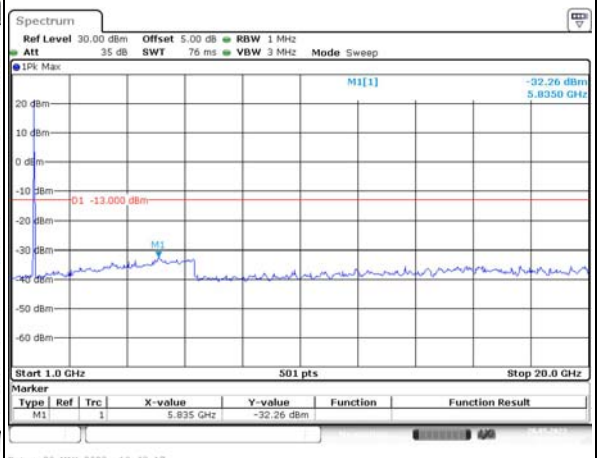
Occupied Bandwidth		
Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

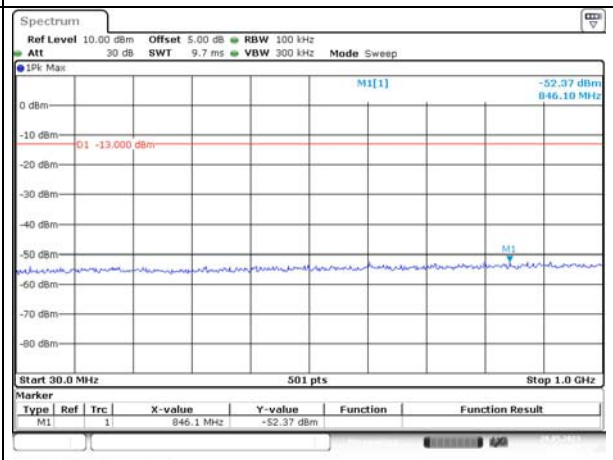
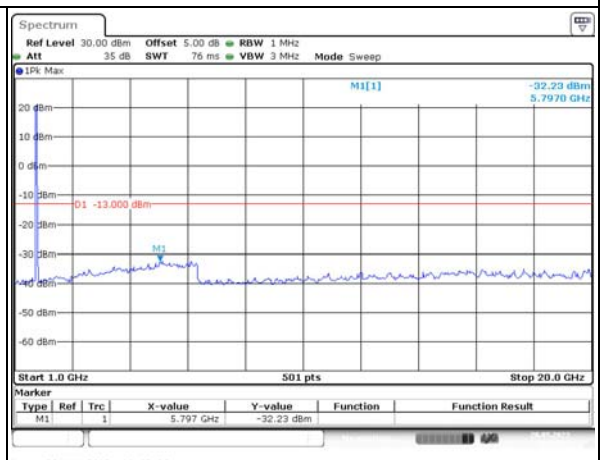
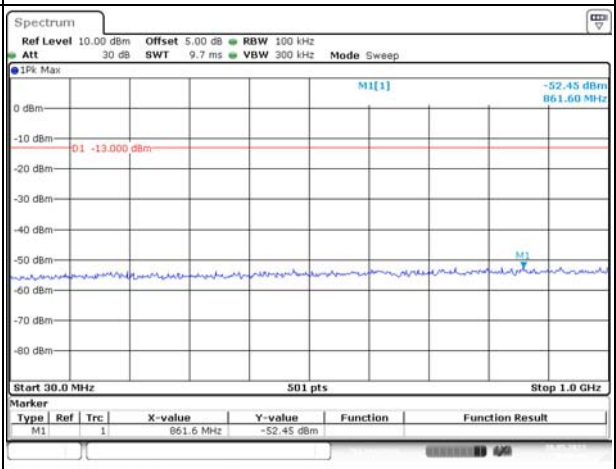
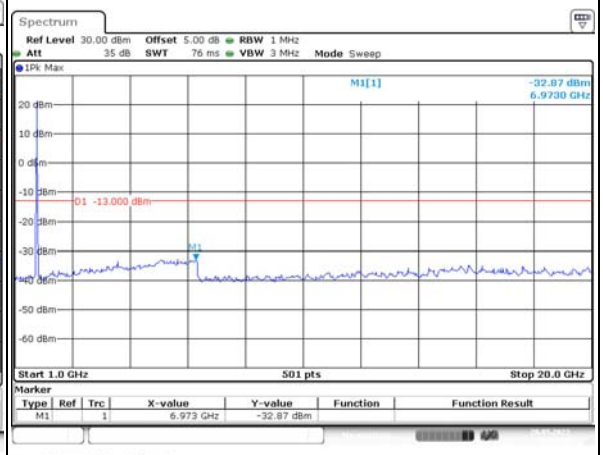
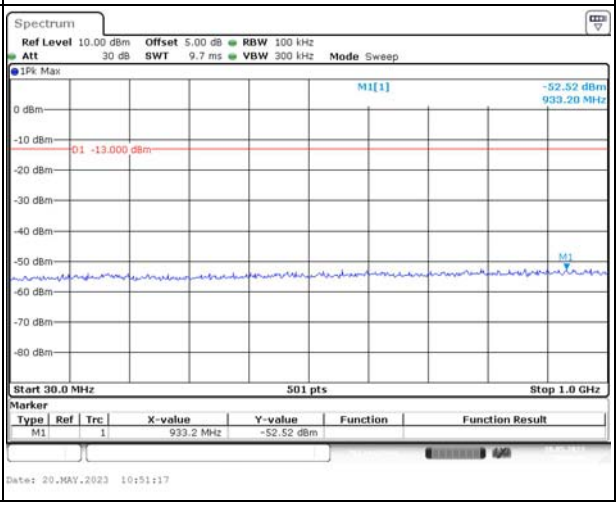
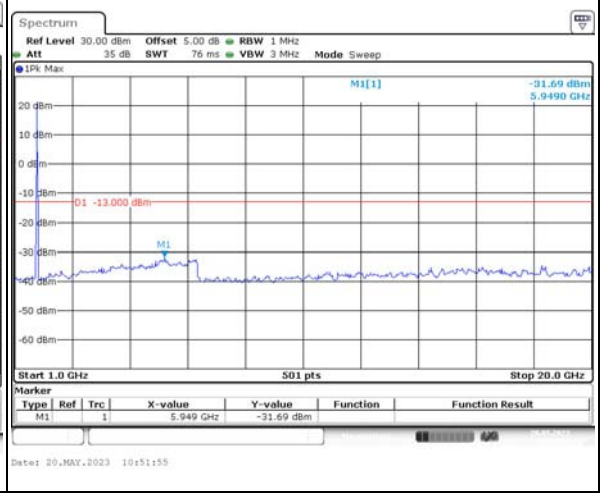
Occupied Bandwidth		
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

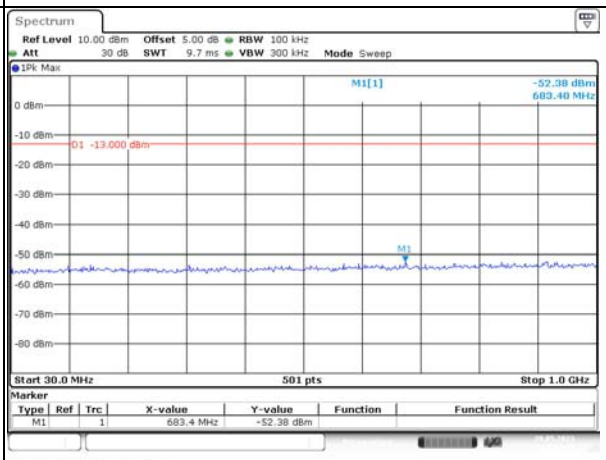
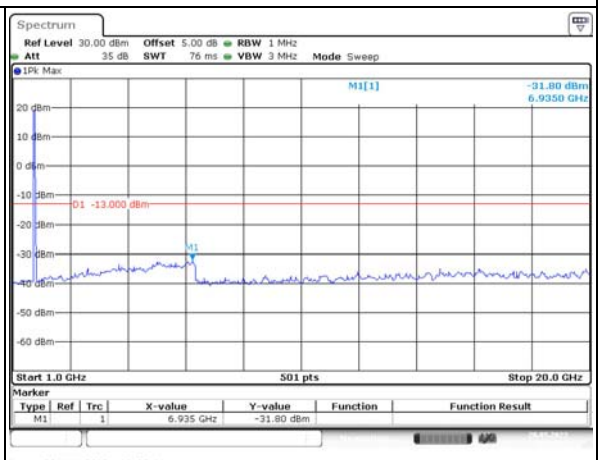
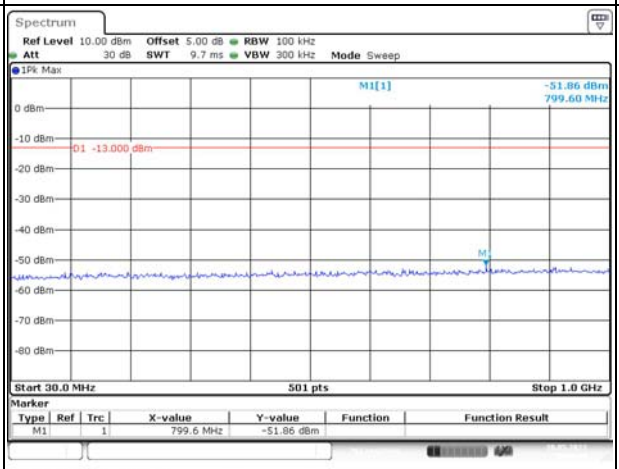
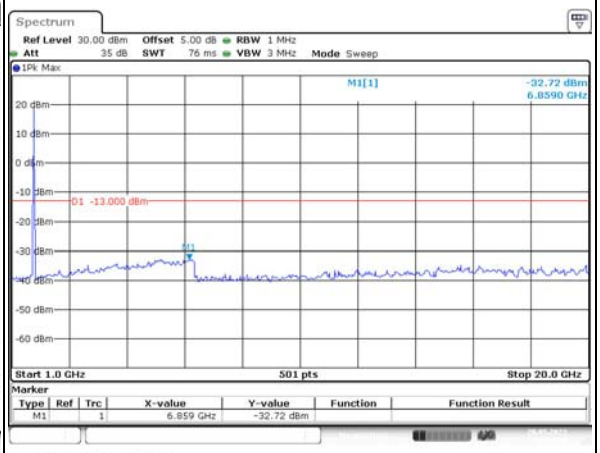
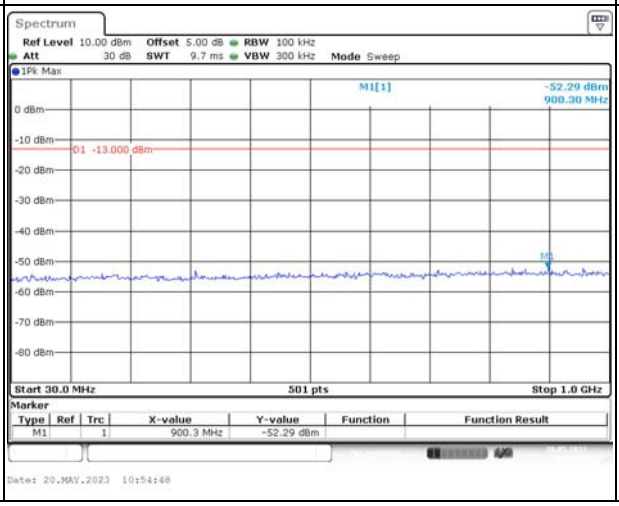
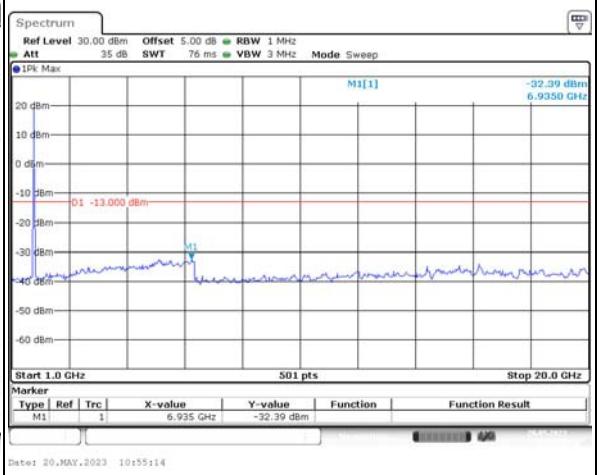
Spurious Emissions at Antenna Terminal		
Channel	**1.4MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

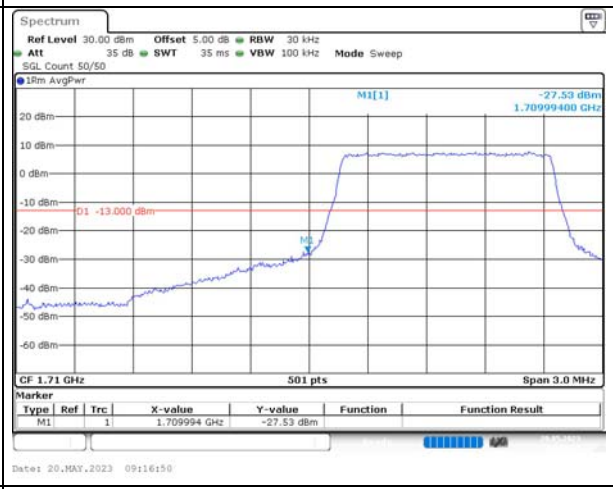
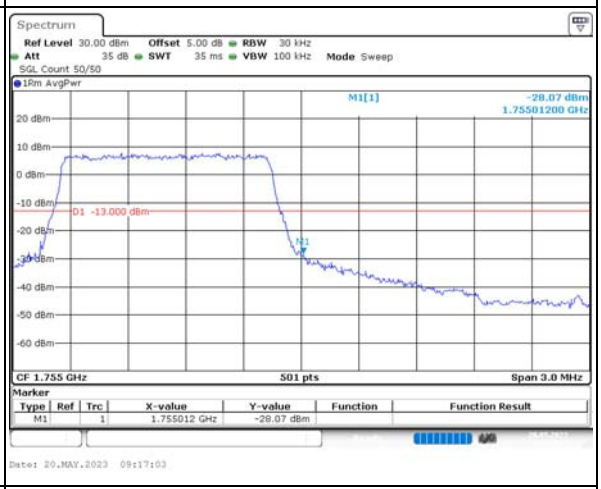
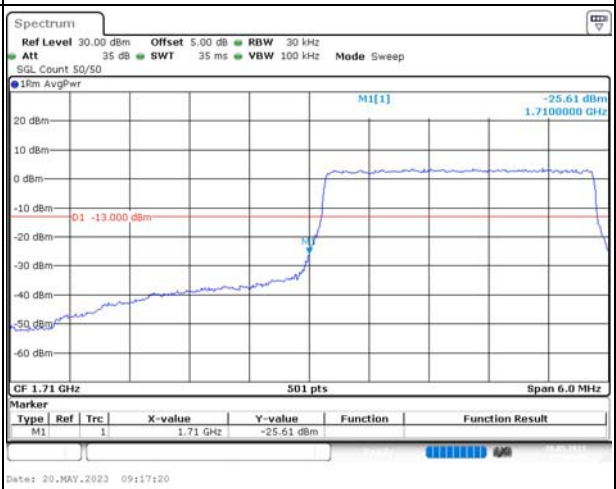
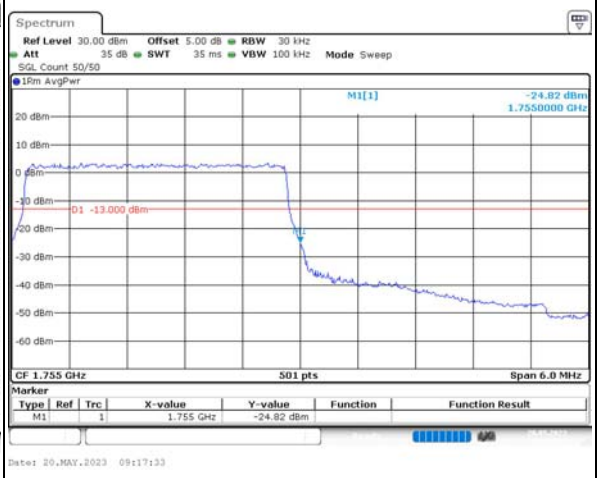
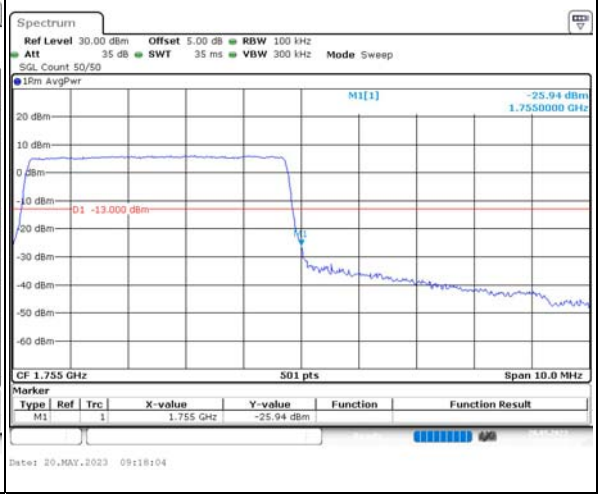
Spurious Emissions at Antenna Terminal		
Channel	**3MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

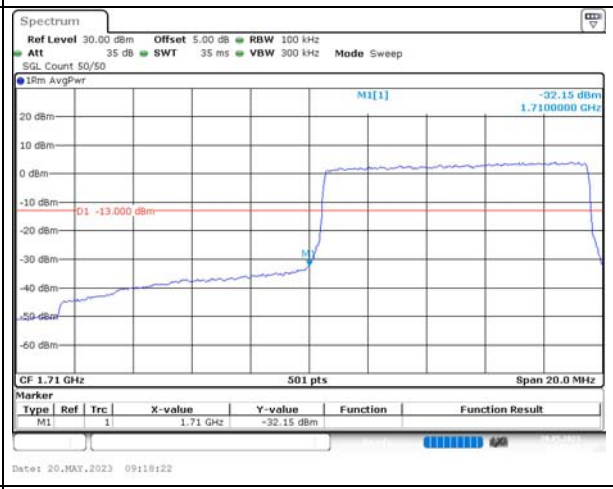
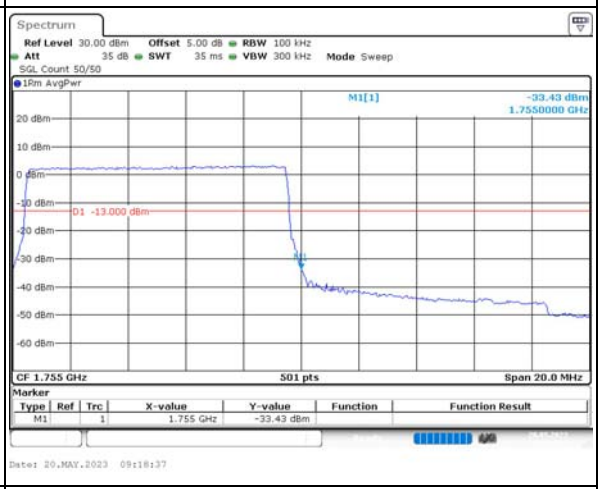
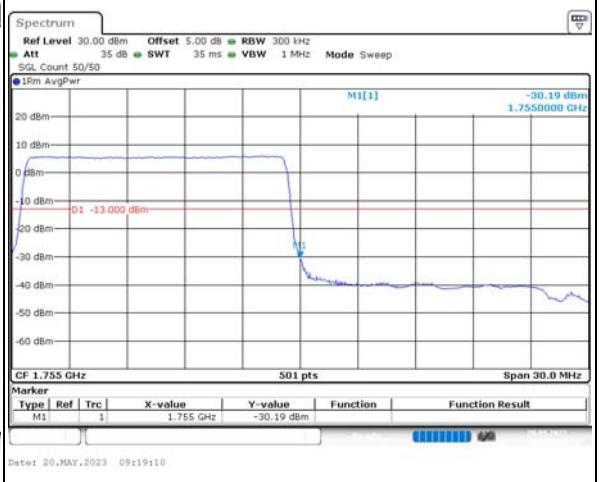
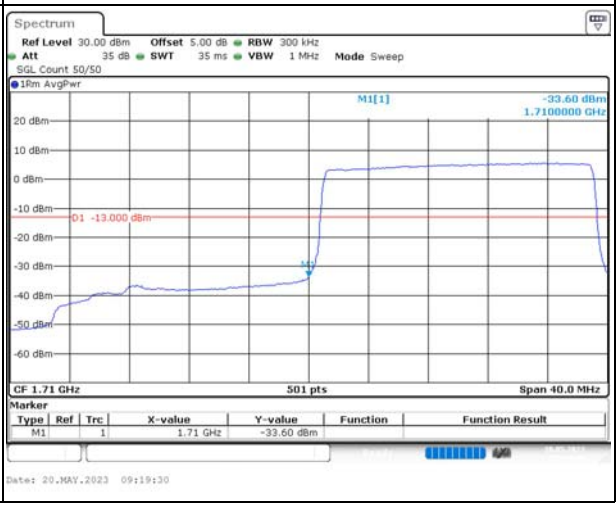
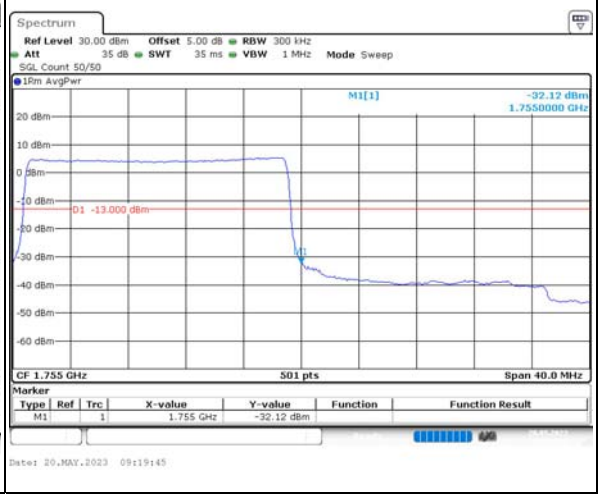
Spurious Emissions at Antenna Terminal		
Channel	**5MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

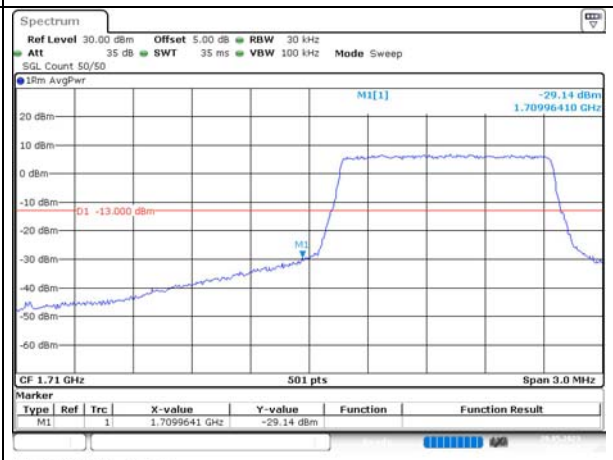
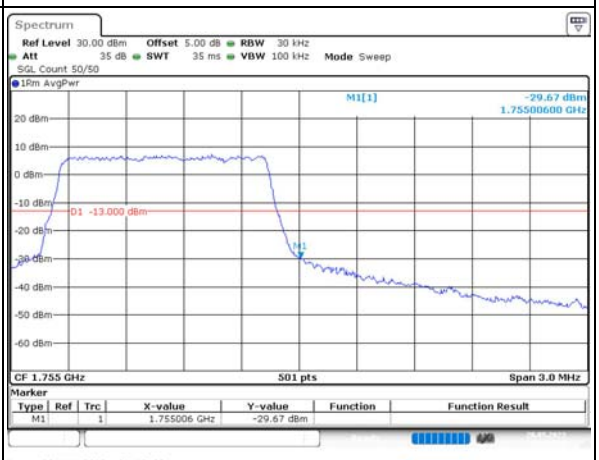
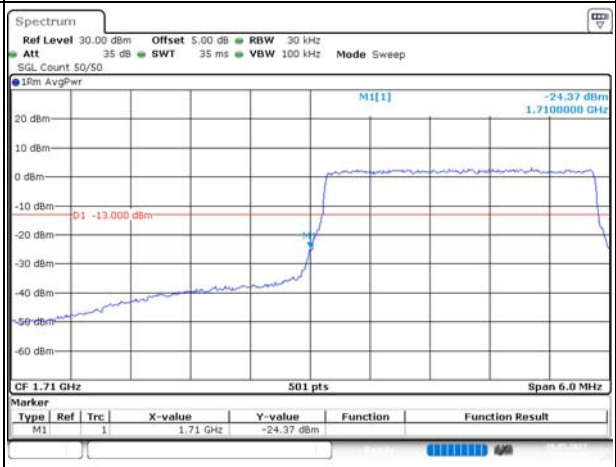
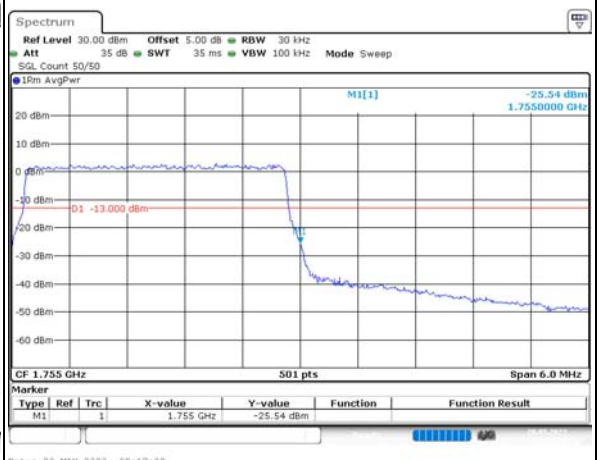
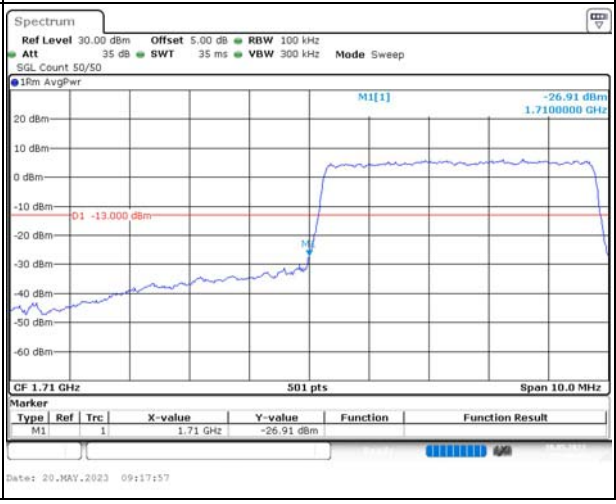
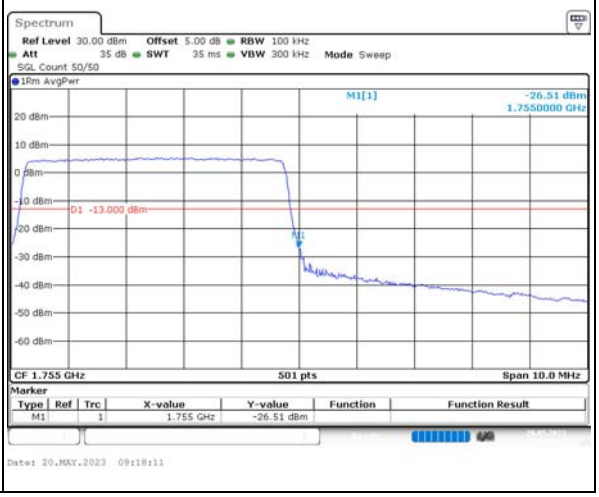
Spurious Emissions at Antenna Terminal		
Channel	**10MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

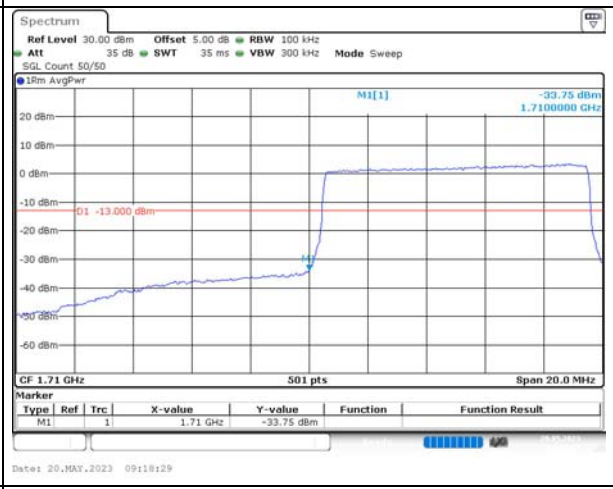
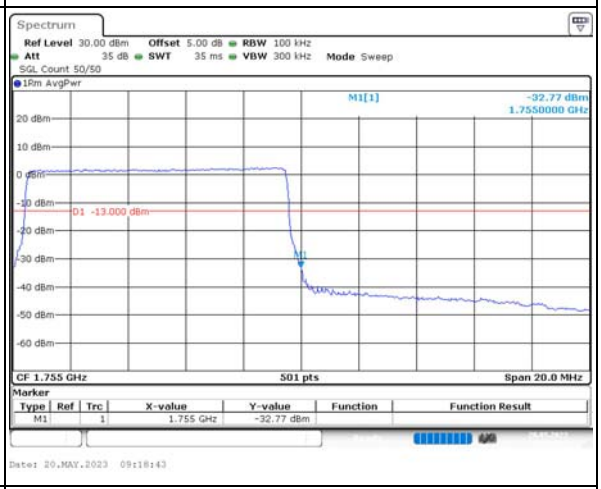
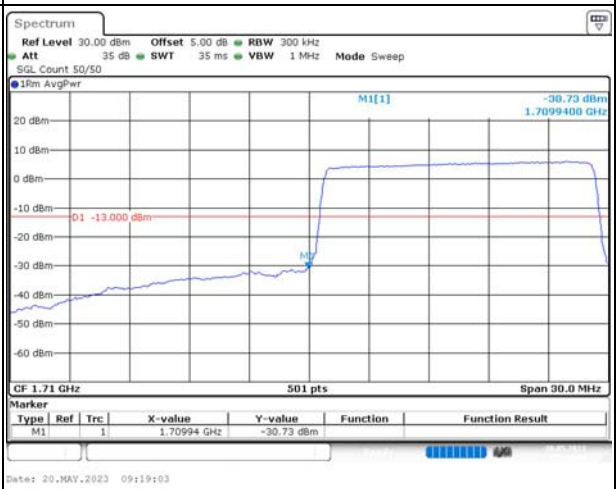
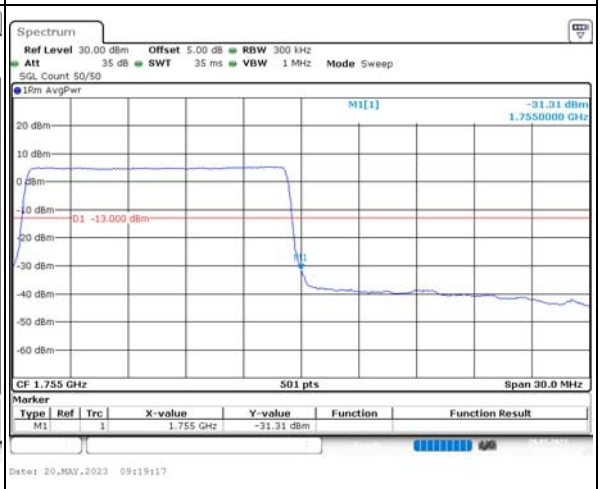
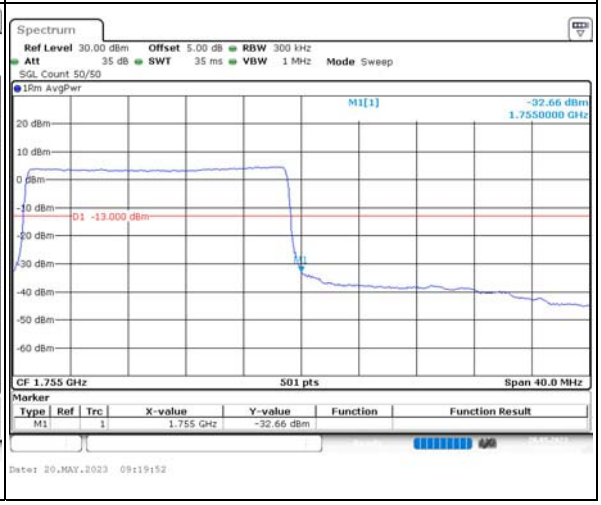
Spurious Emissions at Antenna Terminal		
Channel	**15MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal		
Channel	**20MHz Bandwidth QPSK**	
Lowest		
Middle		
Highest		

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

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

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

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

4.8 Antenna Port Test Data and Results for LTE Band 5

Serial Number:	25TU-1	Test Date:	2023/05/20~2023/06/20
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	22.3~26.8	Relative Humidity: (%)	39~59	ATM Pressure: (kPa)	100.1~102.3

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2022/07/15	2023/07/14
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Power Splitter	1515	RA914	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2022/07/15	2023/07/14
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022/09/29	2023/09/28
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

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

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	23.01	22.98	22.61	22.00	38.45
	RB1#3	22.95	22.81	22.75		
	RB1#5	22.96	22.70	22.73		
	RB3#0	23.24	22.87	22.45		
	RB3#3	23.25	22.80	22.62		
	RB6#0	22.08	21.75	21.57		
1.4MHz 16QAM	RB1#0	22.74	21.34	21.54	21.52	38.45
	RB1#3	22.77	21.31	21.73		
	RB1#5	22.76	21.34	21.67		
	RB3#0	22.07	21.64	21.38		
	RB3#3	22.00	21.63	21.54		
	RB6#0	21.25	20.92	20.78		
3MHz QPSK	RB1#0	23.02	22.78	22.34	21.77	38.45
	RB1#8	22.98	22.73	22.43		
	RB1#14	22.96	22.69	22.60		
	RB6#0	22.09	21.82	21.50		
	RB6#9	22.05	21.76	21.52		
	RB15#0	22.02	21.68	21.49		
3MHz 16QAM	RB1#0	22.78	21.42	21.76	21.53	38.45
	RB1#8	22.78	21.34	21.72		
	RB1#14	22.75	21.36	21.96		
	RB6#0	21.25	21.13	20.59		
	RB6#9	21.15	21.06	20.60		
	RB15#0	21.23	20.83	20.71		
5MHz QPSK	RB1#0	23.12	22.89	22.48	21.87	38.45
	RB1#13	23.12	22.61	22.41		
	RB1#24	22.98	22.66	22.74		
	RB15#0	22.06	21.86	21.59		
	RB15#10	21.99	21.69	21.46		
	RB25#0	22.09	21.72	21.42		
5MHz 16QAM	RB1#0	22.28	21.54	20.67	21.03	38.45
	RB1#13	22.23	21.43	20.52		
	RB1#24	22.05	21.43	20.68		
	RB15#0	21.15	20.98	20.74		
	RB15#10	21.04	20.88	20.71		
	RB25#0	21.14	20.79	20.78		
10MHz QPSK	RB1#0	23.15	22.60	22.62	21.94	38.45
	RB1#25	23.02	22.75	22.51		
	RB1#49	23.19	22.74	22.49		

	RB25#0	22.04	21.86	21.62		
	RB25#25	21.94	21.68	21.42		
	RB50#0	21.84	21.83	21.70		
10MHz 16QAM	RB1#0	22.22	21.37	21.91	20.97	38.45
	RB1#25	22.13	21.32	21.87		
	RB1#49	22.15	21.19	21.79		
	RB25#0	21.21	21.11	20.77		
	RB25#25	21.16	20.91	20.67		
	RB50#0	21.11	20.84	20.77		
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	3.83	6.84	4.7	13
	RB50#0	5.51	5.71	5.33	13
10MHz 16QAM	RB1#0	4.78	7.83	5.74	13
	RB50#0	6.35	6.67	6.12	13
				Result:	**Pass**

FCC §2.1049, §22.905:Occupied Bandwidth

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
1.4MHz QPSK	1.102	1.108	1.102	1.356	1.308	1.296
1.4MHz 16QAM	1.102	1.108	1.108	1.290	1.362	1.284
3MHz QPSK	2.695	2.695	2.695	3.012	3.024	3.024
3MHz 16QAM	2.695	2.695	2.695	3.084	3.072	3.012
5MHz QPSK	4.531	4.531	4.551	5.200	5.420	5.320
5MHz 16QAM	4.551	4.571	4.511	5.280	5.320	4.860
10MHz QPSK	8.942	8.982	8.982	9.840	9.920	9.840
10MHz 16QAM	8.982	8.982	8.982	9.960	10.16	9.840
Note: The test plots please refer to the Plots of Occupied Bandwidth						

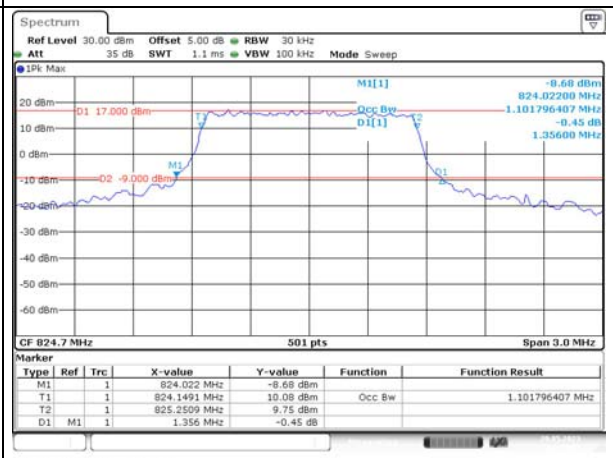
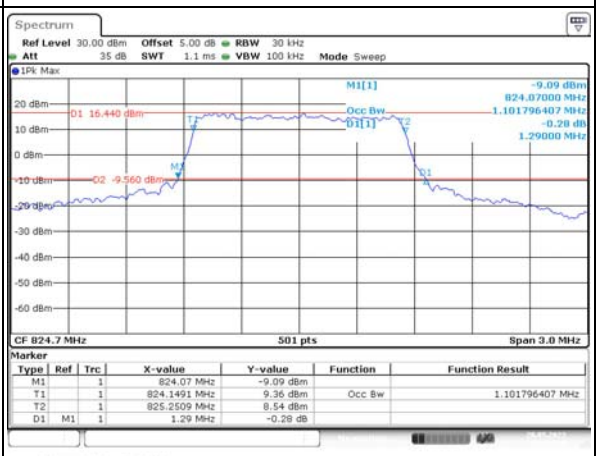
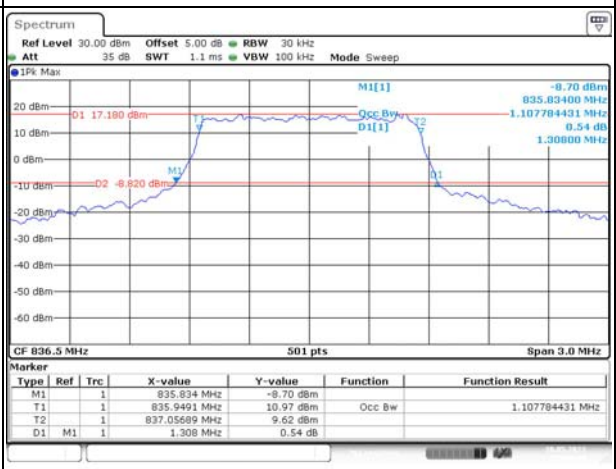
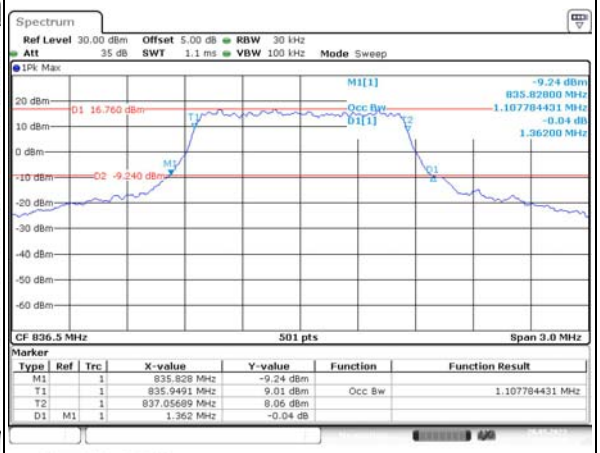
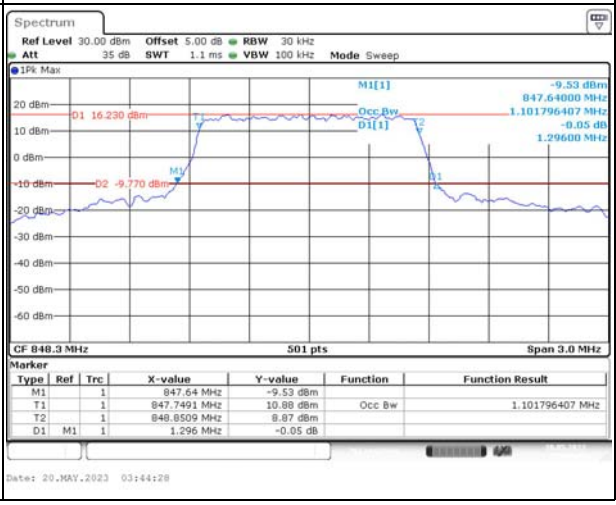
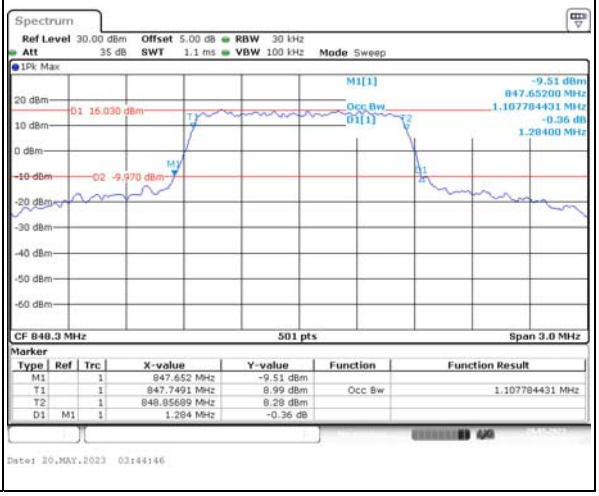
FCC §2.1051, §22.917(a):Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

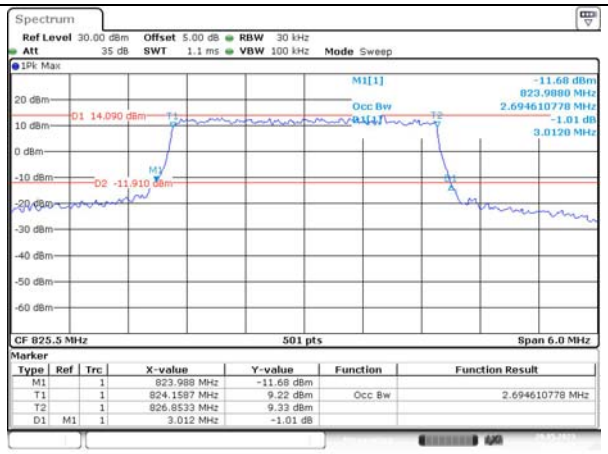
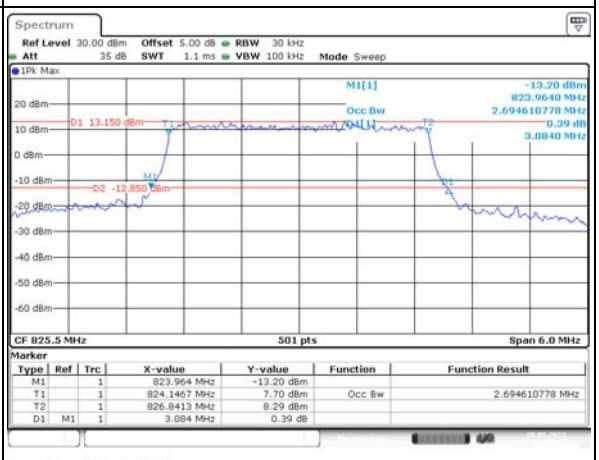
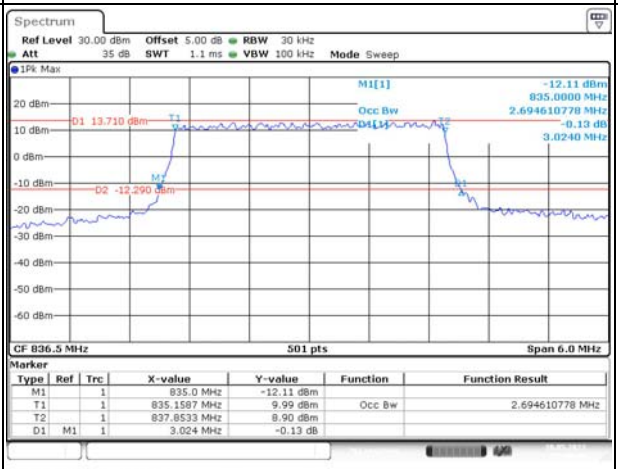
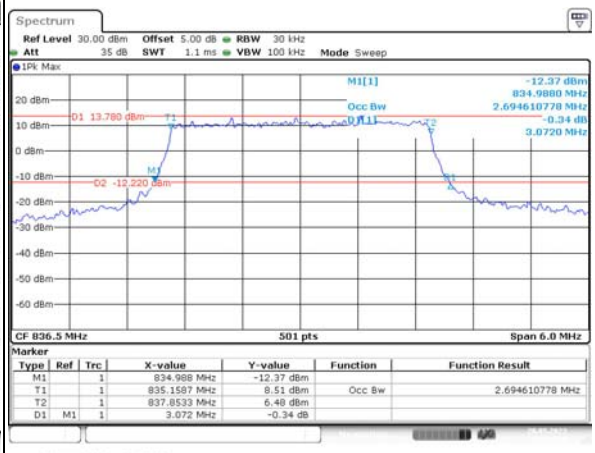
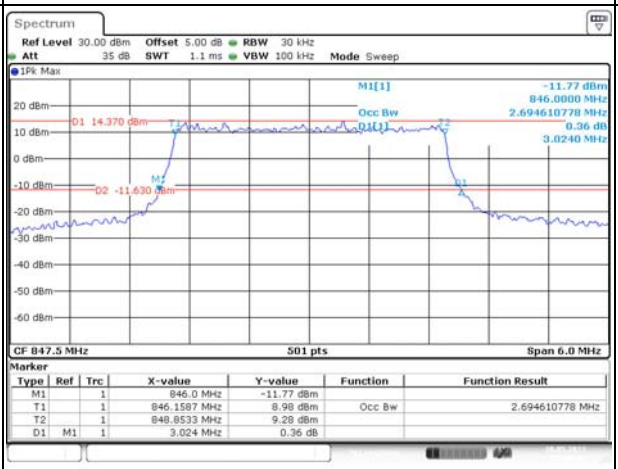
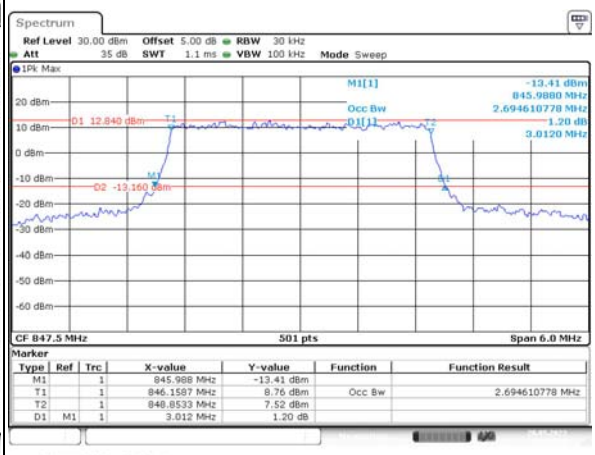
FCC §2.1051, §22.917(a):Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

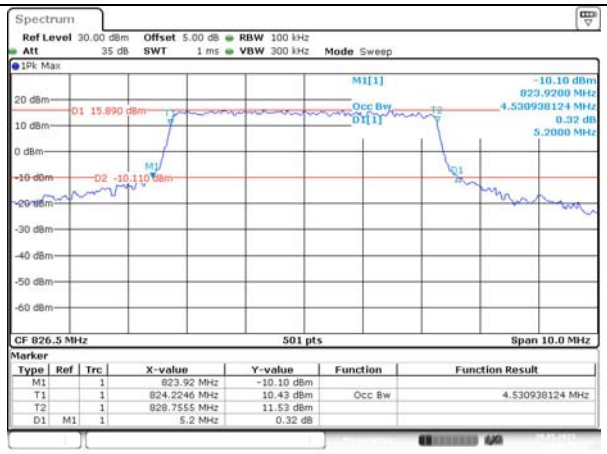
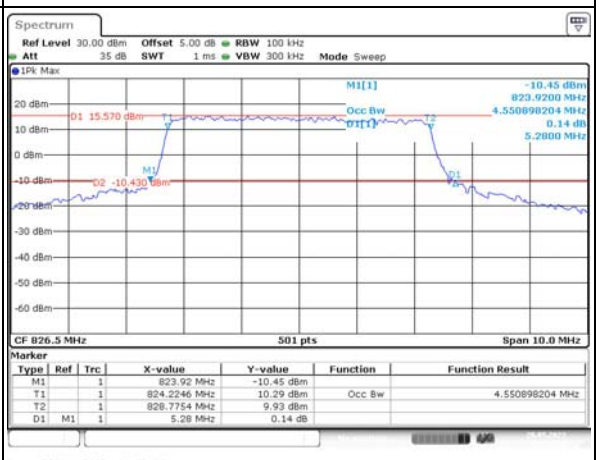
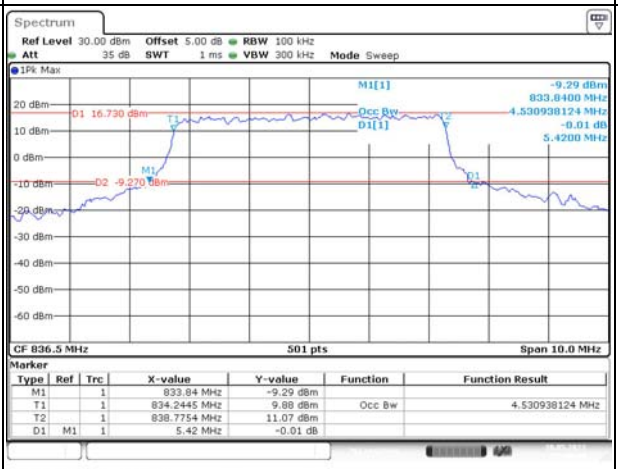
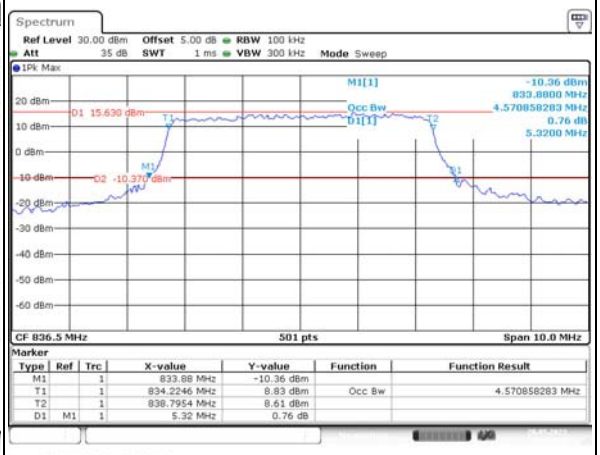
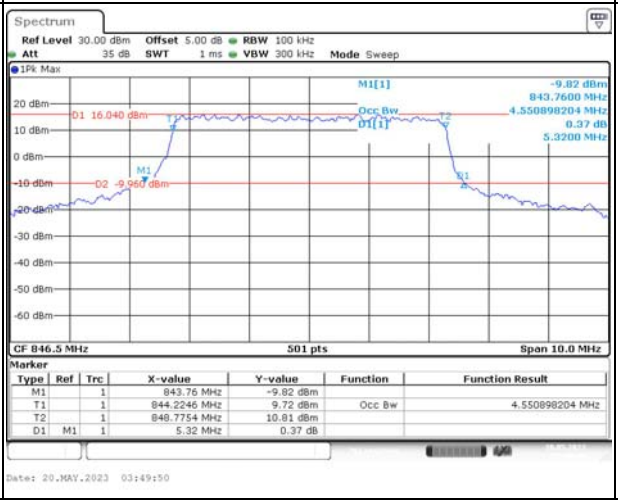
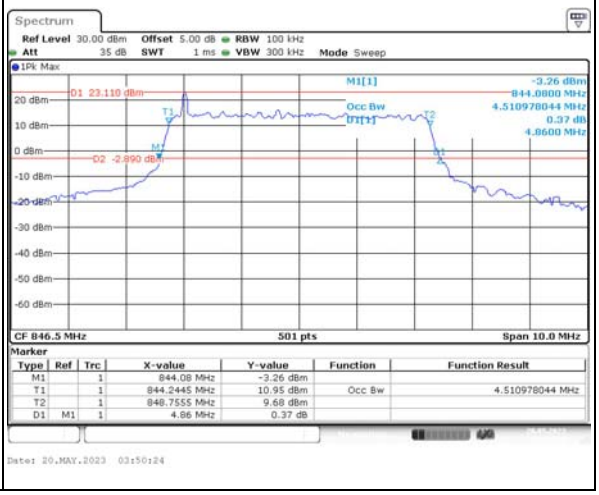
FCC §2.1055, §22.355: Frequency Stability					
Test Modulation:	10 MHz QPSK		Test Channel:	836.5	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.85	-54.87	-0.066	2.5
	-20	3.85	-5.05	-0.006	2.5
	-10	3.85	-6.93	-0.008	2.5
	0	3.85	7.71	0.009	2.5
	10	3.85	8.78	0.010	2.5
	20	3.85	-6.09	-0.007	2.5
	30	3.85	5.59	0.007	2.5
	40	3.85	8.18	0.010	2.5
	50	3.85	8.43	0.010	2.5
Frequency Stability vs. Voltage	20	3.5	-6.98	-0.008	2.5
	20	4.4	8.86	0.011	2.5
				Result:	**Pass**

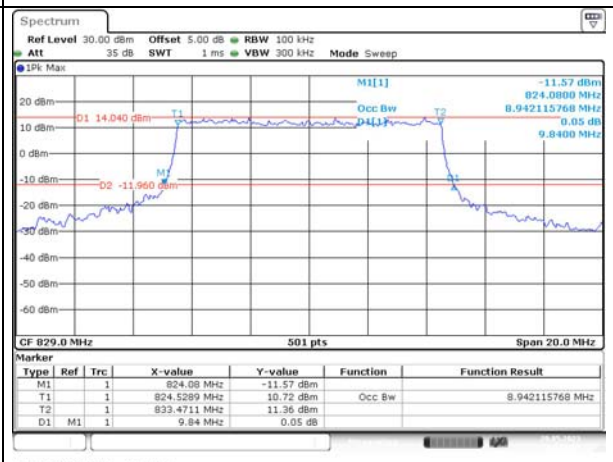
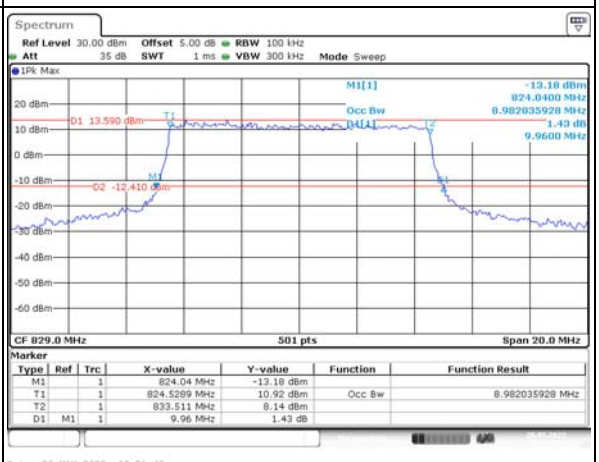
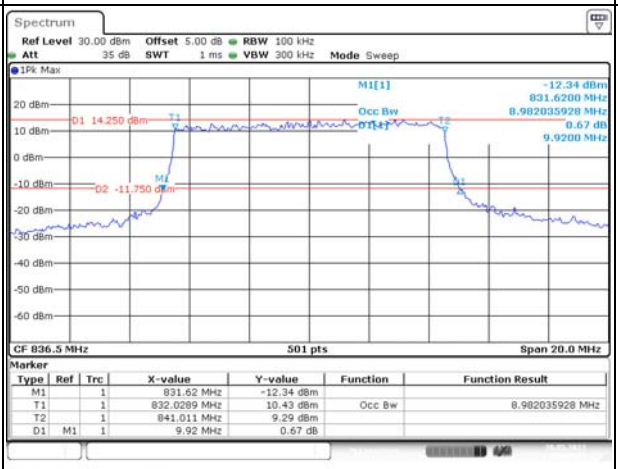
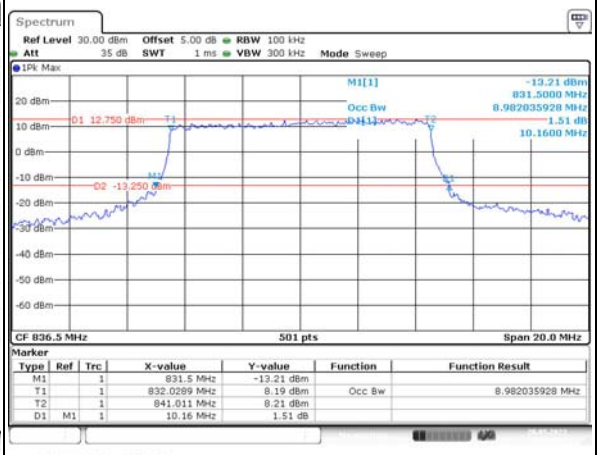
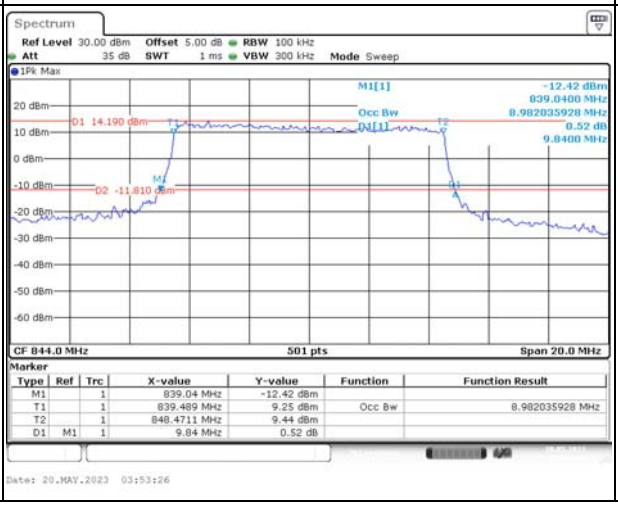
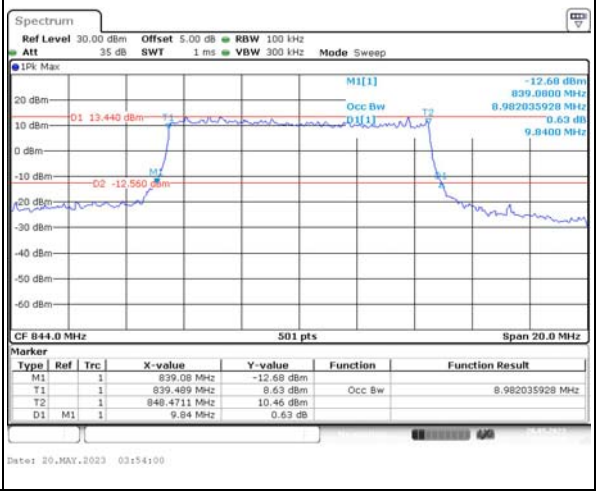
Test Modulation:	10 MHz 16QAM		Test Channel:	836.5	MHz
Test Item	Temperature(℃)	Voltage(V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.85	-45.32	-0.054	2.5
	-20	3.85	9.49	0.011	2.5
	-10	3.85	5.52	0.007	2.5
	0	3.85	7.41	0.009	2.5
	10	3.85	-5.79	-0.007	2.5
	20	3.85	-9.92	-0.012	2.5
	30	3.85	5.01	0.006	2.5
	40	3.85	-7.72	-0.009	2.5
	50	3.85	9.85	0.012	2.5
Frequency Stability vs. Voltage	20	3.5	-9.23	-0.011	2.5
	20	4.4	-6.21	-0.007	2.5
				Result:	**Pass**

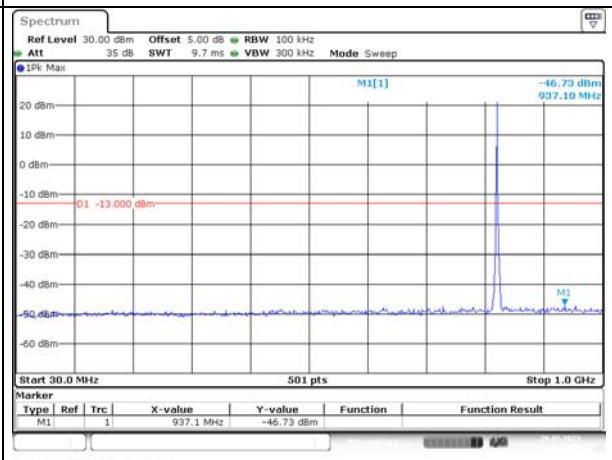
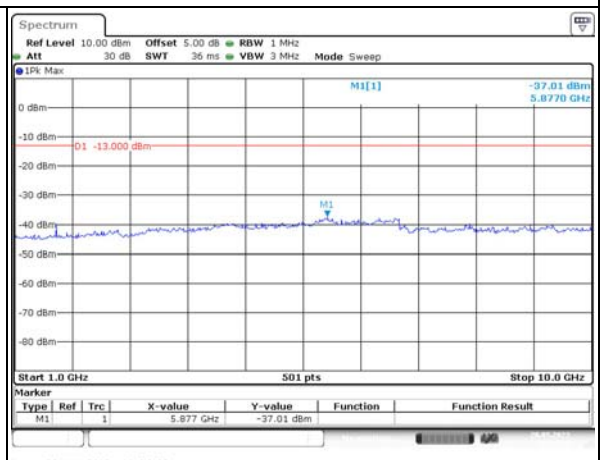
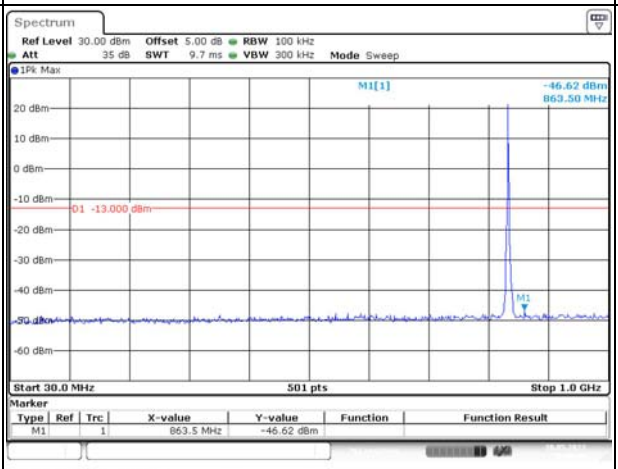
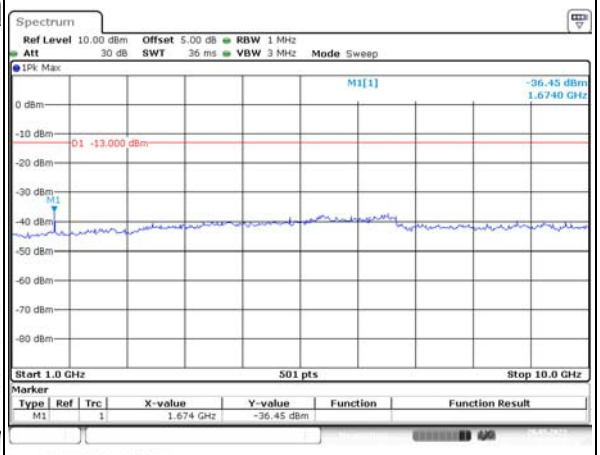
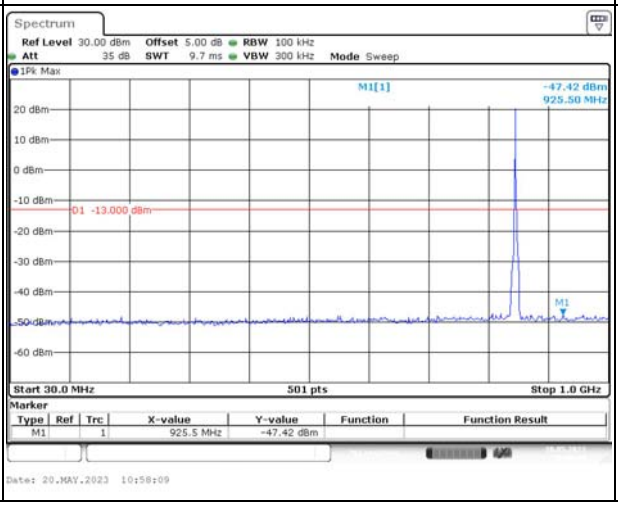
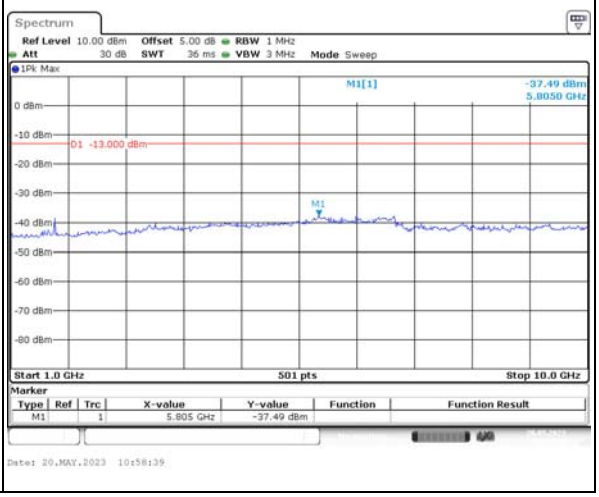
Test Plots(Note: The 5.0dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer)**:**

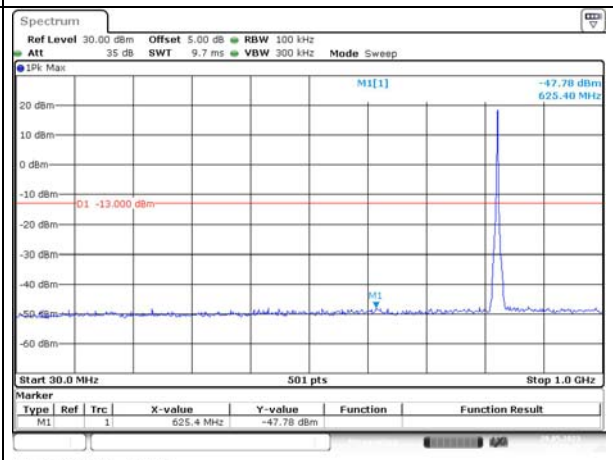
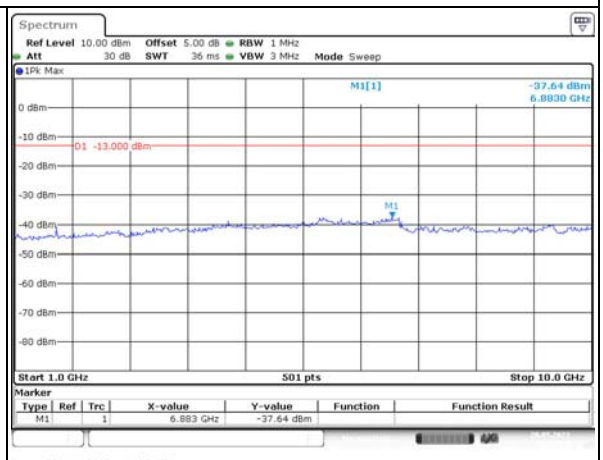
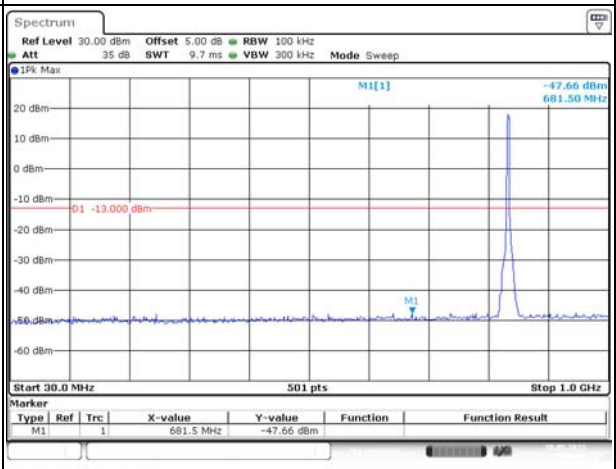
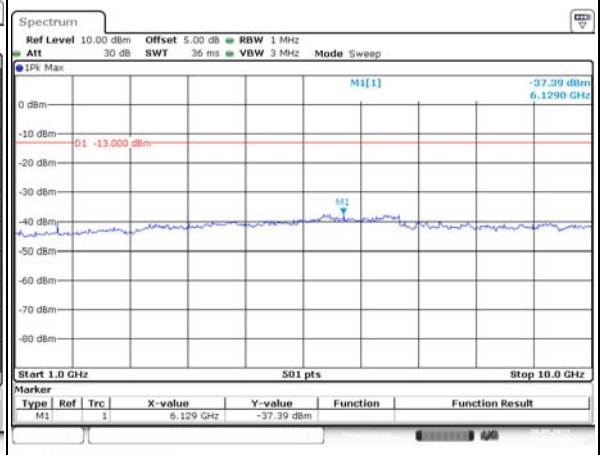
Occupied Bandwidth		
Channel	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

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

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

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

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

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