

Appendix for LTE Band 13

Product Name: 5G Window CPE

Model No: TITAN 5100

Appendix A: Average Power Output Data

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dBm)	Verdict
Band13	5MHz	QPSK	23205	1RB#0	22.42	PASS
Band13	5MHz	16QAM	23205	1RB#0	21.49	PASS
Band13	5MHz	QPSK	23205	1RB#12	22.44	PASS
Band13	5MHz	16QAM	23205	1RB#12	21.32	PASS
Band13	5MHz	QPSK	23205	1RB#24	22.42	PASS
Band13	5MHz	16QAM	23205	1RB#24	21.42	PASS
Band13	5MHz	QPSK	23205	12RB#0	21.38	PASS
Band13	5MHz	16QAM	23205	12RB#0	20.43	PASS
Band13	5MHz	QPSK	23205	12RB#6	21.43	PASS
Band13	5MHz	16QAM	23205	12RB#6	20.45	PASS
Band13	5MHz	QPSK	23205	12RB#13	21.43	PASS
Band13	5MHz	16QAM	23205	12RB#13	20.35	PASS
Band13	5MHz	QPSK	23205	25RB#0	21.50	PASS
Band13	5MHz	16QAM	23205	25RB#0	20.50	PASS
Band13	5MHz	QPSK	23230	1RB#0	22.44	PASS
Band13	5MHz	16QAM	23230	1RB#0	21.34	PASS
Band13	5MHz	QPSK	23230	1RB#12	22.47	PASS
Band13	5MHz	16QAM	23230	1RB#12	21.46	PASS
Band13	5MHz	QPSK	23230	1RB#24	22.56	PASS
Band13	5MHz	16QAM	23230	1RB#24	21.49	PASS
Band13	5MHz	QPSK	23230	12RB#0	21.39	PASS
Band13	5MHz	16QAM	23230	12RB#0	20.33	PASS
Band13	5MHz	QPSK	23230	12RB#6	21.33	PASS
Band13	5MHz	16QAM	23230	12RB#6	20.35	PASS
Band13	5MHz	QPSK	23230	12RB#13	21.50	PASS
Band13	5MHz	16QAM	23230	12RB#13	20.35	PASS
Band13	5MHz	QPSK	23230	25RB#0	21.39	PASS
Band13	5MHz	16QAM	23230	25RB#0	20.41	PASS
Band13	5MHz	QPSK	23255	1RB#0	22.52	PASS
Band13	5MHz	16QAM	23255	1RB#0	21.39	PASS
Band13	5MHz	QPSK	23255	1RB#12	22.58	PASS
Band13	5MHz	16QAM	23255	1RB#12	21.46	PASS
Band13	5MHz	QPSK	23255	1RB#24	22.52	PASS
Band13	5MHz	16QAM	23255	1RB#24	21.46	PASS
Band13	5MHz	QPSK	23255	12RB#0	21.41	PASS

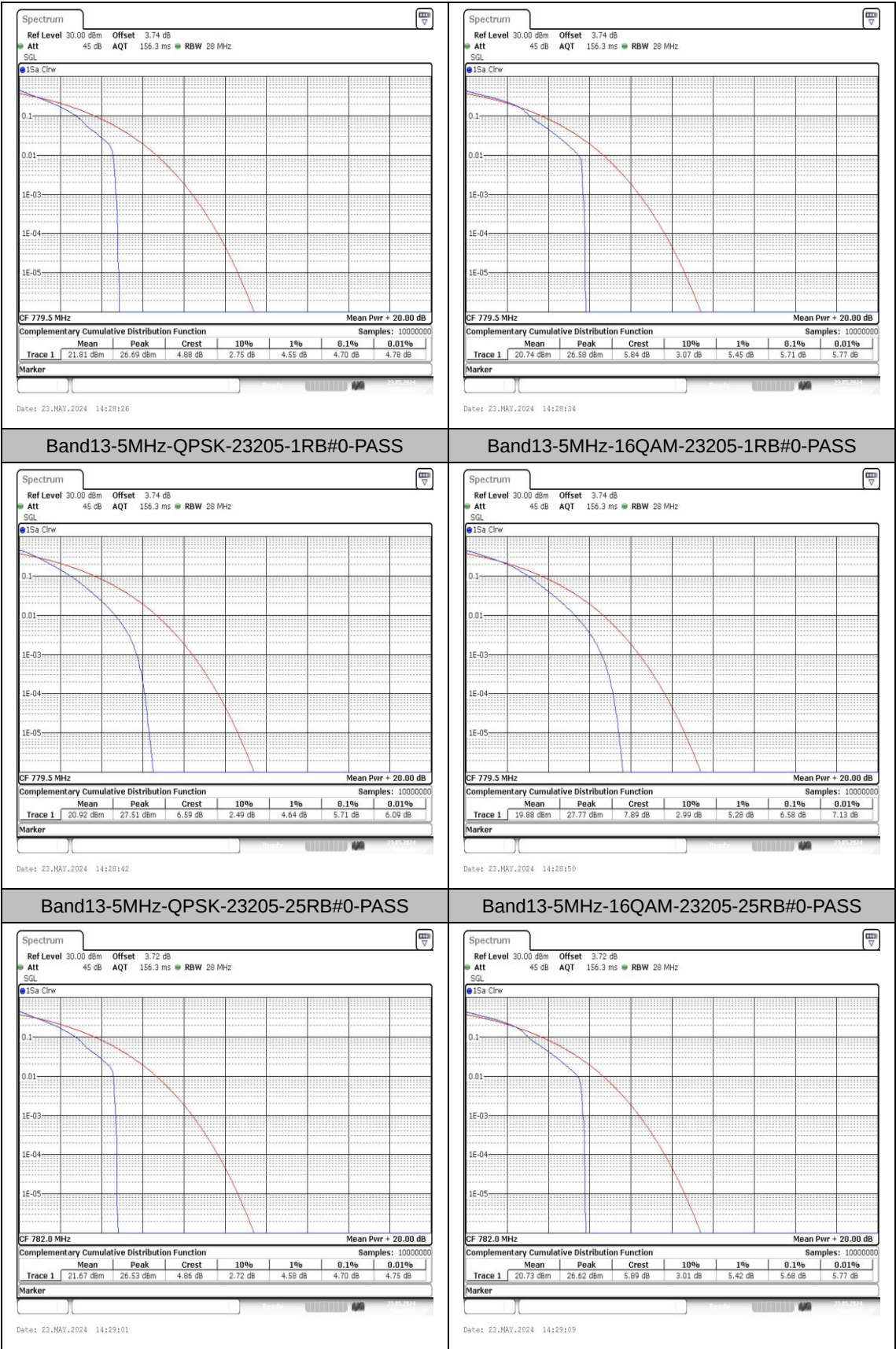
Band13	5MHz	16QAM	23255	12RB#0	20.49	PASS
Band13	5MHz	QPSK	23255	12RB#6	21.46	PASS
Band13	5MHz	16QAM	23255	12RB#6	20.48	PASS
Band13	5MHz	QPSK	23255	12RB#13	21.53	PASS
Band13	5MHz	16QAM	23255	12RB#13	20.51	PASS
Band13	5MHz	QPSK	23255	25RB#0	21.42	PASS
Band13	5MHz	16QAM	23255	25RB#0	20.43	PASS
Band13	10MHz	QPSK	23230	1RB#0	22.47	PASS
Band13	10MHz	16QAM	23230	1RB#0	21.53	PASS
Band13	10MHz	QPSK	23230	1RB#24	22.48	PASS
Band13	10MHz	16QAM	23230	1RB#24	21.51	PASS
Band13	10MHz	QPSK	23230	1RB#49	22.43	PASS
Band13	10MHz	16QAM	23230	1RB#49	21.48	PASS
Band13	10MHz	QPSK	23230	25RB#0	21.44	PASS
Band13	10MHz	16QAM	23230	25RB#0	20.51	PASS
Band13	10MHz	QPSK	23230	25RB#12	21.46	PASS
Band13	10MHz	16QAM	23230	25RB#12	20.48	PASS
Band13	10MHz	QPSK	23230	25RB#25	21.52	PASS
Band13	10MHz	16QAM	23230	25RB#25	20.62	PASS
Band13	10MHz	QPSK	23230	50RB#0	21.57	PASS
Band13	10MHz	16QAM	23230	50RB#0	20.46	PASS

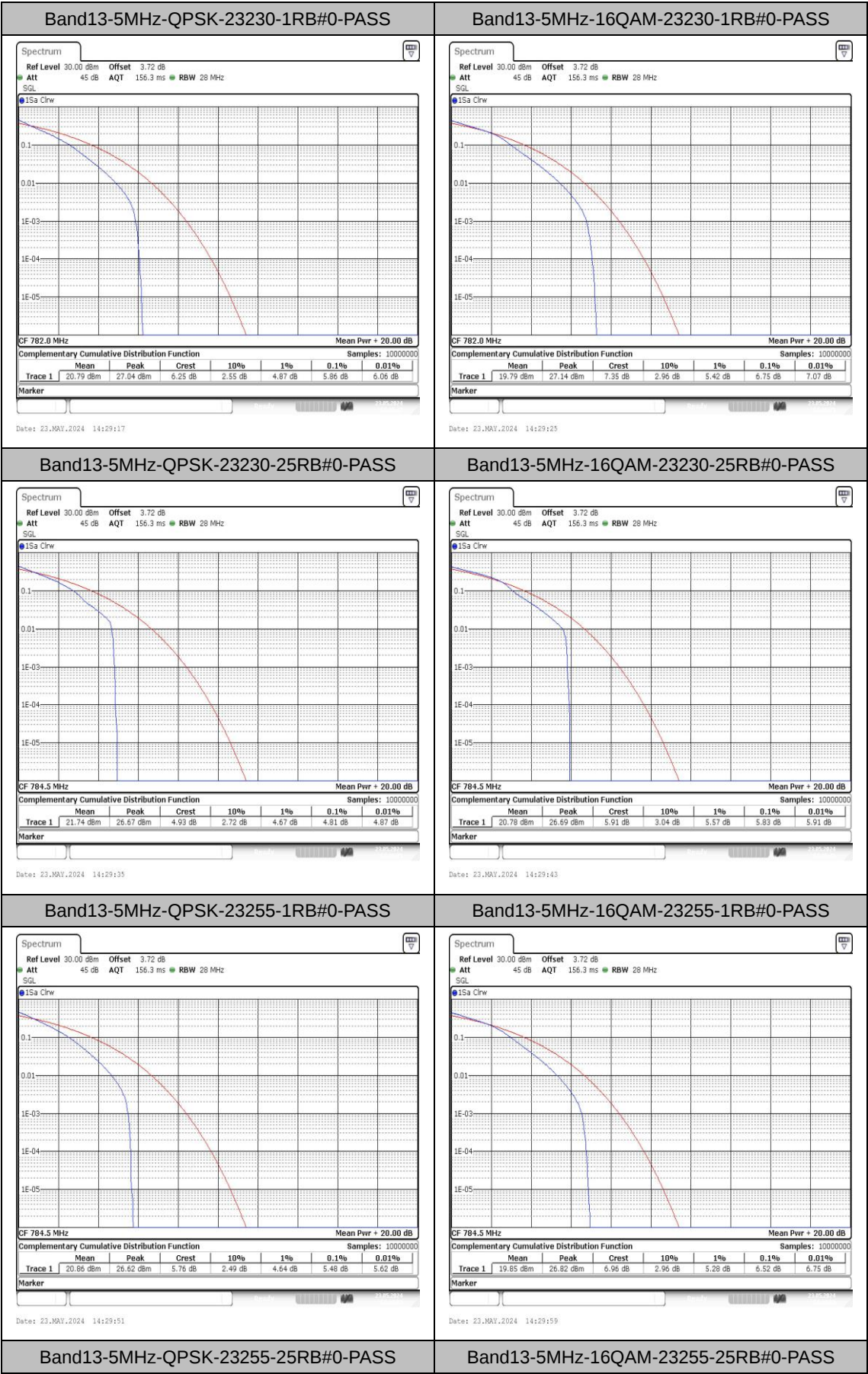
Appendix B: Peak-to-Average Ratio(CCDF)

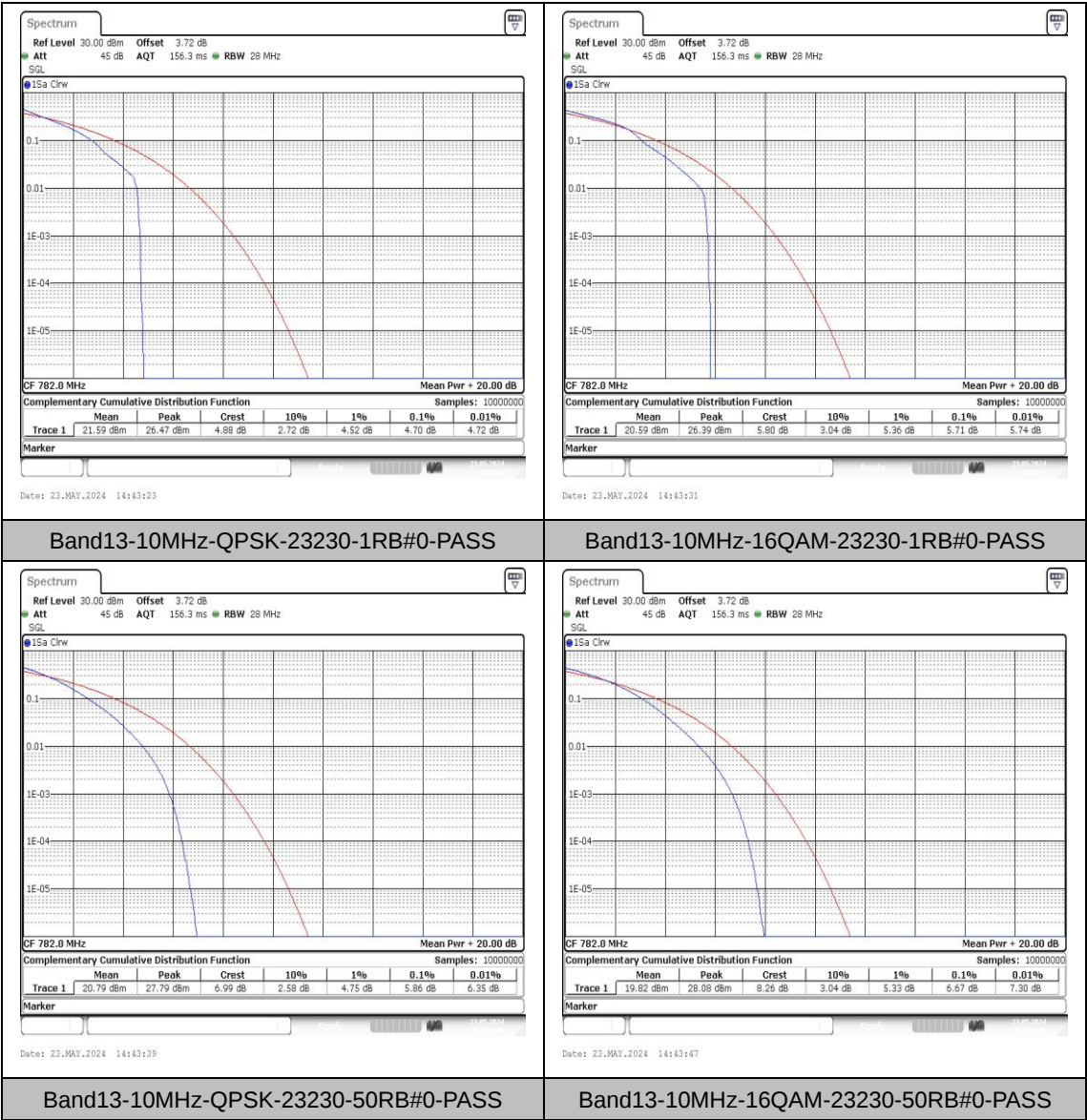
Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band13	5MHz	QPSK	23205	1RB#0	4.70	13	PASS
Band13	5MHz	16QAM	23205	1RB#0	5.71	13	PASS
Band13	5MHz	QPSK	23205	25RB#0	5.71	13	PASS
Band13	5MHz	16QAM	23205	25RB#0	6.58	13	PASS
Band13	5MHz	QPSK	23230	1RB#0	4.70	13	PASS
Band13	5MHz	16QAM	23230	1RB#0	5.68	13	PASS
Band13	5MHz	QPSK	23230	25RB#0	5.86	13	PASS
Band13	5MHz	16QAM	23230	25RB#0	6.75	13	PASS
Band13	5MHz	QPSK	23255	1RB#0	4.81	13	PASS
Band13	5MHz	16QAM	23255	1RB#0	5.83	13	PASS
Band13	5MHz	QPSK	23255	25RB#0	5.48	13	PASS
Band13	5MHz	16QAM	23255	25RB#0	6.52	13	PASS
Band13	10MHz	QPSK	23230	1RB#0	4.70	13	PASS
Band13	10MHz	16QAM	23230	1RB#0	5.71	13	PASS
Band13	10MHz	QPSK	23230	50RB#0	5.86	13	PASS
Band13	10MHz	16QAM	23230	50RB#0	6.67	13	PASS

Test Graphs





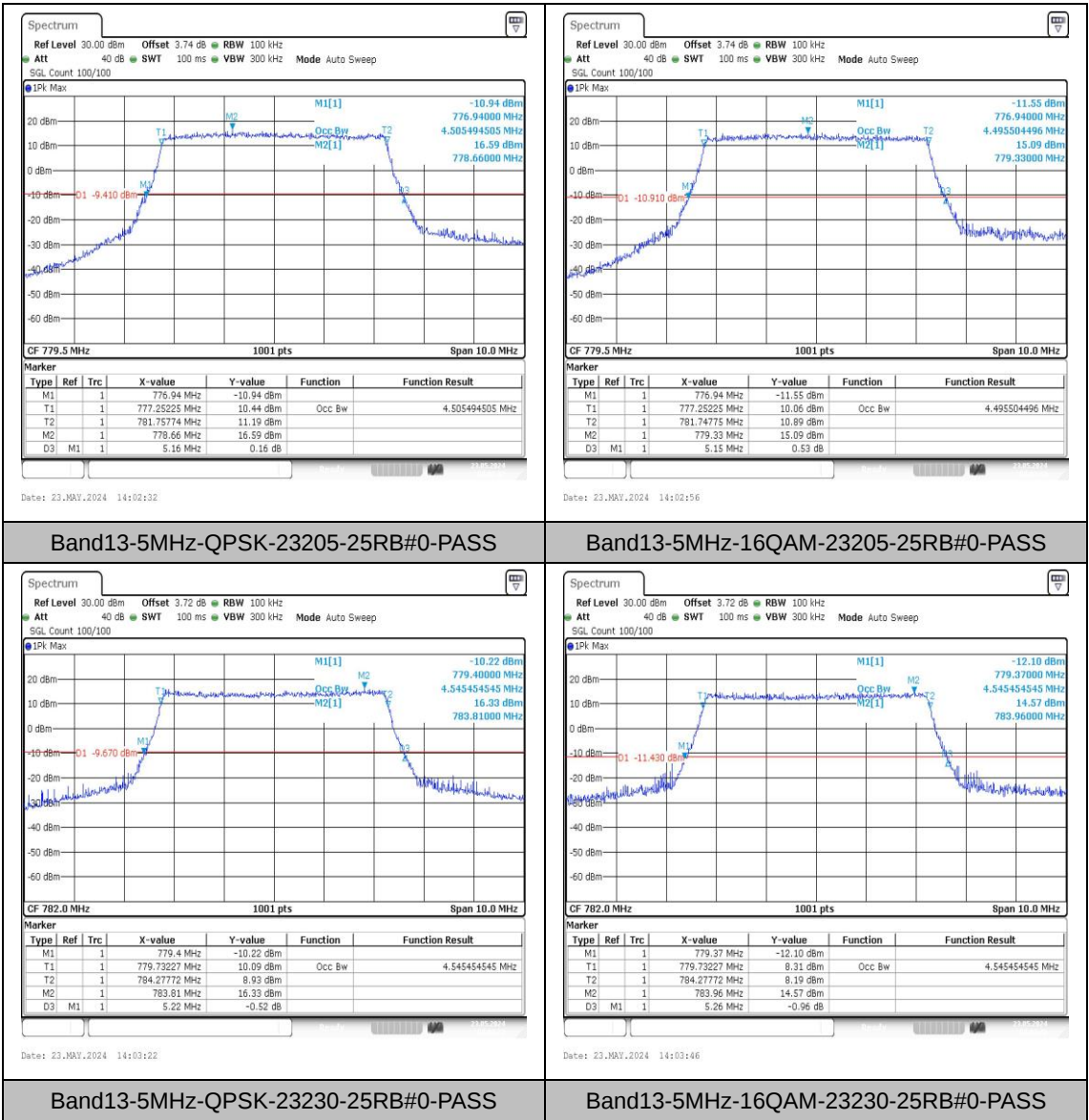


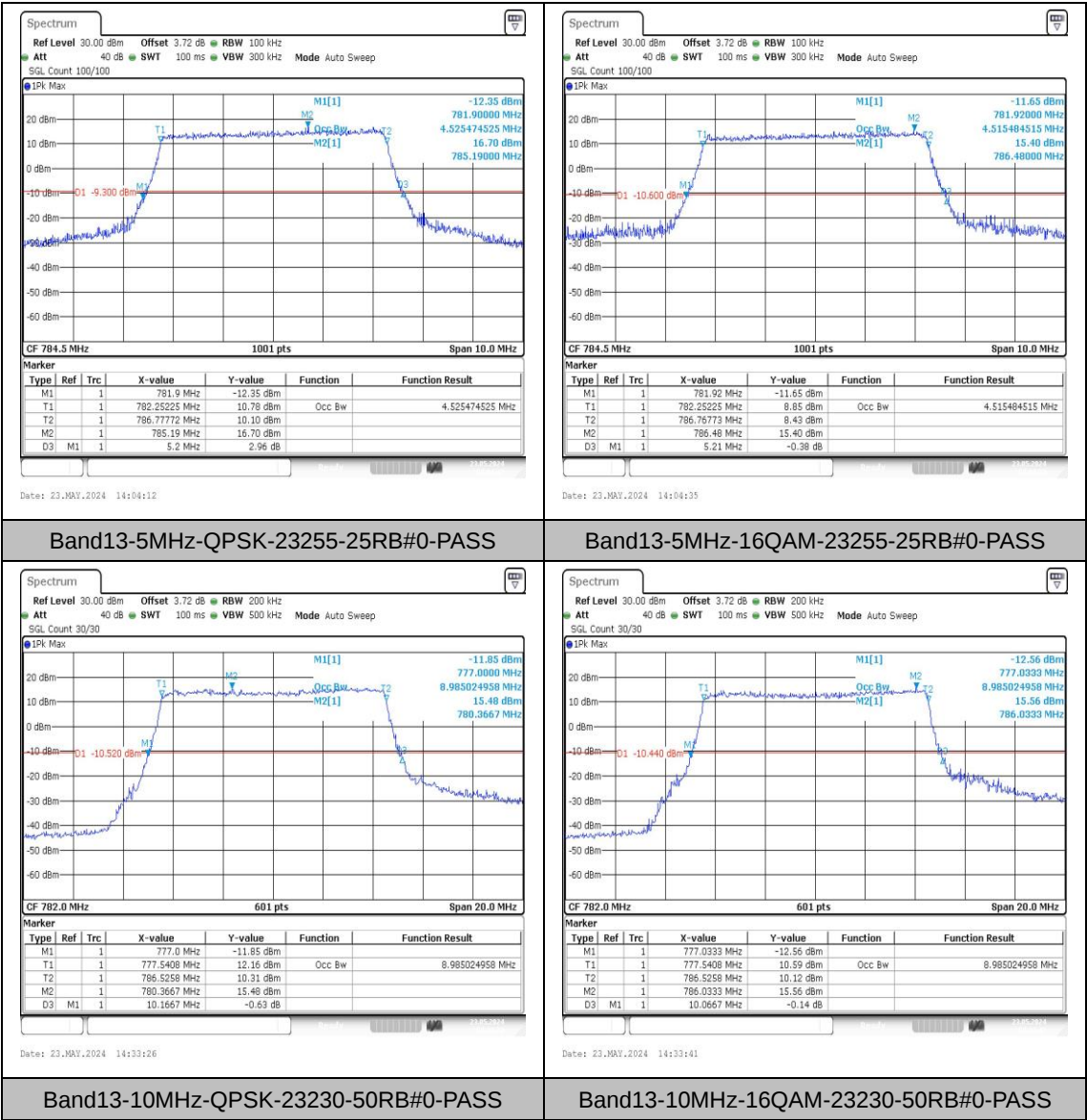
Appendix C: 26dB Bandwidth and Occupied Bandwidth

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	4.505	5.16	PASS
Band13	5MHz	16QAM	23205	25RB#0	4.496	5.15	PASS
Band13	5MHz	QPSK	23230	25RB#0	4.545	5.22	PASS
Band13	5MHz	16QAM	23230	25RB#0	4.545	5.26	PASS
Band13	5MHz	QPSK	23255	25RB#0	4.525	5.20	PASS
Band13	5MHz	16QAM	23255	25RB#0	4.515	5.21	PASS
Band13	10MHz	QPSK	23230	50RB#0	8.985	10.17	PASS
Band13	10MHz	16QAM	23230	50RB#0	8.985	10.07	PASS

Test Graphs



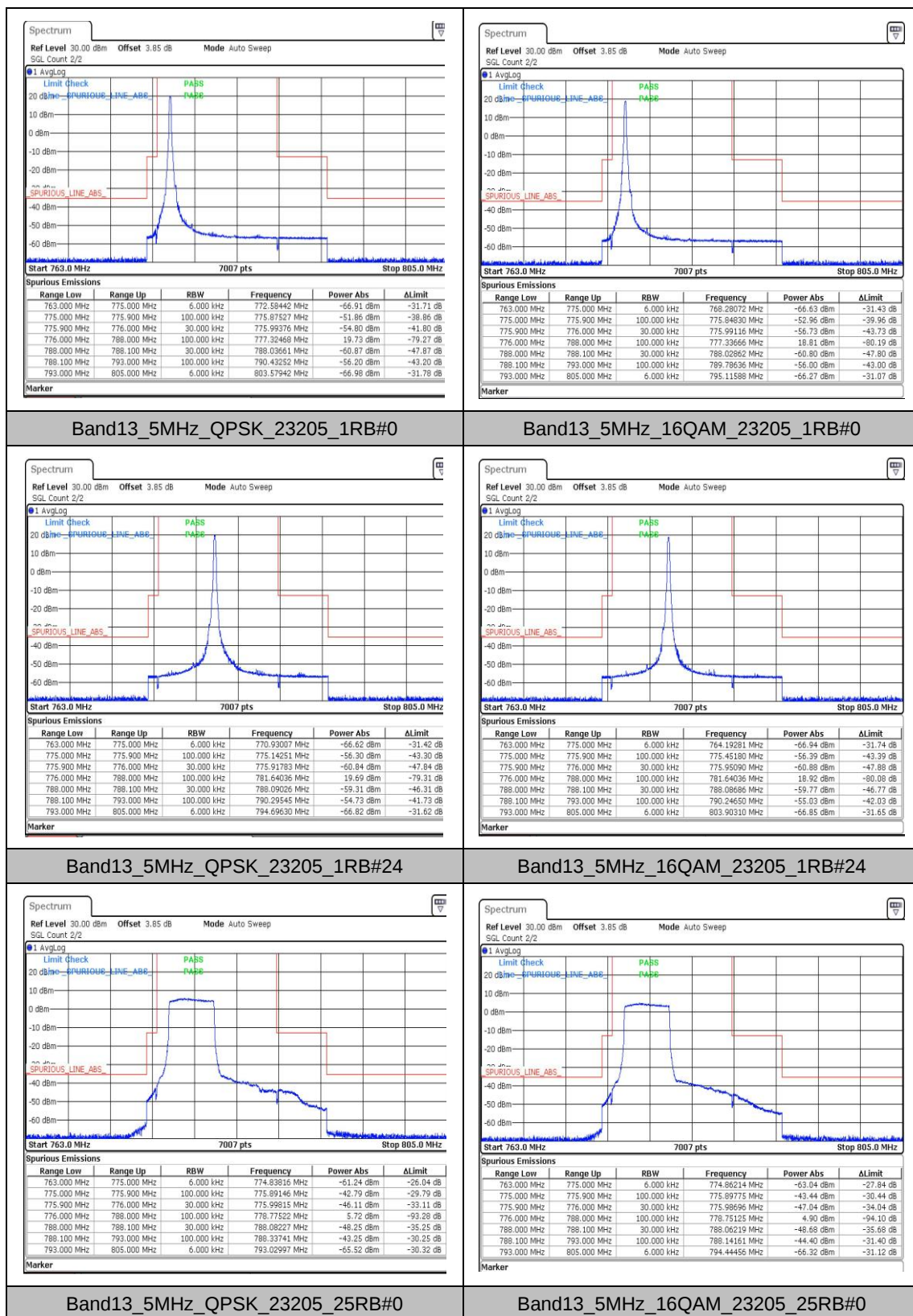


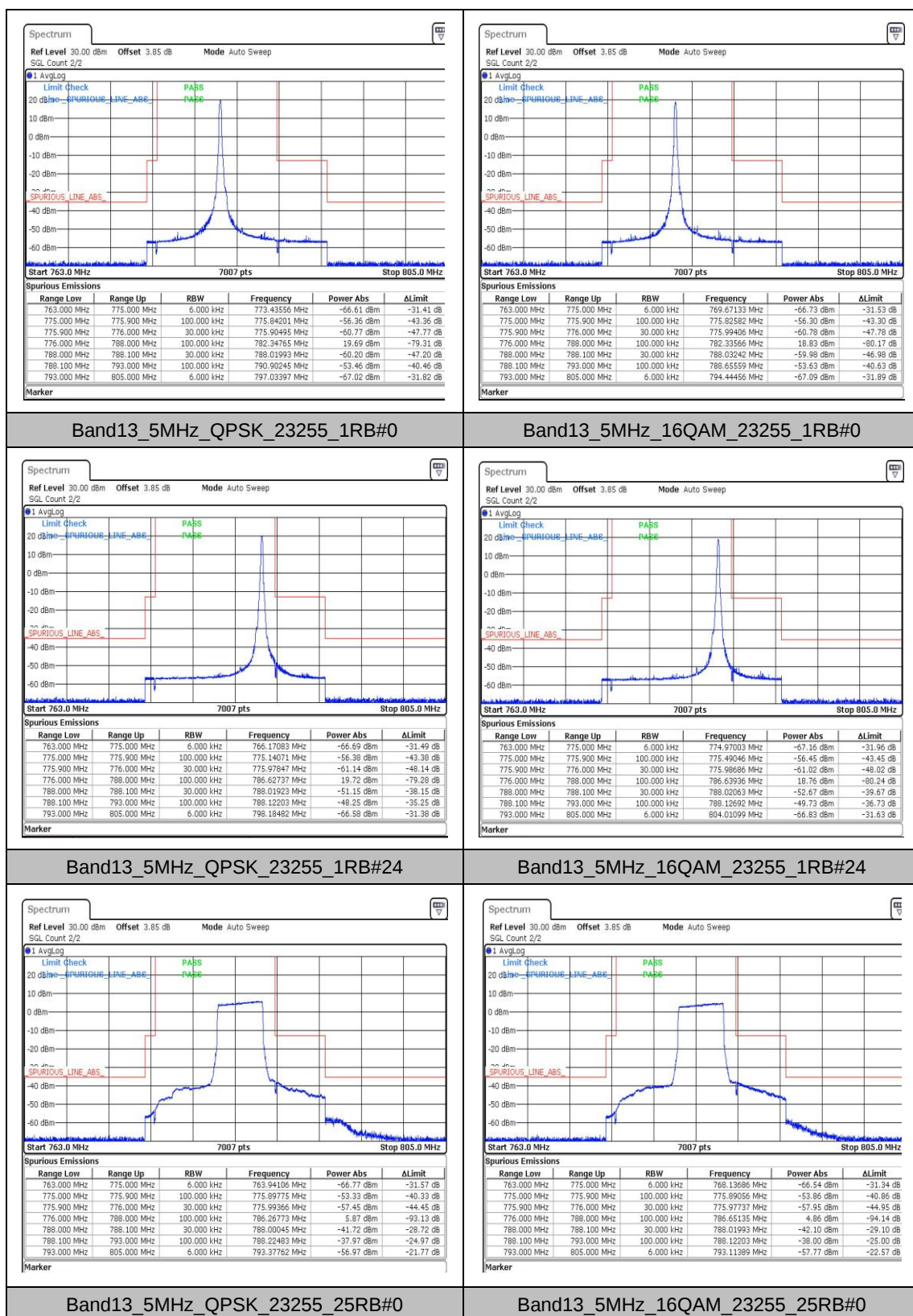
Appendix D: Band Edge

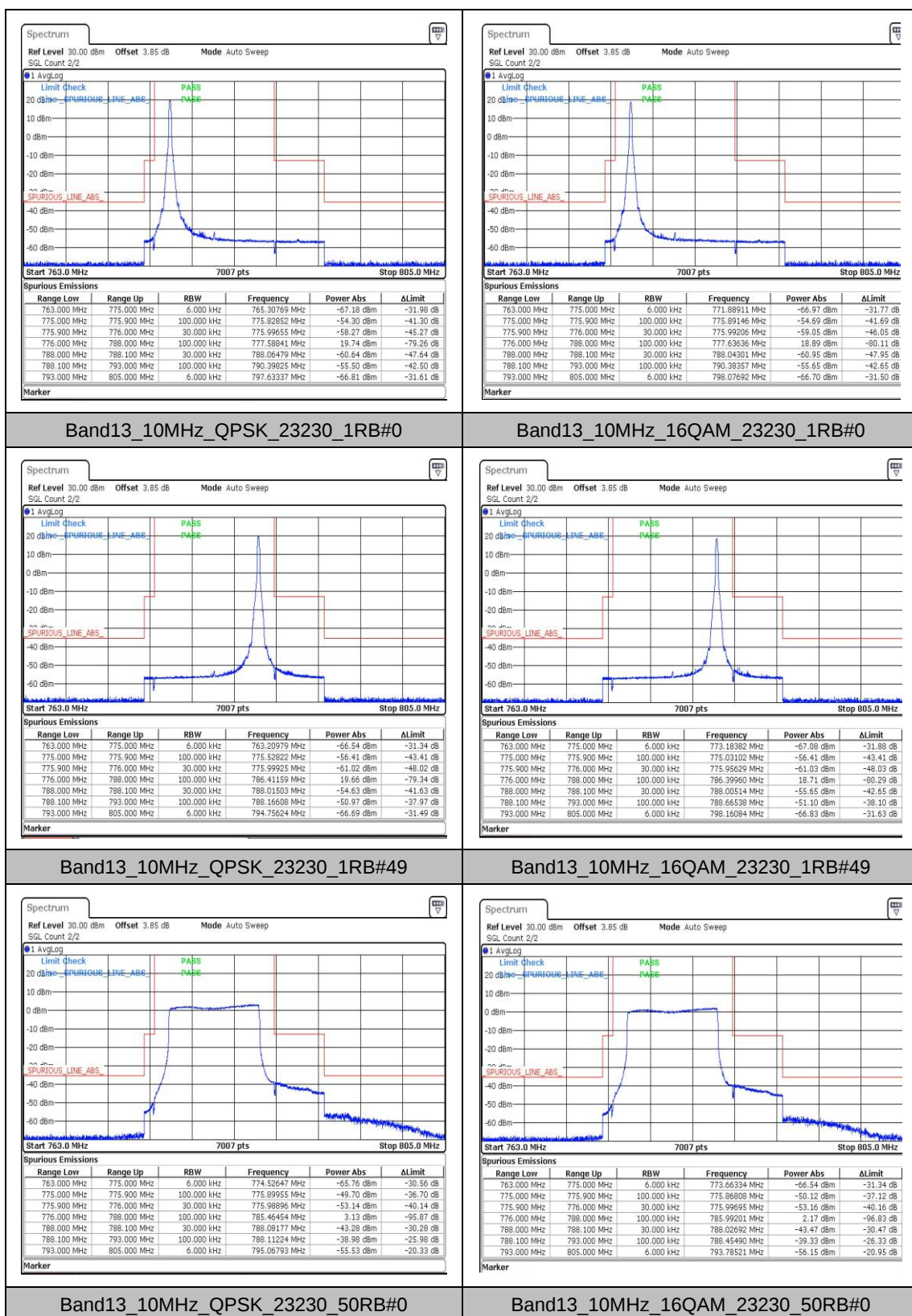
Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dBm)	Verdict
Band13	5MHz	QPSK	23205	1RB#0	-66.91	PASS
Band13	5MHz	16QAM	23205	1RB#0	-66.27	PASS
Band13	5MHz	QPSK	23205	1RB#24	-66.62	PASS
Band13	5MHz	16QAM	23205	1RB#24	-66.85	PASS
Band13	5MHz	QPSK	23205	25RB#0	-61.24	PASS
Band13	5MHz	16QAM	23205	25RB#0	-63.04	PASS
Band13	5MHz	QPSK	23255	1RB#0	-66.61	PASS
Band13	5MHz	16QAM	23255	1RB#0	-66.73	PASS
Band13	5MHz	QPSK	23255	1RB#24	-66.58	PASS
Band13	5MHz	16QAM	23255	1RB#24	-66.83	PASS
Band13	5MHz	QPSK	23255	25RB#0	-56.97	PASS
Band13	5MHz	16QAM	23255	25RB#0	-57.77	PASS
Band13	10MHz	QPSK	23230	1RB#0	-66.81	PASS
Band13	10MHz	16QAM	23230	1RB#0	-66.70	PASS
Band13	10MHz	QPSK	23230	1RB#49	-66.54	PASS
Band13	10MHz	16QAM	23230	1RB#49	-66.83	PASS
Band13	10MHz	QPSK	23230	50RB#0	-55.53	PASS
Band13	10MHz	16QAM	23230	50RB#0	-56.15	PASS

Test Graphs







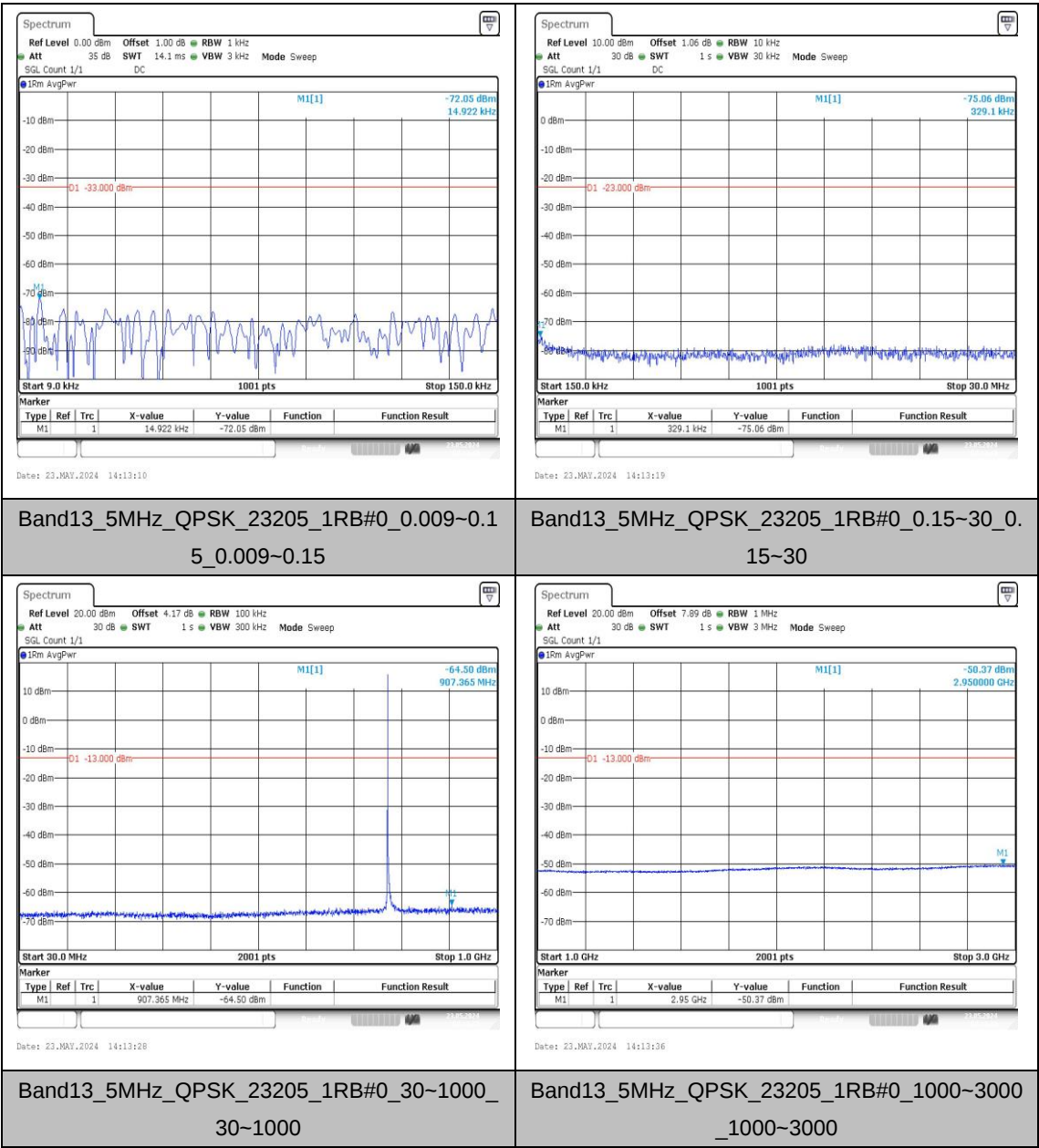
Appendix E: Conducted Spurious Emission

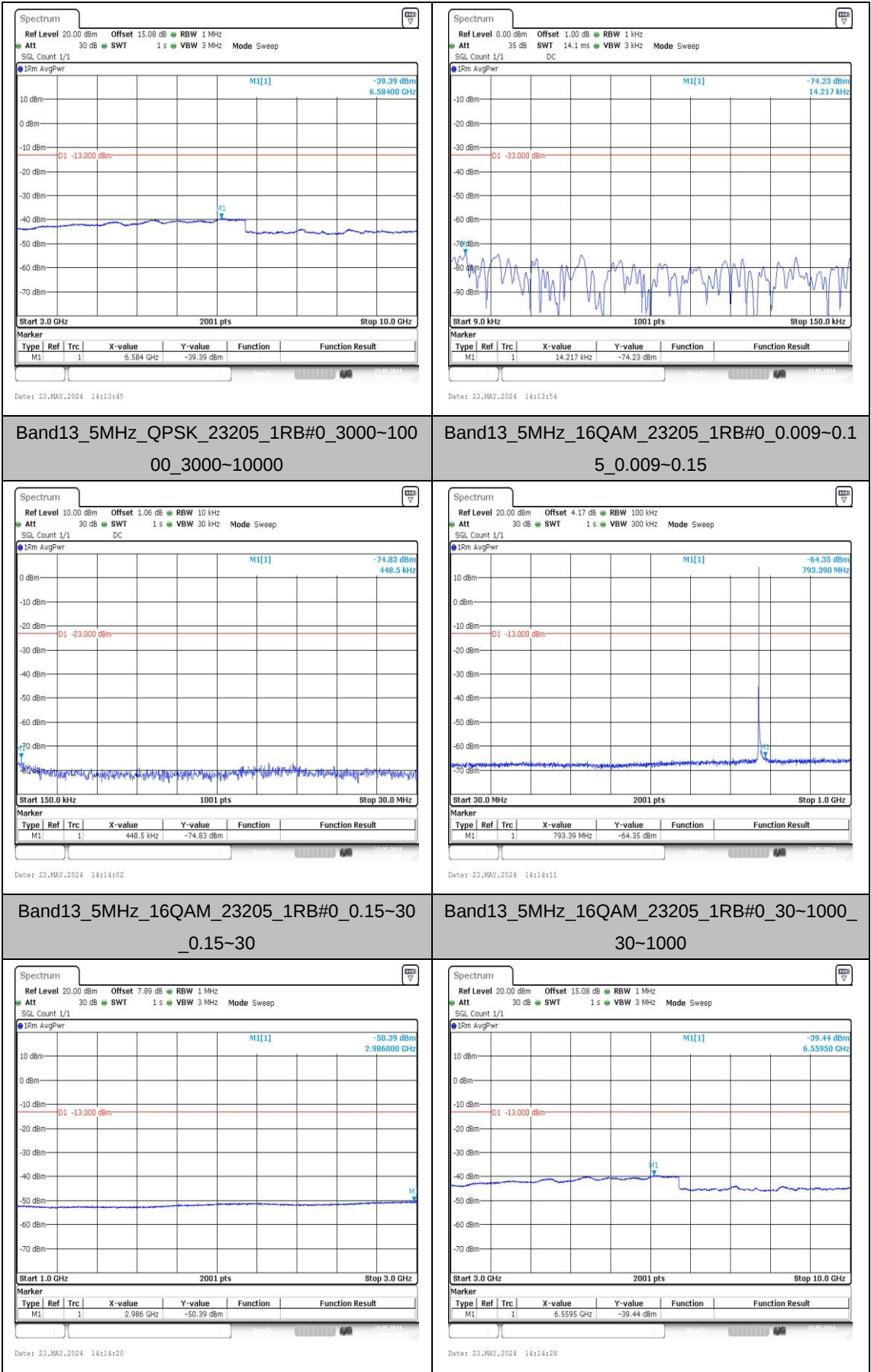
Test Result

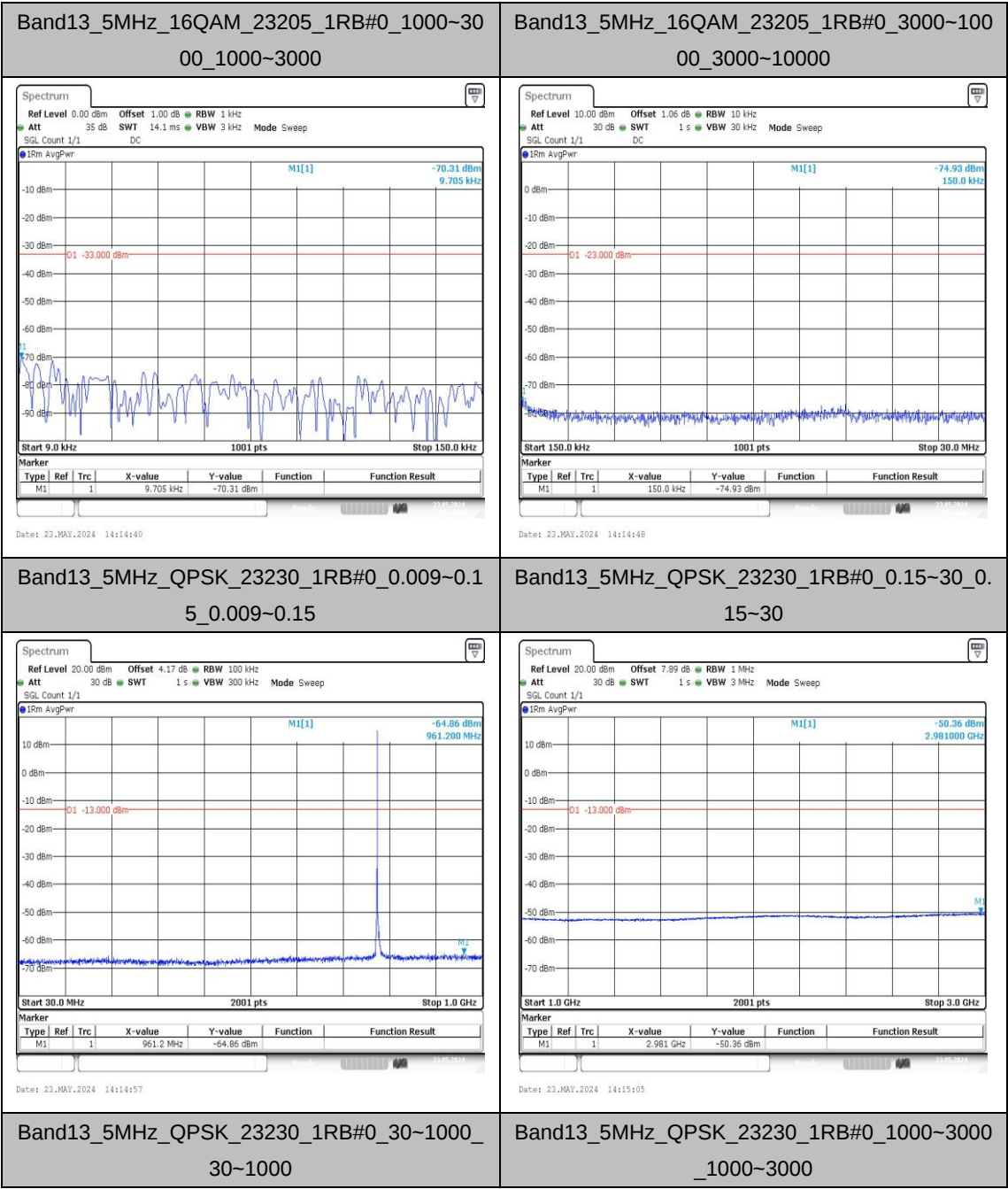
Band	Bandwidth	Modulation	Channel	RB Configuration	Frequency Range	Result (dBm)	Verdict
Band13	5MHz	QPSK	23205	1RB#0	0.009~0.15	-72.05	PASS
Band13	5MHz	QPSK	23205	1RB#0	0.15~30	-75.06	PASS
Band13	5MHz	QPSK	23205	1RB#0	30~1000	-64.50	PASS
Band13	5MHz	QPSK	23205	1RB#0	1000~3000	-50.37	PASS
Band13	5MHz	QPSK	23205	1RB#0	3000~10000	-39.39	PASS
Band13	5MHz	16QAM	23205	1RB#0	0.009~0.15	-74.23	PASS
Band13	5MHz	16QAM	23205	1RB#0	0.15~30	-74.83	PASS
Band13	5MHz	16QAM	23205	1RB#0	30~1000	-64.35	PASS
Band13	5MHz	16QAM	23205	1RB#0	1000~3000	-50.39	PASS
Band13	5MHz	16QAM	23205	1RB#0	3000~10000	-39.44	PASS
Band13	5MHz	QPSK	23230	1RB#0	0.009~0.15	-70.31	PASS
Band13	5MHz	QPSK	23230	1RB#0	0.15~30	-74.93	PASS
Band13	5MHz	QPSK	23230	1RB#0	30~1000	-64.86	PASS
Band13	5MHz	QPSK	23230	1RB#0	1000~3000	-50.36	PASS
Band13	5MHz	QPSK	23230	1RB#0	3000~10000	-39.31	PASS
Band13	5MHz	16QAM	23230	1RB#0	0.009~0.15	-73.33	PASS
Band13	5MHz	16QAM	23230	1RB#0	0.15~30	-75.10	PASS
Band13	5MHz	16QAM	23230	1RB#0	30~1000	-64.85	PASS
Band13	5MHz	16QAM	23230	1RB#0	1000~3000	-50.46	PASS
Band13	5MHz	16QAM	23230	1RB#0	3000~10000	-39.41	PASS
Band13	5MHz	QPSK	23255	1RB#0	0.009~0.15	-74.27	PASS
Band13	5MHz	QPSK	23255	1RB#0	0.15~30	-73.82	PASS
Band13	5MHz	QPSK	23255	1RB#0	30~1000	-64.66	PASS
Band13	5MHz	QPSK	23255	1RB#0	1000~3000	-50.30	PASS
Band13	5MHz	QPSK	23255	1RB#0	3000~10000	-39.47	PASS
Band13	5MHz	16QAM	23255	1RB#0	0.009~0.15	-70.60	PASS
Band13	5MHz	16QAM	23255	1RB#0	0.15~30	-74.18	PASS
Band13	5MHz	16QAM	23255	1RB#0	30~1000	-64.75	PASS
Band13	5MHz	16QAM	23255	1RB#0	1000~3000	-50.37	PASS
Band13	5MHz	16QAM	23255	1RB#0	3000~10000	-39.47	PASS
Band13	10MHz	QPSK	23230	1RB#0	0.009~0.15	-73.29	PASS
Band13	10MHz	QPSK	23230	1RB#0	0.15~30	-76.13	PASS
Band13	10MHz	QPSK	23230	1RB#0	30~1000	-64.91	PASS
Band13	10MHz	QPSK	23230	1RB#0	1000~3000	-50.44	PASS
Band13	10MHz	QPSK	23230	1RB#0	3000~10000	-39.30	PASS

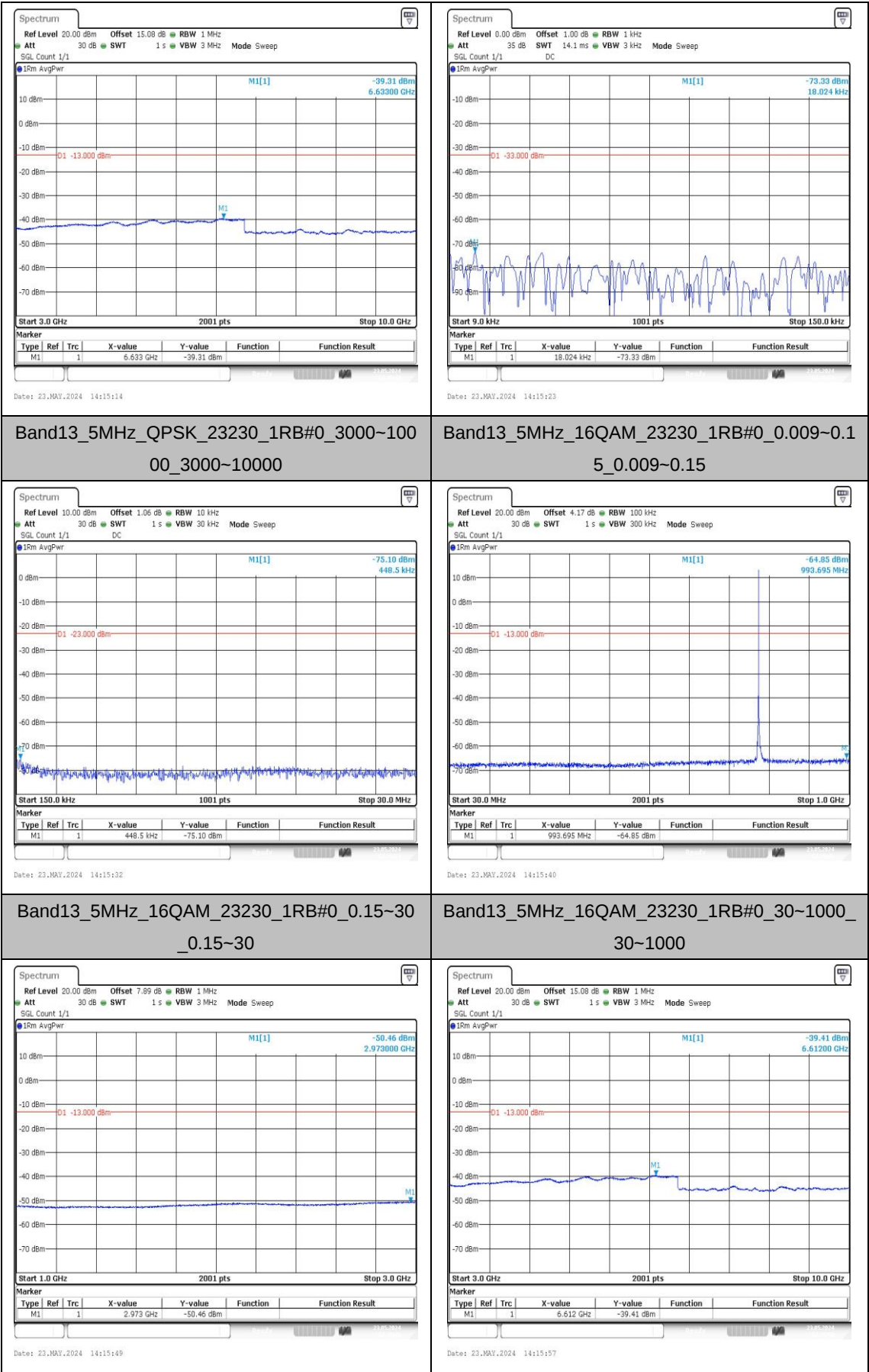
Band13	10MHz	16QAM	23230	1RB#0	0.009~0.15	-73.77	PASS
Band13	10MHz	16QAM	23230	1RB#0	0.15~30	-75.39	PASS
Band13	10MHz	16QAM	23230	1RB#0	30~1000	-65.03	PASS
Band13	10MHz	16QAM	23230	1RB#0	1000~3000	-50.36	PASS
Band13	10MHz	16QAM	23230	1RB#0	3000~10000	-39.44	PASS

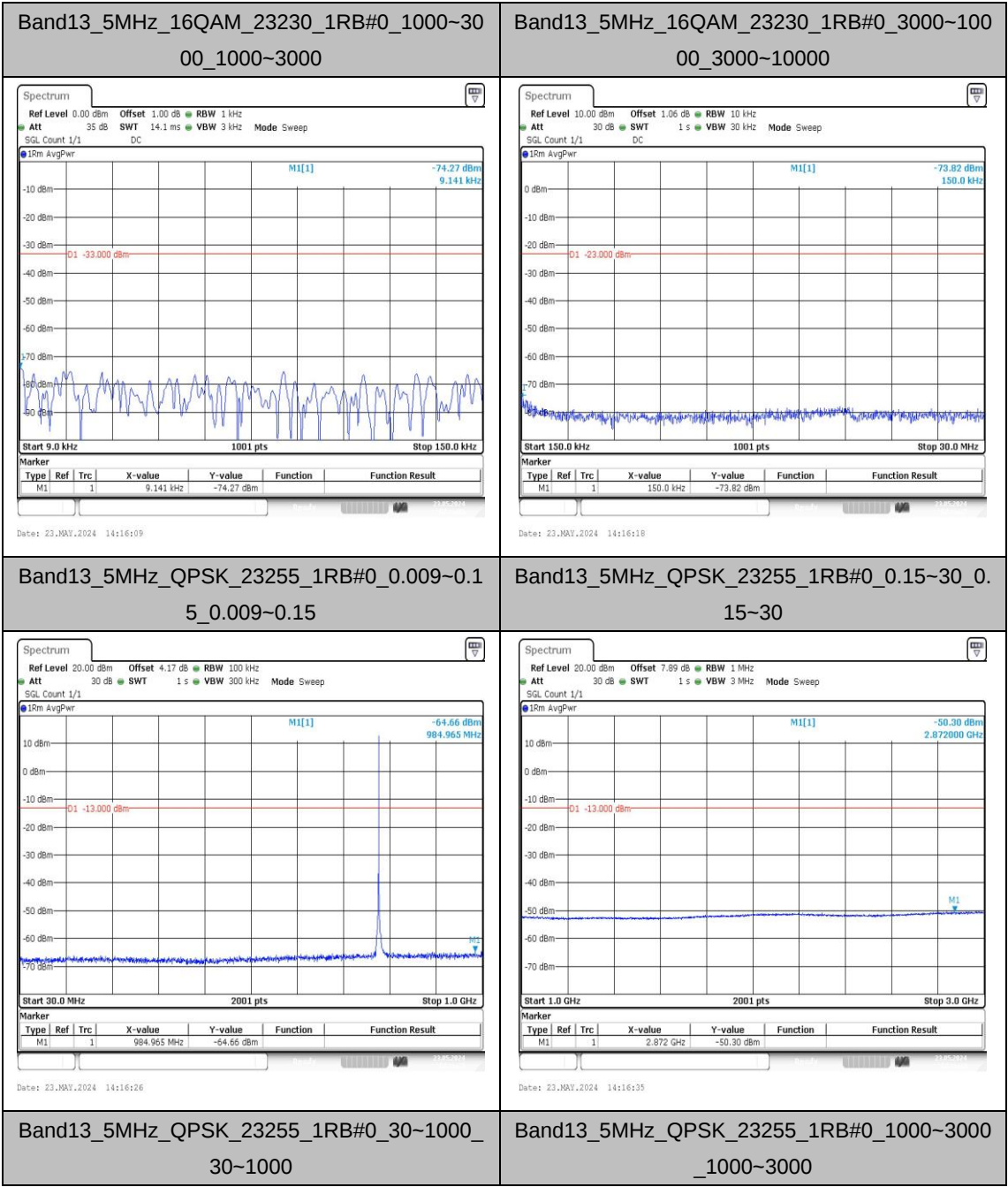
Test Graphs

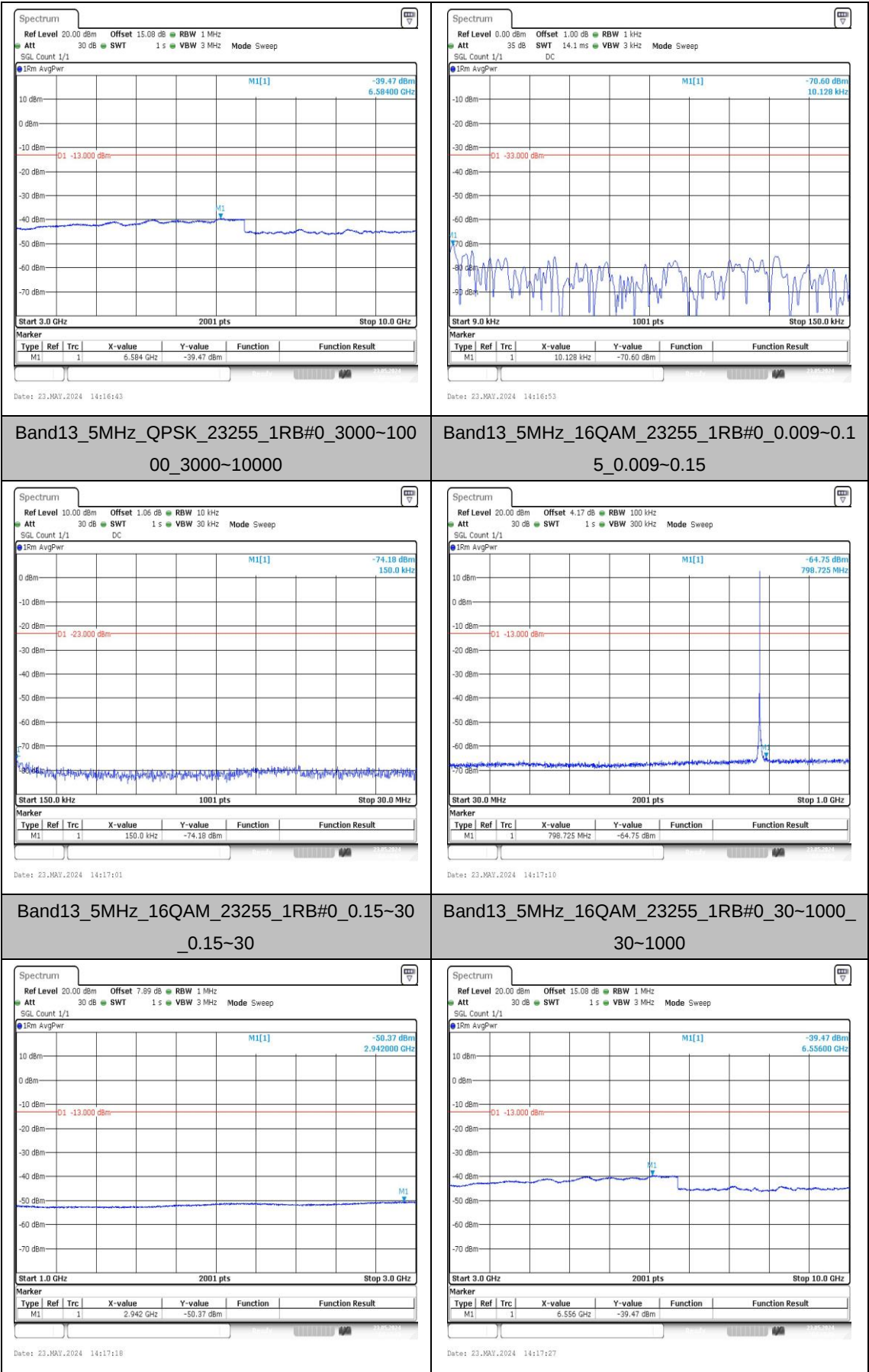


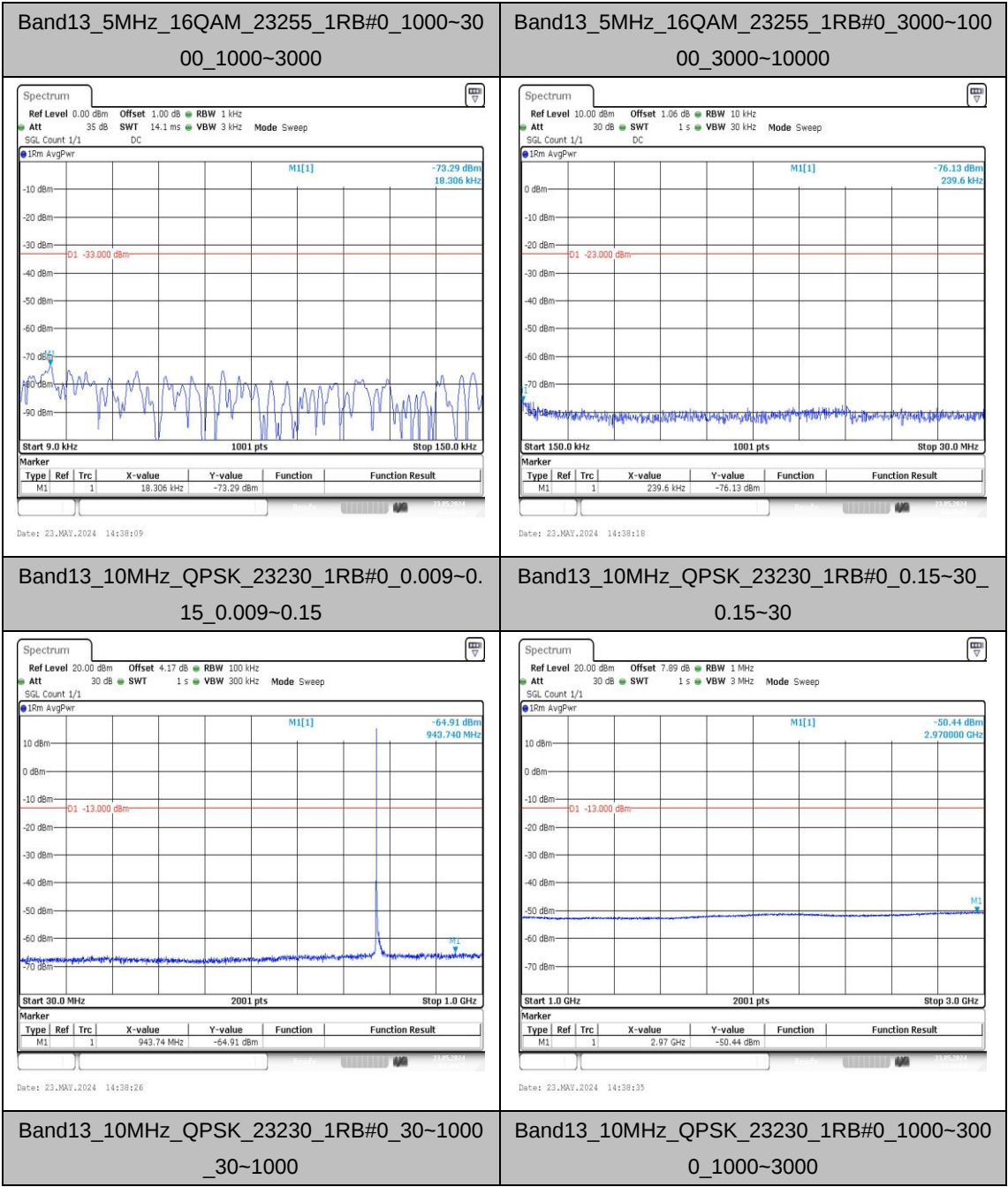


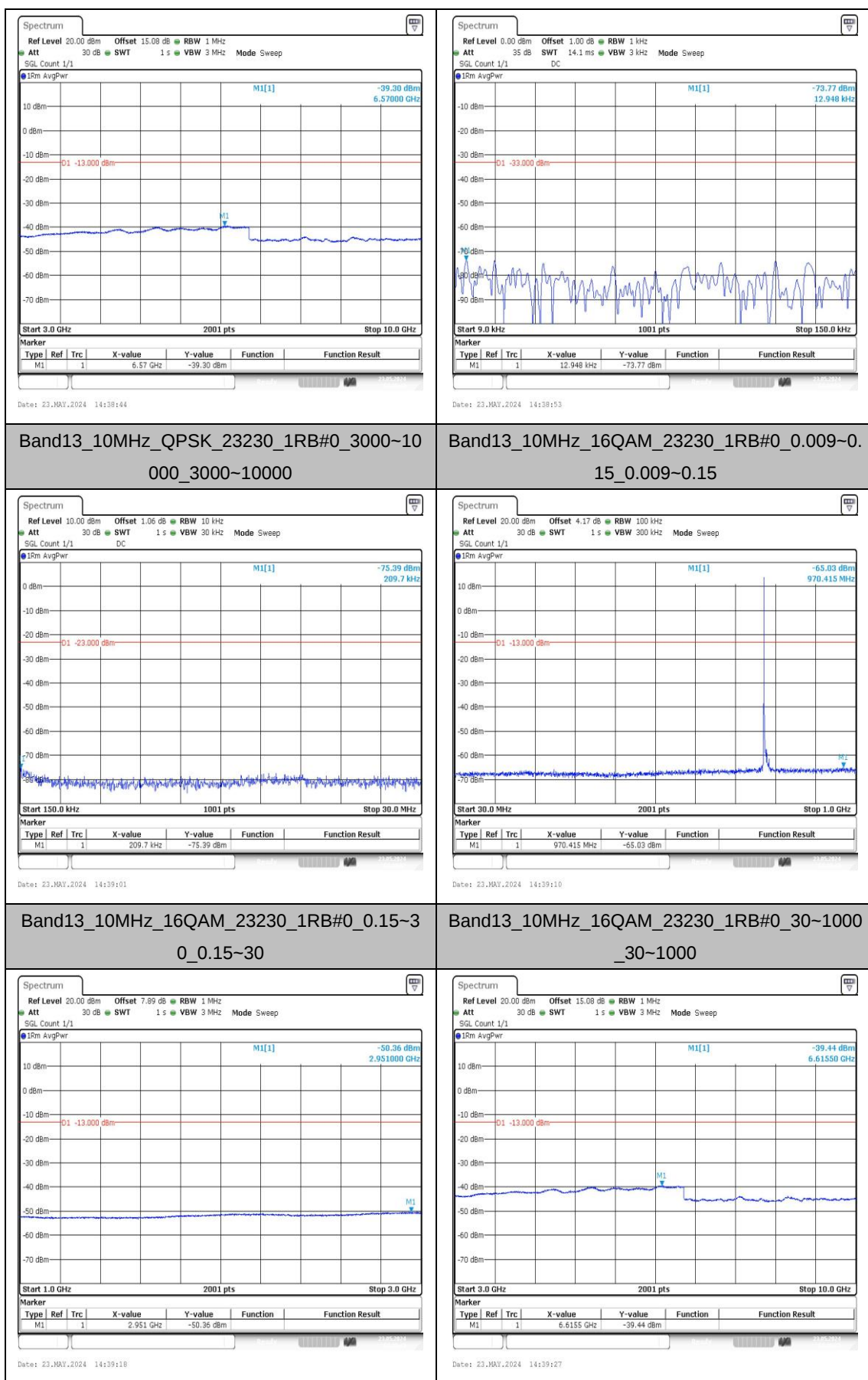












Band13_10MHz_16QAM_23230_1RB#0_1000~3000_1000~3000	Band13_10MHz_16QAM_23230_1RB#0_3000~10000_3000~10000
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Appendix F: Frequency Stability

Test Result

Voltage										
Band	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	VN	NT	2.43	0.003117	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	VL	NT	2.17	0.002784	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	VH	NT	3.02	0.003874	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	VN	NT	-6.42	-0.008236	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	VL	NT	2.50	0.003207	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	VH	NT	4.53	0.005811	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	VN	NT	13.83	0.017685	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	VL	NT	2.52	0.003223	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	VH	NT	15.85	0.020269	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	VN	NT	4.28	0.005473	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	VL	NT	2.76	0.003529	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	VH	NT	3.81	0.004872	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	VN	NT	3.20	0.004079	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	VL	NT	3.10	0.003952	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	VH	NT	3.02	0.003850	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	VN	NT	-2.56	-0.003263	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	VL	NT	-1.53	-0.001950	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	VH	NT	14.62	0.018636	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	VN	NT	3.66	0.004680	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	VL	NT	-6.34	-0.008107	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	VH	NT	2.32	0.002967	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	VN	NT	1.34	0.001714	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	VL	NT	1.39	0.001777	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	VH	NT	-6.28	-0.008031	±2.5	PASS

Temperature										
Band	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	NV	-30	-6.82	-0.008749	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	-20	4.19	0.005375	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	-10	4.49	0.005760	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	0	2.96	0.003797	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	10	4.48	0.005747	±2.5	PASS

Band13	5MHz	QPSK	23205	25RB#0	NV	20	4.61	0.005914	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	30	-6.05	-0.007761	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	40	3.71	0.004759	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	50	2.83	0.003631	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	-30	2.00	0.002566	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	-20	-6.74	-0.008647	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	-10	2.89	0.003708	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	0	-8.14	-0.010443	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	10	3.00	0.003849	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	20	4.48	0.005747	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	30	6.67	0.008557	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	40	5.81	0.007453	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	50	6.49	0.008326	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	-30	2.37	0.003031	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	-20	-2.03	-0.002596	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	-10	2.19	0.002801	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	0	3.56	0.004552	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	10	4.29	0.005486	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	20	2.29	0.002928	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	30	-2.66	-0.003402	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	40	1.66	0.002123	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	50	2.09	0.002673	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	-30	-6.55	-0.008376	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	-20	2.59	0.003312	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	-10	2.46	0.003146	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	0	3.20	0.004092	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	10	-7.21	-0.009220	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	20	19.14	0.024476	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	30	6.28	0.008031	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	40	5.25	0.006714	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	50	5.55	0.007097	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	-30	4.26	0.005430	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	-20	16.49	0.021020	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	-10	4.76	0.006068	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	0	2.37	0.003021	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	10	13.32	0.016979	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	20	2.96	0.003773	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	30	-4.16	-0.005303	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	40	13.65	0.017400	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	50	-2.00	-0.002549	±2.5	PASS

Band13	5MHz	16QAM	23255	25RB#0	NV	-30	-3.76	-0.004793	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	-20	-3.06	-0.003901	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	-10	2.39	0.003047	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	0	1.97	0.002511	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	10	-3.93	-0.005010	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	20	-2.47	-0.003149	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	30	-2.43	-0.003098	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	40	-2.62	-0.003340	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	50	2.10	0.002677	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-30	-1.77	-0.002263	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-20	-1.83	-0.002340	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-10	2.07	0.002647	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	0	3.03	0.003875	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	10	2.06	0.002634	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	20	2.02	0.002583	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	30	2.49	0.003184	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	40	-3.16	-0.004041	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	50	-1.39	-0.001777	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	-30	3.50	0.004476	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	-20	2.70	0.003453	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	-10	1.60	0.002046	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	0	-8.78	-0.011228	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	10	-8.30	-0.010614	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	20	2.00	0.002558	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	30	-6.14	-0.007852	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	40	3.33	0.004258	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	50	3.33	0.004258	±2.5	PASS