

Appendix-A LTE Cat M1 Band 4

Effective (Isotropic) Radiated Power Output Data for M1

Test Result

Band	Bandwidth	Modulation	Channel	RB Size	RB Start	NBIndex	Power (dBm)	EIRP (dBm)	Limit (dBm)	Verdict
Band4	1.4MHz	QPSK	19957	1	0	Low	21.37	23.37	30	PASS
Band4	1.4MHz	QPSK	19957	1	5	Low	21.14	23.14	30	PASS
Band4	1.4MHz	QPSK	19957	6	0	Low	19.26	21.26	30	PASS
Band4	1.4MHz	QPSK	20175	1	0	Low	21.27	23.27	30	PASS
Band4	1.4MHz	QPSK	20175	1	5	Low	21.10	23.1	30	PASS
Band4	1.4MHz	QPSK	20175	6	0	Low	19.35	21.35	30	PASS
Band4	1.4MHz	QPSK	20393	1	0	High	21.37	23.37	30	PASS
Band4	1.4MHz	QPSK	20393	1	5	High	21.12	23.12	30	PASS
Band4	1.4MHz	QPSK	20393	6	0	High	19.34	21.34	30	PASS
Band4	3MHz	QPSK	19965	1	0	Low	21.33	23.33	30	PASS
Band4	3MHz	QPSK	19965	1	5	Low	21.08	23.08	30	PASS
Band4	3MHz	QPSK	19965	6	0	Low	19.28	21.28	30	PASS
Band4	3MHz	QPSK	20175	1	0	Low	21.28	23.28	30	PASS
Band4	3MHz	QPSK	20175	1	5	Low	21.02	23.02	30	PASS
Band4	3MHz	QPSK	20175	6	0	Low	19.33	21.33	30	PASS
Band4	3MHz	QPSK	20385	1	0	High	21.30	23.3	30	PASS
Band4	3MHz	QPSK	20385	1	5	High	21.12	23.12	30	PASS
Band4	3MHz	QPSK	20385	6	0	High	19.36	21.36	30	PASS
Band4	5MHz	QPSK	19975	1	0	Low	21.38	23.38	30	PASS
Band4	5MHz	QPSK	19975	1	5	Low	21.10	23.1	30	PASS
Band4	5MHz	QPSK	19975	6	0	Low	20.27	22.27	30	PASS
Band4	5MHz	QPSK	20175	1	0	Low	21.18	23.18	30	PASS
Band4	5MHz	QPSK	20175	1	5	Low	21.01	23.01	30	PASS
Band4	5MHz	QPSK	20175	6	0	Low	20.24	22.24	30	PASS
Band4	5MHz	QPSK	20375	1	0	High	21.30	23.3	30	PASS
Band4	5MHz	QPSK	20375	1	5	High	21.07	23.07	30	PASS
Band4	5MHz	QPSK	20375	6	0	High	20.32	22.32	30	PASS
Band4	10MHz	QPSK	20000	1	0	Low	20.24	22.24	30	PASS
Band4	10MHz	QPSK	20000	1	5	Low	21.18	23.18	30	PASS
Band4	10MHz	QPSK	20000	6	0	Low	20.33	22.33	30	PASS
Band4	10MHz	QPSK	20175	1	0	Low	21.24	23.24	30	PASS
Band4	10MHz	QPSK	20175	1	5	Low	21.00	23	30	PASS
Band4	10MHz	QPSK	20175	6	0	Low	20.21	22.21	30	PASS
Band4	10MHz	QPSK	20350	1	0	High	21.32	23.32	30	PASS
Band4	10MHz	QPSK	20350	1	5	High	21.05	23.05	30	PASS
Band4	10MHz	QPSK	20350	6	0	High	20.20	22.2	30	PASS
Band4	15MHz	QPSK	20025	1	0	Low	21.28	23.28	30	PASS

Band4	15MHz	QPSK	20025	1	5	Low	21.06	23.06	30	PASS
Band4	15MHz	QPSK	20025	6	0	Low	21.17	23.17	30	PASS
Band4	15MHz	QPSK	20175	1	0	Low	21.23	23.23	30	PASS
Band4	15MHz	QPSK	20175	1	5	Low	20.85	22.85	30	PASS
Band4	15MHz	QPSK	20175	6	0	Low	21.23	23.23	30	PASS
Band4	15MHz	QPSK	20325	1	0	High	21.10	23.1	30	PASS
Band4	15MHz	QPSK	20325	1	5	High	21.04	23.04	30	PASS
Band4	15MHz	QPSK	20325	6	0	High	21.20	23.2	30	PASS
Band4	20MHz	QPSK	20050	1	0	Low	21.23	23.23	30	PASS
Band4	20MHz	QPSK	20050	1	5	Low	21.06	23.06	30	PASS
Band4	20MHz	QPSK	20050	6	0	Low	21.27	23.27	30	PASS
Band4	20MHz	QPSK	20175	1	0	Low	21.12	23.12	30	PASS
Band4	20MHz	QPSK	20175	1	5	Low	20.99	22.99	30	PASS
Band4	20MHz	QPSK	20175	6	0	Low	21.17	23.17	30	PASS
Band4	20MHz	QPSK	20300	6	0	High	21.12	23.12	30	PASS
Band4	1.4MHz	16QAM	19957	1	0	Low	20.44	22.44	30	PASS
Band4	1.4MHz	16QAM	19957	1	5	Low	20.26	22.26	30	PASS
Band4	1.4MHz	16QAM	19957	5	0	Low	19.41	21.41	30	PASS
Band4	1.4MHz	16QAM	20175	1	0	Low	20.39	22.39	30	PASS
Band4	1.4MHz	16QAM	20175	1	5	Low	20.23	22.23	30	PASS
Band4	1.4MHz	16QAM	20175	5	0	Low	19.41	21.41	30	PASS
Band4	1.4MHz	16QAM	20393	1	0	High	20.36	22.36	30	PASS
Band4	1.4MHz	16QAM	20393	1	5	High	20.37	22.37	30	PASS
Band4	1.4MHz	16QAM	20393	5	0	High	19.51	21.51	30	PASS
Band4	3MHz	16QAM	19965	1	0	Low	20.40	22.4	30	PASS
Band4	3MHz	16QAM	19965	1	5	Low	20.20	22.2	30	PASS
Band4	3MHz	16QAM	19965	5	0	Low	19.40	21.4	30	PASS
Band4	3MHz	16QAM	20175	1	0	Low	20.18	22.18	30	PASS
Band4	3MHz	16QAM	20175	1	5	Low	20.25	22.25	30	PASS
Band4	3MHz	16QAM	20175	5	0	Low	19.39	21.39	30	PASS
Band4	3MHz	16QAM	20385	1	0	High	20.27	22.27	30	PASS
Band4	3MHz	16QAM	20385	1	5	High	20.38	22.38	30	PASS
Band4	3MHz	16QAM	20385	5	0	High	19.51	21.51	30	PASS
Band4	5MHz	16QAM	19975	1	0	Low	21.19	23.19	30	PASS
Band4	5MHz	16QAM	19975	1	5	Low	20.93	22.93	30	PASS
Band4	5MHz	16QAM	19975	5	0	Low	19.93	21.93	30	PASS
Band4	5MHz	16QAM	20175	1	0	Low	21.06	23.06	30	PASS
Band4	5MHz	16QAM	20175	1	5	Low	20.67	22.67	30	PASS
Band4	5MHz	16QAM	20175	5	0	Low	19.76	21.76	30	PASS
Band4	5MHz	16QAM	20375	1	0	High	21.41	23.41	30	PASS
Band4	5MHz	16QAM	20375	1	5	High	20.82	22.82	30	PASS
Band4	5MHz	16QAM	20375	5	0	High	19.90	21.9	30	PASS
Band4	10MHz	16QAM	20000	1	0	Low	21.06	23.06	30	PASS
Band4	10MHz	16QAM	20000	1	5	Low	20.82	22.82	30	PASS
Band4	10MHz	16QAM	20000	5	0	Low	20.88	22.88	30	PASS

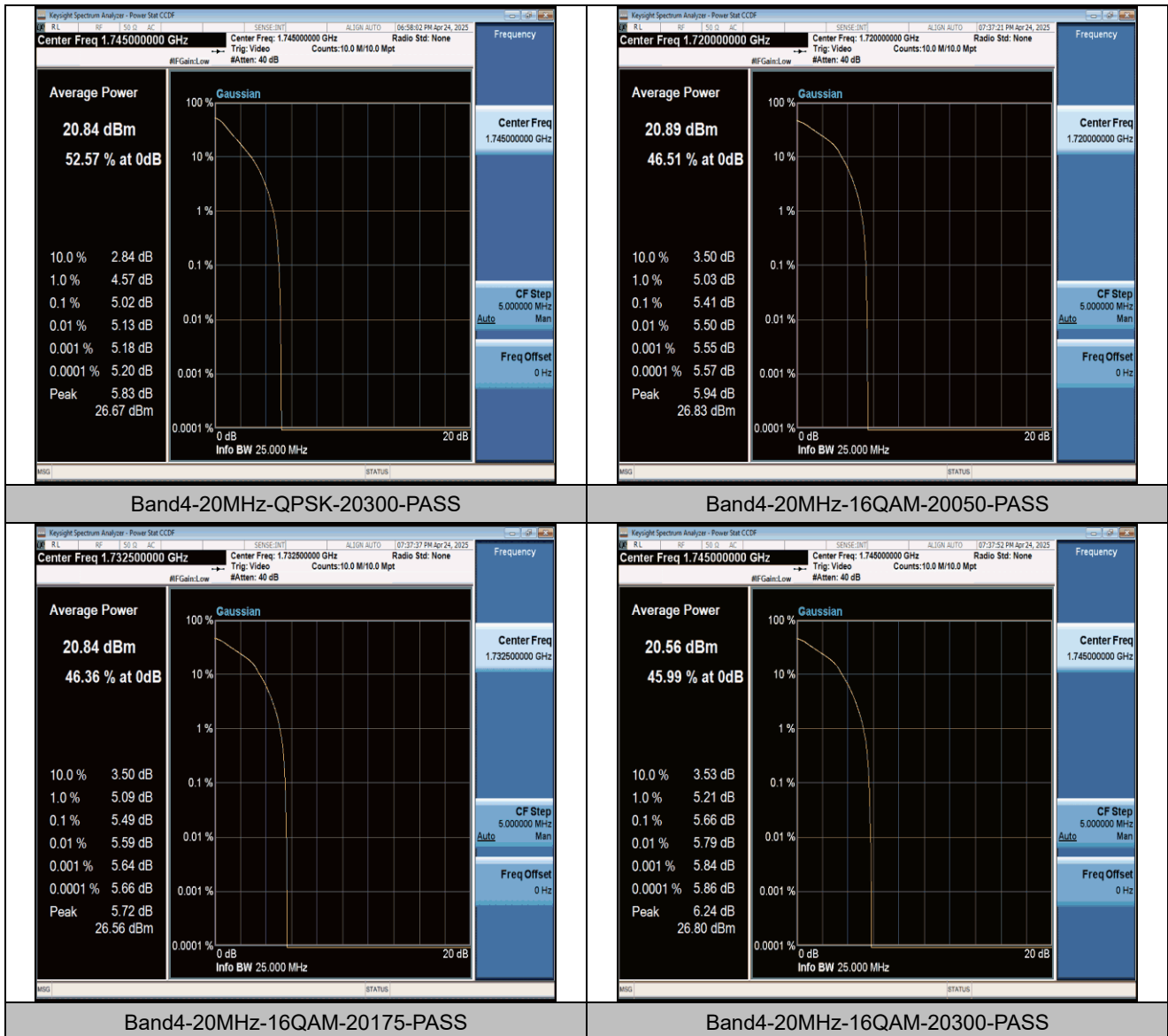
Band4	10MHz	16QAM	20175	1	0	Low	21.09	23.09	30	PASS
Band4	10MHz	16QAM	20175	1	5	Low	20.73	22.73	30	PASS
Band4	10MHz	16QAM	20175	5	0	Low	20.68	22.68	30	PASS
Band4	10MHz	16QAM	20350	1	0	High	21.03	23.03	30	PASS
Band4	10MHz	16QAM	20350	1	5	High	20.80	22.8	30	PASS
Band4	10MHz	16QAM	20350	5	0	High	20.96	22.96	30	PASS
Band4	15MHz	16QAM	20025	1	0	Low	21.00	23	30	PASS
Band4	15MHz	16QAM	20025	1	5	Low	20.79	22.79	30	PASS
Band4	15MHz	16QAM	20025	5	0	Low	20.84	22.84	30	PASS
Band4	15MHz	16QAM	20175	1	0	Low	21.32	23.32	30	PASS
Band4	15MHz	16QAM	20175	1	5	Low	20.63	22.63	30	PASS
Band4	15MHz	16QAM	20175	5	0	Low	20.85	22.85	30	PASS
Band4	15MHz	16QAM	20325	1	0	High	20.99	22.99	30	PASS
Band4	15MHz	16QAM	20325	1	5	High	20.76	22.76	30	PASS
Band4	15MHz	16QAM	20325	5	0	High	20.82	22.82	30	PASS
Band4	20MHz	16QAM	20050	1	0	Low	21.06	23.06	30	PASS
Band4	20MHz	16QAM	20050	1	5	Low	20.81	22.81	30	PASS
Band4	20MHz	16QAM	20050	5	0	Low	20.86	22.86	30	PASS
Band4	20MHz	16QAM	20175	1	0	Low	21.26	23.26	30	PASS
Band4	20MHz	16QAM	20175	1	5	Low	20.72	22.72	30	PASS
Band4	20MHz	16QAM	20175	5	0	Low	20.78	22.78	30	PASS
Band4	20MHz	16QAM	20300	1	0	High	20.88	22.88	30	PASS
Band4	20MHz	16QAM	20300	1	5	High	20.76	22.76	30	PASS
Band4	20MHz	16QAM	20300	5	0	High	20.96	22.96	30	PASS

Peak-to-Average Ratio(CCDF) for M1

Test Result

Band	Bandwidth	Modulation	Channel	RB Size	RB Start	NBIndex	Result(dB)	Limit(dB)	Verdict
Band4	20MHz	QPSK	20300	6	0	High	5.02	<=13	PASS
Band4	20MHz	16QAM	20050	5	0	Low	5.41	<=13	PASS
Band4	20MHz	16QAM	20175	5	0	Low	5.49	<=13	PASS
Band4	20MHz	16QAM	20300	5	0	High	5.66	<=13	PASS

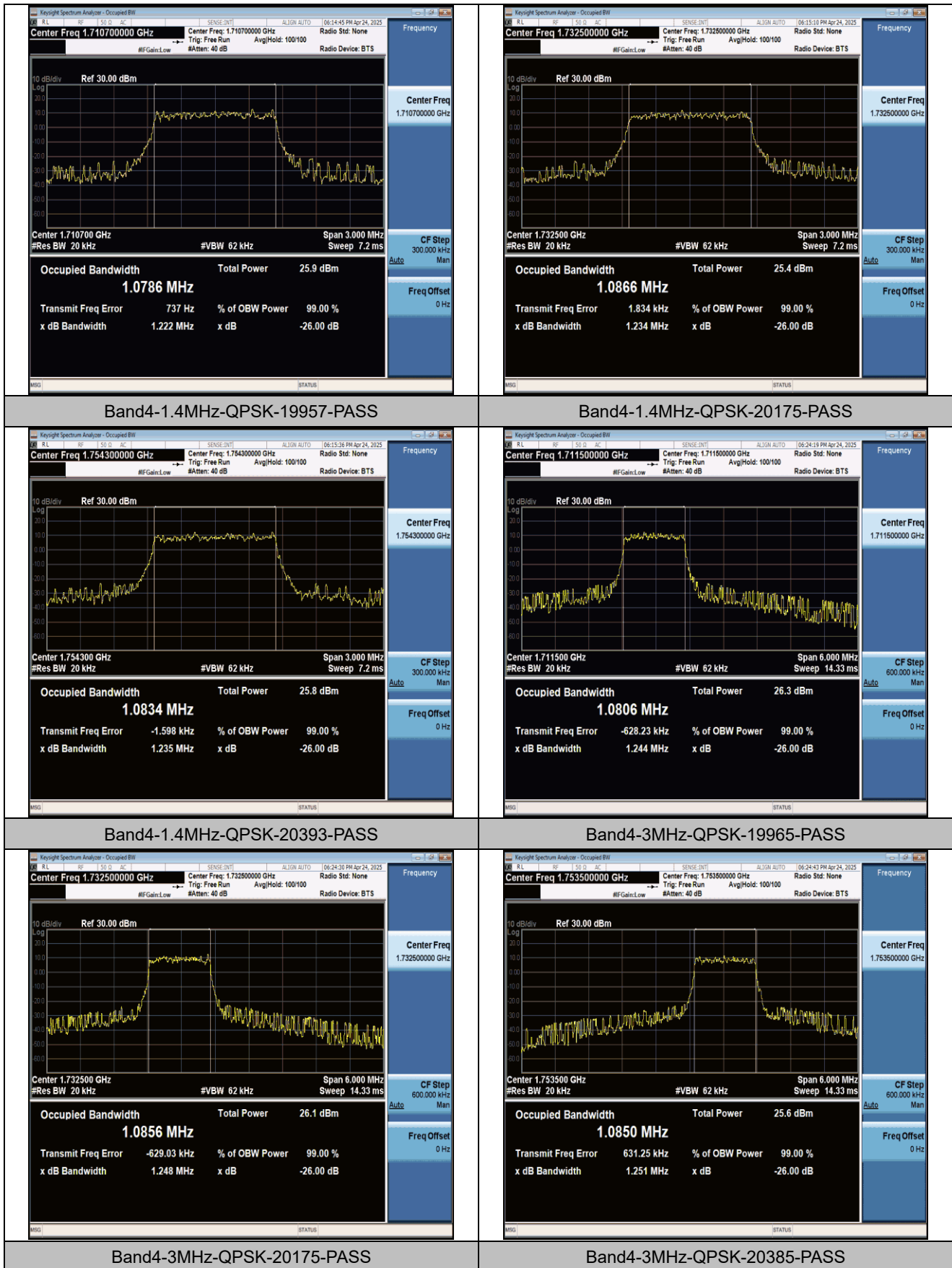
Test Graphs

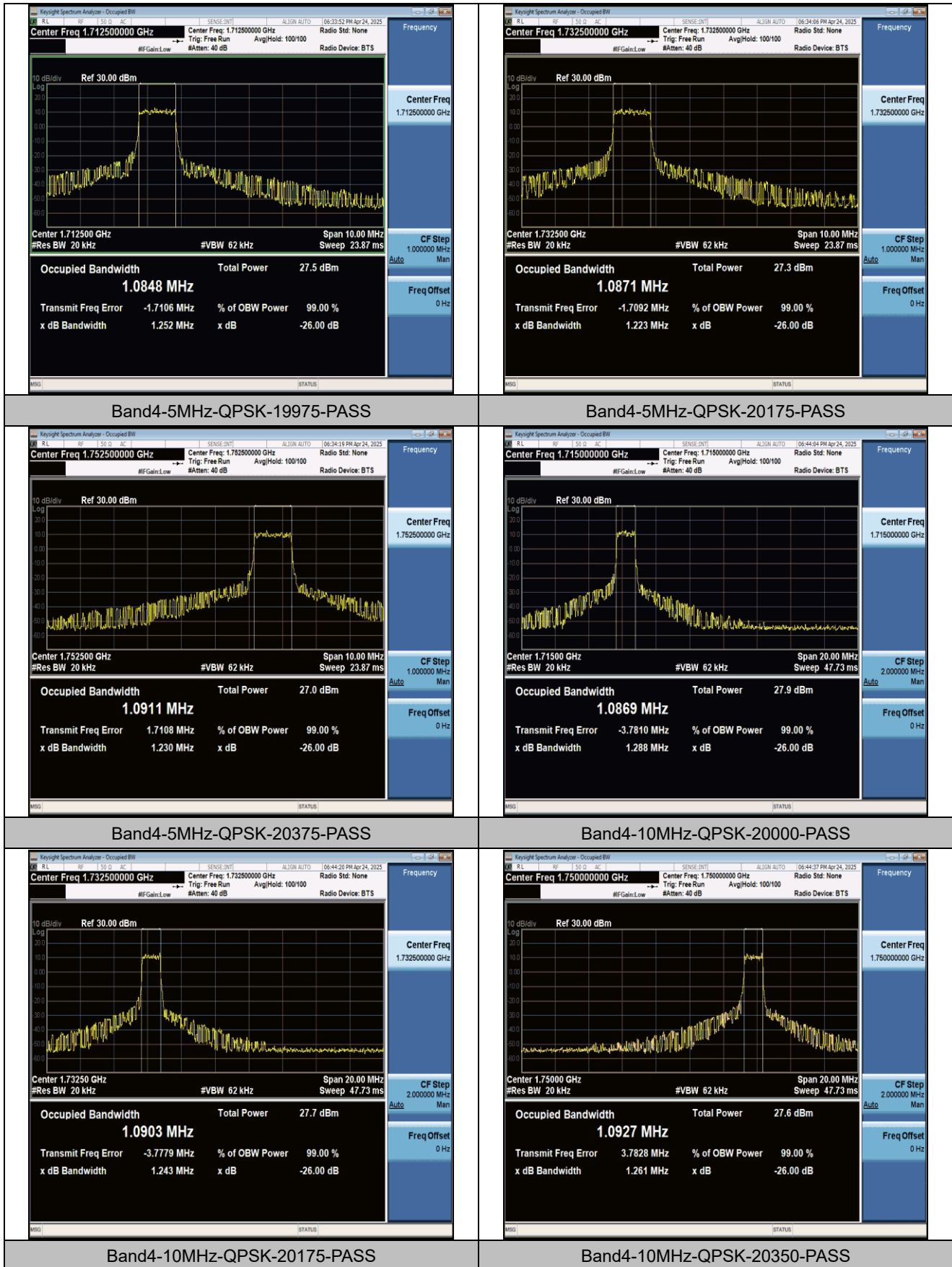


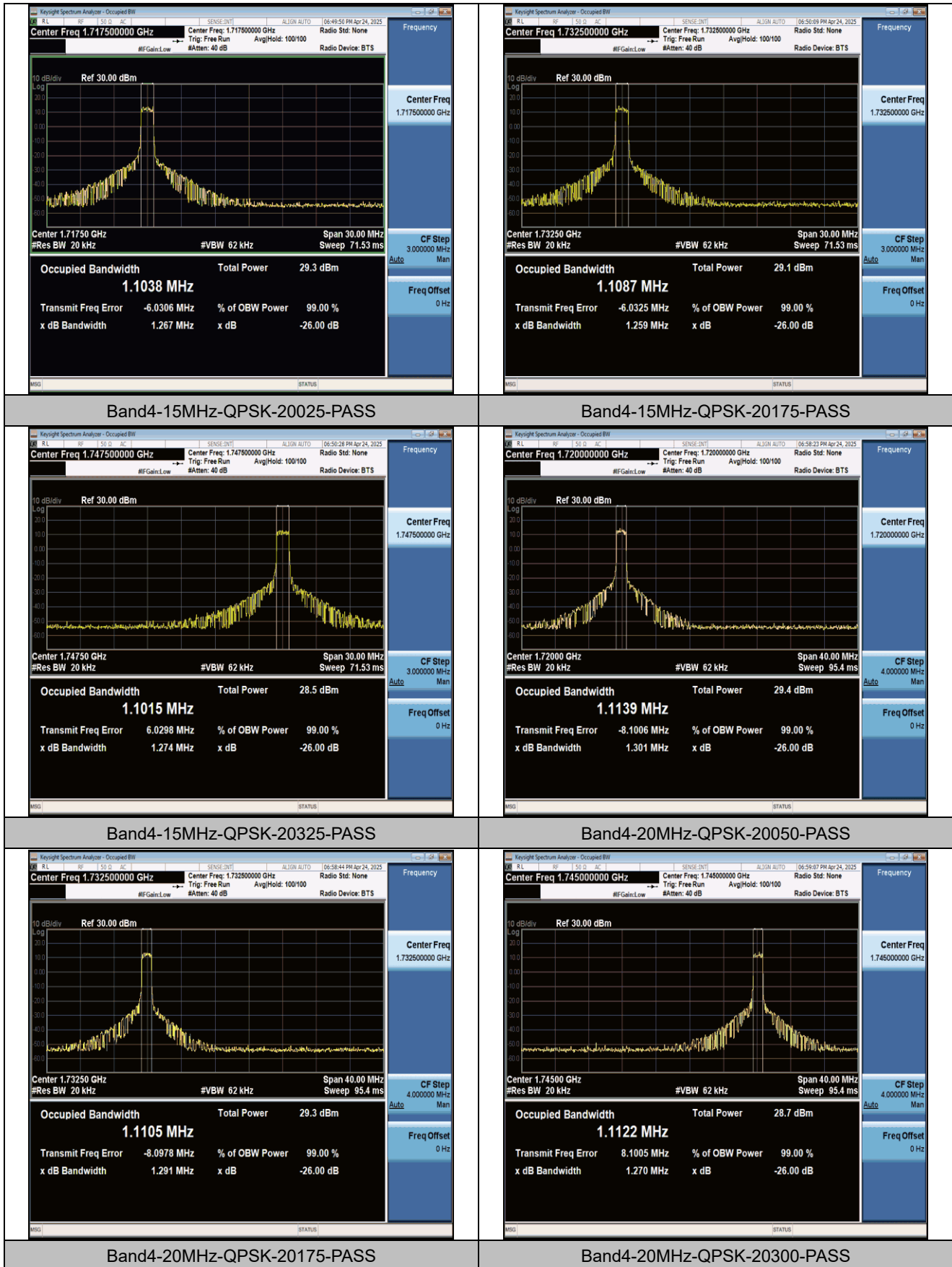
26dB Bandwidth and Occupied Bandwidth for M1**Test Result**

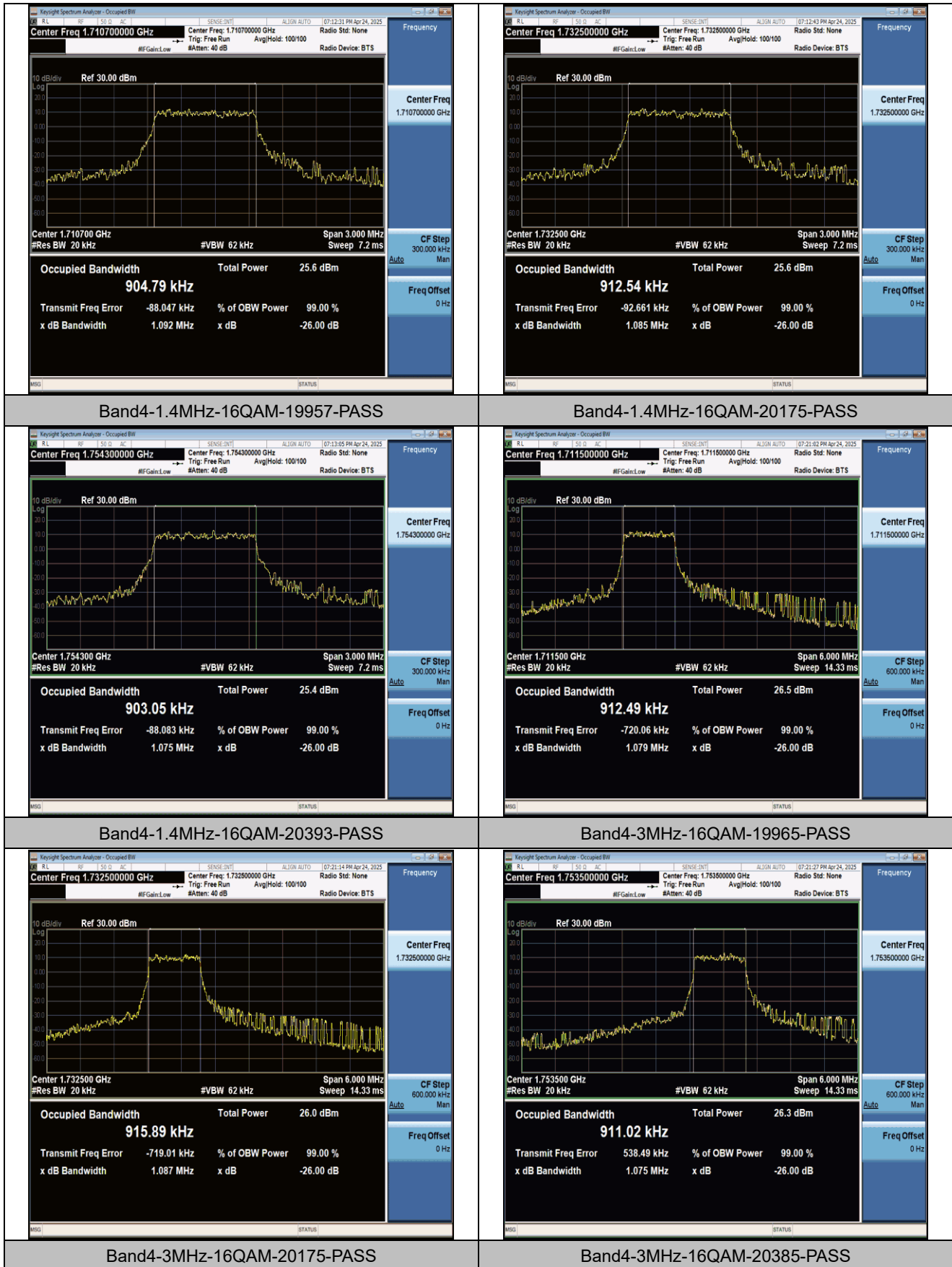
Band	Bandwidth	Modulation	Channel	RB Size	RB Start	NB Index	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band4	1.4MHz	QPSK	19957	6	0	Low	1.0786	1.222	PASS
Band4	1.4MHz	QPSK	20175	6	0	Low	1.0866	1.234	PASS
Band4	1.4MHz	QPSK	20393	6	0	High	1.0834	1.235	PASS
Band4	3MHz	QPSK	19965	6	0	Low	1.0806	1.244	PASS
Band4	3MHz	QPSK	20175	6	0	Low	1.0856	1.248	PASS
Band4	3MHz	QPSK	20385	6	0	High	1.0850	1.251	PASS
Band4	5MHz	QPSK	19975	6	0	Low	1.0848	1.252	PASS
Band4	5MHz	QPSK	20175	6	0	Low	1.0871	1.223	PASS
Band4	5MHz	QPSK	20375	6	0	High	1.0911	1.230	PASS
Band4	10MHz	QPSK	20000	6	0	Low	1.0869	1.288	PASS
Band4	10MHz	QPSK	20175	6	0	Low	1.0903	1.243	PASS
Band4	10MHz	QPSK	20350	6	0	High	1.0927	1.261	PASS
Band4	15MHz	QPSK	20025	6	0	Low	1.1038	1.267	PASS
Band4	15MHz	QPSK	20175	6	0	Low	1.1087	1.259	PASS
Band4	15MHz	QPSK	20325	6	0	High	1.1015	1.274	PASS
Band4	20MHz	QPSK	20050	6	0	Low	1.1139	1.301	PASS
Band4	20MHz	QPSK	20175	6	0	Low	1.1105	1.291	PASS
Band4	20MHz	QPSK	20300	6	0	High	1.1122	1.270	PASS
Band4	1.4MHz	16QAM	19957	5	0	Low	0.90479	1.092	PASS
Band4	1.4MHz	16QAM	20175	5	0	Low	0.91254	1.085	PASS
Band4	1.4MHz	16QAM	20393	5	0	High	0.90305	1.075	PASS
Band4	3MHz	16QAM	19965	5	0	Low	0.91249	1.079	PASS
Band4	3MHz	16QAM	20175	5	0	Low	0.91589	1.087	PASS
Band4	3MHz	16QAM	20385	5	0	High	0.91102	1.075	PASS
Band4	5MHz	16QAM	19975	5	0	Low	0.91599	1.091	PASS
Band4	5MHz	16QAM	20175	5	0	Low	0.91437	1.074	PASS
Band4	5MHz	16QAM	20375	5	0	High	0.92279	1.104	PASS
Band4	10MHz	16QAM	20000	5	0	Low	0.92900	1.109	PASS
Band4	10MHz	16QAM	20175	5	0	Low	0.91508	1.085	PASS
Band4	10MHz	16QAM	20350	5	0	High	0.92959	1.105	PASS
Band4	15MHz	16QAM	20025	5	0	Low	0.92830	1.171	PASS
Band4	15MHz	16QAM	20175	5	0	Low	0.92737	1.124	PASS
Band4	15MHz	16QAM	20325	5	0	High	0.93434	1.150	PASS
Band4	20MHz	16QAM	20050	5	0	Low	0.94599	1.164	PASS
Band4	20MHz	16QAM	20175	5	0	Low	0.95221	1.176	PASS
Band4	20MHz	16QAM	20300	5	0	High	0.94990	1.135	PASS

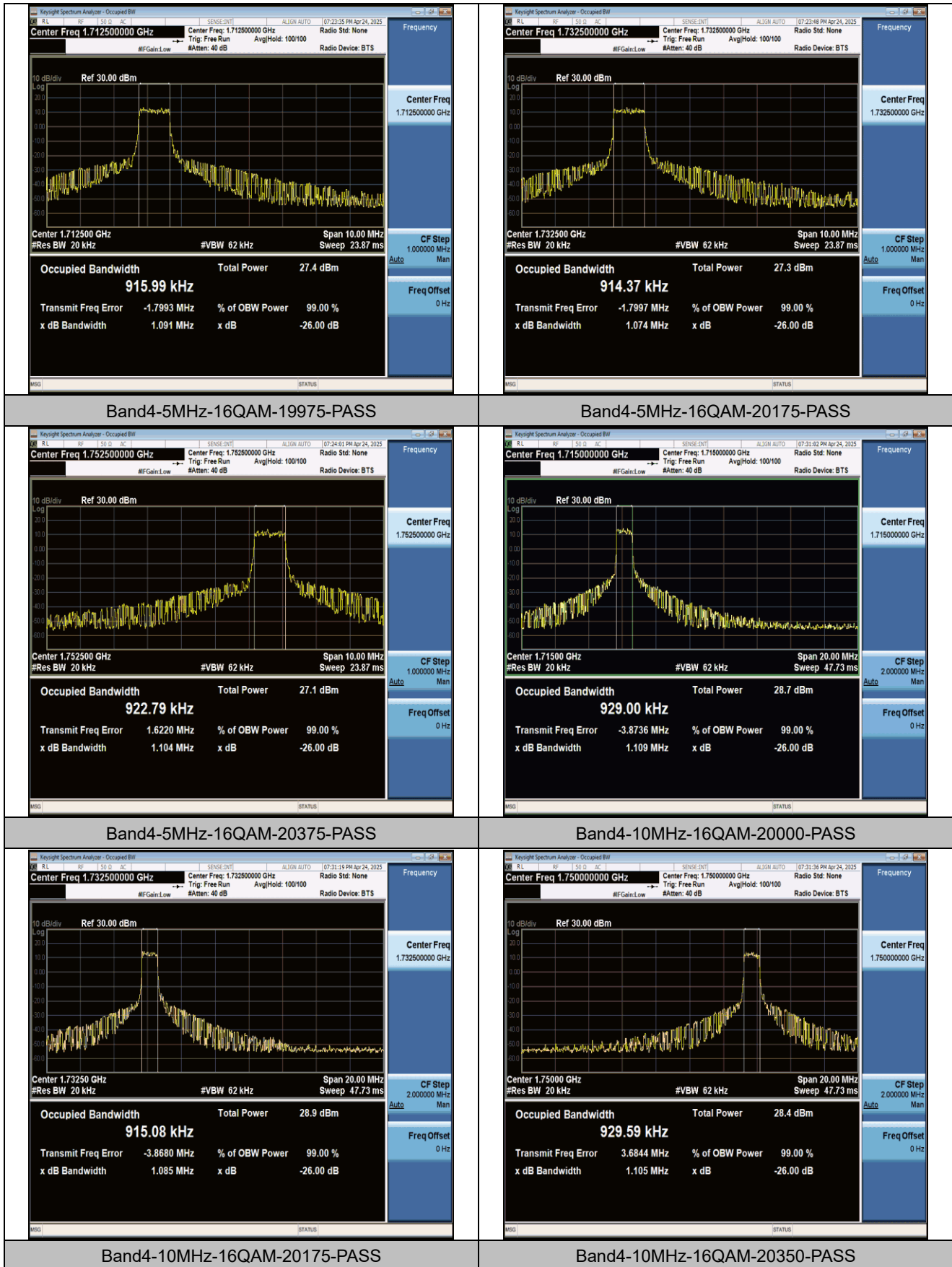
Test Graphs

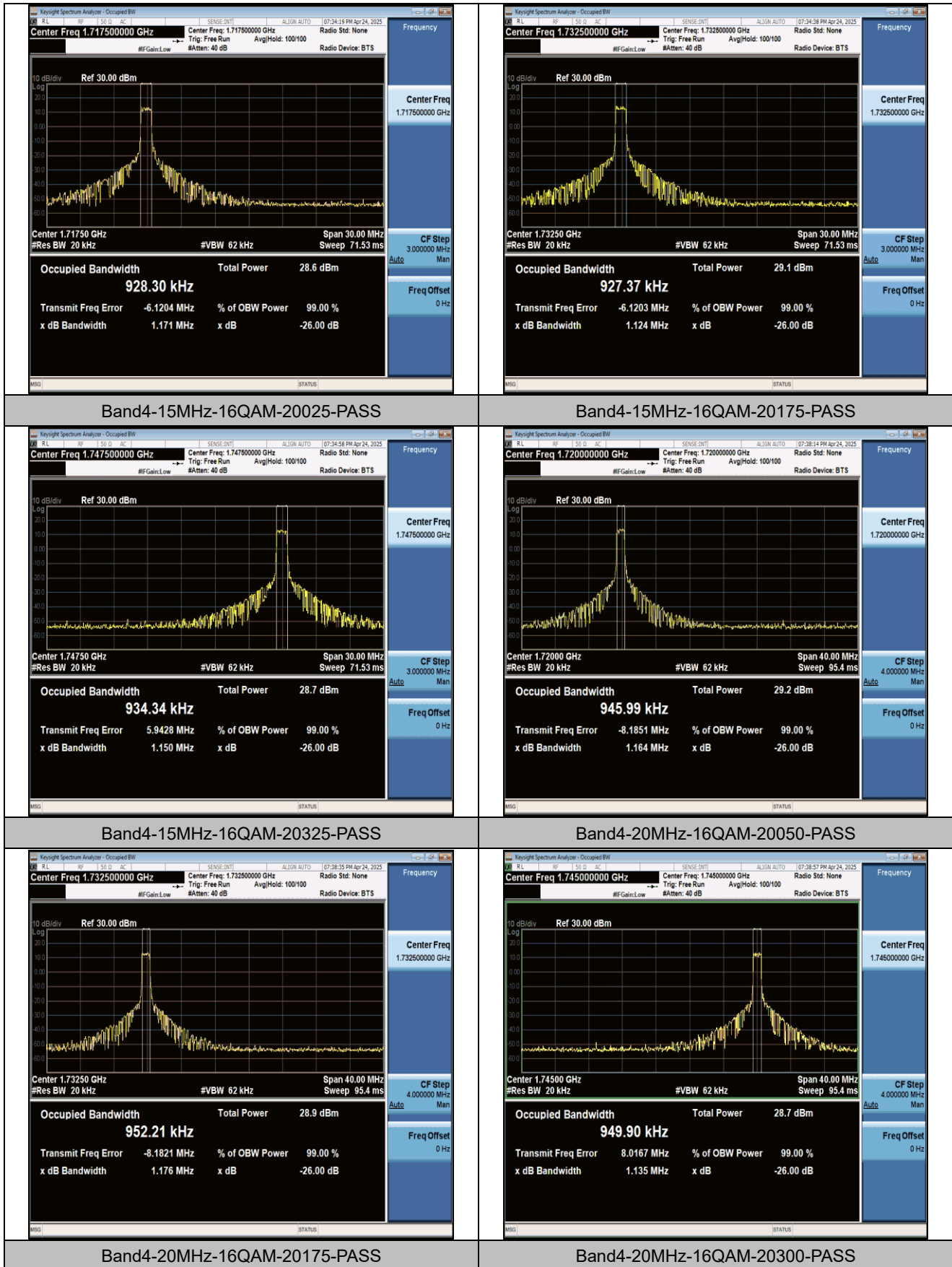






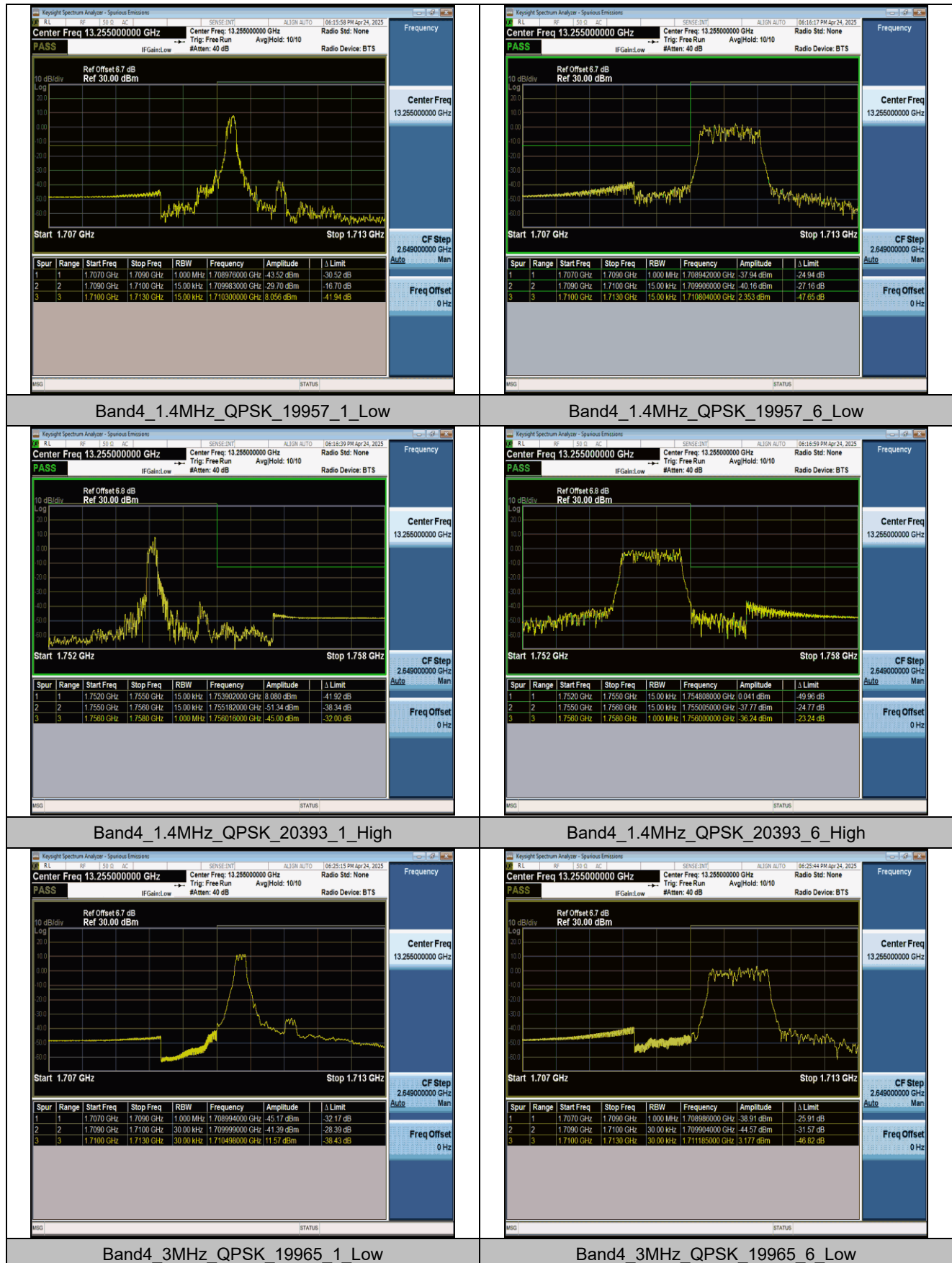


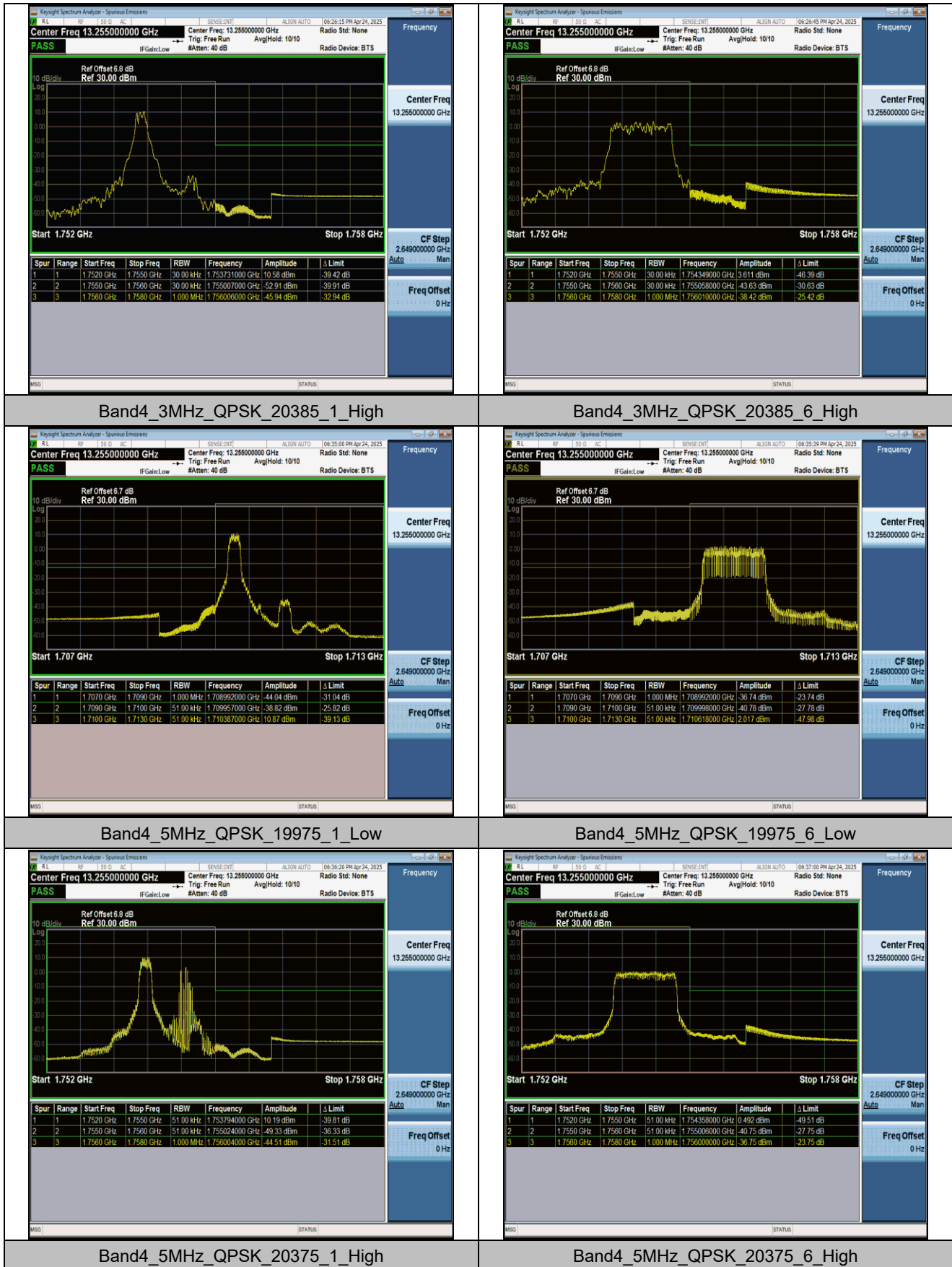


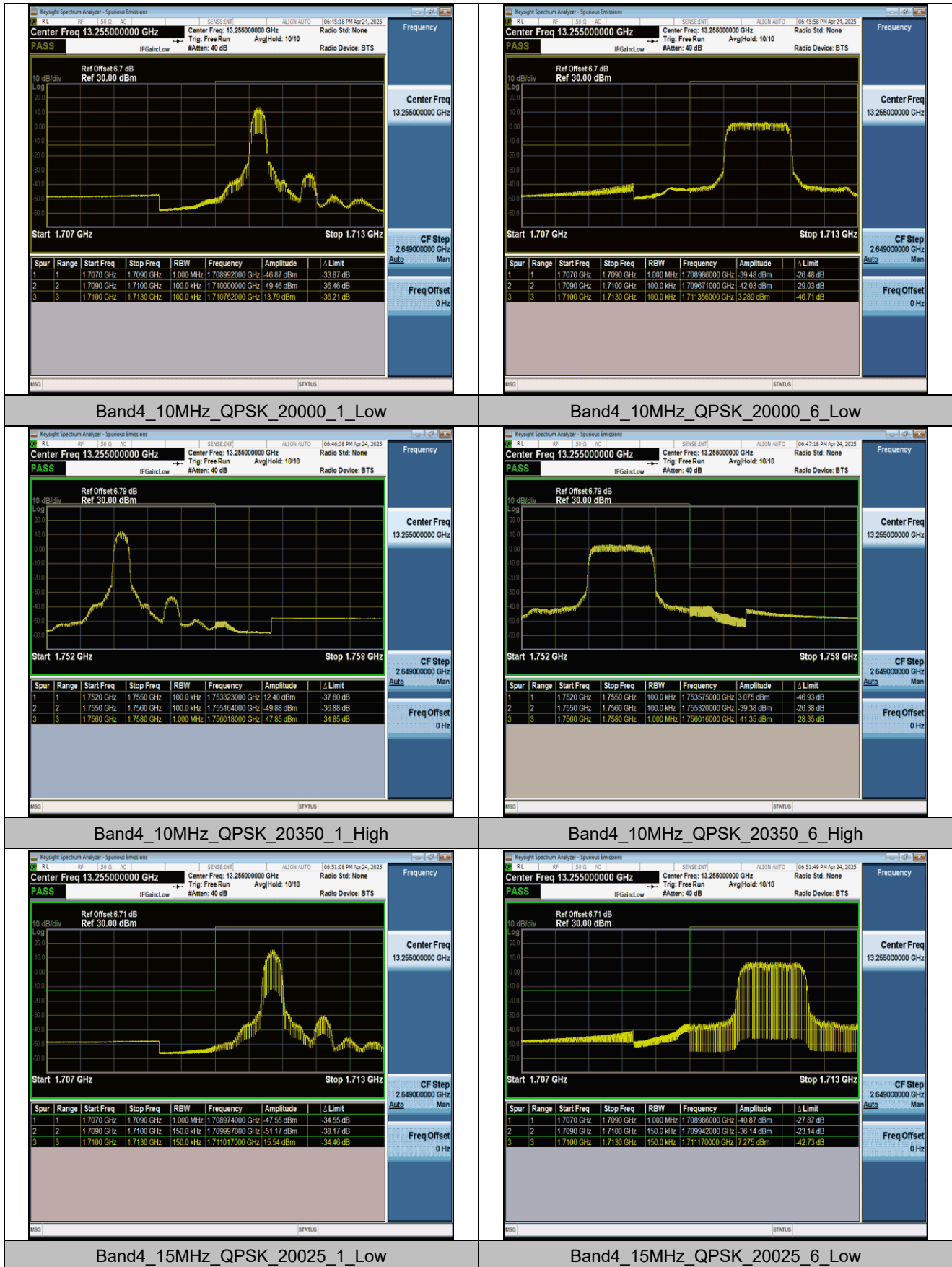


Band Edge for M1

Test Graphs





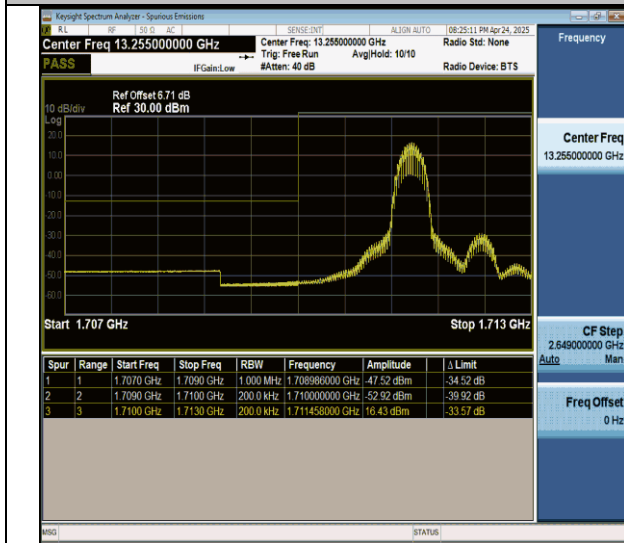




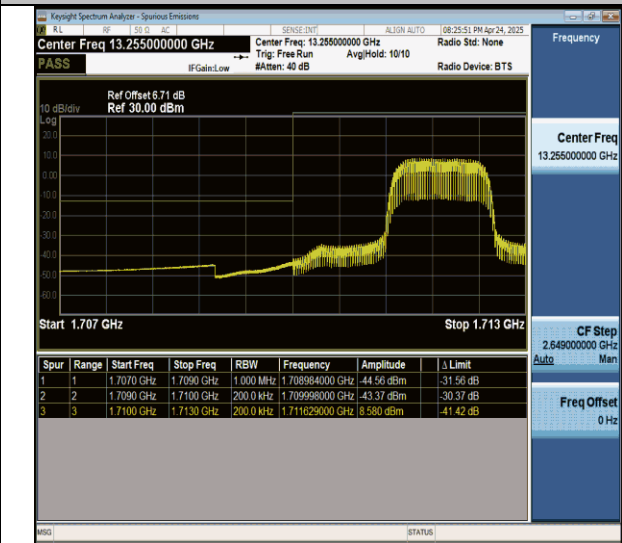
Band4_15MHz_QPSK_20325_1_High



Band4_15MHz_QPSK_20325_6_High



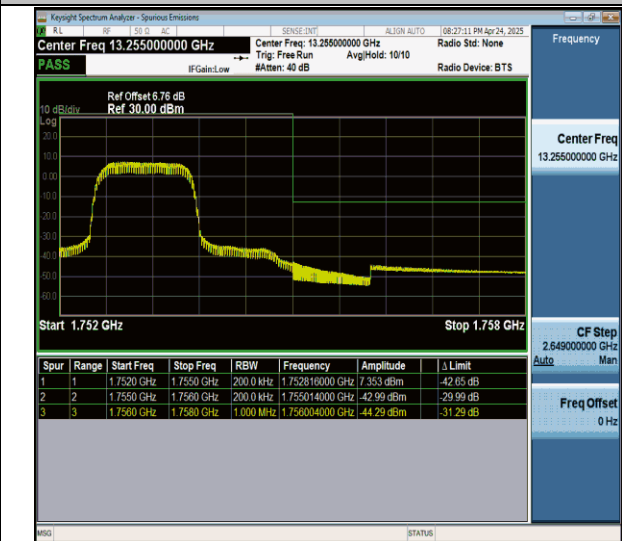
Band4_20MHz_QPSK_20050_1_Low



Band4_20MHz_QPSK_20050_6_Low



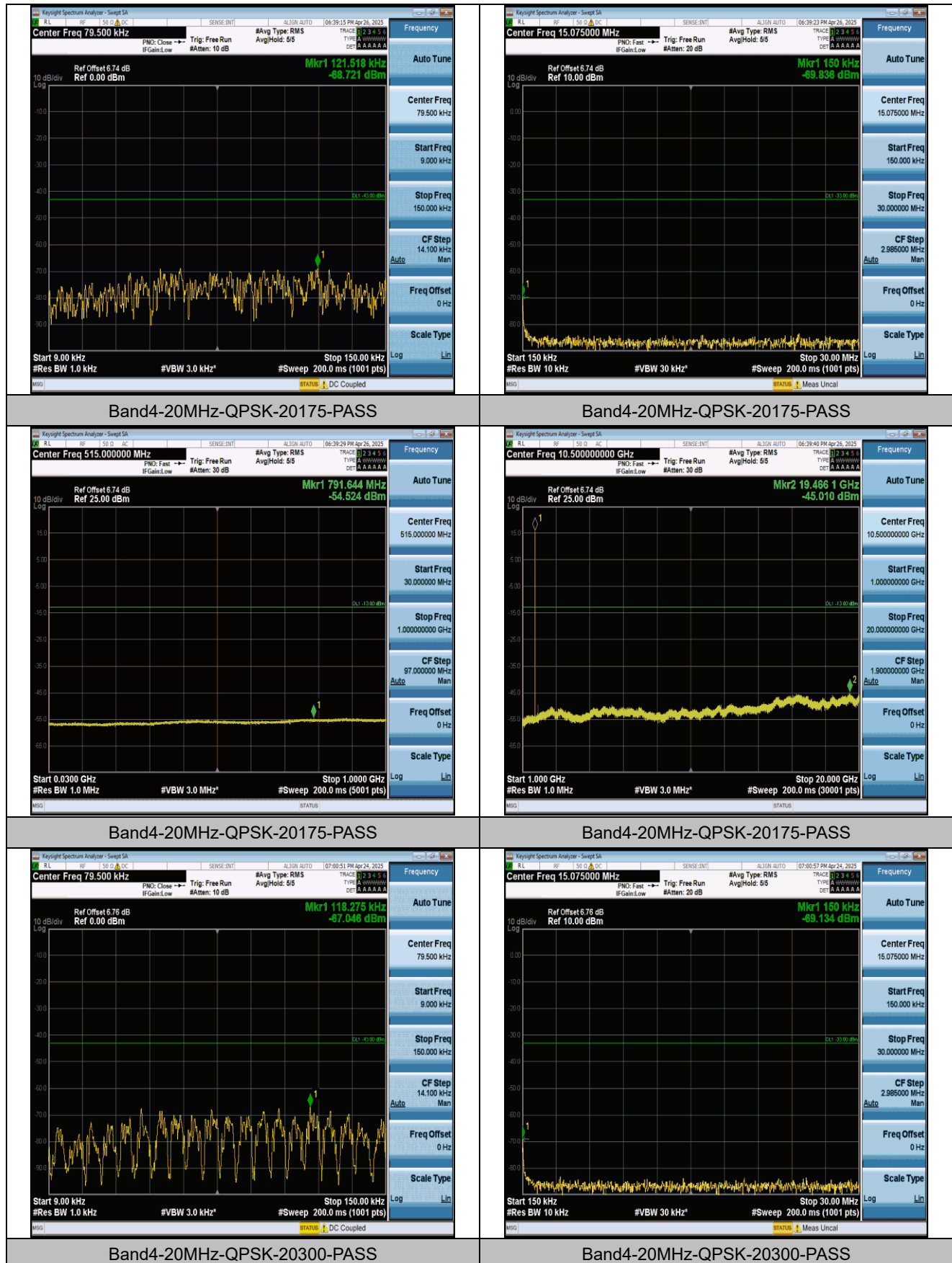
Band4_20MHz_QPSK_20300_1_High

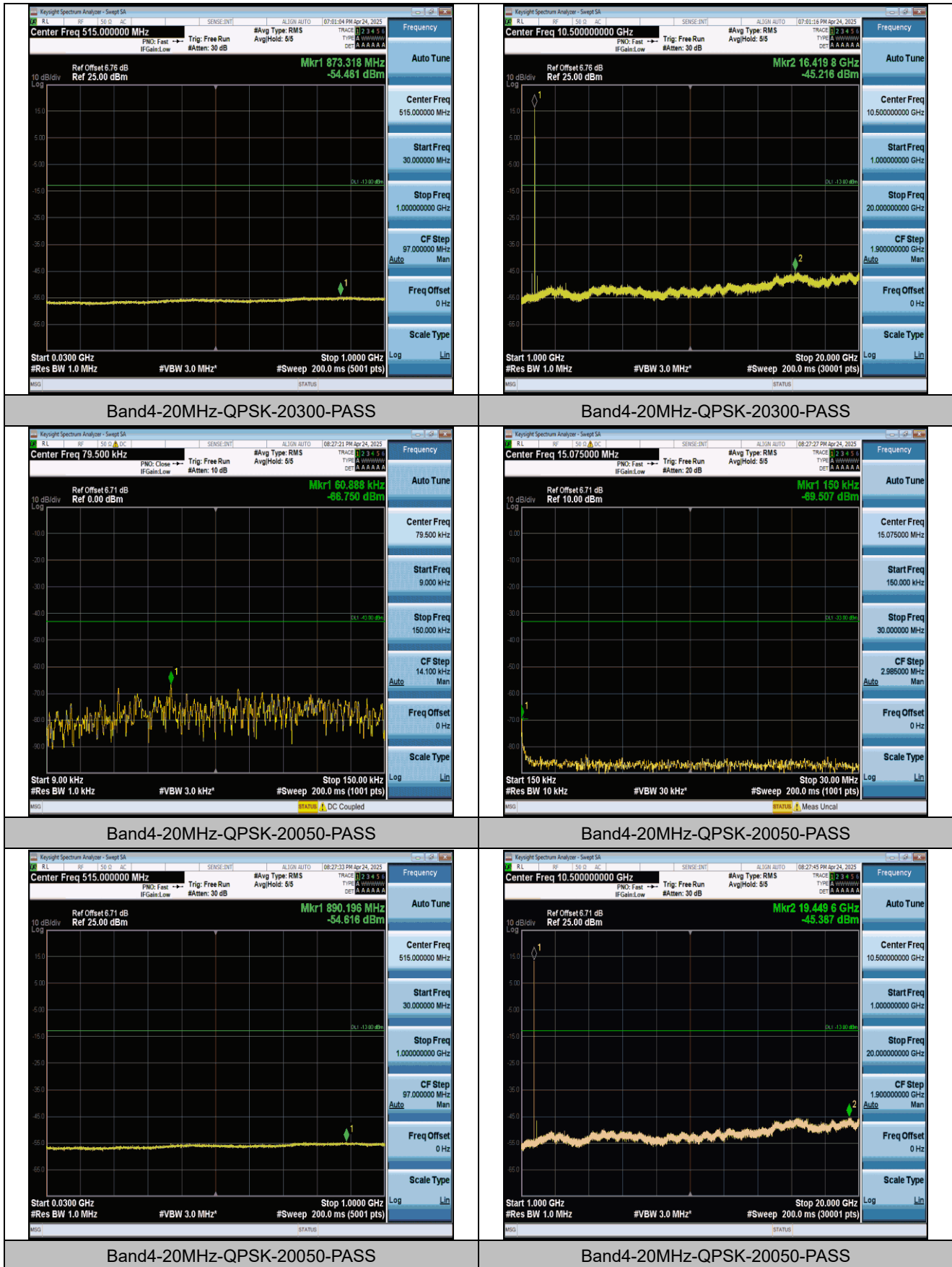


Band4_20MHz_QPSK_20300_6_High

Conducted Spurious Emission for M1

Test Graphs





Frequency Stability for M1

Test Result

Voltage											
Band	Bandwidth	Modulation	Channel	RB Size	RB Start	NB Index	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Verdict
Band4	20MHz	QPSK	20175	6	0	Low	VN	NT	4.30	0.002482	PASS
Band4	20MHz	QPSK	20175	6	0	Low	VL	NT	3.20	0.001847	PASS
Band4	20MHz	QPSK	20175	6	0	Low	VH	NT	1.70	0.000981	PASS

Temperature											
Band	Bandwidth	Modulation	Channel	RB Size	RB Start	NB Index	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Verdict
Band4	20MHz	QPSK	20175	6	0	Low	NV	-30	4.10	0.002367	PASS
Band4	20MHz	QPSK	20175	6	0	Low	NV	-20	5.10	0.002944	PASS
Band4	20MHz	QPSK	20175	6	0	Low	NV	-10	3.10	0.001789	PASS
Band4	20MHz	QPSK	20175	6	0	Low	NV	0	1.80	0.001039	PASS
Band4	20MHz	QPSK	20175	6	0	Low	NV	10	3.60	0.002078	PASS
Band4	20MHz	QPSK	20175	6	0	Low	NV	20	4.70	0.002713	PASS
Band4	20MHz	QPSK	20175	6	0	Low	NV	30	2.90	0.001674	PASS
Band4	20MHz	QPSK	20175	6	0	Low	NV	40	1.10	0.000635	PASS
Band4	20MHz	QPSK	20175	6	0	Low	NV	50	3.80	0.002193	PASS

~The End~