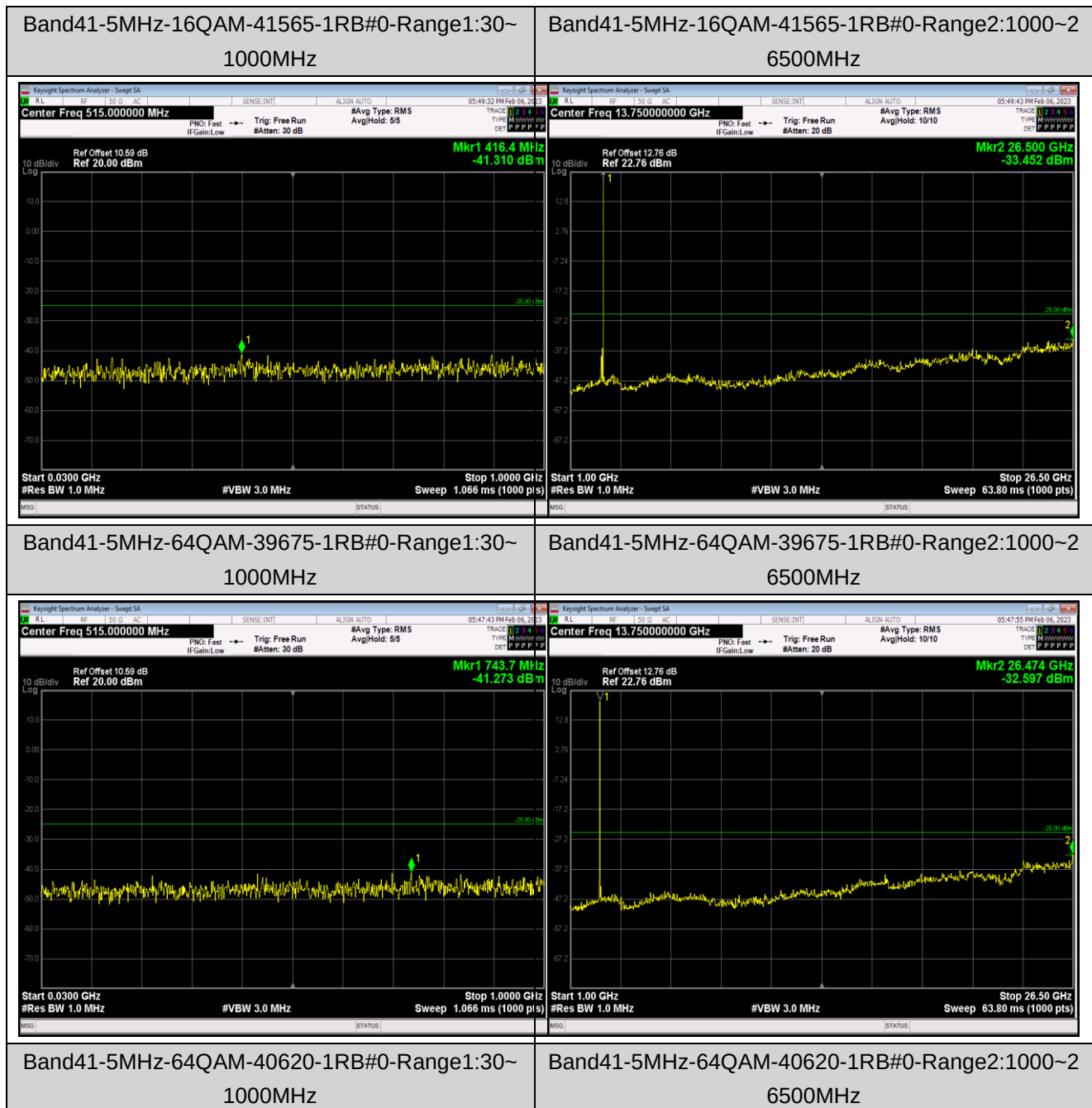
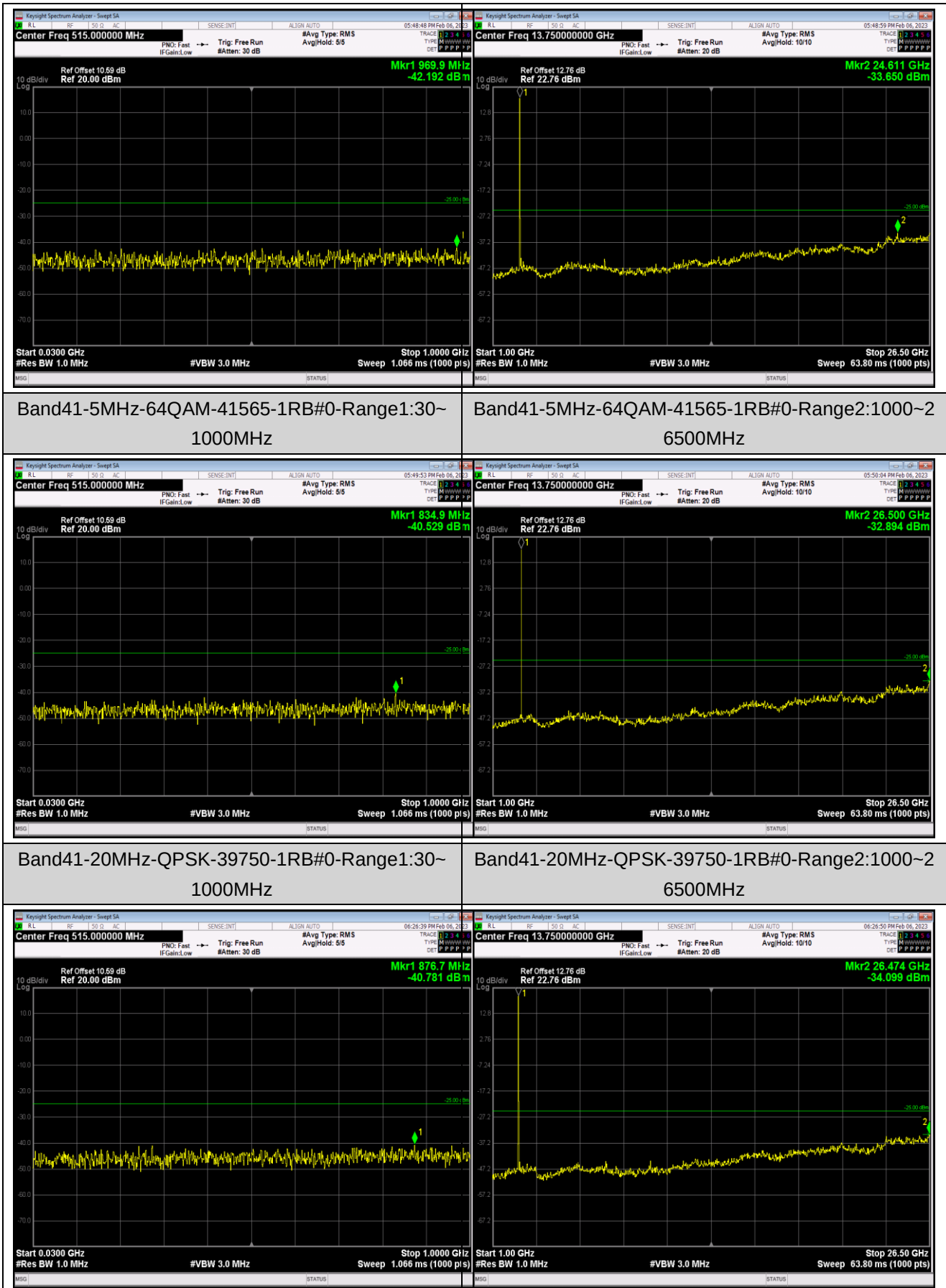
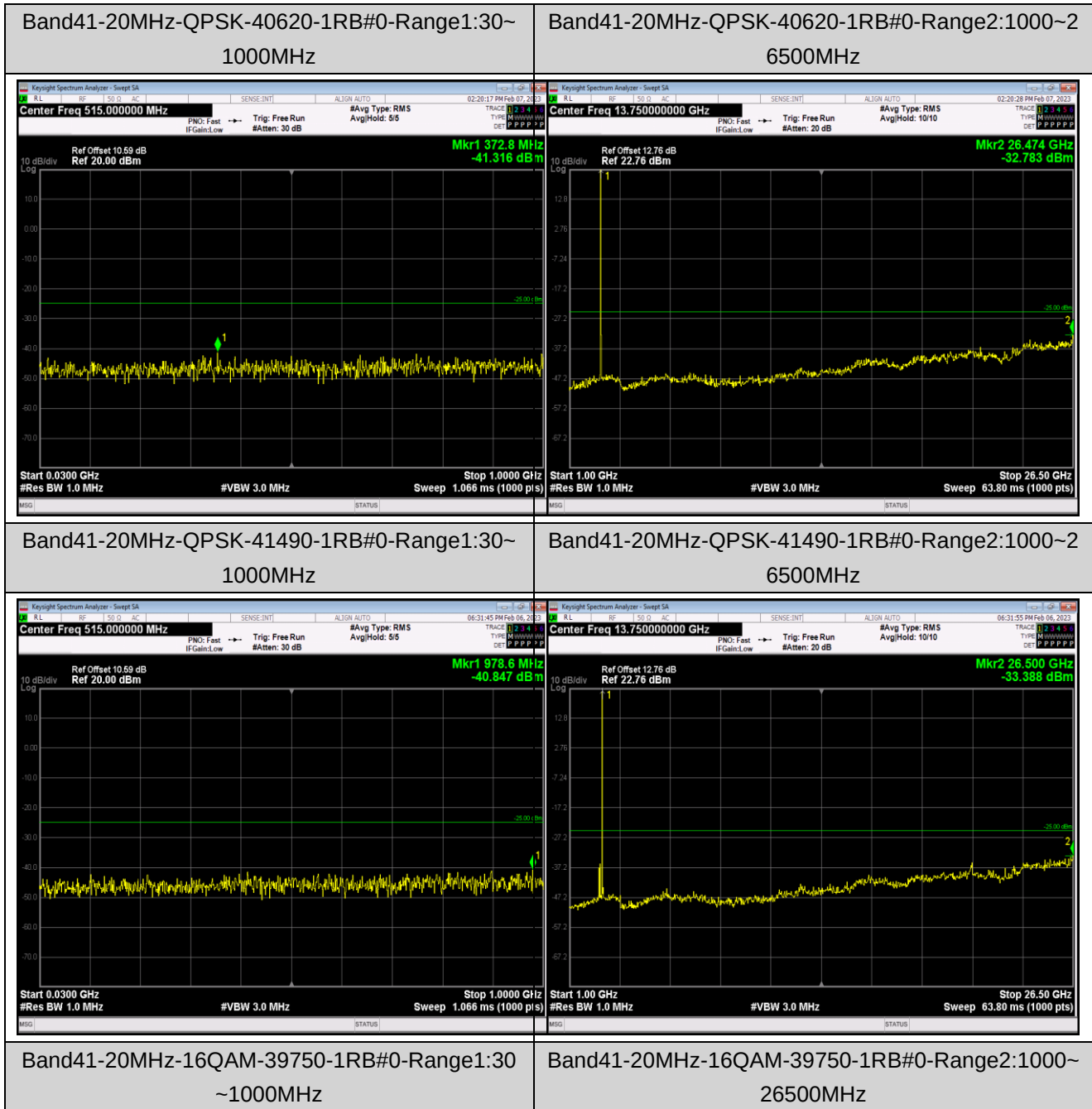
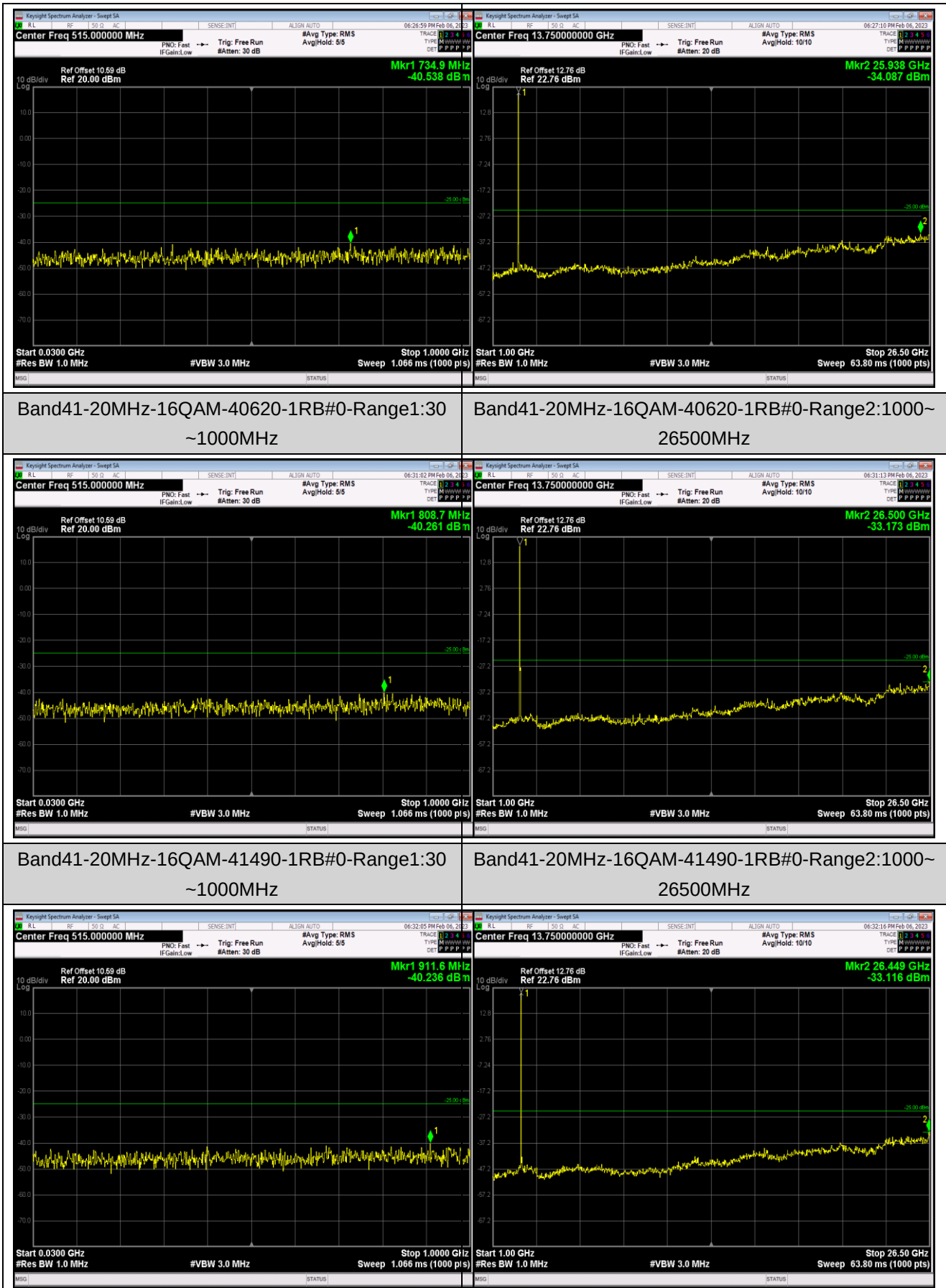
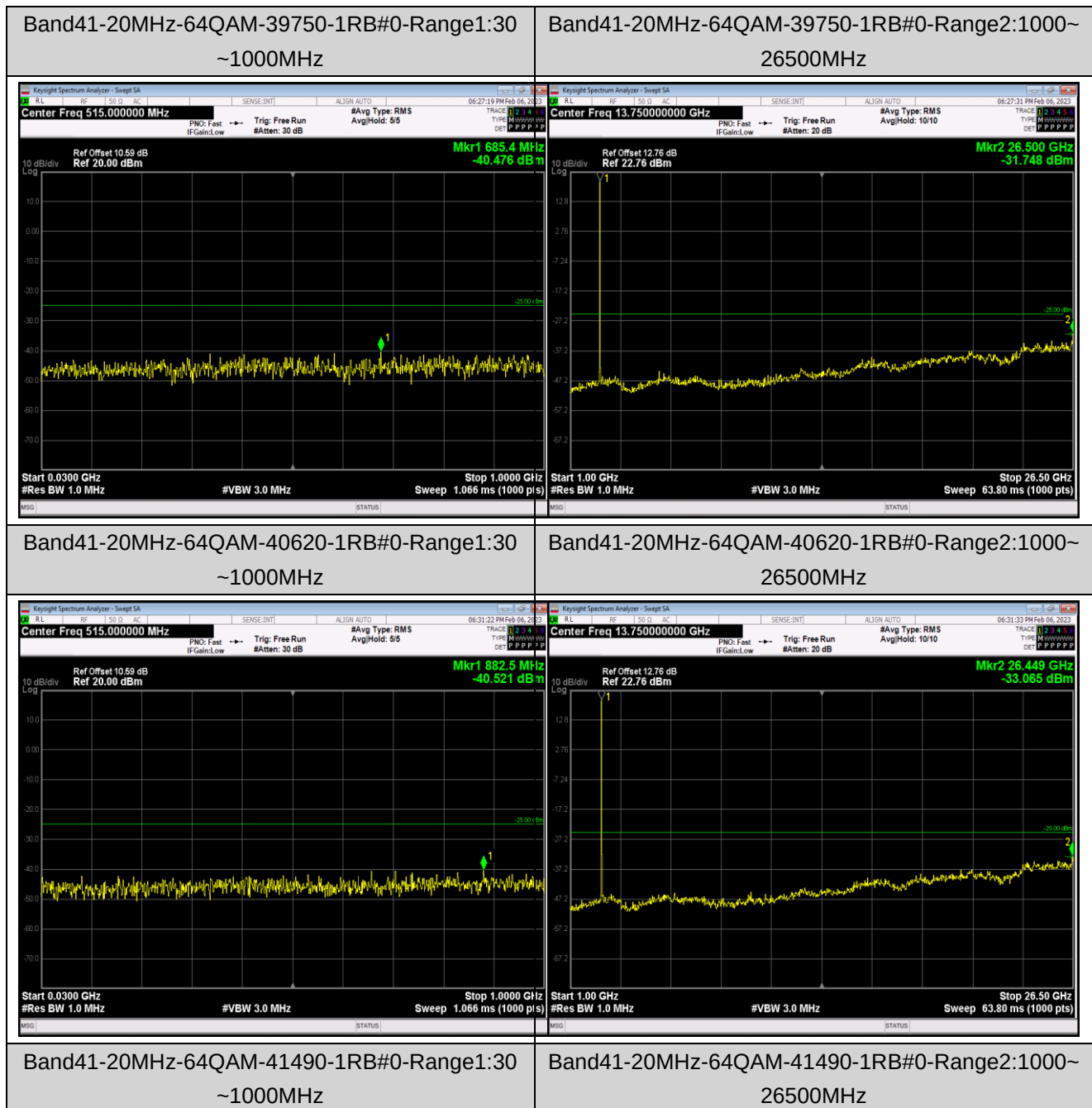


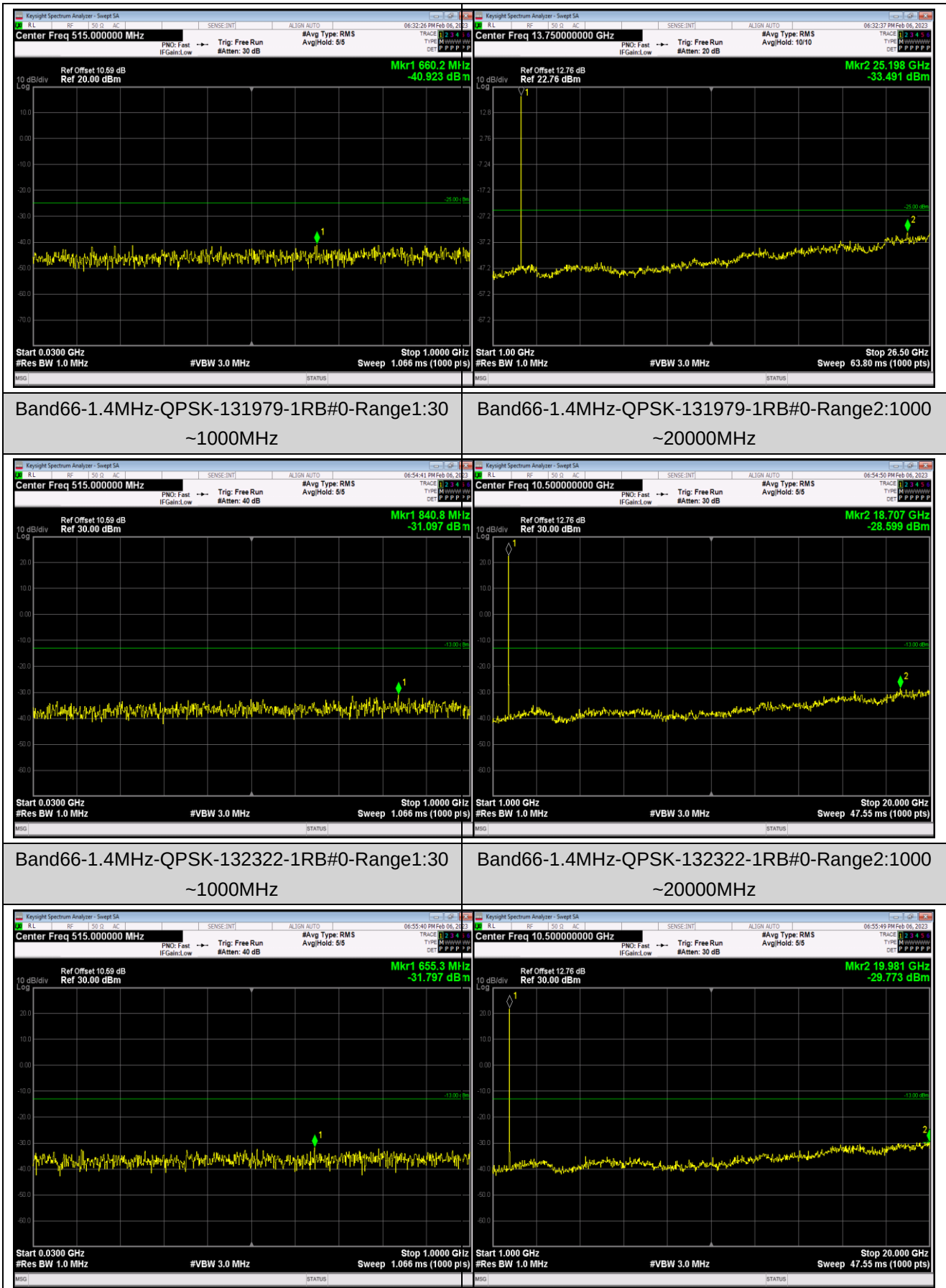


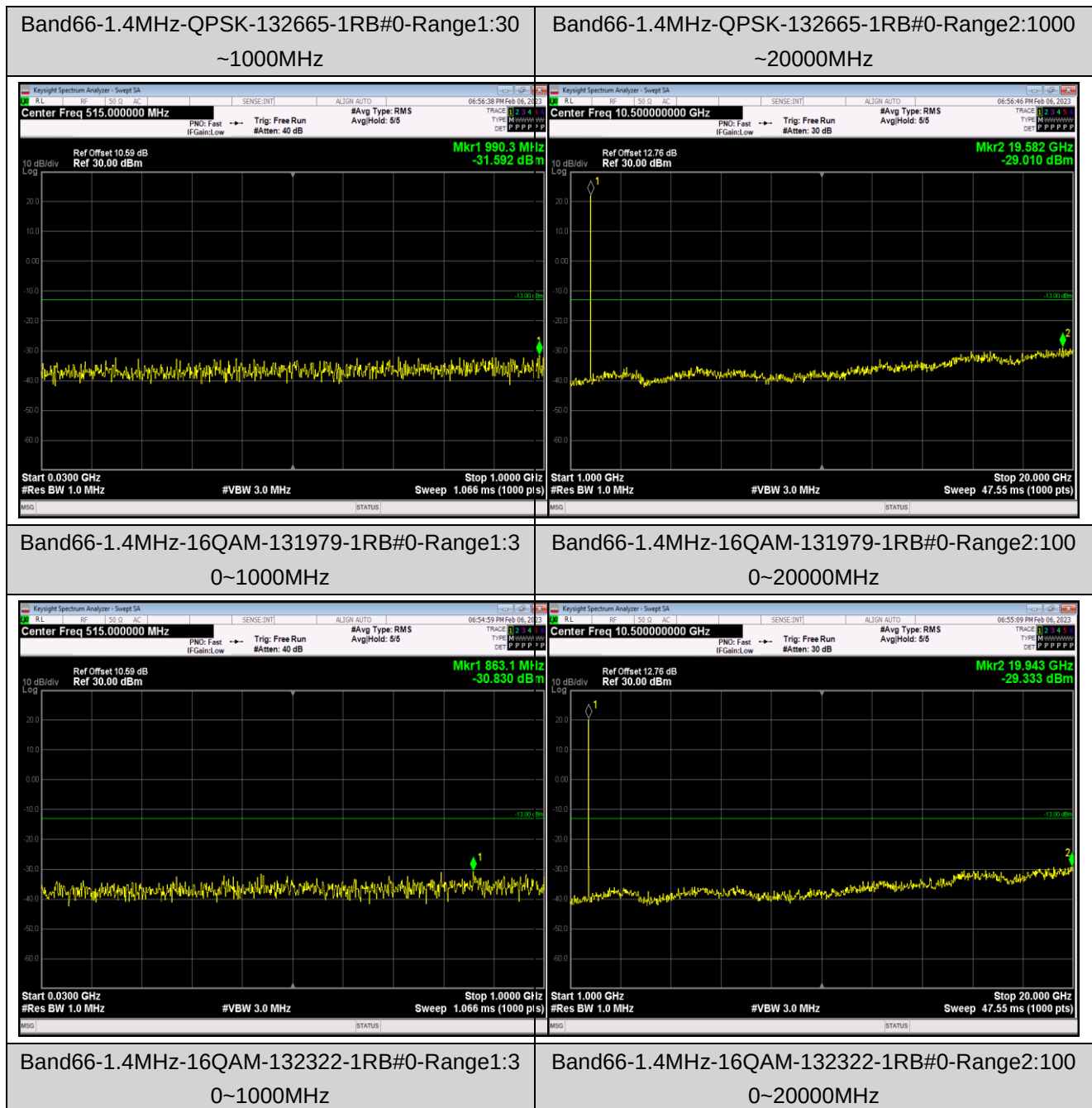


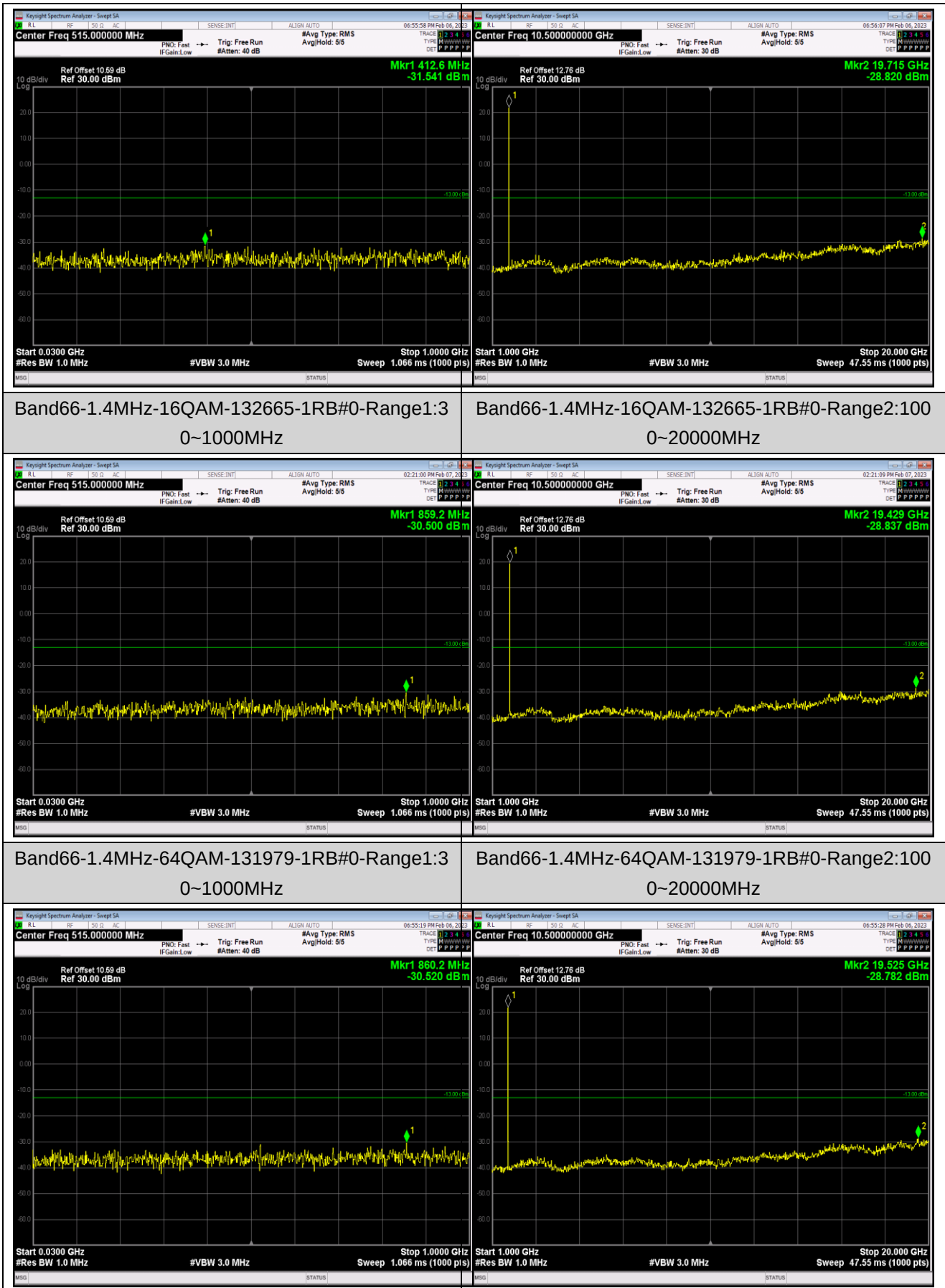


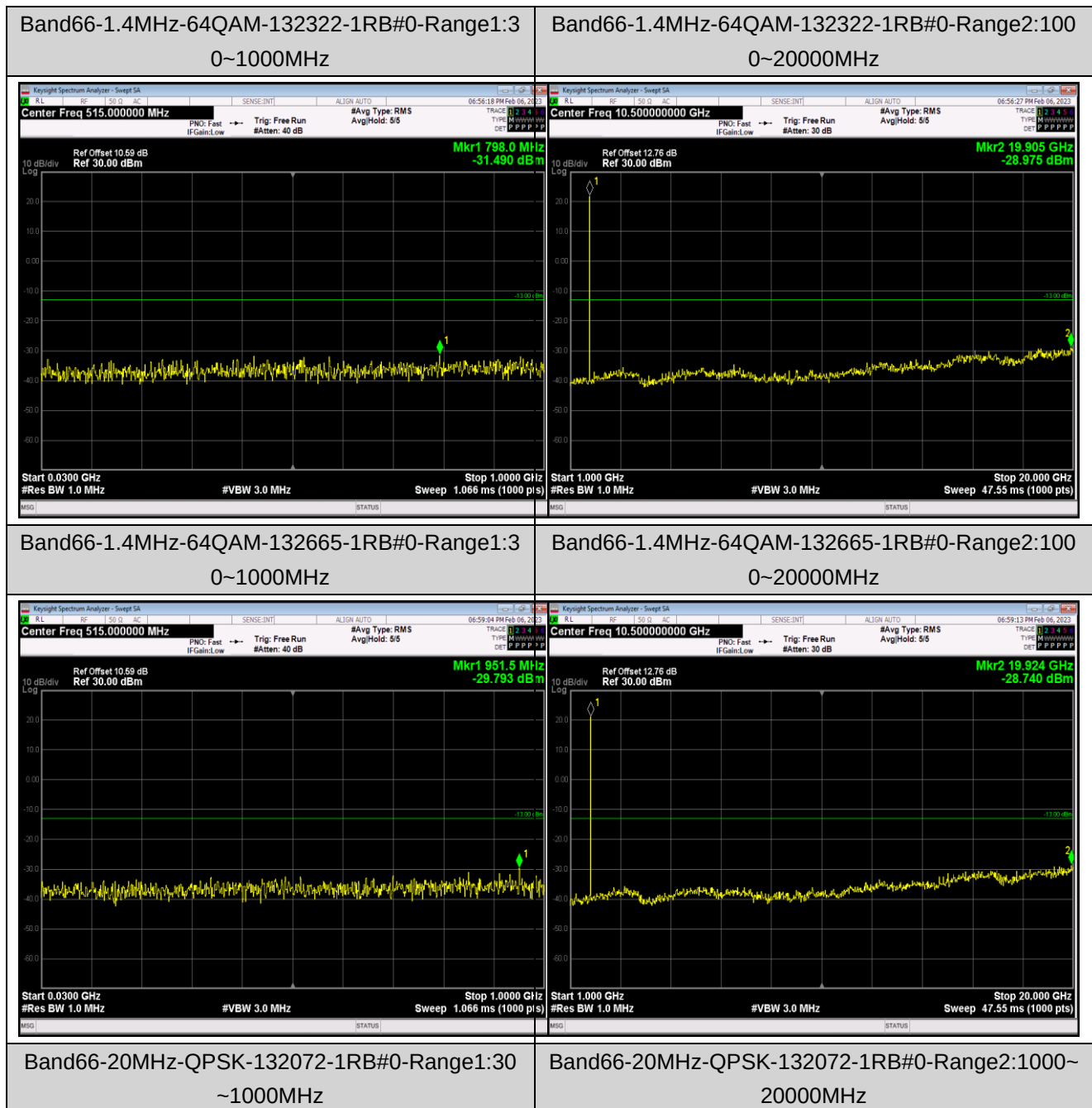


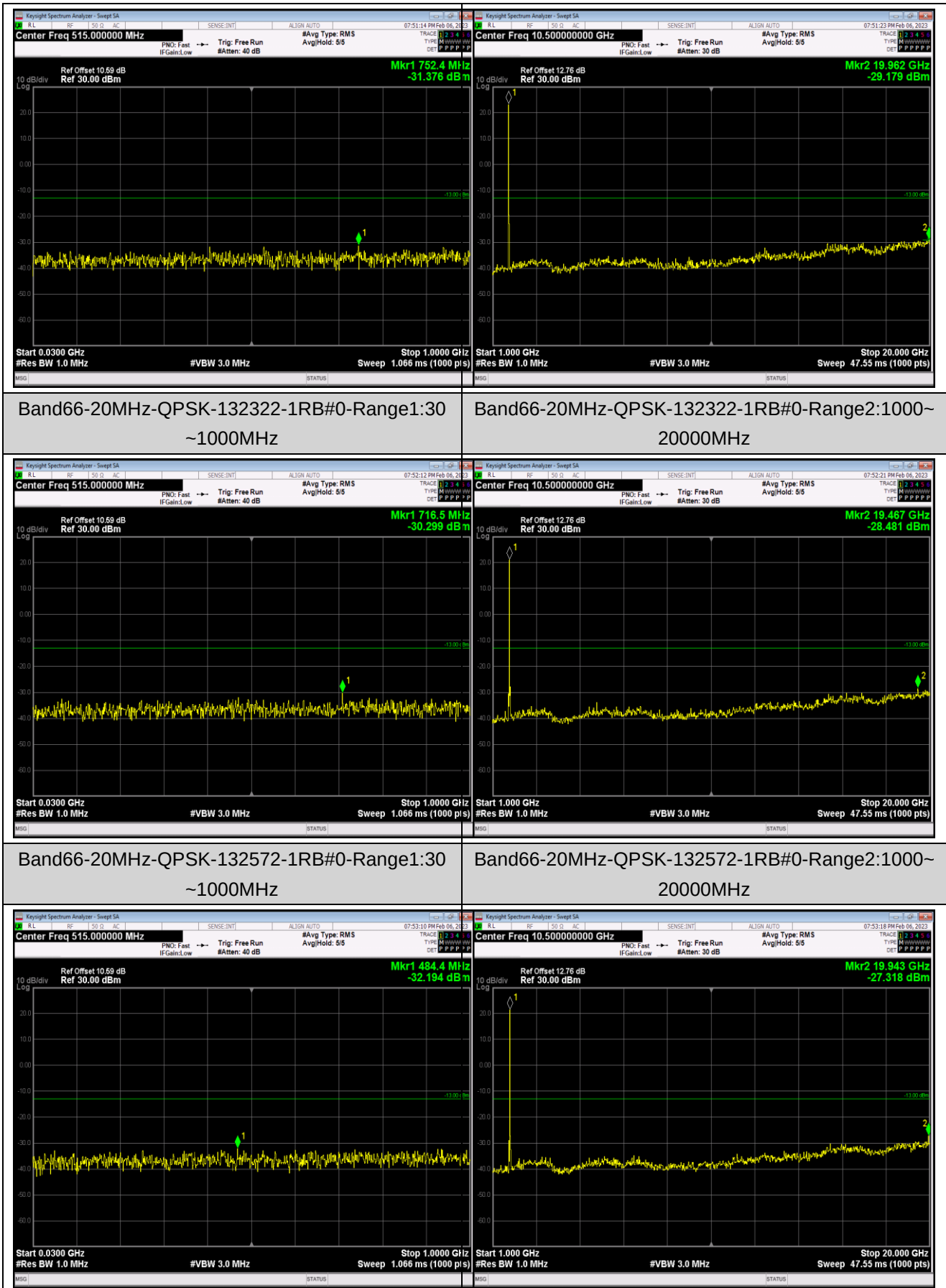


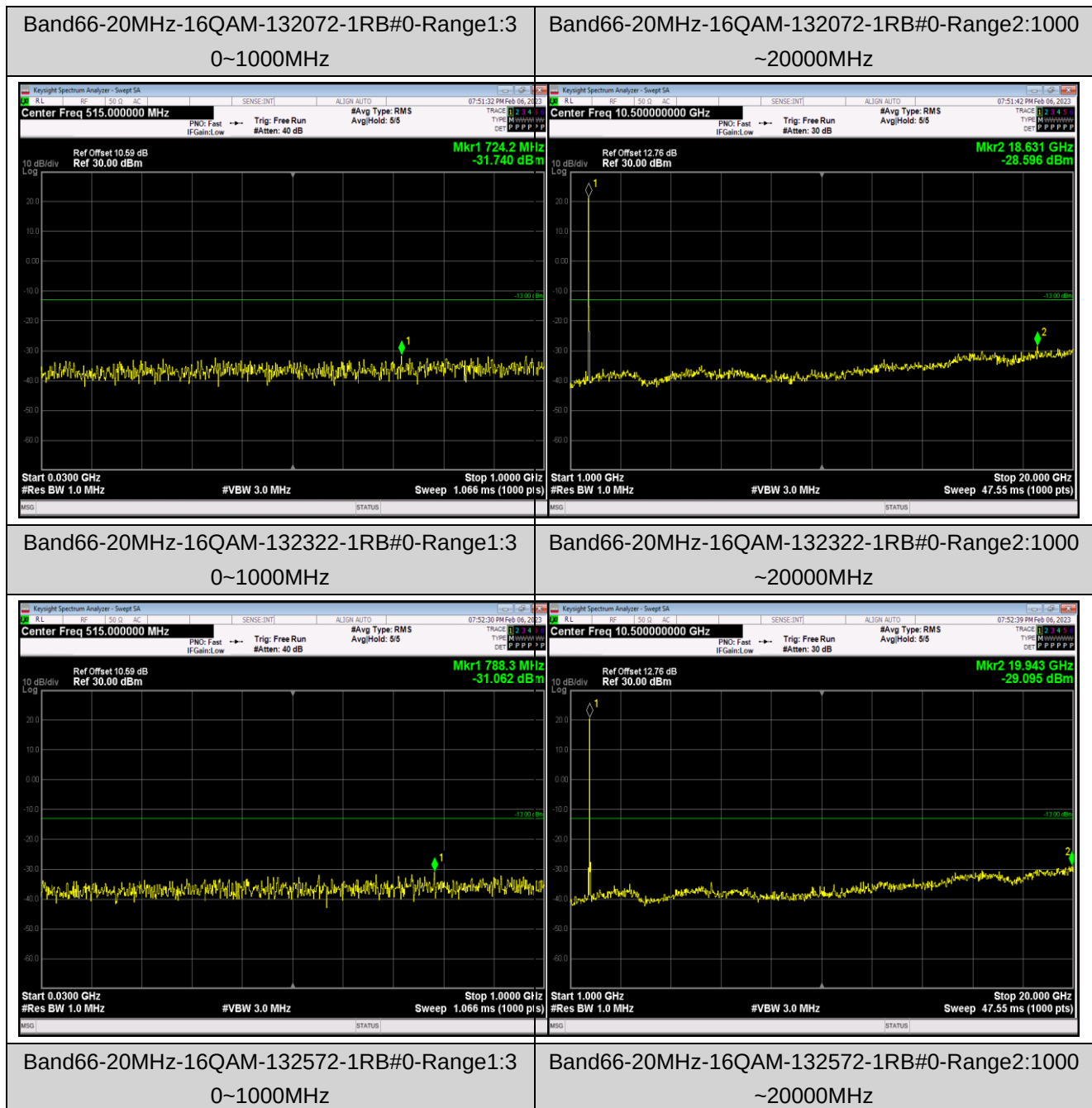


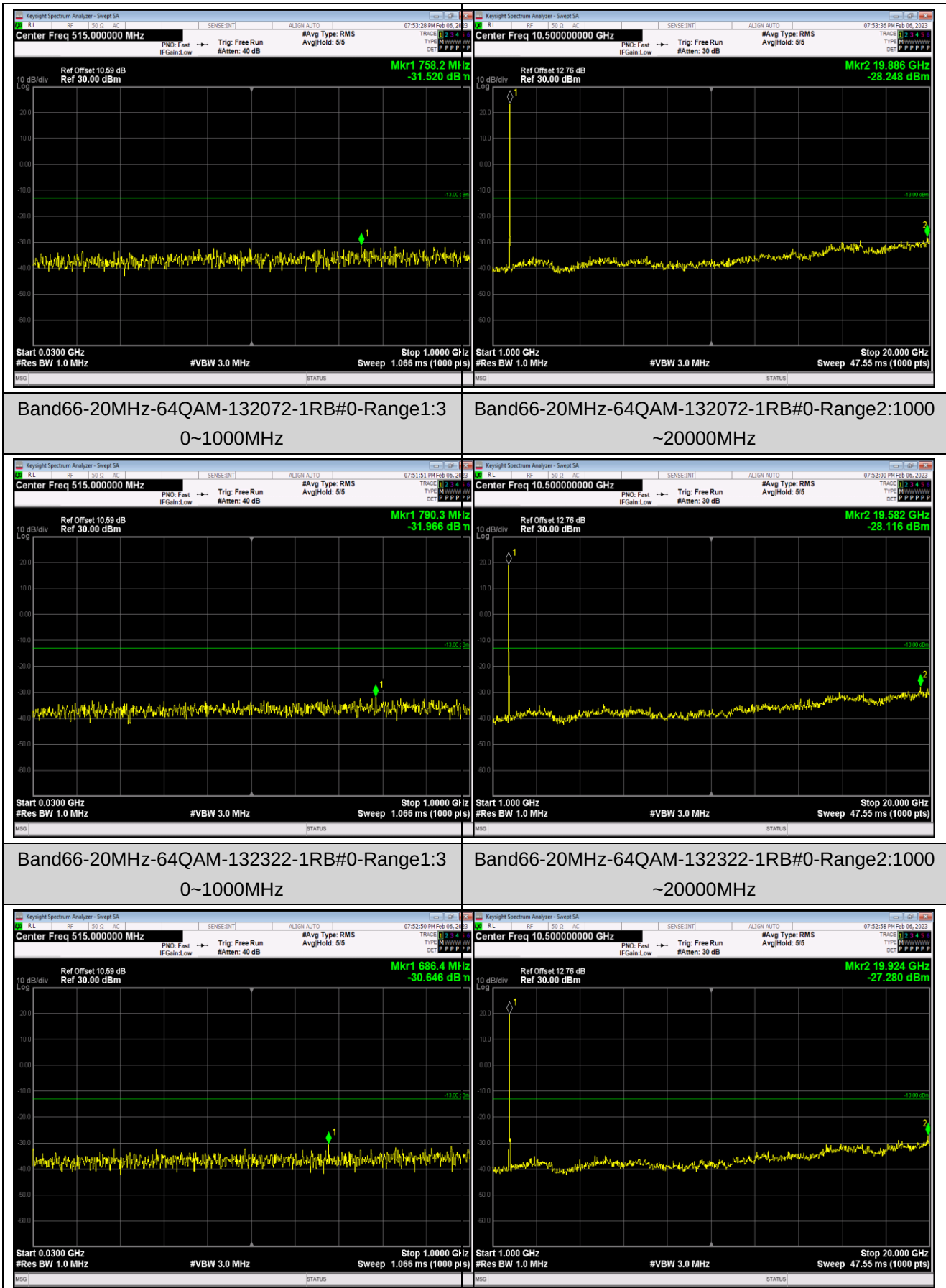


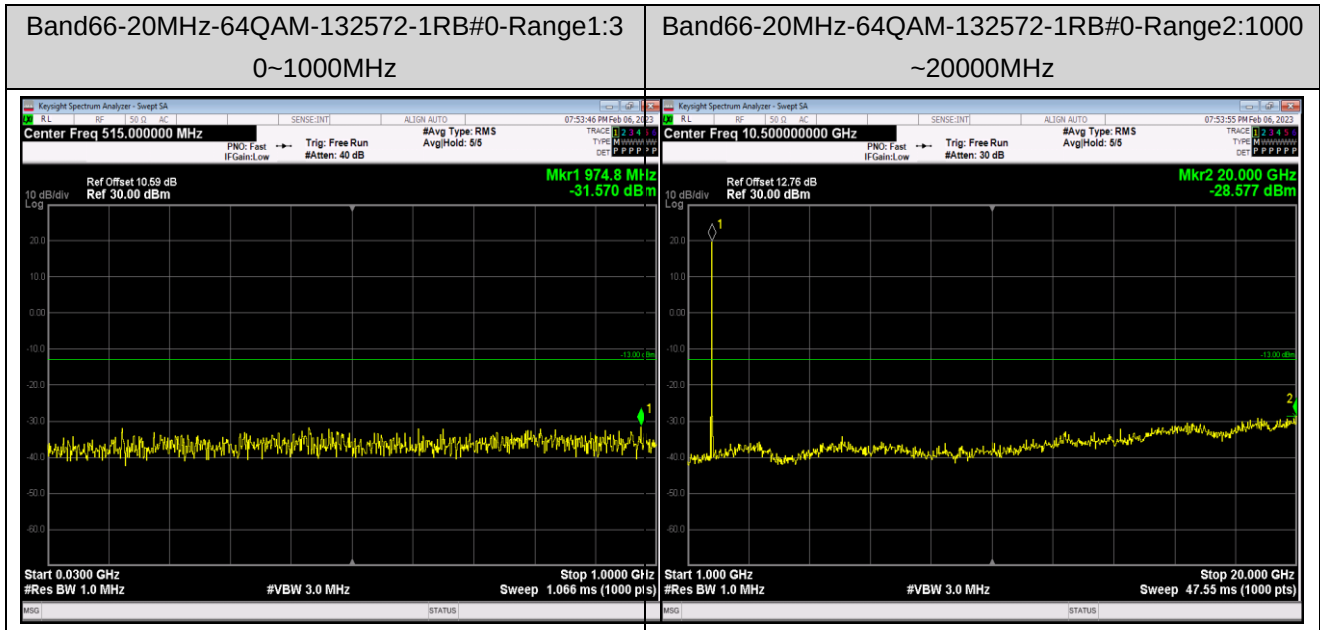












Appendix F: Frequency Stability

Test Result

LTE Band 2 part:

Reference Frequency: LTE Band 2 (10MHz) Middle channel=18900 Frequency=1880.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.89	-30	11.67	0.006207	Within authorized band for Band 2	Pass
	-20	10.73	0.005707		
	-10	2.30	0.001223		
	0	13.96	0.007426		
	10	10.16	0.005404		
	20	5.64	0.003000		
	30	8.05	0.004282		
	40	-3.66	-0.001947		
	50	6.18	0.003287		
16QAM					
3.89	-30	10.17	0.005410	Within authorized band for Band 2	Pass
	-20	11.32	0.006021		
	-10	8.65	0.004601		
	0	6.58	0.003500		
	10	10.50	0.005585		
	20	5.79	0.003080		
	30	6.07	0.003229		
	40	4.21	0.002239		
	50	8.75	0.004654		
64QAM					
3.89	-30	-6.75	-0.003590	Within authorized band for Band 2	Pass
	-20	10.79	0.005739		
	-10	16.06	0.008543		
	0	5.82	0.003096		
	10	9.33	0.004963		
	20	9.77	0.005197		
	30	5.98	0.003181		
	40	14.99	0.007973		
	50	4.94	0.002628		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	5.38	0.002862	Within authorized band for Band 2	Pass
	3.89	6.02	0.003202		
	4.48	5.38	0.002862		
16QAM					
25	3.45	6.88	0.003660	Within authorized band for Band 2	Pass
	3.89	9.27	0.004931		
	4.48	7.45	0.003963		
64QAM					
25	3.45	-5.28	-0.002809	Within authorized band for Band 2	Pass
	3.89	5.51	0.002931		
	4.48	5.51	0.002931		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 5 part:

Reference Frequency: LTE Band 5(10MHz) Middle channel=20525 Frequency=836.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.89	-30	-3.28	-0.003921	±2.5	Pass
	-20	2.23	0.002666		
	-10	3.13	0.003742		
	0	-4.15	-0.004961		
	10	1.52	0.001817		
	20	4.32	0.005164		
	30	2.03	0.002427		
	40	2.82	0.003371		
	50	2.70	0.003228		
16QAM					
3.89	-30	2.86	0.003419	±2.5	Pass
	-20	6.41	0.007663		
	-10	-0.66	-0.000789		
	0	2.73	0.003264		
	10	2.49	0.002977		
	20	-1.52	-0.001817		
	30	-3.68	-0.004399		
	40	4.15	0.004961		
	50	-1.27	-0.001518		
64QAM					
3.89	-30	-2.05	-0.002451	±2.5	Pass
	-20	-2.26	-0.002702		
	-10	2.96	0.003539		
	0	3.50	0.004184		
	10	-7.22	-0.008631		
	20	-2.56	-0.003060		
	30	2.36	0.002821		
	40	2.96	0.003539		
	50	-7.08	-0.008464		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	5.74	0.006862	±2.5	Pass
	3.89	2.82	0.003371		
	4.48	3.68	0.004399		
16QAM					
25	3.45	2.42	0.002893	±2.5	Pass
	3.89	-4.16	-0.004973		
	4.48	3.32	0.003969		
64QAM					
25	3.45	3.82	0.004567	Within authorized band for Band 4	Pass
	3.89	-2.12	-0.002534		
	4.48	2.06	0.002463		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 7 part:

Reference Frequency: LTE Band 7(10MHz) Middle channel=21100 Frequency=2535.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.89	-30	8.63	0.003404	Within authorized band for Band 7	Pass
	-20	-10.20	-0.004024		
	-10	-8.90	-0.003511		
	0	17.97	0.007089		
	10	-5.04	-0.001988		
	20	10.29	0.004059		
	30	5.22	0.002059		
	40	-3.49	-0.001377		
	50	4.76	0.001878		
16QAM					
3.89	-30	-14.10	-0.005562	Within authorized band for Band 7	Pass
	-20	-12.62	-0.004978		
	-10	-11.80	-0.004655		
	0	-11.20	-0.004418		
	10	-11.40	-0.004497		
	20	-12.30	-0.004852		
	30	-12.03	-0.004746		
	40	-11.86	-0.004679		
	50	11.64	0.004592		
64QAM					
3.89	-30	10.70	0.004221	Within authorized band for Band 7	Pass
	-20	10.57	0.004170		
	-10	5.41	0.002134		
	0	10.79	0.004256		
	10	-10.89	-0.004296		
	20	9.47	0.003736		
	30	-8.38	-0.003306		
	40	-4.52	-0.001783		
	50	13.72	0.005412		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	14.59	0.005755	Within authorized band for Band 7	Pass
	3.89	11.62	0.004584		
	4.35	13.65	0.005385		
16QAM					
25	3.45	-12.79	-0.005045	Within authorized band for Band 7	Pass
	3.89	-8.98	-0.003542		
	4.48	-7.31	-0.002884		
64QAM					
25	3.45	-13.29	-0.005243	Within authorized band for Band 7	Pass
	3.89	12.90	0.005089		
	4.48	13.56	0.005349		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 12 part:

Reference Frequency: LTE Band 12(10MHz) Middle channel=23095 Frequency=707.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.89	-30	-1.06	-0.001498	Within authorized band for Band 12	Pass
	-20	2.12	0.002996		
	-10	1.95	0.002756		
	0	5.81	0.008212		
	10	7.14	0.010092		
	20	1.53	0.002163		
	30	2.47	0.003491		
	40	-4.08	-0.005767		
	50	2.23	0.003152		
16QAM					
3.89	-30	2.72	0.003845	Within authorized band for Band 12	Pass
	-20	1.67	0.002360		
	-10	5.39	0.007618		
	0	3.99	0.005640		
	10	5.45	0.007703		
	20	5.66	0.008000		
	30	2.05	0.002898		
	40	6.77	0.009569		
	50	2.95	0.004170		
64QAM					
3.89	-30	2.25	0.003180	Within authorized band for Band 12	Pass
	-20	4.91	0.006940		
	-10	7.95	0.011237		
	0	-5.65	-0.007986		
	10	3.78	0.005343		
	20	5.01	0.007081		
	30	6.29	0.008890		
	40	2.49	0.003519		
	50	4.21	0.005951		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-5.85	-0.008269	Within authorized band for Band 12	Pass
	3.89	4.06	0.005739		
	4.48	-3.86	-0.005456		
16QAM					
25	3.45	5.84	0.008254	Within authorized band for Band 12	Pass
	3.89	4.65	0.006572		
	4.48	-2.20	-0.003110		
64QAM					
25	3.45	2.66	0.003760	Within authorized band for Band 12	Pass
	3.89	3.03	0.004283		
	4.48	2.66	0.003760		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 17 part:

Reference Frequency: LTE Band 17(10MHz) Middle channel=23790 Frequency=710.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.89	-30	-3.53	-0.004972	Within authorized band for Band 17	Pass
	-20	4.29	0.006042		
	-10	4.09	0.005761		
	0	-3.89	-0.005479		
	10	4.18	0.005887		
	20	5.87	0.008268		
	30	5.65	0.007958		
	40	-4.56	-0.006423		
	50	2.98	0.004197		
16QAM					
3.89	-30	2.88	0.004056	Within authorized band for Band 17	Pass
	-20	4.45	0.006268		
	-10	4.96	0.006986		
	0	3.96	0.005577		
	10	7.45	0.010493		
	20	2.73	0.003845		
	30	4.26	0.006000		
	40	6.31	0.008887		
	50	-3.03	-0.004268		
64QAM					
3.89	-30	4.42	0.006225	Within authorized band for Band 17	Pass
	-20	3.32	0.004676		
	-10	3.29	0.004634		
	0	3.92	0.005521		
	10	-3.55	-0.005000		
	20	4.43	0.006239		
	30	-1.46	-0.002056		
	40	2.73	0.003845		
	50	5.11	0.007197		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	3.35	0.004718	Within authorized band for Band 17	Pass
	3.89	3.49	0.004915		
	4.48	3.65	0.005141		
16QAM					
25	3.45	3.18	0.004479	Within authorized band for Band 17	Pass
	3.89	-2.57	-0.003620		
	4.48	3.43	0.004831		
64QAM					
25	3.45	-1.32	-0.001859	Within authorized band for Band 17	Pass
	3.89	3.78	0.005324		
	4.48	-5.45	-0.007676		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 41 part:

Reference Frequency: LTE Band 41 (10MHz) Middle channel=40620 Frequency=2595.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.89	-30	4.49	0.001732	Within authorized band for Band 41	Pass
	-20	-2.88	-0.001111		
	-10	5.79	0.002233		
	0	-13.00	-0.005013		
	10	4.45	0.001716		
	20	6.38	0.002460		
	30	-6.54	-0.002522		
	40	4.18	0.001612		
	50	6.85	0.002642		
16QAM					
3.89	-30	-2.92	-0.001126	Within authorized band for Band 41	Pass
	-20	-3.62	-0.001396		
	-10	-3.28	-0.001265		
	0	-3.56	-0.001373		
	10	3.96	0.001527		
	20	3.62	0.001396		
	30	-4.01	-0.001546		
	40	5.45	0.002102		
	50	2.76	0.001064		
64QAM					
3.89	-30	2.23	0.000860	Within authorized band for Band 41	Pass
	-20	3.33	0.001284		
	-10	-3.16	-0.001219		
	0	6.34	0.002445		
	10	-4.69	-0.001809		
	20	6.81	0.002626		
	30	-2.17	-0.000837		
	40	3.89	0.001500		
	50	-1.83	-0.000706		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	2.68	0.001034	Within authorized band for Band 41	Pass
	3.89	2.82	0.001088		
	4.48	4.89	0.001886		
16QAM					
25	3.45	5.18	0.001998	Within authorized band for Band41	Pass
	3.89	7.47	0.002881		
	4.48	5.79	0.002233		
64QAM					
25	3.45	8.74	0.003371	Within authorized band for Band41	Pass
	3.89	2.92	0.001126		
	4.48	-3.15	-0.001215		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 66 part:

Reference Frequency: LTE Band 66 (10MHz) Middle channel=132322 Frequency=1745.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.89	-30	3.83	0.002195	Within authorized band for Band 66	Pass
	-20	7.68	0.004401		
	-10	12.49	0.007158		
	0	10.90	0.006246		
	10	7.90	0.004527		
	20	9.21	0.005278		
	30	4.62	0.002648		
	40	6.69	0.003834		
	50	8.11	0.004648		
16QAM					
3.89	-30	9.16	0.005249	Within authorized band for Band 66	Pass
	-20	12.70	0.007278		
	-10	13.10	0.007507		
	0	10.93	0.006264		
	10	3.45	0.001977		
	20	7.97	0.004567		
	30	10.77	0.006172		
	40	9.58	0.005490		
	50	10.14	0.005811		
64QAM					
3.89	-30	13.38	0.007668	Within authorized band for Band 66	Pass
	-20	13.65	0.007822		
	-10	9.80	0.005616		
	0	13.88	0.007954		
	10	7.48	0.004287		
	20	7.20	0.004126		
	30	15.44	0.008848		
	40	13.80	0.007908		
	50	7.42	0.004252		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.45	7.94	0.004550	Within authorized band for Band 66	Pass
	3.89	8.13	0.004659		
	4.48	4.11	0.002355		
16QAM					
25	3.45	6.21	0.003559	Within authorized band for Band 66	Pass
	3.89	11.80	0.006762		
	4.48	11.72	0.006716		
64QAM					
25	3.45	7.30	0.004183	Within authorized band for Band 66	Pass
	3.89	11.03	0.006321		
	4.48	5.82	0.003335		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

Appendix G: Modulation Characteristics

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result	Verdict
Band2	20MHz	QPSK	18900	100RB#0	PASS	PASS
Band2	20MHz	16QAM	18900	100RB#0	PASS	PASS
Band2	20MHz	64QAM	18900	100RB#0	PASS	PASS
Band5	10MHz	QPSK	20525	50RB#0	PASS	PASS
Band5	10MHz	16QAM	20525	50RB#0	PASS	PASS
Band5	10MHz	64QAM	20525	50RB#0	PASS	PASS
Band7	20MHz	QPSK	21100	100RB#0	PASS	PASS
Band7	20MHz	16QAM	21100	100RB#0	PASS	PASS
Band7	20MHz	64QAM	21100	100RB#0	PASS	PASS
Band12	10MHz	QPSK	23095	50RB#0	PASS	PASS
Band12	10MHz	16QAM	23095	50RB#0	PASS	PASS
Band12	10MHz	64QAM	23095	50RB#0	PASS	PASS
Band17	10MHz	QPSK	23790	50RB#0	PASS	PASS
Band17	10MHz	16QAM	23790	50RB#0	PASS	PASS
Band17	10MHz	64QAM	23790	50RB#0	PASS	PASS
Band41	20MHz	QPSK	40620	100RB#0	PASS	PASS
Band41	20MHz	16QAM	40620	100RB#0	PASS	PASS
Band41	20MHz	64QAM	40620	100RB#0	PASS	PASS
Band66	20MHz	QPSK	132322	100RB#0	PASS	PASS
Band66	20MHz	16QAM	132322	100RB#0	PASS	PASS
Band66	20MHz	64QAM	132322	100RB#0	PASS	PASS

Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.

Test Graphs

