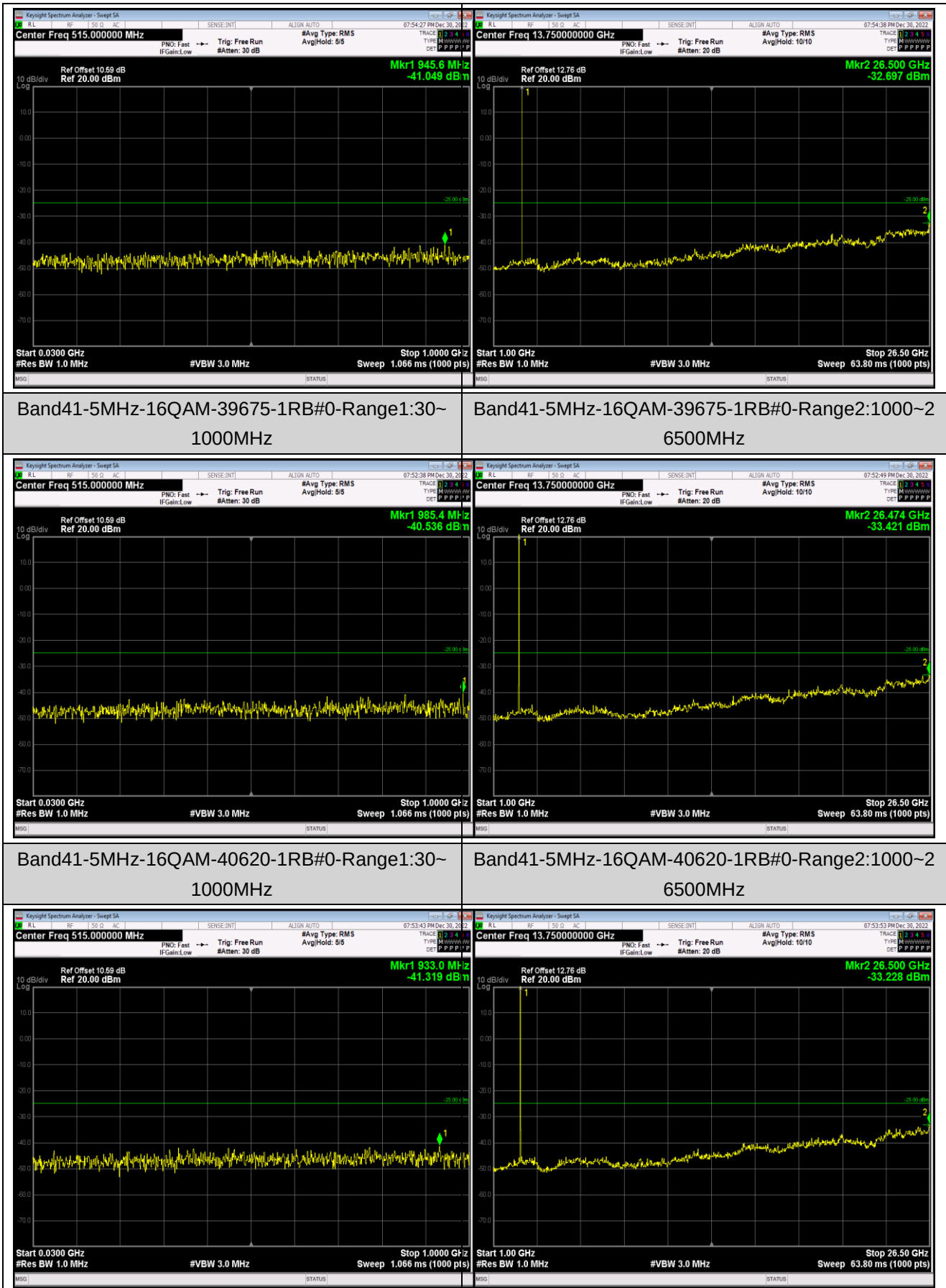
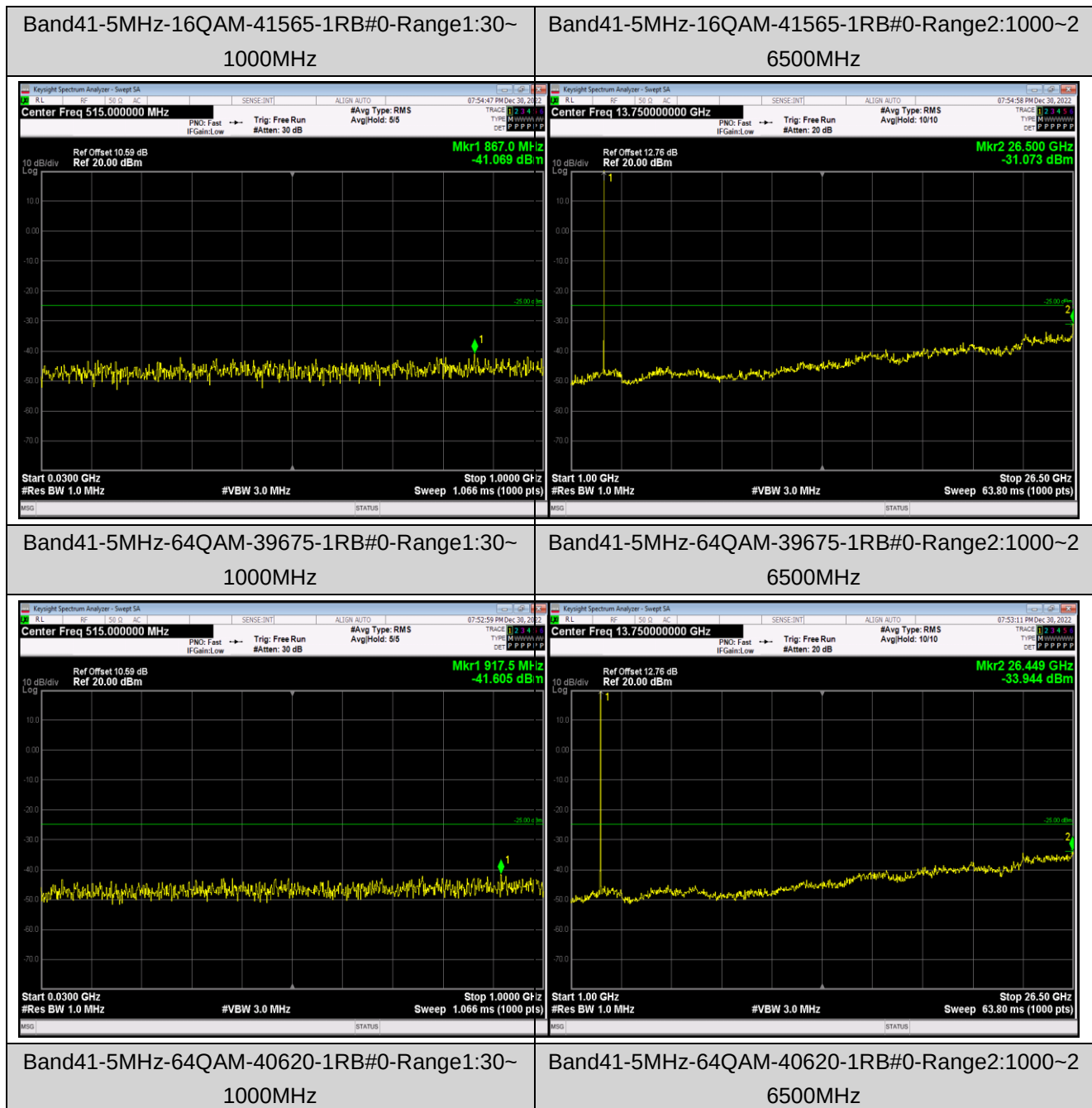
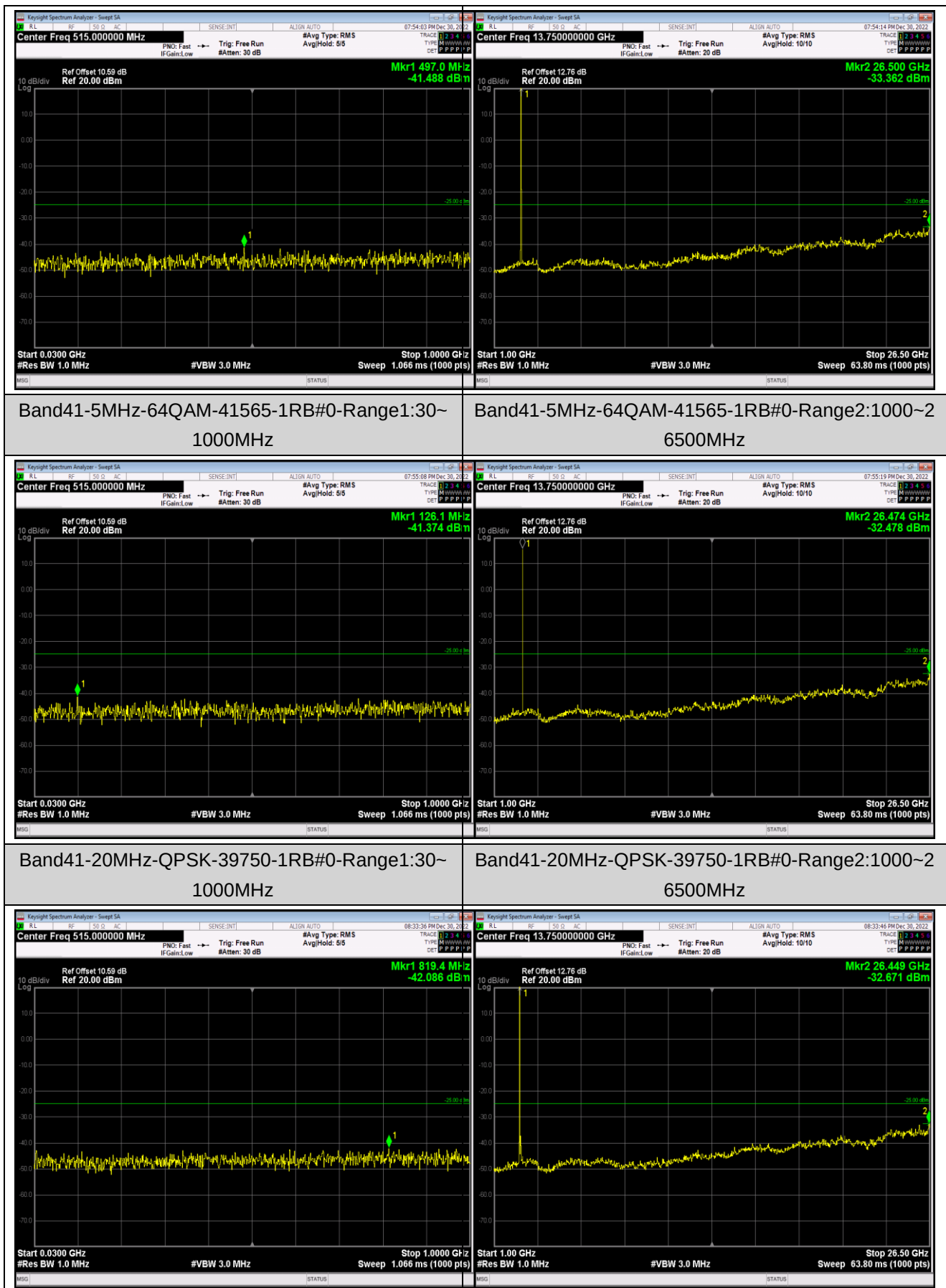
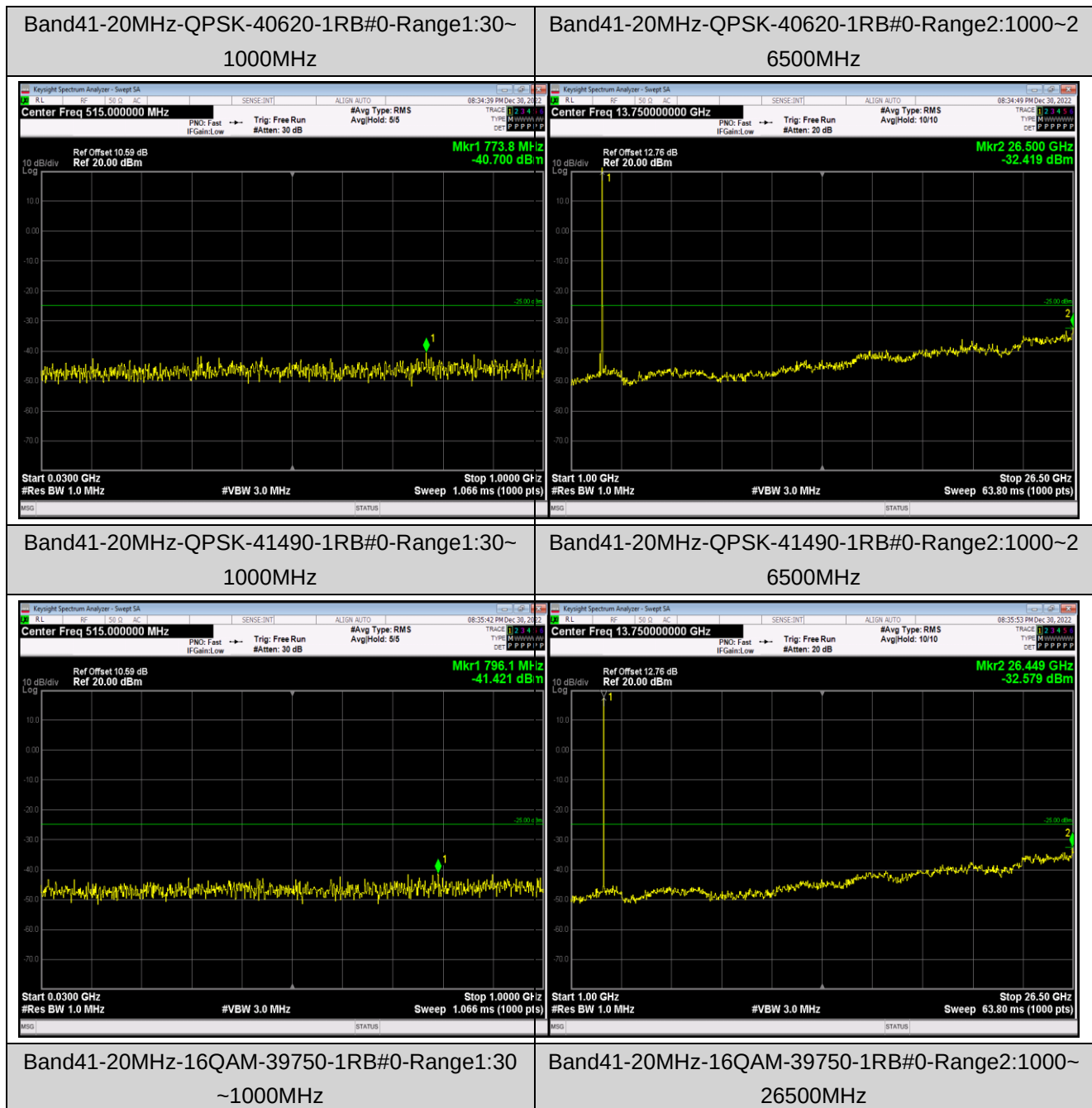
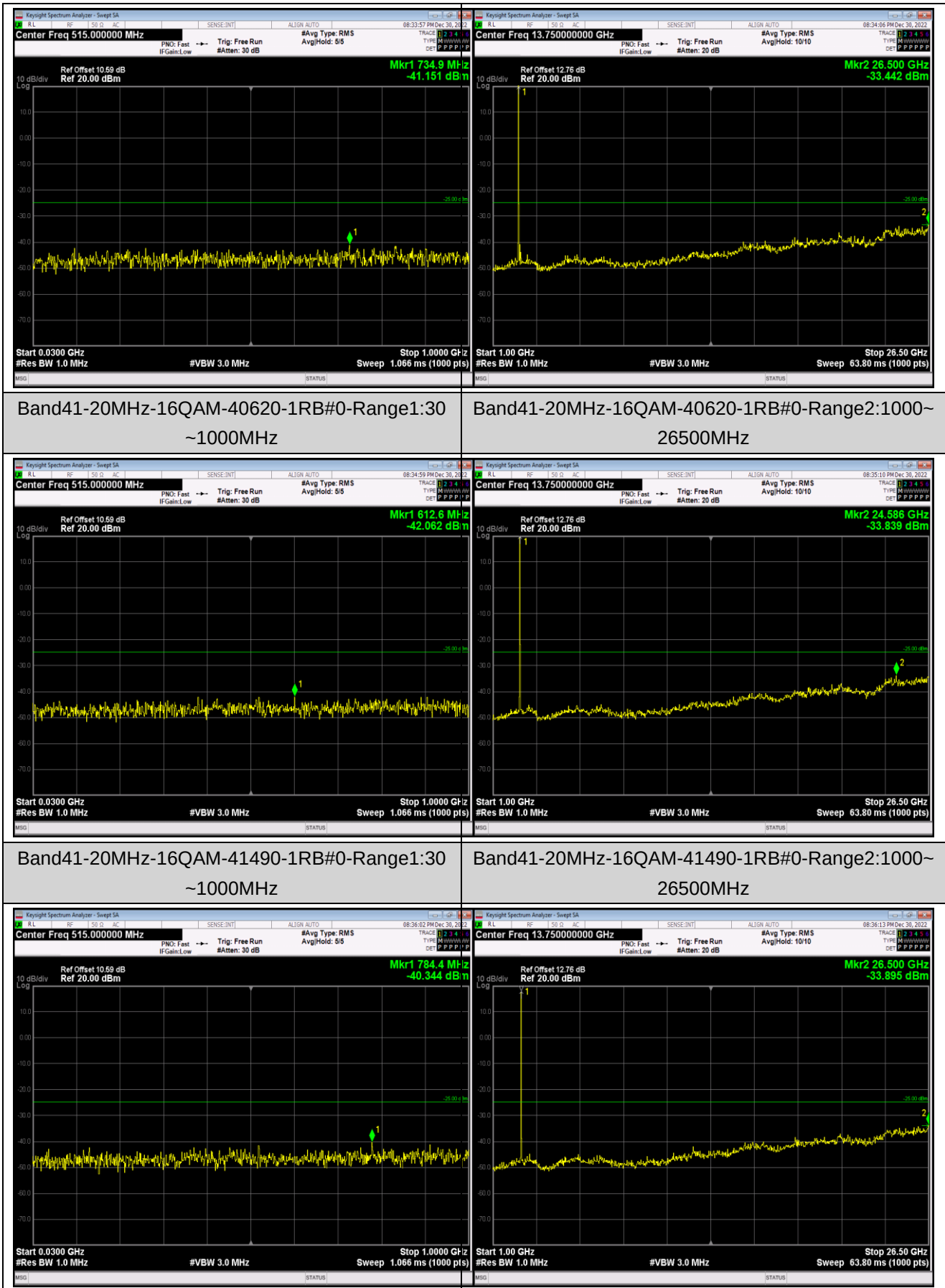


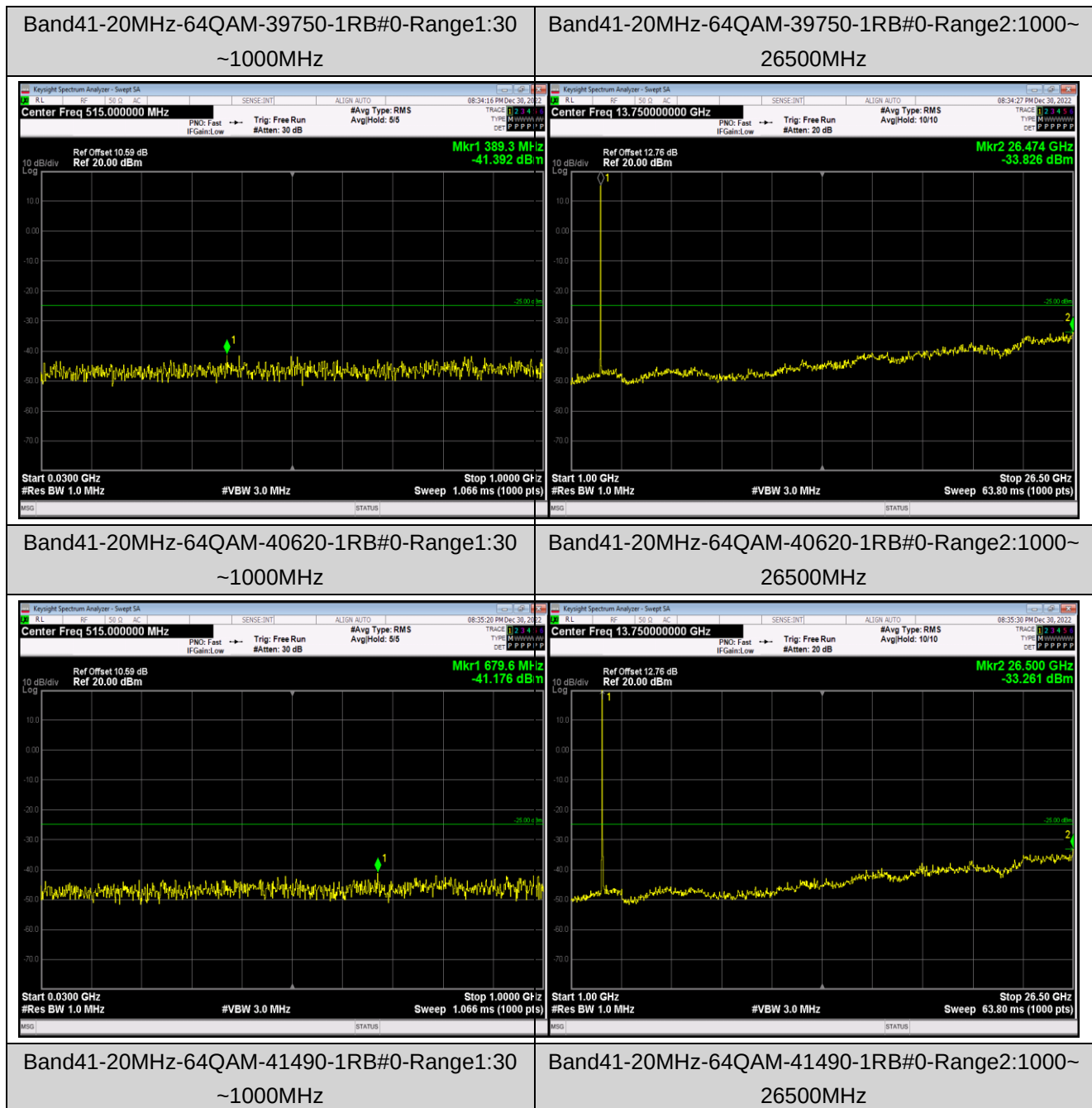


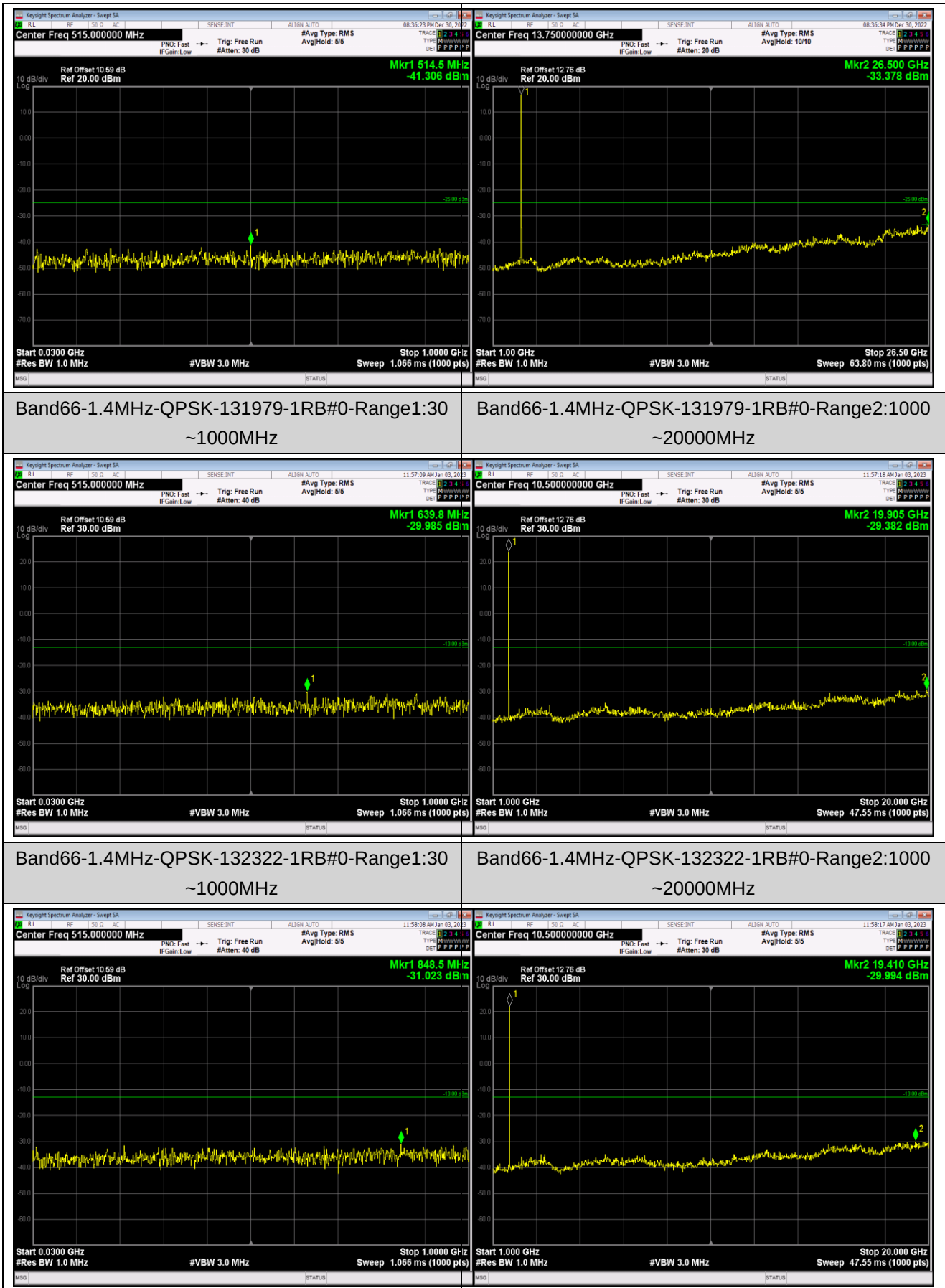


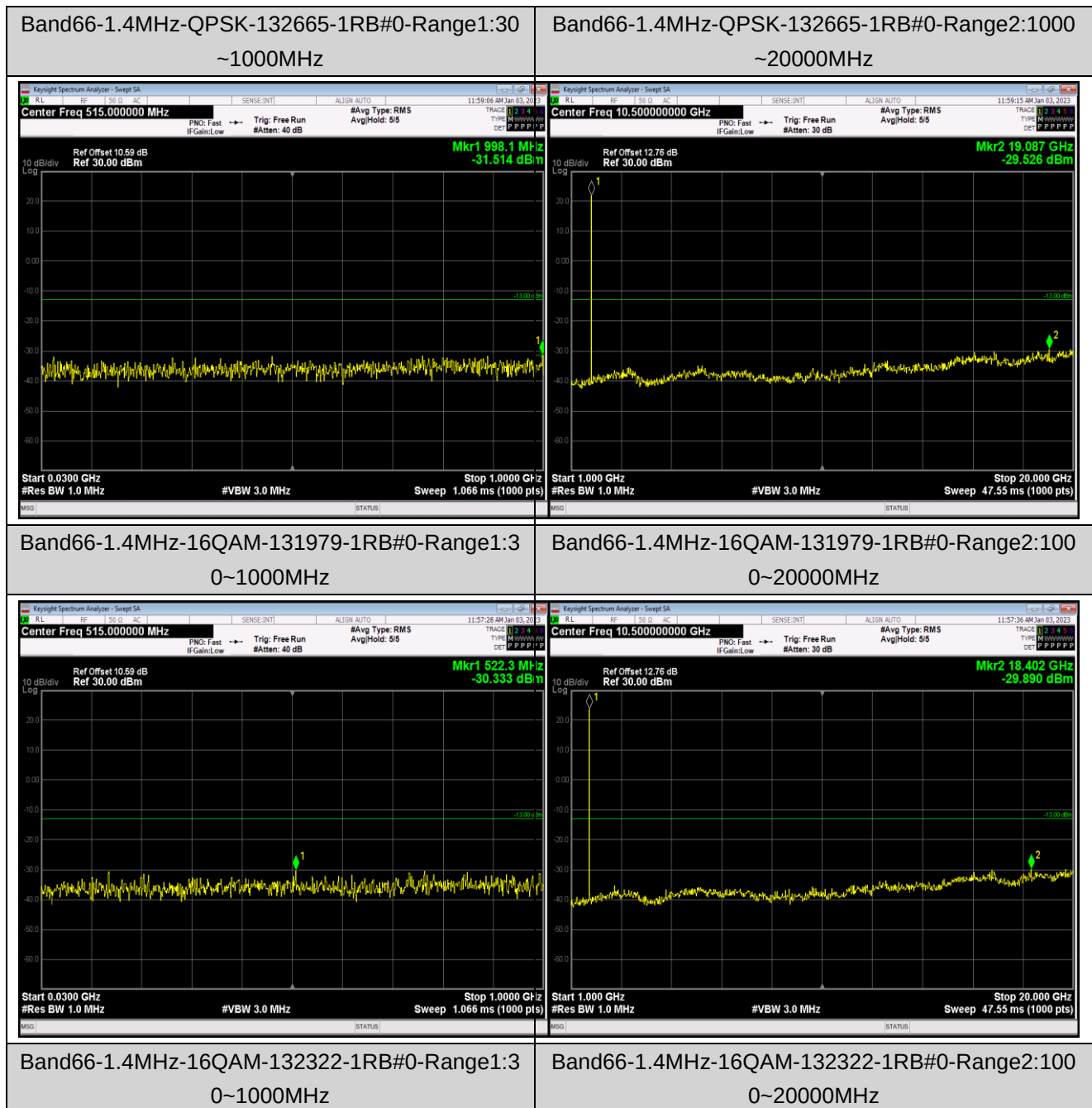


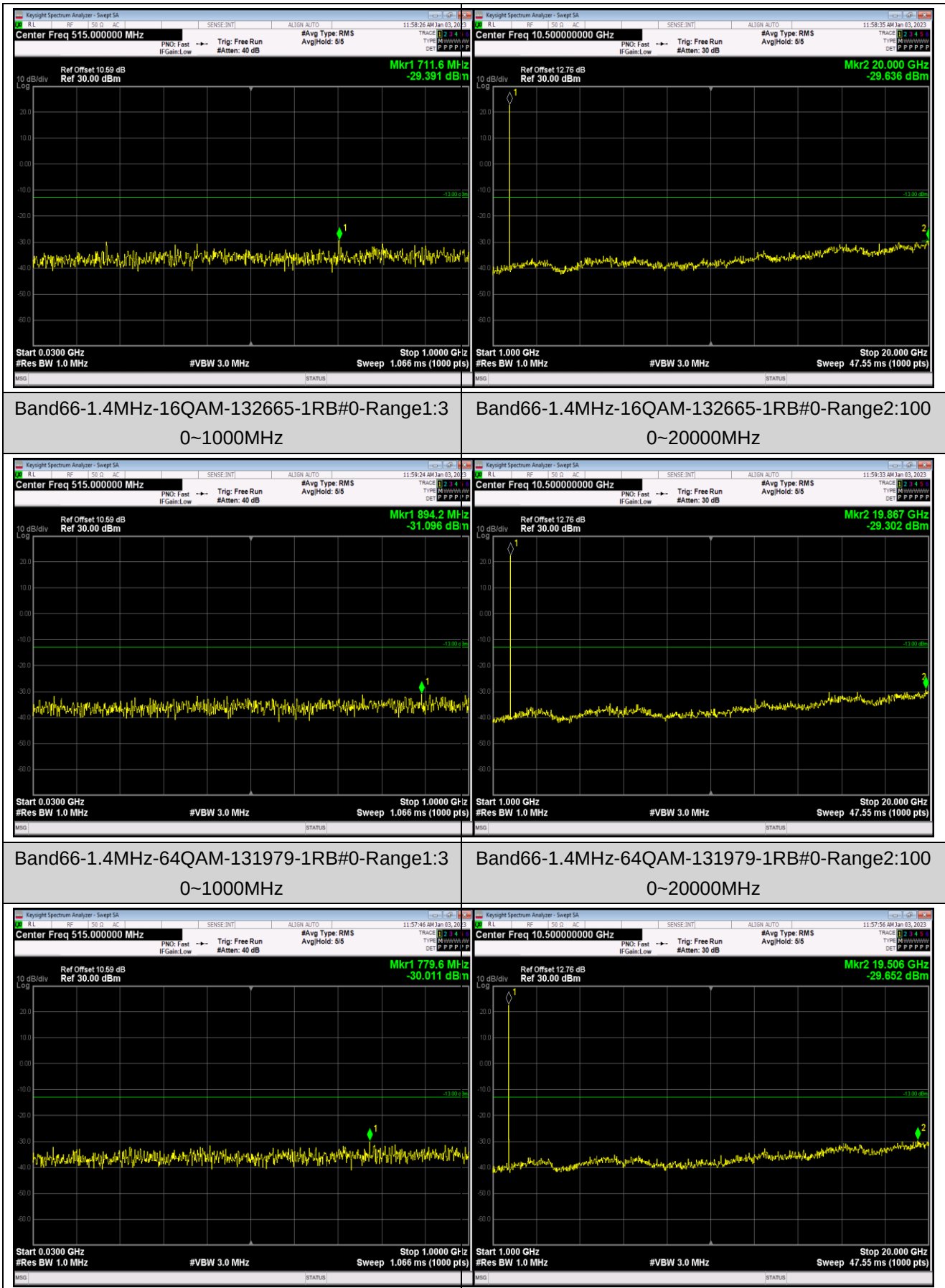


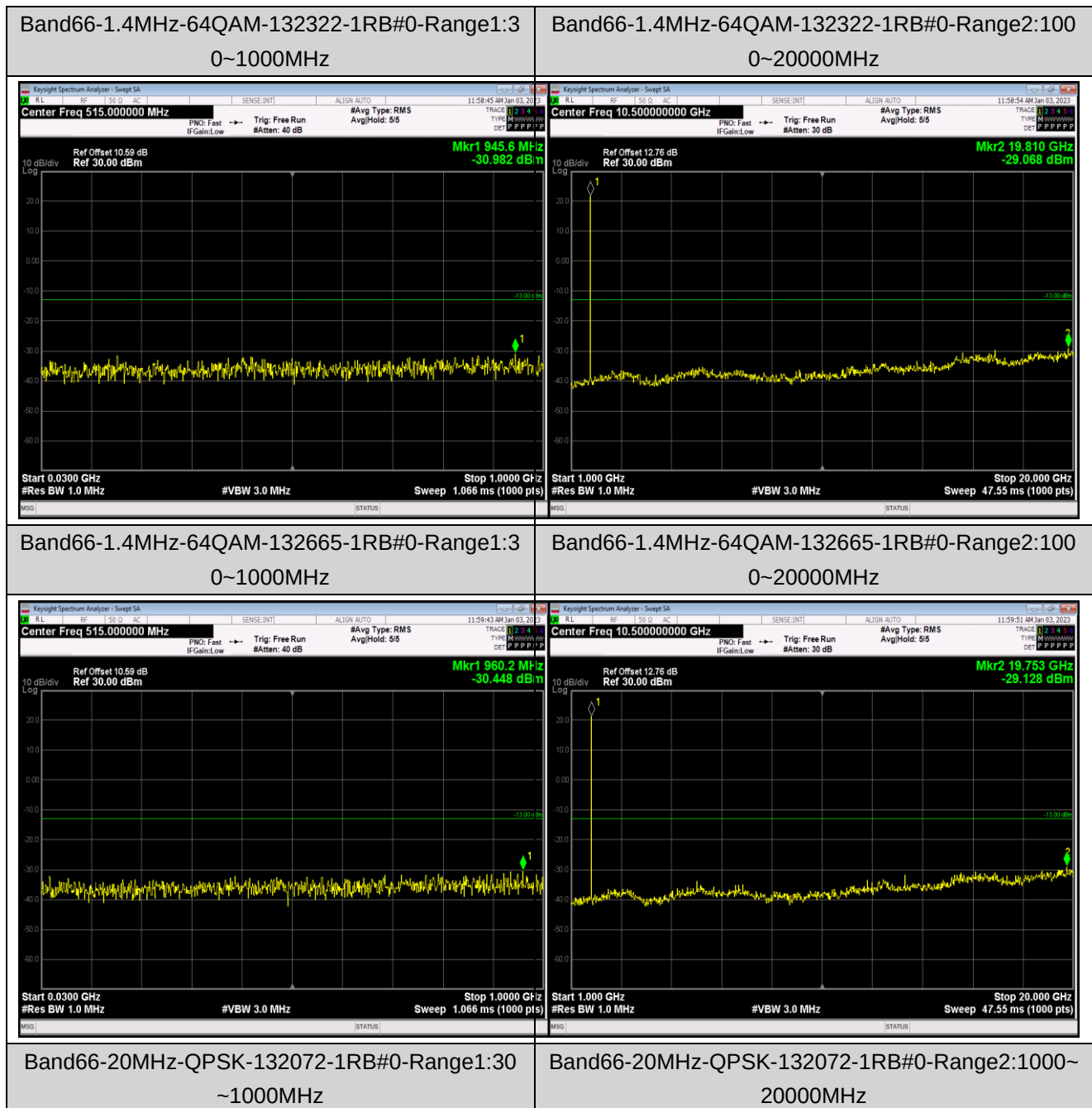


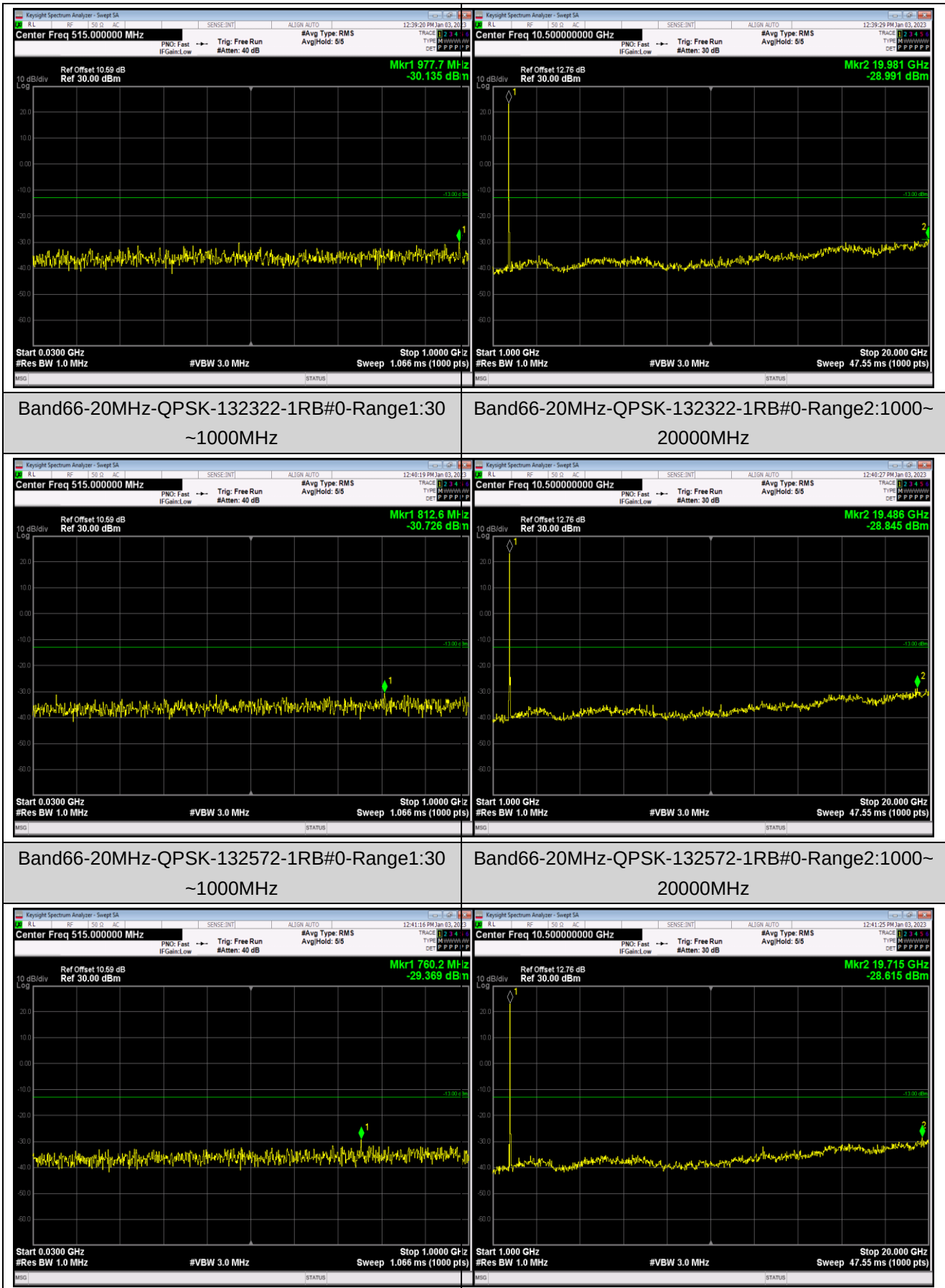


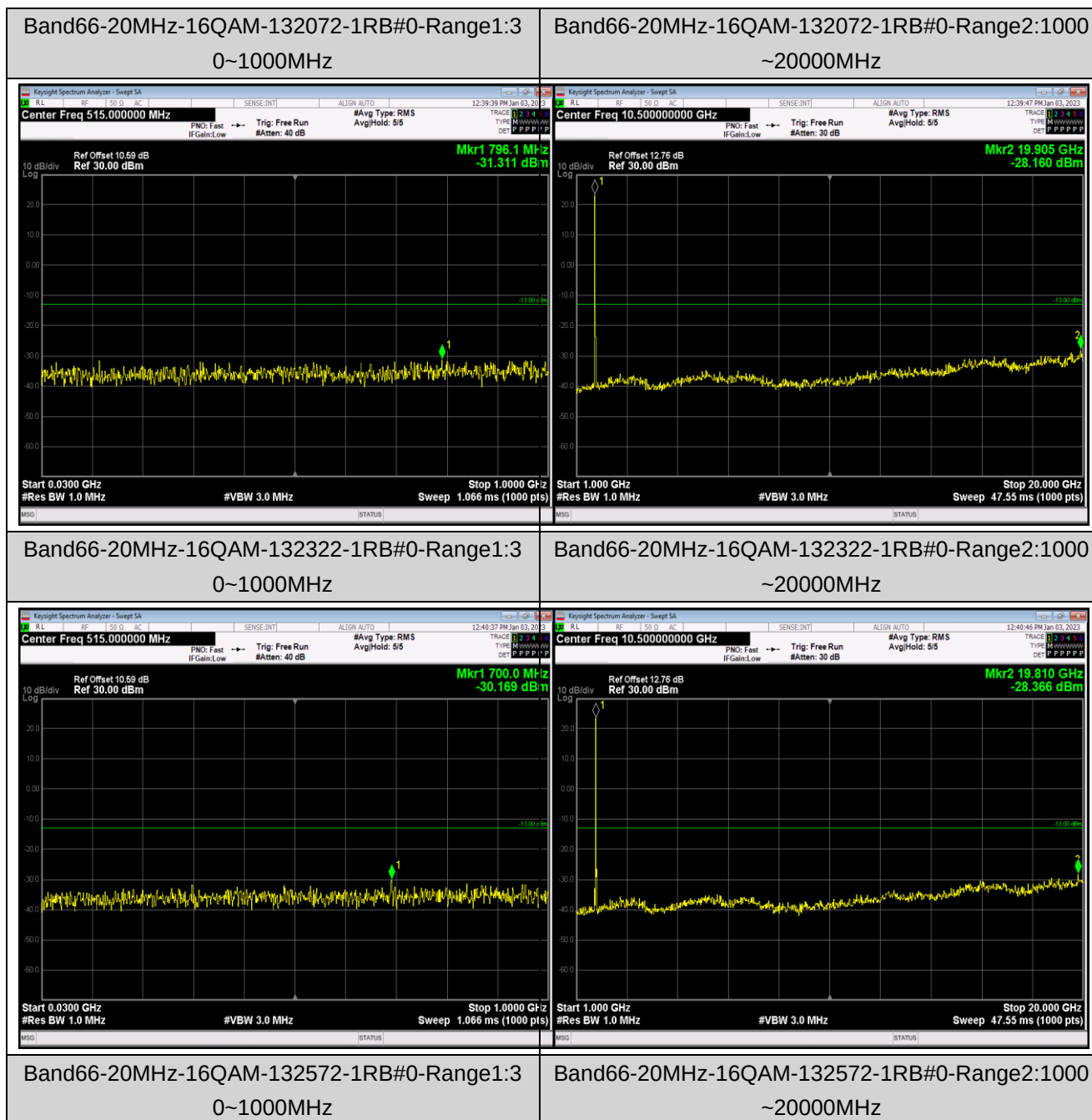


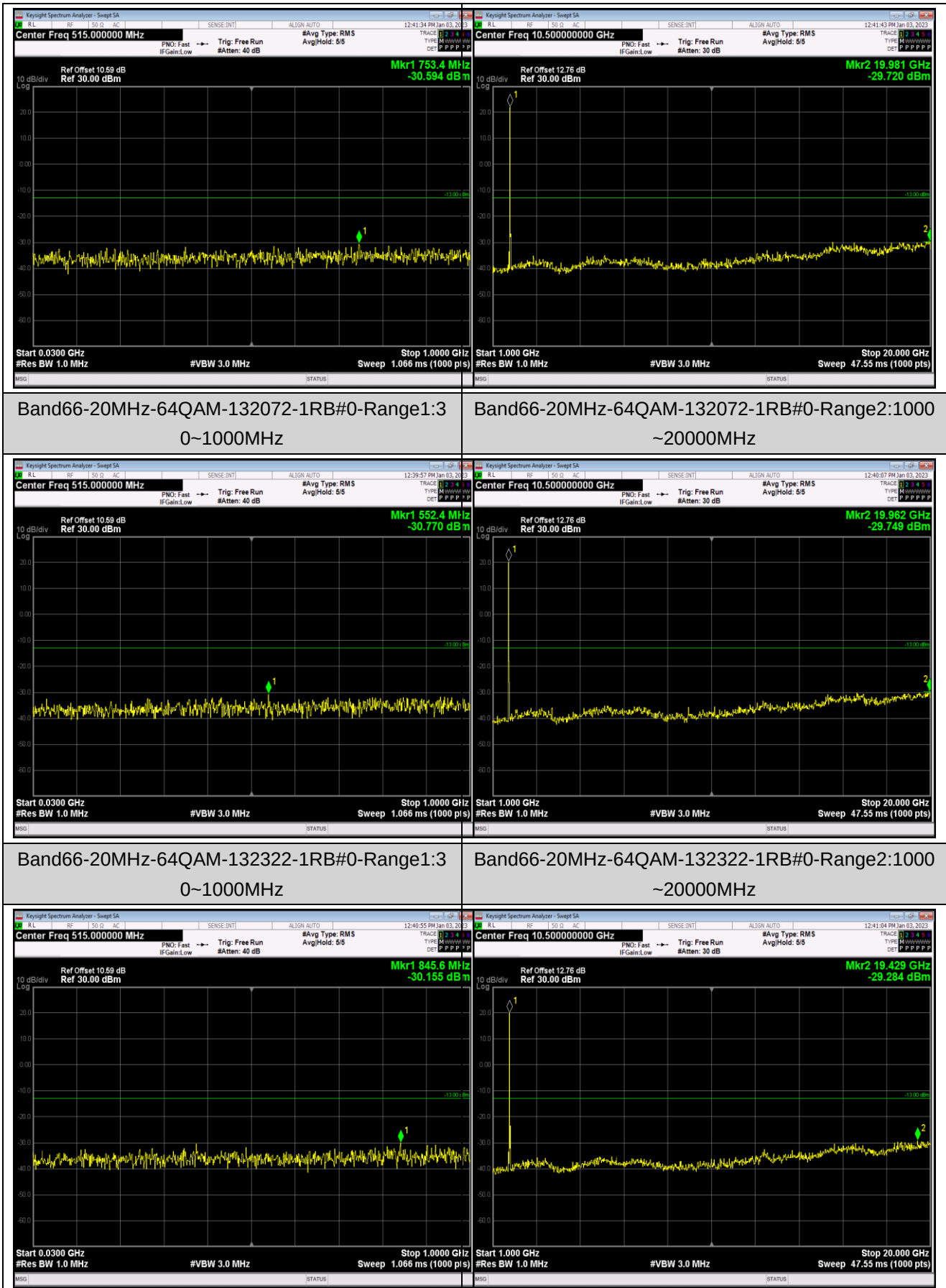


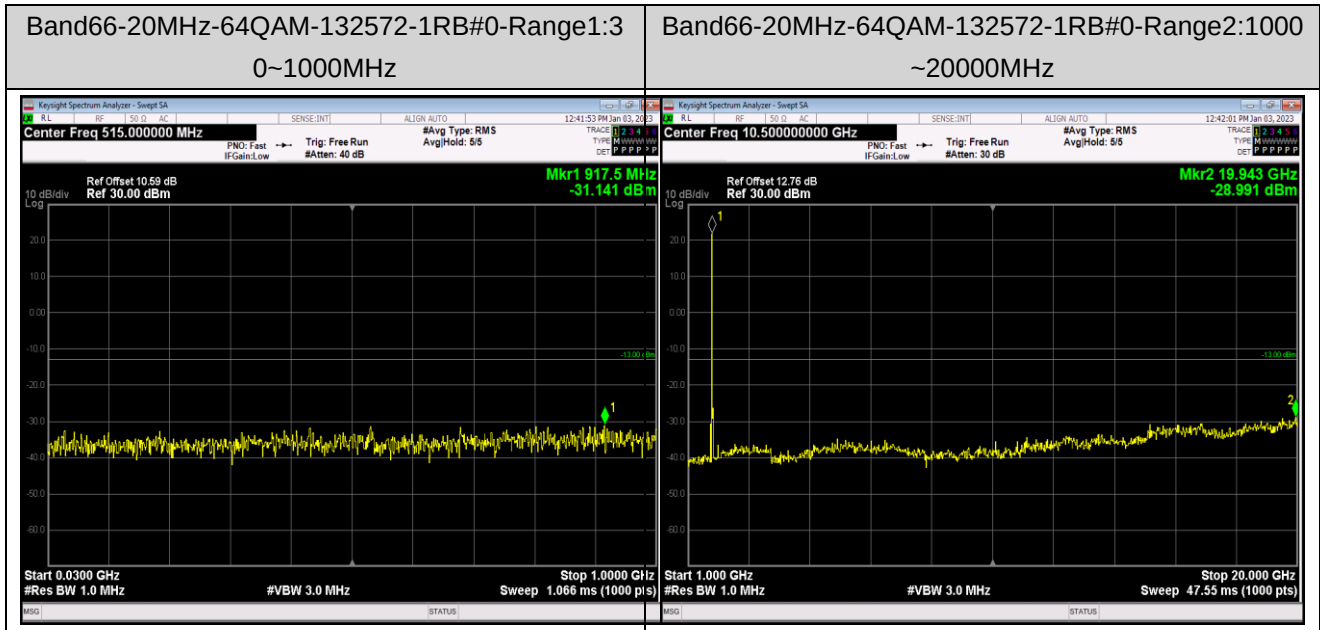












Appendix F: Frequency Stability

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					
3.87	-30	9.31	0.004952	Within authorized band for Band 2	Pass
	-20	7.48	0.003979		
	-10	7.82	0.004160		
	0	5.24	0.002787		
	10	-5.71	-0.003037		
	20	5.42	0.002883		
	30	3.78	0.002011		
	40	11.93	0.006346		
	50	2.12	0.001128		
16QAM					
3.87	-30	7.11	0.003782	Within authorized band for Band 2	Pass
	-20	6.22	0.003309		
	-10	6.52	0.003468		
	0	-4.86	-0.002585		
	10	13.82	0.007351		
	20	10.36	0.005511		
	30	-4.63	-0.002463		
	40	2.16	0.001149		
	50	5.55	0.002952		
64QAM					
3.87	-30	5.95	0.003165	Within authorized band for Band 2	Pass
	-20	-3.75	-0.001995		
	-10	-2.88	-0.001532		
	0	-6.55	-0.003484		
	10	4.51	0.002399		
	20	4.33	0.002303		
	30	-5.18	-0.002755		
	40	-3.89	-0.002069		
	50	2.25	0.001197		
Voltage					
Temperature	Power supplied	Frequency error		Limit (ppm)	Result

(°C)	(Vdc)	Hz	ppm		
QPSK					
25	3.45	8.47	0.004505	Within authorized band for Band 2	Pass
	3.87	4.28	0.002277		
	4.45	2.15	0.001144		
16QAM					
25	3.45	8.91	0.004739	Within authorized band for Band 2	Pass
	3.87	5.05	0.002686		
	4.45	10.30	0.005479		
64QAM					
25	3.45	9.16	0.004872	Within authorized band for Band 2	Pass
	3.87	8.53	0.004537		
	4.45	-4.99	-0.002654		
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 (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	4.85	0.005798	±2.5	Pass
	-20	7.97	0.009528		
	-10	4.11	0.004913		
	0	-3.49	-0.004172		
	10	4.32	0.005164		
	20	-6.90	-0.008249		
	30	-4.29	-0.005129		
	40	3.79	0.004531		
	50	2.27	0.002714		
16QAM					
3.87	-30	-4.18	-0.004997	±2.5	Pass
	-20	-6.61	-0.007902		
	-10	-5.62	-0.006718		
	0	2.59	0.003096		
	10	-5.82	-0.006958		
	20	-3.45	-0.004124		
	30	4.62	0.005523		
	40	-7.10	-0.008488		
	50	-5.56	-0.006647		
64QAM					
3.87	-30	-1.26	-0.001506	±2.5	Pass
	-20	3.16	0.003778		
	-10	-6.19	-0.007400		
	0	-4.01	-0.004794		
	10	1.09	0.001303		
	20	-4.98	-0.005953		
	30	-6.90	-0.008249		
	40	-1.92	-0.002295		
	50	-2.60	-0.003108		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.45	-6.65	-0.007950	±2.5	Pass
	3.87	-4.43	-0.005296		
	4.45	-6.71	-0.008022		
16QAM					
25	3.45	-1.65	-0.001973	±2.5	Pass
	3.87	2.75	0.003288		
	4.45	-3.52	-0.004208		
64QAM					
25	3.45	-4.61	-0.005511	±2.5	Pass
	3.87	-7.30	-0.008727		
	4.45	-5.74	-0.006862		
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 (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	5.26	0.002075	Within authorized band for Band 7	Pass
	-20	16.21	0.006394		
	-10	6.75	0.002663		
	0	17.21	0.006789		
	10	14.32	0.005649		
	20	18.81	0.007420		
	30	-6.21	-0.002450		
	40	-17.50	-0.006903		
	50	3.42	0.001349		
16QAM					
3.87	-30	7.37	0.002907	Within authorized band for Band 7	Pass
	-20	-13.72	-0.005412		
	-10	-11.67	-0.004604		
	0	-7.75	-0.003057		
	10	13.00	0.005128		
	20	10.43	0.004114		
	30	5.71	0.002252		
	40	-5.72	-0.002256		
	50	-14.41	-0.005684		
64QAM					
3.87	-30	3.82	0.001507	Within authorized band for Band 7	Pass
	-20	21.89	0.008635		
	-10	21.89	0.008635		
	0	10.80	0.004260		
	10	6.45	0.002544		
	20	16.31	0.006434		
	30	9.26	0.003653		
	40	7.25	0.002860		
	50	10.53	0.004154		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.45	15.25	0.006016	Within authorized band for Band 7	Pass
	3.87	2.93	0.001156		
	4.45	12.36	0.004876		
16QAM					
25	3.45	-4.49	-0.001771	Within authorized band for Band 7	Pass
	3.87	14.81	0.005842		
	4.45	13.25	0.005227		
64QAM					
25	3.45	14.32	0.005649	Within authorized band for Band 7	Pass
	3.87	16.59	0.006544		
	4.45	13.48	0.005318		
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					
3.87	-30	-3.66	-0.005173	Within authorized band for Band 12	Pass
	-20	5.19	0.007336		
	-10	4.03	0.005696		
	0	4.05	0.005724		
	10	-3.91	-0.005527		
	20	4.22	0.005965		
	30	3.68	0.005201		
	40	1.29	0.001823		
	50	3.98	0.005625		
16QAM					
3.87	-30	-3.33	-0.004707	Within authorized band for Band 12	Pass
	-20	4.66	0.006587		
	-10	2.82	0.003986		
	0	7.84	0.011081		
	10	2.85	0.004028		
	20	3.02	0.004269		
	30	2.06	0.002912		
	40	5.02	0.007095		
	50	-2.46	-0.003477		
64QAM					
3.87	-30	3.69	0.005216	Within authorized band for Band 12	Pass
	-20	-3.10	-0.004382		
	-10	3.98	0.005625		
	0	2.09	0.002954		
	10	1.77	0.002502		
	20	6.08	0.008594		
	30	7.08	0.010007		
	40	3.65	0.005159		
	50	3.45	0.004876		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.45	3.22	0.004551	Within authorized band for Band 12	Pass
	3.87	4.86	0.006869		
	4.45	3.56	0.005032		
16QAM					
25	3.45	4.89	0.006912	Within authorized band for Band 12	Pass
	3.87	2.15	0.003039		
	4.45	3.91	0.005527		
64QAM					
25	3.45	2.66	0.003760	Within authorized band for Band 12	Pass
	3.87	1.93	0.002728		
	4.45	9.28	0.013117		
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					
3.87	-30	-2.17	-0.003056	Within authorized band for Band 17	Pass
	-20	-1.14	-0.001606		
	-10	4.05	0.005704		
	0	-1.53	-0.002155		
	10	1.13	0.001592		
	20	-0.96	-0.001352		
	30	5.39	0.007592		
	40	-3.59	-0.005056		
	50	-2.35	-0.003310		
16QAM					
3.87	-30	-4.75	-0.006690	Within authorized band for Band 17	Pass
	-20	-1.27	-0.001789		
	-10	-3.60	-0.005070		
	0	-0.86	-0.001211		
	10	-3.71	-0.005225		
	20	2.90	0.004085		
	30	3.86	0.005437		
	40	-5.26	-0.007408		
	50	-1.50	-0.002113		
64QAM					
3.87	-30	1.53	0.002155	Within authorized band for Band 17	Pass
	-20	3.42	0.004817		
	-10	-4.29	-0.006042		
	0	-3.46	-0.004873		
	10	3.23	0.004549		
	20	-3.19	-0.004493		
	30	-6.32	-0.008901		
	40	-5.68	-0.008000		
	50	2.06	0.002901		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.45	-2.96	-0.004169	Within authorized band for Band 17	Pass
	3.87	2.68	0.003775		
	4.45	-2.40	-0.003380		
16QAM					
25	3.45	5.21	0.007338	Within authorized band for Band 17	Pass
	3.87	5.36	0.007549		
	4.45	-5.08	-0.007155		
64QAM					
25	3.45	3.10	0.004366	Within authorized band for Band 17	Pass
	3.87	1.67	0.002352		
	4.45	-1.73	-0.002437		
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=40640 Frequency=2595.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	-2.79	-0.001076	Within authorized band for Band 41	Pass
	-20	-2.06	-0.000794		
	-10	7.27	0.002804		
	0	-1.85	-0.000713		
	10	-6.02	-0.002322		
	20	-4.06	-0.001566		
	30	7.38	0.002846		
	40	12.09	0.004663		
	50	7.87	0.003035		
16QAM					
3.87	-30	7.38	0.002846	Within authorized band for Band 41	Pass
	-20	2.92	0.001126		
	-10	-4.95	-0.001909		
	0	-6.79	-0.002619		
	10	5.45	0.002102		
	20	-3.35	-0.001292		
	30	7.93	0.003058		
	40	-5.75	-0.002218		
	50	7.20	0.002777		
64QAM					
3.87	-30	7.01	0.002703	Within authorized band for Band 41	Pass
	-20	6.59	0.002541		
	-10	-2.42	-0.000933		
	0	12.16	0.004690		
	10	4.66	0.001797		
	20	6.24	0.002406		
	30	-5.14	-0.001982		
	40	4.63	0.001786		
	50	-2.83	-0.001091		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.45	-2.70	-0.001041	Within authorized band for Band 41	Pass
	3.87	6.65	0.002565		
	4.45	-5.97	-0.002302		
16QAM					
25	3.45	3.66	0.001411	Within authorized band for Band41	Pass
	3.87	-3.23	-0.001246		
	4.45	4.98	0.001921		
64QAM					
25	3.45	4.68	0.001805	Within authorized band for Band41	Pass
	3.87	-5.81	-0.002241		
	4.45	-7.38	-0.002846		
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					
3.87	-30	7.25	0.004155	Within authorized band for Band 66	Pass
	-20	10.46	0.005994		
	-10	8.31	0.004762		
	0	10.51	0.006023		
	10	9.47	0.005427		
	20	10.13	0.005805		
	30	14.79	0.008476		
	40	6.37	0.003650		
	50	13.76	0.007885		
16QAM					
3.87	-30	10.41	0.005966	Within authorized band for Band 66	Pass
	-20	13.85	0.007937		
	-10	12.49	0.007158		
	0	15.34	0.008791		
	10	10.96	0.006281		
	20	13.35	0.007650		
	30	15.12	0.008665		
	40	14.88	0.008527		
	50	11.04	0.006327		
64QAM					
3.87	-30	10.11	0.005794	Within authorized band for Band 66	Pass
	-20	12.80	0.007335		
	-10	13.55	0.007765		
	0	10.24	0.005868		
	10	12.65	0.007249		
	20	10.79	0.006183		
	30	12.36	0.007083		
	40	14.39	0.008246		
	50	11.12	0.006372		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.45	15.01	0.008602	Within authorized band for Band 66	Pass
	3.87	11.92	0.006831		
	4.45	12.82	0.007347		
16QAM					
25	3.45	13.82	0.007920	Within authorized band for Band 66	Pass
	3.87	12.92	0.007404		
	4.45	15.21	0.008716		
64QAM					
25	3.45	10.67	0.006115	Within authorized band for Band 66	Pass
	3.87	13.90	0.007966		
	4.45	10.90	0.006246		
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

