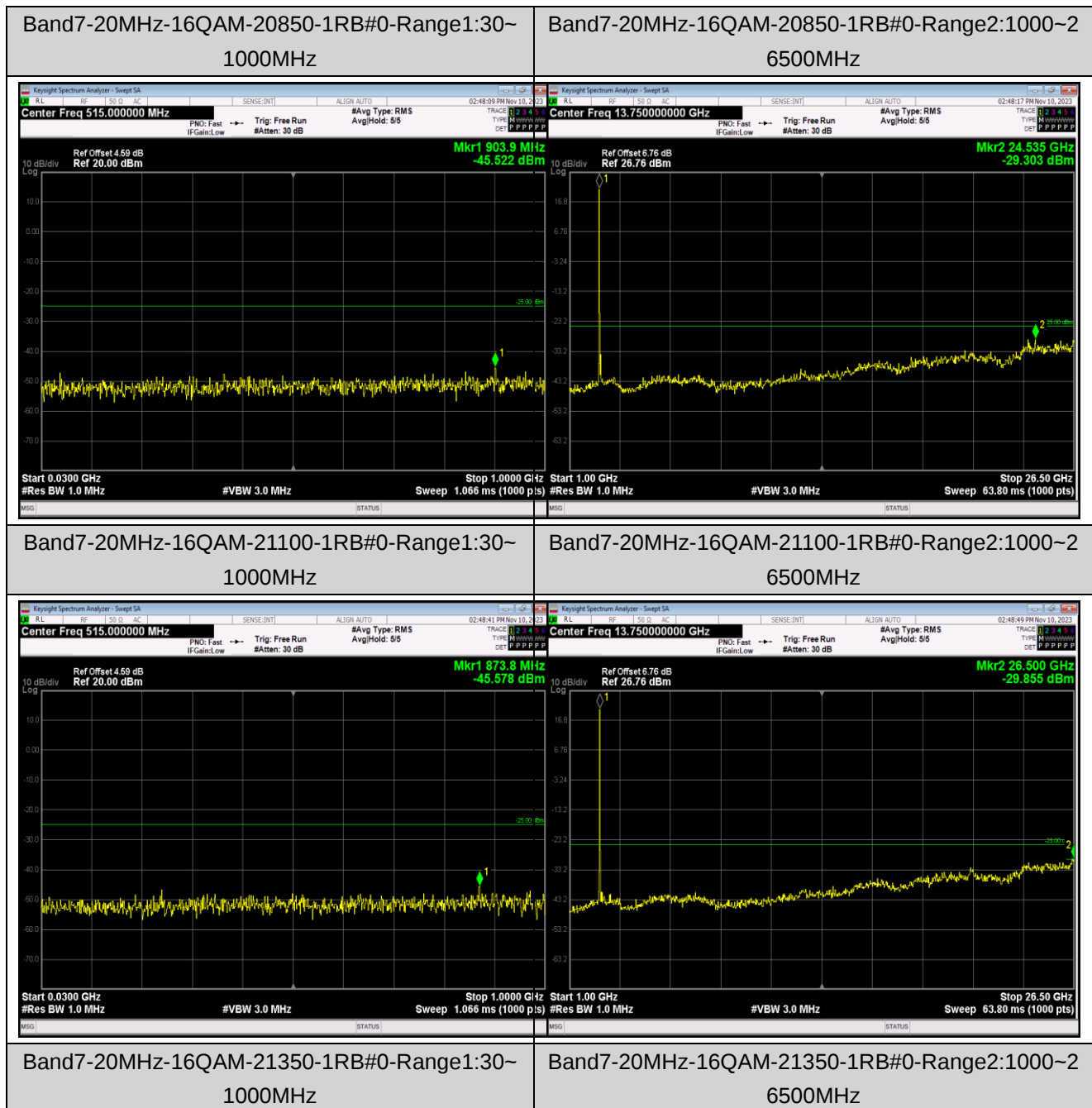
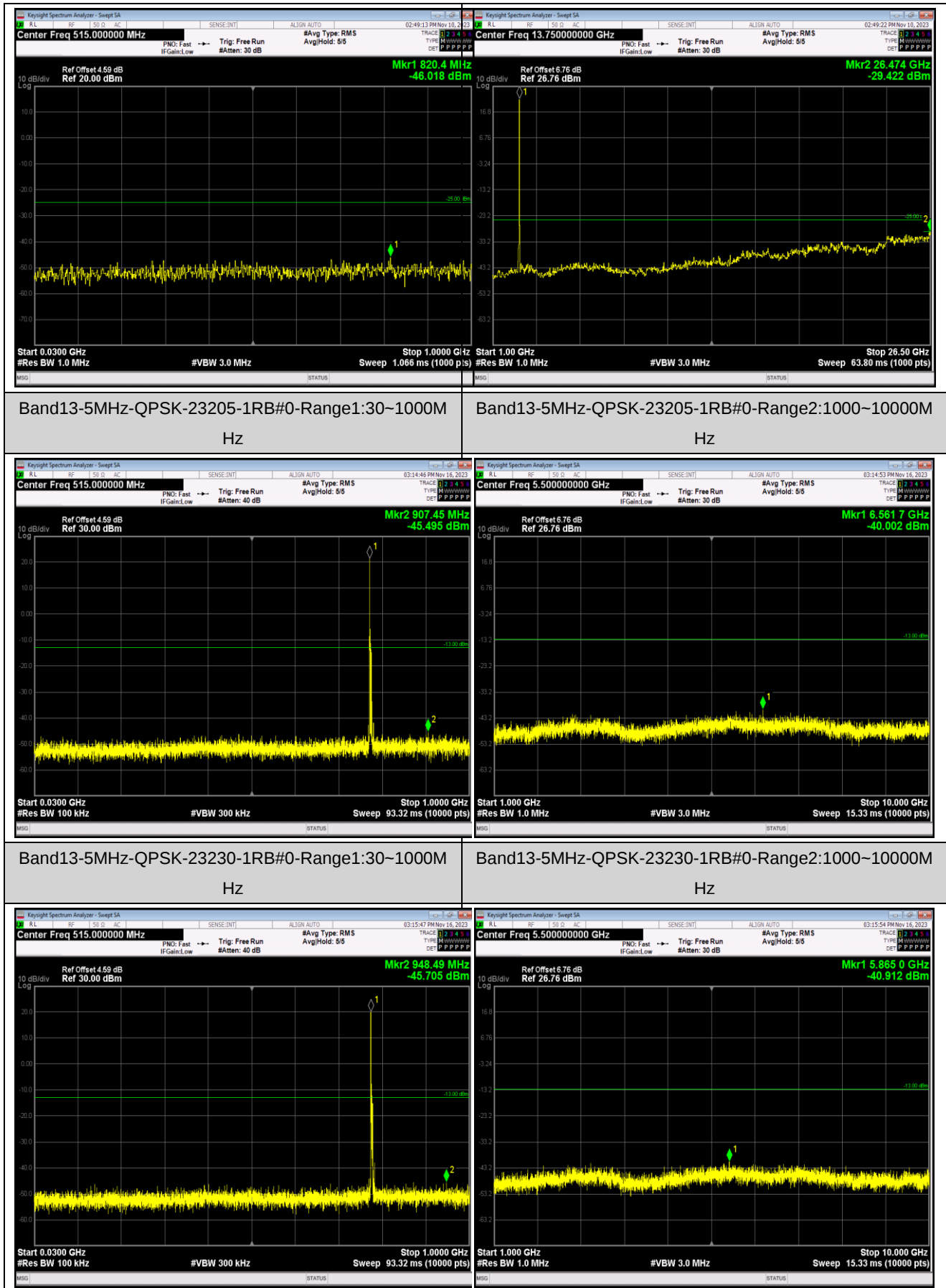
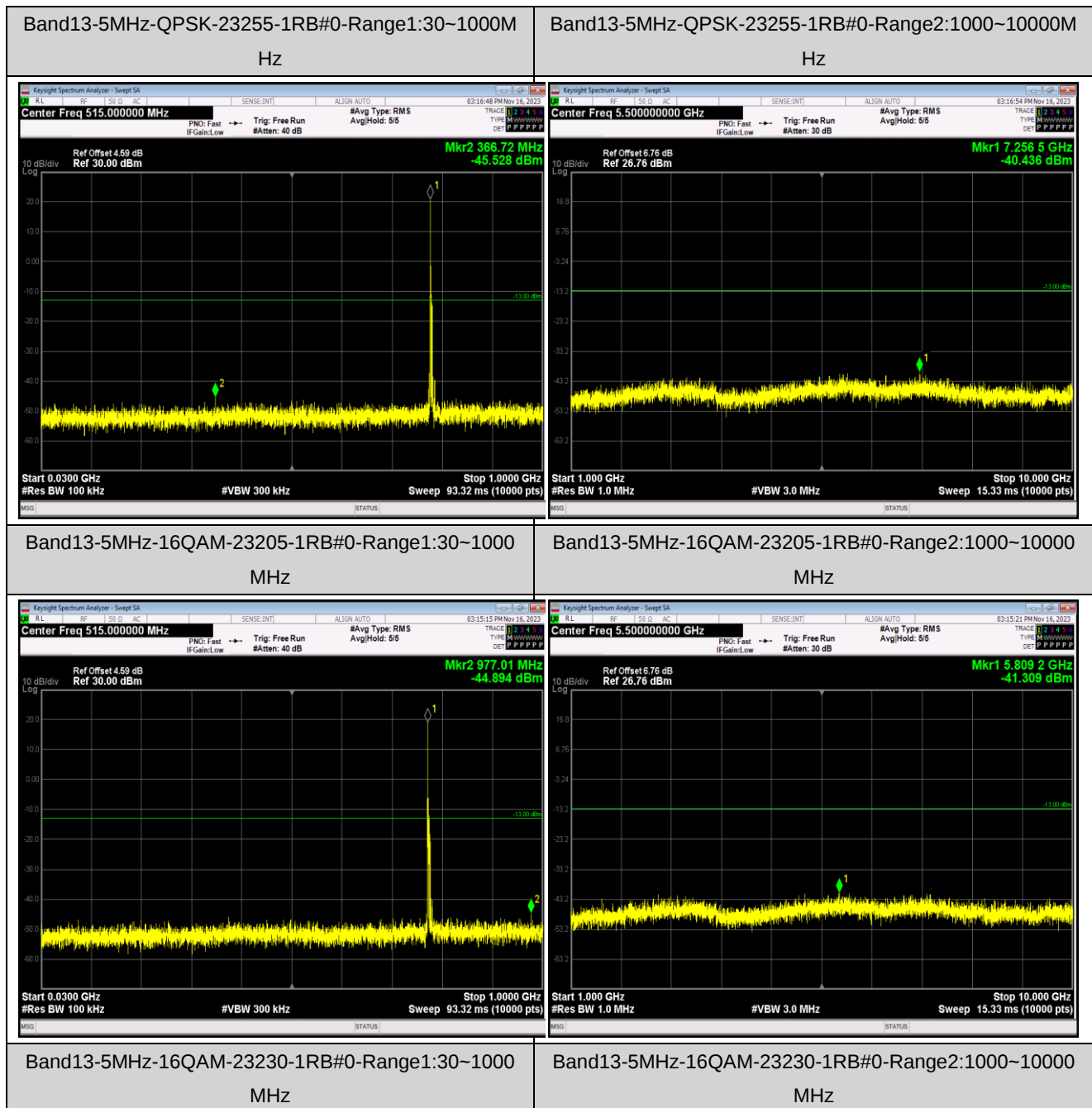
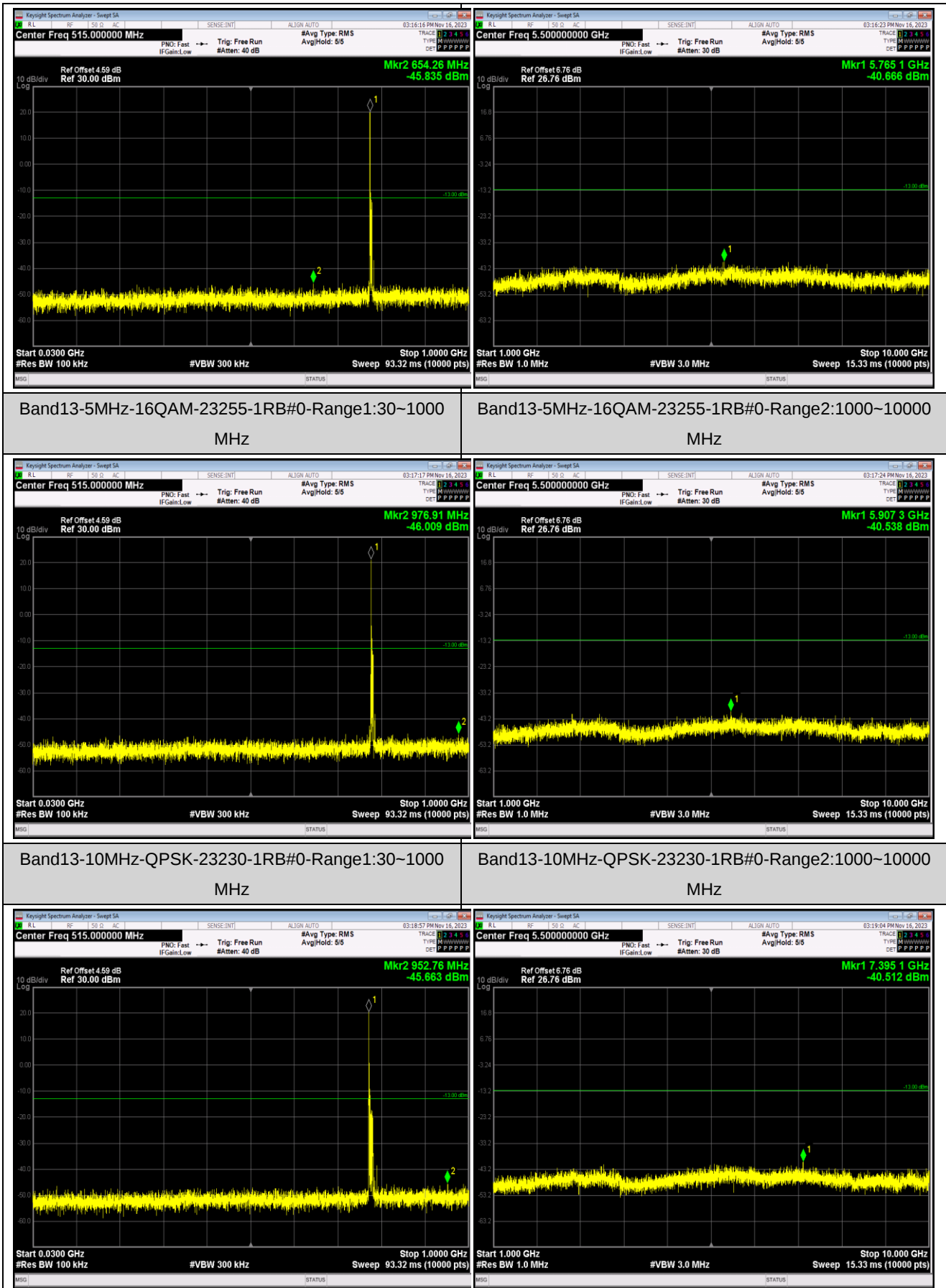
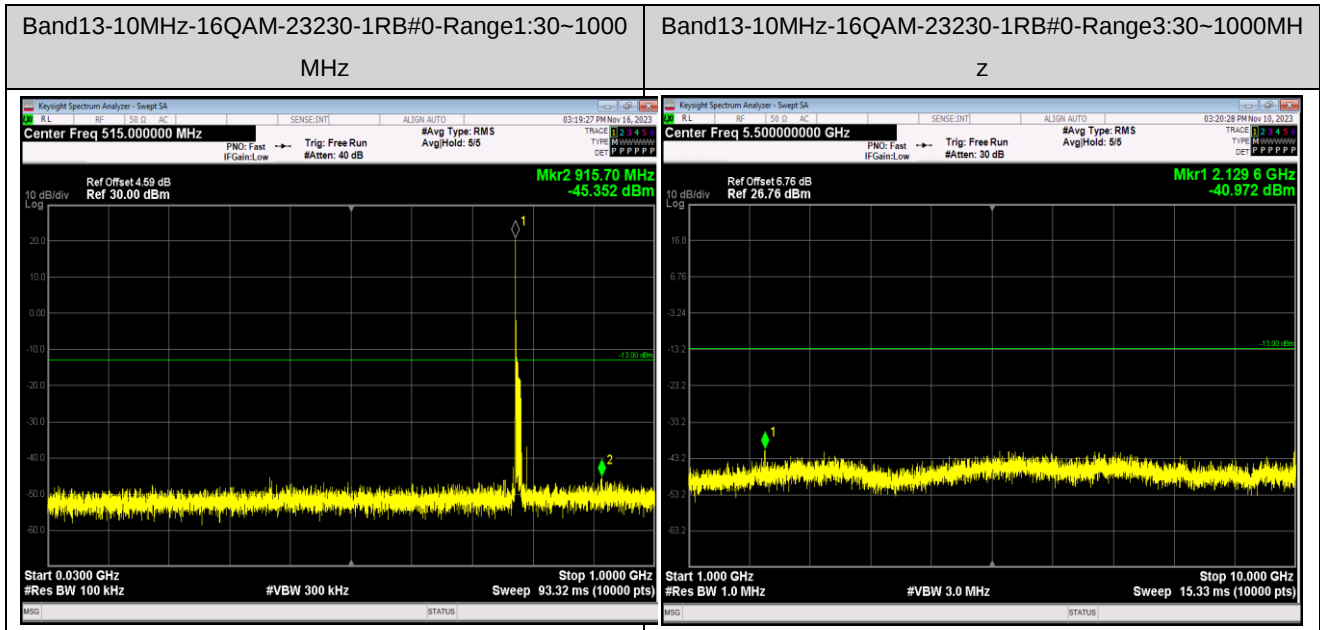












Appendix F: Frequency Stability

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					
3.70	-30	-41.24	-0.021936	Within authorized band for Band 2	Pass
	-20	-52.57	-0.027963		
	-10	-37.35	-0.019867		
	0	-23.78	-0.012649		
	10	-7.54	-0.004011		
	20	-29.24	-0.015553		
	30	-47.02	-0.025011		
	40	-9.38	-0.004989		
	50	-24.05	-0.012793		
16QAM					
3.70	-30	-10.99	-0.005846	Within authorized band for Band 2	Pass
	-20	-11.09	-0.005899		
	-10	-14.06	-0.007479		
	0	-20.81	-0.011069		
	10	-26.59	-0.014144		
	20	-24.68	-0.013128		
	30	-29.14	-0.015500		
	40	-26.11	-0.013888		
	50	-29.01	-0.015431		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-31.69	-0.016856	Within authorized band for Band 2	Pass
	3.70	31.51	0.016761		
	4.20	-46.94	-0.024968		
16QAM					
25	3.50	12.63	0.006718	Within authorized band for Band 2	Pass
	3.70	-37.72	-0.020064		
	4.20	7.15	0.003803		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 4 part:

Reference Frequency: LTE Band 4(10MHz) Middle channel=20175 Frequency=1732.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	-48.74	-0.028133	Within authorized band for Band 4	Pass
	-20	-21.74	-0.012548		
	-10	-45.42	-0.026216		
	0	-25.59	-0.014771		
	10	-42.93	-0.024779		
	20	-7.01	-0.004046		
	30	-17.88	-0.010320		
	40	-28.95	-0.016710		
	50	12.32	0.007111		
16QAM					
3.70	-30	-24.81	-0.014320	Within authorized band for Band 4	Pass
	-20	-24.95	-0.014401		
	-10	-23.98	-0.013841		
	0	-28.78	-0.016612		
	10	-28.30	-0.016335		
	20	-29.00	-0.016739		
	30	-29.28	-0.016900		
	40	-32.56	-0.018794		
	50	-31.60	-0.018240		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-18.05	-0.010418	Within authorized band for Band 4	Pass
	3.70	9.38	0.005414		
	4.20	-12.23	-0.007059		
16QAM					
25	3.50	-13.00	-0.007504	Within authorized band for Band 4	Pass
	3.70	-9.14	-0.005276		
	4.20	-14.13	-0.008156		
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					
3.70	-30	6.97	0.008332	±2.5	Pass
	-20	4.42	0.005284		
	-10	-3.82	-0.004567		
	0	-1.83	-0.002188		
	10	2.69	0.003216		
	20	2.88	0.003443		
	30	5.56	0.006647		
	40	7.47	0.008930		
	50	7.57	0.009050		
16QAM					
3.70	-30	12.49	0.014931	±2.5	Pass
	-20	13.39	0.016007		
	-10	15.29	0.018279		
	0	14.62	0.017478		
	10	16.18	0.019342		
	20	16.21	0.019378		
	30	16.88	0.020179		
	40	16.26	0.019438		
	50	16.49	0.019713		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	9.00	0.010759	±2.5	Pass
	3.70	10.93	0.013066		
	4.20	7.15	0.008548		
16QAM					
25	3.50	10.57	0.012636	±2.5	Pass
	3.70	11.12	0.013293		
	4.20	12.53	0.014979		
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					
3.70	-30	35.51	0.014008	Within authorized band for Band 7	Pass
	-20	-21.40	-0.008442		
	-10	18.98	0.007487		
	0	40.86	0.016118		
	10	22.10	0.008718		
	20	17.25	0.006805		
	30	53.94	0.021278		
	40	22.54	0.008892		
	50	46.09	0.018181		
16QAM					
3.70	-30	-13.25	-0.005227	Within authorized band for Band 7	Pass
	-20	17.82	0.007030		
	-10	34.52	0.013617		
	0	47.84	0.018872		
	10	15.95	0.006292		
	20	21.90	0.008639		
	30	39.18	0.015456		
	40	54.83	0.021629		
	50	-12.72	-0.005018		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	22.49	0.008872	Within authorized band for Band 7	Pass
	3.70	17.18	0.006777		
	4.20	26.72	0.010540		
16QAM					
25	3.50	21.73	0.008572	Within authorized band for Band 7	Pass
	3.70	41.58	0.016402		
	4.20	39.95	0.015759		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 13 part:

Reference Frequency: LTE Band 13(10MHz) Middle channel=23230 Frequency=782MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	-20.44	-0.026138	Within authorized band for Band 13	Pass
	-20	-23.35	-0.029859		
	-10	-22.42	-0.028670		
	0	-24.55	-0.031394		
	10	-26.41	-0.033772		
	20	-26.98	-0.034501		
	30	-28.91	-0.036969		
	40	-31.20	-0.039898		
	50	-28.52	-0.036471		
16QAM					
3.70	-30	-35.13	-0.044923	Within authorized band for Band 13	Pass
	-20	-37.35	-0.047762		
	-10	-39.65	-0.050703		
	0	-39.68	-0.050742		
	10	-40.71	-0.052059		
	20	-46.43	-0.059373		
	30	-43.76	-0.055959		
	40	-45.26	-0.057877		
	50	-47.48	-0.060716		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-14.45	-0.018478	Within authorized band for Band 13	Pass
	3.70	-12.13	-0.015512		
	4.20	-19.17	-0.024514		
16QAM					
25	3.50	-32.27	-0.041266	Within authorized band for Band 13	Pass
	3.70	-28.90	-0.036957		
	4.20	-32.06	-0.040997		
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
Band4	20MHz	QPSK	20175	100RB#0	PASS	PASS
Band4	20MHz	16QAM	20175	100RB#0	PASS	PASS
Band5	10MHz	QPSK	20525	50RB#0	PASS	PASS
Band5	10MHz	16QAM	20525	50RB#0	PASS	PASS
Band7	20MHz	QPSK	21100	100RB#0	PASS	PASS
Band7	20MHz	16QAM	21100	100RB#0	PASS	PASS
Band13	10MHz	QPSK	23230	50RB#0	PASS	PASS
Band13	10MHz	16QAM	23230	50RB#0	PASS	PASS

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

Test Graphs

