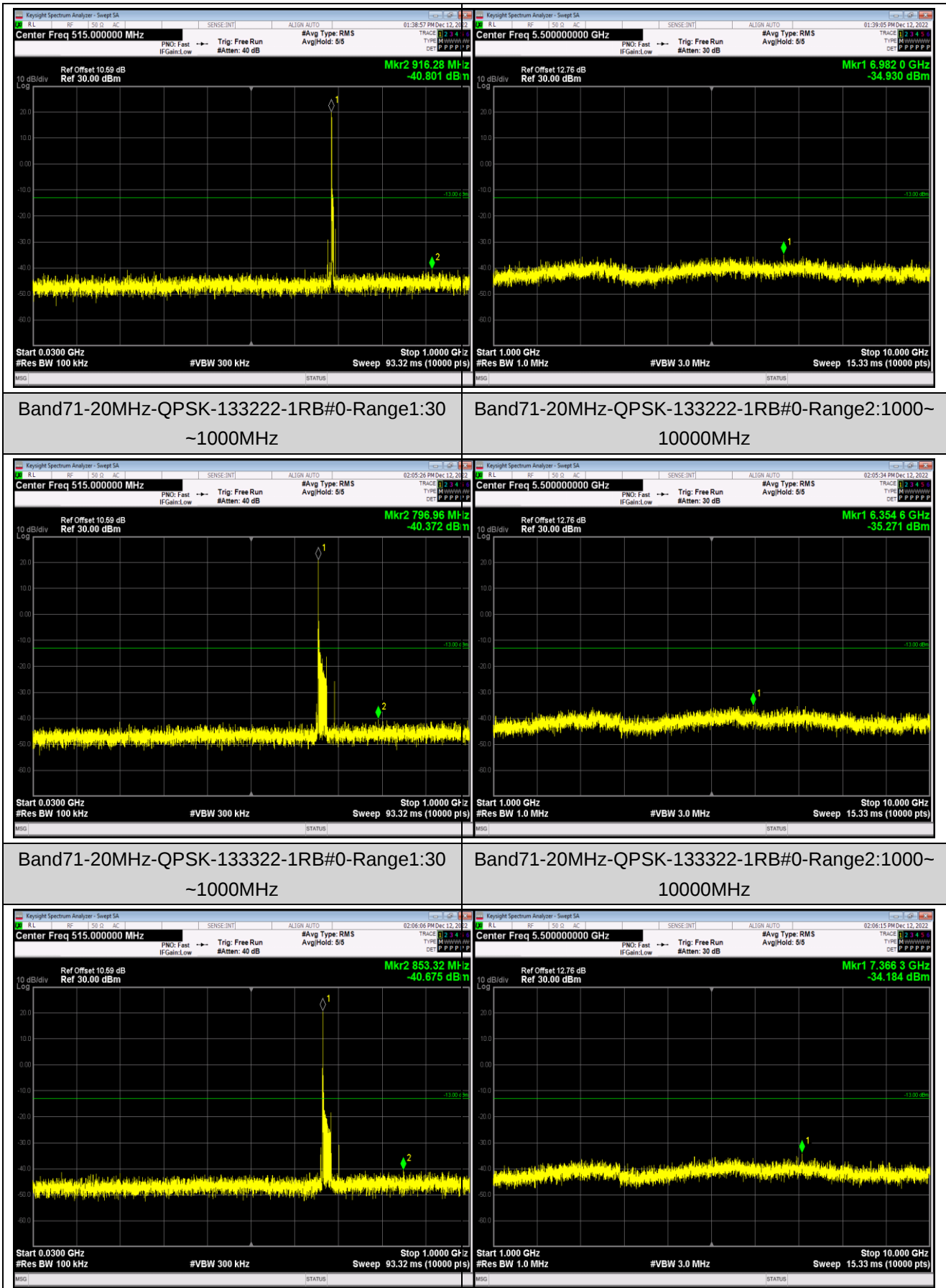
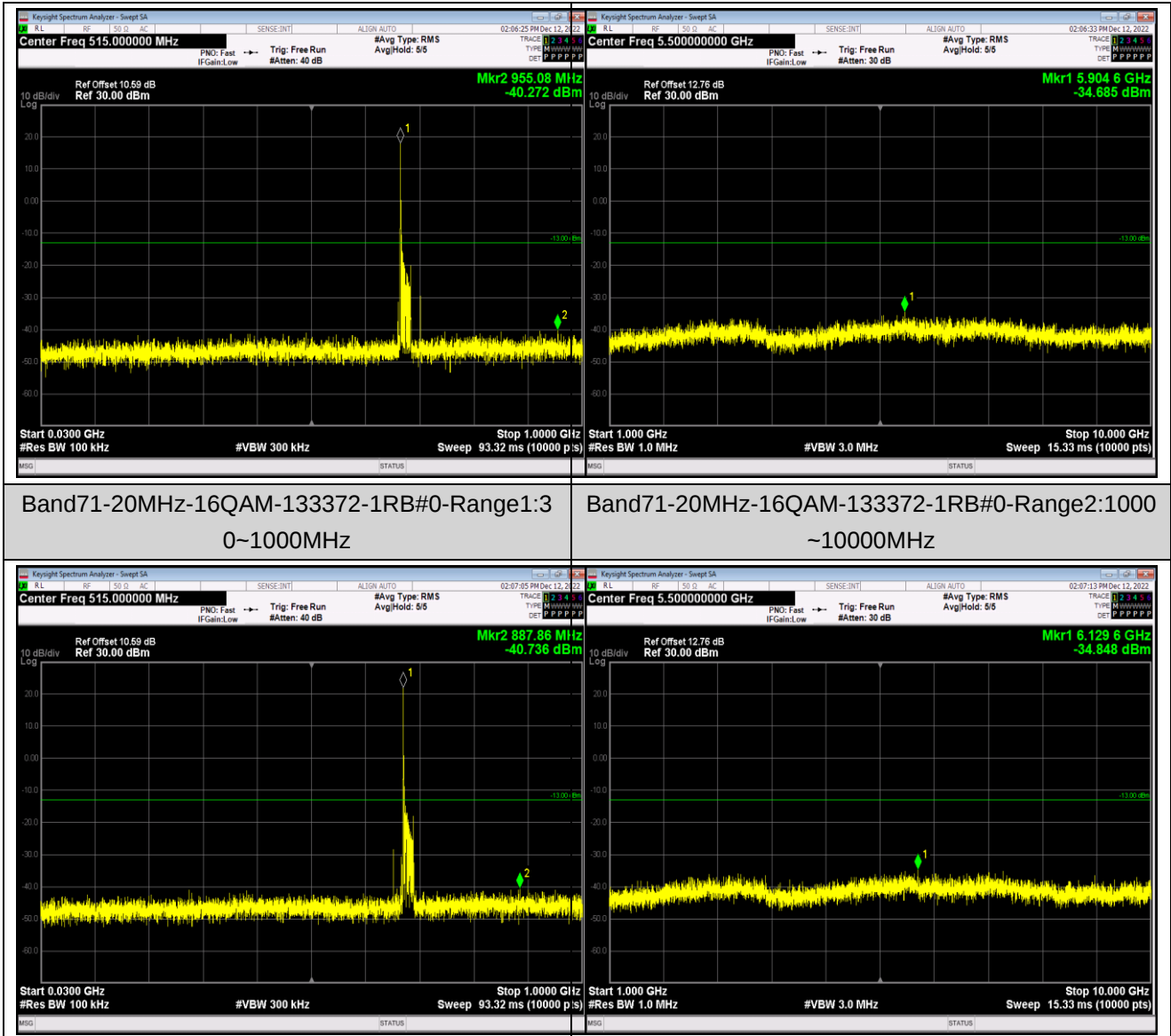








Appendix F: Frequency Stability

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	21.09	0.011218	Within authorized band for Band 2	Pass
	-20	27.52	0.014638		
	-10	34.69	0.018452		
	0	41.77	0.022218		
	10	41.90	0.022287		
	20	12.77	0.006793		
	30	12.96	0.006894		
	40	17.82	0.009479		
	50	20.89	0.011112		
16QAM					
3.70	-30	53.23	0.028314	Within authorized band for Band 2	Pass
	-20	-31.13	-0.016559		
	-10	10.47	0.005569		
	0	25.95	0.013803		
	10	34.03	0.018101		
	20	19.28	0.010255		
	30	-20.00	-0.010638		
	40	32.32	0.017191		
	50	25.85	0.013750		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-4.48	-0.002383	Within authorized band for Band 2	Pass
	3.70	-20.30	-0.010798		
	4.20	10.47	0.005569		
16QAM					
25	3.50	28.67	0.015250	Within authorized band for Band 2	Pass
	3.70	21.92	0.011660		
	4.20	42.13	0.022410		
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	3.78	0.004519	±2.5	Pass
	-20	-6.94	-0.008296		
	-10	2.55	0.003048		
	0	4.84	0.005786		
	10	2.86	0.003419		
	20	-5.06	-0.006049		
	30	-3.43	-0.004100		
	40	-3.93	-0.004698		
	50	-10.96	-0.013102		
16QAM					
3.70	-30	2.75	0.003288	±2.5	Pass
	-20	1.50	0.001793		
	-10	10.80	0.012911		
	0	16.88	0.020179		
	10	23.43	0.028010		
	20	30.67	0.036665		
	30	36.09	0.043144		
	40	42.34	0.050616		
	50	42.49	0.050795		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	10.76	0.012863	±2.5	Pass
	3.70	-3.88	-0.004638		
	4.20	16.16	0.019319		
16QAM					
25	3.50	-15.84	-0.018936	±2.5	Pass
	3.70	-8.43	-0.010078		
	4.20	-7.01	-0.008380		
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 (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	18.00	0.025442	Within authorized band for Band 12	Pass
	-20	20.40	0.028834		
	-10	10.63	0.015025		
	0	15.99	0.022601		
	10	15.23	0.021527		
	20	15.98	0.022587		
	30	16.08	0.022728		
	40	13.56	0.019166		
	50	15.98	0.022587		
16QAM					
3.70	-30	16.67	0.023562	Within authorized band for Band 12	Pass
	-20	27.85	0.039364		
	-10	34.83	0.049230		
	0	33.30	0.047067		
	10	38.55	0.054488		
	20	35.98	0.050855		
	30	47.26	0.066799		
	40	-16.31	-0.023053		
	50	-3.76	-0.005314		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	10.34	0.014615	Within authorized band for Band 12	Pass
	3.70	3.75	0.005300		
	4.20	13.20	0.018657		
16QAM					
25	3.50	16.01	0.022629	Within authorized band for Band 12	Pass
	3.70	8.67	0.012254		
	4.20	18.87	0.026671		
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					
3.70	-30	16.65	0.023451	Within authorized band for Band 17	Pass
	-20	19.27	0.027141		
	-10	18.55	0.026127		
	0	20.46	0.028817		
	10	5.68	0.008000		
	20	10.11	0.014239		
	30	16.28	0.022930		
	40	17.47	0.024606		
	50	17.81	0.025085		
16QAM					
3.70	-30	29.40	0.041408	Within authorized band for Band 17	Pass
	-20	39.44	0.055549		
	-10	44.93	0.063282		
	0	3.63	0.005113		
	10	11.72	0.016507		
	20	12.35	0.017394		
	30	5.34	0.007521		
	40	18.25	0.025704		
	50	25.88	0.036451		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	8.17	0.011507	Within authorized band for Band 17	Pass
	3.70	2.80	0.003944		
	4.20	11.89	0.016746		
16QAM					
25	3.50	21.40	0.030141	Within authorized band for Band 17	Pass
	3.70	16.81	0.023676		
	4.20	26.45	0.037254		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 41 part: (2555-2655)

Reference Frequency: LTE Band 41 (10MHz) Middle channel=40740 Frequency=2605.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	11.44	0.004392	Within authorized band for Band 41	Pass
	-20	24.63	0.009455		
	-10	31.26	0.012000		
	0	39.85	0.015298		
	10	45.63	0.017516		
	20	43.53	0.016710		
	30	49.77	0.019106		
	40	51.86	0.019908		
	50	20.94	0.008038		
16QAM					
3.70	-30	51.33	0.019704	Within authorized band for Band 41	Pass
	-20	4.25	0.001631		
	-10	14.82	0.005689		
	0	23.07	0.008856		
	10	36.49	0.014008		
	20	44.89	0.017232		
	30	-12.29	-0.004718		
	40	-4.75	-0.001823		
	50	8.94	0.003432		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-13.07	-0.005017	Within authorized band for Band 41	Pass
	3.70	-28.78	-0.011048		
	4.20	-23.73	-0.009109		
16QAM					
25	3.50	28.08	0.010779	Within authorized band for Band41	Pass
	3.70	23.29	0.008940		
	4.20	39.32	0.015094		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 66 include LTE Band 4 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					
3.70	-30	30.34	0.017387	Within authorized band for Band 66	Pass
	-20	-19.80	-0.011347		
	-10	-9.53	-0.005461		
	0	-2.83	-0.001622		
	10	10.20	0.005845		
	20	18.18	0.010418		
	30	22.13	0.012682		
	40	27.75	0.015903		
	50	33.85	0.019398		
16QAM					
3.70	-30	4.78	0.002739	Within authorized band for Band 66	Pass
	-20	21.49	0.012315		
	-10	3.35	0.001920		
	0	21.11	0.012097		
	10	37.04	0.021226		
	20	15.58	0.008928		
	30	30.36	0.017398		
	40	43.06	0.024676		
	50	-11.82	-0.006774		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	8.71	0.004991	Within authorized band for Band 66	Pass
	3.70	-13.07	-0.007490		
	4.20	2.55	0.001461		
16QAM					
25	3.50	8.88	0.005089	Within authorized band for Band 66	Pass
	3.70	39.12	0.022418		
	4.20	26.41	0.015135		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 71 part:

Reference Frequency: LTE Band 71 (10MHz) Middle channel=133297 Frequency=680.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	4.01	0.005893	Within authorized band for Band 71	Pass
	-20	-3.15	-0.004629		
	-10	-3.88	-0.005702		
	0	-8.23	-0.012094		
	10	-10.50	-0.015430		
	20	-13.93	-0.020470		
	30	-14.23	-0.020911		
	40	-17.55	-0.025790		
	50	-20.00	-0.029390		
16QAM					
3.70	-30	-21.62	-0.031771	Within authorized band for Band 71	Pass
	-20	-17.80	-0.026157		
	-10	-13.73	-0.020176		
	0	-10.44	-0.015342		
	10	-6.35	-0.009331		
	20	-4.16	-0.006113		
	30	2.17	0.003189		
	40	3.42	0.005026		
	50	6.88	0.010110		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	3.99	0.005863	Within authorized band for Band 71	Pass
	3.70	2.69	0.003953		
	4.20	3.98	0.005849		
16QAM					
25	3.50	-24.26	-0.035650	Within authorized band for Band 71	Pass
	3.70	-23.07	-0.033902		
	4.20	-22.70	-0.033358		
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
Band5	10MHz	QPSK	20525	50RB#0	PASS	PASS
Band5	10MHz	16QAM	20525	50RB#0	PASS	PASS
Band12	10MHz	QPSK	23095	50RB#0	PASS	PASS
Band12	10MHz	16QAM	23095	50RB#0	PASS	PASS
Band17	10MHz	QPSK	23790	50RB#0	PASS	PASS
Band17	10MHz	16QAM	23790	50RB#0	PASS	PASS
Band41	20MHz	QPSK	40740	100RB#0	PASS	PASS
Band41	20MHz	16QAM	40740	100RB#0	PASS	PASS
Band66	20MHz	QPSK	132322	100RB#0	PASS	PASS
Band66	20MHz	16QAM	132322	100RB#0	PASS	PASS
Band71	20MHz	QPSK	133322	100RB#0	PASS	PASS
Band71	20MHz	16QAM	133322	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

