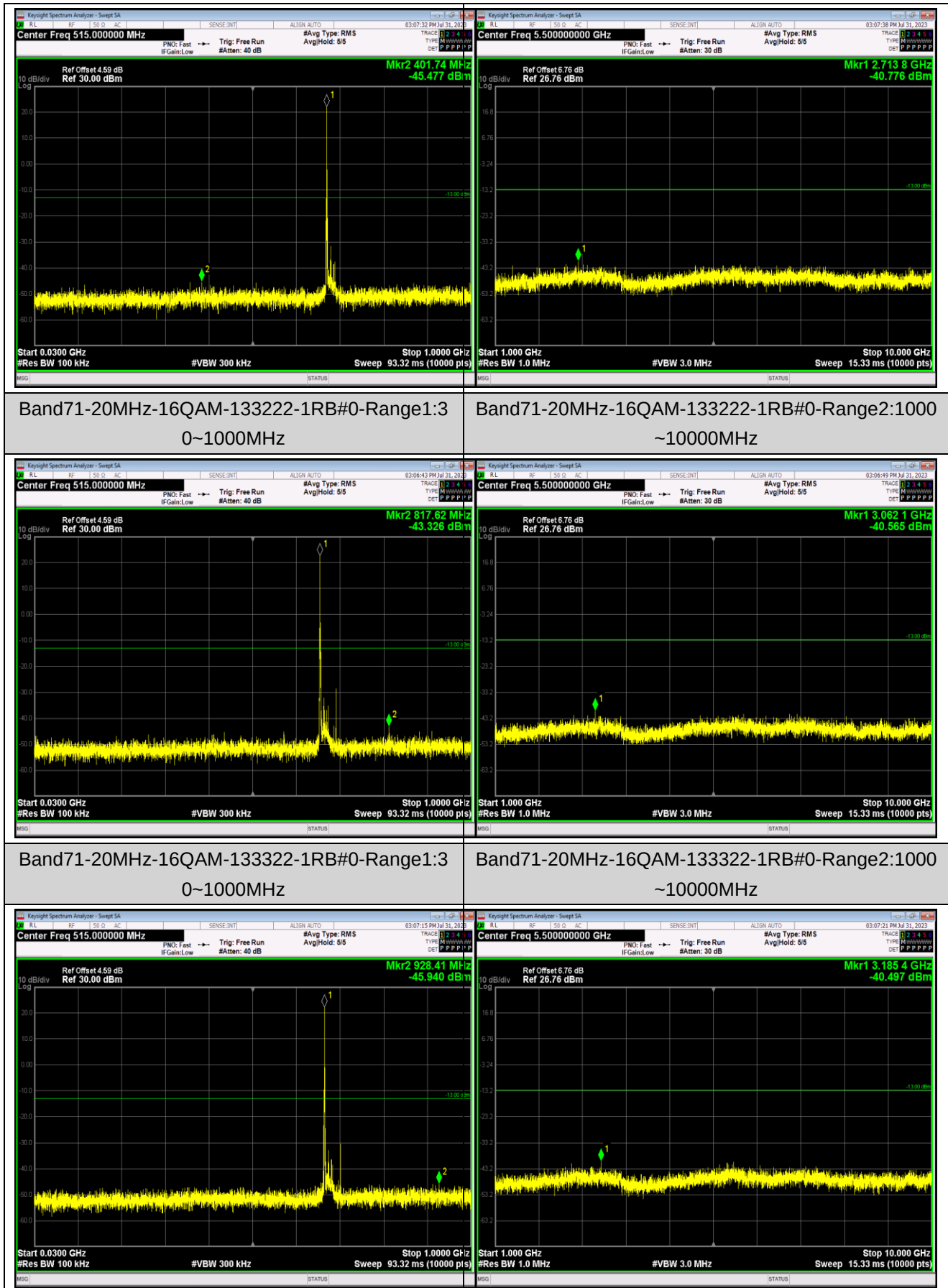
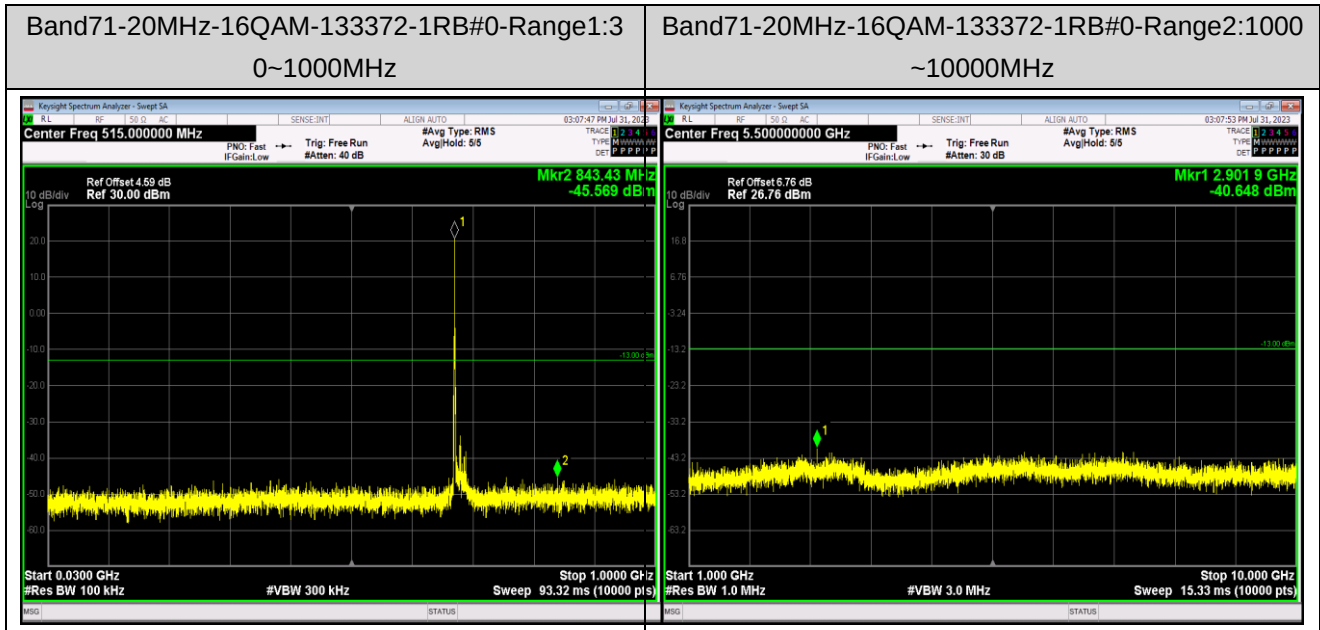






Appendix F: Frequency Stability

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					
3.80	-30	3.36	0.001787	Within authorized band for Band 2	Pass
	-20	-10.81	-0.005750		
	-10	-20.61	-0.010963		
	0	-16.19	-0.008612		
	10	-11.26	-0.005989		
	20	-12.76	-0.006787		
	30	-9.11	-0.004846		
	40	-5.95	-0.003165		
	50	-16.54	-0.008798		
16QAM					
3.80	-30	-14.82	-0.007883	Within authorized band for Band 2	Pass
	-20	-11.06	-0.005883		
	-10	-3.28	-0.001745		
	0	-4.75	-0.002527		
	10	-9.17	-0.004878		
	20	3.55	0.001888		
	30	-5.66	-0.003011		
	40	-2.95	-0.001569		
	50	-16.44	-0.008745		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-4.86	-0.002585	Within authorized band for Band 2	Pass
	3.80	-20.17	-0.010729		
	4.35	-5.14	-0.002734		
16QAM					
25	3.50	-14.98	-0.007968	Within authorized band for Band 2	Pass
	3.80	-13.80	-0.007340		
	4.35	-12.15	-0.006463		
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 (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.80	-30	-10.51	-0.006066	Within authorized band for Band 4	Pass
	-20	-5.94	-0.003429		
	-10	-6.67	-0.003850		
	0	-5.79	-0.003342		
	10	-5.66	-0.003267		
	20	-11.60	-0.006696		
	30	-13.23	-0.007636		
	40	-17.08	-0.009859		
	50	-6.32	-0.003648		
16QAM					
3.80	-30	-9.63	-0.005558	Within authorized band for Band 4	Pass
	-20	4.51	0.002603		
	-10	-4.52	-0.002609		
	0	-16.02	-0.009247		
	10	-13.30	-0.007677		
	20	-10.47	-0.006043		
	30	-12.63	-0.007290		
	40	-12.37	-0.007140		
	50	-6.34	-0.003659		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-7.42	-0.004283	Within authorized band for Band 4	Pass
	3.80	-15.61	-0.009010		
	4.35	-6.84	-0.003948		
16QAM					
25	3.50	-11.29	-0.006517	Within authorized band for Band 4	Pass
	3.80	6.45	0.003723		
	4.35	-12.35	-0.007128		
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					
3.80	-30	-6.85	-0.008189	±2.5	Pass
	-20	-13.10	-0.015660		
	-10	-10.21	-0.012206		
	0	-7.07	-0.008452		
	10	-10.77	-0.012875		
	20	-7.84	-0.009372		
	30	-6.38	-0.007627		
	40	-6.34	-0.007579		
	50	-6.77	-0.008093		
16QAM					
3.80	-30	-2.79	-0.003335	±2.5	Pass
	-20	-4.29	-0.005129		
	-10	-8.77	-0.010484		
	0	-11.59	-0.013855		
	10	-14.46	-0.017286		
	20	-13.03	-0.015577		
	30	-12.04	-0.014393		
	40	-10.69	-0.012779		
	50	-10.06	-0.012026		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-10.41	-0.012445	±2.5	Pass
	3.80	-5.99	-0.007161		
	4.35	-7.27	-0.008691		
16QAM					
25	3.50	-8.78	-0.010496	±2.5	Pass
	3.80	-6.21	-0.007424		
	4.35	-7.45	-0.008906		
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					
3.80	-30	-12.16	-0.017187	Within authorized band for Band 12	Pass
	-20	-13.90	-0.019647		
	-10	-4.08	-0.005767		
	0	-5.68	-0.008028		
	10	-3.33	-0.004707		
	20	-7.17	-0.010134		
	30	-10.69	-0.015110		
	40	-14.38	-0.020325		
	50	-4.23	-0.005979		
16QAM					
3.80	-30	-7.28	-0.010290	Within authorized band for Band 12	Pass
	-20	-8.31	-0.011746		
	-10	-10.36	-0.014643		
	0	-12.79	-0.018078		
	10	-8.15	-0.011519		
	20	-9.73	-0.013753		
	30	-7.30	-0.010318		
	40	-7.18	-0.010148		
	50	-11.33	-0.016014		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-8.85	-0.012509	Within authorized band for Band 12	Pass
	3.80	-10.99	-0.015534		
	4.35	-7.60	-0.010742		
16QAM					
25	3.50	-13.36	-0.018883	Within authorized band for Band 12	Pass
	3.80	-7.67	-0.010841		
	4.35	-6.48	-0.009159		
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					
3.80	-30	-7.62	-0.010732	Within authorized band for Band 17	Pass
	-20	-7.65	-0.010775		
	-10	-4.71	-0.006634		
	0	-6.31	-0.008887		
	10	-5.15	-0.007254		
	20	-5.56	-0.007831		
	30	-6.85	-0.009648		
	40	-8.07	-0.011366		
	50	-11.37	-0.016014		
16QAM					
3.80	-30	-11.34	-0.015972	Within authorized band for Band 17	Pass
	-20	-10.97	-0.015451		
	-10	-5.04	-0.007099		
	0	-9.16	-0.012901		
	10	-1.95	-0.002746		
	20	-6.54	-0.009211		
	30	-10.29	-0.014493		
	40	-11.19	-0.015761		
	50	-11.54	-0.016254		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-15.35	-0.021620	Within authorized band for Band 17	Pass
	3.80	-11.13	-0.015676		
	4.35	-10.46	-0.014732		
16QAM					
25	3.50	-8.04	-0.011324	Within authorized band for Band 17	Pass
	3.80	-7.14	-0.010056		
	4.35	-7.67	-0.010803		
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					
3.80	-30	-3.15	-0.001215	Within authorized band for Band 41	Pass
	-20	-19.15	-0.007385		
	-10	-15.69	-0.006051		
	0	-4.98	-0.001921		
	10	3.15	0.001215		
	20	-17.71	-0.006830		
	30	-12.97	-0.005002		
	40	-9.58	-0.003695		
	50	-8.24	-0.003178		
16QAM					
3.80	-30	-13.59	-0.005241	Within authorized band for Band 41	Pass
	-20	-12.63	-0.004871		
	-10	-17.87	-0.006892		
	0	-14.42	-0.005561		
	10	-14.05	-0.005418		
	20	-11.43	-0.004408		
	30	-12.13	-0.004678		
	40	-10.47	-0.004038		
	50	3.72	0.001435		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-18.14	-0.006996	Within authorized band for Band 41	Pass
	3.80	-24.05	-0.009275		
	4.35	-13.73	-0.005295		
16QAM					
25	3.50	7.40	0.002854	Within authorized band for Band41	Pass
	3.80	15.91	0.006136		
	4.35	-16.91	-0.006521		
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					
3.80	-30	-11.42	-0.006544	Within authorized band for Band 66	Pass
	-20	-9.01	-0.005163		
	-10	-7.07	-0.004052		
	0	-9.18	-0.005261		
	10	-14.08	-0.008069		
	20	-10.41	-0.005966		
	30	-3.40	-0.001948		
	40	-8.50	-0.004871		
	50	-9.88	-0.005662		
16QAM					
3.80	-30	-11.57	-0.006630	Within authorized band for Band 66	Pass
	-20	-8.84	-0.005066		
	-10	-10.83	-0.006206		
	0	-2.82	-0.001616		
	10	2.52	0.001444		
	20	-5.21	-0.002986		
	30	-9.84	-0.005639		
	40	4.51	0.002585		
	50	5.16	0.002957		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-7.90	-0.004527	Within authorized band for Band 66	Pass
	3.80	-15.36	-0.008802		
	4.35	-8.43	-0.004831		
16QAM					
25	3.50	-12.77	-0.007318	Within authorized band for Band 66	Pass
	3.80	-11.10	-0.006361		
	4.35	-7.25	-0.004155		
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					
3.80	-30	-7.80	-0.011462	Within authorized band for Band 71	Pass
	-20	-7.38	-0.010845		
	-10	-7.85	-0.011536		
	0	-6.62	-0.009728		
	10	-6.68	-0.009816		
	20	-5.36	-0.007877		
	30	-8.31	-0.012212		
	40	-9.37	-0.013769		
	50	-5.16	-0.007583		
16QAM					
3.80	-30	-11.47	-0.016855	Within authorized band for Band 71	Pass
	-20	-10.79	-0.015856		
	-10	-7.31	-0.010742		
	0	-12.04	-0.017693		
	10	-8.54	-0.012550		
	20	-10.21	-0.015004		
	30	-9.71	-0.014269		
	40	-8.40	-0.012344		
	50	-5.59	-0.008215		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-11.20	-0.016458	Within authorized band for Band 71	Pass
	3.80	-4.39	-0.006451		
	4.35	-11.74	-0.017252		
16QAM					
25	3.50	-4.55	-0.006686	Within authorized band for Band 71	Pass
	3.80	-4.61	-0.006774		
	4.35	-9.68	-0.014225		
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
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	40620	100RB#0	PASS	PASS
Band41	20MHz	16QAM	40620	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

