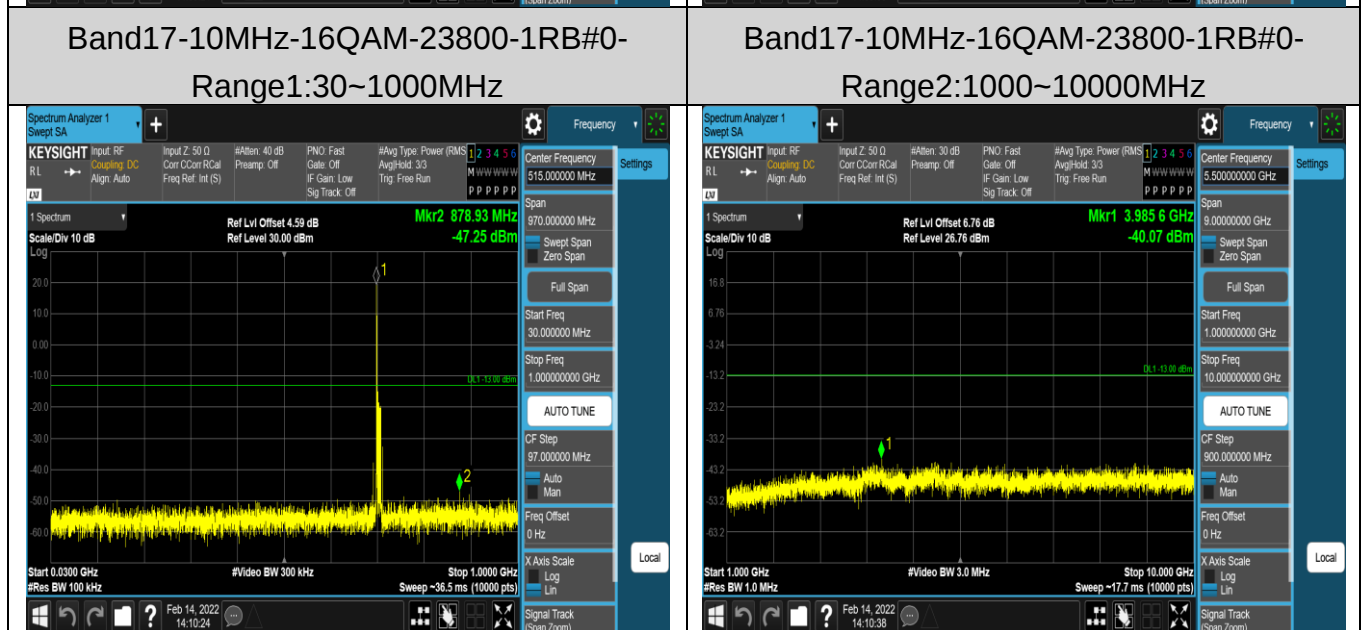
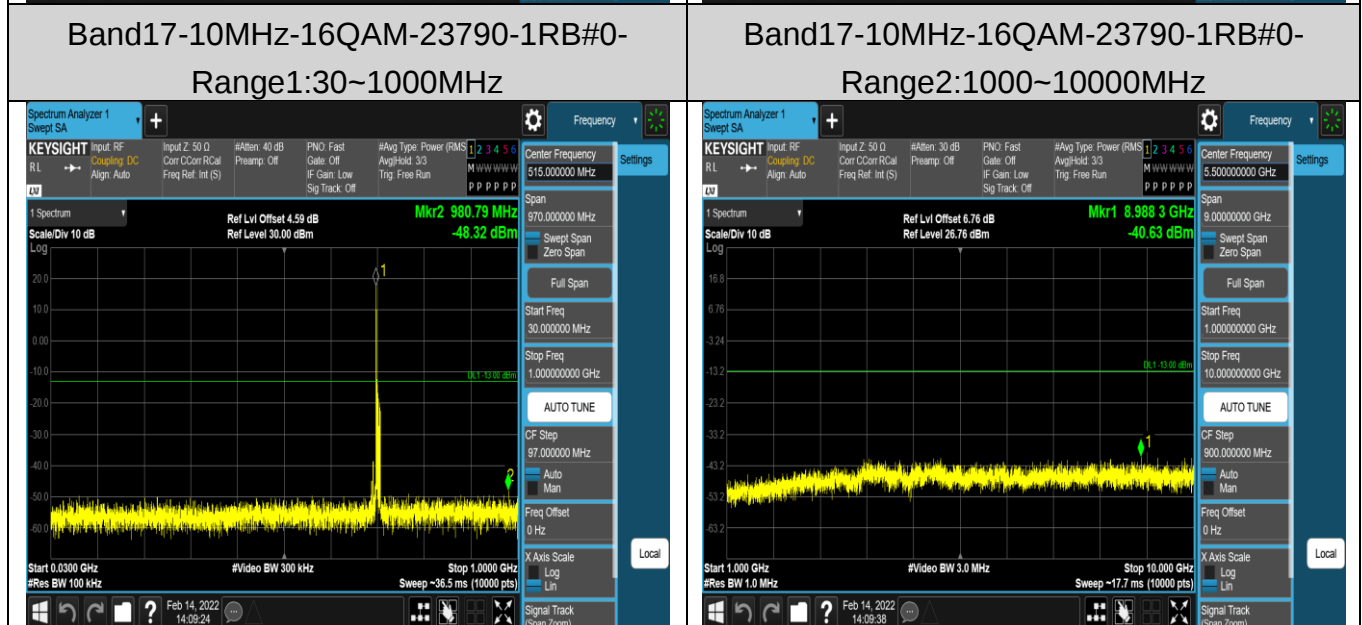
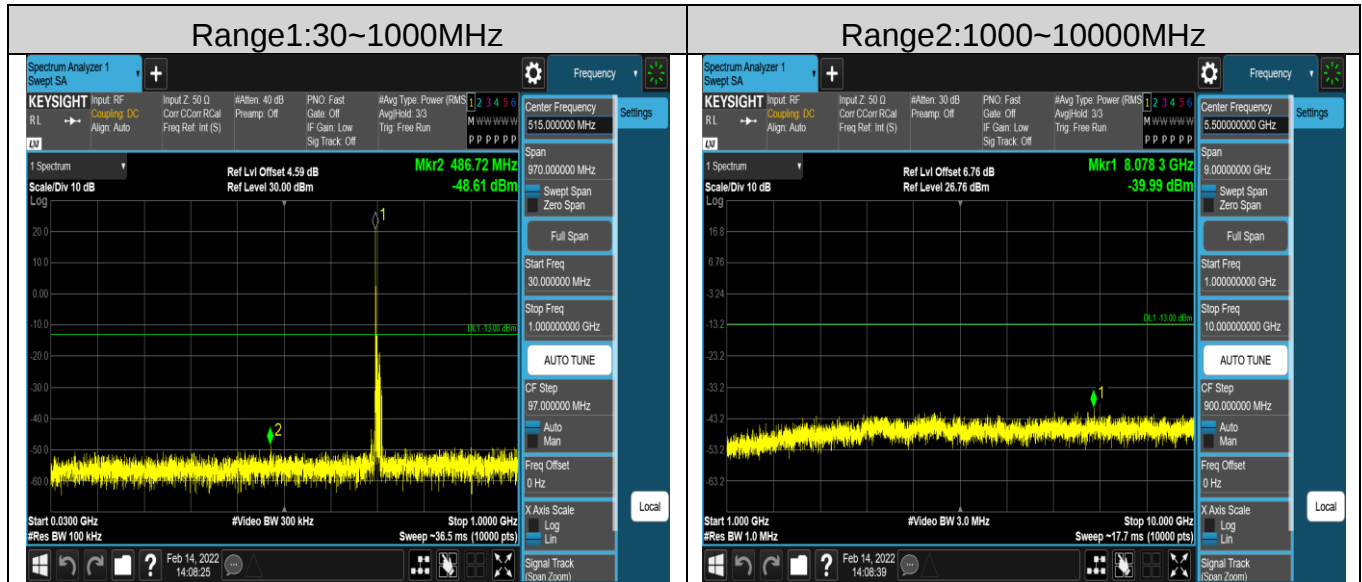




Appendix F: Frequency Stability

Test Result

LTE Band 2 part:

Reference Frequency: LTE Band 2 (10MHz) Middle channel=18900 Frequency=1880.0MHz					
Temperature					
Power supplied (Vac)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
120	-30	-47.65	-0.025346	Within authorized band for Band 2	Pass
	-20	-9.17	-0.004878		
	-10	-33.22	-0.017670		
	0	-6.57	-0.003495		
	10	-39.47	-0.020995		
	20	-6.47	-0.003441		
	30	-31.47	-0.016739		
	40	-8.80	-0.004681		
	50	-35.35	-0.018803		
16QAM					
120	-30	-24.10	-0.012819	Within authorized band for Band 2	Pass
	-20	-29.07	-0.015463		
	-10	-32.62	-0.017351		
	0	5.11	0.002718		
	10	-16.12	-0.008574		
	20	-21.47	-0.011420		
	30	-34.15	-0.018165		
	40	-41.06	-0.021840		
	50	-22.90	-0.012181		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	98.5	14.45	0.007686	Within authorized band for Band 2	Pass
	120.0	9.50	0.005053		
	138.0	-19.66	-0.010457		
16QAM					
25	98.5	-11.42	-0.006074	Within authorized band for Band 2	Pass
	120.0	-58.05	-0.030878		
	138.0	-11.66	-0.006202		
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 (Vac)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
120	-30	42.31	0.024421	Within authorized band for Band 4	Pass
	-20	-12.22	-0.007053		
	-10	-6.85	-0.003954		
	0	18.11	0.010453		
	10	25.61	0.014782		
	20	39.71	0.022921		
	30	46.52	0.026851		
	40	16.92	0.009766		
	50	21.67	0.012508		
16QAM					
120	-30	25.76	0.014869	Within authorized band for Band 4	Pass
	-20	16.68	0.009628		
	-10	34.63	0.019988		
	0	6.28	0.003625		
	10	15.62	0.009016		
	20	31.14	0.017974		
	30	36.31	0.020958		
	40	-14.52	-0.008381		
	50	4.33	0.002499		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	98.5	46.36	0.026759	Within authorized band for Band 4	Pass
	120.0	24.12	0.013922		
	138.0	26.35	0.015209		
16QAM					
25	98.5	-7.45	-0.004300	Within authorized band for Band 4	Pass
	120.0	29.41	0.016975		
	138.0	17.32	0.009997		
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 (Vac)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
120	-30	-4.58	-0.005475	±2.5	Pass
	-20	-7.21	-0.008619		
	-10	-7.12	-0.008512		
	0	-9.00	-0.010759		
	10	-10.53	-0.012588		
	20	-13.02	-0.015565		
	30	-13.69	-0.016366		
	40	-13.39	-0.016007		
	50	-4.58	-0.005475		
	16QAM				
120	-30	-3.18	-0.003802	±2.5	Pass
	-20	-4.31	-0.005152		
	-10	-3.63	-0.004340		
	0	-3.63	-0.004340		
	10	4.25	0.005081		
	20	7.58	0.009062		
	30	7.95	0.009504		
	40	9.21	0.011010		
	50	10.44	0.012481		
	Voltage				
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	98.5	12.90	0.015421	±2.5	Pass
	120.0	16.32	0.019510		
	138.0	8.24	0.009851		
16QAM					
25	98.5	-10.64	-0.012720	±2.5	Pass
	120.0	-13.43	-0.016055		
	138.0	-4.28	-0.005117		
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 (Vac)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
120	-30	6.32	0.008933	Within authorized band for Band 12	Pass
	-20	8.96	0.012664		
	-10	3.58	0.005060		
	0	1.07	0.001512		
	10	-2.22	-0.003138		
	20	-3.28	-0.004636		
	30	-3.79	-0.005357		
	40	-7.54	-0.010657		
	50	-4.99	-0.007053		
16QAM					
120	-30	9.06	0.012806	Within authorized band for Band 12	Pass
	-20	9.28	0.013117		
	-10	13.52	0.019110		
	0	16.32	0.023067		
	10	19.25	0.027208		
	20	21.07	0.029781		
	30	22.46	0.031746		
	40	24.35	0.034417		
	50	23.78	0.033611		
Voltage					
Temperature (°C)	Power supplied (Vac)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	98.5	13.23	0.018700	Within authorized band for Band 12	Pass
	120.0	12.75	0.018021		
	138.0	8.07	0.011406		
16QAM					
25	98.5	-1.86	-0.002629	Within authorized band for Band 12	Pass
	120.0	-3.39	-0.004792		
	138.0	5.65	0.007986		
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=782.0MHz					
Temperature					
Power supplied (Vac)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
120	-30	-1.85	-0.002366	Within authorized band for Band 13	Pass
	-20	-4.99	-0.006381		
	-10	-4.39	-0.005614		
	0	-4.68	-0.005985		
	10	-6.37	-0.008146		
	20	-7.48	-0.009565		
	30	-8.75	-0.011189		
	40	-8.00	-0.010230		
	50	-7.85	-0.010038		
16QAM					
120	-30	9.30	0.011893	Within authorized band for Band 13	Pass
	-20	11.06	0.014143		
	-10	12.89	0.016483		
	0	13.78	0.017621		
	10	16.09	0.020575		
	20	19.24	0.024604		
	30	17.71	0.022647		
	40	21.57	0.027583		
	50	24.15	0.030882		
Voltage					
Temperature (°C)	Power supplied (Vac)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	98.5	4.49	0.005742	Within authorized band for Band 13	Pass
	120.0	-2.20	-0.002813		
	138.0	-2.03	-0.002596		
16QAM					
25	98.5	-5.28	-0.006752	Within authorized band for Band 13	Pass
	120.0	-7.57	-0.009680		
	138.0	4.26	0.005448		
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 (Vac)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
120	-30	5.16	0.007268	Within authorized band for Band 17	Pass
	-20	5.36	0.007549		
	-10	4.25	0.005986		
	0	3.32	0.004676		
	10	3.36	0.004732		
	20	3.96	0.005577		
	30	4.58	0.006451		
	40	4.16	0.005859		
	50	4.82	0.006789		
16QAM					
120	-30	3.78	0.005324	Within authorized band for Band 17	Pass
	-20	4.38	0.006169		
	-10	3.38	0.004761		
	0	2.90	0.004085		
	10	3.62	0.005099		
	20	4.85	0.006831		
	30	4.94	0.006958		
	40	5.92	0.008338		
	50	5.29	0.007451		
Voltage					
Temperature (°C)	Power supplied (Vac)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	98.5	2.79	0.003930	Within authorized band for Band 17	Pass
	120.0	7.07	0.009958		
	138.0	6.05	0.008521		
16QAM					
25	98.5	5.97	0.008408	Within authorized band for Band 17	Pass
	120.0	2.92	0.004113		
	138.0	4.96	0.006986		
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
Band13	10MHz	QPSK	23230	50RB#0	PASS	PASS
Band13	10MHz	16QAM	23230	50RB#0	PASS	PASS
Band17	10MHz	QPSK	23790	50RB#0	PASS	PASS
Band17	10MHz	16QAM	23790	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

