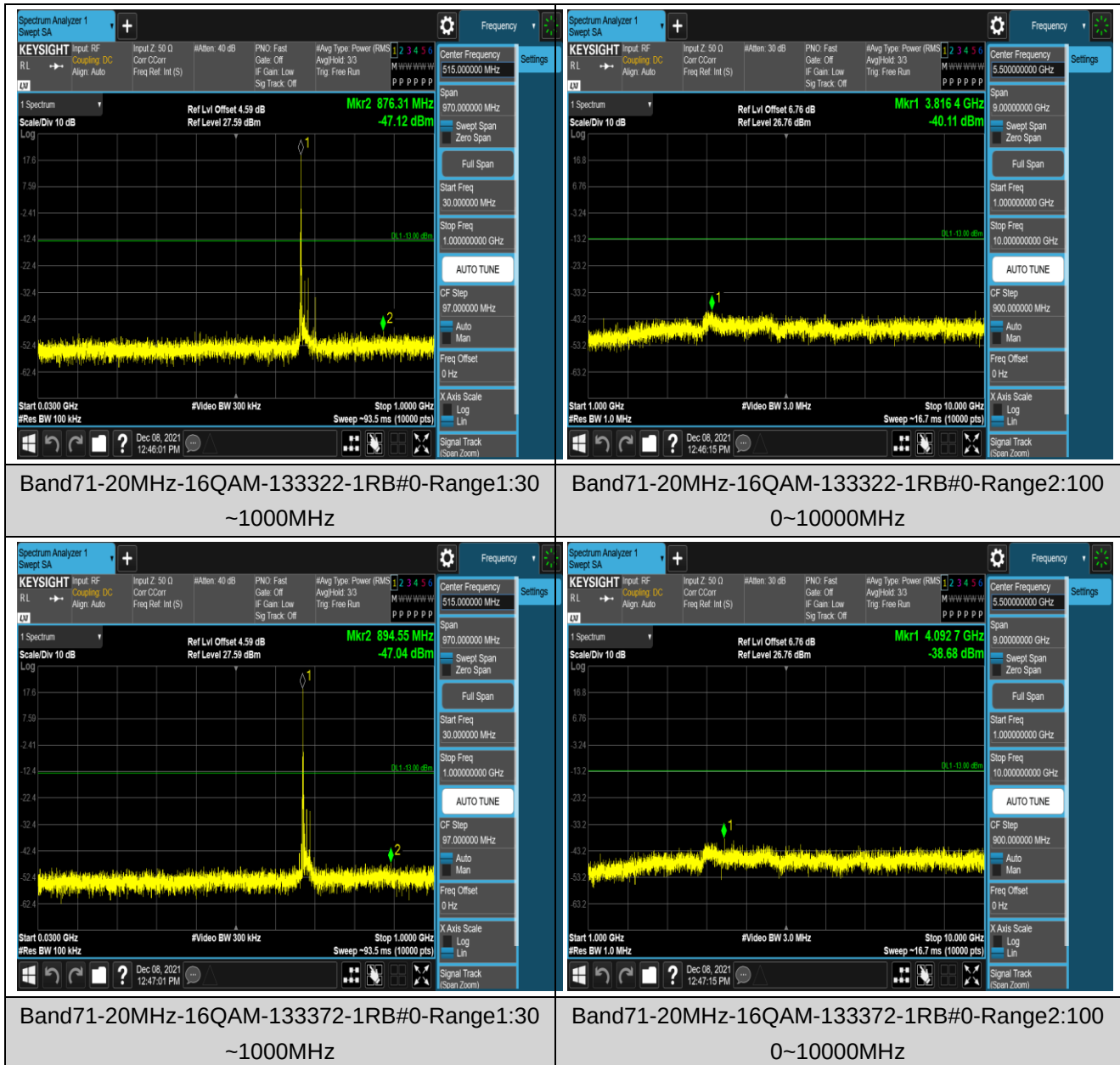




Appendix F: Frequency Stability

Test Result

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	-6.32	-0.007555	±2.5	Pass
	-20	-4.94	-0.005906		
	-10	-7.44	-0.008894		
	0	-2.99	-0.003574		
	10	-12.19	-0.014573		
	20	-6.41	-0.007663		
	30	-7.18	-0.008583		
	40	-3.05	-0.003646		
	50	-10.93	-0.013066		
16QAM					
3.80	-30	-6.92	-0.008273	±2.5	Pass
	-20	-8.01	-0.009576		
	-10	-9.18	-0.010974		
	0	-9.13	-0.010915		
	10	-11.59	-0.013855		
	20	-6.34	-0.007579		
	30	-7.54	-0.009014		
	40	-9.50	-0.011357		
	50	-10.74	-0.012839		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-13.48	-0.016115	±2.5	Pass
	3.80	-9.98	-0.011931		
	4.35	-8.30	-0.009922		
16QAM					
25	3.50	-7.48	-0.008942	±2.5	Pass
	3.80	-4.13	-0.004937		
	4.35	-10.47	-0.012516		
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					
3.80	-30	-5.22	-0.007378	Within authorized band for Band 12	Pass
	-20	-14.19	-0.020057		
	-10	-8.70	-0.012297		
	0	-8.23	-0.011633		
	10	-16.44	-0.023237		
	20	-10.76	-0.015208		
	30	-10.30	-0.014558		
	40	-3.16	-0.004466		
	50	-11.23	-0.015873		
16QAM					
3.80	-30	-6.07	-0.008580	Within authorized band for Band 12	Pass
	-20	-8.55	-0.012085		
	-10	-10.56	-0.014926		
	0	-6.44	-0.009102		
	10	-8.98	-0.012693		
	20	-13.55	-0.019152		
	30	4.55	0.006431		
	40	-8.08	-0.011420		
	50	-11.30	-0.015972		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-13.85	-0.019576	Within authorized band for Band 12	Pass
	3.80	-5.82	-0.008226		
	4.35	-14.68	-0.020749		
16QAM					
25	3.50	-11.54	-0.016311	Within authorized band for Band 12	Pass
	3.80	-10.81	-0.015279		
	4.35	-9.94	-0.014049		
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					
3.80	-30	-12.13	-0.015512	Within authorized band for Band 13	Pass
	-20	-9.93	-0.012698		
	-10	-5.54	-0.007084		
	0	-13.42	-0.017161		
	10	-13.40	-0.017136		
	20	-13.02	-0.016650		
	30	-17.72	-0.022660		
	40	-10.30	-0.013171		
	50	-11.26	-0.014399		
16QAM					
3.80	-30	-12.29	-0.015716	Within authorized band for Band 13	Pass
	-20	-12.19	-0.015588		
	-10	-10.96	-0.014015		
	0	-13.45	-0.017199		
	10	-10.74	-0.013734		
	20	-13.39	-0.017123		
	30	-7.98	-0.010205		
	40	-8.33	-0.010652		
	50	-13.62	-0.017417		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-11.59	-0.014821	Within authorized band for Band 13	Pass
	3.80	-12.52	-0.016010		
	4.35	-12.07	-0.015435		
16QAM					
25	3.50	-9.61	-0.012289	Within authorized band for Band 13	Pass
	3.80	-15.69	-0.020064		
	4.35	-17.08	-0.021841		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 25 part:

Reference Frequency: LTE Band 25(10MHz) Middle channel=26365 Frequency=1882.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.80	-30	-18.81	-0.009992	Within authorized band for Band 25	Pass
	-20	-27.09	-0.014390		
	-10	14.52	0.007713		
	0	-26.99	-0.014337		
	10	-13.46	-0.007150		
	20	-27.77	-0.014752		
	30	-17.58	-0.009339		
	40	-22.37	-0.011883		
	50	-28.07	-0.014911		
16QAM					
3.80	-30	-17.34	-0.009211	Within authorized band for Band 25	Pass
	-20	-24.63	-0.013084		
	-10	14.56	0.007734		
	0	-6.69	-0.003554		
	10	-22.09	-0.011734		
	20	-27.92	-0.014831		
	30	-16.12	-0.008563		
	40	-28.77	-0.015283		
	50	-13.05	-0.006932		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-21.96	-0.011665	Within authorized band for Band 25	Pass
	3.80	-17.04	-0.009052		
	4.35	-24.18	-0.012845		
16QAM					
25	3.50	-18.93	-0.010056	Within authorized band for Band 25	Pass
	3.80	12.33	0.006550		
	4.35	-10.04	-0.005333		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 26 part 90:

Reference Frequency: LTE Band 26(10MHz) Middle channel=26740Frequency=819.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.80	-30	-13.10	-0.015995	Within authorized band for Band 26	Pass
	-20	-11.60	-0.014164		
	-10	-12.19	-0.014884		
	0	-9.57	-0.011685		
	10	-7.44	-0.009084		
	20	2.72	0.003321		
	30	-11.92	-0.014554		
	40	-4.94	-0.006032		
	50	-8.65	-0.010562		
16QAM					
3.80	-30	-11.92	-0.014554	Within authorized band for Band 26	Pass
	-20	-12.97	-0.015836		
	-10	-11.42	-0.013944		
	0	6.95	0.008486		
	10	-13.79	-0.016838		
	20	-16.32	-0.019927		
	30	-5.56	-0.006789		
	40	-12.27	-0.014982		
	50	-11.10	-0.013553		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-10.80	-0.013187	Within authorized band for Band 26	Pass
	3.80	-8.18	-0.009988		
	4.35	-8.96	-0.010940		
16QAM					
25	3.50	-8.47	-0.010342	Within authorized band for Band 26	Pass
	3.80	-7.90	-0.009646		
	4.35	-8.84	-0.010794		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 26 part 22:

Reference Frequency: LTE Band 26(10MHz) Middle channel=26915Frequency=836.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.80	-30	-8.15	-0.009743	Within authorized band for Band 26	Pass
	-20	-11.14	-0.013317		
	-10	-11.19	-0.013377		
	0	-8.93	-0.010675		
	10	-11.64	-0.013915		
	20	-11.62	-0.013891		
	30	-8.73	-0.010436		
	40	-16.59	-0.019833		
	50	-10.03	-0.011990		
16QAM					
3.80	-30	-9.30	-0.011118	Within authorized band for Band 26	Pass
	-20	-6.07	-0.007256		
	-10	-7.34	-0.008775		
	0	-9.98	-0.011931		
	10	-11.13	-0.013305		
	20	-9.08	-0.010855		
	30	-14.41	-0.017227		
	40	-11.32	-0.013533		
	50	-10.30	-0.012313		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-13.33	-0.015935	Within authorized band for Band 26	Pass
	3.80	-8.83	-0.010556		
	4.35	-7.78	-0.009301		
16QAM					
25	3.50	-5.05	-0.006037	Within authorized band for Band 26	Pass
	3.80	-8.31	-0.009934		
	4.35	-11.72	-0.014011		
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	13.90	0.005356	Within authorized band for Band 41	Pass
	-20	-22.57	-0.008697		
	-10	-21.50	-0.008285		
	0	-22.87	-0.008813		
	10	16.77	0.006462		
	20	-21.10	-0.008131		
	30	-22.00	-0.008478		
	40	16.31	0.006285		
	50	-18.87	-0.007272		
16QAM					
3.80	-30	-15.49	-0.005969	Within authorized band for Band 41	Pass
	-20	-17.65	-0.006802		
	-10	-24.00	-0.009249		
	0	-16.79	-0.006470		
	10	-18.71	-0.007210		
	20	-15.26	-0.005881		
	30	-20.50	-0.007900		
	40	-18.98	-0.007314		
	50	20.51	0.007904		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-26.39	-0.010170	Within authorized band for Band 41	Pass
	3.80	-31.97	-0.012320		
	4.35	-5.28	-0.002035		
16QAM					
25	3.50	-27.39	-0.010555	Within authorized band for Band41	Pass
	3.80	-23.27	-0.008967		
	4.35	-21.23	-0.008181		
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	-11.14	-0.006384	Within authorized band for Band 66	Pass
	-20	12.62	0.007232		
	-10	14.02	0.008034		
	0	7.17	0.004109		
	10	-13.32	-0.007633		
	20	14.32	0.008206		
	30	-20.30	-0.011633		
	40	-13.62	-0.007805		
	50	-11.27	-0.006458		
16QAM					
3.80	-30	-16.65	-0.009542	Within authorized band for Band 66	Pass
	-20	-13.85	-0.007937		
	-10	16.16	0.009261		
	0	-6.57	-0.003765		
	10	-16.01	-0.009175		
	20	-11.66	-0.006682		
	30	-9.71	-0.005564		
	40	-13.50	-0.007736		
	50	12.30	0.007049		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-10.66	-0.006109	Within authorized band for Band 66	Pass
	3.80	-9.94	-0.005696		
	4.35	-14.73	-0.008441		
16QAM					
25	3.50	-14.65	-0.008395	Within authorized band for Band 66	Pass
	3.80	-10.40	-0.005960		
	4.35	-8.61	-0.004934		
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	-10.40	-0.015283	Within authorized band for Band 71	Pass
	-20	-8.40	-0.012344		
	-10	-12.57	-0.018472		
	0	-4.91	-0.007215		
	10	-13.38	-0.019662		
	20	-11.83	-0.017384		
	30	-7.82	-0.011492		
	40	-11.20	-0.016458		
	50	-13.32	-0.019574		
16QAM					
3.80	-30	-7.60	-0.011168	Within authorized band for Band 71	Pass
	-20	-11.86	-0.017428		
	-10	-13.19	-0.019383		
	0	-9.13	-0.013417		
	10	-8.51	-0.012506		
	20	-13.70	-0.020132		
	30	-6.35	-0.009331		
	40	-10.43	-0.015327		
	50	-12.33	-0.018119		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-9.71	-0.014269	Within authorized band for Band 71	Pass
	3.80	-6.72	-0.009875		
	4.35	-12.32	-0.018104		
16QAM					
25	3.50	-13.68	-0.020103	Within authorized band for Band 71	Pass
	3.80	-11.70	-0.017193		
	4.35	-11.87	-0.017443		
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
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
Band25	20MHz	QPSK	26365	100RB#0	PASS	PASS
Band25	20MHz	16QAM	26365	100RB#0	PASS	PASS
Band26	10MHz	QPSK	26740	50RB#0	PASS	PASS
Band26	10MHz	16QAM	26740	50RB#0	PASS	PASS
Band26	15MHz	QPSK	26915	75RB#0	PASS	PASS
Band26	15MHz	16QAM	26915	75RB#0	PASS	PASS
Band41	20MHz	QPSK	40640	100RB#0	PASS	PASS
Band41	20MHz	16QAM	40640	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

