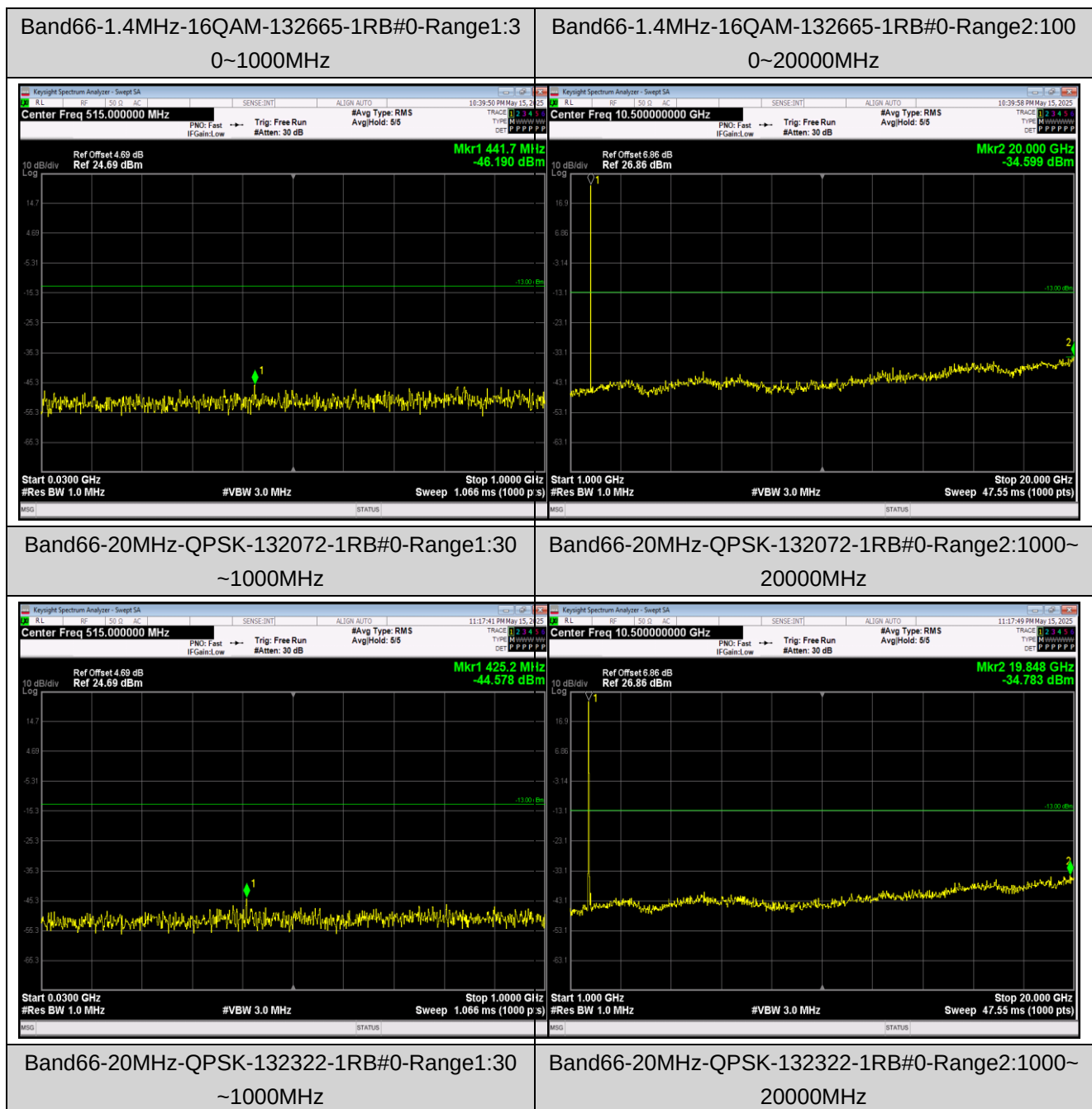
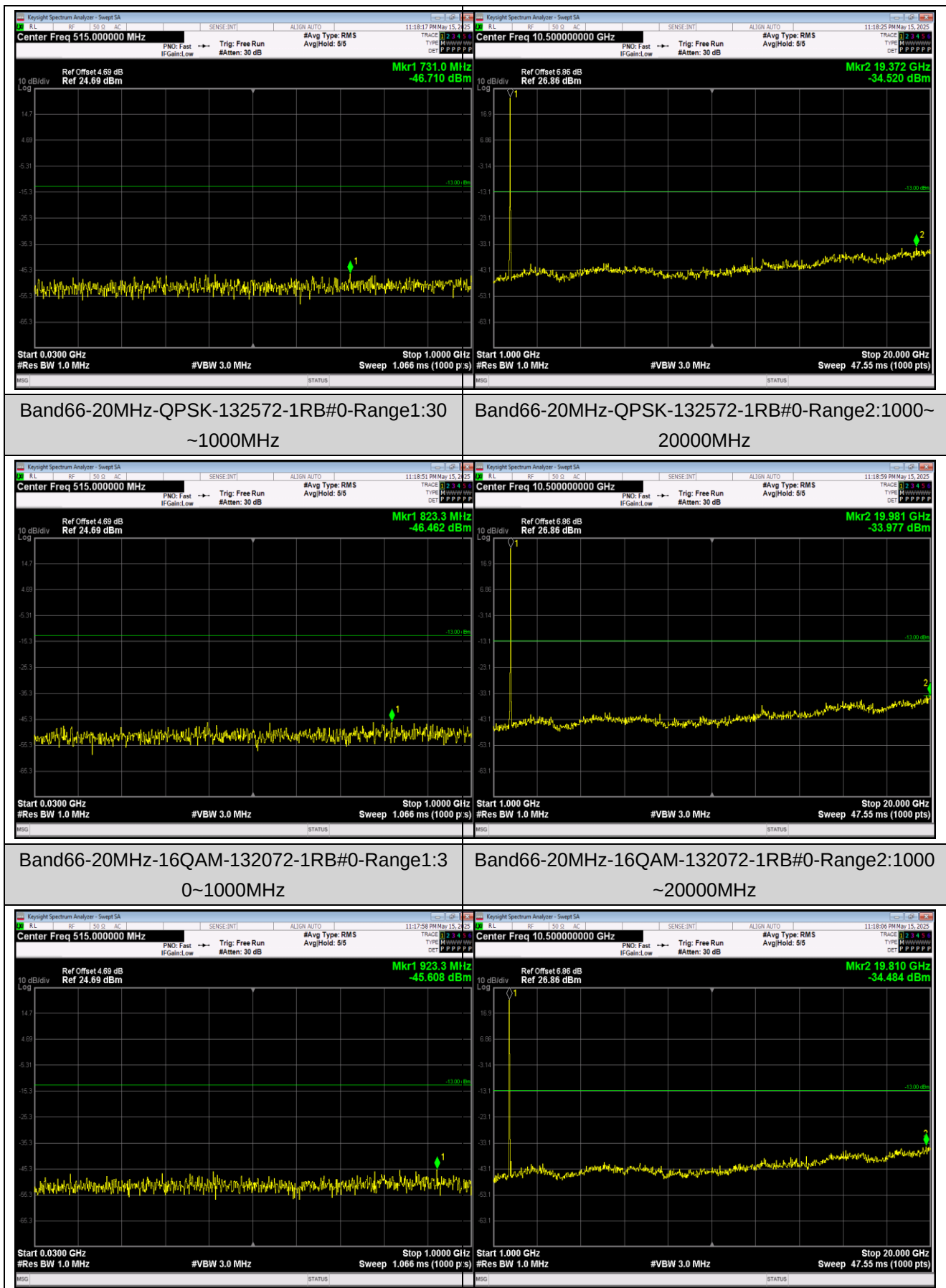
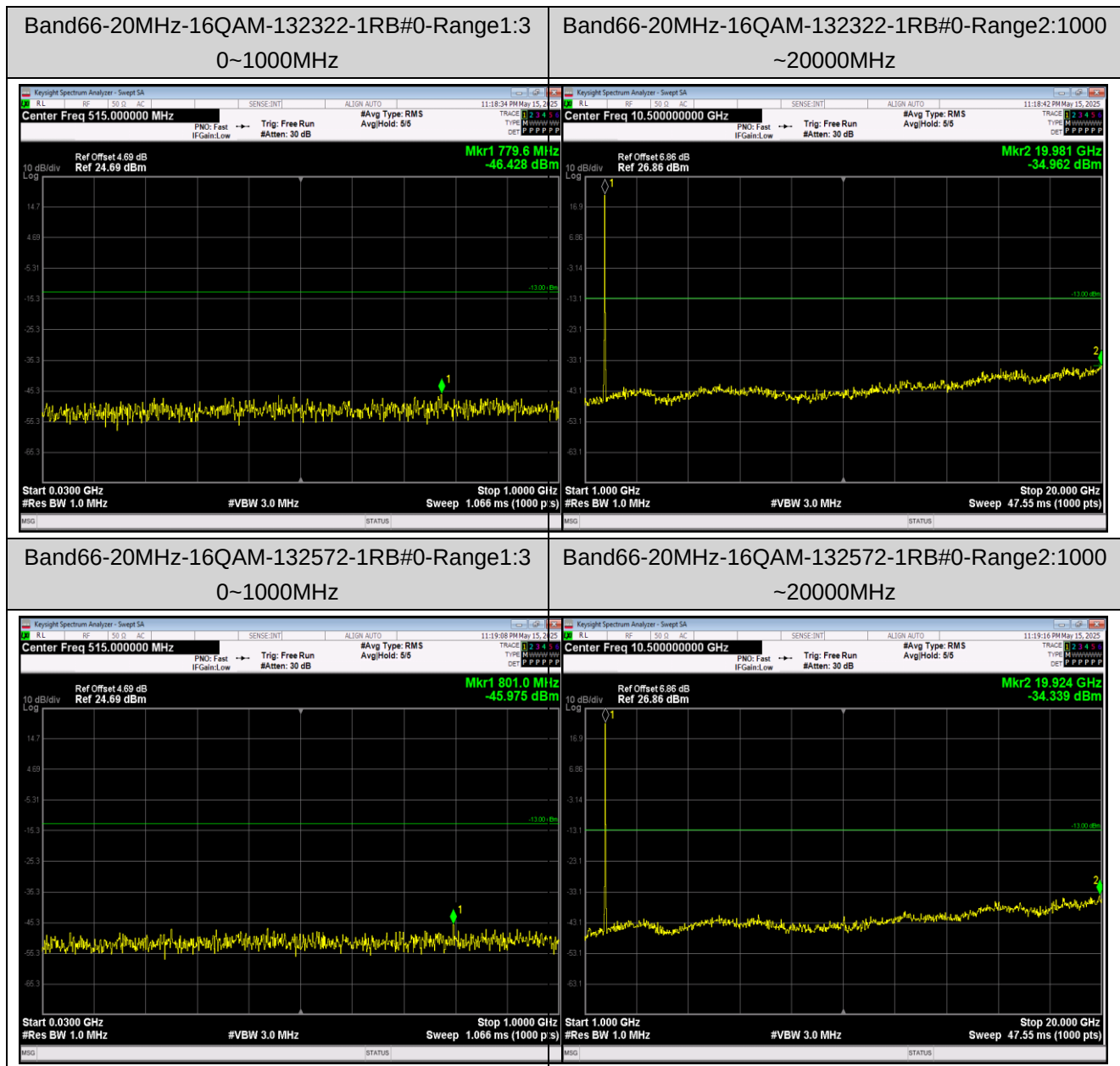










Appendix F: Frequency Stability

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					
3.87	-30	-16.58	-0.008819	Within authorized band for Band 2	Pass
	-20	-10.57	-0.005622		
	-10	-12.00	-0.006383		
	0	12.56	0.006681		
	10	20.70	0.011011		
	20	13.23	0.007037		
	30	16.72	0.008894		
	40	12.13	0.006452		
	50	20.87	0.011101		
16QAM					
3.87	-30	30.04	0.015979	Within authorized band for Band 2	Pass
	-20	45.66	0.024287		
	-10	-10.84	-0.005766		
	0	29.11	0.015484		
	10	3.12	0.001660		
	20	-13.35	-0.007101		
	30	32.44	0.017255		
	40	41.96	0.022319		
	50	25.66	0.013649		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-22.03	-0.011718	Within authorized band for Band 2	Pass
	3.87	23.52	0.012511		
	4.45	-13.09	-0.006963		
16QAM					
25	3.50	66.59	0.035420	Within authorized band for Band 2	Pass
	3.87	39.68	0.021106		
	4.45	28.98	0.015415		
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					
3.87	-30	8.47	0.004889	Within authorized band for Band 4	Pass
	-20	-21.06	-0.012156		
	-10	-40.07	-0.023128		
	0	-16.08	-0.009281		
	10	-28.45	-0.016421		
	20	-39.88	-0.023019		
	30	-40.56	-0.023411		
	40	-41.76	-0.024104		
	50	-37.91	-0.021882		
16QAM					
3.87	-30	54.14	0.031250	Within authorized band for Band 4	Pass
	-20	11.00	0.006349		
	-10	12.75	0.007359		
	0	36.96	0.021333		
	10	23.32	0.013460		
	20	39.31	0.022690		
	30	-5.68	-0.003278		
	40	7.67	0.004427		
	50	28.34	0.016358		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-7.55	-0.004358	Within authorized band for Band 4	Pass
	3.87	27.88	0.016092		
	4.45	-24.92	-0.014384		
16QAM					
25	3.50	7.75	0.004473	Within authorized band for Band 4	Pass
	3.87	-59.58	-0.034390		
	4.45	24.96	0.014407		
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					
3.87	-30	28.70	0.034310	±2.5	Pass
	-20	25.82	0.030867		
	-10	27.31	0.032648		
	0	31.30	0.037418		
	10	28.35	0.033891		
	20	29.24	0.034955		
	30	34.29	0.040992		
	40	37.69	0.045057		
	50	24.48	0.029265		
16QAM					
3.87	-30	21.96	0.026252	±2.5	Pass
	-20	38.65	0.046204		
	-10	8.43	0.010078		
	0	19.87	0.023754		
	10	26.88	0.032134		
	20	14.31	0.017107		
	30	15.18	0.018147		
	40	23.70	0.028332		
	50	42.31	0.050580		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	34.72	0.041506	±2.5	Pass
	3.87	26.01	0.031094		
	4.45	31.53	0.037693		
16QAM					
25	3.50	-9.06	-0.010831	±2.5	Pass
	3.87	-14.10	-0.016856		
	4.45	7.97	0.009528		
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 (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	-11.54	-0.004552	Within authorized band for Band 7	Pass
	-20	13.00	0.005128		
	-10	-18.68	-0.007369		
	0	-14.62	-0.005767		
	10	14.22	0.005609		
	20	15.64	0.006170		
	30	24.36	0.009609		
	40	40.93	0.016146		
	50	50.24	0.019819		
16QAM					
3.87	-30	38.22	0.015077	Within authorized band for Band 7	Pass
	-20	16.22	0.006398		
	-10	20.31	0.008012		
	0	36.38	0.014351		
	10	19.04	0.007511		
	20	40.70	0.016055		
	30	18.35	0.007239		
	40	31.41	0.012391		
	50	32.39	0.012777		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	16.14	0.006367	Within authorized band for Band 7	Pass
	3.87	40.56	0.016000		
	4.45	16.77	0.006615		
16QAM					
25	3.50	-17.64	-0.006959	Within authorized band for Band 7	Pass
	3.87	-18.58	-0.007329		
	4.45	32.57	0.012848		
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					
3.87	-30	-3.72	-0.005258	Within authorized band for Band 12	Pass
	-20	-4.84	-0.006841		
	-10	2.68	0.003788		
	0	5.38	0.007604		
	10	-14.45	-0.020424		
	20	-27.55	-0.038940		
	30	-38.37	-0.054233		
	40	-5.51	-0.007788		
	50	-6.39	-0.009032		
16QAM					
3.87	-30	17.67	0.024975	Within authorized band for Band 12	Pass
	-20	29.64	0.041894		
	-10	40.17	0.056777		
	0	47.66	0.067364		
	10	9.50	0.013428		
	20	17.54	0.024792		
	30	16.04	0.022671		
	40	11.09	0.015675		
	50	7.74	0.010940		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	8.27	0.011689	Within authorized band for Band 12	Pass
	3.87	8.01	0.011322		
	4.45	-4.16	-0.005880		
16QAM					
25	3.50	22.09	0.031223	Within authorized band for Band 12	Pass
	3.87	3.63	0.005131		
	4.45	46.19	0.065286		
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					
3.87	-30	-44.79	-0.025668	Within authorized band for Band 66	Pass
	-20	-29.75	-0.017049		
	-10	-27.24	-0.015610		
	0	-31.81	-0.018229		
	10	-44.99	-0.025782		
	20	-9.26	-0.005307		
	30	-17.01	-0.009748		
	40	-14.88	-0.008527		
	50	-19.24	-0.011026		
16QAM					
3.87	-30	18.40	0.010544	Within authorized band for Band 66	Pass
	-20	-21.36	-0.012241		
	-10	-23.20	-0.013295		
	0	-34.73	-0.019903		
	10	-12.33	-0.007066		
	20	18.73	0.010734		
	30	36.81	0.021095		
	40	11.00	0.006304		
	50	17.92	0.010269		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-37.68	-0.021593	Within authorized band for Band 66	Pass
	3.87	27.37	0.015685		
	4.45	-27.92	-0.016000		
16QAM					
25	3.50	16.79	0.009622	Within authorized band for Band 66	Pass
	3.87	-18.34	-0.010510		
	4.45	45.10	0.025845		
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
Band12	10MHz	QPSK	23095	50RB#0	PASS	PASS
Band12	10MHz	16QAM	23095	50RB#0	PASS	PASS
Band66	20MHz	QPSK	132322	100RB#0	PASS	PASS
Band66	20MHz	16QAM	132322	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

