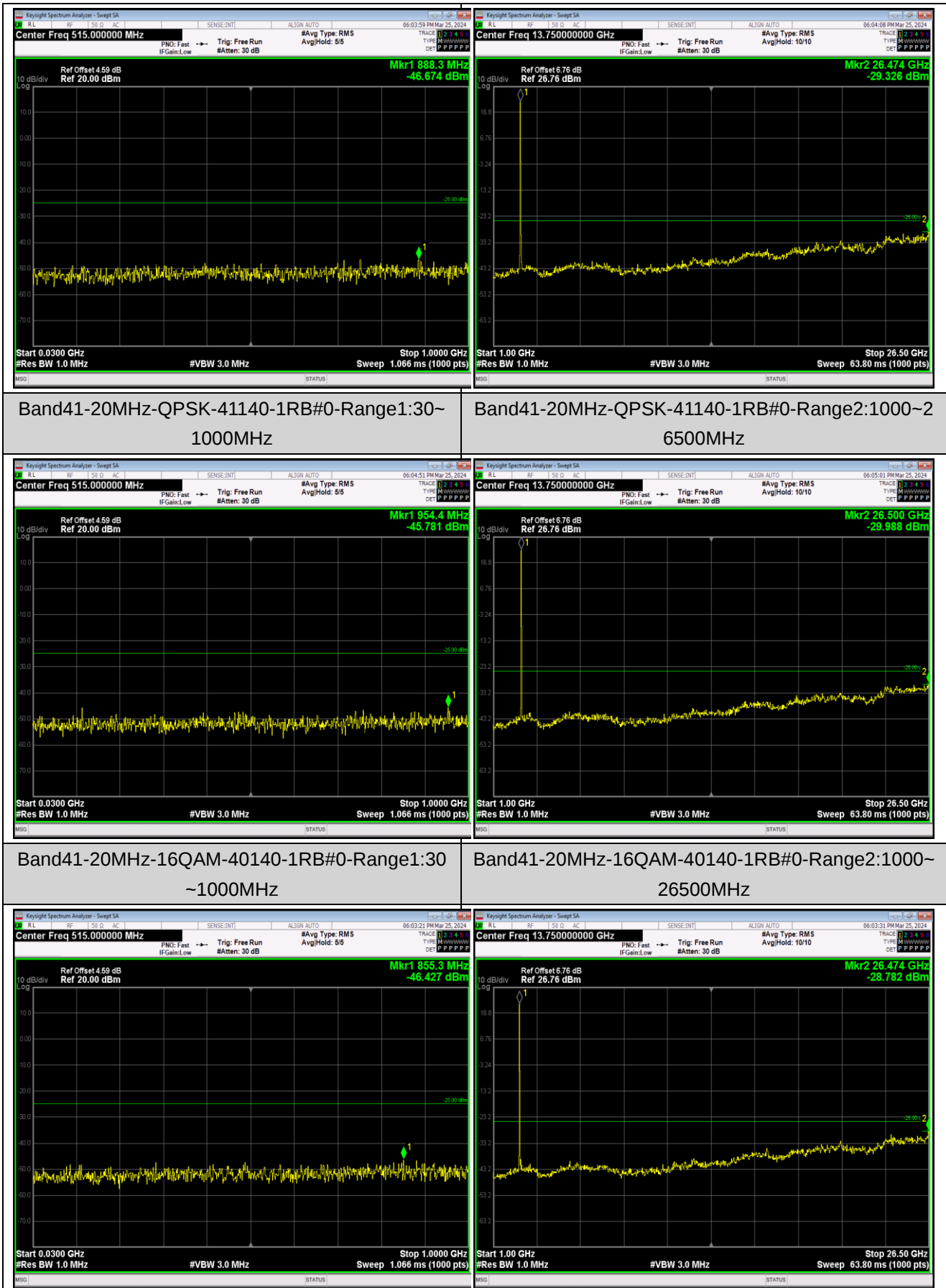
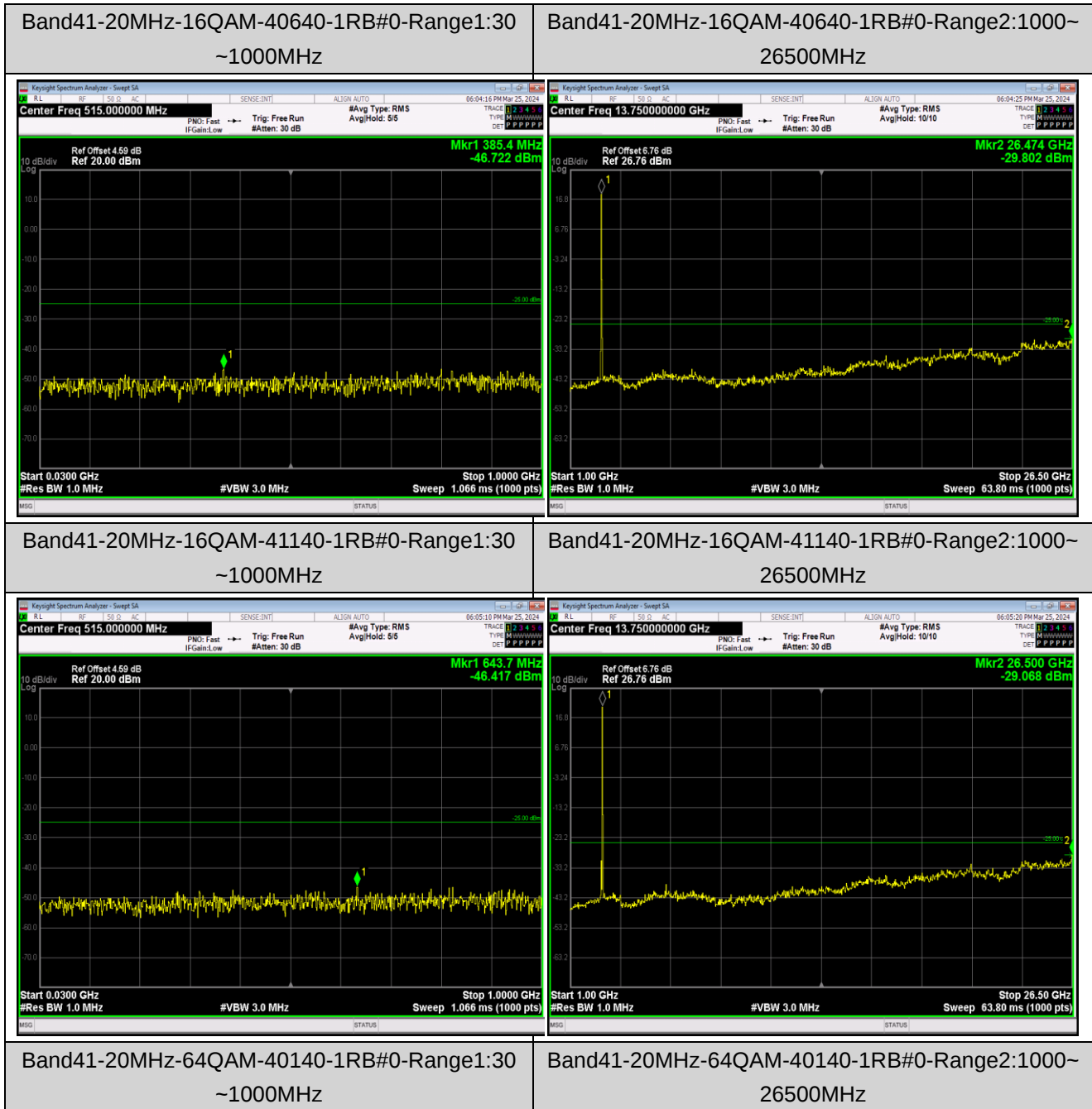
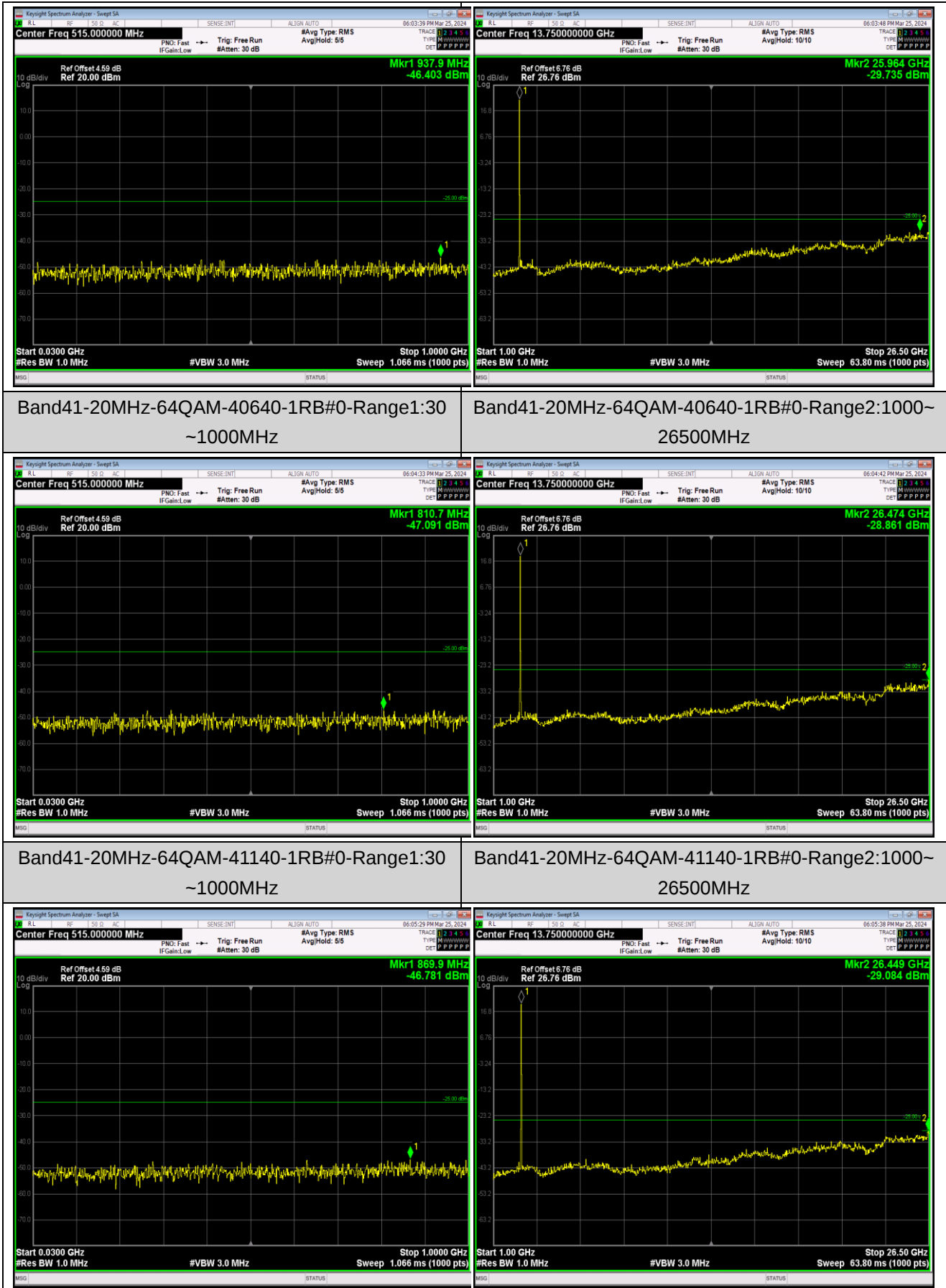








Band41-20MHz-64QAM-40640-1RB#0-Range1:30
~1000MHz

Band41-20MHz-64QAM-40640-1RB#0-Range2:1000~
26500MHz

Band41-20MHz-64QAM-41140-1RB#0-Range1:30
~1000MHz

Band41-20MHz-64QAM-41140-1RB#0-Range2:1000~
26500MHz

Appendix F: Frequency Stability

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					
3.85	-30	-49.92	-0.026553	Within authorized band for Band 2	Pass
	-20	-22.26	-0.011840		
	-10	-35.39	-0.018824		
	0	-55.76	-0.029660		
	10	-38.65	-0.020559		
	20	-45.50	-0.024202		
	30	-25.45	-0.013537		
	40	-40.33	-0.021452		
	50	-23.66	-0.012585		
16QAM					
3.85	-30	19.61	0.010431	Within authorized band for Band 2	Pass
	-20	35.95	0.019122		
	-10	7.72	0.004106		
	0	40.20	0.021383		
	10	35.99	0.019144		
	20	36.62	0.019479		
	30	19.37	0.010303		
	40	25.88	0.013766		
	50	22.49	0.011963		
64QAM					
3.85	-30	31.84	0.016936	Within authorized band for Band 2	Pass
	-20	58.49	0.031112		
	-10	40.83	0.021718		
	0	-15.92	-0.008468		
	10	12.57	0.006686		
	20	33.83	0.017995		
	30	47.05	0.025027		
	40	22.87	0.012165		
	50	26.45	0.014069		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-30.30	-0.016117	Within authorized band for Band 2	Pass
	3.85	21.80	0.011596		
	4.40	-37.77	-0.020090		
16QAM					
25	3.45	-11.89	-0.006324	Within authorized band for Band 2	Pass
	3.85	-49.68	-0.026426		
	4.40	53.57	0.028495		
64QAM					
25	3.45	48.14	0.025606	Within authorized band for Band 2	Pass
	3.85	42.82	0.022777		
	4.40	42.80	0.022766		
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					
3.85	-30	-20.56	-0.011867	Within authorized band for Band 4	Pass
	-20	-10.59	-0.006113		
	-10	-7.30	-0.004214		
	0	-15.03	-0.008675		
	10	-46.66	-0.026932		
	20	-21.27	-0.012277		
	30	-13.33	-0.007694		
	40	-40.74	-0.023515		
	50	-24.59	-0.014193		
16QAM					
3.85	-30	18.57	0.010719	Within authorized band for Band 4	Pass
	-20	42.16	0.024335		
	-10	21.90	0.012641		
	0	23.42	0.013518		
	10	29.04	0.016762		
	20	27.72	0.016000		
	30	48.19	0.027815		
	40	17.72	0.010228		
	50	37.36	0.021564		
64QAM					
3.85	-30	48.74	0.028133	Within authorized band for Band 4	Pass
	-20	21.19	0.012231		
	-10	40.40	0.023319		
	0	-19.31	-0.011146		
	10	27.92	0.016115		
	20	37.22	0.021483		
	30	23.12	0.013345		
	40	38.45	0.022193		
	50	29.80	0.017201		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-16.11	-0.009299	Within authorized band for Band 4	Pass
	3.85	18.61	0.010742		
	4.40	-33.47	-0.019319		
16QAM					
25	3.45	-12.73	-0.007348	Within authorized band for Band 4	Pass
	3.85	-44.98	-0.025962		
	4.40	31.89	0.018407		
64QAM					
25	3.45	37.89	0.021870	Within authorized band for Band 4	Pass
	3.85	-18.35	-0.010592		
	4.40	33.72	0.019463		
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					
3.85	-30	-35.68	-0.042654	±2.5	Pass
	-20	-49.92	-0.059677		
	-10	-11.33	-0.013545		
	0	-23.52	-0.028117		
	10	-28.01	-0.033485		
	20	-37.01	-0.044244		
	30	-45.50	-0.054393		
	40	-47.98	-0.057358		
	50	4.23	0.005057		
16QAM					
3.85	-30	10.80	0.012911	±2.5	Pass
	-20	22.85	0.027316		
	-10	30.18	0.036079		
	0	34.49	0.041231		
	10	43.95	0.052540		
	20	44.36	0.053030		
	30	45.96	0.054943		
	40	12.13	0.014501		
	50	8.41	0.010054		
64QAM					
3.85	-30	38.88	0.046479	±2.5	Pass
	-20	4.15	0.004961		
	-10	21.44	0.025631		
	0	32.50	0.038852		
	10	35.58	0.042534		
	20	50.01	0.059785		
	30	6.84	0.008177		
	40	18.90	0.022594		
	50	29.60	0.035386		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	7.85	0.009384	±2.5	Pass
	3.85	12.80	0.015302		
	4.40	-13.28	-0.015876		
16QAM					
25	3.45	21.41	0.025595	±2.5	Pass
	3.85	-8.45	-0.010102		
	4.40	44.62	0.053341		
64QAM					
25	3.45	39.18	0.046838	±2.5	Pass
	3.85	12.85	0.015362		
	4.40	16.29	0.019474		
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 (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.85	-30	-34.12	-0.013460	Within authorized band for Band 7	Pass
	-20	-59.82	-0.023598		
	-10	-67.25	-0.026529		
	0	-22.57	-0.008903		
	10	-58.99	-0.023270		
	20	-52.11	-0.020556		
	30	-18.50	-0.007298		
	40	-28.64	-0.011298		
	50	-45.82	-0.018075		
16QAM					
3.85	-30	-29.24	-0.011535	Within authorized band for Band 7	Pass
	-20	-36.79	-0.014513		
	-10	-49.21	-0.019412		
	0	-47.06	-0.018564		
	10	-58.61	-0.023120		
	20	-39.17	-0.015452		
	30	-41.33	-0.016304		
	40	-41.28	-0.016284		
	50	-15.88	-0.006264		
64QAM					
3.85	-30	58.95	0.023254	Within authorized band for Band 7	Pass
	-20	25.45	0.010039		
	-10	24.35	0.009606		
	0	-20.24	-0.007984		
	10	-25.08	-0.009893		
	20	-56.42	-0.022256		
	30	-23.53	-0.009282		
	40	13.43	0.005298		
	50	-52.90	-0.020868		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-50.65	-0.019980	Within authorized band for Band 7	Pass
	3.85	-76.58	-0.030209		
	4.40	-26.25	-0.010355		
16QAM					
25	3.45	-42.29	-0.016682	Within authorized band for Band 7	Pass
	3.85	-21.04	-0.008300		
	4.40	-21.44	-0.008458		
64QAM					
25	3.45	26.79	0.010568	Within authorized band for Band 7	Pass
	3.85	-18.87	-0.007444		
	4.40	32.70	0.012899		
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					
3.85	-30	-17.27	-0.006655	Within authorized band for Band 41	Pass
	-20	22.77	0.008775		
	-10	-27.85	-0.010732		
	0	-47.86	-0.018443		
	10	-65.79	-0.025353		
	20	-38.44	-0.014813		
	30	-44.16	-0.017017		
	40	-56.83	-0.021900		
	50	-62.18	-0.023961		
16QAM					
3.85	-30	26.65	0.010270	Within authorized band for Band 41	Pass
	-20	46.22	0.017811		
	-10	-17.22	-0.006636		
	0	-42.20	-0.016262		
	10	-40.11	-0.015457		
	20	-33.19	-0.012790		
	30	-53.50	-0.020617		
	40	-30.54	-0.011769		
	50	-34.48	-0.013287		
64QAM					
3.85	-30	55.96	0.021565	Within authorized band for Band 41	Pass
	-20	43.17	0.016636		
	-10	-55.49	-0.021383		
	0	19.64	0.007568		
	10	25.71	0.009908		
	20	28.90	0.011137		
	30	39.02	0.015037		
	40	44.12	0.017002		
	50	51.91	0.020004		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-33.87	-0.013052	Within authorized band for Band 41	Pass
	3.85	38.50	0.014836		
	4.40	-45.53	-0.017545		
16QAM					
25	3.45	-17.31	-0.006671	Within authorized band for Band41	Pass
	3.85	-15.36	-0.005919		
	4.40	11.83	0.004559		
64QAM					
25	3.45	38.88	0.014983	Within authorized band for Band41	Pass
	3.85	-33.29	-0.012829		
	4.40	23.15	0.008921		
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
Band2	20MHz	64QAM	18900	100RB#0	PASS	PASS
Band4	20MHz	QPSK	20175	100RB#0	PASS	PASS
Band4	20MHz	16QAM	20175	100RB#0	PASS	PASS
Band4	20MHz	64QAM	20175	100RB#0	PASS	PASS
Band5	10MHz	QPSK	20525	50RB#0	PASS	PASS
Band5	10MHz	16QAM	20525	50RB#0	PASS	PASS
Band5	10MHz	64QAM	20525	50RB#0	PASS	PASS
Band7	20MHz	QPSK	21100	100RB#0	PASS	PASS
Band7	20MHz	16QAM	21100	100RB#0	PASS	PASS
Band7	20MHz	64QAM	21100	100RB#0	PASS	PASS
Band41	20MHz	QPSK	40640	100RB#0	PASS	PASS
Band41	20MHz	16QAM	40640	100RB#0	PASS	PASS
Band41	20MHz	64QAM	40640	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

