

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					
3.70	-30	-5.84	-0.003106	Within authorized band for Band 2	Pass
	-20	-25.13	-0.013367		
	-10	-12.57	-0.006686		
	0	-6.25	-0.003324		
	10	-14.08	-0.007489		
	20	-26.06	-0.013862		
	30	-13.70	-0.007287		
	40	-13.98	-0.007436		
	50	-10.47	-0.005569		
16QAM					
3.70	-30	-20.11	-0.010697	Within authorized band for Band 2	Pass
	-20	-13.03	-0.006931		
	-10	-25.42	-0.013521		
	0	-18.95	-0.010080		
	10	-15.58	-0.008287		
	20	-10.04	-0.005340		
	30	-12.52	-0.006660		
	40	2.25	0.001197		
	50	2.63	0.001399		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-3.72	-0.001979	Within authorized band for Band 2	Pass
	3.70	-6.19	-0.003293		
	4.25	6.04	0.003213		
16QAM					
25	3.50	-18.97	-0.010090	Within authorized band for Band 2	Pass
	3.70	-11.54	-0.006138		
	4.25	-16.19	-0.008612		
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					
3.70	-30	3.18	0.001835	Within authorized band for Band 4	Pass
	-20	-5.94	-0.003429		
	-10	4.94	0.002851		
	0	-12.39	-0.007152		
	10	8.18	0.004722		
	20	-14.02	-0.008092		
	30	-10.70	-0.006176		
	40	-11.74	-0.006776		
	50	-8.84	-0.005102		
16QAM					
3.70	-30	-14.31	-0.008260	Within authorized band for Band 4	Pass
	-20	-1.54	-0.000889		
	-10	-7.90	-0.004560		
	0	10.03	0.005789		
	10	-10.93	-0.006309		
	20	-13.48	-0.007781		
	30	-4.12	-0.002378		
	40	13.56	0.007827		
	50	-7.80	-0.004502		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	2.70	0.001558	Within authorized band for Band 4	Pass
	3.70	-13.30	-0.007677		
	4.25	-14.43	-0.008329		
16QAM					
25	3.50	-9.68	-0.005587	Within authorized band for Band 4	Pass
	3.70	-14.05	-0.008110		
	4.25	-7.32	-0.004225		
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					
3.70	-30	-3.89	-0.004650	±2.5	Pass
	-20	-7.50	-0.008966		
	-10	-5.85	-0.006993		
	0	-9.28	-0.011094		
	10	-11.94	-0.014274		
	20	-10.00	-0.011955		
	30	-5.21	-0.006228		
	40	-10.26	-0.012265		
	50	-7.24	-0.008655		
16QAM					
3.70	-30	-5.55	-0.006635	±2.5	Pass
	-20	-12.53	-0.014979		
	-10	-8.74	-0.010448		
	0	-6.22	-0.007436		
	10	-5.99	-0.007161		
	20	-8.30	-0.009922		
	30	-10.77	-0.012875		
	40	-7.07	-0.008452		
	50	-7.44	-0.008894		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-10.33	-0.012349	±2.5	Pass
	3.70	-8.50	-0.010161		
	4.25	-9.37	-0.011201		
16QAM					
25	3.50	-4.31	-0.005152	±2.5	Pass
	3.70	-5.84	-0.006981		
	4.25	-12.04	-0.014393		
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					
3.70	-30	-14.12	-0.005570	Within authorized band for Band 7	Pass
	-20	-14.68	-0.005791		
	-10	-18.85	-0.007436		
	0	6.58	0.002596		
	10	-18.34	-0.007235		
	20	13.85	0.005464		
	30	-14.53	-0.005732		
	40	-15.59	-0.006150		
	50	-13.46	-0.005310		
16QAM					
3.70	-30	5.09	0.002008	Within authorized band for Band 7	Pass
	-20	-18.58	-0.007329		
	-10	-20.14	-0.007945		
	0	4.35	0.001716		
	10	13.23	0.005219		
	20	-15.69	-0.006189		
	30	-22.17	-0.008746		
	40	-16.75	-0.006607		
	50	-18.65	-0.007357		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-13.89	-0.019563	Within authorized band for Band 7	Pass
	3.70	-11.12	-0.015662		
	4.25	-7.75	-0.010915		
16QAM					
25	3.50	-9.93	-0.013986	Within authorized band for Band 7	Pass
	3.70	9.27	0.003657		
	4.25	6.82	0.002690		
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					
3.70	-30	-9.10	-0.012817	±2.5	Pass
	-20	-10.19	-0.014352		
	-10	-9.04	-0.012732		
	0	-8.50	-0.011972		
	10	-13.89	-0.019563		
	20	-11.12	-0.015662		
	30	-7.75	-0.010915		
	40	-12.03	-0.016944		
	50	-9.93	-0.013986		
16QAM					
3.70	-30	-6.37	-0.008972	±2.5	Pass
	-20	-13.15	-0.018521		
	-10	-11.42	-0.016085		
	0	-13.18	-0.018563		
	10	-13.48	-0.018986		
	20	-9.88	-0.013915		
	30	-8.48	-0.011944		
	40	-4.05	-0.005704		
	50	-11.87	-0.016718		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-5.08	-0.007155	±2.5	Pass
	3.70	-13.88	-0.019549		
	4.25	-8.50	-0.011972		
16QAM					
25	3.50	-4.84	-0.006817	±2.5	Pass
	3.70	-7.24	-0.010197		
	4.25	-10.80	-0.015211		
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
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



