



























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	-20.96	-0.011149	Within authorized band for Band 2	Pass
	-20	-18.88	-0.010043		
	-10	-12.26	-0.006521		
	0	12.30	0.006543		
	10	-17.09	-0.009090		
	20	13.40	0.007128		
	30	-14.43	-0.007676		
	40	6.90	0.003670		
	50	-11.17	-0.005941		
16QAM					
3.70	-30	-12.02	-0.006394	Within authorized band for Band 2	Pass
	-20	-18.00	-0.009574		
	-10	-16.24	-0.008638		
	0	-7.71	-0.004101		
	10	-21.89	-0.011644		
	20	-15.39	-0.008186		
	30	-8.84	-0.004702		
	40	-6.58	-0.003500		
	50	-8.78	-0.004670		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.15	-3.29	-0.001750	Within authorized band for Band 2	Pass
	3.70	-14.12	-0.007511		
	4.20	-24.00	-0.012766		
16QAM					
25	3.15	-15.13	-0.008048	Within authorized band for Band 2	Pass
	3.70	-6.57	-0.003495		
	4.20	-8.04	-0.004277		

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	-4.62	-0.005523	±2.5	Pass
	-20	-12.65	-0.015123		
	-10	-9.94	-0.011883		
	0	-5.98	-0.007149		
	10	-7.05	-0.008428		
	20	-12.16	-0.014537		
	30	-9.53	-0.011393		
	40	-12.77	-0.015266		
	50	-10.93	-0.013066		
16QAM					
3.70	-30	-14.83	-0.017729	±2.5	Pass
	-20	-9.61	-0.011488		
	-10	-7.70	-0.009205		
	0	-2.16	-0.002582		
	10	4.66	0.005571		
	20	-12.85	-0.015362		
	30	-9.27	-0.011082		
	40	-7.28	-0.008703		
	50	-11.37	-0.013592		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.15	-12.67	-0.015146	±2.5	Pass
	3.70	-9.94	-0.011883		
	4.20	-4.22	-0.005045		
16QAM					
25	3.15	-11.06	-0.013222	±2.5	Pass
	3.70	-13.25	-0.015840		
	4.20	-16.24	-0.019414		

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					
3.70	-30	-12.33	-0.017428	Within authorized band for Band 12	Pass
	-20	-2.56	-0.003618		
	-10	-7.01	-0.009908		
	0	-11.37	-0.016071		
	10	-13.36	-0.018883		
	20	-10.86	-0.015350		
	30	-10.29	-0.014544		
	40	-9.58	-0.013541		
	50	-13.19	-0.018643		
16QAM					
3.70	-30	-12.39	-0.017512	Within authorized band for Band 12	Pass
	-20	-6.68	-0.009442		
	-10	-13.79	-0.019491		
	0	-12.53	-0.017710		
	10	-6.61	-0.009343		
	20	-4.95	-0.006996		
	30	-9.68	-0.013682		
	40	-6.47	-0.009145		
	50	-9.83	-0.013894		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.15	-8.27	-0.011689	Within authorized band for Band 12	Pass
	3.70	-10.29	-0.014544		
	4.20	-5.29	-0.007477		
16QAM					
25	3.15	-8.25	-0.011661	Within authorized band for Band 12	Pass
	3.70	-13.05	-0.018445		
	4.20	-10.31	-0.014572		

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=40740 Frequency=2605.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	10.56	0.004054	Within authorized band for Band 41	Pass
	-20	-22.07	-0.008472		
	-10	-17.60	-0.006756		
	0	-16.67	-0.006399		
	10	-17.98	-0.006902		
	20	-27.52	-0.010564		
	30	11.42	0.004384		
	40	10.06	0.003862		
	50	19.28	0.007401		
16QAM					
3.70	-30	-16.61	-0.006376	Within authorized band for Band 41	Pass
	-20	10.61	0.004073		
	-10	-22.37	-0.008587		
	0	-19.45	-0.007466		
	10	-22.76	-0.008737		
	20	-17.45	-0.006699		
	30	7.95	0.003052		
	40	-25.66	-0.009850		
	50	-21.31	-0.008180		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.15	-18.41	-0.007067	Within authorized band for Band 41	Pass
	3.70	-24.43	-0.009378		
	4.20	-19.47	-0.007474		
16QAM					
25	3.15	-10.44	-0.005983	Within authorized band for Band41	Pass
	3.70	-11.90	-0.006819		
	4.20	-14.09	-0.008074		

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					
3.70	-30	-16.22	-0.009295	Within authorized band for Band 66	Pass
	-20	-13.02	-0.007461		
	-10	-16.45	-0.009427		
	0	-14.63	-0.008384		
	10	-17.19	-0.009851		
	20	-16.31	-0.009347		
	30	-17.02	-0.009754		
	40	-16.04	-0.009192		
	50	6.75	0.003868		
16QAM					
3.70	-30	-14.10	-0.008080	Within authorized band for Band 66	Pass
	-20	13.06	0.007484		
	-10	-15.39	-0.008819		
	0	-7.82	-0.004481		
	10	-22.93	-0.013140		
	20	-17.74	-0.010166		
	30	-8.11	-0.004648		
	40	-18.50	-0.010602		
	50	-10.99	-0.006298		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.15	-10.44	-0.005983	Within authorized band for Band 66	Pass
	3.70	-11.90	-0.006819		
	4.20	-14.09	-0.008074		
16QAM					
25	3.15	10.00	0.005731	Within authorized band for Band 66	Pass
	3.70	13.79	0.007903		
	4.20	-16.38	-0.009387		

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 66 (10MHz) Middle channel=133297 Frequency=680.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	-7.28	-0.010698	Within authorized band for Band 71	Pass
	-20	-6.95	-0.010213		
	-10	-9.70	-0.014254		
	0	-6.41	-0.009420		
	10	-7.47	-0.010977		
	20	-7.64	-0.011227		
	30	-12.40	-0.018222		
	40	-2.49	-0.003659		
	50	-17.24	-0.025334		
16QAM					
3.70	-30	-7.81	-0.011477	Within authorized band for Band 71	Pass
	-20	-15.36	-0.022572		
	-10	-9.18	-0.013490		
	0	-11.04	-0.016223		
	10	-9.20	-0.013519		
	20	-11.70	-0.017193		
	30	-9.13	-0.013417		
	40	-12.59	-0.018501		
	50	-12.07	-0.017737		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.15	-10.96	-0.016106	Within authorized band for Band 71	Pass
	3.70	-9.58	-0.014078		
	4.20	-6.31	-0.009273		
16QAM					
25	3.15	-12.37	-0.018178	Within authorized band for Band 71	Pass
	3.70	-12.75	-0.018736		
	4.20	-10.17	-0.014945		

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
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
Band41	20MHz	QPSK	40740	100RB#0	PASS	PASS
Band41	20MHz	16QAM	40740	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



