

Appendix F: Frequency Stability

Test Result

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	-11.72	-0.004623	Within authorized band for Band 7	Pass
	-20	-15.64	-0.006170		
	-10	-17.50	-0.006903		
	0	-21.80	-0.008600		
	10	-17.42	-0.006872		
	20	-19.34	-0.007629		
	30	-6.39	-0.002521		
	40	-16.82	-0.006635		
	50	-15.45	-0.006095		
16QAM					
3.85	-30	-13.36	-0.005270	Within authorized band for Band 7	Pass
	-20	-21.14	-0.008339		
	-10	-19.71	-0.007775		
	0	-10.91	-0.004304		
	10	-15.89	-0.006268		
	20	-14.08	-0.005554		
	30	-15.06	-0.005941		
	40	-6.22	-0.002454		
	50	-7.01	-0.002765		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.40	-18.75	-0.007396	Within authorized band for Band 7	Pass
	3.85	-22.42	-0.008844		
	4.40	-14.78	-0.005830		
16QAM					
25	3.40	-6.27	-0.002473	Within authorized band for Band 7	Pass
	3.85	6.08	0.002398		
	4.40	-14.45	-0.005700		
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					
3.85	-30	-3.03	-0.004283	Within authorized band for Band 12	Pass
	-20	-3.36	-0.004749		
	-10	-7.27	-0.010276		
	0	-4.05	-0.005724		
	10	-7.17	-0.010134		
	20	-2.59	-0.003661		
	30	-2.27	-0.003208		
	40	-4.05	-0.005724		
	50	-3.19	-0.004509		
16QAM					
3.85	-30	-13.15	-0.018587	Within authorized band for Band 12	Pass
	-20	-12.33	-0.017428		
	-10	-9.83	-0.013894		
	0	-3.96	-0.005597		
	10	-10.84	-0.015322		
	20	-9.67	-0.013668		
	30	-6.90	-0.009753		
	40	-9.03	-0.012763		
	50	-15.85	-0.022403		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.40	-4.61	-0.006516	Within authorized band for Band 12	Pass
	3.85	-11.00	-0.015548		
	4.40	-3.92	-0.005541		
16QAM					
25	3.40	-9.07	-0.012820	Within authorized band for Band 12	Pass
	3.85	-13.96	-0.019731		
	4.40	-4.56	-0.006445		
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=782.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.85	-30	-3.58	-0.004578	Within authorized band for Band 17	Pass
	-20	-11.56	-0.014783		
	-10	-6.31	-0.008069		
	0	-3.42	-0.004373		
	10	-11.46	-0.014655		
	20	-12.02	-0.015371		
	30	-15.91	-0.020345		
	40	-10.90	-0.013939		
	50	-10.61	-0.013568		
16QAM					
3.85	-30	-7.82	-0.010000	Within authorized band for Band 17	Pass
	-20	-8.81	-0.011266		
	-10	-10.39	-0.013286		
	0	-7.05	-0.009015		
	10	-7.25	-0.009271		
	20	-8.70	-0.011125		
	30	-6.12	-0.007826		
	40	-11.52	-0.014731		
	50	-11.67	-0.014923		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.40	-8.64	-0.011049	Within authorized band for Band 17	Pass
	3.85	-7.70	-0.009847		
	4.40	-10.46	-0.013376		
16QAM					
25	3.40	-7.82	-0.010000	Within authorized band for Band 17	Pass
	3.85	-9.06	-0.011586		
	4.40	-10.30	-0.013171		
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					
3.85	-30	-13.40	-0.007118	Within authorized band for Band 17	Pass
	-20	-11.99	-0.006369		
	-10	-10.49	-0.005572		
	0	-14.88	-0.007904		
	10	-12.09	-0.006422		
	20	-9.40	-0.004993		
	30	-9.51	-0.005052		
	40	-11.29	-0.005997		
	50	-7.48	-0.003973		
16QAM					
3.85	-30	-11.26	-0.005981	Within authorized band for Band 17	Pass
	-20	-3.86	-0.002050		
	-10	-7.30	-0.003878		
	0	-7.80	-0.004143		
	10	-9.01	-0.004786		
	20	-9.04	-0.004802		
	30	-8.67	-0.004606		
	40	-5.95	-0.003161		
	50	-12.17	-0.006465		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.40	-11.76	-0.006247	Within authorized band for Band 17	Pass
	3.85	-16.69	-0.008866		
	4.40	-11.42	-0.006066		
16QAM					
25	3.40	-7.10	-0.003772	Within authorized band for Band 17	Pass
	3.85	-9.88	-0.005248		
	4.40	-13.42	-0.007129		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 26 part:

Reference Frequency: LTE Band 26(10MHz) Middle channel=26740 Frequency=819.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.85	-30	-5.92	-0.007228	Within authorized band for Band 26	Pass
	-20	-6.58	-0.008034		
	-10	-3.63	-0.004432		
	0	-6.82	-0.008327		
	10	-9.51	-0.011612		
	20	-6.68	-0.008156		
	30	-7.10	-0.008669		
	40	-3.15	-0.003846		
	50	-5.51	-0.006728		
16QAM					
3.85	-30	-6.34	-0.007741	Within authorized band for Band 26	Pass
	-20	-7.52	-0.009182		
	-10	-8.25	-0.010073		
	0	-5.08	-0.006203		
	10	-3.79	-0.004628		
	20	-7.22	-0.008816		
	30	-5.26	-0.006422		
	40	-5.12	-0.006252		
	50	-10.87	-0.013272		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.40	-4.75	-0.005800	Within authorized band for Band 26	Pass
	3.85	-6.45	-0.007875		
	4.40	-6.97	-0.008510		
16QAM					
25	3.40	-9.20	-0.011233	Within authorized band for Band 26	Pass
	3.85	-12.07	-0.014737		
	4.40	-9.86	-0.012039		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 26 part:

Reference Frequency: LTE Band 26(10MHz) Middle channel=26915 Frequency=836.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.85	-30	-7.18	-0.008583	Within authorized band for Band 26	Pass
	-20	-8.27	-0.009886		
	-10	-8.35	-0.009982		
	0	-9.46	-0.011309		
	10	-11.47	-0.013712		
	20	-6.69	-0.007998		
	30	-9.03	-0.010795		
	40	-13.53	-0.016175		
	50	-4.59	-0.005487		
16QAM					
3.85	-30	-10.87	-0.012995	Within authorized band for Band 26	Pass
	-20	-4.55	-0.005439		
	-10	-6.65	-0.007950		
	0	-6.27	-0.007496		
	10	-2.83	-0.003383		
	20	-9.63	-0.011512		
	30	-9.27	-0.011082		
	40	-7.88	-0.009420		
	50	-12.57	-0.015027		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.40	-7.05	-0.008428	Within authorized band for Band 26	Pass
	3.85	-11.82	-0.014130		
	4.40	-8.05	-0.009623		
16QAM					
25	3.40	-6.49	-0.007759	Within authorized band for Band 26	Pass
	3.85	-6.71	-0.008022		
	4.40	-7.98	-0.009540		
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	-7.87	-0.003033	Within authorized band for Band 41	Pass
	-20	-13.36	-0.005148		
	-10	-9.71	-0.003742		
	0	-11.90	-0.004586		
	10	-7.04	-0.002713		
	20	-11.16	-0.004301		
	30	-10.23	-0.003942		
	40	-11.59	-0.004466		
	50	-13.99	-0.005391		
16QAM					
3.85	-30	-15.26	-0.005881	Within authorized band for Band 41	Pass
	-20	-11.20	-0.004316		
	-10	-15.42	-0.005942		
	0	-9.96	-0.003838		
	10	-10.59	-0.004081		
	20	-9.94	-0.003830		
	30	-10.87	-0.004189		
	40	-8.80	-0.003391		
	50	-7.27	-0.002802		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.40	-15.72	-0.006058	Within authorized band for Band 41	Pass
	3.85	-9.04	-0.003484		
	4.40	-14.09	-0.005430		
16QAM					
25	3.40	-7.72	-0.002975	Within authorized band for Band41	Pass
	3.85	-11.73	-0.004520		
	4.40	-7.62	-0.002936		
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					
3.85	-30	-3.88	-0.002223	Within authorized band for Band 66	Pass
	-20	-6.92	-0.003966		
	-10	-5.45	-0.003123		
	0	-3.36	-0.001926		
	10	-4.31	-0.002470		
	20	-5.65	-0.003238		
	30	-8.70	-0.004986		
	40	-6.45	-0.003696		
	50	-8.65	-0.004957		
16QAM					
3.85	-30	-6.74	-0.003862	Within authorized band for Band 66	Pass
	-20	-7.44	-0.004264		
	-10	-12.26	-0.007026		
	0	-10.97	-0.006287		
	10	-3.18	-0.001822		
	20	-5.48	-0.003140		
	30	-9.68	-0.005547		
	40	-7.64	-0.004378		
	50	-5.51	-0.003158		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.40	-8.37	-0.004797	Within authorized band for Band 66	Pass
	3.85	-13.16	-0.007542		
	4.40	-4.03	-0.002309		
16QAM					
25	3.40	-8.10	-0.004642	Within authorized band for Band 66	Pass
	3.85	-7.32	-0.004195		
	4.40	-7.15	-0.004097		
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
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
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

Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.

Test Graphs





