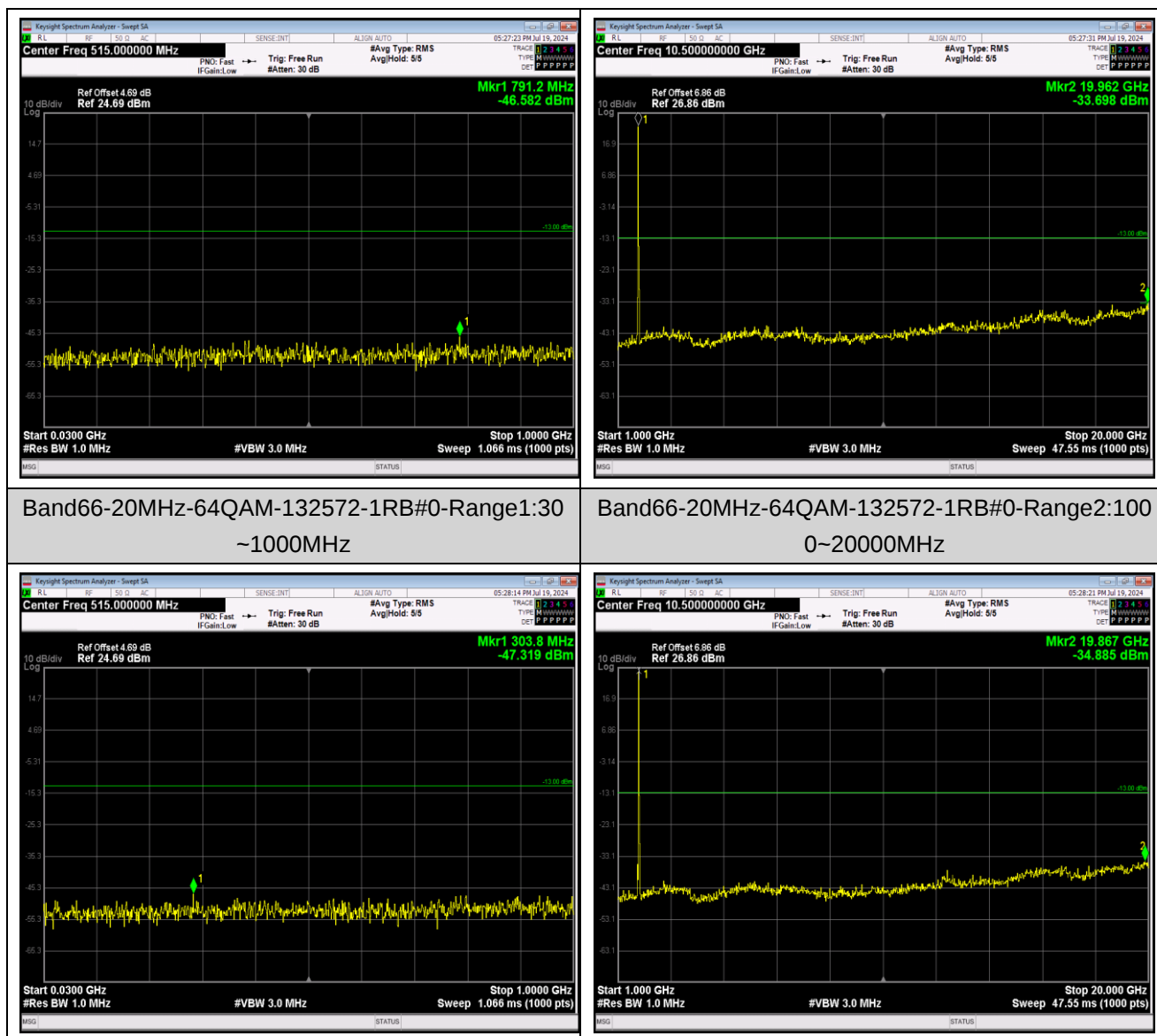




Appendix F: Frequency Stability

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					
3.87	-30	-16.95	-0.006686	Within authorized band for Band 7	Pass
	-20	-15.98	-0.006304		
	-10	-16.49	-0.006505		
	0	-13.78	-0.005436		
	10	24.29	0.009582		
	20	-16.05	-0.006331		
	30	-20.46	-0.008071		
	40	-16.65	-0.006568		
	50	-20.20	-0.007968		
16QAM					
3.87	-30	-14.73	-0.005811	Within authorized band for Band 7	Pass
	-20	-12.90	-0.005089		
	-10	-17.65	-0.006963		
	0	7.14	0.002817		
	10	11.20	0.004418		
	20	-14.72	-0.005807		
	30	-13.88	-0.005475		
	40	13.99	0.005519		
	50	-8.58	-0.003385		
64QAM					
3.87	-30	-10.79	-0.004256	Within authorized band for Band 7	Pass
	-20	2.92	0.001152		
	-10	-18.48	-0.007290		
	0	-18.22	-0.007187		
	10	10.46	0.004126		
	20	12.47	0.004919		
	30	13.49	0.005321		
	40	-13.22	-0.005215		
	50	-9.11	-0.003594		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-24.20	-0.009546	Within authorized band for Band 7	Pass
	3.87	-24.23	-0.009558		
	4.45	-13.35	-0.005266		
16QAM					
25	3.45	12.80	0.005049	Within authorized band for Band 7	Pass
	3.87	6.87	0.002710		
	4.45	-14.58	-0.005751		
64QAM					
25	3.45	-13.18	-0.005199	Within authorized band for Band 7	Pass
	3.87	-10.43	-0.004114		
	4.45	6.72	0.002651		
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	-6.69	-0.009456	Within authorized band for Band 12	Pass
	-20	-4.63	-0.006544		
	-10	-3.52	-0.004975		
	0	-6.71	-0.009484		
	10	-4.43	-0.006261		
	20	-6.52	-0.009216		
	30	-2.98	-0.004212		
	40	-6.45	-0.009117		
	50	3.82	0.005399		
16QAM					
3.87	-30	-3.58	-0.005060	Within authorized band for Band 12	Pass
	-20	-3.42	-0.004834		
	-10	-3.69	-0.005216		
	0	-6.07	-0.008580		
	10	-6.17	-0.008721		
	20	-4.45	-0.006290		
	30	-8.10	-0.011449		
	40	-4.58	-0.006473		
	50	-7.37	-0.010417		
64QAM					
3.87	-30	-4.76	-0.006728	Within authorized band for Band 12	Pass
	-20	-3.58	-0.005060		
	-10	-6.79	-0.009597		
	0	-4.55	-0.006431		
	10	-7.47	-0.010558		
	20	2.00	0.002827		
	30	-7.08	-0.010007		
	40	-6.32	-0.008933		
	50	-4.99	-0.007053		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-4.42	-0.006247	Within authorized band for Band 12	Pass
	3.87	-6.78	-0.009583		
	4.45	-4.03	-0.005696		
16QAM					
25	3.45	1.32	0.001866	Within authorized band for Band 12	Pass
	3.87	-6.54	-0.009244		
	4.45	-5.12	-0.007237		
64QAM					
25	3.45	-3.30	-0.004664	Within authorized band for Band 12	Pass
	3.87	-6.17	-0.008721		
	4.45	-1.75	-0.002473		
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					
3.87	-30	-6.34	-0.008107	Within authorized band for Band 17	Pass
	-20	-7.94	-0.010153		
	-10	-4.89	-0.006253		
	0	-7.02	-0.008977		
	10	-7.58	-0.009693		
	20	-2.19	-0.002801		
	30	-6.09	-0.007788		
	40	-6.87	-0.008785		
	50	-3.99	-0.005102		
16QAM					
3.87	-30	-4.26	-0.005448	Within authorized band for Band 17	Pass
	-20	-5.69	-0.007276		
	-10	-1.03	-0.001317		
	0	-8.73	-0.011164		
	10	-7.35	-0.009399		
	20	-7.80	-0.009974		
	30	-1.92	-0.002455		
	40	-1.52	-0.001944		
	50	-6.07	-0.007762		
64QAM					
3.87	-30	-2.26	-0.002890	Within authorized band for Band 17	Pass
	-20	-2.68	-0.003427		
	-10	-3.63	-0.004642		
	0	-3.89	-0.004974		
	10	-3.91	-0.005000		
	20	-10.17	-0.013005		
	30	-8.61	-0.011010		
	40	-2.86	-0.003657		
	50	-2.90	-0.003708		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-5.09	-0.006509	Within authorized band for Band 17	Pass
	3.87	-8.57	-0.010959		
	4.45	2.75	0.003517		
16QAM					
25	3.45	-6.92	-0.008849	Within authorized band for Band 17	Pass
	3.87	-10.10	-0.012916		
	4.45	-4.09	-0.005230		
64QAM					
25	3.45	-6.19	-0.007916	Within authorized band for Band 17	Pass
	3.87	-4.41	-0.005639		
	4.45	-2.10	-0.002685		
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					
3.87	-30	5.06	0.002688	Within authorized band for Band 17	Pass
	-20	2.62	0.001392		
	-10	-8.54	-0.004537		
	0	-7.22	-0.003835		
	10	7.58	0.004027		
	20	-10.49	-0.005572		
	30	2.96	0.001572		
	40	-7.27	-0.003862		
	50	-5.76	-0.003060		
16QAM					
3.87	-30	-3.10	-0.001647	Within authorized band for Band 17	Pass
	-20	-5.15	-0.002736		
	-10	-6.78	-0.003602		
	0	4.79	0.002544		
	10	8.37	0.004446		
	20	4.84	0.002571		
	30	-5.59	-0.002969		
	40	-3.91	-0.002077		
	50	-5.59	-0.002969		
64QAM					
3.87	-30	-6.64	-0.003527	Within authorized band for Band 17	Pass
	-20	-5.78	-0.003070		
	-10	-5.95	-0.003161		
	0	3.42	0.001817		
	10	-5.58	-0.002964		
	20	6.38	0.003389		
	30	4.95	0.002629		
	40	-6.11	-0.003246		
	50	-5.68	-0.003017		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-7.28	-0.003867	Within authorized band for Band 17	Pass
	3.87	-9.47	-0.005031		
	4.45	-4.13	-0.002194		
16QAM					
25	3.45	-4.09	-0.002173	Within authorized band for Band 17	Pass
	3.87	5.61	0.002980		
	4.45	8.40	0.004462		
64QAM					
25	3.45	-7.51	-0.003989	Within authorized band for Band 17	Pass
	3.87	-6.94	-0.003687		
	4.45	-7.81	-0.004149		
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					
3.87	-30	-2.10	-0.002564	Within authorized band for Band 17	Pass
	-20	-5.79	-0.007070		
	-10	-3.93	-0.004799		
	0	-4.73	-0.005775		
	10	-7.10	-0.008669		
	20	-5.82	-0.007106		
	30	-2.60	-0.003175		
	40	-6.68	-0.008156		
	50	-5.87	-0.007167		
16QAM					
3.87	-30	-5.38	-0.006569	Within authorized band for Band 17	Pass
	-20	2.78	0.003394		
	-10	3.66	0.004469		
	0	-4.55	-0.005556		
	10	-5.99	-0.007314		
	20	-3.08	-0.003761		
	30	-6.58	-0.008034		
	40	-4.02	-0.004908		
	50	-3.26	-0.003980		
64QAM					
3.87	-30	-1.75	-0.002137	Within authorized band for Band 17	Pass
	-20	-7.15	-0.008730		
	-10	-5.51	-0.006728		
	0	-2.25	-0.002747		
	10	-7.45	-0.009096		
	20	-2.16	-0.002637		
	30	-3.73	-0.004554		
	40	-3.62	-0.004420		
	50	-5.41	-0.006606		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-4.96	-0.006056	Within authorized band for Band 17	Pass
	3.87	-4.52	-0.005519		
	4.45	-5.09	-0.006215		
16QAM					
25	3.45	-3.23	-0.003944	Within authorized band for Band 17	Pass
	3.87	-1.02	-0.001245		
	4.45	-5.39	-0.006581		
64QAM					
25	3.45	-2.63	-0.003211	Within authorized band for Band 17	Pass
	3.87	-3.99	-0.004872		
	4.45	-6.52	-0.007961		
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					
3.87	-30	-7.14	-0.008536	Within authorized band for Band 38	Pass
	-20	-5.72	-0.006838		
	-10	-8.13	-0.009719		
	0	-7.24	-0.008655		
	10	-6.18	-0.007388		
	20	-4.18	-0.004997		
	30	-4.84	-0.005786		
	40	-7.31	-0.008739		
	50	-6.51	-0.007782		
16QAM					
3.87	-30	-7.35	-0.008787	Within authorized band for Band 38	Pass
	-20	-7.55	-0.009026		
	-10	-3.69	-0.004411		
	0	-3.73	-0.004459		
	10	-8.21	-0.009815		
	20	-4.98	-0.005953		
	30	-5.97	-0.007137		
	40	-7.07	-0.008452		
	50	-2.75	-0.003288		
64QAM					
3.87	-30	-4.19	-0.005009	Within authorized band for Band 38	Pass
	-20	-3.36	-0.004017		
	-10	-7.68	-0.009181		
	0	-5.88	-0.007029		
	10	-6.92	-0.008273		
	20	-6.58	-0.007866		
	30	-9.88	-0.011811		
	40	-2.68	-0.003204		
	50	-7.95	-0.009504		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-8.43	-0.003251	Within authorized band for Band 38	Pass
	3.87	-8.10	-0.003124		
	4.45	3.50	0.001350		
16QAM					
25	3.45	-5.51	-0.002125	Within authorized band for Band 38	Pass
	3.87	4.61	0.001778		
	4.45	-6.39	-0.002464		
64QAM					
25	3.45	-8.34	-0.003216	Within authorized band for Band 38	Pass
	3.87	-8.00	-0.003085		
	4.45	-1.97	-0.000760		
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=40620 Frequency=2593.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	-5.78	-0.002229	Within authorized band for Band 41	Pass
	-20	-6.64	-0.002561		
	-10	-4.35	-0.001678		
	0	-5.04	-0.001944		
	10	-4.71	-0.001816		
	20	3.43	0.001323		
	30	3.13	0.001207		
	40	8.28	0.003193		
	50	-6.39	-0.002464		
16QAM					
3.87	-30	3.99	0.001539	Within authorized band for Band 41	Pass
	-20	5.87	0.002264		
	-10	-4.65	-0.001793		
	0	-5.38	-0.002075		
	10	2.09	0.000806		
	20	-2.79	-0.001076		
	30	-9.44	-0.003641		
	40	5.34	0.002059		
	50	-5.95	-0.002295		
64QAM					
3.87	-30	-3.29	-0.001269	Within authorized band for Band 41	Pass
	-20	-6.08	-0.002345		
	-10	-6.85	-0.002642		
	0	-8.00	-0.003085		
	10	6.32	0.002437		
	20	-3.93	-0.001516		
	30	-7.08	-0.002730		
	40	-8.44	-0.003255		
	50	-11.24	-0.004335		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-6.58	-0.002526	Within authorized band for Band 41	Pass
	3.87	-11.27	-0.004326		
	4.45	-7.00	-0.002687		
16QAM					
25	3.45	-7.81	-0.002998	Within authorized band for Band41	Pass
	3.87	-6.79	-0.002607		
	4.45	2.78	0.001067		
64QAM					
25	3.45	-5.68	-0.002180	Within authorized band for Band41	Pass
	3.87	1.62	0.000622		
	4.45	-5.78	-0.002219		
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	-5.16	-0.002957	Within authorized band for Band 66	Pass
	-20	7.80	0.004470		
	-10	-7.62	-0.004367		
	0	7.84	0.004493		
	10	8.67	0.004968		
	20	-7.91	-0.004533		
	30	-5.61	-0.003215		
	40	-12.07	-0.006917		
	50	-4.89	-0.002802		
16QAM					
3.87	-30	-5.42	-0.003106	Within authorized band for Band 66	Pass
	-20	5.94	0.003404		
	-10	-4.56	-0.002613		
	0	-7.98	-0.004573		
	10	-3.28	-0.001880		
	20	-3.91	-0.002241		
	30	4.85	0.002779		
	40	3.75	0.002149		
	50	-8.25	-0.004728		
64QAM					
3.87	-30	-6.98	-0.004000	Within authorized band for Band 66	Pass
	-20	6.14	0.003519		
	-10	-2.12	-0.001215		
	0	-5.95	-0.003410		
	10	7.01	0.004017		
	20	4.33	0.002481		
	30	-5.74	-0.003289		
	40	-6.08	-0.003484		
	50	-5.31	-0.003043		

Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	7.97	0.004567	Within authorized band for Band 66	Pass
	3.87	-11.17	-0.006401		
	4.45	-8.71	-0.004991		
16QAM					
25	3.45	-10.23	-0.005862	Within authorized band for Band 66	Pass
	3.87	-2.93	-0.001679		
	4.45	-8.55	-0.004900		
64QAM					
25	3.45	-9.06	-0.005192	Within authorized band for Band 66	Pass
	3.87	-5.84	-0.003347		
	4.45	-7.01	-0.004017		
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
Band7	20MHz	64QAM	21100	100RB#0	PASS	PASS
Band12	10MHz	QPSK	23095	50RB#0	PASS	PASS
Band12	10MHz	16QAM	23095	50RB#0	PASS	PASS
Band12	10MHz	64QAM	23095	50RB#0	PASS	PASS
Band13	10MHz	QPSK	23230	50RB#0	PASS	PASS
Band13	10MHz	16QAM	23230	50RB#0	PASS	PASS
Band13	10MHz	64QAM	23230	50RB#0	PASS	PASS
Band25	20MHz	QPSK	26365	100RB#0	PASS	PASS
Band25	20MHz	16QAM	26365	100RB#0	PASS	PASS
Band25	20MHz	64QAM	26365	100RB#0	PASS	PASS
Band26	10MHz	QPSK	26740	50RB#0	PASS	PASS
Band26	10MHz	16QAM	26740	50RB#0	PASS	PASS
Band26	10MHz	64QAM	26740	50RB#0	PASS	PASS
Band26	15MHz	QPSK	26915	75RB#0	PASS	PASS
Band26	15MHz	16QAM	26915	75RB#0	PASS	PASS
Band26	15MHz	64QAM	26915	75RB#0	PASS	PASS
Band41	20MHz	QPSK	40620	100RB#0	PASS	PASS
Band41	20MHz	16QAM	40620	100RB#0	PASS	PASS
Band41	20MHz	64QAM	40620	100RB#0	PASS	PASS
Band66	20MHz	QPSK	132322	100RB#0	PASS	PASS
Band66	20MHz	16QAM	132322	100RB#0	PASS	PASS
Band66	20MHz	64QAM	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

