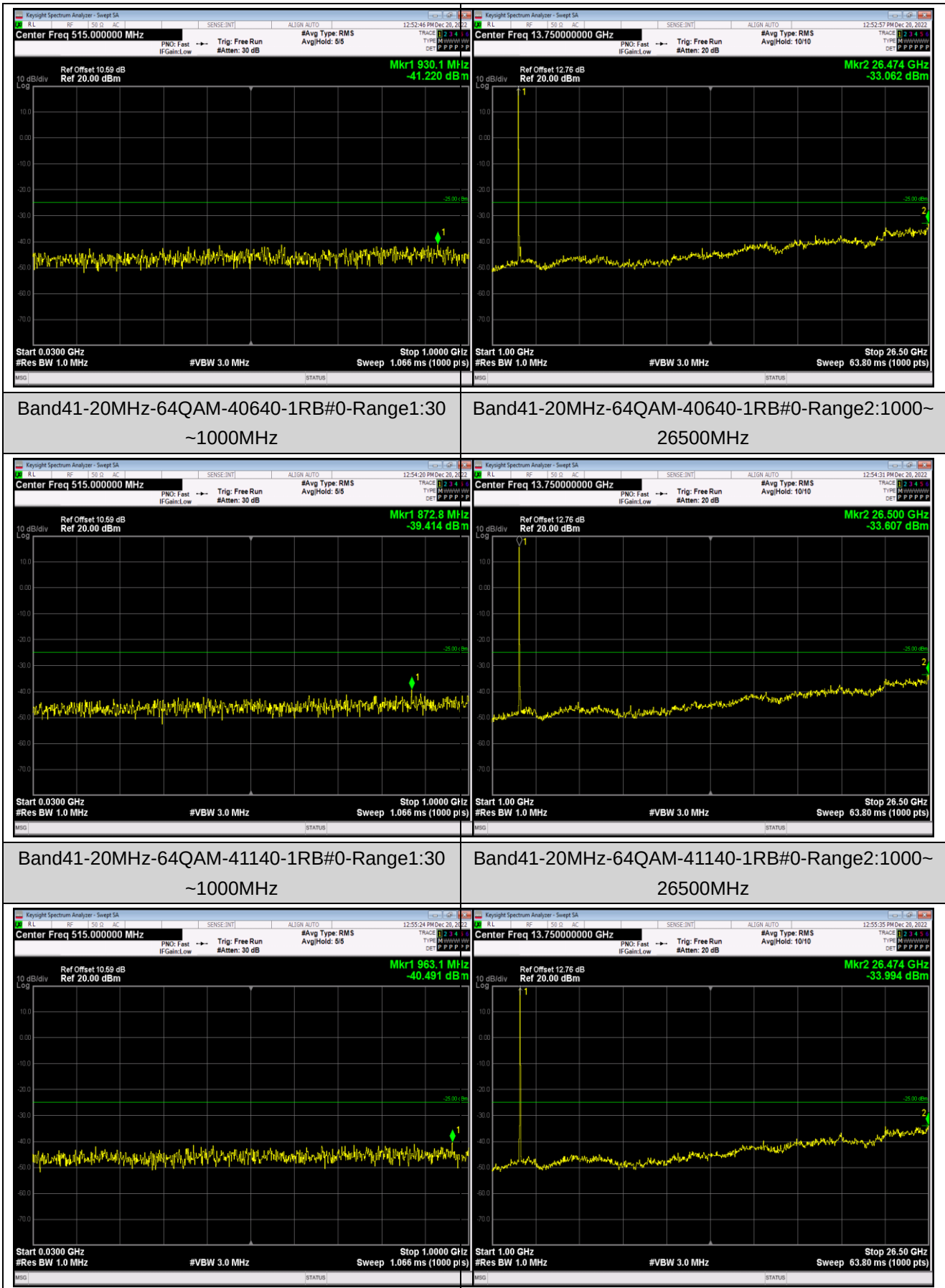




Appendix F: Frequency Stability

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					
3.85	-30	26.55	0.014122	Within authorized band for Band 2	Pass
	-20	36.58	0.019457		
	-10	28.58	0.015202		
	0	14.73	0.007835		
	10	-20.50	-0.010904		
	20	-31.34	-0.016670		
	30	-43.60	-0.023191		
	40	-53.74	-0.028585		
	50	-10.57	-0.005622		
16QAM					
3.85	-30	48.15	0.025612	Within authorized band for Band 2	Pass
	-20	14.12	0.007511		
	-10	34.02	0.018096		
	0	50.58	0.026904		
	10	-11.92	-0.006340		
	20	-24.56	-0.013064		
	30	7.30	0.003883		
	40	23.88	0.012702		
	50	42.53	0.022622		
64QAM					
3.85	-30	-13.75	-0.007314	Within authorized band for Band 2	Pass
	-20	14.46	0.007691		
	-10	28.17	0.014984		
	0	-12.63	-0.006718		
	10	10.27	0.005463		
	20	33.22	0.017670		
	30	62.41	0.033197		
	40	36.76	0.019553		
	50	31.69	0.016856		
Voltage					
Temperature	Power supplied	Frequency error		Limit (ppm)	Result

(°C)	(Vdc)	Hz	ppm		
QPSK					
25	3.45	24.70	0.013138	Within authorized band for Band 2	Pass
	3.85	37.54	0.019968		
	4.40	30.47	0.016207		
16QAM					
25	3.45	4.23	0.002250	Within authorized band for Band 2	Pass
	3.85	-11.63	-0.006186		
	4.40	21.34	0.011351		
64QAM					
25	3.45	66.89	0.035580	Within authorized band for Band 2	Pass
	3.85	39.95	0.021250		
	4.40	34.42	0.018309		
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					
3.85	-30	-32.79	-0.018926	Within authorized band for Band 4	Pass
	-20	-30.64	-0.017685		
	-10	-33.40	-0.019278		
	0	-39.87	-0.023013		
	10	-43.87	-0.025322		
	20	-21.73	-0.012543		
	30	-38.82	-0.022407		
	40	-32.30	-0.018644		
	50	-40.03	-0.023105		
16QAM					
3.85	-30	-13.39	-0.007729	Within authorized band for Band 4	Pass
	-20	9.71	0.005605		
	-10	22.73	0.013120		
	0	27.44	0.015838		
	10	19.01	0.010973		
	20	28.88	0.016670		
	30	41.26	0.023815		
	40	47.39	0.027354		
	50	41.93	0.024202		
64QAM					
3.85	-30	9.31	0.005374	Within authorized band for Band 4	Pass
	-20	23.86	0.013772		
	-10	32.79	0.018926		
	0	39.41	0.022747		
	10	16.81	0.009703		
	20	21.03	0.012139		
	30	23.55	0.013593		
	40	22.97	0.013258		
	50	42.70	0.024646		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.45	13.68	0.007896	Within authorized band for Band 4	Pass
	3.85	21.64	0.012491		
	4.40	-31.89	-0.018407		
16QAM					
25	3.45	-15.99	-0.009229	Within authorized band for Band 4	Pass
	3.85	-13.55	-0.007821		
	4.40	-9.66	-0.005576		
64QAM					
25	3.45	18.25	0.010534	Within authorized band for Band 4	Pass
	3.85	49.64	0.028652		
	4.40	32.13	0.018545		
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	8.45	0.010102	±2.5	Pass
	-20	3.88	0.004638		
	-10	-6.22	-0.007436		
	0	-6.68	-0.007986		
	10	-9.04	-0.010807		
	20	-11.73	-0.014023		
	30	-13.52	-0.016163		
	40	-11.52	-0.013772		
	50	-11.22	-0.013413		
16QAM					
3.85	-30	2.80	0.003347	±2.5	Pass
	-20	5.97	0.007137		
	-10	9.23	0.011034		
	0	-3.89	-0.004650		
	10	4.12	0.004925		
	20	13.90	0.016617		
	30	28.64	0.034238		
	40	38.71	0.046276		
	50	41.48	0.049588		
64QAM					
3.85	-30	7.35	0.008787	±2.5	Pass
	-20	18.02	0.021542		
	-10	43.49	0.051990		
	0	9.68	0.011572		
	10	25.28	0.030221		
	20	36.74	0.043921		
	30	34.98	0.041817		
	40	36.46	0.043586		
	50	40.00	0.047818		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.45	26.32	0.031464	±2.5	Pass
	3.85	11.54	0.013796		
	4.40	31.06	0.037131		
16QAM					
25	3.45	-18.95	-0.022654	±2.5	Pass
	3.85	-15.64	-0.018697		
	4.40	-15.05	-0.017992		
64QAM					
25	3.45	41.58	0.049707	±2.5	Pass
	3.85	42.23	0.050484		
	4.40	50.61	0.060502		
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 (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.85	-30	23.83	0.009400	Within authorized band for Band 7	Pass
	-20	-42.37	-0.016714		
	-10	-34.12	-0.013460		
	0	-42.82	-0.016892		
	10	-46.03	-0.018158		
	20	-22.43	-0.008848		
	30	-31.39	-0.012383		
	40	-78.08	-0.030801		
	50	-53.57	-0.021132		
16QAM					
3.85	-30	-21.24	-0.008379	Within authorized band for Band 7	Pass
	-20	29.63	0.011688		
	-10	40.30	0.015897		
	0	52.01	0.020517		
	10	34.83	0.013740		
	20	38.28	0.015101		
	30	38.84	0.015321		
	40	19.48	0.007684		
	50	21.90	0.008639		
64QAM					
3.85	-30	40.98	0.016166	Within authorized band for Band 7	Pass
	-20	48.77	0.019239		
	-10	32.72	0.012907		
	0	61.21	0.024146		
	10	51.94	0.020489		
	20	13.79	0.005440		
	30	20.70	0.008166		
	40	49.51	0.019531		
	50	14.45	0.005700		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.45	45.03	0.017763	Within authorized band for Band 7	Pass
	3.85	-54.72	-0.021586		
	4.40	38.87	0.015333		
16QAM					
25	3.45	-16.99	-0.006702	Within authorized band for Band 7	Pass
	3.85	-43.37	-0.017108		
	4.40	-31.41	-0.012391		
64QAM					
25	3.45	45.80	0.018067	Within authorized band for Band 7	Pass
	3.85	35.51	0.014008		
	4.40	49.81	0.019649		
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	13.98	0.005387	Within authorized band for Band 41	Pass
	-20	-18.24	-0.007029		
	-10	27.54	0.010613		
	0	38.27	0.014748		
	10	20.14	0.007761		
	20	48.95	0.018863		
	30	37.44	0.014428		
	40	17.51	0.006748		
	50	21.33	0.008220		
16QAM					
3.85	-30	34.76	0.013395	Within authorized band for Band 41	Pass
	-20	22.19	0.008551		
	-10	53.56	0.020640		
	0	-15.86	-0.006112		
	10	28.61	0.011025		
	20	48.05	0.018516		
	30	27.94	0.010767		
	40	-16.51	-0.006362		
	50	-24.88	-0.009588		
64QAM					
3.85	-30	33.40	0.012871	Within authorized band for Band 41	Pass
	-20	43.76	0.016863		
	-10	17.31	0.006671		
	0	39.63	0.015272		
	10	41.58	0.016023		
	20	18.01	0.006940		
	30	11.60	0.004470		
	40	26.62	0.010258		
	50	46.58	0.017950		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.45	31.99	0.012328	Within authorized band for Band 41	Pass
	3.85	-18.97	-0.007310		
	4.40	31.56	0.012162		
16QAM					
25	3.45	52.30	0.020154	Within authorized band for Band41	Pass
	3.85	31.83	0.012266		
	4.40	23.66	0.009118		
64QAM					
25	3.45	-12.16	-0.004686	Within authorized band for Band41	Pass
	3.85	-39.71	-0.015303		
	4.40	-20.54	-0.007915		
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

