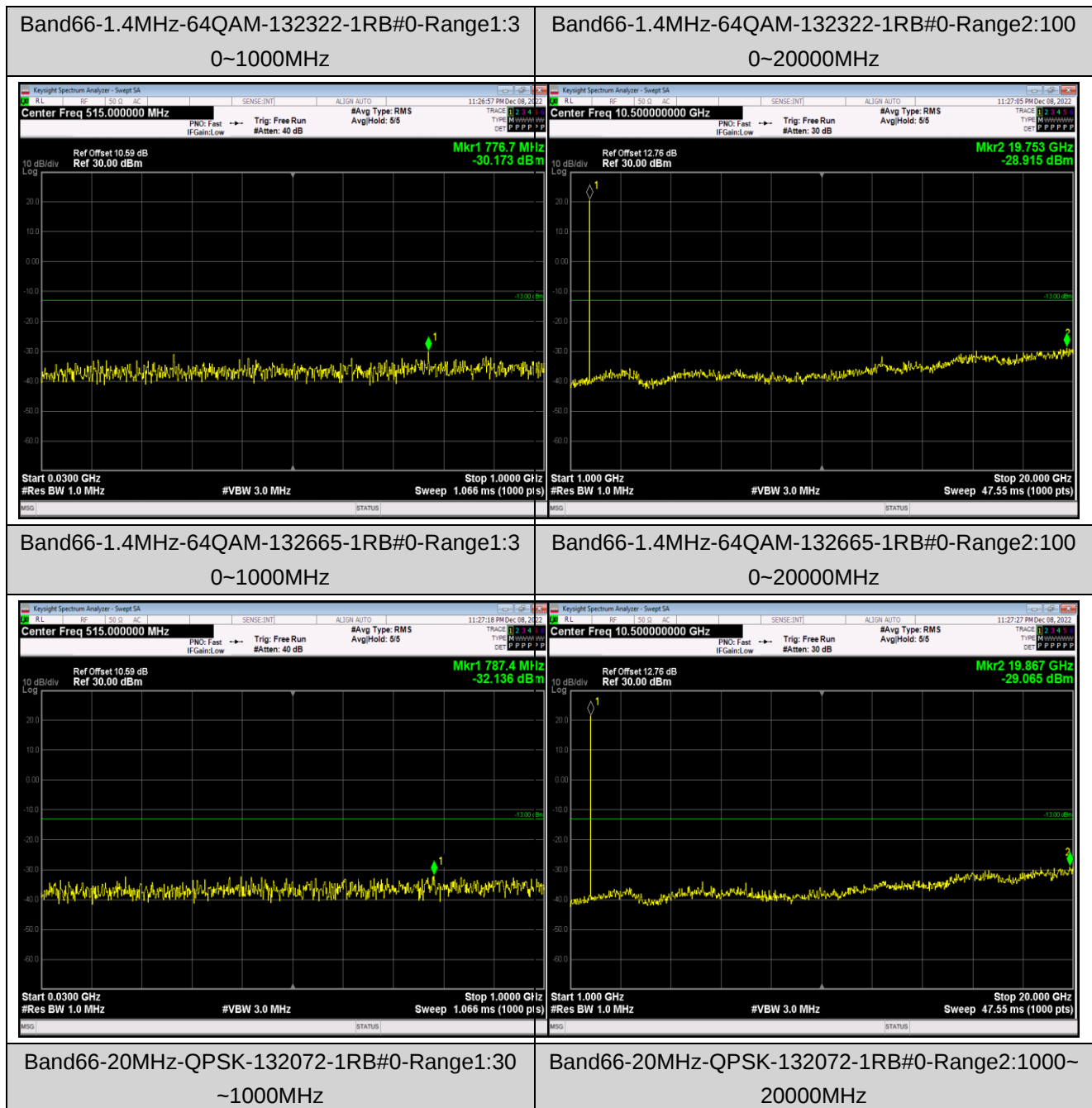
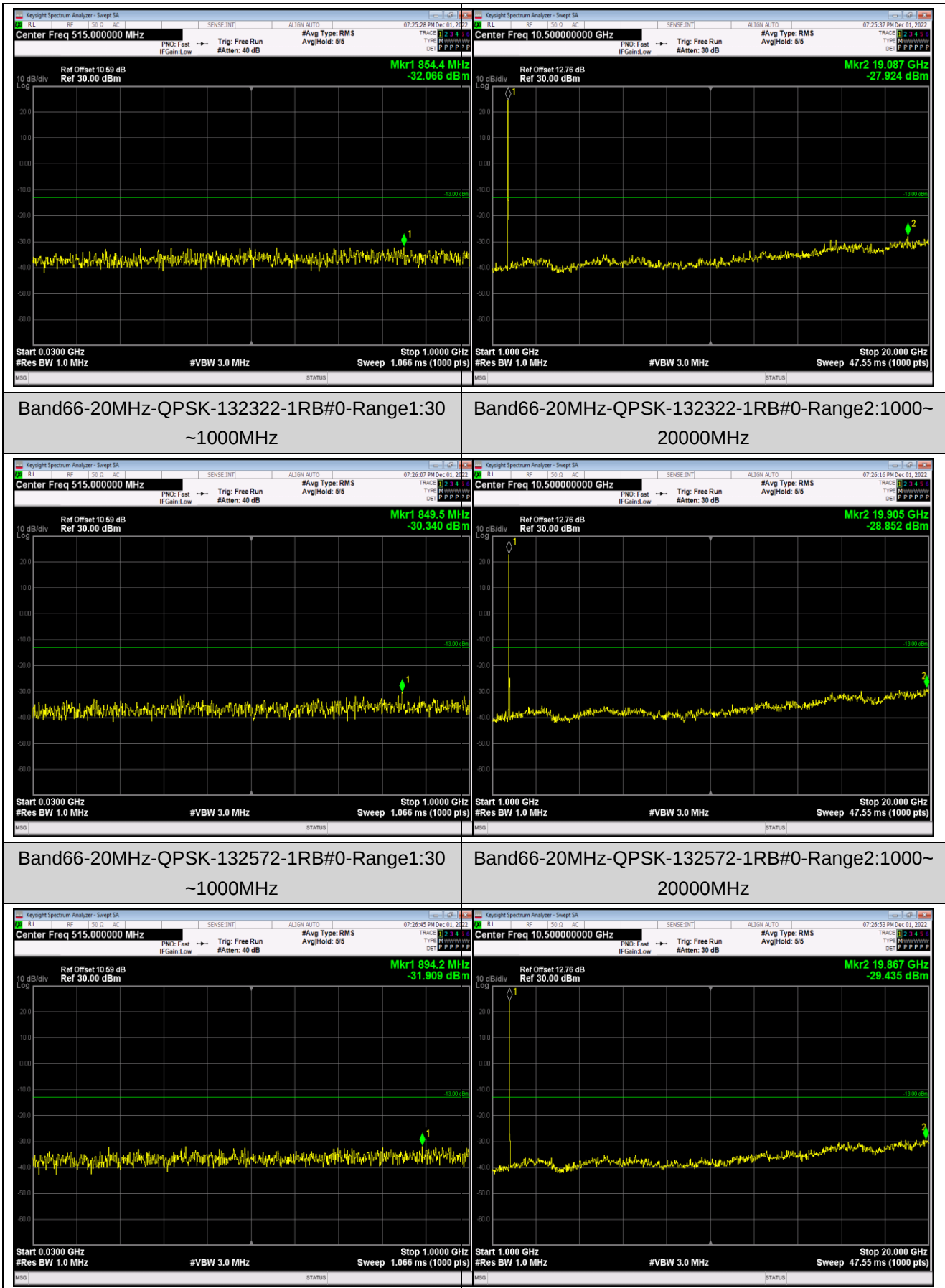
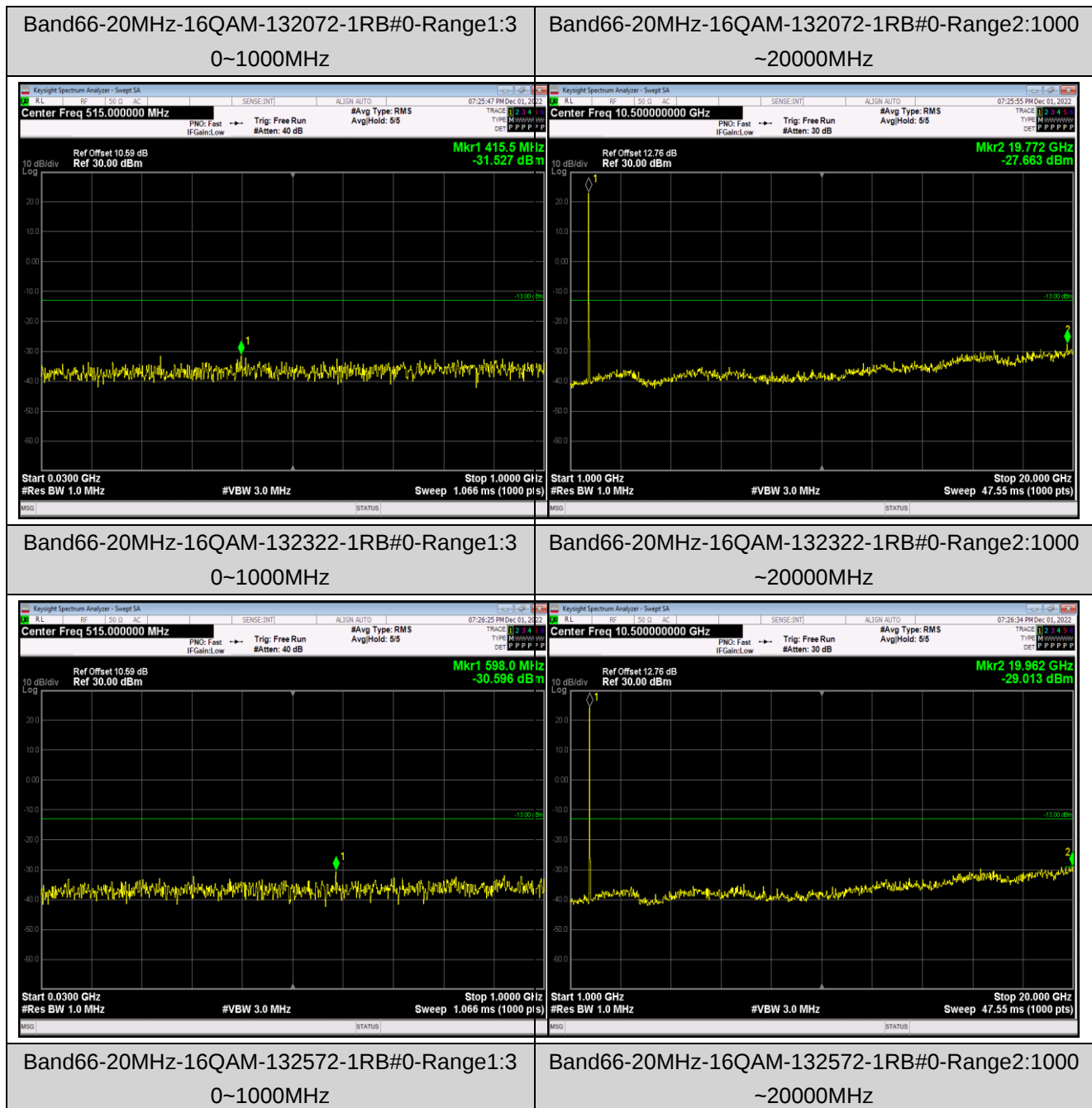
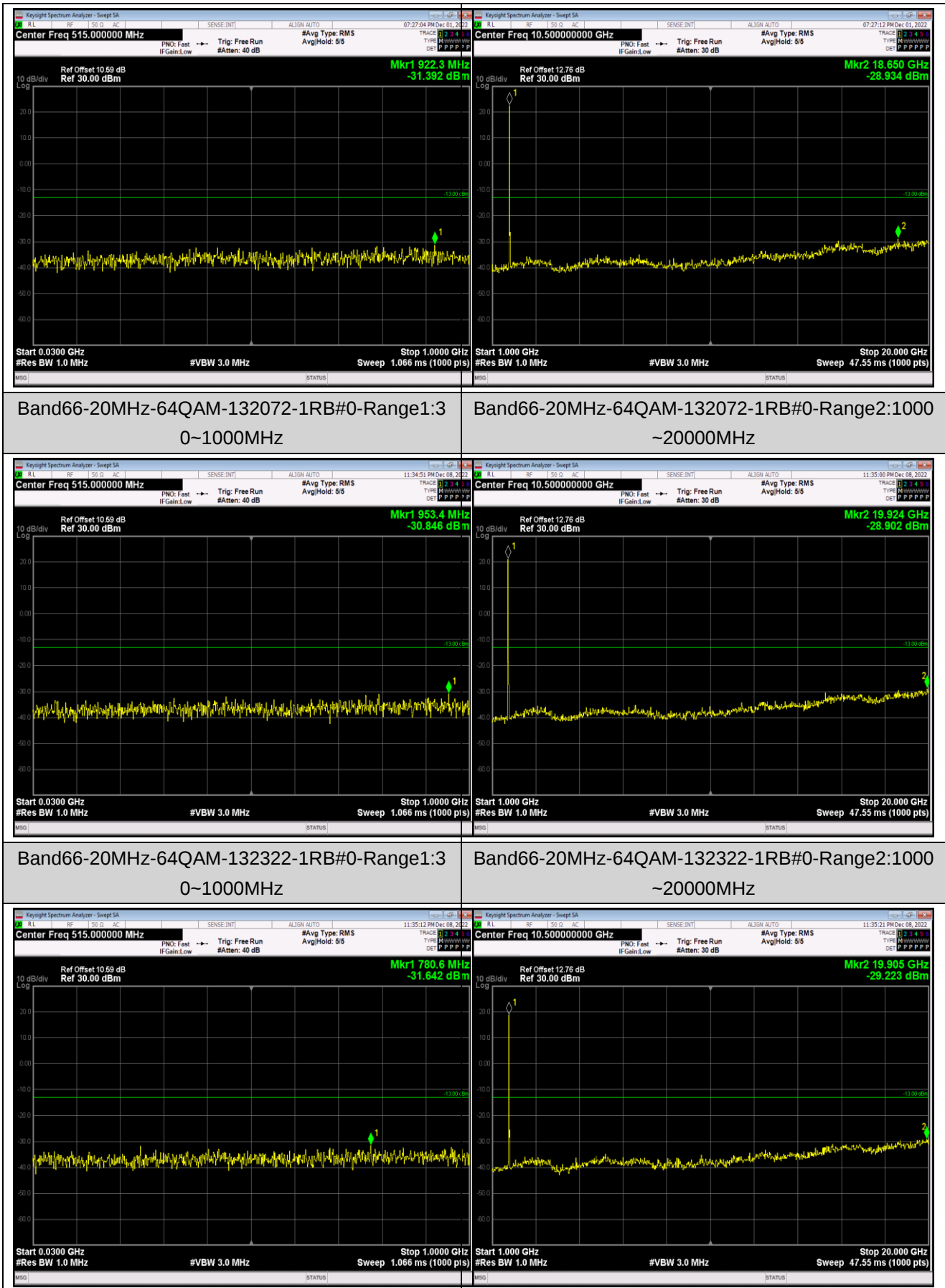
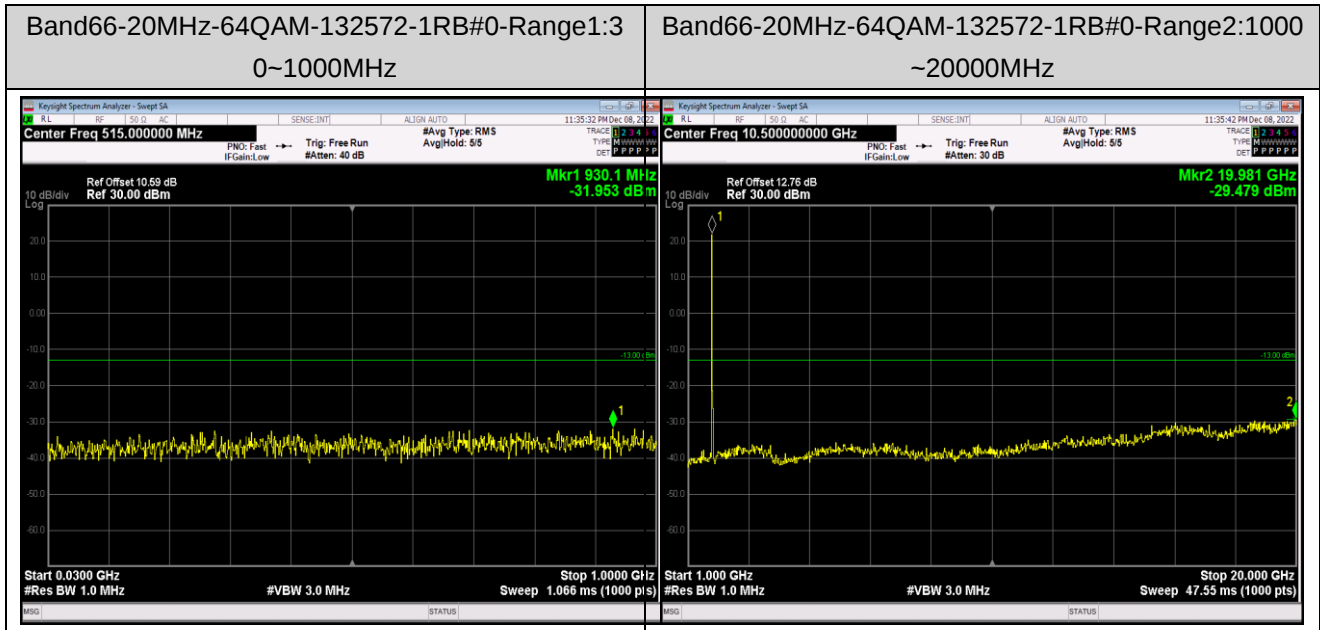












Appendix F: Frequency Stability

Test Result

LTE Band 2 part:

Reference Frequency: LTE Band 2 (10MHz) Middle channel=18900 Frequency=1880.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.85	-30	-13.92	-0.007404	Within authorized band for Band 2	Pass
	-20	-10.44	-0.005553		
	-10	-14.48	-0.007702		
	0	-10.46	-0.005564		
	10	-8.91	-0.004739		
	20	-11.42	-0.006074		
	30	-9.13	-0.004856		
	40	-5.16	-0.002745		
	50	-7.80	-0.004149		
16QAM					
3.85	-30	-11.09	-0.005899	Within authorized band for Band 2	Pass
	-20	-7.42	-0.003947		
	-10	5.76	0.003064		
	0	-8.30	-0.004415		
	10	-8.24	-0.004383		
	20	-9.36	-0.004979		
	30	-8.14	-0.004330		
	40	-7.75	-0.004122		
	50	-13.15	-0.006995		
64QAM					
3.85	-30	-10.80	-0.005745	Within authorized band for Band 2	Pass
	-20	-9.76	-0.005191		
	-10	-16.91	-0.008995		
	0	-14.98	-0.007968		
	10	-6.58	-0.003500		
	20	-9.74	-0.005181		
	30	-17.80	-0.009468		
	40	-9.78	-0.005202		
	50	-15.31	-0.008144		
Voltage					
Temperature	Power supplied	Frequency error		Limit (ppm)	Result

(°C)	(Vdc)	Hz	ppm		
QPSK					
25	3.40	-10.54	-0.005606	Within authorized band for Band 2	Pass
	3.85	-8.44	-0.004489		
	4.40	-7.02	-0.003734		
16QAM					
25	3.40	-6.61	-0.003516	Within authorized band for Band 2	Pass
	3.85	-9.64	-0.005128		
	4.40	-17.17	-0.009133		
64QAM					
25	3.40	-13.56	-0.007213	Within authorized band for Band 2	Pass
	3.85	-15.48	-0.008234		
	4.40	-14.29	-0.007601		
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					
3.85	-30	-8.25	-0.009863	Within authorized band for Band 5	Pass
	-20	-5.54	-0.006623		
	-10	-9.51	-0.011369		
	0	-11.34	-0.013556		
	10	-9.87	-0.011799		
	20	-10.67	-0.012756		
	30	-11.54	-0.013796		
	40	-10.21	-0.012206		
	50	-11.06	-0.013222		
16QAM					
3.85	-30	-8.50	-0.010161	Within authorized band for Band 5	Pass
	-20	-9.97	-0.011919		
	-10	-11.24	-0.013437		
	0	-10.81	-0.012923		
	10	-5.09	-0.006085		
	20	-7.04	-0.008416		
	30	-12.73	-0.015218		
	40	-9.18	-0.010974		
	50	-6.42	-0.007675		
64QAM					
3.85	-30	-7.50	-0.008966	Within authorized band for Band 5	Pass
	-20	-8.18	-0.009779		
	-10	-10.40	-0.012433		
	0	-9.16	-0.010950		
	10	-10.49	-0.012540		
	20	-5.72	-0.006838		
	30	-2.86	-0.003419		
	40	-8.18	-0.009779		
	50	-5.35	-0.006396		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.40	-13.62	-0.016282	Within authorized band for Band 5	Pass
	3.85	-10.36	-0.012385		
	4.40	-11.12	-0.013293		
16QAM					
25	3.40	-10.50	-0.012552	Within authorized band for Band 5	Pass
	3.85	-13.36	-0.015971		
	4.40	-13.55	-0.016198		
64QAM					
25	3.40	-12.25	-0.014644	Within authorized band for Band 5	Pass
	3.85	-11.76	-0.014059		
	4.40	-12.95	-0.015481		
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					
3.85	-30	-12.50	-0.004931	Within authorized band for Band 7	Pass
	-20	-18.55	-0.007318		
	-10	-15.13	-0.005968		
	0	5.22	0.002059		
	10	-16.39	-0.006465		
	20	13.70	0.005404		
	30	-13.92	-0.005491		
	40	-15.71	-0.006197		
	50	-20.80	-0.008205		
16QAM					
3.85	-30	-15.65	-0.006174	Within authorized band for Band 7	Pass
	-20	-13.75	-0.005424		
	-10	-6.51	-0.002568		
	0	-18.74	-0.007393		
	10	-7.01	-0.002765		
	20	-16.41	-0.006473		
	30	-15.91	-0.006276		
	40	-18.67	-0.007365		
	50	-18.07	-0.007128		
64QAM					
3.85	-30	-5.76	-0.002272	Within authorized band for Band 7	Pass
	-20	-17.70	-0.006982		
	-10	-12.83	-0.005061		
	0	-51.90	-0.020473		
	10	-3.38	-0.001333		
	20	-13.15	-0.005187		
	30	13.26	0.005231		
	40	3.29	0.001298		
	50	-6.21	-0.002450		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.40	-10.13	-0.003996	Within authorized band for Band 7	Pass
	3.85	-15.02	-0.005925		
	4.40	-15.18	-0.005988		
16QAM					
25	3.40	-9.81	-0.003870	Within authorized band for Band 7	Pass
	3.85	25.09	0.009897		
	4.40	-9.57	-0.003775		
64QAM					
25	3.40	12.83	0.005061	Within authorized band for Band 7	Pass
	3.85	-11.16	-0.004402		
	4.40	-14.82	-0.005846		
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	-5.88	-0.008311	Within authorized band for Band 12	Pass
	-20	-7.34	-0.010375		
	-10	-6.97	-0.009852		
	0	-3.29	-0.004650		
	10	-5.79	-0.008184		
	20	-6.90	-0.009753		
	30	-8.18	-0.011562		
	40	-10.93	-0.015449		
	50	-8.83	-0.012481		
16QAM					
3.85	-30	-7.21	-0.010191	Within authorized band for Band 12	Pass
	-20	-6.78	-0.009583		
	-10	-6.22	-0.008792		
	0	-4.61	-0.006516		
	10	-8.75	-0.012367		
	20	-7.17	-0.010134		
	30	-12.49	-0.017654		
	40	-8.98	-0.012693		
	50	-9.33	-0.013187		
64QAM					
3.85	-30	-8.60	-0.012155	Within authorized band for Band 12	Pass
	-20	-11.53	-0.016297		
	-10	-7.02	-0.009922		
	0	-6.65	-0.009399		
	10	-9.16	-0.012947		
	20	-8.65	-0.012226		
	30	-4.62	-0.006530		
	40	-8.11	-0.011463		
	50	-9.81	-0.013866		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.40	-8.68	-0.012269	Within authorized band for Band 12	Pass
	3.85	-7.01	-0.009908		
	4.40	-7.01	-0.009908		
16QAM					
25	3.40	-5.34	-0.007548	Within authorized band for Band 12	Pass
	3.85	-10.17	-0.014375		
	4.40	-7.15	-0.010106		
64QAM					
25	3.40	-7.28	-0.010290	Within authorized band for Band 12	Pass
	3.85	-10.06	-0.014219		
	4.40	-7.88	-0.011138		
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					
3.85	-30	-3.39	-0.004775	Within authorized band for Band 17	Pass
	-20	-6.04	-0.008507		
	-10	-7.74	-0.010901		
	0	-8.78	-0.012366		
	10	-11.99	-0.016887		
	20	-8.01	-0.011282		
	30	-6.52	-0.009183		
	40	2.80	0.003944		
	50	-5.55	-0.007817		
16QAM					
3.85	-30	-8.34	-0.011746	Within authorized band for Band 17	Pass
	-20	-6.17	-0.008690		
	-10	-8.97	-0.012634		
	0	-4.09	-0.005761		
	10	-10.61	-0.014944		
	20	-9.24	-0.013014		
	30	-7.37	-0.010380		
	40	-7.44	-0.010479		
	50	-10.29	-0.014493		
64QAM					
3.85	-30	-5.59	-0.007873	Within authorized band for Band 17	Pass
	-20	-8.34	-0.011746		
	-10	-9.11	-0.012831		
	0	-7.52	-0.010592		
	10	-4.45	-0.006268		
	20	-6.65	-0.009366		
	30	-10.86	-0.015296		
	40	-7.08	-0.009972		
	50	-3.83	-0.005394		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.40	-7.22	-0.010169	Within authorized band for Band 17	Pass
	3.85	-8.15	-0.011479		
	4.40	-6.78	-0.009549		
16QAM					
25	3.40	-3.95	-0.005563	Within authorized band for Band 17	Pass
	3.85	-8.30	-0.011690		
	4.40	-6.11	-0.008606		
64QAM					
25	3.40	-7.71	-0.010859	Within authorized band for Band 17	Pass
	3.85	-10.44	-0.014704		
	4.40	-12.49	-0.017592		
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	-12.39	-0.004775	Within authorized band for Band 41	Pass
	-20	-1.75	-0.000674		
	-10	-9.40	-0.003622		
	0	-6.47	-0.002493		
	10	-16.06	-0.006189		
	20	-11.60	-0.004470		
	30	-11.14	-0.004293		
	40	-11.59	-0.004466		
	50	-15.82	-0.006096		
16QAM					
3.85	-30	-13.06	-0.005033	Within authorized band for Band 41	Pass
	-20	-13.52	-0.005210		
	-10	-11.93	-0.004597		
	0	-16.65	-0.006416		
	10	-6.24	-0.002405		
	20	-6.68	-0.002574		
	30	-6.67	-0.002570		
	40	-12.22	-0.004709		
	50	-16.81	-0.006478		
64QAM					
3.85	-30	-5.89	-0.002270	Within authorized band for Band 41	Pass
	-20	5.05	0.001946		
	-10	-11.96	-0.004609		
	0	-12.85	-0.004952		
	10	-2.30	-0.000886		
	20	-9.68	-0.003730		
	30	-10.76	-0.004146		
	40	-9.13	-0.003518		
	50	-10.19	-0.003927		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.40	-15.05	-0.005800	Within authorized band for Band 41	Pass
	3.85	-14.71	-0.005669		
	4.40	-9.36	-0.003607		
16QAM					
25	3.40	-14.09	-0.005430	Within authorized band for Band41	Pass
	3.85	-3.83	-0.001476		
	4.40	-11.94	-0.004601		
64QAM					
25	3.40	-9.23	-0.003557	Within authorized band for Band41	Pass
	3.85	-8.47	-0.003264		
	4.40	-9.90	-0.003815		
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	-6.34	-0.003633	Within authorized band for Band 66	Pass
	-20	-8.40	-0.004814		
	-10	-13.80	-0.007908		
	0	-8.81	-0.005049		
	10	-11.23	-0.006436		
	20	-10.10	-0.005788		
	30	-8.33	-0.004774		
	40	-9.23	-0.005289		
	50	-1.90	-0.001089		
16QAM					
3.85	-30	-9.33	-0.005347	Within authorized band for Band 66	Pass
	-20	-8.48	-0.004860		
	-10	-10.20	-0.005845		
	0	-13.92	-0.007977		
	10	-10.49	-0.006011		
	20	-9.21	-0.005278		
	30	-1.79	-0.001026		
	40	-2.98	-0.001708		
	50	3.23	0.001851		
64QAM					
3.85	-30	-2.45	-0.001404	Within authorized band for Band 66	Pass
	-20	-12.93	-0.007410		
	-10	-8.54	-0.004894		
	0	-9.83	-0.005633		
	10	-3.79	-0.002172		
	20	-4.35	-0.002493		
	30	-9.23	-0.005289		
	40	5.11	0.002928		
	50	-9.36	-0.005364		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					

25	3.40	-8.96	-0.005135	Within authorized band for Band 66	Pass
	3.85	-14.91	-0.008544		
	4.40	-8.73	-0.005003		
16QAM					
25	3.40	-7.54	-0.004321	Within authorized band for Band 66	Pass
	3.85	-11.66	-0.006682		
	4.40	-10.06	-0.005765		
64QAM					
25	3.40	-8.00	-0.004585	Within authorized band for Band 66	Pass
	3.85	-9.60	-0.005501		
	4.40	-9.30	-0.005330		
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
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
Band12	10MHz	QPSK	23095	50RB#0	PASS	PASS
Band12	10MHz	16QAM	23095	50RB#0	PASS	PASS
Band12	10MHz	64QAM	23095	50RB#0	PASS	PASS
Band17	10MHz	QPSK	23790	50RB#0	PASS	PASS
Band17	10MHz	16QAM	23790	50RB#0	PASS	PASS
Band17	10MHz	64QAM	23790	50RB#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
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

