

FCC Appendix RF Test Data for LTE Band 13

FCC ID : 2AU4T-TH11

Company : Shanghai TUGE Data Technologies Co., Ltd.

EUT : MobileHub

Model Number : TH11

Report No. : CTA26071403107

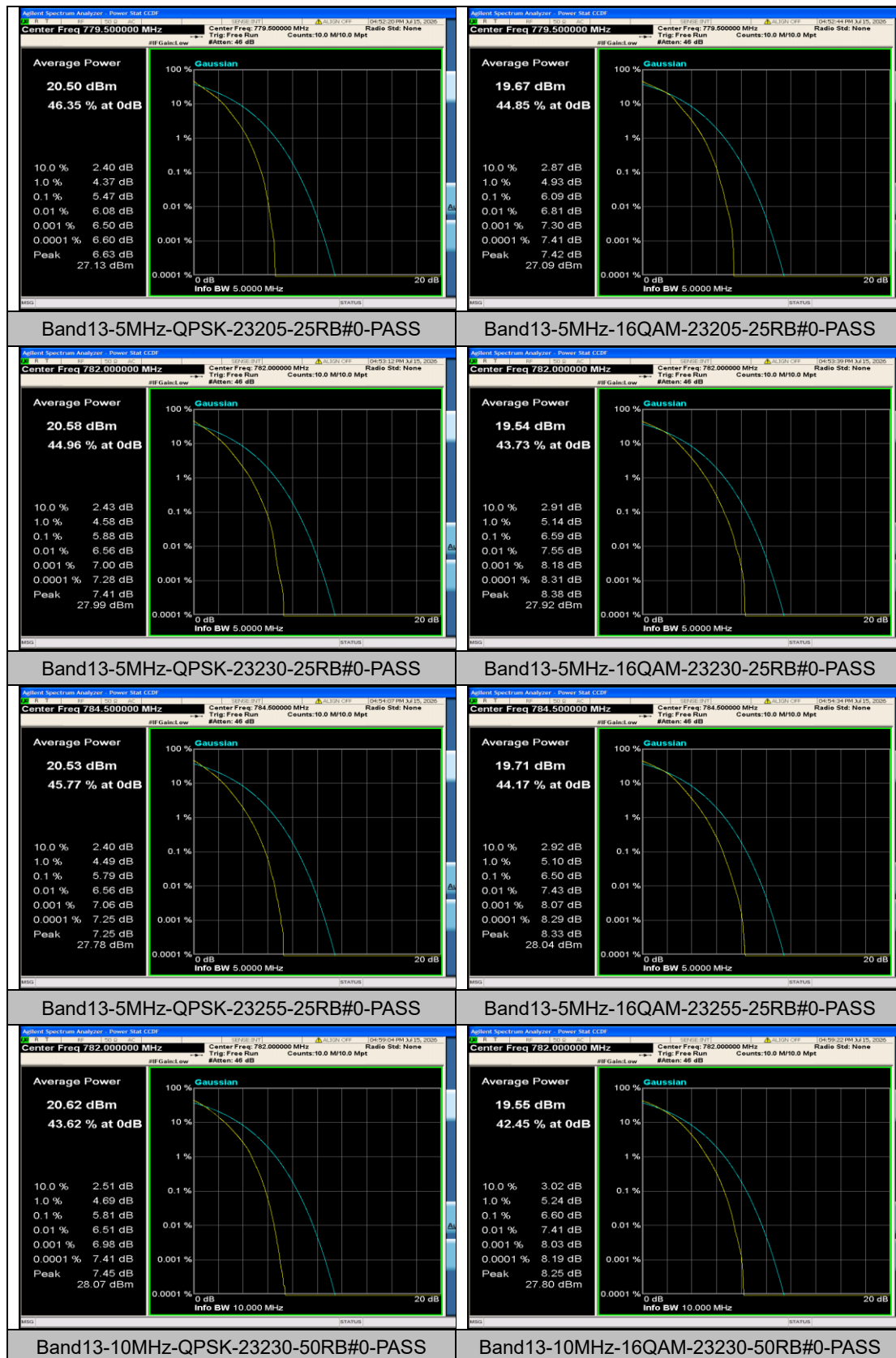
Reviewed By : Eric Wang

Appendix B: Peak-to-Average Ratio(CCDF)

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	5.47	13	PASS
Band13	5MHz	16QAM	23205	25RB#0	6.09	13	PASS
Band13	5MHz	QPSK	23230	25RB#0	5.88	13	PASS
Band13	5MHz	16QAM	23230	25RB#0	6.59	13	PASS
Band13	5MHz	QPSK	23255	25RB#0	5.79	13	PASS
Band13	5MHz	16QAM	23255	25RB#0	6.50	13	PASS
Band13	10MHz	QPSK	23230	50RB#0	5.81	13	PASS
Band13	10MHz	16QAM	23230	50RB#0	6.60	13	PASS

Test Graphs

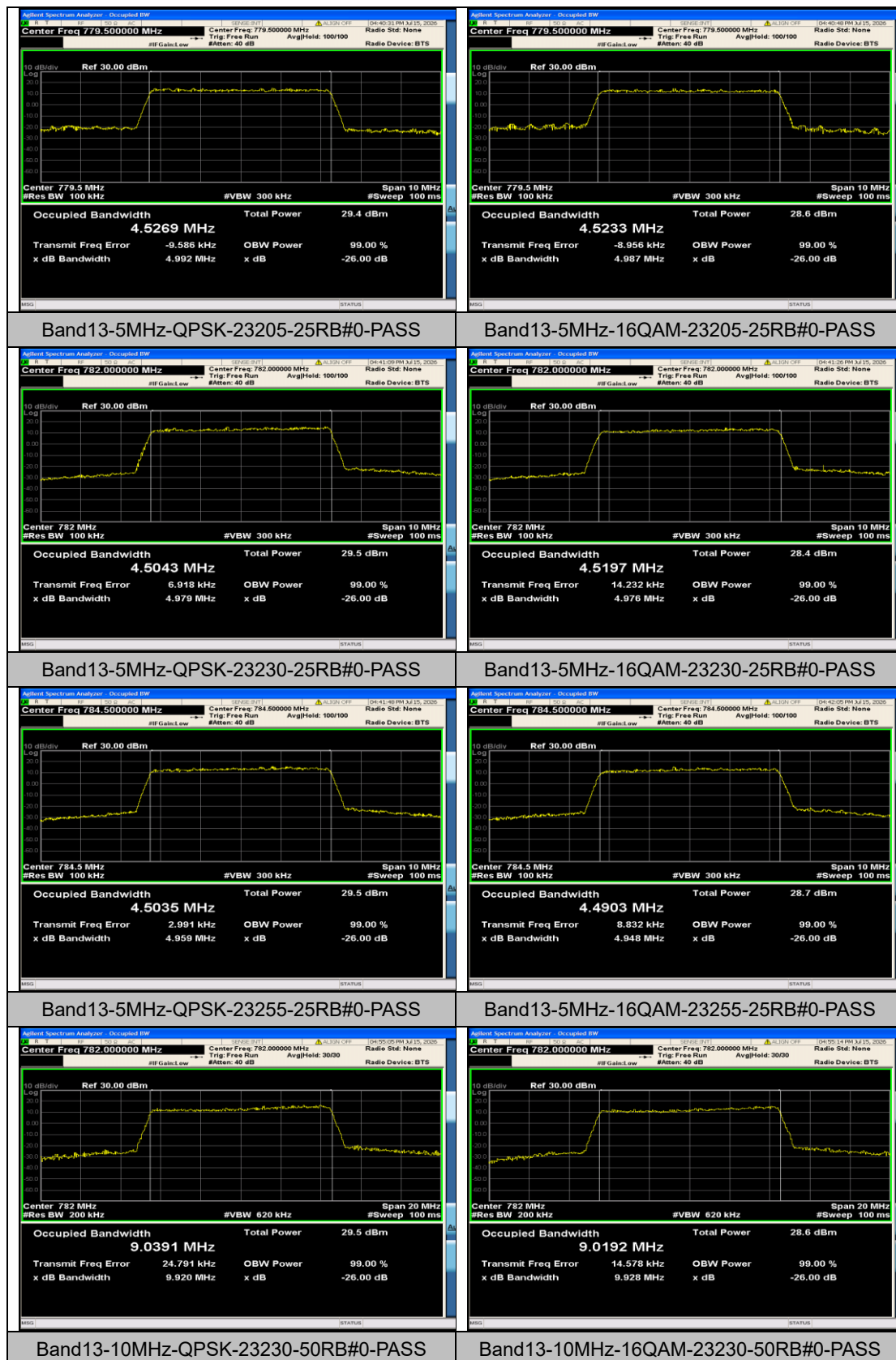


Appendix C: 26dB Bandwidth and Occupied Bandwidth

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	4.5269	4.992	PASS
Band13	5MHz	16QAM	23205	25RB#0	4.5233	4.987	PASS
Band13	5MHz	QPSK	23230	25RB#0	4.5043	4.979	PASS
Band13	5MHz	16QAM	23230	25RB#0	4.5197	4.976	PASS
Band13	5MHz	QPSK	23255	25RB#0	4.5035	4.959	PASS
Band13	5MHz	16QAM	23255	25RB#0	4.4903	4.948	PASS
Band13	10MHz	QPSK	23230	50RB#0	9.0391	9.920	PASS
Band13	10MHz	16QAM	23230	50RB#0	9.0192	9.928	PASS

Test Graphs

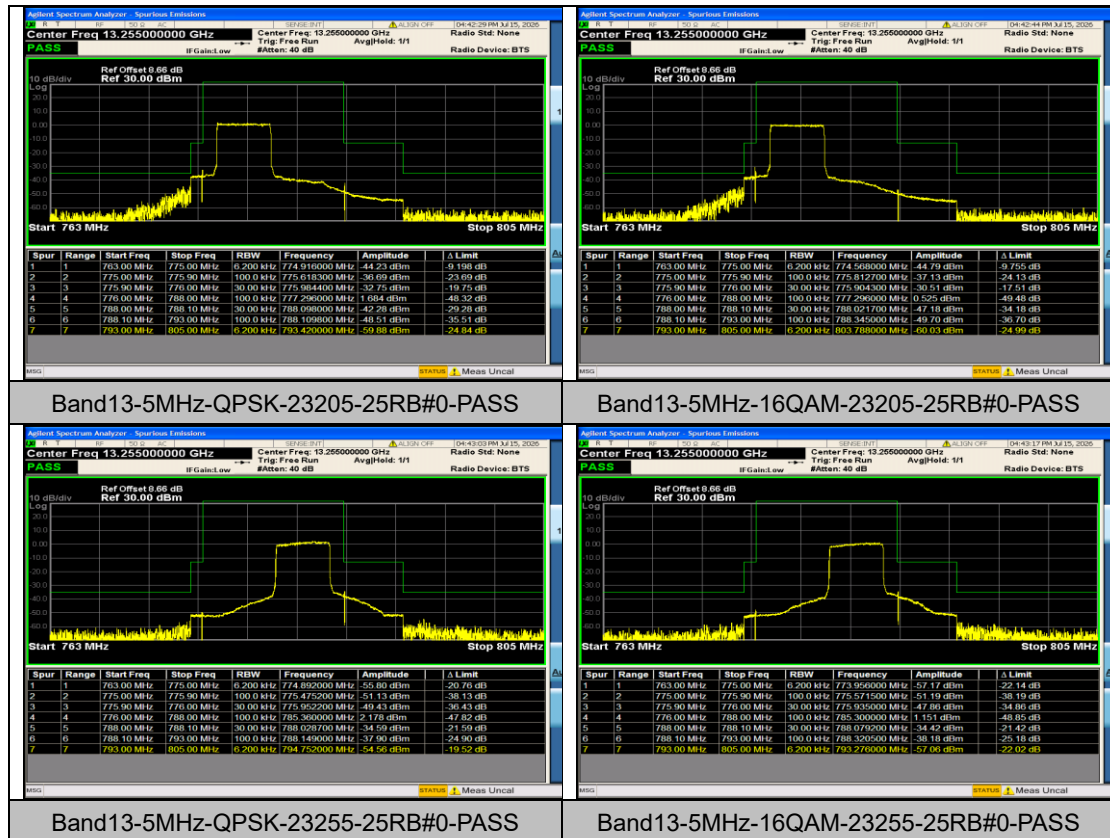


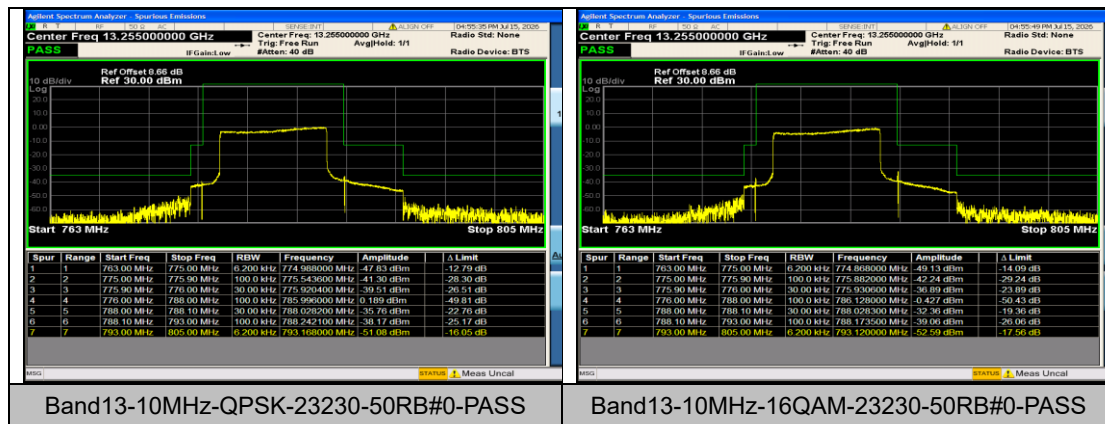
Appendix D: Band Edge

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dBm)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	-44.23	PASS
Band13	5MHz	16QAM	23205	25RB#0	-44.79	PASS
Band13	5MHz	QPSK	23255	25RB#0	-54.56	PASS
Band13	5MHz	16QAM	23255	25RB#0	-34.42	PASS
Band13	10MHz	QPSK	23230	50RB#0	-47.83	PASS
Band13	10MHz	16QAM	23230	50RB#0	-49.13	PASS

Test Graphs





Agilent Spectrum Analyzer - Spurious Emissions

Center Freq 13.255000000 GHz

Ref Offset 0.66 dB
Ref 30.00 dBm

Start 763 MHz

Stop 805 MHz

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	763.00 MHz	775.00 MHz	6.200 kHz	774.980000 MHz	-49.13 dBm	-14.09 dB
2	2	775.00 MHz	775.90 MHz	100.0 kHz	775.882000 MHz	-42.24 dBm	-29.24 dB
3	3	775.90 MHz	776.00 MHz	30.00 kHz	775.930600 MHz	-36.89 dBm	-23.89 dB
4	4	776.00 MHz	788.00 MHz	100.0 kHz	786.128000 MHz	-0.427 dBm	-50.43 dB
5	5	788.00 MHz	788.10 MHz	30.00 kHz	788.026300 MHz	-32.38 dBm	-19.38 dB
6	6	788.10 MHz	793.00 MHz	100.0 kHz	788.173500 MHz	-39.06 dBm	-26.06 dB
7	7	793.00 MHz	805.00 MHz	6.200 kHz	793.120000 MHz	-52.59 dBm	-17.56 dB

STATUS Measure Uncal

Band13-10MHz-16QAM-23230-50RB#0-PASS

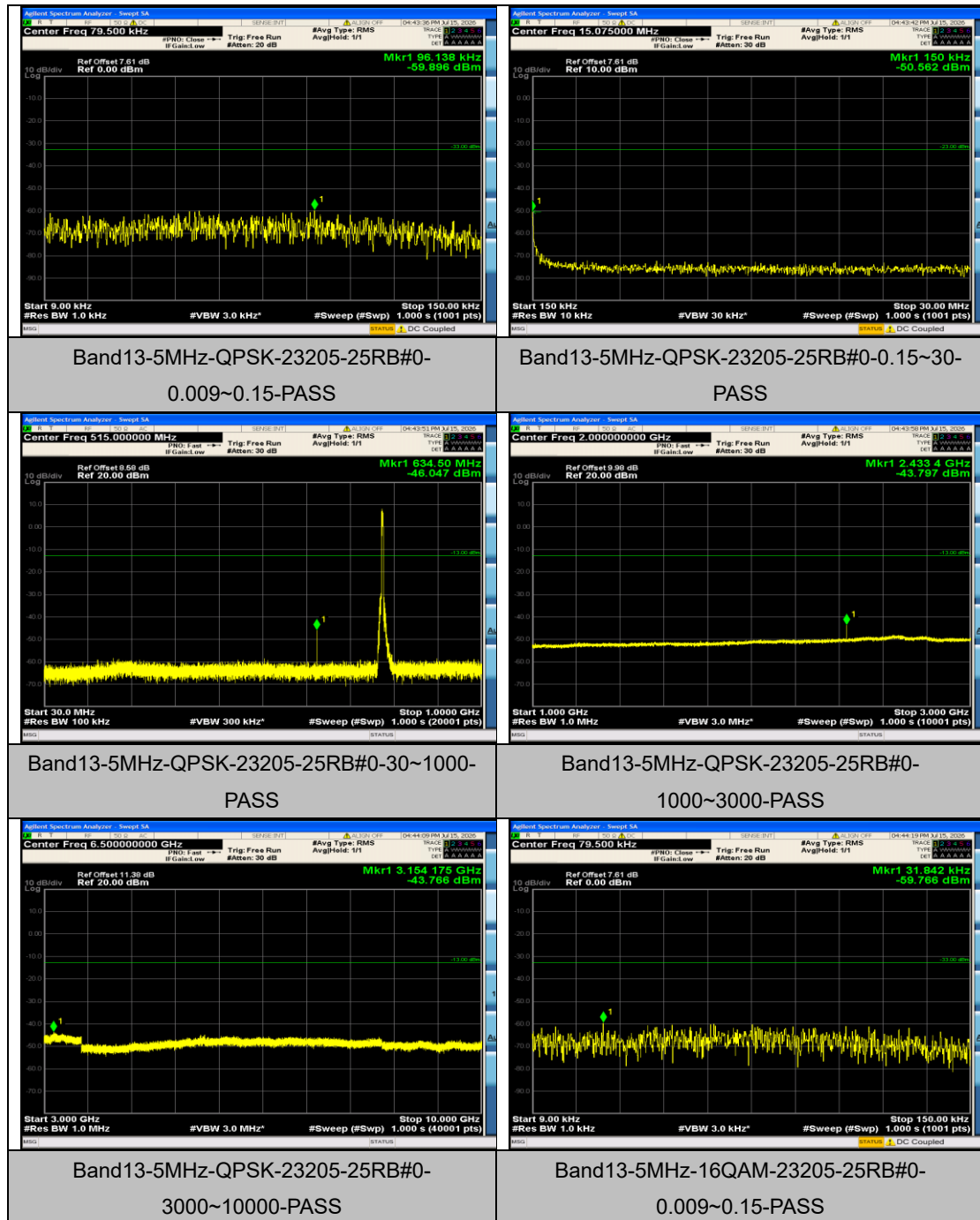
Appendix E: Conducted Spurious Emission

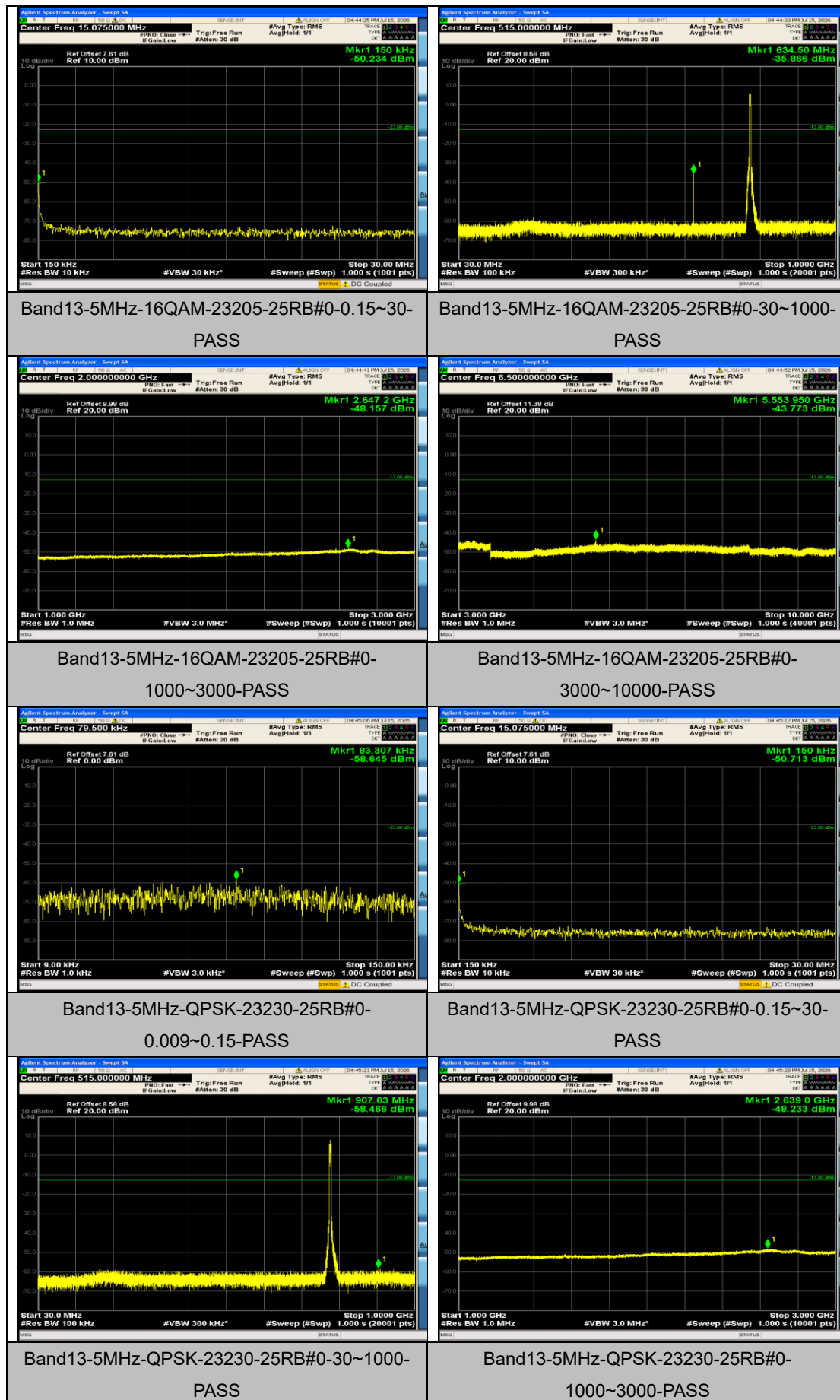
Test Result

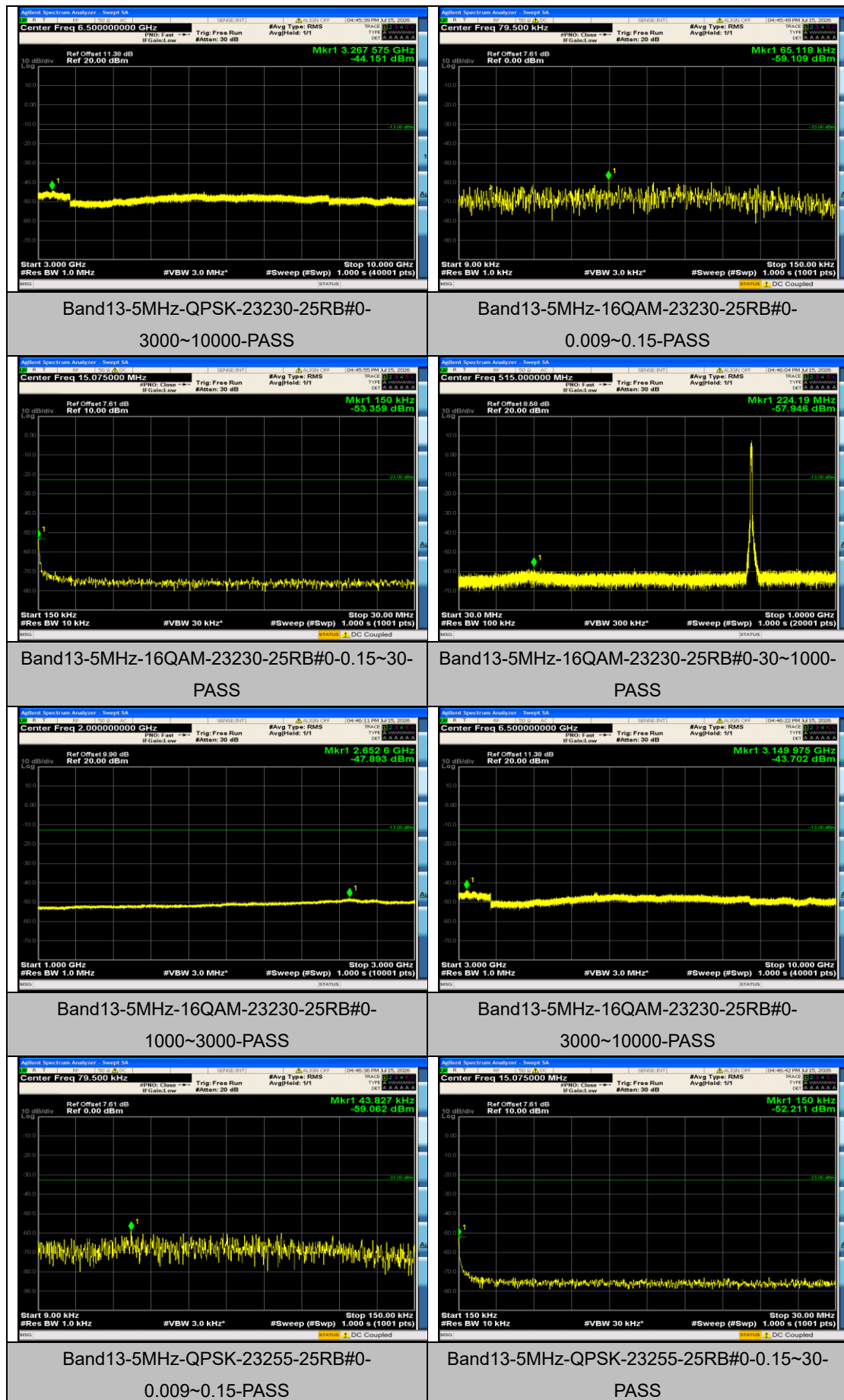
Band	Bandwidth	Modulation	Channel	RB Configuration	Frequency Range	Result (dBm)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	0.009~0.15	-59.90	PASS
Band13	5MHz	QPSK	23205	25RB#0	0.15~30	-50.56	PASS
Band13	5MHz	QPSK	23205	25RB#0	30~1000	-46.05	PASS
Band13	5MHz	QPSK	23205	25RB#0	1000~3000	-43.80	PASS
Band13	5MHz	QPSK	23205	25RB#0	3000~10000	-43.77	PASS
Band13	5MHz	16QAM	23205	25RB#0	0.009~0.15	-59.77	PASS
Band13	5MHz	16QAM	23205	25RB#0	0.15~30	-50.23	PASS
Band13	5MHz	16QAM	23205	25RB#0	30~1000	-35.87	PASS
Band13	5MHz	16QAM	23205	25RB#0	1000~3000	-48.16	PASS
Band13	5MHz	16QAM	23205	25RB#0	3000~10000	-43.77	PASS
Band13	5MHz	QPSK	23230	25RB#0	0.009~0.15	-58.65	PASS
Band13	5MHz	QPSK	23230	25RB#0	0.15~30	-50.71	PASS
Band13	5MHz	QPSK	23230	25RB#0	30~1000	-58.47	PASS
Band13	5MHz	QPSK	23230	25RB#0	1000~3000	-48.23	PASS
Band13	5MHz	QPSK	23230	25RB#0	3000~10000	-44.15	PASS
Band13	5MHz	16QAM	23230	25RB#0	0.009~0.15	-59.11	PASS
Band13	5MHz	16QAM	23230	25RB#0	0.15~30	-53.36	PASS
Band13	5MHz	16QAM	23230	25RB#0	30~1000	-57.95	PASS
Band13	5MHz	16QAM	23230	25RB#0	1000~3000	-47.89	PASS
Band13	5MHz	16QAM	23230	25RB#0	3000~10000	-43.70	PASS
Band13	5MHz	QPSK	23255	25RB#0	0.009~0.15	-59.06	PASS
Band13	5MHz	QPSK	23255	25RB#0	0.15~30	-52.21	PASS
Band13	5MHz	QPSK	23255	25RB#0	30~1000	-58.24	PASS
Band13	5MHz	QPSK	23255	25RB#0	1000~3000	-35.25	PASS
Band13	5MHz	QPSK	23255	25RB#0	3000~10000	-43.72	PASS
Band13	5MHz	16QAM	23255	25RB#0	0.009~0.15	-58.23	PASS
Band13	5MHz	16QAM	23255	25RB#0	0.15~30	-52.17	PASS
Band13	5MHz	16QAM	23255	25RB#0	30~1000	-58.34	PASS
Band13	5MHz	16QAM	23255	25RB#0	1000~3000	-47.65	PASS
Band13	5MHz	16QAM	23255	25RB#0	3000~10000	-42.28	PASS
Band13	10MHz	QPSK	23230	50RB#0	0.009~0.15	-59.68	PASS
Band13	10MHz	QPSK	23230	50RB#0	0.15~30	-50.44	PASS
Band13	10MHz	QPSK	23230	50RB#0	30~1000	-56.32	PASS
Band13	10MHz	QPSK	23230	50RB#0	1000~3000	-48.10	PASS
Band13	10MHz	QPSK	23230	50RB#0	3000~10000	-43.48	PASS
Band13	10MHz	16QAM	23230	50RB#0	0.009~0.15	-60.19	PASS

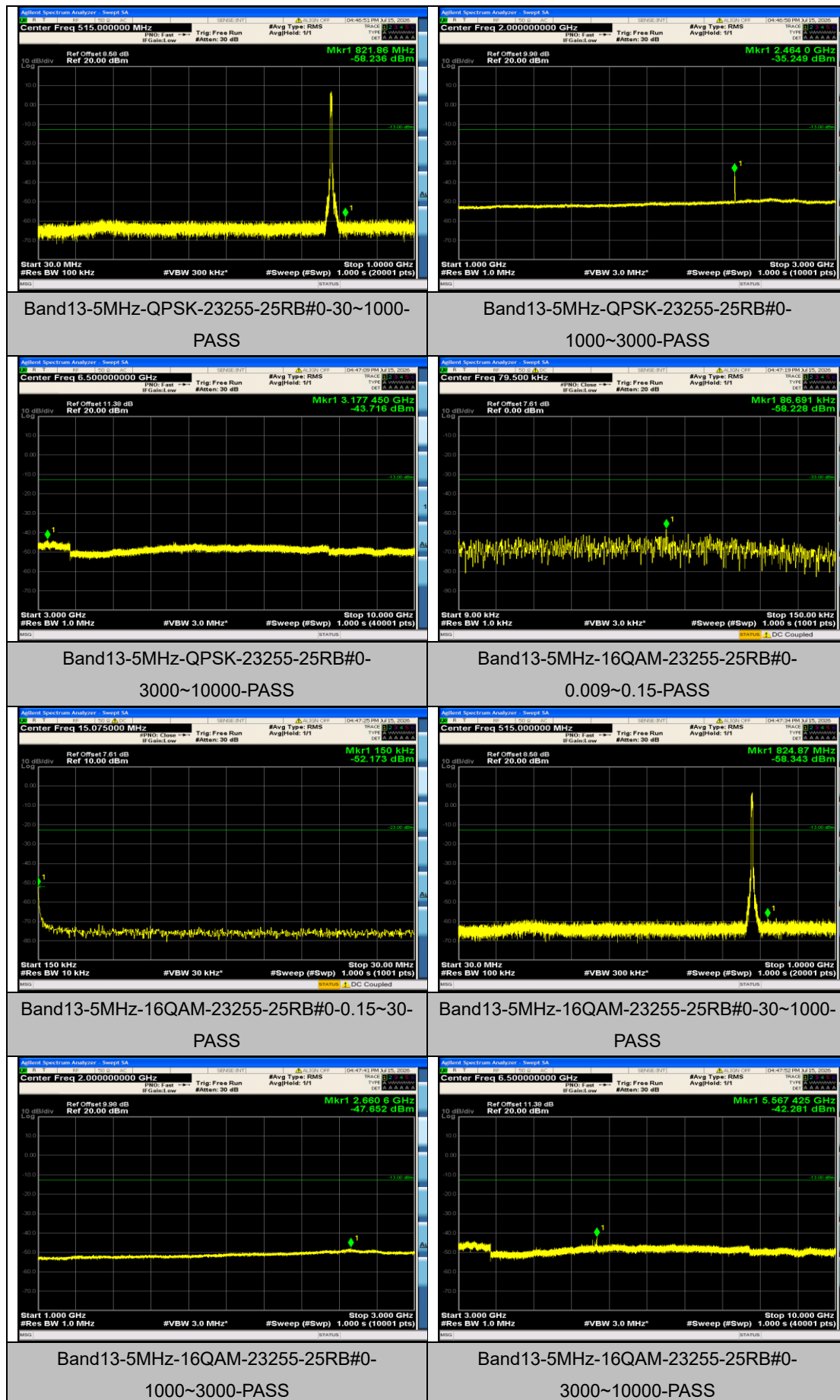
Band13	10MHz	16QAM	23230	50RB#0	0.15~30	-52.09	PASS
Band13	10MHz	16QAM	23230	50RB#0	30~1000	-57.64	PASS
Band13	10MHz	16QAM	23230	50RB#0	1000~3000	-46.11	PASS
Band13	10MHz	16QAM	23230	50RB#0	3000~10000	-42.38	PASS

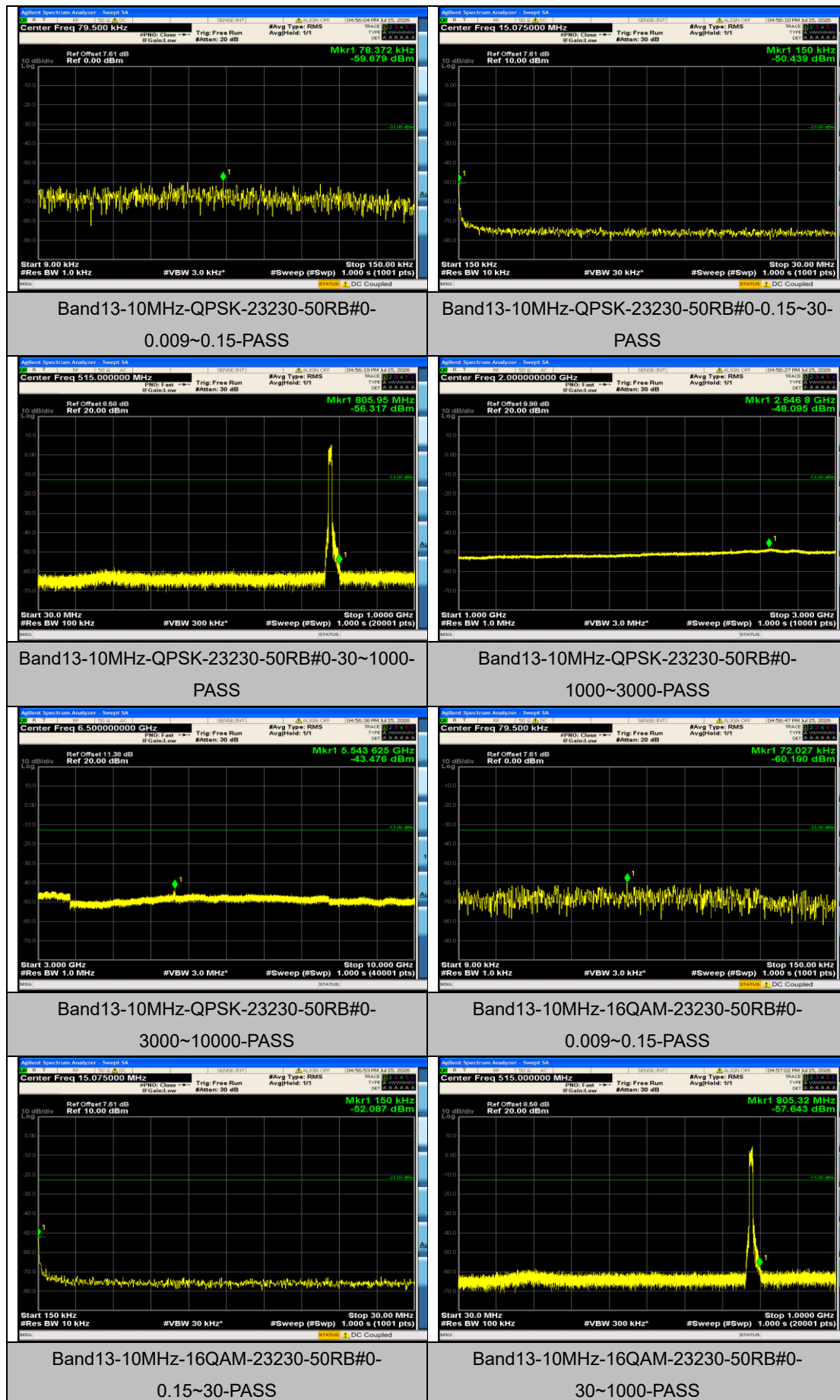
Test Graphs

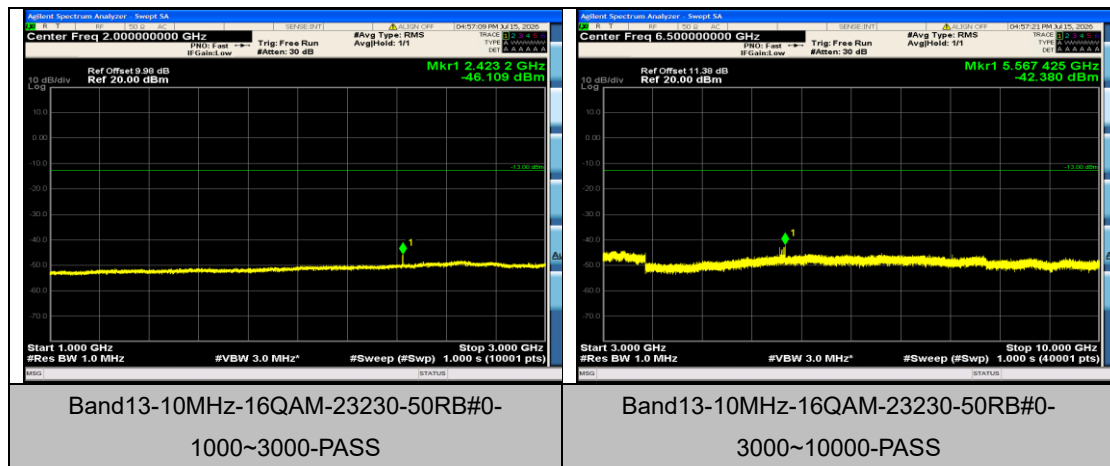












Appendix F: Frequency Stability

Test Result

Temperature										
Band	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	NV	-30	-13.15	-0.016870	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	-20	-17.29	-0.022181	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	-10	-16.57	-0.021257	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	0	-18.85	-0.024182	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	10	-18.85	-0.024182	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	20	-17.50	-0.022450	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	30	-20.26	-0.025991	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	40	-19.86	-0.025478	±2.5	PASS
Band13	5MHz	QPSK	23205	25RB#0	NV	50	-21.97	-0.028185	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	-30	-17.74	-0.022758	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	-20	-17.31	-0.022207	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	-10	-15.75	-0.020205	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	0	-14.98	-0.019217	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	10	-14.39	-0.018461	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	20	-14.88	-0.019089	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	30	-13.79	-0.017691	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	40	-14.28	-0.018319	±2.5	PASS
Band13	5MHz	16QAM	23205	25RB#0	NV	50	-15.29	-0.019615	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	-30	8.61	0.011010	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	-20	3.98	0.005090	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	-10	2.55	0.003261	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	0	-3.53	-0.004514	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	10	-7.00	-0.008951	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	20	-10.16	-0.012992	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	30	-9.64	-0.012327	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	40	-14.19	-0.018146	±2.5	PASS
Band13	5MHz	QPSK	23230	25RB#0	NV	50	-18.30	-0.023402	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	-30	-22.43	-0.028683	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	-20	-24.52	-0.031355	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	-10	-24.30	-0.031074	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	0	-22.43	-0.028683	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	10	-23.96	-0.030639	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	20	-20.33	-0.025997	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	30	-20.50	-0.026215	±2.5	PASS
Band13	5MHz	16QAM	23230	25RB#0	NV	40	-19.91	-0.025460	±2.5	PASS

Band13	5MHz	16QAM	23230	25RB#0	NV	50	-19.10	-0.024425	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	-30	-3.79	-0.004831	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	-20	-5.49	-0.006998	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	-10	-9.04	-0.011523	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	0	-13.85	-0.017655	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	10	-15.84	-0.020191	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	20	-17.05	-0.021734	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	30	-20.01	-0.025507	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	40	-23.05	-0.029382	±2.5	PASS
Band13	5MHz	QPSK	23255	25RB#0	NV	50	-23.65	-0.030147	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	-30	-25.13	-0.032033	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	-20	-23.83	-0.030376	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	-10	-22.46	-0.028630	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	0	-23.13	-0.029484	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	10	-24.03	-0.030631	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	20	-24.38	-0.031077	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	30	-21.74	-0.027712	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	40	-23.52	-0.029981	±2.5	PASS
Band13	5MHz	16QAM	23255	25RB#0	NV	50	-20.80	-0.026514	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-30	-11.19	-0.014309	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-20	-12.23	-0.015639	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-10	-14.03	-0.017941	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	0	-15.35	-0.019629	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	10	-13.82	-0.017673	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	20	-16.69	-0.021343	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	30	-19.33	-0.024719	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	40	-19.33	-0.024719	±2.5	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	50	-22.10	-0.028261	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	-30	-17.72	-0.022660	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	-20	-16.87	-0.021573	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	-10	-14.69	-0.018785	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	0	-13.89	-0.017762	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	10	-14.06	-0.017980	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	20	-12.37	-0.015818	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	30	-9.41	-0.012033	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	40	-9.28	-0.011867	±2.5	PASS
Band13	10MHz	16QAM	23230	50RB#0	NV	50	-7.97	-0.010192	±2.5	PASS

Appendix G: Modulation Characteristics

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Verdict
Band13	5MHz	QPSK	23205	25RB#0	PASS
Band13	5MHz	16QAM	23205	25RB#0	PASS
Band13	5MHz	QPSK	23230	25RB#0	PASS
Band13	5MHz	16QAM	23230	25RB#0	PASS
Band13	5MHz	QPSK	23255	25RB#0	PASS
Band13	5MHz	16QAM	23255	25RB#0	PASS
Band13	10MHz	QPSK	23230	50RB#0	PASS
Band13	10MHz	16QAM	23230	50RB#0	PASS

Test Graphs

