

APPENDIX D: TEST RESULTS OF BAND 12 FOR CAT-M OPERATION

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APPENDIX D.1: EFFECTIVE (ISOTROPIC) RADIATED POWER OUTPUT DATA FOR M1

Test Result

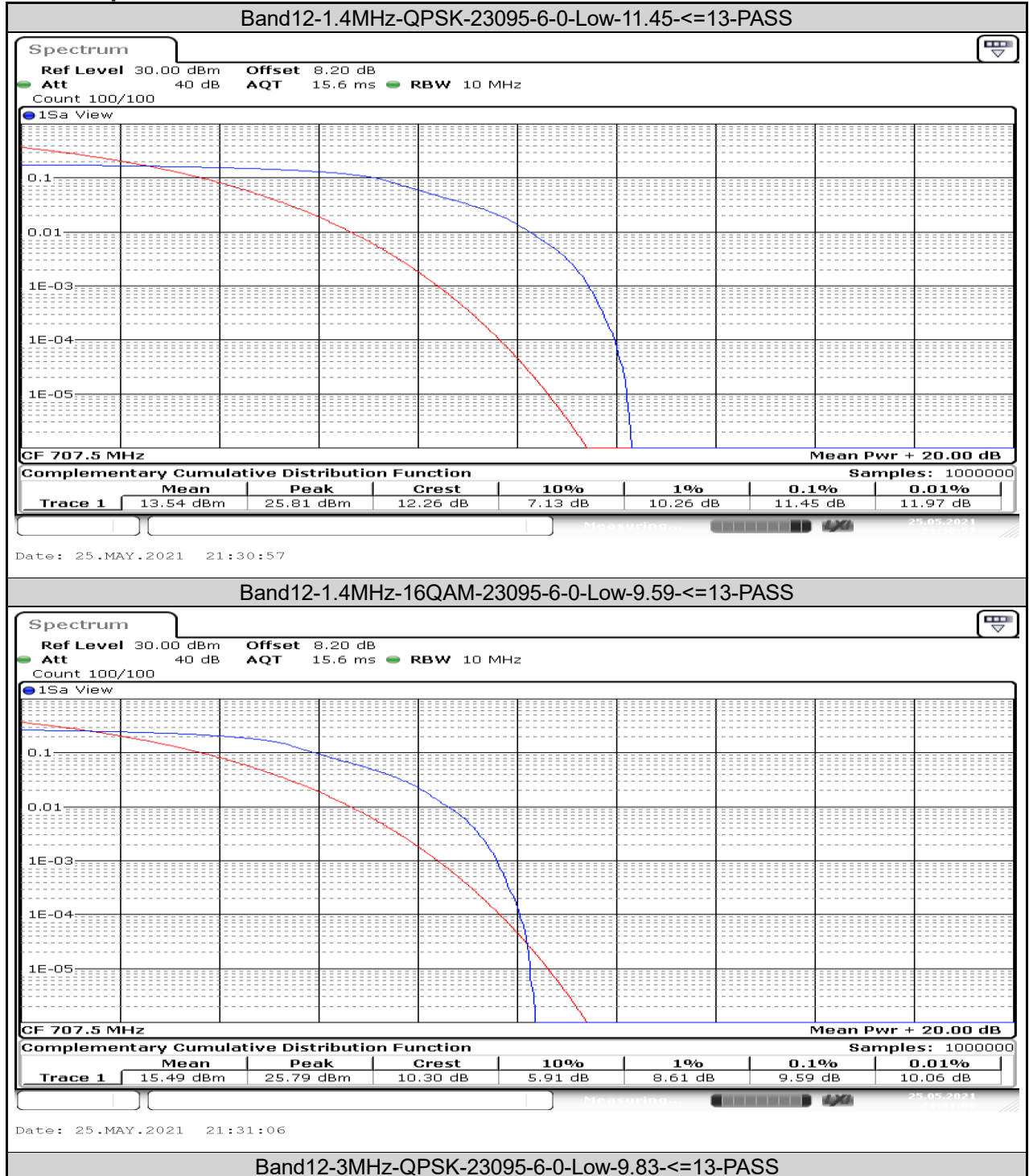
Band	Bandwidth	Channel	Modulation	RB Size	RB Start	NBIndex	Measure Result (dBm)	ERP		Limit (watts)	Verdict
								dBm	Watts		
Band12	1.4MHz	23017	QPSK	1	0	Low	23.22	23.21	0.209	3	PASS
Band12	1.4MHz	23017	QPSK	6	0	Low	21.02	21.01	0.126	3	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	23.07	23.06	0.202	3	PASS
Band12	1.4MHz	23095	QPSK	6	0	Low	21.21	21.20	0.132	3	PASS
Band12	1.4MHz	23173	QPSK	1	5	Low	22.77	22.76	0.189	3	PASS
Band12	1.4MHz	23173	QPSK	6	0	Low	21.05	21.04	0.127	3	PASS
Band12	1.4MHz	23017	16QAM	1	0	Low	22.11	22.10	0.162	3	PASS
Band12	1.4MHz	23017	16QAM	6	0	Low	21.37	21.36	0.137	3	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	21.96	21.95	0.157	3	PASS
Band12	1.4MHz	23095	16QAM	6	0	Low	21.27	21.26	0.134	3	PASS
Band12	1.4MHz	23173	16QAM	1	5	Low	21.62	21.61	0.145	3	PASS
Band12	1.4MHz	23173	16QAM	6	0	Low	21.03	21.02	0.126	3	PASS
Band12	3MHz	23025	QPSK	1	0	Low	23.31	23.30	0.214	3	PASS
Band12	3MHz	23025	QPSK	6	0	Low	21.08	21.07	0.128	3	PASS
Band12	3MHz	23095	QPSK	1	0	Low	23.14	23.13	0.206	3	PASS
Band12	3MHz	23095	QPSK	6	0	Low	21.28	21.27	0.134	3	PASS
Band12	3MHz	23165	QPSK	1	5	High	22.84	22.83	0.192	3	PASS
Band12	3MHz	23165	QPSK	6	0	High	21.05	21.04	0.127	3	PASS
Band12	3MHz	23025	16QAM	1	0	Low	22.14	22.13	0.163	3	PASS
Band12	3MHz	23025	16QAM	6	0	Low	21.41	21.40	0.138	3	PASS
Band12	3MHz	23095	16QAM	1	0	Low	22.02	22.01	0.159	3	PASS
Band12	3MHz	23095	16QAM	6	0	Low	21.26	21.25	0.133	3	PASS
Band12	3MHz	23165	16QAM	1	5	High	21.61	21.60	0.145	3	PASS
Band12	3MHz	23165	16QAM	6	0	High	21.03	21.02	0.126	3	PASS
Band12	5MHz	23035	QPSK	1	0	Low	23.28	23.27	0.212	3	PASS
Band12	5MHz	23035	QPSK	6	0	Low	22.2	22.19	0.166	3	PASS
Band12	5MHz	23095	QPSK	1	0	Low	23.11	23.10	0.204	3	PASS
Band12	5MHz	23095	QPSK	6	0	Low	22.06	22.05	0.160	3	PASS
Band12	5MHz	23155	QPSK	1	5	High	22.69	22.68	0.185	3	PASS
Band12	5MHz	23155	QPSK	3	3	High	21.71	21.70	0.148	3	PASS
Band12	5MHz	23035	16QAM	1	0	Low	23.52	23.51	0.224	3	PASS
Band12	5MHz	23035	16QAM	6	0	Low	21.95	21.94	0.156	3	PASS
Band12	5MHz	23095	16QAM	1	0	Low	23.38	23.37	0.217	3	PASS
Band12	5MHz	23095	16QAM	6	0	Low	21.88	21.87	0.154	3	PASS
Band12	5MHz	23155	16QAM	1	5	High	23.1	23.09	0.204	3	PASS
Band12	5MHz	23155	16QAM	3	3	High	21.85	21.84	0.153	3	PASS
Band12	10MHz	23060	QPSK	1	0	Low	23.38	23.37	0.217	3	PASS
Band12	10MHz	23060	QPSK	5	0	Low	22.18	22.17	0.165	3	PASS
Band12	10MHz	23095	QPSK	1	0	Low	23.33	23.32	0.215	3	PASS
Band12	10MHz	23095	QPSK	5	0	Low	22.09	22.08	0.161	3	PASS
Band12	10MHz	23130	QPSK	1	5	High	22.82	22.81	0.191	3	PASS
Band12	10MHz	23130	QPSK	5	1	High	21.79	21.78	0.151	3	PASS
Band12	10MHz	23060	16QAM	1	0	Low	23.51	23.50	0.224	3	PASS
Band12	10MHz	23060	16QAM	5	0	Low	21.99	21.98	0.158	3	PASS
Band12	10MHz	23095	16QAM	1	0	Low	23.45	23.44	0.221	3	PASS
Band12	10MHz	23095	16QAM	5	0	Low	21.99	21.98	0.158	3	PASS
Band12	10MHz	23130	16QAM	1	5	High	23.31	23.30	0.214	3	PASS
Band12	10MHz	23130	16QAM	5	1	High	21.69	21.68	0.147	3	PASS

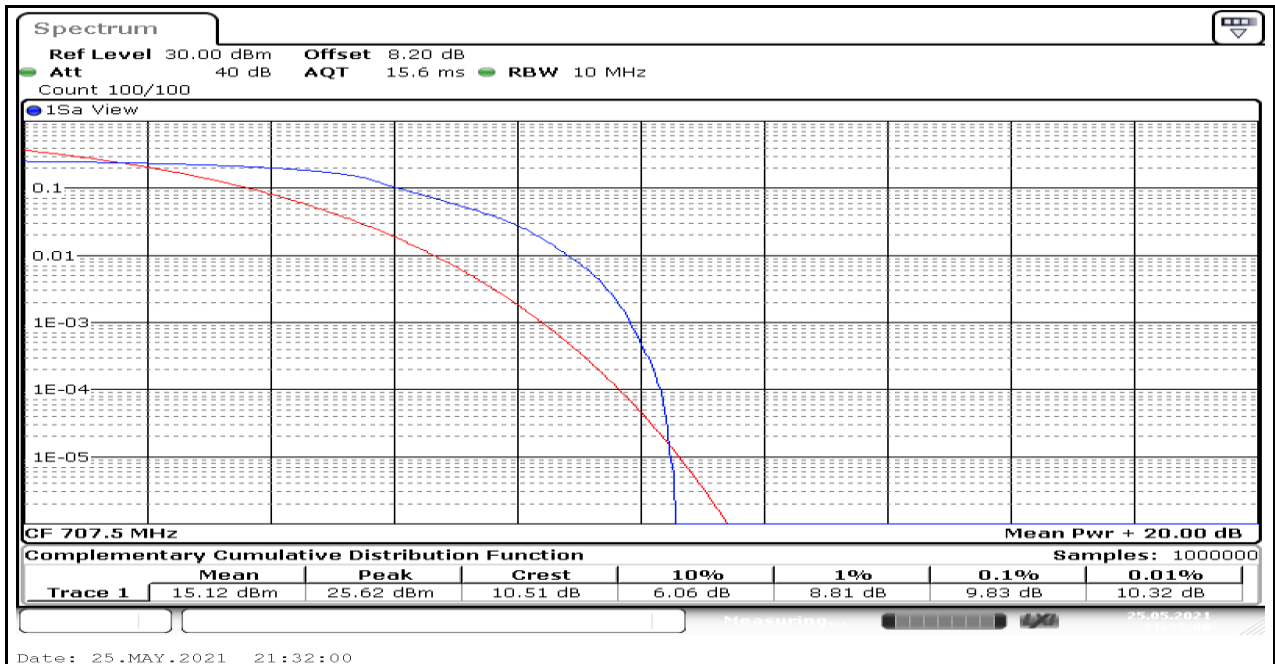
APPENDIX D.2: PEAK-TO-AVERAGE RATIO (CCDF) FOR M1

Test Result

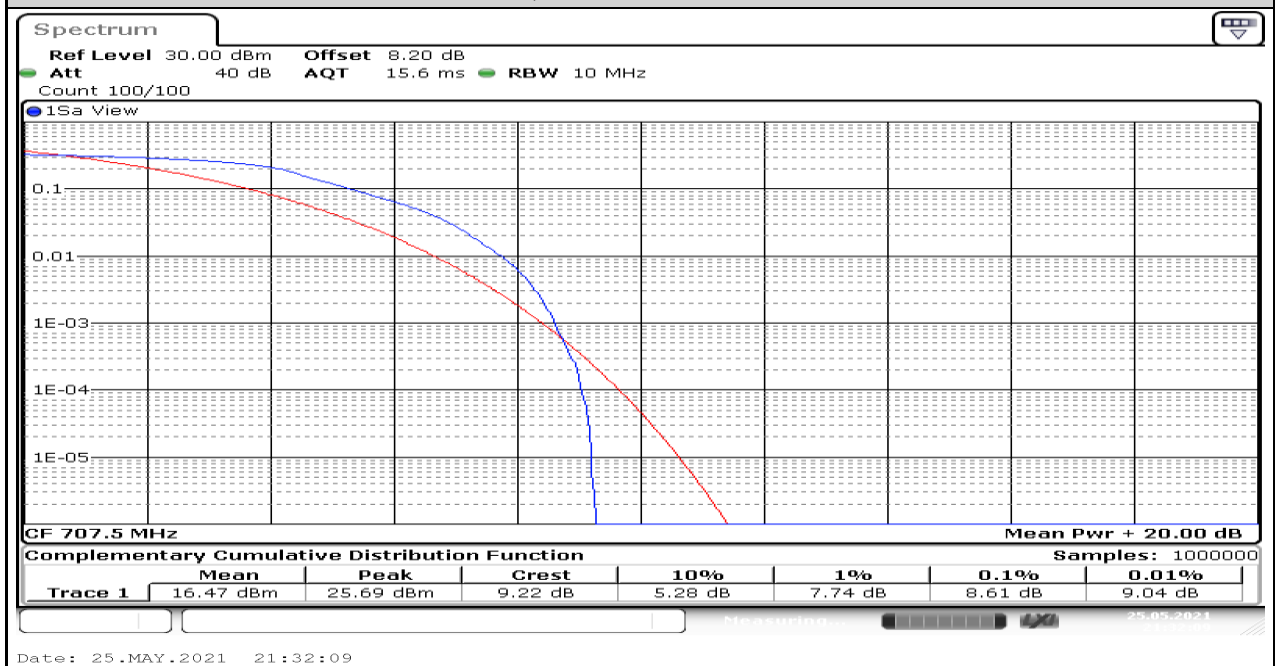
Band	Bandwidth	Channel	Modulation	RB Size	RB Start	Index	Result (dB)	Limit (dB)	Verdict
Band12	1.4MHz	23095	QPSK	6	0	Low	11.45	<=13	PASS
Band12	1.4MHz	23095	16QAM	6	0	Low	9.59	<=13	PASS
Band12	3MHz	23095	QPSK	6	0	Low	9.83	<=13	PASS
Band12	3MHz	23095	16QAM	6	0	Low	8.61	<=13	PASS
Band12	5MHz	23095	QPSK	6	0	Low	11.16	<=13	PASS
Band12	5MHz	23095	16QAM	6	0	Low	9.10	<=13	PASS
Band12	10MHz	23095	QPSK	6	0	Low	8.55	<=13	PASS
Band12	10MHz	23095	16QAM	6	0	Low	8.52	<=13	PASS

Test Graphs

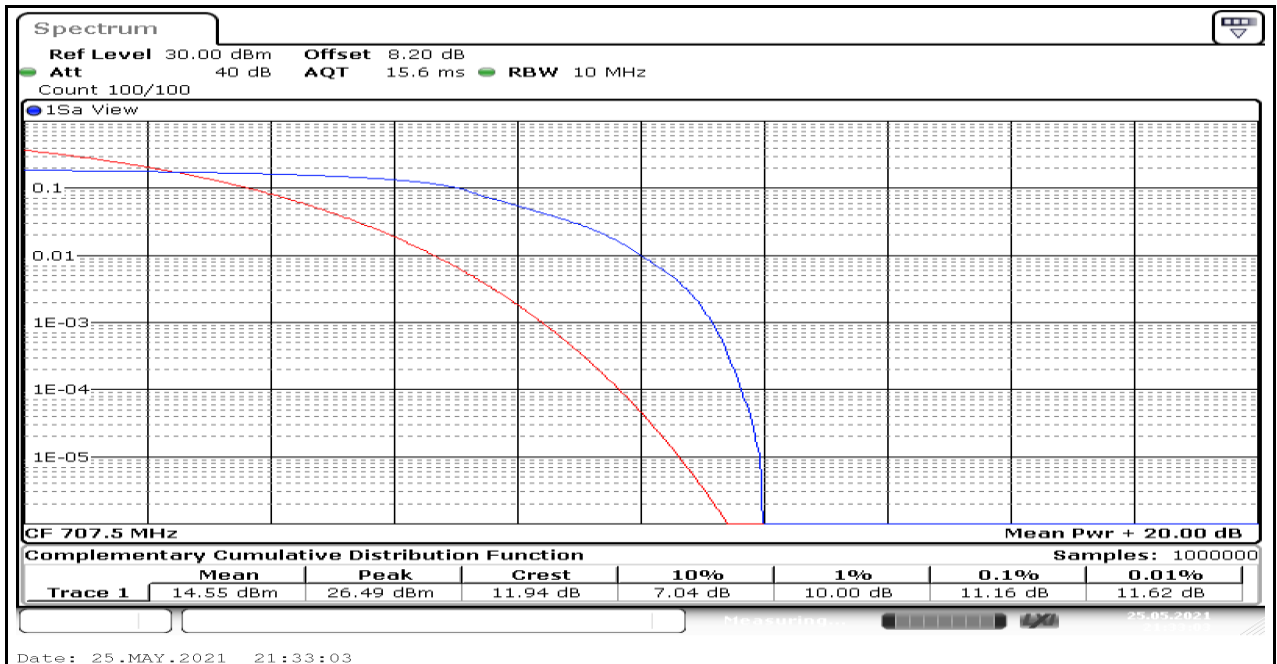




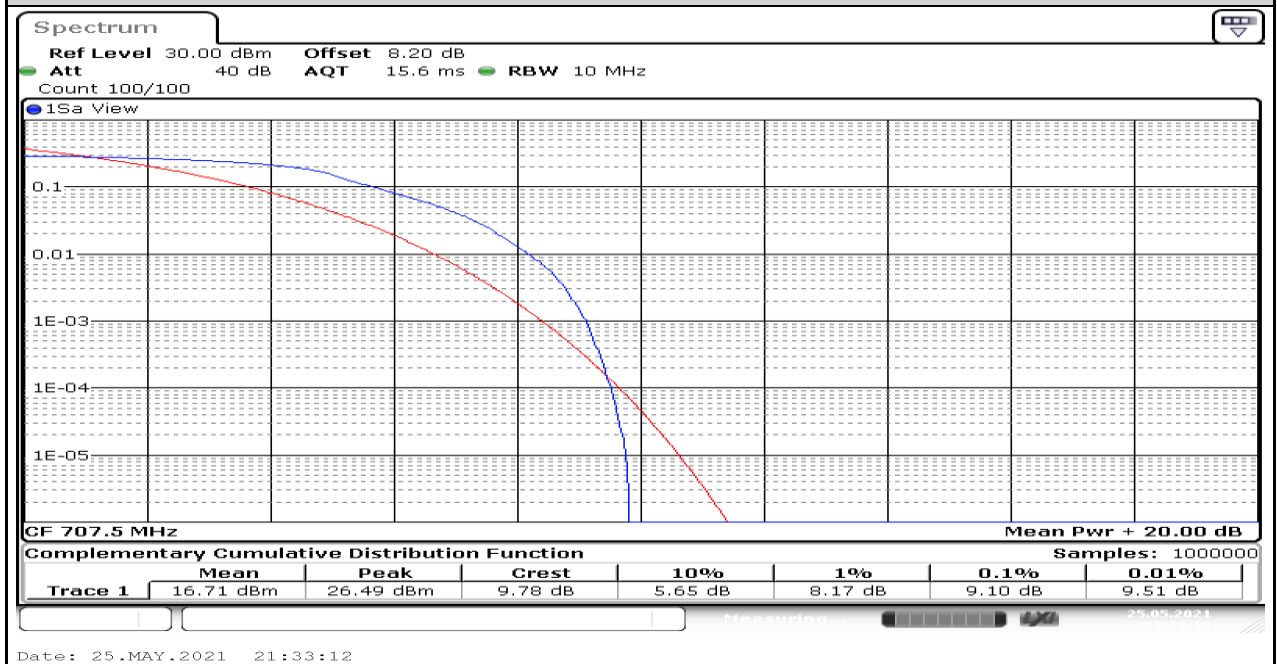
Band12-3MHz-16QAM-23095-6-0-Low-8.61-<=13-PASS



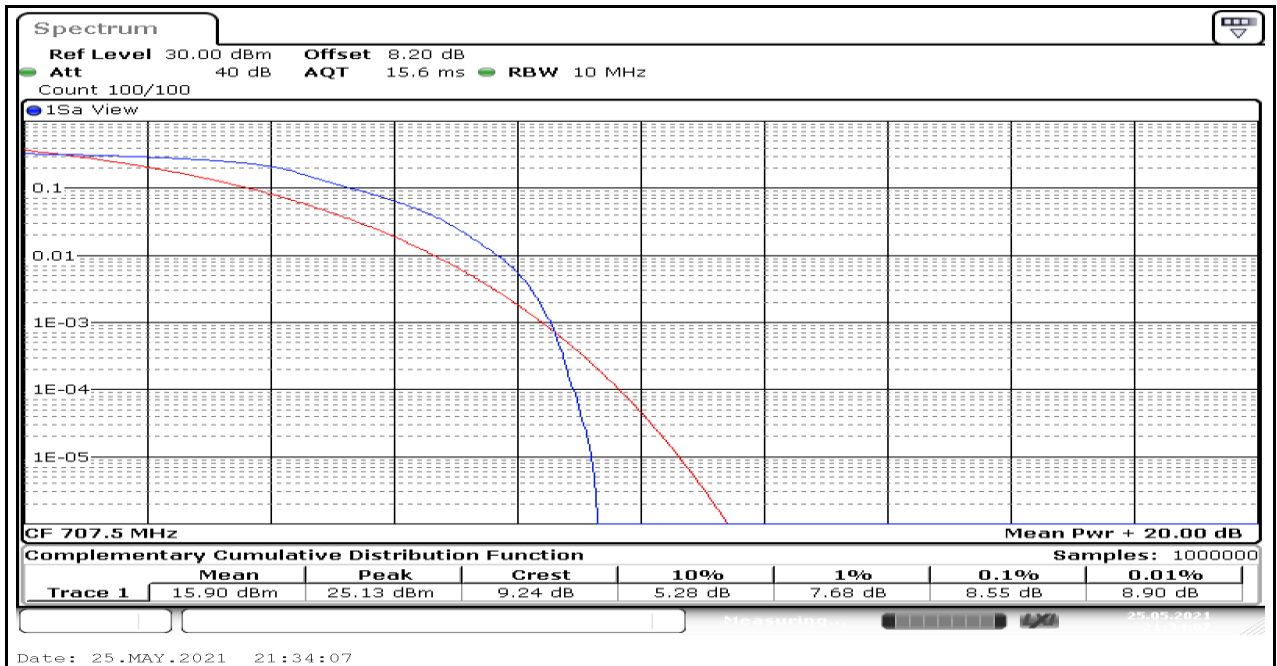
Band12-5MHz-QPSK-23095-6-0-Low-11.16-<=13-PASS



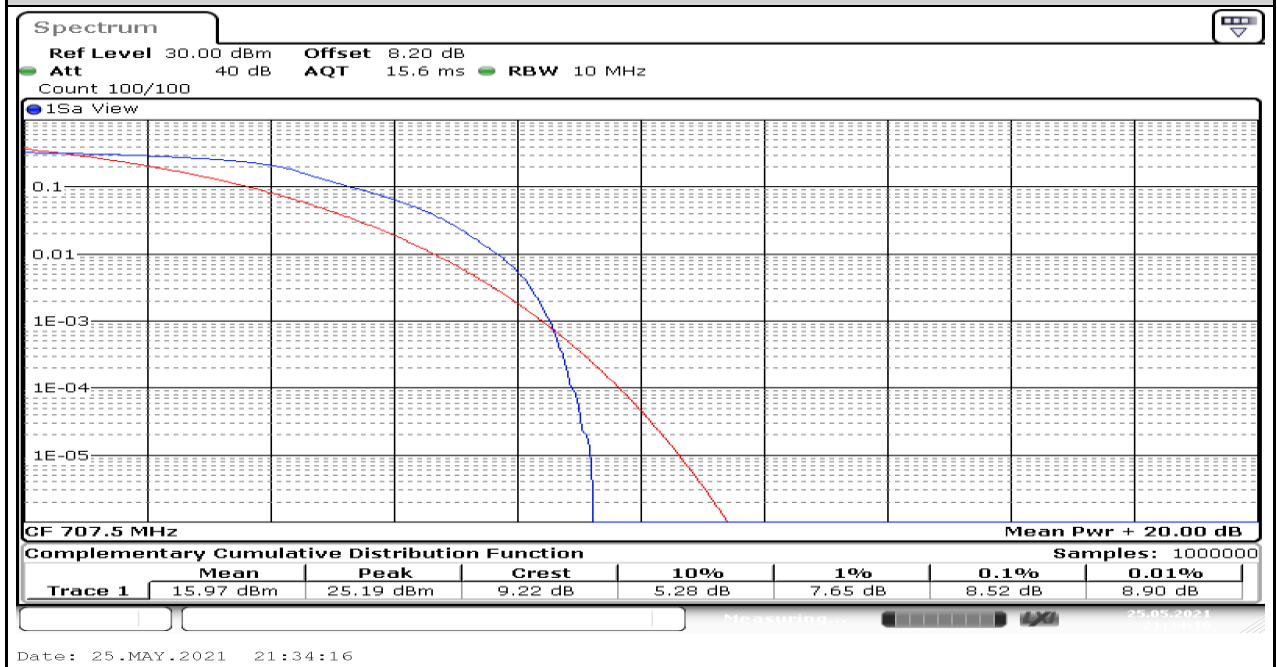
Band12-5MHz-16QAM-23095-6-0-Low-9.10-<=13-PASS



Band12-10MHz-QPSK-23095-6-0-Low-8.55-<=13-PASS



Band12-10MHz-16QAM-23095-6-0-Low-8.52-<=13-PASS

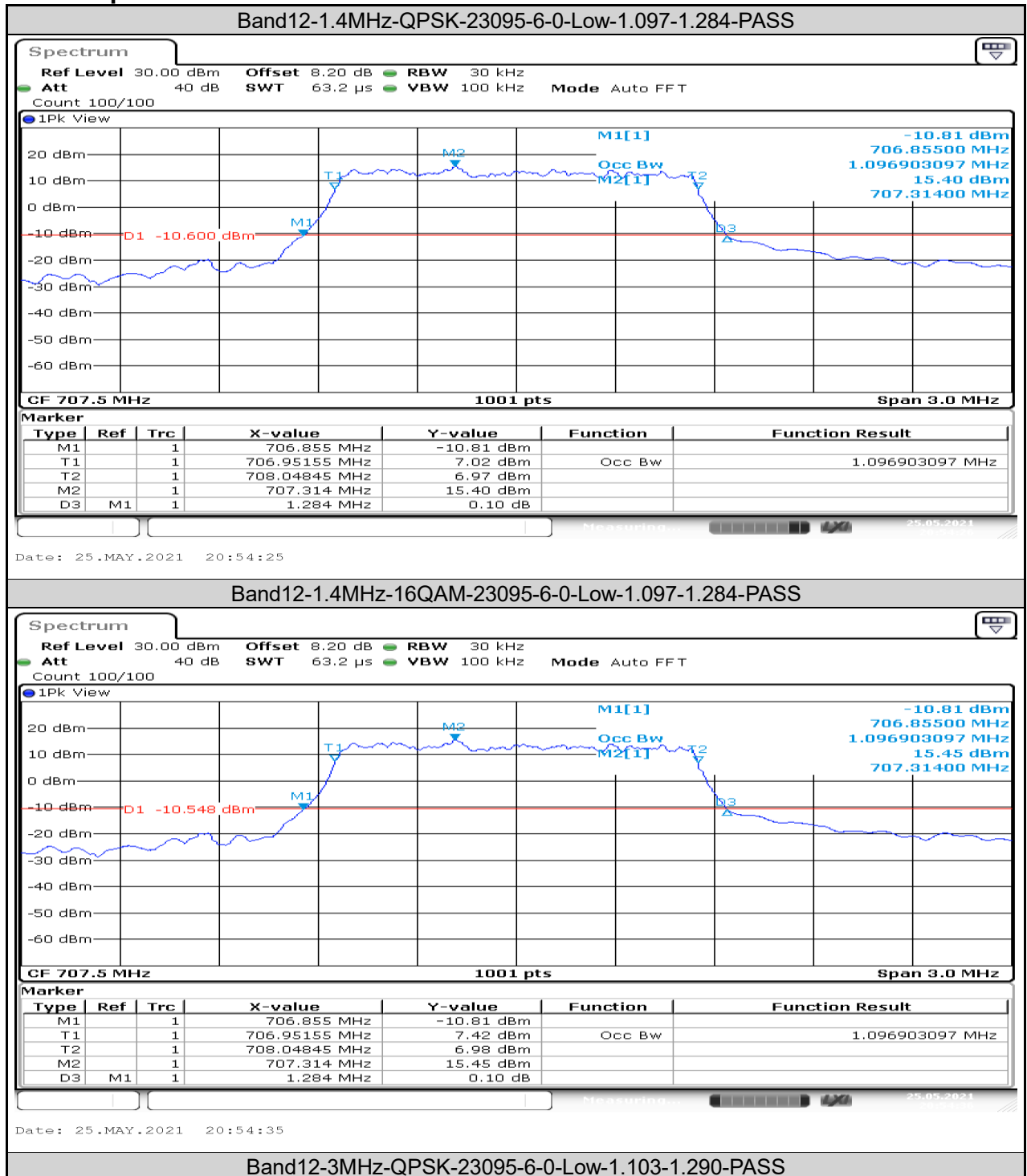


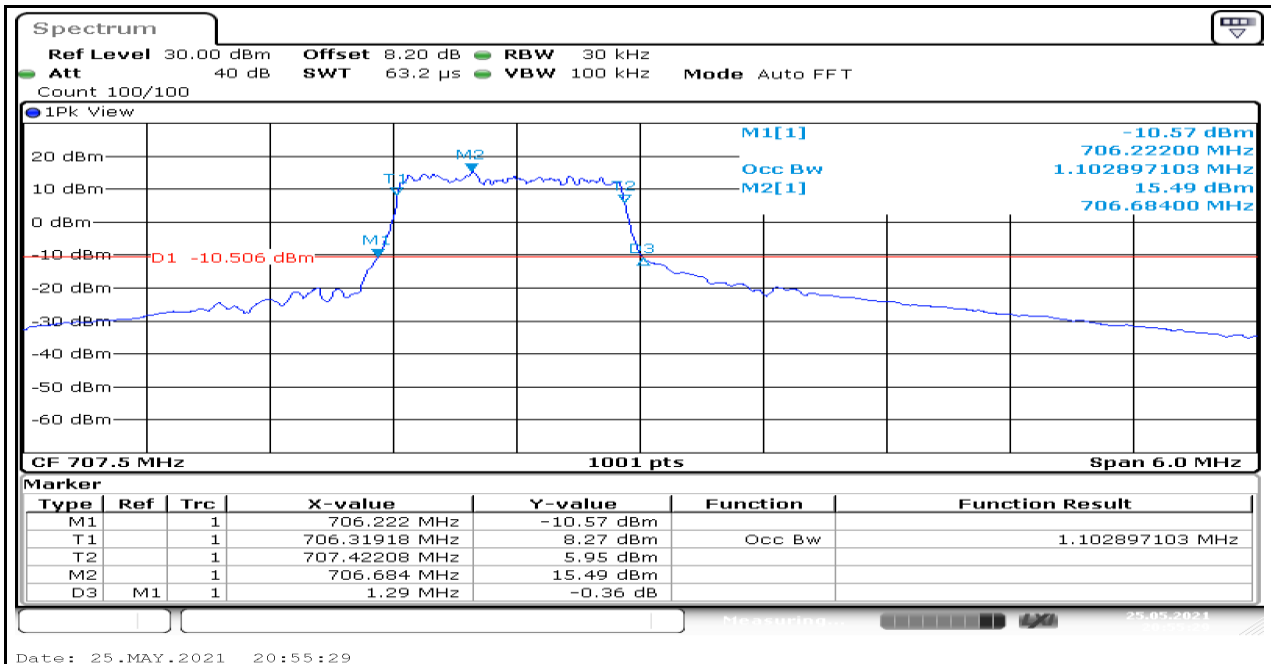
APPENDIX D.3: 26dB BANDWIDTH AND OCCUPIED BANDWIDTH FOR M1

Test Result

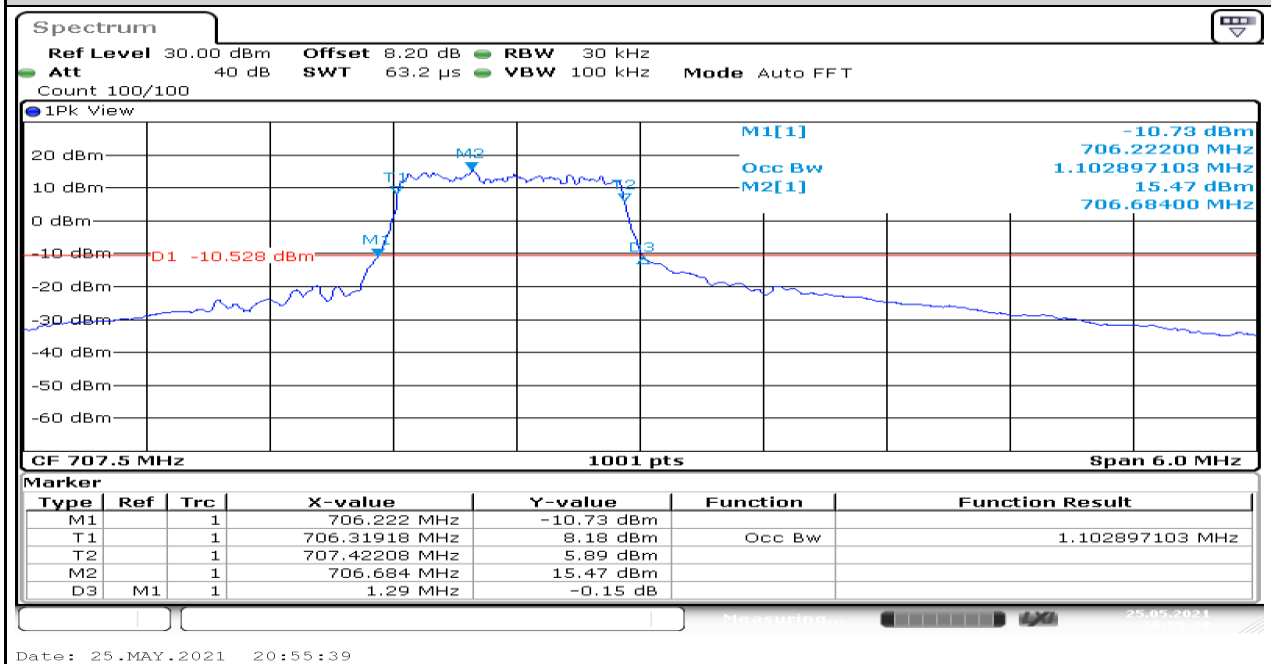
Band	Bandwidth	Channel	Modulation	RB Size	RB Start	Index	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band12	1.4MHz	23095	QPSK	6	0	Low	1.097	1.284	PASS
Band12	1.4MHz	23095	16QAM	6	0	Low	1.097	1.284	PASS
Band12	3MHz	23095	QPSK	6	0	Low	1.103	1.290	PASS
Band12	3MHz	23095	16QAM	6	0	Low	1.103	1.290	PASS
Band12	5MHz	23095	QPSK	6	0	Low	1.109	1.340	PASS
Band12	5MHz	23095	16QAM	6	0	Low	1.109	1.340	PASS
Band12	10MHz	23095	QPSK	6	0	Low	1.099	1.340	PASS
Band12	10MHz	23095	16QAM	6	0	Low	1.099	1.340	PASS

Test Graphs

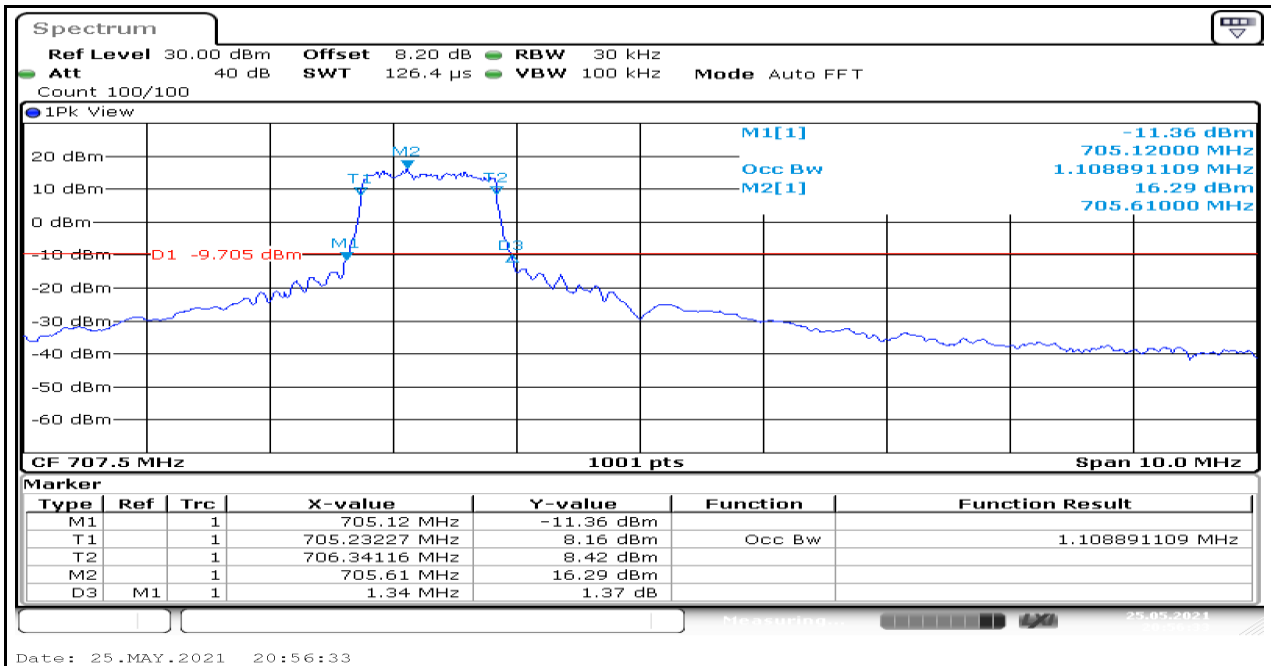




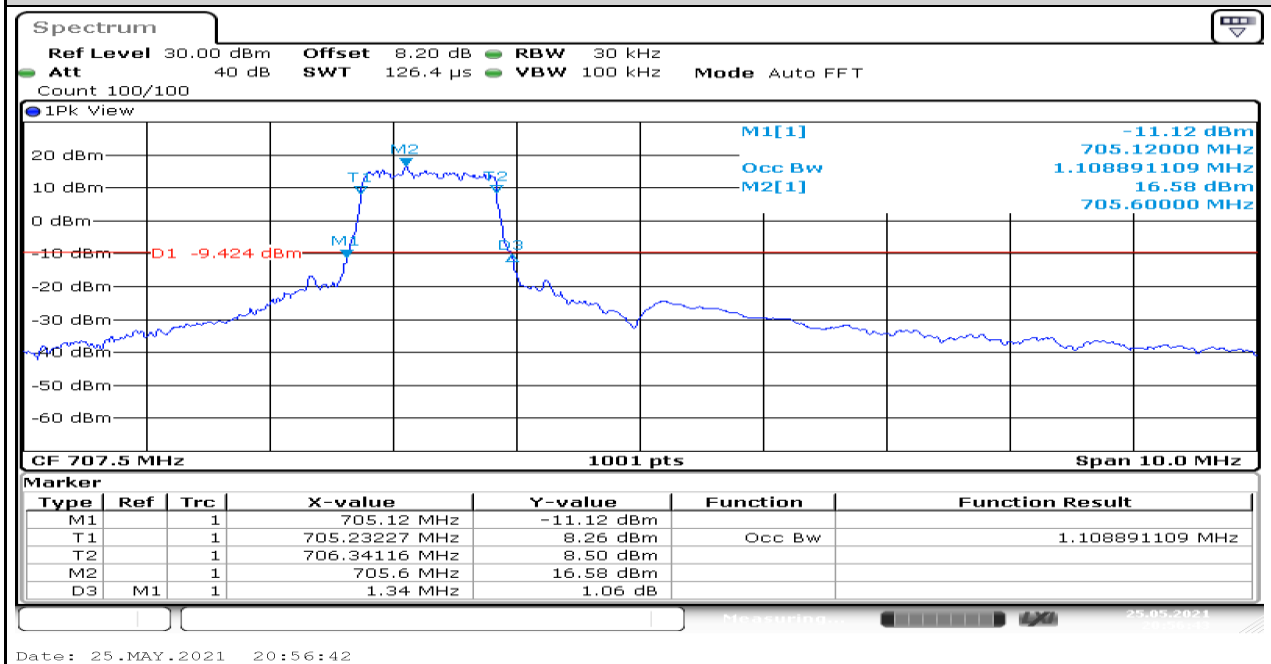
Band12-3MHz-16QAM-23095-6-0-Low-1.103-1.290-PASS



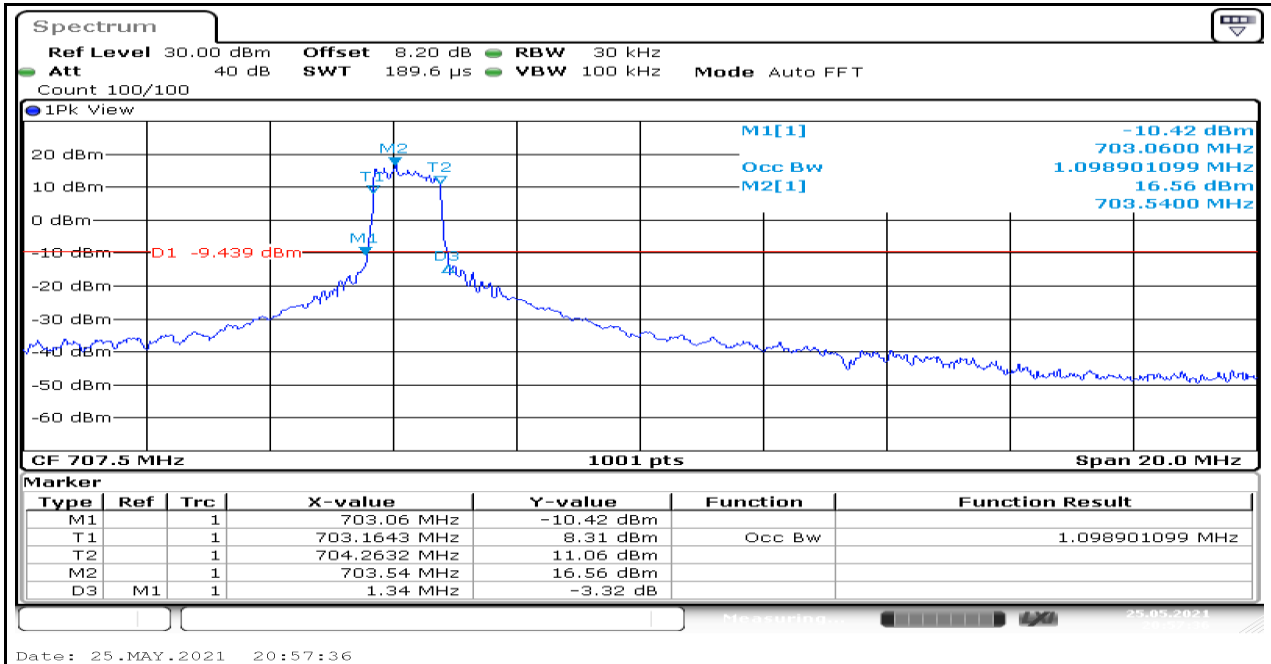
Band12-5MHz-QPSK-23095-6-0-Low-1.109-1.340-PASS



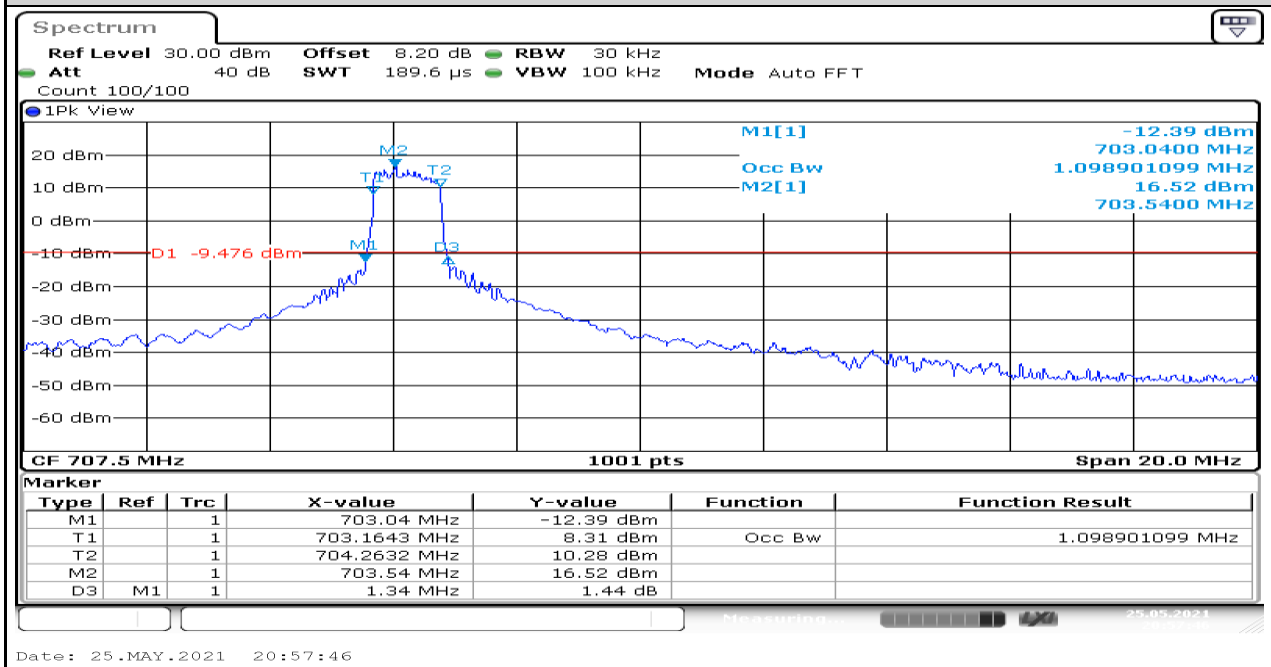
Band12-5MHz-16QAM-23095-6-0-Low-1.109-1.340-PASS



Band12-10MHz-QPSK-23095-6-0-Low-1.099-1.340-PASS



Band12-10MHz-16QAM-23095-6-0-Low-1.099-1.340-PASS

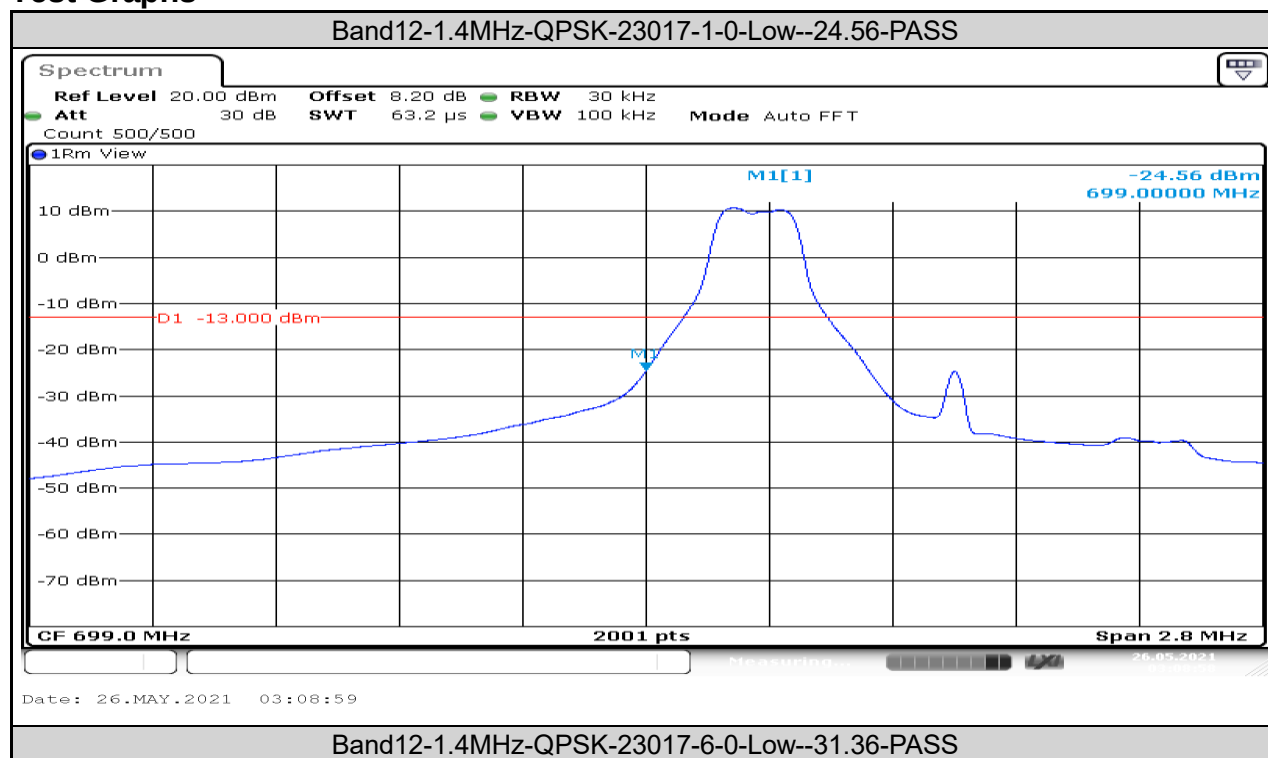


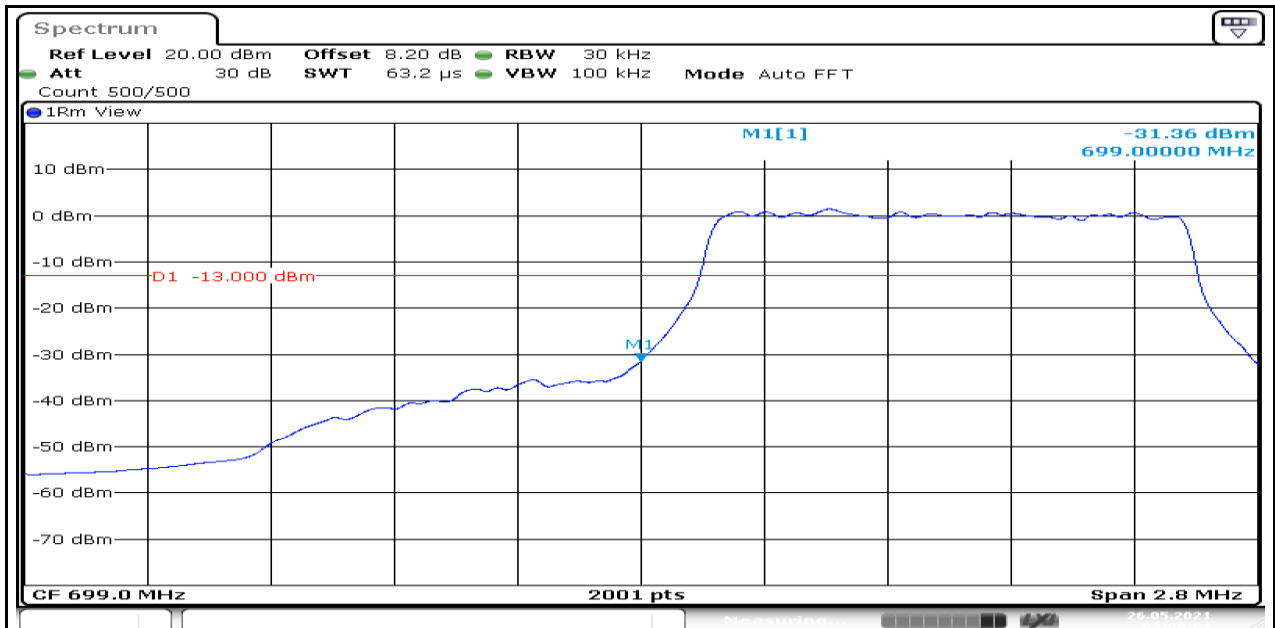
APPENDIX D.4: BAND EDGE FOR M1

Test Result

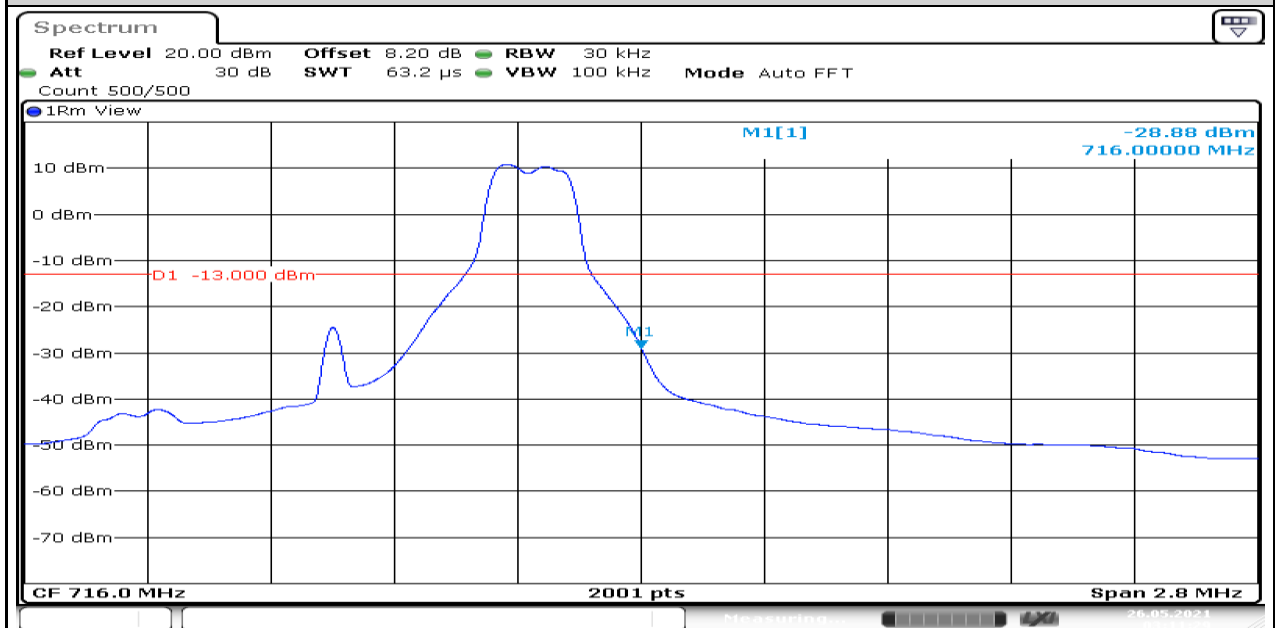
Band	Bandwidth	Channel	Modulation	RB Size	RB Start	NB Index	Result(dBm)	Verdict
Band12	1.4MHz	23017	QPSK	1	0	Low	-24.56	PASS
Band12	1.4MHz	23017	QPSK	6	0	Low	-31.36	PASS
Band12	1.4MHz	23173	QPSK	1	5	Low	-28.88	PASS
Band12	1.4MHz	23173	QPSK	6	0	Low	-31.79	PASS
Band12	1.4MHz	23017	16QAM	1	0	Low	-27.65	PASS
Band12	1.4MHz	23017	16QAM	6	0	Low	-31.79	PASS
Band12	1.4MHz	23173	16QAM	1	5	Low	-28.06	PASS
Band12	1.4MHz	23173	16QAM	6	0	Low	-32.61	PASS

Test Graphs

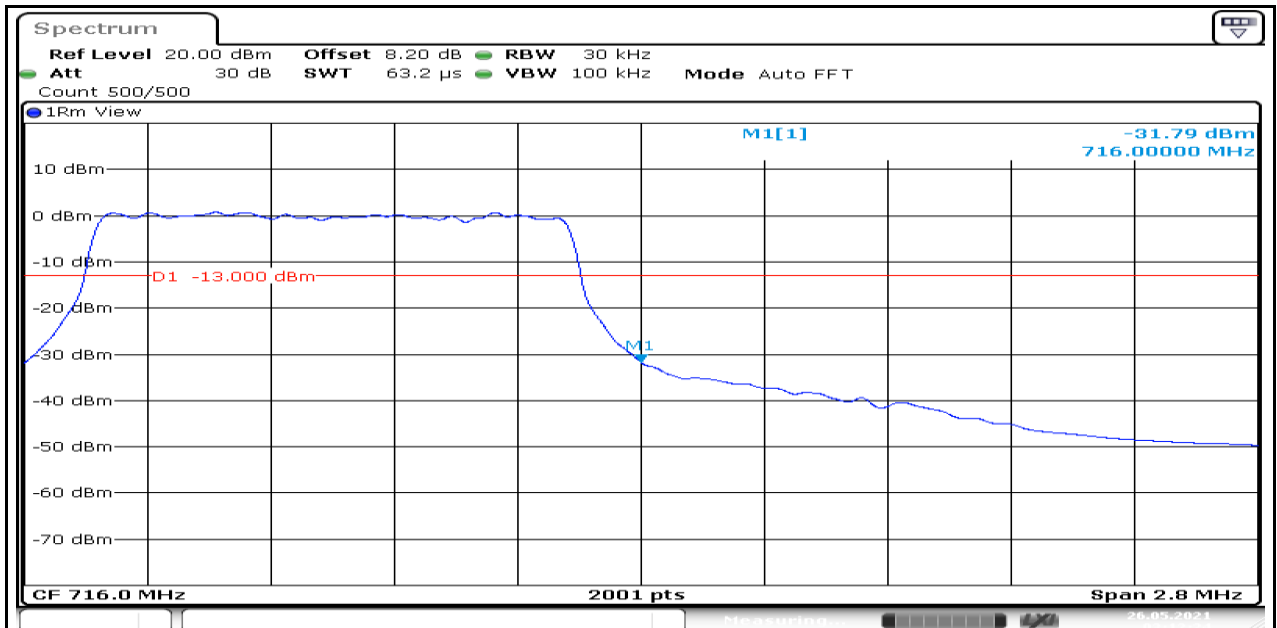




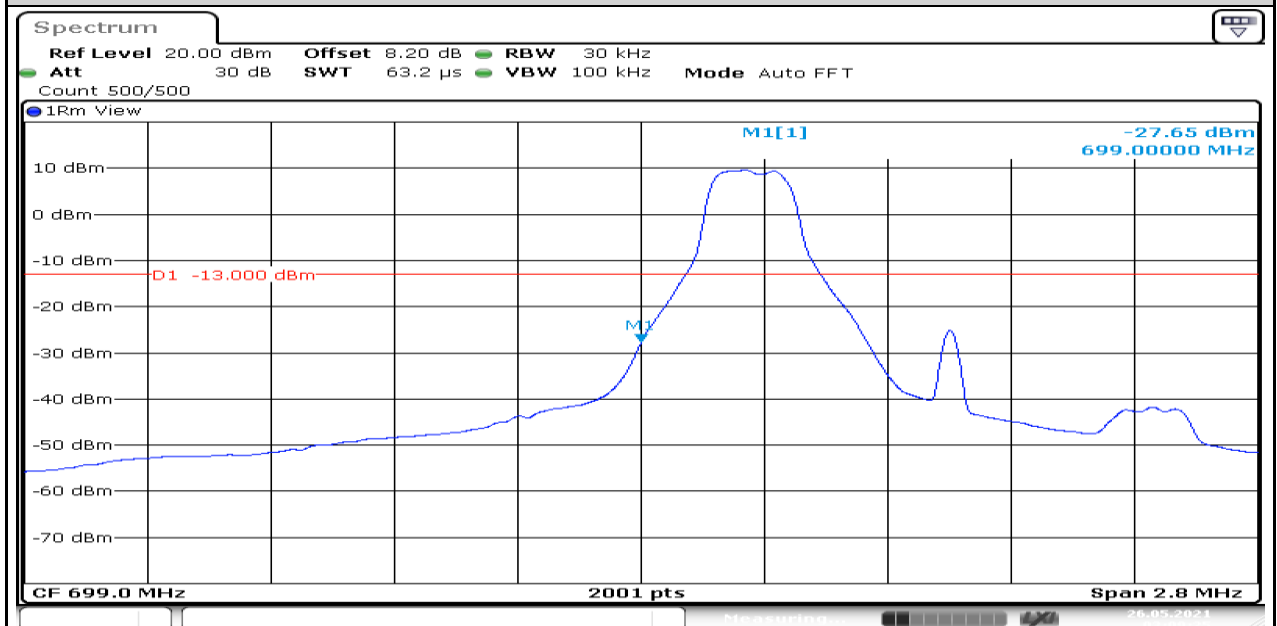
Band12-1.4MHz-QPSK-23173-1-5-Low--28.88-PASS



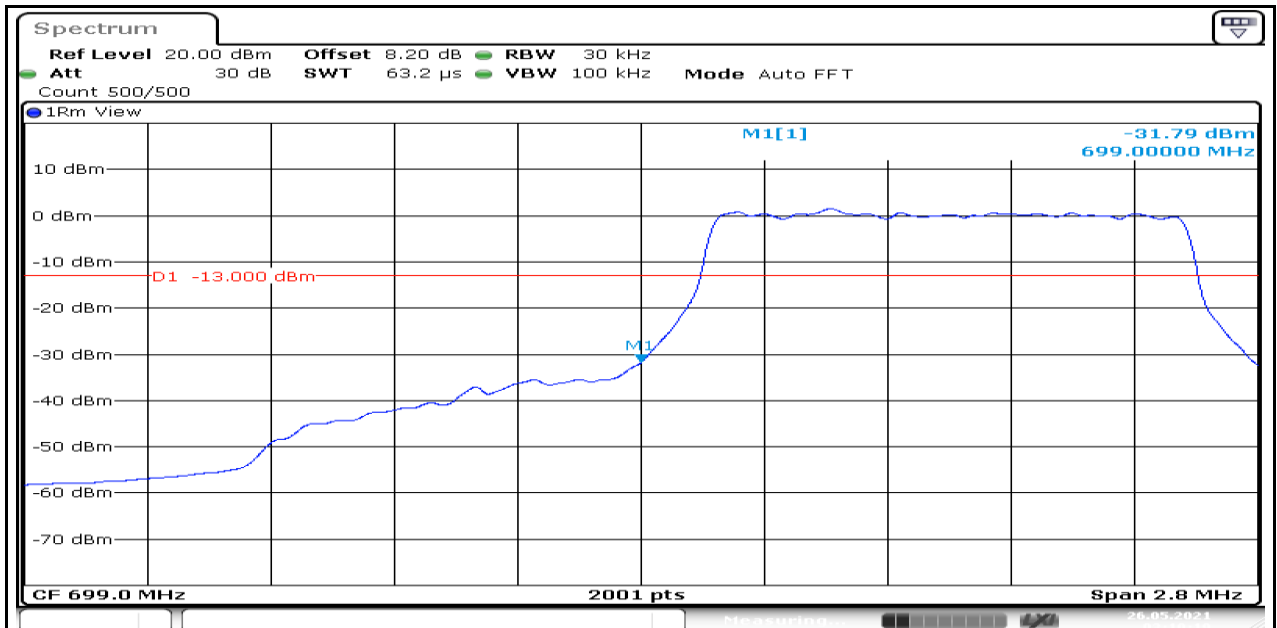
Band12-1.4MHz-QPSK-23173-6-0-Low--31.79-PASS



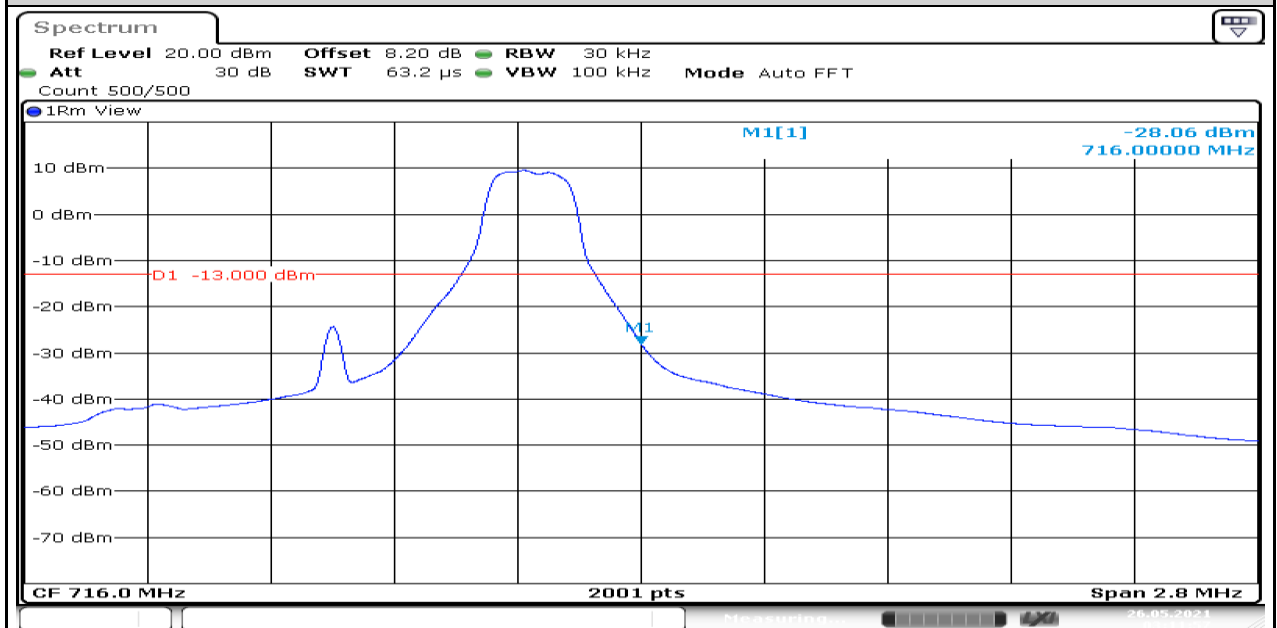
Band12-1.4MHz-16QAM-23017-1-0-Low--27.65-PASS



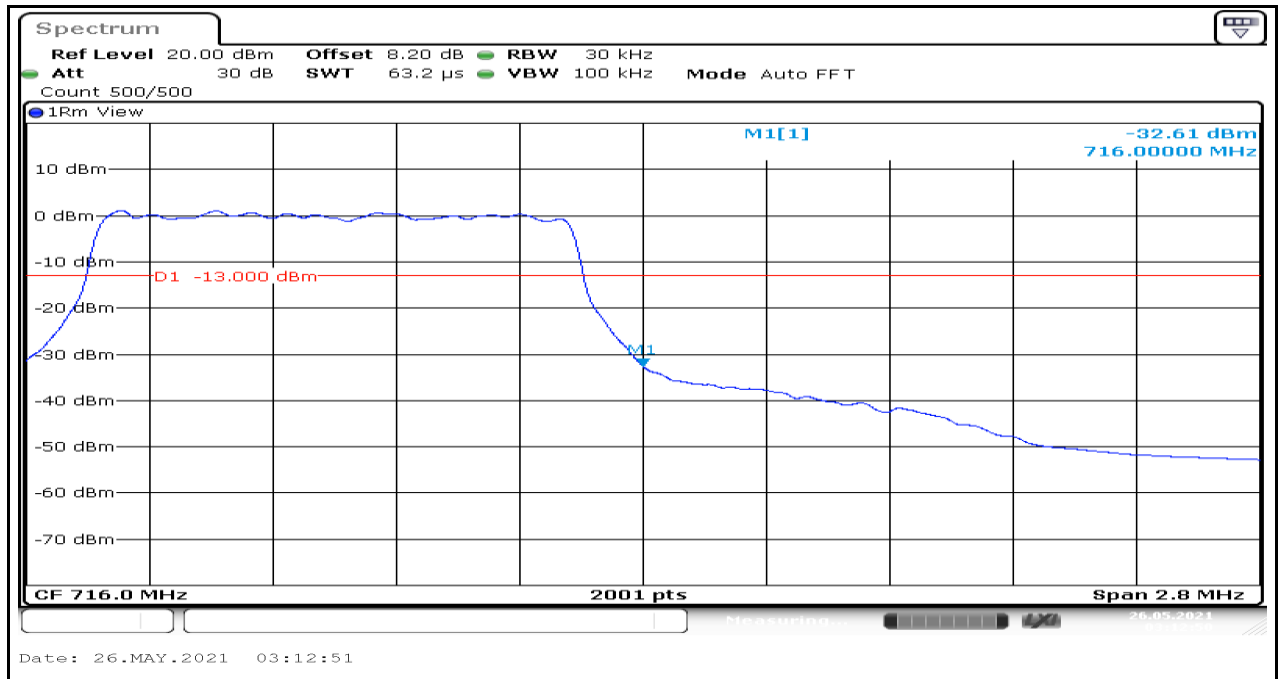
Band12-1.4MHz-16QAM-23017-6-0-Low--31.79-PASS



Band12-1.4MHz-16QAM-23173-1-5-Low--28.06-PASS



Band12-1.4MHz-16QAM-23173-6-0-Low--32.61-PASS



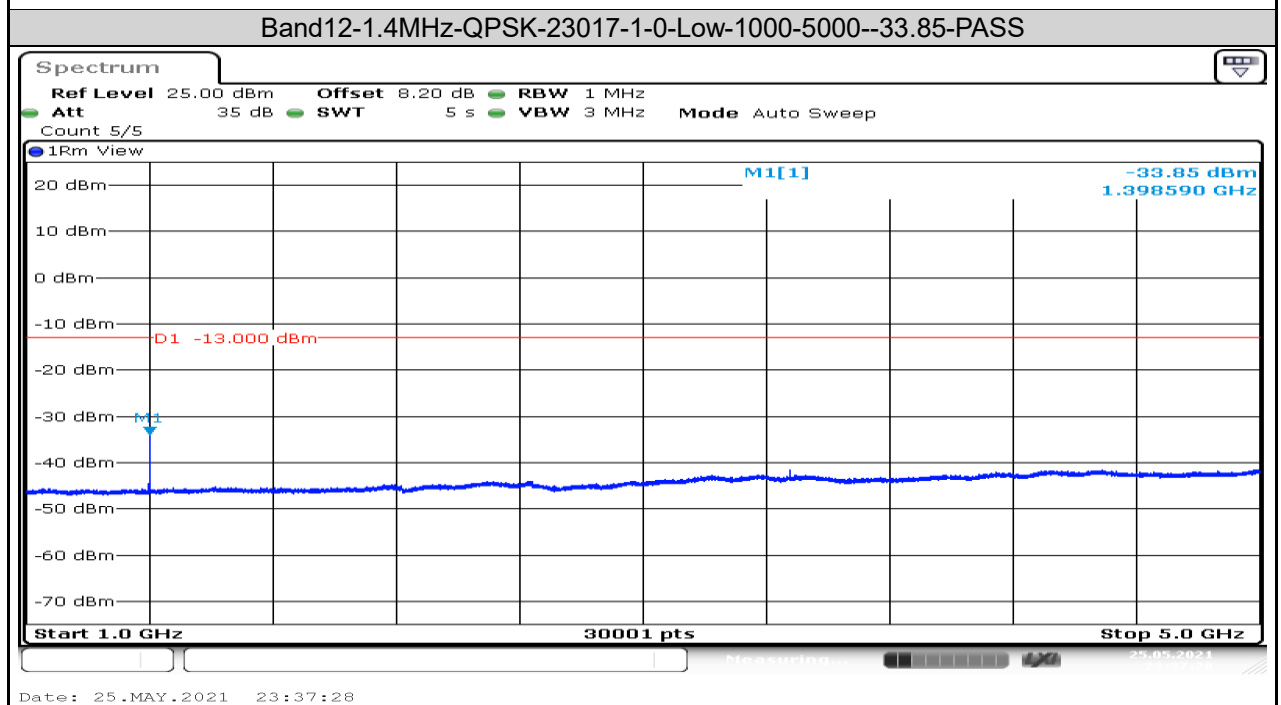
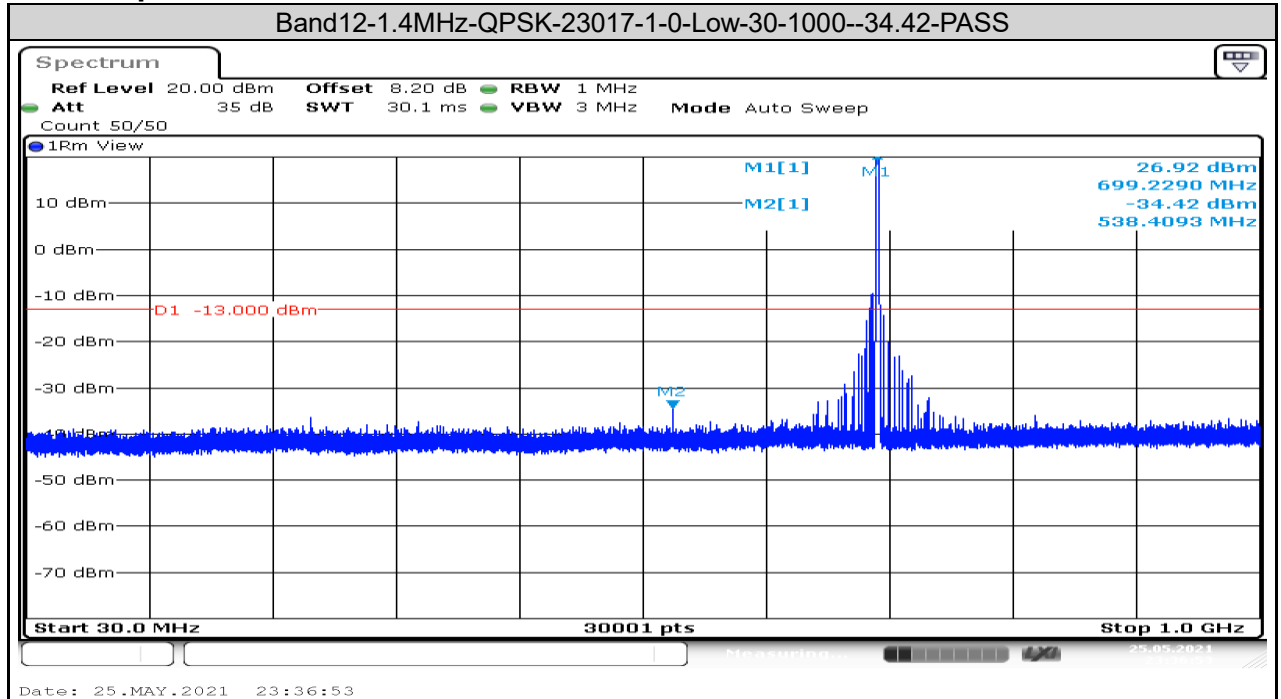
APPENDIX D.5: CONDUCTED SPURIOUS EMISSION FOR M1

Test Result

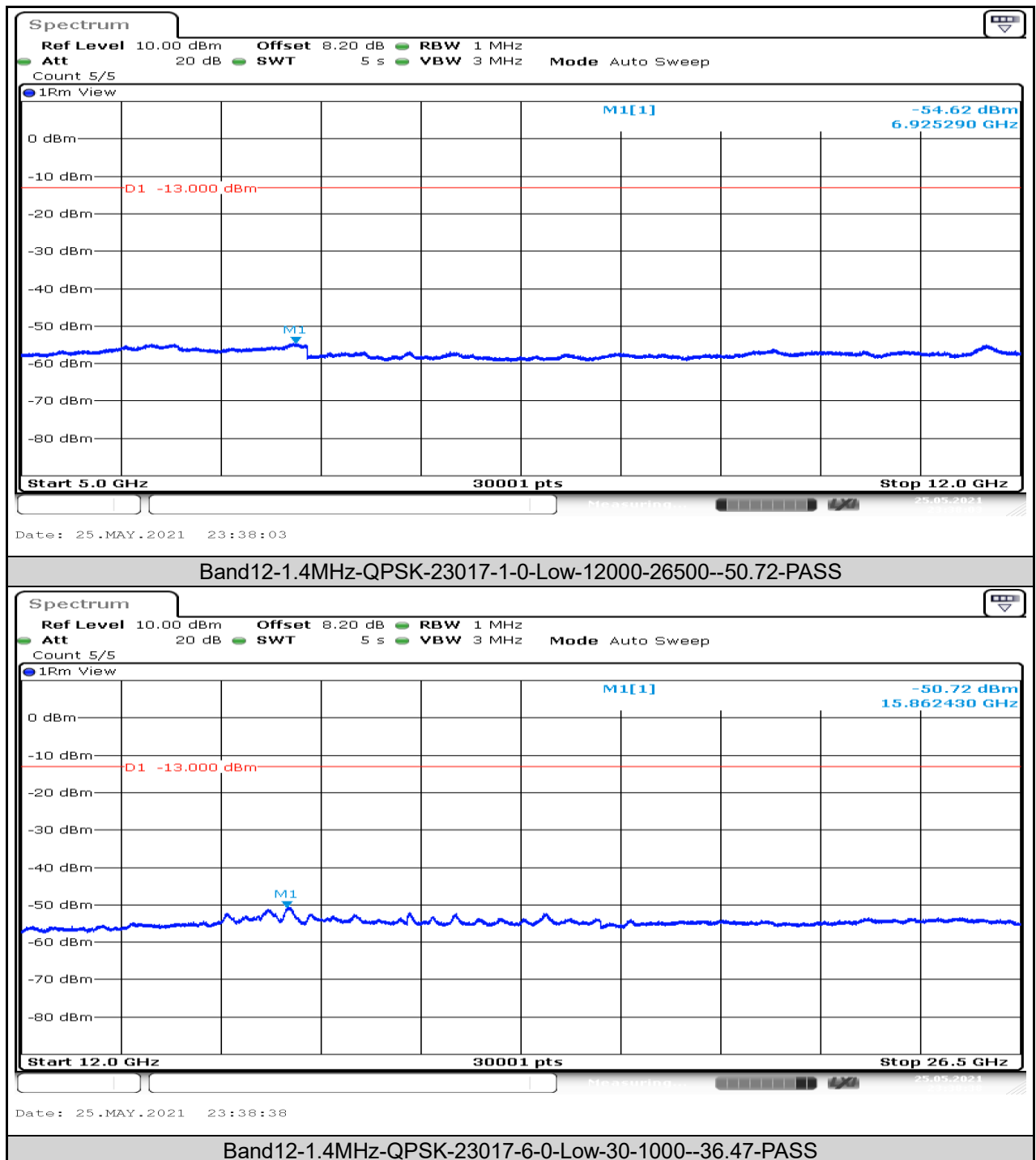
Band	Bandwidth	Channel	Modulation	RB Size	RB Start	Index	Start Freq	Stop Freq	Result (dBm)	Verdict
Band12	1.4MHz	23017	QPSK	1	0	Low	30	1000	-34.42	PASS
Band12	1.4MHz	23017	QPSK	1	0	Low	1000	5000	-33.85	PASS
Band12	1.4MHz	23017	QPSK	1	0	Low	5000	12000	-54.62	PASS
Band12	1.4MHz	23017	QPSK	1	0	Low	12000	26500	-50.72	PASS
Band12	1.4MHz	23017	QPSK	6	0	Low	30	1000	-36.47	PASS
Band12	1.4MHz	23017	QPSK	6	0	Low	1000	5000	-40.45	PASS
Band12	1.4MHz	23017	QPSK	6	0	Low	5000	12000	-54.55	PASS
Band12	1.4MHz	23017	QPSK	6	0	Low	12000	26500	-50.54	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	30	1000	-36.13	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	1000	5000	-36.56	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	5000	12000	-54.53	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	12000	26500	-50.63	PASS
Band12	1.4MHz	23095	QPSK	6	0	Low	30	1000	-36.39	PASS
Band12	1.4MHz	23095	QPSK	6	0	Low	1000	5000	-41.41	PASS
Band12	1.4MHz	23095	QPSK	6	0	Low	5000	12000	-54.46	PASS
Band12	1.4MHz	23095	QPSK	6	0	Low	12000	26500	-50.41	PASS
Band12	1.4MHz	23173	QPSK	1	5	Low	30	1000	-36.64	PASS
Band12	1.4MHz	23173	QPSK	1	5	Low	1000	5000	-38.96	PASS
Band12	1.4MHz	23173	QPSK	1	5	Low	5000	12000	-54.47	PASS
Band12	1.4MHz	23173	QPSK	1	5	Low	12000	26500	-50.54	PASS
Band12	1.4MHz	23173	QPSK	6	0	Low	30	1000	-36.78	PASS
Band12	1.4MHz	23173	QPSK	6	0	Low	1000	5000	-40.99	PASS
Band12	1.4MHz	23173	QPSK	6	0	Low	5000	12000	-54.63	PASS
Band12	1.4MHz	23173	QPSK	6	0	Low	12000	26500	-50.48	PASS
Band12	1.4MHz	23017	16QAM	1	0	Low	30	1000	-36.74	PASS
Band12	1.4MHz	23017	16QAM	1	0	Low	1000	5000	-35.44	PASS
Band12	1.4MHz	23017	16QAM	1	0	Low	5000	12000	-54.44	PASS
Band12	1.4MHz	23017	16QAM	1	0	Low	12000	26500	-50.45	PASS
Band12	1.4MHz	23017	16QAM	6	0	Low	30	1000	-36.74	PASS
Band12	1.4MHz	23017	16QAM	6	0	Low	1000	5000	-40.86	PASS
Band12	1.4MHz	23017	16QAM	6	0	Low	5000	12000	-54.47	PASS
Band12	1.4MHz	23017	16QAM	6	0	Low	12000	26500	-50.58	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	30	1000	-36.73	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	1000	5000	-36.93	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	5000	12000	-54.36	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	12000	26500	-50.56	PASS
Band12	1.4MHz	23095	16QAM	6	0	Low	30	1000	-36.25	PASS
Band12	1.4MHz	23095	16QAM	6	0	Low	1000	5000	-41.41	PASS
Band12	1.4MHz	23095	16QAM	6	0	Low	5000	12000	-54.38	PASS
Band12	1.4MHz	23095	16QAM	6	0	Low	12000	26500	-50.68	PASS
Band12	1.4MHz	23173	16QAM	1	5	Low	30	1000	-35.63	PASS
Band12	1.4MHz	23173	16QAM	1	5	Low	1000	5000	-40.45	PASS
Band12	1.4MHz	23173	16QAM	1	5	Low	5000	12000	-54.47	PASS
Band12	1.4MHz	23173	16QAM	1	5	Low	12000	26500	-50.56	PASS
Band12	1.4MHz	23173	16QAM	6	0	Low	30	1000	-35.46	PASS

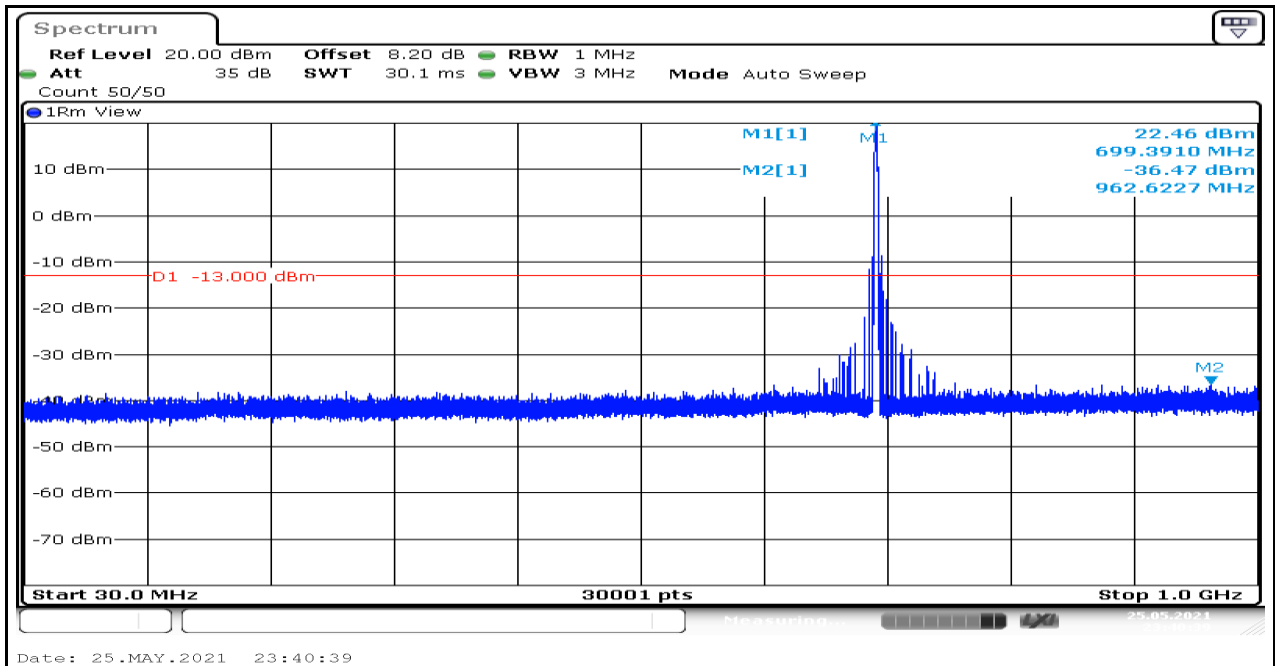
Band12	1.4MHz	23173	16QAM	6	0	Low	1000	5000	-41.42	PASS
Band12	1.4MHz	23173	16QAM	6	0	Low	5000	12000	-54.44	PASS
Band12	1.4MHz	23173	16QAM	6	0	Low	12000	26500	-50.53	PASS

Test Graphs

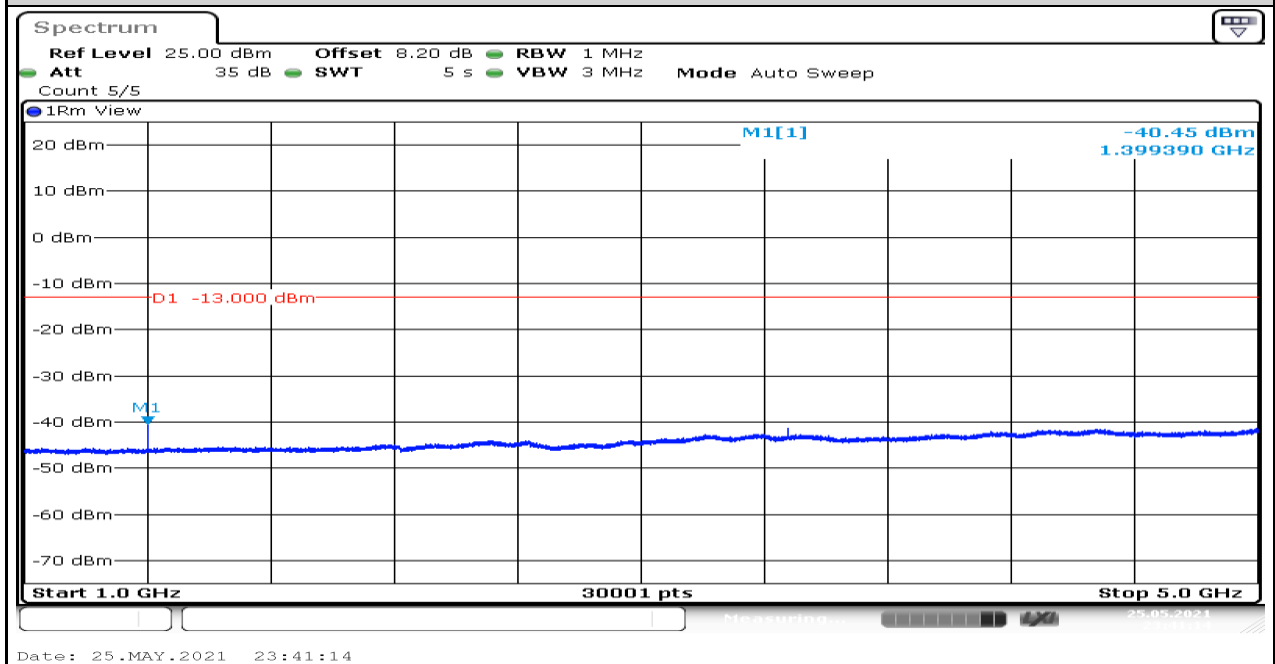


Band12-1.4MHz-QPSK-23017-1-0-Low-5000-12000--54.62-PASS

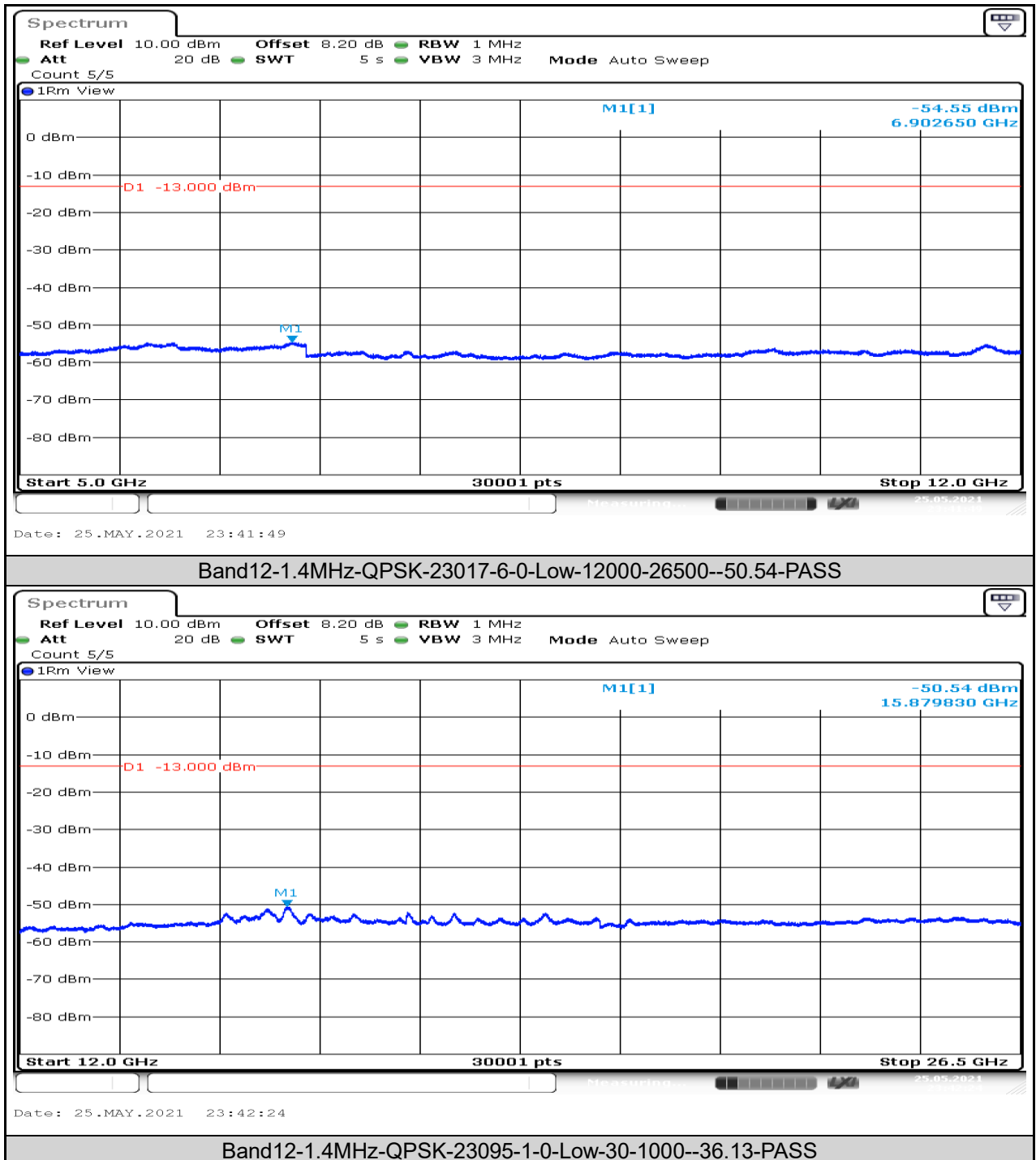


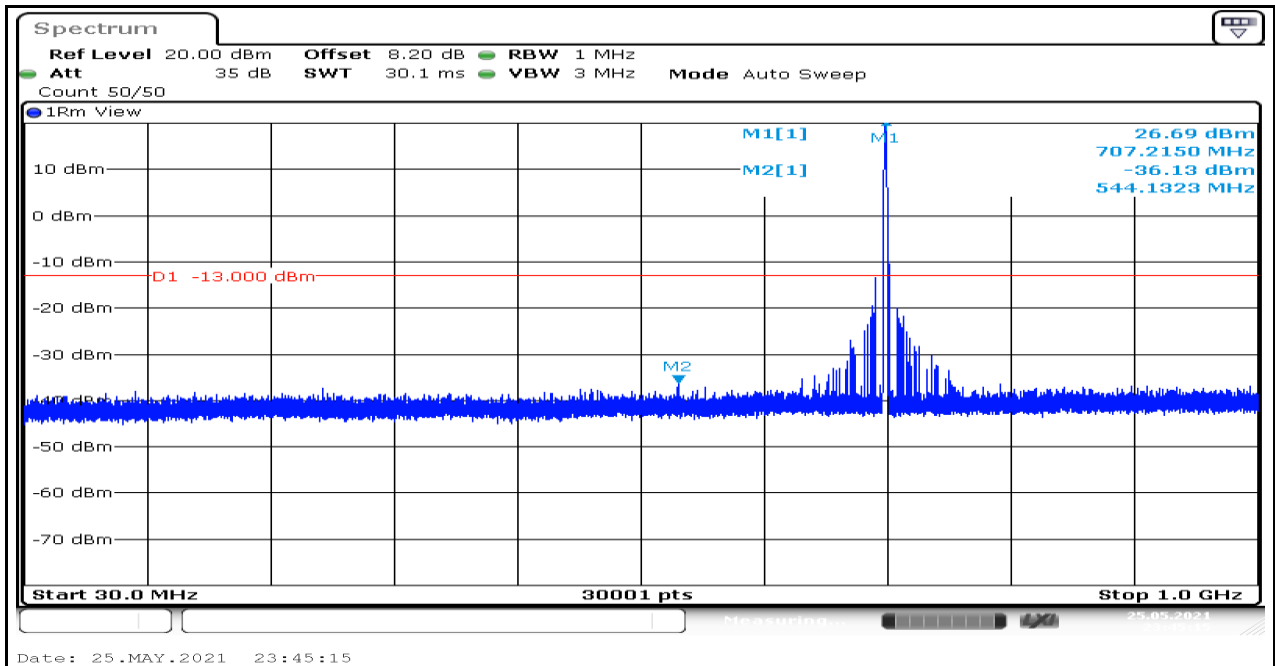


Band12-1.4MHz-QPSK-23017-6-0-Low-1000-5000--40.45-PASS

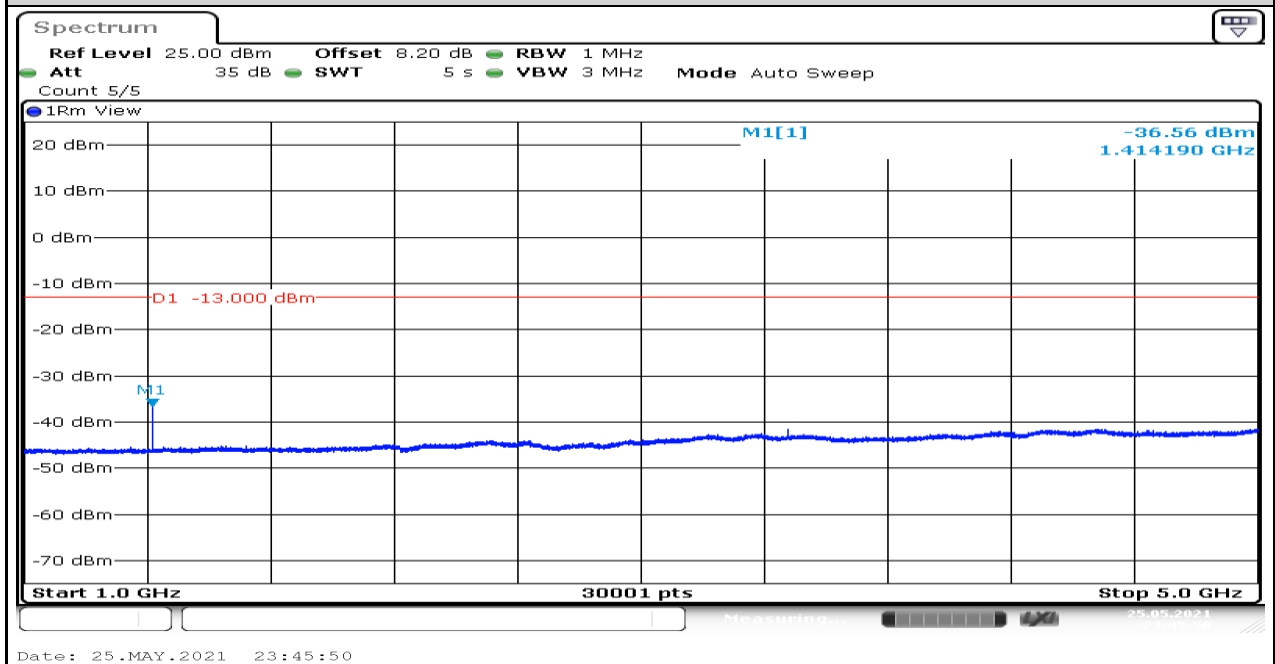


Band12-1.4MHz-QPSK-23017-6-0-Low-5000-12000--54.55-PASS

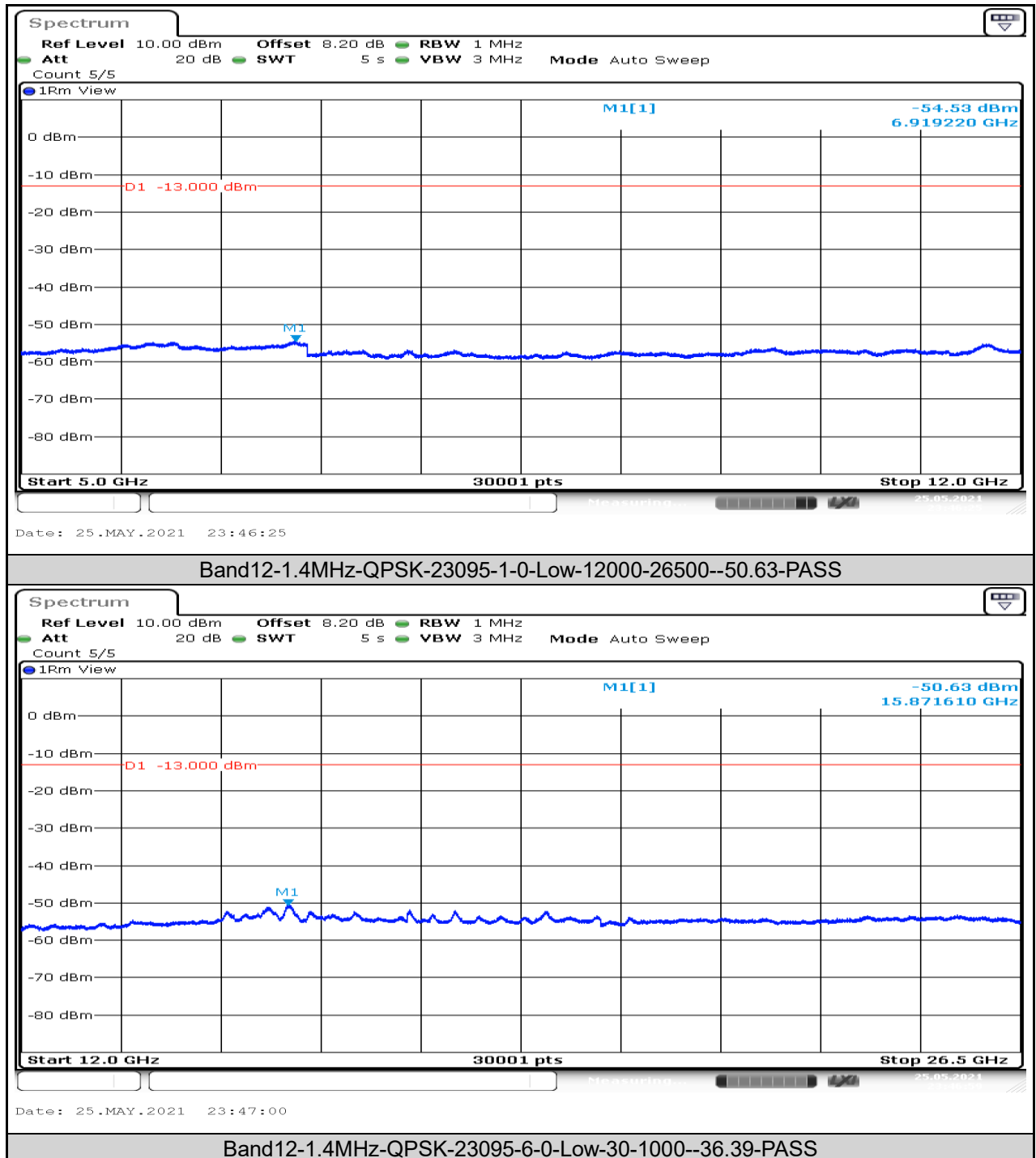


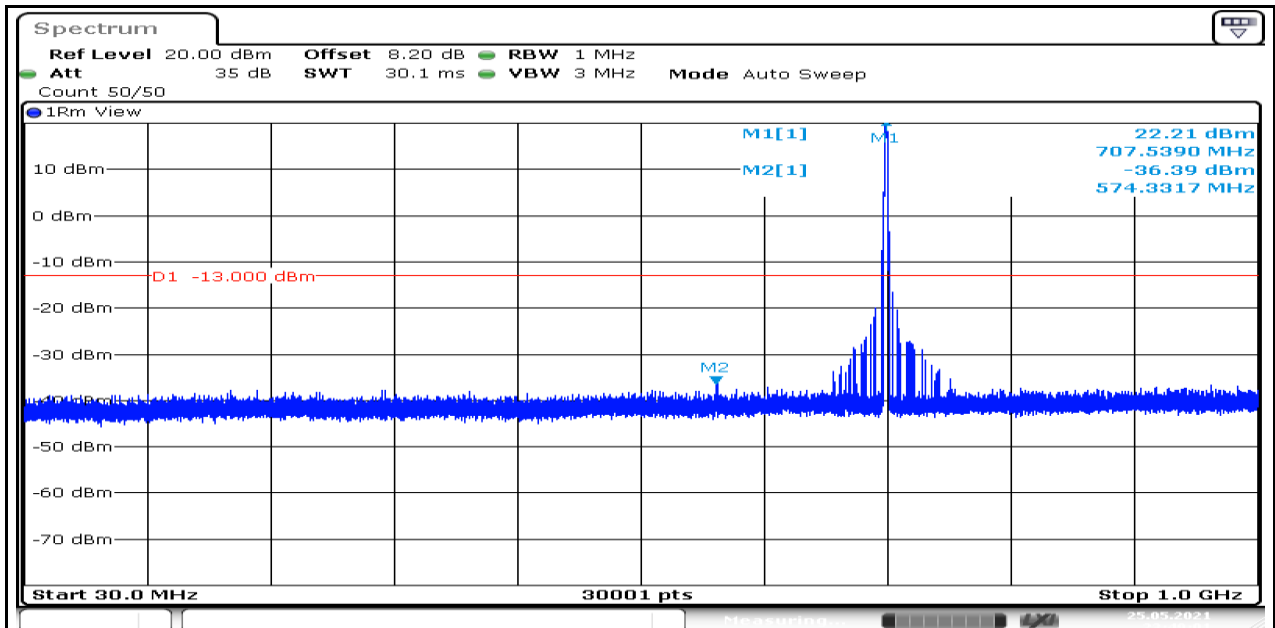


Band12-1.4MHz-QPSK-23095-1-0-Low-1000-5000--36.56-PASS

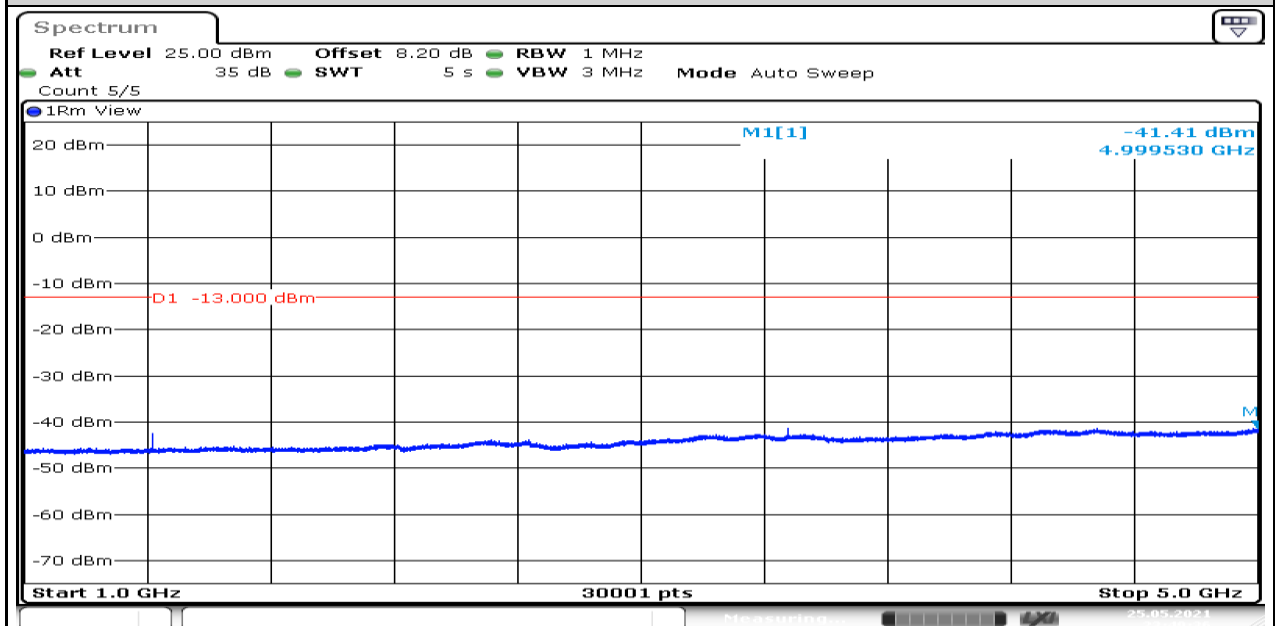


Band12-1.4MHz-QPSK-23095-1-0-Low-5000-12000--54.53-PASS

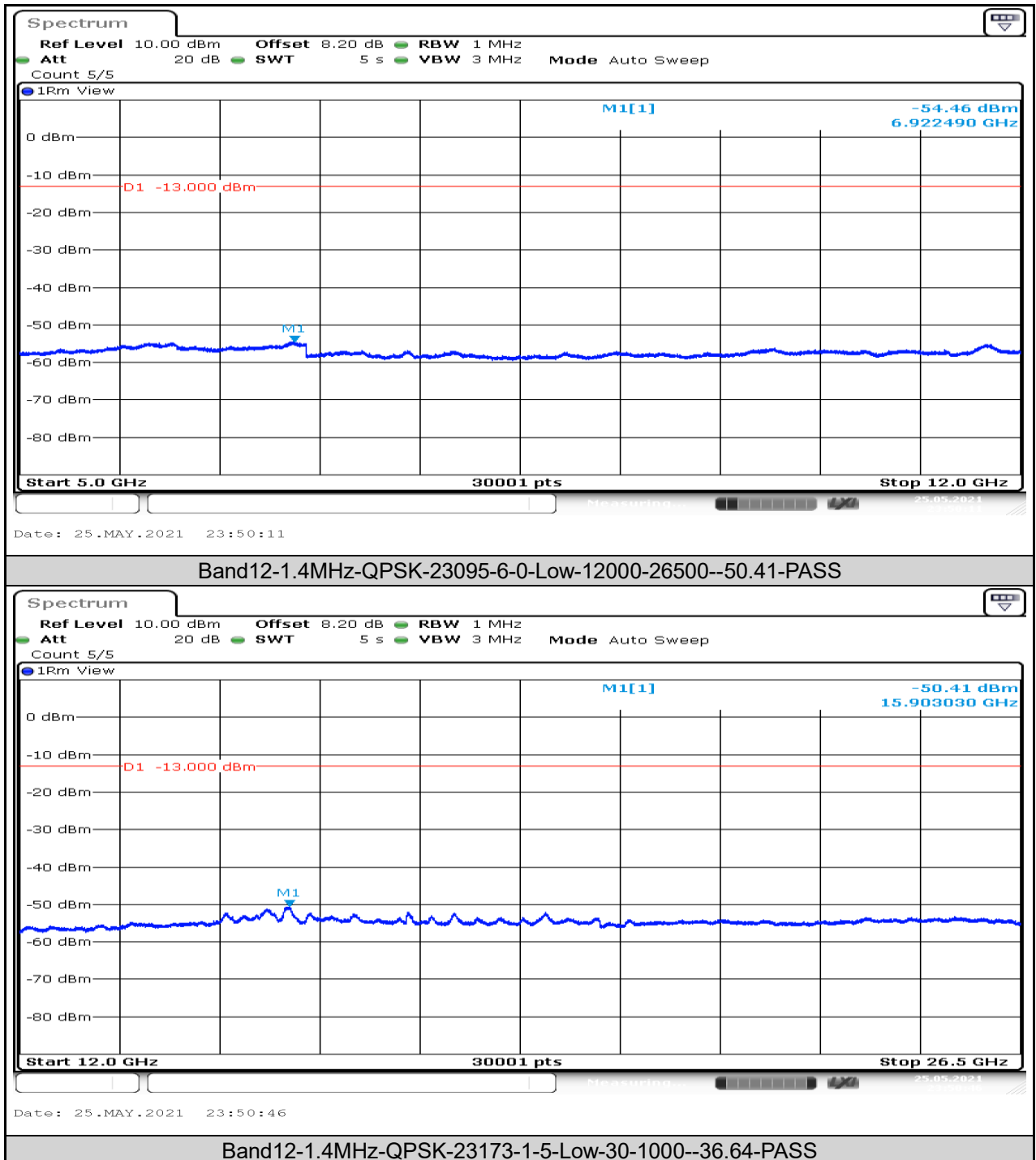


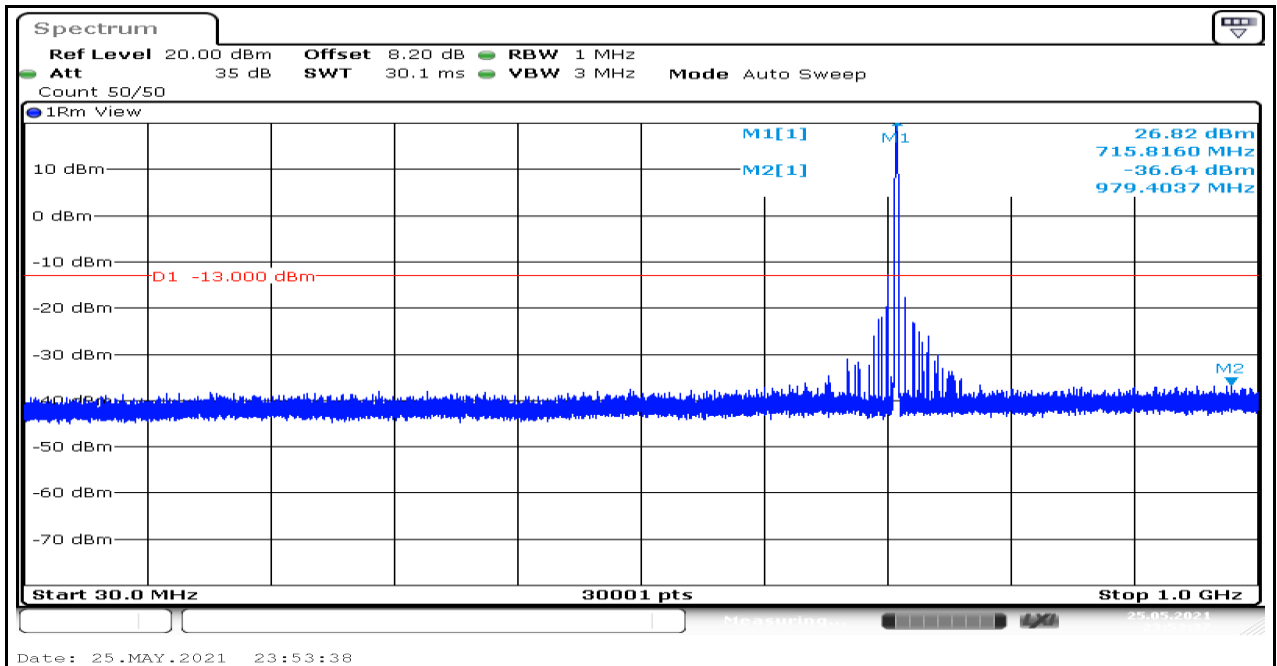


Band12-1.4MHz-QPSK-23095-6-0-Low-1000-5000--41.41-PASS

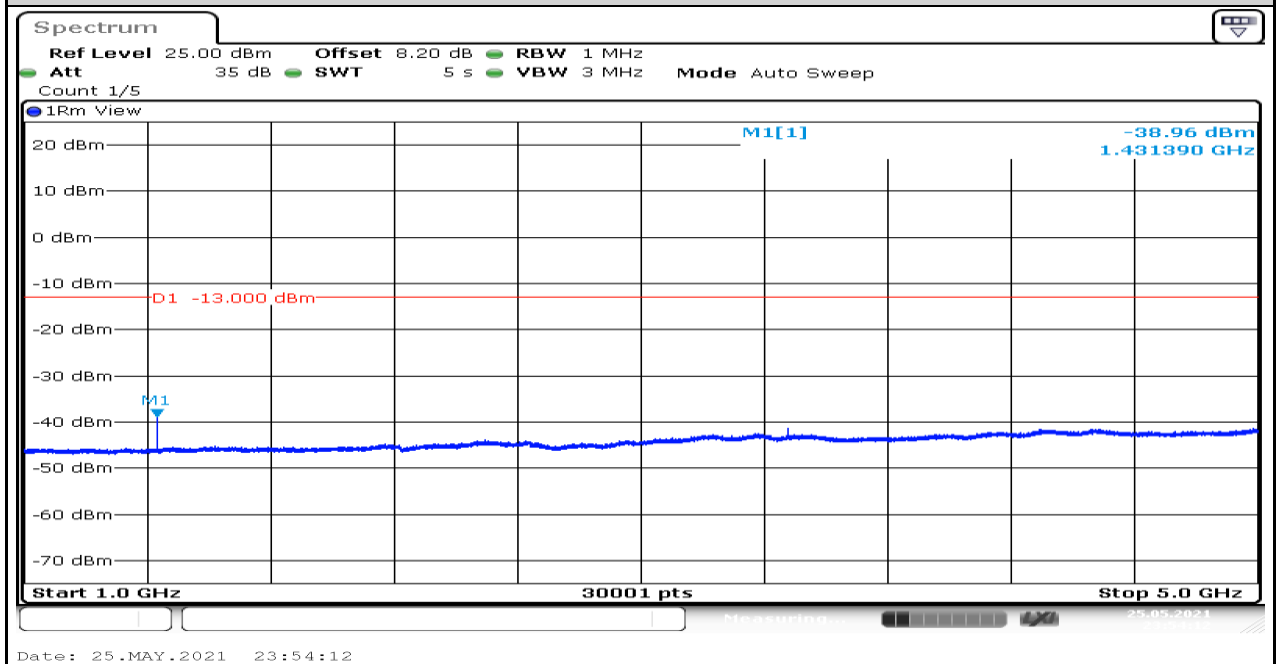


Band12-1.4MHz-QPSK-23095-6-0-Low-5000-12000--54.46-PASS

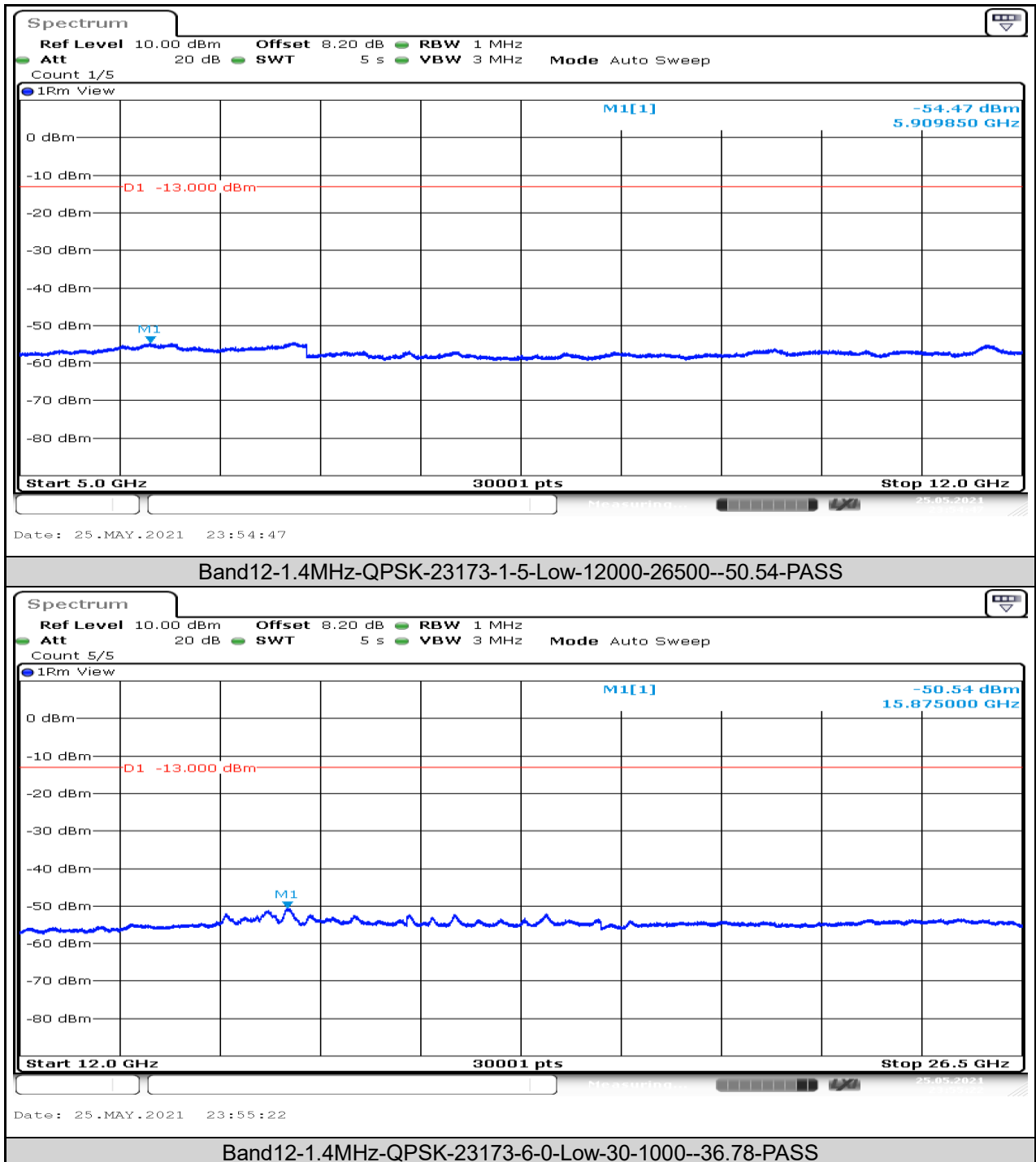


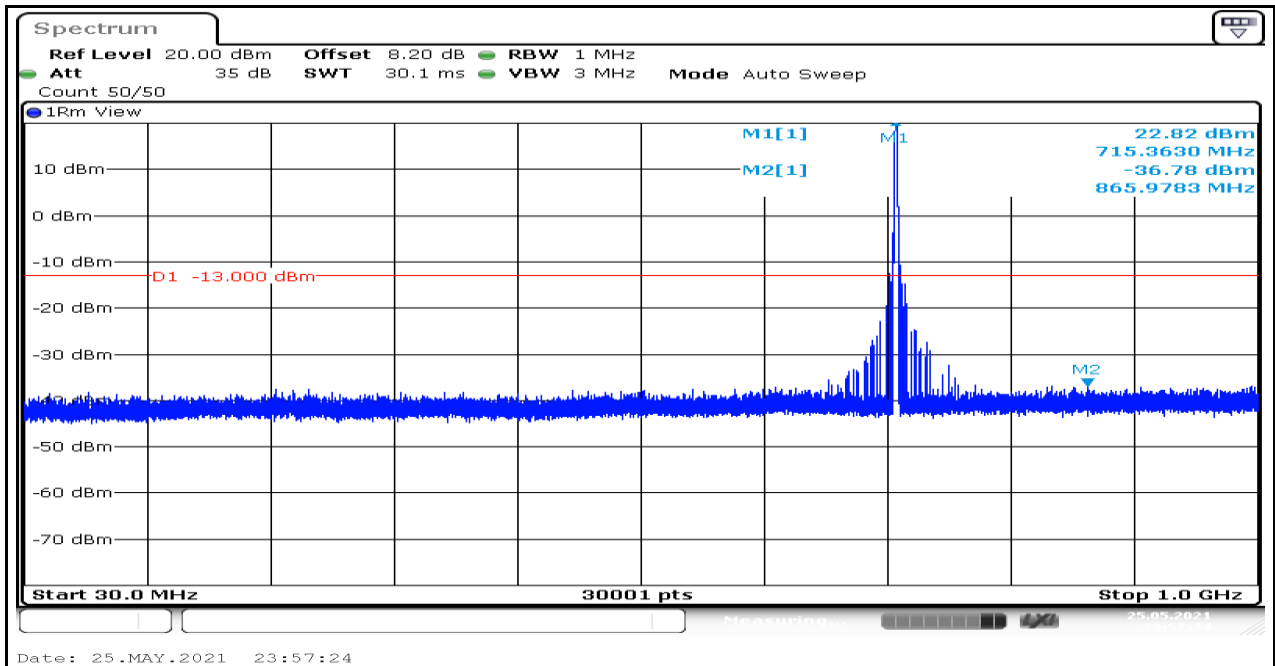


Band12-1.4MHz-QPSK-23173-1-5-Low-1000-5000--38.96-PASS

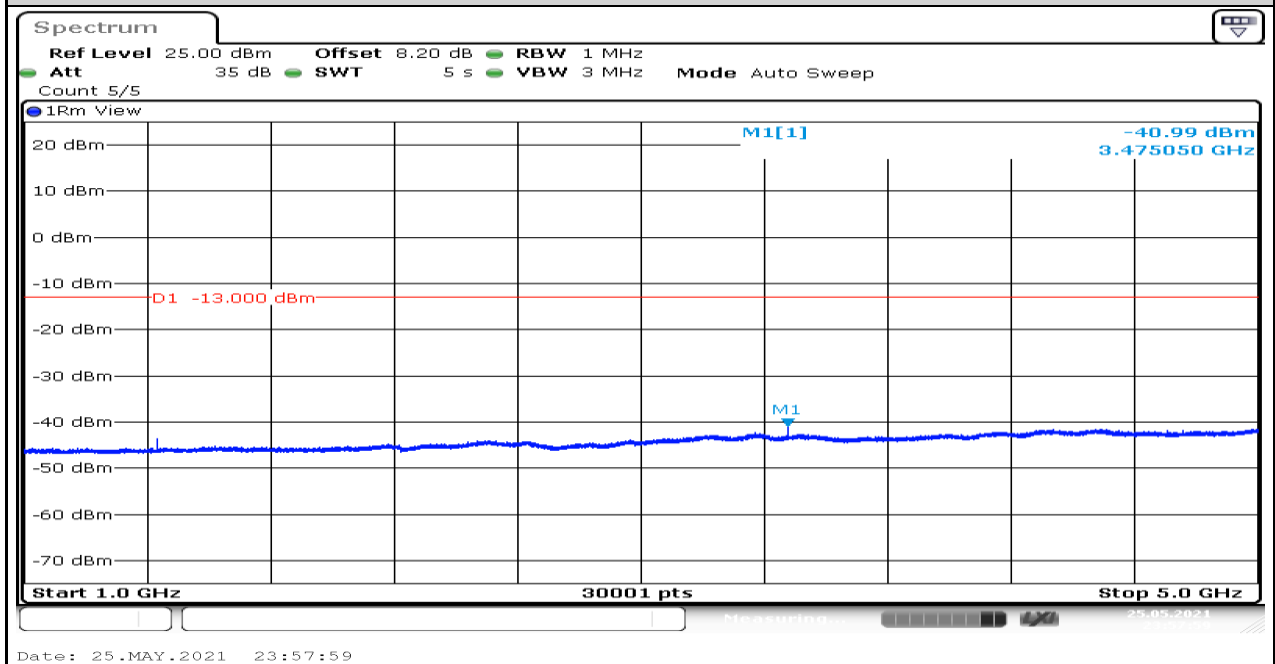


Band12-1.4MHz-QPSK-23173-1-5-Low-5000-12000--54.47-PASS

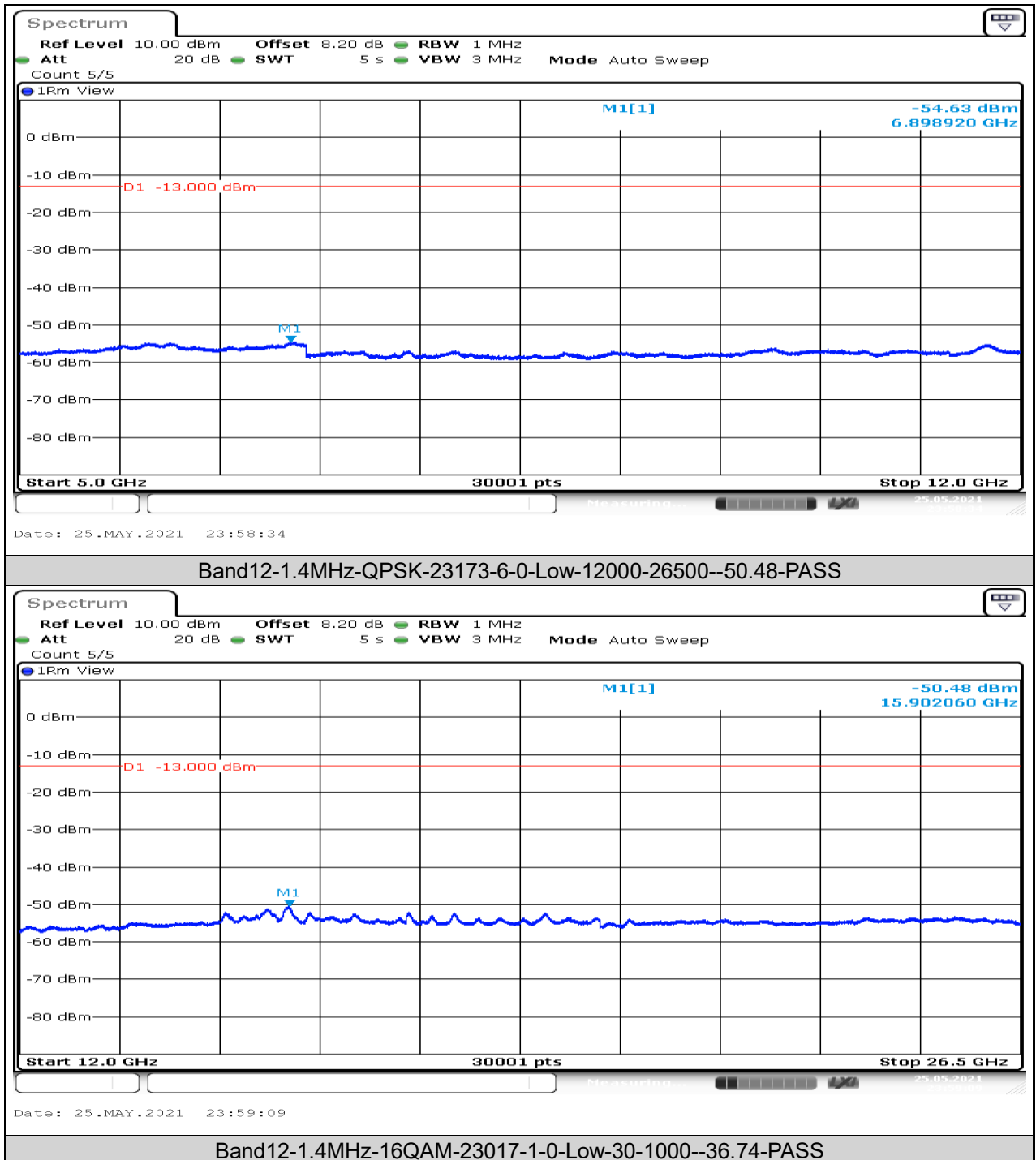


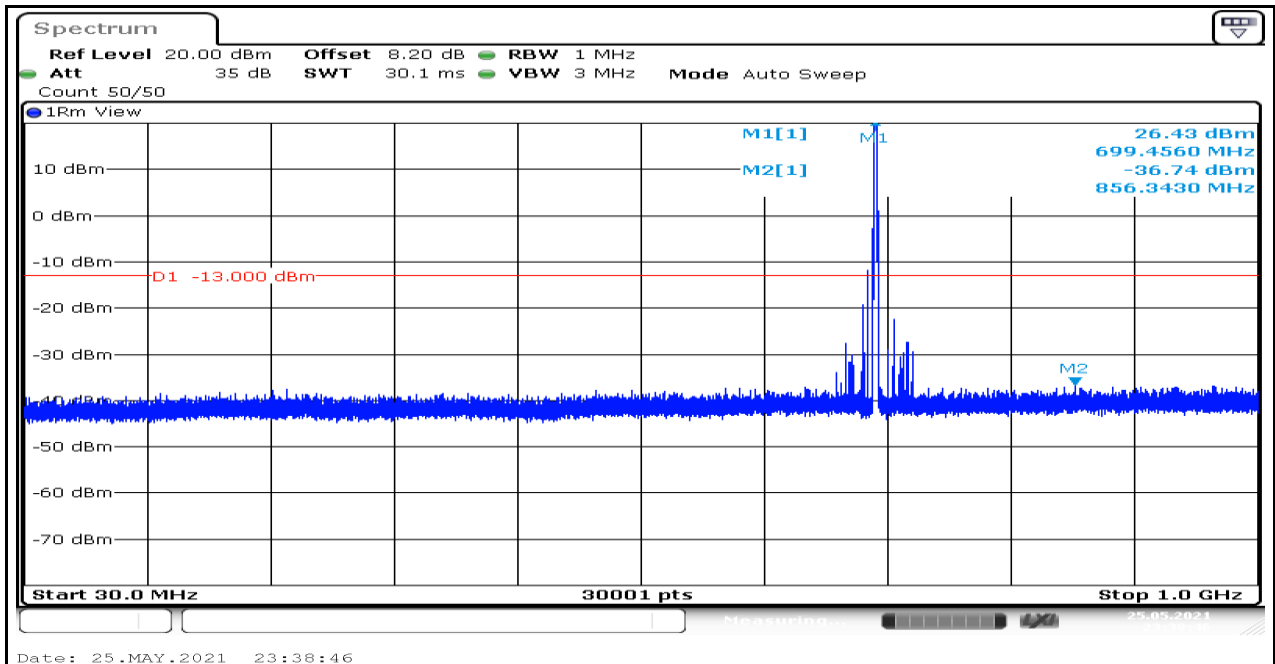


Band12-1.4MHz-QPSK-23173-6-0-Low-1000-5000--40.99-PASS

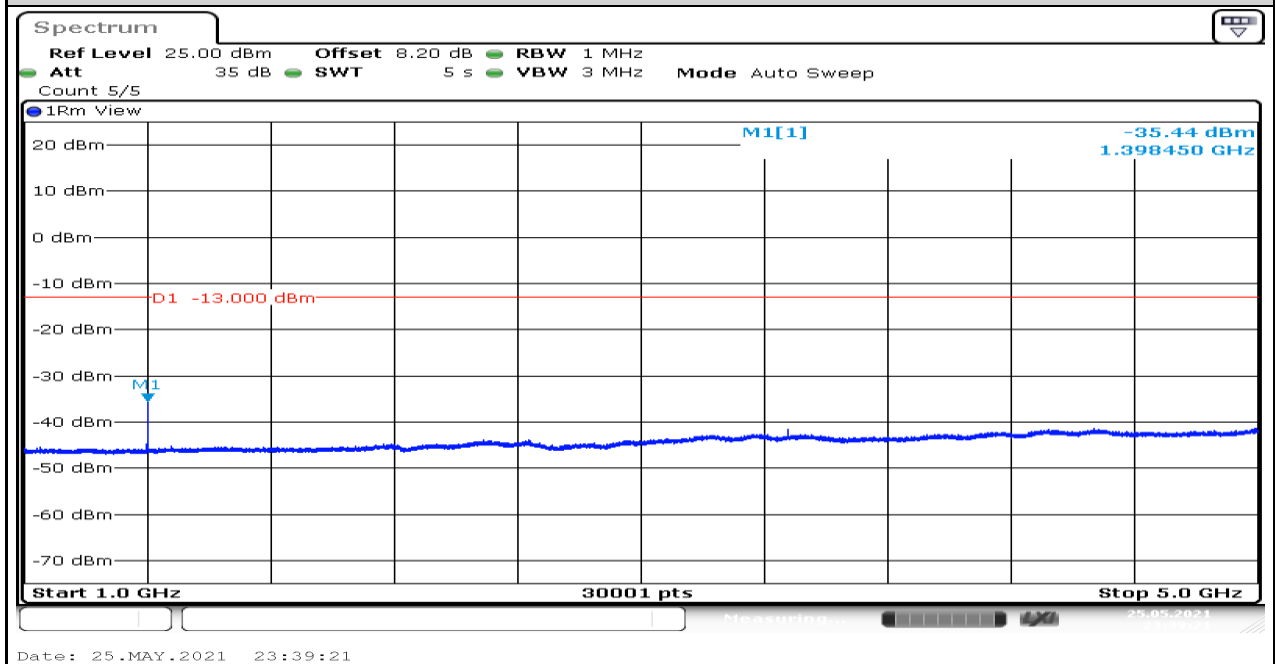


Band12-1.4MHz-QPSK-23173-6-0-Low-5000-12000--54.63-PASS

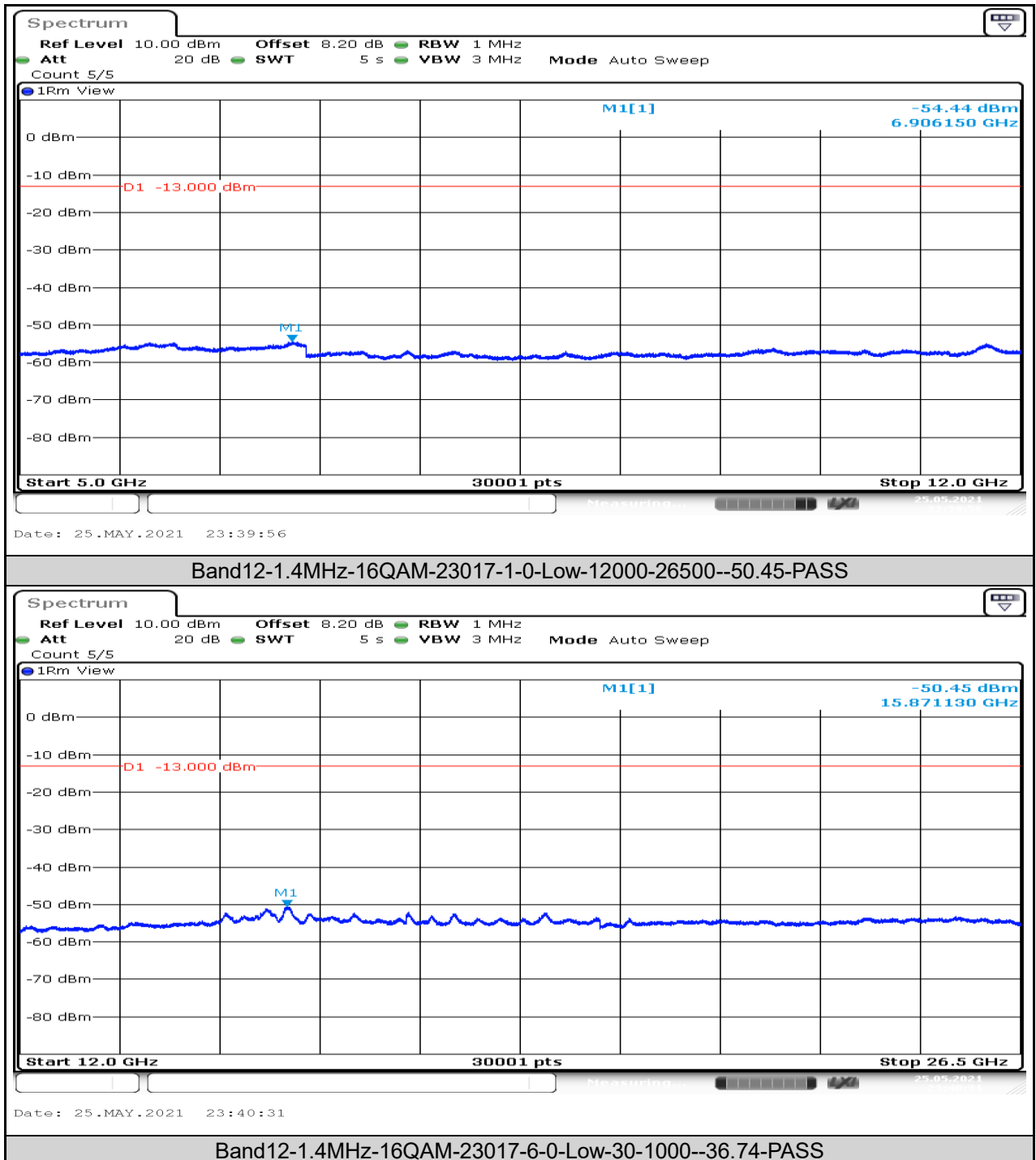


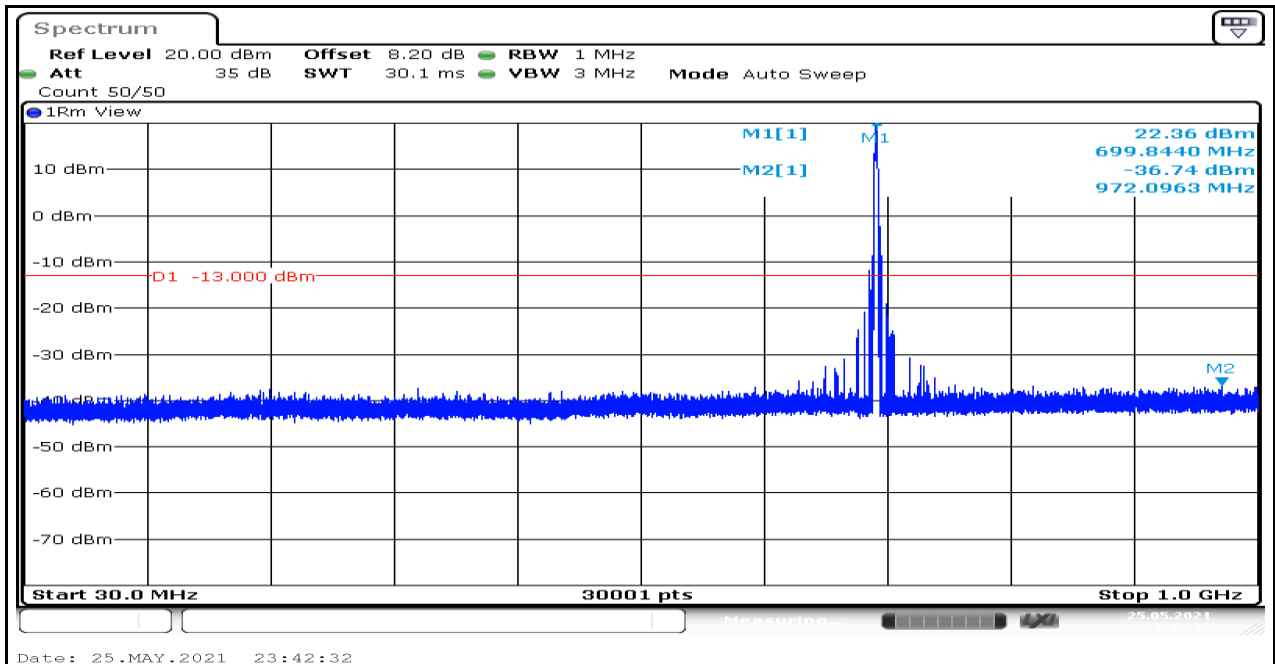


Band12-1.4MHz-16QAM-23017-1-0-Low-1000-5000--35.44-PASS

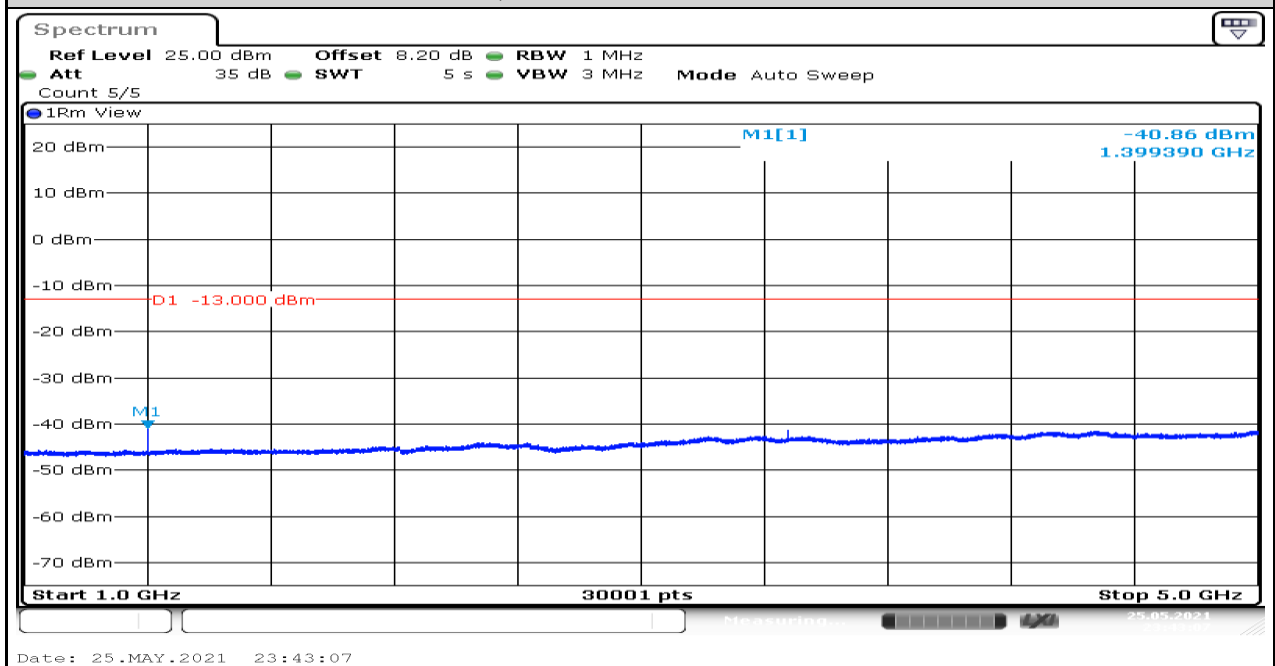


Band12-1.4MHz-16QAM-23017-1-0-Low-5000-12000--54.44-PASS

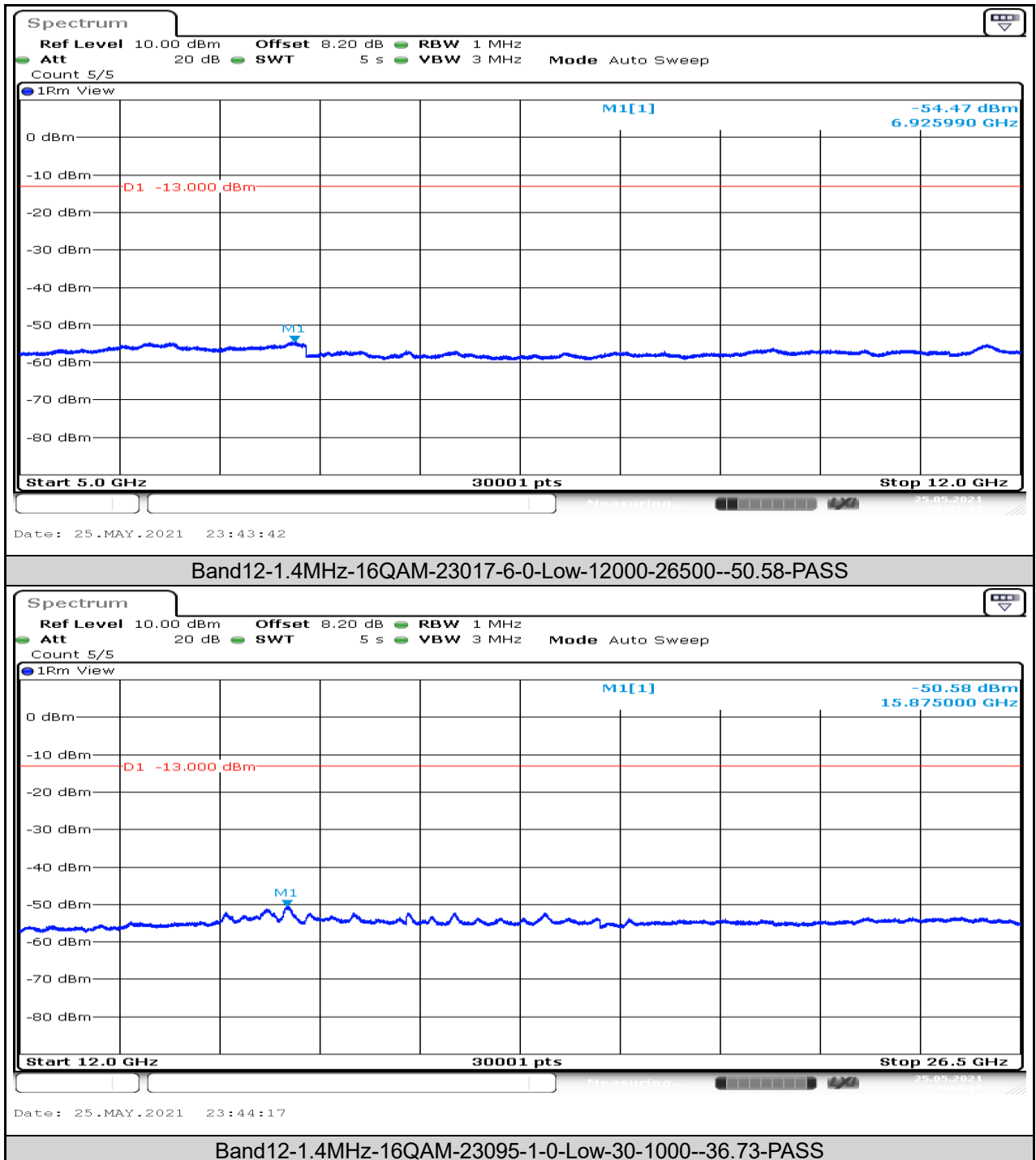


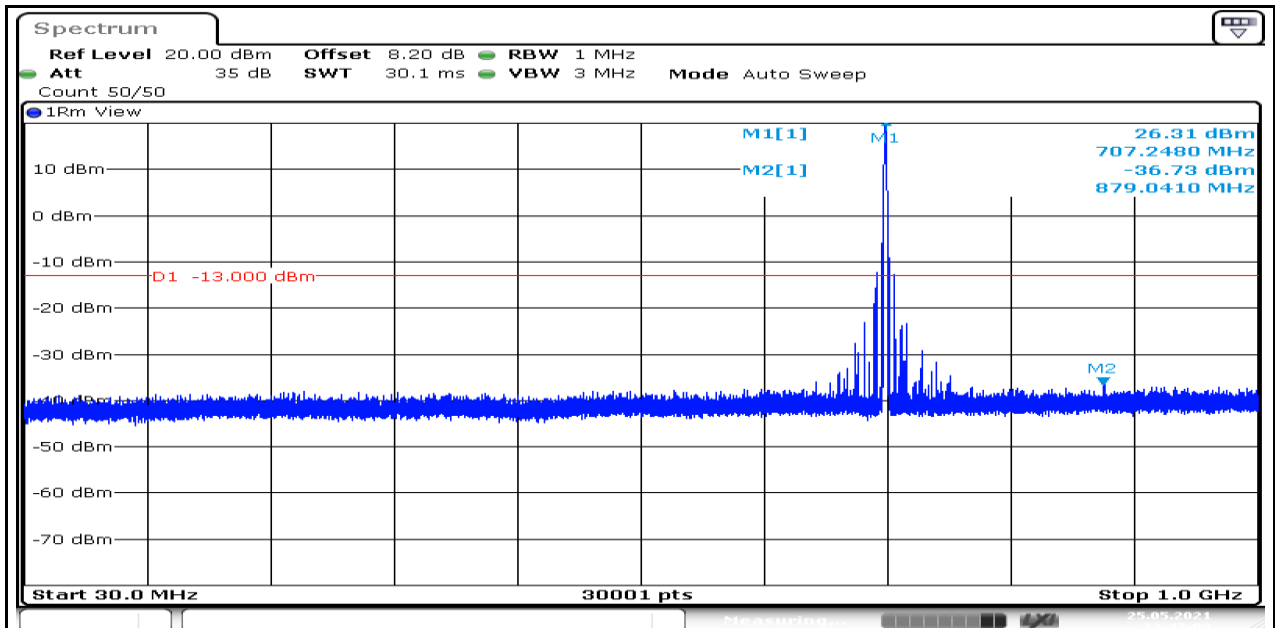


Band12-1.4MHz-16QAM-23017-6-0-Low-1000-5000--40.86-PASS

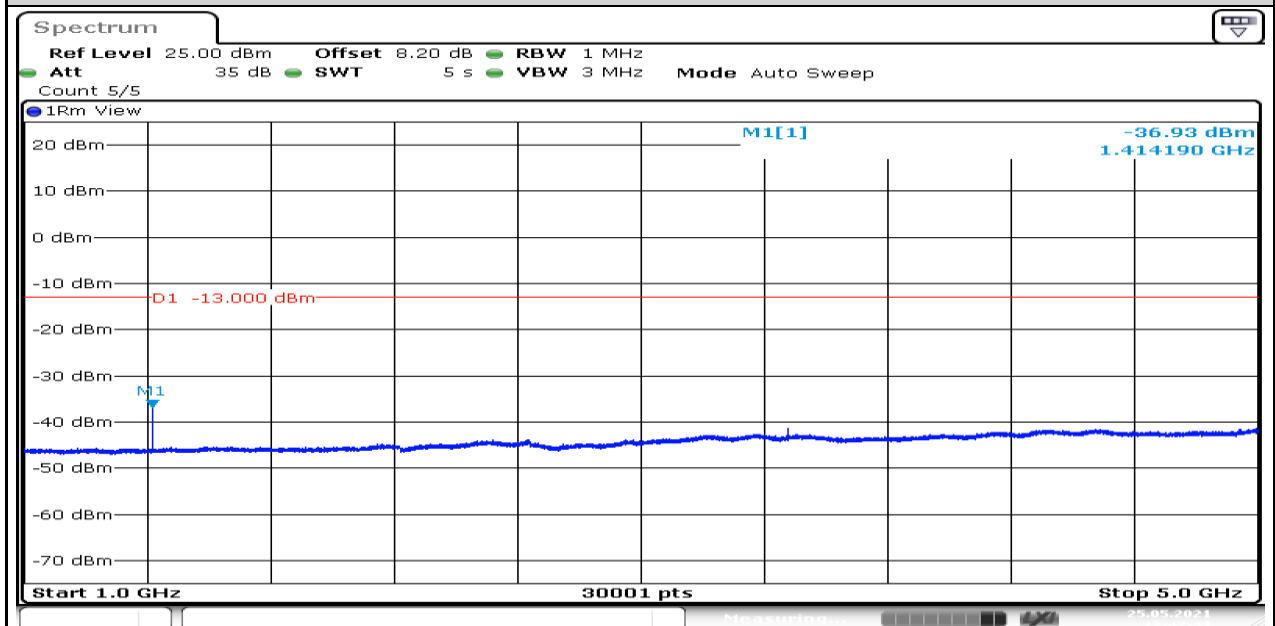


Band12-1.4MHz-16QAM-23017-6-0-Low-5000-12000--54.47-PASS

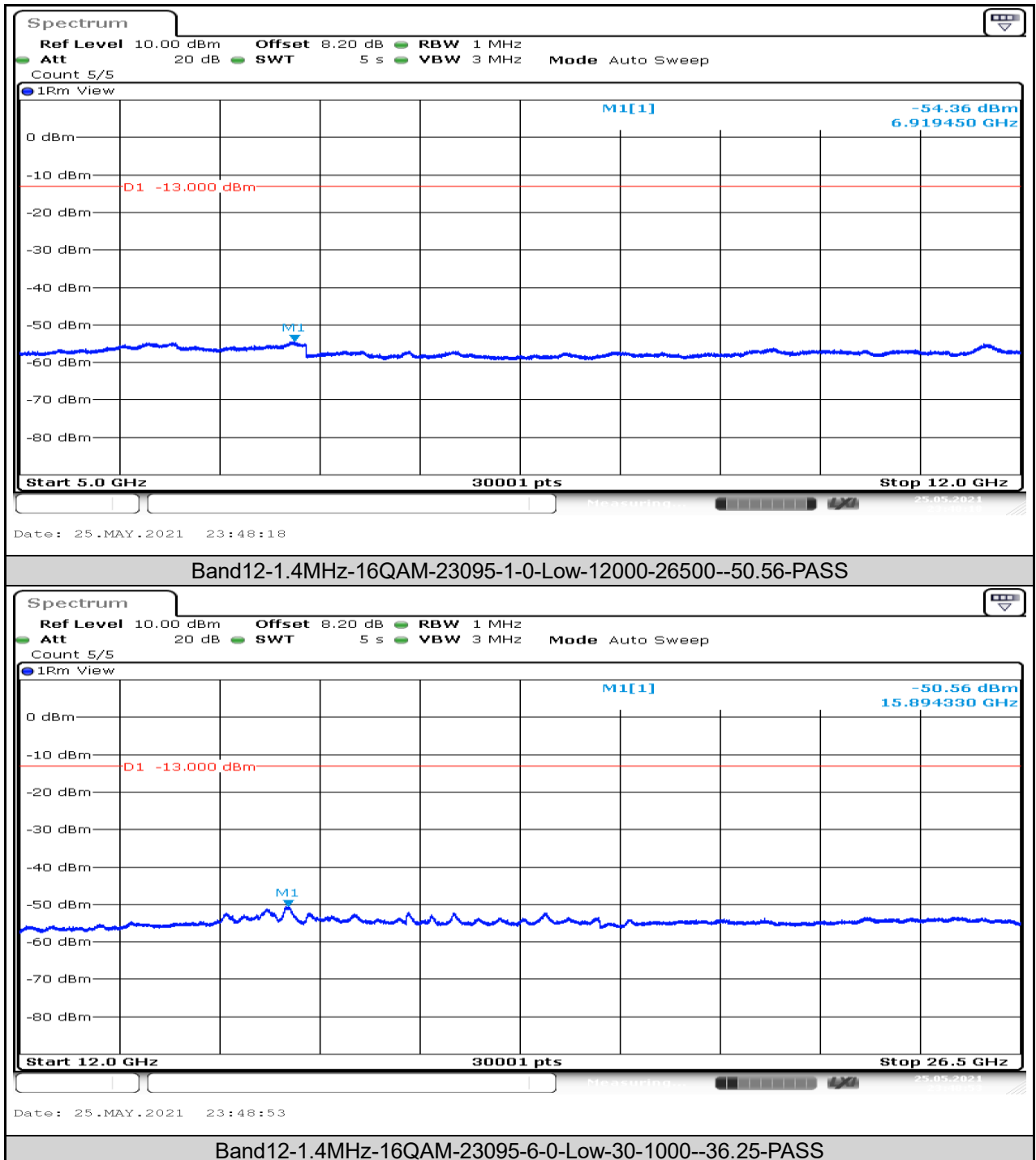


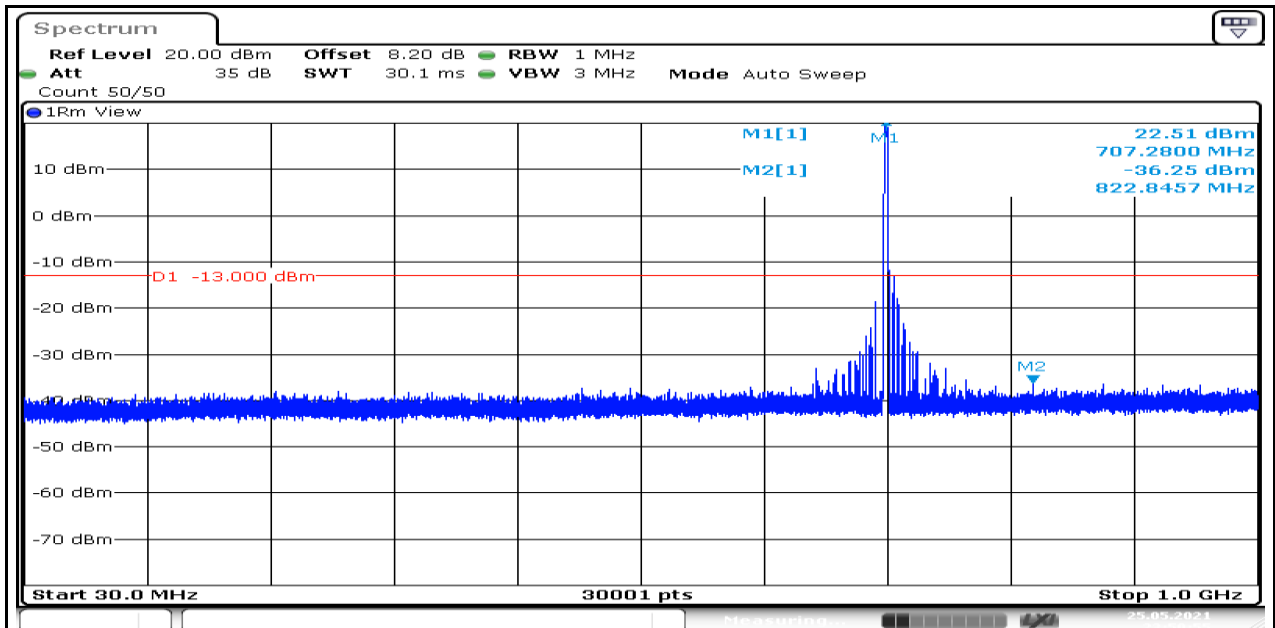


Band12-1.4MHz-16QAM-23095-1-0-Low-1000-5000--36.93-PASS

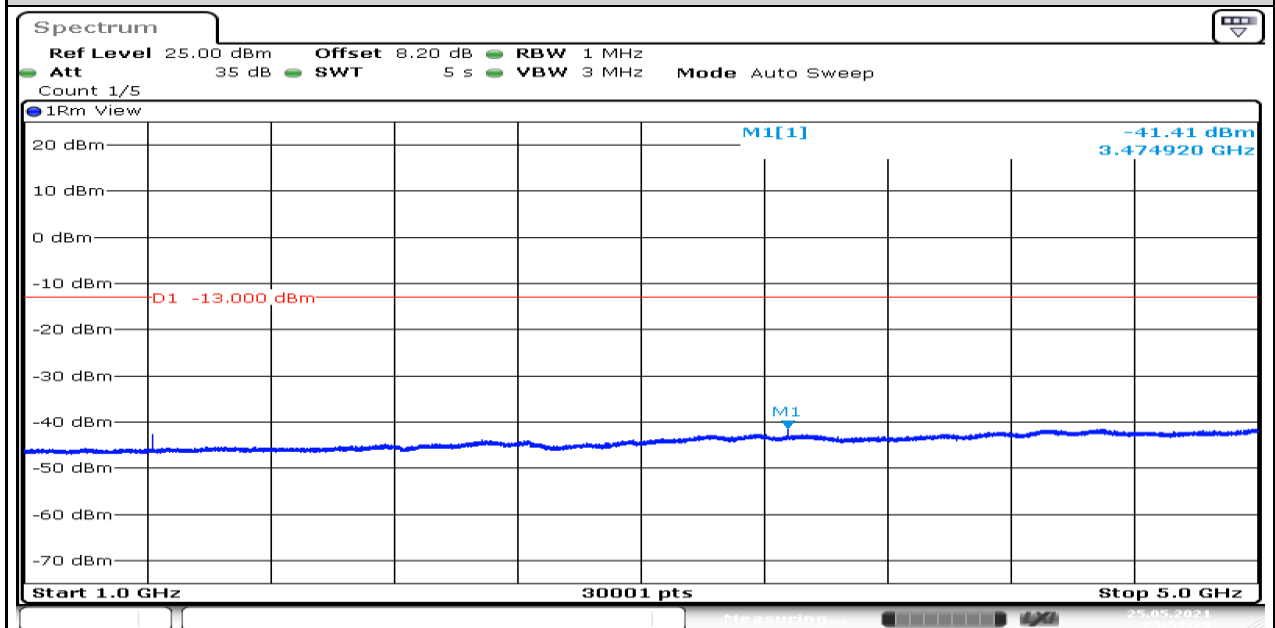


Band12-1.4MHz-16QAM-23095-1-0-Low-5000-12000--54.36-PASS

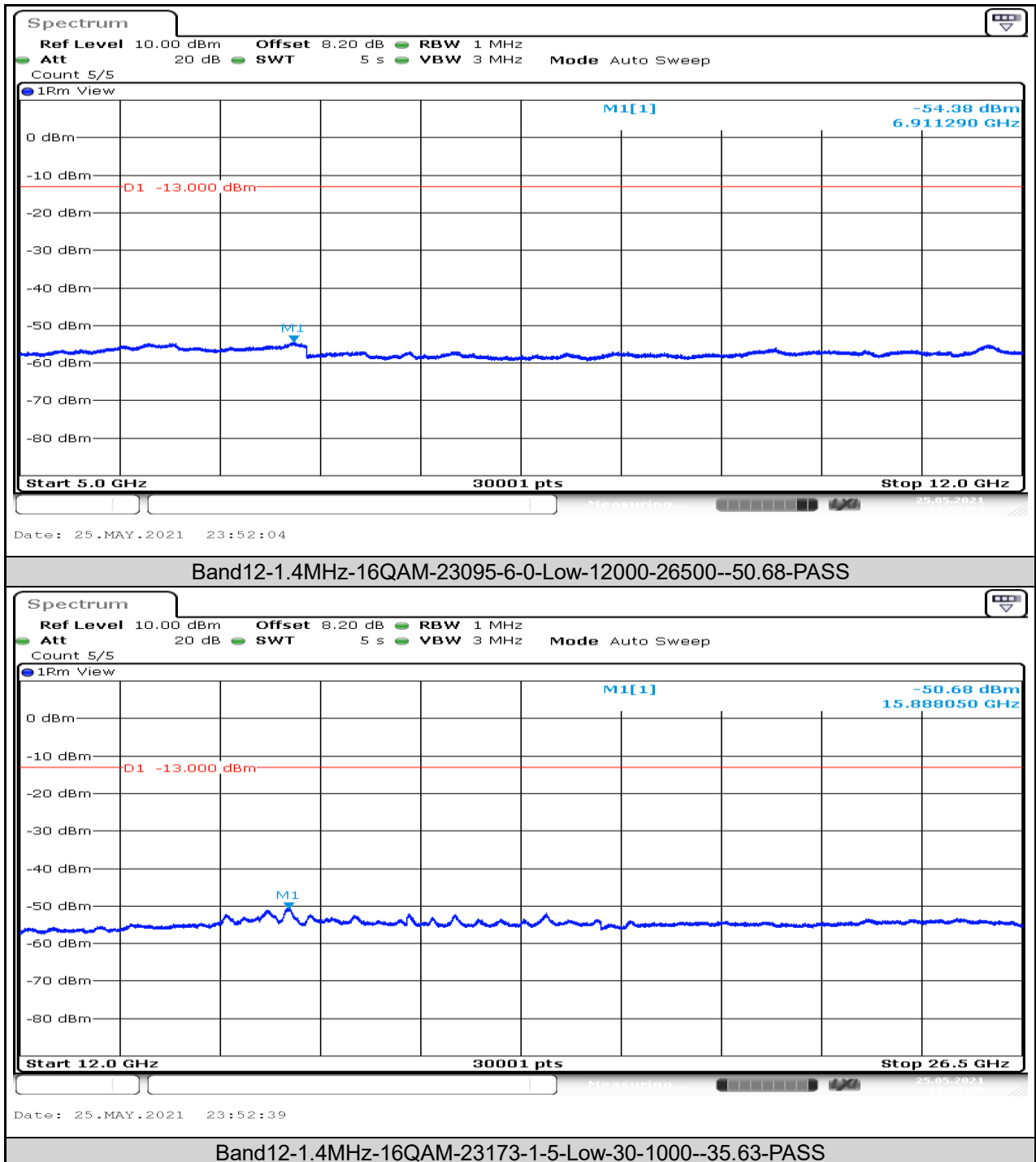


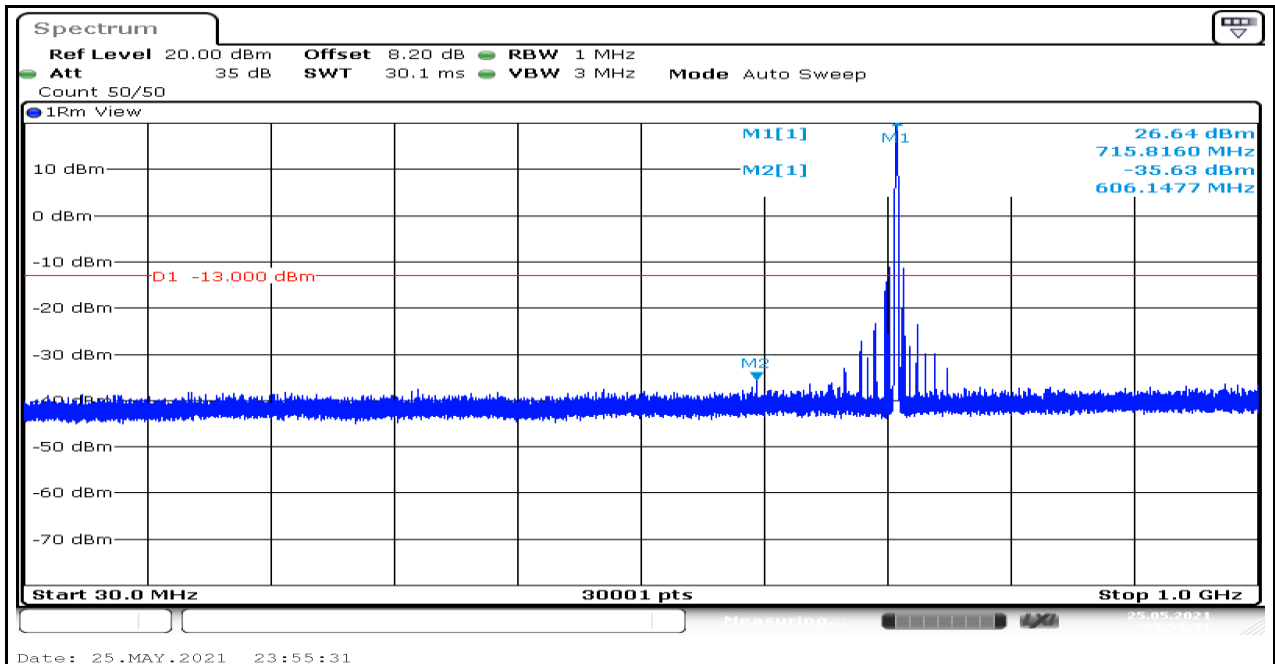


Band12-1.4MHz-16QAM-23095-6-0-Low-1000-5000--41.41-PASS

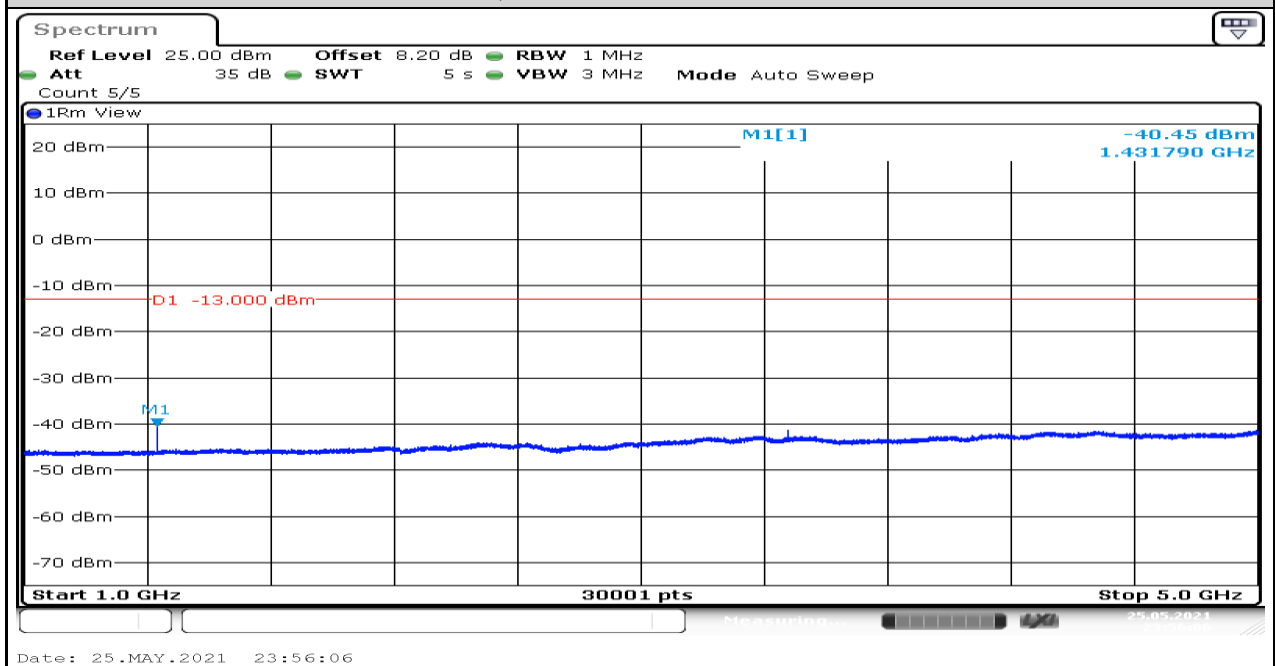


Band12-1.4MHz-16QAM-23095-6-0-Low-5000-12000--54.38-PASS

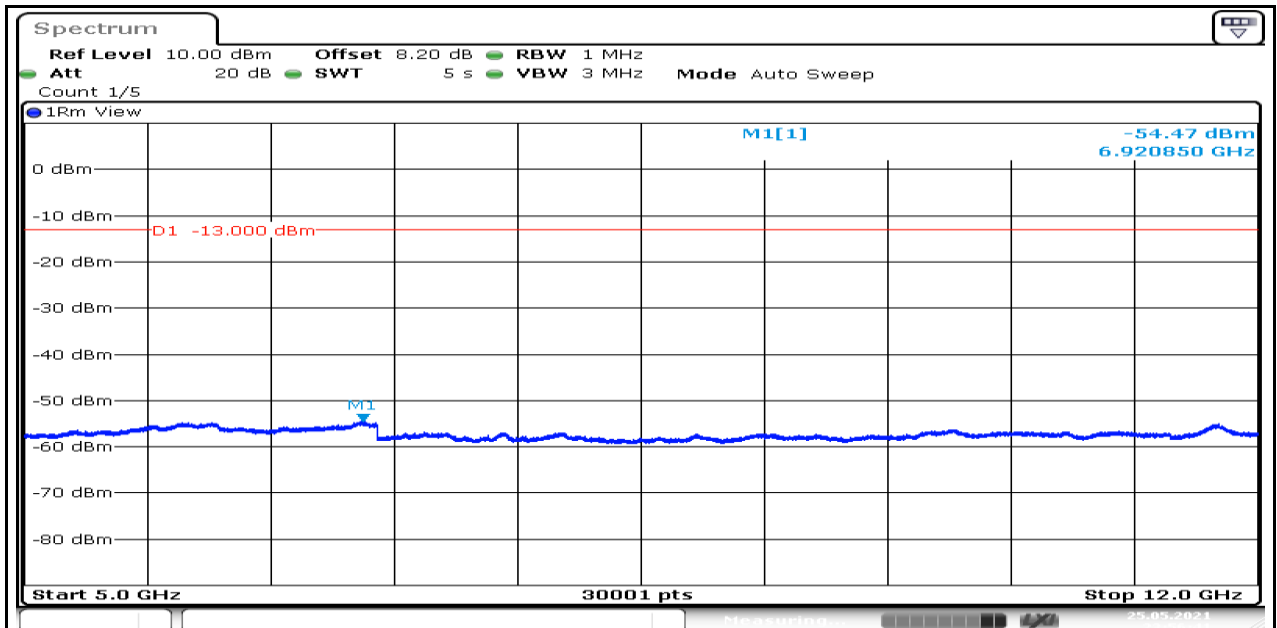




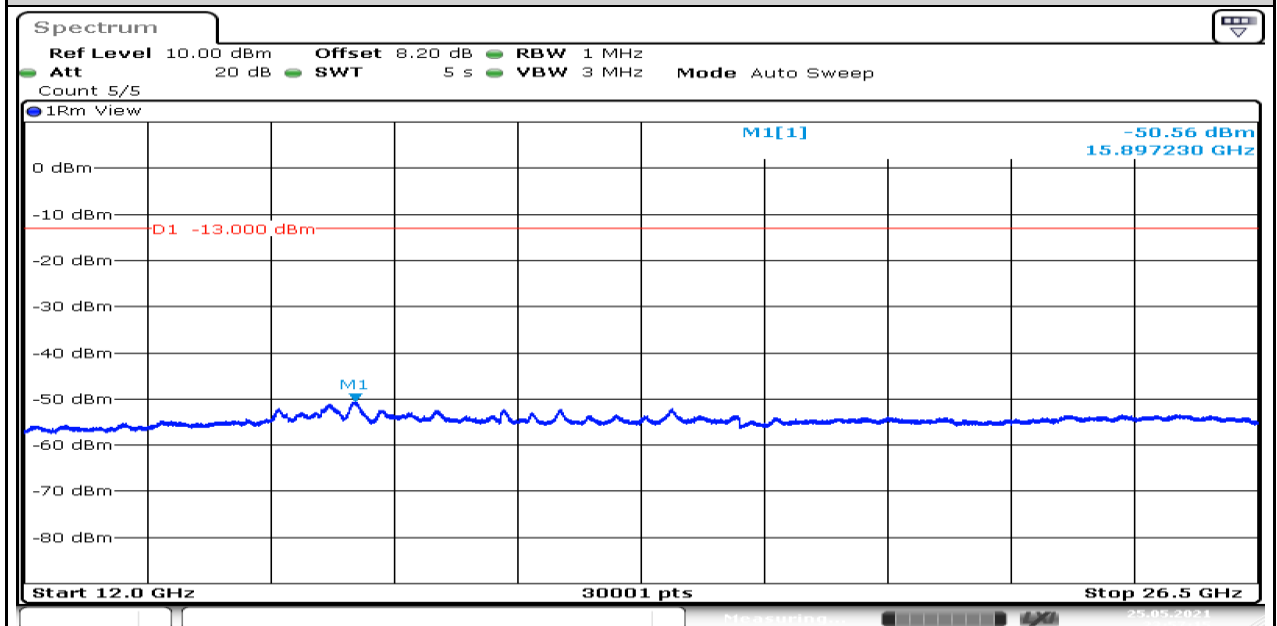
Band12-1.4MHz-16QAM-23173-1-5-Low-1000-5000--40.45-PASS



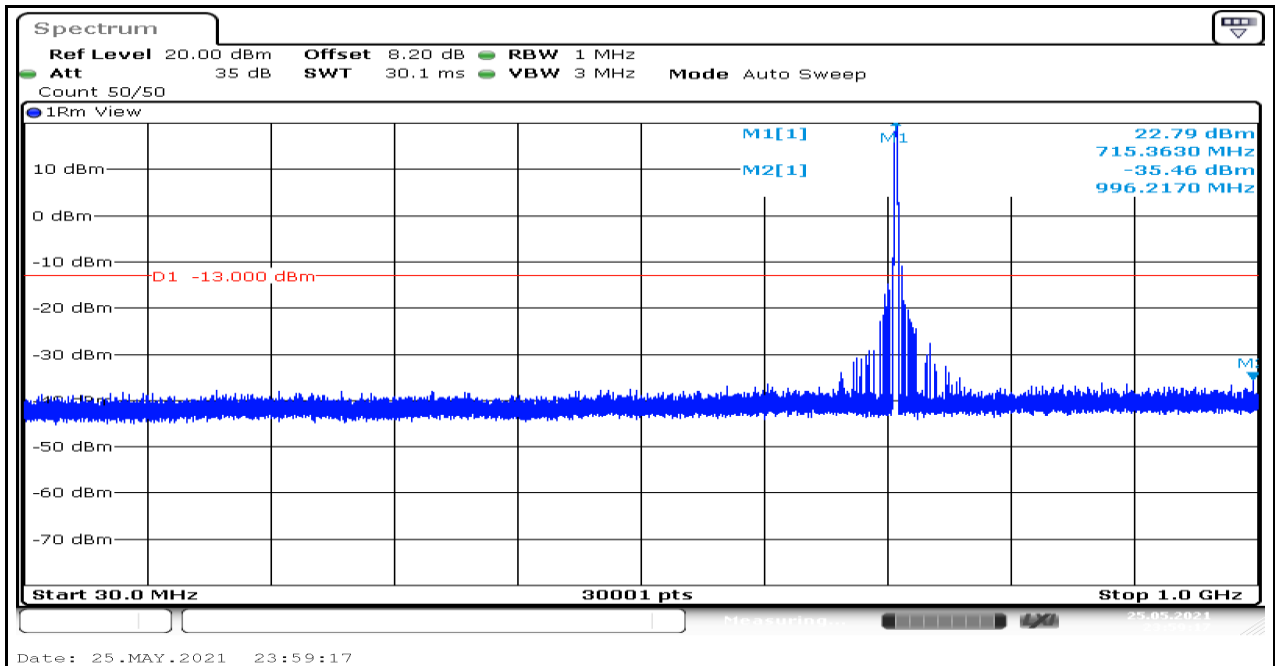
Band12-1.4MHz-16QAM-23173-1-5-Low-5000-12000--54.47-PASS



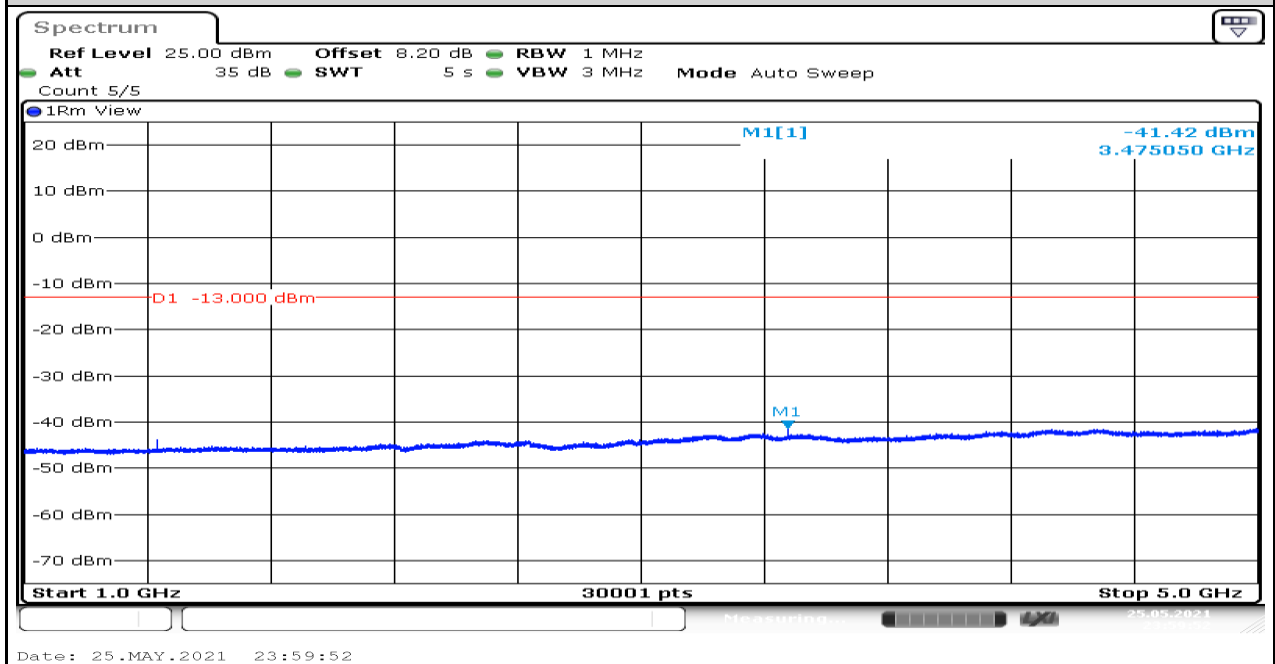
Band12-1.4MHz-16QAM-23173-1-5-Low-12000-26500--50.56-PASS



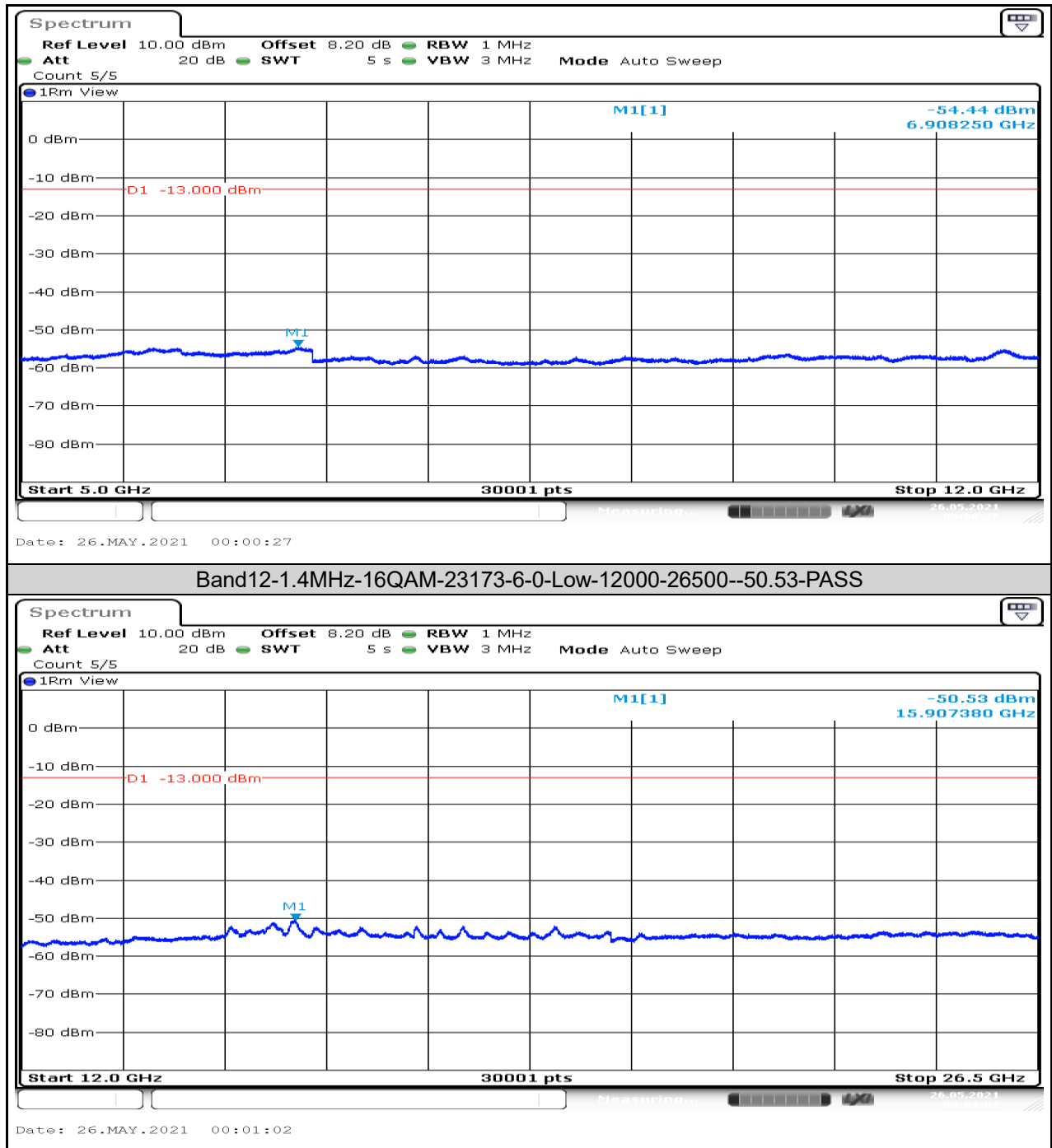
Band12-1.4MHz-16QAM-23173-6-0-Low-30-1000--35.46-PASS



Band12-1.4MHz-16QAM-23173-6-0-Low-1000-5000--41.42-PASS



Band12-1.4MHz-16QAM-23173-6-0-Low-5000-12000--54.44-PASS



APPENDIX D.6: FREQUENCY STABILITY FOR M1

Test Result

Voltage												
Band	Bandwidth	Channel	Modulation	RB Size	RB Start	Index	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band12	1.4MHz	23095	QPSK	1	0	Low	HV	NT	-8.34	-0.011788	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	LV	NT	-6.72	-0.009498	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	NT	-7.30	-0.010318	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	HV	NT	-8.70	-0.012297	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	LV	NT	-7.51	-0.010615	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	NT	-8.41	-0.011887	±2.5	PASS

Temperature												
Band	Bandwidth	Channel	Modulation	RB Size	RB Start	Index	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	85	-9.46	-0.013371	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	-30	-8.64	-0.012212	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	-20	-9.07	-0.012820	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	-10	-7.70	-0.010883	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	0	-9.44	-0.013343	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	10	-8.57	-0.012113	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	20	-8.45	-0.011943	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	30	-8.81	-0.012452	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	40	-8.93	-0.012622	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	50	-6.47	-0.009145	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	60	-7.70	-0.010883	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	70	-7.81	-0.011039	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	-40	-7.94	-0.011223	±2.5	PASS
Band12	1.4MHz	23095	QPSK	1	0	Low	NV	80	-7.48	-0.010572	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	85	-7.61	-0.010756	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	-30	-8.93	-0.012622	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	-20	-7.25	-0.010247	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	-10	-7.01	-0.009908	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	0	-7.47	-0.010558	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	10	-5.92	-0.008367	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	20	-9.30	-0.013145	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	30	-9.64	-0.013625	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	40	-8.77	-0.012396	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	50	-8.74	-0.012353	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	60	-8.90	-0.012580	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	70	-7.91	-0.011180	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	80	-9.13	-0.012905	±2.5	PASS
Band12	1.4MHz	23095	16QAM	1	0	Low	NV	-40	-9.06	-0.012806	±2.5	PASS