Appendix N: Test Data for NB1 Band 4

Product Name: IoTgo Track-Solar iot

Test Model: iot

Environmental Conditions

Temperature:	23.8°C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Can Kun
Supervised by:	Nick Peng

N.1 Conducted Output Power Data for NB1

Test Result

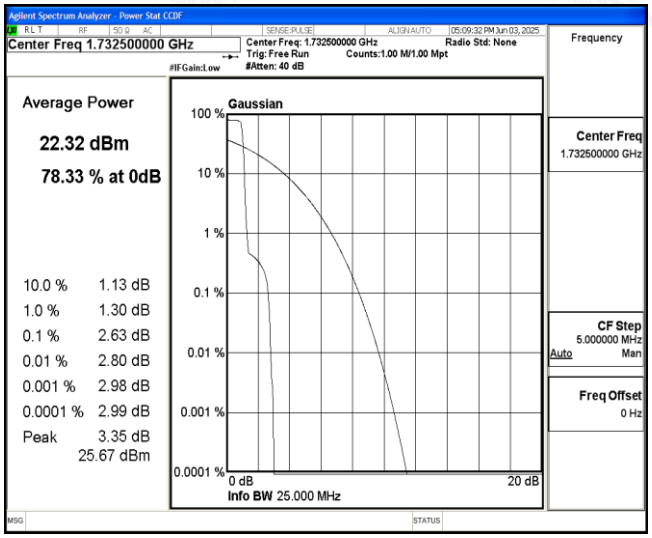
Band	OpMode	SCS	BW	Modu	Channel	Tones	Result (dBm)	Limit (dBm)	Verdict
Band4	Stand-Alone	3.75kHz	NaN	BPSK	19951	1@0	21.52	-999 To 30	PASS
Band4	Stand-Alone	3.75kHz	NaN	BPSK	19951	1@47	21.46	-999 To 30	PASS
Band4	Stand-Alone	3.75kHz	NaN	BPSK	20175	1@0	21.77	-999 To 30	PASS
Band4	Stand-Alone	3.75kHz	NaN	BPSK	20175	1@47	21.69	-999 To 30	PASS
Band4	Stand-Alone	3.75kHz	NaN	BPSK	20399	1@0	21.72	-999 To 30	PASS
Band4	Stand-Alone	3.75kHz	NaN	BPSK	20399	1@47	21.64	-999 To 30	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@0	21.58	-999 To 30	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@47	21.49	-999 To 30	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@0	21.78	-999 To 30	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@47	21.69	-999 To 30	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@0	21.75	-999 To 30	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@47	21.69	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@0	21.61	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@11	21.60	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	3@3	21.67	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@0	21.81	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@11	21.72	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	3@3	21.78	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@0	21.84	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@11	21.74	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	3@3	21.70	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	1@0	21.69	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	1@11	21.66	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	3@3	21.71	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	1@0	21.85	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	1@11	21.84	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	3@3	21.87	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	1@0	21.94	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	1@11	21.80	-999 To 30	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	3@3	21.77	-999 To 30	PASS

N.2 Peak-to-Average Ratio(CCDF) for NB1

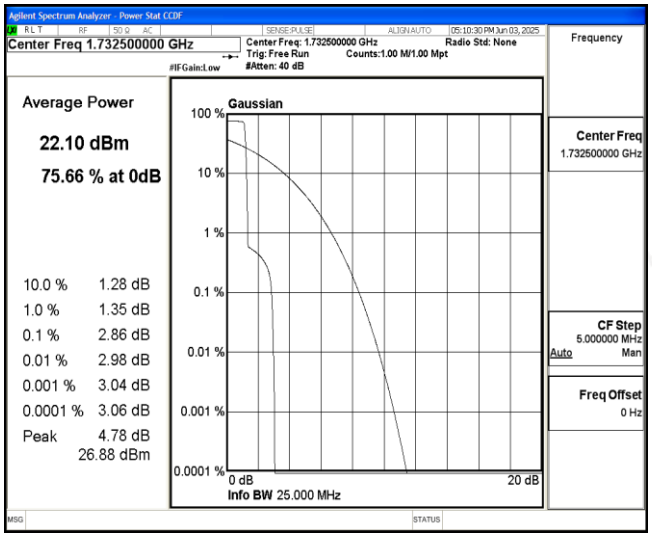
Test Result

Band	OpMode	SCS	BW	Modu	Channel	Tones	Result (dBm)	Limit (dBm)	Verdict
Band4	Stand-Alone	3.75kHz	NaN	BPSK	20175	1@0	2.63	<=13	PASS
Band4	Stand-Alone	3.75kHz	NaN	BPSK	20175	1@47	2.86	<=13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@0	3.12	<=13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@47	3.26	<=13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@0	4.84	<=13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@11	5.04	<=13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	3@3	8.24	<=13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	1@0	6.27	<=13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	1@11	6.68	<=13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	3@3	9.01	<=13	PASS

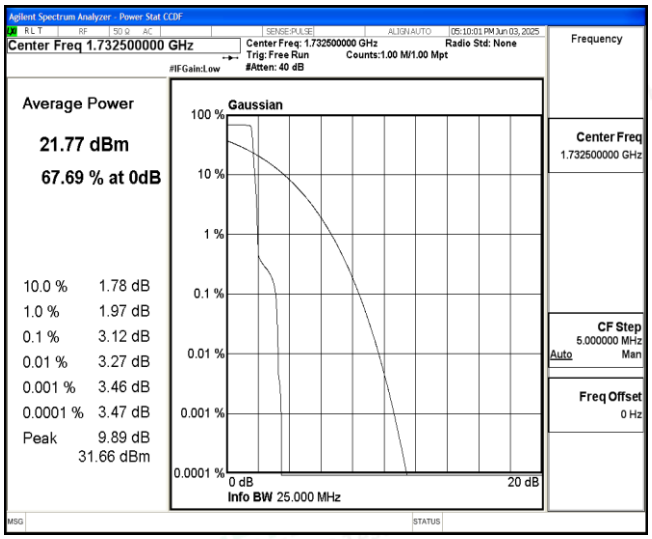
Test Graphs



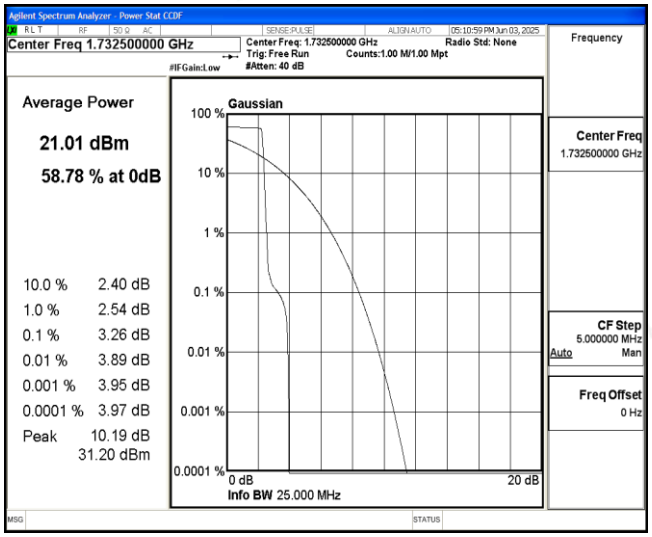
Band4-Stand-Alone-NaN-BPSK-20175-1@0-3.75kHz-2.63-<=13-PASS



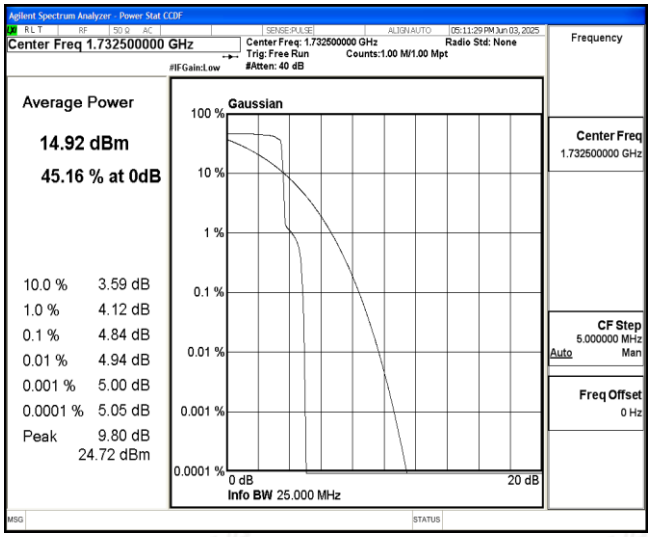
Band4-Stand-Alone-NaN-BPSK-20175-1@47-3.75kHz-2.86-<=13-PASS



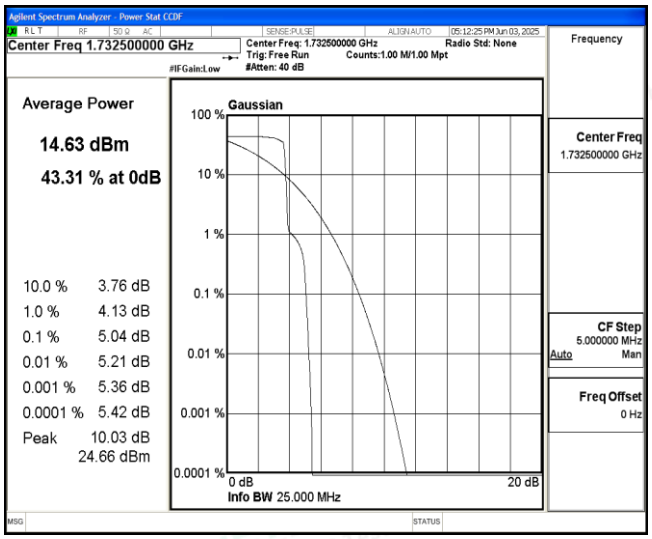
Band4-Stand-Alone-NaN-QPSK-20175-1@0-3.75kHz-3.12-<=13-PASS



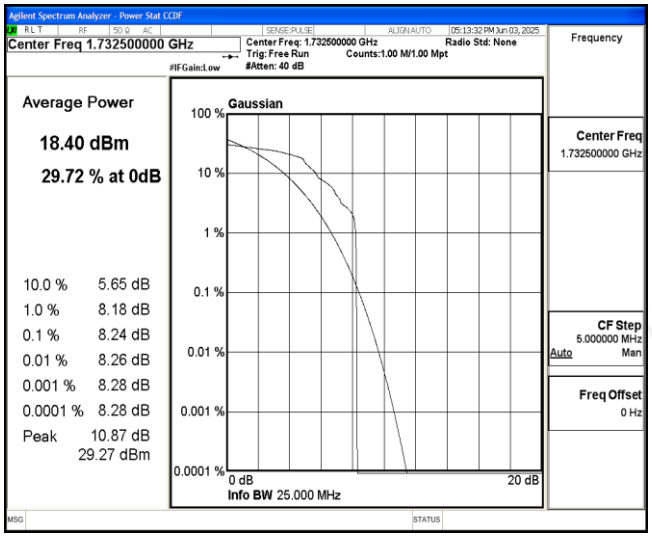
Band4-Stand-Alone-NaN-QPSK-20175-1@47-3.75kHz-3.26-<=13-PASS



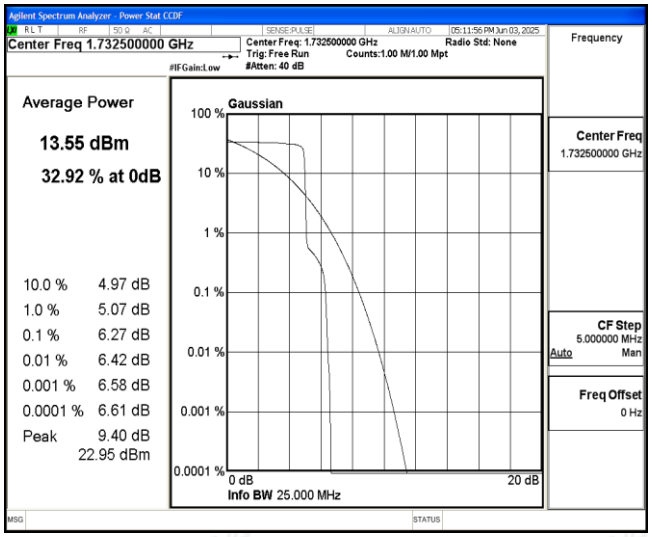
Band4-Stand-Alone-NaN-BPSK-20175-1@0-15kHz-4.84-<=13-PASS



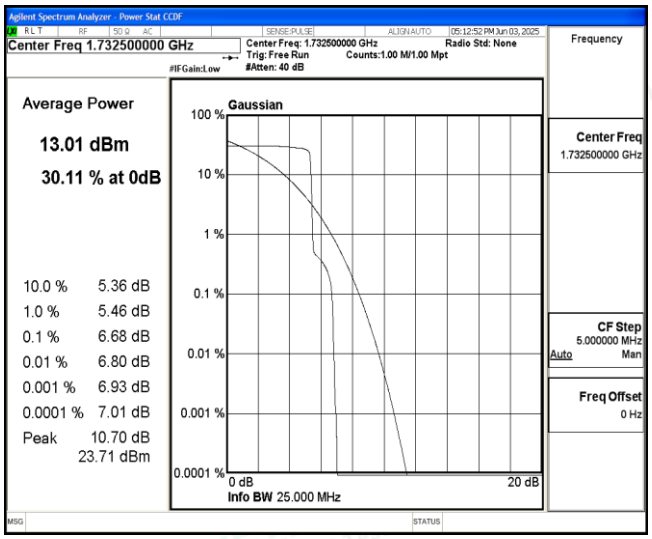
Band4-Stand-Alone-NaN-BPSK-20175-1@11-15kHz-5.04-<=13-PASS



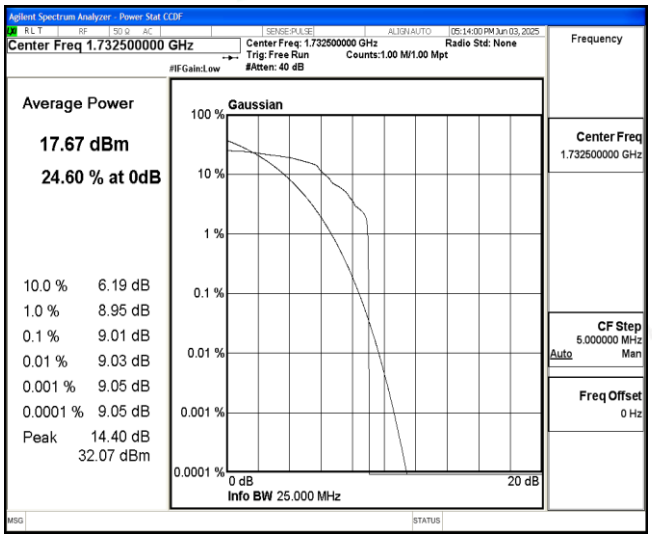
Band4-Stand-Alone-NaN-BPSK-20175-3@3-15kHz-8.24-<=13-PASS



Band4-Stand-Alone-NaN-QPSK-20175-1@0-15kHz-6.27-<=13-PASS



Band4-Stand-Alone-NaN-QPSK-20175-1@11-15kHz-6.68-<=13-PASS



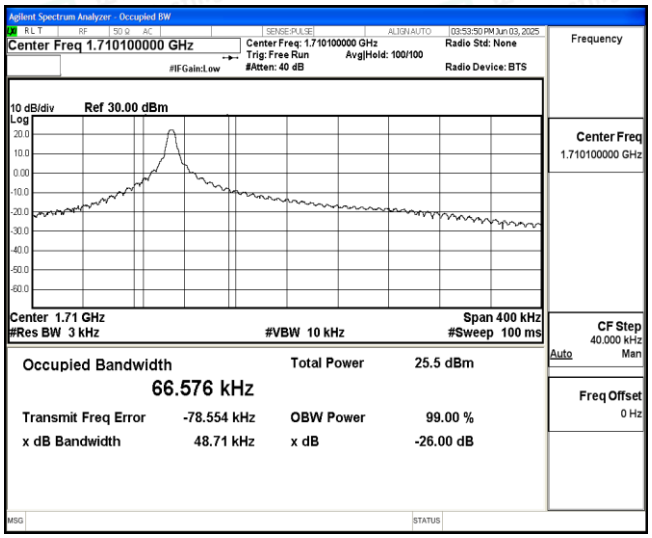
Band4-Stand-Alone-NaN-QPSK-20175-3@3-15kHz-9.01-<=13-PASS

N.3 Emission Bandwidth for NB1

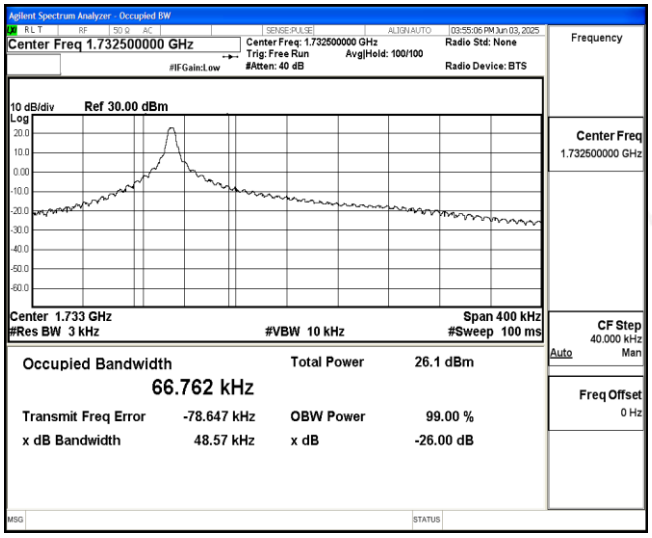
Test Result

Band	OpMode	SCS	BW	Modu	Channel	Tones	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band4	Stand-Alone	3.75kHz	NaN	BPSK	19951	1@0	0.0666	0.0487	PASS
Band4	Stand-Alone	3.75kHz	NaN	BPSK	20175	1@0	0.0668	0.0486	PASS
Band4	Stand-Alone	3.75kHz	NaN	BPSK	20399	1@0	0.0668	0.0488	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@0	0.0762	0.0517	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@0	0.0771	0.0507	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@0	0.0763	0.0518	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@0	0.1275	0.1133	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	12@0	0.1865	0.2633	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@0	0.1266	0.1061	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	12@0	0.1882	0.2615	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@0	0.1283	0.1060	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	12@0	0.1865	0.2499	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	1@0	0.1234	0.1167	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	12@0	0.1877	0.2342	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	1@0	0.1293	0.1159	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	12@0	0.1911	0.2464	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	1@0	0.1181	0.1147	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	12@0	0.1923	0.2498	PASS

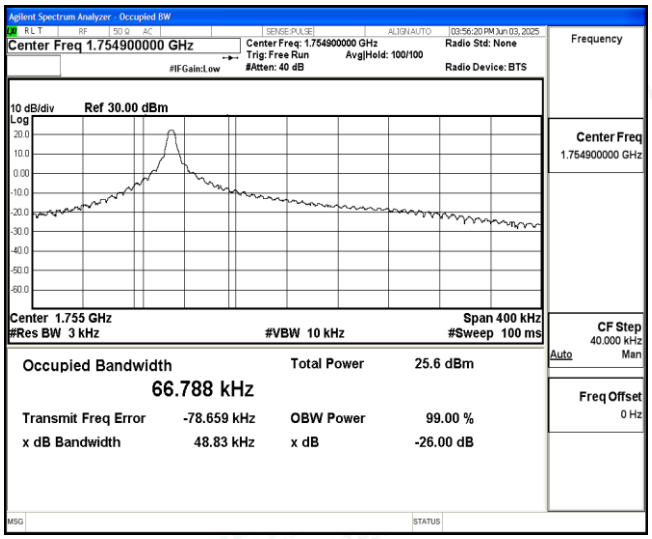
Test Graphs



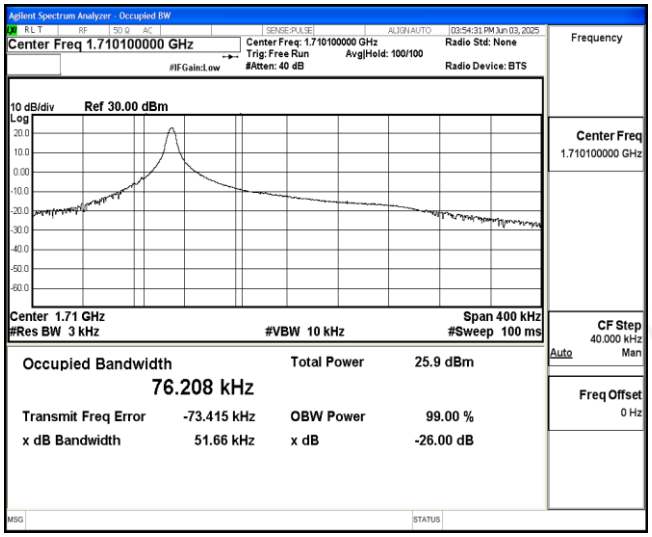
Band4-Stand-Alone-NaN-BPSK-19951-1@0-3.75kHz-0.0487-PASS



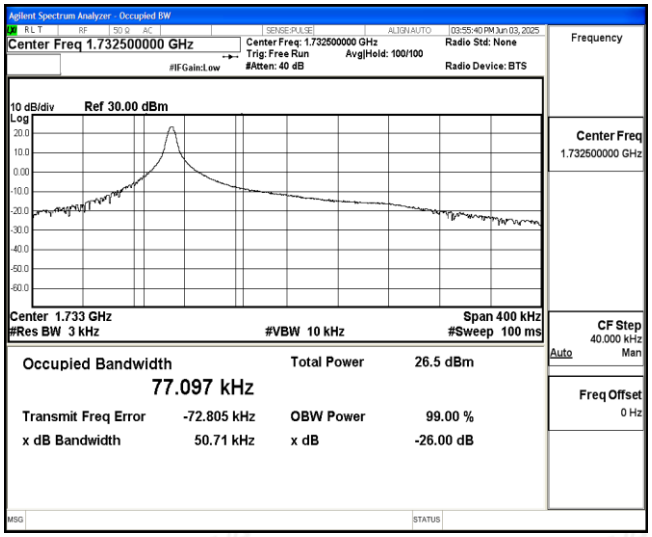
Band4-Stand-Alone-NaN-BPSK-20175-1@0-3.75kHz-0.0486-PASS



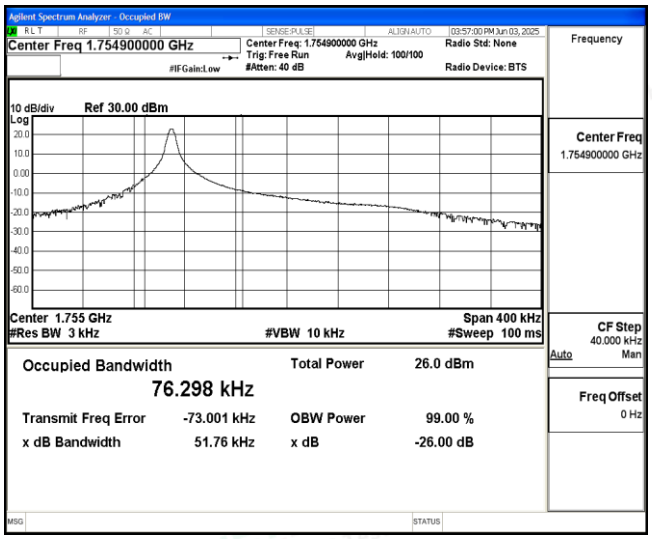
Band4-Stand-Alone-NaN-BPSK-20399-1@0-3.75kHz-0.0488-PASS



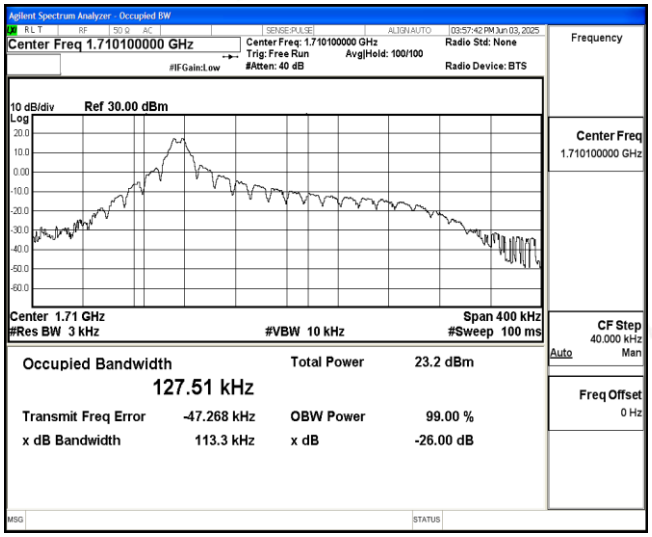
Band4-Stand-Alone-NaN-QPSK-19951-1@0-3.75kHz-0.0517-PASS



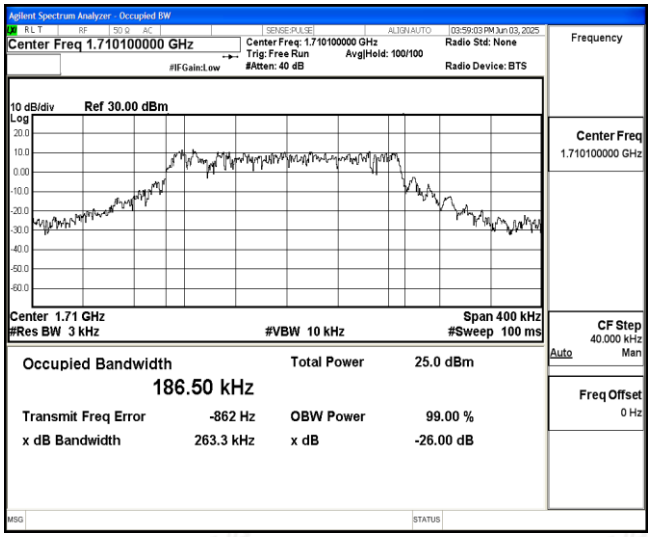
Band4-Stand-Alone-NaN-QPSK-20175-1@0-3.75kHz-0.0507-PASS



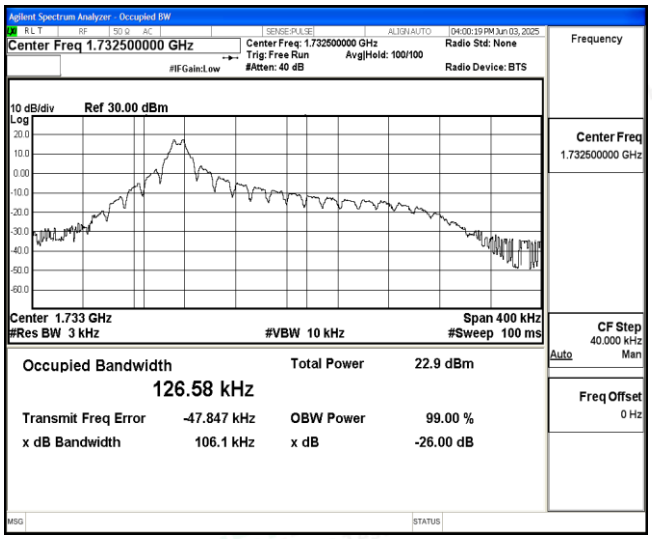
Band4-Stand-Alone-NaN-QPSK-20399-1@0-3.75kHz-0.0518-PASS



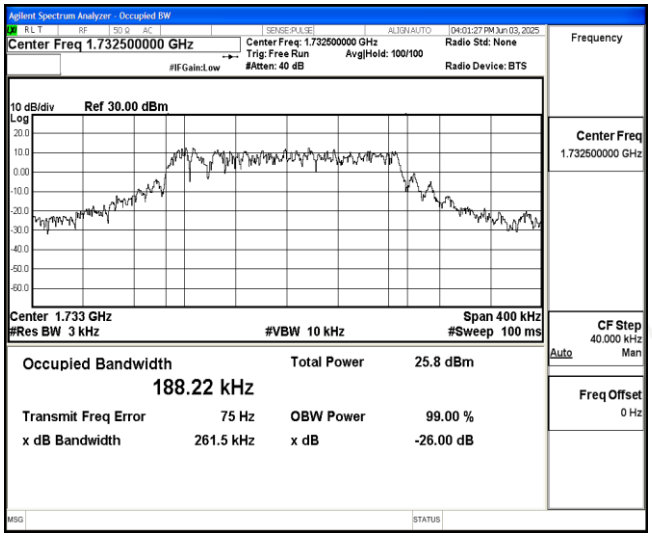
Band4-Stand-Alone-NaN-BPSK-19951-1@0-15kHz-0.1133-PASS



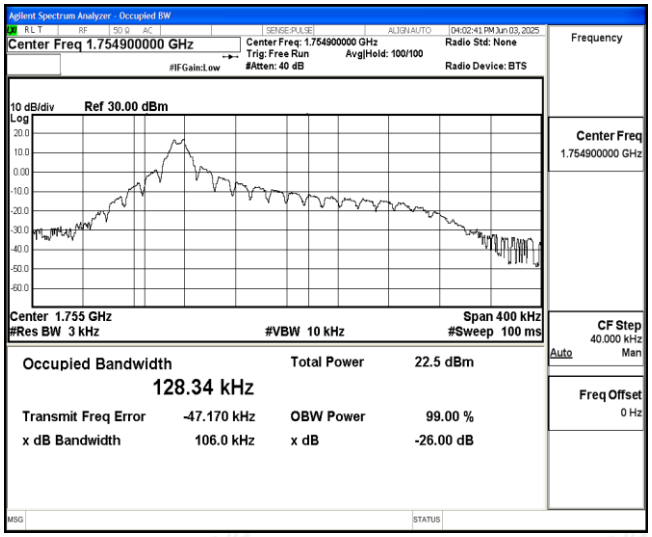
Band4-Stand-Alone-NaN-BPSK-19951-12@0-15kHz-0.2633-PASS



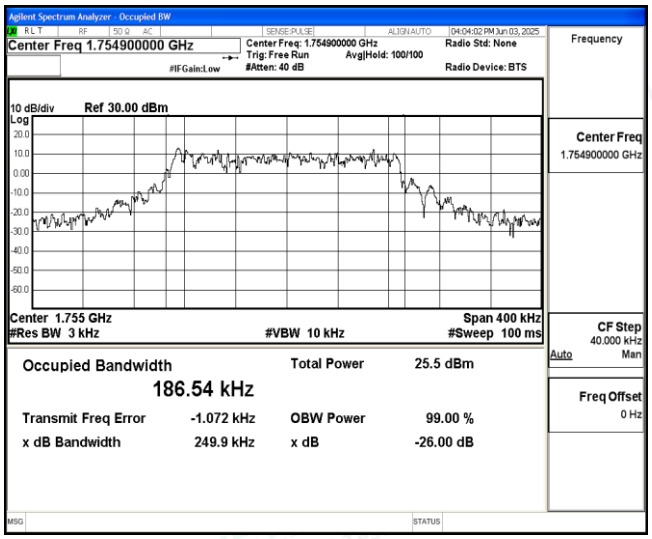
Band4-Stand-Alone-NaN-BPSK-20175-1@0-15kHz-0.1061-PASS



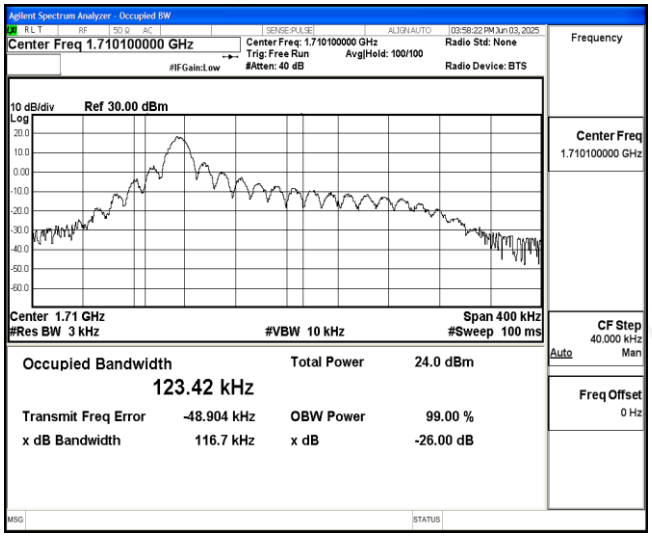
Band4-Stand-Alone-NaN-BPSK-20175-12@0-15kHz-0.2615-PASS



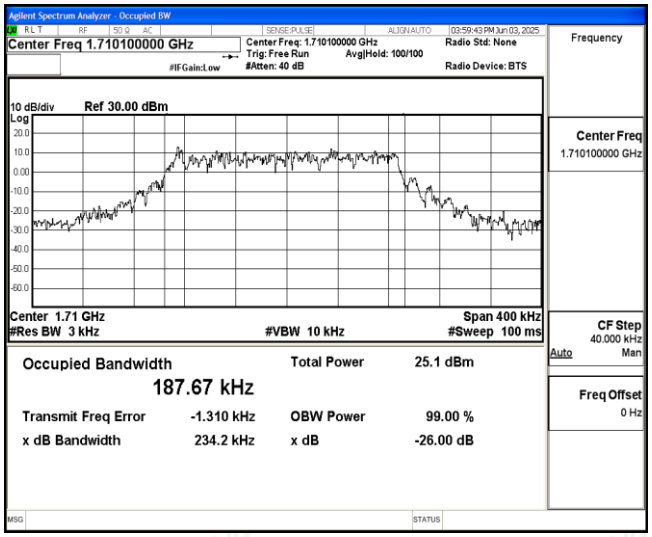
Band4-Stand-Alone-NaN-BPSK-20399-1@0-15kHz-0.1060-PASS



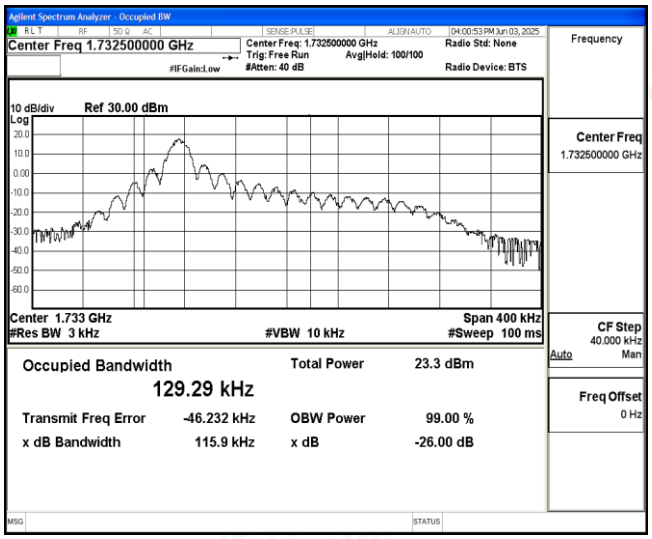
Band4-Stand-Alone-NaN-BPSK-20399-12@0-15kHz-0.2499-PASS



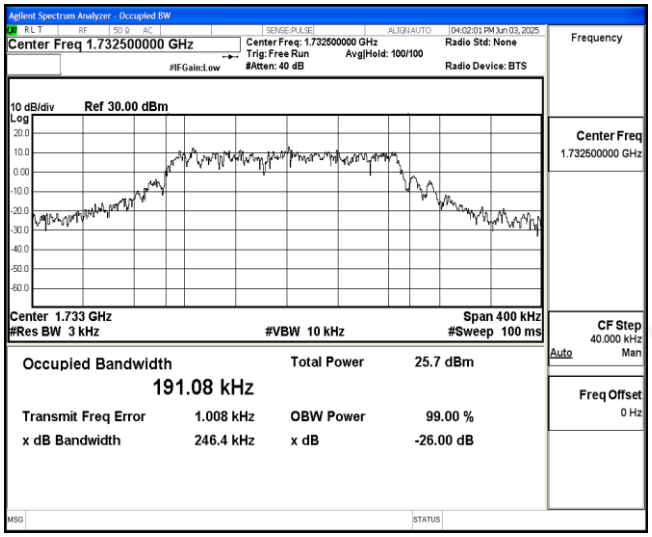
Band4-Stand-Alone-NaN-QPSK-19951-1@0-15kHz-0.1167-PASS



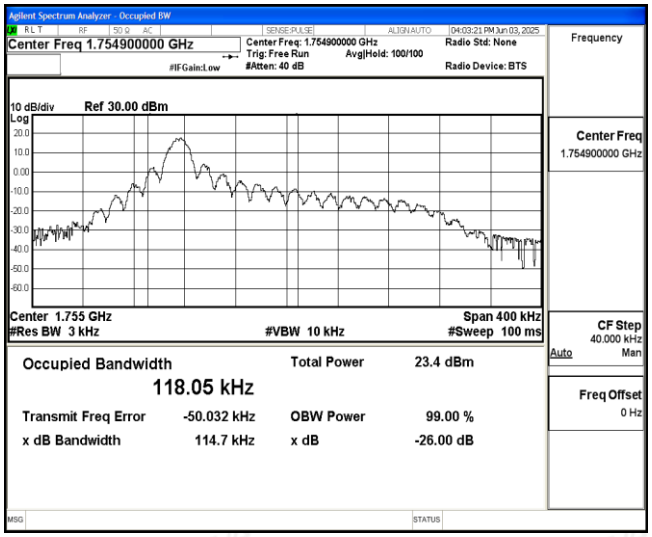
Band4-Stand-Alone-NaN-QPSK-19951-12@0-15kHz-0.2342-PASS



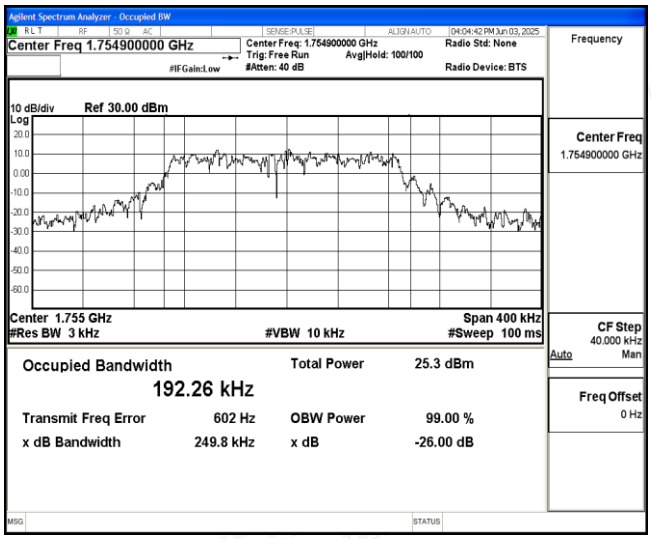
Band4-Stand-Alone-NaN-QPSK-20175-1@0-15kHz-0.1159-PASS



Band4-Stand-Alone-NaN-QPSK-20175-12@0-15kHz-0.2464-PASS



Band4-Stand-Alone-NaN-QPSK-20399-1@0-15kHz-0.1147-PASS



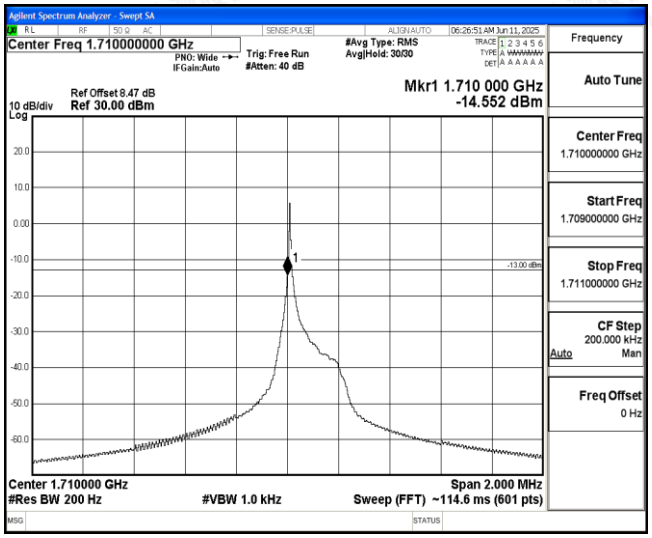
Band4-Stand-Alone-NaN-QPSK-20399-12@0-15kHz-0.2498-PASS

N.4 Band Edge for NB1

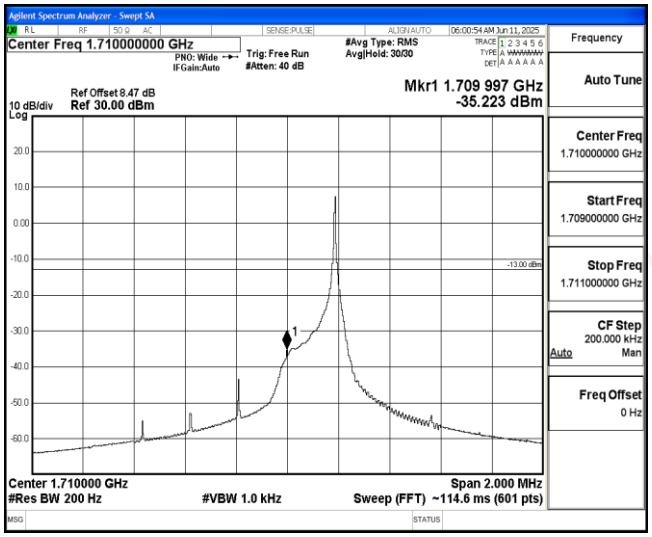
Test Result

Band	OpMode	SCS	BW	Modu	Channel	Tones	Result (dBm)	Verdict
Band4	Stand-Alone	3.75kHz	NaN	BPSK	19951	1@0	-14.58	PASS
Band4	Stand-Alone	3.75kHz	NaN	BPSK	19951	1@47	-35.22	PASS
Band4	Stand-Alone	3.75kHz	NaN	BPSK	20399	1@0	-36.93	PASS
Band4	Stand-Alone	3.75kHz	NaN	BPSK	20399	1@47	-16.65	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@0	-13.30	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@47	-37.17	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@0	-37.91	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@47	-17.45	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@0	-17.09	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@11	-36.84	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	12@0	-24.18	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@0	-38.57	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@11	-13.20	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	12@0	-33.61	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	1@0	-19.30	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	1@11	-37.99	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	12@0	-25.73	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	1@0	-34.16	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	1@11	-15.76	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	12@0	-20.89	PASS

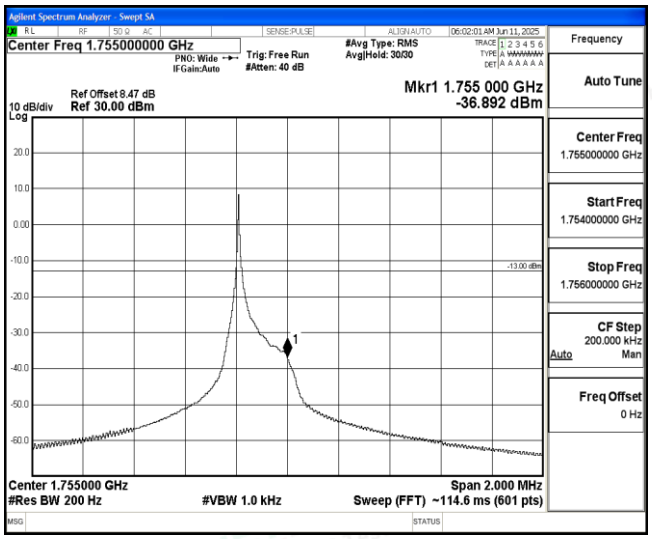
Test Graphs



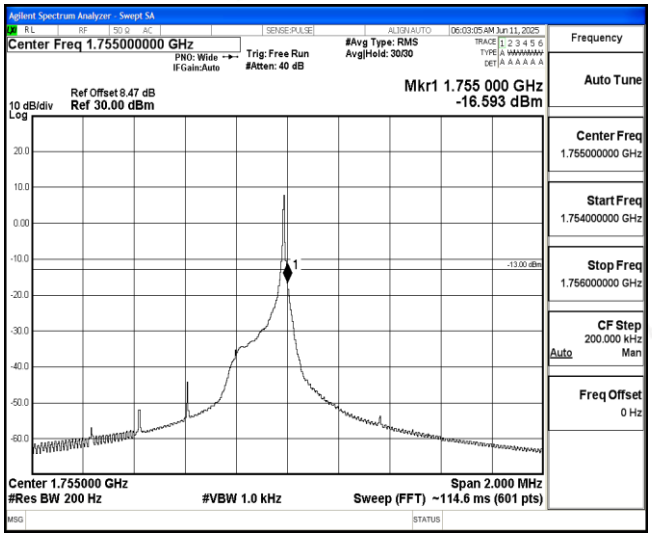
Band4-Stand-Alone-NaN-BPSK-19951-1@0-3.75kHz--14.58-PASS



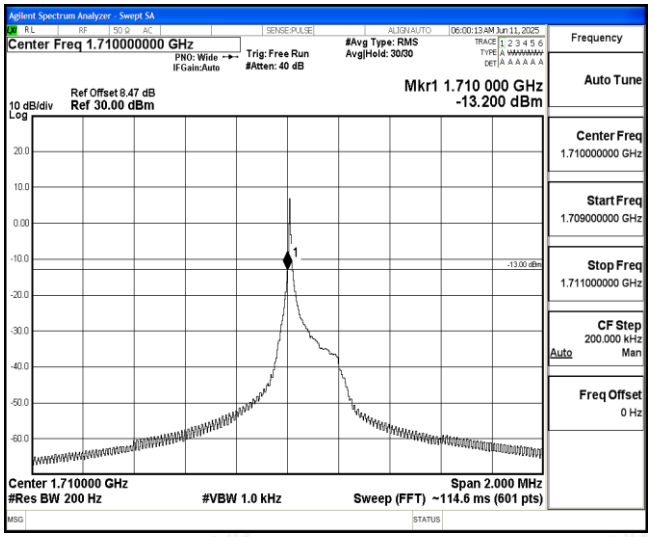
Band4-Stand-Alone-NaN-BPSK-19951-1@47-3.75kHz--35.22-PASS



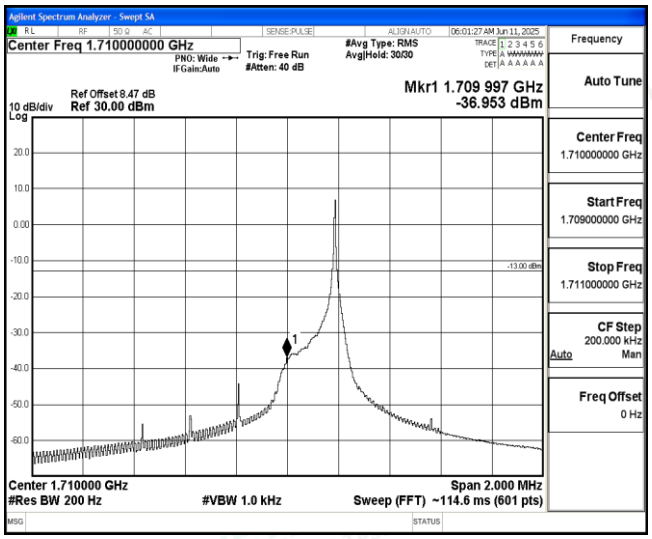
Band4-Stand-Alone-NaN-BPSK-20399-1@0-3.75kHz--36.93-PASS



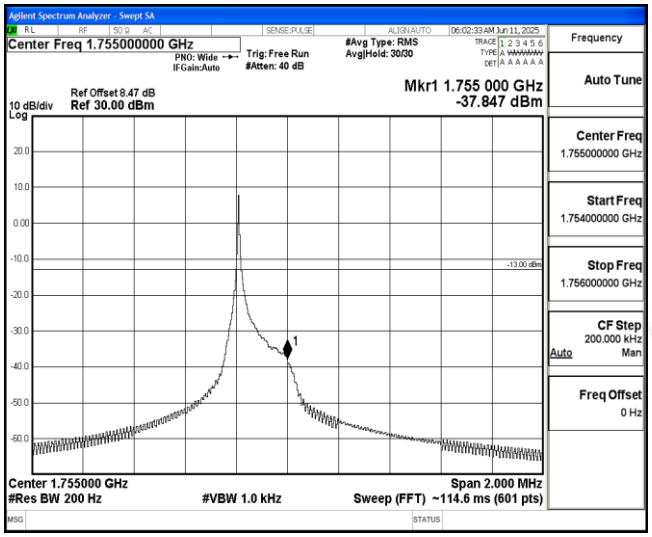
Band4-Stand-Alone-NaN-BPSK-20399-1@47-3.75kHz--16.65-PASS



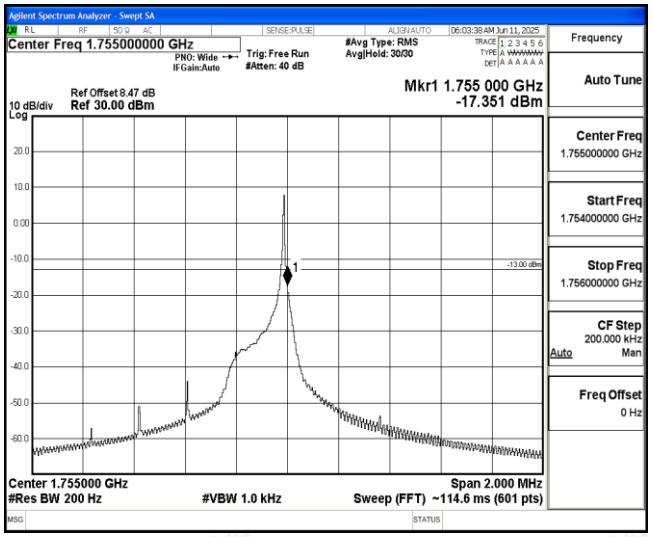
Band4-Stand-Alone-NaN-QPSK-19951-1@0-3.75kHz--13.30-PASS



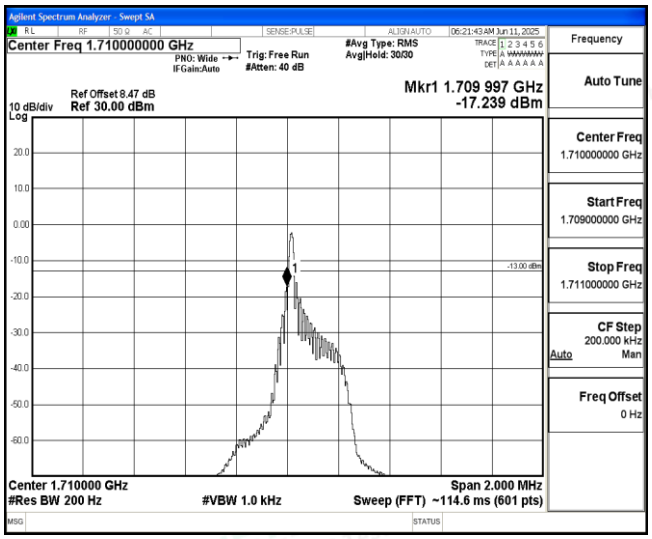
Band4-Stand-Alone-NaN-QPSK-19951-1@47-3.75kHz--37.17-PASS



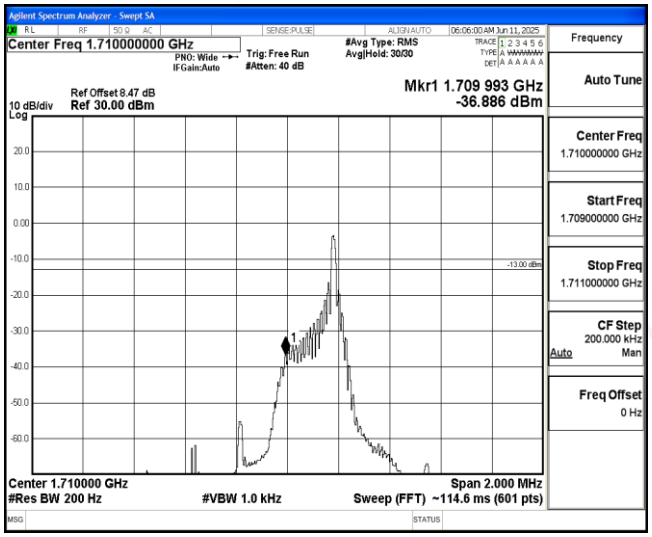
Band4-Stand-Alone-NaN-QPSK-20399-1@0-3.75kHz--37.91-PASS



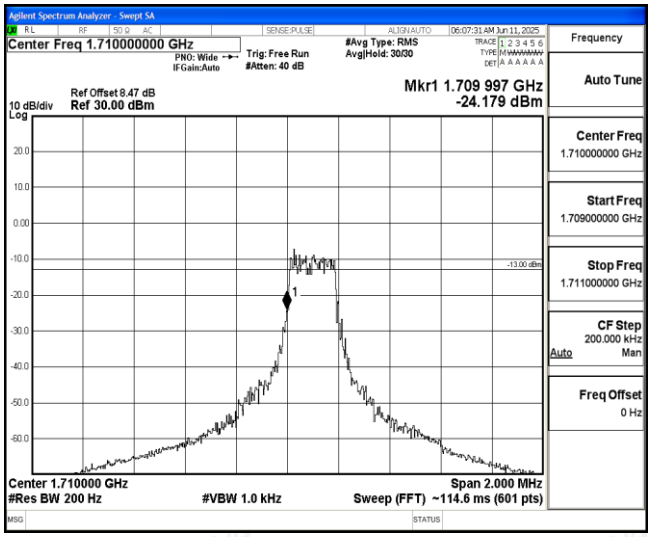
Band4-Stand-Alone-NaN-QPSK-20399-1@47-3.75kHz--17.45-PASS



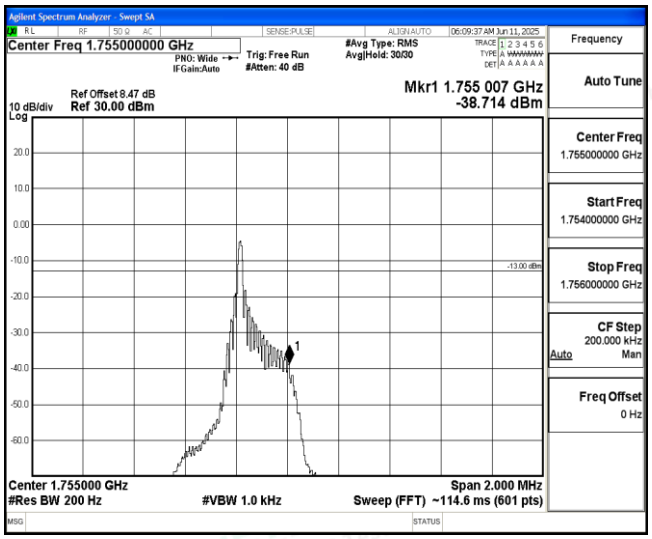
Band4-Stand-Alone-NaN-BPSK-19951-1@0-15kHz--17.09-PASS



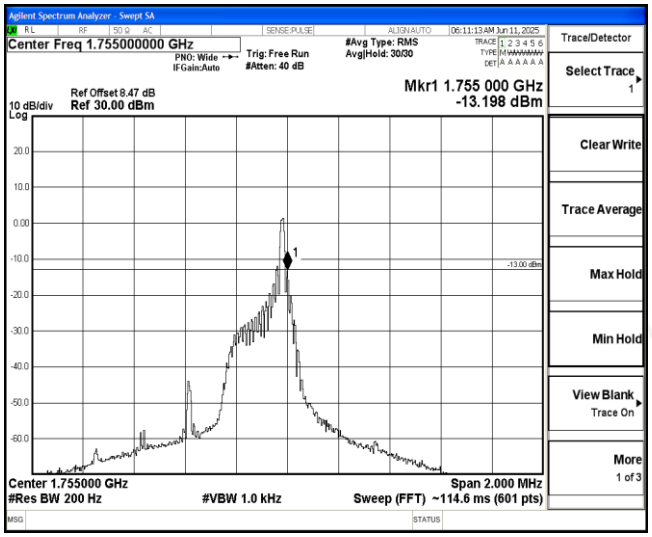
Band4-Stand-Alone-NaN-BPSK-19951-1@11-15kHz--36.84-PASS



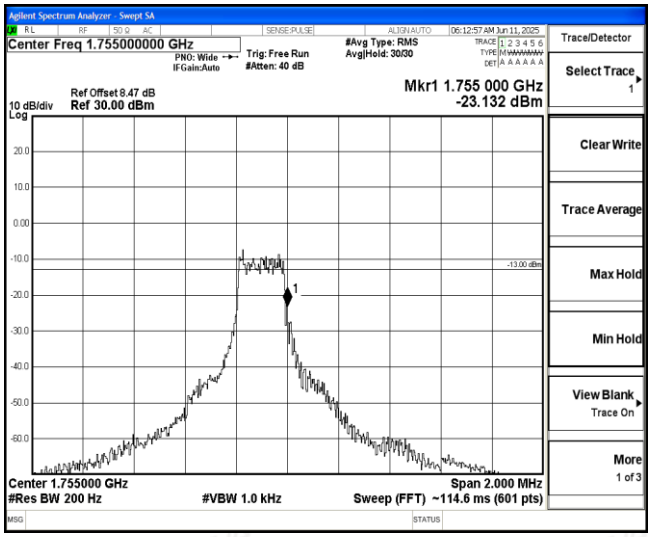
Band4-Stand-Alone-NaN-BPSK-19951-12@0-15kHz--24.18-PASS



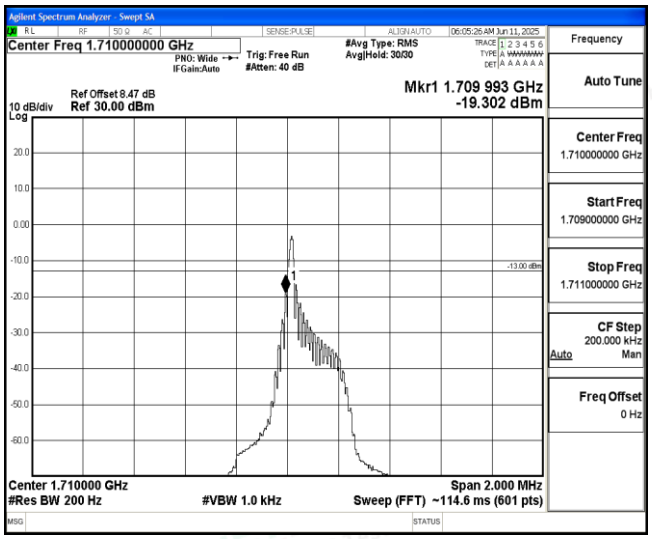
Band4-Stand-Alone-NaN-BPSK-20399-1@0-15kHz--38.57-PASS



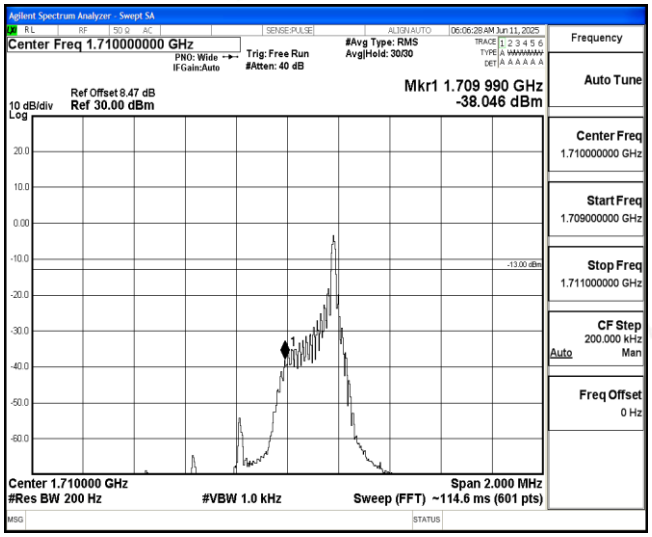
Band4-Stand-Alone-NaN-BPSK-20399-1@11-15kHz--13.20-PASS



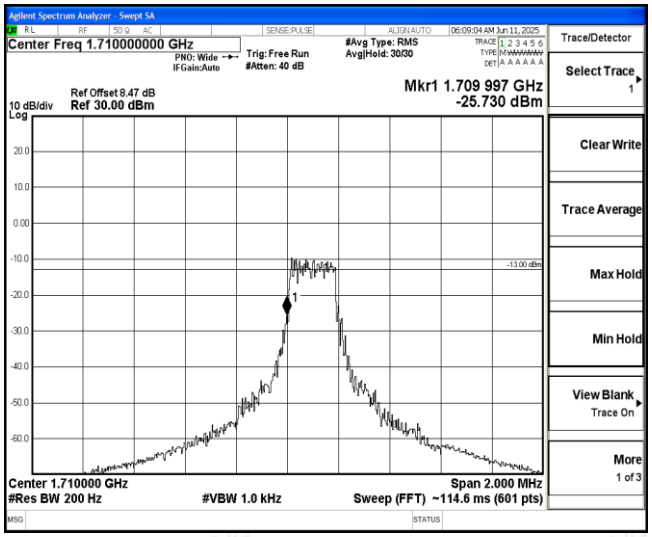
Band4-Stand-Alone-NaN-BPSK-20399-12@0-15kHz--33.61-PASS



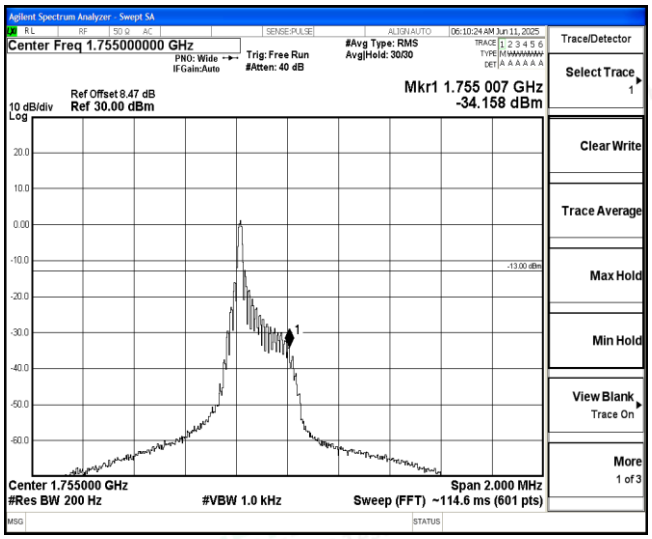
Band4-Stand-Alone-NaN-QPSK-19951-1@0-15kHz--19.30-PASS



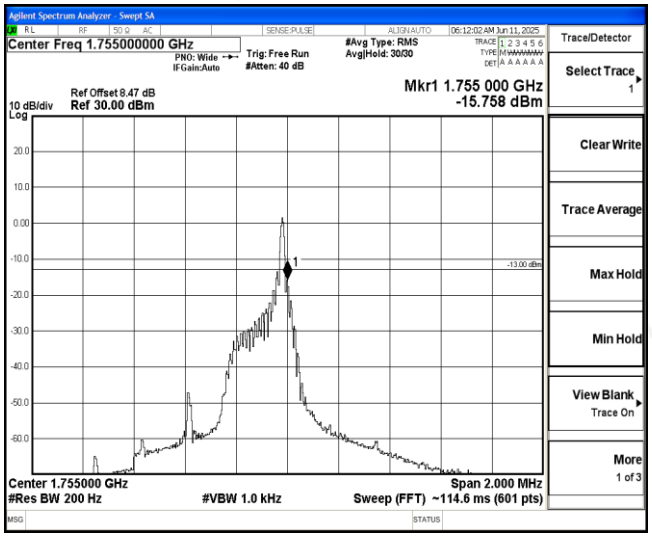
Band4-Stand-Alone-NaN-QPSK-19951-1@11-15kHz--37.99-PASS



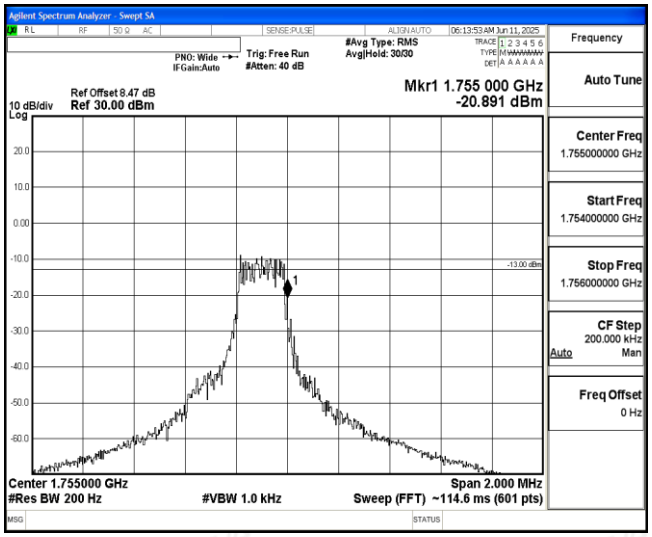
Band4-Stand-Alone-NaN-QPSK-19951-12@0-15kHz--25.73-PASS



Band4-Stand-Alone-NaN-QPSK-20399-1@0-15kHz--34.16-PASS



Band4-Stand-Alone-NaN-QPSK-20399-1@11-15kHz--15.76-PASS



Band4-Stand-Alone-NaN-QPSK-20399-12@0-15kHz--20.89-PASS

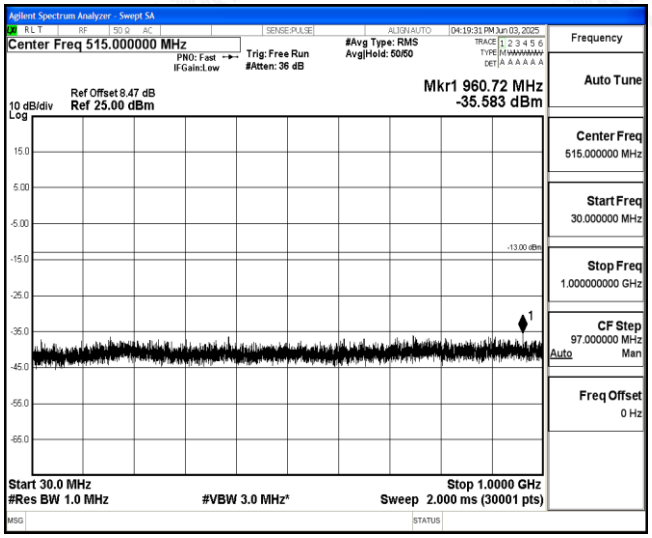
N.5 Conducted Spurious Emission for NB1

Test Result

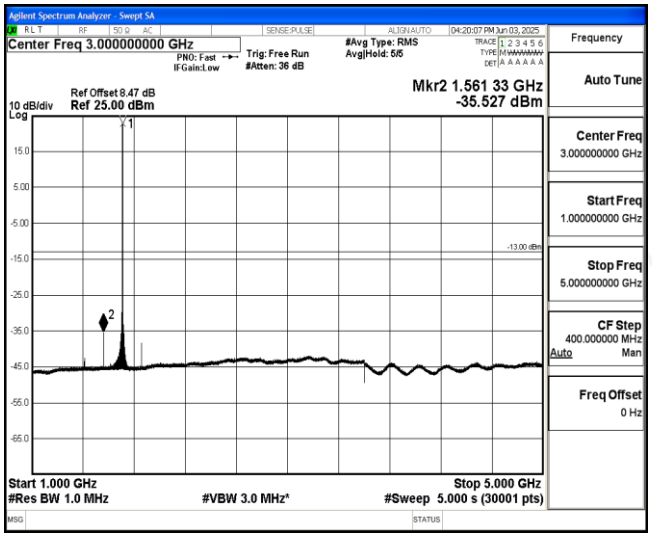
Band	OpMode	SCS	BW	Modu	Channel	Tones	Freq Start [MHz]	Freq Stop [MHz]	Result (dBm)	Limit (dBm)	Verdict
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@0	30	1000	-35.58	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@0	1000	5000	-35.53	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@0	5000	12000	-57.74	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@0	12000	26500	-42.77	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@47	30	1000	-35.25	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@47	1000	5000	-35.27	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@47	5000	12000	-57.46	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	19951	1@47	12000	26500	-42.74	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@0	30	1000	-35.2	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@0	1000	5000	-36.09	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@0	5000	12000	-57.61	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@0	12000	26500	-42.59	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@47	30	1000	-35.59	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@47	1000	5000	-34.33	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@47	5000	12000	-57.71	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20175	1@47	12000	26500	-42.54	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@0	30	1000	-35.63	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@0	1000	5000	-34.24	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@0	5000	12000	-57.56	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@0	12000	26500	-42.52	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@47	30	1000	-35.31	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@47	1000	5000	-34.27	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@47	5000	12000	-57.64	-13	PASS
Band4	Stand-Alone	3.75kHz	NaN	QPSK	20399	1@47	12000	26500	-42.68	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@0	30	1000	-35.64	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@0	1000	5000	-38.85	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@0	5000	12000	-57.56	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@0	12000	26500	-42.74	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@11	30	1000	-35.87	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@11	1000	5000	-38.56	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@11	5000	12000	-57.65	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	19951	1@11	12000	26500	-42.56	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@0	30	1000	-35.29	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@0	1000	5000	-39.07	-13	PASS

Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@0	5000	12000	-57.5	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@0	12000	26500	-42.6	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@11	30	1000	-34.85	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@11	1000	5000	-39.07	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@11	5000	12000	-57.72	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20175	1@11	12000	26500	-42.79	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@0	30	1000	-36.01	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@0	1000	5000	-38.71	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@0	5000	12000	-57.65	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@0	12000	26500	-42.59	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@11	30	1000	-35.89	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@11	1000	5000	-38.43	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@11	5000	12000	-57.61	-13	PASS
Band4	Stand-Alone	15kHz	NaN	BPSK	20399	1@11	12000	26500	-42.59	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	12@0	30	1000	-36.13	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	12@0	1000	5000	-37.16	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	12@0	5000	12000	-57.81	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	19951	12@0	12000	26500	-42.85	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	12@0	30	1000	-35.84	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	12@0	1000	5000	-40.61	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	12@0	5000	12000	-57.7	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20175	12@0	12000	26500	-42.7d	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	12@0	30	1000	-35.95	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	12@0	1000	5000	-35.58	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	12@0	5000	12000	-57.68	-13	PASS
Band4	Stand-Alone	15kHz	NaN	QPSK	20399	12@0	12000	26500	-42.64	-13	PASS

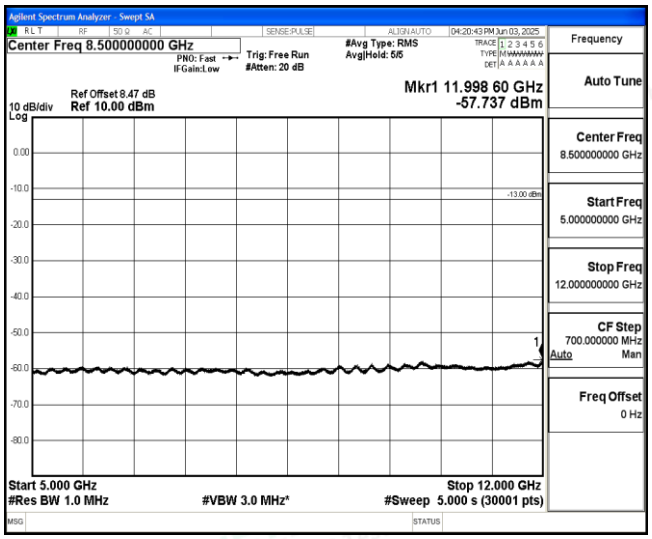
Test Graphs



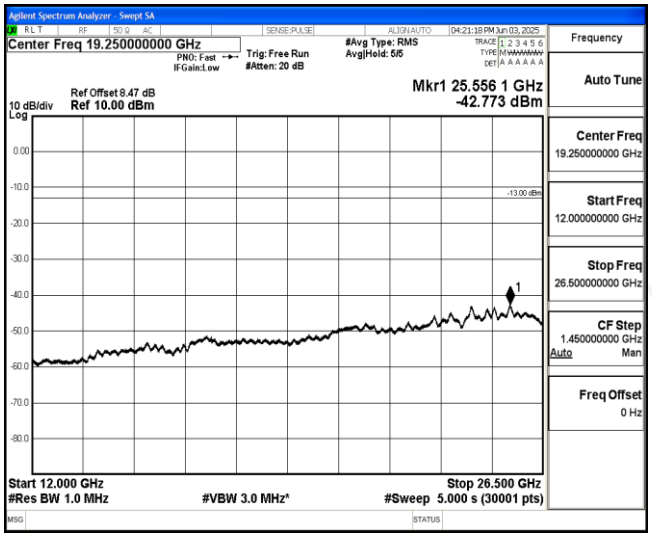
Band4-Stand-Alone-NaN-QPSK-19951-1@0-3.75kHz-30-1000-30~1000MHz@-35.58dBm--13-PASS



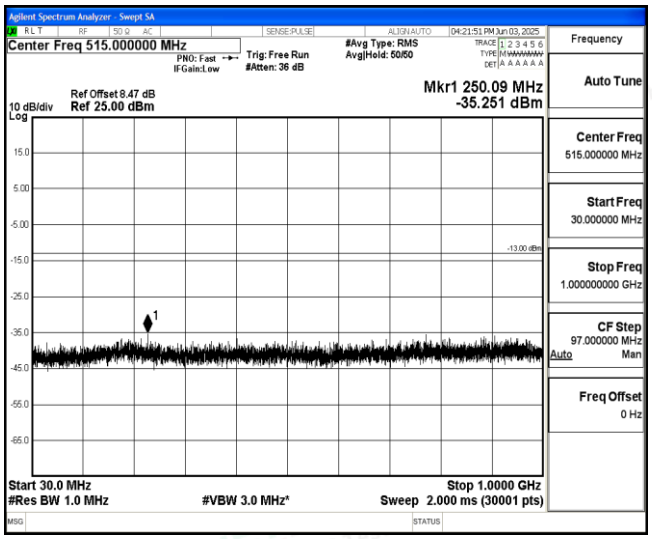
Band4-Stand-Alone-NaN-QPSK-19951-1@0-3.75kHz-1000-5000-1000~5000MHz@-35.53dBm--13-PASS



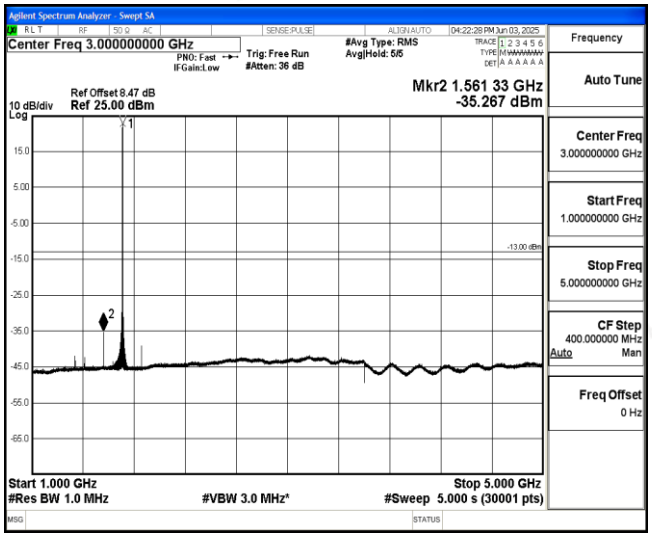
Band4-Stand-Alone-NaN-QPSK-19951-1@0-3.75kHz-5000-12000-5000~12000MHz@-57.74dBm--13-PASS



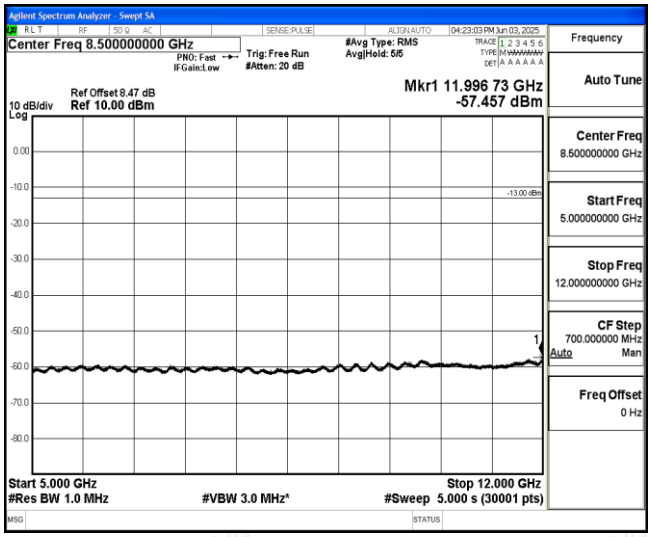
Band4-Stand-Alone-NaN-QPSK-19951-1@0-3.75kHz-12000-26500-12000~26500MHz@-42.77dBm--13-PASS



Band4-Stand-Alone-NaN-QPSK-19951-1@47-3.75kHz-30-1000-30~1000MHz@-35.25dBm--13-PASS

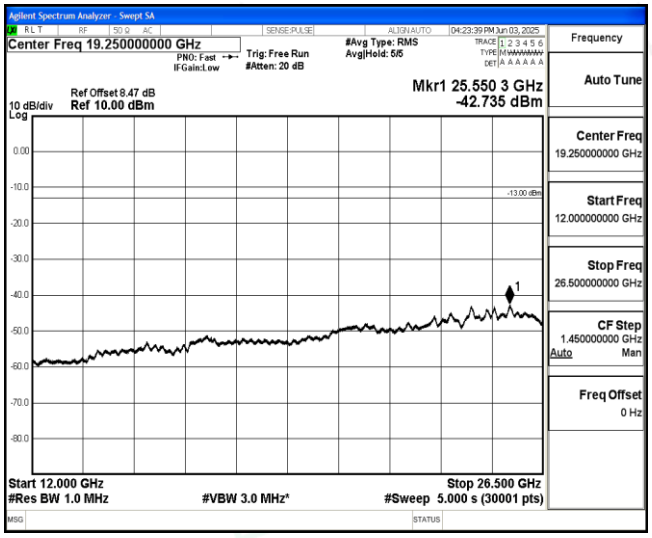


Band4-Stand-Alone-NaN-QPSK-19951-1@47-3.75kHz-1000-5000-1000~5000MHz@-35.27dBm--13-PASS

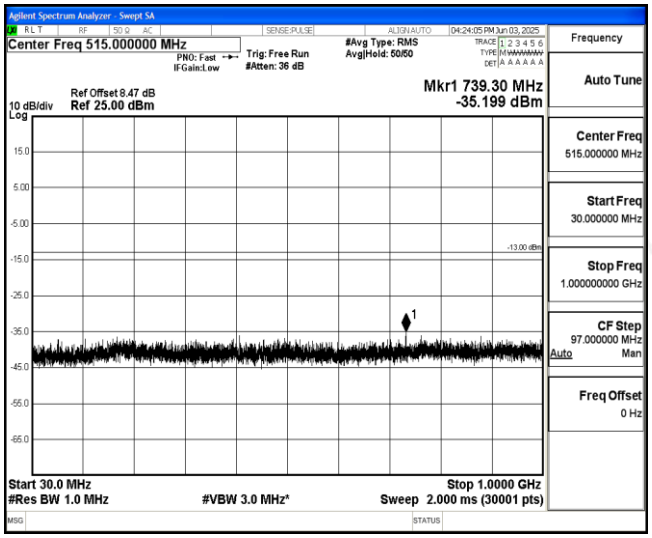


Band4-Stand-Alone-NaN-QPSK-19951-1@47-3.75kHz-5000-12000-5000~12000MHz@-57.46dBm--13-PA

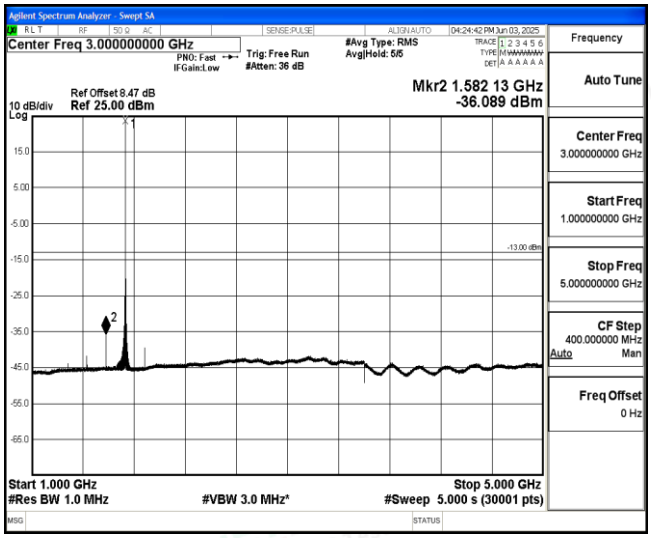
SS



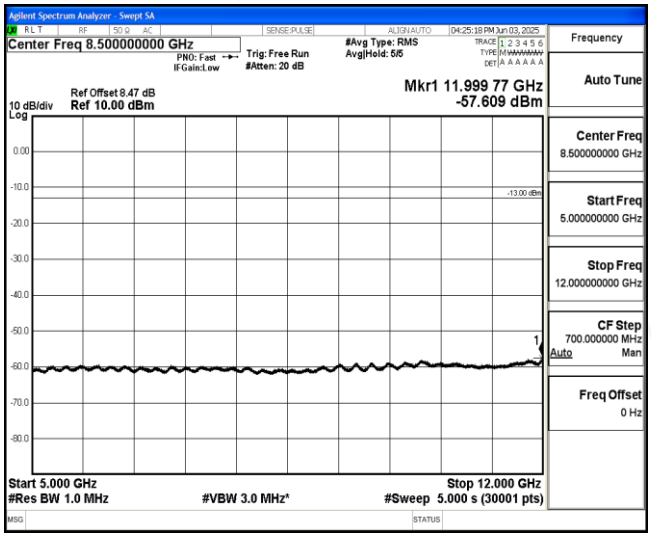
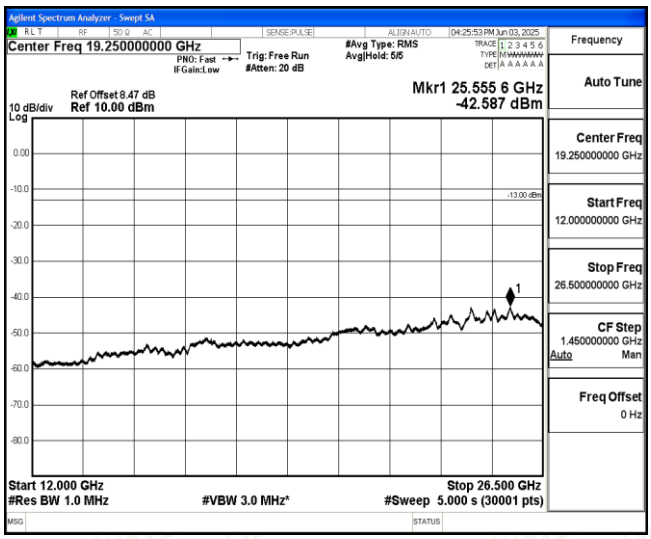
Band4-Stand-Alone-NaN-QPSK-19951-1@47-3.75kHz-12000-26500-12000~26500MHz@-42.74dBm--13-PASS



Band4-Stand-Alone-NaN-QPSK-20175-1@0-3.75kHz-30-1000-30~1000MHz@-35.2dBm--13-PASS



Band4-Stand-Alone-NaN-QPSK-20175-1@0-3.75kHz-1000-5000-1000~5000MHz@-36.09dBm--13-PASS



Band4-Stand-Alone-NaN-QPSK-20175-1@0-3.75kHz-5000-12000-5000~12000MHz@-57.61dBm--13-PASS