Appendix A: Test Results of Band 2 for NB-IoT operation

Appendix A.1: RF Power Output and Effective (Isotropic) Radiated Power Output Data for NB

Test Result

Band	OpMode	Bandwidth	Modulation	Channel	Tones	SCS	Result	EIRP		Limit (watts)	Verdict
							dBm	dBm	Watts		
Band2	Stand-Alone	NaN	QPSK	18601	1@0	3.75kHz	12.53	14.67	0.029	2	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@47	3.75kHz	12.55	14.69	0.029	2	PASS
Band2	Stand-Alone	NaN	QPSK	18601	3@3	15kHz	11.85	13.99	0.025	2	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@11	15kHz	11.84	13.98	0.025	2	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@0	15kHz	12.01	14.15	0.026	2	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	21.23	23.37	0.217	2	PASS
Band2	Stand-Alone	NaN	QPSK	18900	3@3	15kHz	21.58	23.72	0.236	2	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	21.24	23.38	0.218	2	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	21.57	23.71	0.235	2	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	21.52	23.66	0.232	2	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@47	3.75kHz	12.41	14.55	0.029	2	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@0	15kHz	12	14.14	0.026	2	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@11	15kHz	12.04	14.18	0.026	2	PASS
Band2	Stand-Alone	NaN	QPSK	19199	3@3	15kHz	12	14.14	0.026	2	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@0	3.75kHz	12.52	14.66	0.029	2	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@0	15kHz	11.97	14.11	0.026	2	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@0	3.75kHz	12.51	14.65	0.029	2	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@11	15kHz	11.81	13.95	0.025	2	PASS
Band2	Stand-Alone	NaN	BPSK	18601	3@3	15kHz	11.95	14.09	0.026	2	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@47	3.75kHz	12.49	14.63	0.029	2	PASS
Band2	Stand-Alone	NaN	BPSK	18900	3@3	15kHz	21.59	23.73	0.236	2	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@0	15kHz	21.43	23.57	0.228	2	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@47	3.75kHz	21.27	23.41	0.219	2	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@0	3.75kHz	21.27	23.41	0.219	2	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@11	15kHz	21.43	23.57	0.228	2	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@0	15kHz	11.86	14.00	0.025	2	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@47	3.75kHz	12.51	14.65	0.029	2	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@11	15kHz	11.75	13.89	0.024	2	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@0	3.75kHz	12.52	14.66	0.029	2	PASS
Band2	Stand-Alone	NaN	BPSK	19199	3@3	15kHz	12.3	14.44	0.028	2	PASS

Appendix A.2: Peak-to-Average Ratio (CCDF) for NB

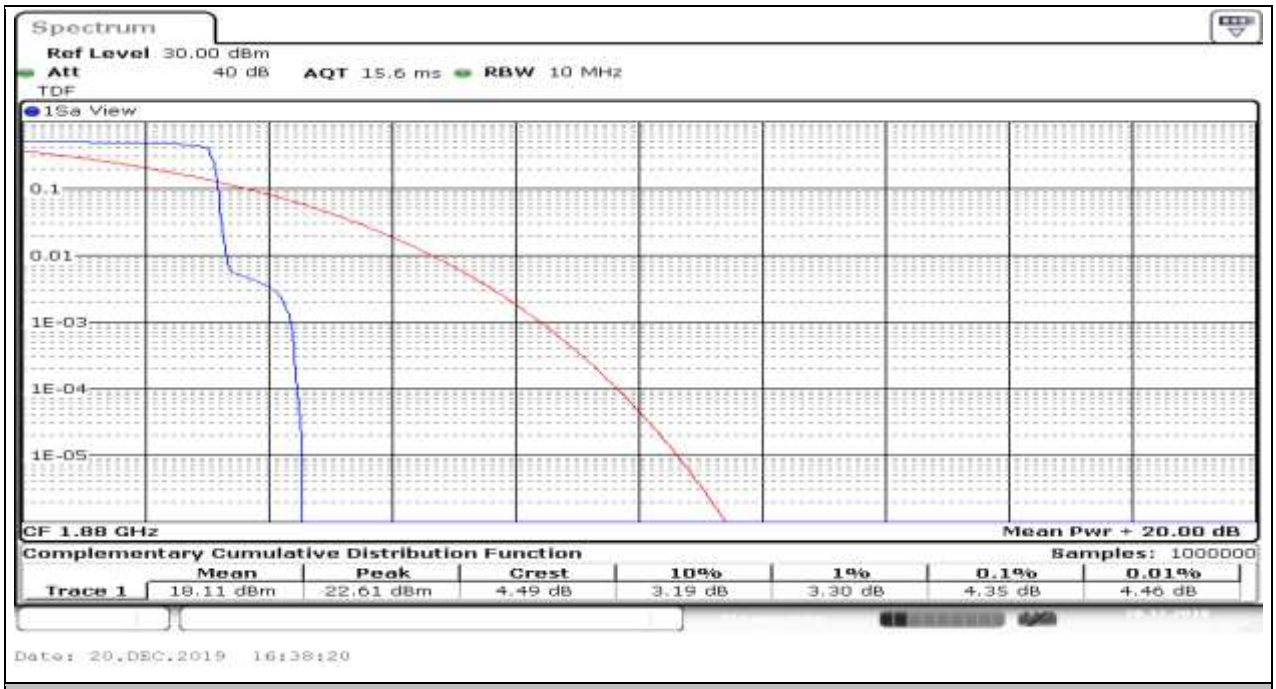
Test Result

Band	OpMode	Bandwidth	Modulation	Channel	Tones	SCS	Result (dB)	Limit (dB)	Verdict
Band2	Stand-Alone	NaN	QPSK	18900	3@3	15kHz	8.43	<=13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	4.35	<=13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	9.28	<=13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	9.68	<=13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	6.64	<=13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	3@3	15kHz	11.28	<=13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@11	15kHz	12.96	<=13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@0	15kHz	1.39	<=13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@47	3.75kHz	1.91	<=13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@0	3.75kHz	1.74	<=13	PASS

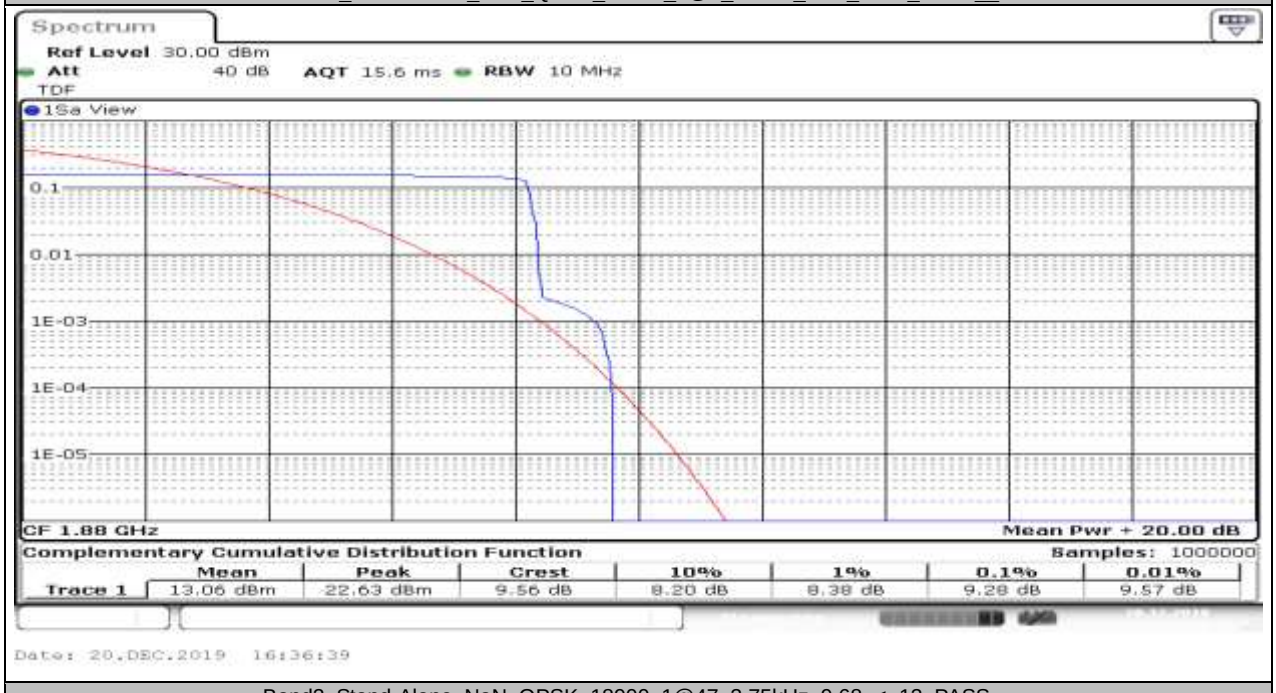
Test Graphs

Band2_Stand-Alone_NaN_QPSK_18900_3@3_15kHz_8.43_<=13_PASS__

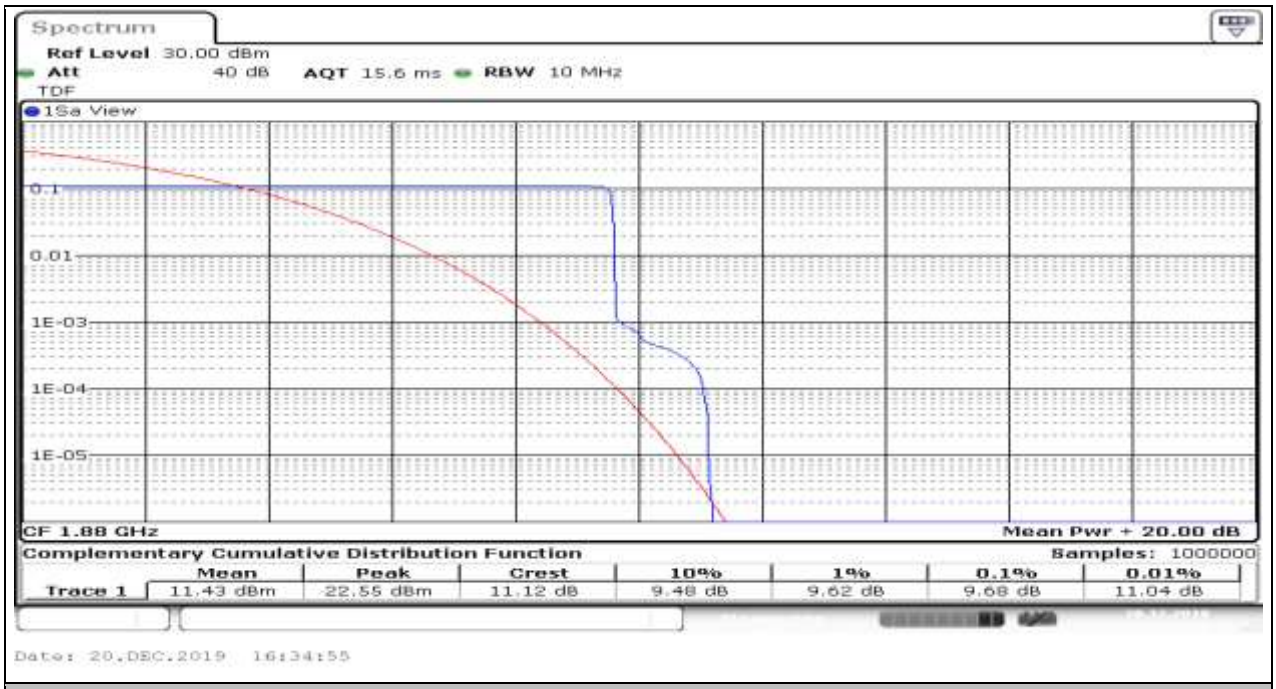
Band2_Stand-Alone_NaN_QPSK_18900_1@11_15kHz_4.35_<=13_PASS__



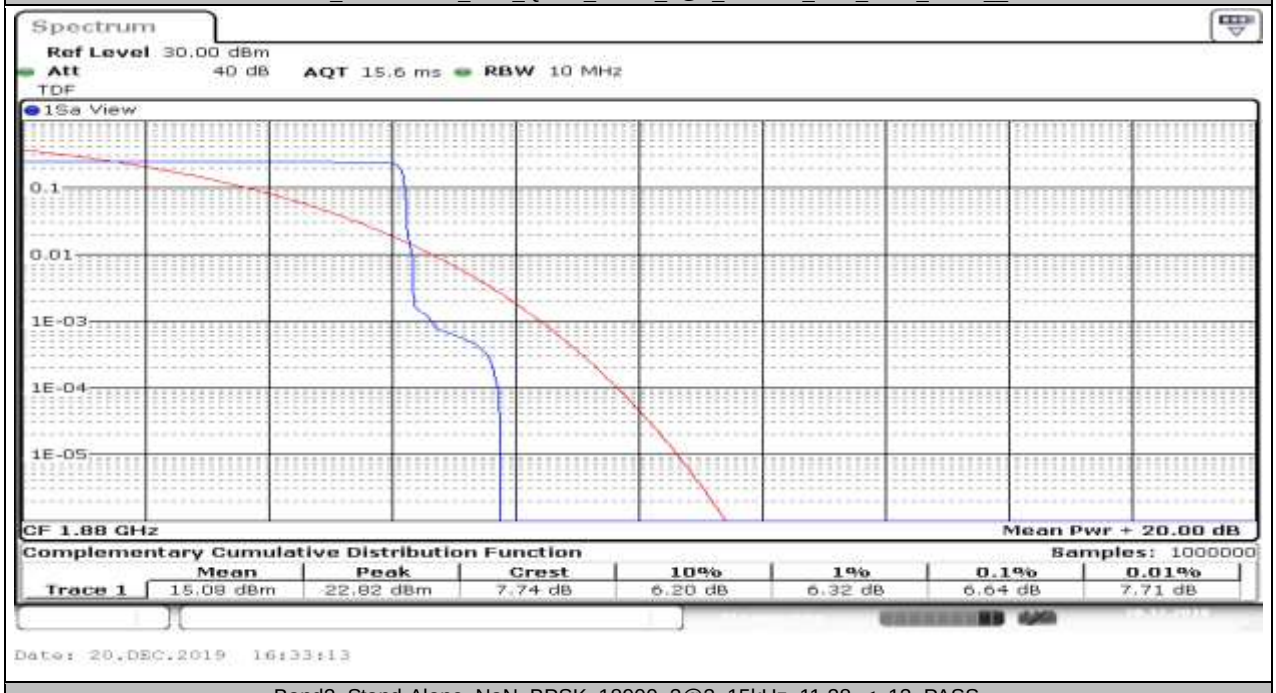
Band2_Stand-Alone_NaN_QPSK_18900_1@0_15kHz_9.28_<=13_PASS__



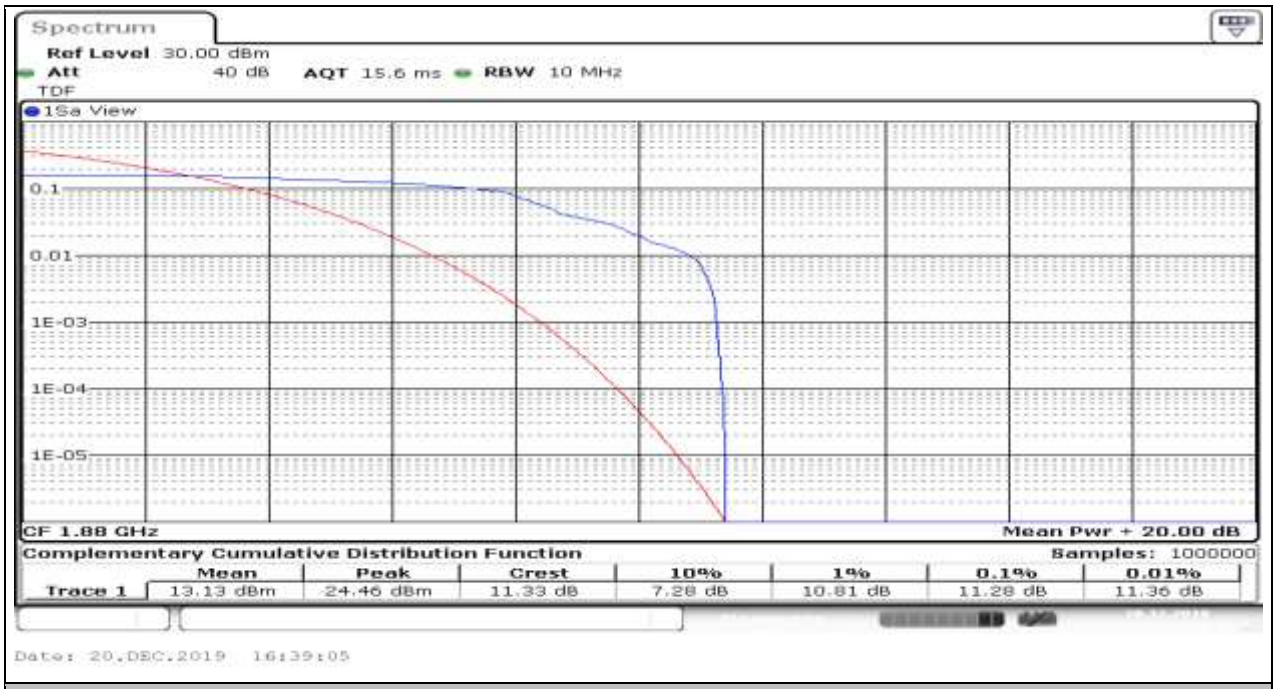
Band2_Stand-Alone_NaN_QPSK_18900_1@47_3.75kHz_9.68_<=13_PASS__



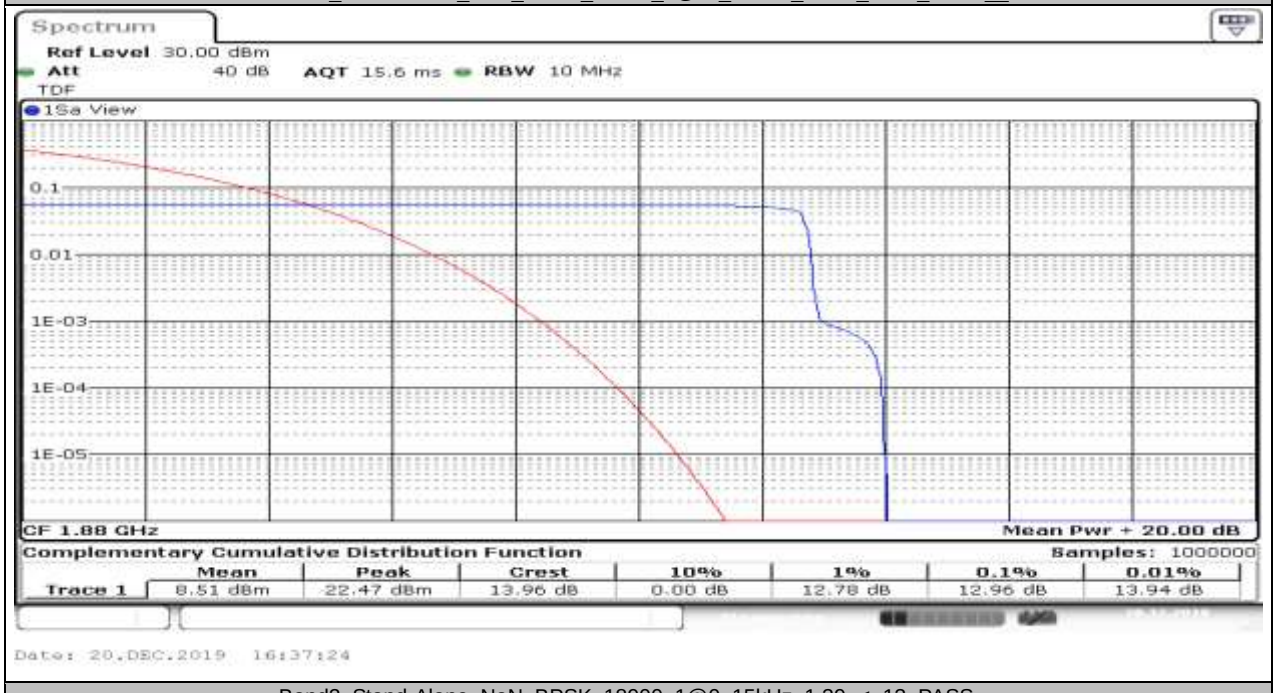
Band2_Stand-Alone_NaN_QPSK_18900_1@0_3.75kHz_6.64_<=13_PASS__



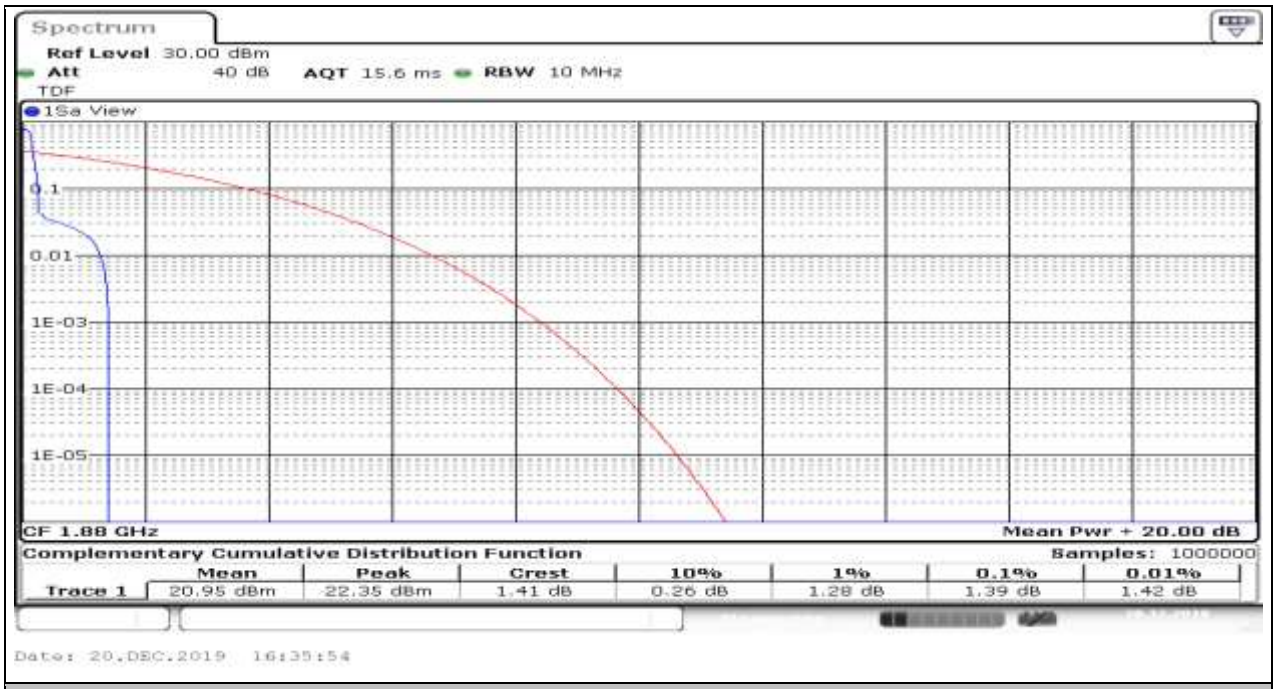
Band2_Stand-Alone_NaN_BPSK_18900_3@3_15kHz_11.28_<=13_PASS__



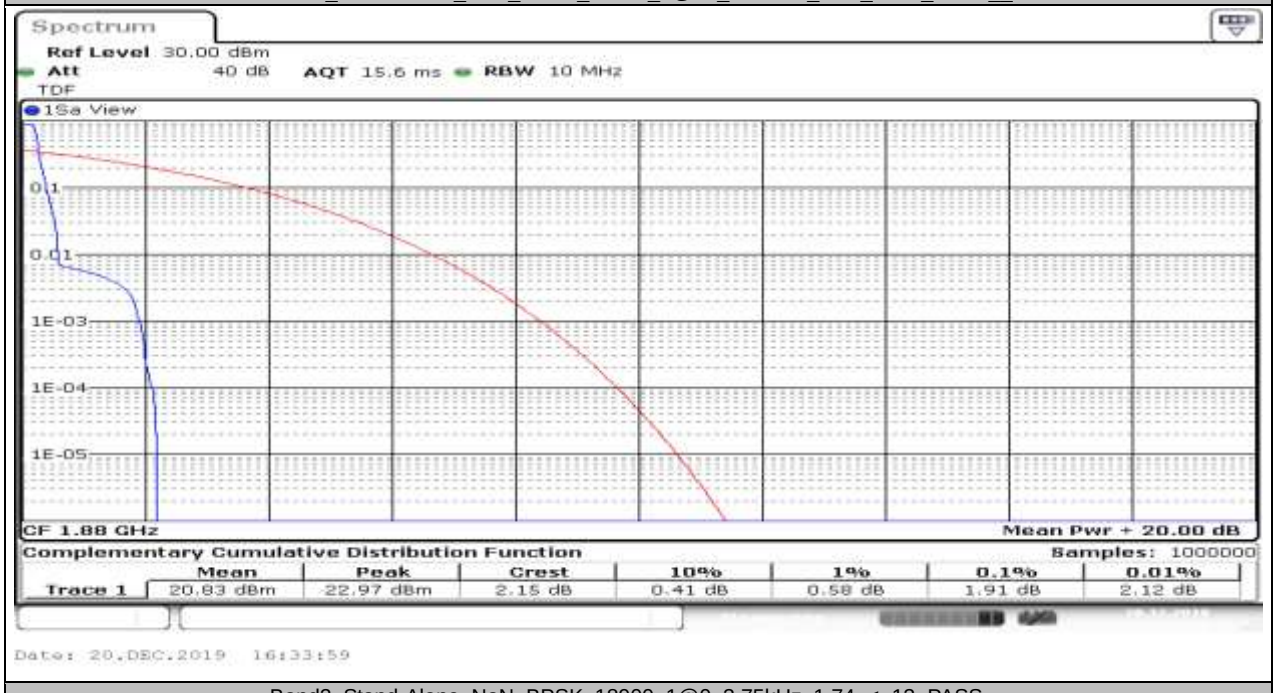
Band2_Stand-Alone_NaN_BPSK_18900_1@11_15kHz_12.96_<=13_PASS__



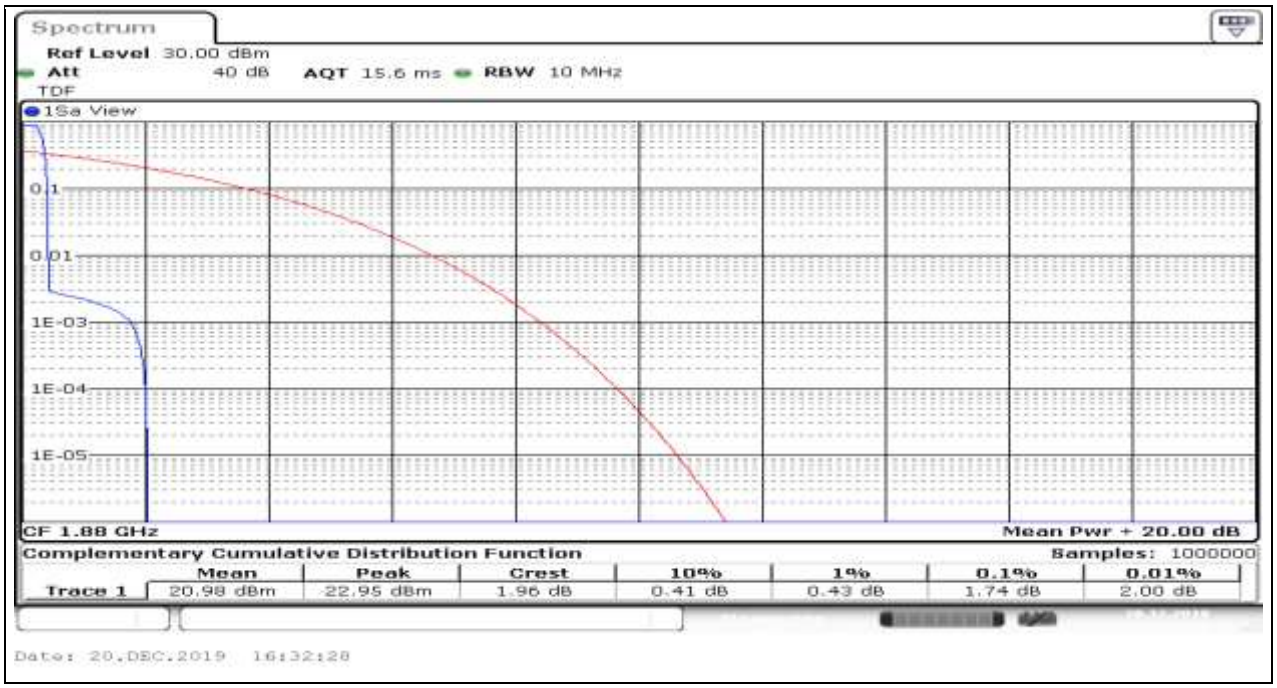
Band2_Stand-Alone_NaN_BPSK_18900_1@0_15kHz_1.39_<=13_PASS__



Band2_Stand-Alone_NaN_BPSK_18900_1@47_3.75kHz_1.91_<=13_PASS__



Band2_Stand-Alone_NaN_BPSK_18900_1@0_3.75kHz_1.74_<=13_PASS__


Spectrum
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Att 40 dB
AQT 15.6 ms
RBW 10 MHz
TDF
1Sa View
0.1
0.01
1E-03
1E-04
1E-05
CF 1.88 GHz
Mean Pwr + 20.00 dB
Complementary Cumulative Distribution Function
Samples: 1000000
Mean
Peak
Crest
10%
1%
0.1%
0.01%
Trace 1
20.98 dBm
22.95 dBm
1.96 dB
0.41 dB
0.43 dB
1.74 dB
2.00 dB
Date: 20.DEC.2019 16:32:28

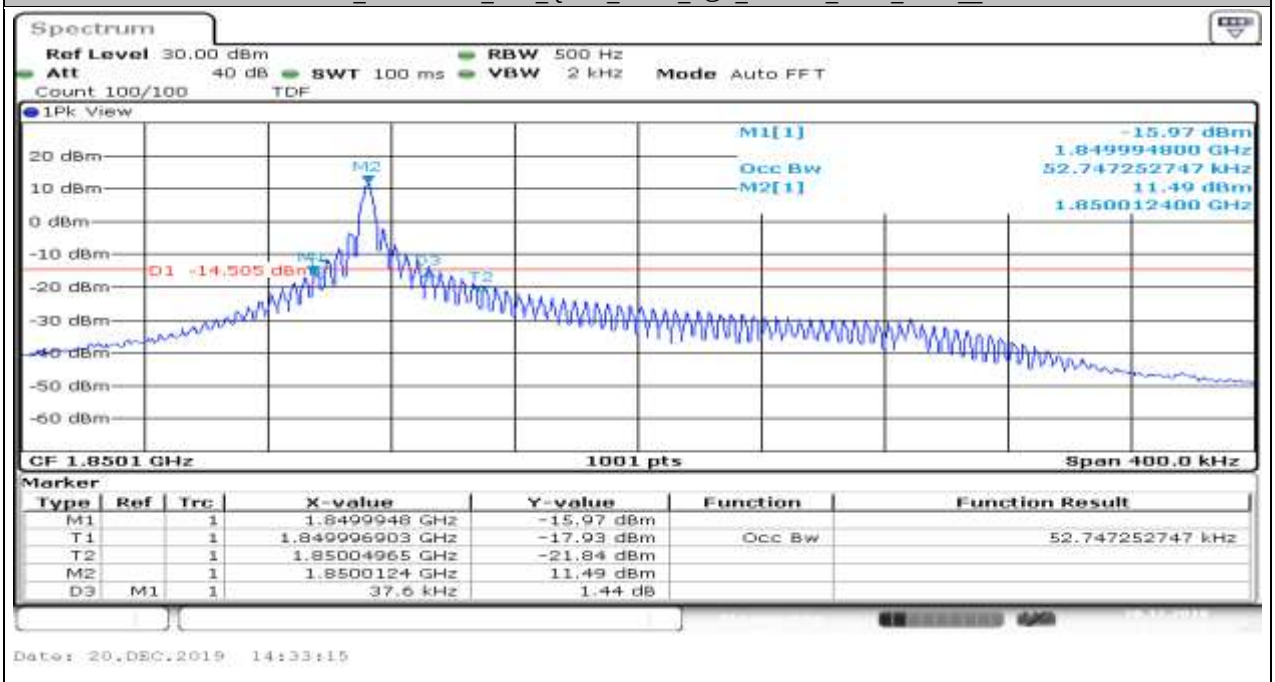
Appendix A.3: 26dB Emission Bandwidth and Occupied Bandwidth for NB

Test Result

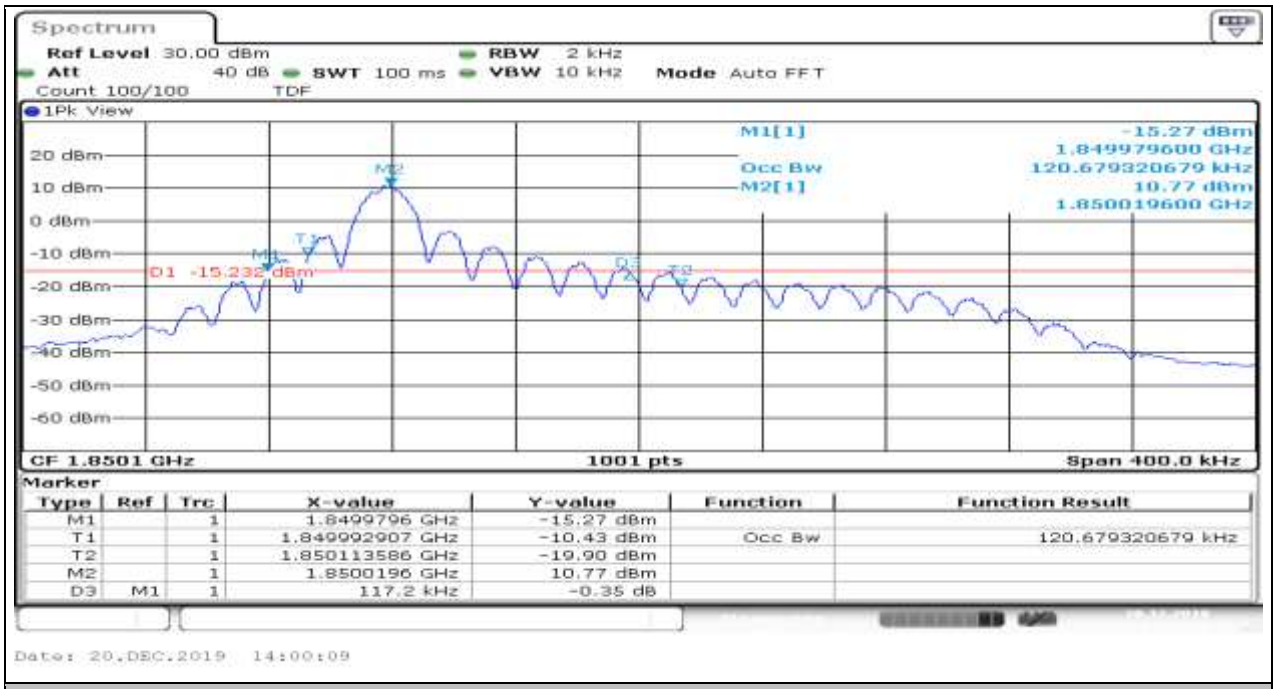
Band	OpMode	Bandwidth	Modulation	Channel	Tones	SCS	26dB Bandwidth (MHz)	Occupied Bandwidth (MHz)	Verdict
Band2	Stand-Alone	NaN	QPSK	18601	1@0	3.75kHz	0.038	0.053	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@0	15kHz	0.117	0.121	PASS
Band2	Stand-Alone	NaN	QPSK	18601	12@0	15kHz	0.251	0.185	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	0.038	0.053	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	0.118	0.120	PASS
Band2	Stand-Alone	NaN	QPSK	18900	12@0	15kHz	0.252	0.185	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@0	3.75kHz	0.037	0.052	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@0	15kHz	0.118	0.121	PASS
Band2	Stand-Alone	NaN	QPSK	19199	12@0	15kHz	0.253	0.185	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@0	3.75kHz	0.032	0.056	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@0	15kHz	0.106	0.129	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@0	3.75kHz	0.032	0.056	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@0	15kHz	0.106	0.129	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@0	3.75kHz	0.032	0.057	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@0	15kHz	0.106	0.130	PASS

Test Graphs

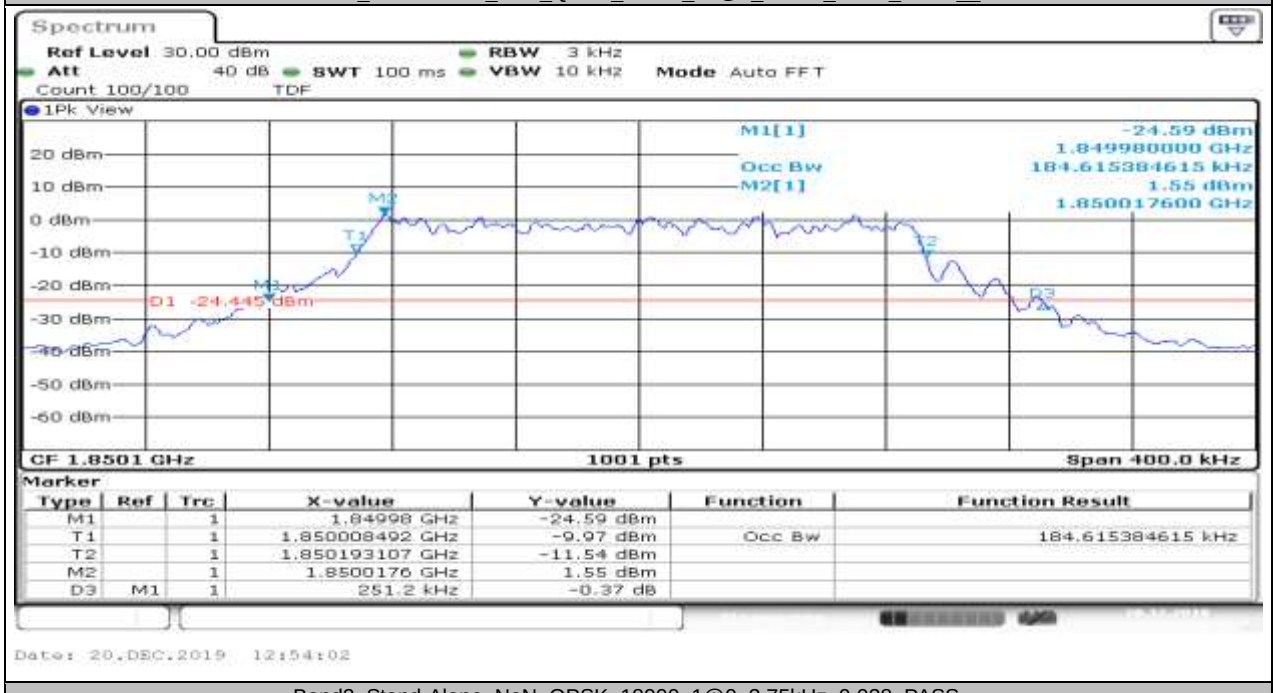
Band2_Stand-Alone_NaN_QPSK_18601_1@0_3.75kHz_0.038_PASS__



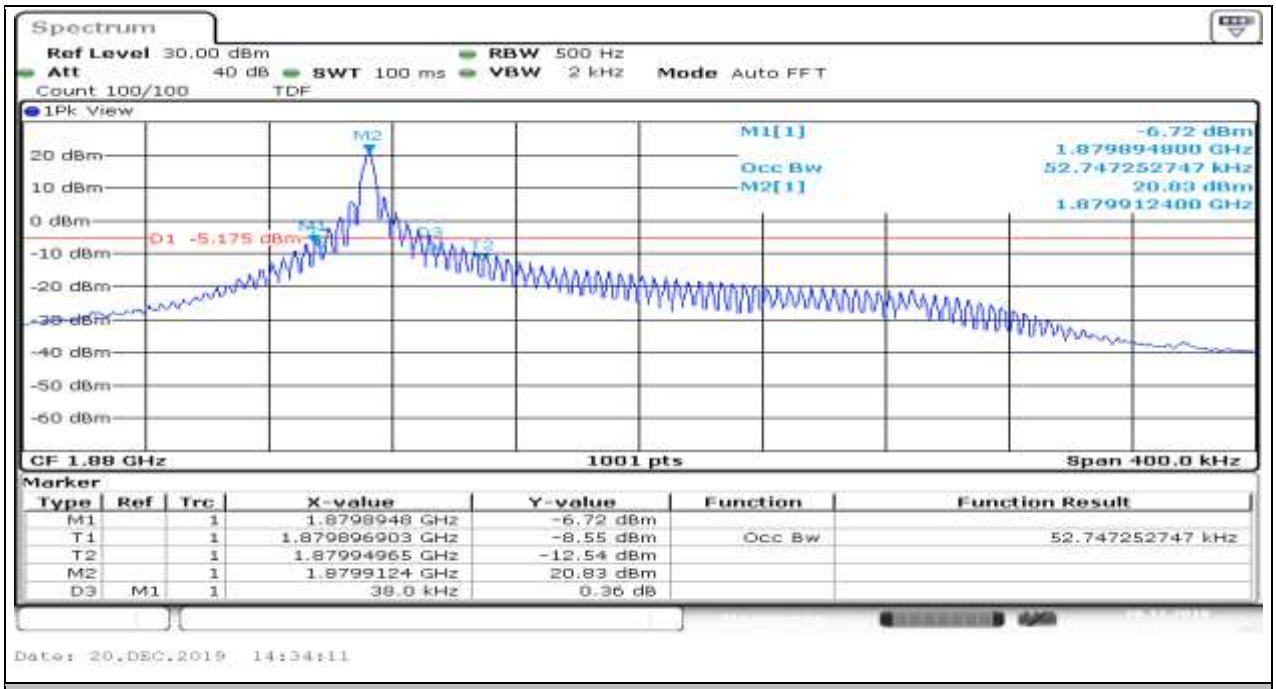
Band2_Stand-Alone_NaN_QPSK_18601_1@0_15kHz_0.117_PASS__



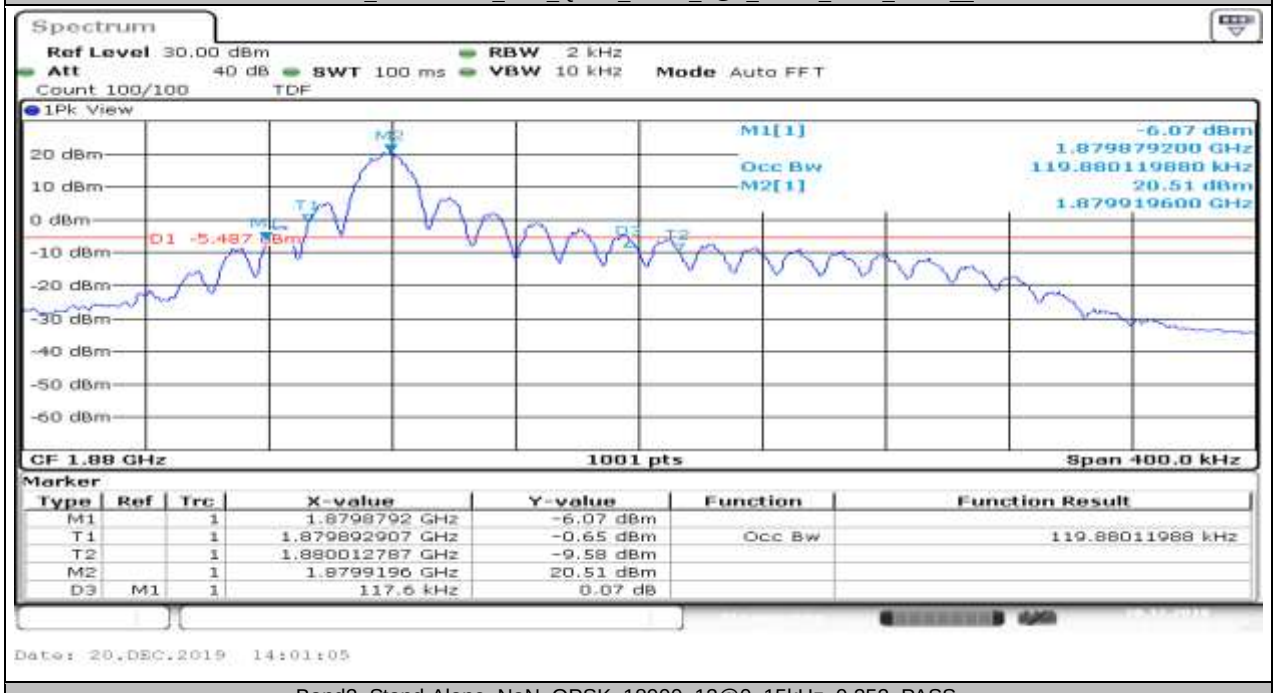
Band2_Stand-Alone_NaN_QPSK_18601_12@0_15kHz_0.251_PASS__



Band2_Stand-Alone_NaN_QPSK_18900_1@0_3.75kHz_0.038_PASS__

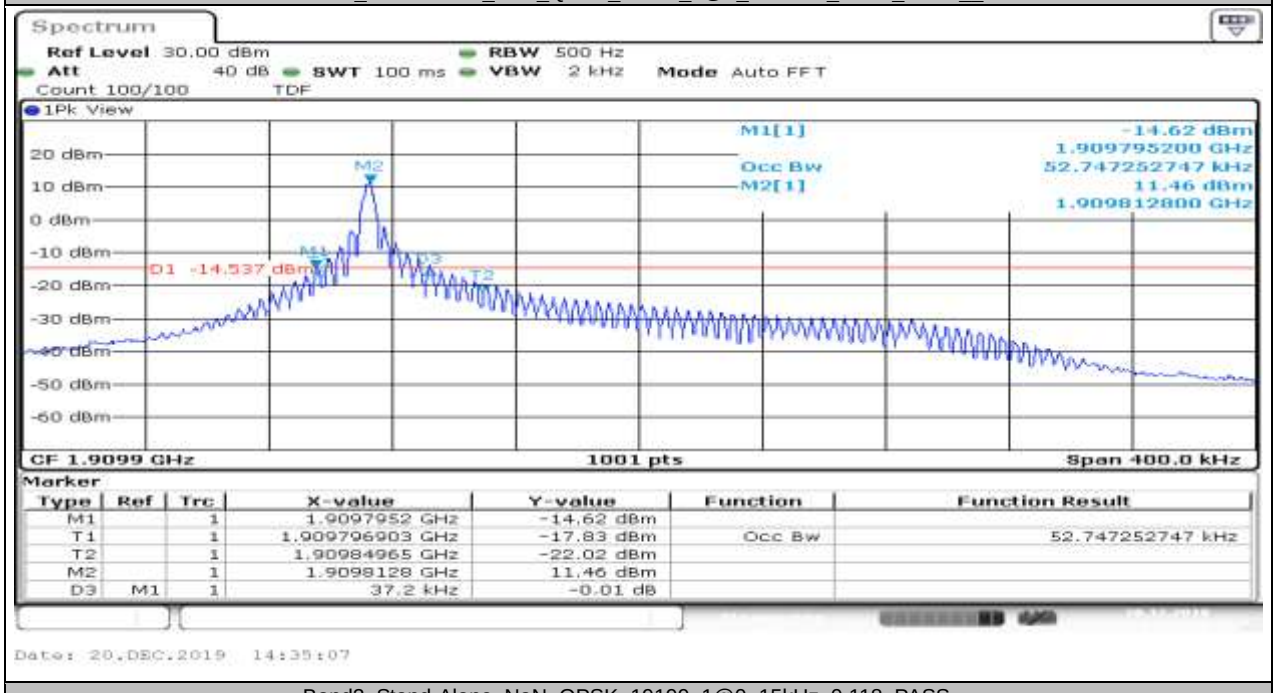


Band2_Stand-Alone_NaN_QPSK_18900_1@0_15kHz_0.118_PASS__

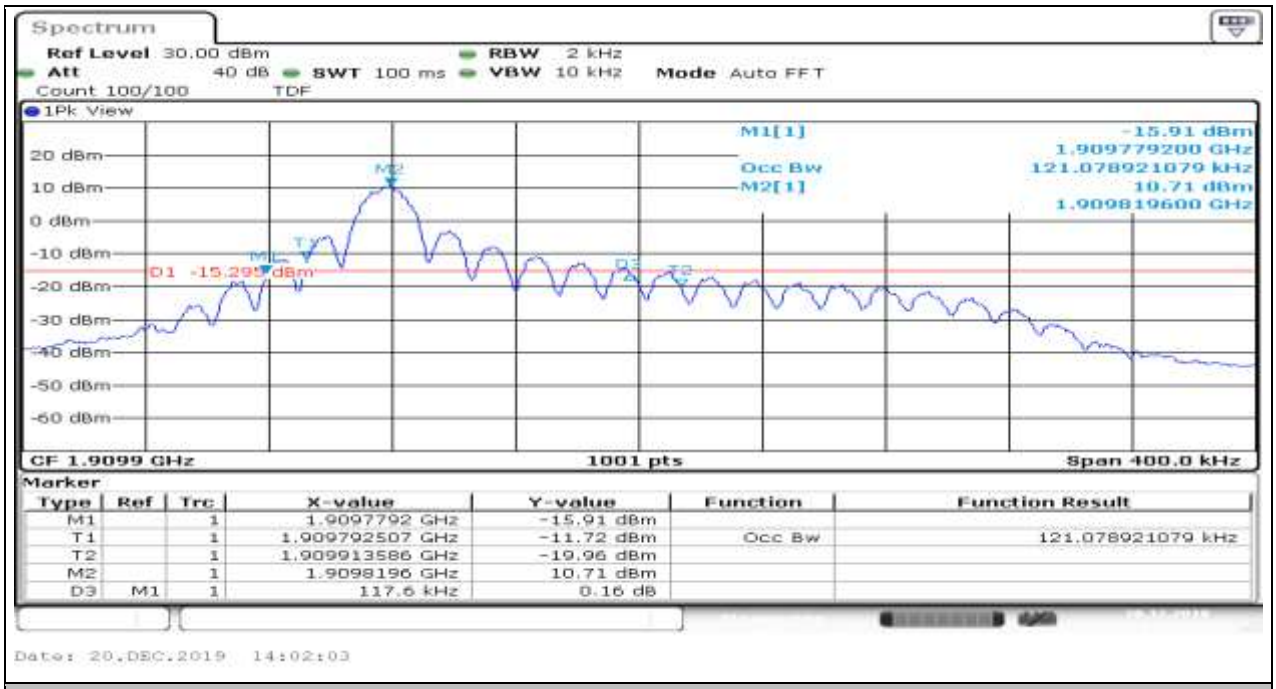


Band2_Stand-Alone_NaN_QPSK_18900_12@0_15kHz_0.252_PASS__

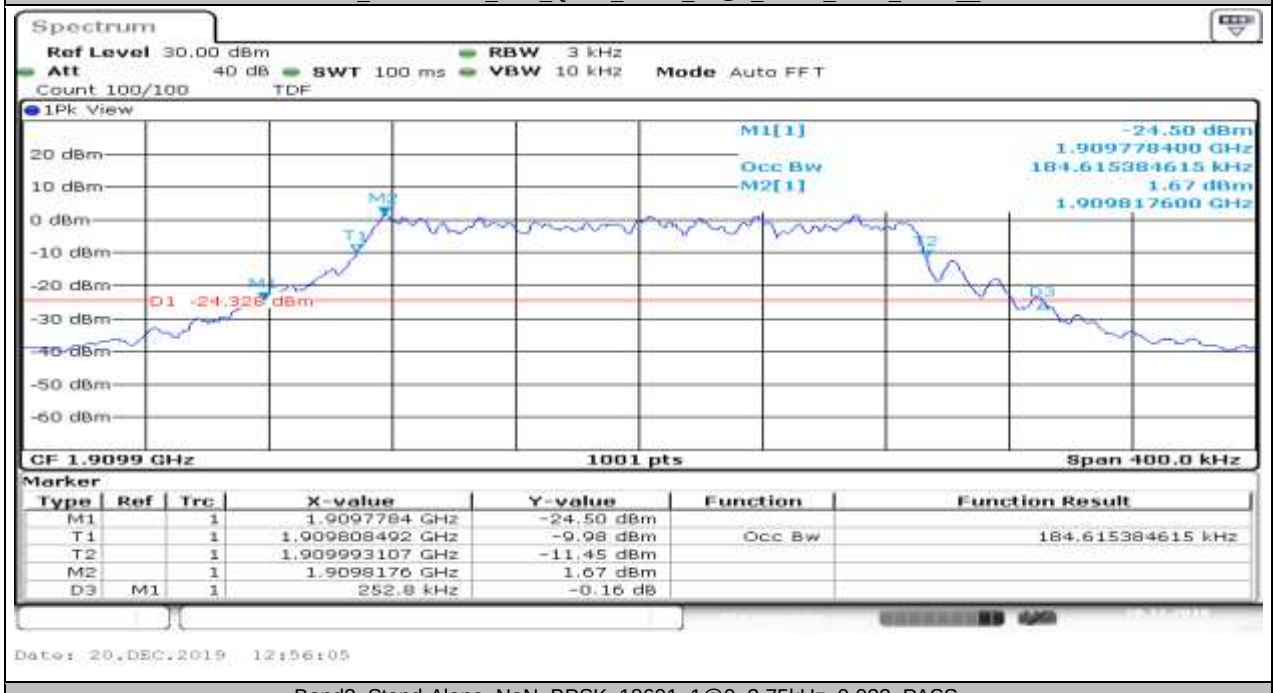
Band2_Stand-Alone_NaN_QPSK_19199_1@0_3.75kHz_0.037_PASS__



Band2_Stand-Alone_NaN_QPSK_19199_1@0_15kHz_0.118_PASS__

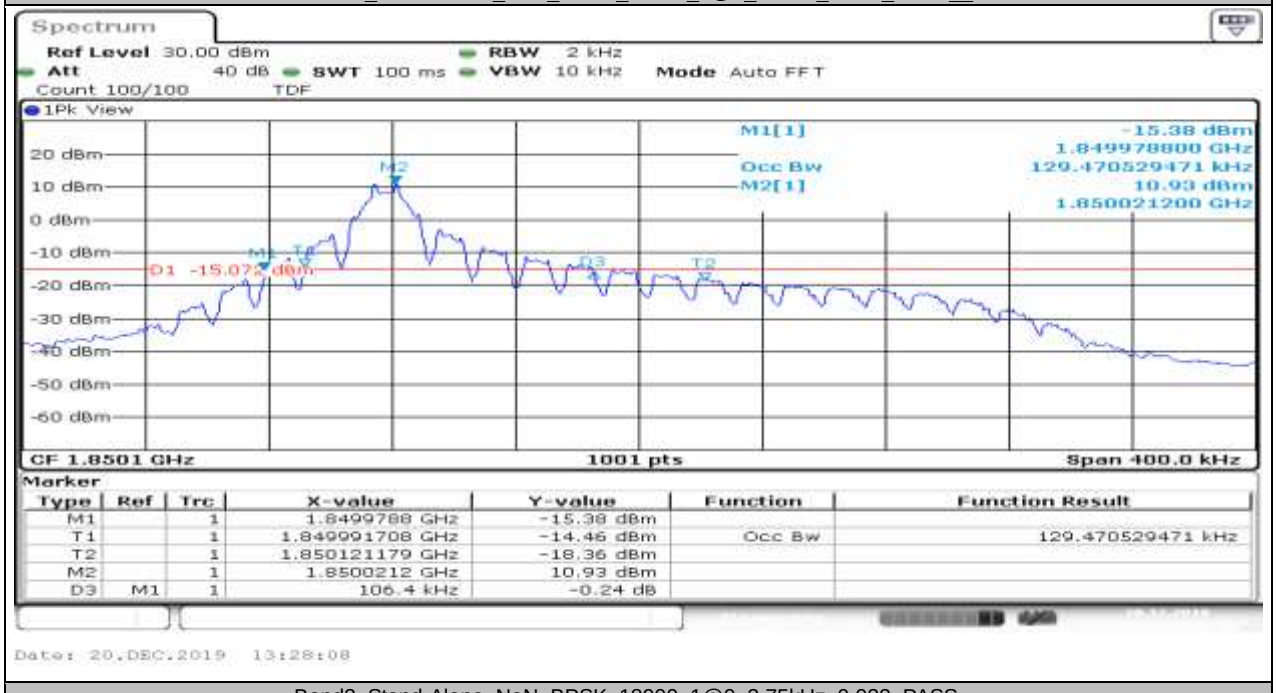


Band2_Stand-Alone_NaN_QPSK_19199_12@0_15kHz_0.253_PASS__



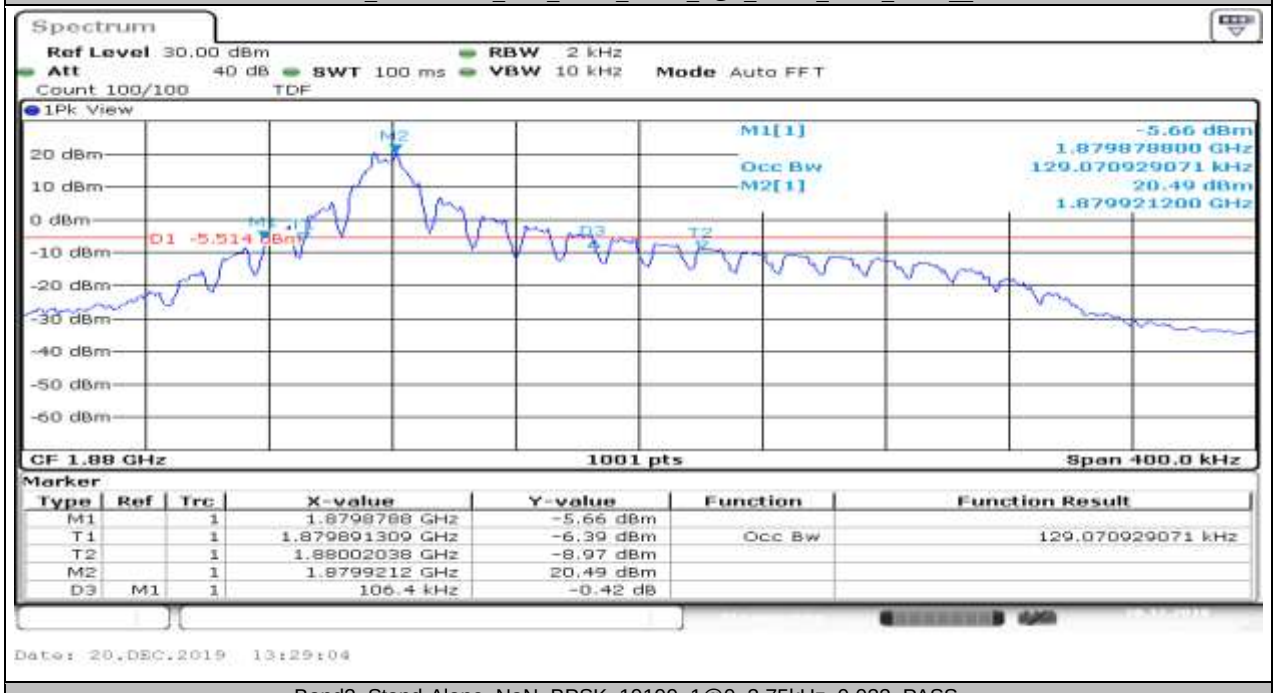
Band2_Stand-Alone_NaN_BPSK_18601_1@0_3.75kHz_0.032_PASS__

Band2_Stand-Alone_NaN_BPSK_18601_1@0_15kHz_0.106_PASS__



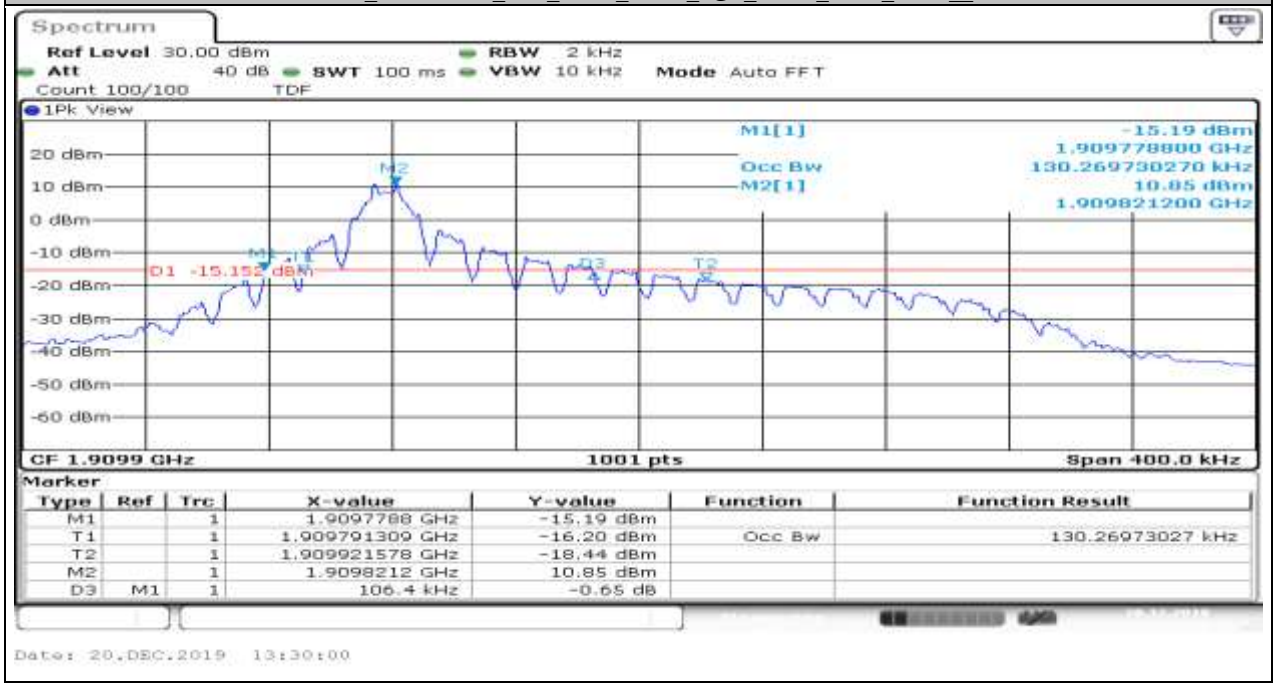
Band2_Stand-Alone_NaN_BPSK_18900_1@0_3.75kHz_0.032_PASS__

Band2_Stand-Alone_NaN_BPSK_18900_1@0_15kHz_0.106_PASS__



Band2_Stand-Alone_NaN_BPSK_19199_1@0_3.75kHz_0.032_PASS__

Band2_Stand-Alone_NaN_BPSK_19199_1@0_15kHz_0.106_PASS__



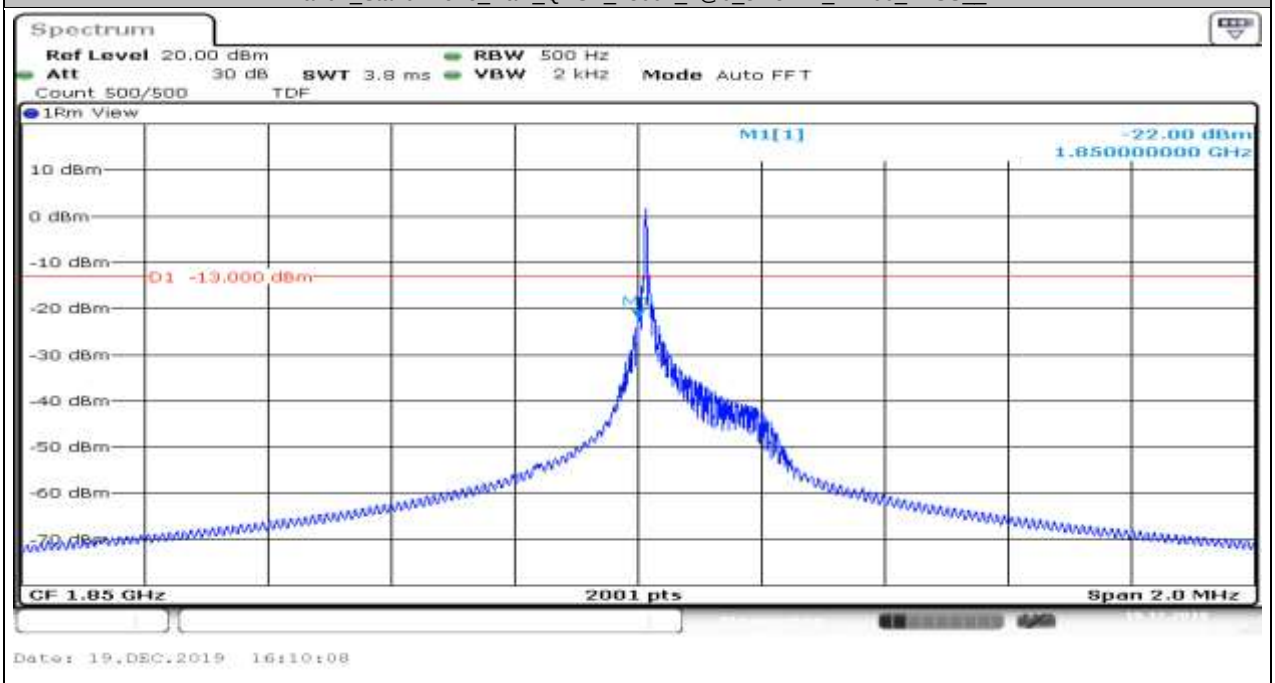
Appendix A.4: Band Edge for NB

Test Result

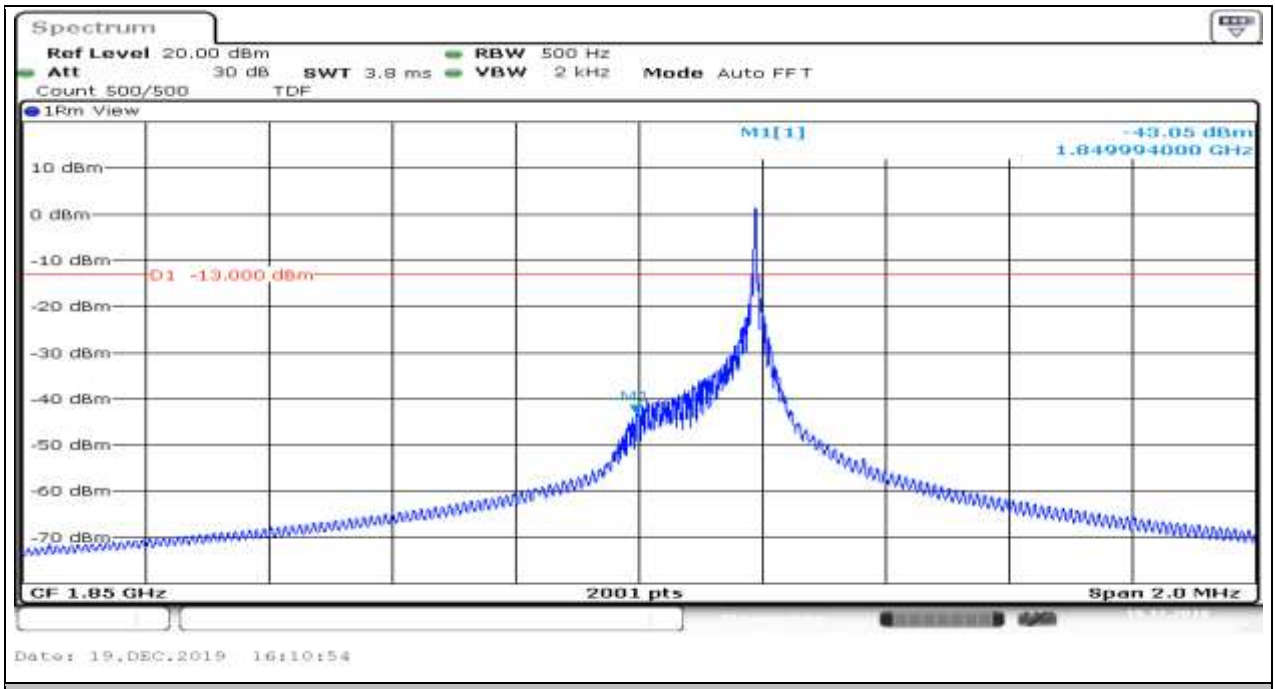
Band	OpMode	Bandwidth	Modulation	Channel	Tones	SCS	Result (dBm)	Verdict
Band2	Stand-Alone	NaN	QPSK	18601	1@0	3.75kHz	-22.00	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@47	3.75kHz	-43.05	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@0	15kHz	-17.05	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@11	15kHz	-35.20	PASS
Band2	Stand-Alone	NaN	QPSK	18601	12@0	15kHz	-33.01	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@11	15kHz	-16.07	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@0	3.75kHz	-42.89	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@0	15kHz	-35.33	PASS
Band2	Stand-Alone	NaN	QPSK	19199	12@0	15kHz	-30.76	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@47	3.75kHz	-21.23	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@0	3.75kHz	-20.18	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@47	3.75kHz	-41.83	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@0	15kHz	-13.69	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@11	15kHz	-32.65	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@11	15kHz	-13.79	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@0	3.75kHz	-41.33	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@47	3.75kHz	-19.84	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@0	15kHz	-33.12	PASS

Test Graphs

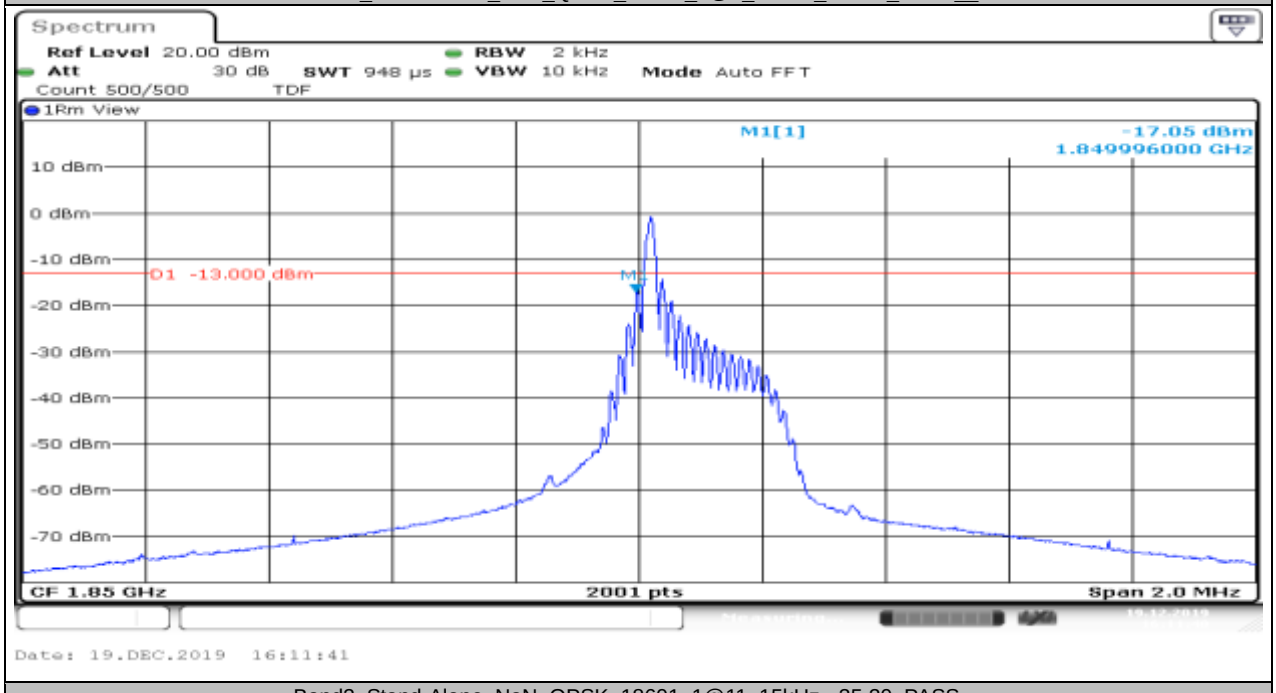
Band2_Stand-Alone_NaN_QPSK_18601_1@0_3.75kHz_-22.00_PASS__



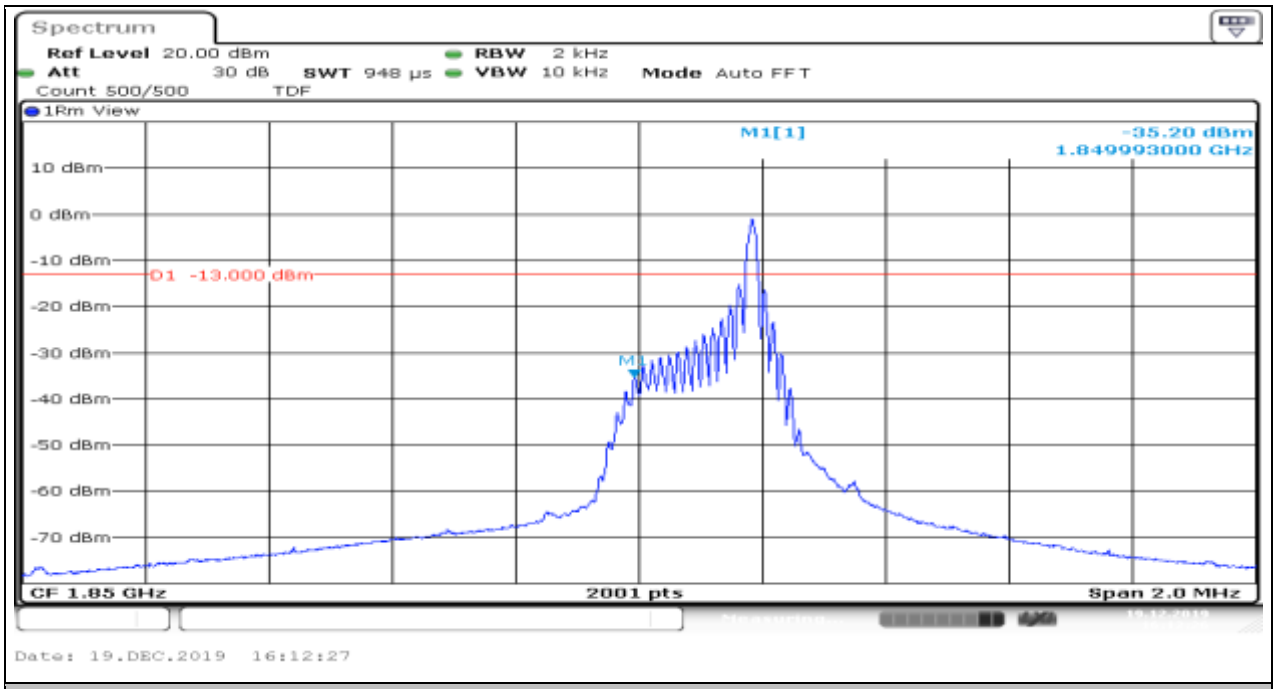
Band2_Stand-Alone_NaN_QPSK_18601_1@47_3.75kHz_-43.05_PASS__



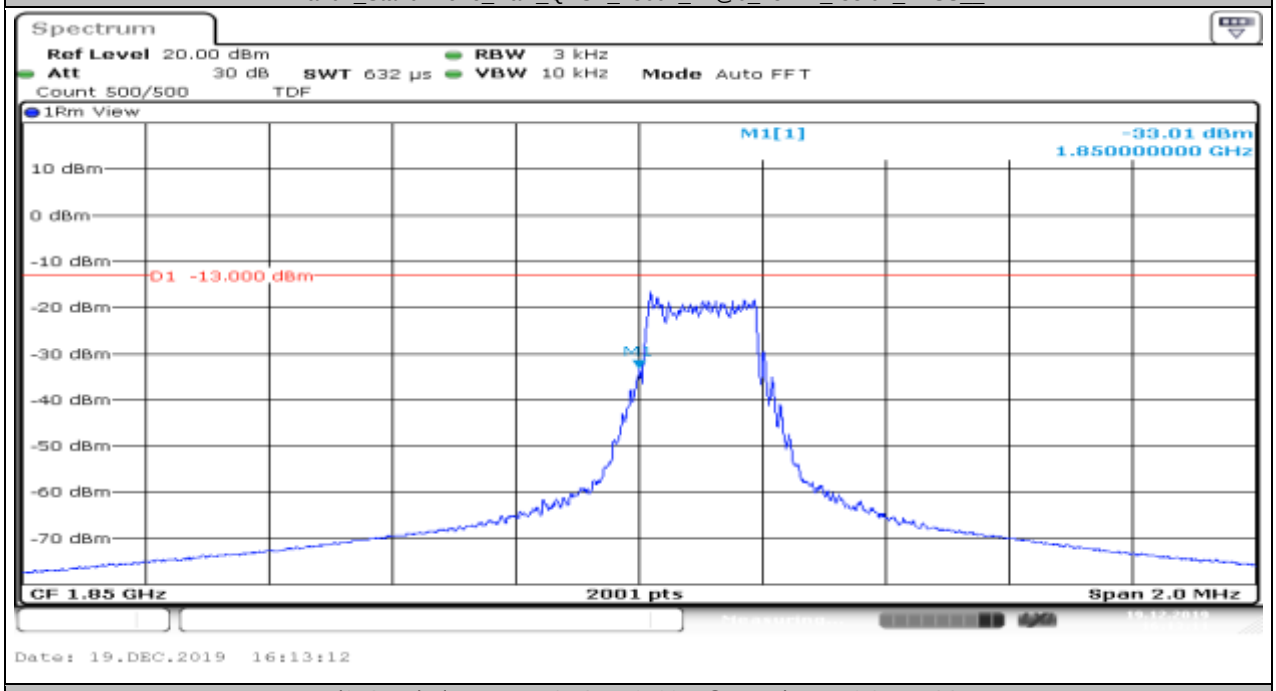
Band2_Stand-Alone_NaN_QPSK_18601_1@0_15kHz_-17.05_PASS__



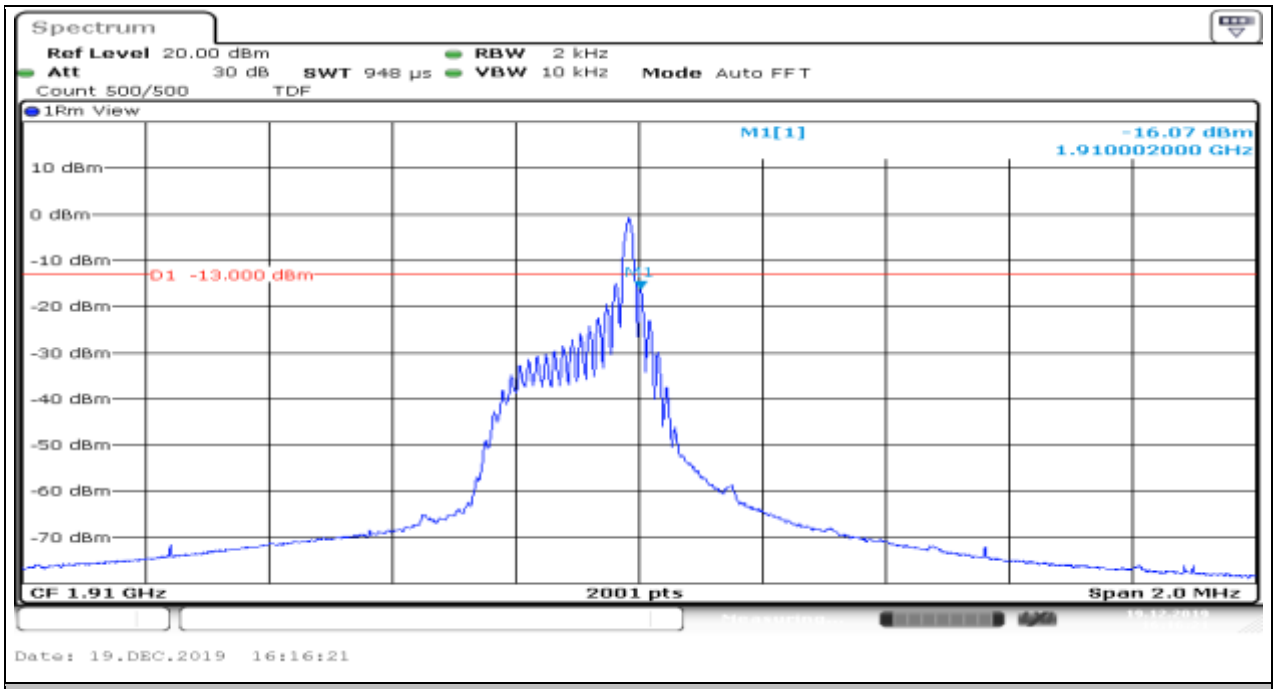
Band2_Stand-Alone_NaN_QPSK_18601_1@11_15kHz_-35.20_PASS__



Band2_Stand-Alone_NaN_QPSK_18601_12@0_15kHz_-33.01_PASS__

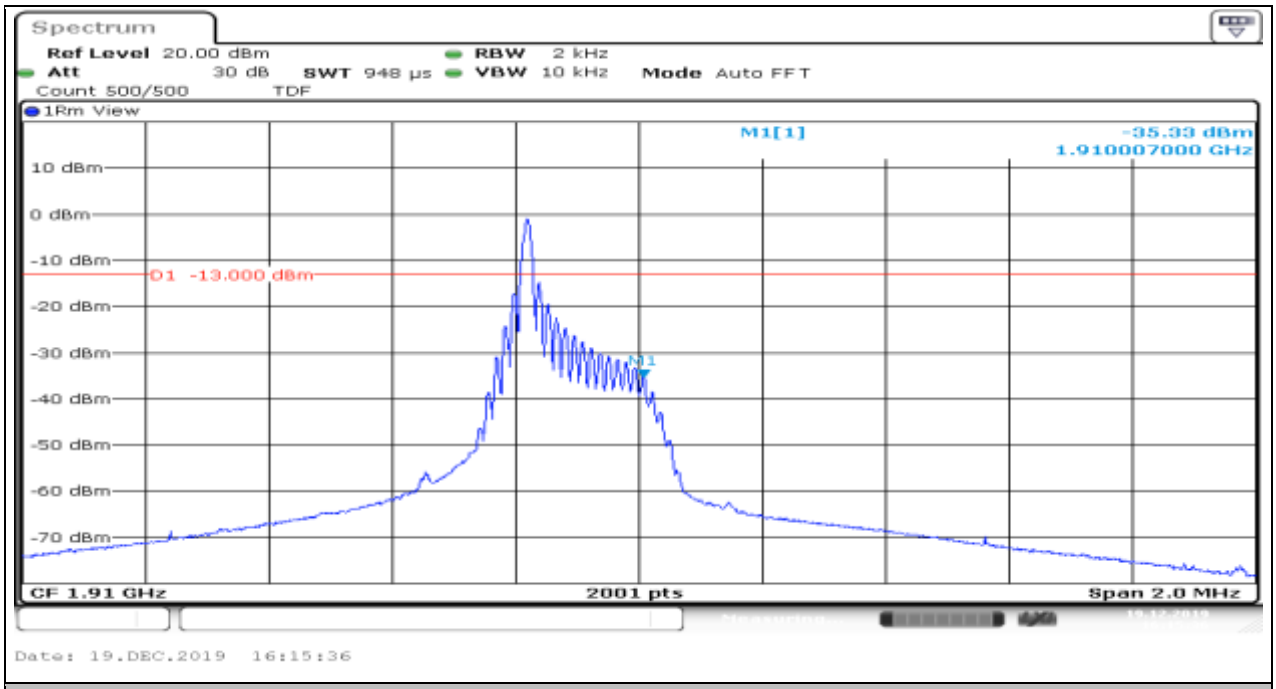


Band2_Stand-Alone_NaN_QPSK_19199_1@11_15kHz_-16.07_PASS__

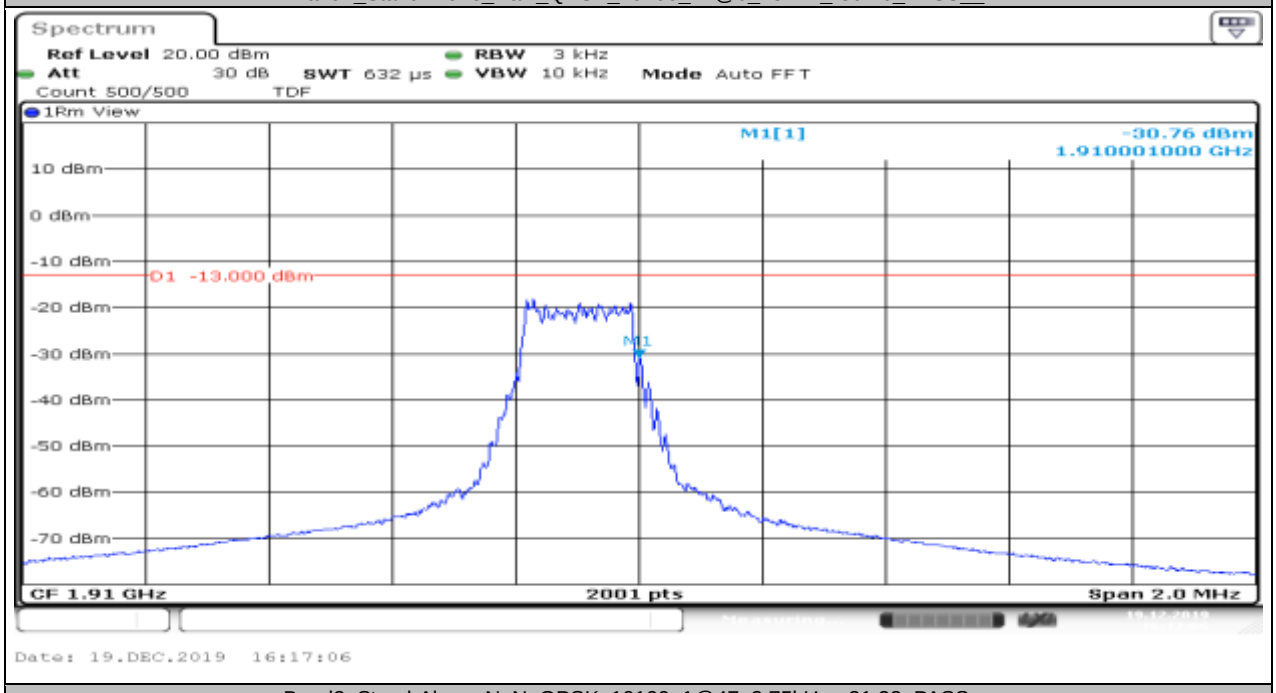


Band2_Stand-Alone_NaN_QPSK_19199_1@0_3.75kHz_-42.89_PASS__

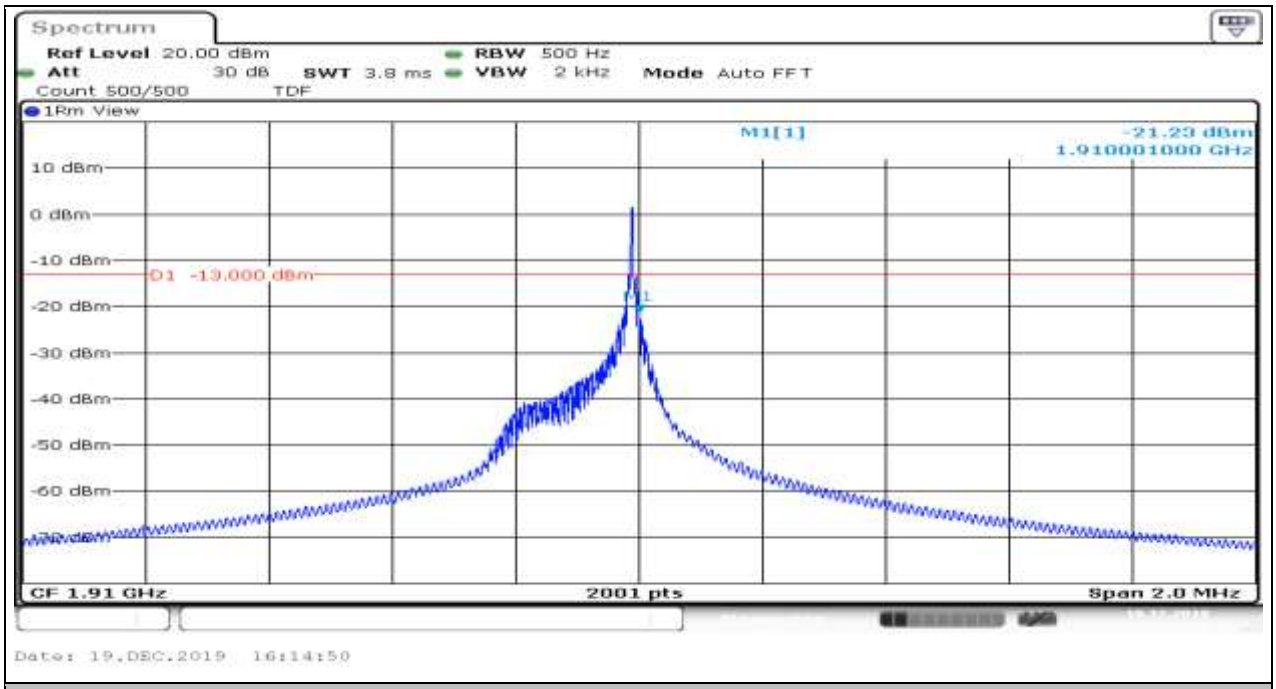
Band2_Stand-Alone_NaN_QPSK_19199_1@0_15kHz_-35.33_PASS__



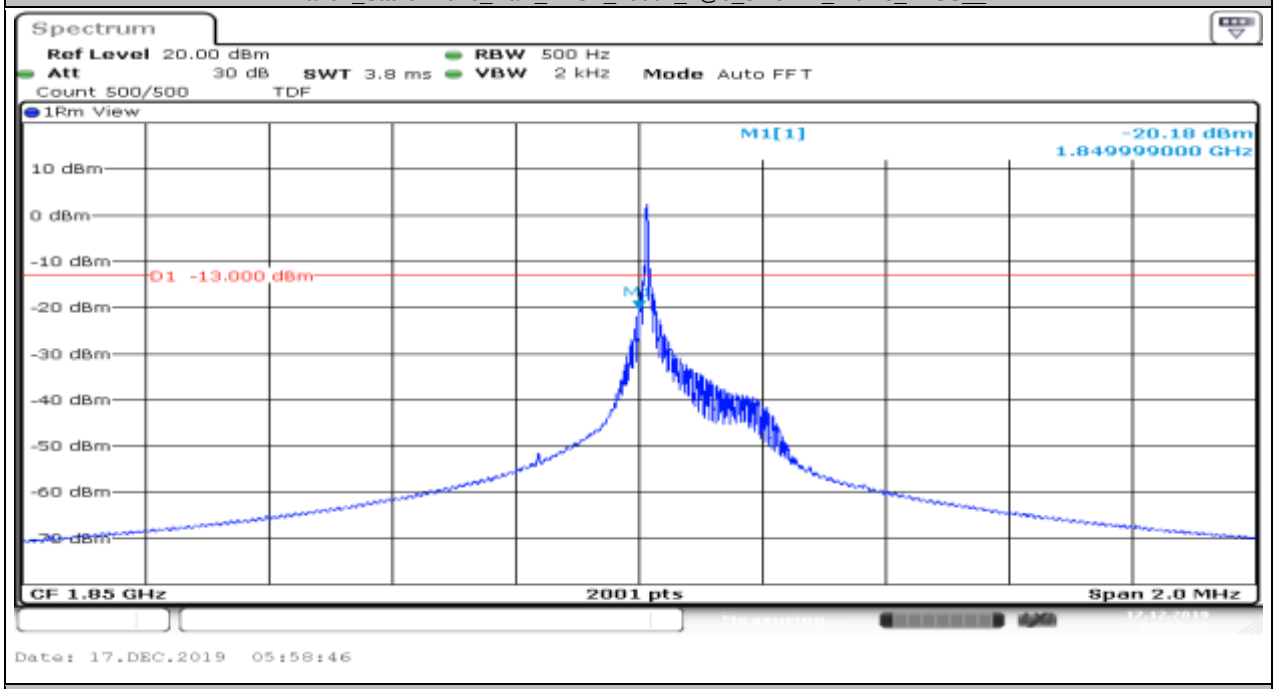
Band2_Stand-Alone_NaN_QPSK_19199_12@0_15kHz_-30.76_PASS__



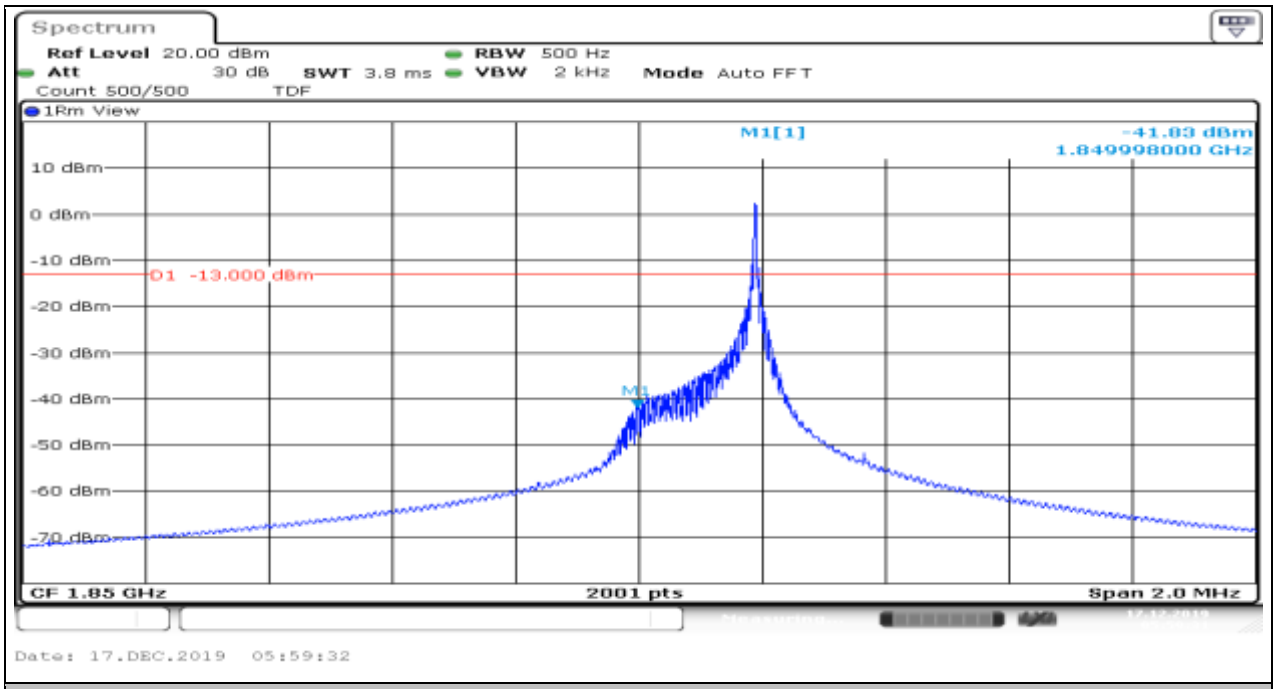
Band2_Stand-Alone_NaN_QPSK_19199_1@47_3.75kHz_-21.23_PASS__



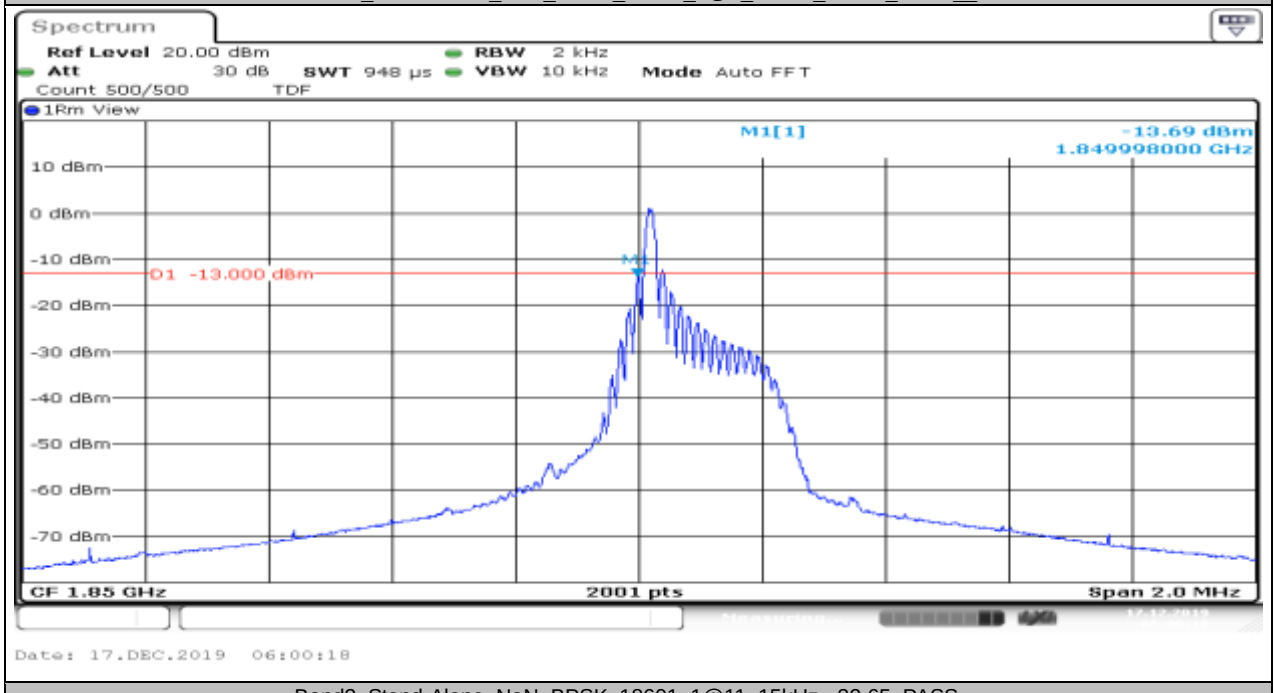
Band2_Stand-Alone_NaN_BPSK_18601_1@0_3.75kHz_-20.18_PASS__



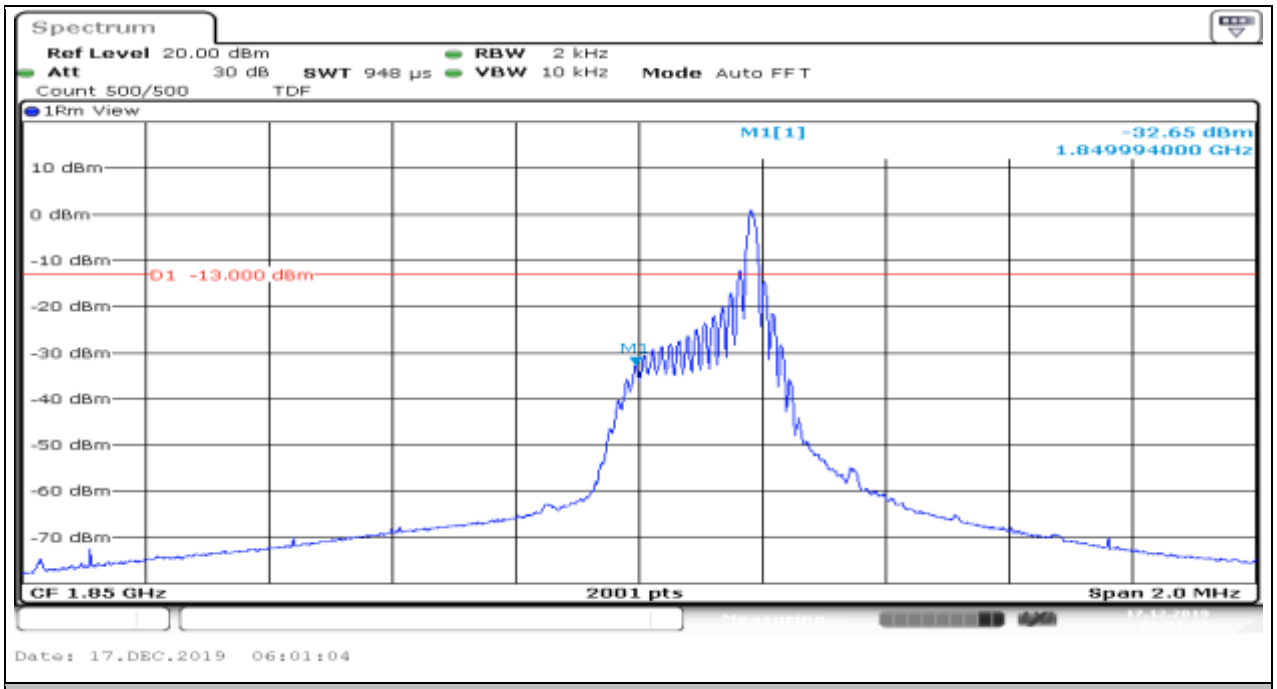
Band2_Stand-Alone_NaN_BPSK_18601_1@47_3.75kHz_-41.83_PASS__



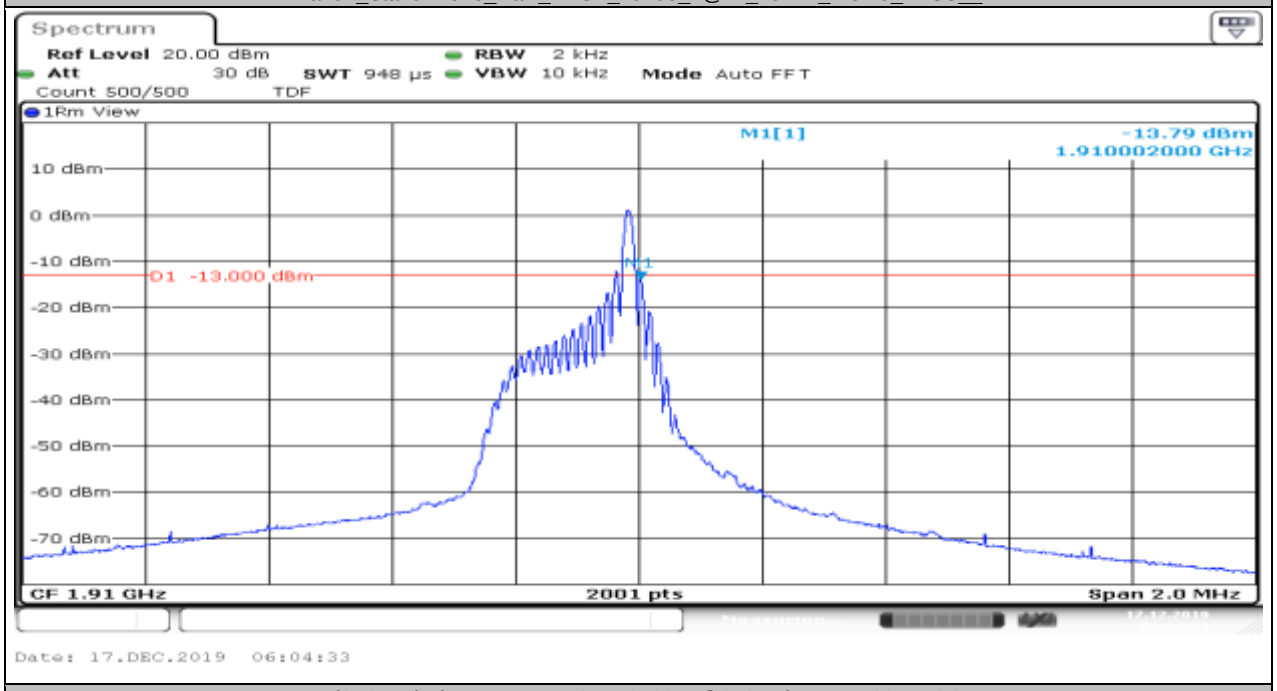
Band2_Stand-Alone_NaN_BPSK_18601_1@0_15kHz_-13.69_PASS__



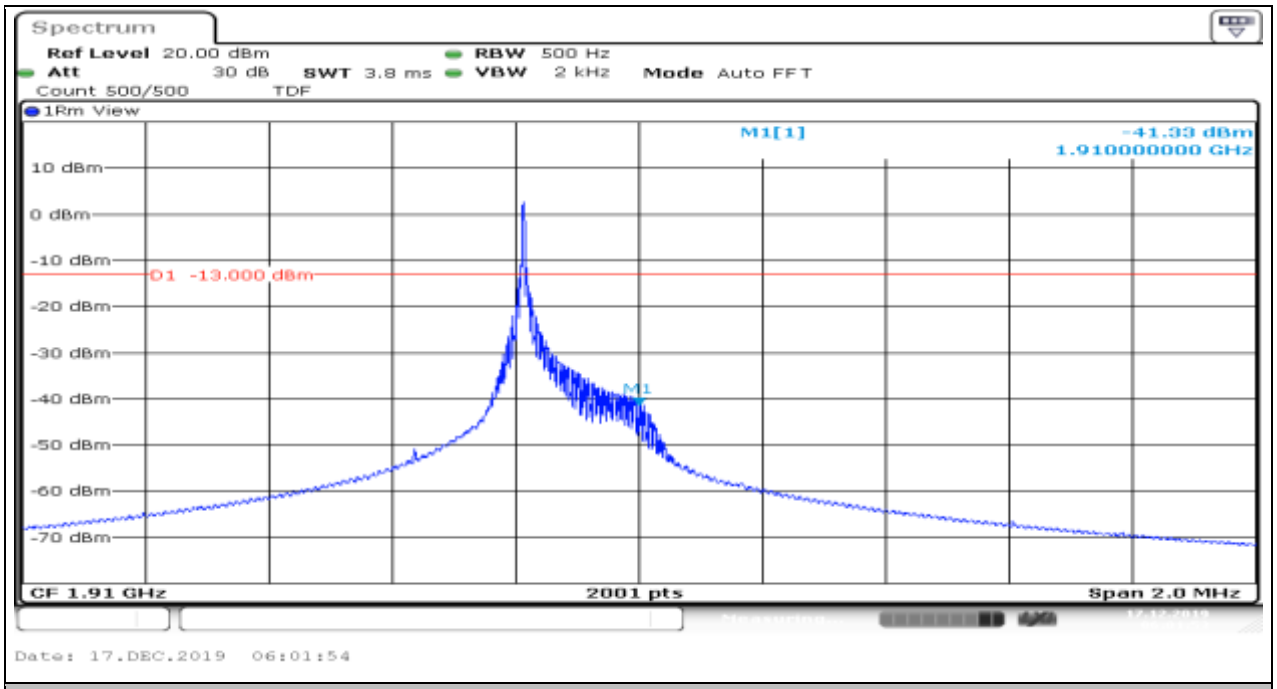
Band2_Stand-Alone_NaN_BPSK_18601_1@11_15kHz_-32.65_PASS__



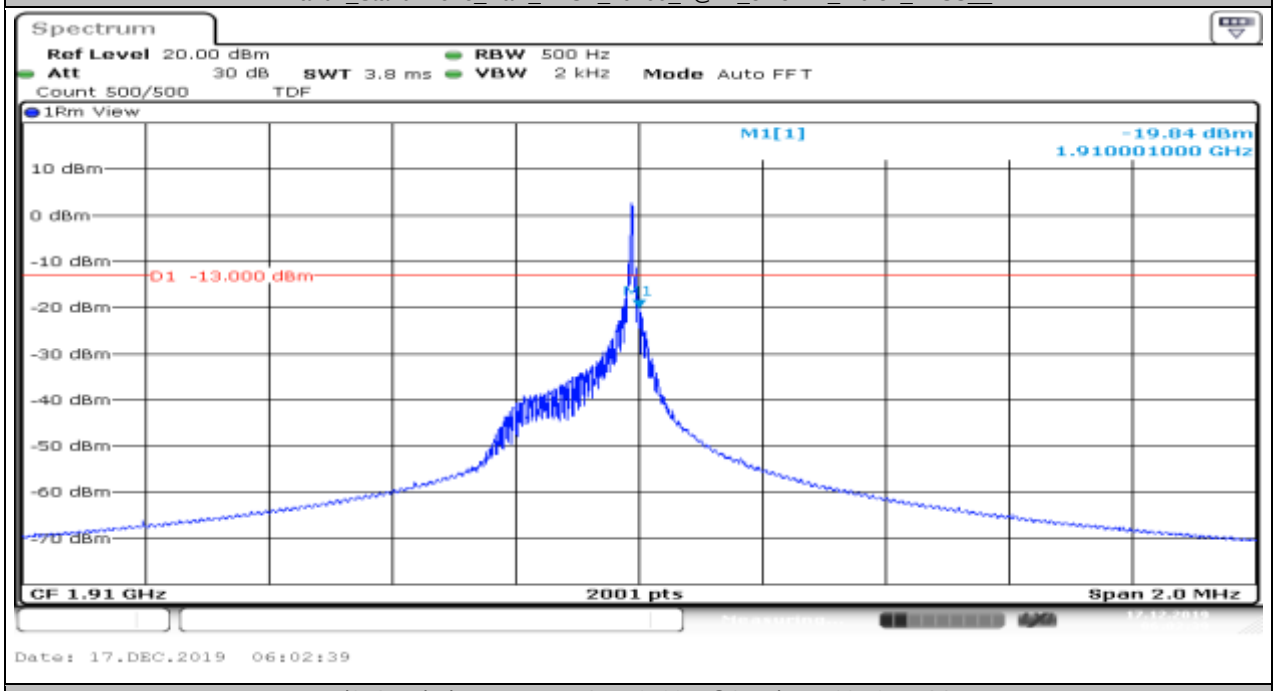
Band2_Stand-Alone_NaN_BPSK_19199_1@11_15kHz_-13.79_PASS__



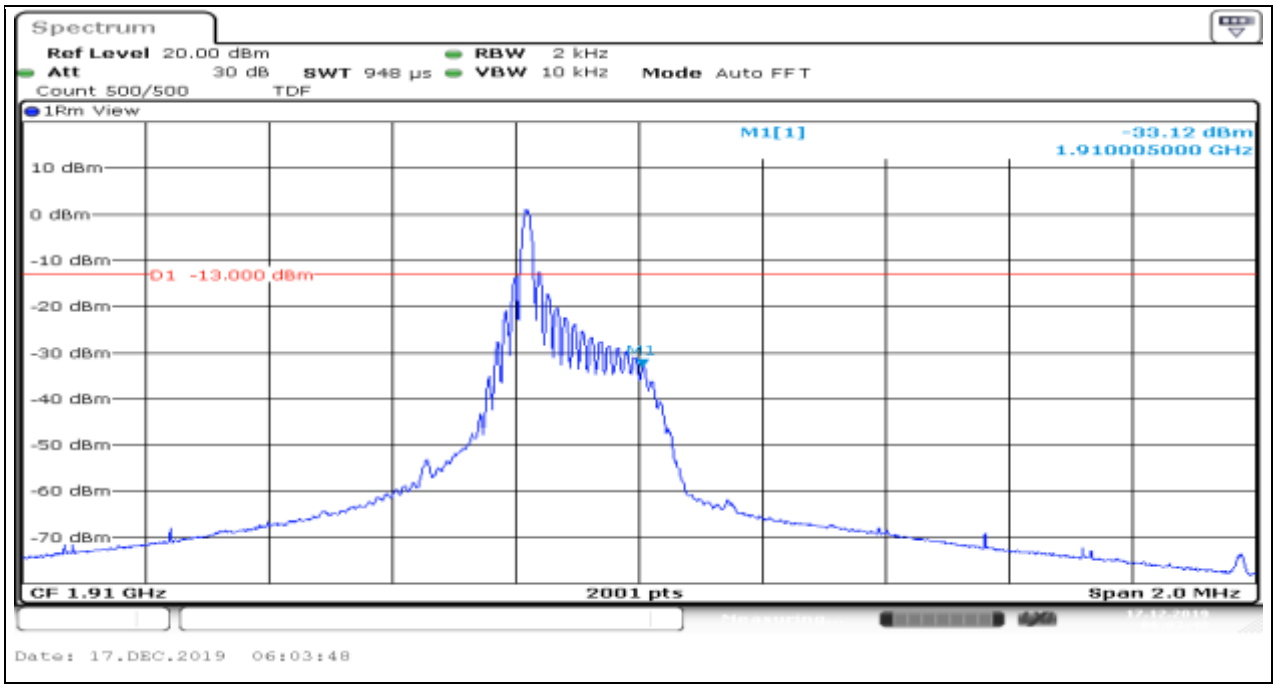
Band2_Stand-Alone_NaN_BPSK_19199_1@0_3.75kHz_-41.33_PASS__



Band2_Stand-Alone_NaN_BPSK_19199_1@47_3.75kHz_-19.84_PASS__



Band2_Stand-Alone_NaN_BPSK_19199_1@0_15kHz_-33.12_PASS__


Spectrum
Ref Level 20.00 dBm
RBW 2 kHz
Att 30 dB
SWT 948 µs
VBW 10 kHz
Mode Auto FFT
Count 500/500
TDF
1Rm View
M1[1]
-33.12 dBm
1.910005000 GHz
10 dBm
0 dBm
-10 dBm
D1 -13.000 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 1.91 GHz
2001 pts
Span 2.0 MHz
Date: 17.DEC.2019 06:03:48

Appendix A.5: Conducted Spurious Emission for NB

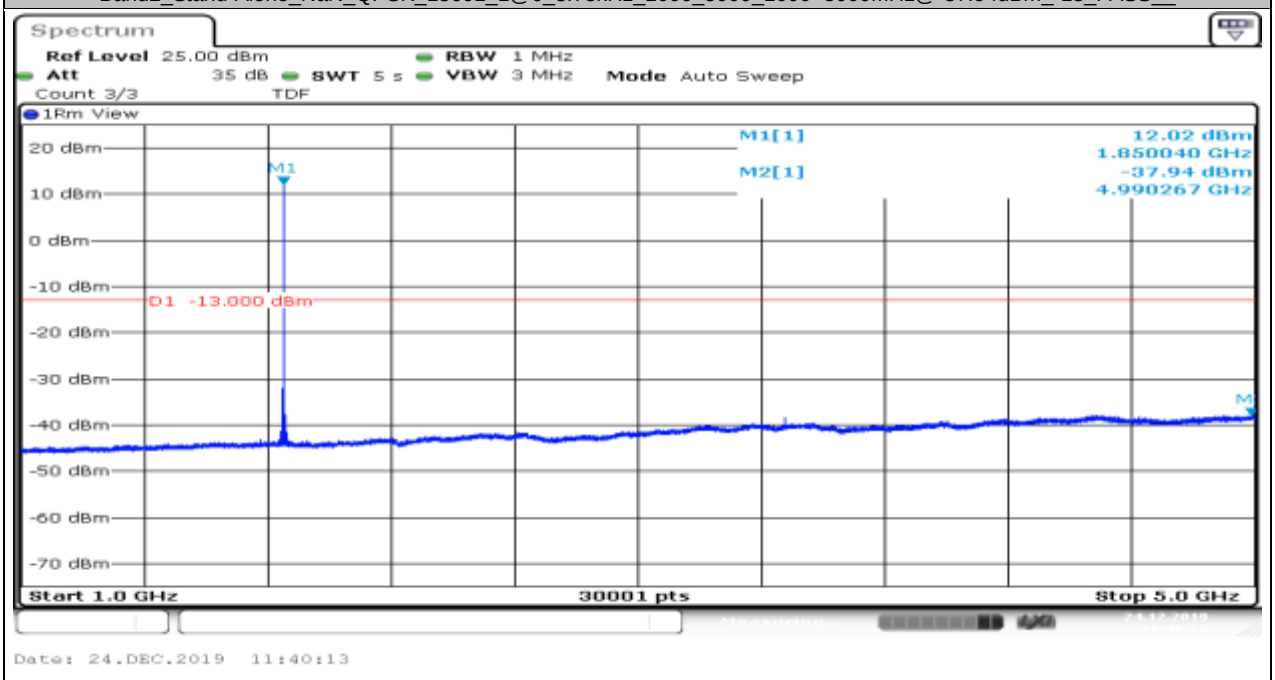
Test Result

Band	OpMode	Bandwidth	Modulation	Channel	Tones	SCS	StartFreq (MHz)	StopFreq (MHz)	Result (dBm)	Limit (dBm)	Verdict
Band2	Stand-Alone	NaN	QPSK	18601	1@0	3.75kHz	1000	5000	1000~5000MHz@-37.94dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@0	3.75kHz	5000	12000	5000~12000MHz@-47.63dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@0	3.75kHz	12000	26500	12000~26500MHz@-41.61dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@47	3.75kHz	30	1000	30~1000MHz@-35.89dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@47	3.75kHz	1000	5000	1000~5000MHz@-37.82dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@47	3.75kHz	5000	12000	5000~12000MHz@-47.51dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@47	3.75kHz	12000	26500	12000~26500MHz@-41.45dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18601	1@0	3.75kHz	30	1000	30~1000MHz@-36.34dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18601	12@0	15kHz	12000	26500	12000~26500MHz@-41.22dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18601	12@0	15kHz	5000	12000	5000~12000MHz@-47.51dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18601	12@0	15kHz	1000	5000	1000~5000MHz@-37.81dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18601	12@0	15kHz	30	1000	30~1000MHz@-35.81dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	5000	12000	5000~12000MHz@-44.39dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	12@0	15kHz	1000	5000	1000~5000MHz@-36.9dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	12000	26500	12000~26500MHz@-41.59dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	5000	12000	5000~12000MHz@-44.55dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	1000	5000	1000~5000MHz@-35.55dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	12@0	15kHz	12000	26500	12000~26500MHz@-41.43dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	12000	26500	12000~26500MHz@-41.58dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	12@0	15kHz	5000	12000	5000~12000MHz@-47.54dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	1000	5000	1000~5000MHz@-35.63dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	30	1000	30~1000MHz@-36.25dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	30	1000	30~1000MHz@-35.61dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	18900	12@0	15kHz	30	1000	30~1000MHz@-35.96dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@0	3.75kHz	12000	26500	12000~26500MHz@-41.52dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@0	3.75kHz	30	1000	30~1000MHz@-35.95dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@0	3.75kHz	5000	12000	5000~12000MHz@-47.39dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@47	3.75kHz	30	1000	30~1000MHz@-35.88dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@47	3.75kHz	1000	5000	1000~5000MHz@-37.89dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@47	3.75kHz	5000	12000	5000~12000MHz@-47.37dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@47	3.75kHz	12000	26500	12000~26500MHz@-41.48dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	12@0	15kHz	30	1000	30~1000MHz@-35.81dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	1@0	3.75kHz	1000	5000	1000~5000MHz@-37.8dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	12@0	15kHz	12000	26500	12000~26500MHz@-41.54dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	12@0	15kHz	5000	12000	5000~12000MHz@-47.39dBm	-13	PASS
Band2	Stand-Alone	NaN	QPSK	19199	12@0	15kHz	1000	5000	1000~5000MHz@-37.89dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@0	15kHz	12000	26500	12000~26500MHz@-41.21dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@0	15kHz	1000	5000	1000~5000MHz@-37.73dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@0	15kHz	5000	12000	5000~12000MHz@-47.58dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@11	15kHz	12000	26500	12000~26500MHz@-41.48dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@11	15kHz	5000	12000	5000~12000MHz@-47.53dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@11	15kHz	1000	5000	1000~5000MHz@-37.79dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@11	15kHz	30	1000	30~1000MHz@-35.86dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18601	1@0	15kHz	30	1000	30~1000MHz@-34.7dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@0	15kHz	30	1000	30~1000MHz@-35.56dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@11	15kHz	12000	26500	12000~26500MHz@-41.56dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@11	15kHz	1000	5000	1000~5000MHz@-35.06dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@11	15kHz	5000	12000	5000~12000MHz@-44.17dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@11	15kHz	30	1000	30~1000MHz@-35.99dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@0	15kHz	12000	26500	12000~26500MHz@-41.37dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@0	15kHz	1000	5000	1000~5000MHz@-35.14dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	18900	1@0	15kHz	5000	12000	5000~12000MHz@-44.02dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@11	15kHz	12000	26500	12000~26500MHz@-41.52dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@0	15kHz	30	1000	30~1000MHz@-36.06dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@0	15kHz	1000	5000	1000~5000MHz@-37.81dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@0	15kHz	5000	12000	5000~12000MHz@-47.58dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@0	15kHz	12000	26500	12000~26500MHz@-41.51dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@11	15kHz	30	1000	30~1000MHz@-36.09dBm	-13	PASS

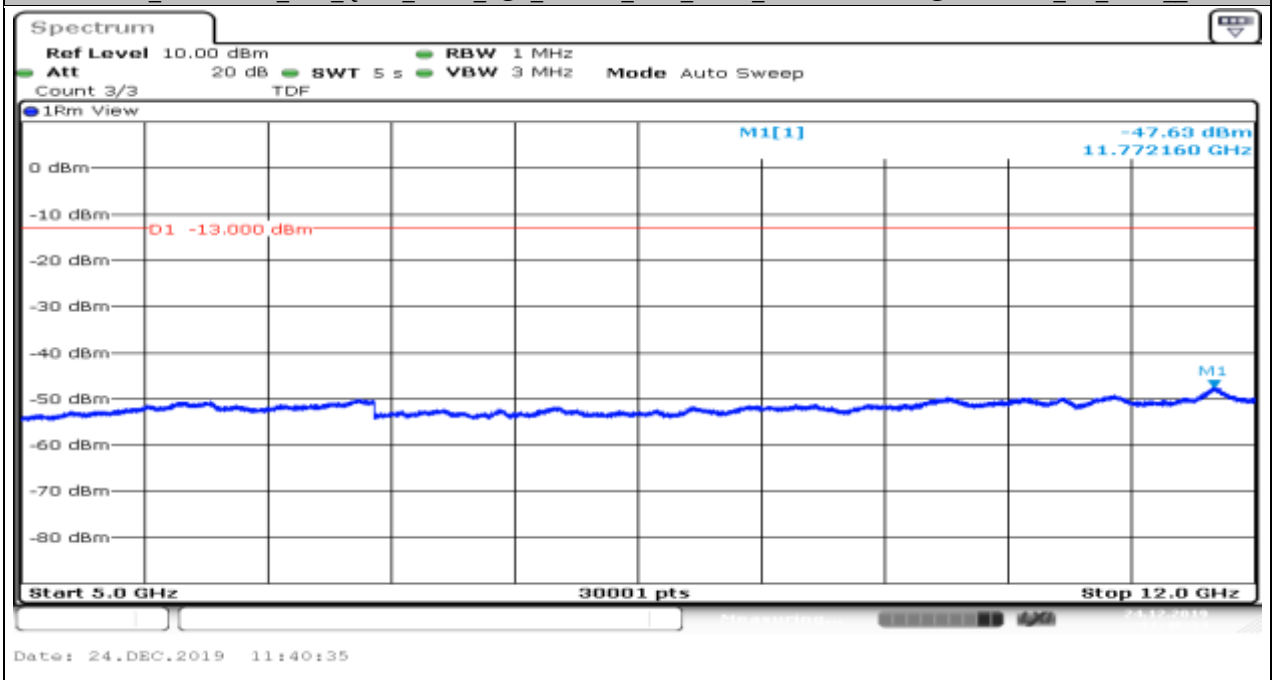
Band2	Stand-Alone	NaN	BPSK	19199	1@11	15kHz	1000	5000	1000~5000MHz@-37.81dBm	-13	PASS
Band2	Stand-Alone	NaN	BPSK	19199	1@11	15kHz	5000	12000	5000~12000MHz@-47.5dBm	-13	PASS

Test Graphs

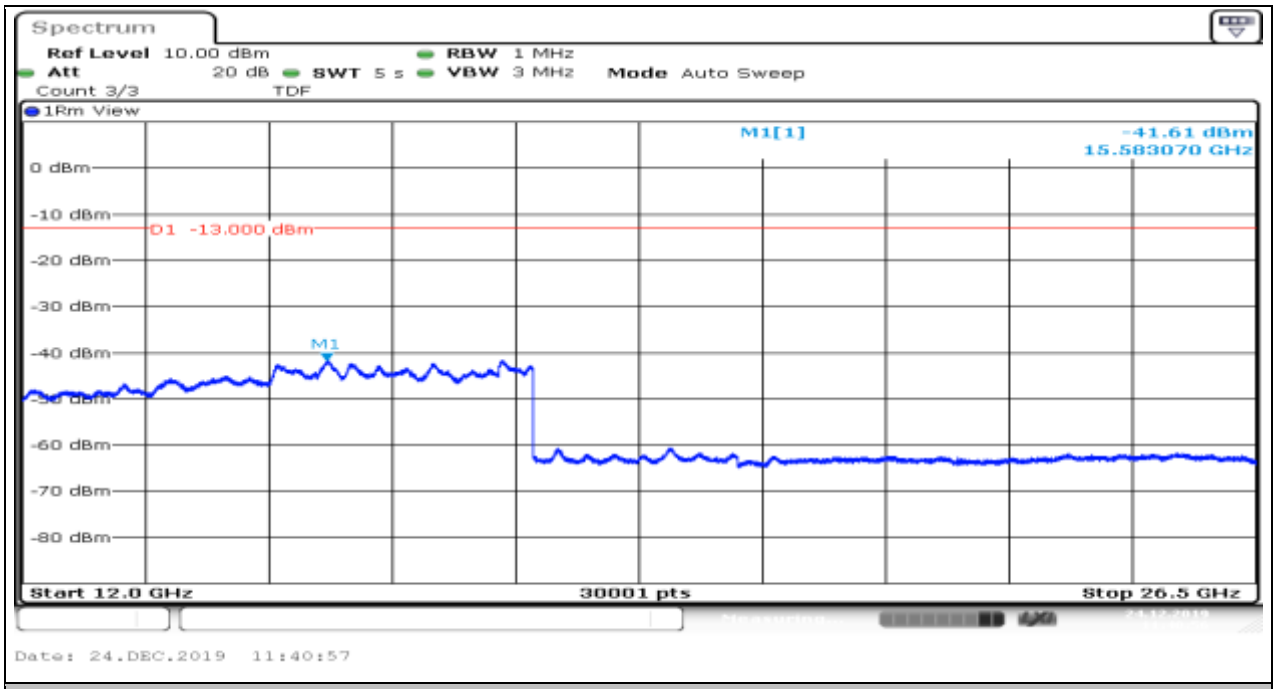
Band2_Stand-Alone_NaN_QPSK_18601_1@0_3.75kHz_1000_5000_1000~5000MHz@-37.94dBm_-13_PASS__



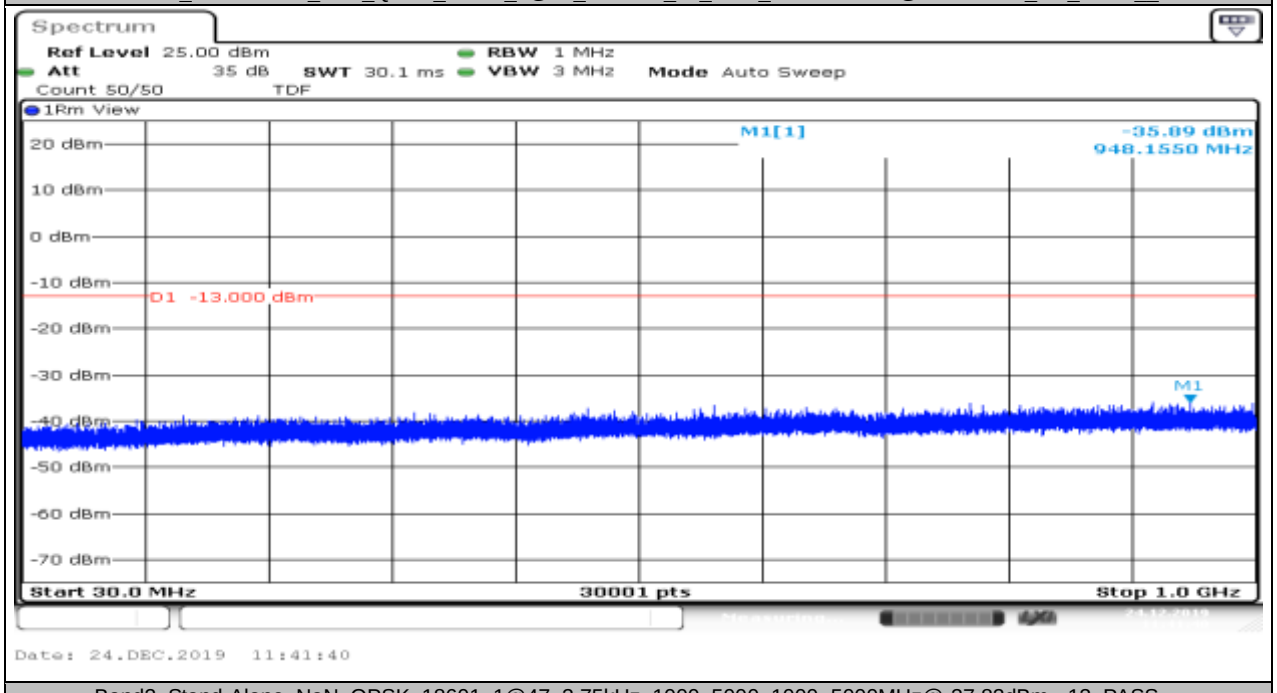
Band2_Stand-Alone_NaN_QPSK_18601_1@0_3.75kHz_5000_12000_5000~12000MHz@-47.63dBm_-13_PASS__



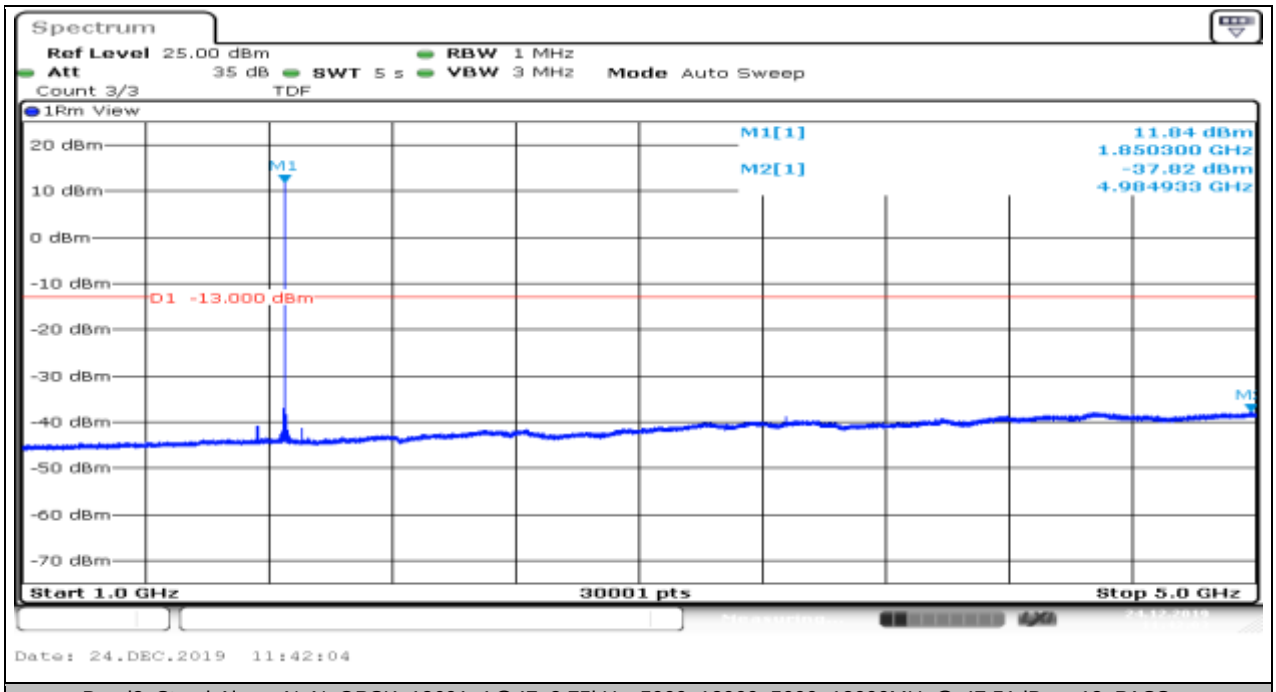
Band2_Stand-Alone_NaN_QPSK_18601_1@0_3.75kHz_12000_26500_12000~26500MHz@-41.61dBm_-13_PASS__



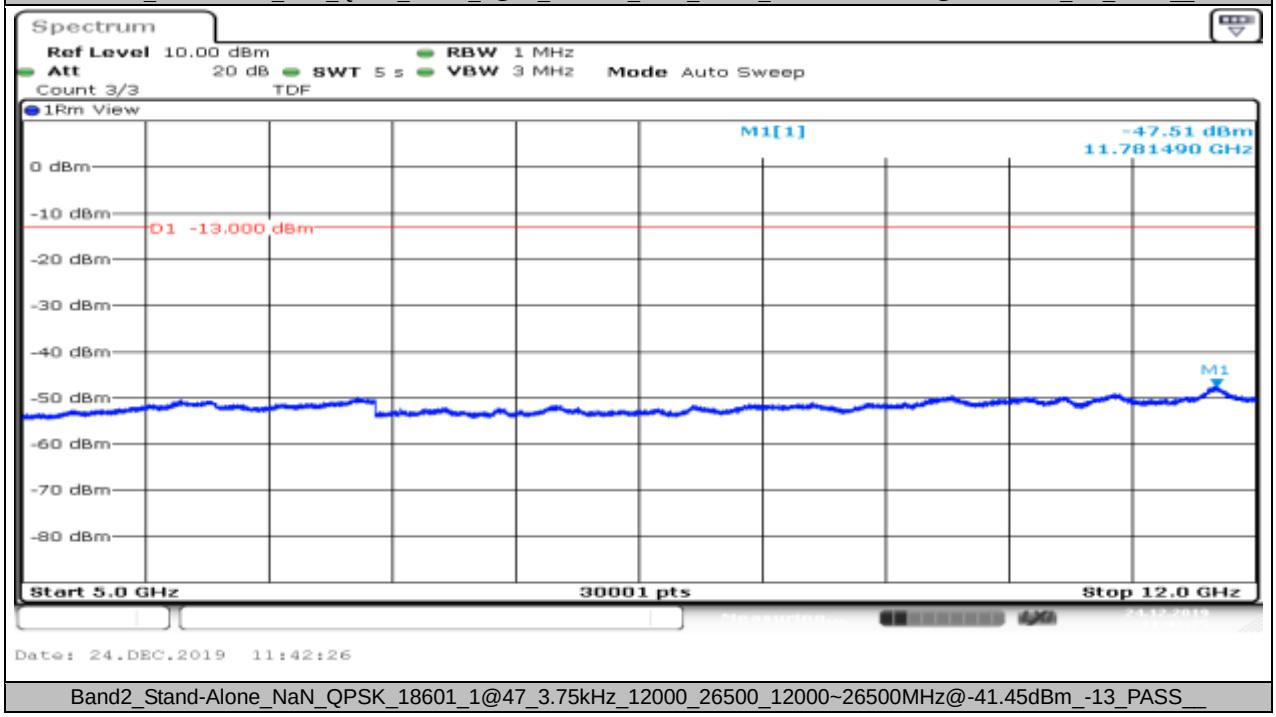
Band2_Stand-Alone_NaN_QPSK_18601_1@47_3.75kHz_30_1000_30~1000MHz@-35.89dBm_-13_PASS__



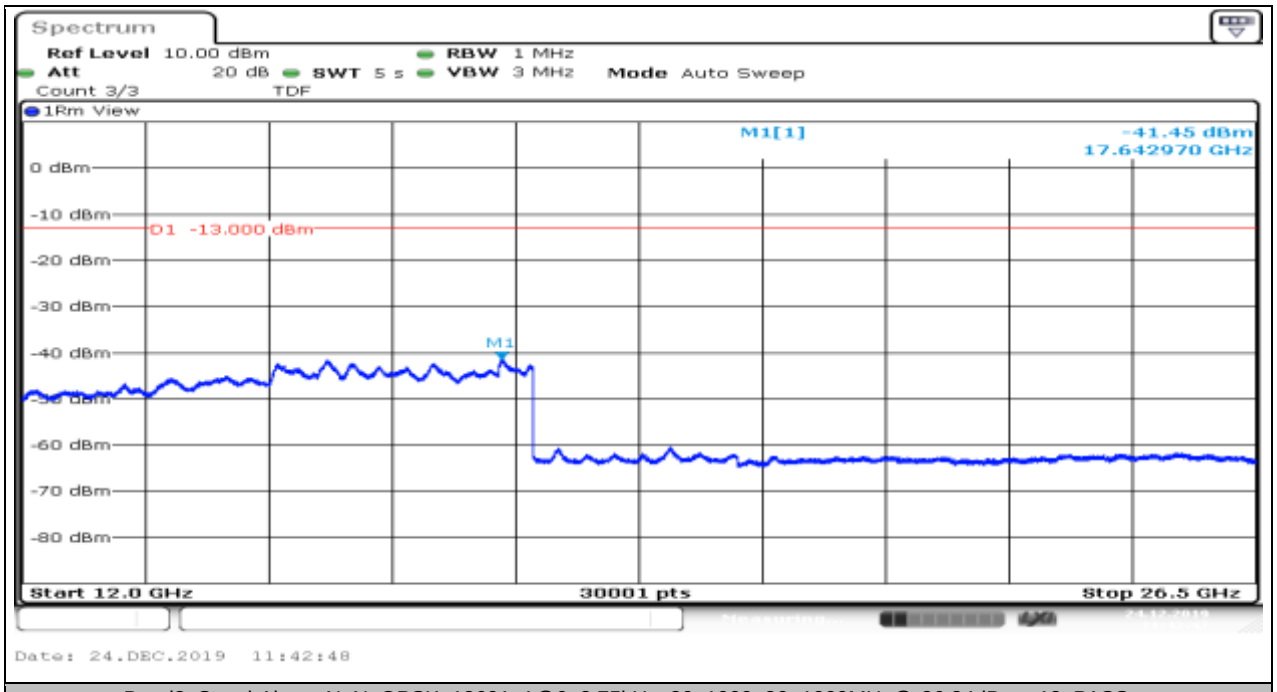
Band2_Stand-Alone_NaN_QPSK_18601_1@47_3.75kHz_1000_5000_1000~5000MHz@-37.82dBm_-13_PASS__



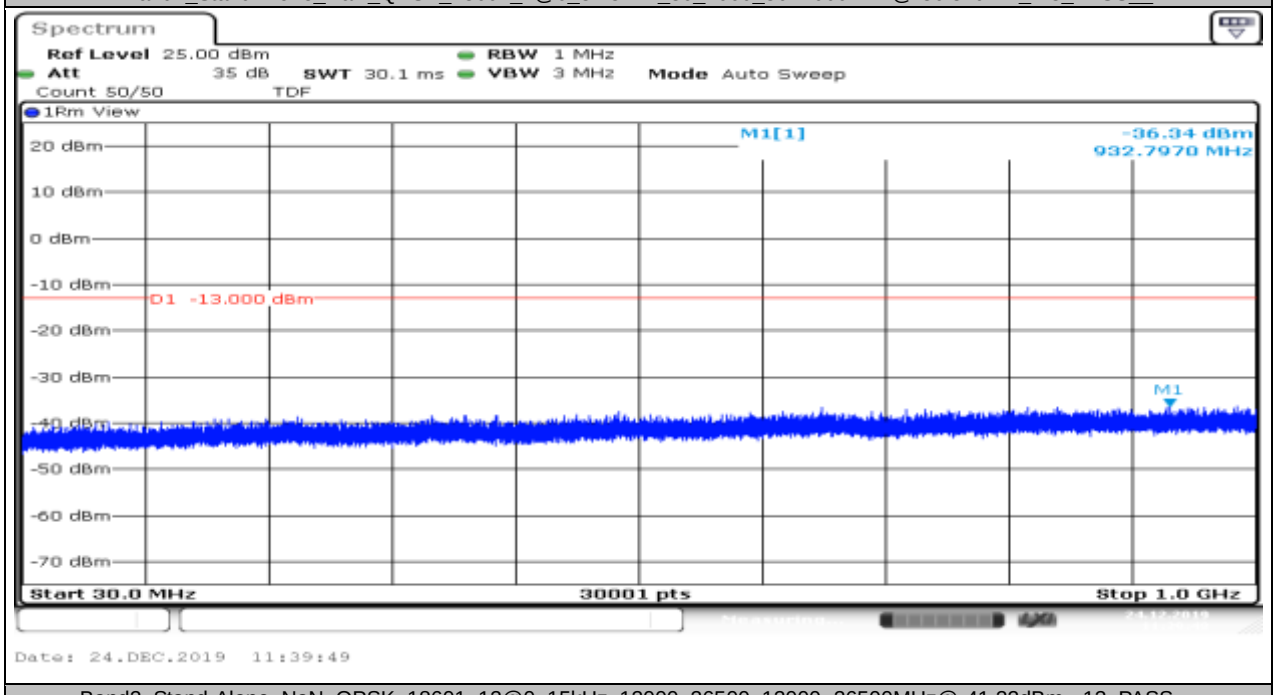
Band2_Stand-Alone_NaN_QPSK_18601_1@47_3.75kHz_5000_12000_5000~12000MHz@-47.51dBm_-13_PASS__



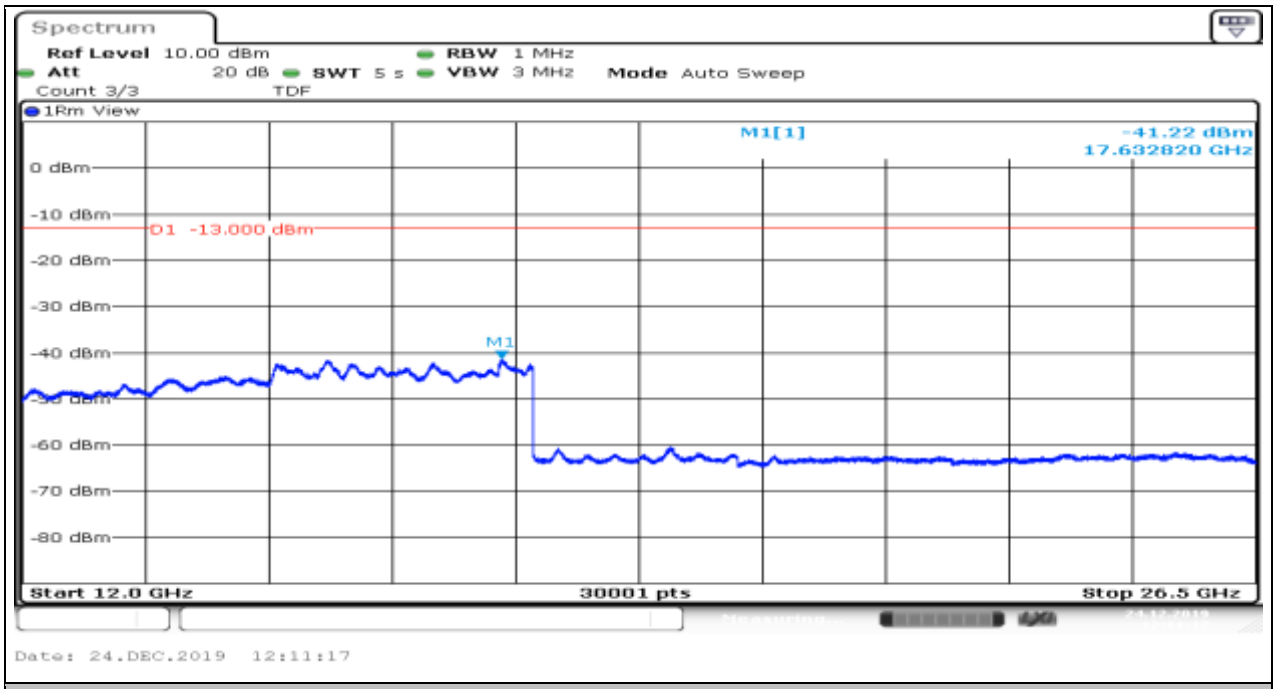
Band2_Stand-Alone_NaN_QPSK_18601_1@47_3.75kHz_12000_26500_12000~26500MHz@-41.45dBm_-13_PASS__



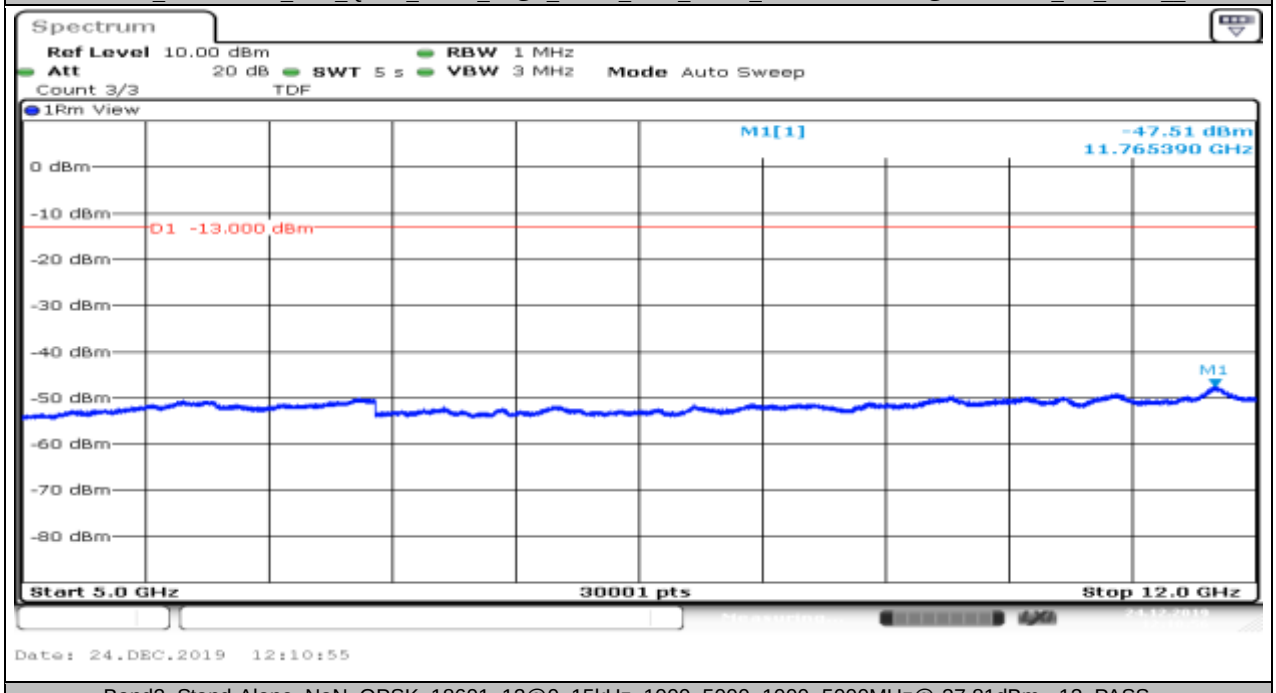
Band2_Stand-Alone_NaN_QPSK_18601_1@0_3.75kHz_30_1000_30~1000MHz@-36.34dBm_-13_PASS__



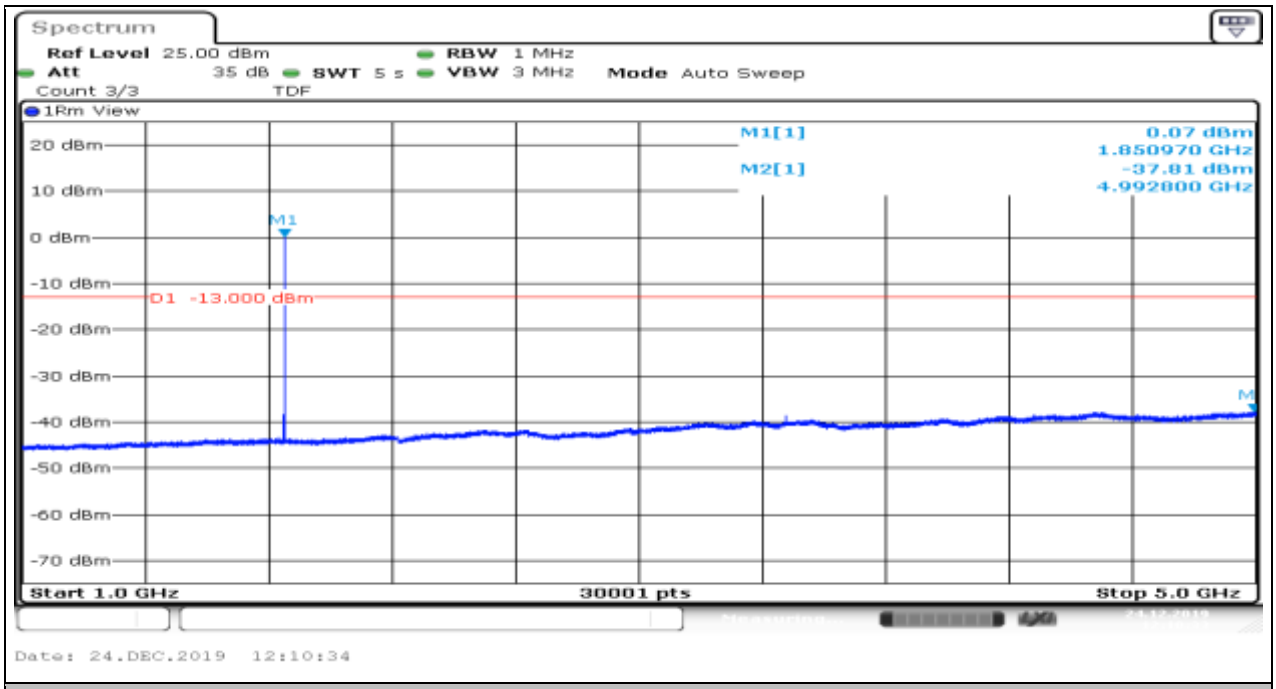
Band2_Stand-Alone_NaN_QPSK_18601_12@0_15kHz_12000_26500_12000~26500MHz@-41.22dBm_-13_PASS__



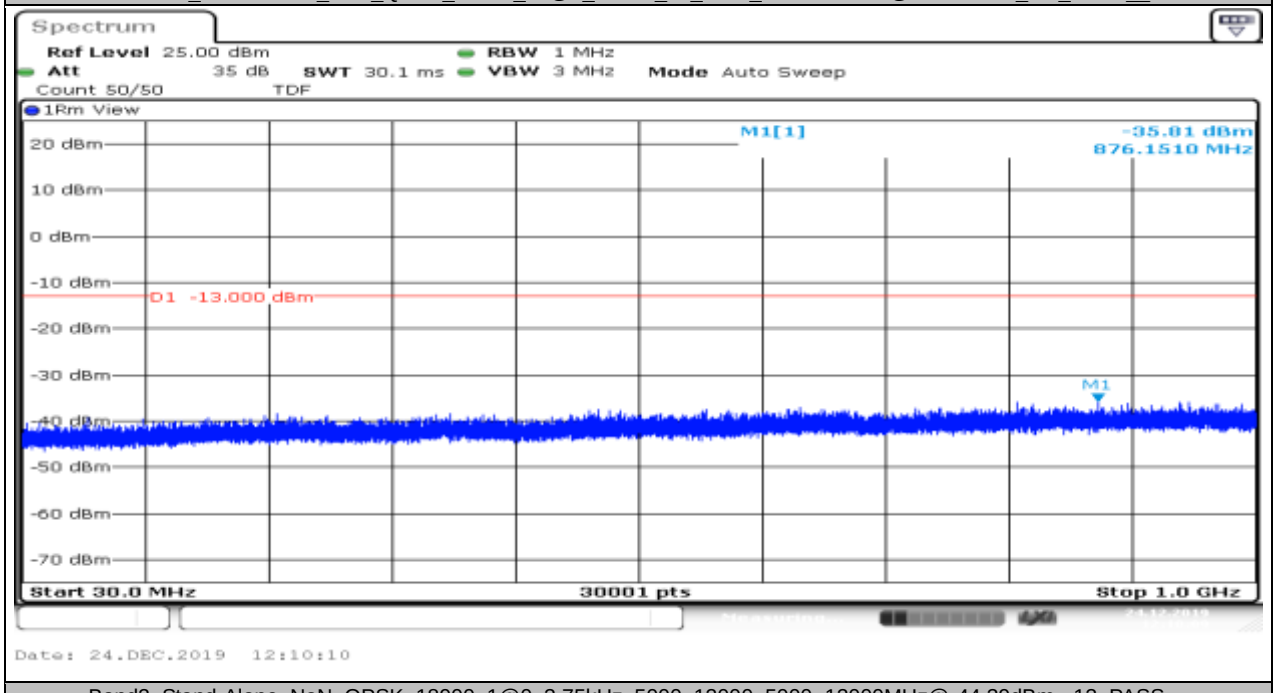
Band2_Stand-Alone_NaN_QPSK_18601_12@0_15kHz_5000_12000_5000~12000MHz@-47.51dBm_-13_PASS__



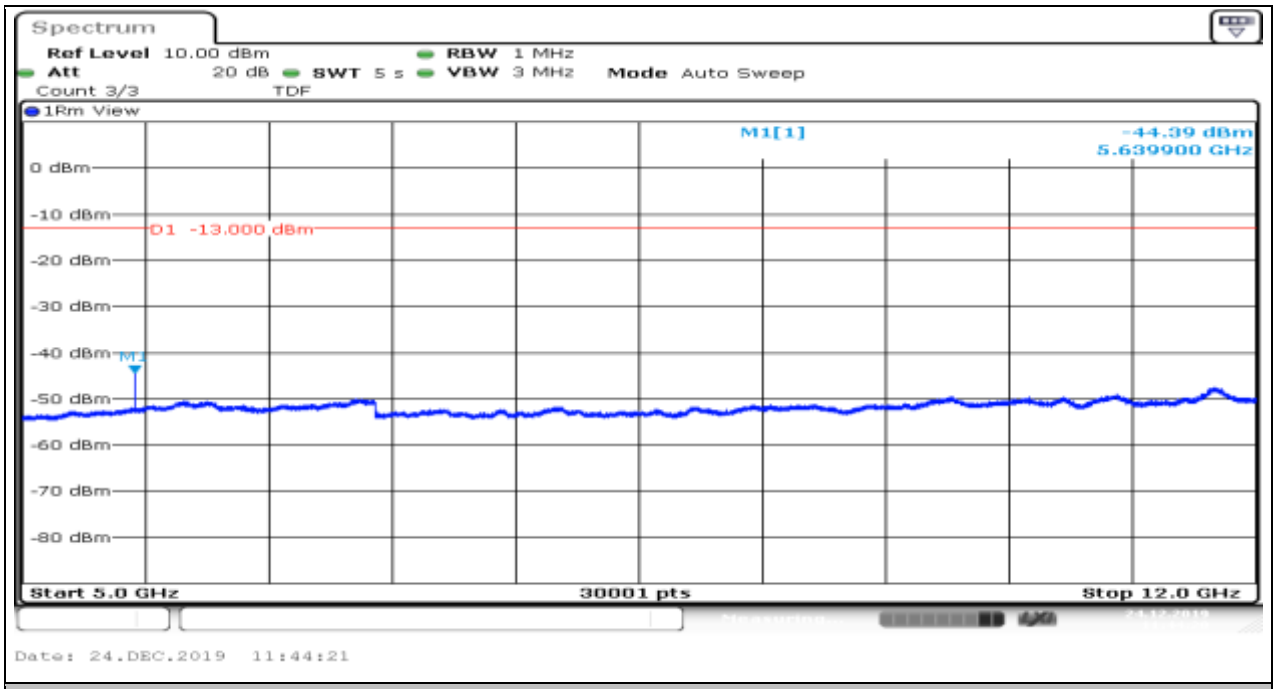
Band2_Stand-Alone_NaN_QPSK_18601_12@0_15kHz_1000_5000_1000~5000MHz@-37.81dBm_-13_PASS__



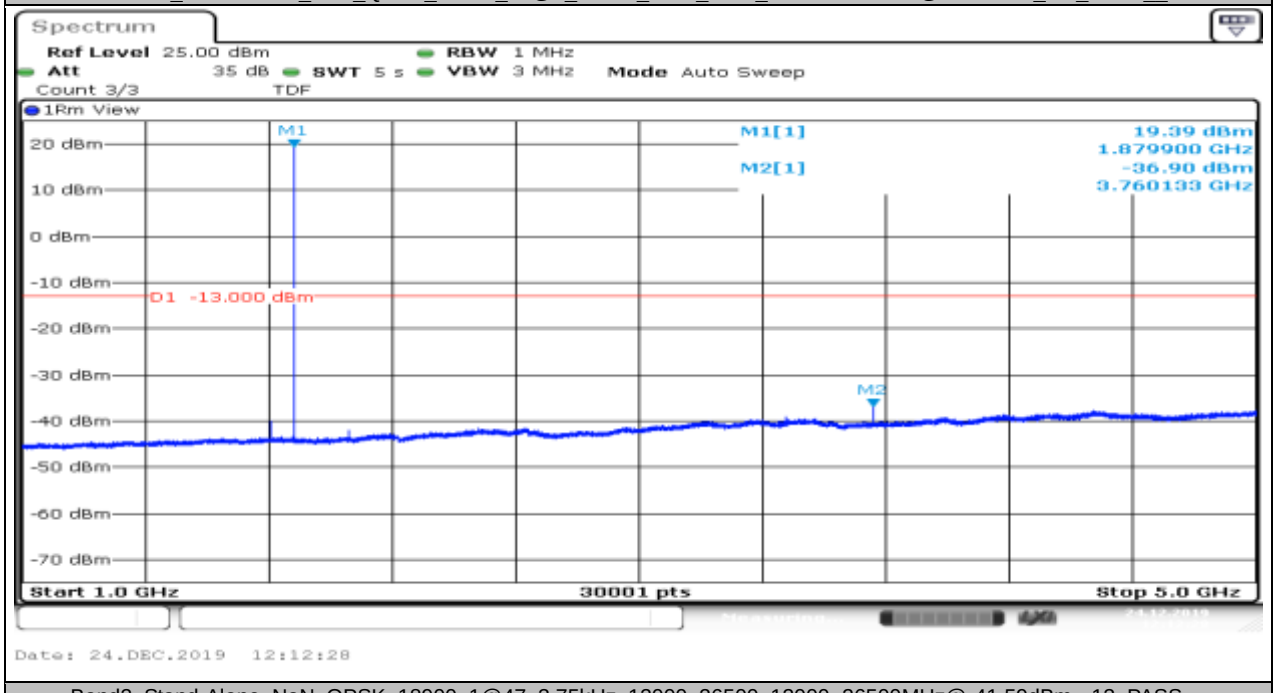
Band2_Stand-Alone_NaN_QPSK_18601_12@0_15kHz_30_1000_30~1000MHz@-35.81dBm_-13_PASS__



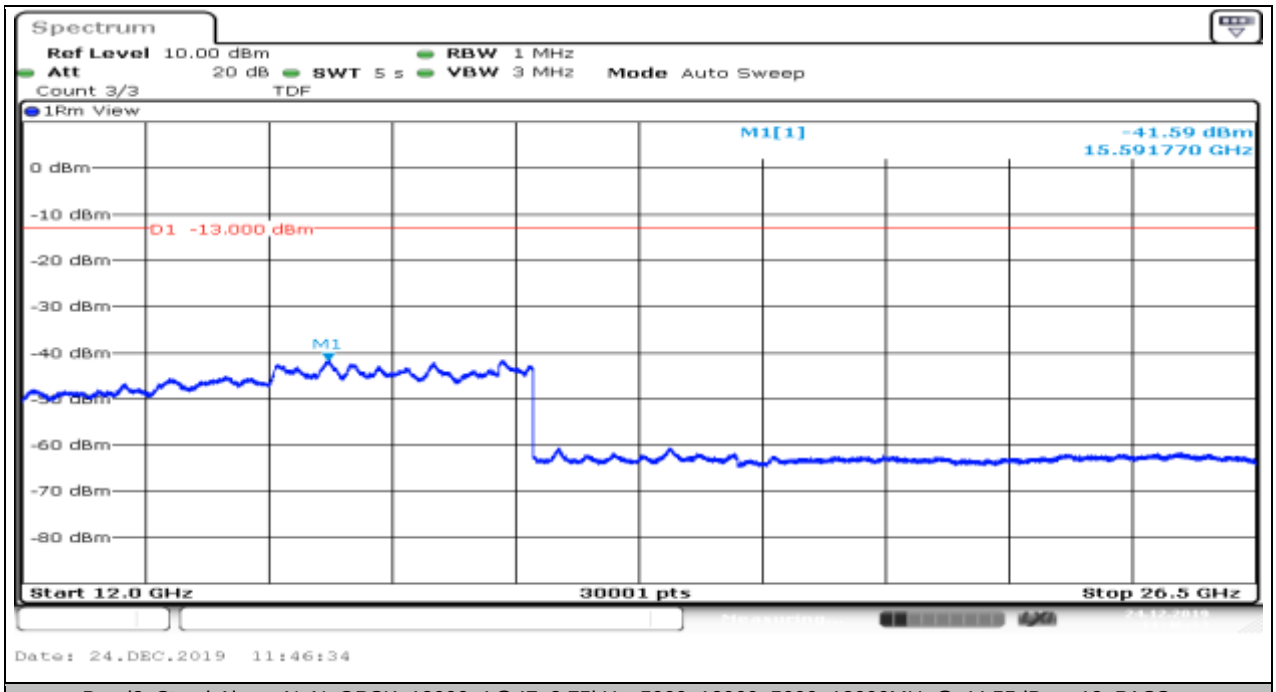
Band2_Stand-Alone_NaN_QPSK_18900_1@0_3.75kHz_5000_12000_5000~12000MHz@-44.39dBm_-13_PASS__



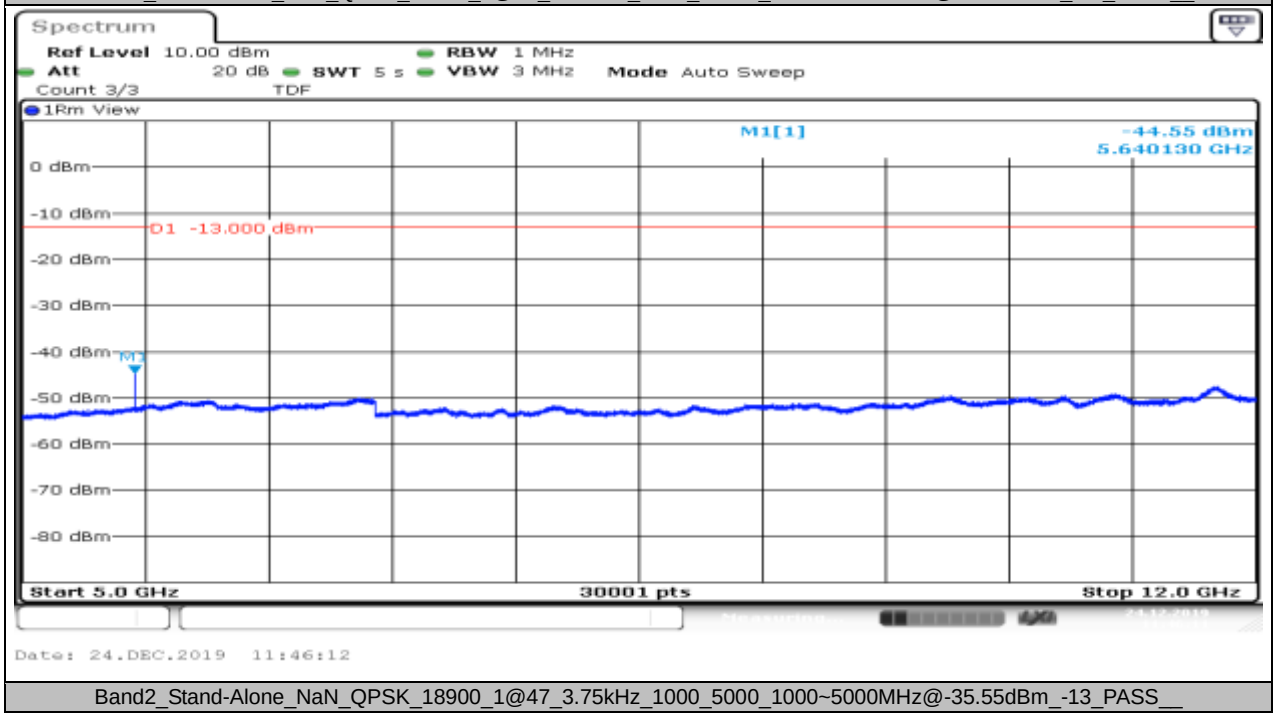
Band2_Stand-Alone_NaN_QPSK_18900_12@0_15kHz_1000_5000_1000~5000MHz@-36.9dBm_-13_PASS__



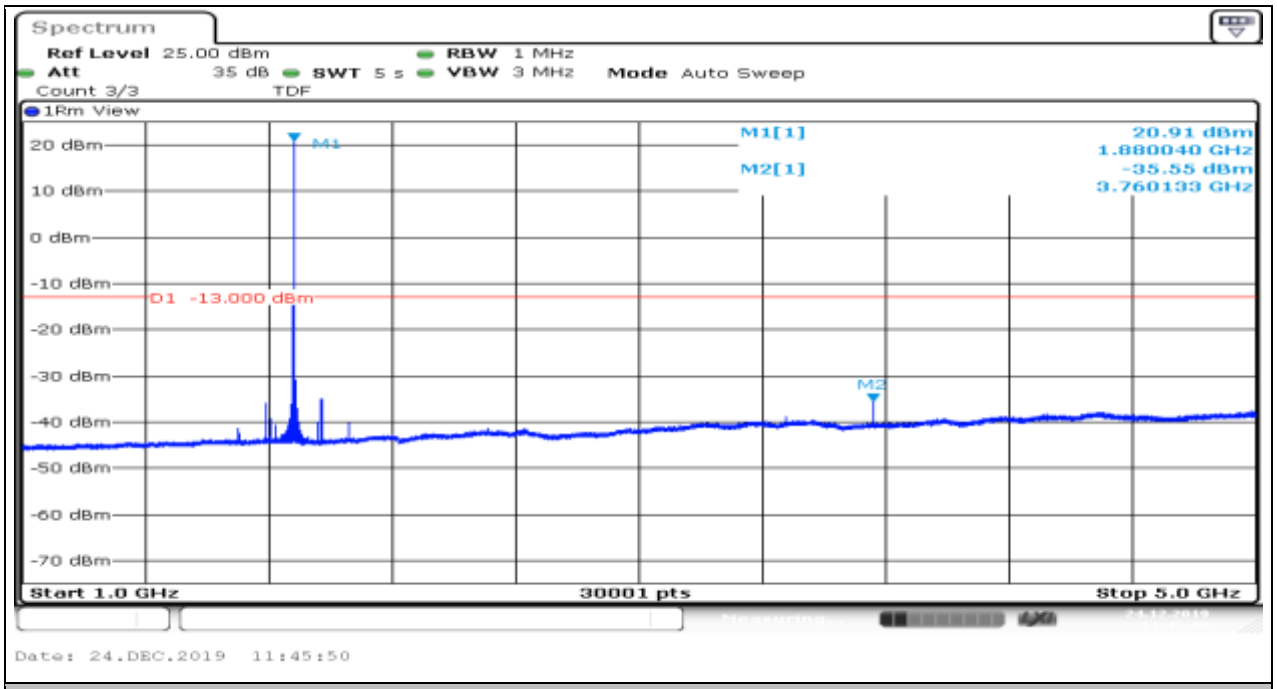
Band2_Stand-Alone_NaN_QPSK_18900_1@47_3.75kHz_12000_26500_12000~26500MHz@-41.59dBm_-13_PASS__



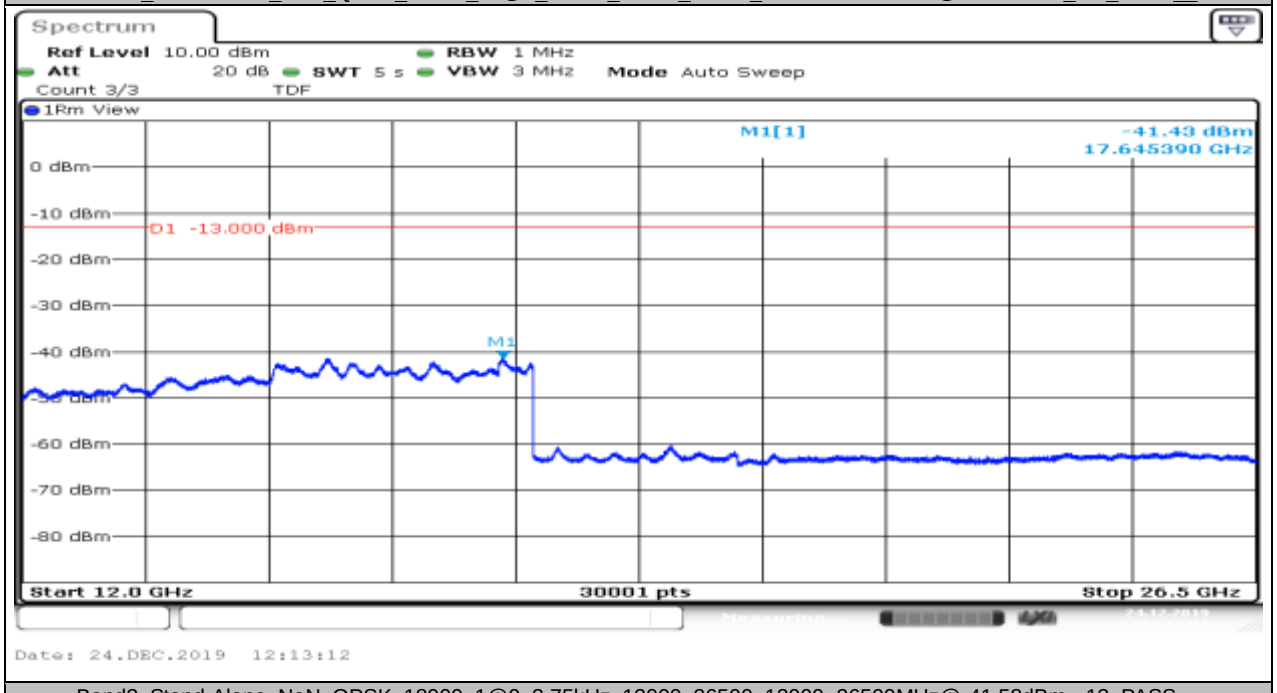
Band2_Stand-Alone_NaN_QPSK_18900_1@47_3.75kHz_5000_12000_5000~12000MHz@-44.55dBm_-13_PASS__



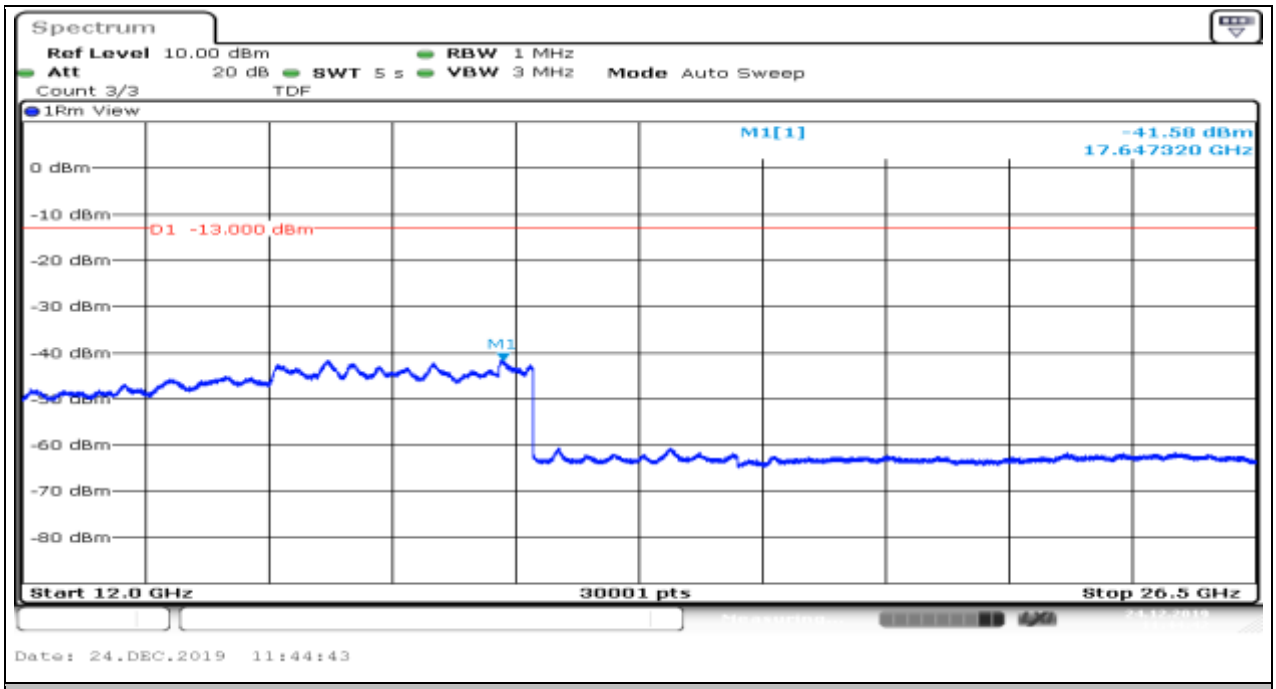
Band2_Stand-Alone_NaN_QPSK_18900_1@47_3.75kHz_1000_5000_1000~5000MHz@-35.55dBm_-13_PASS__



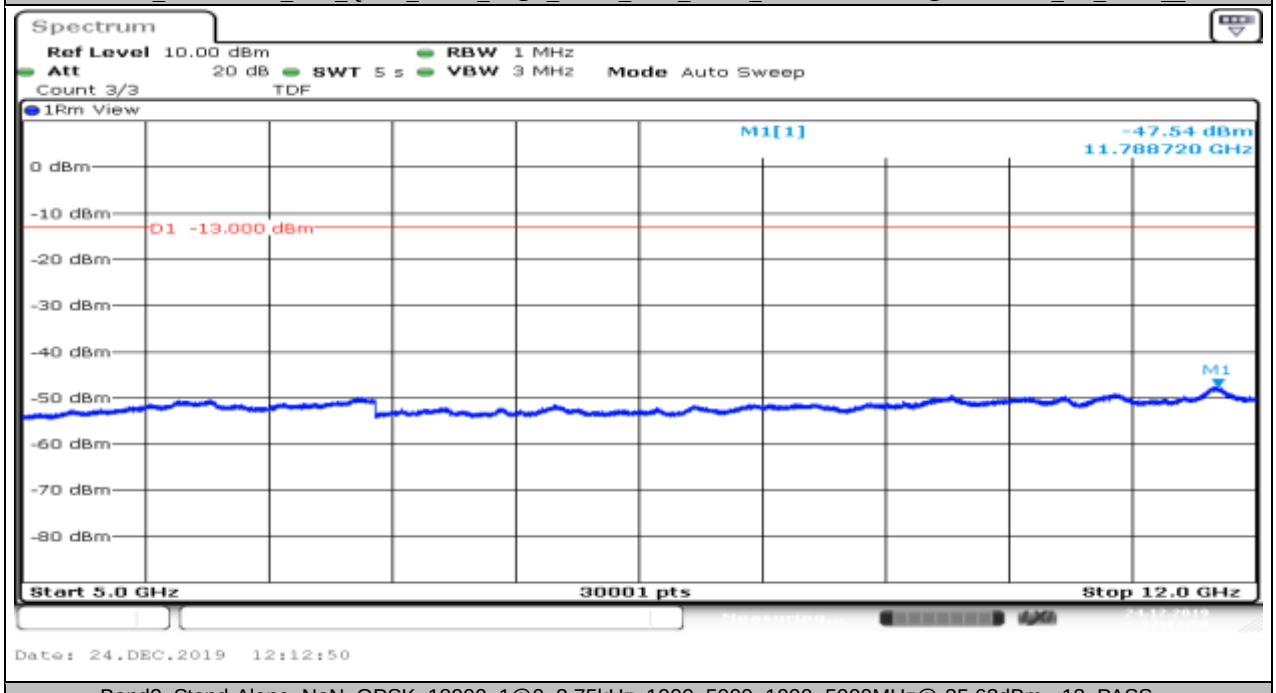
Band2_Stand-Alone_NaN_QPSK_18900_12@0_15kHz_12000_26500_12000~26500MHz@-41.43dBm_-13_PASS__



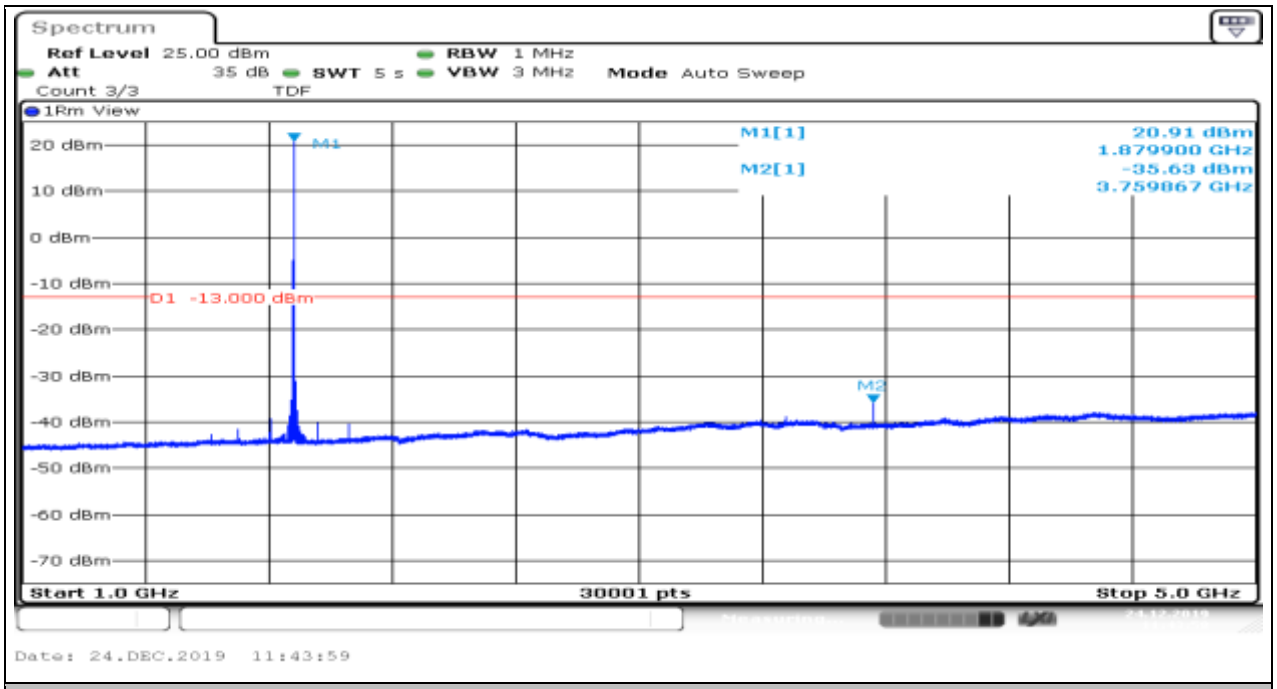
Band2_Stand-Alone_NaN_QPSK_18900_1@0_3.75kHz_12000_26500_12000~26500MHz@-41.58dBm_-13_PASS__



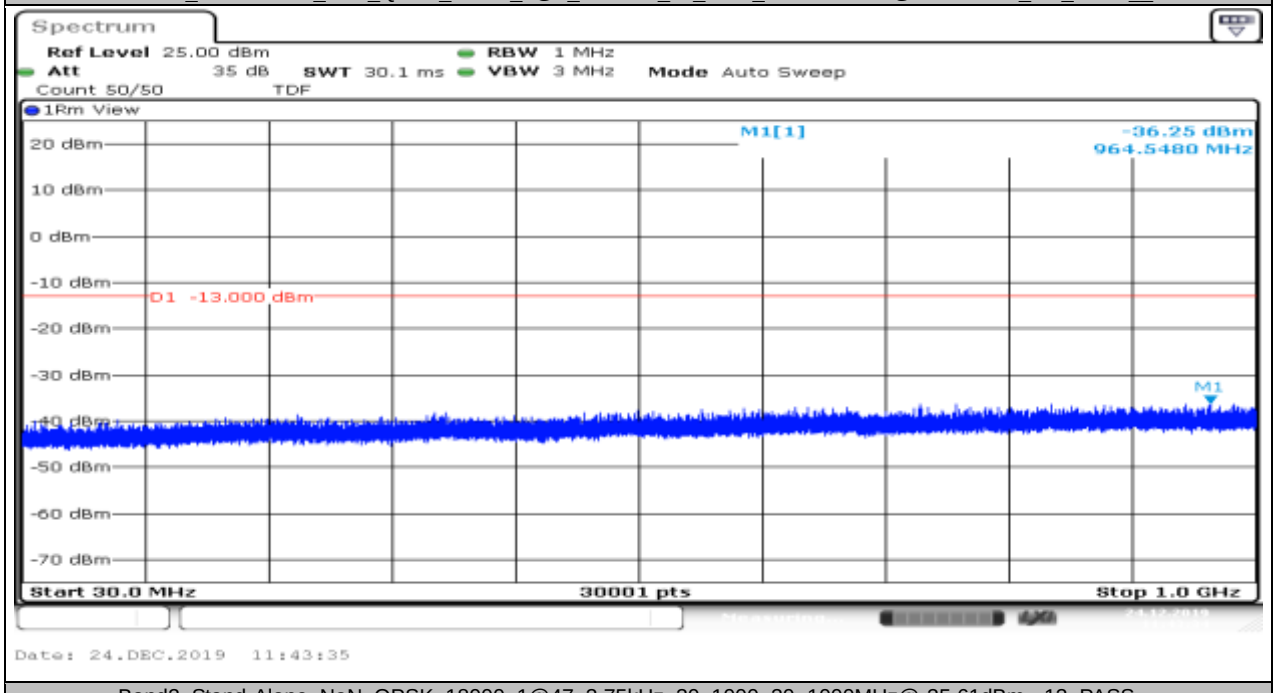
Band2_Stand-Alone_NaN_QPSK_18900_12@0_15kHz_5000_12000_5000~12000MHz@-47.54dBm_-13_PASS__



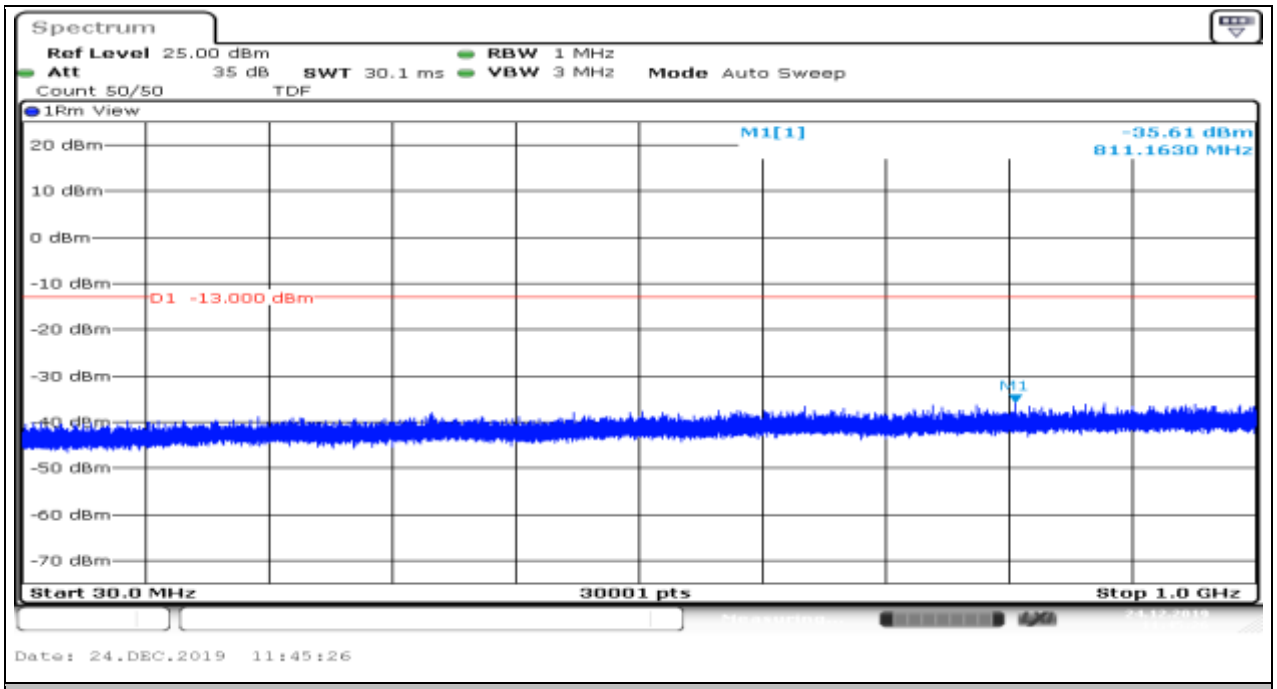
Band2_Stand-Alone_NaN_QPSK_18900_1@0_3.75kHz_1000_5000_1000~5000MHz@-35.63dBm_-13_PASS__



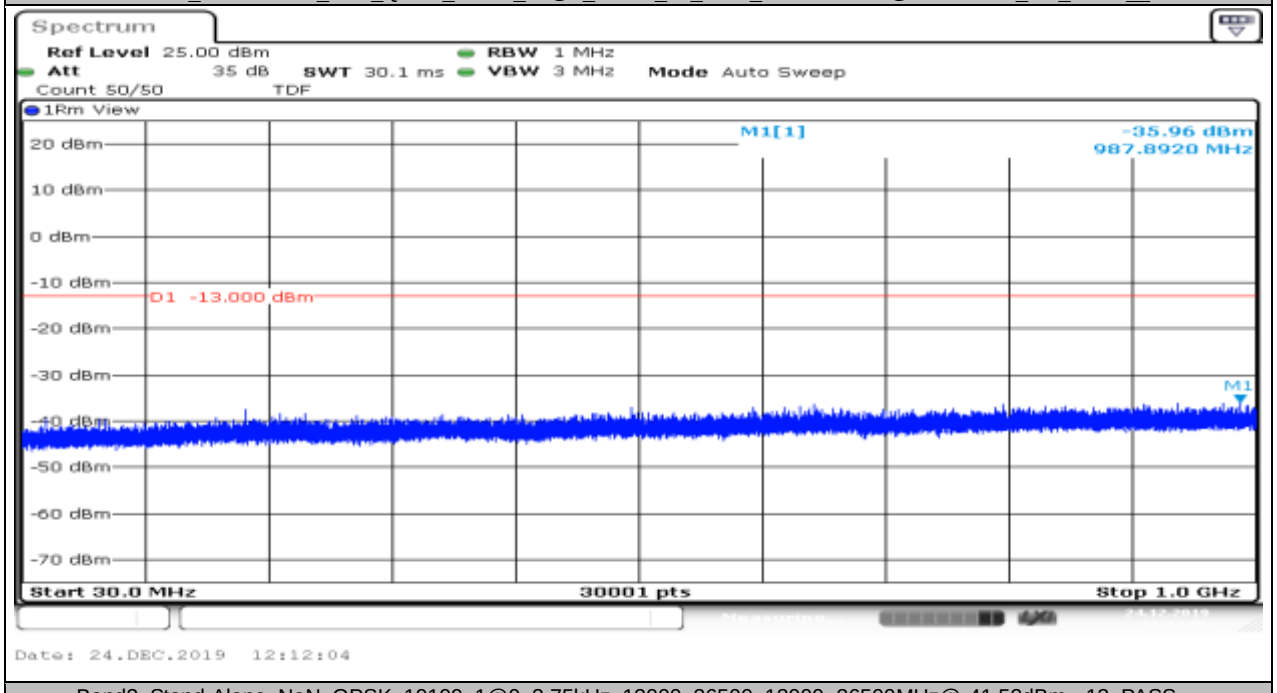
Band2_Stand-Alone_NaN_QPSK_18900_1@0_3.75kHz_30_1000_30~1000MHz@-36.25dBm_-13_PASS__



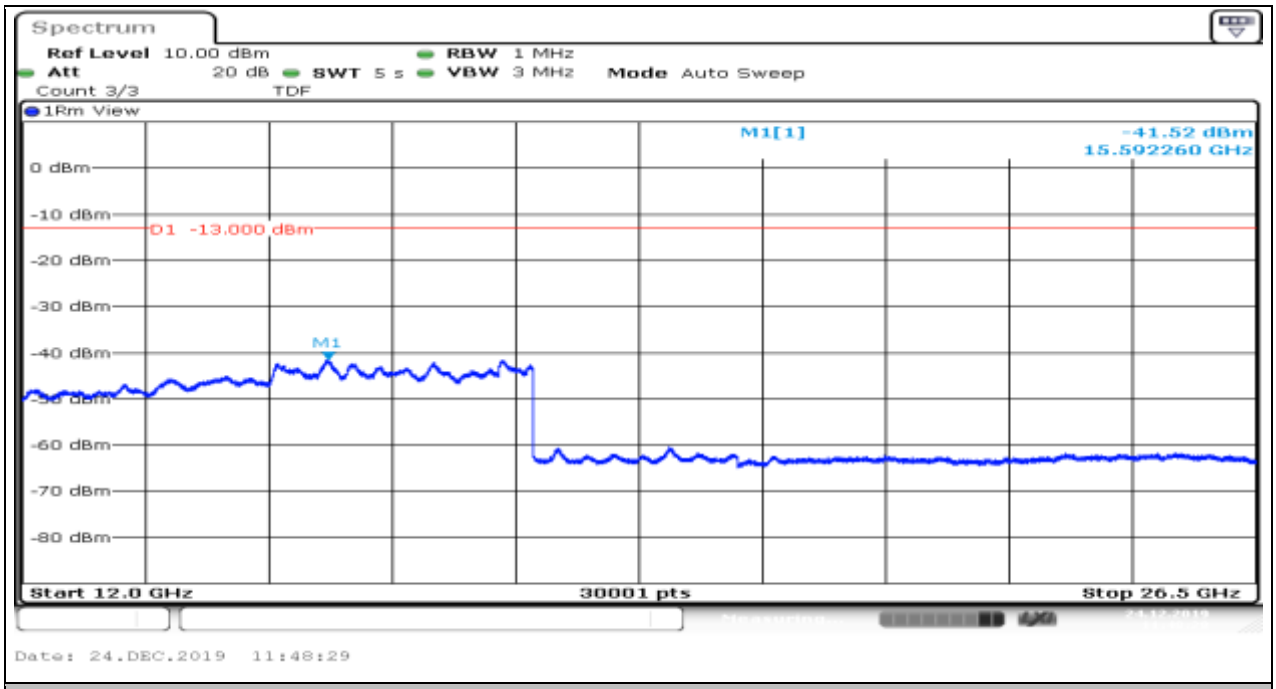
Band2_Stand-Alone_NaN_QPSK_18900_1@47_3.75kHz_30_1000_30~1000MHz@-35.61dBm_-13_PASS__



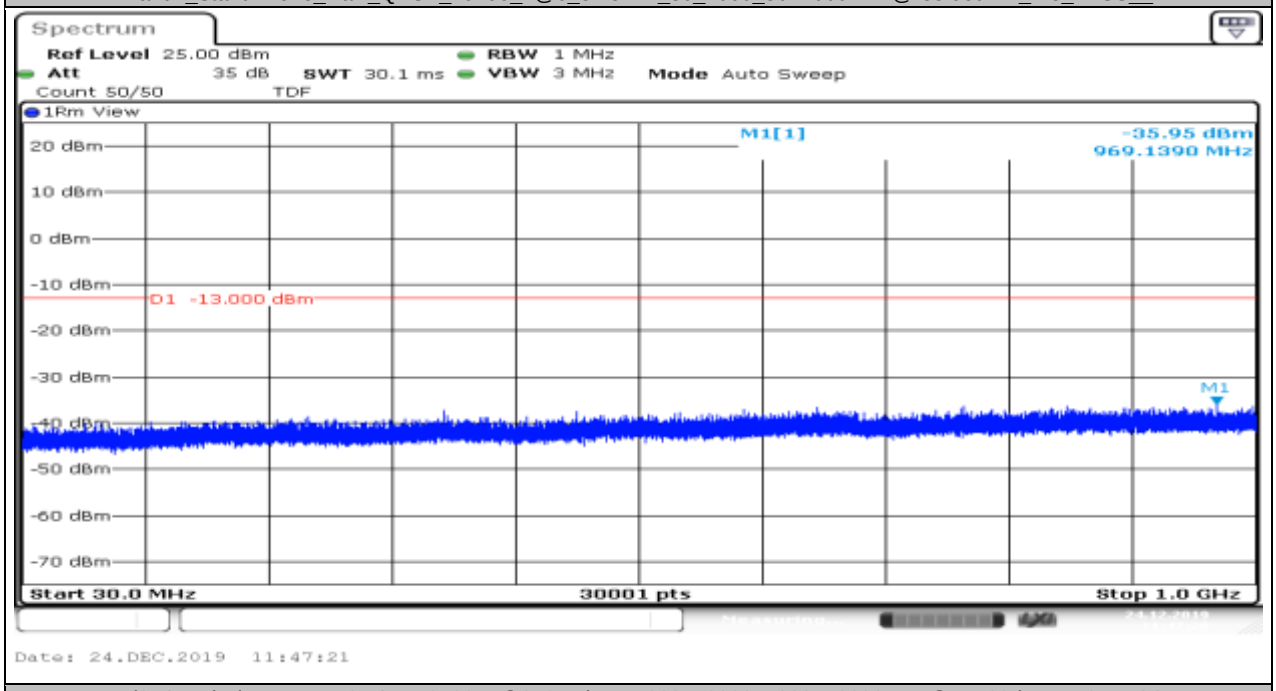
Band2_Stand-Alone_NaN_QPSK_18900_12@0_15kHz_30_1000_30~1000MHz@-35.96dBm_-13_PASS__



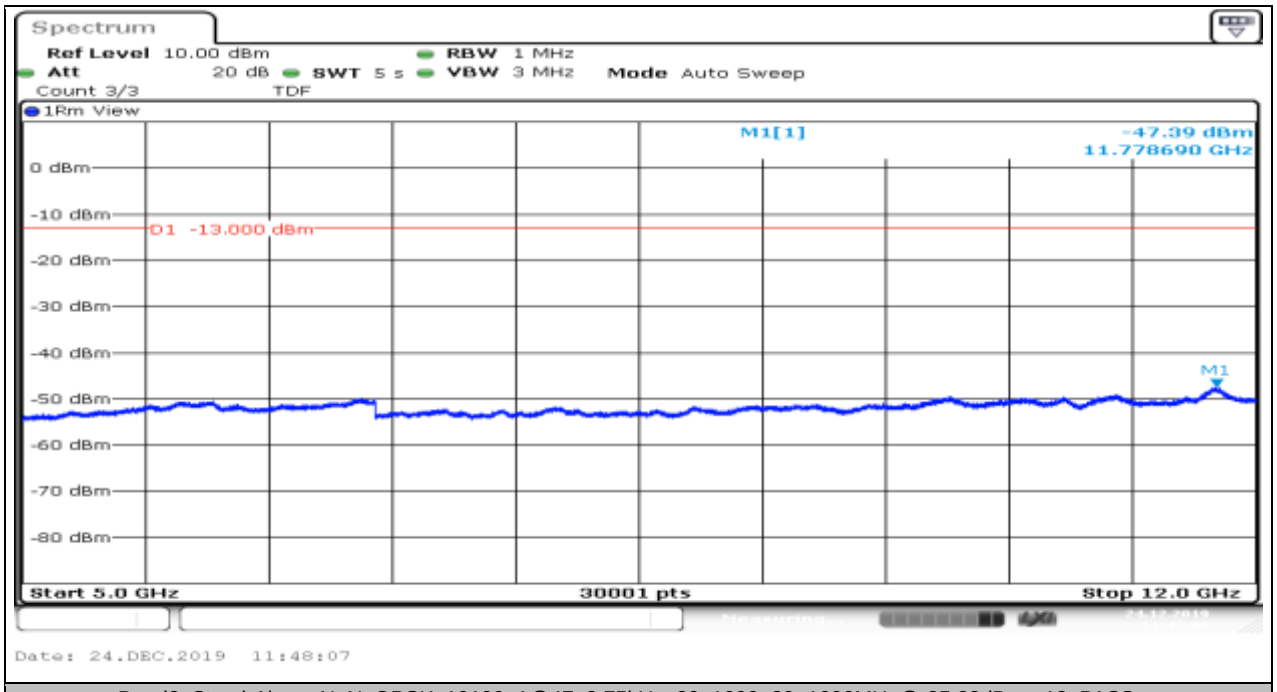
Band2_Stand-Alone_NaN_QPSK_19199_1@0_3.75kHz_12000_26500_12000~26500MHz@-41.52dBm_-13_PASS__



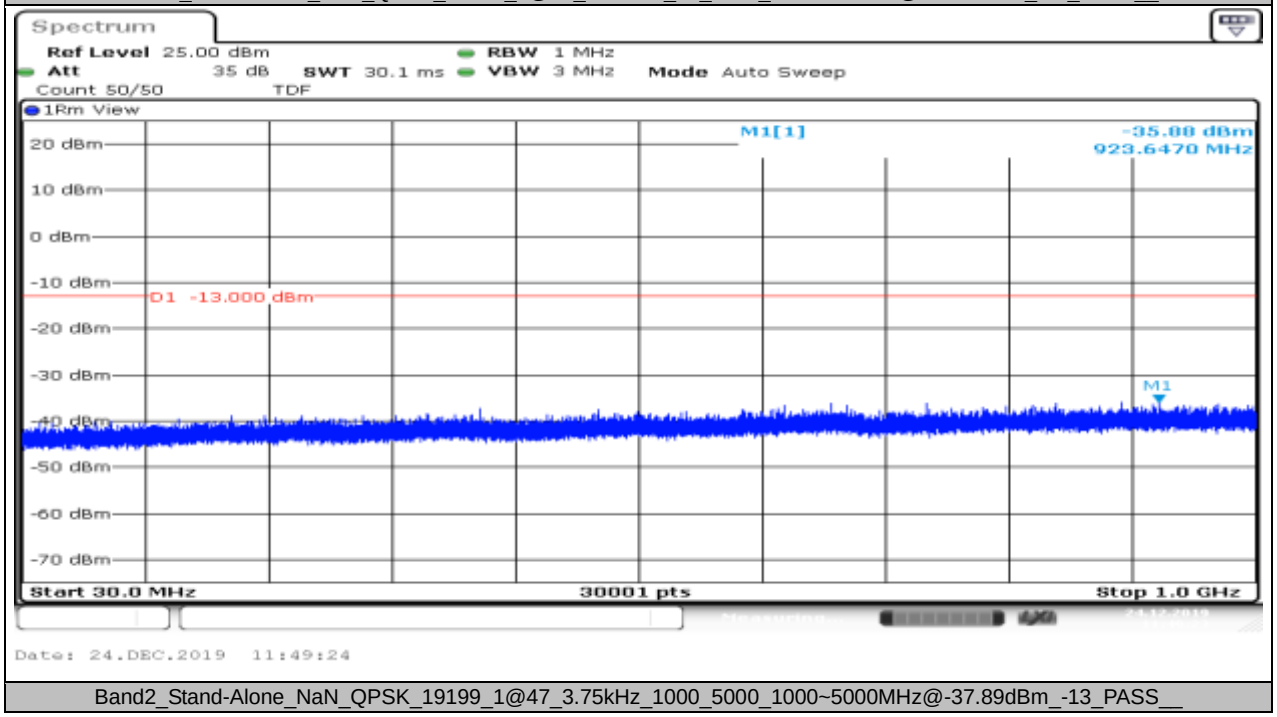
Band2_Stand-Alone_NaN_QPSK_19199_1@0_3.75kHz_30_1000_30~1000MHz@-35.95dBm_-13_PASS__



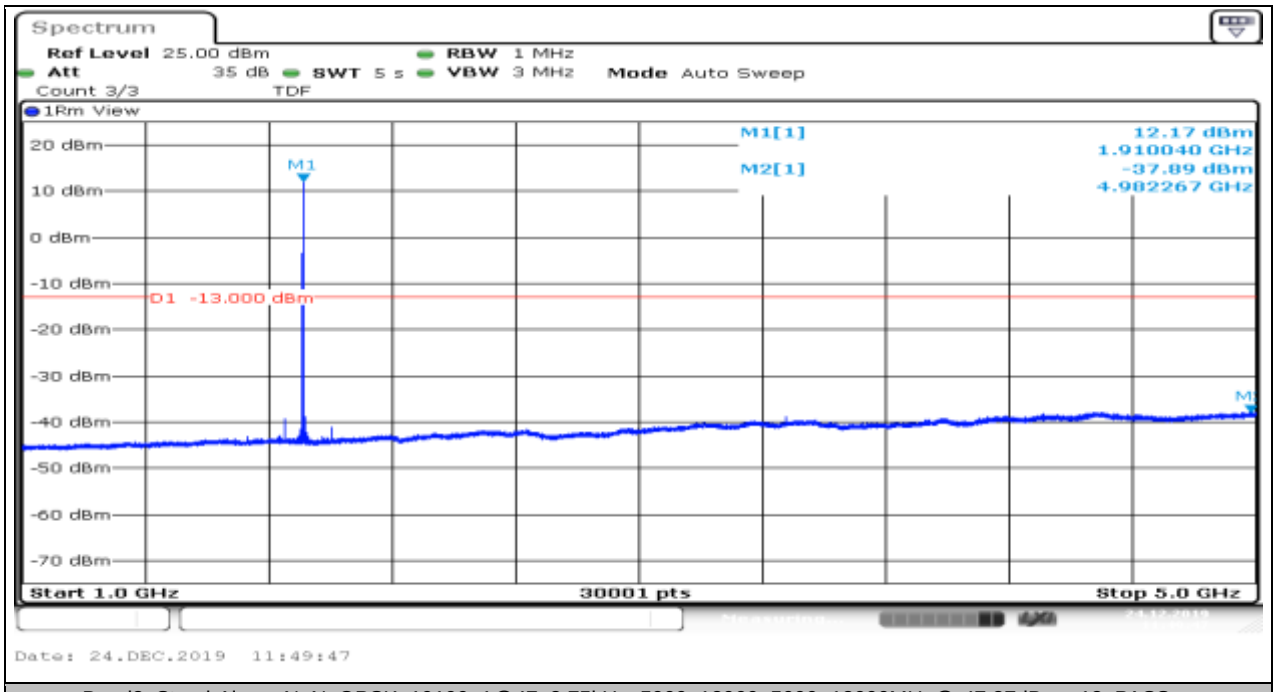
Band2_Stand-Alone_NaN_QPSK_19199_1@0_3.75kHz_5000_12000_5000~12000MHz@-47.39dBm_-13_PASS__



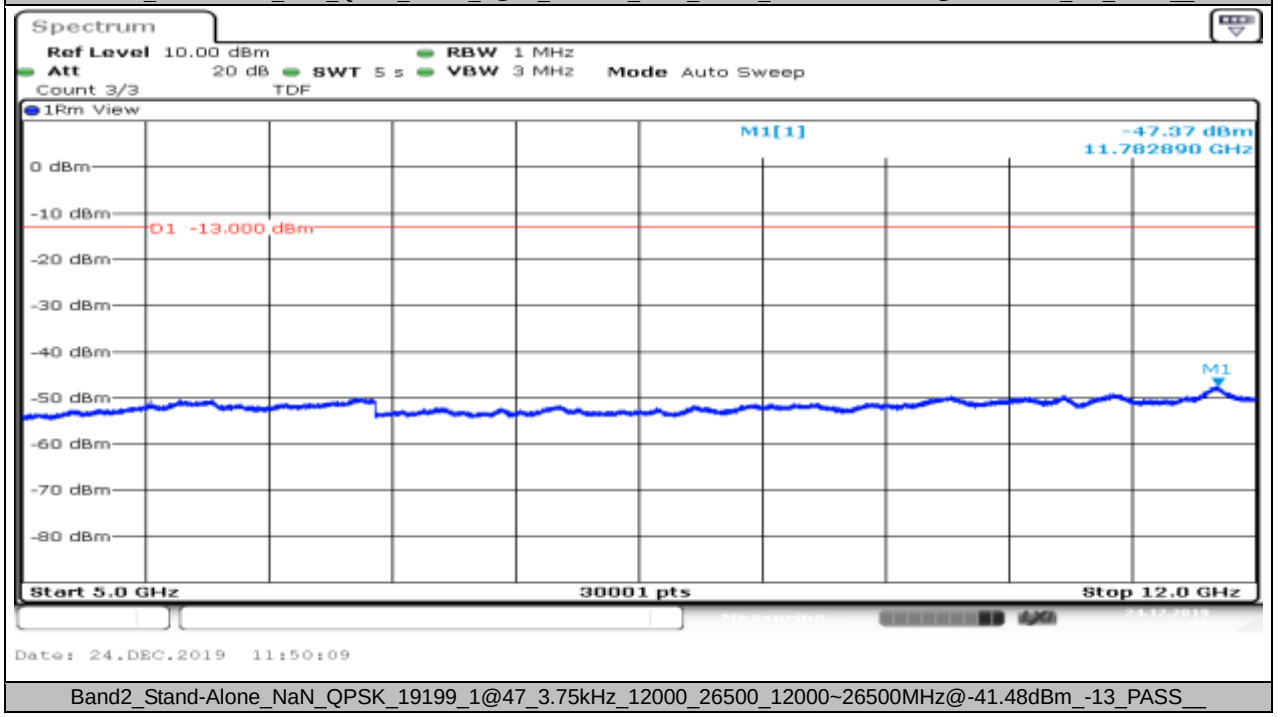
Band2_Stand-Alone_NaN_QPSK_19199_1@47_3.75kHz_30_1000_30~1000MHz@-35.88dBm_-13_PASS__



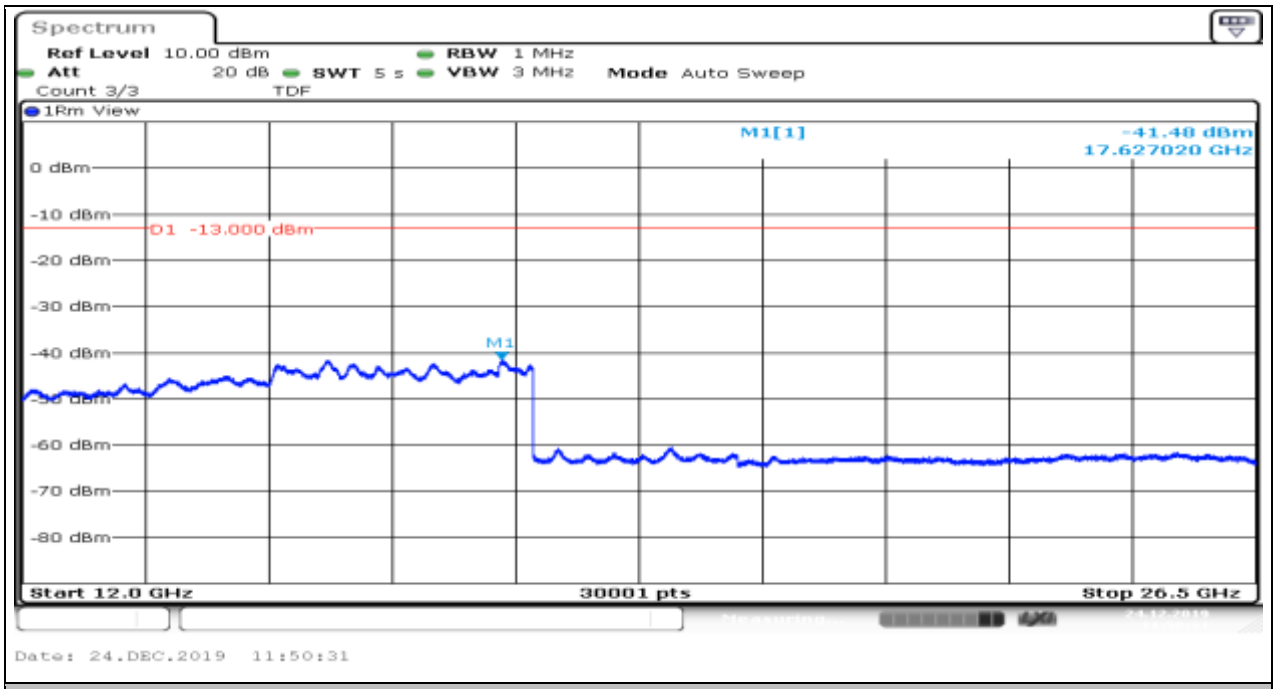
Band2_Stand-Alone_NaN_QPSK_19199_1@47_3.75kHz_1000_5000_1000~5000MHz@-37.89dBm_-13_PASS__



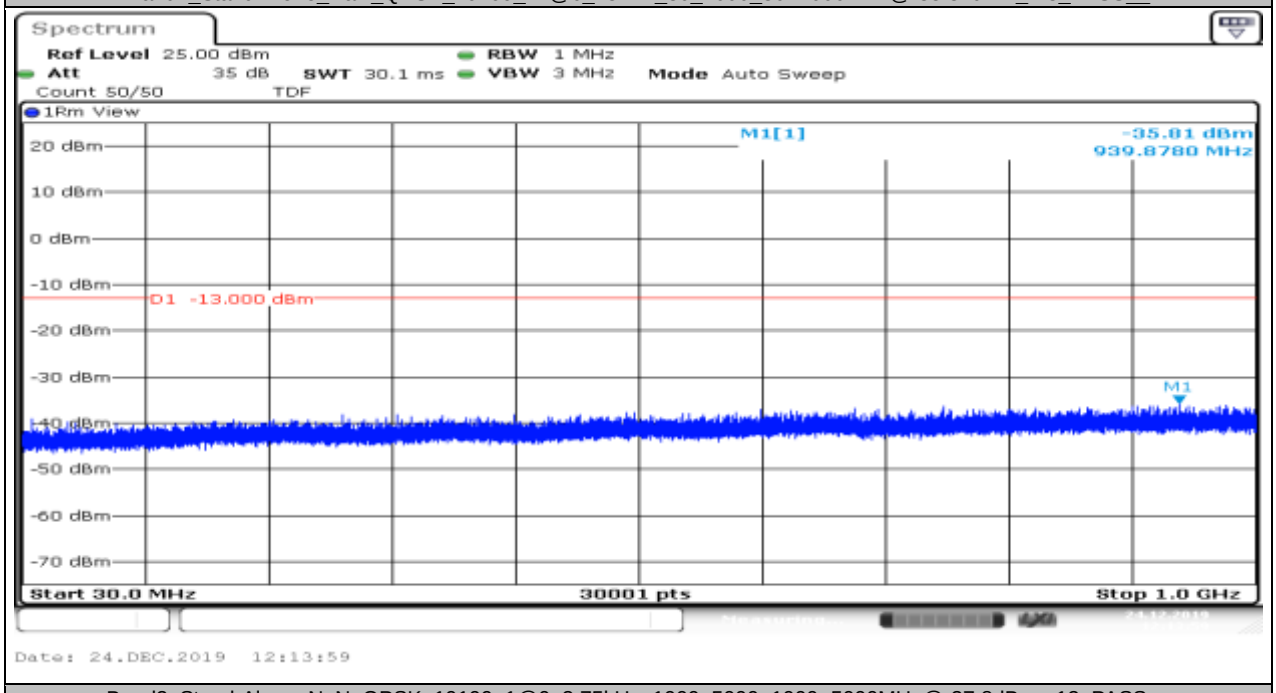
Band2_Stand-Alone_NaN_QPSK_19199_1@47_3.75kHz_5000_12000_5000~12000MHz@-47.37dBm_-13_PASS__



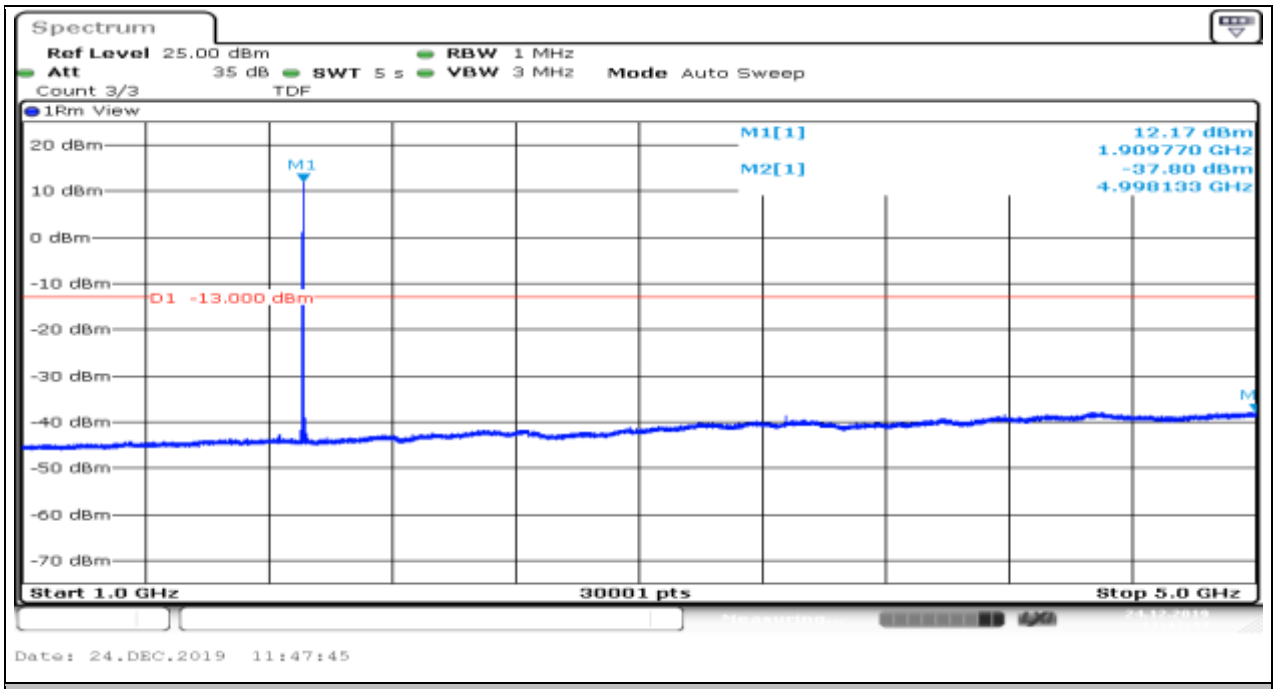
Band2_Stand-Alone_NaN_QPSK_19199_1@47_3.75kHz_12000_26500_12000~26500MHz@-41.48dBm_-13_PASS__



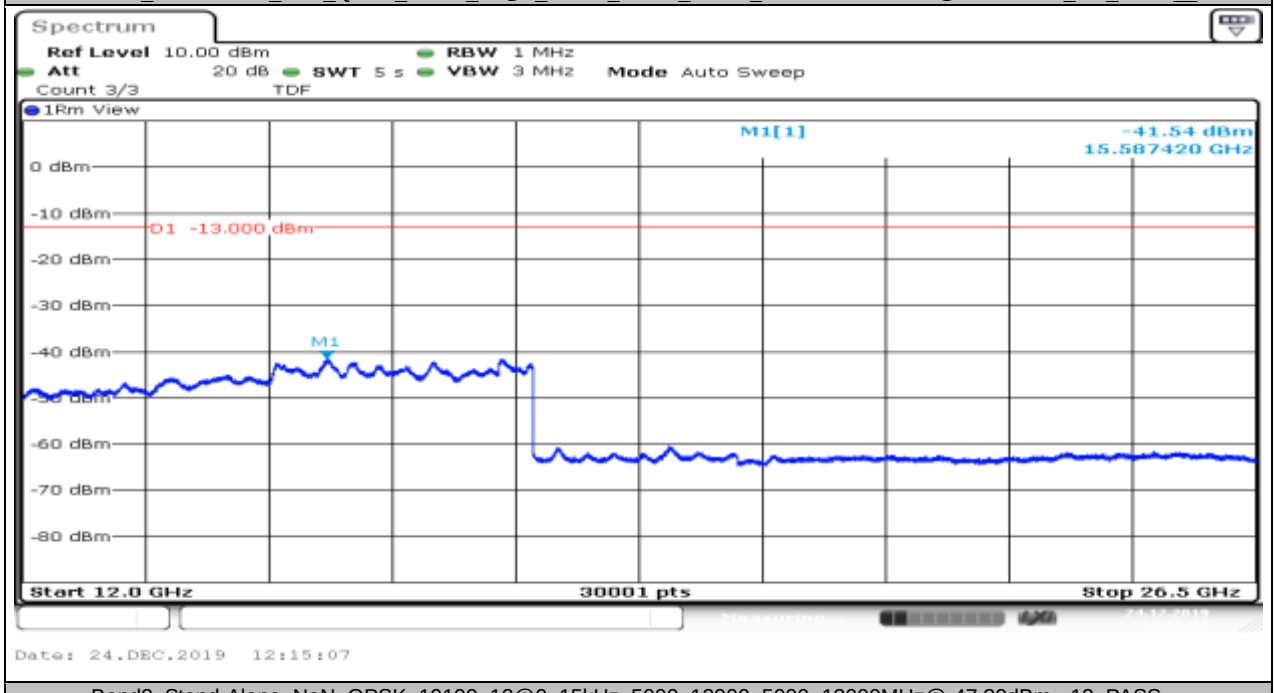
Band2_Stand-Alone_NaN_QPSK_19199_12@0_15kHz_30_1000_30~1000MHz@-35.81dBm_-13_PASS__



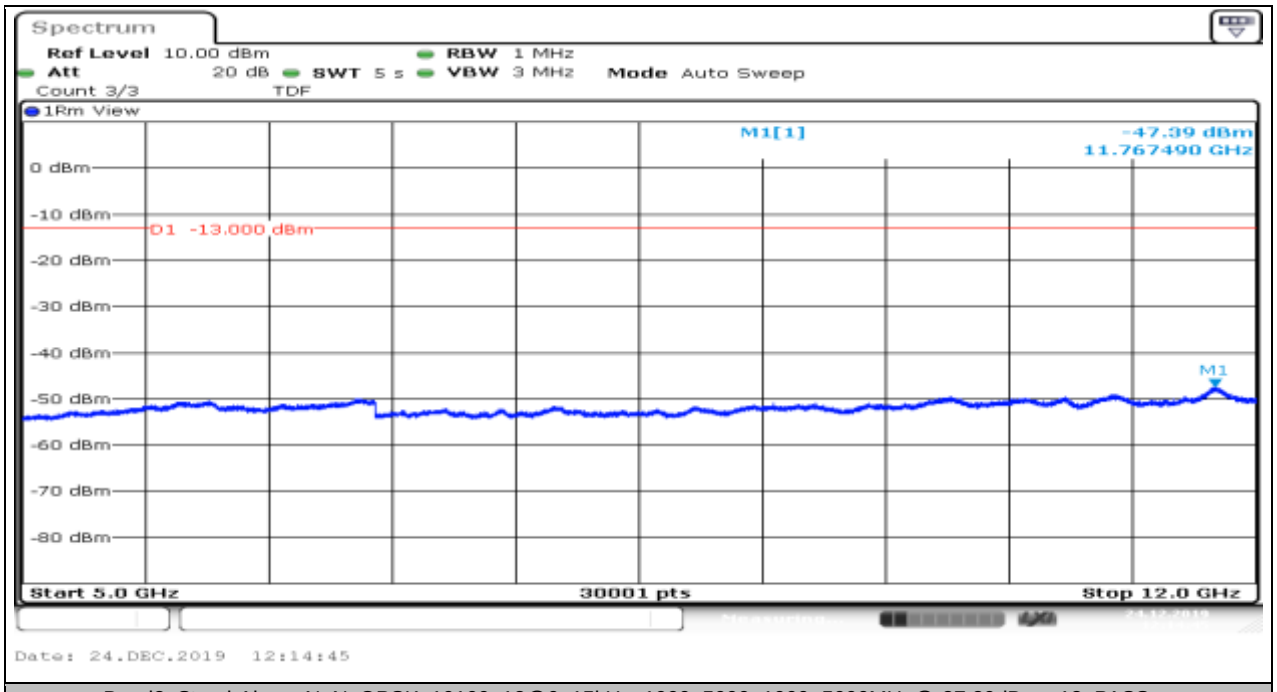
Band2_Stand-Alone_NaN_QPSK_19199_1@0_3.75kHz_1000_5000_1000~5000MHz@-37.8dBm_-13_PASS__



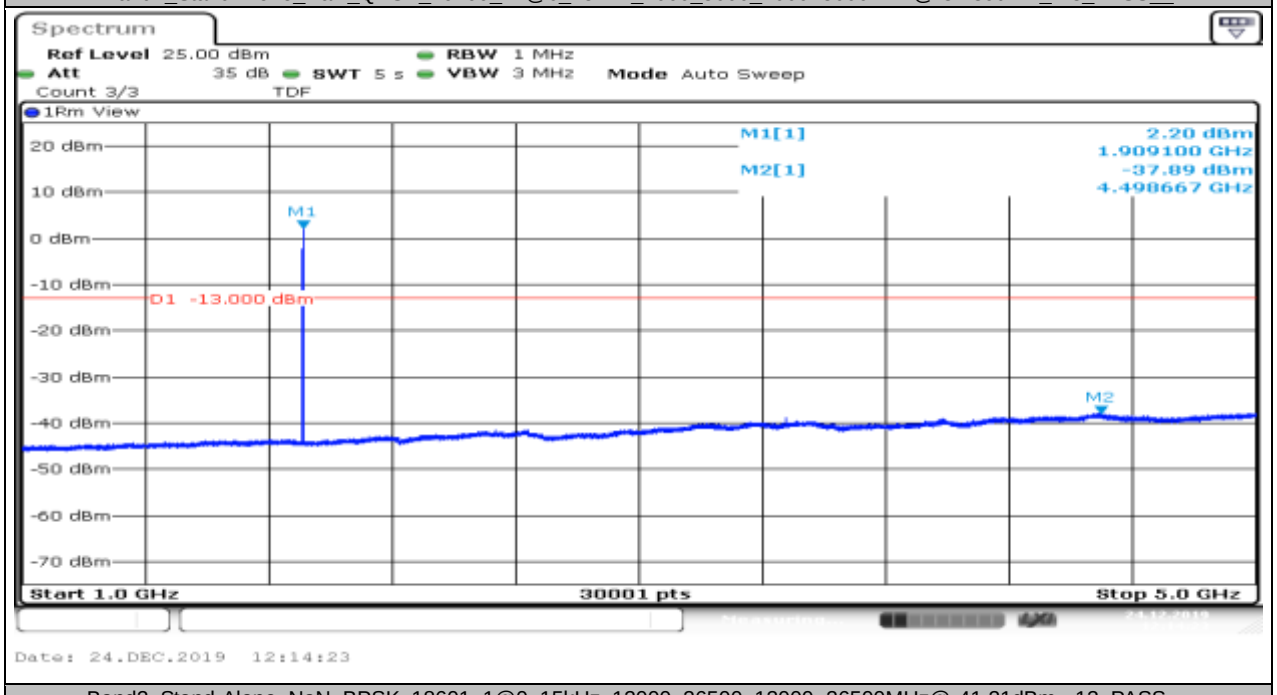
Band2_Stand-Alone_NaN_QPSK_19199_12@0_15kHz_12000_26500_12000~26500MHz@-41.54dBm_-13_PASS__



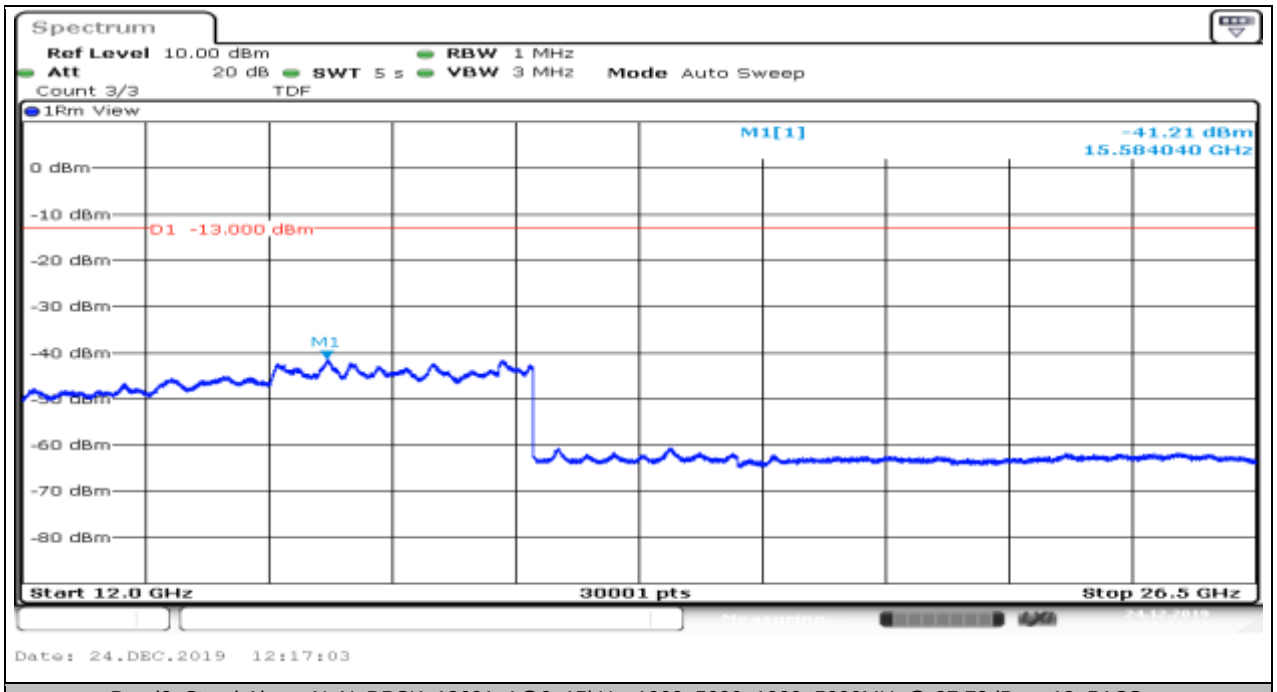
Band2_Stand-Alone_NaN_QPSK_19199_12@0_15kHz_5000_12000_5000~12000MHz@-47.39dBm_-13_PASS__



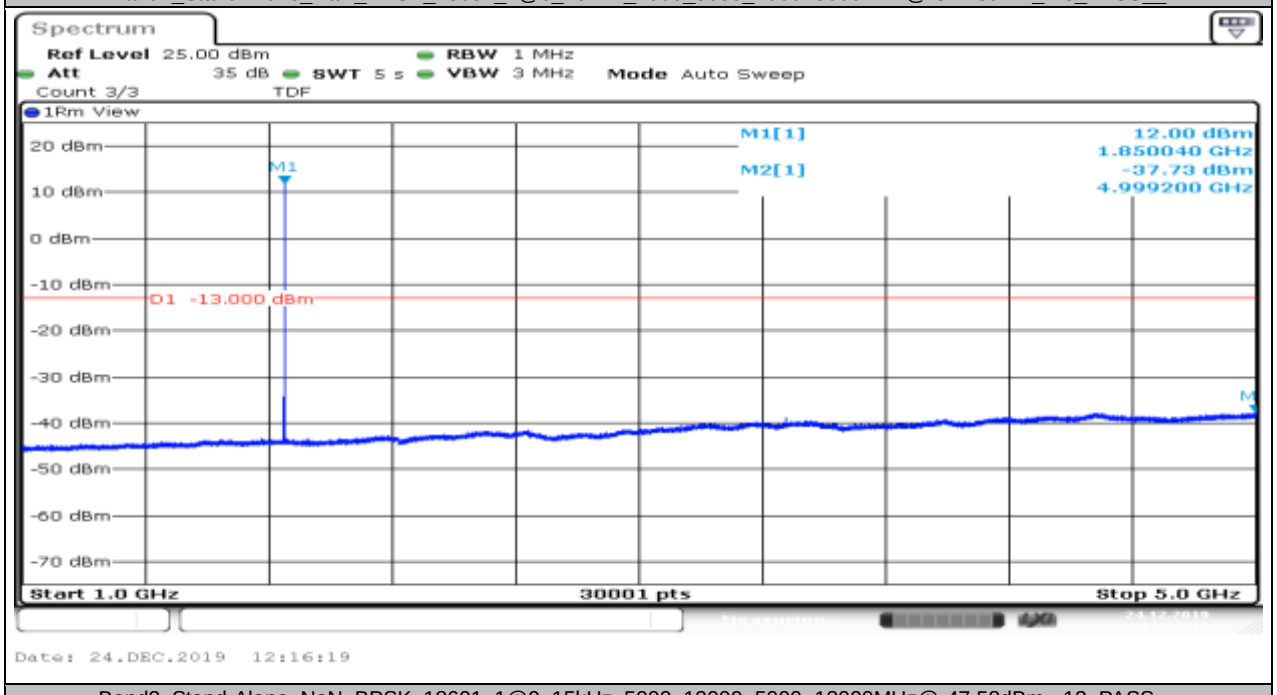
Band2_Stand-Alone_NaN_QPSK_19199_12@0_15kHz_1000_5000_1000~5000MHz@-37.89dBm_-13_PASS__



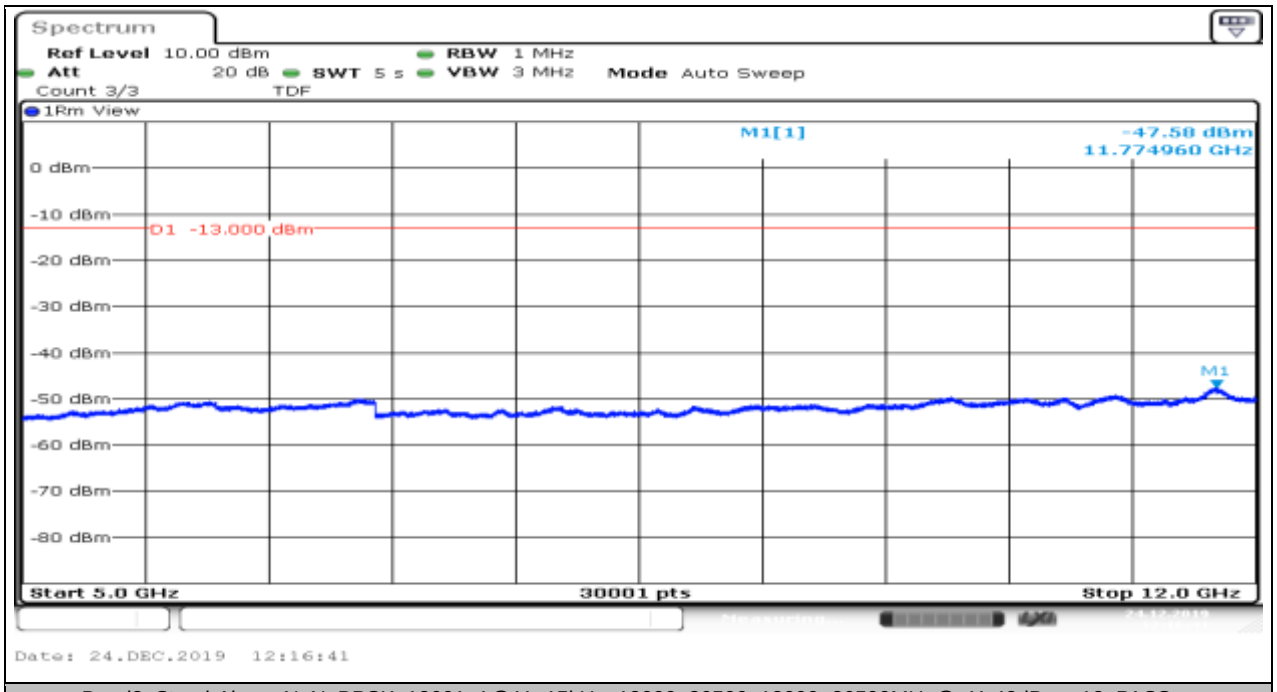
Band2_Stand-Alone_NaN_BPSK_18601_1@0_15kHz_12000_26500_12000~26500MHz@-41.21dBm_-13_PASS__



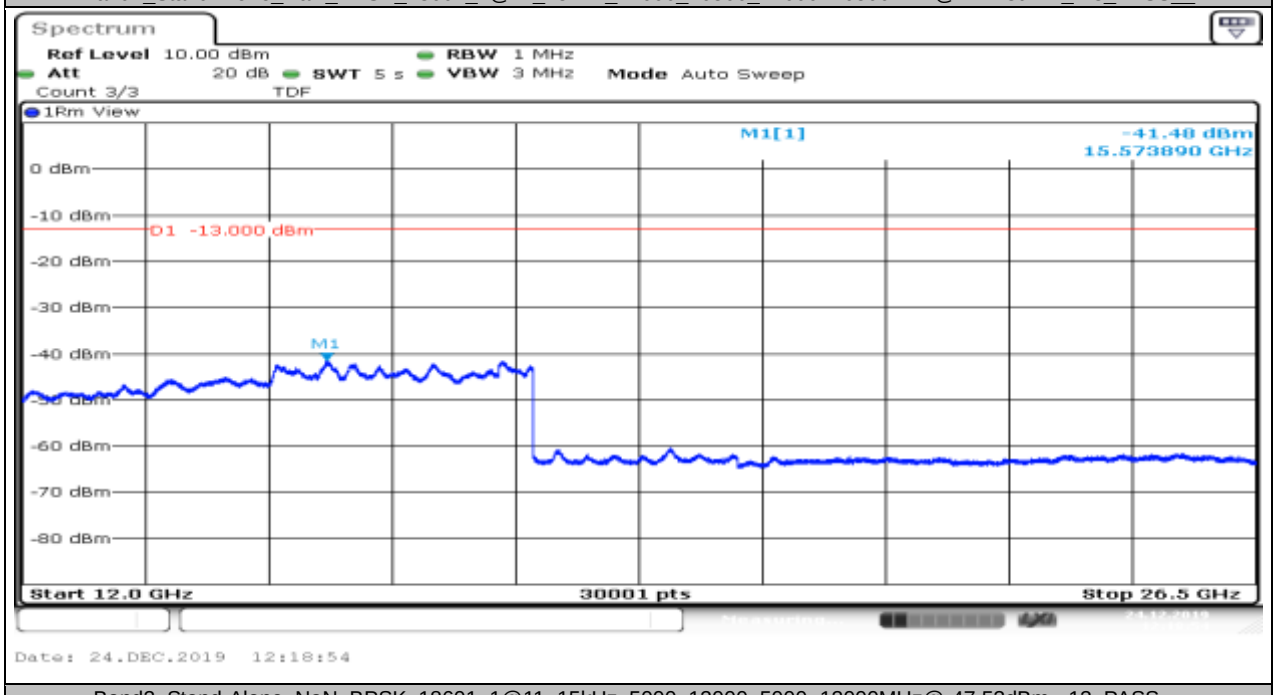
Band2_Stand-Alone_NaN_BPSK_18601_1@0_15kHz_1000_5000_1000~5000MHz@-37.73dBm_-13_PASS__



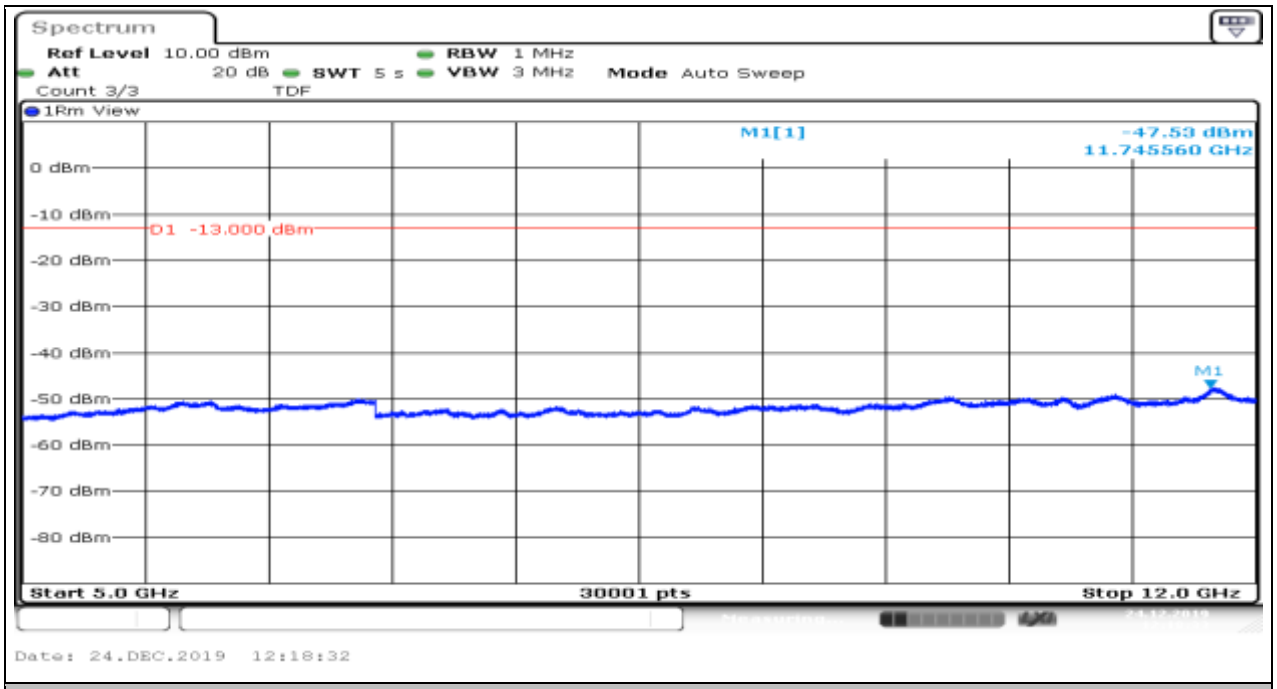
Band2_Stand-Alone_NaN_BPSK_18601_1@0_15kHz_5000_12000_5000~12000MHz@-47.58dBm_-13_PASS__



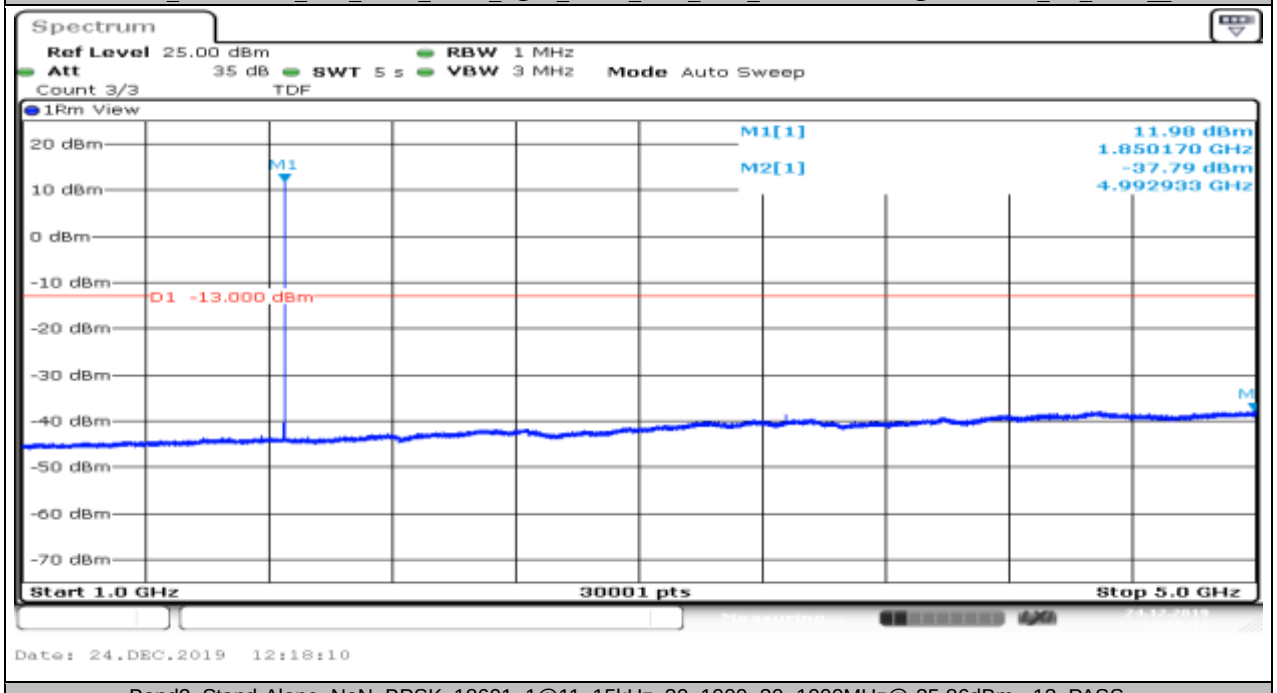
Band2_Stand-Alone_NaN_BPSK_18601_1@11_15kHz_12000_26500_12000~26500MHz@-41.48dBm_-13_PASS__



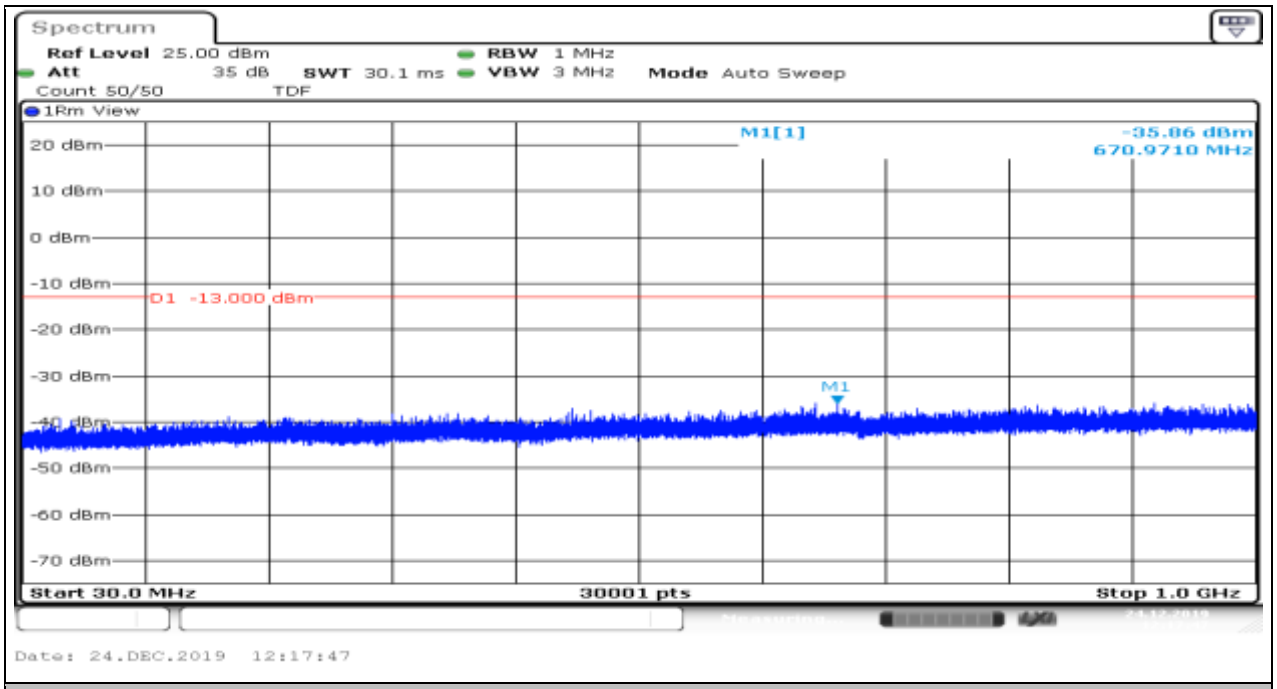
Band2_Stand-Alone_NaN_BPSK_18601_1@11_15kHz_5000_12000_5000~12000MHz@-47.53dBm_-13_PASS__



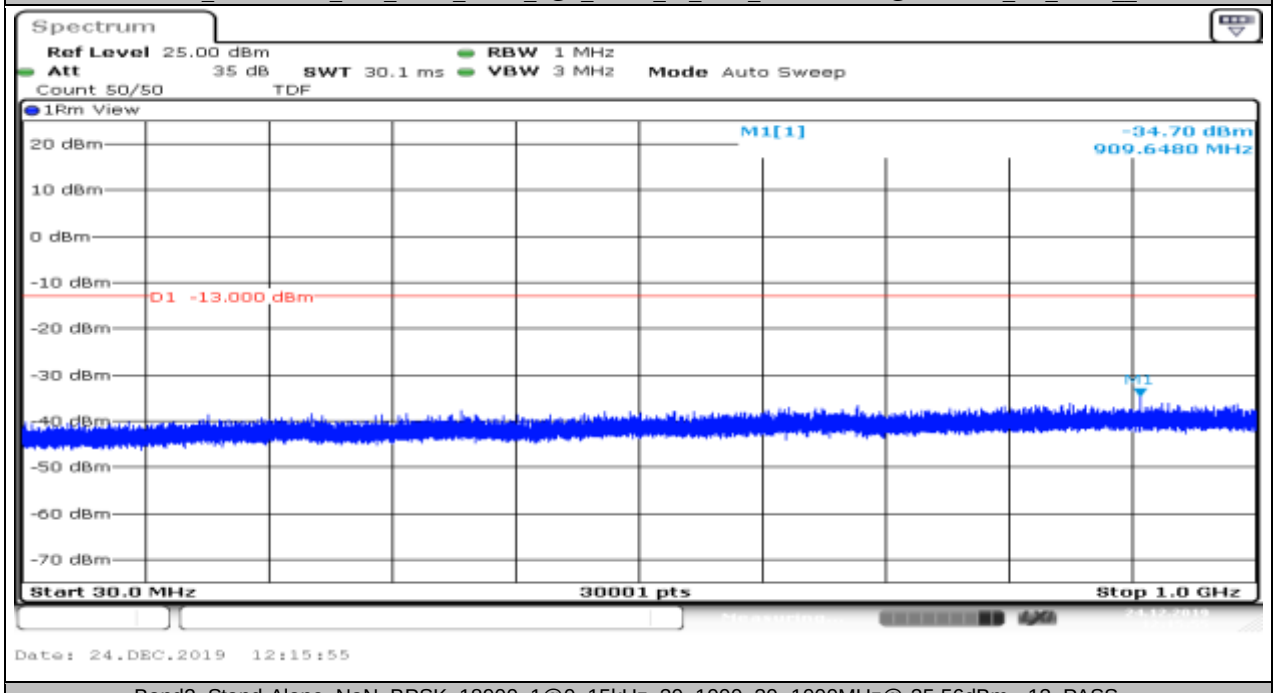
Band2_Stand-Alone_NaN_BPSK_18601_1@11_15kHz_1000_5000_1000~5000MHz@-37.79dBm_-13_PASS__



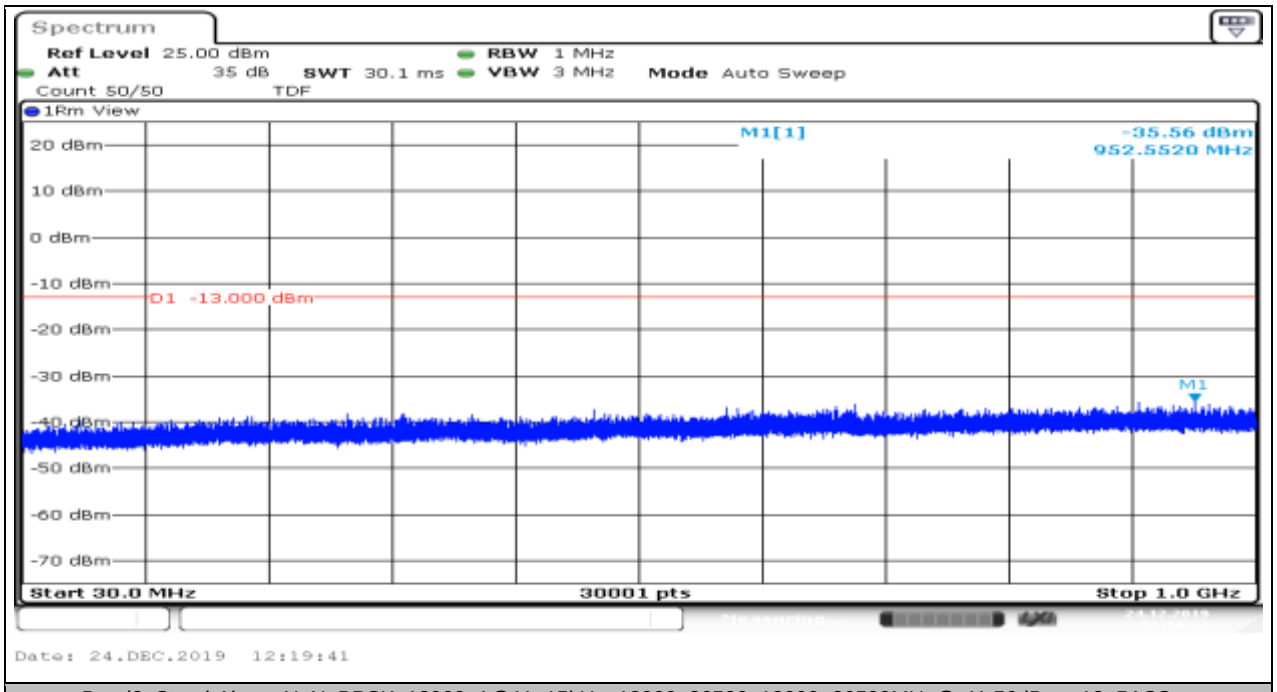
Band2_Stand-Alone_NaN_BPSK_18601_1@11_15kHz_30_1000_30~1000MHz@-35.86dBm_-13_PASS__



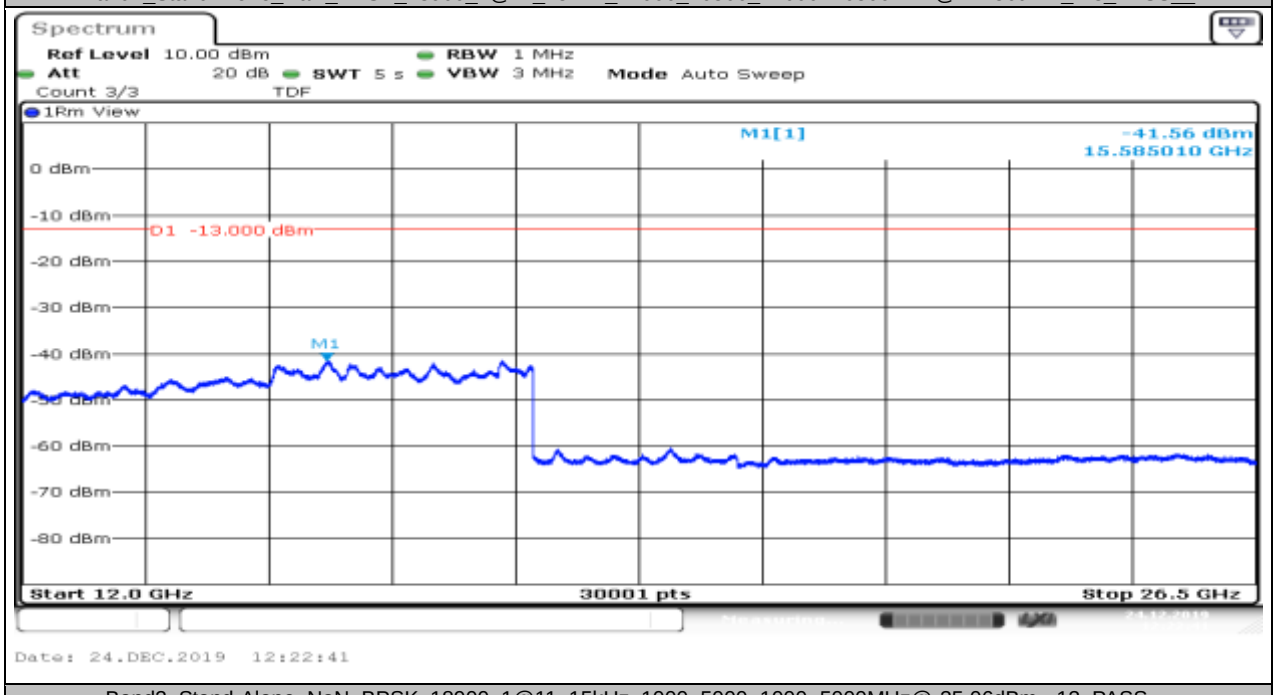
Band2_Stand-Alone_NaN_BPSK_18601_1@0_15kHz_30_1000_30~1000MHz@-34.7dBm_-13_PASS__



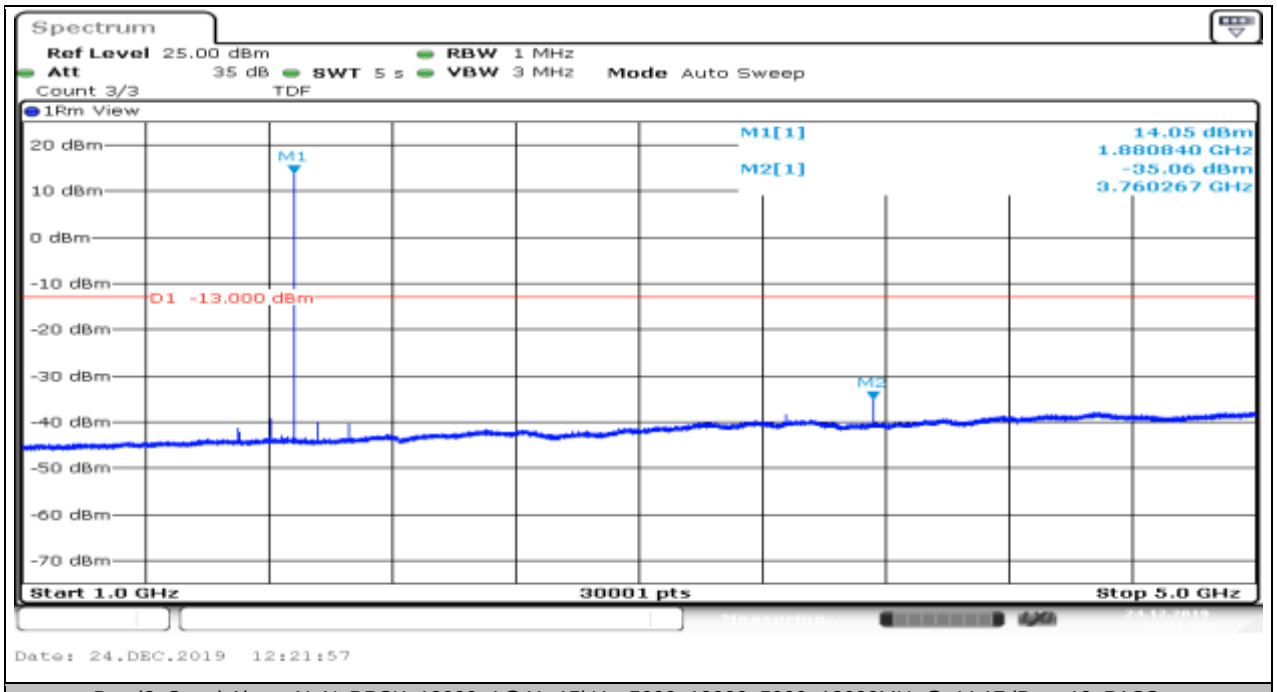
Band2_Stand-Alone_NaN_BPSK_18900_1@0_15kHz_30_1000_30~1000MHz@-35.56dBm_-13_PASS__



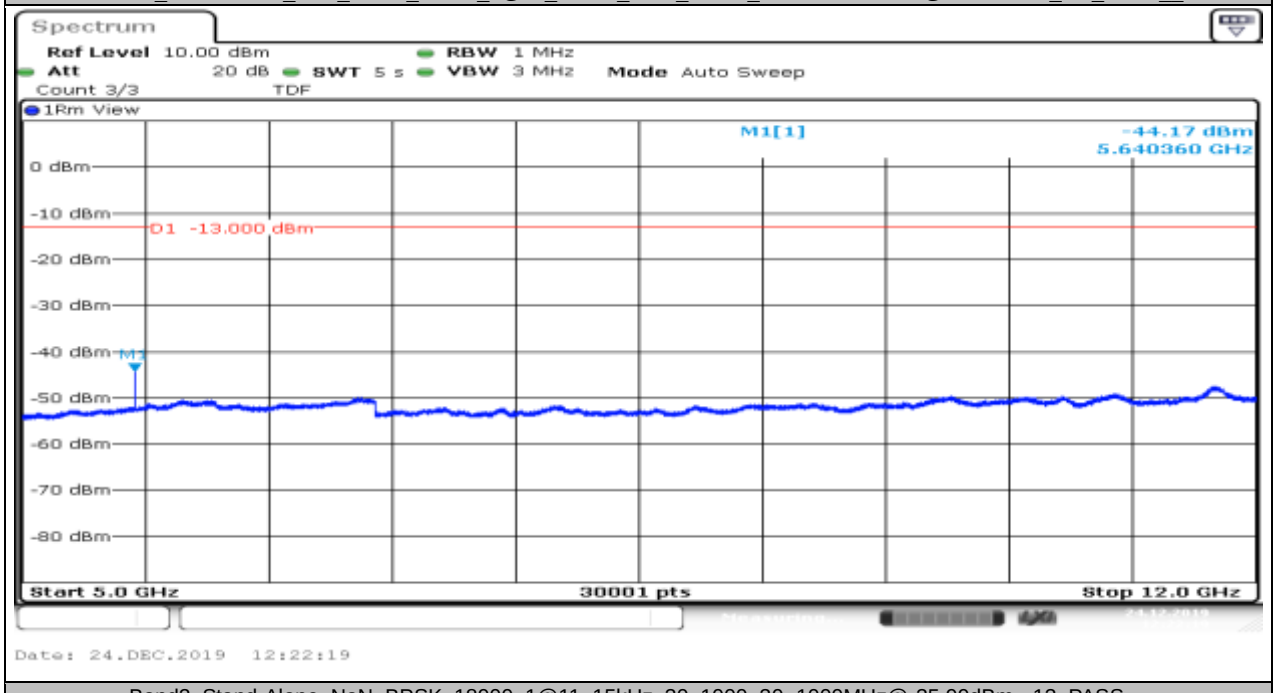
Band2_Stand-Alone_NaN_BPSK_18900_1@11_15kHz_12000_26500_12000~26500MHz@-41.56dBm_-13_PASS__



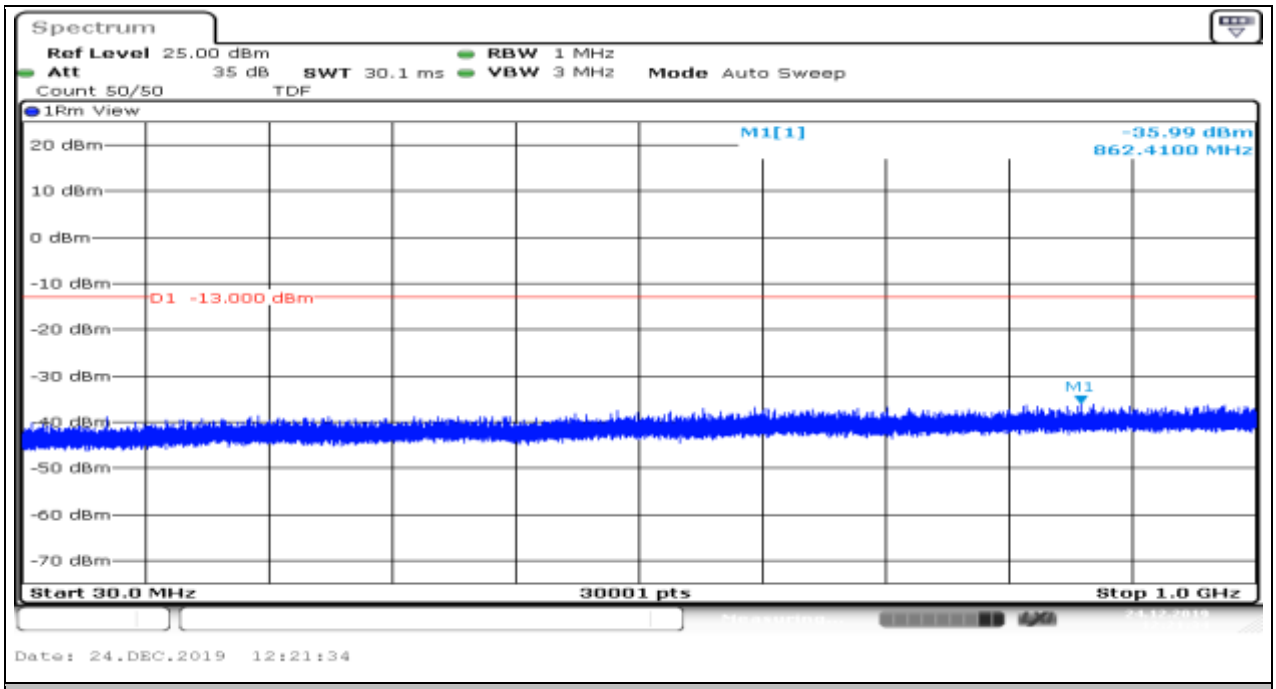
Band2_Stand-Alone_NaN_BPSK_18900_1@11_15kHz_1000_5000_1000~5000MHz@-35.06dBm_-13_PASS__



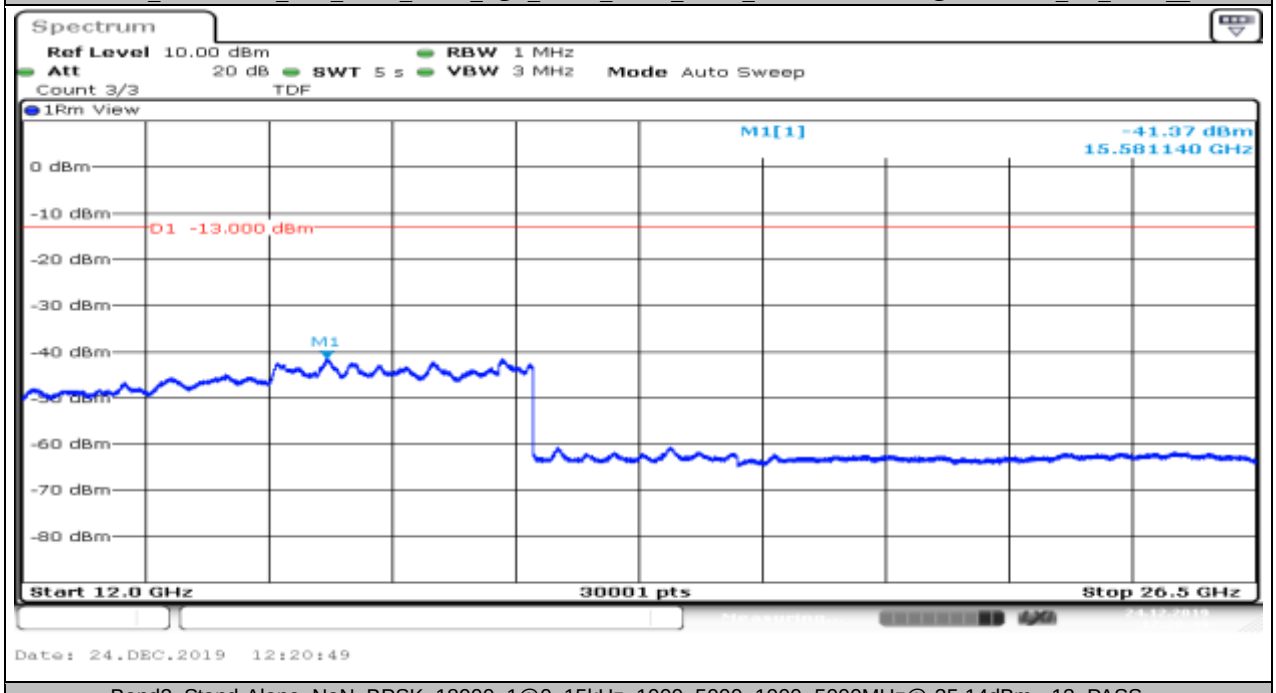
Band2_Stand-Alone_NaN_BPSK_18900_1@11_15kHz_5000_12000_5000~12000MHz@-44.17dBm_-13_PASS__



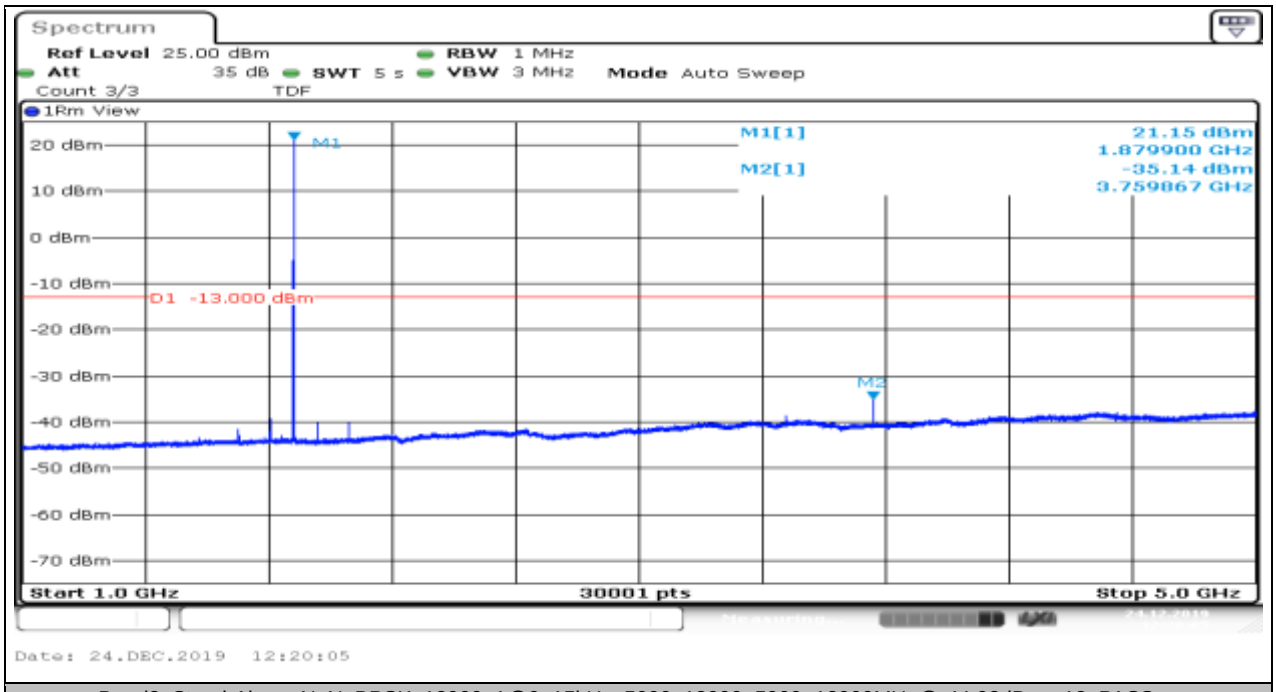
Band2_Stand-Alone_NaN_BPSK_18900_1@11_15kHz_30_1000_30~1000MHz@-35.99dBm_-13_PASS__



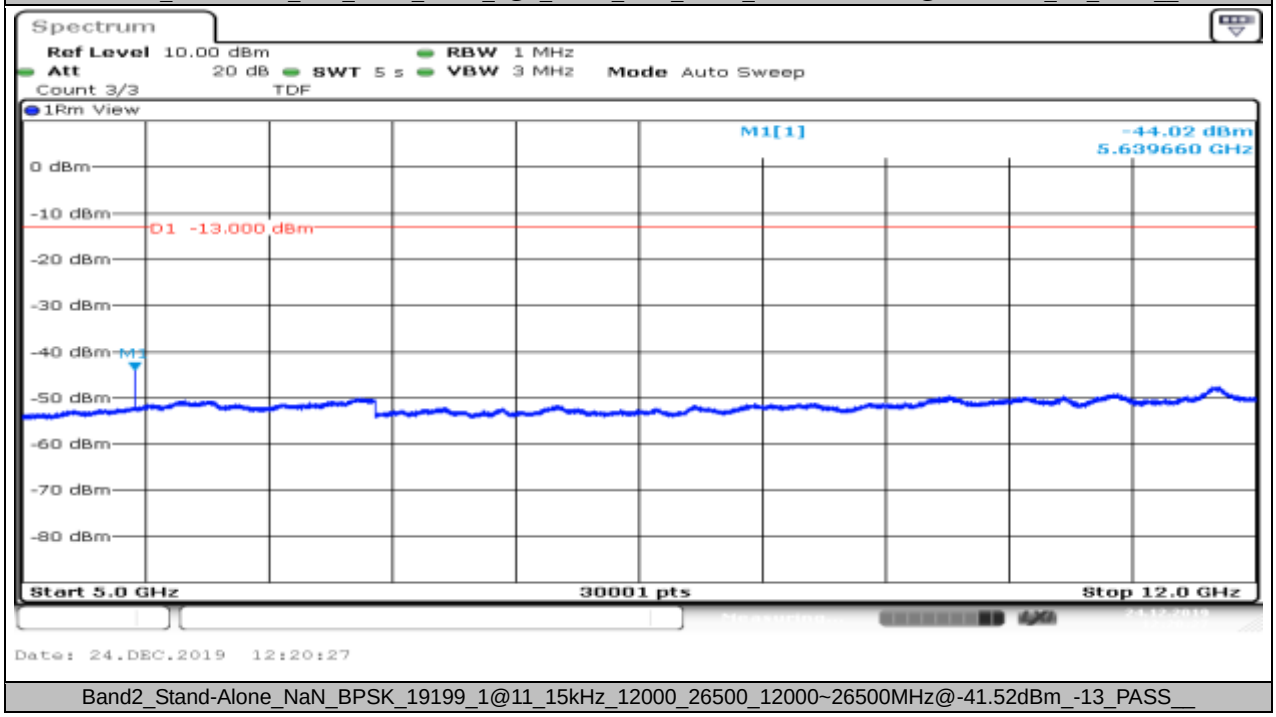
Band2_Stand-Alone_NaN_BPSK_18900_1@0_15kHz_12000_26500_12000~26500MHz@-41.37dBm_-13_PASS__



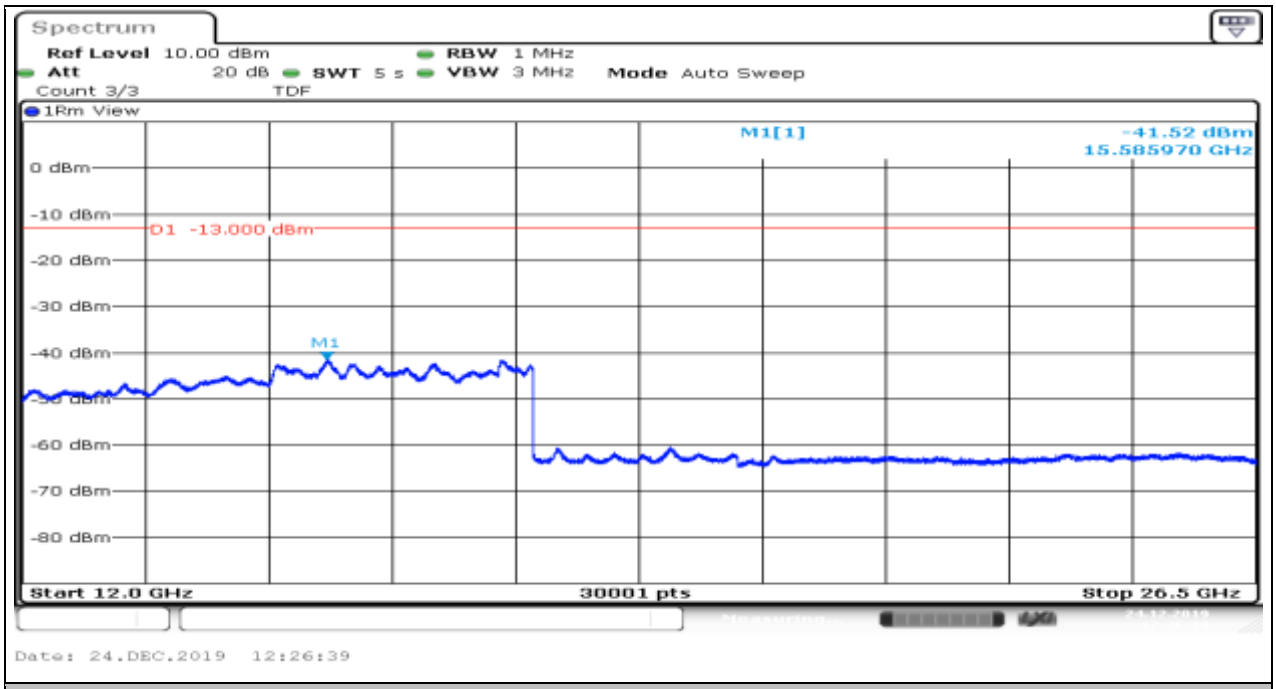
Band2_Stand-Alone_NaN_BPSK_18900_1@0_15kHz_1000_5000_1000~5000MHz@-35.14dBm_-13_PASS__



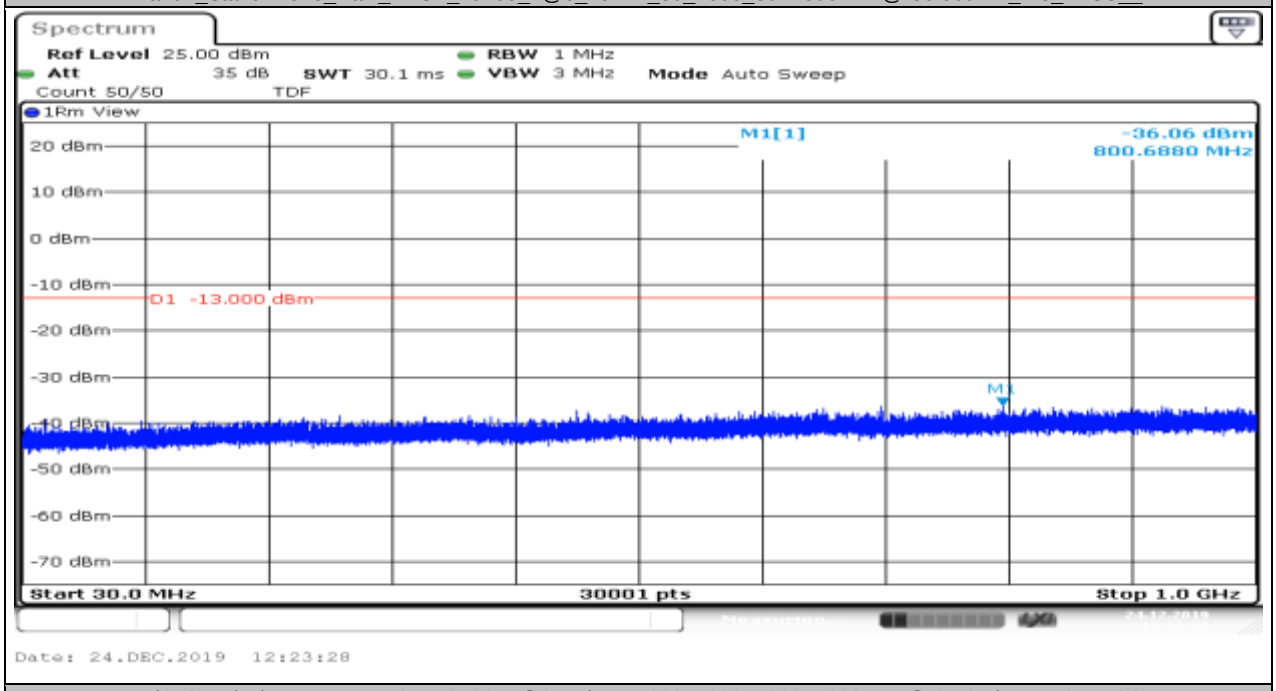
Band2_Stand-Alone_NaN_BPSK_18900_1@0_15kHz_5000_12000_5000~12000MHz@-44.02dBm_-13_PASS__



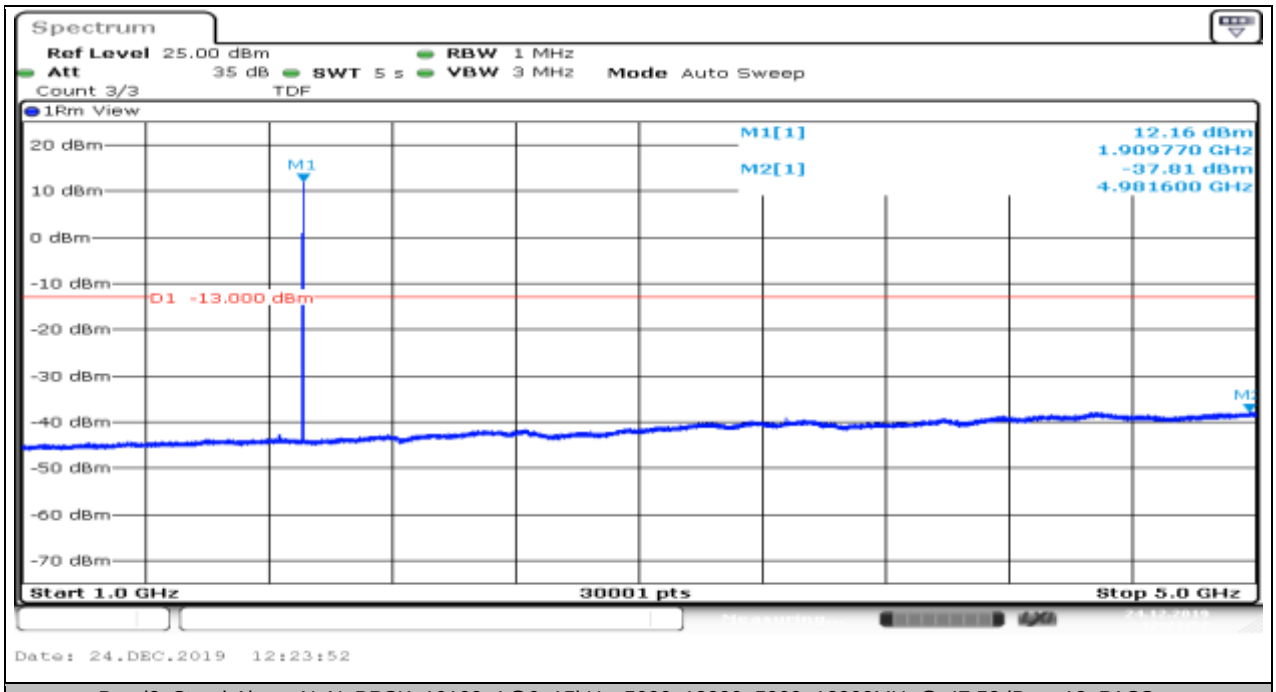
Band2_Stand-Alone_NaN_BPSK_19199_1@11_15kHz_12000_26500_12000~26500MHz@-41.52dBm_-13_PASS__



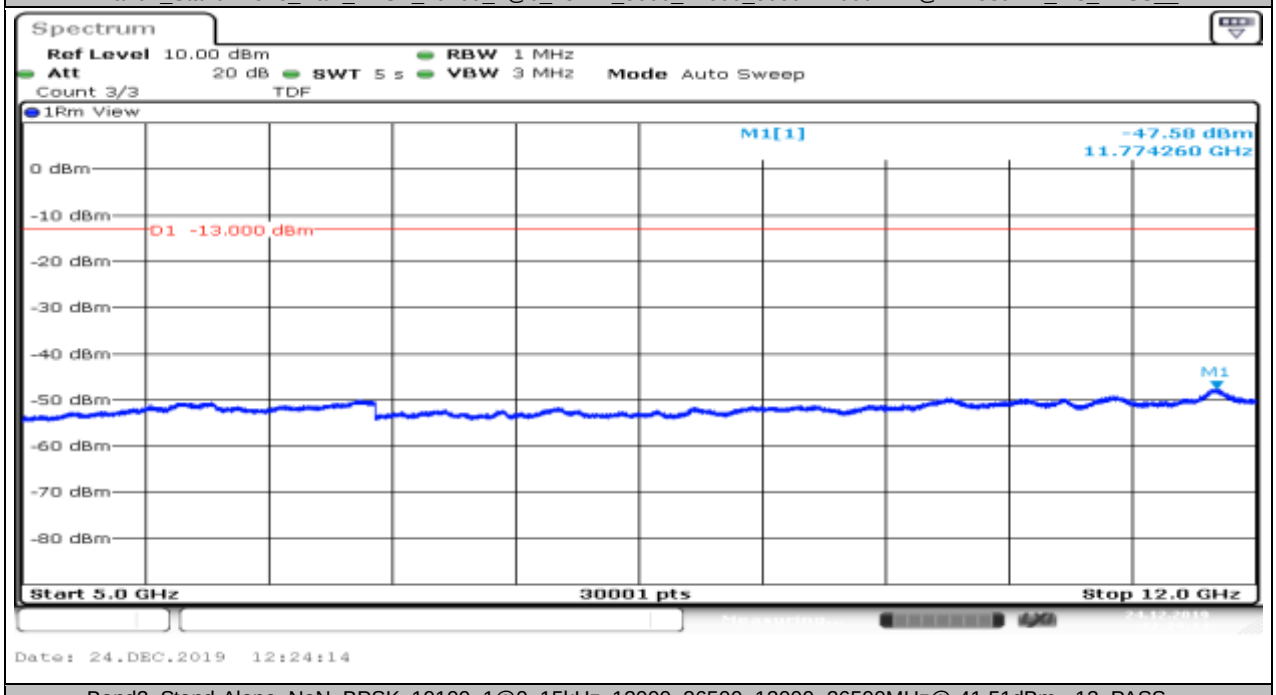
Band2_Stand-Alone_NaN_BPSK_19199_1@0_15kHz_30_1000_30~1000MHz@-36.06dBm_-13_PASS__



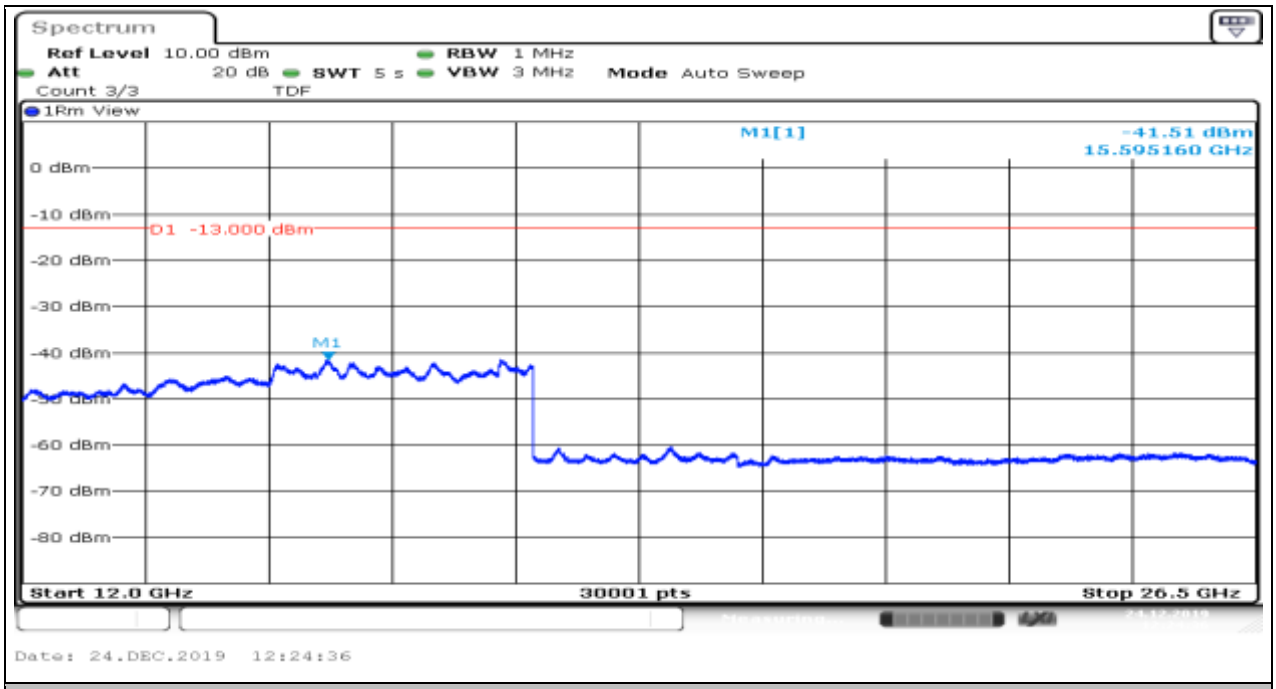
Band2_Stand-Alone_NaN_BPSK_19199_1@0_15kHz_1000_5000_1000~5000MHz@-37.81dBm_-13_PASS__



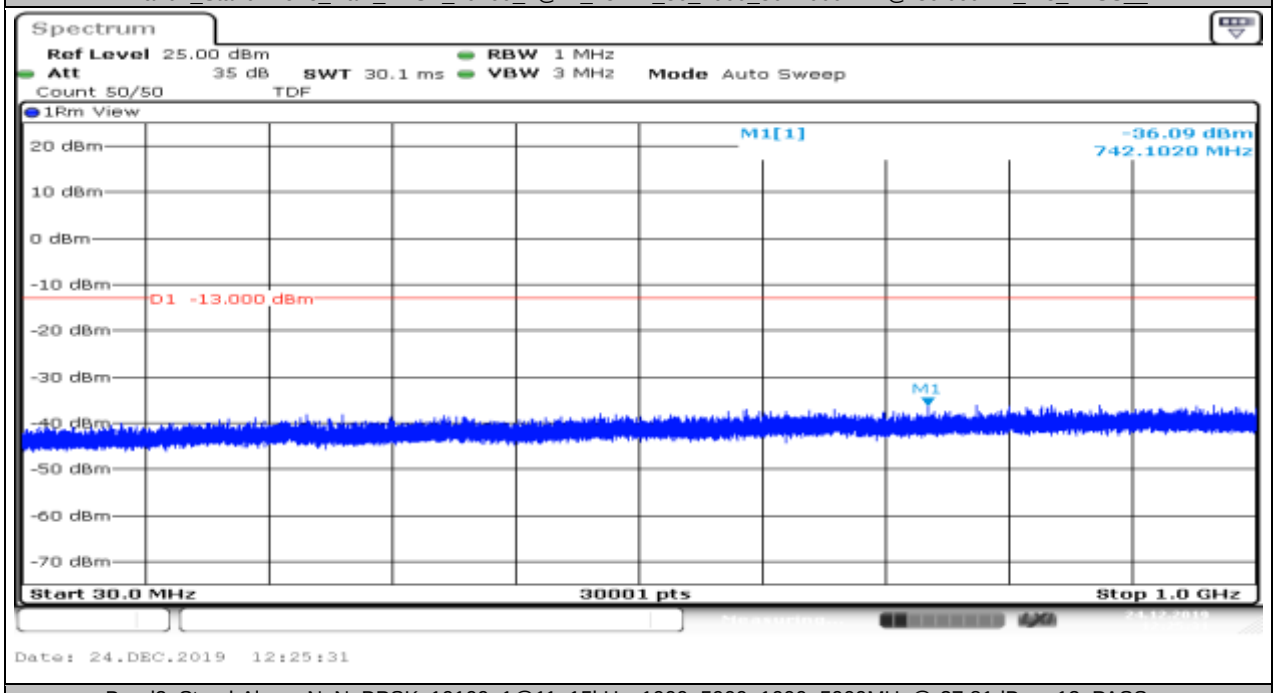
Band2_Stand-Alone_NaN_BPSK_19199_1@0_15kHz_5000_12000_5000~12000MHz@-47.58dBm_-13_PASS__



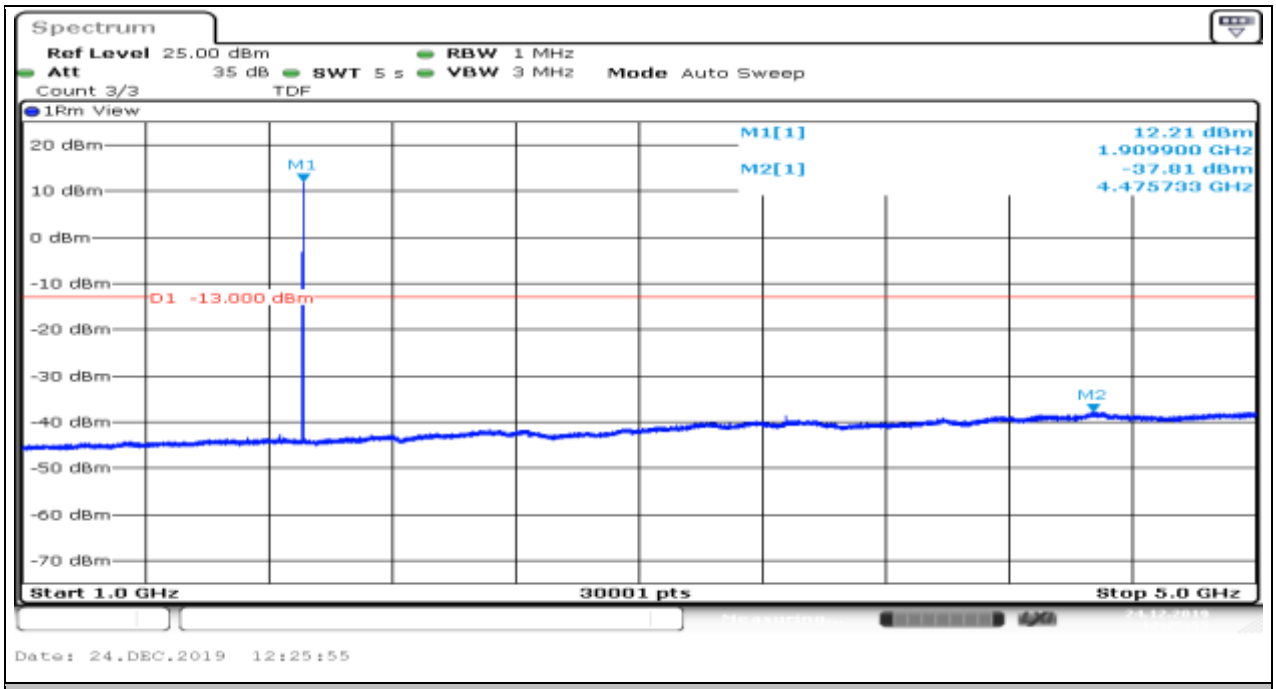
Band2_Stand-Alone_NaN_BPSK_19199_1@0_15kHz_12000_26500_12000~26500MHz@-41.51dBm_-13_PASS__



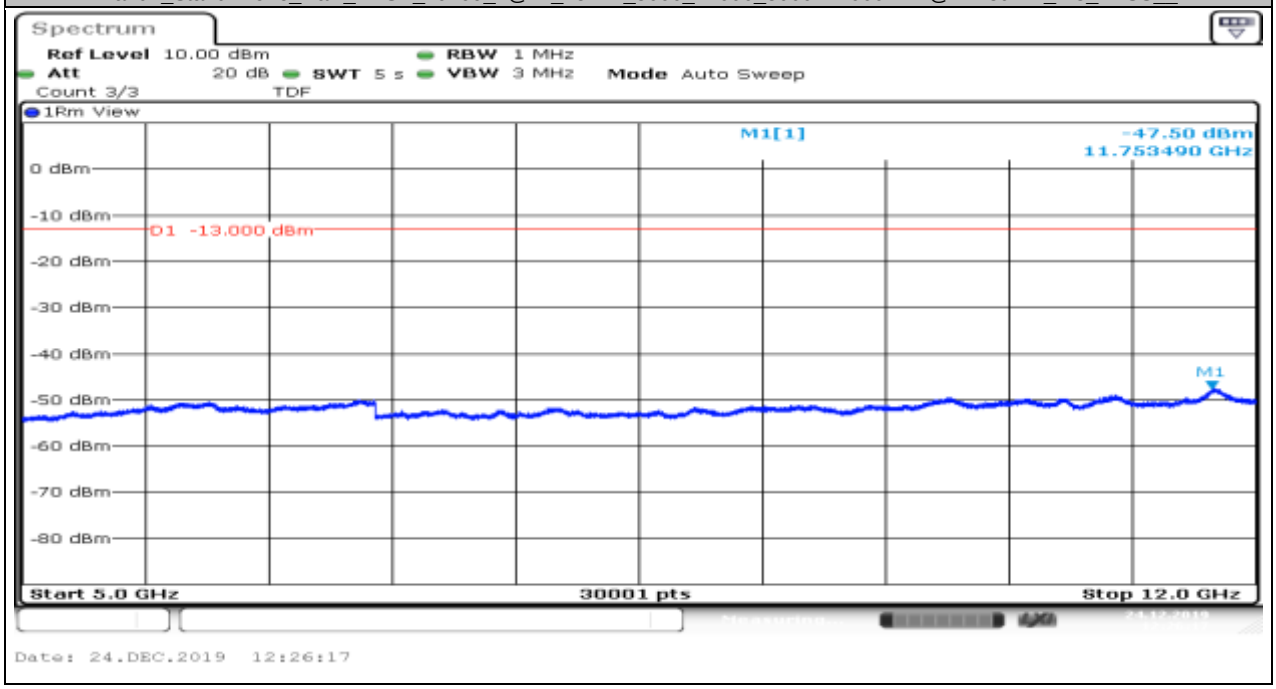
Band2_Stand-Alone_NaN_BPSK_19199_1@11_15kHz_30_1000_30~1000MHz@-36.09dBm_-13_PASS__



Band2_Stand-Alone_NaN_BPSK_19199_1@11_15kHz_1000_5000_1000~5000MHz@-37.81dBm_-13_PASS__



Band2_Stand-Alone_NaN_BPSK_19199_1@11_15kHz_5000_12000_5000~12000MHz@-47.5dBm_-13_PASS__



Appendix A.6: Frequency Stability for NB

Test Result

Voltage												
Band	OpMode	Bandwidth	Modulation	Channel	Tones	SCS	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	HV	NT	-24.30	-0.012926	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	NT	-28.67	-0.015250	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	HV	NT	-19.67	-0.010463	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	NT	-24.20	-0.012872	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	LV	NT	-21.57	-0.011473	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	NT	-22.19	-0.011803	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	HV	NT	-19.28	-0.010255	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	LV	NT	-21.27	-0.011314	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	NT	-22.85	-0.012154	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	HV	NT	-21.16	-0.011255	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	LV	NT	-22.02	-0.011713	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	LV	NT	-21.96	-0.011681	±2.5	PASS

Temperature												
Band	OpMode	Bandwidth	Modulation	Channel	Tones	SCS	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	-20	-20.01	-0.010644	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	-30	-24.25	-0.012899	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	-20	-21.43	-0.011399	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	-10	-22.65	-0.012048	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	0	-22.66	-0.012053	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	10	-23.02	-0.012245	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	20	-21.92	-0.011660	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	30	-19.90	-0.010585	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	40	-23.10	-0.012287	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	50	-22.16	-0.011787	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	60	-22.20	-0.011809	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	70	-24.63	-0.013101	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	-40	-21.30	-0.011330	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	-40	-28.70	-0.015266	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	85	-26.35	-0.014016	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	-10	-21.59	-0.011484	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	0	-18.34	-0.009755	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	10	-22.12	-0.011766	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	20	-20.74	-0.011032	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	30	-21.29	-0.011324	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	40	-20.66	-0.010989	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	50	-19.13	-0.010176	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	60	-25.71	-0.013676	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	70	-23.78	-0.012649	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	80	-18.57	-0.009878	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	85	-21.79	-0.011590	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	-40	-19.77	-0.010516	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	15kHz	NV	80	-19.86	-0.010564	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	-20	-18.77	-0.009984	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@11	15kHz	NV	-30	-24.89	-0.013239	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	-30	-17.55	-0.009335	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	85	-19.05	-0.010133	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	-10	-22.03	-0.011718	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	0	-16.01	-0.008516	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	10	-17.35	-0.009229	±2.5	PASS

Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	20	-16.21	-0.008622	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	30	-20.07	-0.010676	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	40	-19.10	-0.010160	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	50	-21.21	-0.011282	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	60	-18.44	-0.009809	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	70	-18.38	-0.009777	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	80	-14.35	-0.007633	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@0	3.75kHz	NV	85	-16.75	-0.008910	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	60	-20.44	-0.010872	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	70	-15.65	-0.008324	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	50	-21.53	-0.011452	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	40	-20.08	-0.010681	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	30	-15.99	-0.008505	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	20	-18.01	-0.009580	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	10	-18.93	-0.010069	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	-10	-20.08	-0.010681	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	-20	-19.70	-0.010479	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	-30	-18.94	-0.010074	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	-40	-20.53	-0.010920	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	0	-18.44	-0.009809	±2.5	PASS
Band2	Stand-Alone	NaN	QPSK	18900	1@47	3.75kHz	NV	80	-19.08	-0.010149	±2.5	PASS