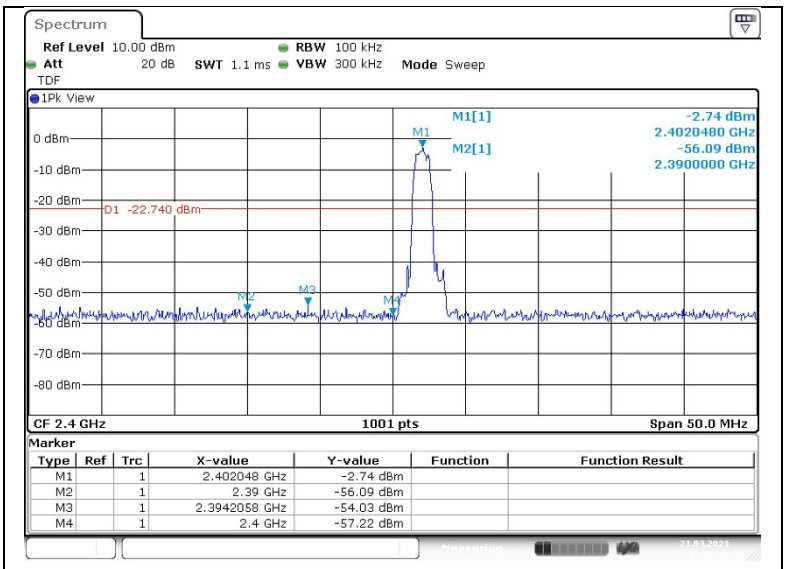
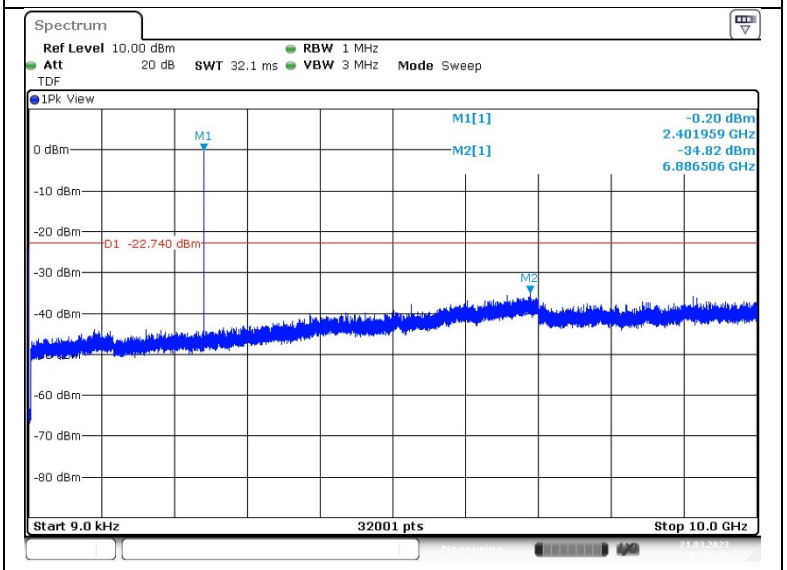
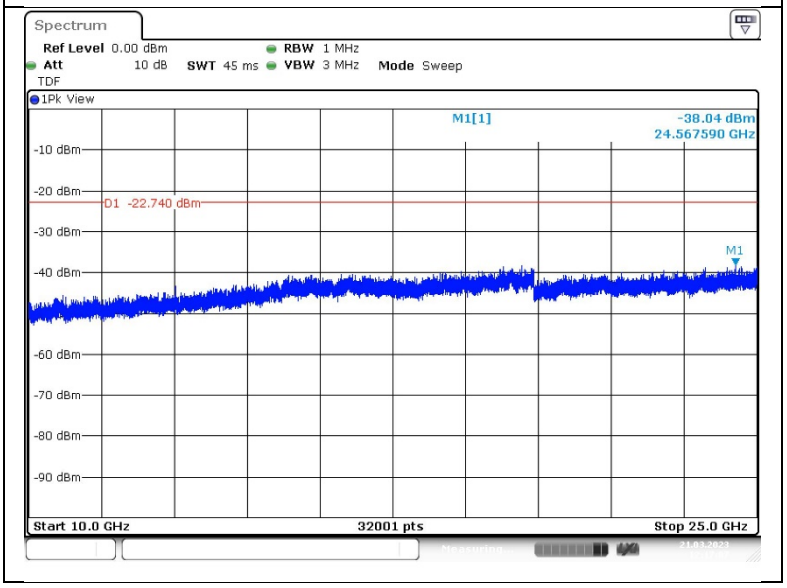
Operating Mode: 8DPSK_hopping function turned off

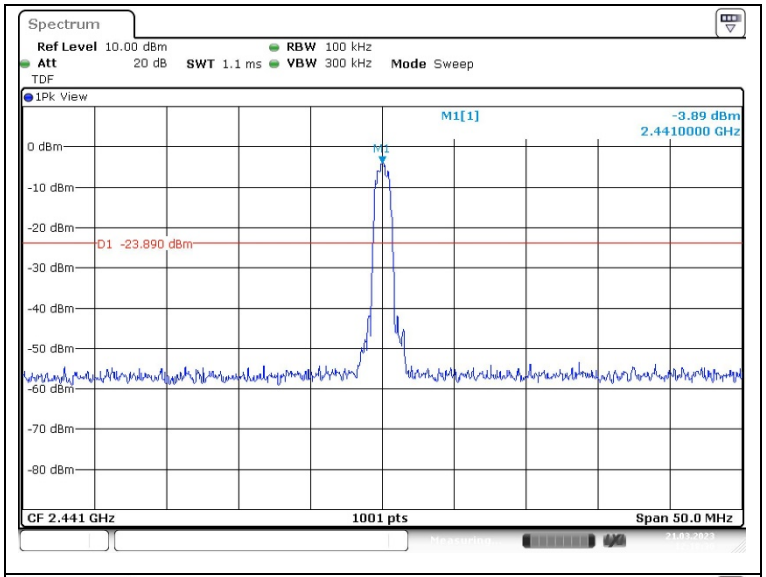
Low channel

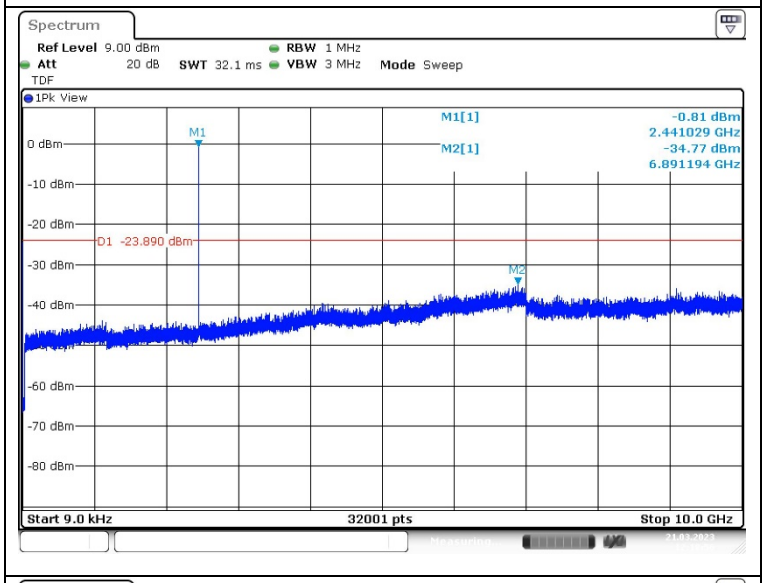


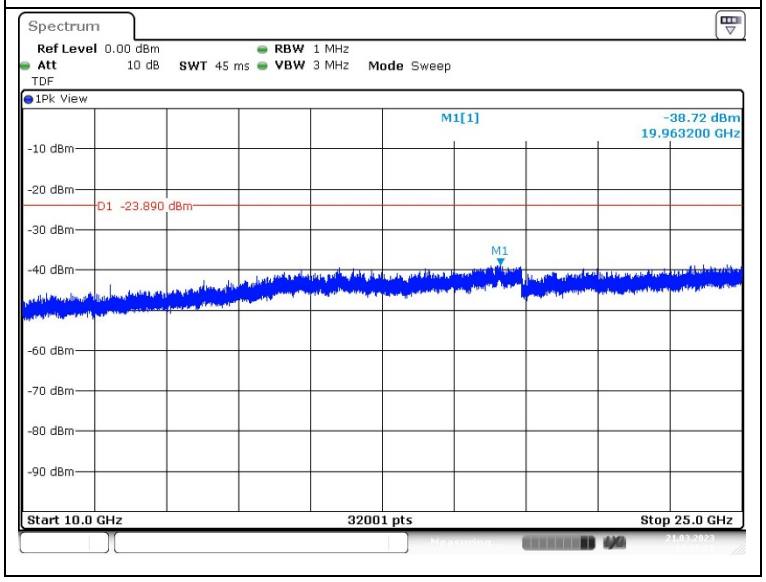




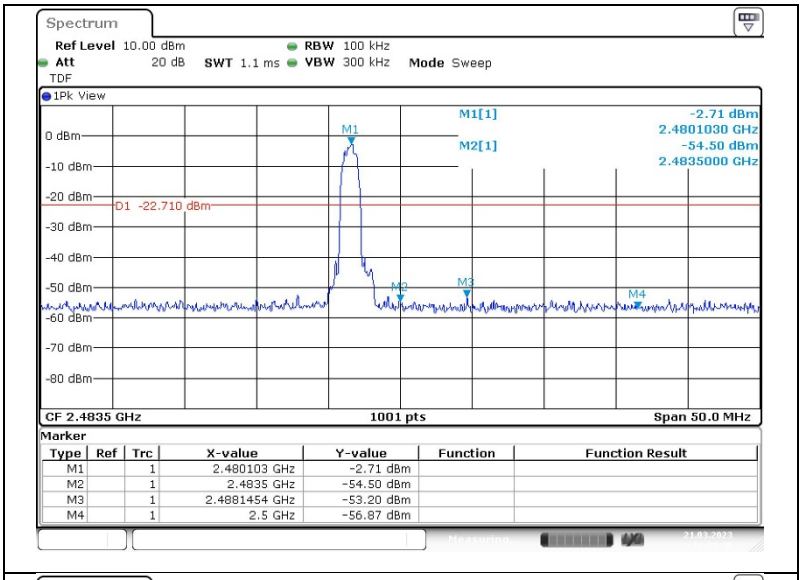
Middle channel

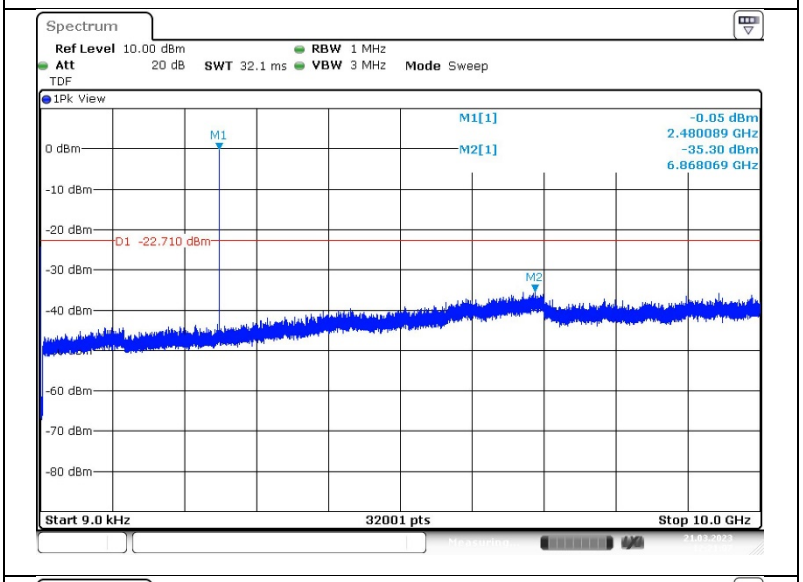


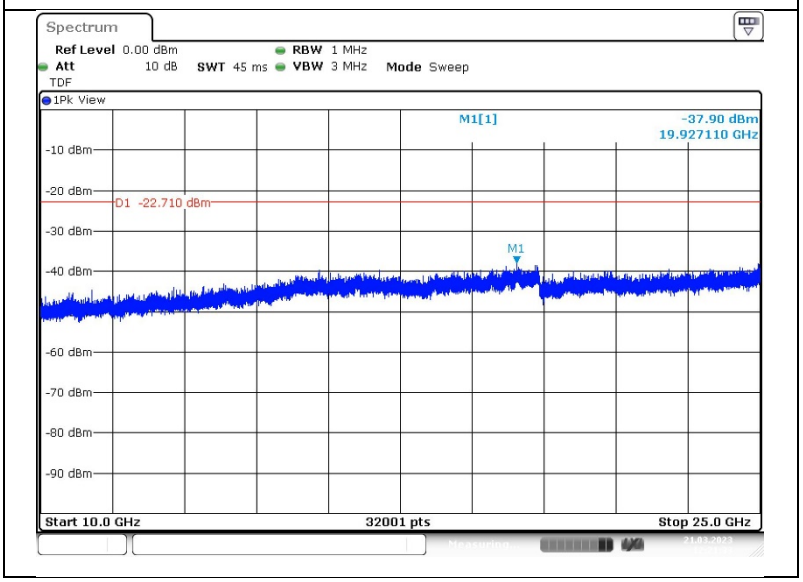




High channel

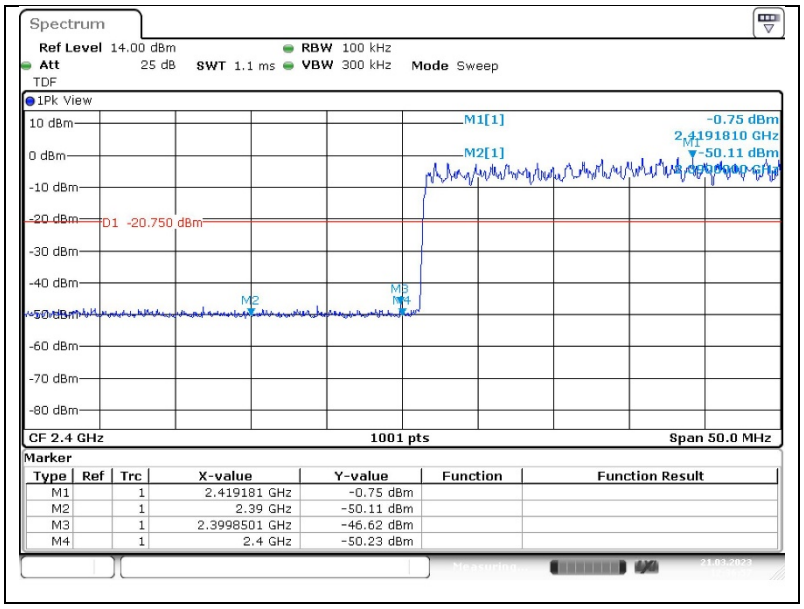




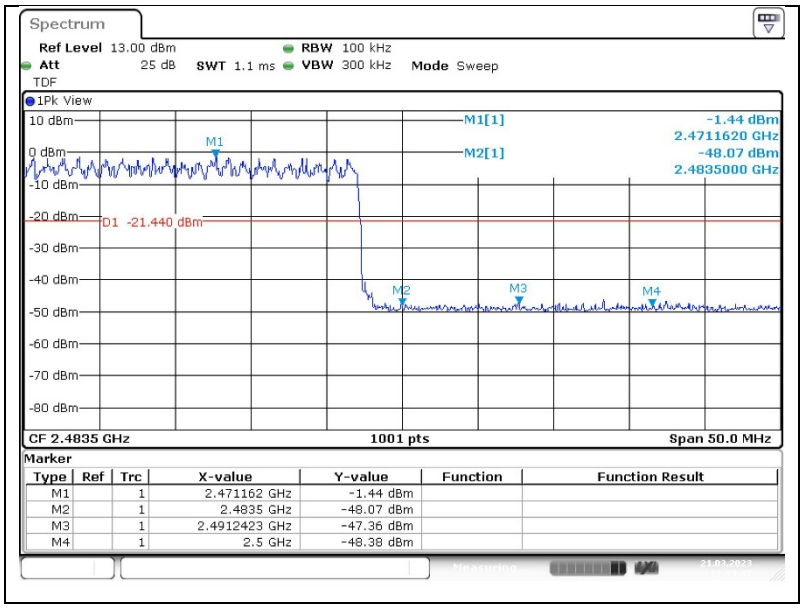


Operating Mode: 8DPSK_hopping function turned on
Band edge compliance

Low channel



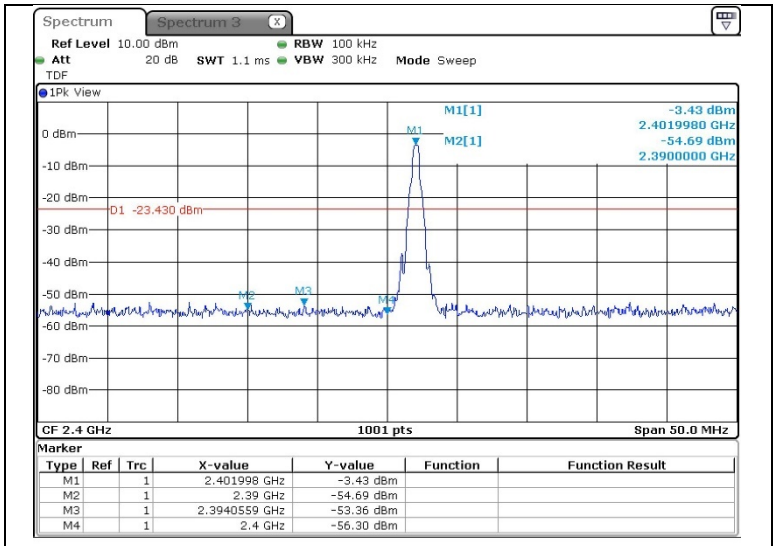
High channel

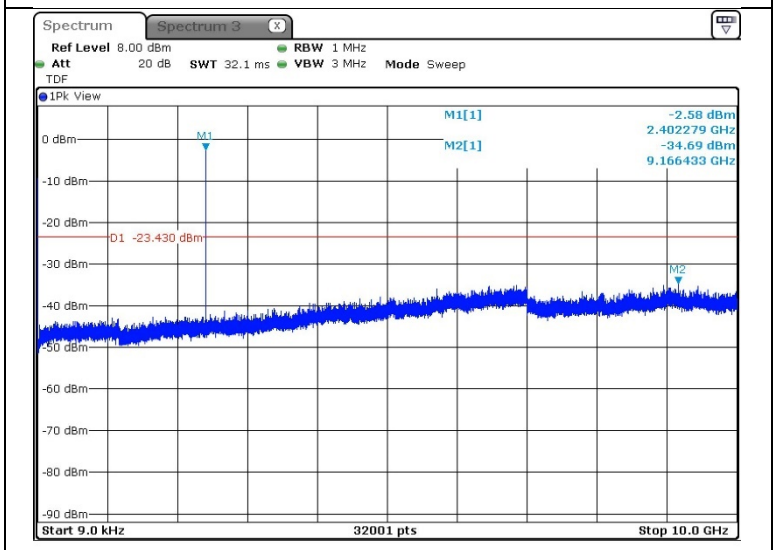


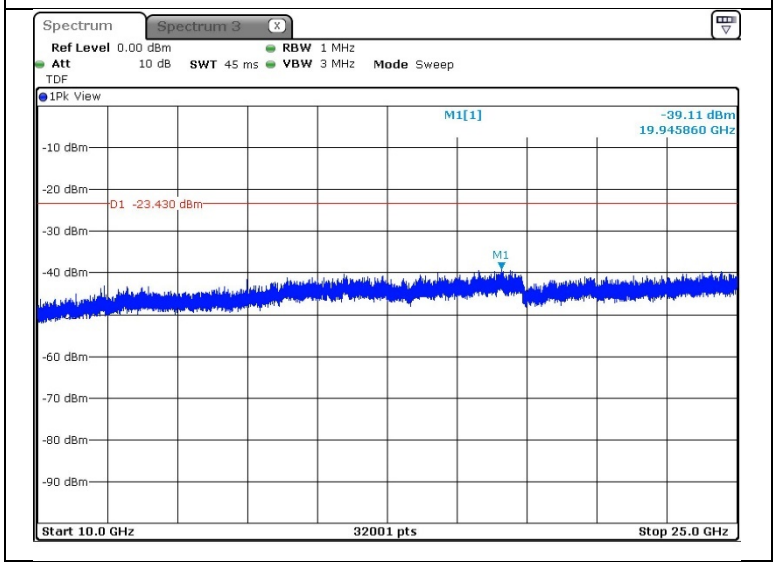
2.4.3.2. Variant model

Operating Mode: GFSK_hopping function turned off

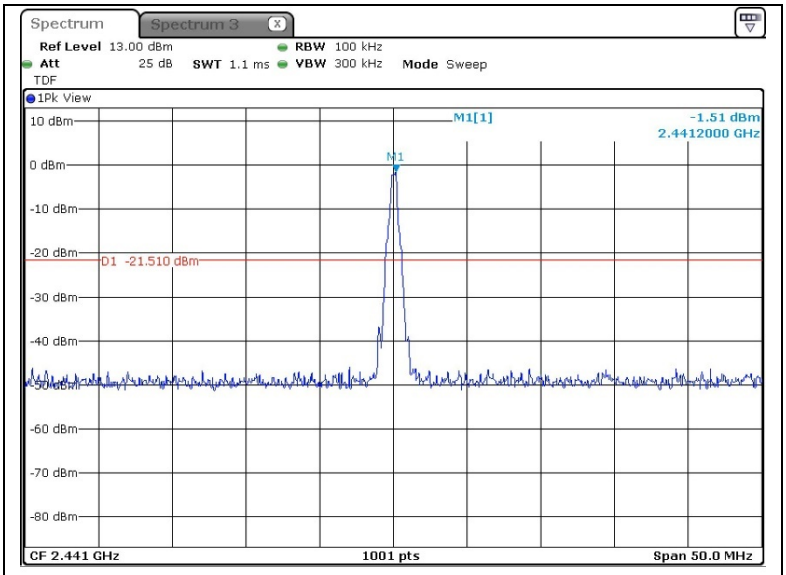
Low channel

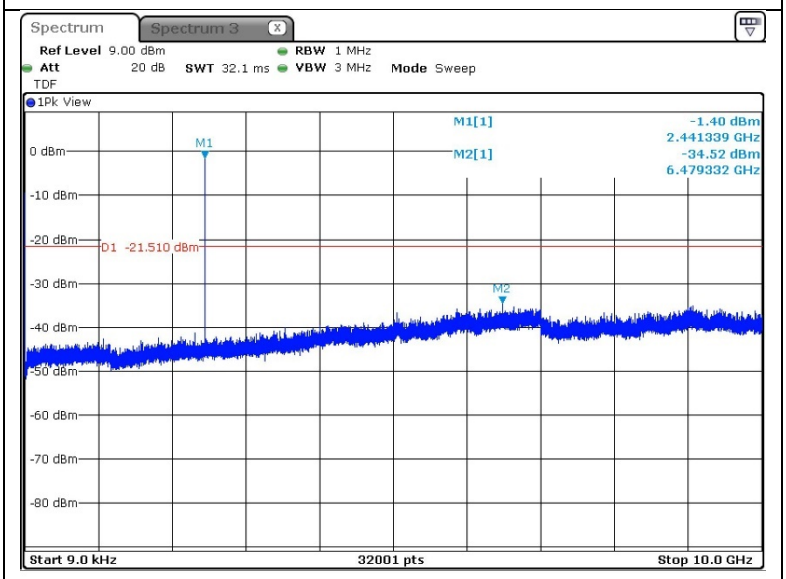


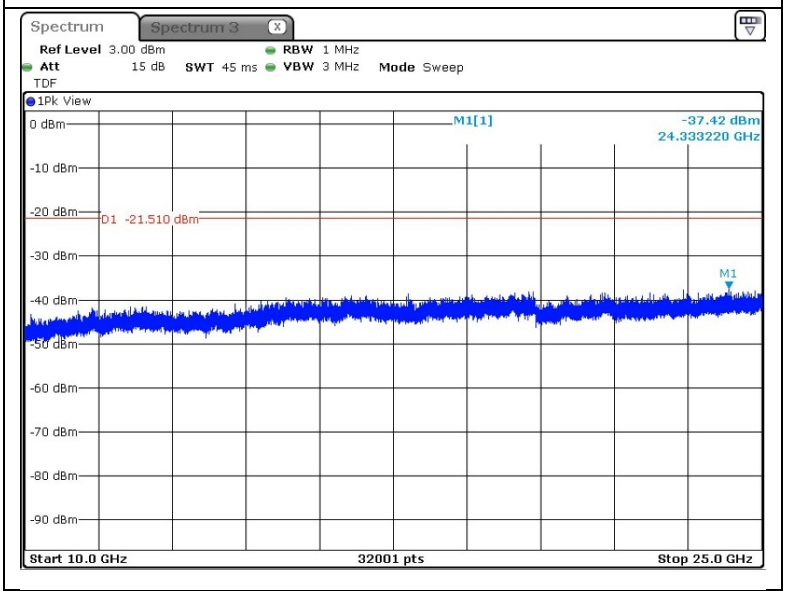




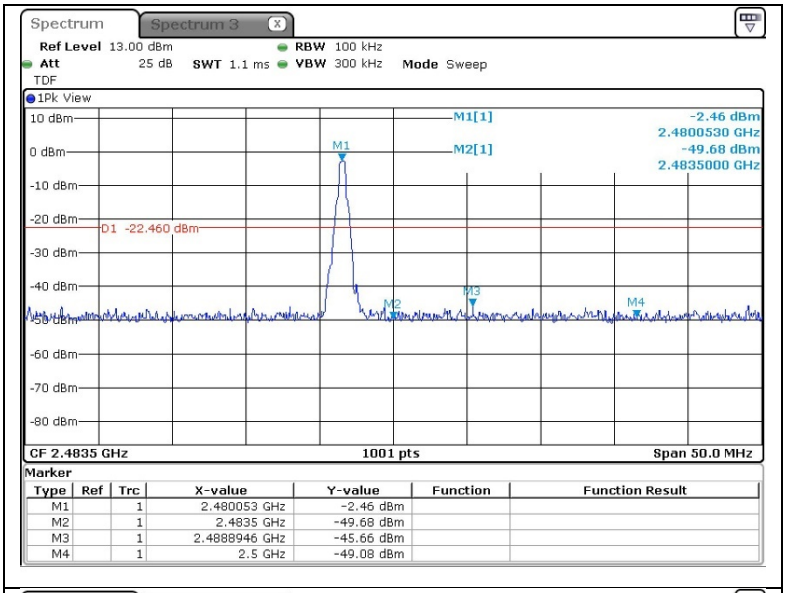
Middle channel

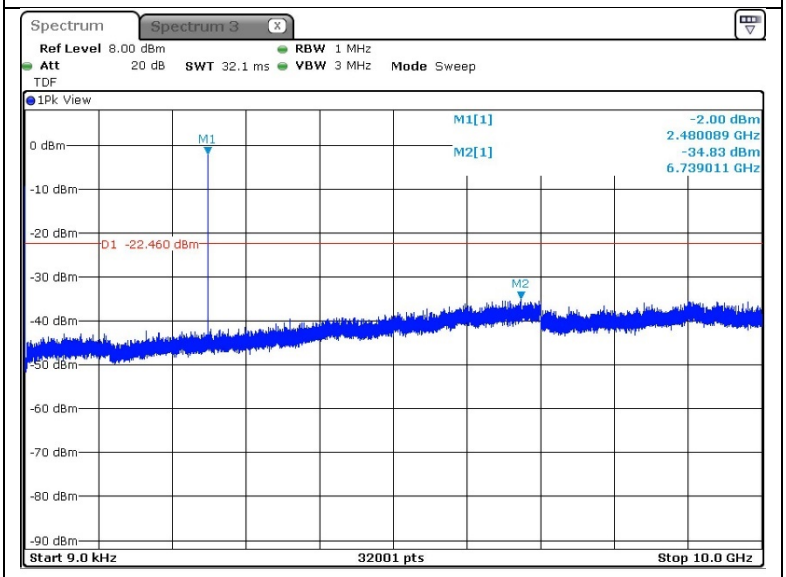


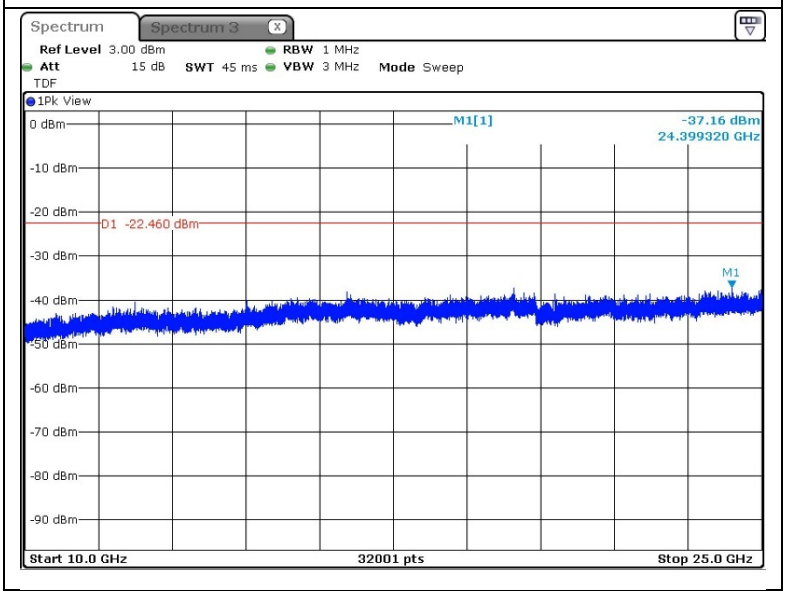




High channel

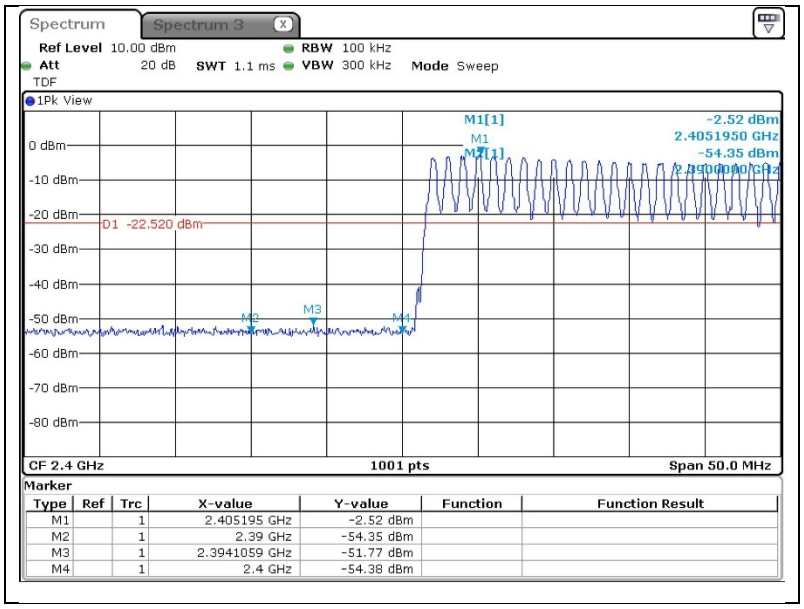




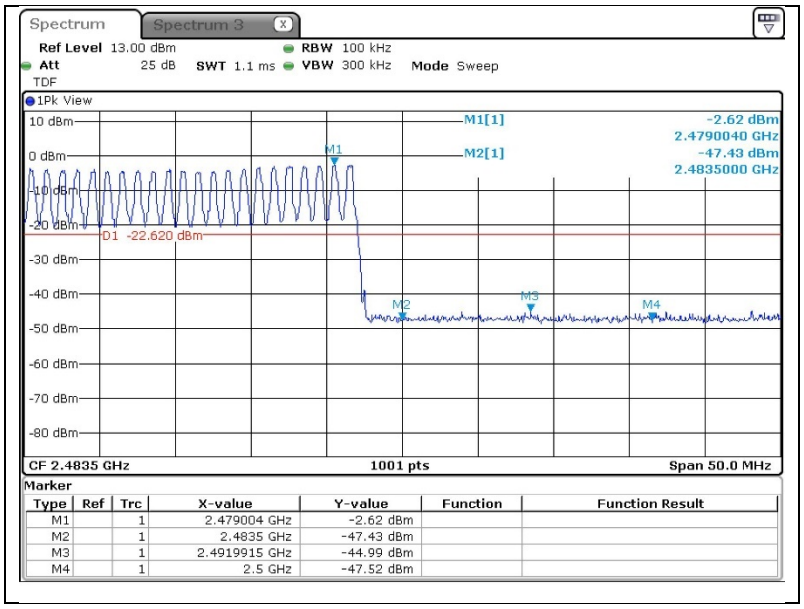


Operating Mode: GFSK_hopping function turned on
Band edge compliance

Low channel

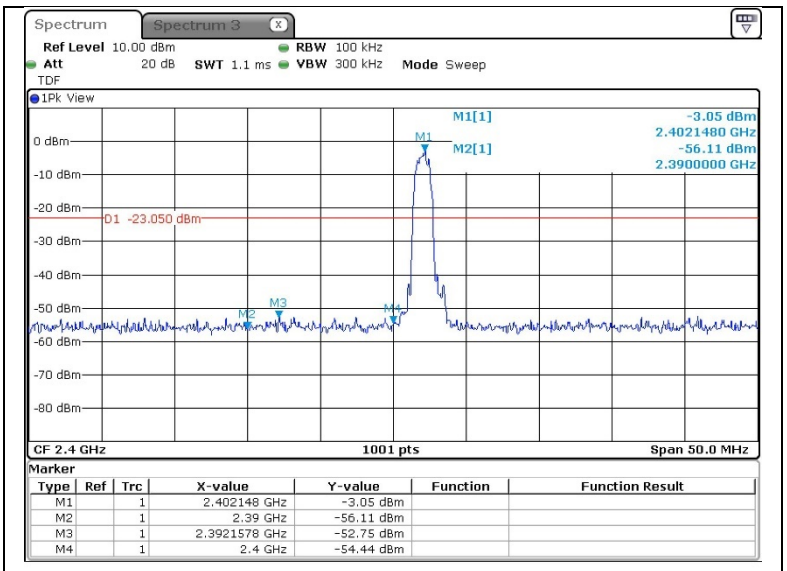


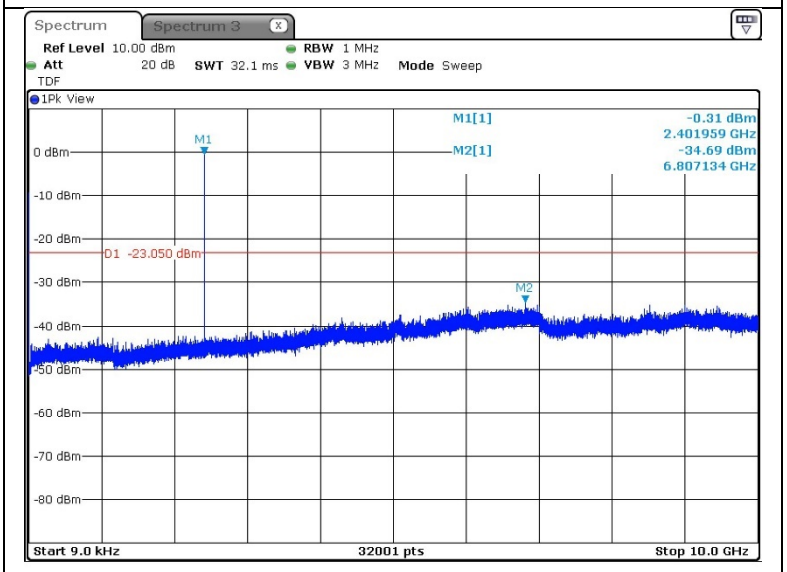
High channel

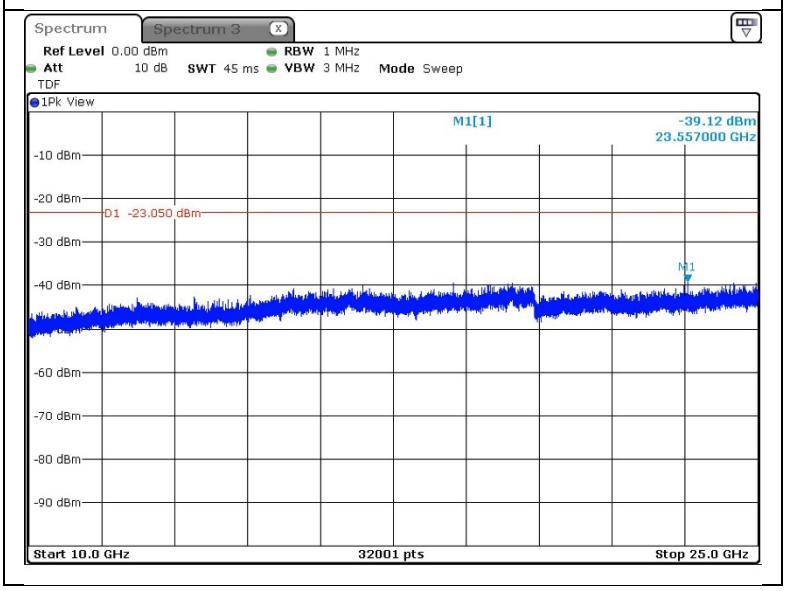


Operating Mode: 8DPSK_hopping function turned off

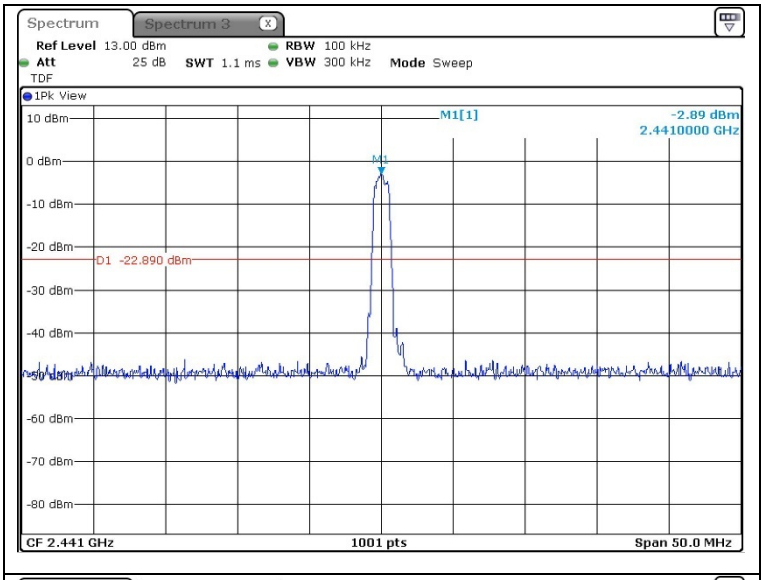
Low channel

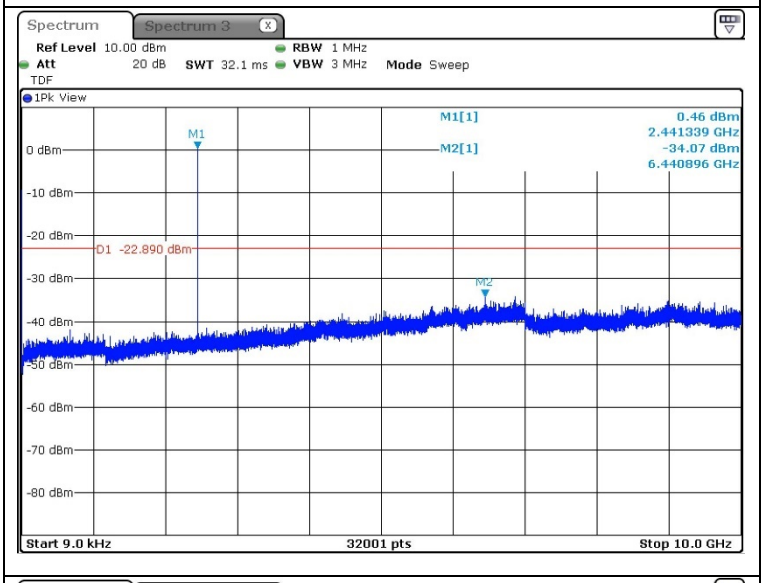


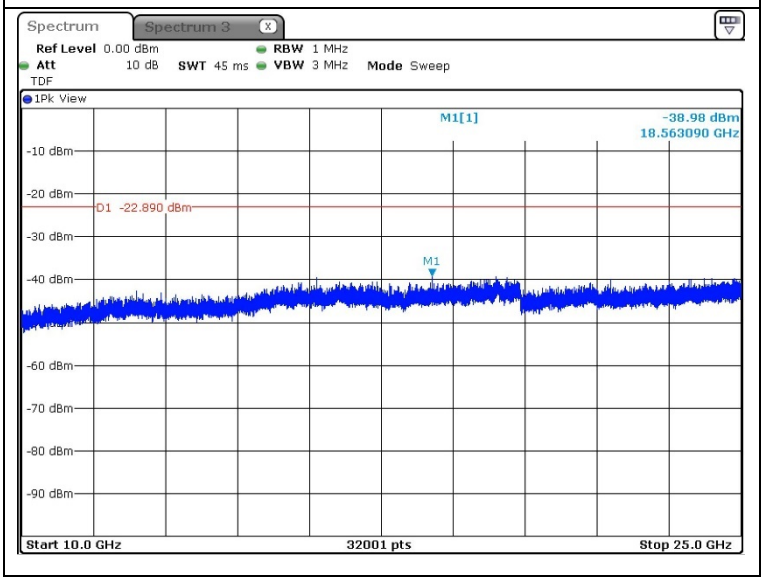




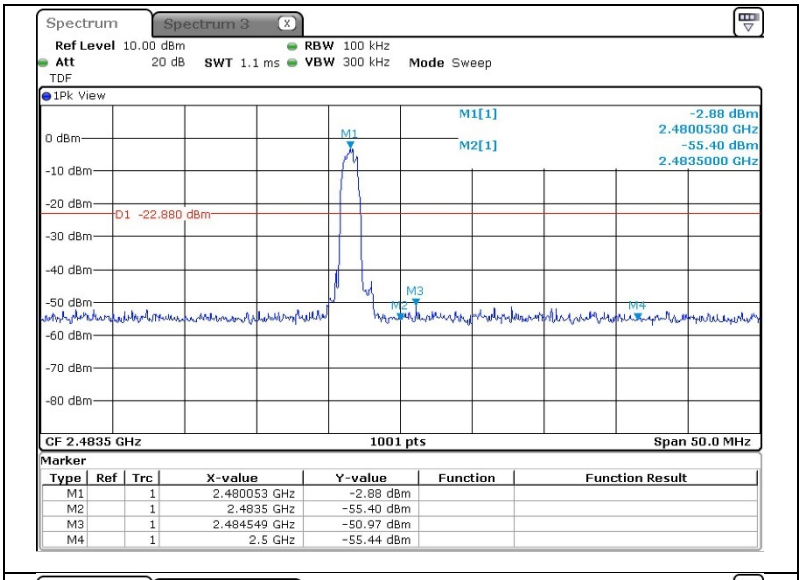
Middle channel

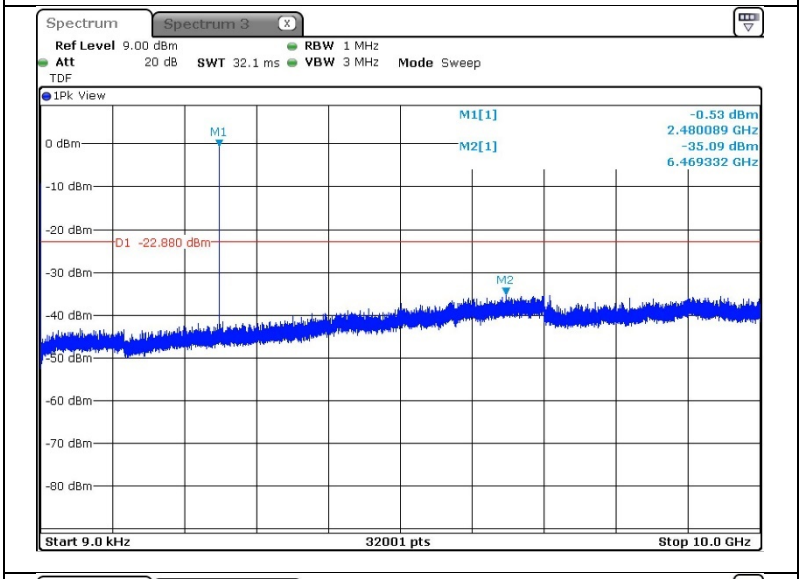


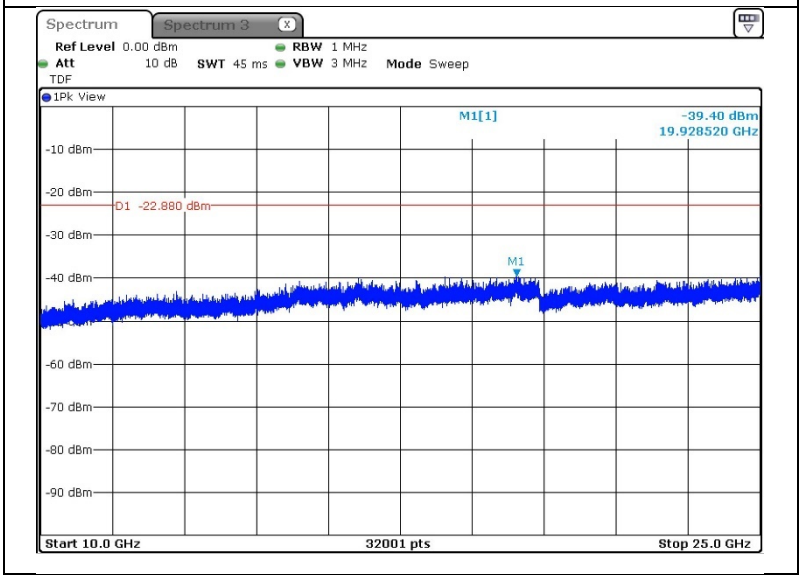




High channel

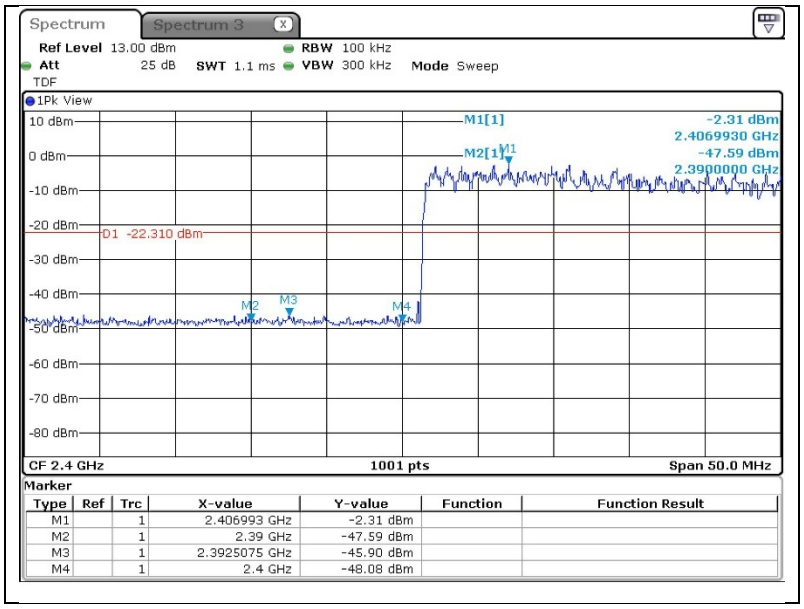




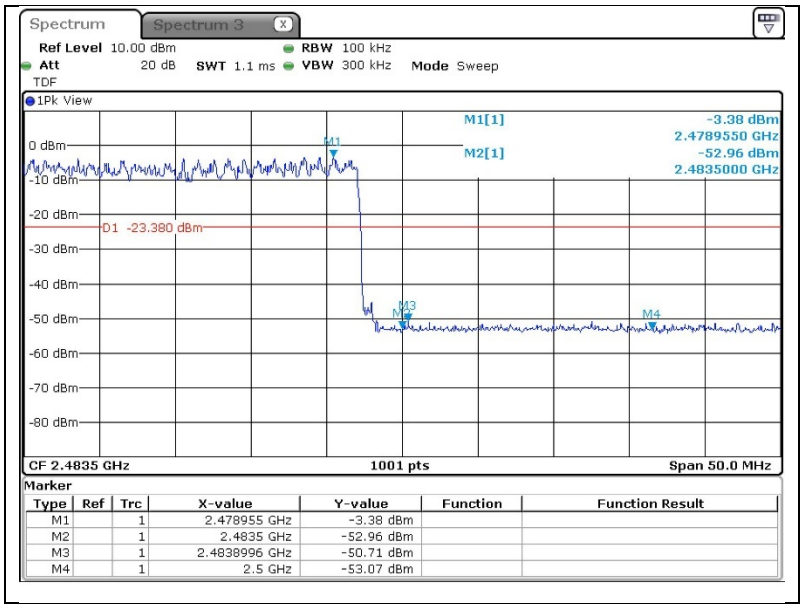


Operating Mode: 8DPSK_hopping function turned on
Band edge compliance

Low channel

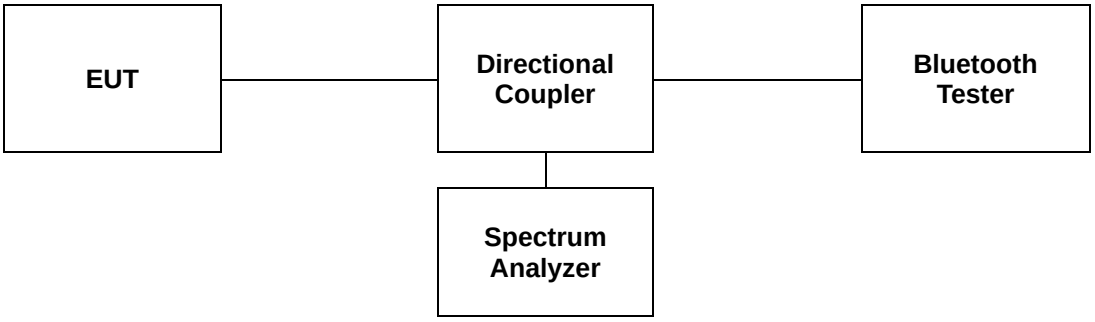


High channel



3. 20 ㏈ Bandwidth and 99 % Bandwidth

3.1. Test Setup



3.2. Limit

Limit: Not Applicable

3.3. Test Procedure

3.3.1. 20 ㏈ Bandwidth

The test follows ANSI C63.10-2013.

The 20 ㏈ bandwidth was measured with a spectrum analyzer connected to RF antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate center frequency.

Use the following spectrum analyzer setting:

1. Span = approximately 2 to 5 times the 20 ㏈ bandwidth.
2. RBW ≥ 1 % to 5 % of the 20 ㏈ bandwidth.
3. VBW ≥ 3 x RBW
4. Sweep = auto
5. Detector = peak
6. Trace = max hold

The marker-to-peak function to set the mark to the peak of the emission. Use the marker-delta function to measure 20 ㏈ down one side of the emission. Reset the function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is 20 ㏈ bandwidth of the emission.

3.3.2. 99 % Bandwidth

● The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

● The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.

● The resolution bandwidth (RBW) shall be in the range of 1 % to 5 % of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99 % emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99 % emission bandwidth).

3.4. Test Results

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

- Basic model

Operation Mode	Data Rate (Mbps)	Channel	Frequency (㎒)	20 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
GFSK	1	Low	2 402	1.040	0.947
		Middle	2 441	1.049	0.965
		High	2 480	1.049	0.965
π/4DQPSK	2	Low	2 402	1.367	1.208
		Middle	2 441	1.364	1.208
		High	2 480	1.361	1.205
8DPSK	3	Low	2 402	1.316	1.199
		Middle	2 441	1.349	1.208
		High	2 480	1.346	1.211

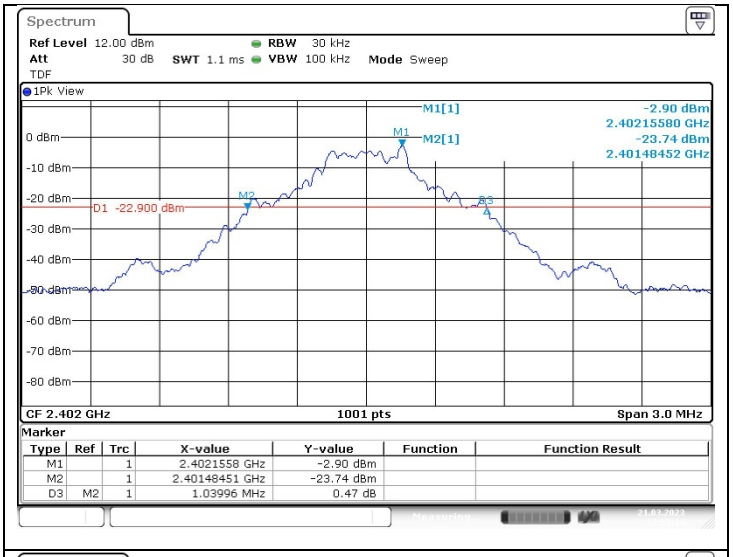
- Variant model

Operation Mode	Data Rate (Mbps)	Channel	Frequency (㎒)	20 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
GFSK	1	Low	2 402	1.052	0.968
		Middle	2 441	1.052	0.968
		High	2 480	1.052	0.962
π/4DQPSK	2	Low	2 402	1.361	1.208
		Middle	2 441	1.364	1.205
		High	2 480	1.361	1.205
8DPSK	3	Low	2 402	1.349	1.208
		Middle	2 441	1.346	1.211
		High	2 480	1.346	1.211

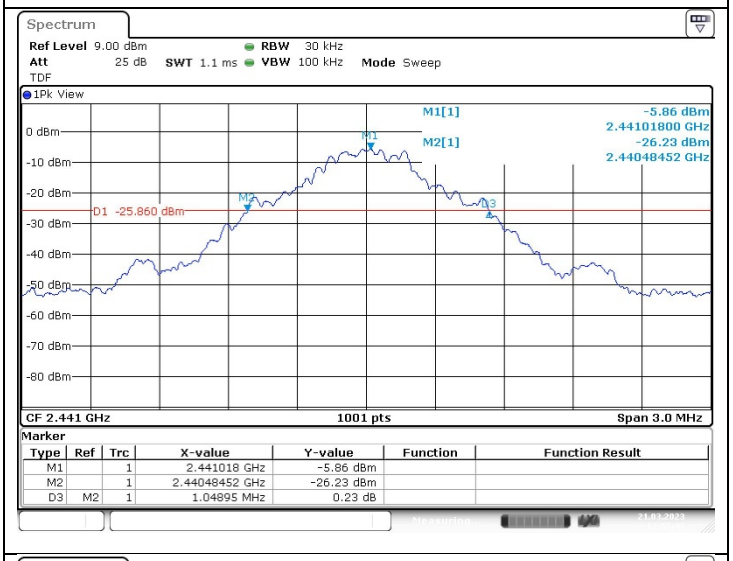
- Test plots

Basic model_20 ㏈ Bandwidth
Operating Mode: GFSK

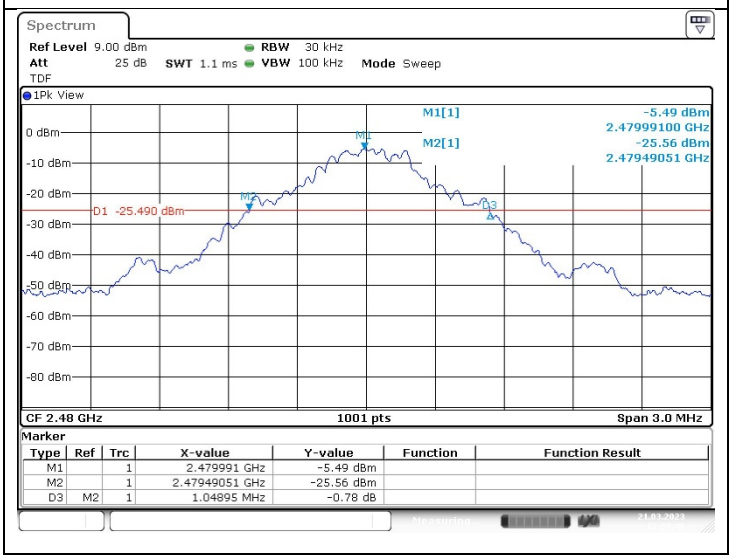
Low Channel



Middle Channel

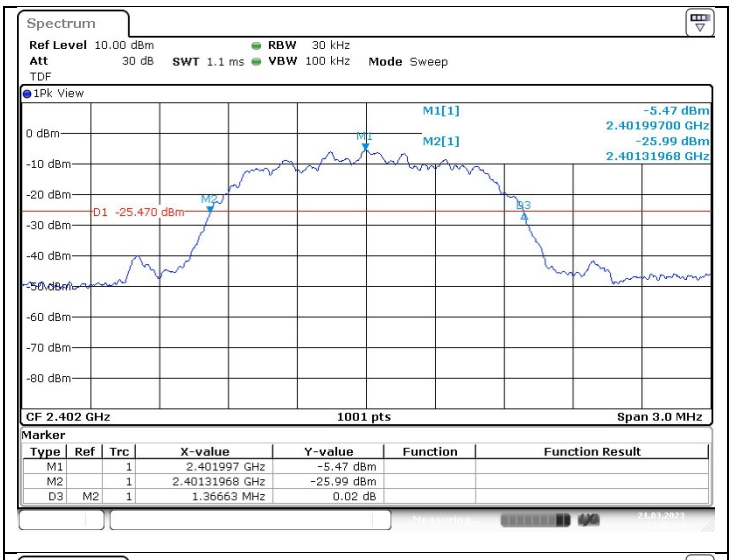


High Channel

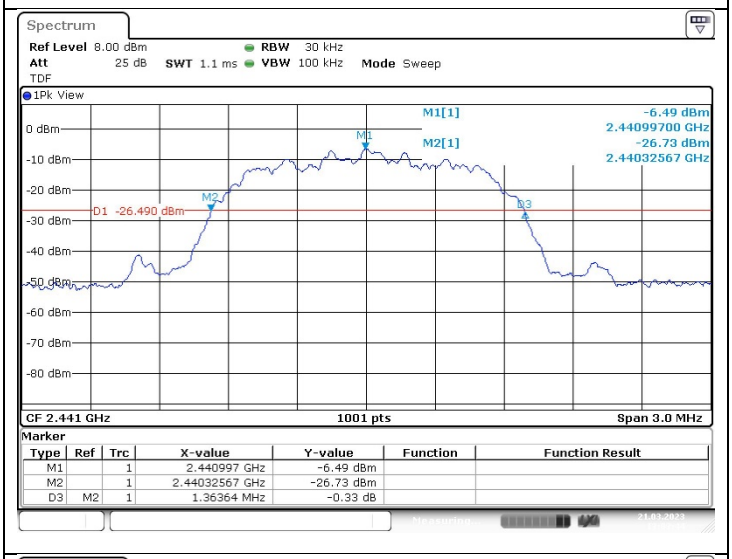
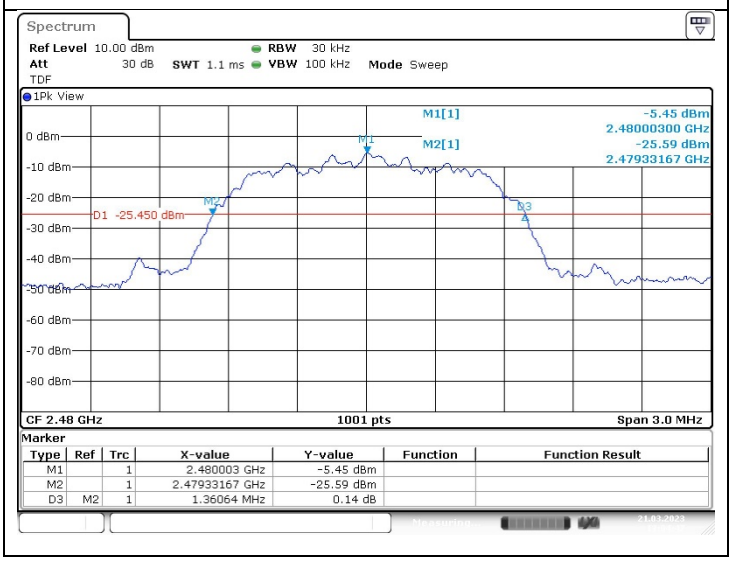


Operating Mode: π/4DQPSK

Low Channel



Middle Channel



High Channel