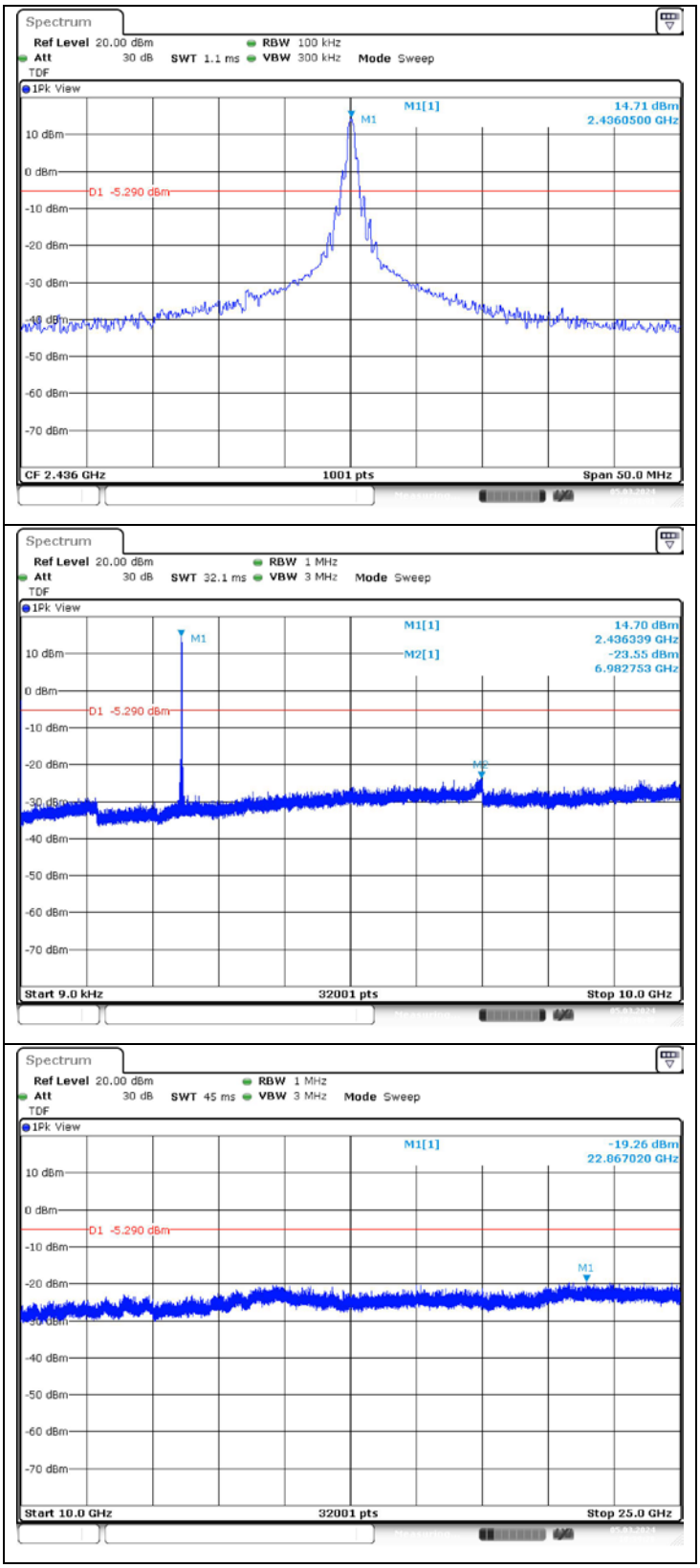
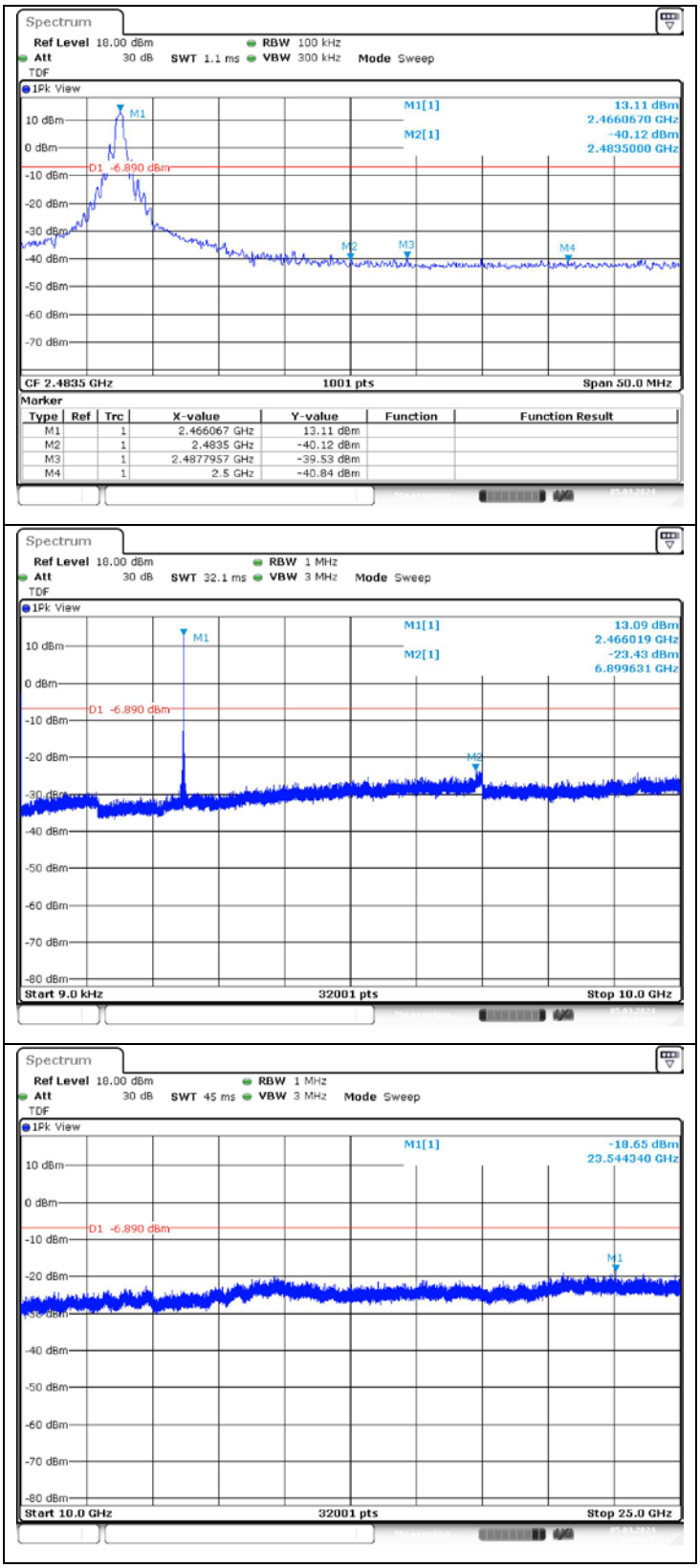
Middle Channel

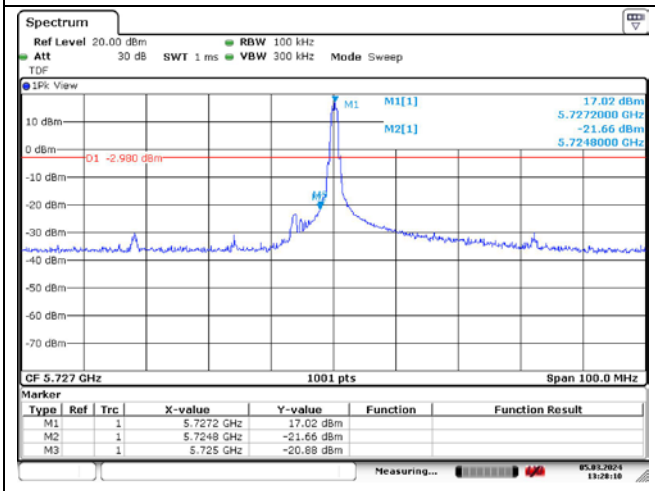


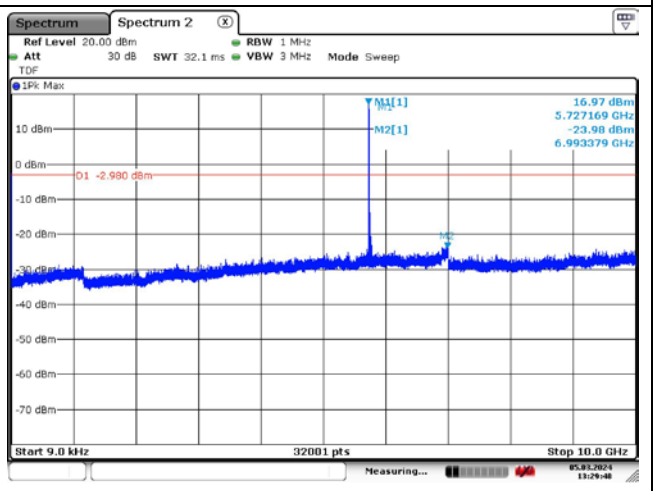
High Channel

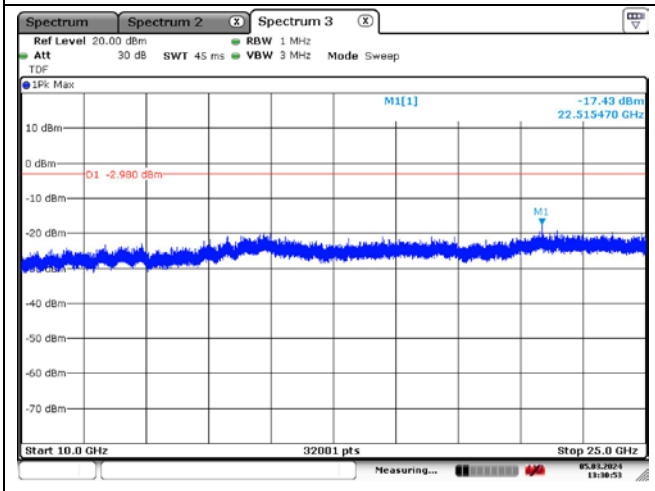


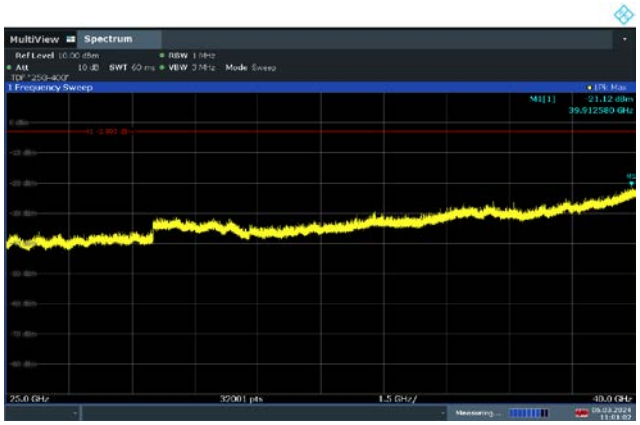
Port 2: 5 727 ㎒ ~ 5 847 ㎒

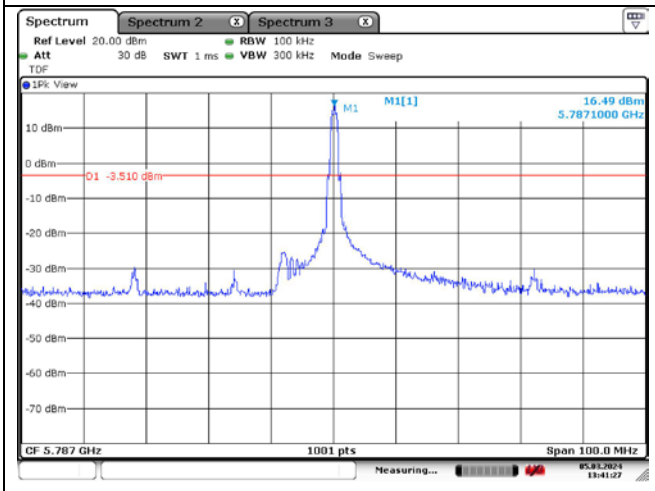
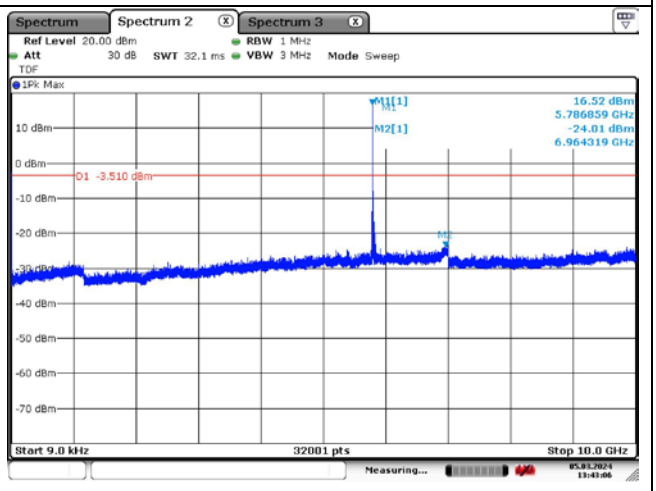
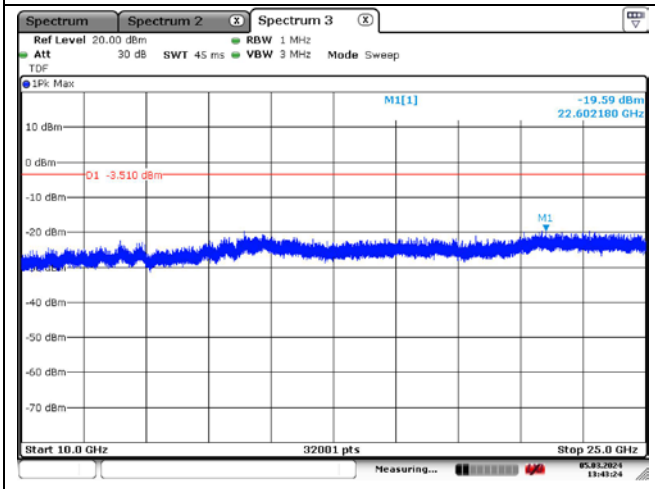
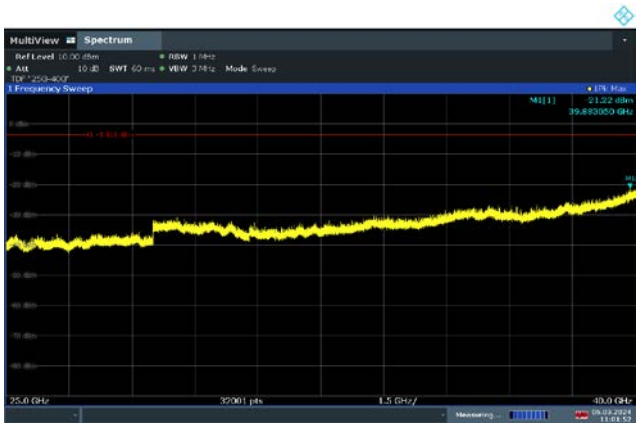
Low channel



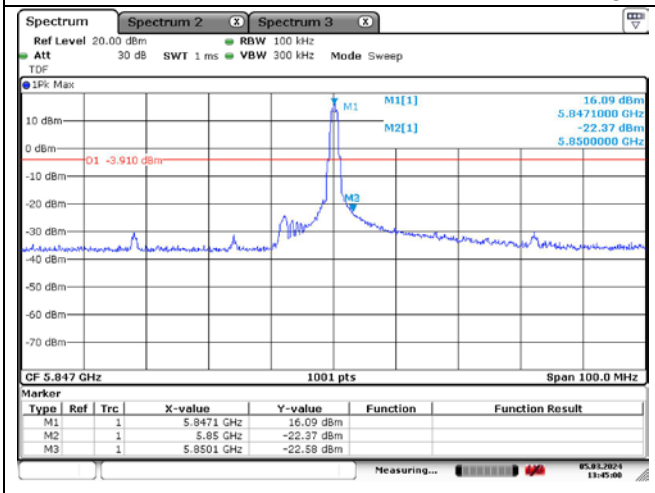


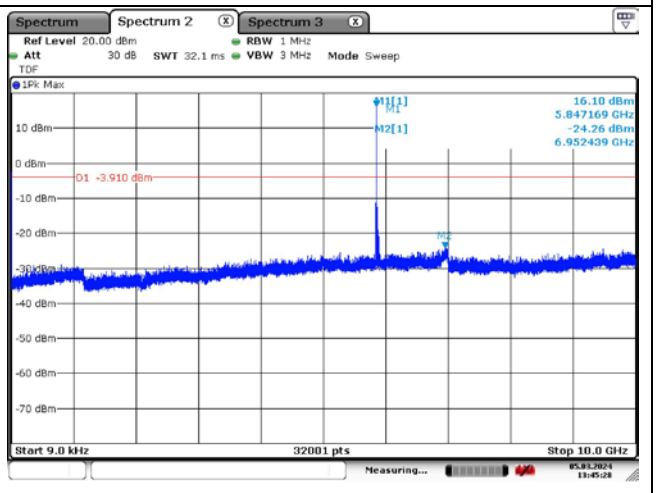


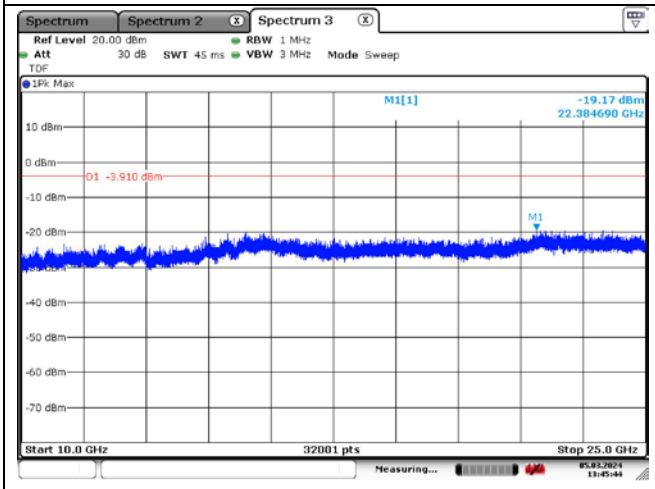


Middle channel	
	
	

High channel







3. 6 dB Bandwidth

3.1. Test Setup

3.2. Limit

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902-928 ㎒, 2 400-2 483.5 ㎒, and 5 725-5 850 ㎒ bands. The minimum 6 ㏈ bandwidth shall be at least 500 ㎑.

3.3. Test Procedure

The test follows section 11.8 DTS bandwidth of ANSI C63.10-2013.
Tests performed using section 11.8.1 Option 1.

- Option 1:
1. Set RBW to = 100 ㎑.
2. Set the VBW ≥ [3 x RBW].
3. Detector = peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 ㏈ relative to the maximum level measured in the fundamental emission.

3.4. Test Results

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

- Port 1: 2 405 ㎒ ~ 2 466 ㎒

Mode	Channel	Frequency (㎒)	6 ㏈ Bandwidth (㎒)	Minimum Bandwidth (㎑)
GFSK	Low	2 405	0.504	500
	Middle	2 436	0.534	
	High	2 466	0.629	

- Port 1: 5 727 ㎒ ~ 5 847 ㎒

Mode	Channel	Frequency (㎒)	6 ㏈ Bandwidth (㎒)	Minimum Bandwidth (㎑)
GFSK	Low	5 727	0.974	500
	Middle	5 787	1.024	
	High	5 847	1.039	

- Port 2: 2 405 ㎒ ~ 2 466 ㎒

Mode	Channel	Frequency (㎒)	6 ㏈ Bandwidth (㎒)	Minimum Bandwidth (㎑)
GFSK	Low	2 405	0.505	500
	Middle	2 436	0.534	
	High	2 466	0.624	

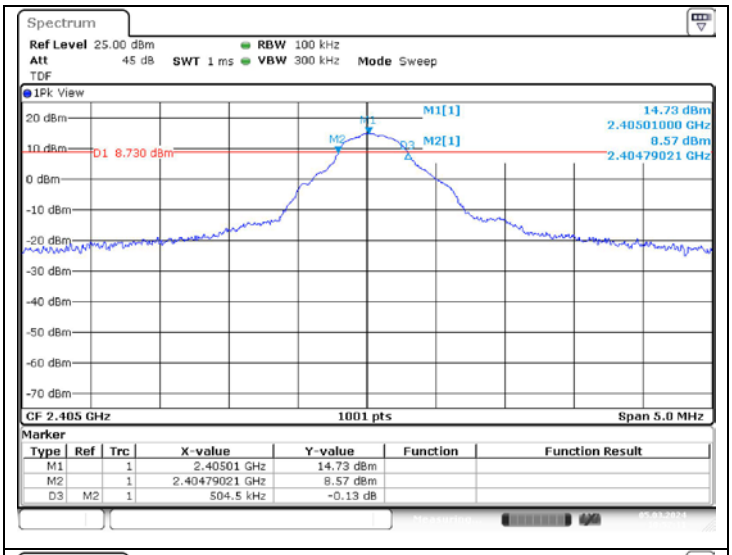
- Port 2: 5 727 ㎒ ~ 5 847 ㎒

Mode	Channel	Frequency (㎒)	6 ㏈ Bandwidth (㎒)	Minimum Bandwidth (㎑)
GFSK	Low	5 727	0.944	500
	Middle	5 787	0.989	
	High	5 847	1.039	

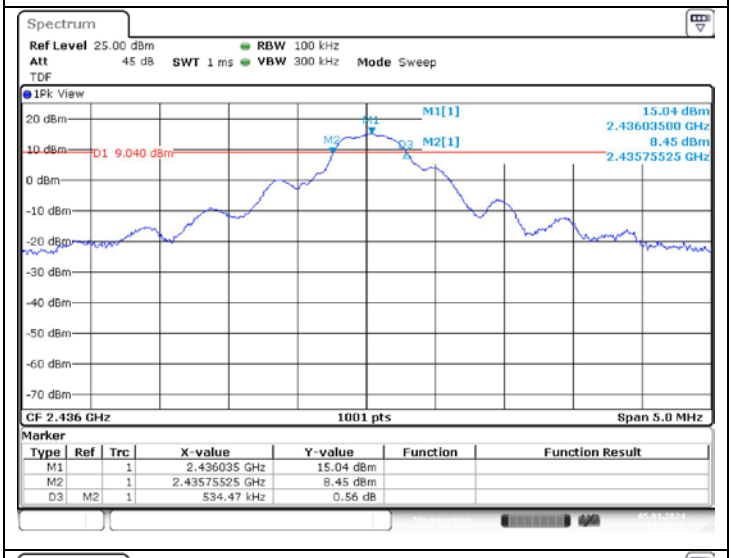
- Test plots

Port 1: 2 405 ㎒ ~ 2 466 ㎒

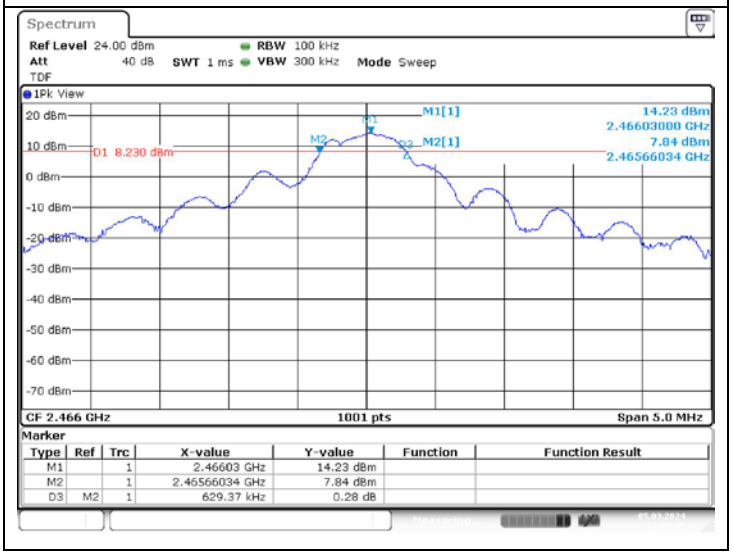
Low Channel



Middle Channel

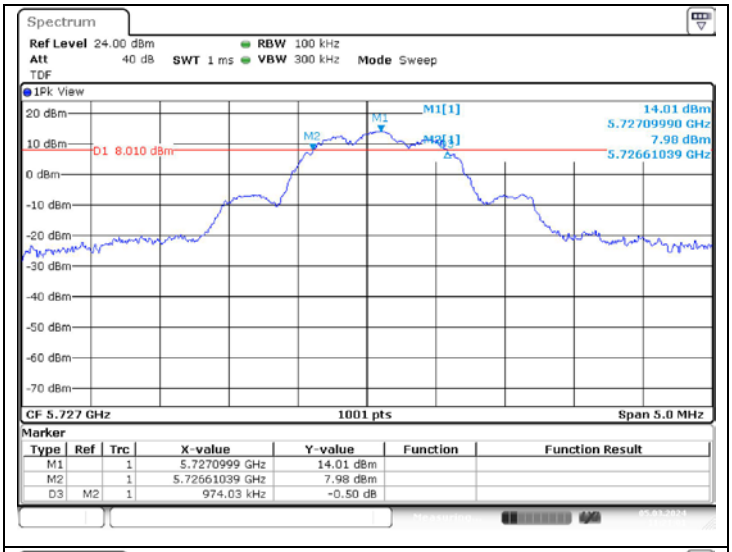


High Channel

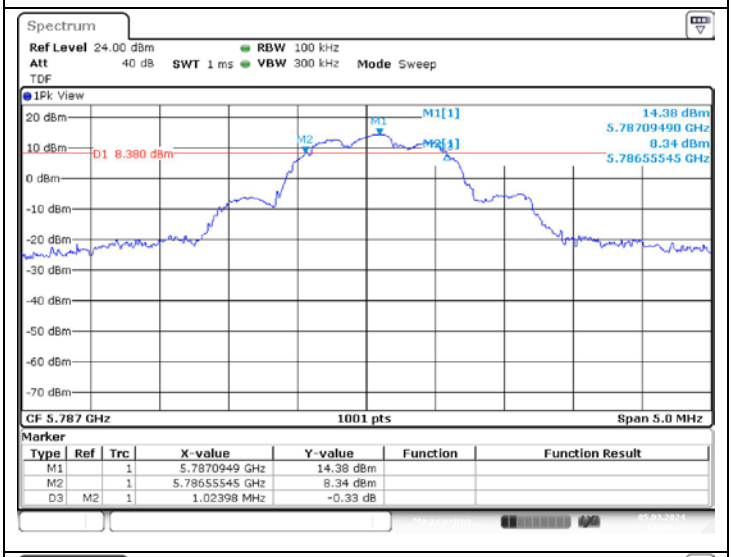


Port 1: 5 727 ㎒ ~ 5 847 ㎒

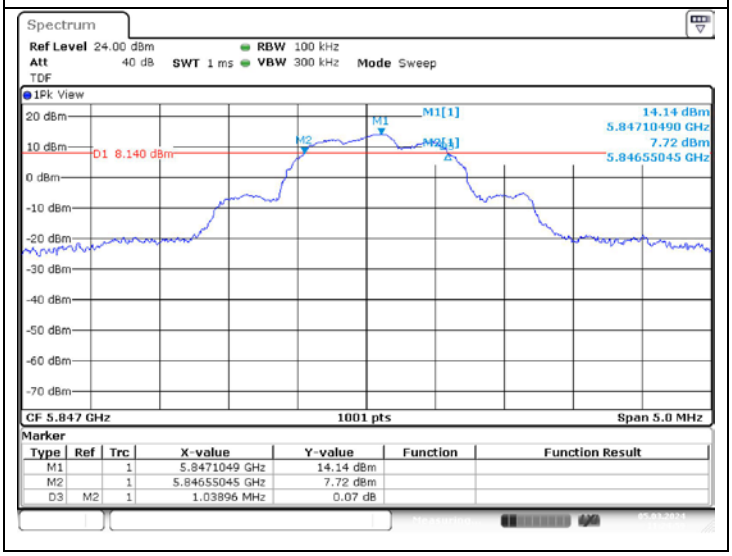
Low Channel



Middle Channel

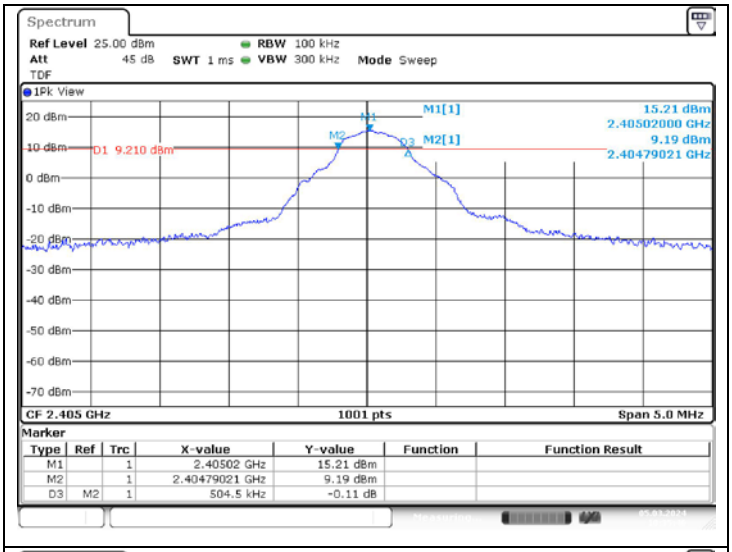


High Channel

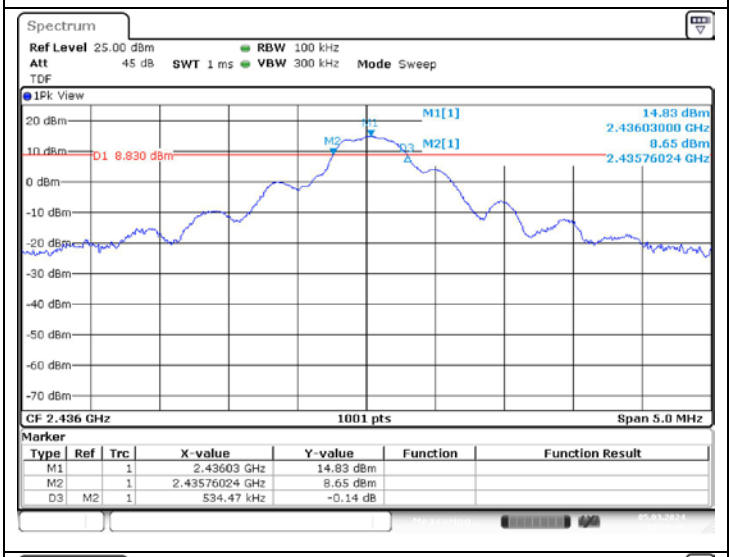


Port 2: 2 405 ㎒ ~ 2 466 ㎒

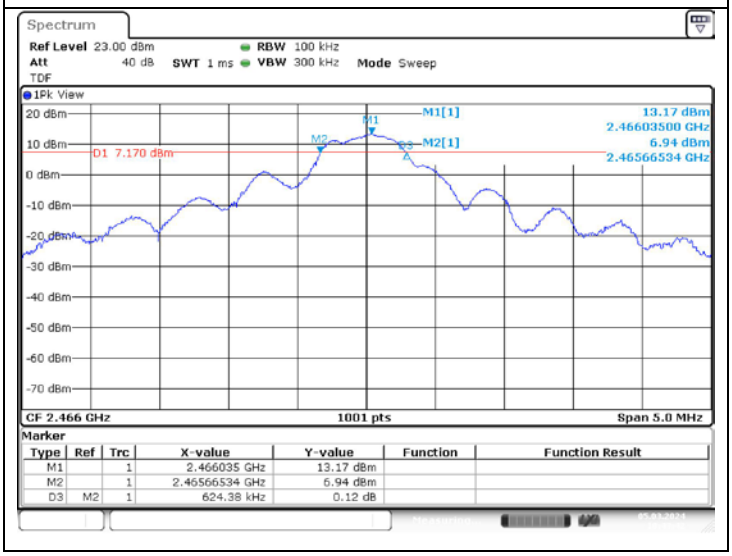
Low Channel



Middle Channel

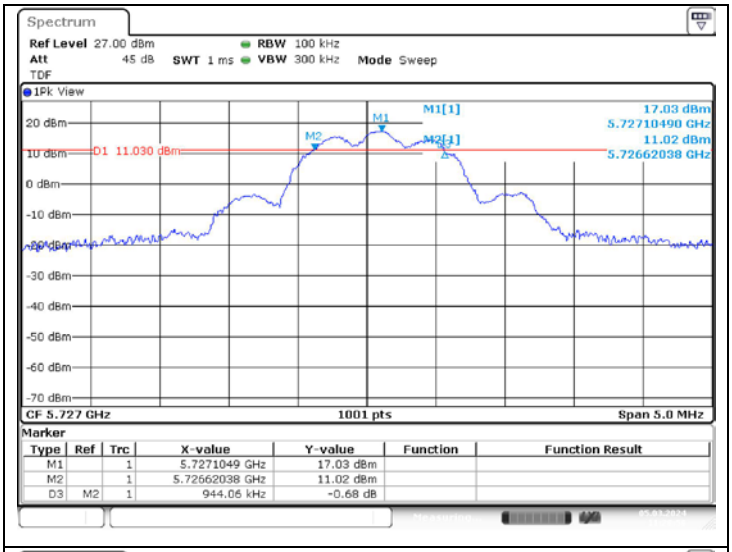


High Channel

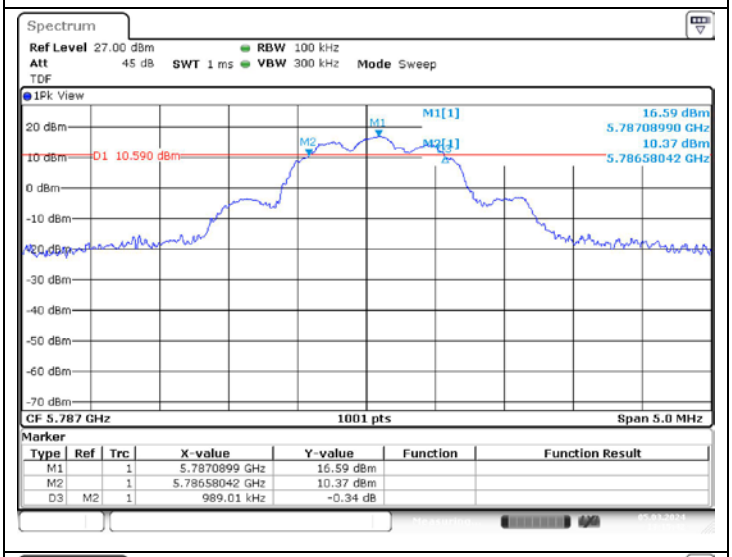


Port 2: 5 727 ㎒ ~ 5 847 ㎒

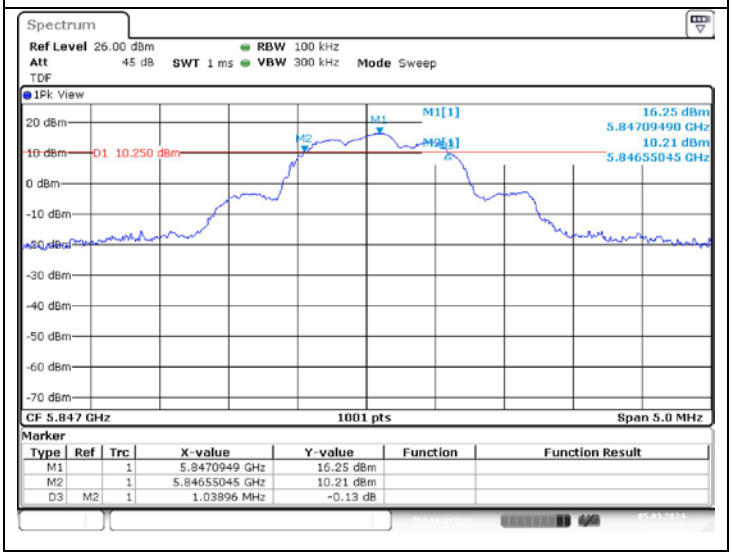
Low Channel



Middle Channel

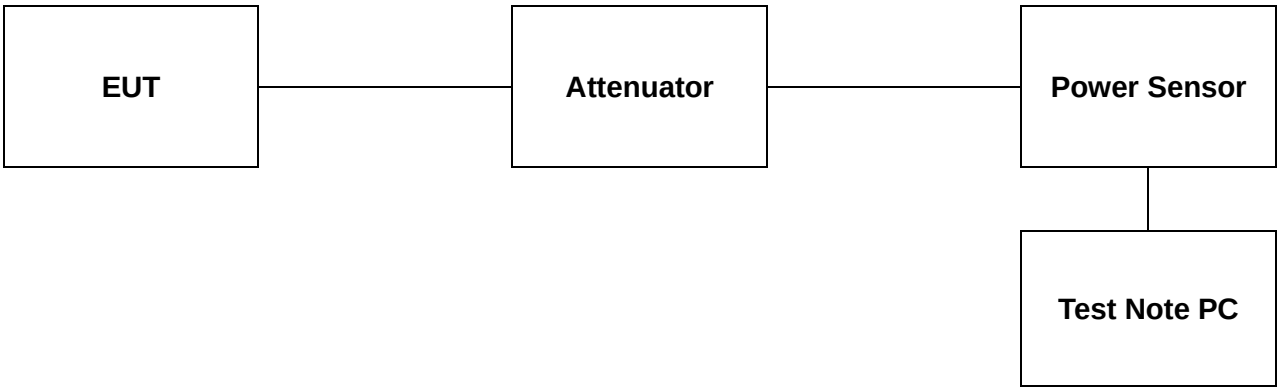


High Channel



4. Maximum Peak Conducted Output Power

4.1. Test Setup



4.2. Limit

According to §15.247(b)(3), for systems using digital modulation in the 902-928 ㎒, 2 400-2 483.5 ㎒, and 5 725-5 850 ㎒ bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 ㏈i. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 ㏈i are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraph (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

4.3. Test Procedure

The test follows section 11.9.1.3 of ANSI C63.10-2013.

PKPM1 Peak-reading power meter method
- The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

The test follows section 11.9.2.3.2 of ANSI C63.10-2013.

Method AVGPM-G (Measurement using a gated RF average-reading power meter)
- Alternatively, measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

Test program: (S/W name: R&S Power Viewer, Version: 3.2.0)

1. Initially overall offset for attenuator and cable loss is measured per frequency.
2. Measured offset is inserted in test program in advance of measurement for output power.
3. Power for each frequency (channel) of device is investigated as final result.
4. Final result reported on this section from R&S power viewer program includes with several factors and test program shows only final result.

4.4. Test Results

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

- Port 1: 2 405 ㎒ ~ 2 466 ㎒

Mode	Channel	Frequency (㎒)	Average Power Result (dB m)	Peak Power Result (dB m)	Limit (dB m)
GFSK	Low	2 405	16.43	16.86	30
	Middle	2 436	**16.66**	**17.16**	
	High	2 466	15.81	16.32	

- Port 1: 5 727 ㎒ ~ 5 847 ㎒

Mode	Channel	Frequency (㎒)	Average Power Result (dB m)	Peak Power Result (dB m)	Limit (dB m)
GFSK	Low	5 727	**17.45**	**18.56**	30
	Middle	5 787	17.38	18.26	
	High	5 847	17.09	18.25	

- Port 2: 2 405 ㎒ ~ 2 466 ㎒

Mode	Channel	Frequency (㎒)	Average Power Result (dB m)	Peak Power Result (dB m)	Limit (dB m)
GFSK	Low	2 405	**16.51**	**17.00**	30
	Middle	2 436	15.96	16.45	
	High	2 466	14.53	15.13	

- Port 2: 5 727 ㎒ ~ 5 847 ㎒

Mode	Channel	Frequency (㎒)	Average Power Result (dB m)	Peak Power Result (dB m)	Limit (dB m)
GFSK	Low	5 727	**20.05**	**20.44**	30
	Middle	5 787	18.99	20.26	
	High	5 847	18.61	19.81	

5. Power Spectral Density

5.1. Test Setup

5.2. Limit

According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 ㏈m in any 3 ㎑ band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

5.3. Test Procedure

The measurements are recorded using the PKPSD measurement procedure in section 11.10.2 of ANSI C63.10-2013.

- This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance, and is optional if the maximum conducted (average) output power was used to demonstrate compliance.

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to 3 ㎑ ≤ RBW ≤ 100 ㎑.
4. Set the VBW ≥ [3 x RBW].
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds requirement, then reduce RBW (but no less than 3 ㎑) and repeat.

5.4. Test Results

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

- Port 1: 2 405 ㎒ ~ 2 466 ㎒

Mode	Channel	Frequency (㎒)	Measured PSD (dB m/3 ㎑)	Limit (dB m/3 ㎑)
GFSK	Low	2 405	3.67	8
	Middle	2 436	4.13	
	High	2 466	3.72	

- Port 1: 5 727 ㎒ ~ 5 847 ㎒

Mode	Channel	Frequency (㎒)	Measured PSD (dB m/3 ㎑)	Limit (dB m/3 ㎑)
GFSK	Low	5 727	1.86	8
	Middle	5 787	2.03	
	High	5 847	0.58	

- Port 2: 2 405 ㎒ ~ 2 466 ㎒

Mode	Channel	Frequency (㎒)	Measured PSD (dB m/3 ㎑)	Limit (dB m/3 ㎑)
GFSK	Low	2 405	4.19	8
	Middle	2 436	3.63	
	High	2 466	2.63	

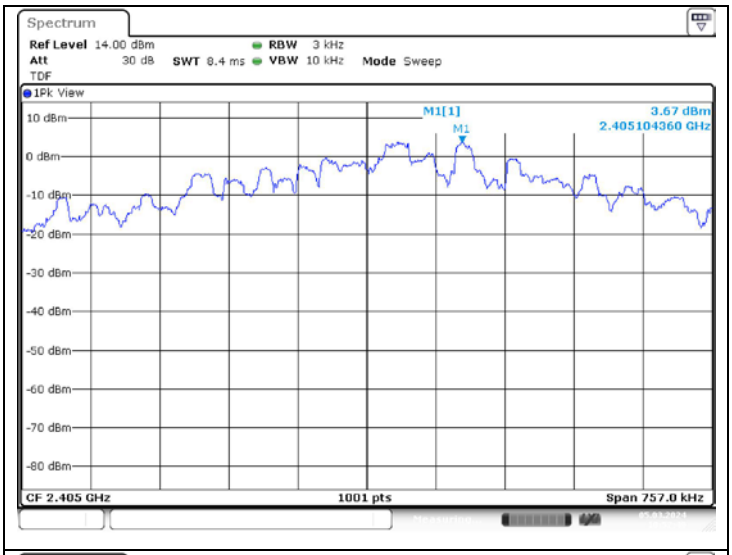
- Port 2: 5 727 ㎒ ~ 5 847 ㎒

Mode	Channel	Frequency (㎒)	Measured PSD (dB m/3 ㎑)	Limit (dB m/3 ㎑)
GFSK	Low	5 727	5.41	8
	Middle	5 787	4.25	
	High	5 847	2.78	

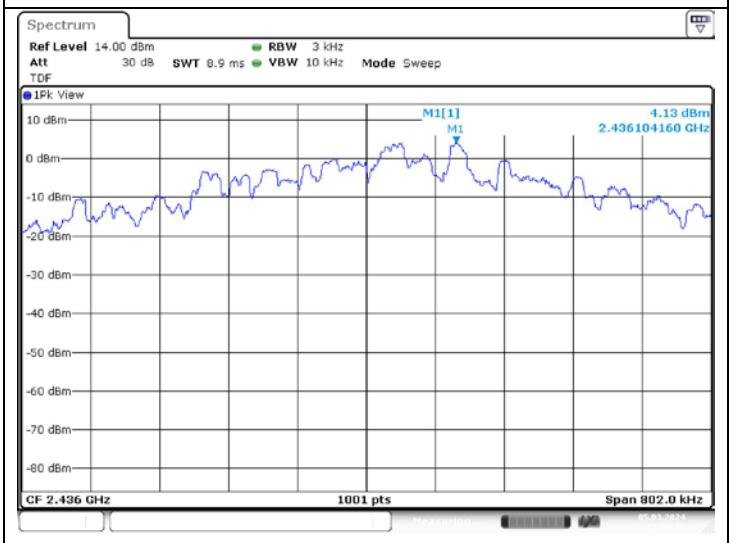
- Test plots

Port 1: 2 405 ㎒ ~ 2 466 ㎒

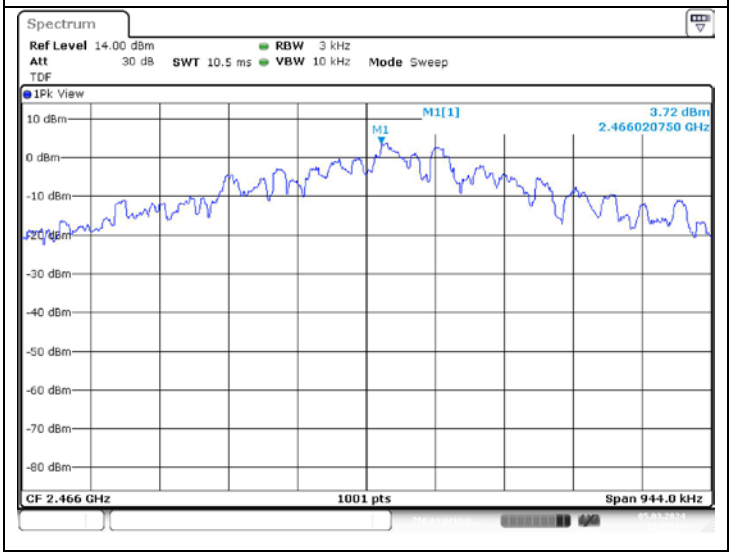
Low Channel



Middle Channel

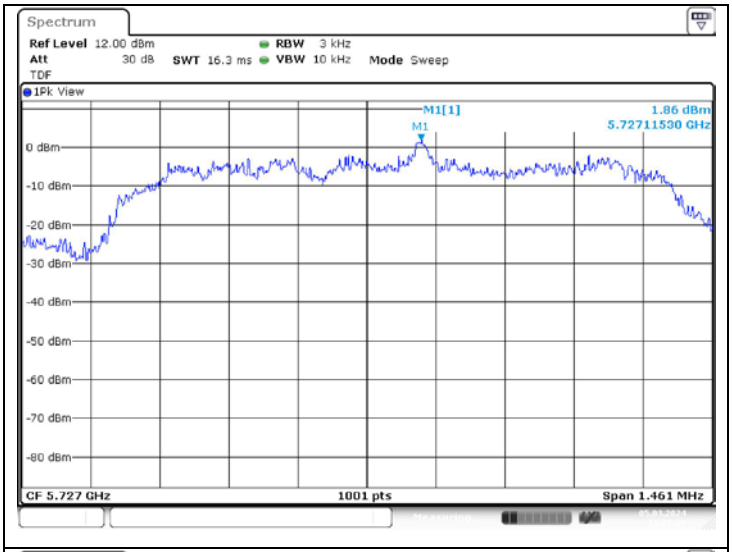


High Channel

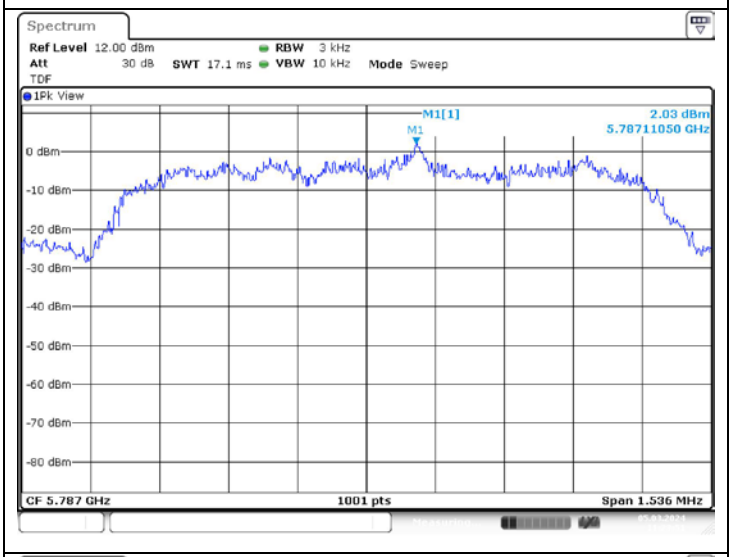


Port 1: 5 727 ㎒ ~ 5 847 ㎒

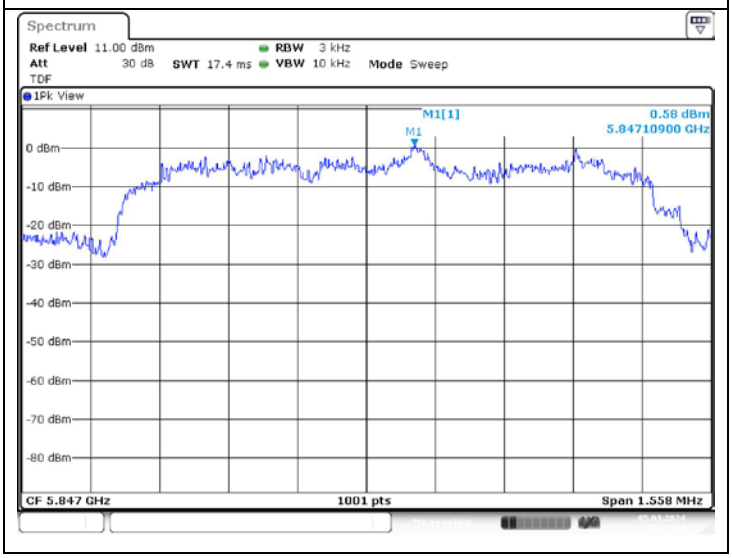
Low Channel



Middle Channel

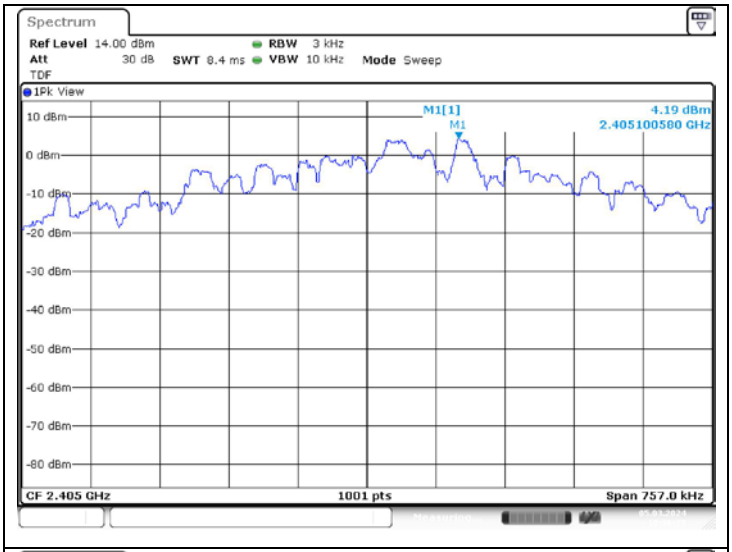


High Channel

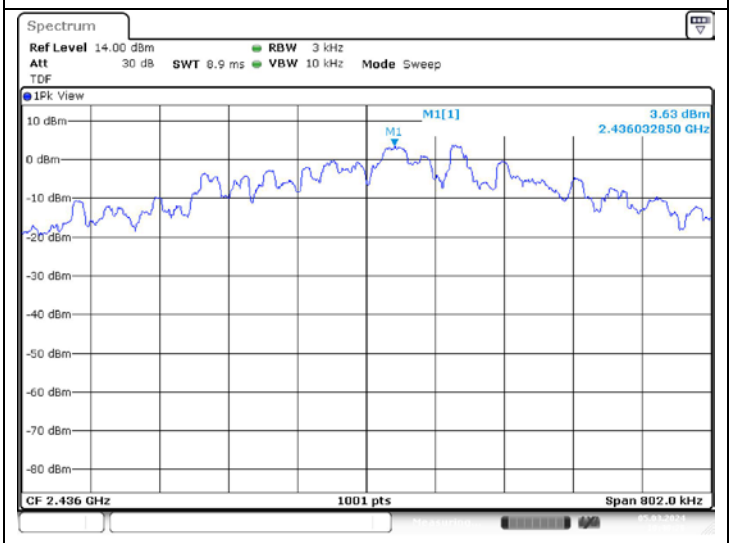


Port 2: 2 405 ㎒ ~ 2 466 ㎒

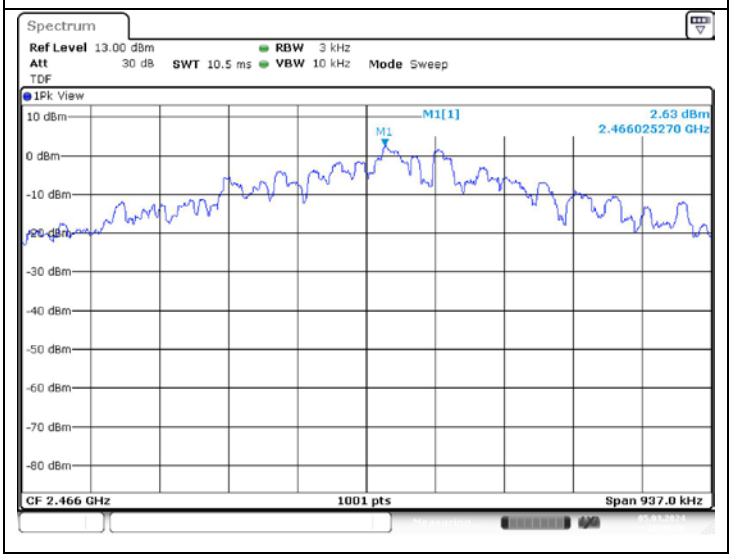
Low Channel



Middle Channel

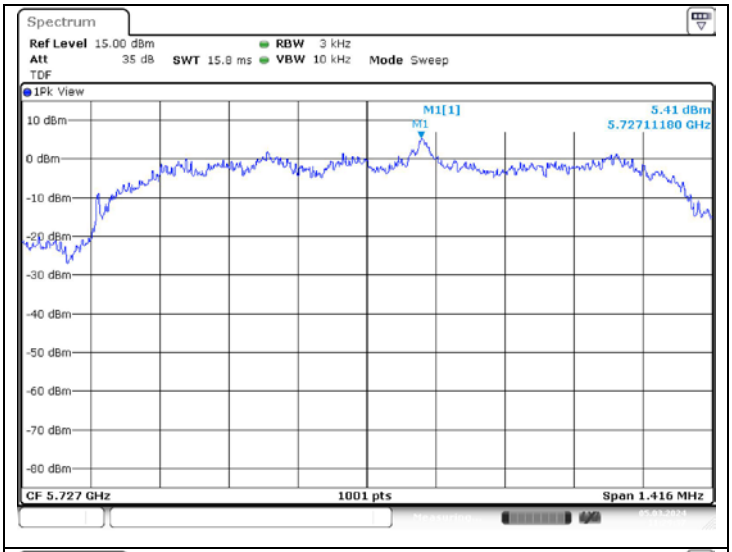


High Channel

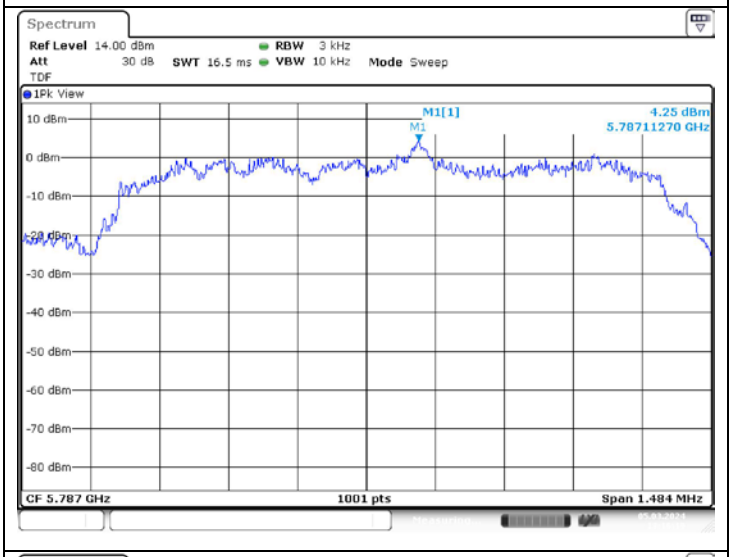


Port 2: 5 727 ㎒ ~ 5 847 ㎒

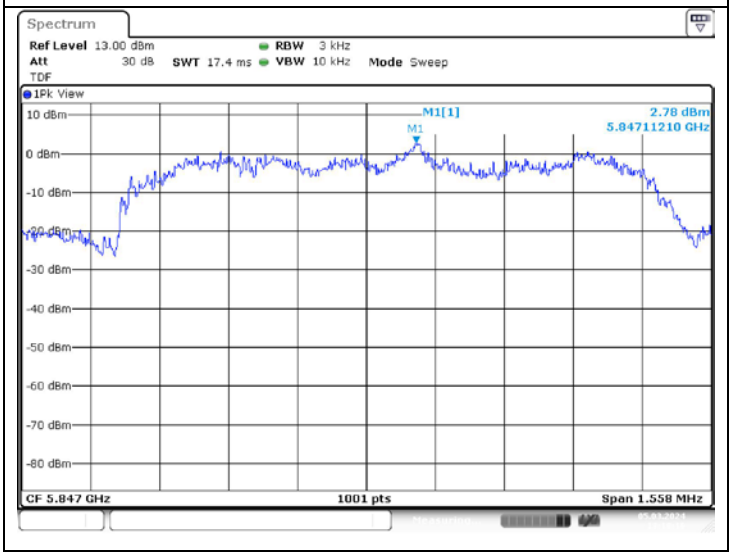
Low Channel



Middle Channel



High Channel



6. Antenna Requirement

6.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. And according to FCC 47 CFR Section §15.247(b) if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power shall be reduced appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.2. Antenna Connected Construction

Internal antenna used in this product is Multilayer monopole antenna.
External antenna used in this product is Dipole antenna.
Antenna gains are as follows.

Port	Antenna	Frequency range	Gain (dBi)
Port 1	Internal antenna	2 405 ㎒ ~ 2 466 ㎒	2.1
		5 727 ㎒ ~ 5 847 ㎒	2.4
Port 2	Internal antenna	2 405 ㎒ ~ 2 466 ㎒	2.1
		5 727 ㎒ ~ 5 847 ㎒	2.4
	External antenna	2 405 ㎒ ~ 2 466 ㎒	2.5
		5 727 ㎒ ~ 5 847 ㎒	2.9

- End of the Test Report -