DEKRA Testing and Certification, S.A.U.
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C.I.F. A29507456

ºISED CABid: ES1909

Lab. Company Number: 4621A

Test Report No:
78857RRF.005

Test Report
USA FCC Part 15.247, 15.209
CANADA RSS-247, RSS-Gen

(*) Identification of item tested	Receiver In the Ear Hearing Aid (RIE)
(*) Trademark	ReSound, Beltone, Jabra, Interton, Audigy, Danavox
(*) Model and /or type reference	DURR1A
Other identification of the product	FCC ID: X26DURR1A IC: 6941C-DURR1A
(*) Features	BLE (1 & 2 Mbit), Proximity, wireless charging, MI HW version: V3,C6.0AI SW version: Dooku3
Applicant	GN Hearing A/S Lautrupbjerg 7, 2750 Ballerup, Denmark
Test method requested, standard	USA FCC Part 15.247 (10-1-23 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-23 Edition): Radiated emission limits; general requirements. CANADA RSS-247 Issue 3 (August 2023). CANADA RSS-Gen Issue 5 amendment 2 (February 2021). Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid Systems Devices Operating Under Section 15.247 of the FCC Rules. 558074 D01 Meas Guidance v05r02 dated April 2, 2019. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager Firmado digitalmente por 53680346W JOSE MANUEL GOMEZ (C:A29507456)
Date of issue	2024-11-06
Report template No	FDT08_25 (*) "Data provided by the client"

Index

INDEX 2
ACRONYMS 3
COMPETENCES AND GUARANTEES 3
GENERAL CONDITIONS 4
UNCERTAINTY 4
DATA PROVIDED BY THE CLIENT 4
USAGE OF SAMPLES 5
TEST SAMPLE DESCRIPTION 6
IDENTIFICATION OF THE CLIENT 8
TESTING PERIOD AND PLACE 8
DOCUMENT HISTORY 8
ENVIRONMENTAL CONDITIONS 8
REMARKS AND COMMENTS 9
TESTING VERDICTS 10
SUMMARY 11
APPENDIX A: TEST RESULTS. 12

Acronyms

Acronym ID	Acronym Description
BW	Bandwidth
Detector	Detector used
Ebw	Emission Bandwidth
Equipment	Equipment Type
Freq	Frequency
Freq Rng	Frequency Range
Inband Peak Lvl	Inband Peak Level
Lvl	Level
MP	Measurement Point
Mod	Modulation
Mode	MIMO Mode
Occ Ch BW	Occupied Channel Bandwidth
PSD	Power Spectral Density
Peak Power	Maximum Peak Conducted Output Power
Pol	Polarization
Port	Active Port
Unwanted Freq	Unwanted Emissions Frequency
Unwanted Lvl	Unwanted Emissions Level

Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification S.A.U. is an FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification S.A.U. is an ISED-recognized accredited testing laboratory, CABid: ES1909, Company Number: 4621A, with the appropriate scope of accreditation that covers the performed tests in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification S.A.U. at the time of performance of the test.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

The total uncertainty of the measurement system for the radiated emissions of EUT from 30 MHz to 1 GHz is:
Measurement uncertainty ≤ ± 5,35 dB with factor (k = 2).

The total uncertainty of the measurement system for the radiated emissions of EUT from 1 GHz to 17 GHz is:
Measurement uncertainty ≤ ± 4,32 dB with factor (k = 2).

The total uncertainty of the measurement system for the radiated emissions of EUT from 17 GHz to 26 GHz is:
Measurement uncertainty ≤ ± 5,51 dB with factor (k = 2).

The total uncertainty of the measurement system for the conducted testing of EUT is:
RF Peak Output Power: Measurement uncertainty ≤ ± 0,80 dB
RF Average Output Power: Measurement uncertainty ≤ ± 0,99 dB
Power Spectral Density: Measurement uncertainty ≤ ± 0,99 dB
6dB Bandwidth: Measurement uncertainty ≤ ± 2,84 %
Occupied Channel Bandwidth: Measurement uncertainty ≤ ± 1,17 %
Conducted Band-edge spurious emissions: Measurement uncertainty ≤ ± 1,76 dB

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").

2. The sample consists of a receiver In the Ear Hearing Aid. The hearing aid features a sound amplification of the sound received by the microphone, wireless streaming via BLE, proximity, MI and wireless charging.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results. The laboratory is not responsible for such information and it is not covered by accreditation.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial Nº	Date of Reception	Application
S/01	78857F_66.1	Hearing aid	DURR1A	2400805445	2024-08-14	Element Under Test
S/02	78857F_84.1	Pocket Device	DURR1A	1833085101	2024-08-14	Element Under Test

Notes referenced to samples during the project:

Id	Type
S/01	Radiated sample
S/02	Conducted sample

Test sample description

Ports…… ……. :	**Port name and description**	**Cable**			
		Specified max length [m]	**Attached during test**	**Shielded**	**Coupled to patient(3)**
Supplementary information to the ports…… ……. :					

Rated power supply ..... :	**Voltage and Frequency**		**Reference poles**				
			L1	**L2**	**L3**	**N**	**PE**
		AC:					
		AC:					
		DC: 3.7 V (rechargeable battery)					
		DC:					

Rated Power ..... :	3.7 – 3.85V, 19.5 – 24.5 mAh	
Clock frequencies..... :	CPU XTAL: 32MHz	
Other parameters ..... :		
Software version ..... :	Dooku3	
Hardware version ..... :	V3,C6.0AI	
Dimensions in cm (W x H x D)..... :	0.7 x 1.2 x 2.6	
Mounting position ..... :		Table top equipment
		Wall/Ceiling mounted equipment
		Floor standing equipment

		Hand-held equipment
	[X]	Other: HA behind the ear with receiver in the ear.

Modules/parts..... :	**Module/parts of test item**	**Type**	**Manufacturer**
	HA (Hearing Aid)	DURR1A	GN Hearing A/S
Accessories (not part of the test item)..... :	**Description**	**Type**	**Manufacturer**
	Charger	C-1	GN Hearing A/S
	USB-C power cord	-	-
	Power adapter_EU, type: A806A-050100U-EU1	-	Dongguang Aohai
	Power adapter_US, type: A18A-050100U-US2	-	Dongguang Aohai
Documents as provided by the applicant..... :	**Description**	**File name**	**Issue date**
	Uploaded to DEKRA ftp		

(3) Only for Medical Equipment

Identification of the client

GN Hearing A/S
Lautrupbjerg 7, 2750 Ballerup, Denmark

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2024-08-22
Date (finish)	2024-09-17

Document history

Report number	Date	Description
78857RRF.005	2024-11-06	First release.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %

Remarks and comments

The tests have been performed by the technical personnel: Jia Hao Luo Chen, Ruben Mora Fernandez and Victoria Olmedo Villalba.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
05862	EMI TEST RECEIVER 9kHz-7GHz	ESR7	ROHDE AND SCHWARZ	2025-02-15
07040	EXTENSION FOR OPEN SWITCH UNIT UP TO 40GHz	OSP-B157Wx	Rohde&Schwarz	2025-04-19
07763	HORN ANTENNA 1-18GHz	BBHA 9120D	SCHWARZBECK MESS-ELEKTRONIK	2026-01-16
06495	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2027-07-11
09968	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2026-09-22
07862	PRE-AMPLIFIER G>30dB 18-40GHz	BLMA 1840-3G	BONN ELEKTRONIK	2025-04-02
07769	PREAMPLIFIER 30dB 500MHz-18GHz	BBV 9718 C	SCHWARZBECK	2025-03-13
07039	Rohde&Schwarz	OSP-B157W8	ROHDE & SCHWARZ	2025-05-25
08130	SEMIANECHOIC ABSORBER LINED CHAMBER	P29419	ALBATROSS	--
08134	SHIELDED ROOM	P29419	ALBATROSS PROJECTS GMBH	--
08661	SHIELDED ROOM	-	SIEPEL	--
08835	SIGNAL AND SPECTRUM ANALYZER 2Hz-50GHz	FSW50	ROHDE AND SCHWARZ	2025-02-08
04848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	--
07549	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2025-04-24
07550	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2025-04-24
07552	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2025-04-24
07798	WMS32	WMS32	ROHDE AND SCHWARZ	--
10418	EMI TEST RECEIVER 1Hz-26.5GHz	ESW26	ROHDE & SCHWARZ	2025-02-13

Testing verdicts

Fail	F
Inconclusive	I
Not applicable	N/A
Not measured	N/M
Pass	P

Summary

Bluetooth Low Energy (1M, 2M) and Proximity (2M).

FCC PART 15 PARAGRAPH/ RSS-247			
Requirement – Test case		**Verdict**	**Remark**
FCC 15.247 (a)(2) / RSS-247 5.2. (a)	6 dB Bandwidth	P	-
FCC 15.247 (b) / RSS-247 5.4. (d)	Maximum output power and antenna gain	P	-
FCC 15.247 (d) / RSS-247 5.5.	Band-edge emissions compliance (Transmitter)	P	-
FCC 15.247 (e) / RSS-247 5.2. (b)	Power spectral density	P	-
FCC 15.247 (d) / RSS-247 5.5.	Emission limitations radiated (Transmitter)	P	-
Supplementary information and remarks: None			

Appendix A: Test results.

INDEX

TEST CONDITIONS 14

TEST CASES DETAILS 17

99dBw Occupied Channel Bandwidth 99% 17
RSS-247 5.2 (a) / FCC 15.247 (a) (2) [6dBw] 6 dB Bandwidth 29
RSS-247 5.2 (b) / FCC 15.247 (e) [Psd] Power spectral density 41
RSS-247 5.4 (d) / FCC 15.247 (b) (3) [Pkcp] Maximum Peak Conducted output power 53
RSS-247 5.5 / FCC 15.247 (d) [Bndedge] Band-edge emissions compliance (Transmitter) 65
RSS-247 5.5 / FCC 15.247 (d) [RSE] Emission limitations radiated (Transmitter) 81

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal:	3.7 V
Type of Power Supply:	Internal rechargeable battery

ANTENNA (*):

Type of Antenna:	Integral
Maximum Declared Antenna Gain:	-16.0 dBi

TEST FREQUENCIES (*):

Modulation	Data rates	Low Channel:	Middle Channel	High Channel
BTLE GFSK	1M 1 Mbit/s	2402 MHz	2440 MHz	2480 MHz
BTLE GFSK	2M 2 Mbit/s	2404 MHz	2440 MHz	2478 MHz
PROXIMITY	2M 2 Mbit/s	2402 MHz	2440 MHz	2480 MHz

During transmitter test the EUT was controlled by a SW tool provided by the client to operate in a continuous transmit mode on the modulation schemes and test channels as required.

CONDUCTED MEASUREMENTS:

The equipment under test was set up in a shielded room and it is connected to the TS8997 using a low loss RF cable. The reading of the spectrum analyser is corrected taking into account the cable loss.

RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Bilog antenna for the range between 30 MHz to 1000 MHz and 1 GHz-17 GHz Double ridge horn antenna) is situated at a distance of 3 m and at a distance of 1.5 m for the frequency range 17 GHz-26 GHz (17 GHz-40 GHz horn antenna).

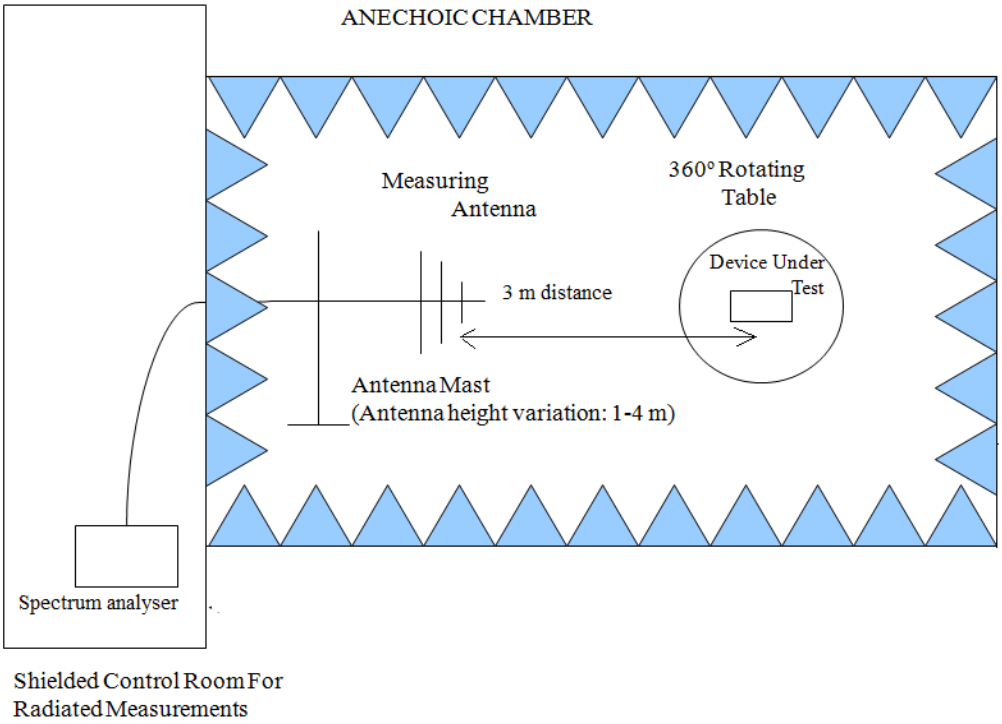
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360º and the antenna height (Bilog antenna and Double ridge horn antenna) was varied from 1 to 4 meters to find the maximum radiated emission.

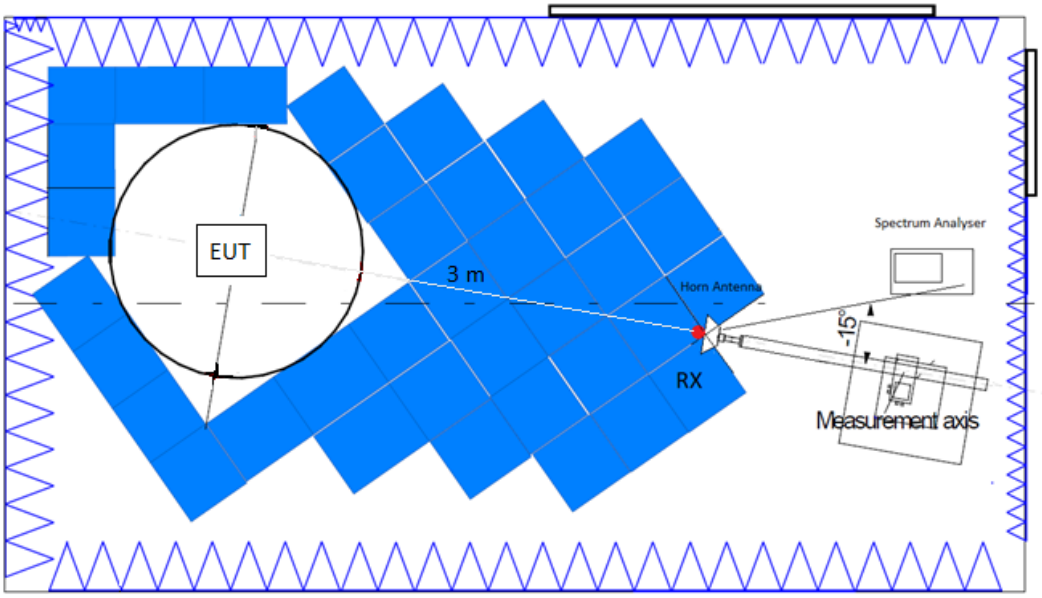
Measurements were made in both horizontal and vertical planes of polarization.

A resolution bandwidth/video bandwidth of 100 kHz / 300 kHz was used for frequencies below 1 GHz and 1 MHz / 3 MHz for frequencies above 1 GHz.

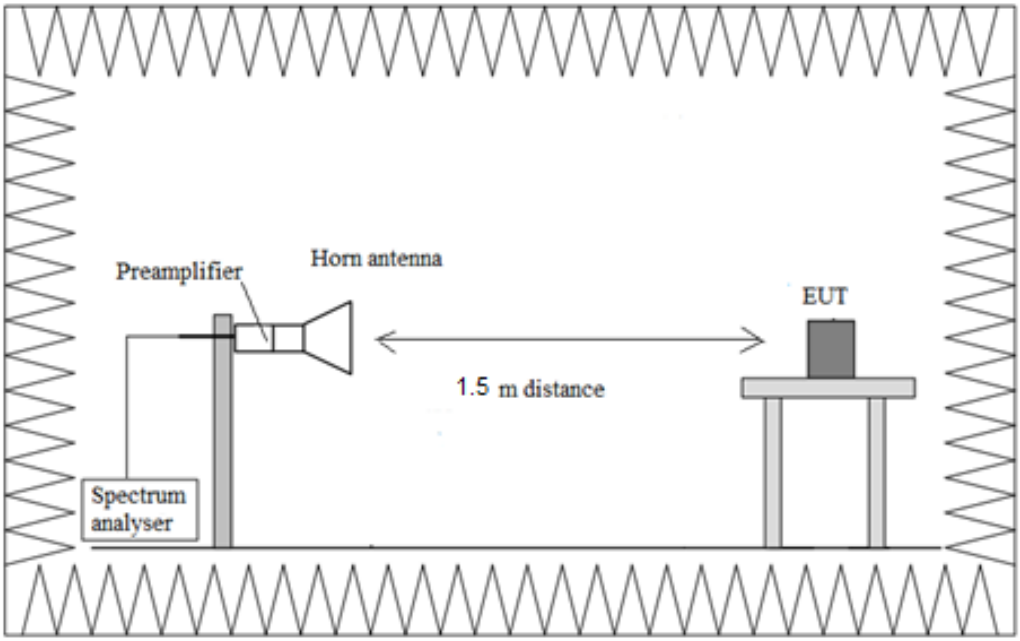
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup f > 17 GHz:



TEST CASES DETAILS

99dBw Occupied Channel Bandwidth 99%

Limits

RSS-Gen 6.7 Occupied bandwidth (or 99% emission bandwidth) and x dB bandwidth:

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

Modulation: BTLE 5.4 (GFSK 1 Mbit/s)

MIMO Mode: SISO

Results

Freq (MHz)	Occ Ch BW (MHz)
2402.00000	1.035
2440.00000	1.030
2480.00000	1.035

Verdict

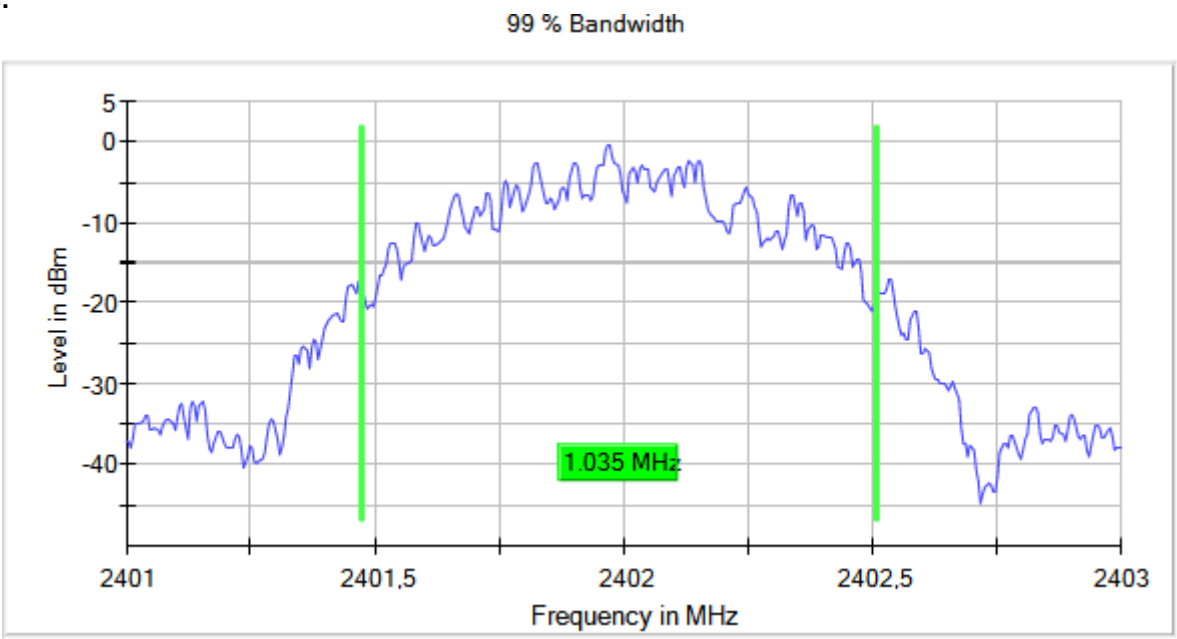
Pass

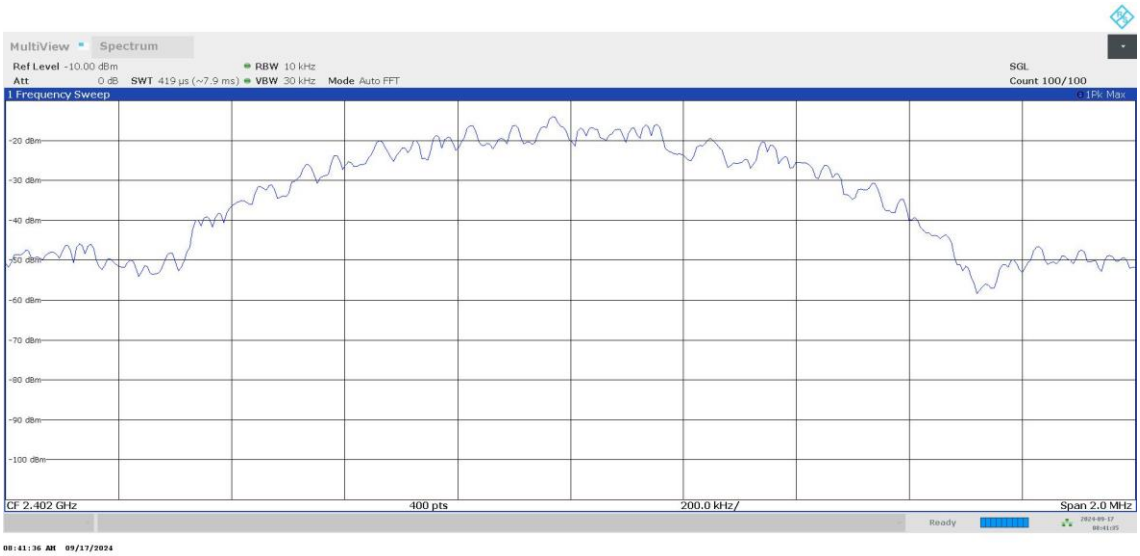
Attachments

Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2402.00000 MIMO Mode = SISO

Images:

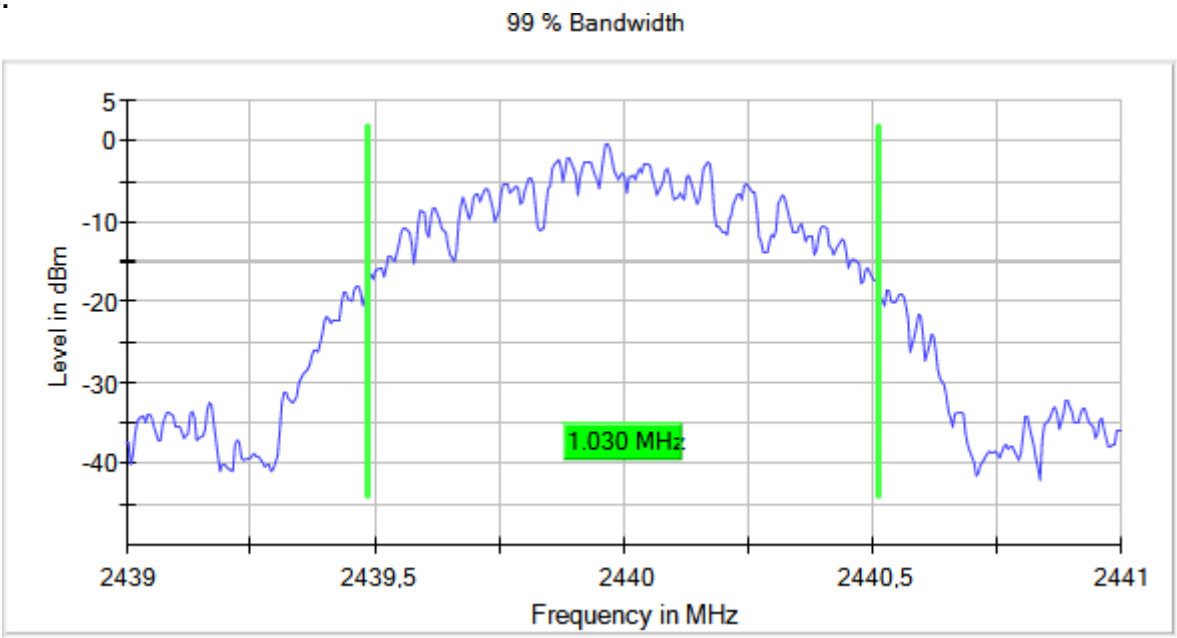


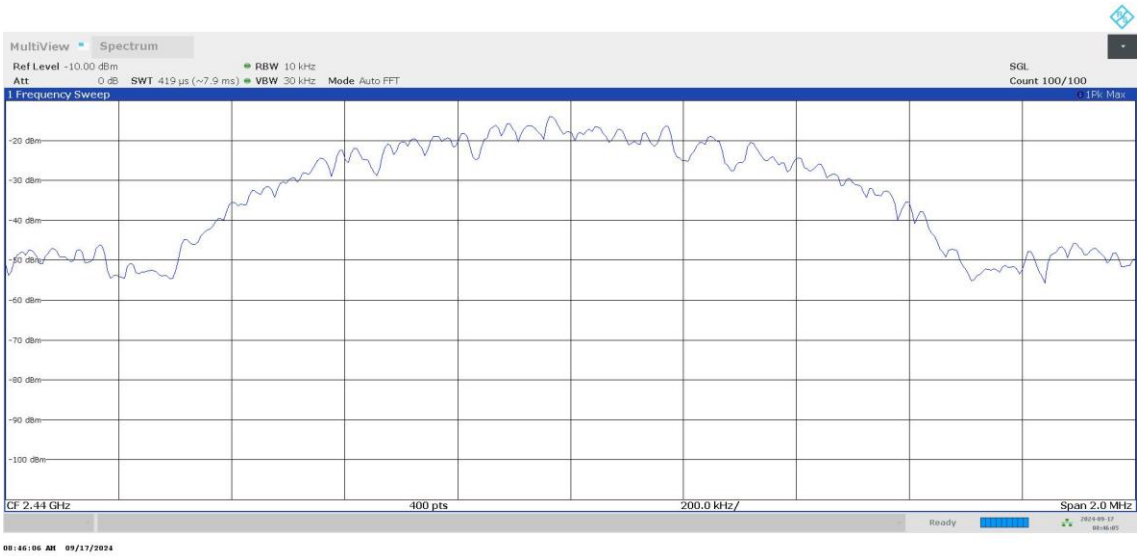


Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

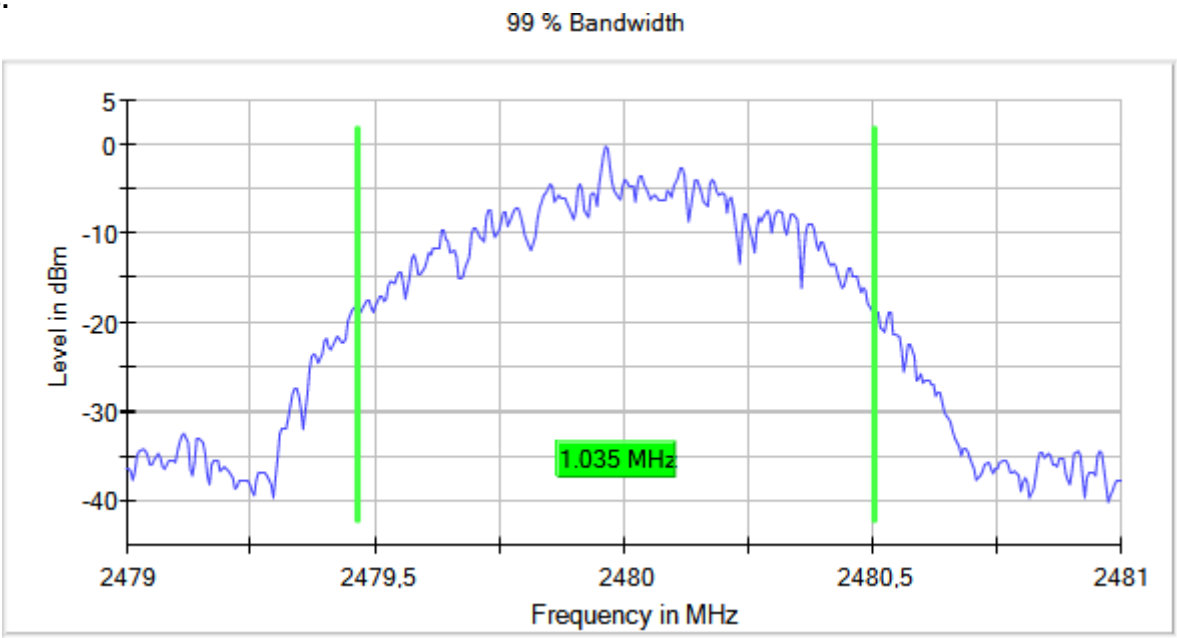


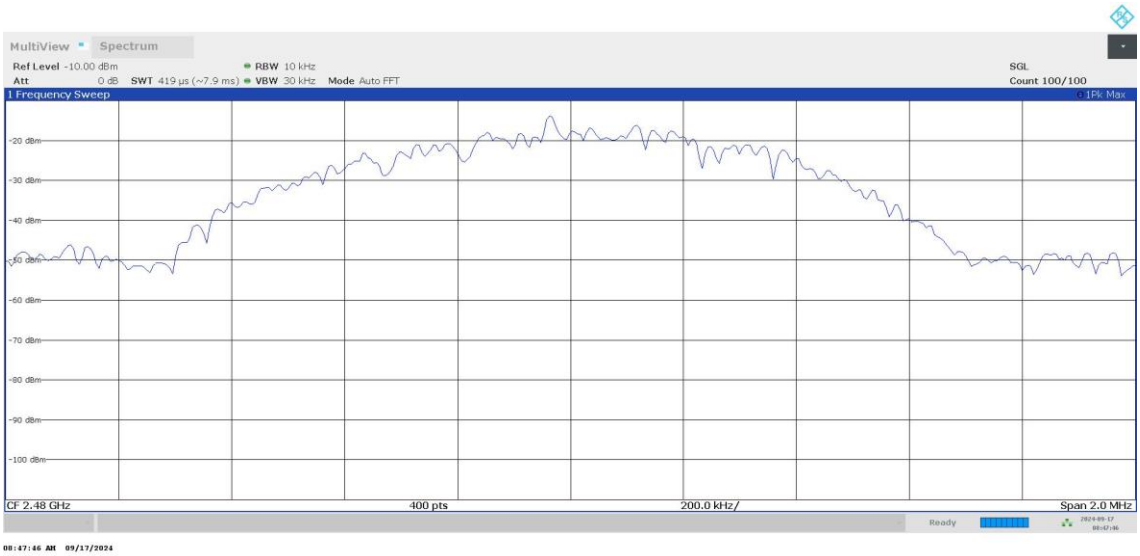


Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2480.00000 MIMO Mode = SISO

Images:





Modulation: BTLE 5.4 (GFSK 2 Mbit/s)

MIMO Mode: SISO

Results

Freq (MHz)	Occ Ch BW (MHz)
2404.00000	2.010
2440.00000	2.010
2478.00000	2.010

Verdict

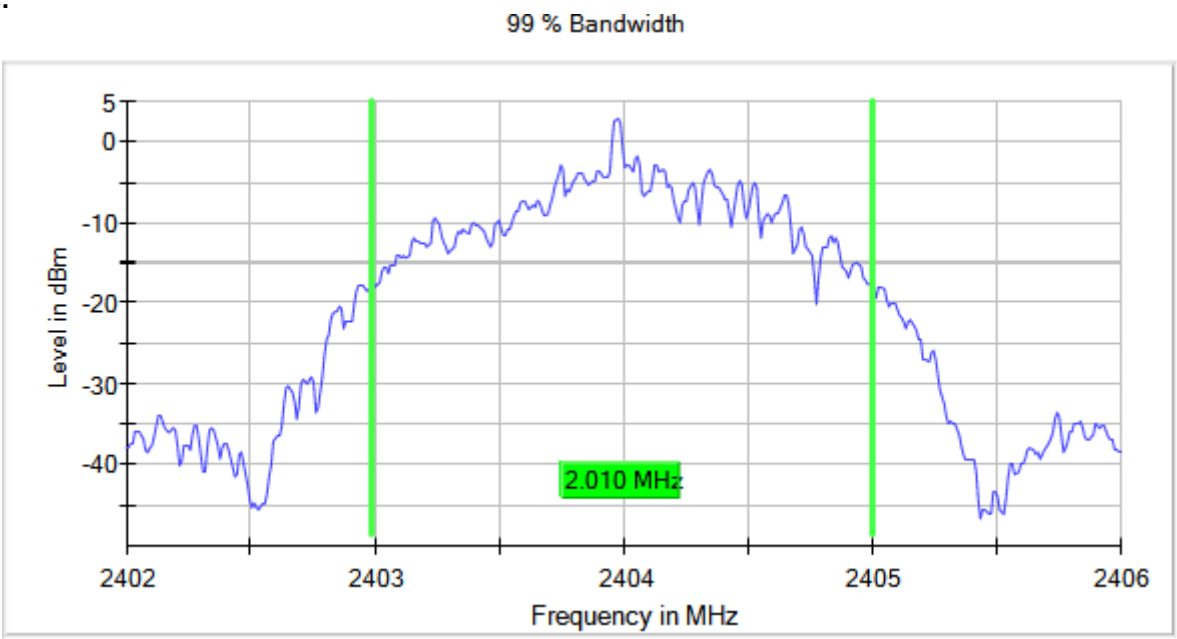
Pass

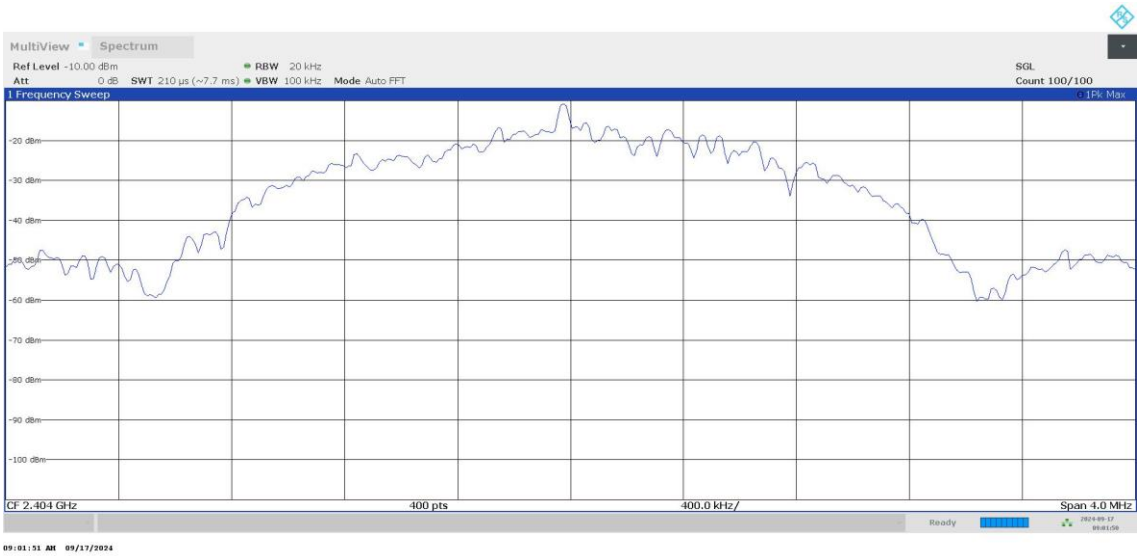
Attachments

Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2404.00000 MIMO Mode = SISO

Images:

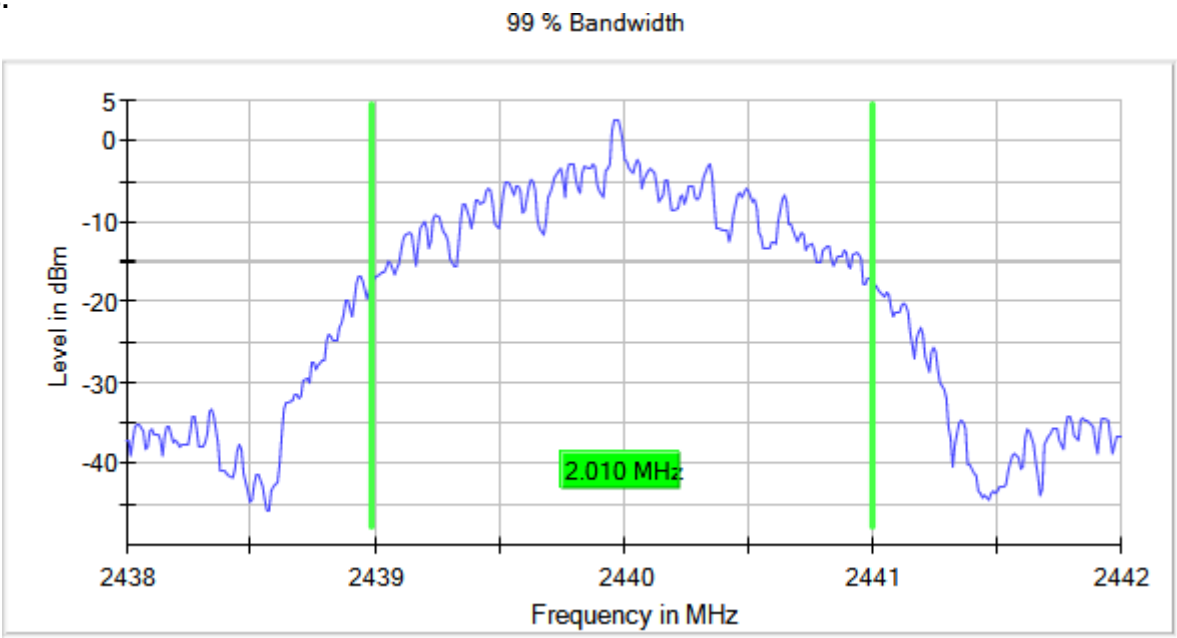


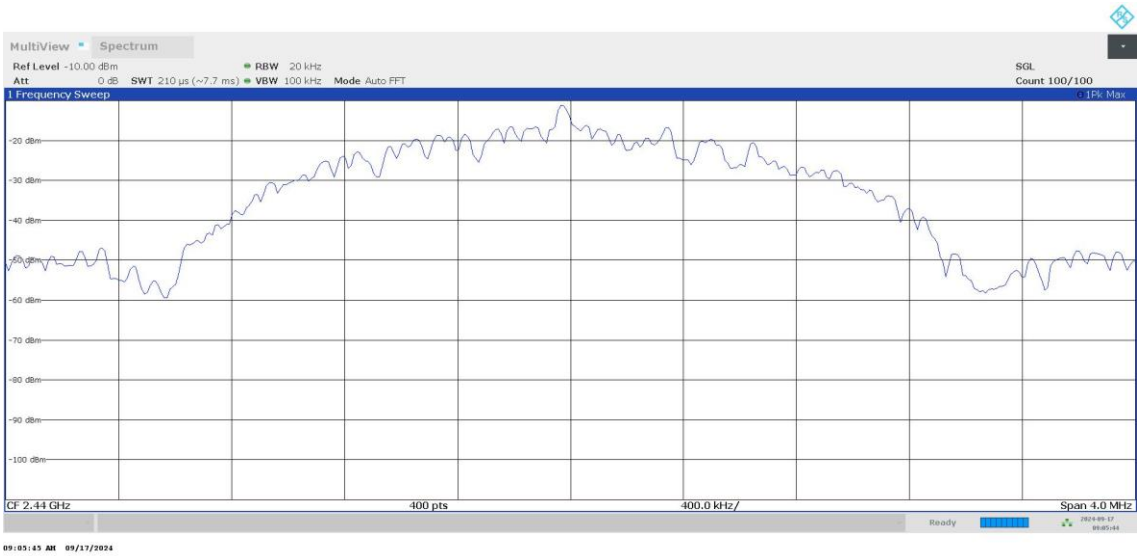


Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

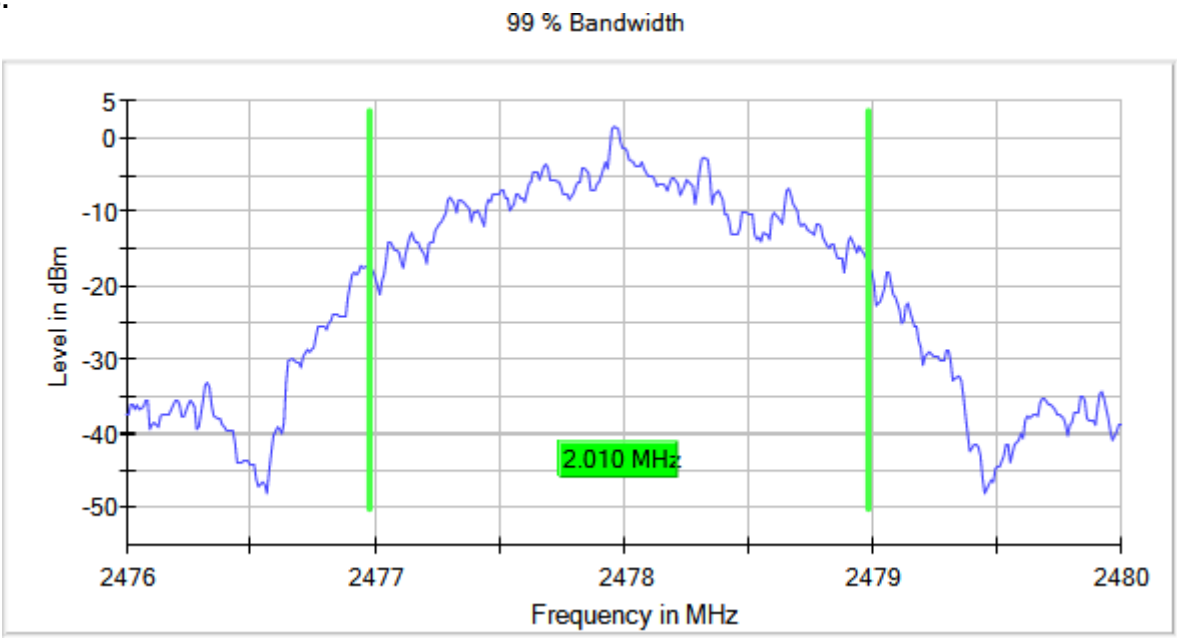


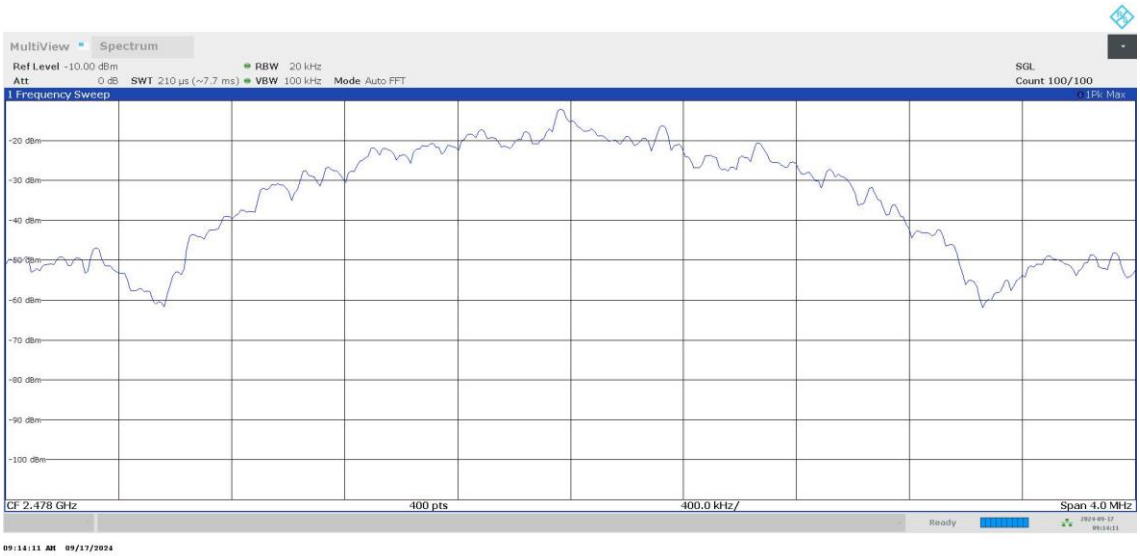


Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2478.00000 MIMO Mode = SISO

Images:





Modulation: Proximity

MIMO Mode: SISO

Results

Freq (MHz)	Occ Ch BW (MHz)
2402.00000	1.710
2440.00000	1.670
2480.00000	1.670

Verdict

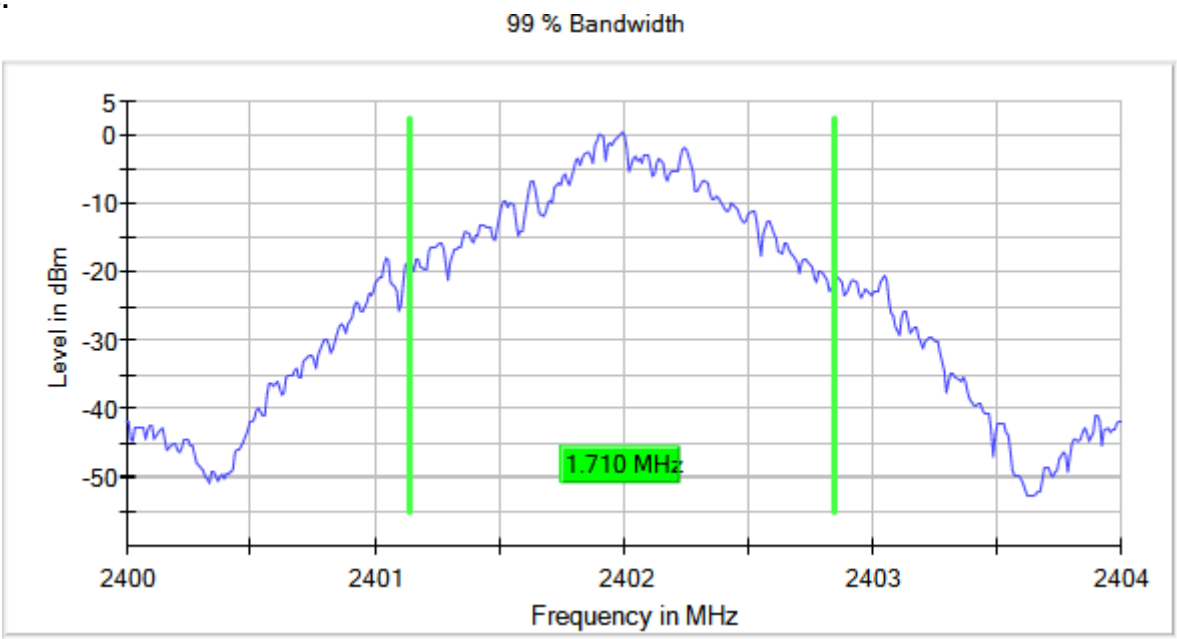
Pass

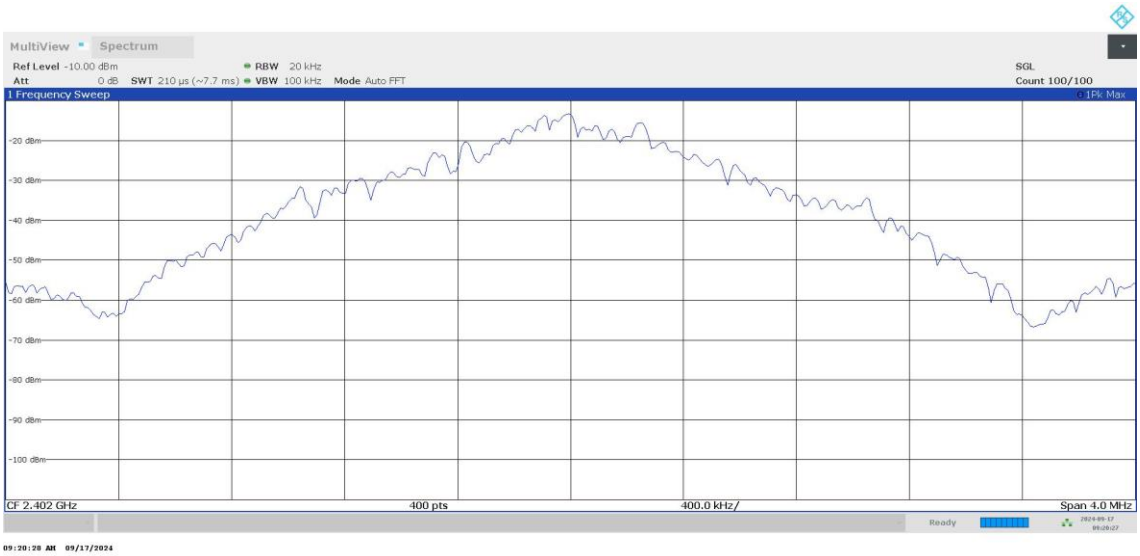
Attachments

Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2402.00000 MIMO Mode = SISO

Images:

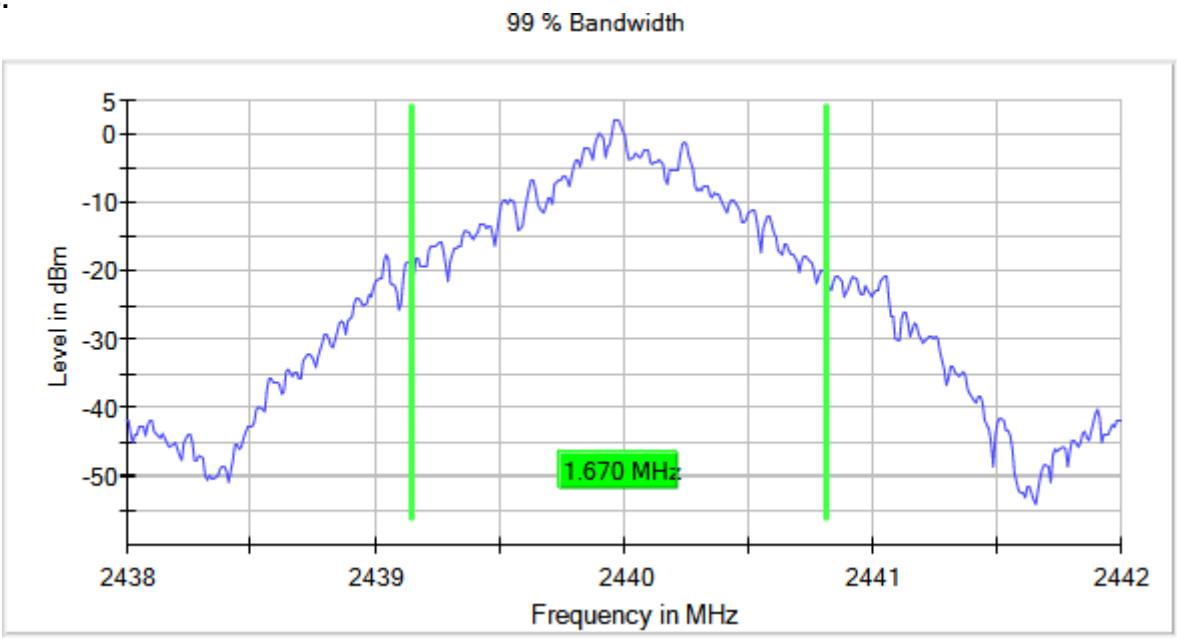


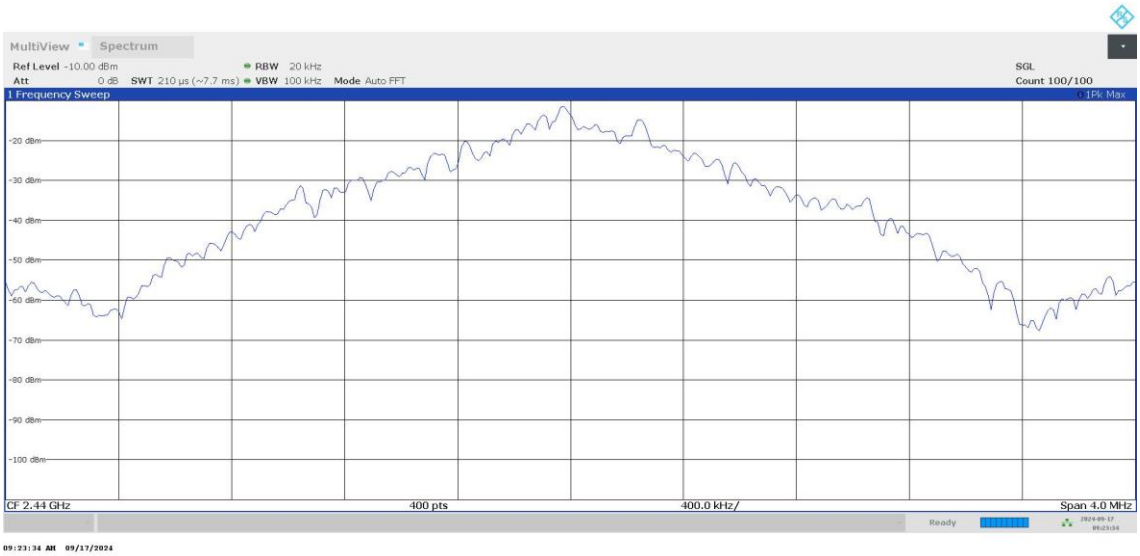


Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

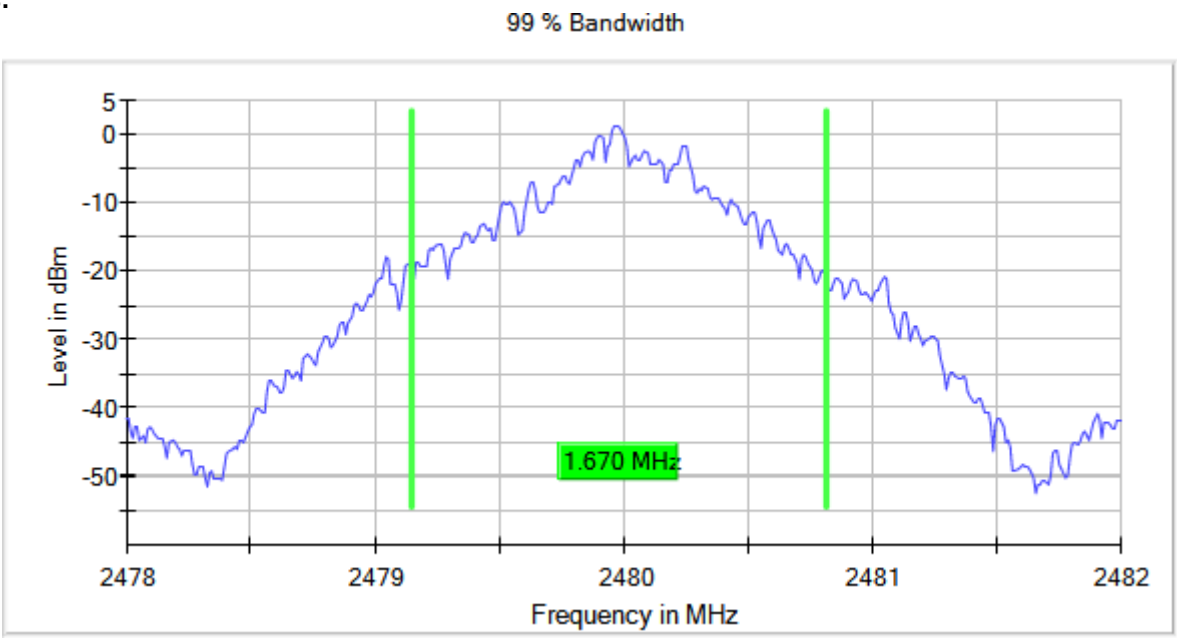


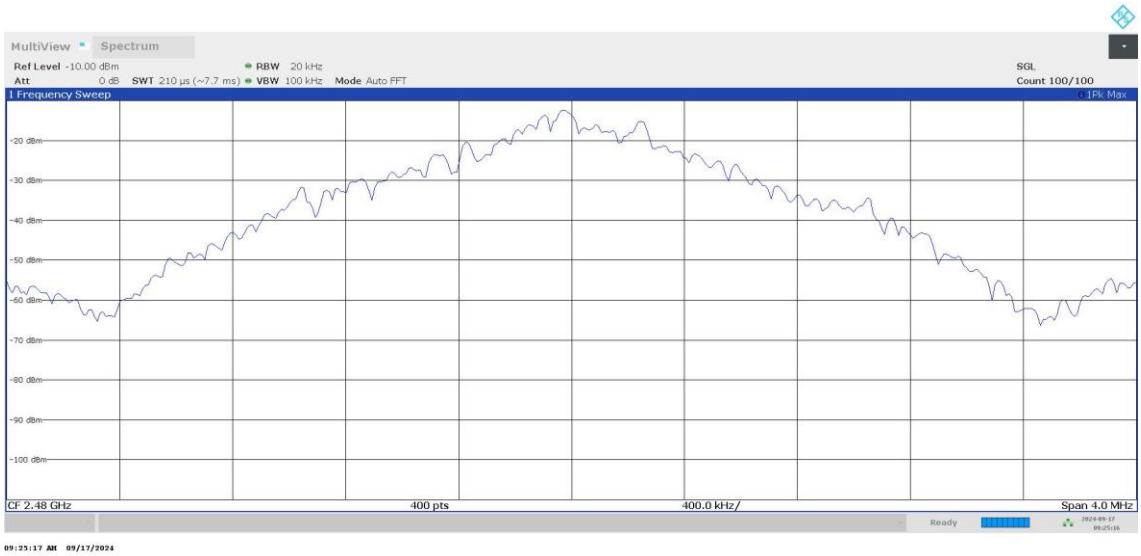


Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2480.00000 MIMO Mode = SISO

Images:





RSS-247 5.2 (a) / FCC 15.247 (a) (2) [6dBw] 6 dB Bandwidth

Limits

The minimum 6 dB bandwidth shall be at least 500 kHz.

Modulation: BTLE 5.4 (GFSK 1 Mbit/s)

MIMO Mode: SISO

Results

Freq (MHz)	Ebw (MHz)
2402.00000	0.752
2440.00000	0.713
2480.00000	0.772

Verdict

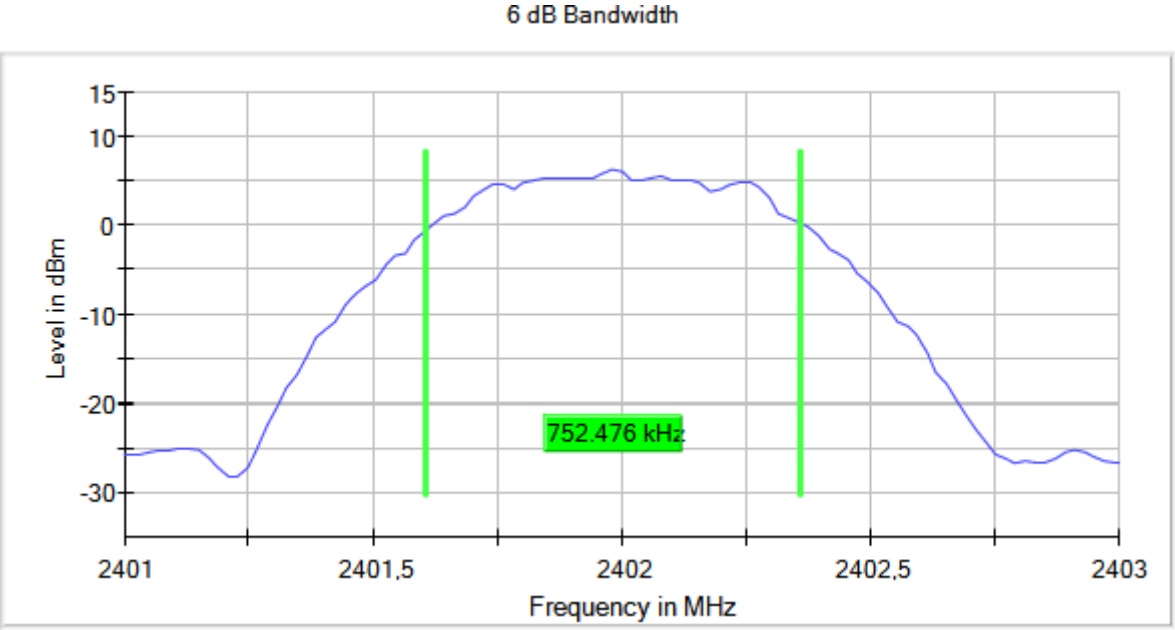
Pass

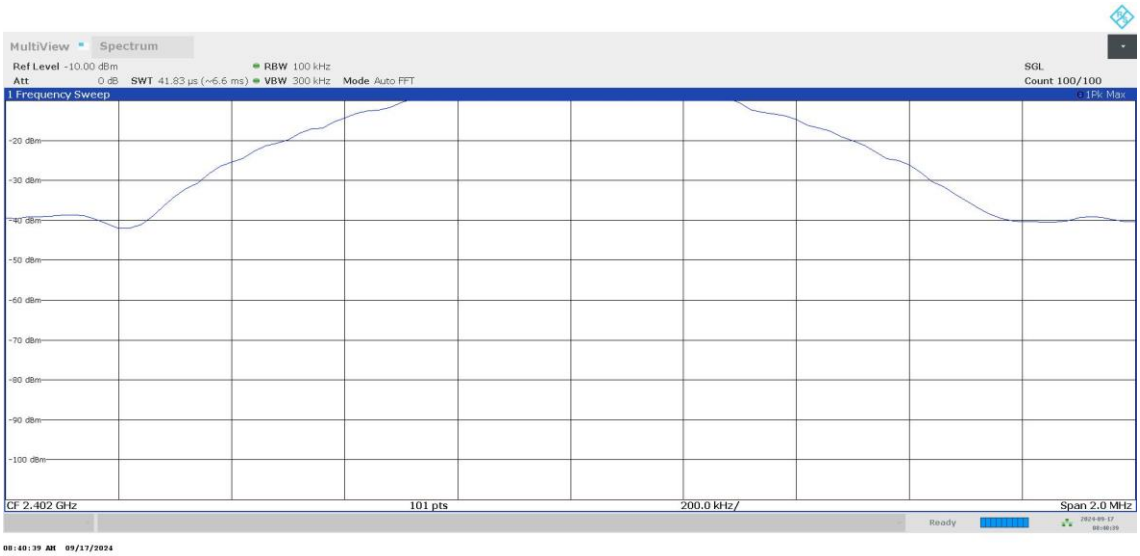
Attachments

Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2402.00000 MIMO Mode = SISO

Images:

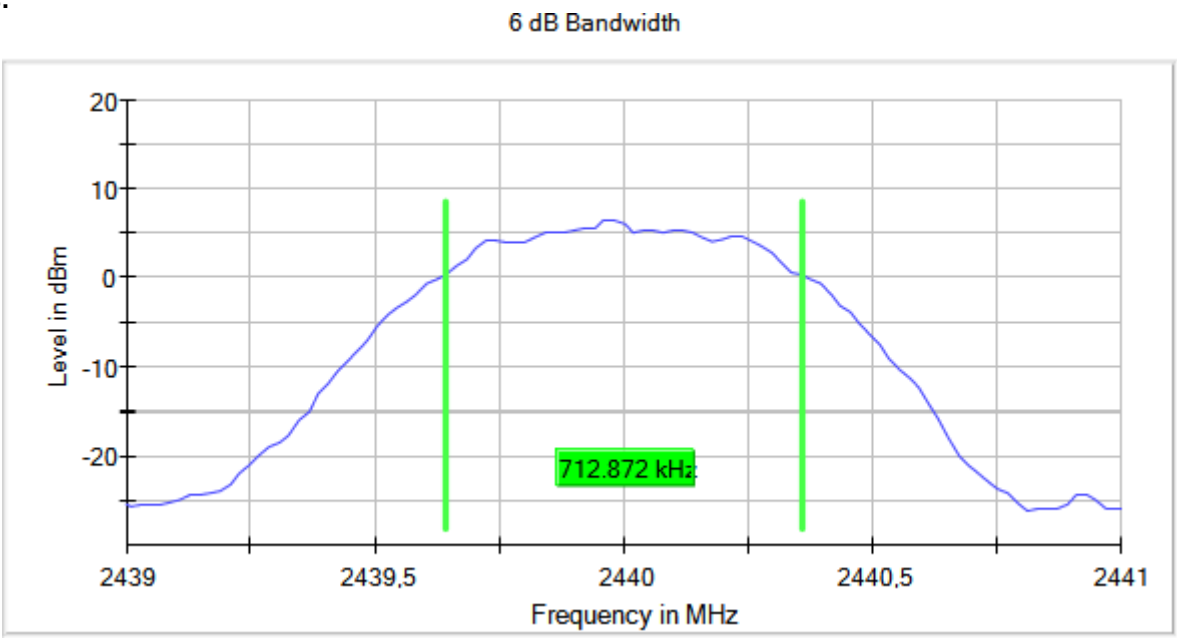


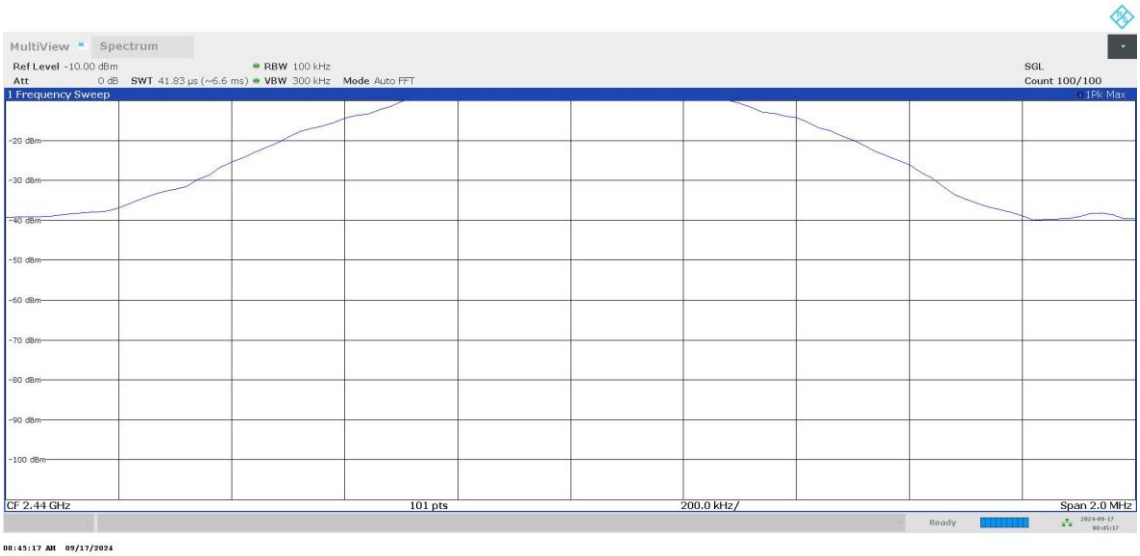


Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

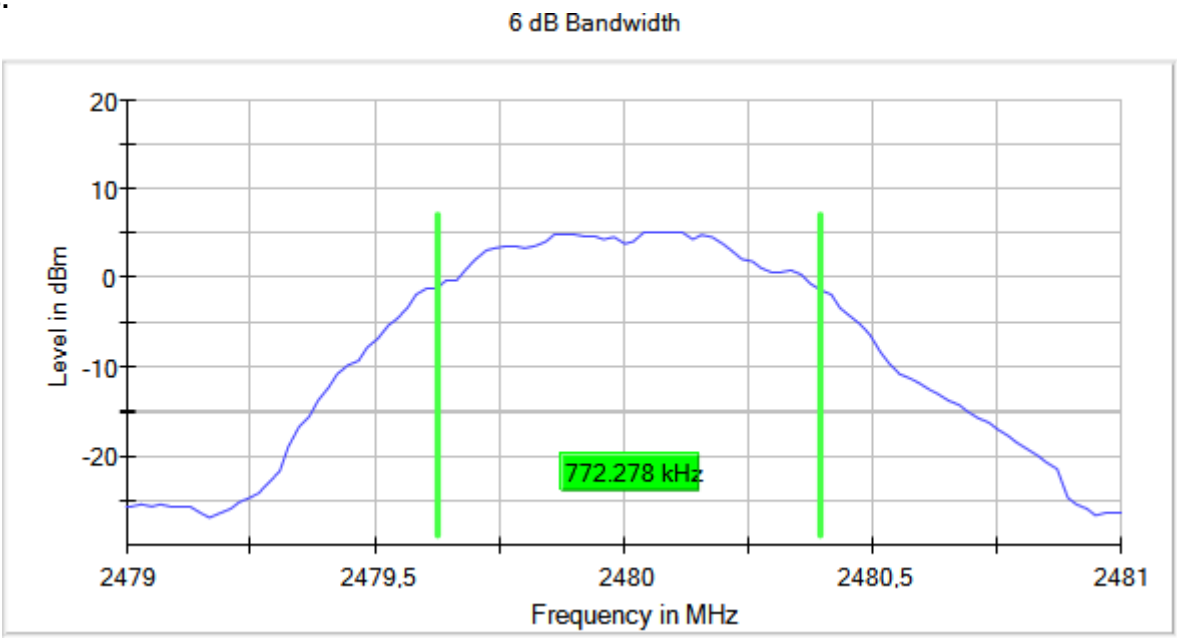


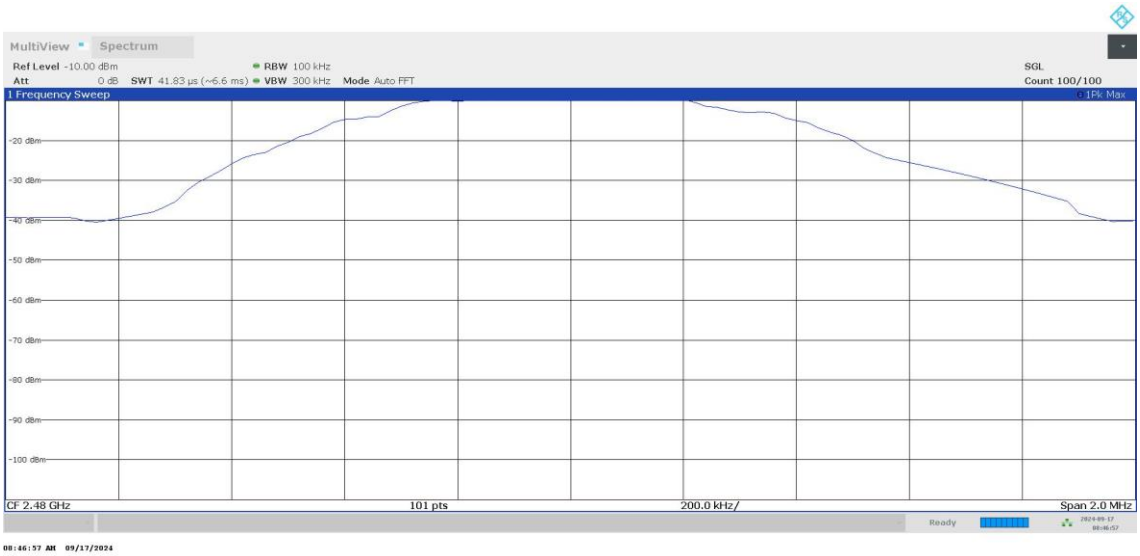


Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2480.00000 MIMO Mode = SISO

Images:





Modulation: BTLE 5.4 (GFSK 2 Mbit/s)

MIMO Mode: SISO

Results

Freq (MHz)	Ebw (MHz)
2404.00000	1.307
2440.00000	1.030
2478.00000	0.950

Verdict

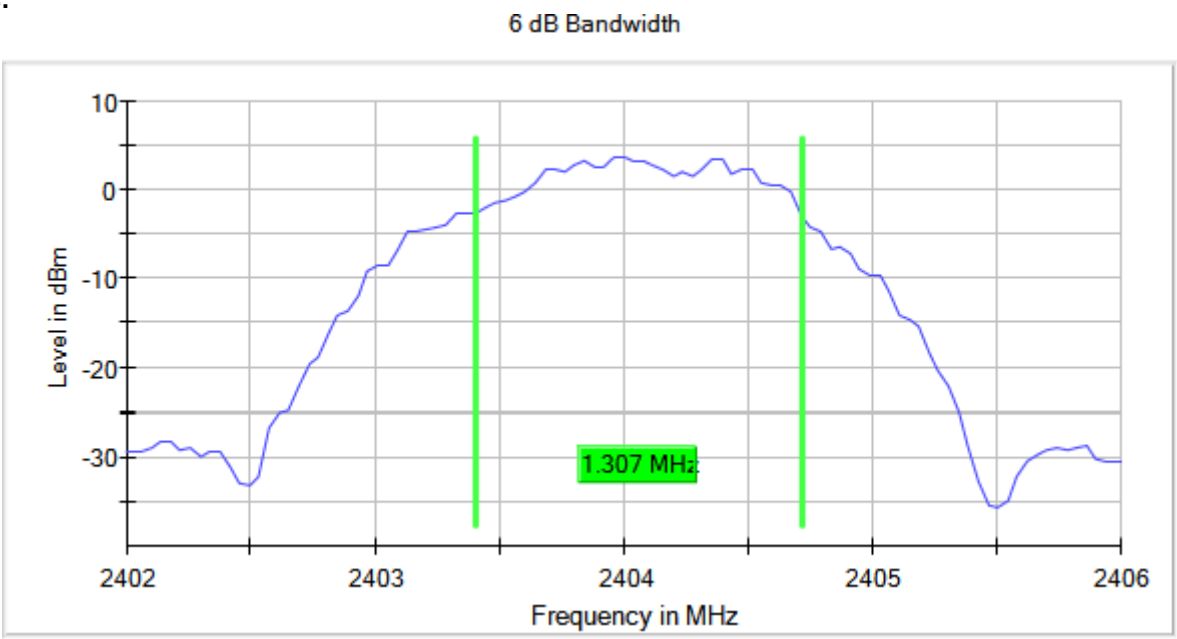
Pass

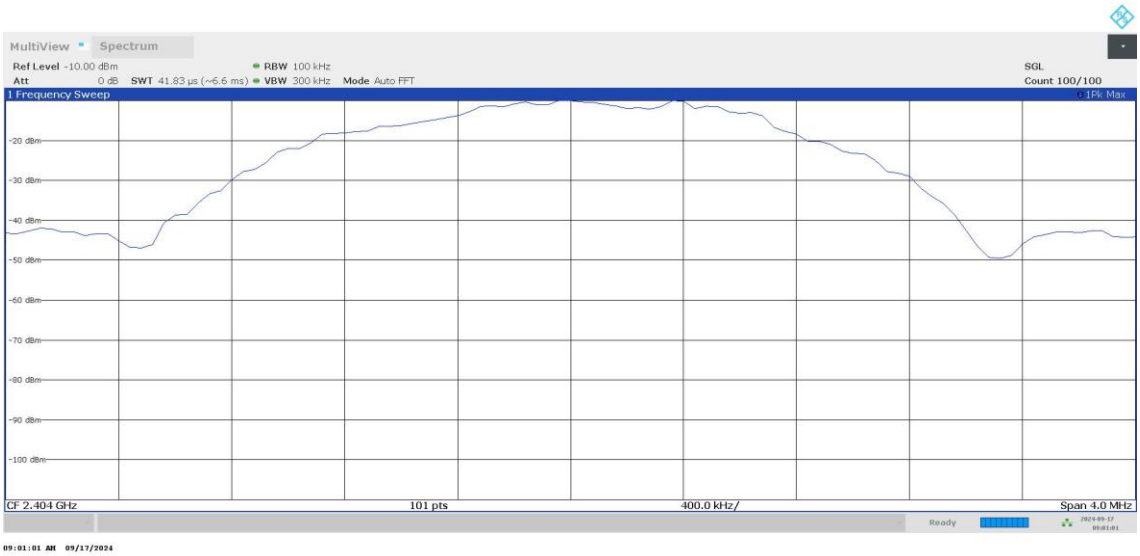
Attachments

Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2404.00000 MIMO Mode = SISO

Images:

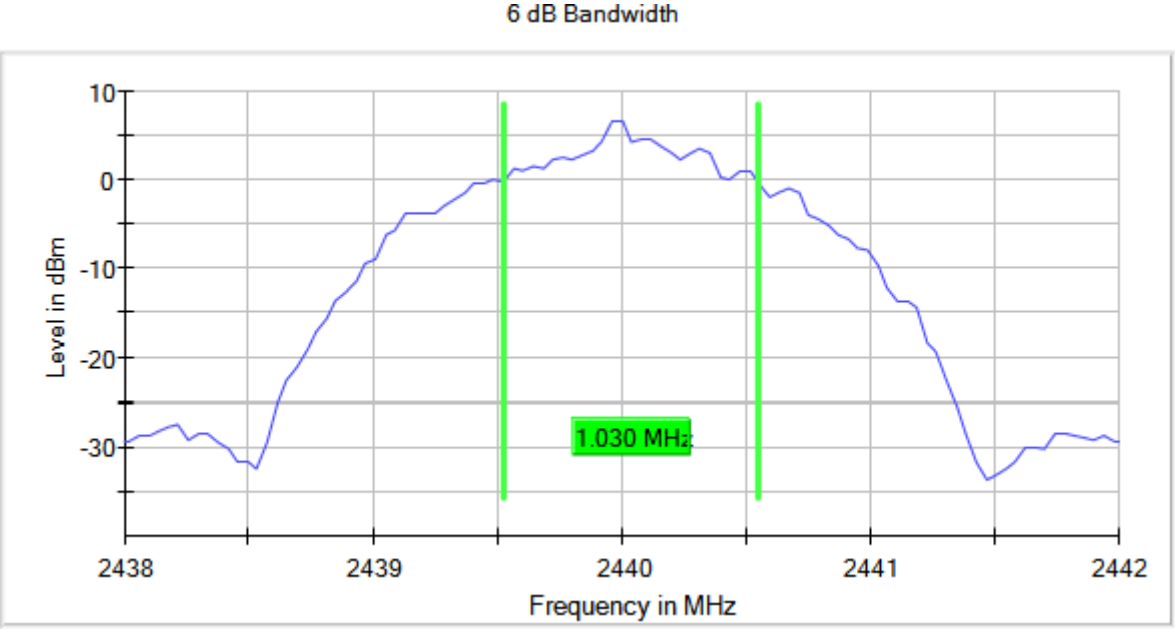


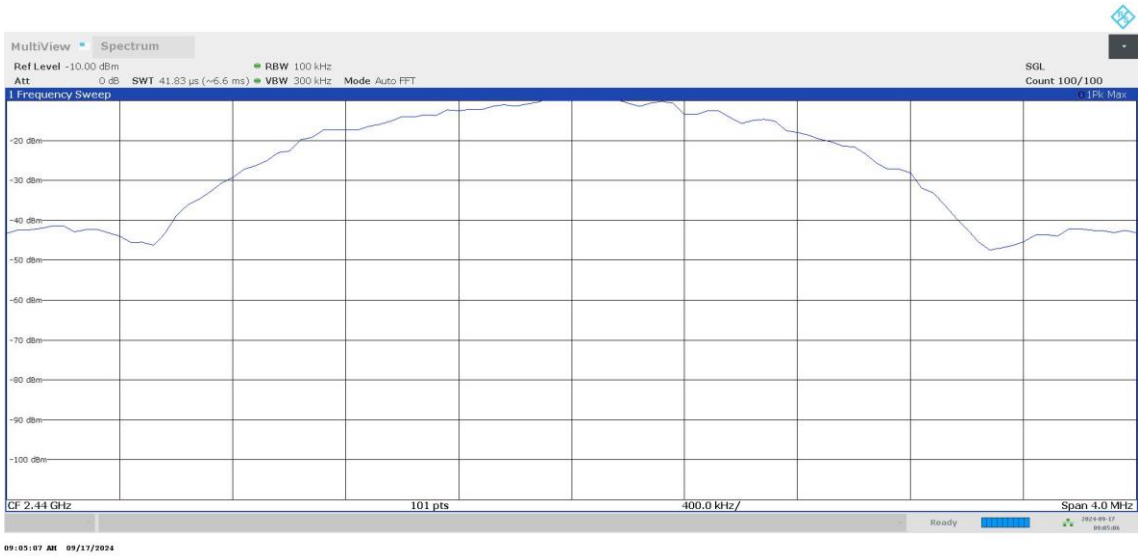


Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

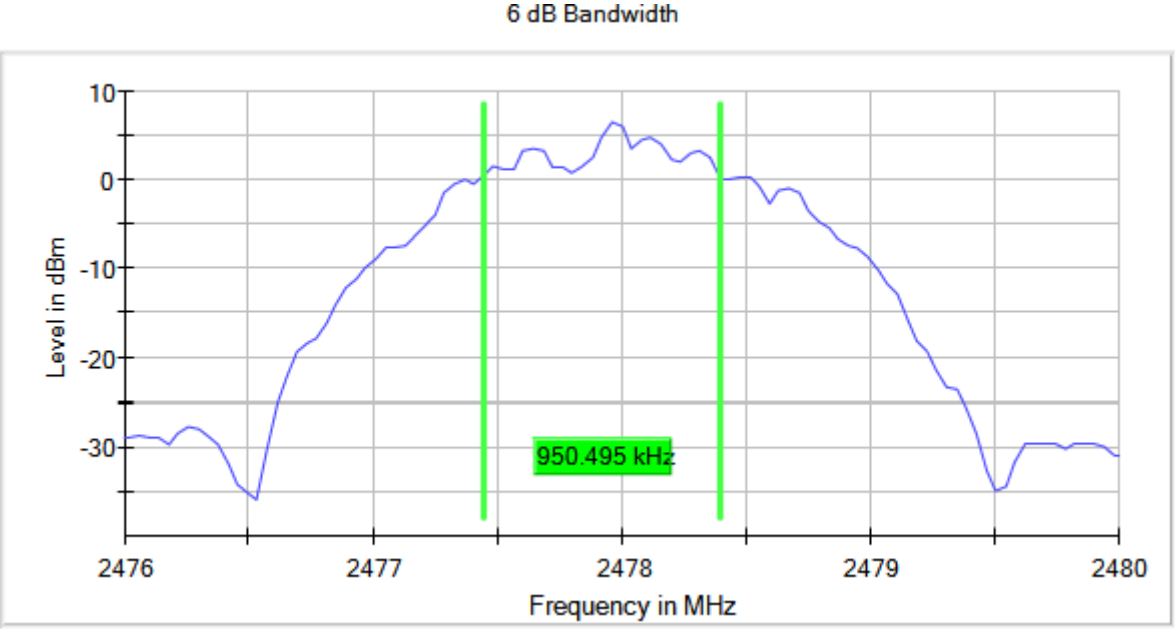


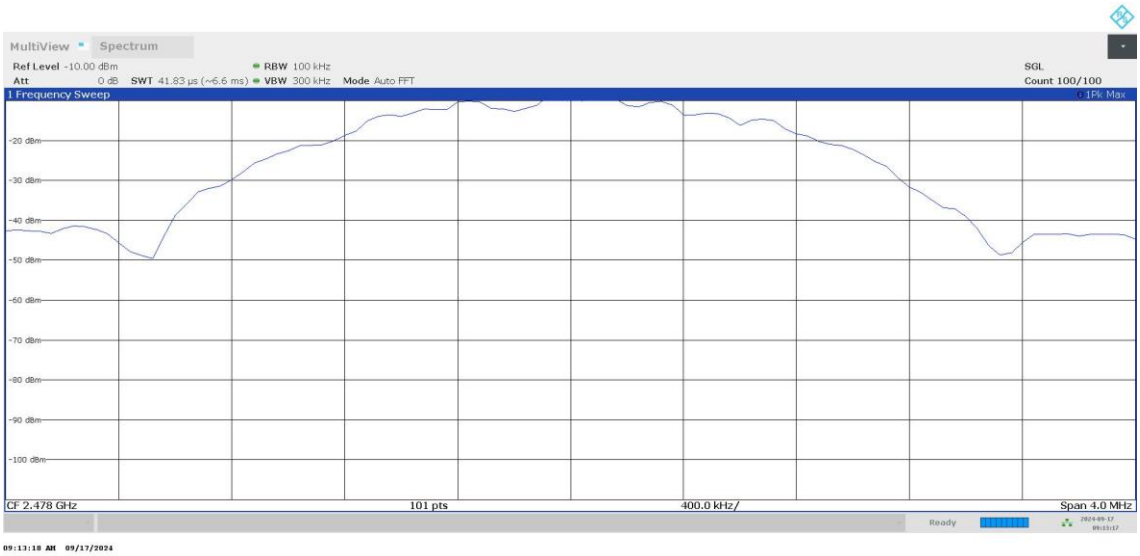


Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2478.00000 MIMO Mode = SISO

Images:





Modulation: Proximity

MIMO Mode: SISO

Results

Freq (MHz)	Ebw (MHz)
2402.00000	0.594
2440.00000	0.871
2480.00000	0.673

Verdict

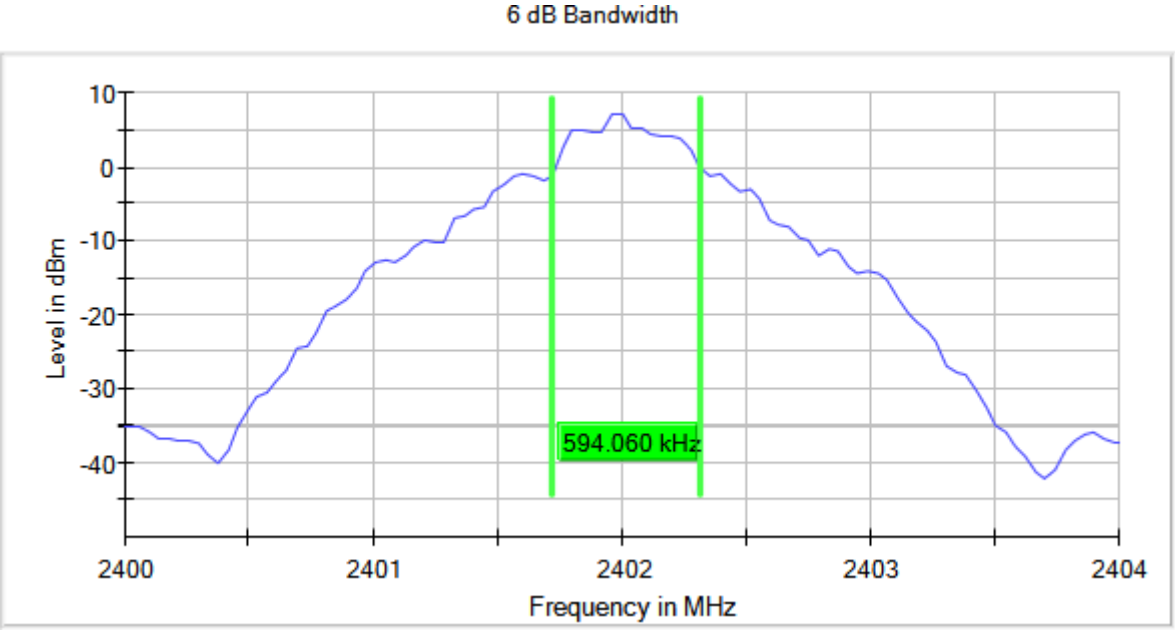
Pass

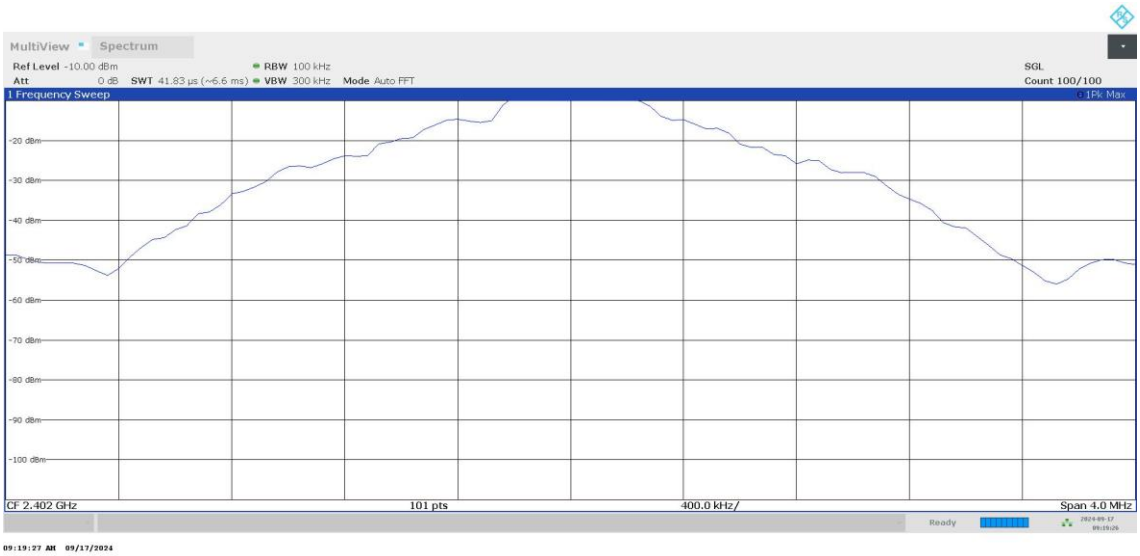
Attachments

Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2402.00000 MIMO Mode = SISO

Images:

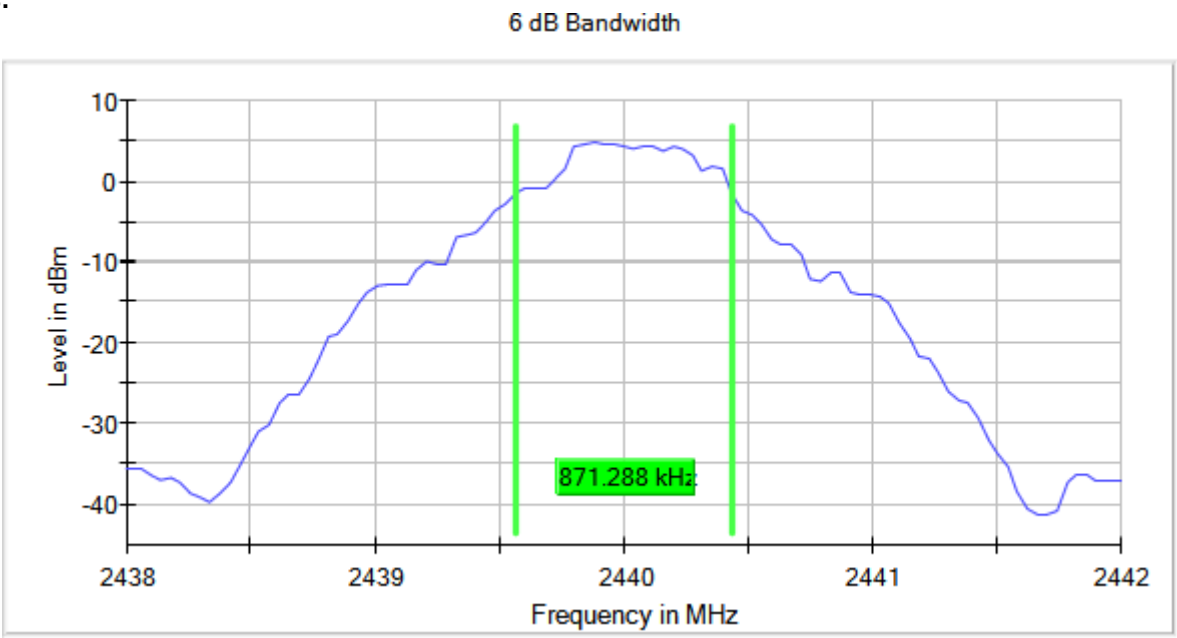


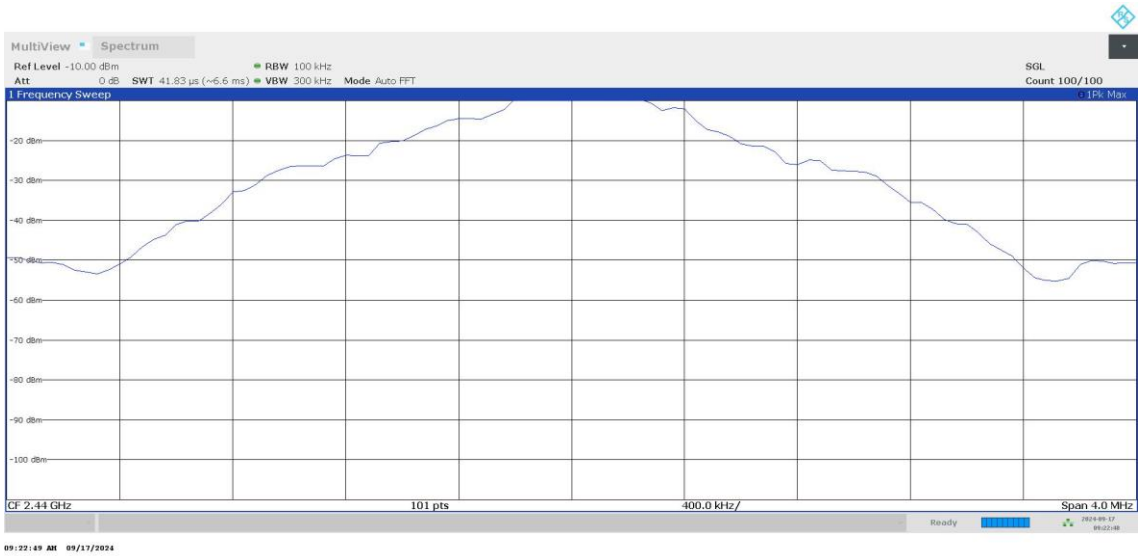


Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

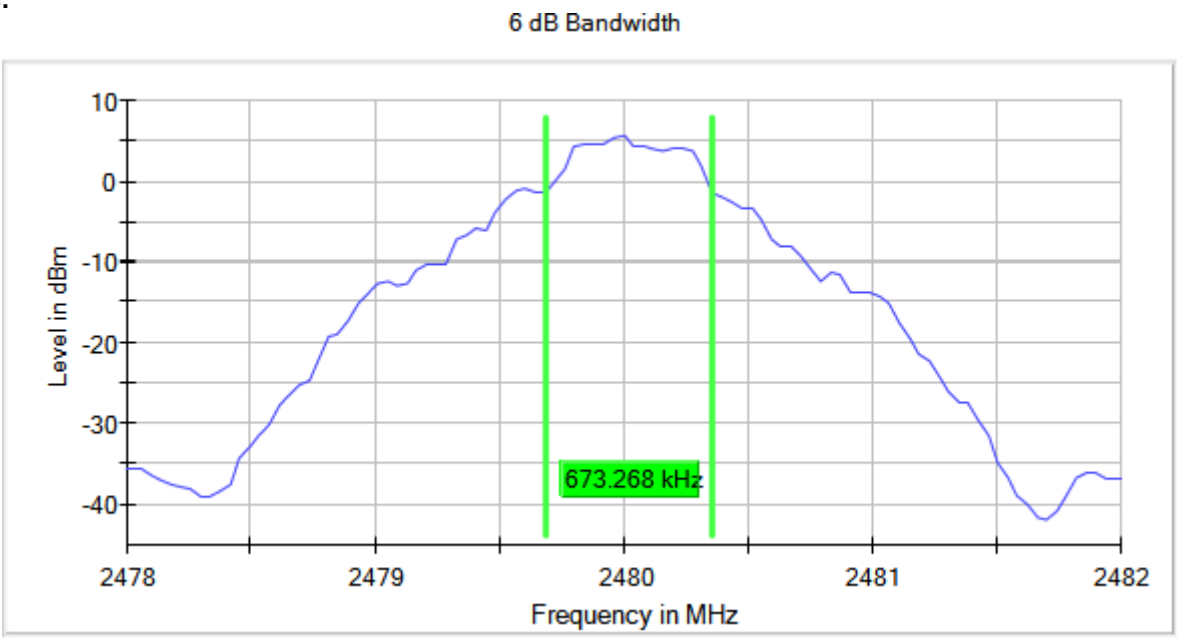


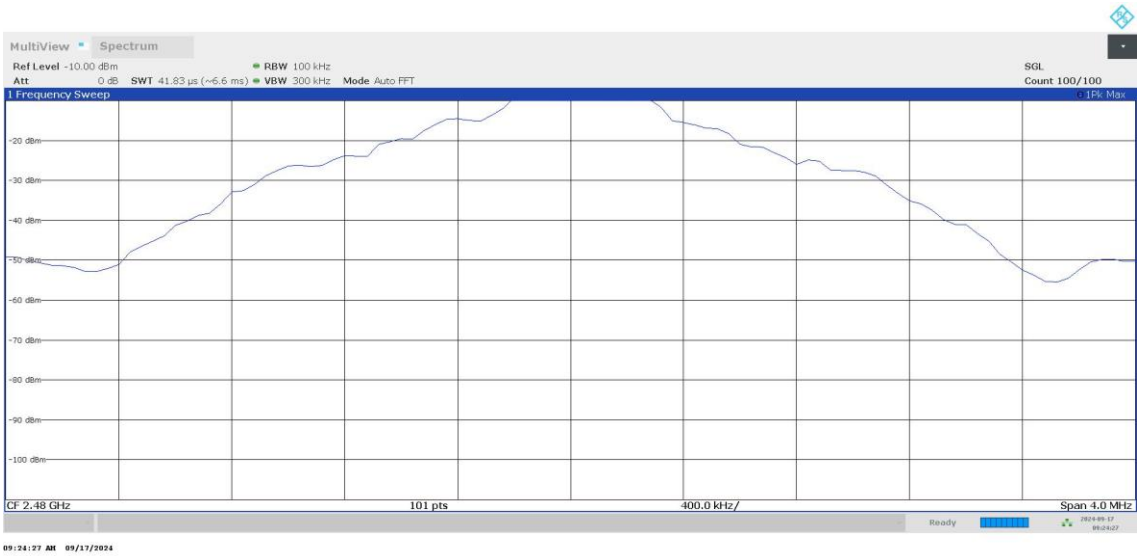


Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2480.00000 MIMO Mode = SISO

Images:





RSS-247 5.2 (b) / FCC 15.247 (e) [Psd] Power spectral density

Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Modulation: BTLE 5.4 (GFSK 1 Mbit/s)

MIMO Mode: SISO

Results

Freq (MHz)	PSD (dBm)
2402.00000	-0.49
2440.00000	-0.18
2480.00000	-0.45

Verdict

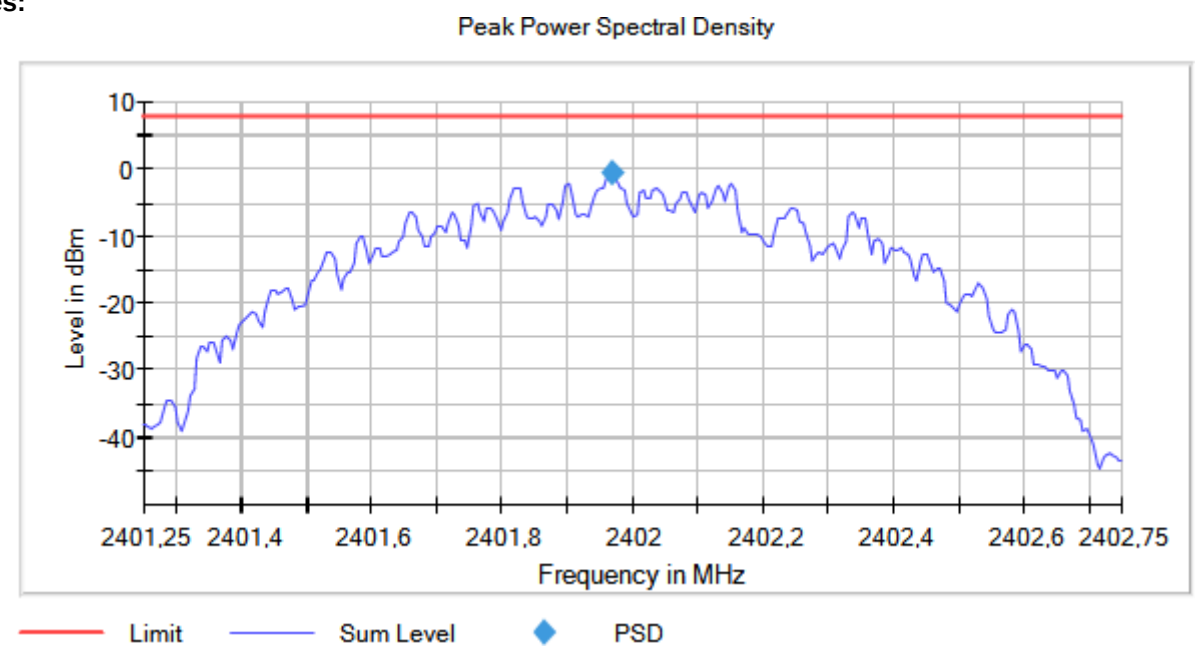
Pass

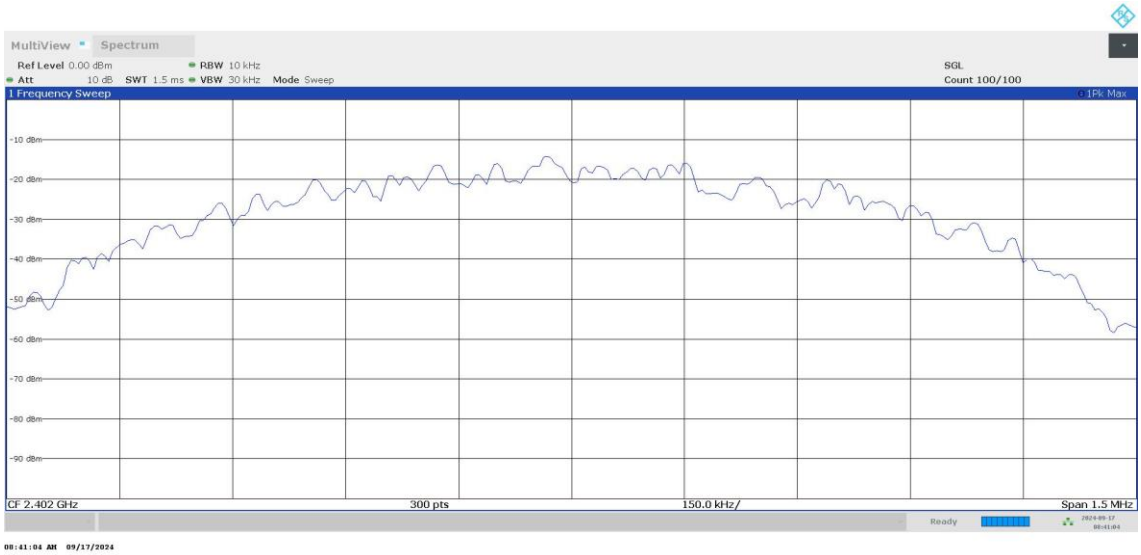
Attachments

Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2402.00000 MIMO Mode = SISO

Images:

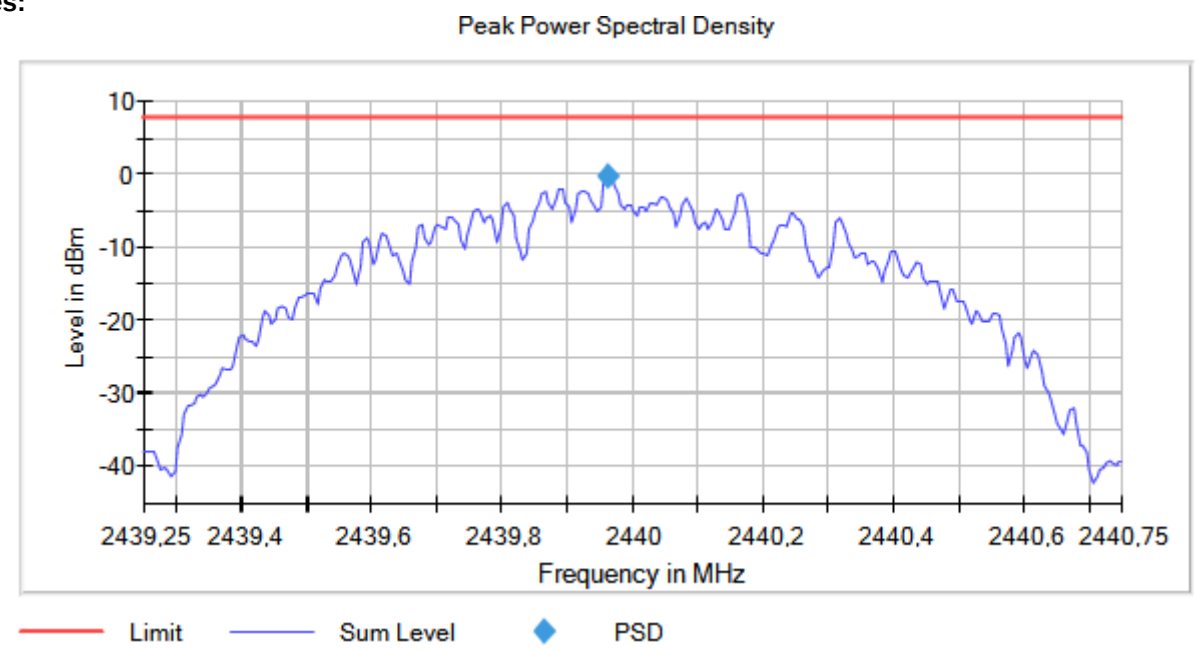


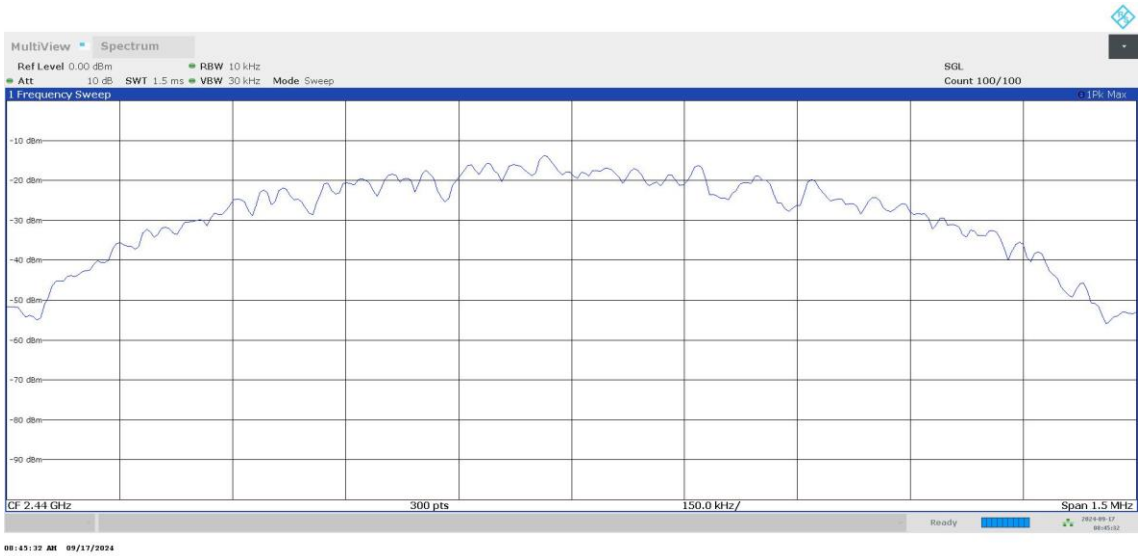


Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

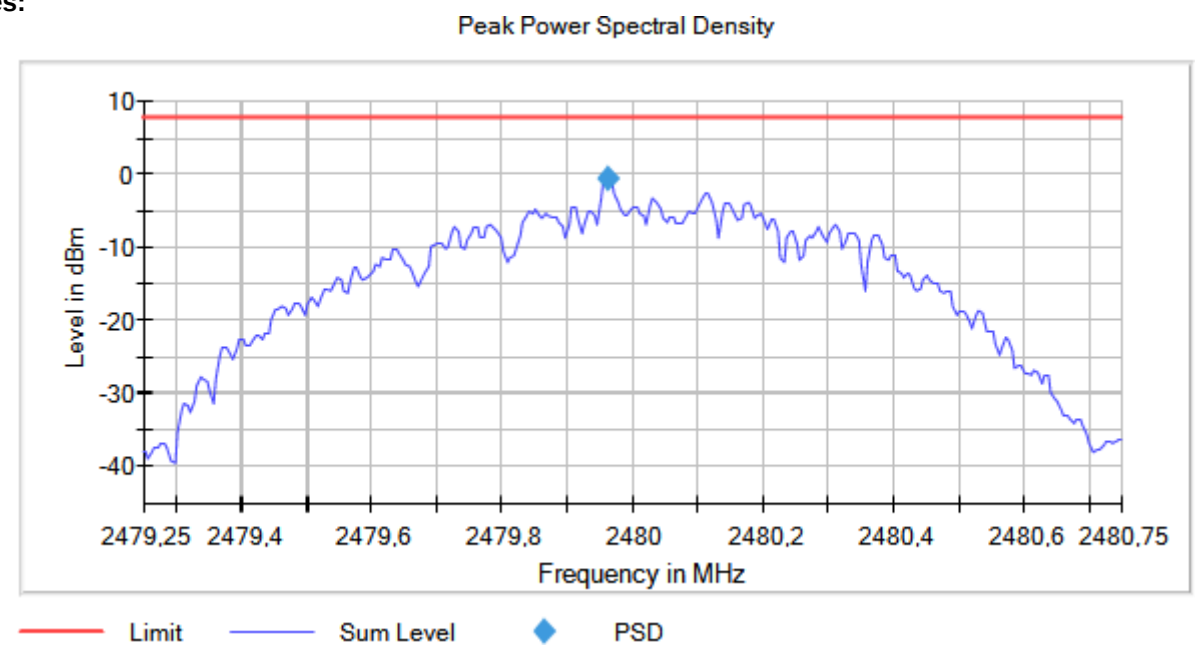


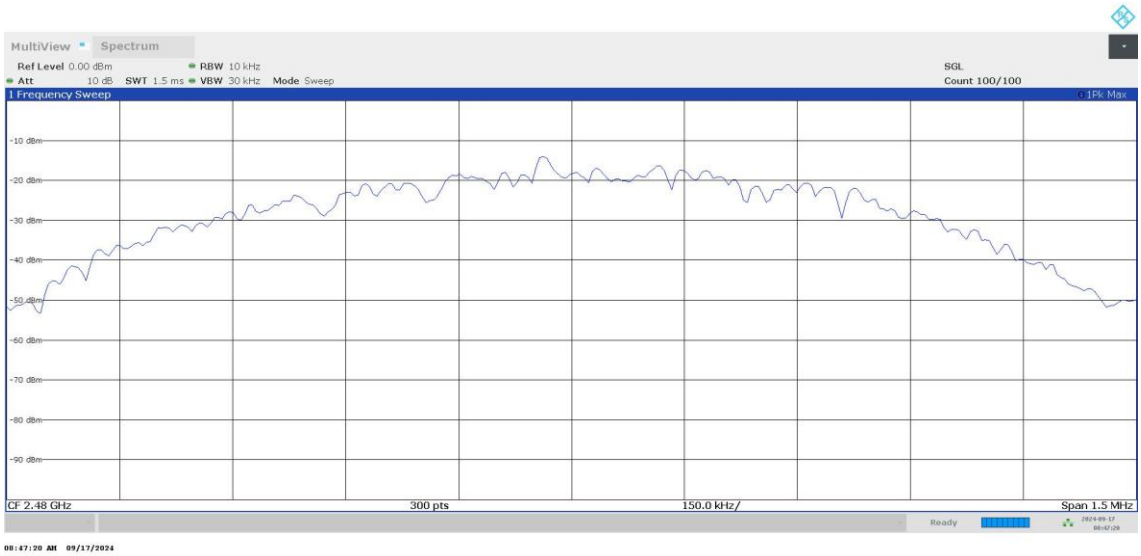


Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2480.00000 MIMO Mode = SISO

Images:





Modulation: BTLE 5.4 (GFSK 2 Mbit/s)

MIMO Mode: SISO

Results

Freq (MHz)	PSD (dBm)
2404.00000	-1.09
2440.00000	-2.10
2478.00000	-2.60

Verdict

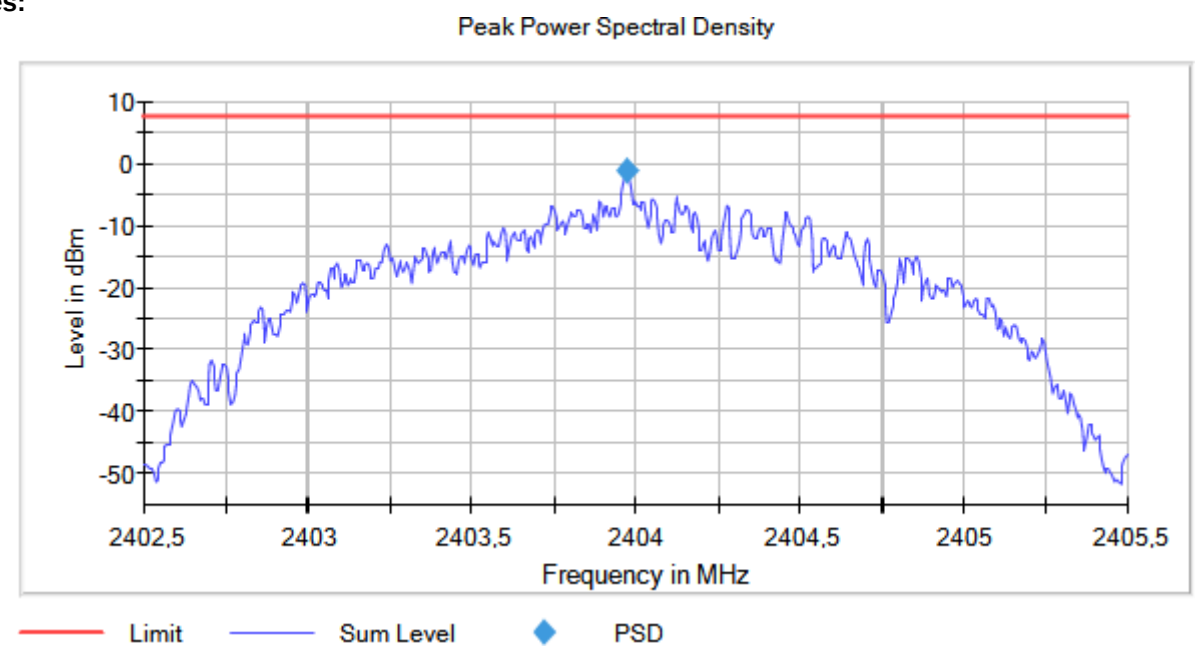
Pass

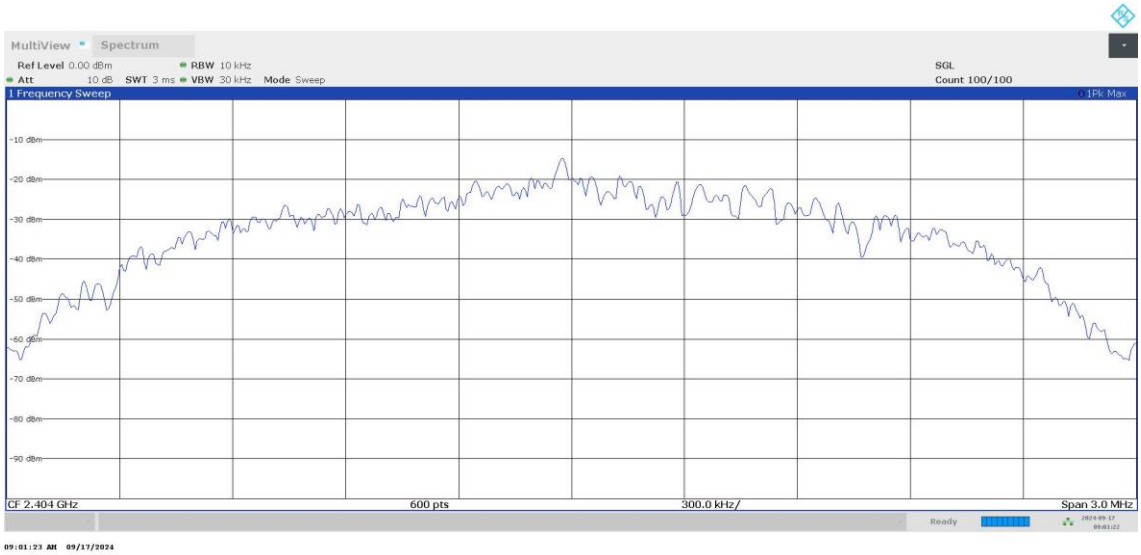
Attachments

Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2404.00000 MIMO Mode = SISO

Images:

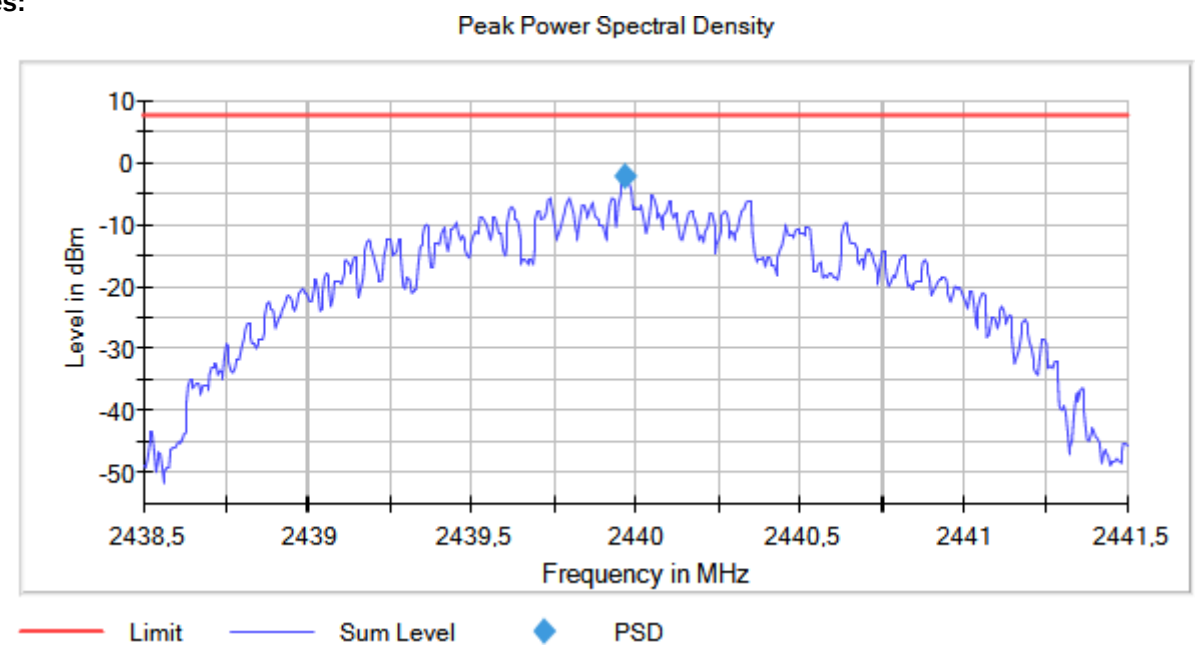


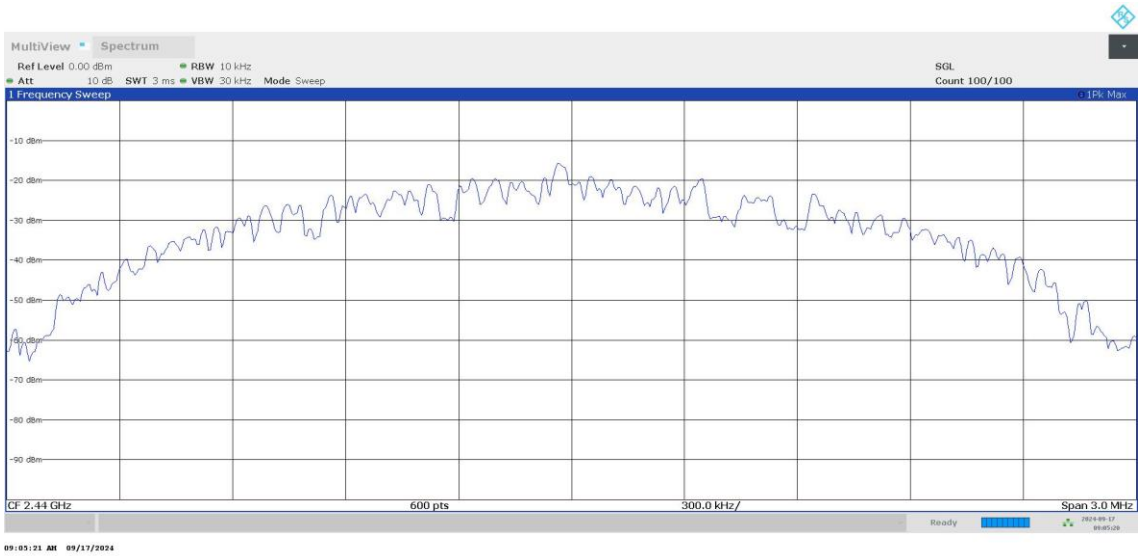


Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

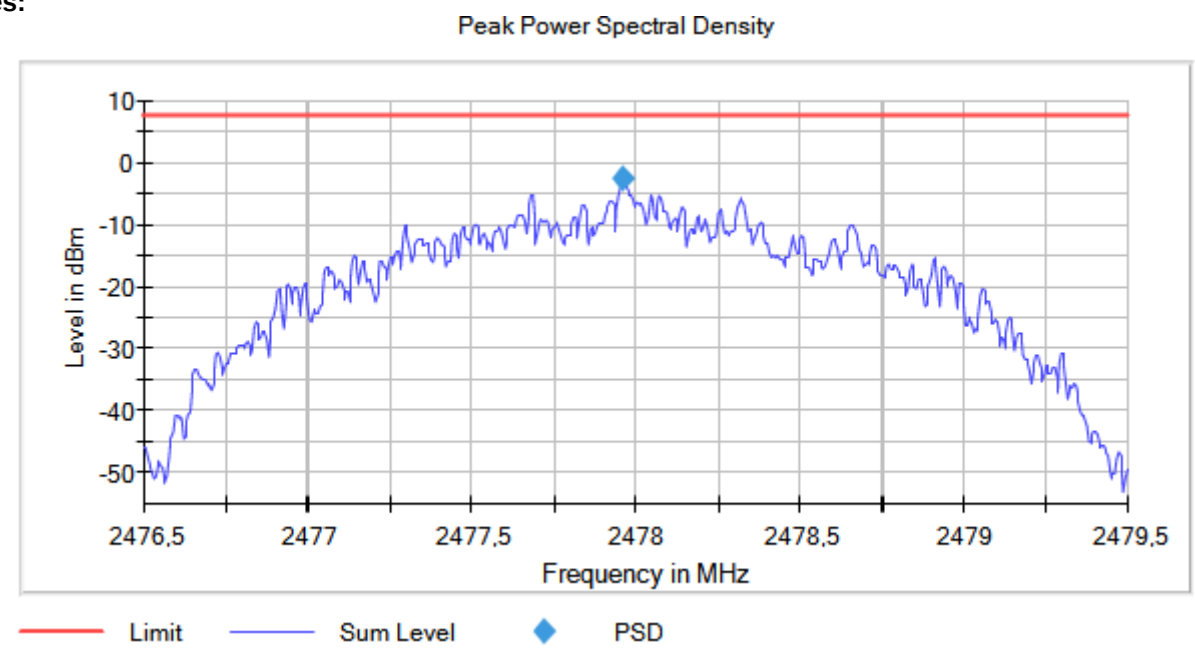


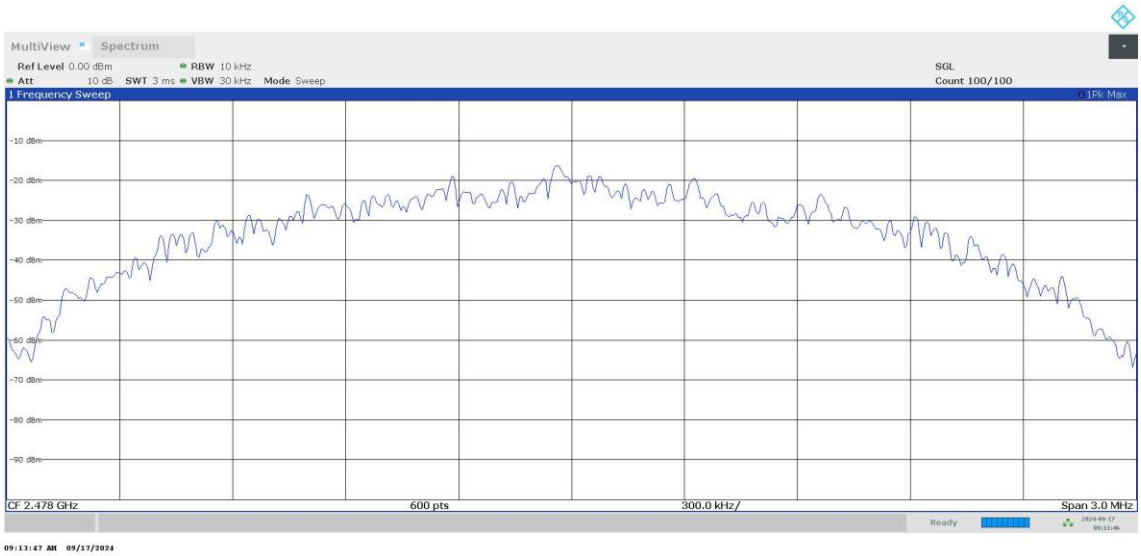


Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2478.00000 MIMO Mode = SISO

Images:





Modulation: Proximity

MIMO Mode: SISO

Results

Freq (MHz)	PSD (dBm)
2402.00000	-2.30
2440.00000	-2.27
2480.00000	-2.37

Verdict

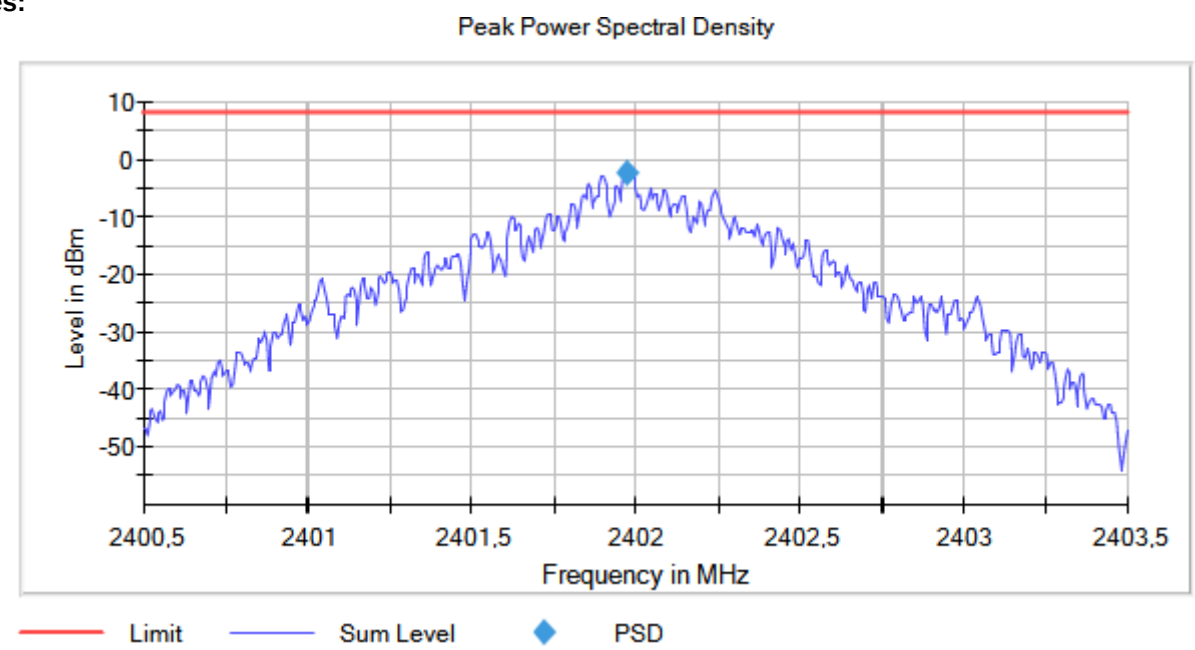
Pass

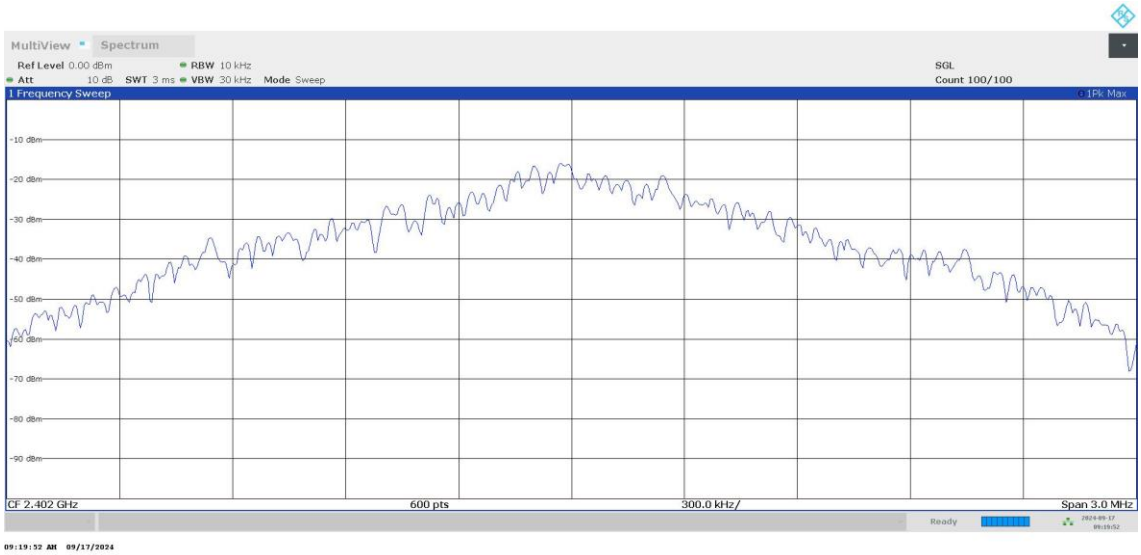
Attachments

Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2402.00000 MIMO Mode = SISO

Images:

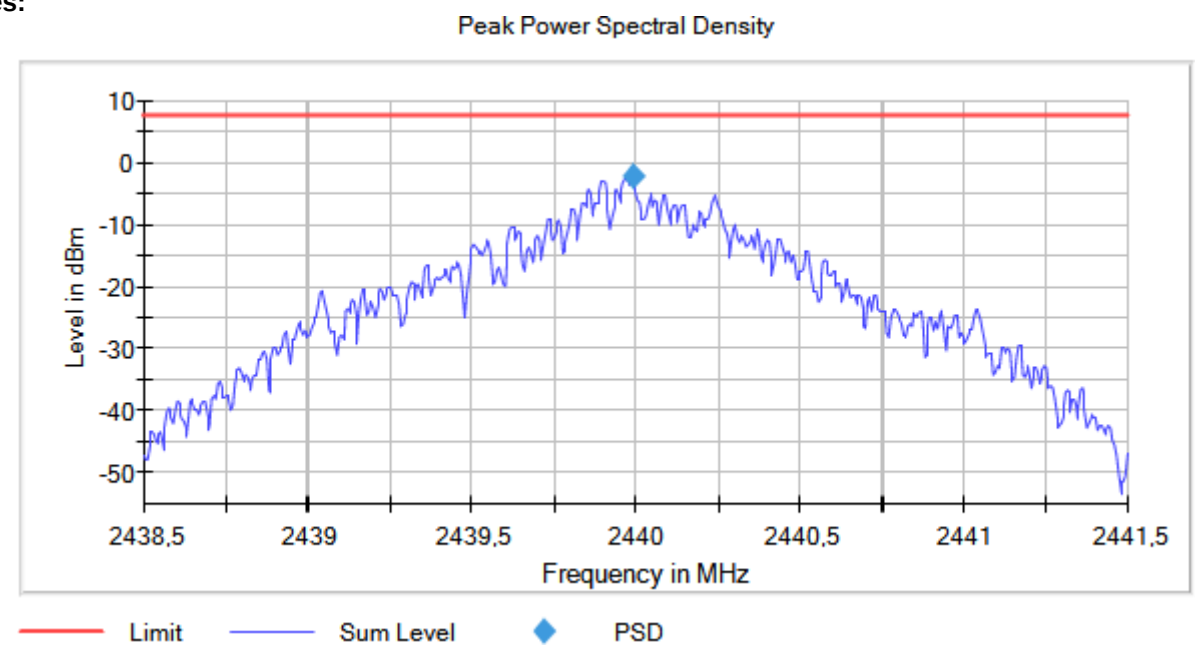


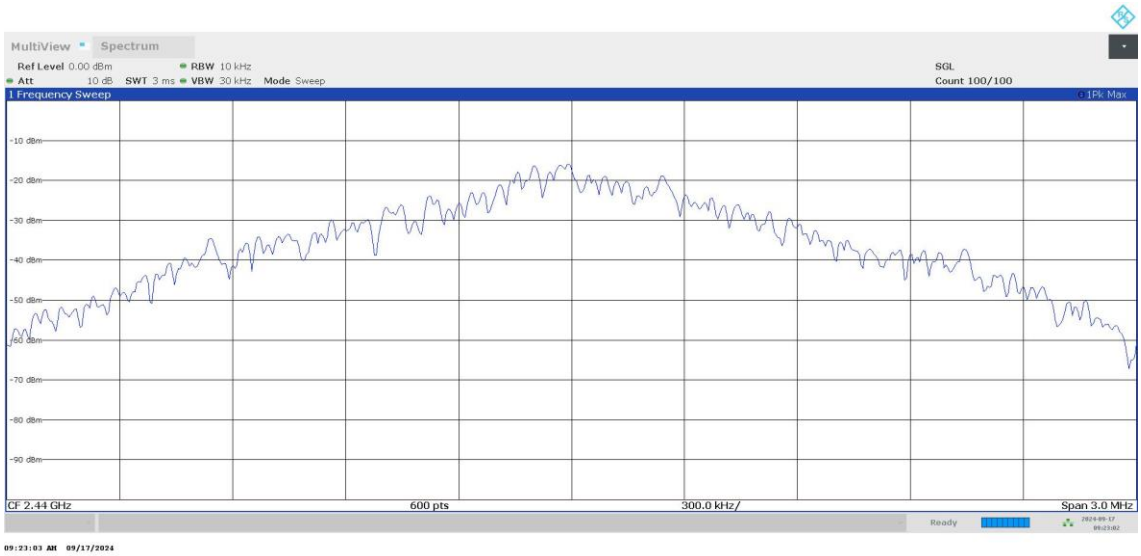


Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

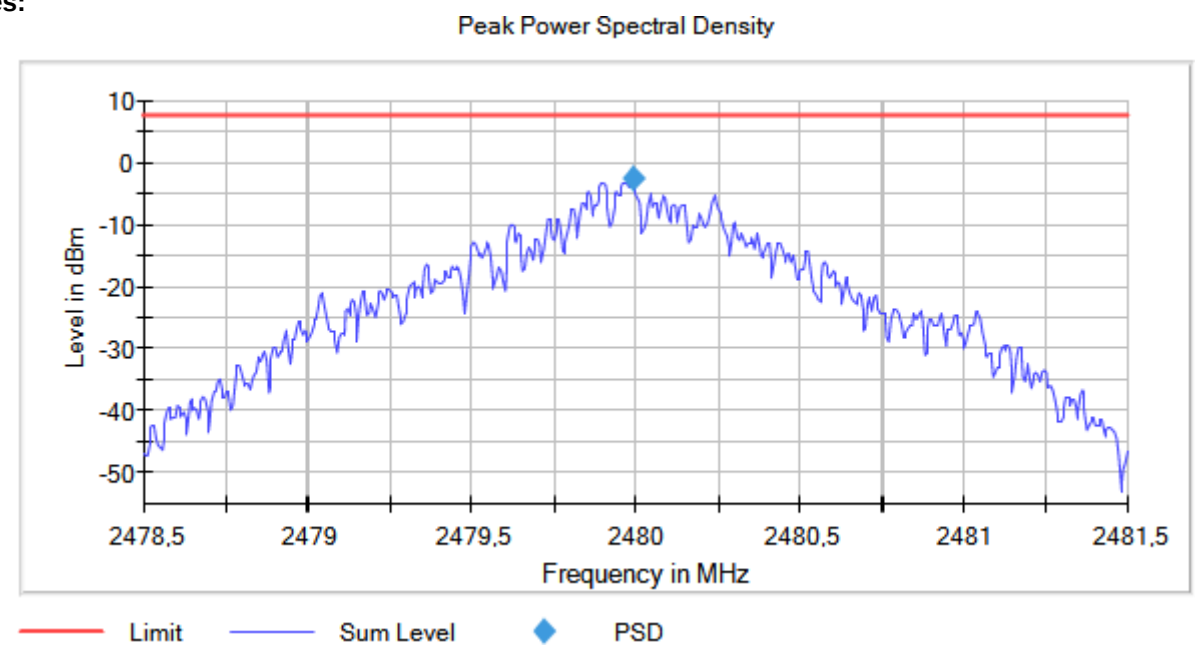


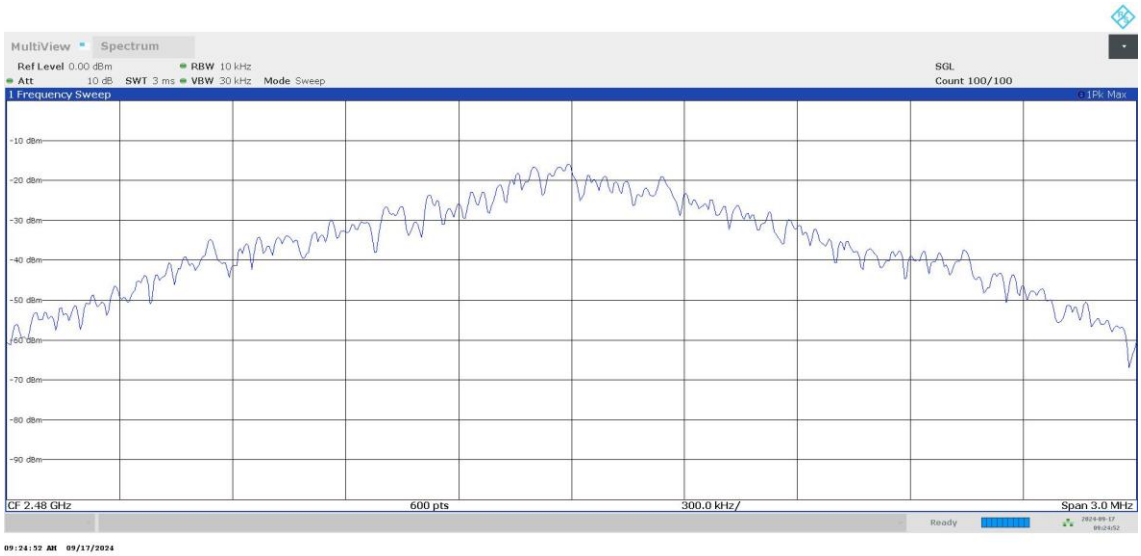


Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2480.00000 MIMO Mode = SISO

Images:





RSS-247 5.4 (d) / FCC 15.247 (b) (3) [Pkcp] Maximum Peak Conducted output power

Limits

For systems using digital modulation in the 2400-2483.5 MHz band: 1 watt (30 dBm).

The e.i.r.p. shall not exceed 4 W (36 dBm) (Canada).

The maximum peak conducted output power level in the fundamental emission was measured using the method according to point 11.9.1.1 ”RBW ≥ DTS bandwidth” of ANSI C.63.10-2013.

Modulation: BTLE 5.4 (GFSK 1 Mbit/s)

MIMO Mode: SISO

Results

Freq (MHz)	Peak Power (dBm)	Peak Power E.I.R.P (dBm)
2402.00000	7.3230	-8.677
2440.00000	7.5110	-8.489
2480.00000	7.1800	-8.820

Verdict

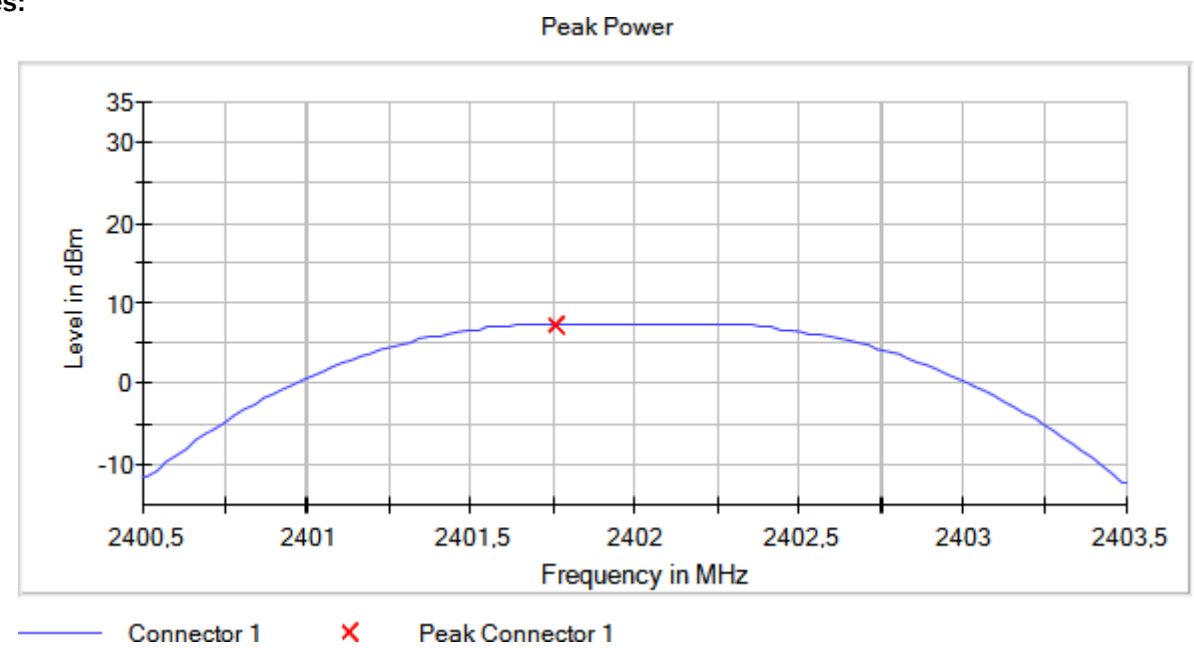
Pass

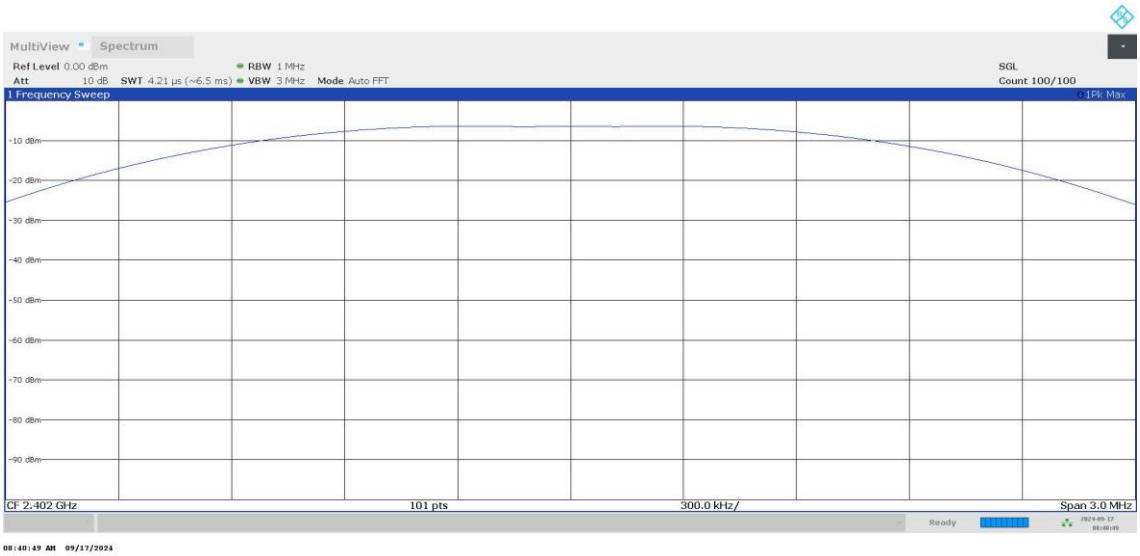
Attachments

Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2402.00000 MIMO Mode = SISO

Images:

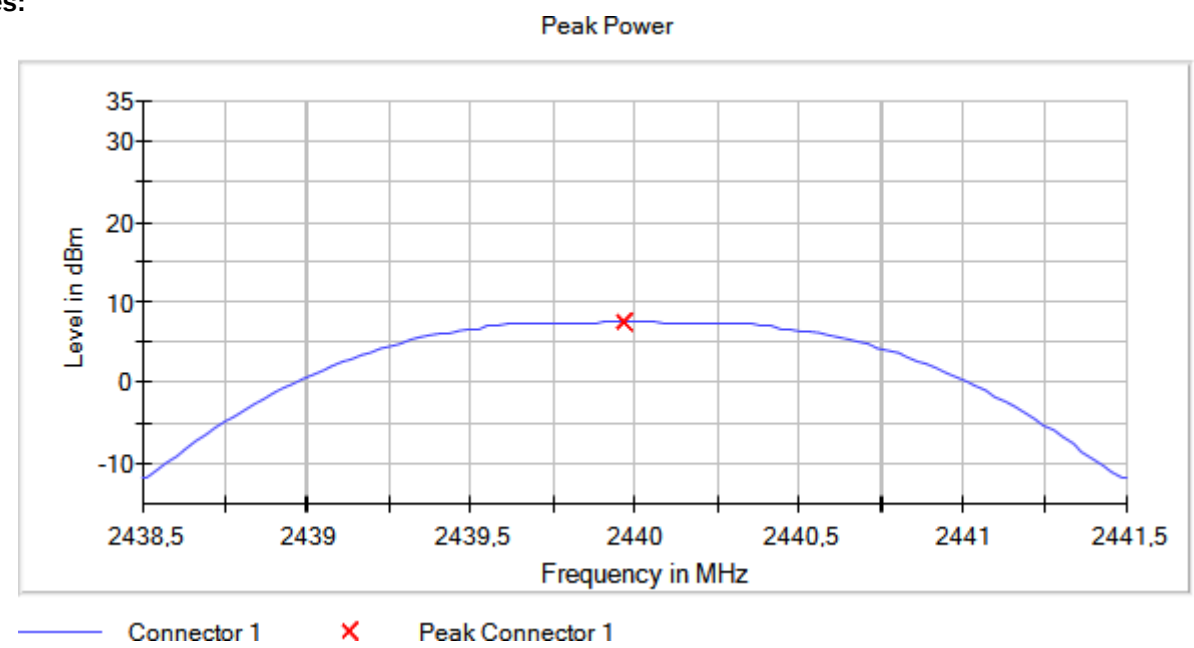


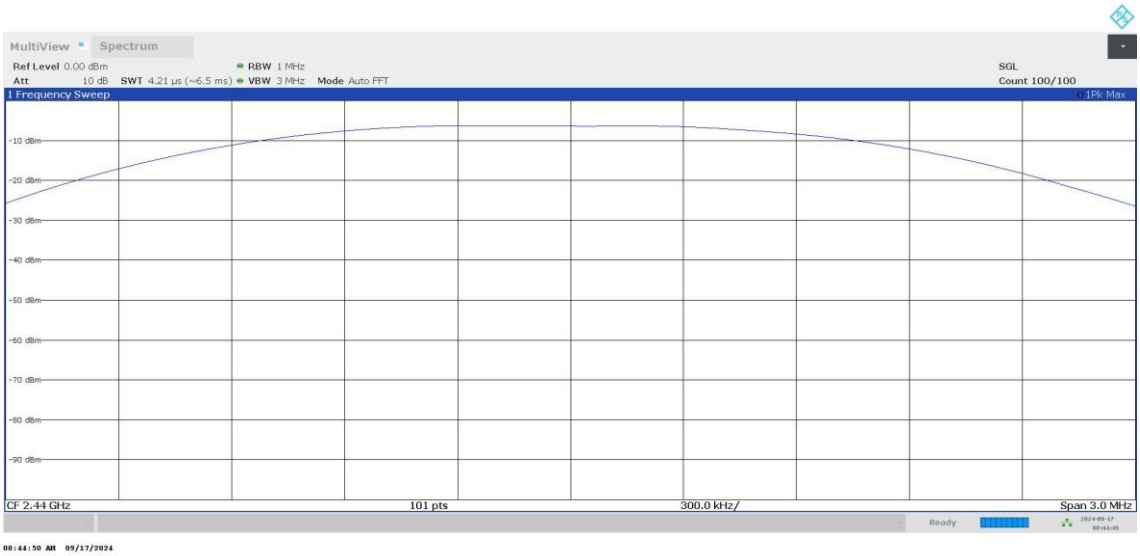


Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

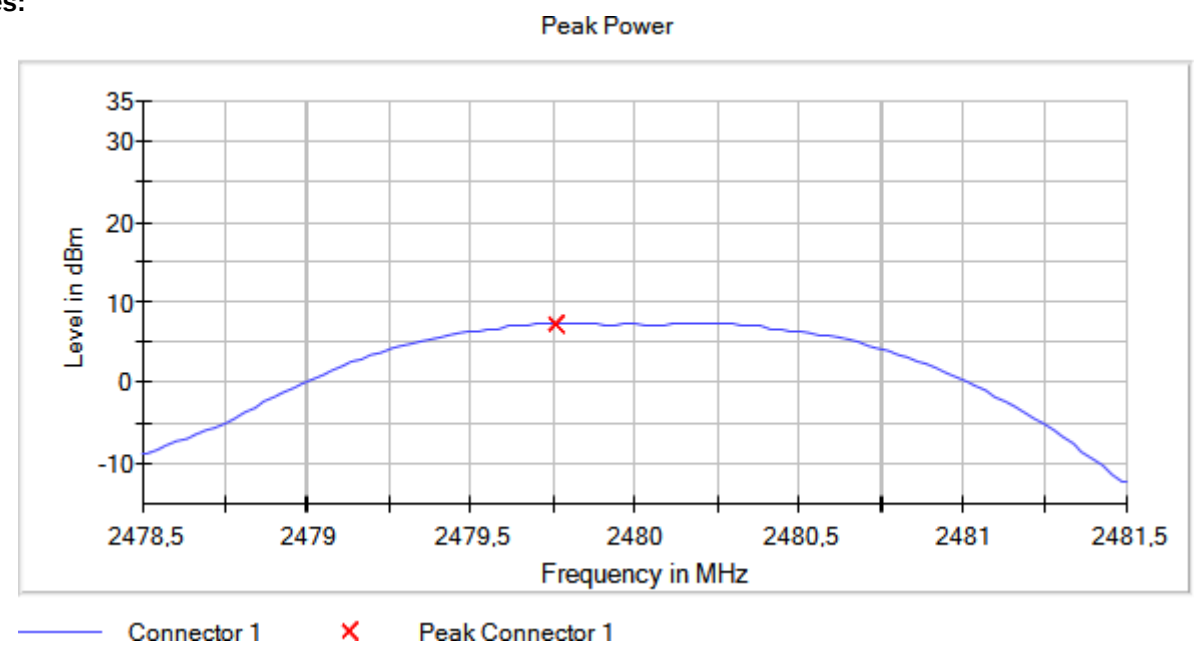


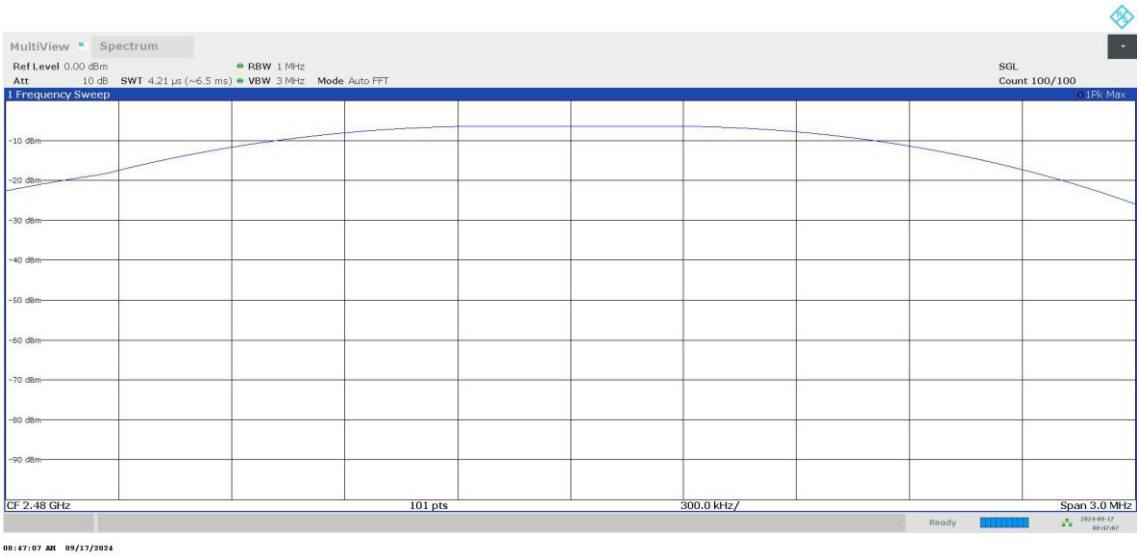


Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2480.00000 MIMO Mode = SISO

Images:





Modulation: BTLE 5.4 (GFSK 2 Mbit/s)

MIMO Mode: SISO

Results

Freq (MHz)	Peak Power (dBm)	Peak Power E.I.R.P (dBm)
2404.00000	8.5940	-7.406
2440.00000	8.5600	-7.440
2478.00000	7.1910	-8.809

Verdict

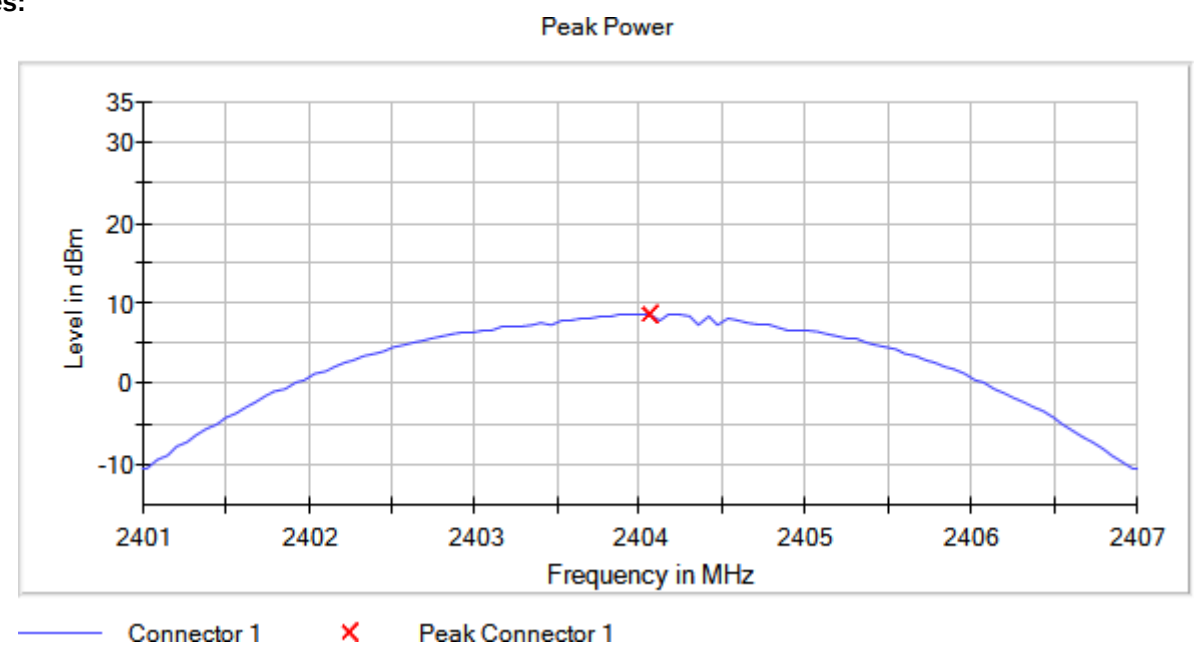
Pass

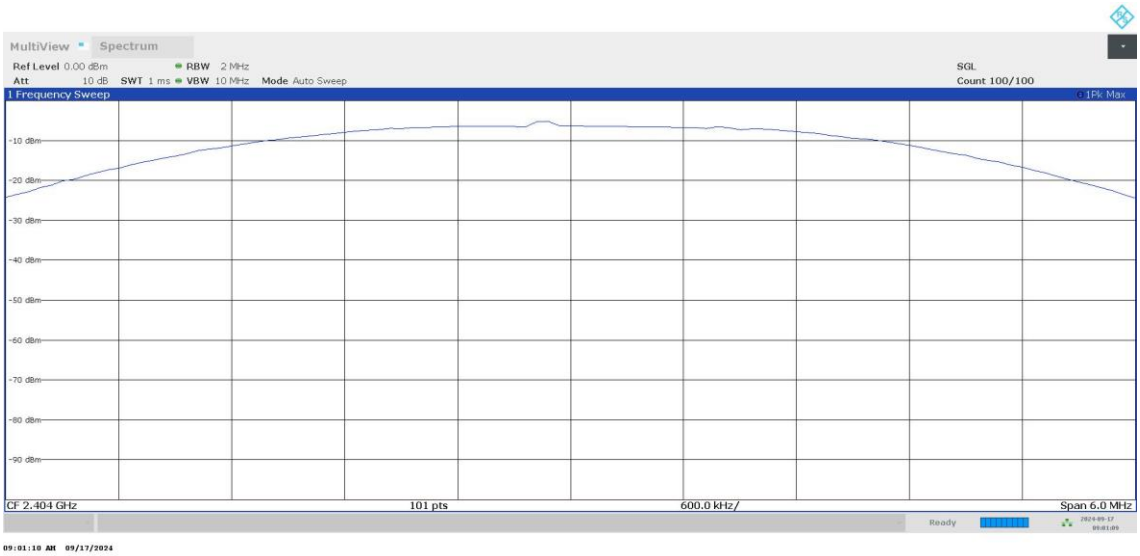
Attachments

Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2404.00000 MIMO Mode = SISO

Images:

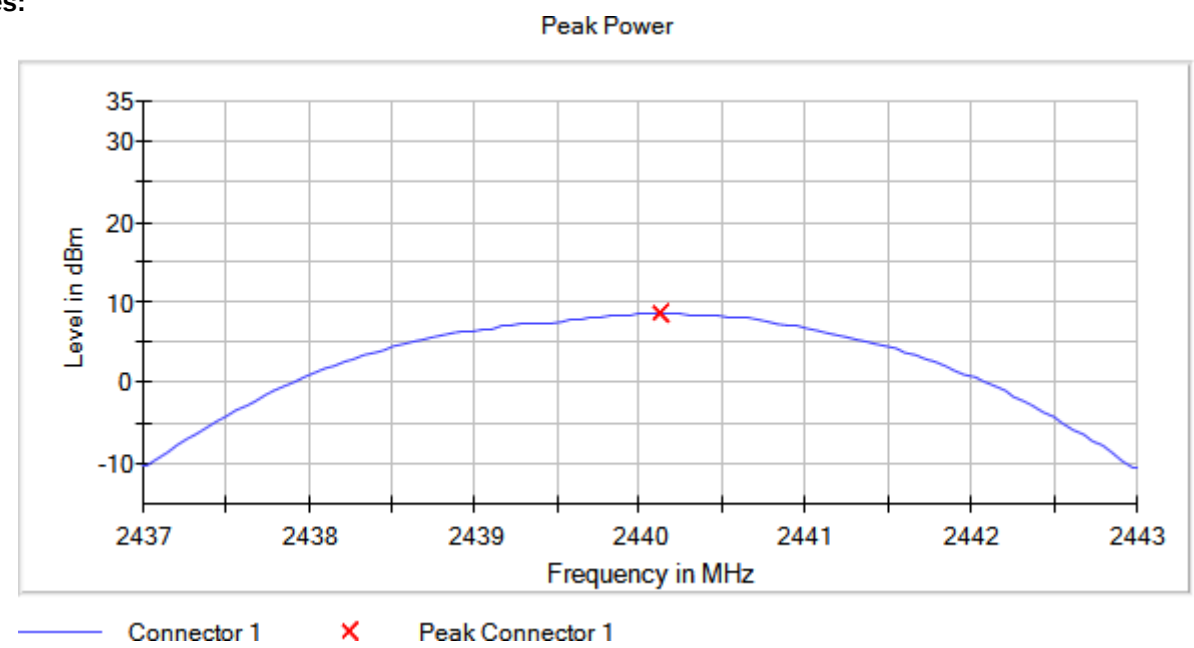


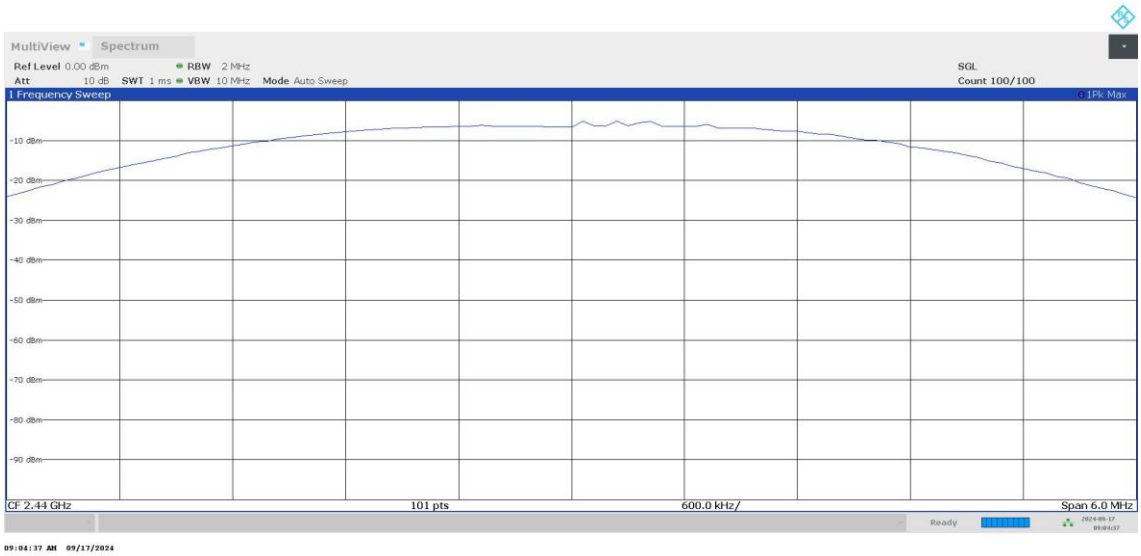


Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

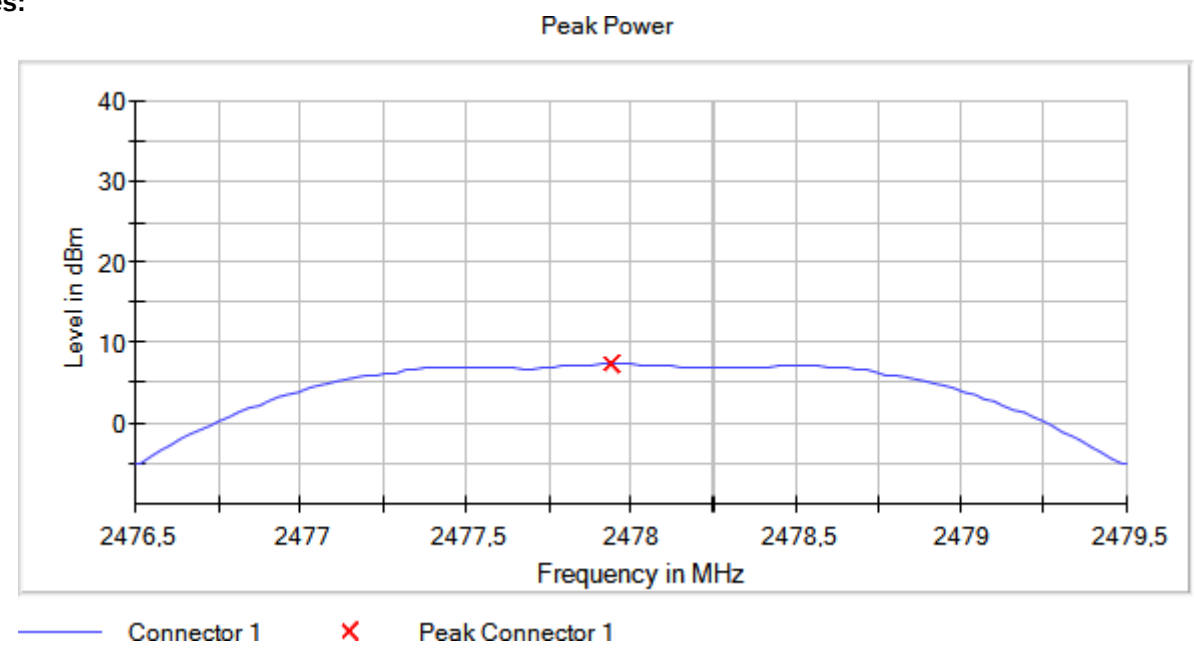


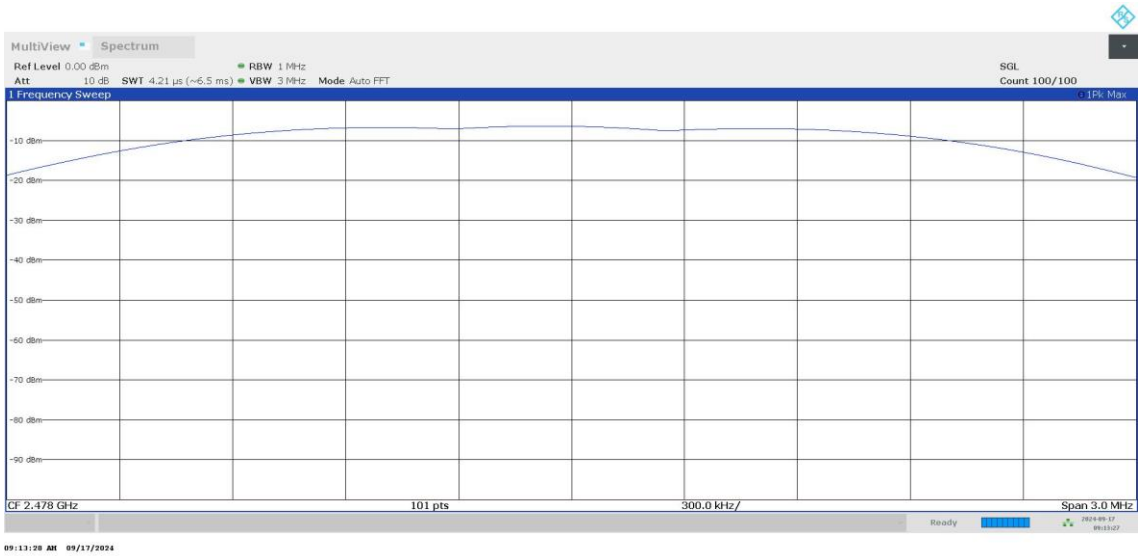


Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2478.00000 MIMO Mode = SISO

Images:





Modulation: Proximity

MIMO Mode: SISO

Results

Freq (MHz)	Peak Power (dBm)	Peak Power (dBm)
2402.00000	7.3000	-8.700
2440.00000	8.3950	-7.605
2480.00000	7.1900	-8.810

Verdict

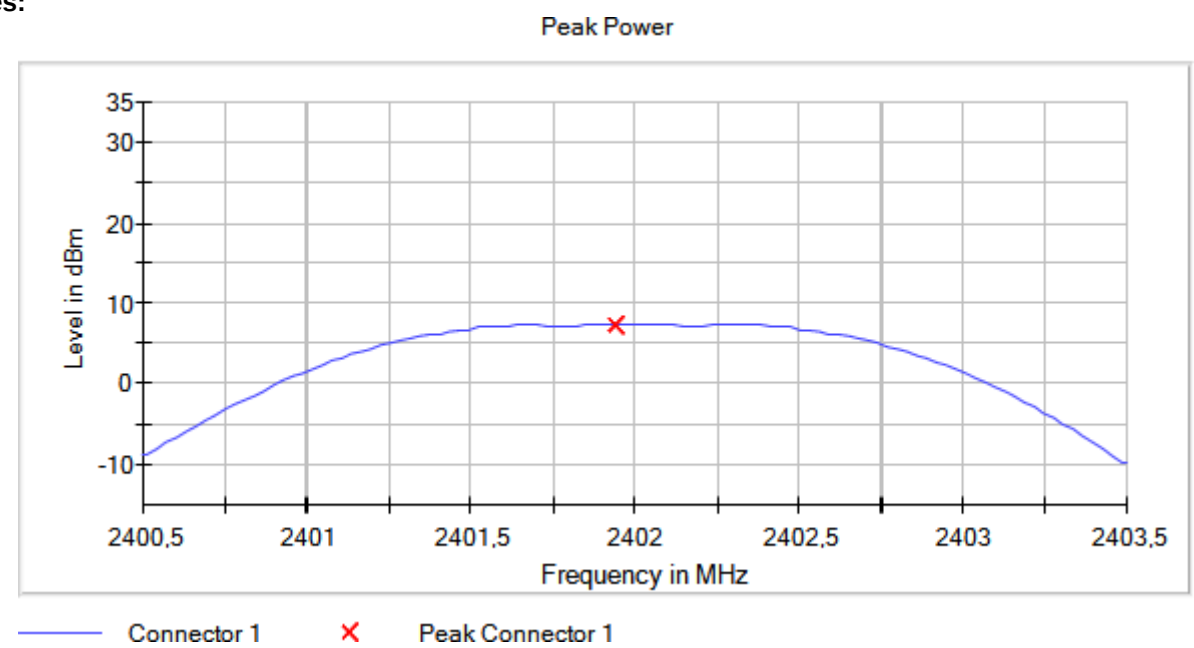
Pass

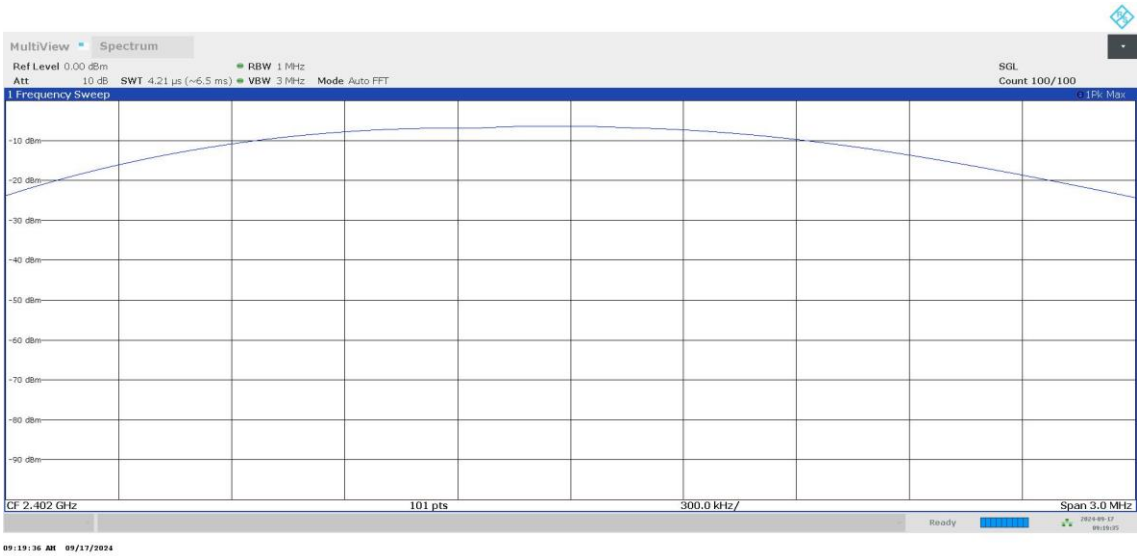
Attachments

Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2402.00000 MIMO Mode = SISO

Images:

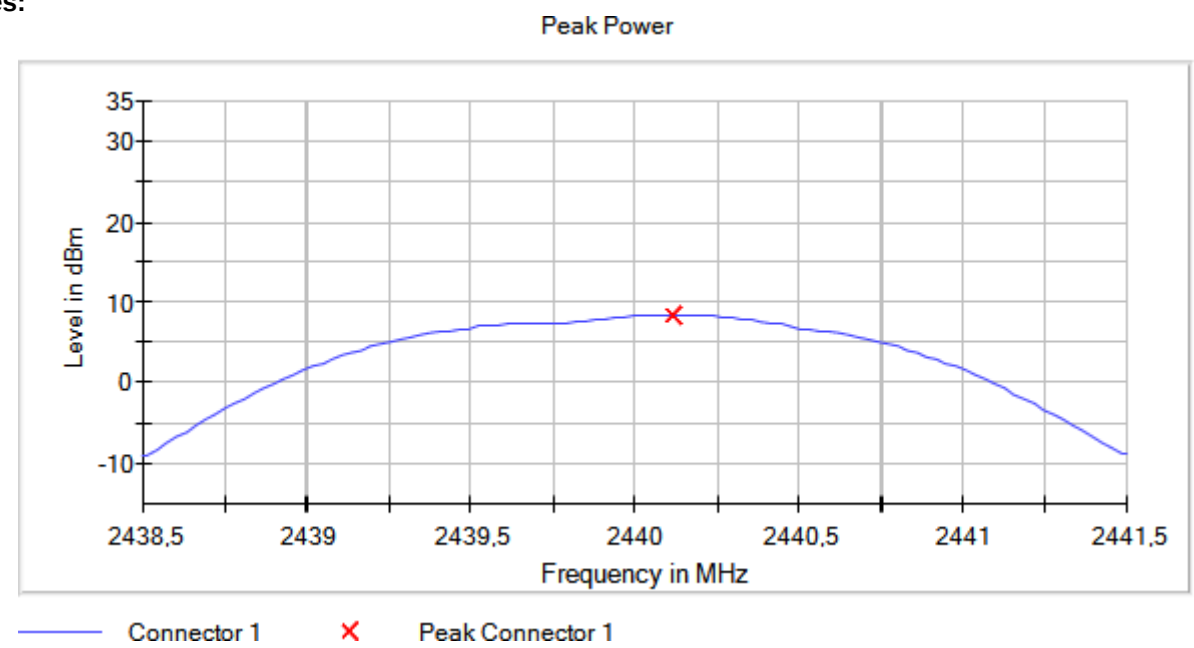


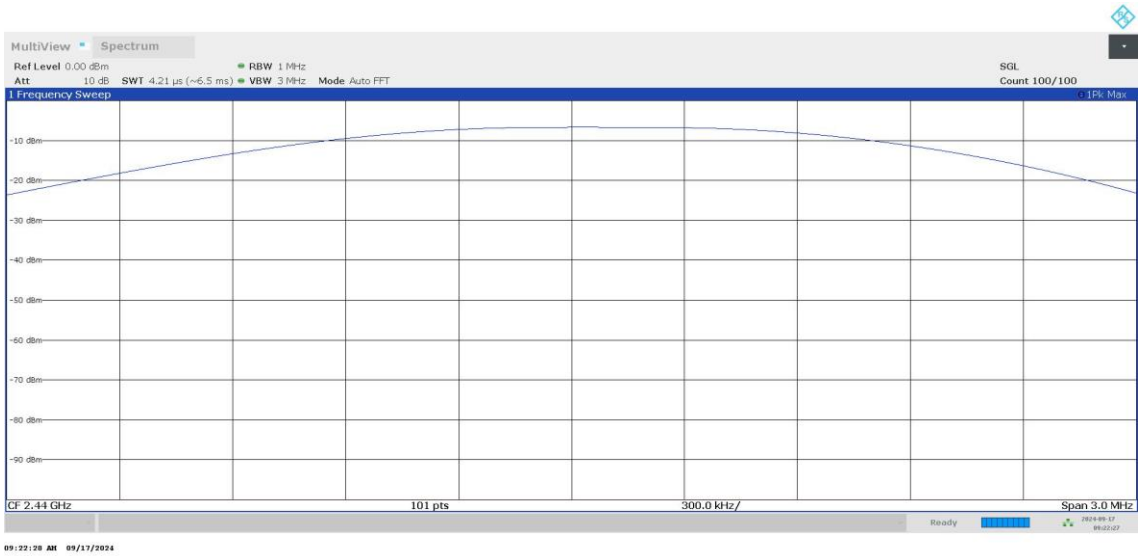


Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2440.00000 MIMO Mode = SISO

Images:

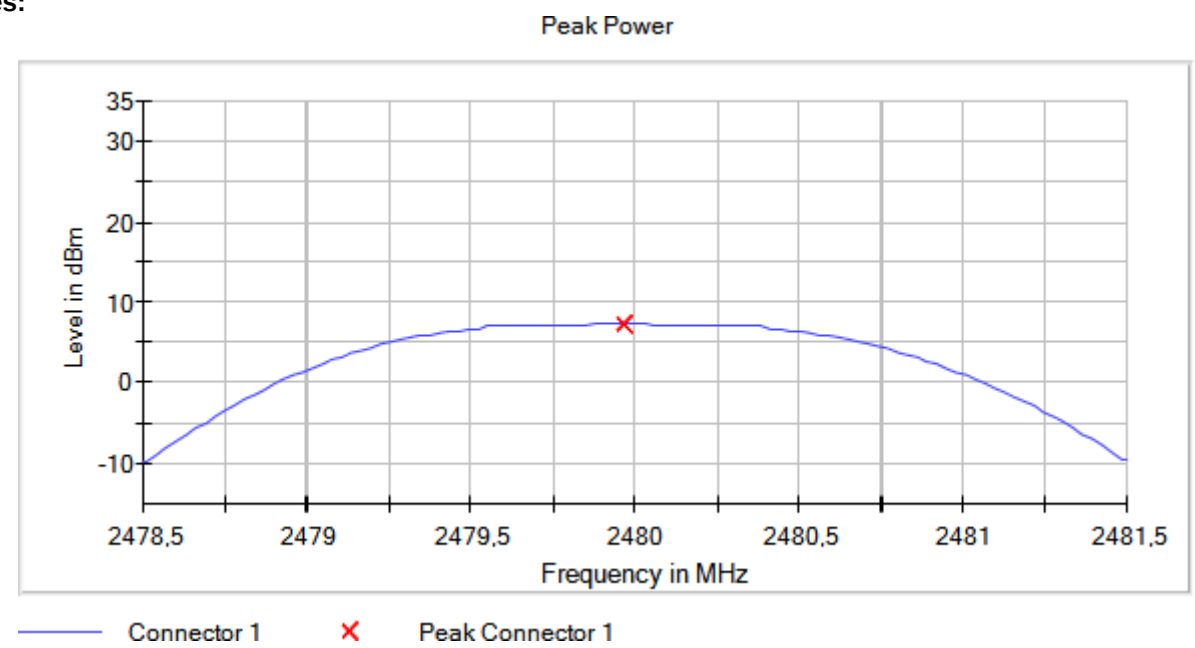


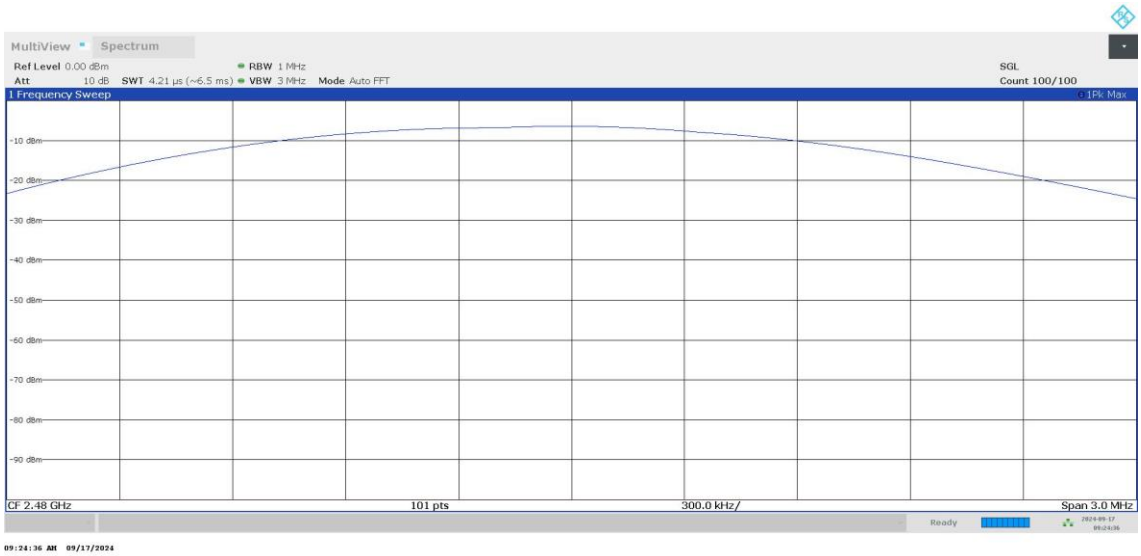


Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2480.00000 MIMO Mode = SISO

Images:





RSS-247 5.5 / FCC 15.247 (d) [Bndedge] Band-edge emissions compliance (Transmitter)

Limits

In any 100 kHz bandwidths outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Modulation: BTLE 5.4 (GFSK 1 Mbit/s)

MIMO Mode: SISO

Results

Freq (MHz)	Freq (MHz)	Lvl (dBm)
2402.00000	2399.075000	-57.2
	2399.125000	-57.4
	2399.375000	-58.1
	2399.325000	-58.2
	2399.175000	-58.5
	2399.025000	-58.6
	2399.225000	-58.8
	2399.725000	-59.1
	2399.775000	-59.1
	2399.425000	-59.1
	2399.475000	-59.4
	2399.825000	-59.4
	2399.525000	-59.9
	2399.675000	-59.9
	2399.875000	-60.3
2480.00000	2483.925000	-61.6
	2483.875000	-61.8
	2485.375000	-62.4
	2483.825000	-62.4
	2485.325000	-62.5
	2483.975000	-62.5
	2484.625000	-62.5
	2483.625000	-62.6
	2484.025000	-62.6
	2483.775000	-62.6
	2485.425000	-62.7
	2484.575000	-62.8

Freq (MHz)	Freq (MHz)	Lvl (dBm)
	2483.525000	-62.8
	2484.075000	-62.9
	2484.525000	-62.9

Verdict

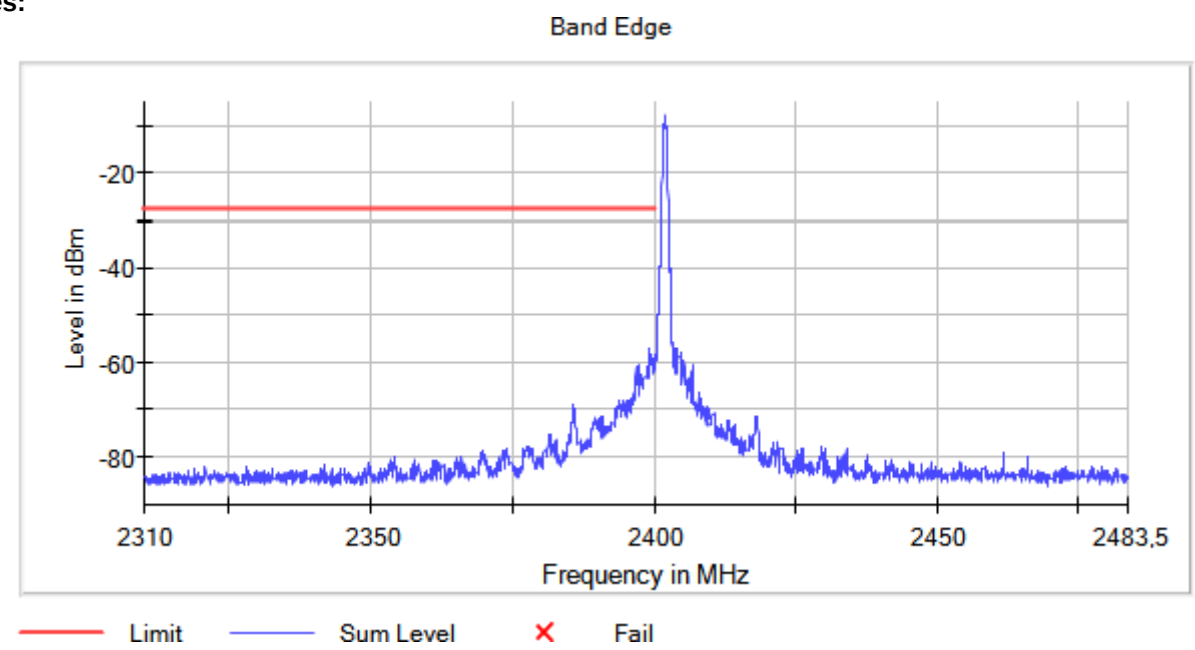
Pass

Attachments

Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2402.00000 MIMO Mode = SISO

Images:



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	1.800 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	30 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

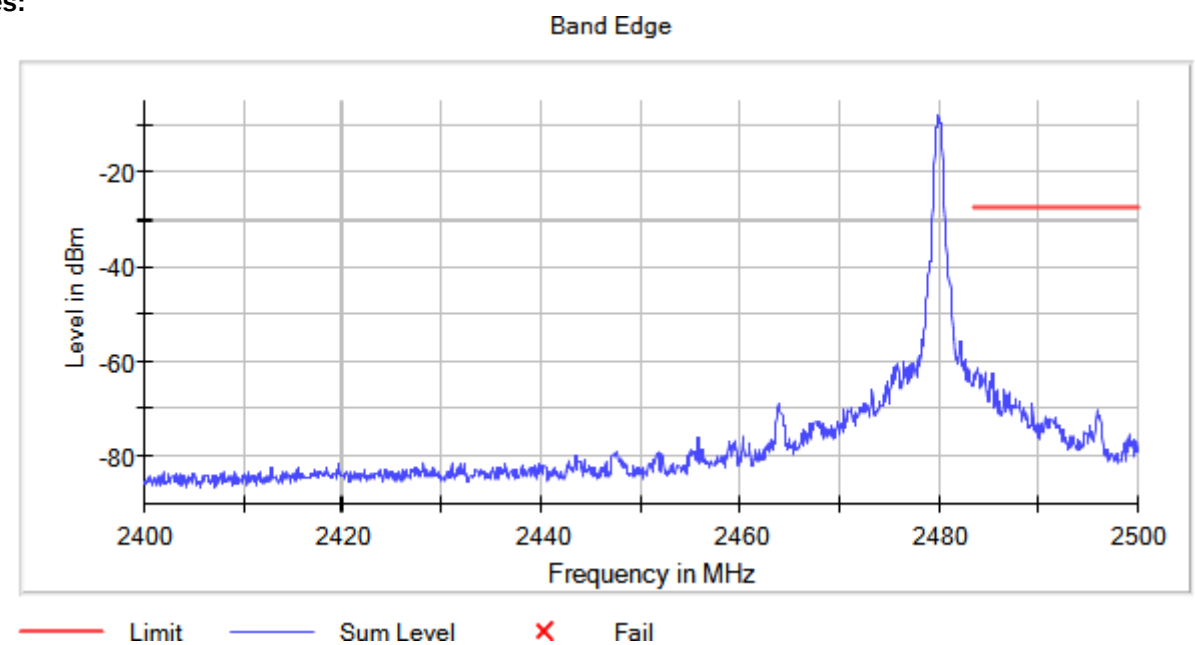
Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	1.670 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	14 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.09 dB	0.50 dB

Bandwidth MHz = 1 Modulation = BTLE 5.4 (GFSK 1 Mbit/s)

Frequency MHz = 2480.00000 MIMO Mode = SISO

Images:



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	1.800 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	30 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	1.670 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	14 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.09 dB	0.50 dB

Modulation: BTLE 5.4 (GFSK 2 Mbit/s)

MIMO Mode: SISO

Results

Freq (MHz)	Freq (MHz)	Lvl (dBm)
2404.00000	2399.925000	-62.1
	2399.875000	-62.2
	2399.975000	-63.4
	2399.725000	-63.7
	2399.675000	-64.0
	2399.825000	-64.1
	2399.075000	-64.2
	2399.025000	-64.3
	2399.125000	-64.6
	2399.175000	-65.0
	2399.475000	-65.2
	2399.525000	-65.2
	2399.625000	-65.5
	2399.375000	-65.5
	2399.775000	-65.5
2478.00000	2483.975000	-65.0
	2483.525000	-65.3
	2483.925000	-66.0
	2484.025000	-66.0
	2483.725000	-66.3
	2483.775000	-66.5
	2484.175000	-66.6
	2483.675000	-67.5
	2485.025000	-67.8
	2485.425000	-67.8
	2484.925000	-67.8
	2484.975000	-67.8
	2484.225000	-67.9
	2485.325000	-68.1
	2485.375000	-68.2

Verdict

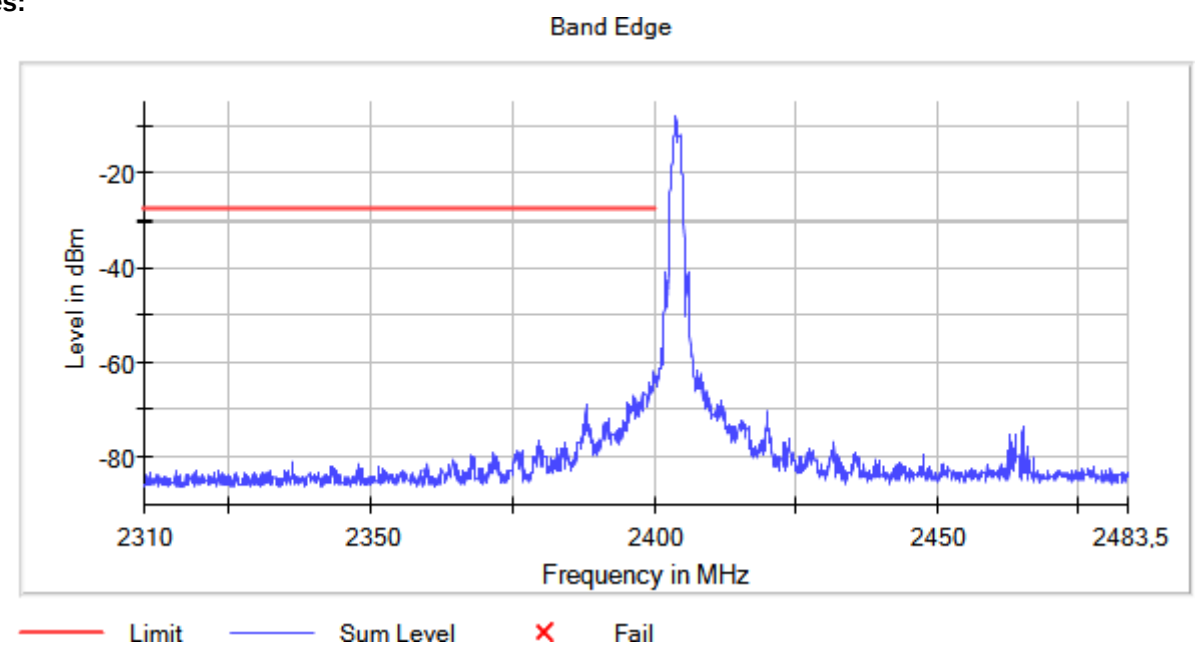
Pass

Attachments

Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2404.00000 MIMO Mode = SISO

Images:



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	1.800 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	18 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.25 dB	0.50 dB

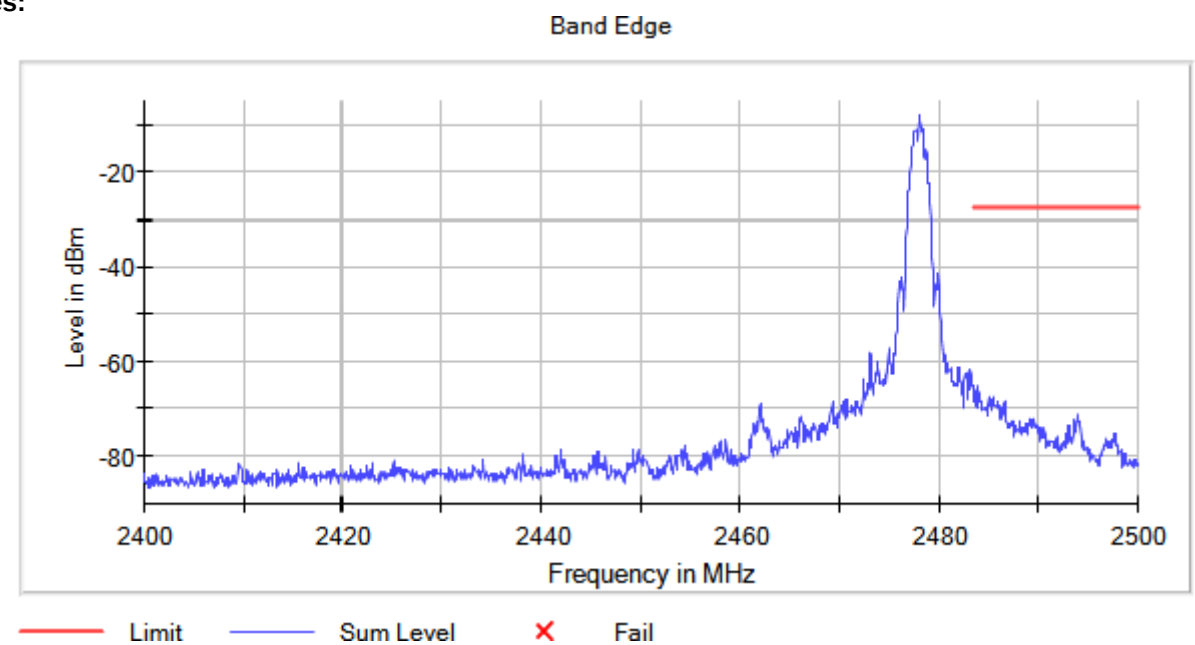
Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	1.670 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	18 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Bandwidth MHz = 2 Modulation = BTLE 5.4 (GFSK 2 Mbit/s)

Frequency MHz = 2478.00000 MIMO Mode = SISO

Images:



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	1.800 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	18 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.25 dB	0.50 dB

Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	1.670 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	18 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Modulation: Proximity

MIMO Mode: SISO

Results

Freq (MHz)	Freq (MHz)	Lvl (dBm)
2402.00000	2399.925000	-50.3
	2399.975000	-50.4
	2399.875000	-53.2
	2399.825000	-56.8
	2399.775000	-59.2
	2399.475000	-59.9
	2399.525000	-60.0
	2399.425000	-60.7
	2399.575000	-61.3
	2399.375000	-61.4
	2399.325000	-61.7
	2399.725000	-62.1
	2399.625000	-62.3
	2398.325000	-62.4
	2399.275000	-62.8
2480.00000	2483.925000	-60.5
	2483.975000	-60.6
	2484.025000	-61.3
	2483.525000	-61.7
	2485.425000	-61.7
	2483.575000	-61.7
	2483.625000	-61.8
	2485.475000	-61.9
	2483.875000	-62.0
	2483.675000	-62.3
	2483.825000	-62.3
	2484.375000	-62.6
	2483.775000	-62.9
	2484.075000	-63.1
	2485.375000	-63.3

Verdict

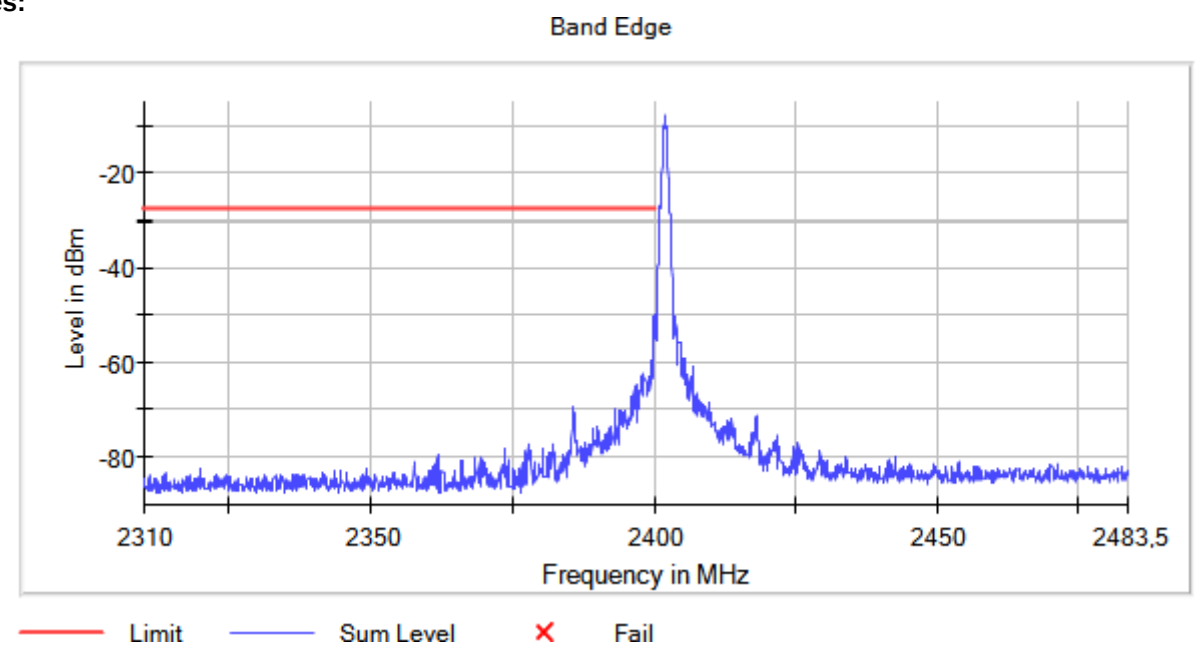
Pass

Attachments

Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2402.00000 MIMO Mode = SISO

Images:



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	1.800 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

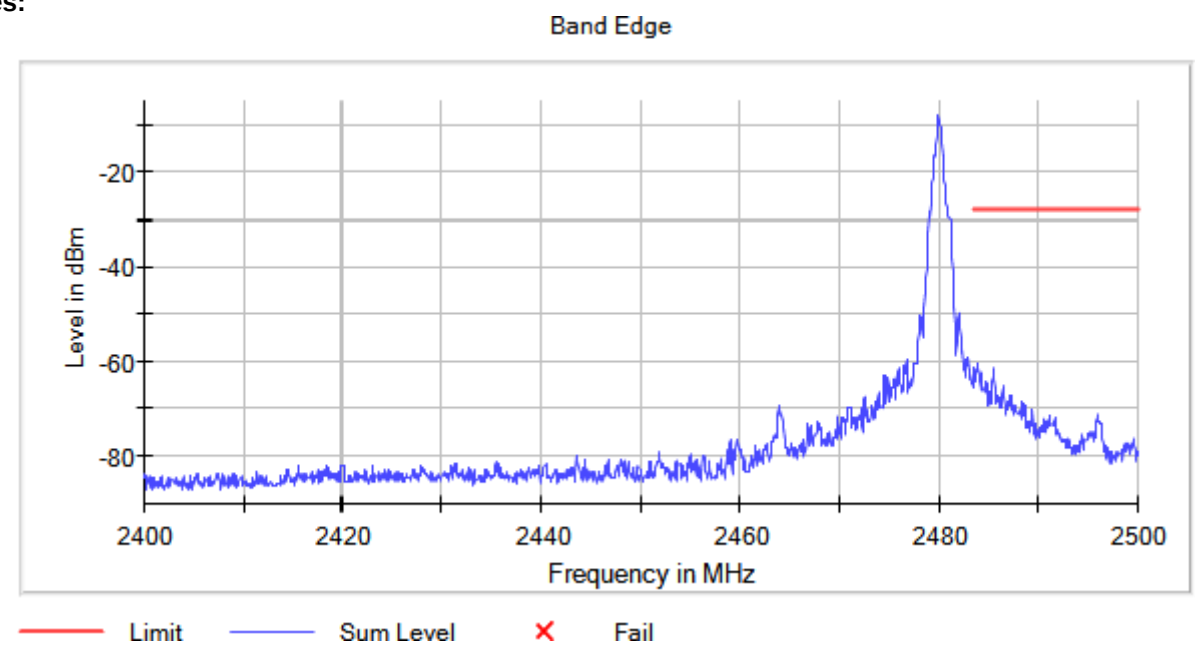
Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	1.670 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	17 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Bandwidth MHz = 2 Modulation = Proximity

Frequency MHz = 2480.00000 MIMO Mode = SISO

Images:



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	1.800 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	1.670 ms	AUTO
Reference Level	10.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	17 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB