DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29507456

ISED CABid: ES1909

Lab. Company Number: 4621A

Test Report No:
71985RRF.002A1

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

(*) Identification of item tested	IILATION2
(*) Trademark	Connected Ride
(*) Model and /or type reference	BMW Baukastenelektronik (BKE)
(*) Applicant	SCHOEFFEL SPORTBEKLEIDUNG GMBH
(*) Features	BTLE 1Mbps & 2 Mbps HW version: C1-Sample (Rev0x01) SW version: 0.8.0 FCC ID: 2BB4X40122223824 IC: 30974-40122223824
Manufacturer	BMW Group Hufelandstraße 20D -80788 München – Germany
Test method requested, standard	USA FCC Part 15.247 (10-1-21 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-21 Edition): Radiated emission limits; general requirements. CANADA RSS-247 Issue 3 (August 2023). CANADA RSS-Gen Issue 5 amendment 1 (March 2019). 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	2024-04-17
Report template No	FDT08_24 (*) "Data provided by the client"

Index

Acronyms

Acronym ID	Acronym Description
# of Tx Chains	Number of Transmission Chains
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
Occ Ch BW	Occupied Channel Bandwidth
PSD	Power Spectrum 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 is a FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification 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.

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 module that connects a smartphone via Bluetooth to the accessories electronics in a motorcycle jacket. It controls heating, LEDs, fan and a pump for comfort functions of the driver.

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.

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	71985B_8.1	USB to TTL cable	--	--	2022-09-29	Auxiliary Element
S/01	71985B_34.1	BKE board (RF-sample)	BMW Baukastenelektronik (BKE)	#99	2022-09-29	Element Under Test
S/01	71985B_26.1	Spiral cable	9830007_1	--	2022-09-29	Element Under Test
S/02	71985B_36.1	BKE board (RF-sample)	BMW Baukastenelektronik (BKE)	#101	2022-09-29	Element Under Test
S/02	71985B_8.1	USB to TTL cable	--	--	2022-09-29	Auxiliary Element
S/02	71985B_26.1	Spiral cable	9830007_1	--	2022-09-29	Element Under Test
S/02	71985B_11.1	SMA cable	--	--	2022-09-29	Auxiliary Element

Notes referenced to samples during the project:

Id	Type
S/01	Radiated
S/02	Conducted

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)		
	Power supply	2.1	[X]	[ ]	[ ]		
	LED Lights	0.4	[X]	[ ]	[ ]		
	Heating	0.4	[X]	[ ]	[ ]		
	Pump	not yet defined	[ ]	[ ]	[ ]		
	Fan	not yet defined	[ ]	[ ]	[ ]		
	Switch (Userinterface)	2.3	[X]	[ ]	[ ]		
Supplementary information to the ports..... :	.....						
Rated power supply .....:	Voltage and Frequency			Reference poles			
				L1	L2	L3	N	PE
	[ ]	AC:		[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	AC:		[ ]	[ ]	[ ]	[ ]	[ ]
	[X]	DC: 14V						
	[X]	DC: 5V - 9V via USB-C Powerbank						
Rated Power .....:	max: 42W						
Clock frequencies.....:	32kHz, 32MHz						
Other parameters .....:	.....						
Software version .....:	.....						
Hardware version .....:	C1-Sample						
Dimensions in cm (W x H x D) ....:	.....						
Mounting position .....:	[ ]	Table top equipment					
	[ ]	Wall/Ceiling mounted equipment					
	[ ]	Floor standing equipment					
	[ ]	Hand-held equipment					
	[X]	Other: Wearable, mounted in a jacket					

Modules/parts.....:	Module/parts of test item	Type	Manufacturer
	.....	.....	.....
Accessories (not part of the test item) .....:	Description	Type	Manufacturer
	Pump Simulator	.....	.....
	Fan Simulator	.....	.....
	Powerbank	.....	.....
	Smartphone	.....	.....
Documents as provided by the applicant.....:	Description	File name	Issue date
	.....	.....	.....

(3) Only for Medical Equipment

Identification of the client

Gigler Elektronik GmbH
Industriestr. 8 94357 Konzell

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2022-10-05
Date (finish)	2022-11-30

Document history

Report number	Date	Description
71985RRF.002	2023-01-10	First release.
71985RRF.002A1	2024-04-17	First modification. Applicant information on the cover page is included: SCHOEFFEL SPORTBEKLEIDUNG GMBH Some missing test results have been added (Emission limitations radiated (Transmitter)). This report cancels and replaces the previous report 71985RRF.002

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: Antonio Manuel Sánchez Carrizo and Daniel Mejías Herrera.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
5862	EMI TEST RECEIVER 9kHz-7GHz	ESR7	ROHDE AND SCHWARZ	2022-12-12
7763	HORN ANTENNA 1-18GHz	BBHA 9120D	SCHWARZBECK MESS-ELEKTRONIK	2022-11-15
6495	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2024-03-19
7862	PRE-AMPLIFIER G>30dB 18-40GHz	BLMA 1840-3G	BONN ELEKTRONIK	2023-02-15
7769	PREAMPLIFIER 30dB 500MHz-18GHz	BBV 9718 C	SCHWARZBECK	2023-03-25
8130	SEMIANECHOIC ABSORBER LINED CHAMBER	P29419	ALBATROSS	--
8134	SHIELDED ROOM	P29419	ALBATROSS PROJECTS GMBH	--
8661	SHIELDED ROOM	-	SIEPEL	--
6668	SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2024-05-19
4848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	--
6143	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2023-10-29
9193	POWER SUPPLY DC 30 V / 3 A	ALR3003	ELC	--
7760	DIGITAL MULTIMETER	175	FLUKE	2023-11-23

Testing verdicts

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

Summary

Bluetooth Low Energy 5.0 (2M, 1M).

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. Bluetooth Low Energy 5.0 (2M, 1M)

INDEX

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal:	14V
Type of Power Supply:	External power supply

ANTENNA (*):

Type of Antenna:	Chip Antenna
Maximum Declared Antenna Gain:	2.2 dBi

TEST FREQUENCIES (*):

Low Channel:	2402 MHz
Middle Channel:	2440 MHz
High Channel:	2480 MHz

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.

An external DC power supply was connected to the EUT for voltage variation test.

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).

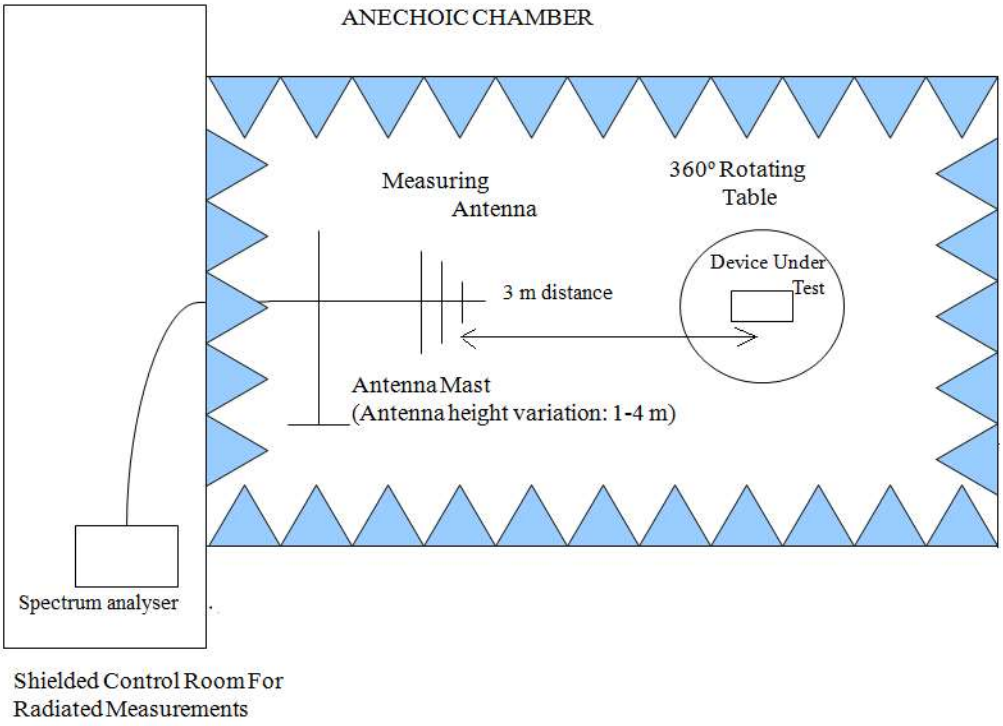
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

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.

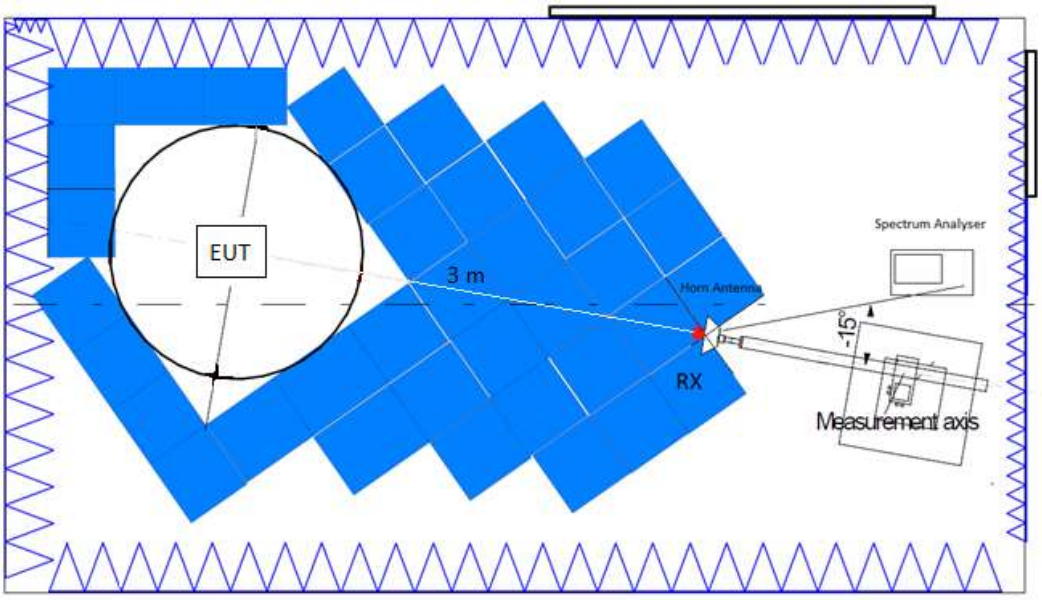
Measurements were made in both horizontal and vertical planes of polarization.

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.

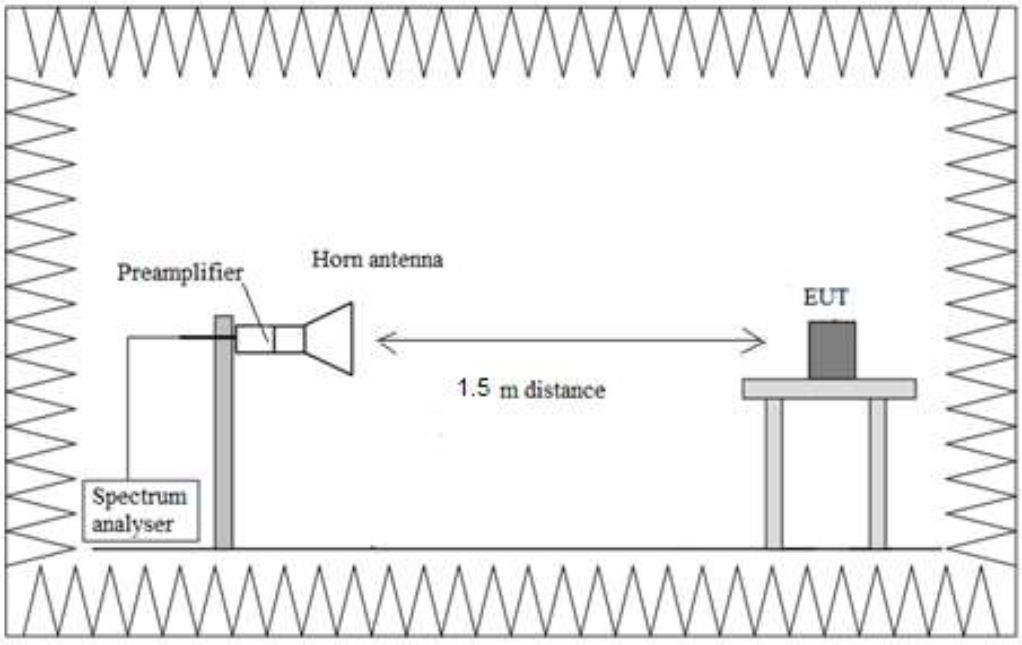
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup f > 17 GHz:



TEST CASES DETAILS

FCC 47 CFR Part 15.247 / RSS-247

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 5.0 (GFSK 1 Mbit/s)

Results

Freq (MHz)	BW (MHz)	# of Tx Chains	Port	Ebw (MHz)
2402.00000	1	1	1	0.693
2440.00000				0.693
2480.00000				0.693

Verdict

Pass

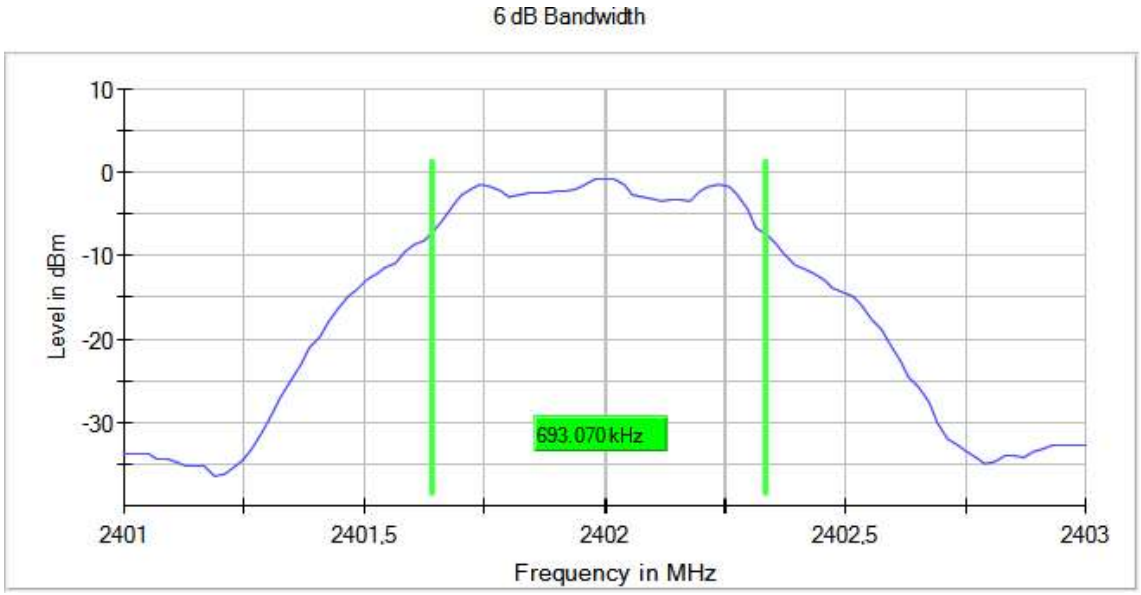
Attachments

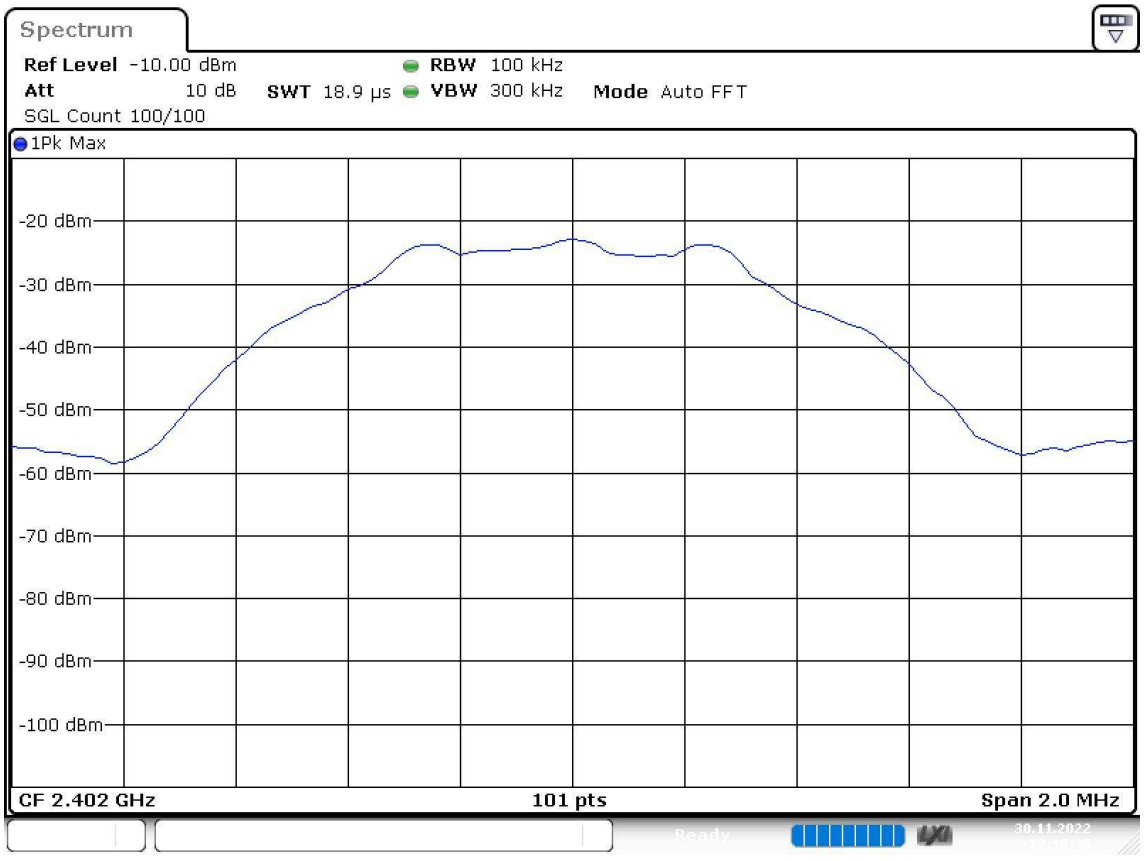
Frequency MHz = 2402.00000 Bandwidth MHz = 1

Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Number of Transmission Chains = 1

Active Port = 1

Images:





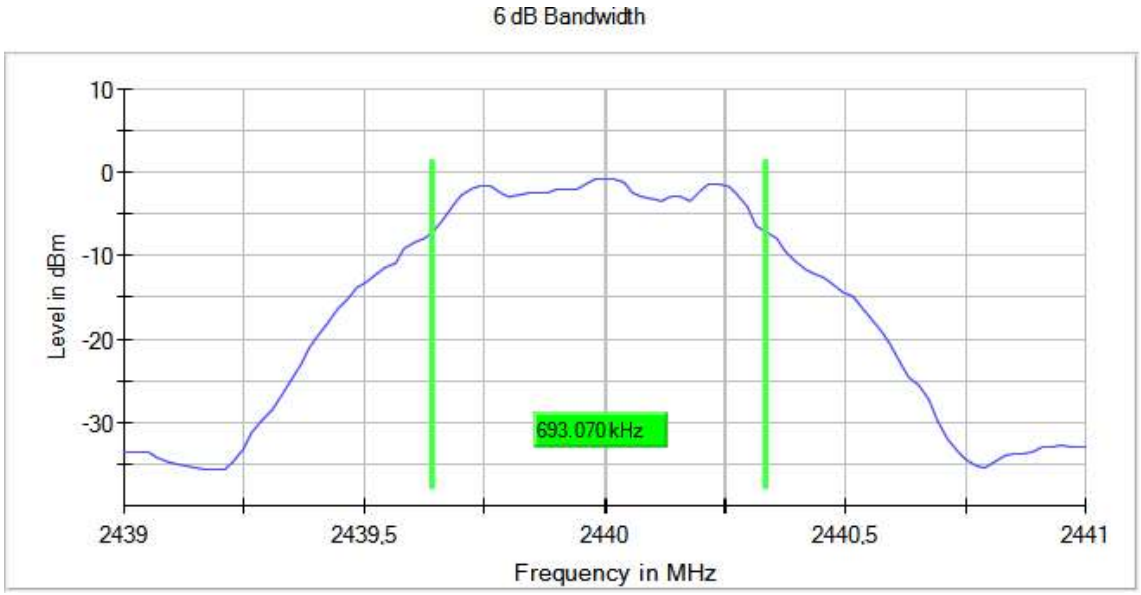
Date: 30.NOV.2022 13:18:45

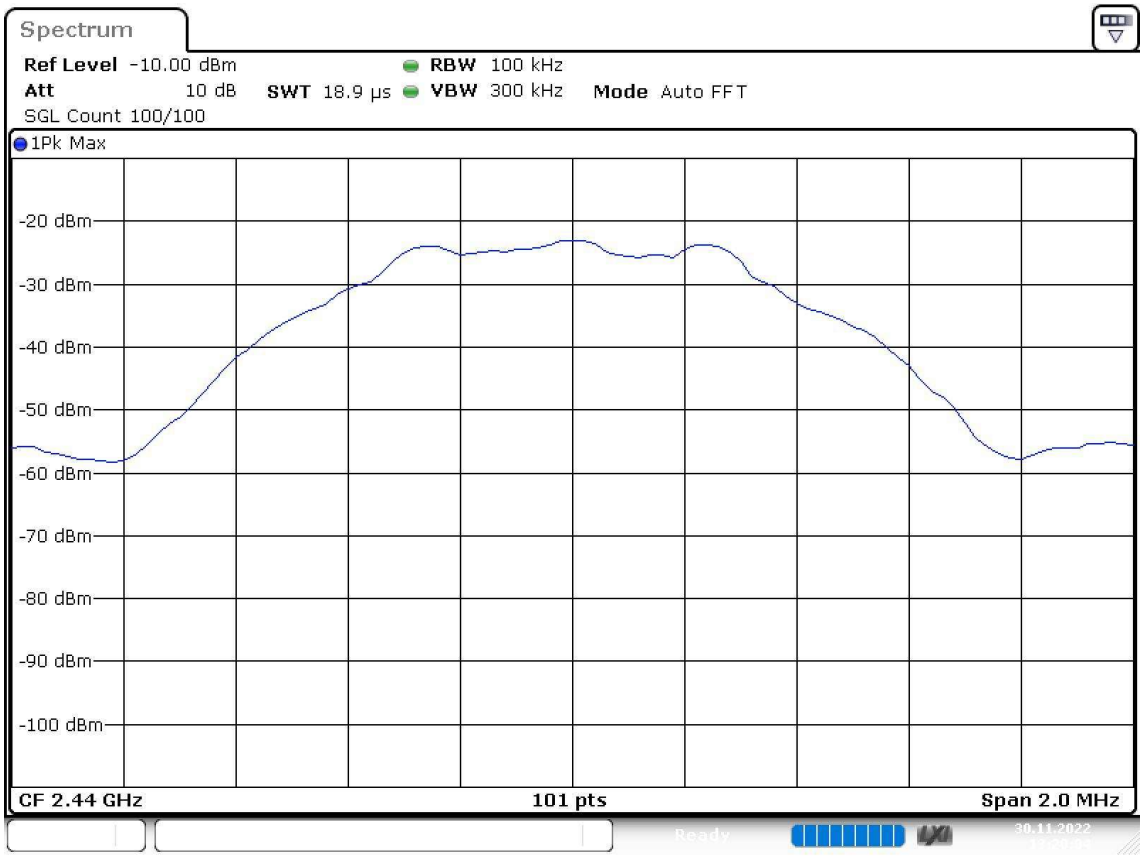
Frequency MHz = 2440.00000 Bandwidth MHz = 1

Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Number of Transmission Chains = 1

Active Port = 1

Images:





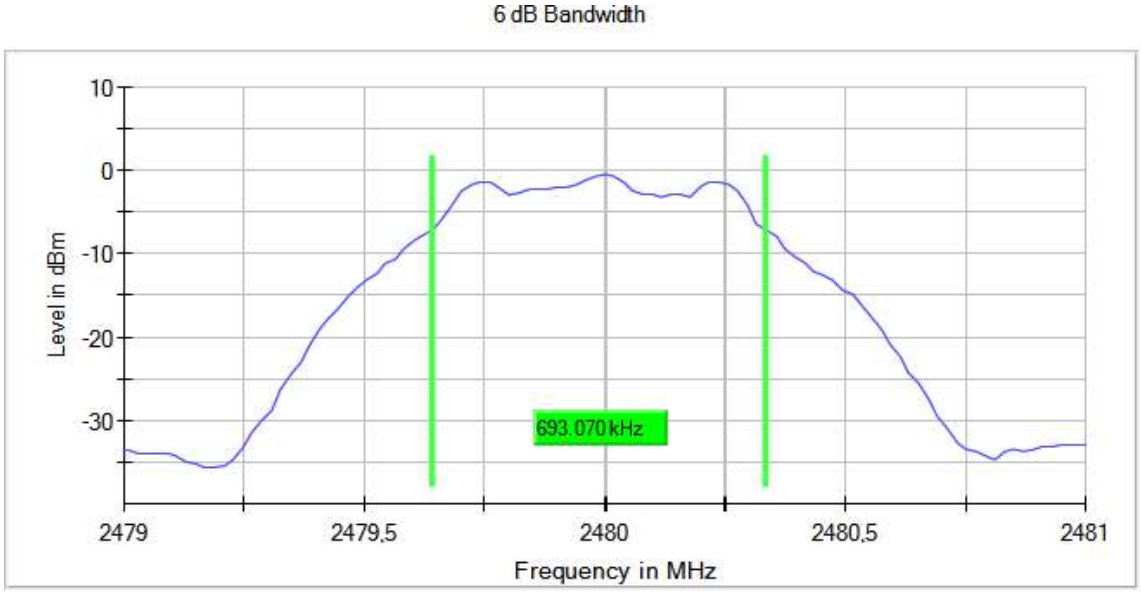
Date: 30.NOV.2022 13:20:04

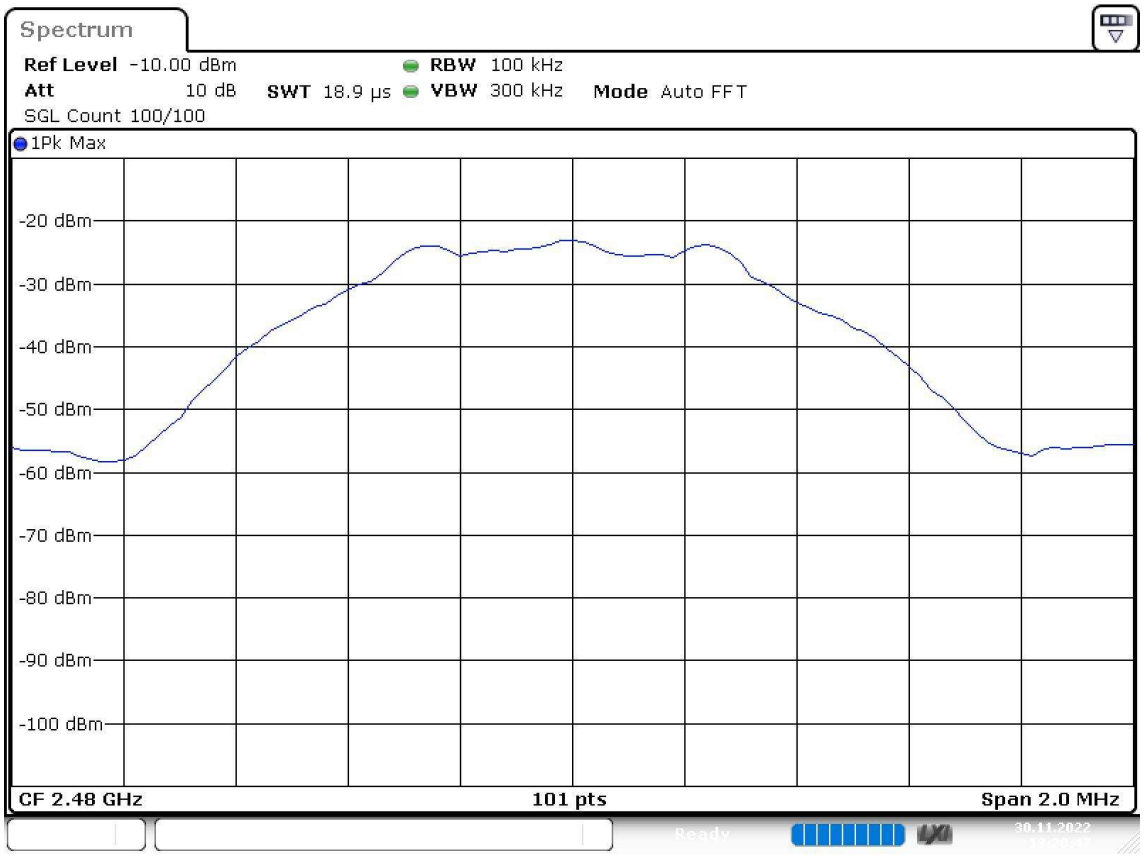
Frequency MHz = 2480.00000 Bandwidth MHz = 1

Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Number of Transmission Chains = 1

Active Port = 1

Images:





Date: 30.NOV.2022 13:20:47

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Results

Freq (MHz)	BW (MHz)	# of Tx Chains	Port	Ebw (MHz)
2402.00000	2	1	1	1.188
2440.00000				1.188
2480.00000				1.188

Verdict

Pass

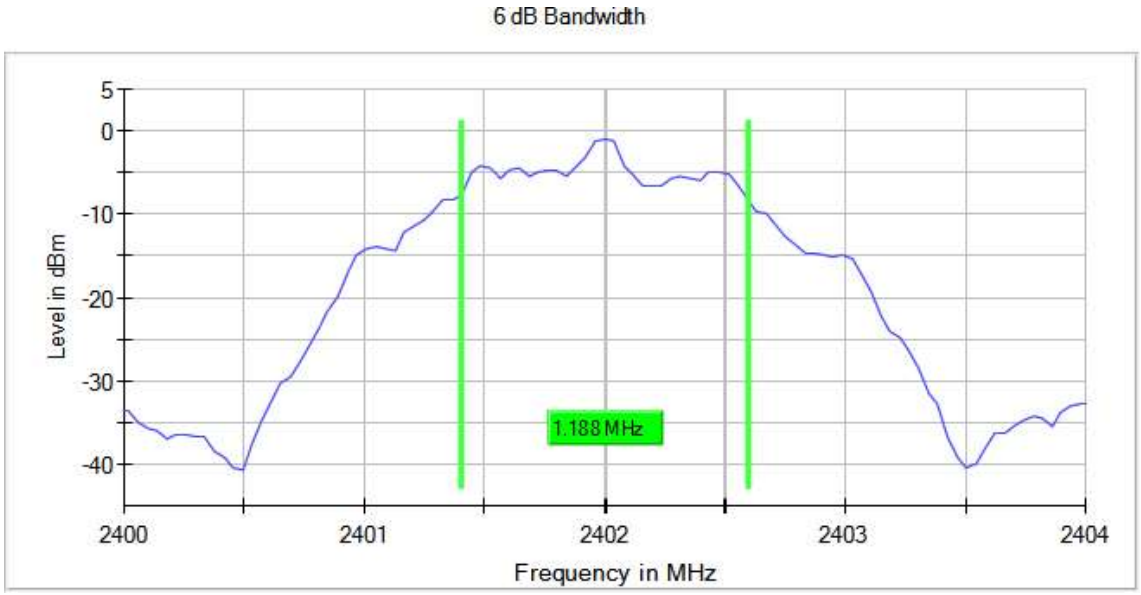
Attachments

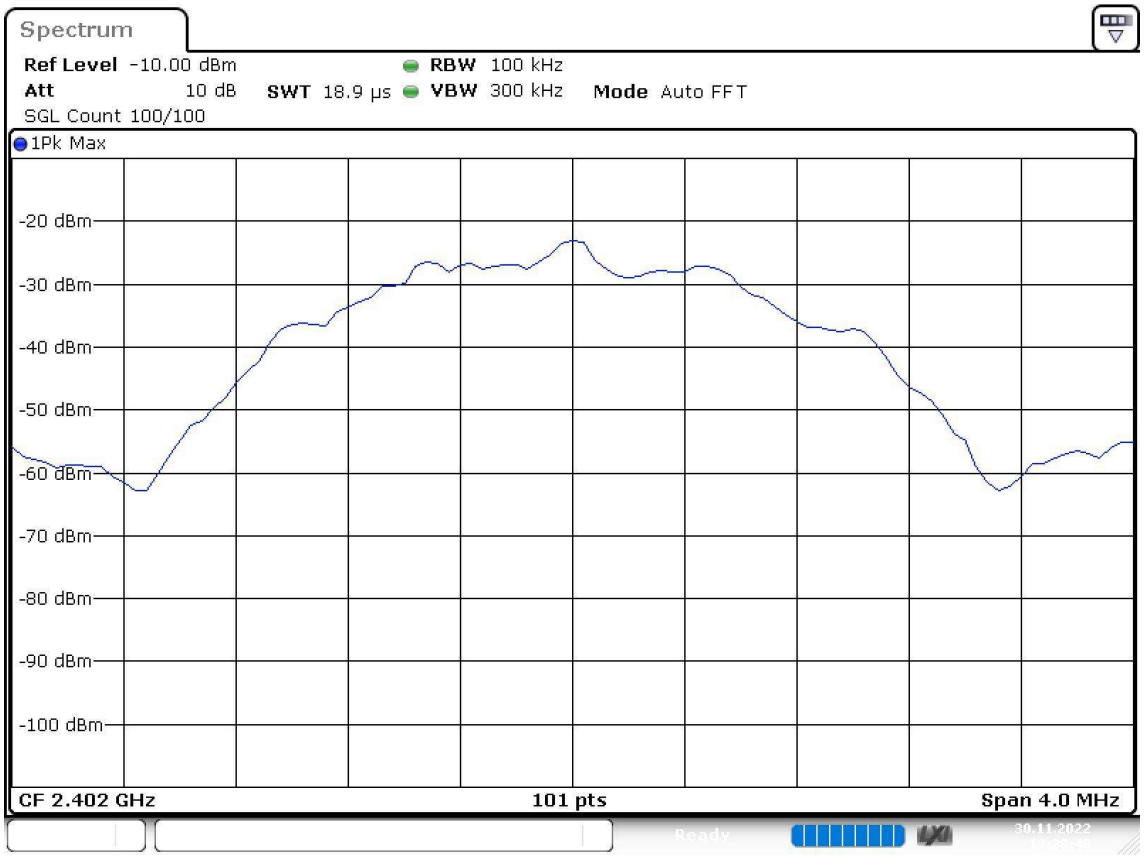
Frequency MHz = 2402.00000 Bandwidth MHz = 2

Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Number of Transmission Chains = 1

Active Port = 1

Images:





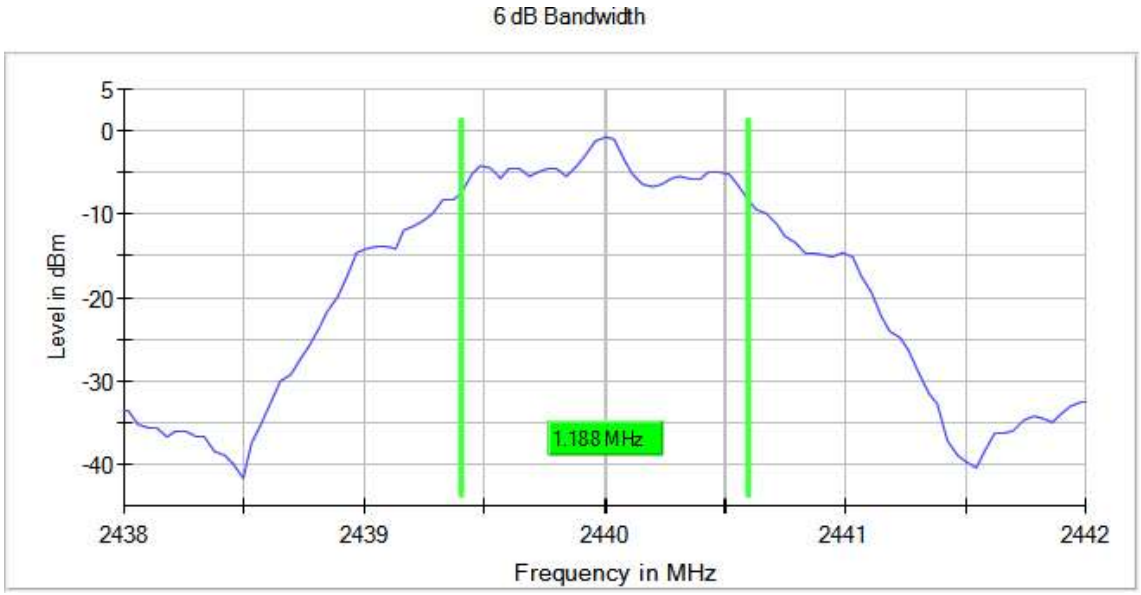
Date: 30.NOV.2022 13:28:48

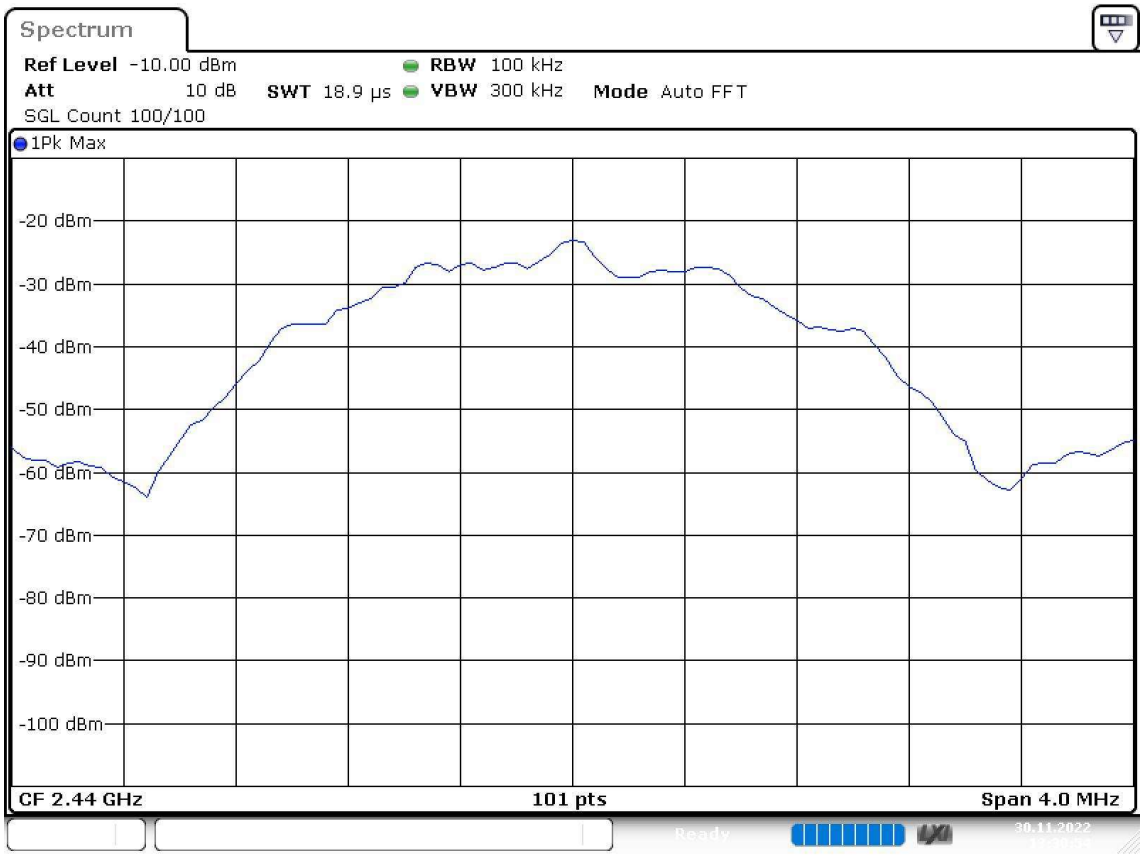
Frequency MHz = 2440.00000 Bandwidth MHz = 2

Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Number of Transmission Chains = 1

Active Port = 1

Images:





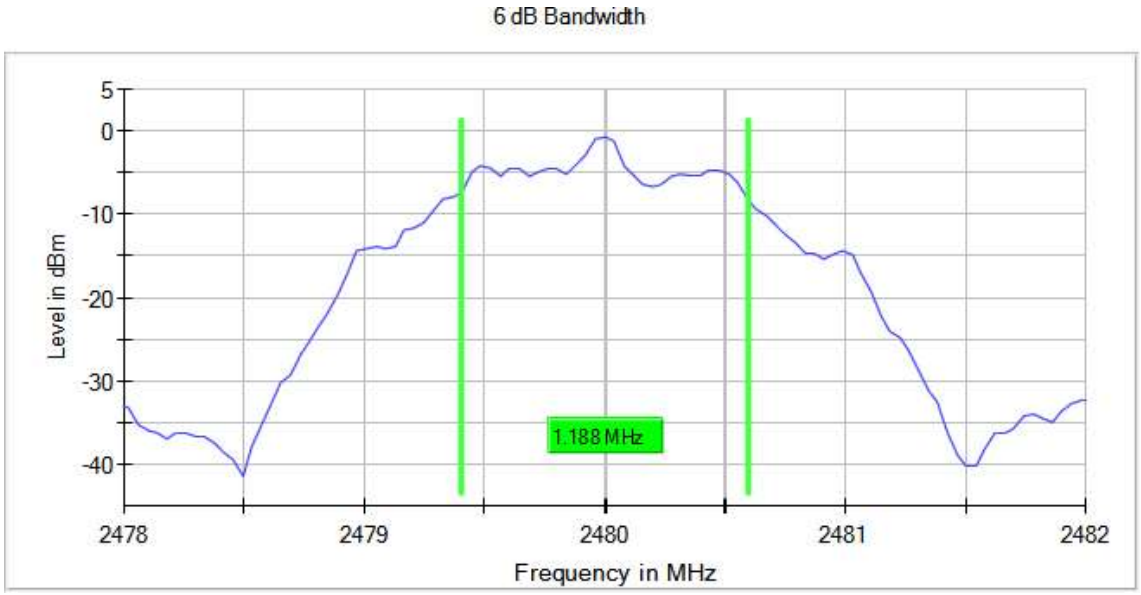
Date: 30.NOV.2022 13:30:54

Frequency MHz = 2480.00000 Bandwidth MHz = 2

Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Number of Transmission Chains = 1

Active Port = 1

Images:



Date: 30.NOV.2022 13:32:28

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 5.0 (GFSK 1 Mbit/s)

Results

Freq (MHz)	Equipment	BW (MHz)	# of Tx Chains	Port	PSD (dBm)
2402.00000	Digital Transmission System (DTS)	1	1	1	-6.48
2440.00000					-6.27
2480.00000					-5.97

Verdict

Pass

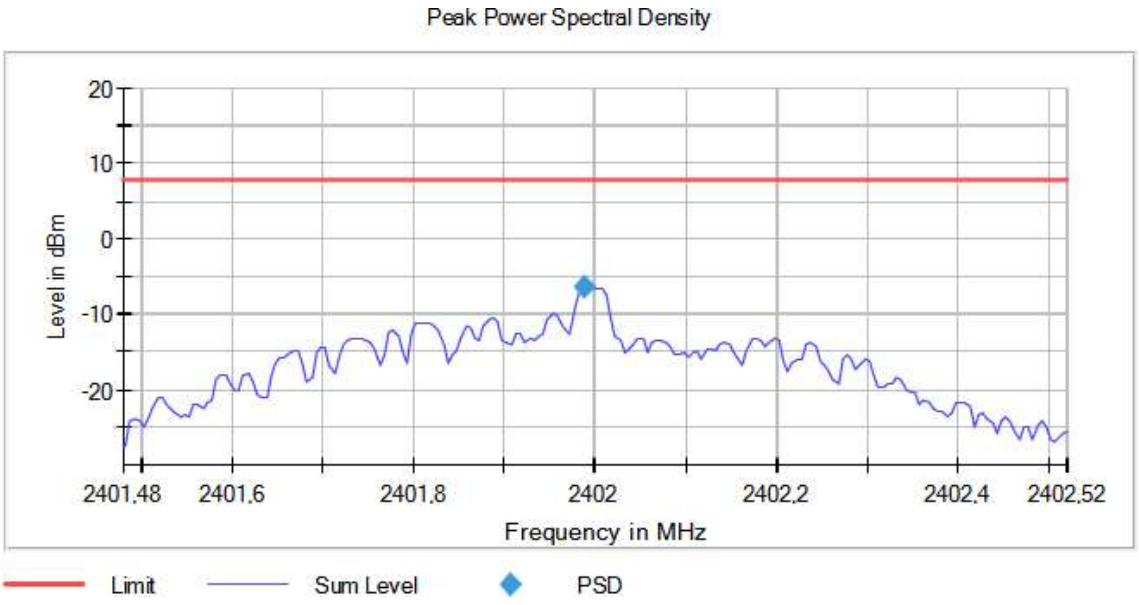
Attachments

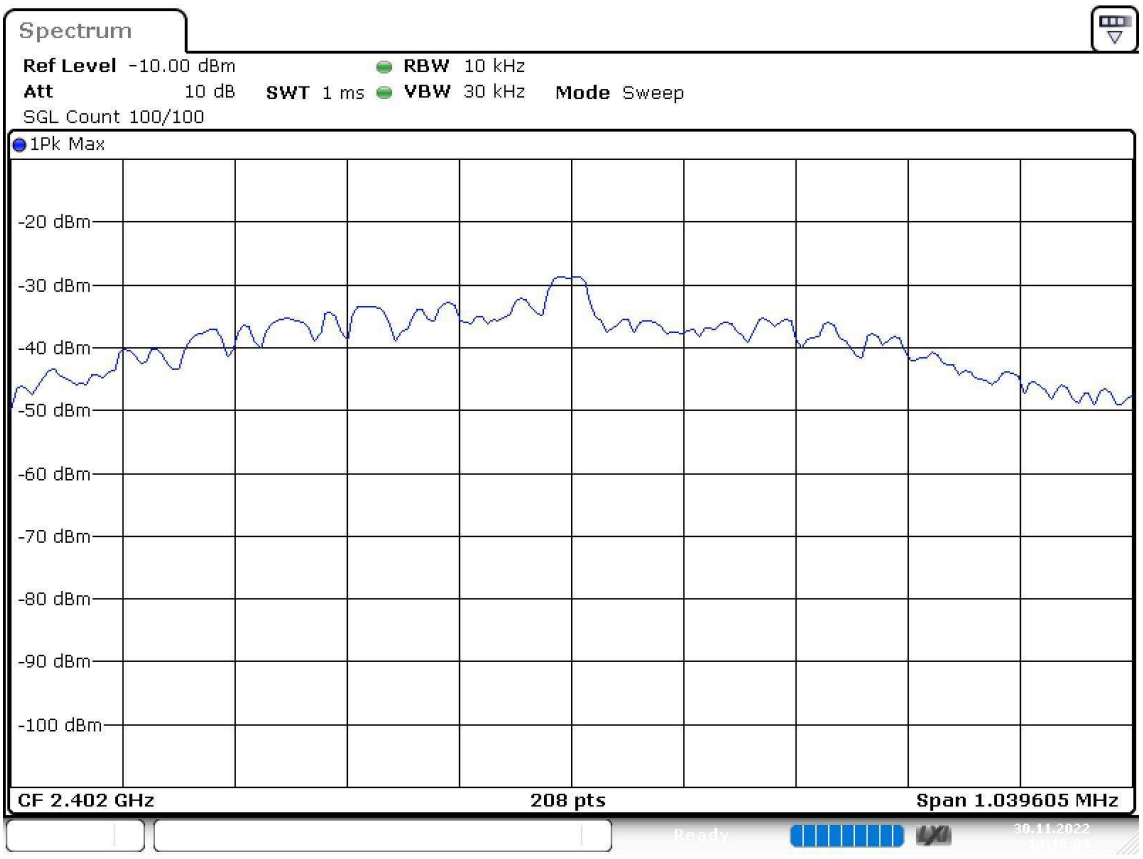
Frequency MHz = 2402.00000 Equipment Type = Digital Transmission System (DTS)

Bandwidth MHz = 1 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Number of Transmission Chains = 1 Active Port = 1

Images:





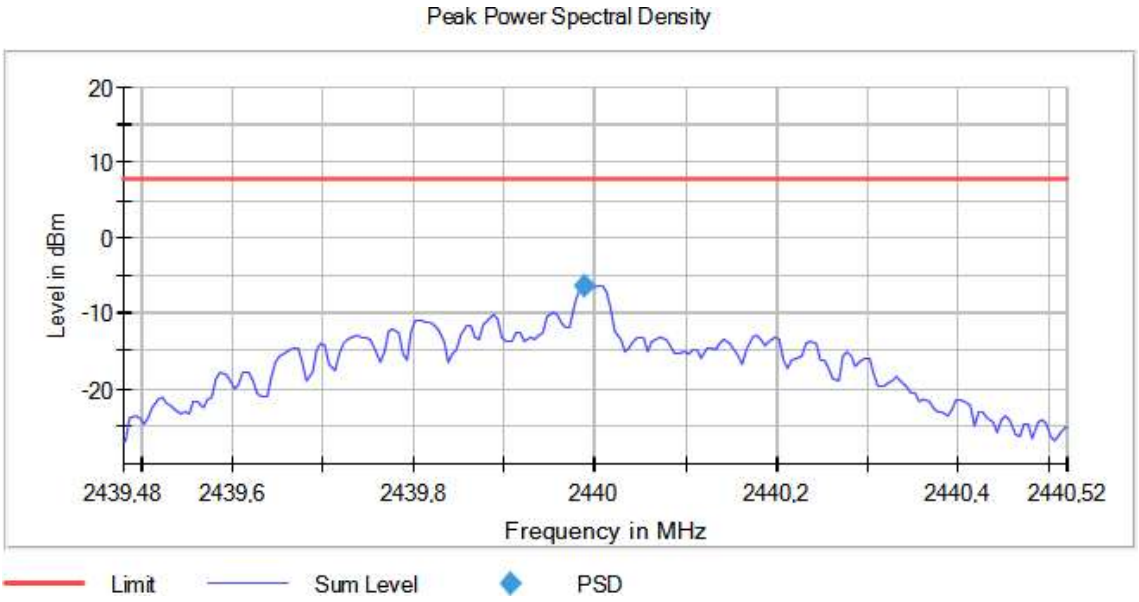
Date: 30.NOV.2022 13:19:04

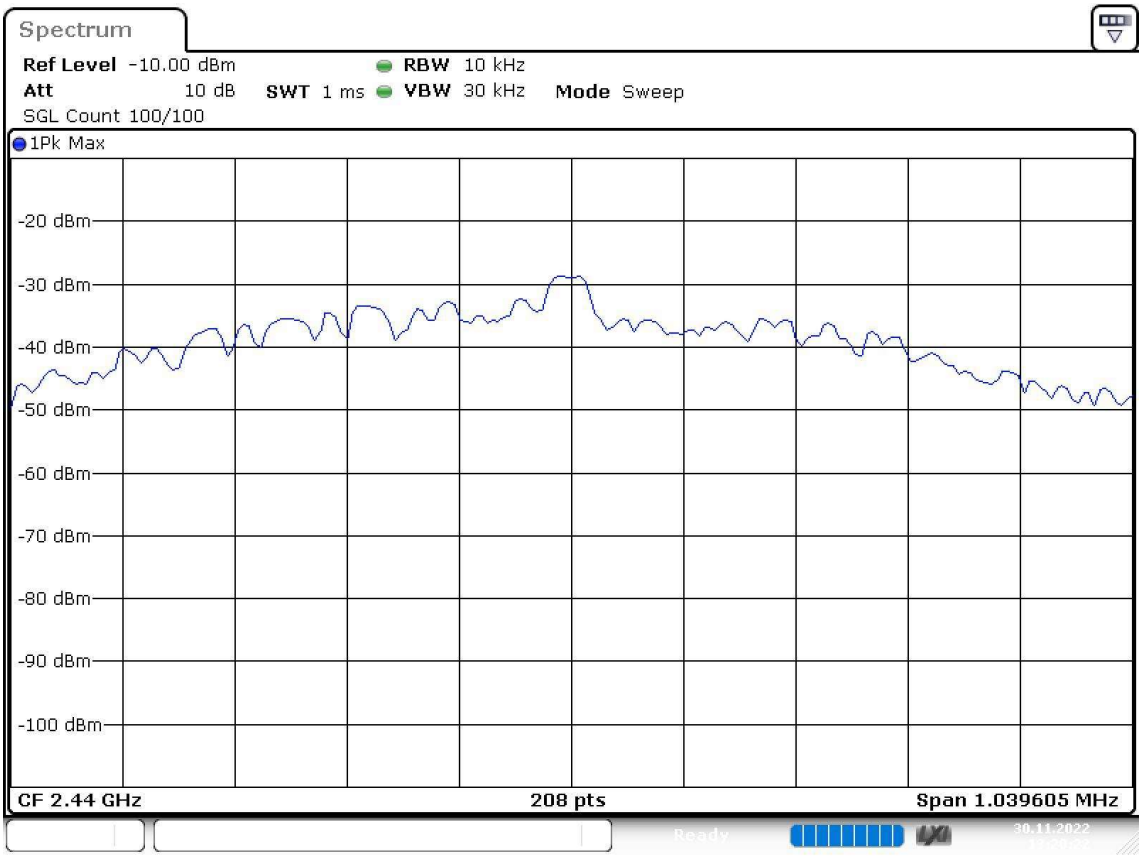
Frequency MHz = 2440.00000 Equipment Type = Digital Transmission System (DTS)

Bandwidth MHz = 1 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Number of Transmission Chains = 1 Active Port = 1

Images:





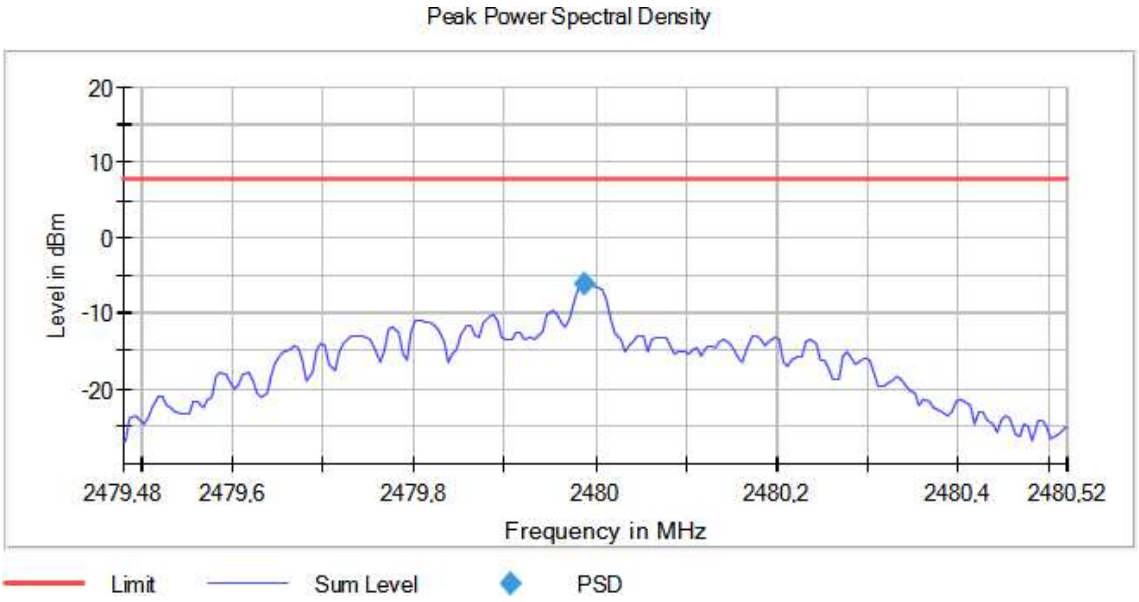
Date: 30.NOV.2022 13:20:23

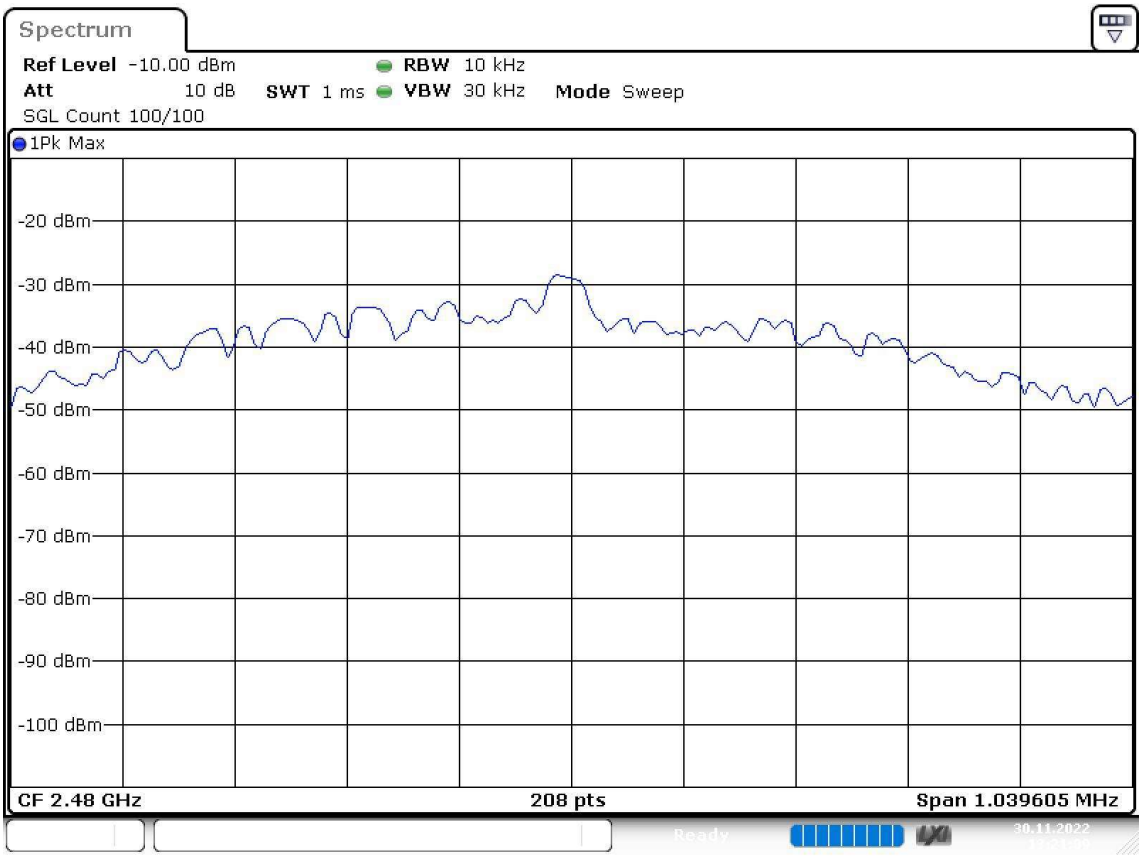
Frequency MHz = 2480.00000 Equipment Type = Digital Transmission System (DTS)

Bandwidth MHz = 1 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Number of Transmission Chains = 1 Active Port = 1

Images:





Date: 30.NOV.2022 13:21:10

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Results

Freq (MHz)	Equipment	BW (MHz)	# of Tx Chains	Port	PSD (dBm)
2402.00000	Digital Transmission System (DTS)	2	1	1	-6.36
2440.00000					-6.21
2480.00000					-5.99

Verdict

Pass

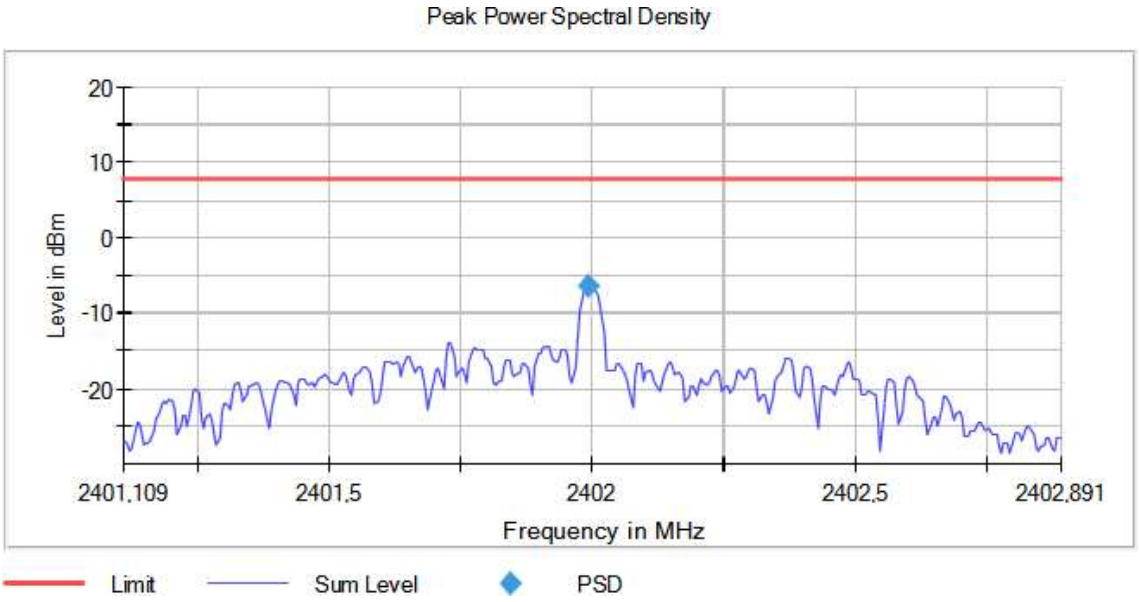
Attachments

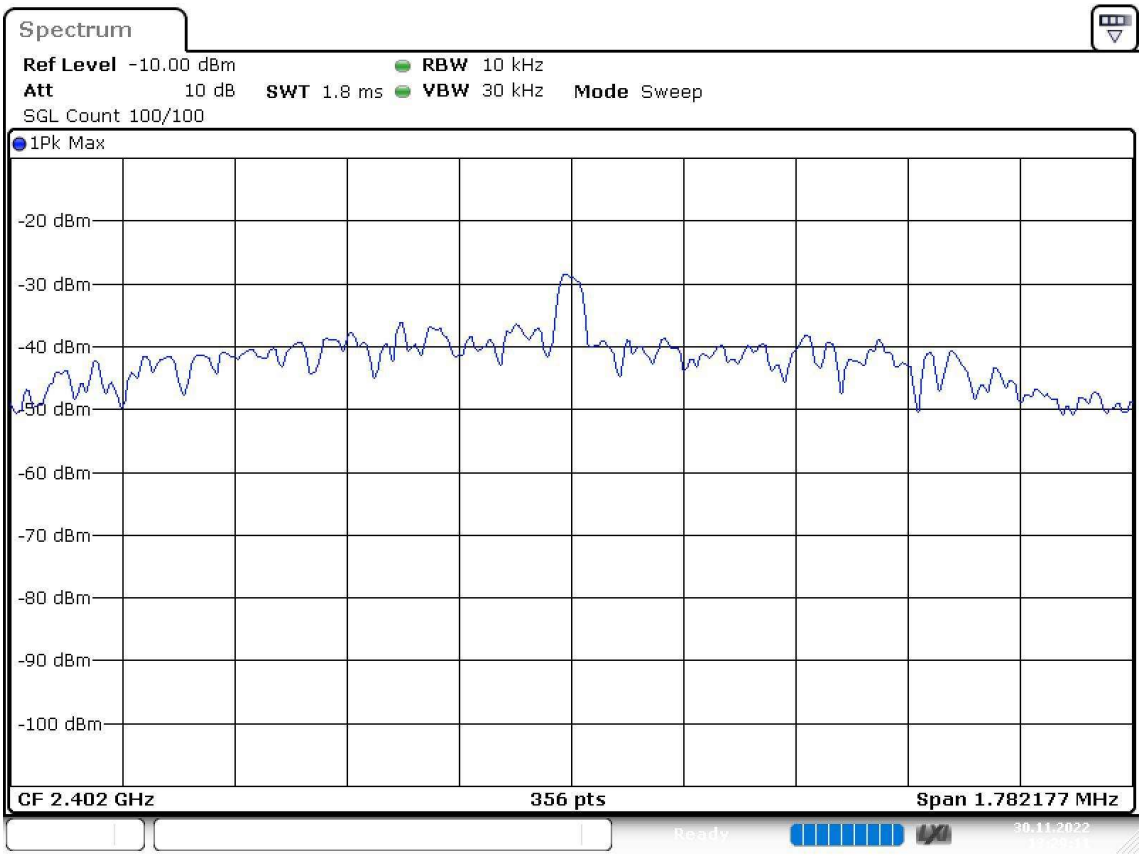
Frequency MHz = 2402.00000 Equipment Type = Digital Transmission System (DTS)

Bandwidth MHz = 2 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Number of Transmission Chains = 1 Active Port = 1

Images:





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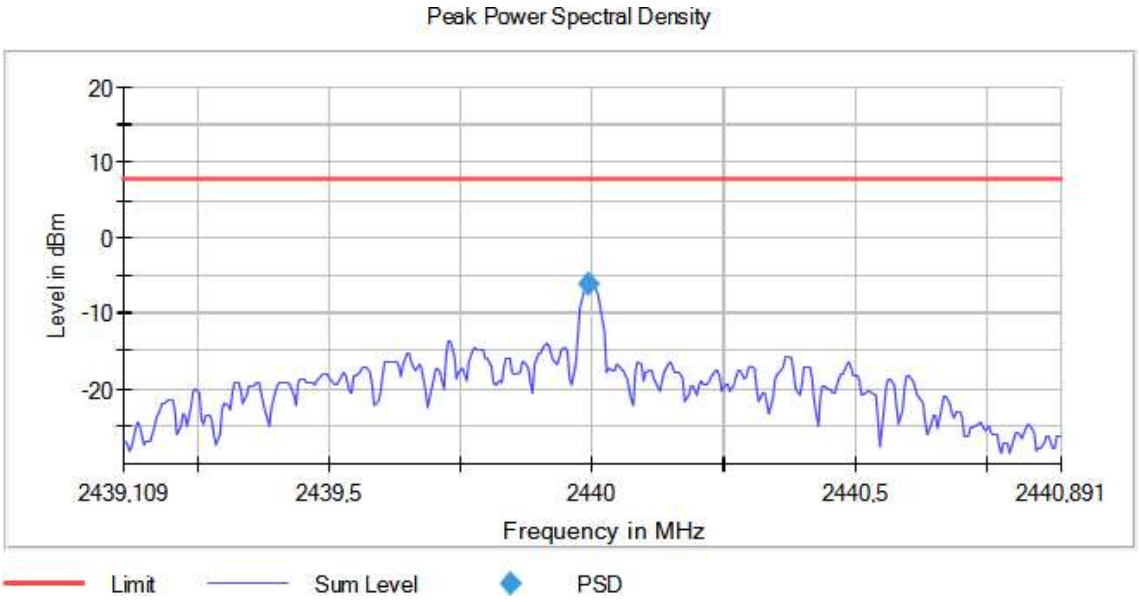
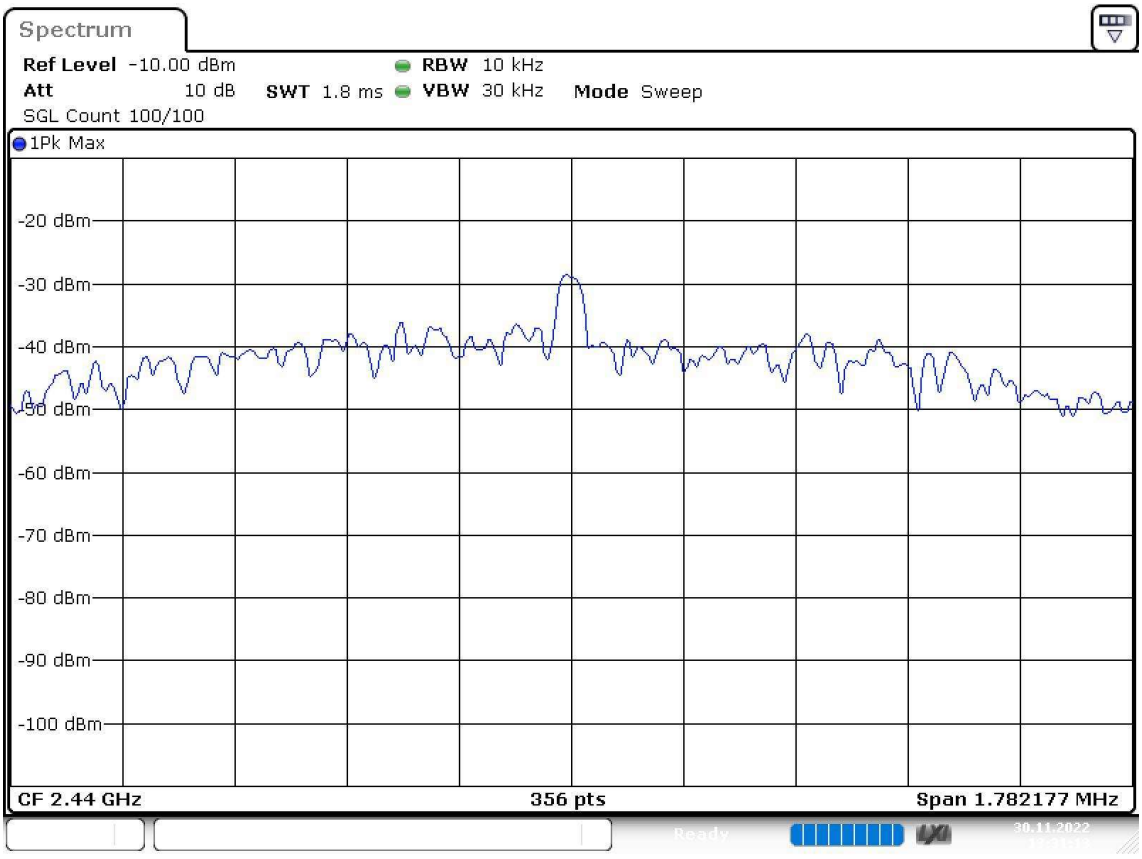
Frequency MHz = 2440.00000 Equipment Type = Digital Transmission System (DTS)

Bandwidth MHz = 2 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Number of Transmission Chains = 1 Active Port = 1

Images:





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