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

Test Report No:
NIE: 69157RRF.005

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

(*) Identification of item tested	Rechargeable wireless hearing instrument
(*) Trademark	ReSound, Beltone
(*) Model and /or type reference	CABR70
Other identification of the product	HW version: PCBA,CAM BTE70 RHI,V1.A,C6.0 SW version: Dooku2 FCC ID: XC26CABR70 IC: 6941C-CABR70
(*) Features	BT 1/2Mbit, proximity & MI radio, rechargeable battery, IP68 enclosure
Manufacturer	GN HEARING A/S Lautrupbjerg 7, 2750 Ballerup, Denmark
Test method requested, standard	USA FCC Part 15.247 (10-1-20 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-20 Edition): Radiated emission limits; general requirements. CANADA RSS-247 Issue 2 (February 2017). 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)	Rafael López Martín EMC Consumer & RF Lab. Manager  2022.02.04 08:38:34 +01'00'
Date of issue	2022-02-03
Report template No	FDT08_23 (*) "Data provided by the client"

Index

INDEX 2
ACRONYMS 3
COMPETENCES AND GUARANTEES 3
GENERAL CONDITIONS 3
UNCERTAINTY 4
DATA PROVIDED BY THE CLIENT 4
USAGE OF SAMPLES 4
TEST SAMPLE DESCRIPTION 5
IDENTIFICATION OF THE CLIENT 7
TESTING PERIOD AND PLACE 7
DOCUMENT HISTORY 7
ENVIRONMENTAL CONDITIONS 7
REMARKS AND COMMENTS 8
TESTING VERDICTS 9
SUMMARY 9
APPENDIX A: TEST RESULTS. BLUETOOTH LOW ENERGY 5.0 (2M, 1M) 10
INDEX 11
TEST CONDITIONS 12
TEST CASES DETAILS 15
FCC 47 CFR PART 15.247 / RSS-247 15
RSS-247 5.2 (a) / FCC 15.247 (a) (2) [6dBw] 6 dB Bandwidth 15
RSS-247 5.2 (b) / FCC 15.247 (e) [Psd] Power spectral density 19
RSS-247 5.4 (d) / FCC 15.247 (b) (3) [Pkcp] Maximum Peak Conducted output power 23
RSS-247 5.5 / FCC 15.247 (d) [Bndedge] Band-edge emissions compliance (Transmitter) 31
RSS-247 5.5 / FCC 15.247 (d) [RSE] Emission limitations radiated (Transmitter) 42
99dBw Occupied Channel Bandwidth 99% 63

Acronyms

Acronym ID	Acronym Description
	Emission Bandwidth
Detector	Detector used
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
Operation Band	Operation Band
PSD	Power Spectrum Density
Peak Power	Maximum Peak Conducted Output Power
Pol	Polarization
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, 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.

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 of the model CABR70 is a Rechargeable wireless hearing aid.

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	69157B/029	Rechargeable wireless hearing instrument	CABR70	2100815094	2021-11-24	Element Under Test
S/02	69157B/036	Rechargeable wireless hearing instrument	CABR70	--	2021-11-24	Element Under Test

Notes referenced to samples during the project:

Test sample description

<table>
<tr><td rowspan="7">Ports…… :</td><td rowspan="2">Port name and description</td><td colspan="4">Cable</td></tr>
<tr><td>Specified max length [m]</td><td>Attached during test</td><td>Shielded</td><td>Coupled to patient(3)</td></tr>
<tr><td>.....</td><td>.....</td><td>[ ]</td><td>[ ]</td><td>[ ]</td></tr>
<tr><td>.....</td><td>.....</td><td>[ ]</td><td>[ ]</td><td>[ ]</td></tr>
<tr><td>.....</td><td>.....</td><td>[ ]</td><td>[ ]</td><td>[ ]</td></tr>
<tr><td>.....</td><td>.....</td><td>[ ]</td><td>[ ]</td><td>[ ]</td></tr>
<tr><td>.....</td><td>.....</td><td>[ ]</td><td>[ ]</td><td>[ ]</td></tr>
<tr><td>Supplementary information to the ports…… :</td><td colspan="5">.....</td></tr>
<tr><td rowspan="5">Rated power supply .....:</td><td colspan="2" rowspan="2">Voltage and Frequency</td><td colspan="5">Reference poles</td></tr>
<tr><td>L1</td><td>L2</td><td>L3</td><td>N</td><td>PE</td></tr>
<tr><td>[ ]</td><td>AC: .....</td><td>[ ]</td><td>[ ]</td><td>[ ]</td><td>[ ]</td><td>[ ]</td></tr>
<tr><td>[ ]</td><td>AC: .....</td><td>[ ]</td><td>[ ]</td><td>[ ]</td><td>[ ]</td><td>[ ]</td></tr>
<tr><td>[x]</td><td colspan="5">DC: 3.8 Vdc</td></tr>
<tr><td>[ ]</td><td colspan="5">DC: .....</td></tr>
<tr><td>Rated Power .....:</td><td colspan="6">.....</td></tr>
<tr><td>Clock frequencies.....:</td><td colspan="6">.....</td></tr>
<tr><td>Other parameters .....:</td><td colspan="6">.....</td></tr>
<tr><td>Software version .....:</td><td colspan="6">Dooku2</td></tr>
<tr><td>Hardware version .....:</td><td colspan="6">PCBA,CAM BTE70 RHI,V1.A,C6.0</td></tr>
<tr><td>Dimensions in cm (W x H x D) ....:</td><td colspan="6">.....</td></tr>
<tr><td rowspan="5">Mounting position .....:</td><td>[ ]</td><td colspan="5">Table top equipment</td></tr>
<tr><td>[ ]</td><td colspan="5">Wall/Ceiling mounted equipment</td></tr>
<tr><td>[ ]</td><td colspan="5">Floor standing equipment</td></tr>
<tr><td>[ ]</td><td colspan="5">Hand-held equipment</td></tr>
<tr><td>[x]</td><td colspan="5">Other:</td></tr>
<tr><td>Modules/parts.....:</td><td colspan="4">Module/parts of test item</td><td>Type</td><td>Manufacturer</td></tr>
</table>

	.....	.....	.....
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....
Accessories (not part of the test item) .....:	Description	Type	Manufacturer
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....
Documents as provided by the applicant.....:	Description	File name	Issue date
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....

(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)	2021-12-10
Date (finish)	2021-12-15

Document history

Report number	Date	Description
69157RRF.005	2022-01-21	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: Jaime Barranquero Gómez.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
8835	SIGNAL AND SPECTRUM ANALYZER 2Hz-50GHz	FSW50	ROHDE AND SCHWARZ	2023/07
7040	Extension for Open Switch Unit up to 40 GHz	OSP-B157Wx	ROHDE AND SCHWARZ	2023/03
3345	Vector Signal Generator 100 KHz-6GHz	SMU200A	ROHDE AND SCHWARZ	2023/04
8130	Semianechoic Absorber Lined Chamber VI	P29419	ALBATROSS PROJECTS GMBH	2023/01
8134	Shielded Room	P29419	ALBATROSS PROJECTS GMBH	N/A
7826	Ultralog Antenna 30MHz-6GHz	HL562E_UPG	ROHDE AND SCHWARZ	2022/10
6666	EMI Test Receiver 2 Hz - 44 GHz	ESW44	ROHDE AND SCHWARZ	2022/02
7763	Horn Antenna 1-18 GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2022/11
6495	Horn Antenna 18 - 40 GHz	BBHA 9170	SCHWARZBECK MESS-ELEKTRONIK	2024/03
5705	RF Preamplifier, 40 dB ,1-18 GHz	BLMA 0118-1M	BONN ELEKTRONIK	2022/06
7862	Preamplifier G>30 dB 18-40GHz	BLMA 1840-3G	BONN ELEKTRONIK	N/A

Testing verdicts

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

Summary

Bluetooth Low Energy 5.0 (2M, 1M)

Requirement – Test case	FCC PART 15 PARAGRAPH / RSS-247	Verdict	Remark
RSS-247 5.2 (a) / FCC 15.247 (a) (2) [6dBw] 6 dB Bandwidth		Pass	
RSS-247 5.2 (b) / FCC 15.247 (e) [Psd] Power spectral density		Pass	
RSS-247 5.4 (d) / FCC 15.247 (b) (3) [Pkcp] Maximum Peak Conducted output power		Pass	
RSS-247 5.5 / FCC 15.247 (d) [Bndedge] Band-edge emissions compliance (Transmitter)		Pass	
RSS-247 5.5 / FCC 15.247 (d) [RSE] Emission limitations radiated (Transmitter)		Pass	
99dBw Occupied Channel Bandwidth 99%		Pass	

Supplementary information and remarks:
None

Appendix A: Test results. Bluetooth Low Energy 5.0 (2M, 1M)

INDEX

TEST CONDITIONS 12

TEST CASES DETAILS 15

FCC 47 CFR PART 15.247 / RSS-247 15

RSS-247 5.2 (a) / FCC 15.247 (a) (2) [6dBw] 6 dB Bandwidth 15
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RSS-247 5.5 / FCC 15.247 (d) [Bndedge] Band-edge emissions compliance (Transmitter) 31
RSS-247 5.5 / FCC 15.247 (d) [RSE] Emission limitations radiated (Transmitter) 42
99dBw Occupied Channel Bandwidth 99% 63

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal:	3.8 Vdc
Type of Power Supply:	Rechargeable battery.

ANTENNA (*):

Type of Antenna:	Integral.
Maximum Declared Antenna Gain:	-7.4 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.

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).

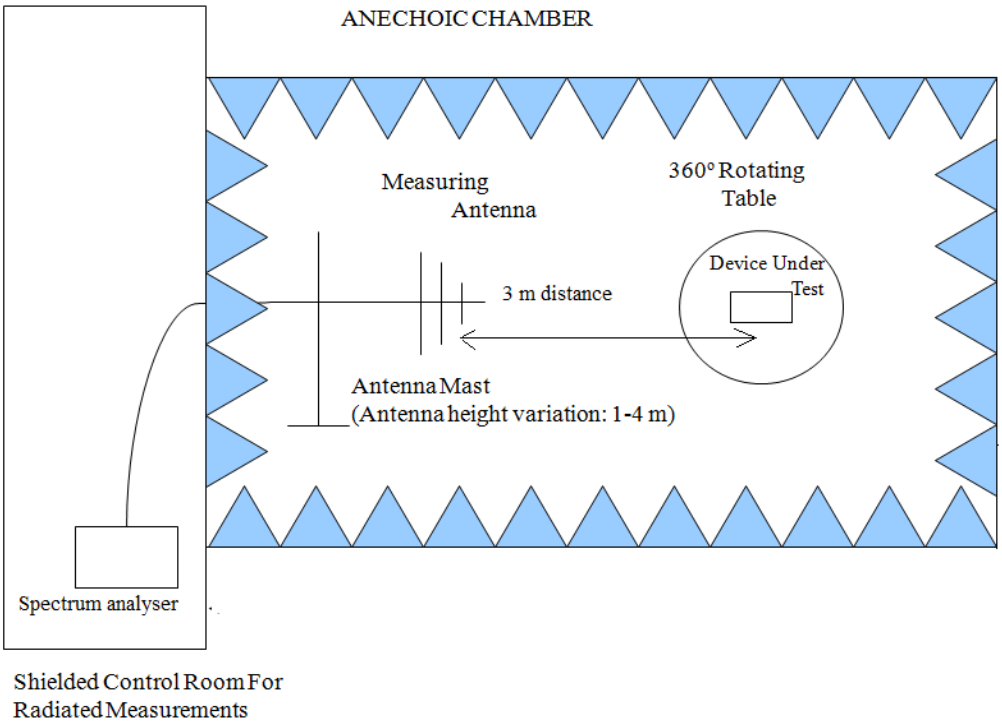
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

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.

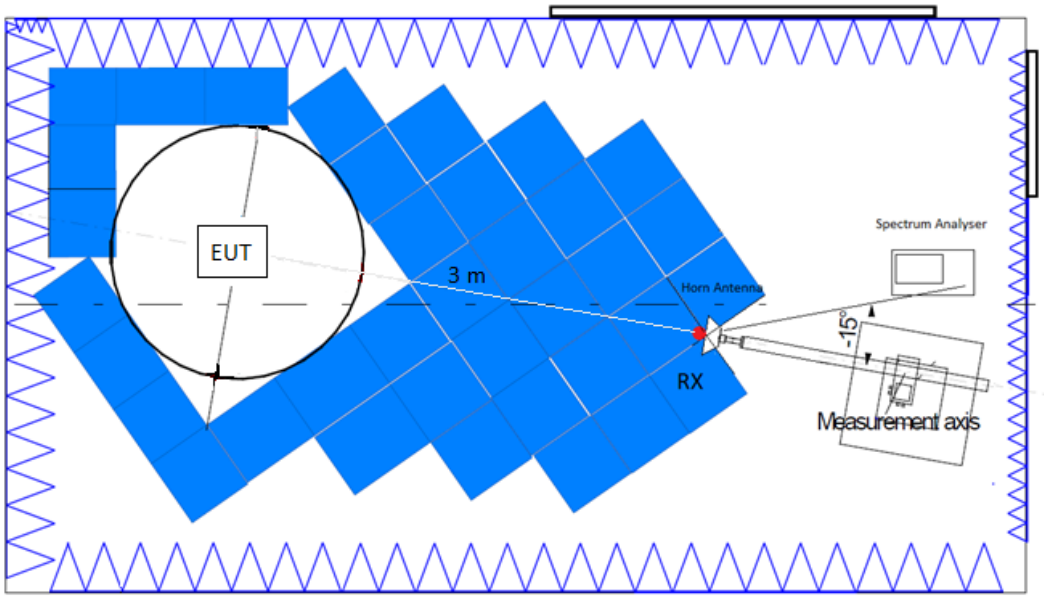
Measurements were made in both horizontal and vertical planes of polarization.

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.

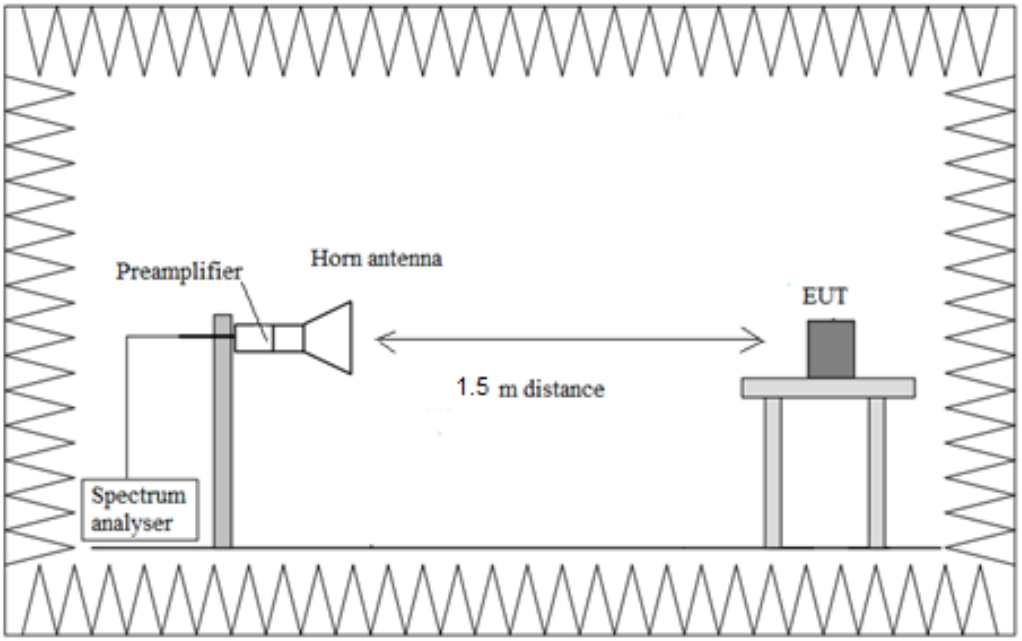
Radiated measurements setup from 30 MHz to 1 GHz:



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 2 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	Emission Bandwidth (MHz)
[2400, 2483.5]	2402.00000	Digital Transmission System (DTS)	1.346534
	2440.00000		1.465346
	2480.00000		1.108910

Verdict

Pass

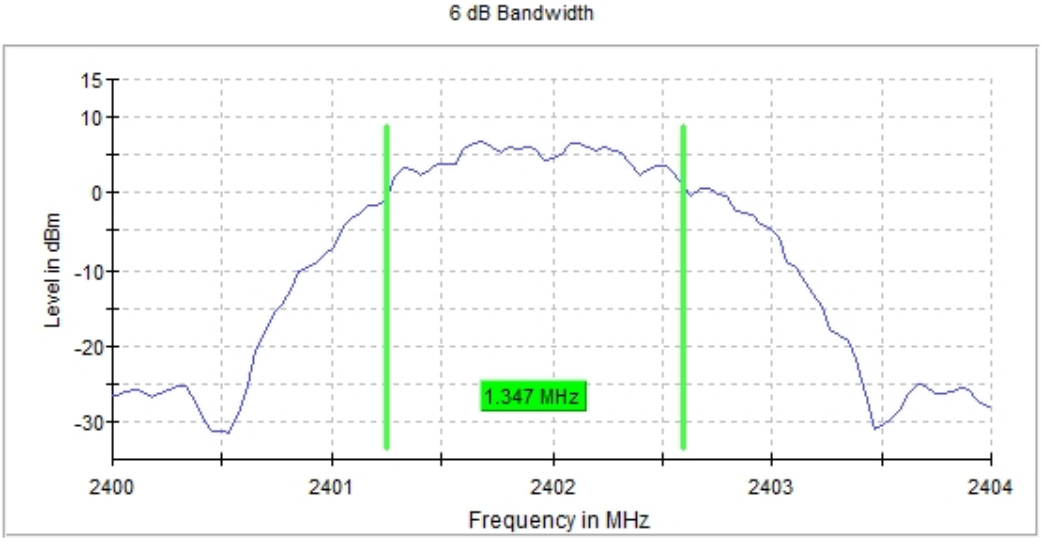
Uncertainty

Measurement uncertainty (%) <±2.84

Attachments

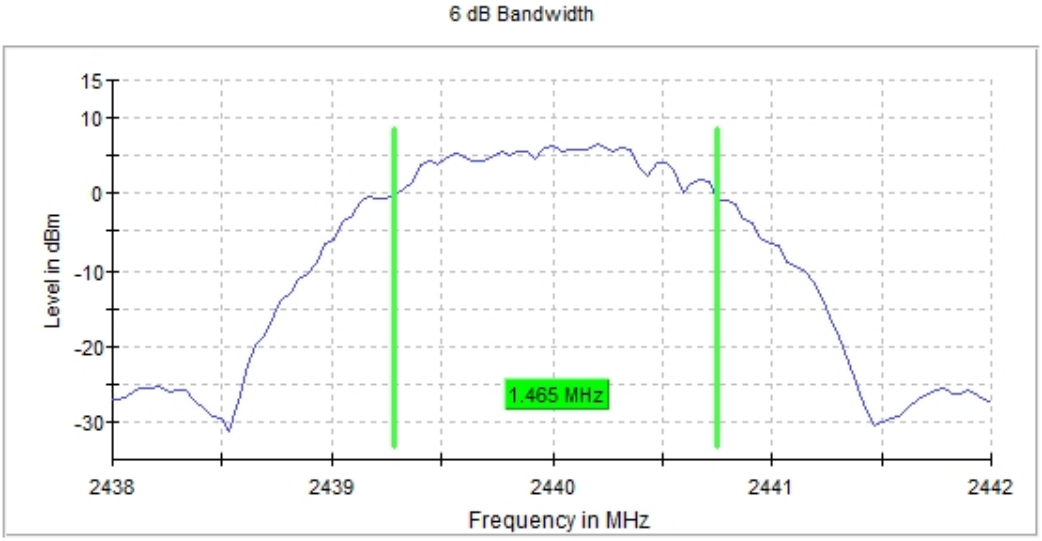
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Images:



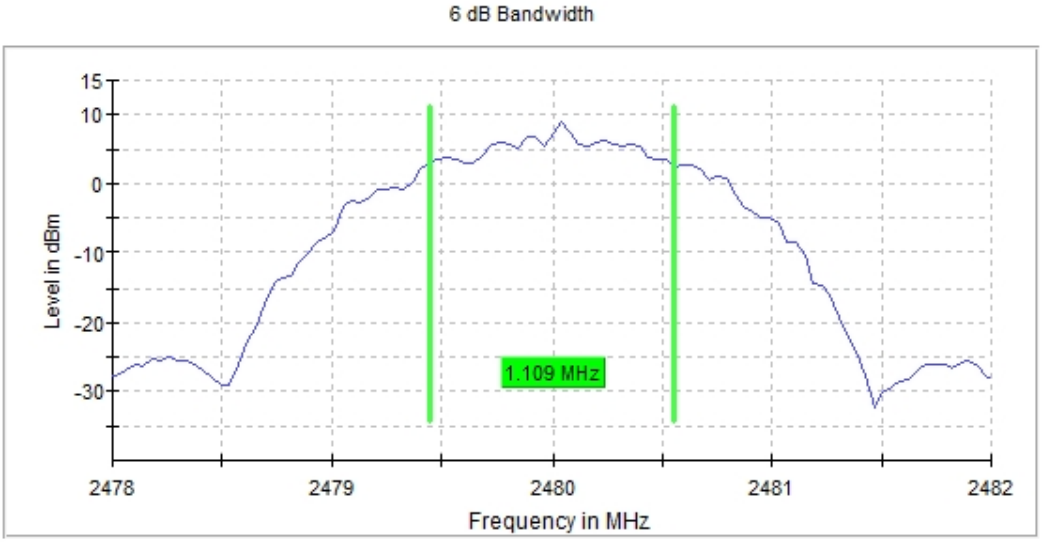
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Images:



Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	Emission Bandwidth (MHz)
[2400, 2483.5]	2402.00000	Digital Transmission System (DTS)	0.712872
	2440.00000		0.693070
	2480.00000		0.772278

Verdict

Pass

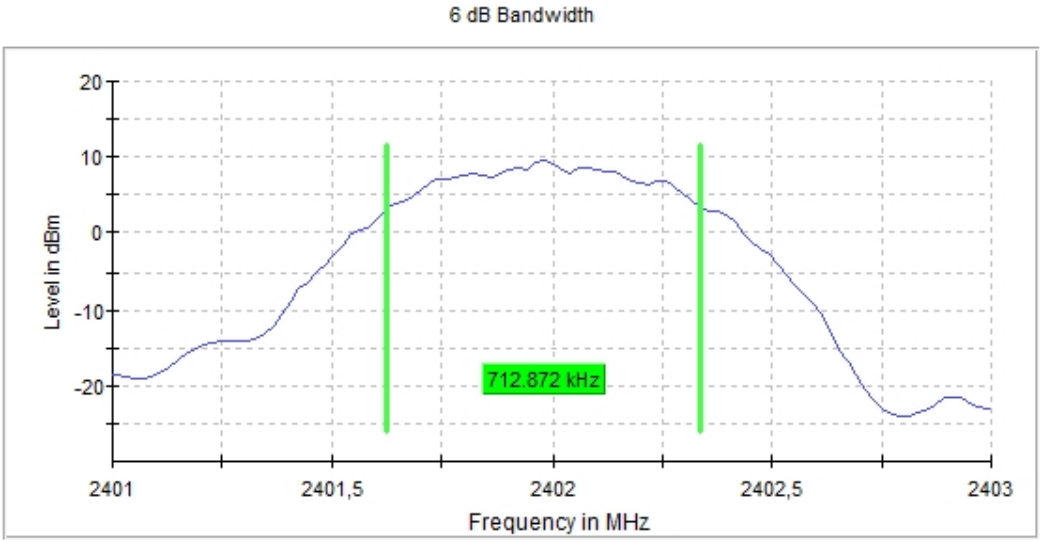
Uncertainty

Measurement uncertainty (%) <±2.84

Attachments

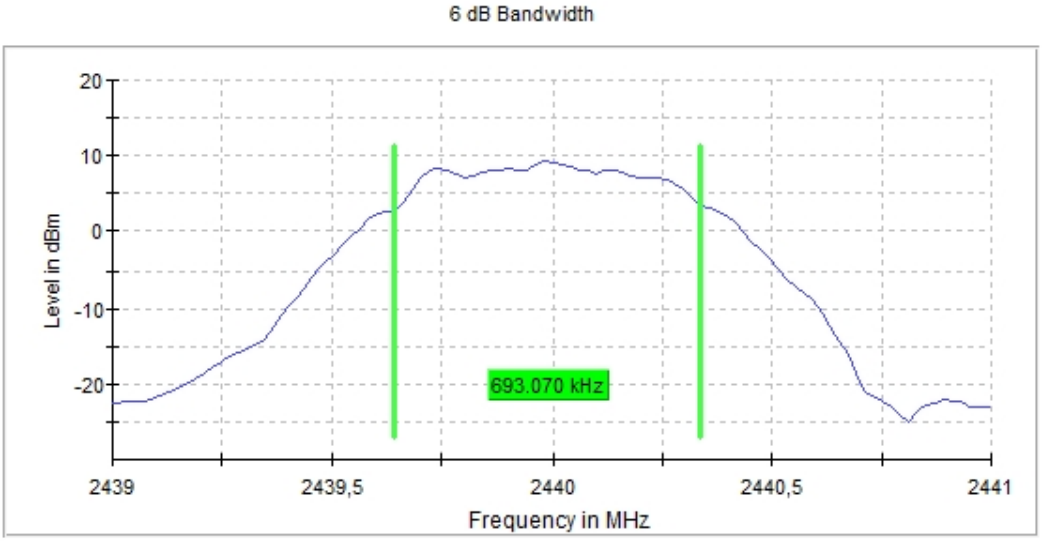
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Images:



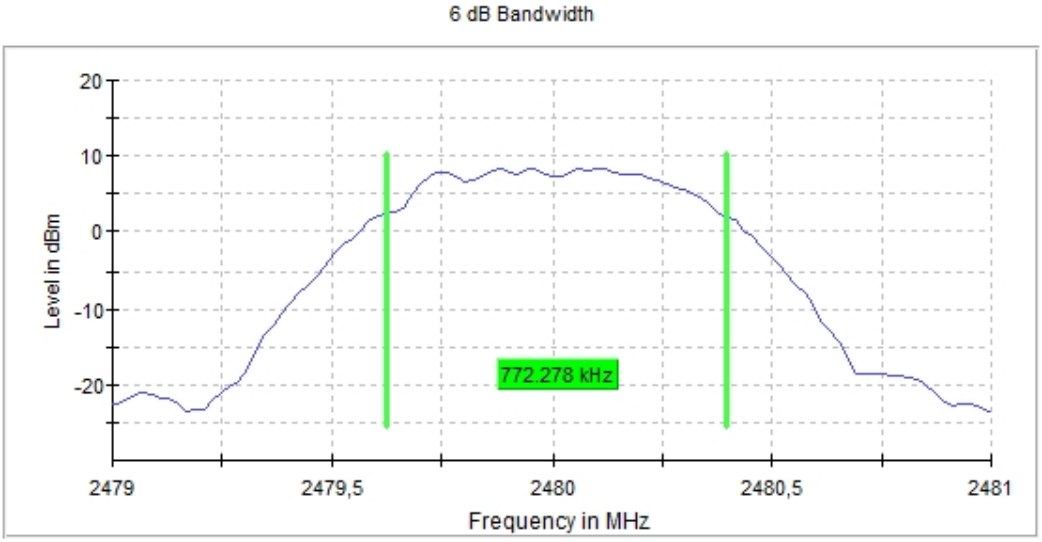
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

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 5.0 (GFSK 2 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	PSD (dBm)
[2400, 2483.5]	2402.00000	Digital Transmission System (DTS)	-0.095000
	2440.00000		0.608000
	2480.00000		0.016000

Verdict

Pass

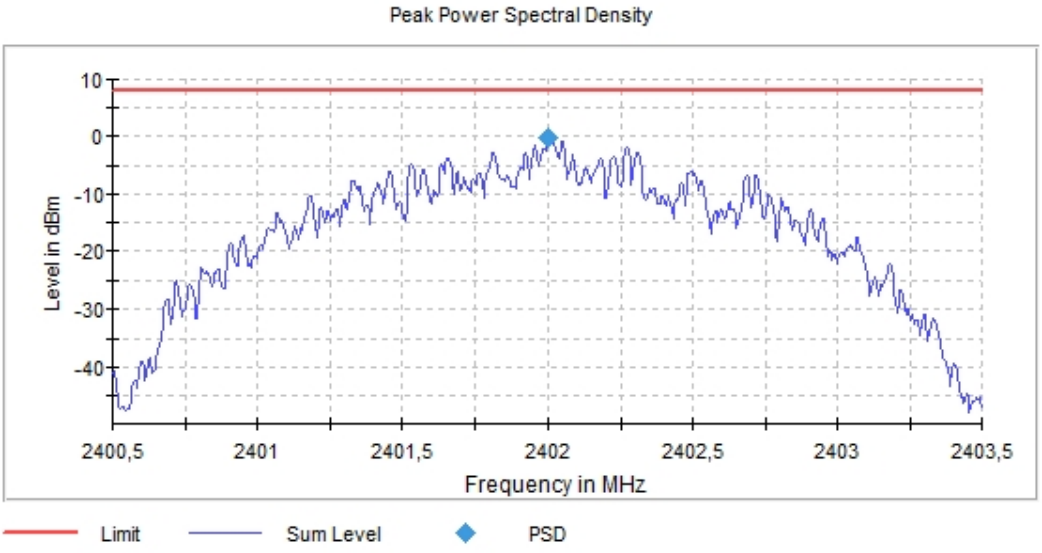
Uncertainty

Measurement uncertainty (dB) <±0.99

Attachments

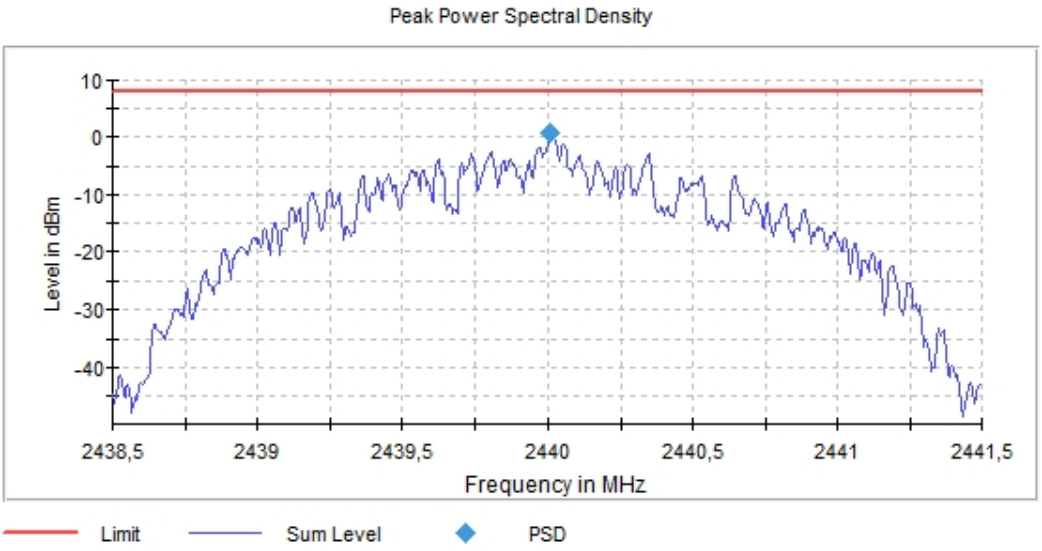
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Images:



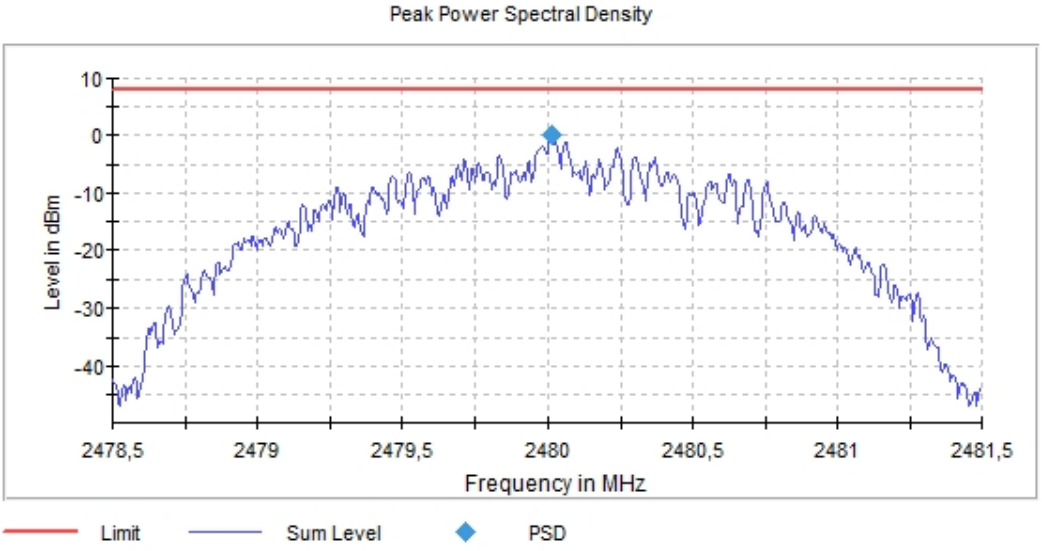
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Images:



Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	PSD (dBm)
[2400, 2483.5]	2402.00000	Digital Transmission System (DTS)	1.224000
	2440.00000		1.356000
	2480.00000		1.580000

Verdict

Pass

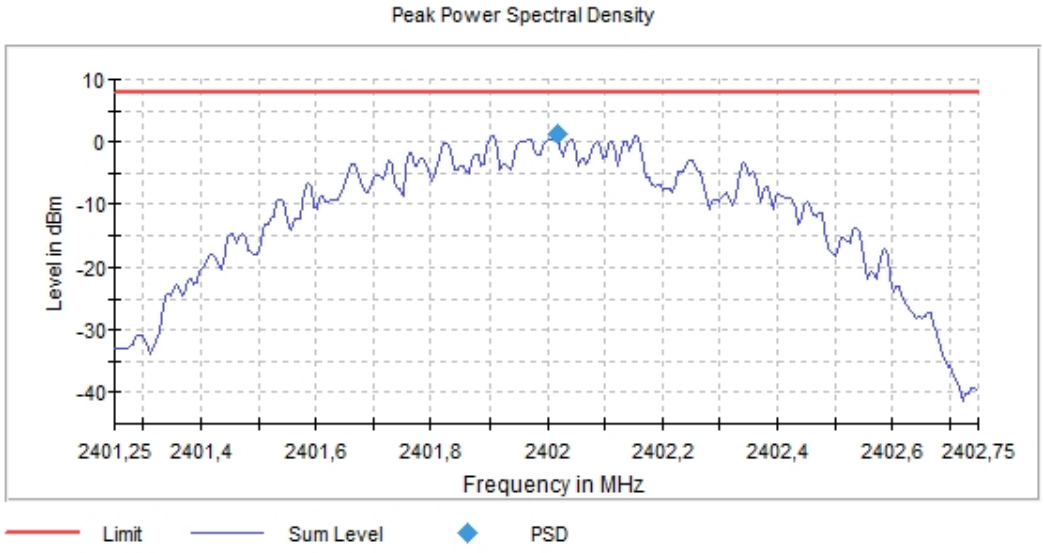
Uncertainty

Measurement uncertainty (dB) <±0.99

Attachments

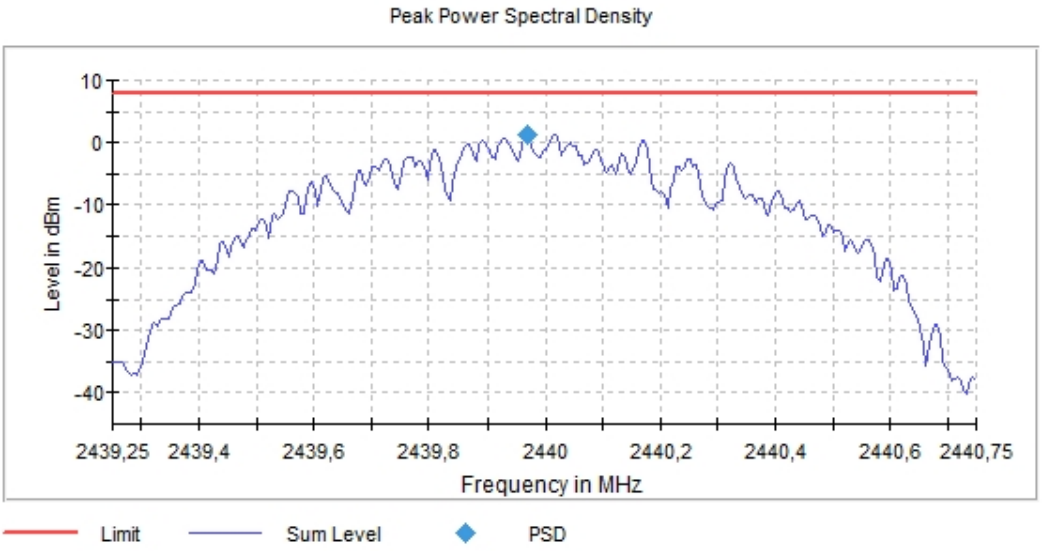
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Images:



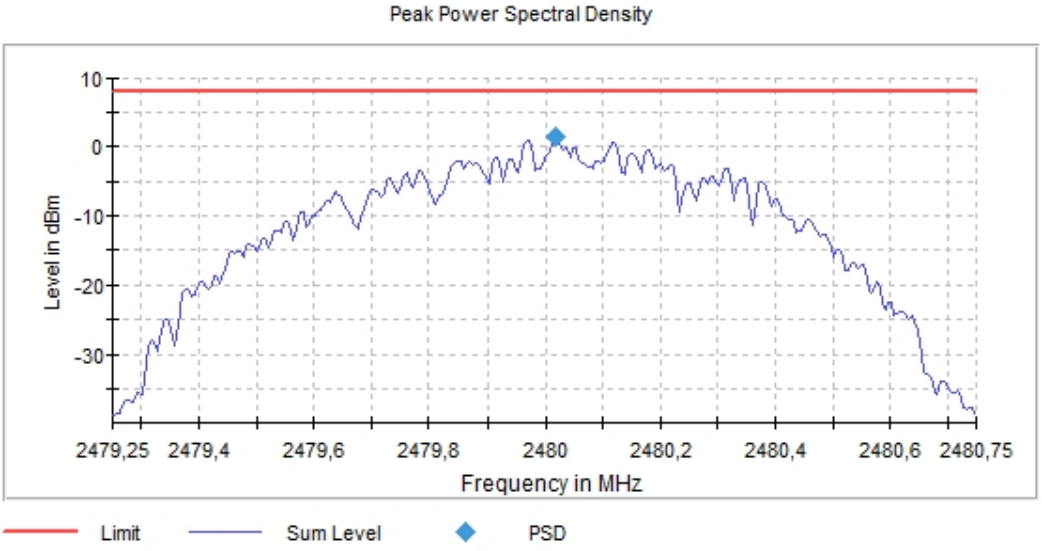
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Images:



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

Limits

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.

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	Peak Power (dBm)
[2400, 2483.5]	2402.00000	Digital Transmission System (DTS)	10.1
	2440.00000		10.1
	2480.00000		10.0

Verdict

Pass

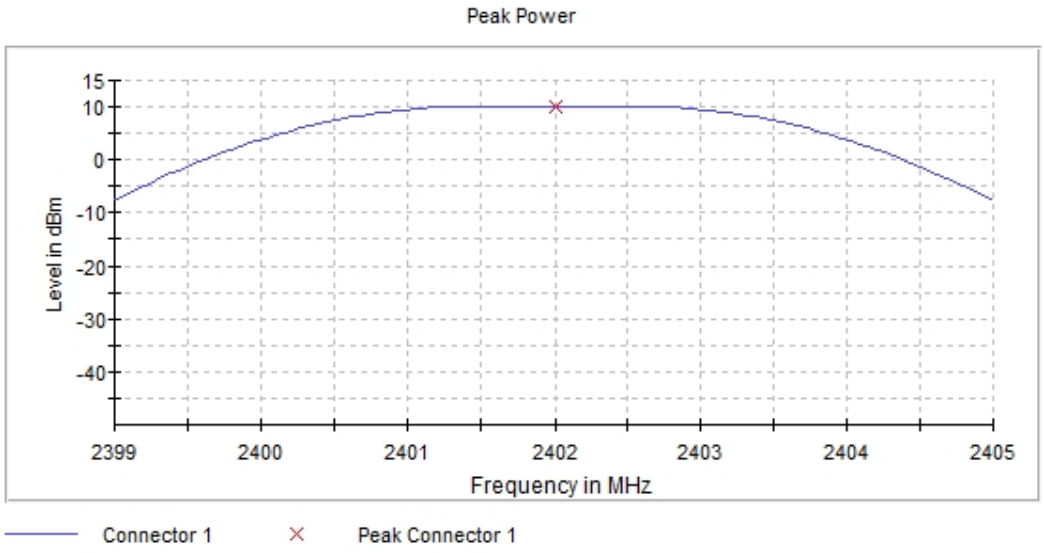
Uncertainty

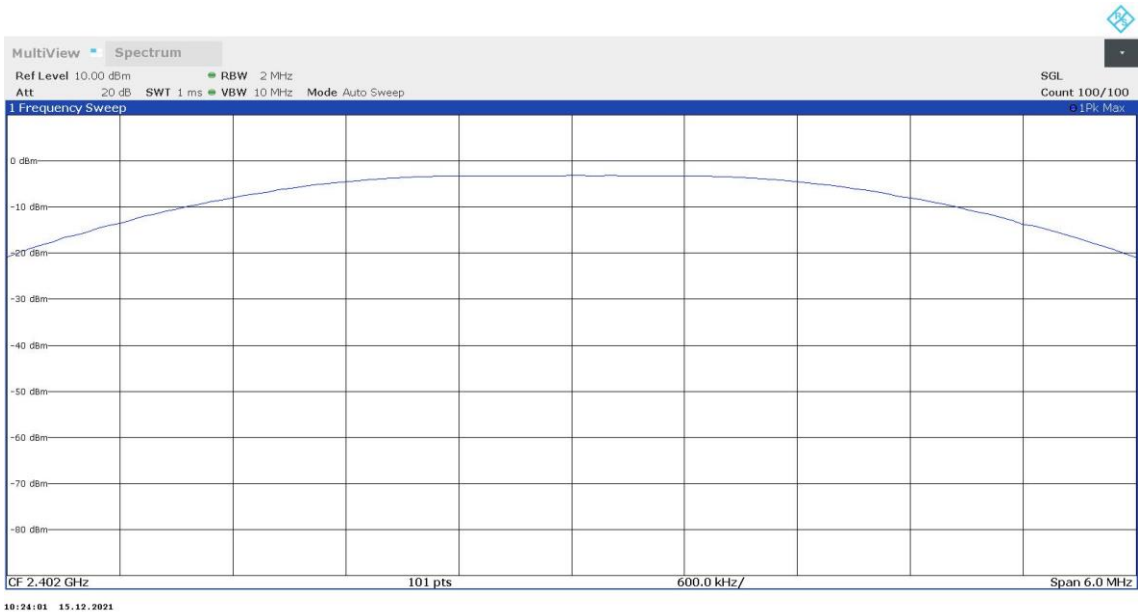
Measurement uncertainty (dB) <±0.80

Attachments

Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

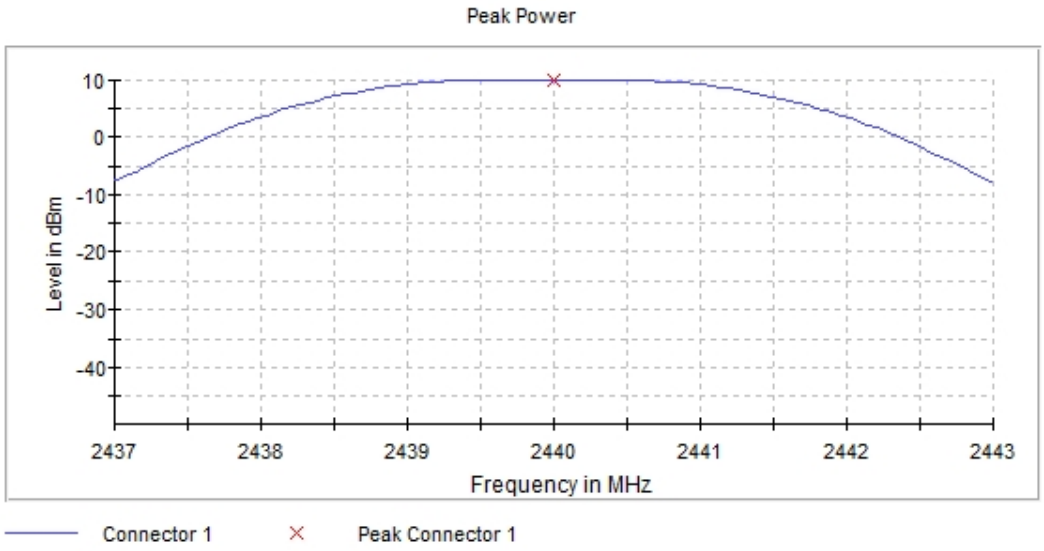
Images:

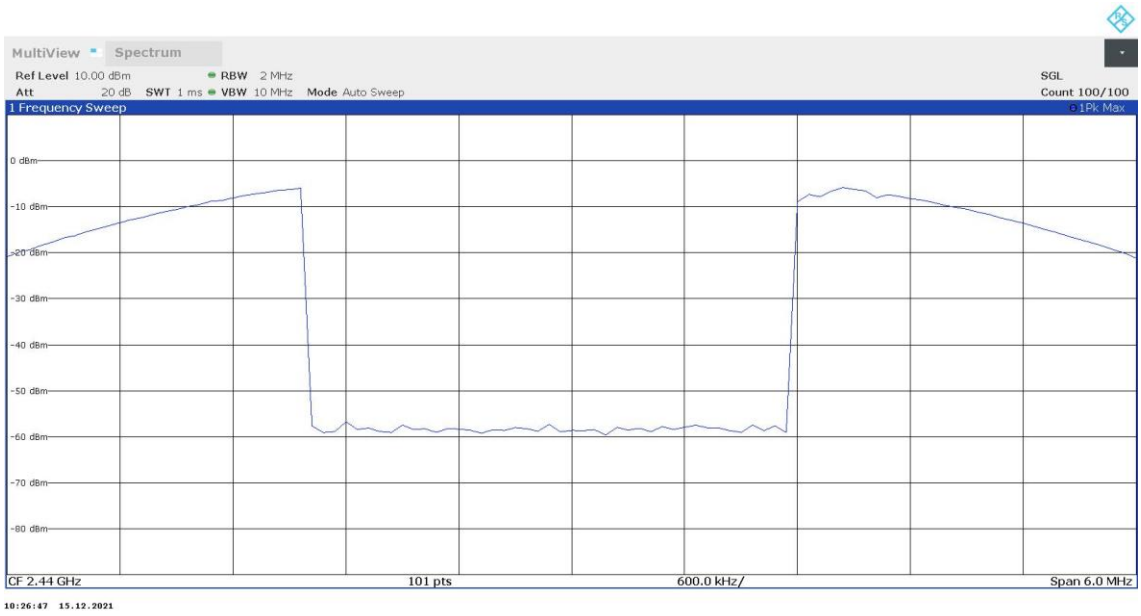




Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

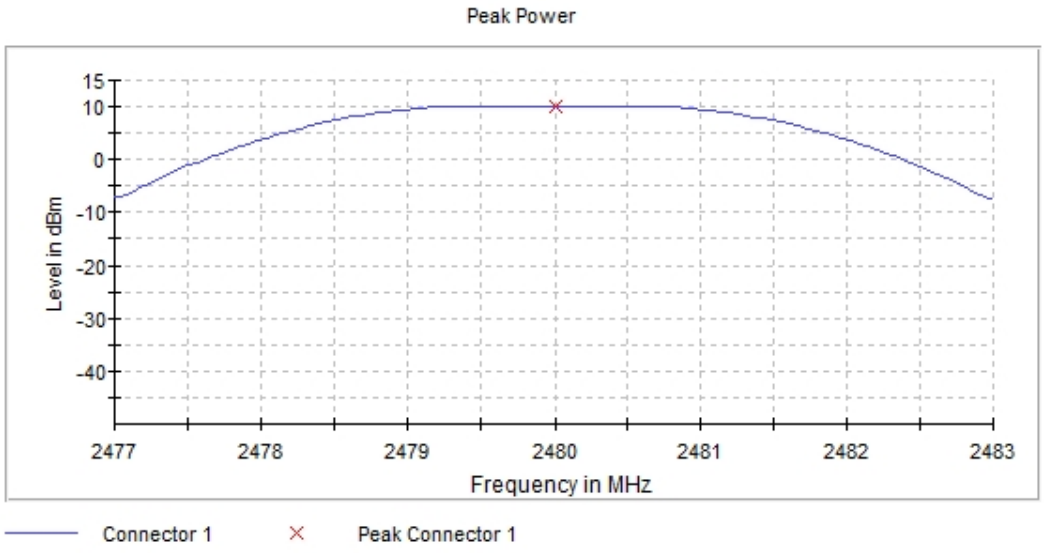
Images:

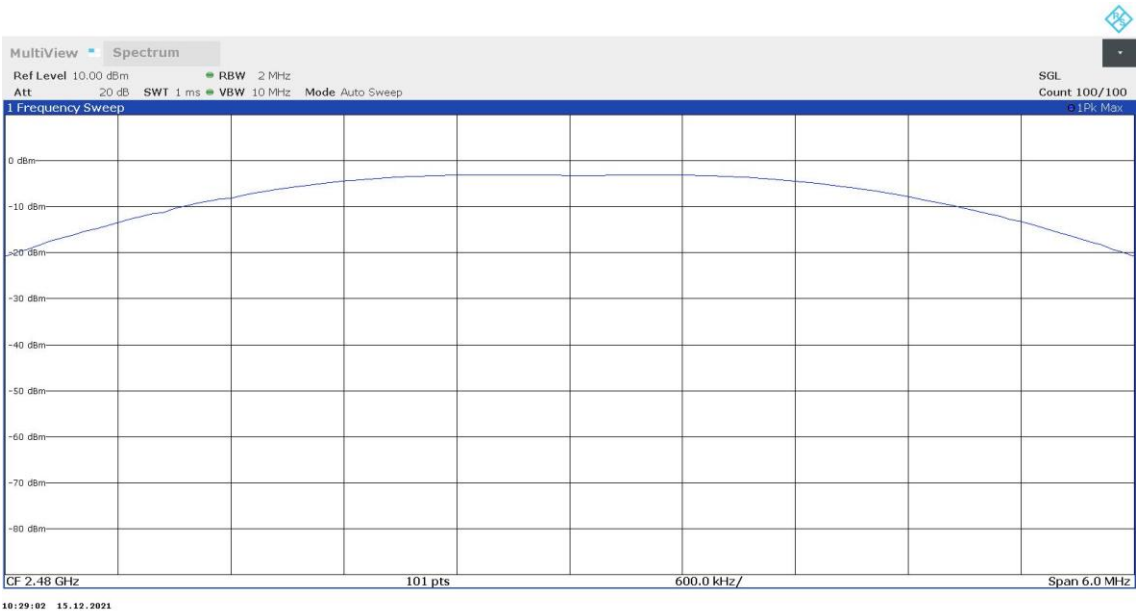




Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Images:





Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	Peak Power (dBm)
[2400, 2483.5]	2402.00000	Digital Transmission System (DTS)	10.0
	2440.00000		9.9
	2480.00000		10.1

Verdict

Pass

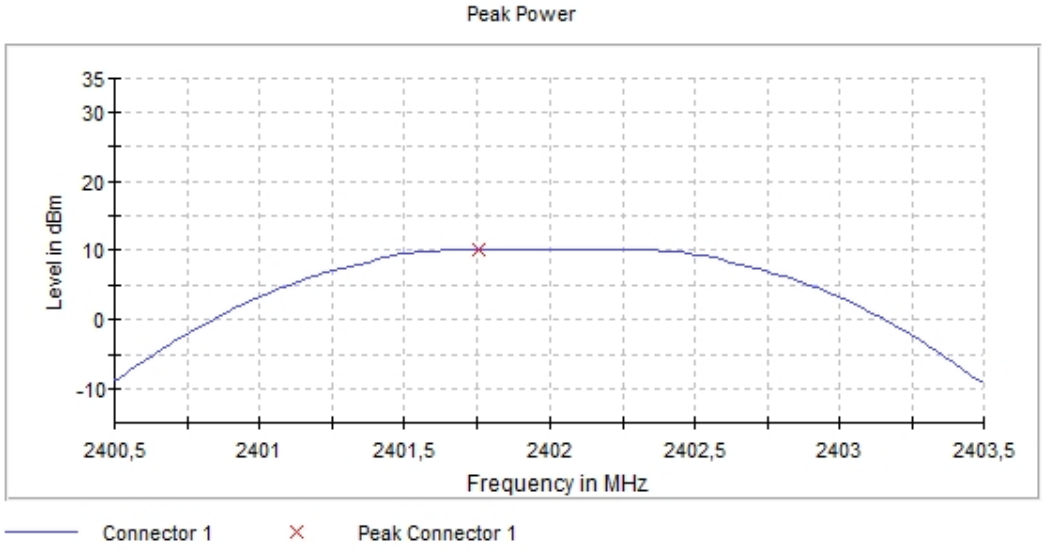
Uncertainty

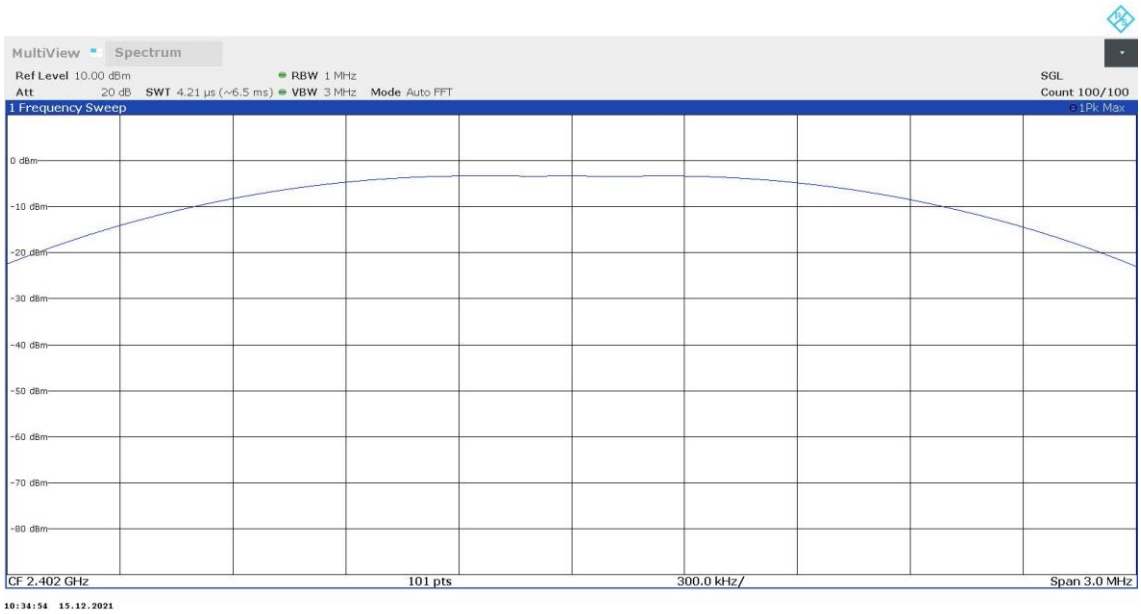
Measurement uncertainty (dB) <±0.80

Attachments

Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

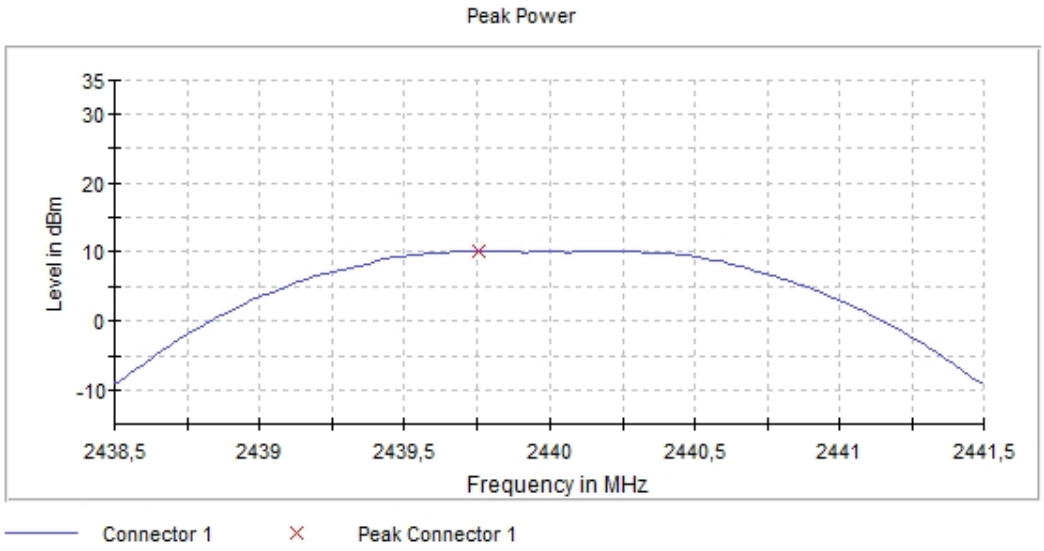
Images:

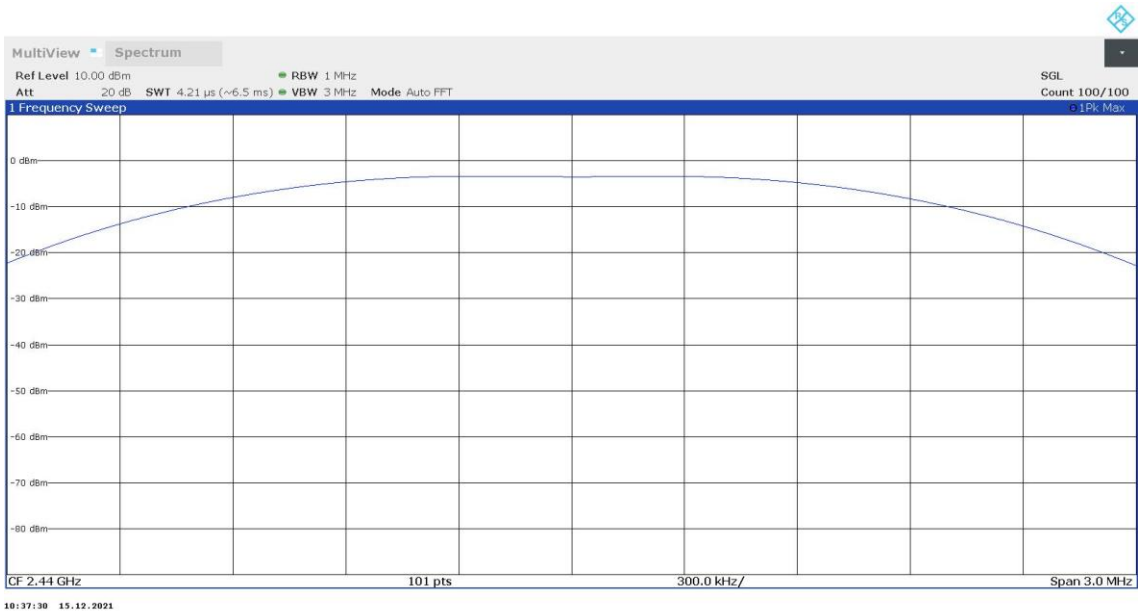




Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

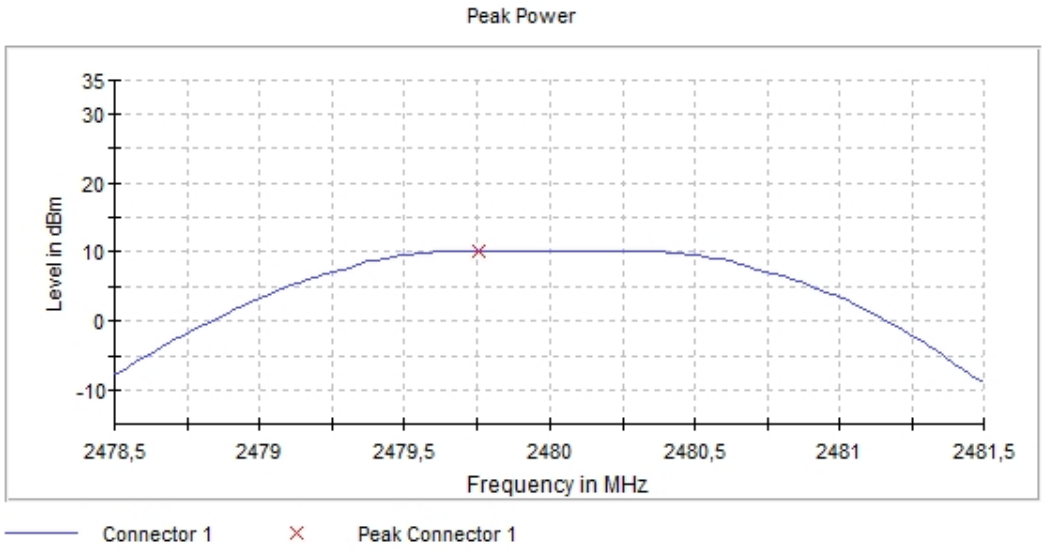
Images:

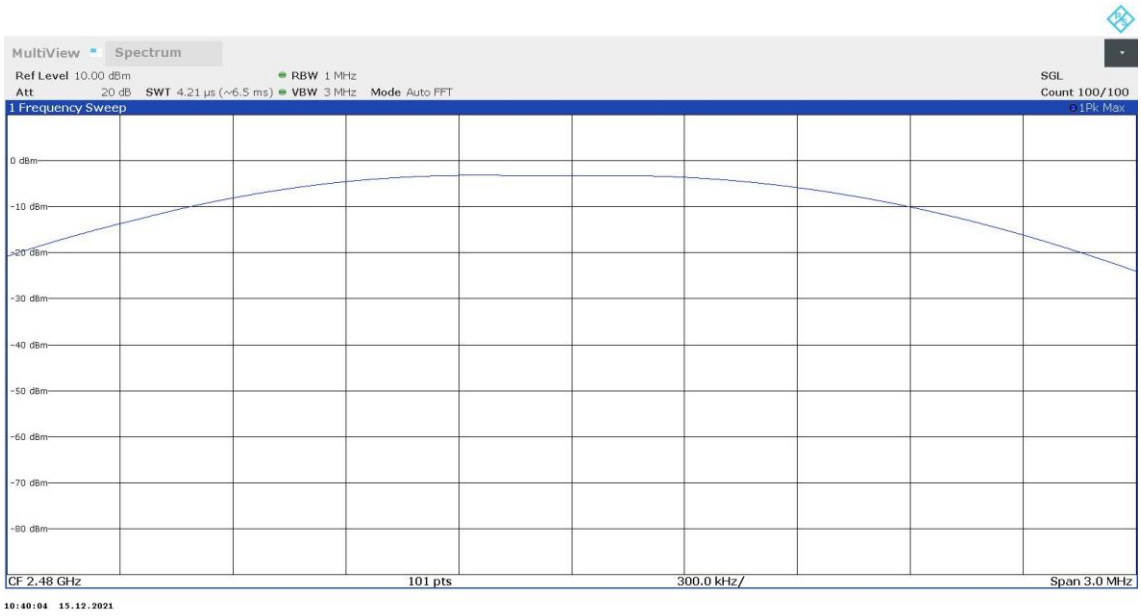




Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

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 5.0 (GFSK 2 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	Inband Peak Lvl (dBm)	Freq (MHz)	Lvl (dBm)
[2400, 2483.5]	2402.00000	Digital Transmission System (DTS)	3.6	2399.975000	-25.3
			3.6	2399.925000	-26.1
			3.6	2399.875000	-28.4
			3.6	2399.825000	-29.6
			3.6	2399.775000	-30.0
			3.6	2399.725000	-31.2
			3.6	2399.675000	-34.7
			3.6	2399.625000	-35.5
			3.6	2399.575000	-37.4
			3.6	2397.975000	-37.9
			3.6	2398.025000	-38.2
			3.6	2398.075000	-38.3
			3.6	2397.925000	-38.4
			3.6	2399.525000	-38.6
			3.6	2399.475000	-38.6
	2480.00000		3.6	2483.925000	-37.9
			3.6	2483.875000	-37.9
			3.6	2483.775000	-38.7
			3.6	2484.125000	-38.7
			3.6	2484.075000	-38.8
			3.6	2483.975000	-38.9
			3.6	2484.025000	-39.0
			3.6	2483.625000	-39.2
			3.6	2483.575000	-39.3
			3.6	2484.325000	-39.3
			3.6	2484.675000	-39.5
			3.6	2483.825000	-39.6
			3.6	2484.225000	-39.8

Operation Band (MHz)	Freq (MHz)	Equipment	Inband Peak Lvl (dBm)	Freq (MHz)	Lvl (dBm)
			3.6	2484.175000	-39.8
			3.6	2483.525000	-39.9

Verdict

Pass

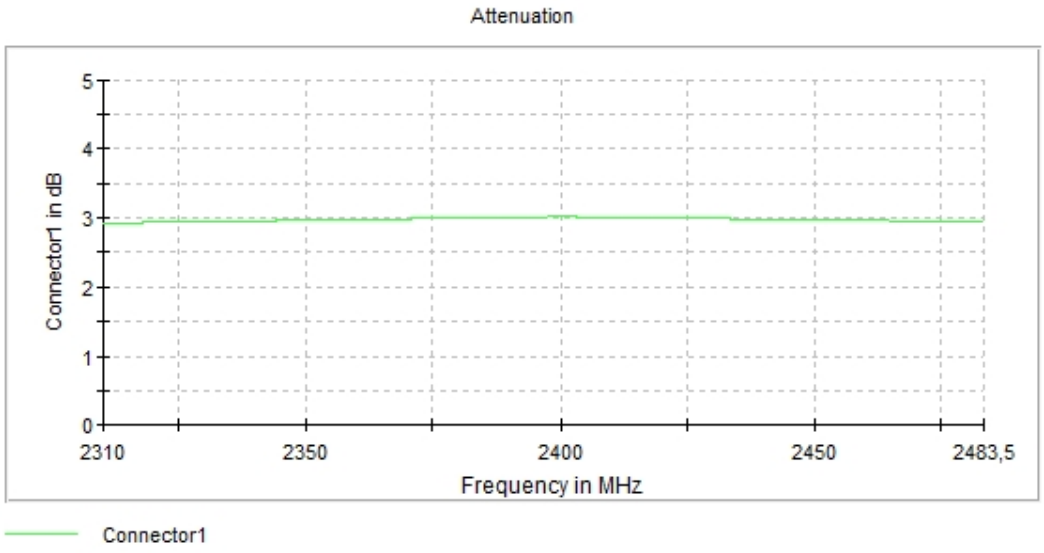
Uncertainty

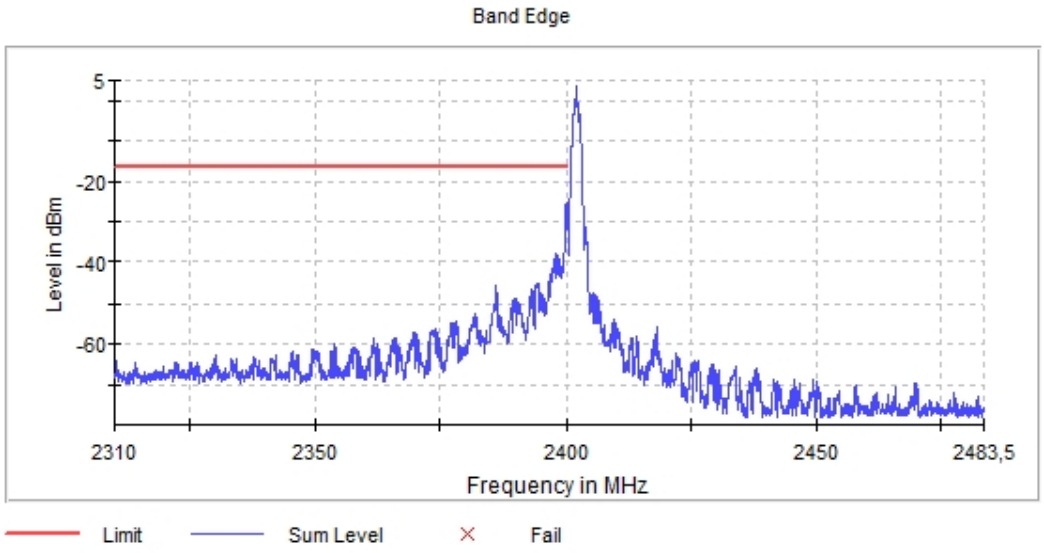
Measurement uncertainty (dB) <±1.53

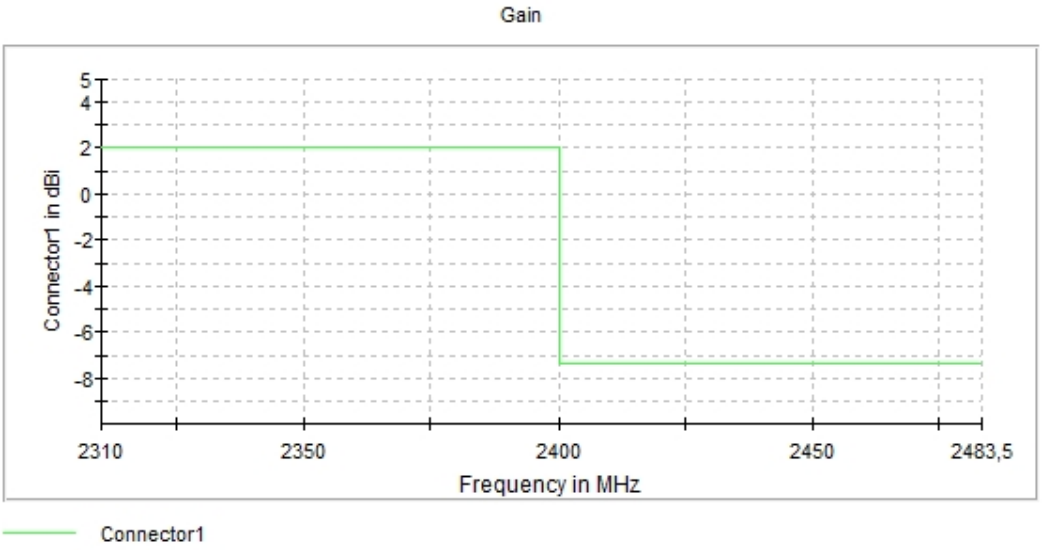
Attachments

Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Measurement Point = 1

Images:

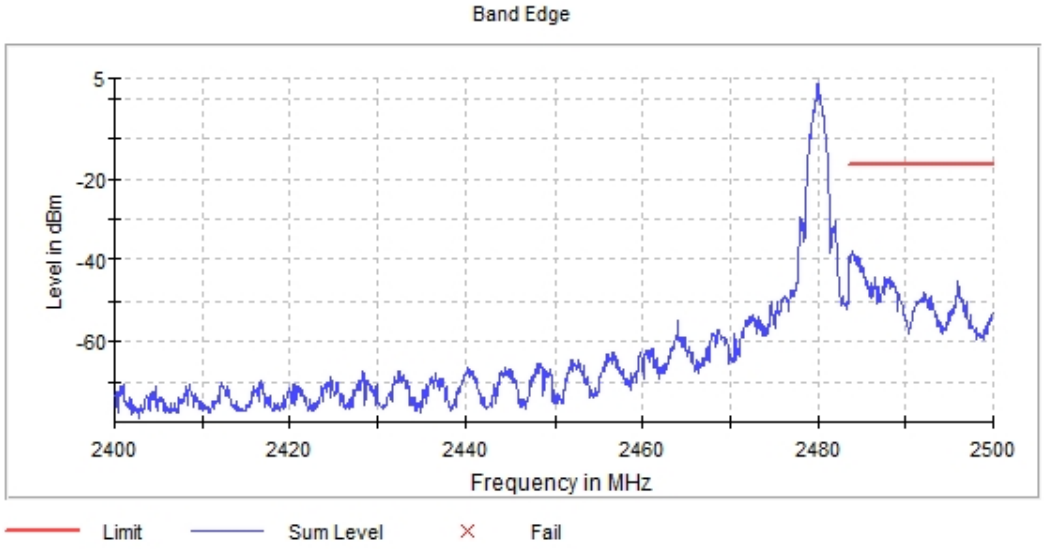


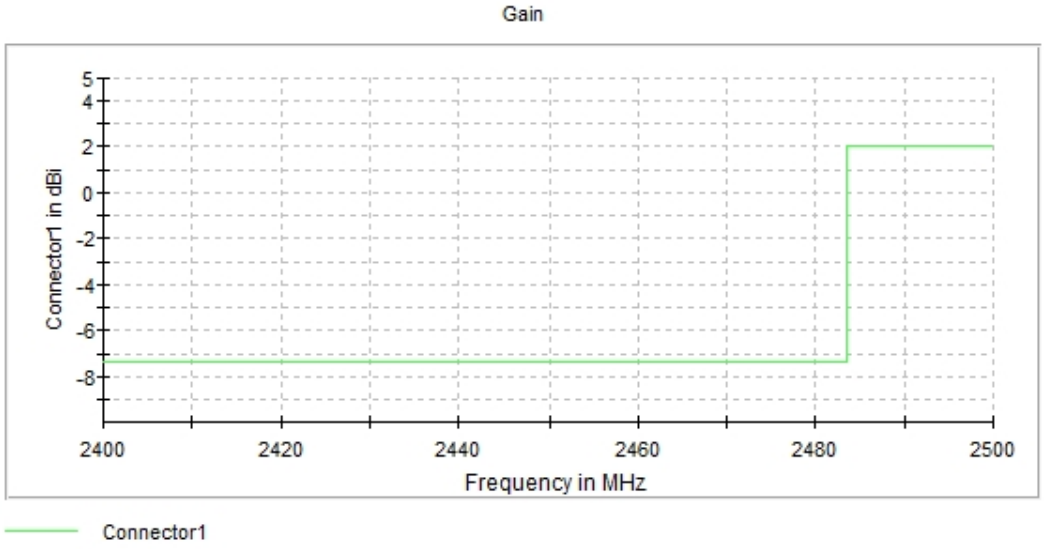


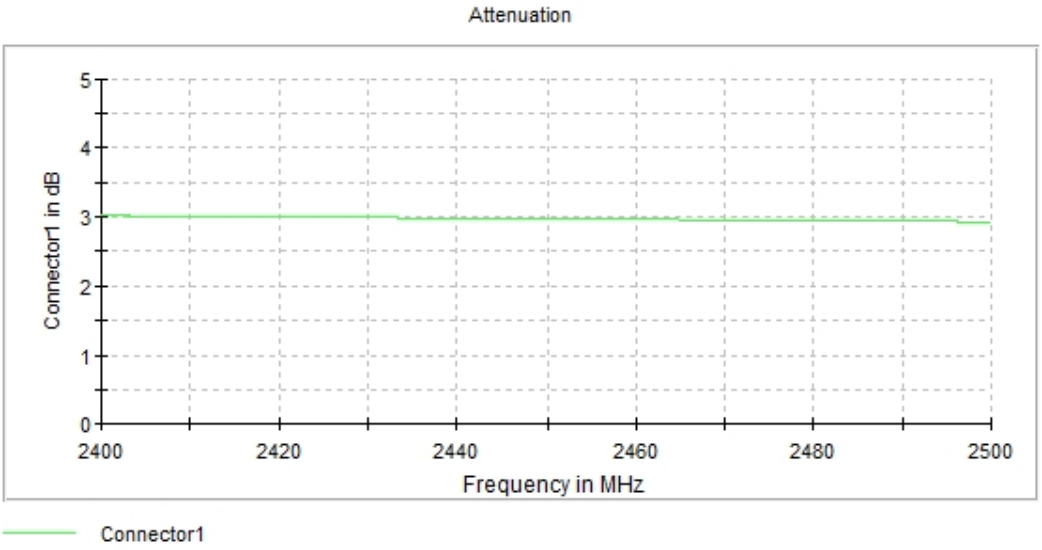

Gain
5
4
2
0
-2
-4
-6
-8
Connector1 in dBi
2310
2350
2400
2450
2483,5
Frequency in MHz
Connector1

Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Measurement Point = 1

Images:






Attenuation
Connector1 in dB
0
1
2
3
4
5
2400
2420
2440
2460
2480
2500
Frequency in MHz
Connector1

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	Inband Peak Lvl (dBm)	Freq (MHz)	Lvl (dBm)
[2400, 2483.5]	2402.00000	Digital Transmission System (DTS)	3.6	2399.875000	-35.2
			3.6	2399.325000	-35.8
			3.6	2399.275000	-35.9
			3.6	2399.975000	-36.3
			3.6	2399.925000	-36.4
			3.6	2399.825000	-36.4
			3.6	2399.475000	-37.9
			3.6	2399.375000	-37.9
			3.6	2399.225000	-37.9
			3.6	2399.425000	-38.0
			3.6	2398.025000	-38.2
			3.6	2397.975000	-38.3
			3.6	2399.525000	-38.4
			3.6	2398.125000	-38.6
			3.6	2398.175000	-38.6
	2480.00000		3.6	2483.625000	-38.2
			3.6	2483.575000	-38.2
			3.6	2484.075000	-38.5
			3.6	2483.675000	-38.6
			3.6	2484.025000	-38.7
			3.6	2483.975000	-38.7
			3.6	2484.375000	-38.9
			3.6	2484.475000	-39.1
			3.6	2484.525000	-39.2
			3.6	2484.175000	-39.2
			3.6	2483.725000	-39.3
			3.6	2484.125000	-39.5
			3.6	2484.425000	-39.8
			3.6	2483.925000	-39.8
			3.6	2484.275000	-39.9

Verdict

Pass

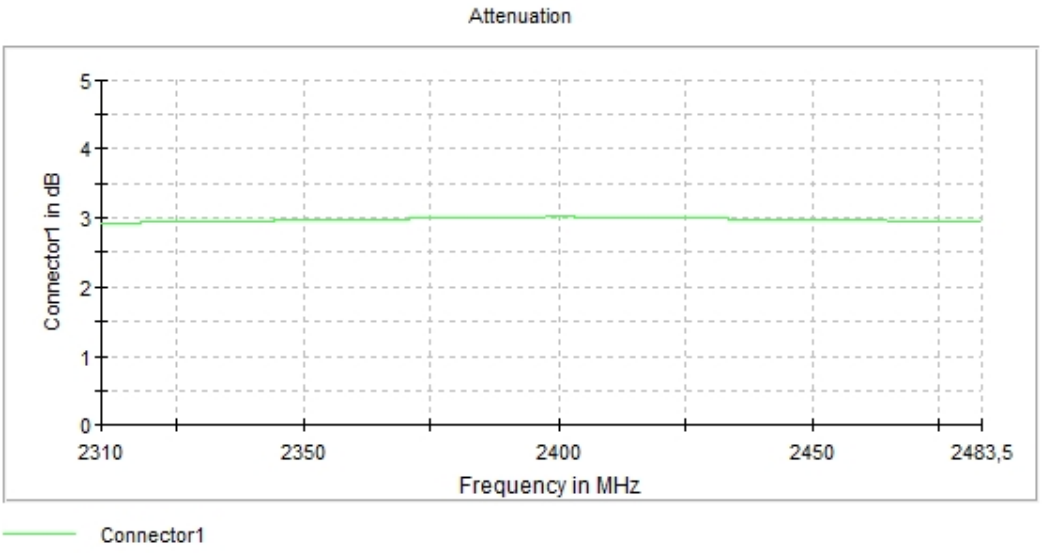
Uncertainty

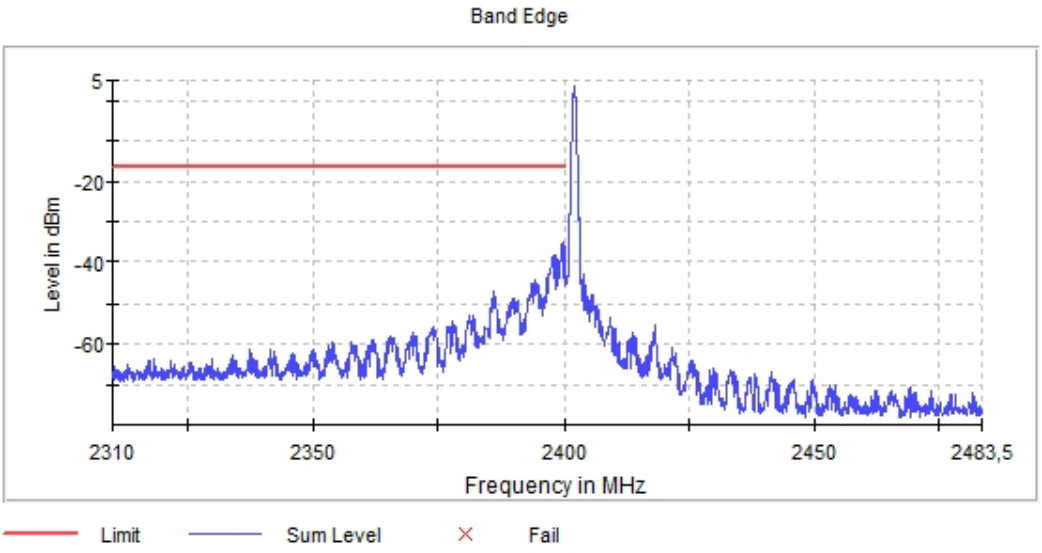
Measurement uncertainty (dB) <±1.53

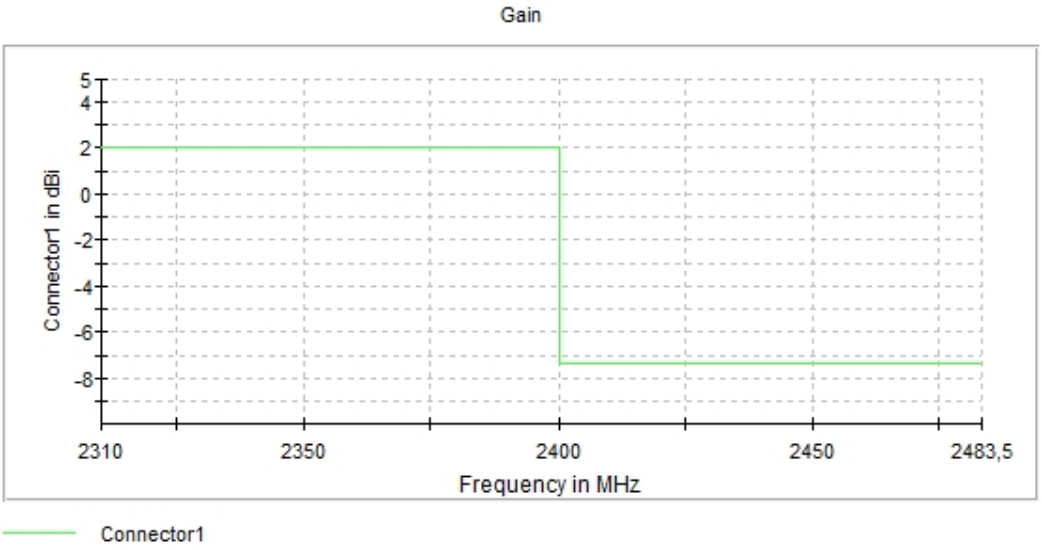
Attachments

Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Measurement Point = 1

Images:

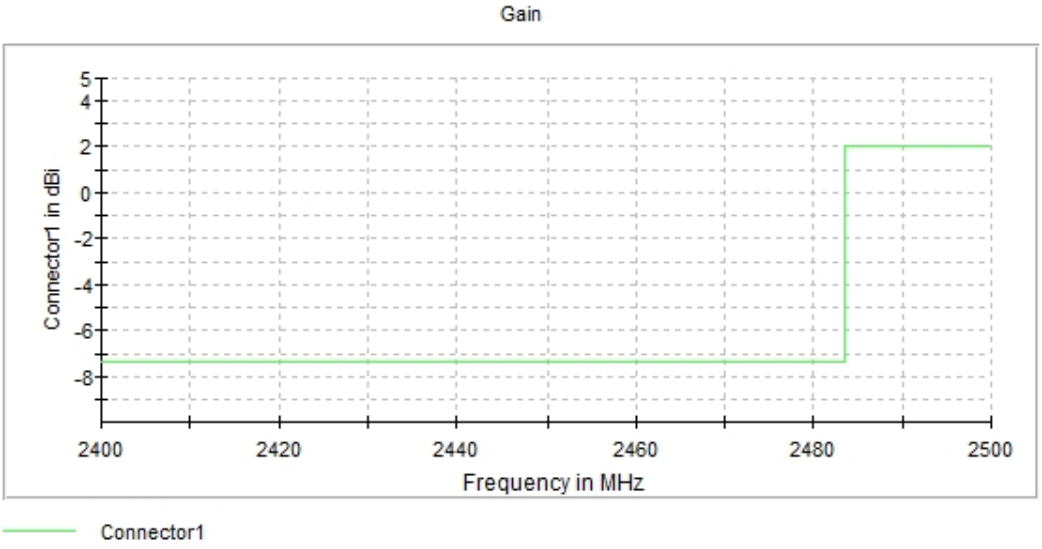


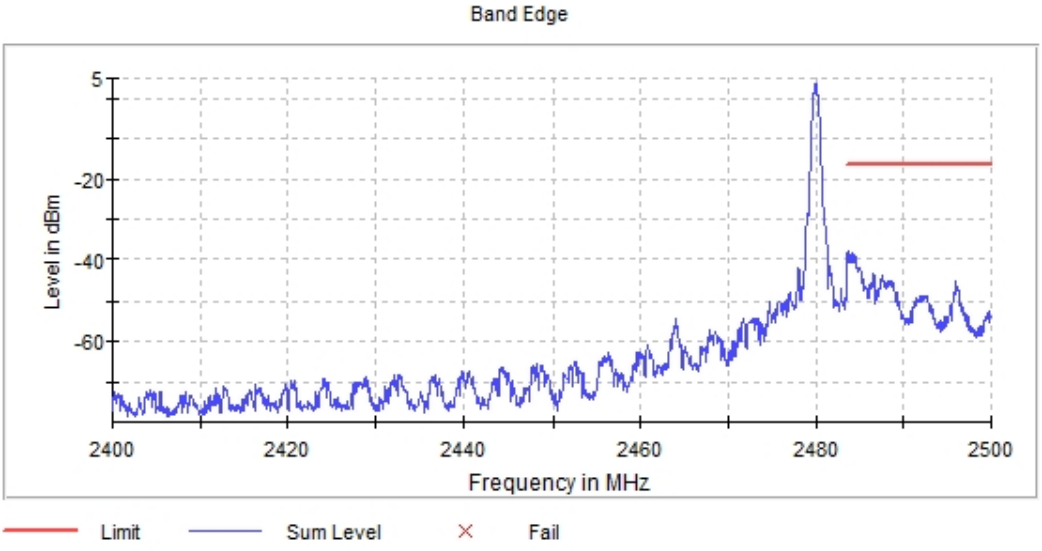


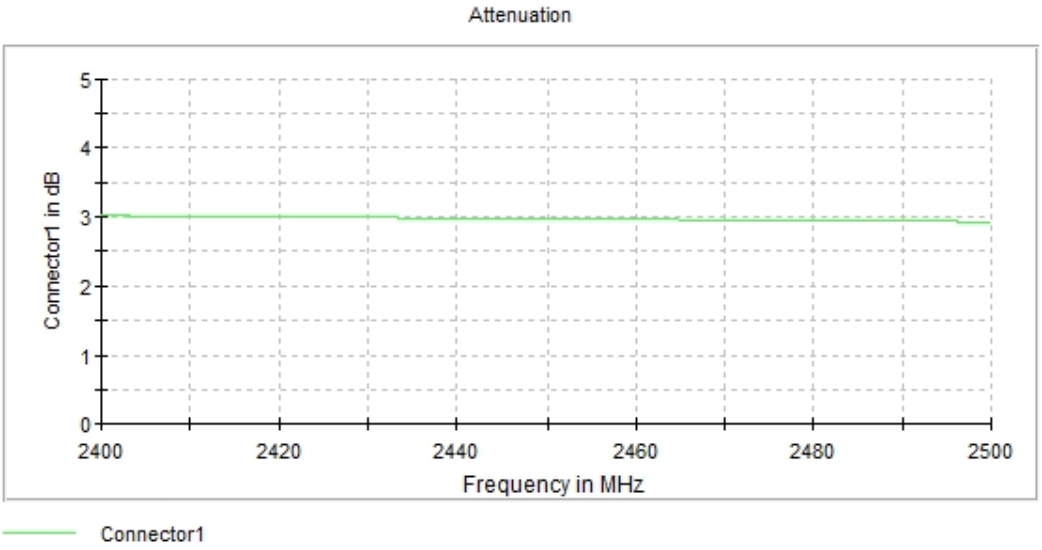

Gain
5
4
2
0
-2
-4
-6
-8
Connector1 in dBi
2310
2350
2400
2450
2483,5
Frequency in MHz
Connector1

Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Measurement Point = 1

Images:






Attenuation
Connector1 in dB
0
1
2
3
4
5
2400
2420
2440
2460
2480
2500
Frequency in MHz
Connector1

RSS-247 5.5 / FCC 15.247 (d) [RSE] Emission limitations radiated (Transmitter)

Limits

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)/RSS-Gen):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 10000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RSS-247: Attenuation below the general field strength limits specified in RSS-Gen is not required.

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	Freq Rng (GHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[2400, 2483.5]	2480.00000	Digital Transmission System (DTS)	[0.03, 1]	854.306000	33.83	V	QP
				854.306000	38.53	V	PK
	2402.00000		[1, 3]	2368.400000	55.70	H	PK
				2491.733333	55.74	V	PK
				2368.400000	44.92	H	AVG
				2491.733333	44.57	V	AVG
	2440.00000			2373.666667	55.53	H	PK
				2489.000000	55.33	H	PK
				2373.666667	44.74	H	AVG
				2489.000000	44.69	H	AVG
	2480.00000			2367.733333	55.29	H	PK
				2493.800000	55.12	H	PK
				2367.733333	44.68	H	AVG
				2493.800000	44.75	H	AVG

Operation Band (MHz)	Freq (MHz)	Equipment	Freq Rng (GHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
	2402.00000		[3, 17]	7207.500000	60.04	V	PK
				13350.000000	54.71	V	PK
				7207.500000	47.06	V	AVG
				13350.000000	42.62	V	AVG
	2440.00000			7321.500000	61.78	V	PK
				13260.000000	52.28	H	PK
				7321.500000	49.18	V	AVG
				13260.000000	41.04	H	AVG
	2480.00000			7440.500000	57.99	V	PK
				13361.500000	53.70	V	PK
				7440.500000	44.37	V	AVG
				13361.500000	42.71	V	AVG

Verdict

Pass

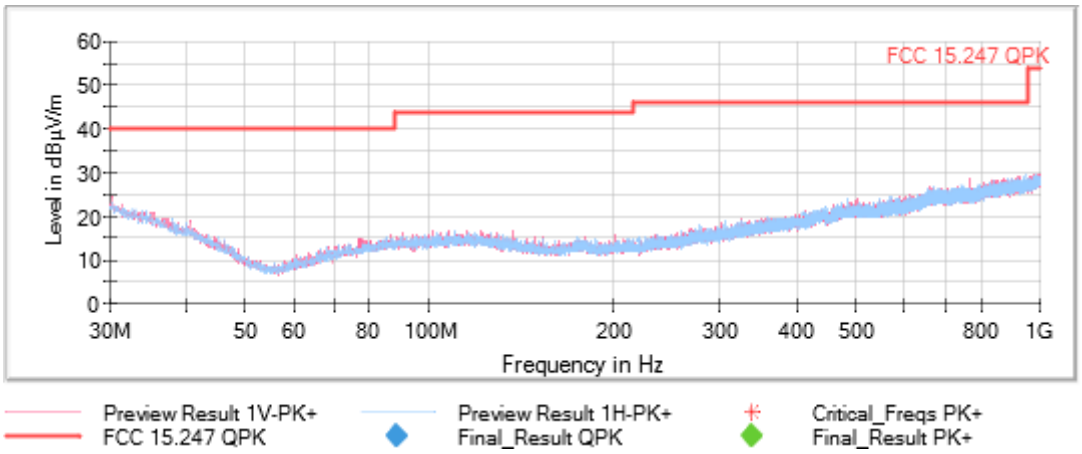
Uncertainty

Measurement Uncertainty (dB): <± 5.1 for 30 MHz < f < ≤1 GHz
<± 4.6 for 1< f < ≤17 GHz
<± 4.89 for 17< f ≤26 GHz

Attachments

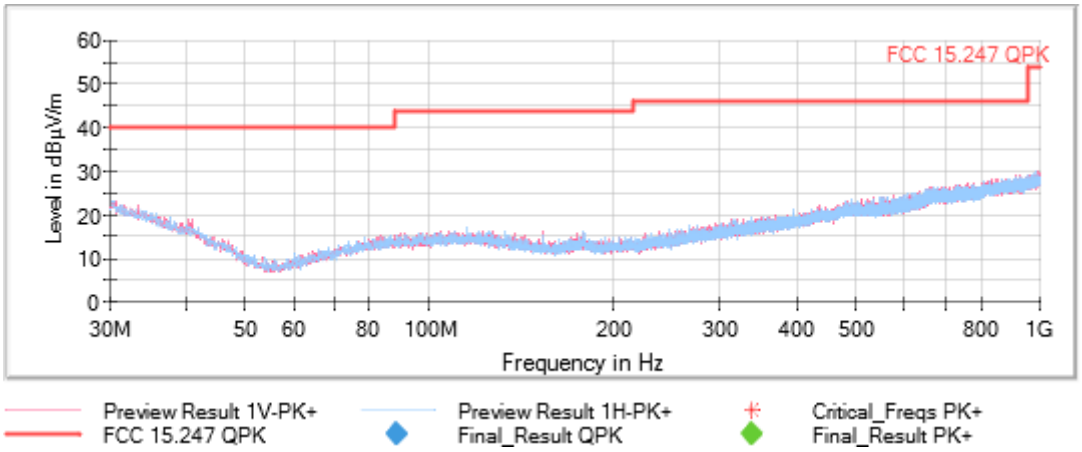
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Frequency Range GHz = [0.03, 1], Measurement Point = 1

Images:



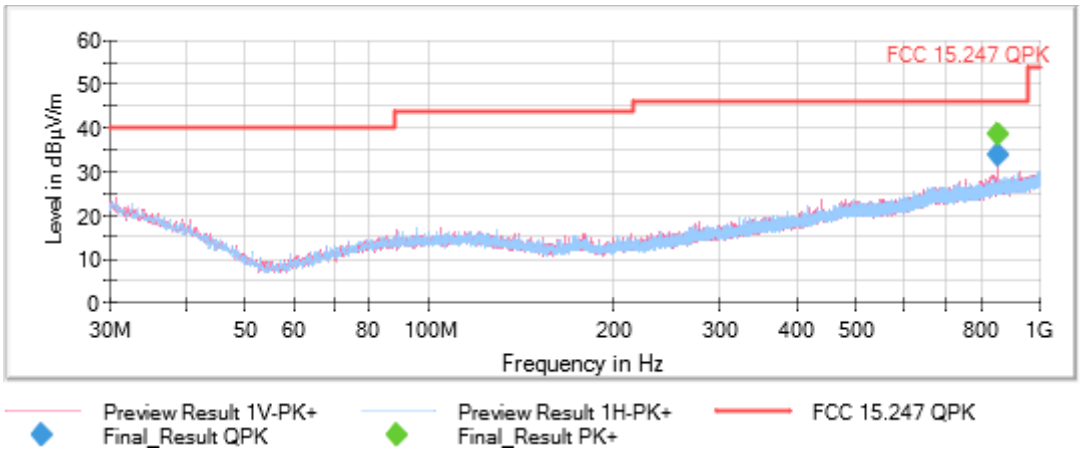
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Frequency Range GHz = [0.03, 1], Measurement Point = 1

Images:



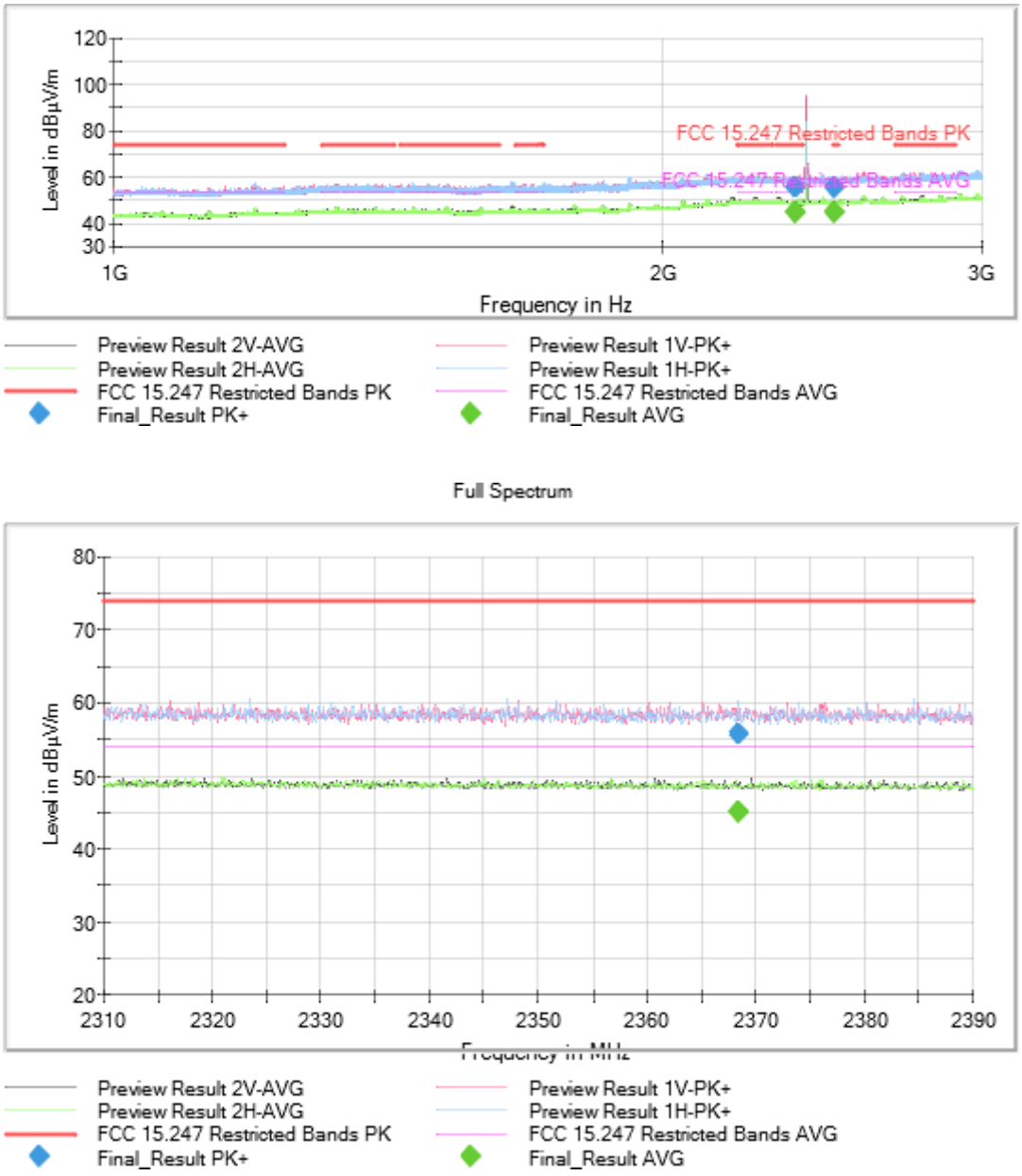
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Frequency Range GHz = [0.03, 1], Measurement Point = 1

Images:

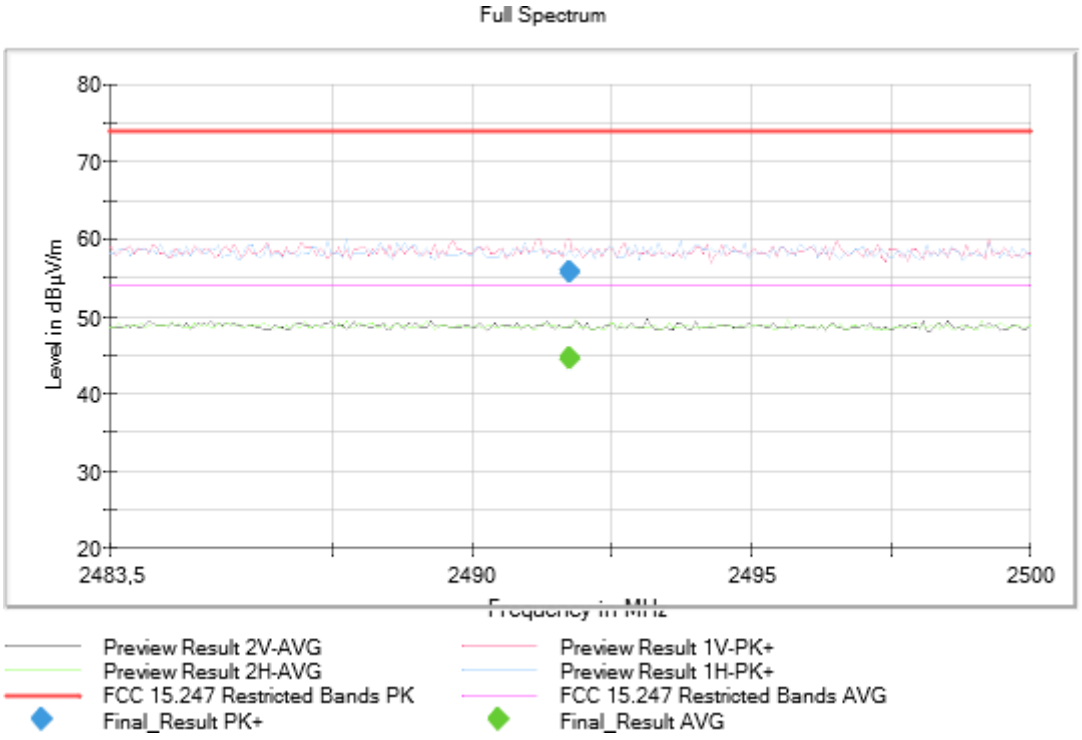


Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Frequency Range GHz = [1, 3], Measurement Point = 1

Images:

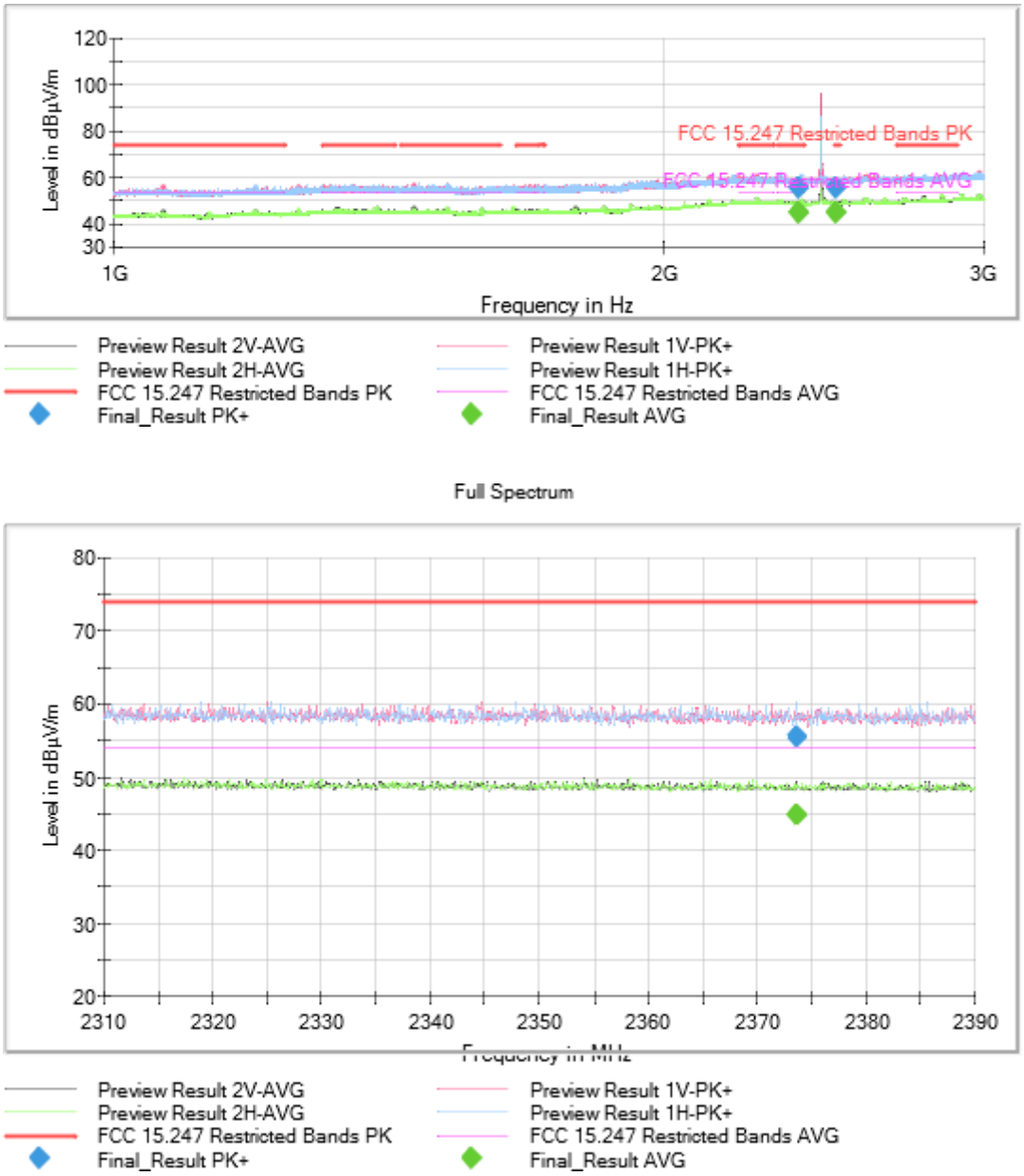


Full Spectrum

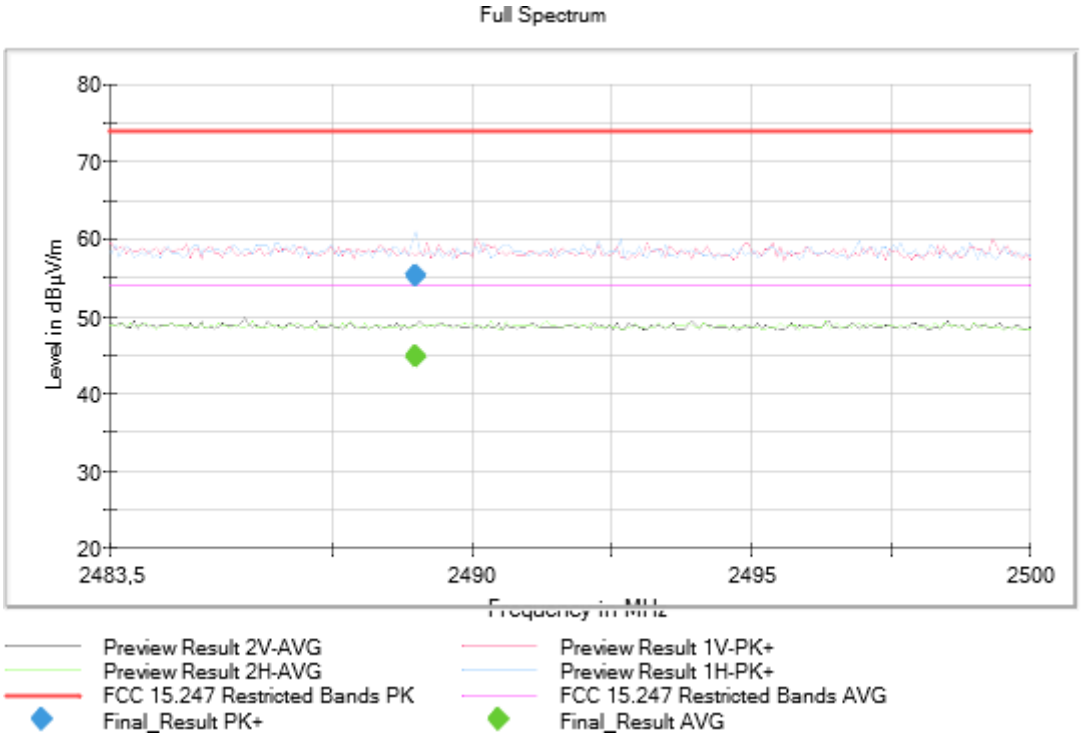

Full Spectrum
80
70
60
50
40
30
20
Level in dBµV/m
2483,5
2490
2495
2500
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Frequency Range GHz = [1, 3], Measurement Point = 1

Images:

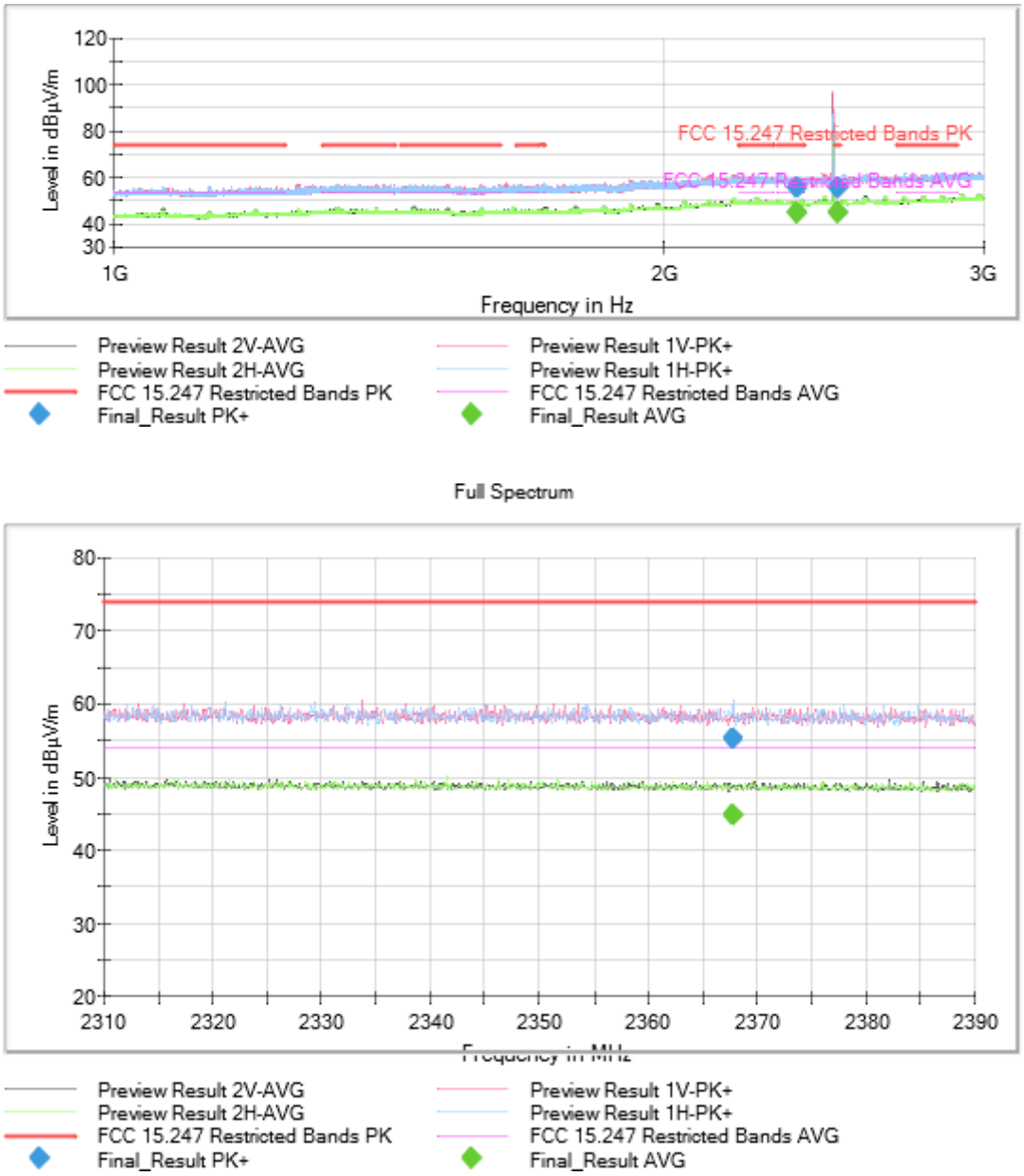


Full Spectrum

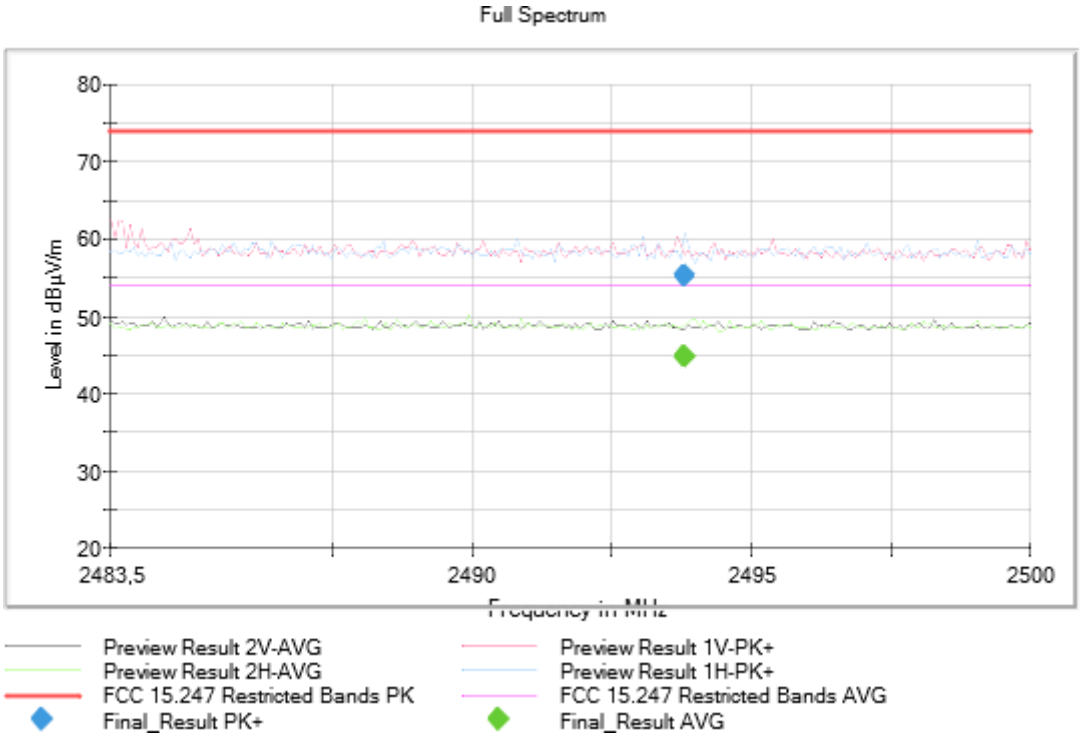

Full Spectrum
80
70
60
50
40
30
20
Level in dBµV/m
2483,5
2490
2495
2500
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Frequency Range GHz = [1, 3], Measurement Point = 1

Images:

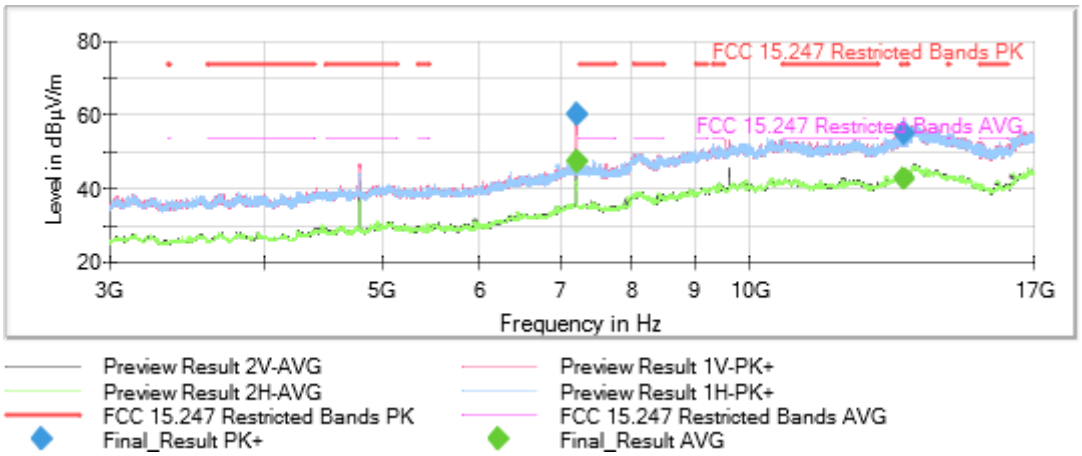


Full Spectrum



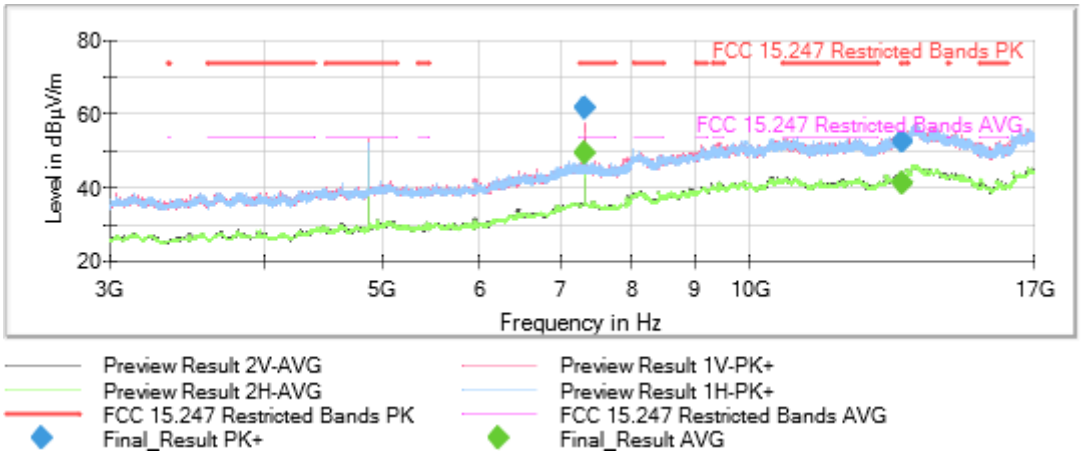
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Frequency Range GHz = [3, 17], Measurement Point = 1

Images:



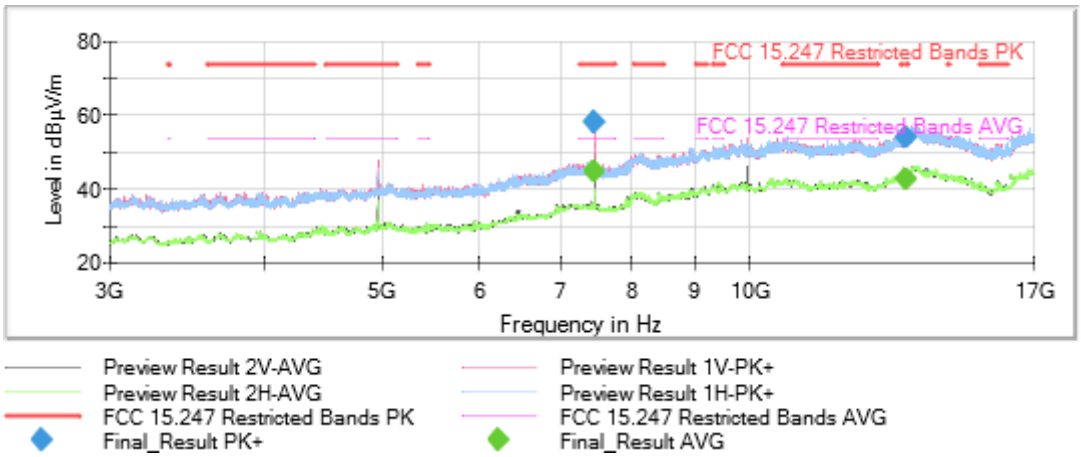
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Frequency Range GHz = [3, 17], Measurement Point = 1

Images:



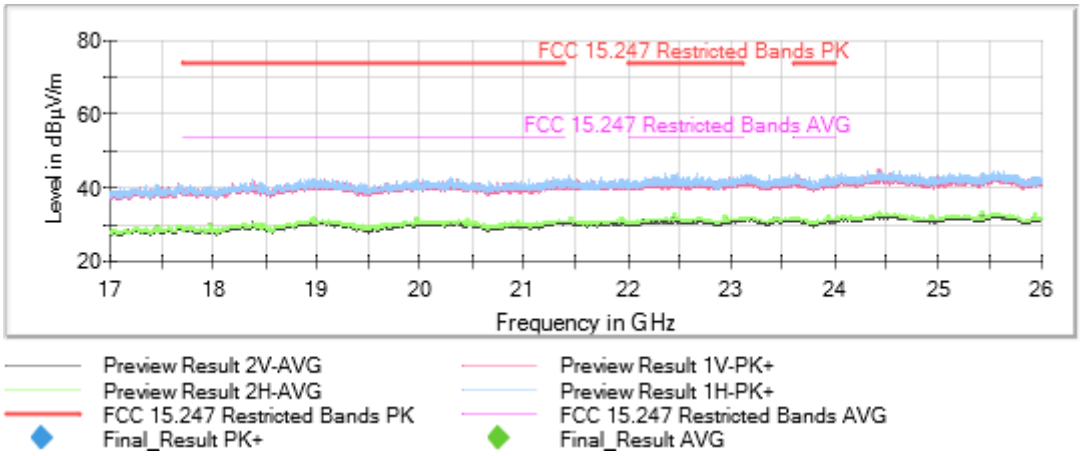
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Frequency Range GHz = [3, 17], Measurement Point = 1

Images:



Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Frequency Range GHz = [17, 26], Measurement Point = 1

Images:



Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	Freq Rng (GHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[2400, 2483.5]	2402.00000	Digital Transmission System (DTS)	[1, 3]	2340.600000	60.15	V	PK
				2485.533333	60.43	V	PK
				2340.600000	49.71	V	AVG
				2485.533333	49.53	V	AVG
	2440.00000			2370.800000	60.51	H	PK
				2486.533333	60.05	H	PK
				2370.800000	49.37	H	AVG
				2486.533333	49.53	H	AVG
	2480.00000			2388.133333	59.82	V	PK
				2483.866667	62.28	V	PK
				2388.133333	49.33	V	AVG
				2483.866667	49.05	V	AVG
	2402.00000		[3, 17]	7205.000000	58.98	V	PK
				7205.000000	47.59	V	AVG
	2440.00000			7321.000000	60.24	V	PK
				13532.500000	56.71	V	PK
				7321.000000	49.81	V	AVG
				13532.500000	46.20	V	AVG
	2480.00000			4959.500000	56.20	V	PK
				7440.500000	58.91	V	PK
				4959.500000	45.68	V	AVG
				7440.500000	48.10	V	AVG

Verdict

Pass

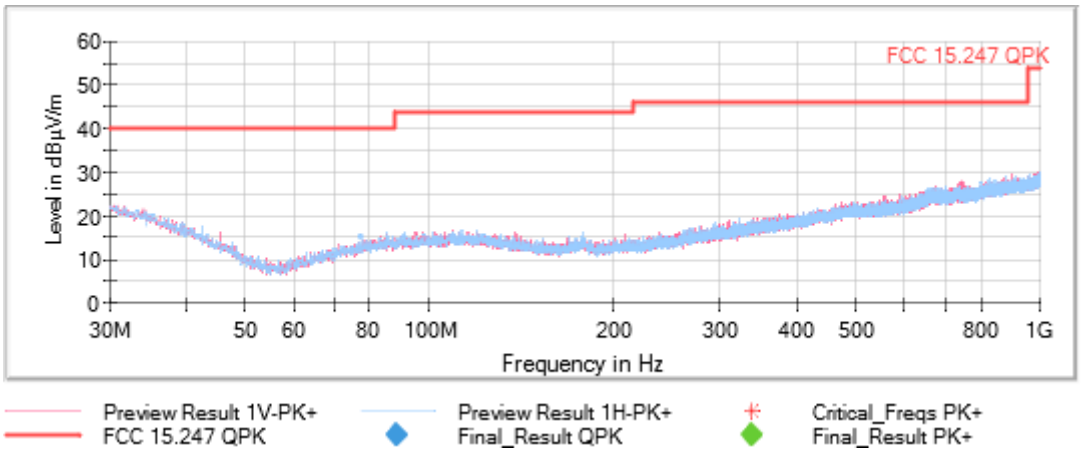
Uncertainty

Measurement Uncertainty (dB): <± 5.1 for 30 MHz < f < ≤1 GHz
<± 4.6 for 1< f < ≤17 GHz
<± 4.89 for 17< f ≤26 GHz

Attachments

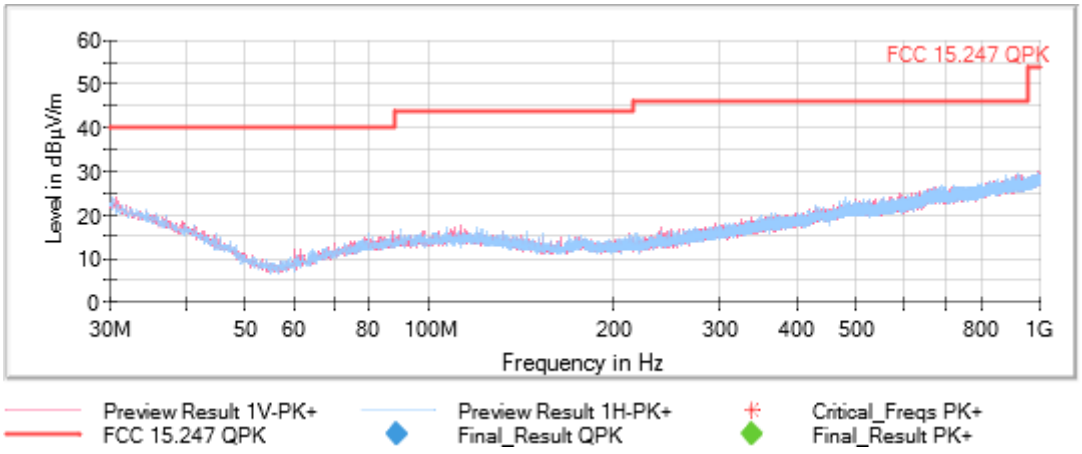
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Frequency Range GHz = [0.03, 1], Measurement Point = 1

Images:



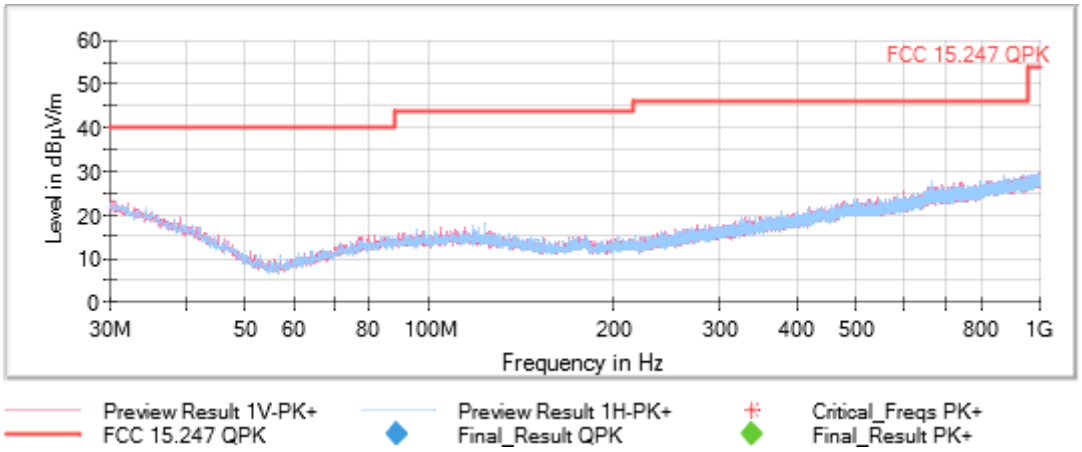
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Frequency Range GHz = [0.03, 1], Measurement Point = 1

Images:



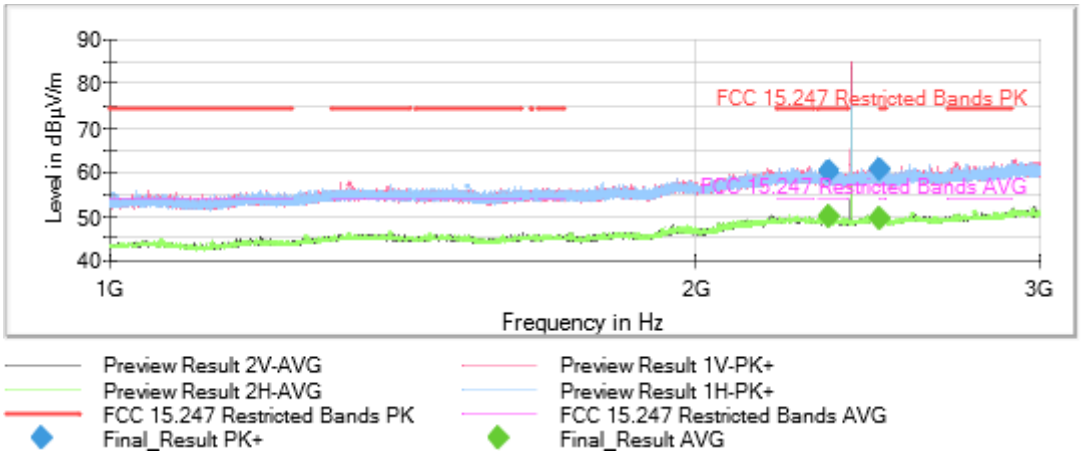
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Frequency Range GHz = [0.03, 1], Measurement Point = 1

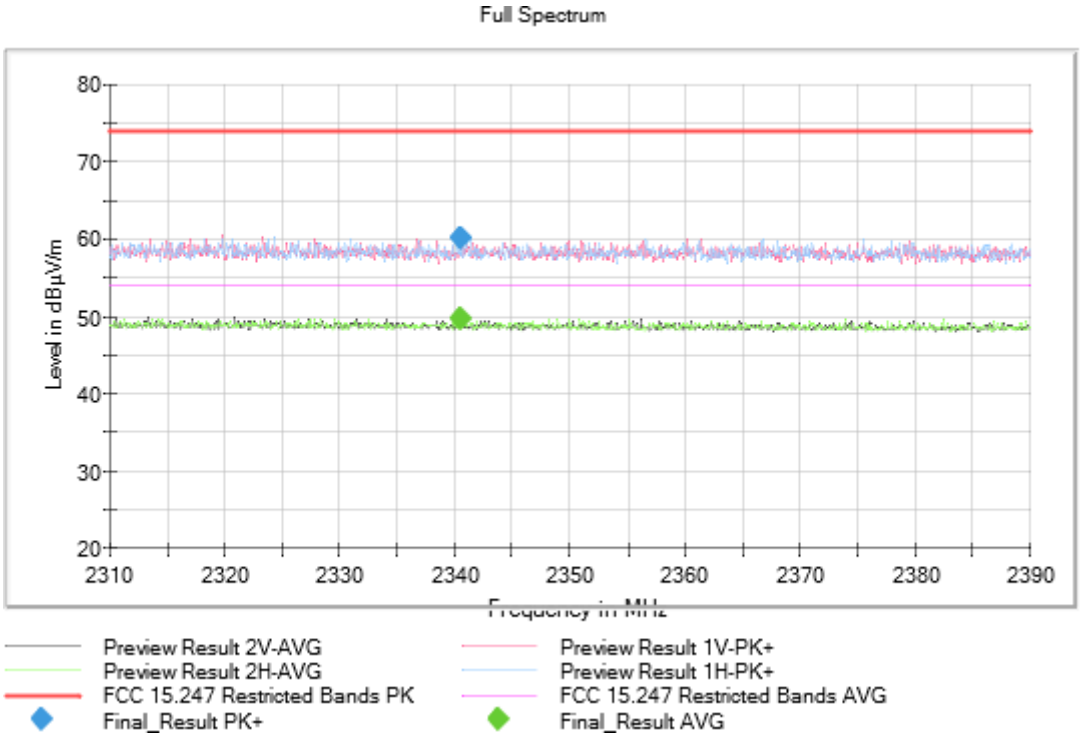
Images:

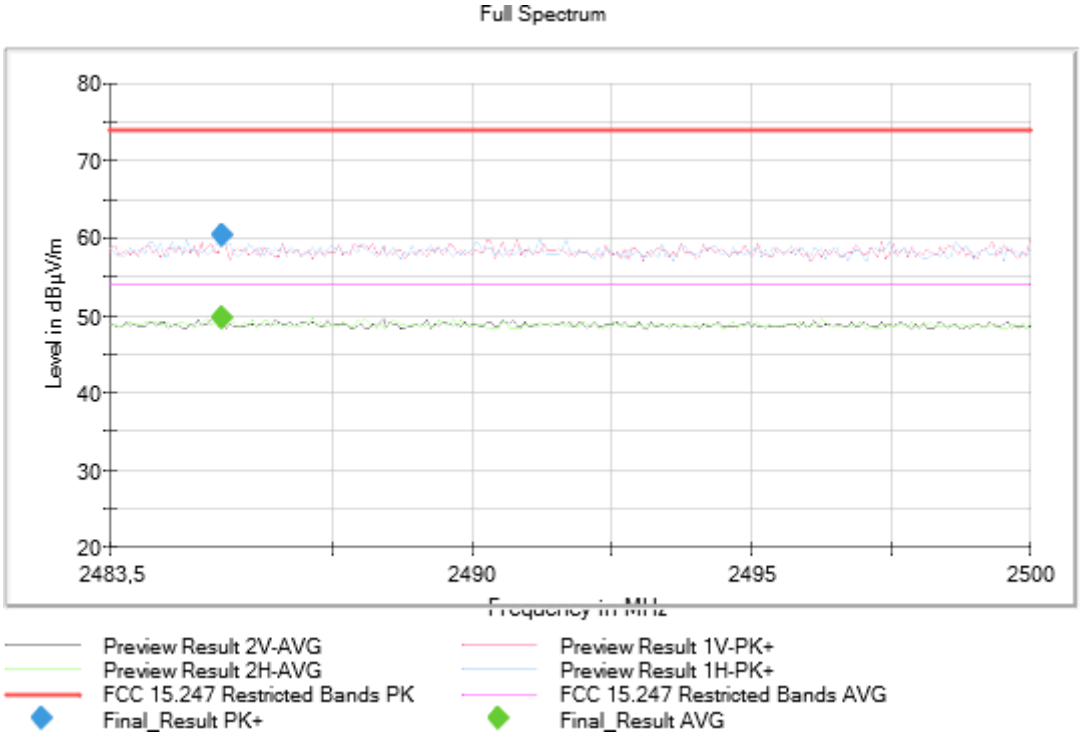


Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Frequency Range GHz = [1, 3], Measurement Point = 1

Images:

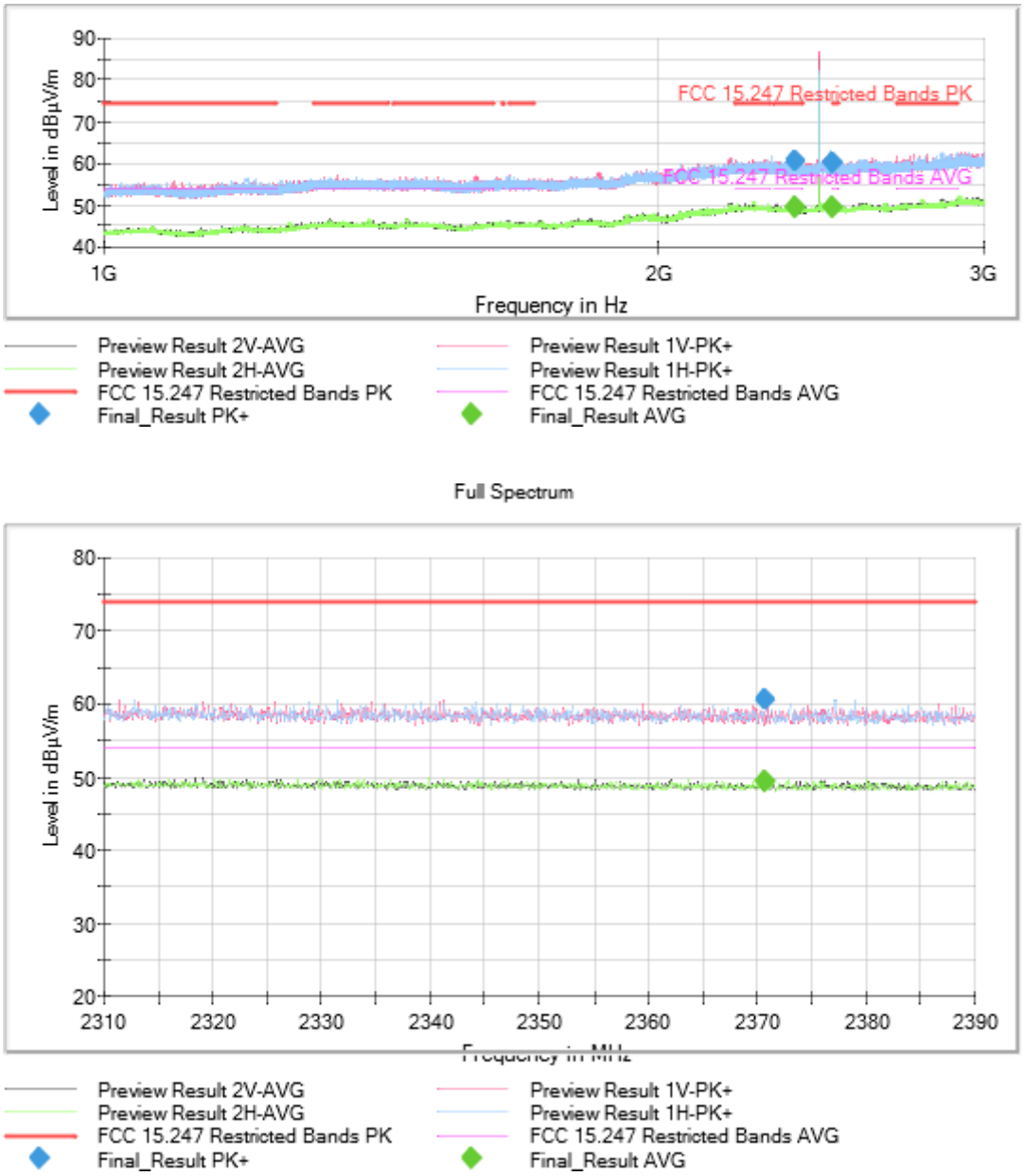



Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2310
2320
2330
2340
2350
2360
2370
2380
2390
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

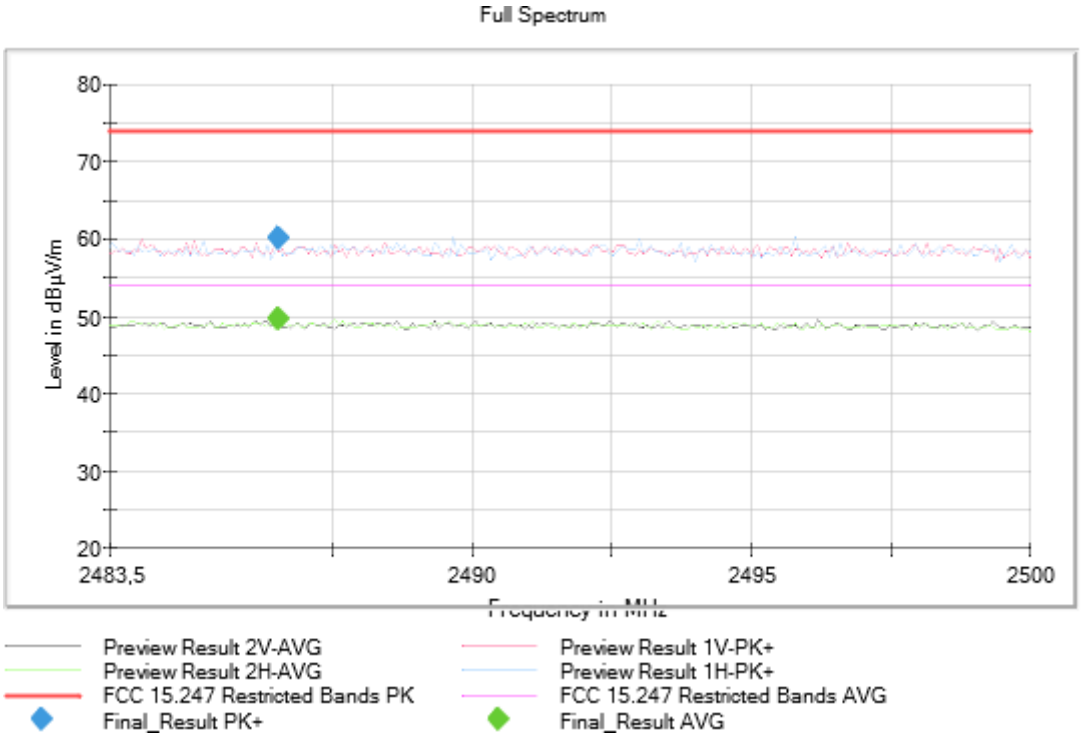

Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2483,5
2490
2495
2500
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Frequency Range GHz = [1, 3], Measurement Point = 1

Images:

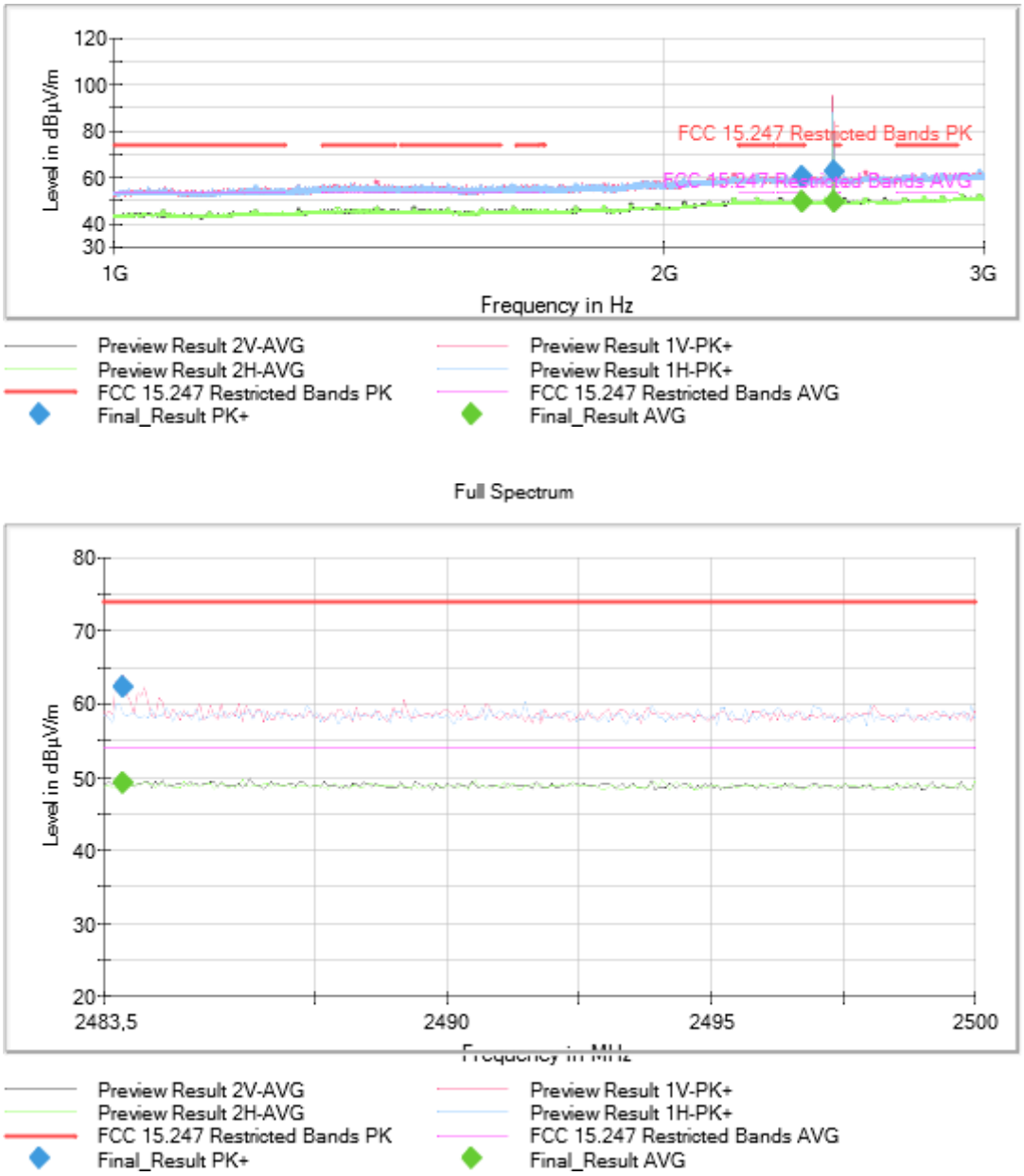


Full Spectrum

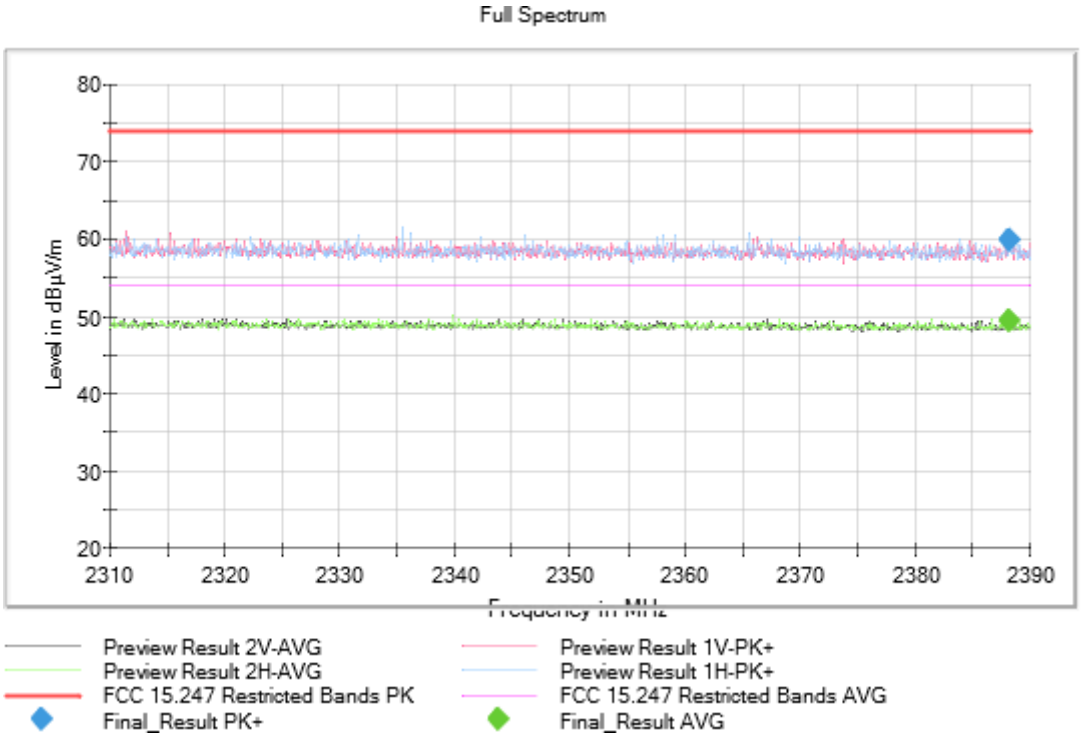

Full Spectrum
80
70
60
50
40
30
20
Level in dBµV/m
2483,5
2490
2495
2500
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Frequency Range GHz = [1, 3], Measurement Point = 1

Images:

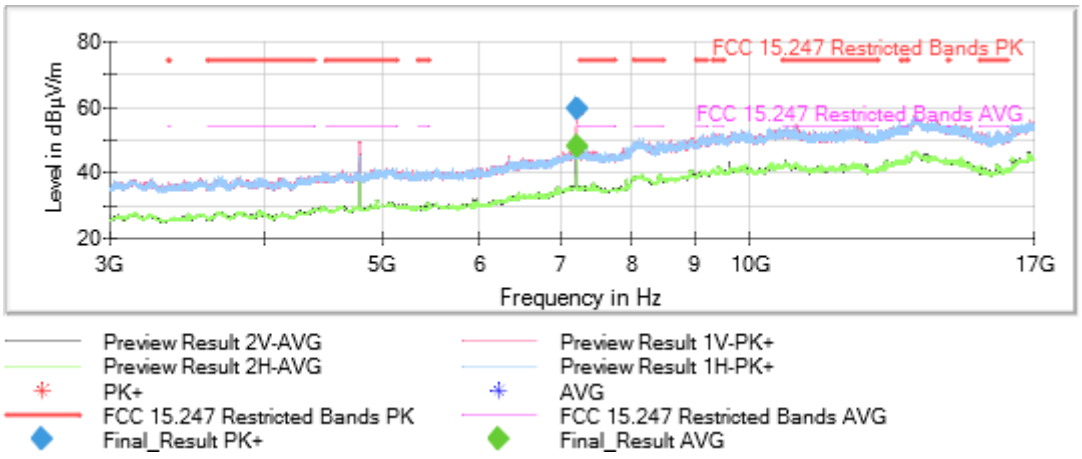


Full Spectrum



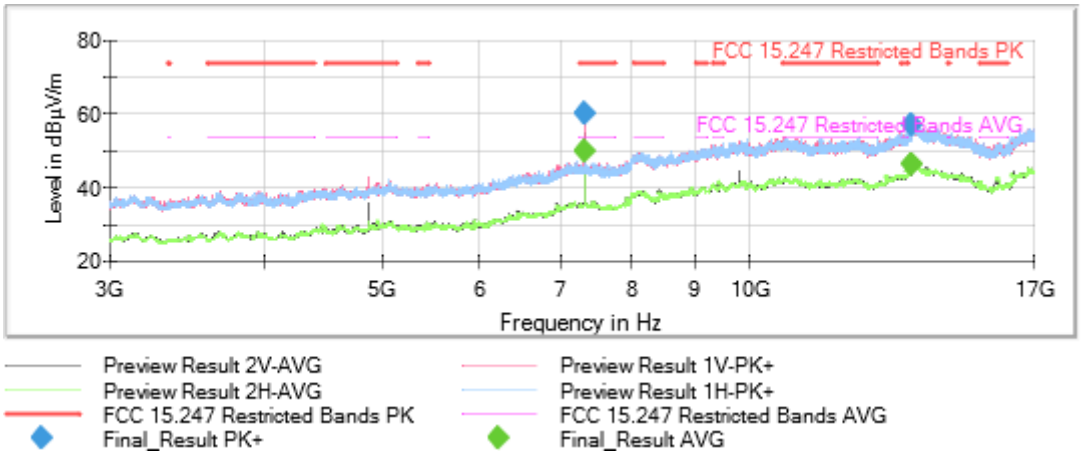
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Frequency Range GHz = [3, 17], Measurement Point = 1

Images:



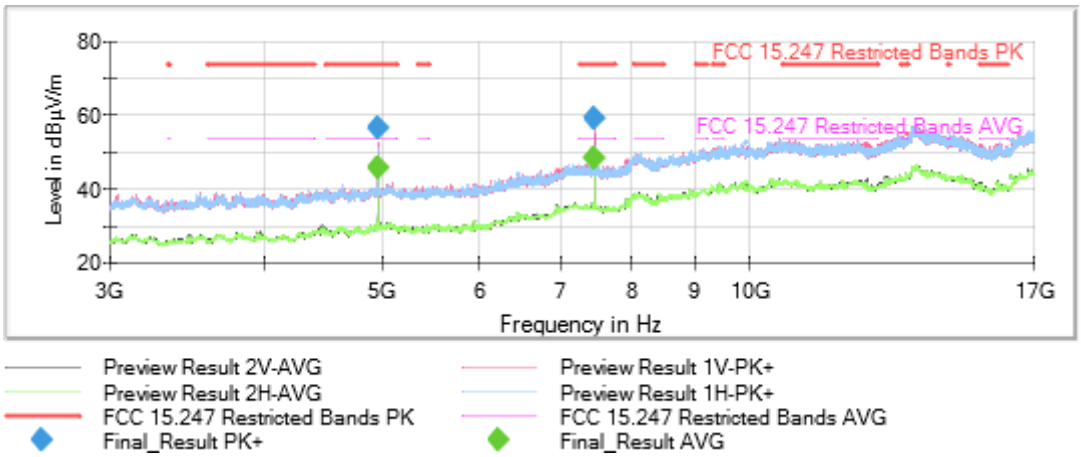
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Frequency Range GHz = [3, 17], Measurement Point = 1

Images:



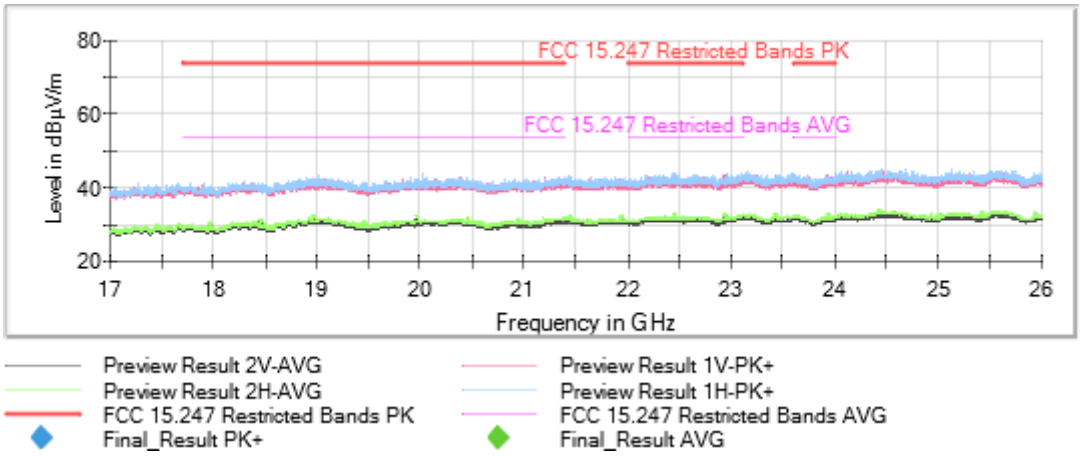
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Frequency Range GHz = [3, 17], Measurement Point = 1

Images:



Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s), Frequency Range GHz = [17, 26], Measurement Point = 1

Images:



99dBw Occupied Channel Bandwidth 99%

Limits

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 5.0 (GFSK 2 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	Occ Ch BW (MHz)
[2400, 2483.5]	2402.00000	Digital Transmission System (DTS)	2.010000
	2440.00000		2.010000
	2480.00000		2.010000

Verdict

Pass

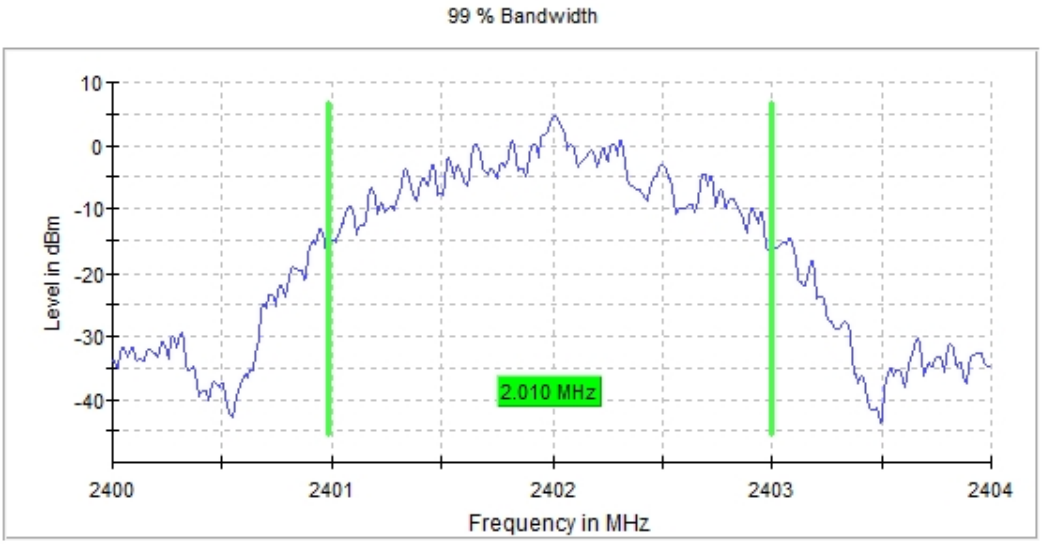
Uncertainty

Measurement uncertainty (%) <± 1.17

Attachments

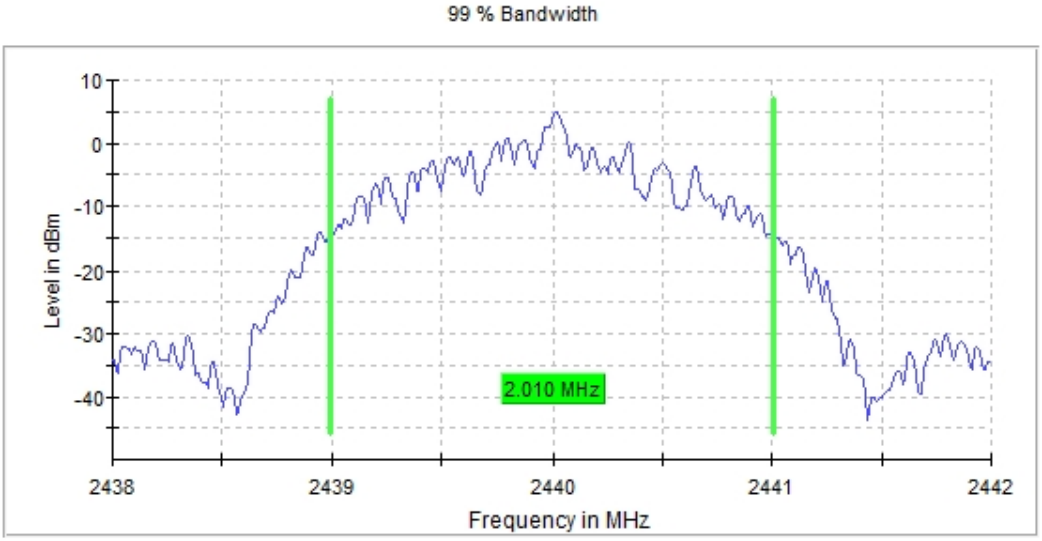
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Images:



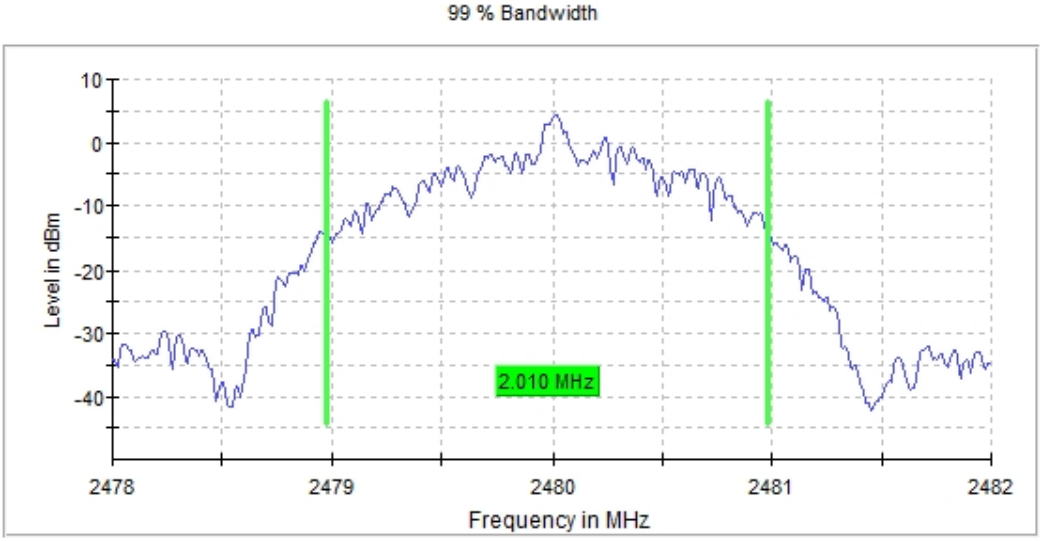
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Images:



Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Freq (MHz)	Equipment	Occ Ch BW (MHz)
[2400, 2483.5]	2402.00000	Digital Transmission System (DTS)	1.040000
	2440.00000		1.040000
	2480.00000		1.030000

Verdict

Pass

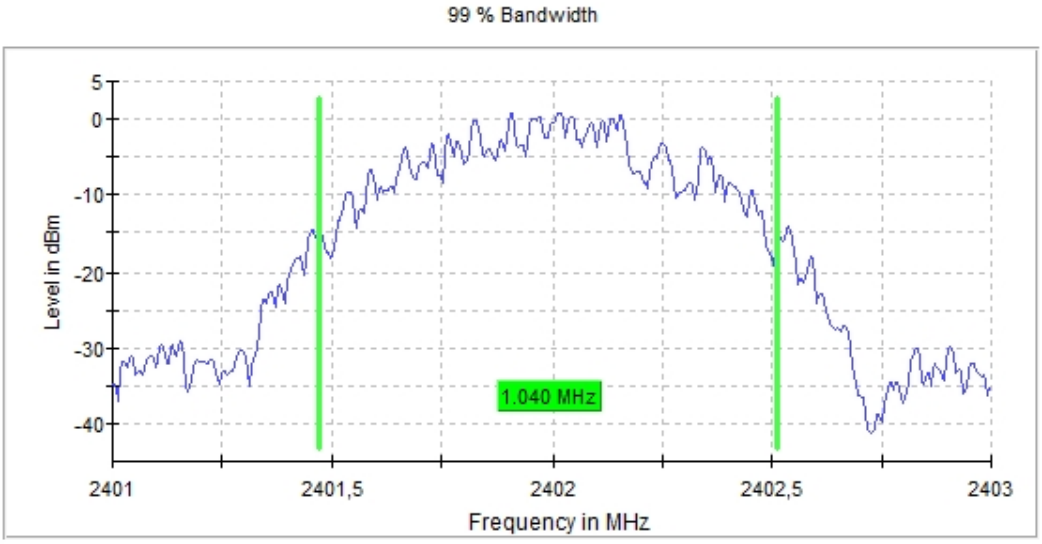
Uncertainty

Measurement uncertainty (%) <± 1.17

Attachments

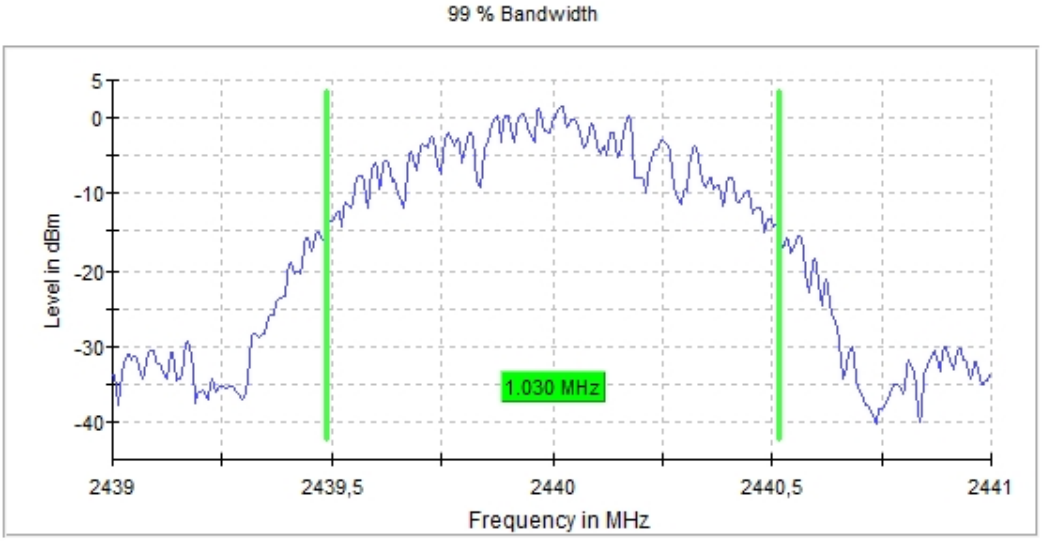
Operation Band MHz = [2400, 2483.5], Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5], Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5], Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Images: