**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:
84979RRF.003A1

# Test Report

## USA FCC Part 15.247, 15.209
## CANADA RSS-247, RSS-Gen

| | |
|---|---|
| (*) Identification of item tested | Wellness ring |
| (*) Trademark | Oura |
| (*) Model and /or type reference | OA13 |
| Other identification of the product | FCC ID: 2AD7V-OURA2601<br>IC: 20635-OURA2601 |
| (*) Features | Bluetooth LE<br>HW version: 01<br>SW version: 0.8.1 |
| (*) Manufacturer | Oura Health Oy<br>Elektroniikkatie 10, 90590 Oulu, Finland |
| 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.<br>USA FCC Part 15.209 (10-1-23 Edition): Radiated emission limits; general requirements.<br>CANADA RSS-247 Issue 4 (July 2025).<br>CANADA RSS-Gen Issue 5 amendment 2 (February 2021).<br>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.<br>558074 D01 Meas Guidance v05r02 dated April 2, 2019.<br>ANSI C63.10-2020 + Cor.1-2023 + C63.10a-2024 + Errata to C63.10a-2024: American National Standard for Testing Unlicensed Wireless Devices. |
| Summary | IN COMPLIANCE |
| Approved by (name / position & signature) | José Manuel Gómez Galván<br>EMC Consumer & RF<br>Lab. Manager<br>Firmado digitalmente por 53680346W JOSE MANUEL GOMEZ (C:A29507456) |
| Date of issue | 2026-03-16 |
| Report template No | FDT08_27<br>(*) "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. BLUETOOTH LOW ENERGY (1MBPS) ..... 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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1. This report is only referred to the item that has undergone the test.
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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", “Manufacturer”).

2. The sample consists of a Wellness ring. Wellness ring and app designed to help user gets more restful sleep and performs better.

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 | 84979_27.1 | Smart Ring (Size 13) | OA13 | -- | 2025-12-05 | Element Under Test |
| S/02 | 84979_19.1 | Module | OA13 | 207333 | 2025-12-05 | Element Under Test |

Notes referenced to samples during the project:

| Id | Type |
|---|---|
| S/01 | Sample used for Radiated Testing |
| S/02 | Sample used for Conducted Testing |

# Test sample description

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ports…… : | **Port name and description** | | **Cable** | | | | |
| | | | **Specified max length [m]** | **Attached during test** | **Shielded** | | |
| | ..... | | ..... | [ ] | [ ] | | |
| | ..... | | ..... | [ ] | [ ] | | |
| | ..... | | ..... | [ ] | [ ] | | |
| | ..... | | ..... | [ ] | [ ] | | |
| | ..... | | ..... | [ ] | [ ] | | |
| | ..... | | ..... | [ ] | [ ] | | |
| Supplementary information to the ports…… : | ..... | | | | | | |
| Rated power supply .....: | **Voltage and Frequency** | | **Reference poles** | | | | |
| | | | **L1** | **L2** | **L3** | **N** | **PE** |
| | [ ] | AC: ..... | [ ] | [ ] | [ ] | [ ] | [ ] |
| | [ ] | AC: ..... | [ ] | [ ] | [ ] | [ ] | [ ] |
| | [X] | DC: 3.7V | | | | | |
| | [ ] | DC: ..... | | | | | |
| Rated Power .....: | ..... | | | | | | |
| Clock frequencies.....: | ..... | | | | | | |
| Other parameters .....: | ..... | | | | | | |
| Software version .....: | 0.8.1 | | | | | | |
| Hardware version .....: | 01 | | | | | | |
| Dimensions in cm (W x H x D) ....: | ..... | | | | | | |
| Mounting position .....: | [ ] | Table top equipment | | | | | |
| | [ ] | Wall/Ceiling mounted equipment | | | | | |
| | [ ] | Floor standing equipment | | | | | |
| | [X] | Hand-held equipment | | | | | |
| | [ ] | Other: ..... | | | | | |
| Modules/parts.....: | **Module/parts of test item** | | | **Type** | | **Manufacturer** | |

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

# Identification of the client

Oura Health Oy
Elektroniikkatie 10, 90590 Oulu, Finland

# Testing period and place

| | |
|---|---|
| **Test Location** | DEKRA TESTING AND CERTIFICATION S.A.U.<br>C/ Margarita Salas Boulevard, 26 - Parque Tecnológico de Andalucía; 29590 Campanillas (Málaga) (Location D) |
| **Date (start)** | 2025-12-16 |
| **Date (finish)** | 2025-12-18 |

# Document history

| Report number | Date | Description |
|---|---|---|
| 84979RRF.003 | 2026-03-05 | First release. |
| 84979RRF.003A1 | 2026-03-16 | First modification.<br><br>On page 40, an explanation of the selected measurement range is included<br><br>This report cancels and replaces report 84979RRF.003 |

# Environmental conditions

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

| | |
|---|---|
| **Temperature** | Min. = 15 ºC<br>Max. = 35 ºC |
| **Relative humidity** | Min. = 20 %<br>Max. = 75 % |

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

| | |
|---|---|
| **Temperature** | Min. = 15 ºC<br>Max. = 35 ºC |
| **Relative humidity** | Min. = 20 %<br>Max. = 75 % |

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

| | |
|---|---|
| **Temperature** | Min. = 15 ºC<br>Max. = 35 ºC |
| **Relative humidity** | Min. = 20 %<br>Max. = 75 % |

# Remarks and comments

The tests have been performed by the technical personnel: Antonio Manuel Sánchez Carrizo, Rubén Mora Fernandez and Victoria Olmedo Villalba.

Used instrumentation:

| Control No. | Equipment | Model | Manufacturer | Next Calibration |
|---|---|---|---|---|
| 10304 | EMI TEST RECEIVER 2Hz-44GHz | ESW44 | ROHDE AND SCHWARZ | 2026-10-01 |
| 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 | 2026-07-09 |
| 07769 | PREAMPLIFIER 30dB 500MHz-18GHz | BBV 9718 C | SCHWARZBECK | 2026-03-17 |
| 08130 | SEMIANECHOIC ABSORBER LINED CHAMBER | P29419 | ALBATROSS | -- |
| 08134 | SHIELDED ROOM | P29419 | ALBATROSS PROJECTS GMBH | -- |
| 04848 | SOFTWARE FOR EMC/RF TESTING | EMC32 | ROHDE AND SCHWARZ | -- |
| 07550 | TEMPERATURE AND HUMIDITY PROBE | HWg-STE | HW GROUP | 2026-04-23 |
| 07549 | TEMPERATURE AND HUMIDITY PROBE | HWg-STE | HW GROUP | 2026-04-23 |
| 07798 | WMS32 | WMS32 | ROHDE AND SCHWARZ | -- |
| 07552 | TEMPERATURE AND HUMIDITY PROBE | HWg-STE | HW GROUP | 2026-04-23 |
| 08661 | SHIELDED ROOM | - | SIEPEL | -- |
| 07039 | Rohde&Schwarz | OSP-B157W8 | ROHDE & SCHWARZ | 2027-08-14 |
| 07040 | EXTENSION FOR OPEN SWITCH UNIT UP TO 40GHz | OSP-B157Wx | Rohde&Schwarz | 2027-08-26 |
| 07794 | SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz | FSV40 | ROHDE AND SCHWARZ | 2027-06-10 |

# Testing verdicts

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

# Summary

## Appendix A: Bluetooth Low Energy (1Mbps)

| FCC PART 15 PARAGRAPH/ RSS-247 | | |
|---|---|---|
| **Requirement – Test case** | **Verdict** | **Remark** |
| FCC 15.247 (a)(2) / RSS-247 6.3.1. (a)<br>6 dB Bandwidth | P | -- |
| FCC 15.247 (b) / RSS-247 6.3.2.<br>Maximum output power and antenna gain | P | -- |
| FCC 15.247 (d) / RSS-247 6.6<br>Band-edge emissions compliance (Transmitter) | P | -- |
| FCC 15.247 (e) / RSS-247 6.3.1. (b)<br>Power spectral density | P | -- |
| FCC 15.247 (d) / RSS-247 6.6.<br>Emission limitations radiated (Transmitter) | P | -- |
| Supplementary information and remarks:<br>None | | |

# **Appendix A:** Test results. Bluetooth Low Energy (1Mbps)

# INDEX

TEST CONDITIONS ..... 14

SAMPLE CALCULATION ..... 17

TEST CASES DETAILS ..... 18

FCC 47 CFR PART 15.247 / RSS-247 ..... 18

*99dBw Occupied Channel Bandwidth 99%* ..... *18*
*RSS-247 6.3.1 (a) / FCC 15.247 (a) (2) [6dBw] 6 dB Bandwidth* ..... *22*
*RSS-247 6.3.1. (b) / FCC 15.247 (e) [PSD] Power Spectral Density* ..... *26*
*RSS-247 6.3.2 / FCC 15.247 (b) [Pkcp] Maximum Peak Conducted Output Power* ..... *30*
*RSS-247 6.6 / FCC 15.247 (d) [Bndedge] Band-edge emissions compliance (Transmitter)* ..... *34*
*RSS-247 6.6 / FCC 15.247 (d) [RSE] Emission limitations radiated (Transmitter)* ..... *40*

# TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

| | |
|---|---|
| Vnominal: | 3.7V DC |
| Type of Power Supply: | Battery (radiated measurements) |
| | Power source (conducted measurements) |

ANTENNA (*):

| | |
|---|---|
| Type of Antenna: | Integral Antenna |
| Maximum Declared Antenna Gain: | -10,7dBi |

TEST FREQUENCIES (*):

| Modulation | Data rates | Low Channel: | Middle Channel | High Channel |
|---|---|---|---|---|
| BTLE GFSK | 1M 1 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).

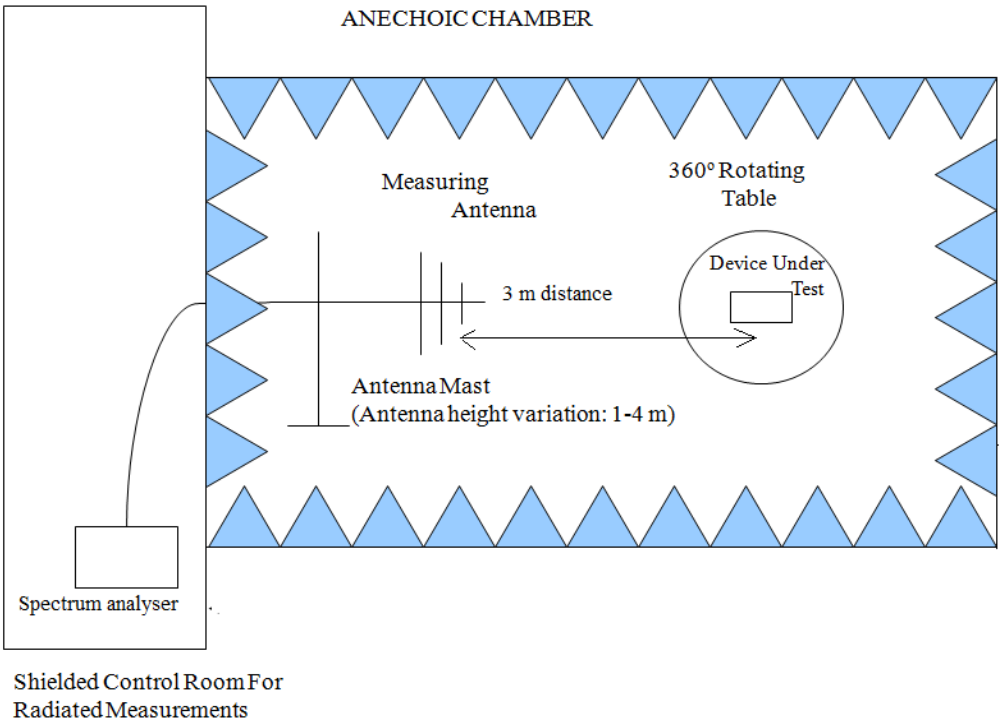
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

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.

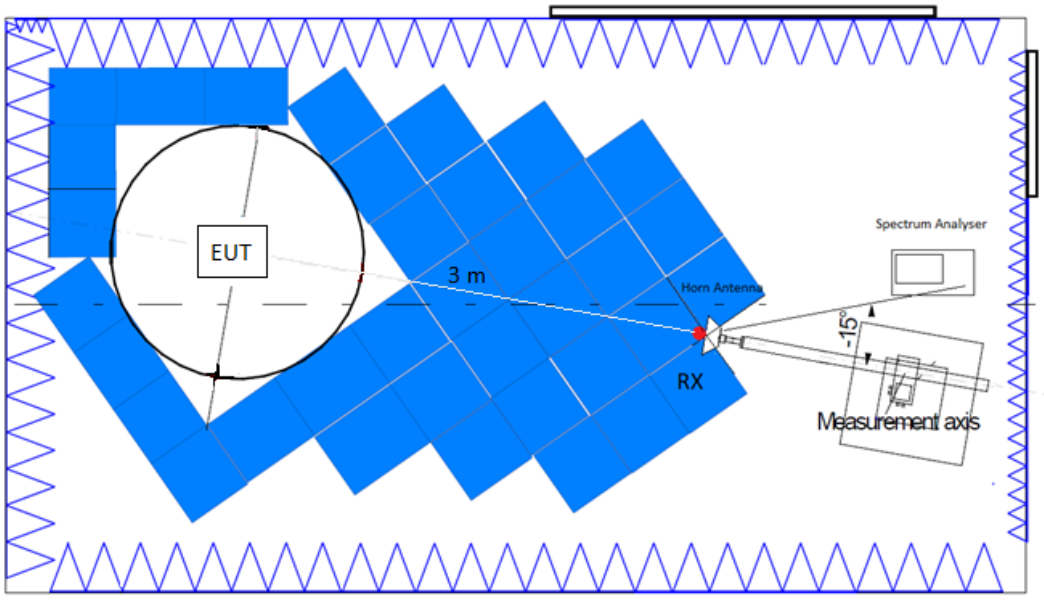
Measurements were made in both horizontal and vertical planes of polarization.

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.

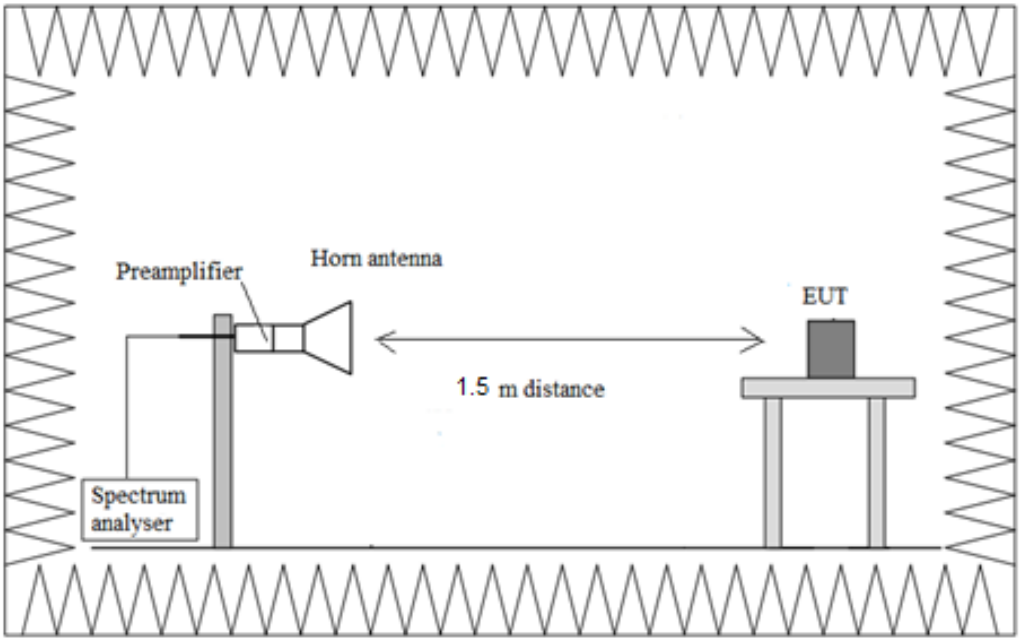
Radiated measurements setup from 30 MHz to 1 GHz:




Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup f > 17 GHz:



# SAMPLE CALCULATION

For radiated measurements:

Values measures by the test receiver / analyzer are converted to field strength, in dBuV/m, at the regulatory distance using the following calculation:

Unwanted Lvl (dBuV/m) = Raw Rec (dBuV) + Preamp (dB) + Trd Corre. (dB/m) + SigPath (dB)

Where,

Raw Rec (dBuV): Measured voltage in the receiver / spectrum analyzer in dBuV

Preamp (dB): Path loses due to preamplifier

Trd Corr. (dB/m): Antenna factor in dB/m

SigPath (dB) = Cable loss (dB) – External Gain amplifier (dB) – Distance factor (dB)

Cable loss (dB): Cable loss

External Gain amplifier (dB): Gain from external amplifier (when used)

Distance factor (dB): Distance factor in dB. When measurement distance is different to limit distance

The field strength, calculated by this way is compared with the regulatory limit.

# TEST CASES DETAILS

## FCC 47 CFR Part 15.247 / RSS-247

## 99dBw Occupied Channel Bandwidth 99%

Modulation: BTLE (GFSK 1 Mbit/s)

***Results***

| Freq (MHz) | Occ Ch BW (MHz) |
|---|---|
| 2402.00000 | 1.030 |
| 2440.00000 | 1.045 |
| 2480.00000 | 1.080 |

***Verdict***

Pass

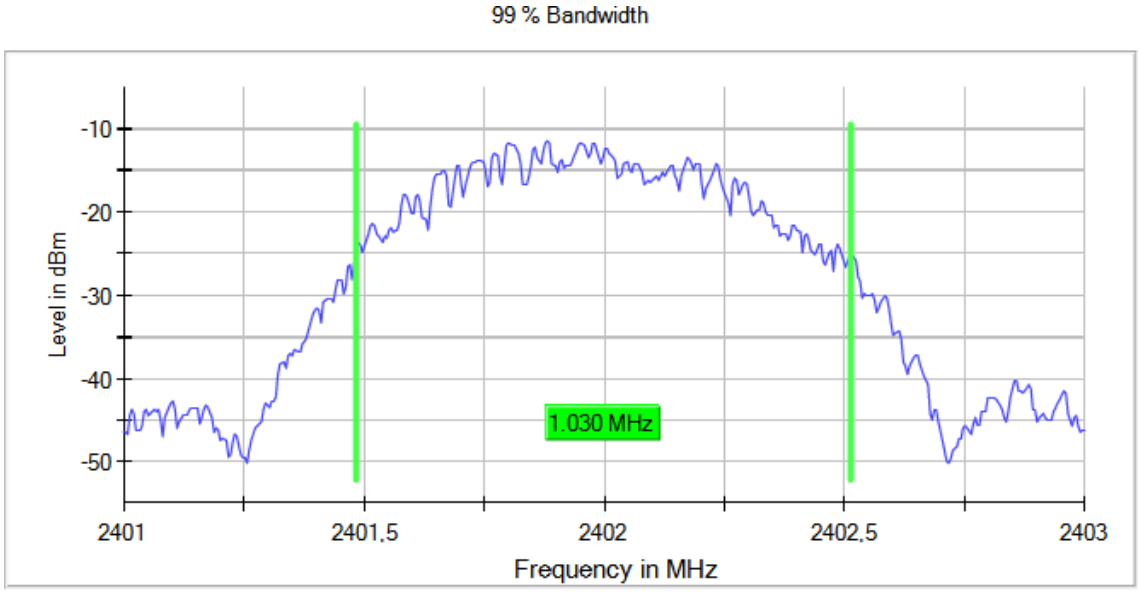
### *Attachments*

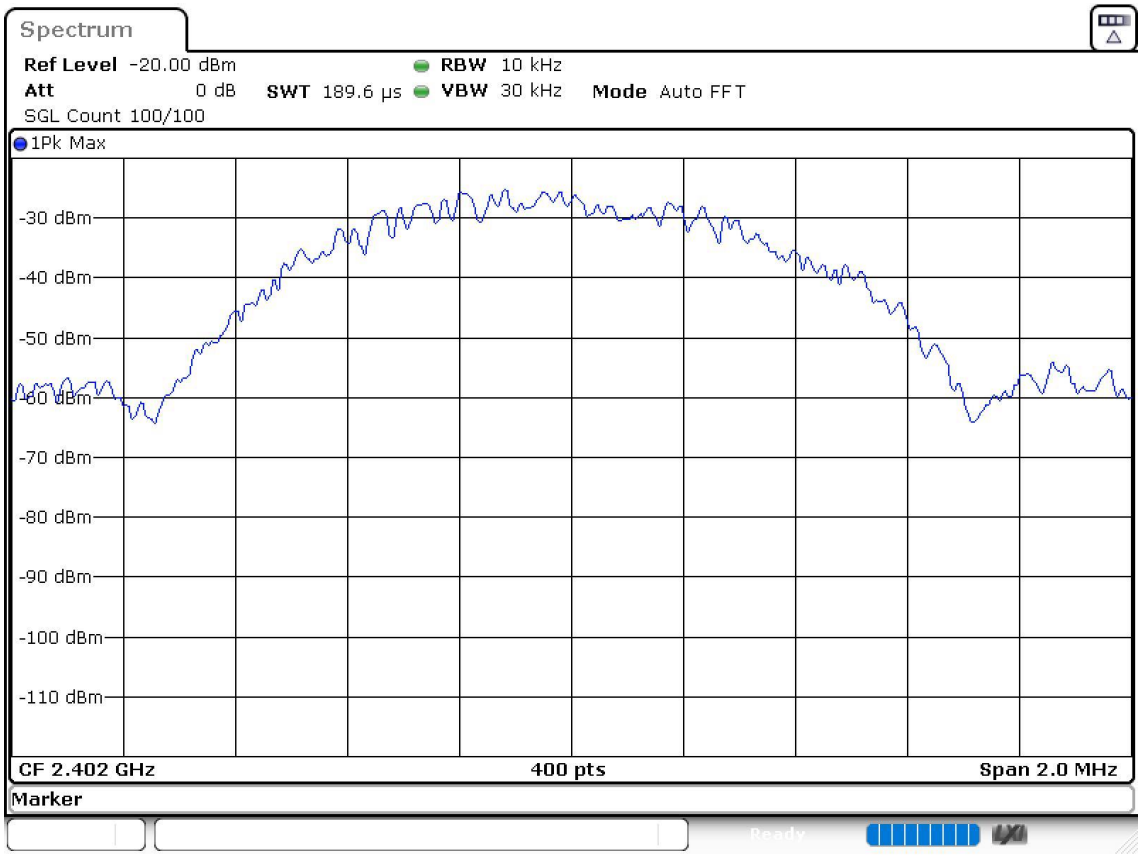
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2402.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



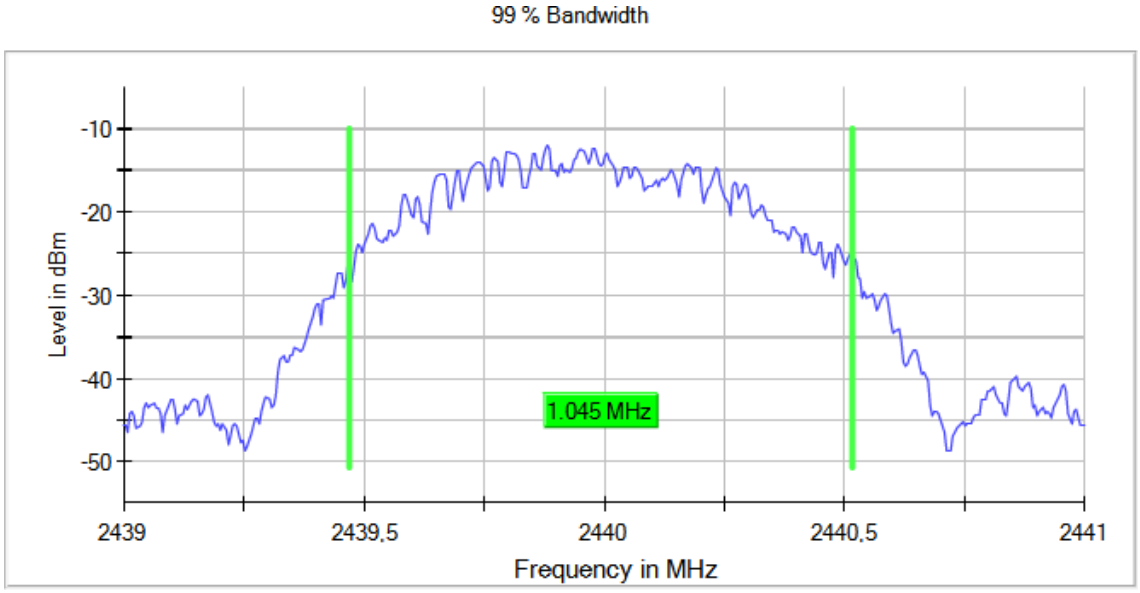



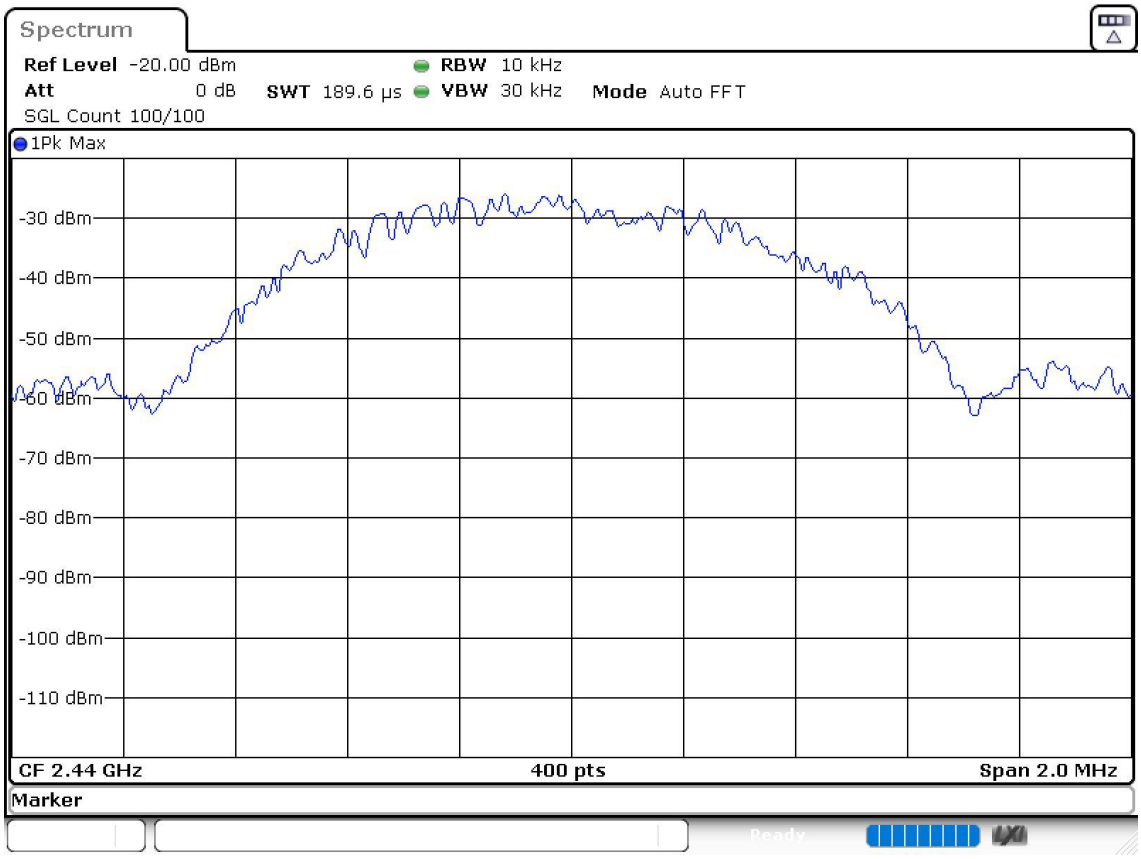
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2440.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



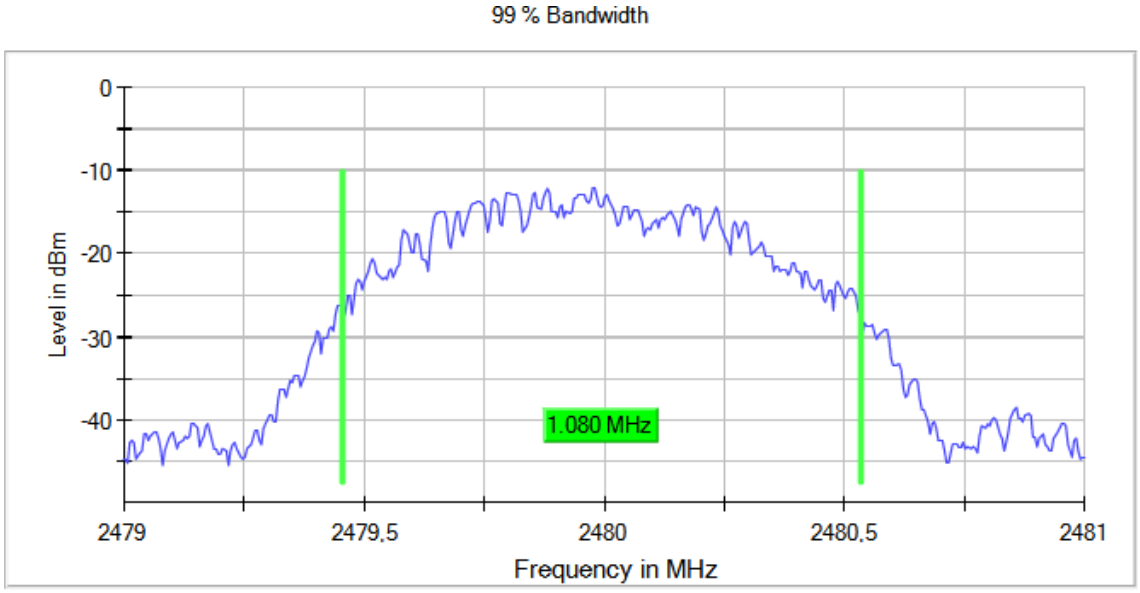



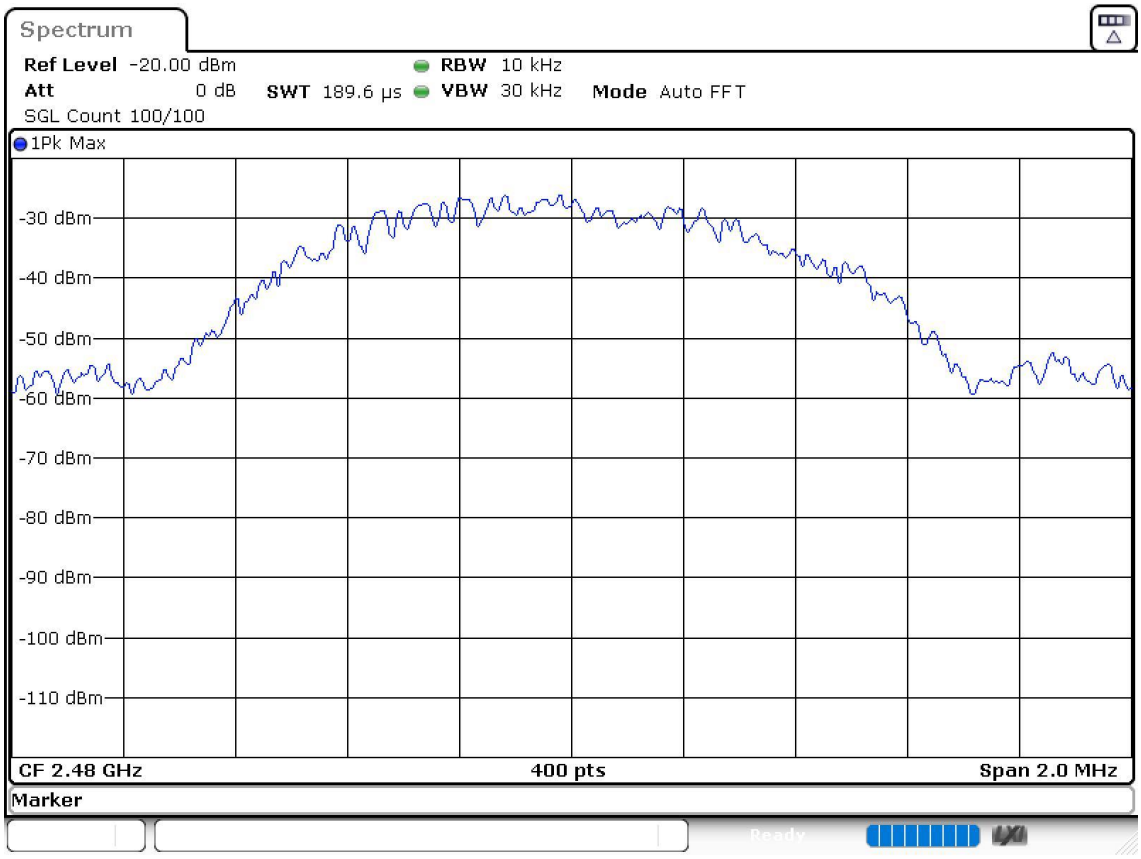
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2480.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



# RSS-247 6.3.1 (a) / FCC 15.247 (a) (2) [6dBw] 6 dB Bandwidth

***Limits***

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

Modulation: BTLE (GFSK 1 Mbit/s)

***Results***

| Freq (MHz) | Ebw (MHz) |
|---|---|
| 2402.00000 | 0.713 |
| 2440.00000 | 0.713 |
| 2480.00000 | 0.772 |

***Verdict***

Pass

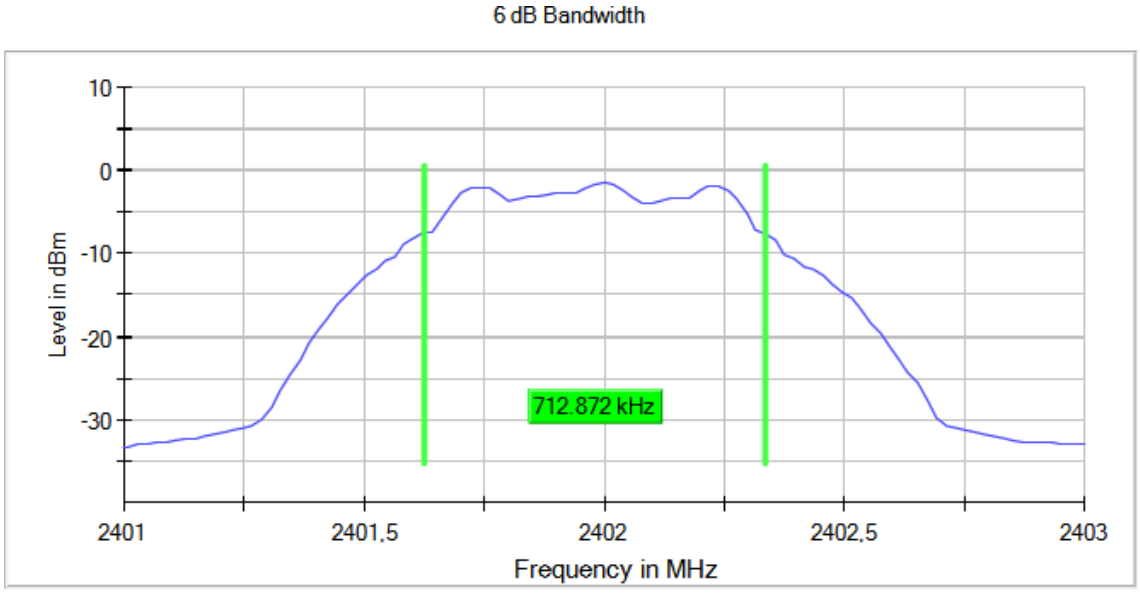
### *Attachments*

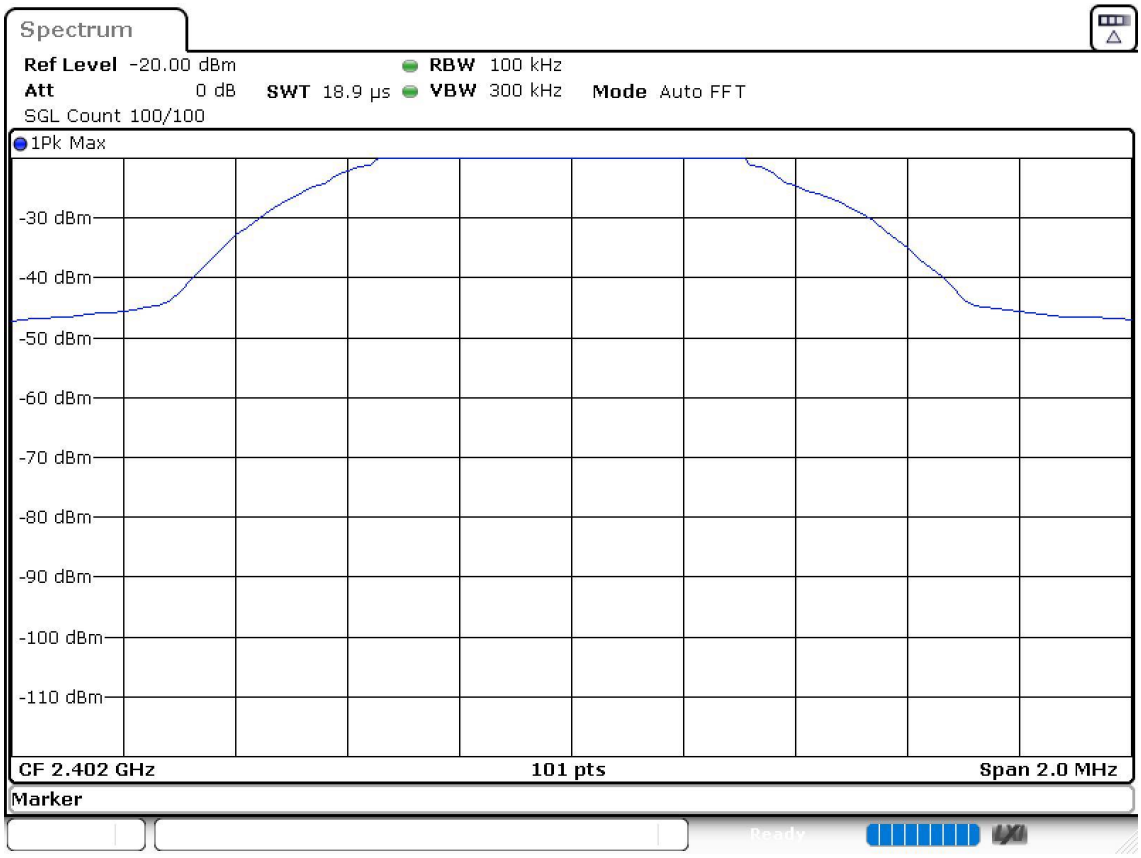
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2402.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



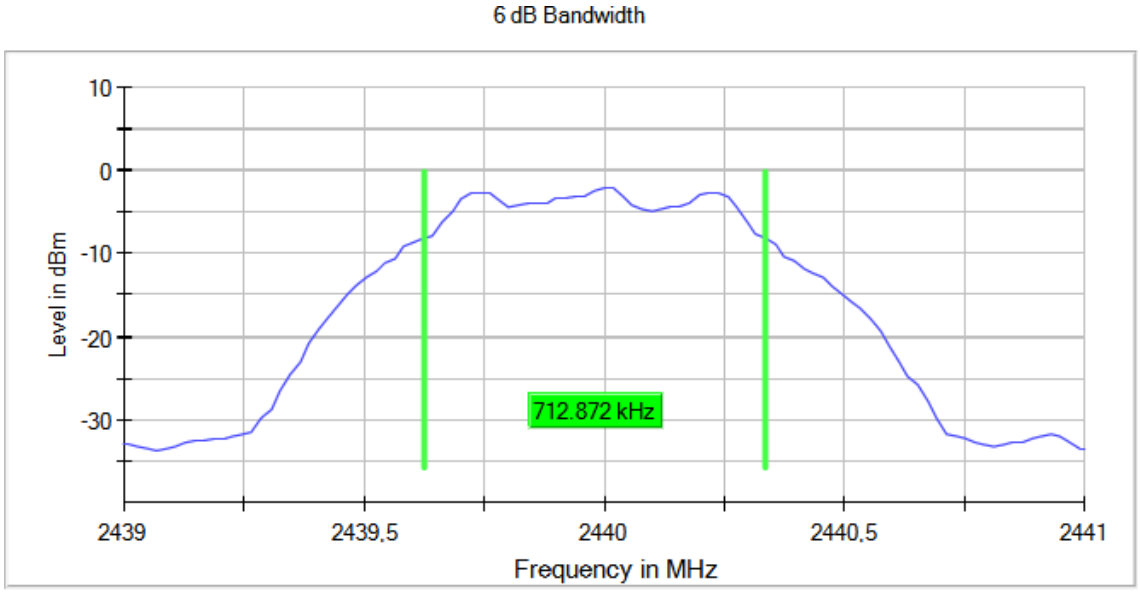



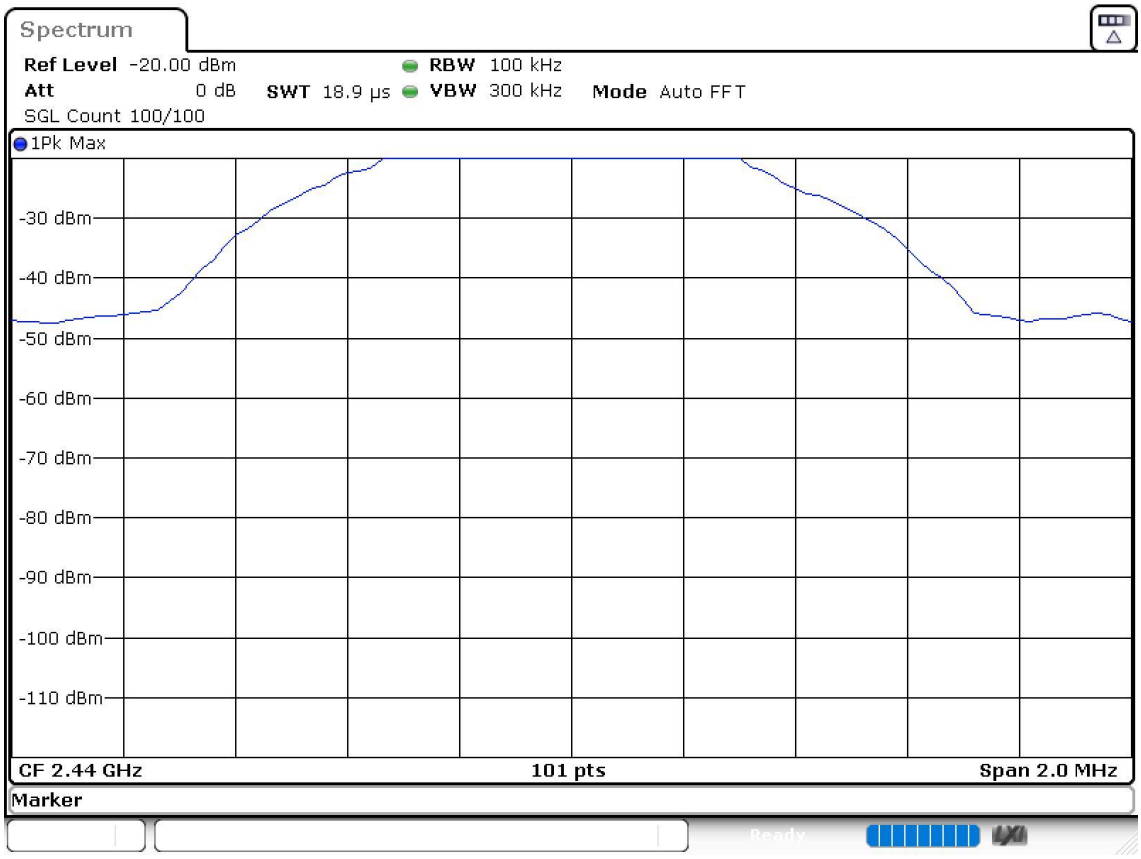
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2440.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



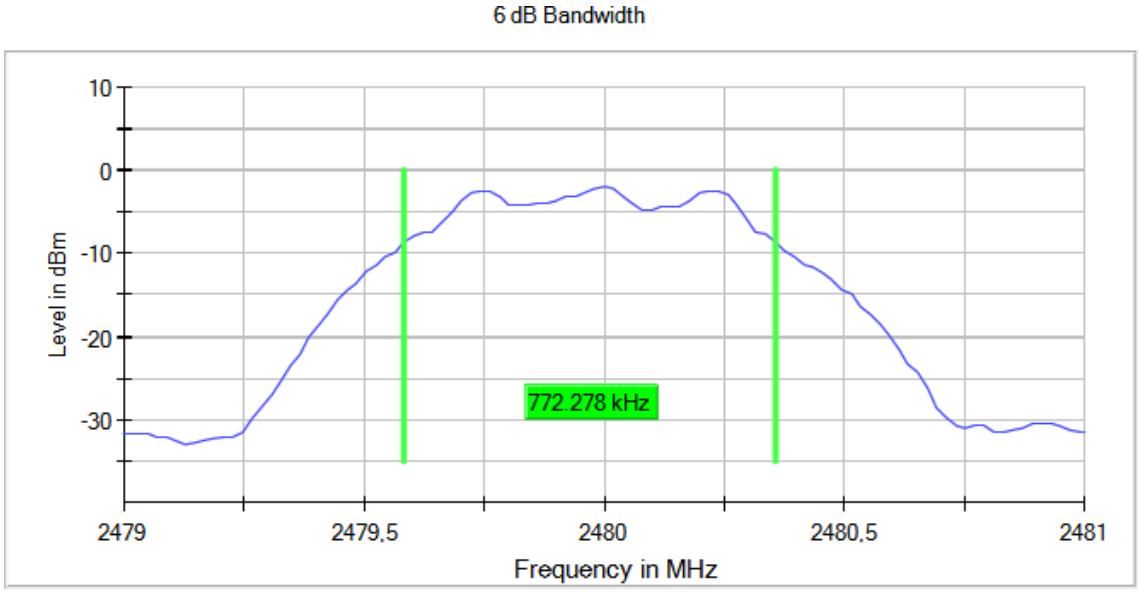



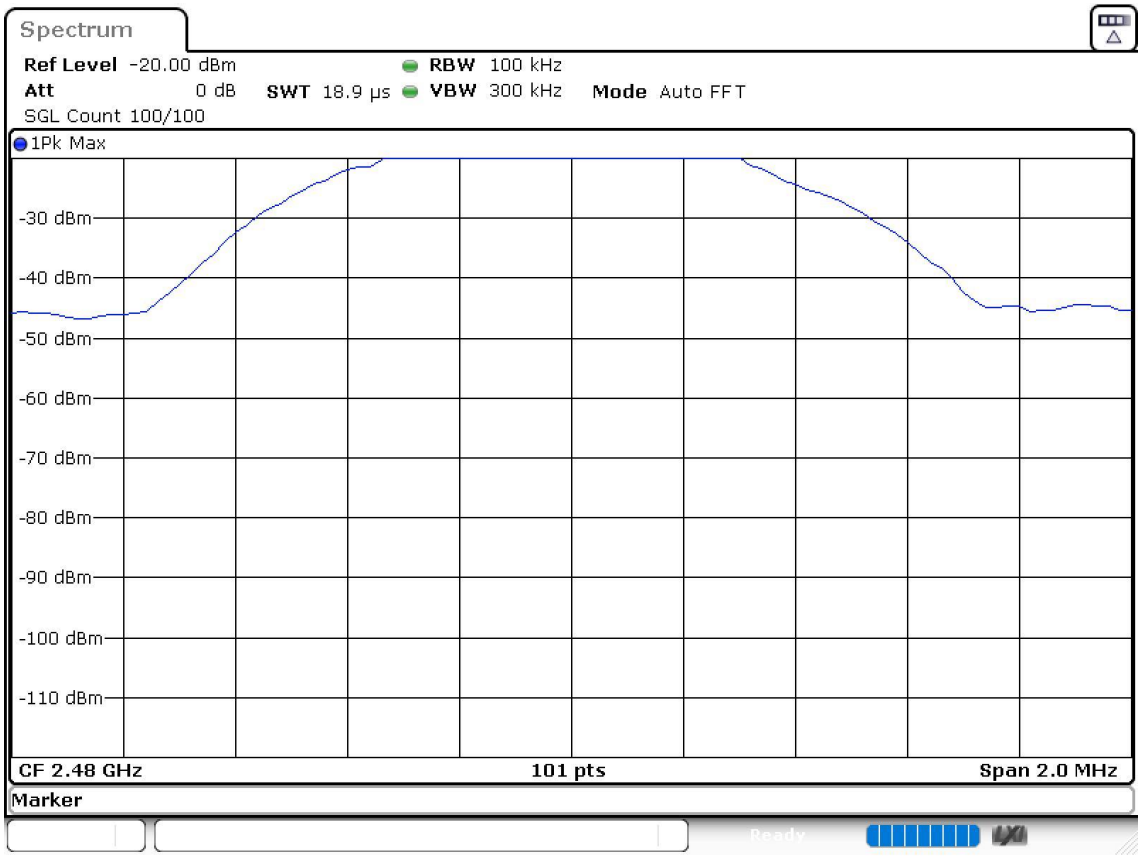
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2480.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



# RSS-247 6.3.1. (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 (GFSK 1 Mbit/s)

***Results***

| Freq (MHz) | PSD (dBm) |
|---|---|
| 2402.00000 | -11.25 |
| 2440.00000 | -12.10 |
| 2480.00000 | -12.02 |

***Verdict***

Pass

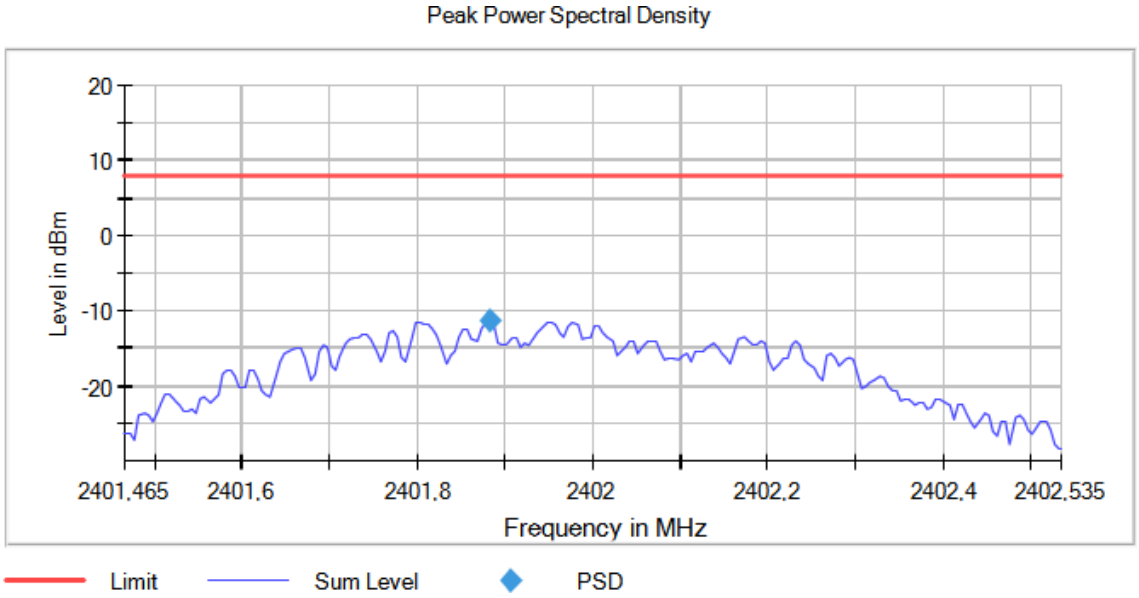
### *Attachments*

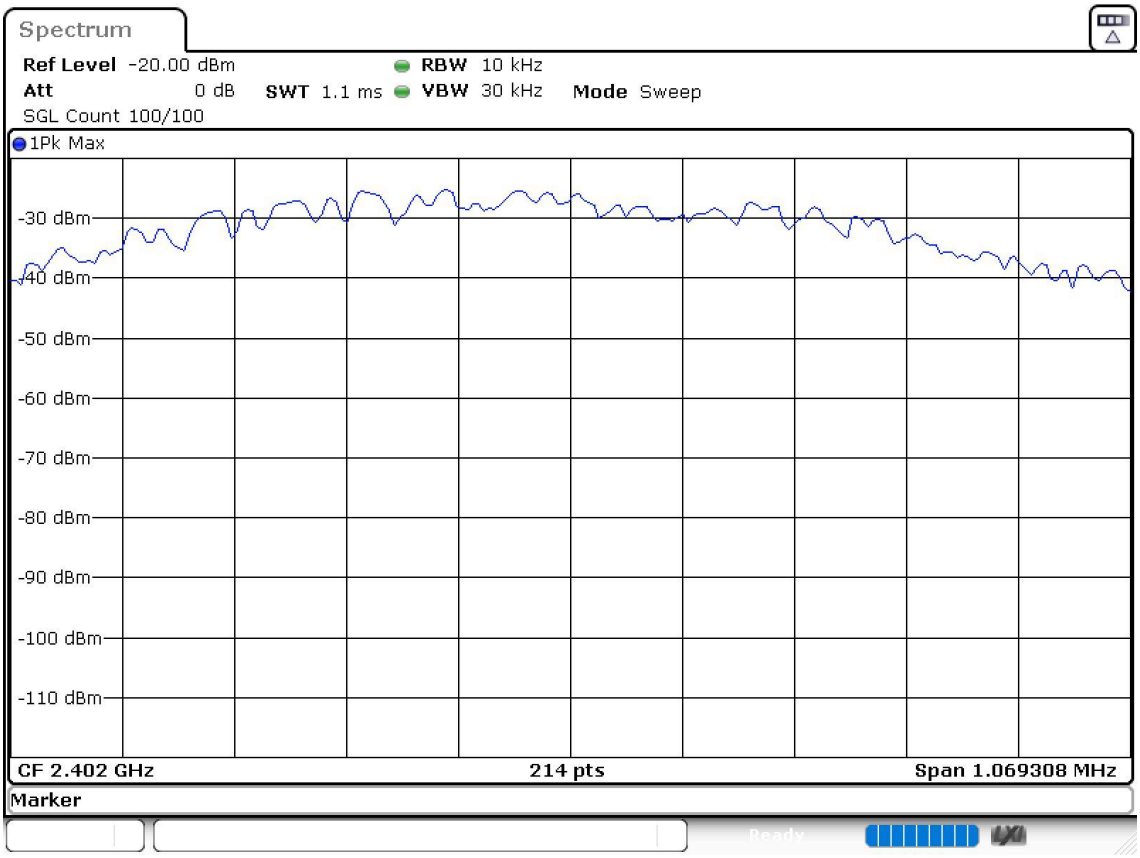
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2402.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



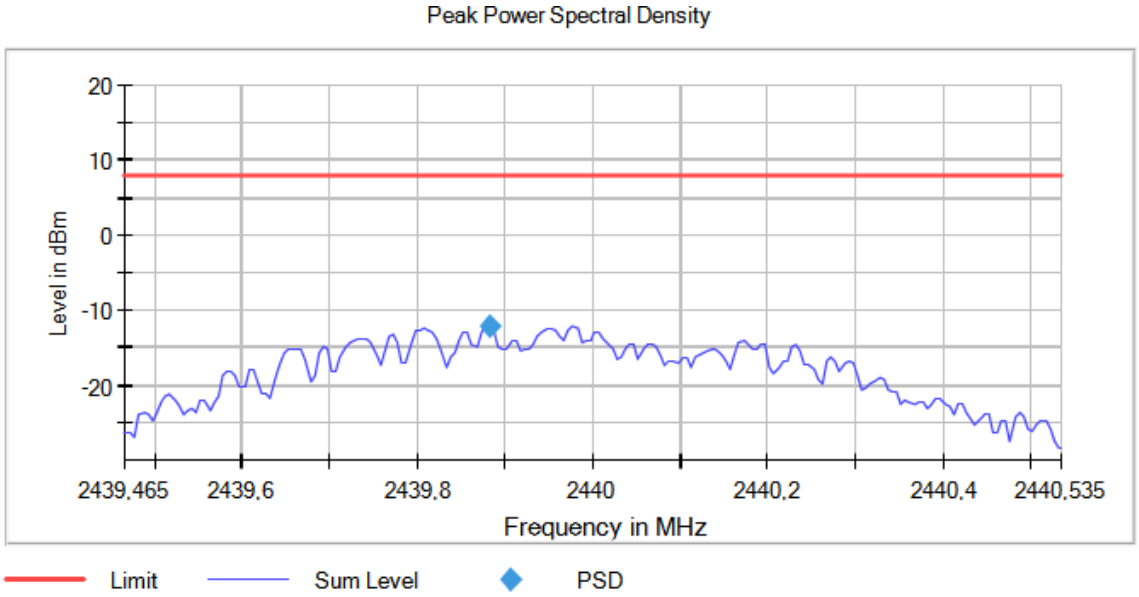



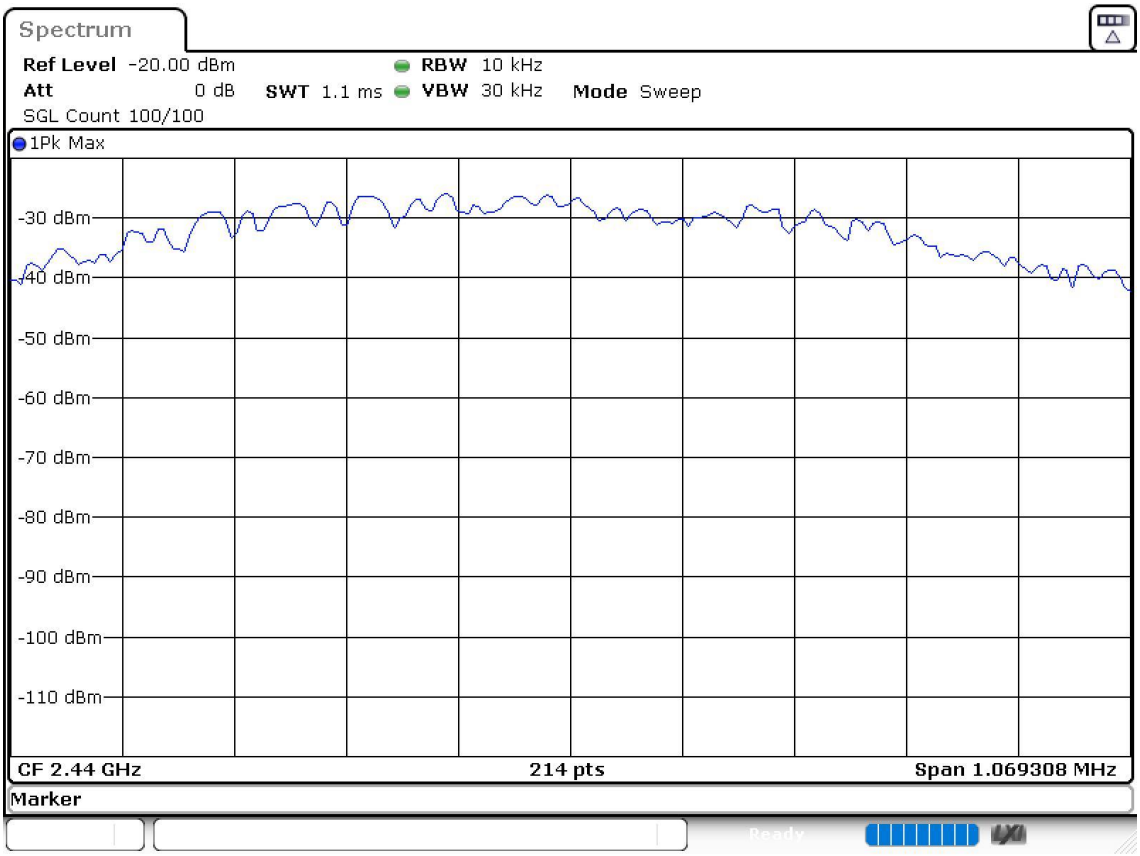
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2440.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



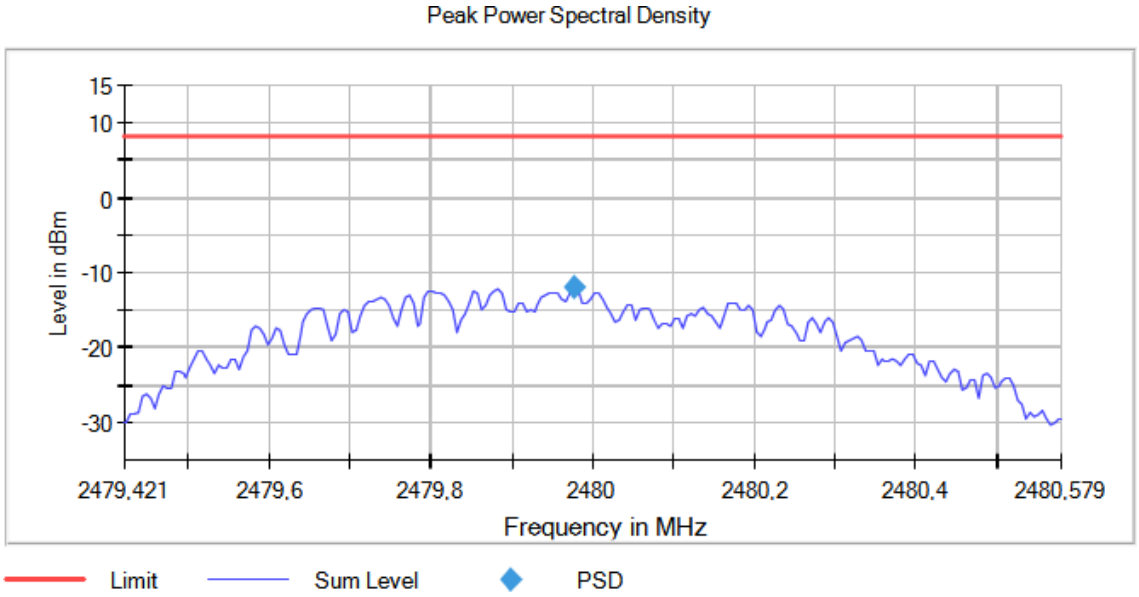



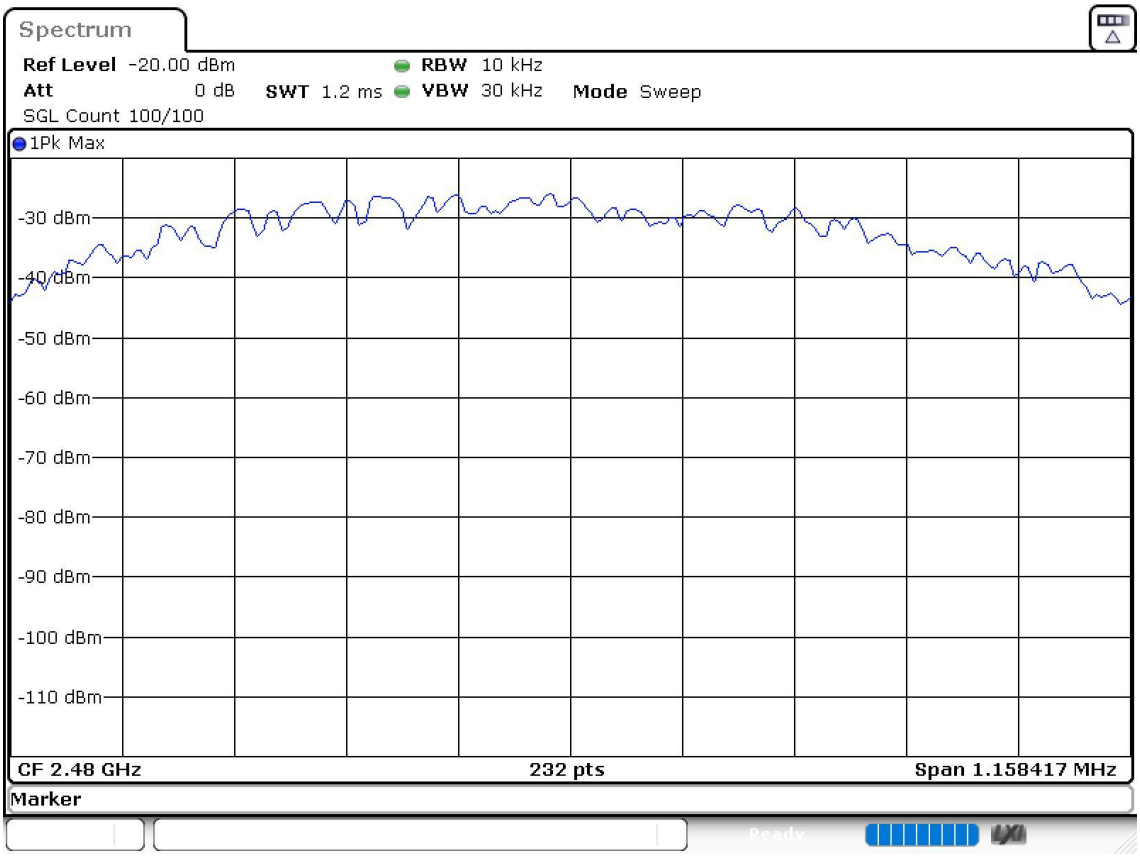
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2480.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



# RSS-247 6.3.2 / FCC 15.247 (b) [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 (GFSK 1 Mbit/s)

***Results***

| Freq (MHz) | Peak Power (dBm) | E.I.R.P. (dBm) |
|---|---|---|
| 2402.00000 | -1.1890 | -11.8890 |
| 2440.00000 | -1.7490 | -12.4490 |
| 2480.00000 | -1.5770 | -12.2770 |

***Verdict***

Pass

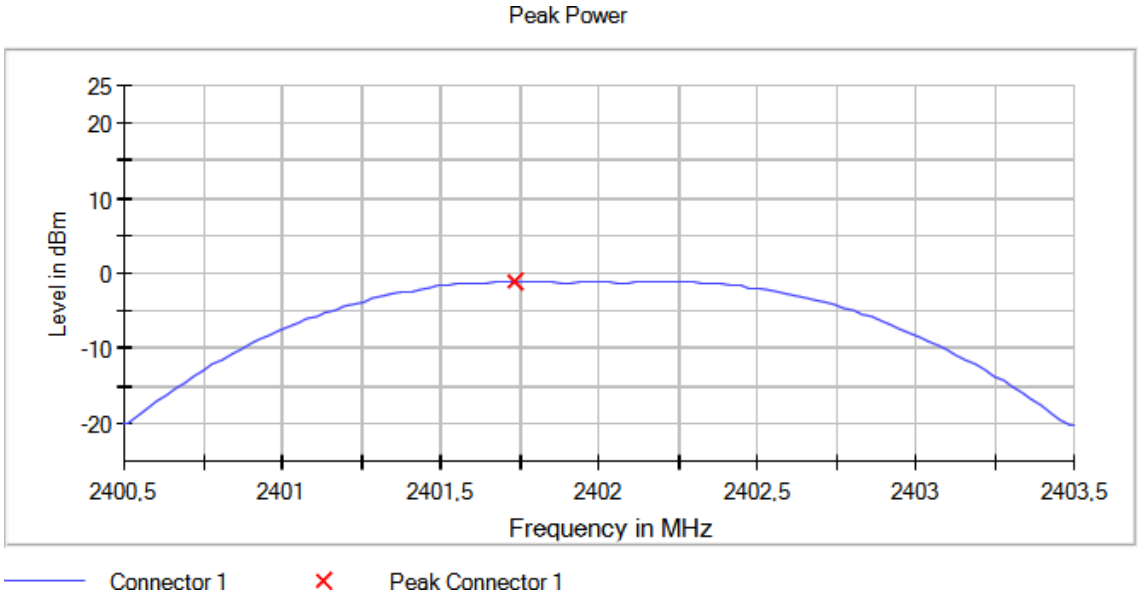
### *Attachments*

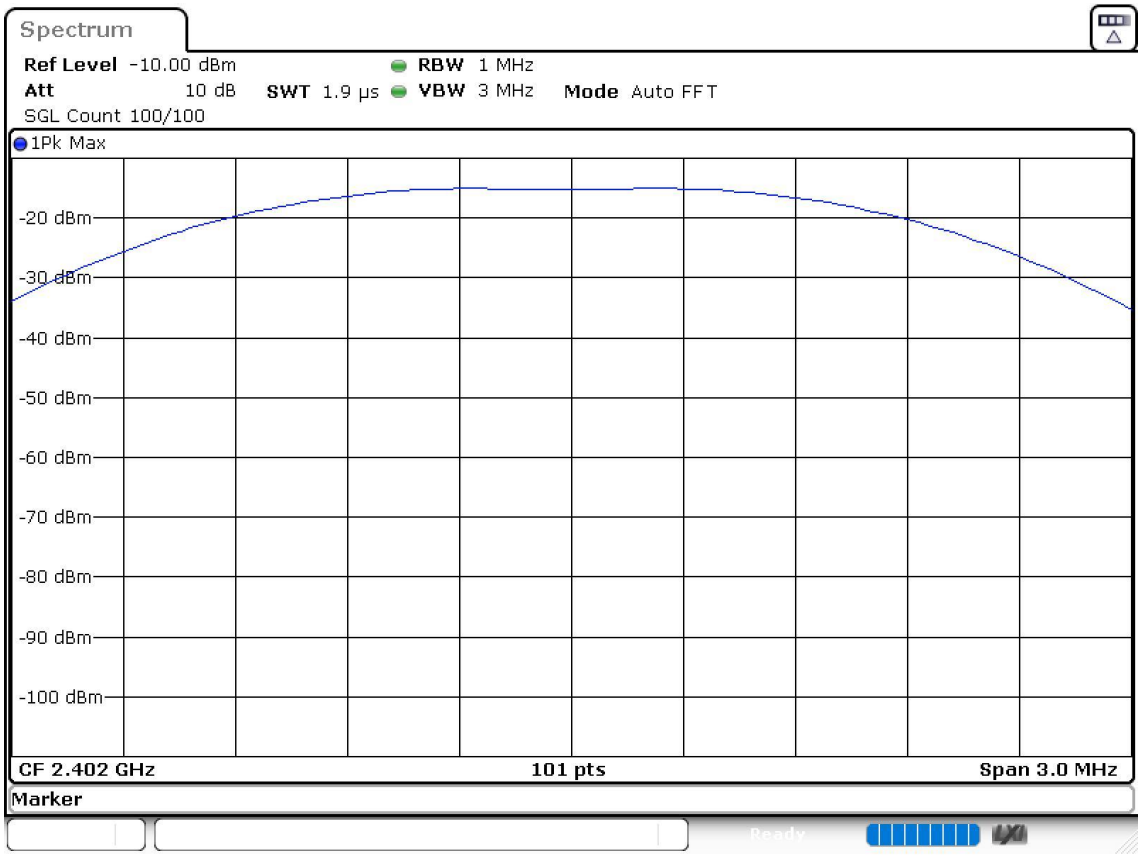
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2402.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



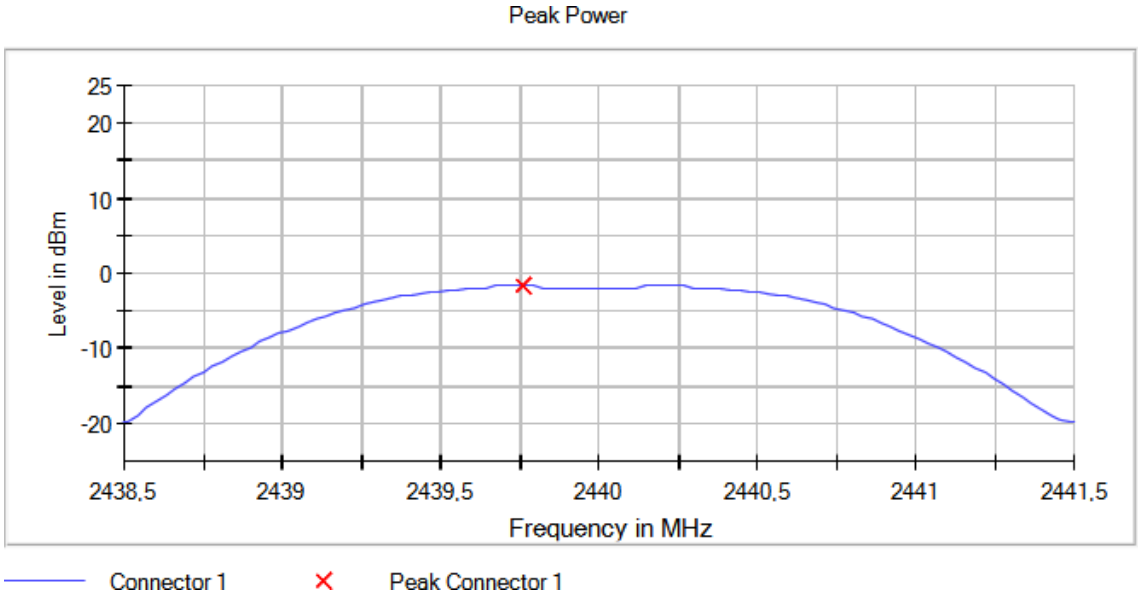



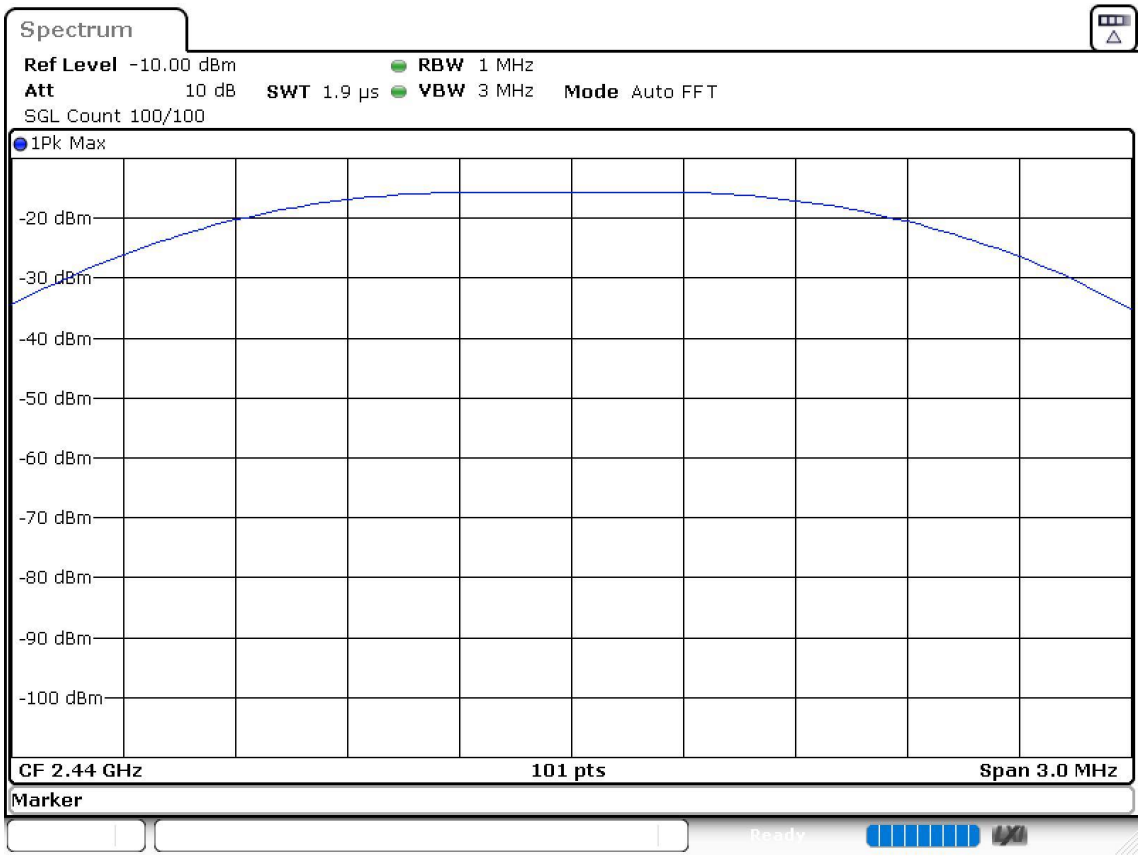
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2440.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



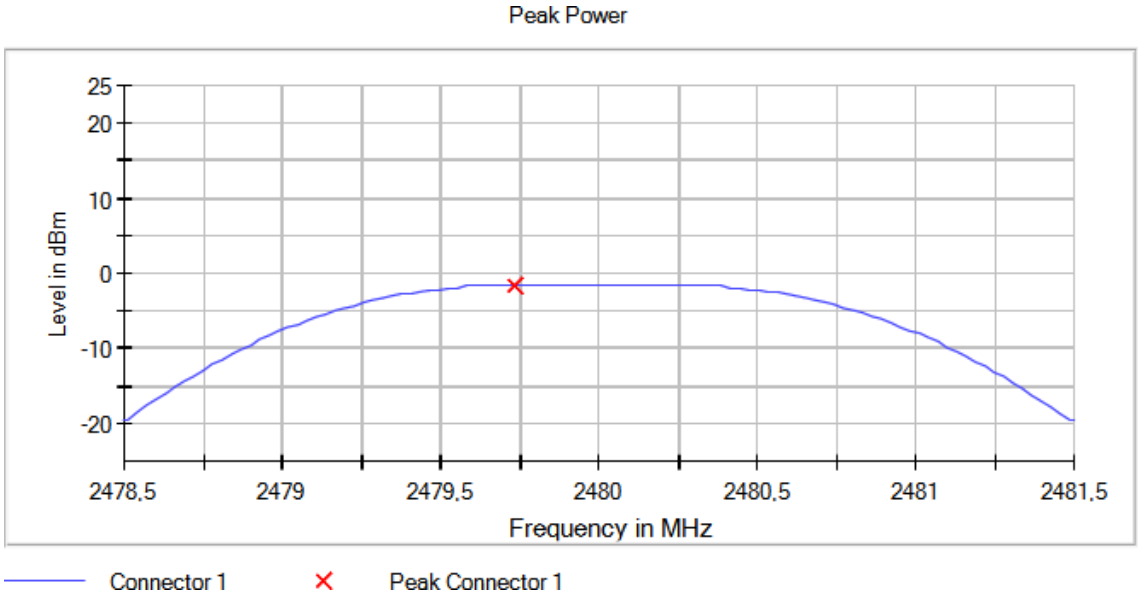



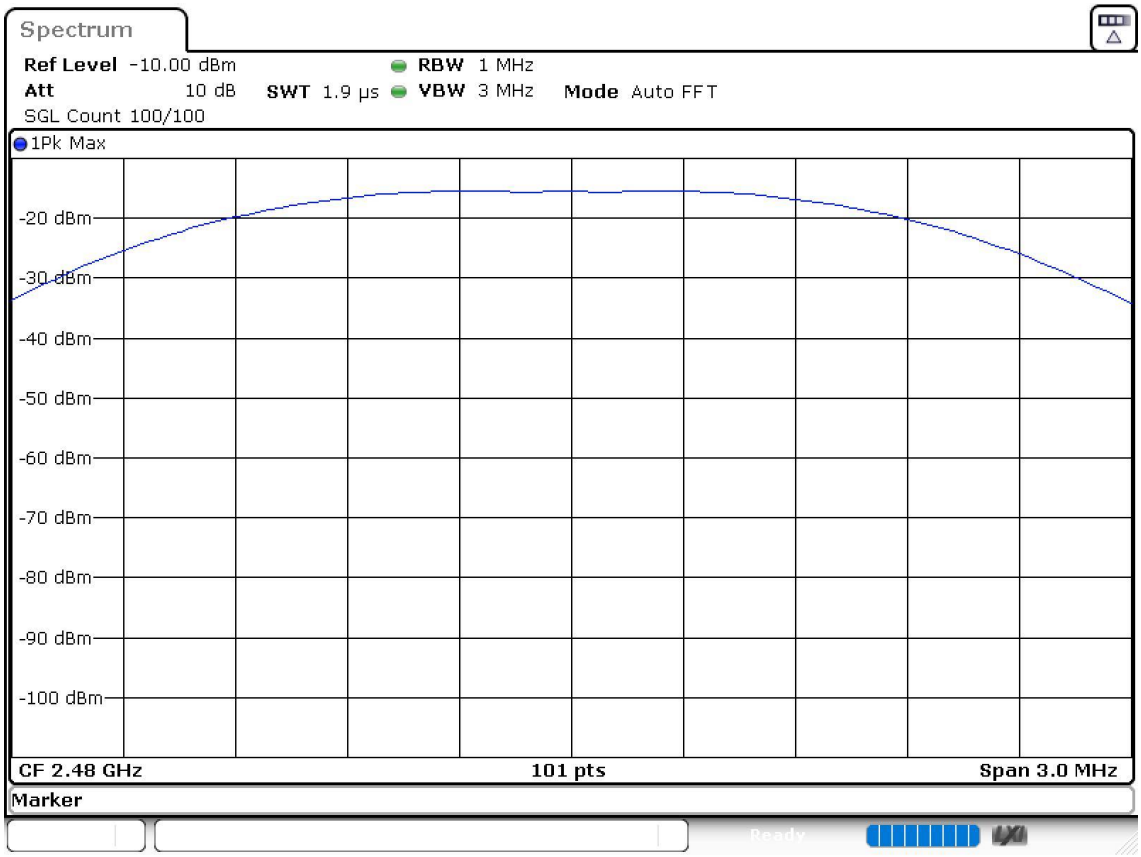
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2480.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**Images:**



# RSS-247 6.6 / 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 (GFSK 1 Mbit/s)

***Results***

| Freq (MHz) | Inband Peak Lvl (dBm) | Freq (MHz) | Lvl (dBm) |
|---|---|---|---|
| 2402.00000 | -11.427 | 2400.000000 | -49.6 |
| | -11.427 | 2399.975000 | -50.7 |
| | -11.427 | 2399.925000 | -51.0 |
| | -11.427 | 2399.875000 | -51.1 |
| | -11.427 | 2399.825000 | -51.4 |
| | -11.427 | 2399.775000 | -51.7 |
| | -11.427 | 2399.725000 | -51.8 |
| | -11.427 | 2399.675000 | -52.0 |
| | -11.427 | 2399.625000 | -52.1 |
| | -11.427 | 2399.575000 | -52.2 |
| | -11.427 | 2399.525000 | -52.4 |
| | -11.427 | 2399.475000 | -52.7 |
| | -11.427 | 2399.425000 | -52.9 |
| | -11.427 | 2399.375000 | -53.1 |
| | -11.427 | 2399.325000 | -53.3 |
| 2480.00000 | -11.921 | 2483.625000 | -55.4 |
| | -11.921 | 2483.575000 | -55.4 |
| | -11.921 | 2483.675000 | -55.6 |
| | -11.921 | 2483.525000 | -55.6 |
| | -11.921 | 2483.725000 | -55.9 |
| | -11.921 | 2483.775000 | -56.1 |
| | -11.921 | 2483.825000 | -56.2 |
| | -11.921 | 2483.875000 | -56.4 |
| | -11.921 | 2484.025000 | -56.4 |
| | -11.921 | 2484.075000 | -56.5 |
| | -11.921 | 2483.975000 | -56.5 |
| | -11.921 | 2483.925000 | -56.6 |
| | -11.921 | 2484.125000 | -56.7 |
| | -11.921 | 2484.175000 | -56.9 |
| | -11.921 | 2484.225000 | -57.1 |

***Verdict***

Pass

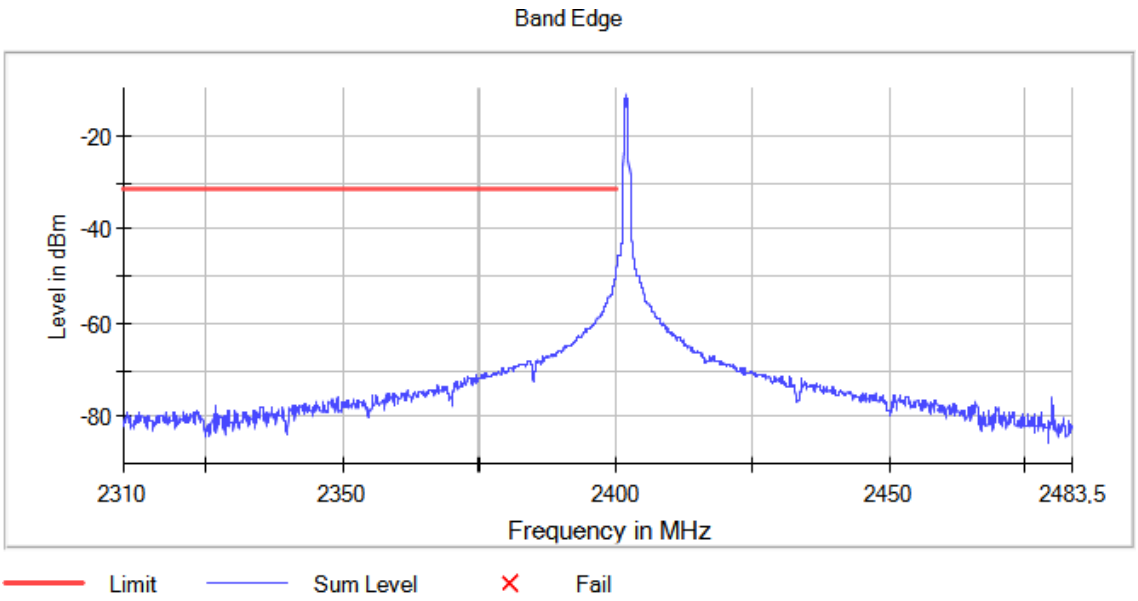
### *Attachments*

Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2402.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**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 | 113.672 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 4 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.45 dB | 0.50 dB |

Spectrum Analyzer Parameters 2

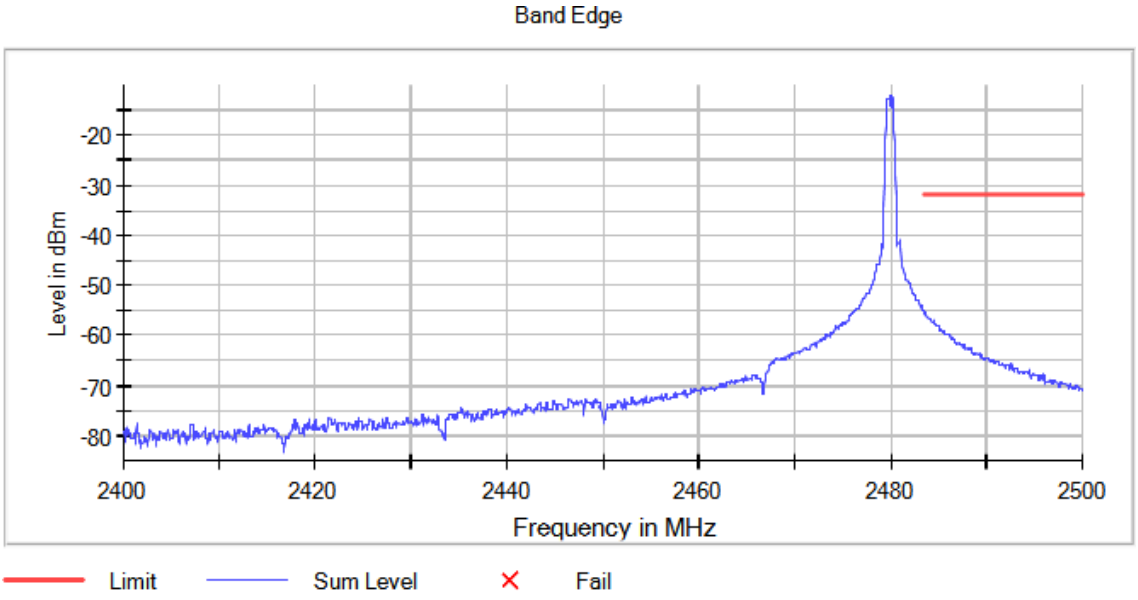
| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.40000 GHz | 2.40000 GHz |
| Stop Frequency | 2.48350 GHz | 2.48350 GHz |
| Span | 83.500 MHz | 83.500 MHz |
| RBW | 100.000 kHz | <= 100.000 kHz |
| VBW | 300.000 kHz | >= 300.000 kHz |
| SweepPoints | 1670 | ~ 1670 |
| Sweeptime | 94.727 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 6 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.12 dB | 0.50 dB |

Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2480.00000 Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

**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 | 113.672 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 4 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.45 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 | 94.727 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 6 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.12 dB | 0.50 dB |

# RSS-247 6.6 / 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 |
| Above 960 | 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.

***Frequency range tested for Radiated emissions:***

Start frequency: no radiofrequency signal generated in the device found below 10$^{th}$ sub-harmonic, no further investigation required.
Stop frequency: it has been performed the radiated spurious emissions until 10$^{th}$ harmonic.

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

***Results***

**Range 30MHz-1GHz**

No spurious frequencies detected at less than 20dB below the limit.

**Range 1GHz-3GHz**

| Freq Rng (GHz) | Freq (MHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector | Sig Path (dB) | Preamp (dB) | Trd Corr. (dB/m) | Raw Rec (dBµV) |
|---|---|---|---|---|---|---|---|---|---|
| [1, 3] | 2480.00000 | 2484.200 | 62.54 | H | PK | 4.2 | 0.0 | 27.6 | 30.7 |
| | | | 49.13 | H | AVG | 4.2 | 0.0 | 27.6 | 17.3 |

**Range 3GHz-17GHz**

| Freq Rng (GHz) | Freq (MHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector | Sig Path (dB) | Preamp (dB) | Trd Corr. (dB/m) | Raw Rec (dBµV) |
|---|---|---|---|---|---|---|---|---|---|
| [3, 17] | 2480.00000 | 7440.000 | 54.29 | V | PK | -22.5 | 0.0 | 36.5 | 40.2 |
| | | | 49.35 | V | AVG | -22.5 | 0.0 | 36.5 | 29.9 |

**Range 17GHz-26GHz**

No spurious frequencies detected at less than 20dB below the limit.

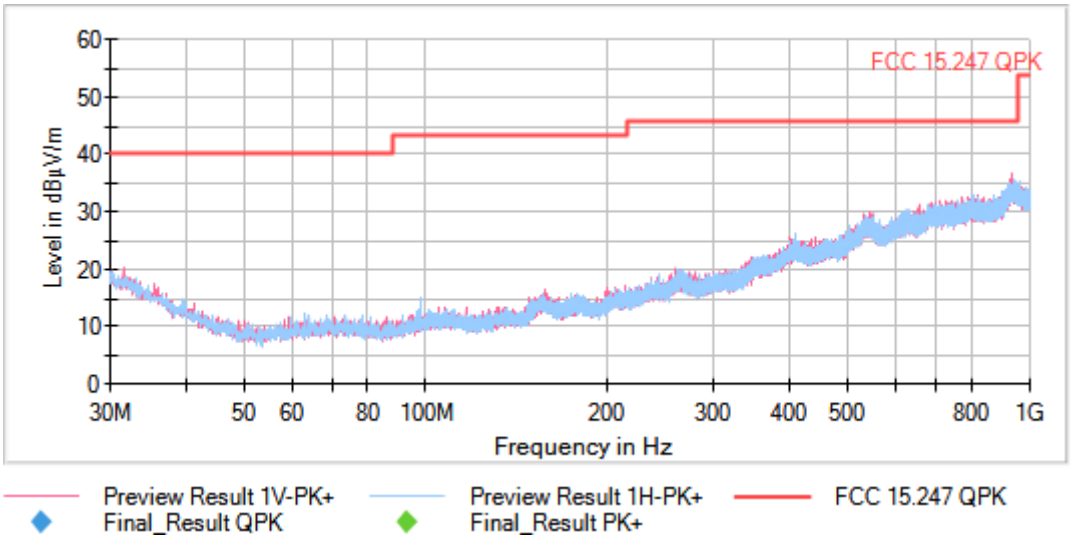
***Verdict***

Pass

### *Attachments*

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

**Images:**

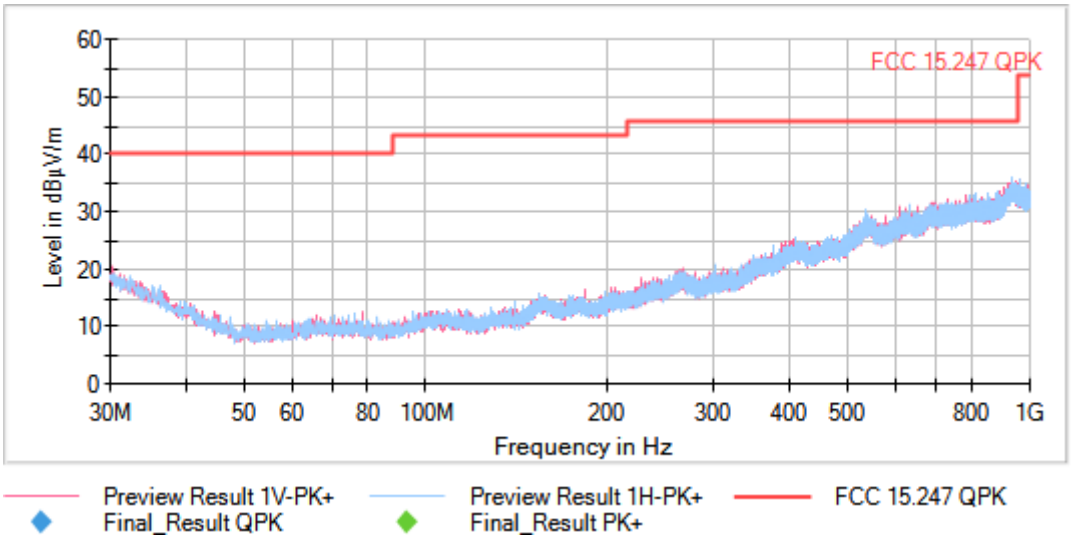



**Tables:**
Spectrum Analyzer Parameters

| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 30 MHz - 1 GHz | 48,5 kHz | PK+ | 100 kHz | 1 s | 0 dB |

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

**Images:**

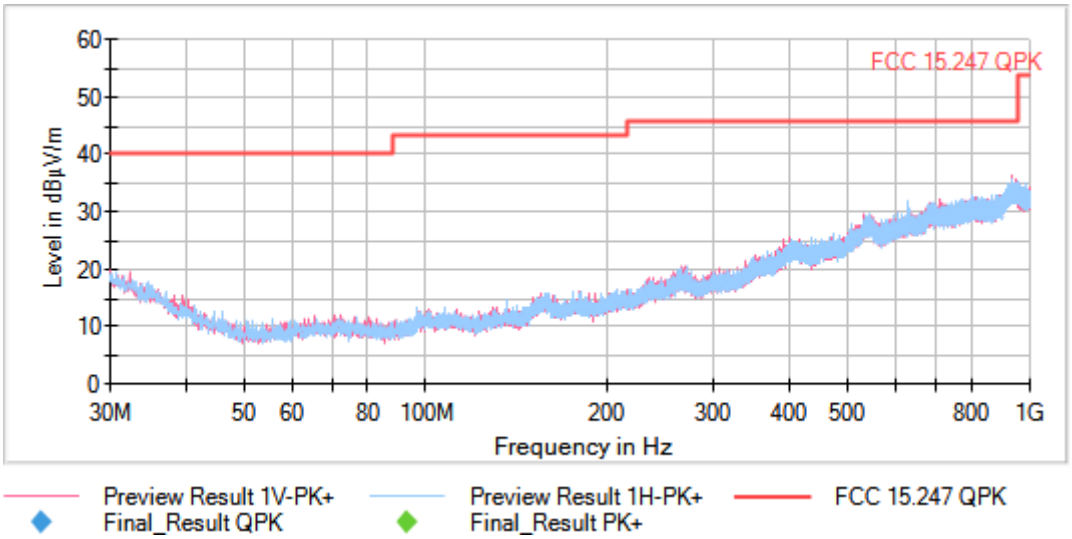



**Tables:**
Spectrum Analyzer Parameters

| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 30 MHz - 1 GHz | 48,5 kHz | PK+ | 100 kHz | 1 s | 0 dB |

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

**Images:**

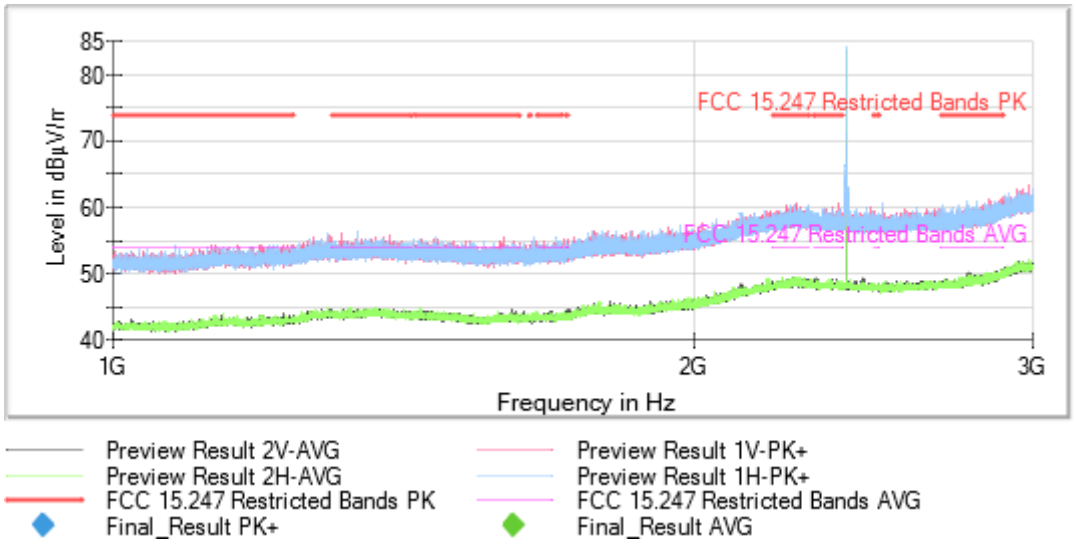



**Tables:**
Spectrum Analyzer Parameters

| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 30 MHz - 1 GHz | 48,5 kHz | PK+ | 100 kHz | 1 s | 0 dB |

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

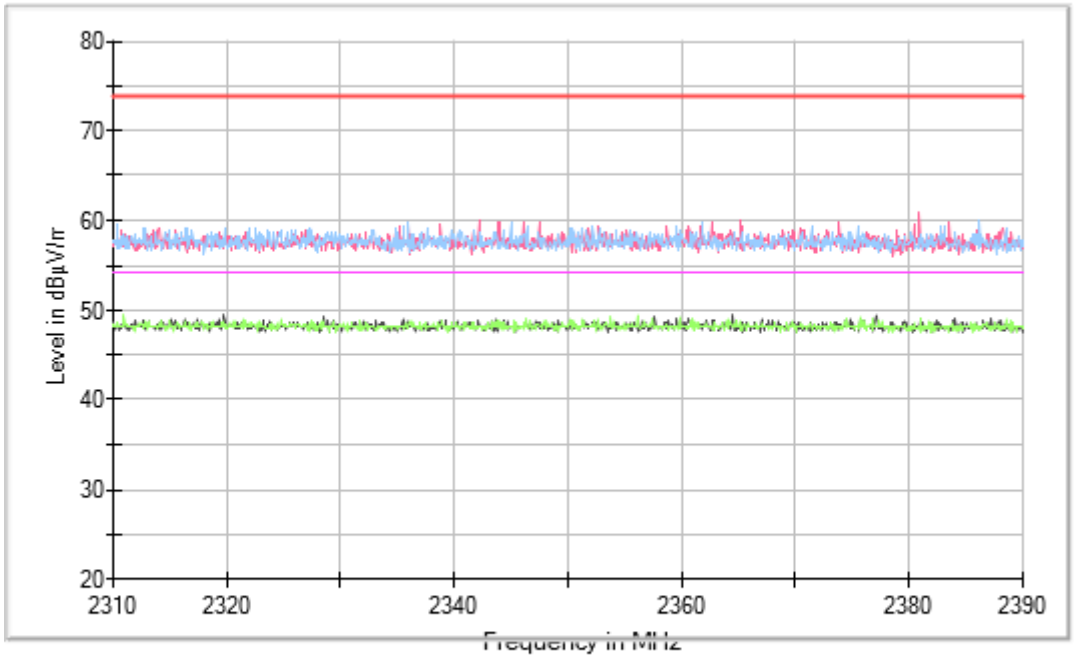
**Images:**







Full Spectrum

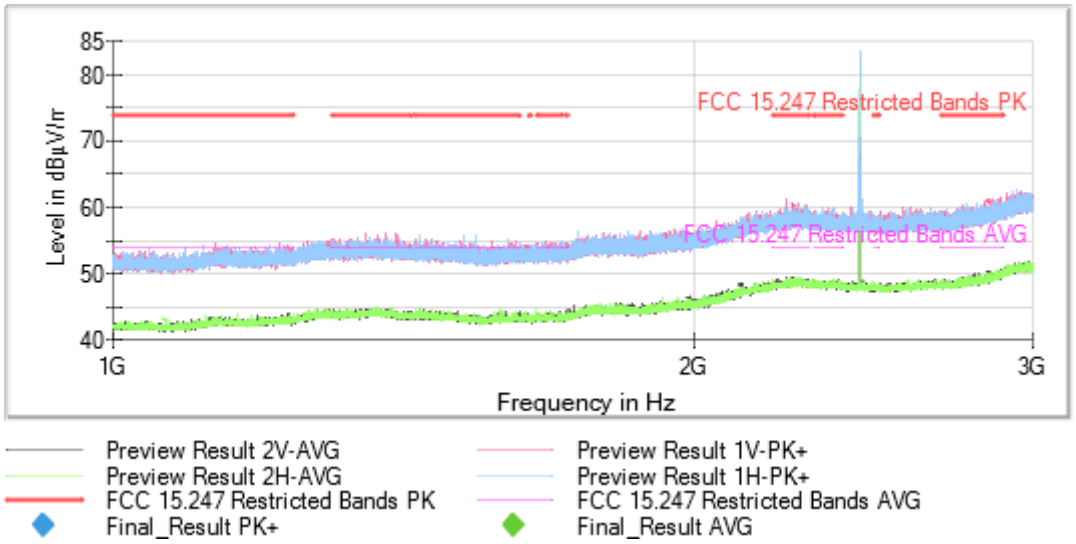


**Tables:**
Spectrum Analyzer Parameters

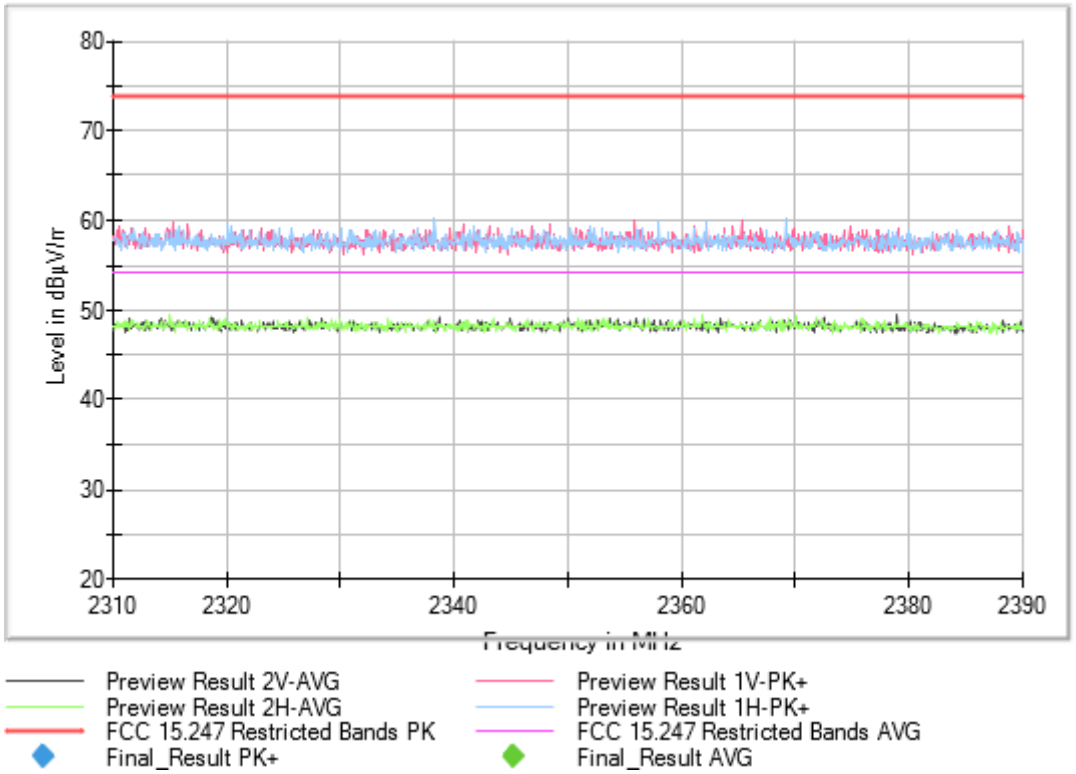
| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 1 GHz - 3 GHz | 66,667 kHz | PK+ ; AVG | 1 MHz | 1 s | 0 dB |

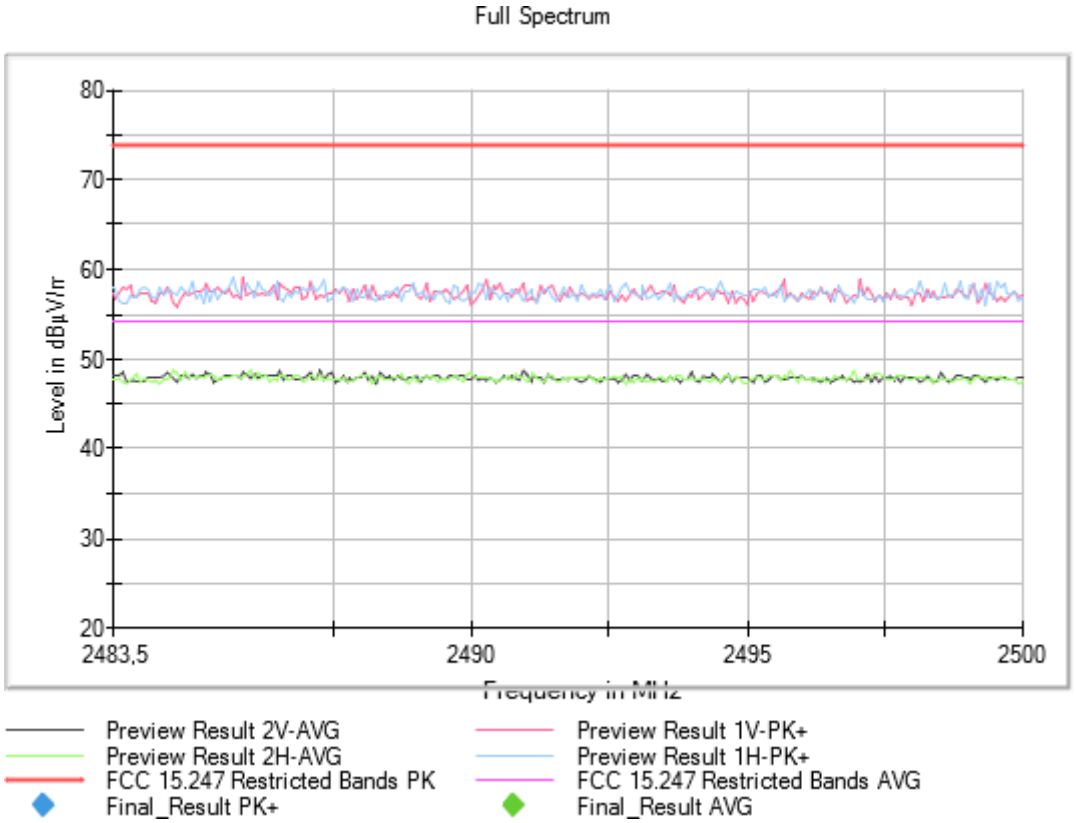
Operation Band MHz = [2400, 2483.5]
Frequency Range GHz = [1, 3]
Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000
Active Port = 1
Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

**Images:**




Full Spectrum



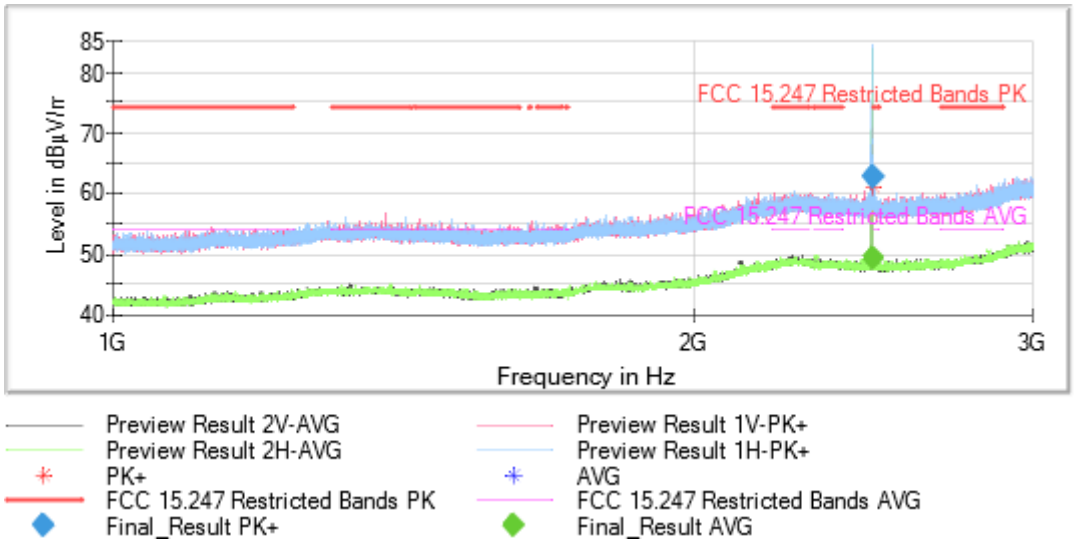



**Tables:**
Spectrum Analyzer Parameters

| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 1 GHz - 3 GHz | 66,667 kHz | PK+ ; AVG | 1 MHz | 1 s | 0 dB |

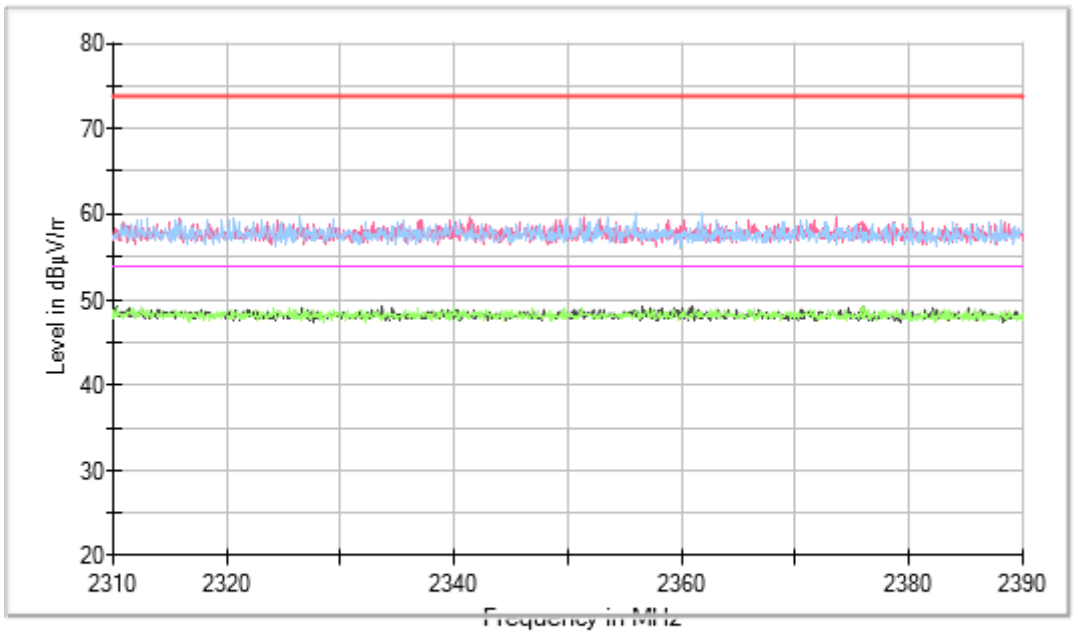
Operation Band MHz = [2400, 2483.5]
Frequency Range GHz = [1, 3]
Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000
Active Port = 1
Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

**Images:**

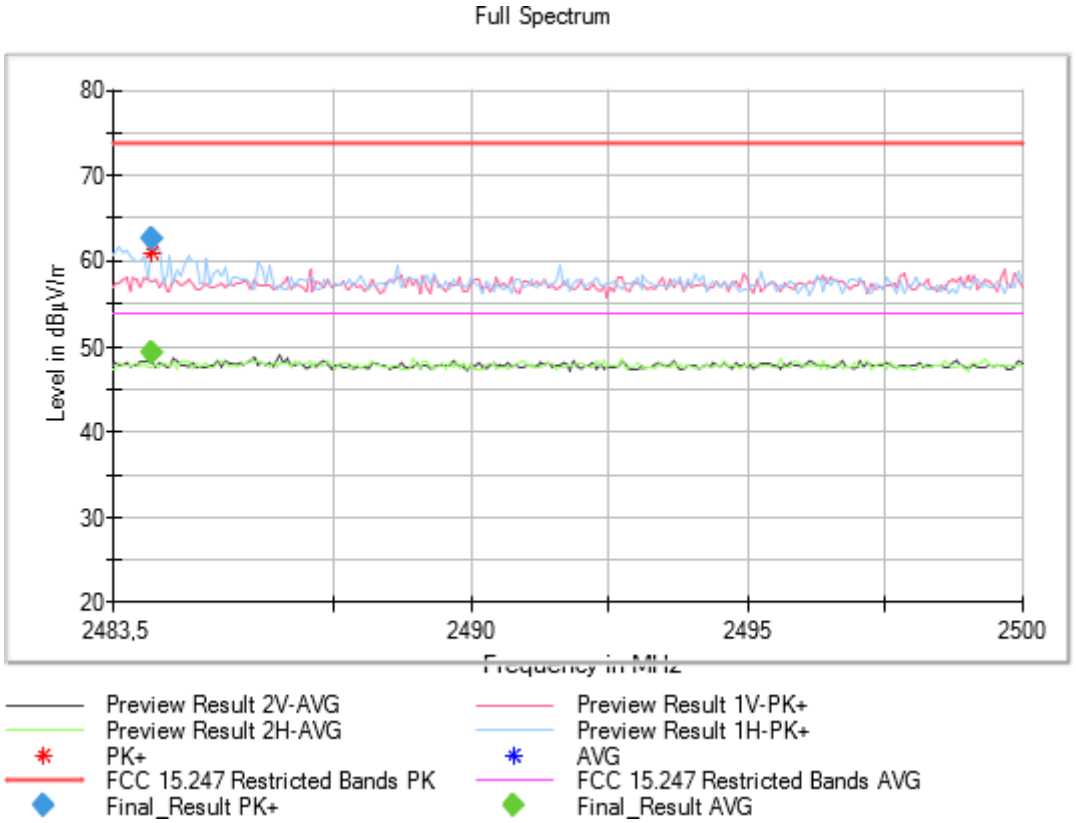



Preview Result 2V-AVG
Preview Result 2H-AVG
PK+
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
AVG
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Full Spectrum




Preview Result 2V-AVG
Preview Result 2H-AVG
PK+
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
AVG
FCC 15.247 Restricted Bands AVG
Final_Result AVG

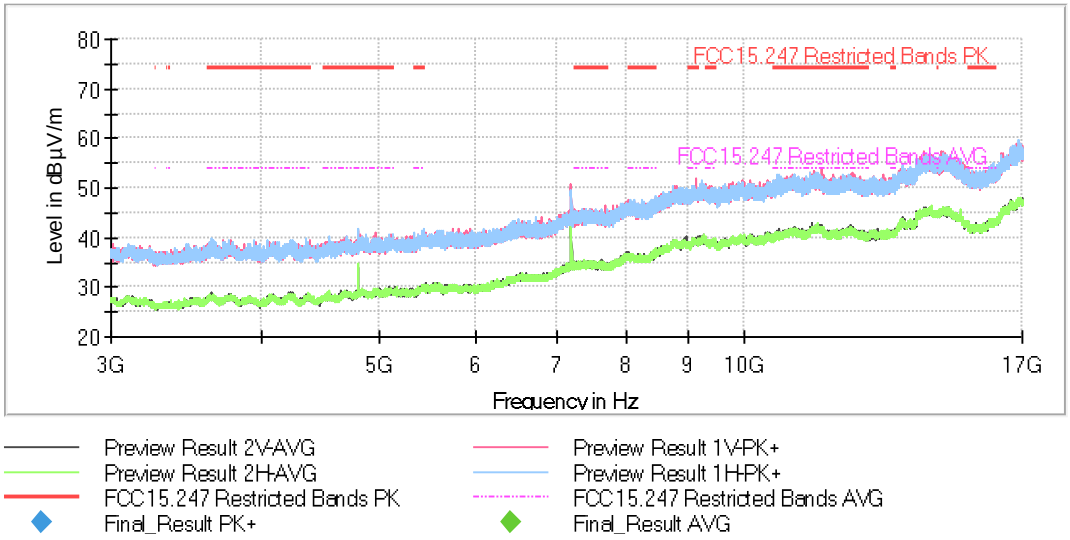



**Tables:**
Spectrum Analyzer Parameters

| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 1 GHz - 3 GHz | 66,667 kHz | PK+ ; AVG | 1 MHz | 1 s | 0 dB |

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

**Images:**




**Tables:**

Spectrum Analyzer Parameters

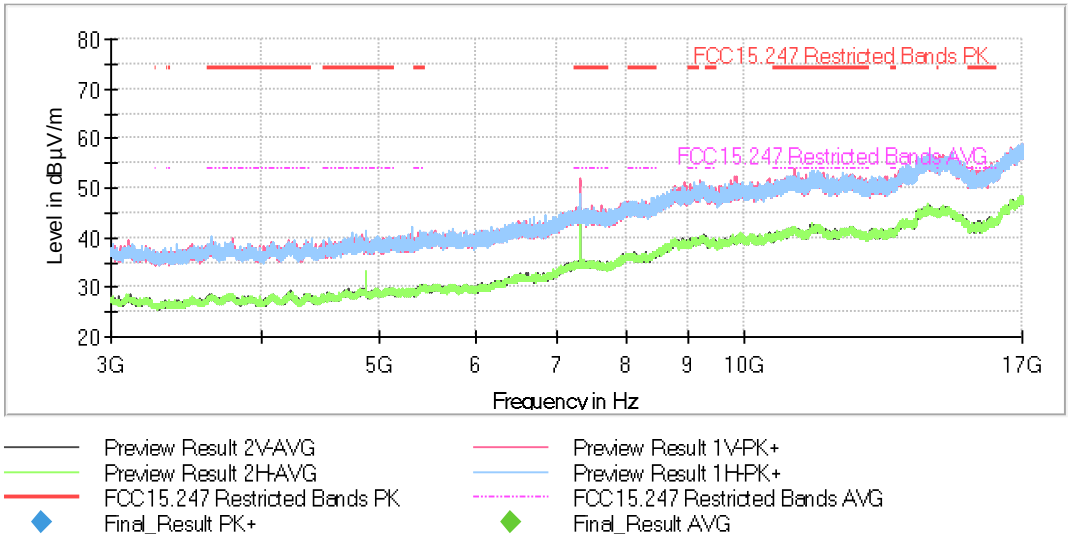
| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 3 GHz - 17 GHz | 500 kHz | PK+ ; AVG | 1 MHz | 1 s | 0 dB |

Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)

Modulation = BTLE (GFSK 1 Mbit/s) Frequency MHz = 2440.00000

MIMO Mode = SISO Active Port = 1

**Images:**




**Tables:**

Spectrum Analyzer Parameters

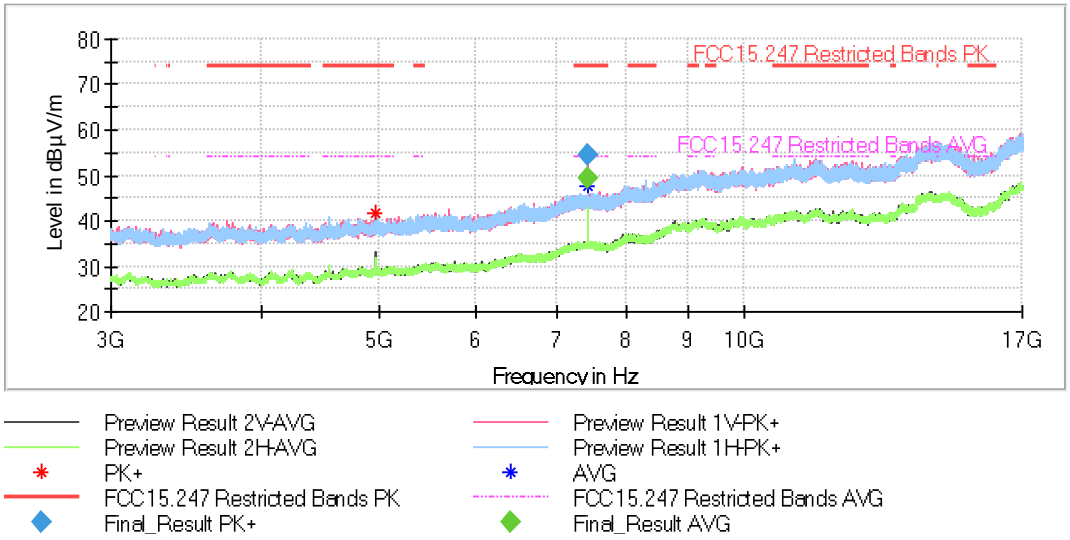
| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 3 GHz - 17 GHz | 500 kHz | PK+ ; AVG | 1 MHz | 1 s | 0 dB |

Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)

Modulation = BTLE (GFSK 1 Mbit/s) Frequency MHz = 2480.00000

MIMO Mode = SISO Active Port = 1

**Images:**



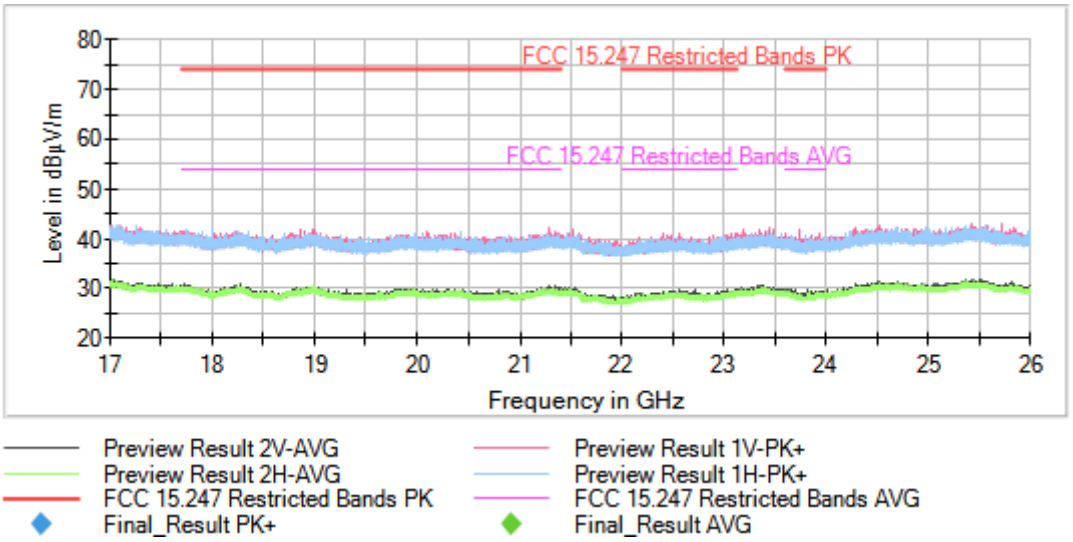

**Tables:**

Spectrum Analyzer Parameters

| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 3 GHz - 17 GHz | 500 kHz | PK+ ; AVG | 1 MHz | 1 s | 0 dB |

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

**Images:**



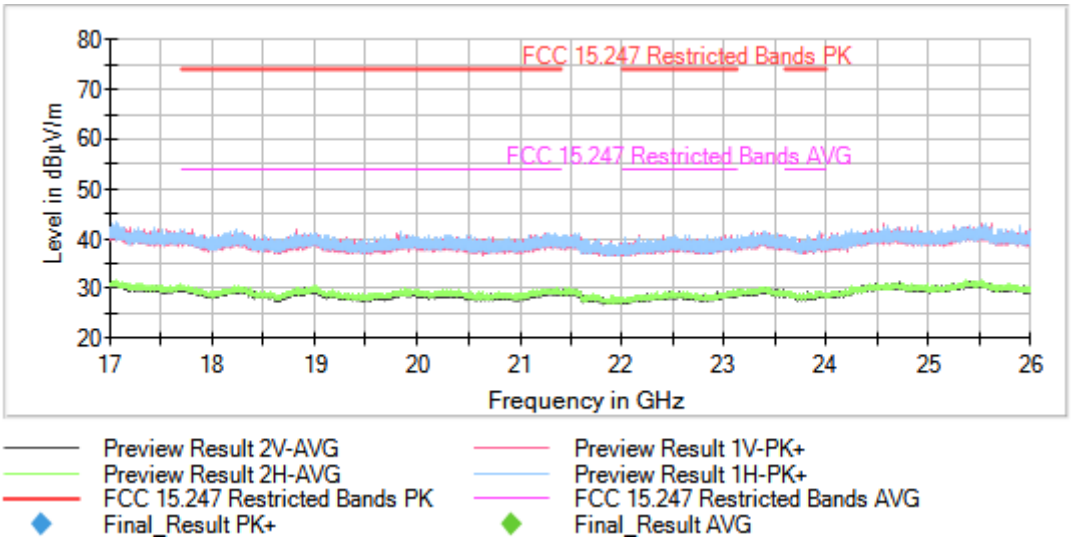

**Tables:**

Spectrum Analyzer Parameters

| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 17 GHz - 26 GHz | 500 kHz | PK+ ; AVG | 1 MHz | 1 s | 0 dB |

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

**Images:**



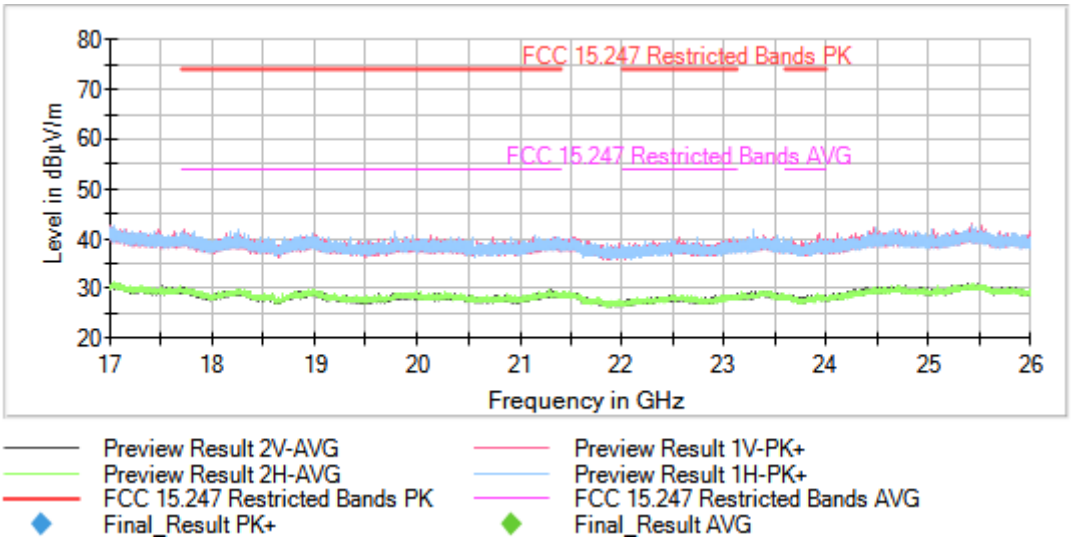

**Tables:**

Spectrum Analyzer Parameters

| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 17 GHz - 26 GHz | 500 kHz | PK+ ; AVG | 1 MHz | 1 s | 0 dB |

Operation Band MHz = [2400, 2483.5]
Frequency Range GHz = [17, 26]
Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000
Active Port = 1
Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

**Images:**




**Tables:**

Spectrum Analyzer Parameters

| | Subrange | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|---|---|---|---|---|---|---|
| | Receiver: [ESW 44] | | | | | |
| | 17 GHz - 26 GHz | 500 kHz | PK+ ; AVG | 1 MHz | 1 s | 0 dB |