

ISED CABid: ES1909  
Lab. Company Number: 4621A

Test Report No:  
NIE: 70923RRF.004

## Test Report

USA FCC Part 15.247, 15.209

CANADA RSS-247, RSS-Gen

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (*) Identification of item tested         | Radio Anchor that localises transmitters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| (*) Trademark                             | Inpixon nanoANQ Chirp V3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| (*) Model and /or type reference          | PN03ANQCS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Other identification of the product       | FCC ID: SIFANQ03QCS<br>IC: 7654A-ANQ03C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| (*) Features                              | Features: 2x Chirp 2.4g Rx/Tx RF Front End, USB and PoE<br>HW version: 0387-20 Inpixon nanoANQ Chirp<br>SW version: TDOAnchor-ver-2.0.14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Applicant                                 | Nanotron Technologies GmbH<br>Alt Moabit 60a<br>10555, Berlin, GERMANY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Test method requested, standard           | USA FCC Part 15.247 (10-1-21) Edition: Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz.<br>USA FCC Part 15.209 (10-1-21) Edition: Radiated emission limits; general requirements.<br>CANADA RSS-247 Issue 2 (Feb. 2017).<br>CANADA RSS-Gen Issue 5 Amendment 1 (Mar. 2019) + Amendment 2 (Feb. 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. 558074 D01 Meas Guidance v05r02 dated April 2, 2019.<br>ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices. |
| Summary                                   | IN COMPLIANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Approved by (name / position & signature) | Rafael López Martín<br>EMC Consumer & RF Lab. Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Date of issue                             | 2023-01-18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Report template No.                       | FDT08_24<br>(*) "Data provided by the client"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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## Acronyms

| Acronym ID      | Acronym Description                 |
|-----------------|-------------------------------------|
| 6Ebw            | 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          |
| 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 an FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

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

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

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

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

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

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## General conditions

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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.
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## 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  $\leq \pm 5.35$  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  $\leq \pm 4.32$  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  $\leq \pm 5.51$  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  $\leq \pm 0.80$  dB

Power Spectral Density: Measurement uncertainty  $\leq \pm 0.99$  dB

6dB Bandwidth: Measurement uncertainty  $\leq \pm 2.84$  %

Occupied Channel Bandwidth: Measurement uncertainty  $\leq \pm 1.17$  %

Conducted Band-edge spurious emissions: Measurement uncertainty  $\leq \pm 1.76$  dB

## Data provided by the client

---

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample of the model PN03ANQCS is an Anchor for receiving blinks in a radio network that localises tags using a real time localisation system in an area.

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 Reception | of | Application        |
|------|----------------|--------------------------|-------------------|--------------------|----------------|----|--------------------|
| S/01 | 70923_25.1     | Inpixon nanoANQ Chirp V3 | PN03ANQCS         | --                 | 2022-05-03     |    | Element Under Test |
| S/01 | 70923_30.1     | Ethernet Cable           | --                | --                 | 2022-05-03     |    | Auxiliary Element  |
| S/01 | 70923_33.1     | USB-micro Cable          | --                | --                 | 2022-05-03     |    | Auxiliary Element  |
| S/01 | 70923_37.1     | POE Router               | FS108P            | 2HK1253P51390      | 2022-05-03     |    | Auxiliary Element  |
| S/01 | 70923_38.1     | Power Supply             | NU60-F480125-I1NN | 261211181102900742 | 2022-05-03     |    | Auxiliary Element  |
| S/01 | 70923_39.1     | Power Cable (EU)         | --                | --                 | 2022-05-03     |    | Auxiliary Element  |
| S/02 | 70923_23.1     | Inpixon nanoANQ Chirp V3 | PN03ANQCS         | --                 | 2022-05-03     |    | Element Under Test |
| S/02 | 70923_31.1     | SMA to UFL cable         | --                | --                 | 2022-05-03     |    | Auxiliary Element  |
| S/02 | 70923_32.1     | SMA to UFL cable         | --                | --                 | 2022-05-03     |    | Auxiliary Element  |

Notes referenced to samples during the project:

| Id   | Type                              |
|------|-----------------------------------|
| S/01 | Sample for radiated measurements  |
| S/02 | Sample for conducted measurements |

## Test sample description

|                                               |                               |                                |                          |                      |              |                                   |     |
|-----------------------------------------------|-------------------------------|--------------------------------|--------------------------|----------------------|--------------|-----------------------------------|-----|
| Ports..... :                                  | Port name and description     |                                | Cable                    |                      |              |                                   |     |
|                                               |                               |                                | Specified max length [m] | Attached during test | Shielded     | Coupled to patient <sup>(3)</sup> |     |
|                                               | PoE Ethernet                  |                                |                          | [X]                  | [ ]          | [ ]                               |     |
|                                               | USB Connection                |                                |                          | [X]                  | [ ]          | [ ]                               |     |
|                                               |                               | --                             |                          | [ ]                  | [ ]          | [ ]                               |     |
| Supplementary information to the ports..... : | --                            |                                |                          |                      |              |                                   |     |
| Rated power supply .....                      | Voltage and Frequency         |                                | Reference poles          |                      |              |                                   |     |
|                                               |                               |                                | L1                       | L2                   | L3           | N                                 | PE  |
|                                               | [ ]                           | AC:                            | [ ]                      | [ ]                  | [ ]          | [ ]                               | [ ] |
|                                               | [X]                           | DC: 48V / PoE                  |                          |                      |              |                                   |     |
|                                               |                               | [X]                            | DC: 5V USB               |                      |              |                                   |     |
| Rated Power .....                             | 5W on PoE                     |                                |                          |                      |              |                                   |     |
| Clock frequencies.....                        | 32 MHz, 32.768 kHz            |                                |                          |                      |              |                                   |     |
| Other parameters .....                        | --                            |                                |                          |                      |              |                                   |     |
| Software version .....                        | TDOAAnchor-ver-2.0.14         |                                |                          |                      |              |                                   |     |
| Hardware version .....                        | 0387-20 Inpixon nanoANQ Chirp |                                |                          |                      |              |                                   |     |
| Dimensions in cm (W x H x D) .....            | 196.3x145.5x34.3              |                                |                          |                      |              |                                   |     |
| Mounting position .....                       | [ ]                           | Table top equipment            |                          |                      |              |                                   |     |
|                                               | [X]                           | Wall/Ceiling mounted equipment |                          |                      |              |                                   |     |
|                                               | [ ]                           | Floor standing equipment       |                          |                      |              |                                   |     |
|                                               | [ ]                           | Hand-held equipment            |                          |                      |              |                                   |     |
|                                               | [X]                           | 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   |                                   |     |
|                                               | User Guide                    |                                |                          |                      |              |                                   |     |
|                                               | Schematic and PCB Layout      |                                |                          |                      |              |                                   |     |
|                                               | Battery/PCB certificates      |                                |                          |                      |              |                                   |     |
|                                               | Housing Documentation         |                                |                          |                      |              |                                   |     |
|                                               | --                            |                                |                          |                      |              |                                   |     |

<sup>(3)</sup> Only for Medical Equipment

## Identification of the client

Nanotron Technologies GmbH  
Alt Moabit 60a, 10555, Berlin  
Germany

## Testing period and place

|               |                                        |
|---------------|----------------------------------------|
| Test Location | DEKRA Testing and Certification S.A.U. |
| Date (start)  | 2022-05-05                             |
| Date (finish) | 2022-06-03                             |

## Document history

| Report number | Date       | Description    |
|---------------|------------|----------------|
| 70923RRF.004  | 2023-01-18 | First release. |

## Environmental conditions

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

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

In the semi-anechoic chamber, the following limits were not exceeded during the test:

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

## Remarks and comments

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

Used instrumentation:

| Control No. | Equipment                               | Model           | Manufacturer                | Next Calibration |
|-------------|-----------------------------------------|-----------------|-----------------------------|------------------|
| 8130        | SEMIANECHOIC ABSORBER LINED CHAMBER VI  | P29419          | ALBATROSS PROJECTS GMBH     | 2023-01-16       |
| 8134        | SHIELDED ROOM                           | P29419          | ALBATROSS PROJECTS GMBH     | N/A              |
| 7826        | ULTRALOG ANTENNA 30MHz-6GHz             | HL562E_UPG      | ROHDE AND SCHWARZ           | 2022-10-15       |
| 6165        | EMI TEST RECEIVER 9kHz-7GHz             | ESR7            | ROHDE AND SCHWARZ           | 2023-11-08       |
| 6157        | SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz | FSV40           | ROHDE AND SCHWARZ           | 2023-10-11       |
| 7763        | HORN ANTENNA 1-18GHz                    | BBHA 9120D      | SCHWARZBECK MESS-ELEKTRONIK | 2022-11-15       |
| 7769        | PREAMPLIFIER 30dB 500MHz-18GHz          | BBV 9718 C      | SCHWARZBECK                 | 2023-03-25       |
| 6495        | HORN ANTENNA 18-40GHz                   | BBHA 9170       | SCHWARZBECK                 | 2024-03-19       |
| 7862        | PRE-AMPLIFIER G>30dB 18-40GHz           | BLMA 1840-3G    | BONN ELEKTRONIK             | 2023-02-15       |
| 4848        | EMC/RF SOFTWARE MEASUREMENTS            | EMC32           | ROHDE AND SCHWARZ           | N/A              |
| 8835        | SIGNAL AND SPECTRUM ANALYZER 2Hz-50GHz  | FSW50           | ROHDE AND SCHWARZ           | 2023-07-29       |
| 8848        | OPEN SWITCH UNIT UP TO 7.5 GHz          | OSP-B157W8 PLUS | ROHDE & SCHWARZ             | 2023-08-20       |
| 7798        | EMC/RF MEASUREMENT SOFTWARE             | WMS32           | ROHDE AND SCHWARZ           | N/A              |

## Testing verdicts

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

## Summary

### 2.4GHz proprietary

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

## Appendix A: Test results. 2.4GHz proprietary

|                                                                                        |    |
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# TEST CONDITIONS

(\*): Data provided by the client.

POWER SUPPLY (\*):

Vnominal: 5 Vdc  
Type of Power Supply: External power supply

ANTENNA (\*):

Type of Antenna: 2 Chip antennas (Internal).  
Maximum Declared Antenna Gain: 2 dBi

TEST FREQUENCIES (\*):

Single Channel: 2440 MHz

POWER SETTING:

The next power setting was used to configure the sample for the tests:

|                                |                             | Output Power |
|--------------------------------|-----------------------------|--------------|
| Proprietary Protocol<br>2.4GHz | Single Channel:<br>2440 MHz | txpwr36      |

The tests have been performed on both antennas (CHAIN A and CHAIN B) with the following data rates:

- Data rate 1 Mbit/s
- Data rate 250 kbit/s

CONDUCTED MEASUREMENTS:

The equipment under test was set up in a shielded room and connected to the TS8997 test bench system 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).

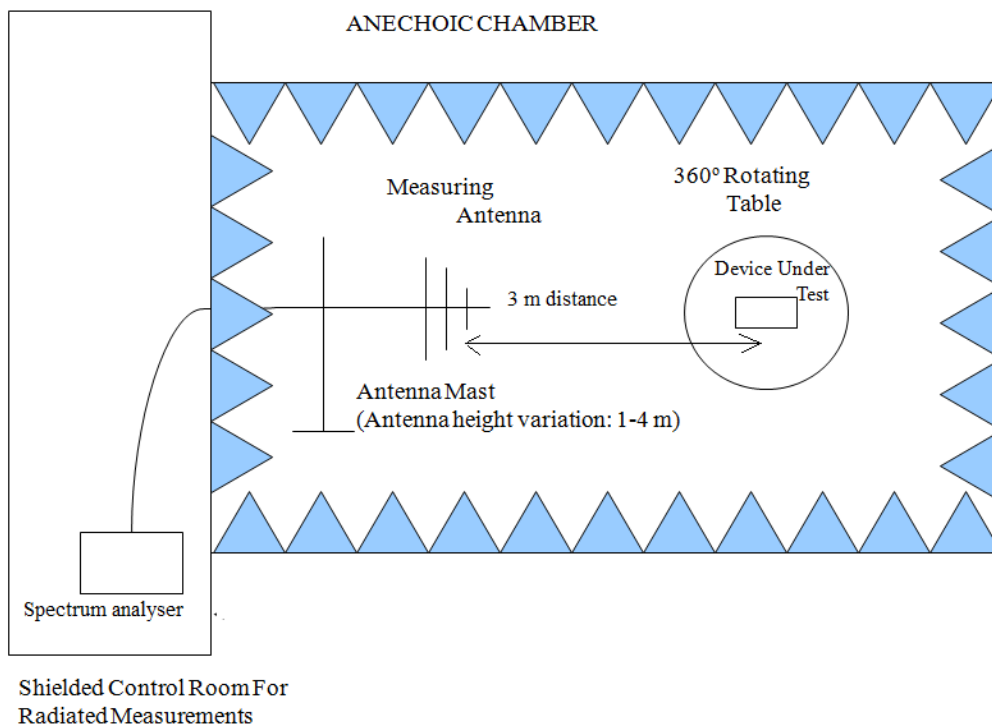
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

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 360° and the antenna height (Bilog antenna and Double ridge horn antenna) was varied from 1 to 4 meters to find the maximum radiated emission.

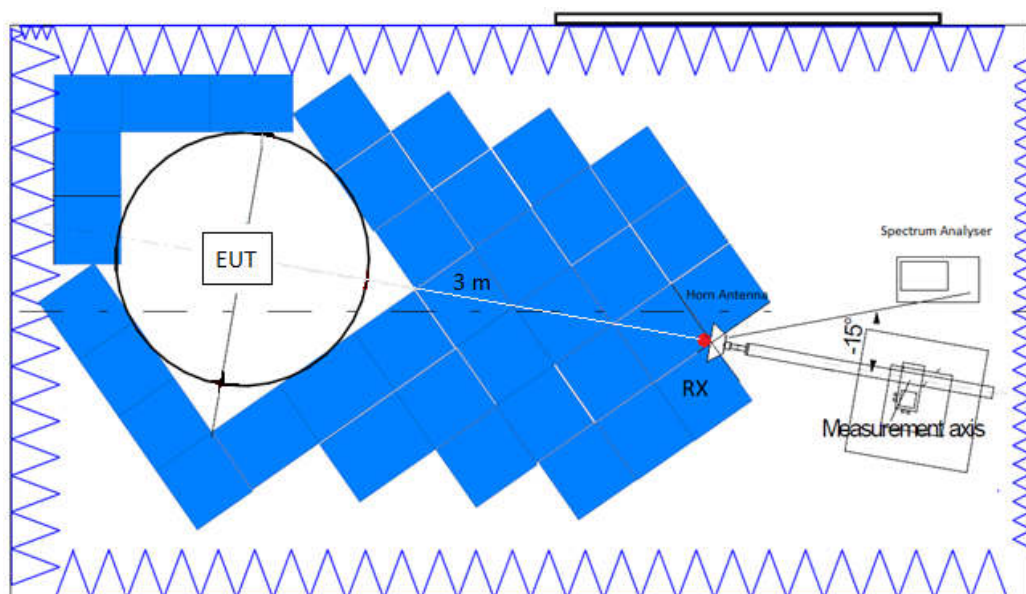
Measurements were made in both horizontal and vertical planes of polarization.

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.

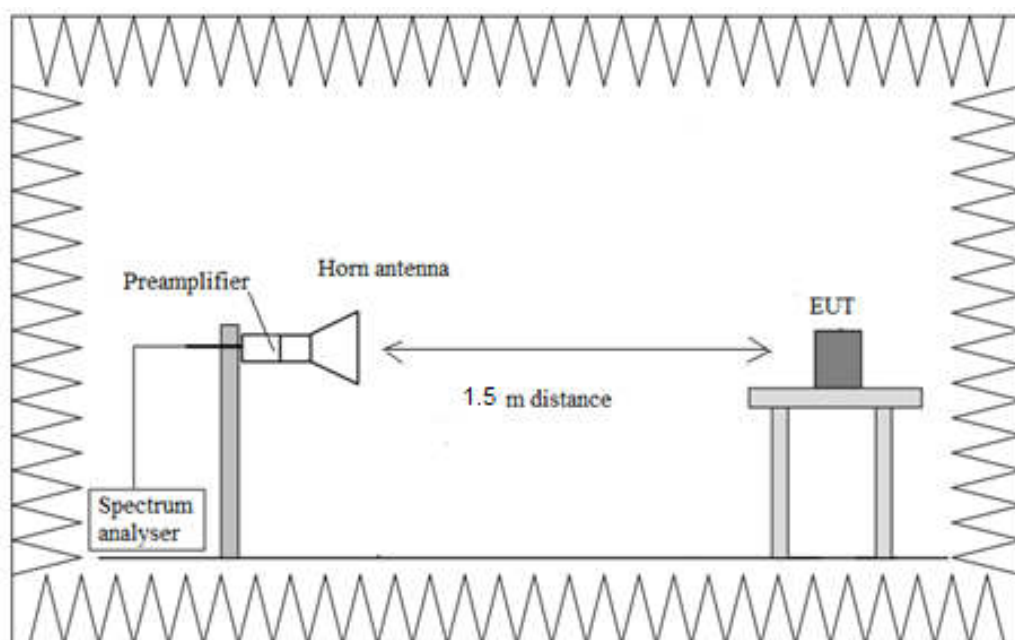
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup  $f > 17$  GHz:



# TEST CASES DETAILS

## Occupied Channel Bandwidth 99%

### Results

Modulation: 2.4GHz Proprietary (1 Mbit/s)

CHAIN A:

| Freq (MHz) | Occ Ch BW (MHz) |
|------------|-----------------|
| 2440.00000 | 59.000          |

CHAIN B:

| Freq (MHz) | Occ Ch BW (MHz) |
|------------|-----------------|
| 2440.00000 | 59.500          |

Modulation: 2.4GHz Proprietary (250 kbit/s)

CHAIN A:

| Freq (MHz) | Occ Ch BW (MHz) |
|------------|-----------------|
| 2440.00000 | 59.000          |

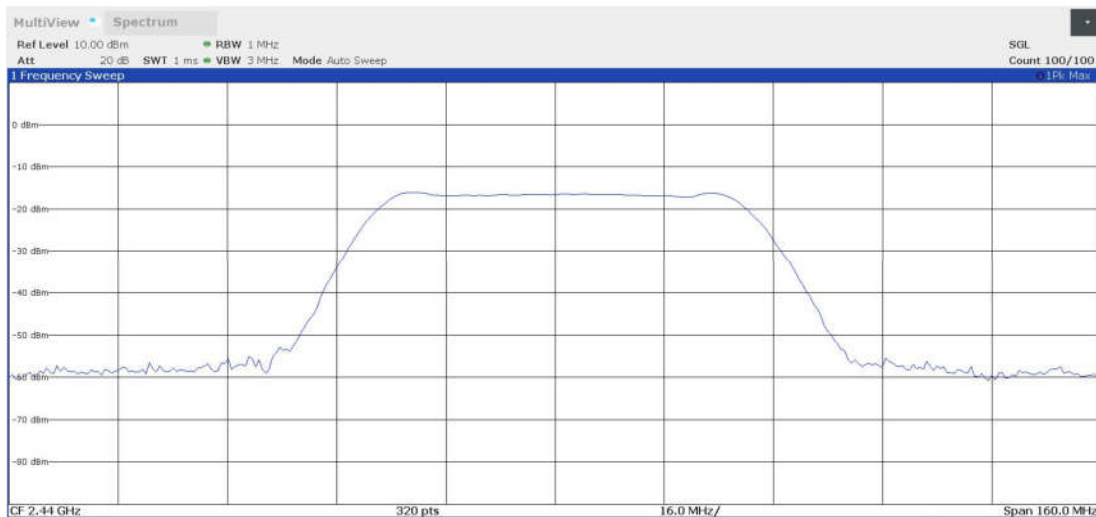
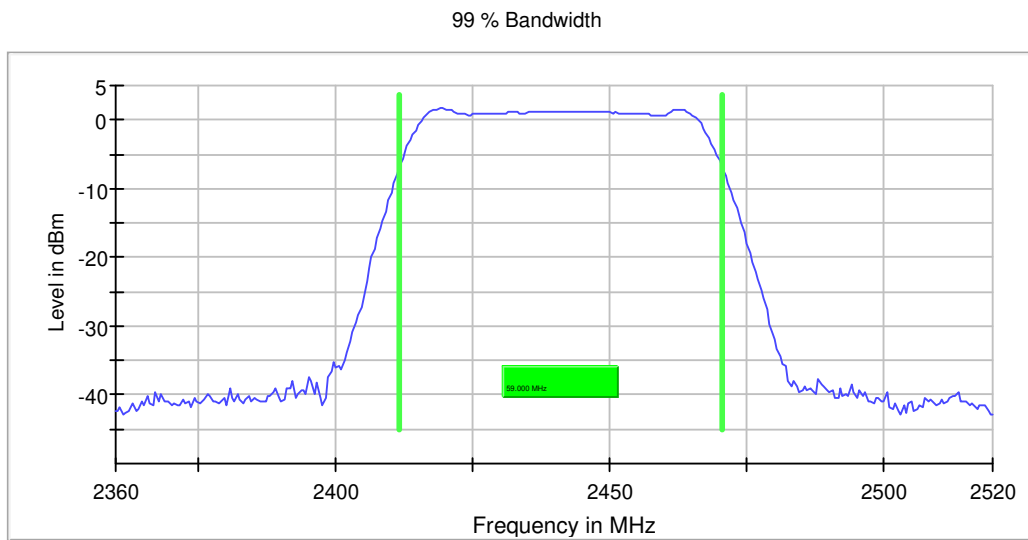
CHAIN B:

| Freq (MHz) | Occ Ch BW (MHz) |
|------------|-----------------|
| 2440.00000 | 60.000          |

## Attachments

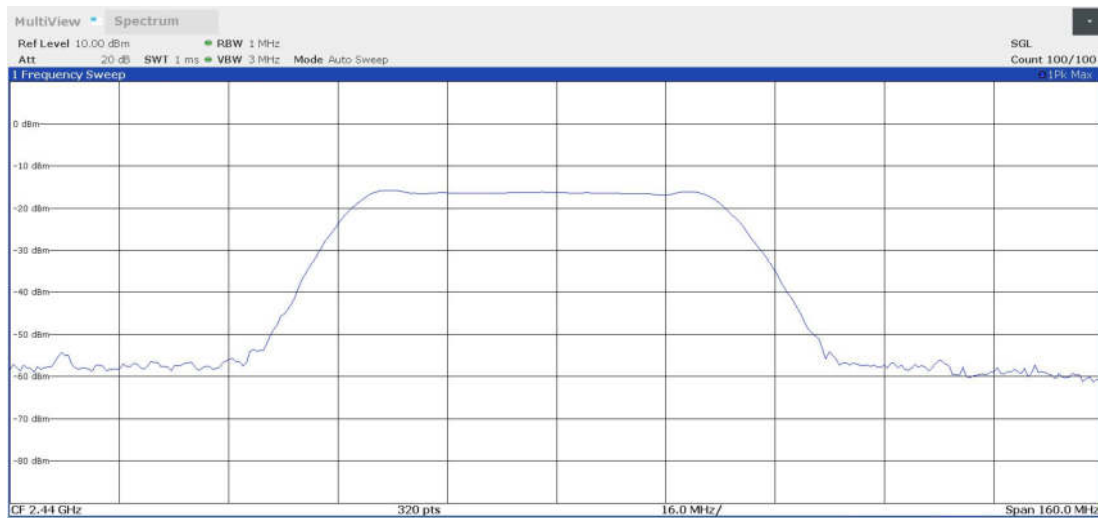
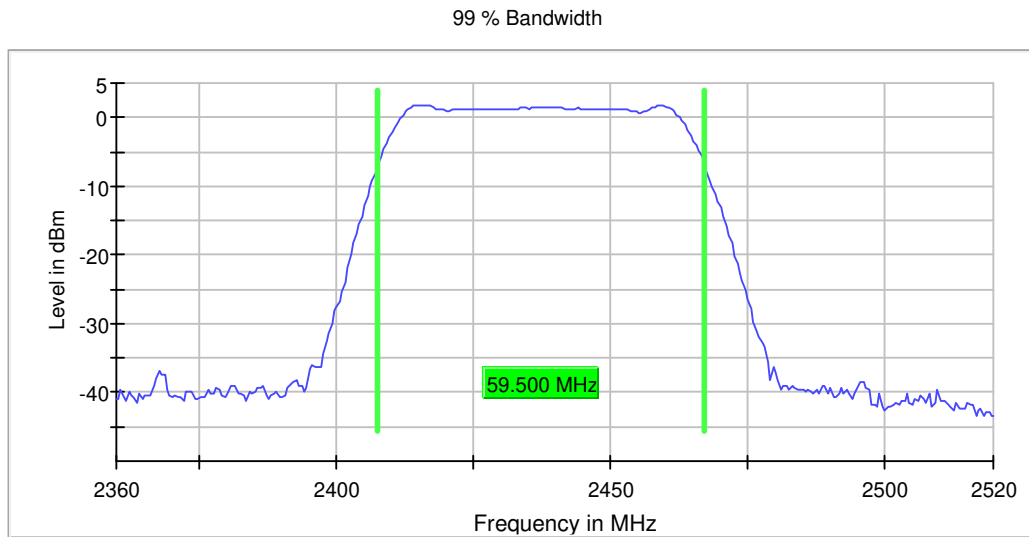
**Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), CHAIN A**

**Figures:**



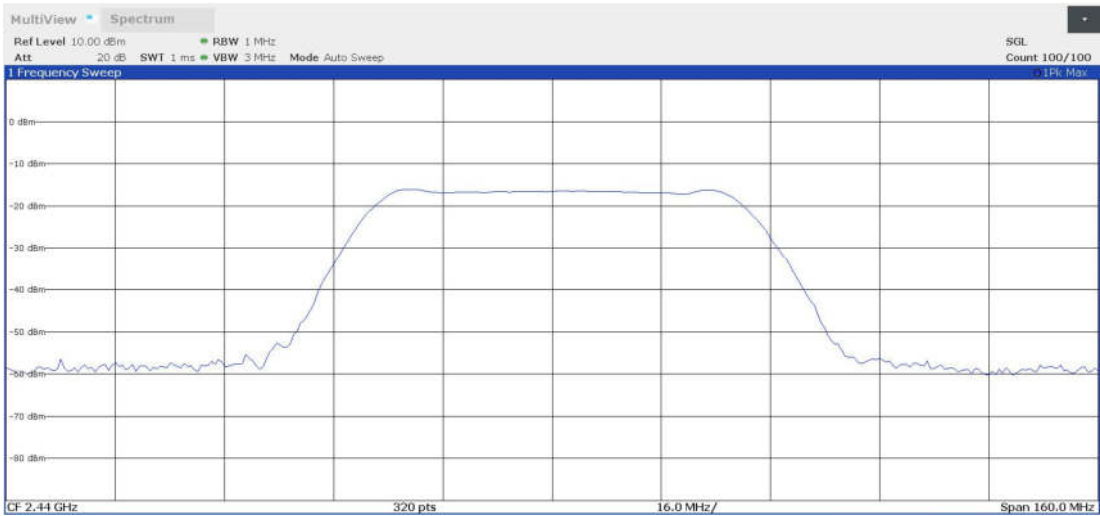
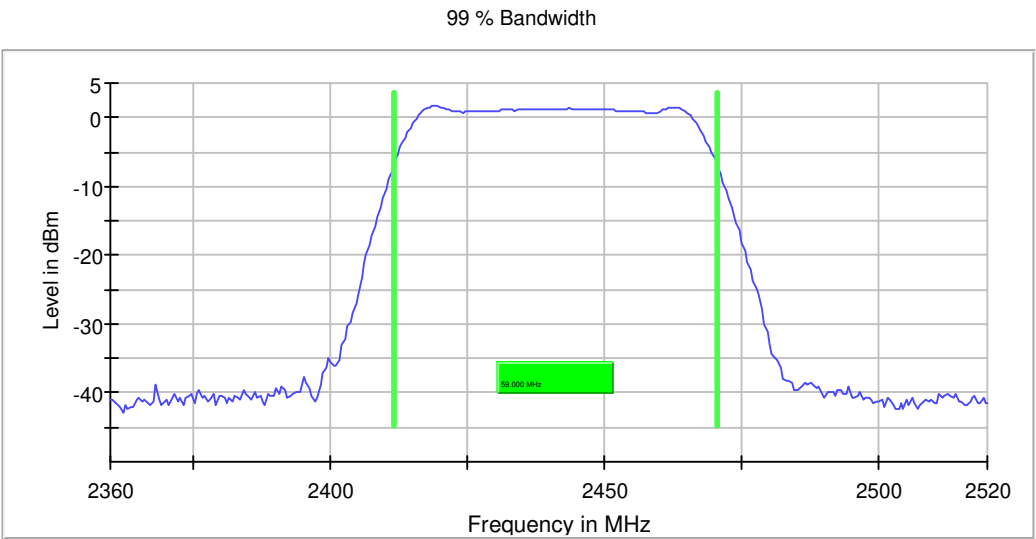
**Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), CHAIN B**

**Figures:**



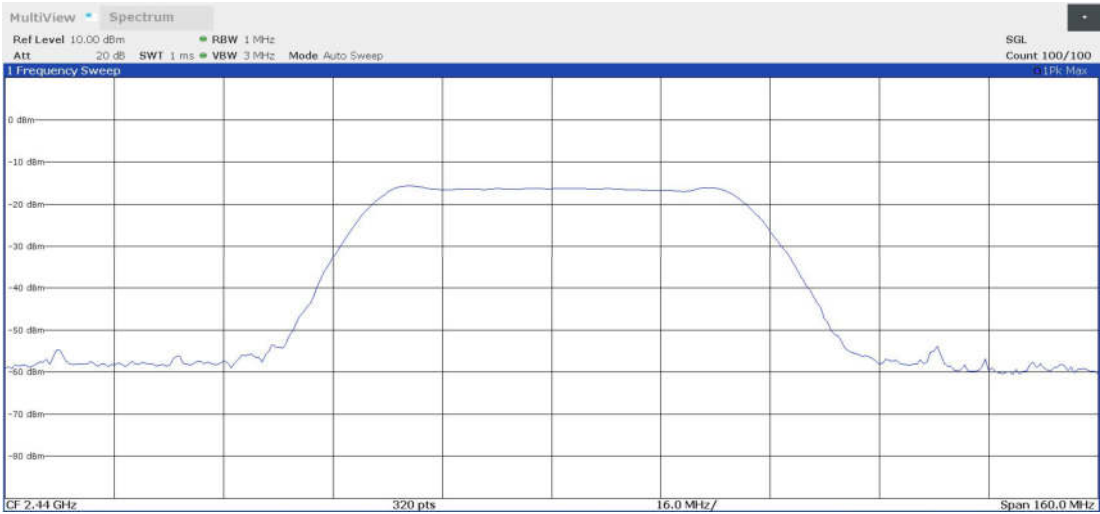
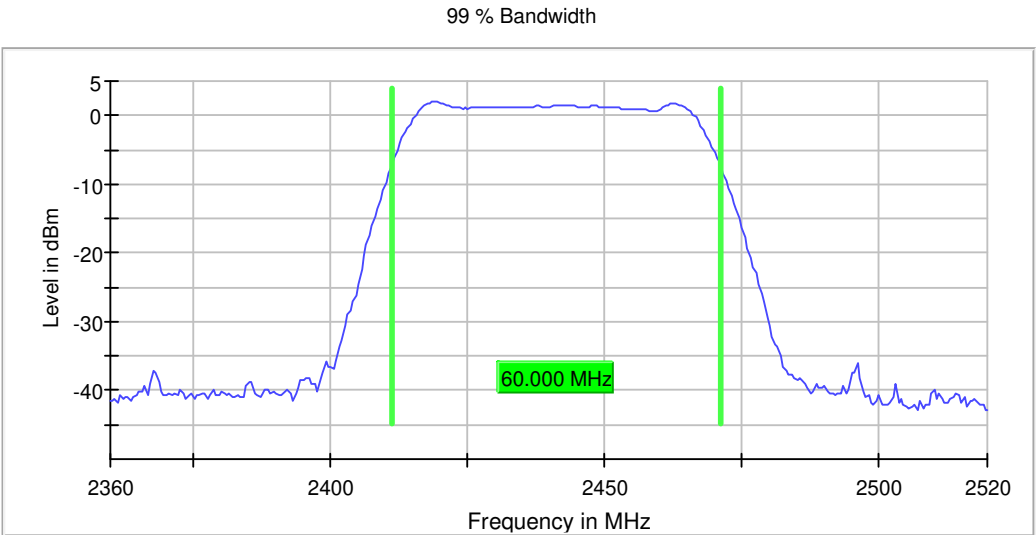
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), CHAIN A

Figures:



Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), CHAIN B

Figures:



# RSS-247 5.2 (a) / FCC 15.247 (a)(2) 6 dB Bandwidth

## Limits

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

## Results

Modulation: Proprietary 2.4GHz (1 Mbit/s)

CHAIN A:

| Freq (MHz) | 6 dB Bandwidth (MHz) |
|------------|----------------------|
| 2440.00000 | 55.900               |

CHAIN B:

| Freq (MHz) | 6 dB Bandwidth (MHz) |
|------------|----------------------|
| 2440.00000 | 55.500               |

## Verdict

Pass

Modulation: Proprietary 2.4GHz (250 kbit/s)

CHAIN A:

| Freq (MHz) | 6 dB Bandwidth (MHz) |
|------------|----------------------|
| 2440.00000 | 56.000               |

CHAIN B:

| Freq (MHz) | 6 dB Bandwidth (MHz) |
|------------|----------------------|
| 2440.00000 | 56.000               |

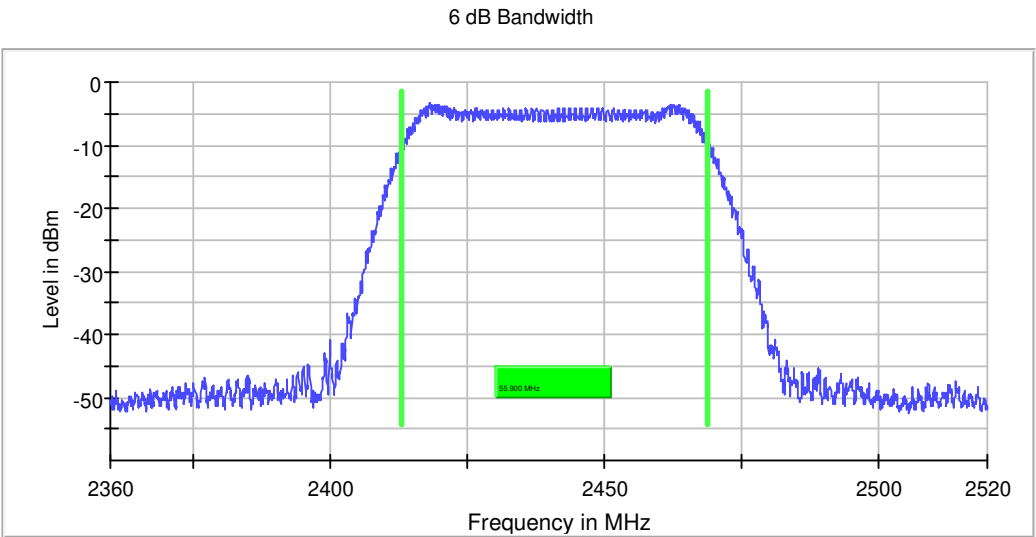
## Verdict

Pass

Attachments

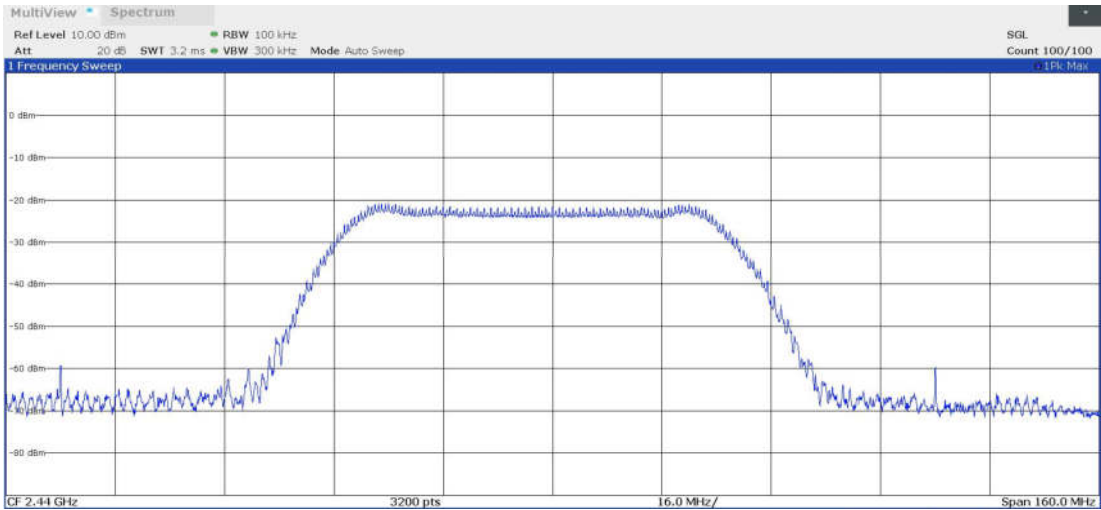
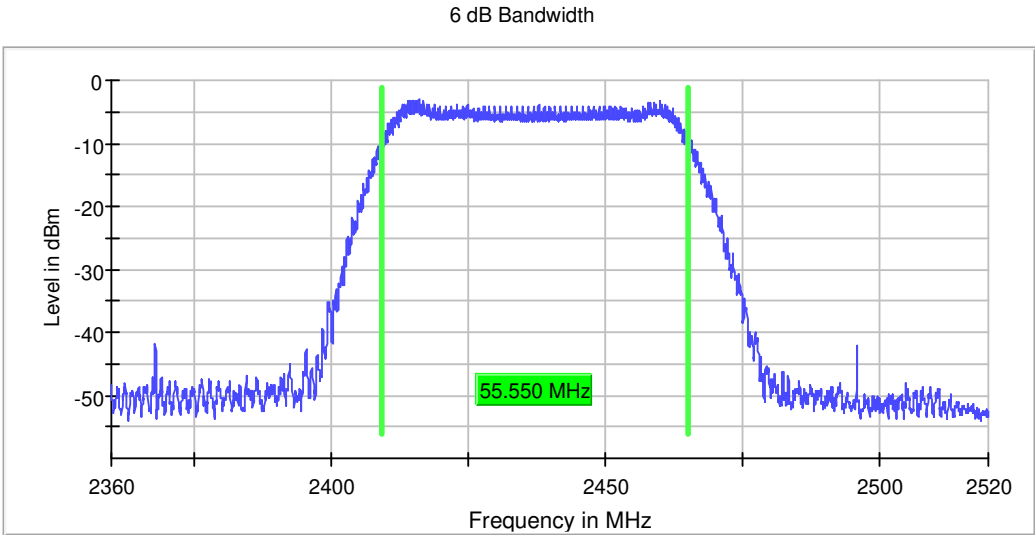
Frequency (MHz) = 2440.00000, Modulation: Proprietary 2.4GHz (1 Mbit/s), CHAIN A

Figures:



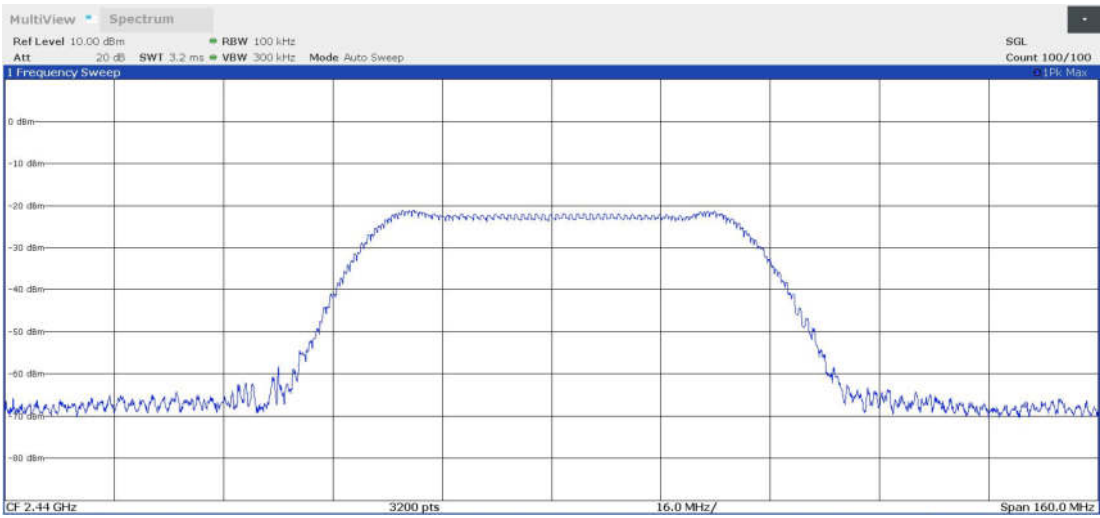
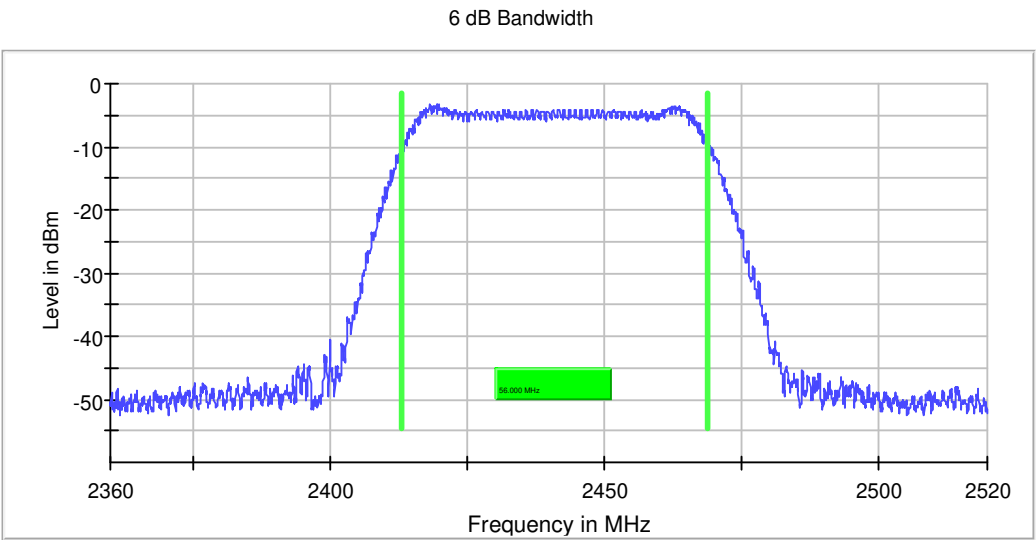
Frequency (MHz) = 2440.00000, Modulation: Proprietary 2.4GHz (1 Mbit/s), CHAIN B

Figures:



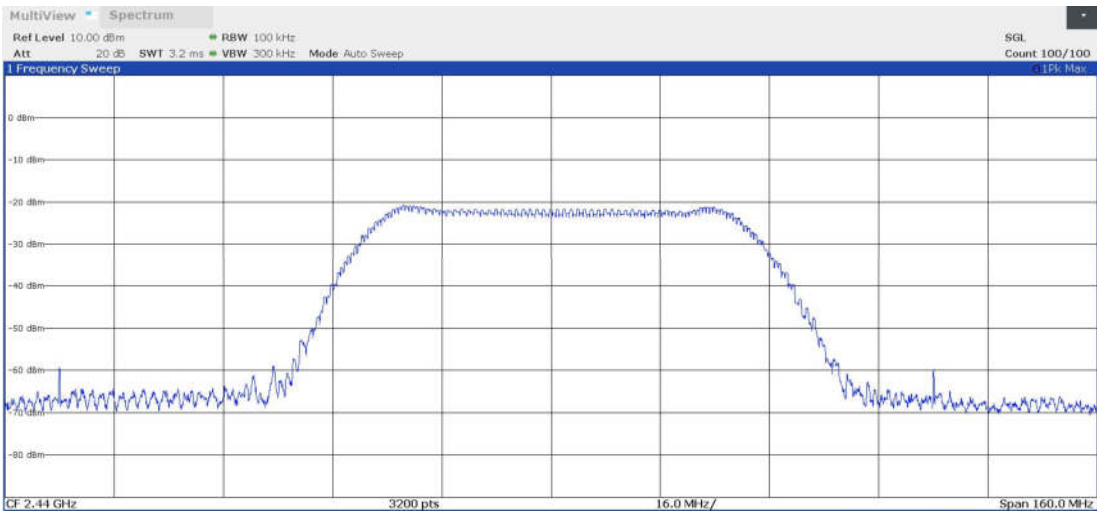
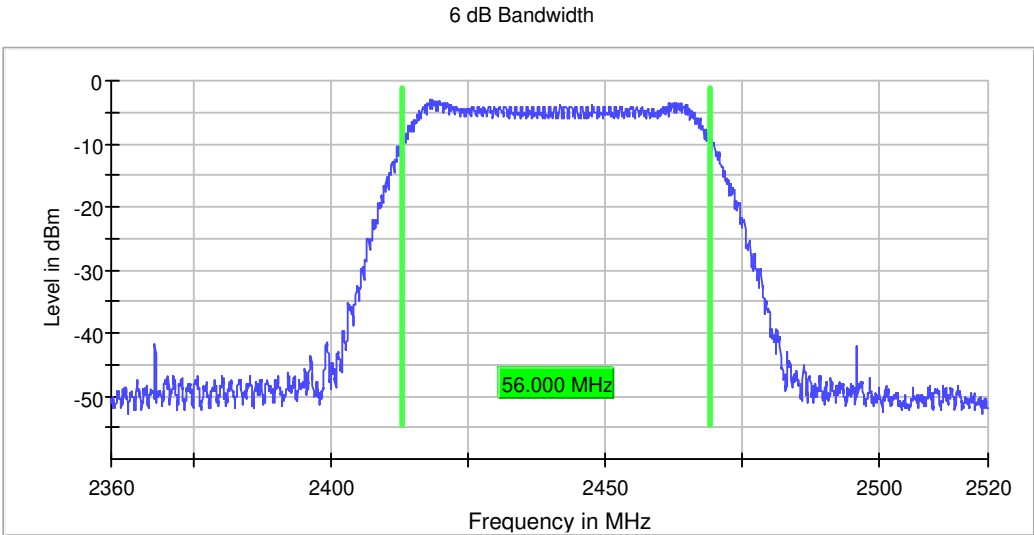
Frequency (MHz) = 2440.00000, Modulation: Proprietary 2.4GHz (250 kbit/s), CHAIN A

Figures:



Frequency (MHz) = 2440.00000, Modulation: Proprietary 2.4GHz (250 kbit/s), CHAIN B

Figures:



## RSS-247 5.2 (b) / FCC 15.247 (e) 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.

### Results

The power spectral density was measured according to clause 11.10.2 "Method PKPSD (peak PSD)" of ANSI C63.10-2013.

Modulation: Proprietary 2.4GHz (1 Mbit/s)

CHAIN A:

| Freq (MHz) | PSD (dBm) |
|------------|-----------|
| 2440.00000 | -3.384    |

CHAIN B:

| Freq (MHz) | PSD (dBm) |
|------------|-----------|
| 2440.00000 | -3.179    |

### Verdict

Pass

Modulation: Proprietary 2.4GHz (250 kbit/s)

CHAIN A:

| Freq (MHz) | PSD (dBm) |
|------------|-----------|
| 2440.00000 | -3.460    |

CHAIN B:

| Freq (MHz) | PSD (dBm) |
|------------|-----------|
| 2440.00000 | -3.179    |

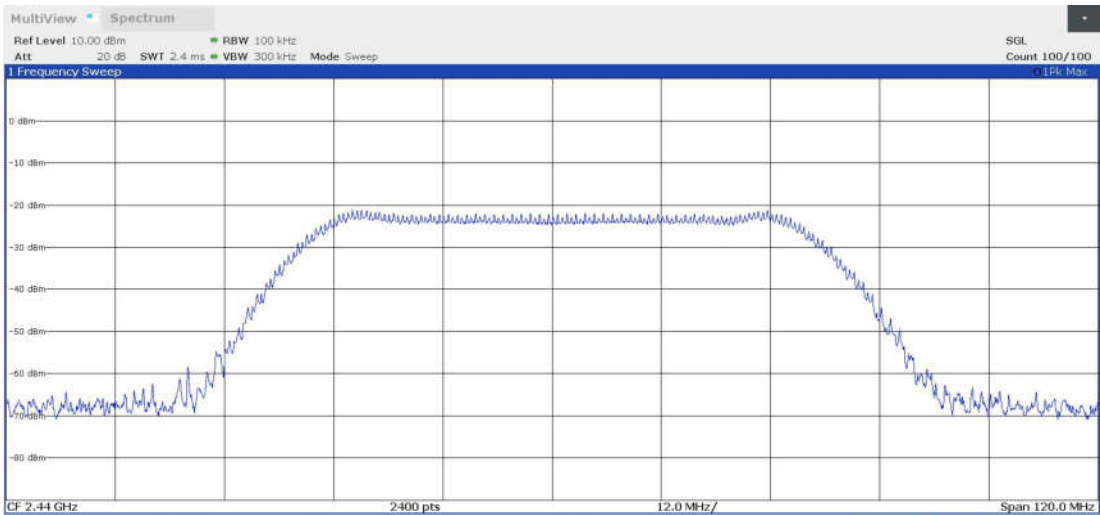
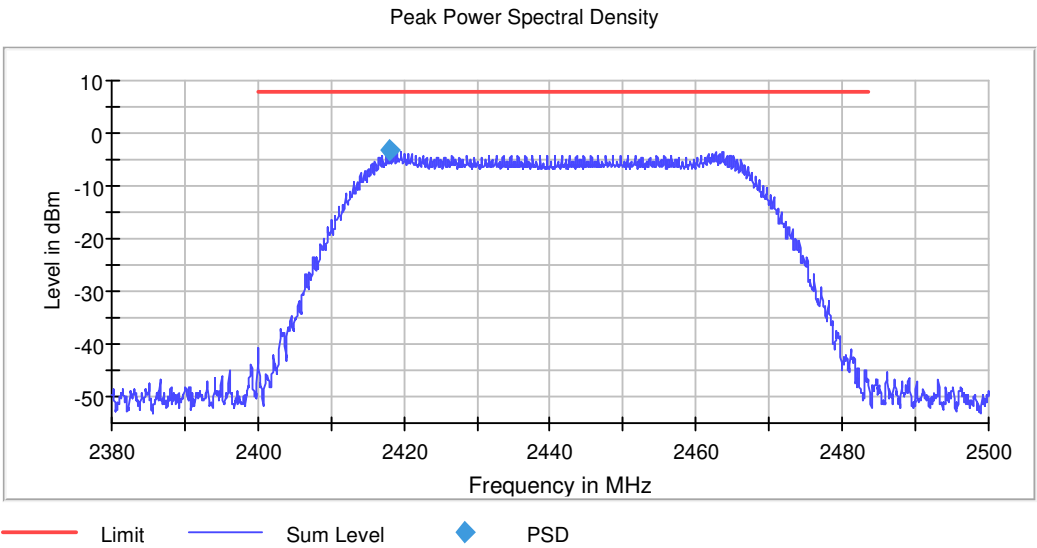
### Verdict

Pass

Attachments

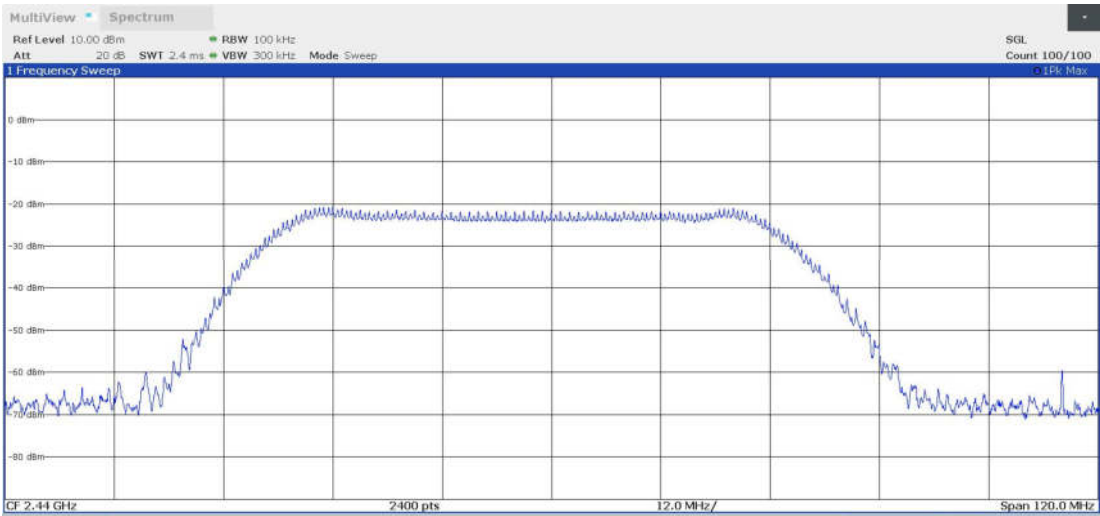
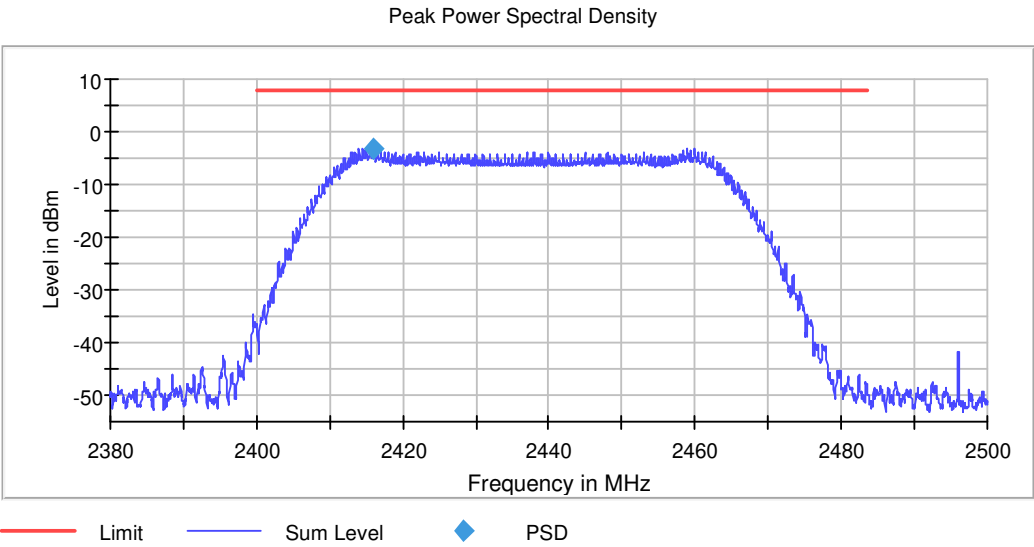
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), CHAIN A

Figures:



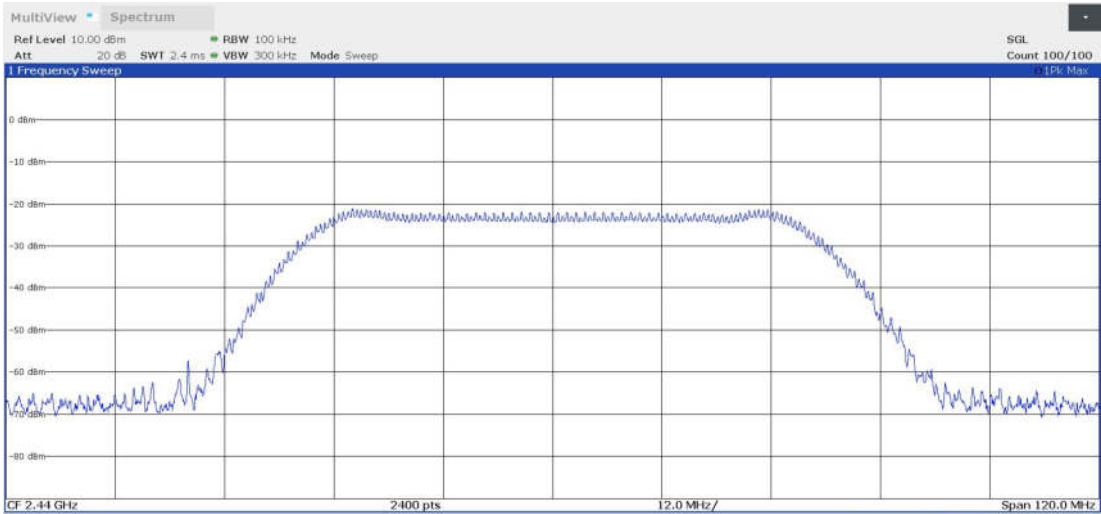
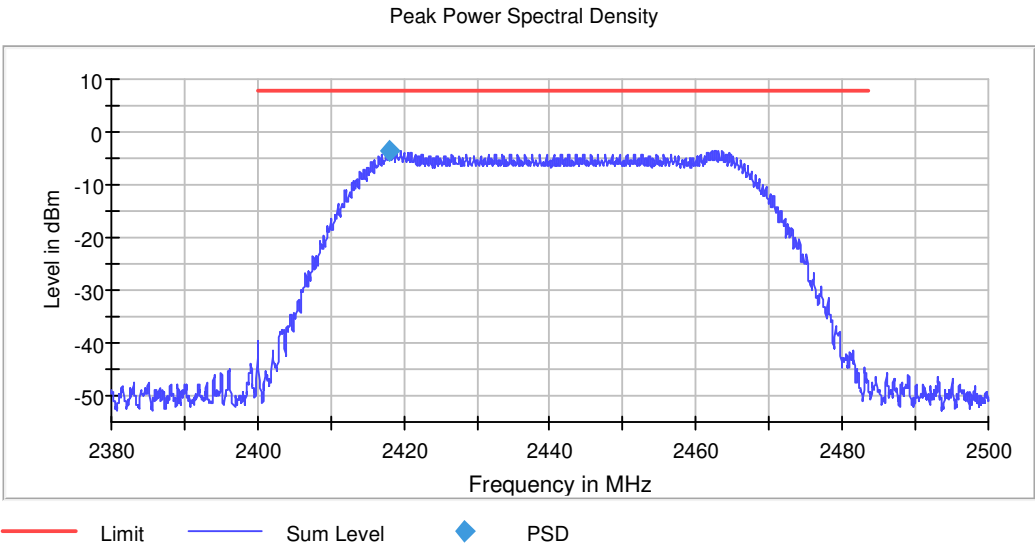
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), CHAIN B

Figures:



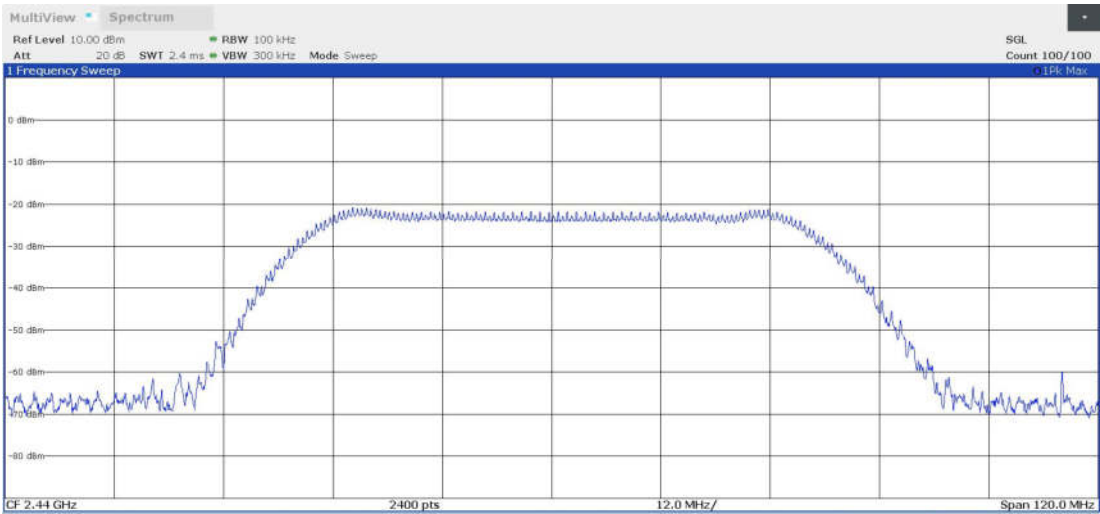
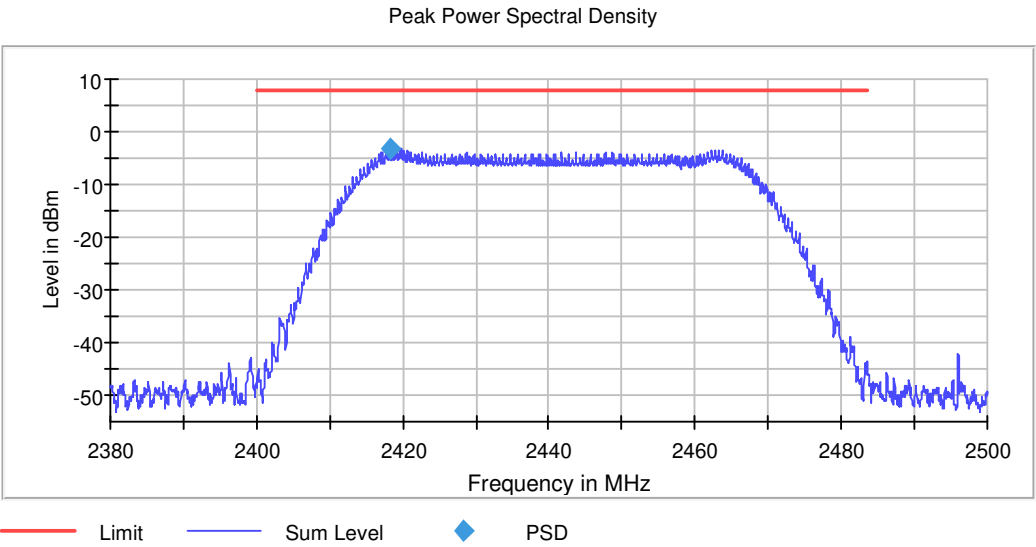
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), CHAIN A

Figures:



Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), CHAIN B

Figures:



## RSS-247 5.4 (d) / FCC 15.247 (b) Maximum Peak Conducted output power

### Limits

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

RSS-247:

The e.i.r.p. shall not exceed 4 W (RSS-247).

### Results

The maximum peak conducted output power level in the fundamental emission was measured using the method according to clause 11.9.1.1 "RBW  $\geq$  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.

Maximum Declared Antenna Gain: 2 dBi

Modulation: Proprietary 2.4GHz (1 Mbit/s)

CHAIN A:

| Freq (MHz) | Maximum Conducted Power (dBm) | Maximum EIRP Power (dBm) |
|------------|-------------------------------|--------------------------|
| 2440.00000 | 16.083                        | 18.083                   |

CHAIN B:

| Freq (MHz) | Maximum Conducted Power (dBm) | Maximum EIRP Power (dBm) |
|------------|-------------------------------|--------------------------|
| 2440.00000 | 16.105                        | 18.105                   |

### Verdict

Pass

Modulation: Proprietary 2.4GHz (250 kbit/s)

CHAIN A:

| Freq (MHz) | Maximum Conducted Power (dBm) | Maximum EIRP Power (dBm) |
|------------|-------------------------------|--------------------------|
| 2440.00000 | 16.009                        | 18.009                   |

CHAIN B:

| Freq (MHz) | Maximum Conducted Power (dBm) | Maximum EIRP Power (dBm) |
|------------|-------------------------------|--------------------------|
| 2440.00000 | 16.066                        | 18.066                   |

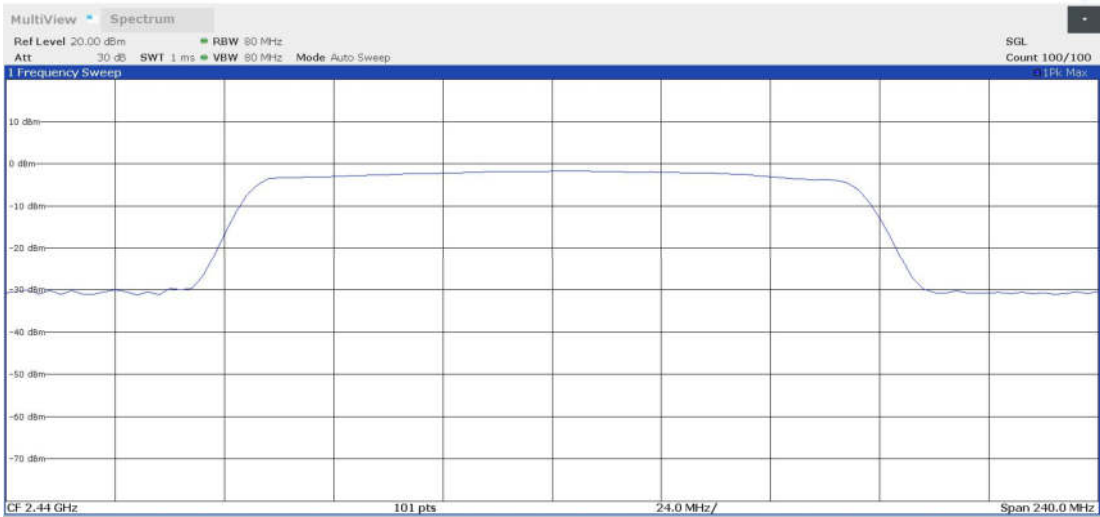
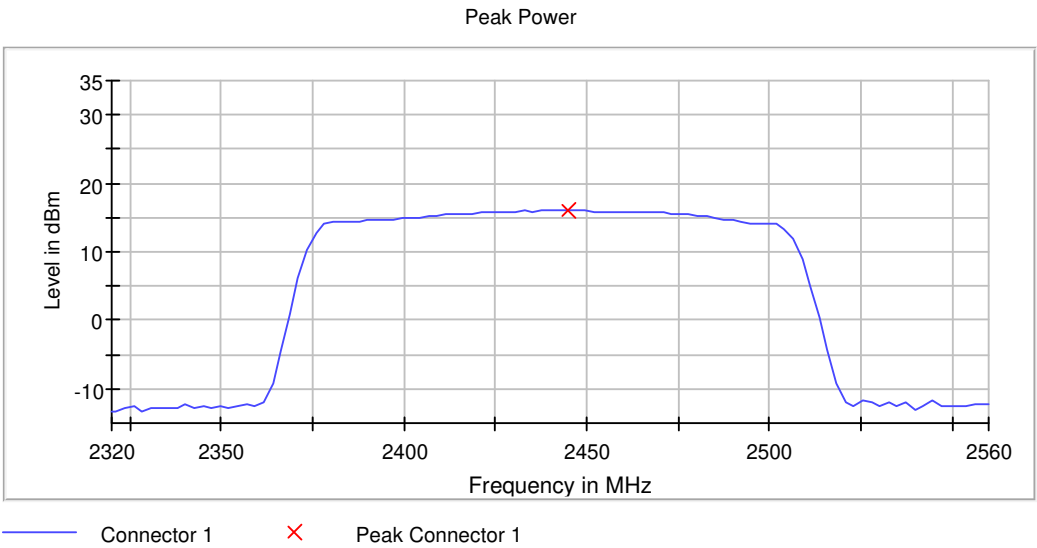
**Verdict**

Pass

Attachments

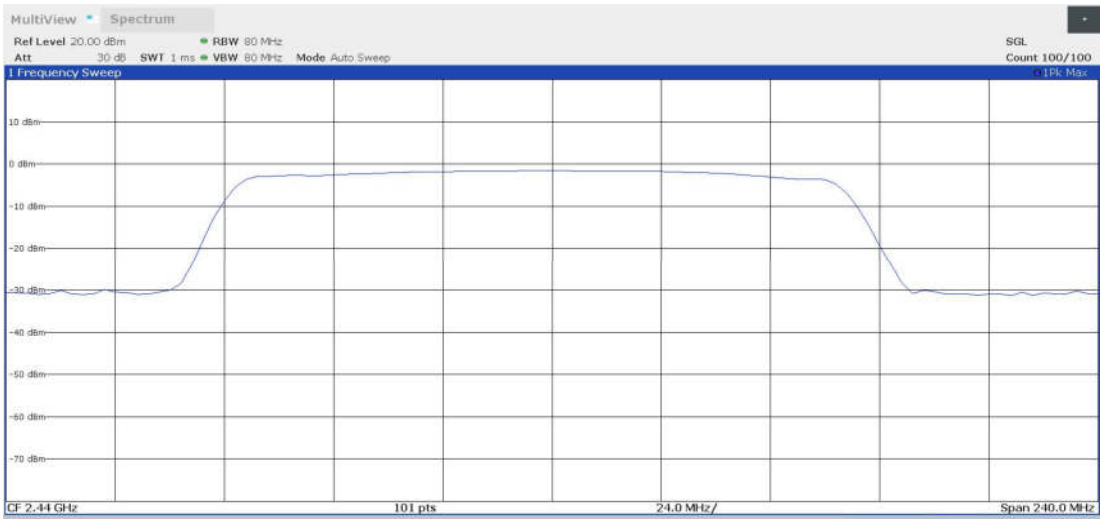
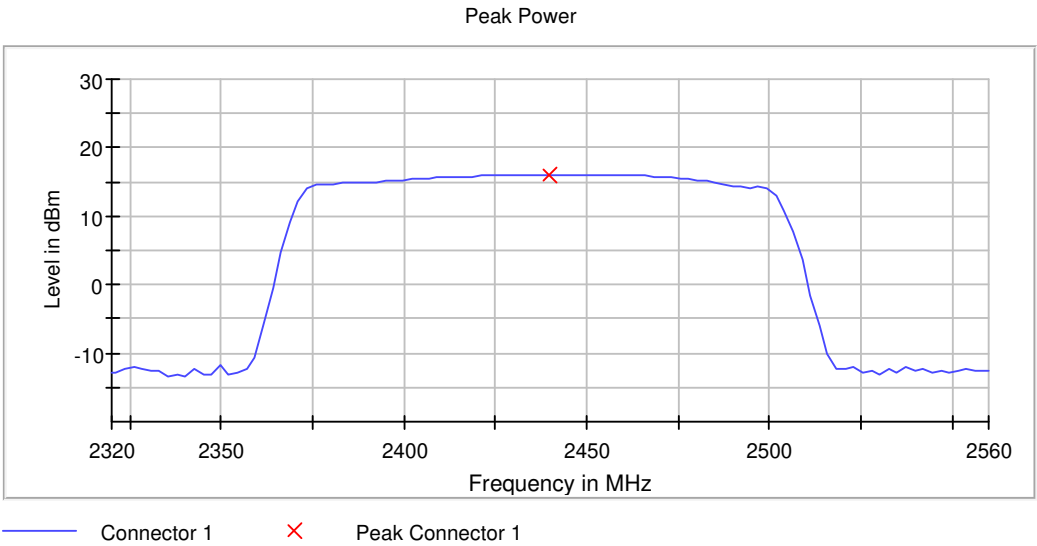
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), CHAIN A

Figures:



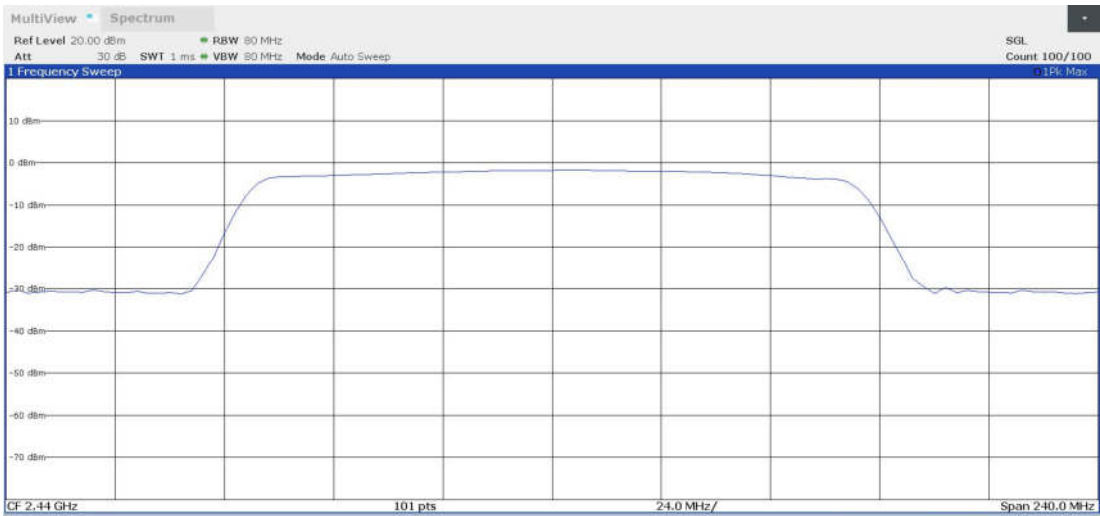
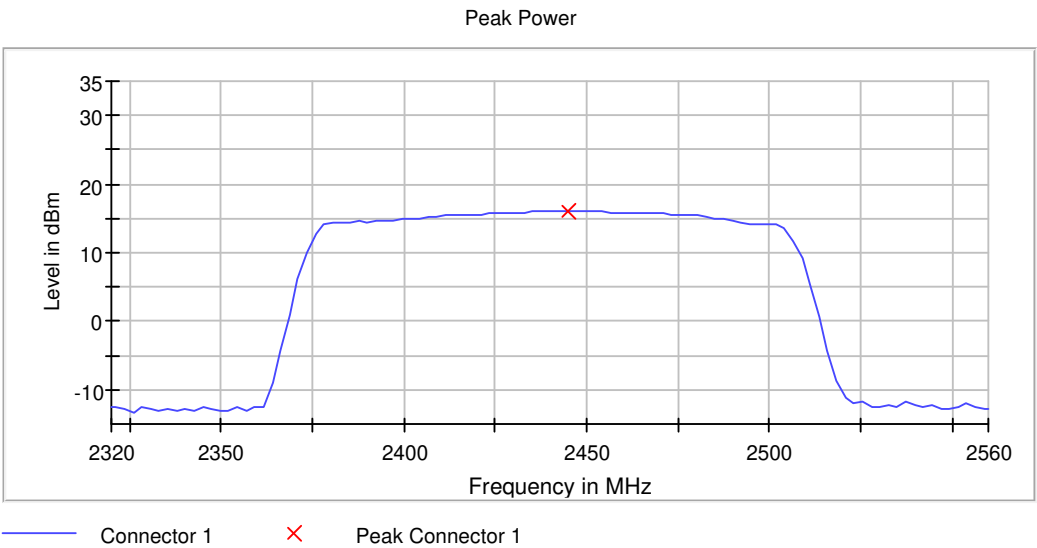
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), CHAIN B

Figures:



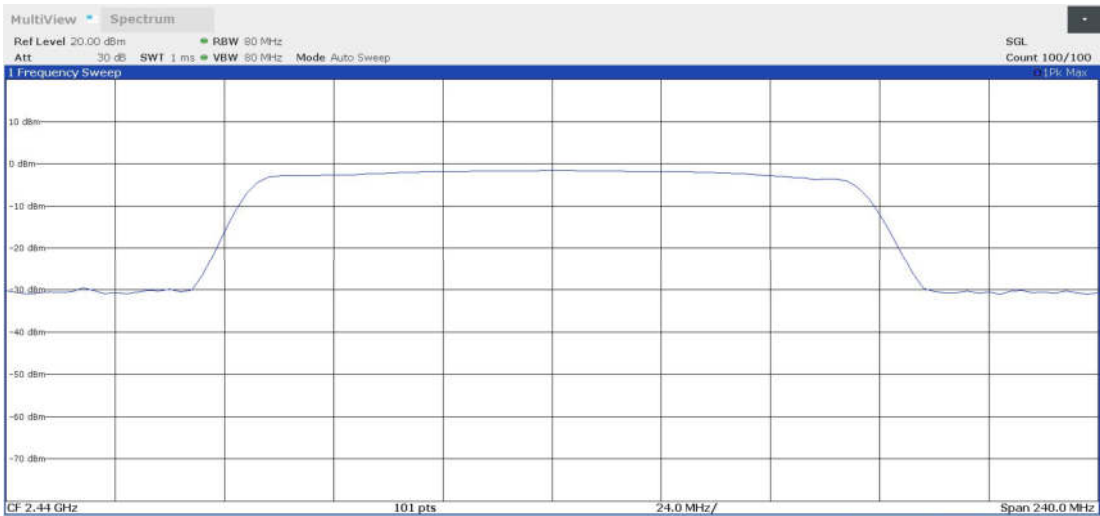
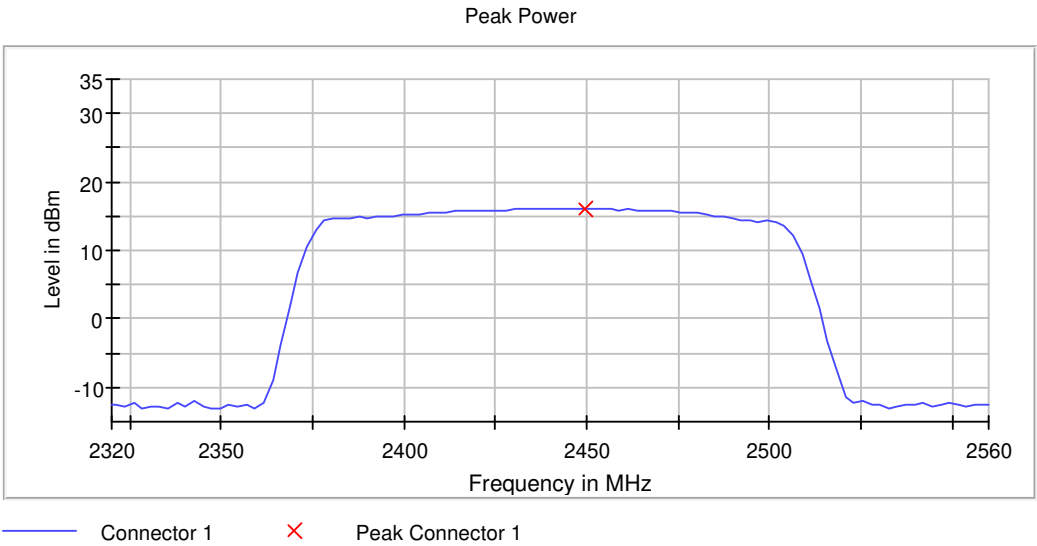
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), CHAIN A

Figures:



Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), CHAIN B

Figures:



## RSS-247 5.5 / FCC 15.247 (d) 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 shall be 30 dB instead of 20 dB.

### **Results**

Modulation: Proprietary 2.4GHz (1 Mbit/s)

#### CHAIN A

Radiated measurements were used to show compliance with the limits in the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

#### CHAIN B

Radiated measurements were used to show compliance with the limits in the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

### **Verdict**

Pass

Modulation: Proprietary 2.4GHz (250 kbit/s)

#### CHAIN A

Radiated measurements were used to show compliance with the limits in the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

#### CHAIN B

Radiated measurements were used to show compliance with the limits in the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

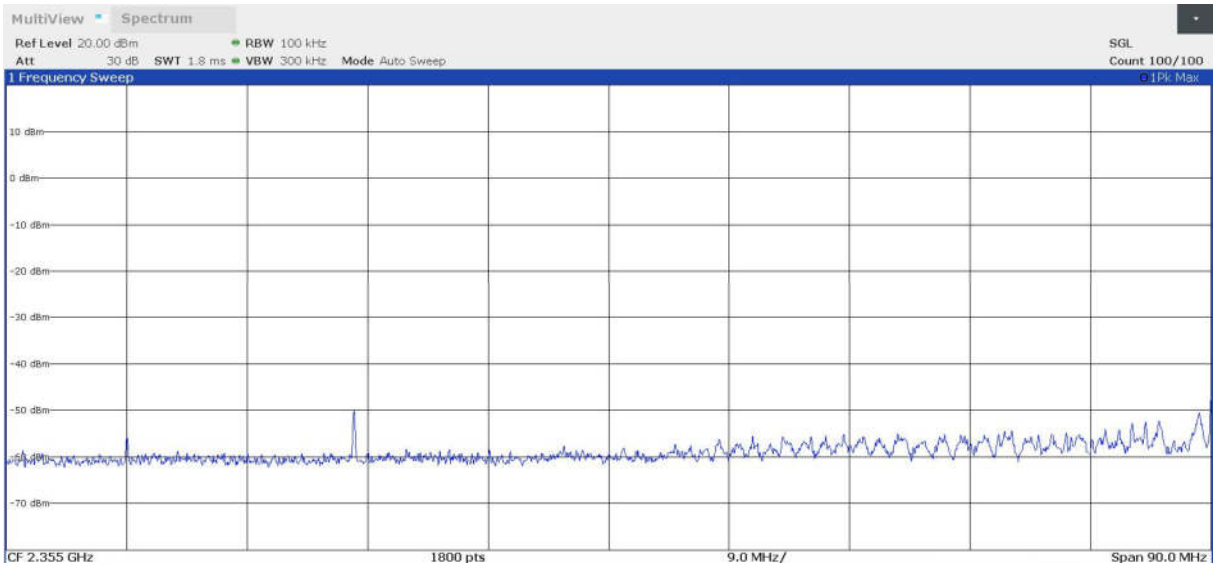
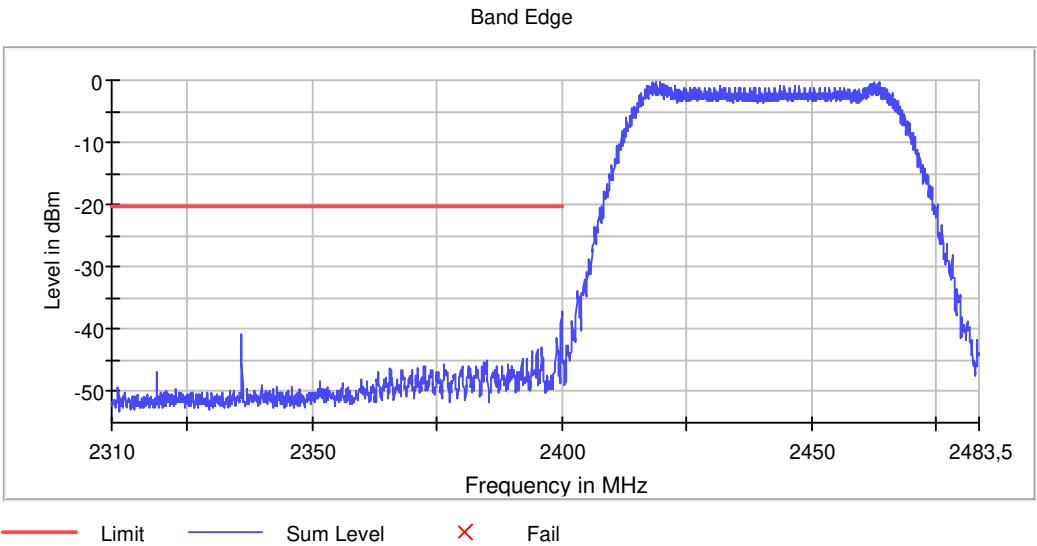
### **Verdict**

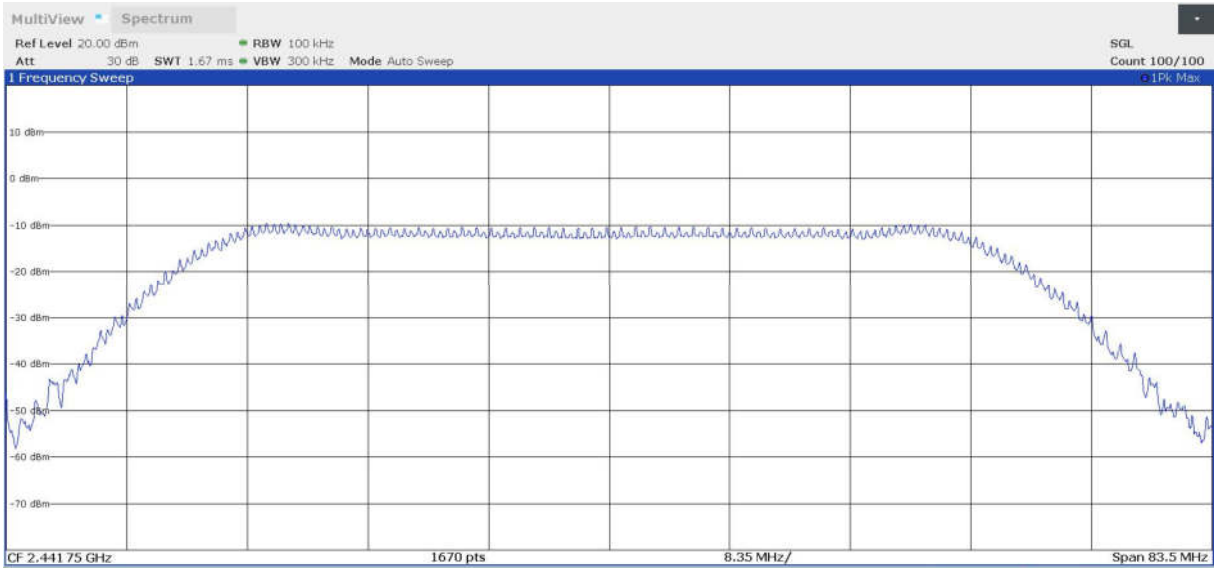
Pass

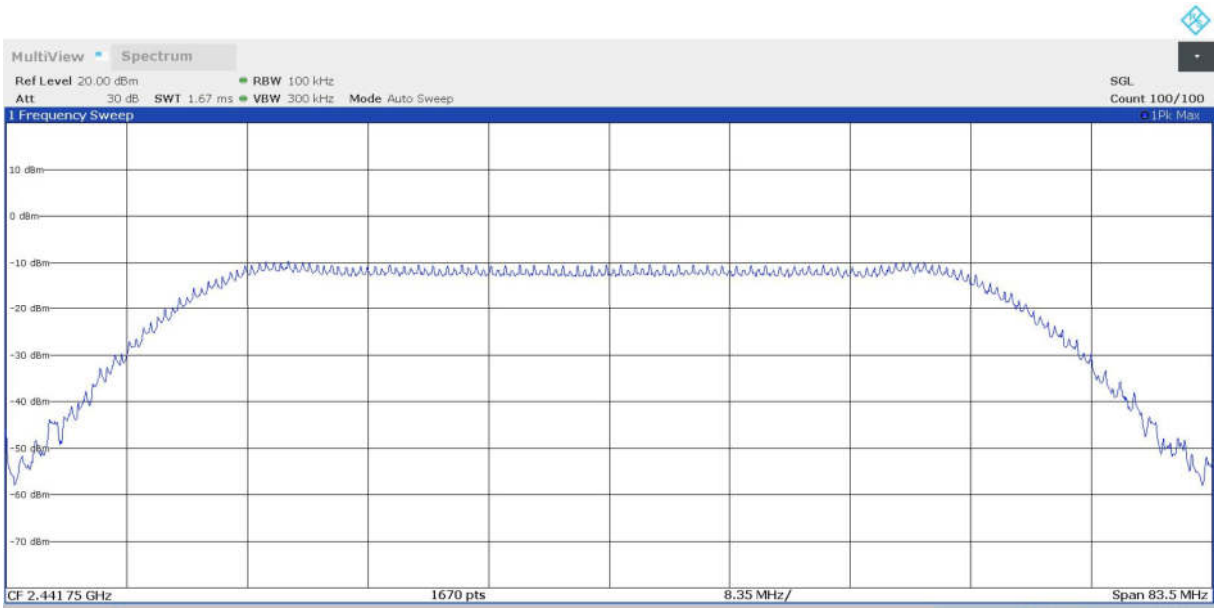
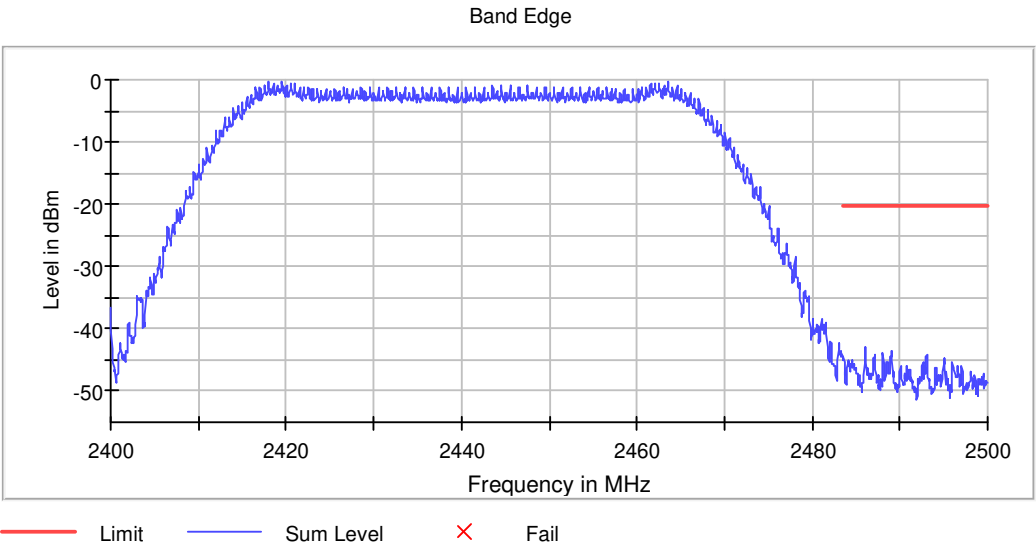
Attachments

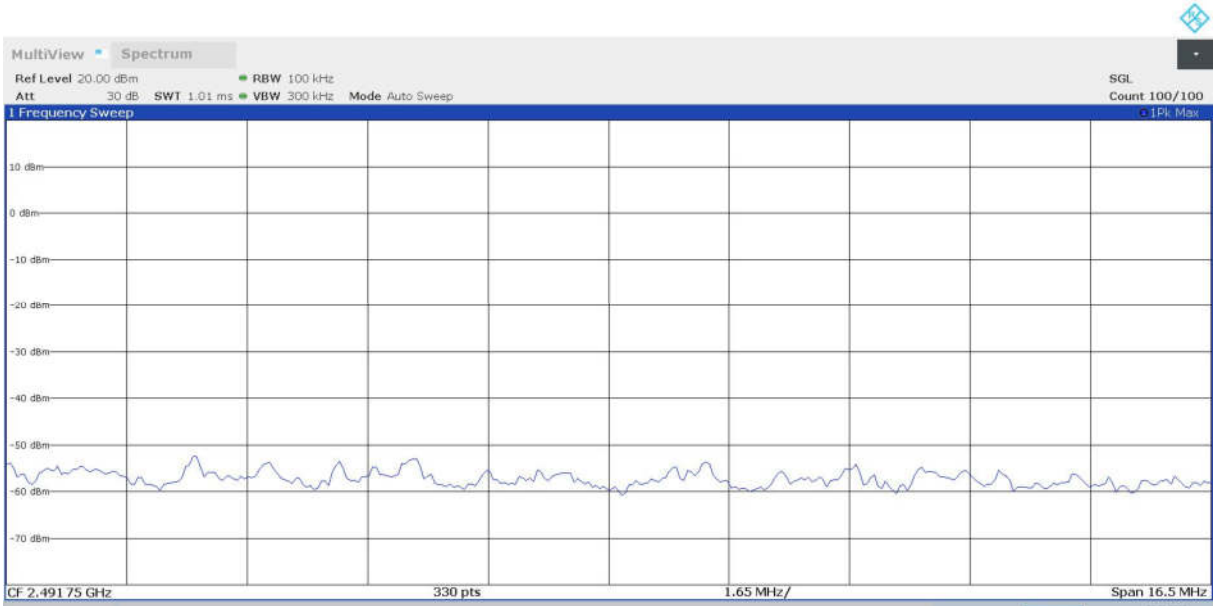
Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), CHAIN A

Figures:



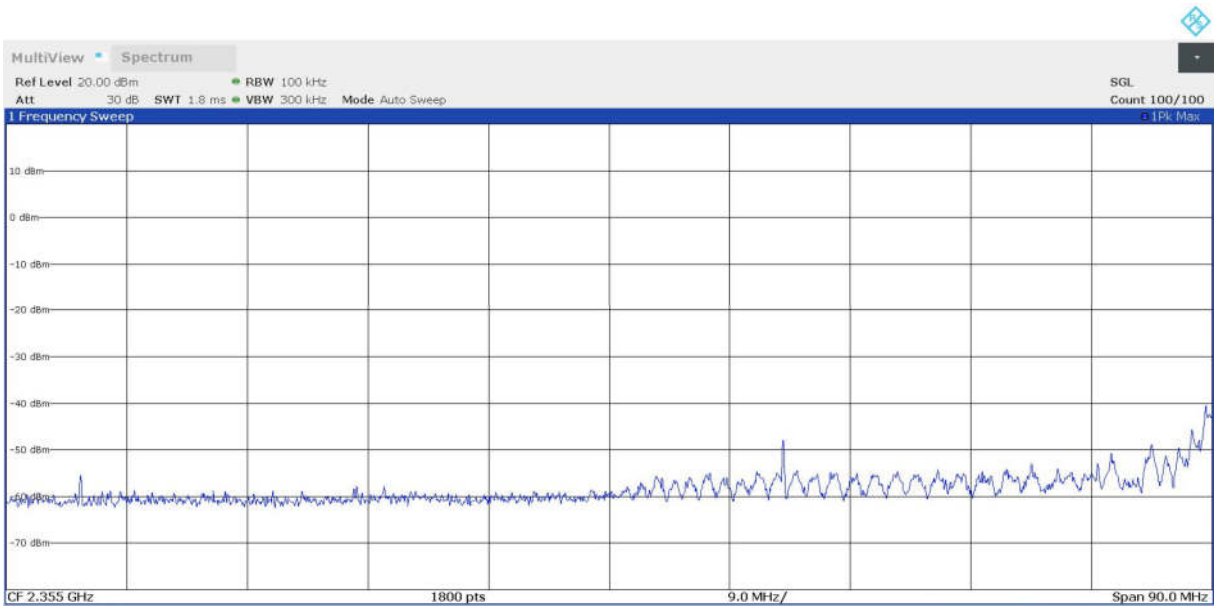
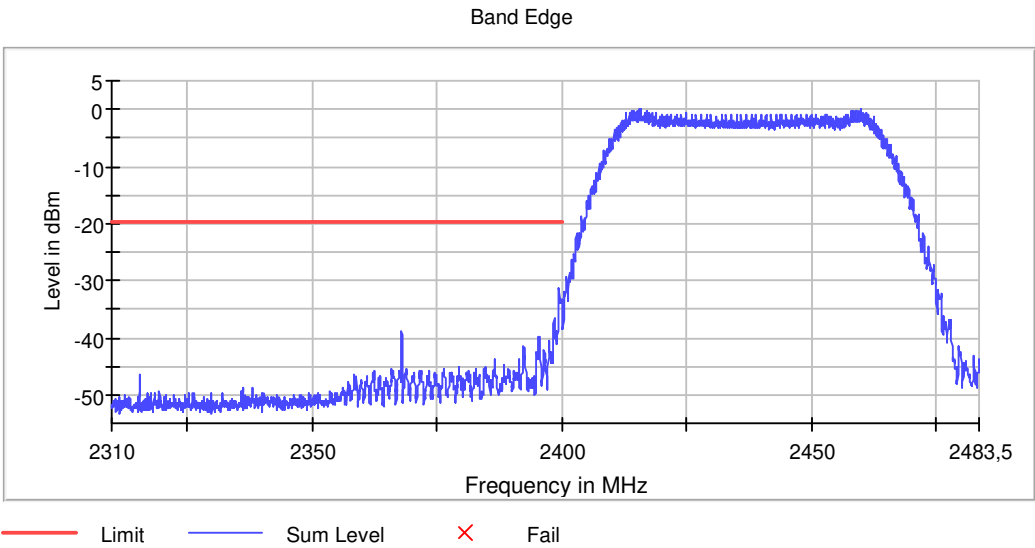


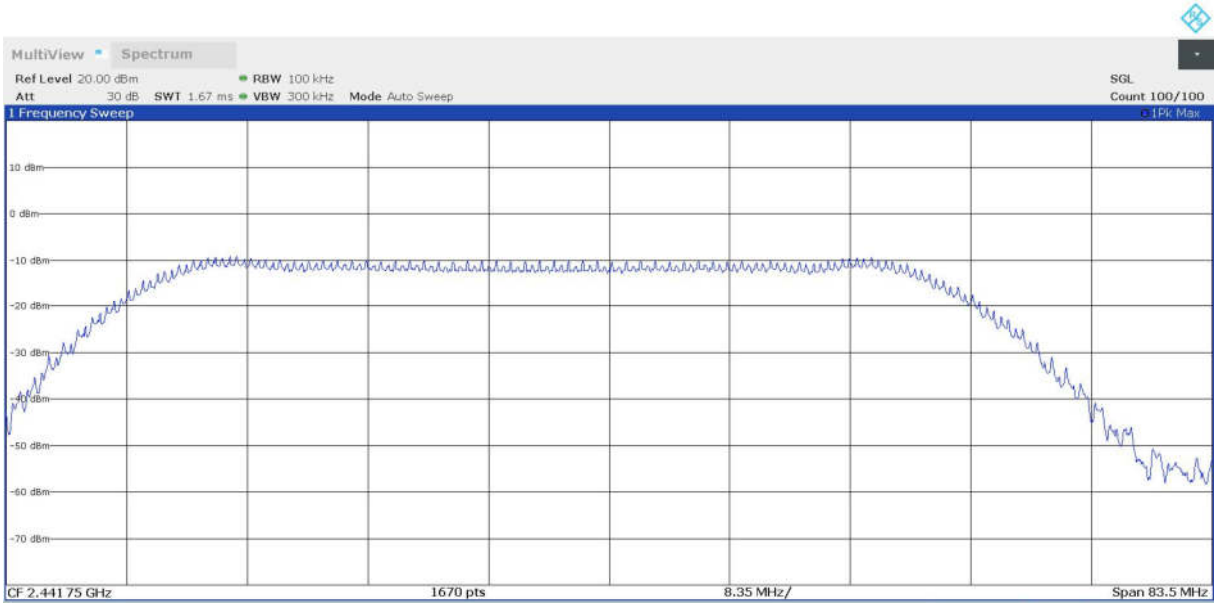


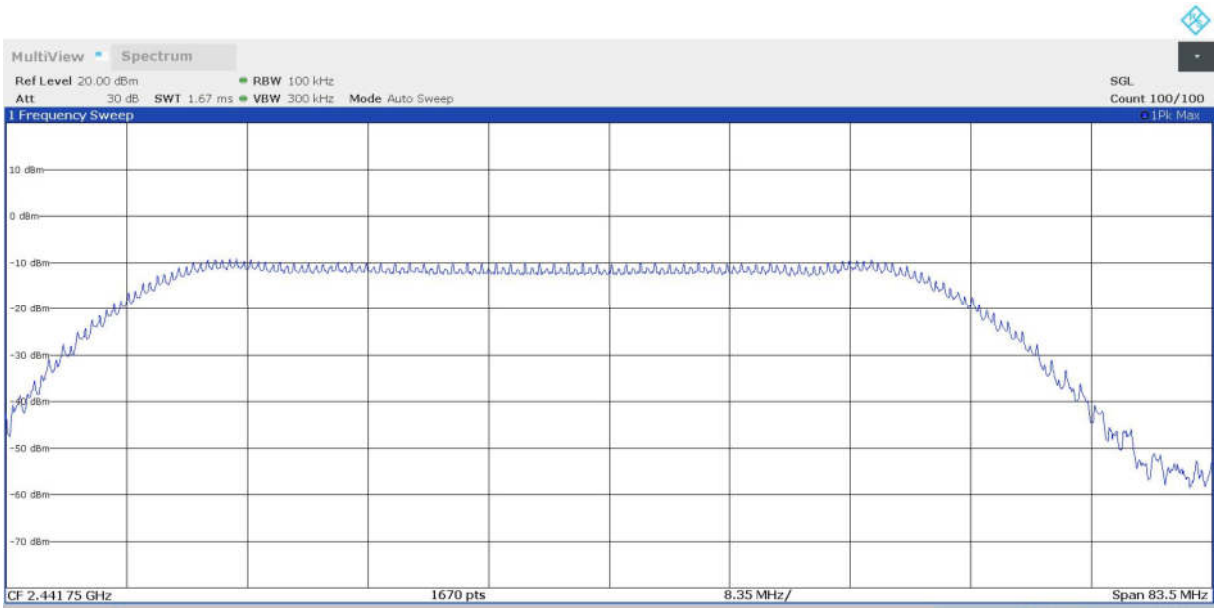
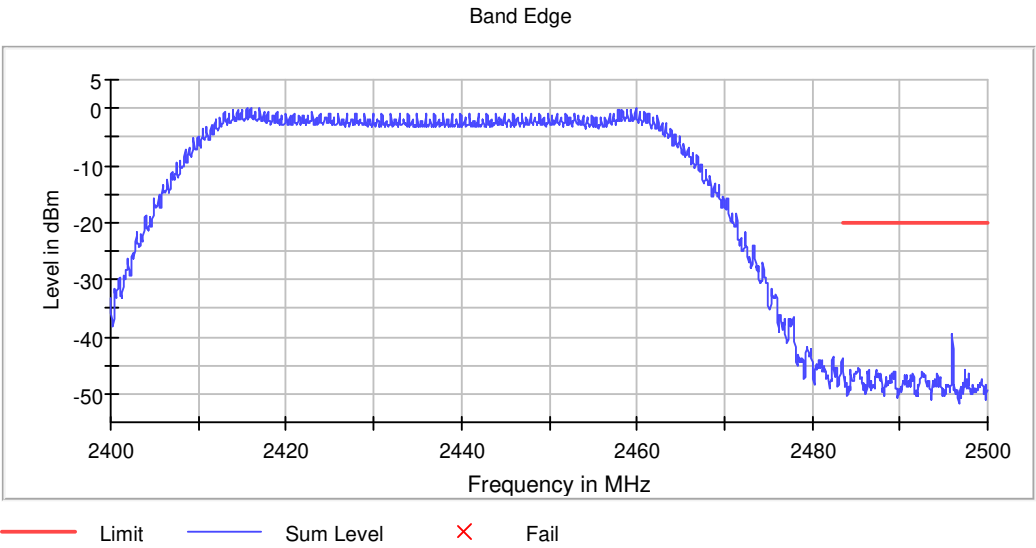


Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), CHAIN B

Figures:



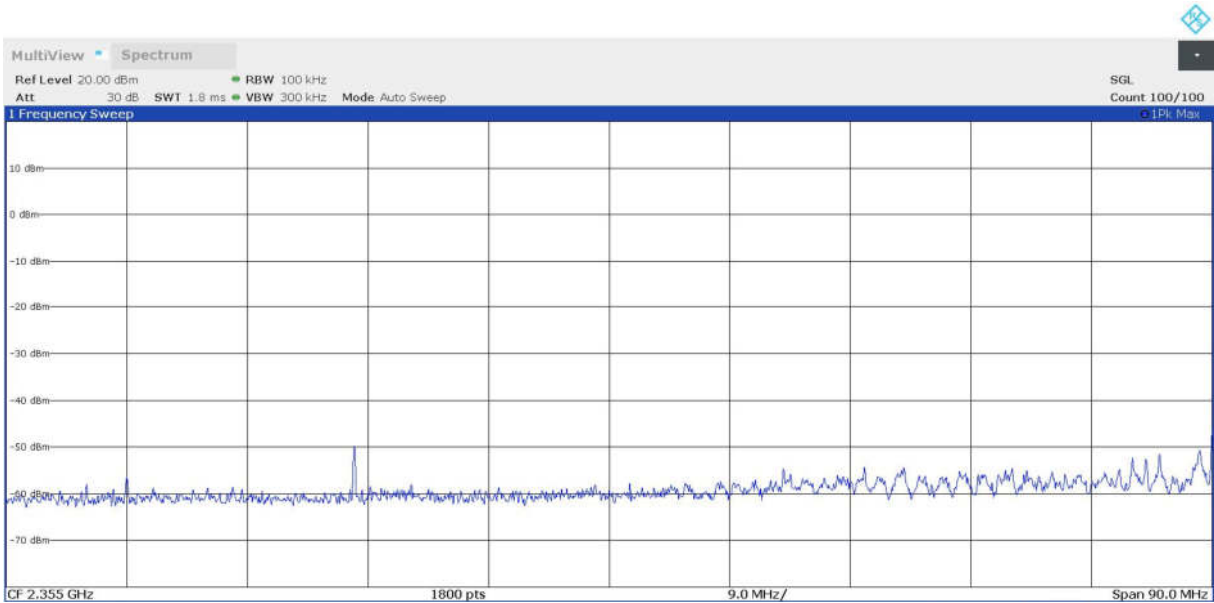
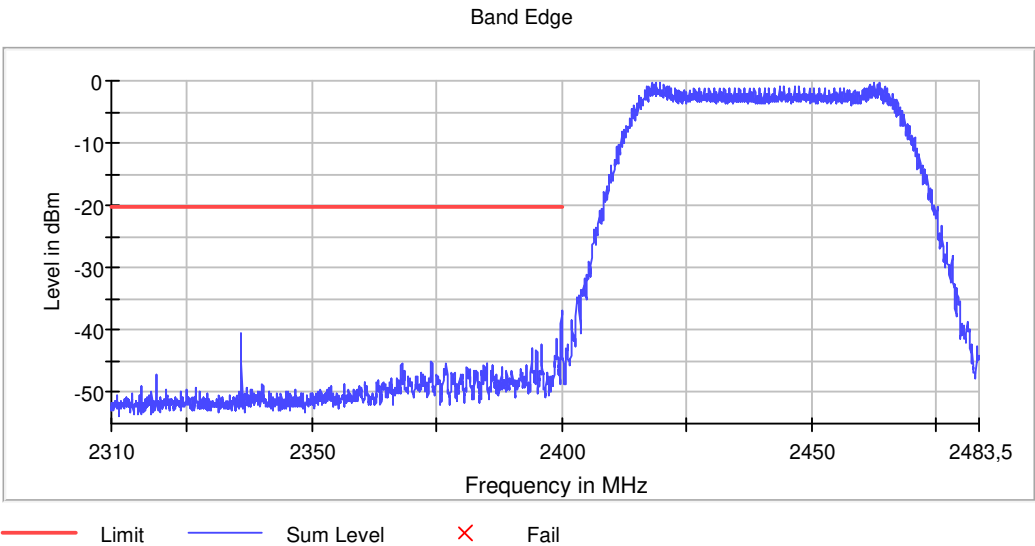


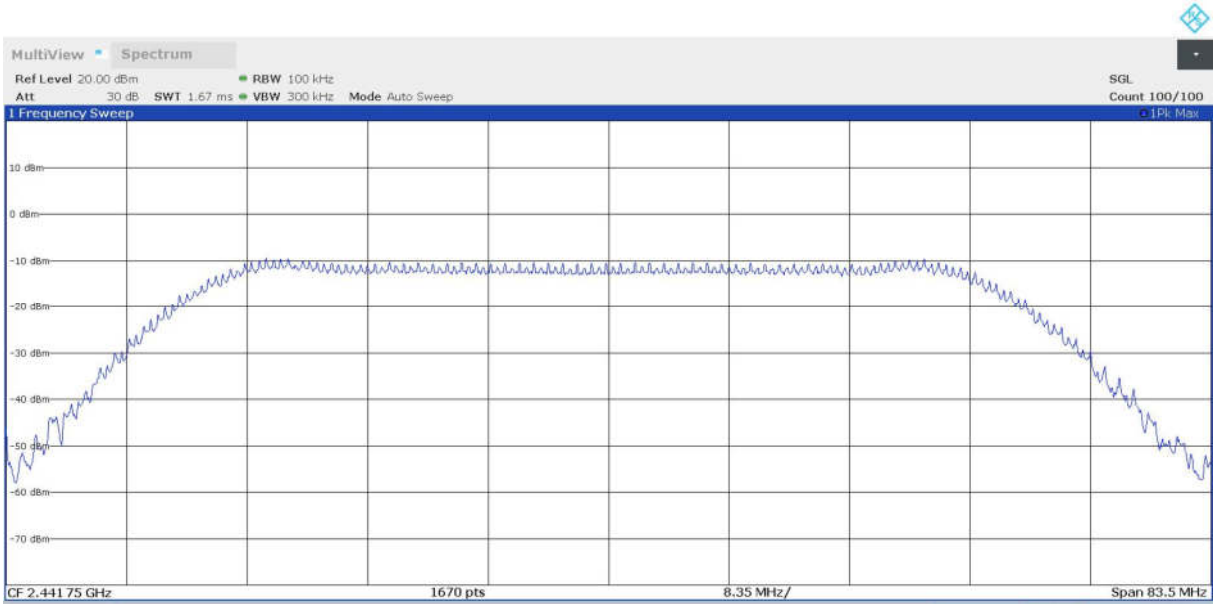


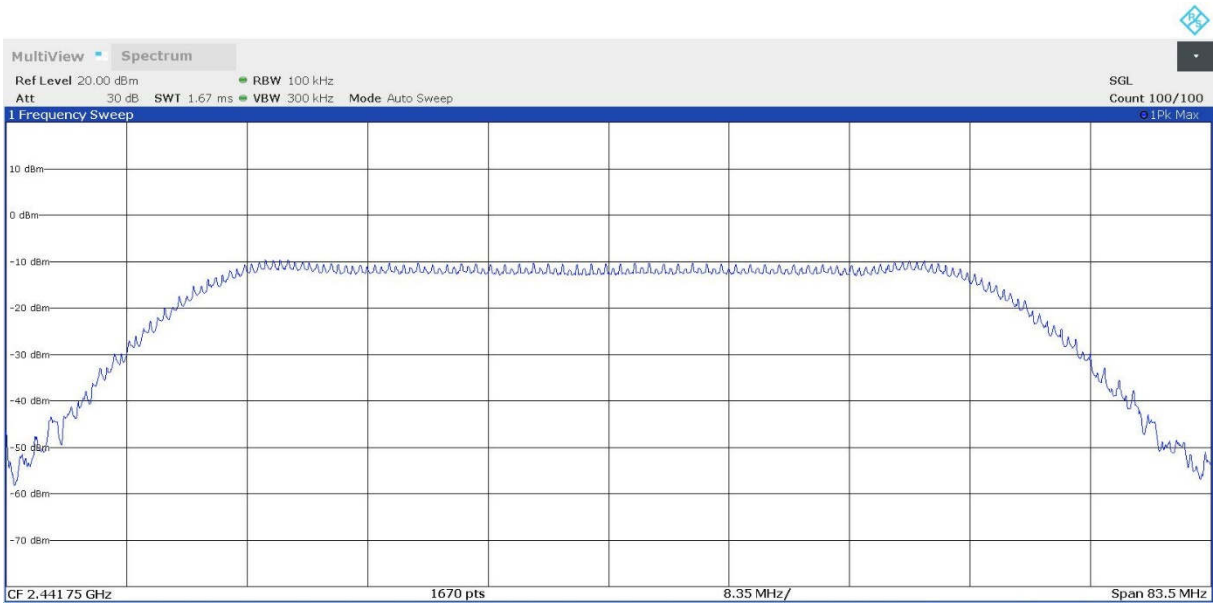
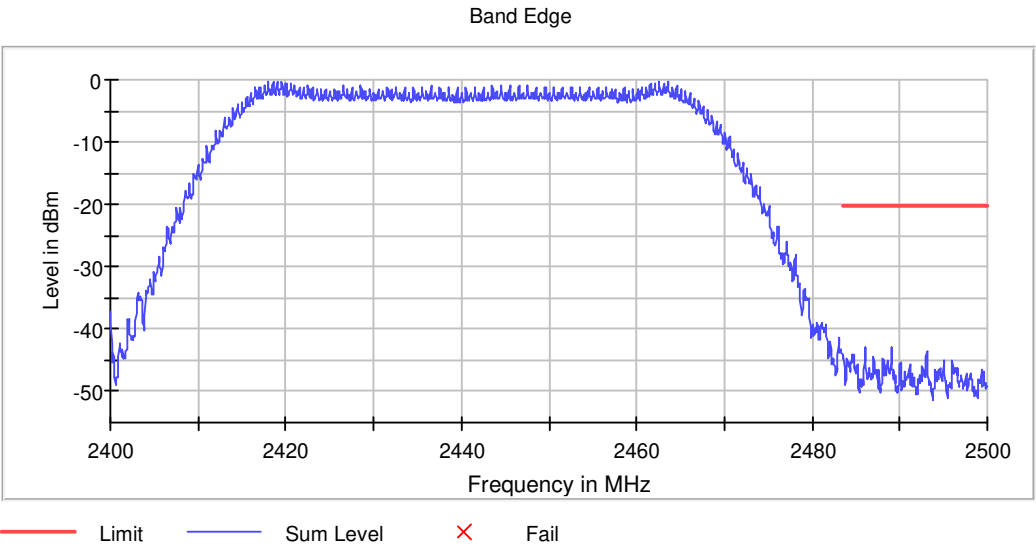


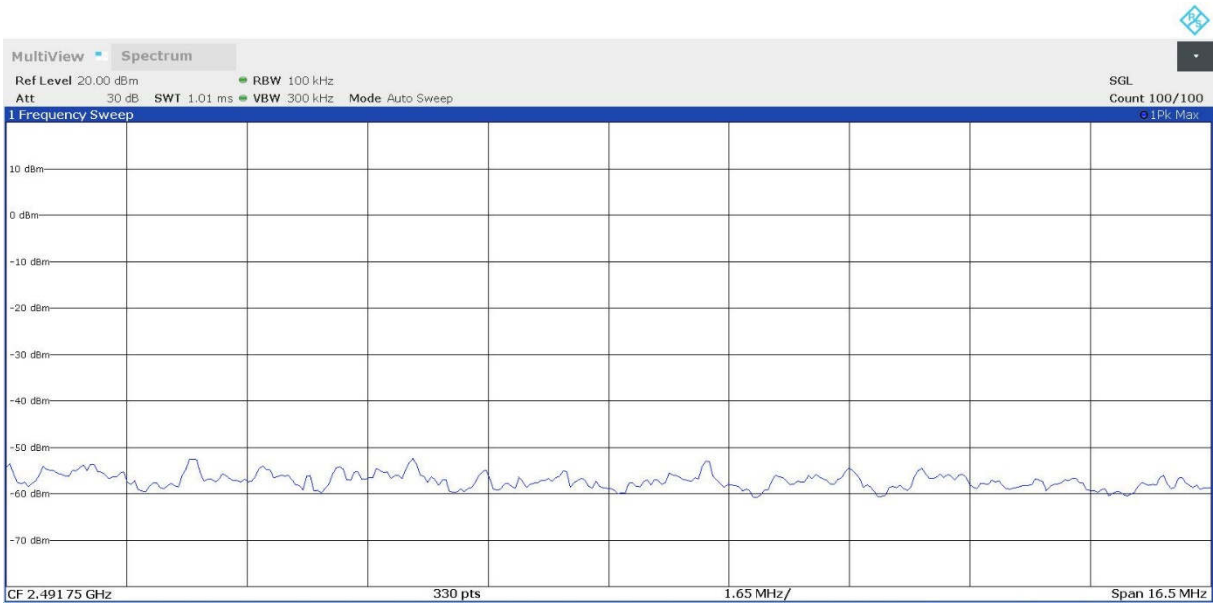
Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), CHAIN A

Figures:



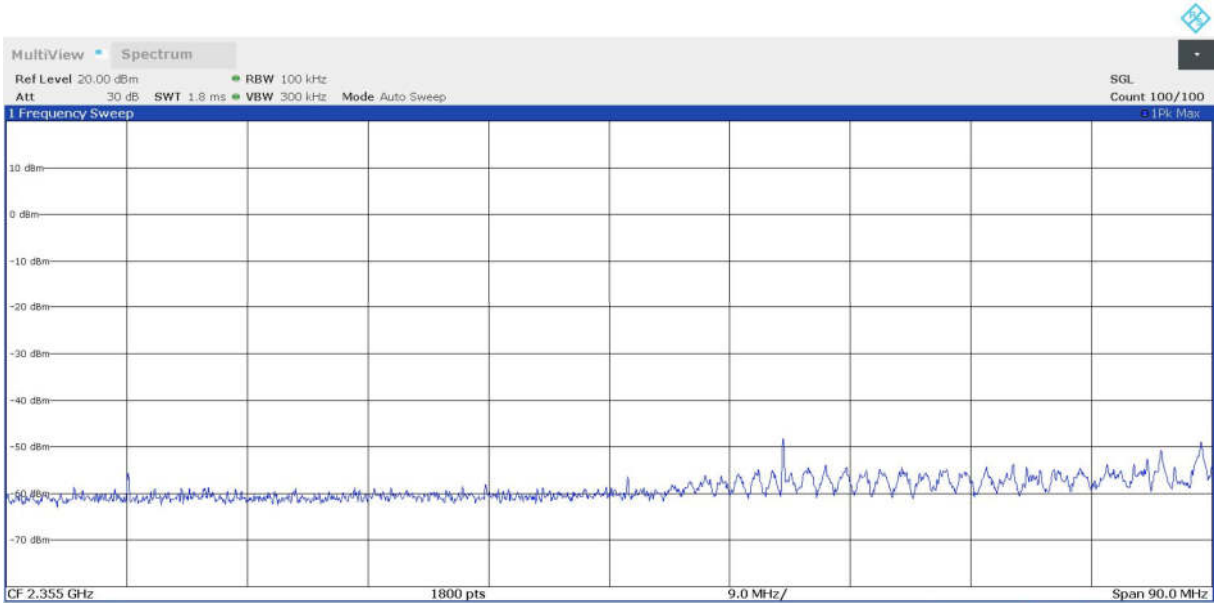
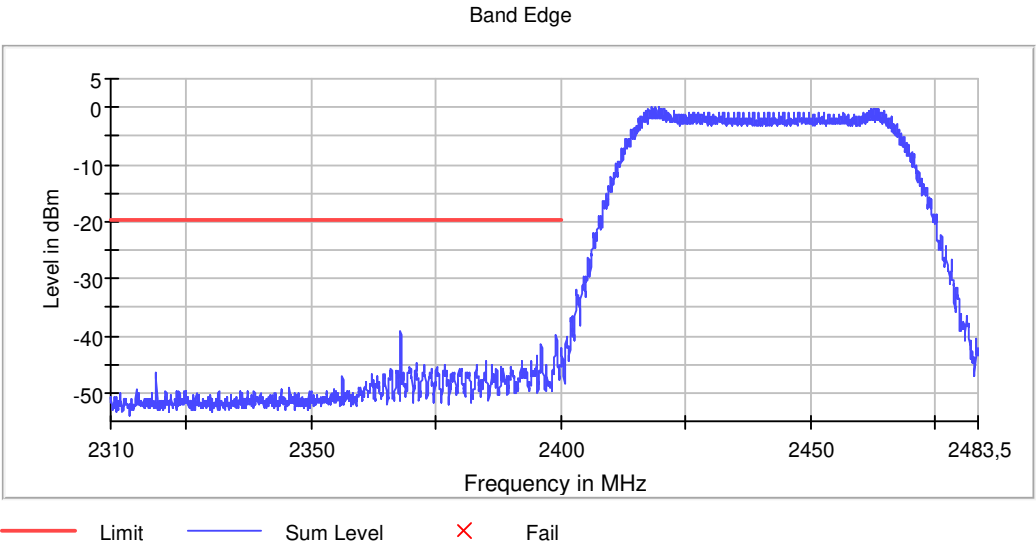


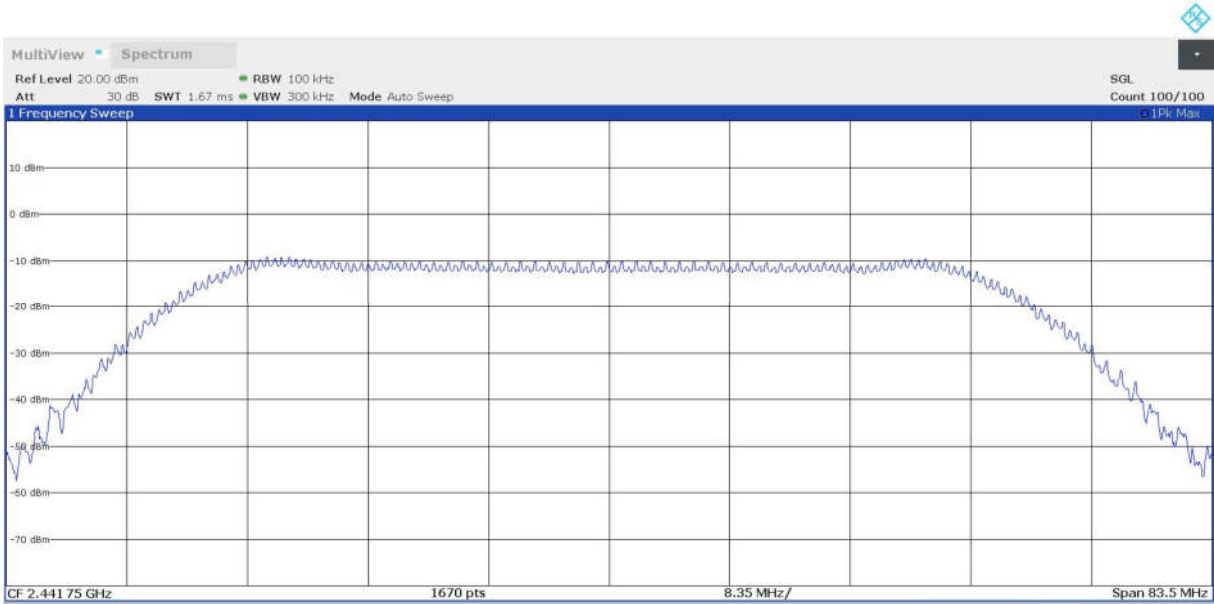


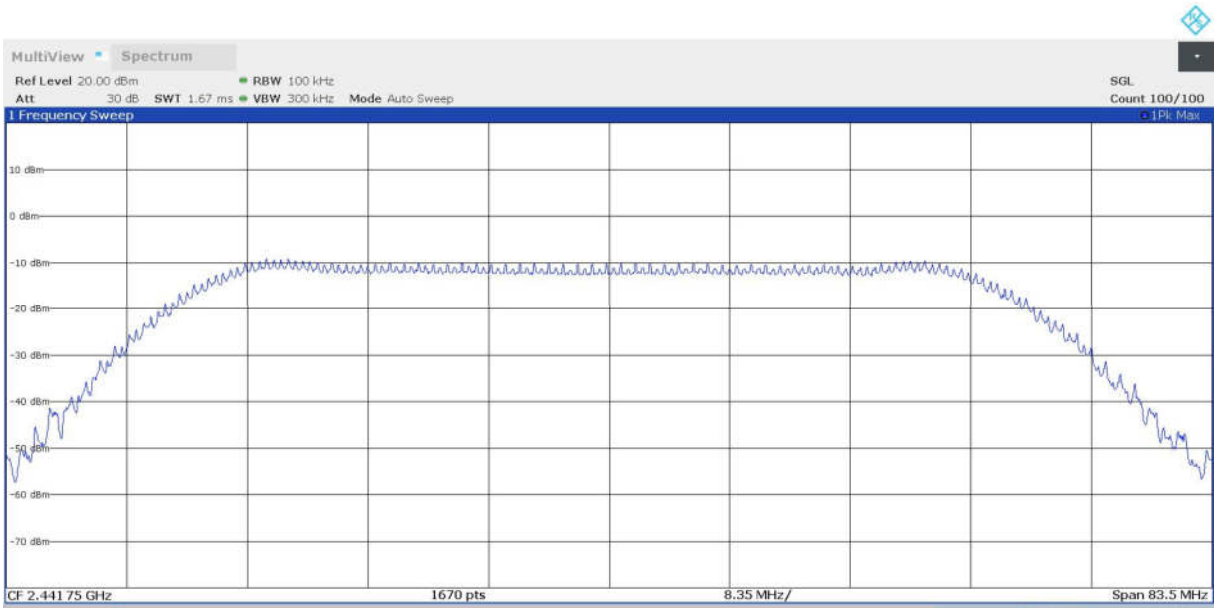
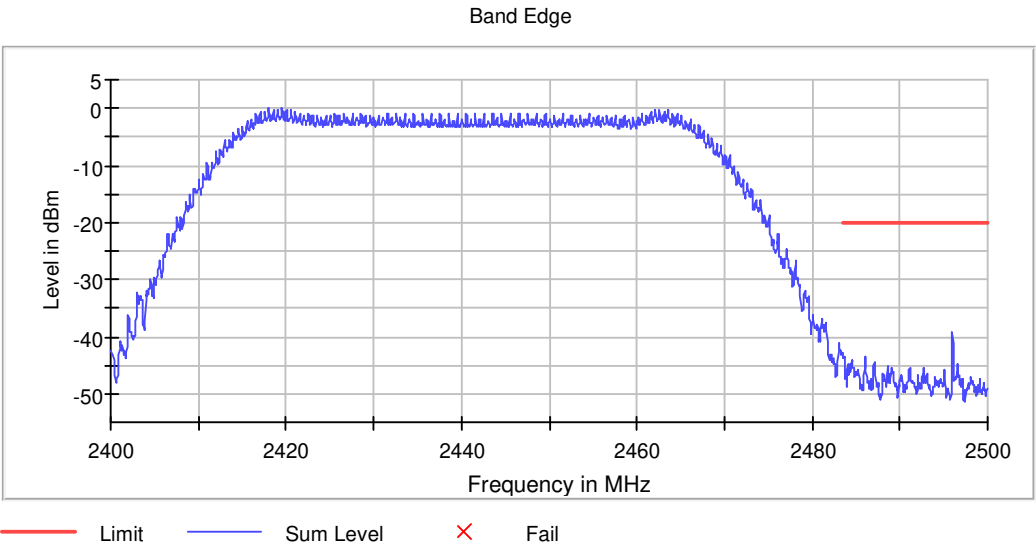


Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), CHAIN B

Figures:









## RSS-247 5.5 / FCC 15.247 (d) 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, specified when measuring with peak detector function.

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

### Results

Modulation: Proprietary 2.4GHz (1 Mbit/s)

The EUT was configured to transmit with commercial duty cycle for this test.

Duty Cycle (commercial): 0.279 %

### CHAIN A

#### Frequency range 30 MHz – 1 GHz:

| Freq (MHz) | Freq Rng (GHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBμV/m) | Pol | Detector |
|------------|----------------|---------------------|-----------------------|-----|----------|
| 2440.00000 | [0.03, 1]      | 31.552              | 22.52                 | V   | QP       |
|            |                | 49.934              | 32.70                 | V   | QP       |
|            |                | 58.712              | 31.53                 | V   | QP       |
|            |                | 72.001              | 30.03                 | V   | QP       |
|            |                | 98.434              | 28.71                 | H   | QP       |
|            |                | 166.625             | 24.90                 | V   | QP       |
|            |                | 215.998             | 31.24                 | V   | QP       |
|            |                | 249.996             | 35.30                 | V   | QP       |
|            |                | 500.014             | 32.03                 | V   | QP       |
|            |                | 874.967             | 35.99                 | H   | QP       |

### Frequency range 1 GHz – 26 GHz:

The results below show the maximum measured levels in the 1 – 26 GHz range including the restricted bands 2.31 – 2.39 GHz and 2.4835 – 2.5 GHz.

Spurious frequencies with peak levels above the average limit (54 dBµV/m at 3 m) are measured with average detector for compliance checking with the average limit.

| Freq (MHz) | Freq Rng (GHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector |
|------------|----------------|---------------------|-----------------------|-----|----------|
| 2440.00000 | [1, 3]         | 2377.867            | 58.06                 | V   | PK       |
|            |                |                     | 48.42                 | V   | AVG      |
|            |                | 2484.067            | 59.79                 | H   | PK       |
|            |                |                     | 49.28                 | H   | AVG      |

### CHAIN B

### Frequency range 30 MHz – 1 GHz:

| Freq (MHz) | Freq Rng (GHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector |
|------------|----------------|---------------------|-----------------------|-----|----------|
| 2440.00000 | [0.03, 1]      | 30.727              | 26.52                 | V   | QP       |
|            |                | 49.982              | 38.15                 | V   | QP       |
|            |                | 71.953              | 28.48                 | V   | QP       |
|            |                | 101.877             | 29.82                 | H   | QP       |
|            |                | 215.949             | 27.51                 | V   | QP       |
|            |                | 249.948             | 29.74                 | V   | QP       |
|            |                | 399.958             | 26.62                 | H   | QP       |
|            |                | 875.015             | 35.12                 | H   | QP       |

### Frequency range 1 GHz – 26 GHz:

The results below show the maximum measured levels in the 1 – 26 GHz range including the restricted bands 2.31 – 2.39 GHz and 2.4835 – 2.5 GHz.

Spurious frequencies with peak levels above the average limit (54 dBµV/m at 3 m) are measured with average detector for compliance checking with the average limit.

| Freq (MHz) | Freq Rng (GHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector |
|------------|----------------|---------------------|-----------------------|-----|----------|
| 2440.00000 | [1, 3]         | 2367.733            | 59.12                 | V   | PK       |
|            |                |                     | 48.42                 | V   | AVG      |
|            | [3, 17]        | 11332.000           | 52.09                 | V   | PK       |
|            |                | 15938.000           | 54.37                 | V   | PK       |
|            |                |                     | 43.97                 | V   | AVG      |

### Verdict

Pass

Modulation: Proprietary 2.4GHz (250 kbit/s)

The EUT was configured to transmit with commercial duty cycle for this test.

Duty Cycle (commercial): 0.298 %

#### CHAIN A

#### Frequency range 30 MHz – 1 GHz:

| Freq (MHz) | Freq Rng (GHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector |
|------------|----------------|---------------------|-----------------------|-----|----------|
| 2440.00000 | [0.03, 1]      | 41.300              | 38.76                 | V   | QP       |
|            |                | 42.998              | 34.46                 | V   | QP       |
|            |                | 51.049              | 31.59                 | V   | QP       |
|            |                | 55.269              | 35.14                 | V   | QP       |
|            |                | 58.712              | 33.46                 | V   | QP       |
|            |                | 83.350              | 34.71                 | V   | QP       |
|            |                | 249.996             | 39.89                 | H   | QP       |
|            |                | 400.007             | 31.77                 | H   | QP       |
|            |                | 875.015             | 35.54                 | H   | QP       |

#### Frequency range 1 GHz – 26 GHz:

The results below show the maximum measured levels in the 1 – 26 GHz range including the restricted bands 2.31 – 2.39 GHz and 2.4835 – 2.5 GHz.

Spurious frequencies with peak levels above the average limit (54 dBµV/m at 3 m) are measured with average detector for compliance checking with the average limit.

| Freq (MHz) | Freq Rng (GHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector |
|------------|----------------|---------------------|-----------------------|-----|----------|
| 2440.00000 | [1, 3]         | 2380.867            | 58.73                 | V   | PK       |
|            |                |                     | 48.44                 | V   | AVG      |
|            |                | 2495.933            | 59.76                 | V   | PK       |
|            |                |                     | 49.14                 | V   | AVG      |

## CHAIN B

### Frequency range 30 MHz – 1 GHz:

| Freq (MHz) | Freq Rng (GHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector |
|------------|----------------|---------------------|-----------------------|-----|----------|
| 2440.00000 | [0.03, 1]      | 41.252              | 37.96                 | V   | QP       |
|            |                | 42.950              | 35.61                 | V   | QP       |
|            |                | 51.194              | 35.15                 | V   | QP       |
|            |                | 55.269              | 37.34                 | V   | QP       |
|            |                | 58.712              | 34.12                 | V   | QP       |
|            |                | 83.932              | 34.55                 | V   | QP       |
|            |                | 249.996             | 42.23                 | H   | QP       |
|            |                | 875.015             | 36.19                 | H   | QP       |

### Frequency range 1 GHz – 26 GHz:

The results below show the maximum measured levels in the 1 – 26 GHz range including the restricted bands 2.31 – 2.39 GHz and 2.4835 – 2.5 GHz.

Spurious frequencies with peak levels above the average limit (54 dBµV/m at 3 m) are measured with average detector for compliance checking with the average limit.

| Freq (MHz) | Freq Rng (GHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector |
|------------|----------------|---------------------|-----------------------|-----|----------|
| 2440.00000 | [1, 3]         | 2319.800            | 58.26                 | V   | PK       |
|            |                |                     | 48.48                 | V   | AVG      |
|            |                | 2873.133            | 60.93                 | V   | PK       |
|            |                |                     | 50.97                 | V   | AVG      |

## Verdict

Pass

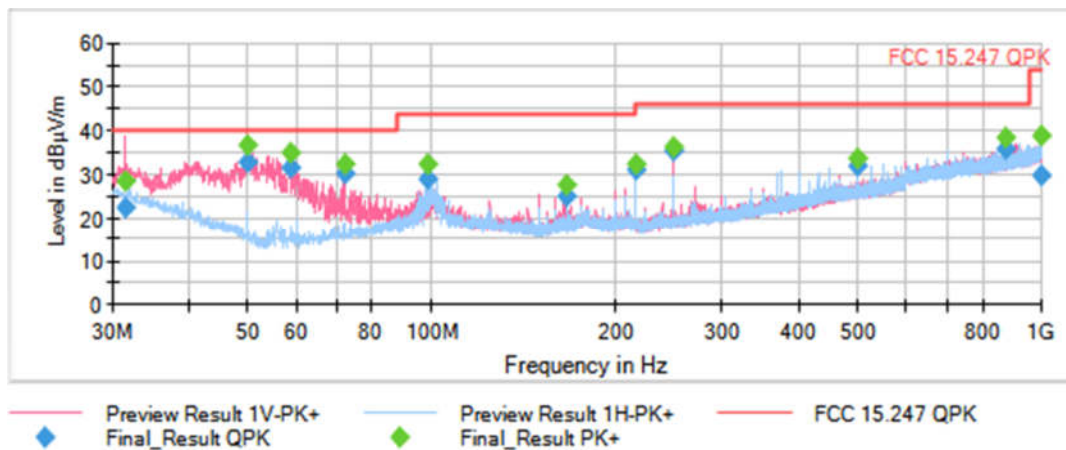
## Attachments

The measurement settings for each range of frequency are as follows:

| Subrange                              | Step Size  | Detectors | Bandwidth | Sweep Time | Preamp |
|---------------------------------------|------------|-----------|-----------|------------|--------|
| Receiver: [ESR 7]<br>30 MHz - 1 GHz   | 48,5 kHz   | PK+       | 100 kHz   | 1 s        | 20 dB  |
| Subrange                              | Step Size  | Detectors | Bandwidth | Sweep Time | Preamp |
| Receiver: [FSV 40]<br>1 GHz - 3 GHz   | 66,667 kHz | PK+ ; AVG | 1 MHz     | 1 s        | 0 dB   |
| Subrange                              | Step Size  | Detectors | Bandwidth | Sweep Time | Preamp |
| Receiver: [FSV 40]<br>3 GHz - 17 GHz  | 500 kHz    | PK+ ; AVG | 1 MHz     | 1 s        | 0 dB   |
| Subrange                              | Step Size  | Detectors | Bandwidth | Sweep Time | Preamp |
| Receiver: [FSV 40]<br>17 GHz - 26 GHz | 500 kHz    | PK+ ; AVG | 1 MHz     | 1 s        | 0 dB   |

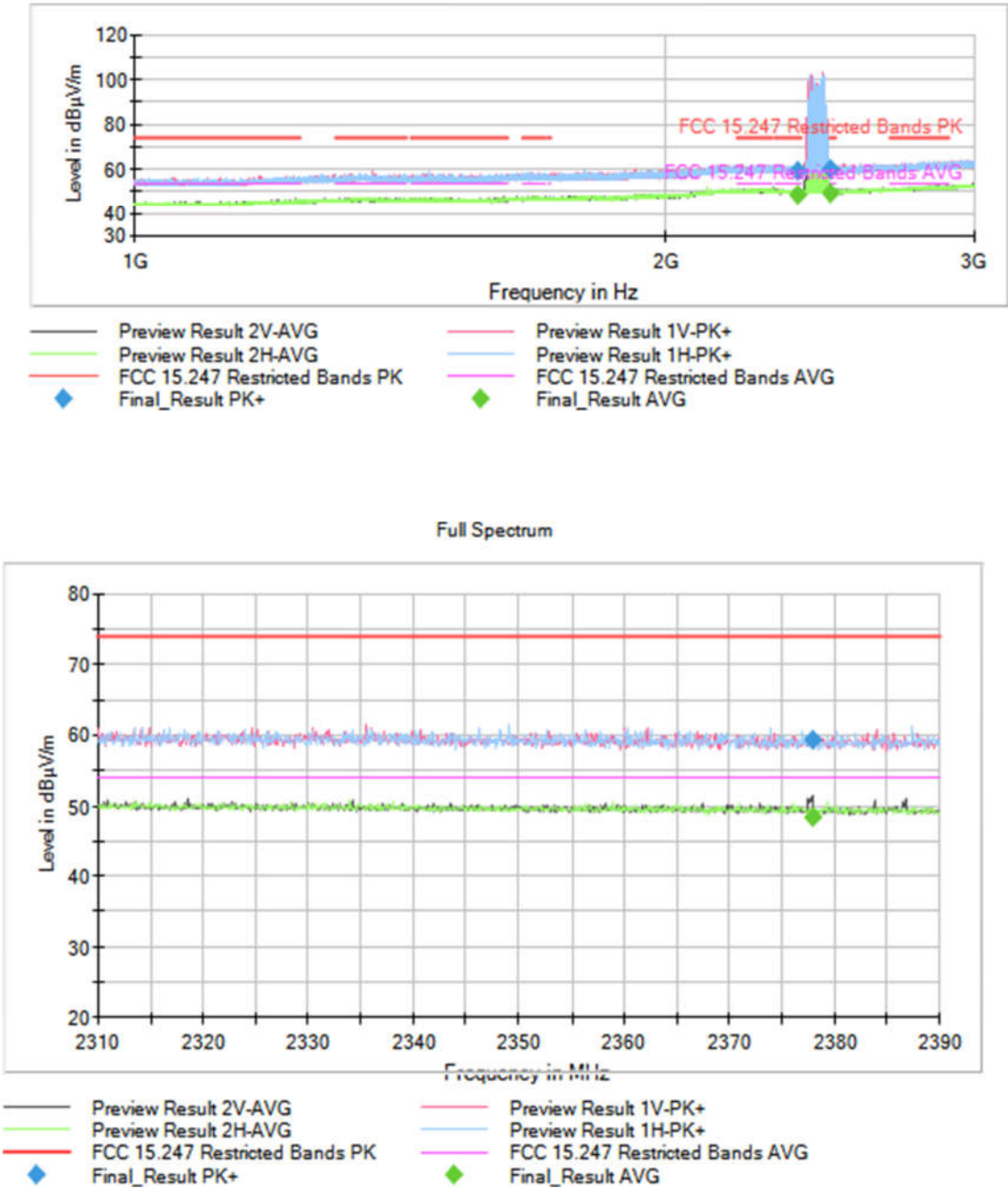
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), Frequency Range (GHz) = [0.03, 1], CHAIN A

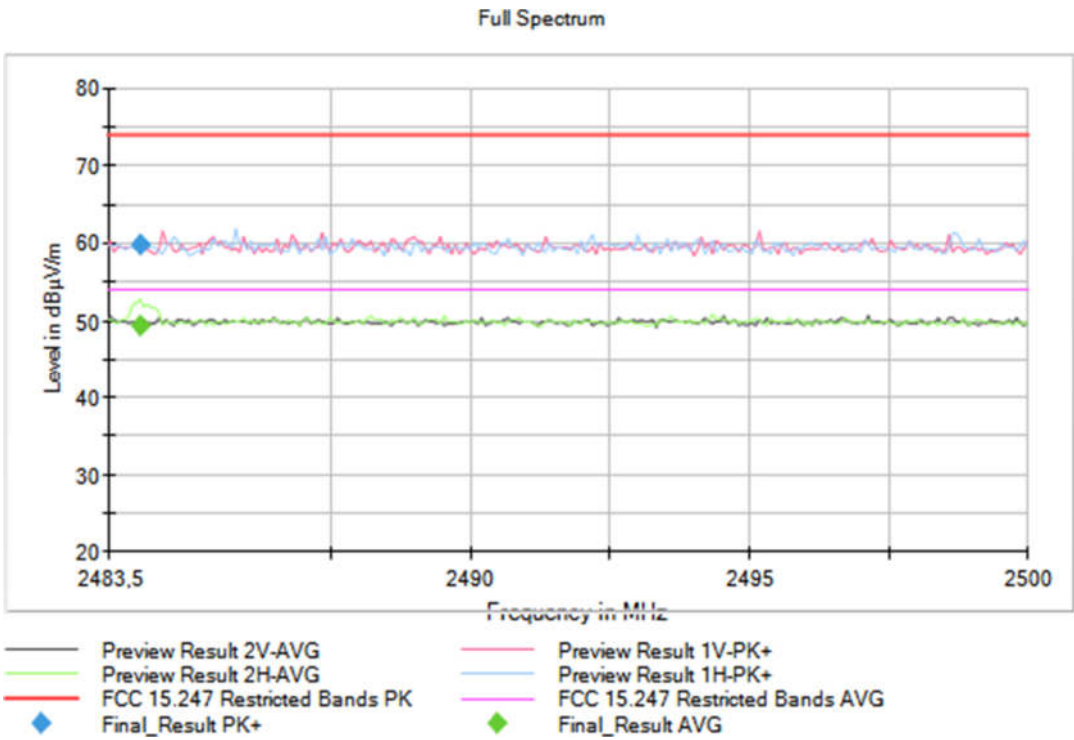
Figures:



Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), Frequency Range (GHz) = [1, 3], CHAIN A

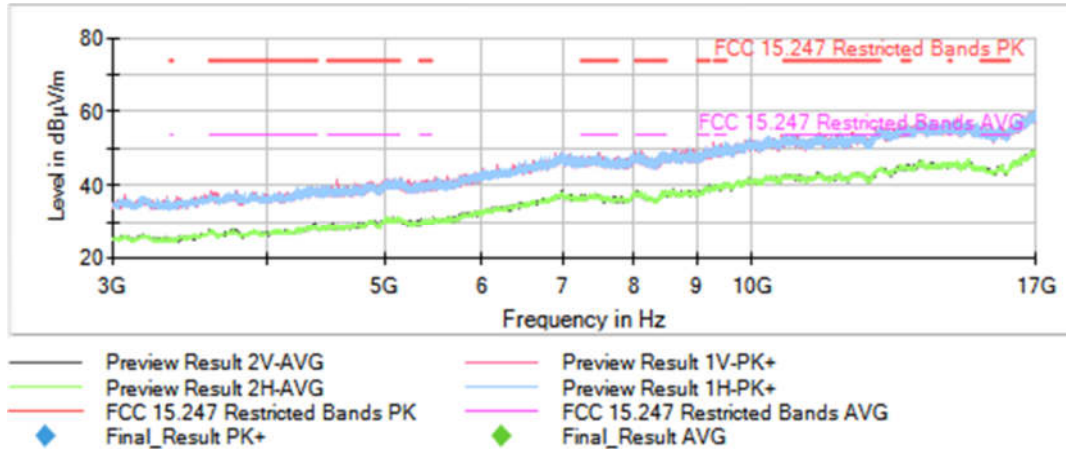
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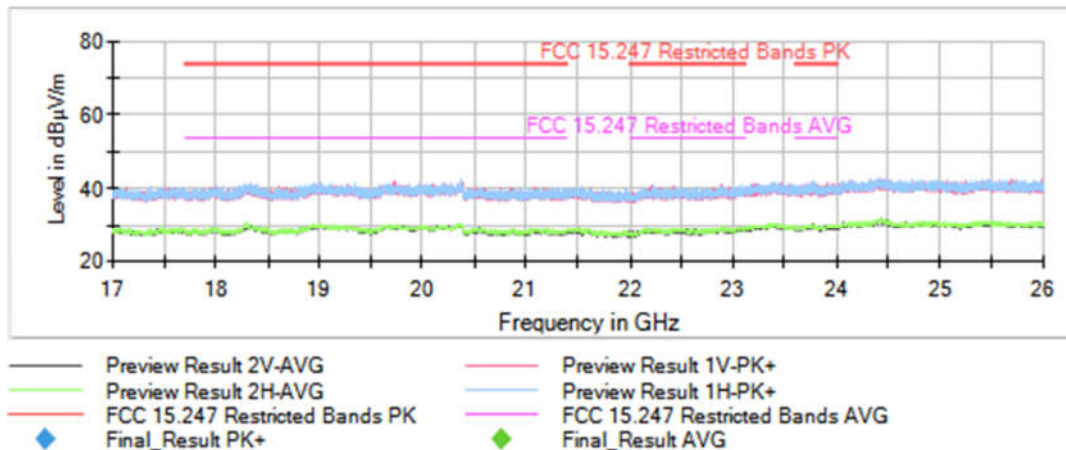
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Figures:



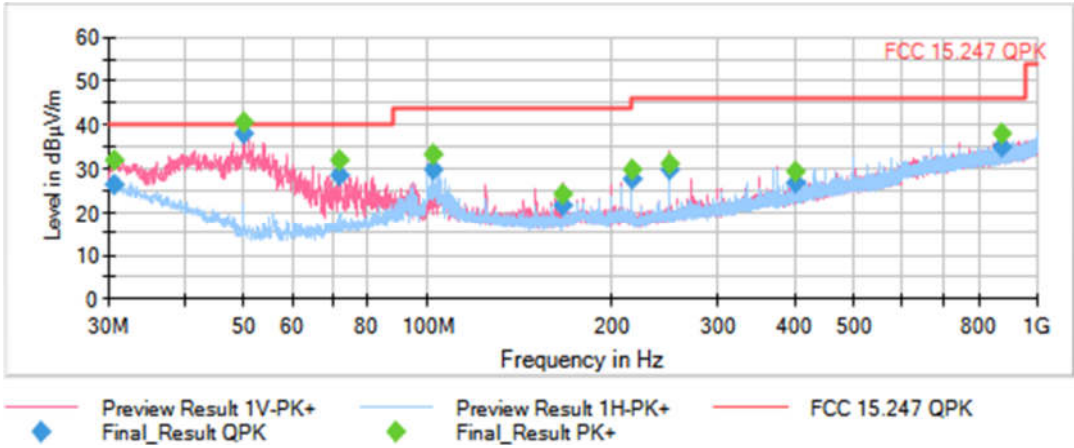
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), Frequency Range (GHz) = [17, 26], CHAIN A

Figures:



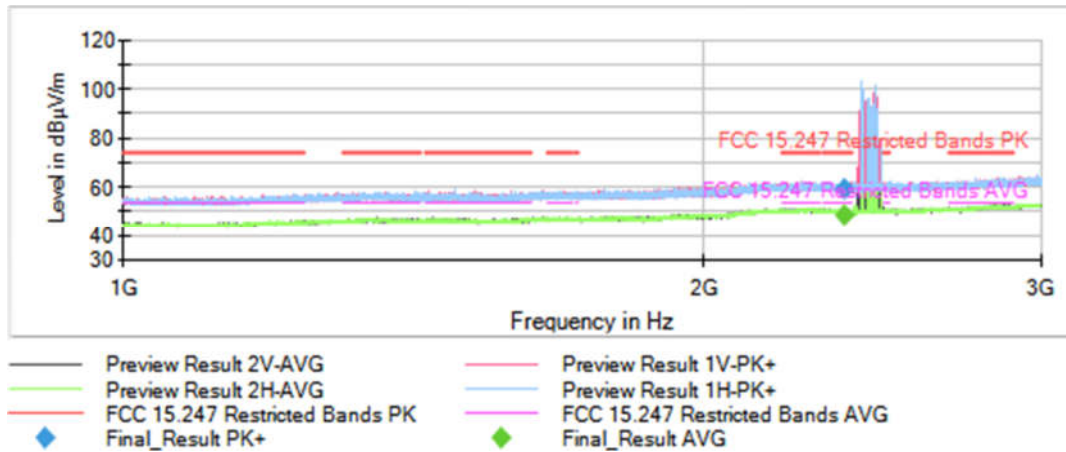
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Figures:

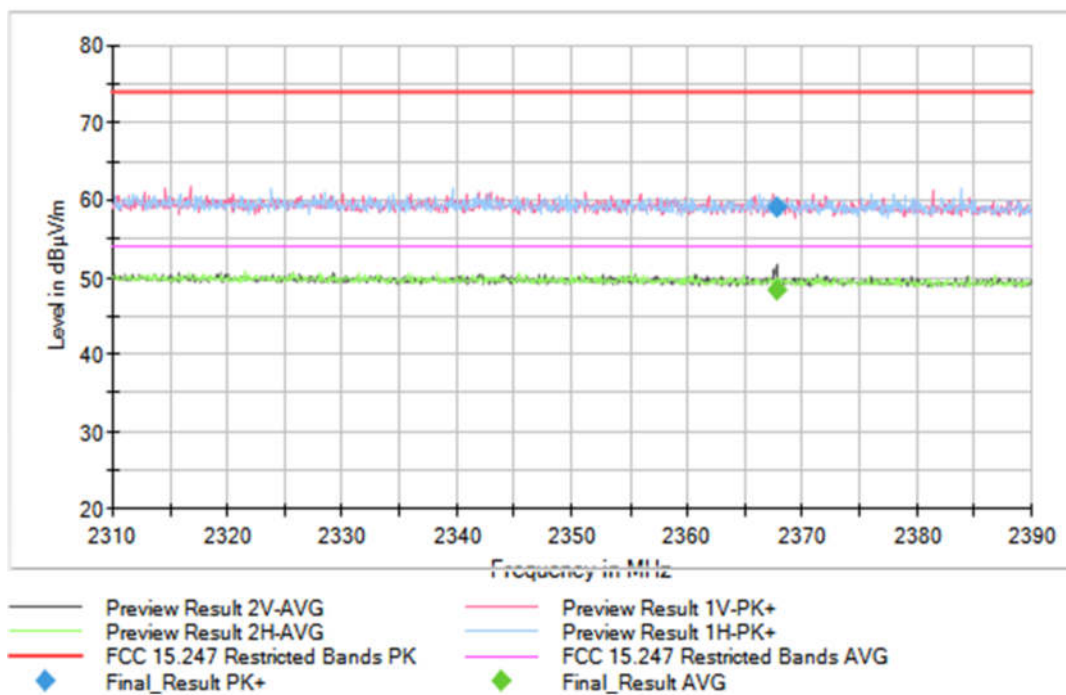


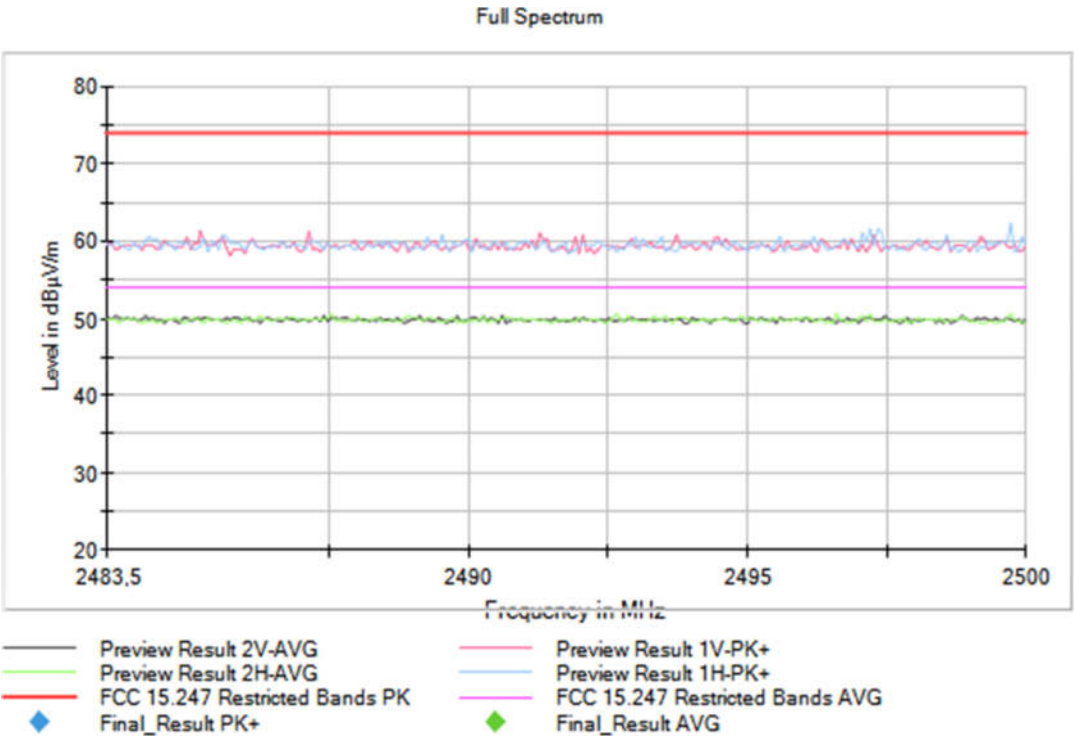
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Figures:



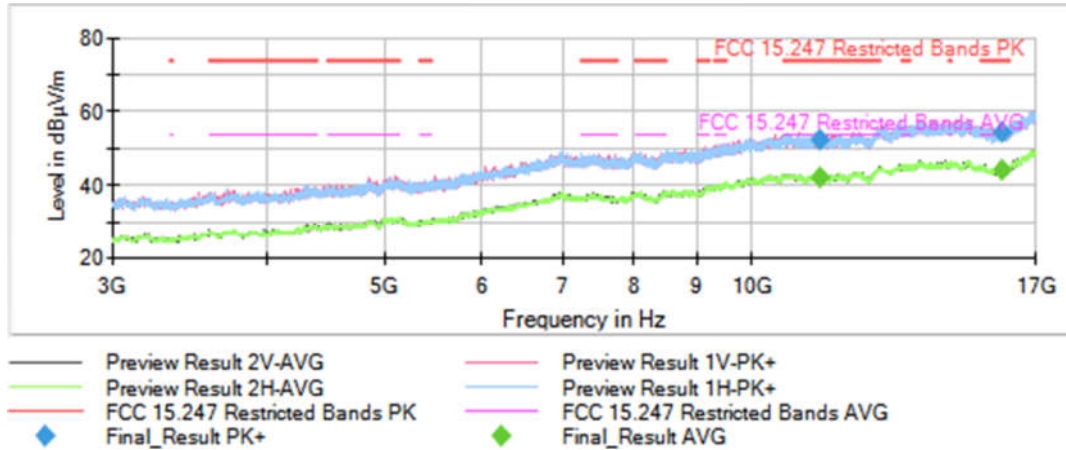
Full Spectrum





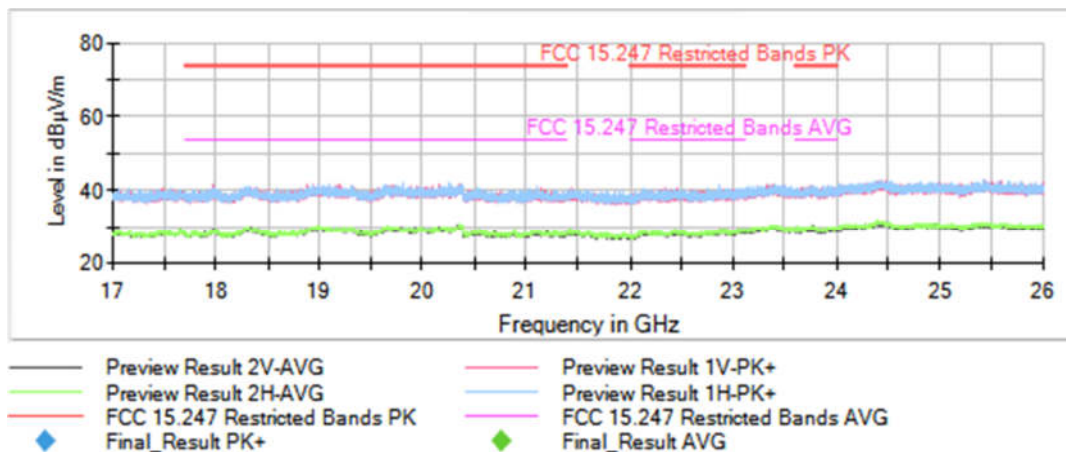
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Figures:



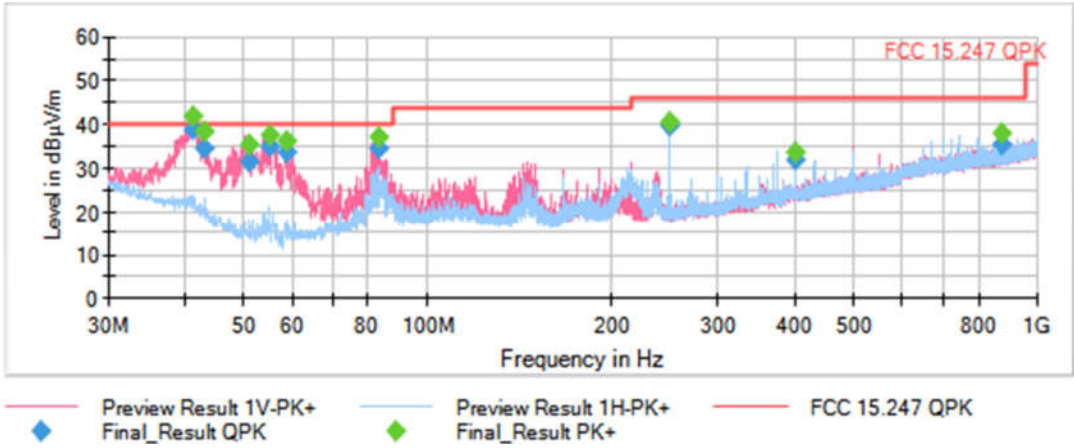
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (1 Mbit/s), Frequency Range (GHz) = [17, 26], CHAIN B

Figures:



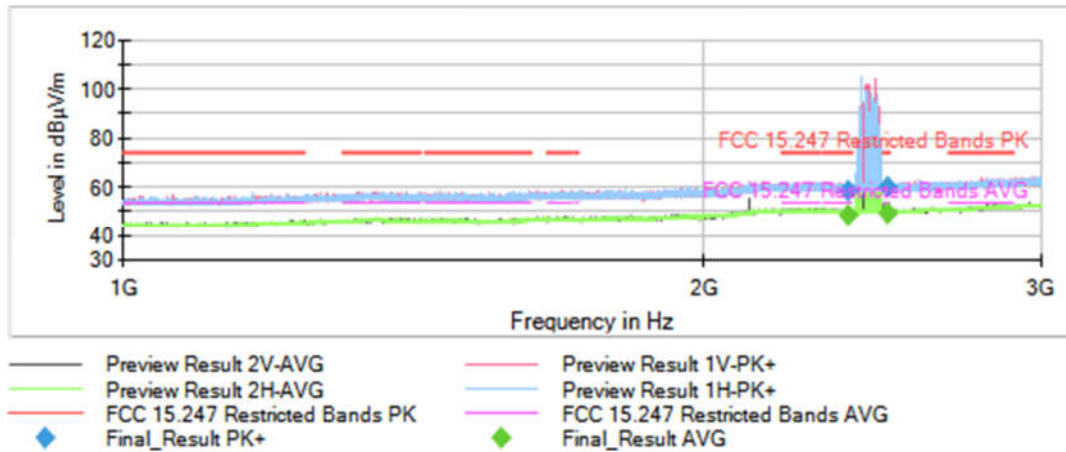
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), Frequency Range (GHz) = [0.03, 1], CHAIN A

Figures:

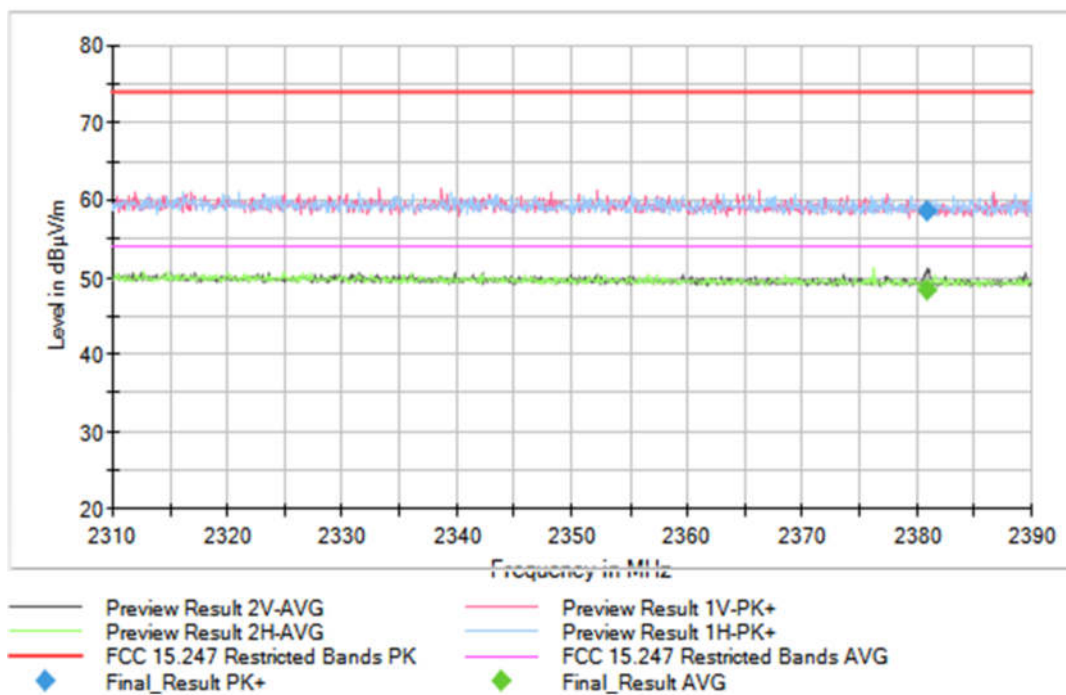


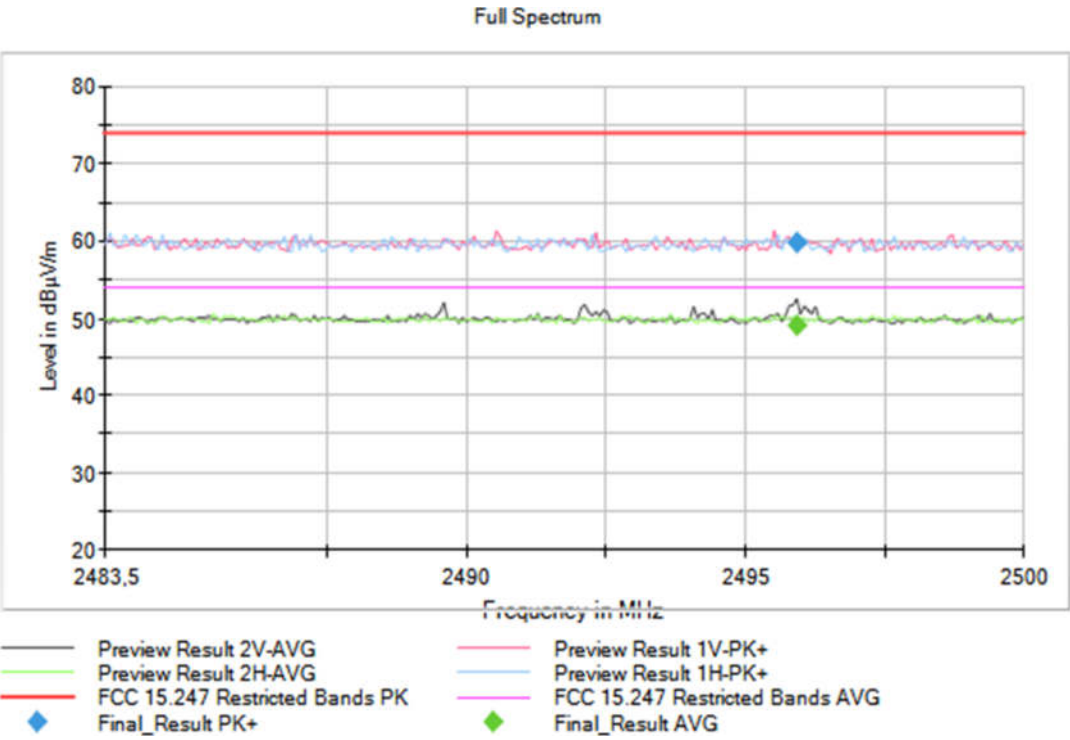
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Figures:



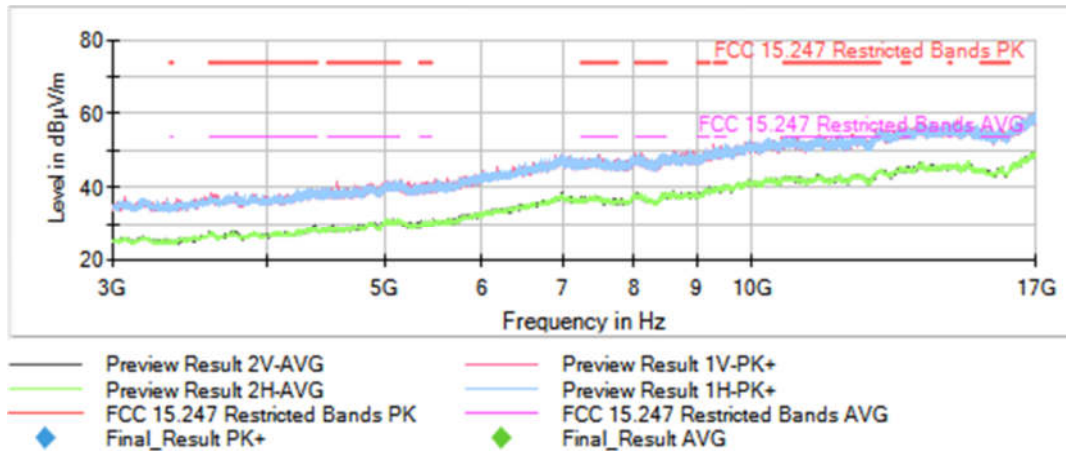
Full Spectrum





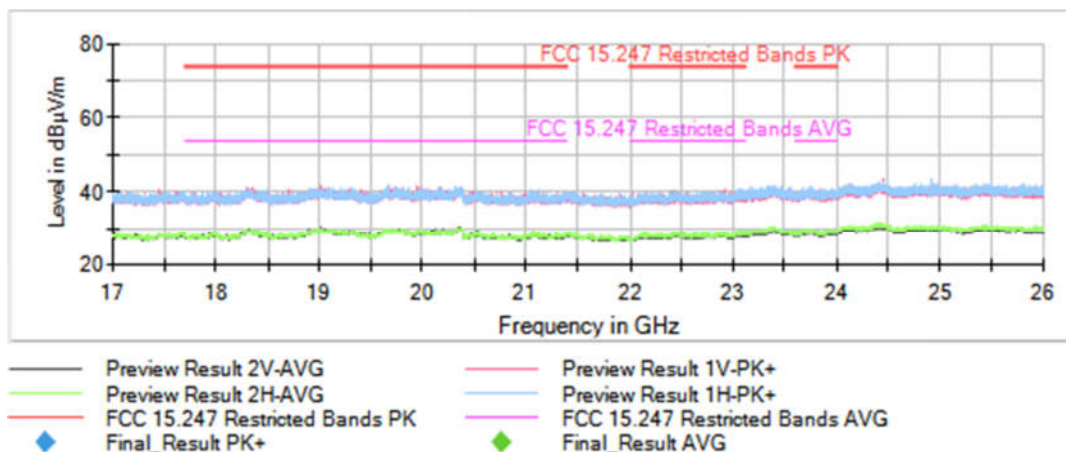
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Figures:



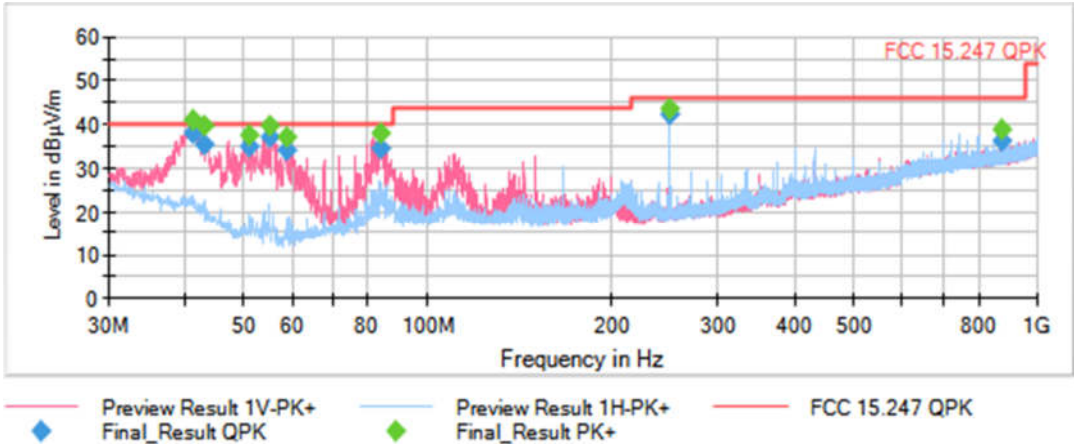
Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), Frequency Range (GHz) = [17, 26], CHAIN A

Figures:



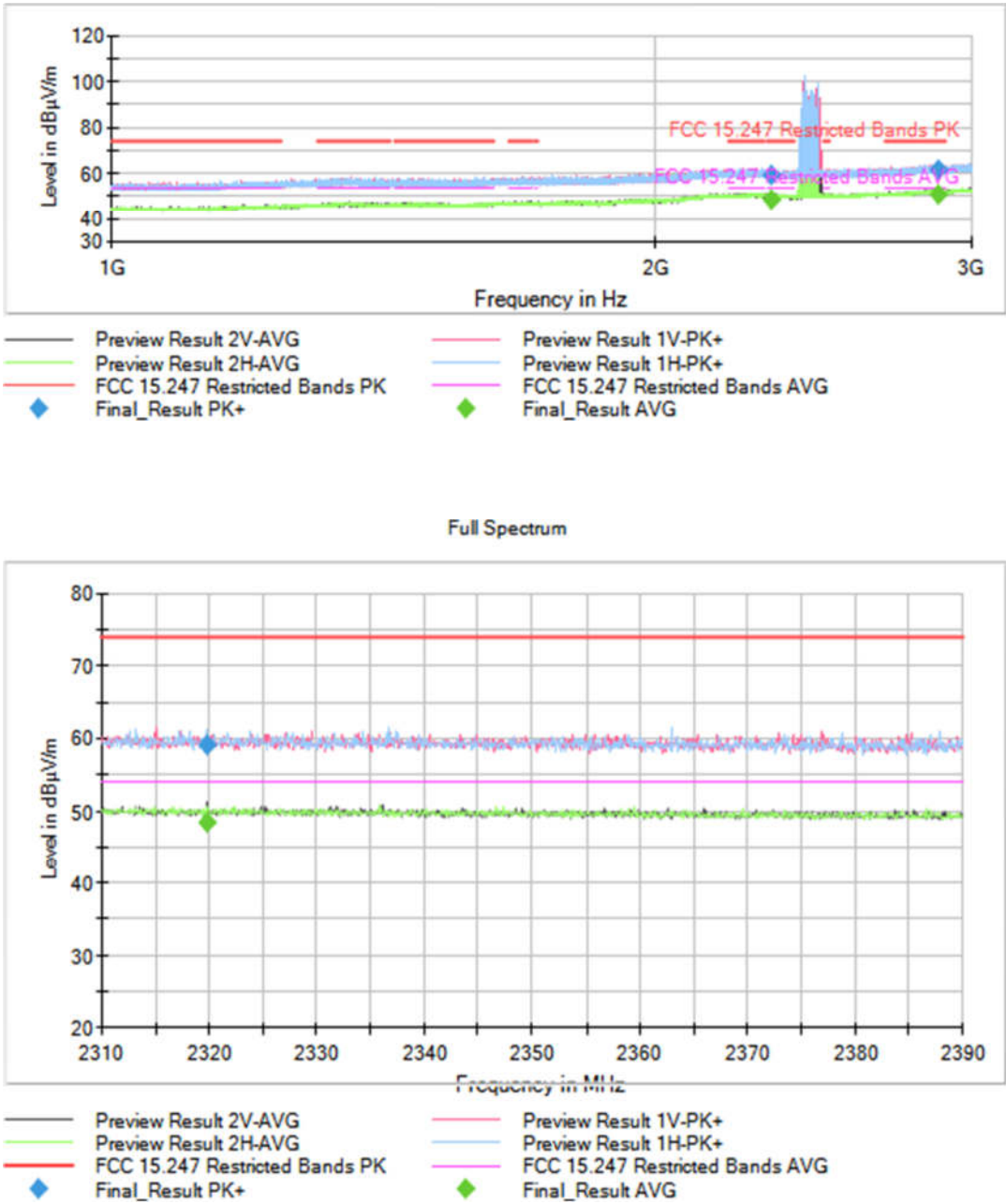
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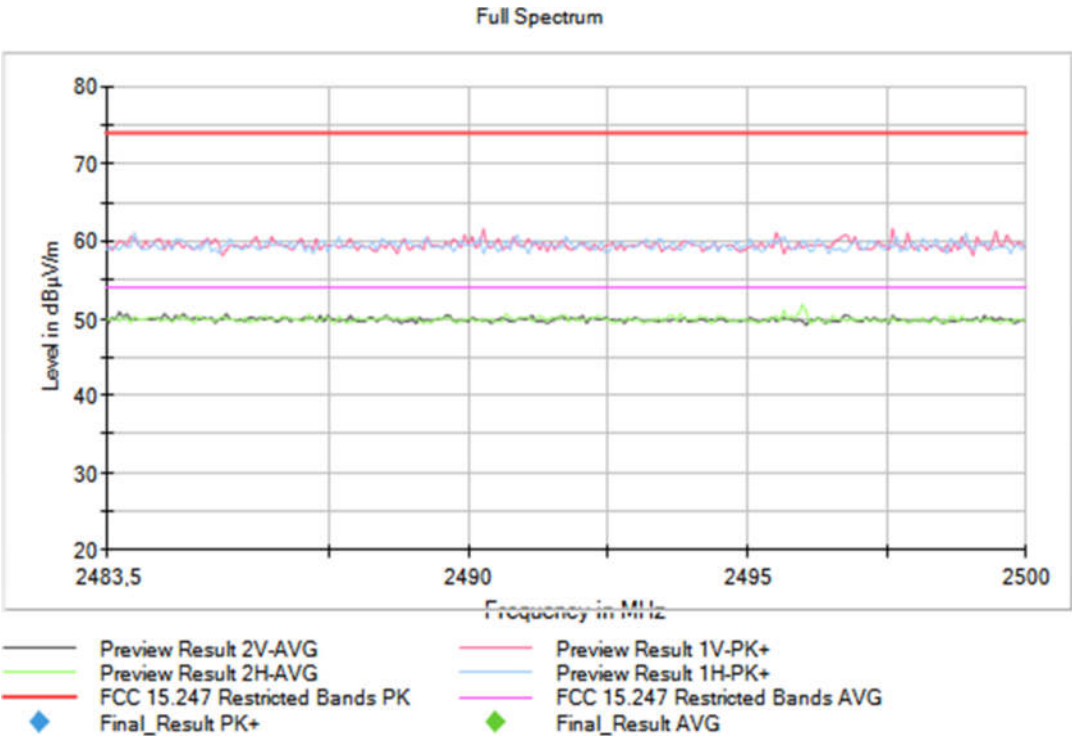
Figures:



Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), Frequency Range (GHz) = [1, 3], CHAIN B

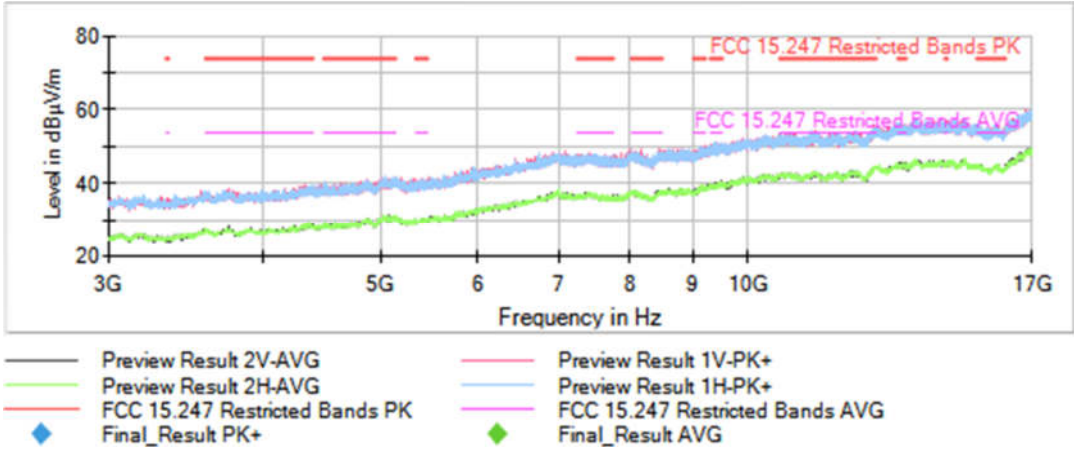
Figures:





Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), Frequency Range (GHz) = [3, 17], CHAIN B

Figures:



Frequency (MHz) = 2440.00000, Equipment Type: Digital Transmission System (DTS), Modulation: Proprietary 2.4GHz (250 kbit/s), Frequency Range (GHz) = [17, 26], CHAIN B

Figures:

