

ISED CABid: ES1909

Lab. Company Number: 4621A

Test Report No:

74986RRF.001A2

## Test Report

USA FCC Part 15.247, 15.209

CANADA RSS-247, RSS-Gen

(*) Identification of item tested	Ultrasonic Water Meter
(*) Trademark	flowIQ®2200
(*) Model and /or type reference	KWM2220
Other identification of the product	FCC ID: OUY-2023NB82 IC: 22376-2023NB82
(*) Features	LTE Cat NB2 and SRD in ISM band. HW version: 55502095-A4 (Top PCB) ; 55502080-D5 (Bottom PCB); SW version: 50981795 (Top PCB)
Applicant	Kamstrup A/S Industrivej 28 8660 Skanderborg, Denmark
Test method requested, standard	USA FCC Part 15.247 (10-1-21 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-21 Edition): Radiated emission limits; general requirements. CANADA RSS-247 Issue 3 (August 2023). CANADA RSS-Gen Issue 5 amendment 2 (February 2021). Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid Systems Devices Operating Under Section 15.247 of the FCC Rules. 558074 D01 Meas Guidance v05r02 dated April 2, 2019. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager
Date of issue	2024-02-22
Report template No	FDT08_24 (* "Data provided by the client")

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## Acronyms

Acronym ID	Acronym Description
Detector	Detector used
Equipment	Equipment Type
Freq	Frequency
Freq Rng	Frequency Range
MP	Measurement Point
Mod	Modulation
Mode	MIMO Mode
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.

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

## Uncertainty

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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

RF Average Output Power: Measurement uncertainty  $\leq \pm 0,99$  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

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The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample consists of a Ultrasonic Water Meter. The KWM2220 is based on 2 PCB boards and an Antenna. - Top PCB, where the MCU of the Meter calculator, the MCU of the communication and the NB-IoT modem and a short range device (SRD) radio are presented. - Bottom PCB, used for water flow measurement via Piezo electric device controlled with an ASIC. - The Antenna is a click-on antenna or a wall antenna. The KWM2220 contains a NB-IoT module with the FCC ID: XMR2021BC660KGL. The NB-IoT module is controlled by the RF micro controller. The KWM2220 forwards data directly to Meter Data Management system (MDM) READY Manager over the NB-IoT network with a subscription handled by Kamstrup. The main configuration of the KWM2220 is 1 daily data transmission. .

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 N°	Date of Reception	Application
S/01	74986C_2.1	Water Meter	flowIQ® 2200	02K82D18B8CA	2023-08-31	Element Under Test
	74986C_3.1	Click On Antenna Kit	6699663	--	2023-08-31	Element Under Test
S/02	74986C_1.1	Water Meter	flowIQ® 2200	02K82D18B8UB	2023-08-31	Element Under Test
	70058_6.1	Optical Readout USB	6699-099	--	2023-08-31	Auxiliary Element
	74986C_9.1	Connector SMA	--	--	2023-08-31	Auxiliary Element

Notes referenced to samples during the project:

Id	Type
S/01	Radiated
S/02	Conducted

## Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient <sup>(3)</sup>		
	<i>Antenna port</i>	7.5	[X]	[X]	[ ]		
	.....	.....	[ ]	[ ]	[ ]		
	.....	.....	[ ]	[ ]	[ ]		
Supplementary information to the ports..... :	.....						
Rated power supply .....	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[ ]	AC: .....	[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	AC: .....	[ ]	[ ]	[ ]	[ ]	[ ]
	[X]	DC: 3.6 Volt D celle Battery					
[ ]	DC: .....						
Rated Power .....	.....						
Clock frequencies.....	.....						
Other parameters .....	.....						
Software version .....	.....						
Hardware version .....	.....						
Dimensions in cm (W x H x D) .....	.....						
Mounting position .....	[ ]	Table top equipment					
	[ ]	Wall/Ceiling mounted equipment					
	[ ]	Floor standing equipment					
	[ ]	Hand-held equipment					
	[X]	Other: in the water pipe-Line in house or in the a pit.					
Modules/parts..... :	Module/parts of test item			Type	Manufacturer		
	KWM2220			02K82D18B 8UB	Kamstrup		

	KWM2220	02K82D18B 8CA	Kamstrup
	.....	.....	.....
	.....	.....	.....
Accessories (not part of the test item) .....	<b>Description</b>	<b>Type</b>	<b>Manufacturer</b>
	USB optical eye	6699099	Kamstrup
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....
Documents as provided by the applicant .....	<b>Description</b>	<b>File name</b>	<b>Issue date</b>
	Instruction to how set the test item into diff. testmodes	KWM_NB-C2 Instruction Manual	10-07-2023
	.....	.....	.....
	.....	.....	.....
	.....	.....	.....

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

## Identification of the client

Kamstrup A/S  
Industrivej 28 8660 Skanderborg, Denmark

## Testing period and place

<b>Test Location</b>	DEKRA Testing and Certification S.A.U.
<b>Date (start)</b>	2023-09-06
<b>Date (finish)</b>	2023-09-06

## Document history

Report number	Date	Description
74986RRF.001	2023-10-17	First release.
74986RRF.001A1	2024-02-13	First modification. Some typos are corrected: <ul style="list-style-type: none"><li>- On section "Maximum output power and antenna gain", references to BTLE 5.0 (GFSK 1 Mbit/s) are removed and replaced with 2-FSK.</li><li>- Along the report, a typo in the antenna gain is corrected to: Clik-ON antenna: Max 0 dBi; Wall antenna: Max 2.2 dBi.</li></ul> This report cancels and replaces the previous 74986RRF.001.
74986RRF.001A2	2024-02-22	Second modification. Pretesting measurements to determine the worst case between the click-on antenna and the wall antenna are added. The issue of standard " CANADA RSS-247 " has been updated from issue 2 to issue 3.  This report cancels and replaces the previous 74986RRF.001A1.



## Environmental conditions

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

<b>Temperature</b>	Min. = 15 °C Max. = 35 °C
<b>Relative humidity</b>	Min. = 20 % Max. = 75 %

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

<b>Temperature</b>	Min. = 15 °C Max. = 35 °C
<b>Relative humidity</b>	Min. = 20 % Max. = 75 %

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

<b>Temperature</b>	Min. = 15 °C Max. = 35 °C
<b>Relative humidity</b>	Min. = 20 % Max. = 75 %

## Remarks and comments

The tests have been performed by the technical personnel: Alvaro Gutierrez Naranjo, Pablo Redondo Reyes and Antonio Manuel Sánchez Carrizo.

## List of equipment used during the test

Control No.	Equipment	Model	Manufacturer	Next Calibration
04578	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2026-06-01
04611	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2026-01-16
04716	SIGNAL AND SPECTRUM ANALYZER 2Hz-50GHz	FSW50	ROHDE AND SCHWARZ	2024-08-12
04825	SEMIANECHOIC ABSORBER LINED CHAMBER II	FACT 3 200 STP	ETS LINDGREN	---
04826	SHIELDED ROOM	S101	ETS LINDGREN	---
04848	EMC/RF MEASUREMENT SOFTWARE	EMC32	ROHDE AND SCHWARZ	---
05705	PRE-AMPLIFIER G>40dB 1-18 GHz	BLMA 0118-1M	BONN ELEKTRONIK	2024-07-26
06142	PRE-AMPLIFIER G>38dB 30MHz-6GHz	BLNA 0360-01N	BONN ELEKTRONIK	2024-06-28
06165	EMI TEST RECEIVER 9kHz-7GHz	ESR7	ROHDE AND SCHWARZ	2023-11-08
07547	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2024-04-21
07548	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2024-04-21
07758	DIGITAL MULTIMETER	175	FLUKE	2023-11-14
07552	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2024-05-02
08835	SIGNAL AND SPECTRUM ANALYZER 2Hz-50GHz	FSW50	ROHDE AND SCHWARZ	2025-02-08

## Testing verdicts

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

## Summary

### SRD 902-928 MHz

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

## Appendix A: Test results. SRD 902-928 MHz

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<i>FCC 15.247 (a)(2) / RSS-247 5.2. (a) 6 dB Bandwidth .....</i>	<i>30</i>
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<i>FCC 15.247 (d) / RSS-247 5.5. Band-edge emissions compliance (Transmitter) .....</i>	<i>34</i>
<i>FCC 15.247 (e) / RSS-247 5.2. (b) Power spectral density.....</i>	<i>36</i>

## TEST CONDITIONS

(\*): Data provided by the client.

### POWER SUPPLY (\*):

Vnominal: 3.6 Volt D celle Battery V  
 Type of Power Supply: Battery

### ANTENNA (\*):

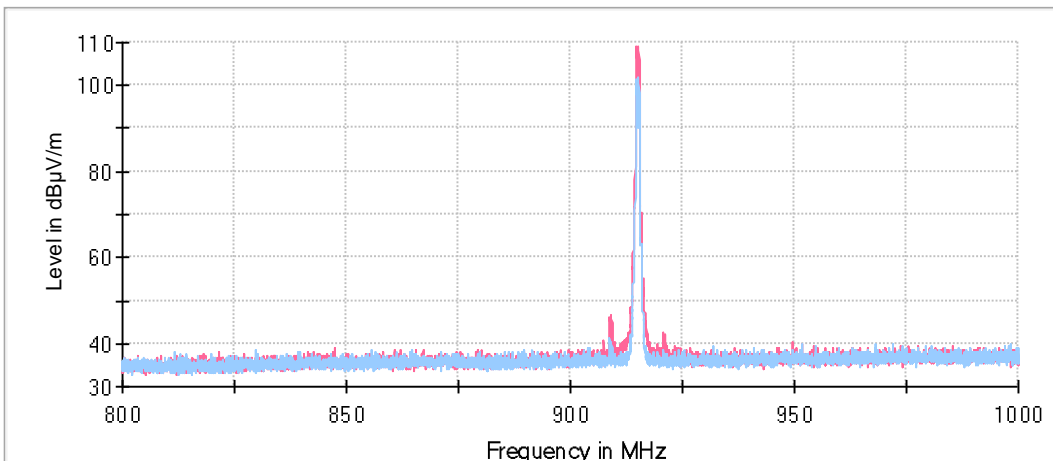
Type of Antenna: Klik-ON antenna  
 Maximum Declared Antenna Gain: 0 dBi

Type of Antenna: Wall antenna  
 Maximum Declared Antenna Gain: 2.2 dBi

The radiated measurements were performed with worst case antenna, Klik ON antenna.

Worst case results:

### CLICK-ON ANTENNA:

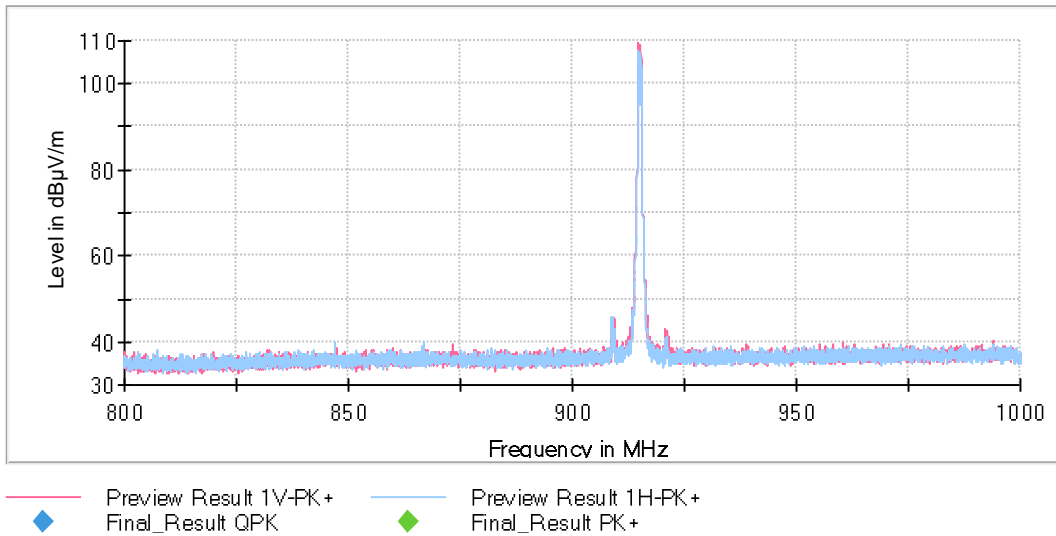


◆ Preview Result 1V-PK+ Final\_Result QPK  
 ◆ Preview Result 1H-PK+ Final\_Result PK+

### Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)
914.791563	109.47

WALL ANTENNA:



**Critical\_Freqs**

Frequency (MHz)	MaxPeak (dBµV/m)
914.791563	109.19

TEST FREQUENCIES (\*):

Modulation	Low Channel	Middle Channel	High Channel
2-FSK	912.5 MHz	915 MHz	918.5 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.

The middle channel was not measured because the difference between the low and high channel is less than 10MHz.

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).

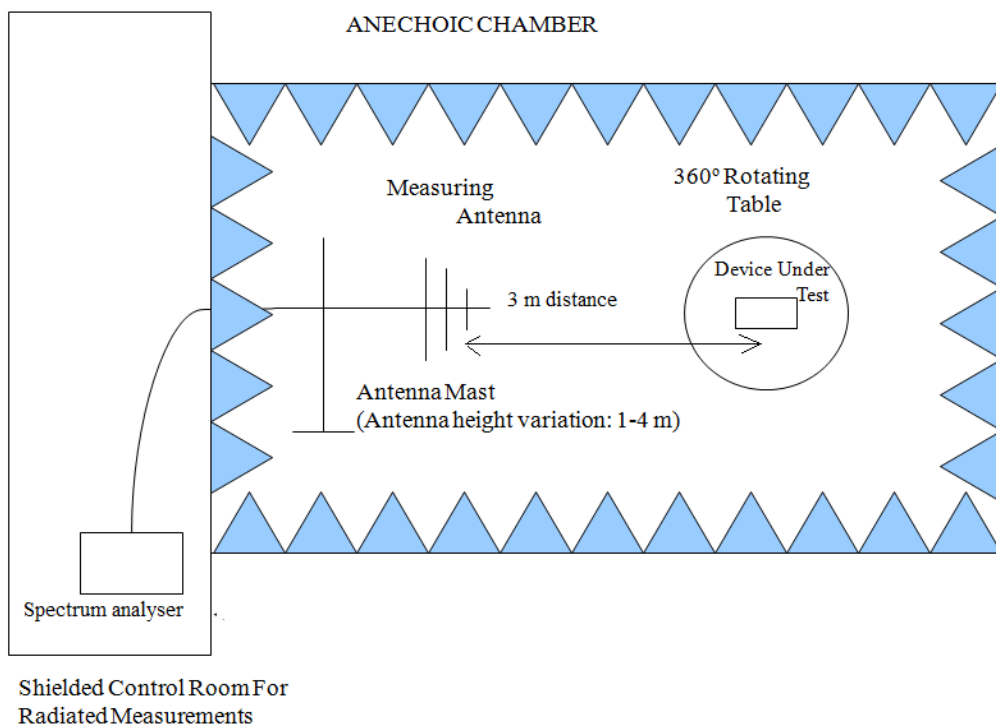
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

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 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.

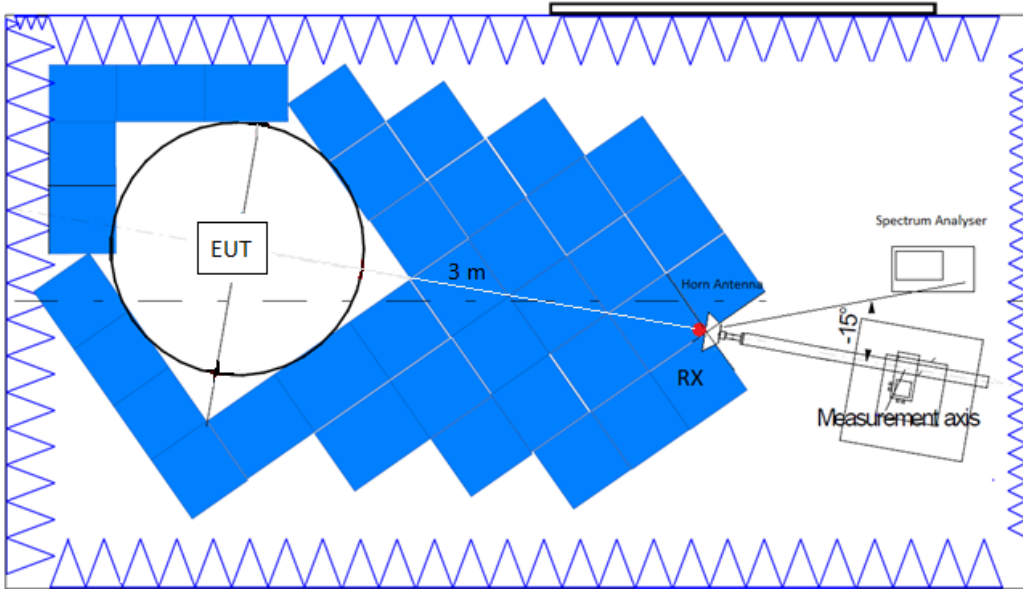
A resolution bandwidth/video bandwidth of 100 kHz / 300 kHz was used for frequencies below 1 GHz and 1 MHz / 3 MHz for frequencies above 1 GHz.

Radiated measurements setup from 30 MHz to 1 GHz:

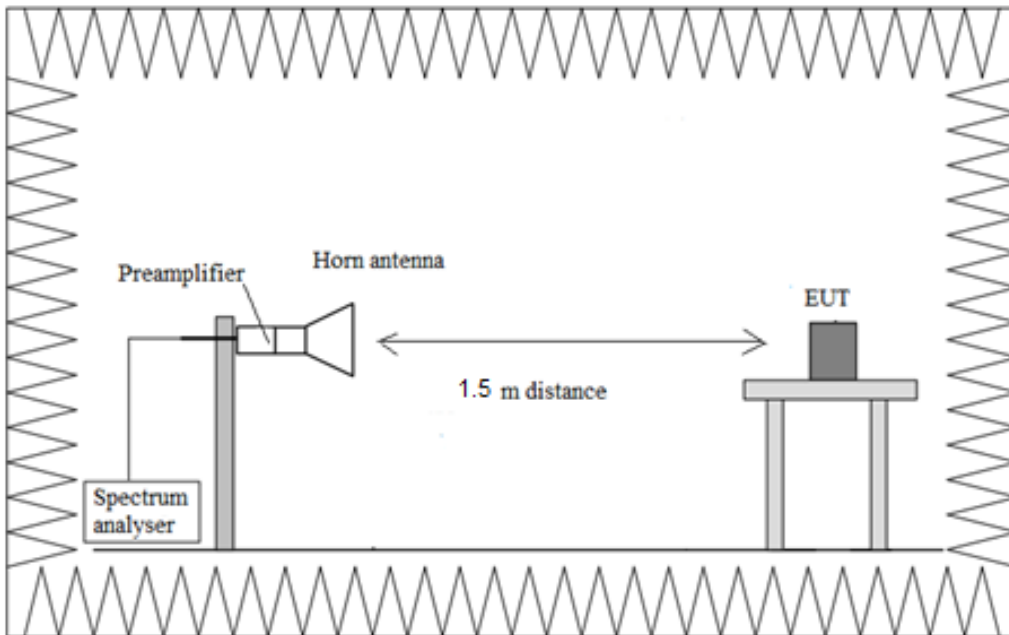




Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup  $f > 17$  GHz:



## TEST CASES DETAILS

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

#### Limits

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

Frequency Range (MHz)	Field strength ( $\mu\text{V/m}$ )	Field strength ( $\text{dB}\mu\text{V/m}$ )	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.

Modulation: 2-FSK

**Results**

S/01

Spurious frequencies detected at less than 20 dB below the limit

Freq Rng (GHz)	Freq (MHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[0.03, 1]	912.50000	863.139	28.22	V	PK
		863.139	22.62	V	QP
		864.715	29.53	V	PK
		864.715	26.07	V	QP
		894.725	29.39	V	PK
		894.725	24.93	V	QP
		900.242	30.40	V	PK
		900.242	26.01	V	QP
		930.706	28.79	V	PK
		930.706	24.30	V	QP
	918.50000	870.778	29.13	V	PK
		870.778	24.04	V	QP
		895.452	30.05	V	PK
		895.452	25.74	V	QP
		897.574	29.41	V	PK
		897.574	25.33	V	QP
		900.696	30.13	V	PK
		900.696	24.85	V	QP
		930.312	29.43	V	PK
		930.312	25.06	V	QP
[1, 3]	912.50000	1824.462	55.20	V	PK
		1824.462	46.91	V	AVG
	918.50000	1836.738	56.23	V	PK
		1836.738	47.56	V	AVG
[3, 10]	912.50000	No spurious frequencies detected			
	918.50000				

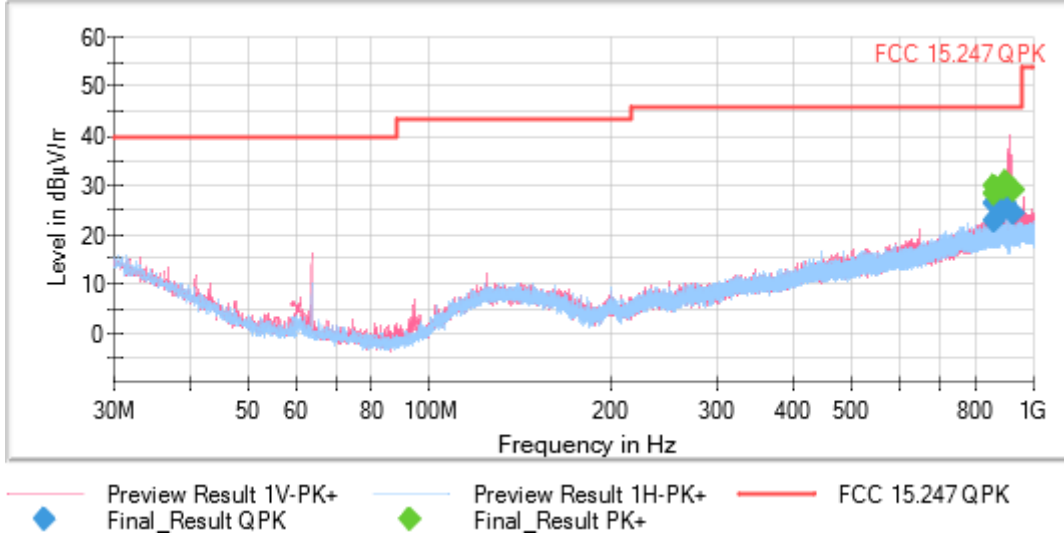
**Verdict**

Pass

**Attachments**

Frequency Range GHz = [0.03, 1]    Equipment Type = Digital Transmission System (DTS)  
 Modulation = 2-FSK    Frequency MHz = 912.50000  
 MIMO Mode = SISO    Measurement Point = 1  
 Active Port = 1

**Images:**



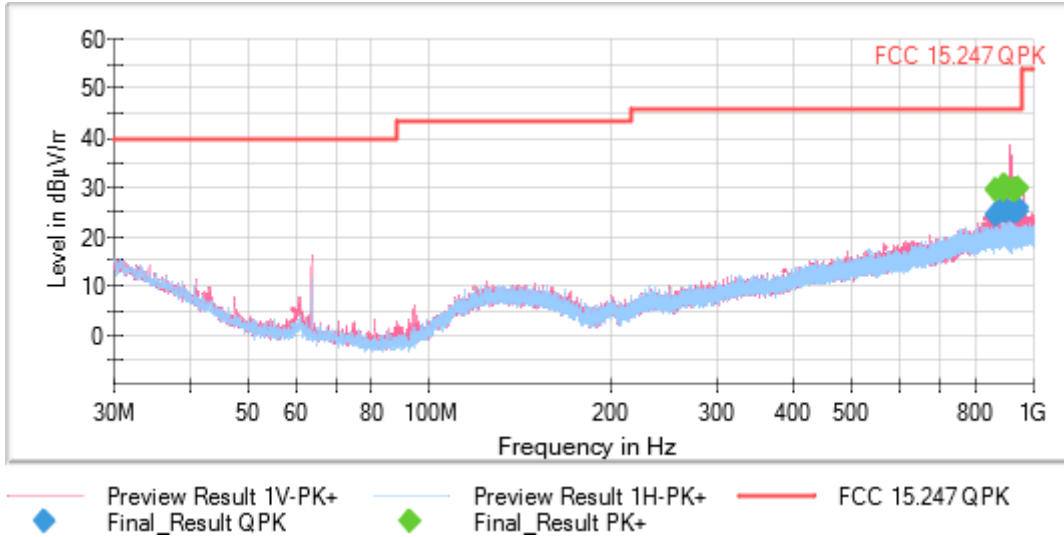
**Tables:**

Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESR 7]					
	30 MHz - 1 GHz	30,312 kHz	PK+	100 kHz	1 s	0 dB

Frequency Range GHz = [0.03, 1]    Equipment Type = Digital Transmission System (DTS)  
 Modulation = 2-FSK    Frequency MHz = 918.50000  
 MIMO Mode = SISO    Measurement Point = 1  
 Active Port = 1

**Images:**



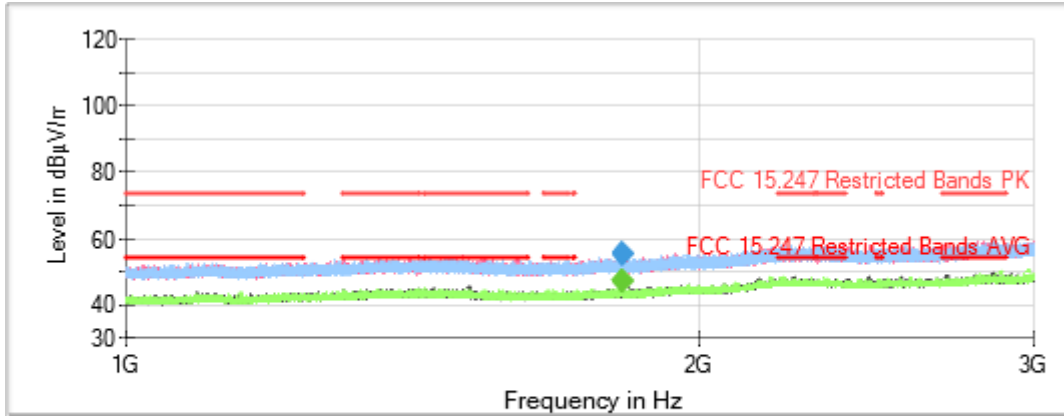
**Tables:**

Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESR 7]					
	30 MHz - 1 GHz	30,312 kHz	PK+	100 kHz	1 s	0 dB

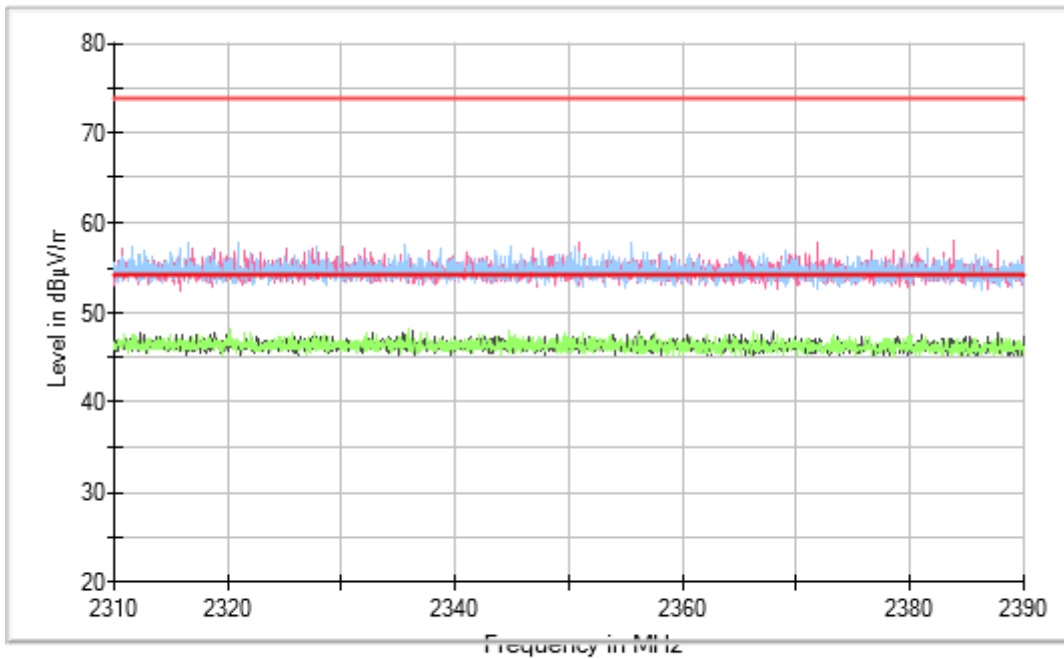
Frequency Range GHz = [1, 3]    Equipment Type = Digital Transmission System (DTS)  
 Modulation = 2-FSK    Frequency MHz = 912.50000  
 MIMO Mode = SISO    Measurement Point = 1  
 Active Port = 1

Images:



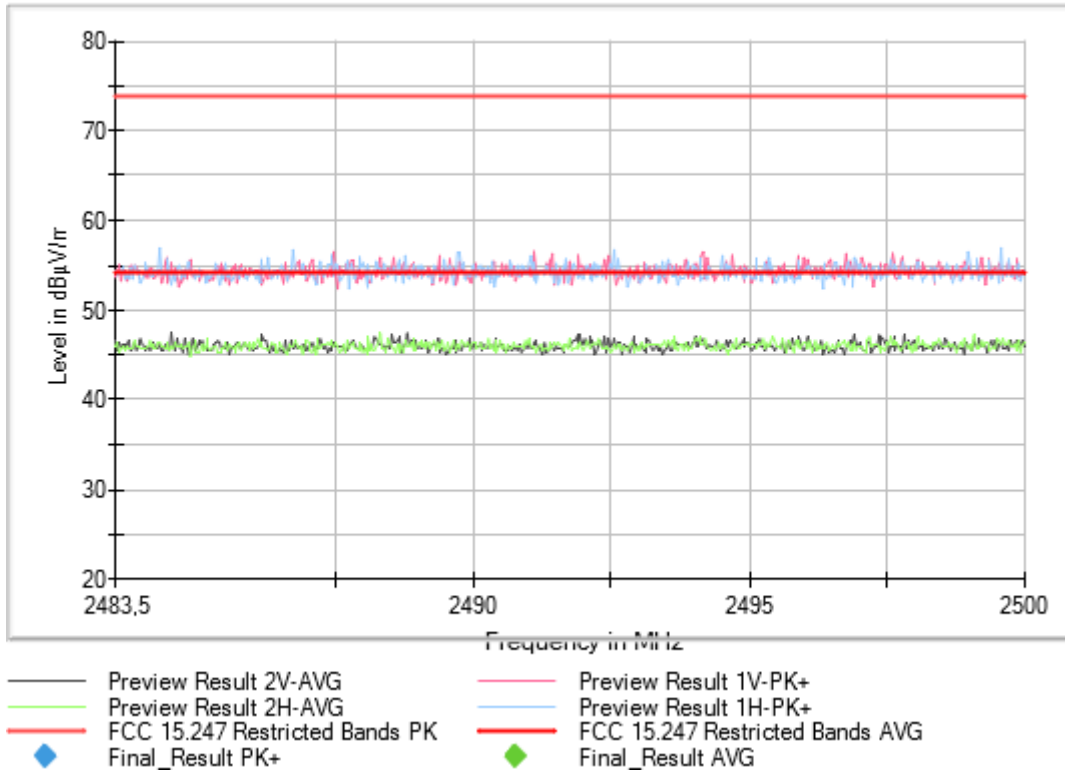
- Preview Result 2V-AVG
- Preview Result 2H-AVG
- FCC 15.247 Restricted Bands PK
- ◆ Final\_Result PK+
- Preview Result 1V-PK+
- Preview Result 1H-PK+
- FCC 15.247 Restricted Bands AVG
- ◆ Final\_Result AVG

Full Spectrum



- Preview Result 2V-AVG
- Preview Result 2H-AVG
- FCC 15.247 Restricted Bands PK
- ◆ Final\_Result PK+
- Preview Result 1V-PK+
- Preview Result 1H-PK+
- FCC 15.247 Restricted Bands AVG
- ◆ Final\_Result AVG

Full Spectrum



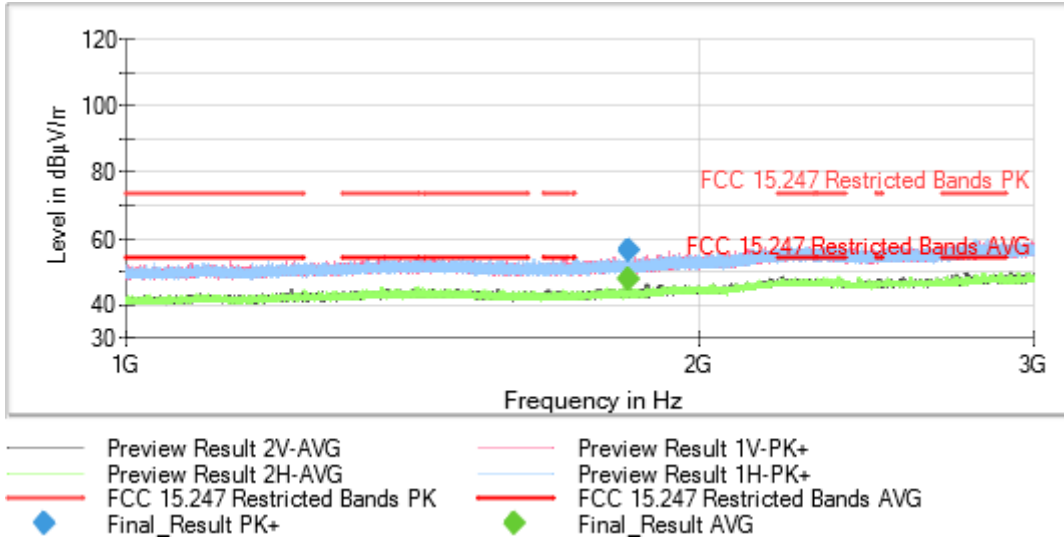
**Tables:**

Spectrum Analyzer Parameters

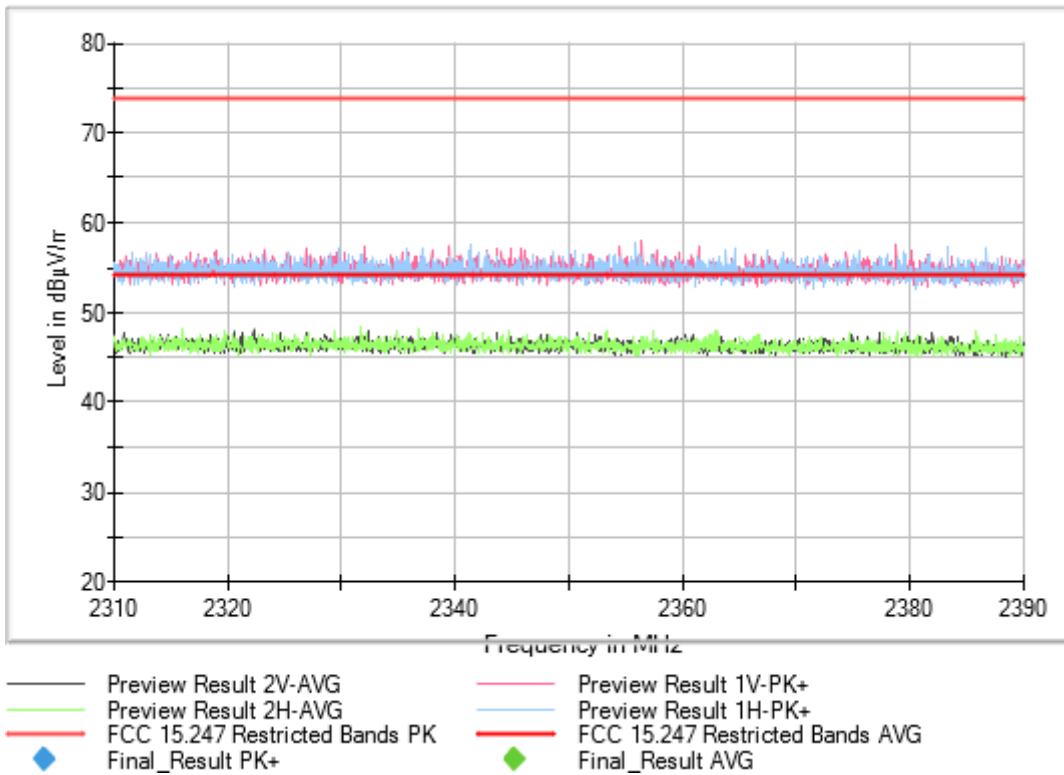
	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [FSW 50]					
	1 GHz - 3 GHz	30,769 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

Frequency Range GHz = [1, 3]    Equipment Type = Digital Transmission System (DTS)  
 Modulation = 2-FSK    Frequency MHz = 918.50000  
 MIMO Mode = SISO    Measurement Point = 1  
 Active Port = 1

**Images:**

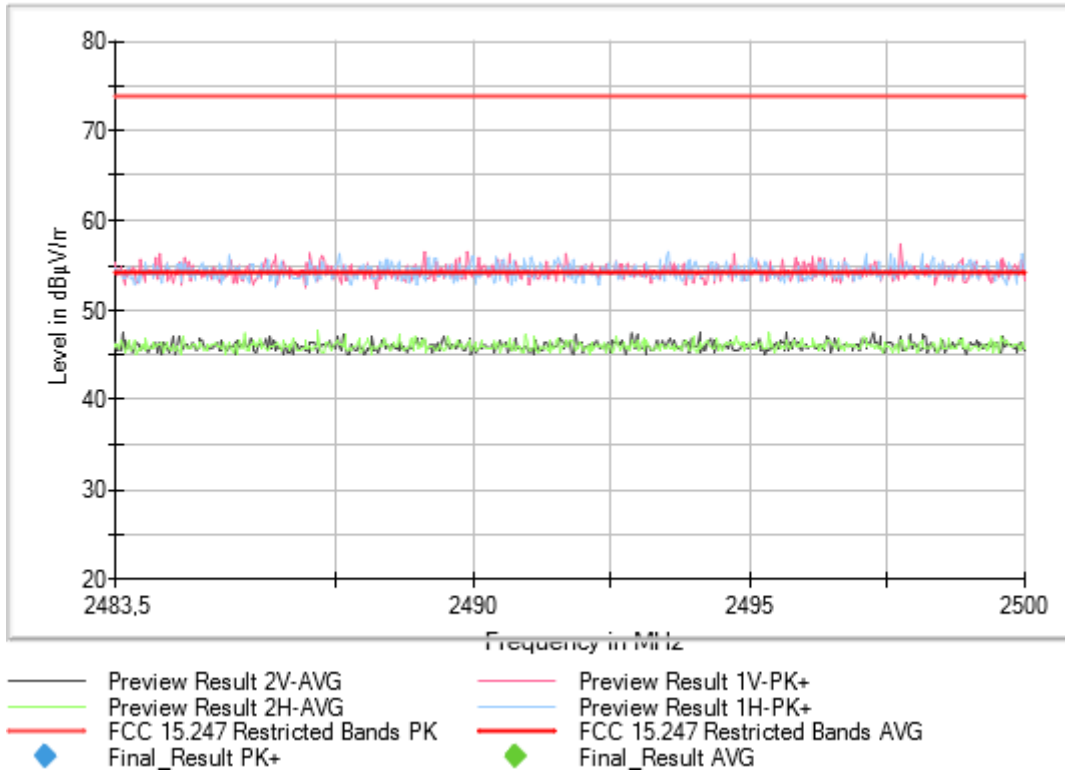


Full Spectrum





Full Spectrum



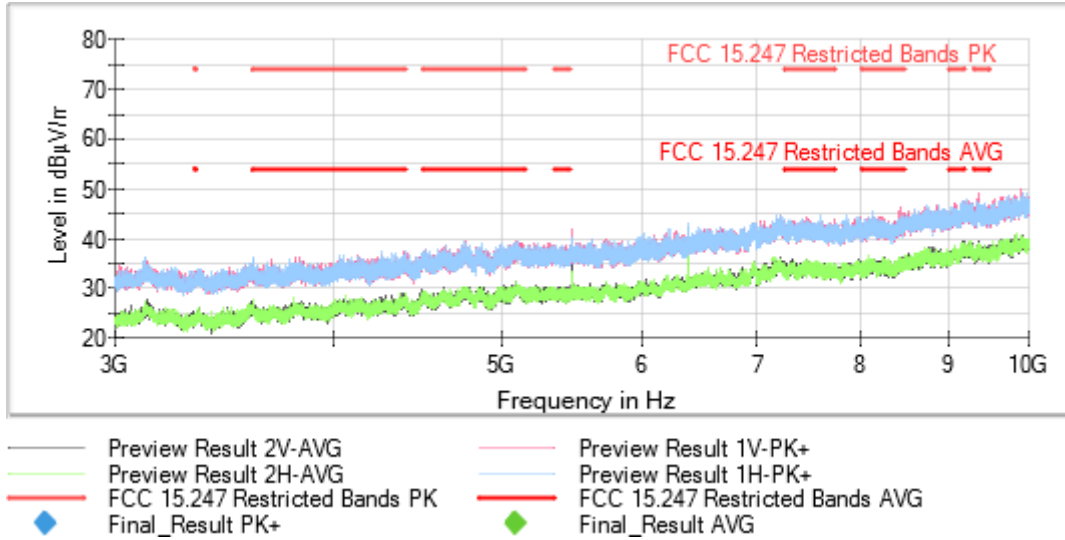
**Tables:**

Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [FSW 50]					
	1 GHz - 3 GHz	30,769 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

Frequency Range GHz = [3, 10]    Equipment Type = Digital Transmission System (DTS)  
 Modulation = 2-FSK    Frequency MHz = 912.50000  
 MIMO Mode = SISO    Measurement Point = 1  
 Active Port = 1

**Images:**



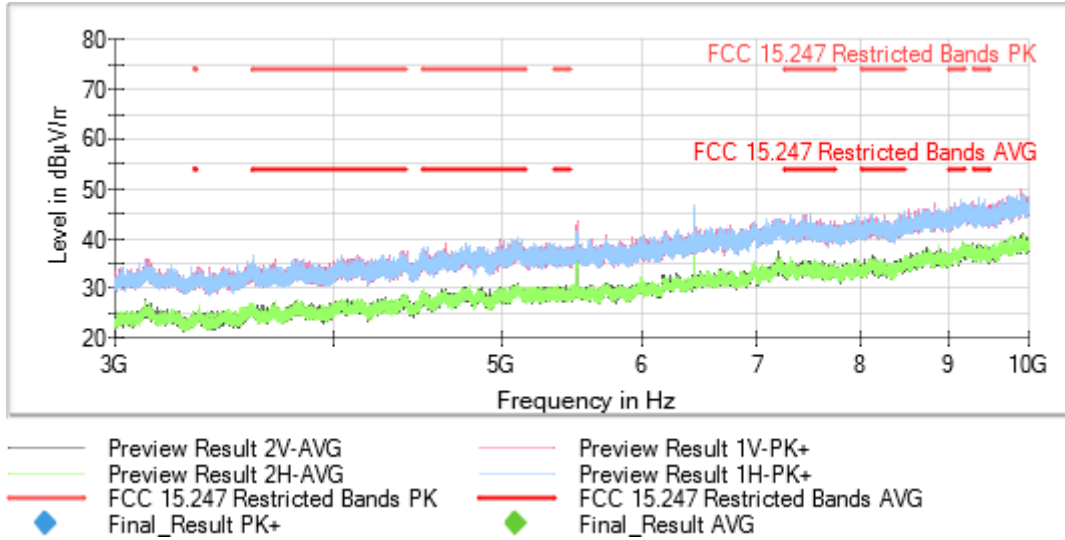
**Tables:**

Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [FSW 50]					
	3 GHz - 17 GHz	140 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

Frequency Range GHz = [3, 10]    Equipment Type = Digital Transmission System (DTS)  
 Modulation = 2-FSK    Frequency MHz = 918.50000  
 MIMO Mode = SISO    Measurement Point = 1  
 Active Port = 1

**Images:**



**Tables:**

Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [FSW 50]					
	3 GHz - 17 GHz	140 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

## Occupied Channel Bandwidth 99% & 26dB Bandwidth

### Results

S/02

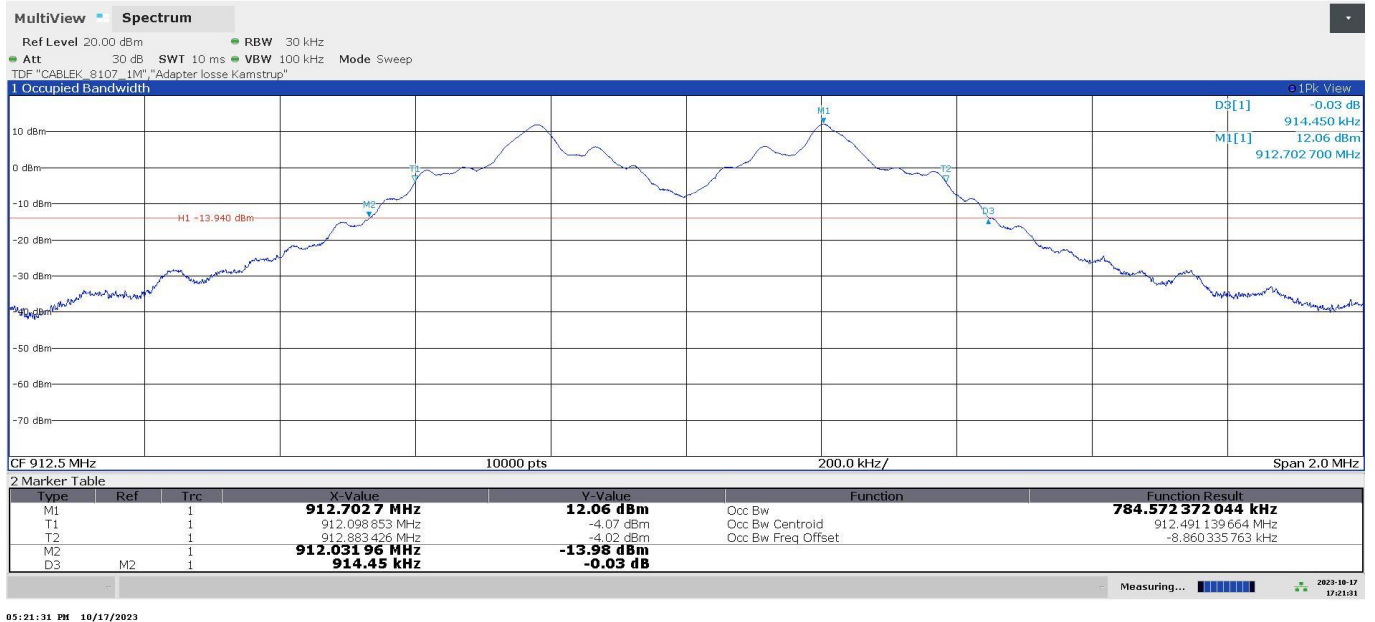
Modulation: 2-FSK

Freq (MHz)	Occ Ch BW (MHz)	26dB BW (MHz)
912.5	0.784572	0.91445
918.5	0.783598	0.91238

### Attachments

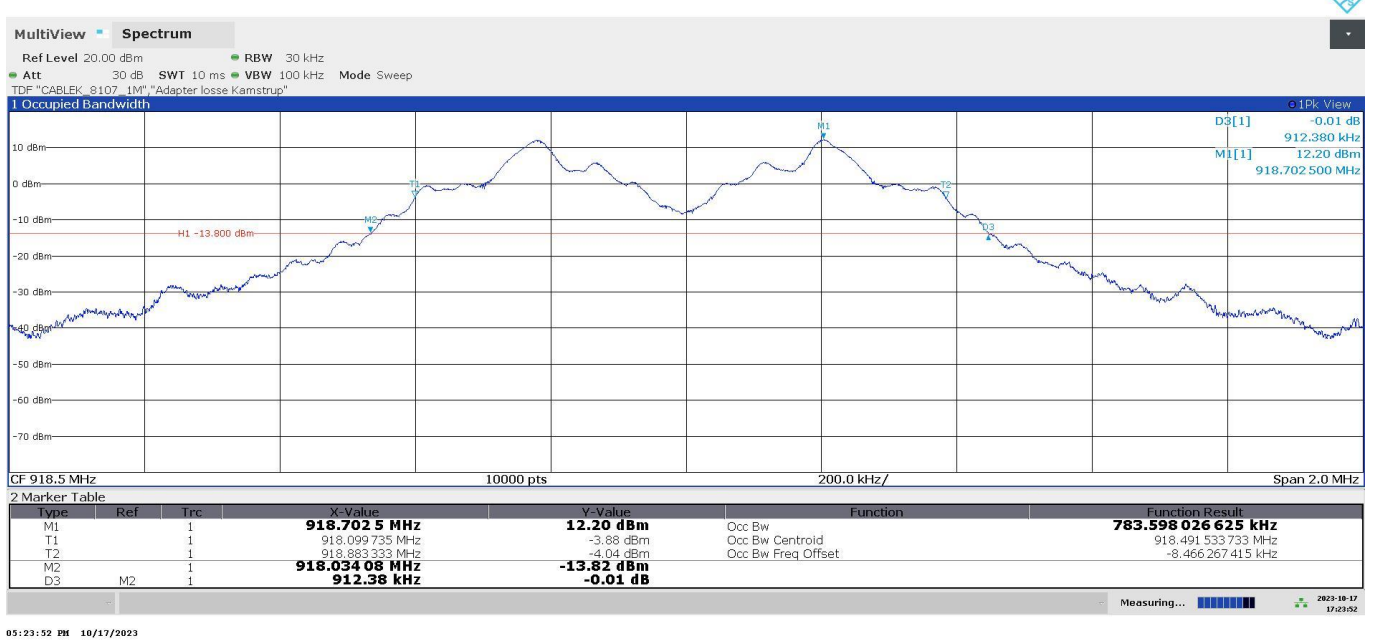
Modulation = 2-FSK Frequency MHz = 912.5

### Images:



Modulation = 2-FSK Frequency MHz = 918.5

### Images:



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

### Limits

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

### Results

S/02

Modulation: 2-FSK

Freq (MHz)	6 dB Bandwidth (MHz)
912.5	0.65031
918.5	0.64747

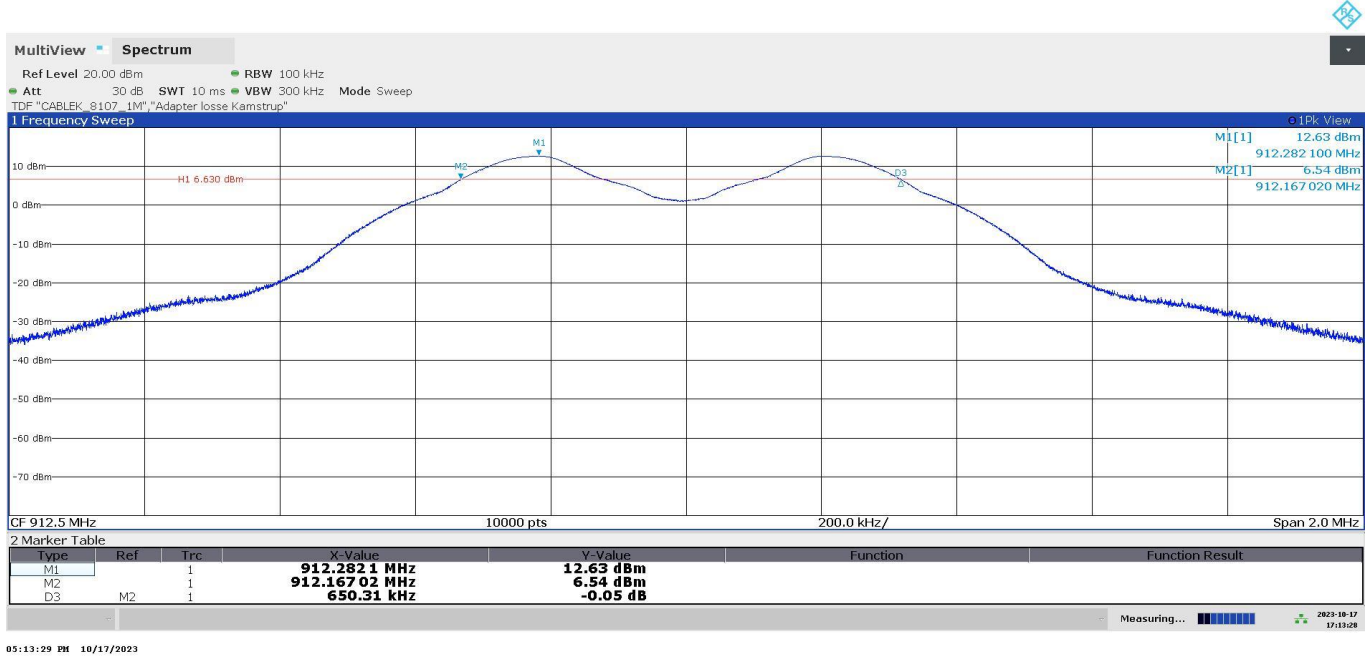
### Verdict

Pass

**Attachments**

Modulation = 2-FSK Frequency MHz = 912.5

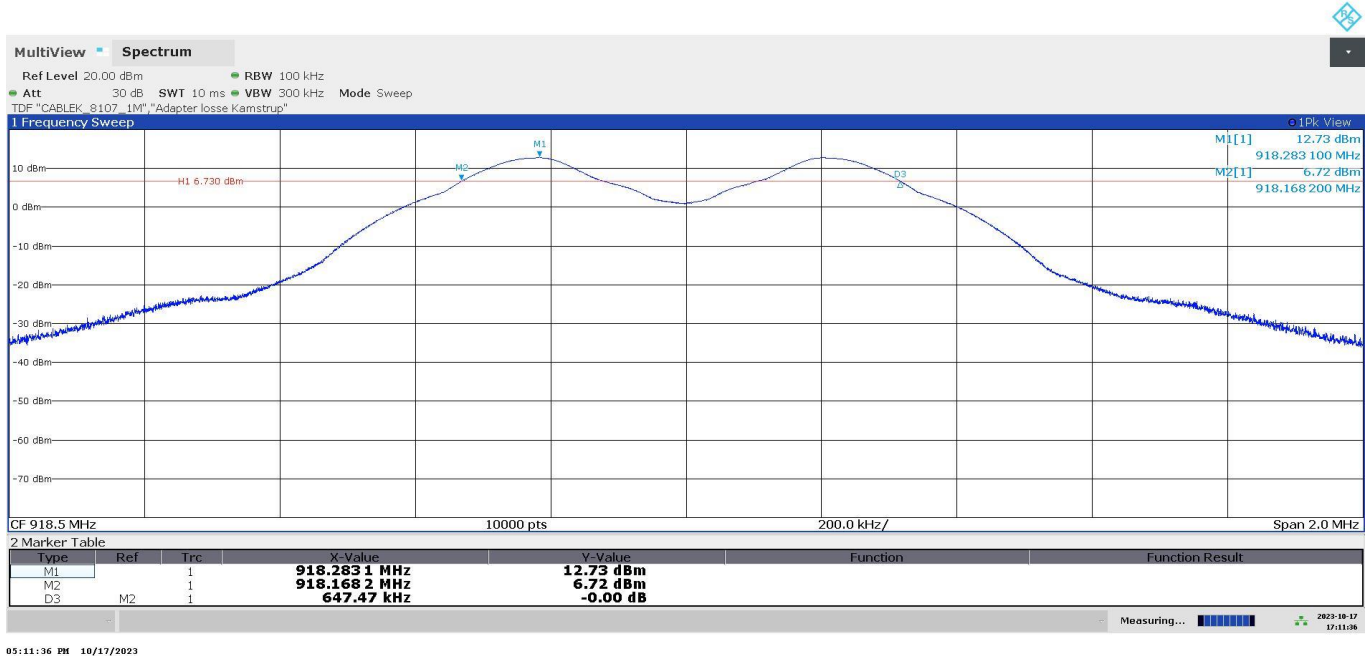
**Images:**



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Modulation = 2-FSK Frequency MHz = 918.5

**Images:**



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## FCC 15.247 (b) / RSS-247 5.4. (d) Maximum output power and antenna gain

### 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) (RSS-247).

The maximum peak conducted output power level in the fundamental emission was measured using the method according to point 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.

Type of Antenna: Clik-ON antenna  
Maximum Declared Antenna Gain: 0 dBi

Type of Antenna: Wall antenna  
Maximum Declared Antenna Gain: 2.2 dBi

### Results

S/02

Modulation: 2-FSK

Freq (MHz)	Maximum Conducted Power (dBm)	Clik-ON antenna Maximum EIRP Power (dBm)	Wall antenna Maximum EIRP Power (dBm)
912.5	12.75	12.75	14.95
918.5	12.64	12.64	14.84

### Verdict

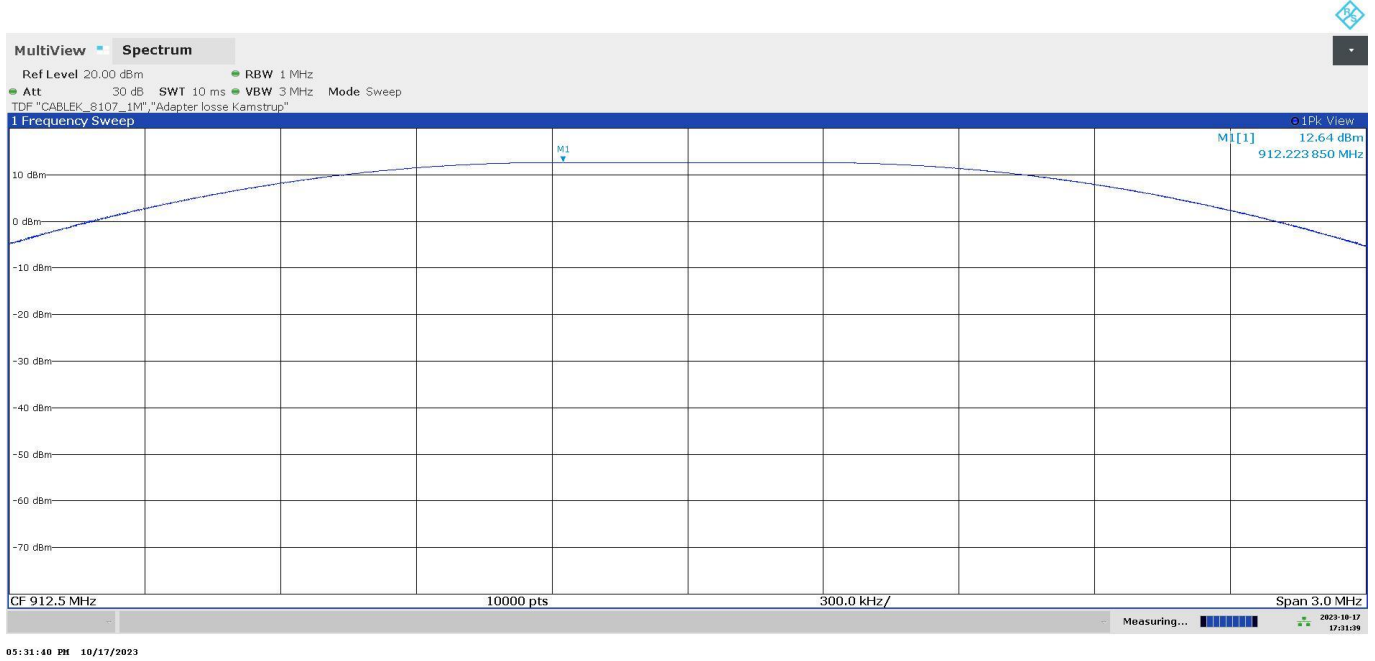
Pass



### Attachments

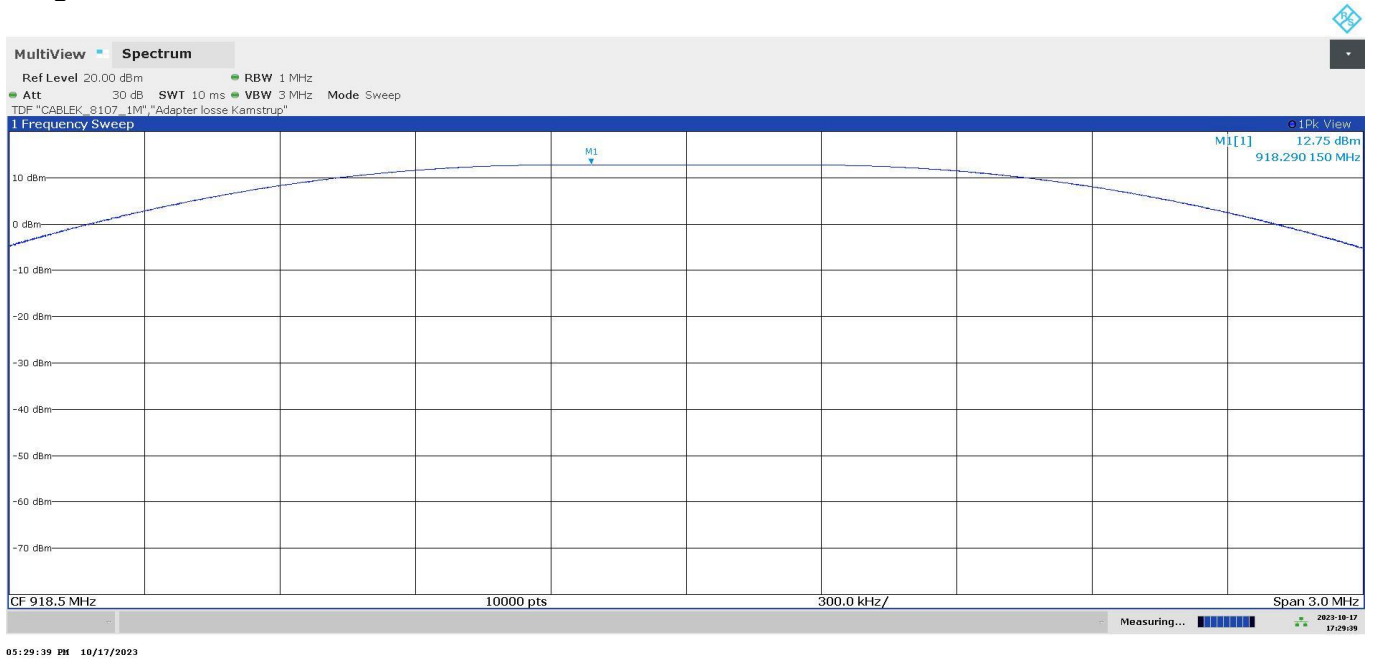
Modulation = 2-FSK Frequency MHz = 912.5

### Images:



Modulation = 2-FSK Frequency MHz = 918.5

### Images:



## FCC 15.247 (d) / RSS-247 5.5. 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.

### **Results**

S/02

Modulation: 2-FSK

No peaks detected at less than 20 dB below the limit.

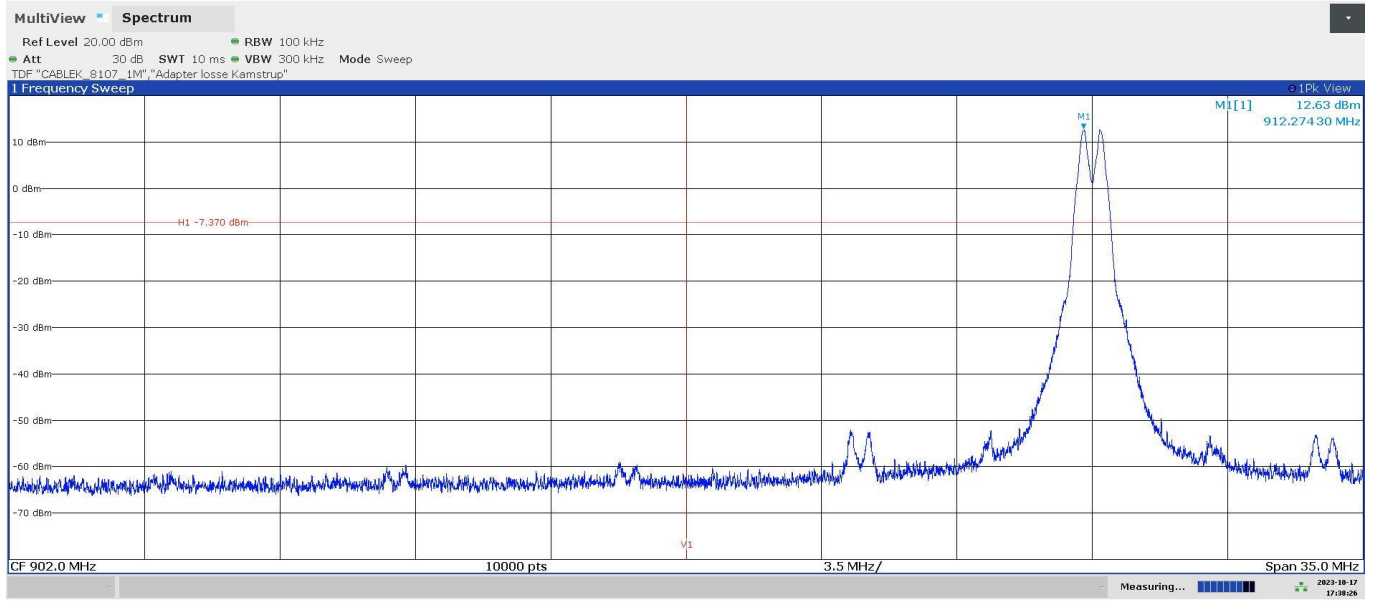
### **Verdict**

Pass

### Attachments

Modulation = 2-FSK Frequency MHz = 912.5

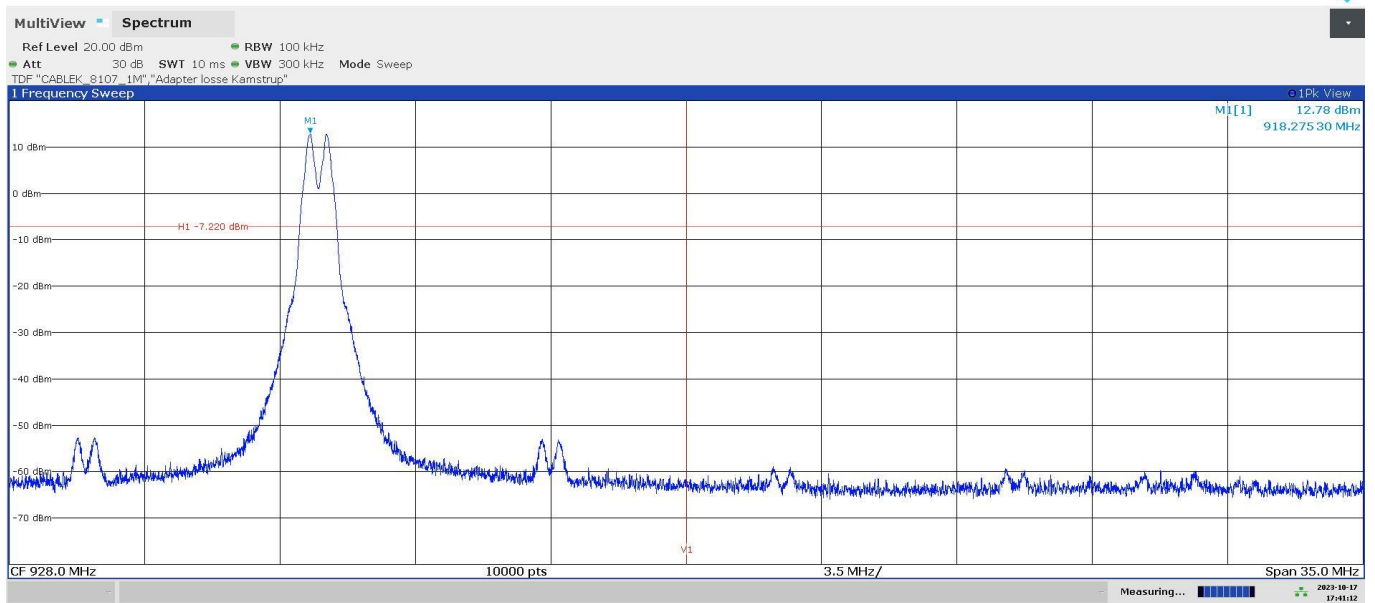
### Images:



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Modulation = 2-FSK Frequency MHz = 918.5

### Images:



05:41:12 PM 10/17/2023

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

S/02

Modulation: 2-FSK

Freq (MHz)	Measured Freq (MHz)	PSD (dBm)
912.5	912.7272345	4.21
918.5	918.7270195	4.36

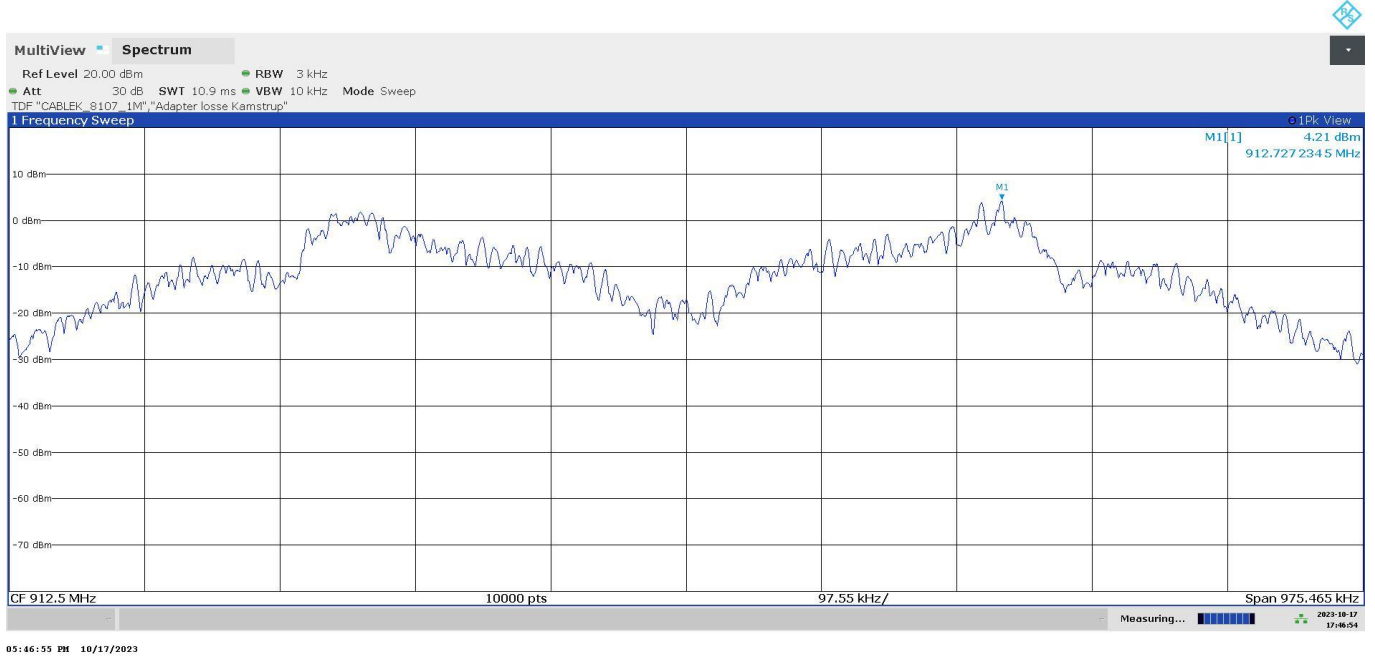
### Verdict

Pass

### Attachments

Modulation = 2-FSK Frequency MHz = 912.5

### Images:



Modulation = 2-FSK Frequency MHz = 918.5

### Images:

