

ISED CABid: ES1909

Lab. Company Number: 4621A

Test Report No:

82138RRF.003A1

Test Report

USA FCC Part 15.247, 15.209

CANADA RSS-247, RSS-Gen

(*) Identification of item tested	LoRaWAN gateway
(*) Trademark	Fonroche Lighting
(*) Model and /or type reference	GATEWAY V2
Other identification of the product	FCC ID: 2AZ65-GWV2 - Contains FCCID: XMR201903EG25G Model: EG25G IC: Not provided data - Contains IC: 10224A- 201903EG25G Model: EG25G
(*) Features	LoRa, LTE, GNSS HW version: V1.0 SW version: Keros 6.2.0 (Caius)
Applicant	Fonroche Lighting 174 Allée de Martinon CS 40010 47901 Agen Cedex 9 FRANCE
Test method requested, standard	USA FCC Part 15.247 (10-1-23 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-23 Edition): Radiated emission limits; general requirements. CANADA RSS-247 Issue 4 (July 2025). 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 C63.10-2020 + Cor.1-2023 + C63.10a-2024 + Errata to C63.10a-2024: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager  Firmado digitalmente por 53680346W JOSE MANUEL GOMEZ (C:A29507456)
Date of issue	2025-12-02
Report template No	FDT08_25 (*) "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
Operation Band	Operation Band
Pol	Polarization
Port	Active Port
RU	Resource Unit
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

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 10 GHz is:
Measurement uncertainty $\leq \pm 4,32$ 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 consists of a LoRaWAN gateway. The gateway is part of the global Long Range Radio fixed network to provide M2M connectivity link between low power endpoint and Internet Access. The product is specifically designed for street lighting application in outdoor environments. It is based on "LoRa" technology provided by Semtech Company and is compatible and interoperable with existing LoRa LPWAN.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results. The laboratory is not responsible for such information and it is not covered by accreditation.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial N°	Date of Reception	Application
S/01	82138B_2	Wirnet iStation Gauja 915	Gateway V2	450E0a01002A	2025-03-18	Element Under Test
	82138B_25	Power Supply Cable	--	--	2025-03-18	Auxiliary Element
S/02	82138B_2	Wirnet iStation Gauja 915	Gateway V2	450E0a01002A	2025-03-18	Element Under Test
	82138B_27	Power Supply Cable	--	--	2025-03-18	Auxiliary Element

Notes referenced to samples during the project:

Id	Type
S/01	Sample used for radiated testing.
S/02	Sample used for conducted testing.

Test sample description

Ports..... :	Port name and description		Cable				
			Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾	
	Ethernet		>3m	[X]	[]	[]	
	DC supply		<1m	[X]	[]	[]	
	LoRa RF		1m	[X]	[X]	[]	
.....			[]	[]	[]		
Supplementary information to the ports..... :	Ethernet port is used for configuration only (and during tests) but is not used in nominal usage						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[]	AC:	[]	[]	[]	[]	[]
[X]	DC: 24VDC nominal (10VDC-56VDC range)						
Rated Power	2.5W nominal; 0.75A max						
Clock frequencies.....	32MHz, 26MHz, 24MHz, 32.768KHz						
Other parameters							
Software version	Keros 6.2.0 (Caius)						
Hardware version	V1.0						
Dimensions in cm (W x H x D)	430 x 105 x 55 mm						
Mounting position	[]	Table top equipment					
	[]	Wall/Ceiling mounted equipment					
	[]	Floor standing equipment					
	[]	Hand-held equipment					
	[X]	Other: Solar streetlights					
Modules/parts..... :	Module/parts of test item		Type		Manufacturer		
	EG25G		LTE		Quectel		
	NEO7N		GNSS		uBlox		
Accessories (not part of the test item)	Description		Type		Manufacturer		
	Kit fasteners		Mechanical		Fonroche		
	Supply cable		Cable		Chogori		
	External LoRa antenna		Antenna		Panorama		
	External LoRa antenna mounting kit		Mechanical		Panorama		
Documents as provided by the applicant	Description		File name		Issue date		
							

⁽³⁾ Only for Medical Equipment

Identification of the client

Kerlink
1 rue Jacqueline Auriol 35235 Thorigne-Fouillard, France

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2025-06-13
Date (finish)	2025-06-18

Document history

Report number	Date	Description
82138RRF.003	2025-06-23	First release.
82138RRF.003A1	2025-12-02	Second release. Modification due to ANSI standard update. This test report cancels and replaces to 82138RRF.003

Environmental conditions

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

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

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

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

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

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

Remarks and comments

The tests have been performed by the technical personnel: Aitana Díaz and Carmen Vázquez.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
06791	SEMIANECHOIC ABSORBER LINED CHAMBER IV	FACT 3 200 STP	ETS LINDGREN	N/A
06792	SHIELDED ROOM	S101	ETS LINDGREN	N/A
06609	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2026-04-21
06615	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2026-04-24
06143	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2027-01-22
06496	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK	2026-12-01
03783	PRE-AMPLIFIER G>30dB 1GHz-18GHz	BLMA 0118-3A	BONN ELEKTRONIK	2026-03-17
07817	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2026-07-01
07445	DC POWER SUPPLY 30V/5A	U8002A	KEYSIGHT TECHNOLOGIES	N/A
07760	DIGITAL MULTIMETER	175	FLUKE	2025-11-07
04848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	N/A
06793	SHIELDED ROOM	S101	ETS LINDGREN	N/A
06611	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2026-04-21
06793	SHIELDED ROOM	S101	ETS LINDGREN	N/A
06611	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2026-04-21
06668	SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2027-04-01
09335	DC POWER SUPPLY 200V/25A	EA-PSI-9200-25-DT	ELEKTRO-AUTOMATIC	N/A
05850	DIGITAL MULTIMETER	179	FLUKE	2025-11-04

Testing verdicts

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

Summary

LoRa (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. LoRa

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TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 24 V
Type of Power Supply: External DC Power supply

ANTENNA (*):

Type of Antenna: External
Maximum Declared Antenna Gain: 2.5 dBi

TEST FREQUENCIES (*):

Modulation	Data rates	Low Channel	High Channel
LoRa (Digital Modulation)	980 (SF=12)	923.30 MHz	927.50 MHz

During transmitter test the EUT was controlled by a SW tool provided by the client to operate in a continuous transmit mode on the modulation schemes and test channels as required.

CONDUCTED MEASUREMENTS:

The equipment under test was set up in a shielded room and it is connected to the TS8997 using a low loss RF cable. The reading of the spectrum analyser is corrected taking into account the cable loss.



RADIATED MEASUREMENTS:

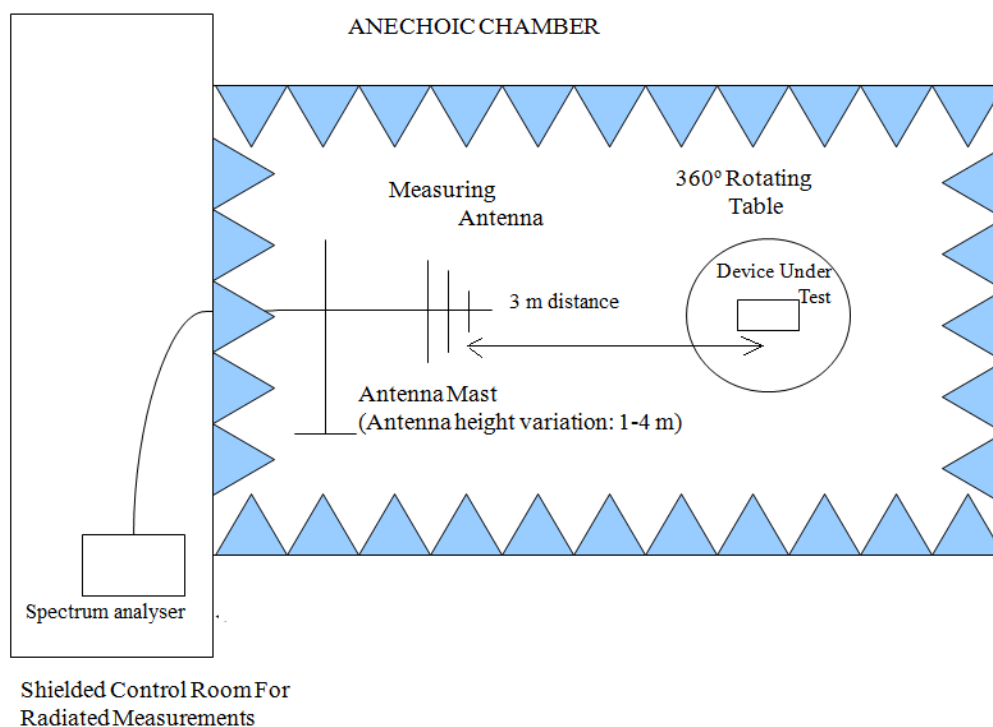
All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Bilog antenna for the range between 30 MHz to 1000 MHz and 1 GHz-10 GHz Double ridge horn antenna) is situated at a distance of 3 m.

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.

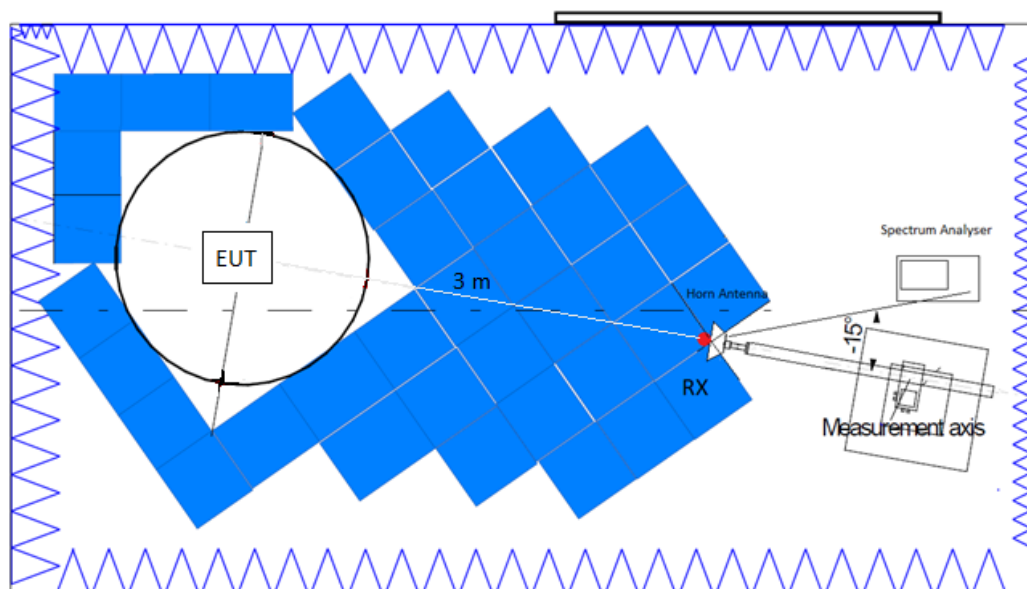
Measurements were made in both horizontal and vertical planes of polarization.

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 10 GHz:



TEST CASES DETAILS

FCC 47 CFR Part 15.247 / RSS-247
Occupied Bandwidth

Modulation: LoRa

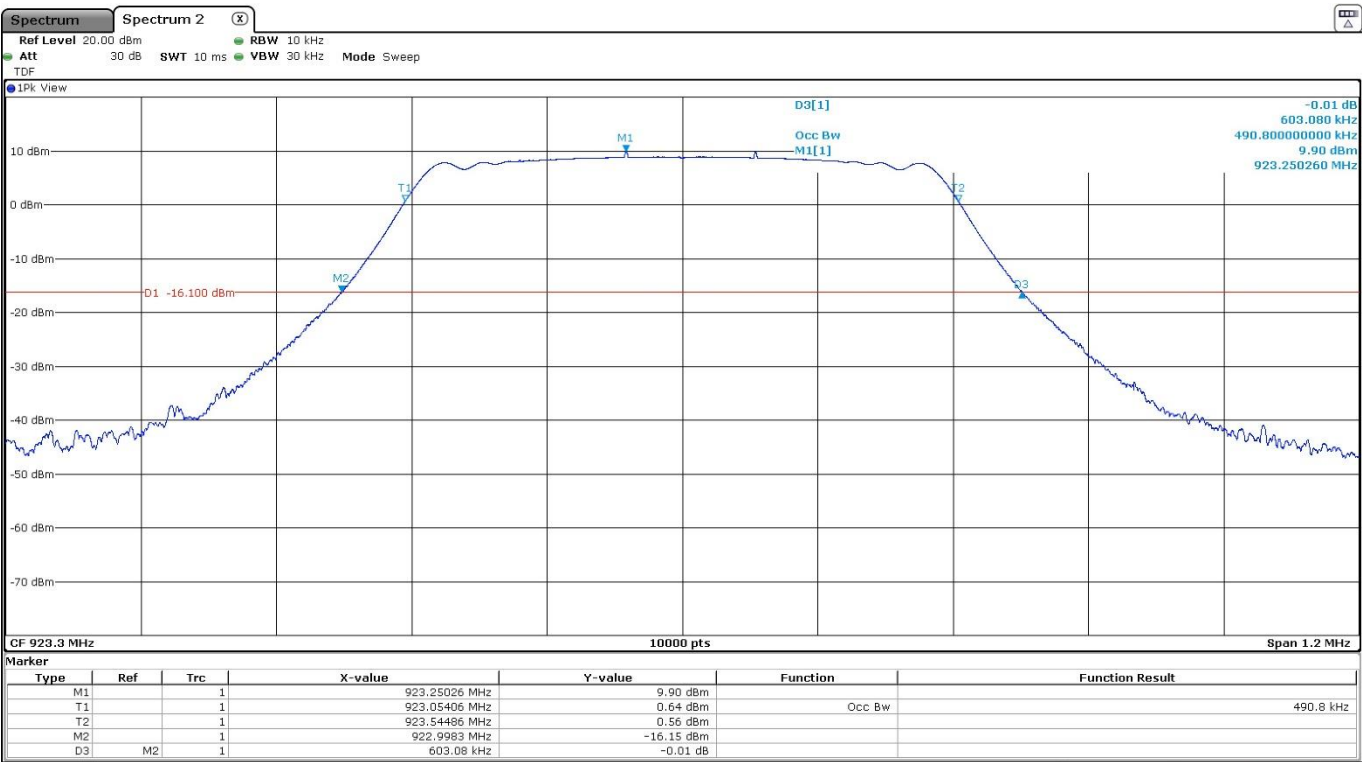
Results

Freq (MHz)	Occ Ch BW (kHz)
923.30	550.20
927.50	550.60

Attachments

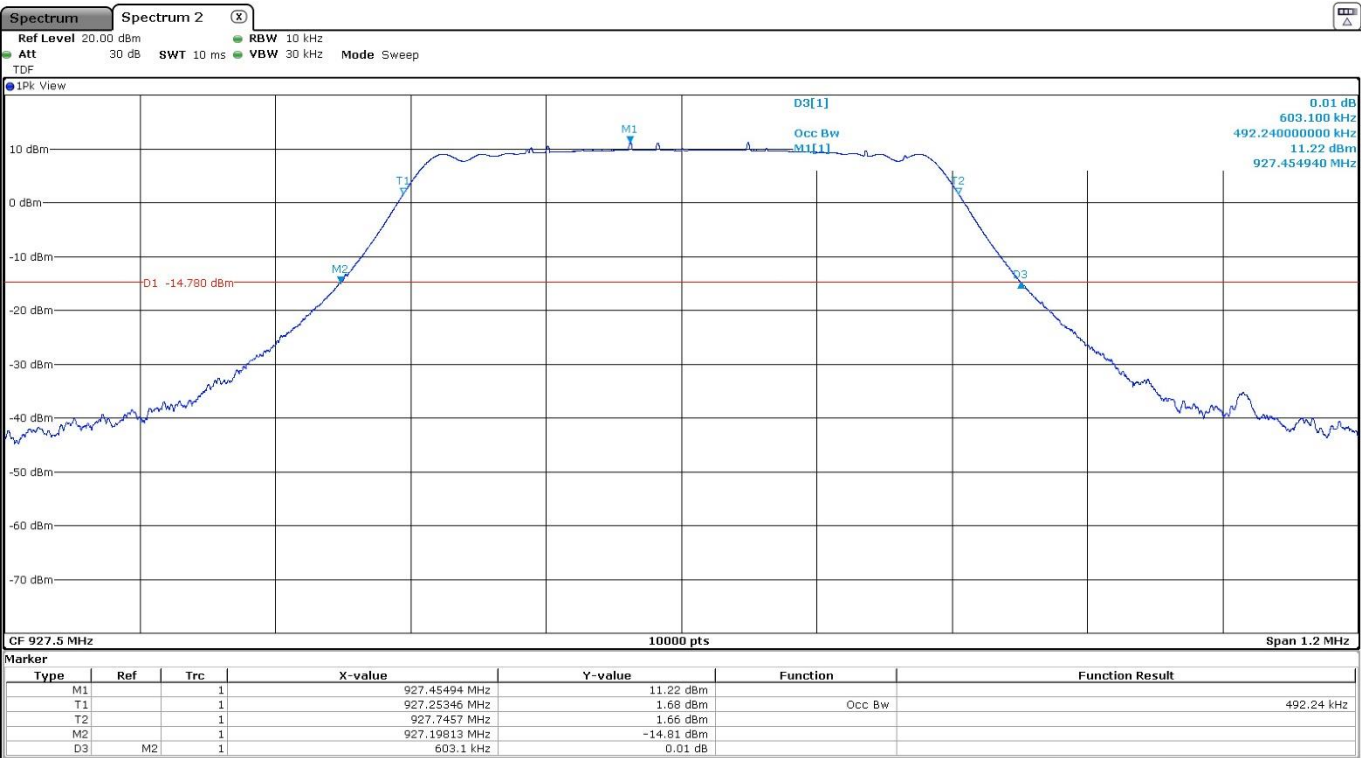
Frequency MHz = 923.30; Equipment Type = Digital Transmission System (DTS)

Images:



Frequency MHz = 927.50; Equipment Type = Digital Transmission System (DTS)

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.

Modulation: LoRa

Results

Freq (MHz)	Ebw (kHz)
923.30	568.57
927.50	585.78

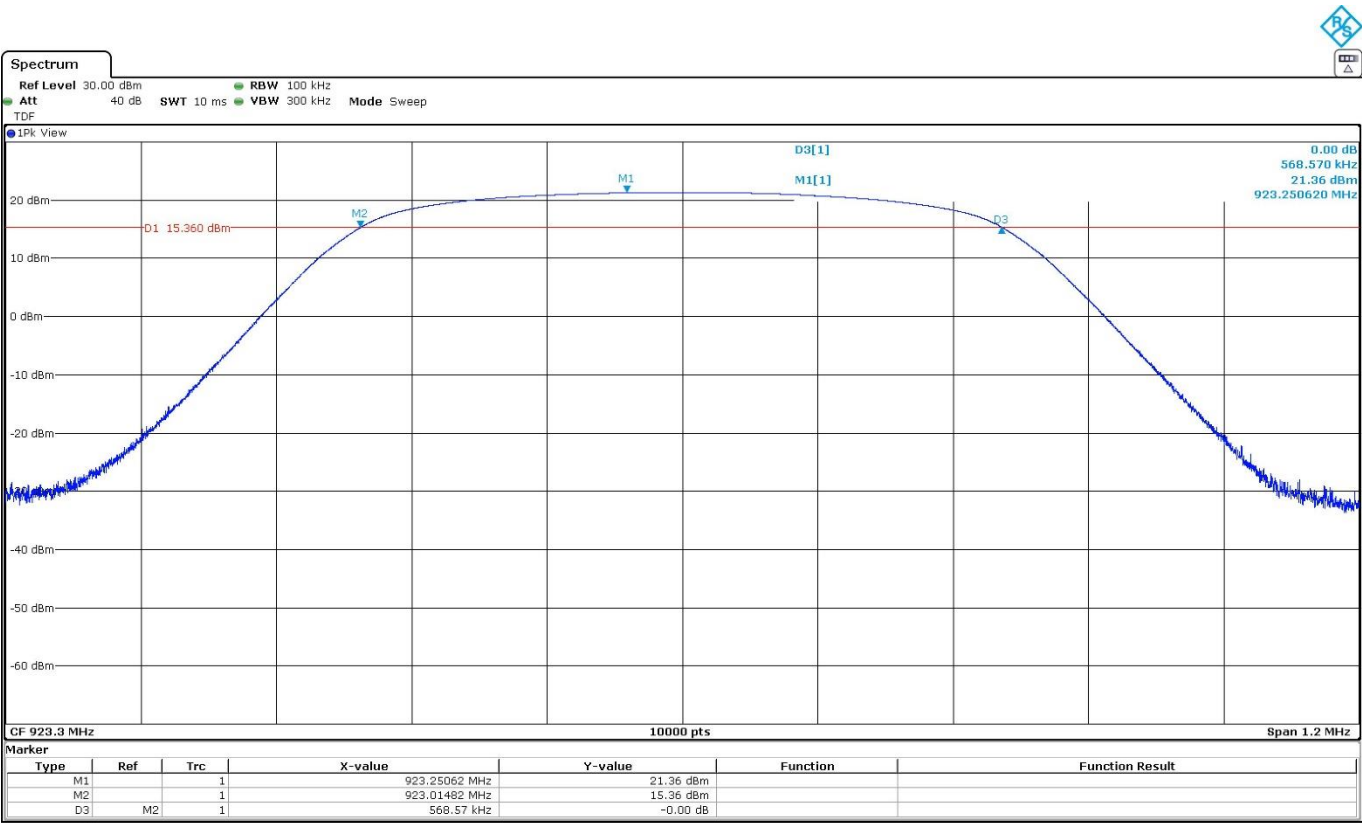
Verdict

Pass

Attachments

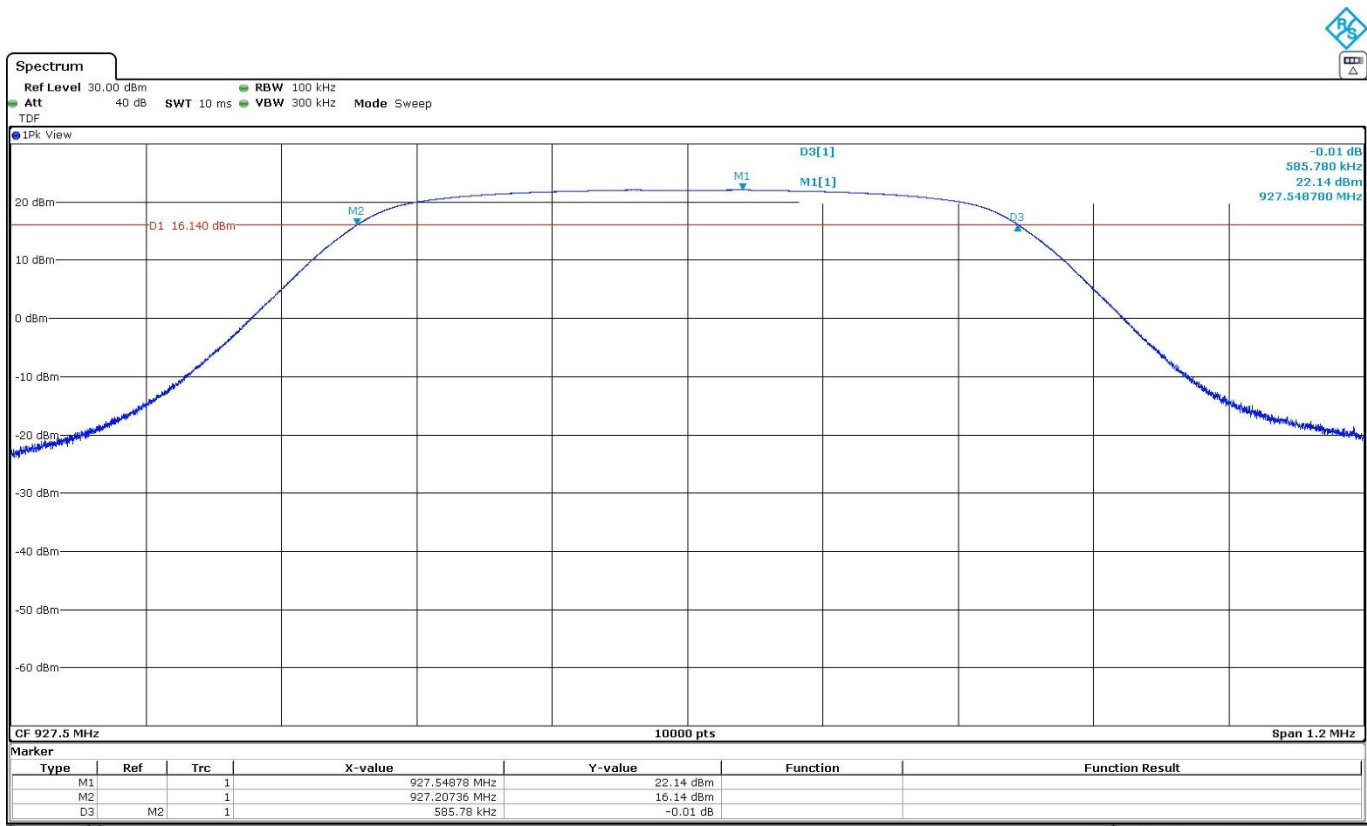
Frequency MHz = 923.30; Equipment Type = Digital Transmission System (DTS)

Images:



Frequency MHz = 927.50; Equipment Type = Digital Transmission System (DTS)

Images:



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

Limits

For systems using digital modulation in the 902-928 MHz band: 1 watt (30 dBm).
The e.i.r.p. shall not exceed 4 W (36 dBm) (Canada).

Modulation: LoRa

Results

The maximum peak conducted output power level was measured using the method according to clause “11.9.1.1. RBW ≥ DTS bandwidth” of ANSI C.63.10-2013.

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

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Freq (MHz)	Peak Power (dBm)	E.I.R.P. (dBm)
923.30	21.79	24.29
927.50	22.15	24.65

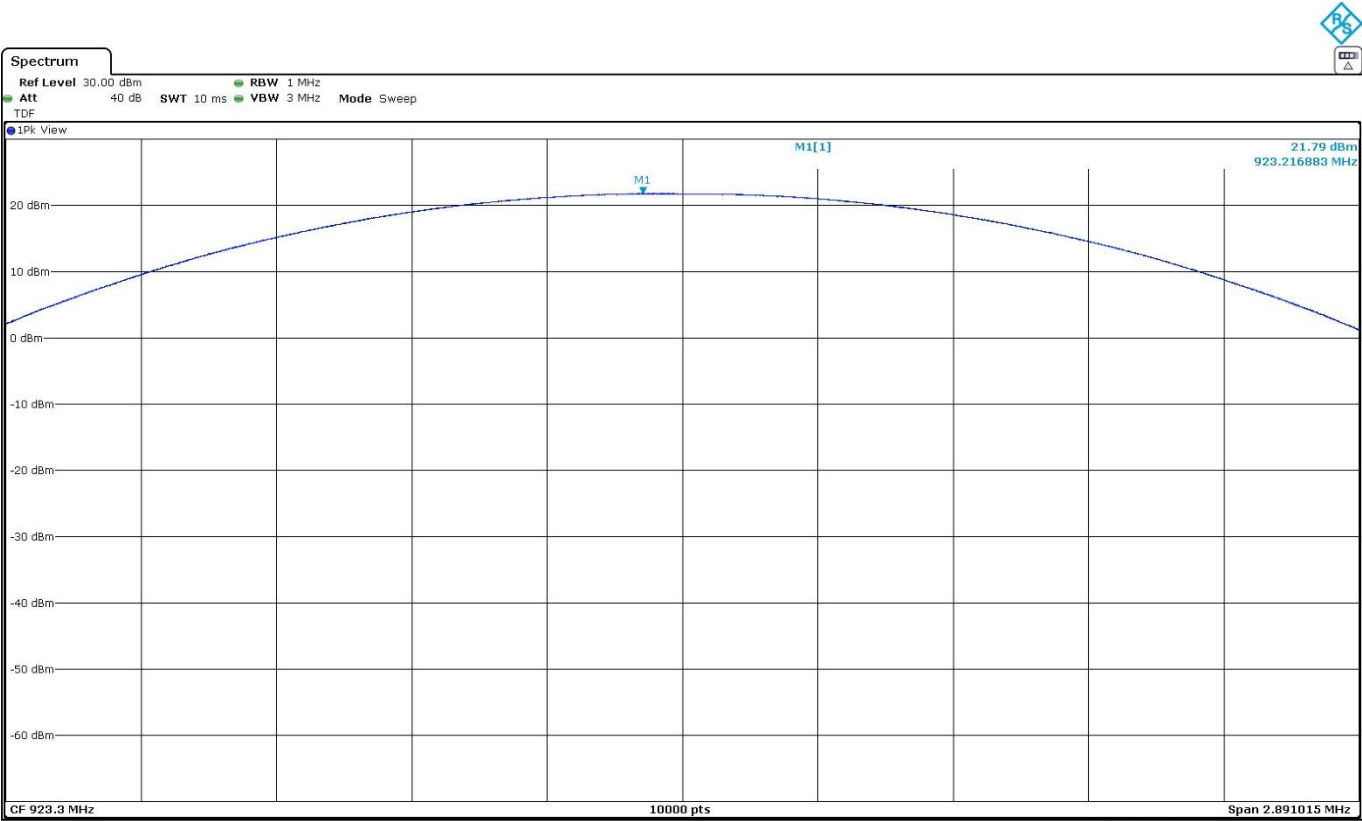
Verdict

Pass

Attachments

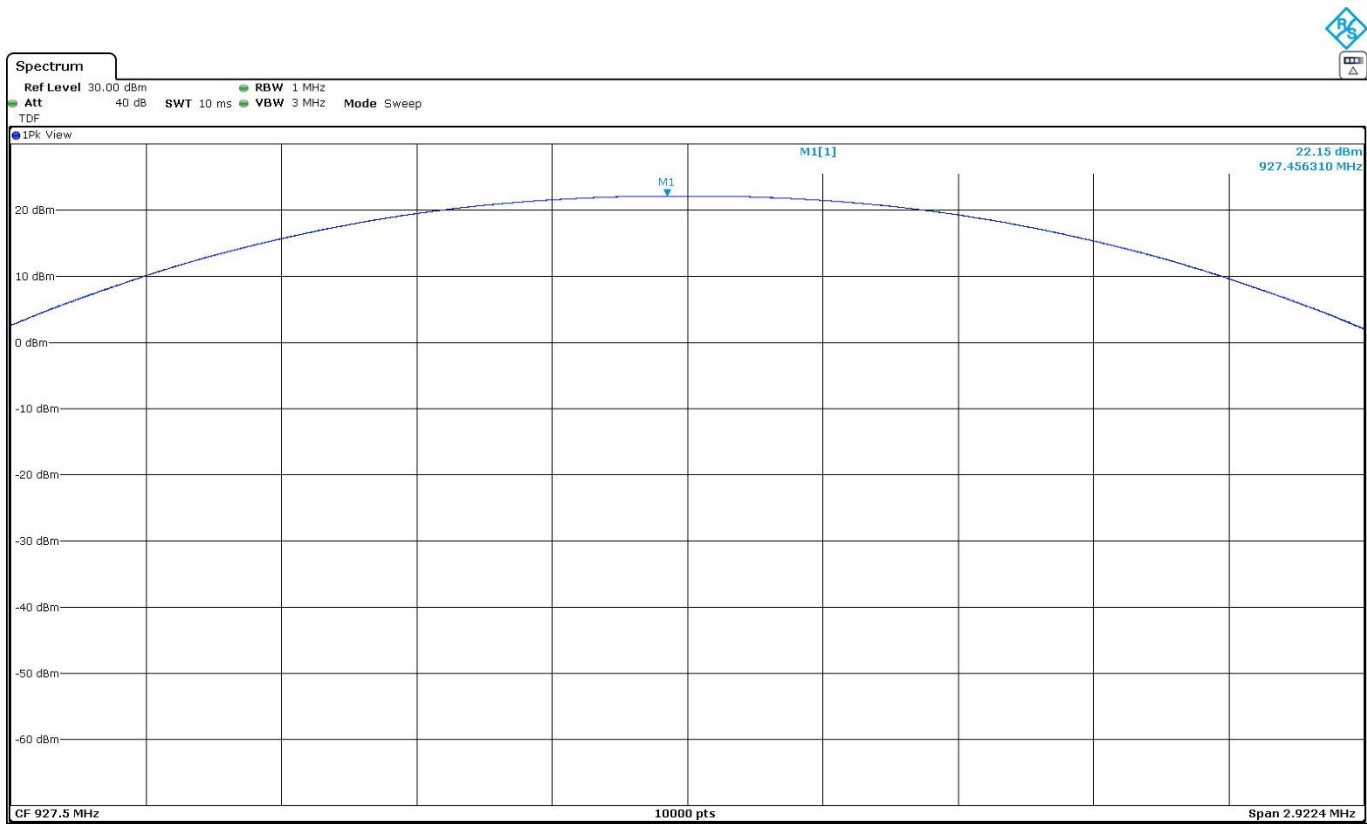
Frequency MHz = 923.30; Equipment Type = Digital Transmission System (DTS)

Images:



Frequency MHz = 927.50; Equipment Type = Digital Transmission System (DTS)

Images:



FCC 15.247 (d) / RSS-247 5.5. Band-edge emissions compliance (Transmitter)

Limits

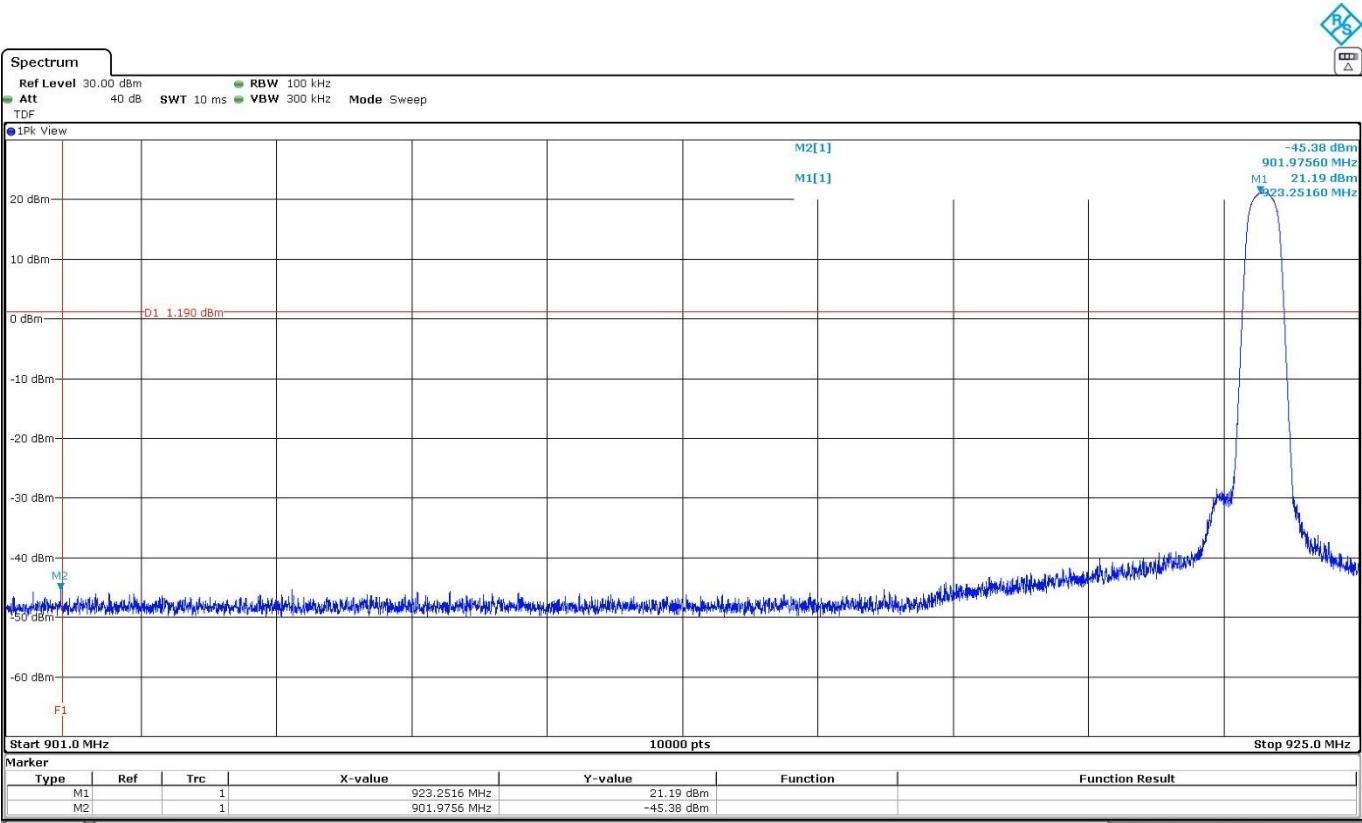
In any 100 kHz bandwidths outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, 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.

Modulation: LoRa

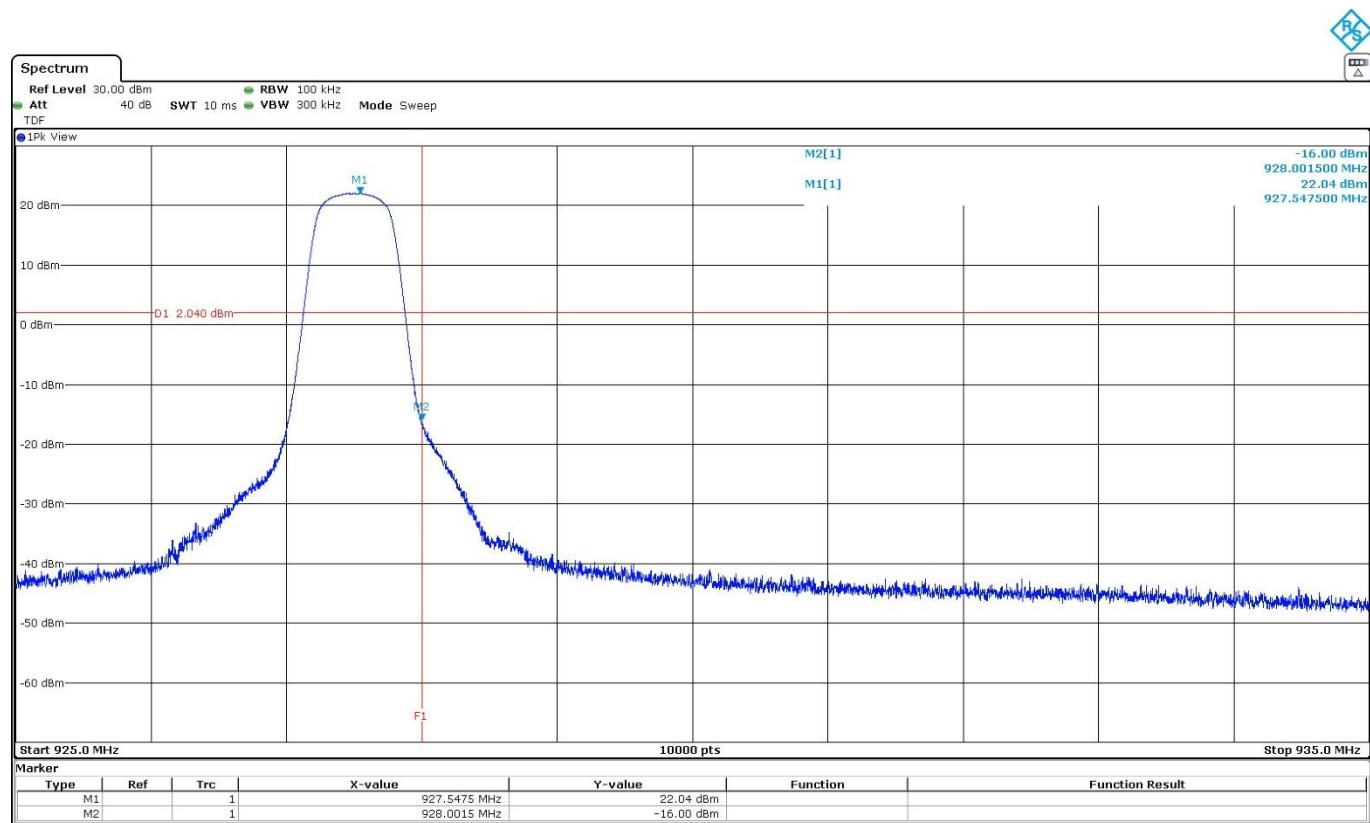
Results

Frequency MHz = 923.30; Equipment Type = Digital Transmission System (DTS)

Images:



Images:



Pass

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.

Modulation: LoRa

Results

The power spectral density was measured according to clause “11.10.2 Method PKPSD (peak PSD)” of ANSI C.63.10-2013.

Freq (MHz)	Peak PSD (dBm)
923.30	6.40
927.50	6.97

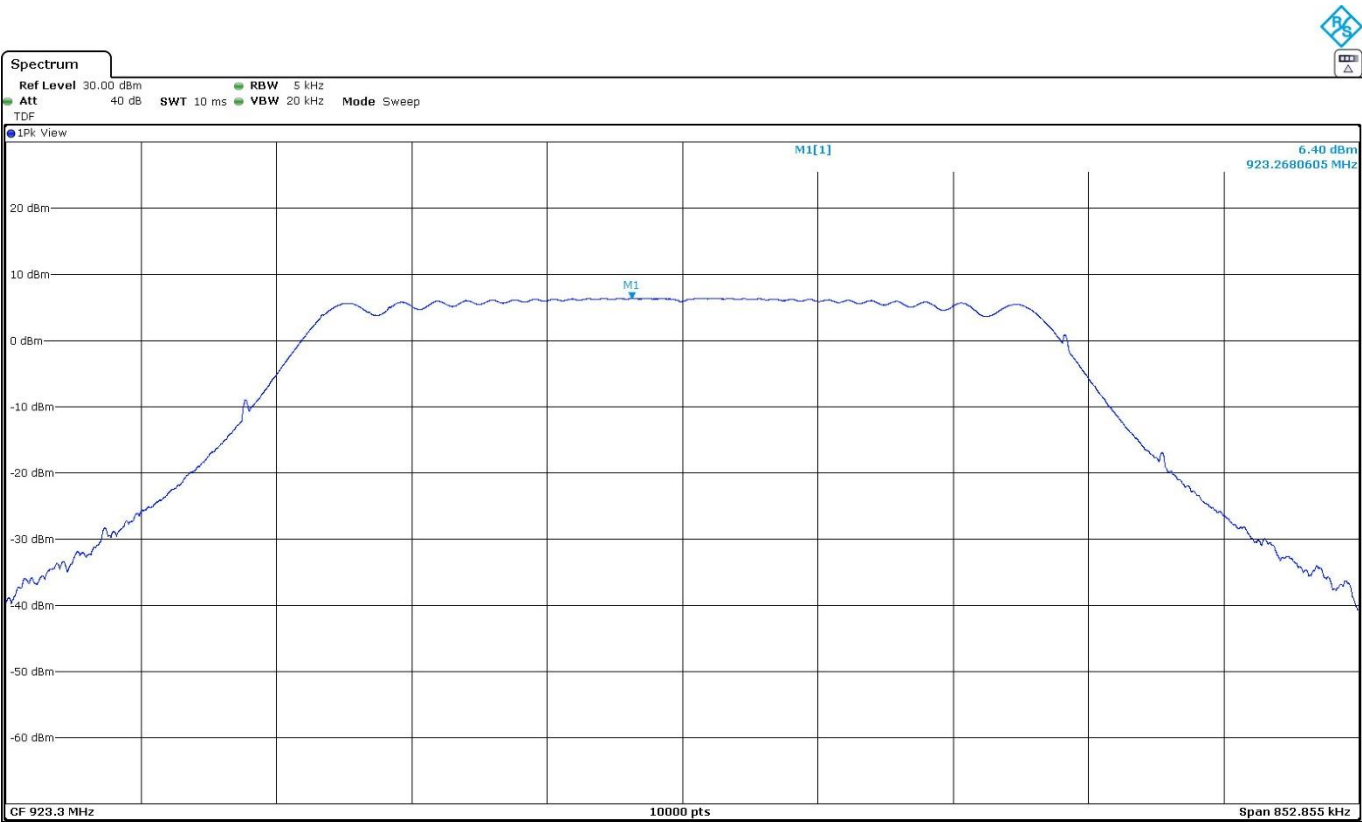
Verdict

Pass

Attachments

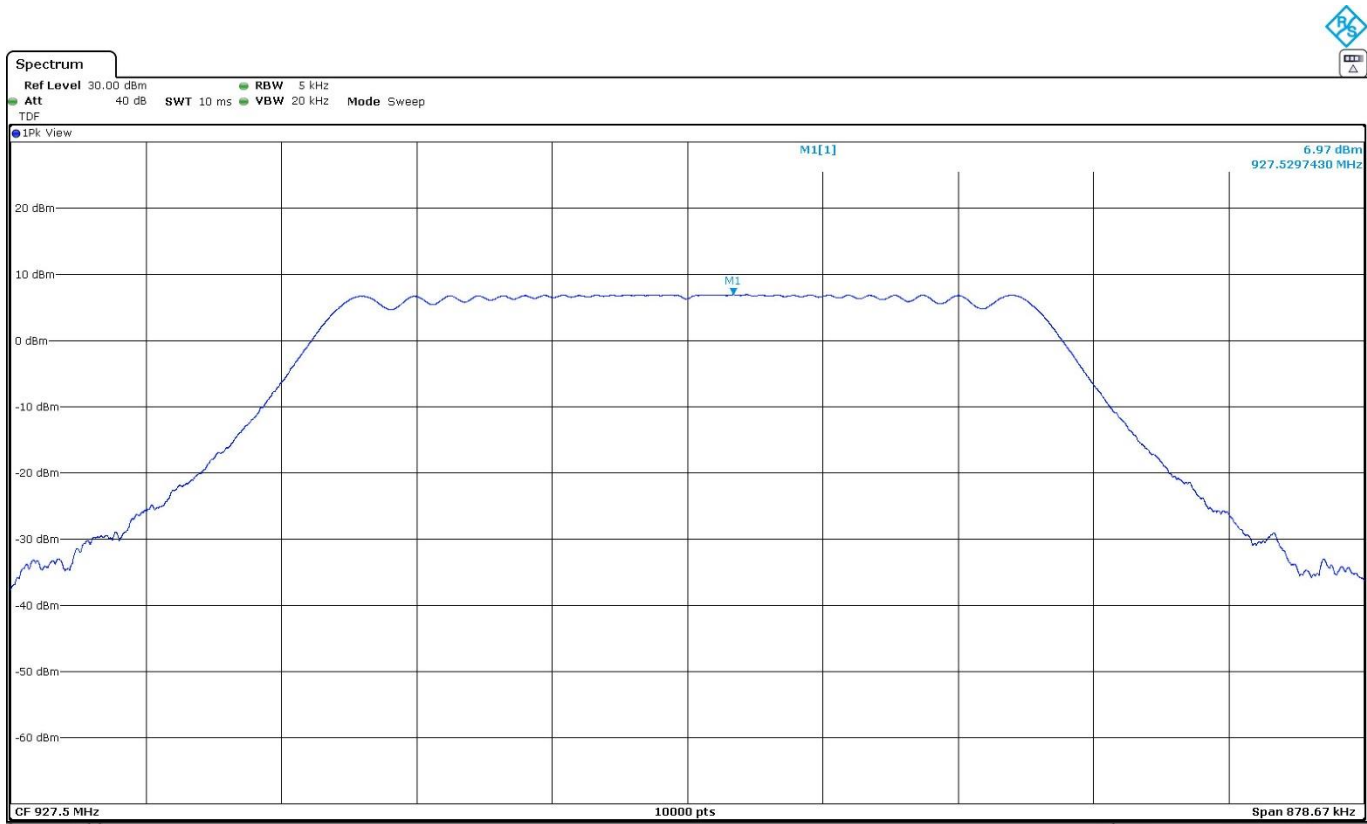
Frequency MHz = 923.30; Equipment Type = Digital Transmission System (DTS)

Images:



Frequency MHz = 927.50; Equipment Type = Digital Transmission System (DTS)

Images:



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

Frequency range tested for Radiated emissions:

Start frequency: no radiofrequency signal generated in the device found below 10th sub-harmonic, no further investigation required.

Stop frequency: it has been performed the radiated spurious emissions until 10th harmonic.

Modulation: LoRa

Results

Spurious frequencies detected within 20 dB of the limit:

Freq (MHz)	Freq Rng (GHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBμV/m)	Pol	Detector
923.30	[0.03, 1]	42.1250	30.50	V	PK
			28.20		QP
		50.0300	27.13	V	PK
			25.11		QP
		133.3050	26.00	V	PK
			25.89		QP
		250.0445	30.24	H	PK
			27.80		QP
		272.5000	21.69	H	PK
			16.71		QP
		499.9650	40.92	H	PK
			39.79		QP
		677.3780	29.20	H	PK
			23.88		QP
927.50		42.1250	30.49	V	PK
			28.50		QP
		47.2000	31.84	V	PK
			28.65		QP
	50.0305	33.45	V	PK	
		25.25		QP	
	133.3050	26.19	V	PK	
		26.00		QP	
	249.9475	29.32	V	PK	
		26.53		QP	
	272.5970	21.55	V	PK	
		16.52		QP	
	374..9805	33.48	V	PK	
		31.66		QP	
	499.9650	40.85	V	PK	
		39.67		QP	
	624.9980	41.52	H	PK	
		40.08		QP	
677.3780	28.87	V	PK		
	22.94		QP		

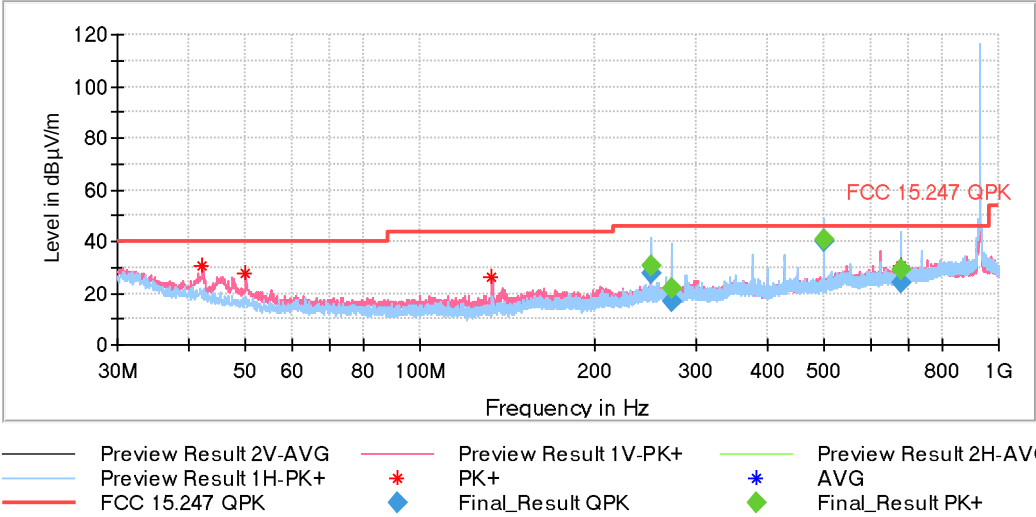
Verdict

Pass

Attachments

Frequency Range GHz = [0.03, 1] Operation Band MHz = [902, 928]
Equipment Type = Digital Transmission System (DTS) Frequency MHz = 923.30000
Active Port = 1 Modulation = LoRa

Images:



The peak above the limit is the LoRa carrier.

Tables:

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	48,5 kHz	PK+	100 kHz	1 s	0 dB

Frequency Range GHz = [0.03, 1]

Operation Band MHz = [902, 928]

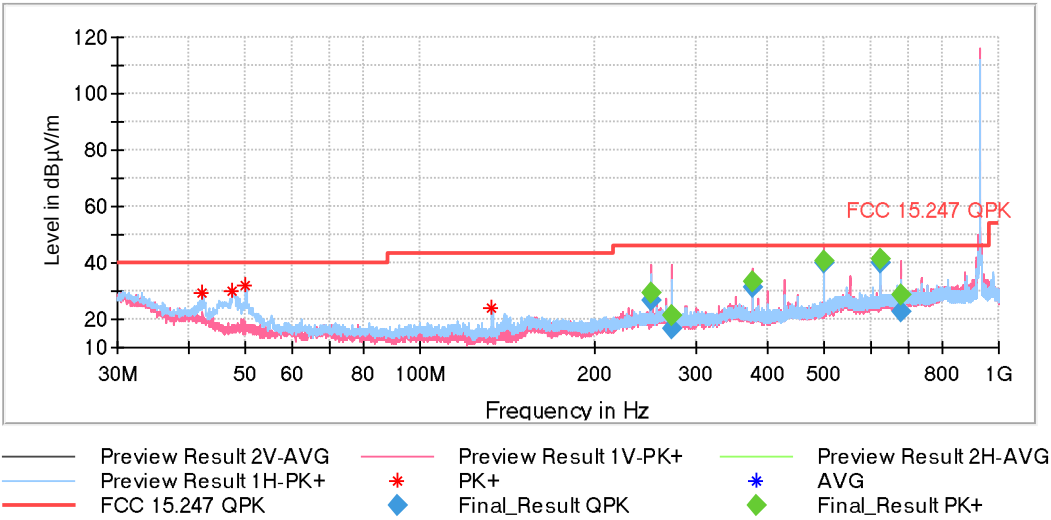
Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 927.50000

Active Port = 1

Modulation = LoRa

Images:



The peak above the limit is the LoRa carrier.

Tables:
Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	48,5 kHz	PK+	100 kHz	1 s	0 dB

Frequency Range GHz = [1, 10]

Operation Band MHz = [902, 928]

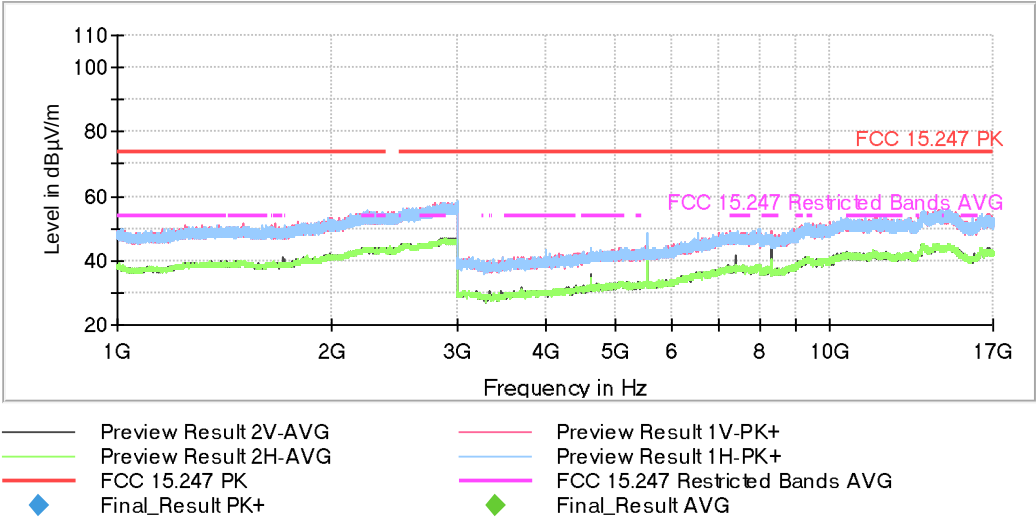
Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 923.30000

Active Port = 1

Modulation = LoRa

Images:



Tables:

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
1 GHz - 3 GHz	100 kHz	PK+ ; AVG	1 MHz	1 s	0 dB
3 GHz - 10 GHz	466,667 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

Frequency Range GHz = [1, 10]

Operation Band MHz = [902, 928]

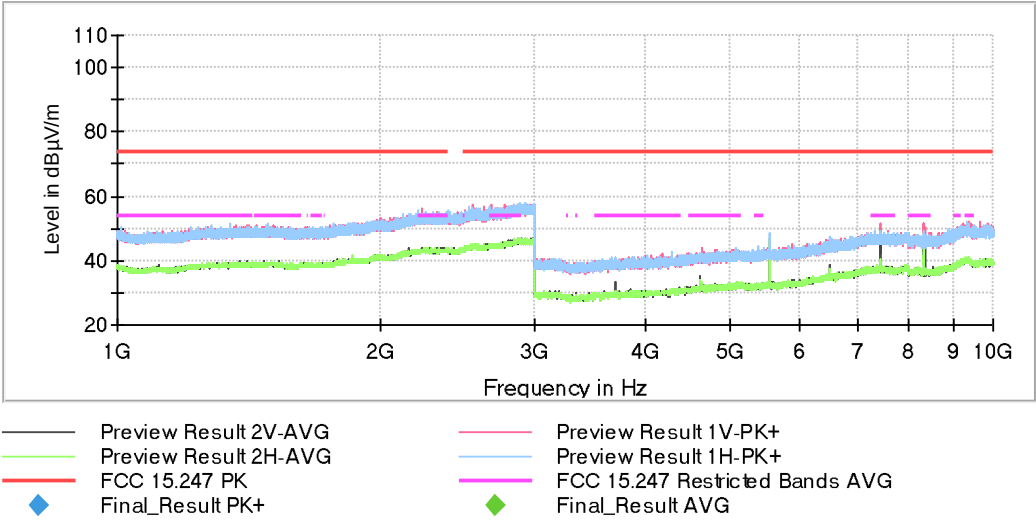
Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 927.50000

Active Port = 1

Modulation = LoRa

Images:



Tables:

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
1 GHz - 3 GHz	100 kHz	PK+ ; AVG	1 MHz	1 s	0 dB
3 GHz - 10 GHz	466,667 kHz	PK+ ; AVG	1 MHz	1 s	0 dB