

RADIO REPORT FCC 47 CFR Part 15C ISED Canada RSS-247 Digital transmission systems operating within the 902.0 MHz - 928.0 MHz band	
Report Reference No	G0M-2303-1961-TFC247DT-V05
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	    DAkkS - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	Navico Inc.
Address	4500 South 129th East Ave, Suite 200 Tulsa, Oklahoma, Postal Code 74134-5885 United States
Test Specification	47 CFR Part 15C RSS-247, Issue 3, 2023-08 RSS-Gen, Issue 5, Amendment 2, 2021-02
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Marine and recreational IoT Gateway and vessel management system
Model(s)	Connect 1
Model(s) number	80-911-0270-00
Brand Name(s)	CZone
Hardware Version(s)	E4
Software Version(s)	emc_tests_op11587 / 1.0
FCC ID	RAYE3801
IC	978B-E3801
Test Result	PASSED

Possible test case verdicts:		
Required by standard but not tested	N/T	
Not required by standard	N/R	
Not applicable to EUT	N/A	
Test object does meet the requirement	P(PASS)	
Test object does not meet the requirement	F(FAIL)	
Testing:		
Test Lab Temperature	20 °C - 30 °C	
Test Lab Humidity	25 % - 55 %	
Date of receipt of test item	2023-05-16	
Report:		
Compiled by	Stephan Liebich	
Tested and tests supervised by (+ signature) (Responsible for Test)	Florian Voigt	
Approved by (+ signature) (Senior Radio Expert)	Radwan Jaafar	
Date of Issue	2025-01-10	
Total number of pages	68	
General Remarks:		
The test results presented in this report relate only to the object tested. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		
None		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2023-11-22	Initial Release	--
02	2024-02-05	Replaced document: G0M-2303-1961-TFC247DT-V01 Replaced by: G0M-2303-1961-TFC247DT-V02 Reason: - Brand name updated - Model name updated - Model number added	G. Offorji
03	2024-05-30	Replaced document: G0M-2303-1961-TFC247DT-V02 Replaced by: G0M-2303-1961-TFC247DT-V03 Reason: - Applicant updated - Address update	St. Liebich
04	2024-12-18	Replaced document: G0M-2303-1961-TFC247DT-V03 Replaced by: G0M-2303-1961-TFC247DT-V04 Reason: - Update master data	St. Liebich
05	2025-01-10	Replaced document: G0M-2303-1961-TFC247DT-V04 Replaced by: G0M-2303-1961-TFC247DT-V05 Reason: - Add power calculation tables	A. Ibraimov

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
RBW	Resolution bandwidth
RMS	Root mean square
VBW	Video bandwidth
V _{NOM}	Nominal supply voltage

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1 Equipment (Test Item) Under Test

Description	Marine and recreational IoT Gateway and vessel management system	
Model(s)	Connect 1	
Model(s) number	80-911-0270-00	
Brand Name(s)	CZone	
Serial Number(s)	EHE22000056	
Test Sample Id(s)	44397	
Hardware Version(s)	E4	
Software Version(s)	emc_tests_op11587 / 1.0	
PMN	Connect 1	
HVIN	E4/A	
FVIN	1.18.0	
HMN	n/a	
FCC ID	RAYE3801	
IC	978B-E3801	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	902.0 MHz - 928.0 MHz	
Radio technology	WiMEA	
Modulation	2-GFSK	
Number of antenna ports	1	
Antenna	Type	External antenna
	Model	JCG016-2M-RPSMA-MAG-ADH
	Manufacturer	JC Antenna
	Gain	2.0 dBi
Supply Voltage	V _{NOM}	13.8 VDC
Operating Temperature	T _{NOM}	25 °C
AC/DC-Adaptor	None	
Manufacturer	Fell Technology AS Bragernes Torg 2 3017 Drammen NORWAY	

1.3 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	AC/DC adapter	I.T.E. Power Supply	SA07H1217 120VAC to 12 VDC	Used for AC powerline conducted emissions
SIM	Artificial load	FellTech	HS load	Artificial load used for tests under stress
AE	Lead-acid battery	BPower Quoltec Betta Batteries	BCL24-12 53030 6-CNFJ-14	--
AE	WiFi router	TP Link Asus	Archer AX1500 RT-N12	--
AE	CC1352R devkit	Texas Instruments	LAUNCHXL- CC1352R1	Device providing connection with DUT over WIMEA protocol
AE	Antenna	not specified	GPS-500 JCW402D COTS	--
AE	Laptop	Dell	Latitude 6420	For test software
SFT	Test mode software	Texas Instruments	RF Smart Studio v2.24.0	--
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment:				

1.4 Test Modes

Mode	Description
Transmit	Mode = Transmit Modulation = 2-GFSK Data-Rate = 100 kbit/s Deviation = 177 kHz Duty cycle = 100 %
Receive	Mode = Receive Modulation = 2-GFSK
Comment:	

1.5 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx	1	906.5
F2	Tx / Rx	2	914.5
F3	Tx	3	922.5

1.6 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dB μ V. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

$$\text{Reading on Analyzer (dB}\mu\text{V)} + \text{A.F. (dB/m)} = \text{Net field strength (dB}\mu\text{V/m)}$$

Net:

This is the net field strength measurement (as shown above).

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Field strength limit:

This is the FCC Class B radiated emission limit (in units of dB μ V/m). The FCC limits are given in units of μ V/m. The following formula is used to convert the units of μ V/m to dB μ V/m:

$$\text{Field strength limit (dB}\mu\text{V/m)} = 20 \cdot \log (\mu\text{V/m})$$

Example only for radiated field strength:

Reading + AF	= Net Reading	:	Net reading	- Field strength limit	= Margin
+21.5 dB μ V	+ 26 dB/m	:	47.5 dB μ V/m	- 57.0 dB μ V/m	= -9.5

2 Result Summary

FCC 47 CFR Part 15C, ISED RSS-247				
Product Standard Reference	Requirement	Reference Method	Result	Remarks
ISED RSS-Gen, Issue 5 A2 (section 6.7)	Occupied Bandwidth	ANSI C63.10-2013	N/R	Informational only
FCC § 15.247(a)(2) ISED RSS-247, Issue 2 (section 5.2)	6 dB Bandwidth	ANSI C63.10-2013	PASS	--
FCC § 15.247(b) ISED RSS-247, Issue 2 (section 5.4)	Maximum peak conducted power	ANSI C63.10-2013	PASS	--
FCC § 15.247(e) ISED RSS-247, Issue 2 (section 5.2)	Power spectral density	ANSI C63.10-2013	PASS	--
FCC § 15.207 ISED RSS-247, Issue 2 (section 3.1)	AC power line conducted emissions	ANSI C63.10-2013	N/R	no provisions for connection to the public utility ac power-lines
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Band edge compliance	ANSI C63.10-2013	PASS	--
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Conducted spurious emissions	ANSI C63.10-2013	PASS	--
FCC § 15.247(d) FCC § 15.209 ISED RSS-Gen, Issue 5 A2 (section 6.13)	Transmitter radiated spurious emissions	ANSI C63.10-2013	PASS	--
ISED RSS-247, Issue 2 (section 3.1)	Receiver radiated spurious emissions	ANSI C63.4-2014	PASS	--
Comment: The Decision Rule is applied on the basis of ETSI TR 102 273 and ETSI TR 100 028. These standards provide guidance on how to calculate and apply measurement uncertainty whilst providing maximum uncertainties allowance. In all cases due consideration will be given to ILAC-G8:09/2019. Where a result is considered conditional in respect of its proximity to the limit line, the customer would be made aware of situation so that they can make an informed decision on how to proceed.				

Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

3 Test Conditions and Results

3.1 Test Conditions and Results - Occupied bandwidth

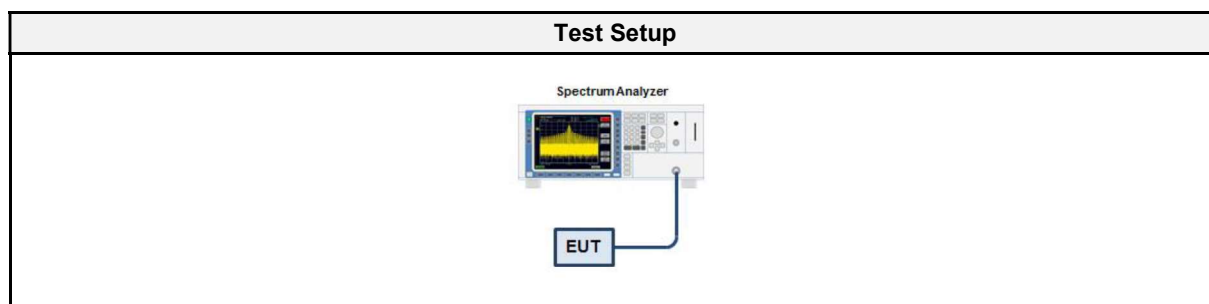
3.1.1 Information

Test Information	
Reference	ISED RSS-Gen, Issue 5 A2 (section 6.7)
Measurement Method	ANSI C63.10 6.9.3
Measurement Uncertainty	$\pm 1.26 \%$
Test Sample ID	44397
Operator	Florian Voigt
Date	2023-05-16

3.1.2 Limits

Limits
None (Informational only)

3.1.3 Setup



3.1.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 43	EF01631	2022-08	2023-08
Cable	Huber + Suhner	Sucoflex 102EA	EF00779 CAABT	2023-03	2024-03

3.1.5 Procedure

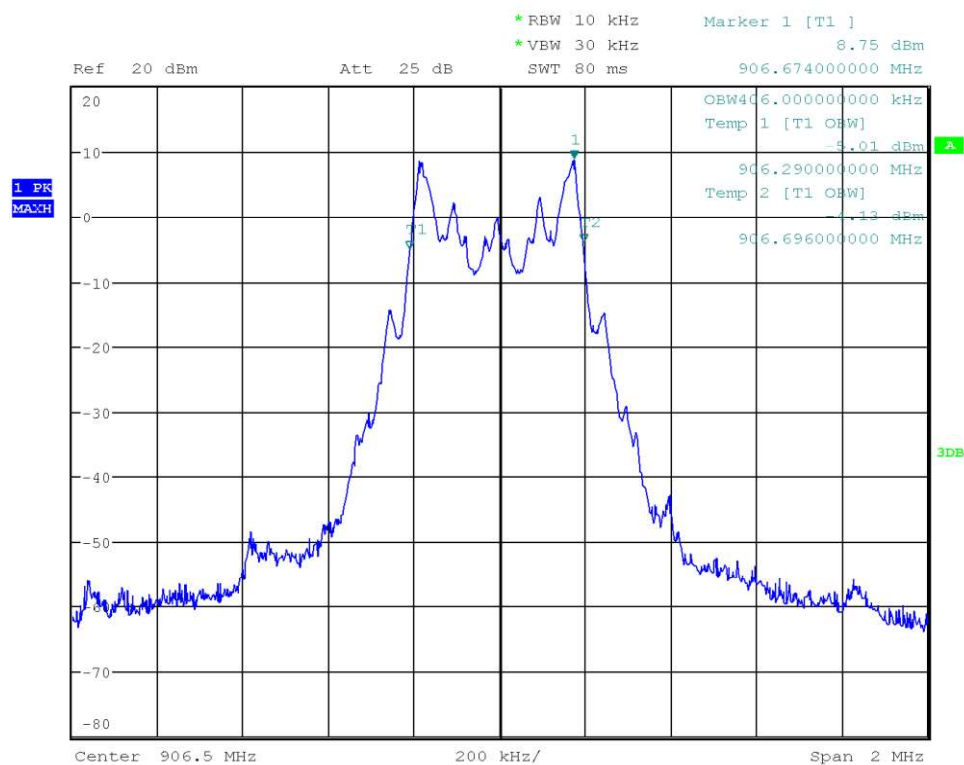
Test Procedure
1. EUT transmitter is activated in test mode under normal conditions 2. The spectrum analyzer is set to peak detection and maximum hold with a span twice the emission spectrum 3. The resolution bandwidth is set to the range of 1 % to 5 % of the occupied bandwidth 4. The occupied bandwidth is measured with the build-in analyzer function

3.1.6 Results

Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
Transmit	906.5	0.406
Transmit	914.5	0.418
Transmit	922.5	0.418

Occupied Bandwidth

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: 2-GFSK, Channel: 906.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Occupied Bandwidth [MHz]: 0.406



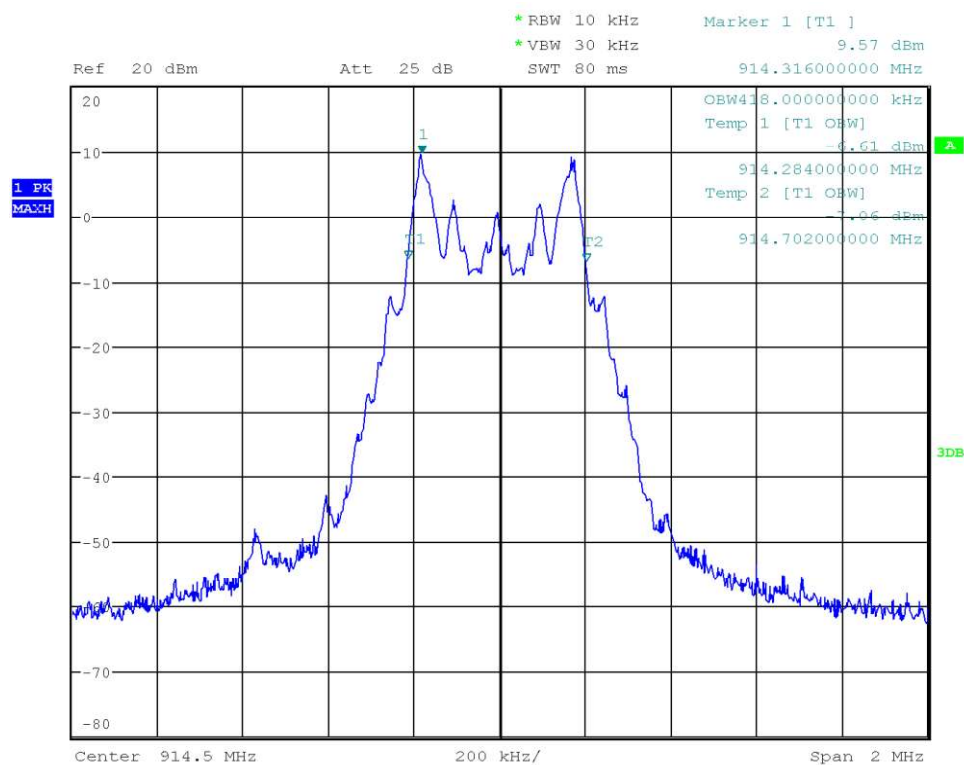
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Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Occupied Bandwidth

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: 2-GFSK, Channel: 914.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Occupied Bandwidth [MHz]: 0.418



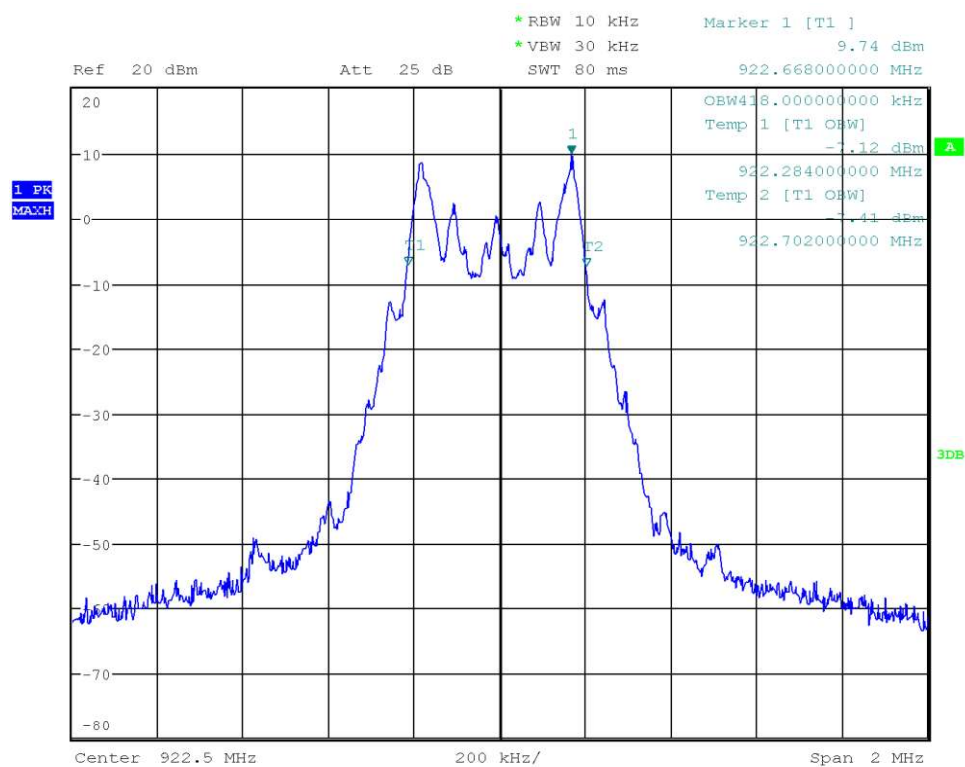
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Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Occupied Bandwidth

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: 2-GFSK, Channel: 922.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Occupied Bandwidth [MHz]: 0.418



Date: 16.MAY.2023 14:39:07

Test Report No.: G0M-2303-1961-TFC247DT-V05

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3.2 Test Conditions and Results - 6 dB bandwidth

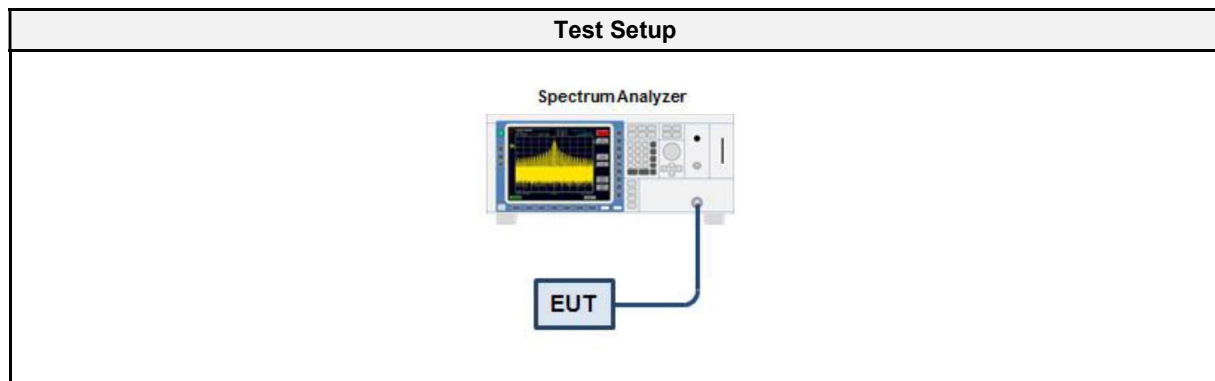
3.2.1 Information

Test Information	
Reference	FCC § 15.247(a)(2); ISSED RSS-247, Issue 3 (section 5.2)
Measurement Method	ANSI C63.10 11.8
Measurement Uncertainty	$\pm 1.26 \%$
Operator	Florian Voigt
Date	2023-05-16

3.2.2 Limits

Limits
$\geq 500\text{kHz}$

3.2.3 Setup



3.2.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 43	EF01631	2022-08	2023-08
Cable	Huber + Suhner	Sucoflex 102EA	EF00779 CAABT	2023-03	2024-03

3.2.5 Procedure

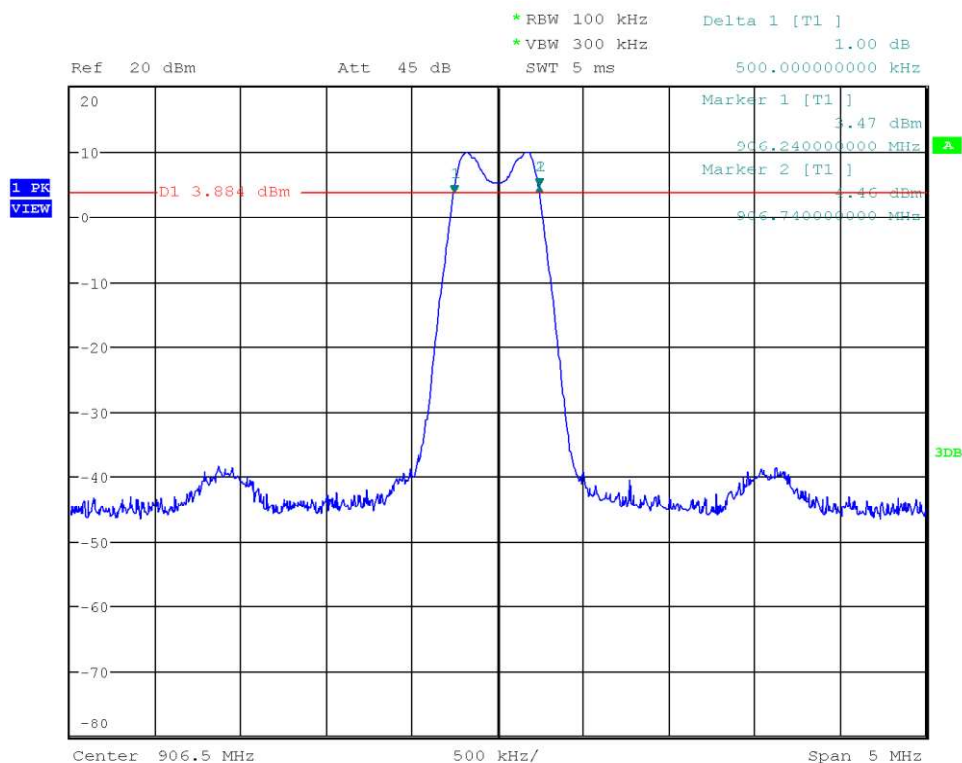
Test Procedure
1. EUT set to test mode 2. Span set to at least twice the emission spectrum 3. Detector set to peak and max hold and RBW is set to 100 kHz 4. Envelope peak value of emission spectrum is selected 5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak 6. Marker on envelope of spectrum is set to level of -6 dB to the right of the peak 7. 6 dB Bandwidth is determined by marker frequency separation

3.2.6 Results

Test Results				
Mode	Frequency [MHz]	Bandwidth [kHz]	Limit [kHz]	Verdict
Transmit	906.5	500	500	PASS
Transmit	914.5	500	500	PASS
Transmit	922.5	500	500	PASS

DTS (6 dB) Bandwidth

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: 2-GFSK, Channel: 906.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Lower Frequency [MHz]: 906.240
 Upper Frequency [MHz]: 906.740
 6 dB Bandwidth [kHz]: 500



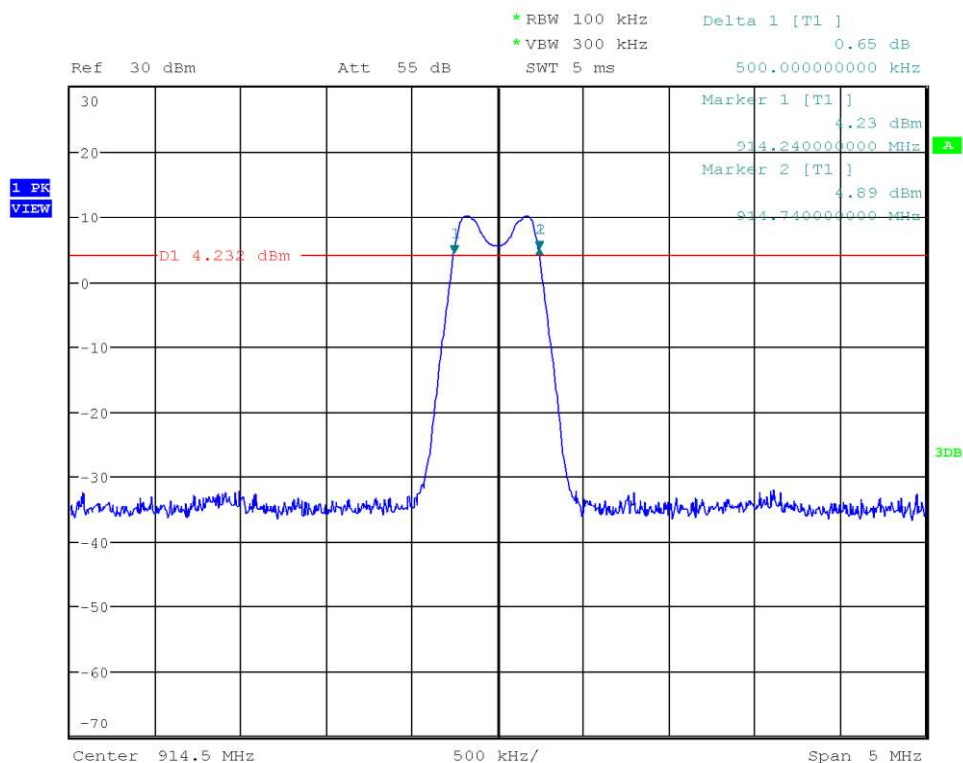
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Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

DTS (6 dB) Bandwidth

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: 2-GFSK, Channel: 914.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Lower Frequency [MHz]: 914.240
 Upper Frequency [MHz]: 914.740
 6 dB Bandwidth [kHz]: 500



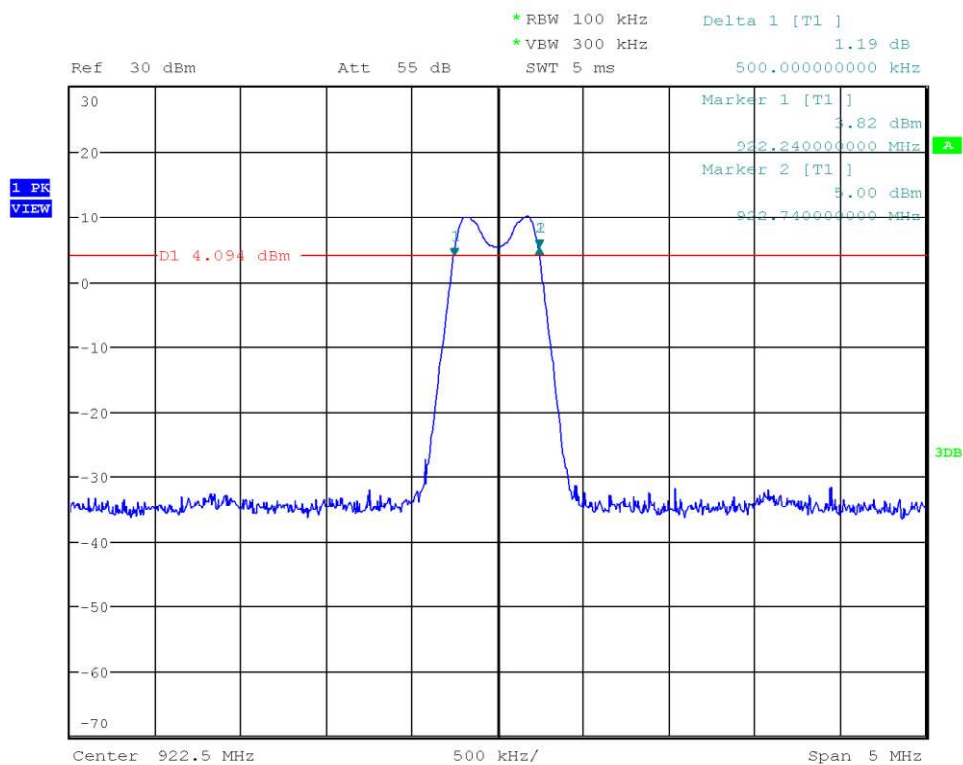
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Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

DTS (6 dB) Bandwidth

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: 2-GFSK, Channel: 922.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Lower Frequency [MHz]: 922.240
 Upper Frequency [MHz]: 922.740
 6 dB Bandwidth [kHz]: 500



Date: 16.MAY.2023 14:47:00

Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

3.3 Test Conditions and Results - Maximum peak conducted output power

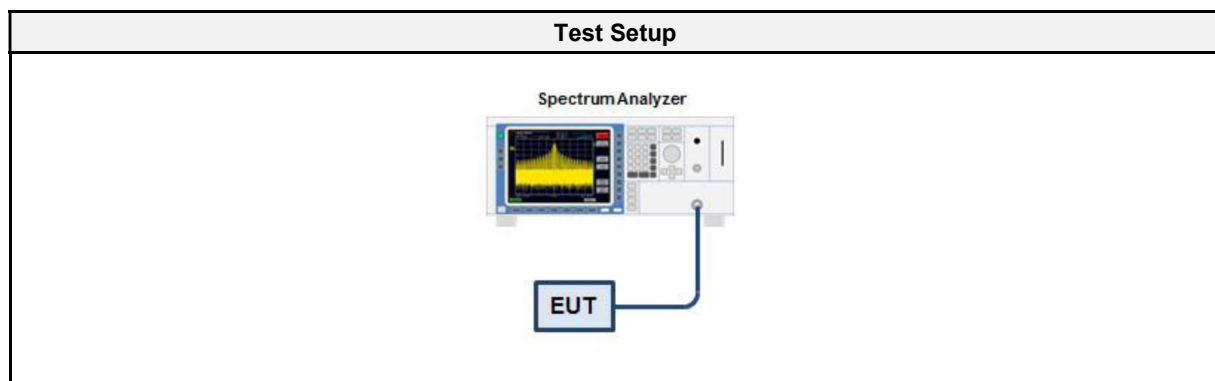
3.3.1 Information

Test Information	
Reference	FCC § 15.247(b); ISSED RSS-247, Issue 3 (section 5.4)
Measurement Method	ANSI C63.10 11.9.1
Measurement Uncertainty	± 2.86 dB
Operator	Florian Voigt
Date	2023-05-16

3.3.2 Limits

Limits
1 W conducted (30 dBm) / 4 W EIRP
The conducted output power limit specified above is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in the table, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.3 Setup



3.3.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 43	EF01631	2022-08	2023-08
Cable	Huber + Suhner	Sucoflex 102EA	EF00779 CAABT	2023-03	2024-03

3.3.5 Procedure

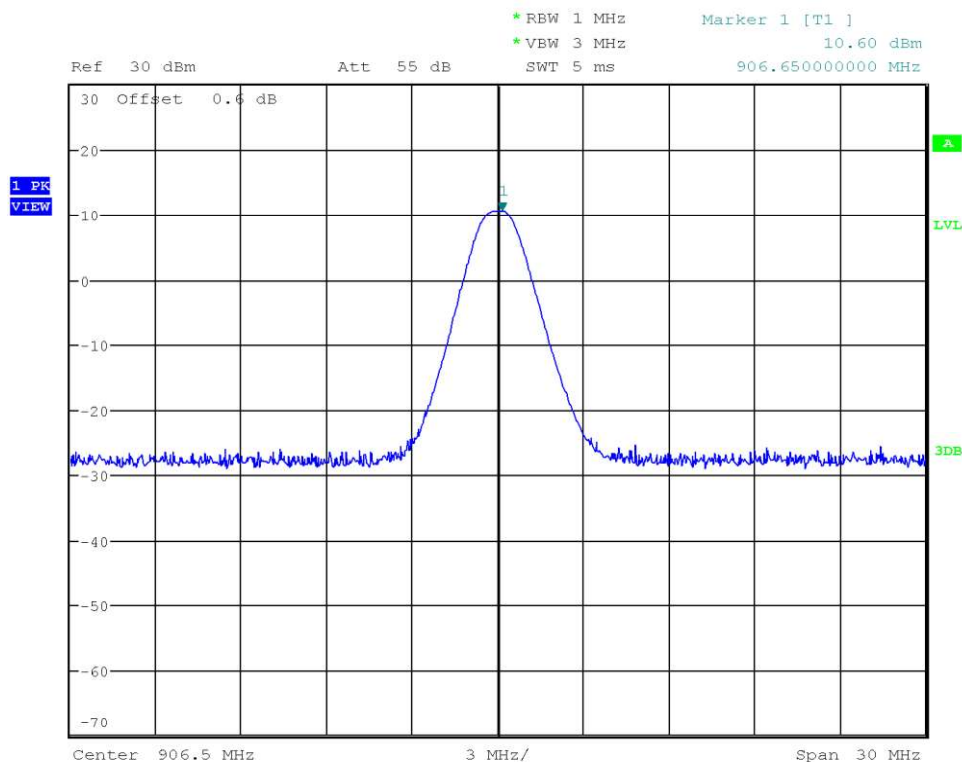
Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Analyzer resolution bandwidth is set ≥ DTS bandwidth 3. Detector set to peak and max hold 4. Sweep time is set to auto 5. After the trace has stabilized a marker is set to peak of envelope

3.3.6 Results

Test Results							
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Antenna Gain [dBi]	E.I.R.P. [W]	E.I.R.P. Limit [W]	Verdict
906.5	10.60	0.0115	1.0	2.0	0.0182	4.0	PASS
914.5	10.96	0.0125	1.0	2.0	0.0198	4.0	PASS
922.5	10.81	0.0120	1.0	2.0	0.0191	4.0	PASS

Peak Conducted Output Power

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.9.1.1
 Operational Mode: 2-GFSK, Channel: 906.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Peak Power [dBm]: 10.596
 Peak Power [W]: 0.0115



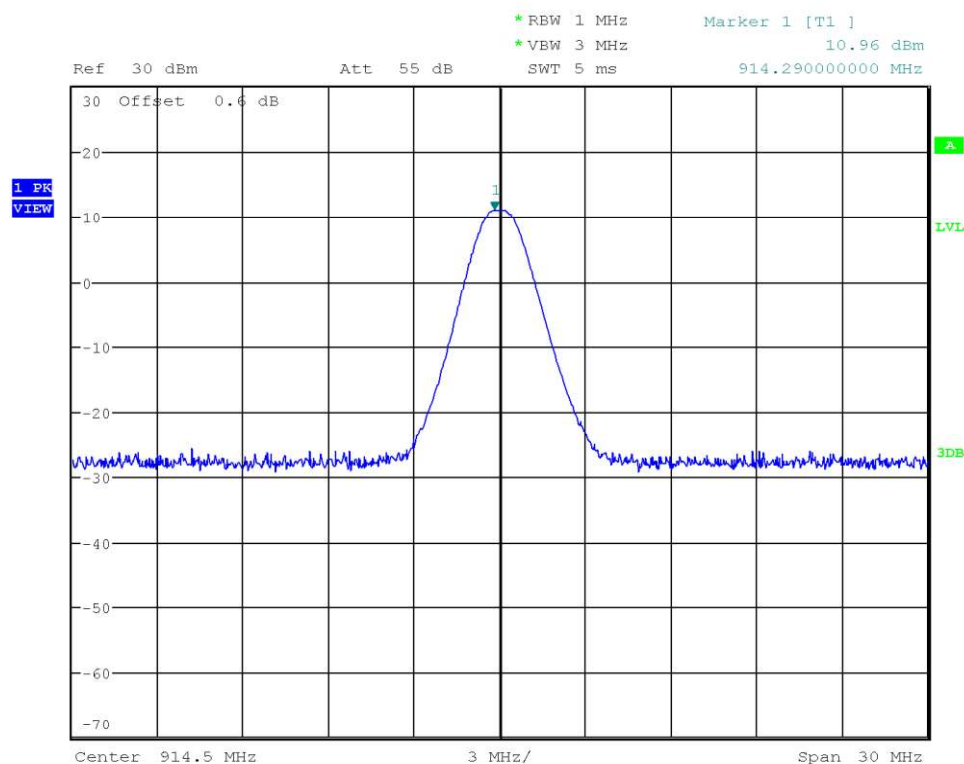
Date: 16.MAY.2023 14:53:25

Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Peak Conducted Output Power

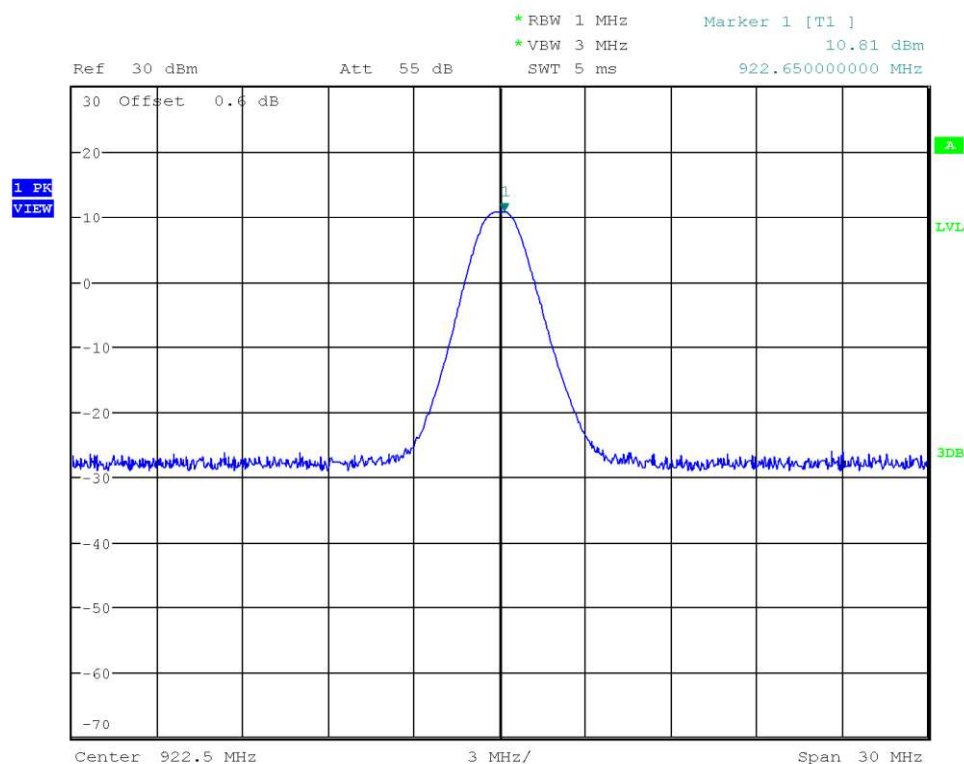
Project Number:	G0M-2303-1961
Applicant:	Navico Inc.
Model Description:	Marine and recreational IoT Gateway and vessel management system
Model:	Connect 1
Test Sample ID:	44397
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	2-GFSK, Channel: 914.5 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Florian Voigt
Test Site:	Eurofins Product Service GmbH
Test Date:	2023-05-16
Peak Power [dBm]:	10.963
Peak Power [W]:	0.0125



Date: 16.MAY.2023 14:54:30

Peak Conducted Output Power

Project Number:	G0M-2303-1961
Applicant:	Navico Inc.
Model Description:	Marine and recreational IoT Gateway and vessel management system
Model:	Connect 1
Test Sample ID:	44397
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	2-GFSK, Channel: 922.5 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Florian Voigt
Test Site:	Eurofins Product Service GmbH
Test Date:	2023-05-16
Peak Power [dBm]:	10.809
Peak Power [W]:	0.0120



Date: 16.MAY.2023 14:55:16

Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

3.4 Test Conditions and Results - Power spectral density

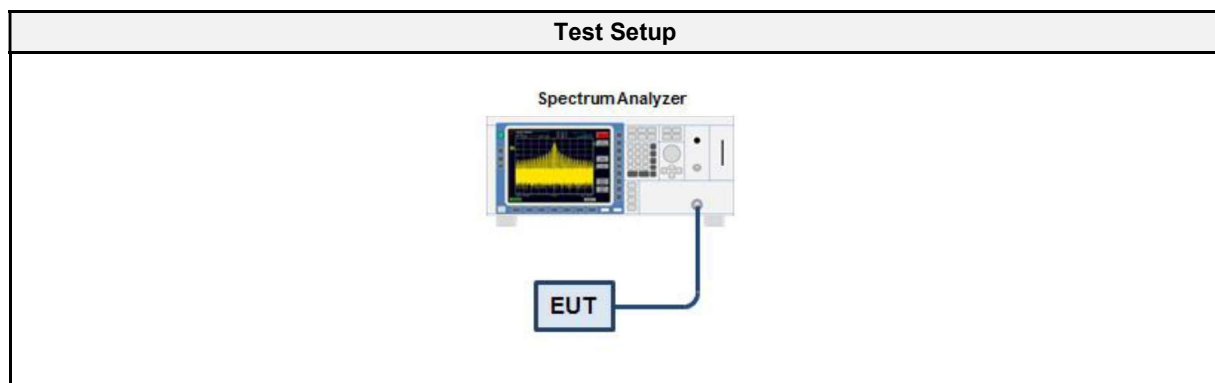
3.4.1 Information

Test Information	
Reference	FCC § 15.247(e); ISSED RSS-247, Issue 3 (section 5.2)
Measurement Method	ANSI C63.10 11.10.2, 14.3.2
Measurement Uncertainty	± 2.86 dB
Operator	Florian Voigt
Date	2023-05-16

3.4.2 Limits

Limits
8 dBm / 3 kHz

3.4.3 Setup



3.4.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 43	EF01631	2022-08	2023-08
Cable	Huber + Suhner	Sucoflex 102EA	EF00779 CAABT	2023-03	2024-03

3.4.5 Procedure

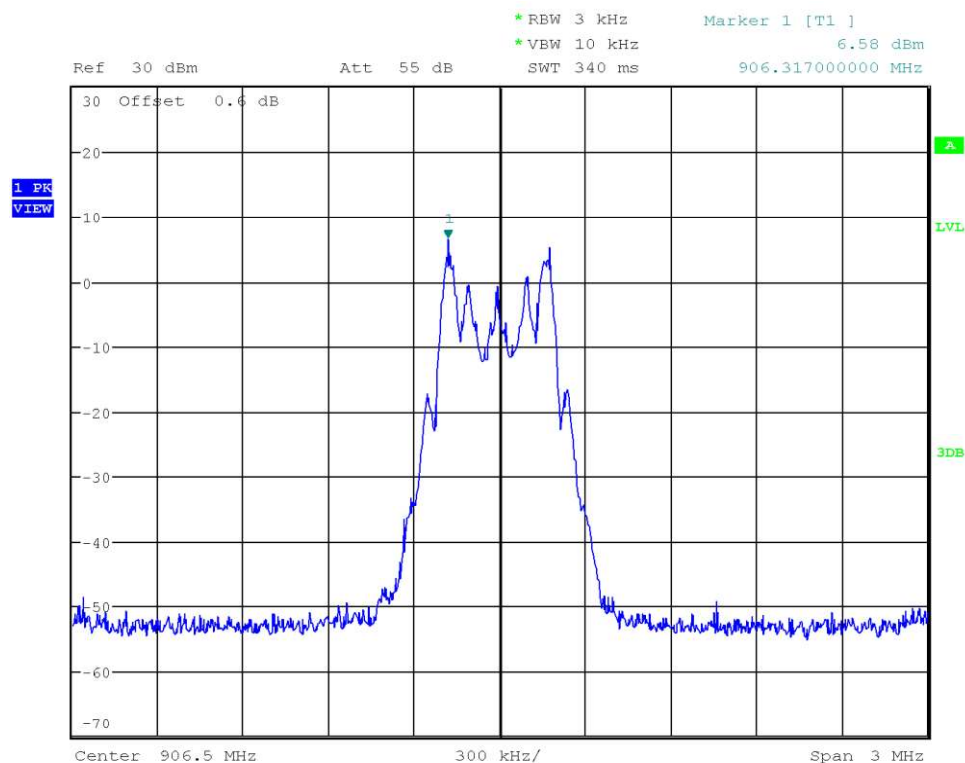
Test Procedure
- EUT set to test mode - The analyzer is set to DTS channel center frequency with a span of 1.5 times the DTS bandwidth - The RBW is set to 100 kHz with VBW $\geq$ RBW and the detector is set to peak with max hold - After the trace has stabilized a marker is set to the envelope maximum - If the power spectral density is above the limit the RBW is reduced (not lower than 3 kHz) and the measurement is repeated - If the EUT has more than one transmit chain the procedure is repeated for each transmit chain

3.4.6 Results

Test Results			
Channel [MHz]	PSD [dBm/RBW]	Limit [dBm/3kHz]	Verdict
906.5	6.58	8.0	PASS
914.5	5.54	8.0	PASS
922.5	4.96	8.0	PASS
RBW = 3 kHz			

Peak Power Spectral Density

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.10.2
 Operational Mode: 2-GFSK, Channel: 906.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Peak Frequency [MHz]: 906.317
 Spectral Density [dBm/RBW]: 6.584
 Resolution Bandwidth [kHz]: 3 kHz



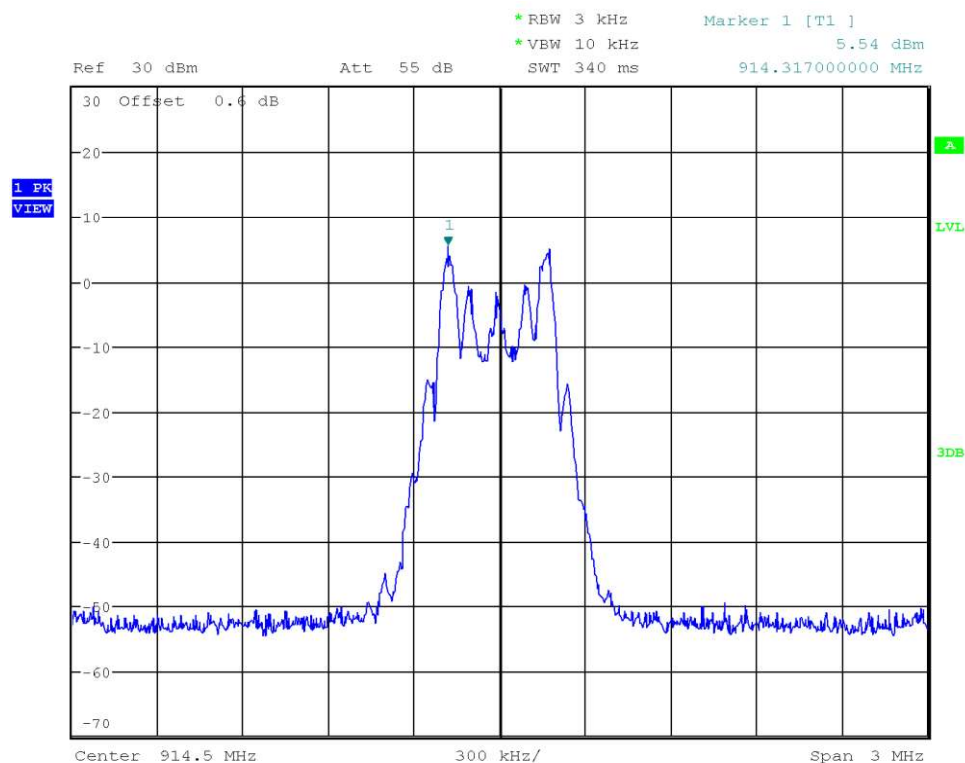
Date: 16.MAY.2023 15:01:46

Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Peak Power Spectral Density

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.10.2
 Operational Mode: 2-GFSK, Channel: 914.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Peak Frequency [MHz]: 914.317
 Spectral Density [dBm/RBW]: 5.544
 Resolution Bandwidth [kHz]: 3 kHz



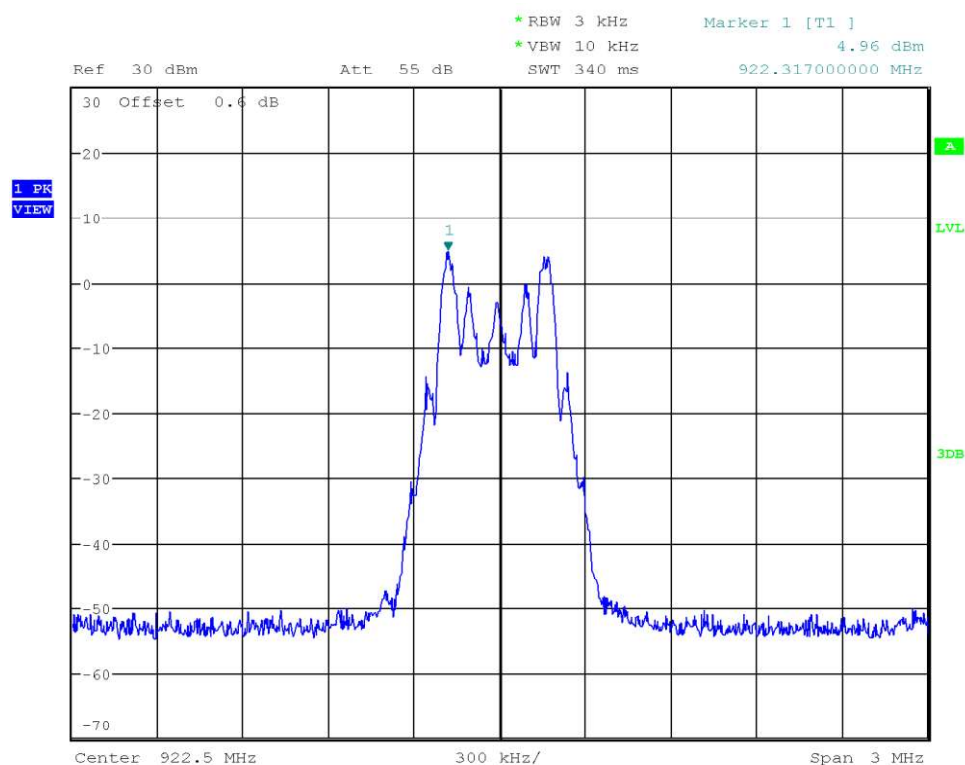
Date: 16.MAY.2023 15:03:38

Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Peak Power Spectral Density

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.10.2
 Operational Mode: 2-GFSK, Channel: 922.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Peak Frequency [MHz]: 922.317
 Spectral Density [dBm/RBW]: 4.957
 Resolution Bandwidth [kHz]: 3 kHz



Date: 16.MAY.2023 15:05:15

Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

3.5 Test Conditions and Results - Band-edge compliance

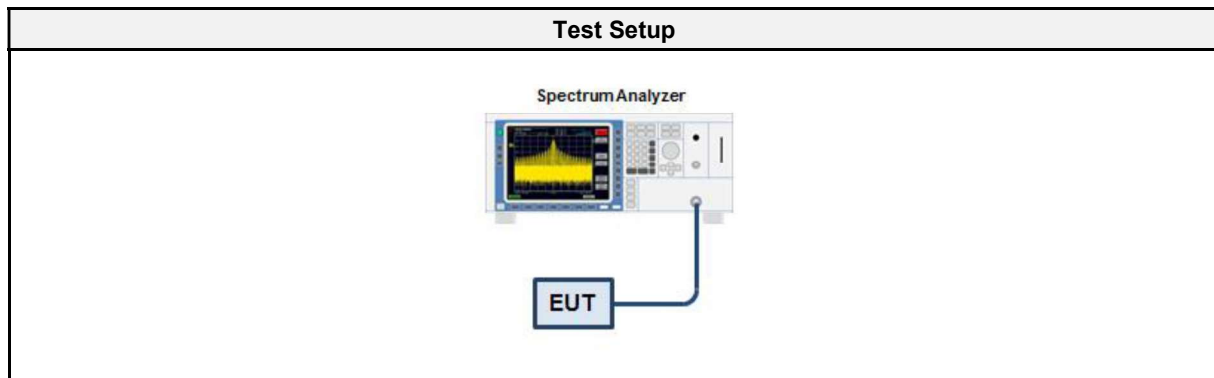
3.5.1 Information

Test Information	
Reference	FCC § 15.247(d); ISSED RSS-247, Issue 3 (section 5.5)
Measurement Uncertainty	± 3.64 dB
Measurement Method	ANSI C63.10 11.13
Operator	Florian Voigt
Date	2023-05-16

3.5.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
RMS	30

3.5.3 Setup



3.5.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 43	EF01631	2022-08	2023-08
Cable	Huber + Suhner	Sucoflex 102EA	EF00779 CAABT	2023-03	2024-03

3.5.5 Procedure

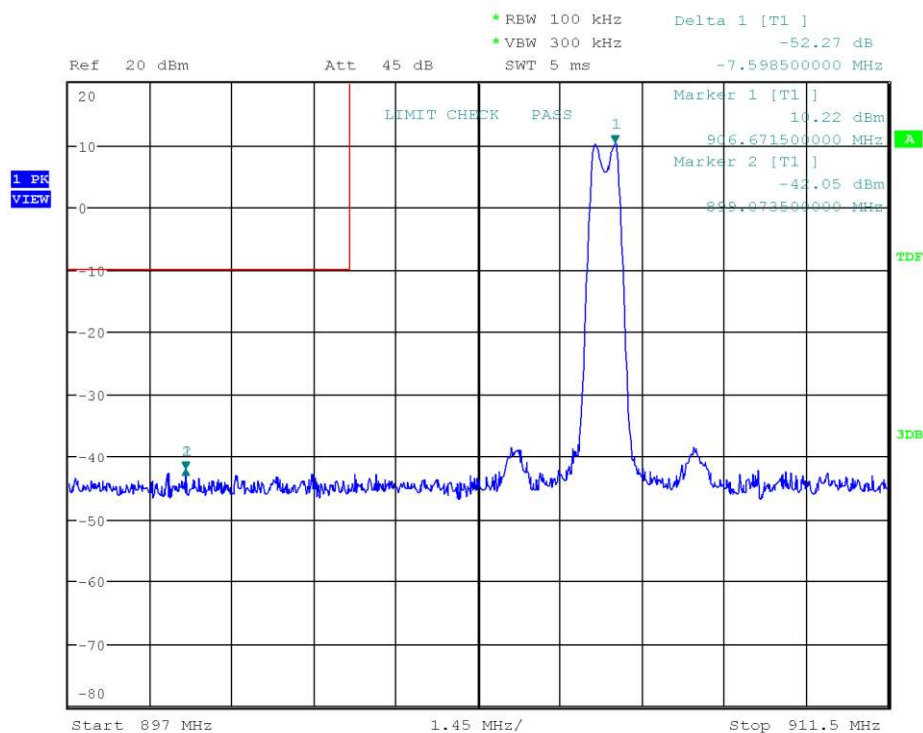
Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span set around lower band edge and detector is set to peak and max hold 3. Resolution bandwidth is set to 100 kHz 4. Markers are set to peak emission levels within frequency band and outside frequency band 5. Band edge attenuation is determined from level difference

3.5.6 Results

Test Results				
Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
Single	906.5	-52.27	-20	PASS
Single	922.5	-51.69	-20	PASS

Emissions in nonrestricted frequency bands at the Band-edge

Project Number: GOM-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.10
 Operational Mode: single frequency, Channel: 906.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Band-edge: Lower
 In-band Frequency [MHz]: 906.672
 Max. in-band Level [dBm/100 kHz]: 10.217
 Out-of-band Frequency [MHz]: 899.073
 Max. out-of-band Level [dBm/100 kHz]: -42.052
 Attenuation [dB]: -52.27



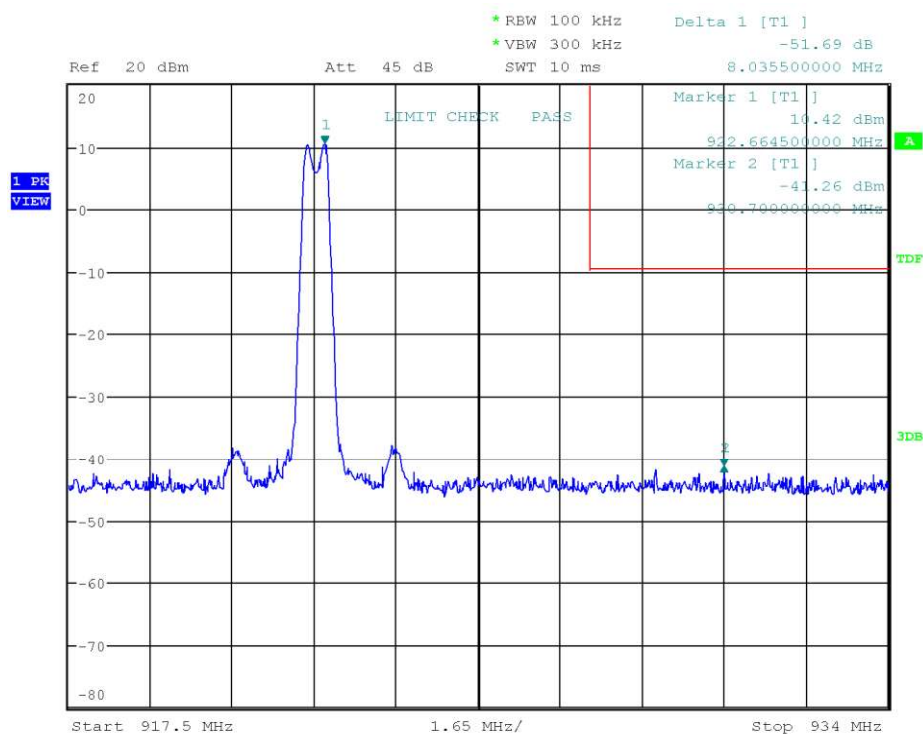
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Test Report No.: GOM-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Emissions in nonrestricted frequency bands at the Band-edge

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.10
 Operational Mode: single frequency, Channel: 922.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Band-edge: Upper
 In-band Frequency [MHz]: 922.664
 Max. in-band Level [dBm/100 kHz]: 10.424
 Out-of-band Frequency [MHz]: 930.7
 Max. out-of-band Level [dBm/100 kHz]: -41.262
 Attenuation [dB]: -51.69



Date: 16.MAY.2023 15:12:10

Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

3.6 Test Conditions and Results - Conducted spurious emissions

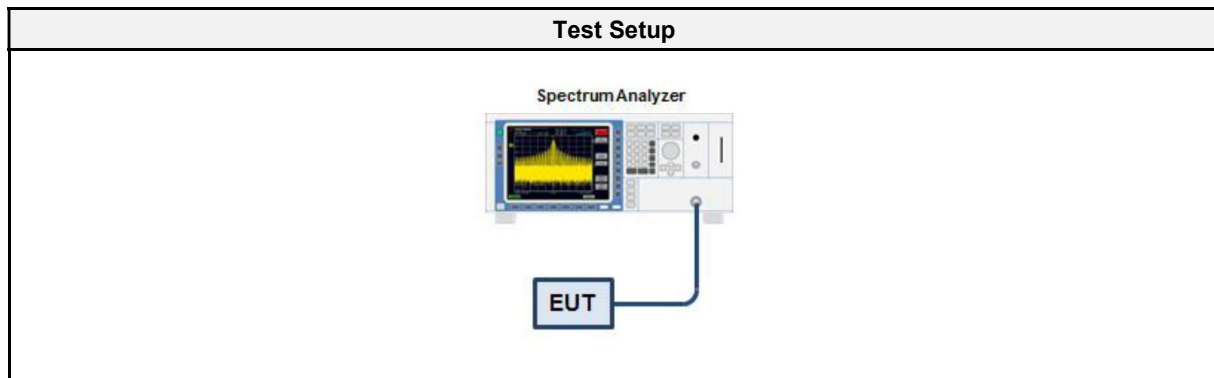
3.6.1 Information

Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 3 (section 5.5)
Measurement Uncertainty	± 4.25 dB
Measurement Method	ANSI C63.10 11.11
Operator	Florian Voigt
Date	2023-05-16

3.6.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
RMS	30

3.6.3 Setup



3.6.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 43	EF01631	2022-08	2023-08
Cable	Huber + Suhner	Sucoflex 102EA	EF00779 CAABT	2023-03	2024-03

3.6.5 Procedure

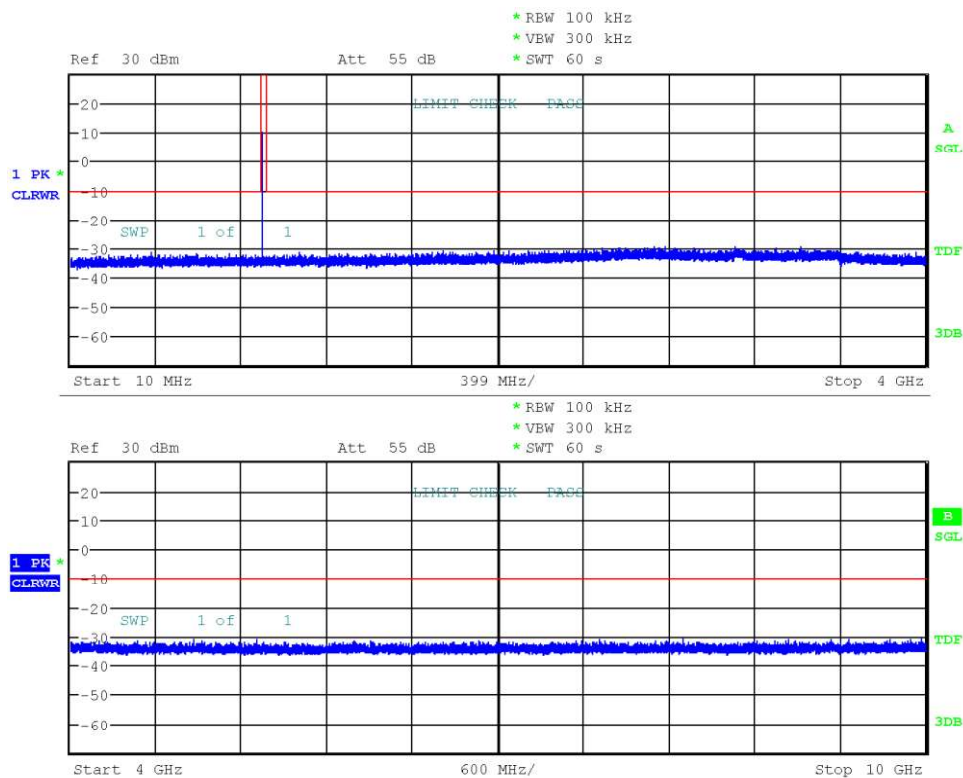
Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span set around lower band edge and detector is set to peak and max hold 3. Resolution bandwidth is set to 100 kHz 4. Markers are set to peak emission levels outside frequency band

3.6.6 Results

Test Results		
Mode	Channel [MHz]	Verdict
Transmit	906.5	PASS
Transmit	914.5	PASS
Transmit	922.5	PASS

Conducted Spurious Emissions

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: 2-GFSK, Channel: 906.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Max. in-band Frequency [MHz]: 906.7
 Max. in-band Level [dBm/100 kHz]: 10.2
 Out-of-band Limit [dBm/100 kHz]: -9.8



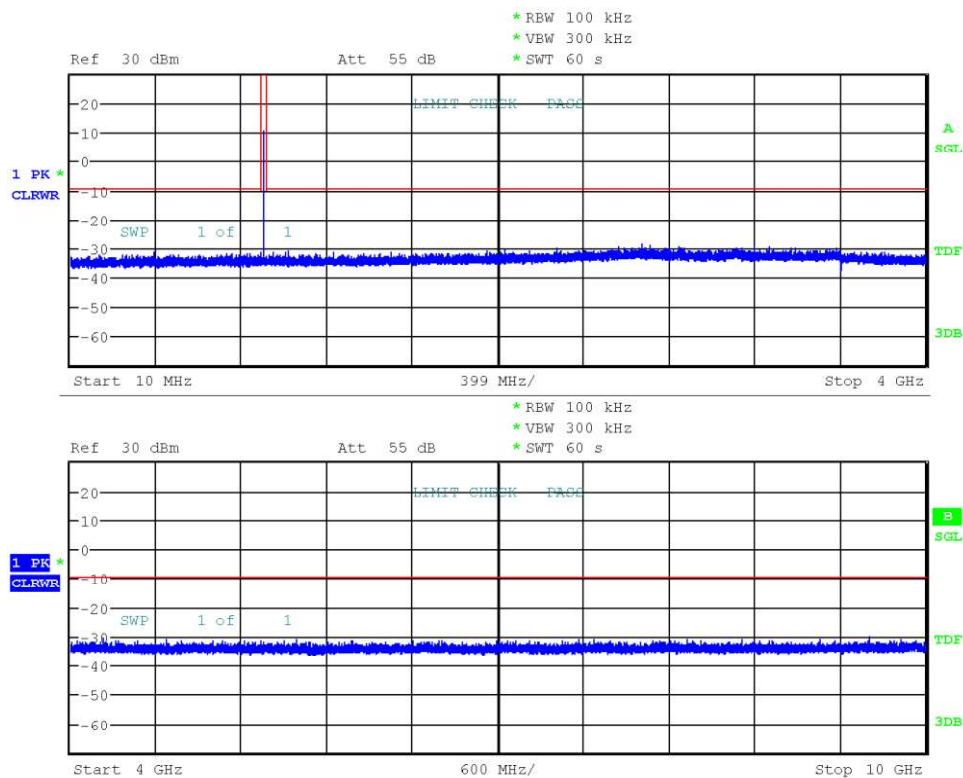
Date: 16.MAY.2023 15:22:40

Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Conducted Spurious Emissions

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: 2-GFSK, Channel: 914.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Max. in-band Frequency [MHz]: 914.3
 Max. in-band Level [dBm/100 kHz]: 10.6
 Out-of-band Limit [dBm/100 kHz]: -9.4



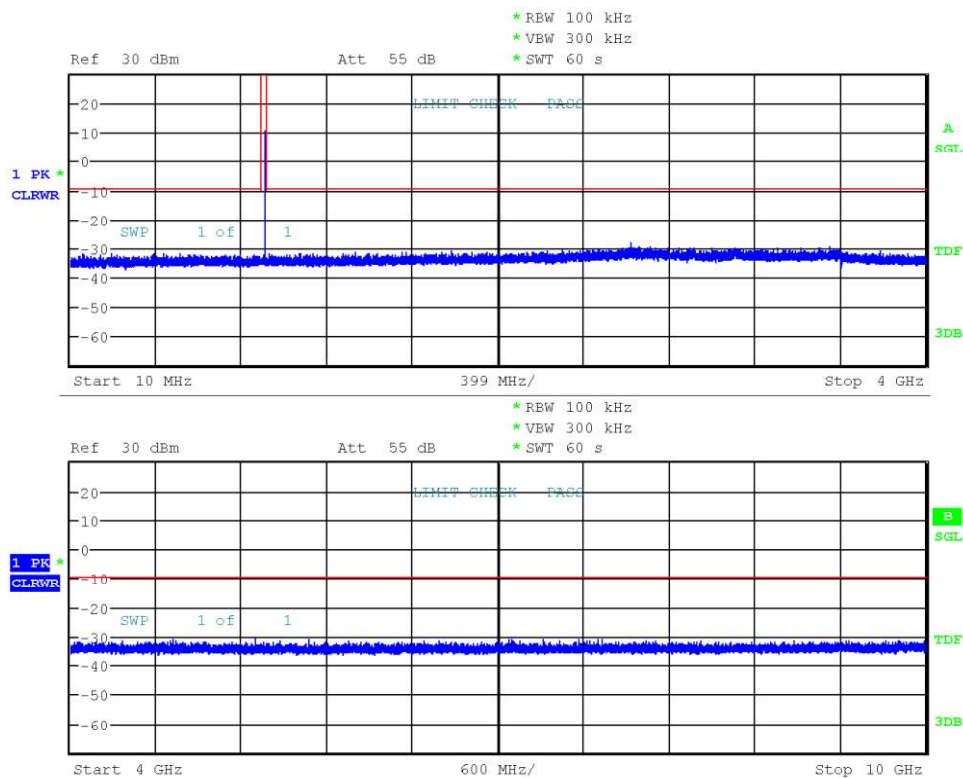
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Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Conducted Spurious Emissions

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44397
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: 2-GFSK, Channel: 922.5 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Florian Voigt
 Test Site: Eurofins Product Service GmbH
 Test Date: 2023-05-16
 Max. in-band Frequency [MHz]: 922.7
 Max. in-band Level [dBm/100 kHz]: 10.5
 Out-of-band Limit [dBm/100 kHz]: -9.5



Date: 16.MAY.2023 15:29:25

Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

3.7 Test Conditions and Results - Transmitter radiated emissions

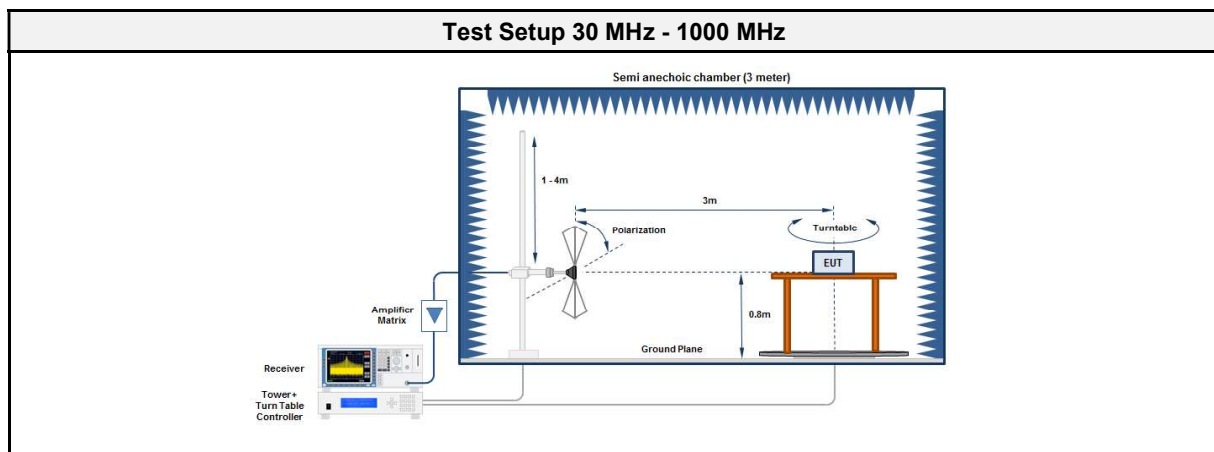
3.7.1 Information

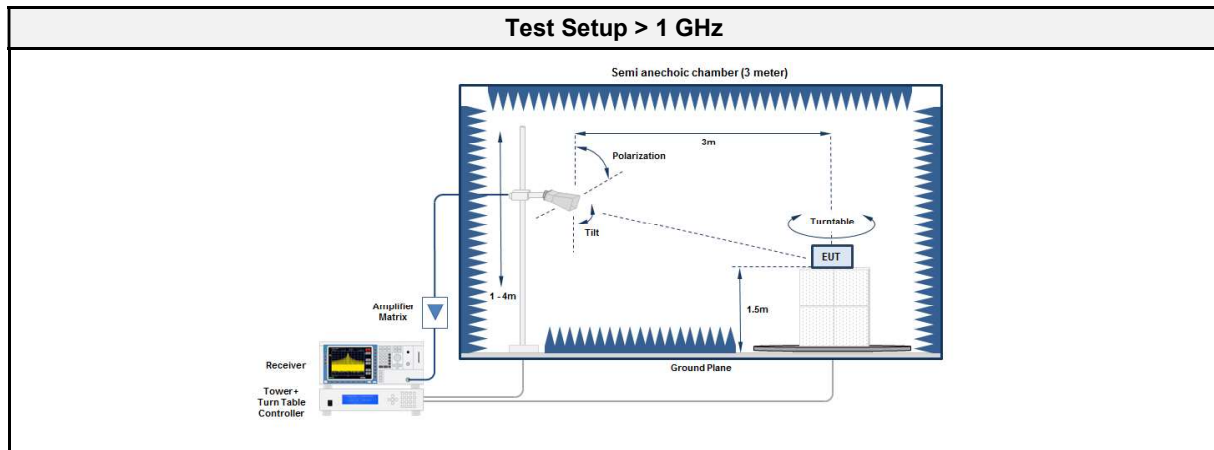
Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISSED RSS-Gen, Issue 5 A2 (section 6.13)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Operator	Azamat Ibraimov, Md Abu Bakar Siddique
Date	2023-08-16 - 2023-10-20

3.7.2 Limits

Limits			
Frequency range [MHz]	Detector	Field strength [µV/m]	Measurement distance [m]
0.009 - 0.09	Average	2400/F[kHz]	300
0.09 - 0.110	Quasi-Peak	2400/F[kHz]	300
0.110 - 0.490	Average	2400/F[kHz]	300
0.490 - 1.705	Quasi-Peak	24000/F[kHz]	30
1.705 - 30.0	Quasi-Peak	30	30
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.7.3 Setup





3.7.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2020.1.8

Test Equipment 30 MHz - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2022-11	2025-11
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2023-02	2024-02
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	EF01824	2022-10	2023-10

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF01011	2022-11	2023-11
Spectrum Analyzer	R&S	FSU43	EF01631	2023-02	2024-02
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2022-12	2025-12
Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2024-03

3.7.5 Procedure

Test Procedure 30 MHz - 1000 MHz
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

Test Procedure > 1 GHz
1. EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

3.7.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
906.5	1500	38.07	pk	ver	74.00	-35.93
906.5	1500	32.71	avg	ver	54.00	-21.29
906.5	4531.7	51.60	pk	ver	74.00	-22.40
906.5	4531.7	45.65	avg	ver	54.00	-08.35
906.5	7500.3	38.14	pk	ver	74.00	-35.86
906.5	7500.3	31.46	avg	ver	54.00	-22.54
906.5	9000.2	39.32	pk	ver	74.00	-34.68
906.5	9000.2	30.39	avg	ver	54.00	-23.61
914.5	4500.1	48.12	pk	ver	74.00	-25.88
914.5	4500.1	44.17	avg	ver	54.00	-09.83
914.5	4575.9	49.72	pk	ver	74.00	-24.28
914.5	4575.9	45.34	avg	ver	54.00	-08.66
914.5	7500.1	43.37	pk	ver	74.00	-30.63
914.5	7500.1	36.29	avg	ver	54.00	-17.71
922.5	1500	38.58	pk	hor	74.00	-35.42
922.5	1500	34.14	avg	hor	54.00	-19.86
922.5	4613.3	46.05	pk	ver	74.00	-27.95
922.5	4613.3	39.15	avg	ver	54.00	-14.85
922.5	7500.4	39.08	pk	ver	74.00	-34.92
922.5	7500.4	31.01	avg	ver	54.00	-22.99
922.5	9000.6	39.11	pk	ver	74.00	-34.89
922.5	9000.6	30.82	avg	ver	54.00	-23.18

3.8 Test Conditions and Results - Receiver radiated emissions

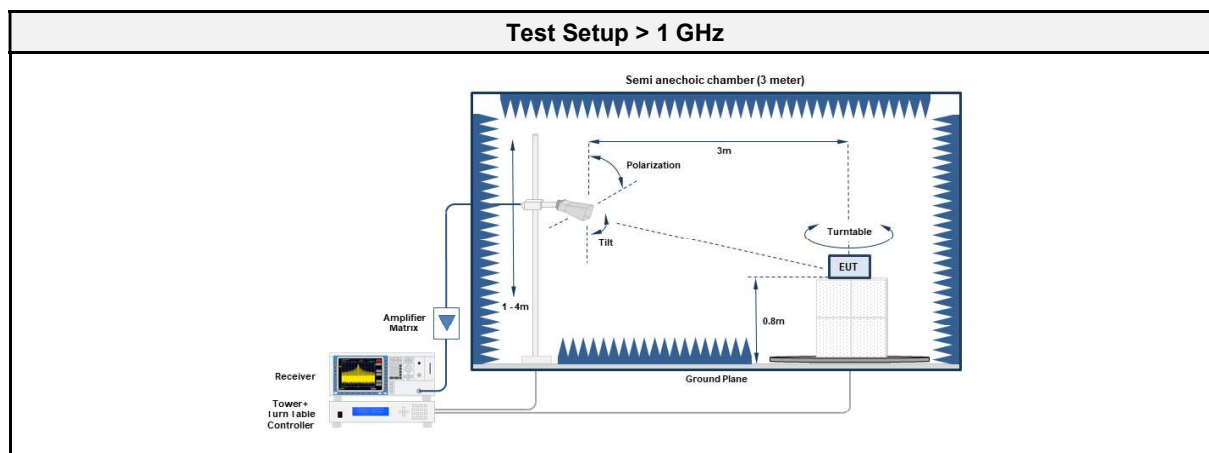
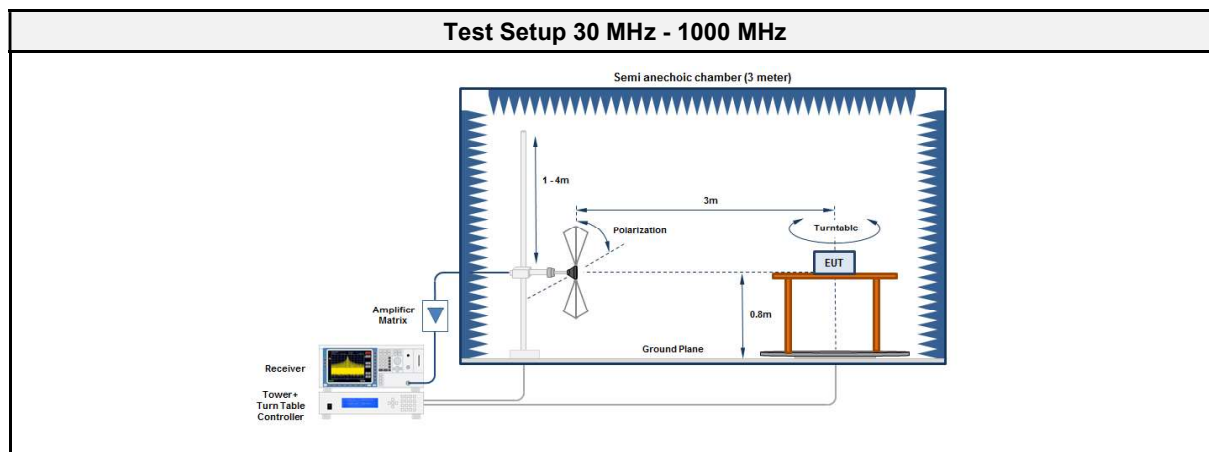
3.8.1 Information

Test Information	
Reference	ISED RSS-247, Issue 3 (section 3.1)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.4-2014 8.1-8.3
Operator	Azamat Ibraimov
Date	2023-08-18 - 2023-08-21

3.8.2 Limits

Limits			
Frequency range [MHz]	Detector	Field strength [$\mu\text{V/m}$]	Measurement distance [m]
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.8.3 Setup



3.8.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2020.1.8

Test Equipment 30 MHz - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2022-11	2025-11
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2023-02	2024-02
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	EF01824	2022-10	2023-10

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF01011	2022-11	2023-11
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2023-02	2024-02
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2022-12	2025-12
Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2024-03

3.8.5 Procedure

Test Procedure	
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT is set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector	

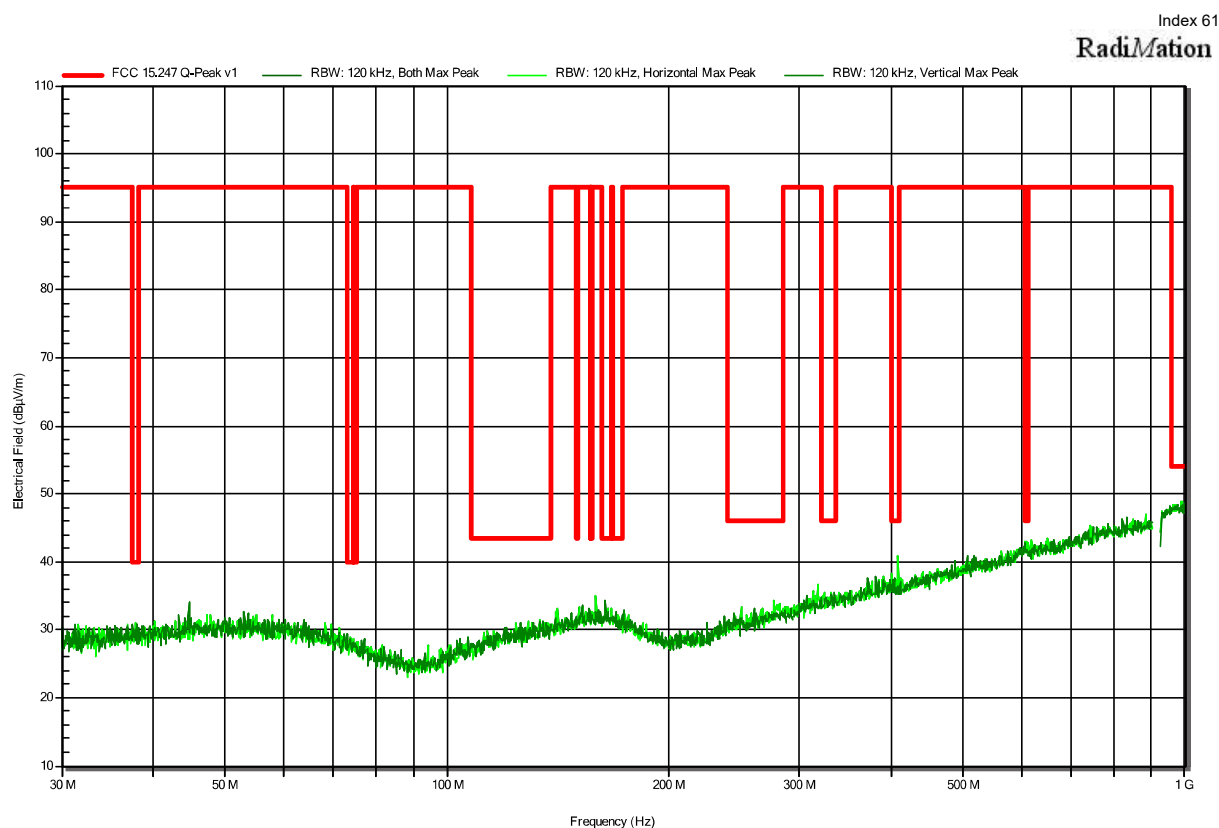
3.8.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
914.5	199.9925	28.20	pk	ver	43.50	-15.29
914.5	249.9717	32.70	pk	ver	46.00	-13.25
914.5	359.994	39.90	pk	hor	46.00	-06.11
914.5	359.994	36.10	qpk	hor	46.00	-09.88
914.5	600.3843	39.40	pk	ver	46.00	-06.61
914.5	600.3843	35.20	qpk	ver	46.00	-10.82
914.5	3000	45.18	pk	hor	74.00	-28.82
914.5	3000	41.44	avg	hor	53.98	-12.54
914.5	4500	48.94	pk	ver	74.00	-25.06
914.5	4500	46.07	avg	ver	53.98	-07.91
914.5	7501	42.01	pk	ver	74.00	-31.99
914.5	7501	38.03	avg	ver	53.98	-15.95

ANNEX A Transmitter spurious emissions

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Tx; WiMEA, 906.5 MHz
 Test Date: 2023-10-18
 Note: EUT horizontal

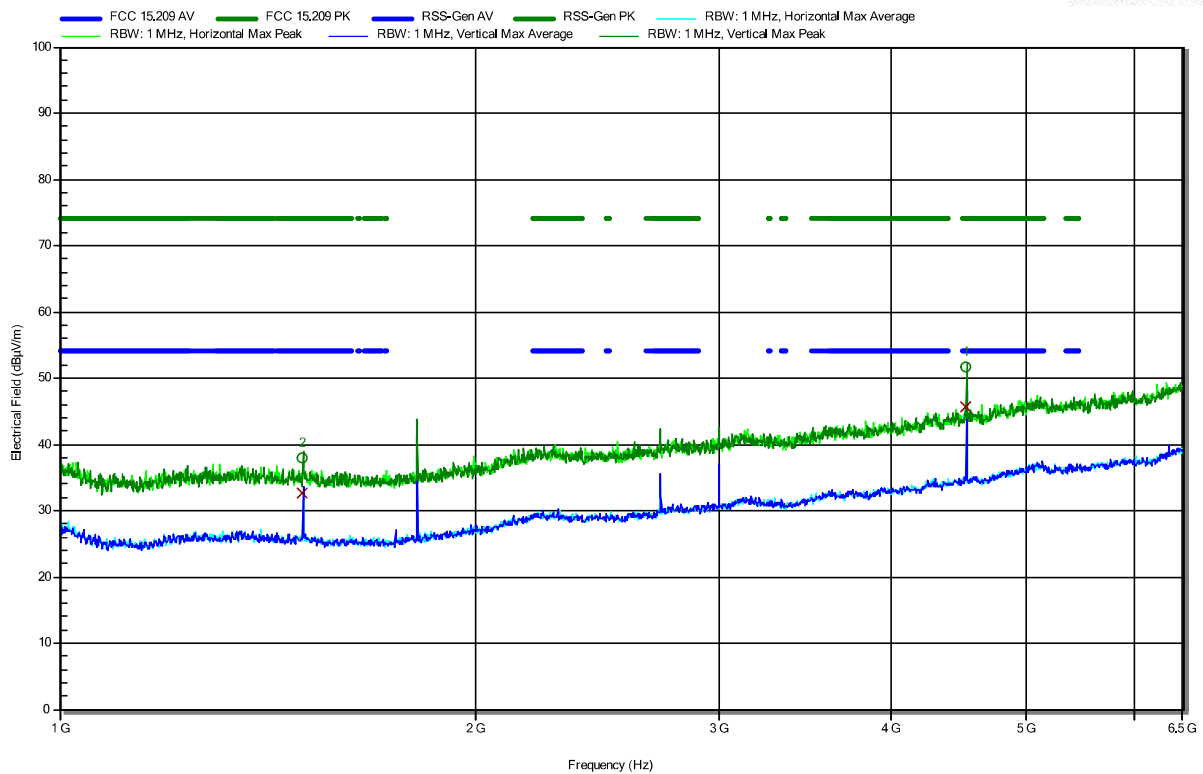


Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Tx; WiMEA, 906.5 MHz
 Test Date: 2023-10-18
 Note: EUT horizontal

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
1.5 GHz	38.07 dBµV/m	74 dBµV/m	-35.93 dB	Pass	Vertical
4.5317 GHz	51.6 dBµV/m	74 dBµV/m	-22.4 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
1.5 GHz	32.71 dBµV/m	54 dBµV/m	-21.29 dB	Pass	Vertical
4.5317 GHz	45.65 dBµV/m	54 dBµV/m	-8.35 dB	Pass	Vertical

Test Report No.: G0M-2303-1961-TFC247DT-V05

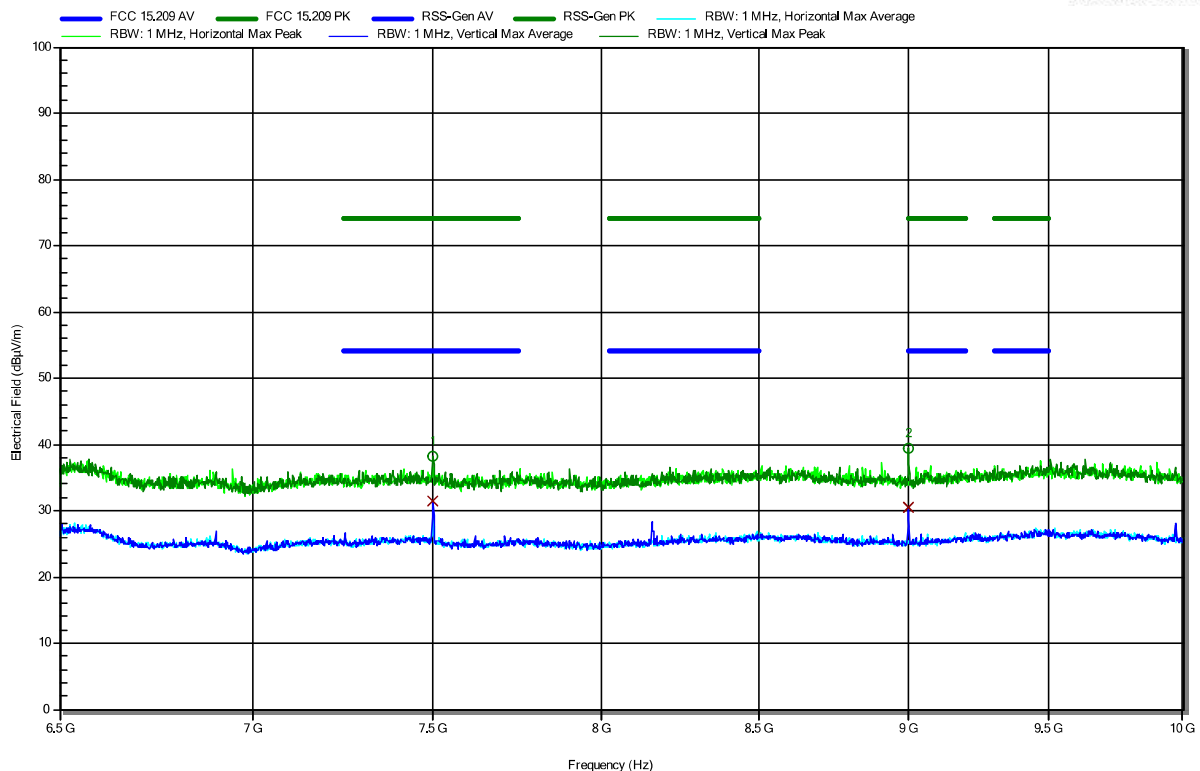
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; WiMEA, 906.5 MHz
 Test Date: 2023-10-20
 Note: EUT horizontal

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
7.5003 GHz	38.14 dBμV/m	74 dBμV/m	-35.86 dB	Pass	Vertical
9.0002 GHz	39.32 dBμV/m	74 dBμV/m	-34.68 dB	Pass	Vertical

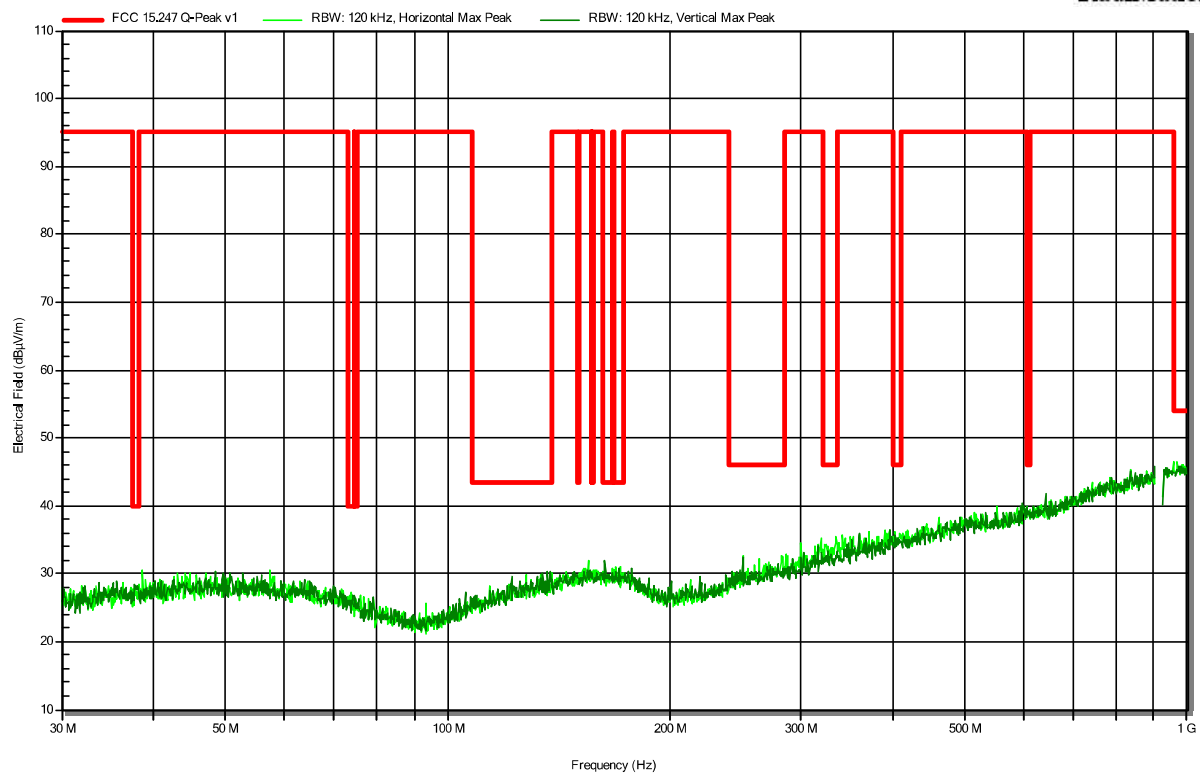
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
7.5003 GHz	31.46 dBμV/m	54 dBμV/m	-22.54 dB	Pass	Vertical
9.0002 GHz	30.39 dBμV/m	54 dBμV/m	-23.61 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: A.Ibraimov
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 25 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Tx; WiMEA, 914.5 MHz
 Test Date: 2023-08-21
 Note: EUT horizontal

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RadiMation

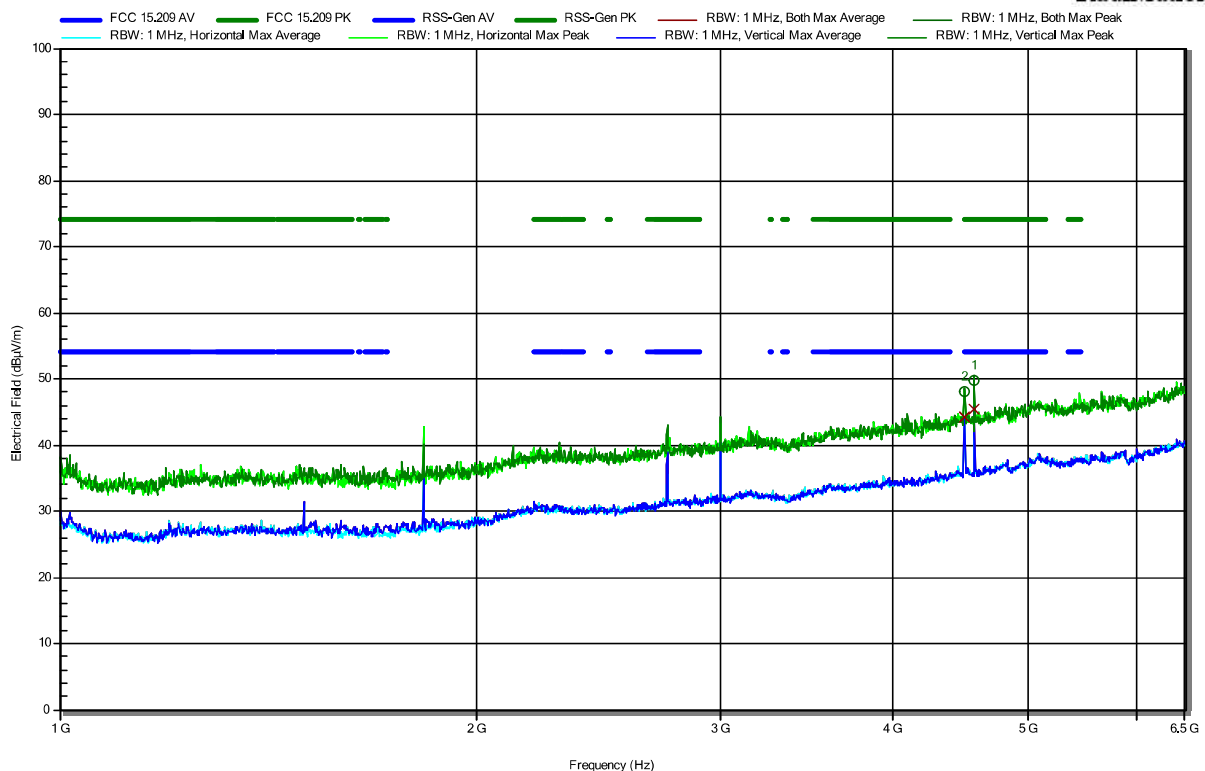


Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: A.Ibraimov
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 25 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Tx; WiMEA, 914.5 MHz
 Test Date: 2023-08-16
 Note: EUT horizontal

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RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
4.5001 GHz	48.12 dBµV/m	74 dBµV/m	-25.88 dB	Pass	Vertical
4.5759 GHz	49.72 dBµV/m	74 dBµV/m	-24.28 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
4.5001 GHz	44.17 dBµV/m	54 dBµV/m	-9.83 dB	Pass	Vertical
4.5759 GHz	45.34 dBµV/m	54 dBµV/m	-8.66 dB	Pass	Vertical

Test Report No.: G0M-2303-1961-TFC247DT-V05

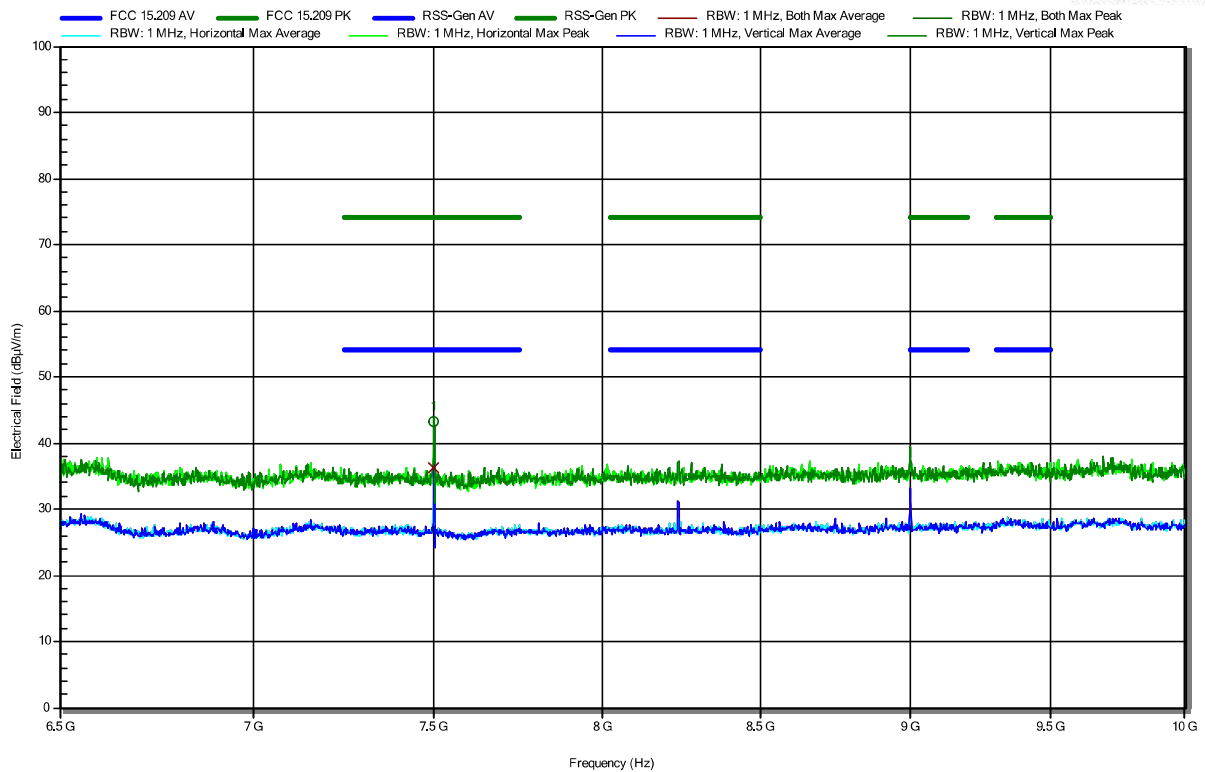
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: A.Ibraimov
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 25 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; WiMEA, 914.5 MHz
 Test Date: 2023-08-16
 Note: EUT horizontal

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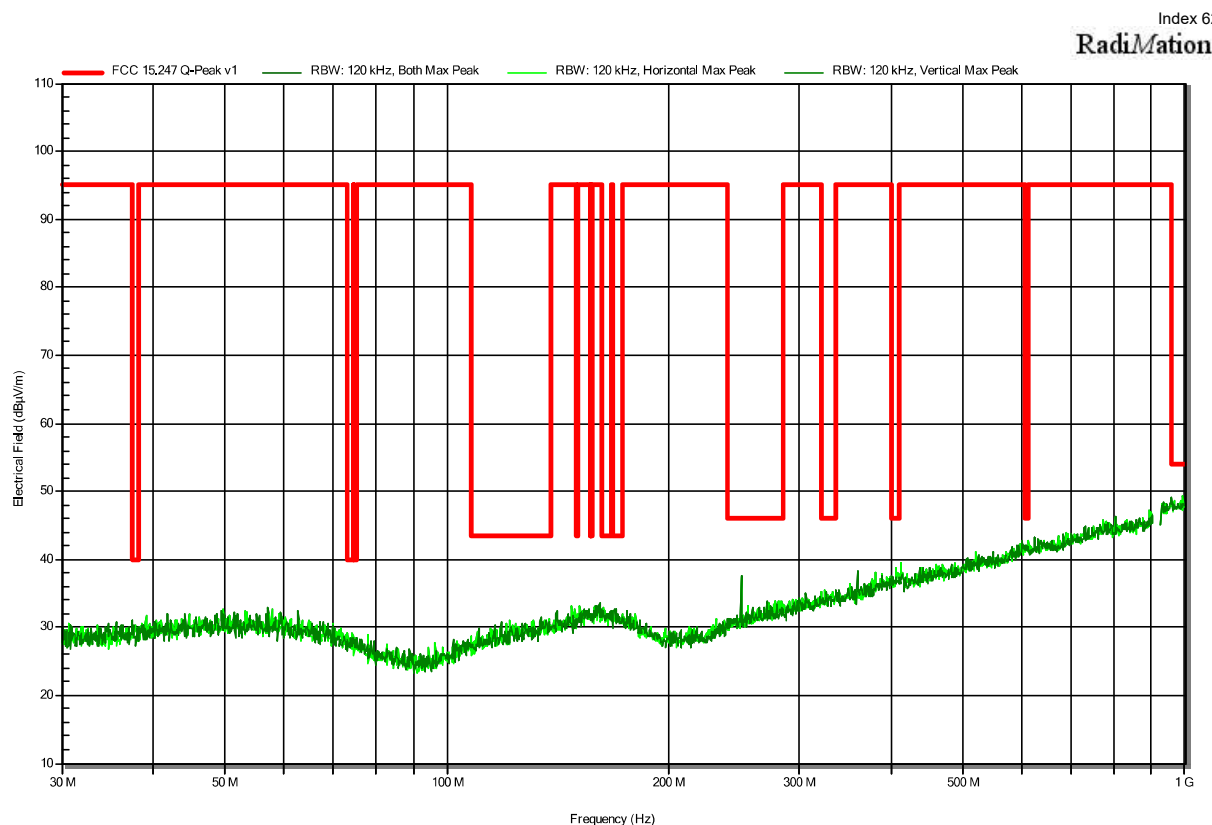
RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
7.5001 GHz	43.37 dBµV/m	74 dBµV/m	-30.63 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
7.5001 GHz	36.29 dBµV/m	54 dBµV/m	-17.71 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Tx; WiMEA, 922.5 MHz
 Test Date: 2023-10-18
 Note: EUT horizontal

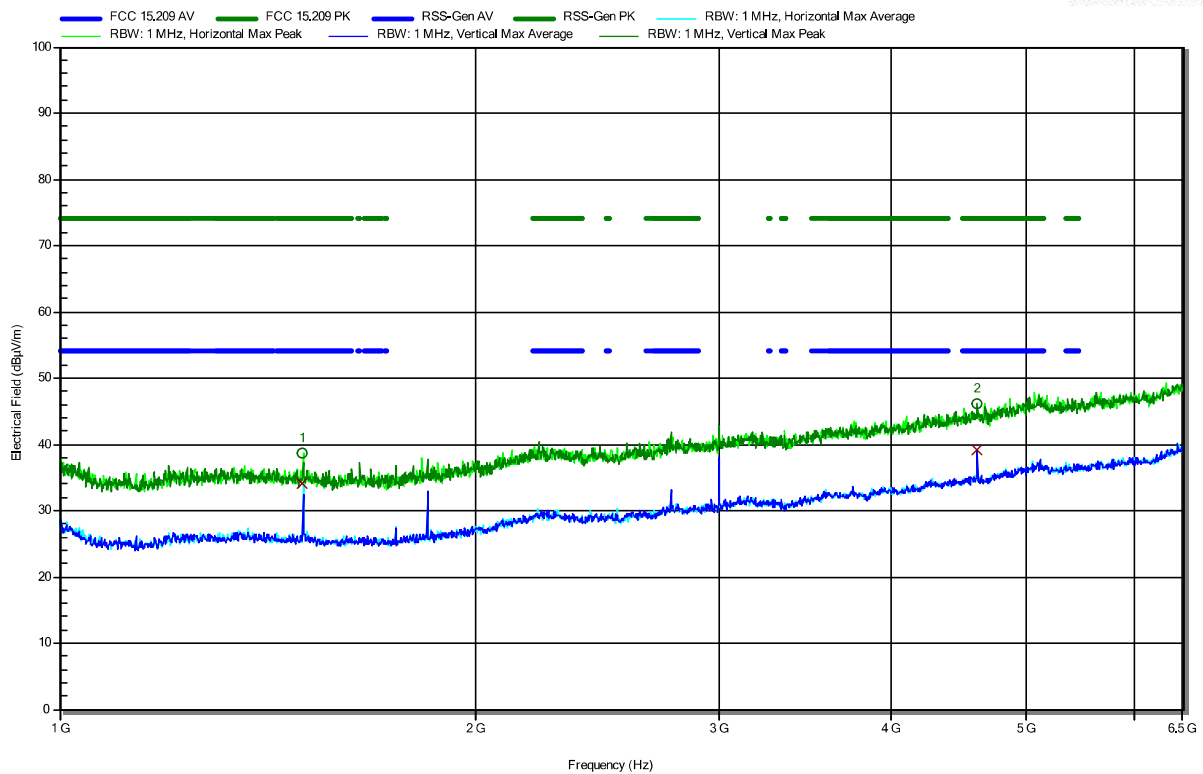


Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Tx; WiMEA, 922.5 MHz
 Test Date: 2023-10-18
 Note: EUT horizontal

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
1.5 GHz	38.58 dBµV/m	74 dBµV/m	-35.42 dB	Pass	Horizontal
4.6133 GHz	46.05 dBµV/m	74 dBµV/m	-27.95 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
1.5 GHz	34.14 dBµV/m	54 dBµV/m	-19.86 dB	Pass	Horizontal
4.6133 GHz	39.15 dBµV/m	54 dBµV/m	-14.85 dB	Pass	Vertical

Test Report No.: G0M-2303-1961-TFC247DT-V05

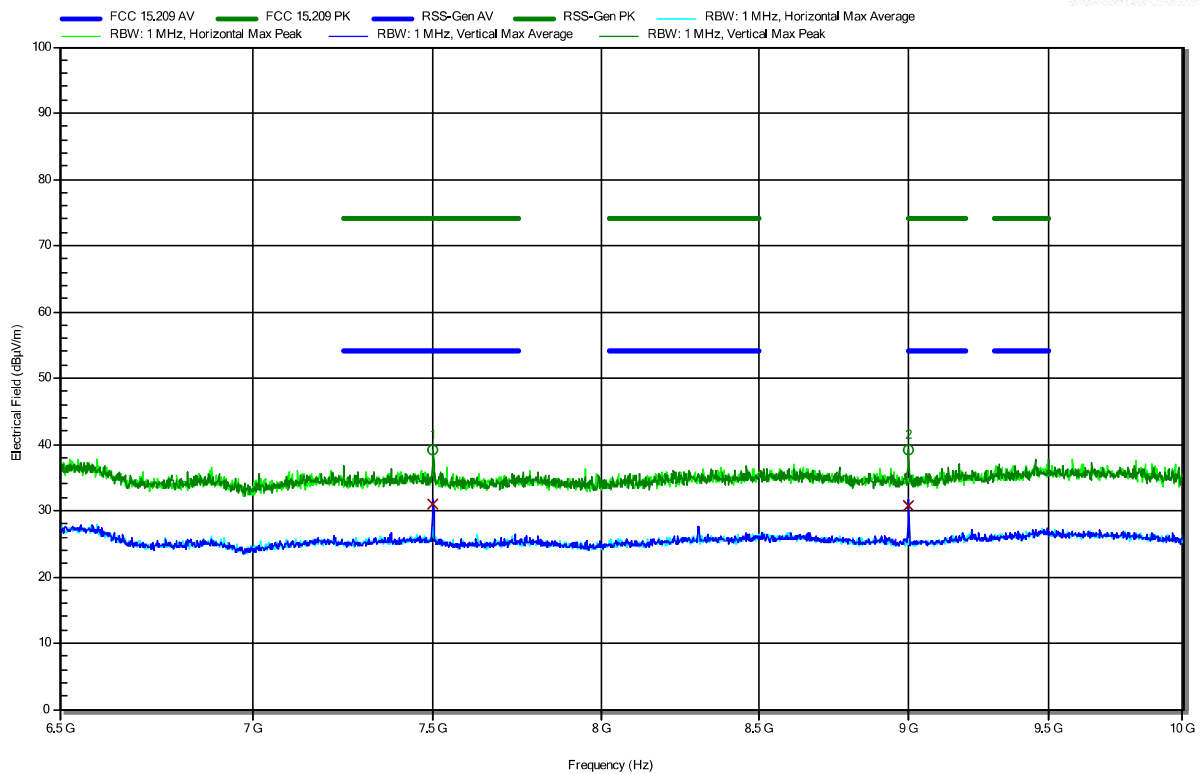
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Siddique
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 21 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; WiMEA, 922.5 MHz
 Test Date: 2023-10-20
 Note:

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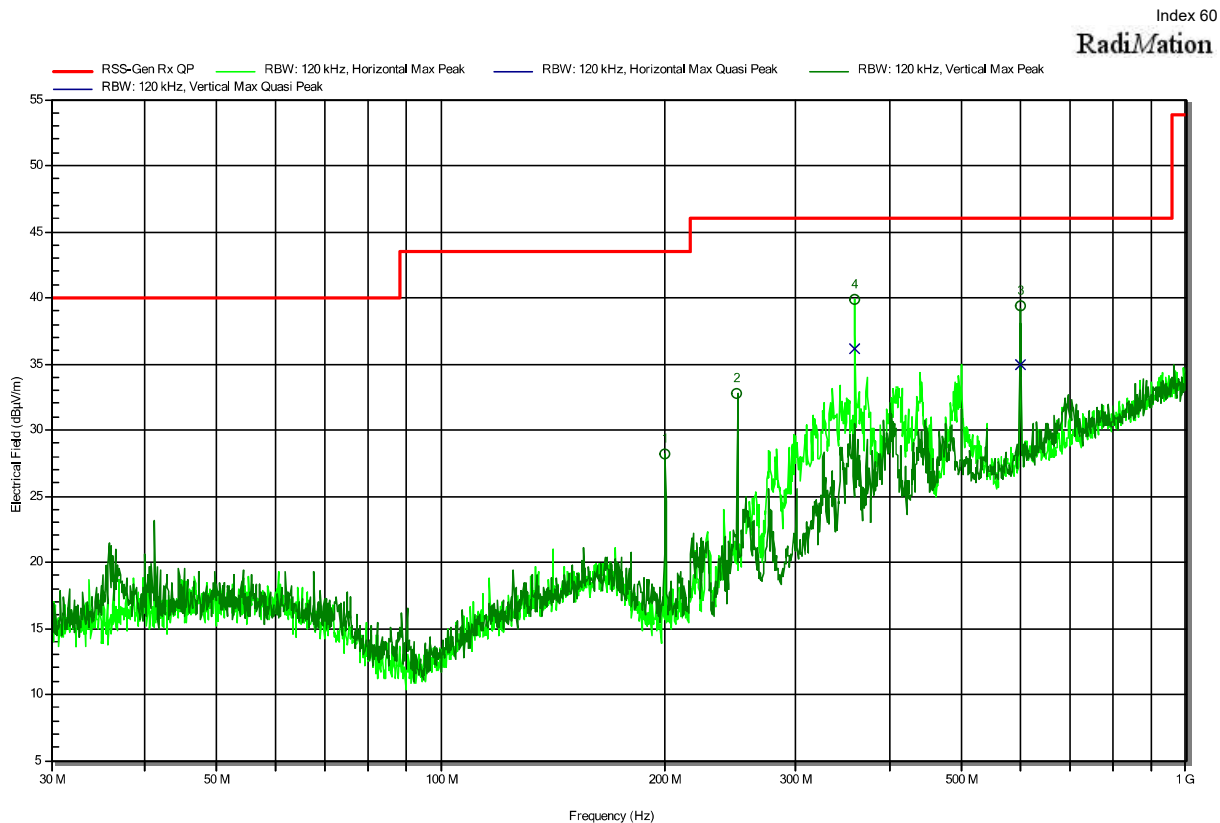


Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
7.5004 GHz	39.08 dBμV/m	74 dBμV/m	-34.92 dB	Pass	Vertical
9.0006 GHz	39.11 dBμV/m	74 dBμV/m	-34.89 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
7.5004 GHz	31.01 dBμV/m	54 dBμV/m	-22.99 dB	Pass	Vertical
9.0006 GHz	30.82 dBμV/m	54 dBμV/m	-23.18 dB	Pass	Vertical

ANNEX B Receiver spurious emissions

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: A.Ibraimov
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 25 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck VULB 9168
 Measurement distance: 3 m
 Mode: Rx; WiMEA, 914.5 MHz, Rx
 Test Date: 2023-08-21



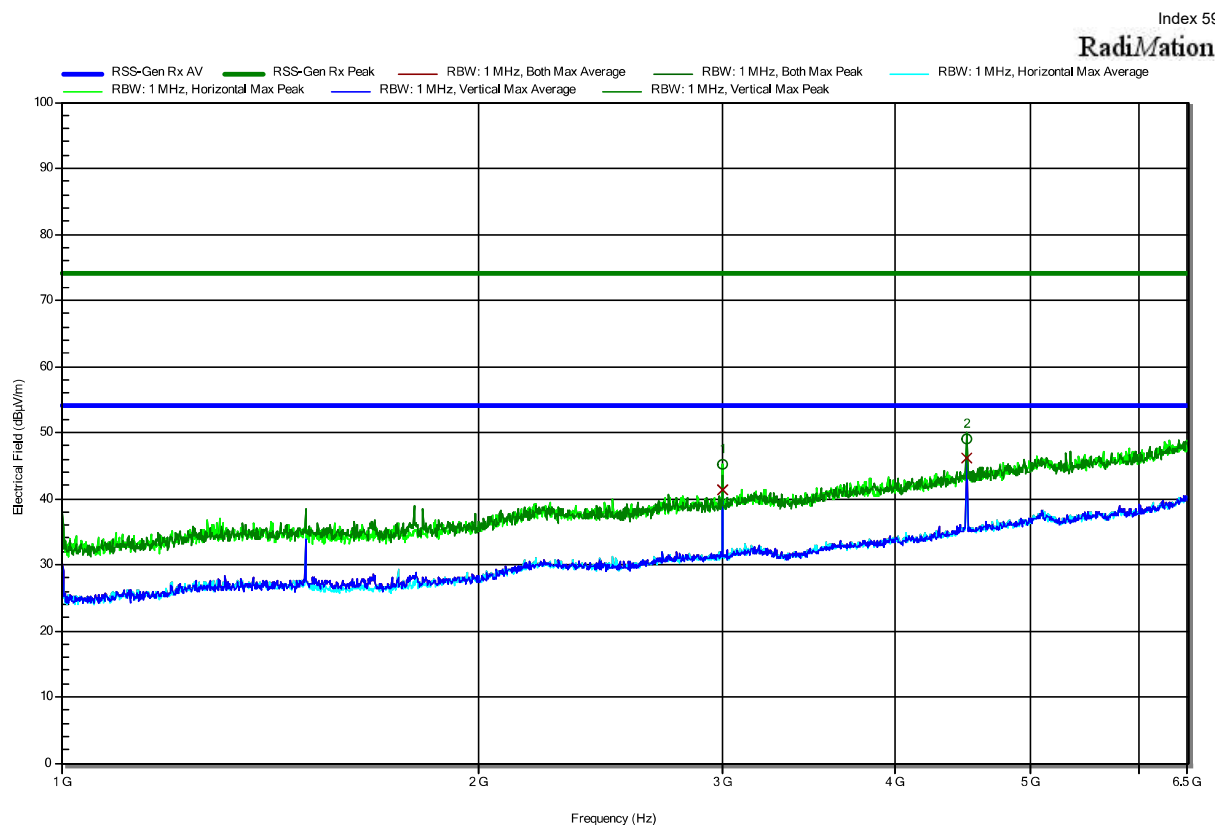
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
199.9925 MHz	28.2 dBµV/m	43.5 dBµV/m	-15.29 dB	Pass	Vertical
249.9717 MHz	32.7 dBµV/m	46 dBµV/m	-13.25 dB	Pass	Vertical
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Polarization
359.994 MHz	36.1 dBµV/m	46 dBµV/m	-9.88 dB	Pass	Horizontal
600.3843 MHz	35.2 dBµV/m	46 dBµV/m	-10.82 dB	Pass	Vertical

Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: A.Ibraimov
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 25 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Rx; WiMEA, 914.5 MHz, Rx
 Test Date: 2023-08-18
 Note:



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
3 GHz	45.18 dBµV/m	74 dBµV/m	-28.82 dB	Pass	Horizontal
4.5 GHz	48.94 dBµV/m	74 dBµV/m	-25.06 dB	Pass	Vertical

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
3 GHz	41.44 dBµV/m	53.98 dBµV/m	-12.54 dB	Pass	Horizontal
4.5 GHz	46.07 dBµV/m	53.98 dBµV/m	-7.91 dB	Pass	Vertical

Test Report No.: G0M-2303-1961-TFC247DT-V05

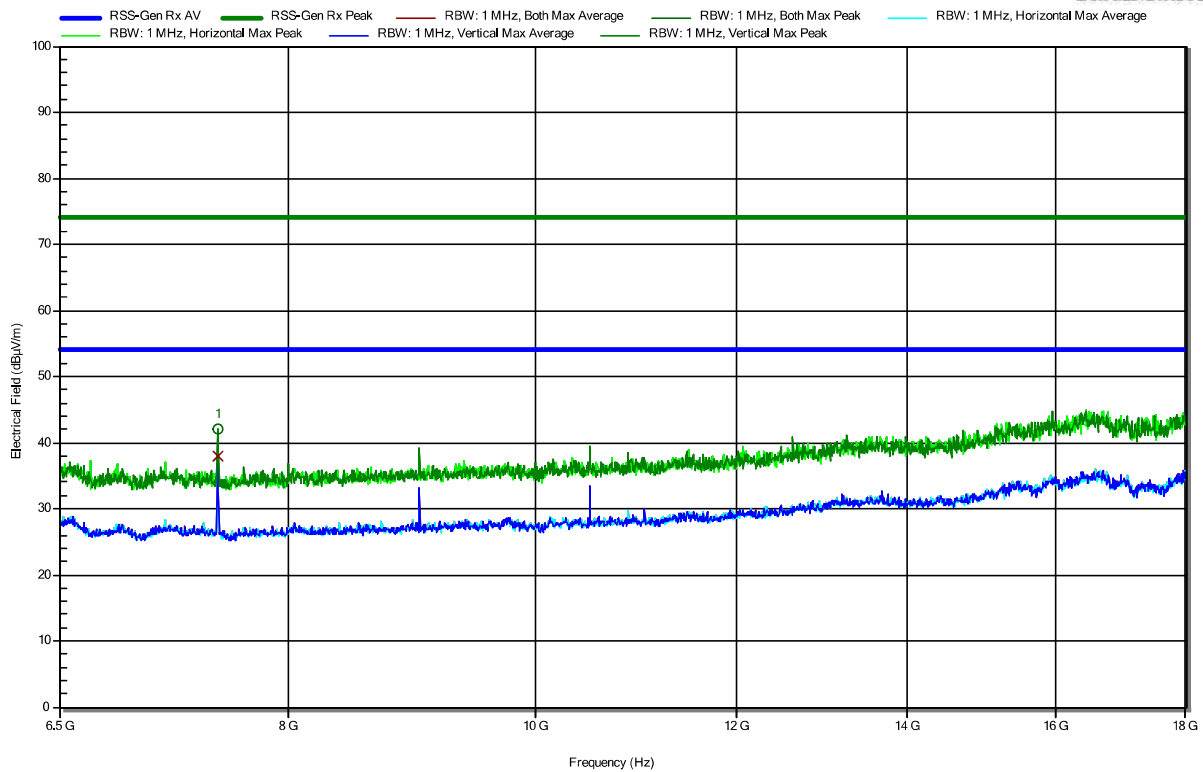
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247, RSS-247

Project Number: G0M-2303-1961
 Applicant: Navico Inc.
 Model Description: Marine and recreational IoT Gateway and vessel management system
 Model: Connect 1
 Test Sample ID: 44396
 Test Site: Eurofins Product Service GmbH
 Operator: A.Ibraimov
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 25 °Celsius, Vnom: 13.8 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Rx; WiMEA, 914.5 MHz, Rx
 Test Date: 2023-08-18
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
7.501 GHz	42.01 dBµV/m	74 dBµV/m	-31.99 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
7.501 GHz	38.03 dBµV/m	53.98 dBµV/m	-15.95 dB	Pass	Vertical

=== END OF TEST REPORT ===

Test Report No.: G0M-2303-1961-TFC247DT-V05

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany