

Test Report No:
80540RRF.004

Partial Test Report

USA FCC Part 90

CANADA RSS-140

(*) Identification of item tested	Cat1 bis data only module
(*) Trademark	u-blox
(*) Model and /or type reference	LEXI-R10401D
Other identification of the product	FCC ID: XPYUBX23AD01 IC: 8595A-UBX23AD01
(*) Features	LTE Cat1 bis, Wi-fi Scan / Locate HW version: UBX-437C01 SW version: 01.06.A01.00
Applicant	u-blox AG Zürcherstrasse 68, CH-8800 Thalwil, Switzerland
Test method requested, standard	USA FCC Part 90 (10-1-23 Edition). CANADA RSS-140 Issue 1, April 2018 ANSI C63.26-2015. KDB 971168 D01 Power Meas License Digital Systems v03r01, April. 2018.
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager
Date of issue	2025-01-14
Report No	FDT08_25 (*) "Data provided by the client"

Index

Competences and guarantees3

General conditions3

Uncertainty3

Data provided by the client.....3

Usage of samples4

Test sample description4

Identification of the client.....5

Testing period and place.....5

Document history5

Environmental conditions6

Remarks and comments6

Testing verdicts.....7

Summary7

Appendix A: Test results for FCC 90 / RSS-140.....8

Competences and guarantees

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Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

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 model is LEXI-R10401D is a Cat1 bis data only module for industrial IoT applications.

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 Reception	of	Application
S/01	80540_33.1	Cat1 bis data only module	LEXI-R10401D	-	2024-11-05		Element Under Test
S/01	80540_36.1	AC/DC	-	-	2024-11-05		Auxiliary Element
S/01	80540_37.1	USB Cable	-	-	2024-11-05		Auxiliary Element
S/01	80540_49.1	USB Cable	-	-	2024-11-05		Auxiliary Element

Notes referenced to samples during the project:

Id	Type
S/01	Conducted tests.

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded			
		USB	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
-			<input type="checkbox"/>	<input type="checkbox"/>			
Supplementary information to the ports..... :	-						
Rated power supply :	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	DC: Min: 3.3, Typical: 3.8, Max: 4.5					
Rated Power..... :	-						
Clock frequencies..... :	26 MHz						
Other parameters :	-						
Software version..... :	01.06.A01.00						
Hardware version :	UBX-437C01						
Dimensions in cm (W x H x D) ... :	1.6 x 0.2 x 1.6						
Mounting position :	<input type="checkbox"/>	Table top equipment					
	<input type="checkbox"/>	Wall/Ceiling mounted equipment					
	<input type="checkbox"/>	Floor standing equipment					
	<input type="checkbox"/>	Hand-held equipment					

	<input checked="" type="checkbox"/>	Other: Industrial modem component	
Modules/parts..... :	Module/parts of test item		Type
	-		-
Accessories (not part of the test item) :	Description		Type
	Power supply unit		UUX324-1215
	Antenna LTE		GSA.8835
Documents as provided by the applicant :	Description		File name
	-		-
			Manufacturer
			Unifive
			Taoglass
			Issue date
			-

Identification of the client

u-blox AG
Zürcherstrasse 68, CH-8800 Thalwil, Switzerland

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2024-11-06
Date (finish)	2024-11-06

Document history

Report number	Date	Description
80540RRF.004	2025-01-14	First release.

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 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: Carmen Vázquez.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
9555	TWO CHANNEL POWER SUPPLY, 32V, 10/5A, 188W	HMP2020	ROHDE SCHWARZ AND	N/A
7794	SIGNAL AND SPECTRUM ANALYZER 10 Hz - 40 GHz	FSV40	ROHDE SCHWARZ AND	2025-04-21
8912	WIDEBAND RADIO COMMUNICATION TESTER	CMW500	ROHDE SCHWARZ AND	2025-10-05

Testing verdicts

Not applicable:	N/A
Pass:	P
Fail:	F
Not measured:	N/M

Summary

LTE Cat 1bis Band 14:

FCC PART 90 / RSS-140 PARAGRAPH		
Requirement – Test case	Verdict	Remark
FCC 90.542 (a) (7) / RSS-140 Clause 4.3: Transmitter output power: RF output power	P	
FCC 2.1047 / RSS-140 Clause 4.1: Modulation characteristics	N/M	(1)
FCC 2.1055 / RSS-140 Clause 4.2: Frequency stability	N/M	(1)
FCC 2.1049 / RSS-Gen Clause 6.7: Occupied bandwidth (or 99% emission bandwidth)	N/M	(1)
FCC 90.691 / RSS-140 Clause 4.4: Spurious emissions at antenna terminals	N/M	(1)
FCC 90.691 / RSS-140 Clause 4.4: Spurious emissions at antenna terminals (Emission mask requirements for EA-based systems)	N/M	(1)
FCC 90.691 / RSS-140 Clause 4.4: Radiated emissions	N/M	(1)
<u>Supplementary information and remarks:</u> (1) Test not requested.		

Appendix A: Test results for FCC 90 / RSS-140

INDEX

TEST CONDITIONS10

RF Output Power11

TEST CONDITIONS

(*): Declared by the Applicant.

POWER SUPPLY (*):

Vnominal: 3.8 Vdc
 Vminimum: 3.23 Vdc
 Vmaximum: 4.5 Vdc

Type of Power Supply: DC External (USB).

ANTENNA (*):

Bands	Gain (dBi)	Type
LTE Cat1 bis 14	2.44	External Antenna (Taoglass GSA_8835 (standard reference antenna provided with EVK))

TEST FREQUENCIES:

LTE Cat 1bis Band 14. QPSK and 16QAM:

	Channel (Frequency, MHz)	
	BW=5 MHz	BW=10 MHz
Low	23305 (790.5)	N/A
Middle	N/A	23330 (793)
High	23355 (795.5)	N/A

RF Output Power

Limits

1. LTE Cat 1bis Band 14:

* FCC § 90.542 (a) (7):

(a) The following power limits apply to the 763-768 / 793-798 MHz band:

(7) Portable stations (hand-held devices) transmitting in the 763-768 MHz band and the 793-798 MHz band are limited to 3 watts ERP.

* RSS-140 Clause 4.3: The equivalent radiated power (e.r.p.) for control and mobile equipment shall not exceed 30 W. The e.r.p. for portable equipment including handheld devices shall not exceed 3 W.

Fixed and base station equipment shall comply with the e.r.p. limits in SRSP-540.

In addition, the peak to average power ratio (PAPR) of the equipment shall not exceed 13 dB for more than 0.1% of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

Method

The conducted RF output power measurements were made at the RF output terminals of the EUT using the power meter of the Universal Radio Communication tester R&S CMW500, selecting maximum transmission power of the EUT and different modes of modulation.

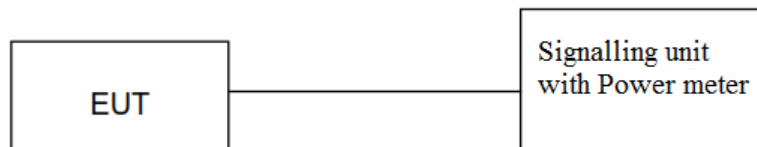
The maximum equivalent isotropically radiated power (e.i.r.p.) is calculated by adding the declared maximum antenna gain (dBi).

The maximum effective radiated power e.r.p. is calculated from the maximum equivalent isotropically radiated power (e.i.r.p.) by subtracting 2.15 dB:

$$\text{E.R.P.} = \text{E.I.R.P.} - 2.15 \text{ dB}$$

Test Setup

1. CONDUCTED AVERAGE POWER:



Results

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
5	Low 23305	790.5	QPSK	1	0	23.21
5			QPSK	1	12	23.24
5			QPSK	1	24	23.32
5			QPSK	12	0	22.31
5			QPSK	12	6	22.37
5			QPSK	12	11	22.44
5			QPSK	25	0	22.37
5			16-QAM	1	0	22.51
5			16-QAM	1	12	22.55
5			16-QAM	1	24	22.59
5			16-QAM	12	0	21.3
5			16-QAM	12	6	21.37
5			16-QAM	12	11	21.44
5			16-QAM	25	0	21.39
5	Middle 23330	793	QPSK	1	0	N/A
5			QPSK	1	12	N/A
5			QPSK	1	24	N/A
5			QPSK	12	0	N/A
5			QPSK	12	6	N/A
5			QPSK	12	11	N/A
5			QPSK	25	0	N/A
5			16-QAM	1	0	N/A
5			16-QAM	1	12	N/A
5			16-QAM	1	24	N/A
5			16-QAM	12	0	N/A
5			16-QAM	12	6	N/A
5			16-QAM	12	11	N/A
5			16-QAM	25	0	N/A
5	High 23355	795.5	QPSK	1	0	22.83
5			QPSK	1	12	22.57
5			QPSK	1	24	22.71
5			QPSK	12	0	21.74
5			QPSK	12	6	21.73
5			QPSK	12	11	21.65
5			QPSK	25	0	21.73
5			16-QAM	1	0	21.95
5			16-QAM	1	12	21.73
5			16-QAM	1	24	21.83
5			16-QAM	12	0	20.82
5			16-QAM	12	6	20.72
5			16-QAM	12	11	20.75
5			16-QAM	25	0	20.76

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
10	Middle 23330	793	QPSK	1	0	22.81
10			QPSK	1	24	23.14
10			QPSK	1	49	22.97
10			QPSK	25	0	22.04
10			QPSK	25	12	22.14
10			QPSK	25	24	22.04
10			QPSK	50	0	22.09
10			16-QAM	1	0	21.86
10			16-QAM	1	24	22.02
10			16-QAM	1	49	21.95
10			16-QAM	25	0	21.16
10			16-QAM	25	12	21.28
10			16-QAM	25	24	21.13
10			16-QAM	50	0	N/A

Verdict

Pass