

Test report No:
 NIE: 68013REM.002A2

Test report

FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)

(*) Identification of item tested	Data radio module
(*) Trademark	Telit
(*) Model and /or type reference	NE310L2-WW
Other identification of the product	FCC ID: RI7NE310L2WW IC: 5131A-NE310L2WW HW version: 1.0 SW version: M0P.100001
(*) Features	LTE FDD Bands: 1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 85 Quad Band 2G – 900MHz & 1800MHz
Manufacturer	Telit Communications S.p.A. Via Stazione di Prosecco 5/B 34010 Sgonico Trieste – Italy
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López Martín EMC Consumer & RF Lab. Manager
Date of issue	2021-10-08
Report template No	FDT08_23 (*) "Data provided by the client"

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Acronyms

Acronym ID	Acronym Description
Avg	Radiated Average Level
Avg	Conducted Average Level
Az	Azimuth
CPL	Zones / Coupling Cables
Code	EMC Test Code
Freq	Frequency
Freq Rng	Frequency Range
H	Height
Line	Conducted Emissions - Tested Line
MP	Measurement Point
Max	Conducted Maximum Level
MaxPeak	Radiated Maximum Peak Level
OM	Operation Mode
Pol	Polarization
QuasiPeak	Conducted Quasi Peak Level
QuasiPeak	Radiated Quasi Peak Level
S/	Sample
V	Verdict
Volt Immunity Lvl	Voltage Immunity Severity Level
Volt Immunity Type	Voltage Immunity Type

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.

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.

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

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

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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 measured radio disturbance characteristics of EUT from 30 MHz to 1000 MHz is $l = \pm 4,9$ dB for quasi-peak measurements, $l = \pm 4,6$ dB for peak measurements ($k= 2$).

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 1000 MHz to 12.75 GHz is $l = \pm 2,6$ dB for peaks and average measurements ($k = 2$).

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 data radio module, model NE310L2-WW.

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	HW Version	Serial N°	Date Reception	of	Application
S/01	68013_9	Data radio module	NE310L2-WW	1.0	--	2021-06-08		Element Under Test
S/01	66585C_6	Cradle - EVK	--	---	--	2021-02-24		Auxiliary Element
S/01	66585C_32	Antenna LTE	T-AT305	---	--	2021-03-09		Auxiliary Element

Notes referenced to samples during the project:

- Auxiliary elements from project 65585C
- All test have been done with sample S/01 (HW 1.0).

Test sample description

Test Sample description (compulsory information for EMC and RF testing services)

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
	[]	[]	[]		
Supplementary information to the ports..... :						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[]	AC:	[]	[]	[]	[]	[]
	[]	AC:	[]	[]	[]	[]	[]
	[X]	DC: 3.2– 4.2VDC (typ 3.8 VDC)					
[]	DC:						
Rated Power	LTE 23 dBm, GSM858/900: 32.5 dBm GSM1800/1900: 29.5 dBm						
Clock frequencies..... :	Clock 26MHz, XTAL 32.768kHz						
Other parameters	-30°C to + 70°C						
Software version	M0P.100001						
Hardware version	1.0						
Dimensions in mm (W x H x D).... :	13.1 x 14.3						
Mounting position	[]	Table top equipment					
	[]	Wall/Ceiling mounted equipment					
	[]	Floor standing equipment					
	[]	Hand-held equipment					
	[X]	Other: solder down on host equipment					
Modules/parts..... :	Module/parts of test item		Type	Manufacturer			
	None, the device is module itself				

Accessories (not part of the test item)	Description	Type	Manufacturer
	Antenna only for testing purposed	T-AT305	ATEL-CAB
Documents as provided by the applicant	Description	File name	Issue date

⁽³⁾ Only for Medical Equipment

Identification of the client

Telit Communications S.p.A.
Via Stazione di Prosecco 5/B 34010 Sgonico
Trieste - Italy

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2021-06-23
Date (finish)	2021-06-23

Document history

Report number	Date	Description
68013REM.002	2021-08-03	First release
68013REM.002A1	2021-09-21	Second release: - Editorial changes - This modification test report cancels and replaces the test report 68013REM.002s
68013REM.002A2	2021-10-08	Third release: - Typographic error on tested bands. - This modification test report cancels and replaces the test report 68013REM.002A1s

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. = 30 % Max. = 75 %
Air pressure	Min. = 860mbar Max. = 1060mbar

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

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860mbar Max. = 1060mbar

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. = 30 % Max. = 60 %
Air pressure	Min. = 860mbar Max. = 1060mbar

Remarks and comments

The tests have been performed by the technical personnel: Alejandro Marin Chorro.

Testing verdicts

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

List of equipment used during the test

Control No.	Equipment	Model	Manufacturer	Next Calibration
6666	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2022-02-05
6607	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2022-04-06
7743	HORN ANTENNA 0,75-18GHz	3115	ETS LINDGREN	2023-08-24
6815	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2022-02-01
6196	PRE-AMPLIFIER G>55dB 1-18GHz	AMF-7D-01001800-22-10P	NARDA	2022-02-25

Summary

Test Specification.	Requirement – Test case	Verdict	Remark
FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) ICES-003 Issue 7 (October 2020)	RE Radiated emission. Electromagnetic field measure	Pass	--
FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) ICES-003 Issue 7 (October 2020)	CE Continuous conducted emission	N/A	(1)
<u>Supplementary information and remarks:</u> 1) Power Supply EUT : 3.8Vdc			

Appendix A: Test results

Appendix A content

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Description of the operation modes

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. Every operation mode takes a failure criteria for the immunity test that they were applying to it and a monitoring to guarantee performance of the same ones.

The operation modes used by the samples to which the present report refers, are shown in the following table:

Id	Description
OM/01	EUT ON. MS in IDLE mode. LTE NB-IoT Band 85 (worst case). Power supply: 3.8Vdc.

Test standards version applied

The product standards and test standards applied for each test cases are shown in the following table:

Product Test Standard	Test standard	Requirement – Test case
FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)	ANSI C63.4:2014 + C63.4a-2017	RE Radiated emission.

Test Cases Details

RE Radiated emission. Electromagnetic field measure

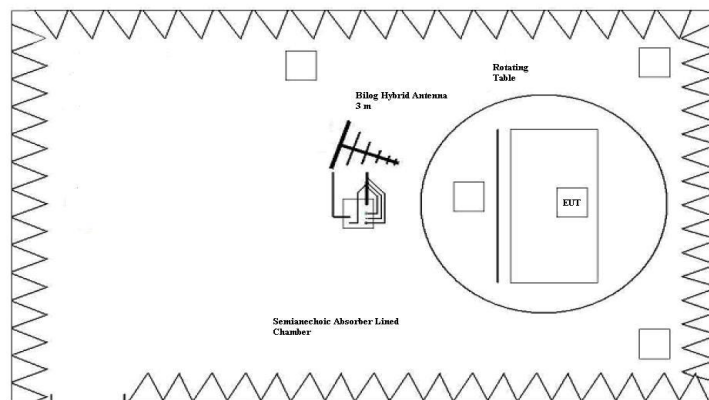
Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-19 Edition), Secs. 15.109 & ICES-003 Issue 7 (October 2020)

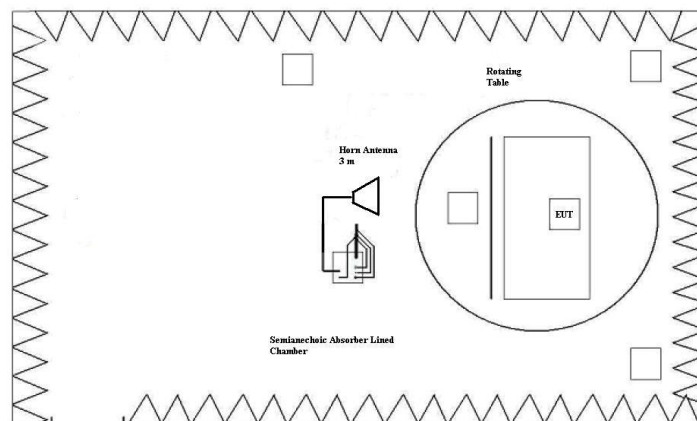
Frequency range (MHz)	FCC Part 15B		ICES-003 Issue 7		FCC Part 15B & ICES-003 Issue 7	
	QP Limit for 3 m ($\mu\text{V/m}$)	QP Limit for 3 m ($\text{dB}\mu\text{V/m}$)	QP Limit for 3 m ($\mu\text{V/m}$)	QP Limit for 3 m ($\text{dB}\mu\text{V/m}$)	PK Limit for 3 m ($\text{dB}\mu\text{V/m}$)	AVG Limit for 3 m ($\text{dB}\mu\text{V/m}$)
30 to 88	100	40	100	40	---	---
88 to 216	150	43.5	150	43.5	---	---
216 to 230	200	46	200	46	---	---
230 to 960	200	46	224	47	---	---
960 to 1000	500	54	500	54	---	---
Above 1000	---	---	---	---	74	54

NOTE: FCC QP and AVG limits are in concordance with RSS-Gen Issue 5 (March 2019), Secs. 7.1 and 7.3.

Limits according to FCC Part 15B, equal to o more stringent than those of ICES-003 Issue 7.



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

Results

S/	OM	Code	Freq Rng (MHz)	V
01	OM/01	RE0101LR	[30, 1000]	P
01	OM/01	RE0101HR	[1000, 12750]	P

Verdict

Pass

Attachments

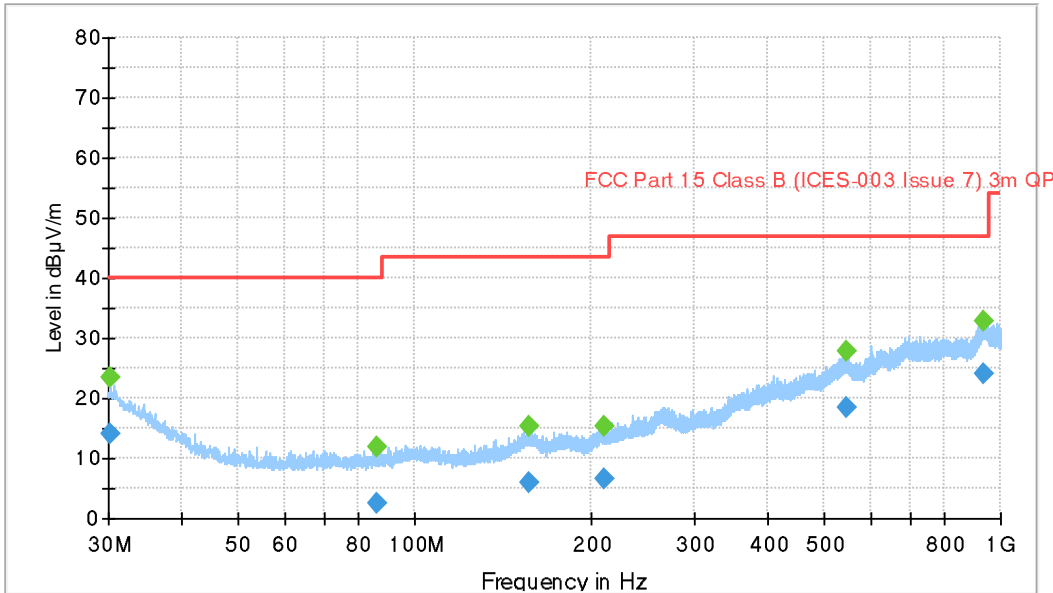
EMC Test Code = RE0101LR, Frequency Range MHz = [30, 1000]

Sample ID: S/01

Operation Mode: OM/01. EUT ON. MS in IDLE mode. LTE NB-IoT Band 85 (worst case). Power supply: 3.8Vdc.

Images:

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
30.310000	---	23.56	---	---	170.0	V	90.0
30.310000	13.99	---	40.00	26.01	170.0	V	90.0
86.355000	---	12.02	---	---	389.0	H	322.0
86.355000	2.61	---	40.00	37.39	389.0	H	322.0
157.327000	6.06	---	43.52	37.46	340.0	V	168.0
157.327000	---	15.36	---	---	340.0	V	168.0
210.512000	---	15.33	---	---	293.0	V	4.0
210.512000	6.43	---	43.52	37.09	293.0	V	4.0
545.790000	18.30	---	47.00	28.70	107.0	V	172.0
545.790000	---	27.72	---	---	107.0	V	172.0
935.492000	---	32.86	---	---	325.0	V	323.0
935.492000	24.12	---	47.00	22.88	325.0	V	323.0

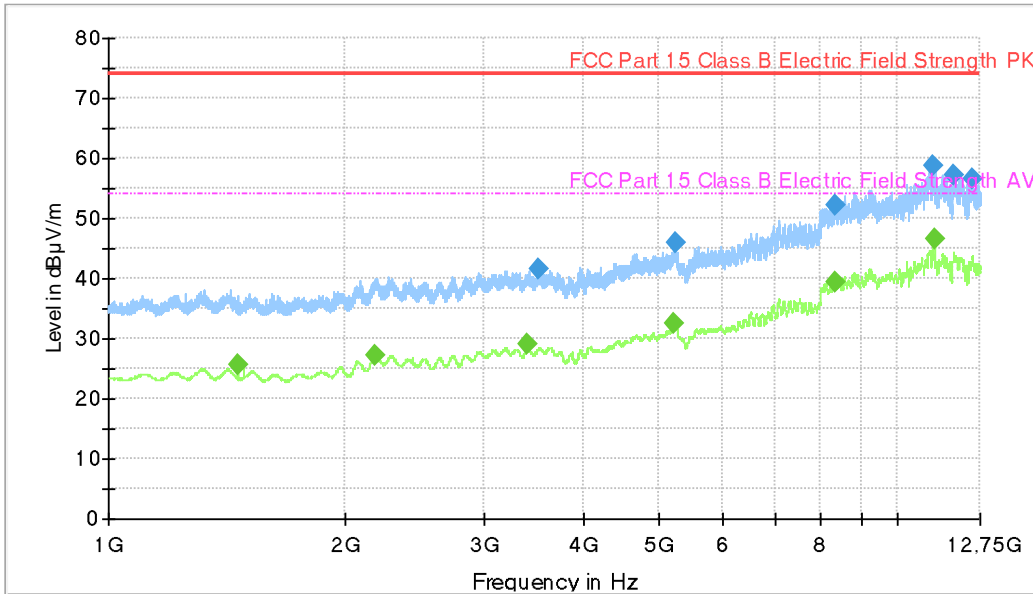
EMC Test Code = RE0101HR, Frequency Range MHz = [1000, 12750]

Sample ID: S/01

Operation Mode: OM/01. EUT ON. MS in IDLE mode. LTE NB-IoT Band 85 (worst case). Power supply: 3.8Vdc

Images:

Full Spectrum



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Corr. (dB/m)
1457.600000	---	25.71	53.97	28.26	-28.0
2185.200000	---	27.31	53.97	26.66	-24.2
3401.200000	---	29.16	53.97	24.81	-21.7
3509.600000	41.57	---	73.97	32.40	-21.1
5218.000000	---	32.38	53.97	21.59	-15.5
5231.200000	45.82	---	73.97	28.15	-15.7
8339.600000	52.04	---	73.97	21.93	-8.8
8339.600000	---	39.32	53.97	14.65	-8.8
11142.000000	58.62	---	73.97	15.35	-2.6
11147.200000	---	46.44	53.97	7.53	-2.6
11818.000000	57.05	---	73.97	16.92	-1.9
12463.600000	56.67	---	73.97	17.30	-1.0