

Test report No:
 NIE: 66585REM.002A1

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-W1
Other identification of the product	HW version: 1.0 SW version: M0P.000001 IMEI TAC: 35188185 FCC ID: RI7NE310L2W1 IC: 5131A-NE310L2W1
(*) Features	LTE FDD Bands: 1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 85
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	2021-07-30
Report template No	FDT08_23 (*) "Data provided by the client"

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Acronyms

Acronym ID	Acronym Description
Avg	Average Level
Az	Azimuth
CPL	Zones / Coupling Cables
Code	EMC Test Code
Freq	Frequency
Freq Rng	Frequency Range
H	Height
MP	Measurement Point
MaxPeak	Radiated Maximum Peak Level
OM	Operation Mode
Pol	Polarization
QuasiPeak	Quasi Peak Level
S/	Sample
V	Verdict
RE	Radiated Emission
LR	Low Range
HR	High Range

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.

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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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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 $I = \pm 4,9$ dB for quasi-peak measurements, $I = \pm 4,6$ 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 17 GHz is $I = \pm 2,6$ 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 LTE Cat NB2 Radio Module.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial N°	Date Reception	of	Application
S/01	66585C_48.1	Data radio module	NE310L2-W1	3518818599966252	2021-05-11		Element Under Test
S/01	66585C_6.1	Cradle – EVK	---	---	2021-02-24		Auxiliary element
S/01	66585C_7.1	USB cable	---	---	2021-02-24		Auxiliary element
S/01	66585C_8.1	LTE Antenna	T-AT305-BU	---	2021-02-24		Auxiliary element

Notes referenced to samples during the project:

None.

Test sample description

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
	[]	AC:	[]	[]	[]	[]
	[X]	DC: 3.2– 4.2VDC (typ 3.8 VDC)				
Rated Power	23 dBm					
Clock frequencies..... :	Clock 26MHz, XTAL 32.768kHz					
Other parameters	-30°C to + 70°C					
Software version	M0P.000001					
Hardware version	1.0					
Dimensions in cm (W x H x D)	13.1 x 14.3 mm					
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)	2021-03-18
Date (finish)	2021-07-29

Document history

Report number	Date	Description
66585REM.002	2021-06-16	First release
66585REM.002A1	2021-07-30	Second release: <ul style="list-style-type: none">- Updated measurements.- This modification test report cancels and replaces the test report 66585REM.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. = 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: Rosa Maria Gallardo & Antonio Ruiz.

Testing verdicts

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

List of equipment used during the test

Control Number	Description	Model	Manufacturer	Next Calibration
2942	EMI TEST RECEIVER 20Hz-40GHz	ESU40	ROHDE AND SCHWARZ	2021-09-17
4523	EMI TEST RECEIVER 20Hz-26.5GHz	ESU26	ROHDE AND SCHWARZ	2023-03-15
4612	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2021-06-14
5641	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2021-07-31
6064	SEMIANECHOIC ABSORBER LINED CHAMBER III	SAC-3	Frankonia	---
6126	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2022-04-05
6132	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2022-04-05
6195	PRE-AMPLIFIER G>55dB 1-18GHz	AMF-7D-01001800-22-10P	NARDA	2021-05-19
6329	SHIELDED ROOM		FRANKONIA	---

Summary

Test Specification	Requirement – Test case	Verdict	Remark
FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)	RE Radiated emission. Electromagnetic field measure	Pass	---
	CE - Continuous conducted emission	N/A	(1)

Supplementary information and remarks:

1. The test is not applicable, not required by the standard. Equipment is powered in DC.

Appendix A: Test results

Appendix A content

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<i>RE Radiated emission. Electromagnetic field measure</i>	15

Description of the operation modes

The operation modes described in this paragraph constitute a functionality of the sample under test for itself.
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. NB-IoT Band 5 (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)	RE Radiated emission. Electromagnetic field measure

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):

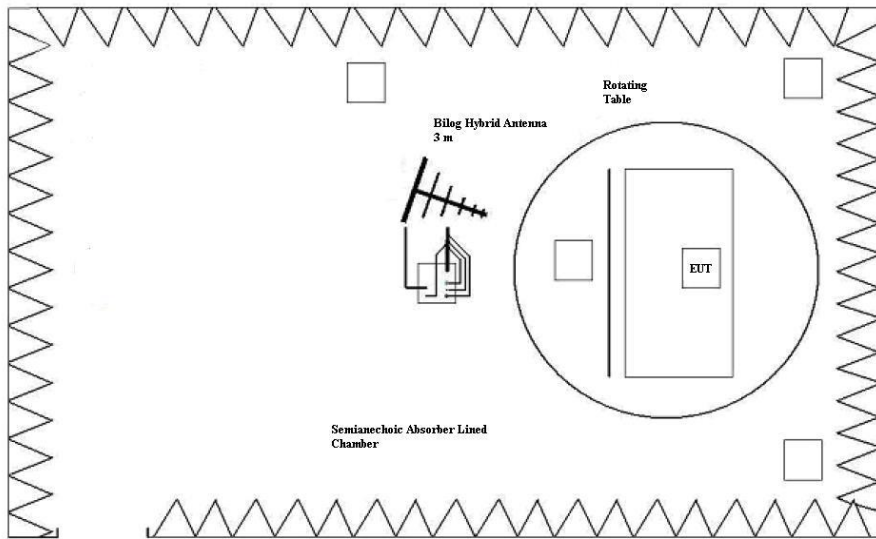
Table 2: Radiated emission limits

Frequency range (MHz)	FCC Part 15B Class B (3 m) Quasi-Peak (dBµV/m)	ICES-003 Issue 7 Limit for 3 m Quasi-Peak (dBµV/m)	FCC Part 15B & ICES-003 Issue 7	
			PK Limit for 3m (dBµV/m)	AVG Limit for 3m (dBµV/m)
30-88	40.0	40.0	---	---
88-216	43.5	43.5	---	---
216-230	46.0	46.0	---	---
230-960	46.0	47.0	---	---
960-1000	54.0	54.0	---	---
1 GHz – F _M	---	---	74	54

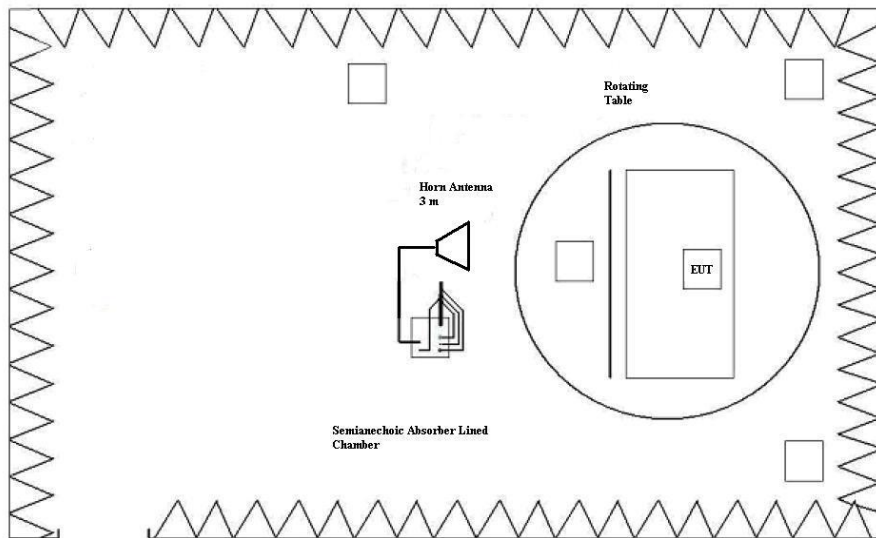
Above 1 GHz, except for outdoor units of home satellite receiving systems, the ITE or digital apparatus shall comply with the limits specified in table 2 up to the frequency F_M, which shall be determined as per table 3.

Table 3: Required highest measurement frequency for radiated emission

Highest internal Frequency (F _x)	Highest measurement Frequency (F _M)
F _x ≤ 108 MHz	1 GHz
108 MHz < F _x ≤ 500 MHz	2 GHz
500 MHz < F _x ≤ 1 GHz	5 GHz
F _x > 1 GHz	5 x F _x up to a maximum of 40 GHz
*F _x is the highest fundamental frequency generated and/or used in the ITE or digital apparatus under test.	



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, 17000]	P

Note: Range: $f > 17$ GHz. Test required only if the 5th harmonics of the maximum internal work frequency EUT is higher than 17GHz.

Verdict

Pass

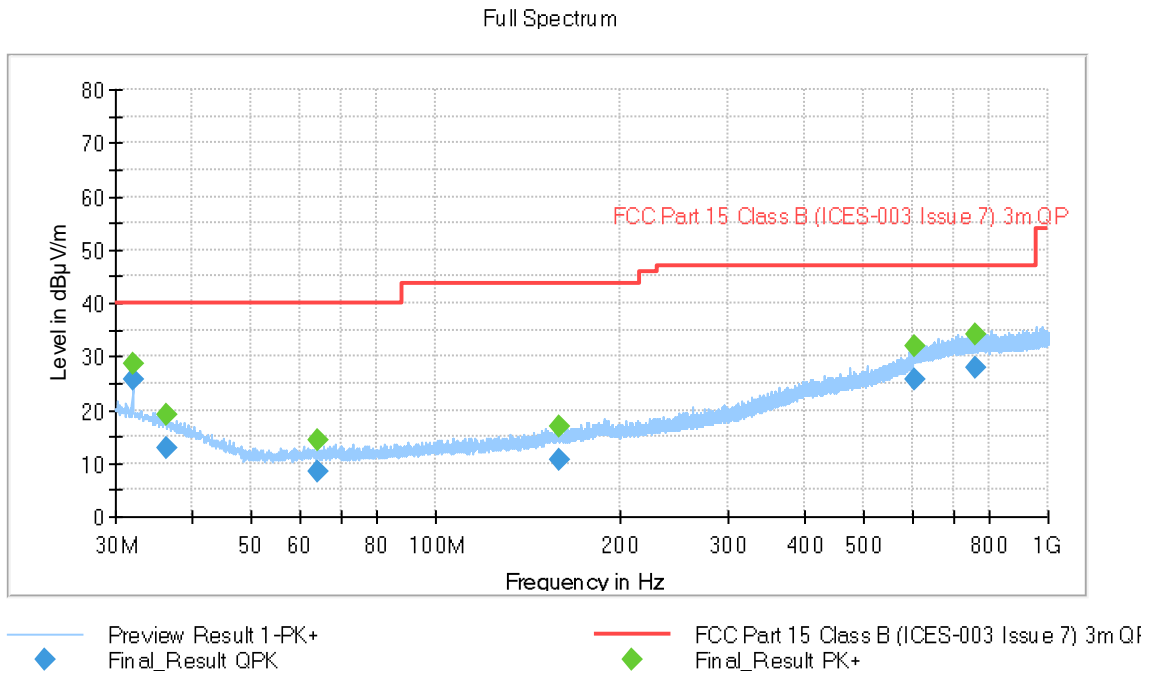
Attachments

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. MS in IDLE mode. NB-IoT Band 5 (worst case). Power supply: 3.8Vdc

Images:



Documents:

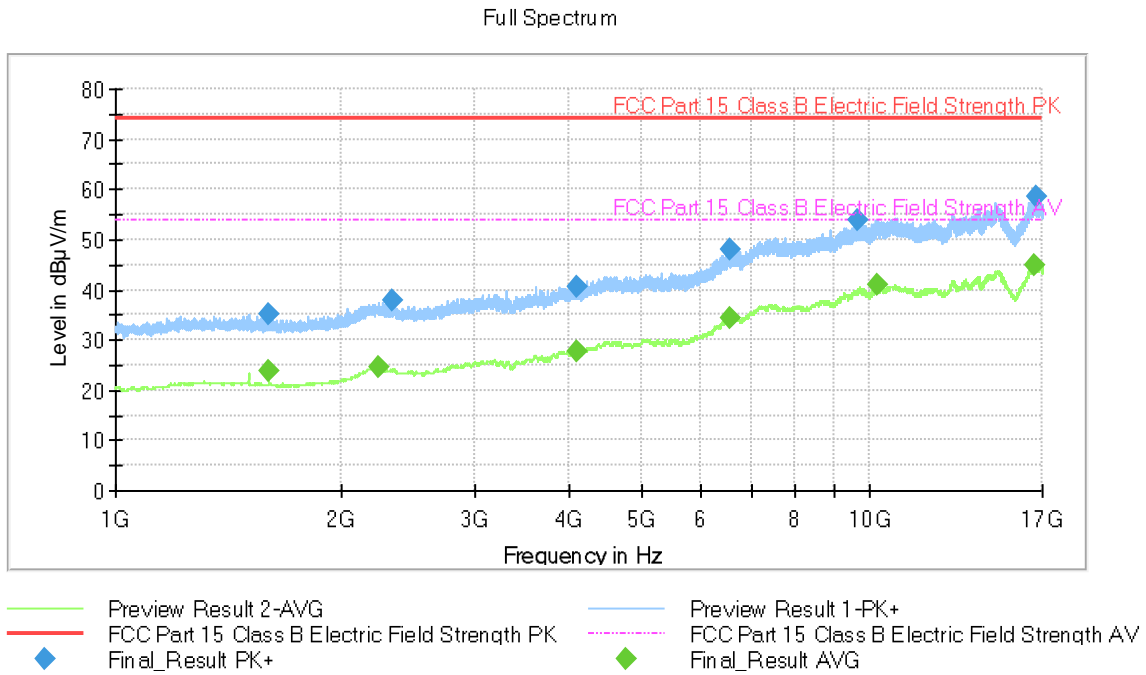
Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
32.005000	25.52	---	40.00	14.48	120.0	V	-125.0
32.005000	---	28.47	---	---	120.0	V	-125.0
36.382000	12.97	---	40.00	27.03	295.0	V	106.0
36.382000	---	19.10	---	---	295.0	V	106.0
63.945000	---	14.42	---	---	118.0	V	23.0
63.945000	8.27	---	40.00	31.73	118.0	V	23.0
159.251000	---	16.90	---	---	218.0	V	168.0
159.251000	10.61	---	43.52	32.91	218.0	V	168.0
604.270000	---	31.92	---	---	211.0	V	108.0
604.270000	25.72	---	47.00	21.28	211.0	V	108.0
763.698000	---	34.25	---	---	357.0	H	50.0
763.698000	27.73	---	47.00	19.27	357.0	H	50.0

EMC Test Code = RE0101HR, Frequency Range MHz = [1000, 17000]

Sample ID: S/01

Operation Mode: OM/01. EUT ON. MS in IDLE mode. NB-IoT Band 5 (worst case). Power supply: 3.8Vdc

Images:



Documents:

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1599.600000	35.30	---	73.97	38.67
1600.000000	---	23.80	53.97	30.17
2229.600000	---	24.49	53.97	29.48
2330.000000	37.86	---	73.97	36.11
4086.400000	40.64	---	73.97	33.33
4098.800000	---	27.80	53.97	26.17
6540.800000	47.87	---	73.97	26.10
6563.200000	---	34.40	53.97	19.57
9675.200000	54.01	---	73.97	19.96
10285.200000	---	40.79	53.97	13.18
16602.000000	---	44.99	53.97	8.98
16723.200000	58.42	---	73.97	15.56