



Test report No:
NIE: 64195RRF.002A1

Test Report

USA FCC Part 15.209
CANADA RSS-210

(*) Identification of item tested	Telematics Control Unit for trucks with TPMS support, GSM, BLE, LF Transmitter and GNSS receiver
(*) Trademark	LDL Technology
(*) Model and /or type reference	19239
Other identification of the product	HW version: 319-158-2090 SW version: 414069191013 FCC ID: T4519239 IC: 6450A-19239 Cell module FCC ID: RI7ME910C1WW Cell module IC: 5131A-ME910C1WW IMEI TAC: 35308109
(*) Features	Bluetooth LE, RF 434, GSM/LTE, GNSS receiver
Applicant	LDL TECHNOLOGY Parc Technologique du Canal, 3 rue Giotto, 31520, Ramonville-Saint-Agne, FRANCE
Test method requested, standard	USA FCC Part 15.209 (10-1-19 Edition): Radiated emission limits, general requirements. CANADA RSS-210 Issue 10 (December 2019). ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Carlos Luque RF Lab. Supervisor
Date of issue	2021-01-07
Report template No	FDT08_22 (*) "Data provided by the client"

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Competences and guarantees

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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.

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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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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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 of the model 19239 is a system that aims to offer telematic services and the device acts like gateway, receiving and transmitting data.

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 result.

Usage of samples

Samples undergoing test have been selected by: The client.

- Sample S/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
64195C/005	Telematics Control Unit	19239	--	2020-03-25
64195C/020	Harness	--	--	2020-03-25
64195C/013	Metallic mounting bracket	--	--	2020-03-25

Sample S/01 has undergone the test(s): The radiated tests indicated in the Appendix A.

- Sample S/02 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
64195C/006	Telematics Control Unit	19239	--	2020-03-25
64195C/019	Harness	--	--	2020-03-25

Sample S/02 has undergone the test(s): The conducted tests indicated in the Appendix A.

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
	Power and data (RS232) test cable	1	☒	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
Supplementary information to the ports..... :							
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: nominal 12V/24V (according to vehicle battery)					
☒	DC: tolerated range: 8 to 32V						
Rated Power	12W						
Clock frequencies.....	8MHz, 32 MHz, 32.768 KHz, 16 MHz						
Other parameters							

Software version	414069191013		
Hardware version	319-158-2090		
Dimensions in cm (W x H x D)	18 x 6.5 x 13		
Mounting position	☐	Table top equipment	
	☐	Wall/Ceiling mounted equipment	
	☐	Floor standing equipment	
	☐	Hand-held equipment	
	☒	Other: attached to provided bracket, mounted on vehicle	
Modules/parts.....	Module/parts of test item	Type	Manufacturer
	TCU 1.2 4G Autolocation	EUT	LDL Technology
	TCU 1.2 Bracket	Metallic mounting bracket	LDL Technology
Accessories (not part of the test item)	Description	Type	Manufacturer
Documents as provided by the applicant.....	Description	File name	Issue date

⁽³⁾ Only for Medical Equipment

Identification of the client

LDL TECHNOLOGY
Parc Technologique du Canal, 3 rue Giotto, 31520, Ramonville-Saint-Agne, FRANCE

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-06-04
Date (finish)	2020-07-22

Document history

Report number	Date	Description
64195RRF.002	2020-09-24	First release: RSS-Gen.
64195RRF.002A1	2021-01-07	Second release: RSS-210.

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: Cristina Calle, Javier Miguel Nadales and Miguel Ángel Torres.

Used instrumentation:

Conducted Measurements:

	Last Calibration	Due Calibration
1. Shielded Room ETS LINDGREN S101	N.A.	N.A.
2. Signal and Spectrum Analyzer 10 Hz - 40 GHz ROHDE AND SCHWARZ FSV40	2019/09	2021/09
3. DC Power Supply 40V/40A Rohde & Schwarz NGPE40	N.A.	N.A.
4. Digital Multimeter FLUKE 179	2019/09	2020/09

Radiated Measurements:

	Last Calibration	Due Calibration
1. Semianechoic Absorber Lined Chamber ETS LINDGREN FACT 3 200 STP	N.A.	N.A.
2. Shielded Room ETS LINDGREN S101	N.A.	N.A.
3. Digital Multimeter FLUKE 179	2019/09	2020/09
4. DC Power Supply 30V/5A 150W AGILENT TECHNOLOGIES U8002A	N.A.	N.A.
5. Active Loop Antenna SCHWARZBECK FMZB 1519B	2018/01	2021/01
6. EMI Test Receiver 7 GHz ROHDE AND SCHWARZ ESR7	2019/10	2021/10

Testing verdicts

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

Summary

1. SRD 125 kHz.

FCC PART 15.209 / RSS-210 PARAGRAPH		
Requirement – Test case	Verdict	Remark
Occupied bandwidth	P	
FCC 15.209 (a) / RSS-210 7.3. Transmitter emission limits	P	
<u>Supplementary information and remarks:</u> None.		

Appendix A: Test results

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TEST CONDITIONS

POWER SUPPLY (V):

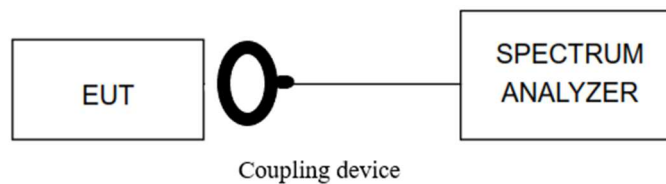
Vnominal:	12 Vdc
Type of Power Supply:	External DC (Car Battery).
Type of Antenna:	Integral (Embedded LC resonant Ferrite).

TEST FREQUENCIES:

Nominal Operating Frequency: 125 kHz

CONDUCTED MEASUREMENTS

The equipment under test EUT was set up in a shielded room and it is connected to the spectrum analyzer through a RF cable and a coupling device.



RADIATED MEASUREMENTS

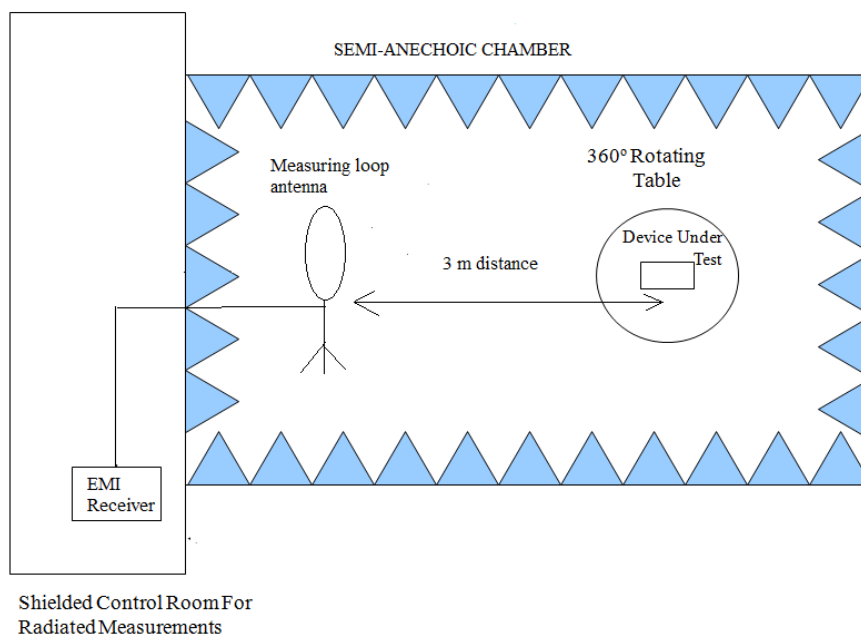
All radiated tests were performed in a semi-anechoic chamber. The measuring antenna is situated at a distance of 3 m (Loop antenna for the range between 9 kHz to 30 MHz).

For radiated emissions in the range 9 kHz to 30 MHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 40 dB per decade is used to normalize the measured data for determining compliance.

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 was varied from 1 to 4 meters to find the maximum radiated emission.

In the range between 9 kHz and 30 MHz the measurements were made in the three different orientation planes of the loop antenna to determine the maximum received field.

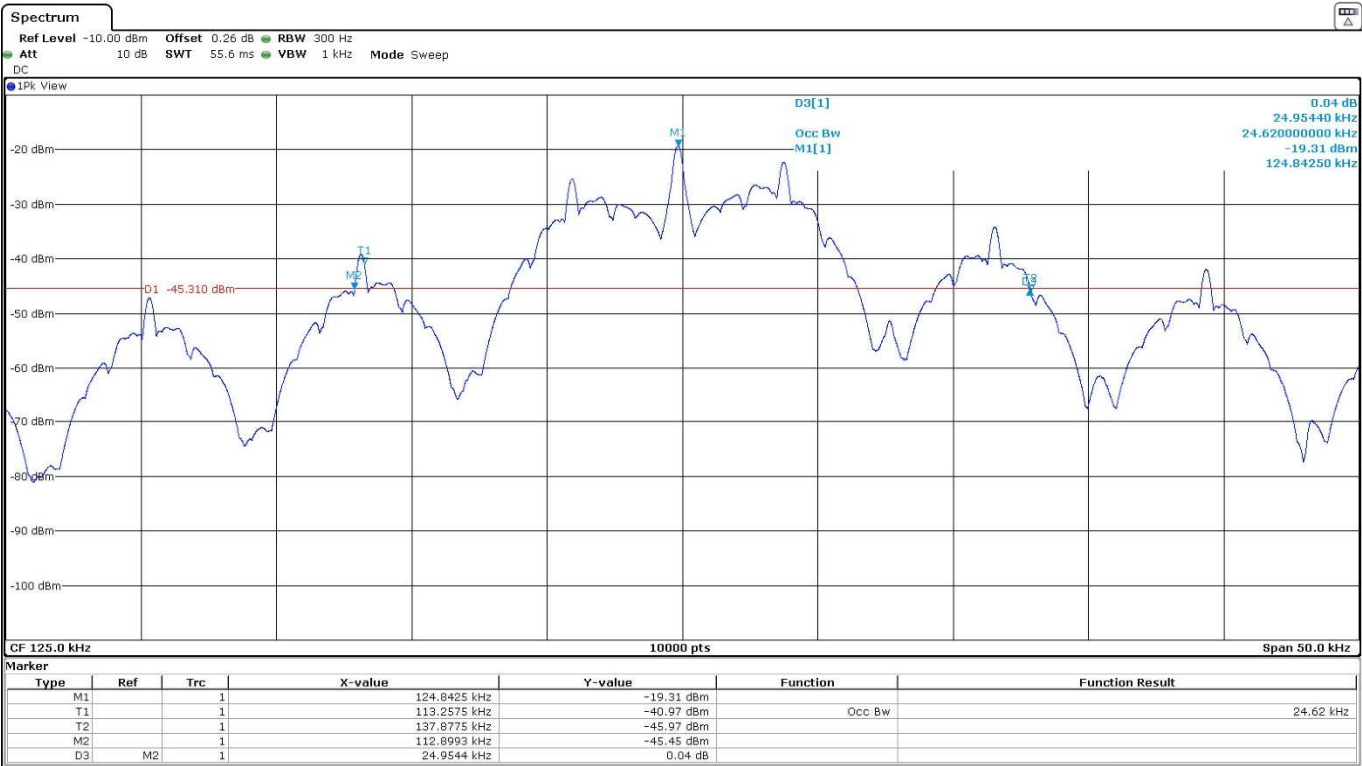
Radiated measurements setup $f < 30$ MHz:



Occupied Bandwidth

RESULTS:

99% Bandwidth (kHz)	24.62
-26 dB Bandwidth (kHz)	24.95
Measurement uncertainty (kHz)	<±0.50



FCC 15.209 (a) / RSS-210 7.3. Transmitter emission limits

SPECIFICATION:

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table (see §15.205(c) / RSS-Gen):

Frequency Range (MHz)	Field strength (μV/m)	Field strength (dBμV/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	29.54	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

RESULTS:

All tests were performed in a semi-anechoic chamber at a distance of 3 m.

The spectrum was inspected from 9 kHz to 30 MHz searching for spurious signals.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyser. This correction factor includes antenna factor and cable loss.

Frequency range 9 kHz - 30 MHz:

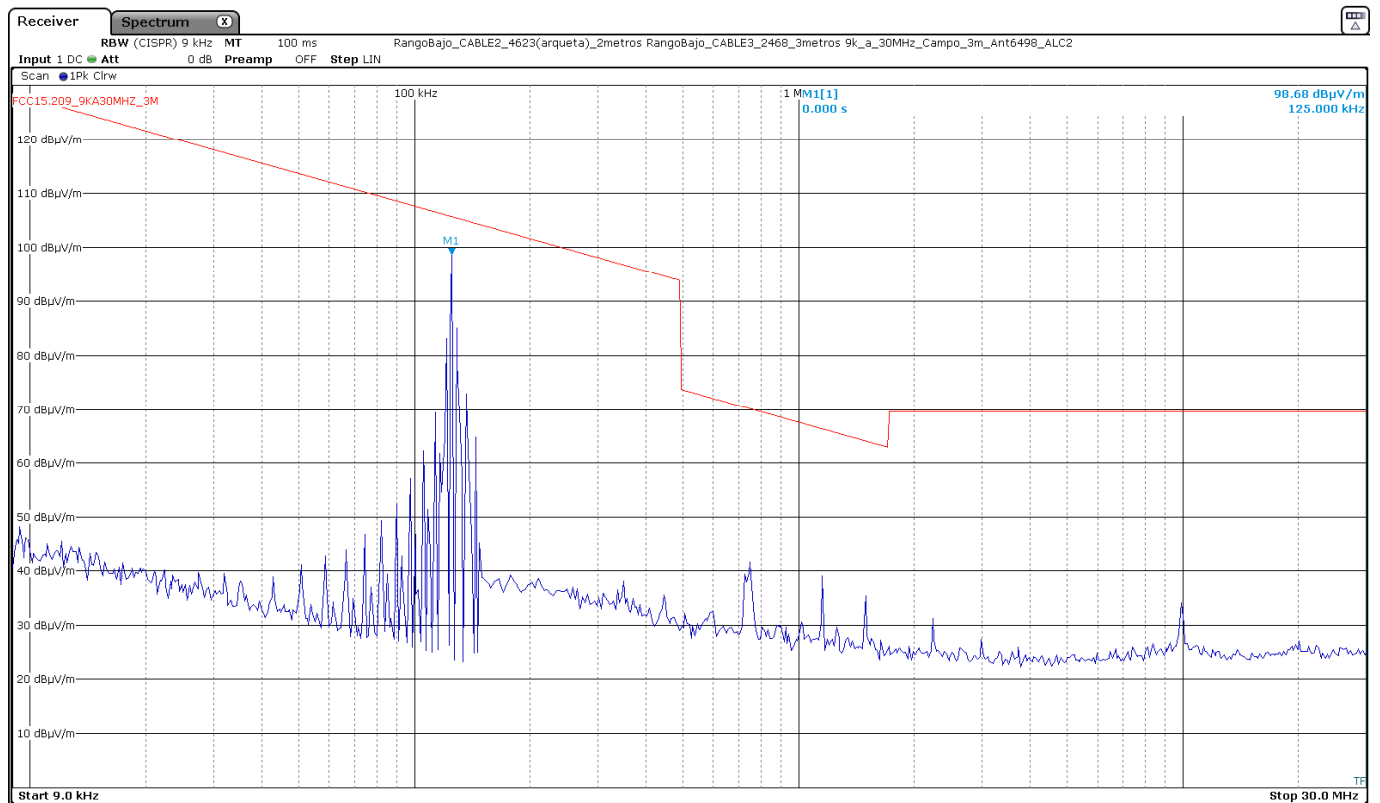
No spurious frequencies detected at less than 20 dB below the limit.

The maximum field strength of fundamental emission:

Frequency (kHz)	Maximum field strength (dBμV/m) measured at 3 m (average detector)	Maximum field strength (dBμV/m) extrapolated to 300 m (40 dB/decade)	Maximum field strength (μV/m) extrapolated to 300 m (40 dB/decade)	Limit (μV/m)
125.00	93.63	13.63	4.80	19.20
Measurement uncertainty (dB)	<±2.99			

Verdict: PASS

FREQUENCY RANGE 9 kHz - 30 MHz:



Resolution bandwidth:

200 Hz for $9 \text{ kHz} \leq f \leq 150 \text{ kHz}$

9 kHz for $150 \text{ kHz} \leq f \leq 30 \text{ MHz}$

Note: The scan is performed with a peak detector. The peaks closest to the limit are re-measured with the detector type as specified in FCC 15.209.

The limits shown in the above plot are extrapolated to 3 meters. The highest peak corresponds to the carrier level.