 <p>ilac-MRA ENAC E N S A Y O S Nº 51/LE147</p>	<p>FCC LISTED, REGISTRATION NUMBER: 720267</p> <p>ISED LISTED REGISTRATION NUMBER 4621A-2 & 4</p>	<p>Test report No: NIE: 57623RRF.002</p>
<h2>Test report</h2> <h3>USA FCC Part 15.209</h3> <h3>CANADA RSS-Gen Issue 5</h3>		
Identification of item tested	SDCM	
Trademark	Valeo	
Model and /or type reference	SD1A	
Other identification of the product	FCC ID: N5F-SD1A	
Features	Not provided data	
Applicant	VALEO COMFORT & DRIVING ASSISTANCE SYSTEMS, SAS. 76, Rue Auguste Perret, 94046 Créteil CEDEX, FRANCE	
Test method requested, standard	USA FCC Part 15.209 (10–1–17 Edition): Radiated emission limits, general requirements. CANADA RSS-Gen Issue 5 (April 2018). General Requirements for Compliance of Radio Apparatus. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.	
Summary	IN COMPLIANCE	
Approved by (name / position & signature)	A. Llamas RF Lab. Manager	
Date of issue	2018-11-07	
Report template No	FDT08_21	

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Competences and guarantees

DEKRA Testing and Certification 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.

DEKRA Testing and Certification is a laboratory with a measurement facility in compliance with the requirements of Section 2.948 of the FCC rules and has been added to the list of facilities whose measurements data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Registration Number: 720267.

DEKRA Testing and Certification is a laboratory with a measurement site in compliance with the requirements of RSS 212, Issue 1 (Provisional) and has been added to the list of filed sites of the Canadian Certification and Engineering Bureau. Reference File Number: ISED 4621A-2 & 4.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification 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 at the time of performance of the test.

DEKRA Testing and Certification 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.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification and the Accreditation Bodies.

Uncertainty

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

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
57623B/095	Smart ECU	SD1A	---	2018-08-27
57623B/080	Antennas	---	---	2018-08-16
57623B/081	Antennas	---	---	2018-08-16
57623B/085	Harness	---	---	2018-08-27
57623B/084	Connection accessory	---	---	2018-08-27

1. Sample S/01 has undergone the following test(s):

All tests indicated in Appendix A.

Sample S/02 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
57623B/132	Smart ECU	SD1A	---	2018-08-27
57623B/080	Antennas	---	---	2018-08-16
57623B/081	Antennas	---	---	2018-08-16
57623B/085	Harness	---	---	2018-08-27
57623B/084	Connection accessory	---	---	2018-08-27

1. Sample S/02 has undergone the following test(s):

Co-location radiated tests indicated in Appendix A.

Auxiliary elements used with the samples S/01 and S/02:

Control N°	Description	Model	Serial N°	Date of reception
57623B/083	Laptop	Lenovo T570	---	2018-08-27

Test sample description

Description of product.....:	Smart ECU for keyless car access and start		
Rated power supply	Voltage and Frequency		
	<input type="checkbox"/>	AC:	
	<input checked="" type="checkbox"/>	DC: 12 Vdc.	
Software version	5.01		
Hardware version.....:	b103475-A		
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: Car Equipment	
Accessories (not part of the test item)	Description	Type	Manufacturer
	Laptop (57623B/083)	---	LENOVO

Identification of the client

VALEO COMFORT & DRIVING ASSISTANCE SYSTEMS, SAS
76 rue Auguste Perret, 94046 Créteil CEDEX, FRANCE

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2018-09-20
Date (finish)	2018-10-11

Document history

Report number	Date	Description
57623RRF.002	2018-11-07	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 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω

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 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω
Normal site attenuation (NSA)	< ±4 dB at 10 m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Field homogeneity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 1000 MHz).

Remarks and comments

The tests have been performed by the technical personnel: Ignacio Cabra.

Used instrumentation:

		Last Cal. date	Cal. due date
1.	Semianechoic Absorber Lined Chamber ETS FACT3 200STP	N.A.	N.A.
2.	Multi Device Controller EMCO 2090	N.A.	N.A.
3.	Multi Device Controller MESSTECHNIK DAV-RR	N.A.	N.A.
4.	Active Loop Antenna 9 kHz-30 MHz HEWLETT PACKARD 11966A	2018/06	2020/06
5.	EMI Test Receiver R&S ESU26	2018/02	2020/02
	EMI Test Receiver R&S ESR7	2017/08	2019/08
6.	Spectrum analyser Rohde & Schwarz FSV40	2018/02	2020/02

Testing verdicts

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

Summary

FCC PART 15 / RSS-Gen PARAGRAPH		
Requirement – Test case	Verdict	Remark
15.209 Subclause (a) / RSS-Gen Clause 8.9. 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 = DC voltage from battery.

Type of antenna = external antennas.

TEST FREQUENCIES:

Nominal Operating frequency: 125 kHz

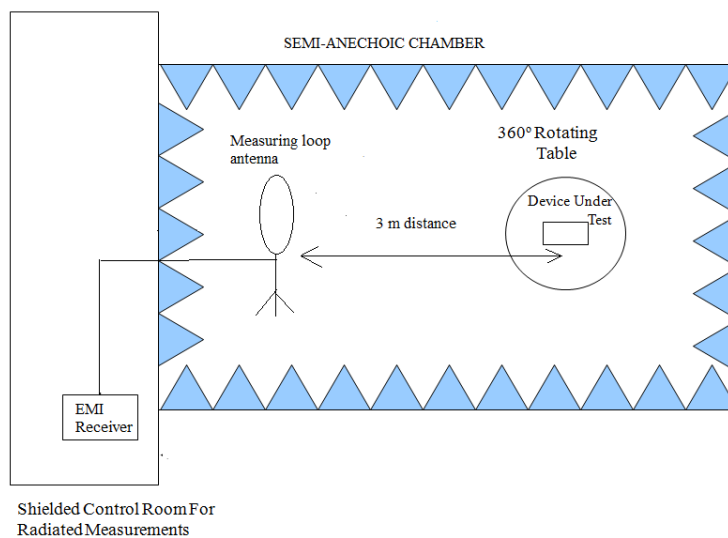
RADIATED MEASUREMENTS

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

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.

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.



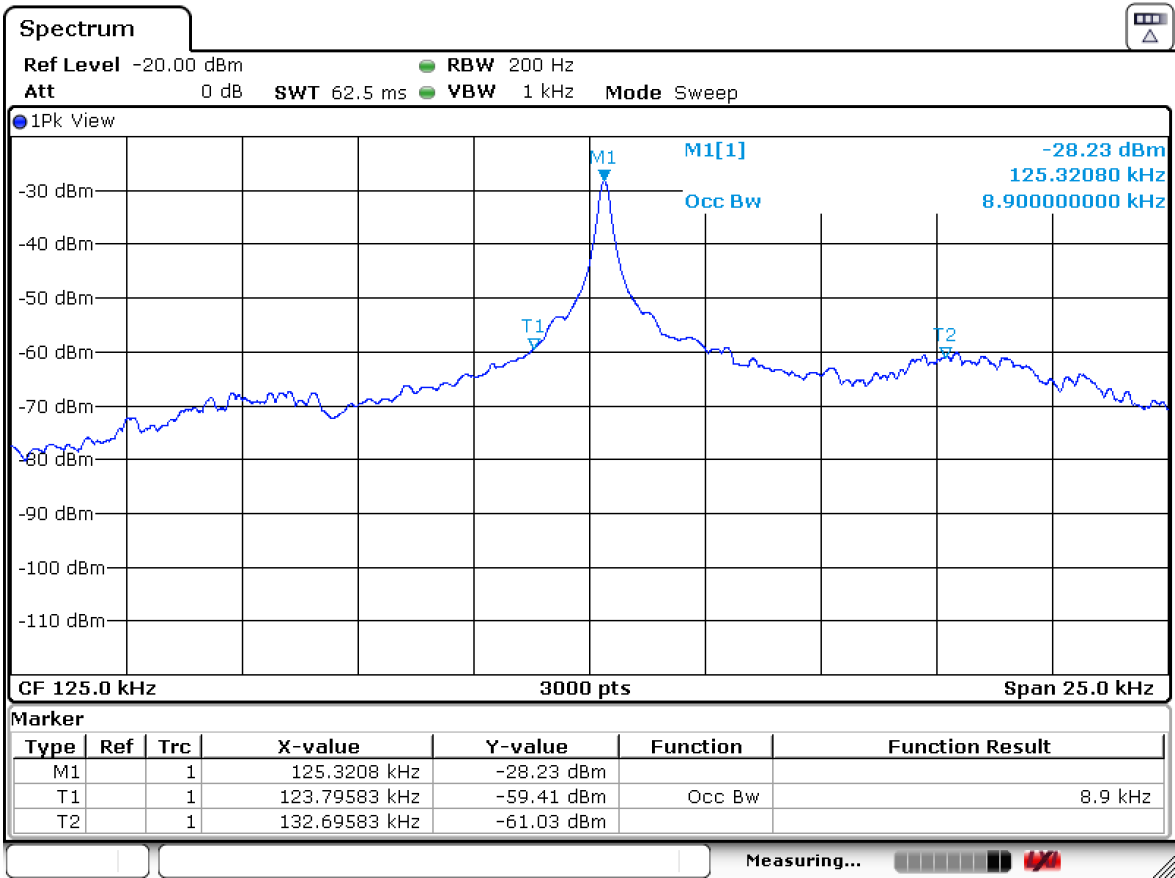
The test was performed with the equipment transmitting first with only the 125 kHz radio and repeated with the 2.4 GHz BT LE radio transmitting simultaneously to check the impact of the co-location of the other radio interface. The results and plots below show the worst results obtained.

Occupied Bandwidth

RESULTS

(see next plots).

99% bandwidth (kHz)	8.90
Measurement uncertainty (kHz)	<±0.02



Section 15.209 Subclause (a) / RSS-Gen Clause 8.9. 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:

Frequency Range (MHz)	Field strength ($\mu\text{V/m}$)	Field strength ($\text{dB}\mu\text{V/m}$)	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

The maximum field strength of fundamental emission:

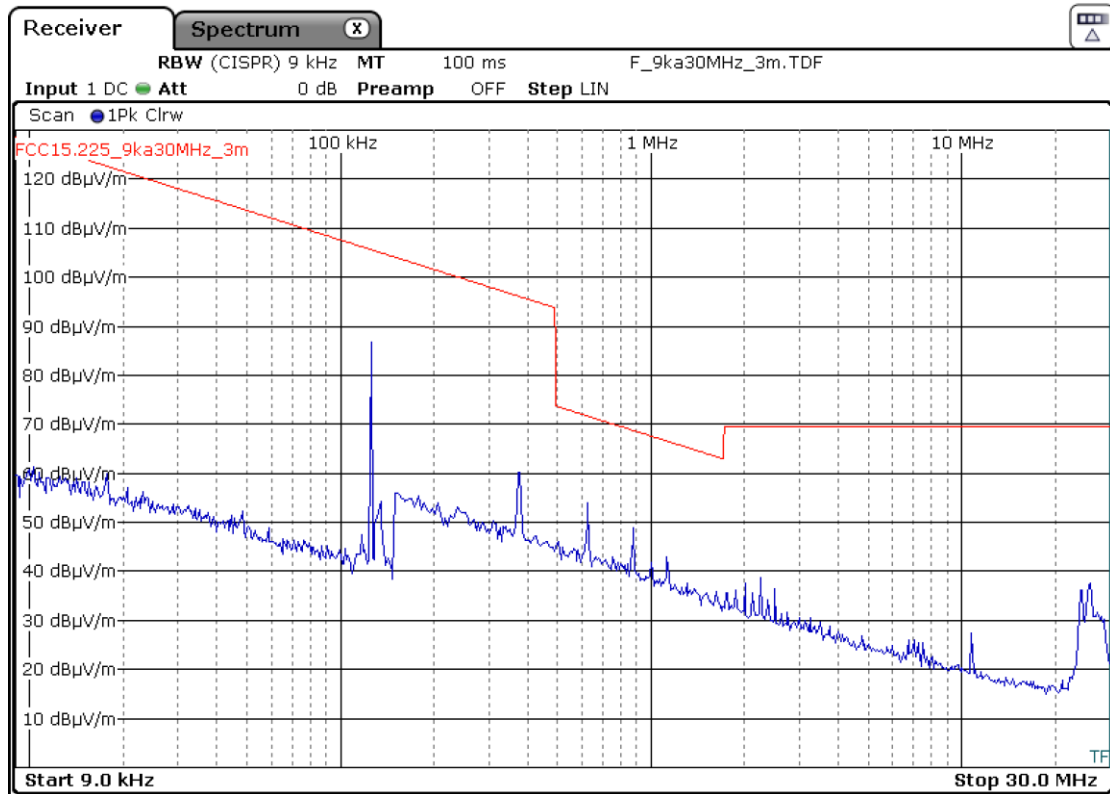
Frequency (kHz)	Maximum field strength ($\text{dB}\mu\text{V/m}$) measured at 3 m (average detector)	Maximum field strength ($\text{dB}\mu\text{V/m}$) extrapolated to 300 m (40 dB/decade)	Maximum field strength ($\mu\text{V/m}$) extrapolated to 300 m (40 dB/decade)	Limit ($\mu\text{V/m}$)
125.400	86.60	6.60	2.14	19.14
Measurement uncertainty (dB)	< ± 3.61			

Spurious emissions closet to the limit:

Frequency (MHz)	Maximum field strength (dB μ V/m) measured at 3 m (average detector)	Maximum field strength (dB μ V/m) extrapolated to 30 m (40 dB/decade)	Maximum field strength (μ V/m) extrapolated to 30 m (40 dB/decade)	Limit (μ V/m)
0.626	53.30	13.30	4.62	38.34
0.878	47.60	7.60	2.40	27.33
28.710	45.50	5.50	1.88	30
Measurement uncertainty (dB)	< \pm 3.61			

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 limits shown in the above plot are extrapolated to 3 meters.