

ISED CABid: ES1909

Test report No:
NIE: 66584RRF.001A1

Test report

USA FCC Part 15.209

CANADA RSS-Gen, RSS-210

(*) Identification of item tested	Steering Column Switch Controls Unit
(*) Trademark	VALEO
(*) Model and /or type reference	VALEO-Com2020-CEM00
Other identification of the product	HW version: B272222-B SW version: SW C5.4.1 RED (Rev4496dae) FCC ID: N5FCOM2020 IC: 3248A-COM2020
(*) Features	433.92 Mhz RF receiver , 125 Khz LF Rx-Tx
Applicant	Valeo Comfort & Driving Assistance Systems 76 rue Auguste Perret Zone Europarc Cedex 94046 Creteil France
Test method requested, standard	USA FCC Part 15.209 (10–1–19 Edition): Radiated emission limits, general requirements. CANADA RSS-Gen Issue 5 (March 2019) Amendment 1. General Requirements for Compliance of Radio Apparatus. CANADA RSS-210 Issue 10 (December 2019). Licence-Exempt Radio Apparatus: Category I Equipment ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Jose Carlos Luque RF Lab. Supervisor 
Date of issue	2021-07-21
Report template No	FDT08_23 (*) "Data provided by the client"

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Competences and guarantees

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DEKRA Testing and Certification S.A.U. is an FCC-recognized accredited testing laboratory with the appropriate scope of accreditation that covers the performed tests in this report.

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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 VALEO-Com2020-CEM00 is an automotive system with multiple functions like: main controls of lighting, wiping, indicators, pushbuttons on end of lever). The TCM manages RF frames reception, LF communication with the transponder, sound generation, the controls on the wheel, via LIN or wiring network (SWS, HOD, SWH, shift paddle).

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
66584B/005	Steering Column Switch Controls Unit	VALEO-Com2020-CEM00	720102-00024	2021/11/25
66584B/023	Power cable DC	--	--	2021/11/25
66584B/037	Key reader	--	--	2021/11/25

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

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

Control N°	Description	Model	Serial N°	Date of reception
66584B/005	Steering Column Switch Controls Unit	VALEO-Com2020-CEM00	720102-00024	2021/11/25
66584B/023	Power cable DC	--	--	2021/11/25

Auxiliary elements used with the Sample S/02:

Control N°	Description	Model	Serial N°	Date of reception
66584B/017	SMA cable	--	--	2021/11/25

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

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	PE
	☒		DC: Vnom : 12V, Vmax : 16V, Vmin : 8V				

Rated Power	--		
Clock frequencies.....	--		
Other parameters	--		
Software version	C5.4.1_Homologation (Rev4496dae)		
Hardware version	B272222-B		
Dimensions in cm (W x H x D)	409.59 x 126.45 x 131.22		
	☒	Other: This module takes place behind the steering wheel.	
Modules/parts.....	Module/parts of test item	Type	Manufacturer
	COM2020 Product	TCM	Valeo
Accessories (not part of the test item)	Description	Type	Manufacturer
	Power Supply Cable		Valeo
	PSA RF Key 433.92 MHz		HUFF
	PSA Transponder antenna 125 kHz		DELPHI
	Monitoring LEDs Connector		Valeo
	125 Khz SMA coaxial cable		Valeo
Documents as provided by the applicant	Description	File name	Issue date
	Electronic schematic	b272222_01_d_schematic	
	RED Test reports		
	Manual User	9012-B42000373-001-B Preconisation de montage (26-5-2020)	
	Technical Presentation	TCM COM 2020 Technical presentation	

⁽³⁾ Only for Medical Equipment

Identification of the client

Valeo Comfort & Driving Assistance Systems
76 rue Auguste Perret Zone Europarc Cedex
94046 Creteil France

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-11-27
Date (finish)	2020-11-28

Document history

Report number	Date	Description
66584RRF.001	2021-02-02	First release
66584RRF.001A1	2021-07-21	Second release: - Added the identifier CABid to the report. - Modification due to typos. - This modification test report cancels and replaces the test report 66584RRF.001.

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

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

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

Remarks and comments

The tests have been performed by the technical personnel: Miguel Ángel Torres.

Used instrumentation:

Conducted Measurements:

	Last Calibration	Due Calibration
1. Signal and Spectrum Analyzer ROHDE AND SCHWARZ FSV40	2020/03	2022/03
2. DC Power Supply Keysight Technologies U8002A	N.A.	N.A.
3. Digital Multimeter FLUKE 179	2020/10	2021/10

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. Active Loop antenna 9 kHz-30 MHz HEWLETT PACKARD 11966A	2020/07	2022/07
4. EMI Test Receiver 9kHz-7GHz ROHDE AND SCHWARZ ESR7	2020/01	2022/01
5. DC Power supply GW INSTEK GPS-3030D	N.A.	N.A.
6. Digital Multimeter FLUKE 175	2020/11	2021/11

Testing verdicts

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

Summary

1. LF 125 kHz.

FCC PART 15.209 / RSS-Gen, RSS-210 PARAGRAPH		
Requirement – Test case	Verdict	Remark
Occupied bandwidth	P	
FCC 15.209 (a) / RSS-Gen 8.9.,RSS-210 7.2. : General field strength and Trasmitter emission limits.	P	
<u>Supplementary information and remarks:</u> None.		

Appendix A: Test results

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TEST CONDITIONS

POWER SUPPLY (V):

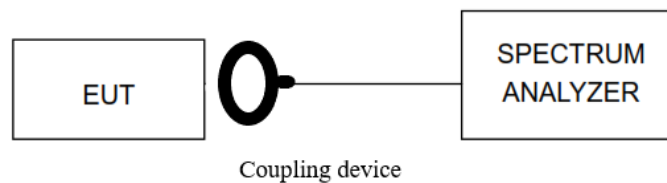
Vnominal:	12 Vdc
Type of Power Supply:	DC voltage from external power supply.
Type of Antenna:	External antenna.

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.



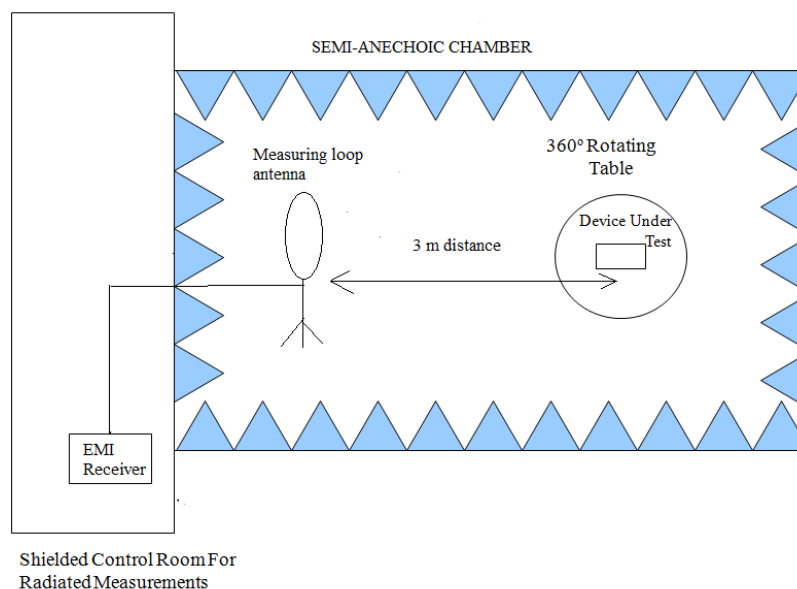
RADIATED MEASUREMENTS

All radiated tests were performed in a semi-anechoic chamber. The 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.

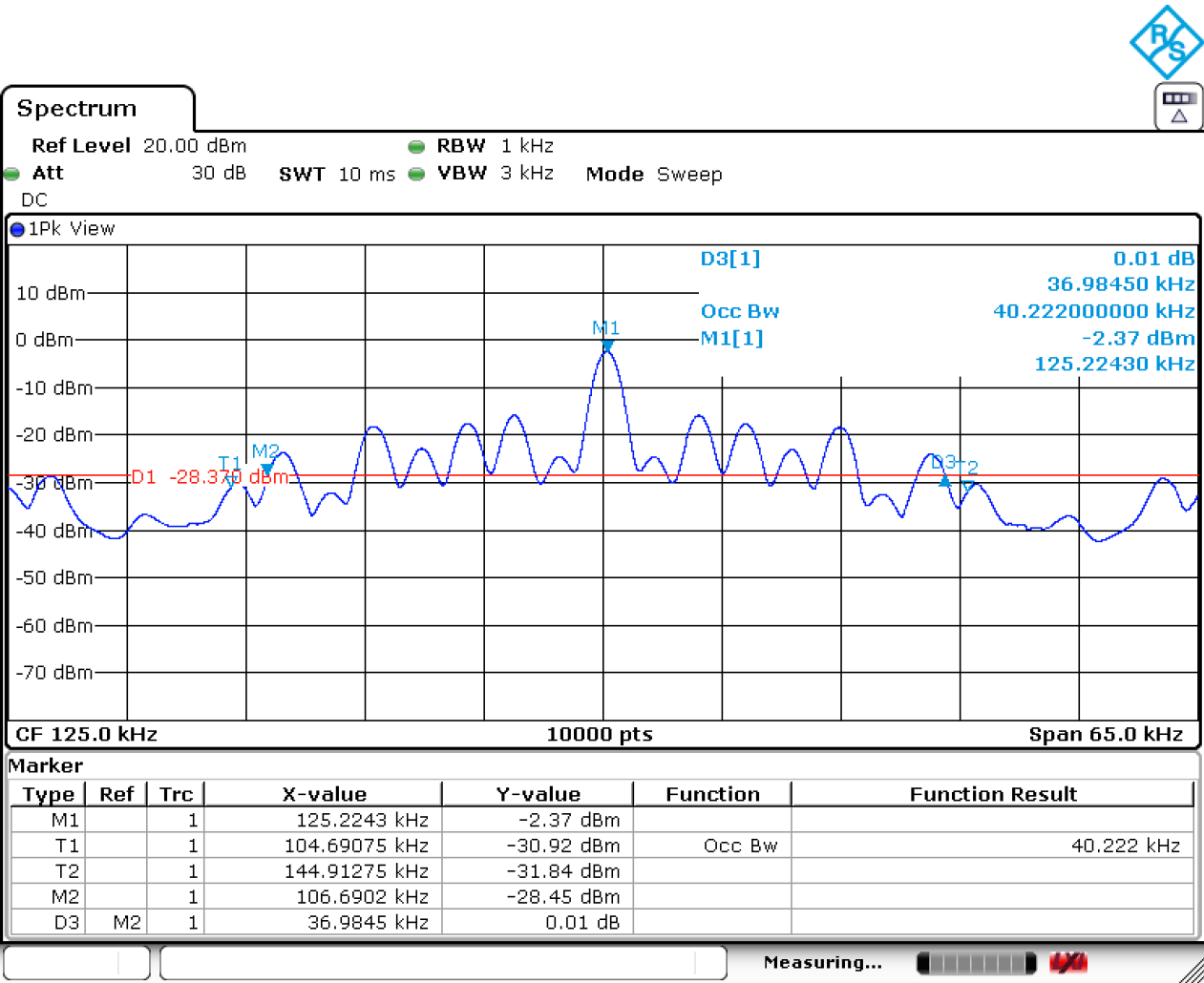
In the range between 9 kHz and 30 MHz the measurements were made in the three different orientation planes of the loop antenna to determine the maximum received field.



Occupied Bandwidth

RESULTS:

99% Bandwidth (kHz)	40.222
Measurement uncertainty (kHz)	<±0.12



15.209 (a) / RSS-Gen 8.9., RSS-210 7.2. General field strength and 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 ($\text{dB}\mu\text{V/m}$)	Magnetic field strength (H-Field) ($\mu\text{A/m}$)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	6.37/ F(kHz)	300
0.490-1.705	24000/F(kHz)	-	63.7/ F(kHz)	30
1.705 - 30.0	30	29.54	0.08	30
30 - 88	100	40	-	3
88 - 216	150	43.5	-	3
216 - 960	200	46	-	3
Above 960	500	54	-	3

Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

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:

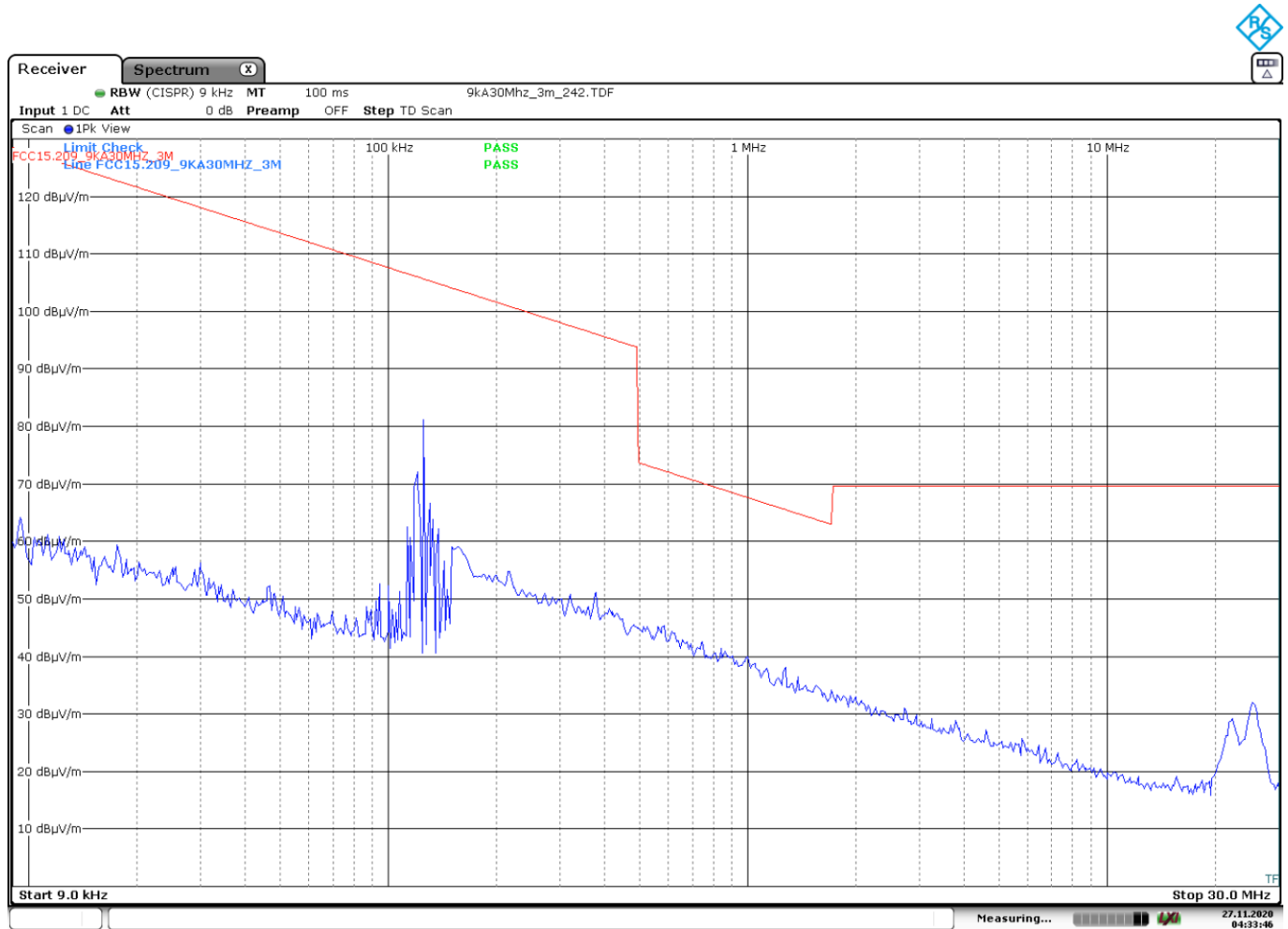
No spurious frequencies detected at less than 20 dB below the limit.

The maximum field strength of fundamental emission:

Frequency (kHz)	Maximum field strength ($\text{dB}\mu\text{V/m}$) measured at 3 m (average detector)	Magnetic field strength (H-Field) ($\text{dB}\mu\text{A/m}$) 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 ($\text{dB}\mu\text{A/m}$) extrapolated to 300 m (40 dB/decade)	Maximum field strength ($\mu\text{V/m}$) extrapolated to 300 m (40 dB/decade)	Maximum field strength ($\mu\text{A/m}$) extrapolated to 300 m (40 dB/decade)
125.00	81.13	29.63	1.13	-50.37	1.14	0.003
Measurement uncertainty (dB)	< ± 3.04					

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