

Test report No:
NIE: 68918REM.002

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	Smart Remote Control Unit with WLAN
(*) Trademark	Audi
(*) Model and /or type reference	SCON2
Other identification of the product	HW version: D0 SW version: 214 FCC ID: T8GSCON2 IC: 6434A-SCON2
(*) Features	Wi-Fi
Manufacturer	HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH BECKER-GOERING-STR. 16 76307 KARLSBAD, GERMANY
Test method requested, standard	FCC 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	2022-01-12
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.

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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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 S.A.U. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification 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 26 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 Smart Remote Control Unit with WLAN.

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 of Reception	Application
S/01	68918_16.1	Display	SCON2	HBV006M6436B MH	2021-08-24	Element Under Test
S/01	68918_6.1	Harness	--	--	2021-08-10	Auxiliary Element
S/01	68918_8.1	CAN box #011	--	--	2021-08-10	Auxiliary Element

Notes referenced to samples during the project.

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⁾		
	Harness						
Supplementary information to the ports..... :	N/A						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☒	DC: 12V Car battery / alternator (9.5V-15.5V normal operation)					
Rated Power	Not provided data						
Clock frequencies.....	Not provided data						
Other parameters	Not provided data						
Software version	214						
Hardware version	D0						
Dimensions in cm (W x H x D)	Not provided data						
Mounting position		Table top equipment					
		Wall/Ceiling mounted equipment					
		Floor standing equipment					
		Hand-held equipment					
	X	Other: Automotive infotainment system					

Modules/parts.....:	Module/parts of test item	Type	Manufacturer
	N/A		
Accessories (not part of the test item)	Description	Type	Manufacturer
	N/A		
	N/A		
Documents as provided by the applicant.....:	Description	File name	Issue date
	N/A		

⁽³⁾ Only for Medical Equipment

Identification of the client

HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
BECKER-GOERING-STR. 16
76307, KARLSBAD, GERMANY

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2021-12-10
Date (finish)	2021-12-20

Document history

Report number	Date	Description
68918REM.002	2022-01-12	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 %

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. = 35 %

Remarks and comments

The tests have been performed by the technical personnel: Salvador Cuellar Guerrero.

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
8866	EMI TEST RECEIVER 2Hz – 44GHz	ESW44	ROHDE AND SCHWARZ	2023-09-21
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
4612	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS- ELEKTRONIK	2024-07-13
4657	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2023-05-05
3541	HYBRID BILOG ANTENNA 30MHz- 6GHz	JB6	SUNOL SCIENCES CORPORATION	2024-11-15
8856	PRE-AMPLIFIER G>30dB 18-40GHz	BLMA 1840- 4A	BONN ELEKTRONIK	2023-09-08
8788	PRE-AMPLIFIER 30dB 500MHz- 18GHz	BBV 9718 C	SCHWARZBECK MESS- ELEKTRONIK	2022-06-07
6064	SEMIANECHOIC ABSORBER LINED CHAMBER	SAC-3	FRANKONIA	---
6329	SHIELDED ROOM	---	FRANKONIA	---

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)	Radiated emission	Pass	---
FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)	Conducted emission	N/A	(1)

Supplementary information and remarks:

1. This test is not applicable because EUT is powered in DC.

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. Display activated. WiFi 2.4GHz and WiFi 5 GHz OFF. Power supply: 12Vdc

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

Test Cases Details

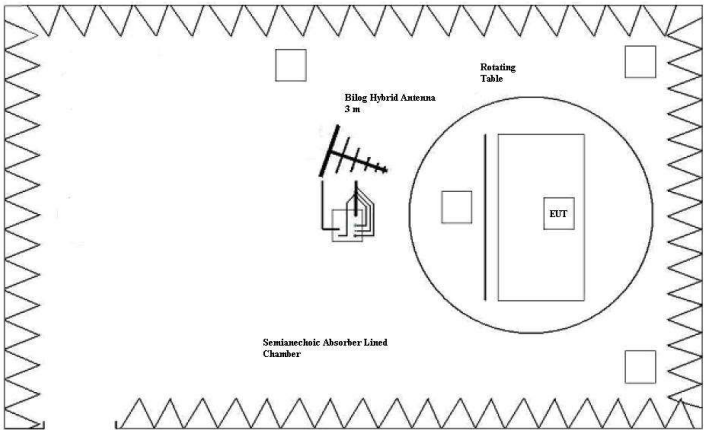
FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) &
ICES-003 Issue 7 (October 2020)
RE Radiated emission

Limits of interference Class B

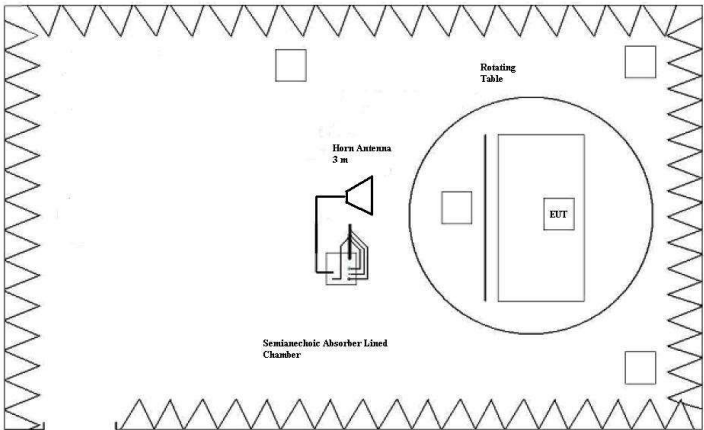
The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-19 Edition), Secs. 15.109 & ICES-003 Issue 7 (Updated 04-2020)

Frequency of emission (MHz)	Field strength limit (microvolt/meter) (QuasiPeak Detector)	ICES-003 Issue 7 Field strength (dBµV/m)
30-88	100	40
88-216	150	43.5
216-230	200	46
230-960	200	47
Above 960	500	54

*Above 1GHz, the limit is defined for an AVG detector.



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

RESULTS

REmmnnRR	Description	Result
RE0101LR	Range: 30 MHz - 1000 MHz.	P
RE0101HR1	Range: 1 GHz – 17 GHz.	P
RE0101HR2	Range: 17 GHz – 26 GHz.	P

REmmnnRR: RE: Radiated Emission; mm: Sample number; nn: Operation mode; RR: Measurement range.

VERDICT

Pass

Images:

Project:68918REM.002

Company:HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH

Sample:S/01

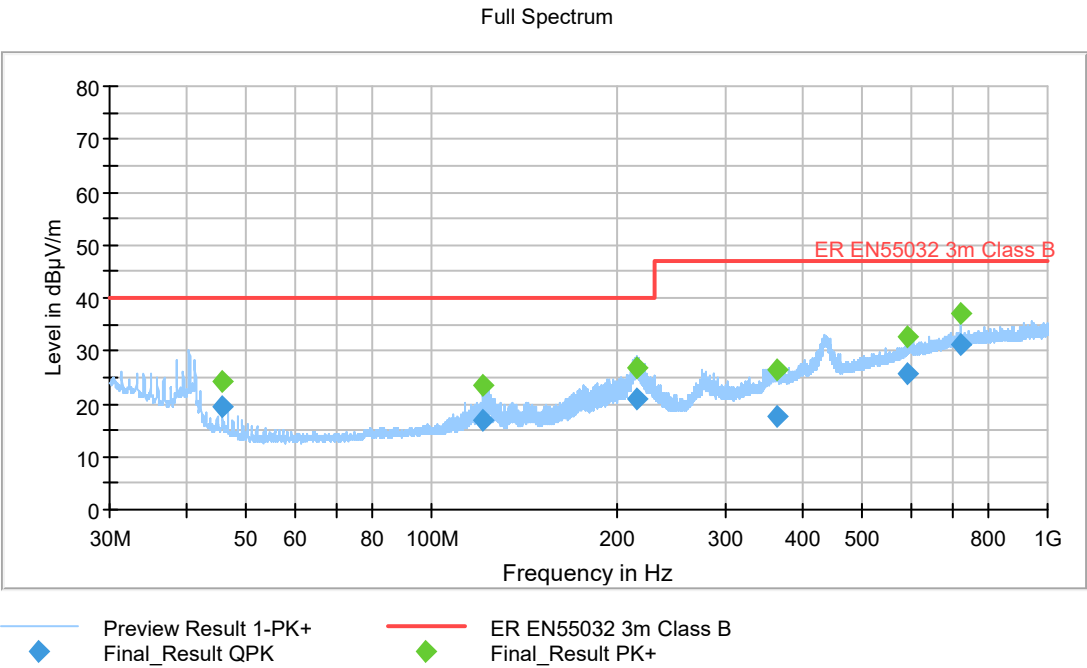
Operation mode:01

Graphical code:RE0101LR

Description:EUT ON. Display activated. WiFi 2.4GHz and WiFi 5 GHz OFF.
Power supply: 12Vdc

Verdict:Passed

RE FCC Part 15 Class B

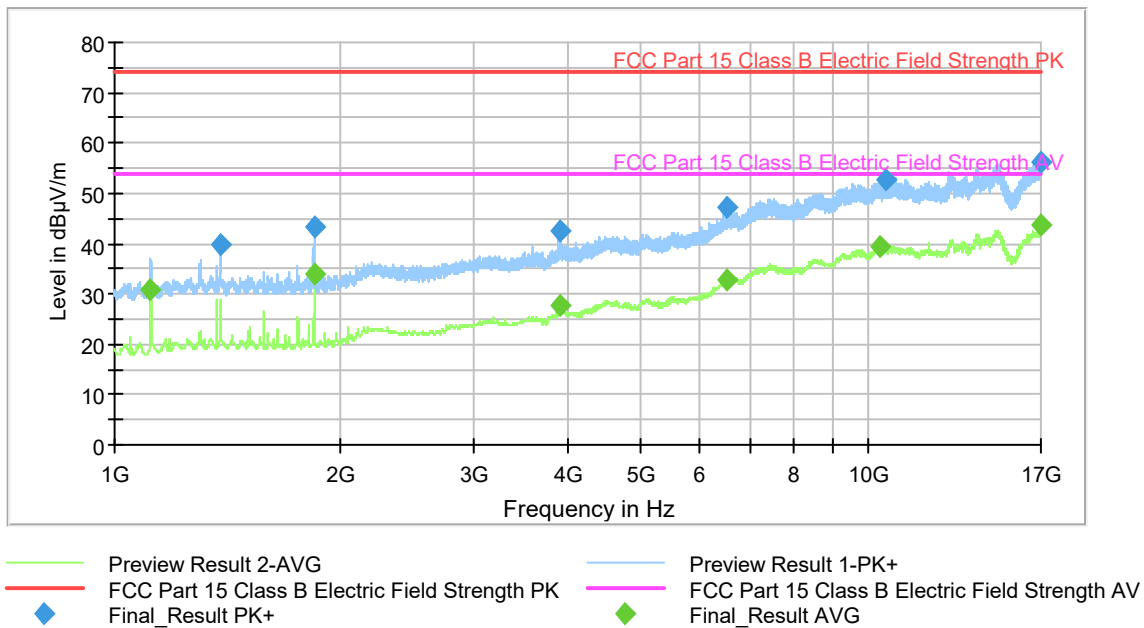


Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
45.780000	19.36	---	40.00	20.64	100.0	V	54.0
45.780000	---	24.09	---	---	100.0	V	54.0
121.083000	---	23.45	---	---	125.0	V	-45.0
121.083000	16.76	---	40.00	23.24	125.0	V	-45.0
215.245000	---	26.84	---	---	220.0	V	-31.0
215.245000	20.78	---	40.00	19.22	220.0	V	-31.0
363.744000	---	26.45	---	---	170.0	V	-164.0
363.744000	17.55	---	47.00	29.45	170.0	V	-164.0
591.461000	---	32.55	---	---	130.0	H	10.0
591.461000	25.78	---	47.00	21.22	130.0	H	10.0
722.952000	---	37.08	---	---	144.0	V	-34.0
722.952000	31.19	---	47.00	15.81	144.0	V	-34.0

Project: 68918REM.002
Company: HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
Sample: S/01
Operation mode: 01
Graphical code: RE0101HR1
Description: EUT ON. Display activated. WiFi 2.4GHz and WiFi 5 GHz OFF.
Power supply: 12Vdc
Verdict: Passed

RE FCC Part 15 Class B



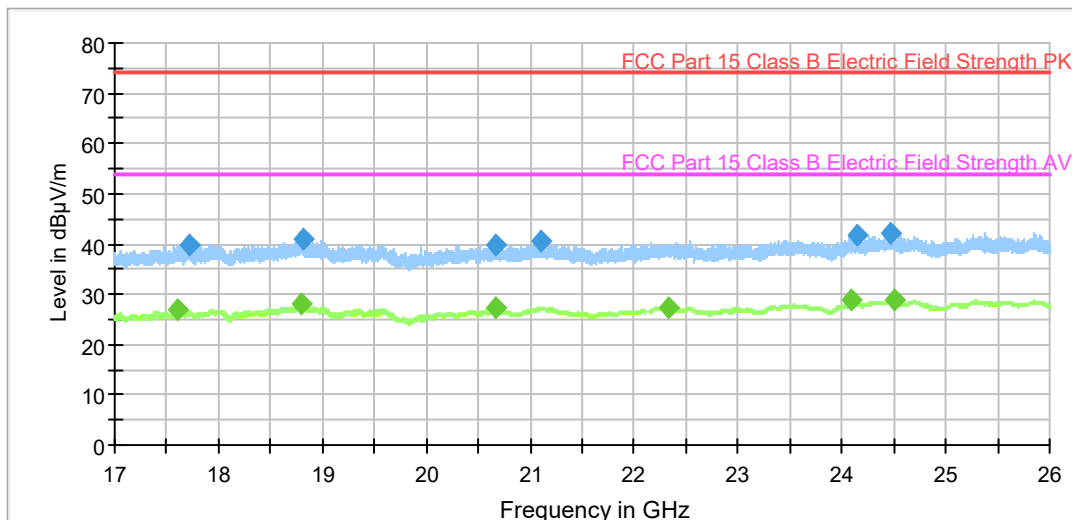
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1297.750000	35.83	---	73.97	38.14
1577.250000	---	25.13	53.97	28.84
2234.500000	---	22.30	53.97	31.67
2256.250000	35.71	---	73.97	38.26
3216.000000	---	23.68	53.97	30.29
3919.250000	36.37	---	73.97	37.60
6529.750000	41.34	---	73.97	32.63
6590.750000	---	27.98	53.97	25.99
9914.250000	47.55	---	73.97	26.42
10419.250000	---	34.05	53.97	19.92
16821.750000	---	37.47	53.97	16.50
16925.500000	50.64	---	73.97	23.33

Project: 68918REM.002
Company: HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
Sample: S/01
Operation mode: 01
Graphical code: RE0101HR2
Description: EUT ON. Display activated. WiFi 2.4GHz and WiFi 5 GHz OFF.
Power supply: 12Vdc
Verdict: Passed

RE FCC Part 15 Class B

Full Spectrum



— Preview Result 2-AVG
— FCC Part 15 Class B Electric Field Strength PK
— Preview Result 1-PK+
— FCC Part 15 Class B Electric Field Strength AV
◆ Final_Result PK+
◆ Final_Result AVG

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)
17611.500000	---	26.89	53.97	27.08
17727.250000	39.88	---	73.97	34.09
18805.500000	---	27.96	53.97	26.01
18807.750000	40.81	---	73.97	33.16
20660.250000	39.95	---	73.97	34.02
20660.500000	---	27.20	53.97	26.77
21109.250000	40.54	---	73.97	33.43
22340.500000	---	27.43	53.97	26.54
24098.500000	---	28.73	53.97	25.24
24141.500000	41.59	---	73.97	32.38
24464.500000	42.29	---	73.97	31.68
24512.750000	---	28.86	53.97	25.11