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REGISTRATION
NUMBER 4621A-2.

Test report No:
NIE: 56848RRF.009

Test report

USA FCC Part 15.247, 15.209
CANADA RSS-247, RSS-Gen

Radio Frequency Devices. Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz.

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices.

General Requirements and Information for the Certification of Radio Apparatus.

Identification of item tested	Automotive infotainment System
Trademark	Mercedes-Benz
Model and /or type reference	NTG6N HIGH
Other identification of the product	HW Version: D4 SW Version: E412.007 FCC ID: T8GNTG6NH IC: 6434A-NTG6NH S/N: HBM249JB002144
Features	FM, AM, DAB, TV, USB, HDD, Bluetooth, WLAN, GPS
Applicant	HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH BECKER-GOERING-STR. 16; 76307 KARLSBAD GERMANY
Test method requested, standard	USA FCC Part 15.247 10-1-18 Edition: Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 10-1-18 Edition: Radiated emission limits; general requirements. CANADA RSS-247 Issue 2 (February 2017). CANADA RSS-Gen Issue 5 (April 2018). Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid Systems Devices Operating Under Section 15.247 of the FCC Rules. 558074 D01 Meas Guidance v05 dated August 24, 2018. 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		Firmado digitalmente por ALEJANDRO LLAMAS RODRIGUEZ Fecha: 2019.06.07 10:52:29 +02'00'
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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.

DEKRA Testing and Certification is a FCC-recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report.

DEKRA Testing and Certification S.A.U. 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.

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.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
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 S.A.U. internal document PODT000.

Data provided by the client

The test sample consist of an automotive head unit to be installed in cars with the following features: FM, AM, DAB, TV, USB, HDD, Bluetooth, WLAN, GPS.

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.

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

Control N°	Description	Model	Serial N°	Reception
56848G/059	Automotive infotainment System	NTG6N HIGH	HBM249JB002144	2019/01/11
56848G/132	HMI-CAN box	--	H0034722	2019/01/11
56848G/087	Ethernet Cable	--		2019/01/11
56848G/118	Harness	--	--	2019/01/11
56848G/106	BT/WLAN antenna	--	--	2019/01/11
56848G/107	BT/WLAN antenna	--	--	2019/01/11
56848G/108	BT/WLAN antenna	--	--	2019/01/11
56848G/109	BT/WLAN antenna	--	--	2019/01/11
56848G/021	BT/WLAN antenna	--	--	2019/01/10

Sample S/01 has undergone the following test(s): All RADIATED tests indicated in Appendix A and Appendix B.

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

Control N°	Description	Model	Serial N°	Reception
56848G/059	Automotive infotainment System	NTG6N HIGH	HBM249JB002144	2019/01/11
56848G/132	HMI-CAN box	--	H0034722	2019/01/11
56848G/088	Ethernet Cable	--	--	2019/01/11
56848G/118	Harness	--	--	2019/01/11

Sample S/02 has undergone the following test(s): All CONDUCTED tests indicated in Appendix A and Appendix B.

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
	Car Connector A	>3m ^(x1)	☒	☐	☐		
	Car Connector B	>3m ^(x1)	☒	☐	☐		
	Display Connector CID/PIP / RVC	>3m ^(x1)	☒	☒	☐		
	USB Connector	<3m ^(x2)	☒	☒	☐		
	Eth Connector	>3m ^(x1)	☒	☒	☐		
	BT/WLAN-Antenna	>3m ^(x1)	☒	☒	☐		
	FM/AM, TV/SDARS Ant	>3m ^(x1)	☒	☒	☐		
	GPS Antenna	>3m ^(x1)	☒	☒	☐		
Supplementary information to the ports..... :	For EMC-Testing all cables should be connected to the connectors!						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 12V Car battery / attenuator (9,5-15,5V normal operation)					
☐	DC:						
Rated Power	9,5-15,5V normal operation						
Clock frequencies	see schematics						
Other parameters.....	FCC ID: T8GNTG6NH / IC: 6434A-NTG6NH						
Software version	E412.007						
Hardware version.....	D4 / Serial Product						
Dimensions in cm (W x H x D).....	182 x 78 x 160 mm						
Mounting position.....	☐	Table top equipment					
	☐	Wall/Ceiling mounted equipment					

	☐	Floor standing equipment	
	☐	Hand-held equipment	
	☒	Other: automotive headunit	
Modules/parts	Module/parts of test item	Type	Manufacturer
	n/a		
Accessories (not part of the test item)	Description	Type	Manufacturer
	Display	A247 905 69	Daimler OEM Displ.
	CAN-Box	-	HBAS
	Cable harness	-	HBAS
	BT/WLAN-Antenna	A247 905 83	Hirschmann
Documents as provided by the applicant.....	Description	File name	Issue date
	Technical Description		

⁽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)	2019-01-21
Date (finish)	2019-03-29

Document history

Report number	Date	Description
56848RRF.009	2019-06-06	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: Miguel Ángel Torres, Ignacio Cabra and José Alberto Aranda.

Used instrumentation:

Conducted Measurements:

	Last Calibration	Due Calibration
1. Spectrum analyser Agilent PSA E4440A	2017/10	2019/10
2. DC power supply Keysight Technologies U8002A	N.A.	N.A.
3. Multimeter Fluke 179	2018/06	2019/06
4. Bluetooth Signalling unit ANRITSU MT8852B	N.A.	N.A.
5. Spectrum analyser Rohde & Schwarz FSV40	2017/07	2019/07
6. EMI Test Receiver R&S ESR7	2018/10	2020/10

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. EMI Test Receiver R&S ESU 40	2018/06	2020/06
4. RF pre-amplifier 30 MHz-6 GHz Bonn Elektronik BLNA 0360-01N	2018/07	2019/07
5. BiconicalLog antenna ETS LINDGREN 3142E	2017/04	2020/04
6. Spectrum analyser Rohde & Schwarz FSW50	2018/02	2020/02
7. RF pre-amplifier 1-18 GHz Bonn Elektronik BLMA 0118-1M	2019/04	2020/04
8. Double-ridge Guide Horn antenna 1-18 GHz SCHWARZBECK BBHA 9120 D	2016/11	2019/11
9. Broadband Horn antenna 18-40 GHz SCHWARZBECK BBHA 9170	2018/07	2021/07
10. RF pre-amplifier 18-40 GHz NARDA JS44-18004000-33-8P	2019/02	2020/02

Testing verdicts

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

Summary

1. BT EDR

FCC PART 15 PARAGRAPH / RSS-247			
Requirement – Test case		Verdict	Remark
Section 15.247 Subclause (a) (1) / RSS-247 5.1. (b)	20 dB Bandwidth and Carrier frequency separation	P	
Section 15.247 Subclause (a)(1)(iii) / RSS-247 5.1 (d)	Number of hopping channels	P	
Section 15.247 Subclause (a)(1)(iii) / RSS-247 5.1 (d)	Time of occupancy (Dwell Time)	P	
Section 15.247 Subclause (b) / RSS-247 5.4. (b)	Maximum peak output power and antenna gain	P	
Section 15.247 Subclause (d) / RSS-247 5.5.	Band-edge emissions compliance (Transmitter)	P	
Section 15.247 Subclause (d) / RSS-247 5.5	Emission limitations conducted (Transmitter)	P	
Section 15.247 Subclause (d) / RSS-247 5.5.	Emission limitations radiated (Transmitter)	P	
<u>Supplementary information and remarks:</u>			
None.			

2. WIFI 2.4 GHz (802.11b/g/n20/n40)

FCC PART 15 PARAGRAPH / RSS-247			
Requirement – Test case		Verdict	Remark
Section 15.247 Subclause (a) (2) / RSS-247 5.2. (a)	6 dB Bandwidth	P	
Section 15.247 Subclause (b) / RSS-247 5.4. (d)	Maximum output power and antenna gain	P	
Section 15.247 Subclause (d) / RSS-247 5.5	Emission limitations conducted (Transmitter)	P	
Section 15.247 Subclause (d) / RSS-247 5.5.	Band-edge emissions compliance (Transmitter)	P	
Section 15.247 Subclause (e) / RSS-247 5.2. (b)	Power spectral density	P	
Section 15.247 Subclause (d) / RSS-247 5.5.	Emission limitations radiated (Transmitter)	P	
<u>Supplementary information and remarks:</u>			