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REGISTRATION NUMBER  
4621A-2,4621A-4

Test report No:  
**NIE: 56848RRF.010**

## Test report

**USA FCC Part 15.407, 15.209**

**CANADA RSS-247, RSS-Gen**

Unlicensed National Information Infrastructure (U-NII) Devices.

General technical requirements.

Radiated emission limits; general requirements.

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	FCC ID: T8GNTG6NH IC: 6434A-NTG6NH HW Version: D4 SW Version: E412.007
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 15.407 10-1-18 Edition: Unlicensed National Information Infrastructure (U-NII) Devices. General technical requirements. Band U-NII-3 (5725 MHz – 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 Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices 789033 D02 General U-NII Test Procedures New Rules v02r01 dated Dec 14, 2017. Guidance for Emission Testing of Transmitters with Multiple Outputs in the Same Band 662911 D01 Multiple Transmitter Output v02r01 dated 10/31/2013

	ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	<div> <div>A. Llamas RF Lab. Manager</div> <div>  <div> Firmado digitalmente  por ALEJANDRO  LLAMAS RODRIGUEZ  Fecha: 2019.06.07  10:54:37 +02'00' </div> </div> </div>
Date of issue	2019-06-06
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## Competences and guarantees

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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 FCC-recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report.

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 and ISED 4621A-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

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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.
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## Uncertainty

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

## Data provided by the client

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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 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 Appendixes B and C.

- 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 Appendixes A, B and C except the conducted tests on range 5.725-5.85MHz in WLAN1 CORE0 antenna port 3 and WLAN1 CORE1 SISO antenna port 4 .

- Sample S/03 is composed of the following elements:

Control N°	Description	Model	Serial N°	Reception
56848G/154	Automotive infotainment System	NTG6N HIGH	HBM249JB002149	2019/03/25
56848G/132	HMI-CAN box	--	H0034722	2019/01/11
56848G/088	Ethernet Cable	--	--	2019/01/11
56848G/118	Harness	--	--	2019/01/11

Sample S/03 has undergone the following test(s): All CONDUCTED tests indicated on range 5.725-5.85MHz in WLAN1 CORE0 antenna port 3 and WLAN1 CORE1 SISO antenna port 4 in Appendixes A and C.

## Test sample description

Ports..... :	Port name and description		Cable				
			Specified max length [m]	Attached during test	Shielded	Coupled to patient <sup>(3)</sup>	
	Car Connector A		>3m <sup>(x1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Car Connector B		>3m <sup>(x1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Display Connector CID/PIP / RVC		>3m <sup>(x1)</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	USB Connector		<3m <sup>(x2)</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Eth Connector		>3m <sup>(x1)</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	BT/WLAN-Antenna		>3m <sup>(x1)</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	FM/AM, TV/SDARS Ant		>3m <sup>(x1)</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	GPS Antenna		>3m <sup>(x1)</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	DC: 12V Car battery / attenuator (9,5-15,5V normal operation)					
<input type="checkbox"/>	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 .....	<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: automotive headunit	
Modules/parts.....:	Module/parts of test item		Type
	n/a		
Accessories (not part of the test item) .....	Description		Type
	Display		A247 905 69
	CAN-Box		-
	Cable harness		-
	BT/WLAN-Antenna		A247 905 83
Documents as provided by the applicant.....:	Description		File name
	Technical Description		

## 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)	2019-01-28
Date (finish)	2019-04-03

## Document history

Report number	Date	Description
56848RRF.010	2019-06-06	First release



## Environmental conditions

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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: Ignacio Cabra, Jose Alberto Aranda, Miguel Ángel Torres, Jaime Barranquero, Francisco Javier Alcaide and Verónica García.

Used instrumentation:

### Radiated Measurements

		Last Cal. date	Cal. due date
1.	Semianechoic Absorber Lined Chamber ETS FACT3 200STP	N.A.	N.A.
2.	EMI Test Receiver R&S ESR7	2017/08	2019/08
3.	BiconicalLog antenna ETS LINDGREN 3142E	2017/09	2020/09
4.	RF pre-amplifier 30-6 GHz Bonn Elektronik BLMA 0360-01N	2018/07	2019/07
5.	Spectrum analyser Rohde & Schwarz FSV40	2018/02	2020/02
6.	RF pre-amplifier 1-18 GHz Bonn Elektronik BLMA 0118-3A	2019/04	2020/04
7.	Double-ridge Guide Horn antenna 1-18 GHz SCHWARZBECK BBHA 9120 D	2018/01	2021/01
8.	RF pre-amplifier 18-40 GHz NARDA JS44-18004000-33-8P	2019/02	2020/02
9.	Double-ridge Guide Horn antenna 1-18 GHz SCHWARZBECK BBHA 9120 D	2018/01	2021/01
10.	Broadband Horn antenna 18-40 GHz SCHWARZBECK BBHA 9170	2018/07	2021/07
11.	DC Power Supply Rohde and Schwarz NGPE 40/40	2018/02	2021/02
12.	Semianechoic Absorber Lined Chamber ETS FACT3 200STP	N.A.	N.A.
13.	EMI Test Receiver R&S ESU40	2018/06	2020/06
14.	Spectrum analyser Rohde & Schwarz FSW50	2018/02	2020/02
15.	RF pre-amplifier 1-18 GHz Bonn Elektronik BLMA 0118-1M	2019/04	2020/04

### Conducted Measurements

		Last Cal. date	Cal. due date
1.	Spectrum analyser Rohde & Schwarz FSV40	2017/07	2019/07
2.	DC Power Supply Rohde and Schwarz NGPE 40/40	2018/02	2021/02
3.	Spectrum analyser Rohde & Schwarz FSW50	2018/02	2020/02

## Testing verdicts

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

## Summary

### A. Common requirements for all bands

FCC PART 15 PARAGRAPH / RSS-247			
Requirement – Test case		Verdict	Remark
RSS-Gen 6.6 / RSS-247 6.2.	Transmitter 99% Occupied Bandwidth	P	
FCC 15.403 (i)	Transmitter 26 dB Emission Bandwidth (EBW)	P	
FCC 15.35 ( c ) / RSS-Gen 6.10	Duty Cycle	P	
FCC 15.407 (g) / RSS-Gen 6.11	Transmitter Frequency Stability (Temperature & Voltage Variation)	N/M	See (1)
<u>Supplementary information and remarks:</u>			
(1) The manufacturer is responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual.			

## B. 5.15 GHz – 5.25 GHz Band

FCC PART 15 PARAGRAPH / RSS-247			
Requirement – Test case		Verdict	Remark
FCC 15.407 (a) (1) (iv)	Transmitter Maximum conducted Output Power	P	
RSS-247 6.2.1.1	Transmitter Maximum Equivalent Isotropically Radiated Power EIRP	P	
FCC 15.407 (a) (1) (iv)	Transmitter Maximum Power Spectral Density	P	
RSS-247 6.2.1.1	Transmitter EIRP Spectral Density	P	
FCC 15.407 (b) (1) / RSS-247 6.2.1.2	Transmitter Band Edge Radiated Emissions	P	
FCC 15.407 (b) (1) (6) / RSS-247 6.2.1.2	Transmitter Out of Band Radiated Emissions	P	
<u>Supplementary information and remarks:</u>			
None			

## C. 5.725 GHz – 5.85 GHz Band

FCC PART 15 PARAGRAPH / RSS-247			
Requirement – Test case		Verdict	Remark
FCC Part 15.407 (a) (3) / RSS-247 6.2.4.1	Transmitter Maximum conducted Output Power	P	
FCC 15.407 (e) / RSS-247 Clause 6.2.4.1	6 dB bandwidth.	P	
FCC 15.407 (a) (3) / RSS-247 Clause 6.2.4.1	Transmitter Maximum Power Spectral Density	P	
FCC 15.407 (b) (4) / RSS-247 6.2.4.2	Transmitter Band Edge Radiated Emissions	P	
FCC 15.407 (b) (4) (6) / RSS-247 6.2.4.2	Transmitter Out of Band Radiated Emissions	P	
<u>Supplementary information and remarks:</u>			
None			