



ISED LISTED  
REGISTRATION  
NUMBER 4621A-4

Test report No:  
NIE: 56848RRF.004

## 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 ENTRY/MID.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Other identification of the product       | HW version: D4.<br>SW version: E412.007.<br>FCC ID: T8GNTG6NEM.<br>IC: 6434A-NTG6NEM.<br>S/N: HBM246JB000724                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Features                                  | FM, AM, DAB, USB, Bluetooth, WLAN, GPS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Applicant                                 | HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH<br>BECKER-GOERING-STR. 16; 76307 KARLSBAD<br>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.<br>USA FCC Part 15.209 10-1-18 Edition: Radiated emission limits; general requirements.<br>CANADA RSS-247 Issue 2 (February 2017).<br>CANADA RSS-Gen Issue 5 (April 2018).<br>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 v05r01 dated February 11, 2019.<br>ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices. |
| Summary                                   | IN COMPLIANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Approved by (name / position & signature) | A. Llamas<br>RF Lab. Manager<br><br>Firmado digitalmente por ALEJANDRO LLAMAS RODRIGUEZ<br>Fecha: 2019.06.05 11:59:27 +02'00'                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|                    |            |
|--------------------|------------|
| Date of issue      | 2019-06-05 |
| Report template No | FDT08_21   |

Index

Competences and guarantees .....4

General conditions.....4

Uncertainty.....4

Data provided by the client .....4

Usage of samples .....5

Test sample description .....6

Identification of the client .....7

Testing period and place .....7

Document history.....7

Environmental conditions .....7

Remarks and comments.....9

Testing verdicts.....10

Summary .....10

Appendix A: Test results. Bluetooth EDR (GFSK, Pi/4 DQPSK, 8DPSK).....11

Appendix B: Test results. 802.11 bgn20 1x1.....66

## Competences and guarantees

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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-4.

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

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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 S.A.U.
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## Uncertainty

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

## Data provided by the client

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The sample consists of an automotive head unit to be installed in cars with the following features: FM, AM, DAB, USB, Bluetooth, WLAN and 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/079 | Automotive Infotainment System | NTG6N ENTRY/MID | HBM246JB000724 | 2019/01/11 |
| 56848G/132 | CAN Box                        | --              | H0034722       | 2019/01/11 |
| 56848G/88  | Ethernet Harness               | --              | --             | 2019/01/11 |
| 56848G/117 | Harness                        | --              | --             | 2019/01/11 |
| 56848G/020 | Dual BT/WLAN antenna           | ---             | ---            | 2019/01/10 |
| 56848G/103 | BT/WLAN antenna                | ---             | ---            | 2019/01/11 |

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

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

| Control N° | Description                    | Model           | Serial N°      | Reception  |
|------------|--------------------------------|-----------------|----------------|------------|
| 56848G/079 | Automotive Infotainment System | NTG6N ENTRY/MID | HBM246JB000724 | 2019/01/11 |
| 56848G/132 | CAN Box                        | --              | H0034722       | 2019/01/11 |
| 56848G/088 | Ethernet Harness               | --              | --             | 2019/01/11 |
| 56848G/117 | Harness                        | --              | --             | 2019/01/11 |

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

## Test sample description

|                                               |                                                                  |                                                               |                                     |                                     |                          |                          |                          |
|-----------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
| Ports..... :                                  | Port name and description                                        | Cable                                                         |                                     |                                     |                          |                          |                          |
|                                               |                                                                  | Specified length [m]                                          | Attached during test                | Shielded                            |                          |                          |                          |
|                                               | Car Connector A                                                  | >3m <sup>(x1)</sup>                                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                          |                          |                          |
|                                               | Car Connector B                                                  | >3m <sup>(x1)</sup>                                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                          |                          |                          |
|                                               | Display Connector CID/PIP / RVC                                  | >3m <sup>(x1)</sup>                                           | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |                          |                          |                          |
|                                               | USB Connector                                                    | <3m <sup>(x2)</sup>                                           | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |                          |                          |                          |
|                                               | Eth Connector                                                    | >3m <sup>(x1)</sup>                                           | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |                          |                          |                          |
|                                               | BT/WLAN-Antenna                                                  | >3m <sup>(x1)</sup>                                           | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |                          |                          |                          |
|                                               | FM/AM, TV/SDARS Ant                                              | >3m <sup>(x1)</sup>                                           | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |                          |                          |                          |
| GPS Antenna                                   | >3m <sup>(x1)</sup>                                              | <input checked="" type="checkbox"/>                           | <input checked="" 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: T8GNTG6NEM<br>IC: 6434A-NTG6NEM                          |                                                               |                                     |                                     |                          |                          |                          |
| Software version .....                        | E412.007                                                         |                                                               |                                     |                                     |                          |                          |                          |
| Hardware version..... :                       | D4 / Serial Product                                              |                                                               |                                     |                                     |                          |                          |                          |
| Dimensions in cm (L x W 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        | Manufacturer       |
|                                               | Not Applicable            |             |                    |
|                                               |                           |             |                    |
|                                               |                           |             |                    |
| 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     |             |                    |
|                                               |                           |             |                    |
|                                               |                           |             |                    |

## 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)  | 2019-01-17                             |
| Date (finish) | 2019-03-29                             |

## Document history

| Report number | Date       | Description   |
|---------------|------------|---------------|
| 56848RRF.004  | 2019-06-05 | 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: Ignacio Cabra, Miguel Ángel Torres 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 AGILENT TECHNOLOGIES N5744A  | N.A.             | N.A.            |
| 3. | Spectrum analyser Rohde & Schwarz FSV40      | 2017/07          | 2019/07         |
| 4. | DC Power Supply, GW INSTEK GPS-3030D         | N.A.             | N.A.            |
| 5. | EMI Test Receiver R&S ESR7                   | 2018/10          | 2020/10         |
| 6. | DC power supply Keysight Technologies U8002A | N.A.             | N.A.            |
| 7. | Multimeter FLUKE 179                         | 2018/06          | 2019/06         |
| 8. | Bluetooth Signalling unit ANRITSU MT8852B    | N.A.             | N.A.            |

### Radiated Measurements:

|     |                                                                  | Last Calibration | Due Calibration |
|-----|------------------------------------------------------------------|------------------|-----------------|
| 1.  | Semianechoic Absorber Lined Chamber ETS FACT3 200STP             | N.A.             | N.A.            |
| 2.  | EMI Test Receiver R&S ESR7                                       | 2018/10          | 2020/10         |
| 3.  | BiconicalLog antenna ETS LINDGREN 3142E                          | 2017/09          | 2020/09         |
| 4.  | RF pre-amplifier 10MHz-6 GHz Bonn Elektronik BLNA 0160-01N       | 2019/02          | 2020/08         |
| 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         |

## Testing verdicts

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

## Summary

### 1. Bluetooth 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 Clause 5.1 (d) | Number of hopping channels                       | P       |        |
| Section 15.247 Subclause (a)(1)(iii) / RSS-247 Clause 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><br>None.        |                                                  |         |        |

### WiFi 2.4 GHz (802.11b/g/n).

| 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><br>None. |                                              |         |        |