



Test report No:
 NIE: 64433REM.004

Test report

FCC Rules and Regulations CFR 47, Part 15,
 Subpart B (10-1-19 Edition) & ICES-003 Issue 6
 (January 2016, Updated April 2019)

(*) Identification of item tested	Automotive Infotainment System
(*) Trademark	Mercedes-Benz
(*) Model and /or type reference	NTG6N HIGH
Other identification of the product	HW version: D8 SW version: E818.119 FCC ID: T8GNTG6NH IC: 6434A-NTG6NH
(*) Features	FM, AM, DAB, TV, USB, HDD, Bluetooth, WLAN, GPS
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 (Updated 04-2019)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López Martín EMC Consumer & RF Lab. Manager
Date of issue	2020-08-04
Report template No	FDT08_22 (*) "Data provided by the client"

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Competences and guarantees

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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.

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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 and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification 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 consists of NTG6N HIGH is 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 under 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
64433/003	Automotive infotainment system	NTG6N HIGH	HBM251LS018895	2020/06/03

Auxiliary elements used with the sample S/01:

Control N°	Description	Model	Serial N°	Date of reception
56848G/043	Display	---	12088	2019-01-11
56848G/044	HMI-CAN-box	---	H0034715	2019-01-11
56848G/045	HU-Harness	---	H0034670	2019-01-11
56848G/046	Harness	---	---	2019-01-11
56848G/164	Antenna cable	---	---	2019-05-29
56848G/165	TV Amplifier	---	---	2019-05-29
56848G/166	Double antenna cable	---	---	2019-05-29
56848G/171	Antenna cable	---	---	2019-05-29
56848G/176	Tel/GPS/VIP antenna	---	---	2019-07-03
56848G/177	Amplifier AM FM DAB	---	---	2019-07-03
56848G/178	Amplifier AM FM DAB	---	---	2019-07-03
56848G/180	BT/WLAN Antenna	---	---	2019-07-03

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)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Car Connector B		>3m ^(x1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Display Connector CID/PIP / RVC		>3m ^(x1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	USB Connector		<3m ^(x2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Eth Connector		>3m ^(x1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	BT/WLAN-Antenna		>3m ^(x1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	FM/AM, TV/SDARS Ant		>3m ^(x1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
GPS Antenna		>3m ^(x1)	<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	E818.119						
Hardware version..... :	D8						
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	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

(x1) Cable length is depending on car line. In worst case we would think length is above 3m

(x2) Cable length of USB is always below 3m

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)	2020-06-09
Date (finish)	2020-06-10

Document history

Report number	Date	Description
64433REM.004	2020-08-04	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. = 30 % 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. = 30 % 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. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The test have been performed by the technical personnel: Daniel Mejías.

Testing verdicts

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

Summary

Emission Test		
Requirement – Test case	Verdict	Remark
Radiated emission. Electromagnetic field measure (30 MHz – 1000 MHz)	P	---
Radiated emission. Electromagnetic field measure (1 GHz – 17 GHz)	P	---
Radiated emission. Electromagnetic field measure (17 GHz – 26 GHz)	P	---
Continuous conducted emission (150 KHz – 30 MHz)	N/A	(1)
<u>Supplymentary information and remarks:</u>		
1) The test is not applicable because the equipment is powered in DC.		

List of the equipment used during the test

Control Number	Description	Model	Manufacturer	Next Calibration
0246	HORN ANTENNA 1-18GHz	11966E	HEWLETT PACKARD	2021-10-13
6196	PRE-AMPLIFIER G>55dB 1-18GHz	AMF-7D-01001800-22-10P	NARDA	2020-12-17
6607	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2021-04-29
6666	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2022-02-05
6815	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2022-02-01
7615	SHIELDED ROOM	S101	ETS LINDGREN	---

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. The operation modes used by the samples to which the present report refers, are shown in the following table:

OPERATION MODE	DESCRIPTION
OM#01	EUT ON. DVB-T mode. Bluetooth, WiFi 2.4GHz and WiFi 5GHz OFF. GNSS active.(worst case). Power supply: 12Vdc

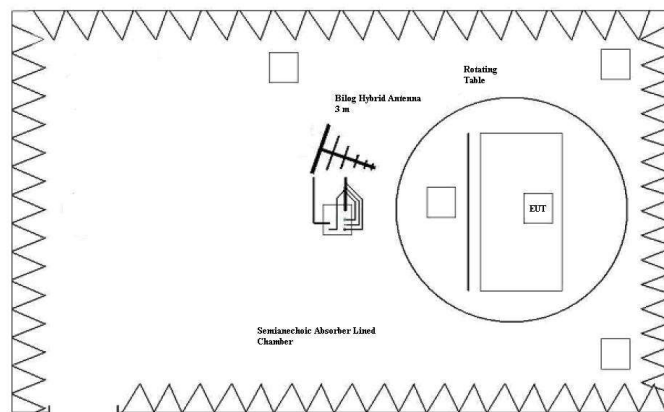
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-19 Edition), Secs. 15.109; ICES-003 (January 2016, updated April 2019)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-19 Edition), Secs. 15.109; ICES-003 (January 2016, updated April 2019)

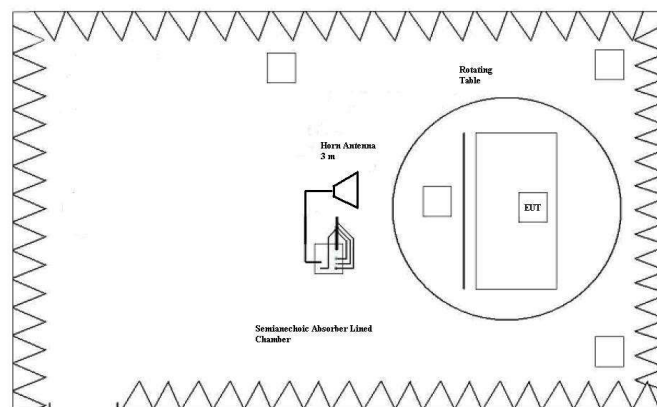
Limits of interference Class B

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 6 (Updated 04-2019)

Frequency of emission (MHz)	Field strength (microvolt/meter)
30-88	100
88-216	150
21-960	200
Above 960	500



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

TESTED SAMPLE:	S/01
TESTED OPERATION MODES:	OM#01
TEST RESULTS:	CRmmnnRRPP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range; PP: Polarization.

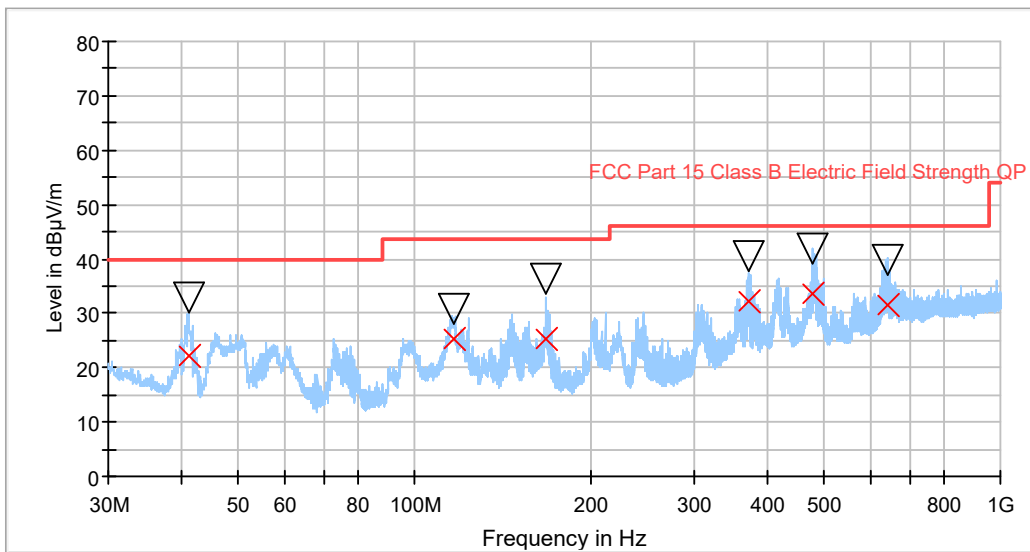
CRmmnnRRPP	Description	Result
CR0101LR	Range: 30 MHz - 1000 MHz.	P
CR0101HR1_PH	Range: 1 GHz - 17 GHz.	P
CR0101HR1_PV	Range: 1 GHz - 17 GHz.	P
CR0101HR1_PH	Range: 17 GHz – 26 GHz.	P
CR0101HR1_PV	Range: 17 GHz – 26 GHz.	P

Radiated Emission. CR0101LR

Project: 64433REM.004
 Company: HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. DVB-T mode. Bluetooth, WiFi 2.4GHz and WiFi 5GHz OFF.
 GNSS active.(worst case). Power supply: 12Vdc

Full Spectrum

Full Spectrum



— Preview Result 1-PK+ QuasiPeak
— FCC Part 15 Class B Electric Field Strength QP
X QuasiPeak
▽ MaxPeak

Maximizations

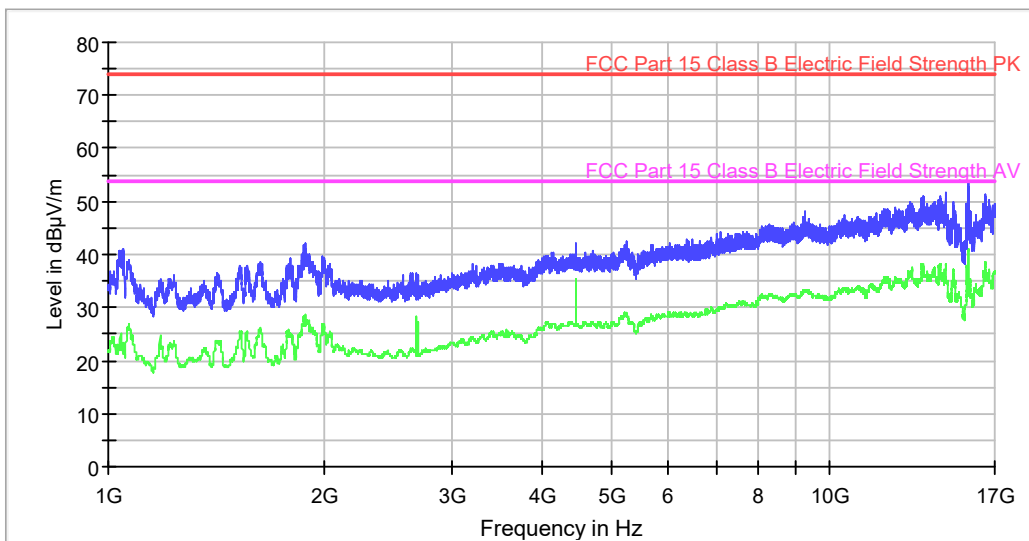
Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Height (cm)	Pol	Azimuth (deg)
41.102000	22.01	32.93	182.0	V	245.0
116.533000	25.21	30.95	138.0	V	294.0
167.683000	25.36	36.26	144.0	V	258.0
371.596000	32.17	40.59	121.0	V	94.0
479.262000	33.66	42.02	135.0	V	340.0
640.768000	31.60	39.89	156.0	H	99.0

Radiated Emission. CR0101HR1_PH

Project: 64433REM.004
Company: HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
Sample: S/01
Operation mode: OM#01
Description: EUT ON. DVB-T mode. Bluetooth, WiFi 2.4GHz and WiFi 5GHz OFF.
GNSS active.(worst case). Power supply: 12Vdc. Horizontal polarization.

RE FCC Part 15 ClassB 1-17 GHz

RE FCC Part 15 ClassB 1-17 GHz



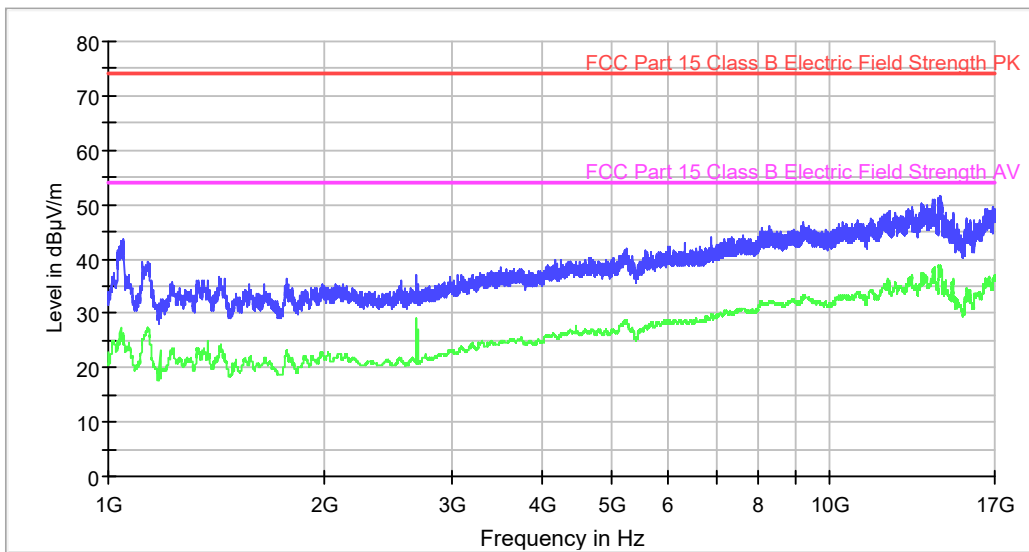
— AVG_CLRWR — PK+_CLRWR
— FCC Part 15 Class B Electric Field Strength PK — FCC Part 15 Class B Electric Field Strength AV

Radiated Emission. CR0101HR1_PV

Project: 64433REM.004
Company: HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
Sample: S/01
Operation mode: OM#01
Description: EUT ON. DVB-T mode. Bluetooth, WiFi 2.4GHz and WiFi 5GHz OFF.
GNSS active.(worst case). Power supply: 12Vdc. Vertical polarization.

RE FCC Part 15 ClassB 1-17 GHz

RE FCC Part 15 ClassB 1-17 GHz



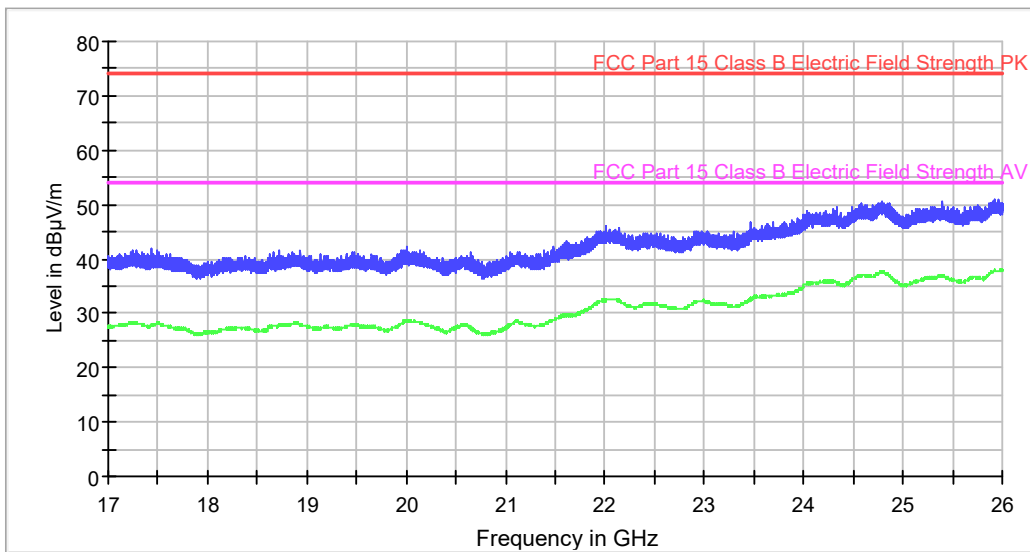
— AVG_CLRWR — PK+_CLRWR
— FCC Part 15 Class B Electric Field Strength PK — FCC Part 15 Class B Electric Field Strength AV

Radiated Emission. CR0101HR2_PH

Project: 64433REM.004
 Company: HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. DVB-T mode. Bluetooth, WiFi 2.4GHz and WiFi 5GHz OFF.
 GNSS active.(worst case). Power supply: 12Vdc. Horizontal polarization.

RE FCC Part 15 ClassB 17-26GHz

RE FCC Part 15 ClassB 17-26GHz



— Average Preview — Peak Preview
— FCC Part 15 Class B Electric Field Strength PK — FCC Part 15 Class B Electric Field Strength AV

Subrange Maxima

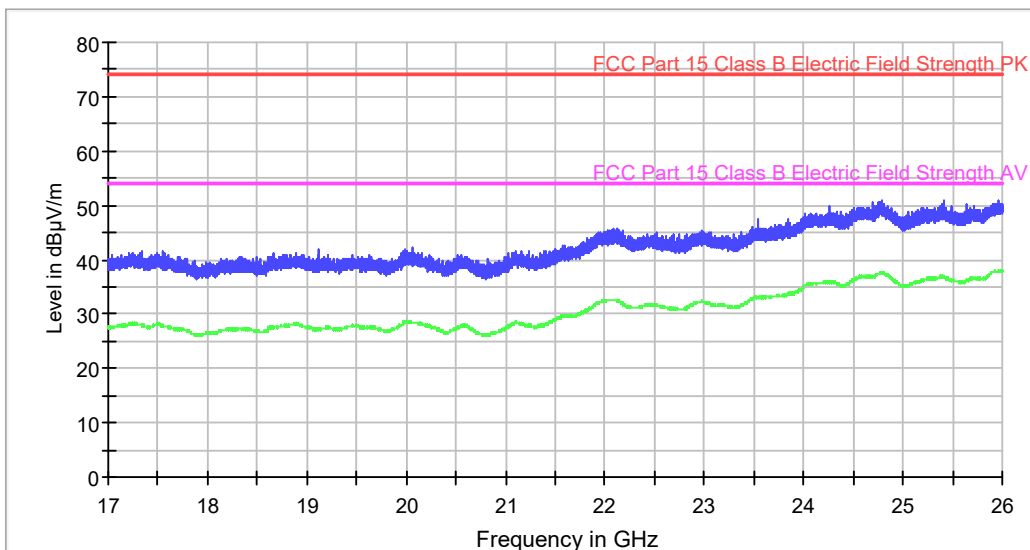
Frequency (MHz)	PK+ CLRWR (dBµV/m)	AVG CLRWR (dBµV/m)
17436.000000	41.9	27.8
18389.200000	40.5	27.2
18726.000000	41.7	27.8
20000.400000	42.1	28.7
20644.000000	41.3	27.4
21913.200000	45.0	31.9
22017.200000	45.9	32.4
23474.000000	46.9	32.7
24787.600000	50.5	37.7
25926.000000	51.1	37.8

Radiated Emission. CR0101HR2_PV

Project: 64433REM.004
 Company: HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. DVB-T mode. Bluetooth, WiFi 2.4GHz and WiFi 5GHz OFF.
 GNSS active.(worst case). Power supply: 12Vdc. Vertical polarization.

RE FCC Part 15 ClassB 17-26GHz

RE FCC Part 15 ClassB 17-26GHz



— Average Preview — Peak Preview
— FCC Part 15 Class B Electric Field Strength PK — FCC Part 15 Class B Electric Field Strength AV

Subrange Maxima

Frequency (MHz)	PK+ CLRWR (dBµV/m)	AVG CLRWR (dBµV/m)
17544.400000	41.7	27.9
18318.400000	40.5	27.3
19124.400000	41.9	27.2
20054.800000	42.1	28.5
20165.600000	41.2	28.2
21925.200000	44.8	32.0
22123.200000	45.6	32.4
23837.600000	47.4	33.7
24792.000000	50.7	37.7
25408.400000	50.9	36.8