

RF Exposure Assessment

Report Reference: MDE_BOSCH_1925_MPEb

on

Radio Navigation System

AIVIP33A0

FCC ID: 2AUXS-AIVIP33A0

IC: 25847-AIVIP33A0

according to:

OET Bulletin 65 Edition 97-01 August 1997

FCC 47 CFR §1.1307

FCC 47 CFR §1.1310

Test Laboratory:

7layers GmbH
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Note:

The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the test laboratory.

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Administrative Data:

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Company Name: 7layers GmbH
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Project Data

Responsible for report: Mr. Abdellah Ahakki
Date of Report: 2020-05-14
Testing Period: 2020-02-04 to 2020-03-18

Applicant Data

Company Name: Robert Bosch GmbH; Business Unit CM
Address: Robert-Bosch-Platz 1
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Contact Person: Mr. Thomas Dargel

Manufacturer Data

Company Name: please see Applicant data
Address: -
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Test object Data

General Description of Radio Device

Kind of Device product description	The EUT is an automotive infotainment head unit. It is supporting Bluetooth and WLAN radio technology in the 2.4 GHz and 5 GHz ISM Band.
Product name	Radio Navigation System
Type	AIVIP33A0
Declared EUT data by the supplier	
Special software used for testing	Labtool
Specific product description for the EUT	Bluetooth and WLAN radio technology in the 2.4 GHz and 5 GHz
Voltage Level	13.5 VDC
Voltage Type	DC (vehicular battery)

RF Exposure evaluation

Model: AIVIP330

FCC ID: 2AUXS-AIVIP33A0

IC: 25847-AIVIP33A

Standards
OET Bulletin 65 Edition 97-01 August 1997
FCC 47 CFR §1.1307
FCC 47 CFR §1.1310

Test limits

As specified in Table 1B of 47 CFR 1.1310 – Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure.

Frequency range (MHz)	Power density (mW/cm ²)
300 – 1,500	f/1500
1,500 – 100,000	1.0

Equation OET bulletin 65, page 18, edition 97-01:
$$S = \frac{PG}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$$

Where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

Distance to antenna R = 20cm

Remark:

- only worst-case values are listed in the table above

Operational Bands	Frequency (MHz)	Antenna Gain (dBi)	Output Power - conducted (dBm)	Output Power - conducted (mW)	Output Power EIRP (dBm)	Output Power EIRP (mW)
Bluetooth	2480	-1.14	1.30	1.35	0.16	1.04
WLAN 2.4 GHz	2472	-1.14	13.50	22.39	12.36	17.22
WLAN 5 GHz	5755	5.7	8	6.30	13.7	23.44

Co-Location Considerations

The calculation below is used to consider situations in which simultaneous exposure to fields of different frequencies occur. The calculation is performed by the sum of each relative exposure for each equipment according to the following criteria.

$$\sum_{1}^N \frac{S_{eqn}}{S_{Limn}} = \frac{S_{eq1}}{S_{Lim1}} + \frac{S_{eq2}}{S_{Lim2}} + \dots + \frac{S_{eqN}}{S_{LimN}} \leq 1$$

Where:

S_{eq} is the power density of the electromagnetic field at a given distance by a specific transmitter and a defined frequency.

S_{lim} is the MPE limit for the frequency being evaluated.

Assessment of Co-Location for FCC:

Technology	Power Density value (mW/cm ²)	FCC Limit (mW/cm ²)	Margin to FCC Limit (mW/cm ²)
BT	0.0002	1.0000	0.9998
WLAN 2.4	0.0034	1.0000	0.9966
WLAN 5	0.0046	1.0000	0.9954
Co-Location	0.0082	1.0000	0.9918

Yours sincerely,



Abdellah Ahakki