

RF Exposure Evaluation Report

Product Name : Multimedia device with Bluetooth and WLAN

Model No. : AIVI2SBXM

FCC ID : 2AUXS-AIVI2SBXM

Applicant : Robert Bosch GmbH

Address : Robert-Bosch-Strasse 200 Hildesheim, 31139 Germany

Date of Receipt : Sep. 21, 2020

Date of Declaration : Nov. 02, 2020

Report No. : 2090718R-E3082100013

Report Version : V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Issued Date: Nov. 02, 2020

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Product Name	Multimedia device with Bluetooth and WLAN	
Applicant	Robert Bosch GmbH	
Address	Robert-Bosch-Strasse 200 Hildesheim, 31139 Germany	
Manufacturer	Robert Bosch GmbH	
Model No.	AIVI2SBXM	
FCC ID.	2AUXS-AIVI2SBXM	
Trade Name	Bosch	
Applicable Standard	KDB 447498 D01 v06	☒ Minimum test separation distance ≥ 20 cm ☐ For low power devices
Test Result	Complied	

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Approved By : 
(Director / Vincent Lin)

Revision History

Report No.	Version	Description	Issued Date
2090718R-E3082100013	V1.0	Initial issue of report.	2020-11-02

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Multimedia device with Bluetooth and WLAN
Trade Name	Bosch
Model No.	AIVI2SBXM
FCC ID.	2AUXS-AIVI2SBXM
Frequency Range	802.11b/g/n-20MHz:2412MHz~2462MHz 802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz, 5745-5825MHz 802.11n-40MHz: 5190-5310MHz, 5510-5670MHz, 5755-5795MHz 802.11ac-80MHz: 5210-5290MHz, 5530-5690MHz, 5775MHz BT : 2402-2480MHz
Channel Number	802.11b/g/n-20MHz: 11, n-40MHz: 9 802.11a/n-20MHz: 25; 802.11n-40MHz: 12 802.11ac-80MHz: 6 BT : 79
Type of Modulation	DSSS/OFDM/BPSK/QPSK/16QAM/64QAM/256QAM FHSS: GFSK(1Mbps) / π / 4DQPSK(2Mbps) / 8DPSK(3Mbps)
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	NISSEI ELECTRIC CO.,LTD.	N/A	Metal Plate Antenna	-0.54 dBi for 2.4 GHz 0.20 dBi for 5.15~5.25GHz -2.22 dBi for 5.25~5.35GHz -3.08 dBi for 5.47~5.725GHz -3.04 dBi for 5.725~5.85GHz
2	Robert Bosch GmbH	N/A	Integral antenna	1.91dBi for 2.4 GHz (BT)

2. RF Exposure Evaluation

2.1. Standard Applicable

According to KDB 447498 D01 (7.1), A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits.

2.2. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0

2.3. Test Result of RF Exposure Evaluation

Product : Multimedia device with Bluetooth and WLAN
 Test Item : RF Exposure Evaluation

BT 2.4G Peak Gain: 1.91dBi

Band	Frequency (MHz)	Conducted maximum Peak Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
BT-3Mbps	2441	4.84	3.048	0.0009	1	Pass

WLAN 2.4G Peak Gain: -0.54dBi

Band	Frequency (MHz)	Conducted maximum Peak Power (dBm)	Worst case Duty Cycle (%)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
2.4G	2462	20.19	98.63	105.923	0.0186	1	Pass

WLAN 5G Peak Gain: 0.20dBi

Band	Frequency (MHz)	Conducted maximum Average Power (dBm)	Worst case Duty Cycle (%)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
5G	5320	9.97	100	9.931	0.0021	1	Pass

Note: The Maximum conducted output power is refer to report No.: 2090718R-E3032110108, 2090718R-E3032110118, 2090718R-E3032110129 from the DEKRA.

2.4. Calculations for Multi-Transmitter

Worst Case Mode	Max Power (dBm)	Power Density (mW/cm ²)	Power Density Limit (mW/cm ²)	Safety distance	Ratios	Result	Limit
BT	4.84	0.0009	1	20	0.0009	0.020	1
WLAN	20.19	0.0186	1		0.0186		

Ratios = Power Density/ Power Density Limit