

RF EXPOSURE REPORT

Equipment Under Test	CAR STEREO AUDIO
Modle Name	ARA-9010HB
Variant Model Name	ARA-9010H
FCC ID	2ARFV-ARA9010HB
IC Number	-
Applicant	WORLDPLUS ELECTRONICS CO.,LTD
Manufacturer	WORLDPLUS ELECTRONICS CO.,LTD
Date of Test(s)	2023. 02. 01 ~ 2023. 02. 06
Date of Issue	2023. 02. 10

In the configuration tested, the EUT complied with the standards specified above.

Issue to	Issue by
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RF EXPOSURE

1. Regulation

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this Chapter.

Limits for Maximum Permissible Exposure: RF exposure is calculated.

Frequency Range	Electric Field Strength [V/m]	Magnetic Field Strength [A/m]	Power Density [mW/cm ²]	Averaging Time [minute]
Limits for General Population / Uncontrolled Exposure				
0.3 ~ 1.34	614	1.63	*(100)	30
1.34 ~ 30	824/f	2.19/f	*(180/f ²)	30
30 ~ 300	27.5	0.073	0.2	30
300 ~ 1 500	/	/	f/1 500	30
1 500 ~ 15 000	/	/	1	30

f=frequency in MHz, *= plane-wave equivalent power density

MPE (Maximum Permissible Exposure) Prediction

Predication of MPE limit at a given distance: Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2 \quad (\Rightarrow R = \sqrt{PG/4\pi S})$$

S = power density [mW/cm²]

P = Power input to antenna [mW]

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 [cm]

2. RF Exposure Compliance Issue

The information should be included in the user's manual:

This appliance and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter. A minimum separation distance of 20 cm must be maintained between the antenna and the person for this appliance to satisfy the RF exposure requirements.

MPE Calculations : Bluetooth BDR_12 V

- Frequency Range : 2 402 MHz ~ 2 480 MHz
- Measured RF Output Power (Peak) : -8.49 dBm
- Target Power & Tolerance -9.40 dBm & ± 1.00 dB
(Maximum : -8.40 dBm & Minimum : -10.40 dBm)
- Maximum Peak Antenna Gain : 0.50 dBi
- **Maximum Output Power for the Calculation** : **-8.40 dBm**

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the
The MPE calculation for this exposure is shown below.

<p>- EIRP = P + G</p> <p>= <u>-8.40</u> dBm + <u>0.50</u> dBi</p> <p>= <u>-7.90</u> dBm</p> <p>= <u>0.16</u> mW</p>	<p>- NOTE</p> <p>P : Max tuneup Power (dBm)</p> <p>G : Maximum Peak Antenna Gain (dBi)</p>
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Power Density at the specific separation

<p>- S = EIRP / (4 X R²π)</p> <p>= 0.16 / (4 X 20² X π)</p> <p>= <u>0.000 032</u> mW/cm²</p>	<p>- NOTE</p> <p>S : Maximum Power Density (mW/cm²)</p> <p>EIRP : Equivalent Isotropic Radiated Power (mW)</p> <p>R : Distance to the center of the radiation of the antenna (<u>20</u> cm)</p>
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MPE Calculations : Bluetooth EDR_12 V

- Frequency Range : 2 402 MHz ~ 2 480 MHz
- Measured RF Output Power (Peak) : -5.79 dBm
- Target Power & Tolerance -5.00 dBm & ± 1.00 dB
(Maximum : -4.00 dBm & Minimum : -6.00 dBm)
- Maximum Peak Antenna Gain : 0.50 dBi
- **Maximum Output Power for the Calculation** : -4.00 dBm

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the
The MPE calculation for this exposure is shown below.

<p>- EIRP = P + G</p> <p>= <u>-4.00</u> dBm + <u>0.50</u> dBi</p> <p>= <u>-3.50</u> dBm</p> <p>= <u>0.45</u> mW</p>	<p>- NOTE</p> <p>P : Max tuneup Power (dBm)</p> <p>G : Maximum Peak Antenna Gain (dBi)</p>
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Power Density at the specific separation

<p>- S = EIRP / (4 X R²π)</p> <p>= 0.45 / (4 X 20² X π)</p> <p>= <u>0.000 089</u> mW/cm²</p>	<p>- NOTE</p> <p>S : Maximum Power Density (mW/cm²)</p> <p>EIRP : Equivalent Isotropic Radiated Power (mW)</p> <p>R : Distance to the center of the radiation of the antenna (<u>20</u> cm)</p>
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MPE Calculations : Bluetooth BDR_24 V

- Frequency Range : 2 402 MHz ~ 2 480 MHz
- Measured RF Output Power (Peak) : -8.55 dBm
- Target Power & Tolerance -8.00 dBm & ± 1.00 dB
(Maximum : -7.00 dBm & Minimum : -9.00 dBm)
- Maximum Peak Antenna Gain : 0.50 dBi
- **Maximum Output Power for the Calculation** : -7.00 dBm

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the
The MPE calculation for this exposure is shown below.

<p>- EIRP = P + G</p> <p>= <u>-7.00</u> dBm + <u>0.50</u> dBi</p> <p>= <u>-6.50</u> dBm</p> <p>= <u>0.22</u> mW</p>	<p>- NOTE</p> <p>P : Max tuneup Power (dBm)</p> <p>G : Maximum Peak Antenna Gain (dBi)</p>
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Power Density at the specific separation

<p>- S = EIRP / (4 X R²π)</p> <p>= 0.22 / (4 X 20² X π)</p> <p>= <u>0.000 045</u> mW/cm²</p>	<p>- NOTE</p> <p>S : Maximum Power Density (mW/cm²)</p> <p>EIRP : Equivalent Isotropic Radiated Power (mW)</p> <p>R : Distance to the center of the radiation of the antenna (<u>20</u> cm)</p>
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MPE Calculations : Bluetooth EDR_24 V

- Frequency Range : 2 402 MHz ~ 2 480 MHz
- Measured RF Output Power (Peak) : -6.09 dBm
- Target Power & Tolerance -6.00 dBm & ± 1.00 dB
(Maximum : -5.00 dBm & Minimum : -7.00 dBm)
- Maximum Peak Antenna Gain : 0.50 dBi
- **Maximum Output Power for the Calculation** : **-5.00 dBm**

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the
The MPE calculation for this exposure is shown below.

<p>- EIRP = P + G</p> <p>= <u>-5.00</u> dBm + <u>0.50</u> dBi</p> <p>= <u>-4.50</u> dBm</p> <p>= <u>0.35</u> mW</p>	<p>- NOTE</p> <p>P : Max tuneup Power (dBm)</p> <p>G : Maximum Peak Antenna Gain (dBi)</p>
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Power Density at the specific separation

<p>- S = EIRP / (4 X R²π)</p> <p>= 0.35 / (4 X 20² X π)</p> <p>= <u>0.000 071</u> mW/cm²</p>	<p>- NOTE</p> <p>S : Maximum Power Density (mW/cm²)</p> <p>EIRP : Equivalent Isotropic Radiated Power (mW)</p> <p>R : Distance to the center of the radiation of the antenna (<u>20</u> cm)</p>
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