1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 General Information

Client Information

Applicant:	Hale Devices, Inc.
Address of applicant:	650 W, Lake St, #220, Chicago, Illinois, United States,60661

Manufacturer:	Hale Devices, Inc.
Address of manufacturer:	650 W, Lake St, #220, Chicago, Illinois, United States,60661

General Description of EUT:

Product Name:	Aiwa Exos-X8 Party Speaker
Trade Name:	Aiwa
Model No.:	Exos-X8-US
Adding Model(s):	Exos-X8-UK, Exos-X8-EU
FCC ID:	2AERP-EXOSX8
Rated Voltage:	Input: DC 12V from battery

Technical Characteristics of EUT:

Bluetooth Version:	V4.2 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	0.93dBm (Conducted)
Data Rate:	1Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	PCB
Antenna Gain:	-0.58dBi
Bluetooth Version:	V4.2

Note 1: The EUT Main board supportGSM850/900/DCS1800/PCS1900 function.It is intended for Multimedia Message Service (MMS) transmission. It is equipped with GPRS class 12 for GSM850/900/DCS1800/PCS1900, GPS functions.

Note 2: The test data is gathered from a production sampleprovided by the manufacturer.The appearance of others models listed in the report is different from main-test model MOPLUS, but the circuit and the electronic construction do not change, declared by the manufacturer.

1.2Standard Applicable

According to §1.1307(b)(1) and KDB 447498 D01General RF Exposure Guidance v06, system operating under

the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

(a) Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2, \|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2, \|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz: * = Plane-wave equivalents power density

1.3 MPE Calculation Method

$S = (30*P*G) / (377*R^2)$

S = power density (in appropriate units, e.g., mw/cm^2)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

1.4 MPE Calculation Result

For BLE:

Maximum output power: <u>0.93(dBm)</u>

Maximum peak output power at antenna input terminal: <u>1.239(mW)</u>

Prediction distance:<u>≥20(cm)</u>

Prediction frequency: <u>2402(MHz)</u>

Antenna gain: <u>-0.58(dBi)</u>

Directional gain(numeric gain): <u>0.87</u>

The worst case is power density at prediction frequency at 20cm: <u>0.0002(mw/cm^2)</u>

MPE limit for general population exposure at prediction frequency:<u>1(mw/cm^2)</u>

For EDR:

Maximum output power:<u>-1.83(dBm)</u>

Maximum peak output power at antenna input terminal: <u>1.239(mW)</u>

Prediction distance:<u>≥20(cm)</u>

Prediction frequency: <u>2402(MHz)</u>

Antenna gain: <u>-0.58(dBi)</u>

Directional gain(numeric gain): <u>0.87</u>

The worst case is power density at prediction frequency at 20cm: <u>0.0001(mw/cm^2)</u>

MPE limit for general population exposure at prediction frequency:<u>1(mw/cm^2)</u>

Result: Pass