RF Exposure Evaluation Declaration

FCC ID: 2ALGLX1000

APPLICANT: Cassia Networks Inc.

Application Type: Certification

Product: Cassia Bluetooth Router

Model No.: X1000, X1000-10, X1000-20

Brand Name: CASSIA

FCC Classification: Digital Transmission System (DTS)

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ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

Revision History

Report No.	Version	Description	Issue Date	Note
1705RSU01203	Rev. 01	Initial report	06-02-2017	Invalid
1705RSU01203	Rev. 02	Revised the power	06-17-2017	Invalid
1705RSU01203	Rev. 03	Revised the power	06-19-2017	Valid

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name	Cassia Bluetooth Router
Model No.	X1000, X1000-10, X1000-20
Wi-Fi Specification	802.11b/g/n-HT20
Bluetooth Version	v4.0, single mode

Note: The EUT was powered by POE adapter (M/N: PoE35-54A) that provided by MRT lab.

1.2. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	Manufacturer	Max Peak Gain (dBi)
Panel Antenna	2400 - 2483.5	AIRGAIN Inc.	2.44
Directional Antenna	2400 - 2483.5	SUNPARL Inc.	7.50

2. RF Exposure Evaluation

2.1. 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

Calculation Formula: $Pd = (Pout*G)/(4*pi*r^2)$

Where
Pd = power density in mW/cm^2
Pout = output power to antenna in mW
G = gain of antenna in linear scale
Pi = 3.1416
r = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, $1mW/cm^2$. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Test Result of RF Exposure Evaluation

Product	Cassia Bluetooth Router
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to Clause 1.2 of antenna description.

Test Mode	Frequency Band (MHz)	Maximum Average Output Power (dBm)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)
Wi-Fi	2412 ~ 2462	11.00	0.0044	1
Bluetooth	2402 ~ 2480	12.00	0.0177	1

Note: The maximum average output power refers to the operation description which is declared by the manufacturer.

CONCULISON:

Both of the WLAN 2.4GHz Band and Bluetooth 2.4GHz Band can transmit simultaneously.

Therefore, the Max Power Density at R (20 cm) = $0.0044mW/cm^2 + 0.0177mW/cm^2 = 0.0221mW/cm^2 < 1mW/cm^2$.

So the EUT complies with the requirement.

The End