IEEE C95.1

KDB 447498 D01 v06

47 C.F.R. Part 1, Subpart I, Section 1.1310
47 C.F.R. Part 2, Subpart J, Section 2.1091

RF EXPOSURE REPORT

For

Dual-lines VDSL2/ADSL2+ Wireless-N 600Mbps 3G/4G LTE VPN Firewall Router

Model: BiPAC 8920NX-600

Data Applies To: BiPAC 8920NXL-600 ; BiPAC 8900NX-600 ; BiPAC 8900NXL-600 ; BEC 8920NX ; BEC 8920NP

Trade Name: Billion ; BEC

Issued for

Billion Electric Co., Ltd.

8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)

Issued by

Compliance Certification Services Inc.
Hsinchu Lab.
NO. 989-1, Wenshan Rd., Shangshan Village,
Qionglin Township, Hsinchu County 30741, Taiwan (R.O.C.)
http://www.ccsrf.com
service@ccsrf.com

Issued Date: June 21, 2016

Testing Laboratory
0240

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	06/21/2016	Initial Issue	All Page	Dola Hsieh

TABLE OF CONTENTS

1. Limit

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.

2. EUT Specification

Product Name	Dual-lines VDSL2/ADSL2+ Wireless-N 600Mbps 3G/4G LTE VPN Firewall Router
Model Number	BiPAC 8920NX-600
Data Applies To	BiPAC 8920NXL-600 ; BiPAC 8900NX-600 ; BiPAC 8900NXL-600 ; BEC 8920NX ; BEC 8920NP
Identify Number	T160503S01
Received Date	May 03, 2015
Frequency band (Operating)	802.11b/g/n HT20 Mode: 2412MHz ~ 2462MHz 802.11n HT40 Mode: 2422MHz ~ 2452MHz
Device category	Mobile (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm^2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2)
Antenna Specification	WiFi 2.4GHz Antenna: Dipole Antenna × 2 Ant. 1 (Chain 0), Antenna Gain: 5 dBi Ant. 2 (Chain 1), Antenna Gain: 5 dBi PCB Antenna × 1 : Ant. 3 (Chain 2), Antenna Gain : 2.36dBi
Maximum average output power	IEEE 802.11b Mode: 23.47 dBm IEEE 802.11g Mode: 20.94 dBm IEEE 802.11n HT20 MCS0 Mode: 19.80 dBm IEEE 802.11n HT40 MCS0 Mode: 19.75 dBm
Evaluation applied	MPE Evaluation*

The difference of the series models:

Model Number	Trade Name	xDSL Dual-lines	Wireless-N	USB	VPN
BiPAC 8920NX-600	Billion	V	V	V	V
BiPAC 8920NXL-600	Billion	V	V	V	X
BiPAC 8900NX-600	Billion	X	V	V	V
BiPAC 8900NXL-600	Billion	X	V	V	X
BEC 8920NX	BEC	V	V	V	X
BEC 8920NP	BEC	V	V	V	V

Remark:

1. *For more details, please refer to the User's manual of the EUT.*
2. *This submittal(s) (test report) is intended for FCC ID: QI3BIL-8920NX600 filing.*
3. *The model BiPAC 8920NX-600 was considered the main model for testing.*

3. Test Results

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***Equation 1***

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm^2

4. Maximum Permissible Exposure

Substituting the MPE safe distance using d = **20** cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

Mode	Frequency (MHz)	Power (dBm)	Ant. Gain (dBi)	Distance (cm)	Power density (mW/cm²)	Limit (mW/cm²)
IEEE 802.11b	2437	23.47	5	20	0.0002	1
IEEE 802.11g	2412	20.94	5	20	0.0002	1
IEEE 802.11n HT20 MCS0	2462	19.80	5	20	0.0002	1
IEEE 802.11n HT40 MCS0	2437	19.75	5	20	0.0002	1