

**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**

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## Revision History

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

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## 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

<b>Product Name</b>	Dual-lines VDSL2/ADSL2+ Wireless-N 600Mbps 3G/4G LTE VPN Firewall Router
<b>Model Number</b>	BiPAC 8920NX-600
<b>Data Applies To</b>	BiPAC 8920NXL-600 ; BiPAC 8900NX-600 ; BiPAC 8900NXL-600 ; BEC 8920NX ; BEC 8920NP
<b>Identify Number</b>	T160503S01
<b>Received Date</b>	May 03, 2015
<b>Frequency band (Operating)</b>	802.11b/g/n HT20 Mode: 2412MHz ~ 2462MHz 802.11n HT40 Mode: 2422MHz ~ 2452MHz
<b>Device category</b>	Mobile (>20cm separation)
<b>Exposure classification</b>	<input type="checkbox"/> Occupational/Controlled exposure ( $S = 5\text{mW/cm}^2$ ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure ( $S=1\text{mW/cm}^2$ )
<b>Antenna Specification</b>	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
<b>Maximum average output power</b>	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
<b>Evaluation applied</b>	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**

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

*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:

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

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

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

*Where*       $d$  = Distance in cm

$P$  = Power in mW

$G$  = Numeric antenna gain

$S$  = Power density in mW / cm<sup>2</sup>

#### 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 / cm<sup>2</sup>

Mode	Frequency (MHz)	Power (dBm)	Ant. Gain (dBi)	Distance (cm)	Power density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
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