1. RF Exposure Requirements

1.1 General Information

Client Information

Applicant:	Benq Corporation
Address of applicant:	16 Jihu Road, Neihu, Taipei 114, Taiwan
Manufacturer:	DONGGUAN FENGSHUO ELECTRONICS COMPANY LIMITED
Address of manufacturer:	No.15 FuMin Road, Zhenxinwei Park, Tangxia Town, Dongguan City, China

General Description of EUT:

Product Name:	Wireless controller
Trade Name	BenQ
Model No.:	IR-1000
Adding Model(s):	/
Rated Voltage:	USB Port:DC5V
Power Adapter:	/
FCC ID:	JVPIR-1000
Equipment Type:	Portable device

Technical Characteristics of EUT:
Bluetooth

Bluetooth Version:	V4.2 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	-0.44dBm (Conducted)
Data Rate:	1Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	-6.31dBi

1.2 RF Exposure Exemption

Option A: FCC Rule Part 1.1307 (b)(3)(i)(A):The available maximum time-averaged power is no more than 1mW, regardless of separation distance.

Option B: FCC Rule Part 1.1307 (b)(3)(i)(B): The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. P_{th} is given by:

$$P_{th} \ (mW) = \begin{cases} ERP_{20 \ cm}(d/20 \ cm)^x & d \leq 20 \ cm \\ ERP_{20 \ cm} & 20 \ cm < d \leq 40 \ cm \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20 \ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz};$$

and

$$ERP_{20 \ cm} \ (mW) = \begin{cases} 2040f & 0.3 \ GHz \leq f < 1.5 \ GHz \\ 3060 & 1.5 \ GHz \leq f \leq 6 \ GHz \end{cases}$$

d = the separation distance (cm);

Option C: FCC Rule Part 1.1307 (b)(3)(i)(C): The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 \ R^2$
1.34-30	$3,450 \ R^2/f^2$
30-300	$3.83 \ R^2$
300-1,500	$0.0128 \ R^2 f$
1,500-100,000	$19.2 R^2$

For Multiple RF sources: FCC Rule Part 1.1307(b)(3)(ii):
(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required).

(B) In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \le 1$$

1.3 Calculated Result

Radio Access Technology	Min. Frequency	Max. Output Power	Max. Tune-Up Output Power	Antenna Gain	Duty Cycle	Tune-Up EIRP
	(MHz)	(dBm)	(dBm)	(dBi)	(%)	(dBm)
Bluetooth	2402	-0.44	0	-6.31	100	-6.31

Frequency	Option	Min. Distance	Max. Time-averaged Power		Exposure Limit	Ratio	Result
(MHz)		(cm)	(dBm)	(mW)	(mW)		Pass/Fail
2402	A	0.5	0	1.0	1.0	--	Pass

Note: 1. ERP=EIRP-2.15dB;   EIRP= Output Power + Antenna gain

2. Option A, B and C refers as clause 1.2.

3. For option B, Pth(mW) convert to Exposure Limit(mW);   For option C, ERP(W) convert to Exposure Limit(mW).

4. Ratio= Tune-Up ERP(mW)/ Exposure Limit (mW)

Mode for Simultaneous Multi-band Transmission:

Radio Access Technology	Ratio 1	Ratio 2	Simultaneous Ratio	Limit	Result
					Pass/Fail
--	--	--	--	--	--

Result: Pass