

# RF exposure information

## Product information from applicant

Applicant	:	FDK CORPORATION
Applicant address	:	2281 Washizu Kosai-shi Shizuoka, Japan
FCC ID	:	2AQ85HY0020
ISED ID	:	31945- HY0020
HVIN	:	HY0020
Product description	:	Bluetooth low energy module
Operating frequency range	:	2402 - 2480 MHz
Peak output power (Measured)	:	4.80dBm @2402MHz, 4.59dBm @2440MHz, 4.69dBm @2480MHz (1Mbps) 4.88dBm @2404MHz, 4.63dBm @2440MHz, 4.69dBm @2478MHz (2Mbps)
Time-averaged maximum e.i.r.p. (Measured)	:	1.07mW @2402MHz, 1.02mW @2440MHz, 1.04mW @2480MHz (1Mbps) 1.09mW @2404MHz, 1.03mW @2440MHz, 1.04mW @2478MHz (2Mbps)
Maximum antenna gain	:	-4.5 dBi
Separation distance	:	more than 20 cm

## Analysis for mobile use

[For FCC]

General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table B.1 to support an exemption from further evaluation from 300 kHz through 100 GHz, in accordance with KDB 447498 D04 Interim General RF Exposure Guidance v01.

TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES  
SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			Minimum Distance			Threshold ERP
$f_L$ MHz		$f_H$ MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	$1,920 R^2$
1.34	–	30	35.6 m	–	1.6 m	$3,450 R^2/f^2$
30	–	300	1.6 m	–	159 mm	$3.83 R^2$
300	–	1,500	159 mm	–	31.8 mm	$0.0128 R^2 f$
1,500	–	100,000	31.8 mm	–	0.5 mm	$19.2R^2$

Subscripts L and H are low and high;  $\lambda$  is wavelength.  
From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.

Since the minimum separation distance between the body of a nearby person and the radiating element of the product is 0.2 m, the threshold ERP is calculated to be 0.768 W for 2402 - 2480 MHz.

On the other hand, the ERP of the product is calculated to be -1.77 dBm (= 4.88 dBm - 4.5dBi - 2.15 dB), which is equal to 0.00067 W and lower than the above threshold ERP (0.768 W).

Therefore, the product meets the MPE-based exemption and further evaluation is not required.

**[For ISED]**

RF exposure evaluation is required if the separation distance between the user and/or bystander and the radiating element of the product is greater than 20 cm, except when the source-based, time-averaged maximum e.i.r.p. of the product is equal to or less than  $1.31 \times 10^{-2} f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz.

The maximum e.i.r.p. of the product is 0.00109 W, which is less than the above exemption limit (2.68 W for 2402 MHz).

Thus the product meets the exemption from the routine evaluation limits in Section 2.5.2 of RSS-102 Issue 5, and RF exposure evaluation is not required.