



RF exposure Estimation

1. Introduction

Product: Bluetooth Low Energy Remote Control Unit
 Model no.: YKF483-B001, YKF483-B002, YKF483-B03, YKF483-B004
 YKF483-B005, YKF483-B006, YKF483-B07, YKF483-B008

FCC ID: PUW-YKF483

IC: 23608-YKF483

The Equipment Under Test (EUT) is a remote control with Bluetooth LE module. All models have the same electrical construction except for button printer, button color, button qty, software and NFC tag.

2. Limit and Guidelines on Exposure to Electromagnetic Fields

According to §15.247(e)(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 Mobile Portable RF Exposure v05r02, no SAR required if power is lower than the following threshold:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})]$

$[\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation²⁵
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz.

3. Calculation method

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$

Conducted Power + tune up tolerance = $-3.69\text{dBm} + 1\text{dB} = -2.69\text{dBm} = 0.54\text{mW}$

Distance = 5 mm

$f = 2.440$ GHz

$[0.54/5] \cdot \text{SQRT}(2.440) = 0.168$

$0.168 \leq 3.0$

Therefore, excluded from SAR testing.



Industry Canada MPE / Health Hazard

Requirement for the 2.4GHz

According to Industry Canada RSS-102 Issue 5, Section 2.5.1, SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance^{4,5}

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Per the test report included herein,

$$\text{EIRP (PK)} = 0.43\text{mW} < 4 \text{ mW (At separation distance of } \leq 5 \text{ mm)}$$

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