

Handheld RF Exposure

The CK3 is a hand-held computer that contains a combination WLAN and Bluetooth radio module, FCC ID: EHA-CK3DDIB. The IP30 is a RFID Tag reader that is an optional accessory to the CK3. It contains two separate radios: FCC IDs: EHAIM4 (915 MHz RFID) and EHA-BTM4 (Bluetooth). The CK3 can be used while attached to the top of the IP30 (see attached photos).

KDB 447498 (4)(c)(iii)(1)-(3) was reviewed for RF Safety test requirements for the combined CK3 / IP30 configuration:

"c) Extremity and body SAR evaluation considerations

i) PDA, UMPC (Ultra-Mobile PC), and devices with similar form factor and configurations that allow next to the ear transmissions are tested according to the handset procedures in IEEE Std 1528-2003, OET Bulletin 65 Supplement C 01-01 and the specific FCC test procedures.

ii) Devices that allow transmissions while worn next to the body using an accessory are tested with the device and associated accessories in all applicable orientations, at the minimum separation distance, using a flat phantom.

iii) Contact the FCC Laboratory to determine whether:

(1) Hand SAR is required for hand-held and hand-operated devices with output power $> 1000_{[f(\text{GHz})]^{-0.5}}$ mW that are designed with the hand operating closer than 5 cm from the antenna during normal use.²⁴

(2) Extremity SAR is required for wrist, feet or ankle worn devices.

(3) Body SAR is required for hand-held and hand-operated or wrist, feet and ankle worn devices that operate closer than 5 cm to the body and the output power is $> 300_{[f(\text{GHz})]^{-0.5}}$ mW."

The following is a discussion of KDB 447498 (4)(c), Items i) – iii), and how it relates to the combination of CK3 and IP30:

Item i), the CK3 in a stand-alone configuration can be used as a “walkie-talkie” in a Push-To-Talk (PTT) mode. This configuration is addressed in the SAR Evaluation report. Ear position is not possible. The user is not likely to attempt PTT operation while using the combined CK3 / IP30 unit.

Item ii), the RFID tag reader cannot operate while worn next to the body. It can only operate when held in the hand, aimed at a remote tag, and the trigger pulled.

Item iii), the attached pictures show that the closest spacing between the user’s hand and the radios contained in the CK3 is 7 cm. The closest spacing between the RFID radio and the user’s hand is 10 cm.

Since the spacing is greater than 5cm between the antennas and the user’s hand, SAR testing is not required. The following MPE estimates are used to demonstrate compliance of the CK3 while operating with the IP30.

A separate SAR Evaluation test report has been submitted with this application to show compliance of the CK3 for body-worn and PTT operation.

CK3

IP30







RFID

FRY



FRY

Auto

MPE Estimates

IP30 (915 MHz) with CK3 -WiFi-BT

FCC regulations compliance

47 CFR 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.

47 CFR 2.1091 (b). The system is classified as a mobile transmitter.

47 CFR 2.1091(c) The EUT is categorically excluded from routine environmental evaluation.

System Description

CK3 hand held computer with the addition of IP30, RFID hand grip scanner

The IP30 RFID scanner is operated by the user only when in the hand.

The user manual instruct to provide for a separation distance of 23-cm or greater distance between the CK3 / IP30 system antennas and the head or torso of the user or near by persons.

CK3

The CK3 is a hand held computer. The CK3 has WLAN and Bluetooth radios that share a PCB but transmit on separate antennas.

FCC ID: EHA-CK3DDIB **all transmitters for this model are filed under a single FCC ID**

The WiFi (WLAN) or Bluetooth radios operates at anytime when the CK3 is connected to the IP30, operation against the head or body is not considered normal when the IP30 is used to read RFID tags as the IP30 should be aimed toward those tags.

IP30

The IP30 is a RFID hand grip option. It contains the IM4 RFID PC Card and Bluetooth Radios

FCC ID: EHAIM4 915 MHz

FCC ID: EHA-BTM4 Bluetooth

The radios all transmit on separate antennas.

Radio Disc / Rule	MHz -	MHz	Watts (Conducted)	antenna	
				main (dBi)	diversity (dBi)
CK3 FCC ID: EHA-CK3DDIB	IC :1223A-CK3DDIB				
802.11abg radio (DDIB)					
15C	2412	2462	0.0928	0.7	0.4
15E	5180	5240	0.0275	3.9	3.0
15E	5260	5320	0.0264	4.3	3.8
15E	5500	5700	0.0240	4.2	2.6
15C	5745	5825	0.0508	2.9	2.5

Bluetooth radio (DDIB) {Cannot operate simultaneous with 802.11abg transmitter}

15C	2402	2480	0.0031		
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IP30

RFID radio FCC ID: EHAIM4	IC: 1223A-IM4				
15C	902.75	927.25	0.8610		

Bluetooth Radio FCC ID: EHA-BTM4	IC: 1223A-BTM4				
15C	2402	2480	0.0096		

Table 1 in 47 CFR 1.1310 defines the maximum permissible exposure (MPE) for the general population. The exposure level at the distance listed from the EUT's transmitting antenna is calculated using the general equation:

The exposure level at a 23 cm distance from the EUT's transmitting antenna is calculated using the general equation (See OET 65, Page 19, Eq. 4):

$$S = (PG)/4(PI)R^2$$

Where: S = power density (mW/cm²)

P = power input to the antenna (mW)

G = numeric power gain relative to an isotropic radiator

R = distance to the center of the radiation of the antenna (23 cm = limit for this MPE estimate)

PG = EIRP

Solving for S, the maximum power densities 23 cm from the transmitting antennas are summarized in the following tables:

