



# Maximum Permissible Exposure Evaluation

**FCC ID: 2AUDF-CK1**

## 1. Client Information

<b>Applicant</b>	:	Shenzhen ADDX Innovation Technology co., LTD.
<b>Address</b>	:	NO.2902, Building 9A-1.Shenzhen Bay Technology and Ecological Park, Nanshan District, Shenzhen, China
<b>Manufacturer</b>	:	Shenzhen ADDX Innovation Technology co., LTD.
<b>Address</b>	:	NO.2902, Building 9A-1.Shenzhen Bay Technology and Ecological Park, Nanshan District, Shenzhen, China

## 2. General Description of EUT

<b>EUT Name</b>	:	IP Camera
<b>Models No.</b>	:	CK1, EC01, F11, CK1A, GS-X20, CB1, VN-VK30
<b>Model Difference</b>	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is Different manufacturers have different names.
<b>Sample ID</b>	:	202306-0050-5-1# & 202306-0050-5-2#
<b>Product Description</b>	:	Operation Frequency: Bluetooth 5.0(BLE): 2402MHz~2480MHz 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz
<b>Power Rating</b>	:	USB Input: DC 5V/1A
<b>Software Version</b>	:	V0.14.1
<b>Hardware Version</b>	:	----
<b>Connecting I/O Port(S)</b>	:	Please refer to the User's Manual
<b>Remark</b>	:	the MPE report used the EUT-2(202306-0050-5-2#).

## MPE Calculations

### 1. Antenna Gain:

Antenna	Brand	Model Name	Type	Antenna Gain(dBi)
Bluetooth	N/A	N/A	PCB	0.5

Antenna	Brand	Model Name	Type	Antenna Gain(dBi)
2.4G WIFI	N/A	N/A	Sheet Iron	0.52

### 2. EUT Operation Condition:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

### 3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

Where

**S:** power density

**P:** power input to the antenna

**G:** power gain of the antenna in the direction of interest relative to an isotropic radiator.

**R:** distance to the center of radiation of the antenna

### 4. Simultaneous transmission MPE Considerations

According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is  $\leq 1.0$ .

This means that:

$$\sum \text{ of MPE ratios } \leq 1.0$$



**5. Standalone MPE Evaluation:**

Bluetooth Worst Maximum MPE Result								
Mode	N <sub>TX</sub>	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm <sup>2</sup> ) [S]
GFSK	1	2402	-2.479	-2±1	-1	0.5	20	0.00018
		2440	-3.311	-3±1	-2	0.5	20	0.00014
		2480	-3.671	-3±1	-2	0.5	20	0.00014

**Note:**

 N<sub>TX</sub>= Number of Transmit Antennas

RF Output power specifies that Maximum Conducted Peak Output Power.

2.4G WiFi Worst Maximum MPE Result								
Mode	N <sub>TX</sub>	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm <sup>2</sup> ) [S]
802.11b	1	2412	17.152	17±1	18	0.52	20	0.0141
		2437	15.315	15±1	16	0.52	20	0.0089
		2462	15.527	15±1	16	0.52	20	0.0089
802.11g	1	2412	11.506	11±1	12	0.52	20	0.0036
		2437	12.225	12±1	13	0.52	20	0.0045
		2462	11.179	11±1	12	0.52	20	0.0036
802.11n (HT20)	1	2412	11.622	11±1	12	0.52	20	0.0036
		2437	10.866	10±1	11	0.52	20	0.0028
		2462	11.201	11±1	12	0.52	20	0.0036
802.11n (HT40)	1	2422	10.829	10±1	11	0.52	20	0.0028
		2437	11.724	11±1	12	0.52	20	0.0036
		2452	10.496	10±1	11	0.52	20	0.0028

**Note:**

 N<sub>TX</sub>= Number of Transmit Antennas

RF Output power specifies that Maximum Conducted Peak Output Power.



Remark:

1. Output power including turn-up tolerance;
2. Output power was adjust to duty cycle at 100% if measured duty cycle less than 98%;
3. MPE evaluate distance is 20cm from user manual provide by manufacturer.
4. Only the worst power was evaluated for each wireless function

## 6. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

### Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm <sup>2</sup> )
300-1,500	F/1500
1,500-100,000	1.0

## 7. Summary simultaneous transmission information

The sample supports two antennas for Bluetooth and WLAN. The Bluetooth and WLAN can transmit simultaneous. The Bluetooth and WLAN with two different Antenna. According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;  
 $\sum$  of MPE ratios  $\leq 1.0$

## 8. Summary simultaneous transmission results

*Bluetooth + 2.4G WIFI Maximum Simultaneous transmission MPE Ratios is*  
 $0.00018+0.0141=0.01428 \leq 1.0$ .

## 9. Conclusion:

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----END OF THE REPORT-----

