Shenzhen Toby Technology Co., Ltd.

Maximum Permissible Exposure Evaluation
FCC ID: 2AXEK-X88
Change II

1. Client Information

Applicant	:	SHENZHEN GENERAL TECHNOLOGY CO., LTD
Address	:	Floor 1-3, Building A, Floor 1-4, Building B, No. 11 Xiantian Road, Xinsheng Community, Longgang Sub-District, Longgang District, Shenzhen, China
Manufacturer	:	SHENZHEN GENERAL TECHNOLOGY CO., LTD
Address	:	Floor 1-3, Building A, Floor 1-4, Building B, No. 11 Xiantian Road, Xinsheng Community, Longgang Sub-District, Longgang District, Shenzhen, China

2. General Description of EUT

EUT Name	:	Smart Battery Camera	
Models No.	:	X88, X80, X81, X82, X83, X84, X85, X86, X87, X89, X90, X91, X92, X93, X94, X95, X96, X97, X98, X99, GS-XXX (X Means letters and numbers)	
Model Different	:	All PCB boards and circuit diagrams are the same, the only difference is the model name	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz Bluetooth LE 5.0: 2402-2480MHz
		Number of Channel:	802.11b/g/n(HT20):11 channels 40 channels for Bluetooth LE
		Antenna Gain:	-0.68dBi PCB Antenna for Bluetooth LE 2.55dBi FPC Antenna for WiFi
Power Rating	:	Input: DC 5V, 1.5A DC 3.7V by 5200mAh Rechargeable Li-ion battery	
Software Version	:	0.7.10	
Hardware Version	:	CQ121C_C01_V3	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	the evaluation report used the EUT(202307-0144-3-2#).	

TB-RF-075-1.0

MPE Calculations for WIFI

1. EUT Operation Condition:

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

2. 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

3. 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 ≤ 1.0.

This means that:

∑ of MPE ratios ≤ 1.0

4. Test Result:

2.4G WiFi & Bluetooth LE worst reported.

Mode	Frequency (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^2) [S]	Limit of Power Density (mW/ cm^2) (S)
Bluetooth LE	2402	-3.371	-3±1	-2	-0.68	20	0.0001	1
	2440	-3.137	-3±1	-2	-0.68	20	0.0001	1
	2480	-3.012	-3±1	-2	-0.68	20	0.0001	1

Mode	Frequency (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^2) [S]	Limit of Power Density (mW/ cm^2) (S)
802.11b	2412	16.430	16±1	17	2.55	20	0.0179	1
	2437	16.316	16±1	17	2.55	20	0.0179	1
	2462	15.867	15±1	16	2.55	20	0.0142	1
802.11g	2412	13.452	13±1	14	2.55	20	0.0090	1
	2437	13.003	13±1	14	2.55	20	0.0090	1
	2462	12.515	12±1	13	2.55	20	0.0071	1
802.11 n(HT20)	2412	12.280	12±1	13	2.55	20	0.0071	1
	2437	11.704	11±1	12	2.55	20	0.0057	1
	2462	11.821	11±1	12	2.55	20	0.0057	1

Maximum Simultaneous transmission MPE Ratios for 2.4GHz WiFi and Bluetooth LE.

Maximum MPE ratio 2.4GWiFi	Maximum MPE ratio Bluetooth LE	∑MPE	Limit	Results
0.0179	0.0001	0.018	1.0	PASS

5. 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^2)
300-1,500	F/1500
1,500-100,000	1.0

For 2.4WIFI:2412~2462 MHz and Bluetooth LE
    MPE limit S: 1mW/ cm^2
The MPE is calculated as **0.018 < *limit 1mW / cm^2***. So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

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Note

    For a more detailed features description, please refer to the RF Test Report.

6. Conclusion:

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

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