

Maximum Permissible Exposure Evaluation

FCC ID: 2BCW9-F405-V3

1. Client Information

Applicant	:	Zhuhai KuaiFeng Technology Co., Ltd.
Address	:	2nd Floor, Room 201-1, Block B, No. 108 Xinghua Road, Xiangzhou District, Zhuhai City.China.
Manufacturer	:	Zhuhai KuaiFeng Technology Co., Ltd.
Address	:	2nd Floor, Room 201-1, Block B, No. 108 Xinghua Road, Xiangzhou District, Zhuhai City.China.

2. General Description of EUT

EUT Name	:	Flight Controller	
Models No.	:	F405-V3, F7V2, F7V3, F405WING-APP, F4MINI, F7AIO, F7MINI, F7-35A-AIO, F4V3-50-STACK, F4MINI-STACK, STACKMINI, STACK-F7, F4V3-50-STACK-SE-HX, BL32-45A, BZ-181, BLS35A-V2, BL32-50A, 35AMINI, BLS-50A, ADAPTER, F4V4-55-STACK, BLS-55A, F405-V4, STACK-F7V3-50A	
Model Different	:	All PCB boards and circuit diagrams are the same, the only difference is that appearance.	
Product Description	:	Operation Frequency:	Bluetooth 5.2(BLE): 2402MHz~2480MHz 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz-2452MHz
	:	Antenna Gain:	0dBi PCB antenna
Power Rating	:	Input: DC 5.2V, 1.3A	
Software Version	:	v1.5	
Hardware Version	:	v3	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	the evaluation report used the EUT(202308-0226-4-2#).	

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:

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

4. Test Result:

Bluetooth 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)
BLE (1Mbps)	2402	7.15	7±1	8	0	20	0.0013	1
	2440	6.29	6±1	7	0	20	0.0010	1
	2480	5.09	5±1	6	0	20	0.0008	1
BLE (2Mbps)	2402	7.20	7±1	8	0	20	0.0013	1
	2440	6.19	6±1	7	0	20	0.0010	1
	2480	5.23	5±1	6	0	20	0.0008	1

2.4G WIFI worst reported.

Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (m) [R]	Power Density (W/ m ²) [S]
802.11b	1	2412	14.14	14±1	15	0	0.2	0.0063
		2437	13.56	14±1	15	0	0.2	0.0063
		2462	13.39	13±1	14	0	0.2	0.0050
802.11g	1	2412	13.69	14±1	15	0	0.2	0.0063

		2437	13.11	13±1	14	0	0.2	0.0050
		2462	12.95	13±1	14	0	0.2	0.0050
802.11n2 0	1	2412	12.29	12±1	13	0	0.2	0.0040
		2437	11.74	12±1	13	0	0.2	0.0040
		2462	11.59	12±1	13	0	0.2	0.0040
802.11n4 0	1	2422	11.76	12±1	13	0	0.2	0.0040
		2437	11.45	11±1	12	0	0.2	0.0032
		2452	11.43	11±1	12	0	0.2	0.0032
Note: N _{TX} = Number of Transmit Antennas RF Output power specifies that Maximum Conducted Peak Output Power.								

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 Bluetooth, 2.4G WiFi

MPE limit S: 1mW/ cm²

The MPE is calculated as **0.0063** < **limit 1mW / cm²**. 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.

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.

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