Maximum Permissible Exposure Evaluation

FCC ID: 2AEJ6-FF916

1. Client Information

Applicant	:	Zhejiang Lucky Manufacturer Co.,Ltd
Address	:	NO.2098 Cuntong Road, Jindong Industrial Zone, JinHua City, ZheJiang Province, China
Manufacturer	:	Zhejiang Lucky Manufacturer Co.,Ltd
Address	:	NO.2098 Cuntong Road, Jindong Industrial Zone, JinHua City, ZheJiang Province, China

2. General Description of EUT

EUT Name	:	Fish Finder	
Models No.	:	FF916, FF916S	
Model Difference	:	All models are identical in the same PCB layout interior structure and electrical circuits, The only difference is charging position.	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz
		Number of Channel:	802.11b/g/n(HT20):11 channels
		RF Output Power:	802.11b: 18.72dBm 802.11g: 17.28dBm 802.11n (HT20):15.46dBm
		Antenna Gain:	3dBi Internal Antenna
		Modulation Type:	802.11b: DSSS(CCK, QPSK, BPSK) 802.11g: OFDM 802.11n: OFDM
		Bit Rate of Transmitter:	802.11b: 11/5.5/2/1 Mbps 802.11g: 54/48/36/24/18/12/9/6 Mbps 802.11n:up to 150Mbps
Power Supply	:	DC Voltage Supply from USB Port DC Supply by the Li-ion Battery	
Power Rating	:	DC 5.0 V from the USB Cable DC 3.7V by 850mAh Li-ion Battery	

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Connecting I/O Port(S)	:	Please refer to the User's Manual
Note: More information about the RF function, please refer the RF test reports.		

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MPE Calculations for WIFI

1. **Antenna Gain:**
   Internal Antenna: 3dBi.

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. **Test Result:**

Worst Maximum MPE Result								
Mode	N_{TX}	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^2) [S]
802.11b	1	2412	18.59	18±1	19	3	20	0.0315
		2437	18.72	18±1	19	3	20	0.0315
		2462	18.01	18±1	19	3	20	0.0315
802.11g	1	2412	16.88	17±1	18	3	20	0.0251
		2437	17.28	17±1	18	3	20	0.0251
		2462	16.92	17±1	18	3	20	0.0251
802.11n (HT20)	1	2412	15.46	15±1	16	3	20	0.0158
		2437	15.10	15±1	16	3	20	0.0158
		2462	14.61	15±1	16	3	20	0.0158

Note:
(1) N_{TX}= Number of Transmit Antennas
(2) 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 802.11b/g/n (2412~2462 MHz)
MPE limit S: 1 mW/cm^2
The MPE is calculated as 0.0315mW / cm^2 < limit 1 mW / 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.

Note

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

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