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RADIO TEST REPORT

Report No: STS2204209H02

Issued for

CATBOB HK LIMITED

FLAT/RM A1, 11/F, Success Commercial Building, No.
245-251 Hennessy Road, Wanchai, Hong Kong

Product Name:	Bobber 200
Brand Name:	BOBBER
Model Name:	G230
Series Model:	N/A
FCC ID:	2A5L3-G23001
Test Standard:	FCC 47CFR §2.1091

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Test Report Certification

Applicant's Name : CATBOB HK LIMITED
Address : FLAT/RM A1, 11/F, Success Commercial Building, No. 245-251
Hennessy Road, Wanchai, Hong Kong
Manufacturer's Name : CATBOB HK LIMITED
Address : FLAT/RM A1, 11/F, Success Commercial Building, No. 245-251
Hennessy Road, Wanchai, Hong Kong

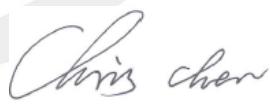
Product Description

Product Name : Bobber 200
Brand Name :  BOBBER
Model Name : G230
Series Model : N/A
Standards : FCC 47CFR §2.1091
447498 D04 Interim General RF Exposure Guidance v01

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Date of Test

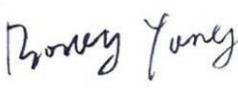
Date of receipt of test item : 05 May 2022
Date (s) of performance of tests : 05 May 2022 ~20 June 2022
Date of Issue : 20 June 2022
Test Result : **Pass**

Testing Engineer : 

(Chris Chen)

Technical Manager : 

(Sean she)

Authorized Signatory : 

(Bovey Yang)





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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	20 June 2022	STS2204209H02	ALL	Initial Issue





1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Bobber 200									
Brand Name	BOBBER									
Model Name	G230									
Series Model	N/A									
Model Difference	N/A									
Product Description	<p>The EUT is Bobber 200</p> <table border="1"><tr><td>Operation Frequency:</td><td>BT/BLE: 2402~2480 MHz 2.4G WIFI: 802.11b/g/n 20: 2412~2462 MHz LongFi: 125KHz: 902.3-915.1MHz, 500KHz: 903-927MHz</td></tr><tr><td>Modulation Type:</td><td>BT: GFSK(1Mbps), π/4-DQPSK(2Mbps), 8DPSK(3Mbps) BLE: GFSK LongFi: FSK 2.4G WIFI: 802.11b(DSSS):CCK,DQPSK,DBPSK 802.11g(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM</td></tr><tr><td>Antenna gain:</td><td>BT/BLE2.4G WLAN: 1dBi LongFi: 4dBi</td></tr><tr><td>Antenna Designation:</td><td>BT/BLE/2.4G WLAN: PCB Antenna LongFi: External Antenna</td></tr></table>		Operation Frequency:	BT/BLE: 2402~2480 MHz 2.4G WIFI: 802.11b/g/n 20: 2412~2462 MHz LongFi: 125KHz: 902.3-915.1MHz, 500KHz: 903-927MHz	Modulation Type:	BT: GFSK(1Mbps), π/4-DQPSK(2Mbps), 8DPSK(3Mbps) BLE: GFSK LongFi: FSK 2.4G WIFI: 802.11b(DSSS):CCK,DQPSK,DBPSK 802.11g(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM	Antenna gain:	BT/BLE2.4G WLAN: 1dBi LongFi: 4dBi	Antenna Designation:	BT/BLE/2.4G WLAN: PCB Antenna LongFi: External Antenna
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Antenna gain:	BT/BLE2.4G WLAN: 1dBi LongFi: 4dBi									
Antenna Designation:	BT/BLE/2.4G WLAN: PCB Antenna LongFi: External Antenna									
Rating	<p>Model: A938-120100W-US1 Input: 100-240V~50/60Hz, 0.35A Output: DC 12V 1A Model: PS120W1000U Input: 100-240V~ 50/60Hz, 0.5A Output: DC 12V 1A</p>									
Battery	<p>Rated Voltage:3V Capacity: one-Chargeable40mAh</p>									
Hardware version number	V1.1									
Software versionnumber	G230-20220222									

1.2 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

Shenzhen STS Test Services Co., Ltd.



2. FCC 47CFR §2.1091 REQUIREMENT

2.1 TEST STANDARDS

Follow the maximum permissible exposure (MPE) limits specified in 447498 D04 Interim General Radio Frequency Exposure Guidelines v01. The gain of the antenna used in the product was extracted from the supplied antenna data sheet and the maximum total power input to the antenna was also measured. Calculate the distance from the product to the MPE limit by the formula.

2.2 LIMIT

For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of Part 1.1307. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);



(C) Or using below table and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

RF Source frequency (MHz)	Threshold ERP(watts)
0.3-1.34	1,920 R ² .
1.34-30	3,450 R ² /f ² .
30-300	3.83 R ² .
300-1,500	0.0128 R ² f.
1,500-100,000	19.2R ² .



For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of Part 1.1307. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

(B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of Part 1.1307 for $P_{th,i}$, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of Part 1.1307 for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

$P_{th,i}$ = the exemption threshold power ($P_{th,i}$) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i .

ERP_j = the ERP of fixed, mobile, or portable RF source j .

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source j , at a distance of at least $\lambda/2\pi$ according to the applicable formula of paragraph (b)(3)(i)(C) of Part 1.1307.

$Evaluated_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

$Exposure\ Limit_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k , as applicable from § 1.1310.



2.3 TEST RESULT

Turn up

Mode	Detector	Turn up Power
BT	AV	7±1dBm
BLE	AV	8±1dBm
2.4G WIFI	AV	13±1dBm
LongFi 125KHz	AV	14±1dBm
LongFi 500KHz	AV	13±1dBm

Protocol	Fre. (GHz)	Separation distance (cm)	Max Turn up power (dBm)	ANT Gain (dBi)	Max EIRP (dBm)	Max EIRP (mW)	Limit (mW)	Ratio	Result
BT	2.441	20	8	1	9	7.94	3060	0.003	Pass
BLE	2.440	20	9	1	10	10.00	3060	0.003	Pass
2.4G WIFI	2.462	20	14	1	15	31.62	3060	0.010	Pass
LongFi 125KHz	0.9085	20	15	4	19	79.43	1853	0.043	Pass
LongFi 500KHz	0.903	20	14	4	18	63.10	1542	0.034	Pass

Multiple transmission:

WIFI+LongFi=0.010+0.043=0.053 < 1

BT+LongFi=0.003+0.043=0.046 < 1

Note: 1. The Maximum power is less than the limit, complies with the exemption requirements.

2. The Bluetooth and WLAN can't simultaneous transmission at the same time.

※※※※※END OF THE REPORT※※※※※