



RADIO TEST REPORT

Report No: STS2111168H02

Issued for

Chengdu Just Do It Information and Technology Co., Ltd.
 Rm 604&605, Unit 1, Building 2, No. 1, Section 1, Huafu Avenue, Huayang Street, Tianfu New District, Chengdu, China.

Product Name:	Bobcat IoT hotspot
Brand Name:	BOBCAT
Model Name:	Bobcat Miner 300
Series Model:	N/A
FCC ID:	2AZCK-MINER3001
Test Standard:	FCC 47CFR §2.1091

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Test Report Certification

Applicant's Name..... : Chengdu Just Do It Information and Technology Co., Ltd.
Address : Rm 604&605, Unit 1, Building 2, No. 1, Section 1, Huafu Avenue, Huayang Street, Tianfu New District, Chengdu, China.
Manufacturer's Name : Chengdu Just Do It Information and Technology Co., Ltd.
Address : Rm 604&605, Unit 1, Building 2, No. 1, Section 1, Huafu Avenue, Huayang Street, Tianfu New District, Chengdu, China.

Product Description

Product Name..... : Bobcat IoT hotspot
Brand Name : BOBCAT
Model Name : Bobcat Miner 300
Series Model..... : N/A

Standards..... : FCC 47CFR §2.1091

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Date of Test..... :
Date of receipt of test item : 26 Nov. 2021
Date (s) of performance of tests..... : 26 Nov. 2021 ~ 01 Dec. 2021
Date of Issue..... : 01 Dec. 2021
Test Result..... : **Pass**

Testing Engineer : *Chris Chen*

 (Chris Chen)

Technical Manager : *Sean She*

 (Sean she)

Authorized Signatory : *Vita Li*

 (Vita Li)





TABLE OF CONTENTS

1. GENERAL INFORMATION	5
1.1 GENERAL DESCRIPTION OF THE EUT	5
1.2 TEST FACTORY	5
2. FCC 47CFR §2.1091 REQUIREMENT	6
2.1 TEST STANDARDS	6
2.2 LIMIT	6
2.3 EUT OPERATION CONDITION	7
2.4 CLASSIFICATION	7
2.5 TEST RESULT	7





Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	01 Dec. 2021	STS2111168H02	ALL	Initial Issue





1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Bobcat IoT hotspot								
Brand Name	BOBCAT								
Model Name	Bobcat Miner 300								
Series Model	N/A								
Model Difference	N/A								
Product Description	<p>The EUT is Bobcat IoT hotspot</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), $\pi/4$-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/BLE/2.4G 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), $\pi/4$ -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/BLE/2.4G WLAN: 1dBi LongFi: 4dBi	Antenna Designation:	BT/BLE/2.4G WLAN: PCB Antenna LongFi: External Antenna
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Antenna gain:	BT/BLE/2.4G 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	Rated Voltage: 3V Capacity: 40mAh								
Hardware version number	V2.0								
Software versionnumber	2021.11.09.01.00								

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



2. FCC 47CFR §2.1091 REQUIREMENT

2.1 TEST STANDARDS

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

2.2 LIMIT

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)
Limits for Occupational / controlled Exposures			
0.3-3.0	614	1.63	*(100)
3.0-30	1842/f	4.89/f	*(900/f ²)
30-300	61.4	0.163	1.0
300 - 1500	--	--	F/300
1500 – 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
0.3-1.34	614	1.63	*(100)
1.34-30	824/f	2.19/f	*(180/f ²)
30-300	27.5	0.073	0.2
300 - 1500	--	--	F/1500
1500 – 100000	--	--	1.0

F= Frequency in MHz

Friss Formula

Friss Transmission Formula: $Pd = (Pout * G) / (4 * \pi * r^2)$

Where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = Distance between observation point and the center of radiator in cm

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.



2.3 EUT OPERATION CONDITION

EUT was enabled to transmit and receive at lowest, middle and highest channels.

2.4 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.

2.5 TEST RESULT

Turn up

Mode	Detector	Turn up power(dBm)
BT	AV	8±1dBm
BLE	AV	8±1dBm
2.4G WIFI	AV	11±1dBm
LongFi 125KHz	AV	12±1dBm
LongFi 500KHz	AV	12±1dBm

ANT Gain (G)

2402-2483.5MHz: 1dBi (gain of antenna in linear scale=1.259)

902-928MHz: 4dBi (gain of antenna in linear scale=2.512)

Protocol	Max Turn up power (dBm)	Max Turn up power (mW)	ANT Gain(gain of antenna in linear scale)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Ratio	Result
BT	9	7.943	1.259	0.00199	1	0.002	Pass
BLE	9	7.943	1.259	0.00199	1	0.002	Pass
2.4G WIFI	12	15.849	1.259	0.00397	1	0.004	Pass
LongFi 125KHz	13	19.953	2.512	0.00997	0.610	0.016	Pass
LongFi 500KHz	13	19.953	2.512	0.00997	0.606	0.016	Pass

Multiple Evaluation

WIFI+LongFi=0.004+0.016=0.020 < 1

BT+LongFi=0.002+0.016=0.018 < 1

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

*****END OF THE REPORT*****