RADIO TEST REPORT

Report No: STS2107149H01

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-MINER300
Test Standard:	FCC 47CFR §2.1091

Shenzhen STS Test Services Co., Ltd.
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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	:	SHENZHEN EASYLINKIN TECHNOLOGY CO.,LTD
Address	:	705, Floor 7, Zhongdian Difu Building, Zhenhua Road, Fuqiang Community, Huaqiang North Street, Futian District, Shenzhen, China.

Product Description

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Date of Test :

Date of receipt of test item	:	21 July 2021
Date (s) of performance of tests	:	21 July 2021~ 11 Aug. 2021
Date of Issue	:	11 Aug. 2021
Test Result	:	**Pass**

Testing Engineer : Chris Chen

(Chris Chen)

Technical Manager : Sean She

(Sean she)

Authorized Signatory : Vita Li

(Vita Li)

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Revision History

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00	11 Aug. 2021	STS2107149H01	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	The EUT is Bobcat IoT hotspot Operation Frequency: BT/BLE: 2402 – 2480 MHz 2.4G WIFI: 2412~2462 MHz LongFi(DTS): US915:902-928MHz AS923:919-925MHz LongFi(DSS): 902.3 – 915.1MHz(125KHz) Modulation Type: BT: GFSK(1Mbps), π/4-DQPSK(2Mbps), 8DPSK(3Mbps) BLE/ LongFi: GFSK 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: 0.8dBi LongFi: 4dBi Antenna Designation: BT/BLE/2.4G WLAN: PCB Antenna LongFi: External Antenna
Adapter	Input: AC100-240V, 50/60Hz 0.5A Max Output: DC 12V 1.0A 12.0W
Battery	Rated Voltage:3V Capacity: 40mAh
Hardware Version	G280-V1.1
Software Version	2019.11.06.0

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/cm^2

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
802.11b	AV	13±1dBm
802.11g	AV	6±1dBm
802.11n(HT20)	AV	5.5±1dBm
GFSK(BT)	AV	9±1dBm
GFSK(BLE)	AV	5±1dBm
LongFi(DTS)	AV	9±1dBm
LongFi(DSS)	AV	9±1dBm

ANT Gain (G)

BT/BLE/2.4G WLAN: 0.8dBi (gain of antenna in linear scale=1.202)

LongFi: 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/cm²)**	**Limit (mW/cm²)**	**Result**
802.11b	14	25.12	1.20	0.00601	1	Pass
802.11g	7	5.01	1.20	0.00120	1	Pass
802.11n(HT20)	6.5	4.47	1.20	0.00107	1	Pass
GFSK(BT)	10	10	1.20	0.00239	1	Pass
GFSK(BLE)	6	3.98	1.20	0.00095	1	Pass
LongFi(DTS)	10	10	2.51	0.00500	0.617	Pass
LongFi(DSS)	10	10	2.51	0.00500	0.606	Pass

Multiple Evaluation

WIFI/1+LongFi/0.606=(0.00601/1)+(0.00500/0.606)=0.0143 < 1

BTI/1+LongFi/0.606=(0.00239/1)+(0.00500/0.606)=0.0106 < 1

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

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