ACCREDITED
CERT # 5473.03

No.:
FCCSZ2024-0021-H

TEST REPORT

FCC ID	:	**2ASWY24SOLARX310**
NAME OF SAMPLE	:	**GPS Tracker**
APPLICANT	:	**SHENZHEN TOPFLYtech CO., LIMITED**
CLASSIFICATION OF TEST	:	**N/A**

CVC Testing Technology (Shenzhen) Co., Ltd.

Applicant	**Name: SHENZHEN TOPFLYtech CO., LIMITED** **Address: Rm 409, Scientific Research Building, Tsinghua Hi-tech Park Hi-tech Industrial Nanshan District, Shenzhen, Guangdong, China**
Manufacturer	**Name: SHENZHEN TOPFLYtech CO., LIMITED** **Address: Rm 409, Scientific Research Building, Tsinghua Hi-tech Park Hi-tech Industrial Nanshan District, Shenzhen, Guangdong, China**
Equipment Under Test	**Name: GPS Tracker** **Model/Type: SolarX 310** **Brand: TOPFLYtech** **Serial NO.: N/A** **Sample NO.: 6-1**

Date of Receipt.	**2024.04.11**	Date of Testing	**2024.04.11～2024.04.19**

Test Specification	**Test Result**
FCC Part 2 (Section 2.1091) **KDB 447498 D04** **IEEE C95.1**	PASS

Evaluation of Test Result	The equipment under test was found to comply with the requirements of the standards applied. Seal of CVC **Issue Date: 2024.04.19**

Tested by:	Reviewed by:	Approved by:
Zhu Yulin	**Mo Xianbiao**	**Dong Sanbi**
Name Signature	Name Signature	Name Signature

Other Aspects: NONE.

Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested

TABLE OF CONTENTS

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCCSZ2024-0021-H	Original release	2024.04.19

1. GENERAL INFORMATION

PRODUCT	GPS Tracker
BRAND	TOPFLYtech
MODEL	SolarX 310
ADDITIONAL MODEL	N/A
POWER SUPPLY	1. DC 5V from USB host 2. DC 3.7V from Li-ion battery
MODULATIONTECHNOLOGY	GFSK
MODULATION TYPE	GFSK for BT-LE
OPERATING FREQUENCY	2402MHz ~ 2480MHz for BT-LE (1Mbps/2Mbps)
NUMBER OF CHANNEL	GFSK (1Mbps/2Mbps): 40
PEAK OUTPUT POWER	4.18dBm (Maximum)
ANTENNA TYPE AND GAIN (Remark 4/5)	See Scation 5
HARDWARE VERSION:	V1.1
SOFTWARE VERSION:	V1.0
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

Remark:

1. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Please refer to the EUT photo document for detailed product photo. (Report NO.: FCCSZ2024-0021-EUT)
4. Please refer to the antenna report.
5. Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, CVC is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

2. DESCRIPTION OF ACCESSORIES

N/A

3. RF EXPOSURE LIMIT

(Option B) According to FCC Part2.1091 and FCC Part1.1307b, the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (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 is given by:

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

Where：

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

and f is in GHz;

and

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

(Option C) Or using Table 1 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 λ/2π, 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 λ/4 or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to §1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency (MHz)	Threshold ERP (W)
0.3 - 1.34	$1920R^2$
1.34 - 30	$3450R^2/f^2$
30 - 300	$3.38R^2$
300 - 1500	$0.0128R^2/f^2$
1500 - 100000	$19.2R^2$

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 is paragraph (b)(3)(i)(A) of this section. 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 this section for Pth, 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 this section 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.

Pi = 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).

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

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

ERPth,j = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least λ/2π according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

Evaluatedk = 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 Limitk = 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 of this chapter.

4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

Mode	Frequency (MHz)	Peak Gain (dBi)	Antenna Type
BT-LE	2402 ~ 2480	1.20	PCB Antenna
GSM850*	824 ~ 849	-1.34	PCB Antenna
GSM1900*	1850 ~ 1910	2.13	PCB Antenna
LTE Band 2*	1850 ~ 1910	2.13	PCB Antenna
LTE Band 4*	1710 ~ 1755	1.56	PCB Antenna
LTE Band 5*	824 ~ 849	-1.34	PCB Antenna
LTE Band 12*	699 ~ 716	0.65	PCB Antenna
LTE Band 13*	777 ~ 787	0.86	PCB Antenna
LTE Band 25*	1850 ~ 1915	2.13	PCB Antenna
LTE Band 26*	814 ~ 849	0.31	PCB Antenna
LTE Band 66*	1710 ~ 1780	1.61	PCB Antenna
LTE Band 85*	698 ~ 716	0.65	PCB Antenna
NB-IOT Band 2*	1850 ~ 1910	2.13	PCB Antenna
NB-IOT Band 4*	1710 ~ 1755	1.56	PCB Antenna
NB-IOT Band 5*	824 ~ 849	-1.34	PCB Antenna
NB-IOT Band 12*	699 ~ 716	0.65	PCB Antenna
NB-IOT Band 13*	777 ~ 787	0.86	PCB Antenna
NB-IOT Band 25*	1850 ~ 1915	2.13	PCB Antenna
NB-IOT Band 66*	1710 ~ 1780	1.61	PCB Antenna
NB-IOT Band 71*	663 ~ 698	0.65	PCB Antenna
NB-IOT Band 85*	698 ~ 716	0.65	PCB Antenna

Remark:

1. This is provided by the manufacturer. The laboratory is not responsible for technical data provided by the customer.
2. *The EUT contains a certified module (FCC ID: XMR201910BG95M3), according to the MPE reports of FCC ID: XMR201910BG95M3, Date of Grant: 09/24/2021.

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

Mode	Maximum conducted power(dBm)	Target Power (dBm)	Tolerance (dBm)	Lower Tolerance (dBm)	Upper Tolerance (dBm)
BT-LE	4.18	4	+-1	3	5
GSM850*	25.970	26	+-1	25	27
GSM1900*	22.970	23	+-1	22	24
LTE Band 2*	22.000	22	+-1	21	23
LTE Band 4*	22.000	22	+-1	21	23
LTE Band 5*	22.000	22	+-1	21	23
LTE Band 12*	22.000	22	+-1	21	23
LTE Band 13*	22.000	22	+-1	21	23
LTE Band 25*	22.000	22	+-1	21	23
LTE Band 26*	22.000	22	+-1	21	23
LTE Band 66*	22.000	22	+-1	21	23
LTE Band 85*	22.000	22	+-1	21	23
NB-IOT Band 2*	22.000	22	+-1	21	23
NB-IOT Band 4*	22.000	22	+-1	21	23
NB-IOT Band 5*	22.000	22	+-1	21	23
NB-IOT Band 12*	22.000	22	+-1	21	23
NB-IOT Band 13*	22.000	22	+-1	21	23
NB-IOT Band 25*	22.000	22	+-1	21	23
NB-IOT Band 66*	22.000	22	+-1	21	23
NB-IOT Band 71*	22.000	22	+-1	21	23
NB-IOT Band 85*	22.000	22	+-1	21	23
Rematk: *The EUT contains a certified module (FCC ID: XMR201910BG95M3), according to the MPE reports of FCC ID: XMR201910BG95M3, Date of Grant: 09/24/2021.					

7. MAXIMUM PERMISSIBLE EXPOSURE

Mode	Maximum tune up power (dBm)	Maximum Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Part1.1307b Threshold (mW)	Verify
BT-LE	5	1.20	6.2	4.05	2.54	3060	PASS
GSM850*	27	-1.34	25.66	23.51	224.39	1680.96	PASS
GSM1900*	24	2.13	26.13	23.98	250.03	3060	PASS
LTE Band 2*	23	2.13	25.13	22.98	198.61	3060	PASS
LTE Band 4*	23	1.56	24.56	22.41	174.18	3060	PASS
LTE Band 5*	23	-1.34	21.66	19.51	89.33	1680.96	PASS
LTE Band 12*	23	0.65	23.65	21.5	141.25	1425.96	PASS
LTE Band 13*	23	0.86	23.86	21.71	148.25	1585.08	PASS
LTE Band 25*	23	2.13	25.13	22.98	198.61	3060	PASS
LTE Band 26*	23	0.31	23.31	21.16	130.62	1660.56	PASS
LTE Band 66*	23	1.61	24.61	22.46	176.20	3060	PASS
LTE Band 85*	23	0.65	23.65	21.5	141.25	1423.92	PASS
NB-IOT Band 2*	23	2.13	25.13	22.98	198.61	3060	PASS
NB-IOT Band 4*	23	1.56	24.56	22.41	174.18	3060	PASS
NB-IOT Band 5*	23	-1.34	21.66	19.51	89.33	1680.96	PASS
NB-IOT Band 12*	23	0.65	23.65	21.5	141.25	1425.96	PASS
NB-IOT Band 13*	23	0.86	23.86	21.71	148.25	1585.08	PASS
NB-IOT Band 25*	23	2.13	25.13	22.98	198.61	3060	PASS
NB-IOT Band 66*	23	1.61	24.61	22.46	176.20	3060	PASS
NB-IOT Band 71*	23	0.65	23.65	21.5	141.25	1352.52	PASS
NB-IOT Band 85*	23	0.65	23.65	21.5	141.25	1423.92	PASS
Rematk: *The EUT contains a certified module (FCC ID: XMR201910BG95M3), according to the MPE reports of FCC ID: XMR201910BG95M3, Date of Grant: 09/24/2021.							

CALCULATION FOR SIMULTANEOUS TRANSMISSION:

BT-LE and GSM, LTE, NB-IOT can transmit simultaneously, the formula of calculated the MPE is

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

Max：(2.54 / 3060) + (224.39 / 1680.96) = 0.134< 1,which is less than the “1” limit.

------ End of the Report ------

Important

(1) The test report is invalid without the official stamp of CVC;

(2) Any part photocopies of the test report are forbidden without the written permission from CVC;

(3) The test report is invalid without the signatures of Approval and Reviewer;

(4) The test report is invalid if altered;

(5) Objections to the test report must be submitted to CVC within 15 days.

(6) Generally, commission test is responsible for the tested samples only.

(7) As for the test result “-” or “N” means “not applicable”, “/” means “not test”, “P” means “pass” and “F” means “fail”

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