MPE Report

Report No.: STS2502057H01

Issued for

Foxx Development Inc.

3480 Preston Ridge Road Suite 500, Alpharetta, GA 30005, United States

Product Name:	LPWA Module
Brand Name:	FOXX
Model Name:	IQ20
Series Model(s):	N/A
FCC ID:	2AQRM-IQ20
Test Standards:	FCC 47CFR §2.1091

TEST REPORT

Applicant's Name	Foxx Development Inc.
Address	3480 Preston Ridge Road Suite 500, Alpharetta, GA 30005, United States
Manufacturer's Name	Foxx Development Inc.
Address	3480 Preston Ridge Road Suite 500, Alpharetta, GA 30005, United States

Product Description

Product Name	LPWA Module
Brand	FOXX
Model Number	IQ20
Series Model(s)	N/A
Standards	FCC 47CFR §2.1091 447498 D04 Interim General RF Exposure Guidance v01

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

Date of Test	
Date of receipt of test item	19 Feb. 2025
Date (s) of performance of tests	19 Feb. 2025 ~ 17 Mar. 2025
Date of Issue	17 Mar. 2025
Test Result	**Pass**

Testing Engineer : Aaron Bu

(Aaron Bu)

Technical Manager : Tony Liu

(Tony Liu)

Authorized Signatory : Bovey Yang

(Bovey Yang)

SHENZHEN STS TEST SERVICES CO., LTD. TESTING APPROVAL

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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	17 Mar. 2025	STS2502057H01	ALL	Initial Issue

1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name	LPWA Module	
Brand	FOXX	
Model Name	IQ20	
Series Model(s)	N/A	
Model Difference	N/A	
Product Description	The EUT is LPWA Module	
	Operation Frequency:	CAT-M/ NB-IoT Band 2:1850-1910MHz CAT-M/ NB-IoT Band 4:1710-1755MHz CAT-M/ NB-IoT Band 5:824-849MHz CAT-M/ NB-IoT Band 12:699-716MHz CAT-M/ NB-IoT Band 13:777-787MHz CAT-M Band 14: 788-798 MHz CAT-M/ NB-IoT Band 25:1850-1915MHz CAT-M/ NB-IoT Band 26:824-849MHz CAT-M/ NB-IoT Band 66:1710-1780MHz NB-IoT Band 71: 663-698MHz
	Modulation Type:	QPSK /16QAM
	Antenna gain:	CAT-M/ NB-IoT B2:1.63 dBi CAT-M/ NB-IoT B4:3.12 dBi CAT-M/ NB-IoT B5:0.64 dBi CAT-M/ NB-IoT B12:0.95 dBi CAT-M/ NB-IoT B13:2.23 dBi CAT-M B14:2.18 dBi CAT-M/ NB-IoT B25:1.87 dBi CAT-M/ NB-IoT B26:0.91 dBi CAT-M/ NB-IoT B66:3.12 dBi NB-IoT B71:0.22 dBi
	Antenna Designation:	External
Power Rating	Input: DC 3.8V	
Adapter	N/A	
Battery	N/A	
Hardware Version	V1.03	
Software Version	R2117.01	

1.2 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD
Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai 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

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 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). Pth is given by:

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

Where

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

and

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

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 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).

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^2f.
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 is 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 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 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.

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 Part 1.1307.

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.

2.3 TEST RESULT

Tune up

Mode	Detector	Tune up Power
CAT-M Band 2	AV	22±1dBm
CAT-M Band 4	AV	22±1dBm
CAT-M Band 5	AV	22±1dBm
CAT-M Band 12	AV	22±1dBm
CAT-M Band 13	AV	22±1dBm
CAT-M Band 14	AV	22±1dBm
CAT-M Band 25	AV	22±1dBm
CAT-M Band 26	AV	22±1dBm
CAT-M Band 66	AV	22±1dBm
NB-IoT Band 2	AV	20±1dBm
NB-IoT Band 4	AV	20±1dBm
NB-IoT Band 5	AV	20±1dBm
NB-IoT Band 12	AV	20±1dBm
NB-IoT Band 13	AV	20±1dBm
NB-IoT Band 25	AV	19±1dBm
NB-IoT Band 26	AV	20±1dBm
NB-IoT Band 66	AV	19±1dBm
NB-IoT Band 71	AV	20±1dBm

Protocol	Fre. (MHz)	Separation distance (cm)	Max Tune up power (dBm)	ANT Gain (dBi)	Max EIRP (dBm)	Max EIRP (mW)	Limit (mW/cm²)	Ratio	Result
CAT-M B2	1850	20	23.00	1.63	24.63	290.402	1	0.0578	Pass
CAT-M B4	1710	20	23.00	3.12	26.12	409.261	1	0.0814	Pass
CAT-M B5	824	20	23.00	0.64	23.64	231.206	0.549	0.0837	Pass
CAT-M B12	699	20	23.00	0.95	23.95	248.313	0.466	0.1060	Pass
CAT-M B13	777	20	23.00	2.23	25.23	333.426	0.518	0.1281	Pass
CAT-M B14	788	20	23.00	2.18	25.18	329.610	0.525	0.1248	Pass
CAT-M B25	1850	20	23.00	1.87	24.87	306.902	1	0.0611	Pass
CAT-M B26	814	20	23.00	0.91	23.91	246.037	0.543	0.0902	Pass
CAT-M B66	1710	20	23.00	3.12	26.12	409.261	1	0.0814	Pass
NB-IoT B2	1850	20	21.00	1.63	22.63	183.231	1	0.0365	Pass
NB-IoT B4	1710	20	21.00	3.12	24.12	258.226	1	0.0514	Pass
NB-IoT B5	824	20	21.00	0.64	21.64	145.881	0.549	0.0528	Pass
NB-IoT B12	699	20	21.00	0.95	21.95	156.675	0.466	0.0669	Pass
NB-IoT B13	777	20	21.00	2.23	23.23	210.378	0.518	0.0808	Pass
NB-IoT B25	1850	20	20.00	1.87	21.87	153.815	1	0.0306	Pass
NB-IoT B26	814	20	21.00	0.91	21.91	155.239	0.543	0.0569	Pass
NB-IoT B66	1710	20	20.00	3.12	23.12	205.116	1	0.0408	Pass
NB-IoT B71	663	20	21.00	0.22	21.22	132.434	0.442	0.0596	Pass

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

2. ERP=EIRP-2.15

※※※※※END OF THE REPORT※※※※※