

# RF Exposure Evaluation Report

**Product** : Zigbee PCB Module  
**Trade mark** : ENNFU  
**Model/Type reference** : T30PA127F2.4G  
**Serial Number** : N/A  
**Report Number** : EED32J00193102  
**FCC ID** : 2ANLK-T30A  
**Date of Issue** : Dec. 08, 2017  
**Test Standards** : 47 CFR Part 1.1307(2015)  
47 CFR Part 1.1310(2015)  
KDB447498D01v06  
**Test result** : PASS

Prepared for:

**Ennfu Scientific Company Limited**  
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Date:

Dec. 08, 2017

Check No.:2827583977



## 2 Version

| Version No. | Date          | Description |
|-------------|---------------|-------------|
| 00          | Dec. 08, 2017 | Original    |
|             |               |             |
|             |               |             |

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### 3.1 Client Information

|                          |                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Applicant:               | Ennfu Scientific Company Limited                                                                                         |
| Address of Applicant:    | A606, 6F, Area A, University Of Pioneer Park, No. 99, Daxue Road, Tongshan District, Xuzhou, Jiangsu Province, P.R.China |
| Manufacturer:            | Ennfu Scientific Company Limited                                                                                         |
| Address of Manufacturer: | A606, 6F, Area A, University Of Pioneer Park, No. 99, Daxue Road, Tongshan District, Xuzhou, Jiangsu Province, P.R.China |
| Factory:                 | Ennfu Scientific Company Limited                                                                                         |
| Address of Factory:      | A606, 6F, Area A, University Of Pioneer Park, No. 99, Daxue Road, Tongshan District, Xuzhou, Jiangsu Province, P.R.China |

### 3.2 General Description of EUT

|                                  |                   |
|----------------------------------|-------------------|
| Product Name:                    | Zigbee PCB Module |
| Model No.(EUT):                  | T30PA127F2.4G     |
| Trade Mark:                      | ENNFU             |
| EUT Supports Radios application: | Zigbee            |

### 3.3 Product Specification subjective to this standard

|                                                                             |                                                 |
|-----------------------------------------------------------------------------|-------------------------------------------------|
| Frequency Range:                                                            | 2405MHz-2480MHz                                 |
| Modulation Type:                                                            | QPSK                                            |
| Number of Channels:                                                         | 16                                              |
| Test Power Grade:                                                           | N/A                                             |
| Test Software of EUT:                                                       | SmartRF_Studio_7-2.6.0(manufacturer declare )   |
| Antenna Type:                                                               | Modular antenna                                 |
| Antenna Gain:                                                               | 3dBi                                            |
| Power Supply:                                                               | DC 3.3V                                         |
| Conduct Peak Power:                                                         | 1.802dBm                                        |
|                                                                             | The ERP data refer to the report EED32J00193101 |
| Sample Received Date:                                                       | Aug. 30, 2017                                   |
| Sample tested Date:                                                         | Aug. 30, 2017 to Dec. 07, 2017                  |
| The tested sample(s) and the sample information are provided by the client. |                                                 |

### 3.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 3368 3668 Fax: +86 (0) 755 3368 3385

No tests were sub-contracted.

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### **3.5 Deviation from Standards**

None.

### **3.6 Abnormalities from Standard Conditions**

None.

### **3.7 Other Information Requested by the Customer**

None.

## 4 RF Exposure Evaluation

### 4.1 RF Exposure Compliance Requirement

#### 4.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency range<br>(MHz)                                       | Electric field<br>strength<br>(V/m) | Magnetic field<br>strength<br>(A/m) | Power density<br>(mW/cm <sup>2</sup> ) | Averaging time<br>(minutes) |
|----------------------------------------------------------------|-------------------------------------|-------------------------------------|----------------------------------------|-----------------------------|
| <b>(A) Limits for Occupational/Controlled Exposures</b>        |                                     |                                     |                                        |                             |
| 0.3–3.0 .....                                                  | 614                                 | 1.63                                | * (100)                                | 6                           |
| 3.0–30 .....                                                   | 1842/f                              | 4.89/f                              | * (900/f <sup>2</sup> )                | 6                           |
| 30–300 .....                                                   | 61.4                                | 0.163                               | 1.0                                    | 6                           |
| 300–1500 .....                                                 | .....                               | .....                               | f/300                                  | 6                           |
| 1500–100,000 .....                                             | .....                               | .....                               | 5                                      | 6                           |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                                     |                                     |                                        |                             |
| 0.3–1.34 .....                                                 | 614                                 | 1.63                                | * (100)                                | 30                          |
| 1.34–30 .....                                                  | 824/f                               | 2.19/f                              | * (180/f <sup>2</sup> )                | 30                          |
| 30–300 .....                                                   | 27.5                                | 0.073                               | 0.2                                    | 30                          |
| 300–1500 .....                                                 | .....                               | .....                               | f/1500                                 | 30                          |
| 1500–100,000 .....                                             | .....                               | .....                               | 1.0                                    | 30                          |

A rough estimation of the expected exposure in power flux density on a given point can be made with the following equation:

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

Where:

S = power density

P = power input to the antenna

G = numeric gain of the antenna in the direction of interest relative to an isotropic radiator

R= distance to the centre of radiation of the antenna

EIRP = P\*G

The antenna of the product, under normal use condition is at least 20 cm away from the body of the user.

Warning statement to the user for keeping at least 20cm separation distance and the prohibition of operating to a person has been printed on the user's manual. Therefore, the S of the device is calculated with R=20cm, and if it is below the limit S, then we can conclude the device complies with the rules.

#### 4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit data at lowest, middle and highest channel individually.

#### 4.1.3 EUT RF Exposure Evaluation

**Antenna Gain:** 3dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

| Channel | Frequency (MHz) | Max Conducted Peak Output Power(dBm) | Gain (dBi) | EIRP* (dBm) | EIRP (mW) | R (cm) | S (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Result |
|---------|-----------------|--------------------------------------|------------|-------------|-----------|--------|-------------------------|-----------------------------|--------|
| Lowest  | 2405            | 1.802                                | 3          | 4.802       | 3.02      | 20     | 0.0006                  | 1.0                         | Pass   |

**Note:** Refer to report No. EED32I00193101 for EUT test Max Conducted Peak Output Power value.

## **PHOTOGRAPHS OF EUT Constructional Details**

Refer to Report No. EED32J00193101 for EUT external and internal photos.

**\*\*\* End of Report \*\*\***

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