

# RF Exposure Evaluation Report

**Product** : Yarbo Wi-Fi Module  
**Trade mark** : Yarbo  
**Model/Type reference** : WF1  
**Serial Number** : N/A  
**Report Number** : EED32O81789102  
**FCC ID** : 2A9JF-HY0915-YARBO  
**Date of Issue** : Dec. 10, 2022  
**Test Standards** : 47 CFR Part 1.1307  
47 CFR Part 2.1093  
KDB447498D01 General  
RF Exposure Guidance v06  
**Test result** : PASS

Prepared for:

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Dec. 10, 2022



Check No.: 5355111122

## 2 Version

| Version No. | Date          | Description |
|-------------|---------------|-------------|
| 00          | Dec. 10, 2022 | Original    |
|             |               |             |
|             |               |             |

3 Contents

|                                                             | Page |
|-------------------------------------------------------------|------|
| 1 COVER PAGE .....                                          | 1    |
| 2 VERSION .....                                             | 2    |
| 3 CONTENTS .....                                            | 3    |
| 4 GENERAL INFORMATION .....                                 | 4    |
| 4.1 CLIENT INFORMATION .....                                | 4    |
| 4.2 GENERAL DESCRIPTION OF EUT .....                        | 4    |
| 4.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD ..... | 4    |
| 4.4 TEST LOCATION .....                                     | 6    |
| 4.5 DEVIATION FROM STANDARDS .....                          | 6    |
| 4.6 ABNORMALITIES FROM STANDARD CONDITIONS .....            | 6    |
| 4.7 OTHER INFORMATION REQUESTED BY THE CUSTOMER .....       | 6    |
| 5 RF EXPOSURE EVALUATION .....                              | 7    |
| 5.1 RF EXPOSURE COMPLIANCE REQUIREMENT .....                | 7    |
| 5.2 MAXIMUM PERMISSIBLE EXPOSURE .....                      | 8    |

## 4 General Information

### 4.1 Client Information

|                          |                                                                                                                                                                                 |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant:               | Shenzhen Hanyang Technology Co., Ltd.                                                                                                                                           |
| Address of Applicant:    | Room 12KLM, Building 6B, Baoneng Science and Technology Park, Qinghu Community, Longhua Street, Longhua District, Shenzhen                                                      |
| Manufacturer:            | Shenzhen Hanyang Technology Co., Ltd.                                                                                                                                           |
| Address of Manufacturer: | Room 12KLM, Building 6B, Baoneng Science and Technology Park, Qinghu Community, Longhua Street, Longhua District, Shenzhen                                                      |
| Factory:                 | Shenyang Robotics (Huizhou) Co., Ltd.                                                                                                                                           |
| Address of Factory:      | 7th Floor, Building 2, Huizhou Shenghong Electric Industrial Park, No. 31, Huifeng West 2nd Road, Huihuan Street, Zhongkai High-tech District, Huizhou City, Guangdong Province |

### 4.2 General Description of EUT

|                       |                                                                                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------|
| Product Name:         | Yarbo Wi-Fi Module                                                                                                 |
| Model/Type reference: | WF1                                                                                                                |
| Trade mark:           | Yarbo                                                                                                              |
| Product Type:         | <input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location |

### 4.3 Product Specification subjective to this standard

|                   |                                                                                                                                                         |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Range:  | IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz<br>IEEE 802.11n(HT40): 2422MHz to 2452MHz                                                                    |
| Modulation Type:  | IEEE for 802.11b:DSSS(CCK,DQPSK,DBPSK)<br>IEEE for 802.11g:OFDM(64QAM, 16QAM, QPSK, BPSK)<br>IEEE for 802.11n(HT20/HT40): OFDM (64QAM, 16QAM,QPSK,BPSK) |
| Test Power Grade: | Default                                                                                                                                                 |
| Antenna Type      | FPC Antenna                                                                                                                                             |
| Antenna Gain      | ANT1:1.82dBi,ANT2:1.82dBi                                                                                                                               |
| Test Voltage:     | DC 12V                                                                                                                                                  |

|                                                                                                                                                                                              |                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function (Wi-Fi):                                                                                                                                                                            | <input checked="" type="checkbox"/> SISO <input checked="" type="checkbox"/> 2x2 MIMO <input type="checkbox"/> 3x3 MIMO <input type="checkbox"/> 4x4MIMO |
| Power Supply:                                                                                                                                                                                | DC 12V                                                                                                                                                   |
| Max Conducted Peak Output Power:                                                                                                                                                             | 17.81dBm<br>The Max Conducted Peak Output Power data refer to the report EED32O81789101                                                                  |
| Sample Received Date:                                                                                                                                                                        | Nov. 11, 2022                                                                                                                                            |
| Sample tested Date:                                                                                                                                                                          | Nov. 11, 2022 to Nov. 28, 2022                                                                                                                           |
| Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified. |                                                                                                                                                          |

## 4.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

## 4.5 Deviation from Standards

None.

## 4.6 Abnormalities from Standard Conditions

None.

## 4.7 Other Information Requested by the Customer

None.

## 5 RF Exposure Evaluation

### 5.1 RF Exposure Compliance Requirement

Given  $E = \frac{\sqrt{30 \times P \times G}}{d}$  &  $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm<sup>2</sup>

## 5.2 Maximum Permissible Exposure

Substituting the MPE safe distance using  $d = 20$  cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where  $P$  = Power in mW

$G$  = Numeric antenna gain

$S$  = Power density in mW / cm<sup>2</sup>

### 1) For 2.4G WIFI:

The WIFI ant1 test data was worst, only the worst case was recorded in the report.

| 802.11b mode     |                            |                            |                       |        |
|------------------|----------------------------|----------------------------|-----------------------|--------|
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |        |
|                  |                            |                            | (dBm)                 | (mW)   |
| Lowest(2412MHz)  | 17.16                      | 17±1                       | 18                    | 63.096 |
| Middle(2437MHz)  | 17.81                      | 17±1                       | 18                    | 63.096 |
| Highest(2462MHz) | 17.32                      | 17±1                       | 18                    | 63.096 |

### 2.4G WIFI:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / cm <sup>2</sup> | Limit (mW/cm <sup>2</sup> ) |
|-----|-----------|--------|-------------|--------|---------------------------------------|-----------------------------|
| 9   | 2437      | 63.096 | 1.52        | 20     | 0.0191                                | 1                           |

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