



## A Test Lab Techno Corp.

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### MPE Report



|                                  |                                                                                          |
|----------------------------------|------------------------------------------------------------------------------------------|
| Test Report No.                  | : SZ2006FS11                                                                             |
| Applicant                        | : Guangzhou Tupu Technology Co., Ltd.                                                    |
| Product Type                     | : TupuCheck Pro                                                                          |
| Trade Name                       | : TupuCheck Pro                                                                          |
| Model Number                     | : TupuCheck Pro                                                                          |
| Received Date                    | : Jun. 03, 2020                                                                          |
| Test Period                      | : Jun.05 ~ Jun.15 , 2020                                                                 |
| Issue Date                       | : Jun. 23, 2020                                                                          |
| Test Specification               | : ANSI / IEEE Std.C95.1-1992 / IEEE Std. 1528-2013<br>47 CFR § 2.1091<br>47 CFR § 1.1310 |
| Location of Test Lab.            | : Chang-an Lab.                                                                          |
| Test Firm MRA designation number | : TW0010                                                                                 |

1. The test operations have to be performed with cautious behavior, the test results are as attached.
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Approved By :

(Louis Shen)

Tested By :

(Joyce Feng)



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## 1. Description of Equipment under Test (EUT)

|                     |                                                                                                                                        |              |                     |                       |     |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------|-----------------------|-----|
| Applicant           | Guangzhou Tupu Technology Co., Ltd.<br>Room 504, 5/F,Block A1,191 Kexue Avenue, Huangpu District, Guangzhou, Guangdong Province, China |              |                     |                       |     |
| Manufacturer        | Guangzhou Tupu Technology Co., Ltd.<br>Room 504,5/F, Block A1,191 Kexue Avenue, Huangpu District, Guangzhou, Guangdong Province, China |              |                     |                       |     |
| Product Type        | TupuCheck Pro                                                                                                                          |              |                     |                       |     |
| Trade Name          | TupuCheck Pro                                                                                                                          |              |                     |                       |     |
| Model Number        | TupuCheck Pro                                                                                                                          |              |                     |                       |     |
| FCC ID              | 2AWGCTUPUCHECKPRO                                                                                                                      |              |                     |                       |     |
| Frequency Range     | Operate Band                                                                                                                           |              |                     | Frequency Range (MHz) |     |
|                     | IEEE 802.11b / 802.11g / 802.11n 2.4 GHz 20 MHz                                                                                        |              |                     | 2412 - 2462           |     |
|                     | IEEE 802.11n 2.4 GHz 40 MHz                                                                                                            |              |                     | 2422 - 2452           |     |
| Antenna Information | ANT                                                                                                                                    | Model        | Type                | Max. Gain (dBi)       |     |
|                     | ANT-0                                                                                                                                  | M12.0140-R0A | Copper tube antenna | 2.4 GHz               | 2.0 |
| RF Evaluation       | 0.0117 mW/cm <sup>2</sup>                                                                                                              |              |                     |                       |     |
| Temperature Range   | -20 ~ +50℃                                                                                                                             |              |                     |                       |     |

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1091 / 47 CFR § 1.1310. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties



## 2. Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR § 1.1310 titled "Radiofrequency radiation exposure limits", generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as "a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. " This product is intended to be installed into a vehicle such that the unit is physically secured at one location. In the installation guide supplied with the product,

Client has made the following statement: "IMPORTANT: To meet the FCC's RF Exposure Guidelines, the antenna should be installed so there is at least 20 cm of separation between the body of the user and nearby persons and the antenna". Based on the installation of the transceiver and the antenna, the transmitters radiating structure is more than 20 cm from the user. Thus, this product is a "mobile device" as defined in section § 2.1091 paragraph (b).

Exposure evaluation

$$S = \frac{PG}{4\pi R^2}$$

Where

S: power density

P: power input to the antenna

G: power gain of the antenna in the direction of interest relative to an isotropic radiator.

R: distance to the center of radiation of the antenna.

### 3. RF Output Power

The conducted power turn-up tolerance reference manufacturer specification.

| Band                        | Data Rate (Mbps) | Frequency (MHz) | Peak Conducted power (dBm) |
|-----------------------------|------------------|-----------------|----------------------------|
|                             |                  |                 | ANT-0                      |
| IEEE 802.11b                | 1                | 2412.0          | 15.72                      |
|                             |                  | 2437.0          | 14.74                      |
|                             |                  | 2462.0          | 14.16                      |
| IEEE 802.11g                | 6                | 2412.0          | 10.75                      |
|                             |                  | 2437.0          | 11.39                      |
|                             |                  | 2462.0          | 11.70                      |
| IEEE 802.11n 2.4 GHz 20 MHz | 6.5              | 2412.0          | 12.84                      |
|                             |                  | 2437.0          | 11.68                      |
|                             |                  | 2462.0          | 11.52                      |
| IEEE 802.11n 2.4 GHz 40 MHz | 13.5             | 2422.0          | 9.55                       |
|                             |                  | 2437.0          | 11.55                      |
|                             |                  | 2452.0          | 8.58                       |

Note: The relevant measured result has the offset with cable loss already.

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## 4. Test Results

| Band                           | Data Rate (Mbps) | Frequency (MHz) | Limit (mw)/cm <sup>2</sup> | Distance [R] (cm) | Max tune-up Power (upper limit) [P] (dBm) | ANT Gain (dBi) | Numeric Gain [G] | Duty Cycle | Power with Duty cycle [TP] (mW) | Power Density [S] (mw/cm <sup>2</sup> ) |
|--------------------------------|------------------|-----------------|----------------------------|-------------------|-------------------------------------------|----------------|------------------|------------|---------------------------------|-----------------------------------------|
| IEEE 802.11b                   | 1                | 2412.0          | 1                          | 20                | 15.72                                     | 2              | 1.58             | 1          | 58.974                          | 0.0117                                  |
|                                |                  | 2437.0          | 1                          | 20                | 14.74                                     | 2              | 1.58             | 1          | 47.061                          | 0.0094                                  |
|                                |                  | 2462.0          | 1                          | 20                | 14.16                                     | 2              | 1.58             | 1          | 41.177                          | 0.0082                                  |
| IEEE 802.11g                   | 6                | 2412.0          | 1                          | 20                | 10.75                                     | 2              | 1.58             | 1          | 18.778                          | 0.0037                                  |
|                                |                  | 2437.0          | 1                          | 20                | 11.39                                     | 2              | 1.58             | 1          | 21.760                          | 0.0043                                  |
|                                |                  | 2462.0          | 1                          | 20                | 11.70                                     | 2              | 1.58             | 1          | 23.370                          | 0.0046                                  |
| IEEE 802.11n<br>2.4 GHz 20 MHz | 6.5              | 2412.0          | 1                          | 20                | 12.84                                     | 2              | 1.58             | 1          | 30.385                          | 0.0060                                  |
|                                |                  | 2437.0          | 1                          | 20                | 11.68                                     | 2              | 1.58             | 1          | 23.263                          | 0.0046                                  |
|                                |                  | 2462.0          | 1                          | 20                | 11.52                                     | 2              | 1.58             | 1          | 22.421                          | 0.0045                                  |
| IEEE 802.11n<br>2.4 GHz 40 MHz | 13.5             | 2422.0          | 1                          | 20                | 9.55                                      | 2              | 1.58             | 1          | 14.245                          | 0.0028                                  |
|                                |                  | 2437.0          | 1                          | 20                | 11.55                                     | 2              | 1.58             | 1          | 22.577                          | 0.0045                                  |
|                                |                  | 2452.0          | 1                          | 20                | 8.58                                      | 2              | 1.58             | 1          | 11.393                          | 0.0023                                  |

Note:

- 1.Mobile or fixed location transmitters, minimum separation distance is 20 cm, even if calculations indicate MPE distance is less.
- 2.The Numeric Gain calculated by  $10^{(\text{ant. Gain(dBi)} / 10)}$ .
- 3.Each band max power which perform MPE of any configurations.