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# RF Exposure Evaluation Report

**Report No.:** CQASZ20210300360E-02  
**Applicant:** FUZHOU EMAX ELECTRONIC CO., LTD.  
**Address of Applicant:** Building #12-#16, Cangshan Industrial Area, Juyuanzhou, Jinshan District, Fuzhou, China.  
**Equipment Under Test (EUT):**  
**EUT Name:** Wind Speed& Rainfall Transmitter  
**Model No.:** 3390TX  
**Brand Name:** N/A  
**FCC ID:** WEC-2101  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 2.1093  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2021-3-25  
**Date of Test:** 2021-3-25 to 2021-5-6  
**Date of Issue:** 2021-5-6  
**Test Result:** PASS\*

\*In the configuration tested, the EUT complied with the standards specified above

**Tested By:**

Lewis Zhou

(Lewis Zhou)

**Reviewed By:**

Rock Huang

(Rock Huang)

**Approved By:**

Jack Ai

(Jack Ai)



## 1 Version

### Revision History Of Report

| Report No.           | Version | Description    | Issue Date |
|----------------------|---------|----------------|------------|
| CQASZ20210300360E-02 | Rev.01  | Initial report | 2021-5-6   |

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### 3 General Information

#### 3.1 Client Information

|                          |                                                                                          |
|--------------------------|------------------------------------------------------------------------------------------|
| Applicant:               | FUZHOU EMAX ELECTRONIC CO., LTD.                                                         |
| Address of Applicant:    | Building #12-#16, Cangshan Industrial Area, Juyuanzhou, Jinshan District, Fuzhou, China. |
| Manufacturer:            | FUZHOU EMAX ELECTRONIC CO., LTD.                                                         |
| Address of Manufacturer: | Building #12-#16, Cangshan Industrial Area, Juyuanzhou, Jinshan District, Fuzhou, China. |
| Factory:                 | FUZHOU EMAX ELECTRONIC CO., LTD.                                                         |
| Address of Factory:      | Building #12-#16, Cangshan Industrial Area, Juyuanzhou, Jinshan District, Fuzhou, China. |

#### 3.2 General Description of EUT

|                   |                                        |
|-------------------|----------------------------------------|
| Product Name:     | Wind Speed& Rainfall Transmitter       |
| Model No.:        | 3390TX                                 |
| Trade Mark:       | N/A                                    |
| Hardware Version: | V1.0                                   |
| Software Version: | V1.0                                   |
| Power Supply:     | EUT is powered by 3*AAA size batteries |

#### 3.3 General Description of 433.92MHz

|                     |                                                                                                                    |
|---------------------|--------------------------------------------------------------------------------------------------------------------|
| Frequency Range:    | 433.92                                                                                                             |
| Modulation Type:    | FSK                                                                                                                |
| Number of Channels: | 1                                                                                                                  |
| Product Type:       | <input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location |
| Antenna Type:       | Spring antenna                                                                                                     |
| Antenna Gain:       | 0dBi                                                                                                               |

## 4 MPE Evaluation

### 4.1 RF Exposure Compliance Requirement

#### 4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

##### 4.3.1. Standalone MPE test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

#### 4.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$$\left[ \frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

$f(\text{GHz})$  is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation<sup>17</sup>

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion

#### 4.1.3 EUT RF Exposure

##### 1) EUT RF Exposure

$$e_{irp} = p_t \times g_t = (E \times d)^2 / 30$$

where:

$p_t$  = transmitter output power in watts,

$g_t$  = numeric gain of the transmitting antenna (unitless),

$E$  = electric field strength in V/m,  $10^{((dB_{\mu V/m})/20)/10^6}$ ,

$d$  = measurement distance in meters (m)---3m,

$$\text{So } p_t = (E \times d)^2 / 30 / g_t$$

The worst case (refer to report CQASZ20210300360E-01) is below:

| Antenna polarization: Horizontal |                |              |
|----------------------------------|----------------|--------------|
| Frequency (MHz)                  | Level (dBuV/m) | Polarization |
| 433.92                           | 95.91          | Peak         |
| 433.92                           | 69.91          | Average      |

| Antenna polarization: Vertical |                |              |
|--------------------------------|----------------|--------------|
| Frequency (MHz)                | Level (dBuV/m) | Polarization |
| 433.92                         | 87.10          | Peak         |
| 433.92                         | 61.10          | Average      |

For 433.92MHz wireless:

Field strength = 95.91dB $\mu$ V/m @3m

Ant. gain 0dBi; so Ant numeric gain=1.0

$$\text{So } p_t = \{ [10^{(95.91/20)} / 10^6 \times 3]^2 / 30 / 1.0 \} \times 1000 \text{mW} = 1.17 \text{mW}$$

$$\text{So } (1.17 \text{mW} / 5 \text{mm}) \times \sqrt{0.43392 \text{GHz}} = 0.154,$$

$$0.154 < 3.0 \text{ for 1-g SAR}$$

So the SAR report is not required.