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# RF Exposure Evaluation Report

**Report No. :** CQASZ20191101215E-02  
**Applicant:** Zhejiang PDW Industrial Co., Ltd.  
**Address of Applicant:** Quanxi Industrial Park, Wuyi County, Jinhua City, Zhejiang, P.R. China 321200  
**Equipment Under Test (EUT):**  
**EUT Name:** Truck TPMS Repeater  
**Model No.:** 04.01.21, 04.01.52  
**Test Model No.:** 04.01.21  
**Brand Name:** PDW, PROCAS  
**FCC ID:** 2ATWD-040121  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 2.1093  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2019-11-29  
**Date of Test:** 2019-11-29 to 2020-05-07  
**Date of Issue:** 2020-05-07  
**Test Result :** **PASS\***

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

**Tested By:**   
\_\_\_\_\_

(Tom Chen)

**Reviewed By:**   
\_\_\_\_\_

(Sheek Luo)

**Approved By:**   
\_\_\_\_\_

(Jack Ai)



## 1 Version

### Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20191101215E-02	Rev.01	Initial report	2020-05-07

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### 3 General Information

#### 3.1 Client Information

Applicant:	Zhejiang PDW Industrial Co., Ltd.
Address of Applicant:	Quanxi Industrial Park, Wuyi County, Jinhua City, Zhejiang, P.R. China 321200
Manufacturer:	Zhejiang PDW Industrial Co., Ltd.
Address of Manufacturer:	Quanxi Industrial Park, Wuyi County, Jinhua City, Zhejiang, P.R. China 321200

#### 3.2 General Description of EUT

Product Name:	Truck TPMS Repeater
Model No.:	04.01.21, 04.01.52
Test Model No.:	04.01.21
Trade Mark:	PDW, PROCAST
Hardware Version:	V4
Software Version:	V03
Sample Type:	<input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location
Operation Frequency:	433.92MHz
Channel Numbers:	1
Modulation Type:	FSK
Antenna Type:	Integral antenna
Antenna Gain:	-2.56dBi
Power Supply:	DC 9V~DC 36V

Model No.: 04.01.21, 04.01.52

Only the model 04.01.21 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being Trademarks and models.

## 4 SAR Evaluation

### 4.1 RF Exposure Compliance Requirement

#### 4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

##### 4.3.1. Standalone SAR 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:

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

f(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

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

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 CQASZ20191101215E-01) is below:

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Polarization
433.92	76.77	Peak
433.92	74.36	Average

Antenna polarization: Vertical		
Frequency (MHz)	Level (dBuV/m)	Polarization
433.92	79.04	Peak
433.92	76.63	Average

For 433.92MHz wireless:

Field strength = 79.04dB $\mu$ V/m @3m

Ant. gain -2.56dBi; so Ant numeric gain=0.55

$$\text{So } p_t = \{ [10^{(79.04/20)} / 10^6 \times 3]^2 / 30 / 0.55 \} \times 1000 \text{mW} = 0.043 \text{mW}$$

$$\text{So } (0.043 \text{mW} / 5 \text{mm}) \times \sqrt{0.43392 \text{GHz}} = 0.0057,$$

0.0057 < 3.0 for 1-g SAR

So the SAR report is not required.