



## Shenzhen Huaxia Testing Technology Co., Ltd

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640  
Fax: +86-755-26648637  
Website: [www.cqa-cert.com](http://www.cqa-cert.com)

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# RF Exposure Evaluation Report

**Report No.:** CQASZ20210901654E -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:** Programmed GMC TPMS Sensor BCS105 (4pcs)  
**Model No.:** BCS105, BCS101, BCS1A4, BCS1A2, BCS1A5  
**Test Model No.:** BCS105  
**Brand Name:** N/A  
**FCC ID:** 2ATWD-BCS105  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 2.1093  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2021-09-18  
**Date of Test:** 2021-09-18 to 2021-10-11  
**Date of Issue:** 2021-10-19  
**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
CQASZ20210901654E -02	Rev.01	Initial report	2021-10-19

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

#### 3.2 General Description of EUT

Product Name:	Programmed GMC TPMS Sensor BCS105 (4pcs)
Model No.:	BCS105, BCS101, BCS1A4, BCS1A2, BCS1A5
Test Model No.:	BCS105
Trade Mark:	N/A
Hardware Version:	V1.0
Software Version:	V01
Sample Type:	<input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location
Operation Frequency:	314.9MHz
Channel Numbers:	1
Modulation Type:	FSK
Antenna Type:	PCB antenna
Antenna Gain:	-4.46 dBi
Power Supply:	This test EUT is powered by buttom batteries.

Note: Using the new battery for testing.

## 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

$f(\text{GHz})$  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

$$eirp = pt \times gt = (E \times d)^2 / 30$$

where:

pt = transmitter output power in watts,

gt = 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,

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

The worst case (refer to report CQASZ20210901654E-01) is below:

Frequency (MHz)	Level (dBuV/m)	Polarization
314.9	72.71	Peak
314.9	60.67	Average

Antenna polarization: Vertical		
Frequency (MHz)	Level (dBuV/m)	Polarization
314.9	73.12	Peak
314.9	61.08	Average

For 314.9MHz wireless:

Field strength = 73.12dB $\mu$ V/m @3m

Ant. gain -4.46dBi; so Ant numeric gain=0.358

So  $pt = \{ [10^{(73.12/20)} / 10^6 \times 3]^2 / 30 / 0.358 \} \times 1000mW = 0.0172mW$

So  $(0.0172mW/5mm) \times \sqrt{0.3142GHz} = 0.0019$ ,

0.0019 < 3.0 for 1-g SAR

So the SAR report is not required.