

# Test Report

Verified code: 417170

Report No.: E20240724756701-3

Customer: Shenzhen H&T Intelligent Product Co., Ltd.

Address: 1004,10/F, Building D, Shenzhen Academy of Aerospace Technology, No. 6  
Technology South 10th Rd., Hi-Tech Park, South Zone, Nanshan, Shenzhen City,  
Guangdong Province, P. R. China

Sample Name: Presence Sensor S1

Sample Model: PS-SP1

Receive Sample Date: Jul.25,2024

Test Date: Aug.01,2024 ~ Oct.23,2024

Reference Document: CFR 47, FCC Part 2.1091 Radio frequency radiation exposure evaluation:  
mobile devices

Test Result: Pass

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GRG METROLOGY & TEST GROUP CO., LTD

Issued Date: 2024-11-04

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REPORT ISSUED HISTORY

| Report Version | Report No.        | Description    | Compile Date |
|----------------|-------------------|----------------|--------------|
| 1.0            | E20240724756701-3 | Original Issue | 2024-10-25   |

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## 1. GENERAL DESCRIPTION OF EUT

### 1.1. APPLICANT

Name: Shenzhen H&T Intelligent Product Co., Ltd.  
Address: 1004,10/F, Building D, Shenzhen Academy of Aerospace Technology, No. 6  
Technology South 10th Rd., Hi-Tech Park, South Zone, Nanshan, Shenzhen City,  
Guangdong Province, P. R. China

### 1.2. MANUFACTURER

Name: Shenzhen H&T Intelligent Product Co., Ltd.  
Address: 1004,10/F, Building D, Shenzhen Academy of Aerospace Technology, No. 6  
Technology South 10th Rd., Hi-Tech Park, South Zone, Nanshan, Shenzhen City,  
Guangdong Province, P. R. China

### 1.3. Factory

Name: Shenzhen H&T Intelligent Product Co., Ltd.  
Address: 1004,10/F, Building D, Shenzhen Academy of Aerospace Technology, No. 6  
Technology South 10th Rd., Hi-Tech Park, South Zone, Nanshan, Shenzhen City,  
Guangdong Province, P. R. China

### 1.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Product Name: Presence Sensor S1  
Product Model: PS-SP1  
Trade Name: /  
Power Supply: DC 5V by USB port  
FCC ID: 2BHYS88888888  
Frequency Band: 2402MHz-2480MHz for BLE\_1M  
2412MHz-2462MHz for 802.11b/g/n HT20  
2422MHz-2452MHz: 802.11n HT40  
Millimeter wave radar: 59.16-61.56GHz  
Maximum conducted output Power: 2.08dBm for BLE\_1M, 21.72dBm for 2.4G WiFi  
Modulation type: GFSK for BLE\_1M, DSSS for 802.11b mode, OFDM for 802.11g/n HT20/  
n HT40 mode  
FMCW for 59.16-61.56GHz  
Antenna Specification: For BLE and 2.4G WiFi Internal FPC antenna with 3.24dBi (Max.)  
For 59.16-61.56GHz Microstrip antenna with 0dBi(Max.)  
Temperature Range: -10 ℃ ~ +40 ℃  
Hardware Version: V01  
Software Version: 0.0.3.2  
Sample No: E20240724756701-0001, E20240724756701-0002

Note :

The EUT antenna gain is provided by the applicant. This report is made solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions.

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## 2. LABORATORY AND ACCREDITATIONS

### 2.1. LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

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### 2.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

**USA** A2LA(Certificate #2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

**Canada** ISED (Company Number: 24897, CAB identifier:CN0069)

**USA** FCC (Registration Number: 759402, Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site,  
<http://www.grgtest.com>

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### 3. LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE

According to the KDB 447498 D04 Interim General RF Exposure Guidance v01, General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table 4.1 to support an exemption from further evaluation from 300 kHz through 100 GHz.

TABLE 4.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

| RF Source Frequency                                                                                                                      |   |           | Minimum Distance   |   |                    | Threshold ERP                        |
|------------------------------------------------------------------------------------------------------------------------------------------|---|-----------|--------------------|---|--------------------|--------------------------------------|
| $f_L$ MHz                                                                                                                                |   | $f_H$ MHz | $\lambda_L / 2\pi$ |   | $\lambda_H / 2\pi$ | W                                    |
| 0.3                                                                                                                                      | – | 1.34      | 159 m              | – | 35.6 m             | 1,920 R <sup>2</sup>                 |
| 1.34                                                                                                                                     | – | 30        | 35.6 m             | – | 1.6 m              | 3,450 R <sup>2</sup> /f <sup>2</sup> |
| 30                                                                                                                                       | – | 300       | 1.6 m              | – | 159 mm             | 3.83 R <sup>2</sup>                  |
| 300                                                                                                                                      | – | 1,500     | 159 mm             | – | 31.8 mm            | 0.0128 R <sup>2</sup> f              |
| 1,500                                                                                                                                    | – | 100,000   | 31.8 mm            | – | 0.5 mm             | 19.2R <sup>2</sup>                   |
| Subscripts L and H are low and high; $\lambda$ is wavelength.<br>From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns. |   |           |                    |   |                    |                                      |

For mobile devices that are not exempt per Table 4.1 at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in §1.1310 is necessary if the ERP of the device is greater than  $ERP_{20\text{cm}}$  in Formula (4.1).

Formula (4.1):

$$P_{\text{th}} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

#### 4. CALCULATION METHOD

Predication of MPE limit at a given distance

$EIRP(dBm) = \text{Maximum Tune-up Output power (dBm)} + \text{Maximum antenna gain(dBi)}$

$ERP(dBm) = EIRP(dBm) - 2.15$

R=minimum distance to the center of radiation of the antenna

From the EUT RF output power, the minimum mobile separation distance, d=20cm, as well as the maximum gain of the used as following information, the RF power ERP can be obtained.

**Table 1 Antenna Specification**

| Mode                  | Antenna type       | Maximum antenna gain |
|-----------------------|--------------------|----------------------|
| BLE                   | Internal antenna   | 3.24dBi              |
| 2.4G WiFi             | Internal antenna   | 3.24dBi              |
| Millimeter wave radar | Microstrip antenna | 0dBi                 |

**Table 2 Transmit Power**

| Mode      | Peak Conducted Output Power (dBm) | Target (dBm) | Tolerance ±(dB) |
|-----------|-----------------------------------|--------------|-----------------|
| BLE_1M    | 2.08                              | 2.0          | 1.0             |
| 2.4G WiFi | 21.72                             | 21.0         | 1.0             |

| Mode                  | EIRP (dBm) | Target (dBm) | Tolerance ±(dB) |
|-----------------------|------------|--------------|-----------------|
| Millimeter wave radar | 12.28      | 12.0         | 1.0             |

#### 5. ESTIMATION RESULT

##### 5.1 MEASUREMENT RESULTS

###### STANDALONE MPE

| Mode      | Frequency (MHz) | Maximum Tune-up Output power (dBm) | Antenna Gain (dBi) | Maximum Tune-up EIRP (dBm) | Maximum Tune-up ERP (dBm) | Maximum Tune-up ERP (W) | Threshold ERP(W) |
|-----------|-----------------|------------------------------------|--------------------|----------------------------|---------------------------|-------------------------|------------------|
| BLE_1M    | 2402- 2480      | 3.0                                | 3.24               | 6.24                       | 4.09                      | 0.0026                  | 0.768            |
| 2.4G WiFi | 2412- 2462      | 22.0                               | 3.24               | 25.24                      | 23.09                     | 0.2037                  | 0.768            |

| Mode                  | Frequency (MHz) | Maximum Tune-up EIRP (dBm) | Maximum Tune-up ERP (dBm) | Maximum Tune-up ERP (W) | Threshold ERP(W) |
|-----------------------|-----------------|----------------------------|---------------------------|-------------------------|------------------|
| Millimeter wave radar | 59.16-61.56GHz  | 13.0                       | 10.85                     | 0.012                   | 0.768            |

Remark:

1. RF Exposure use distance is 20cm from manufacturer declaration of user manual.
2. Threshold  $ERP(W) = 19.2R^2(W) = 19.2 \times 0.2^2(W) = 0.768(W)$ .
3.  $ERP(dBm) = EIRP(dBm) - 2.15$ .
4. The BLE and 2.4G WiFi can't simultaneously transmit. BLE & Millimeter wave radar can simultaneously transmit. 2.4G WiFi & Millimeter wave radar can simultaneously transmit.
5. For Millimeter wave radar EIRP refer to report 2402W88632E-RF-00A Rev 1.0 by Bay Area Compliance Laboratories Corp. (Dongguan) report date is 2024-09-18. For BLE & 2.4G WiFi refer to report E20240724756701-1 & E20240724756701-2.

**Maximum Simultaneous transmission MPE Ratio for 2.4G WiFi, BLE, Millimeter wave radar:**

| Maximum MPE ratio 2.4G WiFi | Maximum MPE ratio Millimeter wave radar | $\Sigma$ MPEratios | Limit | Results |
|-----------------------------|-----------------------------------------|--------------------|-------|---------|
| 0.265                       | 0.016                                   | 0.281              | 1.000 | Pass    |

| Maximum MPE ratio BLE | Maximum MPE ratio Millimeter wave radar | $\Sigma$ MPEratios | Limit | Results |
|-----------------------|-----------------------------------------|--------------------|-------|---------|
| 0.003                 | 0.016                                   | 0.019              | 1.000 | Pass    |

Remark:

According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;

$\Sigma$  of MPE ratios  $\leq 1.0$

## 6. CONCLUSION

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

----- End of Report -----