

# **MAXIMUM PERMISSIBLE EXPOSURE**

## **MEASUREMENT REPORT**

For

EUT Name: Wireless Photo Frame  
Item No.: PXT408WR01; PXT408WT01;  
PXT410WR01; PXT410WT01  
FCC ID: YHO-PXT408410  
Serial No.: Not supplied by client

Prepared for : Spheris Digital Ltd.  
Flat Room A21, BLK a, 4/F, Sheung Shui Plaza, 3ka fu close,  
Sheung Shui, Hong Kong

Prepared by : Shenzhen Toby Technology Co., Ltd.  
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Date of Test : May 31-June 02, 2010  
Date of Report : June 21, 2010

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## TEST REPORT DECLARATION

Applicant : Spheris Digital Ltd.  
Manufacturer : Spheris Digital Ltd.  
EUT Description : Wireless photo frame  
Model No. : PXT408WR01; PXT408WT01;  
PXT410WR01; PXT410WT01

The device described above is tested by Bontek Compliance Testing Laboratory Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits for both radiation and conduction emissions.

The measurement results are contained in this test report and Shenzhen Toby Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Toby Technology Co., Ltd.

Reported by: Ray Lai Date: June 21, 2010  
(Ray Lai)

Reviewer: Jacky Wang Date: June 22, 2010  
(Jacky Wang)

Approved by: Justin Zhang Date: June 22, 2010  
(Justin Zhang)

# 1. GENERAL INFORMATION

## 1.1. Product Description for Equipment Under Test (EUT)

### Client Information

Applicant : Spheris Digital Ltd.  
Address : Flat Room A21, BLK a, 4/F, Sheung Shui Plaza, 3ka fu close,  
Sheung Shui, Hong Kong  
Manufacturer : Spheris Digital Ltd.  
Address : Flat Room A21, BLK a, 4/F, Sheung Shui Plaza, 3ka fu close,  
Sheung Shui, Hong Kong

### General Description of E.U.T

|                        |   |  |
|------------------------|---|--|
| Equipment              | Wireless Photo Frame  |  |
| Trade Mark             | Pix-Star  |  |
| Model Name             | PXT408WR01  |  |
| Other Model Name       | PXT408WR01; PXT408WT01;<br>PXT410WR01; PXT410WT01   |  |
| Model Difference       | All above models are identical in schematic, structure and critical components except for different model number and appearance; We choose PXT408WR01 for test. |  |
| Product Description    | The EUT is Wireless Photo Frame   |  |
|                        | Operation frequency:  | 2412~2462 MHz  |
|                        | Modulation Type:  | 802.11b:CCK, QPSK, BPSK<br>802.11g:OFDM                      |
|                        | Bit Rate of Transmitter:  | 802.11b:11/5.5/2/1 Mbps<br>802.11g:54/48/36/24/18/12/9/6Mbps |
|                        | Number Of Channel   | Please see Note 2.   |
|                        | Antenna Designation:  | Please see Note 3.   |
|                        | Antenna Gain(Peak)  | Please see Note 3.   |
|                        | Output Power:   | 802.11b: 11.36 dBm (Max.)<br>802.11g: 10.62 dBm (Max.)       |
| Channel List           | Please refer to the Note 2.   |  |
| Power Source           | DC Voltage supplied from AC/DC adapter.<br>Model name:GFP151U-050250B-1<br>Brand name: GME  |  |
| Power Rating           | I/P 100-240V~ 50/60Hz, 0.36A O/P 5.0 V, 2.5A  |  |
| Products Covered       | N/A   |  |
| Connecting I/O Port(s) | Please refer to the User's Manual   |  |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Channel list.

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 1       | 2412            | 5       | 2432            | 9       | 2452            |
| 2       | 2417            | 6       | 2437            | 10      | 2457            |
| 3       | 2422            | 7       | 2442            | 11      | 2462            |
| 4       | 2427            | 8       | 2447            |         |                 |

3. Antenna description.

| Ant. | Brand    | Model Name | Antenna Type | Connector | Gain (dBi) |
|------|----------|------------|--------------|-----------|------------|
| 1    | Sky Wave | HF1100     | Embedded     | U.FL      | 2.0        |

**1.2. Description of Test Modes**

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| For Conducted Test |             |
|--------------------|-------------|
| Final Test Mode    | Description |
| Mode 1             | WIFI MODE   |

| For Radiated Test |                             |
|-------------------|-----------------------------|
| Final Test Mode   | Description                 |
| Mode 2            | TX B MODE CHANNEL 01//06/11 |
| Mode 3            | TX G MODE CHANNEL 01/06/11  |

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.

**1.3. Description of Test Software Setting**

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of WLAN.

| Test software Version | Test Program: LABTOOL |          |          |
|-----------------------|-----------------------|----------|----------|
|                       | 2412 MHz              | 2437 MHz | 2462 MHz |
| IEEE 802.11b DSSS     | 14                    | 14       | 14       |
| IEEE 802.11g OFDM     | 14                    | 14       | 14       |

#### **1.4. Test Location**

**FCC – Registration No.: 338263**

BONTEK ELECTRONIC TECHNOLOGY CO., LTD., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March, 2008.

Bontek Compliance Testing Laboratory Ltd

Address: 1/F, Block East H-3, OCT Eastern Ind. Zone Qiaocheng East Road, Nanshan, Shenzhen, 518055 China

## 2. PEAK OUTPUT POWER TEST

### 2.1. Limits

| FCC Part15 (15.247) , Subpart C |                   |                 |                       |        |
|---------------------------------|-------------------|-----------------|-----------------------|--------|
| Section                         | Test Item         | Limit           | Frequency Range (MHz) | Result |
| 15.247(b)(3)                    | Peak Output Power | 1 watt or 30dBm | 2400-2483.5           | PASS   |

### 2.2. Test Equipment List and Details

| Description  | Manufacturer | Model No. | Serial No. | Cal. Date  | Cal. Date  |
|--------------|--------------|-----------|------------|------------|------------|
| Power Meter  | Boonton      | 4232A     | 29002      | 2009-11-05 | 2010-11-05 |
| Power Sensor | Boonton      | 51024     | 31286      | 2009-11-05 | 2010-11-05 |

### 2.3. Test Procedure

The EUT was directly connected to the power metter and antenna output port as show in the block diagram below.

### 2.4. Test SET-UP





## 2.5. Test Result

|              |                            |       |                    |              |
|--------------|----------------------------|-------|--------------------|--------------|
| EUT:         | Wireless<br>Frame          | Photo | Model Name :       | PTX408WR01   |
| Temperature: | 23 °C                      |       | Relative Humidity: | 54 %         |
| Pressure:    | 1010hPa                    |       | Test Power :       | AC 120V/60Hz |
| Test Mode :  | TX B MODE CHANNEL 01/06/11 |       |                    |              |

| Test Channel | Frequency<br>(MHz) | Peak Output Power<br>(dBm) | LIMIT<br>(dBm) | LIMIT<br>(W) |
|--------------|--------------------|----------------------------|----------------|--------------|
| CH01         | 2412 MHz           | 9.24                       | 30             | 1            |
| CH06         | 2437 MHz           | 9.18                       | 30             | 1            |
| CH11         | 2462 MHz           | 9.36                       | 30             | 1            |

|              |                            |       |                    |              |
|--------------|----------------------------|-------|--------------------|--------------|
| EUT:         | Wireless<br>Frame          | Photo | Model Name :       | PTX408WR01   |
| Temperature: | 23 °C                      |       | Relative Humidity: | 54 %         |
| Pressure:    | 1010hPa                    |       | Test Power :       | AC 120V/60Hz |
| Test Mode :  | TX G MODE CHANNEL 01/06/11 |       |                    |              |

| Test Channel | Frequency<br>(MHz) | Peak Output Power<br>(dBm) | LIMIT<br>(dBm) | LIMIT<br>(W) |
|--------------|--------------------|----------------------------|----------------|--------------|
| CH01         | 2412 MHz           | 8.53                       | 30             | 1            |
| CH06         | 2437 MHz           | 8.47                       | 30             | 1            |
| CH11         | 2462 MHz           | 8.62                       | 30             | 1            |

### 3. MAXIMUM PERMISSIBLE EXPOSURE TEST

#### 3.1. Limits

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

#### (A) Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength(E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S)(mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|----------------------------------|-----------------------------------|---|--|
| 0.3-3.0               | 614                              | 1.63                              | (100)*                                  | 6  |
| 3.0-30                | 1842 / f                         | 4.89 / f                          | (900 / f)*                              | 6  |
| 30-300                | 61.4                             | 0.163                             | 1.0                                     | 6  |
| 300-1500              |                                  |                                   | F/300                                   | 6  |
| 1500-100,000          |                                  |                                   | 5                                       | 6  |

#### (B) Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | ElectricField Strength(E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S)(mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|---------------------------------|-----------------------------------|---|--|
| 0.3-1.34              | 614                             | 1.63                              | (100)*                                  | 30   |
| 1.34-30               | 824/f                           | 2.19/f                            | (180/f)*                                | 30   |
| 30-300                | 27.5                            | 0.073                             | 0.2                                     | 30   |
| 300-1500              |                                 |                                   | F/1500                                  | 30   |
| 1500-100,000          |                                 |                                   | 1.0                                     | 30   |

Note: f = frequency in MHz ; \*Plane-wave equivalent power density

### 3.2. MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**E** = Electric field (V/m)

**P** = Peak RF output power (W)

**G** = EUT Antenna numeric gain (numeric)

**d** = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance,  $d=0.2\text{m}$ , as well as the gain of the used antenna, the RF power density can be obtained.

### 3.3. Test Result

|              |                            |                    |              |
|--------------|----------------------------|--------------------|--------------|
| EUT:         | Wireless Photo<br>Frame    | Model Name :       | PTX408WR01   |
| Temperature: | 23 °C                      | Relative Humidity: | 54 %         |
| Pressure:    | 1010hPa                    | Test Power :       | AC 120V/60Hz |
| Test Mode :  | TX B MODE CHANNEL 01/06/11 |                    |              |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) (mW/cm <sup>2</sup> ) | Limit of Power Density(S) (mW/cm <sup>2</sup> ) | Test Result |
|--------------------|------------------------|-------------------------|------------------------|---|---|-------------|
| 2.00               | 1.5849                 | 9.24                    | 8.3946                 | 0.00264820                              | 1   | Complies    |
| 2.00               | 1.5849                 | 9.18                    | 8.2794                 | 0.00261186                              | 1   | Complies    |
| 2.00               | 1.5849                 | 9.36                    | 8.6298                 | 0.00272239                              | 1   | Complies    |

|              |                            |                    |              |
|--------------|----------------------------|--------------------|--------------|
| EUT:         | Wireless Photo<br>Frame    | Model Name :       | PTX408WR01   |
| Temperature: | 23 °C                      | Relative Humidity: | 54 %         |
| Pressure:    | 1010hPa                    | Test Power :       | AC 120V/60Hz |
| Test Mode :  | TX G MODE CHANNEL 01/06/11 |                    |              |

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) (mW/cm <sup>2</sup> ) | Limit of Power Density(S) (mW/cm <sup>2</sup> ) | Test Result |
|--------------------|------------------------|-------------------------|------------------------|---|---|-------------|
| 2.00               | 1.5849                 | 8.53                    | 7.1285                 | 0.00224880                              | 1   | Complies    |
| 2.00               | 1.5849                 | 8.47                    | 7.0307                 | 0.00221794                              | 1   | Complies    |
| 2.00               | 1.5849                 | 8.62                    | 7.2778                 | 0.00229589                              | 1   | Complies    |