



## Bandai (HK) Company Limited

Application  
For  
Certification

**FCC ID: PQ337480DDTG14**

**TAMAGOTCHI FRIENDS DIGITAL FRIEND**

**Model: UV0037480-DD**

**Additional Models: UV0037493, UV0037494, UV0037495, UV0037496,  
UV0037497, UV0037498**

**Transceiver**

**Report No.: SZHH00896286-003**

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-01-13]

Prepared and Checked by:

Approved by:

Sign on file

Jimmy Wen  
Engineer

Digitally signed  
by Andy Yan  
Location: Intertek  
Testing Services

Andy Yan  
Senior Project Engineer  
Date: December 23, 2014

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
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- The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF No.: FCC 15C\_Tx\_b

**Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch**

6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China  
Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751 Website: www.china.intertek-etlsemko.com

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## INTERTEK TESTING SERVICES

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#### *INTRODUCTION*

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## INTERTEK TESTING SERVICES

### MEASUREMENT / TECHNICAL REPORT

**Bandai (HK) Company Limited**

**Model: UV0037480-DD**

**Additional Models: UV0037493, UV0037494, UV0037495, UV0037496,  
UV0037497, UV0037498**

**FCC ID: PQ337480DDTG14**

This report concerns (check one:)      Original Grant ☒ Class II Change ☐

Equipment Type: DCD-Low Power Transmitter Below 1705 KHz

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?      Yes ☐      No ☒

If yes, defer until: \_\_\_\_\_  
date

Company Name agrees to notify the Commission by: \_\_\_\_\_  
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37?      Yes ☐      No ☒

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-01-13 Edition] provision.

Report prepared by:

Jimmy Wen  
Intertek Testing Services Shenzhen Ltd.  
Kejiyuan Branch  
6F, D Block, Huahan Building, Langshan Road  
Nanshan District, Shenzhen, P. R. China  
Phone: (86 755) 8614 0713  
Fax: (86 755) 8601 6751

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## INTERTEK TESTING SERVICES

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### List of attached file

| Exhibit Type          | File Description           | Filename            |
|-----------------------|----------------------------|---------------------|
| Test Report           | Test Report                | report.pdf          |
| Test Setup Photo      | Radiated photos            | radiated photos.pdf |
| External Photo        | External Photos            | external photos.pdf |
| Internal Photo        | Internal Photos            | internal photos.pdf |
| Schematics            | Circuit Diagram            | circuit.pdf         |
| Operation Description | Technical Description      | descri.pdf          |
| Block Diagram         | Block Diagram              | block.pdf           |
| ID Label / Location   | Label Artwork and Location | label.pdf           |
| User Manual           | User Manual                | manual.pdf          |
| Cover Letter          | Letter of Agency           | agency.pdf          |

# **INTERTEK TESTING SERVICES**

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## **EXHIBIT 1**

### **GENERAL DESCRIPTION**

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### 1.0 General Description

#### 1.1 Product Description

The equipment under test (EUT) is a TAMAGOTCHI FRIENDS DIGITAL FRIEND operating at the frequency 125 KHz. The EUT is powered by DC 3.0V (2 x 1.5V AAA batteries).

The Models: UV0037493, UV0037494, UV0037495, UV0037496, UV0037497, UV0037498 are the same as the Model: UV0037480-DD in hardware aspect. The difference in item name and main body color serves as marketing strategy.

Antenna Type: Integral antenna

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

#### 1.2 Related Submittal(s) Grants

This is a single application for certification of a transceiver.

#### 1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements was performed according to the procedures in ANSI C63.4 (2009). Radiated emission measurement was performed in Semi-anechoic chamber. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

#### 1.4 Test Facility

The Semi-anechoic chamber used to collect the radiated data is **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

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## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 2**

### **SYSTEM TEST CONFIGURATION**

## INTERTEK TESTING SERVICES

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### 2.0 **System Test Configuration**

#### 2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2009).

The EUT was powered by two new DC 1.5V AAA batteries during the test and only the worst data was reported in this report.

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emission at and above 30 MHz, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data report in Exhibit 3.0.

The unit was operated standalone and placed in the center of the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on turntable, which enabled the Engineer to maximize emissions through its placement in the three orthogonal axes.

#### 2.2 EUT Exercising Software

N/A.

#### 2.3 Special Accessories

No special accessory.

#### 2.4 Equipment Modification

Any modifications installed previous to testing by Bandai (HK) Company Limited will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

## **INTERTEK TESTING SERVICES**

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### **2.5 Measurement Uncertainty**

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

### **2.6 Support Equipment List and Description**

N/A

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## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 3**

### **EMISSION RESULTS**

### 3.0 **Emission Results**

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

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## INTERTEK TESTING SERVICES

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### 3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

where FS = Field Strength in dB $\mu$ V/m

RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

#### Example

Assume a receiver reading of 62.0dB $\mu$ V is obtained. The antenna factor of 7.4dB and cable factor of 1.6dB is added. The amplifier gain of 29dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0dB, and the resultant average factor was -10dB. The net field strength for comparison to the appropriate emission limit is 32dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$RA = 62.0\text{dB}\mu\text{V}$$

$$AF = 7.4\text{dB}$$

$$CF = 1.6\text{dB}$$

$$AG = 29.0\text{dB}$$

$$PD = 0\text{dB}$$

$$AV = -10\text{dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32\text{dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V/m})/20] = 39.8\mu\text{V/m}$$

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### 3.2 Radiated Emission Data and Configuration Photograph

Worst Case Radiated Emission  
At  
0.500 MHz

Judgement: Passed by 23.8 dB

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos.pdf.

#### **TEST PERSONNEL:**

*Sign on file*

Jimmy Wen, Engineer

*Typed / Printed Name*

October 31, 2014

*Date*

## INTERTEK TESTING SERVICES

Company: Bandai (HK) Company Limited  
Model: UV0037480-DD  
Operating Mode: Transmit

Date of Test: October 31, 2014

**Table 1**

### **Radiated Emissions**

| Polarization | Frequency (MHz) | Net at 3m (dB $\mu$ V) | Distance Factor (-dB) (dB) | Calculated at 300m (dB $\mu$ V/m) | Limit at 300m (dB $\mu$ V/m) | Margin (dB) |
|--------------|-----------------|------------------------|----------------------------|-----------------------------------|------------------------------|-------------|
| Vertical     | 0.125           | 66.1                   | 80.0                       | -13.9                             | 25.7                         | -39.6       |
| Vertical     | 0.250           | 55.9                   | 80.0                       | -24.1                             | 19.6                         | -43.7       |
| Vertical     | 0.375           | 56.6                   | 80.0                       | -23.4                             | 16.1                         | -39.5       |

| Polarization | Frequency (MHz) | Net at 3m (dB $\mu$ V) | Distance Factor (-dB) (dB) | Calculated at 30m (dB $\mu$ V/m) | Limit at 30m (dB $\mu$ V/m) | Margin (dB) |
|--------------|-----------------|------------------------|----------------------------|----------------------------------|-----------------------------|-------------|
| Vertical     | 0.500           | 49.8                   | 40.0                       | 9.8                              | 33.6                        | -23.8       |
| Vertical     | 0.625           | 45.7                   | 40.0                       | 5.7                              | 31.7                        | -26.0       |
| Vertical     | 0.750           | 46.2                   | 40.0                       | 6.2                              | 30.1                        | -23.9       |
| Vertical     | 0.875           | 44.1                   | 40.0                       | 4.1                              | 28.8                        | -24.7       |
| Vertical     | 1.000           | 42.7                   | 40.0                       | 2.7                              | 27.6                        | -24.9       |
| Vertical     | 1.125           | 42.7                   | 40.0                       | 2.7                              | 26.6                        | -23.9       |

#### NOTES:

1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3 meter distances were measured at 0.3- meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Loop Antenna was used for the frequency band below 30MHz.
5. The formula of factor at frequencies below 30MHz is extrapolated according to FCC part 15.31 (f) as below.  
Limit dB $\mu$ V/m at 3m = Limit dB $\mu$ V/m at 300m + 40log(300/3) dB  
Limit dB $\mu$ V/m at 3m = Limit dB $\mu$ V/m at 30m + 40log(30/3) dB

Test Engineer: Jimmy Wen

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## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 4**

### **EQUIPMENT PHOTOGRAPHS**

## INTERTEK TESTING SERVICES

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### 4.0 **Equipment Photographs**

For electronic filing, photographs of the tested EUT are saved with filename: external photos.pdf and internal photos.pdf.

**EXHIBIT 5**  
**PRODUCT LABELLING**

## INTERTEK TESTING SERVICES

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### 5.0 **Product Labelling**

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

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### **EXHIBIT 6**

### **TECHNICAL SPECIFICATIONS**

## INTERTEK TESTING SERVICES

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### 6.0 **Technical Specifications**

For electronic filing, the block diagram of the tested EUT is saved with filename: block.pdf and circuit.pdf respectively.

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## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 7**

### **INSTRUCTION MANUAL**

## INTERTEK TESTING SERVICES

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### 7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold / leased in the United States.

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## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 8**

### **MISCELLANEOUS INFORMATION**

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## INTERTEK TESTING SERVICES

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### 8.0 **Miscellaneous Information**

This miscellaneous information includes emission measuring procedure.

#### 8.1 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitter operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 – 2009.

The Transmitter equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjust through all three orthogonal axes to obtain maximum emission levels. For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emission at and above 30 MHz, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed.

The IF bandwidth used for measurement of radiated signal strength was 10 KHz for emission below 30 MHz and 120 KHz for emission from 30 MHz to 1000 MHz.

For radiated emission, the frequency range scanned is 9KHz to 1GHz.

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## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 9**

### **TEST EQUIPMENT LIST**

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## INTERTEK TESTING SERVICES

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### 9.0 Test Equipment List

| Equipment No. | Equipment           | Manufacturer    | Model No.   | Serial No. | Cal. Date | Due Date  |
|---------------|---------------------|-----------------|-------------|------------|-----------|-----------|
| SZ061-03      | BiConiLog Antenna   | ETS             | 3142C       | 00066460   | 28-Jun-14 | 28-Jun-15 |
| SZ185-01      | EMI Receiver        | R&S             | ESCI        | 100547     | 10-Mar-14 | 10-Mar-15 |
| SZ061-06      | Active Loop Antenna | Electro-Metrics | EM-6876     | 217        | 29-Apr-14 | 29-Apr-15 |
| SZ188-01      | Anechoic Chamber    | ETS             | RFD-F/A-100 | 4102       | 19-Apr-14 | 19-Mar-15 |
| SZ062-22      | RF Cable            | HUBER+SUHNER    | SF104PE     | MY1913/4PE | 11-Nov-13 | 11-Nov-14 |
| SZ062-23      | RF Cable            | HUBER+SUHNER    | SF104PE     | MY4262/4PE | 11-Nov-13 | 11-Nov-14 |
| SZ062-26      | RF Cable            | HUBER+SUHNER    | SF104PE     | MY4556/4PE | 14-Jan-14 | 14-Jan-15 |