



**Antonio Precise Products Manufactory Ltd.**

Application  
For  
Certification

Bluetooth Dongle

**(FCC ID: QLM0150609)**

06152941  
KL/ ac  
June 20, 2007

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# INTERTEK TESTING SERVICES

## MEASUREMENT/TECHNICAL REPORT

**Antonio Precise Products Manufactory Ltd. - Model: BD23**  
**FCC ID: QLM0150609**

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

Equipment Type : DXT - Pt 15 Low Pwr Transceiver, Rx Verified  
JBP - Pt 15 Class B Computer Peripheral

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

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   X  

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [04-05-05  
Edition] Provision.

Report prepared by:

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# INTERTEK TESTING SERVICES

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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
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated & Conducted Emission for Dongle	config photos.doc
Test Report	Emission Plot	emission.pdf
Test Report	Conducted Emission Test Result	conduct.pdf
External Photo	External Photo	external photos.doc
Internal Photo	Internal Photo	internal photos.doc
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf

# **INTERTEK TESTING SERVICES**

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## **EXHIBIT 1 GENERAL DESCRIPTION**

## INTERTEK TESTING SERVICES

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### 1.0 General Description

#### 1.1 Product Description

The Equipment Under Test (EUT) is a Bluetooth Dongle operating at 2402.000MHz to 2480.000MHz. The EUT is powered by 1 x “AAA” size 1.5V alkaline battery. The EUT has a ON/OFF button for turning on or off itself and also for pairing with a Bluetooth-equipped mobile device or a Bluetooth-equipped headphone. After switching on the unit, it transmits an audio signal and a file to a corresponding Bluetooth-equipped mobile device and headphone when connecting an audio device and an USB cable/adaptor respectively.

The antennas used in dongle is integral, and the tested sample is a prototype.

The circuit description is saved with filename: descri.pdf

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### 1.2 Related Submittal(s) Grants

This is an Application for Certification of a DXT - Part 15 Low Power Transceiver, RX Verified and a JBP – Part 15 Class B Computing Device Peripheral. One Transmitter is included in this application.

### 1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine 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 open area test site and conducted measurement facility used to collect the radiated data and conducted data are located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.



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### **EXHIBIT 2 SYSTEM TEST CONFIGURATION**

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### 2.0 System Test Configuration

#### 2.1 Justification

For emissions testing, the equipment under test (EUT) was setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by 1 x 1.5V alkaline battery.

For the measurements, the EUT is attached to a plastic stand if necessary and placed on the wooden turntable. The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

#### 2.2 EUT Exercising Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

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### 2.3 Support Equipment List and Description

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system are:

#### *POWER SOURCE:*

An "AAA" size 1.5VDC alkaline battery is used to power the device.

#### *CABLES:*

- (1) 1 x USB Mini B 5-pin adaptor (Supplied by Client)
- (2) 1 x USB cable A to Mini B 5-pin with 1 meter long (Supplied by Client)
- (3) 1 x serial cable with 1 meter long

#### *OTHERS:*

- (1) Sony Walkman, Model: WM-FX288
- (2) HP Notebook, Model: NC6220, S/N: CNU62015KN, DoC Product
- (3) HP Mouse, Model: M-UV96, S/N: F93A90AN3SY385Y, DoC Product
- (4) Hayes Modem, Model: 6800CN, S/N: A00900153317, FCC ID: BFJ9D907-00038
- (5) Genius Modem, Model: GM56EX, S/N: ZT5505000355, DoC Product

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### 2.4 Measurement Uncertainty

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

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

### 2.5 Equipment Modification

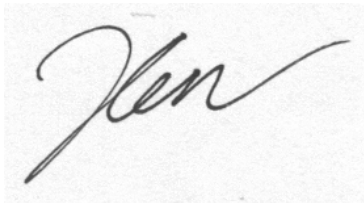
Any modifications installed previous to testing by Antonio Precise Products Manufactory Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by ETL Division, Intertek Testing Services Hong Kong Ltd.

All the items listed under section 2.0 of this report are confirmed by:

*Confirmed by:*

*Lam Chun Cheong, Kenneth  
Assistant Supervisor  
Intertek Testing Services  
Agent for Antonio Precise Products Manufactory Ltd.*



\_\_\_\_\_  
Signature

\_\_\_\_\_  
June 18, 2007

\_\_\_\_\_  
Date

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 3 EMISSION RESULTS**

## INTERTEK TESTING SERVICES

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### 3.0 **Emission Results**

Data is included of the 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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### 3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

where       $FS$  = Field Strength in  $\text{dB}\mu\text{V/m}$   
               $RA$  = Receiver Amplitude (including preamplifier) in  $\text{dB}\mu\text{V}$   
               $CF$  = Cable Attenuation Factor in  $\text{dB}$   
               $AF$  = Antenna Factor in  $\text{dB}$   
               $AG$  = Amplifier Gain in  $\text{dB}$

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:-

$$FS = RR + LF$$

where       $FS$  = Field Strength in  $\text{dB}\mu\text{V/m}$   
               $RR = RA - AG$  in  $\text{dB}\mu\text{V}$   
               $LF = CF + AF$  in  $\text{dB}$

Assume a receiver reading of  $52.0 \text{ dB}\mu\text{V}$  is obtained. The antenna factor of  $7.4 \text{ dB}$  and cable factor of  $1.6 \text{ dB}$  is added. The amplifier gain of  $29 \text{ dB}$  is subtracted, giving a field strength of  $32 \text{ dB}\mu\text{V/m}$ . This value in  $\text{dB}\mu\text{V/m}$  was converted to its corresponding level in  $\mu\text{V/m}$ .

$RA = 52.0 \text{ dB}\mu\text{V}$	
$AF = 7.4 \text{ dB}$	$RR = 23.0 \text{ dB}\mu\text{V}$
$CF = 1.6 \text{ dB}$	$LF = 9.0 \text{ dB}$
$AG = 29.0 \text{ dB}$	
$FS = RR + LF$	
$FS = 23 + 9 = 32 \text{ dB}\mu\text{V/m}$	

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

## **INTERTEK TESTING SERVICES**

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### 3.2 Radiated Emission Configuration Photograph - Dongle

Worst Case Radiated Emission

at 2441.000 MHz & 9764.000 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: config photos.doc



## INTERTEK TESTING SERVICES

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### 3.3 Radiated Emission Data - Dongle

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Judgement : Passed by 0.6 dB margin

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#### **TEST PERSONNEL:**



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*Tester Signature*

Jess Tang, Lead Engineer  
*Typed/Printed Name*

June 18, 2007  
*Date*

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## INTERTEK TESTING SERVICES

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Company: Antonio Precise Products Manufactory Ltd. Date of Test: August 25-September 15, 2006  
Model: BD23  
Mode : TX-Channel 1

Table 1

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre- Amp (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	2402.000	96.6	33	29.4	93.0	94.0	-1.0
V	*4804.000	47.9	33	34.9	49.8	54.0	-4.2
V	7206.000	48.0	33	37.9	52.9	54.0	-1.1
V	9608.000	45.7	33	40.4	53.1	54.0	-0.9
V	*12010.000	45.5	33	40.5	53.0	54.0	-1.0

- NOTES: 1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated 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. Horn antenna is used for the emission over 1000MHz.
5. Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).
- \* Emission within the restricted band meets the requirement of part 15.205.

Test Engineer: Jess Tang

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## INTERTEK TESTING SERVICES

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Company: Antonio Precise Products Manufactory Ltd. Date of Test: August 25-September 15, 2006  
Model: BD23  
Mode : TX-Channel 40

Table 2

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre- Amp (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	2441.000	97.0	33	29.4	93.4	94.0	-0.6
V	*4882.000	47.7	33	34.9	49.6	54.0	-4.4
V	*7323.000	48.1	33	37.9	53.0	54.0	-1.0
V	9764.000	46.0	33	40.4	53.4	54.0	-0.6
V	*12205.000	45.7	33	40.5	53.2	54.0	-0.8

- NOTES: 1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated 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. Horn antenna is used for the emission over 1000MHz.
5. Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).
- \* Emission within the restricted band meets the requirement of part 15.205.

Test Engineer: Jess Tang

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## INTERTEK TESTING SERVICES

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Company: Antonio Precise Products Manufactory Ltd.    Date of Test: August 25-September 15, 2006  
Model: BD23  
Mode : TX-Channel 79

Table 3

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre- Amp (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	2480.000	96.9	33	29.4	93.3	94.0	-0.7
V	*4960.000	47.7	33	34.9	49.6	54.0	-4.4
V	*7440.000	48.1	33	37.9	53.0	54.0	-1.0
V	9920.000	45.4	33	40.4	52.8	54.0	-1.2
V	*12400.000	45.5	33	40.5	53.0	54.0	-1.0

- NOTES: 1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated 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. Horn antenna is used for the emission over 1000MHz.
5. Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).
- \* Emission within the restricted band meets the requirement of part 15.205.

Test Engineer: Jess Tang

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## INTERTEK TESTING SERVICES

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### 3.4 Radiated Emission on the Bandedge

From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz and 2483.5MHz). In case of the fundamental emissions are within two standard bandwidths from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.4 (2003) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).

Please refer to the following plots for radiated emission on the bandedge:

Plot D1A\*: Handset - Low Channel Emissions

Plot D1B: Handset - High Channel Emissions

For electronic filing, the above plots are saved with filename: emission.pdf

\* Bandedge compliance is determined by applying marker-delta method, i.e.

Resultant field strength = Fundamental emissions - delta from the plot

$$= 93.0\text{dB}\mu\text{V/m} - 46.88\text{dB}$$

$$= 46.12\text{dB}\mu\text{V/m}$$

The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 54dB $\mu$ V/m.

## **INTERTEK TESTING SERVICES**

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### 3.5 Line Conducted Configuration Photograph - Dongle

Worst Case Line-Conducted Configuration

at 0.225 MHz

For electronic filing, the worst case line conducted configuration photographs are saved with filename: config photos.doc

## INTERTEK TESTING SERVICES

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### 3.6 Line Conducted Emission Data - Dongle

The data on the following pages list the significant emission frequencies, the limit, and the margin of compliance.

Judgement : Passed by 18.0 dB margin

For electronic filing, the conducted emission test result is saved with filename: conduct.pdf

#### **TEST PERSONNEL:**



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*Tester Signature*

Jess Tang, Lead Engineer  
*Typed/Printed Name*

June 18, 2007

*Date*

## INTERTEK TESTING SERVICES

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Company: Antonio Precise Products Manufactory Ltd.    Date of Test: August 25-September 15, 2006  
Model: BD23

### 3.7 Radiated Emissions from Digital Portion of EUT, FCC Ref: 15.109

- ☐ Not required - No digital part
- ☒ Test results are attached
- ☐ Included in the separated DOC report.



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## INTERTEK TESTING SERVICES

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Company: Antonio Precise Products Manufactory Ltd.    Date of Test: August 25-September 15, 2006  
Model: BD23  
Mode: Data Transfer via USB and Bluetooth

Table 4

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
H	48.000	31.9	16	11.0	26.9	40.0	-13.1
H	128.001	34.4	16	14.0	32.4	43.5	-11.1
H	143.998	33.0	16	14.0	31.0	43.5	-12.5
H	160.000	30.7	16	16.0	30.7	43.5	-12.8
H	192.000	32.4	16	16.0	32.4	43.5	-11.1
H	223.999	25.5	16	18.0	27.5	46.0	-18.5
H	256.000	21.8	16	21.0	26.8	46.0	-19.2

- NOTES:
1. Peak detector is used for the emission measurement.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance 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 radiated 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.

Test Engineer: Jess Tang

**EXHIBIT 4  
EQUIPMENT PHOTOGRAPHS**

## INTERTEK TESTING SERVICES

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### 4.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.doc & internal photos.doc

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 5 PRODUCT LABELLING**

## INTERTEK TESTING SERVICES

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### 5.0 **Product Labelling**

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

## **INTERTEK TESTING SERVICES**

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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 and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

## **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

The required FCC Information to the User is stated on P.9 of the Instruction Manual.

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