

**Primatronix Ltd.**

Application  
For  
Certification

Bluetooth Headset

**(FCC ID: DYF86708)**

06146851  
KL/ Ann Choy  
August 8, 2006

- 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.
- This report shall not be reproduced except in full without prior authorization from Intertek Testing Services Hong Kong Limited.
- For Terms And Conditions of the services, it can be provided upon request.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

**Intertek Testing Services Hong Kong Ltd.**

2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.  
Tel: (852) 2173 8888 Fax: (852) 2741 1693 Website: [www.hk.intertek-etlsemko.com](http://www.hk.intertek-etlsemko.com)

## LIST OF EXHIBITS

### *INTRODUCTION*

<i>EXHIBIT 1:</i>	General Description
<i>EXHIBIT 2:</i>	System Test Configuration
<i>EXHIBIT 3:</i>	Emission Results
<i>EXHIBIT 4:</i>	Equipment Photographs
<i>EXHIBIT 5:</i>	Product Labelling
<i>EXHIBIT 6:</i>	Technical Specifications
<i>EXHIBIT 7:</i>	Instruction Manual

**FCC ID: DYF86708**

---

# INTERTEK TESTING SERVICES

---

## Table of Contents

<b>1.0 General Description</b>	2
1.1 Product Description	2
1.2 Related Submittal(s) Grants	3
1.3 Test Methodology	3
1.4 Test Facility	3
<b>2.0 System Test Configuration</b>	5
2.1 Justification	5
2.2 EUT Exercising Software	5
2.3 Support Equipment List and Description	6
2.4 Measurement Uncertainty	7
2.5 Equipment Modification	7
<b>3.0 Emission Results</b>	9
3.1 Field Strength Calculation	10
3.2 Radiated Emission Configuration Photograph - Headset	11
3.3 Radiated Emission Data - Headset	12
3.4 Radiated Emission on the Bandedge	16
3.5 Line Conducted Configuration Photograph - Headset	17
3.6 Line Conducted Emission Data	18
3.7 Radiated Emissions from Digital Portion of EUT	19
<b>4.0 Equipment Photographs</b>	22
<b>5.0 Product Labelling</b>	24
<b>6.0 Technical Specifications</b>	26
<b>7.0 Instruction Manual</b>	28

---

## INTERTEK TESTING SERVICES

---

### 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 Emission for Headset	config photos.doc
Test Report	Emission Plot	emission.pdf
Test Setup Photo	Conducted Emission	config photos.doc
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**

---

## **EXHIBIT 1 GENERAL DESCRIPTION**

## INTERTEK TESTING SERVICES

---

### 1.0 General Description

#### 1.1 Product Description

The Equipment Under Test (EUT) is a Bluetooth Headset operating at 2402.000MHz to 2480.000MHz. The EUT is powered by 2 x "Ni-MH" Type GP rechargeable battery (1.2V 400mAh, Model: 40AAAMC) and/or a switching power adaptor (100-240VAC to 5.4VDC 450mA, model: S004CU0540045), a desktop cradle, or an USB port. The EUT consists of three function keys (Volume +, Volume -, Talk). After switching on the unit, it transmits a user's voice to a corresponding paired Bluetooth enable phone.

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

The circuit description is saved with filename: descri.pdf

## INTERTEK TESTING SERVICES

---

### 1.2 Related Submittal(s) Grants

This is an Application for Certification of a DXT - Part 15 Low Power Transceiver, RX Verified. 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 is 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.

## **INTERTEK TESTING SERVICES**

---

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

## INTERTEK TESTING SERVICES

---

### 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 2 x "Ni-MH" Type GP rechargeable battery (1.2V 400mAh, model: 40AAAMC) and/or a switching power adaptor (100-240VAC to 5.4VDC 450mA, model: S004CU0540045), a desktop cradle, or an USB port.

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.

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.

All relevant operation modes with different power sources have been tested, and the worst case data is included in this report.

#### 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.

---

## INTERTEK TESTING SERVICES

---

### 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:

#### *HARDWARE:*

The unit was operated standalone. An AC adaptor and a rechargeable battery (provided with the unit) were used to power the device. Their description are listed below.

- (1) A switching power adaptor (100-240VAC to 5.4VDC 450mA, Model: S004CU0540045)
- (2) 2 x "Ni-MH" type GP rechargeable battery (1.2V 400mAh, Model: 40AAAMC)

#### *CABLES:*

- (1) 1 x serial cable with 1 meter long
- (2) 1 x USB cable with 1.1 meter long (Supplied by Client)

#### *OTHERS:*

- (1) HP Notebook, Model: nc6220, S/N: CNU62015KN, DoC Product
- (2) HP USB Mouse, Model: M-UV96, S/N: 265986-003, DoC Product
- (3) Genius 56K Modem, Model: GM56EX, S/N: ZT5505000355, DoC Product

## INTERTEK TESTING SERVICES

---

### 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

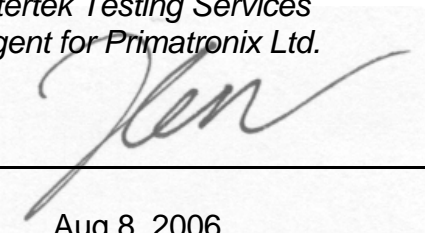
Any modifications installed previous to testing by Primatronix Ltd. will be incorporated in each production model sold/leased in the United States.

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  
Senior Lead Engineer  
Intertek Testing Services  
Agent for Primatronix Ltd.*



Signature

Aug 8, 2006

Date

## **INTERTEK TESTING SERVICES**

---

### **EXHIBIT 3 EMISSION RESULTS**

## INTERTEK TESTING SERVICES

---

### 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.

---

## INTERTEK TESTING SERVICES

---

### 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  $\text{dB}\mu\text{V}/\text{m}$   
               $RA$  = 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  $\text{dB}\mu\text{V}/\text{m}$   
               $RR = RA - AG$  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  $32 \text{ dB}\mu\text{V}/\text{m}$ . This value in  $\text{dB}\mu\text{V}/\text{m}$  was converted to its corresponding level in  $\mu\text{V}/\text{m}$ .

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

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

## **INTERTEK TESTING SERVICES**

---

### 3.2 Radiated Emission Configuration Photograph - Headset

Worst Case Radiated Emission

at 4804.000 MHz

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

## INTERTEK TESTING SERVICES

---

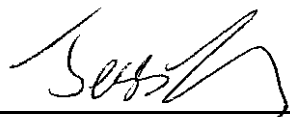
### 3.3 Radiated Emission Data - Headset

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

Judgement : Passed by 0.4 dB margin

\*\*\*\*\*

#### **TEST PERSONNEL:**



\_\_\_\_\_  
*Tester Signature*

Jess Tang, Lead Engineer  
*Typed/Printed Name*

August 8, 2006  
*Date*

## INTERTEK TESTING SERVICES

Company: Primatronix Ltd.  
Model: GE 86708  
Mode : TX-Channel 0

Date of Test: July 25-28, 2006

Table 1, Headset

### 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	94.0	33	29.4	90.4	94.0	-3.6
H	*4804.000	51.7	33	34.9	53.6	54.0	-0.4
H	7206.000	43.5	33	37.9	48.4	54.0	-5.6
H	9608.000	40.8	33	40.4	48.2	54.0	-5.8
H	*12010.000	40.1	33	40.5	47.6	54.0	-6.4

- 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

---

## INTERTEK TESTING SERVICES

---

Company: Primatronix Ltd.  
Model: GE 86708  
Mode : TX-Channel 39

Date of Test: July 25-28, 2006

Table 2, Headset

### 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	93.6	33	29.4	90.0	94.0	-4.0
H	*4882.000	51.3	33	34.9	53.2	54.0	-0.8
H	*7323.000	43.7	33	37.9	48.6	54.0	-5.4
H	9764.000	40.8	33	40.4	48.2	54.0	-5.8
H	*12205.000	40.4	33	40.5	47.9	54.0	-6.1

- 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

## INTERTEK TESTING SERVICES

Company: Primatronix Ltd.  
Model: GE 86708  
Mode : TX-Channel 78

Date of Test: July 25-28, 2006

Table 3, Headset

### 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	94.0	33	29.4	90.4	94.0	-3.6
H	*4960.000	51.5	33	34.9	53.4	54.0	-0.6
H	*7440.000	44.0	33	37.9	48.9	54.0	-5.1
H	9920.000	41.2	33	40.4	48.6	54.0	-5.4
H	*12400.000	40.3	33	40.5	47.8	54.0	-6.2

- 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.
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

## INTERTEK TESTING SERVICES

---

### 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 H1A\*: Headset - Low Channel Emissions

Plot H1B: Headset - 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

$$= 90.4\text{dB}\mu\text{V/m} - 40.01\text{dB}$$

$$= 50.39\text{dB}\mu\text{V/m}$$

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**

---

### 3.5 Line Conducted Configuration Photograph - Headset

Worst Case Line-Conducted Configuration

at 0.230 MHz

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

## INTERTEK TESTING SERVICES

---

### 3.6 Line Conducted Emission Data

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

Judgement : Passed by 12.7 dB margin

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

#### **TEST PERSONNEL:**

  
\_\_\_\_\_  
Tester Signature

Jess Tang, Lead Engineer  
Typed/Printed Name

August 8, 2006  
Date

## INTERTEK TESTING SERVICES

---

Company: Primatronix Ltd.  
Model: GE 86708

Date of Test: July 25-28, 2006

### 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.

---

## INTERTEK TESTING SERVICES

---

Company: Primatronix Ltd.  
Model: GE 86708  
Mode: Headset Online

Date of Test: July 25-28, 2006

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)
V	32.023	36.4	16	10.0	30.4	40.0	-9.6
V	48.225	34.4	16	11.0	29.4	40.0	-10.6
V	64.554	36.3	16	9.0	29.3	40.0	-10.7
V	80.159	38.5	16	6.0	28.5	40.0	-11.5
V	96.765	32.4	16	12.0	28.4	43.5	-15.1
V	112.249	30.2	16	14.0	28.2	43.5	-15.3

- 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

## **INTERTEK TESTING SERVICES**

---

### **EXHIBIT 4 EQUIPMENT PHOTOGRAPHS**

## INTERTEK TESTING SERVICES

---

### 4.0 Equipment Photographs

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

## **INTERTEK TESTING SERVICES**

---

### **EXHIBIT 5 PRODUCT LABELLING**

## INTERTEK TESTING SERVICES

---

### 5.0 **Product Labelling**

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

## **INTERTEK TESTING SERVICES**

---

### **EXHIBIT 6 TECHNICAL SPECIFICATIONS**

## INTERTEK TESTING SERVICES

---

### 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**

---

### **EXHIBIT 7 INSTRUCTION MANUAL**

## INTERTEK TESTING SERVICES

---

### 7.0 Instruction Manual

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

Please note that the required FCC Information to the User is located at the end of the Instruction Manual.

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