### **Giant Electronics Ltd.**

## Application For Certification (FCC ID: K7GHCLE4065)

Transmitter

WO# 0214101 TL/Sandy October 31, 2002

- 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) 2785 5487

# LIST OF EXHIBITS

### INTRODUCTION

EXHIBIT 1:	General Description
EXHIBIT 2:	System Test Configuration
EXHIBIT 3:	Emission Results
EXHIBIT 4:	Equipment Photographs
EXHIBIT 5:	Product Labelling
EXHIBIT 6:	Technical Specifications
EXHIBIT 7:	Instruction Manual
EXHIBIT 8:	Miscellaneous Information
EXHIBIT 9:	Confidentiality Request

### MEASUREMENT/TECHNICAL REPORT

### Giant Electronics Ltd. - MODEL: SWIM MX240a FCC ID: K7GHCLE4065

### October 31, 2002

This report concerns (check one:) Original Gr Equipment Type: <u>Low Power Transmitter</u> (examp	cant X Class II Change
Deferred grant requested per 47 CFR 0.457(d)(1)	(ii)? Yes <u>No X</u>
Ι	f yes, defer until:
Company Name agrees to notify the Commission b	by:date
of the intended date of announcement of the pro on that date.	duct so that the grant can be issued
Transition Rules Request per 15.37?	Yes No_X_
If no, assumed Part 15, Subpart C for intentiona Edition] provision.	l radiator - the new 47 CFR [12-18-01
Report prepared by:	Tommy Leung
	Intertek Testing Services
	576, Castle Peak Road,
	HONG KONG.
	Phone: 852-2173-8538
	Fax: 852-2371-0521

## **Table of Contents**

1.0 General Description	2
1.1 Product Description	2
1.2 Related Submittal(s) Grants	2
1.3 Test Methodology	3
1.4 Test Facility	3
2.0 System Test Configuration	5
2.1 Justification	5
2.2 EUT Exercising Software	5
2.3 Special Accessories	5
2.4 Equipment Modification	6
2.5 Measurement Uncertainty	6
2.6 Support Equipment List and Description	6
3.0 Emission Results	8
3.1 Field Strength Calculation	9
3.2 Radiated Emission Configuration Photograph	11
3.3 Radiated Emission Data	12
3.4 Conducted Emission Configuration Photograph	14
3.5 Conducted Emission Data	15
4.0 Equipment Photographs	17
5.0 Product Labelling	19
6.0 <u>Technical Specifications</u>	21
7.0 Instruction Manual	23
<ul><li>8.0 <u>Miscellaneous Information</u>.</li><li>8.1 Bandedge Plot</li></ul>	25
9.0 Confidentiality Request	

Exhibit type	File Description	filename	
Test Report	Test Report	report.pdf	
<b>Operation Description</b>	Technical Description	descri.pdf	
Test Setup Photo	Radiated Emission	radiated photos.pdf	
Test Setup Photo	Conducted Emission	conducted photos.pdf	
Test Report	Conducted Emission Test Result	conducted.pdf	
Test Report	Bandedge Plot	bw.pdf	
External Photo	External Photo	external photos.pdf	
Internal Photo	Internal Photo	internal photos.pdf	
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	
Cover Letter	Confidentiality Request	request.pdf	

## List of attached file

# **EXHIBIT 1**

# **GENERAL DESCRIPTION**

### 1.0 General Description

### 1.1 Product Description

The Equipment Under Test (EUT) is a Transmitter Portion Short-Range Wireless Instant Message (Handheld Unit) operating at 902.475 - 927.475MHz. The EUT is powered by 3.6V d.c. (1 x 3.6V 550mAh NiMH battery or 120VAC 60Hz input, 9.0VDC 300mA output adaptor). It is a portable device that allows up to eight users to simultaneously send and receive Instant Message and participate in chat sessions over the internet from a maximum of 150 feet from a single PC. The EUT has 32 Channels which can be selected by the Up / Down scroll keys.

Antenna Type : Internal, Integral

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 transmitter portion. The receiver portion associated with the EUT is subjected to verification procedure.

### 1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). 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. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. 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 emission 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.

# EXHIBIT 2

# SYSTEM TEST CONFIGURATION

### 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 (1992).

The EUT was powered from 120VAC 60Hz input, 9.0VDC 300mA output adaptor.

For maximizing emissions, 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 reported in Exhibit 3.0.

The frequency range from 902MHz to 9.3GHz was searched for spurious emissions from the device. Only those emissions reported were detected. All other emissions were at least 20 dB below the applicable limits.

#### 2.2 EUT Exercising Software

There was no special software to exercise the device. Once the button is depressed, the unit transmits the typical signal. For simplicity of testing, the unit was wired to transmit continuously.

#### 2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

2.4 Equipment Modification

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

No modifications were installed by Intertek Testing Services.

2.5 Measurement Uncertainty

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

2.6 Support Equipment List and Description

Refer List:

1. GP NiMH 3.6V 500mAh battery

2. Adaptor
Input: 120VAC 60Hz
Output: 9.0VDC 300mA
Model: ELECTRADE MICRO POWER CO. DCBBD0930D

Confirmed by:

Tommy Leung Assistant Supervisor Intertek Testing Services Hong Kong Ltd. Agent for Giant Electronics Ltd.

Kumj

Signature

Date

October 31, 2002

# 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.

### 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  $dB\mu V/m$ 

 $\label{eq:RA} \begin{array}{l} \mathsf{RA} = \mathsf{Receiver} \ \mathsf{Amplitude} \ (\mathsf{including preamplifier}) \ \mathsf{in} \ \mathsf{dB} \mu \mathsf{V} \\ \mathsf{CF} = \mathsf{Cable} \ \mathsf{Attenuation} \ \mathsf{Factor} \ \mathsf{in} \ \mathsf{dB} \\ \mathsf{AF} = \mathsf{Antenna} \ \mathsf{Factor} \ \mathsf{in} \ \mathsf{dB} \\ \mathsf{AG} = \mathsf{Amplifier} \ \mathsf{Gain} \ \mathsf{in} \ \mathsf{dB} \\ \mathsf{PD} = \mathsf{Pulse} \ \mathsf{Desensitization} \ \mathsf{in} \ \mathsf{dB} \\ \mathsf{AV} = \mathsf{Average} \ \mathsf{Factor} \ \mathsf{in} \ \mathsf{-dB} \end{array}$ 

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

### 3.1 Field Strength Calculation (cont'd)

#### Example

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

 $RA = 62.0 dB\mu V$  AF = 7.4 dB CF = 1.6 dB AG = 29.0 dBPD = 0 dB

AV = -10 dB

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

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

### 3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission at 927.457 MHz

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

#### 3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 2.0 dB

**TEST PERSONNEL:** 

Signature

Ben W. K. Ho, Compliance Engineer Typed/Printed Name

October 31, 2002

Date

Company: Giant Electronics Ltd. Model: SWIM MX240a Mode: TX (Handheld Unit) Date of Test: October 7, 2002

#### Table 1

#### **Radiated Emissions**

#### Channel 1

Polarity	Frequency	Reading	Antenna	Pre-	Net	Limit	Margin
	(MHz)	(dBµV)	Factor	Amp	at 3m	at 3m	(dB)
			(dB)	Gain	$(dB\mu V/m)$	(dBµV/m)	
				(dB)			
Н	902.562	82.0	22.6	16	88.6	94	-5.4
Н	1805.125	45.1	26.5	34	37.6	54	-16.4
Н	2707.682	40.3	29.1	34	35.4	54	-18.6
Н	3610.244	36.2	32.8	34	35.0	54	-19.0

#### Channel 16

Polarity	Frequency	Reading	Antenna	Pre-	Net	Limit	Margin
	(MHz)	(dBµV)	Factor	Amp	at 3m	at 3m	(dB)
			(dB)	Gain	$(dB\mu V/m)$	$(dB\mu V/m)$	
				(dB)			
Н	914.286	82.6	22.6	16	89.2	94	-4.8
Н	1828.562	45.5	26.5	34	38.0	54	-16.0
Н	2742.856	40.5	29.1	34	35.6	54	-18.4
Н	3657.135	36.2	32.8	34	35.0	54	-19.0

#### Channel 32

Polarity	Frequency	Reading	Antenna	Pre-	Net	Limit	Margin
	(MHz)	(dBµV)	Factor	Amp	at 3m	at 3m	(dB)
			(dB)	Gain	$(dB\mu V/m)$	$(dB\mu V/m)$	
				(dB)			
Н	927.457	85.2	22.8	16	92.0	94	-2.0
Н	1854.916	45.5	26.5	34	38.0	54	-16.0
Н	2782.376	40.3	29.1	34	35.4	54	-18.6
Н	3709.826	36.2	32.8	34	35.0	54	-19.0

Notes: 1. Peak Detector Data unless otherwise stated.

- 2. All measurements were made at 3 meter. Harmonic 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 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. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Ben W. K. Ho

FCC ID: K7GHCLE4065

### 3.4 Conducted Emission Configuration Photograph

### Worst Case Line-Conducted Configuration at 0.450 MHz

For electronic filing, the worst case line-conducted configuration photograph are saved with filename: conducted photos.pdf.

3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission is saved with filename: conducted.pdf.

Judgement: Passed by 21.5 dB

**TEST PERSONNEL:** 

Signature

Ben W. K. Ho, Compliance Engineer Typed/Printed Name

October 31, 2002 Date

# **EXHIBIT 4**

# EQUIPMENT PHOTOGRAPHS

### 4.0 Equipment Photographs

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

# EXHIBIT 5

# PRODUCT LABELLING

### 5.0 Product Labelling

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

# **EXHIBIT 6**

# **TECHNICAL SPECIFICATIONS**

### 6.0 **Technical Specifications**

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

# EXHIBIT 7

# **INSTRUCTION MANUAL**

### 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.

# **EXHIBIT 8**

# **MISCELLANEOUS INFORMATION**

## 8.0 Miscellaneous Information

This miscellaneous information includes details of the bandedge plot.

### 8.1 Bandedge Plot

For electronic filing, the plot shows the fundamental emission when modulated is saved with filename: bw.pdf. From the plot, the field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges are attenuated at least 50 dB below the level of the unmodulated carrier. It fulfil the requirement of 15.249(d).

# EXHIBIT 9

# CONFIDENTIALITY REQUEST

### 9.0 Confidentiality Request

The applicant would like to have confidential protection of the following documents:

- Schematic
- Block Diagram
- Operational Description

For electronic filing, the request letter is saved with filename: request.pdf.