

Shenzhen China East Electronics Co., Ltd.

Application
For
Certification

Transmitter

(FCC ID: OIRCE-701)

WO# 0213168
TL/Ann Choy
October 28, 2002

- The test results reported in this 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 Limited

FCC ID: OIRCE-701

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

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

INTERTEK TESTING SERVICES

MEASUREMENT/TECHNICAL REPORT

Shenzhen China East Electronics Co., Ltd. - MODEL: CE-701
FCC ID: OIRCE-701

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

Equipment Type : Low Power Transmitter (example : computer, modem, transmitter, etc.)

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 [12-18-01 Edition] Provision.

Report prepared by:

Tommy Leung
Intertek Testing Services.
2/F., Garment Centre,
576 Castle Peak Road,
Kowloon, Hong Kong.
Phone : 852-2173-8538
Fax: 852-2741-1693

INTERTEK TESTING SERVICES

Table of Contents

1.0	<u>General Description</u>	2
1.1	Product Description	2
1.2	Related Submittal(s) Grants	3
1.3	Test Methodology	3
1.4	Test Facility	3
2.0	<u>System Test Configuration</u>	5
2.1	Justification	5
2.2	EUT Exercising Software	5
2.3	Support Equipment List and Description	6
2.4	Measurement Uncertainty	6
2.5	Equipment Modification	6
3.0	<u>Emission Results</u>	8
3.1	Field Strength Calculation	9
3.2	Radiated Emission Configuration Photograph	10
3.3	Radiated Emission Data	11
3.4	Bandwidth of Radiated Emission	13
4.0	<u>Equipment Photographs</u>	16
5.0	<u>Product Labelling</u>	18
6.0	<u>Technical Specifications</u>	20
7.0	<u>Instruction Manual</u>	22

INTERTEK TESTING SERVICES

List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.doc
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	config photos.doc
Test Report	Bandwidth Plot	bw.pdf
External Photo	External Photo	external photos.doc
Internal Photo	Internal Photo	internal photos.doc
ID Label/Location	Label Artwork and Location	label.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
User Manual	User Manual	manual.pdf
User Manual	FCC Information	fcc information.pdf

INTERTEK TESTING SERVICES

**EXHIBIT 1
GENERAL DESCRIPTION**

INTERTEK TESTING SERVICES

1.0 **General Description**

1.1 Product Description

The CE-701 is a Car Wireless Hands-Free for Mobile Phone operated at 96.102MHz and powered by 12VDC car cigarette lighter. The main function of the Equipment Under Test (EUT) is to transmit the modulated signal that can be received by common FM broadcast radio. The power indicator (red LED) on the bottom of EUT will be illuminated when directly plug it into the dashboard cigarette lighter. The antenna is permanent soldered inside the EUT which is integral with a soft wire.

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

INTERTEK TESTING SERVICES

1.2 Related Submittal(s) Grants

This is a single Application for Certification of a transmitter.

1.3 Test Methodology

The radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). The measurement was 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 emission testing, the equipment under test (EUT) 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).

For the measurements, the EUT was operated standalone and placed in the center of the turntable. The unit was powered by 12VDC power supply, and it was operated in transmitting continuously.

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. The spurious emissions more than 20 dB below the permissible value are not reported.

2.2 EUT Exercising Software

There was no special software to exercise the device.

For emissions testing, the unit was setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

INTERTEK TESTING SERVICES

2.3 Support Equipment List and Description

The unit was operated standalone. An 12VDC car cigarette lighter was used to power the device.

OTHERS:

Mobile Phone: Nokia 3310 (supplied by ITS)

2.4 Measurement Uncertainty

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

2.5 Equipment Modification

Any modifications installed previous to testing by Shenzhen China East Electronics Co., 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:

*Tommy Leung
Assistant Supervisor
Intertek Testing Services
Agent for Shenzhen China East Electronics Co., Ltd.*



Signature

October 28, 2002 Date

INTERTEK TESTING SERVICES

**EXHIBIT 3
EMISSION RESULTS**

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 dB μ V/m
 RA = Receiver Amplitude (including preamplifier) in dB μ V
 CF = Cable Attenuation Factor in dB
 AF = Antenna Factor in dB
 AG = Amplifier Gain in 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 dB μ V/m
 RR = RA - AG in dB μ V
 LF = CF + AF in dB

Assume a receiver reading of 52.0 dB μ 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, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = 52.0 dB μ V/m	
AF = 7.4 dB	RR = 23.0 dB μ V
CF = 1.6 dB	LF = 9.0 dB
AG = 29.0 dB	
FS = RR + LF	
FS = 23 + 9 = 32 dB μ V/m	

Level in μ V/m = Common Antilogarithm [(32 dB μ V/m)/20] = 39.8 μ V/m

3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission

at 96.102 MHz

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

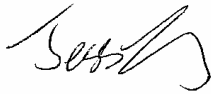
INTERTEK TESTING SERVICES

3.3 Radiated Emission Data

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

Judgement : Passed by 4.4 dB

TEST PERSONNEL:



Tester Signature

Jess Tang, Engineer
Typed/Printed Name

October 26, 2002
Date

INTERTEK TESTING SERVICES

Company: Shenzhen China East Electronics Co., Ltd.
Model: CE-701
Mode: TX

Date of Test: October 21, 2002

Table 1

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dBμV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
H	96.102	49.0	10.6	16	43.6	48.0	-4.4
V	32.034	33.4	11.6	16	29.0	40.0	-11.0
V	48.051	33.5	11.9	16	29.4	40.0	-10.6
V	64.068	38.3	9.9	16	32.2	40.0	-7.8
H	80.085	37.1	6.7	16	27.8	40.0	-12.2
H	*112.119	31.9	12.6	16	28.5	43.5	-15.0
H	*128.136	30.8	12.6	16	27.4	43.5	-16.1
H	144.153	32.4	11.7	16	28.1	43.5	-15.4
H	160.170	32.0	13.1	16	29.1	43.5	-14.4

- NOTES:
1. Quasi-peak detector is used for the emission below or equal to 1000 MHz.
 2. All measurements were made at 3 meters. 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 and average detector are used for the emission over 1000MHz.
 5. Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9kHz to 1GHz.
- * Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Jess Tang

3.4 Bandwidth of Radiated Emission

From the following plots, they show that the fundamental emission which are with and without apply modulation (1kHz audio tone with 100dB SPL). Besides, they show the fundamental emission is with the 200kHz bandwidth and wholly inside the frequency range of 88MHz and 108MHz. The unit meets the FCC bandwidth requirement of section 15.239(a).

Bandwidth Plot

For electronic filing, the bandwidth plots are saved with filename: bw.pdf

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**

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**

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 saved with filename: fcc information.pdf.

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