

CCT R&D Ltd.

Application
For
Certification

900MHz/2.4GHz 40 Channel Analog Modulation Cordless Phone with
Caller ID and Digital Answering Machine - Handset

(FCC ID: NC8MA361SH)

05202872
TL/ Ann Choy
October 19, 2005

- 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.

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
<i>EXHIBIT 8:</i>	Security Code Information
<i>EXHIBIT 9:</i>	Confidentiality Request

Country	Number of cases	Number of deaths	Number of recoveries
USA	1,234,567	78,901	956,789
Spain	234,567	12,345	222,222
Italy	198,765	34,567	164,198
France	156,789	23,456	133,333
Germany	123,456	10,123	113,333
UK	98,765	8,765	90,000
China	82,345	5,678	76,667
Japan	67,890	4,567	63,323
South Korea	10,123	1,234	9,889
India	5,678	789	4,889
Brazil	3,456	456	3,000
Canada	2,345	234	2,111
Australia	1,234	123	1,111
South Africa	987	98	889
Iran	765	76	689
Spain	543	54	489
Italy	432	43	389
France	321	32	289
Germany	210	21	189
UK	109	10	99
China	98	9	89
Japan	87	8	79
South Korea	76	7	69
India	65	6	59
Brazil	54	5	49
Canada	43	4	39
Australia	32	3	29
South Africa	21	2	19
Iran	10	1	9

Internet: <http://www.hongkongair.com>

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	7
2.5	Equipment Modification	7
3.0	<u>Emission Results</u>	9
3.1	Field Strength Calculation	10
3.2	Radiated Emission Configuration Photograph - Handset.....	11
3.3	Radiated Emission Data - Handset.....	12
3.4	Radiated Emission on the bandedge	15
4.0	<u>Equipment Photographs</u>	17
5.0	<u>Product Labelling</u>	19
6.0	<u>Technical Specifications</u>	21
7.0	<u>Instruction Manual</u>	23
8.0	<u>Security Code Information</u>	25
9.0	<u>Confidentiality Request</u>	27

INTERTEK TESTING SERVICES

List of attached file

Exhibit type	File Description	filename
Cover Page	Confidentiality Request	request.pdf
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission for Handset	config photos.doc
Test Report	Emission Plot	emission.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
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 MA361sys is a 900MHz/2.4GHz 40 Channel Analog Modulation Cordless Phone with Caller ID and Digital Answering Machine. Base Unit and handset operate at frequency of 924.045MHz to 926.219MHz and 2402.484MHz to 2409.004MHz respectively. The unit is capable of either tone or pulse dialing. The internal power supply's isolation is accomplished through a power transformer having an adequate dielectric rating. The circuit wiring is consistent under the requirement of part 68.

The handset unit consists of a keypad with twelve standard keys (0,...9,*,#), nine function keys (frmt, C, CID up, CID down, mute, mem, redial, transfer, flash), and one channel switch key. A Talk key is provided to control pick/release telephone line in a toggle base.

The base unit has a page key, which is used to page the handset unit.

The antennas used in base unit and handset are integral, and the tested sample is a prototype.

The Model: MA361sys is one of the Model: MA36Xsys series, and the letter "X" of the model numbers is in term of number from "0" to "9" with different color. The Model: MA300sys is an additional identical handset with a charger for selling a handset standalone. The difference in model number serves as marketing strategy.

The circuit description is saved with filename: descri.pdf

Connection between the device and the telephone network is accomplished through the use of USOC RJ11C in the 2-wire loop calling central office line.

INTERTEK TESTING SERVICES

1.2 Related Submittal(s) Grants

This is an Application for Certification of Handset of a cordless telephone system. The FCC ID of the associated Base Unit is NC8MA361S and has been filed at the same time as this application. This specific report details the emission characteristics of each transmitter. A verification report has been prepared for the receiver sections of each device. The device is also subject to Part 68 Registration.

1.3 Test Methodology

Radiated emission measurements was 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 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 handset was powered by a fully charged battery.

For the measurements, the EUT is attached to a plastic stand if necessary and placed on the wooden turntable. If the base unit attaches to peripherals, they are connected and operational (as typical as possible). The base unit is remotely located as far from the antenna and the handset as possible to ensure full power transmission from the handset. Else, the handset is wired to transmit full power without modulation.

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

The EUT exercise program used during radiated 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. A battery (provided with the unit) was used to power the device. Its description is listed below.

- (1) Handset: A "Ni-Cd" type rechargeable battery (3.6V 600mAh, Model: 3SN-AA60-S-J1)

CABLES:

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

OTHERS:

- (1) A headset for telephone use with 1.2m unshielded cable permanently affixed. (Supplied by Intertek)

INTERTEK TESTING SERVICES

2.4 Measurement Uncertainty

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

2.5 Equipment Modification

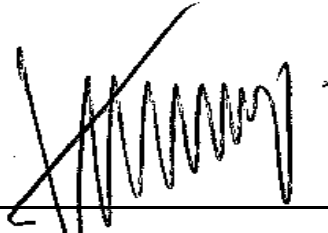
Any modifications installed previous to testing by CCT R&D Ltd. will be incorporated in each production model sold/leased in the United States.

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 Manager
Intertek Testing Services
Agent for CCT R&D Ltd.*



Signature

Oct 25, 2005

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	
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

INTERTEK TESTING SERVICES

3.2 Radiated Emission Configuration Photograph - Handset

Worst Case Radiated Emission

at 12045.021 MHz

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

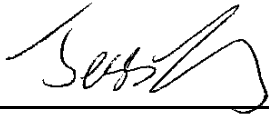
INTERTEK TESTING SERVICES

3.3 Radiated Emission Data - Handset

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

Judgement : Passed by 7.8 dB margin

TEST PERSONNEL:



Tester Signature

Jess Tang, Lead Engineer

Typed/Printed Name

Oct 25, 2005

Date

INTERTEK TESTING SERVICES

Company: CCT R&D Ltd.
Model: MA361sys
Mode : TX-Channel 1

Date of Test: September 26-October 12, 2005

Table 1, Handset

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre- Amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	2402.484	88.7	34	29.4	84.1	94	-9.9
V	*4804.968	41.2	34	34.9	42.1	54	-11.9
V	7207.452	39.1	34	37.9	43.0	54	-11.0
V	9609.936	38.3	34	40.4	44.7	54	-9.3
V	*12012.420	39.1	34	40.5	45.6	54	-8.4
V	14414.904	37.8	34	41.7	45.5	54	-8.5

- NOTES: 1. Peak detector is used for the emission measurement.
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 is 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 25GHz.
- * Emission within the restricted band meets the requirement of part 15.205.

Test Engineer: Jess Tang

INTERTEK TESTING SERVICES

Company: CCT R&D Ltd.
Model: MA361sys
Mode : TX-Channel 40

Date of Test: September 26-October 12, 2005

Table 2, Handset

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre- Amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	2409.004	88.2	34	29.4	83.6	94	-10.4
V	*4818.008	41.4	34	34.9	42.3	54	-11.7
V	7227.013	39.2	34	37.9	43.1	54	-10.9
V	9636.017	38.5	34	40.4	44.9	54	-9.1
V	*12045.021	39.7	34	40.5	46.2	54	-7.8
V	14454.025	37.9	34	41.7	45.6	54	-8.4

- NOTES: 1. Peak detector is used for the emission measurement.
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 is 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 25GHz.
- * 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 and they are at least 50dB below the carrier level at band edge (2400.0MHz and 2483.5MHz). It meets the requirement of section 15.249(d).

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

Plot H1A: Handset - Low Channel Emissions

Plot H1B: Handset - High Channel Emissions

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

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

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.

INTERTEK TESTING SERVICES

EXHIBIT 8 SECURITY CODE INFORMATION

8.0 Security code information

The telephone has an internal security code with 65,536 possible combinations. When the handset firstly places on the charging cradle of the base, both handset and base unit will exchange a random 2^{16} bits digital security code which is generated by the Base station. This code will not be changed even another handset doing the same action unless the power adaptor of the base switches off for long time.

INTERTEK TESTING SERVICES

**EXHIBIT 9
CONFIDENTIALITY REQUEST**

INTERTEK TESTING SERVICES

9.0 **Confidentiality Request**

For electronic filing, a confidentiality request is saved with filename: request.pdf