

CMA Testing and Certification Laboratories

廠商會檢定中心

TEST REPORT

Report No. : AP0041428(8) Date : 03 Sep 2012

Application No. : LP021769(3)

Applicant : Electronics Tomorrow Limited
Unit 903-7, 9/F, Tower 1, Harbour Center
1 Hok Cheung Street, Hung Hom,
Kowloon, Hong Kong

Sample Description : One(1) item of submitted sample stated to be WWVB RC and RF Wall Clock of Model No. 790E

Sample registration No. : RP028863-001
Radio Frequency : 433.9 MHz Receiver
Rating : 2 x 1.5V AA size batteries
No. of submitted sample : Two (2) piece (s)

Date Received : 17 Jul 2012.

Test Period : 17 Jul 2012 to 30 Jul 2012.

Test Requested : FCC Part 15 Certification

Test Method : 47 CFR Part 15 (10-1-10 Edition)
ANSI C63.4 - 2009

Test Engineer : Mr. LEE Man-o, Nelson

Test Result : See attached sheet(s) from page 2 to 30.

Conclusion : The submitted sample was found to comply with requirement of FCC Part 15 Subpart B.

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature :

Mr. WONG Lap-pong, Andrew
Assistant Manager
Electrical Division

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FCC ID: PEQ790E90712

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1 General Information

1.1 General Description

The equipment under test (EUT) is a receiver for clock and weather station. It operates at 60kHz and 433.9MHz and the oscillation of radio control is generated by a 60kHz crystal and LRC circuit for 433.9MHz. The EUT is powered by 2 x 1.5V AA size batteries. It can receive the time signal transmitted by the National Institute of Standards and Technology (NIST) and receives a signal from the outdoor sensor and displays the data on the LCD. The EUT itself also has a temperature sensor.

The brief circuit description is listed as follows:

- U1, X2 and its associated circuit act as RCC Clock receiver
- U2 and its associated circuit act as demodulator
- U3 and its associated circuit act as RF receiver

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1.2 Location of the test site

FCC Registered Test Site Number: 552221

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009. A Semi-Anechoic Chamber Testing Site is set up for investigation and located at:

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
Fo Tan, Shatin,
New Territories,
Hong Kong.

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2009. A shielded room is located at :

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
Fo Tan, Shatin,
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1.3 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.
EMI Test Receiver	R&S	ESCI	100152
Spectrum Analyzer	R&S	FSV-40	N/A
Broadband Antenna	Schaffner	CBL6112B	2718
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-531
Broadband Pre-Amplifier	Schwarzbeck	BBV 9718	9718-119
Coaxial Cable	Schaffner	RG 213/U	N/A
Coaxial Cable	Suhner	RG 214/U	N/A
Coaxial Cable	Suhner	Sucoflex 102	N/A

1.4 Measurement Uncertainty

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

Radiated emissions

Frequency	Uncertainty (U _{lab})
30MHz ~ 200MHz (Horizontal)	4.79dB
30MHz ~ 200MHz (Vertical)	4.80dB
200MHz ~1000MHz (Horizontal)	4.76dB
200MHz ~1000MHz (Vertical)	4.75dB

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2 Description of the radiated emission test

2.1 Test Procedure

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1 m above the ground.

The device was rotated through three orthogonal axes to determine which attitude and configuration produce the highest emission during measurement.

2.2 Test Result

The emissions meeting the requirement of section 15.109 are based on measurements employing the CISPR quasi-peak detector below 1000MHz and average detector for frequencies above 1000MHz.

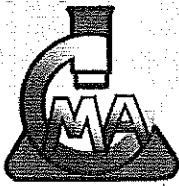
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2.3 Radiated Emission Measurement Data

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart B

Environmental conditions:

Mode: RCC Clock receive

Parameter	Recorded value
Ambient temperature:	24 °C
Relative humidity:	59 %

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB μ V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
49.290	H	14.2	12.6	26.8	40.0	- 13.2
54.140	H	14.9	10.4	25.3	40.0	- 14.7
73.520	H	16.6	7.9	24.5	40.0	- 15.5
99.500	H	12.5	9.9	22.4	43.5	- 21.1
122.140	H	17.0	13.7	30.7	43.5	- 12.8
144.240	H	18.8	12.9	31.7	43.5	- 11.8
172.800	H	16.9	11.6	28.5	43.5	- 15.0
201.980	H	16.9	11.0	27.9	43.5	- 15.6
248.600	H	20.6	11.0	31.6	46.0	- 14.4
341.600	H	18.2	15.9	34.1	46.0	- 11.9

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2.3 Radiated Emission Measurement Data

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart B

Environmental conditions:

Mode: RF receive

Parameter	Recorded value
Ambient temperature:	24 °C
Relative humidity:	59 %

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB μ V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
433.900	H	18.2	18.8	37.0	46.0	- 9.0
535.600	H	17.8	20.6	38.4	46.0	- 7.6
697.200	H	18.5	22.0	40.5	46.0	- 5.5
1162.700	H	30.9	- 9.2	21.7	54.0	- 32.3
1378.650	H	31.9	- 9.2	22.7	54.0	- 31.3
1616.980	H	30.3	- 7.5	22.8	54.0	- 31.2
1988.340	H	31.7	- 7.5	24.2	54.0	- 29.8
2434.150	H	31.4	- 6.6	24.8	54.0	- 29.2
2774.260	H	30.7	- 4.6	26.1	54.0	- 27.9
3472.540	H	33.6	- 3.3	30.3	54.0	- 23.7

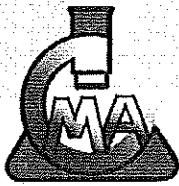
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3 Description of the Line-conducted Test

3.1 Test Procedure

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2009. The EUT was setup as described in the procedures, and both lines were measured.

3.2 Test Result

No measurement is required as the EUT is a battery-operated product.

3.3 Graph and Table of Conducted Emission Measurement Data

Not Applicable

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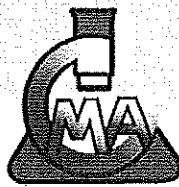
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4 Photograph

4.1 Photographs of the Test Setup for Radiated Emission and Conducted Emission

For electronic filing, the photos are saved with filename TSup1.jpg to TSup4.jpg.

4.2 Photographs of the External and Internal Configurations of the EUT

For electronic filing, the photos are saved with filename ExPho1.jpg to ExPho2.jpg and InPho1.jpg to InPho2.jpg.

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5 Supplementary document

The following document were submitted by applicant, and for electronic filing, the document are saved with the following filenames:

Document	Filename
ID Label/Location	LabelSmp.jpg
Block Diagram	BlkDia.pdf
Schematic Diagram	Schem.pdf
Users Manual	UserMan.pdf
Operational Description	OpDes.pdf

5.1 Bandwidth

Not Applicable

5.2 Duty cycle

Not Applicable

5.3 Transmission time

Not Applicable

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6 Appendices

A1.	Photos of the set-up of Radiated Emissions	2	pages
A2.	Photos of External Configurations	1	page
A3.	Photos of Internal Configurations	1	page
A4.	Label and Location	2	pages
A5.	Block Diagram	1	page
A6.	Schematics Diagram	2	pages
A7.	User Manual	8	pages
A8.	Operation Description	1	page

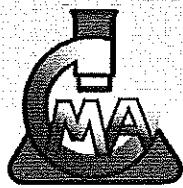
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A4. Label and Location

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Tested by: *Nelson*
Mr. LEE Man-o, Nelson

Reviewed by: *PL*
Mr. WONG Lap-pong, Andrew

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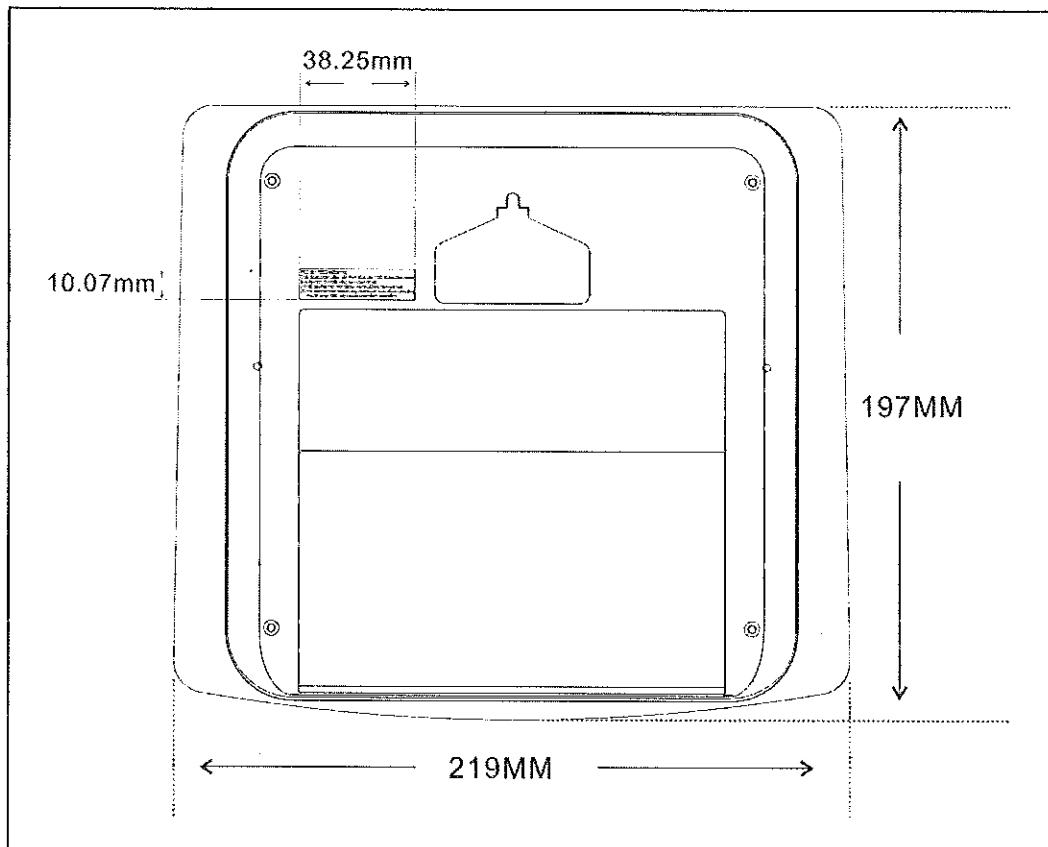


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A4. Label and Location



Tested by: *Nelson L*
Mr. LEE Man-o, Nelson

Reviewed by: *R.P.*
Mr. WONG Lap-pong, Andrew

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