



TEST REPORT

Report No. : AF003383-001

Date : 2005 March 04

Application No.: LF200147(3)

Client : Imperial International
2221 Niagara Falls Blvd.
Niagara Falls, New York. 14304

Sample Description : One(1) submitted sample stated to be Home Weather Station of Model No.DG950
Rating : 2 x 1.5V "AA" size battery
No. of sample(s) : Two (2) piece(s) ***

Date Received : 2005 January 14.

Test Period : 2005 January 14 – 2005 February 22.

Test Requested : FCC Part 15 Certification

Test Method : FCC Rules and Regulations Part 15 – April 2004
ANSI C63.4 – 2001

Test Result : See attached sheet(s) from page 2 to 11.

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

Remark : The following eighty-five models are the same in circuitry and components and
construction, and therefore model DG950 was chosen to be the representative of
the test sample:

HOME WEATHER STATION : DG950

TOWNE HALL : TW950, TW970, TW966, TW975, TW945, TW965, TW940, TW960,
TW990, TW995, TW985, TW935, TW980, TW930

NEWHOUSE HOMES : NH950, NH970, NH966, NH957, NH945, NH965, NH940, NH960,
NH990, NH995, NH985, NH935, NH980, NH930

R.S.V.P : RS950, RS970, RS966, RS975, RS945, RS965, RS940, RS960, RS990,
RS995, RS985 RS935, RS980, RS930

OLDE YORK REPRODUCTIONS : OY950, OY970, OY966, OY975, OY945, OY965, OY940, OY960,
OY990, OY995, OY985, OY935, OY980, OY930

BIOS WEATHER/METEO : BW950, BW965, BW966, BW975, BW945, BW965M, BW940, BW960,
BW990, BW995, BW985, BW935, BW980, BW930

NATIONAL GEOGRAPHIC : IN950, IN970, IN955, IN975, IN945, IN965, IN940, IN960, IN990,
IN995, IN985, IN935, IN980, IN930

For and on behalf of
CMA Testing and Certification Laboratories

Authorized Signature : _____

Danny Chui
EMC Engineer - EL. Division

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1 General Information

1.1 General Description

The equipment under test (EUT) is a transmitter for Home Weather Station. Operating at 433.920 MHz which is controlled by a crystal. The EUT is powered by 2 x 1.5V "AA" size battery. It has four difference sensors for measure wind speed, wind direction, temperature, and rain at out door. When it received the data from the sensors, it will transmit a radio signal to receiver.

The brief circuit description is listed as follows :

- Y1 & Q1 and associated circuit act as oscillator for transmission
- Y1 and associated circuit act as oscillator for transmitter IC
- Y1 and associated circuit act as oscillator for wind sensor IC
- U1, Q3 (A1505A2Y) and associated circuit act as temperature sensor + data encoder.
- U1 and associated circuit act as wind speed & direction sensor
- Q3, Q2 and associated circuit act as rain sensor
- Q2 (TC3356S) and associated circuit act as transmission for RF

1.2 Related Submittal Grants

This is a single application for certification of a transmitter. The receiver for this transmitter is authorized by Certification procedure.



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1.3 Location of the test site

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2001. 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 – 2001. A shielded room is located at :

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
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1.4 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibration Certification No.
EMI Test Receiver	R&S	ESCS30	100001	S21141
Spectrum Analyzer	R&S	FSP30	100416	20-102273
Broadband Antenna	Schaffner	CBL6113B	2718	AC1753
Signal Generator	IFR	2023B	202302/938	Nil
LISN	R&S	ESH3-Z5	100038	S21142
Pulse Limiter	R&S	ESH3-Z2	100001	20-73194
Biconical Antenna	R&S	HK116	837414/004	4000.7752.02
Horn Antenna	EMCO	3115	9002-3351	90023351



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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 – 2001.

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.

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

2.2 Test Result

Measurements were performed according to the requirements of Section 15.231(e)

Peak Detector data was measured unless otherwise stated.

* Emissions appearing within the restricted bands shall follow the requirement of section 15.205.

It was found that the EUT meet the FCC requirement.



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2.3 Radiated Emission Measurement Data

Radiated emission
pursuant to
the requirement of FCC Part 15 subpart C

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB μ V/m)	Antenna and Cable factor (dB)	Average Factor (dB)	Field Strength (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
433.920	V	57.5	17.7	-6.4	68.8	72.9	-4.1
867.970	V	32.1	22.5	-6.4	48.2	52.9	-4.7
* 1301.955	V	17.7	24.3	-6.4	35.6	54.0	-18.4
1735.940	V	29.7	25.5	-6.4	48.8	54.0	-5.2
2169.925	V	20.8	27.6	-6.4	42.0	54.0	-12.0
2603.910	H	18.6	28.6	-6.4	40.8	54.0	-13.2
3037.895	H	19.8	30.1	-6.4	43.5	54.0	-10.5
3471.880	H	21.0	30.1	-6.4	44.7	54.0	-9.3
* 3905.865	H	13.8	31.1	-6.4	38.5	54.0	-15.5
* 4339.850	H	13.0	32.4	-6.4	39.0	54.0	-15.0



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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 – 2001. 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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4 Photograph

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

For electronic filing, the photos are saved with filename TSup1.jpg to TSup2.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

The plot on saved in TestRpt2.pdf shows the fundamental emission is confined in the specified band.

Bandwidth requirement = $0.25\% \times 433.920 \text{ MHz}$

$$= 1.085 \text{ MHz} \text{ (measured at 20 dB down from the modulated carrier)}$$

Measured bandwidth falls within the required bandwidth.

5.2 The duty cycle is simply the on-time divided by the period:

A 0.1-second interval was selected for below calculation according to the provisions in section 15.35 as the pulse train exceeds 0.1 second.

The duty cycle is simply the on-time divided by the selected interval:

$$\text{The duration of selected interval} = 0.1\text{sec}$$

$$\begin{aligned} \text{Effective period of the cycle} &= (2.52\text{ms} \times 10) + (1.26\text{ms} \times 15) + (0.56\text{ms} \times 7) \\ &= 47.870\text{ms} \end{aligned}$$

$$\begin{aligned} \text{Duty Cycle} &= (47.870\text{ms} / 100) \text{ ms} \\ &= 0.4787 \end{aligned}$$

Therefore, the average factor is found by $20 \log_{10} 0.4787 = -6.4\text{dB}$

5.3 Transmission Time

The duration of transmission on time period is 600ms and the silent period is 35.9s. The plot on saved in TestRpt4.pdf shows the EUT fulfil section 15.231 (e) requirements.

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A3.	Photos of Internal Configurations	2 pages
A4.	ID Label/Location	1 page
A5.	Bandwidth Plot	1 page
A6.	Average Factor	2 pages
A7.	Transmission Period	1 page
A8.	Block Diagram	1 page
A9.	Schematics	2 pages
A10.	User Manual	30 pages
A11.	Operation Description	1 page

***** End of Report *****