



TEST REPORT

Report No. : AF022383-001 Date : 2005 September 26

Application No. : LF212372(6)

Client : Norton Instruments Llc.
2221 Niagara Falls Blvd,
Niagara Falls, 14304,
New York

Sample Description : One(1) submitted sample stated to be Home Weather Station of
Model No. DG941
Rating : 4 x 1.5V AA size batteries
No. of submitted sample : One (1) piece***

Date Received : 2005 July 05

Test Period : 2005 July 05 – 2005 September 26

Test Requested : FCC Part 15 Certification

Test Method : FCC Rules and Regulations Part 15 – July 2004
ANSI C63.4 – 2003

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 thirty-four models are the same in circuitry and components and
construction, and therefore model DG941 was chosen to be the representative of
the test sample:

THERMOR : DG955, DG965, DG941

BIOS WEATHER/METEO : BW970, BW975, BW995

NATIONAL GEOGRAPHIC : IN970, IN975, IN995

PRIVITE LABEL : PL001, PL002, PL003, PL004, PL005,
PL006, PL007, PL008, PL009, PL010,
PL011, PL012, PL013, PL014, PL015,
PL016, PL017, PL018, PL019, PL020,
PL021, PL022, PL023, PL024, PL025

For and on behalf of
CMA Testing and Certification Laboratories

Authorized Signature : _____

Daimy Chui
EMC Engineer - EL. Division

Page 1 of 11

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TEST REPORT

Report No. : AF022383-001

Date : 2005 September 26

Table of Contents

1	General Information	3
1.1	General Description	3
1.2	Location of the test site	4
1.3	List of measuring equipment.....	5
2	Description of the radiated emission test	6
2.1	Test Procedure	6
2.2	Test Result	6
2.3	Radiated Emission Measurement Data	7
3	Description of the Line-conducted Test.....	8
3.1	Test Procedure	8
3.2	Test Result	8
3.3	Graph and Table of Conducted Emission Measurement Data	8
4	Photograph	9
4.1	Photographs of the Test Setup for Radiated Emission and Conduction Emission.....	9
4.2	Photographs of the External and Internal Configurations of the EUT	9
5	Supplementary document.....	10
5.1	Bandwidth	10
5.2	Duty Cycle	10
5.3	Transmission time	10
6	Appendices	11

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Report No. : AF022383-001

Date : 2005 September 26

1 General Information

1.1 General Description

The equipment under test (EUT) is a transmitter for Home Weather Station. Operating at 433.920MHz which is controlled by a crystal. The EUT is powered by 4 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 RF.
- X1 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.
- Q2, Q3 and associated circuit act as rain sensor.
- Q2 (TC3566S) and associated circuit act as RF transmitter.

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TEST REPORT

Report No. : AF022383-001

Date : 2005 September 26

1.2 Location of the test site

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. 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 – 2003. A shielded room is located at :

Ground Floor, Yan Hing Centre,
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TEST REPORT

Report No. : AF022383-001

Date : 2005 September 26

1.3 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibration Certification No.
EMI Test Receiver	R&S	ESCS30	100001	S43284
Broadband Antenna	Schaffner	CBL6112B	2692	CA3025
Signal Generator	IFR	2023B	202302/938	S43098
LISN	R&S	ESH3-Z5	100038	S43377
LISN	R&S	ESH3-Z5	100010	S43101
Pulse Limiter	R&S	ESH3-Z2	100001	S43325
Biconical Antenna	R&S	HK116	837414/004	2GB05000535-0001
Loop Antenna	EMCO	6502	00056620	49906

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Report No. : AF022383-001

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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 – 2003.

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

Peak Detector data was measured unless otherwise stated.

Radiated emission measurements were performed according to the requirements of Section 15.231(e).

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

It was found that the EUT meet the FCC requirement.



TEST REPORT

Report No. : AF022383-001

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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	46.5	17.7	-6.6	57.6	72.9	-15.3
867.793	H	30.4	22.5	-6.6	46.3	52.9	-6.6
* 1301.676	H	16.4	24.3	-6.6	34.1	54.0	-19.9
1735.560	H	13.9	25.5	-6.6	32.8	54.0	-21.2
2169.480	H	10.4	27.6	-6.6	31.4	54.0	-22.6
2603.440	H	12.5	28.6	-6.6	34.5	54.0	-19.5
3037.328	H	14.2	30.1	-6.6	37.7	54.0	-16.3
3471.288	H	13.5	30.1	-6.6	37.0	54.0	-17.0
* 3905.208	H	11.7	31.1	-6.6	36.2	54.0	-17.8
* 4339.030	H	11.3	32.4	-6.6	37.1	54.0	-16.9

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Report No. : AF022383-001

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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 – 2003. 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 ExPho4.jpg and InPho1.jpg to InPho4.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 = $0.25\% \times 433.920$

$$= 1.085 \text{ (MHz)}$$

5.2 Duty Cycle

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

The duration of one cycle = 0.1 sec

Effective period of the cycle = $(2.46 \times 10)\text{ms} + (1.21 \times 15)\text{ms} + (0.54 \times 7)\text{ms}$
= 46.53ms

Duty Cycle = $46.53\text{ms} / 100\text{ms}$
= 0.4653

Therefore, the average factor is found by $20 \log_{10} 0.4653 = -6.6\text{dB}$

5.3 Transmission time

Duration of each transmission = 600ms

The duration of each transmission is confined within 1 second, and required silent period is at least 10 seconds or 30 times the duration of transmission according to section 15.231(e). The plot on saved in Test Rpt4.pdf shows the EUT meets the relevant has an at least 30 second silent period and thus met the FCC requirements.

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6 Appendices

A1	Photos of the set-up of Radiated Emissions	1 page
A2	Photos of External Configurations	2 pages
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	3 pages
A10	User Manual	30 pages
A11	Operation Description	1 page

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