CMA Testing and Certification Laboratories
廠商會檢定中心

TEST REPORT

Report No. : AE024762-002 Date : 2005 March 15

Applicant No. : LE203377(0)

Applicant : Suntree Holdings Company Limited
Unit 15-17, 16/F., Tower A, Regent Centre,
63 Wo Yi Hop Road,
Kwai Chung, N. T., Hong Kong.

Sample Description : One(1) submitted sample stated to be Weather Station – Outdoor Sensor of Model No. ST-RFS2L
Rating : 3 x 1.5 V AAA size batteries
No. of sample(s) : Two (2) piece(s)***

Date Received : 2004 November 30

Test Period : 2004 November 30 – 2004 December 22

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 12.

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

For and on behalf of
CMA Testing and Certification Laboratories

Authorized Signature : _____

Danny Chui
EMC Engineer - EL. Division

FCC ID : QZST98888

Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St.., Fo Tan, Shatin, Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com **Web Site:** http://www.cmatcl.com

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1 General Information

1.1 General Description

The equipment under test (EUT) is a transmitter for Weather Station – Outdoor Sensor operating at 433.92 MHz which is controlled by a crystal. The EUT is powered by 3 x 1.5 AAA size batteries. The EUT senses and transmits temperature and humidity data to the receiver – Clock periodically.

The brief circuit description is saved with filename: OpDes.pdf

1.2 Related Submittal Grants

This is a single application for certification of a transmitter.

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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 – 2003. An Open Area Testing Site is set up for investigation and located at :

Top of the Roof, 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 double shielded room is located at :

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

Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St.., Fo Tan, Shatin, Hong Kong.
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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	S43284
Spectrum Analyzer	R&S	FSP30	100416	20-102273
Broadband Antenna	Schaffner	CBL6112B	2718	AC1753
Signal Generator	IFR	2023B	202302/938	S43098
LISN	R&S	ESH3-Z5	100038	S43101
Pulse Limiter	R&S	ESH3-Z2	100001	S43325
Biconical Antenna	R&S	HK116	837414/004	4000.7752.02
Horn Antenna	EMCO	3115	9002-3351	9002-3351

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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.

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

2.2 Test Result

Radiated emission 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.

In addition, measurements were also performed according to the requirements of Section 15.109 for class B digital device. All emissions were at least 20 dB below the permissible limits and are not shown here.

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

Mode: Transmission

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV/m)	Antenna and Cable factor (dB)	Average Factor (-dB)	Field Strength (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
433.920	V	48.9	18.9	8.4	59.4	72.9	-13.5
867.825	H	22.3	24.2	8.4	38.1	52.9	-14.8
* 1301.720	V	22.4	24.3	8.4	38.3	54.0	-15.7
1735.630	V	23.1	25.5	8.4	40.2	54.0	-13.8
2169.513	H	17.1	27.6	8.4	36.3	54.0	-17.7
2603.318	V	15.7	28.6	8.4	35.9	54.0	-18.1
3037.590	H	15.4	30.1	8.4	37.1	54.0	-16.9
3471.904	H	17.8	30.1	8.4	39.5	54.0	-14.5
* 3905.531	V	11.7	31.1	8.4	34.4	54.0	-19.6
* 4339.202	H	7.9	32.4	8.4	31.9	54.0	-22.1

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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

Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St.., Fo Tan, Shatin, Hong Kong.
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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 InPho8.jpg.

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5 Supplementary documents

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.pdf
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% x 433.92 MHz

= 1.0848 MHz (measured at 20 dB down from modulated carrier)

Measured bandwidth falls within the required bandwidth.

5.2 Duty cycle calculation

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

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

The duration of the selected interval = 100.0 ms

Effective period of the cycle = 5 x 4.6 ms + 10 x 1.5 ms

= 38 ms

Duty Cycle = 38 / 100

= 0.38

Therefore, the average factor is found by $\underline{20 \log_{10}}$ 0.38 = -8.4 dB

5.3 Transmission time

Duration of each transmission = 400 ms

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 40-second plot on saved in TestRpt4.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	1 page
A3	Photos of Internal Configurations	4 pages
A4	Bandwidth Plot	1 page
A5	Average Factor	2 pages
A6	Transmission	1 page
A7	ID Label/Location	1 page
A8	Block Diagram	1 page
A9	Schematics	2 pages
A10	User Manual	2 pages
A11	Operation Description	1 page

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

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