

TEST REPORT

Report No.: HK10051012-1

LightAir AB

Application
For
Certification
(FCC ID: YJ550-SKY-MODEL)

Air Purifier

Prepared and Checked by:

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Date: July 8, 2010

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GENERAL INFORMATION

**LightAir AB - MODEL: Ionflow 50C,
Ionflow 50 Sky
FCC ID: YJ550-SKY-MODEL**

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Manufacturer:	N/A
Manufacturer Address:	N/A
Brand Name:	LightAir
Model:	Ionflow 50C, Ionflow 50 Sky
Type of EUT:	Consumer ISM device
Description of EUT:	Air Purifier
Serial Number:	N/A
FCC ID:	YJ550-SKY-MODEL
Date of Sample Submitted:	May 19, 2010
Date of Test:	June 03, 2010
Report No.:	HK10051012-1
Report Date:	July 8, 2010
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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SUMMARY OF TEST RESULT

LightAir AB
BRAND NAME: LightAir, MODEL: Ionflow 50C
Ionflow 50C
FCC ID: YJ550-SKY-MODEL

TEST SPECIFICATION	REFERENCE	RESULTS
Radiated Emissions	18.305	Pass
Conducted Emissions	18.307	Pass

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Table of Contents

1.0	<u>General Description</u>	1
1.1	Product Description	1
1.2	Related Submittal(s) Grants	1
1.3	Test Methodology	1
1.4	Test Facility	1
2.0	<u>System Test Configuration</u>	2
2.1	Justification	2
2.2	EUT Exercising Software	2
2.3	Special Accessories	2
2.4	Equipment Modification	2
2.5	Support Equipment List and Description	2
3.0	<u>Emission Results</u>	3
3.1	Field Strength Calculation	3
3.2	Radiated Emission Configuration Photograph	4
3.3	Radiated Emission Data	4
3.4	Conducted Emission Configuration Photograph	4
3.5	Conducted Emission Data	4
4.0	<u>Equipment Photographs</u>	6
5.0	<u>Product Labelling</u>	6
6.0	<u>Technical Specifications</u>	6
7.0	<u>Instruction Manual</u>	6
8.0	<u>Miscellaneous Information</u>	6
8.1	Discussion of Pulse Desensitization	6
8.2	Calculation of Average Factor	6
8.3	Emissions Test Procedures	7
9.0	Equipment List	7

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1.0 General Description

1.1 Product Description

The equipment under test (EUT) is an Air Purifier. The EUT is powered by the switching mode AC/DC adaptor: 100-240VAC to 12VDC (Model: HKP12-1200750dU). The EUT will generate a high voltage to ionize the surrounding air and produce negative ions. The negative ions will attach to the positively charged harmful particles in the air like dust, pollen, bacteria, mold, pet dander, virus etc, which accumulates and drop out of the air.

The model Ionflow 50 Sky is declared to be identical to the model Ionflow 50C in hardware aspect. The difference in model number serves as marketing strategy. The representative model Ionflow 50C was selected to test.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is an application for Certification of an Air Purifier. No other related submittal grants.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in FCC/OST MP-5 (1986). All measurements were performed in an Open Area Test Site. Preliminary scans were performed in the Open Area Test Site 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 and conducted measurement facility 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 placed on file with the FCC.

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2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in FCC/OST MP-5 (1986).

The EUT was powered by 120VAC.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. The step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the wooden turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it received continuously.

2.3 Special Accessories

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

2.4 Equipment Modification

Any modifications installed previous to testing by LightAir AB will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services Hong Kong Ltd.

2.5 Support Equipment List and Description

N/A

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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.

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 are added. The amplifier gain of 29 dB is subtracted, giving a field strength of 27 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 52.0 \text{ dB}\mu\text{V}/\text{m}$$

$$AF = 7.4 \text{ dB}$$

$$RR = 23.0 \text{ dB}\mu\text{V}$$

$$CF = 1.6 \text{ dB}$$

$$LF = 9.0 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$FS = RR + LF$$

$$FS = 23 + 9 = 32 \text{ dB}\mu\text{V}/\text{m}$$

$$\text{Level in } \mu\text{V}/\text{m} = \text{Common Antilogarithm } [(27 \text{ dB}\mu\text{V}/\text{m})/20] = 39.8 \mu\text{V}/\text{m}$$

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3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 4.525 MHz

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

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 26.7 dB

3.4 Conducted Emission Configuration Photograph

The worst case in line-conducted emission was found at 0.3525 MHz

For electronic filing, the worst case line-conducted configuration photographs are saved with filename: conducted photos.pdf.

3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission is saved with filename: conducted.pdf.

Judgment: Passed by 1.64 dB

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Applicant: LightAir AB

Date of Test: June 03, 2010

Model: Ionflow 50C

Mode: On mode

Table 1

**Radiated Emissions
Pursuant to FCC 18.305(b) Emissions Requirement**

Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V)	Calculated at 300m (dB μ V/m)	Limit at 300m (dB μ V/m)	Margin (dB)
0.127	25.6	10.2	0.0	35.8	-4.2	23.5	-27.7
1.329	26.6	10.0	0.0	36.6	-3.4	23.5	-26.9
4.525	26.8	10.0	0.0	36.8	-3.2	23.5	-26.7
12.549	25.5	10.2	0.0	35.7	-4.3	23.5	-27.8
24.849	26.3	8.9	0.0	35.2	-4.8	23.5	-28.3
48.889	39.1	11.0	16	34.1	-5.9	23.5	-29.4
192.527	33.9	16.0	16	33.9	-6.1	23.5	-29.6

NOTES: 1. Average Detector Data unless otherwise stated.

2. Negative value in the margin column shows emission below limit.

3. Frequency range scanned: 9kHz to 400MHz.

4. Only emissions significantly above equipment noise floor are reported.

5. A closer fixed distance was used for testing and 1/d attenuation law factor was used.

6. Loop antenna was used for the emission below 30MHz.

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4.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

5.0 Product Labelling

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

6.0 Technical Specifications

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

8.0 Miscellaneous Information

This miscellaneous information includes details of the test procedure and calculation of factors such as pulse desensitization and averaging factor.

8.1 Discussion of Pulse Desensitization

No desensitization of the measurement equipment is required as this device is an Air Purifier.

8.2 Calculation of Average Factor

This device is an Air Purifier. It is not necessary to apply average factor to the measurement result.

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8.3 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of Air Purifier operating under the Part 18, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of FCC/OST MP-5 (1986).

The equipment under test (EUT) is placed on a wooden turntable which is 1.5 x 1 meter dimension and approximately 1 meter in height above the ground plane. During the radiated emissions test, the turntable is rotated to resulting in maximum emissions. The antenna polarization is varied during the testing to search for maximum signal levels. For loop antenna, the height of the antenna is set at 2 meters. For biconical and log-periodic antenna, the antenna height is varied from one to four meters.

According to FCC/OCT MP-5 (1986), the frequency range scanned is 9 kHz to 400MHz in field strength emission. The detector function of the measurement is set to average. For line conducted emission, the frequency range scanned is from 0.15MHz to 30MHz in quasi peak and average measurement.

9.0 Equipment List

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Biconical Antenna	Log Periodic Antenna
Registration No.	EW-0014	EW-0954	EW-0446
Manufacturer	R&S	EMCO	EMCO
Model No.	ESVS30	3104C	3146
Calibration Date	Jun 01, 2009	Apr 14, 2010	Apr 26, 2010
Calibration Due Date	Jun 01, 2010	Apr 14, 2011	Oct 26, 2011

Equipment	Active Loop H-Field	Spectrum Analyzer
Registration No.	EW-0191	EW-2188
Manufacturer	EMCO	AGILENTTECH
Model No.	6502	E4407B
Calibration Date	Dec 25, 2009	Dec 25, 2009
Calibration Due Date	Jun 25, 2010	Dec 31, 2010

2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN	Pulse Limiter
Registration No.	EW-2251	EW-0192	EW-0699
Manufacturer	R&S	R&S	R&S
Model No.	ESCI	ESH3-Z5	ESH3-Z2
Calibration Date	Oct 22, 2009	Nov 23, 2009	Dec 24, 2009
Calibration Due Date	Oct 22, 2010	Nov 23, 2010	Jun 24, 2011