

**FCC
Electromagnetic Compatibility
Test Report**

**3M™ Filtrete™ Ultra Slim Air Purifier
Model FAP-04**

FCC ID: DGFCHIMFAP-04


**3M™ Construction Home Improvement Markets
St. Paul, MN 55144-1000**

10 July 2006

Report Number F0106005

Prepared By:

3M Product Safety
EMC Laboratory
Building 76-1-01
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CERTIFICATE OF COMPLIANCE

USA STANDARD 47 CODE OF FEDERAL REGULATIONS

Radiated Emissions (FCC Part 15, Subpart B, Class B)
Conducted Emissions (FCC Part 15, Subpart B, Class B)
Radiated Emissions (FCC Part 15, Subpart C)
Conducted Emissions (FCC Part 15, Subpart C)

MANUFACTURER'S NAME: 3M Company
Construction Home Improvement Markets
St. Paul, MN 55144-1000

NAME OF EQUIPMENT: Ultra Slim Air Purifier

MODEL NUMBER: FAP-04

FCC ID NUMBER: DGFCHIMFAP-04

SERIAL NUMBER: Eng. Prototype

TEST REPORT NUMBER: F0106005

DATE: 10 July 2006

As the responsible EMC Project Engineer, I hereby declare that the equipment tested, as specified in the test report, at the 3M Product Safety EMC Laboratory is in compliance with 47 CFR, Part 15, Subpart B and Subpart C. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

Steve Wytaske
Senior EMC Engineer

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1.0 TEST SUMMARY

Test Report Number: F0106005

Requester: Andy Fox

Company: 3M
Construction Home Improvements Markets
Building 251
St. Paul, MN 55144

Telephone Number: 651 – 733-5433

Test Dates: 18 April through 20 April 2006

Equipment Under Test: Model FAP-04 Air Purifier with RF Remote
FCC ID Number: DGFCHIMFAP-04

Date Of Receipt: 14 April 2006

Test Environment: Temperature: 20 to 30 degrees C
Relative Humidity: 30 to 70 % RH

Test Results: Passed the following tests:
Conducted Emissions: FCC Part 15 Subpart B Class B;
Radiated Emissions: FCC Part 15 Subpart B Class B;
Radiated Emissions: FCC Part 15 Subpart C;

Modifications: (See Paragraph 2.5)

Test Location: 3M Product Safety EMC Laboratory
Building 76
410 Fillmore Ave.
St. Paul, MN 55144-1000

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2.0 INTRODUCTION

2.1 Scope

This report contains results describing the conformance of the Equipment Under Test (EUT) to FCC Part 15, Subpart B, "Class B" rules for unintentional radiators and FCC Part 15, Subpart C rules for intentional radiators.

This report is the confidential property of the client and applies only to the specific item tested under the stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. This report shall not be reproduced without the written approval of the testing laboratory. When approval has been granted, the report shall be reproduced in its entirety.

The appropriate testing standards and references that were used are contained in Section 3.0. Worst-case test data, test configuration, and photographs (worst case configuration) are provided in sections 4.0 and 5.0. Equipment and documentation labeling information is contained in Sections 6.0 and 7.0.

Subsequent tests are necessary from time to time on equipment taken at random from production. Re-testing of the EUT is also required when the EMC profile has been changed or is suspected of being changed.

The 3M Product Safety EMC Laboratory is recognized under the United States Department of Commerce National Institute of Standards and Technology's National Voluntary Laboratory Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQ Q92-1987) as suppliers of test results. Accreditation by the National Voluntary Laboratory Accreditation Program is awarded for specific services, listed on the Scope of Accreditation for: Electromagnetic Compatibility and Telecommunications, FCC, under Lab Code 200033. A complete copy of the Scope of Accreditation is available upon request. The FCC Site Registration Number is 93334.

The NVLAP accreditation or this test report does not in any way constitute or imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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2.2 EUT Description and Operation

The Equipment Under Test (EUT) is the 3M™ Model FAP-04 Ultra Slim Air Purifier Serial Number Eng. Prototype, with RF Remote.

The 3M™ Model FAP-04 Ultra Slim Air Purifier is designed and tested for indoor household use only. The FAP-04 is designed to remove particles from indoor air. The FAP-04 contains an RF Remote which allows operation and control of the unit from across the room.

The remote control has a transmit frequency of **433.8965 MHz**, and a rated power output level of **10 milliwatts or less**. No provision is made to measure conducted power output directly into a 50-ohm load.

The transmitter is activated by pressing one of 6 buttons on the remote. Transmission stops immediately upon release of a button. (47 CFR 15.231 (a) (1))

The EUT has an integral antenna of six (6) cm in length. The antenna is a “U” shaped etch on the circuit board and is directly connected to the transmitter module.

All tests were made using an input of 120 V RMS, 60 Hz, and single-phase power to the Air Purifier and a fresh 12 volt battery in the RF Remote. The EUT was tested with the remote in a continuous transmit mode, that is, one of the buttons was artificially pressed to provide a continuously repeating pulse train with the largest duty cycle of the 6 commands provided.

The Air Purifier portion of the EUT is classified as an appliance and the digital portion is exempt under 47 CFR 15.103 (d). The Air Purifier also contains a receiver tuned to the operating frequency of the remote control and is therefore subject to testing under 47 CFR 15.107 and 15.109 (Class B).

The Remote Control is authorized under a Grant of Certification and the receiver portion under a Declaration of Conformity.

RF Remote Control
FCC ID Number is: **DGFCHIMFAP-04**

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2.3 Block Diagram and schematics

(Submitted as a separate exhibit)

2.4 Parts List

<u>Description</u>	<u>Manufacturer</u>	<u>Model / Type</u>	<u>Remark / 3M Part Number</u>
Air Purifier	3M Company	FAP-04	70-0713-7507-8
Receiver Module	HSIN – BAO Corp. Taiwan R.O.C.	RF-2000	Part of Air Purifier
RF Remote	3M Company	FAPR-04	
Transmit Module	HSIN – BAO Corp. Taiwan R.O.C.	TX-2000	Part of RF Remote

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2.5 Modifications to the EUT

No modifications of the EUT were necessary to meet the test standards.

2.6 Measurement Uncertainty

The data and test results referenced in this report are true and accurate. However, there may be deviations within the calibration limits of the test equipment and facilities that can account for a nominal measurement deviation of ± 2 dB. Furthermore, EUT component and manufacturing process variables may result in additional deviation. The calculated confidence level is 95 %.

3.0 APPLICABLE DOCUMENTS

The following documents were used as reference for the limits and test procedures specified herein.

CFR 47	Part 15 Radio Frequency Devices 15.231, 15.205, 15.209, 15.215, 15.103, 15.107, & 15.109	2004
ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 KHz to 40 GHz.	2003
CISPR 16-1	Specification for radio disturbance and immunity measuring apparatus and methods Part 1: Radio disturbance and immunity measuring apparatus	1998
CISPR 16-2	Specification for radio disturbance and immunity measuring apparatus and methods Part 2: Methods of measurements of disturbances and immunity	1996

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4.0 RADIATED EMISSIONS

Radiated emissions testing was performed in accordance with ANSI C63.4. The limits are prescribed in FCC Part 15, Subpart B (15.107 & 15.109) and in FCC Part 15, Subpart C. (15.231, 15.205, 15.209, & 15.215)

4.1 Transmitter Frequency Stability

The Frequency Stability testing was performed in accordance with ANSI C63.4 and FCC Part 15 to insure that the intentional radiator frequency stability was within the allowable limits for input power and temperature variations.

4.1.1 Test Procedure

The Frequency Stability was measured using the radiated signals from the EUT so that the measurement equipment would not load the radio frequency circuits. An EMI receiver was used for the frequency stability measurements. The Remote was put into a continuous output mode by locking one of remotes function buttons in the on position. 1) The frequency was measured while the DC input voltage to the Remote was varied over the required input voltage range using an External Power Supply. 2) The frequency was also measured while the ambient air temperature was varied in 10 degree increments over the required temperature range (at startup, 2 minutes, 5 minutes, and 10 minutes).

4.1.2 Test Criteria

The FCC Part 15, Subpart C, (15.231 & 15.215 (c)), Frequency Stability Limits versus Supply Voltage are given below.

<u>Carrier Frequency</u> (MHz)	<u>Voltage Range</u>	<u>Max. Frequency Change</u> (%)
434 MHz	(5.2 to 12 volts DC)*	Not specified (Test & report)

* Voltage Range per Manufacturers spec.

The FCC Part 15, Subpart C, (15.231 & 15.215 (c)), Frequency Stability Limits versus Temperature is given below.

<u>Carrier Frequency</u> (MHz)	<u>Temperature Range</u> (Degrees C)	<u>Max. Frequency Change</u> (%)
434 MHz	-20 to +50	Not specified (Test & report)

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4.1.3 Test Results

The EUT met the FCC Part 15, Subpart C Frequency Stability requirement.

Carrier Frequency Stability versus Supply Voltage

<u>Carrier Frequency (MHz)</u>	<u>Frequency (MHz) At 5.2VDC</u>	<u>Frequency (MHz) At 12.0VDC</u>	<u>Frequency Change (%)</u>
433.8965	433.8965	433.8965	0.0 %

Worst case Carrier Frequency Stability versus Temperature

<u>Carrier Frequency (MHz)</u>	<u>Lowest Frequency (MHz)</u>	<u>Highest Frequency (MHz)</u>	<u>Frequency Change (%)</u>
433.8965	433.8606	433.8965	-0.0089%, +0.0%

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FREQUENCY STABILITY vs TEMPERATURE

3M EMC Lab

TEST REPORT # F0106005 SHEET 1 OF 1
 EUT MODEL # FAP-04 EUT SERIAL # no s/n
 DESCRIPTION Room Air Purifier RF Remote

TIME

	Initial	2 Min.	5 Min.	10 Min.
Temp ° C				
-20	433.8606	433.8651	433.8660	433.8665
-10	433.8756	433.8752	433.8755	433.8760
0	433.8837	433.8854	433.8856	433.8863
10	433.8902	433.8914	433.8917	433.8920
20	433.8960	433.8961	433.8961	433.8965
30	433.8948	433.8951	433.8950	433.8954
40	433.8827	433.8792	433.8900	433.8908
50	433.8861	433.8869	433.8877	433.8878

FREQUENCY IN MHz

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4.2 Transmitter Radiated Field Strength and Emission Bandwidth

The EUT was placed in an anechoic chamber and the Emission testing was performed in accordance with ANSI C63.4 and FCC Part 15, Paragraph 15.231 (c). The Emission Bandwidth measurements were made to determine the intentional radiator frequency, determine the level of electromagnetic energy radiated at that frequency and at the band edges from the EUT.

4.2.1 Test Procedure

The EUT was placed on a 0.8 meter high wooden table in the center of a turntable with a measurement antenna positioned at a fixed distance from the center of the EUT. An EMI receiver was used for the emissions measurements. Initial sweep measurements were taken with the receiver in continuous frequency overview mode utilizing peak level signal detection. The intentional radiator frequency and band edge frequencies utilizing peak and average detection were then maximized. Maximizing a frequency involves finding the angle of the highest emission levels by rotating the EUT 360 degrees (sampling at least every 4 degrees). Then the antenna was varied over a range from 1-meter to 4 meter in height, until the highest emissions levels are found. Measurement results were automatically calculated via software running the EMI receiver. The final measurements recorded were determined by the following formula:

Result (dB μ V/m) = receiver level (μ V) + antenna factor (dB/m) + cable loss (dB) - preamp gain (dB) + lineal conversion (dB).

4.2.2 Test Criteria

The FCC Part 15 Subpart C, Paragraph 15.231 (c) 20 dB Emission Bandwidth Limits are given below. (limit – no wider than 0.25% of center frequency (± 0.125 %))

Lower Emission Limit (MHz) 433.3541	Upper Emission Limit (MHz) 434.4388
-------------------------------------------	-------------------------------------------

The FCC Part 15, Subpart C (15.231 (b) radiated field strength limits are given below.

Fundamental Frequency (MHz)	Distance (m)	Field Strength μ V/m	Field Strength (dB μ V/m) @ 434 MHz
260 to 470	3	3,750 to 12,500 ¹	80.82 ²

Note: 1, linear interpolation, 2, average level

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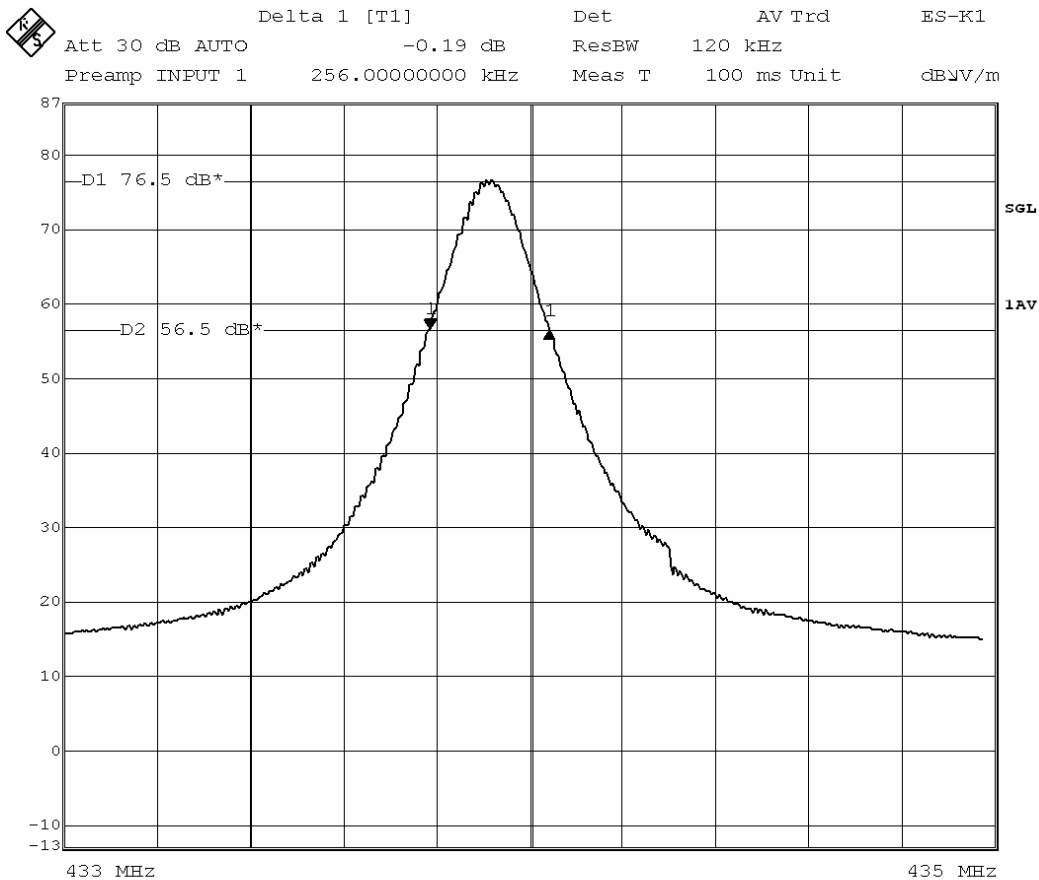
4.2.3 Test Results

The EUT met the FCC Part 15, Subpart C 20 dB Bandwidth Emission requirements. (15.231 (c))

20 dB Bandwidth Data

Lower Frequency (MHz)	Upper Frequency (MHz)	Measured Bandwidth (MHz)	Allowable Bandwidth (MHz)
433.7685	434.0245	0.256	1.0847

20 dB BW PLOT



Date: 20.APR.2006 11:32:12

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The EUT met the FCC Part 15, Subpart C Radiated Field Strength Limit. (15.231 (b))

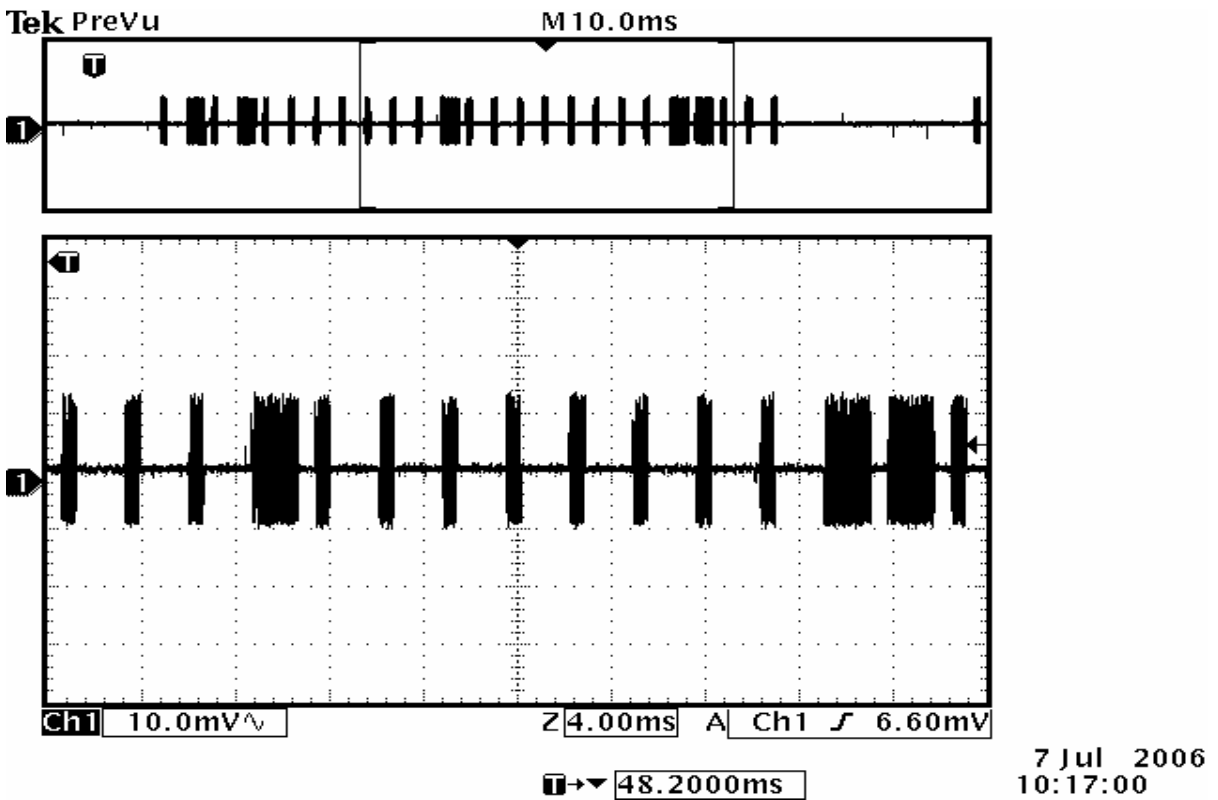
Average Data Calculation

Average Data is determined by measuring the peak level of the emission and correcting for duty cycle. The Duty Cycle is the sum of the pulse widths in one period divided by the length of the period. The EUT has a pulse train period of 86.6 ms including blanking intervals. The pulse train consists of 25 pulses encompassing 23.12 ms.

$$\text{Duty Cycle} = \frac{\text{Total pulse widths}}{\text{Period}} = 26.69 \%$$

Average equals peak detected Field Strength times Duty Cycle.

$$A_v = P_k \mu\text{v/m} \times .2669 = 6,544.07 \mu\text{v/m} = 76.32 \text{ dB}\mu\text{v/m}$$



Top Trace shows one complete pulse train period (10ms/div).

Bottom Trace is expanded portion of pulse train (4ms/div).

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Average Data

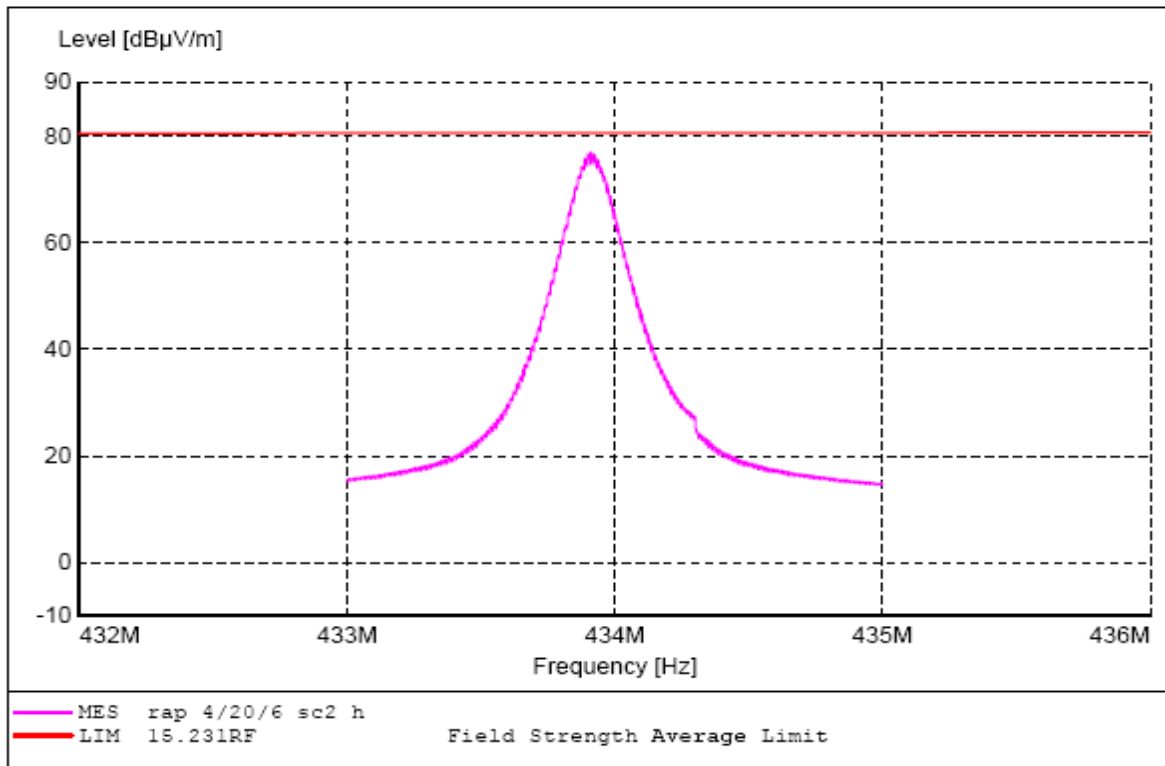
Frequency (MHz)	Average Level (dBμV/m)	Average Limit (dBμV/m)	Passing Margin (dB)	Turntable (Degrees)	Antenna Orientation/Height (Polarity/meters)
433.8965 ¹	76.32	80.82	4.5	97	H / 1.0

1 - Intentional Radiator Frequency

Peak Data

Frequency (MHz)	Peak Level (dBμV/m)	Peak Limit ¹ (dBμV/m)	Passing Margin (dB)	Turntable (Degrees)	Antenna Orientation/Height (Polarity/meters)
433.8965	87.79	100.82	13.03	97	H / 1.0

1 – Peak limit is Average limit + 20 dB (15.35 (b))



Radiated Field Strength (Average Level)

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Radiated Field Strength and Bandwidth

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4.3 Transmitter Spurious & Radiated Emissions (30 MHz to 5 GHz).

The EUT was placed in an anechoic chamber and the Spurious Emissions testing was performed in accordance with ANSI C63.4 and FCC Part 15, Subpart C. The Spurious Emission measurements were made to determine the level of spurious electromagnetic energy radiated from the EUT.

4.3.1 Test Procedure

The EUT was placed on a 0.8 meter high wooden table in the center of a turntable with a measurement antenna positioned at a fixed distance from the center of the EUT. An EMI receiver was used for the emissions measurements. Initial sweep measurements were taken with the receiver in continuous frequency overview mode utilizing peak level signal detection. Acceptance analysis of these sweeps was used to determine which discrete frequencies, other than the intentional radiator frequency and band edge frequencies were to be maximized. Maximizing a frequency involves finding the angle of the highest emission levels by rotating the EUT 360 degrees (sampling at least every 4 degrees). Then the antenna is varied from 1 to 4 meters in height until the highest emissions level is found. Final measurements were taken utilizing peak, quasi-peak, and average detection. Measurement results were automatically calculated via software running the EMI receiver. The final measurements recorded were determined by the following formula:

Result (dB μ V/m) = receiver level (μ V) + antenna factor (dB/m) + cable loss (dB) - preamp gain (dB) + lineal conversion (dB).

4.3.2 Test Criteria

The FCC Part 15, Subpart C (15.231 (b)) spurious emissions limits are given below.

Fundamental Frequency (MHz)	Distance (m)	Spurious Limit μ V/m	Spurious Limit (dB μ V/m) @ 434 MHz
260 to 470	3	375 to 1250 ¹	60.82 ²

Note: 1Linear interpolations, 2 Average Level

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Any spurious emission appearing within the Restricted Bands listed in 15.205 shall not exceed the quasi-peak limits as shown in 15.209 as listed below.

Frequency (MHz)	Distance (m)	Field Strength (dB μ V/m)
30 to 88	3	40.0
88 to 216	3	43.52
216 to 960	3	46.02
960 to 1000	3	53.98
1000 to 40000	3	53.98 and 79.98*

* Per 15.35(B)

Digital Radiated Emissions

The FCC Part 15, Subpart B (15.109), Class B radiated emissions limits are given below.

Frequency (MHz)	Distance (m)	Field Strength (dB μ V/m)
30 to 88	3	40.0
88 to 216	3	43.52
216 to 960	3	46.02
960 to 1000	3	53.98
1000 to 40000	3	53.98 and 79.98*

* Per 15.35(B)

4.3.3 Test Results

The EUT met the FCC Part 15, Subpart B & C for Radiated and Spurious Emissions (30 to 5000 MHz) requirements. All maximized measurements for the EUT were below the limits. No spurious emissions were detected between 1000 MHz and 5000 MHz. The worst-case emission is as follows:

Frequency (MHz)	Average Level (dB μ V/m)	Average Limit (dB μ V/m)	Passing Margin (dB)	Turntable (degrees)	Antenna Orientation/Height (Polarity/meters)
867.8316	41.84	60.82	18.98	40	H / 1.0

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RADIATED EMISSIONS



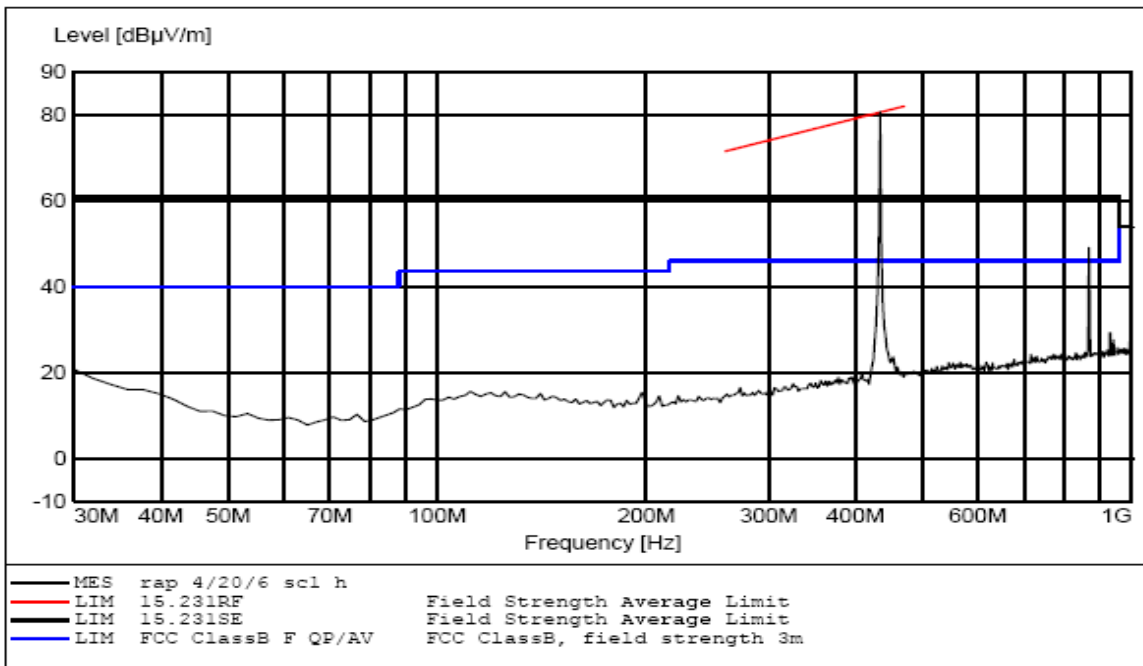
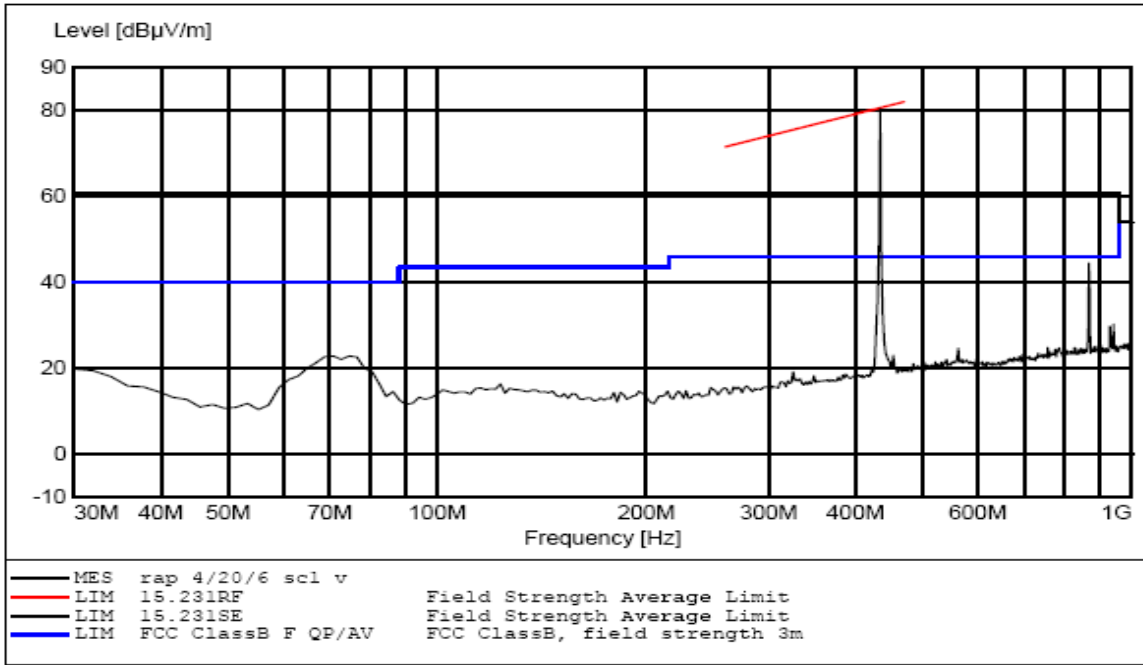
TEST REPORT # F0106005 SHEET 1 OF 1
 EUT MODEL # FAP-04 EUT SERIAL # no s/n
 DESCRIPTION Room Air Purifier RF Remote

FREQ. (MHz)	MAXIMIZED QP SIGNAL		LIMIT LINE (dBμV/m)	PASSING MARGIN (dB)	MAXIMIZED POSITION		REMARKS
	H/V	(dBμV/m)			TURNTABLE (degrees)	ANTENNA (meters)	
30.0	V	12.3	40.0	27.7	139	1.0	Digital Limit
70.0	V	14.0	40.0	26.0	139	1.31	“
75.0	V	13.6	40.0	26.4	77	1.09	“
123.3	V	8.19	40.0	31.81	0	1.36	“

FREQ. (MHz)	MAXIMIZED Average SIGNAL		LIMIT LINE (dBμV/m)	PASSING MARGIN (dB)	MAXIMIZED POSITION		REMARKS
	H/V	(dBμV/m)			TURNTABLE (degrees)	ANTENNA (meters)	
867.8316	H	41.84	60.82	18.98	40	1.0	15.231 Spurious Limit
433.8965	H	76.32	80.82	4.5	97	1.0	Carrier Freq.

FREQ. (MHz)	MAXIMIZED Peak SIGNAL		LIMIT LINE (dBμV/m)	PASSING MARGIN (dB)	MAXIMIZED POSITION		REMARKS
	H/V	(dBμV/m)			TURNTABLE (degrees)	ANTENNA (meters)	
433.8965	H	87.79	100.82	13.03	97	1.0	Carrier Freq.
867.8316	H	53.84	80.82	26.98	40	1.0	15.231 Spurious Limit

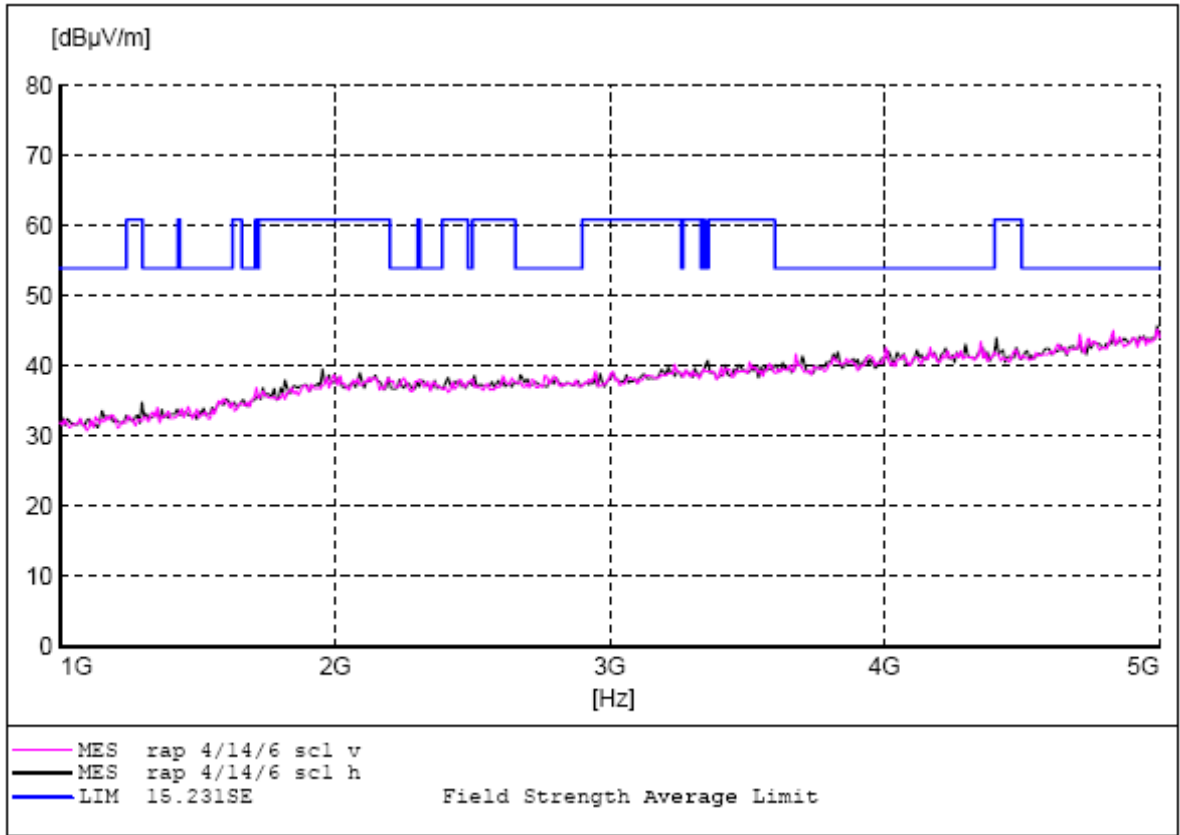
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Radiated and Spurious Emissions 30 to 1000 MHz

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(Max Peak Plot)



Radiated and Spurious Emissions 1 to 5 GHz

(Max Peak Plot)

Limit Line shows both the Limit of 15.231, (higher level) and Limit within the Restricted Bands, (lower level)

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Transmitter Spurious and Radiated Emissions
30 MHz to 1000 MHz



Transmitter Spurious and Radiated Emissions
1 to 5 GHz

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4.4 Radiated Emissions Receiver/Air Purifier (30 to 1000 MHz)

The EUT was placed in an anechoic chamber and the Radiated Emissions testing was performed in accordance with ANSI C63.4, FCC Part 15, Subpart B "Class B". The Radiated Emission measurements were made to determine the level of electromagnetic energy radiated from the EUT.

4.4.1 Test Procedure

The EUT was placed on a 0.8 meter high wooden table in the center of a turntable with a measurement antenna positioned at a fixed distance from the center of the EUT. An EMI receiver was used for the emissions measurements in the range of 30 MHz to 1000 MHz (the upper limit of measurement is determined by Paragraph 15.33). Initial sweep measurements were taken with the receiver in continuous frequency overview mode utilizing peak level signal detection. Acceptance analysis of these sweeps was made to determine which discrete frequencies were to be maximized. Maximizing a frequency involves finding the angle of the highest emission levels by rotating the EUT 360 degrees (sampling at least every 4 degrees) and varying antenna height between 1 and 4 meters at the angle of highest emissions levels found. Final measurements were taken utilizing quasi-peak detection (peak and average detectors were used above 1000 MHz). Measurement results were automatically calculated via software running the EMI receiver. The final measurements recorded were determined by the following formula:

Result (dB μ V/m) = receiver level (μ V) + antenna factor (dB/m) + cable loss (dB) - preamp gain (dB) + lineal conversion (dB).

4.4.2 Test Criteria

The FCC Part 15, Subpart B, "Class B" radiated limits are given below. The lower limit shall apply at the transition frequency. (Limits extrapolated to 10 meter distance per 15.31(f)(1))

Frequency (MHz)	Distance (m)	Field Strength (dB μ V/m)
30 to 88	10	30.0
88 to 216	10	33.52
216 to 960	10	36.02
960 to 1000	10	43.98

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4.4.3 Test Results

The EUT met the FCC Part 15, Subpart B "Class B" Radiated Emissions (30 to 1000MHz.) requirements. All maximized quasi-peak measurements for the EUT were below the quasi-peak limits. The worst-case quasi-peak emission was as follows:

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Passing Margin (dB)	Turntable (degrees)	Antenna (Meters/Polarity)
32.06	14.3	30.0	15.7	51	1.0/V

RADIATED EMISSIONS

3M EMC Lab

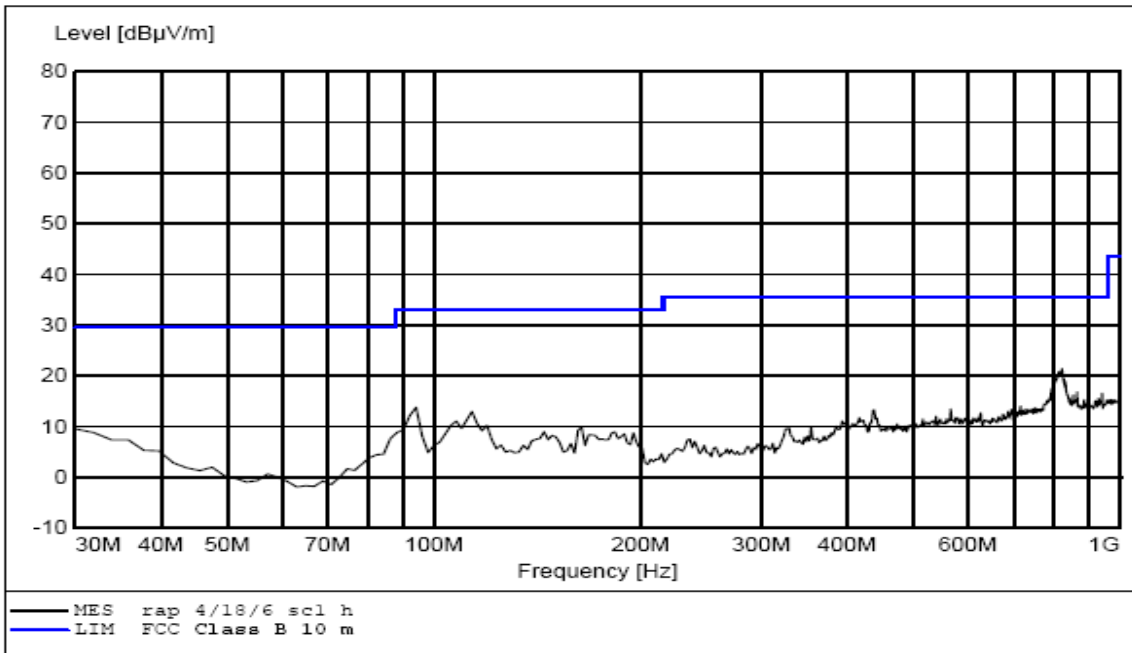
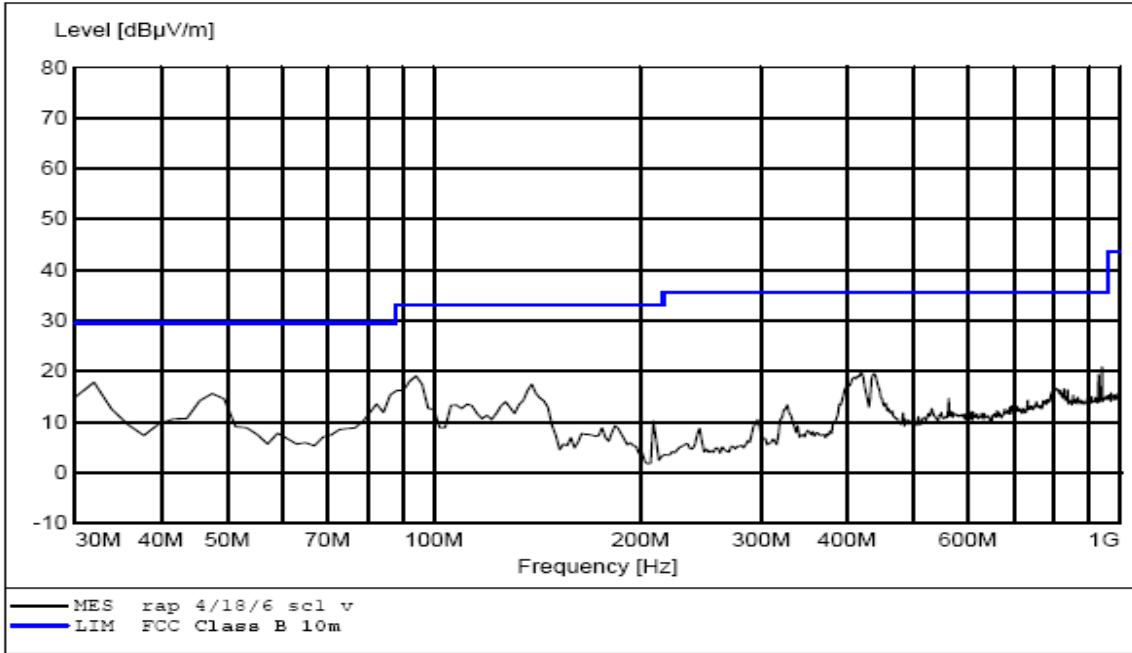
TEST REPORT # F0106005 SHEET 1 OF 1

EUT MODEL # FAP-04 EUT SERIAL # no s/n

DESCRIPTION Room Air Purifier

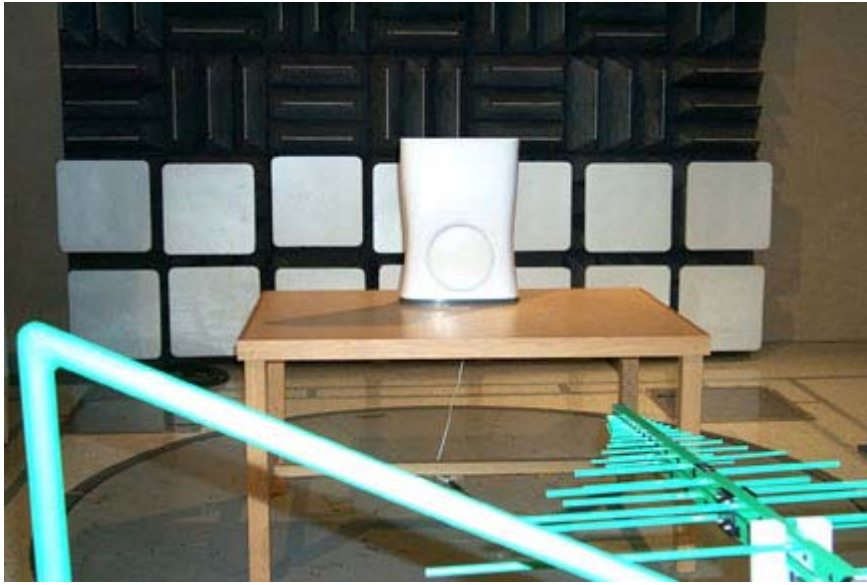
FREQ. (MHz)	MAXIMIZED QP SIGNAL		LIMIT LINE (dB μ V/m)	PASSING MARGIN (dB)	MAXIMIZED POSITION		REMARKS
	H/V	(dB μ V/m)			TURNTABLE (degrees)	ANTENNA (meters)	
32.06	V	14.3	30.0	15.7	51	1.0	15.109 Limit
94.0	V	9.56	33.52	23.96	94	1.0	“
419.5	V	15.38	36.02	20.64	116	1.0	“
438.0	V	14.25	36.02	21.77	116	1.05	“
817.39	H	17.21	36.02	18.81	246	1.22	“

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Radiated Emissions (30 to 1000 MHz)
(Max Peak Plot)

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Radiated Emissions
30 to 1000 MHz

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5.0 CONDUCTED EMISSIONS

Conducted emissions' testing was performed on the receiver, control board, and power supply portion of the EUT in accordance with ANSI C63.4. The limits are prescribed in FCC Part 15, Subpart B (15.107 class B)

5.1 Test Procedure

The EUT was placed in a shielded chamber for the tests and tested while exercising all functions of the unit. A Line Impedance Stabilization Network (LISN) with a 50 Ohm / 50 microHenry characteristic impedance was used to isolate the EUT and give accurate and repeatable readings. An EMI test receiver was used for the emissions measurements in the range from 150 KHz to 30 MHz. Initial sweep measurements were taken with the receiver in continuous frequency overview mode utilizing peak level signal detection. Acceptance analysis was performed on the initial measurements to determine which discrete frequencies to maximize. These frequencies were re-measured utilizing quasi-peak detection. Measurement results were automatically calculated via software running the EMI receiver. The final quasi-peak measurements recorded were determined by the following formula:

$$\text{Result (dB}\mu\text{V)} = \text{receiver reading (dB}\mu\text{V)} + \text{LISN CF (dB)} + \text{cable loss (dB)}$$

5.2 Test Criteria

The FCC Part 15, Subpart B, "Class B" conducted limits are given below. The lower limit shall apply at the transition frequency. (15.107)

Mains Terminal Disturbance Limits		
Frequency (MHz)	Quasi-Peak (dB μ V)	Average (dB μ V)
0.15 to 0.50	66 to 56 (decreasing with log of freq)	56 to 46 (decreasing with log of freq)
0.50 to 5.0	56	46
5.0 to 30.0	60	50

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5.3 Test Results

The EUT met conducted emission requirements for FCC Part 15, Subpart B, "Class B". The worst-case peak and quasi-peak emissions were as follows:

<u>Frequency</u> (MHz)	<u>Limit</u> (dB μ V)	<u>L1- Line</u> Q-P (dB μ V)	<u>L2 - Neutral</u> Q-P (dB μ V)	<u>Passing Margin</u> (dB)
12.078	60.0	23.4	23.52	36.48

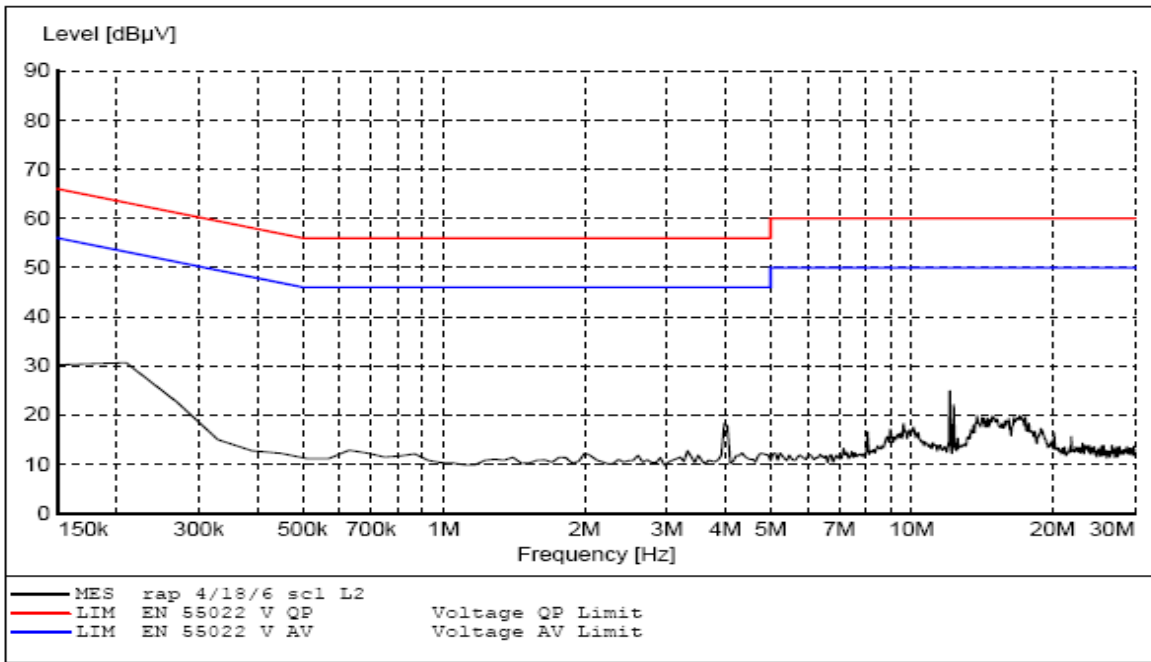
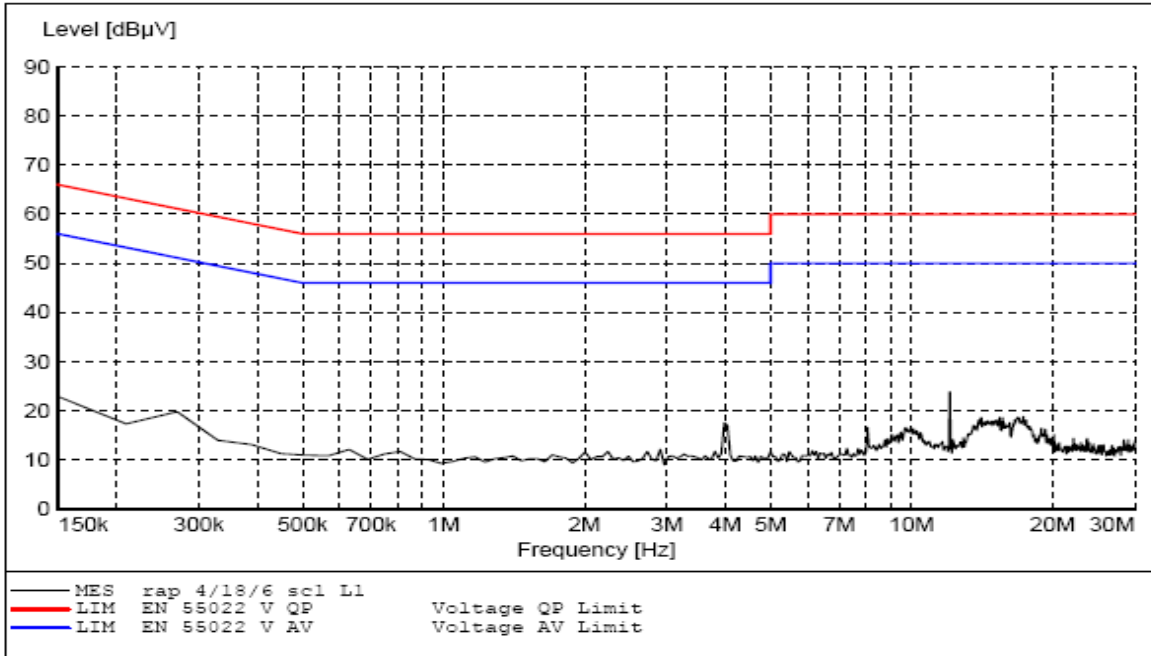
CONDUCTED EMISSIONS

3M EMC Lab

TEST REPORT # F0106005 SHEET 1 OF 1
 EUT MODEL # FAP-04 EUT SERIAL # no s/n
 DESCRIPTION Air Purifier Receiver

FREQUENCY (MHz)	PEAK (dB μ V)		QUASI-PEAK (dB μ V)				AVERAGE (dB μ V)			
	L1 Line	L2 Neut	L1 Line	L2 Neut	Limit	Pass	L1 Line	L2 Neut.	Limit	Pass
0.150	22.95	30.02	11.76	21.05	66	44.95	-	-	-	-
0.200	18.5	24.33	7.04	16.28	63.6	47.32	-	-	-	-
4.027	17.37	16.87	16.14	15.67	56	39.86	-	-	-	-
9.949	13.39	10.03	3.14	2.68	60	56.86	-	-	-	-
12.078	24.23	25.39	23.4	23.52	60	36.48	-	-	-	-
17.053	16.99	16.31	10.45	10.63	60	49.37	-	-	-	-

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Conducted Emissions
(Max Peak Plot)

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Conducted Emissions

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6.0 LIST OF TEST EQUIPMENT

The following test equipment was used to perform the indicated tests. All of the test equipment was calibrated by an accredited calibration laboratory or by the manufacturer. All calibration intervals are one year. All equipment calibrations, test procedures, and the test facility are traceable to the standards of the National Institute of Standards and Technology (NIST). The test facility site attenuation verification results fall within the normalized site attenuation (NSA) criteria for open area test sites using volumetric measurements.

CONDUCTED EMISSIONS

EMCO LISN, Model 3825-2, Serial No. 1039 (cal due date: 12 Sept 06)
Solar High Pass Filter, Model 8131 - 5.0 (cal due date: 30 Jun 06)
Rohde & Schwarz EMI Receiver, Model ESBI40, S/N 100235 (cal due date: 14 Sep 06)
Rohde & Schwarz ESBI40 Firmware Version 4.32.3

FREQUENCY STABILITY

Advantest Spectrum Analyzer, Model R3271A, s/nJ002333 (cal due date: 13 Sep 06)
Variable DC Power Supply, (cal not required)
Fluke Digital Multimeter, Model 87, Serial No. 43718 (cal due 27 Sep. 06)
EMCO Loop Probe, Model 7405-901, s/n none, (cal not required)
Environtronics Chamber, Model EH40-2-3-RF, (cal due date 3 Nov 06)

RADIATED EMISSIONS

A.H. Systems Horn Antenna, Model SAS-200/571, Serial No. 234 (cal due date: 13 Sep 06)
Schaffner Biconilog Antenna, Model CBL6112B, Serial No. 27491 (cal due date: 12 Sep 06)
HP Pre-Amplifier, Model 8447D, Serial No. 1937A03090 (cal due date: 12 Sep 06)
HP Pre-Amplifier, Model 83017A, Serial No. 3123A00259 (cal due date: 13 Sep 06)
Rohde & Schwarz EMI Receiver, Model ESBI40, S/N 100235 (cal due date: 14 Sep 06)
Rohde & Schwarz ESBI40 Firmware Version 4.32.3

TEST FACILITY

Lindgren Semi-Anechoic Chamber, Model 11867A, serial No. 01211 (verification due date: 29 Sep 06)

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7.0 LABELING INFORMATION

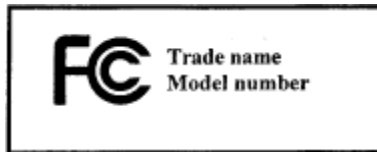
The FCC (Federal Communications Commission) requires the following labeling information. Since the equipment has intentional and unintentional radiators, it must be labeled as a digital device and as an intentional radiator.

Labels on the Product

The following statement shall be placed in a conspicuous location on the device:

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.

Class B devices shall also display the following label located in a conspicuous location on the device and contain a unique identifier such as a Trade Name, Model Number and the following logo:



FCC ID: DGFCHIMFAP-04

Statement in the Manuals

The following statement shall be placed in a prominent location in the text of the user manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC ID: DGFCHIMFAP-04

NO MODIFICATIONS. Modifications to this device shall not be made without the written consent of 3M Company. Unauthorized modifications may void the authority granted under Federal Communications Commission Rules permitting the operation of this device.

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8.0 SIGNATURES

This page contains the secured digital signatures of the parties deemed responsible for approving the contents of this report:

APPROVER:

DATE: 28 April 2006

Steve Wytaske

TEST ENGINEER:

DATE: 28 April 2006

Bruce Jungwirth

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