FCC
Electromagnetic Compatibility
Test Report

For

3M™ SelfCheck System C – Series C1
Model 877

FCC ID: DGFSSD877

3M Safety and Security Systems Division
Library Systems
St. Paul, MN 55144-1000

31 October 2006

Report Number F1205004

Prepared By:

3M Product Safety
EMC Laboratory
Building 76-1-01
410 East Fillmore Avenue
St. Paul, Minnesota 55144-1000

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CERTIFICATE OF COMPLIANCE

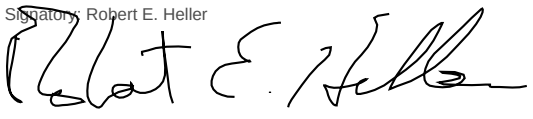
USA STANDARD 47 CODE OF FEDERAL REGULATIONS

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

MANUFACTURER'S NAME:	3M Company Safety and Security Systems Division Library Systems St. Paul, MN 55144-1000
NAME OF EQUIPMENT:	SelfCheck™ System C-Series C1
MODEL NUMBER:	877
SERIAL NUMBER	None
FCC ID NUMBER	DGFSSD877
TEST REPORT NUMBER:	F1205004
DATE:	31 October 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.

Signatory: Robert E. Heller



Robert E. Heller
Senior EMC Engineer

TABLE OF CONTENTS

1.0 TEST SUMMARY

Test Report Number:	F1205004
Requester:	Seth Liefort
Company:	3M Safety and Security Systems Division Library Systems Building 209 St. Paul, MN 55144
Telephone Number:	651 – 736-6939
Test Dates:	Dec. 8,13,20 2005 Jan 3,2006
Equipment Under Test	Model 877
Date Of Receipt:	Dec 5, 2005
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 A; Radiated Emissions: FCC Part 15 Subpart B Class A; Conducted Emissions: FCC Part 15 Subpart C; Radiated Emissions: FCC Part 15 Subpart C;
Modifications:	Modifications were required (See Paragraph 2.5)
Test Location:	3M Product Safety EMC Laboratory Building 76 410 Fillmore Ave. St. Paul, MN 55144-1000

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 A” 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. Equipment and documentation labeling information is contained in Section 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.

2.2 EUT Description and Operation

The Equipment Under Test (EUT) is the 3M™ Model 877 SelfCheck™ Sestem C-Series C1, Serial Number None.

The 3M SelfCheck System C-Series C1 Model 877 is intended for use by library Patrons in checking RFID-tagged books back into a library with minimal assistance by library staff. The system is offered in versions suitable for installation into fire-rated or, non-fire-rated partition walls.

The product has not been tested or proven safe for other uses.

The reader has a transmit frequency of 13.5596 MHz. and a power output level of 4.0 watts (36 dBm) as measured into a 50-ohm load.

The EUT has an integral antenna with an area of 203 square inches (0.131 square meters). The antenna is mounted in the underside of the chute and is connected to the reader via a coax cable employing SMA connectors.

All tests were made using an input of 120 V RMS, 60 Hz, and single-phase power. The EUT was tested with an EMC program exercising all functions. The Reader was set to the fastest read time and was reading tags during all testing.

2.3 Block Diagram and schematic

(Submitted as separate exhibits).

2.4 Parts List

Description	Manufacturer	Model / Type	Remark
PC	HP	DM329#ABA	
Printer	Ithaca	M280	
Monitor	3M Touchsystems	11-81371-505	
Antenna	3M	78-8126-8373-4	
COMMON BOX			
24 VDC Power Supply	Lambda	ZWS75PF-24	
Linefilter	Corcom	6ED1	
RFID Reader	3M	78-8123-9800-2	
DC LED indicator	Lighting Components & Design	L75R-G24-2212T	

2.5 Modifications to the EUT

The following modifications of the EUT were necessary to meet the test standards:

Equipment	Modifications	Where	Material	Turns
Reader Antenna cable	Common Mode Choke	At reader output connector of Common Box	Steward 28A2025-0A0	2 Turns
Reader Cable (RS-232) from computer	Common Mode Choke	At Reader RS-232 Connector of Common Box	Steward 28A2025-0A0	1 Turns
Reader Cable (RS-232) from computer	Common Mode Choke	At the RS-232 output connector of the computer	Steward 28A2025-0A0	1 Turns
Mouse Cable	Common Mode Choke	At computer end	Steward 28A0392-0A0	1 Turn
Reader RF Output connector	Grounding	Ground RF output connector to common box. Remove paint to bare metal		

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	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
CISPR 16-4-1	Uncertainties in Standardized EMC Tests	2005

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 and in FCC Part 15, Subpart C.

4.1 Frequency Stability

The Frequency Stability testing was preformed 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 Reader was put into a continuous output mode through instructions from the host computer (test mode of operation). 1) The frequency was measured while the input AC power to the External Power Supply was varied over the required input voltage range. 2) The frequency was also measured while the ambient air temperature was varied over the required ambient temperature range.

4.1.2 Test Criteria

The FCC Part 15, Subpart C for Frequency Stability Limits versus Supply Voltage is given below.

Carrier Frequency (MHz)	Voltage Range (% of Nominal Supply)	Max. Frequency Change (%)
13.56	85 % to 115 %, (102 to 138 V RMS)	+/- 0.01 %

The FCC Part 15, Subpart C for Frequency Stability Limits versus Temperature is given below.

Carrier Frequency (MHz)	Temperature Range (Degrees C)	Max. Frequency Change (%)
13.56	-20 to +50	+/- 0.01 %

4.1.3 Test Results

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

Carrier Frequency Stability versus Supply Voltage

Carrier Frequency (MHz)	Lowest Frequency (MHz)	Highest Frequency (MHz)	Frequency Change (%)
13.5596	13.5596	13.5597	+/- 0.0007 %

Carrier Frequency Stability versus Temperature

Carrier Frequency (MHz)	Lowest Frequency (MHz)	Highest Frequency (MHz)	Frequency Change (%)
13.5596	13.5594	13.5597	+/- 0.0022 %

Frequency Stability Test Results			
Temperature	Input Voltage		
	102 VAC	120 VAC	138 VAC
-20° C	13.5596	13.5596	13.5596
0° C	13.5597	13.5597	13.5597
23° C	13.5596	13.5596	13.5596
50° C	13.5596	13.5594	13.5596
55° C	13.5594	13.5594	13.5594

4.2 Emission Bandwidth

The EUT was placed in an anechoic chamber and the Emission Bandwidth testing was preformed in accordance with ANSI C63.4 and FCC Part 15, Paragraph 15.225. The Emission Bandwidth measurements were made to determine the intentional radiator frequency and 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 in the center of the turn table and the measurement antenna (loop) was positioned at a distance of 5 meters (to insure far field measurements) 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 quasi-peak 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, which was fixed at 1-meter height, was rotated until the highest emissions levels found. Measurement results were automatically calculated via software running the EMI receiver. The final quasi-peak measurements recorded were determined by the following formula:

Result (dBμV/m) = receiver level (μV) + 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 15.225 Carrier Frequency Limits are given below.

Lower Band Edge (MHz)	Upper Band Edge (MHz)
13.553	13.567

The FCC Part 15, Subpart C radiated limits are given below.

Frequency (MHz)	Test Distance (Meters)	Field Strength (dBμV/m)
1.705 to 13.110	10	48.62
13.110 to 13.410	10	59.58
13.410 to 13.553	10	69.55
13.553 to 13.567	10	103.00
13.567 to 13.710	10	69.55
13.710 to 14.010	10	59.58
14.010 to 30.000	10	48.62

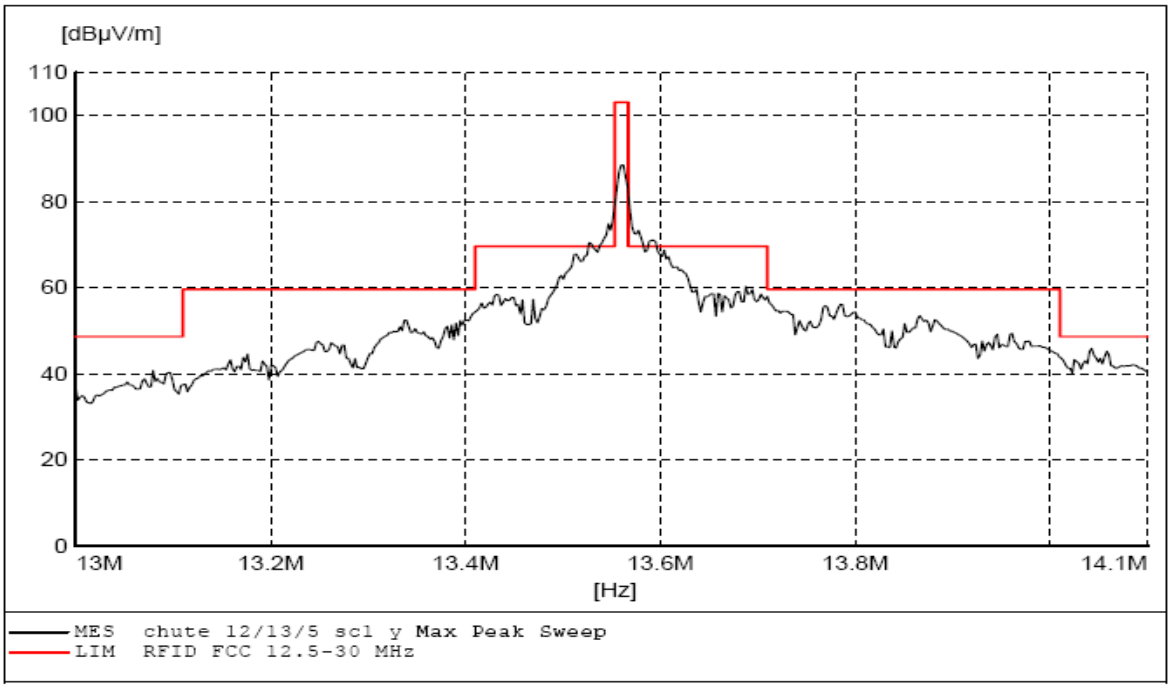
Note: A 40 dB/decade extrapolation factor was used per 15.31.

4.2.3 Test Results

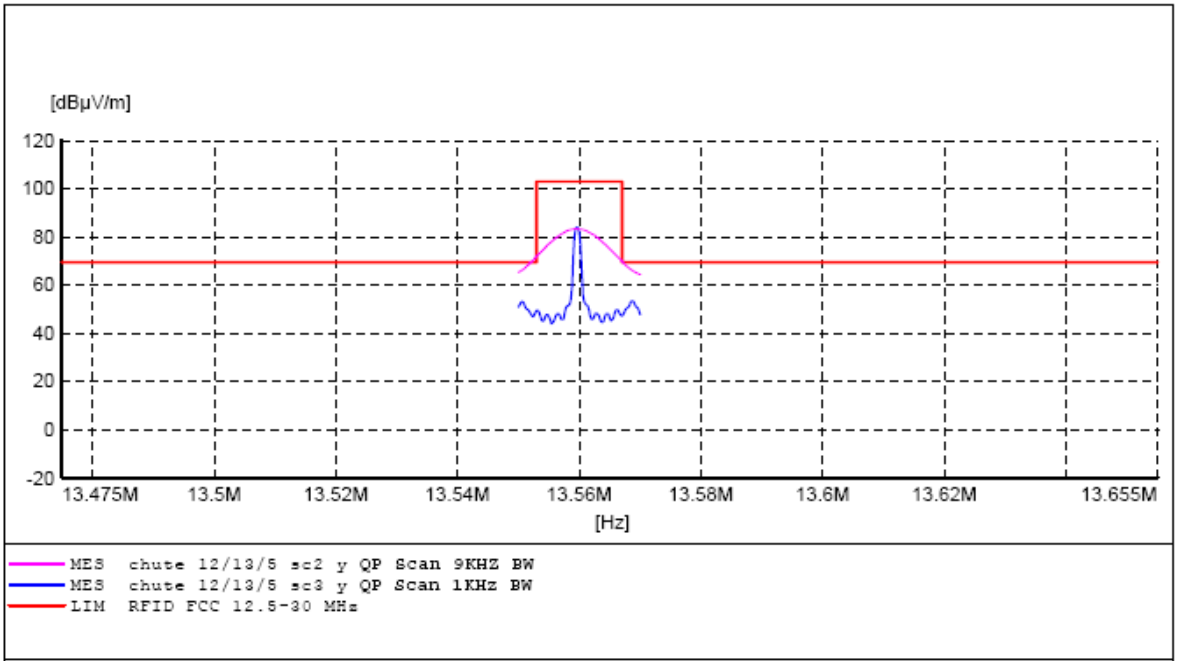
The EUT met the FCC Part 15, Subpart C Emission Bandwidth requirements. The intentional radiator frequency was within the allowed band and all maximized quasi-peak measurements for the EUT were below the quasi-peak limits.

3M™ SelfCheck™ Model 877						
Frequency (MHz)	BW (kHz)	QP Level (dBµV/m)	QP Limit (dBµV/m)	Passing Margin (dB)	Turntable (degrees)	Antenna Orientation/Angle (Polarity/degrees)
13.5596[1]	9	83.22	103	19.78	95	3 ° CW from Y-axis
13.553[2]	1	49.69	69.55	19.86	95	3 ° CW from Y-axis
13.567[2]	1	47.25	69.55	22.30	95	3 ° CW from Y-axis
13.5485	9	63.17	69.55	6.38	95	3 ° CW from Y-axis
13.5715	9	62.67	69.55	6.88	95	3 ° CW from Y-axis
13.41	1	33.16	59.58	26.42	95	3 ° CW from Y-axis
13.71	1	34.69	59.58	24.89	95	3 ° CW from Y-axis
13.4055	9	45.69	59.58	13.89	95	3 ° CW from Y-axis
13.7141	9	47.61	59.58	11.97	95	3 ° CW from Y-axis

1 – Intentional Radiator Frequency
2 – Band edges measured with a receiver bandwidth setting of 1 KHz. Per ANSI C63.4 Paragraph 13.1.7.



Max Peak Emissions



Emissions Bandwidth

TEST SETUP
Emissions Bandwidth

4.3 Spurious Emissions (12.5 to 30 MHz.)

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

4.3.1 Test Procedure

A measurement antenna (loop) was positioned at a distance of 5 meters (to insure far field measurements) 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, which was fixed at 1-meter height, was rotated until the highest emissions levels found. Final measurements were taken utilizing quasi-peak detection. Measurement results were automatically calculated via software running the EMI receiver. The final measurements recorded were determined by the following formula:

Result (dBμV/m) = receiver level (μV) + antenna factor (dB/m) + cable loss (dB) – preamp gain (dB) + lineal conversion (dB).

4.3.2 Test Criteria

The FCC Part 15, Subpart C radiated limits are given below.

Frequency (MHz)	Test Distance (Meters)	Field Strength (dBμV/m)
1.705 to 13.110	10	48.62
13.110 to 13.410	10	59.58
13.410 to 13.553	10	69.55
13.553 to 13.567	10	103.00
13.567 to 13.710	10	69.55
13.710 to 14.010	10	59.58
14.010 to 30.000	10	48.62

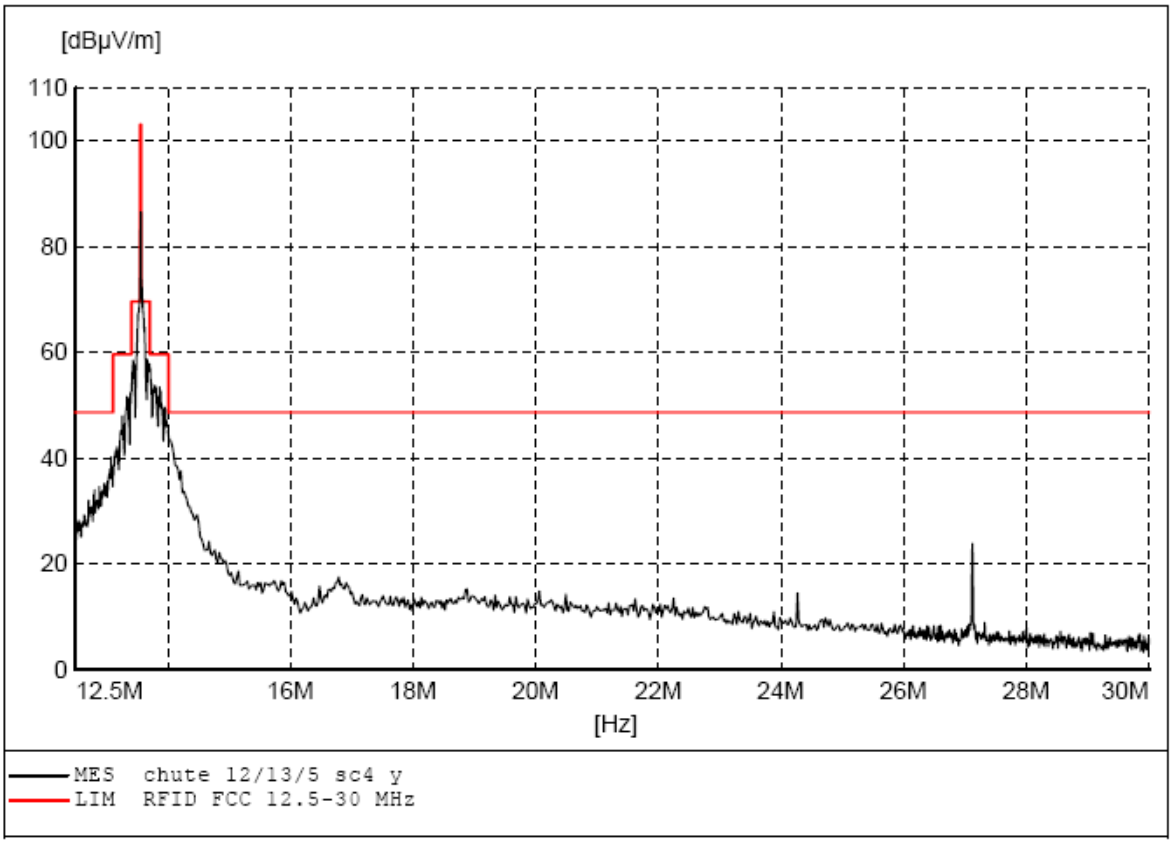
Note: A 40 dB/decade extrapolation factor was use per 15.31.

4.3.3 Test Results

The EUT met the FCC Part 15, Subpart C Spurious Emissions (12.5 to 30 MHz.) requirements. All maximized quasi-peak measurements for the EUT were below the quasi-peak limits. The worst-case quasi-peak emissions were as follows:

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Passing Margin (dB)	Turntable (degrees)	Antenna Orientation/Angle (Polarity/degrees)
13.5485	63.17	69.55	6.38	95	Y+20° CW
27.1192[1]	18.79	48.62	29.83	95	Y+20° CW

1 Second Harmonic.



TEST SETUP
Spurious Emissions 12 to 30 MHz

4.4 Radiated Emissions (30 to 10000 MHz)

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

4.4.1 Test Procedure

A measurement antenna was positioned at a distance of 3 meters from the center of the EUT. An EMI receiver was used for the emissions measurements in the range of 30 MHz to 10000 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 (dBµV/m) = receiver level (µV) + antenna factor (dB/m) + cable loss (dB) – preamp gain (dB) + lineal conversion (dB).

4.4.2 Test Criteria

The FCC Part 15, Subpart C radiated limits are given below.

Frequency (MHz)	Distance (m)	Field Strength (dB µV/m)
30 to 88	10	29.54
88 to 216	10	33.06
216 to 960	10	35.56
960 to 40000	10	43.52

The FCC Part 15, Subpart B, “Class A” radiated limits are given below. The lower limit shall apply at the transition frequency.

Frequency (MHz)	Distance (m)	Field Strength (dB µV/m)
30 to 88	10	39.08
88 to 216	10	43.52
216 to 960	10	46.44
960 to 1000	10	49.54
1000 to 40000	3	59.5 and 79.5*

* Per 15.35(B)

4.4.3 Test Results

The EUT met the FCC Part 15, Subpart C and the FCC Part 15, Subpart B, “Class A” Radiated Emissions (30 to 10000MHz.) requirements. All maximized measurements for the EUT were below the limits. No emissions were detected above 5 GHz. The worst-case quasi-peak emissions were as follows:

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Passing Margin (dB)	Turntable (degrees)	Antenna (Meters/Polarity)
461.034	27.43	35.56[1]	8.13	59	1.0/H
71.837	20.32	39.08	18.76	6	2.37/V

Note 1: This is a harmonic of the intentional radiator, so the Subpart C limit is used.

RADIATED EMISSIONS

3M EMC Lab

TEST REPORT # F1205004 SHEET 1 OF 1

EUT MODEL # 877 EUT SERIAL # no s/n

DESCRIPTION SelfCheck System C-Series

FREQ. (MHz)	MAXIMIZED QP SIGNAL H/V	MAXIMIZED QP SIGNAL (dBµV/m)	LIMIT LINE (dBµV/m)	PASSING MARGIN (dB)	MAXIMIZED POSITION TURNTABLE (degrees)	MAXIMIZED POSITION ANTENNA (meters)	REMARKS
40.687	V	20.70	29.54	8.84	43	1.0	Harmonic[1]
189.843	H	24.82	33.06	8.24	272	1.85	Harmonic[1]
189.843	V	22.85	33.06	10.21	0	1.0	Harmonic[1]
216.956	V	25.97	35.56	9.59	6	1.0	Harmonic[1]
393.236	H	22.93	35.56	12.63	285	1.0	Harmonic[1]
461.034	H	27.43	35.56	8.13	59	1.0	Harmonic[1]
71.837	V	20.32	39.08	18.76	6	2.37	2
143.655	V	23.09	43.52	20.43	334	1.0	2

1 Harmonic of Intentional Radiator. Subpart C Limit used.
2 Digital Signal, Subpart B Limit.

Test Engineer: Bruce Jungwirth Date: Dec 20, 2005

RADIATED EMISSIONS
1 – 5 GHz

3M
EMC Laboratory

TEST REPORT # F1205004 SHEET 1 OF 1

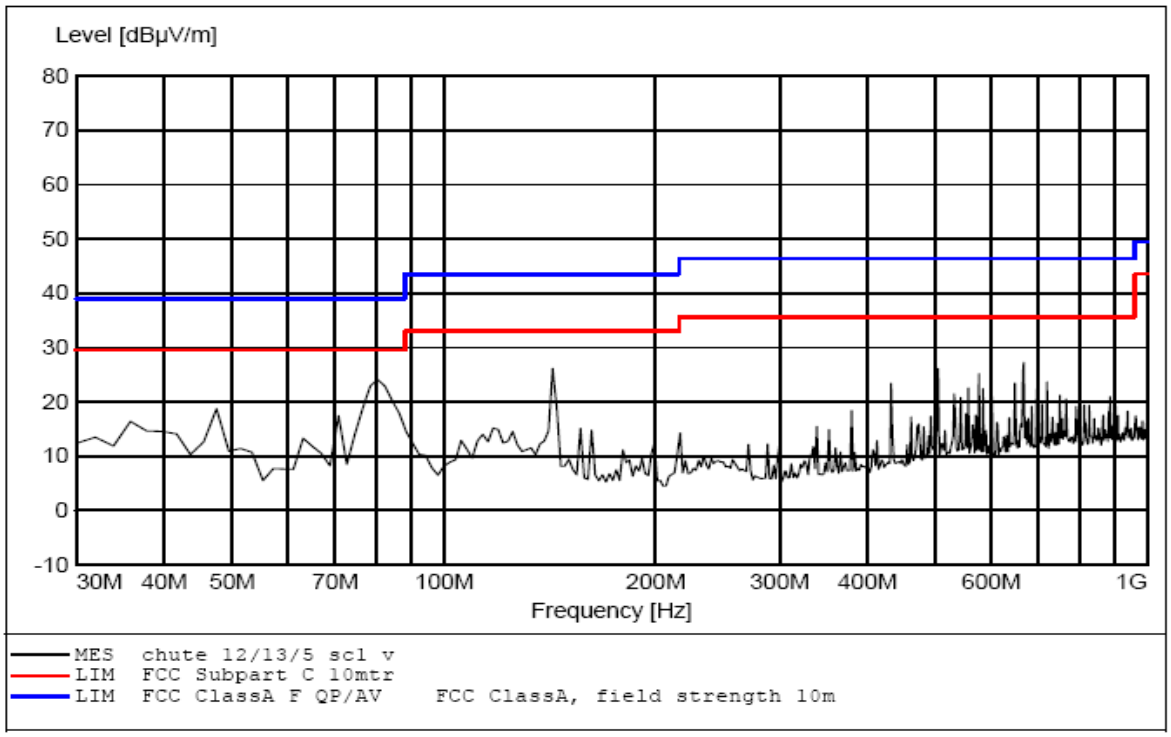
EUT MODEL # 877 EUT SERIAL # None

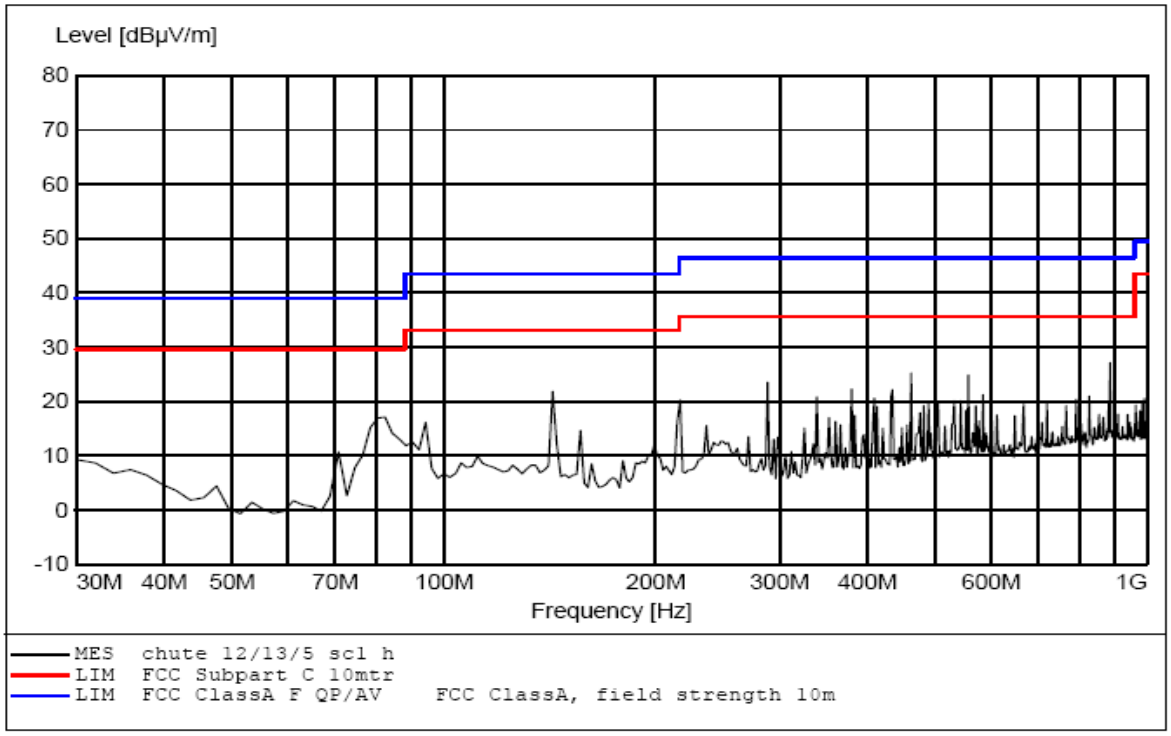
DESCRIPTION SelfCheck System C-Series

FREQ. (GHz)	MAXIMIZED AVG SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED PEAK SIGNAL		LIMIT LINE	PASSING MARGIN	TURN TABLE	ANTENNA HEIGHT
	H/V	(dBµV/m)	(dBµV/m)	(dB)	H/V	(dBµV/m)	(dBµV/m)	(dB)	(degrees)	(m)
1.6649	V	48.56	54	5.44	V	51.25	74	22.75	271	1.48
1.99803	V	42.53	54	11.47	V	48.49	74	25.51	271	1.25
2.3308	V	37.85	54	16.15	V	45.16	74	28.84	22	1.0
3.9757	V	31.0	54	23.0	V	47.51	74	26.49	286	1.0

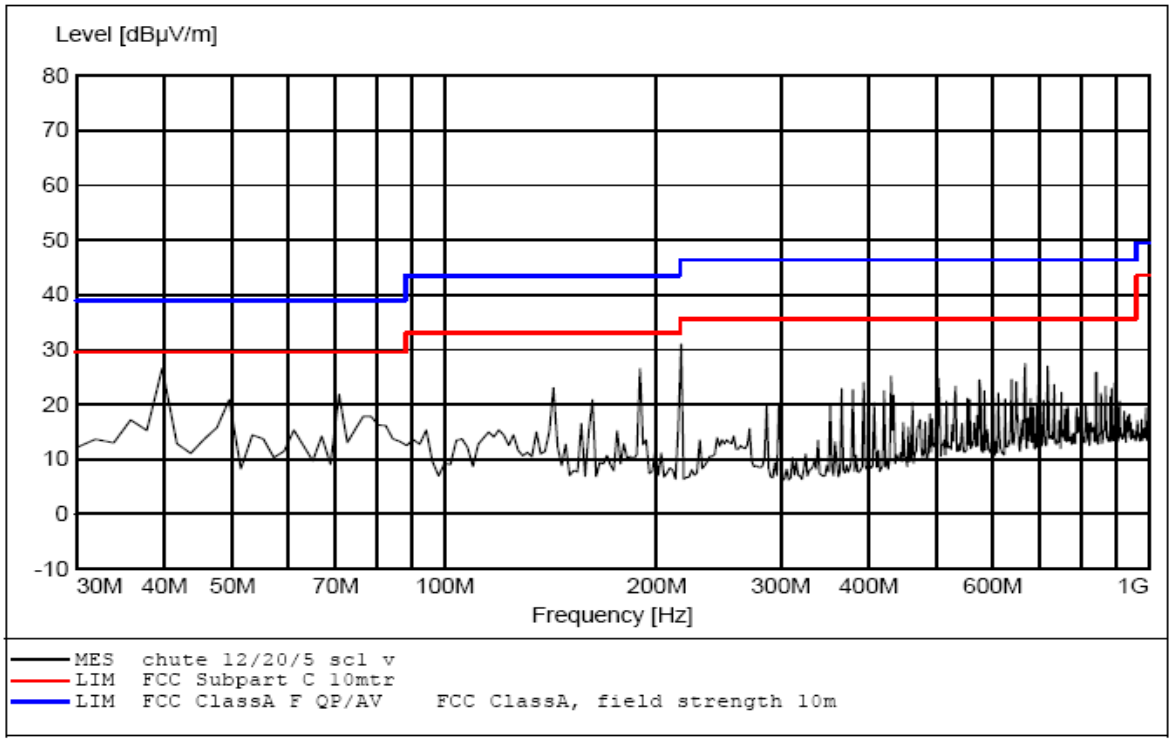
Test Engineer: Bruce Jungwirth

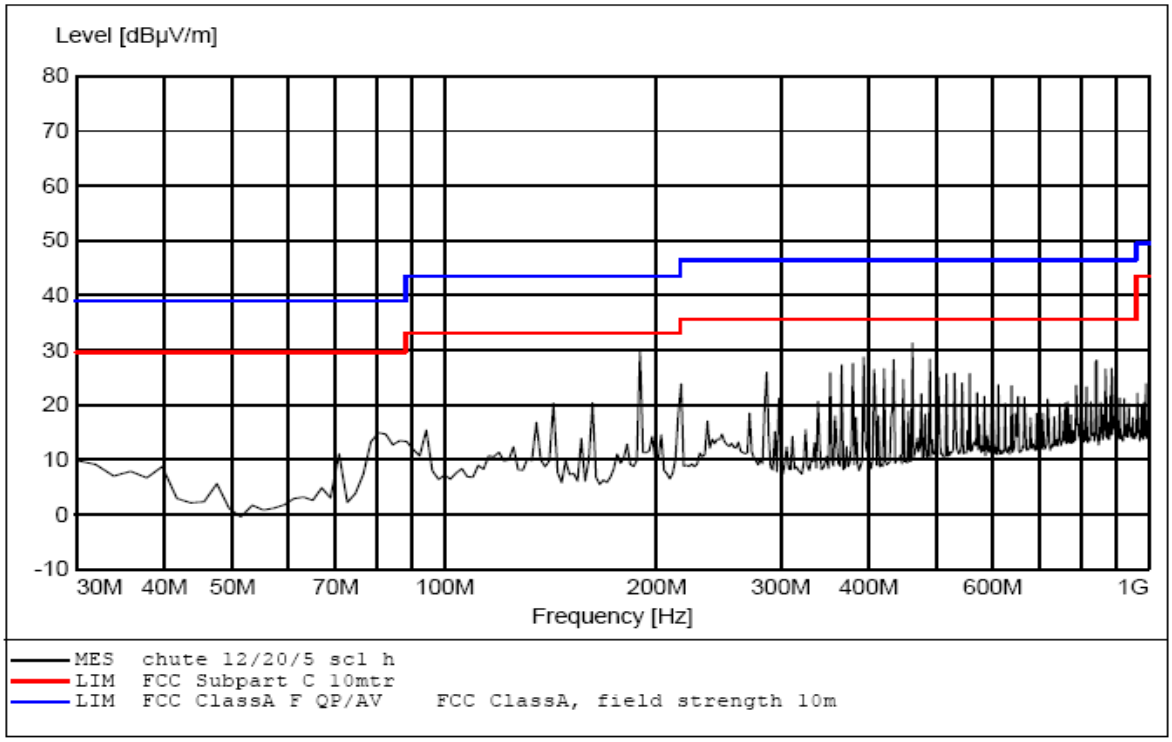
Date: 3 Jan. 2006



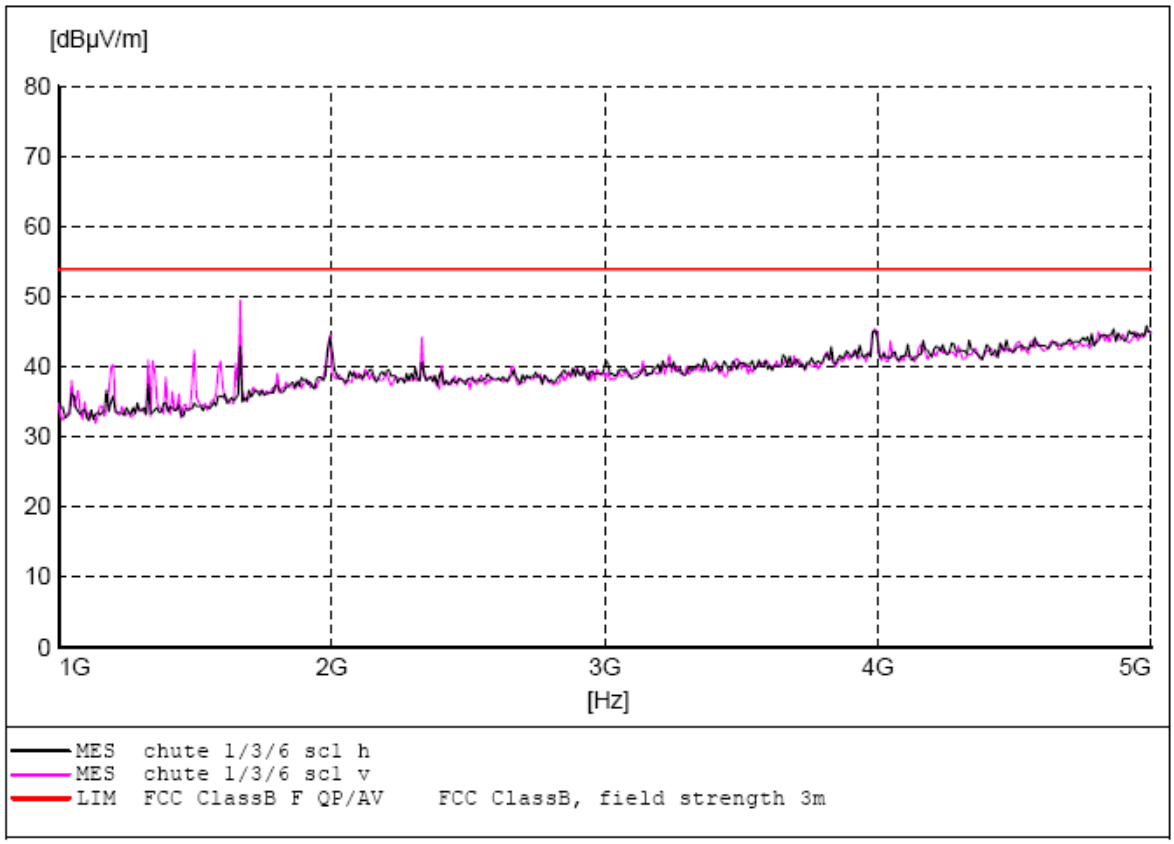


Digital Radiated Emissions 30 to 1000 MHz





Spurious Emissions 30 to 1000 MHz



Radiated Emissions 1 to 5 GHz

TEST SETUP
Radiated and Spurious Emissions 30 to 1000 MHz

TEST SETUP
Radiated Emissions 1 to 10 GHz

5.0 CONDUCTED EMISSIONS

Conducted emissions testing was performed in accordance with ANSI C63.4. The limits are prescribed in FCC Part 15, Subpart B and in FCC Part 15, Subpart C.

5.1 Test Procedure

The EUT was placed in a shielded chamber for the tests and tested while exercising all functions with a dummy load attached to the Reader output terminal (See ANSI C63.4-1992 Paragraph 13.1.3.1).

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 preformed 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:

Result (dBμV) = receiver reading (dBμV) + LISN CF (dB) + cable loss (dB)

5.2 Test Criteria

The FCC Part 15, Subpart B, “Class A” conducted limits are given below.

Mains Terminal Disturbance Limits		
Frequency (MHz)	Quasi-Peak(dBμV)	Average(dBμV)
0.15 to 0.50	79	66
0.50 to 30.0	73	60

The lower limit shall apply at the transition frequency.

The FCC Part 15, Subpart C limits are given below. The lower limit shall apply at the transition frequency.

Mains Terminal Disturbance Limits		
Frequency (MHz)	Quasi-Peak (dBμV)	Average (dBμV)
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

5.3 Test Results

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

3M™ SelfCheck™ Mode 877				
Frequency (MHz)	Limit (dBμV)	L1 (dBμV)	L2 (dBμV)	Passing Margin (dB)
13.5596[1]	60	33.44	33.68	26.32

1 Intentional radiator frequency
FCC Part 15, Subpart C limit is shown

CONDUCTED EMISSIONS

3M EMC Lab

TEST REPORT # F1205004 SHEET 1 OF 1

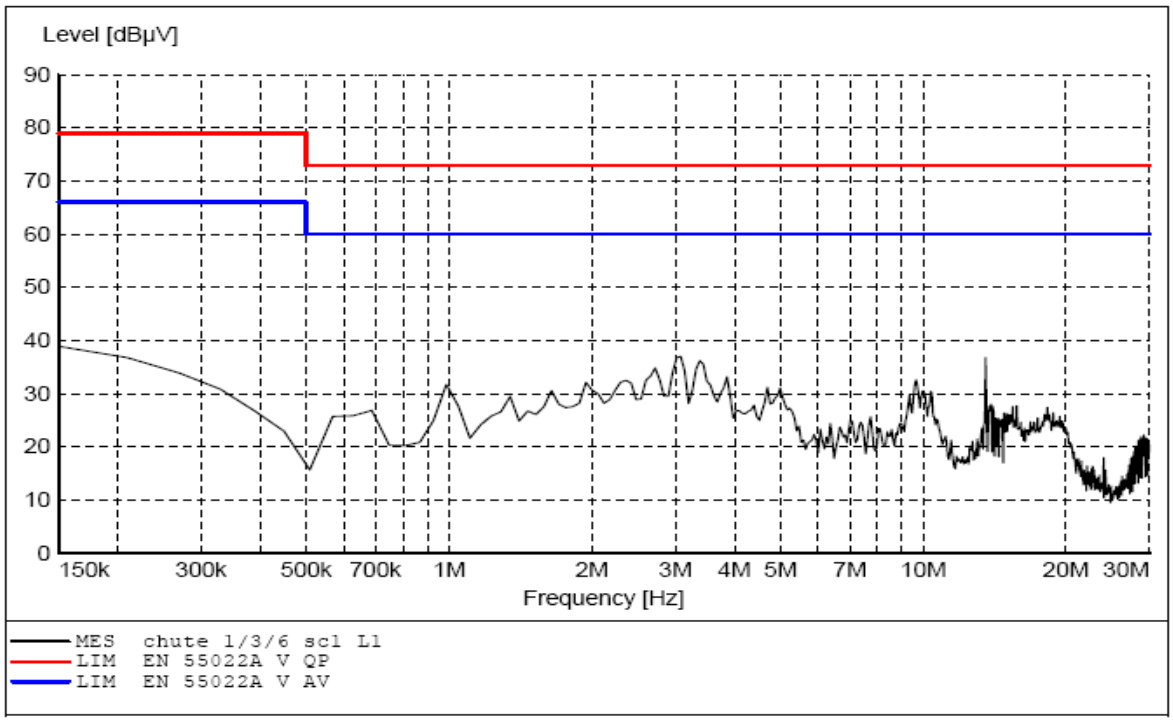
EUT MODEL # 877 EUT SERIAL # no s/n

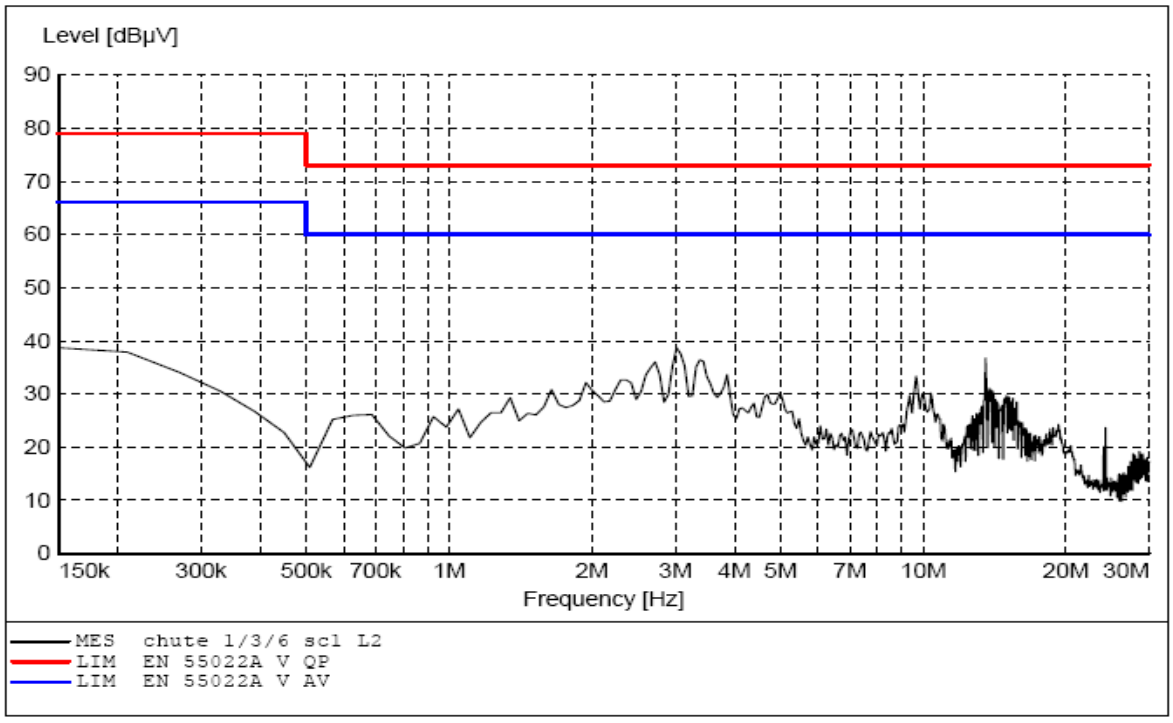
DESCRIPTION SelfCheck System C-Series

FREQUENCY (MHz)	PEAK (dBµV)		QUASI-PEAK (dBµV)				AVERAGE (dBµV)			
	L1 Line	L2 Neut	L1 Line	L2 Neut	Limit	Pass	L1 Line	L2 Neut.	Limit	Pass
.1510	32.65	32.22	25.13	24.63	79	53.87	-	-	66	-
.685	28.22	27.47	26.6	26.16	73	46.4	-	-	60	-
3.033	38.40	38.76	33.64	33.94	73	39.06	-	-	60	-
9.642	34.96	35.06	32.44	32.17	73	40.56	-	-	60	-
13.5596	37.89	37.66	33.44	33.68	60[1]	26.32	-	-	50[1]	-
24.256	15.40	24.44	12.62	22.33	73	50.67	-	-	60	-
							-	-		-

1Subpart C Limit

Test Engineer: Bruce Jungwirth Date: 3 Jan 2006


Level [dBµV]
90
80
70
60
50
40
30
20
10
0
150k
300k
500k
700k
1M
2M
3M
4M
5M
7M
10M
20M
30M
Frequency [Hz]
MES chute 1/3/6 scl L1
LIM EN 55022A V QP
LIM EN 55022A V AV


Level [dBµV]
90
80
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20
10
0
150k
300k
500k
700k
1M
2M
3M
4M
5M
7M
10M
20M
30M
Frequency [Hz]
MES chute 1/3/6 scl L2
LIM EN 55022A V QP
LIM EN 55022A V AV

TEST SETUP
Conducted Emissions

7.0 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

Agilent Technologies Frequency Counter, Model 53131A, s/n MY40012264 (cal due date: 14 Sep 06)
Pacific Power Source, Model 140-TMX, s/n 838761 (cal not required)
EMCO Loop Probe, Model 7405-901, s/n none, (cal not required)
Environtronics Chamber, Model EH40-2-3-RF, s/n J00233 (cal due date 3 Nov 06)

RADIATED EMISSIONS

ElectroMetrics Loop Antenna. Model ALR25M, Serial No. 603 (cal due date: 12 Sep 06)
EMCO Horn Antenna, Model
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
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)

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.
>
> FCC ID: **DGFSSD877**

Labels 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 A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
>
> FCC ID: **DGFSSD877**
>
> NO MODIFICATIONS. Modifications to this device shall not be made without the written consent of 3M, Incorporated. Unauthorized modifications may void the authority granted under Federal Communications Commission Rules permitting the operation of this device.

8.0 SIGNATURES

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

Bruce R. Jungwirth

TEST ENGINEER: _____ **DATE:** October 31,2006

Bruce Jungwirth
3M EMC Laboratory

Signatory: Robert E. Heller

APPROVER: _____ **DATE:** October 31, 2006

Robert E. Heller
3M EMC Laboratory

Last page of the report.