FCC
Electromagnetic Compatibility
Test Report

3M™ Conversion Workstation
Model 812

FCC ID: DGFSSD812

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

29 August 2006

Report Number F0506005

Prepared By:

CR-SEMS Product Safety
Building 76-1-01
410 East Fillmore Avenue
St. Paul, Minnesota 55144-1000

3M Product Safety SEMS Technology Center Building 76-1-01 St. Paul, MN 55144-1000	Phone: 651-778-6279 FAX: 651-778-6252	3M EMC Laboratory

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
NAME OF EQUIPMENT	3M™ Conversion Workstation Model 812
DESCRIPTION	Conversion Workstation with RFID
FCC ID	DGFSSD812
TEST REPORT NUMBER	F0506005
DATE	29 August, 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.

Steven D. Wytaske

Steven D. Wytaske
EMC Engineer

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1.0 TEST SUMMARY

Test Report Number:	F0506005
Requester:	Greg Amell
Company:	3M Safety and Security Systems Division Library Systems Building 209 St. Paul, MN 55144
Telephone Number:	(651) 736-9552
Test Dates:	August 15-25, 2006
Equipment Under Test	3M™ Model 812 FCC ID DGFSSD812
Date Of Receipt:	May 8, 2006
Test Environment	Temperature: 25 degrees C Relative Humidity: 44 % 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:	11 (eleven) modifications required. See section 2.5 for details
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. The 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.

2.2 EUT Descriptions and Operation

The Equipment Under Test (EUT) is the 3M™ Model 812 Conversion Station.
The 3M™ Conversion Station Model 812 is intended for use in converting library items that use optical barcode technology to RFID technology using 3M™ RFID Tags.

The system is designed for use in an indoor library environment and has not been evaluated for other locations or uses.

The reader has a transmit frequency of 13.56 MHz. And a power output level of 1.0 watt (30 dBm) as measured into a 50-ohm load. This maximum output of 1.0 watt (30 dBm) is factory preset.

The EUT contains 1 integral antenna of 49 square inches (0.032 square meters). The antenna is recessed in the underside of the cabinet top directly under the Barcode reader. The antenna is cabled to the reader via coax cable and SMA connectors. The reader is located in the Common Box.

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

2.3 Block Diagram

Block Diagram submitted as separate file under Letter of Confidentiality

2.4 Parts List

Parts List submitted as separate file under Letter of Confidentiality

2.5 Modifications to the EUT

The following modifications are required:

1. Ferrite – Steward # 28A20250A0 (or equivalent) – 1 turn on Monitor power cable at Monitor.
2. Ground Reader antenna connector to common box.
3. Ferrite – Steward # 28A20250A0 (or equivalent) – 1 turn – on Mouse USB cable at computer end.
4. Ferrite – Steward # 28A20290A0 (or equivalent) - 1 turn – on AC power cord of computer at computer end.
5. Ferrite – Steward # 28A20290A0 (or equivalent) – 1 turn – on AC power cord of common box at common box end.
6. Ferrite – Steward # 28A20290A0 (or equivalent) – 2 turn – Ferrite – Steward # 28A20290A0 (or equivalent) – 1 turn – on Monitor power cable at common box end.
7. Ferrite – Steward # 28A20290A0 (or equivalent) – 2 turn – on Tag Dispenser power cable at common box end.
8. Ferrite – Steward # 28A20290A0 (or equivalent) – 2 turn – on Scanner cable at common box end.
9. Ferrite – Steward # 28B1142-000 (or equivalent) – 4 turn – on Tag Dispenser motor leads, as close as possible to motor housing.
10. Ferrite – Steward # 25A20290A0 (or equivalent) – 2 turn – on wire bundle from J5 of Tag Dispenser PCB to Run switch.
11. Coil excess coax from reader to antenna and stow at common box end.

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	2005
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

4.0 CONDUCTED EMISSIONS

Testing of conducted emissions 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 Test Procedure

A Line Impedance Stabilization Network (LISN) with 50Ω/50μH characteristic 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 150kHz to 30MHz. Initial measurements were taken with the receiver in continuous frequency overview mode utilizing peak level signal detection. Initial results were measured at discrete frequencies utilizing quasi-peak detection. Measurement results were automatically calculated via software running the EMI receiver. The final quasi-peak and average measurements recorded were determined by the following:

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

4.2 Test Criteria

The FCC Class 'A' conducted 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	79	66
0.50 to 30.0	73	60

4.3 Test Results

The EUT met the FCC Class 'A' conducted emission requirements. The worst-case quasi-peak emission was as follows:

3M™ Model 812				
Frequency (MHz)	Limit (dBμV)	L1 (dBμV)	L2 (dBμV)	Passing Margin (dB)
0.151	79.00	57.92	57.88	21.08

CONDUCTED EMISSIONS

3M EMC Lab

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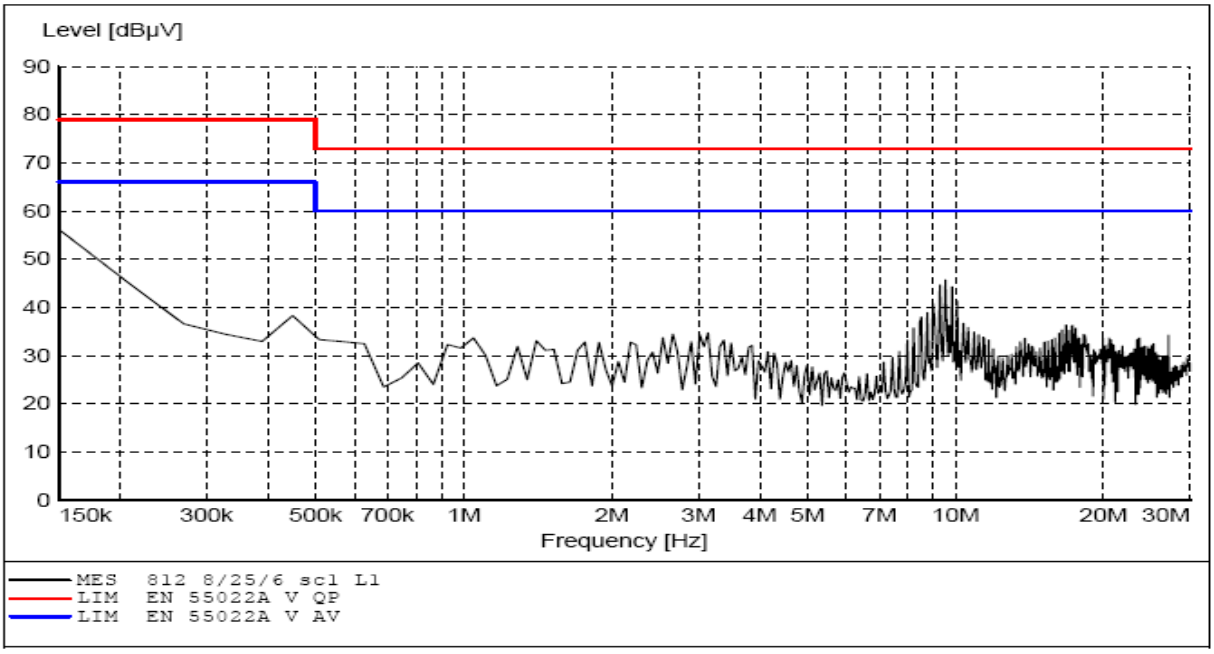
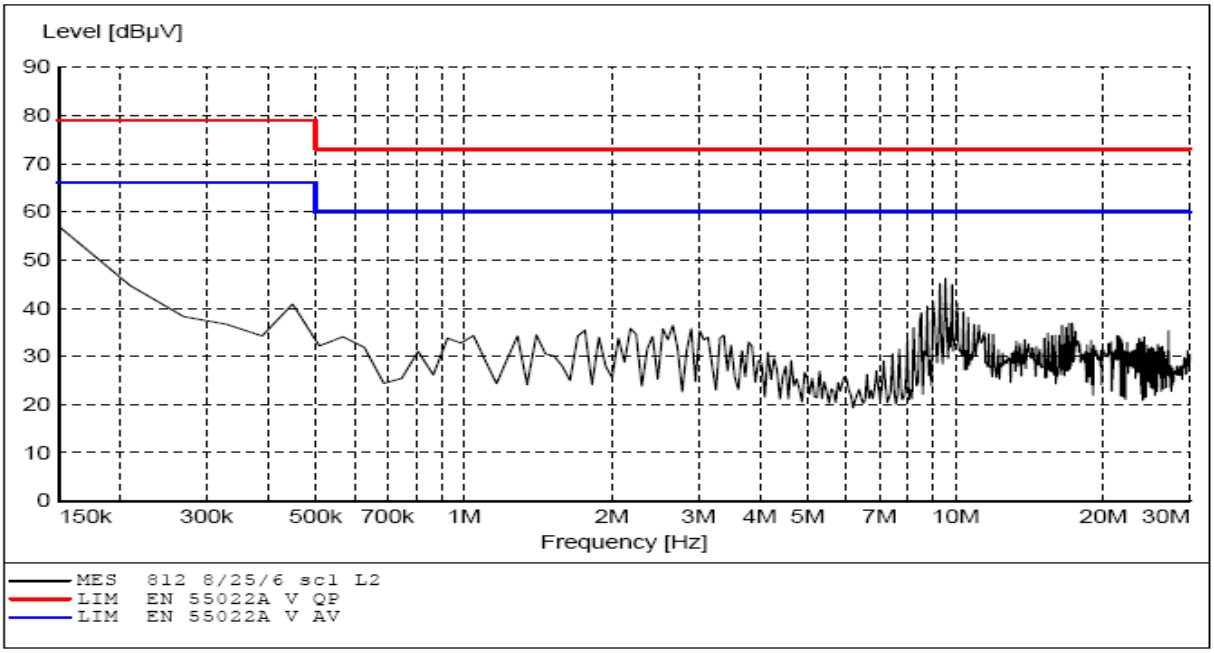
EUT MODEL # 3M™ Model 812 EUT SERIAL # N/A

DESCRIPTION Conversion Workstation

FREQUENCY (MHz)	PEAK (dBµV)		QUASI-PEAK (dBµV)				AVERAGE (dBµV)			
	L1 Line	L2 N	L1 Line	L2 N	Limit	Pass Margin	L1 Line	L2 N	Limit	Pass Margin
0.151	65.37	61.3	57.92	57.88	79.00	21.08	-	-	66	-
0.4749	41.80	43.69	37.44	39.94	79.00	39.06	-	-	66	-
1.0438	35,24	35.21	33.07	33.24	73.00	39.76	-	-	60	-
2.6567	35.60	36.64	34.13	35.49	73.00	37.51	-	-	60	-
9.3042	45.54	46.16	44.19	44.76	73.00	28.24	-	-	60	-
9.5703	46.33	46.59	44.87	45.33	73.00	27.67	-	-	60	-

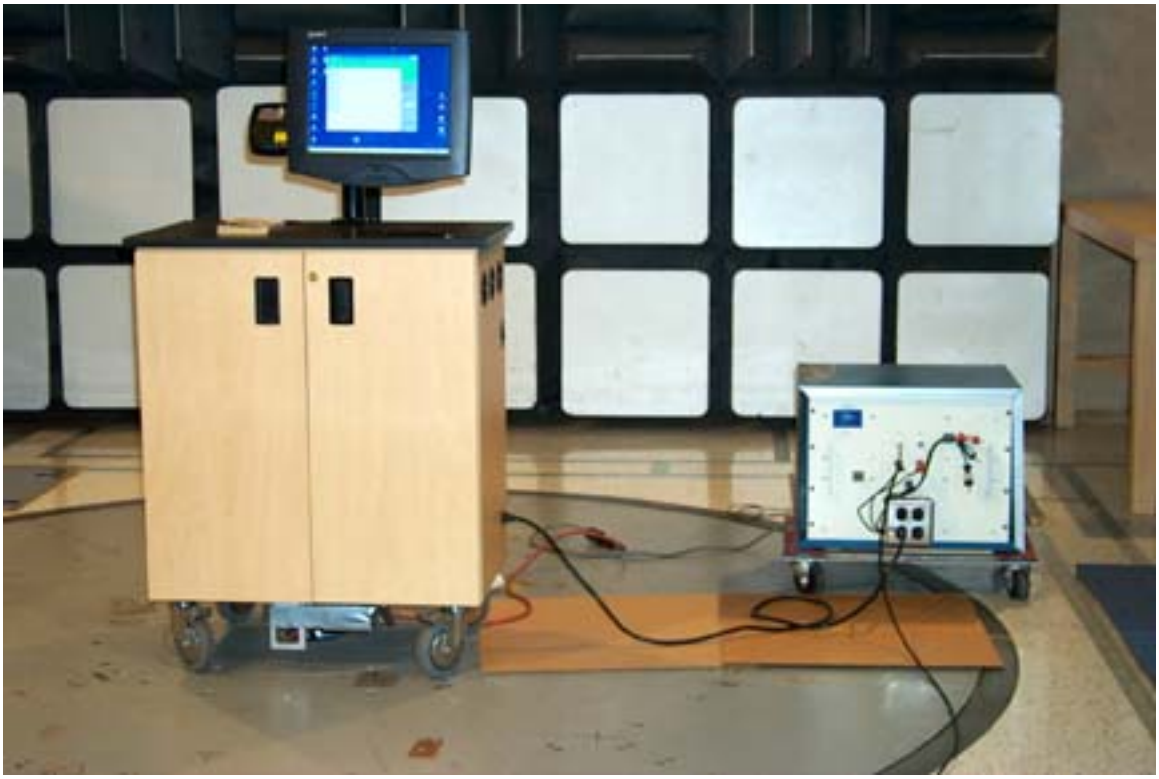
Test Engineer: Bruce Jungwirth
Date: 08-25-2006





NOTE: Plots show Max Peak values only

4.4 Test Setup Photo



Conducted Emissions

5.0 RADIATED EMISSIONS

Testing of radiated emissions 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 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.

5.1.1 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 DC power to the Intentional Radiator (RFID Reader) 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 (at startup, 2 minutes, 5 minutes, and 10 minutes).

5.1.2 Test Criteria

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

Carrier Frequency (MHz)	Voltage Range % of Nominal Supply (85 % to 115 %)	Max.Frequency Change (%)
13.56	10.8 to 13.2 V DC	+/- 0.01 %

The FCC Part 15, Subpart C for Frequency Stability Limits versus Temperature is given as:

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

5.1.3 Test Results

The EUT met all FCC Part 15, Subpart C Frequency Stability requirements.

Carrier Frequency Stability versus Supply Voltage			
Carrier Frequency (MHz)	Lowest Frequency (MHz)	Highest Frequency (MHz)	Max.Frequency Change (%)
13.5598	13.5596	13.5599	+/- 0.0015

Carrier Frequency Stability versus Temperature			
Carrier Frequency (MHz)	Lowest Frequency (MHz)	Highest Frequency (MHz)	Max.Frequency Change (%)
13.5598	13.5596	13.5599	+/- 0.0015

Frequency Stability Test Results			
Temperature	Input Voltage		
	10.8 VDC	12.0 VDC	13.2 VDC
-20° C	13.5598	13.5598	13.5598
0° C	13.5599	13.5599	13.5599
23° C	13.5598	13.5598	13.5598
50° C	13.5598	13.5596	13.5598
55° C	13.5596	13.5596	13.5596

5.2 Emission Bandwidth

The EUT was placed in a semi-anechoic chamber and the Emission Bandwidth testing was performed 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.

5.2.1 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. 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).

5.2.2 Test Criteria

The FCC Part 15 Subpart C, Paragraph 15.225 Carrier Frequency Limits are given as:

Lower Band Edge: 13.553 MHz
Upper Band Edge: 13.567 MHz

The FCC Part 15, Subpart C radiated limits are given as:

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

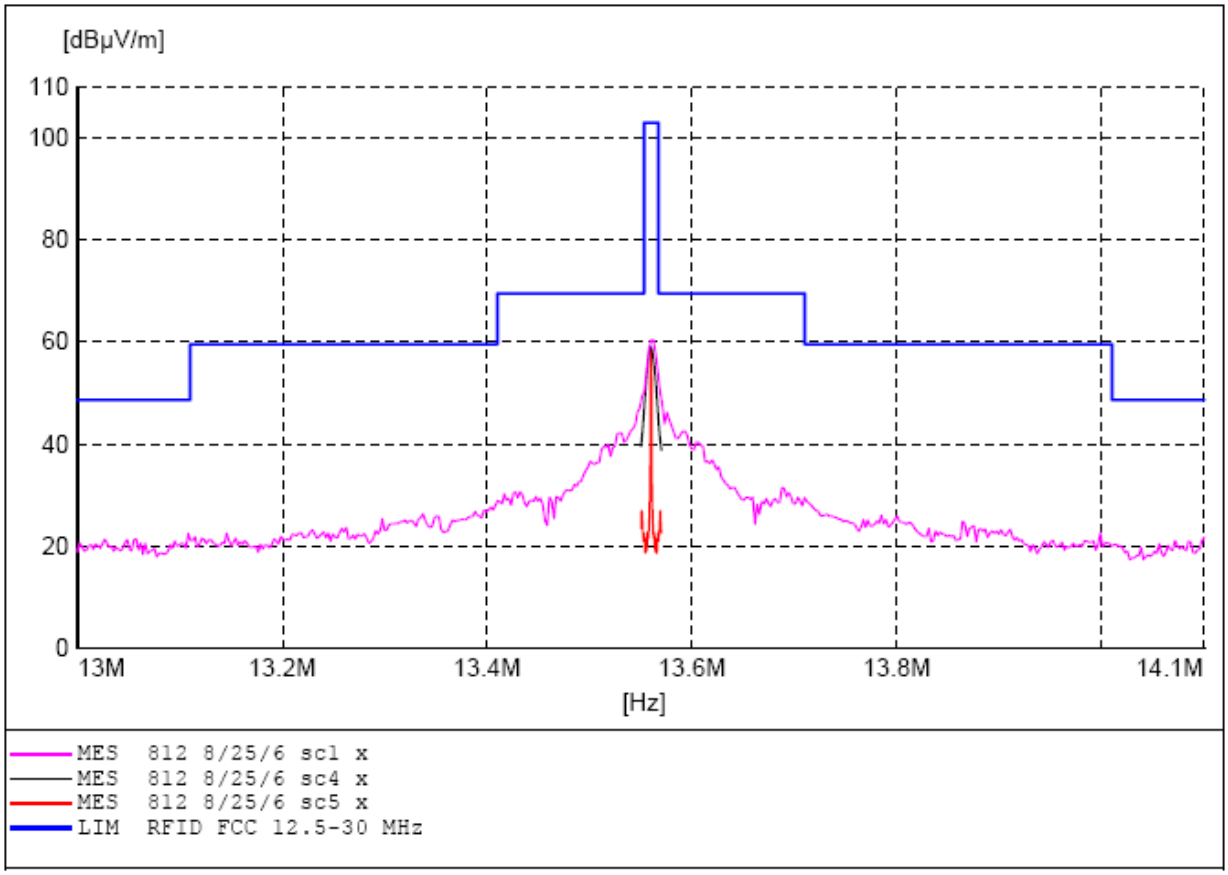
Note: A 40 dB/decade extrapolation factor was used per 15.31.

5.2.3 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.

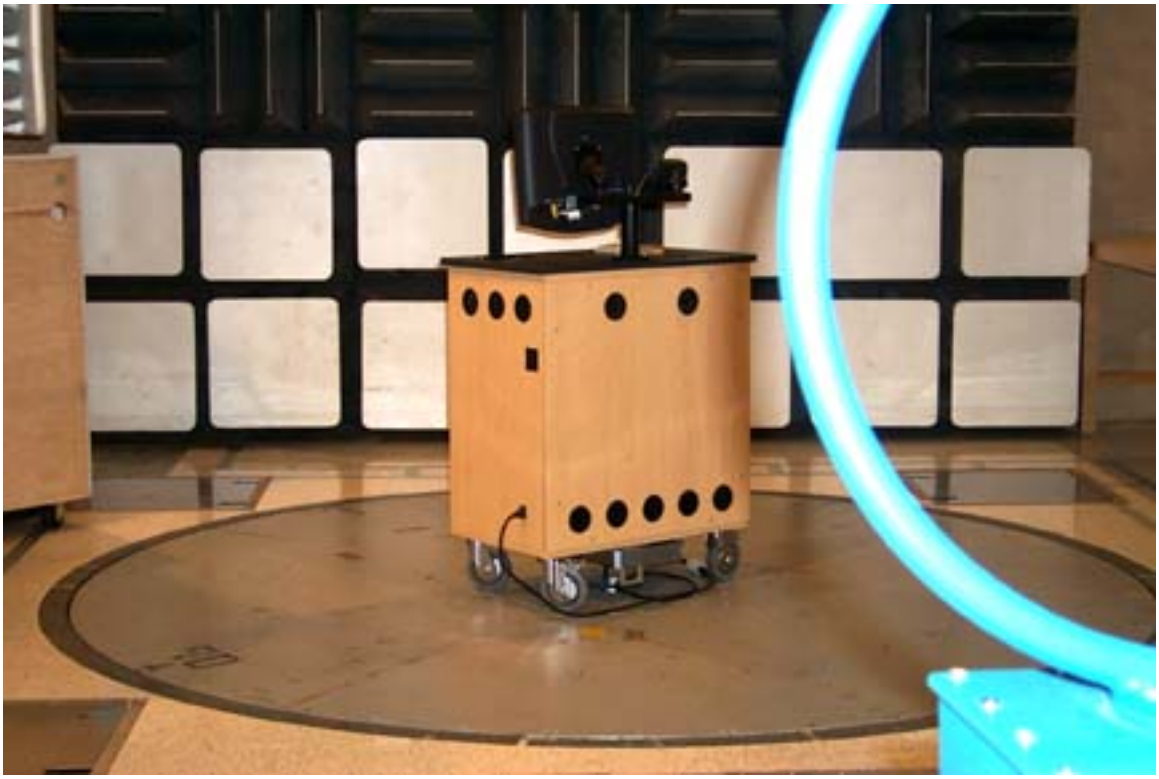
3M™ Model 812						
Frequency (MHz)	BW (kHz)	QP Level (dBµV/m)	QP Limit (dBµV/m)	Passing Margin (dB)	Turntable (degrees)	Antenna Orientation/Angle (Polarity/degrees)
13.5598[1]	9	58.89	103	44.11	144	X- 5° counter clockwise
13.553[2]	1	21.96	69.6	47.64	144	X- 5° counter clockwise
13.567[2]	1	21.27	69.6	48.33	144	X- 5° counter clockwise
13.5485	9	37.33	69.6	32.27	144	X- 5° counter clockwise
13.5715	9	36.76	69.6	32.84	144	X- 5° counter clockwise
13.41	1	8.04	59.6	52.56	144	X- 5° counter clockwise
13.71	1	8.32	59.6	51.28	144	X- 5° counter clockwise
13.4055	9	20.87	59.6	37.73	144	X- 5° counter clockwise
13.7141	9	20.84	59.6	38.76	144	X- 5° counter clockwise
13.11	1	-0.57	48.6	49.17	144	X- 5° counter clockwise
14.01	1	-2.01	48.6	50.61	144	X- 5° counter clockwise
13.1055	9	11.89	48.6	36.71	144	X- 5° counter clockwise
14.0145	9	10.84	48.6	37.76	144	X- 5° counter clockwise

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



Emissions Bandwidth

5.2.4 Test Setup Photo



Emissions Bandwidth and Spurious Emissions below 30 MHz

5.3 Spurious Emissions (12.5 to 30 MHz.)

The EUT was placed in a semi-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 spurious electromagnetic energy radiated from the EUT.

5.3.1 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).

5.3.2 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

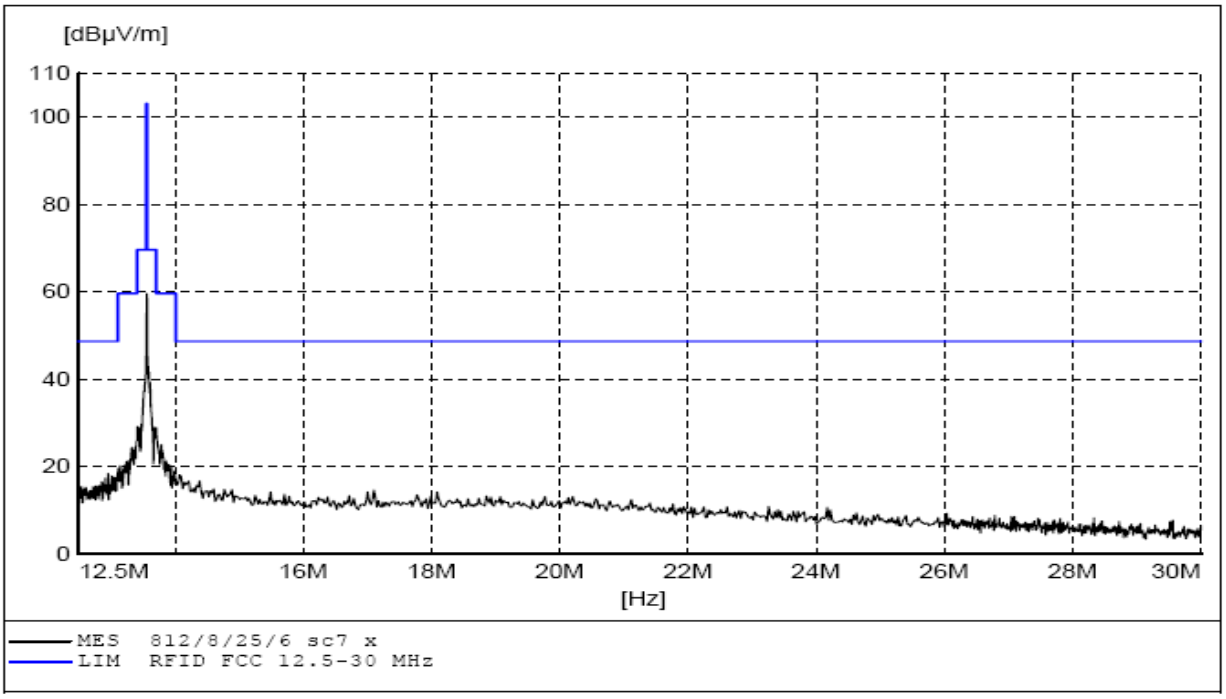
Note: A 40 dB/decade extrapolation factor was used per 15.31.

5.3.3 Test Results

The EUT met the FCC Part 15, Subpart C Spurious Emissions (12.5 to 30 MHz.) requirements. The worst-case emission was as follows:

3M™ Model 812			
Frequency (MHz)	Limit (dBμV)	Maximized QP Signal (dBμV)	Passing Margin (dB)
27.1196[1]	48.6	3.01	45.59

1. 2nd Harmonic of Intentional Radiator



5.3.4 Test Setup Photo

See Section 5.4.2 Emissions Bandwidth

5.4 Spurious Emissions (30 to 1000 MHz.)

The EUT was placed in a semi-anechoic chamber for spurious emissions testing 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.

5.4.1 Test Procedure

The EUT was placed on a 0.80 meter high wooden table in the center of a turntable. An EMI receiver was used for the emissions measurements in the range of 30MHz to 1000MHz. Initial measurements were taken with the receiver in continuous frequency overview mode utilizing peak level signal detection. Peak results were maximized at discrete frequencies utilizing quasi-peak detection. Maximizing a frequency involves finding the angle of the highest emission levels by rotating the EUT 360 degrees (sampling every 4 degrees) and varying the antenna height between 1 and 4 meters at the angles of the highest emissions levels found. Measurements were taken in both vertical and horizontal antenna polarization. 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)

5.4.2 Test Criteria

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

Frequency (MHz)	Test Distance (Meters)	Field Strength (dBμV/m)
30 - 88	10	29.54
88 - 216	10	33.06
216 - 960	10	35.56
960 and higher	10	43.52

5.4.3 Test Results

The EUT met the FCC Part 15, Subpart C Spurious Emissions (30 to 1000 MHz.) requirements. No significant frequencies were observed. No emissions detected within 10dB of limit. No maximized data was recorded.

5.5 Radiated Emissions (30 MHz - 18 GHz)

The EUT was placed in a semi-anechoic chamber for radiated emissions testing in accordance with ANSI C63.4 and FCC Part 15. Radiated emissions measurements were made to determine the level of electromagnetic energy radiating from the EUT.

5.5.1 Test Procedure

The EUT was placed on a 0.80 meter high wooden table in the center of a turntable. An EMI receiver was used for the emissions measurements in the range of 30MHz to 18GHz (the upper limit of measurement is determined by the 5th harmonic of the highest frequency generated in the device or 40 GHz whichever is lower). Initial measurements were taken with the receiver in continuous frequency overview mode utilizing peak level signal detection. Peak results were maximized at discrete frequencies utilizing quasi-peak detection. Maximizing a frequency involves finding the angle of the highest emission levels by rotating the EUT 360 degrees (sampling every 4 degrees) and varying the antenna height between 1 and 4 meters at the angles of the highest emissions levels found. Measurements were taken in both vertical and horizontal antenna polarization. The final quasi-peak measurements recorded were determined by the following (the detector used above 1000 MHz is both average and peak):

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

5.5.2 Test Criteria

The FCC Class 'A' radiated limits are given below. The lower limit shall apply at the transition frequency.

Frequency (MHz)	Test Distance (Meters)	Field Strength (dBμV/m)
30 - 88	10	39.08
88 - 216	10	43.52
216 - 960	10	46.44
960 - 1000	10	49.54
1000 – 40000	10	49.54 AVG 69.54 PEAK

5.5.3 Test Results

The EUT met the FCC Class 'A' radiated emission requirements. No signals were detected above 5 GHz in either the horizontal or vertical polarization. All maximized quasi-peak measurements for the EUT were below the quasi-peak limit. The worst-case emission was as follows:

3M™ Model 812					
Frequency (MHz)	Level (dBμV /m)	Limit (dBμV /m)	Passing Margin (dB)	Turntable (degrees)	Antenna (m/polarity)
59.699	22.38	39.08	16.7	42	1.0/vertical

RADIATED EMISSIONS
30 - 1000 MHz

3M EMC Lab

TEST REPORT # F0506005 SHEET 1 OF 1

EUT MODEL # 3M™ Model 812 EUT SERIAL # N/A

DESCRIPTION Conversion Workstation

FREQ. (MHz)	MAXIMIZED QP SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED POSITION		REMARKS
	H/V	(dBµV/m)	(dBµV/m)	(dB)	TURNTABLE (degrees)	ANTENNA (meters)	
36.432	V	21.8	39.08	17.28	296	1.0	
59.699	V	22.38	39.08	16.7	42	1.0	
80.741	V	21.58	39.08	17.5	0	1.0	
110.621	V	21.39	43.52	22.13	2	1.0	
144.028	V	20.03	43.52	23.49	0	1.0	
187.176	V	18.61	43.52	24.91	178	1.0	
226.653	H	22.26	46.44	24.18	290	1.07	

Test Engineer: Bruce Jungwirth
Date: 08-22-2006

RADIATED EMISSIONS
1 - 5 GHz

3M EMC Lab

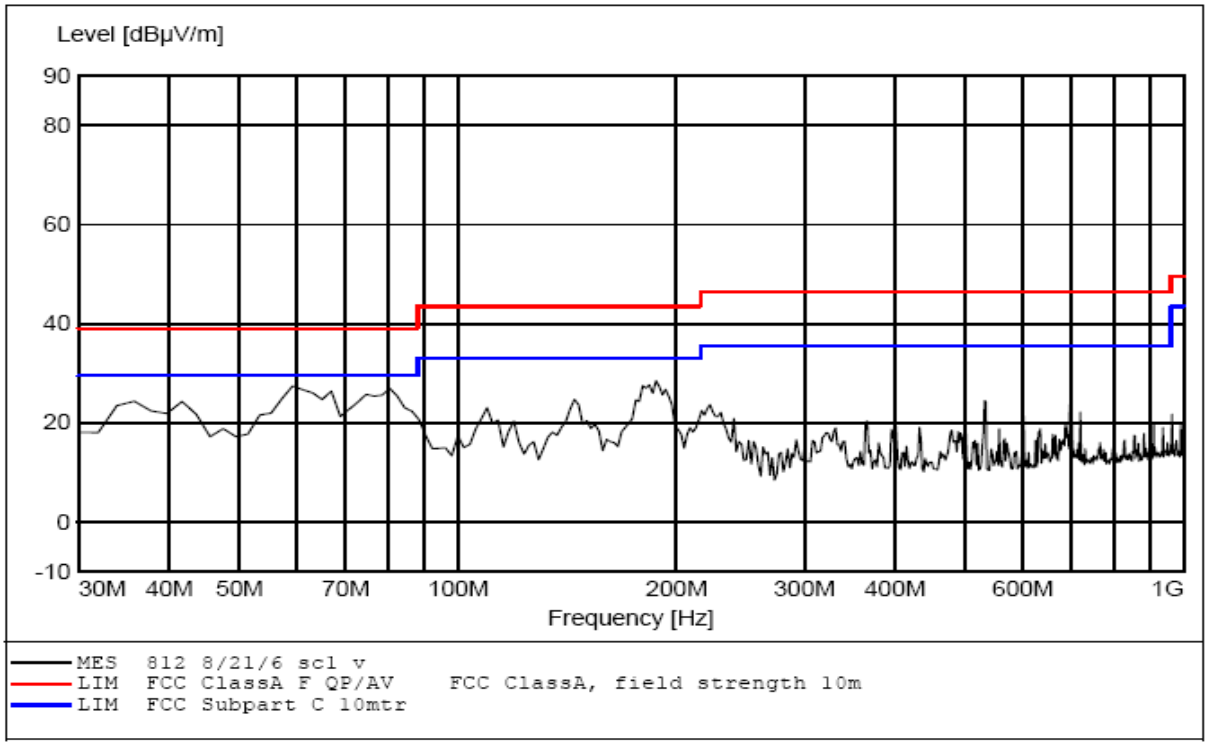
TEST REPORT # F0506005 SHEET 1 OF 1

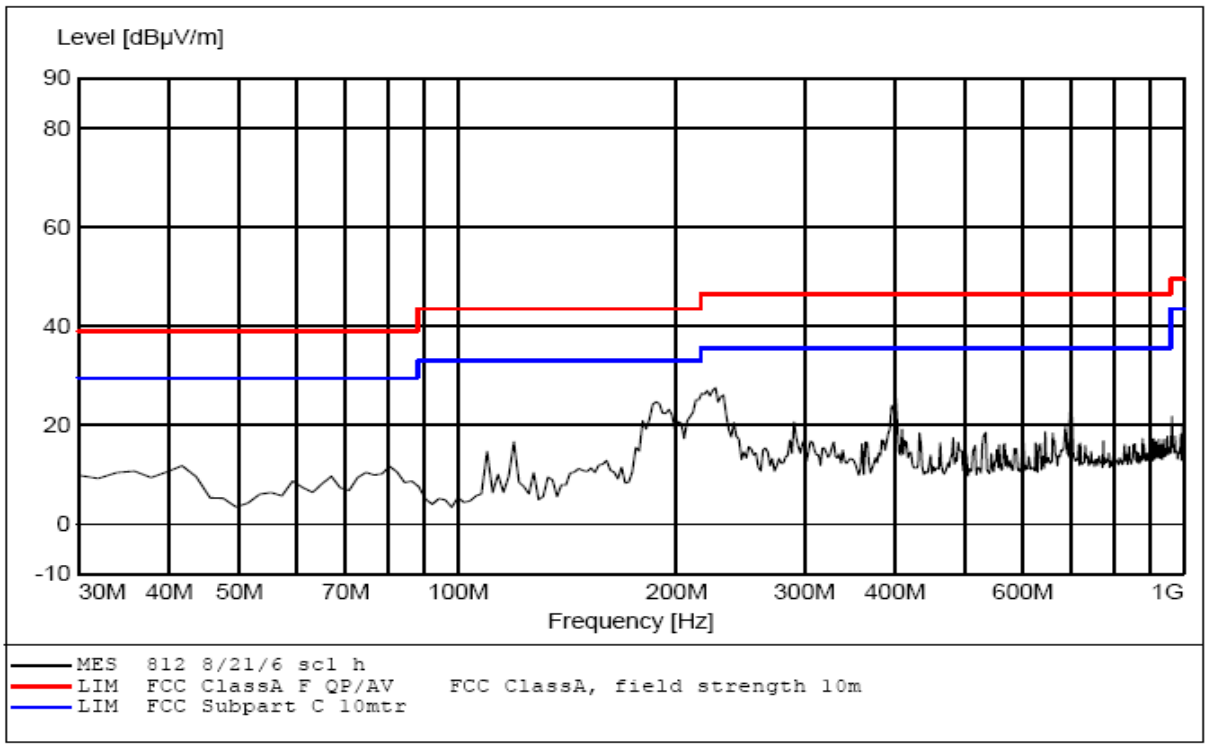
EUT MODEL # 3M™ Model 812 EUT SERIAL # N/A

DESCRIPTION Conversion Workstation

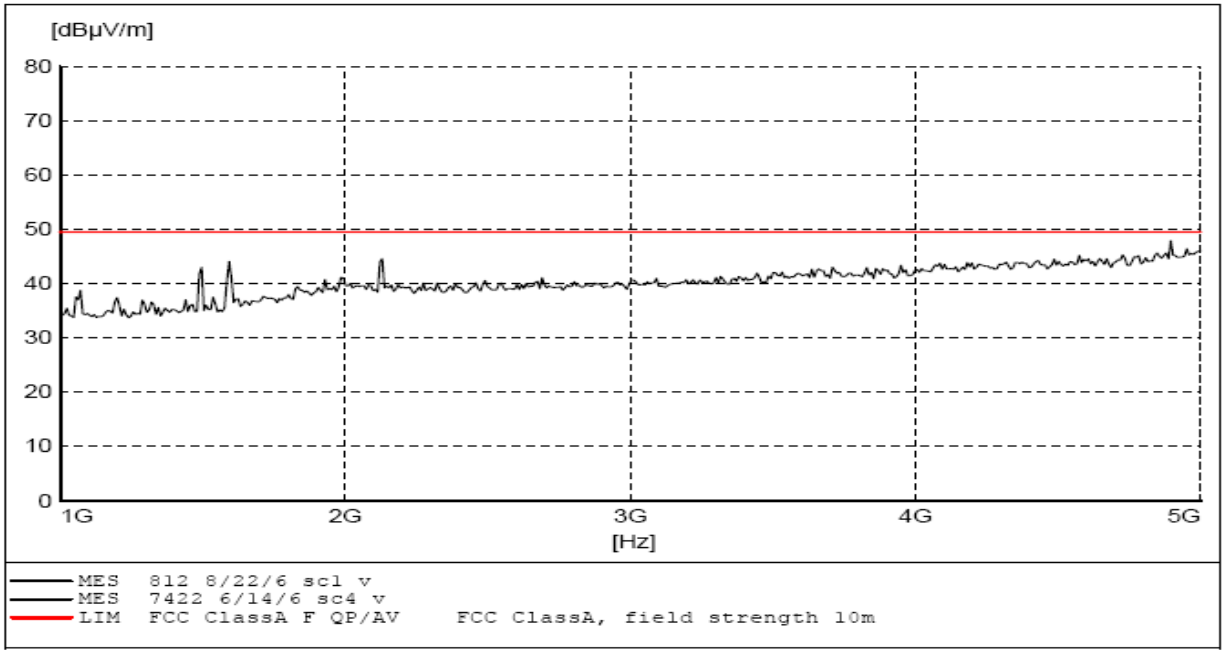
FREQ. (GHz)	MAXIMIZED AVG SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED PEAK SIGNAL		LIMIT LINE	PASSING MARGIN	Turn table	Antenna Height
	H/V	(dBµV/m)	(dBµV/m)	(dB)	H/V	(dBµV/m)	(dBµV/m)	(dB)	(deg.)	(m)
1.0639	H	30.03	49.54	19.51	H	44.29	69.54	25.25		
1.4966	V	26.64	49.54	22.9	V	42.02	69.54	27.52		
1.5947	V	32.34	49.54	17.2	V	48.41	69.54	21.13		
2.1252	V	28.23	49.54	21.31	V	46.37	69.54	23.17		

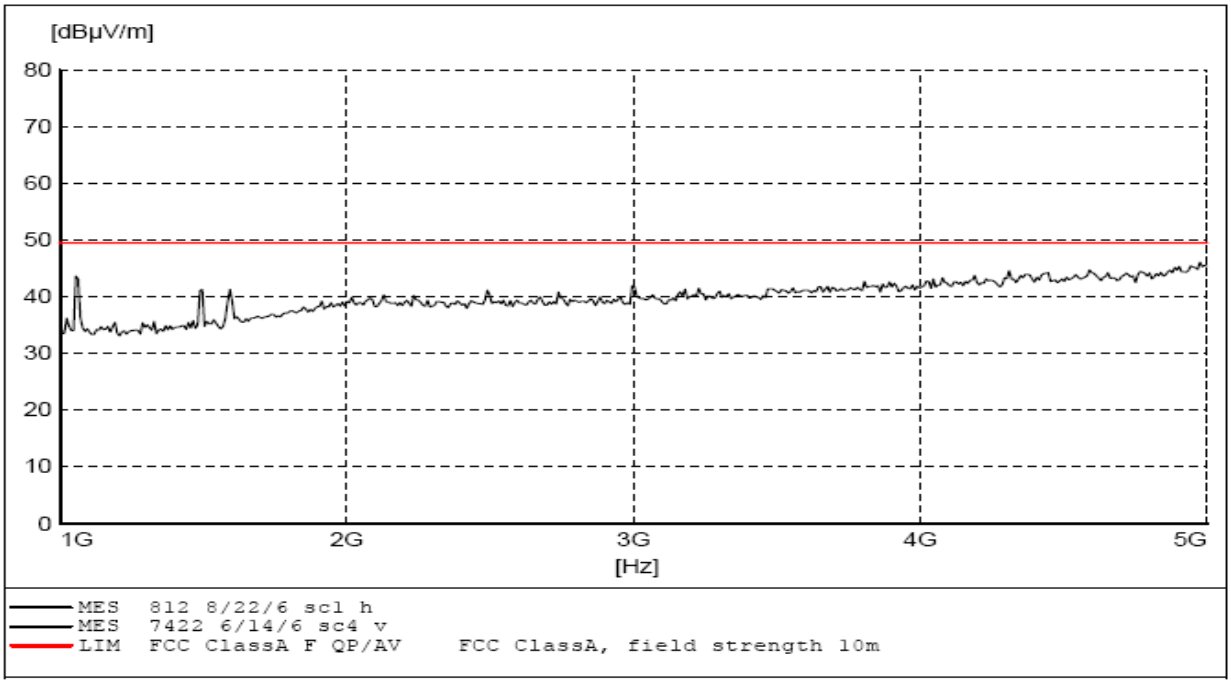
Test Engineer: Bruce Jungwirth
Date: 08-22-2006





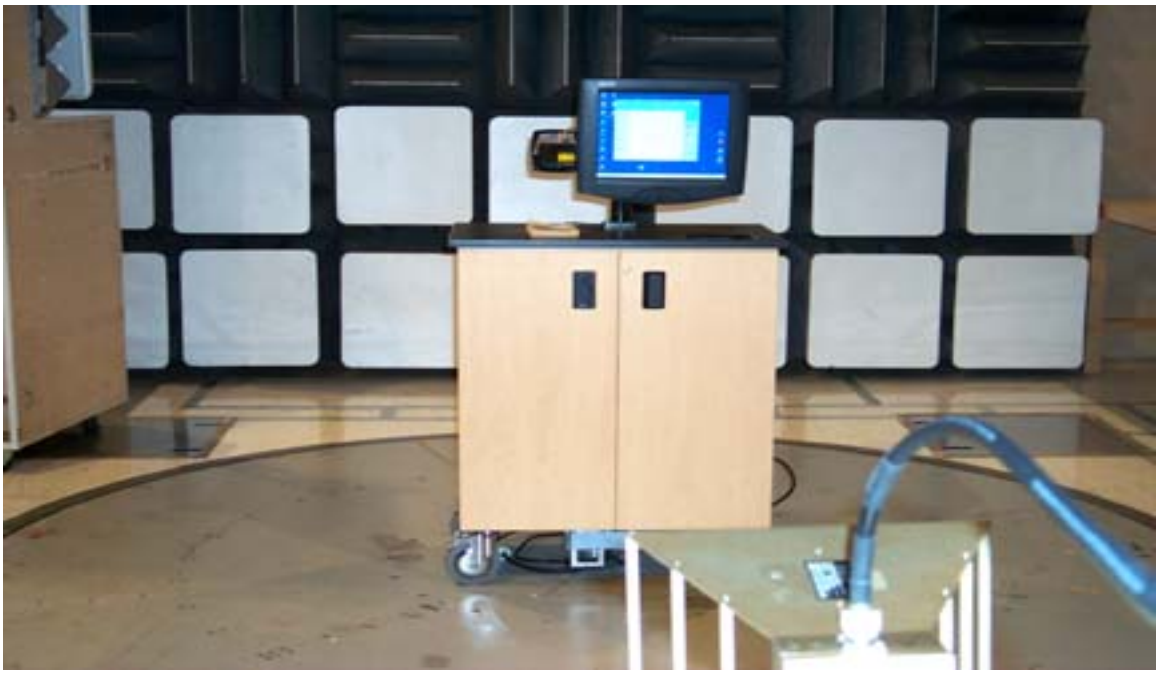
NOTE: Plots show Max Peak values





NOTE: Plots show Max Peak values

5.5.4 Test Setup Photo: 30-1000MHz (top) 1-5GHz (bottom)



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.

FREQUENCY STABILITY / POWER OUTPUT

Advantest Spectrum Analyzer, Model R3272A, Serial No. J00233 (cal due date: 14 Sep 06)
Thermotron Environmental Chamber, Model SM-3SS, SN: 19972-S (cal due date: 27 June 06)

RADIATED EMISSIONS

ElectroMetrics Large Loop Antenna. Model ALR25M, Serial No. 603 (cal due date: 12 Sep 06)
Schaffner Biconilog Antenna, Model CBL6112B, Serial No. 27491 (cal due date: 12 Sep 06)
A. H Systems Horn Antenna, Model SAS_200/571 Serial No: 234 (cal due date: 13 Sep 06)
HP Pre-Amplifier, Model 8447D, Serial No. 2944A08064 (cal due date: 12 Sep 06)
HP Pre-Amplifier, Model 83017A, (cal due date: 13 Sep 06)
Rohde & Schwarz EMI Receiver, Model ESIB 40, S/N 100235 (cal due date: 14 Sep 06)
Rohde & Schwarz ESIB 40 Firmware Version 4.32.3

CONDUCTED EMISSIONS

EMCO LISN, Model 3825-2, Serial No. 1039 (cal due date: 12 Sep 06)
Solar High Pass Filter, Model 8131 - 5.0 (cal due date: 30 Jun 06)
Rohde & Schwarz EMI Receiver, Model ESIB 40, S/N 100235 (cal due date: 14 Sep 06)
Rohde & Schwarz ESIB 40 Firmware Version 4.32.3

TEST FACILITY

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

The radiated and conducted emission measurements were performed in our semi-anechoic chamber located at 3M Building 76, 410 Fillmore Street, St. Paul, MN. Details concerning this site are on file with the FCC laboratory Division in Columbia Maryland.

The FCC Site Registration Number is 93334.

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 all device models:

> 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: DGFSSD812

Labels in the Manuals

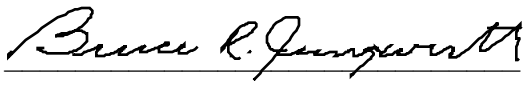
The following statement shall be placed in a prominent location in the text of the user manual:

> 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/her own expense.
>
> FCC ID: DGFSSD812
>
> 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

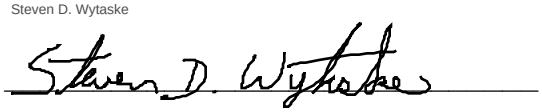
This page contains the secured digital signatures of the parties deemed responsible for reviewing and approving the contents of this report:

Bruce R. Jungwirth

TEST ENGINEER:  **DATE:** **August 29, 2006**

Bruce Jungwirth
3M EMC Laboratory

Steven D. Wytaske

APPROVER:  **DATE:** **August 29, 2006**

Steven D. Wytaske
3M EMC Laboratory

This is the last page of the Test Report