FCC
Electromagnetic Compatibility
Test Report

For

3M™ RFID Reader
Model 810

FCC ID: DGFTTS810

IC: 458A-TTS810

3M Track & Trace Solutions Division

St. Paul, MN

21 April 2008

Report Number: F1007004

Prepared By:
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CERTIFICATE OF COMPLIANCE

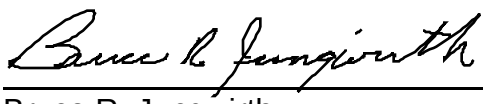
MANUFACTURER'S NAME:	3M™ Company
NAME OF EQUIPMENT:	3M™ RFID Reader
MODEL NUMBER:	810
FCC ID	DGFTTS810
IC	IC:458A-TTS810
TEST REPORT NUMBER:	F1007004
DATE OF ISSUE:	21 April 2008

USA STANDARD 47, CODE OF FEDERAL REGULATIONS (2005)
Industry Canada

Radiated Emissions	**(FCC Part 15, Subpart B, Class A) (IC, ICES-003)**
Conducted Emissions	**(FCC Part 15, Subpart B, Class A) (IC, ICES-003)**
Radiated Emissions	**(FCC Part 15, Subpart C) (IC, RSS-210, RSS-GEN)**
Conducted Emissions	**(FCC Part 15, Subpart C) (IC, RSS-210, RSS-GEN)**

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, and Industry Canada RSS & ICES Standards. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

Bruce R. Jungwirth



Bruce R. Jungwirth
Sr. EMC Engineer

TABLE OF CONTENTS

Title Page
Certificate of Compliance
Table of Contents

1.0 Test Summary

2.0 Introduction
- 2.1 Scope
- 2.2 EUT Description and Operation
- 2.3 Modifications to EUT
- 2.4 Measurement Uncertainty

3.0 Applicable Documents

4.0 Conducted Emissions
- 4.1 Test Procedure
- 4.2 Test Criteria
- 4.3 Test Results
- 4.4 Test Setup Photo

5.0 Radiated Emissions
- 5.1 Frequency Stability
  - 5.1.1 Test Procedure
  - 5.1.2 Test Criteria
  - 5.1.3 Test Results
  - 5.1.4 Test Setup Photo
- 5.2 Emissions Bandwidth
  - 5.2.1 Test Procedure
  - 5.2.2 Test Criteria
  - 5.2.3 Test Results
  - 5.2.4 Test Setup Photo
  - 5.2.5 99% Occupied Bandwidth Test Procedure and Test Results
  - 5.2.6 99% Occupied Bandwidth Test Setup Photo

5.3 Spurious Emissions (9KHz to 30 MHz)
5.3.1 Test Procedure
5.3.2 Test Criteria
5.3.3 Test Results
5.3.4 Test Setup Photo
5.4 Spurious Emissions (30 MHz to 1000 MHz)
5.4.1 Test Procedure
5.4.2 Test Criteria
5.4.3 Test Results
5.5 Radiated Emissions (30 MHz - 40 GHz)
5.5.1 Test Procedure
5.5.2 Test Criteria
5.5.3 Test Results
5.5.4 Test Setup photo

6.0 List of Test Equipment

7.0 Labeling Information

8.0 Signatures

1.0 TEST SUMMARY

Test Report Number:	F1007004
Requester:	Steve Miller 651-736-1083
Company:	3M Company, Track & Trace Solutions
Test Date(s):	Various: 21 Jan 2008 - 14 Mar 2008
Equipment Under Test:	3M™ RFID Reader, Model 810
Date of Receipt	16 Jan 2008
EUT Condition on receipt:	EUT was in good working order
Test Environment:	See individual test data sheets.
Test Results:	Passed the following tests: Conducted Emissions: FCC Part 15, ICES-003 Class A Radiated Emissions: FCC Part 15, ICES-003 Class A Conducted Emissions: FCC Part 15 Subpart C, IC RSS-210, RSS-Gen Radiated Emissions: FCC Part 15 Subpart C, IC RSS-210, RSS-Gen
Modifications:	See paragraph 2.5
Test Location:	3M Regulatory Engineering and Quality 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", IC ICES-003 rules for unintentional radiators and FCC Part 15, Subpart C, IC RSS 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 except in full without the written approval of the testing laboratory. The appropriate testing standards and references that were used are contained in Section 3.0. Worse case test data, test configuration, and photographs (worst case configuration) are provided in Sections 4.0 and 5.0. Equipment information is contained in Section 6.0. Documentation labeling information is contained in Section 7.0.

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

The 3M Regulatory Engineering and Quality EMC Laboratory is recognized under the United States Department of Commerce National Institute of Standards and Technology's National Voluntary Laboratory Accreditation 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 17025 and the relevant requirements of ISO 9002 (ANSI/ASQC 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 Industry Canada Site Registration Number is 458A-1.

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) was the 3M™ RFID Reader, Model 810. The RFID Reader is designed and tested to read and / or program RFID Tags. When used in conjunction with appropriate computer software, the Model 810 can track, monitor, and assist in locating various items equipped with RFID Tags. The EUT was tested with an input voltage of 120 VAC, 60 Hz while exercising all functions. The EUT was operated in accordance with the manufacturer's instructions. The Model 810 can be supplied in two configurations. The 1st consists of the Reader contained in an extruded aluminum enclosure, a corded AC Power Adaptor, and an appropriate antenna. The 2nd consists of the Reader mounted in an aluminum interconnect box, which also contains one of two possible open frame power Supplies, and the appropriate antenna.

Major Parts List

Description	Manufacturer	Model or Part Number
RFID Reader	3M Company	Model 810
AC Power Adaptor	Mean Well	ES18A12-P1J
Interconnect Box	3M Company	Model 7499
12 VDC, Power Supply	Mean Well	LPS-50-12
12 VDC, Power Supply	Lambda	ZWS50-12

Antenna Description

The Model 810 can be operated with the following antennas. Each antenna is designed for specific applications and the EUT was tested with each of the antennas mounted in a typical configuration while operating at maximum power.

Antenna Part Number	Description	Size
78-8129-2159-7	P12 Pad Antenna	49 in^2, 0.032 m^2
78-8129-2122-5	P08 Pad Antenna	36 in^2, 0.023 m^2
78-8129-8102-7	V Antenna	102 in^2, 0.066 m^2
78-8129-2618-2	L Antenna	119 in^2, 0.077 m^2

Power Output

The Model 810 has a measured transmit frequency of 13.5599 MHz, and a measured output power level of 1.0 watt (30 dBm) as measured into a 50 ohm load. This maximum output of 1.0 watt is factory preset.

2.3 Modifications to EUT

No modifications were required.

2.4 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 deviations. The following table lists the measurement uncertainty for the emissions testing. Furthermore, EUT component and manufacturing process variables may result in additional deviation.

Emission test	Confidence (95%)	Measurement Uncertainty	CISPR Limit
Radiated Emissions (30 MHz – 5000 MHz)	k=2.0	4.11 dB	5.20 dB
Conducted Emissions (150 kHz – 30 MHz)	k=2.0	3.29 dB	3.60 dB

3.0 APPLICABLE DOCUMENTS

The following documents were used as references. The dates that are referenced are the dates of the latest amendments. All 3M Test Procedures can be found in the Document Center of the SEMS QDS System.

CFR 47: 2005	Part 15 Radio Frequency Devices, Subpart B Unintentional Radiators and Subpart C, Intentional Radiators.	
CISPR 16-1	Specification for radio disturbance and immunity measuring apparatus and methods	
	-1 Measuring Apparatus	2003
	-2 Ancillary Equipment – Conducted Disturbance	2004
	-3 Ancillary Equipment – Disturbance Power	2004
	-4 Ancillary Equipment – Radiated Disturbance	2004
CISPR 16-2	Specification for radio disturbance and immunity measuring apparatus and methods	
	-1 Conducted Disturbance Measurements	2003
	-2 Measurements of Disturbance Power	2004
	-3 Radiated Disturbance Measurements	2003
CISPR 16-4	-1 Uncertainties in Standardized EMC Tests	2005
ANSI C63.4:2003	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.	
ICES-003	Industry Canada, Interference-Causing Equipment Standard 2004 Issue 4	
RSS-210	Industry Canada, Radio Standards Specification Issue 7 2007	
RSS-GEN	Industry Canada, Radio Standards Specification Issue 2 2007	

3M Test Procedure: Radiated Emissions Test (30 MHz – 1 GHz), PBLI-6SHLK2: Issue 1 – Released Effective – 08/09/2006
3M Test Procedure: Radiated Emissions Test (1 GHz – 5 GHz), PBLI-6SNHFY: Issue 1 – Released Effective – 08/14/2006
3M Test Procedure: Conducted Emissions Test (150 kHz – 30 MHz), PBLI-6S8LR2: Issue 1 – Released Effective – 07/31/2006
3M Test Procedure: 13.56 MHz RFID Emissions Test, PBLI-6WHLEM: Issue 1 Released Effective 12/18/2006
3M Test Procedure: 99% Power Bandwidth Test, PBLI-7C9JVN: Issue 1 Released Effective 03/04/2008

4.0 CONDUCTED EMISSIONS TESTING

Conducted emissions testing was performed in accordance with ANSI C63.4, FCC Part 15 and 3M Test Procedures: Conducted Emissions Test (150 kHz – 30 MHz), PBLI-6S8LR2 and 13.56 MHz RFID Emissions Test, PBLI-6WHLEM. Conducted emissions tests were made to determine the level of electromagnetic noise that is conducted onto the power mains from the EUT.

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 150 KHz to 30 MHz. 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 Part 15 Subpart C 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	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

4.3 Test Results

The EUT met the conducted emission and discontinuous requirements. The worst-case quasi-peak emission was as follows:

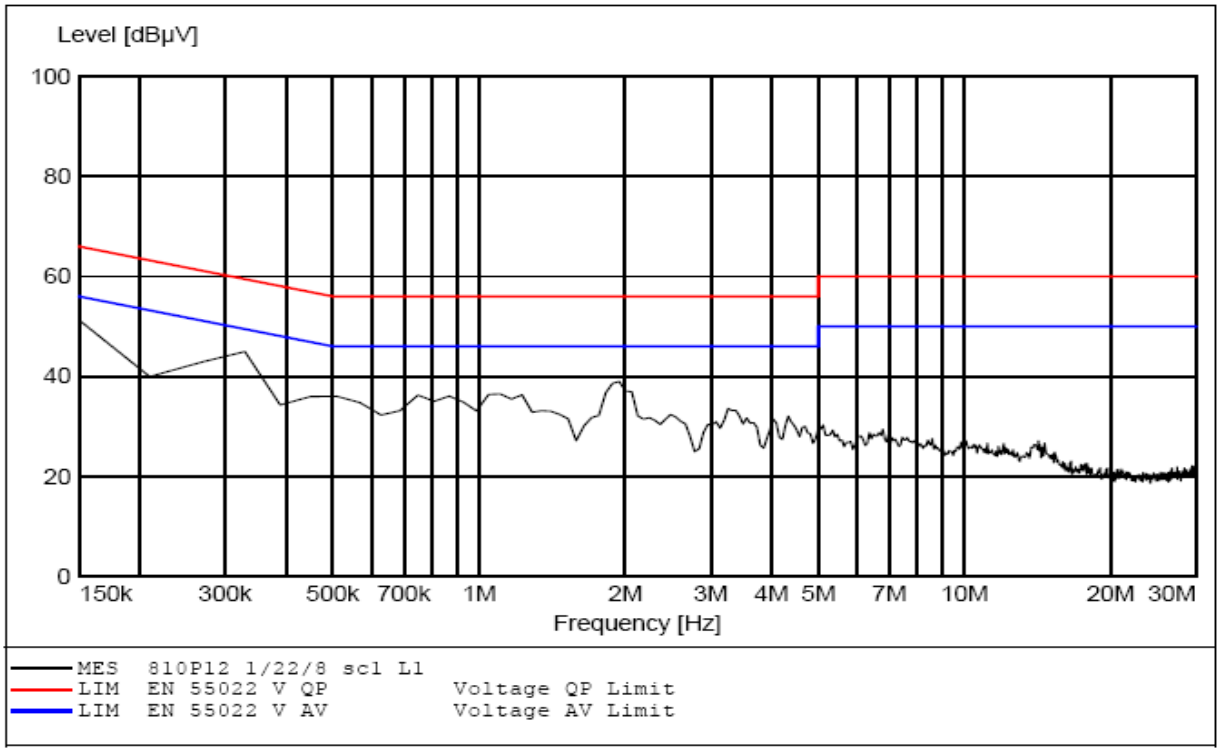
Model 810 RFID Reader				
Frequency (MHz)	Limit (dBμV)	L1 (dBμV)	L2 (dBμV)	Passing Margin (dB)
0.151	66	43.3	43.5	16.0

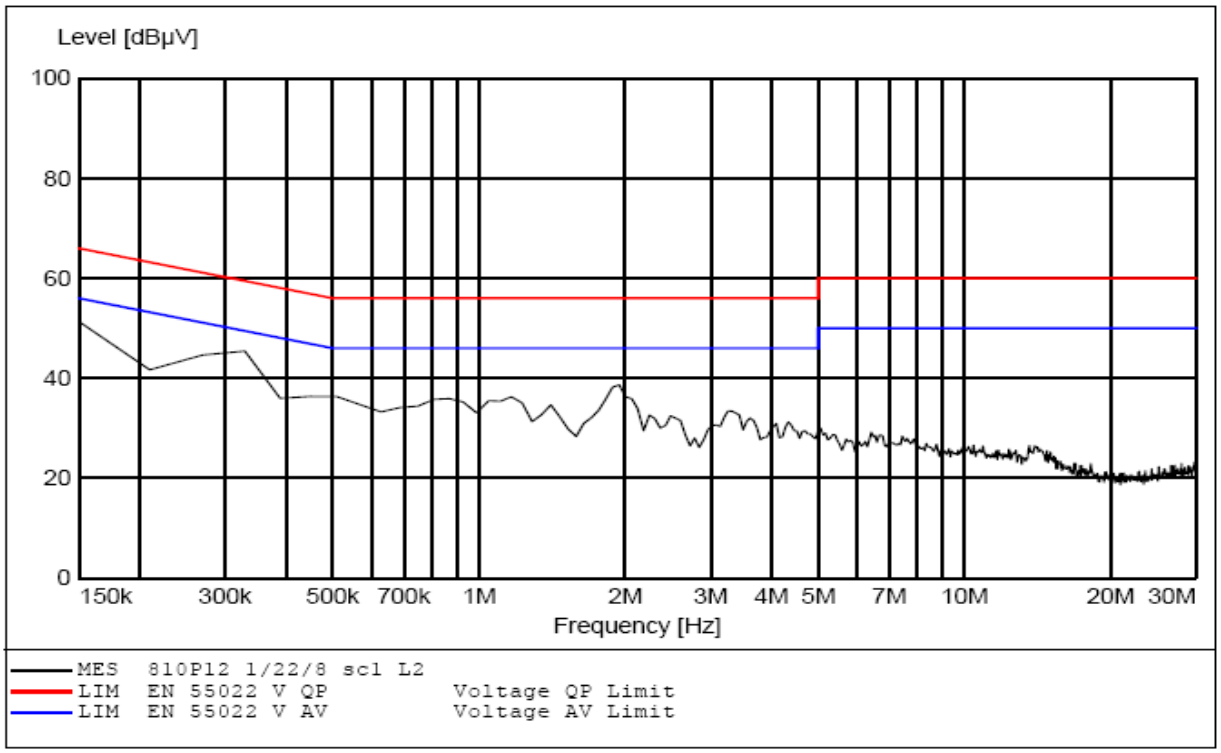
Report Number	1007004	**Date**	22 Jan 2008
EUT Name	RFID Reader	**EUT Power**	120 / 60
EUT Model	810	**Test Std**	FCC 15.207
EUT Serial #	EMC # 1	Temperature (°C)	21
EUT Description	13.56 MHz RFID Reader System / AC Adaptor Supply	Humidity (%)	23
		Air Pressure (kPa)	

MAXIMIZED FILES 810P12 1/22/8 sc1 L1 L2 VOLTAGE/HERTZ 120 / 60

	PEAK (dBµV)		QUASI-PEAK (dBµV)				AVERAGE (dBµV)			
FREQUENCY (MHz)	L1 Line	L2 N	L1 Line	L2 N	Limit	Passing Margin	L1 Line	L2 N	Limit	Passing Margin
.151			48.9	49.1	66	16.9	34.9	36.1	56	19.9
.3292			43.3	43.5	59.5	16.0	36.7	39.5	49.5	10.0
1.182			32.6	32.6	56	23.4	25.9	26.0	46	20.0
1.951			35.5	35.6	56	20.4	29.6	30.1	46	15.9
3.329			30.5	30.4	56	25.5	24.3	24.6	46	21.4
13.5598			14.6	14.0	50	35.4	8.9	8.6	40	31.1

Test Engineer: Bruce Jungwirth	Date: 22 Jan 2008





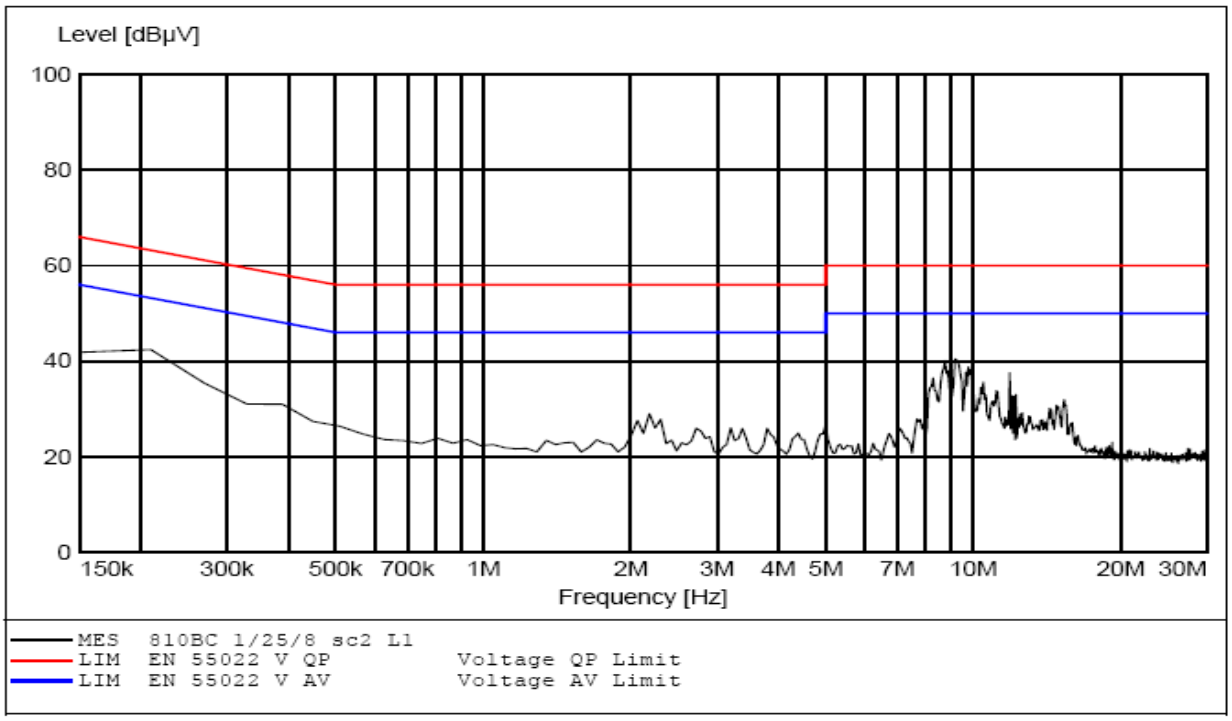
Max Peak Plots
Mean Well AC Adaptor Supply

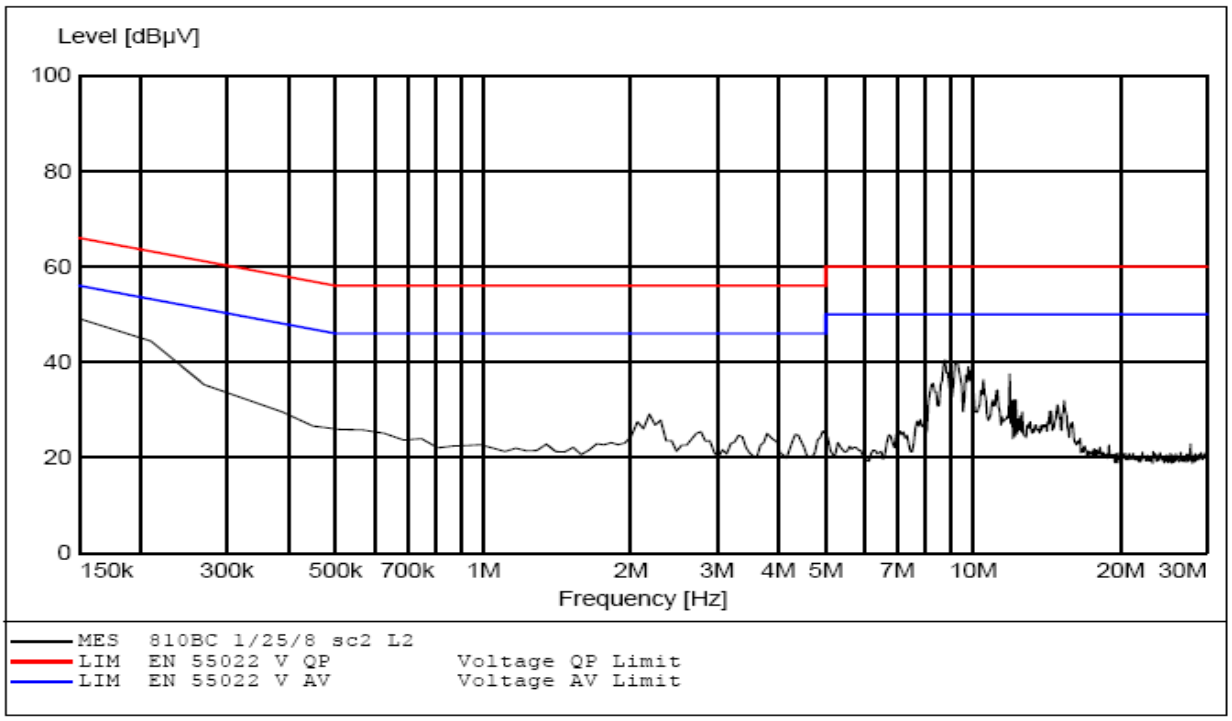
Report Number	1007004	**Date**	25 Jan 2008
EUT Name	RFID Reader	**EUT Power**	120 / 60
EUT Model	810	**Test Std**	FCC 15.207
EUT Serial #	EMC # 1	Temperature (°C)	22
EUT Description	13.56 MHz RFID Reader System Mean Well Supply	Humidity (%)	24
		Air Pressure (kPa)	

MAXIMIZED FILES: 810BC 1/25/8 sc2 L1 L2 VOLTAGE/HERTZ 120 / 60

	PEAK (dBµV)		QUASI-PEAK (dBµV)				AVERAGE (dBµV)			
FREQUENCY (MHz)	L1 Line	L2 N	L1 Line	L2 N	Limit	Passing Margin	L1 Line	L2 N	Limit	Passing Margin
.187			35.8	36.1	64.2	28.1	28.6	29.4	54.2	24.8
.248			38.4	38.4	61.8	23.4	33.6	33.7	51.8	18.1
.400			24.9	25.0	57.8	32.8	1.83	1.45	47.8	45.97
2.00			9.2	7.7	56	46.8	2.2	1.6	46	43.8
8.262			29.6	29.4	60	30.4	23.3	22.7	50	27.3
9.230			26.5	28.1	60	31.9	19.9	20.9	50	29.1

Test Engineer: Bruce Jungwirth	Date: 25 Jan 2008





Max Peak Plots

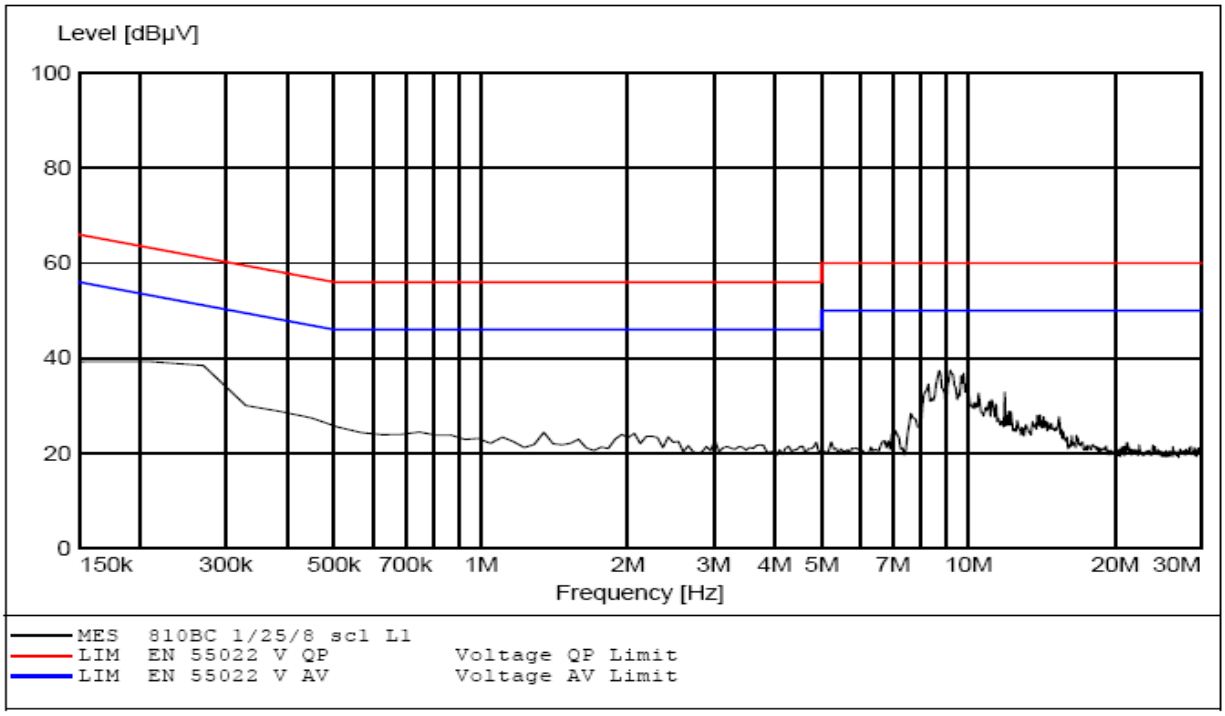
Mean Well Open Frame Supply

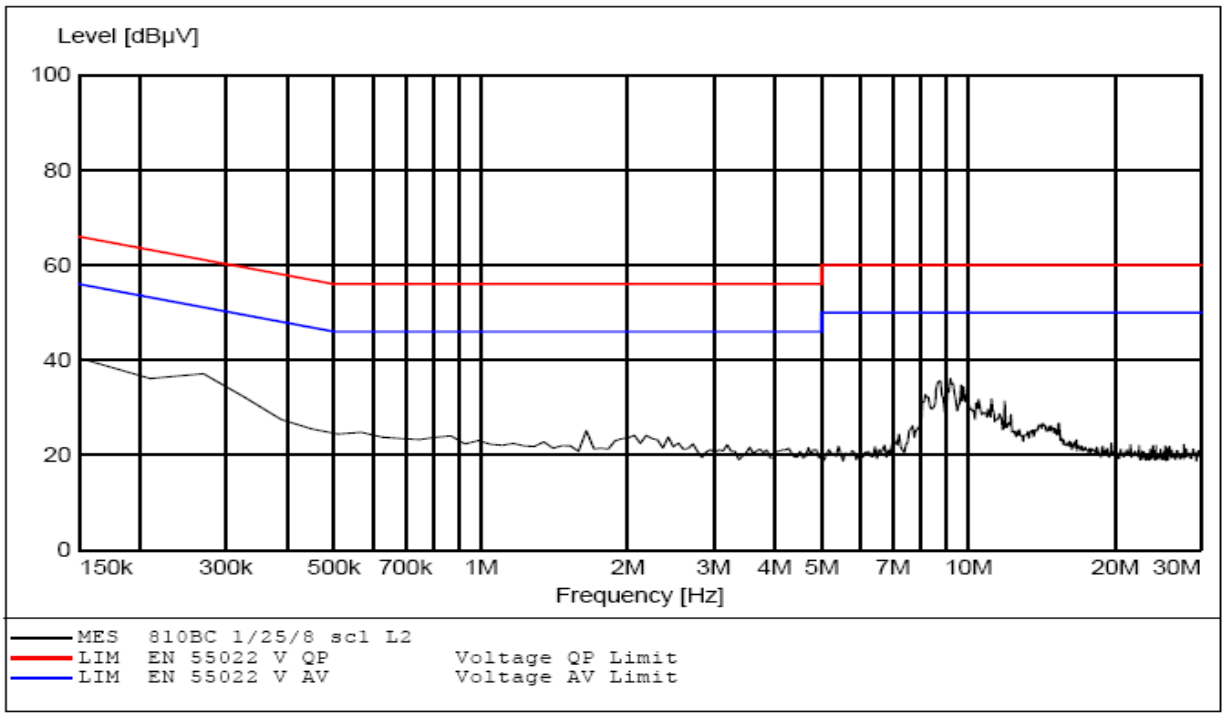
Report Number	1007004	**Date**	25 Jan 2008
EUT Name	RFID Reader	**EUT Power**	120 / 60
EUT Model	810	**Test Std**	FCC 15.207
EUT Serial #	EMC # 1	Temperature (°C)	22
EUT Description	13.56 MHz RFID Reader System Lambda Supply	Humidity (%)	24
		Air Pressure (kPa)	

MAXIMIZED FILES 810BC 1/25/8 sc1 L1 L2 VOLTAGE/HERTZ 120 / 60

	PEAK (dBµV)		QUASI-PEAK (dBµV)				AVERAGE (dBµV)			
FREQUENCY (MHz)	L1 Line	L2 N	L1 Line	L2 N	Limit	Passing Margin	L1 Line	L2 N	Limit	Passing Margin
.150			31.6	31.7	66	34.3	10.7	10.5	56	45.3
.265			29.2	28.7	61.3	32.1	14.8	15.0	51.3	36.3
8.737			33.1	34.8	60	25.2	26.1	28.0	50	22.0
9.325			34.6	35.8	60	24.2	28.7	29.8	50	20.2
11.884			33.7	34.8	60	25.2	30.1	31.6	50	18.4
13.5598			14.9	19.7	60	40.3	9.8	13.5	50	36.5

Test Engineer: Bruce Jungwirth	Date: 25 Jan 2008





Max Peak Plots
Lambda Open Frame Supply

4.4 Test Setup Photographs

Conducted Emissions Test Setup

5.0 Radiated Emissions

The EUT was placed in an anechoic chamber and radiated emissions testing was performed in accordance with FCC Part 15.225 and 3M Test Procedures: Radiated Emissions Test (30 MHz – 1 GHz), PBLI-6SHLK2, Radiated Emissions Test (1 GHz – 5 GHz), PBLI-6SNHFY and 13.56 MHz RFID Emissions Test, PBLI-6WHLEM. Radiated emissions measurements were made to determine the level of electromagnetic energy radiating from the EUT.

5.1 Frequency Stability

The Frequency Stability testing was preformed in accordance with ANSI C63.4 and FCC Part 15.225 (e) 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. A frequency counter was used for the frequency stability measurements. A close field probe was attached to the counter and placed near the antenna of the reader for measurement. 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 (measurements are taken within 1 minute of startup, and after 10 minutes of operation at each test condition).

5.1.2 Test Criteria

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

Carrier Frequency (MHz)	Voltage Range % of Nominal Supply (85 % to 115 %)	Max.Frequency Change (%)
13.56	102 to 138 V AC	+/- 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 (%)
13.5599	13.5599	13.5599	+/- 0.0

Carrier Frequency Stability versus Temperature			
Carrier Frequency (MHz)	Lowest Frequency (MHz)	Highest Frequency (MHz)	Max.Frequency Change (%)
13.5599	13.55927	13.55997	- 0.0046, + 0.0005

Carrier Frequency (MHz) vs. Supply Voltage at 20° C

Voltage	Freq. at Startup	Freq. after 10 Min.
102 VAC	13.55990	13.55990
120 VAC	13.55990	13.55990
138 VAC	13.55990	13.55990

Carrier Frequency (MHz) vs. Temperature at nominal supply voltage

Temp. ° C	Freq. at Startup	Freq. after 10 min.
-20°	13.55988	13.55927
0°	13.55995	13.55997
20°	13.55990	13.55990
50°	13.55986	13.55986

5.1.4 Test Setup Photo

Frequency Stability

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, FCC Part 15.225 and 3M Test Procedure: 13.56 MHz RFID Emissions Test, PBLI-6WHLEM 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)	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.

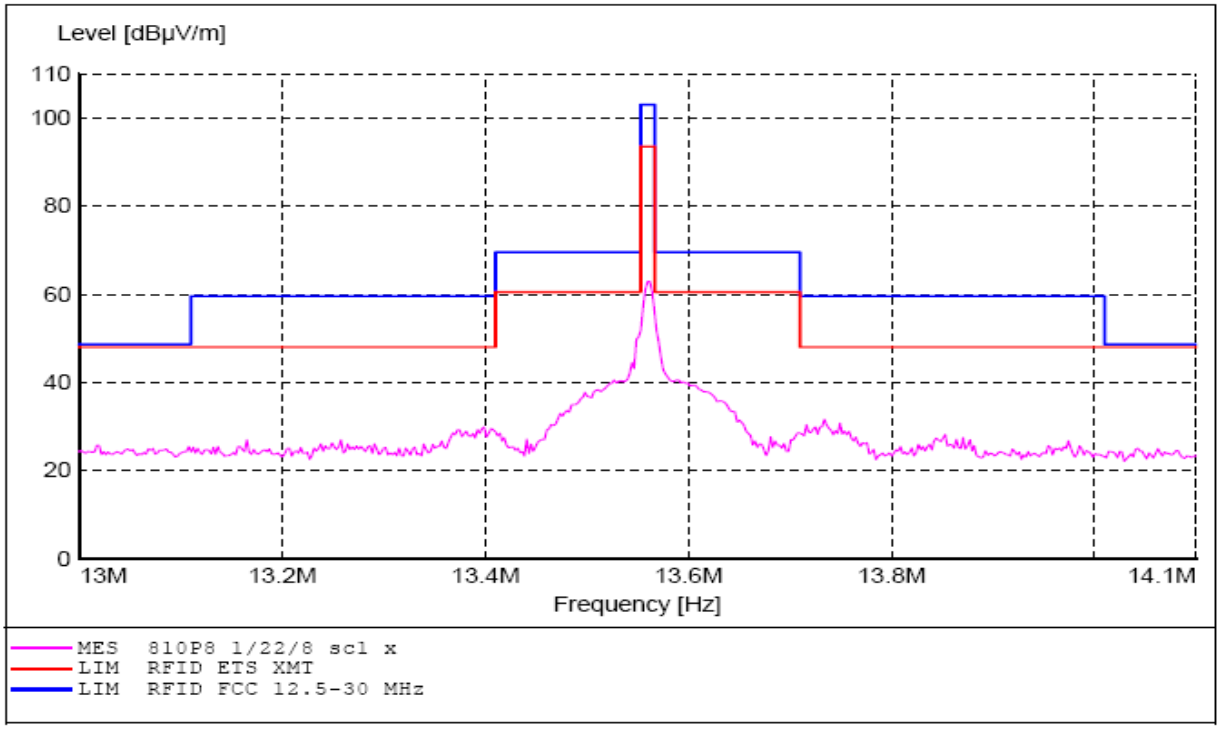
5.2.3 Test Results

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.

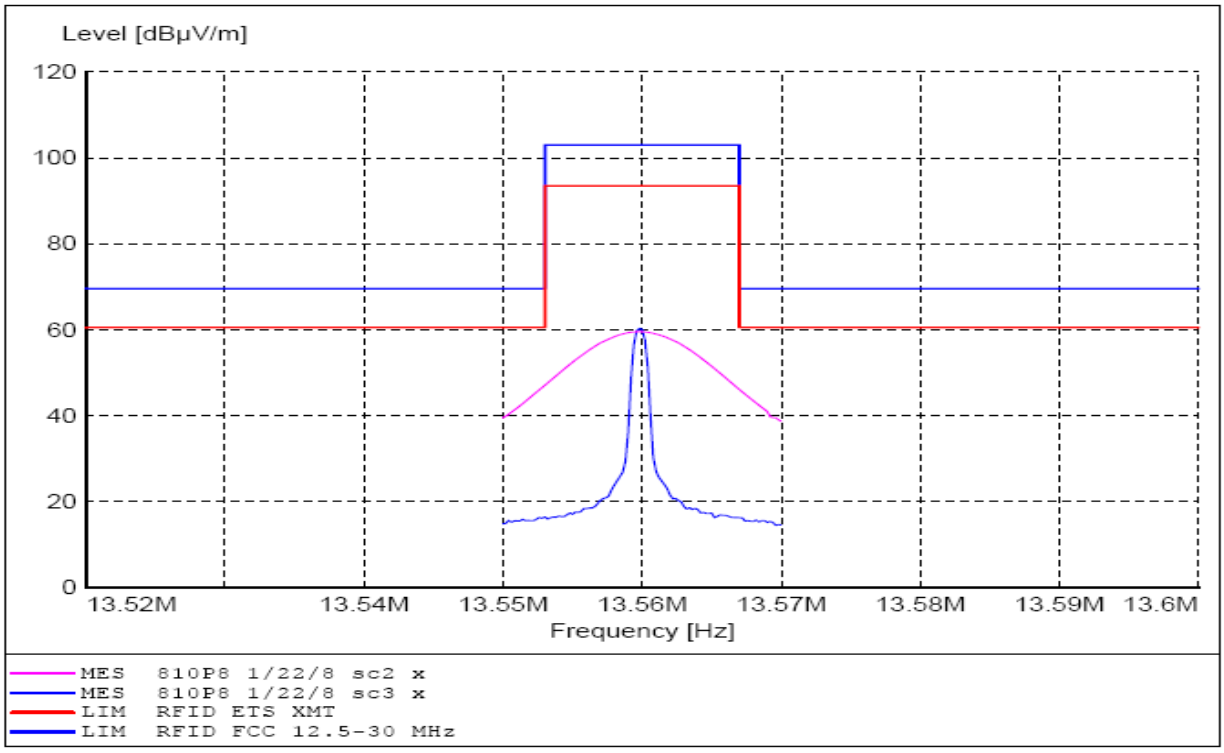
3M™ RFID Reader Model 810 P08 Antenna						
Frequency (MHz)	BW (kHz)	QP Level (dBµV/m)	QP Limit (dBµV/m)	Passing Margin (dB)	Turntable (degrees)	Antenna Orientation/Angle (Polarity/degrees)
13.5599[1]	9	63.07	103	39.93	196	X -5° CCW
13.553[2]	1	15.87	69.6	53.73	196	X -5° CCW
13.567[2]	1	16.11	69.6	53.49	196	X -5° CCW
13.5485	9	37.37	69.6	32.23	196	X -5° CCW
13.5715	9	36.75	69.6	32.85	196	X -5° CCW
13.41	1	2.09	59.6	57.51	196	X -5° CCW
13.71	1	2.52	59.6	57.08	196	X -5° CCW
13.4055	9	19.60	59.6	40.0	196	X -5° CCW
13.7141	9	19.90	59.6	39.70	196	X -5° CCW
13.11	1	0.93	48.6	47.67	196	X -5° CCW
14.01	1	0.41	48.6	48.19	196	X -5° CCW
13.1055	9	14.77	48.6	33.83	196	X -5° CCW
14.0145	9	13.79	48.6	34.81	196	X -5° CCW

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

Test Engineer: Bruce Jungwirth
Date: 22 Jan. 2008



Carrier Output
Peak Plot



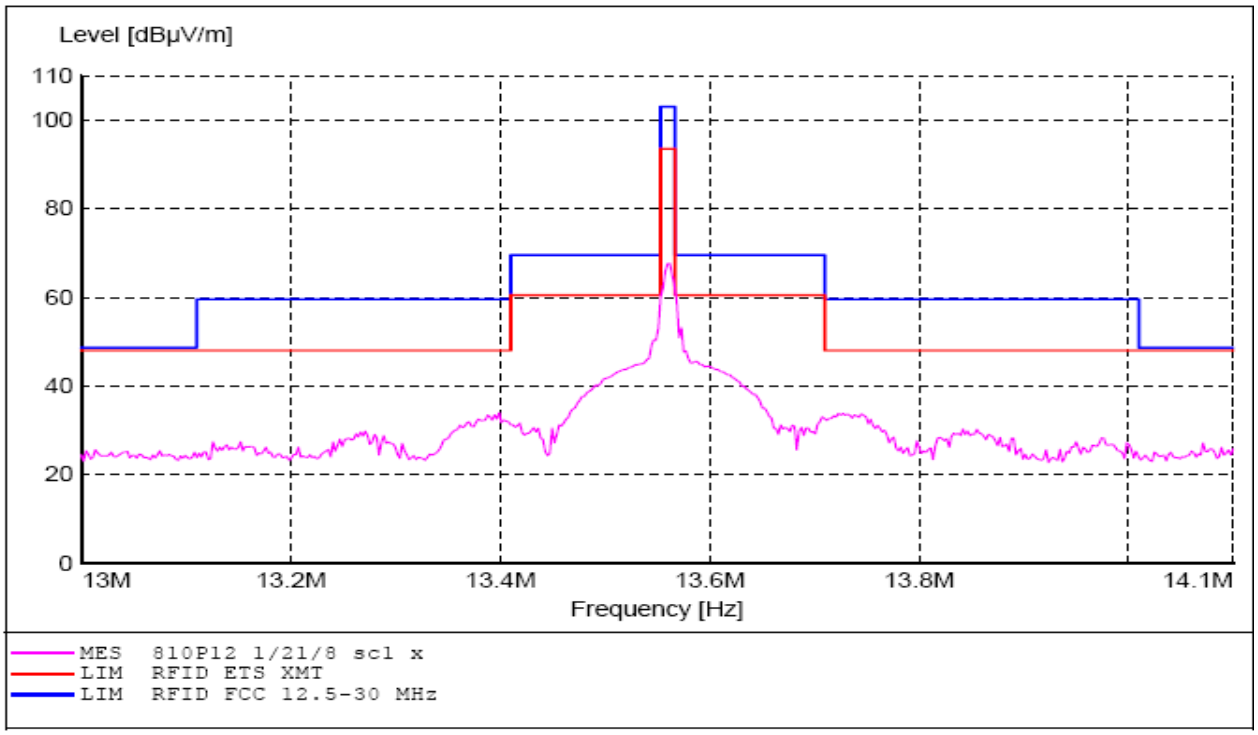
Violet – QP Plot 9 KHz BW Blue – QP Plot 1 KHz BW

Bandwidth Plots

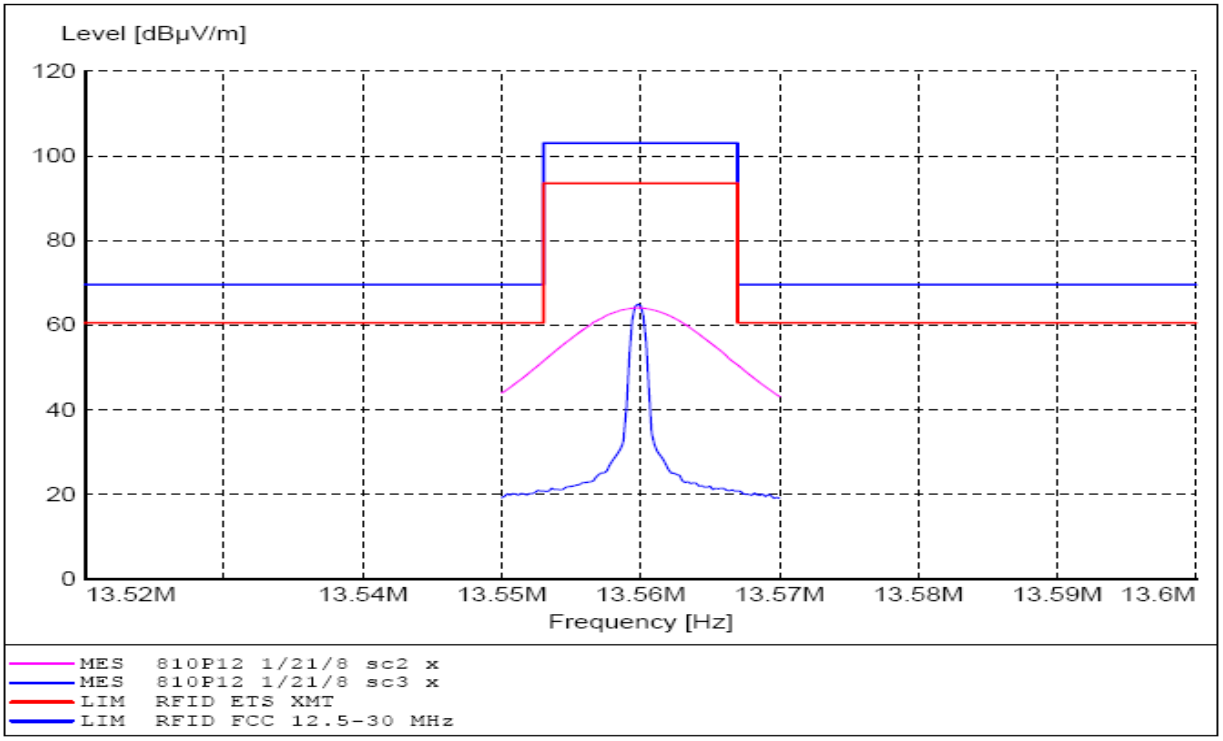
3M™ RFID Reader Model 810 P12 Antenna						
Frequency (MHz)	BW (kHz)	QP Level (dBµV/m)	QP Limit (dBµV/m)	Passing Margin (dB)	Turntable (degrees)	Antenna Orientation/Angle (Polarity/degrees)
13.5599[1]	9	67.34	103	35.66	133	X±0°
13.553[2]	1	20.53	69.6	49.07	133	X±0°
13.567[2]	1	20.44	69.6	49.16	133	X±0°
13.5485	9	41.18	69.6	28.42	133	X±0°
13.5715	9	40.80	69.6	28.80	133	X±0°
13.41	1	4.75	59.6	54.85	133	X±0°
13.71	1	5.85	59.6	53.75	133	X±0°
13.4055	9	23.15	59.6	36.45	133	X±0°
13.7141	9	24.10	59.6	35.50	133	X±0°
13.11	1	1.61	48.6	46.99	133	X±0°
14.01	1	1.11	48.6	47.49	133	X±0°
13.1055	9	15.20	48.6	33.40	133	X±0°
14.0145	9	14.53	48.6	34.07	133	X±0°

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

Test Engineer: Bruce Jungwirth
Date: 21 Jan. 2008



Carrier Output
Peak Plot



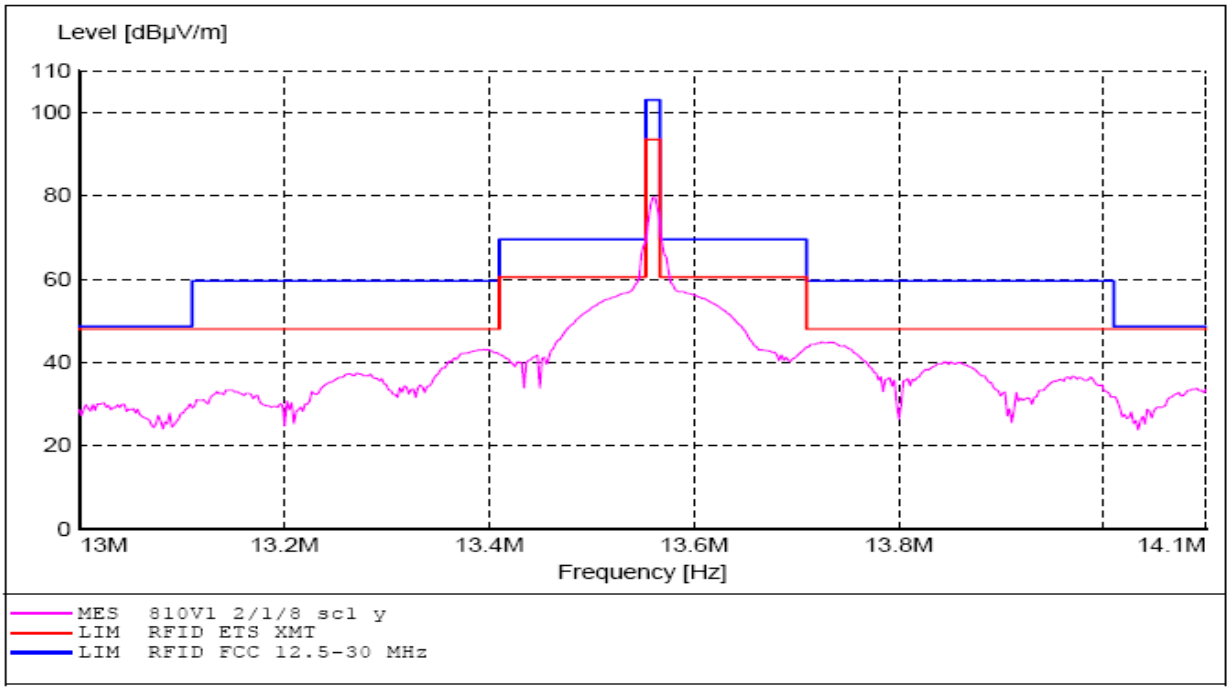
Violet – QP Plot 9 KHz BW Blue – QP Plot 1 KHZ BW

Bandwidth Plots

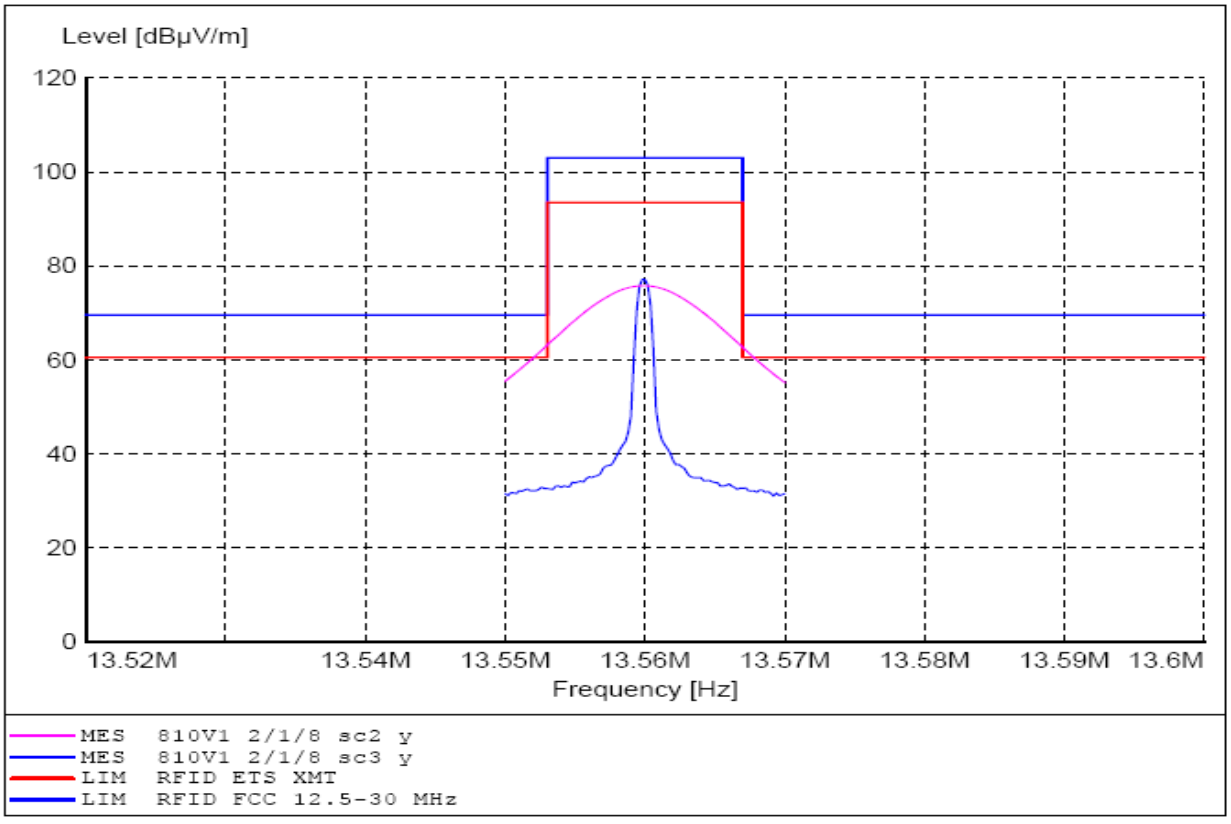
3M™ RFID Reader Model 810 V Antenna						
Frequency (MHz)	BW (kHz)	QP Level (dBµV/m)	QP Limit (dBµV/m)	Passing Margin (dB)	Turntable (degrees)	Antenna Orientation/Angle (Polarity/degrees)
13.5599[1]	9	79.64	103	23.36	96	Y±0°
13.553[2]	1	32.00	69.6	37.60	96	Y±0°
13.567[2]	1	32.07	69.6	37.53	96	Y±0°
13.5485	9	52.93	69.6	16.67	96	Y±0°
13.5715	9	52.82	69.6	16.78	96	Y±0°
13.41	1	15.02	59.6	44.58	96	Y±0°
13.71	1	16.46	59.6	43.14	96	Y±0°
13.4055	9	34.23	59.6	26.37	96	Y±0°
13.7141	9	35.92	59.6	23.68	96	Y±0°
13.11	1	3.67	48.6	44.93	96	Y±0°
14.01	1	6.21	48.6	42.39	96	Y±0°
13.1055	9	18.72	48.6	29.88	96	Y±0°
14.0145	9	20.85	48.6	27.75	96	Y±0°

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

Test Engineer: Bruce Jungwirth
Date: 1 Feb. 2008



Carrier Output
Peak Plot



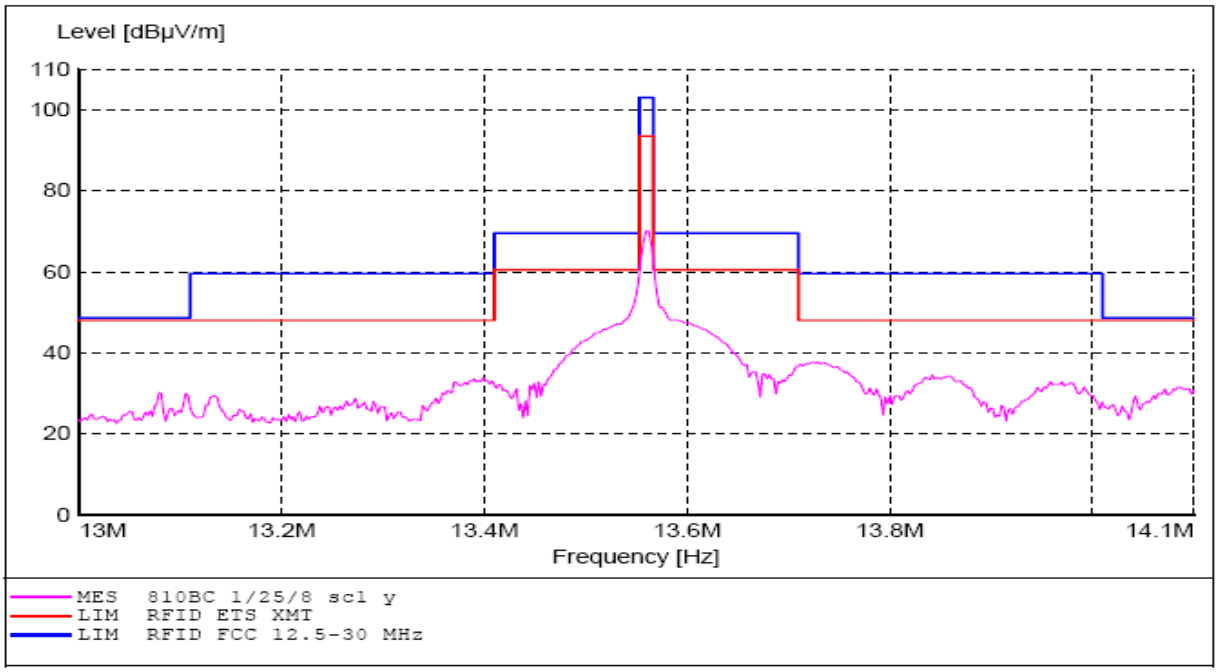
Violet – QP Plot 9 KHz BW Blue – QP Plot 1 KHz BW

Bandwidth Plots

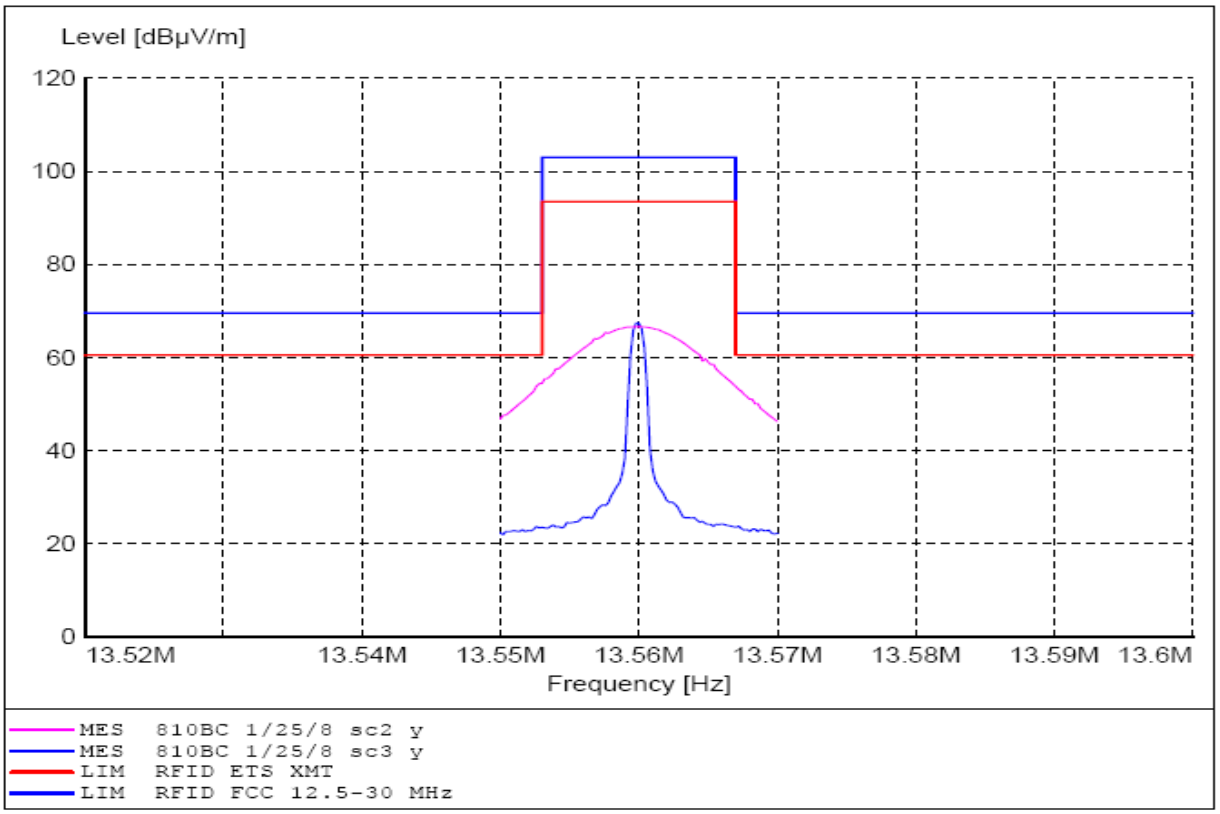
3M™ RFID Reader Model 810 L Antenna						
Frequency (MHz)	BW (kHz)	QP Level (dBµV/m)	QP Limit (dBµV/m)	Passing Margin (dB)	Turntable (degrees)	Antenna Orientation/Angle (Polarity/degrees)
13.5599[1]	9	70.79	103	32.21	204	Y-5°CCW
13.553[2]	1	23.01	69.6	46.59	204	Y-5°CCW
13.567[2]	1	23.16	69.6	46.44	204	Y-5°CCW
13.5485	9	44.40	69.6	25.20	204	Y-5°CCW
13.5715	9	43.95	69.6	25.65	204	Y-5°CCW
13.41	1	6.02	59.6	53.58	204	Y-5°CCW
13.71	1	10.36	59.6	49.24	204	Y-5°CCW
13.4055	9	24.47	59.6	35.13	204	Y-5°CCW
13.7141	9	30.24	59.6	29.36	204	Y-5°CCW
13.11	1	1.63	48.6	46.97	204	Y-5°CCW
14.01	1	3.93	48.6	44.67	204	Y-5°CCW
13.1055	9	20.26	48.6	28.34	204	Y-5°CCW
14.0145	9	18.56	48.6	30.04	204	Y-5°CCW

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

Test Engineer: Bruce Jungwirth
Date: 25 Jan. 2008



Carrier Output
Peak Plot



Violet – QP Plot 9 KHz BW Blue – QP Plot 1 KHz BW

Bandwidth Plots

5.2.4 Test Setup Photo

810 (P08 antenna)
Carrier Frequency Emissions / Emissions Bandwidth / Spurious Emissions 9KHz to 30 MHz

810 (P12 antenna)
Carrier Frequency Emissions / Emissions Bandwidth / Spurious Emissions 9KHz to 30 MHz

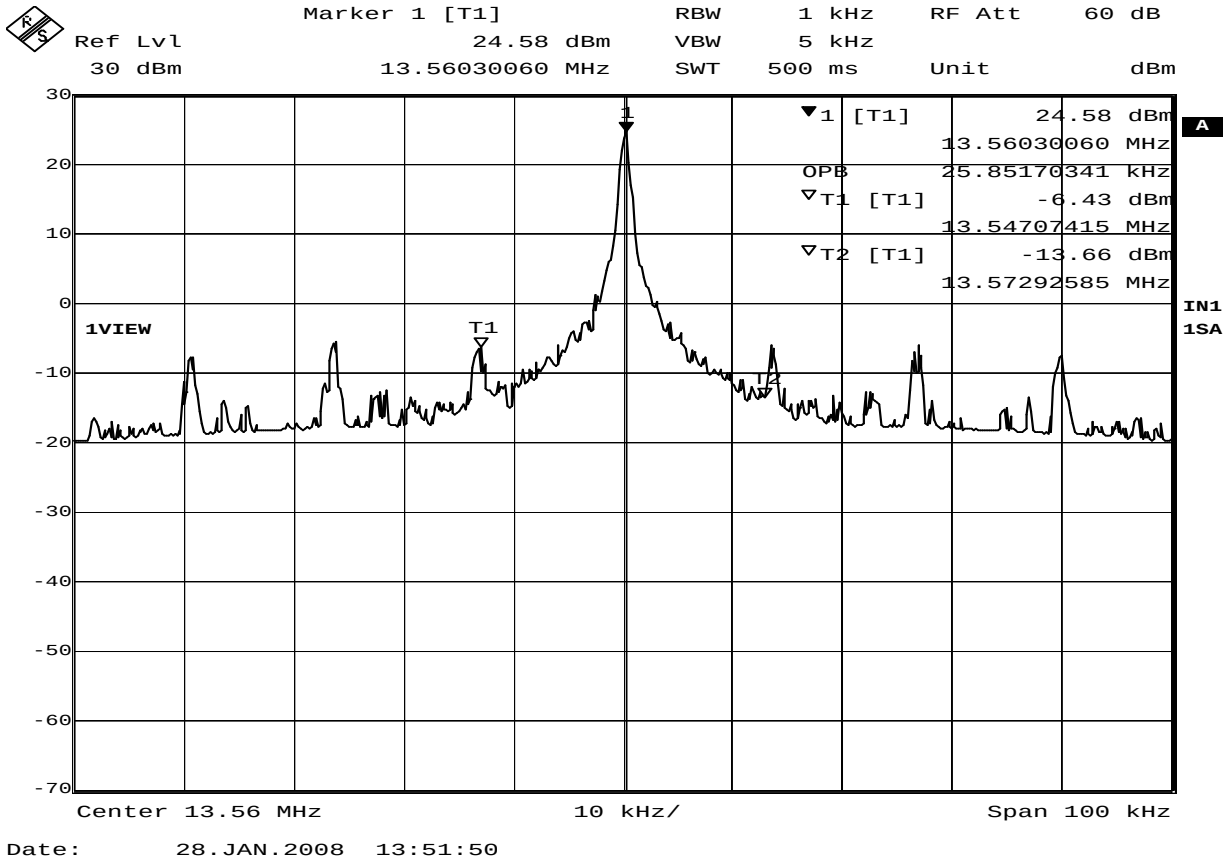
810 (V antenna)
Carrier Frequency Emissions / Emissions Bandwidth / Spurious Emissions 9KHz to 30 MHz

810 (L antenna)
Carrier Frequency Emissions / Emissions Bandwidth / Spurious Emissions 9KHz to 30 MHz

5.2.5 99% Power Bandwidth Test Procedure

The EUT was placed in a shielded room and connected directly to the input of an EMI Receiver. The receiver was operated in the analyzer mode with a center frequency of 13.56 MHz. The transmitter was operated at its maximum carrier output with modulation applied under normal test conditions. The receiver's span and bandwidths were set in accordance with Industry Canada RSS-GEN (section 4.6.1). The receiver has an internal function that can be selected for the measurement of the 99% Bandwidth, and automatic placement of the markers. 3M Test Procedure: 13.56 MHz RFID Emissions Test, PBLI-6WHLEM contains the procedure for selecting the Bandwidth function and output of the result plot.

The EUT had a measured bandwidth of **25.851 KHz.**



Test Engineer: Bruce Jungwirth
Date: 28 Jan. 2008

5.2.6 99% Occupied Bandwidth Photo

5.3 Spurious Emissions (9 KHz 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, FCC Part 15, Subpart C and 3M Test Procedure: 13.56 MHz RFID Emissions Test, PBLI-6WHLEM.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)	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 (9 KHz to 30 MHz.) requirements. The worst-case emission was as follows:

No measurable spurious emissions were detected below 12.5MHz.

3M™ RFID Reader™ Model 810 P08 Antenna			
Frequency (MHz)	Limit (dBμV)	Maximized QP Signal (dBμV)	Passing Margin (dB)
27.1196[1]	48.6	12.5	36.10

1. 2nd Harmonic of Intentional Radiator

3M™RFID Reader™ Model 810 P12 Antenna			
Frequency (MHz)	Limit (dBμV)	Maximized QP Signal (dBμV)	Passing Margin (dB)
27.1196[1]	48.6	13.87	34.73

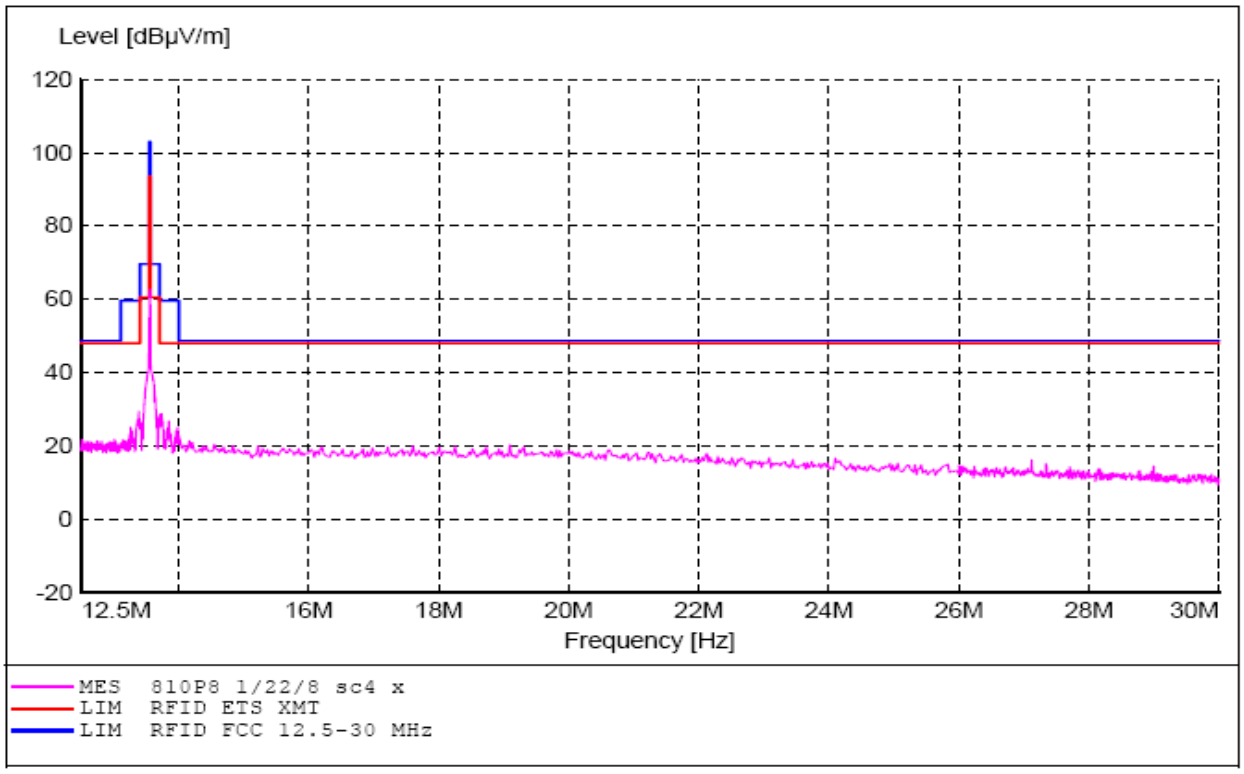
1. 2nd Harmonic of Intentional Radiator

3M™RFID Reader™ Model 810 V Antenna			
Frequency (MHz)	Limit (dBμV)	Maximized QP Signal (dBμV)	Passing Margin (dB)
27.1196[1]	48.6	10.9	37.7

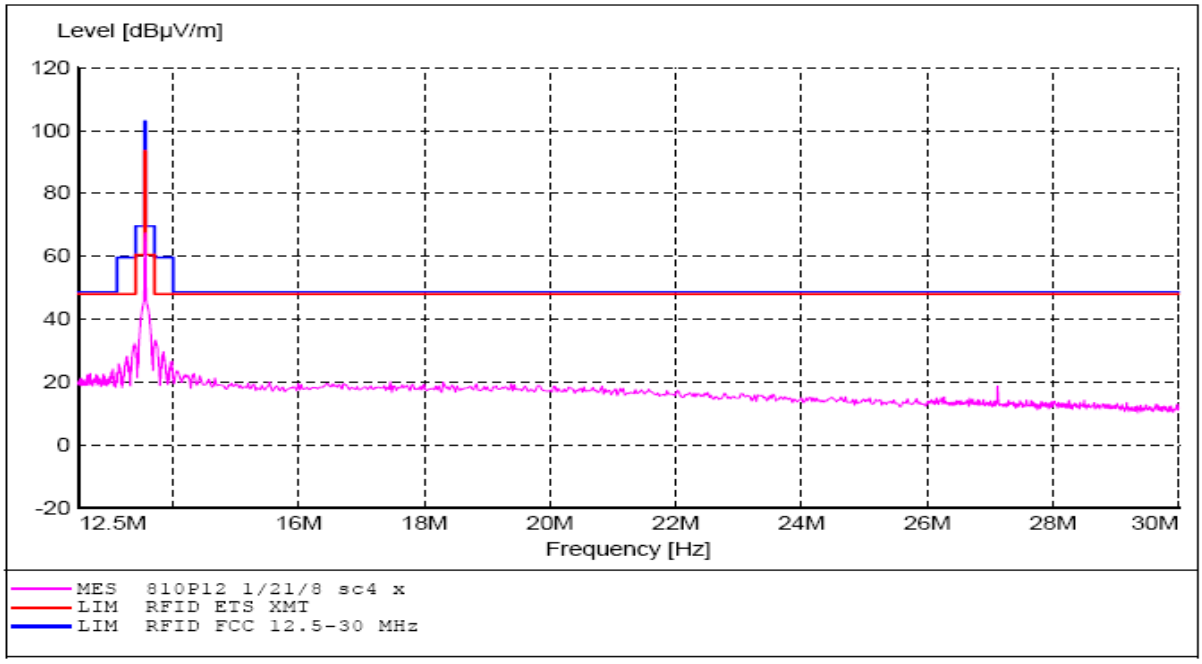
1. 2nd Harmonic of Intentional Radiator

3M™ RFID Reader™ Model 810 L Antenna			
Frequency (MHz)	Limit (dBμV)	Maximized QP Signal (dBμV)	Passing Margin (dB)
27.1196[1]	48.6	41.95	6.65

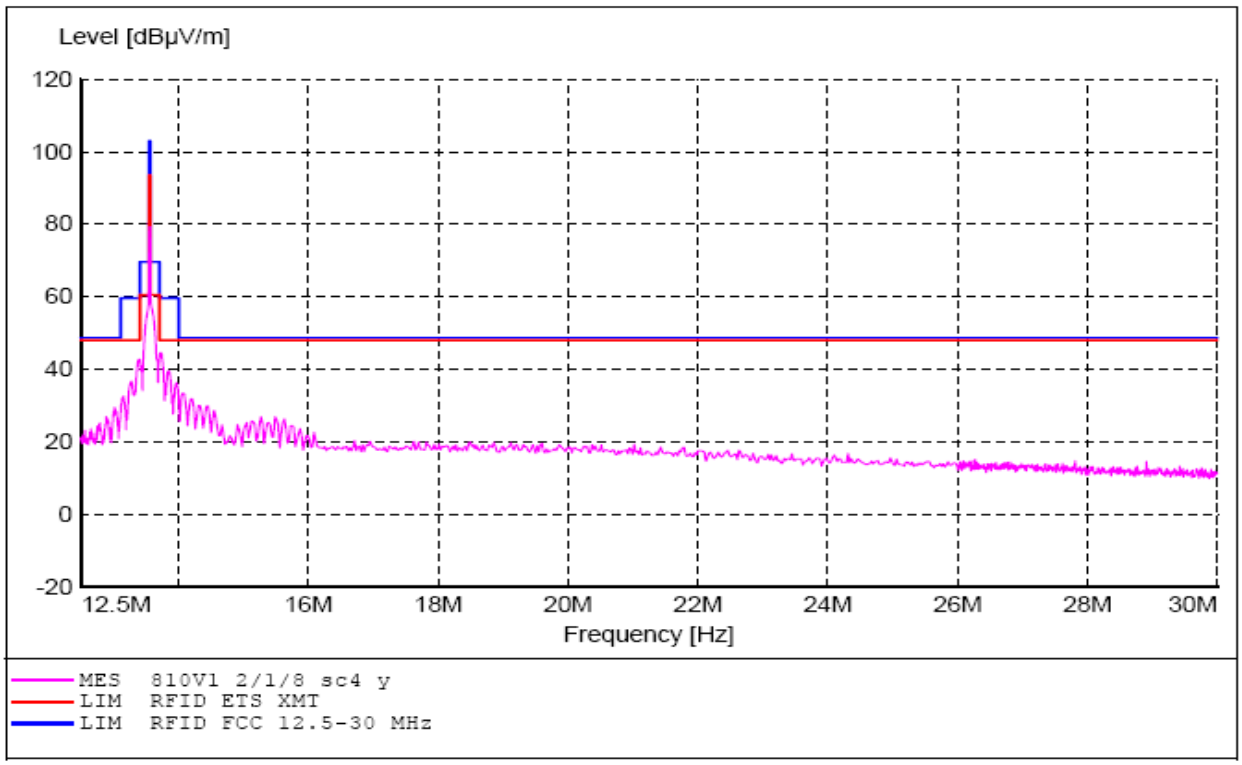
1. 2nd Harmonic of Intentional Radiator



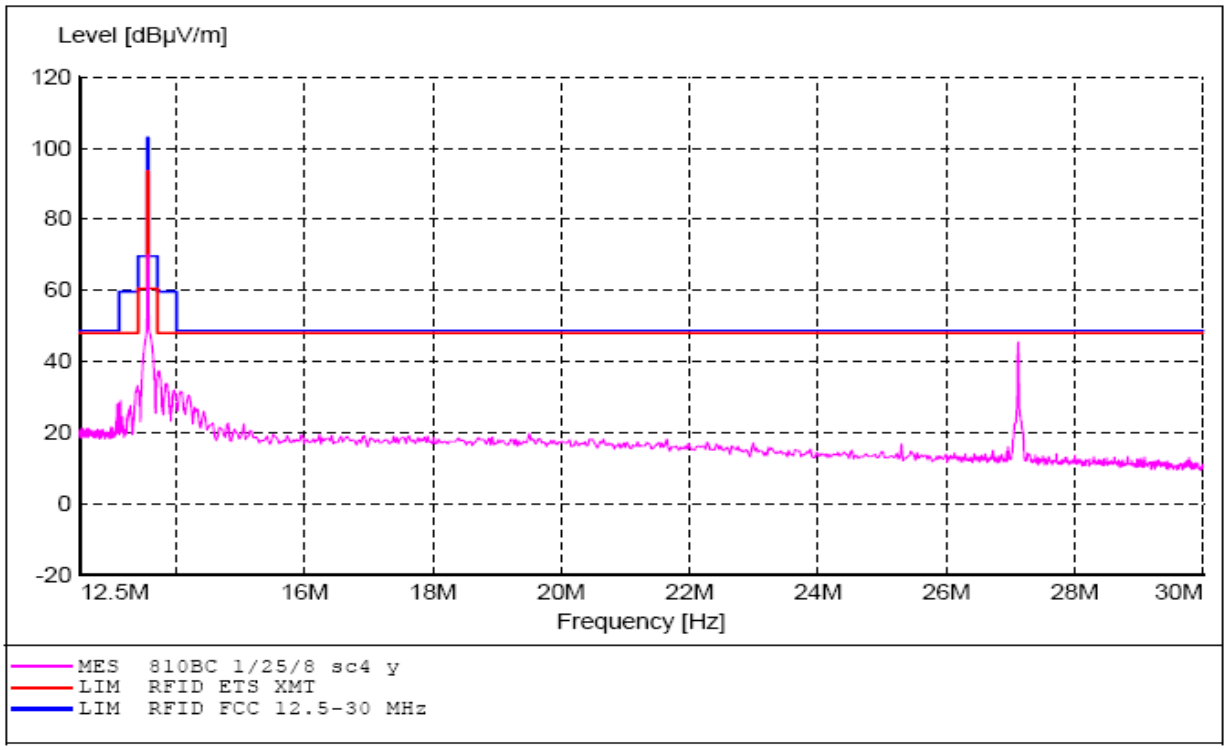
Spurious Emissions 12.5 to 30 MHz
810 P08 Antenna



Spurious Emissions 12.5 to 30 MHz
810 P12 Antenna



Spurious Emissions 12.5 to 30 MHz
810 V Antenna



Spurious Emissions 12.5 to 30 MHz
810 L Antenna

5.3.4 Test Setup Photo

See Section 5.2.4

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, FCC Part 15, Subpart C and 3M Test Procedures: 13.56 MHz RFID Emissions Test, PBLI-6WHLEM and Radiated Emissions Test (30 MHz – 1 GHz), PBLI-6SHLK2. The Spurious Emission measurements were made to determine the level of spurious electromagnetic energy radiated from the EUT while in the transmit mode.

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)	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.

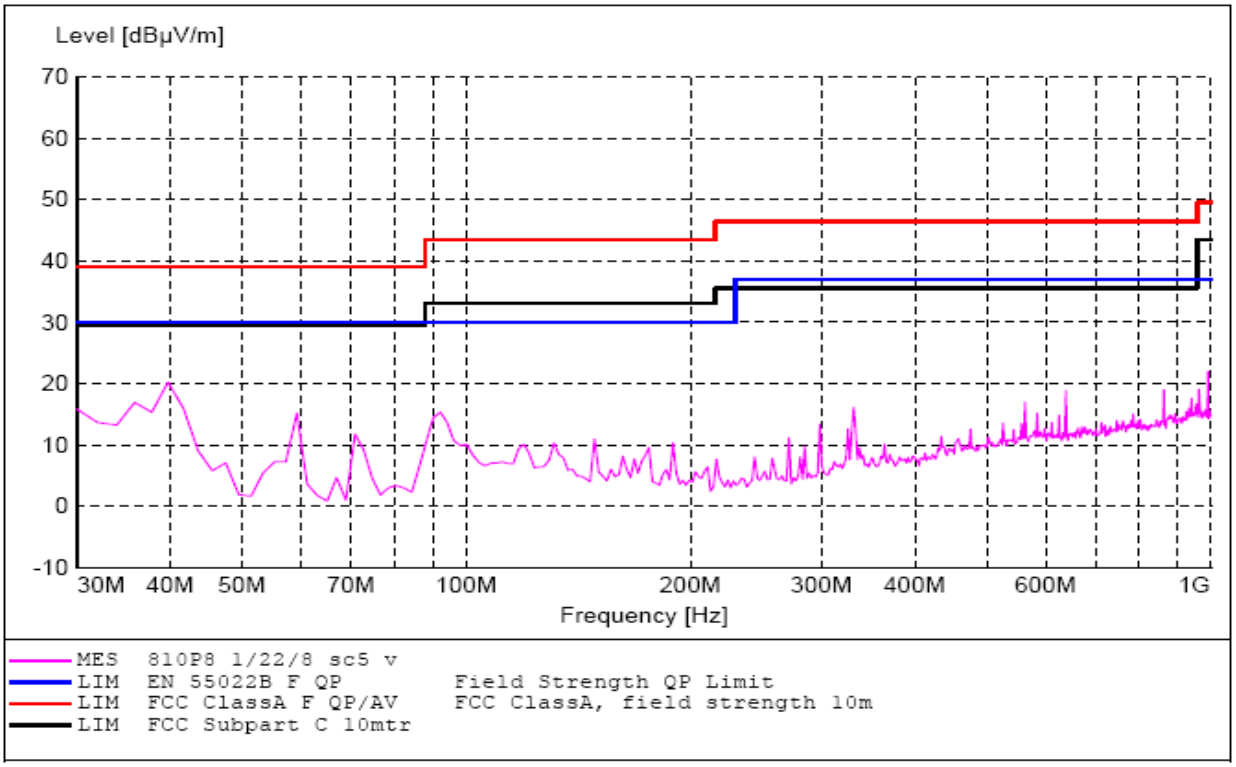
Report Number	1007004	**Date**	22 Jan 2008
EUT Name	RFID Reader	**EUT Power**	120 / 60
EUT Model	810	**Test Std**	FCC Part 15 Sub C
EUT Serial #	EMC #1	Temperature (°C)	21
EUT Description	13.56 MHz RFID Reader System / P08 Antenna	Humidity (%)	24
		Air Pressure (kPa)	

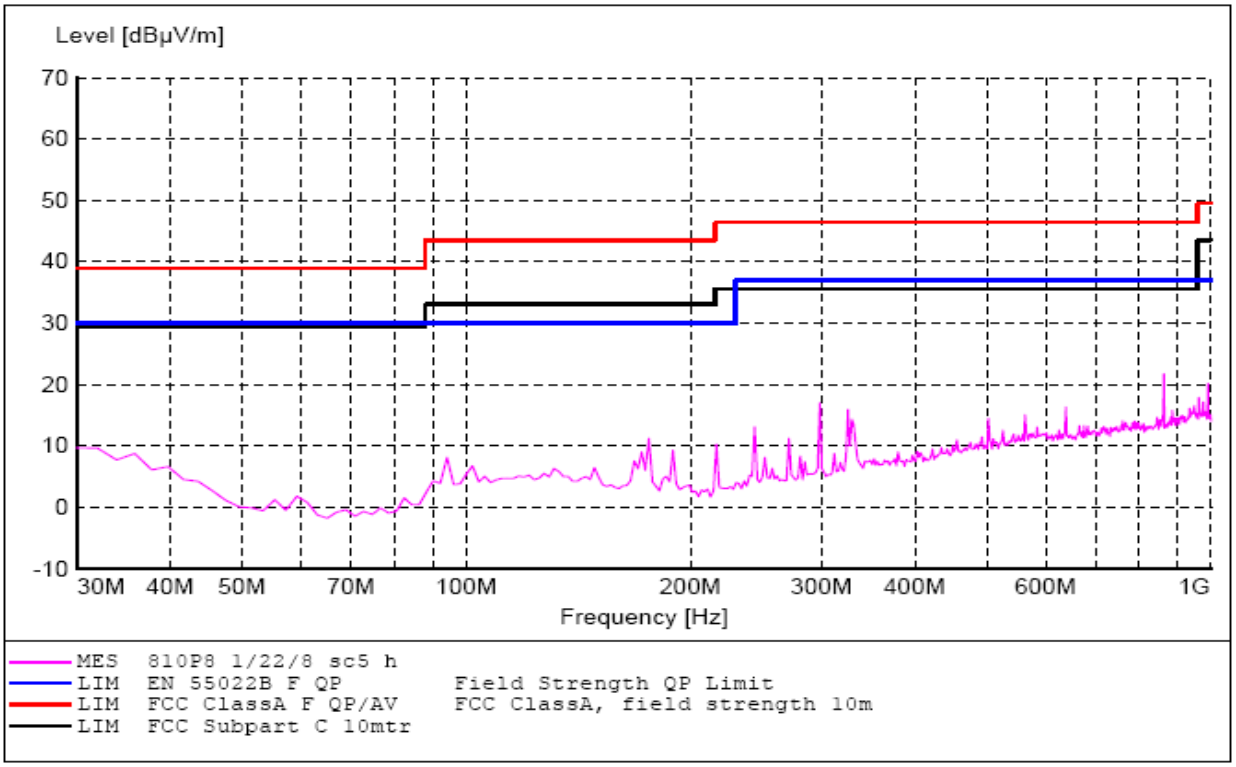
MAXIMIZED FILES: 810P8 1/22/8 sc5

	MAXIMIZED QP SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED POSITION		
FREQ. (MHz)	H/V	dBµV	dBµV	dBµV	TURNTABLE (°)	ANTENNA (M)	REMARKS
40.67	V	22.0	29.54	7.54	46	1.0	Harmonic
244.0	H	15.5	35.56	20.06	258	1.0	Harmonic
298.3	H	22.2	35.56	13.36	111	1.0	Harmonic

* - All readings have the correction factors applied.

Test Engineer: Bruce Jungwirth	Date: 22 Jan 2008





810 P08 Antenna

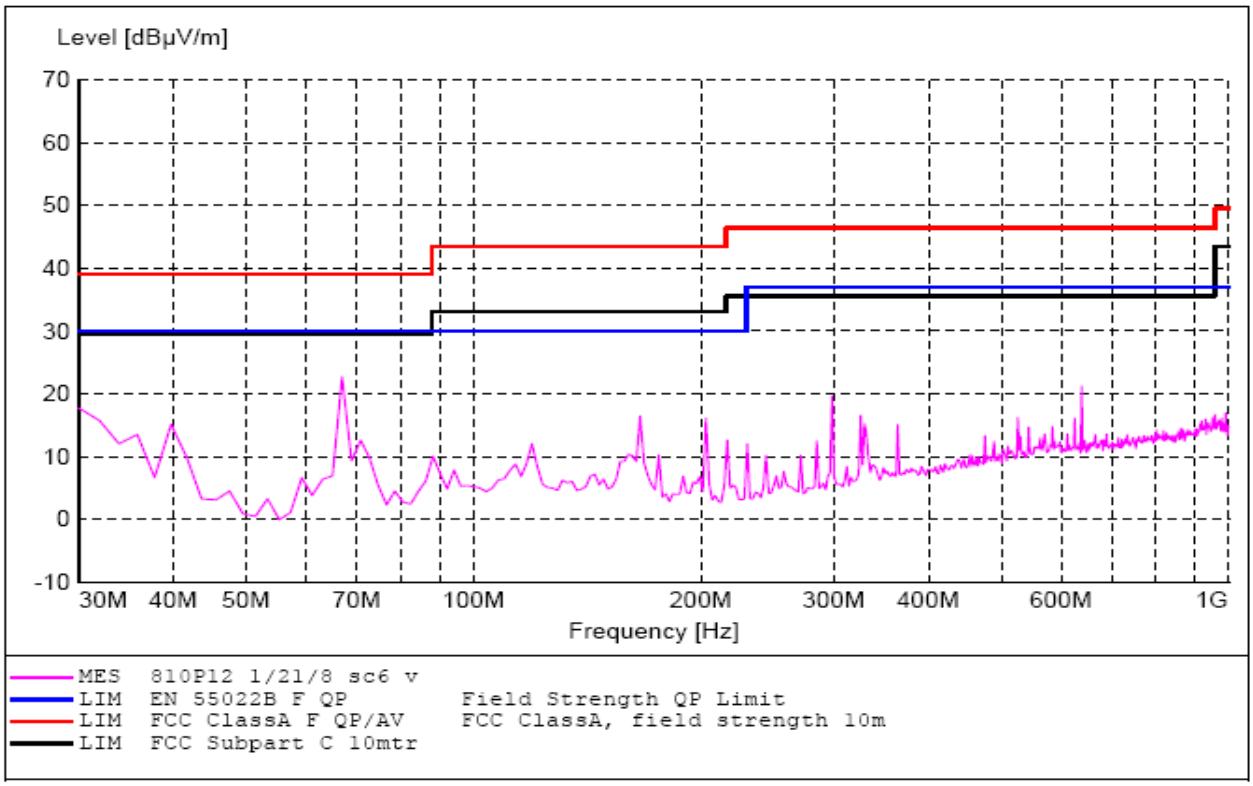
Report Number	1007004	**Date**	23 Jan 2008
EUT Name	RFID Reader	**EUT Power**	120 / 60
EUT Model	810	**Test Std**	FCC Part 15 Sub C
EUT Serial #	EMC #1	Temperature (°C)	21
EUT Description	13.56 MHz RFID Reader System / P12 Antenna	Humidity (%)	24
		Air Pressure (kPa)	

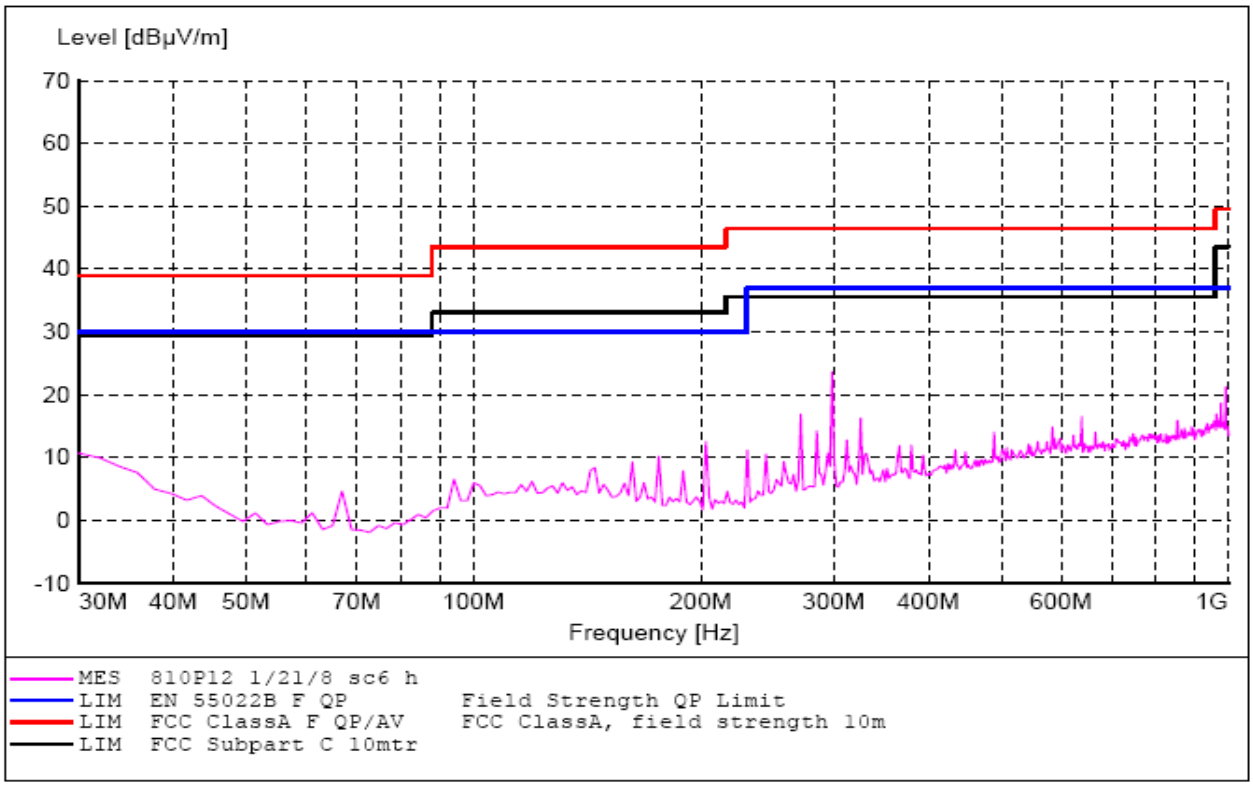
MAXIMIZED FILES: 810P12 1/21/8 sc6

	MAXIMIZED QP SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED POSITION		
FREQ. (MHz)	H/V	dBµV	dBµV	dBµV	TURNTABLE (°)	ANTENNA (M)	REMARKS
40.689	V	18.05	29.54	11.49	0	1.0	Harmonic
67.815	V	24.28	29.54	5.26	177	1.0	Harmonic
203.406	V	14.42	33.06	18.64	65	1.0	Harmonic
298.322	H	16.42	35.56	19.14	187	1.2	Harmonic
637.318	V	21.12	35.56	14.44	198	1.0	Harmonic

* - All readings have the correction factors applied.

Test Engineer: Bruce Jungwirth	Date: 23 Jan 2008





810 P12 Antenna

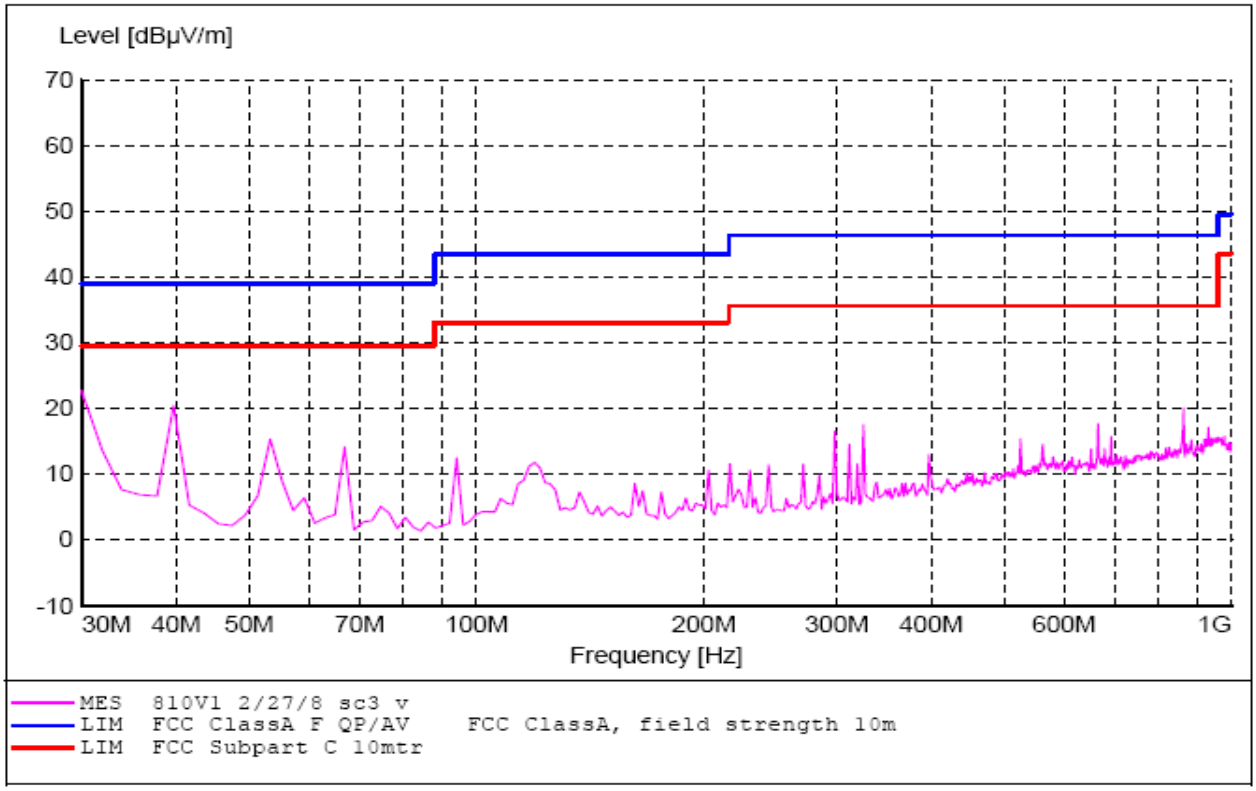
Report Number	1007004	**Date**	27 Feb 2008
EUT Name	RFID Reader	**EUT Power**	120 / 60
EUT Model	810	**Test Std**	FCC Part 15 Sub C
EUT Serial #	EMC #1	Temperature (°C)	22
EUT Description	13.56 MHz RFID Reader System With Kiosk V Ant	Humidity (%)	23
		Air Pressure (kPa)	

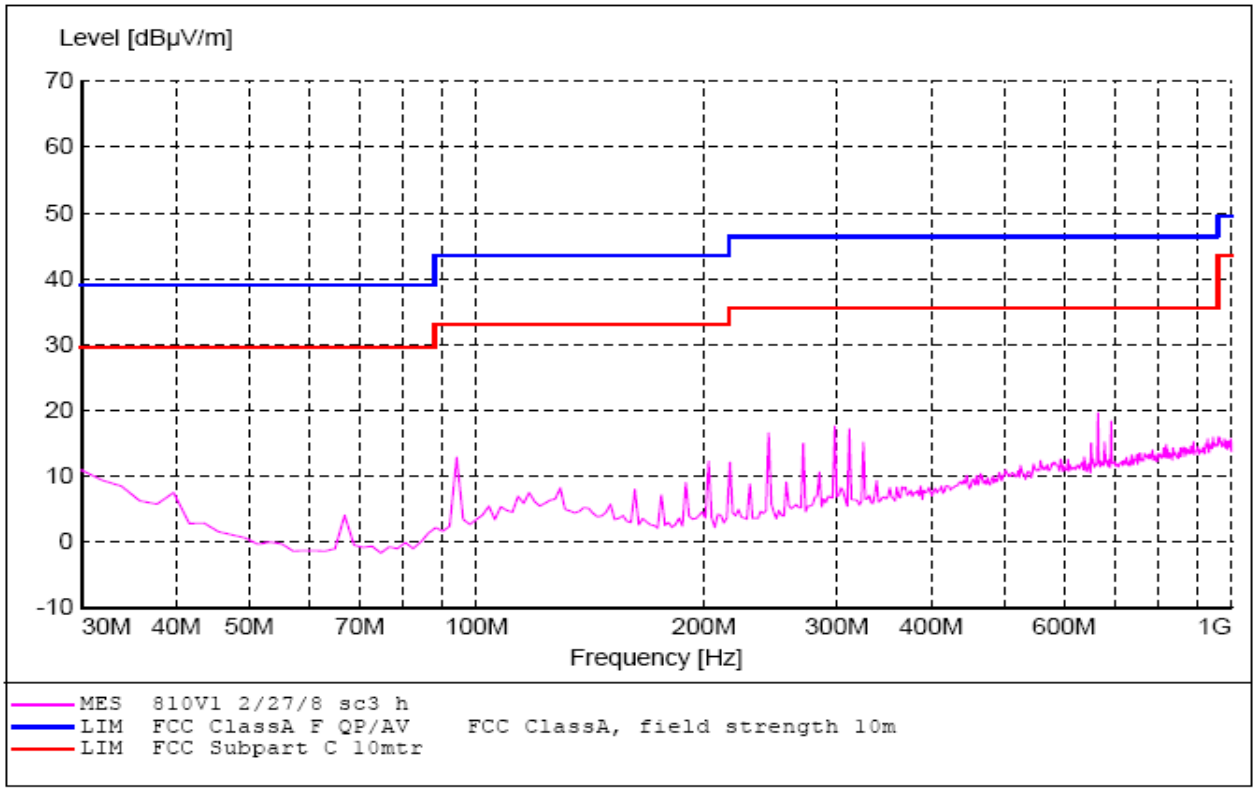
MAXIMIZED FILES: 810V1 2/27/8 sc3 V&H

	MAXIMIZED QP SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED POSITION		
FREQ. (MHz)	H/V	dBµV	dBµV	dBµV	TURNTABLE (°)	ANTENNA (M)	REMARKS
40.678	V	18.78	29.54	10.76	0	1.0	Harmonic
67.801	V	12.83	29.54	16.71	213	1.05	Harmonic
94.917	V	14.85	33.06	18.21	0	4.0	Harmonic
94.917	H	16.85	33.06	16.21	307	2.11	Harmonic
244.070	V	12.26	35.56	23.30	320	1.04	Harmonic

* - All readings have the correction factors applied.

Test Engineer: Bruce Jungwirth	Date: 27 Feb 2008





810 V Antenna

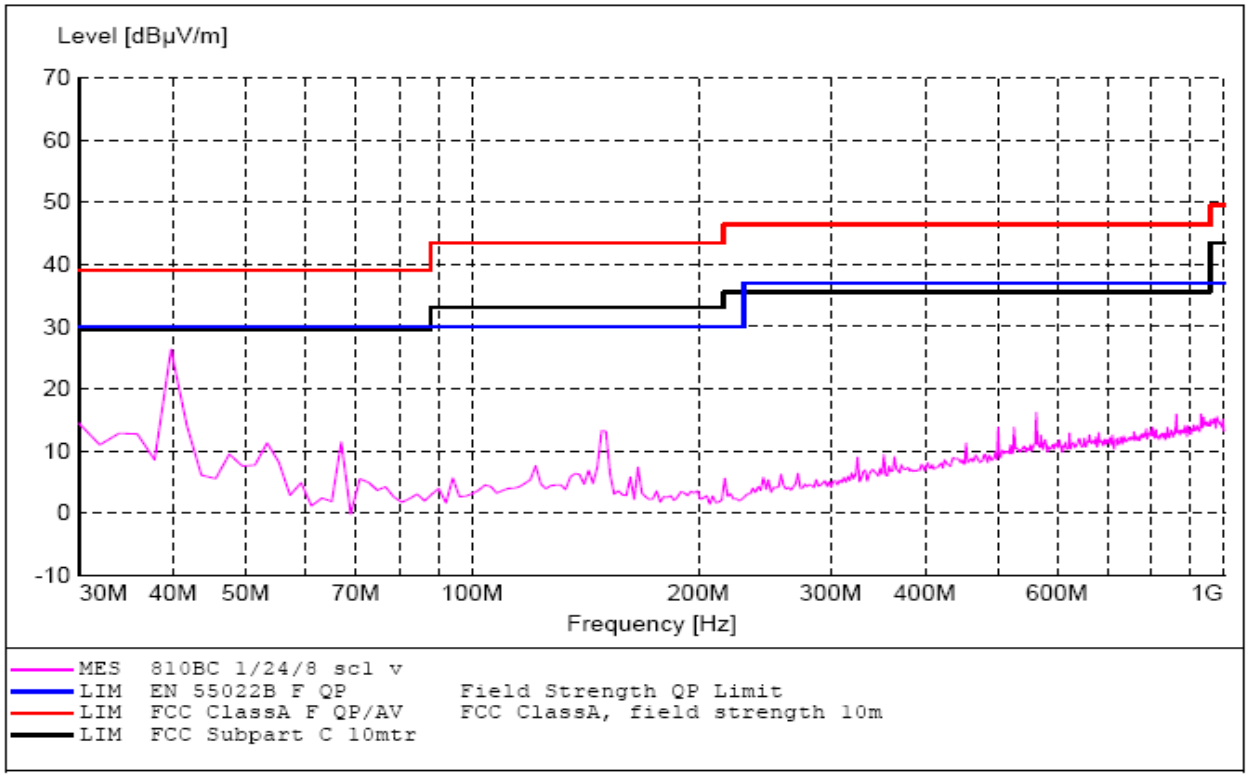
Report Number	1007004	**Date**	24 Jan 2008
EUT Name	RFID Reader	**EUT Power**	120 / 60
EUT Model	810	**Test Std**	FCC Part 15 Sub C
EUT Serial #	EMC #1	Temperature (°C)	22
EUT Description	13.56 MHz RFID Reader System. L Antenna	Humidity (%)	24
		Air Pressure (kPa)	

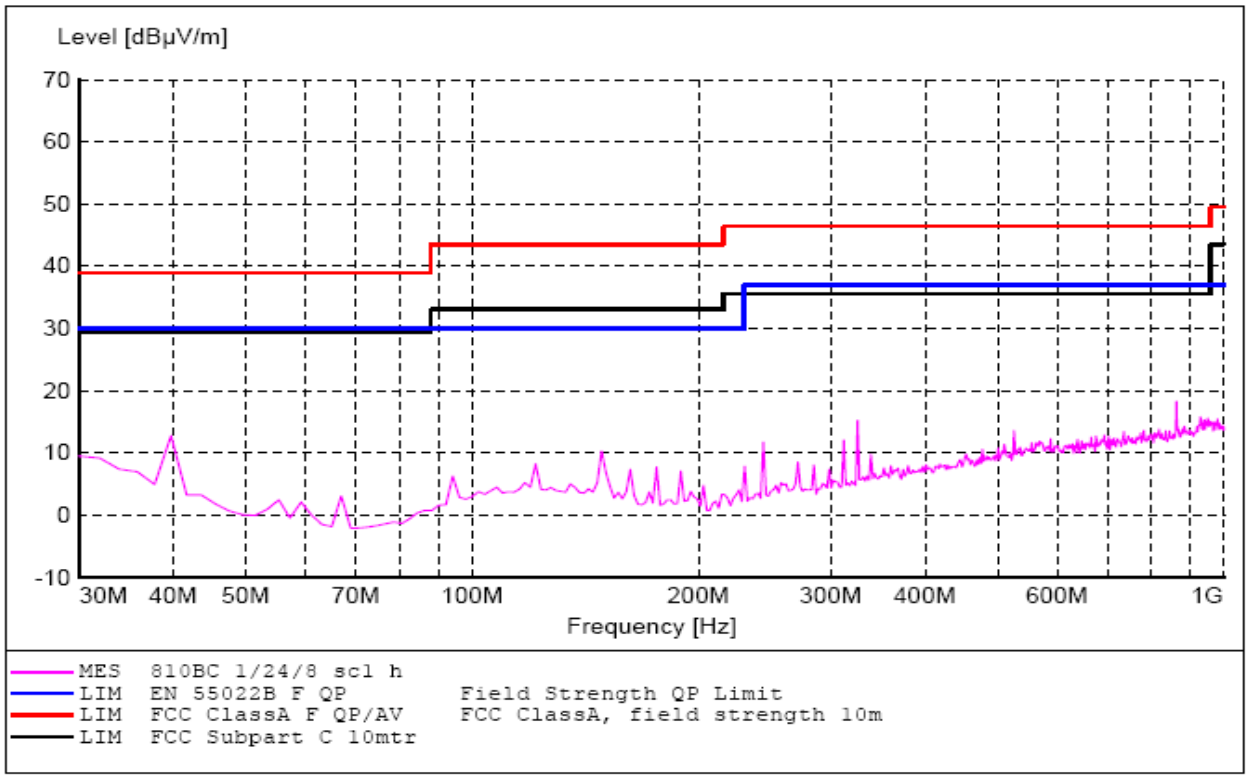
MAXIMIZED FILES: 810BC 1/24/8 sc1

FREQ. (MHz)	MAXIMIZED QP SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED POSITION		REMARKS
	H/V	dBµV	dBµV	dBµV	TURNTABLE (˚)	ANTENNA (M)	
40.66	V	24.4	29.54	5.14	272	1.0	Harmonic
67.79	V	9.3	29.54	44.70	186	1.0	Harmonic
149.14	V	12.8	33.06	20.26	0	1.0	Harmonic
122.0	V	4.47	33.06	28.59	274	1.0	Harmonic
561.24	V	15.1	35.56	20.46	172	1.0	Harmonic

* - All readings have the correction factors applied.

Test Engineer: Bruce Jungwirth	Date: 24 Jan 2008





810 L Antenna

5.5 Digital Radiated Emissions (30 MHz - 40 GHz)

The EUT was placed in an anechoic chamber and radiated emissions testing was performed in accordance with ANSI C63.4, FCC Part 15 and 3M Test Procedures: Radiated Emissions Test (30 MHz – 1 GHz), PBLI-6SHLK2, and Radiated Emissions Test (1 GHz – 5 GHz), PBLI-6SNHFY. 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 40GHz (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)	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. The highest operating frequency in the EUT is 27.12 MHz. The upper Limit of testing was 1000 MHz. All maximized quasi-peak measurements for the EUT were below the quasi-peak limit. The worst-case quasi-peak emissions were as follows:

3M™ RFID Reader Model 810 P08 Antenna					
Frequency (MHz)	Level (dBμV /m)	Limit (dBμV /m)	Passing Margin (dB)	Turntable (degrees)	Antenna (m/polarity)
36.0	12.28	39.08	26.80	180	1.0

3M™ RFID Reader Model 810 P12 Antenna					
Frequency (MHz)	Level (dBμV /m)	Limit (dBμV /m)	Passing Margin (dB)	Turntable (degrees)	Antenna (m/polarity)
30.01	13.97	.9.08	25.11	36	1.0

3M™ RFID Reader Model 810 V Antenna					
Frequency (MHz)	Level (dBμV /m)	Limit (dBμV /m)	Passing Margin (dB)	Turntable (degrees)	Antenna (m/polarity)
30.7	15.28	39.08	23.80	355	1.0

3M™ RFID Reader Model 810 L Antenna					
Frequency (MHz)	Level (dBμV /m)	Limit (dBμV /m)	Passing Margin (dB)	Turntable (degrees)	Antenna (m/polarity)
36.0	7.33	39.08	31.75	0	1.0

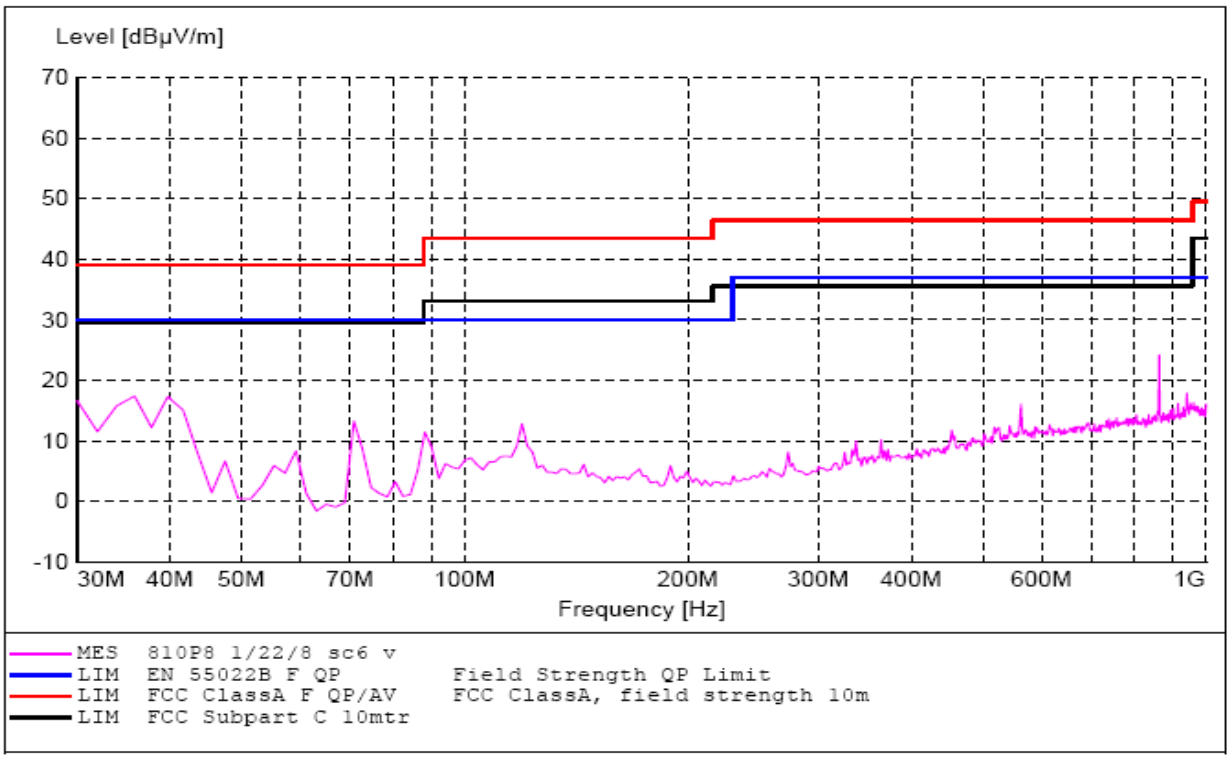
Report Number	1007004	**Date**	22 Jan 2008
EUT Name	RFID Reader	**EUT Power**	120 / 60
EUT Model	810	**Test Std**	FCC Part 15 Sub B
EUT Serial #	EMC #1	Temperature (°C)	21
EUT Description	13.56 MHz RFID Reader System / P08 Antenna	Humidity (%)	24
		Air Pressure (kPa)	

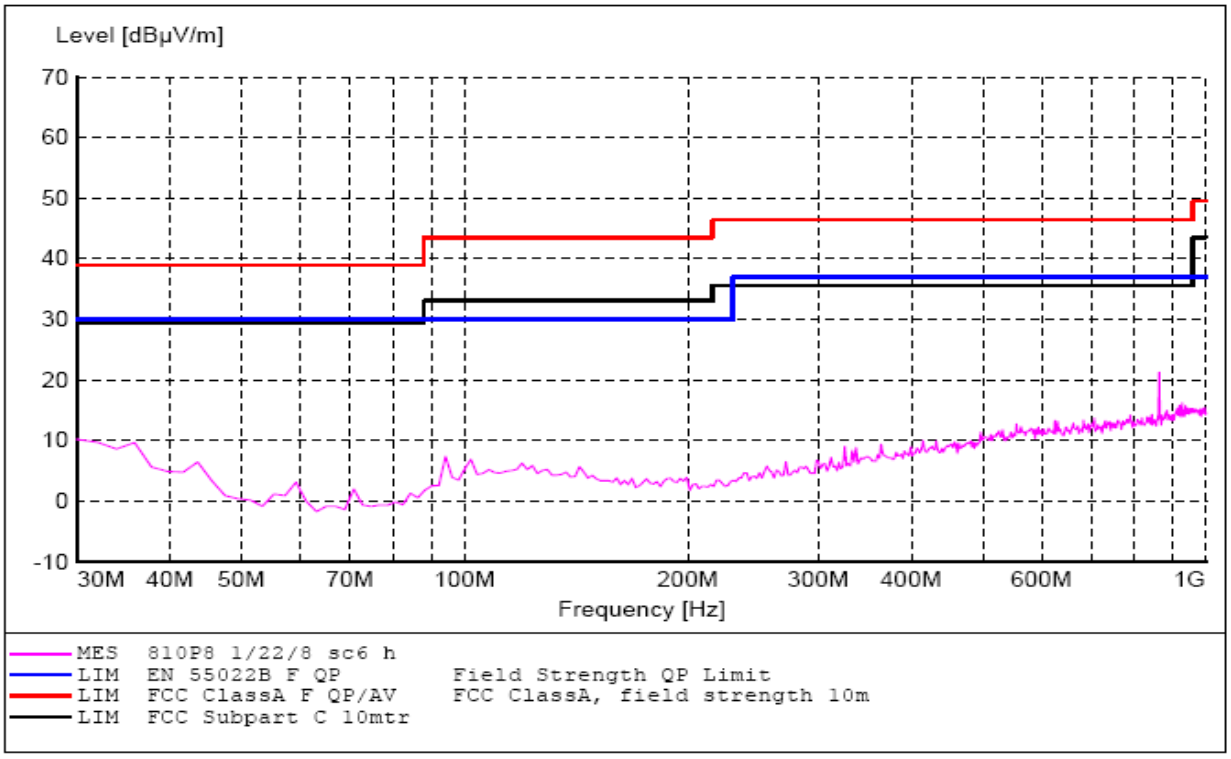
MAXIMIZED FILES: 810P8 1/22/8 sc 6

	MAXIMIZED QP SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED POSITION		
FREQ. (MHz)	H/V	dBµV	dBµV	dBµV	TURNTABLE (°)	ANTENNA (M)	REMARKS
30.0	V	8.50	39.08	30.58	157	1.0	
36.0	V	12.28	39.08	26.80	180	1.0	
59.96	V	9.52	39.08	29.56	183	1.0	
72.11	V	6.48	39.08	32.60	276	1.0	
92.27	V	4.60	43.52	38.92	0	1.0	

* - All readings have the correction factors applied.

Test Engineer: Bruce Jungwirth	Date: 22 Jan 2008





810 P08 Antenna

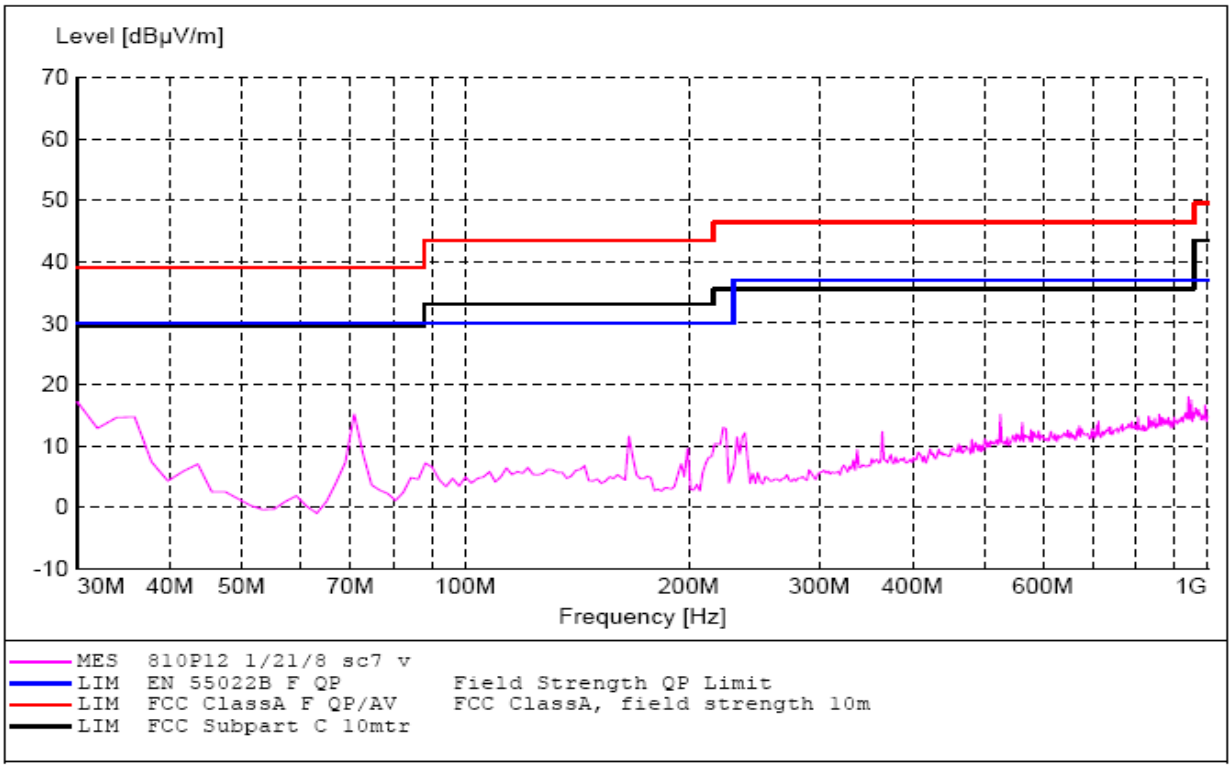
Report Number	1007004	**Date**	23 Jan 2008
EUT Name	RFID Reader	**EUT Power**	115 / 60
EUT Model	810	**Test Std**	FCC Part 15 Sub B
EUT Serial #	EMC #1	Temperature (°C)	21
EUT Description	13.56 MHz RFID Reader System / P12 Antenna	Humidity (%)	24
		Air Pressure (kPa)	

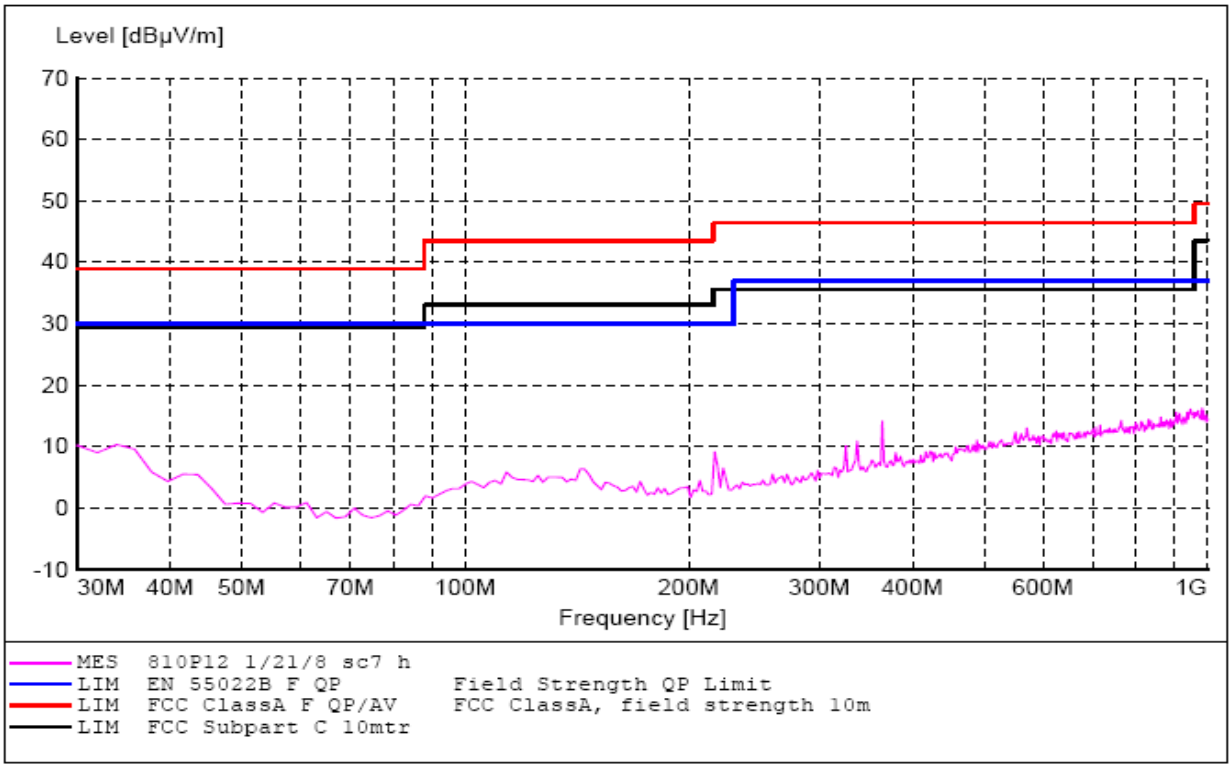
MAXIMIZED FILES: 810P12 1/21/8 sc7

	MAXIMIZED QP SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED POSITION		
FREQ. (MHz)	H/V	dBµV	dBµV	dBµV	TURNTABLE (°)	ANTENNA (M)	REMARKS
30.1	V	13.97	39.08	25.11	36	1.0	
35.991	V	12.45	39.08	26.63	0	1.0	
72.126	V	9.58	39.08	29.50	154	1.0	
163.19	V	12.85	43.52	30.67	0	1.0	
222.04	V	4.6	46.44	41.84	0	1.0	

- - All readings have the correction factors applied.

Test Engineer: Bruce Jungwirth	Date: 23 Jan 2008





810 P12 Antenna

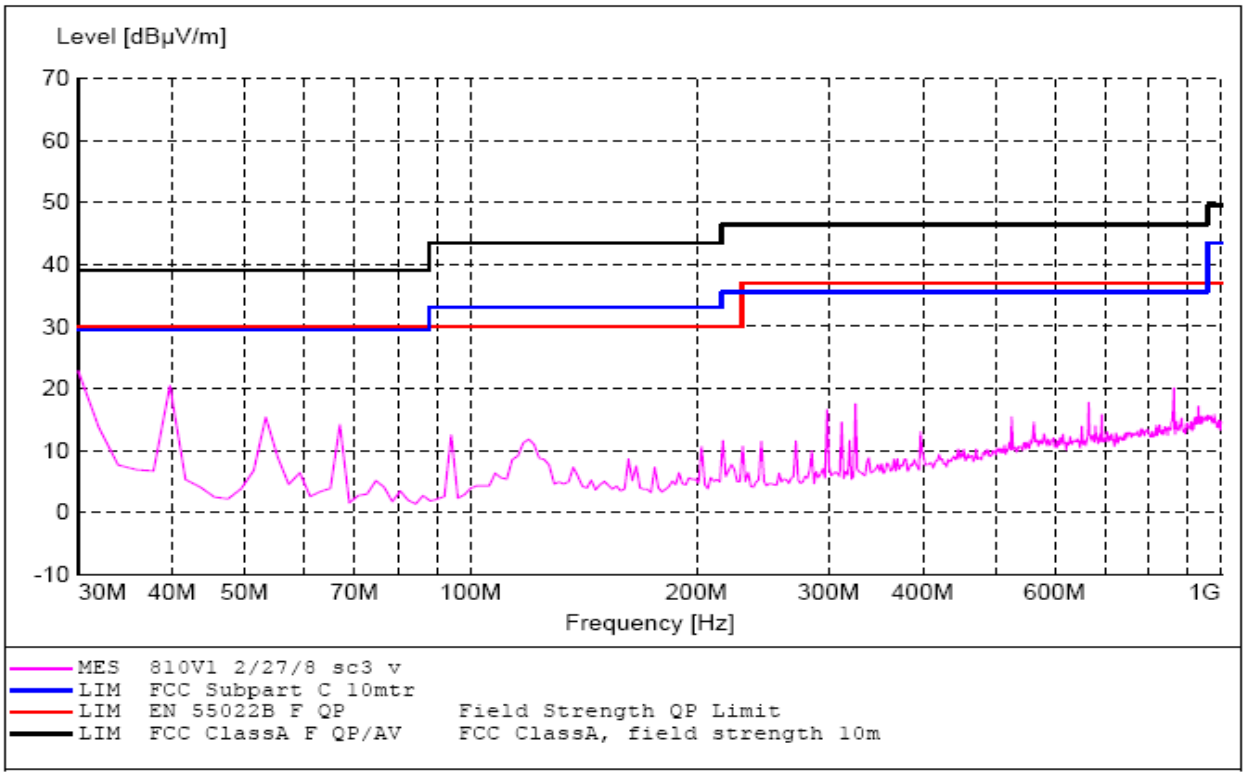
Report Number	1007004	**Date**	27 Feb 2008
EUT Name	RFID Reader	**EUT Power**	120 / 60
EUT Model	810	**Test Std**	FCC Part 15 Sub B
EUT Serial #	EMC #1	Temperature (°C)	22
EUT Description	13.56 MHz RFID Reader System With Kiosk V Ant	Humidity (%)	23
		Air Pressure (kPa)	

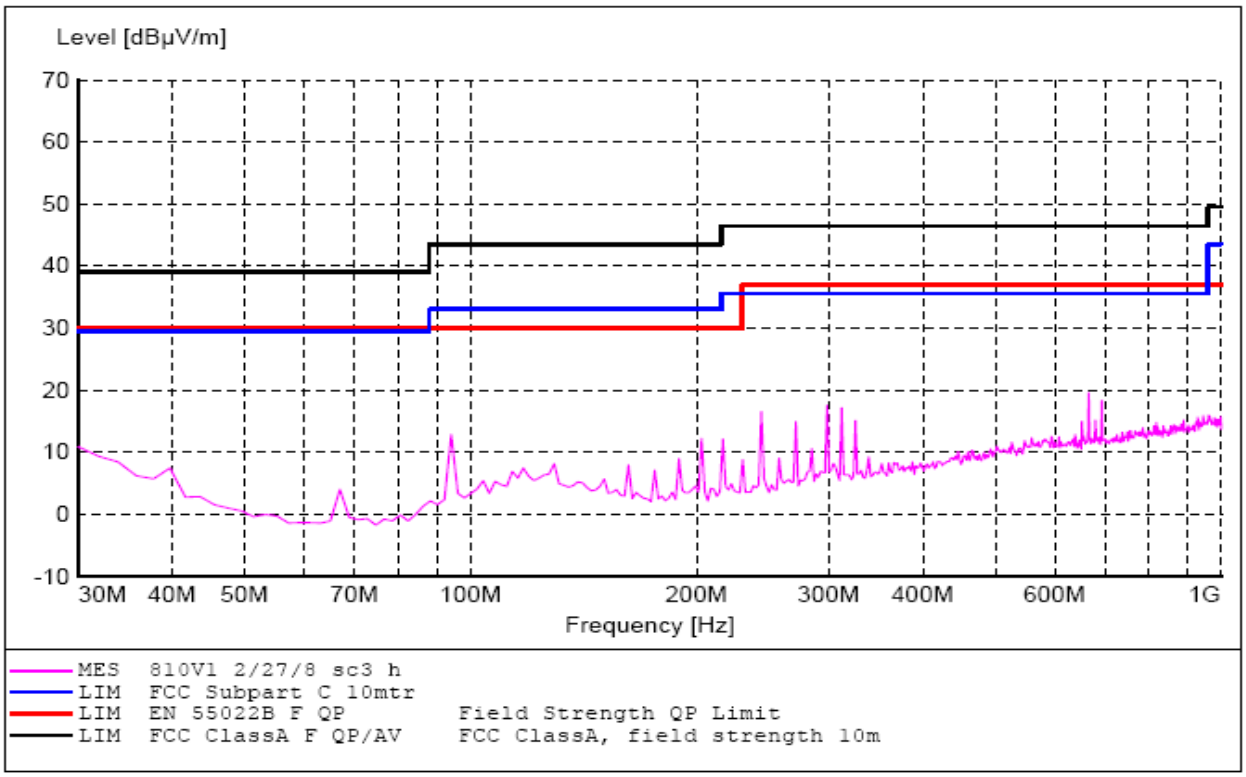
MAXIMIZED FILES 810V1 2/27/8 sc3 V&H

	MAXIMIZED QP SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED POSITION		
FREQ. (MHz)	H/V	dBµV	dBµV	dBµV	TURNTABLE (˚)	ANTENNA (M)	REMARKS
30.70	V	15.28	39.08	23.80	355	1.0	
53.857	V	4.29	39.08	34.79	0	1.0	
120.008	V	9.13	43.52	52.65	256	1.0	

* - All readings have the correction factors applied.

Test Engineer: Bruce Jungwirth	Date: 27 Feb 2008





810 V Antenna

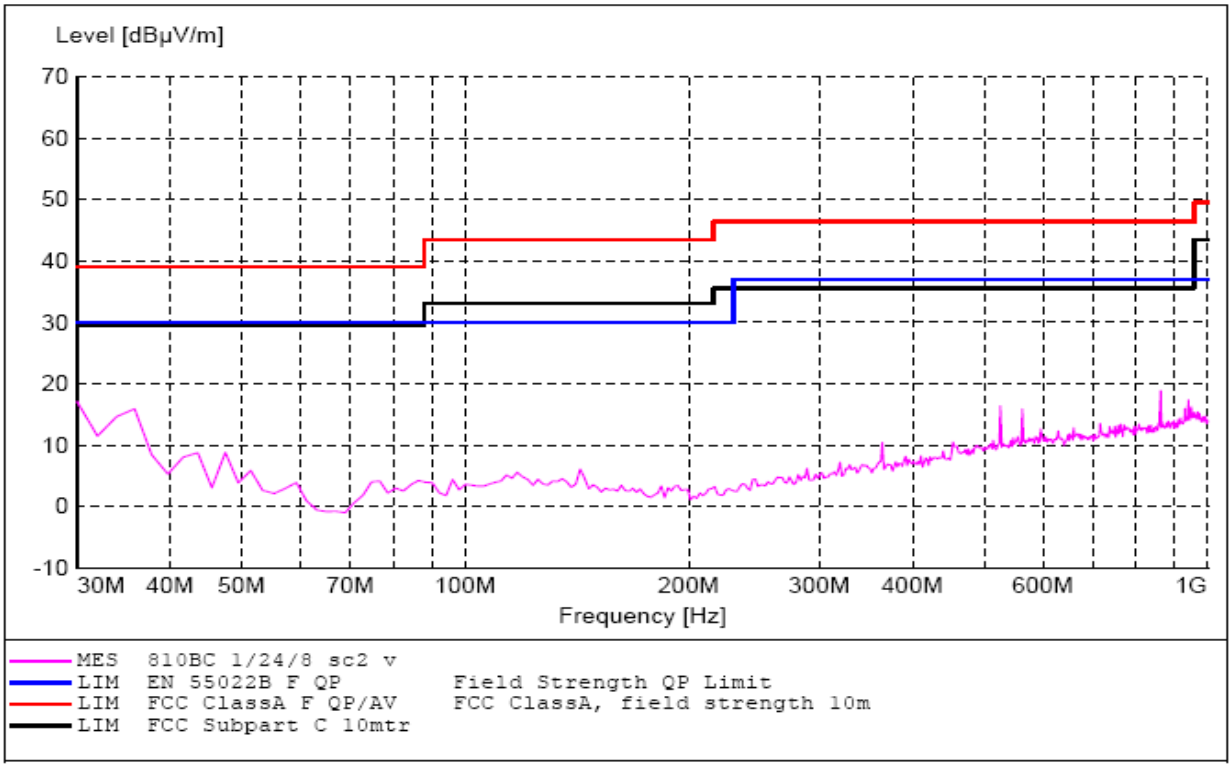
Report Number	1007004	**Date**	24 Jan 2008
EUT Name	RFID Reader	**EUT Power**	120 / 60
EUT Model	810	**Test Std**	FCC Part 15 Sub B
EUT Serial #	EMC #1	Temperature (°C)	22
EUT Description	13.56 MHz RFID Reader System. L Antenna	Humidity (%)	24
		Air Pressure (kPa)	

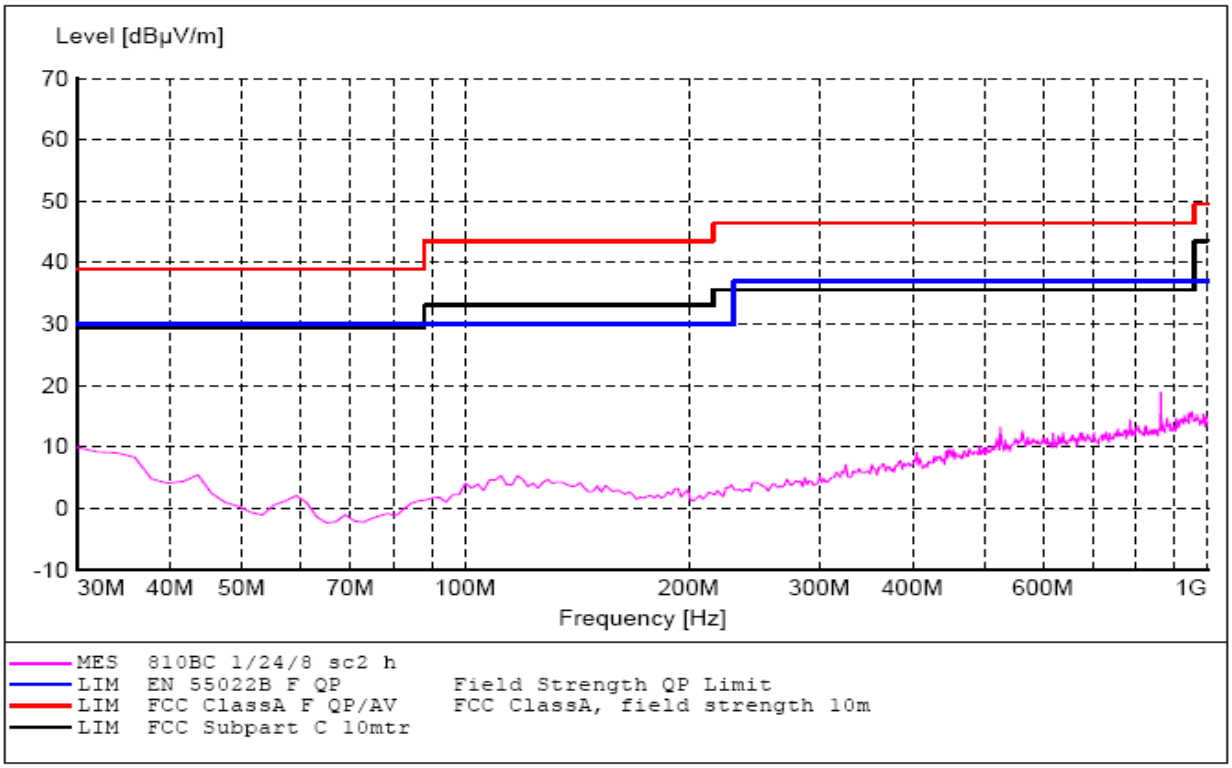
MAXIMIZED FILES: 810BC 1/24/8 sc2

	MAXIMIZED QP SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED POSITION		
FREQ. (MHz)	H/V	dBµV	dBµV	dBµV	TURNTABLE (°)	ANTENNA (M)	REMARKS
36.0	V	7.33	39.08	31.75	0	1.0	
							All Other Digital Signals
							Are more than 20 dB
							Under the Limit

* - All readings have the correction factors applied.

Test Engineer: Bruce Jungwirth	Date: 24 Jan 2008

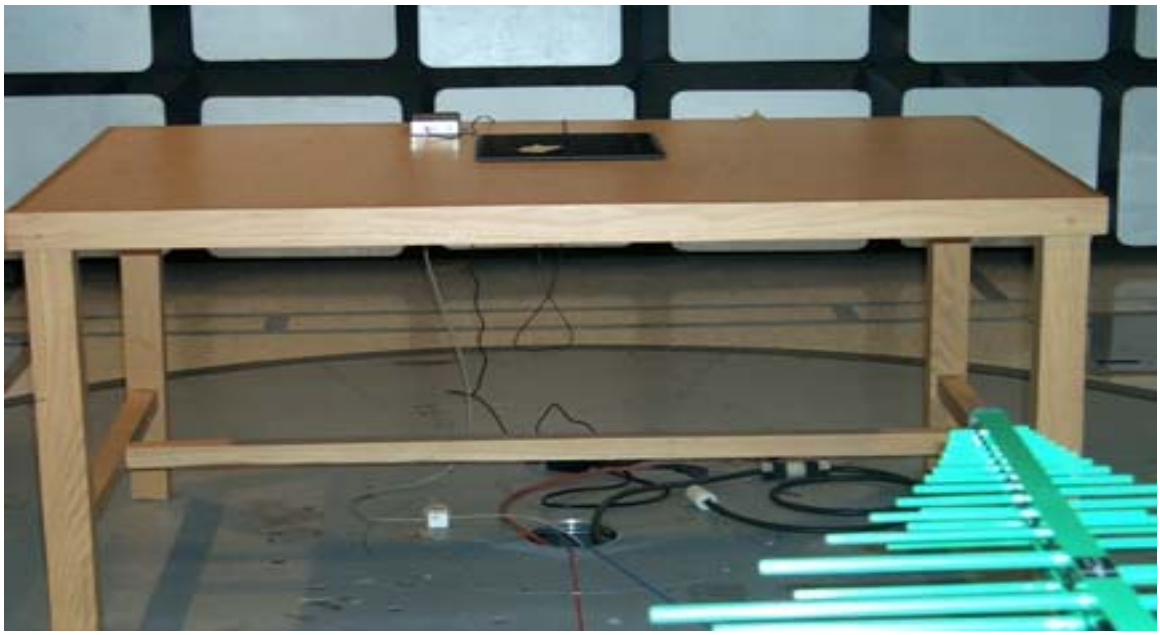




810 L Antenna

5.5.4 Test Setup Photo: 30-1000 MHz

810 (P08 Antenna)



810 (P12 Antenna)

810 (V Antenna)

810 (L Antenna)

Radiated Emissions (30 MHz to 1000 MHz)

6.0 LIST OF TEST EQUIPMENT

The following test equipment was used to perform the indicated tests. All 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 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.

RADIATED EMISSIONS

ElectroMetrics Large Loop Antenna, Model ALR25M, Serial No. 603 (cal due date: 11 Oct 08)
Schaffner Biconilog Antenna, Model CBL6112B, Serial No. 27491 (cal due date: 10 Oct 08)
A. H Systems Horn Antenna, Model SAS_200/571 Serial No: 234 (cal due date: 9 Oct 08)
HP Pre-Amplifier, Model 8447D, Serial No. 1937A03090 (cal due date: 11Oct 08)
HP Pre-Amplifier, Model 83017A, Serial No. 3123A00259 (cal due date: 9 Oct 08)
Rohde & Schwarz EMI Receiver, Model ESIB 40, S/N 100235 (cal due date: 12 Oct 08)
Rohde & Schwarz ESIB 40 Firmware Version 4.34.3

CONDUCTED EMISSIONS

EMCO LISN, Model 3825-2, Serial No. 1039 (cal due date:11 Oct 08)
Solar High Pass Filter, Model 8131 - 5.0 (cal due date:23 May 08)
Rohde & Schwarz EMI Receiver, Model ESIB 40, S/N 100235 (cal due date:12 Oct 08)
Rohde & Schwarz ESIB 40 Firmware Version 4.34.3

FREQUENCY STABILITY / POWER OUTPUT

Agilent Frequency Counter Model 53131A, Serial No. MY40012264 (cal due date: 10 Oct 08)
HP Spectrum Analyzer Model 8591A, Serial No. 3108A02041 (cal due date: 9 Oct 08)
Envirotronics Environmental Chamber, Model EH16-1-1.5AC, SN:10066639 (cal due date: 1 Jan 09)

OCCUPIED BANDWIDTH

Rohde & Schwarz EMI Receiver, Model ESIB 40, S/N 100235 (cal due date: 12 Oct 08)
Rohde & Schwarz ESIB 40 Firmware Version 4.34.3

TEST FACILITY

Lindgren Semi-Anechoic Chamber, (verification due date: 14 Mar 09)
FCC Site Registration Number: 93334
Canadian Site Registration Number: 458A-1

7.0 LABELING INFORMATION

The following labeling information is required by the FCC (Federal Communications Commission) and IC (Industry Canada) for Class A digital devices. Since the equipment contains both intentional and unintentional radiators, it must be labeled as a digital device and as an intentional radiator.

Labels on the Product

The following statements 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: DGFTTS810**
> **IC: 458A-TTS810**
>
> **"This Class A digital apparatus complies with Canadian ICES-003."**
>
> **"Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada."**

Statements 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: DGFTTS810**

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 and Industry Canada Rules permitting the operation of this device.

"This Class A digital apparatus complies with Canadian ICES-003."

"Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada."

IC: 458A-TTS810

8.0 REPORT SIGNATURES

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

APPROVER: Robert E. Heller DATE: 21 April 2008

Robert E. Heller

TEST ENGINEER: DATE: 21 April 2008

Bruce R. Jungwirth

This is the last page of the Test Report