FCC
Electromagnetic Compatibility
Test Report

For

3M Disk Unlocker
Model 1230

3M Track and Trace Solutions
St. Paul, MN 55144-1000

FCC ID: DGFTSS1230
IC: 458A-TSS1230

April 1, 2013

Report Number: RE1211008

Prepared By:
3M Regulatory Engineering and Quality
EMC Laboratory
410 Fillmore Avenue, Building 76
St. Paul, Minnesota 55144-1000

CERTIFICATE OF COMPLIANCE

3M Reg. Eng. And Quality SEMS Technology Center Building 76-1-01 St. Paul, MN 55144-1000	Phone 651 778 6279 FAX 651 778 6252	3M EMC Laboratory

MANUFACTURER'S NAME:	3M Company
NAME OF EQUIPMENT:	3M™ Disk Unlocker
DESIGNATION:	RFID
MODEL NUMBER:	Model 1230
TEST REPORT NUMBER:	RE1211008
DATE:	April 1, 2013

FCC Part 15, Subpart B, Class A,
Industry Canada, ICES-003
FCC Part 15, Subpart C
Industry Canada RSS-210, RSS-GEN

Referring to the performance criteria and operating mode during the tests specified in this report the equipment complies with the essential requirements of the referenced standard(s) at the time the tests were carried out.

Yuriy Litvinov

Digitally signed by Yuriy Litvinov
DN: cn=Yuriy Litvinov, c=US, o=Regulatory Engineering, ou=3M Company
Date: 2013.04.01 14:55:34 -05'00'

Yuriy Litvinov
Lead EMC Engineer

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Certificate of Compliance
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1.0 TEST SUMMARY

Test Report Number:	RE 1211008
Requester:	Seth Lieffort
Company:	3M Company Track and Trace Solutions Building 209 St. Paul, MN 55144
Telephone Number:	(651) 736-6939
Test Dates:	12/21/2012-03/18/2013
Equipment Under Test:	3M™ Disk Unlocker, Model 1230
Date Of Receipt:	12/18/2012
Condition upon receipt	Device was in good working condition
Test Environment:	See individual test 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:	None were required.
Test Location:	3M Product Safety EMC Laboratory Building 76-1-01 410 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) is the 3M™ Model 1230, Media Disk Unlocker. The 3M™ Model: 1230 Disk Unlocker is intended for use by library staff and patrons in checking out optical media, CDs or DVDs that use radio frequency identification (RFID) tags to indicate a security status. It is placed on a desktop in an indoor library environment, and has not been evaluated for other uses or locations. The reader has a transmit frequency of 13.56MHz.

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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	- Uncertainties in Standardized EMC Tests	2005
ANSI C63.4:2009	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 Issue 5	
RSS-210	Industry Canada, Radio Standards Specification Issue 8, 2010	
RSS-GEN	Industry Canada, Radio Standards Specification Issue 3, 2010	

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

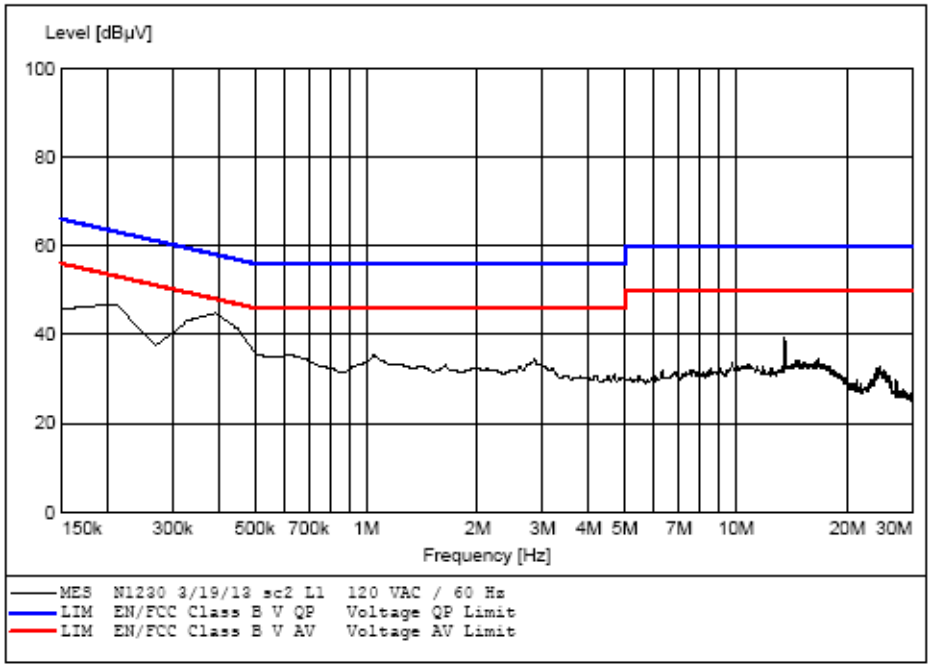
The EUT met the conducted emission and discontinuous requirements.

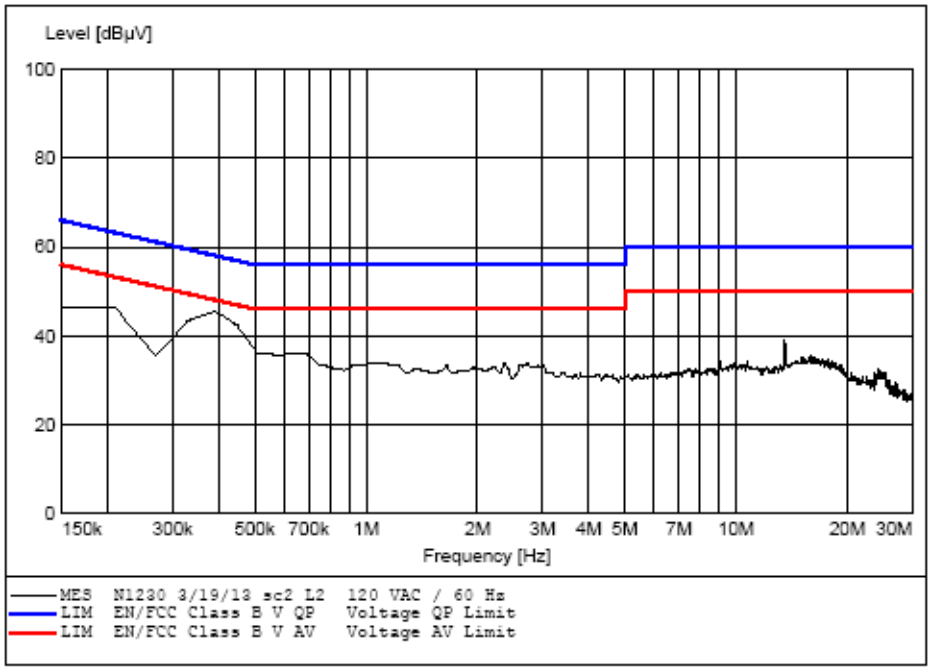
Report Number	RE1211008	**Date**	19 March 2013
EUT Name	3M Disc Media Locker	**EUT Power**	See data
EUT Model	1230	**Test Std**	EN55022B FCC B
EUT Serial #	12567004	Temperature (°C)	23°
EUT Description	Disc case unlocker	Humidity (%)	23 %
		Air Pressure (kPa)	1010

MAXIMIZED FILES_____

	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
N1230 3/19/13 sc1 L1 L2			**230 VAC / 50 Hz**							
.159	X	X	33.5	33.6	**65.5**		7.9	8.0	**55.5**	
.195	X	X	42.2	42.1	**63.8**		30.6	30.0	**53.8**	
.270	X	X	39.2	39.2	**61.1**		28.9	28.8	**51.1**	
.444	X	X	49.0	48.9	**56.9**		30.8	30.7	**46.9**	
.595	X	X	37.9	38.1	**56.0**		24.8	24.7	**46.0**	
.680	X	X	37.0	37.4	**56.0**		20.9	21.3	**46.0**	
N1230 3/19/13 sc2 L1 L2			**120 VAC / 60 Hz**							
.159	X	X	35.0	32.9	**65.5**		10.5	9.2	**55.5**	
.195	X	X	44.9	44.9	**63.8**		31.5	31.0	**53.8**	
.270	X	X	35.6	35.0	**61.1**		23.1	22.8	**51.1**	
.424	X	X	43.3	43.5	**56.9**		27.4	26.6	**46.9**	
.595	X	X	32.2	32.8	**56.0**		22.9	22.3	**46.0**	
.680	X	X	31.9	33.0	**56.0**		17.1	16.6	**46.0**	

Test Engineer: Mike Schultz	Date: 19 March 2013





Max Peak Plots

4.4 Test Setup Photo

Conducted Emissions

5.0 Radiated Emissions Testing

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.

Report Number	RE1211008	**Date**	20 March 2013
EUT Name	3M Disc Media Locker	**EUT Power**	230 VAC / 50 Hz
EUT Model	1230	**Test Std**	EN 301 489
EUT Serial #	12567004	Temperature (°C)	23° C
EUT Description	Disc case unlocker	Humidity (%)	23 %
		Air Pressure (kPa)	101.5 kPA

Measurement	Startup	2 Minutes	5 Minutes	10 Minutes
120 V (+20°C)	13.56017	13.56017	13.56017	13.56017
102 V (+20°C)	13.56017	13.56017	13.56017	13.56017
138 V (+20°C)	13.56017	13.56017	13.56017	13.56017
+50°C (120 V)	13.56017	13.56017	13.56017	13.56017
-20°C (120 V)	13.56017	13.56017	13.56017	13.56017

Note: For 13.56 MHz RFID transmitters, the carrier signal shall be maintained within ±0.01% of the operating frequency (±135.6 kHz).

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

5.2.3 Test Results

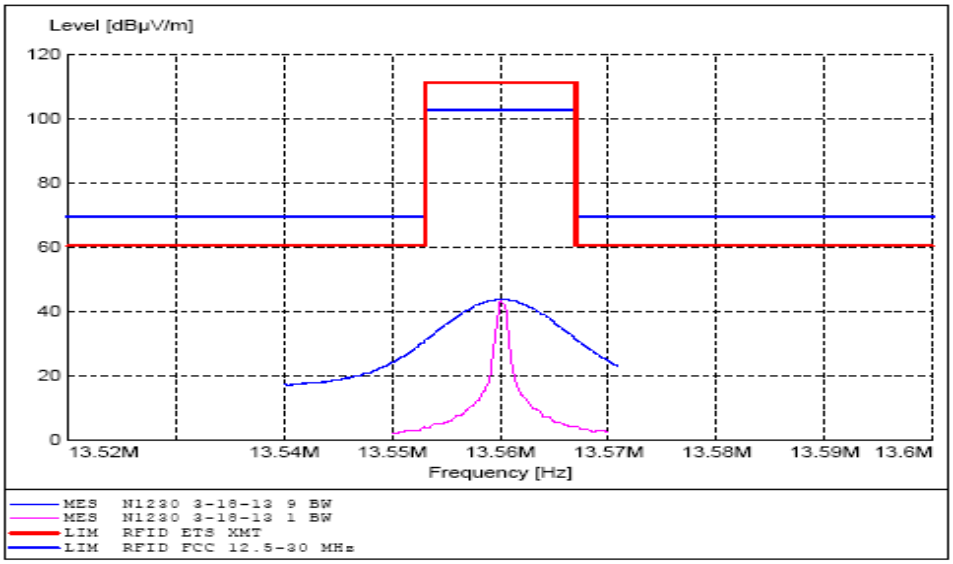
The EUT met the FCC Part 15, Subpart C Emission Bandwidth requirements. The intentional radiator frequency was within the allowed band and all maximized quasi-peak measurements for the EUT were below the quasi-peak limits.

Report Number	RE1211008	**Date**	18 March 2013
EUT Name	3M Disc Media Locker	**EUT Power**	230 VAC / 50 Hz
EUT Model	1230	**Test Std**	
EUT Serial #	12567004	Temperature (°C)	23
EUT Description	Disc case unlocker	Humidity (%)	23
		Air Pressure (kPa)	1010

Frequency	**B/W**	**QP H-Field FCC and EU Limits @ 10 m**		**QP Level**
13.5602 MHz	9 kHz	FCC 103 dBµV/m	EU 60 dBµA/m or111.5 dBµV/m	46.32
13.553 MHz	1 kHz	FCC 69.6 dBµV/m	EU 9 dBµA/m or 60.5 dBµV/m	3.29
13.567 MHz	1 kHz	FCC 69.6 dBµV/m	EU 9 dBµA/m or 60.5 dBµV/m	2.39
13.5485 MHz	9 kHz	FCC 69.6 dBµV/m	EU 9 dBµA/m or 60.5 dBµV/m	20.96
13.5715 MHz	9 kHz	FCC 69.6 dBµV/m	EU 9 dBµA/m or 60.5 dBµV/m	21.63
13.41 MHz	1 kHz	FCC 59.6 dBµV/m	EU -3.5 dBµA/m or 48 dBµV/m	3.48

		Measured Frequency	**Limit**	**QP Level**
2nd	27.12 MHz	27.12	EU -3.5 dBµA/m or 48 dBµV/m	16.01

Test Engineer: Mike Schultz **Date: 18 March 2013**



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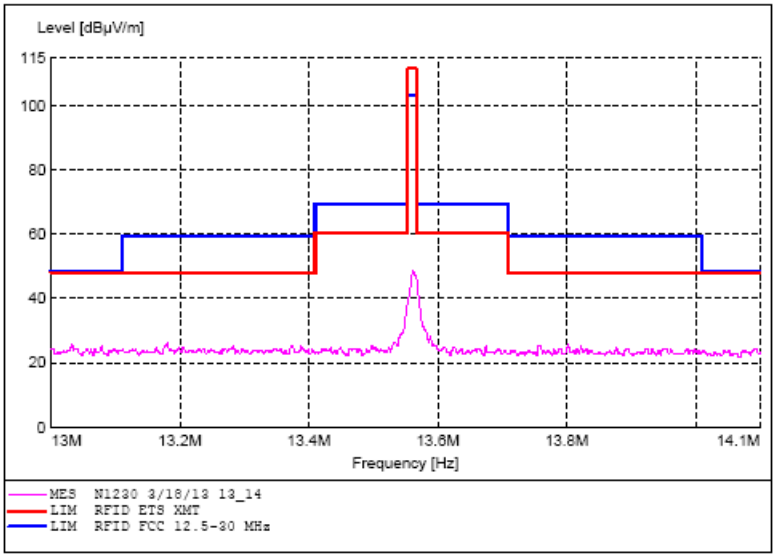

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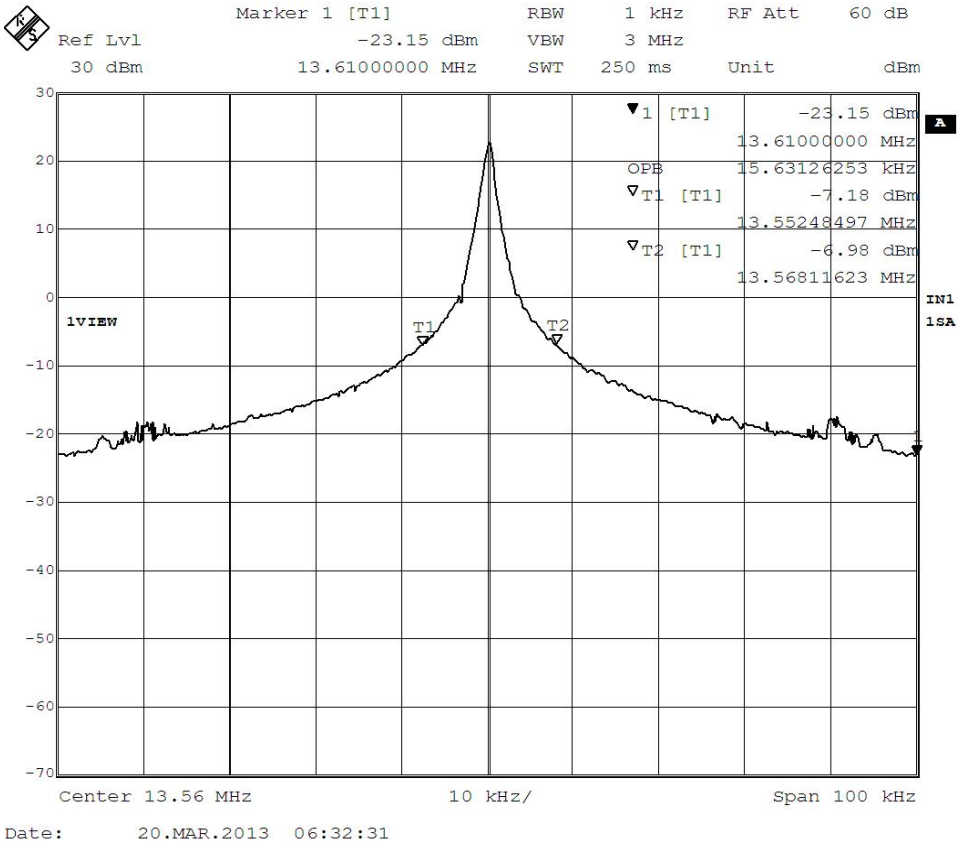
5.2.4 Test Setup Photo

Carrier Frequency / 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 **15.63 KHz.**



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.

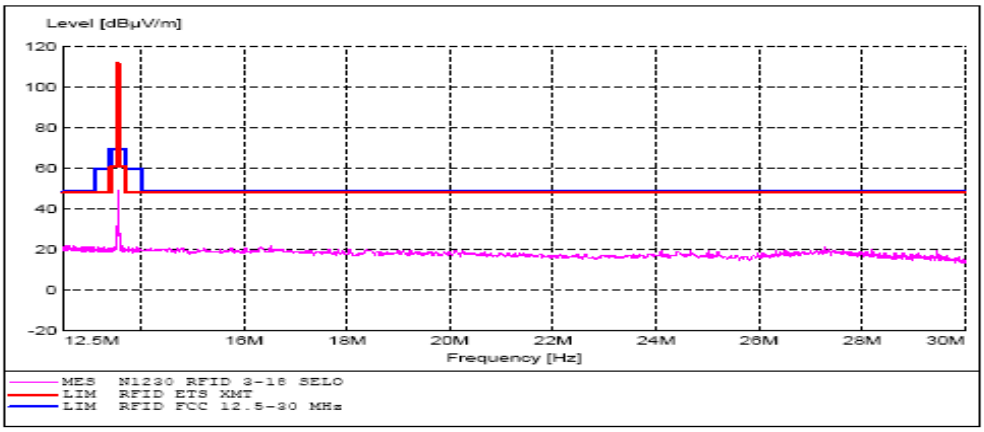
Frequency (MHz)	Distance (Meters)	Field Strength (dBμV/m)
1.705 to 13.110	10	48.62
13.110 to 13.410	10	59.58
13.410 to 13.553	10	69.55
13.553 to 13.567	10	103.00
13.567 to 13.710	10	69.55
13.710 to 14.010	10	59.58
14.010 to 30.000	10	48.62

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. No measurable spurious emissions were detected below 12.5MHz. The worst-case emission was as follows:

Model 1230			
Frequency (MHz)	Limit (dBμV)	Maximized QP Signal (dBμV)	Passing Margin (dB)
27.1198[1]	48.62	16.00	32.62



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Spurious Emissions 12.5 to 30 MHz

5.3.4 Test Setup Photo

See Section 5.2.4

5.4 Spurious Emissions (30 to 1000 MHz.) 15.209/15.109

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.

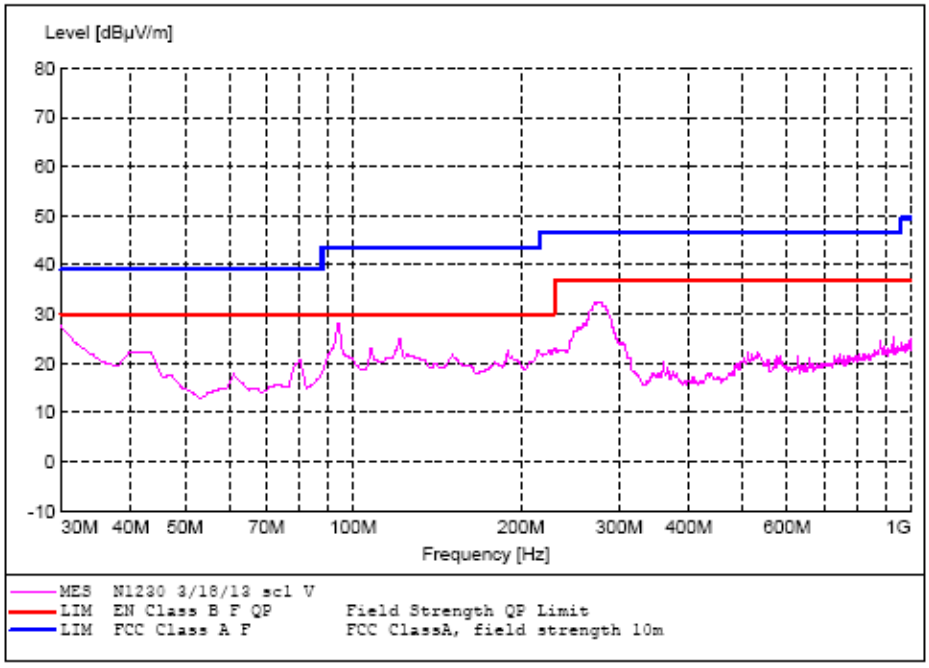
Report Number	RE1211008	**Date**	18 March 2013
EUT Name	3M Disc Media Locker	**EUT Power**	230 VAC / 50 Hz
EUT Model	1230	**Test Std**	FCC 15.209
EUT Serial #	12567004	Temperature (°C)	23° C
EUT Description	Disc case unlocker	Humidity (%)	23 %
		Air Pressure (kPa)	1010

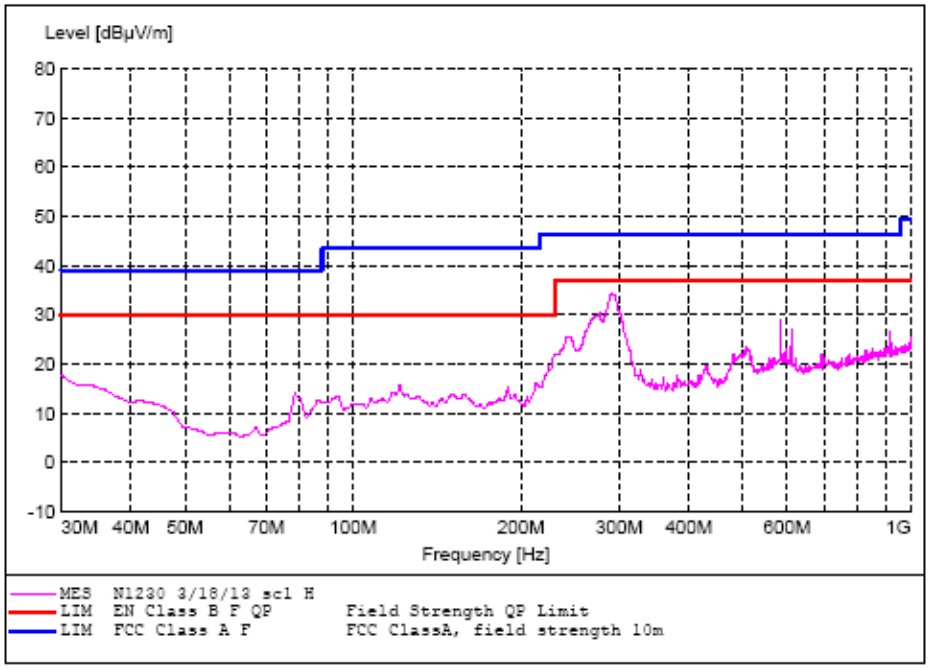
MAXIMIZED FILES N1230 3/18/13 sc1 V-H

	MAXIMIZED QP SIGNAL		LIMIT LINE	PASSING MARGIN	MAXIMIZED POSITION		
FREQ. (MHz)	H/V	dBµV	dBµV	dBµV	TURNTABLE (˚)	ANTENNA (M)	REMARKS
32.000	V	18.59	29.54	10.95	180	1.0	
40.651	V	18.84	29.54	10.70	200	1.0	Spurious
94.913	V	26.30	33.06	6.76	280	1.0	Spurious
122.050	V	23.06	33.06	10.00	200	1.0	Spurious
275.000	V	29.93	35.56	5.63	320	1.0	
298.000	V	29.43	35.56	6.13	190	1.0	

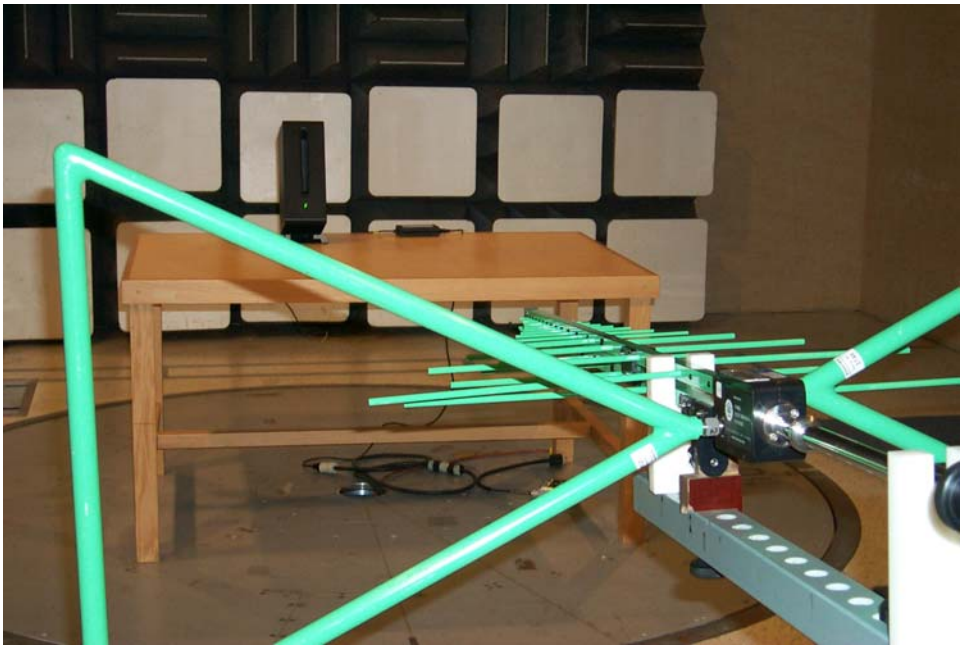
* - All readings have the correction factors applied.

Test Engineer: Mike Schultz	Date: 18 March 2013


Level [dBµV/m]
80
70
60
50
40
30
20
10
0
-10
30M 40M 50M 70M 100M 200M 300M 400M 600M 1G
Frequency [Hz]
MES N1230 3/18/13 scl V
LIM EN Class B F QP Field Strength QP Limit
LIM FCC Class A F FCC ClassA, field strength 10m


Level [dBµV/m]
80
70
60
50
40
30
20
10
0
-10
30M 40M 50M 70M 100M 200M 300M 400M 600M 1G
Frequency [Hz]
MES N1230 3/18/13 scl H
LIM EN Class B F QP Field Strength QP Limit
LIM FCC Class A F FCC ClassA, field strength 10m

5.4.4 Test Setup Photo



Spurious Emissions above 30 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
Electro Metrics Large Loop Antenna, Model ALR25M, Serial No. 603 (cal due date: 20 Oct 13)
Schaffner Biconilog Antenna, Model CBL6112B, Serial No. 27491 (cal due date: 21 Oct 13)
A. H Systems Horn Antenna, Model SAS_200/571 Serial No: 234 (cal due date: 22 Oct 13)
HP Pre-Amplifier, Model 8447D, Serial No. 1937A03090 (cal due date: 21Oct 13)
HP Pre-Amplifier, Model 83017A, Serial No. 3123A00259 (cal due date: 20 Oct 13)
Rohde & Schwarz EMI Receiver, Model ESIB 40, S/N 100235 (cal due date: 23 Oct 13)
Rohde & Schwarz ESIB 40 Firmware Version 4.34.3

CONDUCTED EMISSIONS
EMCO LISN, Model 3825-2, Serial No. 1039 (cal due date: 20 Oct 13)
Solar High Pass Filter, Model 8131 - 5.0 (cal due date: 30 Aug 13)
Rohde & Schwarz EMI Receiver, Model ESIB 40, S/N 100235 (cal due date: 23 Oct 13)
Rohde & Schwarz ESIB 40 Firmware Version 4.34.3

ELECTRICAL FAST TRANSIENTS
ThermoFisher EMC Pro Plus, s/n 0909247(cal due date: Nov 13)
CEWare Software Version 4.0
KeyTek Capacitive Clamp, Model CCL-4/S, s/n 9503344 (verification due date: August 13)

SURGE
ThermoFisher EMC Pro Plus, s/n 0909247(cal due date: Oct 13)
CEWare Software Version 4.0

ELECTROSTATIC DISCHARGE
KeyTek Minizap ESD Generator, Model MZ-15/EC, Ser. No.0112453 (cal due date: Oct 13)
Vertical and Horizontal Coupling Planes (cal. not required)

SOFTWARE
EMI Measurement Software, Rohde & Schwarz ESIB-K1 Vers. 1.20
Harmonics & Flicker, California Instruments CTS 3.0 Vers. 3.2.0.2
Radiated Immunity, Labview Radiated Immunity Program.vi
EFT & Surge, KeyTek CEWare32 Vers. 4.00
Conducted Immunity, Teseq NSG 4070 Control Program Vers. 1.1.0 (Build 4)
Dips & Interruptions, California Instruments GUI32 Vers. 1.27.0.5