CKC LABORATORIES, INC. Testing the Future

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EMC/SAFETY

ADDENDUM TO FC02-024B

FOR THE

ICLASS KEYPAD READER, 613XA (6094-300)

FCC PART 15 SUBPART C SECTIONS 15.207, 15.209 AND 15.225

COMPLIANCE

DATE OF ISSUE: JUNE 19, 2003

PREPARED FOR:

HID Corporation
9292 Jeronimo Road
Irvine, CA 92618-1905

P.O. No.: 10001053
W.O. No.: 80481

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: April 21-23, 2003

Report No.: FC02-024C

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	April 21-23, 2003
DATE OF RECEIPT:	April 21, 2003
PURPOSE OF TEST:	To demonstrate the compliance of the iCLASS R10, 6100A (6091-300); iCLASS RW300, 6111A (6092-300) and iCLASS RW400, 6121A (6093-300) with the requirements for FCC Part 15 Subpart C Sections 15.207, 15.209 & 15.225 devices. **Addendum A** is to add a statement regarding the correction factor to the voltage variation tables. **Addendum B** is to demonstrate the compliance of the Proximity Card Reader, 6094A (6094-300) with the requirements for FCC Part 15 Subpart C Sections 15.207, 15.209 and 15.225 devices. **Addendum C** is to change the model name to iCLASS Keypad Reader, 613xA (6094-300).
TEST METHOD:	ANSI C63.4 (1992)
MANUFACTURER:	HID Corporation 9292 Jeronimo Road Irvine, CA 92618-1905
REPRESENTATIVE:	Frank de Vall
TEST LOCATION:	CKC Laboratories, Inc. 5473A Clouds Rest Mariposa, CA 95338

SUMMARY OF RESULTS

As received, the HID Corporation iCLASS Keypad Reader, 613xA (6094-300) was found to be fully compliant with the following standards and specifications:

FCC PART 15.225	Canada RSS 210	Notes
15.225	6.2.2(e)	Frequency Range 13.553 – 13.567 MHz
15.225(a)	6.2.2(e)	Fundamental Field Strength
15.225(c)	6.2.2(e)	Frequency and Input Voltage Stability Test
NA	6.2.2(e)	Emissions Mask
15.203	5.5	
15.207	6.6	AC Mains Conducted Emissions
15.209	6.2.1	General Field Strength Requirements (RSS 210 Table 3)

CONDITIONS FOR COMPLIANCE
No modifications to the EUT were necessary to comply.

APPROVALS

QUALITY ASSURANCE:

Steve Behm, Director of Engineering Services and Quality Assurance

Joyce Walker, Quality Assurance Administrative Manager

Mike Wilkinson, Lab Manager

TEST PERSONNEL:

Randy Clark, EMC Engineer

FCC 15.31(e) Voltage Variations

FREQUENCY MHz	CORRECTED READING dBµV/m 85%	CORRECTED READING dBµV/m 100%	CORRECTED READING dBµV/m 115%	SPEC LIMIT dBµV/m
13.56	37.4	37.4	37.4	80.0

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.225(a))/15.31(e)
Test Distance: 10 meters

FCC 15.31(m) Number Of Channels
This device operates on a single channel.

FCC 15.33(a) Frequency Ranges Tested
15.207 Conducted: 150 kHz – 30 MHz
15.209 Radiated: 9 kHz – 1000 MHz

FCC SECTION 15.35: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz

FCC 15.203 Antenna Requirements
The antenna is an integral part of the EUT and is non-removable; therefore the EUT complies with Section 15.203 of the FCC rules.

Eut Operating Frequency
The EUT was operating at 13.56 MHz.

Temperature And Humidity During Testing
The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION
The EUT tested by CKC Laboratories was representative of a production unit.

The following model was tested by CKC Laboratories: **6094A (6094-300)**

Since the time of testing the manufacturer has chosen to use the following model name in its place. Any differences between the names does not affect their EMC characteristics and therefore complies to the level of testing equivalent to the tested model name shown on the data sheets: **iCLASS Keypad Reader, 613xA (6094-300)**

6130A 9" or 18" pigtail or 10 pin Connector
6131A 8 pin and 10 pin Connectors

The 6131A was the unit tested at CKC; this model has both Wiegand and Serial interfaces and the maximum circuitry, so it is worst case as far as emissions are concerned. The 6130A has only the Wiegand interface.

The Install Guide refers to the products with other designations, RK40 & RWK400. These are easier designations than the entire model number and name for reference purposes, but are equivalent:

RK40 6130A iCLASS Keypad Reader
RWK400 6131A iCLASS Keypad Reader/Writer

EQUIPMENT UNDER TEST

iCLASS Keypad Reader
Manuf: HID Corporation
Model: 613xA (6094-300)
Serial: 006
FCC ID: JQ6609XA

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Power Supply
Manuf: Topward Electric Instruments
Model: TPS-2000
Serial: 920035
FCC ID: DoC

REPORT OF MEASUREMENTS

The following tables report the worst case emissions levels recorded during the tests performed on the EUT. All readings taken were peak readings unless otherwise stated. The data sheets from which the emissions tables were compiled are contained in Appendix C.

Table 1: FCC 15.207 Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Lisn dB	dB	Cable dB	dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.457196	38.7	0.2		0.1		39.0	46.7	-7.7	B
0.484213	38.7	0.2		0.1		39.0	46.3	-7.3	B
0.503589	37.8	0.2		0.1		38.1	46.0	-7.9	B
0.516415	37.7	0.2		0.1		38.0	46.0	-8.0	B
0.542887	37.8	0.2		0.1		38.1	46.0	-7.9	B
0.583606	38.6	0.2		0.1		38.9	46.0	-7.1	B

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.207

NOTES: B = Black Lead

COMMENTS: EUT is a proximity card reader operating on a frequency of 13.56MHz. EUT is powered by 12VDC through a DC power supply. The DC power supply is powered through the LISN. DC Common is tied to ground and chassis ground at the power supply. Frequency Range Investigated: 150kHz - 30MHz; QP readings are measured with respect to the QP limit, all other readings are measured with respect to the Average limit.

Table 2: FCC 15.209 Highest Radiated Emission Levels: 9 kHz - 30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	dB	Cable dB	Corr dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
27.119	22.7	6.5		0.8	-20.0	10.0	29.5	-19.5	H
27.120	19.4	6.5		0.8	-20.0	6.7	29.5	-22.8	V

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a proximity card reader operating on a frequency of 13.56MHz. EUT is powered by 12VDC through a DC power supply. DC Common is tied to chassis ground at the power supply. To simulate actual installation, the EUT is mounted to a wooden support structure. The power supply is located on the turn table. Test distance correction factor is used in accordance with 15.31 of 40dB per decade to correct the data to 30 and 300 meters for comparison to the spec limit. Frequency Range Investigated: 9kHz to 30MHz.

Table 3: FCC 15.209 Six Highest Radiated Emission Levels: 30-1000 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
352.648	31.9	14.6	-26.8	3.4	10.0	33.1	46.0	-12.9	V
393.316	30.2	15.7	-27.1	3.7	10.0	32.5	46.0	-13.5	V
393.330	31.2	15.7	-27.1	3.7	10.0	33.5	46.0	-12.5	H
406.867	30.3	16.1	-27.2	3.7	10.0	32.9	46.0	-13.1	H
420.400	30.9	16.6	-27.3	3.8	10.0	34.0	46.0	-12.0	H
420.408	30.6	16.6	-27.3	3.8	10.0	33.7	46.0	-12.3	V

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a proximity card reader operating on a frequency of 13.56MHz. EUT is powered by 12VDC through a DC power supply. DC Common is tied to chassis ground at the power supply. To simulate actual installation, the EUT is mounted to a wooden support structure. The power supply is located on the turn table. Test distance correction factor is used in accordance with 15.31 of 20dB per decade to correct the data to 3 meters for comparison to the spec limit. Frequency Range Investigated: 30MHz - 1000MHz.

Table 4: FCC 15.225(a) Fundamental Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	dB	Cable dB	Corr dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
13.560	48.0	8.9		0.5	-20.0	37.4	80.0	-42.6	H
13.560	48.0	8.9		0.5	-20.0	37.4	80.0	-42.6	H
13.560	48.0	8.9		0.5	-20.0	37.4	80.0	-42.6	H
13.566	44.1	8.9		0.5	-20.0	33.5	80.0	-46.5	V

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.225(a)
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

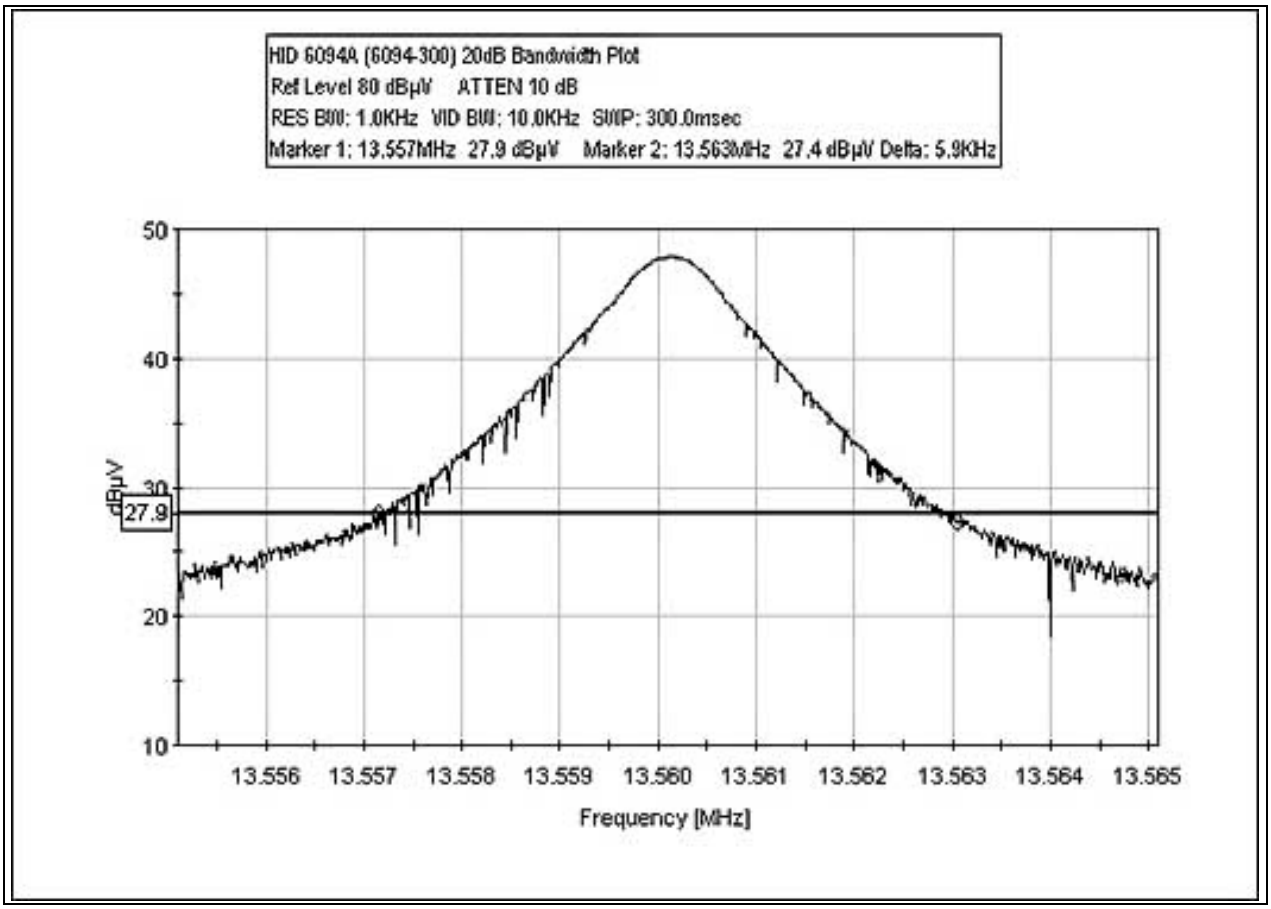
COMMENTS: EUT is a proximity card reader operating on a frequency of 13.56MHz. EUT is powered by 12VDC through a DC power supply. DC Common is tied to chassis ground at the power supply. To simulate actual installation, the EUT is mounted to a wooden support structure. The power supply is located on the turn table. Test distance correction factor is used in accordance with 15.31 of 40dB per decade to correct the test data to 30 meters for comparison to the spec limit. Compliance to 15.31(e) is shown in the following data. The mains input voltage is varied from 85% to 115% of nominal, or 10.2 to 13.8 VDC. Frequency Range Investigated: 13.56MHz.

Table 5: FCC 15.225(c) Frequency Stability

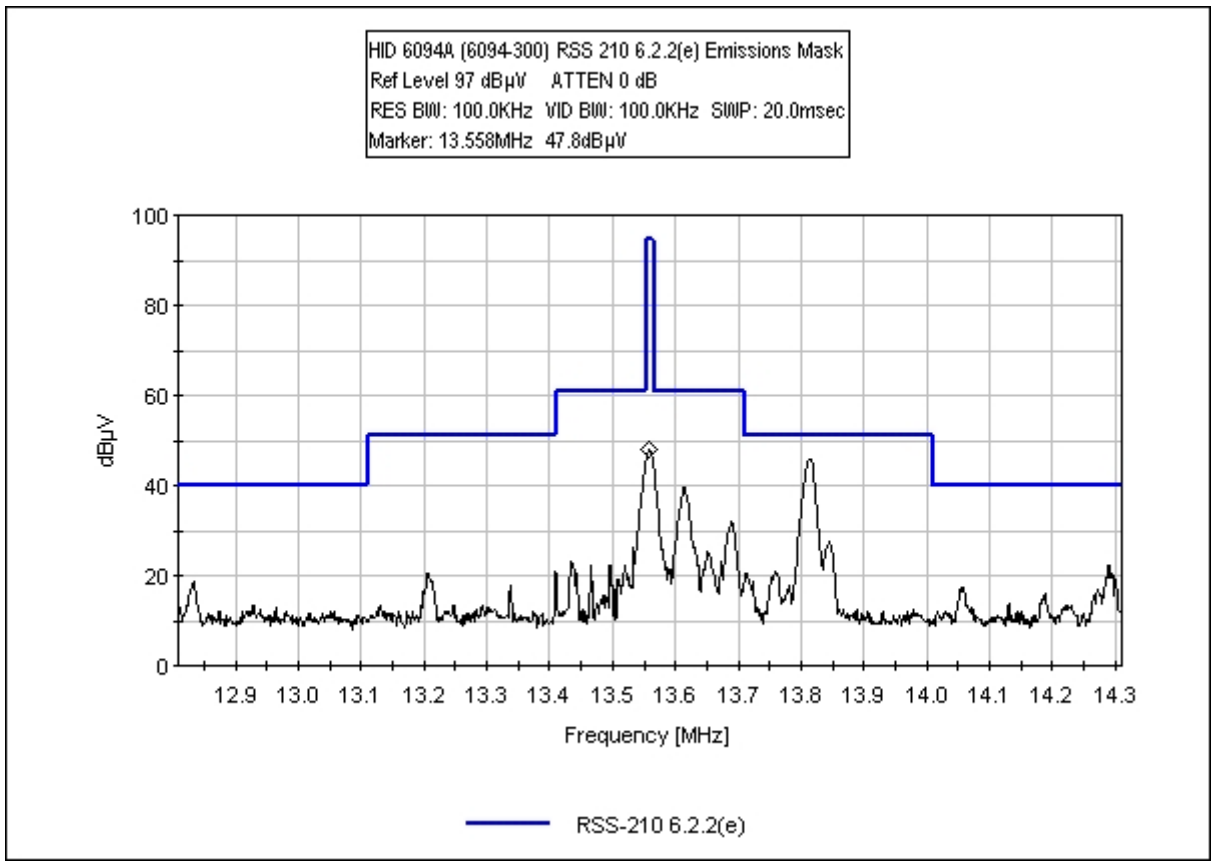
Test Conditions: EUT is a proximity card reader operating on a frequency of 13.56MHz. EUT is powered by 12VDC through a DC power supply. DC Common is tied to chassis ground at the power supply. The EUT and test antenna is placed in a temperature chamber. The test fixture is calibrated to the OATS measurements at ambient temperature.

Customer:		HID	
WO#:		80481	
Test Engineer:		Randal Clark	
Device Model #:		6094A (6094-300)	
Operating Voltage:		12	**VDC**
Frequency Limit:		0.01	**%**
Temperature Variations			
		Channel 1 (MHz)	**Dev. (MHz)**
Channel Frequency:		**13.56**	
Temp (C)	Voltage		
-30	12		
-20	12	13.56008	0.00007
-10	12	13.56014	0.00014
0	12	13.56015	0.00015
10	12	13.56007	0.00006
20	12	13.56005	0.00005
30	12	13.55999	0.00002
40	12	13.55998	0.00003
50	12	13.55993	0.00007
Voltage Variations (±15%)			
20	10.2	13.56006	0.00005
20	12	13.56005	0.00005
20	13.8	13.56003	0.00003
Max Deviation (MHz)			**0.00015**
Max Deviation (%)			**0.00001**
			PASS

20dB OCCUPIED BANDWIDTH



RSS 210 6.2.2(e) EMISSIONS MASK



MEASUREMENT UNCERTAINTY

TEST	HIGHEST UNCERTAINTY
Radiated Emissions	+/- 2.94 dB
Conducted Emissions	+/- 1.56 dB

Note: Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Statements of compliance are based on the nominal values only.

EUT SETUP

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The radiated and conducted emissions data of the EUT was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula in Table A. This reading was then compared to the applicable specification limit to determine compliance.

TABLE A: SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Appendix B were used to collect both the radiated and conducted emissions data. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For frequencies from 30 to 1000 MHz, the biconilog antenna was used. Conducted emissions tests required the use of the FCC type LISNs.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dBµV, and a vertical scale of 10 dB per division.

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the Tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

EUT TESTING

Mains Conducted Emissions

During conducted emissions testing, the EUT was located on a wooden table measuring approximately 80 cm high, 1 meter deep, and 1.5 meters in length. One wall of the room where the EUT was located has a minimum 2 meter by 2 meter conductive plane. The EUT was mounted on the wooden table 40 cm away from the conductive plane, and 80 cm from any other conductive surface.

The vertical metal plane used for conducted emissions was grounded to the earth. Power to the EUT was provided through a LISN. The LISN was grounded to the ground plane. All other objects were kept a minimum of 80 cm away from the EUT during the conducted test.

The LISNs used were 50 µH-/+50 ohms. Above 150 kHz, a 0.15 µF series capacitor was added in-line prior to connecting the analyzer to restore the proper impedance for the range. A 30 to 50 second sweep time was used for automated measurements in the frequency bands of 150 kHz to 500 kHz, and 500 kHz to 30 MHz. All readings within 20 dB of the limit were recorded, and those within 6 dB of the limit were examined with additional measurements using a slower sweep time.

Radiated Emissions

The EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters.

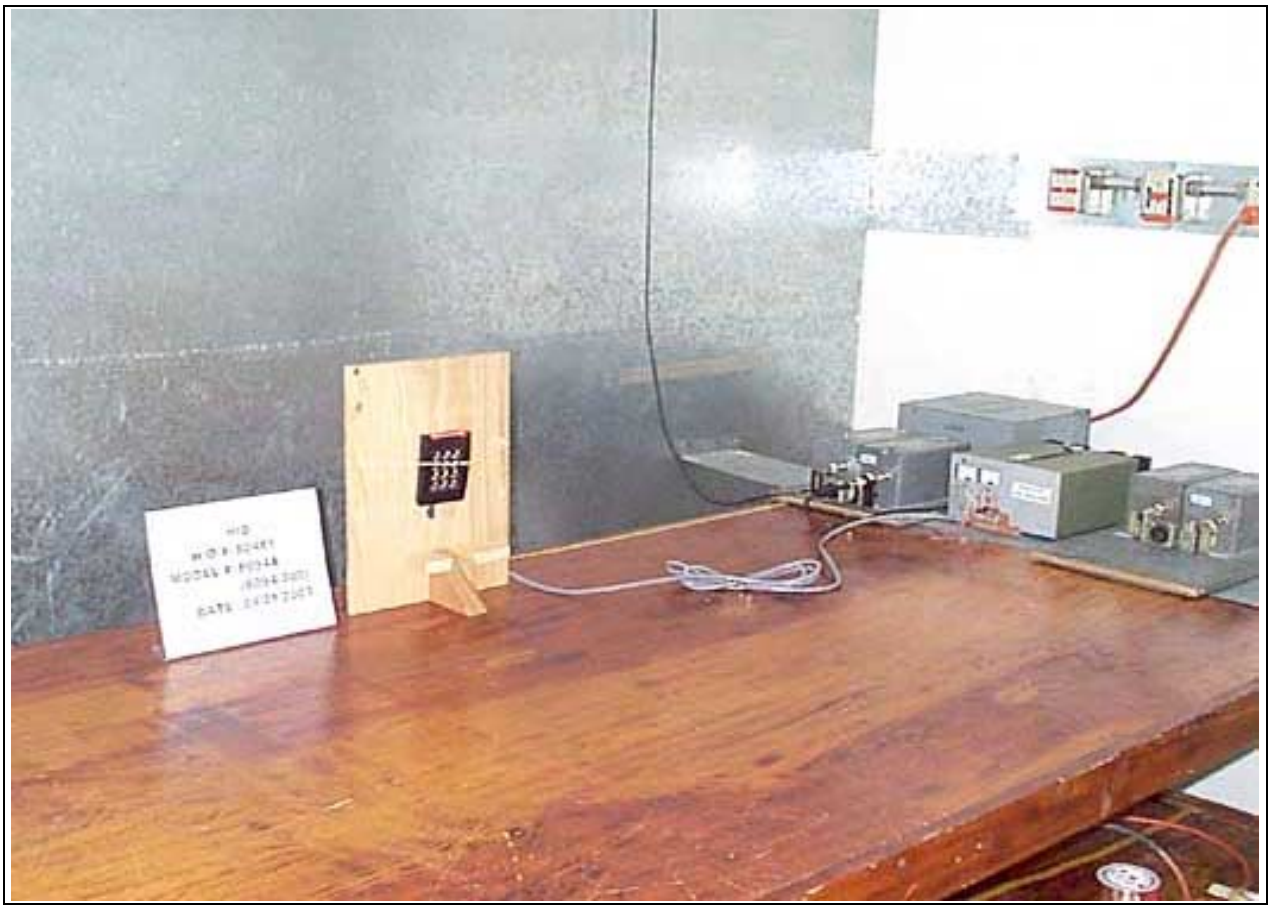
During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 1000 MHz was scanned with the biconilog antenna located about 1.5 meter above the ground plane in the vertical polarity. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. A scan of the FM band from 88 to 110 MHz was then made using a reduced resolution bandwidth and frequency span. The biconilog antenna was changed to the horizontal polarity and the above steps were repeated. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable as needed. The test engineer maximized the readings with respect to the table rotation, antenna height, and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor.

APPENDIX A

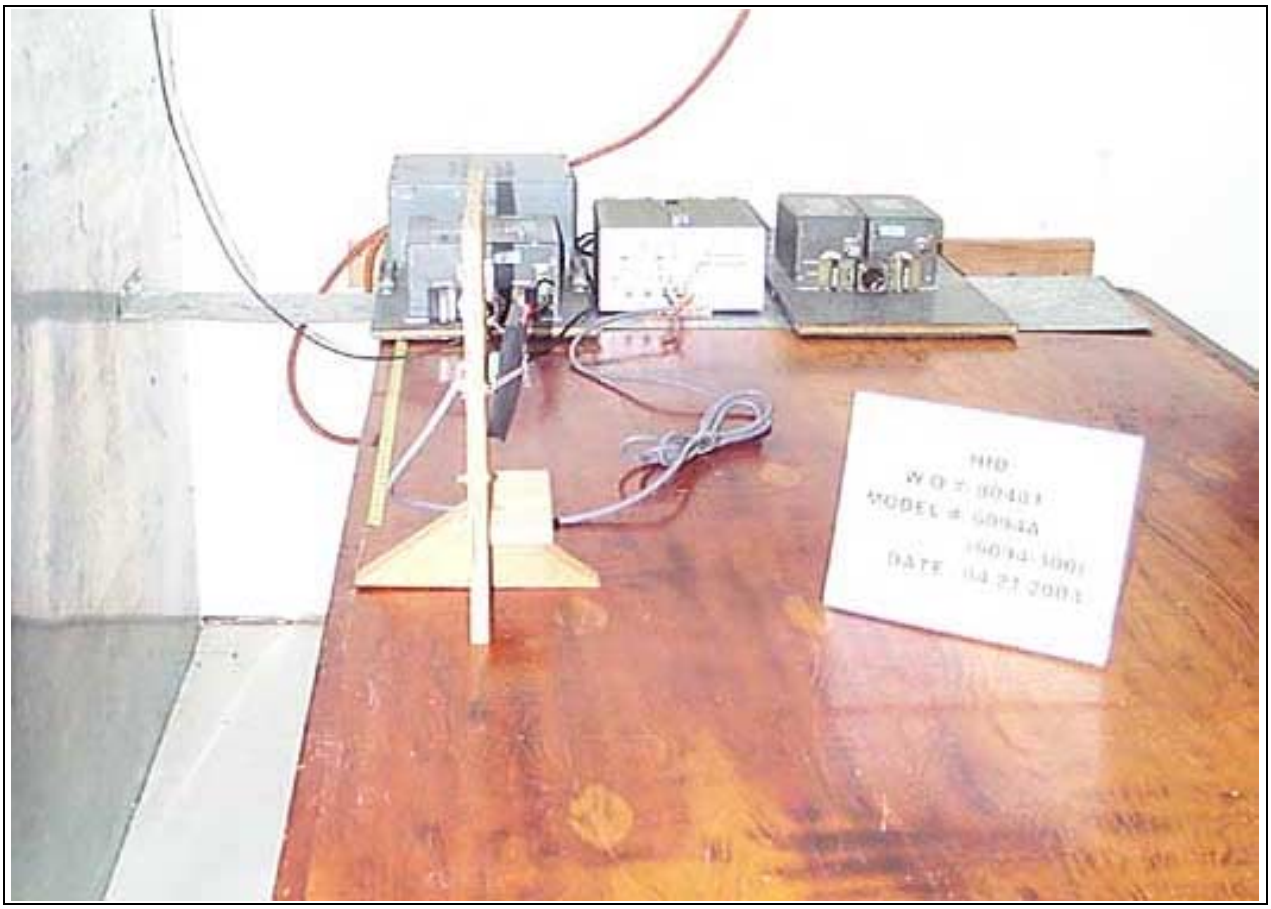
TEST SETUP PHOTOGRAPHS

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Front View

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

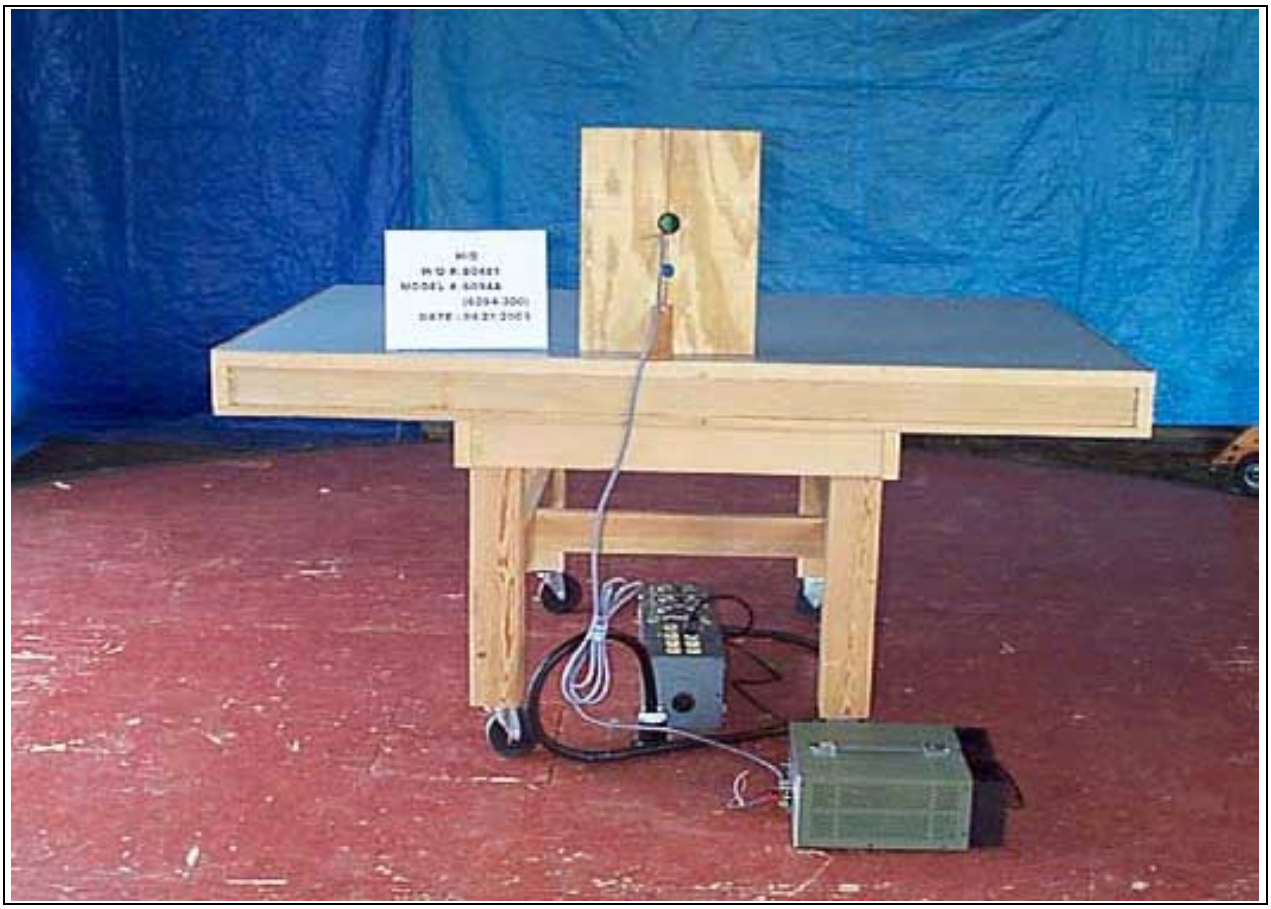


Mains Conducted Emissions - Side View

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View

PHOTOGRAPH SHOWING TEMPERATURE TESTING

APPENDIX B

TEST EQUIPMENT LIST

***15.207 Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
LISN Model 8028-50-TS-24-BNC	474 & 493	06/05/2002	06/05/2003	2056

***15.209 Test Equipment 9kHz – 30MHz*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
EMCO Loop Antenna	2078	06/05/2002	06/05/2003	432

***15.209 Test Equipment 30-1000MHz*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
Chase CBL6111C Bilog	2456	12/13/2002	12/13/2004	1991
HP 8447D Preamp	1937A02604	03/07/2003	03/07/2004	99

***15.225(a) Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2004	490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2004	489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2004	478
EMCO Loop Antenna	2078	06/05/2002	06/05/2003	432

***15.225(c) Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Power Supply, DC (Programmable)	6030090	06/05/2002	06/05/2003	P01889
Spectrum Analyzer 100Hz - 22.5GHz	2209A01404	02/26/2003	02/26/2004	00490
Spectrum Analyzer Display	2403A08241	02/26/2003	02/26/2004	00489
Temp Chamber	11899	01/3120/03	01/31/2004	01879
Thermometer	T-202884	08/30/2002	08/30/2003	02242
Antenna, Loop Sensor	170	12/09/2002	12/09/2003	00170

APPENDIX C:

MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, Ca 95338 • (209) 966-5240

Customer: **HID**
Specification: **FCC 15.207 - AVE**
Work Order #: **80481** Date: 04/21/2003
Test Type: **Conducted Emissions** Time: 10:14:15
Equipment: **Proximity Card Reader** Sequence#: 4
Manufacturer: HID Tested By: Randal Clark
Model: 6094A (6094-300) 120V 60Hz
S/N: 006

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Proximity Card Reader*	HID	6094A (6094-300)	006

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Topward Electric Instruments	TPS-2000	920035

Test Conditions / Notes:

EUT is a proximity card reader operating on a frequency of 13.56MHz. EUT is powered by 12VDC through a DC power supply. The DC power supply is powered through the LISN. DC Common is tied to ground and chassis ground at the power supply. Frequency Range Investigated: 150kHz - 30MHz; QP readings are measured with respect to the QP limit, all other readings are measured with respect to the Average limit.

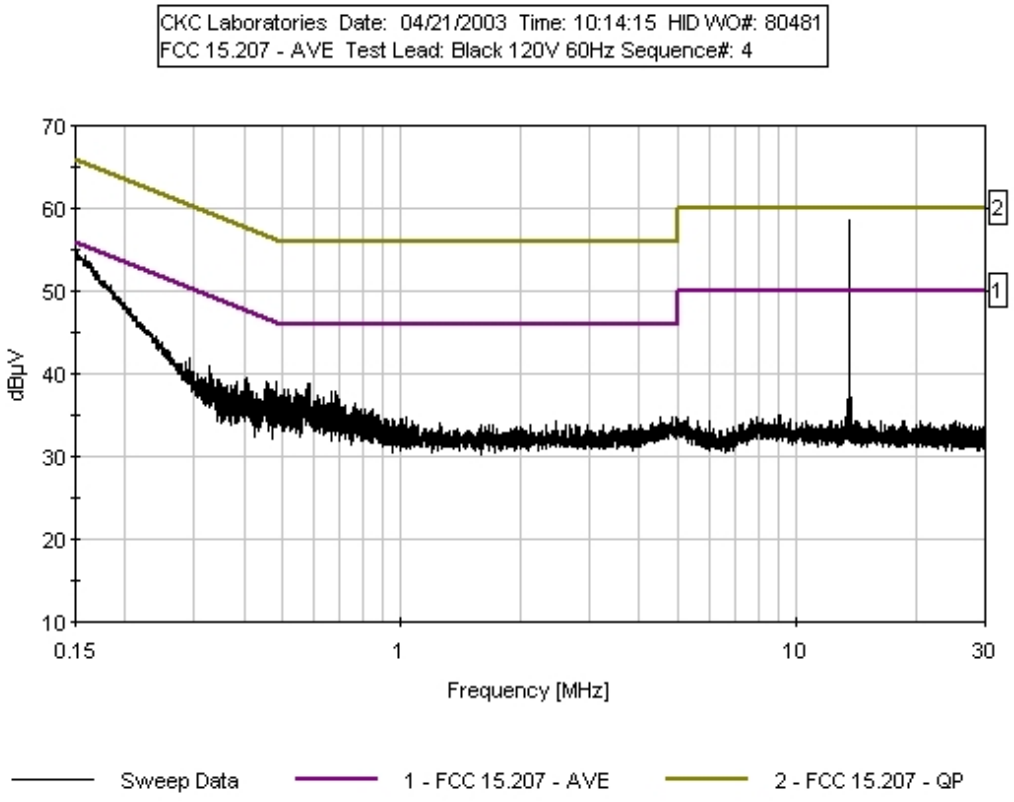
Transducer Legend:

T1=Cable & Cap (Bench)	T2=LISN Insertion Loss s/n493

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	583.606k	38.6	+0.1	+0.2			+0.0	38.9	46.0	-7.1	Black
2	484.213k	38.7	+0.1	+0.2			+0.0	39.0	46.3	-7.3	Black
3	457.196k	38.7	+0.1	+0.2			+0.0	39.0	46.7	-7.7	Black
4	503.589k	37.8	+0.1	+0.2			+0.0	38.1	46.0	-7.9	Black
5	542.887k	37.8	+0.1	+0.2			+0.0	38.1	46.0	-7.9	Black
6	508.228k	37.7	+0.1	+0.2			+0.0	38.0	46.0	-8.0	Black
7	516.415k	37.7	+0.1	+0.2			+0.0	38.0	46.0	-8.0	Black
8	575.128k	37.7	+0.1	+0.2			+0.0	38.0	46.0	-8.0	Black
9	667.860k	37.6	+0.1	+0.2			+0.0	37.9	46.0	-8.1	Black
10	678.988k	37.6	+0.1	+0.2			+0.0	37.9	46.0	-8.1	Black

11	407.528k	39.3	+0.1	+0.1		+0.0	39.5	47.7	-8.2	Black
12	481.484k	37.8	+0.1	+0.2		+0.0	38.1	46.3	-8.2	Black
13	471.387k	37.9	+0.1	+0.2		+0.0	38.2	46.5	-8.3	Black
14	546.434k	37.4	+0.1	+0.2		+0.0	37.7	46.0	-8.3	Black
15	479.574k	37.6	+0.1	+0.2		+0.0	37.9	46.3	-8.4	Black
16	469.477k	37.7	+0.1	+0.2		+0.0	38.0	46.5	-8.5	Black
17	690.646k	37.2	+0.1	+0.2		+0.0	37.5	46.0	-8.5	Black
18	13.567M QP	44.4	+0.2	+0.6		+0.0	45.2	60.0	-14.8	Black
^	13.569M	47.9	+0.2	+0.6		+0.0	48.7	50.0	-1.3	Black
20	150.281k Ave	38.1	+0.1	+0.2		+0.0	38.4	56.0	-17.6	Black
^	150.282k	54.9	+0.1	+0.2		+0.0	55.2	56.0	-0.8	Black
22	13.569M Ave	22.5	+0.2	+0.6		+0.0	23.3	50.0	-26.7	Black


CKC Laboratories Date: 04/21/2003 Time: 10:14:15 HID WO#: 80481
FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 4
70
60
50
40
30
20
10
dBµV
0.15
1
10
30
Frequency [MHz]
2
1
Sweep Data
1 - FCC 15.207 - AVE
2 - FCC 15.207 - QP

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, Ca 95338 • (209) 966-5240

Customer: **HID**
Specification: **FCC 15.207 - AVE**
Work Order #: **80481** Date: 04/21/2003
Test Type: **Conducted Emissions** Time: 11:09:38
Equipment: **Proximity Card Reader** Sequence#: 3
Manufacturer: HID Tested By: Randal Clark
Model: 6094A (6094-300) 120V 60Hz
S/N: 006

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Proximity Card Reader*	HID	6094A (6094-300)	006

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Topward Electric Instruments	TPS-2000	920035

Test Conditions / Notes:

EUT is a proximity card reader operating on a frequency of 13.56MHz. EUT is powered by 12VDC through a DC power supply. The DC power supply is powered through the LISN. DC Common is tied to ground and chassis ground at the power supply. Frequency Range Investigated: 150kHz - 30MHz; QP readings are measured with respect to the QP limit, all other readings are measured with respect to the Average limit.

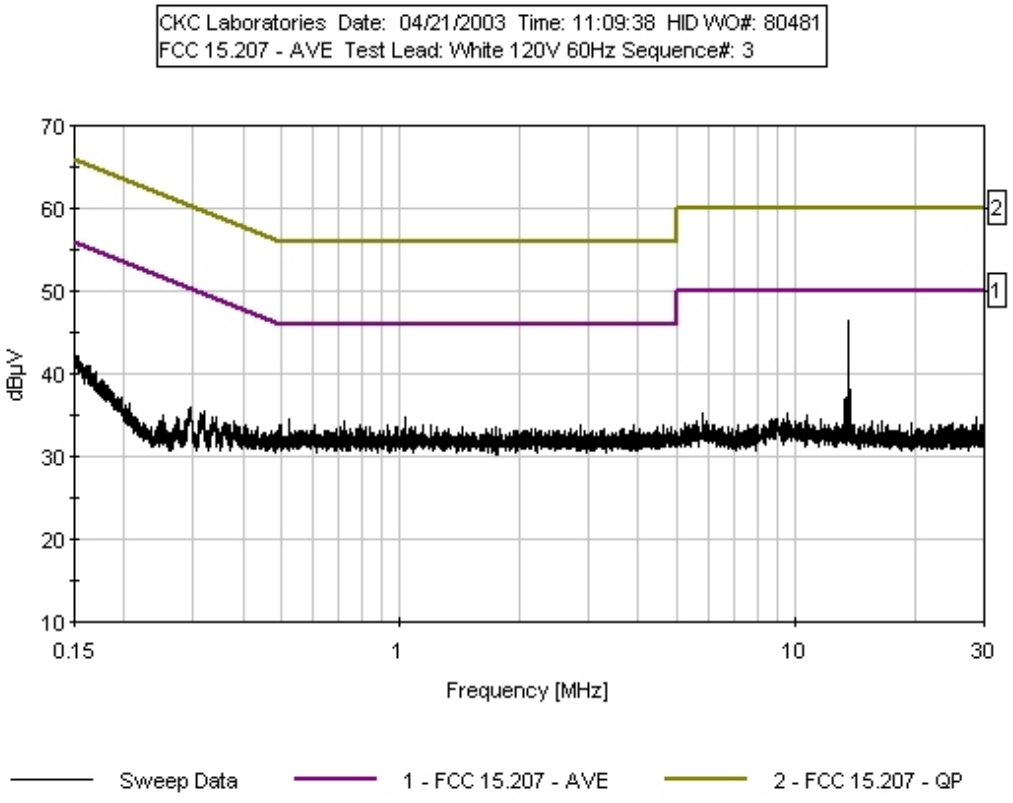
Transducer Legend:

T1=Cable & Cap (Bench)	T2=LISN Insertion Loss s/n474

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1 QP	13.569M	48.0	+0.2	+0.5			+0.0	48.7	60.0	-11.3	White
^	13.567M	51.4	+0.2	+0.5			+0.0	52.1	50.0	+2.1	White
3	522.146k	34.4	+0.1	+0.0			+0.0	34.5	46.0	-11.5	White
4	13.694M	37.4	+0.2	+0.5			+0.0	38.1	50.0	-11.9	White
5	1.192M	33.8	+0.0	+0.1			+0.0	33.9	46.0	-12.1	White
6	2.868M	33.7	+0.1	+0.1			+0.0	33.9	46.0	-12.1	White
7	13.507M	36.5	+0.2	+0.5			+0.0	37.2	50.0	-12.8	White
8	13.357M	36.2	+0.2	+0.5			+0.0	36.9	50.0	-13.1	White
9	150.563k	42.3	+0.1	+0.0			+0.0	42.4	56.0	-13.6	White
10	13.432M	35.7	+0.2	+0.5			+0.0	36.4	50.0	-13.6	White

11	381.057k	34.2	+0.1	+0.0		+0.0	34.3	48.3	-14.0	White
12	318.836k	35.3	+0.1	+0.1		+0.0	35.5	49.7	-14.2	White
13	294.548k	35.7	+0.1	+0.1		+0.0	35.9	50.4	-14.5	White
14	333.300k	34.5	+0.1	+0.1		+0.0	34.7	49.4	-14.7	White
15	5.806M	34.2	+0.1	+0.9		+0.0	35.2	50.0	-14.8	White
16	28.520M	34.2	+0.3	+0.3		+0.0	34.8	50.0	-15.2	White
17	15.605M	33.7	+0.2	+0.3		+0.0	34.2	50.0	-15.8	White
18	13.567M Ave	29.9	+0.2	+0.5		+0.0	30.6	50.0	-19.5	White
19	1.026M	24.9	+0.0	+0.1		+0.0	25.0	46.0	-21.0	White



Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, Ca 95338 • (209) 966-5240

Customer: **HID**
Specification: **FCC 15.209**
Work Order #: **80481** Date: 04/22/2003
Test Type: **Radiated Scan** Time: 14:37:46
Equipment: **Proximity Card Reader** Sequence#: 12
Manufacturer: HID Tested By: Randal Clark
Model: 6094A (6094-300)
S/N: 006

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Proximity Card Reader*	HID	6094A (6094-300)	006

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Topward Electric Instruments	TPS-2000	920035

Test Conditions / Notes:

EUT is a proximity card reader operating on a frequency of 13.56MHz. EUT is powered by 12VDC through a DC power supply. DC Common is tied to chassis ground at the power supply. To simulate actual installation, the EUT is mounted to a wooden support structure. The power supply is located on the turn table. Test distance correction factor is used in accordance with 15.31 of 40dB per decade to correct the data to 30 and 300 meters for comparison to the spec limit. Frequency Range Investigated: 9kHz to 30MHz.

Transducer Legend:

T1=Cable - 10 Meter T2=Mag Loop A/N 00432, S/N 2078
T3=15.31 10m 40dB/Dec Correction

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	27.119M	22.7	+0.8	+6.5	-20.0		+0.0	10.0	29.5	-19.5	Horiz
2	27.120M	19.4	+0.8	+6.5	-20.0		+0.0	6.7	29.5	-22.8	Vert

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, Ca 95338 • (209) 966-5240

Customer: **HID**
Specification: **FCC 15.209**
Work Order #: **80481** Date: 04/21/2003
Test Type: **Radiated Scan** Time: 13:40:02
Equipment: **Proximity Card Reader** Sequence#: 8
Manufacturer: HID Tested By: Randal Clark
Model: 6094A (6094-300)
S/N: 006

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Proximity Card Reader*	HID	6094A (6094-300)	006

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Topward Electric Instruments	TPS-2000	920035

Test Conditions / Notes:

EUT is a proximity card reader operating on a frequency of 13.56MHz. EUT is powered by 12VDC through a DC power supply. DC Common is tied to chassis ground at the power supply. To simulate actual installation, the EUT is mounted to a wooden support structure. The power supply is located on the turn table. Test distance correction factor is used in accordance with 15.31 of 20dB per decade to correct the data to 3 meters for comparison to the spec limit. Frequency Range Investigated: 30MHz - 1000MHz.

Transducer Legend:

T1=Cable - 10 Meter T2=Bilog B
T3=Amp - S/N 604

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	420.400M	30.9	+3.8	+16.6	-27.3		+10.0	34.0	46.0	-12.0	Horiz
2	420.408M	30.6	+3.8	+16.6	-27.3		+10.0	33.7	46.0	-12.3	Vert
3	393.330M	31.2	+3.7	+15.7	-27.1		+10.0	33.5	46.0	-12.5	Horiz
4	352.648M	31.9	+3.4	+14.6	-26.8		+10.0	33.1	46.0	-12.9	Vert
5	406.867M	30.3	+3.7	+16.1	-27.2		+10.0	32.9	46.0	-13.1	Horiz
6	379.732M	30.5	+3.6	+15.4	-27.0		+10.0	32.5	46.0	-13.5	Horiz
7	393.316M	30.2	+3.7	+15.7	-27.1		+10.0	32.5	46.0	-13.5	Vert
8	40.640M	28.8	+0.9	+13.5	-27.3		+10.0	25.9	40.0	-14.1	Vert

9	393.328M	28.8	+3.7	+15.7	-27.1	+10.0	31.1	46.0	-14.9	Vert
10	366.213M	29.4	+3.5	+15.0	-26.9	+10.0	31.0	46.0	-15.0	Horiz
11	339.088M	28.4	+3.3	+14.2	-26.7	+10.0	29.2	46.0	-16.8	Vert

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, Ca 95338 • (209) 966-5240

Customer: **HID**
Specification: **FCC 15.225(a)**
Work Order #: **80481** Date: 04/22/2003
Test Type: **Radiated Scan** Time: 15:19:49
Equipment: **Proximity Card Reader** Sequence#: 9
Manufacturer: HID Tested By: Randal Clark
Model: 6094A (6094-300)
S/N: 006

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Proximity Card Reader*	HID	6094A (6094-300)	006

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Topward Electric Instruments	TPS-2000	920035

Test Conditions / Notes:

EUT is a proximity card reader operating on a frequency of 13.56MHz. EUT is powered by 12VDC through a DC power supply. DC Common is tied to chassis ground at the power supply. To simulate actual installation, the EUT is mounted to a wooden support structure. The power supply is located on the turn table. Test distance correction factor is used in accordance with 15.31 of 40dB per decade to correct the test data to 30 meters for comparison to the spec limit. Compliance to 15.31(e) is shown in the following data. The mains input voltage is varied from 85% to 115% of nominal, or 10.2 to 13.8 VDC. Frequency Range Investigated: 13.56MHz.

Transducer Legend:

T1=Cable - 10 Meter T2=Mag Loop A/N 00432, S/N 2078
T3=15.31 10m 40dB/Dec Correction

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.560M	48.0	+0.5	+8.9	-20.0		+0.0	37.4	80.0	-42.6	Horiz
2	13.560M	48.0	+0.5	+8.9	-20.0		+0.0	37.4	80.0	-42.6	Horiz
									85% of nominal input voltage		
3	13.560M	48.0	+0.5	+8.9	-20.0		+0.0	37.4	80.0	-42.6	Horiz
									115% of nominal input voltage		
4	13.566M	44.1	+0.5	+8.9	-20.0		+0.0	33.5	80.0	-46.5	Vert