HID GLOBAL TEST REPORT

FOR THE

6130B ICLASS RK40 READER & 6131B ICLASS RWK400 READER*

FCC PART 15 SUBPART C SECTIONS 15.207, 15.209 & 15.225 AND RSS-210

COMPLIANCE

DATE OF ISSUE: SEPTEMBER 18, 2006

PREPARED FOR:

HID Global
9292 Jeronimo Road
Irvine, CA 92618-1905

P.O. No.: 11007580
W.O. No.: 85597

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Date of test: August 17 – September 13, 2006

Report No.: FC06-006

***This model was not tested by CKC Laboratories but is part of the family that was tested. See "EUT Description" in the test report for more details.

TABLE OF CONTENTS

ADMINISTRATIVE INFORMATION

DATE OF TEST:	August 17 – September 13, 2006
DATE OF RECEIPT:	August 17, 2006
MANUFACTURER:	HID Global 9292 Jeronimo Road Irvine, CA 92618-1905
REPRESENTATIVE:	Mat Aschenberg
TEST LOCATION:	CKC Laboratories, Inc. 5046 Sierra Pines Drive Mariposa, CA 95338
TEST METHOD:	FCC Part 15 Subpart C Sections 15.207, 15.209 & 15.225, RSS-210 and RSS GEN
PURPOSE OF TEST:	To demonstrate the compliance of the 6130B iCLASS RK40 Reader with the requirements for FCC Part 15 Subpart C Sections 15.207, 15.209 & 15.225 and RSS-210 devices.

FCC TO CANADA STANDARD CORRELATION MATRIX

Canadian Standard	Canadian Section	FCC Standard	FCC Section	Test Description
RSS 210	5.5	47CFR	15.203	Antenna Connector Requirements
RSS 210	6.2.1	47CFR	15.209	General Radiated Emissions Requirement
RSS 210	6.2.2(e)	47CFR	15.225(a)*	Fundamental Requirements
RSS 210	6.2.2(e)	NA	NA	±150kHz to ±450kHz Emissions Requirement
RSS 210	6.2.2(e)	47CFR	15.225(b)*	Out of band emissions
RSS 210	6.2.2(e)	47CFR	15.225(c)*	Carrier Stability
RSS 210	6.3	47CFR	15.205	Restricted Bands of Operation
RSS 210	6.4	47CFR	15.215(c)	Frequency Stability Recommendation
RSS 210	6.5	47CFR	15.35(c)	Pulsed Operation
RSS 210	6.6	47CFR	15.207	AC Mains Conducted Emissions Requirement
	IC 3082A-1		784962	Site File No.

* Indicates that FCC Requirements are more stringent than the Canadian Equivalent.

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

Joyce Walker
Quality Assurance Administrative Manager

TEST PERSONNEL:

Randy Clark
EMC Engineer

Mike Wilkinson
EMC Engineer/Lab Manager

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

FCC 15.33(a) Frequency Ranges Tested
15.207 Conducted Emissions: 150 kHz – 30 MHz
15.209/15.225 Radiated Emissions: 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.

FCC 15.205 Restricted Bands
The fundamental operating frequency lies outside the restricted bands and therefore complies with the requirements of Section 15.205 of the FCC rules. Any spurious emission coming from the EUT was investigated to determine if any portion lies inside the restricted band. If any portion of a spurious emissions signal was found to be within a restricted band, investigation was performed to ensure compliance with Section 15.209.

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 customer declares the EUT tested by CKC Laboratories was representative of a production unit.

The following model has been tested by CKC Laboratories: **iCLASS Reader RK40**

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: **6130B iCLASS RK40 Reader**

The manufacturer states that the following additional models are identical electrically to the one which was tested, or any differences between them do not affect their EMC characteristics, and therefore they comply to the level of testing equivalent to the tested models. **6131B iCLASS RWK400 Reader**

EQUIPMENT UNDER TEST

Reader
Manuf: HID
Model: 6130B iCLASS RK40
Serial: #13
FCC ID: pending

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):
DC Power Supply
Manuf: Topward Electric Instruments Co., Ltd.
Model: TPS-2000
Serial: 920035

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 15.225 Carrier Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Cable dB	Corr dB		CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
13.561	48.7	9.6	1.0	-20.0		39.3	84.0	-44.7	V
13.562	47.6	9.6	1.0	-20.0		38.2	84.0	-45.8	V

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Section 15.225
Test Distance: 10 Meters

NOTES: V = Vertical Polarization

COMMENTS: Equipment is an iCLASS Reader operating on a frequency of 13.56 MHz. The EUT is mounted vertically on a wooden support structure to simulate normal installation. DC power supply is bonded to ground. Test data is corrected for proper test distance using 40dB per decade correction factor in accordance with 15.31. Frequency Range Investigated: Carrier. Temperature: 31ºC, Relative Humidity: 35%.

Table 2: FCC 15.207 Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Lisn dB	HPF dB	Cable dB		CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
4.267000	9.0	0.4	0.1	11.0		20.5	46.0	-25.5	B
13.560300	46.1	0.4	0.1	10.9		57.5	60.0	-2.5	WQ
13.560300	32.0	0.4	0.1	10.9		43.4	50.0	-6.6	WA
13.560300	18.1	0.5	0.1	10.9		29.6	50.0	-20.4	BA
27.119950	25.3	0.4	0.1	11.0		36.8	50.0	-13.2	B
27.123300	25.5	0.5	0.1	11.0		37.1	50.0	-12.9	W

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Section 15.207

NOTES: Q = Quasi Peak Reading
A = Average Reading
B = Black Lead
W = White Lead

COMMENTS: Equipment is an iCLASS Reader operating on a frequency of 13.56 MHz. The EUT is mounted vertically on a support structure to simulate normal installation. DC power supply is bonded to ground. Frequency Range Investigated: 150kHz - 30MHz. Temperature: 31°C, Relative Humidity: 35%.

Table 3: FCC 15.209 Highest Radiated Emission Levels: 9 kHz - 30 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Ant dB	Corr dB		CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
27.060	20.4	1.4	6.6	-20.0		8.4	29.5	-21.1	H
27.122	29.3	1.4	6.6	-20.0		17.3	29.5	-12.2	V
27.123	36.1	1.4	6.6	-20.0		24.1	29.5	-5.4	HQ
27.165	23.0	1.4	6.6	-20.0		11.0	29.5	-18.5	H
27.186	20.1	1.4	6.6	-20.0		8.1	29.5	-21.4	H

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading

COMMENTS: Equipment is an iCLASS Reader operating on a frequency of 13.56 MHz. The EUT is mounted vertically on a wooden support structure to simulate normal installation. DC power supply is bonded to ground. Test data is corrected for proper test distance using 40dB per decade correction factor in accordance with 15.31. Frequency Range Investigated: 9kHz - 30 MHz. Temperature: 31ºC, Relative Humidity: 35%.

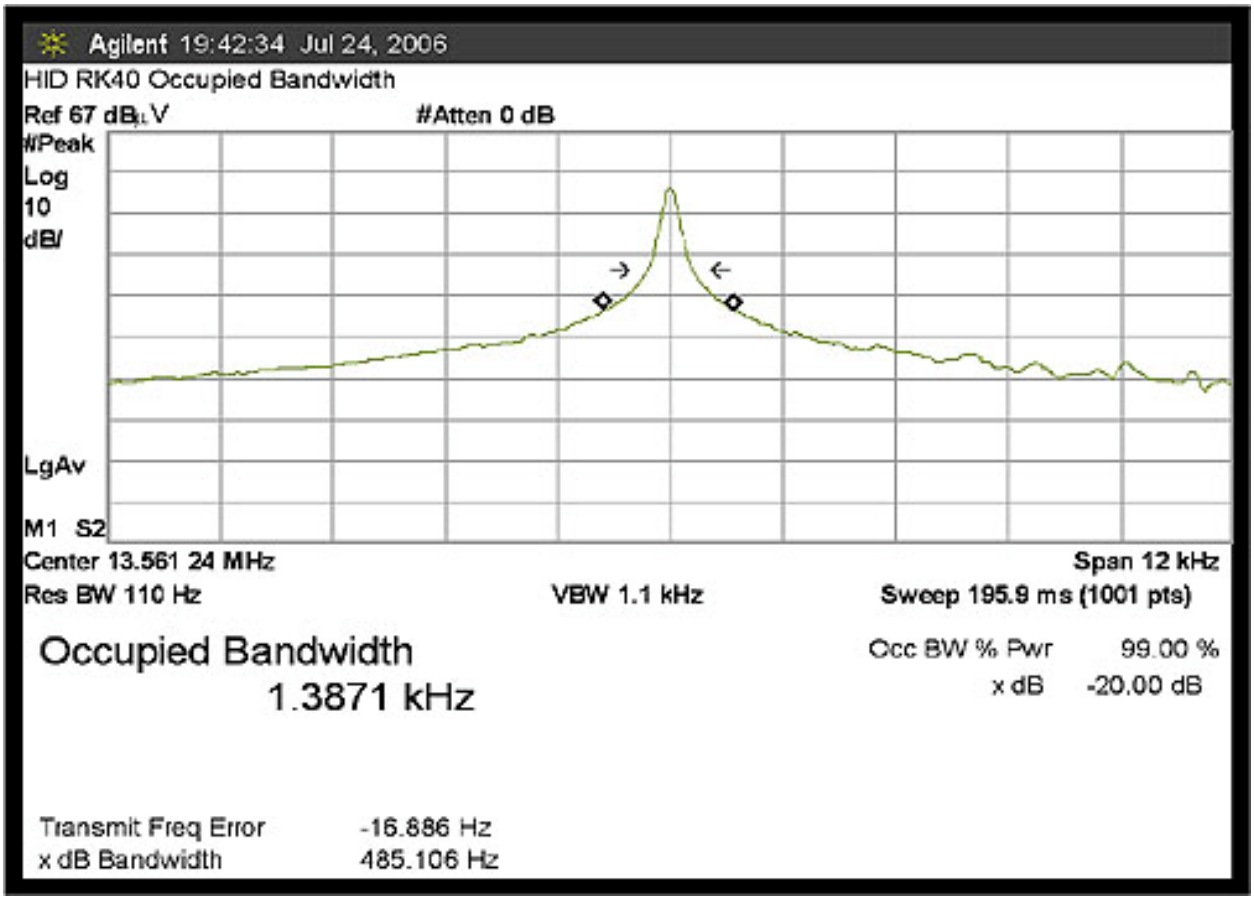
Table 4: FCC 15.209 Six Highest Radiated Emission Levels: 30-1000 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
40.694	36.9	12.0	-27.0	1.7	10.0	33.6	40.0	-6.4	VQ
54.252	41.8	7.3	-26.8	2.0	10.0	34.3	40.0	-5.7	V
81.367	40.4	6.9	-27.0	2.5	10.0	32.8	40.0	-7.2	V
284.789	35.8	12.6	-26.1	5.4	10.0	37.7	46.0	-8.3	V
284.792	38.6	12.6	-26.1	5.4	10.0	40.5	46.0	-5.5	HQ
311.917	39.5	13.2	-26.3	5.5	10.0	41.9	46.0	-4.1	VQ

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading

COMMENTS: Equipment is an iCLASS Reader operating on a frequency of 13.56 MHz. The EUT is mounted vertically on a wooden support structure to simulate normal installation. DC power supply is bonded to ground. Test data is corrected for proper test distance using 20dB per decade correction factor in accordance with 15.31. Frequency Range Investigated: 30-1000 MHz. Temperature: 31ºC, Relative Humidity: 35%.

OCCUPIED BANDWIDTH



FREQUENCY STABILITY

Test Conditions: EUT was placed inside the temperature chamber and was transmitting continuously. SA RBW =10 kHz, VBW = 10 kHz, Span = 100 kHz.

Customer:	HID Global
WO#:	85597
Test Engineer:	Mike Wilkinson

Device Model #:	RK40	
Operating Voltage:	12	**VDC**
Frequency Limit:	0.01	**%**

Temperature Variations

		Channel 1 (MHz)	**Dev. (MHz)**
Channel Frequency:		13.561280	
Temp (C)	Voltage		
-20	12	13.561225	0.00005
-10	12	13.561260	0.00002
0	12	13.561265	0.00001
10	12	13.561262	0.00002
20	12	13.561280	0.00000
30	12	13.561299	0.00002
40	12	13.561419	0.00014
50	12	13.561405	0.00013

Voltage Variations (±15%)

20	10.2	13.561280	0.00000
20	12	13.561280	0.00000
20	13.8	13.561291	0.00001

Max Deviation (MHz)	**0.00014**
	PASS

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. 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

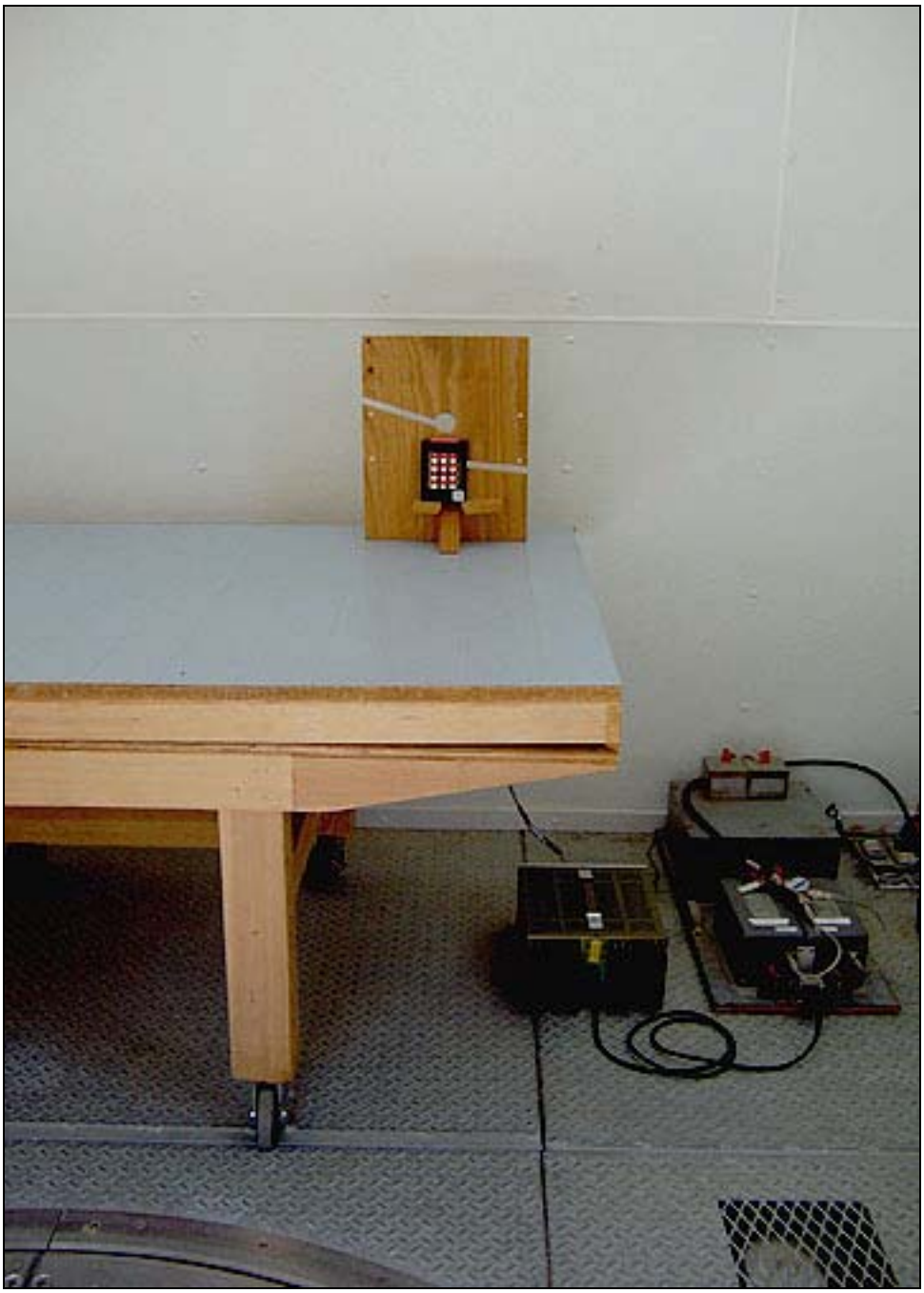
The EUT was mounted on a cart 80 cm above the conductive grid. During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 1000 MHz was scanned 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 and raising and lowering the antenna from one to four meters 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

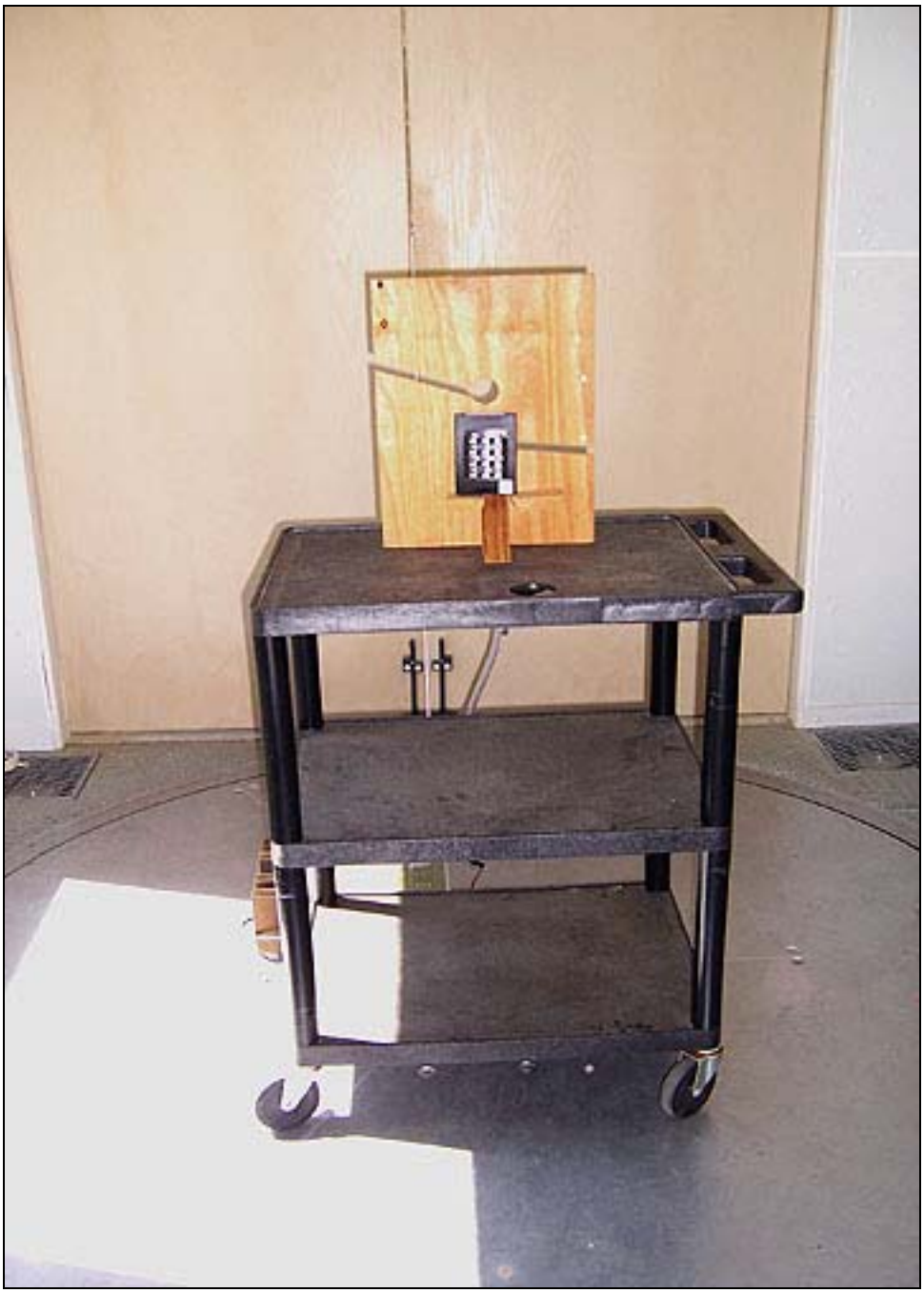
TEST SETUP PHOTOGRAPHS

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS

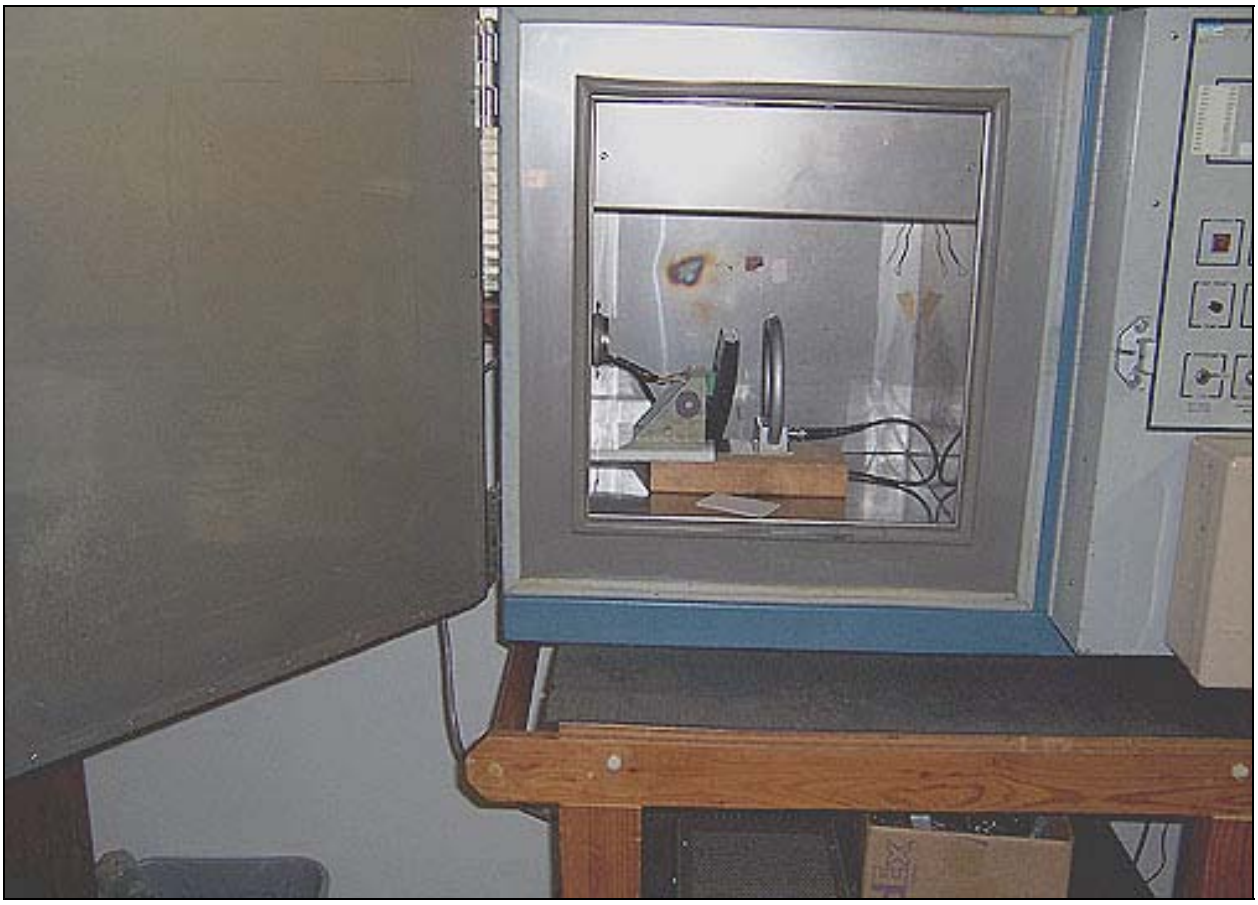


Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Back View

PHOTOGRAPH SHOWING TEMPERATURE TESTING



APPENDIX B

TEST EQUIPMENT LIST

FCC 15.225 & 15.209 9 kHz – 30 MHz

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
EMCO Loop Antenna	1074	05/13/2005	05/13/2007	00226

FCC 15.207

Function	S/N	Calibration Date	Cal Due Date	Asset #
150kHz HP Filter TTE	G7754	03/09/2006	03/09/2008	02608
LISN, 8028-50-TS-24-BNC	8379276, 280	06/03/2005	06/03/2007	1248 & 1249
10 dB Attenuator 10W	None	08/18/2005	08/18/2007	P04255
Spectrum Analyzer (RF Section)	2007A01066	02/16/2005	02/16/2007	01184
Spectrum Analyzer (Display)	2005A01550	02/16/2005	02/16/2007	01183
QP Adapter	2043A00104	02/16/2005	02/16/2007	00069

FCC 15.209 30-1000 MHz

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
Chase CBL6111C Bilog	2456	06/07/2005	06/07/2007	01991
HP 8447D Preamp	1937A02604	03/11/2005	03/11/2007	00099

Frequency Stability

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer HP 8564E	3623A00539	08/01/2006	08/01/2008	1406
Temp Chamber Thermotron S-1.2	11899	01/24/2005	01/24/2007	01879
MiniMax				
Thermometer Omega HH-26K	T-202884	01/18/2005	01/18/2007	02242
Multimeter Fluke 8520A	2905006	04/25/2005	04/25/2007	02369

APPENDIX C:

MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID Global**
Specification: **FCC 15.225(a)**
Work Order #: **85597** Date: 9/7/2006
Test Type: **Radiated Scan** Time: 13:40:40
Equipment: **iCLASS Reader** Sequence#: 8
Manufacturer: HID Tested By: Mike Wilkinson
Model: RK40
S/N: #13

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

Function	Manufacturer	Model #	S/N
iCLASS Reader*	HID	RK40	#13

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd.	TPS-2000	920035

Test Conditions / Notes:

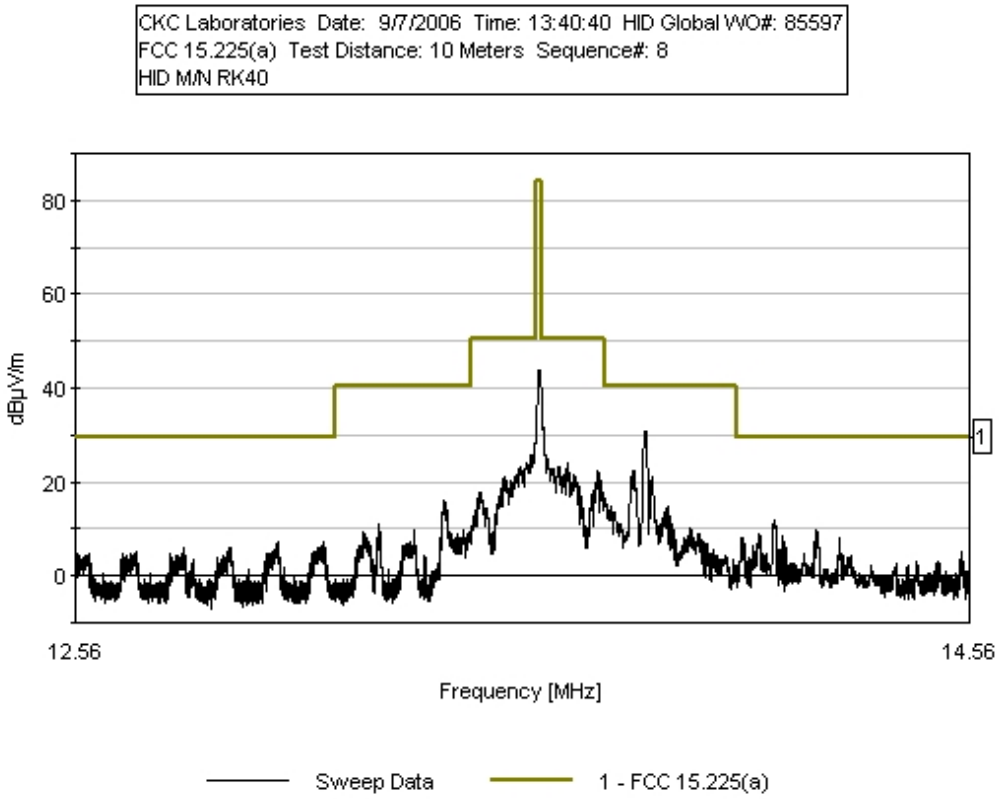
Equipment is an iCLASS Reader operating on a frequency of 13.56 MHz. The EUT is mounted vertically on a wooden support structure to simulate normal installation. DC power supply is bonded to ground. Test data is corrected for proper test distance using 40dB per decade correction factor in accordance with 15.31. Frequency Range Investigated: Carrier. Temperature: 31ºC, Relative Humidity: 35%.

Transducer Legend:

T1=Cable - Site D 10m 9k-1G T2=Mag Loop - AN 00226 - 9kHz-30M
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	13.561M	48.7	+1.0	+9.6	-20.0		+0.0	39.3	84.0	-44.7	Verti 100
2	13.562M	47.6	+1.0	+9.6	-20.0		+0.0	38.2	84.0	-45.8	Vert 100


CKC Laboratories Date: 9/7/2006 Time: 13:40:40 HID Global WO#: 85597
FCC 15.225(a) Test Distance: 10 Meters Sequence#: 8
HID M/N RK40
80
60
40
20
0
dBµV/m
1
12.56
14.56
Frequency [MHz]
Sweep Data
1 - FCC 15.225(a)

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID Global**
Specification: **FCC 15.207 - AVE**
Work Order #: **85597** Date: 9/7/2006
Test Type: **Conducted Emissions** Time: 10:25:27
Equipment: **iCLASS Reader** Sequence#: 15
Manufacturer: HID Tested By: Mike Wilkinson
Model: RK40 120V 60Hz
S/N: #13

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

Function	Manufacturer	Model #	S/N
iCLASS Reader*	HID	RK40	#13

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd.	TPS-2000	920035

Test Conditions / Notes:

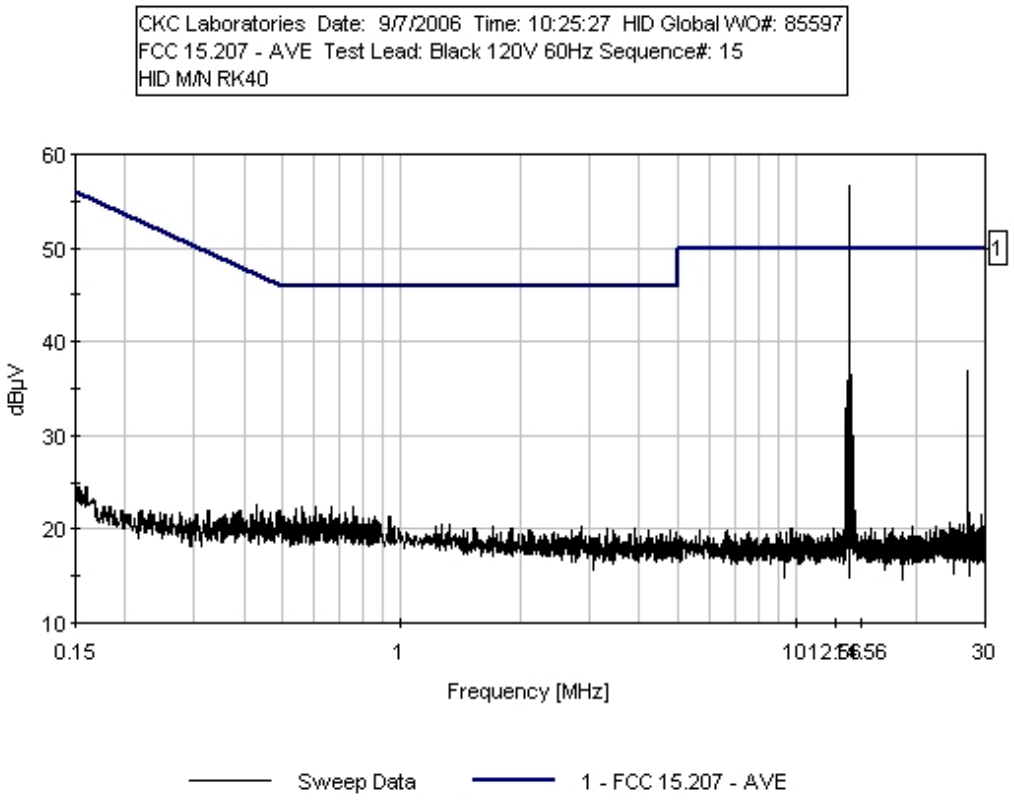
Equipment is an iCLASS Reader operating on a frequency of 13.56 MHz. The EUT is mounted vertically on a support structure to simulate normal installation. DC power supply is bonded to ground. Frequency Range Investigated: 150 kHz – 30 MHz. Temperature: 31ºC, Relative Humidity: 35%.

Transducer Legend:

T1=LISN Insertion Loss s/n276 T2=Filter 150kHz HP AN02608
T3=Cable - Site D LISN 100k-30M

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	27.120M	25.3	+0.4	+0.1	+11.0		+0.0	36.8	50.0	-13.2	Black
2	13.560M Ave	18.1	+0.5	+0.1	+10.9		+0.0	29.6	50.0	-20.4	Black
^	13.556M	45.1	+0.5	+0.1	+10.9		+0.0	56.6	50.0	+6.6	Black
4	4.267M	9.0	+0.4	+0.1	+11.0		+0.0	20.5	46.0	-25.5	Black
5	311.000k	10.9	+0.3	+0.1	+11.9		+0.0	23.2	49.9	-26.7	Black
6	14.860M	11.5	+0.4	+0.1	+10.8		+0.0	22.8	50.0	-27.2	Black
7	233.300k	10.8	+0.4	+0.2	+11.8		+0.0	23.2	52.3	-29.1	Black
8	11.680M	9.0	+0.5	+0.1	+10.9		+0.0	20.5	50.0	-29.5	Black
9	175.600k	11.0	+0.4	+0.3	+11.7		+0.0	23.4	54.7	-31.3	Black


CKC Laboratories Date: 9/7/2006 Time: 10:25:27 HID Global WO#: 85597
FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 15
HID M/N RK40
60
50
40
30
20
10
dBµV
0.15
1
30
Frequency [MHz]
1
Sweep Data
1 - FCC 15.207 - AVE

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID Global**
Specification: **FCC 15.207 - AVE**
Work Order #: **85597** Date: 9/7/2006
Test Type: **Conducted Emissions** Time: 10:12:12
Equipment: **iCLASS Reader** Sequence#: 14
Manufacturer: HID Tested By: Mike Wilkinson
Model: RK40 120V 60Hz
S/N: #13

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

Function	Manufacturer	Model #	S/N
iCLASS Reader*	HID	RK40	#13

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd.	TPS-2000	920035

Test Conditions / Notes:

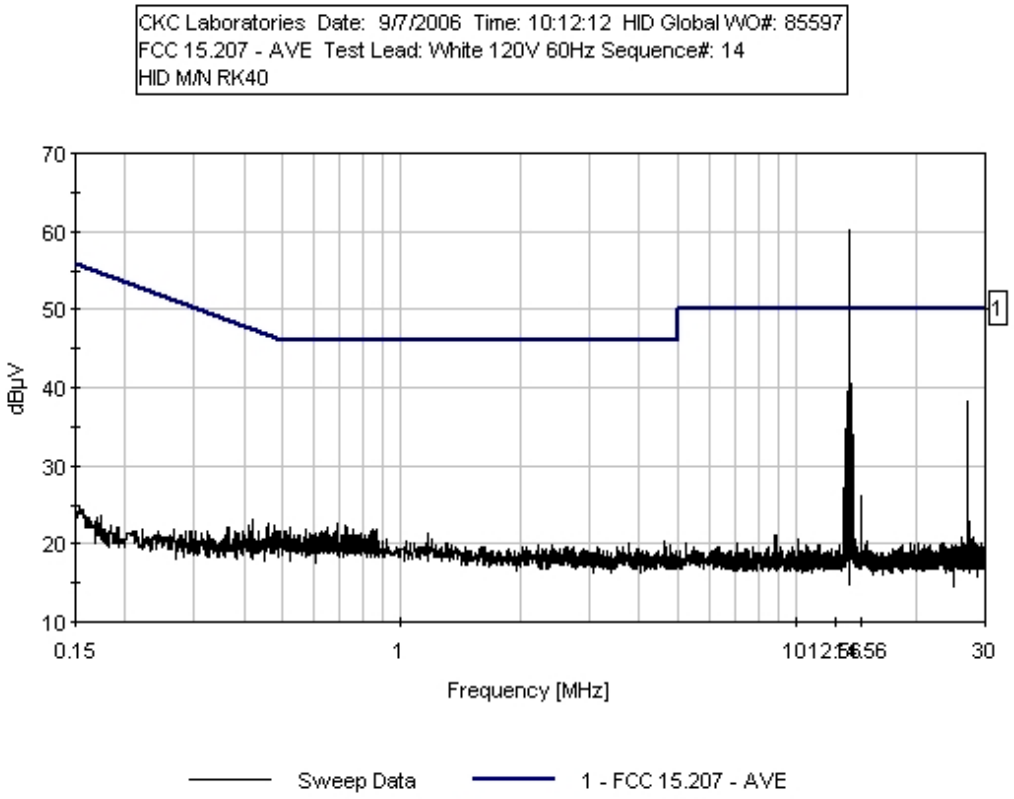
Equipment is an iCLASS Reader operating on a frequency of 13.56 MHz. The EUT is mounted vertically on a support structure to simulate normal installation. DC power supply is bonded to ground. Frequency Range Investigated: 150 kHz – 30 MHz. Temperature: 31ºC, Relative Humidity: 35%.

Transducer Legend:

T1=LISN Insertion Loss s/n280 T2=Filter 150kHz HP AN02608
T3=Cable - Site D LISN 100k-30M

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1 QP	13.560M	46.1	+0.4	+0.1	+10.9		+0.0	57.5	60.0	-2.5	White
^	13.554M	48.8	+0.4	+0.1	+10.9		+0.0	60.2	50.0	+10.2	White
3 Ave	13.560M	32.0	+0.4	+0.1	+10.9		+0.0	43.4	50.0	-6.6	White
4	27.123M	25.5	+0.5	+0.1	+11.0		+0.0	37.1	50.0	-12.9	White
5	394.800k	9.6	+0.3	+0.2	+12.0		+0.0	22.1	48.0	-25.9	White
6	265.000k	9.7	+0.2	+0.2	+11.9		+0.0	22.0	51.3	-29.3	White
7	9.977M	9.2	+0.4	+0.1	+10.8		+0.0	20.5	50.0	-29.5	White
8	15.460M	8.5	+0.4	+0.1	+10.8		+0.0	19.8	50.0	-30.2	White


CKC Laboratories Date: 9/7/2006 Time: 10:12:12 HID Global WO#: 85597
FCC 15.207 - AVE Test Lead: White 120V 60Hz Sequence#: 14
HID M/N RK40
70
60
50
40
30
20
10
dBµV
0.15
1
10
12.56
13.56
30
Frequency [MHz]
1
Sweep Data
1 - FCC 15.207 - AVE

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID Global**
Specification: **FCC 15.209**
Work Order #: **85597** Date: 9/7/2006
Test Type: **Radiated Scan** Time: 12:49:04 PM
Equipment: **iCLASS Reader** Sequence#: 4
Manufacturer: HID Tested By: Mike Wilkinson
Model: RK40
S/N: #13

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

Function	Manufacturer	Model #	S/N
iCLASS Reader*	HID	RK40	#13

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd.	TPS-2000	920035

Test Conditions / Notes:

Equipment is an iCLASS Reader operating on a frequency of 13.56 MHz. The EUT is mounted vertically on a wooden support structure to simulate normal installation. DC power supply is bonded to ground. Test data is corrected for proper test distance using 40dB per decade correction factor in accordance with 15.31. Frequency Range Investigated: 9 kHz - 30 MHz. Temperature: 31ºC, Relative Humidity: 35%.

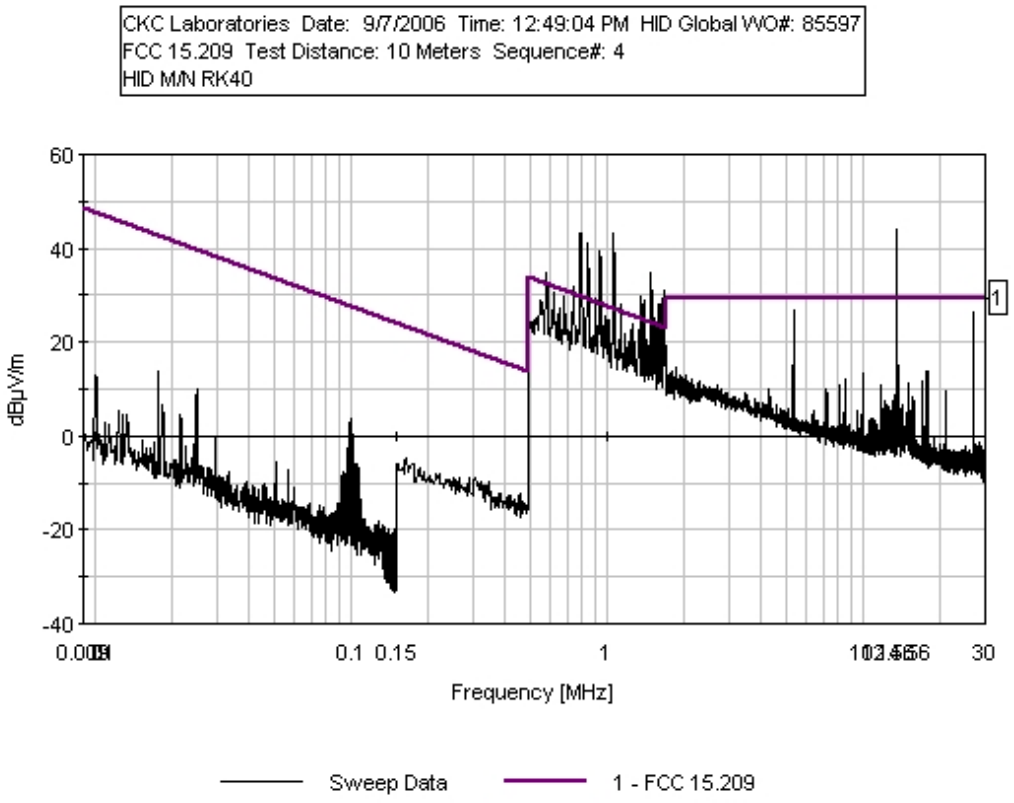
Transducer Legend:

T1=Cable - Site D 10m 9k-1G T2=Mag Loop - AN 00226 - 9kHz-30M
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	27.123M QP	36.1	+1.4	+6.6	-20.0		+0.0	24.1	29.5	-5.4	Horiz 100
^	27.123M	38.8	+1.4	+6.6	-20.0		+0.0	26.8	29.5	-2.7	Horiz 100
3	27.122M	29.3	+1.4	+6.6	-20.0		+0.0	17.3	29.5	-12.2	Verti 100
4	27.165M	23.0	+1.4	+6.6	-20.0		+0.0	11.0	29.5	-18.5	Horiz 100
5	27.060M	20.4	+1.4	+6.6	-20.0		+0.0	8.4	29.5	-21.1	Horiz 100
6	27.186M	20.1	+1.4	+6.6	-20.0		+0.0	8.1	29.5	-21.4	Horiz 100
7	27.256M	18.5	+1.4	+6.6	-20.0		+0.0	6.5	29.5	-23.0	Horiz 100
8	99.444k Ambient	53.6	+0.2	+10.0	-60.0		+0.0	3.8	27.6	-23.8	Horiz 100

9	17.655k	60.5	+0.1	+13.3	-60.0	+0.0	13.9	42.7	-28.8	Horiz
	Ambient									100
10	24.931k	57.8	+0.1	+12.1	-60.0	+0.0	10.0	39.7	-29.7	Horiz
	Ambient									100
11	10.004k	56.9	+0.1	+15.8	-60.0	+0.0	12.8	47.6	-34.8	Horiz
	Ambient									100



Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID Global**
Specification: **15.225/15.209**
Work Order #: **85597** Date: 8/17/2006
Test Type: **Radiated Scan** Time: 15:48:35
Equipment: **iCLASS Reader** Sequence#: 1
Manufacturer: HID Tested By: Randal Clark
Model: RK40
S/N: #13

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

Function	Manufacturer	Model #	S/N
iCLASS Reader*	HID	RK40	#13

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd.	TPS-2000	920035

Test Conditions / Notes:

Equipment is an iCLASS Reader operating on a frequency of 13.56 MHz. The EUT is mounted vertically on a wooden support structure to simulate normal installation. DC power supply is bonded to ground. Test data is corrected for proper test distance using 20dB per decade correction factor in accordance with 15.31. Frequency Range Investigated: 30-1000 MHz. Temperature: 31ºC, Relative Humidity: 35%.

Transducer Legend:

T1=Cable - Site D 10m 9k-1G T2=Amp - S/N 604
T3=Bilog Site D

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	311.917M QP	39.5	+5.5	-26.3	+13.2		+10.0	41.9	46.0	-4.1	Verti 100
^	311.911M	41.1	+5.5	-26.3	+13.2		+10.0	43.5	46.0	-2.5	Verti 100
3	284.792M QP	38.6	+5.4	-26.1	+12.6		+10.0	40.5	46.0	-5.5	Horiz 271
^	284.794M	40.5	+5.4	-26.1	+12.6		+10.0	42.4	46.0	-3.6	Horiz 271
5	54.252M	41.8	+2.0	-26.8	+7.3		+10.0	34.3	40.0	-5.7	Verti 100
6	40.694M QP	36.9	+1.7	-27.0	+12.0		+10.0	33.6	40.0	-6.4	Verti 100
^	40.688M	39.5	+1.7	-27.0	+12.0		+10.0	36.2	40.0	-3.8	Verti 100
8	81.367M	40.4	+2.5	-27.0	+6.9		+10.0	32.8	40.0	-7.2	Verti 100
9	284.789M	35.8	+5.4	-26.1	+12.6		+10.0	37.7	46.0	-8.3	Verti 100
10	339.032M	33.5	+5.6	-26.4	+13.9		+10.0	36.6	46.0	-9.4	Verti 100

11	298.347M	33.1	+5.5	-26.2	+12.8	+10.0	35.2	46.0	-10.8	Verti 100
12	325.477M	32.3	+5.6	-26.4	+13.5	+10.0	35.0	46.0	-11.0	Verti 100
13	339.026M	31.4	+5.6	-26.4	+13.9	+10.0	34.5	46.0	-11.5	Horiz 335
14	67.815M	36.9	+2.3	-26.8	+5.8	+10.0	28.2	40.0	-11.8	Verti 100
15	298.350M	32.1	+5.5	-26.2	+12.8	+10.0	34.2	46.0	-11.8	Horiz 271
16	366.166M	30.2	+5.9	-26.6	+14.6	+10.0	34.1	46.0	-11.9	Verti 100
17	40.684M	31.0	+1.7	-27.0	+12.0	+10.0	27.7	40.0	-12.3	Horiz 307
18	393.276M	28.7	+6.3	-26.8	+15.2	+10.0	33.4	46.0	-12.6	Verti 100
19	379.726M	28.0	+6.1	-26.7	+14.9	+10.0	32.3	46.0	-13.7	Verti 100
20	325.465M	28.7	+5.6	-26.4	+13.5	+10.0	31.4	46.0	-14.6	Horiz 335
21	271.230M	28.4	+5.3	-26.0	+12.4	+10.0	30.1	46.0	-15.9	Horiz 271
22	352.592M	26.2	+5.6	-26.5	+14.3	+10.0	29.6	46.0	-16.4	Verti 100
23	271.224M	27.9	+5.3	-26.0	+12.4	+10.0	29.6	46.0	-16.4	Verti 100
24	230.548M	29.8	+4.7	-26.2	+10.7	+10.0	29.0	46.0	-17.0	Horiz 271
25	149.176M	29.0	+3.6	-26.7	+10.4	+10.0	26.3	43.5	-17.2	Verti 100
26	54.244M	30.1	+2.0	-26.8	+7.3	+10.0	22.6	40.0	-17.4	Horiz 307
27	135.612M	28.3	+3.4	-26.7	+11.0	+10.0	26.0	43.5	-17.5	Verti 100
28	257.667M	27.0	+5.1	-26.0	+12.1	+10.0	28.2	46.0	-17.8	Verti 100
29	203.424M	29.4	+4.2	-26.5	+8.6	+10.0	25.7	43.5	-17.8	Horiz 289
30	216.990M	29.7	+4.4	-26.3	+9.7	+10.0	27.5	46.0	-18.5	Verti 104
31	216.987M	29.4	+4.4	-26.3	+9.7	+10.0	27.2	46.0	-18.8	Horiz 293
32	230.550M	27.2	+4.7	-26.2	+10.7	+10.0	26.4	46.0	-19.6	Verti 100
33	162.736M	24.8	+3.8	-26.7	+9.8	+10.0	21.7	43.5	-21.8	Verti 100