



HID CORPORATION TEST REPORT
FOR THE
6101BxU iCLASS RW100, 6111BxU iCLASS RW300 & 6121BxU iCLASS RW400
FCC PART 15 SUBPART C SECTIONS 15.207, 15.209 & 15.225 AND RSS-210
COMPLIANCE

DATE OF ISSUE: JANUARY 27, 2006

PREPARED FOR:

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Date of test: October 10, 2005 –
January 25, 2006

Report No.: FC06-002

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ADMINISTRATIVE INFORMATION

DATE OF TEST: October 10, 2005 - January 25, 2006

DATE OF RECEIPT: October 10, 2005

MANUFACTURER: HID Corporation
9292 Jeronimo Road
Irvine, CA 92718

REPRESENTATIVE: Frank de Vall

TEST LOCATION: CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

TEST METHOD: ANSI C63.4 (2003), FCC-MP5, RSS-210
and RSS-GEN

PURPOSE OF TEST: To demonstrate the compliance of the 6101BxU
iCLASS RW100, 6111BxU iCLASS RW300 &
6121BxU iCLASS RW400 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	$\pm 150\text{kHz}$ to $\pm 450\text{kHz}$ 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	15.225(e)	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

* 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:

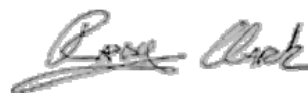


Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:



Mike Wilkinson, Lab Manager



Randy Clark, EMC Engineer

FCC 15.31(m) Number Of Channels

This device was tested on a single channel.

FCC 15.33(a) Frequency Ranges Tested

15.207 Conducted Emissions: 150 kHz – 30 MHz

15.209 Radiated Emissions: 9 kHz – 1000 MHz

15.225 Radiated Emissions: 9 kHz – 30 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 customer declares the EUT tested by CKC Laboratories was representative of a production unit.

The following models were tested by CKC Laboratories: **6100B, 6110B & 6121B**

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:

The units tested:

6101BxU iCLASS RW100

6111BxU iCLASS RW300

6121BxU iCLASS RW400

(The "U" in the suffix characters indicate USB Module. The "x" is color.)

A "2" indicates a RS232 Module.

A "4" indicates a RS485 Module.

(These were not tested because the USB Module is worst case with an extra 6 MHz oscillator.)

These versions should be added as variants, however:

6101Bx2 iCLASS RW100

6111Bx2 iCLASS RW300

6121Bx2 iCLASS RW400

6101Bx4 iCLASS RW100

6111Bx4 iCLASS RW300

6121Bx4 iCLASS RW400

This list can be shortened by defining the suffix character.

If no module is plugged in, the models become:

6100B iCLASS R10

6110B iCLASS R30

6120B iCLASS R40

EQUIPMENT UNDER TEST

Universal 13.56 MHz Reader

Manuf: HID
Model: 6101BxU iCLASS RW100
Serial: RW100-USB
FCC ID: pending

Universal 13.56 MHz Reader

Manuf: HID
Model: 6111BxU iCLASS RW300
Serial: RW300-USB
FCC ID: pending

Universal 13.56 MHz Reader

Manuf: HID
Model: 6120B iCLASS R40
Serial: RW400-USB
FCC ID: pending

PERIPHERAL DEVICES

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

DC Power Supply

Manuf: Topward
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				CORRECTED READING dBμV	SPEC LIMIT dBμV	MARGIN dB	NOTES
		Cable dB	Lisn dB	HPF dB	Att dB				
13.562200	22.1	0.4	0.4	0.1	10.3	33.3	50.0	-16.7	WA-1
13.562200	19.6	0.4	0.4	0.1	10.3	30.8	50.0	-19.2	WA-3
13.562500	19.1	0.4	0.4	0.1	10.3	30.3	50.0	-19.7	WA-2
13.820000	20.8	0.4	0.4	0.1	10.3	32.0	50.0	-18.0	W-2
15.130000	20.4	0.4	0.4	0.1	10.3	31.6	50.0	-18.4	W-2
17.820000	17.5	0.5	0.4	0.2	10.3	28.9	50.0	-21.1	W-2

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

NOTES:
W = White Lead
A = Average Reading
1 = 6101BxU iCLASS RW100
2 = 6111BxU iCLASS RW300
3 = 6121BxU iCLASS RW400

COMMENTS: EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Frequency range investigated: 150 kHz to 30 MHz. Temperature: 22°C, Relative Humidity: 48%.

Table 2: FCC 15.209 Six Highest Radiated Emission Levels: 9 kHz - 30 MHz

FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV/m	SPEC LIMIT dBμV/m	MARGIN dB	NOTES
		Cable dB	Corr dB	Ant dB					
27.121	21.1	1.1	-20.0	6.6		8.8	29.5	-20.7	H-3
27.124	18.0	1.1	-20.0	6.6		5.7	29.5	-23.8	V-3
27.124	16.5	1.1	-20.0	6.6		4.2	29.5	-25.3	V-1
27.125	20.1	1.1	-20.0	6.6		7.8	29.5	-21.7	V-2
27.125	12.0	1.1	-20.0	6.6		-0.3	29.5	-29.8	H-2
27.126	10.2	1.1	-20.0	6.6		-2.1	29.5	-31.6	H-1

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
1 = 6101BxU iCLASS RW100
2 = 6111BxU iCLASS RW300
3 = 6121BxU iCLASS RW400

COMMENTS: EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Test distance correction factor used in accordance with 15.31, 40dB per decade to correct test data for comparison with the limit at 30 and 300 meters as appropriate. Frequency Range Investigated: 9kHz - 30MHz. Temperature: 22°C, Relative Humidity: 48%.

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

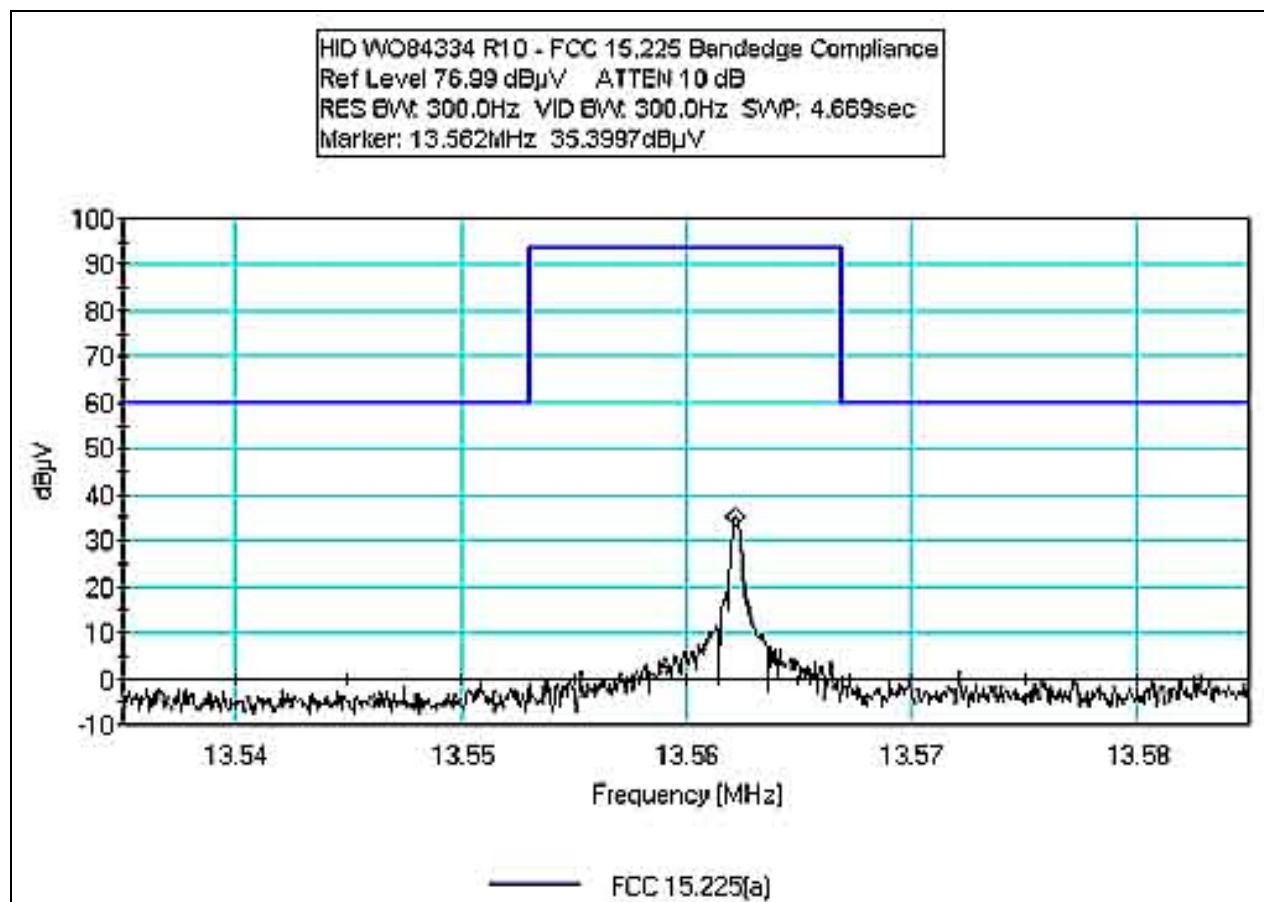
FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V/m	SPEC LIMIT dB μ V/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
30.000	32.5	17.9	-27.2	1.2	10.0	34.4	40.0	-5.6	VQ-1
40.685	41.4	12.0	-27.0	1.4	10.0	37.8	40.0	-2.2	VQ-1
40.687	37.8	12.0	-27.0	1.4	10.0	34.2	40.0	-5.8	V-2
40.691	41.2	12.0	-27.0	1.4	10.0	37.6	40.0	-2.4	VQ-3
60.017	42.7	6.1	-26.8	1.7	10.0	33.7	40.0	-6.3	V-1
122.063	41.2	11.0	-26.7	2.5	10.0	38.0	43.5	-5.5	VQ-3

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

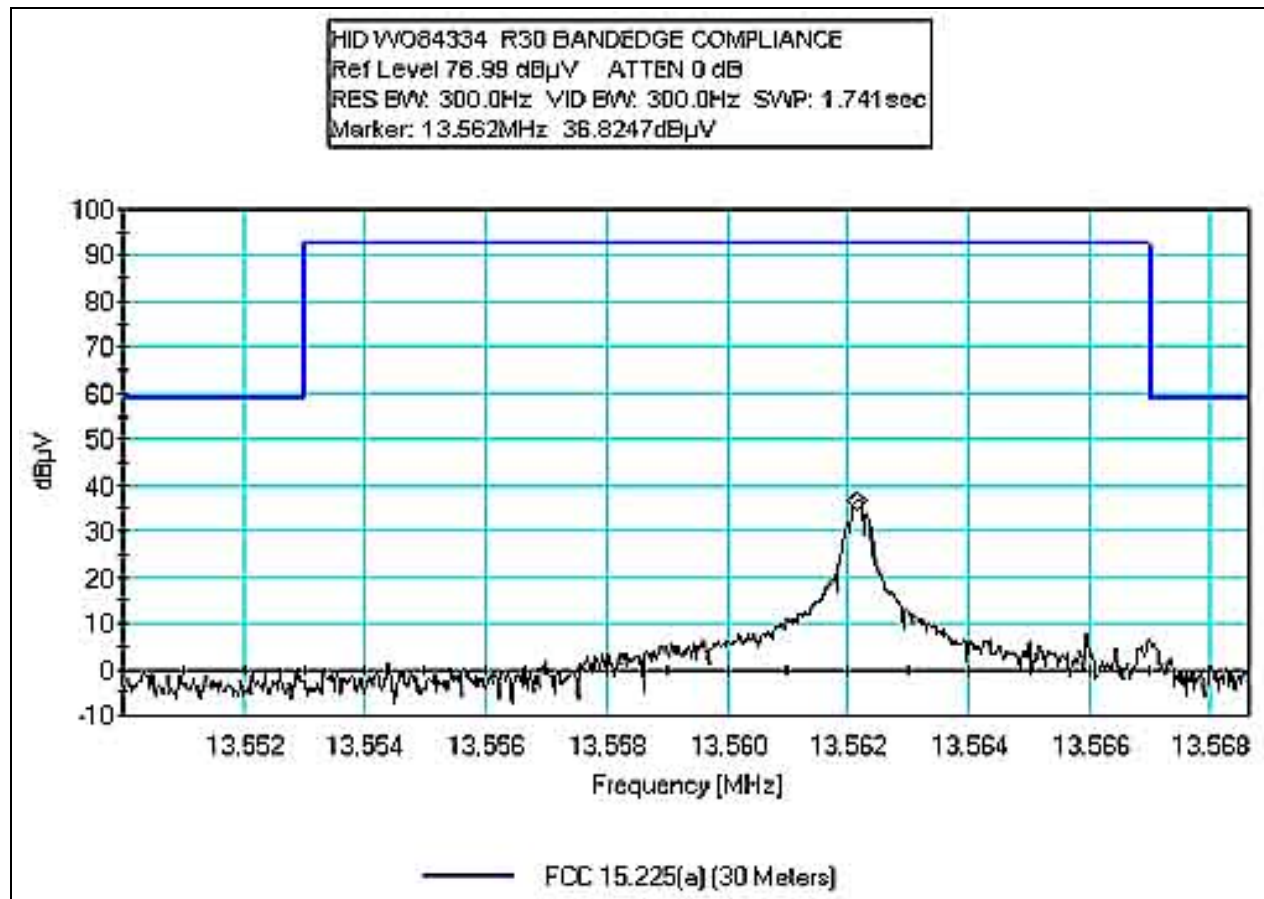
NOTES:
Q = Quasi Peak Reading
V = Vertical Polarization
1 = 6101BxU iCLASS RW100
2 = 6111BxU iCLASS RW300
3 = 6121BxU iCLASS RW400

COMMENTS: EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Test distance correction factor used in accordance with 15.35, 20dB per decade. Frequency range investigated: 30-1000 MHz. Temperature: 22°C, Relative Humidity: 48%.

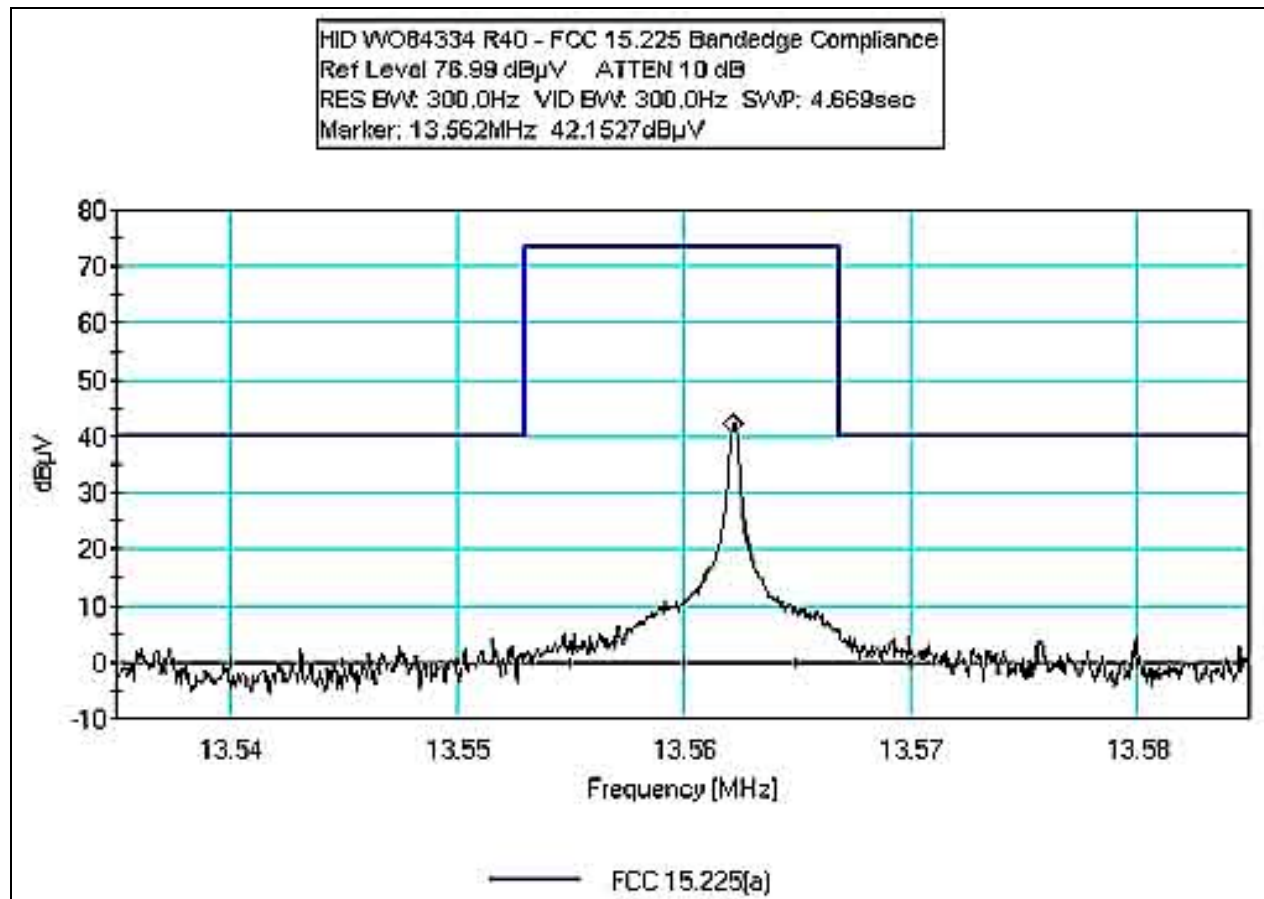
FCC 15.225(a) BAND EDGE PLOT - 6101BxU iCLASS RW100



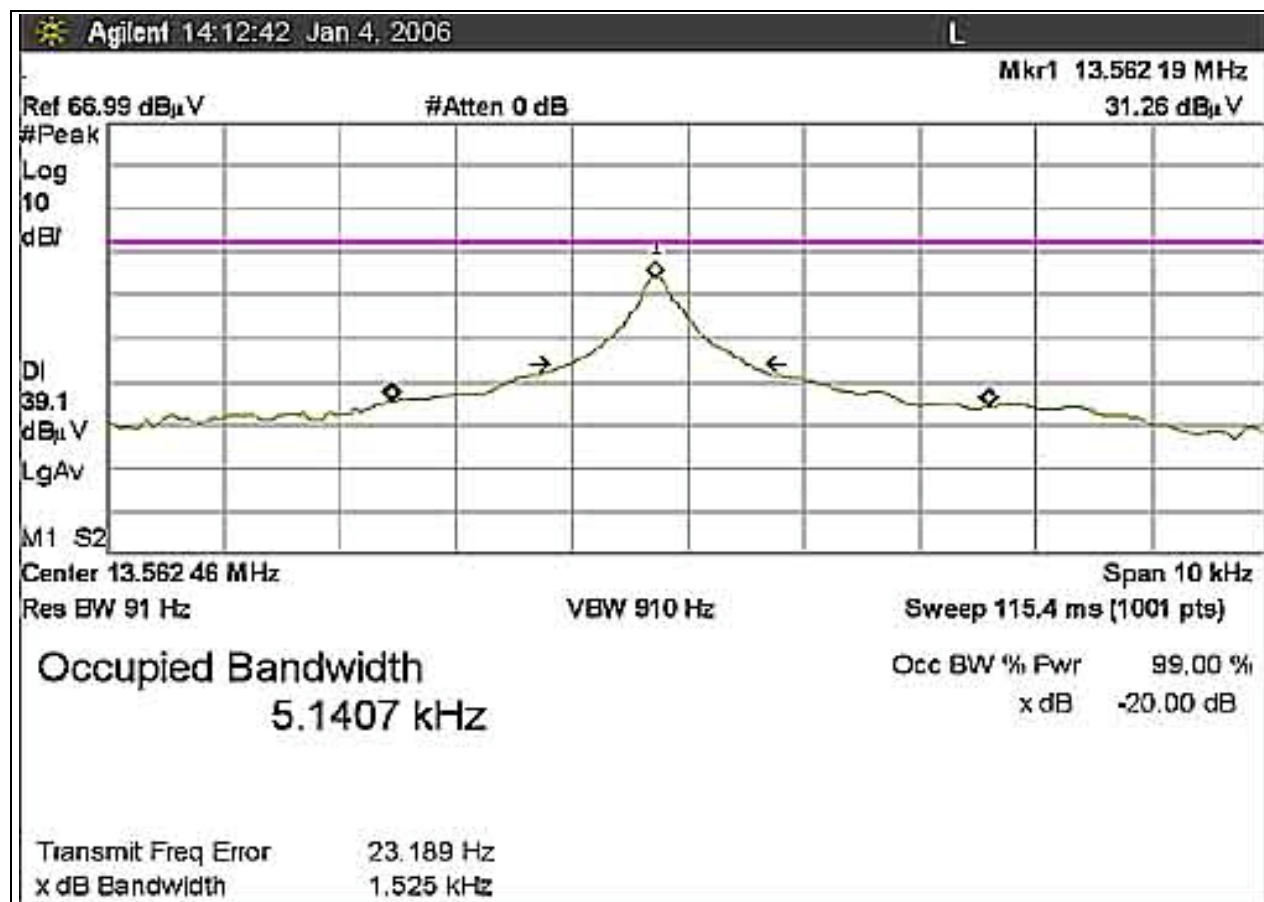
FCC 15.225(a) BANDEDGE - 6111BxU iCLASS RW300



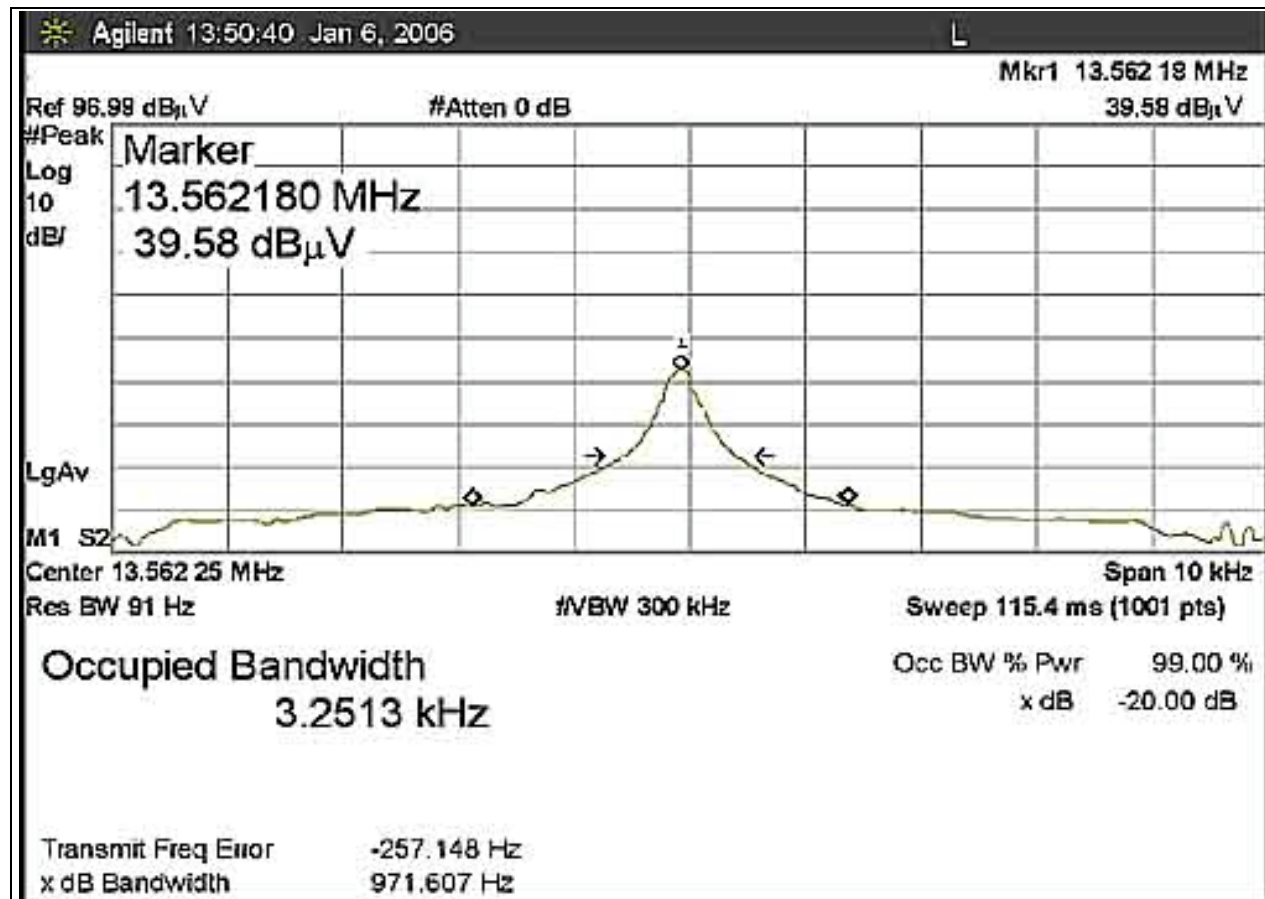
FCC 15.225(a) BANDEDGE - 6121BxU iCLASS RW400



FCC 15.215(c)/RSS-210 OCCUPIED BANDWIDTH PLOT - 6101BxU iCLASS RW100



FCC 15.215(c)/RSS-210 OCCUPIED BANDWIDTH - 6111BxU iCLASS RW300



FCC 15.215(c)/RSS-210 OCCUPIED BANDWIDTH - 6121BxU iCLASS RW400

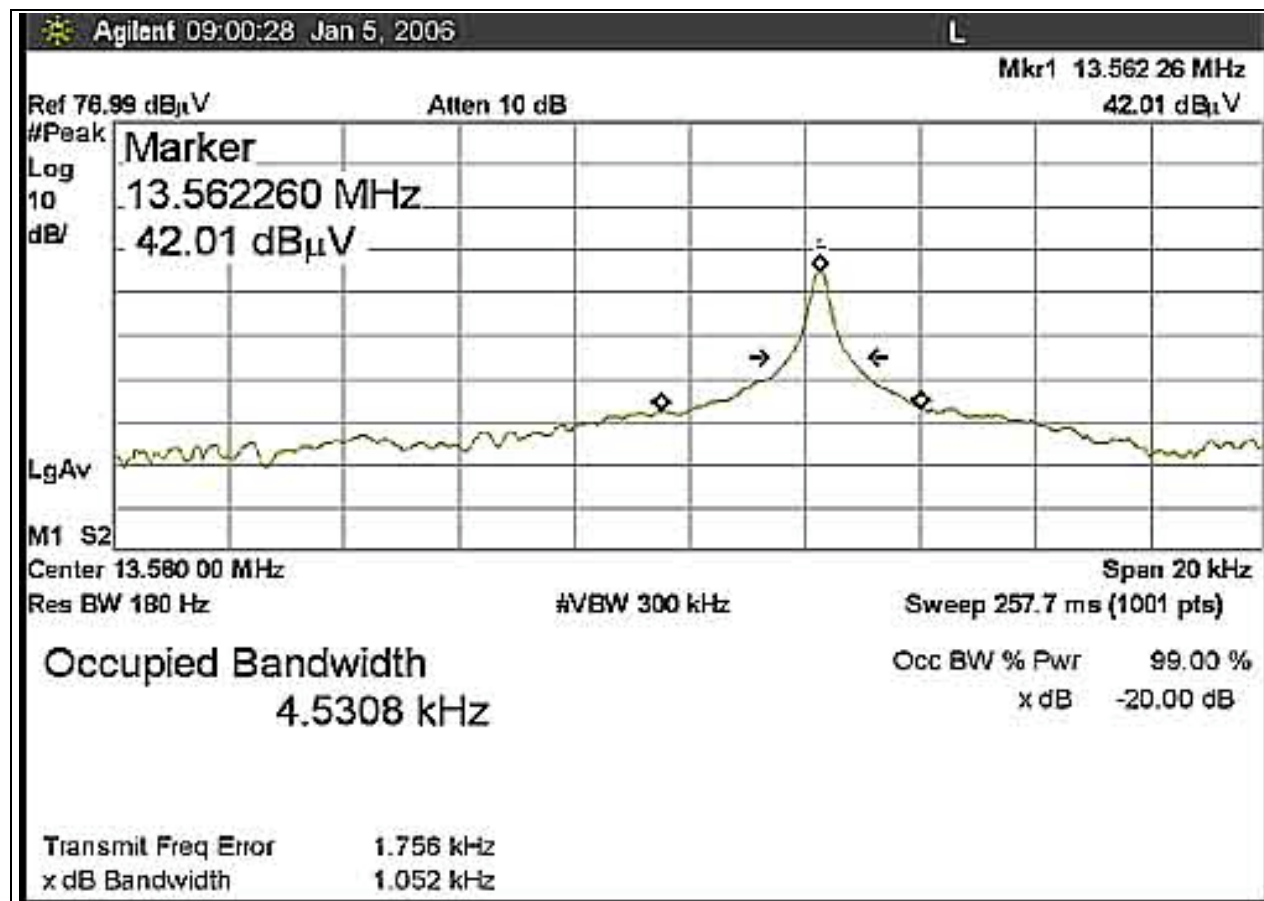


Table 4: FCC 15.225(a) Six Highest Radiated Emission Levels

FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V/m	SPEC LIMIT dB μ V/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
13.562	43.4	9.6		0.8	-19.0	34.8	84.0	-49.2	V-3
13.562	40.8	9.6		0.8	-19.0	32.2	84.0	-51.8	H-3
13.562	38.2	9.6		0.8	-19.0	29.6	84.0	-54.4	H-2
13.562	37.1	9.6		0.8	-19.0	28.5	84.0	-55.5	V-1
13.562	33.7	9.6		0.8	-19.0	25.1	84.0	-58.9	H-1
13.563	41.2	9.6		0.8	-19.0	32.6	84.0	-51.4	V-2

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

NOTES:
H = Horizontal Polarization
V = Vertical Polarization
1 = 6101BxU iCLASS RW100
2 = 6111BxU iCLASS RW300
3 = 6121BxU iCLASS RW400

COMMENTS: EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Test distance correction factor used in accordance with 15.31, 40dB per decade to correct test data for comparison with the limit at 30 and 300 meters as appropriate. Frequency Range Investigated: 9kHz - 30MHz. Temperature: 22°C, Relative Humidity: 48%.

15.225(e) FREQUENCY STABILITY AND 15.31(e) VOLTAGE VARIATIONS

Test Conditions: EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is powered via support power supply. EUT is housed in a temperature chamber with a near field antenna which is connected to a spectrum analyzer. Voltage variations performed using customer support equipment.

Customer: HID
 WO#: 84334
 Date: Jan 24 2006
 Test Engineer: Randal Clark

Device Model #: 61xxB
 Operating Voltage: 12.0 VDC
 Frequency Limit: 0.01 PPM/%

Temperature Variations

Channel Frequency:		6100B R10 (MHz)	Dev. (MHz)	6110B R30 (MHz)	Dev. (MHz)	6120B R40 (MHz)	Dev. (MHz)
		13.562		13.562		13.562	
Temp (C)	Voltage						
-30	12.0	NA	NA	NA	NA	NA	NA
-20	12.0	13.56217	0.00017	13.56211	0.00011	13.56229	0.00029
-10	12.0	13.56220	0.00020	13.56214	0.00014	13.56230	0.00030
0	12.0	13.56221	0.00021	13.56217	0.00017	13.56231	0.00031
10	12.0	13.56222	0.00022	13.56217	0.00017	13.56229	0.00029
20	12.0	13.56221	0.00021	13.56219	0.00019	13.56228	0.00028
30	12.0	13.56219	0.00019	13.56216	0.00016	13.56221	0.00021
40	12.0	13.56217	0.00017	13.56216	0.00016	13.56223	0.00023
50	12.0	13.56220	0.00020	13.56217	0.00017	13.56220	0.00020

Voltage Variations (±15%)

20	10.2	13.56221	0.00021	13.56218	0.00018	13.56225	0.00025
20	12.0	13.56221	0.00021	13.56219	0.00019	13.56228	0.00028
20	13.8	13.56220	0.00020	13.56219	0.00019	13.56225	0.00025

Max Deviation (MHz)	0.00022	0.00019	0.00031
Max Deviation (%)	0.00161	0.00142	0.00226
	PASS	PASS	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 dB μ V/m, the spectrum analyzer reading in dB μ V 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	(dB μ V)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dB μ V/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. The horn antenna was used for frequencies above 1000 MHz. 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 dB μ V, 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 μ H/+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 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 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 - 6101BxU iCLASS RW100 AC

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Side View - 6101BxU iCLASS RW100 AC

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



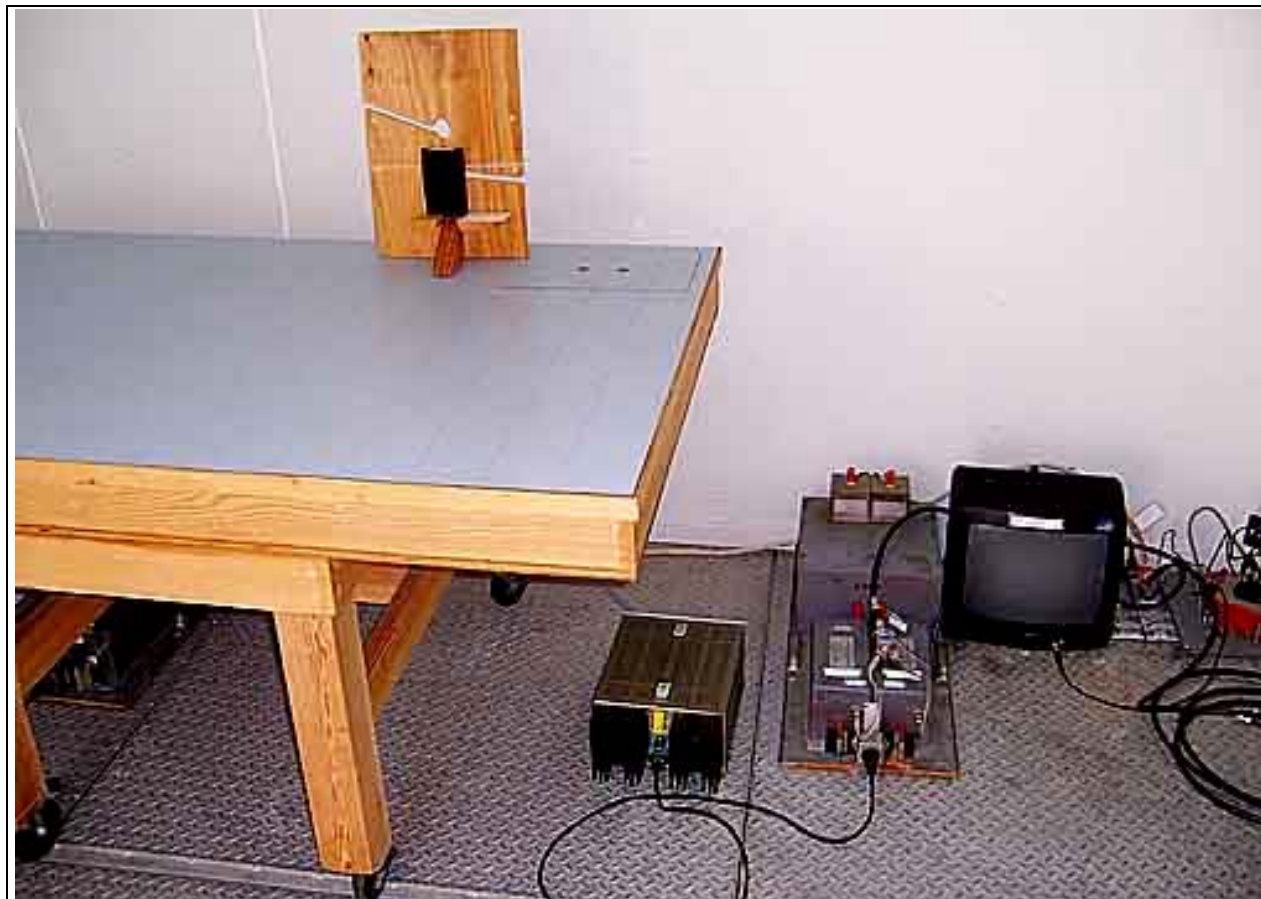
Mains Conducted Emissions - Front View - 6111BxU iCLASS RW300 AC

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Side View - 6111BxU iCLASS RW300 AC

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Front View - 6121BxU iCLASS RW400 AC

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Side View - 6121BxU iCLASS RW400 AC

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View - 6101BxU iCLASS RW100

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View - 6101BxU iCLASS RW100

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View - 6111BxU iCLASS RW300

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View - 6111BxU iCLASS RW300

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View - 6121BxU iCLASS RW400

PHOTOGRAPH SHOWING RADIATED EMISSIONS



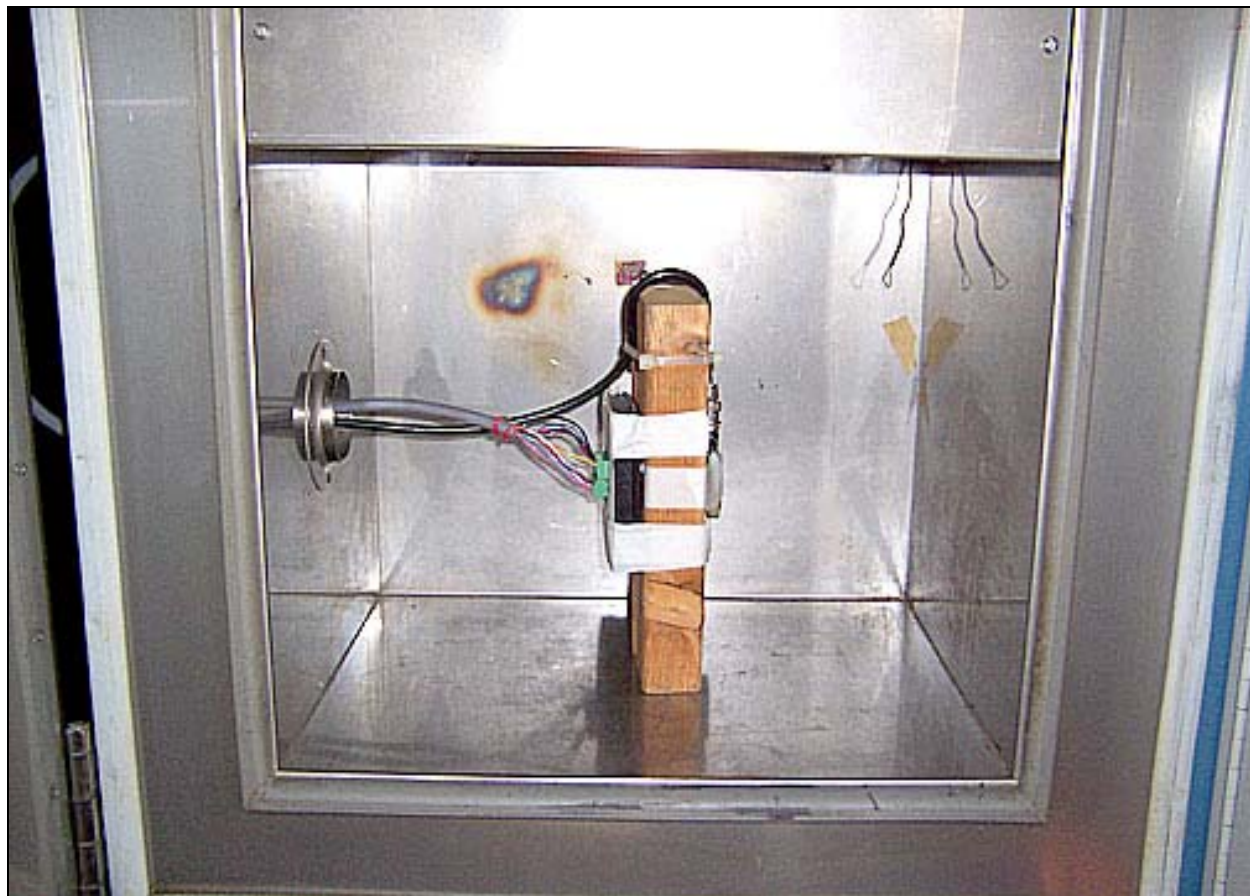
Radiated Emissions - Back View - 6121BxU iCLASS RW400

PHOTOGRAPH SHOWING TEMPERATURE TESTING



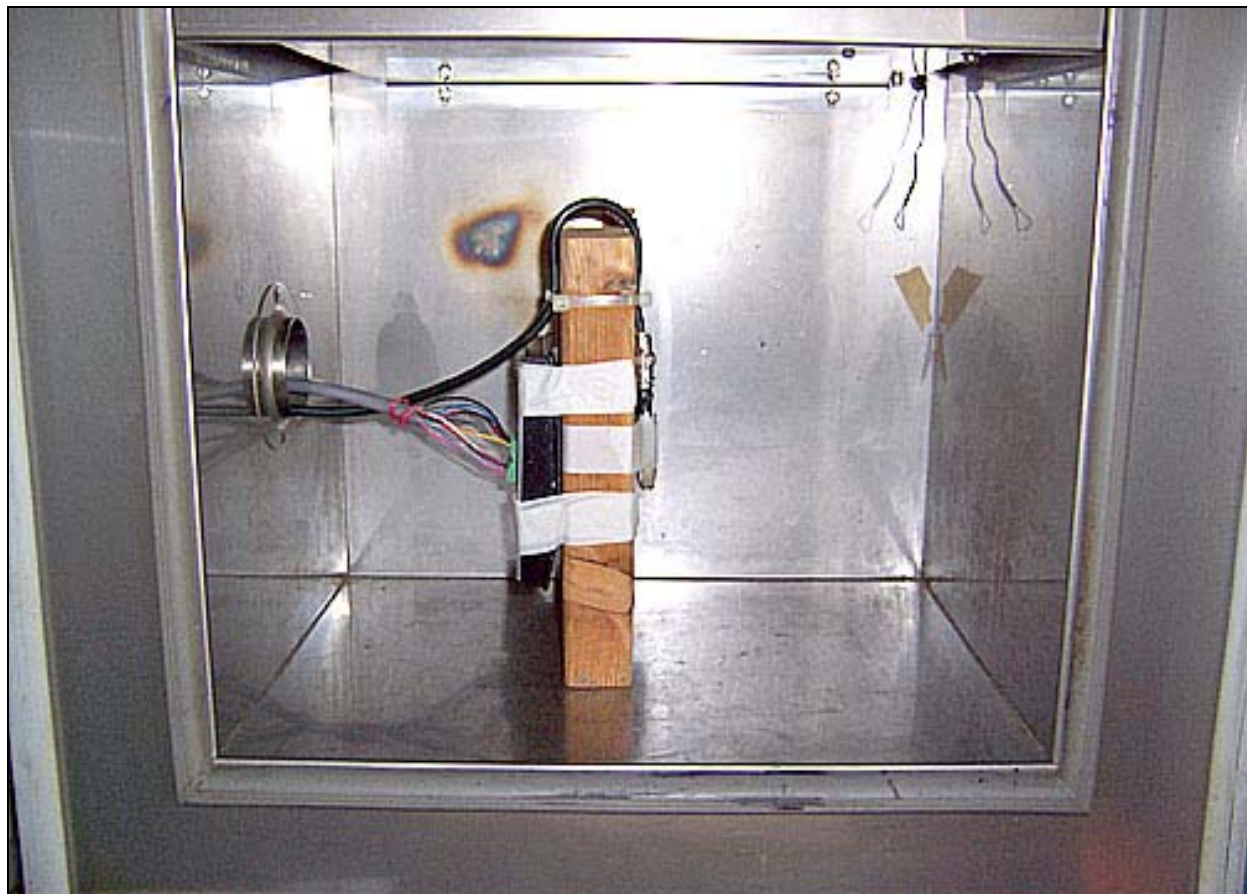
6101BxU iCLASS RW100

PHOTOGRAPH SHOWING TEMPERATURE TESTING



6111BxU iCLASS RW300

PHOTOGRAPH SHOWING TEMPERATURE TESTING



6121BxU iCLASS RW400

APPENDIX B

TEST EQUIPMENT LIST

15.207

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
LISN, 8028-50-TS-24-BNC	8379276, 280	06/03/2005	06/03/2007	1248 & 1249

15.209 9 kHz – 30 MHz and 15.225

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

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

15.225 Temperature Testing

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer-AF E4446A	02660	1/12/2005	1/12/2007	Agilent
Temp Chamber Thermotron	11899	1/24/2005	1/24/2007	01879
Thermometer Omega	T-202884	1/18/2005	1/18/2007	02242

APPENDIX C:
MEASUREMENT DATA SHEETS

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

Customer: **HID**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **84334**
 Test Type: **Conducted Emissions**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6100B**
 S/N: **RW100-USB**

Date: 1/3/2006
 Time: 13:59:44
 Sequence#: 30
 Tested By: Mike Wilkinson
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6100B	RW100-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Frequency range investigated: 150 kHz to 30 MHz. Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n276
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

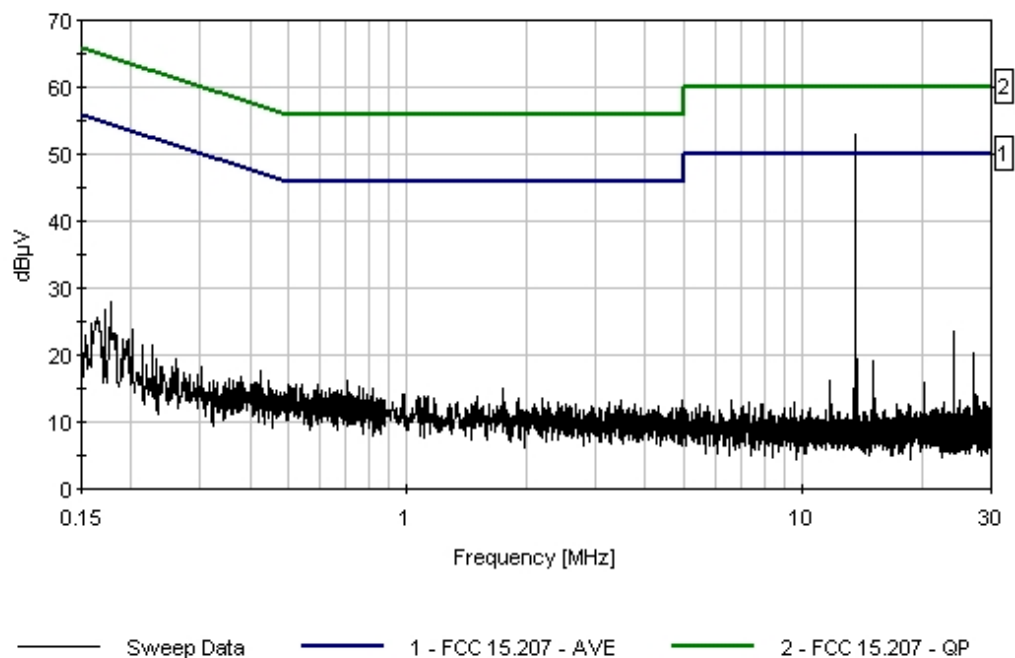
Measurement Data:

Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	13.562M	16.6	+0.4	+0.5	+0.1	+10.3	+0.0	27.9	50.0	-22.1	Black
Ave											
^	13.562M	41.6	+0.4	+0.5	+0.1	+10.3	+0.0	52.9	50.0	+2.9	Black
3	24.000M	15.0	+0.5	+0.4	+0.2	+10.3	+0.0	26.4	50.0	-23.6	Black
4	9.970M	13.4	+0.3	+0.5	+0.1	+10.3	+0.0	24.6	50.0	-25.4	Black
5	15.430M	12.5	+0.4	+0.4	+0.1	+10.3	+0.0	23.7	50.0	-26.3	Black
6	11.730M	10.3	+0.4	+0.5	+0.1	+10.3	+0.0	21.6	50.0	-28.4	Black
7	150.000k	13.1	+0.1	+0.4	+2.7	+10.2	+0.0	26.5	56.0	-29.5	Black
8	27.130M	5.8	+0.5	+0.4	+0.2	+10.3	+0.0	17.2	50.0	-32.8	Black
9	20.330M	4.8	+0.5	+0.4	+0.2	+10.3	+0.0	16.2	50.0	-33.8	Black

CKC Laboratories Date: 1/3/2006 Time: 13:59:44 HID WO#: 84334
 FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 30
 HID M/N 6100B



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

Customer: **HID**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **84334**
 Test Type: **Conducted Emissions**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6100B**
 S/N: **RW100-USB**

Date: 1/3/2006
 Time: 13:45:08
 Sequence#: 29
 Tested By: Mike Wilkinson
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6100B	RW100-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Frequency range investigated: 150 kHz to 30 MHz. Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n280
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

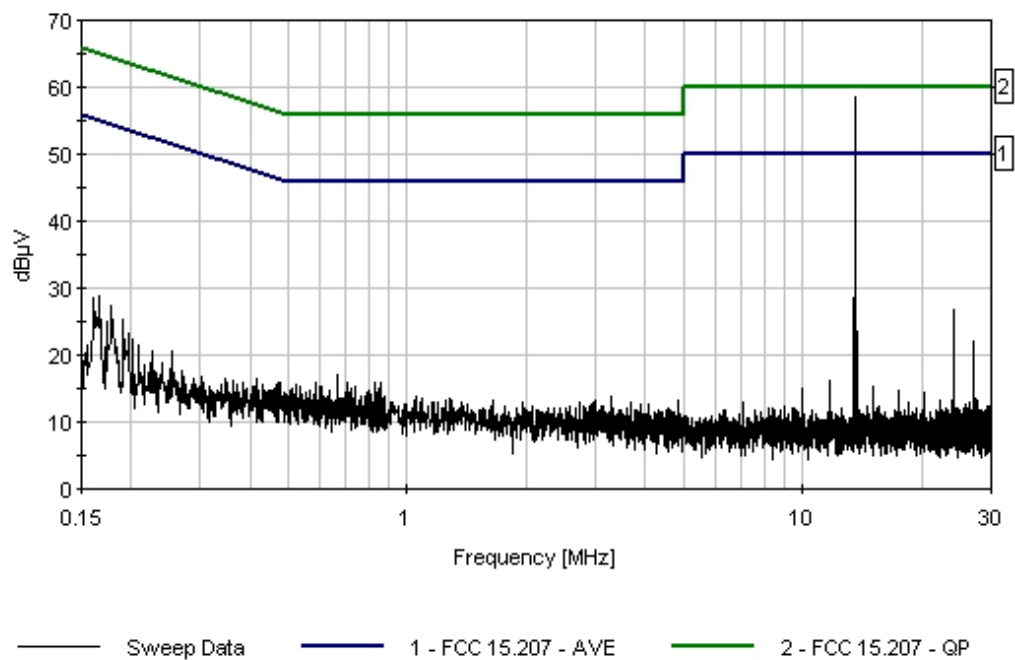
Measurement Data:

Reading listed by margin.

Test Lead: White

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	13.562M	22.1	+0.4	+0.4	+0.1	+10.3	+0.0	33.3	50.0	-16.7	White
Ave											
^	13.562M	47.3	+0.4	+0.4	+0.1	+10.3	+0.0	58.5	50.0	+8.5	White
3	150.000k	14.5	+0.1	+0.3	+2.7	+10.2	+0.0	27.8	56.0	-28.2	White
4	24.030M	10.1	+0.5	+0.4	+0.2	+10.3	+0.0	21.5	50.0	-28.5	White
5	14.270M	9.9	+0.4	+0.4	+0.1	+10.3	+0.0	21.1	50.0	-28.9	White
6	4.330M	3.4	+0.3	+0.4	+0.1	+10.3	+0.0	14.5	46.0	-31.5	White
7	27.100M	6.1	+0.5	+0.5	+0.2	+10.3	+0.0	17.6	50.0	-32.4	White
8	17.760M	6.0	+0.5	+0.4	+0.2	+10.3	+0.0	17.4	50.0	-32.6	White

CKC Laboratories Date: 1/3/2006 Time: 13:45:08 HID WO#: 84334
 FCC 15.207 - AVE Test Lead: White 120V 60Hz Sequence#: 29
 HID M/N 6100B



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

Customer: **HID**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **84334**
 Test Type: **Conducted Emissions**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6110B**
 S/N: **RW300-USB**

Date: 1/6/2006
 Time: 11:10:15
 Sequence#: 40
 Tested By: Mike Wilkinson
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6110B	RW300-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Frequency range investigated: 30-1000 MHz. Temperature: 22°C, Relative Humidity: 48%.

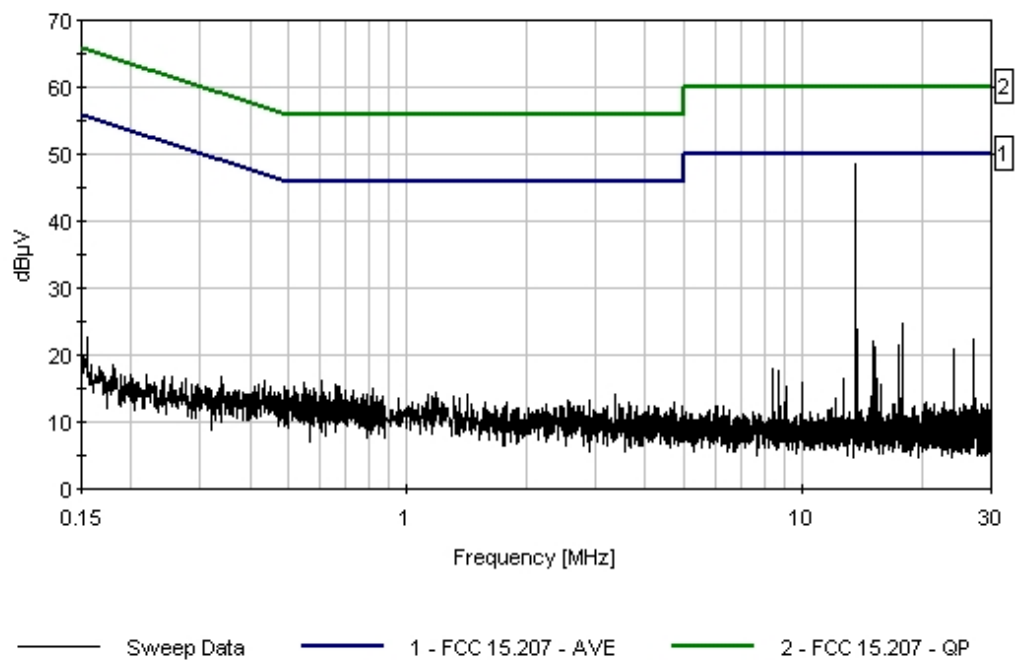
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n276
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

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

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	15.130M	13.4	+0.4	+0.4	+0.1	+10.3	+0.0	24.6	50.0	-25.4	Black
2	17.580M	12.5	+0.5	+0.4	+0.2	+10.3	+0.0	23.9	50.0	-26.1	Black
3	13.562M	12.6	+0.4	+0.5	+0.1	+10.3	+0.0	23.9	50.0	-26.1	Black
Ave	13.562M	37.2	+0.4	+0.5	+0.1	+10.3	+0.0	48.5	50.0	-1.5	Black
5	27.020M	9.5	+0.5	+0.4	+0.2	+10.3	+0.0	20.9	50.0	-29.1	Black
6	23.970M	7.5	+0.5	+0.4	+0.2	+10.3	+0.0	18.9	50.0	-31.1	Black
7	150.000k	10.0	+0.1	+0.4	+2.7	+10.2	+0.0	23.4	56.0	-32.6	Black
8	8.690M	6.1	+0.3	+0.5	+0.1	+10.3	+0.0	17.3	50.0	-32.7	Black

CKC Laboratories Date: 1/6/2006 Time: 11:10:15 HID WO#: 84334
 FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 40
 HID M/N 6110B



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

Customer: **HID**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **84334**
 Test Type: **Conducted Emissions**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6110B**
 S/N: **RW300-USB**

Date: 1/6/2006
 Time: 11:06:12
 Sequence#: 41
 Tested By: Mike Wilkinson
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6110B	RW300-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Frequency range investigated: 30-1000 MHz. Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n280
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

Measurement Data:

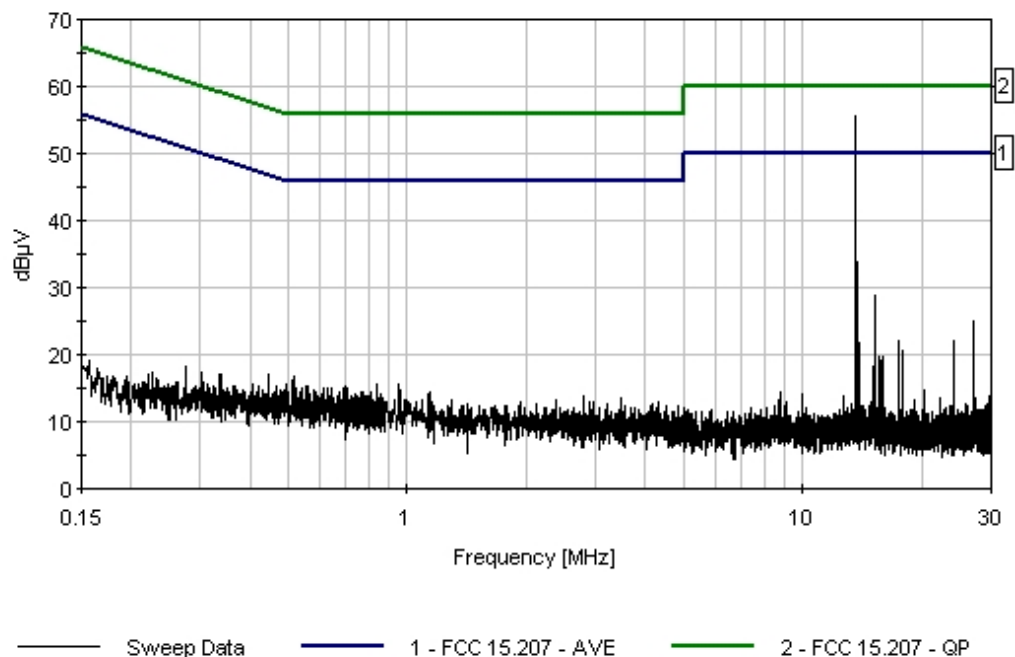
Reading listed by margin.

Test Lead: White

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	13.820M	20.8	+0.4	+0.4	+0.1	+10.3	+0.0	32.0	50.0	-18.0	White
2	15.130M	20.4	+0.4	+0.4	+0.1	+10.3	+0.0	31.6	50.0	-18.4	White
3	13.563M	19.1	+0.4	+0.4	+0.1	+10.3	+0.0	30.3	50.0	-19.7	White
Ave	13.563M	44.4	+0.4	+0.4	+0.1	+10.3	+0.0	55.6	50.0	+5.6	White
5	17.820M	17.5	+0.5	+0.4	+0.2	+10.3	+0.0	28.9	50.0	-21.1	White
6	15.790M	17.4	+0.4	+0.4	+0.1	+10.3	+0.0	28.6	50.0	-21.4	White
7	27.130M	13.3	+0.5	+0.5	+0.2	+10.3	+0.0	24.8	50.0	-25.2	White
8	24.000M	13.2	+0.5	+0.4	+0.2	+10.3	+0.0	24.6	50.0	-25.4	White

9	29.670M	12.6	+0.6	+0.5	+0.2	+10.3	+0.0	24.2	50.0	-25.8	White
10	8.420M	9.9	+0.3	+0.5	+0.1	+10.3	+0.0	21.1	50.0	-28.9	White
11	570.000k	4.3	+0.1	+0.2	+0.2	+10.3	+0.0	15.1	46.0	-30.9	White

CKC Laboratories Date: 1/5/2006 Time: 11:06:12 HID WO#: 84334
FCC 15.207 - AVE Test Lead: White 120V 60Hz Sequence#: 41
HID M/N 6110B



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

Customer: **HID**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **84334**
 Test Type: **Conducted Emissions**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6121B**
 S/N: **RW400-USB**

Date: 1/3/2006
 Time: 09:37:57
 Sequence#: 21
 Tested By: Mike Wilkinson
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6121B	RW400-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Frequency range investigated: 150 kHz to 30 MHz. Temperature: 22°C, Relative Humidity: 48%.

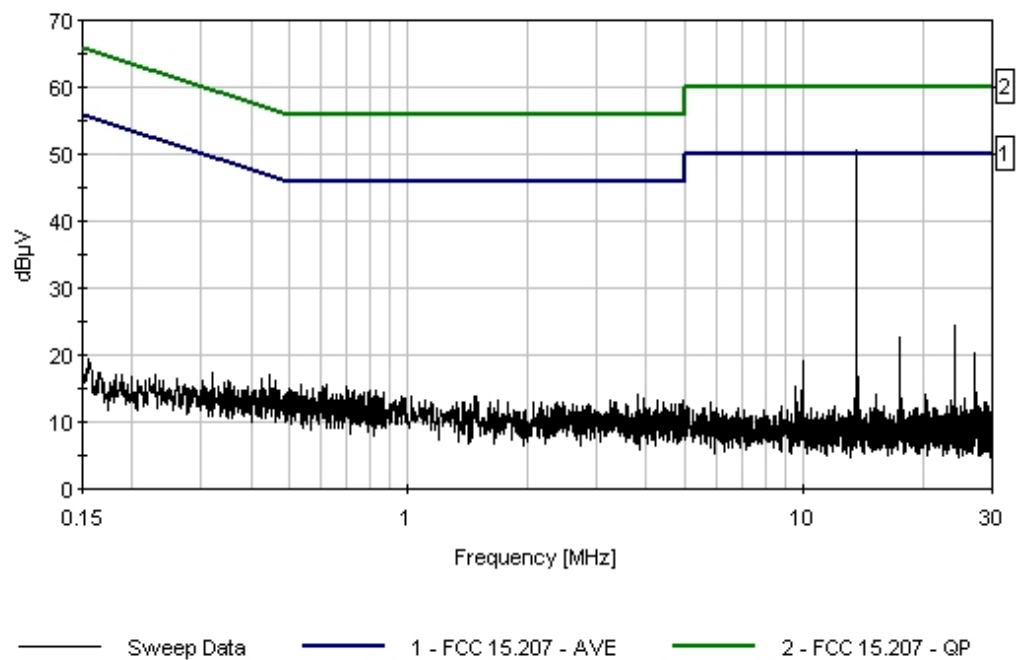
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n276
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

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

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	13.562M	14.9	+0.4	+0.5	+0.1	+10.3	+0.0	26.2	50.0	-23.8	Black
Ave											
^	13.562M	39.3	+0.4	+0.5	+0.1	+10.3	+0.0	50.6	50.0	+0.6	Black
3	24.030M	9.5	+0.5	+0.4	+0.2	+10.3	+0.0	20.9	50.0	-29.1	Black
4	270.000k	8.5	+0.1	+0.3	+0.2	+10.3	+0.0	19.4	51.1	-31.7	Black
5	28.090M	5.7	+0.6	+0.4	+0.2	+10.3	+0.0	17.2	50.0	-32.8	Black
6	17.590M	4.8	+0.5	+0.4	+0.2	+10.3	+0.0	16.2	50.0	-33.8	Black
7	9.990M	4.4	+0.3	+0.5	+0.1	+10.3	+0.0	15.6	50.0	-34.4	Black

CKC Laboratories Date: 1/3/2006 Time: 09:37:57 HID WO#: 84334
 FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 21
 HID M/N 6121B



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

Customer: **HID**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **84334**
 Test Type: **Conducted Emissions**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6121B**
 S/N: **RW400-USB**

Date: 1/3/2006
 Time: 09:53:26
 Sequence#: 22
 Tested By: Mike Wilkinson
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6121B	RW400-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Frequency range investigated: 150 kHz to 30 MHz. Temperature: 22°C, Relative Humidity: 48%.

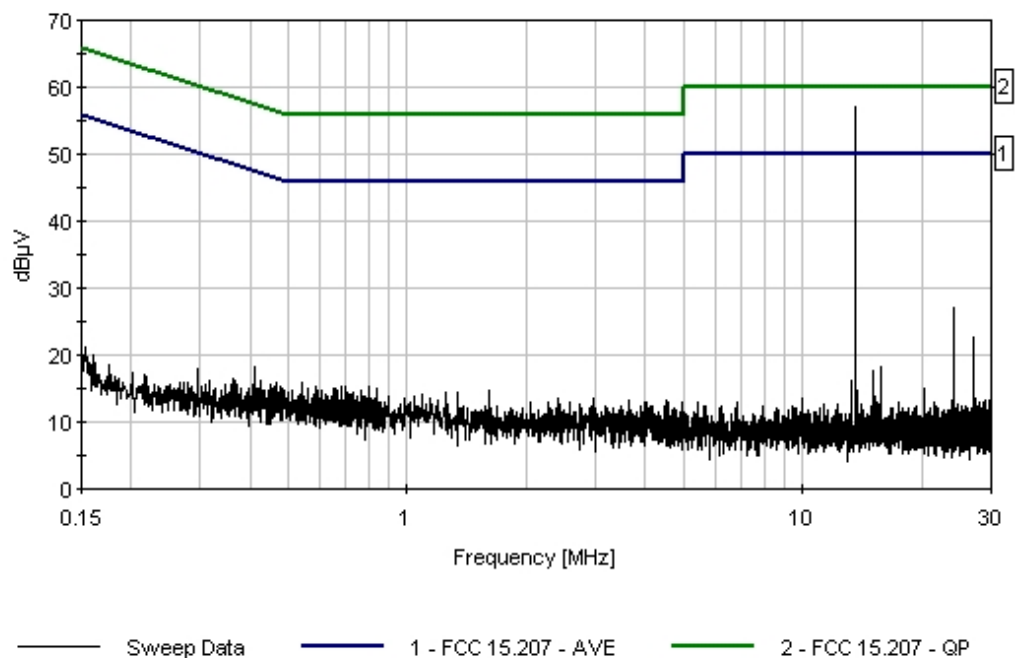
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n280
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

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

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	13.562M	19.6	+0.4	+0.4	+0.1	+10.3	+0.0	30.8	50.0	-19.2	White
Ave											
^	13.562M	46.0	+0.4	+0.4	+0.1	+10.3	+0.0	57.2	50.0	+7.2	White
3	24.000M	16.3	+0.5	+0.4	+0.2	+10.3	+0.0	27.7	50.0	-22.3	White
4	15.160M	12.1	+0.4	+0.4	+0.1	+10.3	+0.0	23.3	50.0	-26.7	White
5	27.130M	11.2	+0.5	+0.5	+0.2	+10.3	+0.0	22.7	50.0	-27.3	White
6	9.610M	8.9	+0.3	+0.4	+0.1	+10.3	+0.0	20.0	50.0	-30.0	White
7	17.520M	7.6	+0.5	+0.4	+0.2	+10.3	+0.0	19.0	50.0	-31.0	White
8	210.000k	8.8	+0.1	+0.3	+0.1	+10.2	+0.0	19.5	53.2	-33.7	White

CKC Laboratories Date: 1/3/2006 Time: 09:53:26 HID WO#: 84334
 FCC 15.207 - AVE Test Lead: White 120V 60Hz Sequence#: 22
 HID M/N 6121B



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

Customer: **HID**
 Specification: **FCC 15.209**
 Work Order #: **84334**
 Test Type: **Radiated Scan**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6100B**
 S/N: **RW100-USB**

Date: 1/4/2006
 Time: 11:15:45
 Sequence#: 33
 Tested By: Mike Wilkinson

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6100B	RW100-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Test distance correction factor used in accordance with 15.31, 40dB per decade to correct test data for comparison with the limit at 30 and 300 meters as appropriate. Frequency Range Investigated: 9kHz - 30MHz. Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

T1=Cable - 10 Meter	T2=15.31 10m 40dB/Dec Correction
T3=Mag Loop - AN 00226 - 9kHz-30M	

Measurement Data:

Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	Dist dB	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	27.124M	16.5	+1.1	-20.0	+6.6	+0.0	4.2	29.5	-25.3	Vert
2	27.126M	10.2	+1.1	-20.0	+6.6	+0.0	-2.1	29.5	-31.6	Horiz

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

Customer: **HID**
 Specification: **FCC 15.209**
 Work Order #: **84334**
 Test Type: **Radiated Scan**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6110B**
 S/N: **RW300-USB**

Date: 1/6/2006
 Time: 13:37:45
 Sequence#: 44
 Tested By: Mike Wilkinson

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6110B	RW300-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Test distance correction factor used in accordance with 15.31, 40dB per decade to correct test data for comparison with the limit at 30 and 300 meters as appropriate. Frequency Range Investigated: 9kHz - 30MHz. Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

T1=Cable - 10 Meter	T2=15.31 10m 40dB/Dec Correction
T3=Mag Loop - AN 00226 - 9kHz-30M	

Measurement Data:

Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	Dist dB	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	27.125M	20.1	+1.1	-20.0	+6.6	+0.0	7.8	29.5	-21.7	Vert
2	27.125M	12.0	+1.1	-20.0	+6.6	+0.0	-0.3	29.5	-29.8	Horiz

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

Customer: **HID**
 Specification: **FCC 15.209**
 Work Order #: **84334** Date: 1/5/2006
 Test Type: **Radiated Scan** Time: 10:14:19
 Equipment: **Universal 13.56 MHz Reader** Sequence#: 36
 Manufacturer: **HID** Tested By: Mike Wilkinson
 Model: 6121B
 S/N: RW400-USB

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6121B	RW400-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Test distance correction factor used in accordance with 15.31, 40dB per decade to correct test data for comparison with the limit at 30 and 300 meters as appropriate. Frequency Range Investigated: 9kHz - 30MHz. Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

T1=Cable - 10 Meter	T2=15.31 10m 40dB/Dec Correction
T3=Mag Loop - AN 00226 - 9kHz-30M	

Measurement Data:

Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	Dist dB	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	27.121M	21.1	+1.1	-20.0	+6.6	+0.0	8.8	29.5	-20.7	Horiz
2	27.124M	18.0	+1.1	-20.0	+6.6	+0.0	5.7	29.5	-23.8	Vert

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

Customer: **HID**
 Specification: **FCC 15.209**
 Work Order #: **84334**
 Test Type: **Maximized Emissions**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6100B**
 S/N: **RW100-USB**

Date: 12/21/2005
 Time: 15:38:05
 Sequence#: 10
 Tested By: Randal Clark

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6100B	RW100-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Test distance correction factor used in accordance with 15.35, 20dB per decade. Frequency range investigated: 30-1000 MHz. Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

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

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	40.685M	41.4	+12.0	-27.0	+1.4		+10.0	37.8	40.0	-2.2	Verti 100
^	40.692M	45.1	+12.0	-27.0	+1.4		+10.0	41.5	40.0	+1.5	Verti 100
3	30.000M	32.5	+17.9	-27.2	+1.2		+10.0	34.4	40.0	-5.6	Verti 100
^	30.001M	38.4	+17.9	-27.2	+1.2		+10.0	40.3	40.0	+0.3	Verti 100
5	60.017M	42.7	+6.1	-26.8	+1.7		+10.0	33.7	40.0	-6.3	Verti 100
6	239.995M	41.0	+11.3	-26.1	+3.5		+10.0	39.7	46.0	-6.3	Verti 100
7	149.185M	40.5	+10.4	-26.7	+2.8		+10.0	37.0	43.5	-6.5	Verti 100
^	149.186M	42.7	+10.4	-26.7	+2.8		+10.0	39.2	43.5	-4.3	Verti 100
9	600.006M	32.1	+19.1	-27.7	+5.9		+10.0	39.4	46.0	-6.6	Horiz 197
10	515.373M	32.6	+17.7	-27.4	+5.7		+10.0	38.6	46.0	-7.4	Horiz 184

11	600.017M	31.1	+19.1	-27.7	+5.9	+10.0	38.4	46.0	-7.6	Verti 106
12	596.739M	31.1	+19.0	-27.7	+5.9	+10.0	38.3	46.0	-7.7	Verti 100
13	678.122M	29.1	+20.1	-27.6	+6.6	+10.0	38.2	46.0	-7.8	Horiz 204
14	189.867M	40.7	+8.3	-26.6	+3.2	+10.0	35.6	43.5	-7.9	Verti 100
15	542.489M QP	31.2	+18.2	-27.5	+5.9	+10.0	37.8	46.0	-8.2	Verti 100
^	542.498M	32.5	+18.2	-27.5	+5.9	+10.0	39.1	46.0	-6.9	Verti 100
17	650.991M	28.9	+19.7	-27.5	+6.4	+10.0	37.5	46.0	-8.5	Horiz 204
18	515.365M	31.1	+17.7	-27.4	+5.7	+10.0	37.1	46.0	-8.9	Verti 100
19	48.000M	37.4	+8.8	-26.8	+1.6	+10.0	31.0	40.0	-9.0	Verti 100
20	276.008M	36.8	+12.4	-26.0	+3.8	+10.0	37.0	46.0	-9.0	Verti 106
21	339.065M	34.8	+13.9	-26.4	+4.4	+10.0	36.7	46.0	-9.3	Horiz 252
22	623.859M	28.8	+19.4	-27.6	+6.1	+10.0	36.7	46.0	-9.3	Verti 100
23	40.703M	34.3	+12.0	-27.0	+1.4	+10.0	30.7	40.0	-9.3	Horiz 264
24	135.615M	37.2	+11.0	-26.7	+2.6	+10.0	34.1	43.5	-9.4	Verti 100
25	461.112M	32.0	+16.7	-27.3	+5.1	+10.0	36.5	46.0	-9.5	Verti 100
26	479.984M	31.5	+17.0	-27.3	+5.3	+10.0	36.5	46.0	-9.5	Verti 106
27	542.505M	29.7	+18.2	-27.5	+5.9	+10.0	36.3	46.0	-9.7	Horiz 258
28	705.249M QP	26.7	+20.4	-27.7	+6.8	+10.0	36.2	46.0	-9.8	Verti 100
^	705.254M	30.3	+20.4	-27.7	+6.8	+10.0	39.8	46.0	-6.2	Verti 100
30	264.017M	36.3	+12.2	-26.0	+3.7	+10.0	36.2	46.0	-9.8	Verti 100
31	569.621M	29.0	+18.6	-27.6	+6.0	+10.0	36.0	46.0	-10.0	Verti 100
32	162.747M	37.2	+9.8	-26.7	+2.9	+10.0	33.2	43.5	-10.3	Verti 100
33	149.186M	36.6	+10.4	-26.7	+2.8	+10.0	33.1	43.5	-10.4	Horiz 252
34	300.016M	34.8	+12.8	-26.2	+4.1	+10.0	35.5	46.0	-10.5	Verti 106
35	528.921M	29.1	+17.9	-27.4	+5.8	+10.0	35.4	46.0	-10.6	Verti 100

36	678.113M QP	26.2	+20.1	-27.6	+6.6	+10.0	35.3	46.0	-10.7	Verti 100
^	678.116M	29.8	+20.1	-27.6	+6.6	+10.0	38.9	46.0	-7.1	Verti 100
38	556.075M	28.3	+18.4	-27.5	+6.0	+10.0	35.2	46.0	-10.8	Verti 100
39	240.003M	36.5	+11.3	-26.1	+3.5	+10.0	35.2	46.0	-10.8	Horiz 223
40	240.003M	36.5	+11.3	-26.1	+3.5	+10.0	35.2	46.0	-10.8	Horiz 223
41	276.003M	34.8	+12.4	-26.0	+3.8	+10.0	35.0	46.0	-11.0	Horiz 214
42	650.990M QP	26.4	+19.7	-27.5	+6.4	+10.0	35.0	46.0	-11.0	Verti 100
^	650.973M	30.5	+19.7	-27.5	+6.4	+10.0	39.1	46.0	-6.9	Verti 100
44	360.011M	32.5	+14.4	-26.6	+4.6	+10.0	34.9	46.0	-11.1	Verti 106
45	300.000M	34.2	+12.8	-26.2	+4.1	+10.0	34.9	46.0	-11.1	Horiz 214
46	240.018M	36.1	+11.3	-26.1	+3.5	+10.0	34.8	46.0	-11.2	Horiz 223
47	372.011M	31.8	+14.7	-26.6	+4.8	+10.0	34.7	46.0	-11.3	Verti 106
48	179.999M	37.5	+8.2	-26.7	+3.1	+10.0	32.1	43.5	-11.4	Verti 100
49	325.478M	33.0	+13.5	-26.4	+4.3	+10.0	34.4	46.0	-11.6	Horiz 252
50	204.003M	36.2	+8.6	-26.4	+3.3	+10.0	31.7	43.5	-11.8	Verti 100
51	408.002M	30.4	+15.6	-26.9	+5.1	+10.0	34.2	46.0	-11.8	Verti 106
52	271.311M	33.9	+12.4	-26.0	+3.8	+10.0	34.1	46.0	-11.9	Verti 121
53	339.067M	32.1	+13.9	-26.4	+4.4	+10.0	34.0	46.0	-12.0	Verti 106
54	288.001M	33.3	+12.6	-26.1	+4.0	+10.0	33.8	46.0	-12.2	Verti 106
55	120.003M	34.3	+10.9	-26.7	+2.5	+10.0	31.0	43.5	-12.5	Verti 100
56	383.988M	30.3	+15.0	-26.7	+4.9	+10.0	33.5	46.0	-12.5	Horiz 197
57	288.003M	32.9	+12.6	-26.1	+4.0	+10.0	33.4	46.0	-12.6	Horiz 214
58	192.003M	36.0	+8.3	-26.6	+3.2	+10.0	30.9	43.5	-12.6	Verti 100
59	488.242M	28.0	+17.2	-27.3	+5.4	+10.0	33.3	46.0	-12.7	Verti 100
60	257.721M	33.5	+12.1	-26.0	+3.7	+10.0	33.3	46.0	-12.7	Horiz 252

61	372.007M	30.4	+14.7	-26.6	+4.8	+10.0	33.3	46.0	-12.7	Horiz 197
62	504.004M	27.4	+17.5	-27.3	+5.5	+10.0	33.1	46.0	-12.9	Verti 106
63	324.006M	31.5	+13.5	-26.3	+4.3	+10.0	33.0	46.0	-13.0	Verti 106
64	366.190M	30.3	+14.6	-26.6	+4.7	+10.0	33.0	46.0	-13.0	Horiz 236
65	474.671M	28.0	+16.9	-27.3	+5.3	+10.0	32.9	46.0	-13.1	Verti 100
66	366.244M	29.9	+14.6	-26.6	+4.7	+10.0	32.6	46.0	-13.4	Verti 117
67	379.743M	29.2	+14.9	-26.7	+4.9	+10.0	32.3	46.0	-13.7	Horiz 236
68	122.061M	33.0	+11.0	-26.7	+2.5	+10.0	29.8	43.5	-13.7	Verti 100
69	379.758M	29.1	+14.9	-26.7	+4.9	+10.0	32.2	46.0	-13.8	Verti 100
70	352.621M	29.9	+14.3	-26.5	+4.5	+10.0	32.2	46.0	-13.8	Verti 106
71	216.004M	35.4	+9.6	-26.3	+3.4	+10.0	32.1	46.0	-13.9	Horiz 223
72	144.009M	32.8	+10.7	-26.7	+2.7	+10.0	29.5	43.5	-14.0	Verti 100
73	264.003M	32.0	+12.2	-26.0	+3.7	+10.0	31.9	46.0	-14.1	Horiz 214
74	227.995M	34.1	+10.5	-26.2	+3.4	+10.0	31.8	46.0	-14.2	Verti 100
75	384.002M	28.6	+15.0	-26.7	+4.9	+10.0	31.8	46.0	-14.2	Verti 106
76	360.000M	29.3	+14.4	-26.6	+4.6	+10.0	31.7	46.0	-14.3	Horiz 197
77	468.010M	26.7	+16.8	-27.3	+5.2	+10.0	31.4	46.0	-14.6	Verti 106
78	216.003M	34.7	+9.6	-26.3	+3.4	+10.0	31.4	46.0	-14.6	Verti 100
79	311.996M	30.3	+13.2	-26.3	+4.2	+10.0	31.4	46.0	-14.6	Verti 106
80	501.805M	25.7	+17.4	-27.3	+5.5	+10.0	31.3	46.0	-14.7	Verti 100
81	176.307M	33.7	+8.4	-26.7	+3.0	+10.0	28.4	43.5	-15.1	Verti 100
82	312.016M	29.8	+13.2	-26.3	+4.2	+10.0	30.9	46.0	-15.1	Verti 106
83	167.999M	32.8	+9.2	-26.7	+2.9	+10.0	28.2	43.5	-15.3	Verti 100
84	406.868M	26.8	+15.6	-26.9	+5.1	+10.0	30.6	46.0	-15.4	Horiz 184
85	420.002M	26.6	+15.8	-27.0	+5.1	+10.0	30.5	46.0	-15.5	Verti 106

86	135.629M	31.1	+11.0	-26.7	+2.6	+10.0	28.0	43.5	-15.5	Horiz 252
87	433.992M	26.3	+16.1	-27.1	+5.0	+10.0	30.3	46.0	-15.7	Verti 100
88	406.883M	26.1	+15.6	-26.9	+5.1	+10.0	29.9	46.0	-16.1	Verti 100
89	108.501M	31.2	+10.1	-26.8	+2.4	+10.0	26.9	43.5	-16.6	Verti 100
90	203.440M	31.4	+8.6	-26.5	+3.3	+10.0	26.8	43.5	-16.7	Verti 140
91	393.308M	25.6	+15.2	-26.8	+5.0	+10.0	29.0	46.0	-17.0	Horiz 192
92	230.557M	30.4	+10.7	-26.2	+3.4	+10.0	28.3	46.0	-17.7	Verti 100
93	67.824M	30.4	+5.8	-26.8	+1.9	+10.0	21.3	40.0	-18.7	Verti 100
94	162.747M	28.4	+9.8	-26.7	+2.9	+10.0	24.4	43.5	-19.1	Horiz 252

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

Customer: **HID**
 Specification: **FCC 15.209**
 Work Order #: **84334**
 Test Type: **Maximized Emissions**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6110B**
 S/N: **RW300-USB**

Date: 1/5/2006
 Time: 16:47:29
 Sequence#: 39
 Tested By: Mike Wilkinson

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6110B	RW300-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Test distance correction factor used in accordance with 15.35, 20dB per decade. Frequency range investigated: 30-1000 MHz .Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

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

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	40.687M	37.8	+12.0	-27.0	+1.4		+10.0	34.2	40.0	-5.8	Verti
2	176.313M	42.4	+8.4	-26.7	+3.0		+10.0	37.1	43.5	-6.4	Verti
	QP										
^	176.305M	44.8	+8.4	-26.7	+3.0		+10.0	39.5	43.5	-4.0	Verti
4	47.997M	38.0	+8.8	-26.8	+1.6		+10.0	31.6	40.0	-8.4	Verti
5	480.000M	32.3	+17.0	-27.3	+5.3		+10.0	37.3	46.0	-8.7	Verti
6	596.756M	29.9	+19.0	-27.7	+5.9		+10.0	37.1	46.0	-8.9	Horiz
7	180.011M	40.0	+8.2	-26.7	+3.1		+10.0	34.6	43.5	-8.9	Verti
8	240.008M	38.2	+11.3	-26.1	+3.5		+10.0	36.9	46.0	-9.1	Verti
9	191.999M	39.5	+8.3	-26.6	+3.2		+10.0	34.4	43.5	-9.1	Verti
10	276.004M	35.6	+12.4	-26.0	+3.8		+10.0	35.8	46.0	-10.2	Verti

11	203.433M	37.9	+8.6	-26.5	+3.3	+10.0	33.3	43.5	-10.2	Verti
12	599.965M	28.0	+19.1	-27.7	+5.9	+10.0	35.3	46.0	-10.7	Horiz
13	299.979M	34.3	+12.8	-26.2	+4.1	+10.0	35.0	46.0	-11.0	Verti
14	515.346M	28.5	+17.7	-27.4	+5.7	+10.0	34.5	46.0	-11.5	Verti
15	488.263M	29.1	+17.2	-27.3	+5.4	+10.0	34.4	46.0	-11.6	Verti
16	359.994M	31.8	+14.4	-26.6	+4.6	+10.0	34.2	46.0	-11.8	Horiz
17	203.999M	35.7	+8.6	-26.4	+3.3	+10.0	31.2	43.5	-12.3	Verti
18	324.008M	32.0	+13.5	-26.3	+4.3	+10.0	33.5	46.0	-12.5	Verti
19	432.023M	29.2	+16.1	-27.1	+5.0	+10.0	33.2	46.0	-12.8	Verti
20	352.604M	30.6	+14.3	-26.5	+4.5	+10.0	32.9	46.0	-13.1	Horiz
21	395.994M	29.1	+15.3	-26.8	+5.1	+10.0	32.7	46.0	-13.3	Horiz
22	433.981M	28.5	+16.1	-27.1	+5.0	+10.0	32.5	46.0	-13.5	Horiz
23	324.030M	30.7	+13.5	-26.3	+4.3	+10.0	32.2	46.0	-13.8	Horiz
24	47.989M	32.6	+8.8	-26.8	+1.6	+10.0	26.2	40.0	-13.8	Horiz
25	168.010M	34.1	+9.2	-26.7	+2.9	+10.0	29.5	43.5	-14.0	Verti
26	433.990M	27.6	+16.1	-27.1	+5.0	+10.0	31.6	46.0	-14.4	Verti
27	149.190M	32.6	+10.4	-26.7	+2.8	+10.0	29.1	43.5	-14.4	Verti
28	360.006M	28.7	+14.4	-26.6	+4.6	+10.0	31.1	46.0	-14.9	Verti
29	407.994M	27.1	+15.6	-26.9	+5.1	+10.0	30.9	46.0	-15.1	Horiz
30	144.022M	31.7	+10.7	-26.7	+2.7	+10.0	28.4	43.5	-15.1	Verti
31	240.008M	32.0	+11.3	-26.1	+3.5	+10.0	30.7	46.0	-15.3	Horiz
32	180.003M	32.7	+8.2	-26.7	+3.1	+10.0	27.3	43.5	-16.2	Horiz
33	352.620M	27.4	+14.3	-26.5	+4.5	+10.0	29.7	46.0	-16.3	Verti
34	312.001M	28.4	+13.2	-26.3	+4.2	+10.0	29.5	46.0	-16.5	Verti
35	192.003M	31.8	+8.3	-26.6	+3.2	+10.0	26.7	43.5	-16.8	Horiz

36	216.016M	32.4	+9.6	-26.3	+3.4	+10.0	29.1	46.0	-16.9	Verti
37	67.830M	31.8	+5.8	-26.8	+1.9	+10.0	22.7	40.0	-17.3	Verti
38	119.994M	28.6	+10.9	-26.7	+2.5	+10.0	25.3	43.5	-18.2	Verti
39	203.436M	29.4	+8.6	-26.5	+3.3	+10.0	24.8	43.5	-18.7	Horiz
40	217.000M	28.9	+9.7	-26.3	+3.4	+10.0	25.7	46.0	-20.3	Verti

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

Customer: **HID**
 Specification: **FCC 15.209**
 Work Order #: **84334**
 Test Type: **Maximized Emissions**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6121B**
 S/N: **RW400-USB**

Date: 12/22/2005
 Time: 16:18:23
 Sequence#: 13
 Tested By: Randal Clark

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6121B	RW400-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Test distance correction factor used in accordance with 15.35, 20dB per decade. Frequency range investigated: 30-1000 MHz. Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

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

Measurement Data:

Reading listed by margin.

Test Distance: 10 Meters

Measurement Data		Reading noted by Marlin				Test Distance: 10 Meters					
#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	40.691M	41.2	+12.0	-27.0	+1.4		+10.0	37.6	40.0	-2.4	Verti
	QP										100
^	40.695M	44.7	+12.0	-27.0	+1.4		+10.0	41.1	40.0	+1.1	Verti
											100
3	122.063M	41.2	+11.0	-26.7	+2.5		+10.0	38.0	43.5	-5.5	Verti
	QP										100
^	122.070M	42.3	+11.0	-26.7	+2.5		+10.0	39.1	43.5	-4.4	Verti
											100
5	30.002M	30.5	+17.9	-27.2	+1.2		+10.0	32.4	40.0	-7.6	Horiz
											190
6	705.253M	28.9	+20.4	-27.7	+6.8		+10.0	38.4	46.0	-7.6	Verti
	QP										100
^	705.248M	31.4	+20.4	-27.7	+6.8		+10.0	40.9	46.0	-5.1	Verti
											100
8	257.692M	38.4	+12.1	-26.0	+3.7		+10.0	38.2	46.0	-7.8	Horiz
											303
9	813.729M	26.5	+21.6	-27.3	+7.2		+10.0	38.0	46.0	-8.0	Verti
											100
10	257.695M	37.4	+12.1	-26.0	+3.7		+10.0	37.2	46.0	-8.8	Horiz
											282

11	732.359M	27.0	+20.7	-27.6	+6.9	+10.0	37.0	46.0	-9.0	Verti 100
12	40.679M	34.6	+12.0	-27.0	+1.4	+10.0	31.0	40.0	-9.0	Horiz 303
13	678.120M QP	27.6	+20.1	-27.6	+6.6	+10.0	36.7	46.0	-9.3	Verti 100
^	678.113M	31.0	+20.1	-27.6	+6.6	+10.0	40.1	46.0	-5.9	Verti 100
15	30.012M	28.4	+17.9	-27.2	+1.2	+10.0	30.3	40.0	-9.7	Verti 100
16	840.870M QP	23.9	+22.0	-27.3	+7.6	+10.0	36.2	46.0	-9.8	Verti 100
^	840.865M	26.8	+22.0	-27.3	+7.6	+10.0	39.1	46.0	-6.9	Verti 100
18	433.962M	32.2	+16.1	-27.1	+5.0	+10.0	36.2	46.0	-9.8	Verti 100
19	600.001M	28.7	+19.1	-27.7	+5.9	+10.0	36.0	46.0	-10.0	Verti 108
20	650.999M QP	27.4	+19.7	-27.5	+6.4	+10.0	36.0	46.0	-10.0	Verti 100
^	650.992M	30.4	+19.7	-27.5	+6.4	+10.0	39.0	46.0	-7.0	Verti 100
22	149.186M	36.8	+10.4	-26.7	+2.8	+10.0	33.3	43.5	-10.2	Verti 100
23	480.015M	30.7	+17.0	-27.3	+5.3	+10.0	35.7	46.0	-10.3	Horiz 228
24	240.001M	36.9	+11.3	-26.1	+3.5	+10.0	35.6	46.0	-10.4	Horiz 201
25	596.728M	28.3	+19.0	-27.7	+5.9	+10.0	35.5	46.0	-10.5	Verti 100
26	257.673M	35.5	+12.1	-26.0	+3.7	+10.0	35.3	46.0	-10.7	Verti 100
27	299.999M	34.4	+12.8	-26.2	+4.1	+10.0	35.1	46.0	-10.9	Horiz 188
28	135.623M	35.4	+11.0	-26.7	+2.6	+10.0	32.3	43.5	-11.2	Verti 100
29	276.016M	34.4	+12.4	-26.0	+3.8	+10.0	34.6	46.0	-11.4	Horiz 188
30	515.380M	28.5	+17.7	-27.4	+5.7	+10.0	34.5	46.0	-11.5	Horiz 262
31	108.510M	35.9	+10.1	-26.8	+2.4	+10.0	31.6	43.5	-11.9	Verti 100
32	732.370M QP	24.1	+20.7	-27.6	+6.9	+10.0	34.1	46.0	-11.9	Horiz 233
^	732.375M	28.9	+20.7	-27.6	+6.9	+10.0	38.9	46.0	-7.1	Horiz 233
34	542.488M	27.4	+18.2	-27.5	+5.9	+10.0	34.0	46.0	-12.0	Verti 100
35	610.288M	26.4	+19.2	-27.7	+6.0	+10.0	33.9	46.0	-12.1	Verti 100

36	372.005M	30.7	+14.7	-26.6	+4.8	+10.0	33.6	46.0	-12.4	Horiz 188
37	488.248M	28.3	+17.2	-27.3	+5.4	+10.0	33.6	46.0	-12.4	Verti 100
38	251.984M	34.0	+12.0	-26.0	+3.6	+10.0	33.6	46.0	-12.4	Horiz 188
39	122.076M	34.2	+11.0	-26.7	+2.5	+10.0	31.0	43.5	-12.5	Horiz 303
40	384.005M	29.9	+15.0	-26.7	+4.9	+10.0	33.1	46.0	-12.9	Horiz 188
41	230.573M	35.0	+10.7	-26.2	+3.4	+10.0	32.9	46.0	-13.1	Horiz 303
42	360.005M	30.5	+14.4	-26.6	+4.6	+10.0	32.9	46.0	-13.1	Horiz 188
43	300.004M	32.1	+12.8	-26.2	+4.1	+10.0	32.8	46.0	-13.2	Verti 108
44	244.133M	33.6	+11.6	-26.0	+3.6	+10.0	32.8	46.0	-13.2	Horiz 303
45	288.002M	32.2	+12.6	-26.1	+4.0	+10.0	32.7	46.0	-13.3	Horiz 188
46	366.189M	29.7	+14.6	-26.6	+4.7	+10.0	32.4	46.0	-13.6	Horiz 262
47	67.823M	35.5	+5.8	-26.8	+1.9	+10.0	26.4	40.0	-13.6	Verti 100
48	366.177M	29.6	+14.6	-26.6	+4.7	+10.0	32.3	46.0	-13.7	Verti 100
49	488.234M	26.9	+17.2	-27.3	+5.4	+10.0	32.2	46.0	-13.8	Horiz 262
50	393.314M	28.8	+15.2	-26.8	+5.0	+10.0	32.2	46.0	-13.8	Horiz 262
51	176.278M	34.8	+8.4	-26.7	+3.0	+10.0	29.5	43.5	-14.0	Verti 100
52	149.176M	32.9	+10.4	-26.7	+2.8	+10.0	29.4	43.5	-14.1	Horiz 303
53	379.749M	28.7	+14.9	-26.7	+4.9	+10.0	31.8	46.0	-14.2	Horiz 262
54	287.997M	31.1	+12.6	-26.1	+4.0	+10.0	31.6	46.0	-14.4	Verti 108
55	360.004M	29.2	+14.4	-26.6	+4.6	+10.0	31.6	46.0	-14.4	Verti 108
56	379.757M	28.4	+14.9	-26.7	+4.9	+10.0	31.5	46.0	-14.5	Verti 100
57	372.001M	28.5	+14.7	-26.6	+4.8	+10.0	31.4	46.0	-14.6	Verti 108
58	352.608M	29.1	+14.3	-26.5	+4.5	+10.0	31.4	46.0	-14.6	Verti 100
59	406.869M	27.5	+15.6	-26.9	+5.1	+10.0	31.3	46.0	-14.7	Verti 100
60	263.990M	31.4	+12.2	-26.0	+3.7	+10.0	31.3	46.0	-14.7	Horiz 188

61	244.114M	32.1	+11.6	-26.0	+3.6	+10.0	31.3	46.0	-14.7	Verti 100
62	408.005M	27.4	+15.6	-26.9	+5.1	+10.0	31.2	46.0	-14.8	Horiz 188
63	216.001M	34.5	+9.6	-26.3	+3.4	+10.0	31.2	46.0	-14.8	Horiz 201
64	311.999M	30.0	+13.2	-26.3	+4.2	+10.0	31.1	46.0	-14.9	Horiz 188
65	144.008M	31.7	+10.7	-26.7	+2.7	+10.0	28.4	43.5	-15.1	Horiz 190
66	271.253M	30.6	+12.4	-26.0	+3.8	+10.0	30.8	46.0	-15.2	Verti 100
67	323.999M	29.1	+13.5	-26.3	+4.3	+10.0	30.6	46.0	-15.4	Horiz 188
68	352.607M	28.3	+14.3	-26.5	+4.5	+10.0	30.6	46.0	-15.4	Horiz 262
69	150.003M	31.4	+10.4	-26.7	+2.8	+10.0	27.9	43.5	-15.6	Horiz 201
70	396.005M	26.8	+15.3	-26.8	+5.1	+10.0	30.4	46.0	-15.6	Horiz 188
71	135.616M	30.9	+11.0	-26.7	+2.6	+10.0	27.8	43.5	-15.7	Horiz 303
72	420.412M	26.4	+15.8	-27.0	+5.1	+10.0	30.3	46.0	-15.7	Verti 100
73	162.746M	31.4	+9.8	-26.7	+2.9	+10.0	27.4	43.5	-16.1	Verti 100
74	393.305M	26.4	+15.2	-26.8	+5.0	+10.0	29.8	46.0	-16.2	Verti 100
75	216.000M	30.4	+9.6	-26.3	+3.4	+10.0	27.1	43.5	-16.4	Verti 100
76	244.127M	30.1	+11.6	-26.0	+3.6	+10.0	29.3	46.0	-16.7	Horiz 100
77	203.439M	31.4	+8.6	-26.5	+3.3	+10.0	26.8	43.5	-16.7	Verti 100
78	119.991M	30.1	+10.9	-26.7	+2.5	+10.0	26.8	43.5	-16.7	Horiz 190
79	108.516M	30.9	+10.1	-26.8	+2.4	+10.0	26.6	43.5	-16.9	Horiz 303
80	298.368M	28.4	+12.8	-26.2	+4.1	+10.0	29.1	46.0	-16.9	Horiz 303
81	149.988M	30.0	+10.4	-26.7	+2.8	+10.0	26.5	43.5	-17.0	Verti 100
82	298.351M	28.3	+12.8	-26.2	+4.1	+10.0	29.0	46.0	-17.0	Verti 100
83	311.911M	26.9	+13.2	-26.3	+4.2	+10.0	28.0	46.0	-18.0	Verti 100
84	144.006M	28.6	+10.7	-26.7	+2.7	+10.0	25.3	43.5	-18.2	Verti 100
85	217.002M	30.7	+9.7	-26.3	+3.4	+10.0	27.5	46.0	-18.5	Verti 100

86	312.004M	25.5	+13.2	-26.3	+4.2	+10.0	26.6	46.0	-19.4	Verti 108
87	230.562M	28.7	+10.7	-26.2	+3.4	+10.0	26.6	46.0	-19.4	Verti 100
88	264.003M	26.5	+12.2	-26.0	+3.7	+10.0	26.4	46.0	-19.6	Verti 108
89	203.455M	28.1	+8.6	-26.5	+3.3	+10.0	23.5	43.5	-20.0	Horiz 282
90	210.000M	27.4	+9.1	-26.4	+3.3	+10.0	23.4	43.5	-20.1	Verti 100
91	252.000M	25.7	+12.0	-26.0	+3.6	+10.0	25.3	46.0	-20.7	Verti 108
92	204.000M	26.2	+8.6	-26.4	+3.3	+10.0	21.7	43.5	-21.8	Verti 100
93	203.420M	26.3	+8.6	-26.5	+3.3	+10.0	21.7	43.5	-21.8	Horiz 100
94	204.003M	26.0	+8.6	-26.4	+3.3	+10.0	21.5	43.5	-22.0	Horiz 201
95	230.540M	25.9	+10.7	-26.2	+3.4	+10.0	23.8	46.0	-22.2	Horiz 100

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

Customer: **HID**
 Specification: **FCC 15.225(a) (30 Meters)**
 Work Order #: **84334** Date: 1/4/2006
 Test Type: **Radiated Scan** Time: 14:30:19
 Equipment: **Universal 13.56 MHz Reader** Sequence#: 34
 Manufacturer: **HID** Tested By: Mike Wilkinson
 Model: 6100B
 S/N: RW100-USB

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6100B	RW100-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply Test distance correction factor used in accordance with 15.31, 40dB per decade to correct test data for comparison with the limit at 30 and 300 meters as appropriate. Frequency Range Investigated: 9kHz - 30MHz. Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

T1=Cable - 10 Meter	T2=Mag Loop - AN 00226 - 9kHz-30M
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Measurement Data:

Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB		Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.562M	37.1	+0.8	+9.6		-19.0	28.5	84.0	-55.5	Vert
2	13.562M	33.7	+0.8	+9.6		-19.0	25.1	84.0	-58.9	Horiz

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

Customer: **HID**
 Specification: **FCC 15.225(a) (30 Meters)**
 Work Order #: **84334** Date: 1/6/2006
 Test Type: **Radiated Scan** Time: 14:13:21
 Equipment: **Universal 13.56 MHz Reader** Sequence#: 45
 Manufacturer: **HID** Tested By: Mike Wilkinson
 Model: 6110B
 S/N: RW300-USB

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6110B	RW300-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Test distance correction factor used in accordance with 15.31, 40dB per decade to correct test data for comparison with the limit at 30 and 300 meters as appropriate. Frequency Range Investigated: 9kHz - 30MHz. Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

T1=Cable - 10 Meter	T2=Mag Loop - AN 00226 - 9kHz-30M
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Measurement Data:		Reading listed by margin.				Test Distance: 10 Meters					
#	Freq MHz	Rdng dBμV	T1 dB	T2 dB			Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	13.563M	41.2	+0.8	+9.6			-19.0	32.6	84.0	-51.4	Vert
2	13.562M	38.2	+0.8	+9.6			-19.0	29.6	84.0	-54.4	Horiz

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

Customer: **HID**
 Specification: **FCC 15.225(a) (30 Meters)**
 Work Order #: **84334**
 Test Type: **Radiated Scan**
 Equipment: **Universal 13.56 MHz Reader**
 Manufacturer: **HID**
 Model: **6121B**
 S/N: **RW400-USB**

Date: 1/5/2006
 Time: 09:34:29
 Sequence#: 35
 Tested By: Mike Wilkinson

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Universal 13.56 MHz Reader*	HID	6121B	RW400-USB

Support Devices:

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

Test Conditions / Notes:

EUT is an iClass reader operating on a carrier frequency of 13.56MHz. EUT is transmitting continuously with a tag in the field. Reader has USB expansion module installed. Power supply chassis bonded to ground plane. Drain wire not connected to power supply. Test distance correction factor used in accordance with 15.31, 40dB per decade to correct test data for comparison with the limit at 30 and 300 meters as appropriate. Frequency Range Investigated: 9kHz - 30MHz. Temperature: 22°C, Relative Humidity: 48%.

Transducer Legend:

T1=Cable - 10 Meter	T2=Mag Loop - AN 00226 - 9kHz-30M
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Measurement Data:

Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB			Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.562M	43.4	+0.8	+9.6			-19.0	34.8	84.0	-49.2	Vert
2	13.562M	40.8	+0.8	+9.6			-19.0	32.2	84.0	-51.8	Horiz