ADDENDUM TO FC02-024

FOR THE

iCLASS R10, 6100A (6091-300); iCLASS RW300, 6111A (6092-300) AND iCLASS RW400, 6121A (6093-300)

FCC PART 15 SUBPART C SECTIONS 15.207, 15.209 AND 15.225

COMPLIANCE

DATE OF ISSUE: JULY 25, 2002

PREPARED FOR:

HID Corporation
9292 Jeronimo Road
Irvine, CA 92618-1905

P.O. No.: 11259
W.O. No.: 78445

PREPARED BY:

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

Date of test: May 1-24, 2002

Report No.: FC02-024A

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	May 1-24, 2002
DATE OF RECEIPT:	May 1, 2002
PURPOSE OF TEST:	To demonstrate the compliance of the iCLASS R10, 6100A (6091-300); iCLASS RW300, 6111A (6092-300) and iCLASS RW400, 6121A (6093-300) with the requirements for FCC Part 15 Subpart C Sections 15.207, 15.209 & 15.225 devices. The purpose of Addendum A is to add a statement regarding the correction factor to the voltage variation tables.
TEST METHOD:	ANSI C63.4 (1992)
MANUFACTURER:	HID Corporation 9292 Jeronimo Road Irvine, CA 92618-1905
REPRESENTATIVE:	Frank de Vall
TEST LOCATION:	CKC Laboratories, Inc. 5473A Clouds Rest Mariposa, CA 95338

SUMMARY OF RESULTS

As received, the HID iCLASS R10, 6100A (6091-300); iCLASS RW300, 6111A (6092-300) and iCLASS RW400, 6121A (6093-300) was found to be fully compliant with the following standards and specifications:

United States

- FCC Part 15 Subpart C Sections 15207, 15.209 and 15.225
- ANSI C63.4 (1992) method

Canada

RSS-210 Sections 6.6, 6.2.1 and 6.2.2 using:

- FCC Part 15 Subpart C Sections 15.207, 15.209 and 15.225

Industry of Canada File No. IC 3082-D

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

QUALITY ASSURANCE:

Steve Behm, Director of Engineering Services

Joyce Walker, Quality Assurance Administrative Manager

Chuck Kendall, EMC/Lab Manager

TEST PERSONNEL:

Randy Clark, EMC Engineer

15.31(e) Voltage Variations

Customer: HID
WO#: 78445
Date: 25-Jul-02
Test Engineer: Randal Clark

Device Model #: 6100A (6091-300)
Operating Voltage: 12.00 **VDC**

Voltage Variations

Channel Frequency:		**Channel 1 (MHz)** **13.56**	**Corrected Output** (dBuV/m)
Temp (C)	Voltage		
20	10.20	13.56	31.0
20	12.00	13.56	31.0
20	13.80	13.56	31.0

Test Distance 10 meters
Test Distance correction factor used and is included in accordance with 15.31

Customer: HID
WO#: 78445
Date: 25-Jul-02
Test Engineer: Randal Clark

Device Model #: 6111A (6092-300)
Operating Voltage: 12.00 **VDC**

Voltage Variations

Channel Frequency:		**Channel 1 (MHz)** **13.56**	**Corrected Output** (dBuV/m)
Temp (C)	Voltage		
20	10.20	13.56	31.6
20	12.00	13.56	31.6
20	13.80	13.56	31.5

Test Distance 10 meters
Test Distance correction factor used and is included in accordance with 15.31

Customer: HID
WO#: 78445
Date: 25-Jul-02
Test Engineer: Randal Clark

Device Model #: 6121A (6093-300)
Operating Voltage: 12.00 **VDC**

Voltage Variations

Channel Frequency:		**Channel 1 (MHz)** **13.56**	**Corrected Output** (dBuV/m)
Temp (C)	Voltage		
20	10.20	13.56	34.8
20	12.00	13.56	34.8
20	13.80	13.56	34.8

Test Distance 10 meters
Test Distance correction factor used and is included in accordance with 15.31

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

15.33(a) Frequency Ranges Tested
15.207 Conducted: 450 kHz – 30 MHz
15.209/15.225 Radiated: 9 kHz – 1000 MHz

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.

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.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The EUT tested by CKC Laboratories was representative of a production unit. Proximity Readers.

The following models have been tested by CKC Laboratories: iCLASS R10, 6100A (6091-300); iCLASS RW300, 6111A (6092-300) and iCLASS RW400, 6121A (6093-300)

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.

6110A (6092-300) iCLASS R30
For initial production, the 6111A test data is the same as the 6110A, because both have and are running identical electronics. For both, the Wiegand and Serial interfaces run simultaneously; the user chooses which interface to use. For future production, the Serial interface chip will not be stuffed for the 6110A. When this is the case, the 6111A test data is worst case compared to the 6110A.

6120A (6093-300) iCLASS R40
Description: Wallmount with a Wiegand format interface
The R40 is the same as the RW400 without serial interface capability. The RW400 was tested with both the Wiegand and Serial interfaces running, which is worst case.

EQUIPMENT UNDER TEST

iCLASS R10
Manuf: HID
Model: 6100A (6091-300)
Serial: 1502-0008
FCC ID: JQ6609XA (pending)

iCLASS RW400
Manuf: HID
Model: 6121A (6093-300)
Serial: 1502-0003
FCC ID: JQ6609XA (pending)

iCLASS RW300
Manuf: HID
Model: 6111A (6092-300)
Serial: 1502-0005
FCC ID: JQ6609XA (pending)

PERIPHERAL DEVICES

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

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

REPORT OF MEASUREMENTS

The following tables report the worst case emissions levels recorded during the tests performed on the iCLASS R10, 6100A (6091-300); iCLASS RW300, 6111A (6092-300) and iCLASS RW400, 6121A (6093-300). 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: Fundamental Emission Levels - 6100A

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Corr. dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
13.560	40.3	10.0		0.7	-20.0	31.0	80.0	-49.0	V
13.562	37.6	10.0		0.7	-20.0	28.3	80.0	-51.7	V

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

NOTES: V = Vertical Polarization

COMMENTS: EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: Fundamental.

Table 2: Fundamental Emission Levels - 6111A									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Corr. dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
13.561	40.9	10.0		0.7	-20.0	31.6	80.0	-48.4	V
13.561	37.6	10.0		0.7	-20.0	28.3	80.0	-51.7	V

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

NOTES: V = Vertical Polarization

COMMENTS: EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: Fundamental.

Table 3: Fundamental Emission Levels - 6121A

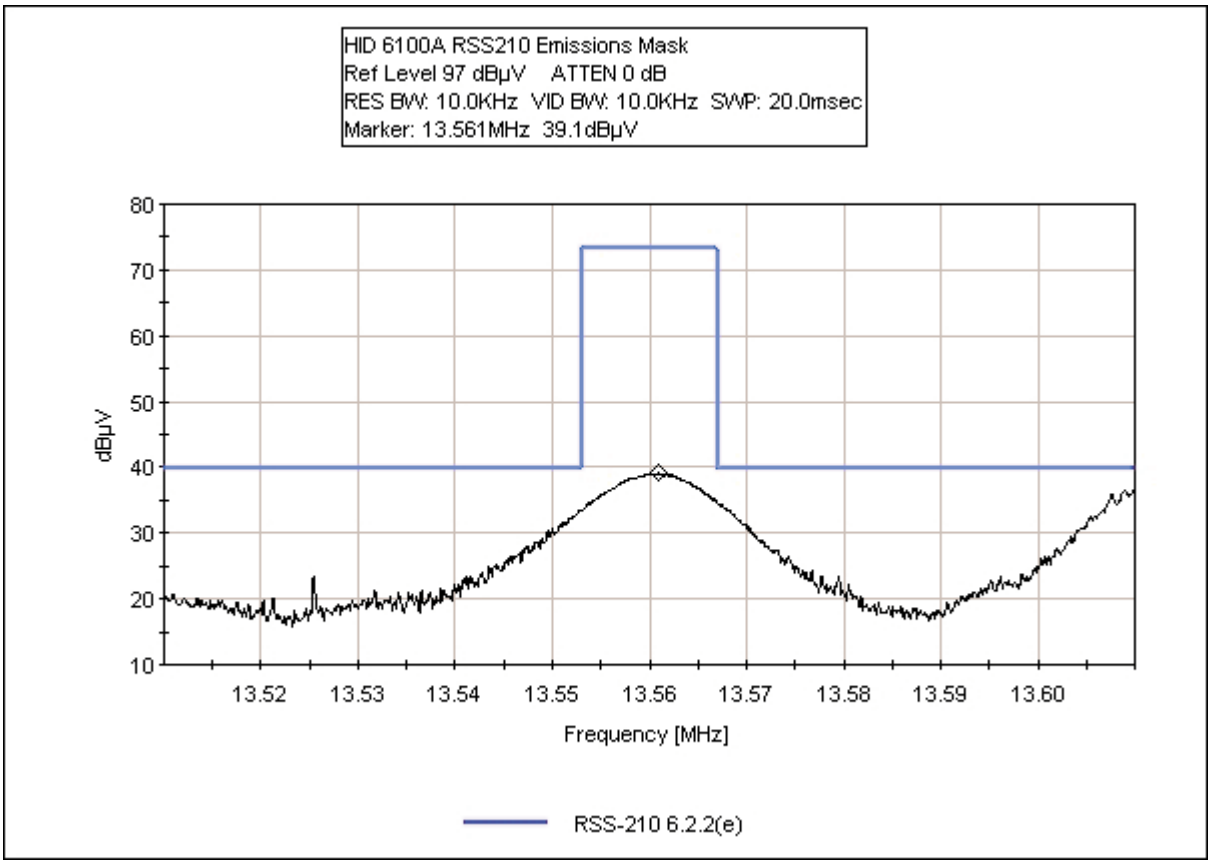
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Corr. dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
13.560	44.1	10.0		0.7	-20.0	34.8	80.0	-45.2	V
13.561	41.1	10.0		0.7	-20.0	31.8	80.0	-48.2	V

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

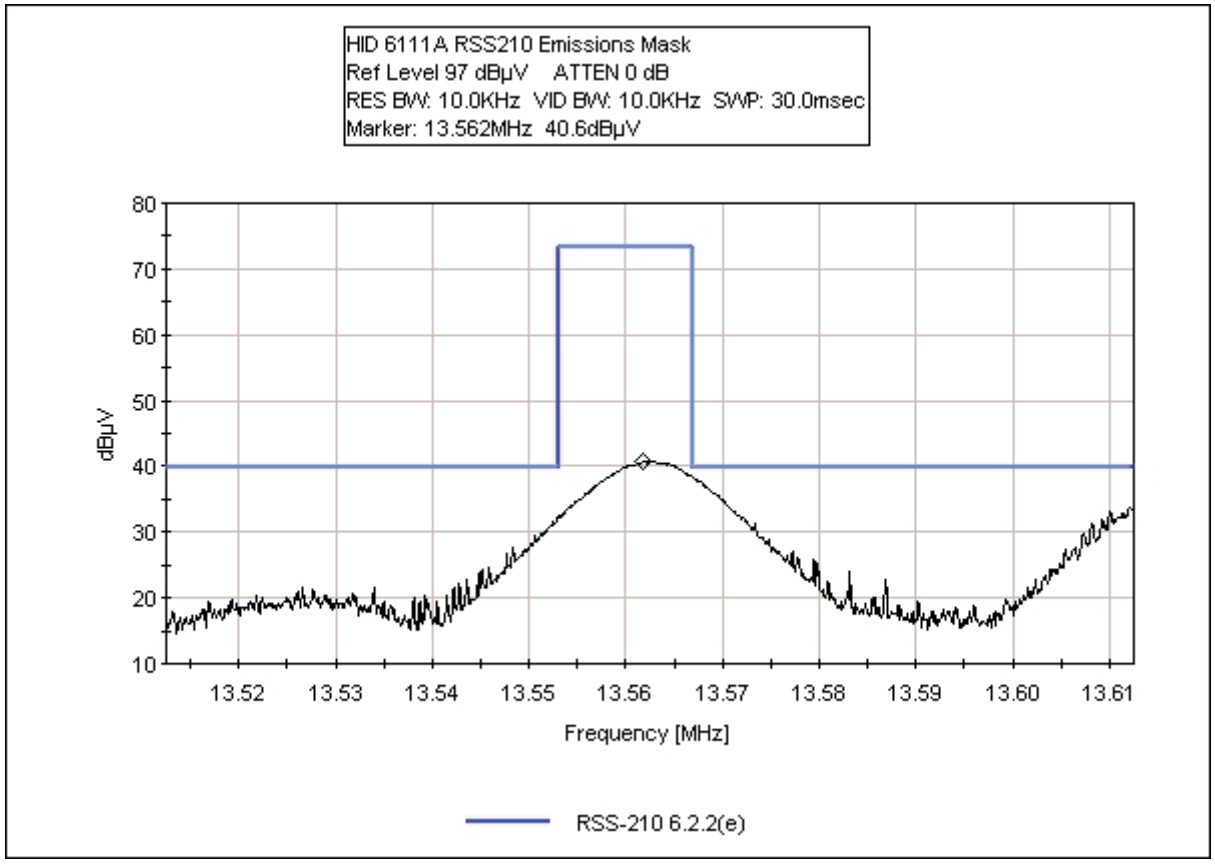
NOTES: V = Vertical Polarization

COMMENTS: EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: Fundamental.

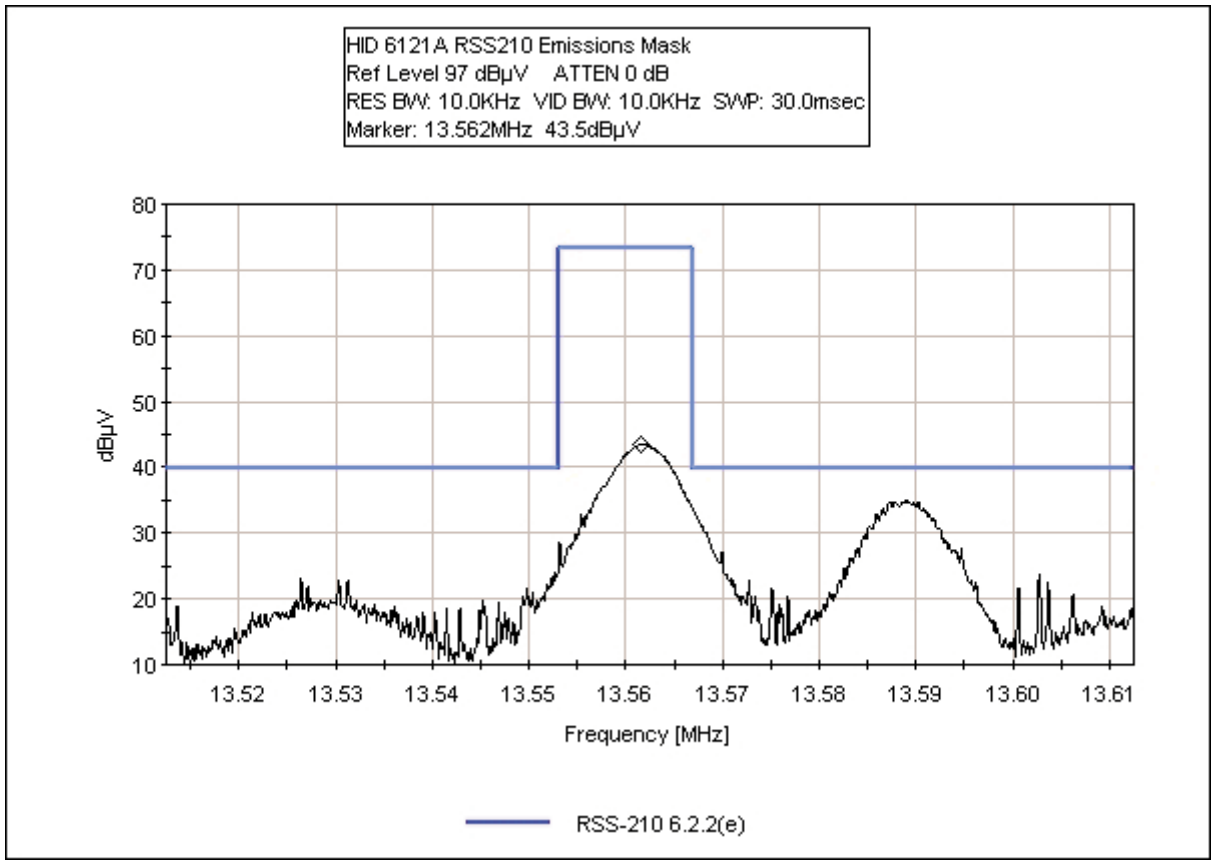
RSS-210 EMISSIONS MASK – 6100A



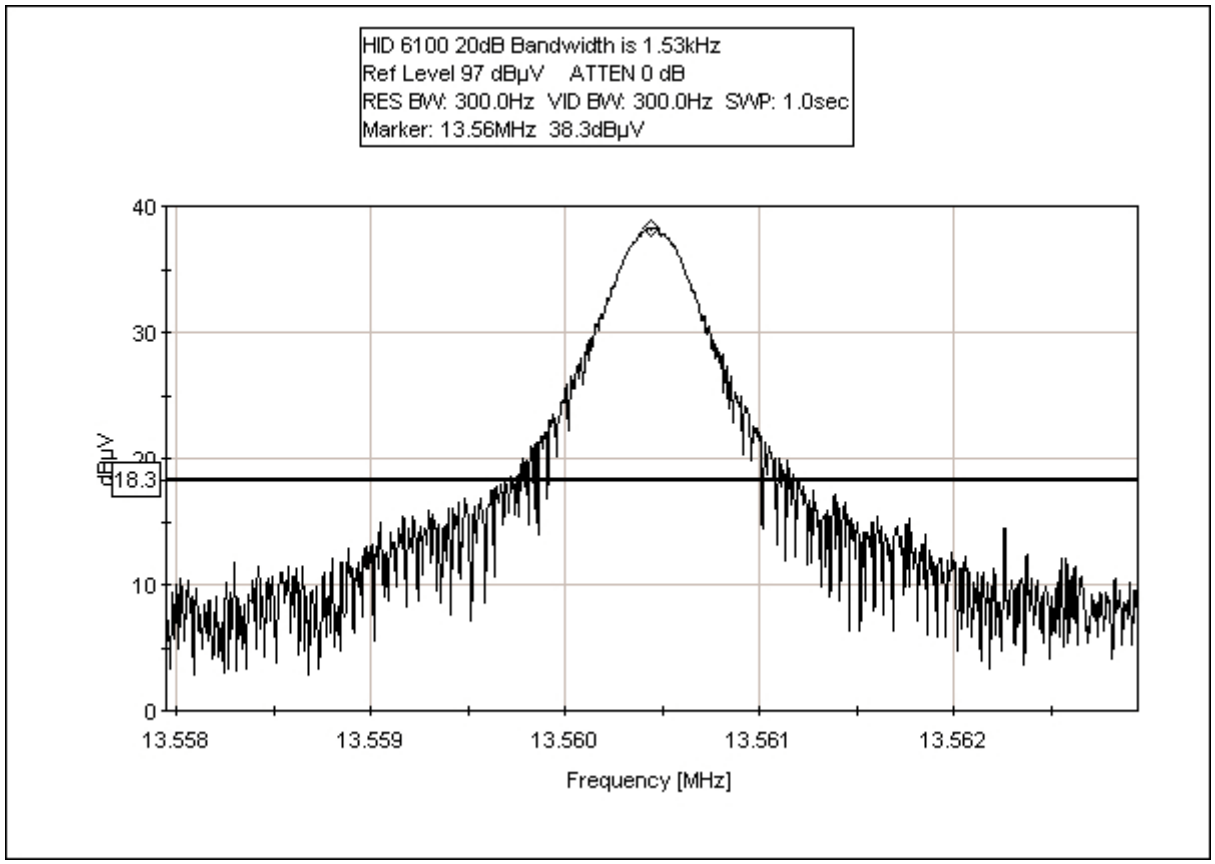
RSS-210 EMISSIONS MASK – 6111A



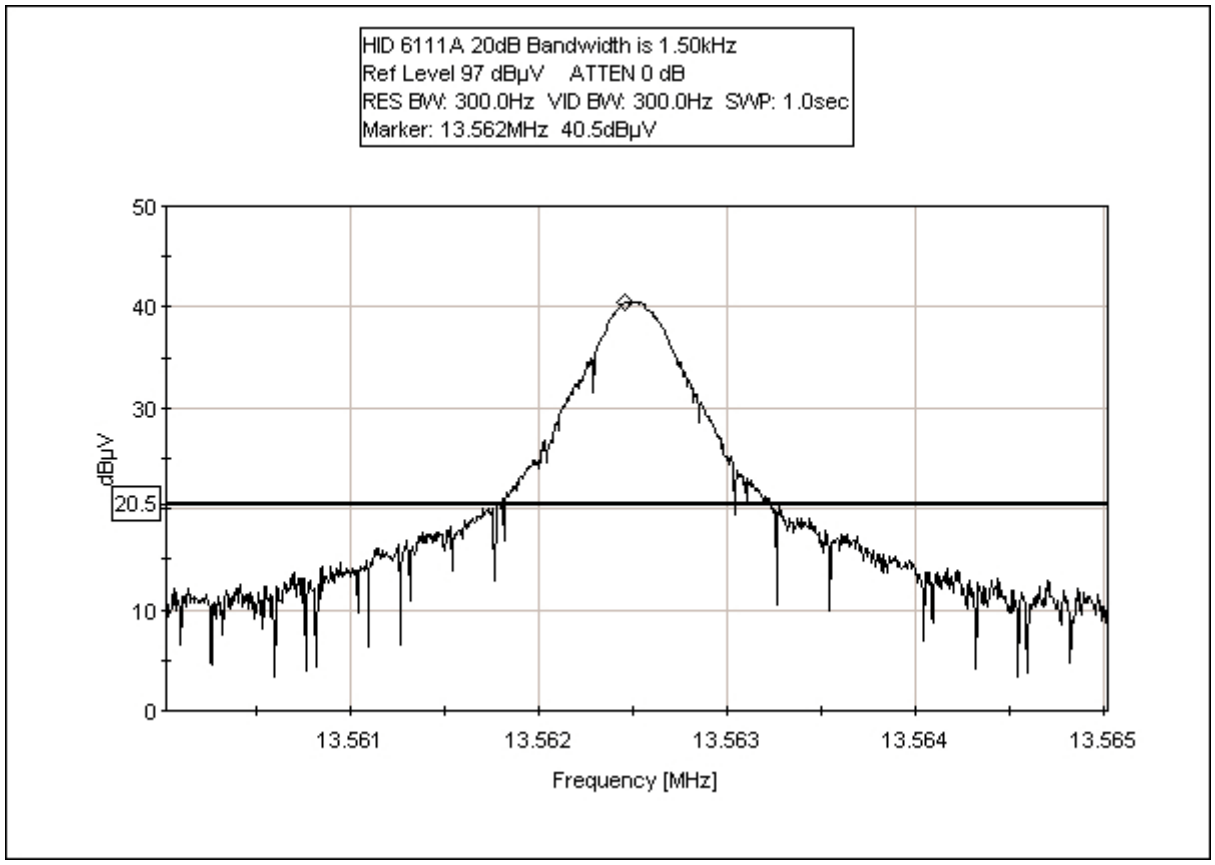
RSS-210 EMISSIONS MASK – 6121A



RSS-210 20 dB/99% BANDWIDTH PLOT– 6100A



RSS-210 20 dB/99% BANDWIDTH PLOT – 6111A



RSS-210 20 dB/99% BANDWIDTH PLOT – 6121A

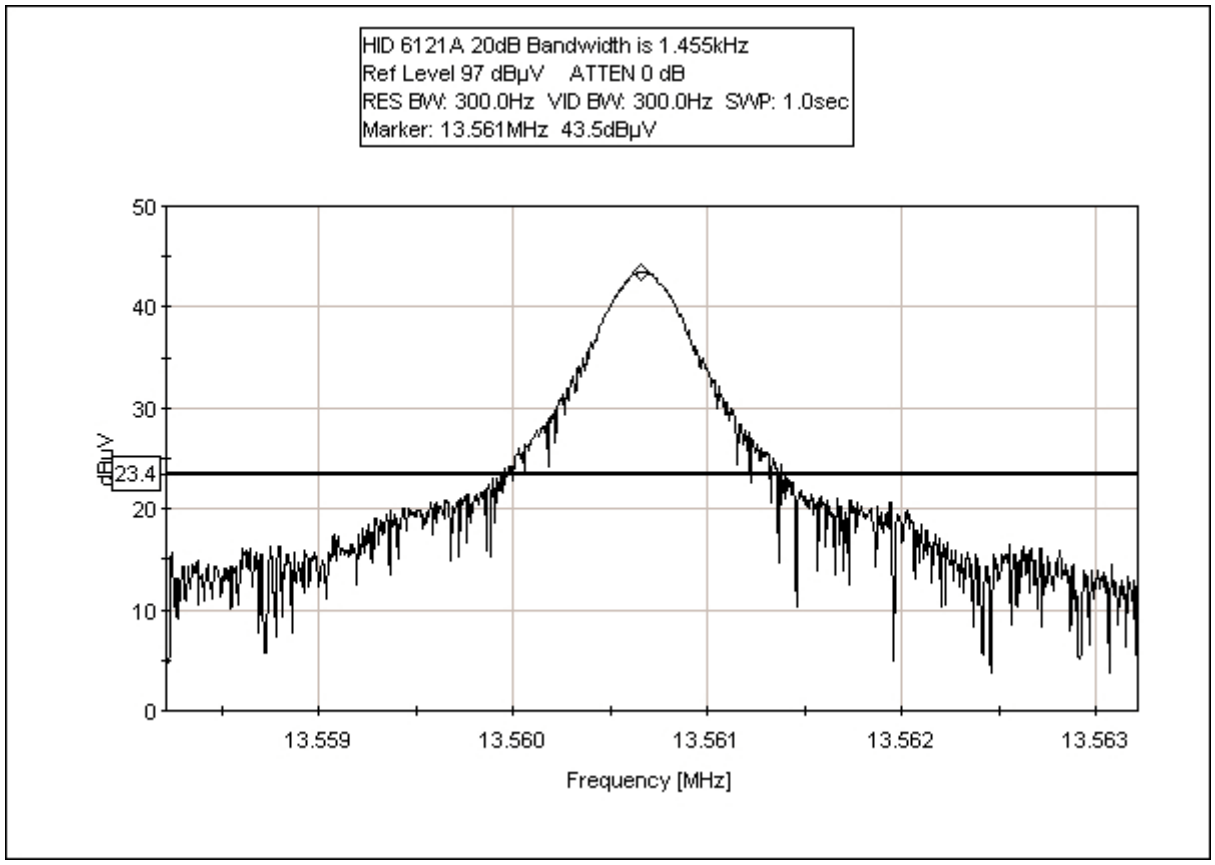


Table 4: Six Highest Conducted Emission Levels - 15.207 - 6100A

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Lisn dB		Cable dB		CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.492601	31.0	0.4		0.1		31.5	48.0	-16.5	B
0.493484	29.9	0.6		0.1		30.6	48.0	-17.4	W
0.975902	29.5	0.3		0.1		29.9	48.0	-18.1	B
13.491840	29.1	0.6		0.3		30.0	48.0	-18.0	W
13.567390	45.3	0.6		0.3		46.2	48.0	-1.8	WQ
13.568700	42.5	1.0		0.3		43.8	48.0	-4.2	BQ

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

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

COMMENTS: EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. Power supply is located on the ground plane. EUT shield wire is disconnected. Frequency Range Investigated: 450-30MHz.

Table 5: Six Highest Conducted Emission Levels - 15.207 - 6111A									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Lisn dB	dB	Cable dB	dB	READING dBµV	LIMIT dBµV	MARGIN dB	NOTES
0.485815	33.4	0.4		0.1		33.9	48.0	-14.1	B
0.489774	35.6	0.4		0.1		36.1	48.0	-11.9	B
0.495806	38.0	0.4		0.1		38.5	48.0	-9.5	B
6.111624	31.3	1.0		0.3		32.6	48.0	-15.4	B
13.556300	34.3	1.0		0.3		35.6	48.0	-12.4	B
13.566600	33.2	0.6		0.3		34.1	48.0	-13.9	W

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

NOTES: B = Black Lead
W = White Lead

COMMENTS: EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. Power supply is located on the ground plane. EUT shield wire is disconnected. Frequency Range Investigated: 450-30MHz.

Table 6: Six Highest Conducted Emission Levels - 15.207 - 6121A									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Lisn dB	dB	Cable dB	dB	READING dBµV	LIMIT dBµV	MARGIN dB	NOTES
0.460179	34.2	0.6		0.1		34.9	48.0	-13.1	W
0.501649	34.8	0.6		0.1		35.5	48.0	-12.5	W
0.778484	34.2	0.5		0.0		34.7	48.0	-13.3	W
0.861961	36.5	0.5		0.0		37.0	48.0	-11.0	W
13.566000	34.5	1.0		0.3		35.8	48.0	-12.2	B
13.567200	34.8	0.6		0.3		35.7	48.0	-12.3	W

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

NOTES: B = Black Lead
W = White Lead

COMMENTS: EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. Power supply is located on the ground plane. EUT shield wire is disconnected. Frequency Range Investigated: 450-30MHz.

Table 7: Six Highest Radiated Emission Levels - 15.209/15.225(b) - 6100A									
	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
40.760	40.2	11.1	-26.8	1.2	10.0	35.7	40.0	-4.3	V
67.904	40.6	8.4	-26.8	1.6	10.0	33.8	40.0	-6.2	VQ
81.448	43.0	7.2	-26.8	1.8	10.0	35.2	40.0	-4.8	VQ
312.092	30.2	20.5	-26.3	3.8	10.0	38.2	46.0	-7.8	H
325.551	32.2	19.7	-26.3	3.9	10.0	39.5	46.0	-6.5	H
379.792	35.3	16.7	-26.6	4.2	10.0	39.6	46.0	-6.4	H

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Sections 15.209/15.225(b)
Test Distance: 10 Meters

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

COMMENTS: EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: 9kHz - 1000MHz. (Note: No spurious emissions found below 30MHz).

Table 8: Six Highest Radiated Emission Levels - 15.209/15.225(b) - 6111A									
	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
40.737	33.0	11.1	-26.8	1.2	10.0	28.5	40.0	-11.5	H
40.781	39.5	11.1	-26.8	1.2	10.0	35.0	40.0	-5.0	VQ
54.345	41.9	10.9	-26.8	1.4	10.0	37.4	40.0	-2.6	VQ
67.902	45.9	8.4	-26.8	1.6	10.0	39.1	40.0	-0.9	VQ
81.442	38.0	7.2	-26.8	1.8	10.0	30.2	40.0	-9.8	V
325.552	29.0	19.7	-26.3	3.9	10.0	36.3	46.0	-9.7	V

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Sections 15.209/15.225(b)
Test Distance: 10 Meters

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

COMMENTS: EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: 9kHz - 1000MHz. (Note: No spurious emissions found below 30MHz).

Table 9: Six Highest Radiated Emission Levels - 15.209/15.225(b) - 6121A									
	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
40.736	39.1	11.1	-26.8	1.2	10.0	34.6	40.0	-5.4	V
54.339	39.4	10.9	-26.8	1.4	10.0	34.9	40.0	-5.1	VQ
596.742	31.6	19.3	-27.5	5.4	10.0	38.8	46.0	-7.2	H
610.305	32.3	19.5	-27.5	5.5	10.0	39.8	46.0	-6.2	H
623.882	30.6	19.8	-27.5	5.7	10.0	38.6	46.0	-7.4	H
637.418	32.7	20.0	-27.6	5.9	10.0	41.0	46.0	-5.0	H

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Sections 15.209/15.225(b)
Test Distance: 10 Meters

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

COMMENTS: EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: 9kHz - 1000MHz. (Note: No spurious emissions found below 30MHz).

Table 10: Frequency Stability - 15.225(c) – 6100A

Customer: HID Corporation
WO#: 78445
Date: 21-May-02
Test Engineer: Randal Clark

Device Model #: 6100A (6091-300) iCLASS R10
Operating Voltage: 12 **VDC**
Frequency Limit: 0.01 **%**

Temperature Variations

		Channel 1 (MHz)	Dev. (MHz)
Channel Frequency:		**13.56**	
Temp (C)	Voltage		
-30	12.0	13.56039	0.00039
-20	12.0	13.56046	0.00046
-10	12.0	13.56044	0.00044
0	12.0	13.56048	0.00048
10	12.0	13.56046	0.00046
20	12.0	13.56046	0.00046
30	12.0	13.56046	0.00046
40	12.0	13.56038	0.00038
50	12.0	13.56032	0.00032

Voltage Variations (±15%)

20	10.2	13.56043	0.00043
20	12.0	13.56046	0.00046
20	13.8	13.56044	0.00044

Max Deviation (MHz)	**0.00048**
Max Deviation (%)	**0.00355**
	PASS

Table 11: Frequency Stability - 15.225(c) – 6111A

Customer: HID Corporation
WO#: 78445
Date: 21-May-02
Test Engineer: Randal Clark

Device Model #: 6111A (6092-300) iCLASS RW300
Operating Voltage: 12 **VDC**
Frequency Limit: 0.01 **%**

Temperature Variations

		Channel 1 (MHz)	Dev. (MHz)
Channel Frequency:		**13.562**	
Temp (C)	Voltage		
-30	12.0	13.56257	0.00057
-20	12.0	13.56252	0.00052
-10	12.0	13.56255	0.00055
0	12.0	13.56262	0.00061
10	12.0	13.56251	0.00051
20	12.0	13.56253	0.00053
30	12.0	13.56245	0.00045
40	12.0	13.56246	0.00046
50	12.0	13.56231	0.00031

Voltage Variations

20	10.8	13.56254	0.00054
20	12.0	13.56253	0.00053
20	13.2	13.56246	0.00046

Max Deviation (MHz)	**0.00061**
Max Deviation (%)	**0.00453**
	PASS

Table 12: Frequency Stability - 15.225(c) – 6121A

Customer: HID Corporation
WO#: 78445
Date: 21-May-02
Test Engineer: Randal Clark

Device Model #: 6121A (6093-300) iCLASS RW400
Operating Voltage: 12 **VDC**
Frequency Limit: 0.01 **%**

Temperature Variations

		Channel 1 (MHz)	Dev. (MHz)
Channel Frequency:		**13.56**	
Temp (C)	Voltage		
-30	12.0	13.56065	0.00065
-20	12.0	13.56071	0.00071
-10	12.0	13.56079	0.00079
0	12.0	13.56073	0.00072
10	12.0	13.56076	0.00075
20	12.0	13.56072	0.00071
30	12.0	13.56068	0.00067
40	12.0	13.56056	0.00056
50	12.0	13.56054	0.00054

Voltage Variations

20	10.8	13.56070	0.00070
20	12.0	13.56072	0.00071
20	13.2	13.56066	0.00066

Max Deviation (MHz)	**0.00079**
Max Deviation (%)	**0.00006**
	PASS

MEASUREMENT UNCERTAINTY

Measurement uncertainty associated with data in this report is a ± 2.94dB for radiated and ± 1.56dB for conducted emissions.

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

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 radiated and conducted emissions data of the iCLASS R10, 6100A (6091-300); iCLASS RW300, 6111A (6092-300) and iCLASS RW400, 6121A (6093-300), 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 the iCLASS R10, 6100A (6091-300); iCLASS RW300, 6111A (6092-300) and iCLASS RW400, 6121A (6093-300). For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For radiated measurements below 300 MHz, the biconical antenna was used. For frequencies from 300 to 1000 MHz, the log periodic 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.

FCC SECTION 15.35:
TABLE B: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE

TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	450 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

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 for the iCLASS R10, 6100A (6091-300); iCLASS RW300, 6111A (6092-300) and iCLASS RW400, 6121A (6093-300).

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.

For conducted emissions testing, a 30 to 50 second sweep time was used for automated measurements in the frequency bands of 450 kHz to 1.705 MHz, 1.705 MHz to 3 MHz, and 3 MHz to 30 MHz. All readings within 20 dB of the limit were recorded. At frequencies where the recorded emissions were close to the limit, further investigation was performed manually at a slower sweep rate.

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 88 MHz was scanned with the biconical antenna located about 1.5 meter above the ground plane in the vertical configuration. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. The frequency range of 100 to 300 MHz was then scanned in the same manner using the biconical antenna and the peaks recorded. Lastly, a scan of the FM band from 88 to 110 MHz was made, using a reduced resolution bandwidth and frequency span. The biconical antenna was changed to the horizontal polarity and the above steps were repeated. After changing to the log periodic antenna in the horizontal configuration, the frequency range of 300 to 1000 MHz was scanned. The log periodic antenna was changed to the vertical polarity and the frequency range of 300 to 1000 MHz was again scanned. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

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

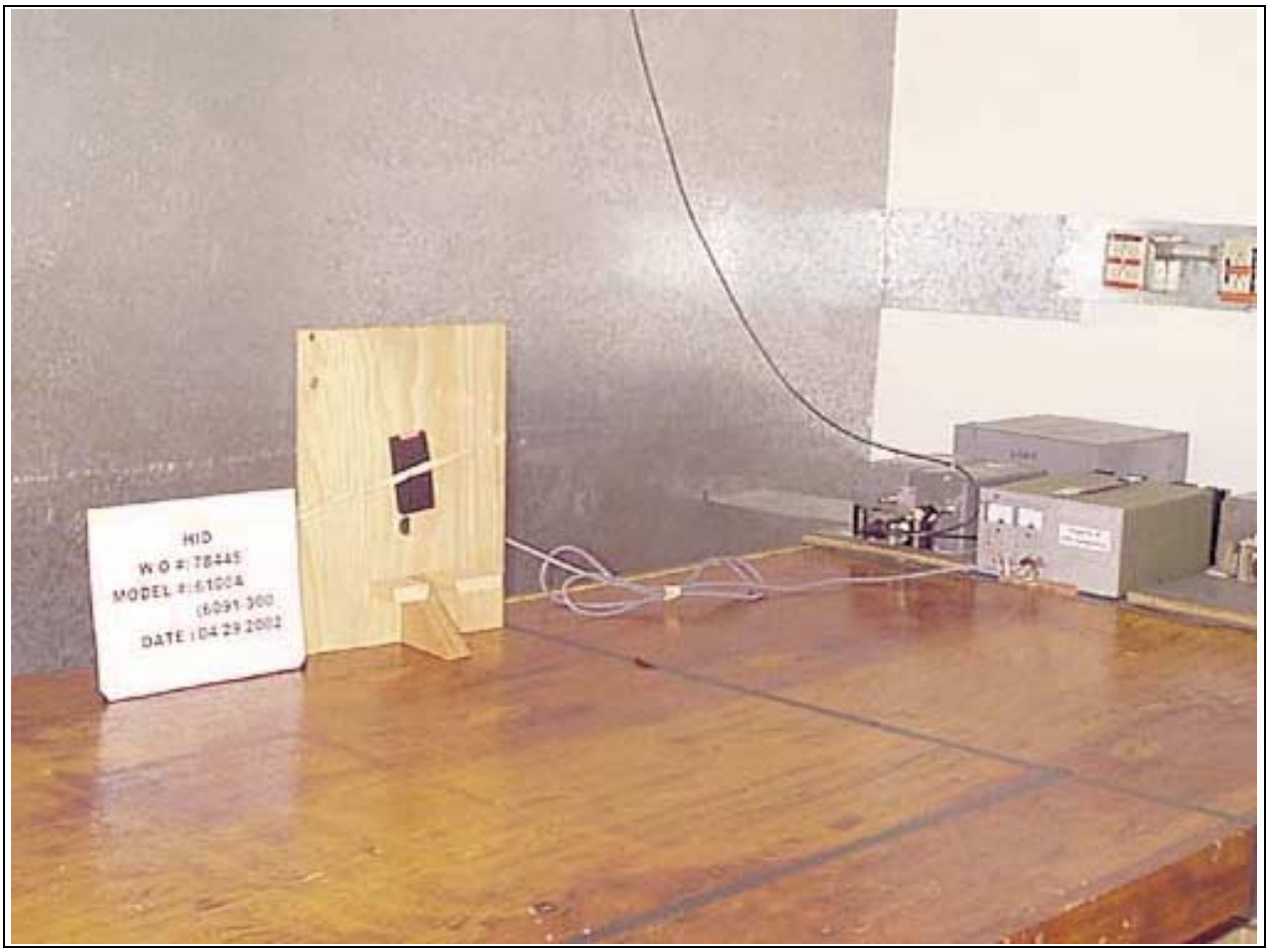
APPENDIX A

TEST SETUP DIAGRAM AND PHOTOGRAPHS

PHOTOGRAPH SHOWING VOLTAGE VARIATIONS

Voltage Variations

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

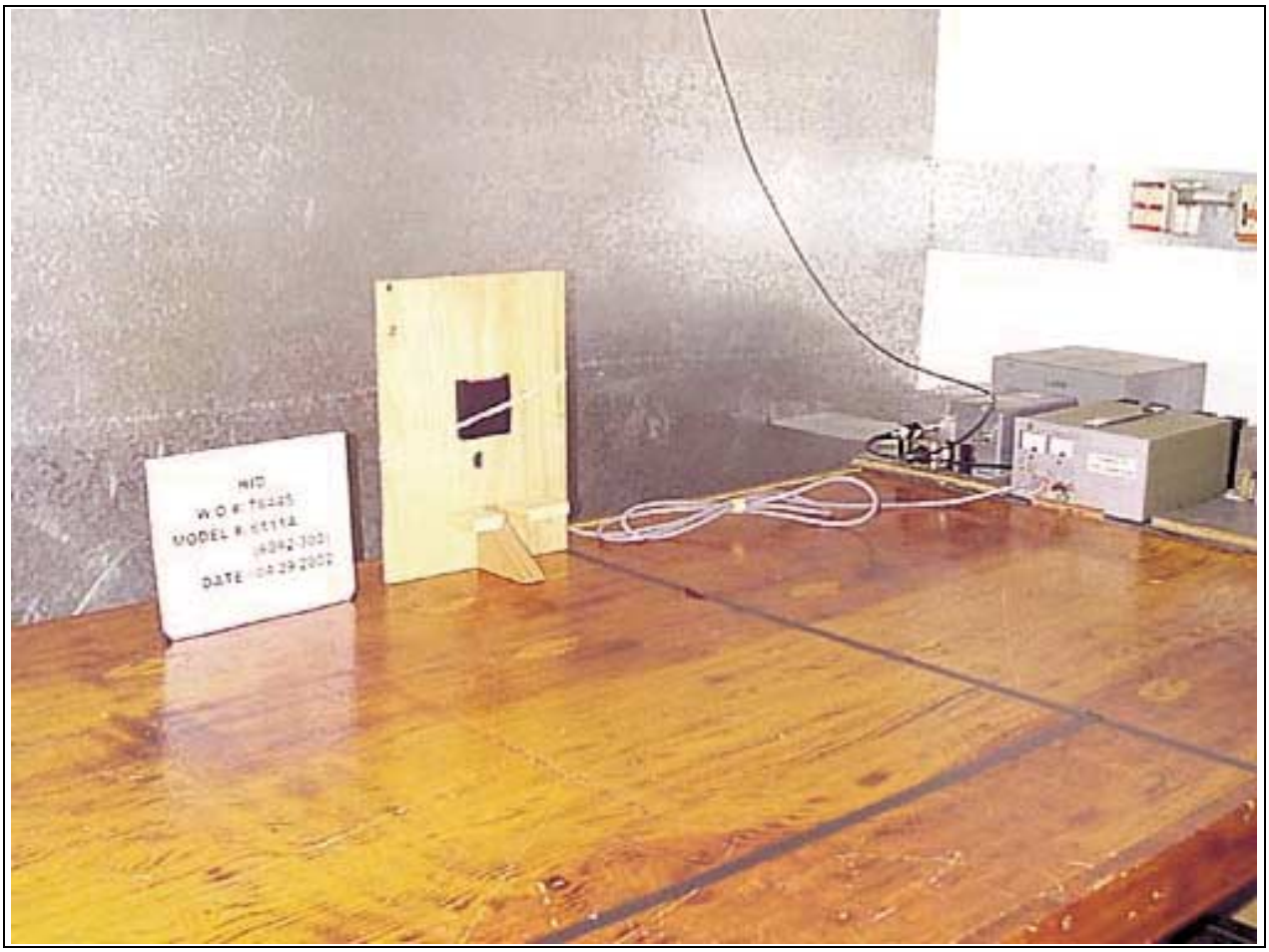


Mains Conducted Emissions - Front View - 6100A

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

Mains Conducted Emissions - Side View - 6100A

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

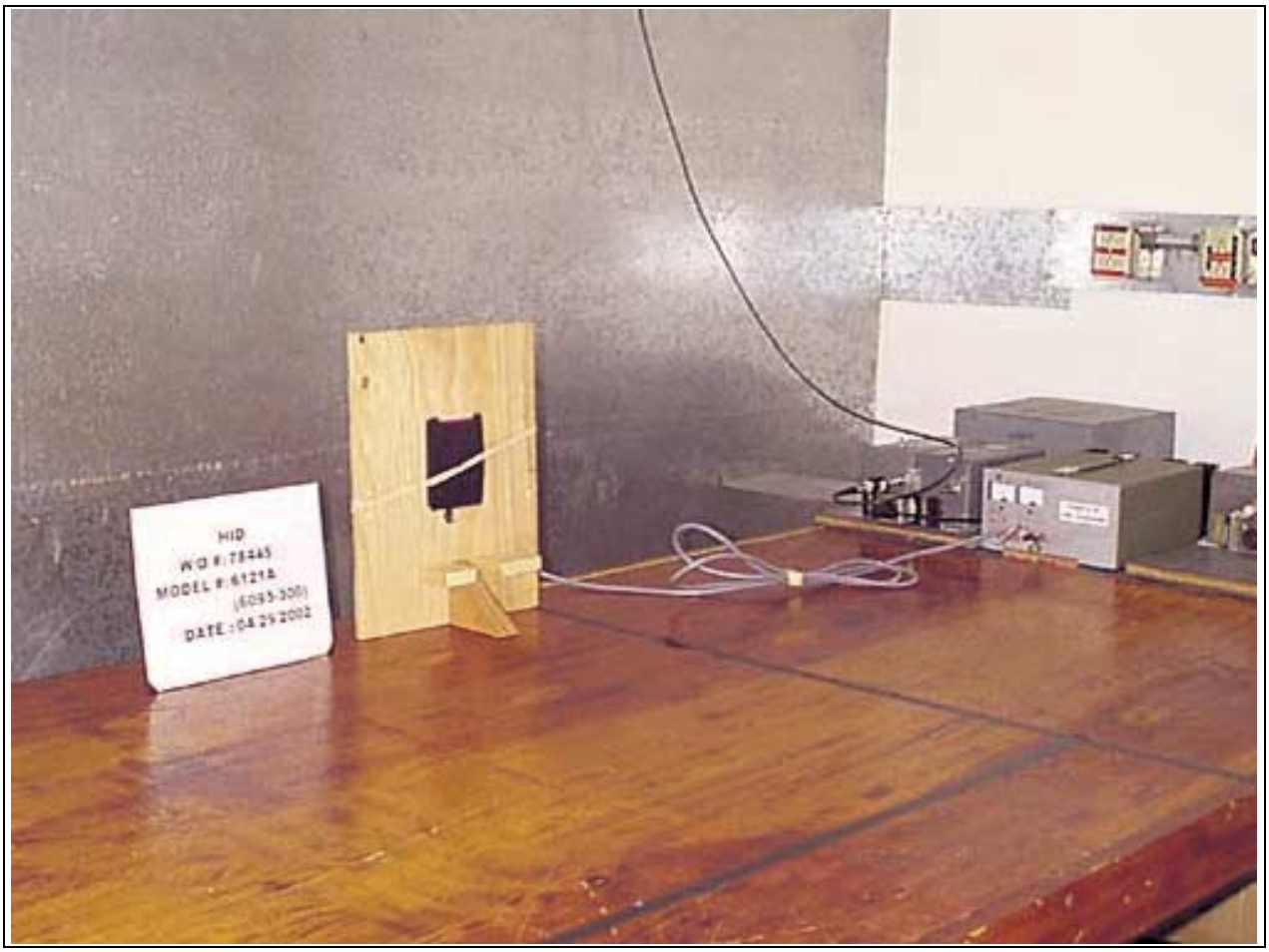


Mains Conducted Emissions - Front View - 6111A

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

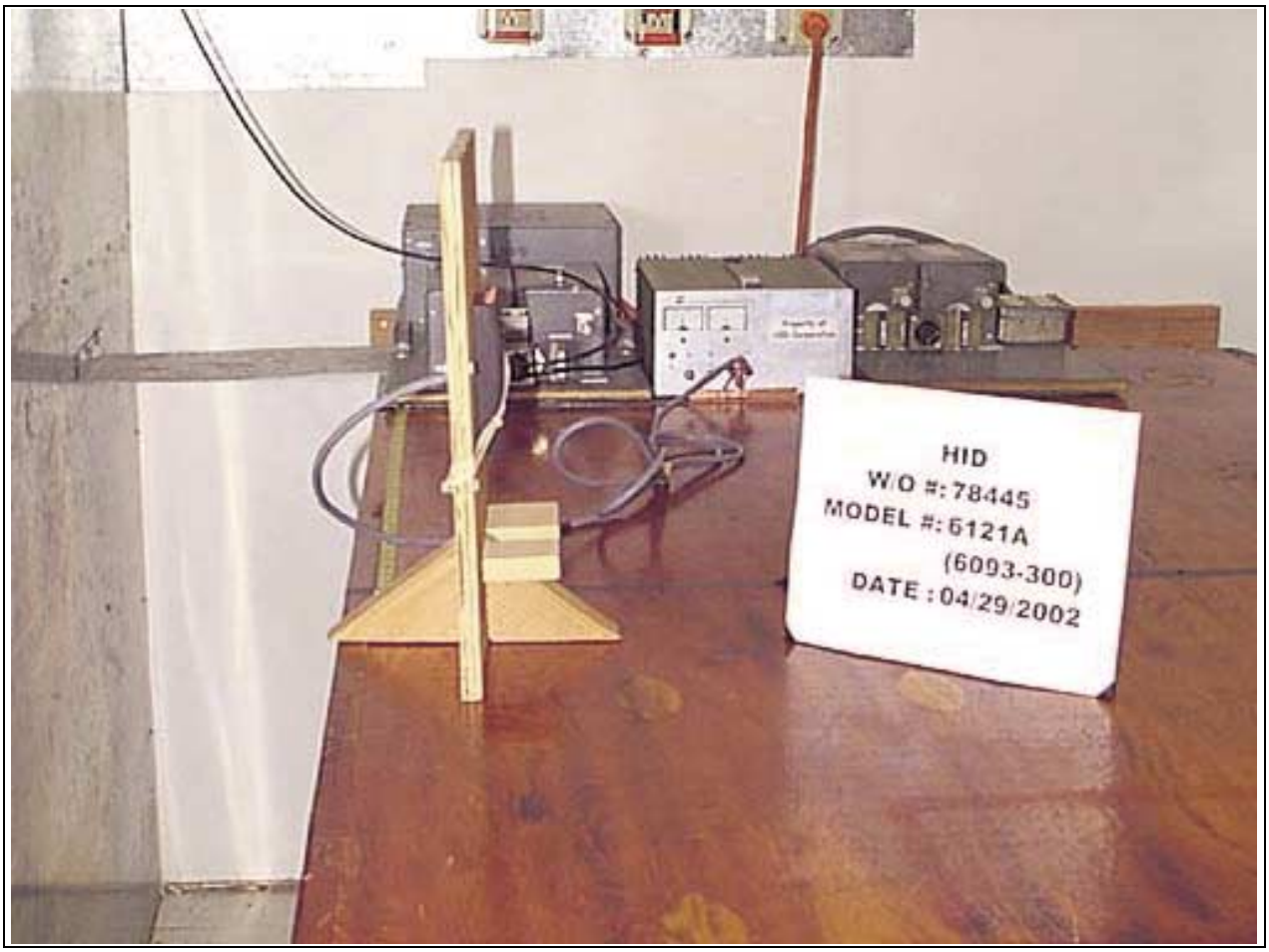
Mains Conducted Emissions - Side View - 6111A

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Front View - 6121A

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

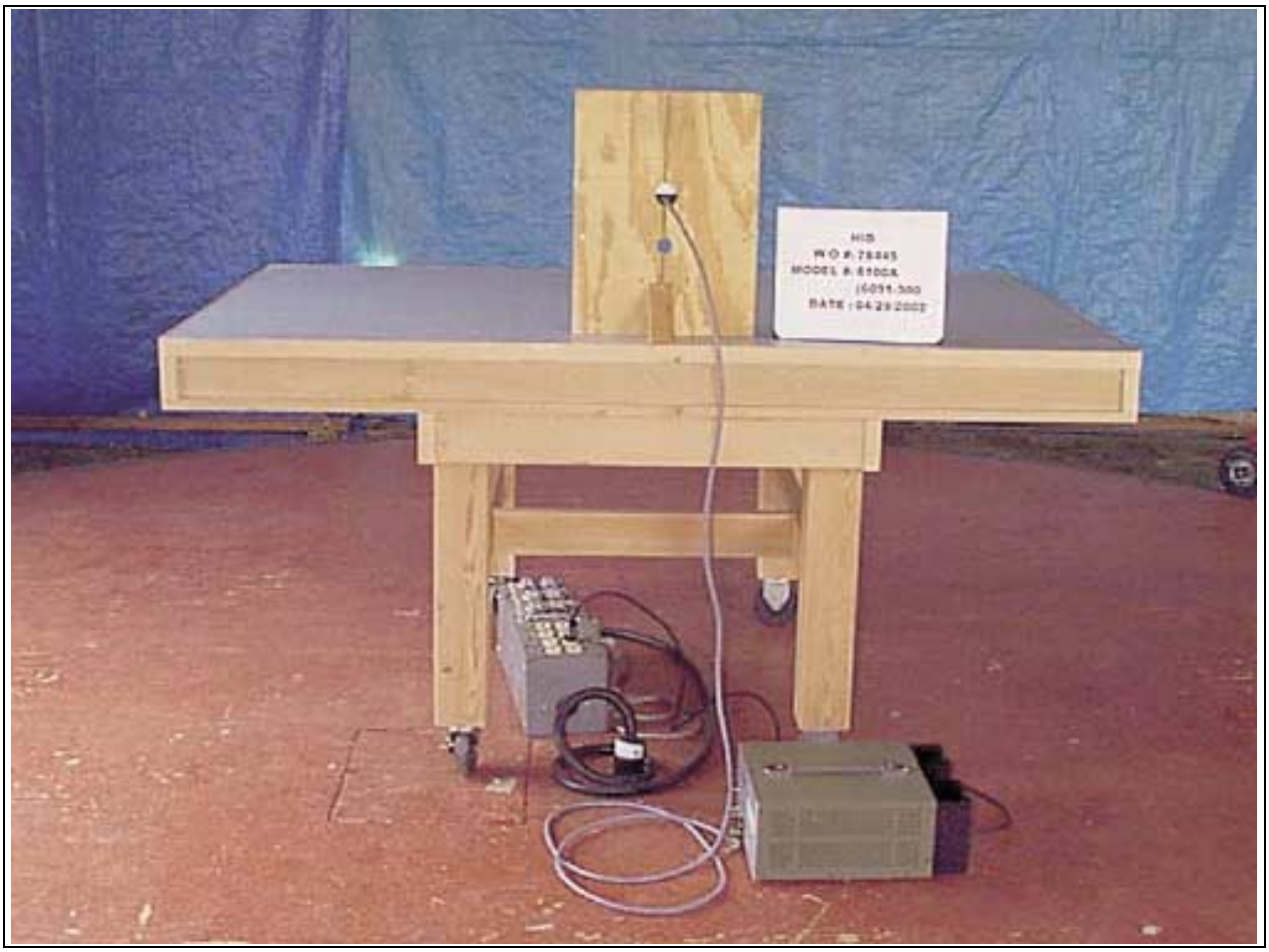


Mains Conducted Emissions - Side View - 6121A

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Front View - 6100A

PHOTOGRAPH SHOWING RADIATED EMISSIONS

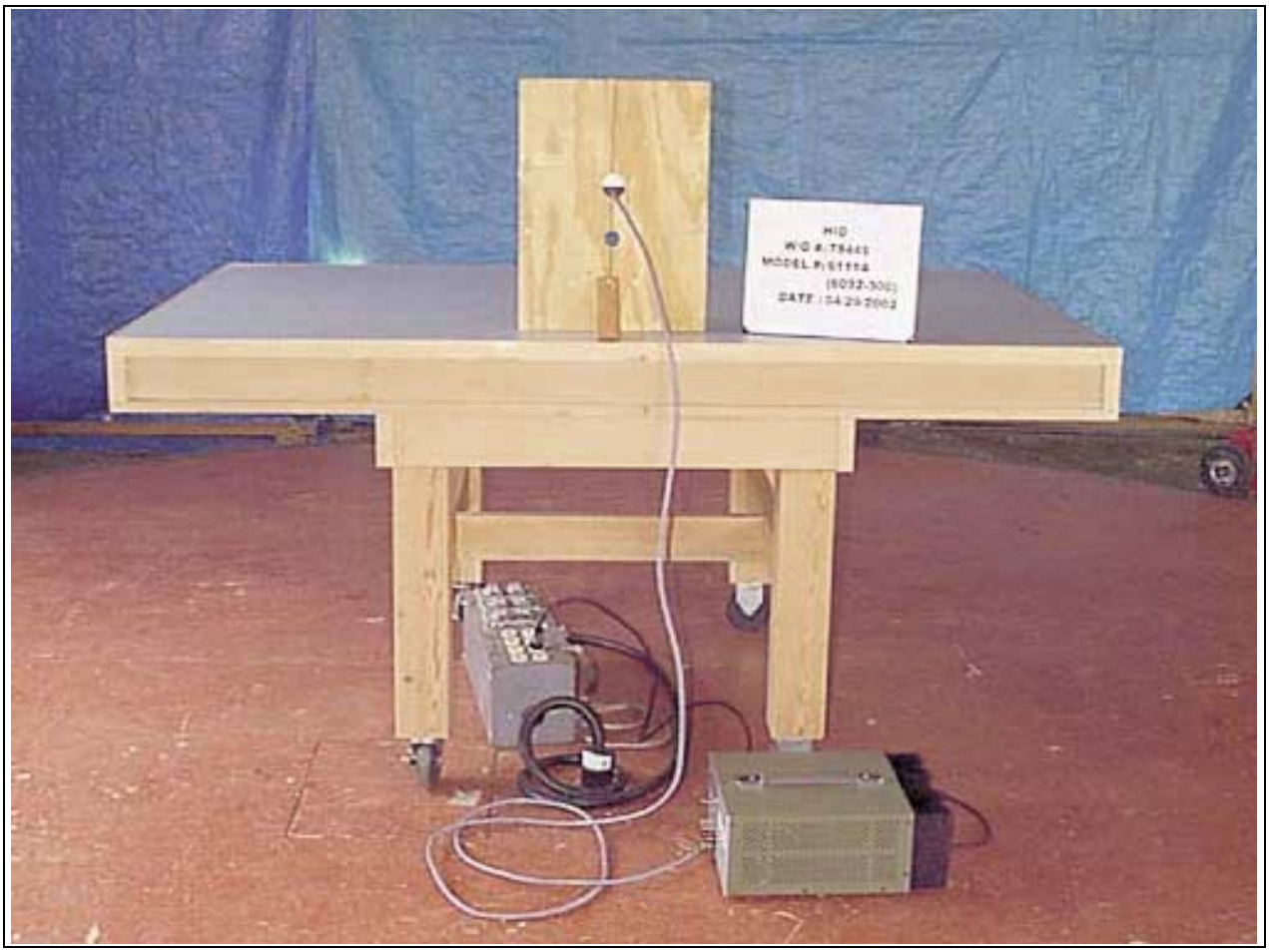


Radiated Emissions - Back View - 6100A

PHOTOGRAPH SHOWING RADIATED EMISSIONS

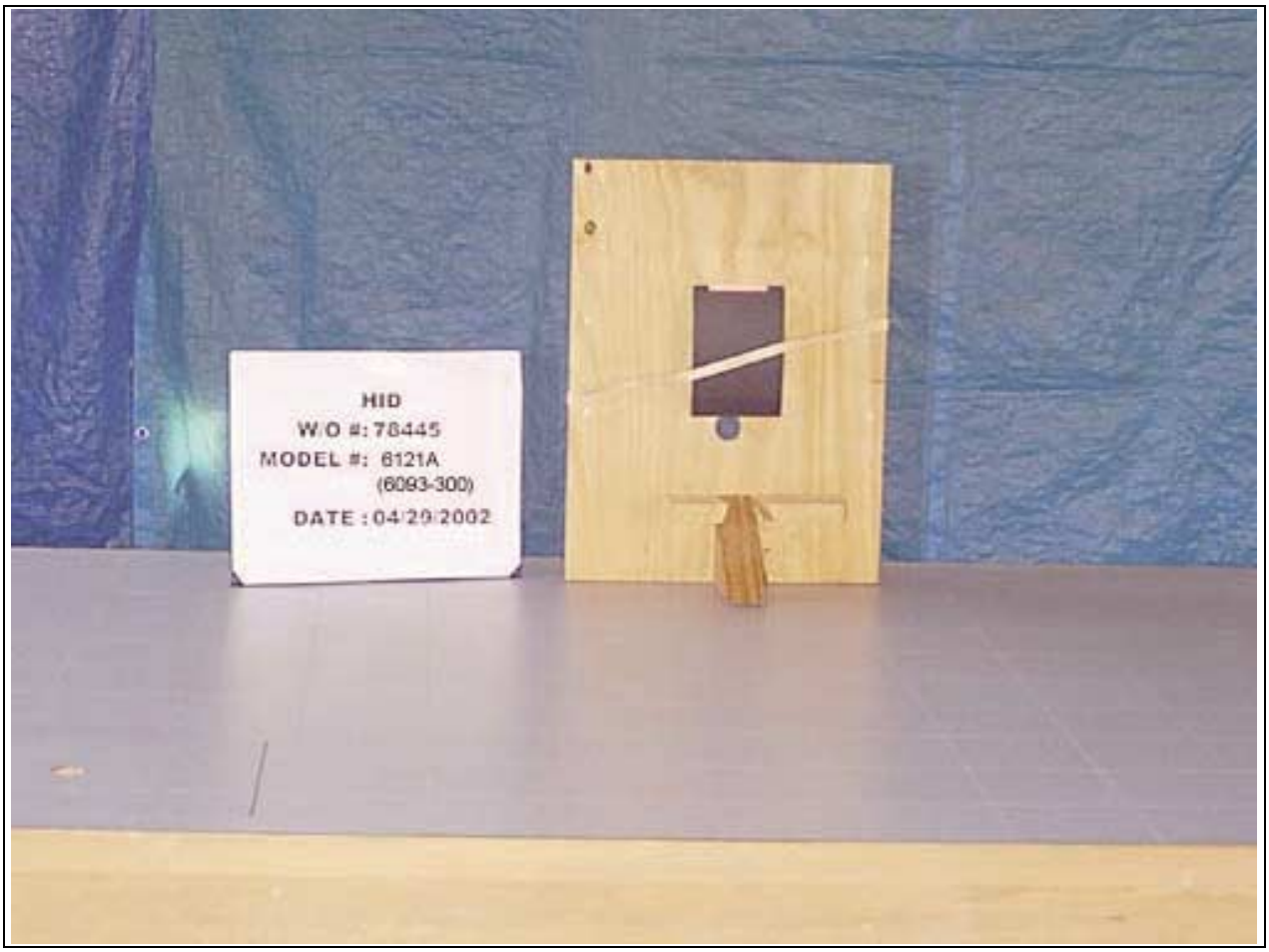
Radiated Emissions - Front View - 6111A

PHOTOGRAPH SHOWING RADIATED EMISSIONS



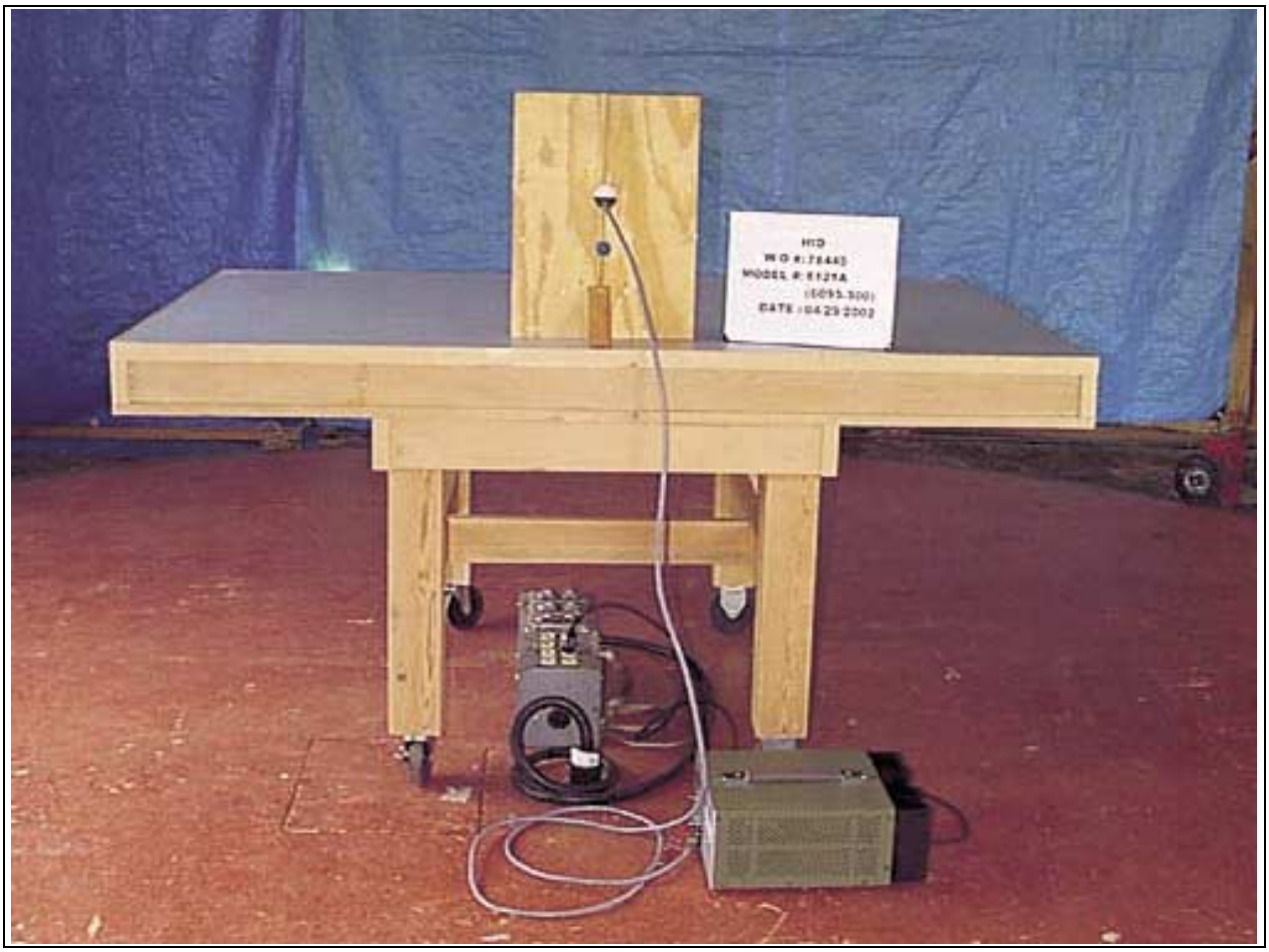
Radiated Emissions - Back View - 6111A

PHOTOGRAPH SHOWING RADIATED EMISSIONS



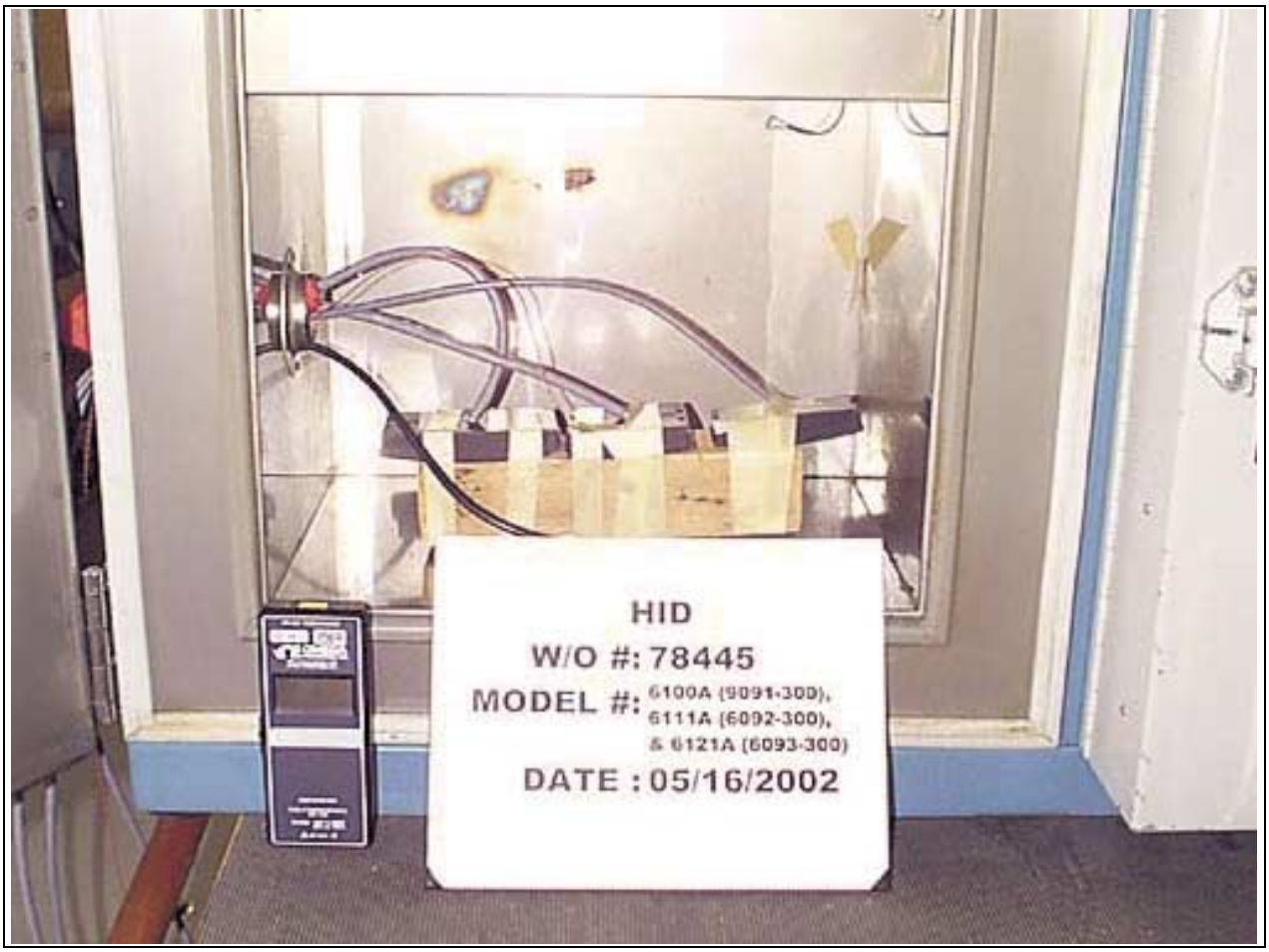
Radiated Emissions - Front View - 6121A

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View - 6121A

PHOTOGRAPH SHOWING FREQUENCY STABILITY



Frequency Stability

APPENDIX B

TEST EQUIPMENT LIST

Radiated measurements including fundamental and spurs.

Equipment	*Manufacturer*	*Model #*	*Serial #*	*Asset #*	*Cal Date*	*Cal Due*
3/10m & LISN Cable	Andrews	Hardline	N/A	N/A	11/19/01	11/19/02
30 Meter Cable	Andrews	Hardline	N/A	N/A	11/19/01	11/19/02
Antenna, Bicon	A&H	SAS-200/542	156	00225	12/06/01	12/6/02
Antenna, Log	A&H	SAS-200/510	154	01330	05/07/01	5/7/02
Antenna, Loop	EMCO	6502	1074	00226	5/31/2001	5/31/02
Digital Multimeter	Radio Shack	22-183	NA	01241	8/30/01	8/30/02
Preamp	HP	8447D	1937A02604	00099	3/21/02	3/21/03
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03
Spectrum Analyzer	HP	8566B	2209A01404	00490	1/30/02	1/30/03

AC conducted measurements

Equipment	*Manufacturer*	*Model #*	*Serial #*	*Asset #*	*Cal Date*	*Cal Due*
3/10m & LISN Cable	Andrews	Hardline	N/A	N/A	11/19/01	11/19/02
Digital Multimeter	Radio Shack	22-183	NA	01241	8/30/01	8/30/02
LISN Set	Solar	8028-50-TS-24-BNC	814493, 474	02056	5/22/01	5/22/02
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03
Spectrum Analyzer	HP	8566B	2209A01404	00490	1/30/02	1/30/03

Temperature and voltage variation test equipment

Equipment	*Manufacturer*	*Model #*	*Serial #*	*Asset #*	*Cal Date*	*Cal Due*
Digital Multimeter	Radio Shack	22-183	NA	01241	8/30/01	8/30/02
Power Supply, DC	Leader	LPS-2801	6030090		02/10/02	2/10/03
Power Supply, DC	HP	6205C	2228A01775	00762	5/31/2001	5/31/02
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03
Spectrum Analyzer	HP	8566B	2209A01404	00490	1/30/02	1/30/03
Temp Chamber	Thermotron	S-1.2 MiniMax	11899	01879	2/7/02	2/7/03
Thermometer	Omega	HH-26K	T-202884	02242	7/26/01	7/26/02

APPENDIX C: MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.225(a)**
Work Order #: **78445** Date: 05/01/2002
Test Type: **Maximized Emissions** Time: 17:24:28
Equipment: **Proximity Reader** Sequence#: 58
Manufacturer: HID Tested By: Randal Clark
Model: 6100A (6091-300) iCLASS R10
S/N: 1502-0008

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6100A (6091-300) iCLASS R10	1502-0008

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: Fundamental.

Transducer Legend:

T1=Cable - 10 Meter T2=Loop 1074
T3=15.31 10m 40dB/Dec Correction

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.560M	40.3	+0.7	+10.0	-20.0		+0.0	31.0	80.0	-49.0	Vert
2	13.562M	37.6	+0.7	+10.0	-20.0		+0.0	28.3	80.0	-51.7	Vert

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.225(a)**
Work Order #: **78445** Date: 05/01/2002
Test Type: **Maximized Emissions** Time: 18:00:45
Equipment: **Proximity Reader** Sequence#: 59
Manufacturer: HID Tested By: Randal Clark
Model: 6111A (6092-300) iCLASS RW300
S/N: 1502-0005

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6111A (6092-300) iCLASS RW300	1502-0005

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: Fundamental.

Transducer Legend:

T1=Cable - 10 Meter	T2=Loop 1074
T3=15.31 10m 40dB/Dec Correction	T4=dBuA Conversion

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.561M	40.9	+0.7	+10.0	-20.0		+0.0	31.6	80.0	-48.4	Vert
2	13.561M	37.6	+0.7	+10.0	-20.0	+0.0	+0.0	28.3	80.0	-51.7	Vert

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.225(a)**
Work Order #: **78445** Date: 05/01/2002
Test Type: **Maximized Emissions** Time: 18:21:12
Equipment: **Proximity Reader** Sequence#: 60
Manufacturer: HID Tested By: Randal Clark
Model: 6121A (6093-300) iCLASS RW400
S/N: 1502-0003

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6121A (6093-300) iCLASS RW400	1502-0003

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: Fundamental.

Transducer Legend:

T1=Cable - 10 Meter T2=Loop 1074
T3=15.31 10m 40dB/Dec Correction

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.560M	44.1	+0.7	+10.0	-20.0		+0.0	34.8	80.0	-45.2	Vert
2	13.561M	41.1	+0.7	+10.0	-20.0		+0.0	31.8	80.0	-48.2	Vert

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.207**
Work Order #: **78445** Date: 05/01/2002
Test Type: **Conducted Emissions** Time: 09:59:00
Equipment: **Proximity Reader** Sequence#: 47
Manufacturer: HID Tested By: Randal Clark
Model: 6100A (6091-300) iCLASS R10 120V 60Hz
S/N: 1502-0008

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6100A (6091-300) iCLASS R10	1502-0008

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. Power supply is located on the ground plane. EUT shield wire is disconnected. Frequency Range Investigated: 450-30MHz.

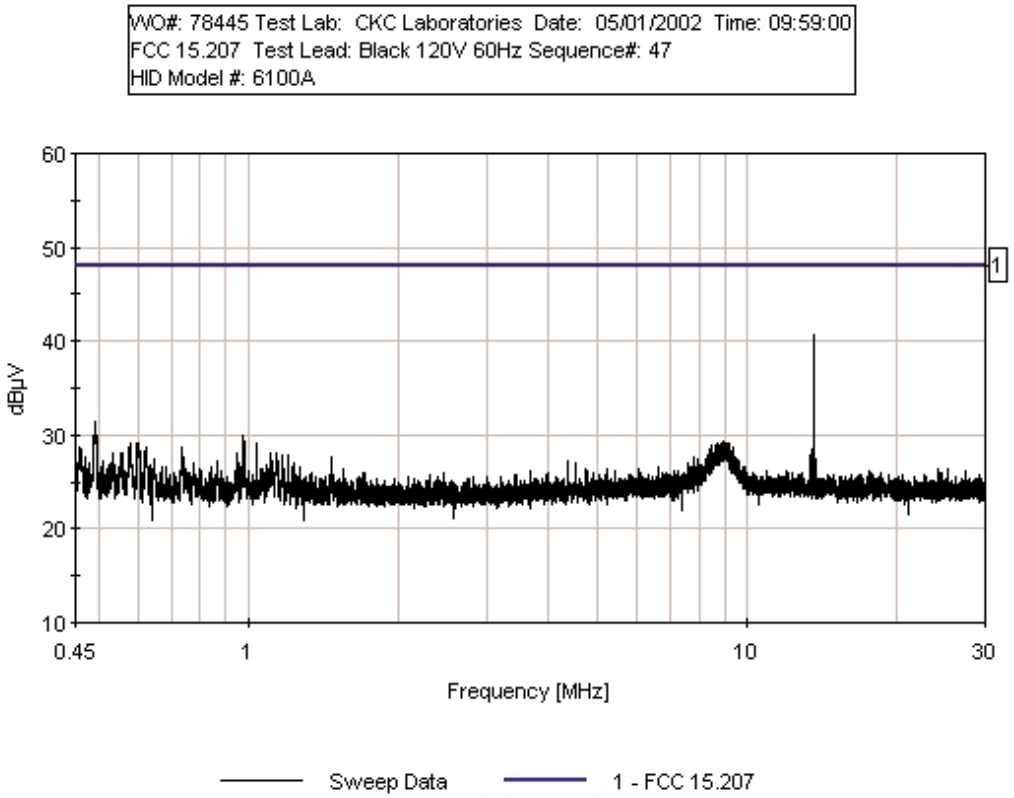
Transducer Legend:

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

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	13.569M QP	42.5	+0.3	+1.0			+0.0	43.8	48.0	-4.2	Black
^	13.564M	45.4	+0.3	+1.0			+0.0	46.7	48.0	-1.3	Black
3	492.601k	31.0	+0.1	+0.4			+0.0	31.5	48.0	-16.5	Black
4	975.902k	29.5	+0.1	+0.3			+0.0	29.9	48.0	-18.1	Black
5	8.986M	24.1	+0.2	+5.1			+0.0	29.4	48.0	-18.6	Black
6	599.104k	28.7	+0.1	+0.4			+0.0	29.2	48.0	-18.8	Black
7	581.950k	28.6	+0.1	+0.4			+0.0	29.1	48.0	-18.9	Black
8	1.037M	28.7	+0.1	+0.3			+0.0	29.1	48.0	-18.9	Black
9	459.237k	28.3	+0.1	+0.4			+0.0	28.8	48.0	-19.2	Black
10	735.545k	28.4	+0.0	+0.3			+0.0	28.7	48.0	-19.3	Black

11	624.174k	28.1	+0.1	+0.4		+0.0	28.6	48.0	-19.4	Black
12	535.768k	27.6	+0.1	+0.4		+0.0	28.1	48.0	-19.9	Black
13	553.864k	27.6	+0.1	+0.4		+0.0	28.1	48.0	-19.9	Black
14	1.107M	27.7	+0.1	+0.3		+0.0	28.1	48.0	-19.9	Black
15	1.137M	27.7	+0.1	+0.3		+0.0	28.1	48.0	-19.9	Black
16	947.029k	27.5	+0.1	+0.4		+0.0	28.0	48.0	-20.0	Black
17	1.170M	27.5	+0.1	+0.3		+0.0	27.9	48.0	-20.1	Black
18	1.201M	27.4	+0.1	+0.3		+0.0	27.8	48.0	-20.2	Black
19	471.489k	27.1	+0.1	+0.4		+0.0	27.6	48.0	-20.4	Black
20	1.467M	27.2	+0.1	+0.3		+0.0	27.6	48.0	-20.4	Black
21	13.693M	26.1	+0.3	+1.0		+0.0	27.4	48.0	-20.6	Black



Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.207**
Work Order #: **78445** Date: 05/01/2002
Test Type: **Conducted Emissions** Time: 09:05:13
Equipment: **Proximity Reader** Sequence#: 46
Manufacturer: HID Tested By: Randal Clark
Model: 6100A (6091-300) iCLASS R10 120V 60Hz
S/N: 1502-0008

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6100A (6091-300) iCLASS R10	1502-0008

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. Power supply is located on the ground plane. EUT shield wire is disconnected. Frequency Range Investigated: 450-30MHz.

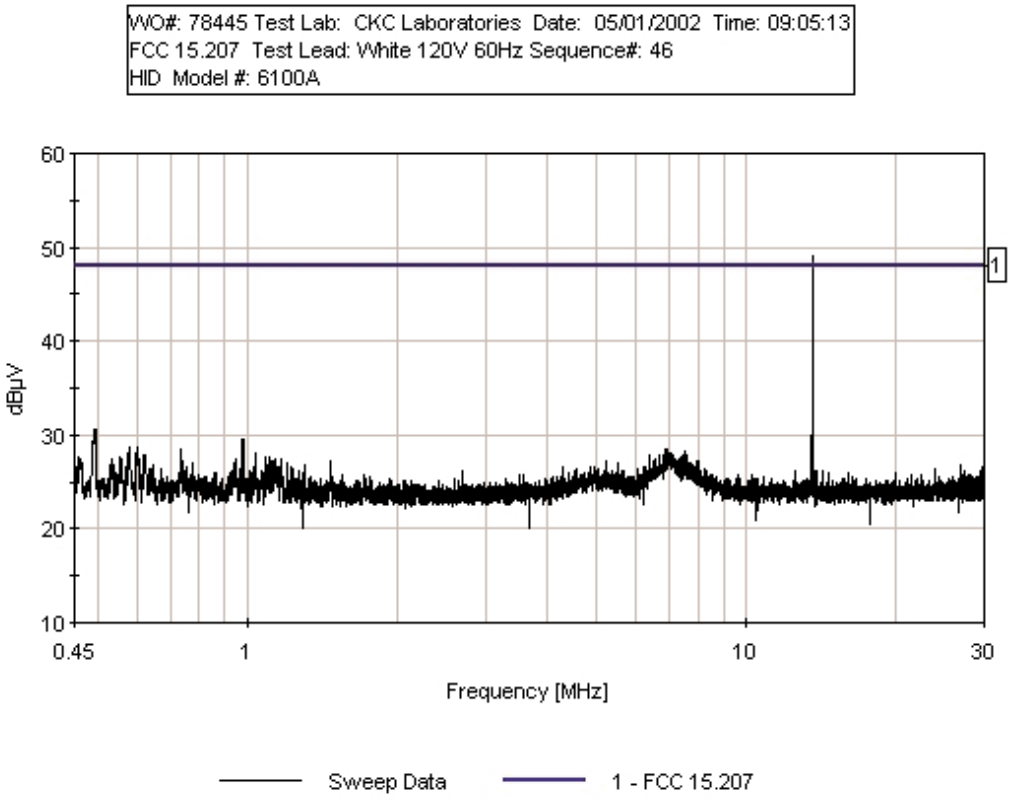
Transducer Legend:

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

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	13.567M QP	45.3	+0.3	+0.6			+0.0	46.2	48.0	-1.8	White
^	13.564M	48.1	+0.3	+0.6			+0.0	49.0	48.0	+1.0	White
3	493.484k	29.9	+0.1	+0.6			+0.0	30.6	48.0	-17.4	White
4	13.492M	29.1	+0.3	+0.6			+0.0	30.0	48.0	-18.0	White
5	979.717k	29.2	+0.1	+0.3			+0.0	29.6	48.0	-18.4	White
6	601.883k	28.2	+0.1	+0.5			+0.0	28.8	48.0	-19.2	White
7	580.452k	28.1	+0.1	+0.5			+0.0	28.7	48.0	-19.3	White
8	736.994k	28.0	+0.0	+0.5			+0.0	28.5	48.0	-19.5	White
9	6.871M	24.5	+0.3	+3.6			+0.0	28.4	48.0	-19.6	White
10	1.037M	27.6	+0.1	+0.3			+0.0	28.0	48.0	-20.0	White

11	622.072k	27.3	+0.1	+0.5		+0.0	27.9	48.0	-20.1	White
12	1.091M	27.3	+0.1	+0.3		+0.0	27.7	48.0	-20.3	White
13	554.983k	27.0	+0.1	+0.5		+0.0	27.6	48.0	-20.4	White
14	1.103M	27.2	+0.1	+0.3		+0.0	27.6	48.0	-20.4	White
15	1.137M	27.1	+0.1	+0.3		+0.0	27.5	48.0	-20.5	White
16	1.169M	27.0	+0.1	+0.3		+0.0	27.4	48.0	-20.6	White
17	1.118M	26.9	+0.1	+0.3		+0.0	27.3	48.0	-20.7	White
18	1.471M	26.8	+0.1	+0.3		+0.0	27.2	48.0	-20.8	White
19	5.216M	25.1	+0.3	+1.8		+0.0	27.2	48.0	-20.8	White
20	5.516M	25.2	+0.3	+1.5		+0.0	27.0	48.0	-21.0	White
21	26.941M	25.8	+0.4	+0.7		+0.0	26.9	48.0	-21.1	White



The Y-axis is peak.

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.207**
Work Order #: **78445** Date: 05/01/2002
Test Type: **Conducted Emissions** Time: 10:18:03
Equipment: **Proximity Reader** Sequence#: 48
Manufacturer: HID Tested By: Randal Clark
Model: 6111A (6092-300) iCLASS RW300 120V 60Hz
S/N: 1502-0005

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6111A (6092-300) iCLASS RW300	1502-0005

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. Power supply is located on the ground plane. EUT shield wire is disconnected. Frequency Range Investigated: 450-30MHz.

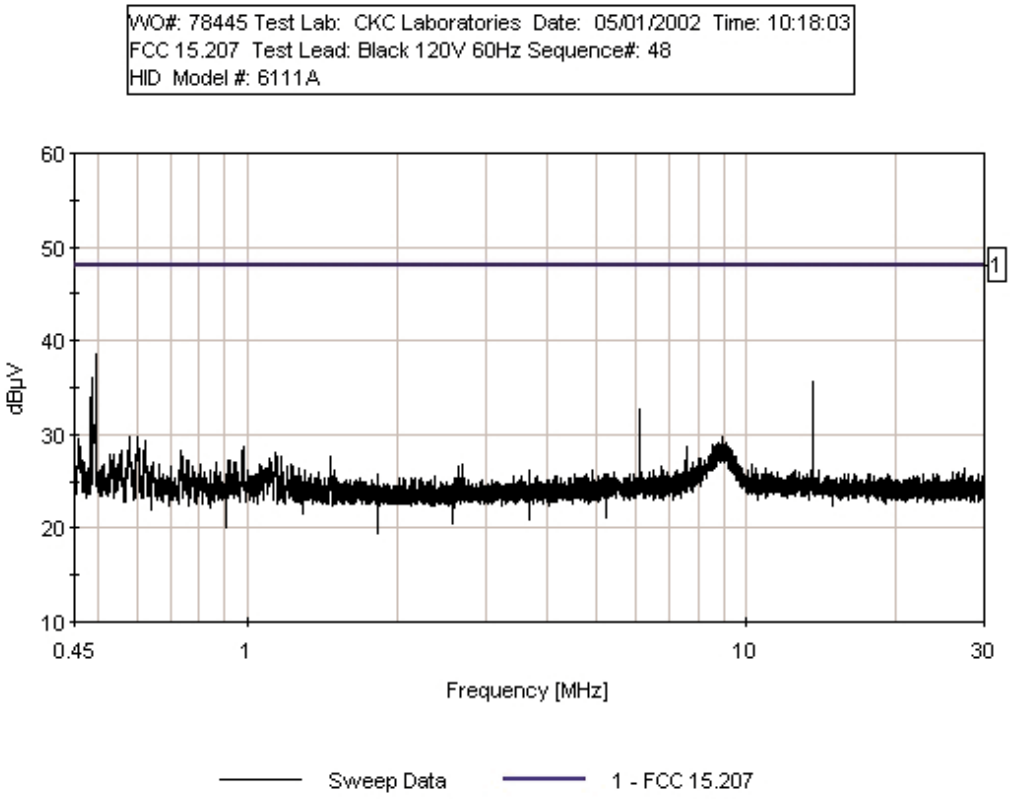
Transducer Legend:

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

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	495.806k	38.0	+0.1	+0.4			+0.0	38.5	48.0	-9.5	Black
2	489.774k	35.6	+0.1	+0.4			+0.0	36.1	48.0	-11.9	Black
3	13.556M	34.3	+0.3	+1.0			+0.0	35.6	48.0	-12.4	Black
4	485.815k	33.4	+0.1	+0.4			+0.0	33.9	48.0	-14.1	Black
5	6.112M	31.3	+0.3	+1.0			+0.0	32.6	48.0	-15.4	Black
6	579.123k	29.3	+0.1	+0.4			+0.0	29.8	48.0	-18.2	Black
7	604.005k	29.2	+0.1	+0.4			+0.0	29.7	48.0	-18.3	Black
8	8.921M	24.6	+0.2	+4.9			+0.0	29.7	48.0	-18.3	Black
9	459.048k	29.0	+0.1	+0.4			+0.0	29.5	48.0	-18.5	Black
10	622.101k	28.8	+0.1	+0.4			+0.0	29.3	48.0	-18.7	Black

11	981.980k	28.4	+0.1	+0.3		+0.0	28.8	48.0	-19.2	Black
12	7.569M	26.8	+0.2	+1.6		+0.0	28.6	48.0	-19.4	Black
13	557.634k	27.7	+0.1	+0.4		+0.0	28.2	48.0	-19.8	Black
14	734.745k	27.9	+0.0	+0.3		+0.0	28.2	48.0	-19.8	Black
15	1.134M	27.7	+0.1	+0.3		+0.0	28.1	48.0	-19.9	Black
16	1.172M	27.2	+0.1	+0.3		+0.0	27.6	48.0	-20.4	Black
17	1.471M	27.2	+0.1	+0.3		+0.0	27.6	48.0	-20.4	Black
18	617.200k	26.9	+0.1	+0.4		+0.0	27.4	48.0	-20.6	Black
19	1.105M	27.0	+0.1	+0.3		+0.0	27.4	48.0	-20.6	Black
20	918.537k	26.8	+0.1	+0.4		+0.0	27.3	48.0	-20.7	Black



Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.207**
Work Order #: **78445** Date: 05/01/2002
Test Type: **Conducted Emissions** Time: 10:31:10
Equipment: **Proximity Reader** Sequence#: 49
Manufacturer: HID Tested By: Randal Clark
Model: 6111A (6092-300) iCLASS RW300 120V 60Hz
S/N: 1502-0005

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6111A (6092-300) iCLASS RW300	1502-0005

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. Power supply is located on the ground plane. EUT shield wire is disconnected. Frequency Range Investigated: 450-30MHz.

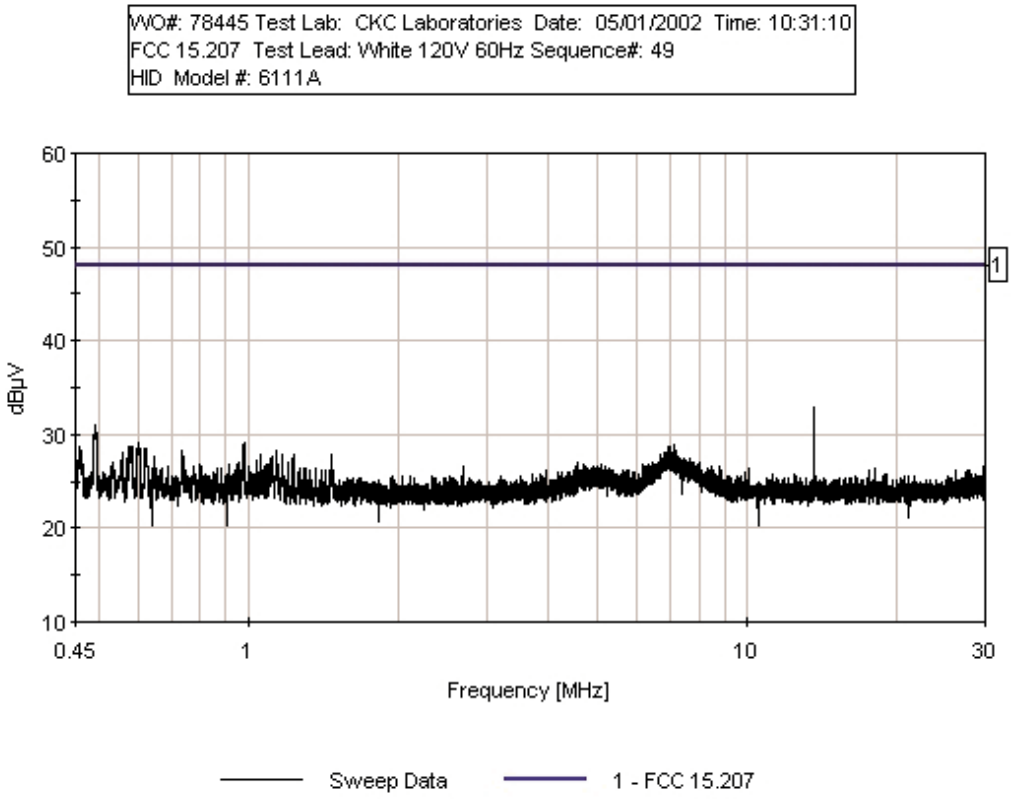
Transducer Legend:

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

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	13.567M	33.2	+0.3	+0.6			+0.0	34.1	48.0	-13.9	White
2	493.167k	30.3	+0.1	+0.6			+0.0	31.0	48.0	-17.0	White
3	603.816k	28.6	+0.1	+0.5			+0.0	29.2	48.0	-18.8	White
4	979.701k	28.8	+0.1	+0.3			+0.0	29.2	48.0	-18.8	White
5	7.149M	25.2	+0.2	+3.6			+0.0	29.0	48.0	-19.0	White
6	577.238k	28.1	+0.1	+0.5			+0.0	28.7	48.0	-19.3	White
7	621.347k	27.9	+0.1	+0.5			+0.0	28.5	48.0	-19.5	White
8	735.012k	27.8	+0.0	+0.5			+0.0	28.3	48.0	-19.7	White
9	1.138M	27.9	+0.1	+0.3			+0.0	28.3	48.0	-19.7	White
10	1.055M	27.5	+0.1	+0.3			+0.0	27.9	48.0	-20.1	White

11	1.170M	27.5	+0.1	+0.3		+0.0	27.9	48.0	-20.1	White
12	1.469M	27.5	+0.1	+0.3		+0.0	27.9	48.0	-20.1	White
13	1.231M	27.4	+0.1	+0.3		+0.0	27.8	48.0	-20.2	White
14	648.068k	27.0	+0.1	+0.5		+0.0	27.6	48.0	-20.4	White
15	1.113M	27.2	+0.1	+0.3		+0.0	27.6	48.0	-20.4	White
16	7.656M	24.6	+0.2	+2.7		+0.0	27.5	48.0	-20.5	White
17	959.566k	26.6	+0.1	+0.4		+0.0	27.1	48.0	-20.9	White
18	1.203M	26.6	+0.1	+0.3		+0.0	27.0	48.0	-21.0	White
19	4.555M	25.3	+0.3	+1.4		+0.0	27.0	48.0	-21.0	White
20	1.087M	26.4	+0.1	+0.3		+0.0	26.8	48.0	-21.2	White



Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.207**
Work Order #: **78445** Date: 05/01/2002
Test Type: **Conducted Emissions** Time: 13:27:08
Equipment: **Proximity Reader** Sequence#: 51
Manufacturer: HID Tested By: Randal Clark
Model: 6121A (6093-300) iCLASS RW400 120V 60Hz
S/N: 1502-0003

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6121A (6093-300) iCLASS RW400	1502-0003

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. Power supply is located on the ground plane. EUT shield wire is disconnected. Frequency Range Investigated: 450-30MHz.

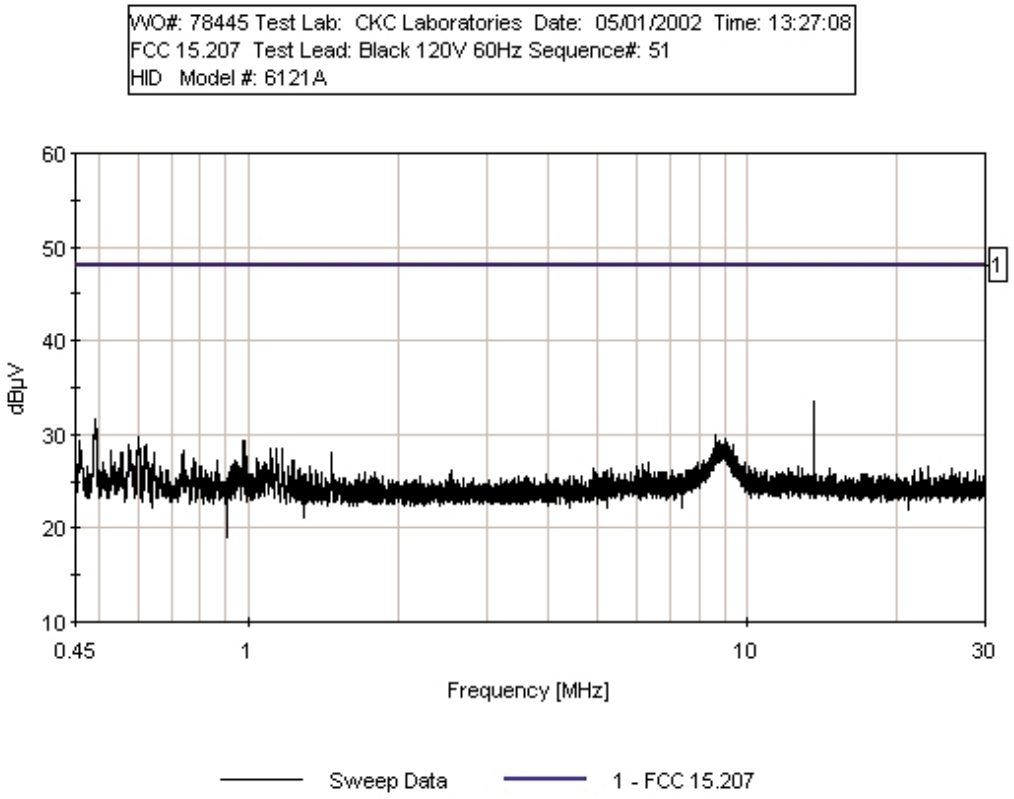
Transducer Legend:

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

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	13.566M	34.5	+0.3	+1.0			+0.0	35.8	48.0	-12.2	Black
2	494.863k	31.2	+0.1	+0.4			+0.0	31.7	48.0	-16.3	Black
3	8.666M	25.7	+0.2	+4.1			+0.0	30.0	48.0	-18.0	Black
4	602.685k	29.2	+0.1	+0.4			+0.0	29.7	48.0	-18.3	Black
5	458.483k	28.9	+0.1	+0.4			+0.0	29.4	48.0	-18.6	Black
6	978.561k	29.0	+0.1	+0.3			+0.0	29.4	48.0	-18.6	Black
7	576.484k	28.4	+0.1	+0.4			+0.0	28.9	48.0	-19.1	Black
8	623.609k	28.4	+0.1	+0.4			+0.0	28.9	48.0	-19.1	Black
9	1.139M	28.1	+0.1	+0.3			+0.0	28.5	48.0	-19.5	Black
10	1.173M	28.1	+0.1	+0.3			+0.0	28.5	48.0	-19.5	Black

11	531.244k	27.8	+0.1	+0.4	+0.0	28.3	48.0	-19.7	Black
12	738.746k	27.9	+0.0	+0.3	+0.0	28.2	48.0	-19.8	Black
13	557.445k	27.6	+0.1	+0.4	+0.0	28.1	48.0	-19.9	Black
14	1.470M	27.6	+0.1	+0.3	+0.0	28.0	48.0	-20.0	Black
15	989.198k	27.3	+0.1	+0.3	+0.0	27.7	48.0	-20.3	Black
16	1.034M	27.0	+0.1	+0.3	+0.0	27.4	48.0	-20.6	Black
17	1.229M	26.9	+0.1	+0.3	+0.0	27.3	48.0	-20.7	Black
18	941.711k	26.7	+0.1	+0.4	+0.0	27.2	48.0	-20.8	Black
19	6.347M	25.8	+0.3	+1.0	+0.0	27.1	48.0	-20.9	Black
20	1.045M	26.6	+0.1	+0.3	+0.0	27.0	48.0	-21.0	Black



Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.207**
Work Order #: **78445** Date: 05/01/2002
Test Type: **Conducted Emissions** Time: 10:53:42
Equipment: **Proximity Reader** Sequence#: 50
Manufacturer: HID Tested By: Randal Clark
Model: 6121A (6093-300) iCLASS RW400 120V 60Hz
S/N: 1502-0003

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6121A (6093-300) iCLASS RW400	1502-0003

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. Power supply is located on the ground plane. EUT shield wire is disconnected. Frequency Range Investigated: 450-30MHz.

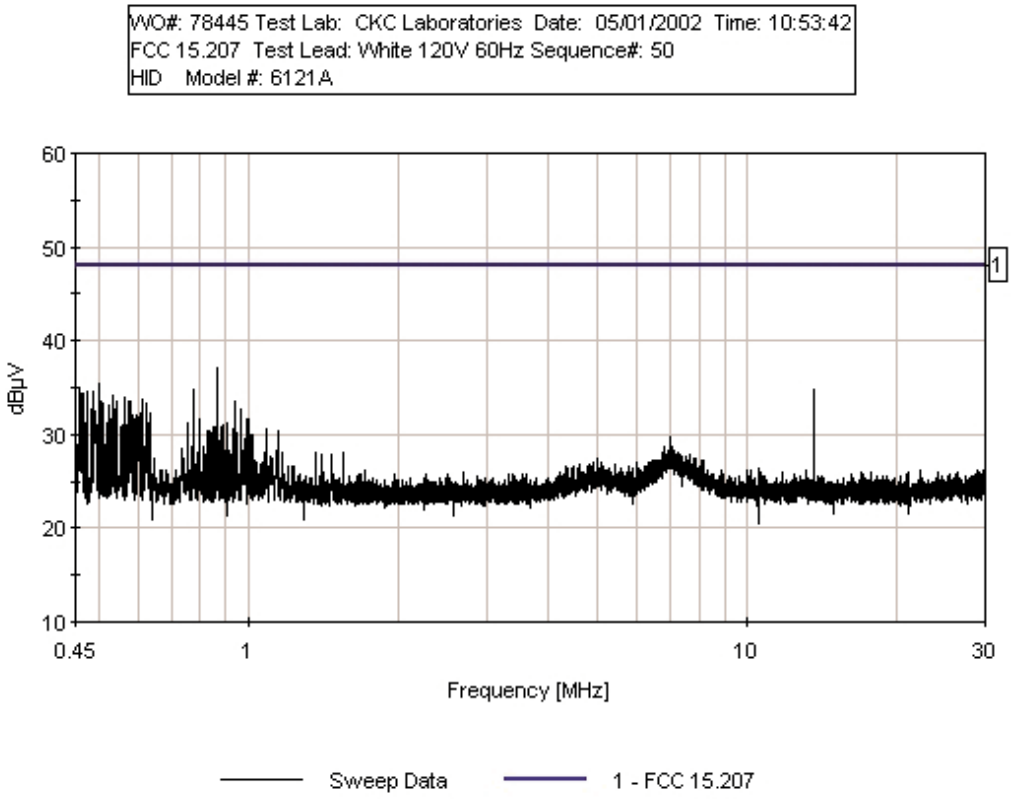
Transducer Legend:

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

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	861.961k	36.5	+0.0	+0.5			+0.0	37.0	48.0	-11.0	White
2	13.567M	34.8	+0.3	+0.6			+0.0	35.7	48.0	-12.3	White
3	501.649k	34.8	+0.1	+0.6			+0.0	35.5	48.0	-12.5	White
4	460.179k	34.2	+0.1	+0.6			+0.0	34.9	48.0	-13.1	White
5	778.484k	34.2	+0.0	+0.5			+0.0	34.7	48.0	-13.3	White
6	476.013k	33.8	+0.1	+0.6			+0.0	34.5	48.0	-13.5	White
7	486.946k	33.8	+0.1	+0.6			+0.0	34.5	48.0	-13.5	White
8	462.441k	33.6	+0.1	+0.6			+0.0	34.3	48.0	-13.7	White
9	466.023k	33.6	+0.1	+0.6			+0.0	34.3	48.0	-13.7	White
10	535.202k	33.5	+0.1	+0.6			+0.0	34.2	48.0	-13.8	White

11	566.682k	33.3	+0.1	+0.5		+0.0	33.9	48.0	-14.1	White
12	461.122k	33.1	+0.1	+0.6		+0.0	33.8	48.0	-14.2	White
13	614.749k	33.2	+0.1	+0.5		+0.0	33.8	48.0	-14.2	White
14	475.448k	32.9	+0.1	+0.6		+0.0	33.6	48.0	-14.4	White
15	507.493k	32.9	+0.1	+0.6		+0.0	33.6	48.0	-14.4	White
16	575.541k	33.0	+0.1	+0.5		+0.0	33.6	48.0	-14.4	White
17	578.557k	33.0	+0.1	+0.5		+0.0	33.6	48.0	-14.4	White
18	545.381k	32.8	+0.1	+0.6		+0.0	33.5	48.0	-14.5	White
19	939.051k	33.0	+0.1	+0.4		+0.0	33.5	48.0	-14.5	White
20	624.928k	32.7	+0.1	+0.5		+0.0	33.3	48.0	-14.7	White



Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.209**
Work Order #: **78445** Date: 05/02/2002
Test Type: **Maximized Emissions** Time: 18:03:27
Equipment: **Proximity Reader** Sequence#: 63
Manufacturer: HID Tested By: Randal Clark
Model: 6100A (6091-300) iCLASS R10
S/N: 1502-0008

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6100A (6091-300) iCLASS R10	1502-0008

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: 9kHz - 1000MHz. (Note: No spurious emissions found below 30MHz).

Transducer Legend:

T1=Amp - S/N 604	T2=Bicon 156
T3=Log s/n 154	T4=Cable - 10 Meter

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	40.760M	40.2	-26.8	+11.1	+0.0	+1.2	+10.0	35.7	40.0	-4.3	Vert
2	81.448M QP	43.0	-26.8	+7.2	+0.0	+1.8	+10.0	35.2	40.0	-4.8	Vert
^	81.432M	44.3	-26.8	+7.2	+0.0	+1.8	+10.0	36.5	40.0	-3.5	Vert
^	81.449M	44.3	-26.8	+7.2	+0.0	+1.8	+10.0	36.5	40.0	-3.5	Vert
5	67.904M QP	40.6	-26.8	+8.4	+0.0	+1.6	+10.0	33.8	40.0	-6.2	Vert
^	67.889M	43.4	-26.8	+8.4	+0.0	+1.6	+10.0	36.6	40.0	-3.4	Vert
7	379.792M	35.3	-26.6	+0.0	+16.7	+4.2	+10.0	39.6	46.0	-6.4	Horiz
8	325.551M	32.2	-26.3	+0.0	+19.7	+3.9	+10.0	39.5	46.0	-6.5	Horiz
9	312.092M	30.2	-26.3	+0.0	+20.5	+3.8	+10.0	38.2	46.0	-7.8	Horiz

10	54.343M QP	36.2	-26.8	+10.9	+0.0	+1.4	+10.0	31.7	40.0	-8.3	Vert
^	54.320M	41.0	-26.8	+10.9	+0.0	+1.4	+10.0	36.5	40.0	-3.5	Vert
12	122.105M	33.1	-26.6	+14.3	+0.0	+2.2	+10.0	33.0	43.5	-10.5	Vert
13	366.214M	30.4	-26.5	+0.0	+17.4	+4.1	+10.0	35.4	46.0	-10.6	Horiz
14	149.237M	33.1	-26.5	+13.0	+0.0	+2.4	+10.0	32.0	43.5	-11.5	Vert
15	176.333M	28.9	-26.4	+16.2	+0.0	+2.6	+10.0	31.3	43.5	-12.2	Vert
16	162.850M	31.4	-26.4	+13.8	+0.0	+2.5	+10.0	31.3	43.5	-12.2	Vert
17	108.544M	29.2	-26.7	+13.3	+0.0	+2.1	+10.0	27.9	43.5	-15.6	Vert

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.209**
Work Order #: **78445** Date: 05/02/2002
Test Type: **Maximized Emissions** Time: 17:44:51
Equipment: **Proximity Reader** Sequence#: 62
Manufacturer: HID Tested By: Randal Clark
Model: 6111A (6092-300) iCLASS RW300
S/N: 1502-0005

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6111A (6092-300) iCLASS RW300	1502-0005

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: 9kHz - 1000MHz. (Note: No spurious emissions found below 30MHz).

Transducer Legend:

T1=Amp - S/N 604	T2=Bicon 156
T3=Log s/n 154	T4=Cable - 10 Meter

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	67.902M QP	45.9	-26.8	+8.4	+0.0	+1.6	+10.0	39.1	40.0	-0.9	Vert
^	67.893M	48.4	-26.8	+8.4	+0.0	+1.6	+10.0	41.6	40.0	+1.6	Vert
3	54.345M QP	41.9	-26.8	+10.9	+0.0	+1.4	+10.0	37.4	40.0	-2.6	Vert
^	54.334M	44.5	-26.8	+10.9	+0.0	+1.4	+10.0	40.0	40.0	+0.0	Vert
5	40.781M QP	39.5	-26.8	+11.1	+0.0	+1.2	+10.0	35.0	40.0	-5.0	Vert
^	40.768M	42.2	-26.8	+11.1	+0.0	+1.2	+10.0	37.7	40.0	-2.3	Vert
7	325.552M	29.0	-26.3	+0.0	+19.7	+3.9	+10.0	36.3	46.0	-9.7	Vert
8	81.442M	38.0	-26.8	+7.2	+0.0	+1.8	+10.0	30.2	40.0	-9.8	Vert
9	40.737M	33.0	-26.8	+11.1	+0.0	+1.2	+10.0	28.5	40.0	-11.5	Horiz

10	108.562M	33.2	-26.7	+13.3	+0.0	+2.1	+10.0	31.9	43.5	-11.6	Vert
11	176.367M	29.3	-26.4	+16.2	+0.0	+2.6	+10.0	31.7	43.5	-11.8	Vert
12	149.252M	31.6	-26.5	+13.0	+0.0	+2.4	+10.0	30.5	43.5	-13.0	Vert
13	122.120M	30.6	-26.6	+14.3	+0.0	+2.2	+10.0	30.5	43.5	-13.0	Vert
14	54.309M	31.5	-26.8	+10.9	+0.0	+1.4	+10.0	27.0	40.0	-13.0	Horiz
15	67.863M	33.6	-26.8	+8.4	+0.0	+1.6	+10.0	26.8	40.0	-13.2	Horiz
16	135.686M	30.1	-26.6	+13.5	+0.0	+2.3	+10.0	29.3	43.5	-14.2	Vert

Test Location:	CKC Laboratories •5473A Clouds Rest • Mariposa CA, 95338 • 800-500-4EMC (4362)		
Customer:	**HID**		
Specification:	**FCC 15.209**		
Work Order #:	**78445**	Date:	05/02/2002
Test Type:	**Maximized Emissions**	Time:	17:49:55
Equipment:	**Proximity Reader**	Sequence#:	61
Manufacturer:	HID	Tested By:	Randal Clark
Model:	6121A (6093-300) iCLASS RW400	S/N:	1502-0003

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

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	6121A (6093-300) iCLASS RW400	1502-0003

Support Devices:

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

Test Conditions / Notes:

EUT is a proximity card reader operating on 13.56MHz. EUT is powered by 12VDC though a DC power supply. EUT is mounted to a wooden test fixture to simulate actual installation. Power output DC (-) is tied to chassis ground at the power supply. EUT shield wire is disconnected. Frequency Range Investigated: 9kHz - 1000MHz. (Note: No spurious emissions found below 30MHz).

Transducer Legend:

T1=Amp - S/N 604	T2=Bicon 156
T3=Log s/n 154	T4=Cable - 10 Meter

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	637.418M	32.7	-27.6	+0.0	+20.0	+5.9	+10.0	41.0	46.0	-5.0	Horiz
2	54.339M QP	39.4	-26.8	+10.9	+0.0	+1.4	+10.0	34.9	40.0	-5.1	Vert
^	54.310M	42.4	-26.8	+10.9	+0.0	+1.4	+10.0	37.9	40.0	-2.1	Vert
4	40.736M	39.1	-26.8	+11.1	+0.0	+1.2	+10.0	34.6	40.0	-5.4	Vert
5	610.305M	32.3	-27.5	+0.0	+19.5	+5.5	+10.0	39.8	46.0	-6.2	Horiz
6	596.742M	31.6	-27.5	+0.0	+19.3	+5.4	+10.0	38.8	46.0	-7.2	Horiz
7	623.882M	30.6	-27.5	+0.0	+19.8	+5.7	+10.0	38.6	46.0	-7.4	Horiz
8	651.002M	29.5	-27.6	+0.0	+20.3	+6.0	+10.0	38.2	46.0	-7.8	Horiz
9	67.882M	38.3	-26.8	+8.4	+0.0	+1.6	+10.0	31.5	40.0	-8.5	Vert
10	325.552M	28.1	-26.3	+0.0	+19.7	+3.9	+10.0	35.4	46.0	-10.6	Horiz