



HID TEST REPORT
FOR THE
6140A iCLASS HANDSPRING
FCC PART 15 SUBPART C SECTIONS 15.225 AND 15.207
COMPLIANCE

DATE OF ISSUE: MARCH 26, 2003

PREPARED FOR:

HID Corporation
9292 Jeronimo Road
Irvine, CA 92618-1905

P.O. No.: 14445
W.O. No.: 79857

PREPARED BY:

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

Date of test: December 16-31, 2002
and March 10, 2003

Report No.: FC03-028

This report contains a total of 51 pages and may be reproduced in full only. Partial reproduction may only be done with the written consent of CKC Laboratories, Inc. The results in this report apply only to the items tested, as identified herein.

TABLE OF CONTENTS

Administrative Information	4
Summary of Results.....	5
Conditions for Compliance.....	5
Approvals.....	5
15.31 Voltage Variation	6
15.31 Number Of Channels	6
15.33 Frequency Ranges Tested.....	6
15.35 Analyzer Bandwidth Settings Per Frequency Range.....	7
15.203 Antenna Requirements	7
15.205 Restricted Bands	7
15.215 Additional Provisions to the General Radiated Emission Limitations	7
Mode Of Operation.....	7
Eut Operating Frequency.....	7
Temperature And Humidity During Testing	7
Equipment Under Test (EUT) Description.....	8
Equipment Under Test.....	8
Peripheral Devices	8
Report of Measurements.....	9
Table 1: 15.207 Six Highest Conducted Emission Levels	9
Table 2: 15.225(a) Fundamental Emission Levels	10
Table 3: 15.225(b) Six Highest Radiated Emission Levels.....	11
15.225(b) Bandwidth Plots	12
15.225(c) Frequency Stability	16
RSS-210 Emissions Mask	17
Measurement Uncertainty.....	18
EUT Setup	18
Correction Factors	18
Table A: Sample Calculations	18
Test Instrumentation and Analyzer Settings.....	19
Spectrum Analyzer Detector Functions.....	19
Peak	19
Quasi-Peak.....	19
Average.....	19
EUT Testing	20
Mains Conducted Emissions	20
Antenna Conducted Emissions	20
Radiated Emissions	20
Appendix A: Test Setup Photographs	22
Photograph Showing Mains Conducted Emissions.....	23
Photograph Showing Mains Conducted Emissions.....	24
Photograph Showing Radiated Emissions.....	25

Photograph Showing Radiated Emissions 26
Photograph Showing Radiated Emissions 27
Photograph Showing Radiated Emissions 28
Photograph Showing Radiated Emissions 29
Photograph Showing Temperature Testing 30
Appendix B: Test Equipment List 31
Appendix C: Measurement Data Sheets 32

ADMINISTRATIVE INFORMATION

DATE OF TEST: December 16-31, 2002 and March 10, 2003

DATE OF RECEIPT: December 16, 2002

PURPOSE OF TEST: To demonstrate the compliance of the 6140A iCLASS Handspring with the requirements for FCC Part 15 Subpart C Section 15.225 and FCC Part 15 Subpart B Section 15.207 devices.

TEST METHOD: ANSI C63.4 (1992)

MANUFACTURER: HID Corporation
9292 Jeronimo Road
Irvine, CA 92618-1905

REPRESENTATIVE: Frank de Vall

TEST LOCATION: CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

SUMMARY OF RESULTS

As received, the HID Corporation 6140A iCLASS Handspring was found to be fully compliant with the following standards and specifications:

United States

- FCC Part 15 Subpart C Section 15.207
- FCC Part 15 Subpart C Section 15.225
- ANSI C63.4 (1992) method

Canada

- RSS-210 6.2.2(e) using:
- FCC Part 15 Subpart C Section 15.207
 - FCC Part 15 Subpart C Section 15.225
 - ANSI C63.4 (1992) method
- Industry of Canada File No. IC 3082-B

FCC/Canada Matrix

Mode/channels	Paragraph
FCC 15.255(a)	RSS210 6.2.2(e)
FCC 15.207	RSS210 6.2.2(e)
Mode 1	RSS210 6.2.2(e)
FCC 15.225(b)&(c)	RSS210 6.2.2(e)

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

QUALITY ASSURANCE:



Steve Behm, Director of Engineering Services and Quality Assurance



Joyce Walker, Quality Assurance Administrative Manager



Chuck Kendall, Lab Manager



Mike Wilkinson, Lab Manager

TEST PERSONNEL:



Monika Brandle, EMC Test Engineer



Randy Clark, EMC Engineer

15.31(e) Voltage Variations

Customer: HID
WO#: 79857
Test Engineer: Monika Brandle
FCC Rule: 15.31(e)
Device Model #: 6140A iCLASS Handspring
Operating Voltage: 120 VAC or portable battery

Voltage Variations ($\pm 15\%$)

Temp	Voltage	Frequency	Output dBuV/m
20	102.0	13.56000	24.30000
20	120.0	13.56000	24.30000
20	138.0	13.56000	24.30000

Test Distance: 10 meters

EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA is set in a charger/base cradle where the EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. Frequency Range Investigated: 13.56 MHz.

The EUT may be operated while in the cradle, or in a portable configuration. In accordance with 15.31(e), a fully charged battery was used to meet the requirements for battery operated devices. This test was additionally performed with the EUT in the cradle. In accordance with 15.33, a test distance correction factor of 40 dB/Decade is used to correct the data to 30 meters for comparison to the applicable limit.

15.31(m) Number Of Channels

This device operates on a single channel.

15.33(a) Frequency Ranges Tested

15.207 Conducted: 150 kHz – 30 MHz

15.209/15.225 Radiated: 9 kHz – 1000 MHz

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

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.

15.215 Additional Provisions to the General Radiated Emission Limitations

The fundamental frequency was kept within the central 80% of the permitted band in order to minimize the possibility of out-of-band operation. Refer to Appendix B for the test equipment used and Appendix C for the occupied bandwidth plot(s).

Mode Of Operation

The EUT was configured by the manufacturer to operate in a continuous read mode with the device not in the docking station and the device in the docking station for testing.

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 6140A iCLASS Handspring tested by CKC Laboratories was a production unit. The EUT is a proximity card reader consisting of the Inside Contactless Hand'IT module plugged into the Handspring Visor Prism PDA. The EUT operates on 13.56 MHz and is powered by the PDA battery or mains power when in its cradle. The EUT will transmit either under battery power or PDA mains power.

The following model has been tested by CKC Laboratories: **Card Reader, Hand'IT**

The following additional model is identical electrically to the one which was tested, or any differences between them do not affect their EMC characteristics, and therefore it complies to the level of testing equivalent to the tested models: **6140A iCLASS Handspring**

EQUIPMENT UNDER TEST

The HID Corporation 6140A iCLASS Handspring consists of:

FCC ID: JQ66140A (pending)

PDA

Manuf: Handspring
Model: Visor Prism
Serial: AEBEB2115227
FCC ID: DoC

Card Reader Module

Manuf: Inside Contactless
Model: Inside Hand'IT
Serial: NA
FCC ID: NA

PERIPHERAL DEVICES

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

Power Supply

Manuf: AULT Incorporated
Model: 14-0017-00
Serial: 1201 S
FCC ID: NA

Charger/Base

Manuf: Handspring
Model: Visor Prism
Serial: NA
FCC ID: DoC

REPORT OF MEASUREMENTS

The following tables report the worst case emissions levels recorded during the tests performed on the 6140A iCLASS Handspring. 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: 15.207 Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V	SPEC LIMIT dB μ V	MARGIN dB	NOTES
		Lisn dB		Cable dB					
0.219084	48.1	0.0		0.0		48.1	52.9	-4.8	B
0.325982	44.4	0.2		0.1		44.7	49.6	-4.9	W
0.836477	41.3	0.2		0.0		41.5	46.0	-4.5	W
13.576000	45.5	0.5		0.2		46.2	50.0	-3.8	BA
13.577080	54.1	0.6		0.2		54.9	60.0	-5.1	WQ
13.577140	55.1	0.5		0.2		55.8	60.0	-4.2	BQ

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

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

COMMENTS: EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA is set in a charger/base cradle where the EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. Frequency Range Investigated: 150 kHz – 30 MHz. Margin for QP readings is taken WRT QP limit, all other data is taken WRT the average limit.

Table 2: 15.225(a) Fundamental 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		Cable dB	Dist dB				
13.560	33.4	9.6		0.5	-19.0	24.5	80.0	-55.5	V-C
13.560	33.1	9.6		0.5	-19.0	24.2	80.0	-55.8	H-C
13.561	30.3	9.6		0.5	-19.0	21.4	80.0	-58.6	V-R
13.561	30.2	9.6		0.5	-19.0	21.3	80.0	-58.7	V-R
13.562	29.5	9.6		0.5	-19.0	20.6	80.0	-59.4	V-R

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

NOTES: H = Horizontal Polarization
 V = Vertical Polarization
 C = EUT in PDA in Base
 R = EUT in PDA Removed from Base

COMMENTS: EUT in PDA in Base: EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA is set in a charger/base cradle where the EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag.

EUT in PDA Removed from Base: EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA has been removed from the charger/base cradle and is set on the table. The EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. Three orthogonal planes tested. PDA positioned with bottom on table and LCD panel facing antenna, PDA Laying flat on table with LCD facing up and proximity card facing antenna, and PDA lying on side with LCD facing antenna.

In accordance with 15.33, a test distance correction factor of 40 dB/Decade is used to correct the data to 30 meters for comparison to the applicable limit.

Table 3: 15.209/15.225(b) 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				
35.162	53.7	11.3	-26.8	0.8		39.0	40.0	-1.0	VQ-C
91.802	58.8	9.6	-26.7	1.5		43.2	43.5	-0.3	VQ-C
96.101	55.8	10.7	-26.7	1.6		41.4	43.5	-2.1	VQ-C
98.293	54.3	11.2	-26.7	1.6		40.4	43.5	-3.1	VQ-C
101.393	56.3	11.8	-26.7	1.6		43.0	43.5	-0.5	VQ-C
176.282	51.6	15.4	-26.4	2.2		42.8	43.5	-0.7	HQ-C

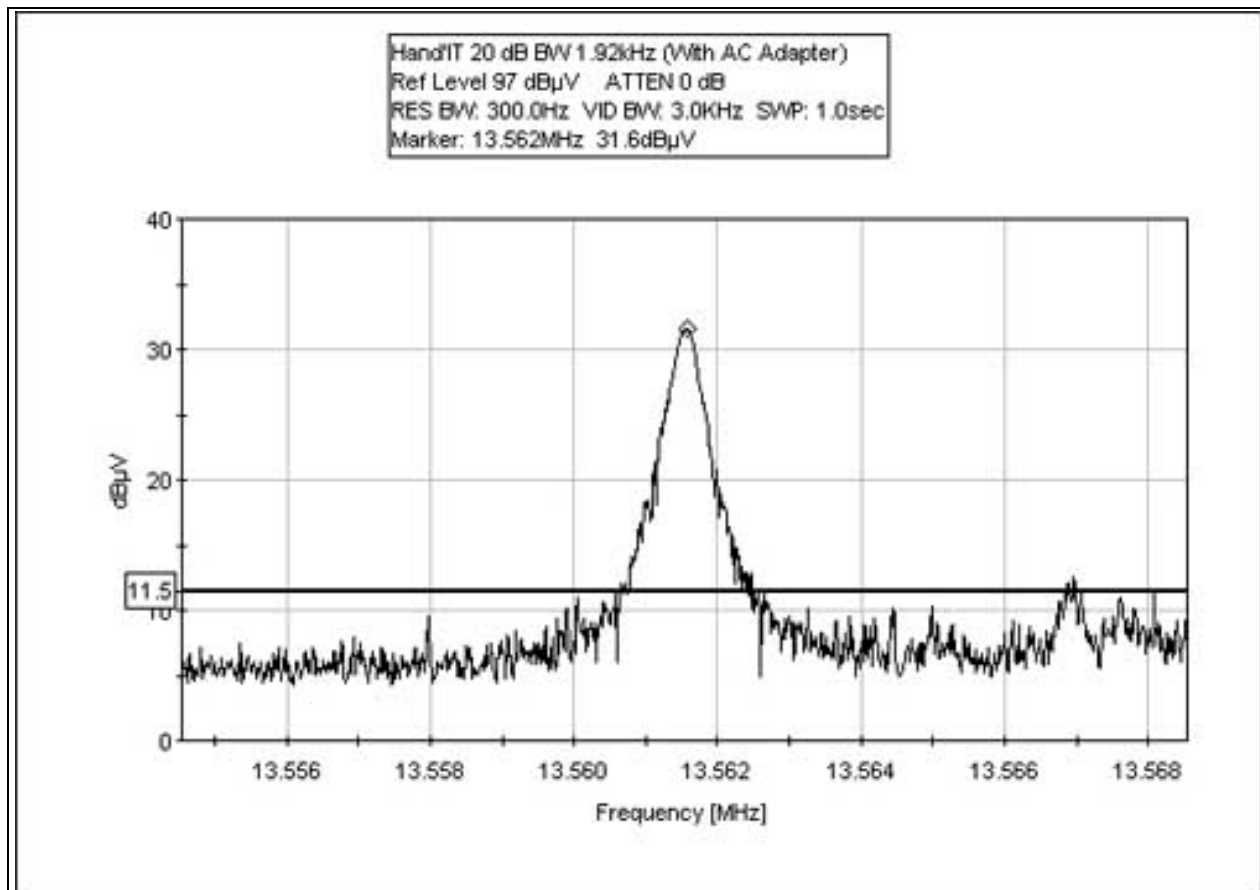
Test Method: ANSI C63.4 (1992)
 Spec Limit: FCC Part 15 Subpart C Section 15.209/15.225(b)
 Test Distance: 3 Meters

H = Horizontal Polarization
 V = Vertical Polarization
 Q = Quasi Peak Reading
 C = EUT in PDA in Base
 R = EUT in PDA Removed from Base

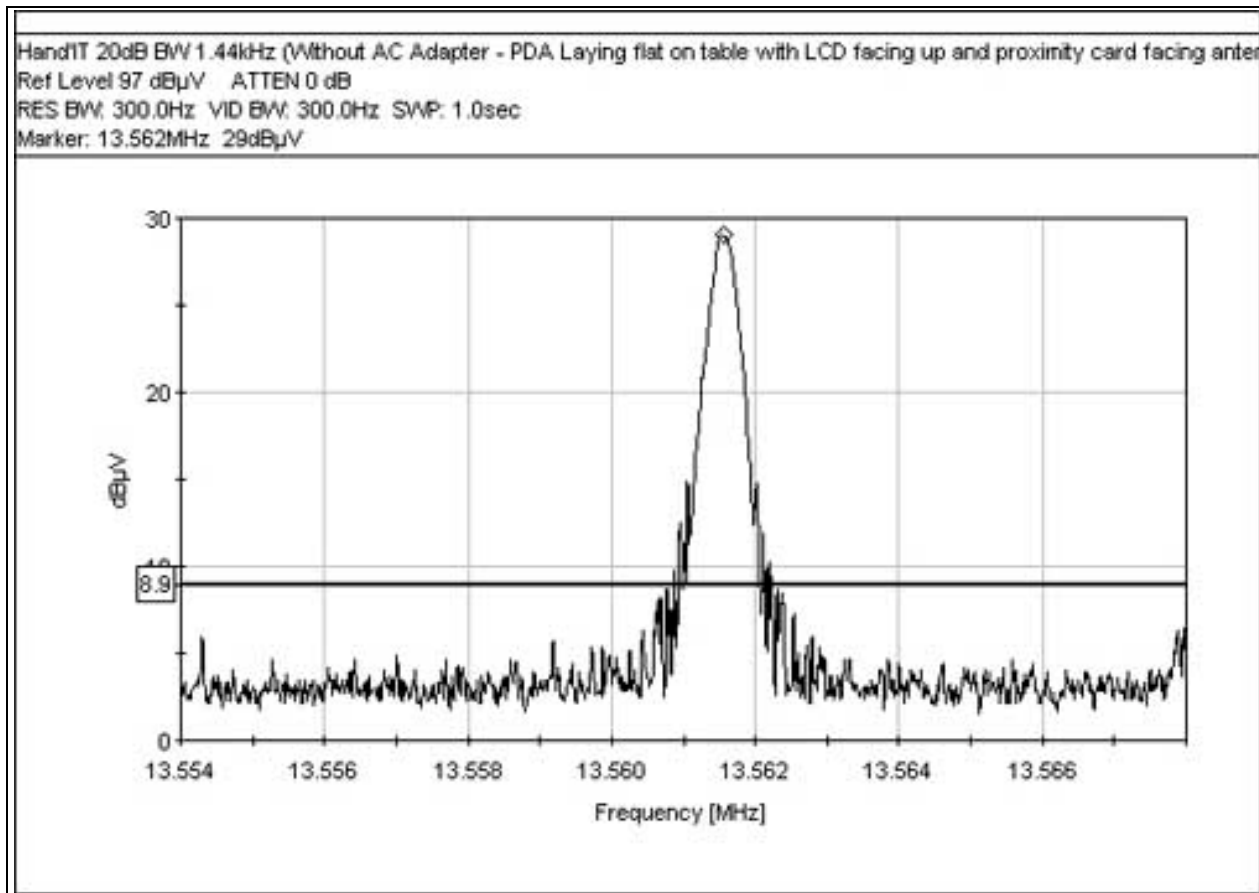
COMMENTS: EUT in PDA in Base: EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA is set in a charger/base cradle where the EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. Frequency Range Investigated: 9 kHz-1000 MHz.

EUT in PDA Removed from Base: EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA has been removed from the charger/base cradle and is set on the table. The EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. Frequency Range Investigated: 9 kHz-1000 MHz. Three orthogonal planes tested. PDA positioned with bottom on table and LCD panel facing antenna PDA Laying flat on table with LCD facing up and proximity card facing antenna PDA laying on side with LCD facing antenna.

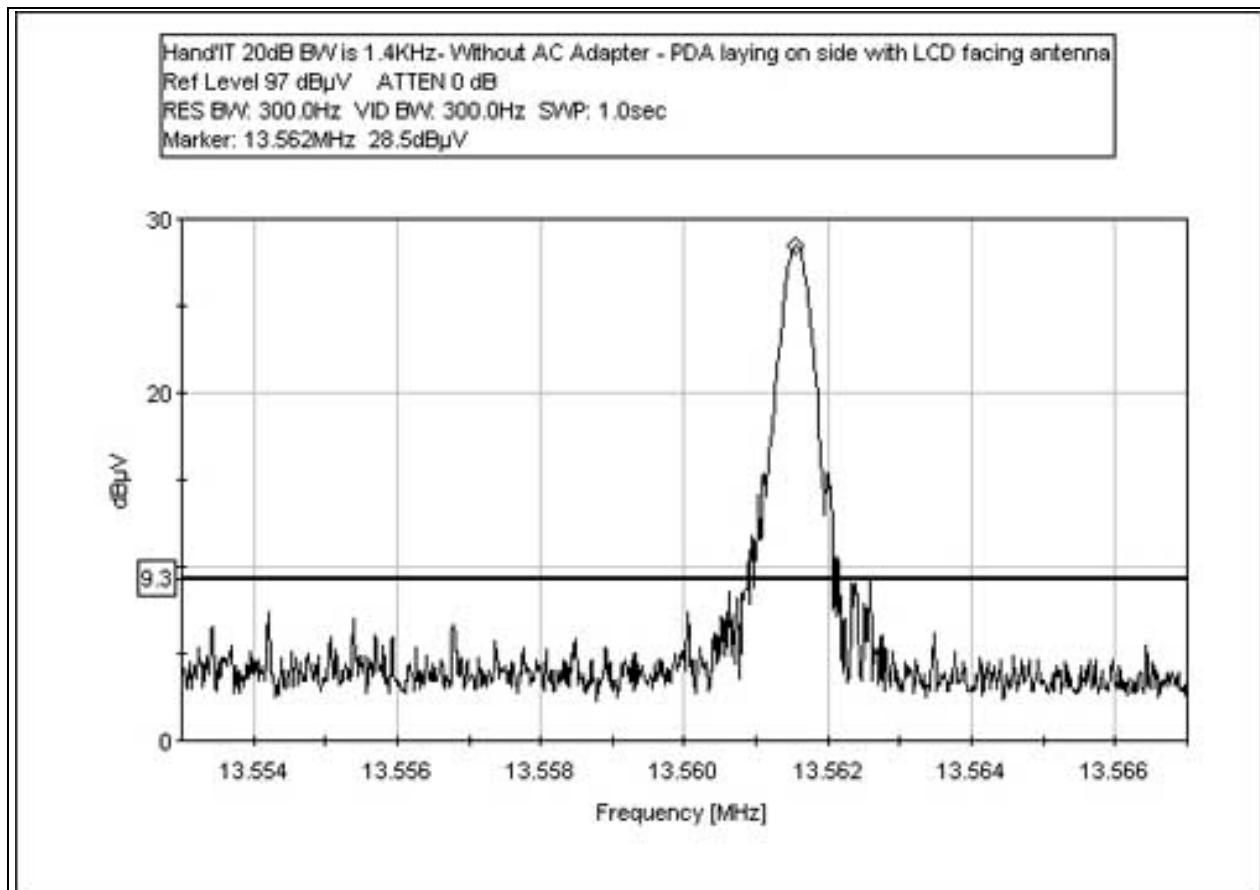
15.225(b) BANDWIDTH PLOT - WITH AC ADAPTER



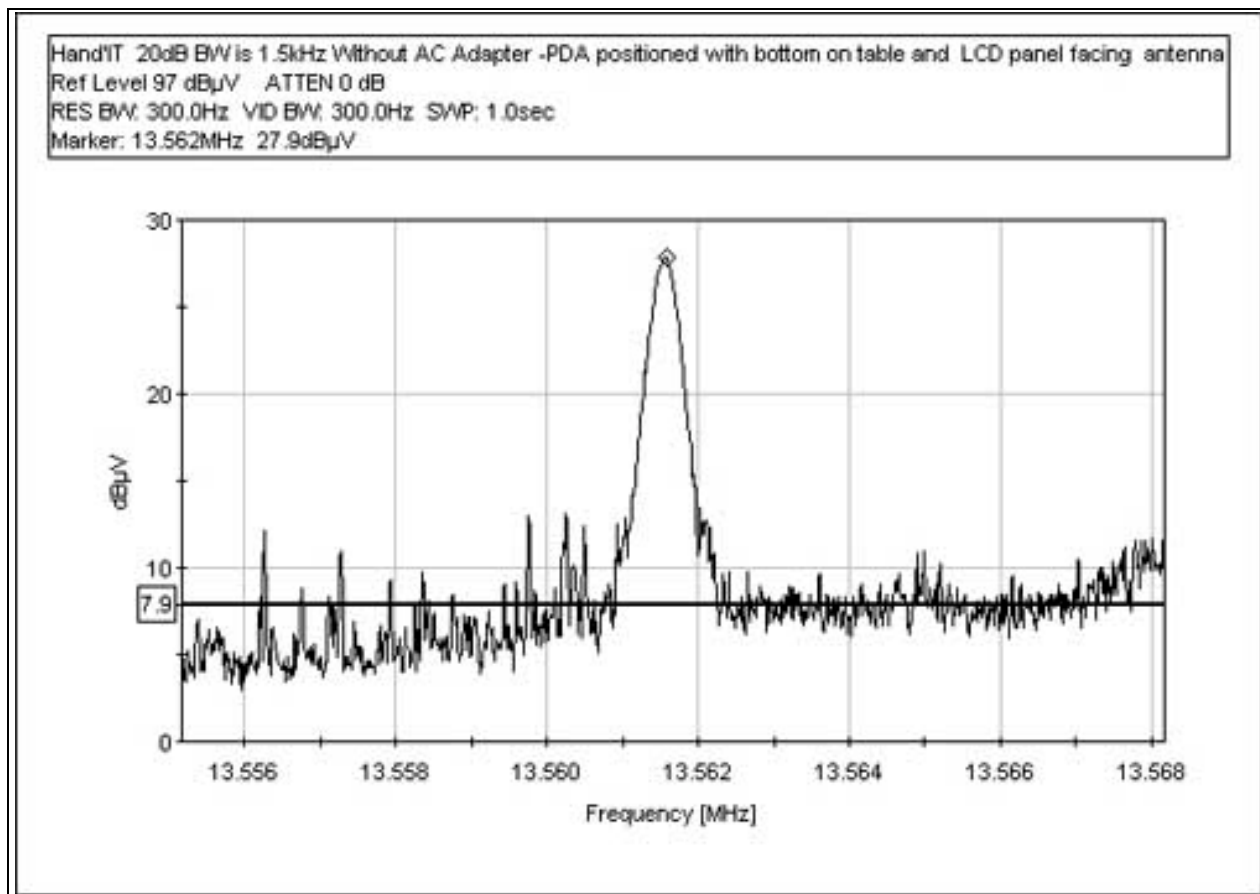
BANDWIDTH PLOT - WITHOUT AC ADAPTER PDA LAYING FLAT



BANDWIDTH PLOT - WITHOUT AC ADAPTER PDA LAYING ON SIDE



BANDWIDTH PLOT - WITHOUT AC ADAPTER PDA LAYING WITH BOTTOM ON TABLE



15.225(c) FREQUENCY STABILITY

Test Conditions: EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA is set in a charger/base cradle where the EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. The charger/base and the PDA are located inside the test fixture which consists of a temperature chamber and a low frequency antenna. The field strength readings are calibrated to the OATS measurements for comparison to the limits.

Customer: HID
WO#: 79857
Date: March 10 2003
Test Engineer: Randal Clark

Device Model #:
Operating Voltage: 120.0 VAC
Frequency Limit: 0.01 %

Temperature Variations

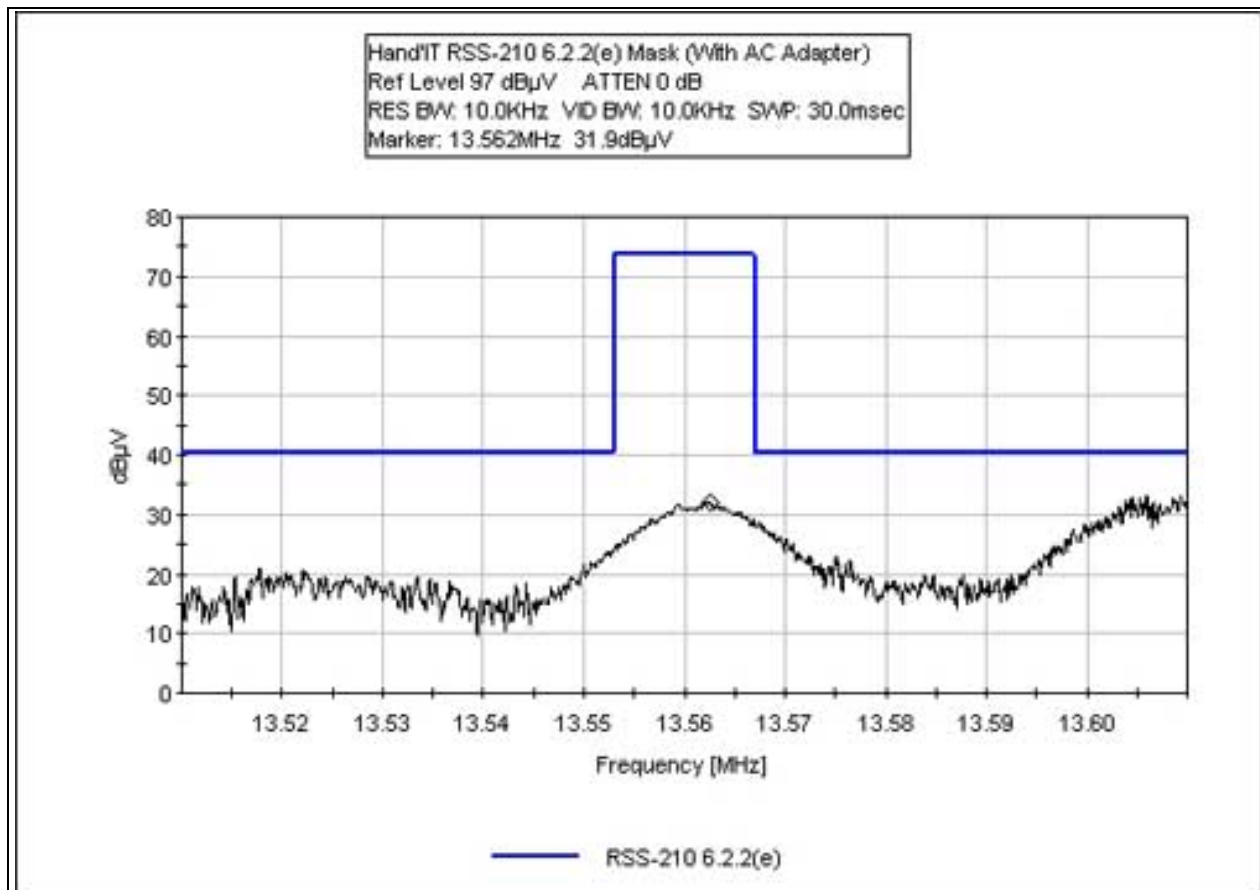
Channel Frequency:		Channel 1 (MHz)	Dev. (MHz)
		13.560000	
Temp (C)	Voltage		
-20	120.0	13.561497	0.00150
-10	120.0	13.561523	0.00152
0	120.0	13.561530	0.00153
10	120.0	13.561514	0.00151
20	120.0	13.561477	0.00148
30	120.0	13.561470	0.00147
40	120.0	13.561449	0.00145
50	120.0	13.561442	0.00144

Voltage Variations ($\pm 15\%$)

20	102.0	13.5614783	0.00148
20	120.0	13.5614771	0.00148
20	138.0	13.5614779	0.00148

Max Deviation (MHz)	0.001530
Max Deviation (%)	0.00011
PASS	

RSS-210 EMISSIONS MASK



MEASUREMENT UNCERTAINTY

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

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

EUT SETUP

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

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected. All excessive interconnecting cable was bundled in 30-40 centimeter lengths.

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

Antenna Conducted Emissions

For measuring the signal strength on the RF output port of the EUT, the spectrum analyzer was connected directly to the EUT. The sweep time of the analyzer was adjusted so that the spectrum analyzer readings were always in a calibrated range. All readings within 20 dB of the limit were recorded.

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 PHOTOGRAPHS

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Front View

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Side View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



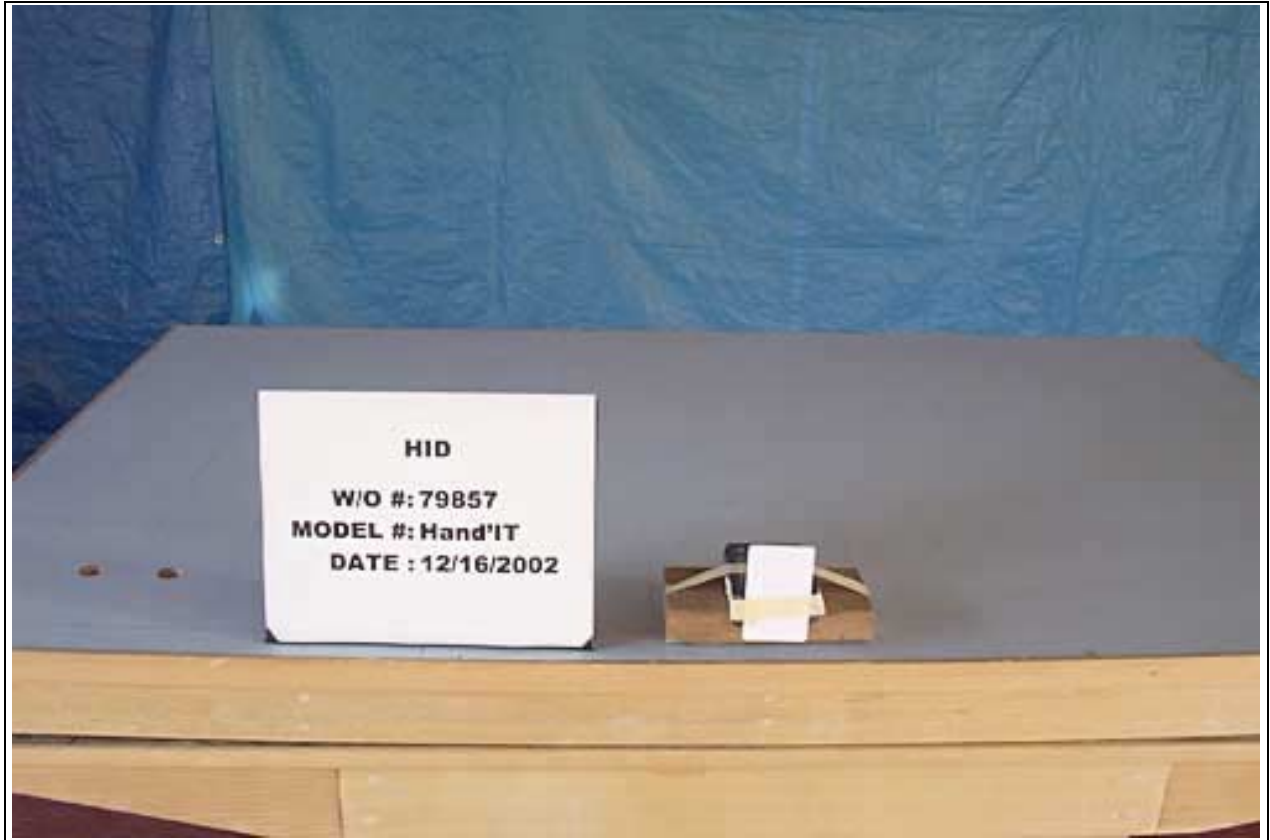
Radiated Emissions - Side View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions

PHOTOGRAPH SHOWING TEMPERATURE TESTING



Temperature Testing

APPENDIX B

TEST EQUIPMENT LIST

<i>Description</i>	<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Asset #</i>	<i>Cal Date</i>	<i>Cal Due</i>
Spectrum Analyzer RF Section	HP	8566B	2235A02425	00092	10/23/02	10/23/03
Spectrum Analyzer Display	HP	8568B	2237A04323	00091	10/23/02	10/23/03
Spectrum Analyzer QP Adapter	HP	85650A	2521A00904	02495	3/4/02	3/4/03
Antenna, Bicon	A&H	SAS-200/542	156	00225	12/2/02	12/2/03
Antenna, Log Periodic	A&H	SAS-200/510	154	01330	6/19/02	6/19/03
Preamp	HP	8447D	1937A02604	00099	3/21/02	3/21/03
LISN	Solar	8028-50-TS-24-BNC	814493, 474	02056	6/5//02	6/5/03
Variac	Superior Electronics	126	N/A	02037	3/29/02	3/29/03

Temperature Testing

<i>Description</i>	<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Asset #</i>	<i>Cal Date</i>	<i>Cal Due</i>
Spectrum Analyzer 100Hz - 22.5GHz	HP	8566B	2209A01404	00490	2/26/03	2/26/04
Spectrum Analyzer Display	HP	8566B	2403A08241	00489	2/26/03	2/26/04
Spectrum Analyzer QP Adapter	HP	85650A	2811A01267	00478	2/26/03	2/26/04
Temp Chamber	Thermotron	S-1.2 MiniMax	11899	01879	1/31/03	1/31/04
Thermometer	Omega	HH-26K	T-202884	02242	8/30/02	8/30/03
Antenna, Loop Sensor	Solar	7334-1	170	00170	12/09/02	12/9/03
Variac	Superior Electronics	126	N/A	02037	3/29/02	3/29/03

APPENDIX C: MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories Inc. •5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **HID**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **79857** Date: 12/16/2002
 Test Type: **Conducted Emissions** Time: 11:06:35
 Equipment: **Card Reader** Sequence#: 2
 Manufacturer: **HID** Tested By: Randal Clark
 Model: **HandIT** 120V 60Hz
 S/N: **C121602**

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
PDA	Handspring	Visor Prism	AEBEB2115227
Card Reader*	HID	HandIT	C121602

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	AULT Incorporated	14-0017-00	1201 S
Charger/Base	Handspring	Visor Prism	

Test Conditions / Notes:

EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA is set in a charger/base cradle where the EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. Frequency Range Investigated: 150 kHz – 30 MHz. Frequency Range Investigated: 150 kHz – 30 MHz. Margin for QP readings is taken WRT QP limit, all other data is taken WRT the average limit.

Transducer Legend:

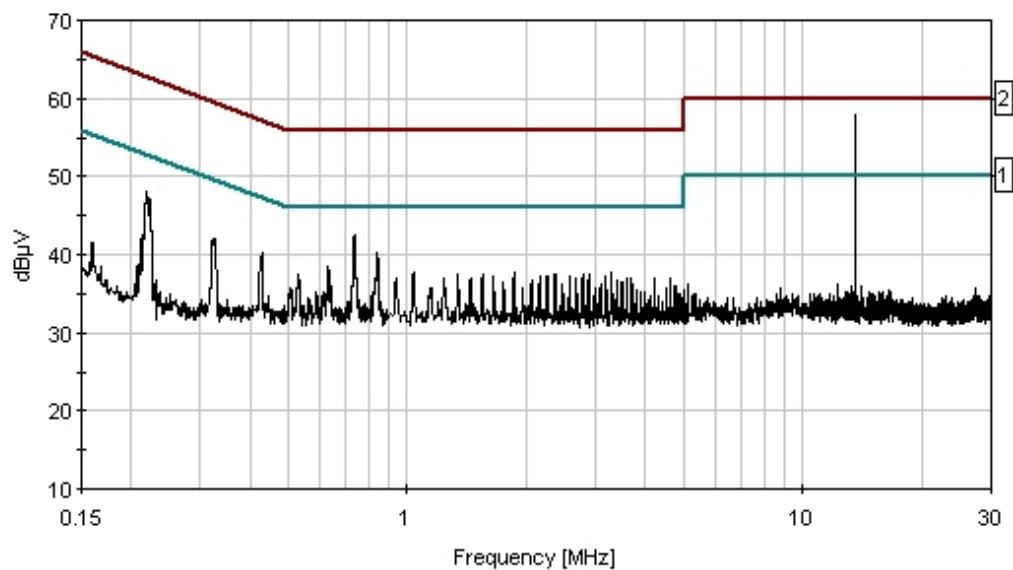
T1=Cable & Cap (Bench)	T2=LISN Insertion Loss s/n474
------------------------	-------------------------------

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	13.576M	45.5	+0.2	+0.5			+0.0	46.2	50.0	-3.8	Black
Ave											
^	13.577M	57.6	+0.2	+0.5			+0.0	58.3	50.0	+8.3	Black
3	13.577M	55.1	+0.2	+0.5			+0.0	55.8	60.0	-4.2	Black
QP											
4	219.084k	48.1	+0.0	+0.0			+0.0	48.1	52.9	-4.8	Black
5	13.562M	43.9	+0.2	+0.5			+0.0	44.6	50.0	-5.4	Black
6	838.658k	40.1	+0.0	+0.1			+0.0	40.2	46.0	-5.8	Black
7	428.518k	40.1	+0.1	+0.0			+0.0	40.2	47.3	-7.1	Black
8	631.406k	38.3	+0.1	+0.1			+0.0	38.5	46.0	-7.5	Black
9	325.982k	41.8	+0.1	+0.1			+0.0	42.0	49.6	-7.6	Black

10	3.284M	37.6	+0.1	+0.1	+0.0	37.8	46.0	-8.2	Black
11	1.039M	37.6	+0.0	+0.1	+0.0	37.7	46.0	-8.3	Black
12	1.859M	37.6	+0.0	+0.1	+0.0	37.7	46.0	-8.3	Black
13	527.417k	37.5	+0.1	+0.0	+0.0	37.6	46.0	-8.4	Black
14	1.549M	37.5	+0.0	+0.1	+0.0	37.6	46.0	-8.4	Black
15	1.345M	37.4	+0.0	+0.1	+0.0	37.5	46.0	-8.5	Black
16	2.361M	37.3	+0.1	+0.1	+0.0	37.5	46.0	-8.5	Black
17	2.876M	37.3	+0.1	+0.1	+0.0	37.5	46.0	-8.5	Black
18	2.778M	37.2	+0.1	+0.1	+0.0	37.4	46.0	-8.6	Black
19	730.000k Ave	37.2	+0.0	+0.1	+0.0	37.3	46.0	-8.7	Black
^	730.400k	42.2	+0.0	+0.1	+0.0	42.3	46.0	-3.7	Black
21	2.161M	37.2	+0.0	+0.1	+0.0	37.3	46.0	-8.7	Black
22	2.259M	37.1	+0.1	+0.1	+0.0	37.3	46.0	-8.7	Black
23	2.578M	37.1	+0.1	+0.1	+0.0	37.3	46.0	-8.7	Black
24	3.182M	37.1	+0.1	+0.1	+0.0	37.3	46.0	-8.7	Black
25	1.651M	37.1	+0.0	+0.1	+0.0	37.2	46.0	-8.8	Black
26	936.542k	37.0	+0.0	+0.1	+0.0	37.1	46.0	-8.9	Black
27	1.239M	37.0	+0.0	+0.1	+0.0	37.1	46.0	-8.9	Black
28	3.692M	36.9	+0.1	+0.1	+0.0	37.1	46.0	-8.9	Black
29	4.624M	36.7	+0.1	+0.3	+0.0	37.1	46.0	-8.9	Black
30	1.447M	36.9	+0.0	+0.1	+0.0	37.0	46.0	-9.0	Black
31	2.676M	36.7	+0.1	+0.1	+0.0	36.9	46.0	-9.1	Black
32	3.595M	36.7	+0.1	+0.1	+0.0	36.9	46.0	-9.1	Black
33	4.207M	36.6	+0.1	+0.2	+0.0	36.9	46.0	-9.1	Black
34	2.064M	36.7	+0.0	+0.1	+0.0	36.8	46.0	-9.2	Black

CKC Laboratories Inc. Date: 12/16/2002 Time: 11:06:35 WO#: 79857
 FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 2
 HID



— 1 - FCC 15.207 - AVE — 2 - FCC 15.207 - QP

Test Location: CKC Laboratories Inc. •5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **HID**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **79857**
 Test Type: **Conducted Emissions**
 Equipment: **Card Reader**
 Manufacturer: **HID**
 Model: **HandIT**
 S/N: **C121602**

Date: 12/16/2002
 Time: 11:47:31
 Sequence#: 3
 Tested By: Randal Clark
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
PDA	Handspring	Visor Prism	AEBEB2115227
Card Reader*	HID	HandIT	C121602

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	AULT Incorporated	14-0017-00	1201 S
Charger/Base	Handspring	Visor Prism	

Test Conditions / Notes:

EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA is set in a charger/base cradle where the EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. Frequency Range Investigated: 150 kHz – 30 MHz. Margin for QP readings is taken WRT QP limit, all other data is taken WRT the average limit.

Transducer Legend:

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

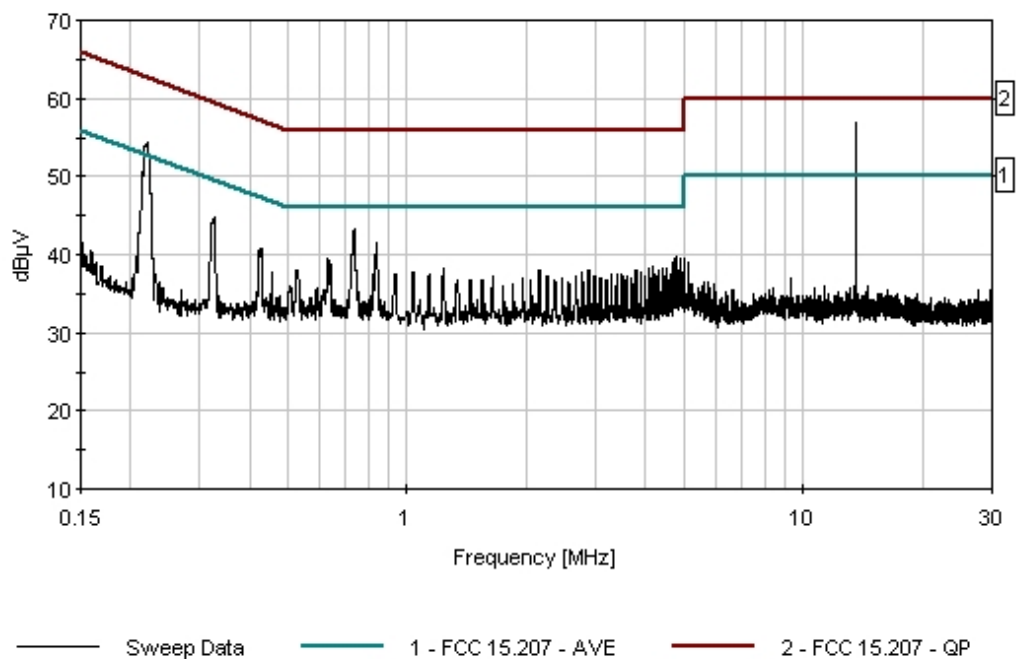
Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	Dist dB	Corr dB	Spec dB μ V	Margin dB	Polar Ant
1	836.477k	41.3	+0.0	+0.2	+0.0	41.5	46.0	-4.5	White
2	325.982k	44.4	+0.1	+0.2	+0.0	44.7	49.6	-4.9	White
3	13.577M	54.1	+0.2	+0.6	+0.0	54.9	60.0	-5.1	White
4	QP 4.811M	38.2	+0.1	+1.5	+0.0	39.8	46.0	-6.2	White
5	629.225k	39.3	+0.1	+0.2	+0.0	39.6	46.0	-6.4	White
6	4.709M	38.1	+0.1	+1.4	+0.0	39.6	46.0	-6.4	White
7	425.609k	40.5	+0.1	+0.1	+0.0	40.7	47.3	-6.6	White
8	4.909M	37.6	+0.1	+1.7	+0.0	39.4	46.0	-6.6	White

9	13.577M	42.2	+0.2	+0.6	+0.0	43.0	50.0	-7.0	White
	Ave								
^	13.577M	56.1	+0.2	+0.6	+0.0	56.9	50.0	+6.9	White
^	13.577M	56.0	+0.2	+0.6	+0.0	56.8	50.0	+6.8	White
12	4.194M	37.9	+0.1	+0.6	+0.0	38.6	46.0	-7.4	White
13	4.398M	37.3	+0.1	+0.9	+0.0	38.3	46.0	-7.7	White
14	1.234M	38.1	+0.0	+0.1	+0.0	38.2	46.0	-7.8	White
15	4.092M	37.6	+0.1	+0.5	+0.0	38.2	46.0	-7.8	White
16	735.000k	37.9	+0.0	+0.2	+0.0	38.1	46.0	-7.9	White
	Ave								
^	735.396k	43.0	+0.0	+0.2	+0.0	43.2	46.0	-2.8	White
18	2.157M	37.9	+0.0	+0.2	+0.0	38.1	46.0	-7.9	White
19	4.309M	37.2	+0.1	+0.8	+0.0	38.1	46.0	-7.9	White
20	525.235k	37.7	+0.1	+0.2	+0.0	38.0	46.0	-8.0	White
21	2.872M	37.7	+0.1	+0.2	+0.0	38.0	46.0	-8.0	White
22	3.782M	37.6	+0.1	+0.3	+0.0	38.0	46.0	-8.0	White
23	1.034M	37.7	+0.0	+0.1	+0.0	37.8	46.0	-8.2	White
24	2.770M	37.4	+0.1	+0.2	+0.0	37.7	46.0	-8.3	White
25	3.901M	37.3	+0.1	+0.3	+0.0	37.7	46.0	-8.3	White
26	4.603M	36.3	+0.1	+1.2	+0.0	37.6	46.0	-8.4	White
27	932.289k	37.3	+0.0	+0.2	+0.0	37.5	46.0	-8.5	White
28	3.280M	37.2	+0.1	+0.2	+0.0	37.5	46.0	-8.5	White
29	3.488M	37.1	+0.1	+0.3	+0.0	37.5	46.0	-8.5	White
30	1.136M	37.3	+0.0	+0.1	+0.0	37.4	46.0	-8.6	White
31	3.386M	37.1	+0.1	+0.2	+0.0	37.4	46.0	-8.6	White

32	3.582M	36.9	+0.1	+0.3	+0.0	37.3	46.0	-8.7	White
33	3.999M	36.8	+0.1	+0.3	+0.0	37.2	46.0	-8.8	White
34	221.000k	40.8	+0.0	+0.2	+0.0	41.0	52.8	-11.8	White
Ave									
^	220.538k	54.2	+0.0	+0.2	+0.0	54.4	52.8	+1.6	White

CKC Laboratories Inc. Date: 12/16/2002 Time: 11:47:31 W/O#: 79857
 FCC 15.207 - AVE Test Lead: White 120V 60Hz Sequence#: 3
 HID M/N: HandIT S/N: C121602



Test Location: CKC Laboratories Inc. •5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **HID**
 Specification: **FCC 15.225(a)**
 Work Order #: **79857** Date: 12/18/2002
 Test Type: **Maximized Emissions** Time: 14:26:03
 Equipment: **Card Reader** Sequence#: 6
 Manufacturer: **HID** Tested By: **Monika Brandle**
 Model: **HandIT**
 S/N: **C121602**

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
PDA	Handspring	Visor Prism	AEBEB2115227
Card Reader*	HID	HandIT	C121602

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	AULT Incorporated	14-0017-00	1201 S
Charger/Base	Handspring	Visor Prism	

Test Conditions / Notes:

EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA is set in a charger/base cradle where the EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. Frequency Range Investigated: 13.56 MHz.

Transducer Legend:

T1=Loop 1074	T2=Cable - 10 Meter
--------------	---------------------

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	13.560M	33.4	+9.6	+0.5		-19.0	24.5	80.0	-55.5	Vert
2	13.560M	33.1	+9.6	+0.5		-19.0	24.2	80.0	-55.8	Horiz

Test Location: CKC Laboratories Inc. •5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **HID**
 Specification: **FCC 15.225(a)**
 Work Order #: **79857** Date: 12/18/2002
 Test Type: **Maximized Emissions** Time: 15:00:49
 Equipment: **Card Reader** Sequence#: 7
 Manufacturer: **HID** Tested By: **Monika Brandle**
 Model: **HandIT**
 S/N: **C121602**

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
PDA	Handspring	Visor Prism	AEBEB2115227
Card Reader*	HID	HandIT	C121602

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	AULT Incorporated	14-0017-00	1201 S
Charger/Base	Handspring	Visor Prism	

Test Conditions / Notes:

EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA has been removed from the charger/base cradle and is set on the table. The EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. Frequency Range Investigated: 13.56 MHz. Three orthogonal planes tested. PDA positioned with bottom on table and LCD panel facing antenna PDA Laying flat on table with LCD facing up and proximity card facing antenna PDA lying on side with LCD facing antenna.

Transducer Legend:

T1=Loop 1074	T2=Cable - 10 Meter
--------------	---------------------

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.561M	30.3	+9.6	+0.5			-19.0	21.4	80.0	-58.6	Vert
									PDA Laying flat on table with LCD facing up and proximity card facing antenna		
2	13.561M	30.2	+9.6	+0.5			-19.0	21.3	80.0	-58.7	Vert
									PDA laying on side with LCD facing antenna		
3	13.562M	29.5	+9.6	+0.5			-19.0	20.6	80.0	-59.4	Vert
									PDA positioned with bottom on table and LCD panel facing antenna		

Test Location: CKC Laboratories Inc. •5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **HID**
 Specification: **15.225/15.209**
 Work Order #: **79857** Date: 12/19/2002
 Test Type: **Maximized Emissions** Time: 13:15:10
 Equipment: **Card Reader** Sequence#: 8
 Manufacturer: **HID** Tested By: Randal Clark
 Model: **HandIT**
 S/N: **C121602**

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
PDA	Handspring	Visor Prism	AEBEB2115227
Card Reader*	HID	HandIT	C121602

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	AULT Incorporated	14-0017-00	1201 S
Charger/Base	Handspring	Visor Prism	

Test Conditions / Notes:

EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA is set in a charger/base cradle where the EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. Frequency Range Investigated: 9 kHz-1000 MHz.

Transducer Legend:

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

Measurement Data: Reading listed by margin. Test Distance: 3 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	91.802M	58.8	+9.6	+0.0	-26.7	+1.5	+0.0	43.2	43.5	-0.3	Vert
	QP										
^	91.795M	59.2	+9.6	+0.0	-26.7	+1.5	+0.0	43.6	43.5	+0.1	Vert
3	101.393M	56.3	+11.8	+0.0	-26.7	+1.6	+0.0	43.0	43.5	-0.5	Vert
	QP										
^	101.338M	57.8	+11.8	+0.0	-26.7	+1.6	+0.0	44.5	43.5	+1.0	Vert
5	176.282M	51.6	+15.4	+0.0	-26.4	+2.2	+0.0	42.8	43.5	-0.7	Horiz
	QP										
^	176.287M	55.2	+15.4	+0.0	-26.4	+2.2	+0.0	46.4	43.5	+2.9	Horiz
7	35.162M	53.7	+11.3	+0.0	-26.8	+0.8	+0.0	39.0	40.0	-1.0	Vert
	QP										
^	35.124M	56.3	+11.3	+0.0	-26.8	+0.8	+0.0	41.6	40.0	+1.6	Vert

9	96.101M	55.8	+10.7	+0.0	-26.7	+1.6	+0.0	41.4	43.5	-2.1	Vert
	QP										
^	96.165M	59.7	+10.7	+0.0	-26.7	+1.6	+0.0	45.3	43.5	+1.8	Vert
11	100.533M	53.8	+11.7	+0.0	-26.7	+1.6	+0.0	40.4	43.5	-3.1	Vert
	QP										
^	100.577M	58.8	+11.7	+0.0	-26.7	+1.6	+0.0	45.4	43.5	+1.9	Vert
13	98.293M	54.3	+11.2	+0.0	-26.7	+1.6	+0.0	40.4	43.5	-3.1	Vert
	QP										
^	98.289M	57.5	+11.2	+0.0	-26.7	+1.6	+0.0	43.6	43.5	+0.1	Vert
15	95.485M	54.9	+10.5	+0.0	-26.7	+1.6	+0.0	40.3	43.5	-3.2	Vert
	QP										
^	95.489M	59.9	+10.5	+0.0	-26.7	+1.6	+0.0	45.3	43.5	+1.8	Vert
17	94.705M	55.1	+10.3	+0.0	-26.7	+1.5	+0.0	40.2	43.5	-3.3	Vert
	QP										
^	94.672M	59.7	+10.3	+0.0	-26.7	+1.5	+0.0	44.8	43.5	+1.3	Vert
19	107.172M	52.5	+12.4	+0.0	-26.7	+1.6	+0.0	39.8	43.5	-3.7	Vert
	QP										
^	107.211M	55.6	+12.4	+0.0	-26.7	+1.6	+0.0	42.9	43.5	-0.6	Vert
21	105.034M	52.7	+12.2	+0.0	-26.7	+1.6	+0.0	39.8	43.5	-3.7	Vert
	QP										
^	105.008M	56.4	+12.2	+0.0	-26.7	+1.6	+0.0	43.5	43.5	+0.0	Vert
23	99.027M	53.5	+11.4	+0.0	-26.7	+1.6	+0.0	39.8	43.5	-3.7	Vert
	QP										
^	99.027M	57.0	+11.4	+0.0	-26.7	+1.6	+0.0	43.3	43.5	-0.2	Vert
25	110.625M	51.6	+12.8	+0.0	-26.7	+1.6	+0.0	39.3	43.5	-4.2	Vert
	QP										
^	110.625M	55.4	+12.8	+0.0	-26.7	+1.6	+0.0	43.1	43.5	-0.4	Vert
27	106.123M	52.1	+12.3	+0.0	-26.7	+1.6	+0.0	39.3	43.5	-4.2	Vert
	QP										
^	106.167M	58.5	+12.3	+0.0	-26.7	+1.6	+0.0	45.7	43.5	+2.2	Vert
29	92.275M	54.7	+9.7	+0.0	-26.7	+1.5	+0.0	39.2	43.5	-4.3	Vert
	QP										
^	92.286M	58.0	+9.7	+0.0	-26.7	+1.5	+0.0	42.5	43.5	-1.0	Vert
31	108.157M	51.4	+12.5	+0.0	-26.7	+1.6	+0.0	38.8	43.5	-4.7	Vert
	QP										
^	108.146M	55.1	+12.5	+0.0	-26.7	+1.6	+0.0	42.5	43.5	-1.0	Vert

33	109.767M	50.7	+12.7	+0.0	-26.7	+1.6	+0.0	38.3	43.5	-5.2	Vert
	QP										
^	109.767M	53.5	+12.7	+0.0	-26.7	+1.6	+0.0	41.1	43.5	-2.4	Vert
35	103.498M	51.4	+12.0	+0.0	-26.7	+1.6	+0.0	38.3	43.5	-5.2	Vert
	QP										
^	103.499M	57.9	+12.0	+0.0	-26.7	+1.6	+0.0	44.8	43.5	+1.3	Vert
37	97.313M	52.1	+11.0	+0.0	-26.7	+1.6	+0.0	38.0	43.5	-5.5	Vert
	QP										
^	97.351M	60.0	+11.0	+0.0	-26.7	+1.6	+0.0	45.9	43.5	+2.4	Vert
39	309.710M	41.6	+0.0	+21.5	-26.2	+3.1	+0.0	40.0	46.0	-6.0	Vert
40	300.032M	40.9	+0.0	+22.2	-26.2	+3.0	+0.0	39.9	46.0	-6.1	Vert
41	102.072M	50.6	+11.8	+0.0	-26.7	+1.6	+0.0	37.2	43.5	-6.3	Vert
	QP										
^	102.062M	58.0	+11.8	+0.0	-26.7	+1.6	+0.0	44.7	43.5	+1.2	Vert
43	57.650M	49.4	+9.7	+0.0	-26.8	+1.1	+0.0	33.4	40.0	-6.6	Vert
44	332.860M	42.2	+0.0	+20.1	-26.3	+3.3	+0.0	39.3	46.0	-6.7	Vert
45	277.274M	43.1	+19.4	+0.0	-26.1	+2.8	+0.0	39.2	46.0	-6.8	Horiz
46	304.076M	40.3	+0.0	+21.9	-26.2	+3.0	+0.0	39.0	46.0	-7.0	Vert
47	113.293M	48.3	+13.1	+0.0	-26.6	+1.7	+0.0	36.5	43.5	-7.0	Vert
	QP										
^	113.280M	54.3	+13.1	+0.0	-26.6	+1.7	+0.0	42.5	43.5	-1.0	Vert
49	93.440M	51.6	+10.0	+0.0	-26.7	+1.5	+0.0	36.4	43.5	-7.1	Vert
	QP										
^	93.421M	58.1	+10.0	+0.0	-26.7	+1.5	+0.0	42.9	43.5	-0.6	Vert
51	84.647M	50.6	+7.6	+0.0	-26.8	+1.5	+0.0	32.9	40.0	-7.1	Vert
52	320.000M	41.0	+0.0	+20.9	-26.3	+3.2	+0.0	38.8	46.0	-7.2	Horiz
53	315.910M	40.7	+0.0	+21.1	-26.3	+3.1	+0.0	38.6	46.0	-7.4	Vert
54	298.402M	39.9	+21.9	+0.0	-26.2	+3.0	+0.0	38.6	46.0	-7.4	Horiz
55	41.631M	47.6	+10.9	+0.0	-26.8	+0.9	+0.0	32.6	40.0	-7.4	Vert
	QP										
^	41.665M	49.9	+10.9	+0.0	-26.8	+0.9	+0.0	34.9	40.0	-5.1	Vert
57	327.680M	41.1	+0.0	+20.4	-26.3	+3.2	+0.0	38.4	46.0	-7.6	Vert

58	74.793M	50.9	+6.8	+0.0	-26.8	+1.4	+0.0	32.3	40.0	-7.7	Vert
59	320.020M	40.3	+0.0	+20.9	-26.3	+3.2	+0.0	38.1	46.0	-7.9	Horiz
60	91.582M	51.3	+9.5	+0.0	-26.7	+1.5	+0.0	35.6	43.5	-7.9	Vert
	QP										
^	91.605M	55.9	+9.5	+0.0	-26.7	+1.5	+0.0	40.2	43.5	-3.3	Vert
62	42.186M	46.6	+10.9	+0.0	-26.8	+0.9	+0.0	31.6	40.0	-8.4	Vert
	QP										
^	42.152M	50.0	+10.9	+0.0	-26.8	+0.9	+0.0	35.0	40.0	-5.0	Vert
64	351.240M	41.5	+0.0	+19.0	-26.4	+3.4	+0.0	37.5	46.0	-8.5	Vert
65	120.730M	45.9	+13.8	+0.0	-26.6	+1.7	+0.0	34.8	43.5	-8.7	Vert
66	40.688M	46.0	+10.9	+0.0	-26.8	+0.9	+0.0	31.0	40.0	-9.0	Horiz
67	174.930M	43.6	+15.1	+0.0	-26.4	+2.2	+0.0	34.5	43.5	-9.0	Vert
68	172.890M	43.8	+14.8	+0.0	-26.4	+2.2	+0.0	34.4	43.5	-9.1	Horiz
69	65.087M	48.2	+8.3	+0.0	-26.8	+1.2	+0.0	30.9	40.0	-9.1	Vert
70	327.680M	39.5	+0.0	+20.4	-26.3	+3.2	+0.0	36.8	46.0	-9.2	Vert
71	332.100M	39.6	+0.0	+20.1	-26.3	+3.3	+0.0	36.7	46.0	-9.3	Horiz
72	281.582M	39.9	+19.9	+0.0	-26.1	+2.9	+0.0	36.6	46.0	-9.4	Horiz
73	50.224M	46.0	+10.4	+0.0	-26.8	+1.0	+0.0	30.6	40.0	-9.4	Vert
74	343.860M	40.1	+0.0	+19.4	-26.4	+3.4	+0.0	36.5	46.0	-9.5	Horiz
75	302.870M	37.7	+0.0	+22.0	-26.2	+3.0	+0.0	36.5	46.0	-9.5	Horiz
76	287.758M	39.1	+20.7	+0.0	-26.2	+2.9	+0.0	36.5	46.0	-9.5	Horiz
77	298.092M	37.5	+21.9	+0.0	-26.2	+3.0	+0.0	36.2	46.0	-9.8	Horiz
78	83.898M	48.1	+7.4	+0.0	-26.8	+1.5	+0.0	30.2	40.0	-9.8	Vert
79	285.538M	38.9	+20.4	+0.0	-26.1	+2.9	+0.0	36.1	46.0	-9.9	Horiz
80	349.160M	39.9	+0.0	+19.1	-26.4	+3.4	+0.0	36.0	46.0	-10.0	Vert
81	60.768M	46.4	+9.3	+0.0	-26.8	+1.1	+0.0	30.0	40.0	-10.0	Vert
	QP										
^	60.768M	53.2	+9.3	+0.0	-26.8	+1.1	+0.0	36.8	40.0	-3.2	Vert

83	327.460M	38.5	+0.0	+20.4	-26.3	+3.2	+0.0	35.8	46.0	-10.2	Vert
84	72.649M	47.9	+7.0	+0.0	-26.8	+1.4	+0.0	29.5	40.0	-10.5	Vert
85	70.335M	47.7	+7.3	+0.0	-26.8	+1.3	+0.0	29.5	40.0	-10.5	Vert
86	55.308M	45.2	+9.9	+0.0	-26.8	+1.1	+0.0	29.4	40.0	-10.6	Vert
87	353.440M	39.0	+0.0	+18.8	-26.4	+3.4	+0.0	34.8	46.0	-11.2	Horiz
88	170.752M	41.6	+14.6	+0.0	-26.4	+2.2	+0.0	32.0	43.5	-11.5	Vert
	QP										
^	170.840M	47.3	+14.6	+0.0	-26.4	+2.2	+0.0	37.7	43.5	-5.8	Vert
90	100.685M	45.3	+11.7	+0.0	-26.7	+1.6	+0.0	31.9	43.5	-11.6	Horiz
91	101.690M	45.0	+11.8	+0.0	-26.7	+1.6	+0.0	31.7	43.5	-11.8	Horiz
92	54.230M	44.0	+10.0	+0.0	-26.8	+1.0	+0.0	28.2	40.0	-11.8	Horiz
93	54.651M	43.9	+10.0	+0.0	-26.8	+1.0	+0.0	28.1	40.0	-11.9	Vert
94	363.040M	38.3	+0.0	+18.3	-26.5	+3.5	+0.0	33.6	46.0	-12.4	Vert
95	310.099M	35.2	+0.0	+21.5	-26.2	+3.1	+0.0	33.6	46.0	-12.4	Vert
	QP										
96	94.763M	46.0	+10.3	+0.0	-26.7	+1.5	+0.0	31.1	43.5	-12.4	Horiz
97	59.189M	43.7	+9.6	+0.0	-26.8	+1.1	+0.0	27.6	40.0	-12.4	Vert
	QP										
^	59.150M	51.7	+9.6	+0.0	-26.8	+1.1	+0.0	35.6	40.0	-4.4	Vert
99	124.860M	42.0	+13.9	+0.0	-26.6	+1.7	+0.0	31.0	43.5	-12.5	Vert
100	67.787M	44.9	+7.8	+0.0	-26.8	+1.3	+0.0	27.2	40.0	-12.8	Horiz
101	46.709M	42.3	+10.7	+0.0	-26.8	+1.0	+0.0	27.2	40.0	-12.8	Vert
102	167.329M	40.9	+14.1	+0.0	-26.4	+2.1	+0.0	30.6	43.5	-12.9	Horiz
	QP										
^	167.330M	49.3	+14.1	+0.0	-26.4	+2.1	+0.0	39.1	43.5	-4.4	Horiz
104	171.072M	40.0	+14.6	+0.0	-26.4	+2.2	+0.0	30.4	43.5	-13.1	Horiz
	QP										
^	171.028M	48.7	+14.6	+0.0	-26.4	+2.2	+0.0	39.1	43.5	-4.4	Horiz
106	116.991M	41.3	+13.5	+0.0	-26.6	+1.7	+0.0	29.9	43.5	-13.6	Horiz
107	149.080M	42.5	+11.9	+0.0	-26.5	+1.9	+0.0	29.8	43.5	-13.7	Vert

108	108.490M	42.2	+12.6	+0.0	-26.7	+1.6	+0.0	29.7	43.5	-13.8	Horiz
109	184.330M	37.3	+16.3	+0.0	-26.4	+2.3	+0.0	29.5	43.5	-14.0	Vert
110	99.555M	43.0	+11.5	+0.0	-26.7	+1.6	+0.0	29.4	43.5	-14.1	Horiz
111	98.130M	43.2	+11.2	+0.0	-26.7	+1.6	+0.0	29.3	43.5	-14.2	Horiz
112	361.880M	36.2	+0.0	+18.4	-26.5	+3.5	+0.0	31.6	46.0	-14.4	Horiz
113	114.232M	40.6	+13.2	+0.0	-26.6	+1.7	+0.0	28.9	43.5	-14.6	Horiz
114	97.245M	43.1	+10.9	+0.0	-26.7	+1.6	+0.0	28.9	43.5	-14.6	Horiz
115	142.400M	41.1	+12.5	+0.0	-26.5	+1.8	+0.0	28.9	43.5	-14.6	Vert
116	112.586M	40.7	+13.0	+0.0	-26.6	+1.7	+0.0	28.8	43.5	-14.7	Horiz
117	95.925M	42.8	+10.6	+0.0	-26.7	+1.6	+0.0	28.3	43.5	-15.2	Horiz
118	159.080M	39.7	+13.0	+0.0	-26.5	+2.0	+0.0	28.2	43.5	-15.3	Vert
119	135.611M	39.4	+13.0	+0.0	-26.6	+1.8	+0.0	27.6	43.5	-15.9	Horiz
120	149.210M	40.2	+11.9	+0.0	-26.5	+1.9	+0.0	27.5	43.5	-16.0	Horiz
121	122.032M	38.2	+13.8	+0.0	-26.6	+1.7	+0.0	27.1	43.5	-16.4	Horiz
122	244.198M	36.8	+16.0	+0.0	-26.1	+2.7	+0.0	29.4	46.0	-16.6	Horiz
123	180.433M	34.8	+16.1	+0.0	-26.4	+2.2	+0.0	26.7	43.5	-16.8	Horiz
124	92.763M	41.9	+9.8	+0.0	-26.7	+1.5	+0.0	26.5	43.5	-17.0	Horiz
125	226.260M	36.2	+16.4	+0.0	-26.2	+2.5	+0.0	28.9	46.0	-17.1	Vert
126	91.793M	41.6	+9.6	+0.0	-26.7	+1.5	+0.0	26.0	43.5	-17.5	Horiz
127	231.630M	35.4	+16.3	+0.0	-26.2	+2.6	+0.0	28.1	46.0	-17.9	Vert
128	85.979M	39.1	+8.0	+0.0	-26.7	+1.5	+0.0	21.9	40.0	-18.1	Horiz
129	89.647M	40.1	+9.0	+0.0	-26.7	+1.5	+0.0	23.9	43.5	-19.6	Horiz

Test Location: CKC Laboratories Inc. •5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **HID**
 Specification: **15.225/15.209**
 Work Order #: **79857** Date: 12/19/2002
 Test Type: **Maximized Emissions** Time: 14:52:22
 Equipment: **Card Reader** Sequence#: 9
 Manufacturer: **HID** Tested By: Randal Clark
 Model: **HandIT**
 S/N: **C121602**

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
PDA	Handspring	Visor Prism	AEBEB2115227
Card Reader*	HID	HandIT	C121602

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	AULT Incorporated	14-0017-00	1201 S
Charger/Base	Handspring	Visor Prism	

Test Conditions / Notes:

EUT is a Proximity Card reader housed in a PDA host. EUT operates on 13.56 MHz and is powered solely by the host. The host PDA has been removed from the charger/base cradle and is set on the table. The EUT is set to transmit. A tag is present in the field. "Read ITPoll" software polls the EUT and returns the serial number of the read tag. Frequency Range Investigated: 9kHz-1000MHz. Three orthogonal planes tested. PDA positioned with bottom on table and LCD panel facing antenna PDA Laying flat on table with LCD facing up and proximity card facing antenna PDA laying on side with LCD facing antenna

Transducer Legend:

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

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	40.674M QP	48.2	+10.9	+0.0	-26.8	+0.9	+0.0	33.2	40.0	-6.8	Vert
									PDA laying on side with LCD facing antenna		
^	40.669M	50.5	+10.9	+0.0	-26.8	+0.9	+0.0	35.5	40.0	-4.5	Vert
									PDA laying on side with LCD facing antenna		
^	40.701M	44.4	+10.9	+0.0	-26.8	+0.9	+0.0	29.4	40.0	-10.6	Vert
									PDA Laying flat on table with LCD facing up and proximity card facing antenna		
^	40.676M	41.1	+10.9	+0.0	-26.8	+0.9	+0.0	26.1	40.0	-13.9	Vert
									PDA positioned with bottom on table and LCD panel facing antenna		
5	67.786M	46.9	+7.8	+0.0	-26.8	+1.3	+0.0	29.2	40.0	-10.8	Vert
									PDA laying on side with LCD facing antenna		
6	176.280M	41.2	+15.4	+0.0	-26.4	+2.2	+0.0	32.4	43.5	-11.1	Vert
									PDA positioned with bottom on table and LCD panel facing antenna		
7	54.225M	44.7	+10.0	+0.0	-26.8	+1.0	+0.0	28.9	40.0	-11.1	Vert
									PDA laying on side with LCD facing antenna		
8	325.476M	37.2	+0.0	+20.5	-26.3	+3.2	+0.0	34.6	46.0	-11.4	Horiz
									PDA Laying flat on table with LCD facing up and proximity card facing antenna		
9	40.671M	43.0	+10.9	+0.0	-26.8	+0.9	+0.0	28.0	40.0	-12.0	Horiz
									PDA laying on side with LCD facing antenna		

10	40.671M	42.7	+10.9	+0.0	-26.8	+0.9	+0.0	27.7	40.0	-12.3	Horiz	PDA positioned with bottom on table and LCD panel facing antenna
11	650.983M	35.9	+0.0	+20.1	-27.6	+5.1	+0.0	33.5	46.0	-12.5	Vert	PDA positioned with bottom on table and LCD panel facing antenna
12	650.959M	35.2	+0.0	+20.1	-27.6	+5.1	+0.0	32.8	46.0	-13.2	Vert	PDA positioned with bottom on table and LCD panel facing antenna
13	149.160M	42.4	+11.9	+0.0	-26.5	+1.9	+0.0	29.7	43.5	-13.8	Horiz	PDA Laying flat on table with LCD facing up and proximity card facing antenna
14	67.782M	43.7	+7.8	+0.0	-26.8	+1.3	+0.0	26.0	40.0	-14.0	Horiz	PDA positioned with bottom on table and LCD panel facing antenna
15	203.400M	36.4	+17.0	+0.0	-26.3	+2.4	+0.0	29.5	43.5	-14.0	Horiz	PDA Laying flat on table with LCD facing up and proximity card facing antenna
16	379.718M	36.7	+0.0	+17.4	-26.6	+3.6	+0.0	31.1	46.0	-14.9	Vert	PDA positioned with bottom on table and LCD panel facing antenna
17	67.791M	42.7	+7.8	+0.0	-26.8	+1.3	+0.0	25.0	40.0	-15.0	Horiz	PDA laying on side with LCD facing antenna
18	379.740M	36.6	+0.0	+17.4	-26.6	+3.6	+0.0	31.0	46.0	-15.0	Horiz	PDA laying on side with LCD facing antenna

19	162.701M	38.8	+13.5	+0.0	-26.4	+2.1	+0.0	28.0	43.5	-15.5	Vert	PDA positioned with bottom on table and LCD panel facing antenna
20	108.493M	40.3	+12.6	+0.0	-26.7	+1.6	+0.0	27.8	43.5	-15.7	Vert	PDA laying on side with LCD facing antenna
21	54.230M	40.0	+10.0	+0.0	-26.8	+1.0	+0.0	24.2	40.0	-15.8	Horiz	PDA laying on side with LCD facing antenna
22	54.271M	39.9	+10.0	+0.0	-26.8	+1.0	+0.0	24.1	40.0	-15.9	Vert	PDA Laying flat on table with LCD facing up and proximity card facing antenna
23	406.843M	36.5	+0.0	+16.4	-26.9	+3.7	+0.0	29.7	46.0	-16.3	Vert	PDA positioned with bottom on table and LCD panel facing antenna
24	81.342M	42.0	+6.7	+0.0	-26.8	+1.5	+0.0	23.4	40.0	-16.6	Horiz	PDA positioned with bottom on table and LCD panel facing antenna
25	81.346M	42.0	+6.7	+0.0	-26.8	+1.5	+0.0	23.4	40.0	-16.6	Vert	PDA laying on side with LCD facing antenna
26	379.740M	34.6	+0.0	+17.4	-26.6	+3.6	+0.0	29.0	46.0	-17.0	Horiz	PDA Laying flat on table with LCD facing up and proximity card facing antenna
27	433.960M	34.2	+0.0	+17.0	-27.1	+3.9	+0.0	28.0	46.0	-18.0	Vert	PDA positioned with bottom on table and LCD panel facing antenna

28	135.590M	36.7	+13.0	+0.0	-26.6	+1.8	+0.0	24.9	43.5	-18.6	Horiz	PDA Laying flat on table with LCD facing up and proximity card facing antenna
29	135.596M	35.9	+13.0	+0.0	-26.6	+1.8	+0.0	24.1	43.5	-19.4	Horiz	PDA positioned with bottom on table and LCD panel facing antenna
30	108.478M	36.3	+12.6	+0.0	-26.7	+1.6	+0.0	23.8	43.5	-19.7	Horiz	PDA positioned with bottom on table and LCD panel facing antenna
31	108.500M	36.0	+12.6	+0.0	-26.7	+1.6	+0.0	23.5	43.5	-20.0	Horiz	PDA Laying flat on table with LCD facing up and proximity card facing antenna
32	81.372M	38.4	+6.7	+0.0	-26.8	+1.5	+0.0	19.8	40.0	-20.2	Vert	PDA Laying flat on table with LCD facing up and proximity card facing antenna