



CERTIFICATION TEST REPORT
FOR THE
PROXIMITY READER, 4045AGN00
FCC PART 15 SUBPART C &
CANADIAN DEPARTMENT OF INDUSTRY RSS-210
COMPLIANCE

DATE OF ISSUE: OCTOBER 4, 1999

PREPARED FOR:

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9292 Jeronimo Road
Irvine, CA 92718

P.O. No: 008006
W.O. No: 72253

Report No: FC99-026

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Date of test: July 28, 1999 through
August 18, 1999

APPROVED BY:

A handwritten signature in black ink that reads 'Dennis Ward'.

Dennis Ward
Director of Laboratories
CKC Laboratories, Inc.

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TABLE OF CONTENTS

Administrative Information	3
Summary Of Results.....	4
Equipment Under Test (EUT) Description.....	4
Measurement Uncertainty.....	4
EUT Operating Frequency.....	4
Peripheral Devices	4
Report Of Measurements.....	5
Table 1: Field Strength Levels.....	5
Table 2: Six Highest Radiated Emission Levels	6
Table 3: Six Highest Conducted Emission Levels	7
Table A: List Of Test Equipment	8
EUT Setup	9
Test Instrumentation And Analyzer Settings.....	10
Table B: Analyzer Bandwidth Settings Per Frequency Range.....	10
Spectrum Analyzer Detector Functions.....	11
Peak	11
Quasi-Peak.....	11
Average.....	11
Test Methods	12
Radiated Emissions Testing.....	12
Conducted Emissions Testing	13
Sample Calculations	14
Appendix A: Information About The Equipment Under Test.....	15
I/O Ports.....	16
Crystal Oscillators	16
Printed Circuit Boards	16
Photograph Showing Radiated Emissions.....	19
Photograph Showing Radiated Emissions.....	20
Photograph Showing Conducted Emissions.....	21
Photograph Showing Radiated Emissions.....	22
Photograph Showing Radiated Emissions.....	23
Photograph Showing Conducted Emissions.....	24
Appendix B: Measurement Data Sheets.....	25

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ADMINISTRATIVE INFORMATION

DATE OF TEST: July 28, 1999 through August 18, 1999

PURPOSE OF TEST: To demonstrate the compliance of the Proximity Reader, 4045AGN00, with the requirements for FCC Part 15 Subpart C & RSS-210 devices.

MANUFACTURER: HID Corporation
9292 Jeronimo Road
Irvine, CA 92718

REPRESENTATIVE: Ken Long

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

TEST PERSONNEL: Dustin Oaks

TEST METHOD: ANSI C63.4 1992

FREQUENCY RANGE TESTED: 9 kHz - 1000 MHz

EQUIPMENT UNDER TEST: Proximity Reader
Manuf: HID Corporation
Model: 4045AGN00
Serial: N/A
FCC ID: Pending

SUMMARY OF RESULTS

The HID Corporation Proximity Reader, 4045AGN00, was tested in accordance with ANSI C63.4 1992 for compliance with FCC Part 15.209 & RSS-210.

As received, the above equipment was found to be fully compliant with the limits of FCC Part 15.209 & RSS-210. The results in this report apply only to the items tested, as identified herein.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

Single Door Access Controller/RFID Reader.

MEASUREMENT UNCERTAINTY

Associated with data in this report is a ± 4 dB measurement uncertainty.

EUT OPERATING FREQUENCY

The EUT was operating at 125 kHz.

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within $+15^{\circ}\text{C}$ and $+35^{\circ}\text{C}$.
The relative humidity was between 20% and 75%.

PERIPHERAL DEVICES

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

DC Power Supply

Manuf: Topward Electronics

Model: 2306

Serial: 920035

FCC ID: N/A

REPORT OF MEASUREMENTS

The following tables report the highest worst case levels recorded during the tests performed on the Proximity Reader, 4045AGN00. All readings taken are peak readings unless otherwise noted by a “Q” or “A”. The data sheets from which these tables were compiled are contained in Appendix B.

Table 1: Field Strength Levels									
FREQUENCY	METER RDG	CORRECTION FACTORS				CORRECTED READING	SPEC LIMIT	MARGIN	NOTES
		Ant	Amp	Cable	FCC 15.231				
MHz	dB μ V	dB	DB	dB	dB	dB μ V/m	dB μ V/m	DB	
0.125265	43.7	12.2	0.0	0.1	-60.0	-4.0	25.6	-29.6	N (Integral Antenna)
0.125	40.7	12.2	0.0	0.1	-60.0	-7.0	25.6	-32.6	N (Antenna w/10-ft cable)

Test Method:
Spec Limit :
Test Distance:

ANSI C63.4 1992
FCC Part 15.209
30 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
N = No Polarization
D = Dipole Reading
Q = Quasi Peak Reading
A = Average Reading

COMMENTS: Tested in the following two configurations:

- I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT with integral antenna, operating with a card in the field. I/O cables are coiled in 30-40cm bundle.
- EUT is operating on 12VDC via DC power supply. EUT equipped with antenna, which has a 10-foot cable, operating with a card in the field.

Table 2: Six Highest Radiated Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS				CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN DB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
31.419	44.9	13.1	-27.0	1.0		32.0	40.0	-8.0	V
83.777	42.7	8.0	-26.9	1.6		25.4	40.0	-14.6	V
85.288	42.6	8.4	-26.9	1.7		25.8	40.0	-14.2	V
201.523	34.1	18.4	-26.5	2.7		28.7	43.5	-14.8	H
204.538	37.6	18.2	-26.5	2.7		32.0	43.5	-11.5	H
238.622	36.5	16.4	-26.3	3.0		29.6	46.0	-16.4	H

Test Method: ANSI C63.4 1992
 Spec Limit : FCC Part 15.209
 Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
 V = Vertical Polarization
 N = No Polarization
 D = Dipole Reading
 Q = Quasi Peak Reading
 A = Average Reading

COMMENTS: Tested in the following two configurations:

- I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT with integral antenna, operating with a card in the field. I/O cables are coiled in 30-40cm bundle. Frequency range scanned from 9kHz – 1000 MHz.
- EUT is operating on 12VDC via DC power supply. EUT equipped with antenna, which has a 10-foot cable, operating with a card in the field. Frequency range scanned from 9kHz – 1000 MHz.

Table 3: Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV	SPEC LIMIT dBμV	MARGIN dB	NOTES
		Lisn dB							
1.192447	40.2	0.0		0.10		40.3	48.0	-7.7	W
1.976775	33.8	0.0		0.10		33.9	48.0	-14.1	W
2.148108	33.6	0.0		0.10		33.7	48.0	-14.3	B
12.685490	40.5	0.0		0.20		40.7	48.0	-7.3	B
16.379260	33.6	0.0		0.30		33.9	48.0	-14.1	W
17.444760	33.5	0.0		0.30		33.8	48.0	-14.2	W

Test Method:
Spec Limit :

ANSI C63.4 1992
FCC Class B

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

COMMENTS: Tested in the following two configurations:

- I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT with integral antenna, operating with a card in the field.
- I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT equipped with antenna, which has a 10-foot cable, operating with a card in the field.

TABLE A

LIST OF TEST EQUIPMENT

Industry Canada File No. IC 3082-D

1. Spectrum Analyzer, Hewlett Packard, Model No. 8566B, CKC 1, S/N 2403A08241 (Display Unit), S/N 2209A01404 (rf Unit). Calibration date: July 7, 1999. Calibration due date: July 7, 2000.
2. Preamp, Hewlett Packard, Model No. 8447D, S/N 1937A02604. Calibration Date: April 28, 1999. Calibration Due: April 28, 2000
3. Quasi-Peak Adapter, Hewlett Packard, Model No. 85650A, S/N 2811A01267. Calibration Date: July 7, 1999. Calibration Due; July 7, 2000.
4. Biconical Antenna, A & H Systems, Model No. SAS-200/542, S/N 156. Calibration Date: May 20, 1999. Calibration Due: May 20, 2000.
5. Log Periodic Antenna, A & H Systems, Model No. SAS-200/512, S/N 154. Calibration Date: May 20, 1999. Calibration Due: May 20, 2000.
6. LISN (FCC), Solar Electronics, S/N 855996, 992. Calibration date: June 4, 1999. Calibration due date: June 4, 2000..
7. LISN, Solar Electronics, S/N 8144793, 474. Calibration date: June 2, 1999. Calibration due date: June 2, 2000.
8. Mag Loop Antenna, EMCO, Model 6502, S/N 01074. Calibration date: June 16, 1999. Calibration due date: June 16, 2000.
9. Test software, EMI Test 3.08.

EUT SETUP

The equipment under test (EUT) and the peripheral(s) listed were set up in a manner that represented their normal use. Any special conditions required for the EUT to operate normally are identified in the comments that accompany Table 1 for fundamental radiated emissions, Table 2 for radiated emissions and Table 3 for conducted characteristics. Additionally, a complete description of all the ports and I/O cables is included on the information sheets contained in Appendix A.

During radiated emissions testing, 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. This configuration is typical for radiated emissions testing of table top devices.

I/O cables were connected to the EUT and peripherals in the manner required for normal operation of the system. Excess cabling was bundled in the center in a serpentine fashion using 30-40 centimeter lengths.

During conducted emissions testing, the EUT was located 80 centimeters above the conducting ground plane on the same nonconducting table as was used for radiated testing. The metal plane was grounded to the earth through the green wire safety ground. Power to the EUT was provided via 3 meters of shielded power cable from a filter grounded to the metal plane to a LISN. The LISN was also grounded to the plane and attached to the LISN was a 4 ganged grounded outlet whose source was also shielded and 60 cm in length. All other objects were kept a minimum of 1 meter away from the EUT during the conducted test.

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Table A were used to collect both the radiated and conducted emissions data for the Proximity Reader, 4045AGN00. For radiated emissions below 30 MHz, the magnetic loop antenna was used at a distance of 30 meters. For radiated measurements between 30 MHz and 300 MHz, the biconical antenna was used at a distance of 10 meters. For frequencies from 300 to 1000 MHz, the log periodic antenna was used at a distance of 10 meters. Conducted emissions tests required the use of the FCC type LISN's.

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.

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	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	40 GHz	1 MHz

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in Tables 1, 2 and 3 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 Proximity Reader, 4045AGN00.

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

When the frequencies exceed 1 GHz, 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.

TEST METHODS

The radiated and conducted emissions data of the Proximity Reader, 4045AGN00, 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 the "Sample Calculations". The corrected data was then compared to the FCC Part 15, Subpart C emissions limits to determine compliance.

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

Radiated Emissions Testing

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode with the I/O cables and line cords facing the antenna. The frequency range of 30 MHz - 88 MHz was then 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 which were at or near the limit were recorded. The frequency range of 100 - 300 MHz was scanned with the biconical antenna in the same manner, and the peaks recorded. Lastly, a scan of the FM band from 88 - 110 MHz was made, using a reduced resolution bandwidth and a reduced 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 - 1000 MHz was scanned. The log periodic antenna was changed to the vertical polarity and the frequency range of 300 - 1000 MHz was again scanned. The magnetic loop antenna was used for the frequency range of 9 kHz to 30 MHz. 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.

For the final radiated scan, the equipment was again positioned with its I/O and power cables facing the antenna. A thorough scan of all frequencies was manually made using a small frequency span, rotating the turntable as needed. Comparison with the previously recorded measurements was then made.

Using the peak readings from both scans as a guide, the test engineer then maximized the readings with respect to the table rotation, antenna height and configuration of the peripherals and cables. Maximizing of the cables was achieved by monitoring the spectrum analyzer on a closed circuit television monitor while the EUT cables were being moved and rearranged on the EUT table for maximum emissions. Photographs showing the final worst case configuration of the EUT are contained in Appendix A.

Conducted Emissions Testing

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.

SAMPLE CALCULATIONS

The basic spectrum analyzer reading was converted using correction factors as shown in the emissions readings in Tables 1, 2 and 3. For radiated emissions in dB μ V/m, the spectrum analyzer reading in dB μ V was corrected by using the following formula:

$$\begin{aligned}
 & \text{Meter reading (dB}\mu\text{V)} \\
 & + \text{Antenna Factor (dB)} \\
 & + \text{Cable Loss (dB)} \\
 & - \text{Distance Correction (dB)} \\
 & - \text{Pre-amplifier Gain (dB)} \\
 \\
 & = \text{Corrected Reading(dB}\mu\text{V/m)}
 \end{aligned}$$

This reading was then compared to the applicable specification limit to determine compliance.

A typical data sheet will display the following in column format:

#	Freq MHz	Rdng dB μ V	Cable	Amp.	FCC 15.23	Bicon	Mag	Log	Dist	Corr dB μ V/m	Spec	Margin	Polar
---	-------------	--------------------	-------	------	--------------	-------	-----	-----	------	----------------------	------	--------	-------

means reading number

Freq MHz is the frequency in MHz of the obtained reading.

Rdng dB μ V is the reading obtained on the spectrum analyzer in dB μ V.

Amp. is short for the preamplifier factor or gain in dB.

FCC 15.23 is the 300 meter correction factor

Bicon is the biconical antenna factor in dB.

Log is the log periodic antenna factor in dB.

Mag is the magnetic loop antenna factor in dB.

Cable is the cable loss in dB of the coaxial cable on the OATS.

Dist is the distance factor (in dB). It is used when testing at a different test distance than the one stated in the spec.

Corr dB μ V/m is the corrected reading which is now in dB μ V/m (field strength).

Spec is the specification limit (dB) stated in the agency's regulations.

Margin is the closeness to the specified limit in dB; + is over and - is under the limit.

Polar is the Polarity of the antenna with respect to earth.

APPENDIX A
INFORMATION ABOUT THE EQUIPMENT UNDER TEST

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

Test Software/Firmware: **Version: Beta 7**
 CRT was displaying: **N/A**
 Power Supply Manufacturer: **N/A**
 Power Supply Part Number: **N/A**
 Line Filter Manufacturer: **N/A**
 Line Filter Part Number: **N/A**

Nominal Operating Voltage: **12 V DC**
 Operating Voltage Range: **10V - 15V DC**

I/O PORTS

Type	#
DC Power + Relay Contacts	P1
Switch Input & Relay Contacts	P2
Digital IO (Wiegand)	P3

CRYSTAL OSCILLATORS

Type	Freq In MHz
Ceramic resonator	4.0
Crystal	0.032768

PRINTED CIRCUIT BOARDS

Function	Model & Rev	Clocks, MHz	Layers	Location
Main Controller	4045-301-01 Rev B	4.0 and 0.032768	4	Back of EUT
Keypad		None	2	Front of EUT

CABLE INFORMATION

Cable #: P1	Cable(s) of this type: 1
Cable Type: DC Power & relay Construction: 22 AWG stranded Connected To End (1): EUT P1 leads Connector At End (1): None (solder to leads) Shield Grounded At (1): yes Part Number: Alpha 1299C	Shield Type: foil Length In Meters: 3 Connected To End (2): Supply +/- , also 3.3 ohm across relay contacts NC,Common Connector At End (2): none Shield Grounded At (2): no Number of Conductors: 9
Notes: only 5 conductors connected at either end, 4 were open both ends	
Cable #: P2	Cable(s) of this type: 1
Cable Type: Door Loop & Aux Relay Construction: 22 AWG stranded Connected To End (1): EUT P2 leads Connector At End (1): None (solder to leads) Shield Grounded At (1): no Part Number: Alpha 1299C	Shield Type: foil Length In Meters: 3 Connected To End (2): open circuited, except 12 ohm across relay contacts NC,Common Connector At End (2): none Shield Grounded At (2): no Number of Conductors: 9
Notes: only 6 conductors connected at either end, 3 were open both ends	
Cable #: P3	Cable(s) of this type: 1
Cable Type: Wiegand IO Construction: 22 AWG stranded Connected To End (1): EUT P3 leads Connector At End (1): None (solder to leads) Shield Grounded At (1): no Part Number: Alpha 1299C	Shield Type: foil Length In Meters: 3 Connected To End (2): Open circuited Connector At End (2): none Shield Grounded At (2): no Number of Conductors: 9
Notes: only 4 conductors connected at either end, 5 were open both ends	

Cable #: P4	Cable(s) of this type:
Cable Type: 10' antenna Construction: 22 AWG sheilded Connected To End (1): EUT P4 Connector At End (1): Amp 4-pin .079 centers Shield Grounded At (1): no Part Number: Alpha 1294C	Shield Type: foil Length In Meters: 3 Connected To End (2): Antenna & bicolor LED Connector At End (2): none Shield Grounded At (2): no Number of Conductors: 4
Notes: EUT also tested with short internal cable P4, integral antenna	

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View Short Antenna

NOTES:

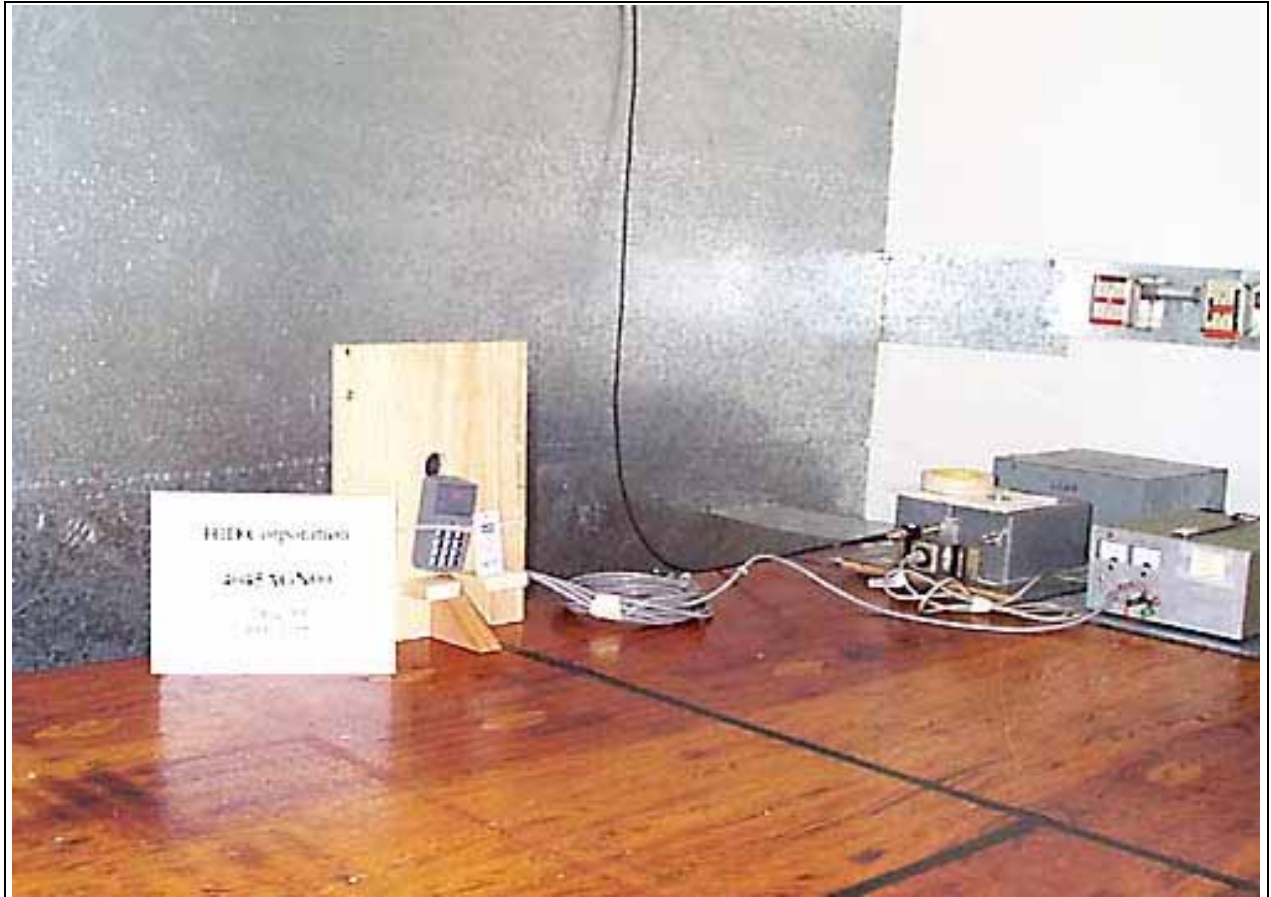
PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View Short Antenna

NOTES:

PHOTOGRAPH SHOWING CONDUCTED EMISSIONS



Conducted Emissions - Front View Short Antenna

NOTES:

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View Long Antenna

NOTES:

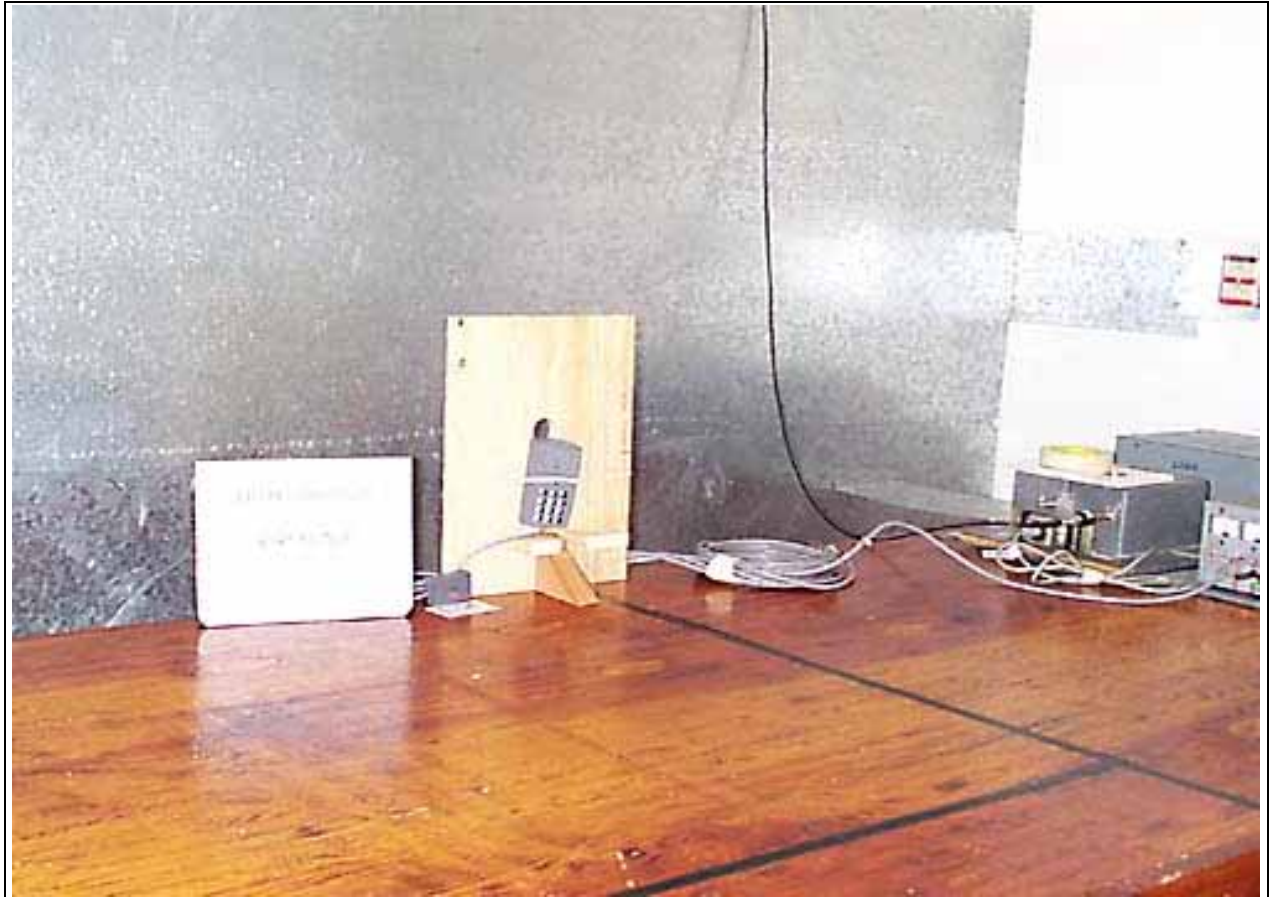
PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View Long Antenna

NOTES:

PHOTOGRAPH SHOWING CONDUCTED EMISSIONS



Conducted Emissions - Front View Long Antenna

NOTES:

APPENDIX B
MEASUREMENT DATA SHEETS

Test Location: . . .

Customer: **HID**
 Specification: **FCC 15 C PARA 15.209**
 Work Order #: **72253**
 Test Type: **Field Strength**
 Equipment: **Proximity Reader**
 Manufacturer: **HID**
 Model: **4045AGN00**
 S/N: **N/A**

Date: Thu Aug-19-1999
 Time: 12:45:45
 Sequence#: 16
 Tested By: Dustin Oaks

EMI Meters:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	4045AGN00	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
DC power supply	Topward Electronics	2306	920035

Test Conditions / Notes:

I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT with integral antenna, operating with a card in the field.

Measurement Data: Reading listed by order taken. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	Pream dB	Bicon dB	FCC 15.31 dB	Barn Cable dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	125.265k	43.7	+12.2	+0.1	-60.0		+0.0	-4.0	25.6	-29.6	None
Short Antenna											

Test Location: . . .

Customer: **HID**
 Specification: **FCC 15 C PARA 15.209**
 Work Order #: **72253**
 Test Type: **Field Strength**
 Equipment: **Proximity Reader**
 Manufacturer: **HID**
 Model: **4045AGN00**
 S/N: **N/A**

Date: Thu Aug-19-1999
 Time: 12:45:45
 Sequence#: 16
 Tested By: Dustin Oaks

EMI Meters:

Function	S/N	Calibration Date	Cal Due Date	Asset #
----------	-----	------------------	--------------	---------

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	4045AGN00	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
DC power supply	Topward Electronics	2306	920035

Test Conditions / Notes:

I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT equipped with antenna, which has a 10-foot cable, operating with a card in the field.

Measurement Data: Reading listed by order taken. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	Pream dB	Bicon dB	FCC 15.31 dB	Barn Cable dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	125.200k	40.7	+12.2	+0.1	-60.0		+0.0	-7.0	25.6	-32.6	None
Long Antenna											

Test Location: . . .

Customer: **HID**
 Specification: **FCC 15.209**
 Work Order #: **72253**
 Test Type: **Maximized Emissions**
 Equipment: **Proximity Reader**
 Manufacturer: **HID**
 Model: **4045AGN00**
 S/N: **N/A**

Date: Wed Aug-18-1999
 Time: 12:18:53
 Sequence#: 20
 Tested By: Dustin Oaks

EMI Meters:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	4045AGN00	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
DC power supply	Topward Electronics	2306	920035

Test Conditions / Notes:

I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT with integral antenna Cable, operating with a card in the field. Frequency range scanned from 9kHz – 1000 MHz.

Measurement Data: Reading listed by order taken. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Reading listed by order taken				Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
			Pream dB	Bicon dB	Log 1 dB	Barn dB					
1	31.419M	44.9	-27.0	+13.1	+0.0	+1.0	+0.0	32.0	40.0	-8.0	Vert
2	73.270M	35.2	-26.8	+7.6	+0.0	+1.5	+0.0	17.5	40.0	-22.5	Vert
3	204.539M	32.5	-26.5	+18.2	+0.0	+2.7	+0.0	26.9	43.5	-16.6	Vert
4	200.061M	30.9	-26.5	+18.5	+0.0	+2.7	+0.0	25.6	43.5	-17.9	Vert
5	185.247M	27.3	-26.6	+17.2	+0.0	+2.6	+0.0	20.5	43.5	-23.0	Vert
6	149.789M	30.5	-26.8	+12.7	+0.0	+2.2	+0.0	18.6	43.5	-24.9	Vert
7	120.714M	30.2	-26.8	+13.6	+0.0	+2.0	+0.0	19.0	43.5	-24.5	Vert
8	109.212M	32.7	-26.8	+12.7	+0.0	+1.9	+0.0	20.5	43.5	-23.0	Vert

Test Location: . . .

Customer: **HID**
 Specification: **FCC 15.209**
 Work Order #: **72253**
 Test Type: **Maximized Emissions**
 Equipment: **Proximity Reader**
 Manufacturer: **HID**
 Model: **4045AGN00**
 S/N: **N/A**

Date: Wed Aug-18-1999
 Time: 09:25:10
 Sequence#: 15
 Tested By: Dustin Oaks

EMI Meters:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	4045AGN00	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
DC power supply	Topward Electronics	2306	920035

Test Conditions / Notes:

I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT equipped with antenna, which has a 10-foot cable, operating with a card in the field. Frequency range scanned from 9kHz – 1000 MHz.

Measurement Data: Reading listed by order taken. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Reading listed by order taken				Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
			Pream dB	Bicon dB	Log 1 dB	Barn dB					
1	73.245M	40.7	-26.8	+7.6	+0.0	+1.5	+0.0	23.0	40.0	-17.0	Vert
2	204.551M	35.4	-26.5	+18.2	+0.0	+2.7	+0.0	29.8	43.5	-13.7	Vert
3	200.038M	30.1	-26.5	+18.5	+0.0	+2.7	+0.0	24.8	43.5	-18.7	Vert
4	185.246M	30.8	-26.6	+17.2	+0.0	+2.6	+0.0	24.0	43.5	-19.5	Vert
5	149.803M	36.9	-26.8	+12.7	+0.0	+2.2	+0.0	25.0	43.5	-18.5	Vert
6	120.735M	37.0	-26.8	+13.6	+0.0	+2.0	+0.0	25.8	43.5	-17.7	Vert
7	109.194M	35.8	-26.8	+12.7	+0.0	+1.9	+0.0	23.6	43.5	-19.9	Vert
8	85.288M	42.6	-26.9	+8.4	+0.0	+1.7	+0.0	25.8	40.0	-14.2	Vert
9	83.777M	42.7	-26.9	+8.0	+0.0	+1.6	+0.0	25.4	40.0	-14.6	Vert
10	204.538M	37.6	-26.5	+18.2	+0.0	+2.7	+0.0	32.0	43.5	-11.5	Horiz
11	82.259M	36.9	-26.9	+7.5	+0.0	+1.6	+0.0	19.1	40.0	-20.9	Horiz
12	149.552M	34.0	-26.8	+12.7	+0.0	+2.2	+0.0	22.1	43.5	-21.4	Horiz

13	170.958M	30.5	-26.6	+14.9	+0.0	+2.5	+0.0	21.3	43.5	-22.2	Horiz
14	201.523M	34.1	-26.5	+18.4	+0.0	+2.7	+0.0	28.7	43.5	-14.8	Horiz
15	238.622M	36.5	-26.3	+16.4	+0.0	+3.0	+0.0	29.6	46.0	-16.4	Horiz

Test Location: . . .

Customer: **HID**
 Specification: **FCC B COND**
 Work Order #: **72253**
 Test Type: **Conducted Emissions**
 Equipment: **Proximity Reader**
 Manufacturer: **HID**
 Model: **4045AGN00**
 S/N: **N/A**

Date: Wed Aug-18-1999
 Time: 14:34:55
 Sequence#: 22
 Tested By: Dustin Oaks

EMI Meters:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	4045AGN00	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
DC power supply	Topward Electronics	2306	920035

Test Conditions / Notes:

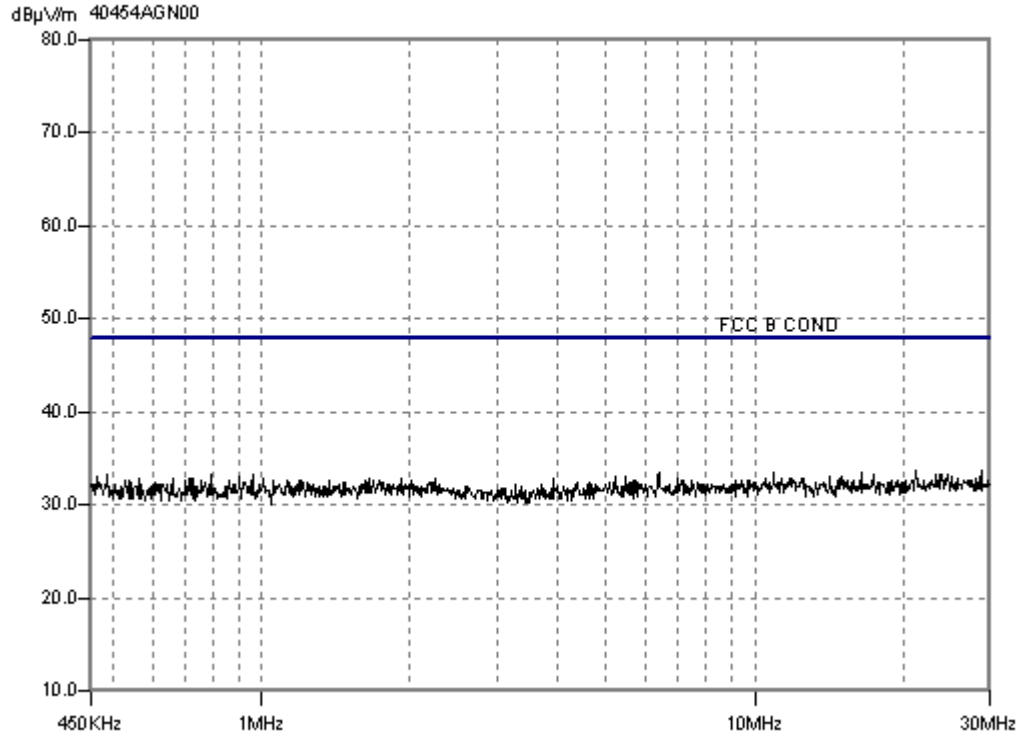
I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT with integral antenna cable, operating with a card in the field.

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

#	Freq MHz	Rdng dBµV	Barn				Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
			dB	dB	dB	dB					
1	28.917M	33.2	+0.4				+0.0	33.6	48.0	-14.4	Black
2	21.298M	33.3	+0.3				+0.0	33.6	48.0	-14.4	Black
3	16.486M	33.1	+0.3				+0.0	33.4	48.0	-14.6	Black
4	10.940M	33.2	+0.2				+0.0	33.4	48.0	-14.6	Black
5	6.398M	33.2	+0.2				+0.0	33.4	48.0	-14.6	Black
6	24.672M	32.9	+0.4				+0.0	33.3	48.0	-14.7	Black
7	960.194k	33.2	+0.1				+0.0	33.3	48.0	-14.7	Black
8	23.962M	32.8	+0.4				+0.0	33.2	48.0	-14.8	Black
9	23.412M	32.8	+0.4				+0.0	33.2	48.0	-14.8	Black
10	17.445M	32.9	+0.3				+0.0	33.2	48.0	-14.8	Black
11	786.957k	33.1	+0.1				+0.0	33.2	48.0	-14.8	Black
12	488.074k	33.1	+0.1				+0.0	33.2	48.0	-14.8	Black
13	5.486M	32.9	+0.2				+0.0	33.1	48.0	-14.9	Black

14	5.208M	32.9	+0.2	+0.0	33.1	48.0	-14.9	Black
15	903.083k	33.0	+0.1	+0.0	33.1	48.0	-14.9	Black

Date: Wed Aug-18-1999 Time: 14:32:36 WFO#: 72253
FCC B COND Test Lead: Black Sequence#: 22
40454AGN00



Test Location: . . .

Customer: **HID**
 Specification: **FCC B COND**
 Work Order #: **72253**
 Test Type: **Conducted Emissions**
 Equipment: **Proximity Reader**
 Manufacturer: **HID**
 Model: **4045AGN00**
 S/N: **N/A**

Date: Wed Aug-18-1999
 Time: 14:49:56
 Sequence#: 23
 Tested By: Dustin Oaks

EMI Meters:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	4045AGN00	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
DC power supply	Topward Electronics	2306	920035

Test Conditions / Notes:

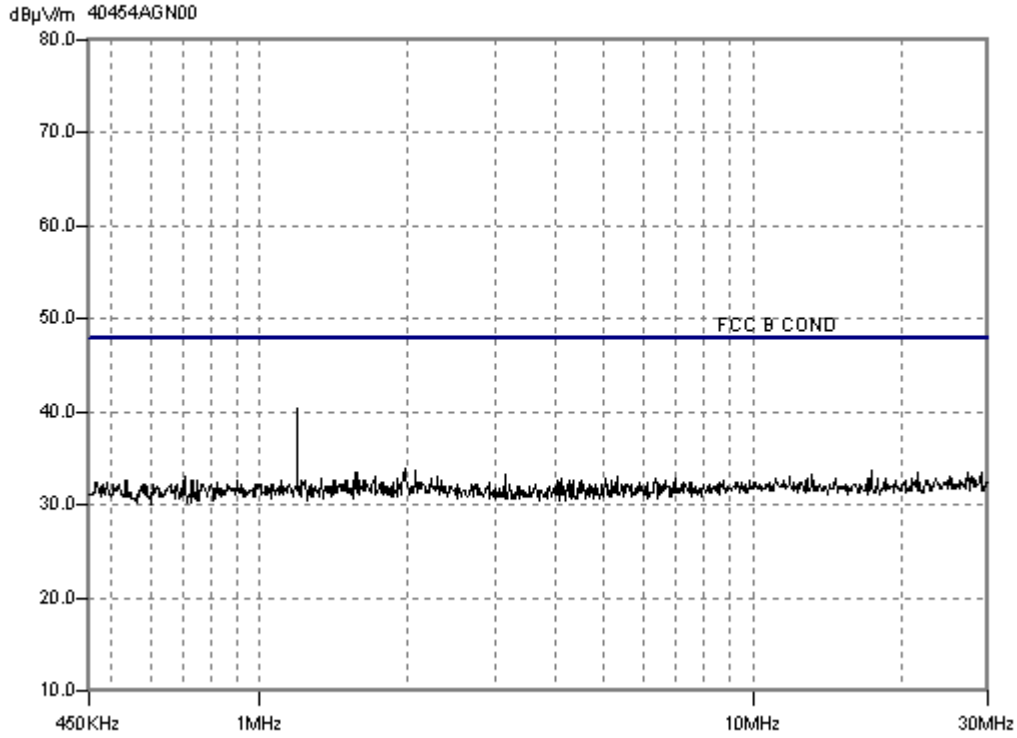
I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT with integral antenna cable, operating with a card in the field.

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

#	Freq MHz	Rdng dBµV	Barn				Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
			dB	dB	dB	dB					
1	1.192M	40.2	+0.1				+0.0	40.3	48.0	-7.7	White
2	1.977M	33.8	+0.1				+0.0	33.9	48.0	-14.1	White
3	17.445M	33.5	+0.3				+0.0	33.8	48.0	-14.2	White
4	2.072M	33.5	+0.1				+0.0	33.6	48.0	-14.4	White
5	29.165M	33.2	+0.3				+0.0	33.5	48.0	-14.5	White
6	27.407M	33.1	+0.4				+0.0	33.5	48.0	-14.5	White
7	21.671M	33.1	+0.3				+0.0	33.4	48.0	-14.6	White
8	1.585M	33.3	+0.1				+0.0	33.4	48.0	-14.6	White
9	1.562M	33.3	+0.1				+0.0	33.4	48.0	-14.6	White
10	13.218M	33.1	+0.2				+0.0	33.3	48.0	-14.7	White
11	3.145M	33.1	+0.1				+0.0	33.2	48.0	-14.8	White
12	11.912M	32.9	+0.2				+0.0	33.1	48.0	-14.9	White
13	5.327M	32.9	+0.2				+0.0	33.1	48.0	-14.9	White

14	2.308M	33.0	+0.1	+0.0	33.1	48.0	-14.9	White
15	1.714M	33.0	+0.1	+0.0	33.1	48.0	-14.9	White

Date: Wed Aug-18-1999 Time: 14:35:51 WFO#: 72253
FCC B COND Test Lead: White Sequence#: 23
40454AGN00



Test Location: . . .

Customer: **HID**
 Specification: **FCC B COND**
 Work Order #: **72253**
 Test Type: **Conducted Emissions**
 Equipment: **Proximity Reader**
 Manufacturer: **HID**
 Model: **4045AGN00**
 S/N: **N/A**

Date: Wed Aug-18-1999
 Time: 15:01:59
 Sequence#: 25
 Tested By: Dustin Oaks

EMI Meters:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	4045AGN00	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
DC power supply	Topward Electronics	2306	920035

Test Conditions / Notes:

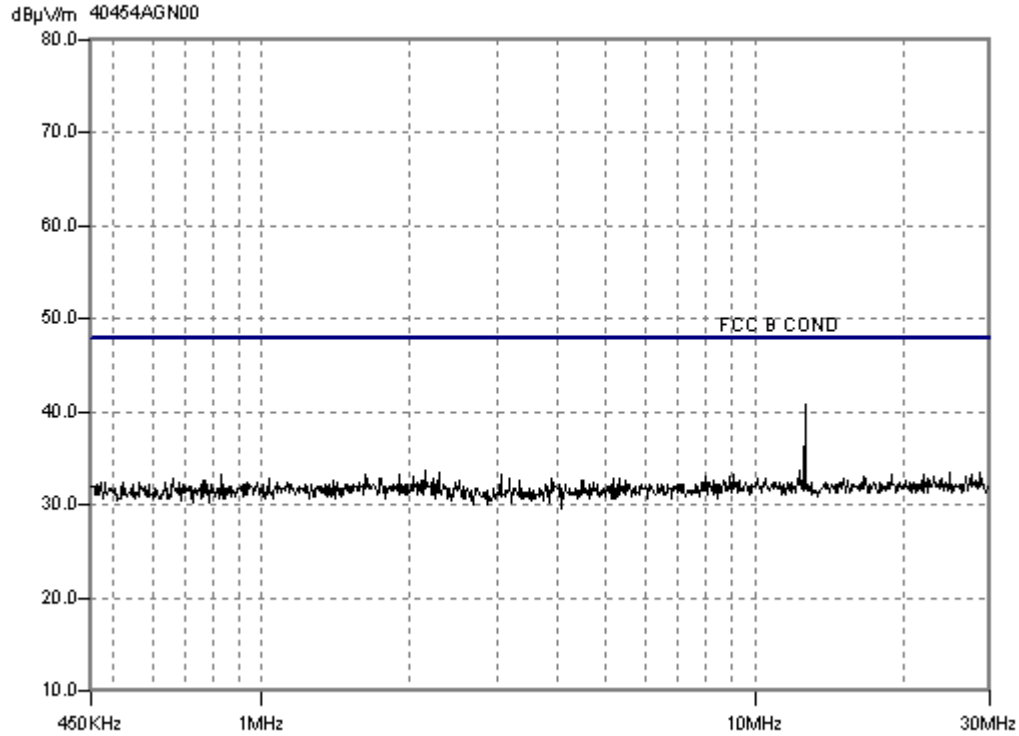
I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT equipped with antenna, which has a 10-foot cable, operating with a card in the field.

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

#	Freq MHz	Rdng dBµV	Barn				Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
			dB	dB	dB	dB					
1	12.685M	40.5	+0.2				+0.0	40.7	48.0	-7.3	Black
2	2.148M	33.6	+0.1				+0.0	33.7	48.0	-14.3	Black
3	12.437M	33.4	+0.2				+0.0	33.6	48.0	-14.4	Black
4	28.810M	33.0	+0.4				+0.0	33.4	48.0	-14.6	Black
5	25.010M	33.1	+0.3				+0.0	33.4	48.0	-14.6	Black
6	2.289M	33.3	+0.1				+0.0	33.4	48.0	-14.6	Black
7	21.991M	33.0	+0.3				+0.0	33.3	48.0	-14.7	Black
8	3.056M	33.2	+0.1				+0.0	33.3	48.0	-14.7	Black
9	1.626M	33.2	+0.1				+0.0	33.3	48.0	-14.7	Black
10	830.742k	33.2	+0.1				+0.0	33.3	48.0	-14.7	Black
11	27.603M	32.8	+0.4				+0.0	33.2	48.0	-14.8	Black
12	19.008M	32.9	+0.3				+0.0	33.2	48.0	-14.8	Black
13	9.096M	33.0	+0.2				+0.0	33.2	48.0	-14.8	Black

14	1.908M	33.1	+0.1	+0.0	33.2	48.0	-14.8	Black
15	2.026M	33.0	+0.1	+0.0	33.1	48.0	-14.9	Black

Date: Wed Aug-18-1999 Time: 14:59:24 WFO#: 72253
FCC B COND Test Lead: Black Sequence#: 25
40454AGN00



Test Location: . . .

Customer: **HID**
 Specification: **FCC B COND**
 Work Order #: **72253**
 Test Type: **Conducted Emissions**
 Equipment: **Proximity Reader**
 Manufacturer: **HID**
 Model: **4045AGN00**
 S/N: **N/A**

Date: Wed Aug-18-1999
 Time: 14:59:08
 Sequence#: 24
 Tested By: Dustin Oaks

EMI Meters:

Function	S/N	Calibration Date	Cal Due Date	Asset #
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	HID	4045AGN00	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
DC power supply	Topward Electronics	2306	920035

Test Conditions / Notes:

I/O cables are coiled in 30-40cm bundle. EUT is operating on 12VDC via DC power supply. EUT equipped with antenna, which has a 10-foot cable, operating with a card in the field.

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

#	Freq MHz	Rdng dBµV	Barn				Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
			dB	dB	dB	dB					
1	12.543M	36.8	+0.2				+0.0	37.0	48.0	-11.0	White
2	16.379M	33.6	+0.3				+0.0	33.9	48.0	-14.1	White
3	1.223M	33.7	+0.1				+0.0	33.8	48.0	-14.2	White
4	17.374M	33.4	+0.3				+0.0	33.7	48.0	-14.3	White
5	13.129M	33.3	+0.2				+0.0	33.5	48.0	-14.5	White
6	12.934M	33.3	+0.2				+0.0	33.5	48.0	-14.5	White
7	10.008M	33.3	+0.2				+0.0	33.5	48.0	-14.5	White
8	676.541k	33.4	+0.1				+0.0	33.5	48.0	-14.5	White
9	499.496k	33.4	+0.1				+0.0	33.5	48.0	-14.5	White
10	20.073M	33.1	+0.3				+0.0	33.4	48.0	-14.6	White
11	5.962M	33.2	+0.2				+0.0	33.4	48.0	-14.6	White
12	451.904k	33.3	+0.1				+0.0	33.4	48.0	-14.6	White
13	2.421M	33.2	+0.1				+0.0	33.3	48.0	-14.7	White

14	2.346M	33.2	+0.1	+0.0	33.3	48.0	-14.7	White
15	1.550M	33.2	+0.1	+0.0	33.3	48.0	-14.7	White

Date: Wed Aug-18-1999 Time: 14:57:14 WFO#: 72253
FCC B COND Test Lead: White Sequence#: 24
40454AGN00

