HID CORPORATION ADDENDEM TO FC01-010

FOR THE

HID MIFARE READER, 6055B (6055-310)

FCC PART 15 SUBPART C
SECTIONS 15.207, 15.209 & 15.225

COMPLIANCE

DATE OF ISSUE: MAY 21, 2001

PREPARED FOR:

HID Corporation
9292 Jeronimo Road
Irvine, CA 92618-1905

P.O. No: 6322
W.O. No: 75755

Report No: FC01-010A

PREPARED BY:

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Date of test: November 29 - December 29, 2000

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TABLE OF CONTENTS

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	November 29 - December 29, 2000
DATE OF RECEIPT:	November 29, 2000
PURPOSE OF TEST:	To demonstrate the compliance of the HID MIFARE Reader, 6055B (6055-310), with the requirements for FCC Part 15 Subpart C Sections 15.207, 15.209 and 15.225 devices. This addendum is to change the model name, add clarification for the use of FCC 15.31 test conditions and add bandedge plots.
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
TEST PERSONNEL:	Randal Clark
TEST METHOD:	ANSI C63.4 1992
FREQUENCY RANGE TESTED:	9 kHz - 1000 MHz
EQUIPMENT UNDER TEST:	**HID MIFARE Reader** Manuf: HID Corporation Model: 6055B (6055-310) Serial: N/A FCC ID: JQ66055BA

SUMMARY OF RESULTS

The HID Corporation HID MIFARE Reader, 6055B (6055-310), was tested in accordance with ANSI C63.4 1992 for compliance with FCC Part 15 Subpart C Sections 15.207, 15.209 and 15.225.

As received, the above equipment was found to be fully compliant with the limits of FCC Part 15 Subpart C Sections 15.207, 15.209 and 15.225. The results in this report apply only to the items tested, as identified herein.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

13.56 MHz proximity reader.

MEASUREMENT UNCERTAINTY

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

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%.

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device:

Power Supply
Manuf: Topward Electronic Instruments
Model: TPS-2000
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 HID MIFARE Reader, 6055B (6055-310). 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: Fundamental Emission Level

FREQUENCY	METER READING	CORRECTION FACTORS				CORRECTED READING	SPEC LIMIT	MARGIN	NOTES
		Mag L	FCC 15.31	Cable	Dist				
MHz	dBµV	dB	dB	dB	dB	dBµV/m	dBµV/m	dB	
13.560	39.5	10.1	-20.0			29.6	80.0	-50.4	N

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

N = No Polarization

COMMENTS: 12VDC is supplied to EUT via DC power supply powered by 120VAC/60Hz. EUT is a card reader operating on 13.56MHz. Distance correction factor added in accordance with FCC 15.31.

Table 2: Highest Spurious Emission Levels - 9kHz-30MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY	READING	Mag L	FCC 15.31	Cable	Dist	READING	LIMIT	MARGIN	NOTES
MHz	dBµV	dB	dB	dB	dB	dBµV/m	dBµV/m	dB	
27.121	22.1	7.3	-20.0	1.0		10.4	29.5	-19.1	N

Test Method: ANSI C63.4 1992
Spec Limit: FCC Part 15.209
Test Distance: 10 Meters

N = No Polarization

COMMENTS: 12VDC is supplied to EUT via DC power supply powered by 120VAC/60Hz. EUT is a card reader operating on 13.56MHz. Distance correction factor added in accordance with FCC 15.31.

Table 3: Highest Spurious Emission Levels - 30MHz-1000MHz									
	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
40.776	48.3	11.1	-25.0	1.1		35.5	40.0	-4.5	VQ
54.334	49.9	10.5	-24.9	1.4		36.9	40.0	-3.1	V
67.894	51.6	8.4	-25.0	1.6		36.6	40.0	-3.4	VQ
81.436	49.1	7.2	-25.0	1.7		33.0	40.0	-7.0	V
135.700	50.1	13.5	-25.0	2.3		40.9	43.5	-2.6	VQ

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

V = Vertical Polarization
Q = Quasi Peak Reading

COMMENTS: 12VDC is supplied to EUT via DC power supply powered by 120VAC/60Hz. EUT is a card reader operating on 13.56MHz.

Table 4: Six Highest Conducted Emission Levels									
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Lisn dB	dB	dB	dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.655955	33.4	0.5				33.9	48.0	-14.1	B
0.763496	33.2	0.7				33.9	48.0	-14.1	W
2.025928	33.6	0.4				34.0	48.0	-14.0	B
4.840904	33.2	2.0				35.2	48.0	-12.8	W
9.028499	32.5	5.6				38.1	48.0	-9.9	B
13.571220	41.3	0.6				41.9	48.0	-6.1	W

Test Method: ANSI C63.4 1992
Spec Limit: FCC Part 15.207

B = Black Lead
W = White Lead

COMMENTS: 12VDC is supplied to EUT via DC power supply powered by 120VAC/60Hz. EUT is a card reader operating on 13.56MHz.

TABLE A

LIST OF TEST EQUIPMENT

Function	S/N	Calibration Date	Cal Due Date
Biconical Antenna	156	05/08/2000	05/08/2001
Log Periodic	154	05/08/2000	05/08/2001
Magnetic Loop	1074	07/03/2000	07/03/2001
Preamplifier	1937A02604	04/03/2000	04/03/2001
Spectrum Analyzer RF Section	2209A01404	11/03/2000	11/03/2001
Spectrum Analyzer Display	2403A08241	11/03/2000	11/03/2001
QP Adapter	2811A01267	11/03/2000	11/03/2001
QP Adapter	2043A00272	11/10/2000	11/10/2001
LISN	814493, 474	06/05/2000	06/05/2001
Spectrum Analyzer	2209A01404	11/3/2000	11/3/2001
S/A Display	2403A08241	11/3/2000	11/3/2001
QPA	2811A01267	11/3/2000	11/3/2001
DVM	N/A	8/30/2000	8/30/2001
Temp Chamber	11899	4/3/2000	4/3/2001

EUT SETUP

The equipment under test (EUT) and the peripheral 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, Tables 2 and 3 for spurious radiated emissions and Table 4 for conducted characteristics.

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 wallmount devices.

Cables were connected to the EUT and peripheral 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 HID MIFARE Reader, 6055B (6055-310). For radiated emissions below 30 MHz, the magnetic loop antenna was used. The biconical antenna was used for frequencies between 30 to 300 MHz. For frequencies from 300 to 1000 MHz, the log periodic antenna was used. All antennas were located at a distance of 10 meters from the edge of the EUT. 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 dBµV, 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	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 Tables 1 - 4 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 HID MIFARE Reader, 6055B (6055-310).

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.

TEST METHODS

The radiated and conducted emissions data of the HID MIFARE Reader, 6055B (6055-310), 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 Sections 15.207, 15.209 and 15.225 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 cables facing the antenna. For frequencies below 30 MHz, the magnetic loop antenna was used. 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. 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 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 - 4. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula:

Meter reading (dBµV)
+ Antenna Factor (dB)
+ Cable Loss (dB)
- Distance Correction (dB)
- Pre-amplifier Gain (dB)

= Corrected Reading(dBµV/m)

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 dBuV	Barn	Pream	Bicon	Mag L	Log 1	FCC 15.31	LISN	74 L	93 L	Dist	Corr dBuV/m	Spec	Margin	Polar

means reading number
Freq MHz is the frequency in MHz of the obtained reading.
Rdng dBuV is the reading obtained on the spectrum analyzer in dBµV.
Barn is the cable loss in dB of the coaxial cable on the OATS.
Pream is short for the preamplifier factor or gain in dB.
Bicon is the biconical antenna factor in dB.
Mag L is the magnetic loop antenna factor in dB
Log 1 is the log periodic antenna factor in dB.
FCC 15.31 is the average correction factor called out in FCC Part 15.31.
LISN is the cable loss in dB of the coaxial cable used on the LISN.
474L is the line impedance stabilization network factor in dB for the black lead.
493L is the line impedance stabilization network factor in dB for the white lead.
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 dBµV/m is the corrected reading which is now in dBµV/m (field strength).
Spec is the specification limit (dB) stated in the 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:	**HID7RDR-Rev 1**
CRT was displaying:	**NA**
Power Supply Manufacturer:	**Topward**
Power Supply Part Number:	**TPS-2000**
AC Line Filter Manufacturer:	**NA**
AC Line Filter Part Number:	**NA**
Line voltage used during testing:	**12 VDC**

I/O PORTS	
Type	#
RS232	1

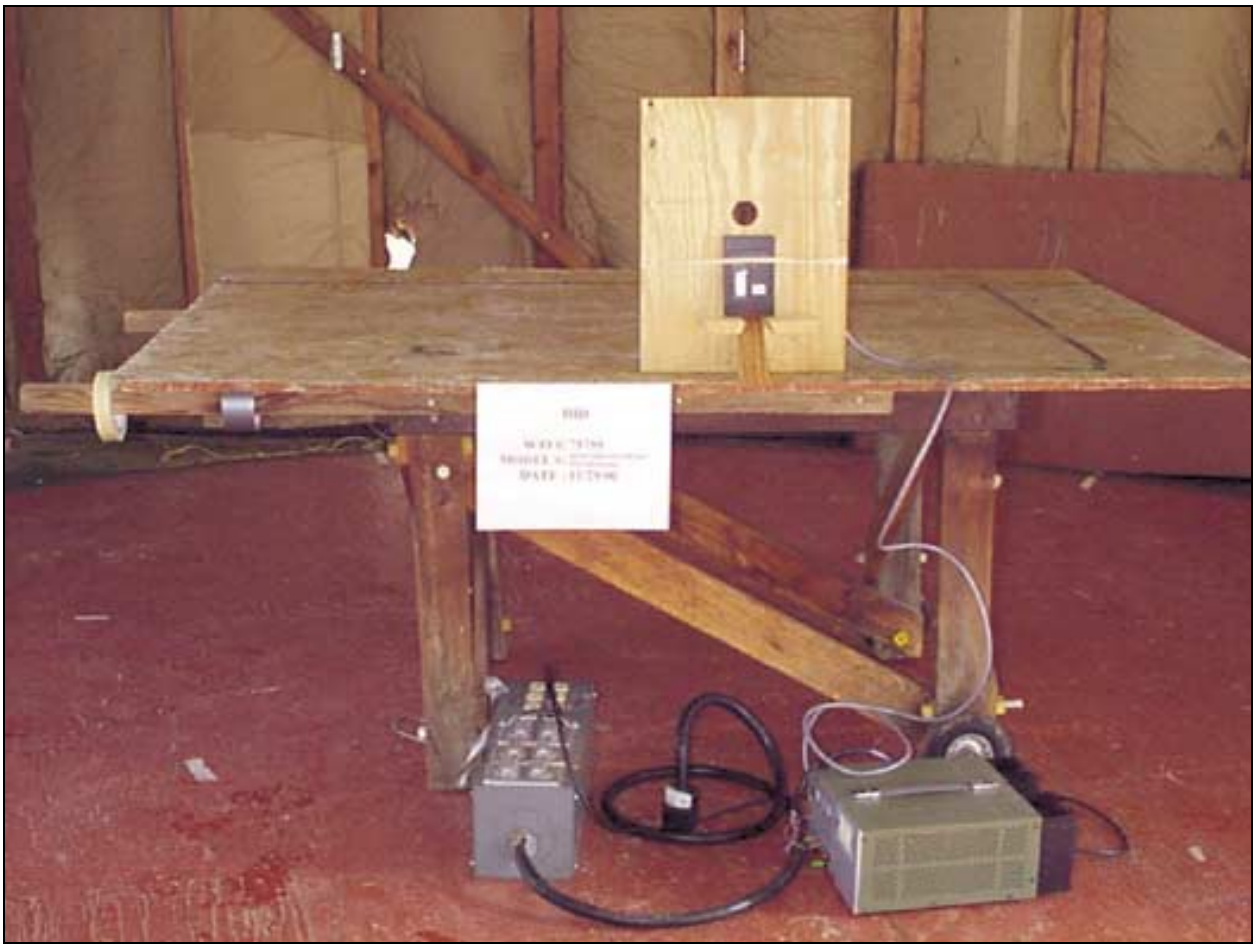
CRYSTAL OSCILLATORS	
Type	Freq In MHz
Ceramic Resonator	4.0MHz
Ceramic Resonator	13.56MHz

PRINTED CIRCUIT BOARDS				
Function	Model & Rev	Clocks, MHz	Layers	Location
Main Board	Rev 6	4MHz, 13.56MHz	2	
Antenna Board	Rev 5	-----	2	

CABLE INFORMATION

Cable #:	1	Cable(s) of this type:	1
Cable Type:	Multi-cond Shielded	Shield Type:	Aluminum foil w/drain
Construction:	12 cond/22ga	Length In Meters:	3
Connected To End (1):	Power & signal	Connected To End (2):	Host & Power Supply
Connector At End (1):	N/A	Connector At End (2):	N/A
Shield Grounded At (1):	Reader	Shield Grounded At (2):	Open
Part Number:	1299/12C	Number of Conductors:	12
Notes and/or description:			

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions – Front View

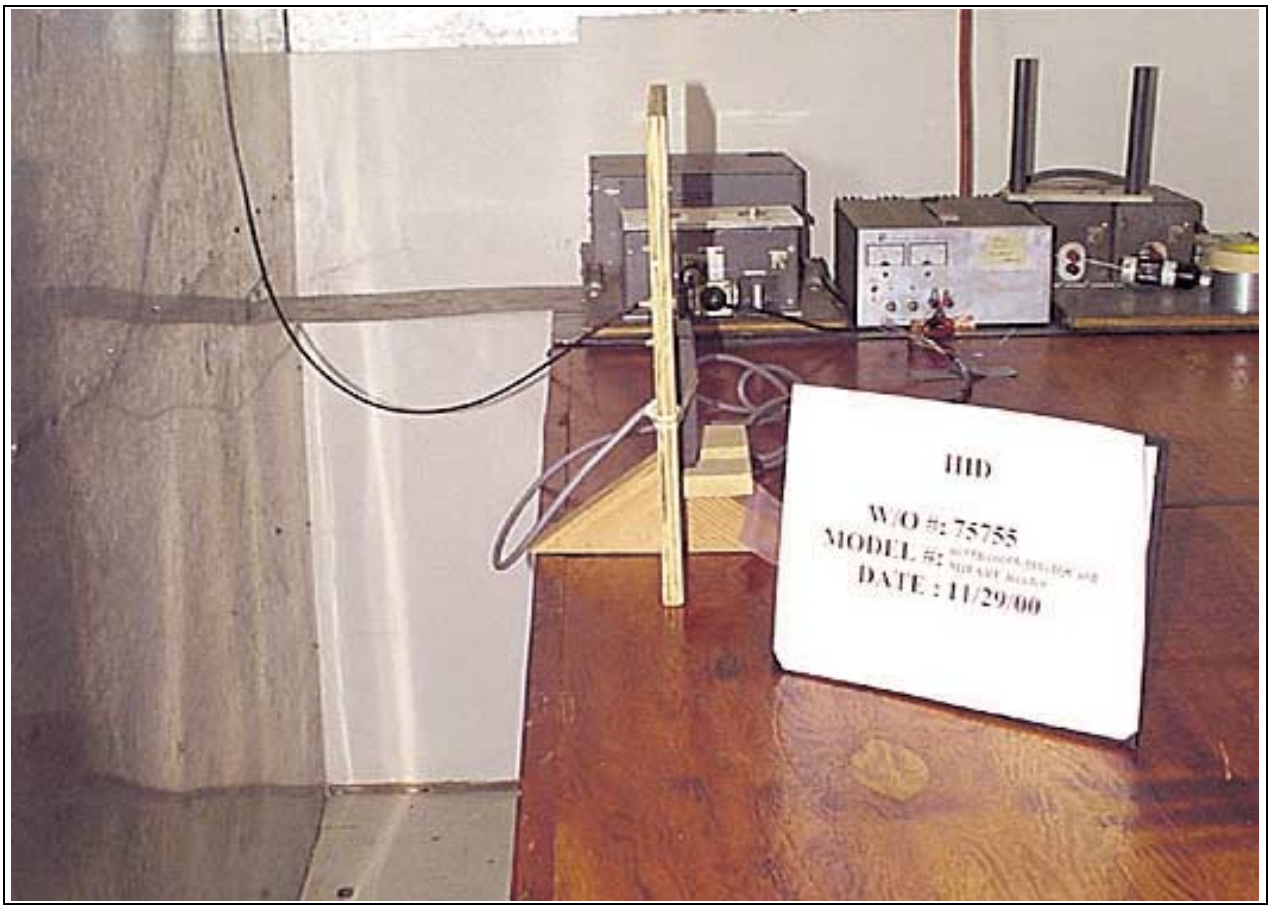
PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions – Back View

PHOTOGRAPH SHOWING CONDUCTED EMISSIONS

Conducted Emissions - Front View

PHOTOGRAPH SHOWING CONDUCTED EMISSIONS



Conducted Emissions - Back View

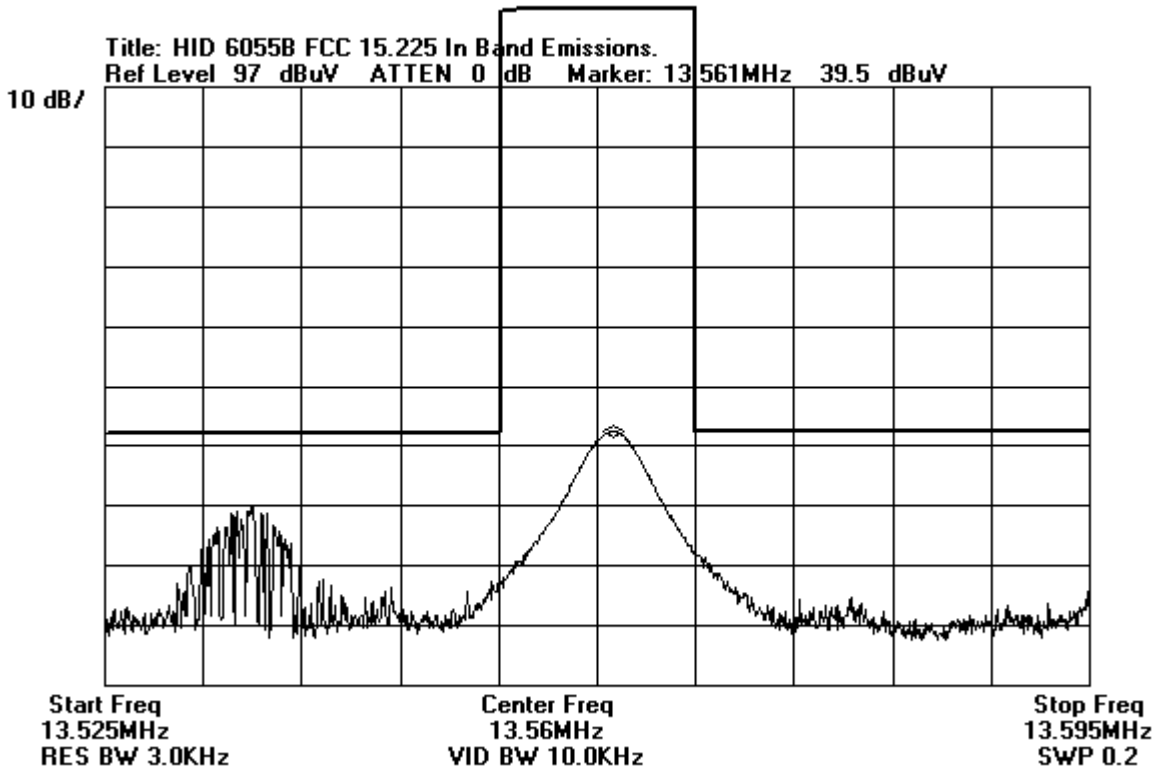
PHOTOGRAPH SHOWING TEMPERATURE TESTING

Temperature Testing

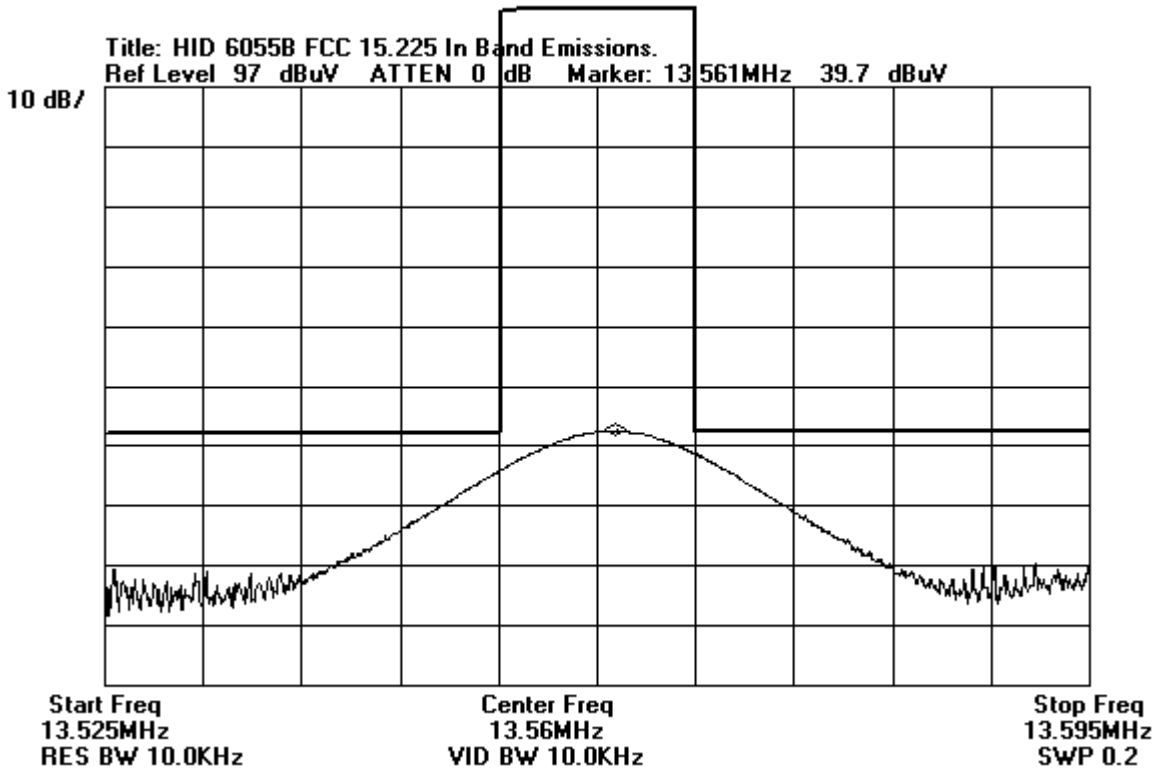
APPENDIX B

MEASUREMENT DATA SHEETS

Bandedge Compliance



Bandedge Compliance



Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **HID**
Specification: **FCC 15.225(a)**
Work Order #: **75755** Date: 12/19/2000
Test Type: **Radiated Scan** Time: 15:13:31
Equipment: **Card Reader** Sequence#: 5
Manufacturer: HID Tested By: Randal Clark
Model: 6055B (6055-310) HID MIFARE Reader
S/N: N/A

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

Function	Manufacturer	Model #	S/N
Card Reader*	HID	6055B (6055-310) IQCard MIFARE Reader	N/A

Support Devices:

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

Test Conditions / Notes:

12VDC is supplied to EUT via DC power supply powered by 120VAC/60Hz. EUT is a card reader operating on 13.56MHz. Distance correction factor added in accordance with FCC 15.31..

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

#	Freq MHz	Rdng dBµV	Mag L dB	FCC 15.31 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.560M	39.5	+10.1	-20.0			+0.0	29.6	80.0	-50.4	None

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **HID**
Specification: **FCC 15 C PARA 15.209**
Work Order #: **75755** Date: 12/26/2000
Test Type: **Maximized Emissions** Time: 18:36:16
Equipment: **Card Reader** Sequence#: 7
Manufacturer: HID Tested By: Randal Clark
Model: 6055B (6055-310) IQCard MIFARE Reader
S/N: N/A

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

Function	Manufacturer	Model #	S/N
Card Reader*	HID	6055B (6055-310) IQCard MIFARE Reader	N/A

Support Devices:

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

Test Conditions / Notes:

12VDC is supplied to EUT via DC power supply powered by 120VAC/60Hz. EUT is a card reader operating on 13.56MHz. Distance correction factor added in accordance with FCC 15.31.

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

#	Freq MHz	Rdng dBµV	Mag L dB	FCC 15.31 dB	Barn dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	27.121M	22.1	+7.3	-20.0	+1.0		+0.0	10.4	29.5	-19.1	None

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **HID**
Specification: **FCC 15.209**
Work Order #: **75755** Date: 12/27/2000
Test Type: **Maximized Emissions** Time: 13:07:03
Equipment: **Card Reader** Sequence#: 8
Manufacturer: HID Tested By: Randal Clark
Model: 6055B (6055-310) IQCard MIFARE Reader
S/N: N/A

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

Function	Manufacturer	Model #	S/N
Card Reader*	HID	6055B (6055-310) IQCard MIFARE Reader	N/A

Support Devices:

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

Test Conditions / Notes:

12VDC is supplied to EUT via DC power supply powered by 120VAC/60Hz. EUT is a card reader operating on 13.56MHz.

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

#	Freq MHz	Rdng dBµV	Pream dB	Bicon dB	Log 1 dB	Barn dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	135.700M QP	50.1	-25.0	+13.5	+0.0	+2.3	+0.0	40.9	43.5	-2.6	Vert
^	135.691M	51.0	-25.0	+13.5	+0.0	+2.3	+0.0	41.8	43.5	-1.7	Vert
3	54.334M	49.9	-24.9	+10.5	+0.0	+1.4	+0.0	36.9	40.0	-3.1	Vert
4	67.894M QP	51.6	-25.0	+8.4	+0.0	+1.6	+0.0	36.6	40.0	-3.4	Vert
^	67.870M	52.1	-25.0	+8.4	+0.0	+1.6	+0.0	37.1	40.0	-2.9	Vert
6	40.776M QP	48.3	-25.0	+11.1	+0.0	+1.1	+0.0	35.5	40.0	-4.5	Vert
^	40.757M	50.5	-25.0	+11.1	+0.0	+1.1	+0.0	37.7	40.0	-2.3	Vert
8	81.436M	49.1	-25.0	+7.2	+0.0	+1.7	+0.0	33.0	40.0	-7.0	Vert

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **HID**
Specification: **FCC 15.207**
Work Order #: **75755** Date: 12/26/2000
Test Type: **Conducted Emissions** Time: 13:12:03
Equipment: **Card Reader** Sequence#: 4
Manufacturer: HID Tested By: Randal Clark
Model: 6055B (6055-310) IQCard MIFARE Reader
S/N: N/A

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

Function	Manufacturer	Model #	S/N
Card Reader*	HID	6055B (6055-310) IQCard MIFARE Reader	N/A

Support Devices:

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

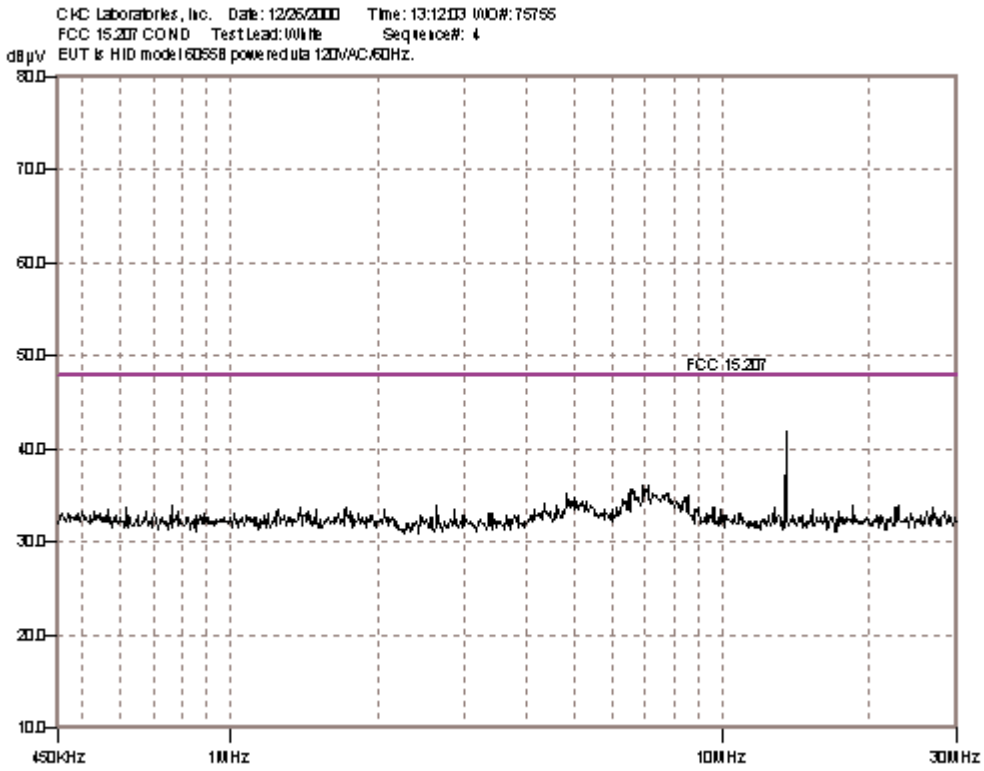
Test Conditions / Notes:

12VDC is supplied to EUT via DC power supply powered by 120VAC/60Hz. EUT is a card reader operating on 13.56MHz.

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

#	Freq MHz	Rdng dBµV	LISN dB	dB	493 L dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	13.571M	41.3	+0.2		+0.4		+0.0	41.9	48.0	-6.1	White
2	4.841M	33.2	+0.1		+1.9		+0.0	35.2	48.0	-12.8	White
3	4.911M	32.3	+0.2		+2.0		+0.0	34.5	48.0	-13.5	White
4	4.360M	32.9	+0.1		+1.1		+0.0	34.1	48.0	-13.9	White
5	4.595M	32.4	+0.1		+1.5		+0.0	34.0	48.0	-14.0	White
6	2.637M	33.4	+0.1		+0.4		+0.0	33.9	48.0	-14.1	White
7	763.496k	33.2	+0.1		+0.6		+0.0	33.9	48.0	-14.1	White
8	1.730M	33.2	+0.1		+0.4		+0.0	33.7	48.0	-14.3	White
9	1.399M	33.0	+0.1		+0.5		+0.0	33.6	48.0	-14.4	White
10	616.991k	32.9	+0.1		+0.6		+0.0	33.6	48.0	-14.4	White
11	4.642M	31.8	+0.1		+1.6		+0.0	33.5	48.0	-14.5	White

12	4.161M	32.6	+0.1	+0.8	+0.0	33.5	48.0	-14.5	White
13	2.871M	33.0	+0.1	+0.4	+0.0	33.5	48.0	-14.5	White
14	1.496M	32.9	+0.1	+0.5	+0.0	33.5	48.0	-14.5	White
15	1.256M	32.9	+0.1	+0.5	+0.0	33.5	48.0	-14.5	White
16	2.070M	32.9	+0.1	+0.4	+0.0	33.4	48.0	-14.6	White
17	563.586k	32.7	+0.1	+0.6	+0.0	33.4	48.0	-14.6	White
18	782.198k	32.6	+0.1	+0.6	+0.0	33.3	48.0	-14.7	White
19	532.919k	32.6	+0.1	+0.6	+0.0	33.3	48.0	-14.7	White
20	498.937k	32.6	+0.1	+0.6	+0.0	33.3	48.0	-14.7	White


CKC Laboratories, Inc. Date: 12/26/2000 Time: 13:12:03 WO#: 75755
FCC 15.207 COND Test Lead: White Sequence#: 4
dBµV EUT is HID model 60858 powered via 120VAC/60Hz.
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
FCC 15.207
450KHz
1MHz
10MHz
30MHz

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **HID**
Specification: **FCC 15.207**
Work Order #: **75755** Date: 12/26/2000
Test Type: **Conducted Emissions** Time: 12:43:36
Equipment: **Card Reader** Sequence#: 3
Manufacturer: HID Tested By: Randal Clark
Model: 6055B (6055-310) IQCard MIFARE Reader
S/N: N/A

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

Function	Manufacturer	Model #	S/N
Card Reader*	HID	6055B (6055-310) IQCard MIFARE Reader	N/A

Support Devices:

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

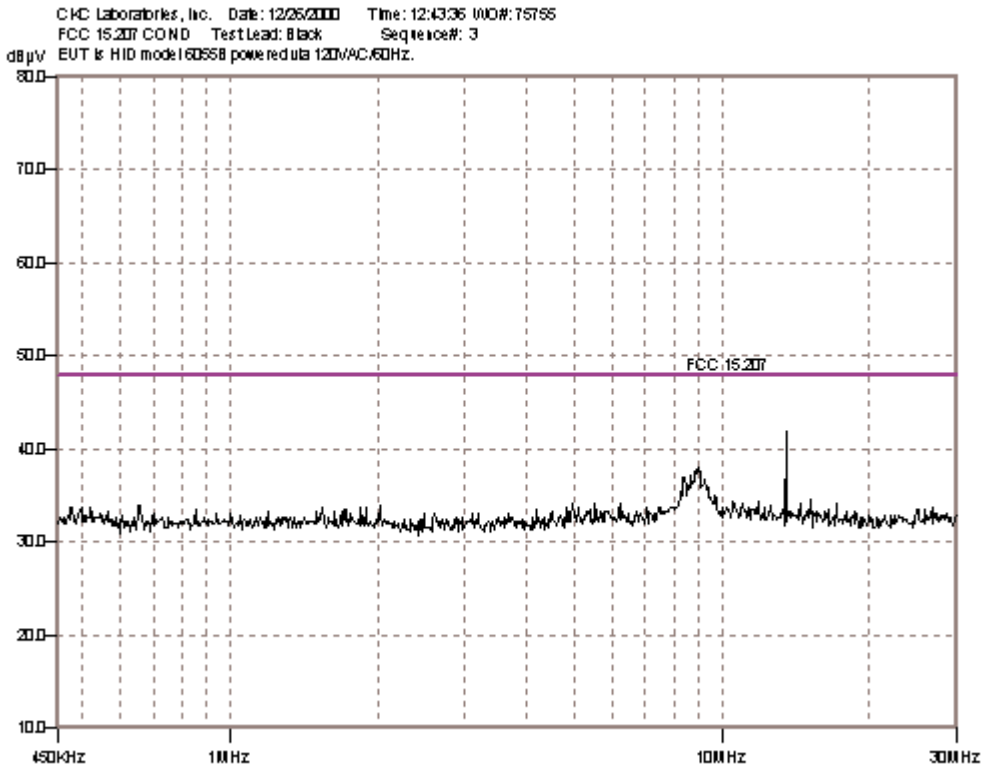
Test Conditions / Notes:

12VDC is supplied to EUT via DC power supply powered by 120VAC/60Hz. EUT is a card reader operating on 13.56MHz.

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

#	Freq MHz	Rdng dBµV	LISN dB	474 L dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	13.571M	40.6	+0.2	+1.0			+0.0	41.8	48.0	-6.2	Black
2	9.028M	32.5	+0.2	+5.4			+0.0	38.1	48.0	-9.9	Black
3	4.982M	33.3	+0.2	+0.6			+0.0	34.1	48.0	-13.9	Black
4	2.026M	33.6	+0.1	+0.3			+0.0	34.0	48.0	-14.0	Black
5	655.955k	33.4	+0.1	+0.4			+0.0	33.9	48.0	-14.1	Black
6	500.595k	33.2	+0.1	+0.5			+0.0	33.8	48.0	-14.2	Black
7	1.892M	33.3	+0.1	+0.3			+0.0	33.7	48.0	-14.3	Black
8	1.540M	33.3	+0.1	+0.3			+0.0	33.7	48.0	-14.3	Black
9	476.973k	33.0	+0.1	+0.5			+0.0	33.6	48.0	-14.4	Black
10	4.829M	32.9	+0.1	+0.6			+0.0	33.6	48.0	-14.4	Black
11	1.848M	33.2	+0.1	+0.3			+0.0	33.6	48.0	-14.4	Black

12	521.315k	33.0	+0.1	+0.5	+0.0	33.6	48.0	-14.4	Black
13	4.231M	32.9	+0.1	+0.5	+0.0	33.5	48.0	-14.5	Black
14	1.714M	33.1	+0.1	+0.3	+0.0	33.5	48.0	-14.5	Black
15	853.892k	33.0	+0.1	+0.4	+0.0	33.5	48.0	-14.5	Black
16	1.736M	33.0	+0.1	+0.3	+0.0	33.4	48.0	-14.6	Black
17	1.636M	32.9	+0.1	+0.3	+0.0	33.3	48.0	-14.7	Black
18	1.200M	32.7	+0.1	+0.4	+0.0	33.2	48.0	-14.8	Black
19	562.757k	32.7	+0.1	+0.4	+0.0	33.2	48.0	-14.8	Black


CKC Laboratories, Inc. Date: 12/26/2000 Time: 12:43:36 WO#: 75755
FCC 15.207 COND Test Lead: Black Sequence#: 3
dBµV EUT is HID model 60858 powered via 120VAC/60Hz.
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
FCC 15.207
450KHz
1MHz
10MHz
30MHz

Temperature Testing

	Frequency MHz	Frequency Error Hz
Temp	**-20**	
V-	13.560692	692
V	13.560689	689
V+	13.560687	687
Temp	**-10**	
V-	13.560787	787
V	13.56079	790
V+	13.560787	787
Temp	**0**	
V-	13.560797	797
V	13.560807	807
V+	13.560804	804
Temp	**10**	
V-	13.560807	807
V	13.560804	804
V+	13.560808	808
Temp	**20**	
V-	13.560781	781
V	13.560779	779
V+	13.56079	790
Temp	**30**	
V-	13.560775	775
V	13.560762	762
V+	13.560759	759
Temp	**40**	
V-	13.560726	726
V	13.560731	731
V+	13.560637	637
Temp	**50**	
V-	13.560637	637
V	13.560607	607
V+	13.560632	632