



ADDENDUM TEST REPORT TO FC99-038B

FOR THE

**PROXPASS,
1351 (1351-300)**

**FCC PART 15 SUBPART C
PART 15.209
COMPLIANCE**

DATE OF ISSUE: DECEMBER 5, 2000

PREPARED FOR:

HID Corporation
9292 Jeronimo
Irvine, CA 92718

P.O. No: 1224
W.O. No: 73097

PREPARED BY:

Joyce Walker
CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: November 22, 1999 and
November 7, 2000

Report No: FC99-038C

DOCUMENTATION CONTROL:

Tracy Phillips
Documentation Control Supervisor
CKC Laboratories, Inc.

APPROVED BY:

Dennis Ward
Director of Laboratories
CKC Laboratories, Inc.

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ACA/NATA (Australia); SABS (South Africa); SWEDAC (Sweden); TUV Rheinland-Germany; TUV Rheinland-Korea; TUV Rheinland-Russia; Radio Communication Agency (RA); NEMKO (Norway).

ADMINISTRATIVE INFORMATION

DATE OF TEST: November 22, 1999 and November 7, 2000

PURPOSE OF TEST:

To demonstrate the compliance of the ProxPass, 1351 (1351-300), with the requirements for FCC Part 15 Subpart C Part 15.209 devices.

Addendum B represented new test data due to the low field strength of the fundamental on the original testing, the ambient grass level at 30 meters made the spurious emissions appear higher than the fundamental. The unit was re-tested at 10 meters off the ground plane to increase the field strength of the fundamental and show that the spurious emissions were lower than the fundamental. Addendum C is combining the original testing with the re-tested data in order to have one comprehensive test report.

MANUFACTURER: HID Corporation
9292 Jeronimo
Irvine, CA 92718

REPRESENTATIVE: Frank de Vall

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

TEST PERSONNEL: Dustin Oaks & Randy Clark

TEST METHOD: ANSI C63.4 1992

FREQUENCY RANGE TESTED: 9 kHz - 1000 MHz

EQUIPMENT UNDER TEST:

ProxPass
Manuf: HID Corporation
Model: 1351(1351-300)
Serial: N/A
FCC ID: JQ61351 (pending)

SUMMARY OF RESULTS

The HID Corporation ProxPass, 1351 (1351-300), was tested in accordance with ANSI C63.4 1992 for compliance with for FCC Part 15 Subpart C Part 15.209.

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

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The ProxPass is for use with HID 125 KHz Access Control Prox Readers.

MEASUREMENT UNCERTAINTY

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

EUT OPERATING FREQUENCY

The EUT was operating at 125kHz.

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 not tested with any peripheral device(s).

REPORT OF MEASUREMENTS

The following tables report the six highest worst case levels recorded during the tests performed on the ProxPass, 1351 (1351-300). 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: Six Highest Radiated Emission Levels - 9kHz-30MHz

FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV/m	SPEC LIMIT dBμV/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	FCC 15.31 dB				
0.110	35.2	10.8		0.0	-60.0	-14.0	27.6	-41.6	N-1
0.447	20.8	10.4		0.0	-60.0	-28.8	14.6	-43.4	N-2
0.602	22.0	10.4		0.0	-20.0	12.4	32.0	-19.6	N-2
1.655	17.8	10.9		0.1	-20.0	8.8	23.2	-14.4	N-2
2.903	20.9	10.7		0.1	-20.0	11.7	29.5	-17.8	N-2
4.002	22.4	10.6		0.1	-20.0	13.1	29.5	-16.4	N-2

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

NOTES: N = No Polarization
 1 = 10 meters
 2 = ambient grass

COMMENTS: EUT is continuously transmitting a modulated carrier at 125kHz. EUT is operating on battery power. All readings with exception of 110k and 137k, are of the ambient noise floor. Readings taken off of the ground plane in accordance with ANSI C63.4. Forty dB/decade correction factor use in accordance with FCC 15.31.

Table 2: Six Highest Radiated Emission Levels - 30-1000MHz

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				
32.306	38.7	12.7	-27.0	0.7		25.1	40.0	-14.9	V
32.940	36.4	12.3	-27.0	0.7		22.4	40.0	-17.6	V
33.496	38.9	12.0	-27.0	0.7		24.6	40.0	-15.4	V
124.973	29.4	14.1	-26.8	1.7		18.4	43.5	-25.1	V
165.600	27.9	14.3	-26.7	2.1		17.6	43.5	-25.9	V
250.426	30.2	15.9	-26.3	2.8		22.6	46.0	-23.4	V

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

NOTES: V = Vertical Polarization

COMMENTS: EUT is continuously transmitting a modulated carrier at 125kHz. EUT is operating on battery power.

TABLE A
LIST OF TEST EQUIPMENT

1. Spectrum Analyzer, Hewlett Packard, Model No. 85662A, S/N 2005A01550 (Display Unit). Calibration date: November 11, 2000. Calibration due date: November 11, 2001.
2. Spectrum Analyzer (RF section), Hewlett Packard, Model No. 8568B, S/N 2007A01066. Calibration date: November 11, 2000. Calibration due date: November 11, 2001.
3. Preamp, Hewlett Packard, Model No. 8447D, S/N 1937A02604. Calibration Date: April 3, 2000. Calibration Due: April 3, 2001.
4. Quasi-Peak Adapter, Hewlett Packard, Model No. 85650A, S/N 2811A01267. Calibration Date: November 3, 2000. Calibration Due: November 3, 2001.
5. Biconical Antenna, A & H Systems, Model No. SAS-200/542, S/N 156. Calibration Date: May 8, 2000. Calibration Due: May 8, 2001.
6. Log Periodic Antenna, A & H Systems, Model No. SAS-200/512, S/N 154. Calibration Date: May 8, 2000. Calibration Due: May 8, 2001.
7. Mag Loop Antenna, EMCO, Model No. 6502, S/N 1074. Calibration Date: July 3, 2000. Calibration Due: July 3, 2001.

EUT SETUP

The equipment under test (EUT) was 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 Tables 1 & 2 for radiated emissions. 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 vertically mounted on a nonconductive, rotating table 80 cm above the conductive grid. This configuration is typical for radiated emissions testing of vehicle windshield mounted devices. The nonconductive table dimensions were 1 meter by 1.5 meters. This configuration is typical for radiated emissions testing of windshield mounted devices.

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Table A were used to collect the radiated emissions data for the ProxPass, 1351 (1351-300). For testing below 30 MHz, the mag loop antenna was placed 30 meters from the EUT. For radiated measurements below 300 MHz, the biconical antenna was used. For frequencies from 300 to 1000 MHz, the log periodic antenna was used. The antennas used for testing between 30-1000 MHz were located at a distance of 3 meters from the edge of the EUT.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. 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
RADIATED EMISSIONS	9kHz	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 and 2 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 ProxPass, 1351 (1351-300).

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

When the frequencies are less than 30 MHz, 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 emissions data of the ProxPass, 1351 (1351-300), was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the "Sample Calculations". The corrected data was then compared to the FCC Part 15, Subpart C Part 15.209 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. The frequency range below 30 MHz was scanned using the mag loop 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. 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 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 and antenna height. Photographs showing the final worst case configuration of the EUT are contained in Appendix A.

SAMPLE CALCULATIONS

The basic spectrum analyzer reading was converted using correction factors as shown in the six highest emissions readings in Tables 1 and 2. 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 dBuV	Cable	Amp	Bicon	Mag	Log	Dist	Corr dBuV/m	Spec	Margin	Polar
	FCC 15.31											

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 dB μ V.

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

Bicon is the biconical antenna factor in dB.

Log is the log periodic antenna factor in dB.

Mag is the mag 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.

FCC 15.31 is the average correction called out in FCC Part 15.31.

APPENDIX A
INFORMATION ABOUT THE EQUIPMENT UNDER TEST

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

Test Software/Firmware: Checksum A6EA
CRT was displaying: NA
Power Supply Manufacturer: NA
Power Supply Part Number: NA
Line Filter Manufacturer: NA
Line Filter Part Number: NA

Nominal Operating Voltage: 6 V DC
Operating Voltage Range: 4.0 - 6.5 V DC Battery Powered

I/O PORTS

Type	#
N/A	

CRYSTAL OSCILLATORS

Type	Freq In MHz
Quartz	4.0

PRINTED CIRCUIT BOARDS

Function	Model & Rev	Clocks, MHz	Layers	Location
Main (only)	Rev 4	4.0 MHz	2	

REQUIRED EUT CHANGES TO COMPLY:

None.

PHOTOGRAPH SHOWING RADIATED EMISSIONS



HID Corporation
Model: 1351
(1351-300)
23 November 1999
WO# 73097

Radiated Emissions - Front View

APPENDIX B
MEASUREMENT DATA SHEETS

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

Customer: **HID**
 Specification: **FCC 15.209**
 Work Order #: **73097** Date: 11/07/2000
 Test Type: **Maximized Emissions** Time: 18:01:51
 Equipment: **Active Transponder** Sequence#: 2
 Manufacturer: **HID** Tested By: Randy Clark
 Model: 1351
 S/N: N/A

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Active Transponder*	HID	1351	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

EUT is continuously transmitting a modulated carrier at 125kHz. EUT is operating on battery power. All readings with exception of 110k and 137k, are of the ambient noise floor. Readings taken off of the ground plane in accordance with ANSI C63.4. Forty dB/decade correction factor use in accordance with FCC 15.31.

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

#	Freq MHz	Rdng dBµV	Reading listed by margin.			Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
			Mag Loop	Cable dB	FCC 15.31 dB					
1	1.655M	17.8	+10.9	+0.1	-20.0	+0.0	8.8	23.2	-14.4	None
Ambient Grass Level										
2	4.002M	22.4	+10.6	+0.1	-20.0	+0.0	13.1	29.5	-16.4	None
Ambient Grass Level										
3	2.903M	20.9	+10.7	+0.1	-20.0	+0.0	11.7	29.5	-17.8	None
Ambient Grass Level										
4	602.200k	22.0	+10.4	+0.0	-20.0	+0.0	12.4	32.0	-19.6	None
Ambient Grass Level										
5	110.250k	35.2	+10.8	+0.0	-60.0	+0.0	-14.0	27.6	-41.6	None
10 Meter										
6	447.200k	20.8	+10.4	+0.0	-60.0	+0.0	-28.8	14.6	-43.4	None
Ambient Grass Level										
7	349.500k	20.8	+10.5	+0.0	-60.0	+0.0	-28.7	16.7	-45.4	None
Ambient Grass Level										
8	223.500k	24.6	+10.5	+0.0	-60.0	+0.0	-24.9	20.6	-45.5	None
Ambient Grass Level										
9	137.600k	30.1	+10.8	+0.0	-60.0	+0.0	-19.1	27.6	-46.7	None

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

Customer: **HID**
 Specification: **FCC 15.209**
 Work Order #: **73097** Date: Mon Nov-22-1999
 Test Type: **Maximized Emissions** Time: 16:31:47
 Equipment: **ProxPass** Sequence#: 5
 Manufacturer: **HID** Tested By: D.Oaks
 Model: 1351
 S/N: N/A

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
ProxPass *	HID	1351 (1351-300)	N/A

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

EUT is continuously transmitting a modulated carrier at 125kHz. EUT is operating on battery power.

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

#	Freq MHz	Rdng dBµV	Reading listed by margin.				Test Distance: 3 Meters					
			Amp dB	Bicon dB	Log dB	Cable dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant	
1	32.306M	38.7	-27.0	+12.7	+0.0	+0.7	+0.0	25.1	40.0	-14.9	Vert	
2	33.496M	38.9	-27.0	+12.0	+0.0	+0.7	+0.0	24.6	40.0	-15.4	Vert	
3	32.940M	36.4	-27.0	+12.3	+0.0	+0.7	+0.0	22.4	40.0	-17.6	Vert	
4	250.426M	30.2	-26.3	+15.9	+0.0	+2.8	+0.0	22.6	46.0	-23.4	Vert	
5	124.973M	29.4	-26.8	+14.1	+0.0	+1.7	+0.0	18.4	43.5	-25.1	Vert	
6	165.600M	27.9	-26.7	+14.3	+0.0	+2.1	+0.0	17.6	43.5	-25.9	Vert	