



**HID GLOBAL CORPORATION TEST REPORT**

**FOR THE**

**6145AXN MULTICLASS RP15**

**FCC PART 15 SUBPART C SECTIONS 15.207, 15.209, 15.225  
AND RSS-210 ISSUE 7**

**TESTING**

**DATE OF ISSUE: JUNE 29, 2007**

**PREPARED FOR:**

HID Global Corporation  
9292 Jeronimo Road  
Irvine, CA 92618-1905

W.O. No.: 86600

**PREPARED BY:**

Mary Ellen Clayton  
CKC Laboratories, Inc.  
5046 Sierra Pines Drive  
Mariposa, CA 95338

Date of test: June 14-25, 2007

**Report No.: FC07-047**

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**ADMINISTRATIVE INFORMATION**

**DATE OF TEST:** June 14-25, 2007

**DATE OF RECEIPT:** June 14, 2007

**REPRESENTATIVE:** Mat Aschenberg

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

**TEST LOCATION:**  
CKC Laboratories, Inc.  
5046 Sierra Pines Drive  
Mariposa, CA 95338

**TEST METHOD:** ANSI C63.4 (2003), RSS-210 Issue 7 and RSS-GEN Issue 2

**PURPOSE OF TEST:** To perform the testing of the multiCLASS Reader, 6145AxN multiCLASS RP15 with the requirements for FCC Part 15 Subpart C Sections 15.207, 15.209, 15.225 and RSS-210 devices.

**APPROVALS**

Steve Behm, Director of Engineering Services

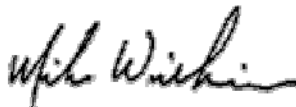
**QUALITY ASSURANCE:**



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Joyce Walker, Quality Assurance Administrative Manager

**TEST PERSONNEL:**



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Mike Wilkinson, EMC Engineer/Lab Manager

### FCC TO CANADA STANDARD CORRELATION MATRIX

Canadian Standard	Canadian Section	FCC Standard	FCC Section	Test Description
RSS GEN	7.1.4	47CFR	15.203	Antenna Connector Requirements
RSS GEN	7.2.1	47CFR	15.35(c)	Pulsed Operation
RSS GEN	7.2.2	47CFR	15.207	AC Mains Conducted Emissions Requirement
RSS 210	2.1	47CFR	15.215(c)	Frequency Stability Recommendation
RSS 210	2.2	47CFR	15.205	Restricted Bands of Operation
RSS 210	2.6	47CFR	15.209	General Radiated Emissions Requirement
RSS 210	A2.6	47CFR	15.225(a-c)	Fundamental and Emissions Mask Requirements
RSS 210	A2.6	NA	NA	$\pm 150\text{kHz}$ to $\pm 450\text{kHz}$ Emissions Requirement
RSS 210	A2.6	47CFR	15.225(d)	Out of band emissions
RSS 210	A2.6	47CFR	15.225(e)	Carrier Stability
	IC 3082A-1		784962	Site File No.

### CONDITIONS DURING TESTING

No modifications to the EUT were necessary during testing.

**FCC 15.31(m) Number Of Channels**

This device was tested on two channels.

**FCC 15.33(a) Frequency Ranges Tested**

15.207 Conducted Emissions: 150 kHz – 30 MHz

15.209 Radiated Emissions: 9 kHz – 1 GHz

<b>FCC SECTION 15.35: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE</b>			
<b>TEST</b>	<b>BEGINNING FREQUENCY</b>	<b>ENDING FREQUENCY</b>	<b>BANDWIDTH SETTING</b>
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

**FCC 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.

**EUT Operating Frequency**

The EUT was operating at 13.56MHz and 125kHz.

**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 customer declares the EUT tested by CKC Laboratories was representative of a production unit. This reader includes a 3126B Prox expansion module.

## **EQUIPMENT UNDER TEST**

### **multiCLASS Reader**

Manuf: HID Global Corporation  
Model: 6145AxN multiCLASS RP15  
Serial: 061407  
FCC ID: pending

## **PERIPHERAL DEVICES**

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

### **DC Power Supply**

Manuf: Topward Electric Instruments Co., Ltd.  
Model: TPS-2000  
Serial: 920027

## REPORT OF EMISSIONS MEASUREMENTS

### TESTING PARAMETERS

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. 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 $\mu$ V/m, the spectrum analyzer reading in dB $\mu$ V was corrected by using the following formula. This reading was then compared to the applicable specification limit.

<b>SAMPLE CALCULATIONS</b>		
	Meter reading	(dB $\mu$ V)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dB $\mu$ V/m)

## **TEST INSTRUMENTATION AND ANALYZER SETTINGS**

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. The following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. When conducted emissions testing was performed, a 10 dB external attenuator was used with internal offset correction in the analyzer.

## **SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS**

The notes that accompany the measurements contained in the emissions 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 highest readings, this is indicated as a "QP" or an "Ave" on the appropriate rows of the data sheets. 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/receiver readings were recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the measuring device called "peak hold," the measuring device had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the measuring device 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 quasi-peak detector.

### **Average**

For certain frequencies, average measurements may be made using the spectrum analyzer/receiver. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.



## FCC 15.207 CONDUCTED EMISSIONS

### Test Setup Photos



## Test Data Sheets

Test Location: CKC Laboratories, Inc. • 4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID Global**  
 Specification: **FCC 15.207 - AVE**  
 Work Order #: **86600** Date: 6/14/2007  
 Test Type: **Conducted Emissions** Time: 15:45:21  
 Equipment: **multiCLASS Reader** Sequence#: 4  
 Manufacturer: HID Global Tested By: Mike Wilkinson  
 Model: 6145AxN multiCLASS RP15 120V 60Hz  
 S/N: 061407

### Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
LISN, 8028-50-TS-24-BNC	8379276, 280	05/07/2007	05/07/2009	1248 & 1249
150kHz HP Filter TTE	G7754	03/09/2006	03/09/2008	02608

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

Function	Manufacturer	Model #	S/N
multiCLASS Reader*	HID Global	6145AxN multiCLASS RP15	061407

### Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd.	TPS-2000	920027

### Test Conditions / Notes:

Equipment is a multiCLASS Reader operating on a frequency of 13.56MHz and 125kHz. The EUT is mounted vertically on a support structure to simulate normal installation. DC power supply is bonded to ground. Frequency Range Investigated: 150 kHz - 30 MHz. Temperature: 25°C, Relative Humidity: 38%.

### Transducer Legend:

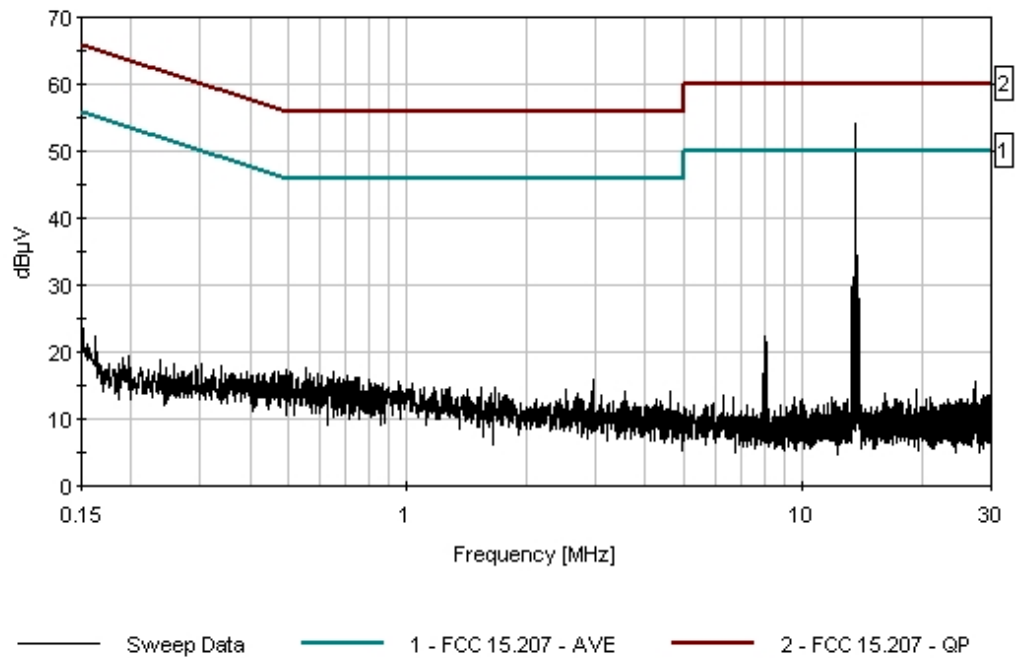
T1=Cable - Site D LISN 100k-30M	T2=Filter 150kHz HP AN02608
T3=LISN -280 - BK	

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

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	13.562M	32.8	+10.9	+0.1	+0.8		+0.0	44.6	50.0	-5.4	Black
Ave											
^	13.562M	42.4	+10.9	+0.1	+0.8		+0.0	54.2	50.0	+4.2	Black
3	9.480M	12.1	+10.8	+0.1	+0.4		+0.0	23.4	50.0	-26.6	Black
4	8.073M	11.3	+10.8	+0.1	+0.4		+0.0	22.6	50.0	-27.4	Black

5	3.041M	6.4	+11.2	+0.1	+0.3	+0.0	18.0	46.0	-28.0	Black
6	9.977M	8.8	+10.8	+0.1	+0.5	+0.0	20.2	50.0	-29.8	Black
7	155.000k	10.0	+11.6	+2.5	+0.2	+0.0	24.3	55.7	-31.4	Black
8	27.122M	1.1	+11.0	+0.1	+1.3	+0.0	13.5	50.0	-36.5	Black

CKC Laboratories, Inc. (ITAR) Date: 6/14/2007 Time: 15:45:21 HID Global W/O#: 86600  
 FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 4  
 HID Global M/N 6145AxN multiCLASS RP15



Test Location: CKC Laboratories, Inc. • 4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID Global**  
 Specification: **FCC 15.207 - AVE**  
 Work Order #: **86600** Date: 6/14/2007  
 Test Type: **Conducted Emissions** Time: 15:52:35  
 Equipment: **multiCLASS Reader** Sequence#: 5  
 Manufacturer: **HID Global** Tested By: **Mike Wilkinson**  
 Model: **6145AxN multiCLASS RP15** 120V 60Hz  
 S/N: **061407**

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
LISN, 8028-50-TS-24-BNC	8379276, 280	05/07/2007	05/07/2009	1248 & 1249
150kHz HP Filter	G7754	03/09/2006	03/09/2008	02608
TTE				

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

Function	Manufacturer	Model #	S/N
multiCLASS Reader*	HID Global	6145AxN multiCLASS RP15	061407

**Support Devices:**

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd.	TPS-2000	920027

**Test Conditions / Notes:**

Equipment is a multiCLASS Reader operating on a frequency of 13.56MHz and 125kHz. The EUT is mounted vertically on a support structure to simulate normal installation. DC power supply is bonded to ground. Frequency Range Investigated: 150 kHz - 30 MHz. Temperature: 25°C, Relative Humidity: 38%.

**Transducer Legend:**

T1=Cable - Site D LISN 100k-30M	T2=Filter 150kHz HP AN02608
T3=LISN -276 - WT	

**Measurement Data:**

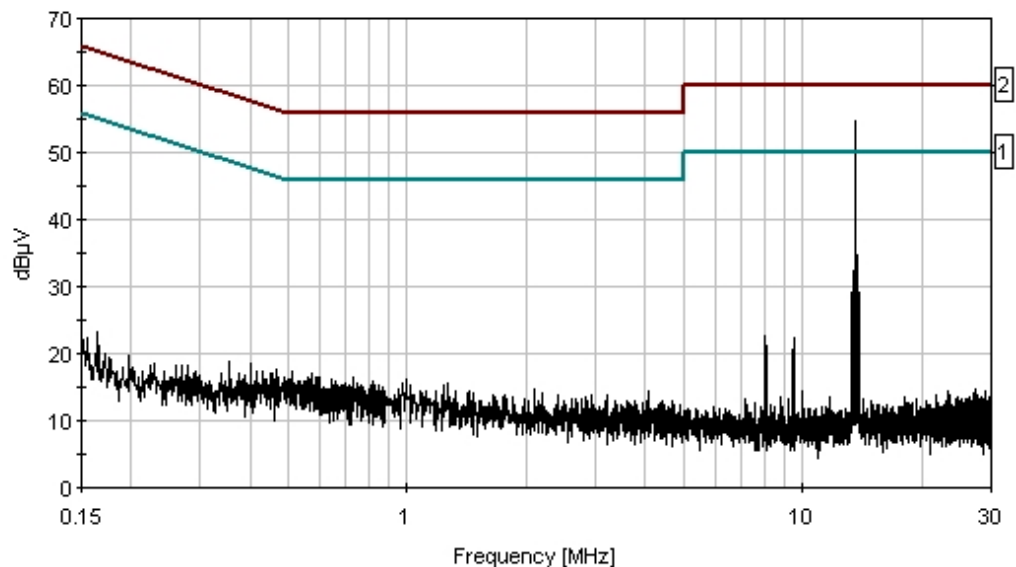
Reading listed by margin.

Test Lead: White

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	Dist dB	Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	13.561M	33.8	+10.9	+0.1	+1.2	+0.0		46.0	50.0	-4.0	White
	Ave										
^	13.561M	42.6	+10.9	+0.1	+1.2	+0.0		54.8	50.0	+4.8	White
3	9.480M	11.8	+10.8	+0.1	+0.9	+0.0		23.6	50.0	-26.4	White
4	1.236M	7.5	+11.7	+0.2	+0.2	+0.0		19.6	46.0	-26.4	White
5	150.000k	14.2	+11.6	+3.1	+0.1	+0.0		29.0	56.0	-27.0	White

6	8.072M	10.3	+10.8	+0.1	+0.8	+0.0	22.0	50.0	-28.0	White
7	2.628M	6.3	+11.3	+0.1	+0.3	+0.0	18.0	46.0	-28.0	White
8	9.976M	8.4	+10.8	+0.1	+0.8	+0.0	20.1	50.0	-29.9	White
9	27.100M	-0.8	+11.0	+0.1	+1.6	+0.0	11.9	50.0	-38.1	White

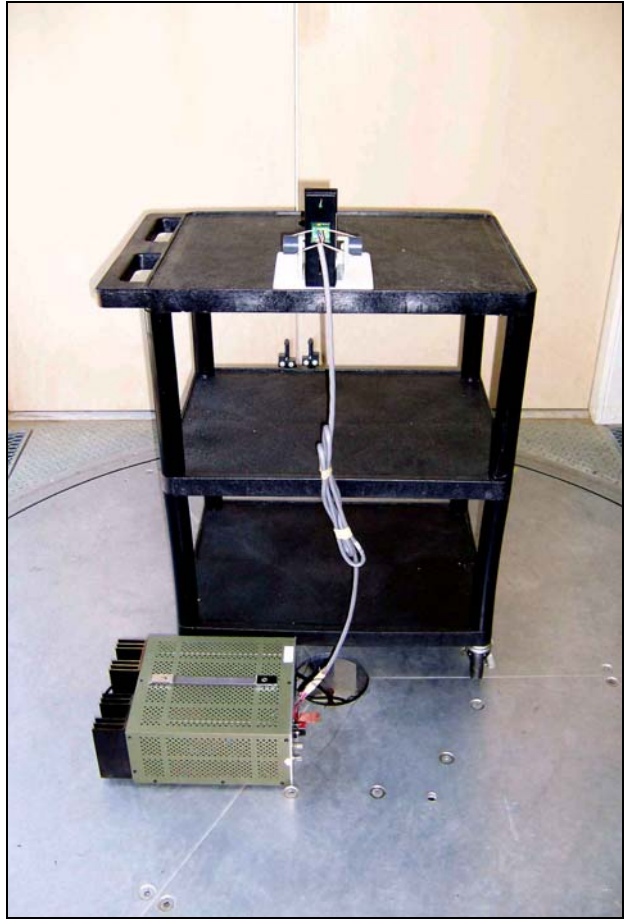
CKC Laboratories, Inc. (ITAR) Date: 6/14/2007 Time: 15:52:35 HID Global WO#: 86600  
 FCC 15.207 - AVE Test Lead: White 120V 60Hz Sequence#: 5  
 HID Global M/N 6145AxN multiCLASS RP15



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

## FCC 15.209 RADIATED EMISSIONS

### Test Setup Photos



## Test Data Sheets

Test Location: CKC Laboratories, Inc. • 4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID Global**

Specification: **FCC 15.209**

Work Order #: **86600**

Date: 6/19/2007

Test Type: **Maximized Emissions**

Time: 11:01:12

Equipment: **multiCLASS Reader**

Sequence#: 24

Manufacturer: HID Global

Tested By: Mike Wilkinson

Model: 6145AxN multiCLASS RP15

S/N: 061407

### Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8593EM SA	3624A00159	03/23/2007	03/23/2009	02111
EMCO Loop Antenna	1074	05/01/2007	05/01/2009	00226

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

Function	Manufacturer	Model #	S/N
multiCLASS Reader*	HID Global	6145AxN multiCLASS RP15	061407

### Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd.	TPS-2000	920027

### Test Conditions / Notes:

Equipment is a multiCLASS Reader operating on a frequency of 13.56MHz and 125kHz. The EUT is mounted vertically on a support structure to simulate normal installation. DC power supply is bonded to ground. Test data is corrected for proper test distance using 40dB per decade correction factor in accordance with 15.31. Frequency Range Investigated: 9 kHz - 30 MHz. Temperature: 25°C, Relative Humidity: 38%

### Transducer Legend:

T1=Cable - Site D 10m 9k-1G	T2=Mag Loop - AN 00226 - 9kHz-30M
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### Measurement Data:

Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	dB	dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	27.123M	15.8	+1.4	+7.1			-19.0	5.3	29.5	-24.2	Horiz
2	252.140k	39.8	+0.2	+9.8			-59.0	-9.2	19.6	-28.8	Vert
3	27.120M	10.4	+1.4	+7.1			-19.0	-0.1	29.5	-29.6	Vert
4	124.920k	32.0	+0.2	+9.9			-59.0	-16.9	25.7	-42.6	Horiz



Test Location: CKC Laboratories, Inc. • 4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID Global**  
 Specification: **FCC 15.209**  
 Work Order #: **86600** Date: 6/14/2007  
 Test Type: **Radiated Scan** Time: 15:00:38  
 Equipment: **multiCLASS Reader** Sequence#: 3  
 Manufacturer: **HID Global** Tested By: **Mike Wilkinson**  
 Model: **6145AxN multiCLASS RP15**  
 S/N: **061407**

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
HP 8447D Preamp	1937A02604	03/14/2007	03/14/2009	00099
Chase CBL6111C	2456	12/30/2006	12/30/2008	01991
Bilog				

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

Function	Manufacturer	Model #	S/N
multiCLASS Reader*	HID Global	6145AxN multiCLASS RP15	061407

**Support Devices:**

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd.	TPS-2000	920027

**Test Conditions / Notes:**

Equipment is a multiCLASS Reader operating on a frequency of 13.56MHz and 125kHz. The EUT is mounted vertically on a support structure to simulate normal installation. DC power supply is bonded to ground. Test distance correction factor used in accordance with 15.31. Frequency Range Investigated: 30-1000. Temperature: 25°C, Relative Humidity: 38%.

**Transducer Legend:**

T1=AMP AN00099	T2=ANT AN01991 25-1000MHZ
T3=Cable - Site D 10m 9k-1G	

**Measurement Data:**

Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	Dist Table dB	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	40.681M	35.0	-27.2	+14.0	+1.7	+10.0	33.5	40.0	-6.5	Verti
	QP									
^	40.675M	36.2	-27.2	+14.0	+1.7	+10.0	34.7	40.0	-5.3	Verti
3	189.926M	36.6	-26.7	+9.1	+4.0	+10.0	33.0	43.5	-10.5	Verti
4	461.087M	27.9	-27.5	+17.4	+6.9	+10.0	34.7	46.0	-11.3	Verti
5	108.477M	35.2	-27.1	+10.8	+3.0	+10.0	31.9	43.5	-11.6	Verti



6	311.905M	31.6	-26.5	+13.7	+5.5	+10.0	34.3	46.0	-11.7	Verti
7	54.235M	34.8	-27.1	+8.2	+2.0	+10.0	27.9	40.0	-12.1	Verti
8	406.841M	27.9	-27.3	+16.1	+6.5	+10.0	33.2	46.0	-12.8	Verti
9	40.699M	28.0	-27.2	+14.0	+1.7	+10.0	26.5	40.0	-13.5	Horiz
10	339.041M	28.9	-26.6	+14.5	+5.6	+10.0	32.4	46.0	-13.6	Verti
11	433.967M	25.7	-27.4	+16.7	+6.7	+10.0	31.7	46.0	-14.3	Verti
12	311.927M	27.6	-26.5	+13.7	+5.5	+10.0	30.3	46.0	-15.7	Horiz
13	284.759M	28.0	-26.4	+13.1	+5.4	+10.0	30.1	46.0	-15.9	Verti
14	135.597M	29.5	-27.0	+11.6	+3.4	+10.0	27.5	43.5	-16.0	Verti
15	135.618M	29.2	-27.0	+11.6	+3.4	+10.0	27.2	43.5	-16.3	Verti
16	162.737M	29.5	-26.8	+10.4	+3.8	+10.0	26.9	43.5	-16.6	Verti
17	298.319M	26.4	-26.4	+13.4	+5.5	+10.0	28.9	46.0	-17.1	Verti
18	203.264M	28.9	-26.7	+9.3	+4.2	+10.0	25.7	43.5	-17.8	Verti
19	203.800M	28.5	-26.7	+9.4	+4.2	+10.0	25.4	43.5	-18.1	Verti
20	149.157M	27.5	-26.9	+11.1	+3.6	+10.0	25.3	43.5	-18.2	Verti
21	230.524M	28.3	-26.5	+11.3	+4.7	+10.0	27.8	46.0	-18.2	Verti
22	216.769M	24.9	-26.6	+10.3	+4.4	+10.0	23.0	46.0	-23.0	Verti

Test Location: CKC Laboratories, Inc. •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID Global**

Specification: **FCC 15.209**

Work Order #: **86600**

Date: 6/19/2007

Test Type: **Maximized Emissions**

Time: 10:53:00

Equipment: **multiCLASS Reader**

Sequence#: 23

Manufacturer: HID Global

Tested By: Mike Wilkinson

Model: 6145AxN multiCLASS RP15

S/N: 061407

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8593EM SA	3624A00159	03/23/2007	03/23/2009	02111
EMCO Loop Antenna	1074	05/01/2007	05/01/2009	00226

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

Function	Manufacturer	Model #	S/N
multiCLASS Reader*	HID Global	6145AxN multiCLASS RP15	061407

**Support Devices:**

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd.	TPS-2000	920027

**Test Conditions / Notes:**

Equipment is a multiCLASS Reader operating on a frequency of 13.56MHz and 125kHz. The EUT is mounted vertically on a support structure to simulate normal installation. DC power supply is bonded to ground. Test data is corrected for proper test distance using 40dB per decade correction factor in accordance with 15.31. Frequency Range Investigated: Carrier 125 kHz. Temperature: 25°C, Relative Humidity: 38%.

**Transducer Legend:**

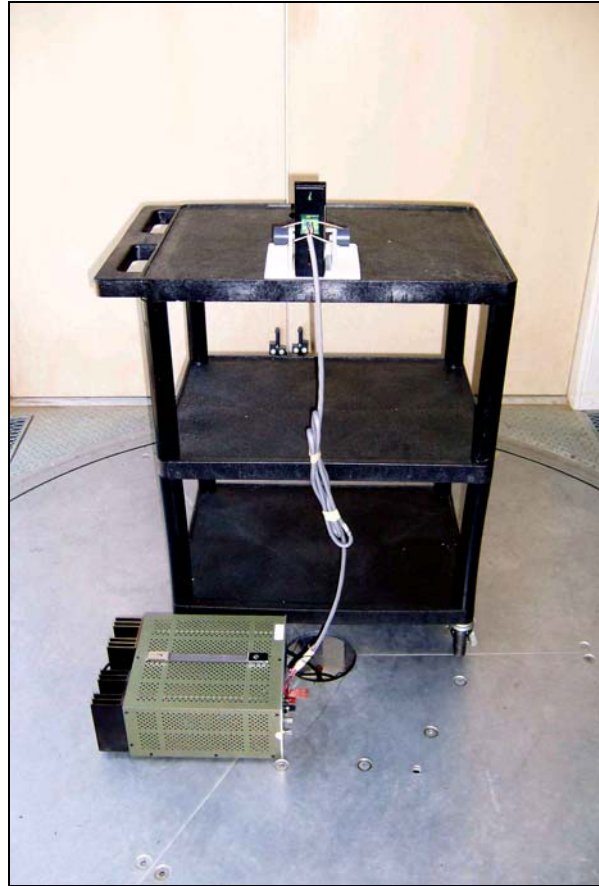
T1=Cable - Site D 10m 9k-1G	T2=Mag Loop - AN 00226 - 9kHz-30M
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**Measurement Data:** Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	126.078k	44.4	+0.2	+9.9	-59.0	-4.5	25.6	-30.1	Vert
2	126.075k	35.7	+0.2	+9.9	-59.0	-13.2	25.6	-38.8	Horiz

## FCC 15.225 RADIATED EMISSIONS

### Test Setup Photos



## Test Data Sheets

Test Location: CKC Laboratories, Inc. • 4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID Global**  
 Specification: **47 CFR 15.225(a)**  
 Work Order #: **86600** Date: 6/18/2007  
 Test Type: **Maximized Emissions** Time: 15:06:19  
 Equipment: **multiCLASS Reader** Sequence#: 22  
 Manufacturer: HID Global Tested By: Mike Wilkinson  
 Model: 6145AxN multiCLASS RP15  
 S/N: 061407

### Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8593EM SA	3624A00159	03/23/2007	03/23/2009	02111
EMCO Loop Antenna	1074	05/01/2007	05/01/2009	00226

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

Function	Manufacturer	Model #	S/N
multiCLASS Reader*	HID Global	6145AxN multiCLASS RP15	061407

### Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd.	TPS-2000	920027

### Test Conditions / Notes:

Equipment is a multiCLASS Reader operating on a frequency of 13.56MHz and 125kHz. The EUT is mounted vertically on a support structure to simulate normal installation. DC power supply is bonded to ground. Test data is corrected for proper test distance using 40dB per decade correction factor in accordance with 15.31. Frequency Range Investigated: Carrier 13.56 MHz. Temperature: 25°C, Relative Humidity: 38%.

### Transducer Legend:

T1=Cable - Site D 10m 9k-1G	T2=Mag Loop - AN 00226 - 9kHz-30M
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### Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	dB	dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	13.562M	40.4	+1.0	+9.6			-19.0	32.0	84.0	-52.0	Vert
2	13.560M	40.4	+1.0	+9.6			-19.0	32.0	84.0	-52.0	Horiz

## RSS-210 OCCUPIED BANDWIDTH

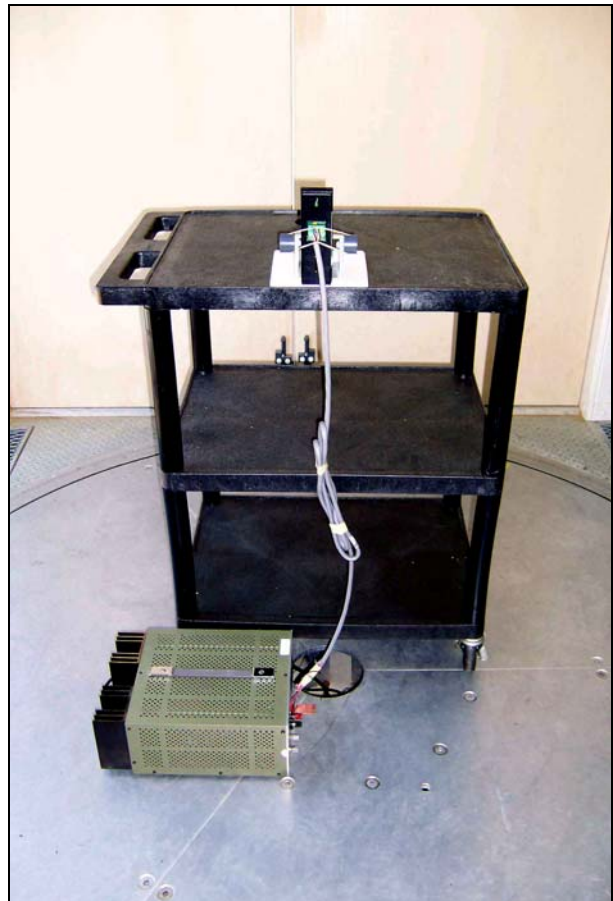
### Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8593EM SA	3624A00159	03/23/2007	03/23/2009	02111
EMCO Loop Antenna	1074	05/01/2007	05/01/2009	00226

### Test Conditions

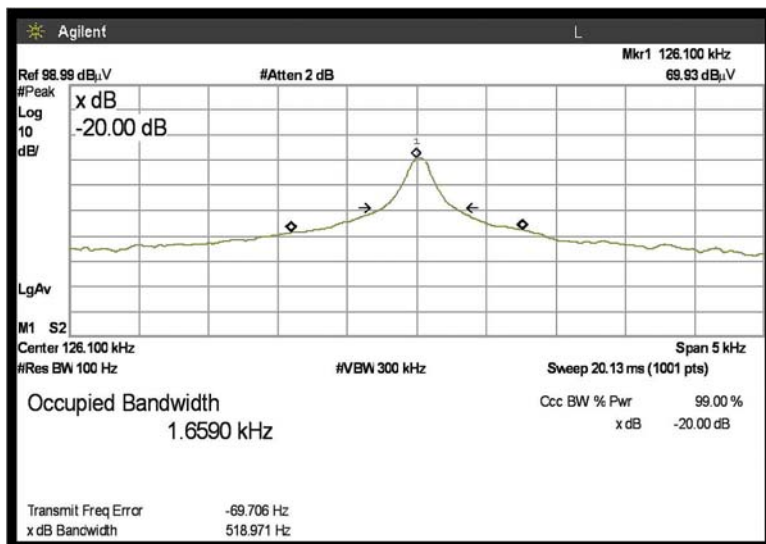
Equipment is a multiCLASS Reader operating on a frequency of 13.56MHz and 125kHz. The EUT is mounted vertically on a support structure to simulate normal installation. DC power supply is bonded to ground.

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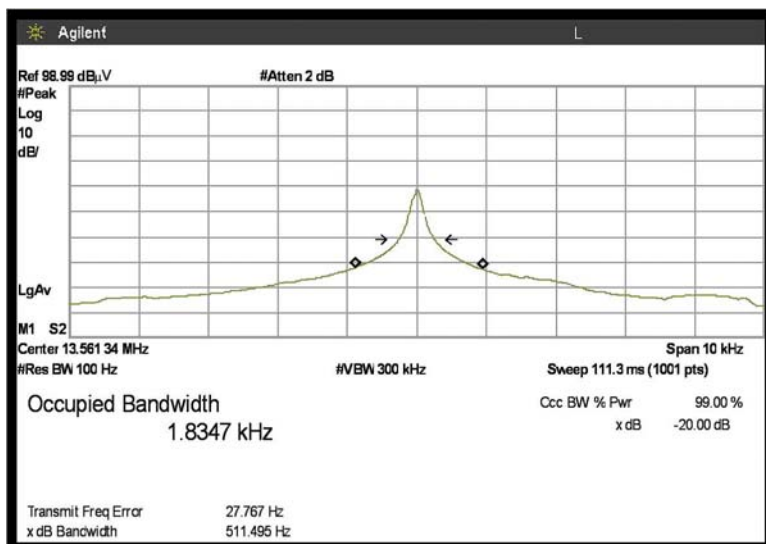
## Plots

### RSS-210 125 kHz OCCUPIED BANDWIDTH



Tested By: Mike Wilkinson

### RSS-210 13.56 MHz OCCUPIED BANDWIDTH



Tested By: Mike Wilkinson



## FCC 15.225 and RSS-210 EMISSIONS MASK

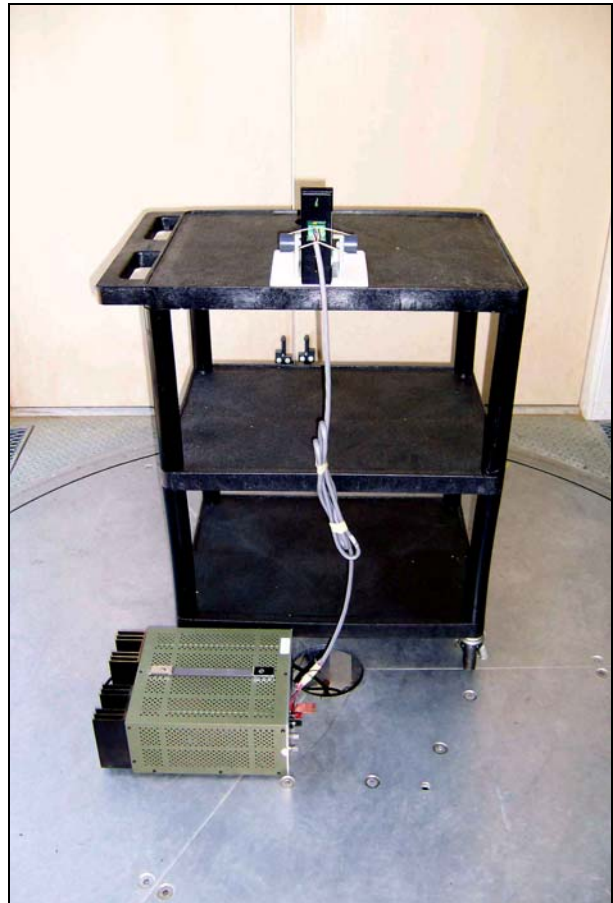
### Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8593EM SA	3624A00159	03/23/2007	03/23/2009	02111
EMCO Loop Antenna	1074	05/01/2007	05/01/2009	00226

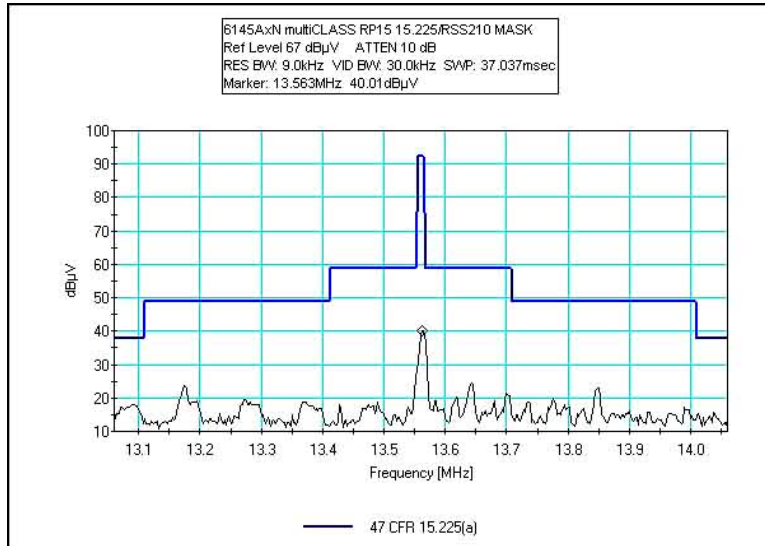
### Test Conditions

Equipment is a multiCLASS Reader operating on a frequency of 13.56MHz and 125kHz. The EUT is mounted vertically on a support structure to simulate normal installation. DC power supply is bonded to ground.

### Test Setup Photos



### Plot



Tested By: Mike Wilkinson



## FREQUENCY STABILITY

### Test Equipment

Function	S/N	Cal Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	1/3/2007	1/3/2009	2660
Solar Loop Sensor	N/A	3/4/2007	3/4/2009	170
Thermotron Temperature Chamber	11899	12/21/2006	12/21/2008	1879
HP 6205C Dual DC Power Supply	2228A01775	8/15/2005	8/15/2007	762

### Test Setup Photos



### Test Conditions

Equipment is placed inside of a temperature chamber. EUT power is provided via bench supply. Power variations are performed while monitoring with a digital volt meter. SA RBW = 1 kHz, SA VBW = 1kHz.

**Test Data**

<b>Customer:</b>	HID Global Corporation	
<b>WO#:</b>	86600	
<b>Date:</b>	29-Jun-07	
<b>Test Engineer:</b>	Mike Wilkinson	
<b>Device Model #:</b>	multiCLASS RP15 Reader	
<b>Operating Voltage:</b>	12	VDC
<b>Frequency Limit:</b>	0.01	%

<b>Temperature Variations</b>			
		<b>Channel (MHz)</b>	<b>Dev. (MHz)</b>
Channel Frequency:		<b>13.561385</b>	
Temp (C)	Voltage		
-30	12		
-20	12	13.56152	0.00013
-10	12	13.56149	0.00010
0	12	13.56146	0.00008
10	12	13.56142	0.00004
20	12	13.56139	0.00000
30	12	13.56138	0.00000
40	12	13.56136	0.00002
50	12	13.56134	0.00005
<b>Voltage Variations (±15%)</b>			
20	10.2	13.56130	0.00009
20	12	13.56139	0.00000
20	13.8	13.56130	0.00009
<b>Max Deviation (MHz)</b>			<b>0.00013</b>
<b>Max Deviation (%)</b>			<b>0.00096</b>
			<b>PASS</b>