TEST REPORT CONCERNING THE COMPLIANCE OF A PROXIMITY CARD READER, OPERATING ON 125 KHZ, 138 KHZ and 13.56 MHZ, BRAND HID, MODELS 814xD INCORPORATING THE SMARTREADERII V01.03 & SMARTEXTENSION/PSK V01.00

47 CFR PART 15 (OCTOBER 07, 2007).
THE REQUIREMENTS OF INDUSTRY CANADA:
RSS-GEN AND RSS-210 (ISSUE 7, JUNE 2007)

FCC listed : 90828
Industry Canada : IC3501A
VCCI Registered : R-1518, C-1598
R&TTE, LVD, EMC Notified Body : 1856

TÜV Rheinland EPS B.V.
P.O. Box 15
9822 ZG Niekerk (NL)
Smidshornerweg 18
9822 TL Niekerk (NL)

Telephone: +31 594 505005
Telefax: +31 594 504804

E-mail: info@tuv-eps.com
Web: www.tuv-eps.com

MEASUREMENT/TECHNICAL REPORT

HID Global Corporation

Model Summary: This report covers only 1 of 2 transmitter models – the applicant states: differences are explained within the HID Attestation of Similarity found in Appendix 1. All models incorporate the identical circuitry and integral RF Section and PWB embedded antenna housed on the SmartReaderII V01.03 PWA. Prescans were completed on all product geometric differences and the worst case unit was tested and shown in this report. Specific notes have been inserted in each section of this report to better clarify the data shown and its applicability to all units covered. Refer to Appendix 1 for more information.

FCC ID: JQ6 – SmartTRANS2 & IC ID: 2236B-SmartTRANS2

May 05, 2008

This report concerns:	Original grant/certification	~~Class 2 change~~ ~~Verification~~
Equipment type:	125 kHz, 138 kHz and 13.56 MHz Inductive Proximity Card Reader	
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) ?	~~Yes~~	~~No~~ n.a.
Report prepared by:	Name	: Richard van der Meer
	Company name	: TÜV Rheinland EPS B.V.
	Address	: Smidshornerweg 18
	Postal code/city	: 9822 ZG Niekerk
	Mailing address	: P.O. Box 15
	Postal code/city	: 9822 TL Niekerk
	Country	: The Netherlands
	Telephone number	: + 31 594 505 005
	Telefax number	: + 31 594 504 804
	E-mail	: info@tuv-eps.com

The data taken for this test and report herein was done in accordance with 47 CFR Part 15 (October 07, 2007), RSS-GEN AND RSS-210 and the measurement procedures of ANSI C63.4-2003. TÜV Rheinland EPS B.V. at Niekerk, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment Under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: May 08, 2008 Signature:

H.J. Pieters
Project Manager TÜV Rheinland EPS B.V.

Description of test item

Test item	:	Proximity Card Reader, operating on 125kHz, 138 kHz and 13.56 MHz, brand HID, model 814xD (Mullion Reader w/ Keypad)
Manufacturer	:	HID Global Corporation
Brand	:	HID
Model(s)	:	814xD incorporating the SmartReaderII V01.03 Main PWA
Serial number(s)	:	n.a.
Revision	:	n.a.
Receipt date	:	March 14, 2008

Applicant information

Applicant's representative	:	Mr. T. Seeley (USA - Denver, CO Compliance)
Company	:	HID Global Corporation
Address	:	9292 Jeromino Road
Postal code	:	92618-1905
City	:	Irving, CA
Country	:	USA
Telephone number	:	1+ 949 598 1600 (Main Office), 303-404-6700 (Denver, CO)
Telefax number	:	1+ 949 598 1680 (Main Office)

Test(s) performed

Location	:	Niekerk
Test(s) started	:	April 15, 2008
Test(s) completed	:	April 29, 2008
Purpose of test(s)	:	Equipment Authorization (Original grant/certification)
Test specification(s)	:	47 CFR Part 15 (October 07, 2007), RSS-GEN AND RSS-210 (ISSUE 7, JUNE 2007)
Test engineers	:	R. van der Meer 
Report written by	:	R. van der Meer 
Report date	:	May 08, 2008

Table of contents

1 General information.

1.1 Product description.

1.1.1 Introduction.

The EUT is an inductive proximity card reader intended to be used in access control systems, parking systems and other applications using RFID readers. It is capable of reading 125 kHz, 138 kHz and 13.56 MHz inductive tags.

In the case of this test report – 1 of 2 different models is covered. The applicant states that the tested model is representative for the other model as noted in the AoS, but it's outside the scope of TÜV Rheinland EPS B.V. to have any judgement on this. Prescans were completed and the worst case model tested – there are additional notes in each section to further clarify the applicability of the testing data shown to each of the covered models.

The content of this report and measurement results have not been changed other than the way of presenting the data.

1.2 Related submittal(s) and/or Grant(s).

1.2.1 General.

This test report supports the original grant/certification in equipment authorization files under FCC ID: JQ6-SmarTRANS2 and **2236B-SmartID**.

1.2.2 FCC ID JQ6-SmartTRANS2

This report supports the results of the 125 kHz, 138 kHz and 13.56 MHz Inductive Card Reader (FCC ID: JQ6-SmartTRANS2).

1.3 Tested system details.

Details and an overview of the system and all of its components, as it has been tested, may be found below.

EUT	:	Inductive proximity card reader operating at 125 kHz, 138 kHz and 13.56MHz
Manufacturer	:	HID Global Corporation.
Brand	:	HID
Model	:	8141D (Mullion Reader with Keypad) was found to be the worst case model
Serial number	:	n.a.
Voltage input rating	:	+5 - +24 VDC (any DC power supply)
Current input rating	:	not provided
Antenna	:	Integral to the SmartReaderII V01.03 PWA
Remarks	:	The EUT contains a SmartreaderII/8pin V01.03 with a SmartExtension/PSK V01.00 Board off the back (encapsulated in the potting and a passive keypad over laying the main board on the front outside of the plastic housing
Auxiliary equipment 1	:	Linear AC/DC Power Supply
Manufacturer	:	Topward electric instruments Co.,LTD.
Brand	:	Topward electric instruments Co.,LTD.
Model	:	TPS-2000
Serial number	:	920035
Voltage input rating	:	100-120V ~ 50-60Hz
Current input rating	:	--
Voltage output rating	:	0-30 Vdc
Current output rating	:	0-6.4A
Remarks	:	-

1.3.1 Description of input and output ports.

Number	Ports	From	To	Shielding	Remarks
1	AC mains	AC mains	AE1	~~yes~~ / no	None
2	DC power input port	AE1	EUT	~~yes~~ / no	None
3	Serial port	EUT	--	yes / ~~no~~	None

AE = Auxiliary equipment

1.4 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (October 07, 2007), sections 15.207, 15.209 and 15.225.

The test methods, which have been used, are based on ANSI C63.4: 2003.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters.
Radiated emission tests below 30 MHz were performed at a measurement distance of 3 meters and 10 meters. To calculate the field strength level from these results to the appropriate distance at which the limit is specified, the distance extrapolation factor of 40dB/decade is used.

The receivers are switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. The antenna factors are programmed in the test receiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate antenna factor for the cable loss. The total correction is automatically added to the measured value.

1.5 Test facility.

The Federal Communications Commission and Industry Canada has reviewed the technical characteristics of the test facilities at TÜV Rheinland EPS B.V., located in Niekerk, 9822 TL Smidshornerweg 18, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948, per October 23, 2000.

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 90828. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The description of the test facilities has been filed to Industry Canada under registration number IC 3501A-1. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

1.6 Test conditions.

Normal test conditions:

Temperature (*) : +15°C to +35°C
Relative humidity(*) : 20 % to 75 %
Supply voltage : 110VAC/60Hz to the AC/DC Power Supply – the DC output was varied across the voltage range specified by the manufacturer
Air pressure : 950 – 1050 hPa

***** When is was impracticable to carry out the tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests are stated separately.

System test configuration.

1.7 Justification.

The system was configured for testing in a typical fashion (as a customer would normally use it).

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4: 2003.

1.8 EUT mode of operation.

The EUT has been tested in active mode, i.e. the EUT is ready to detect a card. To assess the behavior of the EUT while reading the card, the EUT is tested with a card presented such that it continuously reads the card, and continuously sends data to the serial port of the EUT.

The intentional radiator tests (47 CFR Part 15 sections, 15.207, 15.209 and 15.225) have been performed with a complete functioning EUT and interconnections.

1.9 Special accessories.

No special accessories are used and/or needed to achieve compliance.

1.10 Equipment modifications.

No modifications have been made to the equipment in order to achieve compliance.

Only for the Conducted Emissions testing (section 4) test, the test unit was modified to add a resistive termination in lieu of the antenna. Pictures are available to show the modifications. For all other tests no modifications have been made to the equipment.

1.11 Product Labelling

The product labeling information is available in the technical documentation package.

1.12 Block diagram of the EUT.

The block diagram is available in the technical documentation package.

1.13 Schematics of the EUT.

The schematics are available in the technical documentation package.

1.14 Part list of the EUT.

The part list is available in the technical documentation package.

2 Radiated emission data.

2.1 Radiated field strength measurements (30 MHz – 1 GHz, E-field) for 125 kHz option

Frequency (MHz)	Measurement results dB(µV)/m @ 3 metres Quasi-peak		Limits dB(µV)/m @ 3 metres Quasi-peak	Result
	Vertical	Horizontal		PASS/FAIL
30.0-88.0	<25	<25	40.0	PASS
88.0-216.0	<25	<25	43.5	PASS
except for:				
180.820	27.2	25.2	43.5	PASS
205.795	27.4	26.4	43.5	PASS
216.0-950.0	<25	<25	46.0	PASS
except for:				
217.00	24.9	30.9	46.0	PASS
220.80	29.0	28.0		
> 950.0	<25	<25	54.0	PASS

Table 1

Radiated emissions of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.209 & RSS-210, section 7.2.1 and 7.2.2, with the EUT operating in active mode on 125 kHz and 13.562 MHz while detecting a card are depicted in table 1.

Notes:

1. Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
2. "<<" means that measurement values are much lower than the value determined for the other polarization.
3. The test data shown above is of the worst case EUT (8141D).
4. Measurement uncertainty is ±5.0dB
5. Taking into account the worst case measurement uncertainty, that would be +5dB, the tested item still passed the test.
6. 13.56MHz Always Active – the "option" of 125kHz or 138kHz is controlled via software at the factory. (HID Statement).

Test engineer

Signature : 

Name : Richard van der Meer

Date : April 28 , 2008

2.1.1 Radiated field strength measurements (30 MHz – 1 GHz, E-field) for 138 kHz option

Frequency (MHz)	Measurement results dB(µV)/m @ 3 metres Quasi-peak		Limits dB(µV)/m @ 3 metres Quasi-peak	Result
	Vertical	Horizontal		PASS/FAIL
30.0-88.0	<25	<25	40.0	PASS
88.0-216.0	<25	<25	43.5	PASS
except for:				
180.820	26.2	25.2	43.5	PASS
205.795	26.9	25.4	43.5	PASS
216.0-950.0	<25	<25	46.0	PASS
except for:				
217.00	24.7	30.6	46.0	PASS
220.780	28.6	26.0	46.0	PASS
> 950.0	<25	<25	54.0	PASS

Table 2

Radiated emissions of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.209 & RSS-210, section 7.2.1 and 7.2.2, with the EUT operating in active mode on 138 kHz and 13.562 MHz while detecting a card are depicted in table 1.

Notes:

1. Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
2. "<<" means that measurement values are much lower than the value determined for the other polarization.
3. The test data shown above is of the worst case EUT (8141D).
4. Measurement uncertainty is ±5.0dB
5. Taking into account the worst case measurement uncertainty ,that would be +5dB, the tested item still passed the test.
6. Tests carried out at a lower temperature, which was +13°C, than the normal test condition but it is considered as of no consequence taking in to account that both EUT and test equipment used are specified to operate in a wide temperature range that exceeds
7. 13.56MHz Always Active – the "option" of 125kHz or 138kHz is controlled via software at the factory. (HID Statement).

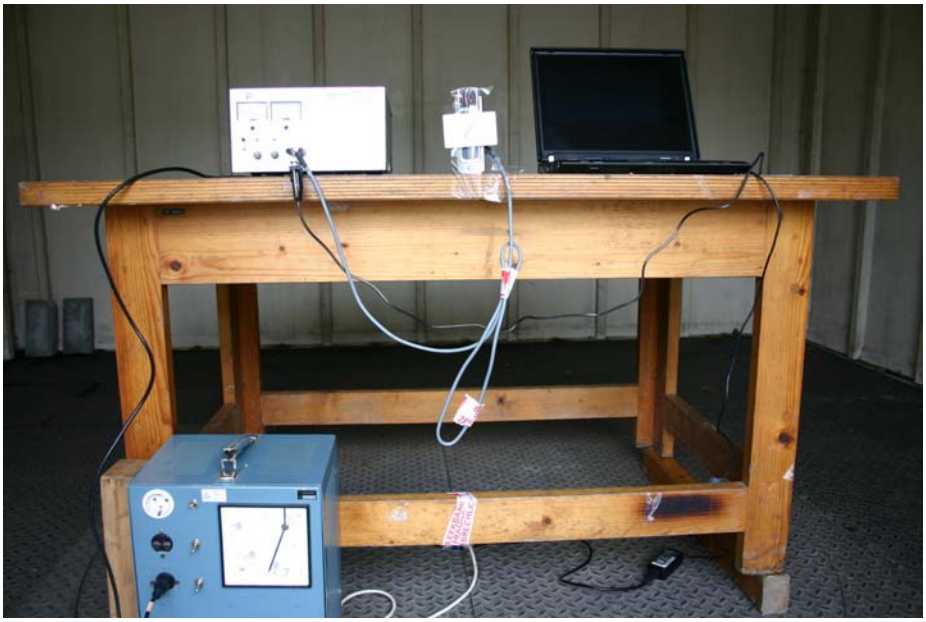
Test engineer

Signature : 

Name : Richard van der Meer

Date : April 16, 2008

E-field Radiated Emissions Test Setup Photos:



8141D Shown in Setup Photos

2.2 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field) for 125 kHz option.

Frequency (MHz)	Measurement results dBµV		Antenna factor	Cable loss	Measurement results dB(µV)/m for 30 m (calculated)	Limits Part 15.209 & Part 15.225 dB(µV)/m
	3 meters	10 meters	dB	dB		
0.009 - 0.490	56.0	27.0	20.1	1	-2.9 (@300m)	48.5 – 13.8 (300 m)
0.490 - 1.705	34.2	n.i.	20.1	1	15.3	33.8 - 22.9 (30 m)
1.705 – 30.0	<25	n.i.	20.1	1	6.1	29.5 (30 m)
13.56	45.1	15	19.6	1	25.7	84.0 (30m) (FCC 15.225-(a)

Table 3

Radiated emissions of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 sections 15.205, 15.209 and 15.225 and RSS-210, section 7.2.1 and 7.2.2 with the EUT operating in continuous transmit mode on 125 kHz and 13.56 MHz, are depicted in table 2.

Notes:

1. Calculated measurement results are obtained by using the distance extrapolation factor of 40dB/decade, antenna factor and cable loss. For example: at 13.56 MHz: 45.1 + 19.6 + 1 – 40 = 25.7 dB(µV)/m
2. Frequency range:
   a. 9- 90 kHz Average detector used during measurements
   b. 110-490 kHz Average detector used during measurements
3. n.i. Indicates that no field strength values could be measured on the listed frequencies or in the listed frequency range.
4. Field strength values of radiated emissions at frequencies not listed in table 3 are more than 20 dB below the applicable limit
5. The EUT was varied in three positions, the loop antenna was varied in horizontal and vertical orientations and also around it's axis. The reported value is the worst case found at the reported frequency.
6. The EUT was tested in both normal mode (i.e. without a label in its proximity) and in activated mode (i.e. with a label in its proximity.
7. The test data shown above is of the worst case EUT (8141D).
8. Measurement uncertainty is ±5.0dB
9. Taking into account the worst case measurement uncertainty, that would be +5dB, the tested item still passed the test.

Test engineer

Signature : 

Name : R. van der Meer

Date : April 28, 2008

2.2.1 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field) for 138 kHz option

Frequency (MHz)	Measurement results dBµV		Antenna factor	Cable loss	Measurement results dB(µV)/m for 30 m (calculated)	Limits Part 15.209 & Part 15.225 dB(µV)/m
	3 meters	10 meters	dB	dB		
0.009 - 0.490	55	n.i.	20.0	1	-4	48.5 – 13.8 (300 m)
0.490 - 1.705	<20	n.i.	20.0	1	n.i.	33.8 - 22.9 (30 m)
1.705 – 30.0	<15	n.i.	20.0	1	n.i.	29.5 (30 m)
13.56	43	24	19.6	1	23.6	84.0 (30m) (FCC 15.225-(a)

Table 4

Radiated emissions of the EUT. The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 sections 15.205, 15.209 and 15.225 and RSS-210, section 7.2.1 and 7.2.2 with the EUT operating in continuous transmit mode on 138 kHz and 13.56 MHz, are depicted in table 2.

Notes:

1. Calculated measurement results are obtained by using the distance extrapolation factor of 40dB/decade, antenna factor and cable loss. For example: at 13.56 MHz: 43 + 19.6 + 1 – 40 = 24 dB(µV)/m
2. Frequency range:
   a. 9- 90 kHz Average detector used during measurements
   b. 110-490 kHz Average detector used during measurements
3. n.i. Indicates that no field strength values could be measured on the listed frequencies or in the listed frequency range.
4. Field strength values of radiated emissions at frequencies not listed in table 3 are more than 20 dB below the applicable limit
5. The EUT was varied in three positions, the loop antenna was varied in horizontal and vertical orientations and also around it's axis. The reported value is the worst case found at the reported frequency.
6. The EUT was tested in both normal mode (i.e. without a label in its proximity) and in activated mode (i.e. with a label in its proximity.
7. The test data shown above is of the worst case EUT (8141D).
8. Measurement uncertainty is ±5.0dB
9. Taking into account the worst case measurement uncertainty ,that would be +5dB, the tested item still passed the test.
10. Tests carried out at a lower temperature, which was +13°C, than the normal test condition but it is considered as of no consequence taking in to account that both EUT and test equipment used are specified to operate in a wide temperature range.

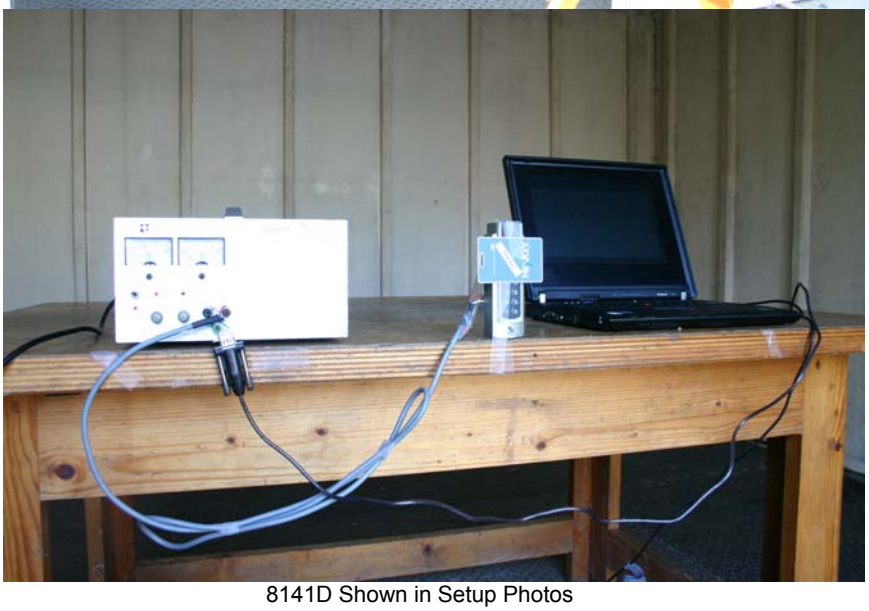
Test engineer

Signature : 

Name : R. van der Meer

Date : April 16, 2008

H-Field Radiated Emissions Test Setup Photos:



8141D Shown in Setup Photos

3 Carrier stability under special conditions.

3.1 Frequency stability (on 13.56 MHz) in accordance with 47 CFR Part 15, section 15.225 (e) & RSS-210, section 7.2.6 (e):

1) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 °C to +50 °C at normal supply voltage (see table 3).

Stability under special conditions Temperature (°C)	Measured frequency (MHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
20.0	13.56207 (reference)	N.A.	N.A.
-20.0	13.56210	< 0.01	PASS
50.0	13.56200	< 0.01	PASS

Table 3.

3.1.1 At 85% and 115% of rated voltage supply level

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency at 85% and at 115% of the rated power supply voltage at 20 °C environmental temperature. The results are stated in Table 4.

Stability under special conditions % variation U	Measured frequency (MHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
100.0	13.56207 *(reference)*	N.A.	N.A.
85.0	13.56210	< 0.01	PASS
115.0	13.56200	< 0.01	PASS

Table 4

3.2 Bandwidth of the emission on 13.56 MHz in accordance with RSS-210, section 7.2.6 (e).

Limit: 20 dB of the bandwidth of the emission shall be within the specified frequency band.
Bandwidth of the emission is determined at the points 20 dB down from the modulated carrier.
Specified frequency band: 13553 kHz - 13567 kHz.

Temperature (°C)	Minimum frequency (kHz)	Maximum frequency (kHz)
+20.0	13562.07	13562.07
-20.0	13562.10	13562.10
+50.0	13562.00	13562.00
Bandwidth	13562.00	13562.10

Table 11
Bandwidth of the emission at 13562kHz.

The measured minimum frequency of 13562.00 kHz and maximum frequency of 13562.10 kHz are well within the specified frequency bandwidth.

3.3 Amplitude stability on 13.56 MHz in accordance with RSS-210.

No particular requirements other than in section 3 of this report.
From measurements performed as indicated below, the amplitude stability will not cause non-compliant situations with respect to exclusion bands or emissions outside permissible bands (band edges)

Stability under special conditions Supply Voltage (Vdc)	Amplitude deviation (dB)
12 (100%)	N.A.
5 (-15%)	-0.28
24 (+15%)	-0.42

Table18
Amplitude stability of the EUT due to voltage variations.

Note (Section 2.2.1 through 2.2.3):
The applicant wants to state:
Since both models incorporated the SmartReaderII V01.03 Main PWA and housed in a plastic enclosure that does not provide different insulative properties to the products – the carrier stability testing was completed on a potted 8141D only and is representative of all models.

Test engineer

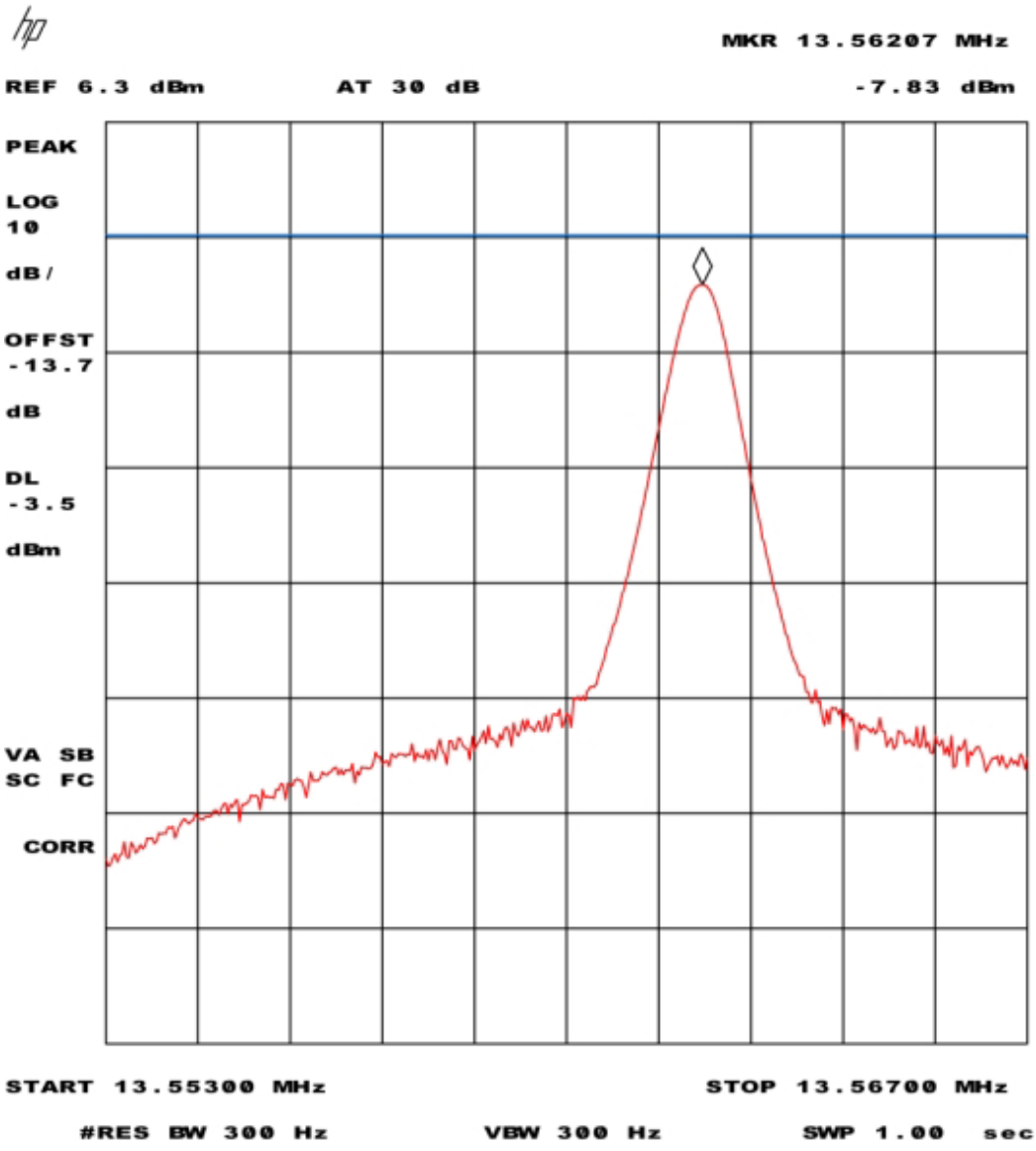
Signature : 

Name : R. van der Meer

Date : April 24, 2008

Carrier Bandwidth/Occupied Bandwidth:

Plot 1 –Bandwidth of the emission at 13562 kHz (Fundamental Carrier),
for IC the measured Occupied Bandwidth is 100Hz



3.4 Frequency stability (on 125 kHz) in accordance with 47 CFR Part 15, section 15.225 (e) & RSS-210, section 7.2.2 (e):

1) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 °C to +50 °C at normal supply voltage (see table 3).

Stability under special conditions Temperature (°C)	Measured frequency (kHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
20.0	124.984 (reference)	N.A.	N.A.
-20.0	124.920	< 0.01	PASS
50.0	124.990	< 0.01	PASS

Table 3.

3.4.1 At 85% and 115% of rated voltage supply level

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency at 85% and at 115% of the rated power supply voltage at 20 °C environmental temperature. The results are stated in Table 4.

Stability under special conditions % variation U	Measured frequency (kHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
100.0	124.984 *(reference)*	N.A.	N.A.
85.0	124.980	< 0.01	PASS
115.0	124.980	< 0.01	PASS

Table 4

3.5 Bandwidth of the emission on 125 kHz in accordance with RSS-210, section 7.2.2 (e).

Limit: 20 dB of the bandwidth of the emission shall be within the specified frequency band.
Bandwidth of the emission is determined at the points 20 dB down from the modulated carrier.
Specified frequency band: 119 kHz - 135 kHz.

Temperature (°C)	Minimum frequency (kHz)	Maximum frequency (kHz)
+20.0	124.984	124.980
-20.0	124.920	124.980
+50.0	124.990	124.980
Bandwidth	124.920	124.990

Table 11
Bandwidth of the emission at 125 kHz.

The measured minimum frequency of 124.920 kHz and maximum frequency of 124.990 kHz are well within the specified frequency bandwidth.

3.6 Amplitude stability on 125 kHz in accordance with RSS-210.

No particular requirements other than in section 3 of this report.
From measurements performed as indicated below, the amplitude stability will not cause non-compliant situations with respect to exclusion bands or emissions outside permissible bands (band edges)

Stability under special conditions Supply Voltage (Vdc)	Amplitude deviation (dB)
12 (100%)	N.A.
5 (-15%)	124.980
24 (+15%)	124.980

Table18
Amplitude stability of the EUT due to voltage variations.

Note (Section 2.2.1 through 2.2.3):
The applicant wants to state:
Since both models incorporated the SmartReaderII V01.03 Main PWA and housed in a plastic enclosure that does not provide different insulative properties to the products – the carrier stability testing was completed on a potted 8141D only and is representative of all models.

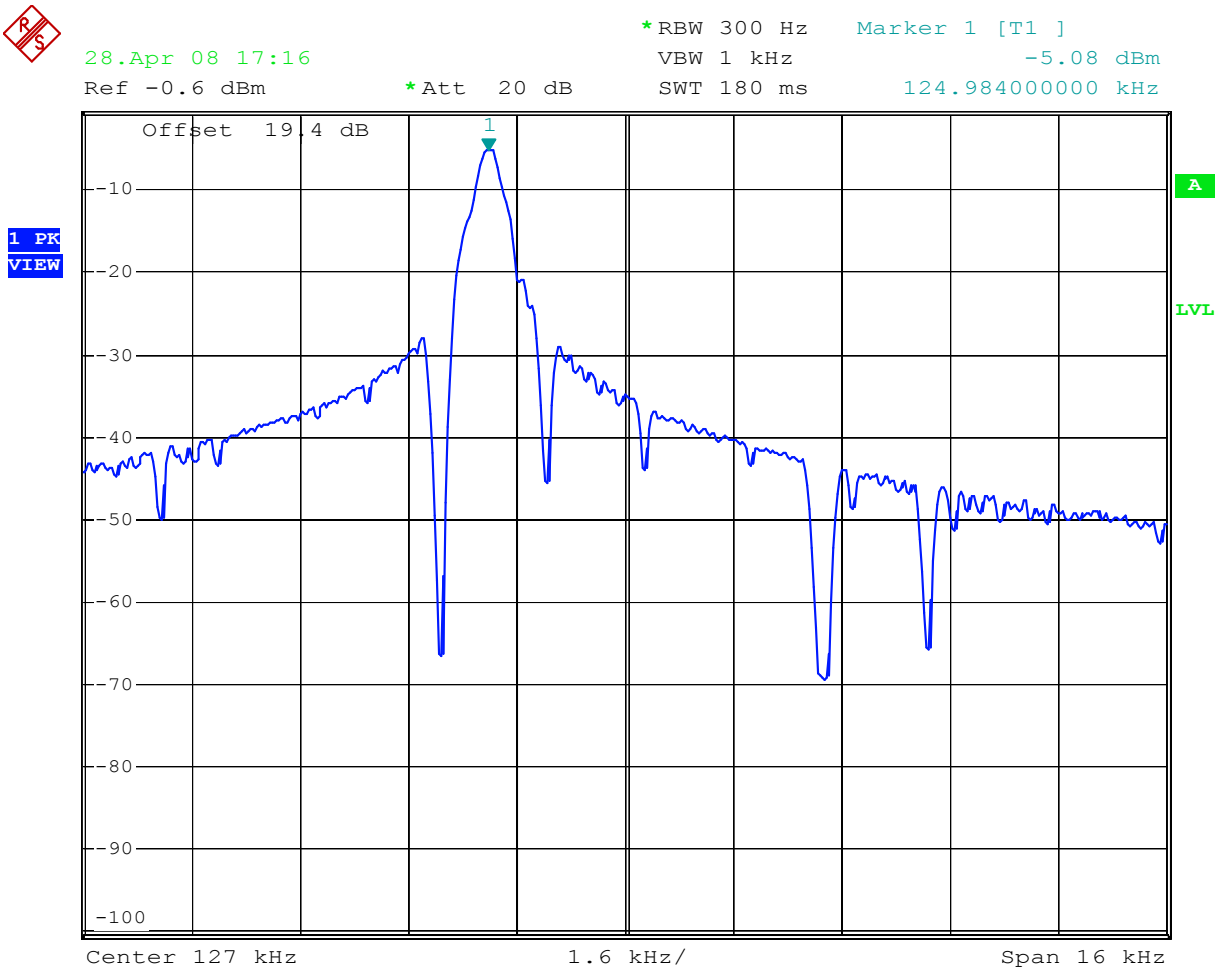
Test engineer

Signature : 

Name : R. van der Meer

Date : April 29, 2008

Plot 2 –Bandwidth of the emission at 125 kHz (Fundamental Carrier),
for IC the measured Occupied Bandwidth is 70 Hz



Date: 28.APR.2008 17:16:13

3.7 Frequency stability (on 138 kHz) in accordance with 47 CFR Part 15, section 15.225 (e) & RSS-210, section 7.2.2 (e):

1) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 °C to +50 °C at normal supply voltage (see table 3).

Stability under special conditions Temperature (°C)	Measured frequency (kHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
20.0	138.762 (reference)	N.A.	N.A.
-20.0	138.762	< 0.01	PASS
50.0	138.800	< 0.01	PASS

Table 3.

3.7.1 At 85% and 115% of rated voltage supply level

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency at 85% and at 115% of the rated power supply voltage at 20 °C environmental temperature. The results are stated in Table 4.

Stability under special conditions % variation U	Measured frequency (kHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
100.0	138.762 *(reference)*	N.A.	N.A.
85.0	138.837	< 0.01	PASS
115.0	138.800	< 0.01	PASS

Table 4

3.8 Bandwidth of the emission on 138 kHz in accordance with RSS-210, section 7.2.2 (e).

Limit: 20 dB of the bandwidth of the emission shall be within the specified frequency band.
Bandwidth of the emission is determined at the points 20 dB down from the modulated carrier.
Specified frequency band: 135 kHz - 140 kHz.

Temperature (°C)	Minimum frequency (kHz)	Maximum frequency (kHz)
+20.0	138.762	138.762
-20.0	138.762	138.762
+50.0	138.800	138.837
Bandwidth	138.762	138.837

Table 11
Bandwidth of the emission at 138 kHz.

The measured minimum frequency of 138.762 kHz and maximum frequency of 138.837 kHz are well within the specified frequency bandwidth.

3.9 Amplitude stability on 138 kHz in accordance with RSS-210.

No particular requirements other than in section 3 of this report.
From measurements performed as indicated below, the amplitude stability will not cause non-compliant situations with respect to exclusion bands or emissions outside permissible bands (band edges)

Stability under special conditions Supply Voltage (Vdc)	Amplitude deviation (dB)
12 (100%)	N.A.
5 (-15%)	138.837
24 (+15%)	138.762

Table18
Amplitude stability of the EUT due to voltage variations.

Note (Section 2.2.1 through 2.2.3):
The applicant wants to state:
Since both models incorporated the SmartReaderII V01.03 Main PWA and housed in a plastic enclosure that does not provide different insulative properties to the products – the carrier stability testing was completed on a potted 8141D only and is representative of all models.

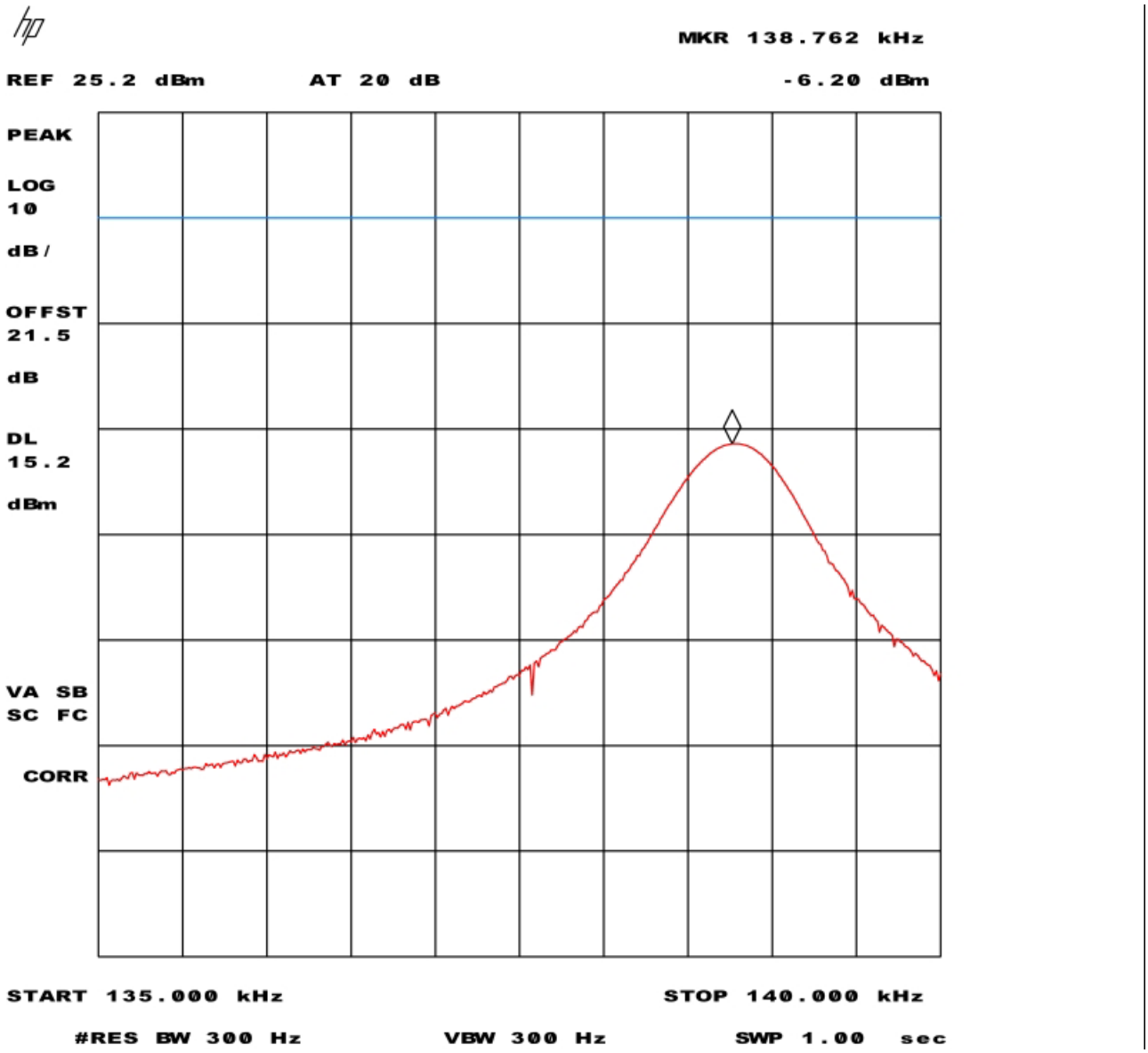
Test engineer

Signature : 

Name : R. van der Meer

Date : April 24, 2008

Plot 3 –Bandwidth of the emission at 138 kHz (Fundamental Carrier),
for IC the measured Occupied Bandwidth is 75 Hz



Carrier/Frequency Stability Test Setup Photos:

4 Conducted emission data.

4.1 Conducted emission data of the EUT (125 kHz and 13.56MHz version)

Supply Voltage (V)	Frequency (MHz)	Measurement results dB(µV) Neutral		Measurement results dB(µV) Line 1		Limits dB(µV)		Result
		QP	AV	QP	AV	QP	AV	
5	0.15 – 1	<20	<20	<20	<20	60.0	50.0	PASS
	5.17	32	33	32	33	60.0	50.0	PASS
	5.60	35	36	35	36	60.0	50.0	PASS
	6.49	36	37	36	37	60.0	50.0	PASS
						60.0	50.0	PASS
12	5.17	33	34	33	34	60.0	50.0	PASS
	5.60	35	36	34	35	60.0	50.0	PASS
	6.49	36	37	36	36	60.0	50.0	PASS
	6.85	35	36	35	36	60.0	50.0	PASS
24	5.47	33	34	33	33	60.0	50.0	PASS
	6.49	34	36	34	36	60.0	50.0	PASS
	6.85	35	36	35	35	60.0	50.0	PASS
	8.84	36	36	36	37	60.0	50.0	PASS

Table 6

Conducted emission measurements. The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15 section 15.207 & RSS-210, section 6.6, at the 110 Volts AC mains connection terminals of the AC/DC power supply which was connected to the EUT, are depicted in table 6. The EUT was tested in both passive and active mode (while detecting a card). Maximum values recorded.

Notes:

1. **The test unit was modified to add a resistive termination in lieu of the antenna.**
2. The test data shown above is of the worst case EUT (8141D).
3. Measurement uncertainty is ±3.5dB

Test engineer

Signature : 

Name : R. van der Meer

Date : April 29, 2008

4.2 Conducted emission data of the EUT (138 kHz and 13.56 MHz version)

Supply Voltage (V)	Frequency (MHz)	Measurement results dB(µV) Neutral		Measurement results dB(µV) Line 1		Limits dB(µV)		Result
		QP	AV	QP	AV	QP	AV	
5	0.15 – 1	<20	<20	<20	<20	60.0	50.0	PASS
	1.1914	29	26	29	25	60.0	50.0	PASS
	3.603	33	25	33	25	60.0	50.0	PASS
	3.777	31	22	31.1	22	60.0	50.0	PASS
	4.1258	30.9	27	30.9	27	60.0	50.0	PASS
	4.376	30.9	22	31.0	22			
	5M – 30M	<30	<30	<30	<30			
12	0.15 – 1	<20	<20	<20	<20	60.0	50.0	PASS
	1.1914	31	27	32	27	60.0	50.0	PASS
	3.603	34.1	28	35	28	60.0	50.0	PASS
	3.777	31.3	23	31.5	23	60.0	50.0	PASS
	4.1258	34.6	29	34.8	29	60.0	50.0	PASS
	4.376	31.2	21	31.3	21	60.0	50.0	PASS
	5M – 30M	<30	<30	<30	<30	60.0	50.0	PASS
24	0.15 – 1	<20	<20	<20	<20	60.0	50.0	PASS
	1.1914	27.8	26	28	26	60.0	50.0	PASS
	3.603	34.1	28	34.3	28	60.0	50.0	PASS
	3.777	32	24	32	24	60.0	50.0	PASS
	4.1258	34.5	28	34.8	28	60.0	50.0	PASS
	5M – 30M	<30	<<30	<30	<30	60.0	50.0	PASS

Table 6

Conducted emission measurements. The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15 section 15.207 & RSS-210, section 6.6, at the 110 Volts AC mains connection terminals of the AC/DC power supply which was connected to the EUT, are depicted in table 6. The EUT was tested in both passive and active mode (while detecting a card). Maximum values recorded.

Notes:

1. **The test unit was modified to add a resistive termination in lieu of the antenna.**
2. The test data shown above is of the worst case EUT (8141D).
3. Measurement uncertainty is ±3.5dB

Test engineer

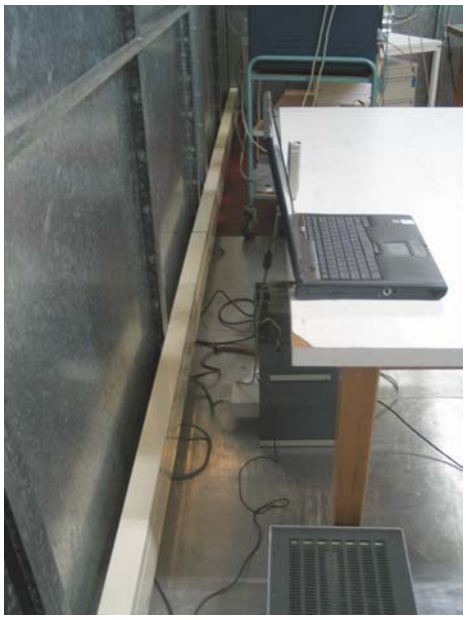
Signature : 

Name : R. van der Meer

Date : April 18, 2008

Conducted Emissions Test Setup Photos:

8141D Shown in Setup Photos



5 List of utilized test equipment.

Inventory number	Description	Brand	Model	Last cal.	Next cal.
12476	Antenna mast	EMCO	TR3	NA	NA
12477	Antenna mast 1-4 mtr	Poelstra	NA	NA	NA
12482	Loop antenna	EMCO	6507	04/2008	04/2009
12503	LISN	R&S	ESH2-Z5	01/2008	01/2010
12513	LISN	EMCO	3625/2	01/2008	01/2010
12640	Temperature chamber	Heraeus	VEM03/500	01/2008	01/2009
15275	Spectrum analyzer	HP	8594E	10/2007	10/2008
99538	Spectrum analyzer	R&S	FSP40	04/28/2007	04/28/2008
99580	Open Area testsite	Comtest	NA	09/2006	09/2009
14051	Anechoic room	Comtest	NA	NA	NA
15633	Biconilog Testantenna	Chase	CBL 6111B	02/2008	02/2009
15667	Measuring receiver	R&S	ESCS 30	04/2007	04/2008
99045	Power supply	Delta	E030-3	04/2008	04/2009
99161	Variac 110Vac	RFT	LTS001	NA	NA
99318	Digital multimeter	HP	34401A	10/2007	10/2008
99596	Preamplifier 0.5 GHz - 18 GHz	Miteq	AMF-5D-005180-28-13p	07/2006	07/2008

NA= Not Applicable

Appendix 1
HID Attestation of Similarity
(added on request of the applicant)
(Photos of Products on Following Page)

HID Global
10383 Westmoor Drive, Ste. 300
Westminster, CO 80021

Attestation of Similarity

The SmartID product family consists of different models that incorporate an identical main CCA (SmartReaderII V01.03) that has integral, Power Section, I/O Section, Digital Processing Section, RF Section and Antenna. This main board is then placed within different plastic enclosure that do not impact compliance for Safety, Radio, Emissions and most immunity requirements. In addition, other CCA's may be added to the main CCA integral to the plastic enclosure to add functionality to the device (E.g. a passive Keypad, 125kHz Prox and biometrics). In cases where the basic geometries may affect compliance – prescans are performed in order to identify the worst case model. All Engineering justifications and or compliance impacts are addressed within the report in the form of additional testing and/or or notes.

SmartID

The following 3 readers share the identical basic product configuration geometry – the only differences between the models is described below.

Reader Type	Mullion – 13.56MHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic/Potted	SmartReaderII V01.03	N/A	N/A
Part Number	8030D			

Reader Type	Mullion with Keypad – 13.56MHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic/Potted	SmartReaderII V01.03	Membrane Keypad V01.00	N/A
Part Number	8031D			
Difference Description From 1st Model	The only difference of this Model from the 8030D above is that a passive keypad is added – changing the product mechanical geometry that may effect emissions and immunity. Everything else is identical.			

Reader Type	Desktop – 13.56MHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic	SmartReaderII V01.03	N/A	N/A
Part Number	8032D			
Difference Description From 1st Model	The only difference of this Model from the 8030D above is that it is placed in a differently molded plastic enclosure. Everything else is identical. There is no other board (passive or active) within this product – therefore testing the 8030D applicable to the 8032D and does not need redone. However, ESD testing shall be done on this unit for the plastic housing is different than the 8030D.			

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Fax: 303.791.6840
Web: www.hidcorp.com

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SmartTRANS1

The following 2 readers share the identical basic product configuration geometry – the only differences between the models is described below.

Reader Type	Mullion – SmartTRANS1 – 13.56MHz&125kHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic/Potted	SmartReaderII V01.03	SmartExtension125 V02.00	N/A
Part Number	8100D			
Difference Description From 1st Model	The only difference of this Model from the 8030D above is that it has an add on CCA "SmartExtension125" that adds the ability to read 125kHz proximity cards that sits above the SmartReaderII board within the potting and plastic enclosure. In addition, the buzzer and back LED are relocated – straight through to the SmartExtension125 CCA. Everything else is identical.			

Reader Type	Mullion with Keypad – SmartTRANS1 – 13.56MHz&125kHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic/Potted	SmartReaderII V01.03	SmartExtension125 V02.00	Membrane Keypad V01.00
Part Number	8101D			
Difference Description From 1st Model	The only difference of this Model from the 8031D above is that it has an add on CCA "SmartExtension125" that adds the ability to read 125kHz proximity cards that sits above the SmartReaderII board within the potting and plastic enclosure. In addition, the buzzer and back LED are relocated – straight through to the SmartExtension125 CCA. Everything else is identical.			

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SmartTRANS2

The following 4 readers share the identical basic product configuration geometry – the only differences between the models is described below.

Reader Type	Mullion – SmartTRANS2 – 13.56MHz&125/138kHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic/Potted	SmartReaderII V01.03	SmartExtensionPSK V01.10	N/A
Part Number	8140D			
Difference Description From 1st Model	The only difference of this Model from the 8030D above is that it has an add on CCA "SmartExtensionPSK" that adds the ability to read 125kHz proximity cards that sits above the SmartReaderII board within the potting and plastic enclosure. In addition, the buzzer and back LED are relocated – straight through to the SmartExtensionPSK CCA. Everything else is identical.			

Reader Type	Mullion with Keypad – SmartTRANS2 – 13.56MHz&125/138kHz Reader			
	Enclosure	Main CCA	CCA #2	CCA# 3
Representative Test Sample Configuration	Plastic/Potted	SmartReaderII V01.03	SmartExtensionPSK V01.10	Membrane Keypad V01.00
Part Number	8141D			
Difference Description From 1st Model	The only difference of this Model from the 8031D above is that it has an add on CCA "SmartExtensionPSK" that adds the ability to read 125kHz proximity cards that sits above the SmartReaderII board within the potting and plastic enclosure. In addition, the buzzer and back LED are relocated – straight through to the SmartExtensionPSK CCA. Everything else is identical.			

Supporting product photos are on the following pages after the signature below.

Company Representative Signature:
Todd Seeley – Manager/Compliance Engineer

4-15-08
Statement Date:

Page 3 of 4

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Fax: 303.404.6840
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From Right to Left (Products in Plastic Enclosures)

1. 8030D Mullion Reader – Also Represents the 8100D & 8140D.
2. 8031D Mullion Reader with Keypad – Also Represents the 8101D & 8141D
3. 8032D Desktop Reader/Programmer
4. SmartReaderII V01.03 Main CCA (the main active CCA incorporated in every product addressed by this AoS).

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