



Testing and certification of, consultancy and
research concerning, electronic and electric
appliances, systems, installations and
telecommunication systems

**TEST REPORT CONCERNING THE COMPLIANCE OF A
13.56 MHZ PASSPORT/OCR READER,
BRAND @-PASSPORT, MODEL 800-8251,
WITH 47 CFR PART 15 (AUGUST 14, 2006).**

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

**TNO Electronic Products & Services (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@tno-eps.com
Web: www.tno-eps.com



Test specification(s): 47 CFR Part 15 (2006-08-14)
Description of EUT: 13.56 MHz Passport/OCR Reader
Manufacturer: HID Global Corporation/Integrated Engineering
Brand mark: @-Passport
Model: 800-8251
FCC & IC ID: JQ6-EDOC

MEASUREMENT/TECHNICAL REPORT

HID Global Corporation & Integrated Engineering B.V.

Model : @-PASSPORT

FCC ID: JQ6-EDOC

November 1, 2007

This report concerns:	Original grant/certification	Class 2 change	Verification
Equipment type:	13.56 MHz Passport / OCR reader		
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) ?	Yes	No	n.a.
Report prepared by:	Name	: O.H. Hoekstra	
	Company name	: TNO Electronic Products & Services (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@tno-eps.com	

The data taken for this test and report herein was done in accordance with 47 CFR Part 15 (August 14, 2006) and the measurement procedures of ANSI C63.4-2003. TNO Electronic Products & Services (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: November 1, 2007

Signature: [signature]

H.J. Pieters
Project Manager TNO Electronic Products & Services (EPS) B.V.



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Description of test item

Test item : 13.56 MHz Passport/OCR reader
Manufacturer : HID Global Corporation / Integrated Engineering B.V.
Brand : @-PASSPORT
Model : 800-8251
Serial number(s) : n.a.
Revision : n.a.
Receipt date : September 17, 2007

Applicant information

Applicant's representative : Mr. R. Holslag / Todd Seeley
Company : Integrated Engineering / HID Global Corporation
Address : Paasheuvelweg 20 / 10385 Westmoor Drive Suite 300
Postal code : 1105 BJ / 80021
City : Amsterdam-Zuidoost / Westminster, CO
Country : The Netherlands / USA
Telephone number : +31 (0)20 4620755 / 1+ 303 404 6773
Telefax number : +31 (0)20 4620756
E-mail : info@smart-ID.com / tseeley@hidglobal.com
Internet : www.smart-ID.com / www.hidglobal.com

Test(s) performed

Location : Niekerk
Test(s) started : September 21, 2007
Test(s) completed : September 28, 2007
Purpose of test(s) : Equipment Authorization (Original grant/certification)
Test specification(s) : 47 CFR Part 15 (August 14, 2006)
Test engineers : M. Edwards van Muyen / R. van der Meer / O.H. Hoekstra
Report written by : O.H. Hoekstra   
Report date : November 1, 2007

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The test results relate only to the item(s) tested.



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FCC & IC ID: JQ6-EDOC

1 General information.

1.1 Product description.

1.1.1 Introduction.

The EUT is a 13.56 MHz passport / OCR reader. It is capable of reading 13.56 MHz inductive tags. 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-EDOC.

1.2.2 FCC ID: JQ6-EDOC

This report supports the results of the 13.56 MHz passport / OCR reader FCC ID: JQ6-EDOC.

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	:	13.56 MHz passport / OCR reader
Manufacturer	:	HID Global Corporation & Integrated Engineering B.V.
Brand	:	@-PASSPORT
Model	:	800-8251
Serial number	:	n.a.
Remarks	:	--
Auxiliary equipment	:	AC/DC adapter
Manufacturer	:	Friwo
Brand	:	Friwo
Model	:	FW75550/05
Voltage input rating	:	100 - 240 VAC
Current input rating	:	400 mA
Voltage output rating	:	5 VDC
Current output rating	:	2.4 A



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1.3.1 Description of input and output ports.

Number	Ports	From	To	Shielding	Remarks
1	AC mains	AC mains	AE1 (AC/DC adapter)	yes / no	None
2	DC power input port	AE1 (AC/DC adapter)	EUT	yes / no	None
3	USB	EUT	AE	yes / no	None

AE = Auxiliary equipment

1.4 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (August 14, 2006), 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 calculation in appendix 1 has been applied.

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 has reviewed the technical characteristics of the test facilities at TNO Electronic Products & Services (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 list of all public test facilities is available on the Internet at <http://www.fcc.gov>.

1.6 Product labeling.

In accordance with 47 CFR Part 15.19 (a)(3) the following text shall be placed on a label, which is attached to the EUT:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

A label, in accordance with 47 CFR Part 15.19 (b)(1)(i), shall be attached to the EUT.

For further details about the labeling requirements (size, legibility, etc.) as set by the Federal Communications Commission see 47 CFR Part 15.19 (a)(3), 47 CFR Part 15.19 (b)(1), 47 CFR Part 15.19 (b)(2) and 47 CFR Part 15.19 (b)(4).



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2 System test configuration

2.1 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.

2.2 EUT mode of operation

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

2.3 Special accessories

No special accessories are used and/or needed to achieve compliance with the appropriate sections of 47 CFR Part 15.

2.4 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the appropriate sections of 47 CFR Part 15.

2.5 Block diagram of the EUT

The block diagram is available in the technical documentation package, which will be submitted to the Commission.

2.6 Schematics of the EUT

The schematics are available in the technical documentation package, which will be submitted to the Commission.

2.7 Part list of the EUT

The part list is available in the technical documentation package, which will be submitted to the Commission.



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3 Radiated emission data

3.1 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field).

Frequency	Measurement results dB μ V		Detector	Antenna factor dB	Cable loss dB	Calculated results dB(μ V)/m	Limits Part 15.209 & 15.225 dB(μ V)/m
	3 meters	10 meters					
9.0 – 490.0 kHz	n.i.	n.i.	QP/AV	-	-	-	48.5 - 13.8 (300 m)
490 - 1705 kHz	n.i.	n.i.	QP	-	-	-	33.8 - 29.5 (30 m)
1.705 – 13.56 MHz	n.i.	n.i.	QP	-	-	-	29.5 (30 m)
13.56 MHz	59.5	37.5	QP	+19.7	1	+40.2	84.0 (30 m)
27.12 MHz	16.7	< 3.0	QP	+19.7	1	-2.6	29.5 (30 m)
27.12 – 30.0 MHz	n.i.	n.i.	QP	-	-	-	29.5 (30 m)

Table 1
Radiated emissions of the EUT, Average and Quasi peak values.

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15, sections 15.205, 15.209 and 15.225, are depicted in table 1. Measurement results are readings from the measuring device in dB μ V. Using the appropriate antenna factor and cable losses, these readings are expressed directly into dB (μ V)/m and are recalculated at distances as appropriate.

Notes:

1. (AV) average detector with a resolution bandwidth of 9 kHz.
2. (QP) quasi peak detector with a resolution bandwidth of 9 kHz.
3. The computation method for calculation of the field strength at different distances can be found in Appendix 1. The extrapolation factor of 40 dB/decade was used for 3m to 30m (80 dB for 3m to 300m, only applicable for 9 kHz to 490 kHz range).
4. n.i. indicates that no field strength values related to the EUT could be measured for the listed frequency or for the listed frequency range.
5. << indicates that field strength values of radiated emissions are more than 20 dB below the applicable limit.
6. The reported field strength values are the worst-case values at the indicated frequency. The EUT was varied in three positions, the loop antenna was varied in horizontal and vertical orientations and also around it's axis.
7. Measurement uncertainty is ± 5.0 dB

Test engineer

Signature :

Name : M. Edwards van Muyen

Date : September 27, 2007



Test specification(s): 47 CFR Part 15 (2006-08-14)
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Frequency	Measurement results dB μ V		Detector	Antenna factor dB	Cable loss dB	Calculated results dB(μ V)/m	Limits Part 15.209 & 15.225 dB(μ V)/m
	3 meters	10 meters					
9.0 - 90 kHz	n.i.	n.i.	PK	-	-	-	68.5 - 48.5 (300 m)
110 - 490 kHz	n.i.	n.i.	PK	-	-	-	46.8 - 33.8 (300 m)

Table 2
Radiated emissions of the EUT, Peak values.

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15, section 15.35 are depicted in table 2. Measurement results are readings from the measuring device in dB μ V. Using the appropriate antenna factor and cable losses, these readings are expressed directly into dB (μ V)/m and are recalculated at distances as appropriate.

Notes:

1. (PK) peak detector with 9 kHz resolution bandwidth.
2. Only for frequencies where average radiated emission measurements are specified.
3. The computation method for calculation of the field strength at different distances can be found in Appendix 1. The extrapolation factor of 40 dB/decade was used for 3m to 30m (80 dB for 3m to 300m, only applicable for 9 kHz to 490 kHz range)..
4. n.i. indicates that no field strength values related to the EUT could be measured for the listed frequency or for the listed frequency range.
5. << indicates that field strength values of radiated emissions are more than 20 dB below the applicable limit.
8. The reported field strength values are the worst-case values at the indicated frequency. The EUT was varied in three positions, the loop antenna was varied in horizontal and vertical orientations and also around it's axis.
6. Measurement uncertainty is ± 5.0 dB

Test engineer

Signature

Name

: M. Edwards van Muyen

Date

: September 27, 2007



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3.2 Radiated field strength measurements (FCC 15-209: 30 MHz – 1 GHz, E-field)

3.2.1 Average and Quasi peak values of the emissions

Frequency (MHz)	Measurement results dB(μ V)/m @ 3 metres		Detector	Limits dB(μ V)/m	Margin (dB)		Result
	Vertical	Horizontal			Vertical	Horizontal	
40.68	36.0	35.0	QP	40.0	-4.0	-5.0	PASS
54.24	28.4	23.4	QP	40.0	-11.6	-16.6	PASS
67.81	15.5	20.3	QP	40.0	-24.5	-19.7	PASS
81.37	30.3	26.0	QP	40.0	-9.7	-14.0	PASS
108.5	33.1	30.2	QP	43.5	-10.4	-13.3	PASS
122.1	34.5	26.9	QP	43.5	-9.0	-16.6	PASS
339.1	22.8	28.5	QP	46.0	-23.2	-17.5	PASS
881.5	29.6	29.6	QP	46.0	-16.4	-16.4	PASS
922.2	37.2	36.2	QP	46.0	-8.8	-9.8	PASS
1000-4000	< 34.0	< 34.0	AV	54.0	< -20.0	< -20.0	PASS

Table 3
Radiated emissions, Average and Quasi peak values of the EUT
while operating in transmit mode.

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15, sections 15.205, 15.209 and 15.225 are depicted in table 3.

Notes:

1. (AV) average detector
2. (QP) quasi peak detector
3. Maximum emissions from active mode and while detecting a card
4. Resolution bandwidth for QP: 120 kHz, Video bandwidth: not applicable
Resolution bandwidth for AV: 1 MHz, Video bandwidth: 10 Hz (linear amplitude scale).
5. The reported field strength values are the worst case values at the indicated frequency. The EUT was varied in three positions, the antenna was varied in horizontal and vertical orientations and also in height (between 1m and 4m).
6. Measurement uncertainty is ± 5.0 dB



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3.2.2 Peak values of the emissions

Frequency (MHz)	Measurement results dB(μ V)/m @ 3 metres		Detector	Limits dB(μ V)/m	Margin (dB)		Result
	Vertical	Horizontal			Vertical	Horizontal	
1000-4000	< 54.0	< 54.0	PK	74.0	< -20.0	< -20.0	PASS

Table 4
Radiated emissions, Peak values of the EUT
while operating in transmit.

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15, section 15.35, are depicted in table 4.

Notes:

1. (PK) peak detector.
2. Maximum emissions from active mode and while detecting a card
3. Resolution bandwidth 1 MHz; Video bandwidth 3 MHz.
4. Only for frequencies where average radiated emission measurements are specified.
5. The reported field strength values are the worst case values at the indicated frequency.
The EUT was varied in three positions, the antenna was varied in horizontal and vertical orientations and also in height (between 1m and 4m).
6. Up to 4 GHz.
7. Measurement uncertainty is ± 5.0 dB

Test engineer

Signature : 

Name : Richard van der Meer

Date : September 28, 2007



Test specification(s): 47 CFR Part 15 (2006-08-14)
Description of EUT: 13.56 MHz Passport/OCR Reader
Manufacturer: HID Global Corporation/Integrated Engineering
Brand mark: @-Passport
Model: 800-8251
FCC & IC ID: JQ6-EDOC

4 Conducted emission data.

4.1 Conducted emission data of the EUT.

Frequency (MHz)	Measurement results dB(μ V) Line 1		Measurement results dB(μ V) Line 2		Limits dB(μ V)		Margin (dB) Line 1		Margin (dB) Line 2		Result
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV	
0.16	35.9	20.9	36.6	22.2	65.5	55.5	-29.6	-34.6	-28.9	-33.3	PASS
0.67	25.8	22.7	30.5	24.5	56.0	46.0	-30.2	-23.3	-25.5	-21.5	PASS
13.56	45.5	44.2	45.5	43.2	60.0	50.0	-14.5	-5.8	-14.5	-6.8	PASS
27.12	29.4	27.9	26.9	26.8	60.0	50.0	-30.6	-22.1	-33.1	-23.2	PASS

Table 5
Conducted emission measurements.

Conducted emission measurements. The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15, section 15.207, at the 110 Volts AC mains connection terminals of the AC/DC power supply which was connected to the EUT, are depicted in table 5. The EUT was tested in both active mode, and while detecting a card. Maximum values were recorded.

Notes:

1. The conducted emissions on frequencies which are not listed in the table above were found to be below 25 dB μ V on both line 1 and line 2.
2. The resolution bandwidth used was 9 kHz.
3. Measurement uncertainty is ± 3.5 dB

Test engineer

Signature :

Name : Richard van der Meer

Date : October 31, 2007



Test specification(s): 47 CFR Part 15 (2006-08-14)
Description of EUT: 13.56 MHz Passport/OCR Reader
Manufacturer: HID Global Corporation/Integrated Engineering
Brand mark: @-Passport
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FCC & IC ID: JQ6-EDOC

5 Bandwidth of the emission.

5.1.1 Bandwidth of the emission on 13.56 MHz in accordance with 47 CFR Part 15, section 15.225 (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)	Bandwidth (kHz)
+21.0	13561.640	13562.660	1.02
-20.0	13561.757	13562.777	1.02
+50.0	13561.610	13562.630	1.02

Table 7
Bandwidth of the emission at 13562 kHz.

Test engineer

Signature :

Name : M. Edwards van Muyen

Date : October 31, 2007



Test specification(s): 47 CFR Part 15 (2006-08-14)
 Description of EUT: 13.56 MHz Passport/OCR Reader
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 Brand mark: @-Passport
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 FCC & IC ID: JQ6-EDOC

6 Carrier stability under special conditions

6.1 Carrier stability with respect to the operating frequency of 13.56 MHz.

6.2 Frequency stability (on 13.56 MHz) in accordance with 47 CFR Part 15, section 15.225 (e)

6.2.1 At -20 °C and +50 °C and 100% of the rated voltage supply level.

- 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.

Stability under special conditions Temperature (°C)	Measured frequency (MHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
+21.0	13562.114 (reference)	N.A.	N.A.
-20.0	13562.231	+0.00086	PASS
+50.0	13562.084	+0.00022	PASS

Table11
Frequency stability of the EUT due to temperature variations.

6.2.2 At 85% and 115% of the rated voltage supply level and 20 °C.

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.

Stability under special conditions % variation U	Measured frequency (MHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
100.0	13562.114 (reference)	N.A.	N.A.
85.0	13562.114	0.0	PASS
115.0	13562.114	0.0	PASS

Table 12
Frequency stability of the EUT due to voltage variations.

Test engineer

Signature

Name : O.H. Hoekstra

Date : October 31, 2007



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6.2.3 Amplitude stability on 13.56 MHz in accordance with 47 CFR Part 15, section 15.31 (e).

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 (V)	Amplitude deviation (dB)
115 (100%)	N.A.
97 (-15%)	0.0
132 (+15%)	0.0

Table 13
Amplitude stability of the EUT due to voltage variations.

Test engineer

Signature :

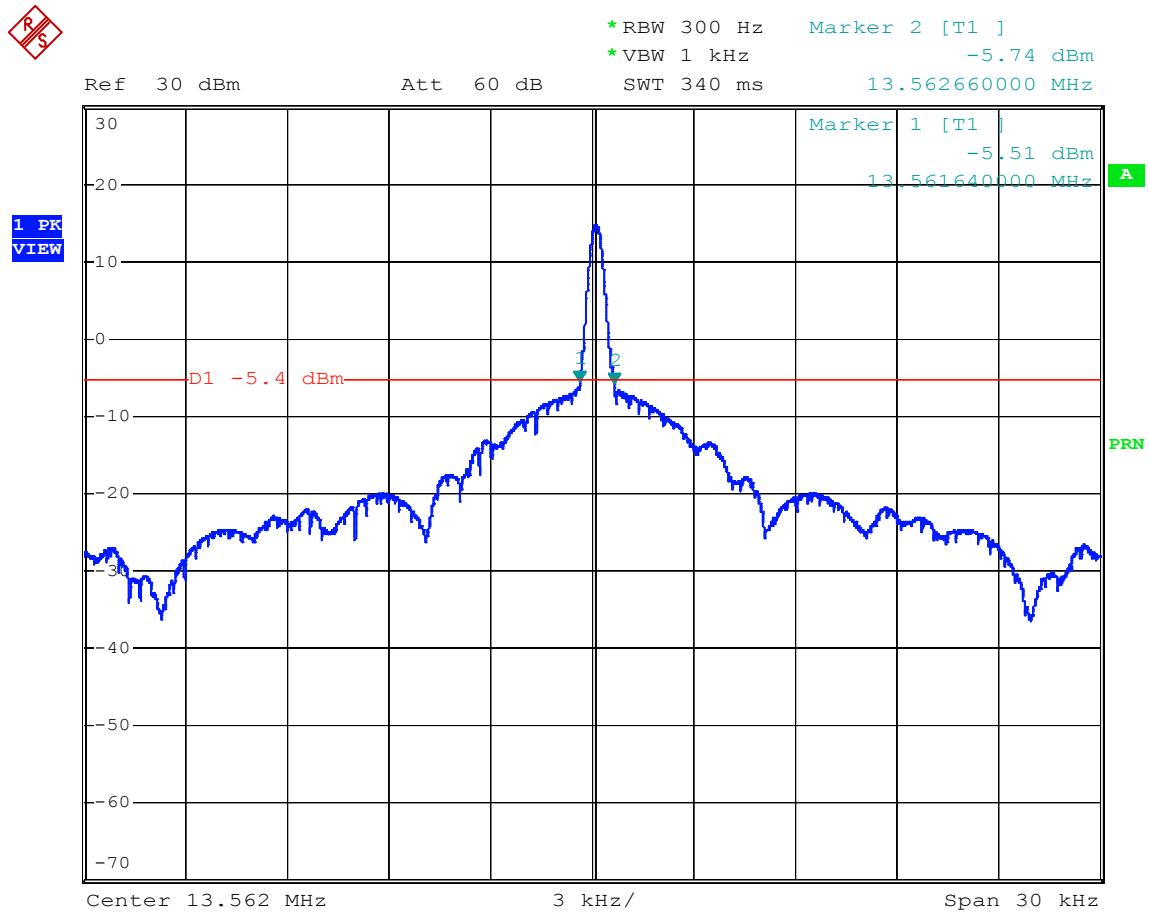
Name : M. Edwards van Muyen

Date : October 31, 2007



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7 Plots of the emission



Date: 31.OCT.2007 15:17:18

Plot 1 – 1.02kHz Bandwidth of the emission at 13562 kHz

Note:

The transmit signal at 13562 kHz is a modulated carrier with a duty cycle of > 99%
OBW = 1.02kHz



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8 List of utilized test equipment

inventory nr.	description	brand	model	date last cal	date cal due
12482	Loop antenna	EMCO	6507	04/2007	04/2008
12483	Guidehorn	EMCO	3115	03/2007	03/2008
12484	Guidehorn	EMCO	3115	03/2007	03/2008
12533	Signalgenerator	MARCONI	2032	03/2007	03/2008
12605	Calibrated dipole 28MHz-1GHz	EMCO	3121c	09/2002	09/2007
12640	Temperature chamber	Heraeus	VEM03/500	01/2007	01/2008
99538	Spectrum analyzer	R&S	FSP40	04/2007	04/2008
99580	Open Area testsite	Comtest	NA	09/2006	09/2008
14051	Anechoic room	Comtest	NA	NA	NA
15633	Biconilog Testantenna	Chase	CBL 6111B	02/2007	02/2008
15667	Measuring receiver	R&S	ESCS 30	04/2007	04/2008
99596	Preamplifier 0.5 GHz - 18 GHz	Miteq	AMF-5D-005180-28-13p	07/2006	07/2008

NA= Not Applicable



Test specification(s): 47 CFR Part 15 (2006-08-14)
Description of EUT: 13.56 MHz Passport/OCR Reader
Manufacturer: HID Global Corporation/Integrated Engineering
Brand mark: @-Passport
Model: 800-8251
FCC & IC ID: JQ6-EDOC

Appendix 1

Calculated measurements results radiated field strength, H-Field

The rules of Part 15 section 15.31 allow scaling of the measured values or limits when measurements are made at distances other than those specified. The extrapolation factor for frequencies below 30 MHz are 40 dB/decade which means that for a distance change of 10 to 1 (a decade), the limit, or measured value, may be recalculated by adding (moving closer) or subtracting (moving away) 40 dB, respectively.

It is also possible to make radiated-emission measurements at two different distances and extrapolate to a third distance. The calculation method described below, should then be followed.

General Formula:

d_1 = short distance

d_2 = long distance

So:

$$(d_1/d_2)^n = H_{d2}/H_{d1}$$
$$n \log(d_1/d_2) = \log(H_{d2}/H_{d1})$$