



**TEST REPORT CONCERNING THE COMPLIANCE OF AN
INDUCTIVE RFID CARD READER,
OPERATING ON 13.56 MHz.
BRAND Nedap, MODEL DVD31356**

**WITH 47 CFR PART 15 (10-1-09 EDITION) AND THE
REQUIREMENTS OF INDUSTRY CANADA:
RSS-GEN AND RSS-210 (ISSUE 8, DECEMBER 2010)**

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May 12, 2011**

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Industry Canada : 2932G-1
VCCI Registered : R-1518, C-1598
R&TTE, LVD, EMC Notified Body : 1856

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MEASUREMENT/TECHNICAL REPORT

N.V. Nederlandsche Apparatenfabriek "Nedap"

Brand: Nedap
Model: DVD31356
FCC ID: CGDVD31356
IC: 1444A-DVD31356

May 12, 2011

This report concerns:	Original grant/certification	Class 2 Permissive Change	Verification
Equipment type:	Inductive RFID Card Reader		
Report prepared by:	Name	: Richard van der Meer	
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The data taken for this test and report herein was done in accordance with 47 CFR Part 15 (10-1-09 Edition), RSS-GEN AND RSS-210 and the measurement procedures of ANSI C63.4-2009. 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 12, 2011

Signature:



O. Hoekstra
Senior Engineer Telecom TÜV Rheinland EPS B.V.

Summary

The device under test does:

- fulfill the general approval requirements as identified in this test report
- not fulfill the general approval requirements as identified in this test report

Description of test item

Test item (EUT) : Inductive RFID Card Reader
Manufacturer : N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand : Nedap
Model(s) : DVD31356
Serial number(s) : X312 B 018 and V412 B005
FCC ID : CGDDVD31356
IC : 1444A-DVD31356
Receipt date : September 28, 2010


Applicant information


Applicant's representative : Mr. J. Hulshof
Company : N.V. Nederlandsche Apparatenfabriek "Nedap"
Address : Parallelweg 2
Postal code : 7141 DC
City : Groenlo
Country : The Netherlands
Telephone number : +31 544 471 162
Telefax number : +31 544 466 475

Test(s) performed

Location : Niekerk
Test(s) started : September 28 , 2010
Test(s) completed : May 12, 2011
Purpose of test(s) : Equipment Authorization (Original grant/certification)

Test specification(s) : 47 CFR Part 15 (10-1-09 Edition) and RSS-GEN AND RSS-210
Compliance statement : The test has demonstrated that this unit complies with stipulated standards.

Test engineer(s) : R. van der Meer 

Report written by : R. van der Meer 

Report date : May 12, 2011

This report is in conformity with NEN-EN-ISO/IEC 17025: 2005

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

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1 General information.

1.1 Product description.

1.1.1 Introduction.

The brand Nedap model DVD31356, hereafter referred to as EUT is an inductive RFID card reader intended to be used in library systems. The EUT can be used in combination with external antennas in the form of a Book Trolley and/or CD/DVD Trolley and antennas that can be placed at an entrance of a library for Electronic Article Surveillance (EAS). The EUT can be connected to existing hardware (PC) and/or Library Management Systems. 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 registration number.

FCC ID: CGDDVD31356 and IC: 1444A-DVD31356.

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 RFID Card Reader
Manufacturer	:	N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand	:	Nedap
Model	:	DVD31356
Serial number	:	X312 B 018 and V412 B005
Voltage input rating	:	100 – 240Vac
Voltage output rating	:	--
Current input rating	:	--
Antenna	:	Intergral
Operating frequency	:	13.56 MHz
Remarks	:	Only used in horizontal position
AUX1	:	Laptop PC including power supply adapter
Manufacturer	:	Lenovo
Brand	:	Lenovo
Model	:	Thinkpad R60
Serial number	:	L3-BF847 07/02
Voltage input rating	:	20Vdc
Voltage output rating	:	--
Current input rating	:	3.25 A
Remarks	:	Required to read data from EUT, property TUV Rheinland EPS

AUX2 : Power supply
 Brand : Power-win Technology Corp.
 Model : PW-012A2-1Y09C1
 Serial number : --
 Voltage input rating : 100 – 240V 50-60Hz
 Voltage output rating : 9Vdc
 Current input rating : 1A
 Remarks : n.a.

AUX3 : Antenna
 Brand : Nedap
 Model : PG45 (2-loop and 3-loop)
 Serial number : V123 001
 Voltage input rating : --
 Voltage output rating : n.a.
 Current input rating : n.a.
 Remarks : Only used in vertical position

AUX4 : Antenna
 Brand : Nedap
 Model : Book Trolley
 Serial number : --
 Voltage input rating : --
 Voltage output rating : n.a.
 Current input rating : n.a.
 Remarks : Only used in vertical position

AUX5 : Antenna
 Brand : Nedap
 Model : CD/DVD Trolley
 Serial number : --
 Voltage input rating : --
 Voltage output rating : n.a.
 Current input rating : n.a.
 Remarks : Only used in vertical position

AUX6 : Splitter/Multiplexer
 Brand : Nedap
 Model : Splitter 4
 Serial number : XN19 001
 Voltage input rating : --
 Voltage output rating : n.a.
 Current input rating : n.a.
 Remarks : n.a.

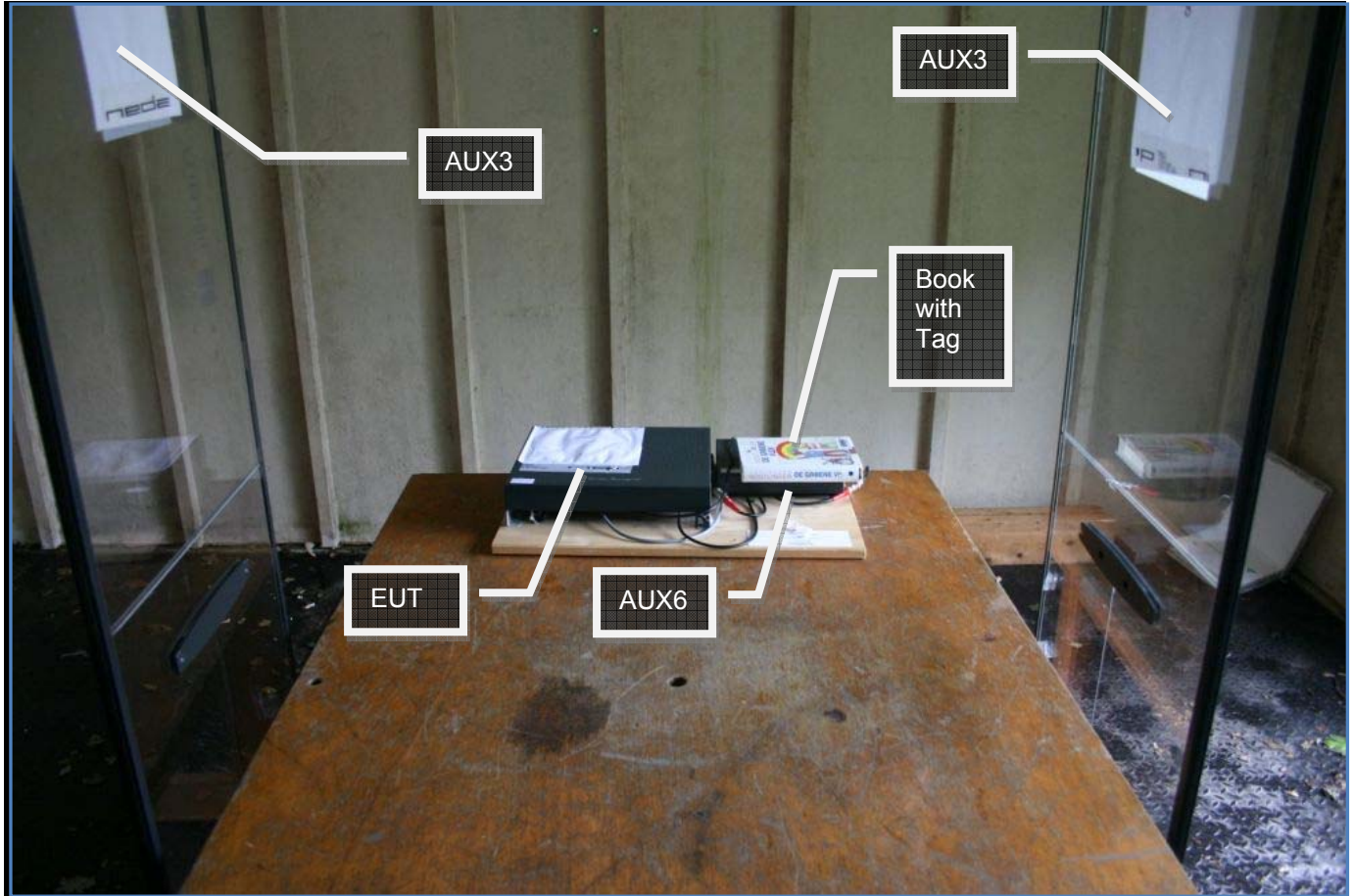


Photo 1: EUT in a typical setup (PG45 antenna's shown)

1.3.1 Description of input and output ports.

Number	Ports	From	To	Shielding	Remarks
1	AC mains	AC mains	EUT	yes / no	None
2	Antenna connection	EUT	AUX3,4 or 5	yes / no	None
3	Serial port (rs-232 or LAN)	EUT	AUX1	yes / no	None

Operation mode 1: System "Passive", not detecting a tag.
 Operation mode 2: System "Active", detecting a tag.

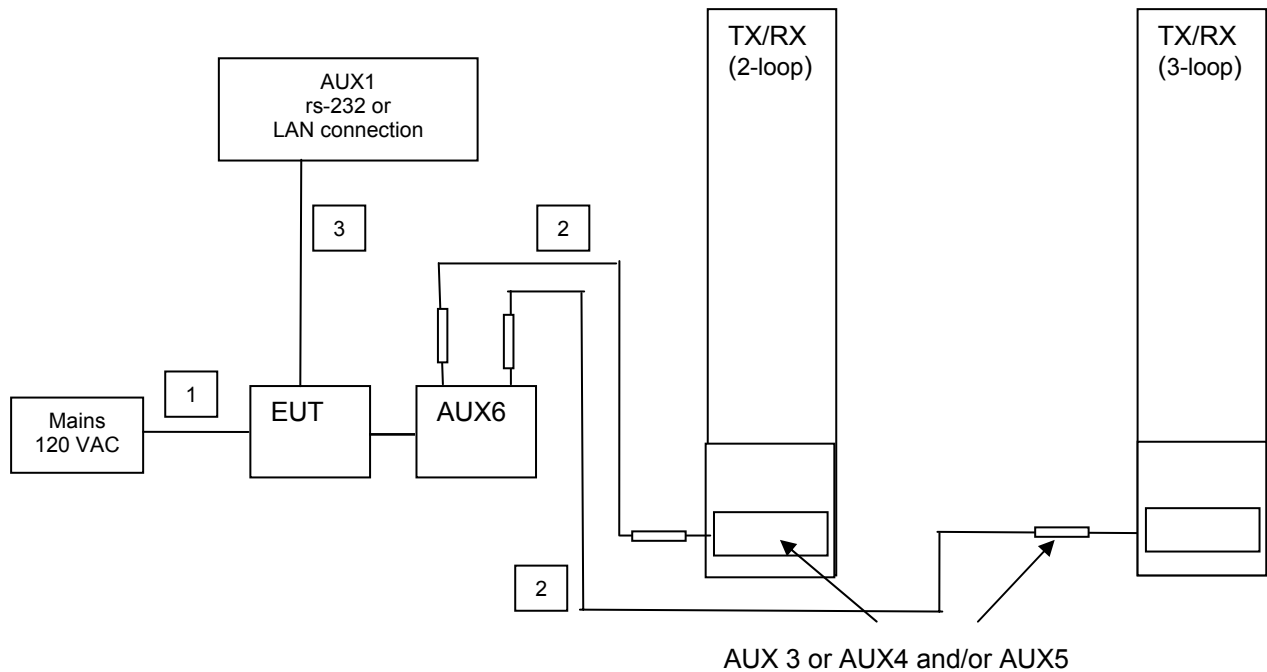


Figure 1: Basic testsetup and connections

1.4 Test Summary

The EUT was tested in accordance with the specifications given in Table 1 below.

Test Standard		Description	Pass / Fail
47 CFR Part 15.225 (10-1-09 Edition)	RSS-210 Issue 8, December 2010		
15.207(a)	RSS-Gen(7.2.4)	Conducted emissions	Pass
15.225(a)	RSS-210(A2.6(a))	Emissions in the band 13.553-13.567 MHz	Pass
15.225(d), 15.209	RSS-210(A2.6)	Emissions outside the band 13.110-14.010 MHz	Pass
15.225(e)	RSS-210(A2.6)	Frequency stability	Pass
15.215(c)	RSS-Gen(4.6.1)	Occupied bandwidth	Pass

Table 1: Test specifications

Testmethods: ANSI C63:2009 and RSS-Gen Issue 3, December 2010

1.5 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (10-1-09 Edition), sections 15.31, 15.35, 15.205, 15.209, 15.209 and 15.225 and RSS-GEN AND RSS-210 (ISSUE 8, DECEMBER 2010).

The test methods, which have been used, are based on ANSI C63.4: 2009.

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.

To calculate the field strength level from these results to the appropriate distance at which the limit is specified, the appropriate extrapolation factor 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.

1.6 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(10-1-06 edition).

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 2932G-1. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

1.7 Test conditions.

Normal test conditions:

Temperature (*)	: +15°C to +35°C
Relative humidity(*)	: 20 % to 75 %
Supply voltage	: 120VAC/60Hz to the AC/DC Power Supply
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.

2 System test configuration.

2.1 Justification.

The system was configured for testing in a typical situation 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: 2009.

2.2 EUT mode of operation.

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

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.

2.4 Equipment modifications.

Only for the Conducted Emissions testing (section 4) test, the test unit was modified to add a resistive termination in lieu of the antenna as per FCC KDB 174.176. Pictures are available to show the modifications. For all other tests no modifications have been made to the equipment.

2.5 Product Labeling

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

2.6 Block diagram of the EUT.

The block diagram is available in the technical documentation package.

2.7 Schematics of the EUT.

The schematics are available in the technical documentation package.

2.8 Part list of the EUT.

The part list is available in the technical documentation package.

3 Radiated emission data.

3.1 Radiated field strength measurements (30 MHz – 1 GHz, E-field)

Frequency (MHz)	Measurement results @3m Vertical (dBµV)	Measurement results @3m Horizontal (dBµV)	Correction factor (dB)	Results after correction Vertical (dBµV/m)	Results after correction Horizontal (dBµV/m)	Limits @3m (dBµV/m)	Pass/Fail
40.68	12.1	8.1	14.0	26.1	22.1	40	Pass
67.80	16.8	3.0	7.3	24.1	10.3	40	Pass
81.36	17.8	5.0	9.4	27.2	14.4	40	Pass
108.48	9.7	3.0	13.1	22.8	16.1	40	Pass
122.04	2.0	1.0	13.8	15.8	14.8	43.5	Pass
135.60	2.0	2.0	14.1	16.1	16.1	43.5	Pass
149.16	5.0	3.0	13.7	18.7	16.7	43.5	Pass
162.72	4.0	3.0	12.9	16.9	15.9	43.5	Pass
271.20	-2.0	-3.0	16.9	14.9	13.9	46	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 15.205, 15.209 and 15.225 and RSS-210 and RSS-Gen, section 2.2 and 2.6 are depicted in Table 2.


Notes:

- Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
- Measurement uncertainty is ± 5.0 dB.
- 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
- The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity). Worst case values noted.
- Tested with AUX3, AUX4 and AUX5, worst case values noted.
- Tested with both RS-232 and LAN connection, worst case values noted.
- A Quasi-peak detector was used with a bandwidth of 120 kHz.

3.1.1 Test equipment used (for reference see test equipment listing).

99699	99547	99071	99070	99069	99174	12483
99733	99606	99580	99608	99742	99107	12476
12477	15633	99161	99616			

Test engineer

Signature : 

Name : Richard van der Meer

Date : April 21, 2011

3.2 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field) in combination with AUX3.

Frequency (MHz)	Measurement results	Detector	Antenna factor	Cable loss	Extrapolation factor	Measurement results (calculated)	Limits	Pass/Fail
	dBµV @3m							
3.854	27.1	Qp	19.5	1	40	7.6	29.5	Pass
4.055	25.3	Qp	19.5	1	40	5.8	29.5	Pass
4.252	25.6	Qp	19.5	1	40	6.1	29.5	Pass
4.468	31.8	Qp	19.5	1	40	12.3	29.5	Pass
9.554	28.2	Qp	19.6	1	40	8.8	29.5	Pass
13.092	18.7	Qp	19.6	1	40	-0.7	29.5	Pass
13.56 fundamental	80.1	Qp	19.7	1	40	60.8	84	Pass
27.12	20.7	Qp	19.7	1	40	1.4	29.5	Pass

Table 3a Radiated emissions of the EUT in combination with AUX3, in the frequency range 0.009 – 30 MHz

The results of the radiated emission tests in the frequency range 0.009 – 30 MHz, carried out in accordance with 47 CFR Part 15 section 15.209 and RSS-210 and RSS-Gen are depicted in Table 3a.

Notes:

1. Calculated measurement results are obtained by using the 40dB/decade factor (antenna factor and cable loss is included). i.e at 13.56 MHz: 80.1 dBuV + 19.7 dB + 1dB - 40dB= 60.8 dBuV/m.
2. A resolution bandwidth of 9kHz was used during testing
3. Field strength values of radiated emissions at frequencies not listed in Table 3a are more than 20 dB below the applicable limit
4. 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.
5. Measurement uncertainty is ±5.0dB
6. Tested with both RS-232 and LAN connection, worst case values noted.
7. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity). Worst case values noted.

3.2.1 Test equipment used (for reference see test equipment listing).

99699	99547	99071	99070	99608	15453	99161
99580	99616					

Test engineer

Signature : 

Name : R. van der Meer

Date : September 28, 2011

3.3 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field) in combination with AUX4.

Frequency (MHz)	Measurement results	Detector	Antenna factor	Cable loss	Extrapolation factor	Measurement results (calculated)	Limits	Pass/Fail
	dBµV @3m							
2.522	8.1	Qp	19.7	1	40	-11.2	29.5	Pass
3.854	6.7	Qp	19.5	1	40	-12.8	29.5	Pass
11.520	8.6	Qp	19.6	1	40	-10.8	29.5	Pass
12.223	4.3	Qp	19.7	1	40	-15.0	29.5	Pass
12.700	15.2	Qp	19.7	1	40	-4.1	29.5	Pass
12.883	16.1	Qp	19.7	1	40	-3.2	29.5	Pass
13.56 fundamental	61.5	Qp	19.7	1	40	42.2	84	Pass
14.7178	5.7	Qp	19.7	1	40	-13.6	29.5	Pass
27.12	15.8	Qp	19.7	1	40	-3.5	29.5	Pass

Table 3b Radiated emissions of the EUT in combination with AUX4, in the frequency range 0.009 – 30 MHz

The results of the radiated emission tests in the frequency range 0.009 – 30 MHz, carried out in accordance with 47 CFR Part 15 section 15.209 and RSS-210 and RSS-Gen are depicted in Table 3b.

Notes:

1. Calculated measurement results are obtained by using the 40dB/decade factor (antenna factor and cable loss is included). i.e at 13.56 MHz: 61.5 dBµV + 19.7 dB + 1dB - 40dB= 42.2 dBµV/m.
2. A resolution bandwidth of 9kHz was used during testing
3. Field strength values of radiated emissions at frequencies not listed in Table 3b are more than 20 dB below the applicable limit
4. 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.
5. Measurement uncertainty is ±5.0dB
6. Tested with both RS-232 and LAN connection, worst case values noted.
7. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity). Worst case values noted.

3.3.1 Test equipment used (for reference see test equipment listing).

99699	99547	99071	99070	99608	15453	99161
99580	99616					

Test engineer

Signature :



Name :

R. van der Meer

Date :

April 21, 2011

3.4 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field) in combination with AUX5.

Frequency (MHz)	Measurement results	Detector	Antenna factor	Cable loss	Extrapolation factor	Measurement results (calculated)	Limits	Pass/Fail
	dBμV @3m							
2.408	10.7	Qp	19.5	1	40	-8.8	29.5	Pass
2.472	17.1	Qp	19.5	1	40	-2.4	29.5	Pass
2.848	19.2	Qp	19.5	1	40	-0.3	29.5	Pass
4.584	11.3	Qp	19.5	1	40	-8.2	29.5	Pass
5.856	13.6	Qp	19.5	1	40	-5.9	29.5	Pass
5.960	14.6	Qp	19.5	1	40	-4.9	29.5	Pass
9.440	11.9	Qp	19.6	1	40	-7.5	29.5	Pass
13.56 fundamental	70.7	Qp	19.7	1	40	51.4	84	Pass
14.48	11.8	Qp	19.7	1	40	-7.5	29.5	Pass
27.12	10.1	Qp	20.0	1	40	-8.9	29.5	Pass

Table 3c Radiated emissions of the EUT in combination with AUX5, in the frequency range 0.009 – 30 MHz

The results of the radiated emission tests in the frequency range 0.009 – 30 MHz, carried out in accordance with 47 CFR Part 15 section 15.209 and RSS-210 and RSS-Gen are depicted in Table 3c.

Notes:

1. Calculated measurement results are obtained by using the 40dB/decade factor (antenna factor and cable loss is included). i.e at 13.56 MHz: 70.7 dBuV + 19.7 dB + 1dB - 40dB= 51.4 dBuV/m.
2. A resolution bandwidth of 9kHz was used during testing
3. Field strength values of radiated emissions at frequencies not listed in Table 3c are more than 20 dB below the applicable limit
4. 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.
5. Measurement uncertainty is ±5.0dB
6. Tested with both RS-232 and LAN connection, worst case values noted.
7. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity). Worst case values noted.

3.4.1 Test equipment used (for reference see test equipment listing).

99699	99547	99071	99070	99608	15453	99161
99580	99616					

Test engineer

Signature : 

Name : R. van der Meer

Date : April 21, 2011

4 Conducted emission data.

4.1 Conducted emission data of the EUT (full configuration).

Frequency (MHz)	Measurement results dB μ V Neutral		Measurement results dB μ V Line 1		Limits dB μ V		Pass/Fail
	QP	AV	QP	AV	QP	AV	
2.500	44.0	33.3	45.5	34.1	56	46	PASS
2.630	46.7	35.8	47.9	37.5	56	46	PASS
3.910	50.7	40.8	51.2	42.0	56	46	PASS
4.685	49.3	39.7	52.4	41.8	56	46	PASS
5.505	48.1	37.7	50.9	39.2	60	50	PASS
6.150	46.2	36.9	47.1	35.1	60	50	PASS
13.560	40.1	39.1	40.2	40.3	60	50	PASS
27.117	43.5	43.3	47.3	47.4	60	50	PASS

Table 4 Conducted emission measurements

The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15 section 15.207 & RSS-Gen, section 7.2.4, at the 120 Volts AC mains connection terminals of the AC/DC power supply which was connected to the EUT, are depicted in Table 4.

Notes:

1. The test unit was modified to add a resistive termination in lieu of the antenna as per KDB 174176.
2. The test data shown above is of the worst case EUT. Maximum values recorded.
3. The values of conducted emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
4. Measurement uncertainty is ± 3.5 dB
5. Tested with both RS-232 and LAN connection, worst case values noted.
6. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity). Worst case values noted.

4.1.1 Test equipment used (for reference see test equipment listing).

15667	12512	99161	99548	13313	99616	99073
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Test engineer

Signature :



Name : R. van der Meer

Date : April 14, 2011

5 Carrier stability under special conditions.

5.1 Frequency stability (on 13.56 MHz) in accordance with 47 CFR Part 15, section 15.225 (e) & RSS-Gen section 4.7 and 7.2.4 and RSS-210 section A2.6:

- 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 5).

Stability under special conditions	Supply Voltage	Measured frequency (MHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
Temperature (°C)	(Vac)			
20.0	120	13.5586900 (reference)	N.A.	N.A.
-20.0	120	13.5586500	< 0.01	PASS
50.0	120	13.5586900	< 0.01	PASS

Table 5 The frequency tolerance of the carrier signal

5.1.1 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 reference is taken at 120Vac which is the recommended supply voltage. The results are stated in Table 6.

Stability under special conditions	Measured frequency (MHz)	Frequency deviation (limit ±0.01%) (%)	PASS/FAIL
% variation U			
100.0 (120 Vac)	13.5586900 (reference)	N.A.	N.A.
85.0 (102 Vac)	13.5586700	< 0.01	PASS
115.0 (138 Vac)	13.5586700	< 0.01	PASS

Table 6 The frequency tolerance of the carrier signal

5.2 Bandwidth of the emission on 13.56 MHz in accordance with RSS-Gen section 4.7 and 7.2.4 and RSS-210 section A2.6.

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	13.55842	13.55896
-20.0	13.55840	13.55865
+50.0	13.55844	13.55898
Bandwidth	13.55840	13.55898

Table 7 Bandwidth of the emission

The measured minimum frequency of 13.55840 kHz and maximum frequency of 13.55898 kHz are well within the specified frequency bandwidth.

5.2.1 Test equipment used (for reference see test equipment listing).

99318	99413	12640	99613	99683		
-------	-------	-------	-------	-------	--	--

Test engineer

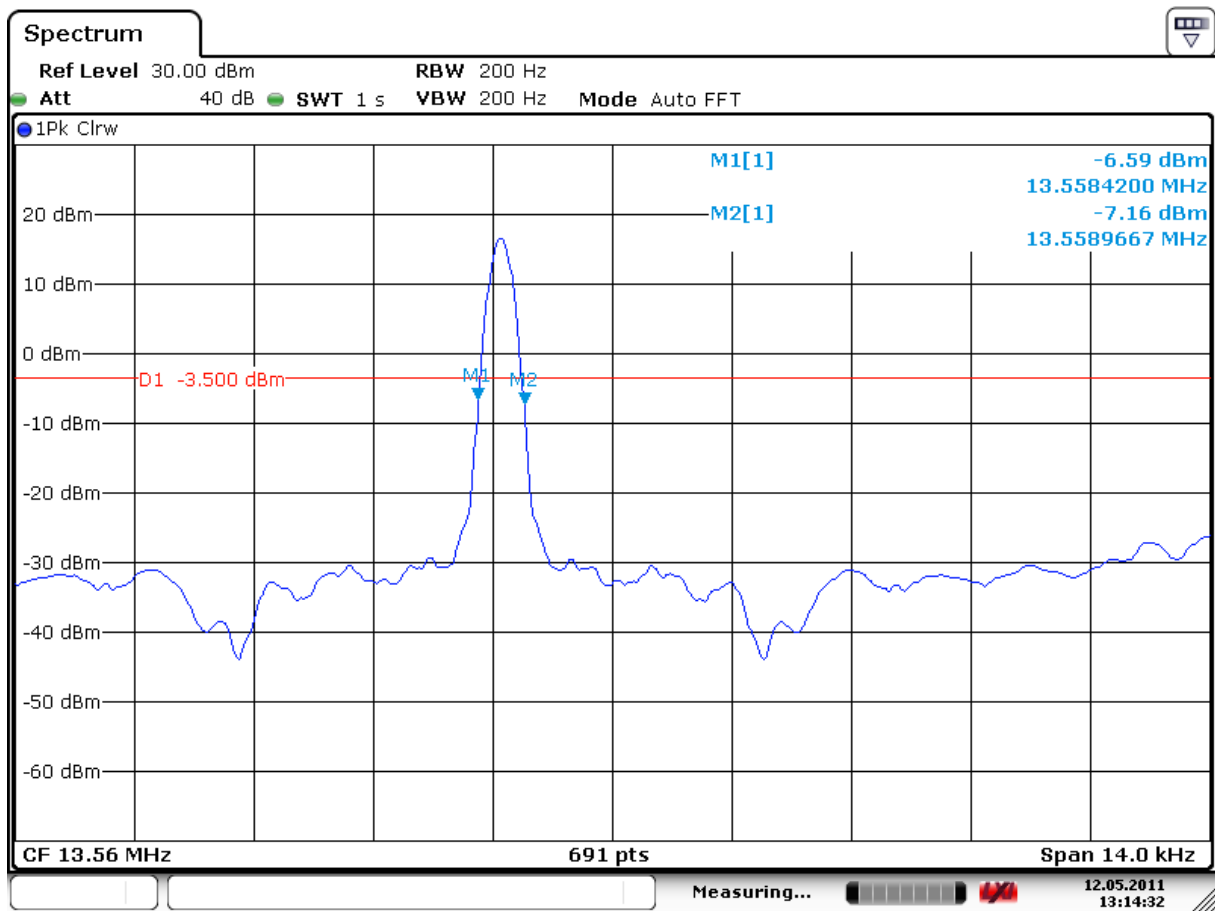
Signature : 

Name : R. van der Meer

Date : May 12, 2011

6 Plots of measurement data

6.1 Bandwidth of the emission



Date: 12.MAY.2011 13:14:32

Plot1: Bandwidth of the emission of the fundamental carrier, for IC the measured Occupied Bandwidth is 547 Hz. Measured on a spectrum analyzer.

6.2 Conducted emissions

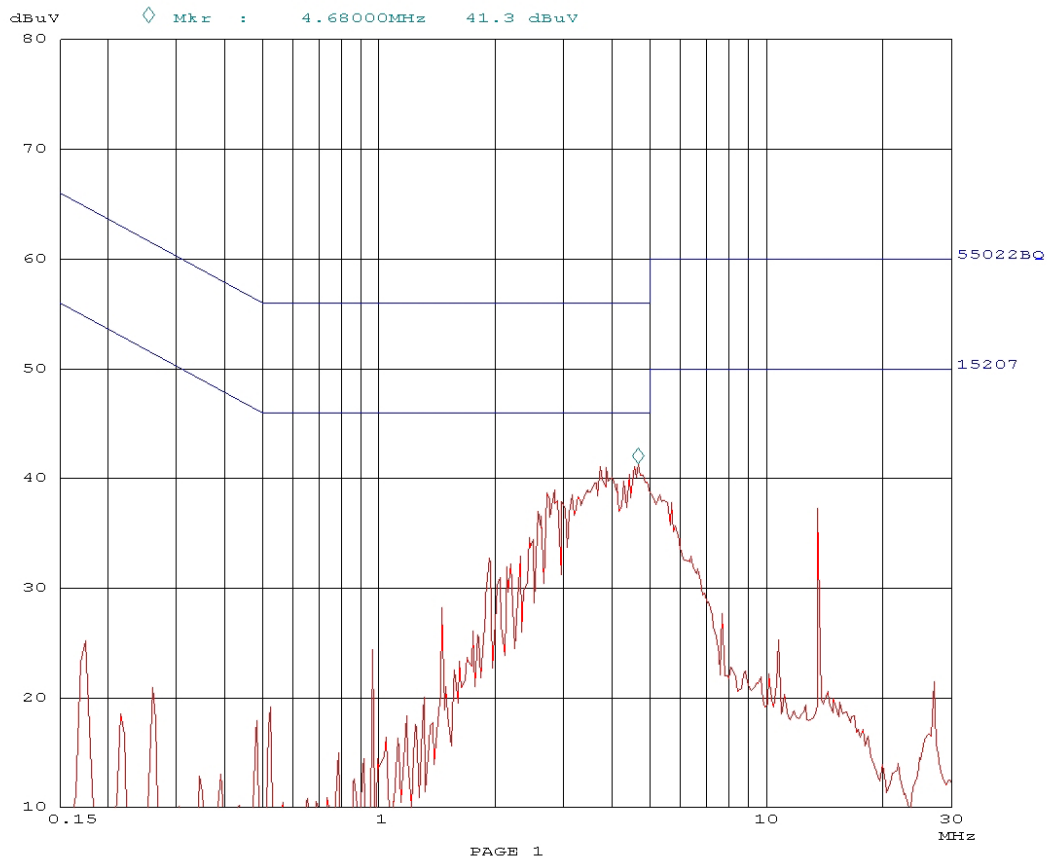
Plots 2 through 5 show some of the results of the conducted emissions.

14. Apr 11 13:48

```

Scan Settings (1 Range)
|----- Frequencies -----|----- Receiver Settings -----|
  Start      Stop      Step      IF BW  Detector  M-Time  Atten  Preamp
  150k       30M       5k       9k     AV       20ms  AUTO  LN   OFF

Final Measurement: x AV
                   Meas Time: 1 ms
                   Subranges: 25
                   Acc Margin: 6dB
  
```



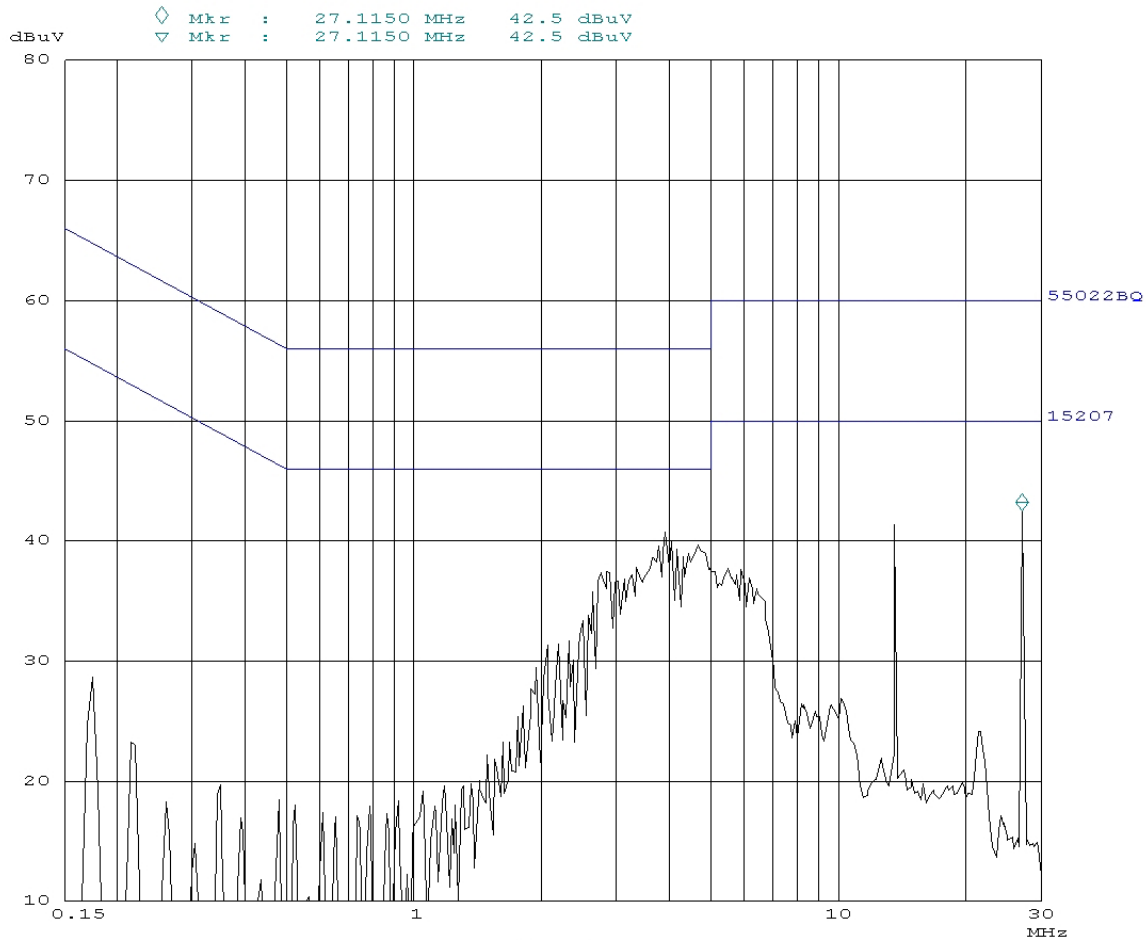
Plot 2: Conducted emissions of the EUT, Av on L1 with LAN connection

14. Apr 11 10:58

```

Scan Settings (1 Range)
|----- Frequencies -----|----- Receiver Settings -----|
Start      Stop      Step      IF BW  Detector  M-Time  Atten  Preamp
150k      30M        5k        9k     AV        20ms   AUTO  LN   OFF

Final Measurement: * AV
Meas Time: 1 ms
Subranges: 25
Acc Margin: 6dB
  
```



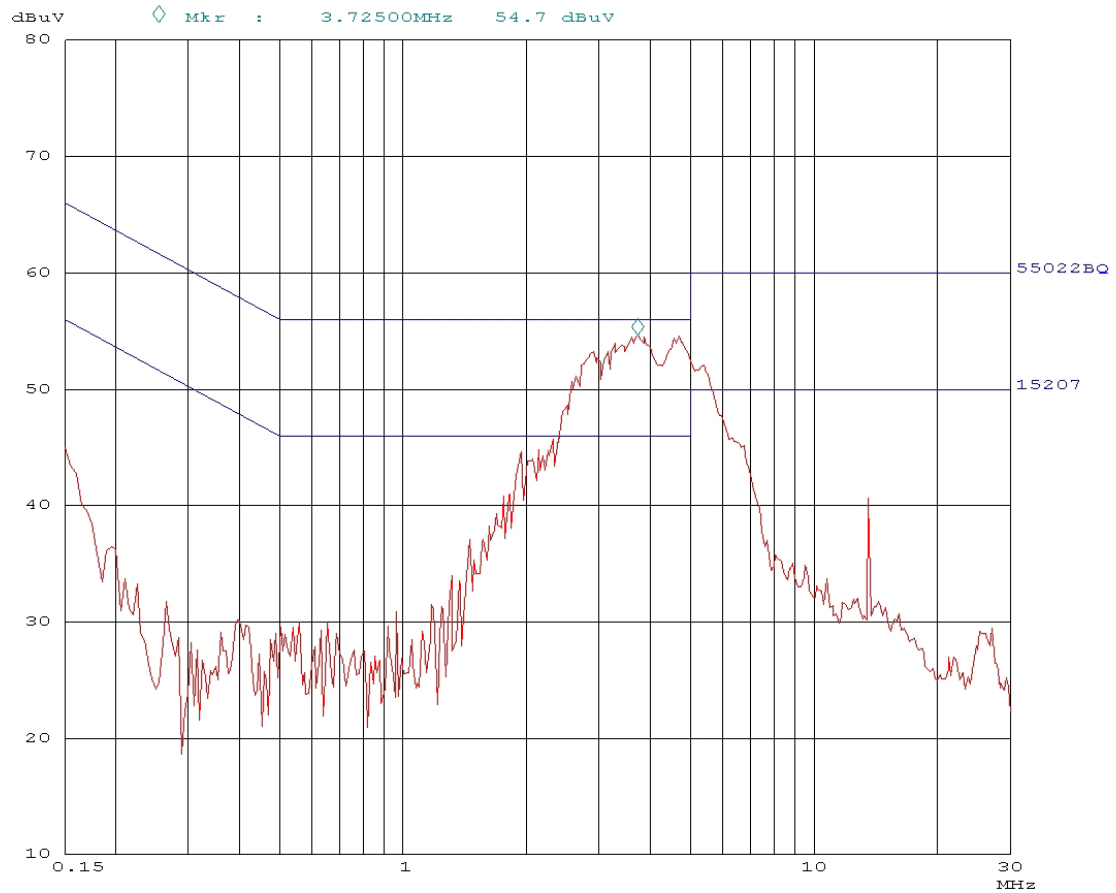
Plot 3: Conducted emissions of the EUT, Av on L1 with RS-232 connection

14. Apr 11 13:57

```

Scan Settings (1 Range)
|----- Frequencies -----|----- Receiver Settings -----|
  Start      Stop      Step      IF BW  Detector  M-Time  Atten  Preamp
  150k       30M        5k        9k     PK        20ms   AUTO  LN   OFF

Final Measurement: x QP
                   Meas Time: 1 ms
                   Subranges: 25
                   Acc Margin: 6dB
  
```



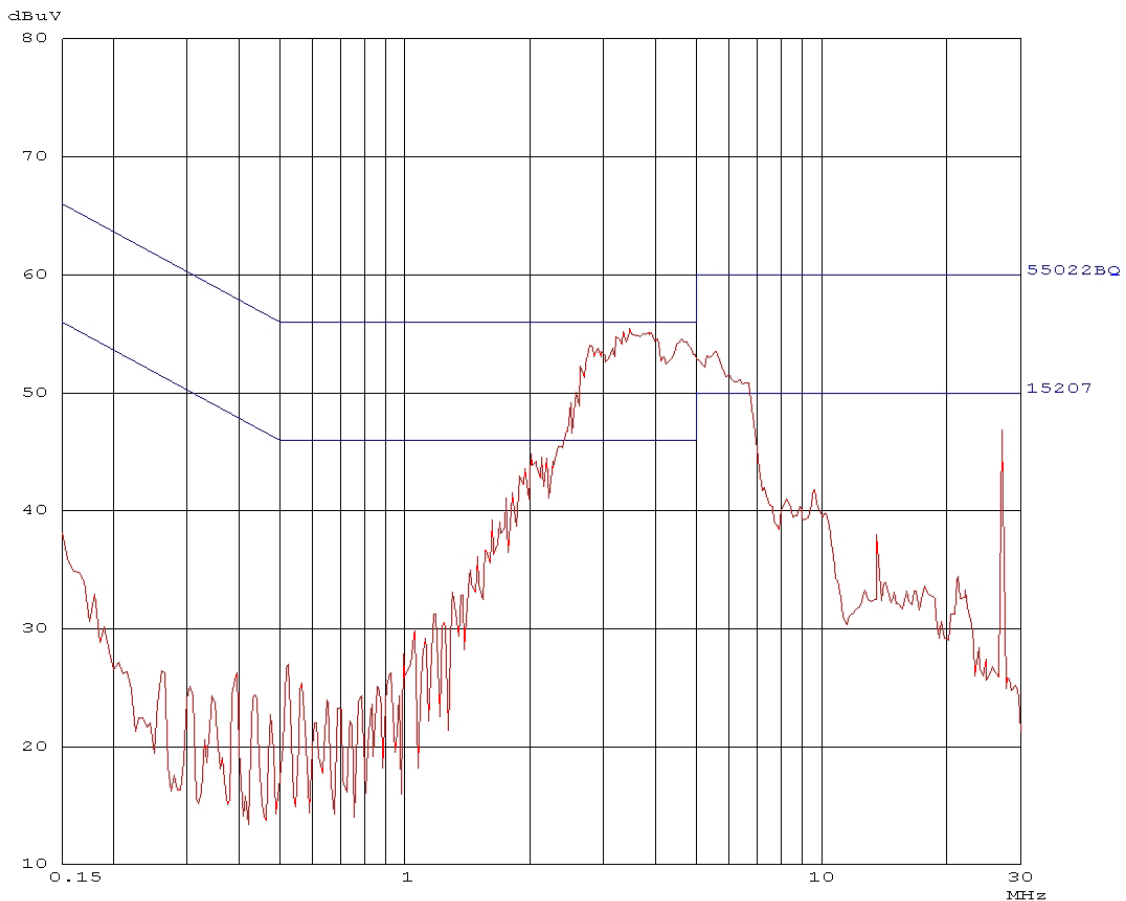
Plot 4: Conducted emissions of the EUT, Pk on L1 with LAN connection

14. Apr 11 11:26

```

Scan Settings (1 Range)
|----- Frequencies -----|----- Receiver Settings -----|
  Start      Stop      Step      IF BW  Detector  M-Time  Atten  Preamp
  150k       30M       5k       9k     PK        20ms   AUTO  LN   OFF

Final Measurement:  x QP
                    Meas Time:  1 ms
                    Subranges:  25
                    Acc Margin:  6dB
  
```



PAGE 1

Plot 5: Conducted emissions of the EUT, Pk on L1 with RS-232 connection

7 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
12512	LISN	EMCO	3625/2	01/2011	01/2012
15453	Active loopant. 60 cm	Chase	HLA6120	05/2010	05/2011
15633	Biconilog Testantenna	Chase	CBL 6111B	02/2011	02/2012
12640	Temperature chamber	Heraeus	VEM03/500	NA	NA
15667	Measuring receiver	R&S	ESCS30	06/201	06/2011
99069	Coax 5m RG213 OATS	NMi Certin B.V.	CABLE 5M OATS	11/2010	11/2011
99070	Coax 15m RG213 OATS	NMi Certin B.V.	CABLE 15M OATS	11/2010	11/2011
99071	Coax OATS ground	NMi Certin B.V.	CABLE OATS	11/2010	11/2011
99073	Termination 50 Ohm	R&S	RNB	NA	NA
99161	Variac 120Vac	RFT	LTS001	NA	NA
99107	Controller OATS	Heinrich Deisel	4630-100	NA	NA
99318	Digital multimeter	HP	34401A	10/2010	10/2011
99413	Temperatuurmeter Climatchamber	Tempcontrol	P570	01/2011	01/2012
99538	Spectrum analyzer	R&S	FSP40	05/2010	05/2011
99547	Temperature-Humiditymeter	Europe supplies	WS-7082	10/2010	10/2011
99580	OATS	Comtest	FCC listed: 90828	08/2008	08/2011
99161	Variac 250V 6A	RFT	LTS006	NA	NA
99608	Controller (OATS)	EMCS	DOC202	NA	NA
99609	Antenna mast	EMCS	AP-4702C	NA	NA
99613	Temperature-Humiditymeter	Europe supplies	WS-7082	10/2010	10/2011
99616	Laptop computer	Lenovo	9456-HTG	NA	NA
99651	Variac	NA	Vast Activa: 08-9510	NA	NA
99699	Measuring receiver	R&S	ESCI	12/2009	12/2010
99683	Loop antenna, 6cm	--	7405-901	09/2010	09/2011
99733	Spectrum Analyzer	R&S	FSV30	05/2010	05/2011

NA= Not Applicable