Registration No. DAT-P-207/05

FCC ID: NDX-RIN13003

EMI -- TEST REPORT

Test Report No. : **T32594-00-02HU**	28. May 2008 Date of issue

Type / Model Name : R-IN1300 MID

Product Description : Mid-Range Industrial RFID High Frequency Reader

Applicant : DATAMARS SA

Address : Via ai Prati

CH-6930 Bedano

Manufacturer : DATAMARS SA

Address : Via ai Prati

CH-6930 Bedano

Licence holder : DATAMARS SA

Address : Via ai Prati

CH-6930 Bedano

Test Result according to the standards listed in clause 1 test standards:	**POSITIVE**

Deutscher Akkreditierungs Rat

DAT-P-207/05-00

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15 Subpart C- Intentional Radiators (October 01, 2007)

Part 15, Subpart C, Section 15.225	Operation within the band 13.110-14.010 MHz
Part 15, Subpart C, Section 15.209(a)	Radiated emissions, general requirements
Part 15, Subpart C, Section 15.207(a)	AC Line conducted emissions

2 SUMMARY

GENERAL REMARKS:

The EuT is working at frequency of 13.56 MHz.

FINAL ASSESSMENT:

The equipment under test **fulfills** the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 13. May 2008

Testing concluded on : 20. May 2008

Checked by:

Thomas Weise
Ich bestätige die Richtigkeit und Integrität dieses Dokuments
2008.06.09 08:52:16 +02'00'

Thomas Weise
Dipl.-Ing.(FH)
Laboratory Manager

Tested by:

Huber Markus
Ich bin der Verfasser dieses Dokuments
2008.06.09 08:09:18 +02'00'

Markus Huber

3 EQUIPMENT UNDER TEST

3.1 Photo documentation of the EuT

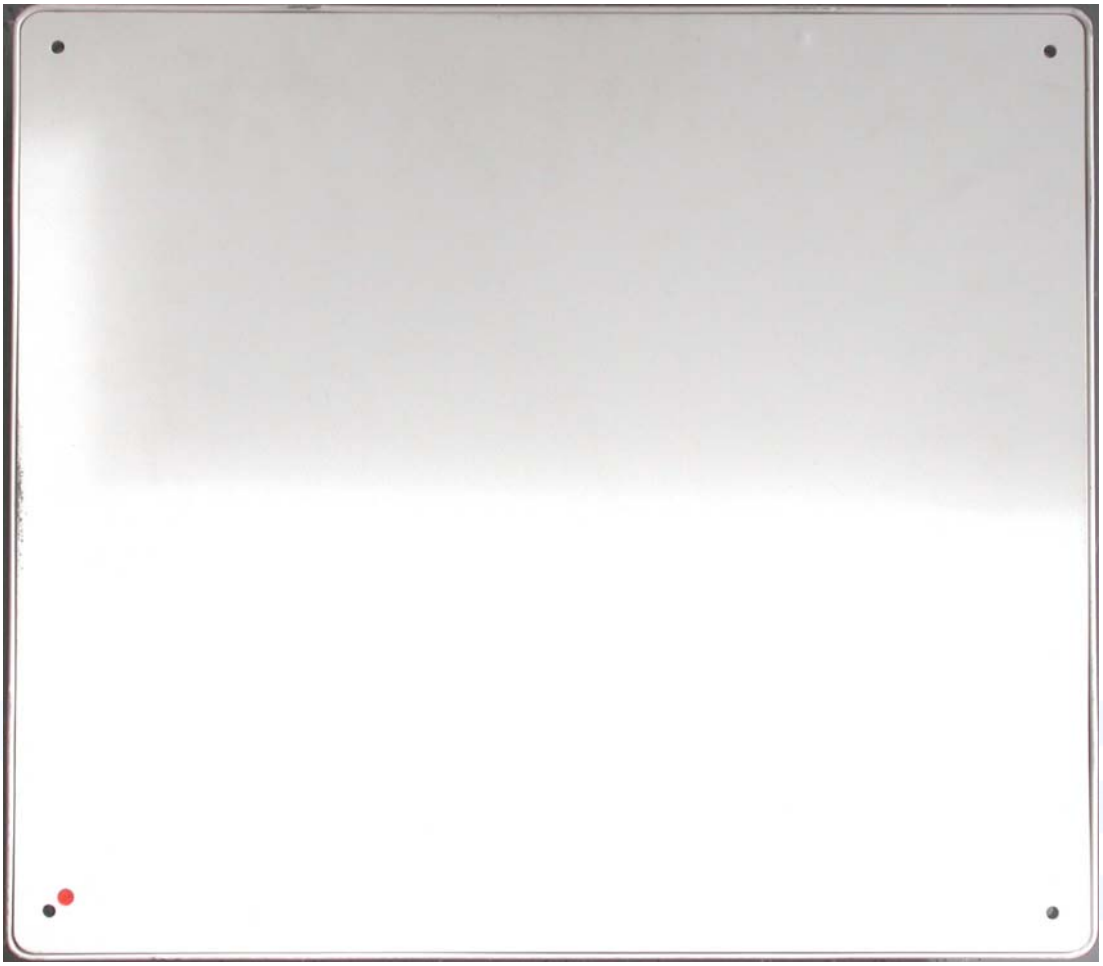
Test Setup:

Antenna:

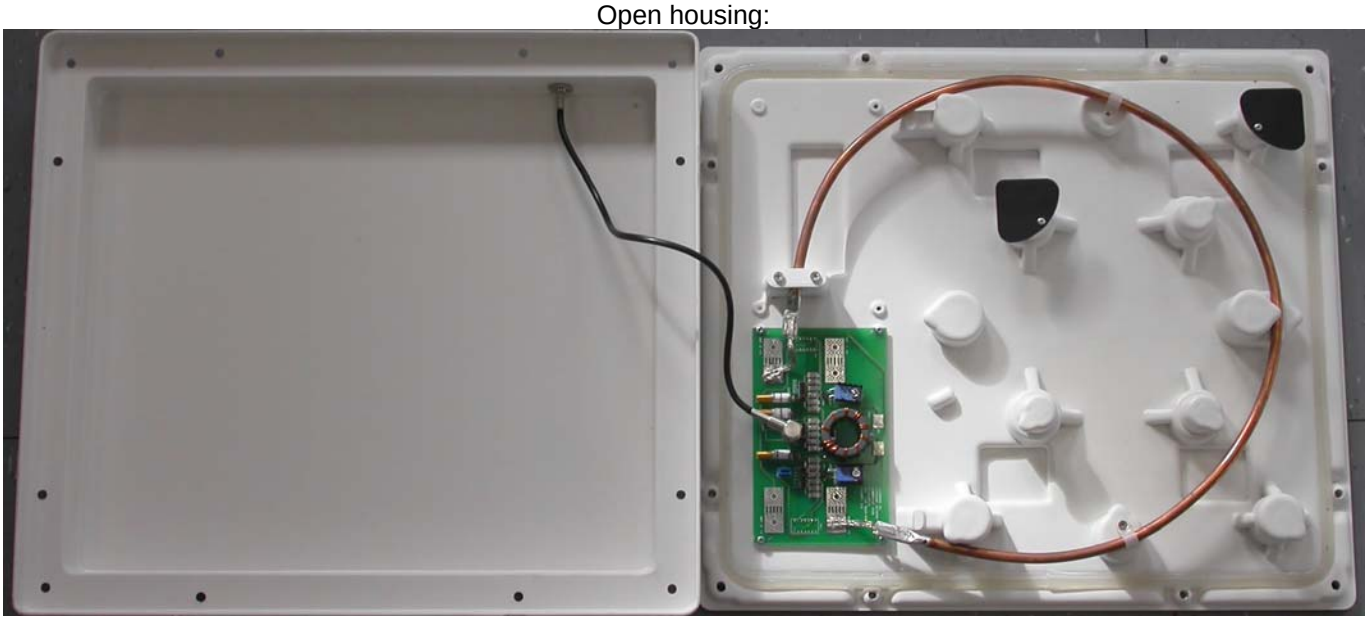
Front view:

Antenna connector:

Rear view:

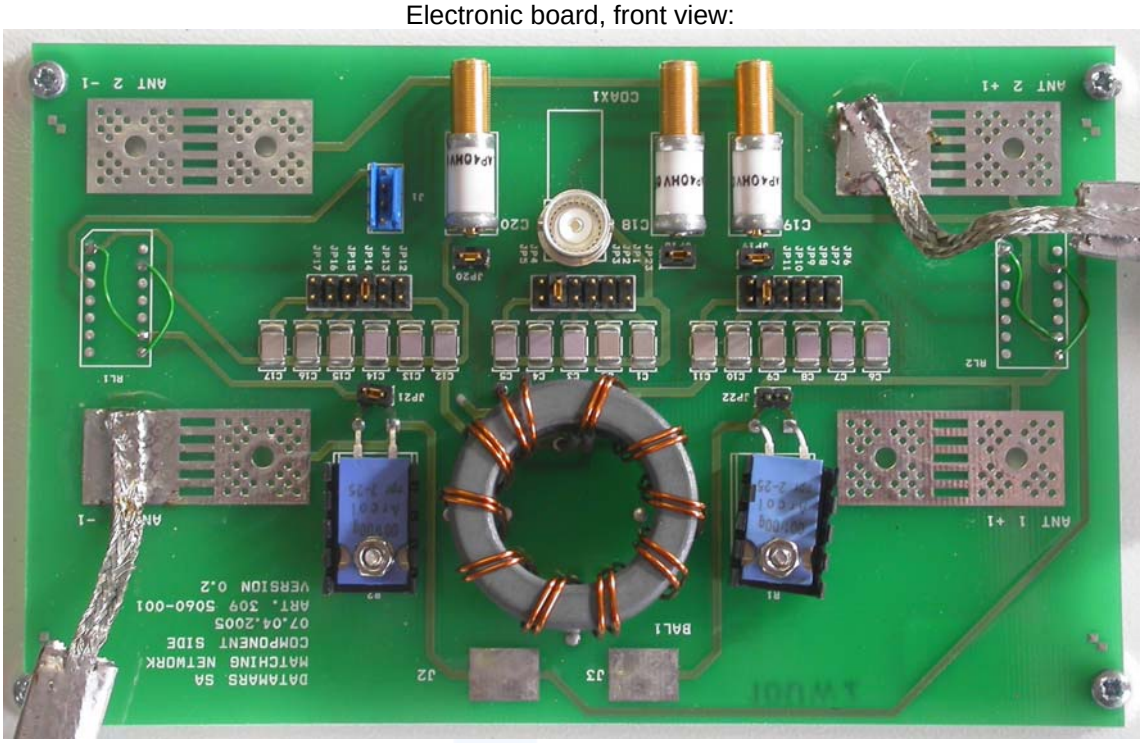


Open housing:

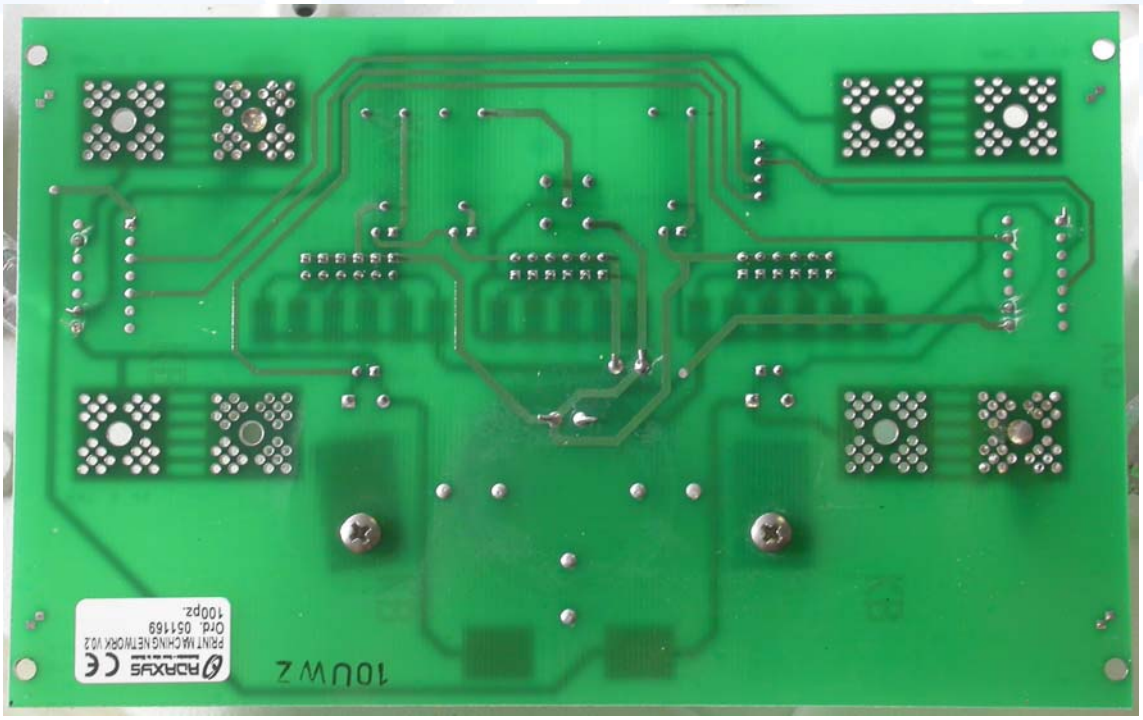


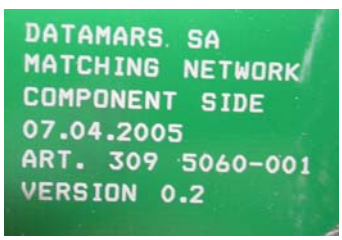
FCC ID: NDX-RIN13003

Electronic board, front view:



Rear view:

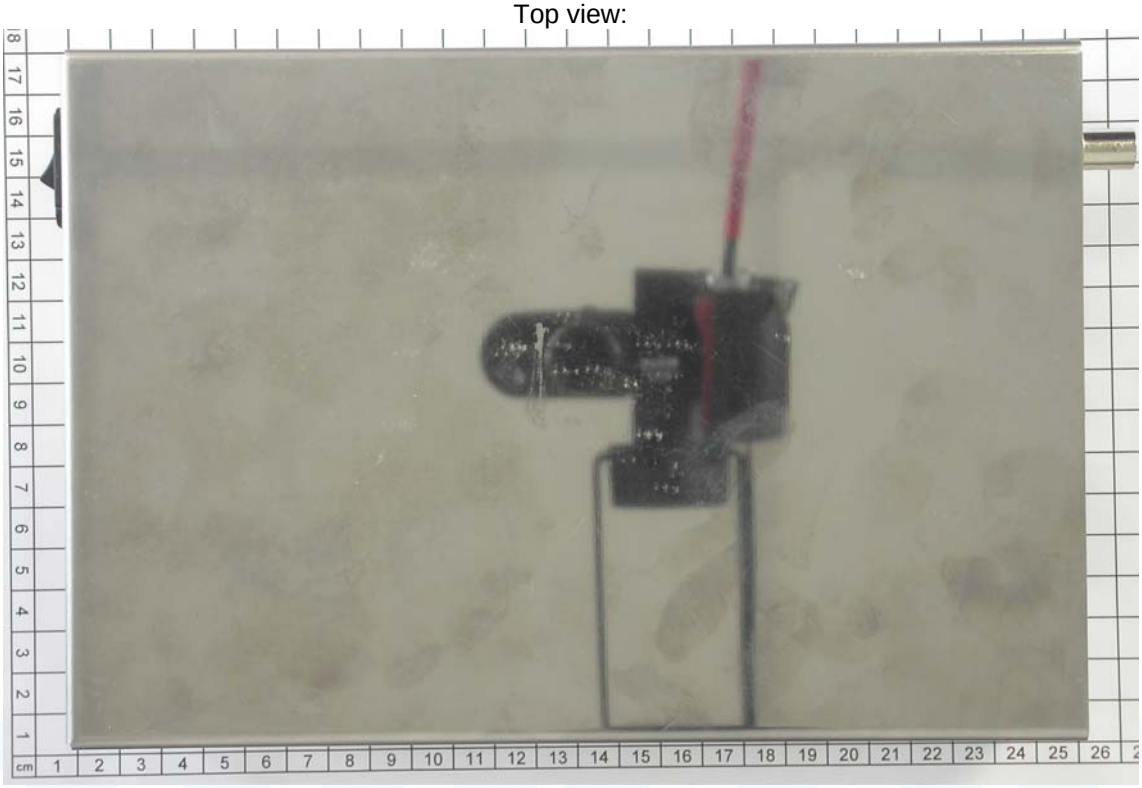




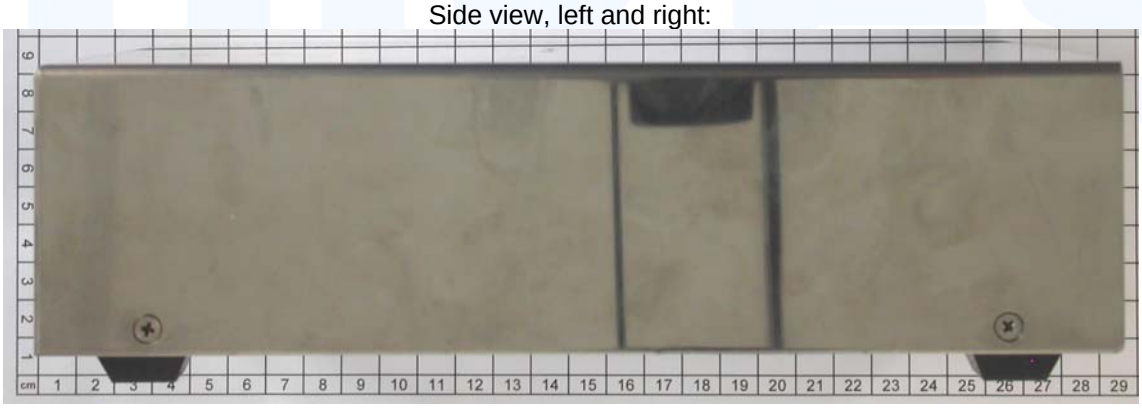
mikes-testingpartners gmbh
Ohmstrasse 2-4 · 94342 Strasskirchen
Tel.:+49(0)9424-94810 · Fax:+49(0)9424-9481240

Reader unit:

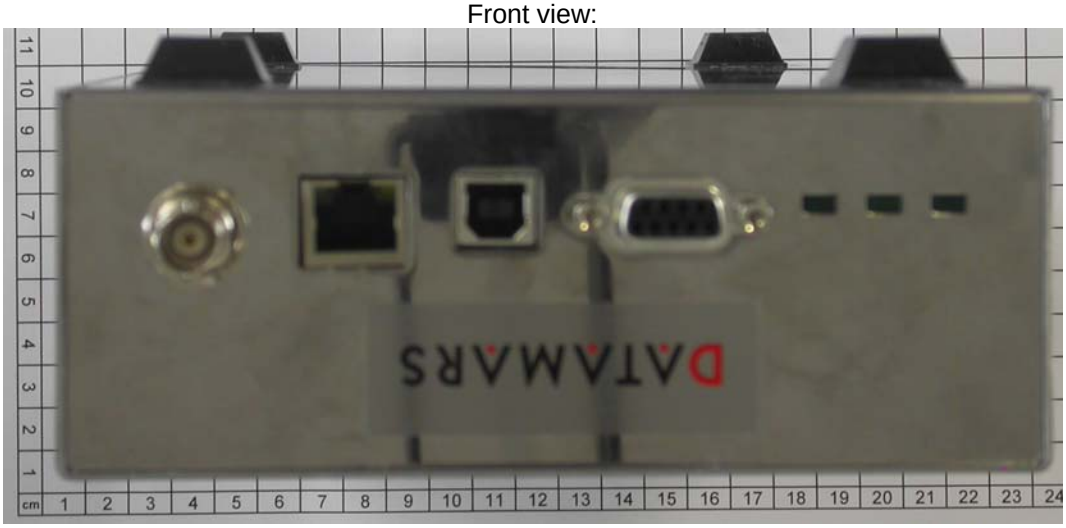
Top view:



Side view, left and right:



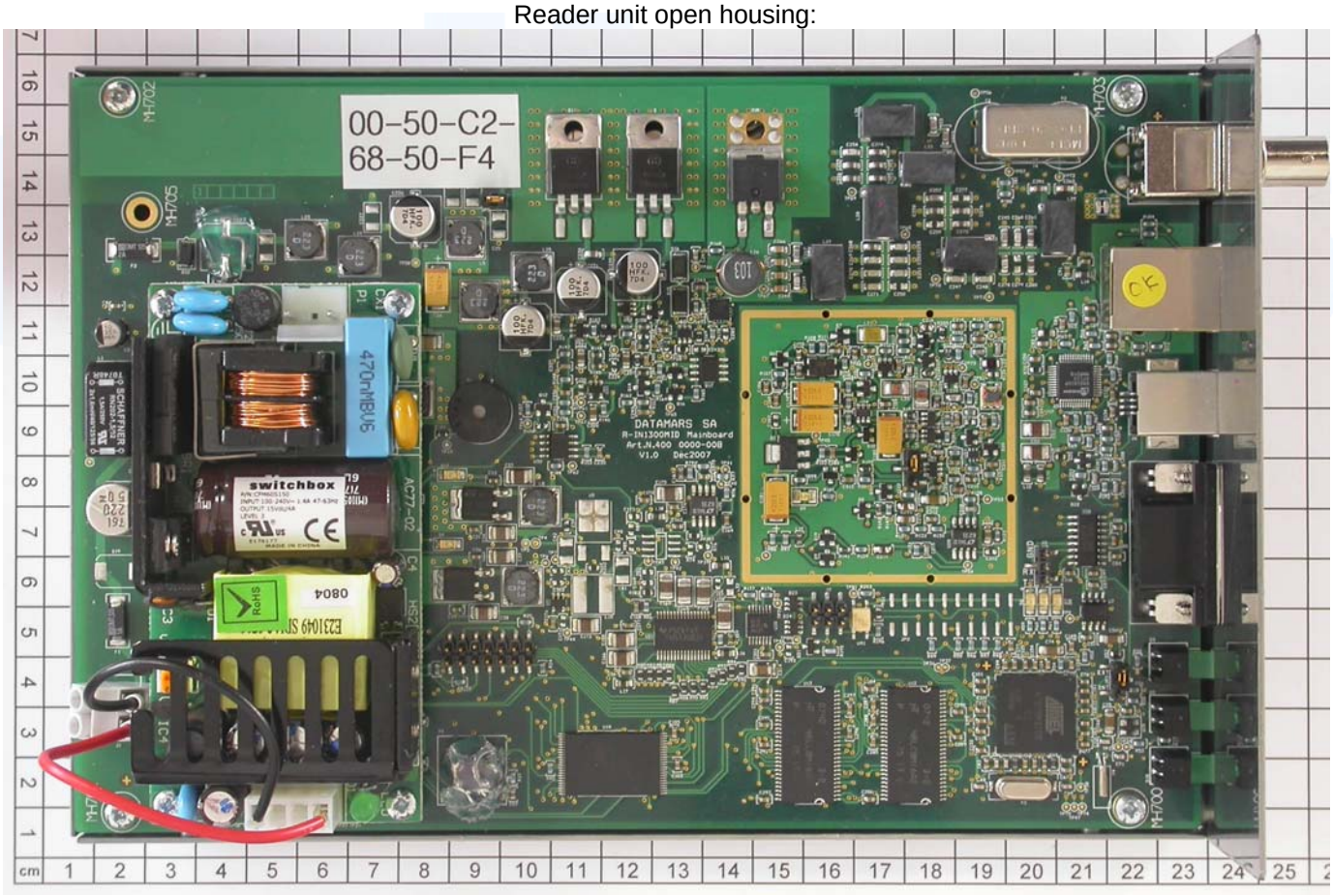
Front view:



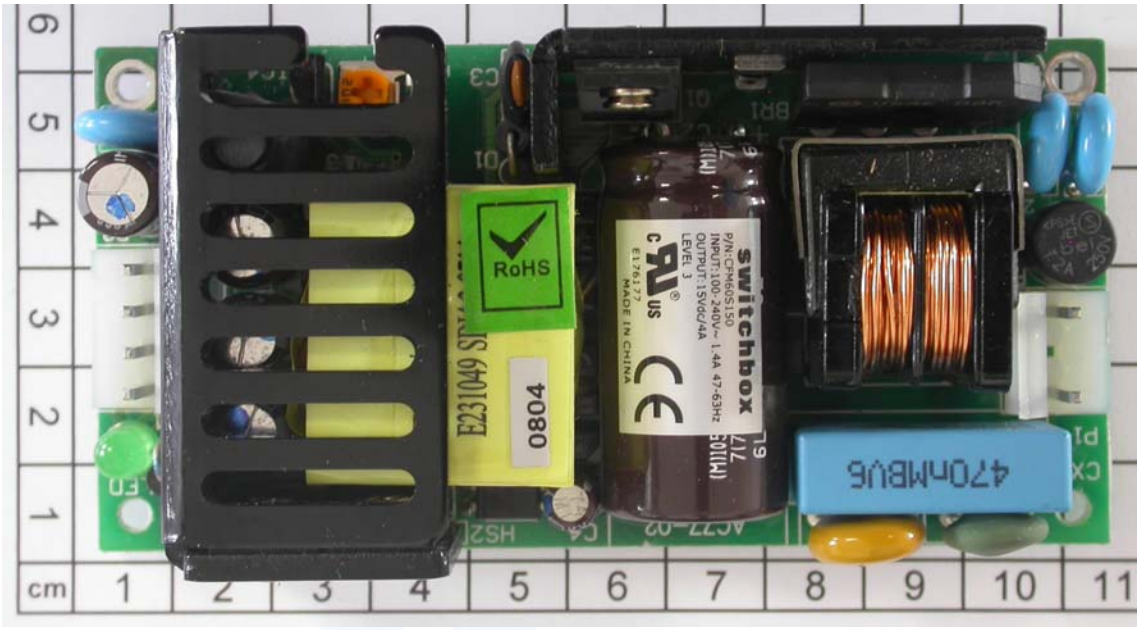
FCC ID: NDX-RIN13003

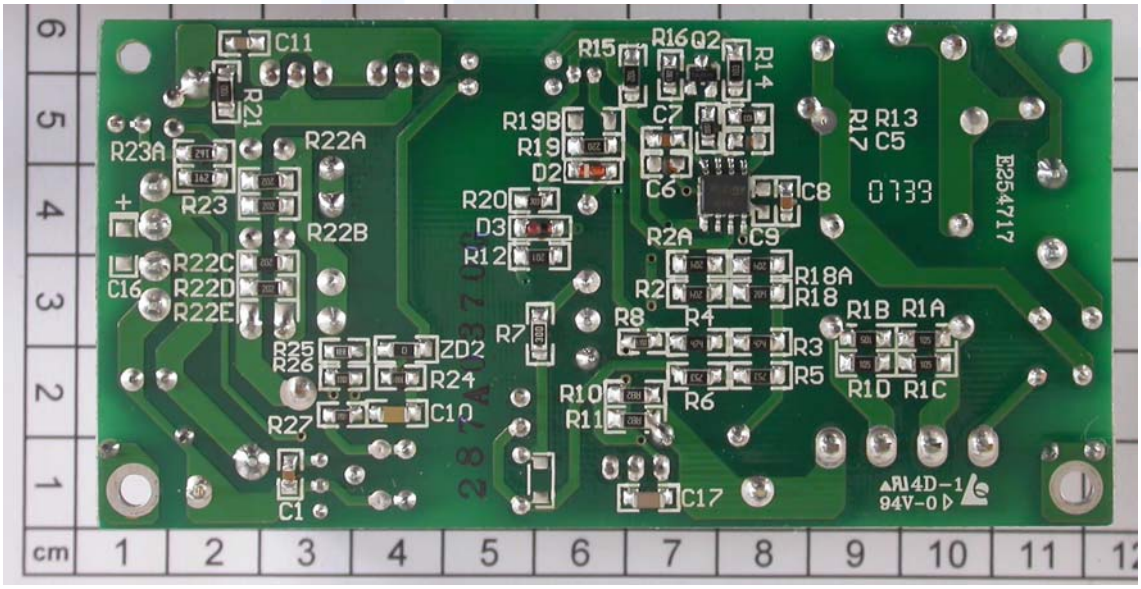
Rear view:

Reader unit open housing:

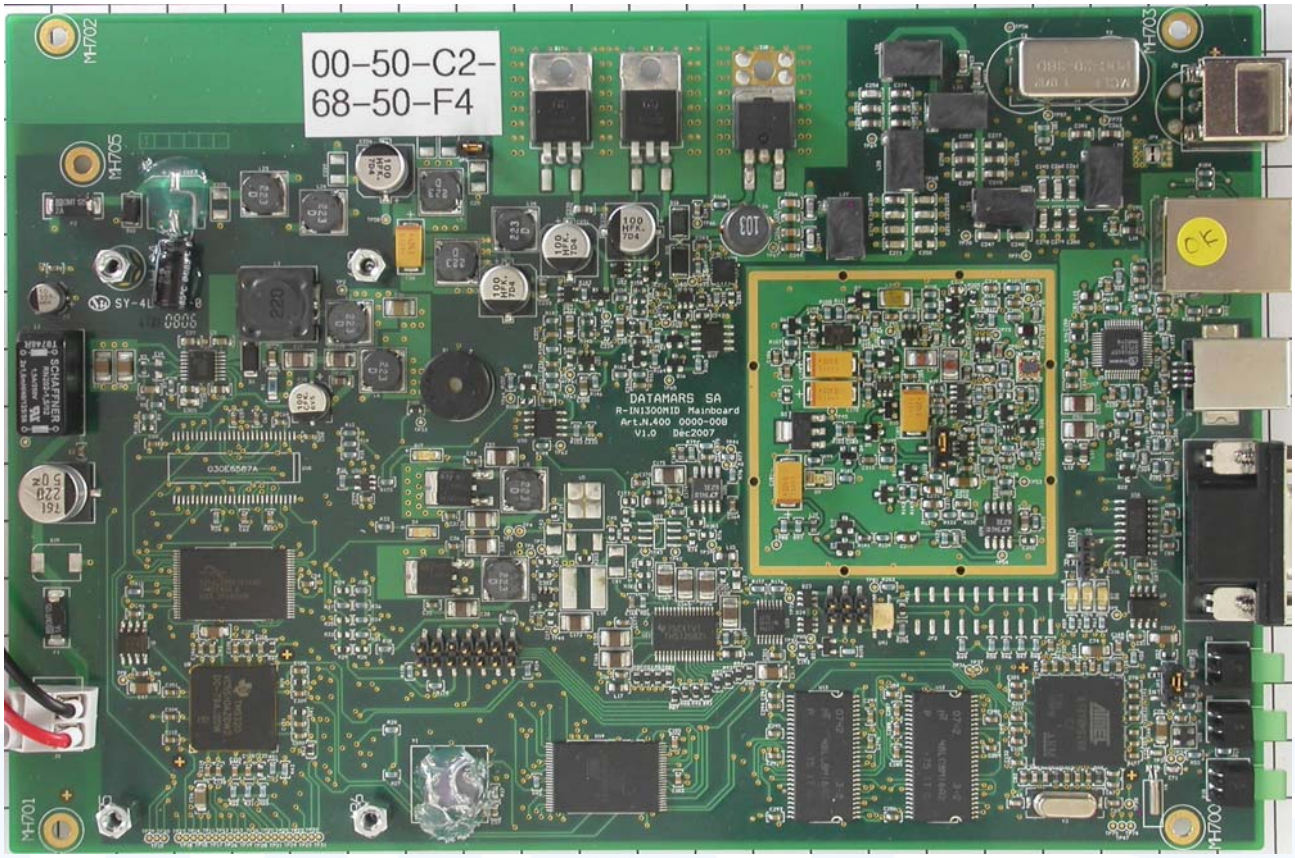


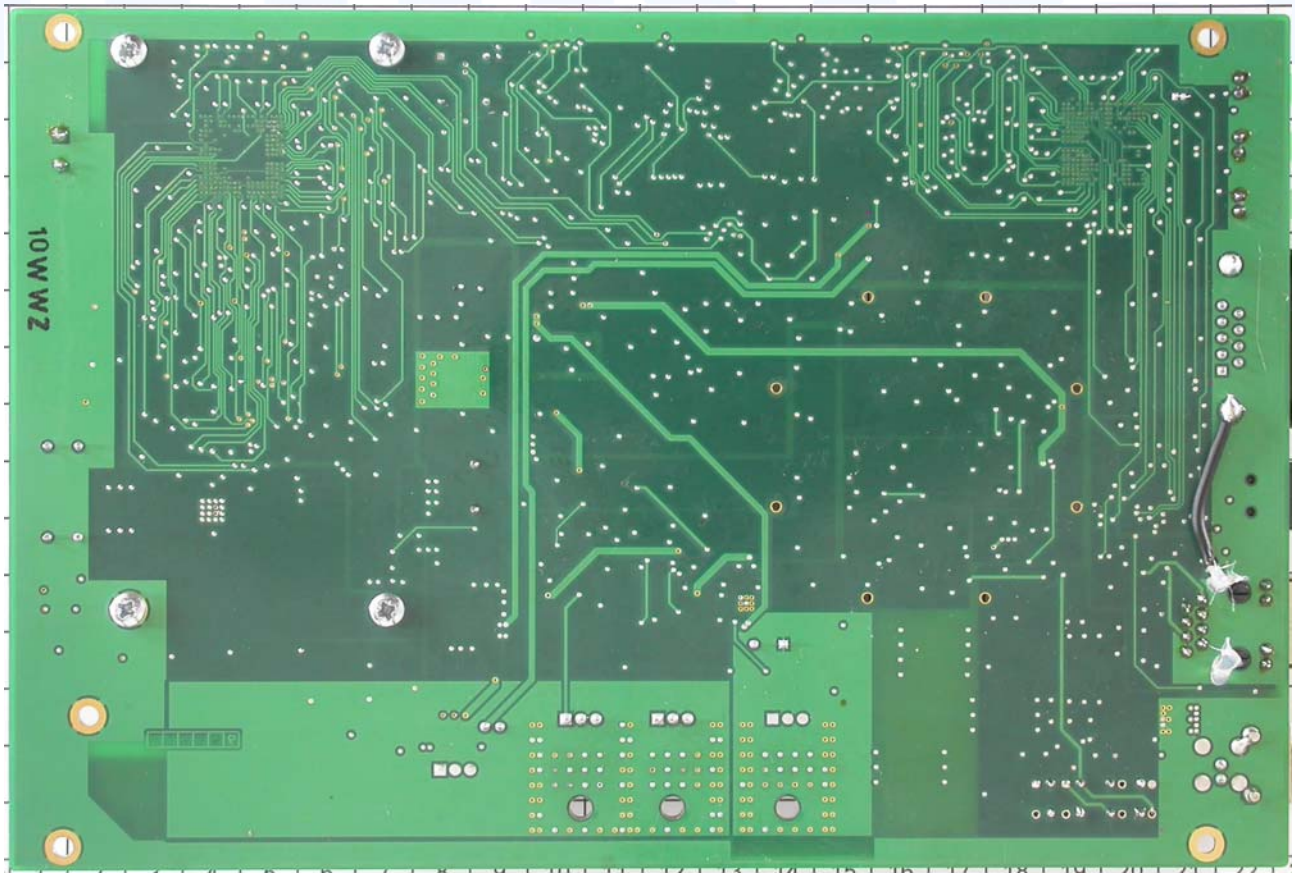
Power supply:





Main board:


00-50-C2-
68-50-F4
DATAMARS SA
R-IN1300MID Mainboard
Art.N.400 0000-008
V1.0 Dec2007


10W WZ

3.2 Power supply system utilised

Power supply voltage : 115 V / 60 Hz / 1ϕ

3.3 Short description of the Equipment under Test (EuT)

The EuT R-IN1300MID is a Mid-Range RFID high frequency reader for industrial use.

Number of tested samples: 1
Serial number: see Photo documentation of the EuT under Point 3 / Equipment Under Test

EuT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- Tx mode at 13.56 MHz / pw: 4000 mW / 100% Mod.

- Standby

EuT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurements:

-	Coax cable	Model :	unshielded, 3.5 m
-	AC power line, shielded and filtered	Model :	Eupen IMU 03
-	Laptop Mikes Intern	Model :	02-01/01-07-007
-	RJ 45 Ethernet Cable Mikes Intern	Model :	Cross Over
-		Model :	
-		Model :	

- customer specific cables

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

mikes-testingpartners gmbh
Ohmstrasse 2-4
94342 Strasskirchen
Germany

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 /11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Measurement Protocol for FCC, VCCI and AUSTEL

4.4.1 GENERAL INFORMATION

4.4.1.1 Test Methodology

Conducted and radiated disturbance testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

In compliance with 47 CFR Part 15 Subpart A Section 15.38 testing for FCC compliance may be done following the ANSI C63.4-2003 procedures and using the CISPR 22 Limits.

4.4.1.2 Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

4.4.2 DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with CISPR Publication 22, EN 55022 - " Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.4-2003 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

5 TEST CONDITIONS AND RESULTS

5.1 Conducted emissions

For test instruments and accessories used see section 6 Part **A 4**.

5.1.1 Description of the test location

Test location: Shielded Room S2

5.1.2 Photo documentation of the test set-up

5.1.3 Description of Measurement

The final level, expressed in dBμV, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC Limit or to the CISPR limit.

To convert between dBμV and μV, the following conversions apply:

dBμV = 20(log μV)

μV = Inverse log(dBμV/20)

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EuT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a Line Impedance Stabilization Network (LISN) with 50Ω/50 μH (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

5.1.4 Test result

Frequency range: 0.15 MHz - 30 MHz

Min. limit margin 1.0 dB at 13.56 MHz

The requirements are **FULFILLED.**

Remarks: _____

_____

_____

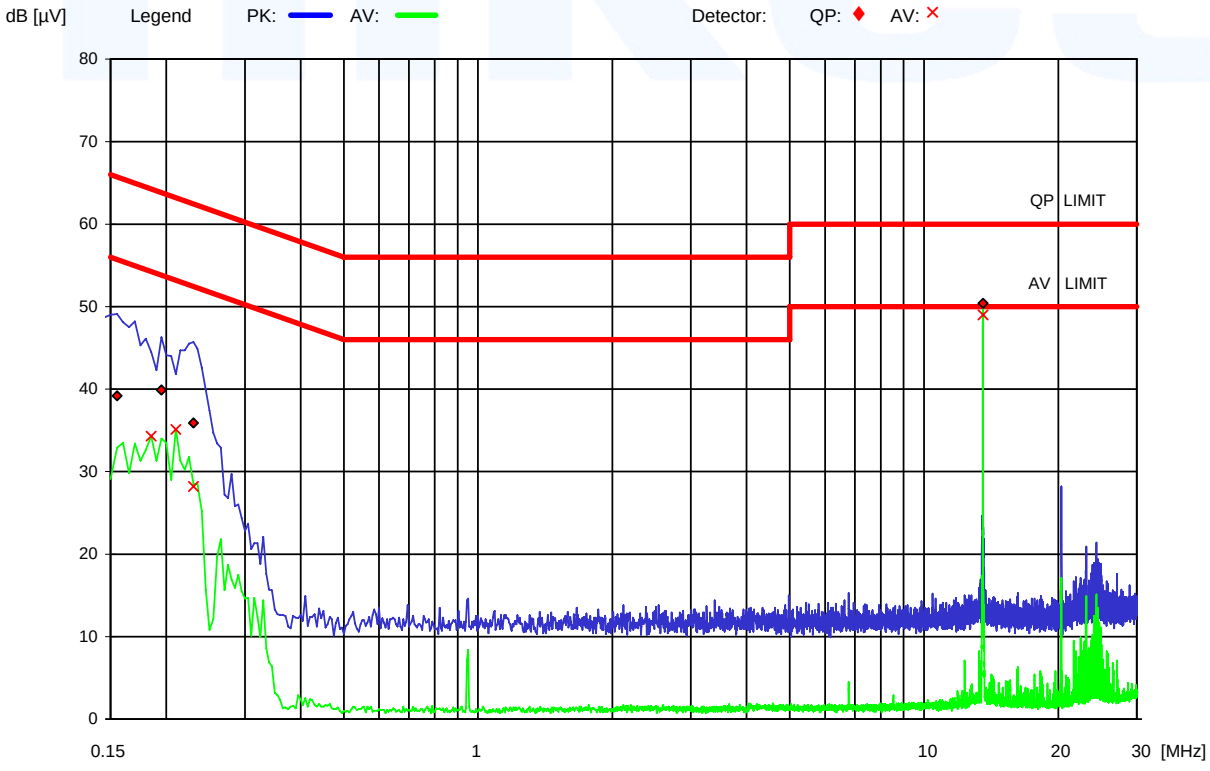
_____

5.1.5 Test protocol

Test point L1 Result: passed
Operation mode: Tx mode
Remarks: FCC Requirements
With shielded and filtered AC-mains cable
EUPEN
Date: 14.05.2008
Tested by: Huber Markus

Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[µV]	QP [dB]	kHz	dB[µV]	AV [dB]
155	39,2	26,5	185	34,3	20,0
195	39,9	23,9	210	35,1	18,1
230	35,9	26,5	230	28,2	24,2
13560	50,4	9,6	13560	49	1,0

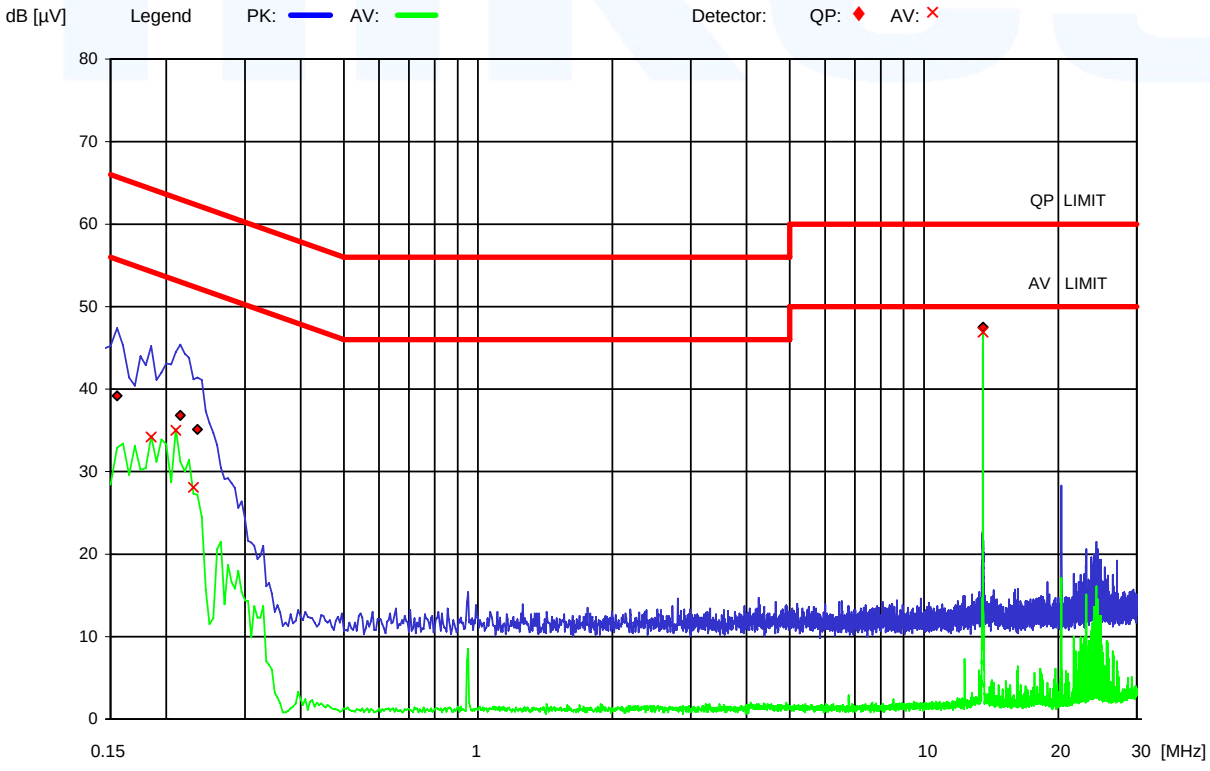
Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[µV]	QP [dB]	kHz	dB[µV]	AV [dB]



Test point N Result: passed
Operation mode: Tx mode
Remarks: FCC Requirements
With shielded and filtered AC-mains cable
EUPEN IMX
Date: 14.05.2008
Tested by: Huber Markus

Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[µV]	QP [dB]	kHz	dB[µV]	AV [dB]
155	39,2	26,5	185	34,2	20,1
215	36,8	26,2	210	35	18,2
235	35,1	27,2	230	28,1	24,3
13560	47,5	12,5	13560	46,9	3,1

Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[µV]	QP [dB]	kHz	dB[µV]	AV [dB]



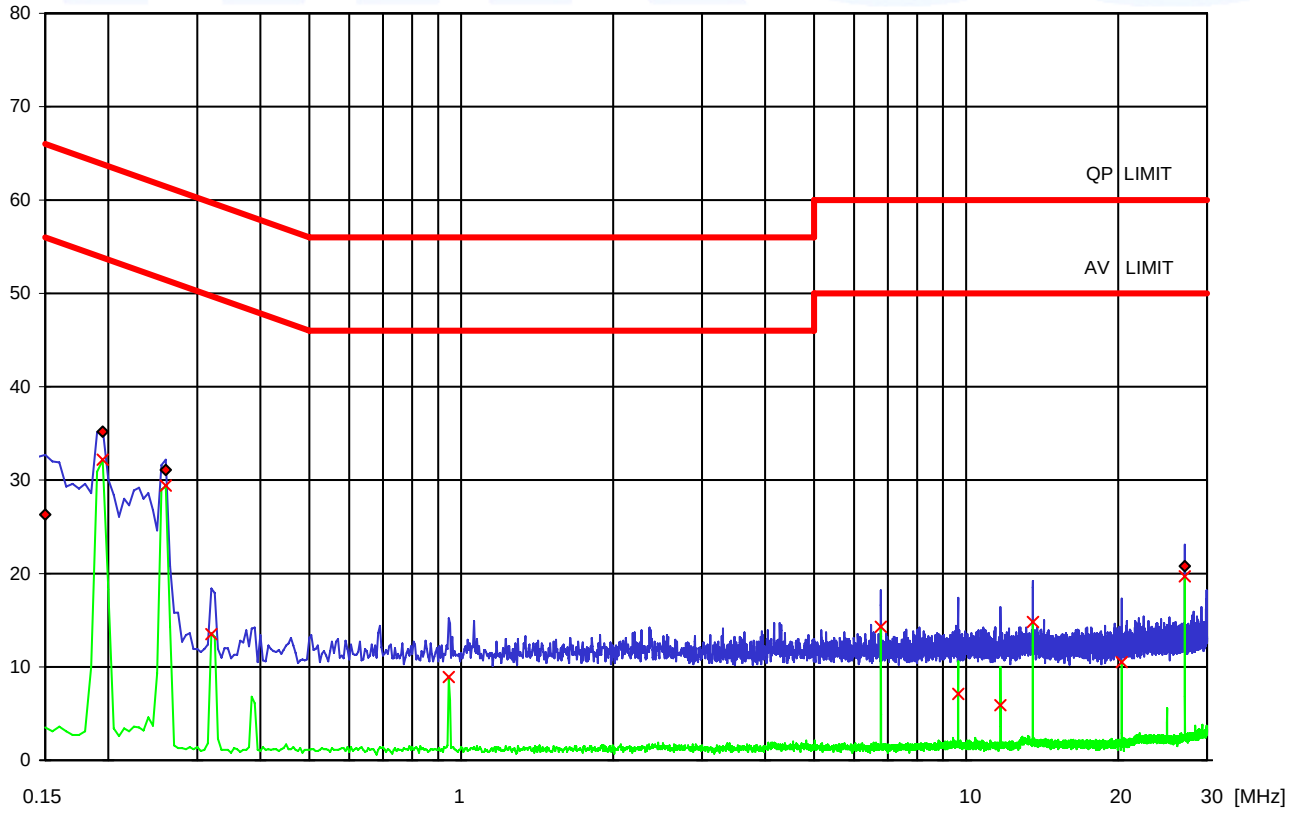
FCC ID: NDX-RIN13003

Test point L1 Result: passed
Operation mode: Standby
Remarks: FCC Requirements
With shielded and filtered AC-mains cable
EUPEN IMX
Date: 14.05.2008
Tested by: Huber Markus

Freq kHz	QP- L dB[µV]	D -Limit QP [dB]	Freq kHz	AV-L dB[µV]	D -Limit AV [dB]
150	26,3	39,7	195	32,2	21,6
195	35,2	28,6	260	29,4	22,0
260	31,1	30,3	320	13,5	36,2
27120	20,8	39,2	945	8,9	37,1
			6780	14,3	35,7
			9645	7,1	42,9
			11700	5,9	44,1
			13560	14,8	35,2
			20340	10,5	39,5
			27120	19,7	30,3

Freq kHz	QP- L dB[µV]	D -Limit QP [dB]	Freq kHz	AV-L dB[µV]	D -Limit AV [dB]

dB [µV] Legend PK: AV: Detector: QP: AV:



FCC ID: NDX-RIN13003

Test point N
Operation mode: Standby
Remarks: FCC Requirements

With shielded and filtered AC-mains cable
EUPEN IMX

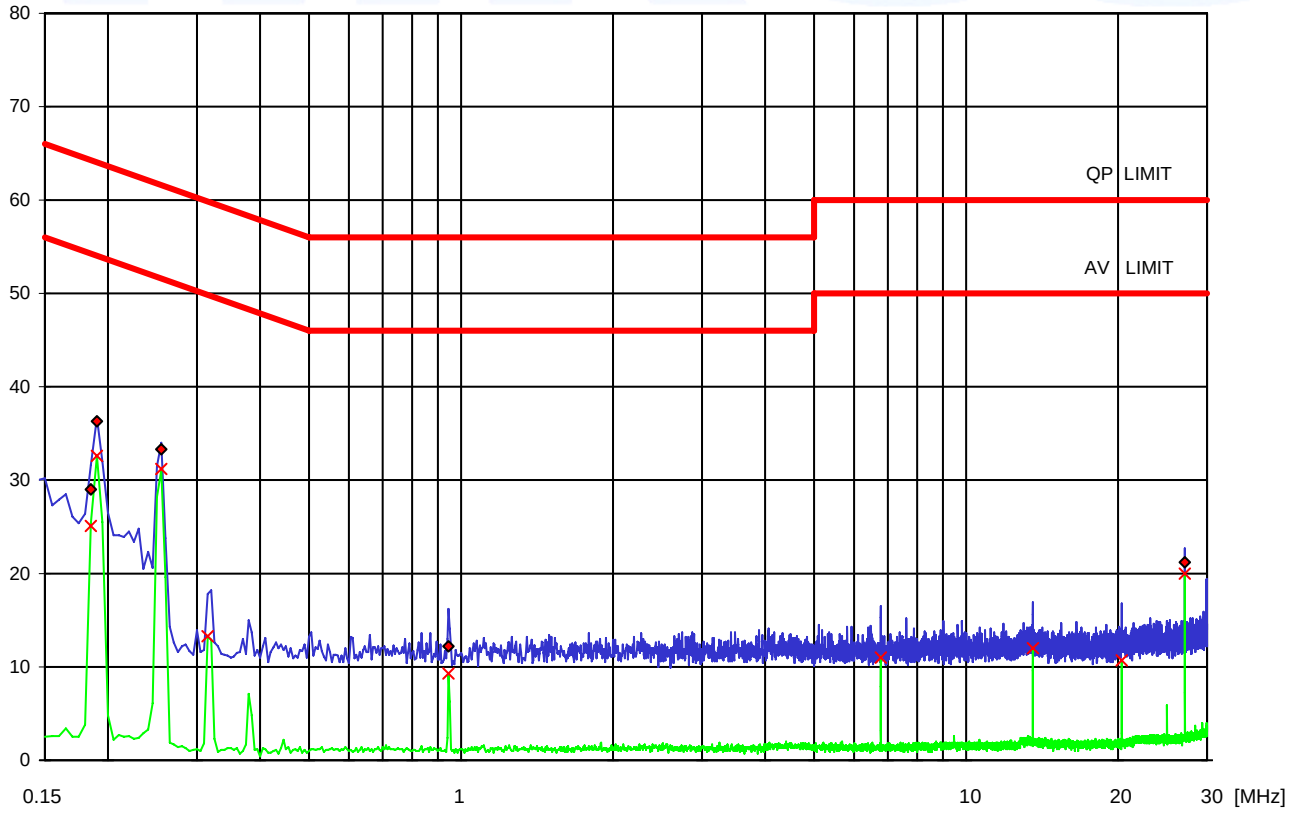
Date: 14.05.2008
Operator: Markus Huber

Result: passed

Freq kHz	QP- L dB[µV]	D -Limit QP [dB]	Freq kHz	AV-L dB[µV]	D -Limit AV [dB]
185	29	35,3	185	25,1	29,2
190	36,3	27,7	190	32,6	21,4
255	33,3	28,3	255	31,2	20,4
945	12,2	43,8	315	13,3	36,5
27120	21,2	38,8	945	9,3	36,7
			6780	11	39,0
			13560	12	38,0
			20340	10,7	39,3
			27120	20	30,0

Freq kHz	QP- L dB[µV]	D -Limit QP [dB]	Freq kHz	AV-L dB[µV]	D -Limit AV [dB]

dB [µV] Legend PK: AV: Detector: QP: AV:



5.2 Field strength of the fundamental wave

For test instruments and accessories used see section 6 Part **CPR 1**.

5.2.1 Description of the test location

Test location: OATS1

Test distance: 3 metres

5.2.2 Photo documentation of the test set-up

5.2.3 Description of Measurement

The magnetic field strength from the EuT will be measured on an open area test site in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions. In the case where larger measuring distances are required the results will extrapolated based on the values measured on the closer distances according to Section 15.31 (f) (2) [2]. The final measurement will be performed with an EMI Receiver set to Quasi Peak detector except for the frequency bands 9 kHz to 90 kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209 (d) [2].

The final level, expressed in dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.
The resolution bandwidth during the measurement is as follows:
9 kHz – 150 kHz: ResBW: 200 Hz
150 kHz – 30 MHz: ResBW: 9 kHz

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	Limit (dBµV/m)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

5.2.4 Test result

Measured value at 3m

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
13.56	81.6	81.3	81.5	20.0	101.6	101.3	101.5	124.0	-22.5

Calculated value at 30m:

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
13.56	41.6	41.3	41.5	20.0	61.6	61.3	61.5	84.0	-22.5

Limit according to FCC Part 15 Subpart 15.225(a)

Frequency (MHz)	Field strength of fundamental wave		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
13.553-13.567	**15848**	**84**	**30**

The requirements are **FULFILLED.**

Remarks: _____

5.3 Spurious emissions (Magnectic field) 9 kHz – 30 MHz

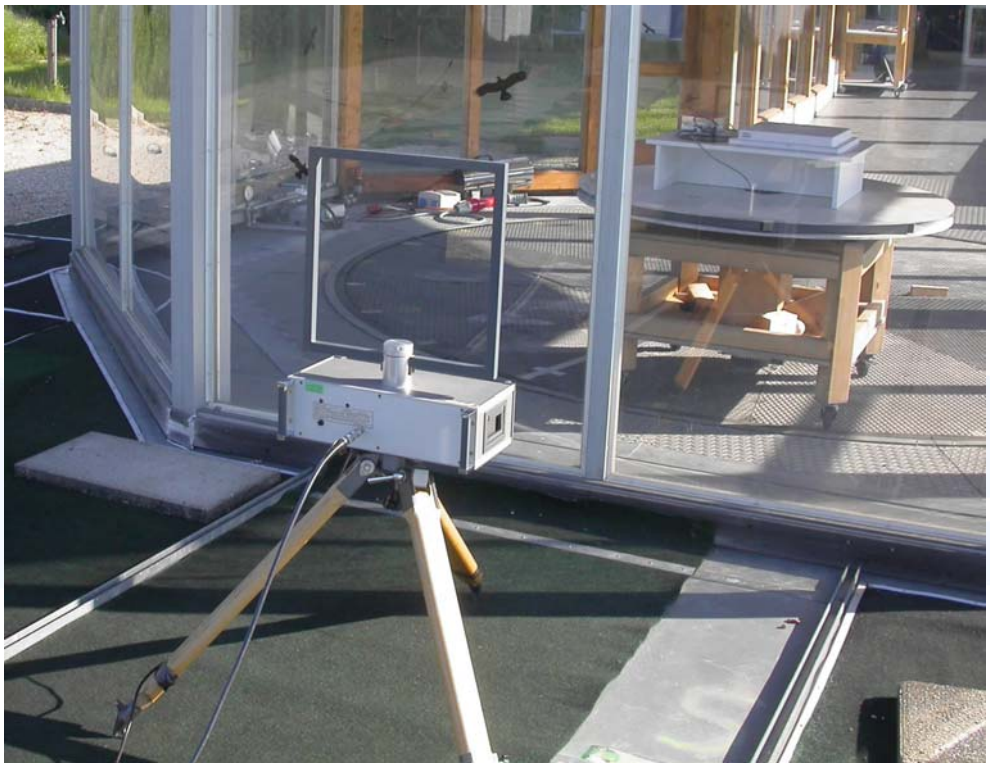
For test instruments and accessories used see section 6 Part **SER 1**.

5.3.1 Description of the test location

Test location: OATS1

Test distance: 3 metres

5.3.2 Photo documentation of the test set-up



5.3.3 Description of Measurement

The spurious emissions from the EuT will be measured on an open area test site in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions. In the case where larger measuring distances are required the results will extrapolated based on the values measured on the closer distances according to Section 15.31 (f) (2) [2]. The final measurement will be performed with an EMI Receiver set to Quasi Peak detector except for the frequency bands 9 kHz to 90 kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209 (d) [2].

The final level, expressed in dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.
The resolution bandwidth during the measurement is as follows:
9 kHz – 150 kHz: ResBW: 200 Hz
150 kHz – 30 MHz: ResBW: 9 kHz

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	Limit (dBµV/m)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

5.3.4 Test result

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
0.009 – 30.0				20				40.0	> 20

Limit according to FCC Part 15 Subpart 15.209(a)

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
0.009-0.490	2400/F(kHz)	--	300
0.490-1.705	24000/F (kHz)	--	30
1.705-30.0	30	29.5	30

The requirements are **FULFILLED.**

Remarks: _____

5.4 Radiated emissions (electric field) 30 MHz – 1 GHz

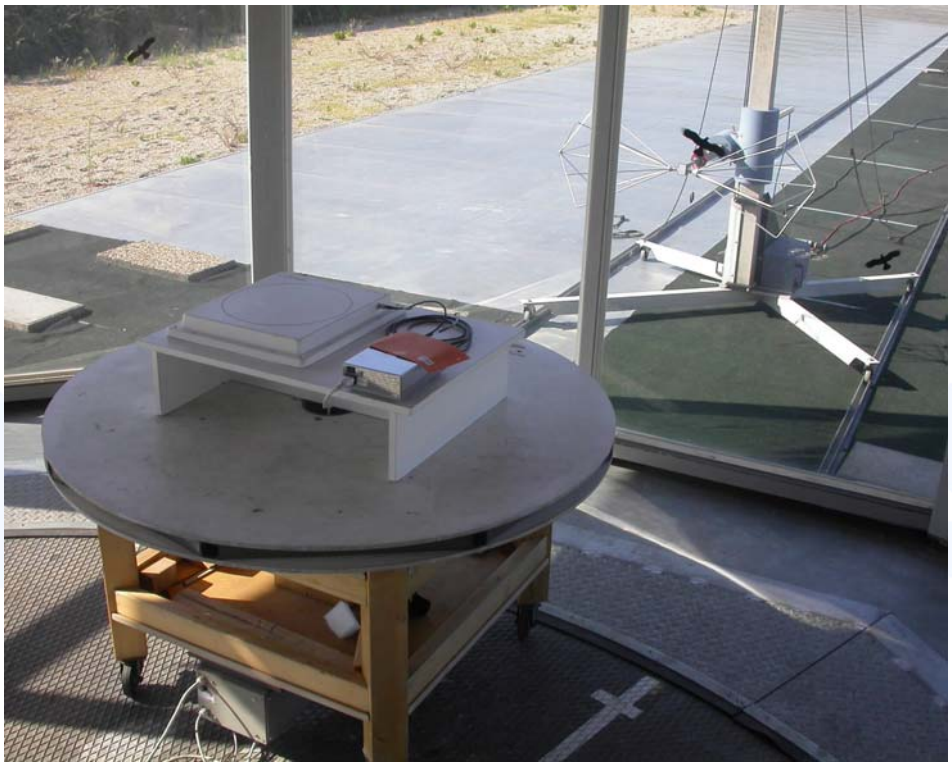
For test instruments and accessories used see section 6 Part **SER 2**.

5.4.1 Description of the test location

Test location: OATS1

Test distance: 3 metres

5.4.2 Photo documentation of the test set-up



5.4.3 Description of Measurement

Spurious emissions from the EuT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003. The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization`s and the EuT are rotated 360 degrees.

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

The resolution bandwidth during the measurement is as follows:
30 MHz – 1000 MHz: ResBW: 120 kHz

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	Limit (dBµV/m)	=	Delta (dB)
719	75	+	32.6	=	107.6	110	=	-2.4

5.4.4 Test result

Frequency [MHz]	L: QP [dBµV]	Correct. [dB]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
54.24	28.4	11.1	39.5	40.0	-0.5
67.80	31.2	8.3	39.5	40.0	-0.5
81.36	31.0	8.6	39.6	40.0	-0.4
108.48	30.0	13.3	43.3	43.5	-0.2
135.60	26.5	16.2	42.7	43.5	-0.8
149.16	25.6	17.3	42.9	43.5	-0.6
172.71	17.3	18.6	35.9	43.5	-7.6
203.39	13.4	19.6	33.0	43.5	-10.5
216.95	16.1	20.0	36.1	46.0	-9.9
230.51	17.1	20.4	37.5	46.0	-8.5
244.07	14.4	20.8	35.2	46.0	-10.8
284.75	22.9	22.9	45.8	46.0	-0.2

Limit according to FCC Part 15 Subpart 15.209(a)

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

The requirements are **FULFILLED.**

Remarks: The values of the test result show an extract of the critical spurious emission level.

5.5 Frequency tolerance of the carrier

For test instruments and accessories used see section 6 Part **FE**.

5.5.1 Description of the test location

Test location: AREA4

5.5.2 Photo documentation of the test set-up

5.5.3 Test result

Test conditions		Test result		
		Frequency (MHz)		
T_{min} (-20)°C	V_{nom} (115)V	13.559626		
T (-10)°C	V_{nom} (115)V	13.559554		
T (0)°C	V_{nom} (115)V	13.559518		
T (10)°C	V_{nom} (115)V	13.559454		
T_{nom} (20)°C	V_{min} (98)V	13.559442		
	V_{nom} (115)V	13.559442		
	V_{max} (132)V	13.559442		
T (30)°C	V_{nom} (115)V	13.559434		
T (40)°C	V_{nom} (115)V	13.559414		
T_{max} (50)°C	V_{nom} (115)V	13.559422		
Maximum tolerance of carrier frequency (kHz)		-0.028 / +0.184		
Measurement uncertainty		± 10 Hz		

Limit according to FCC Part 15 Subpart 15.225 (e): ± 0.01 % of carrier frequency at 13.560 MHz = ± 1.356 kHz

The requirements are **FULFILLED.**

Remarks: _____

5.6 Emission Bandwidth

For test instruments and accessories used see section 6 Part **MB**.

5.6.1 Description of the test location

Test location: Shielded Room S4

5.6.2 Photo documentation of the test set-up

5.6.3 Description of Measurement

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio of -20 dB. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or the first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.
The resolution bandwidth of measuring instrument was set to a value as shown in the folloing table below according to ANSI C63.4-2003.

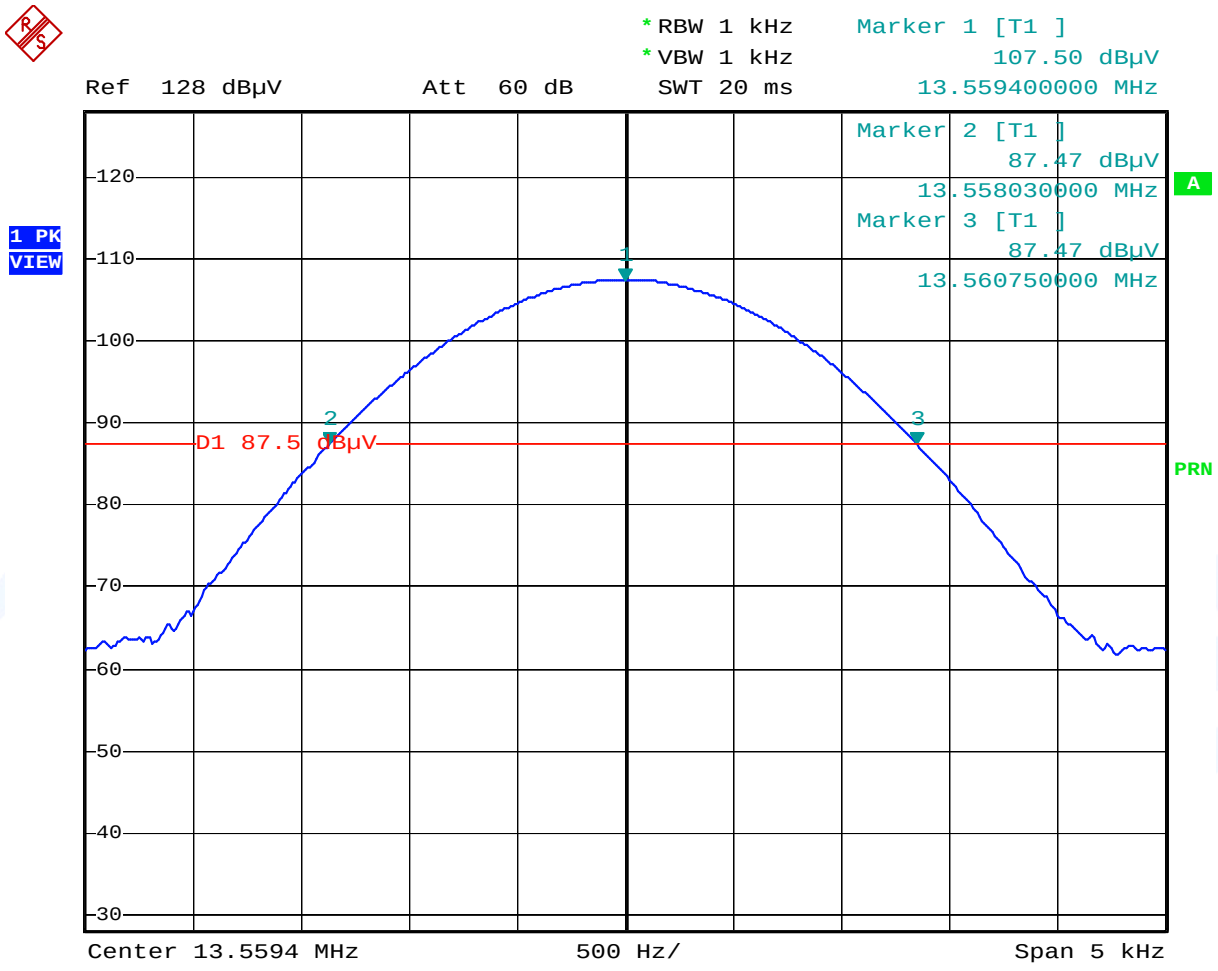
Fundamental frequency	Minimum resolution bandwidth
9 kHz to 30 MHz	1kHz
30 to 1000 MHz	10 kHz
1000 MHz to 40 GHz	100 kHz

5.6.4 Test result

Channel Frequency [MHz]	20 dB Bandwidth [kHz]
13.56	2.72

Remarks: For detailed test result please refer to following test protocol.

5.6.5 Test protocol



5.7 Transmitter spectrum mask

For test instruments and accessories used see section 6 Part **MB**.

5.7.1 Description of the test location

Test location: AREA4

5.7.2 Test result

The absolute levels of RF power at any frequency shall not exceed the limits defined in FCC Part §15.225 a-d

The requirements are **FULFILLED.**

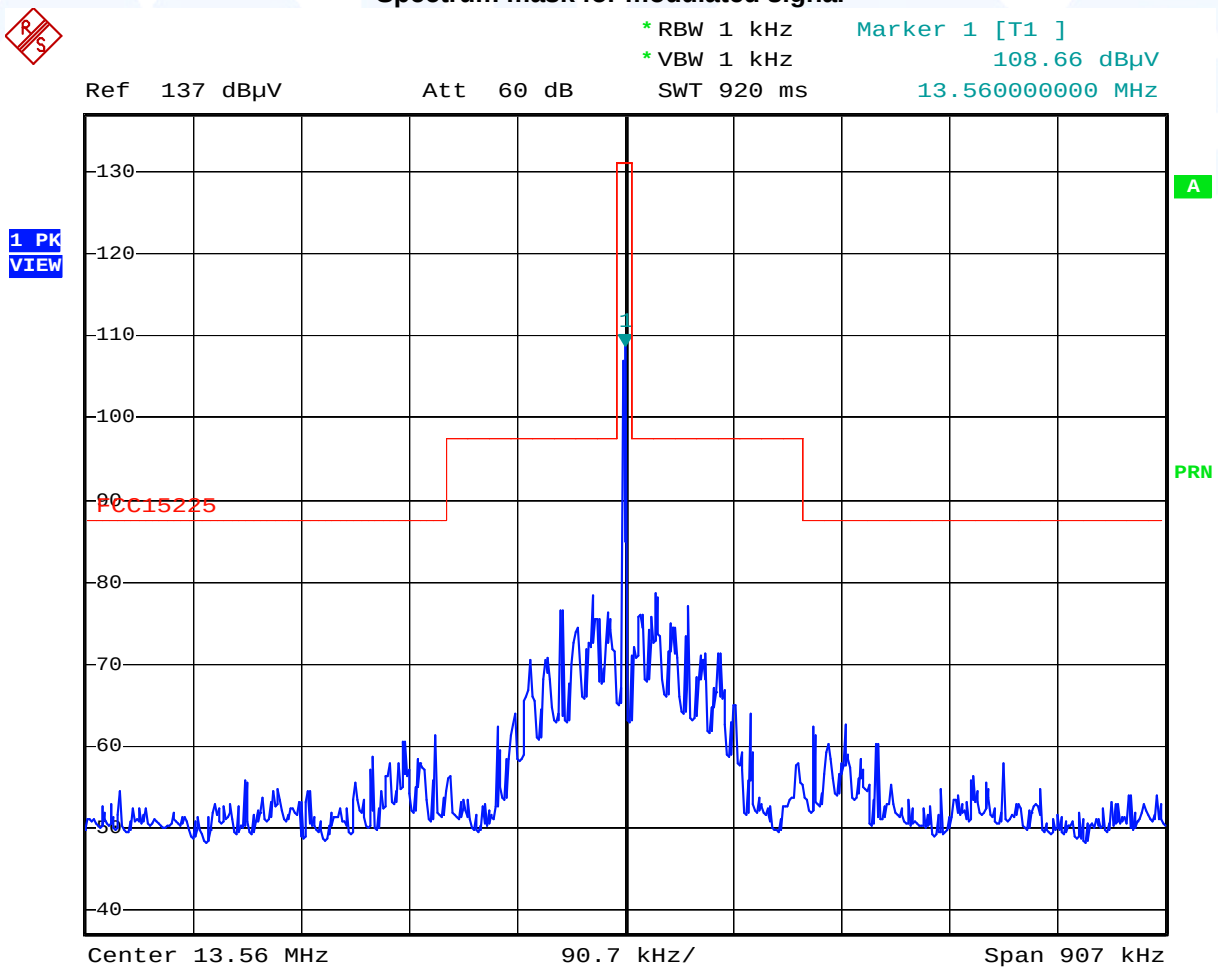
Remarks: _____

_____

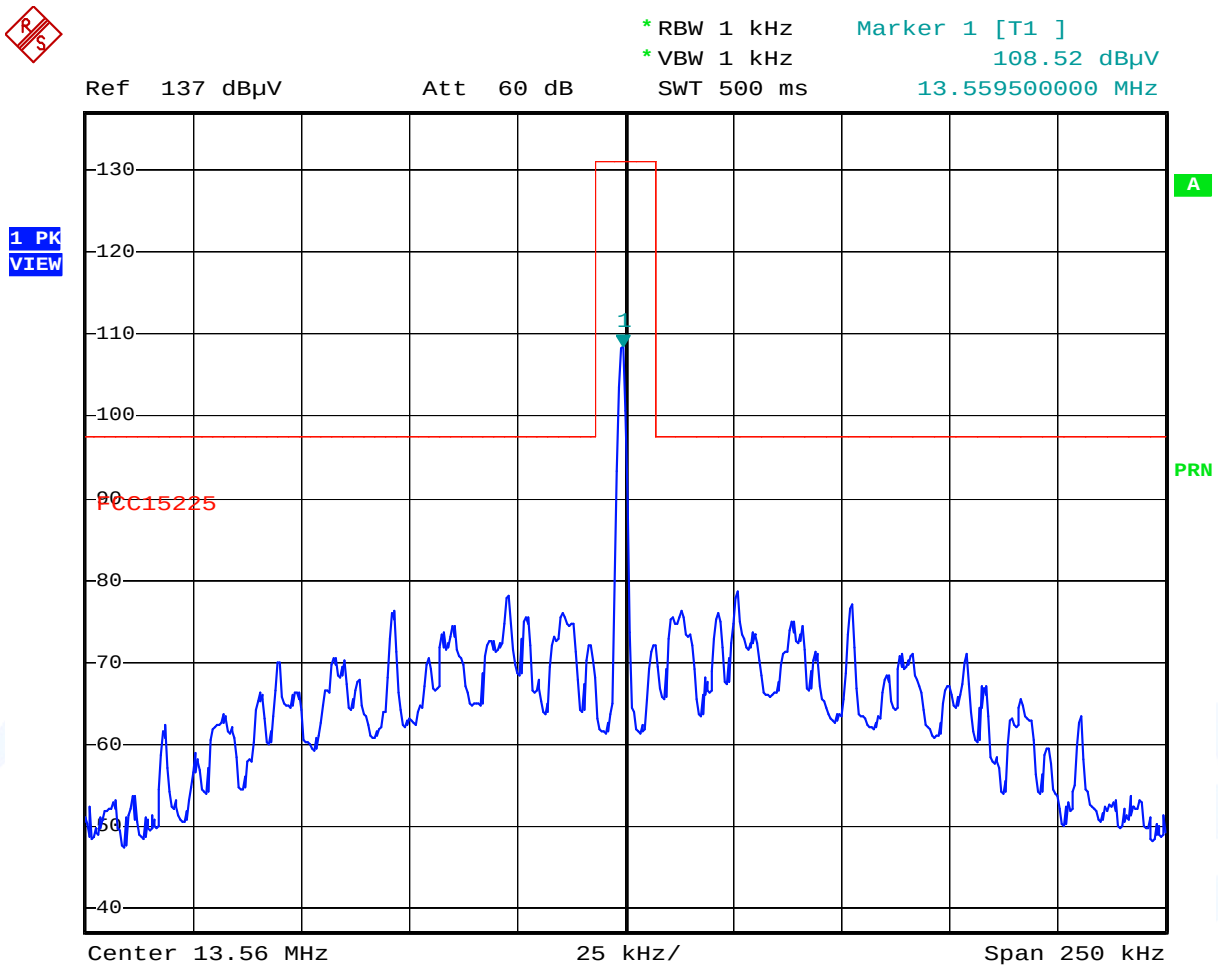
_____

5.7.3 Test protocol

Spectrum mask for modulated signal



Spectrum mask for modulated signal



5.8 Receiver radiated emissions (Magnectic field) 9 kHz – 30 MHz

For test instruments and accessories used see section 6 Part **SER 1**.

5.8.1 Description of the test location

Test location: OATS1

Test distance: 3 metres

5.8.2 Photo documentation of the test set-up

5.8.3 Description of Measurement

Spurious emissions from the EuT are measured in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions.

The final level, expressed in dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

The resolution bandwidth during the measurement was as follows:
9 kHz – 150 kHz: ResBW: 200 Hz
150 kHz – 30 MHz: ResBW: 9 kHz

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	Limit (dBµV/m)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

5.8.4 Test result

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
0.009 - 30		< 0		20		< 20			

Limit according to FCC Part 15 Subpart 15.209(a)

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
0.009-0.490	2400/F(kHz)	--	300
0.490-1.705	24000/F (kHz)	--	30
1.705-30.0	30	29.5	30

The requirements are **FULFILLED.**

Remarks: _____

5.9 Receiver radiated emissions (electric field) 30 MHz – 1 GHz

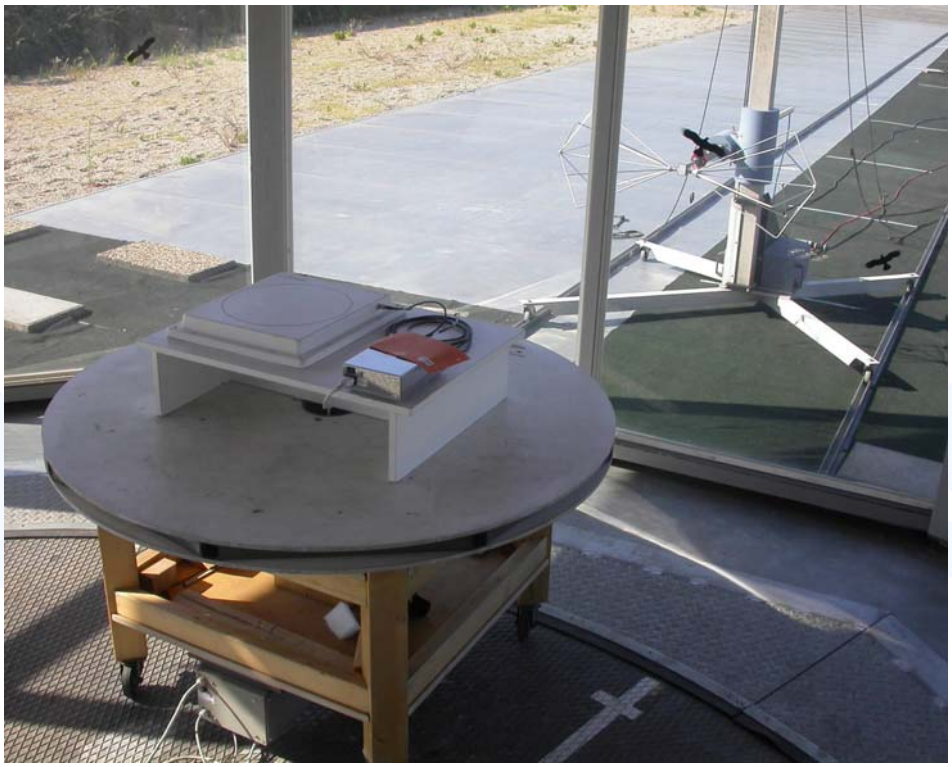
For test instruments and accessories used see section 6 Part **SER 2**.

5.9.1 Description of the test location

Test location: OATS1

Test distance: 3 metres

5.9.2 Photo documentation of the test set-up



5.9.3 Description of Measurement

Spurious emissions from the EuT are measured in the frequency range of 30 MHz to 10 times the highest used frequency using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization`s and the EuT are rotated 360 degrees.

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	Limit (dBµV/m)	=	Delta (dB)
719	75	+	32.6	=	107.6	110	=	-2.4

5.9.4 Test result

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
30 - 1000			< 10	20			< 30		

Limit according to FCC Part 15 Subpart 15.209(a)

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
960-1000	500	54	3

The requirements are **FULFILLED.**

Remarks: _____

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

The calibration intervals and the calibration history will be given out on request.

Test Report No: T32594-00-02HU
Beginning of Testing: 13 May 2008
End of Testing: 20 May 2008

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.
A 4	ESHS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-002
	ESH 2 - Z 5	LISN	Rohde & Schwarz München	02-02/20-05-004
	N-4000-BNC	RF Cable	mikes-testingpartners gmbh	02-02/50-05-138
	N-1500-N	RF Cable	mikes-testingpartners gmbh	02-02/50-05-140
	ESH 3 - Z 2	Pulse Limiter	Rohde & Schwarz München	02-02/50-05-155
	SP 103 /3.5-60	Convertor 220V / 110V	mikes-testingpartners gmbh	02-02/50-05-182
CPR 1	FMZB 1516	Magnetic Field Antenna	Schwarzbeck Mess-Elektron	01-02/24-01-018
	ESCI	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-004
	S10162-B	RF Cable 33m	Huber + Suhner	02-02/50-05-031
	KK-EF393-21N-16	RF Cable 20m	Huber + Suhner	02-02/50-05-033
	NW-2000-NB	RF Cable	Huber + Suhner	02-02/50-05-113
FE	FSP 30	Spectrum Analyzer	Rohde & Schwarz München	02-02/11-05-001
	THS730A	Handheld Scope	Tektronix GmbH	02-02/13-05-001
	HZ-10	Magnetic Field Antenna	Rohde & Schwarz München	02-02/24-05-012
	WK-340/40	Climatic Chamber	Weiss Umwelttechnik GmbH	02-02/45-05-001
	Type 5315.5	Transformer	STATRON Gerätetechnik	02-02/50-05-197
MB	FSP 30	Spectrum Analyzer	Rohde & Schwarz München	02-02/11-05-001
	THS730A	Handheld Scope	Tektronix GmbH	02-02/13-05-001
	HZ-10	Magnetic Field Antenna	Rohde & Schwarz München	02-02/24-05-012
	WK-340/40	Climatic Chamber	Weiss Umwelttechnik GmbH	02-02/45-05-001
	Type 5315.5	Transformer	STATRON Gerätetechnik	02-02/50-05-197
SER 1	FMZB 1516	Magnetic Field Antenna	Schwarzbeck Mess-Elektron	01-02/24-01-018
	ESCI	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-004
	S10162-B	RF Cable 33m	Huber + Suhner	02-02/50-05-031
	KK-EF393-21N-16	RF Cable 20m	Huber + Suhner	02-02/50-05-033
	NW-2000-NB	RF Cable	Huber + Suhner	02-02/50-05-113
SER 2	ESVS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-006
	UHALP 9108 A	Log. Per. Antenna	Schwarzbeck Mess-Elektron	02-02/24-05-004
	BBA 9106	Biconical Antenna	Schwarzbeck Mess-Elektron	02-02/24-05-023
	S10162-B	RF Cable 33m	Huber + Suhner	02-02/50-05-031
	KK-EF393-21N-16	RF Cable 20m	Huber + Suhner	02-02/50-05-033
	NW-2000-NB	RF Cable	Huber + Suhner	02-02/50-05-113

Test Report No: T32594-00-02HU
Beginning of Testing: 13 May 2008
End of Testing: 20 May 2008

Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A 4				
02-02/03-05-002	04/30/2009	04/30/2008		
02-02/20-05-004	03/13/2011	03/13/2008	09/13/2008	03/13/2008
02-02/50-05-138				
02-02/50-05-140				
02-02/50-05-155	09/25/2008	03/25/2008		
02-02/50-05-182				
CPR 1				
01-02/24-01-018	02/20/2009	02/20/2008		
02-02/03-05-004	01/08/2009	01/08/2008		
02-02/50-05-031				
02-02/50-05-033				
02-02/50-05-113				
FE				
02-02/11-05-001	04/08/2009	04/08/2008		
02-02/13-05-001	09/03/2008	09/03/2007		
02-02/24-05-012				
02-02/45-05-001	09/01/2008	09/01/2005	06/07/2008	12/07/2007
02-02/50-05-197				
MB				
02-02/11-05-001	04/08/2009	04/08/2008		
02-02/13-05-001	09/03/2008	09/03/2007		
02-02/24-05-012				
02-02/45-05-001	09/01/2008	09/01/2005	06/07/2008	12/07/2007
02-02/50-05-197				
SER 1				
01-02/24-01-018	02/20/2009	02/20/2008		
02-02/03-05-004	01/08/2009	01/08/2008		
02-02/50-05-031				
02-02/50-05-033				
02-02/50-05-113				
SER 2				
02-02/03-05-006	07/24/2008	07/24/2007		
02-02/24-05-004	08/21/2008	02/21/2008		
02-02/24-05-023	03/16/2010	03/16/2007	08/21/2008	02/21/2008
02-02/50-05-031				
02-02/50-05-033				
02-02/50-05-113				