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# TEST REPORT

**Test Report Reference: F060942E02**

**Equipment under Test: SePem01 Master**

**Applicant: Hermann Sewerin GmbH**

**Manufacturer: Hermann Sewerin GmbH**

**Test Laboratory  
(CAB)**

**accredited by DATech in der TGA GmbH  
in compliance with DIN EN ISO/IEC 17025  
under the Reg. No. DAT-P-105/99-21,**

**recognized by Bundesnetzagentur  
under the Reg.-No. BNetzA-CAB-02/21-104/1,**

**CAB Designation Number DE0004,**

**listed by  
FCC 31040/SIT1300F2**

**FCC Test site registration number 90877  
Industry Canada Test site registration IC3469A-1**

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## 1 IDENTIFICATION

### 1.1 APPLICANT

Name:	Hermann Sewerin GmbH
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	33334 Gütersloh
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Fax:	+49 52 41 934-444
e-mail address:	christian.kreienbrinck@sewerin.com

### 1.2 MANUFACTURER

Name:	Hermann Sewerin GmbH
Address:	Robert-Bosch-Strasse 3
	33334 Gütersloh
Country:	Germany
Name for contact purposes:	Mr. Christian KREIENBRINK
Tel:	+ 49 52 41 934-319
Fax:	+49 52 41 934-444
e-mail address:	christian.kreienbrinck@sewerin.com

### 1.3 DATES

Date of receipt of test sample:	30 October 2008
Start of test:	07 November 2008
End of test:	12 November 2008

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## 1.4 TEST LABORATORY

The tests were carried out at:

**PHOENIX TESTLAB GmbH**  
Königswinkel 10  
D-32825 Blomberg  
Germany

Phone: +49 (0) 52 35 / 95 00-0  
Fax: +49 (0) 52 35 / 95 00-10

Test engineer: Thomas KÜHN  
Name

  
Signature

21 November 2008  
Date

Test report checked: Bernd STEINER  
Name

  
Signature

21 November 2008  
Date

**PHOENIX TESTLAB GmbH**  
Königswinkel 10  
32825 Blomberg  
Tel. 0 52 35 / 95 00-0  
Fax 0 52 35 / 95 00-10

Stamp

## 1.5 RESERVATION

This test report is only valid in its original form.

Any reproduction of its contents without written permission of the accredited test laboratory  
PHOENIX TESTLAB GmbH is prohibited.

The test results herein refer only to the tested sample. PHOENIX TESTLAB GmbH is not responsible for any generalisations or conclusions drawn from these test results concerning further samples. Any modification of the tested samples is prohibited and leads to the invalidity of this test report. Each page necessarily contains the PHOENIX TESTLAB Logo and the TEST REPORT REFERENCE.

## 1.6 NORMATIVE REFERENCES

- [1] **ANSI C63.4:2003** American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
- [2] **FCC 47 CFR Part 15** Radio Frequency Devices (Subpart B)

## 1.7 TEST RESULTS

The requirements of this test document are fulfilled by the equipment under test. The complete test results are presented in the following.

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## 2 TECHNICAL DATA OF EQUIPMENT

### 2.1 DEVICE UNDER TEST

Type of equipment: *	Noise Logger
Type designation: *	SePem 01 Master
Antenna type: *	External antenna K71 17 23 or FSP70/CEL1
Antenna gain: *	4 dB (K71 17 23) or 5 dB (FSP70/CEL1) refered to $\lambda/4$ radiator
Antenna connector: *	BNC
Power supply: *	6.0 V DC by internal battery or 12 V by external power supply
Type of modulation: *	GFSK
Operating frequency range: *	466.0375 MHz to 469.5625 MHz (transmit) 461.0375 MHz to 464.5625 MHz (receive)
Channel spacing: *	12.5 kHz
Number of channels: *	282
Temperature range: *	-20 °C to 70 °C
Lowest / highest internal frequency: *	32 kHz / 16.3676 MHz
Ancillary equipment used for testing:	AC/DC adaptor type FW 75550/12

\*: declared by the applicant

The following external I/O cables were used:

Cable	Length	Shielding	Connector
DC in	2 m <sup>1</sup>	No	2 pole FRIWO socket
USB	2 m <sup>1</sup>	Yes	USB-B connector
Antenna	4 m <sup>1</sup>	Yes	BNC

<sup>1</sup>: Length during the test if no other specified and if the cable was used during the test.

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## 2.2 PERIPHERY DEVICES

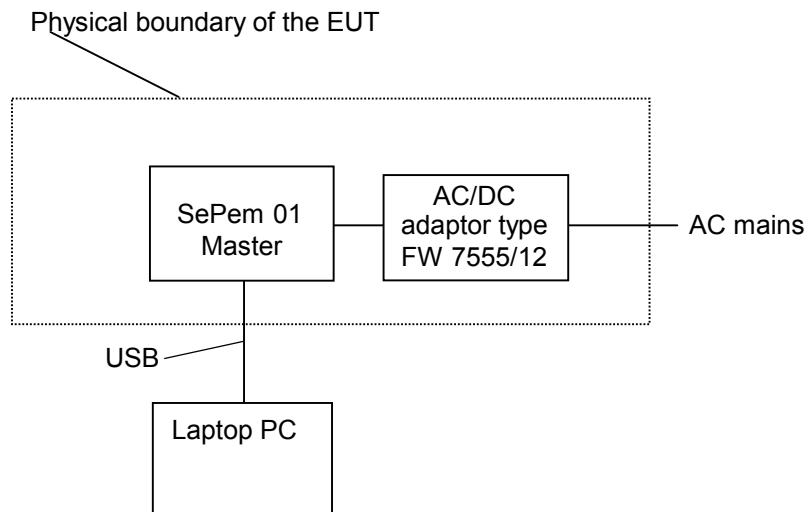
The following equipment was used as control unit and ancillary equipment:

- If stated, an AC/DC adaptor type FW75550/12, which was connected to an AC mains network with 120 V DC / 60 Hz was used.
- As external antenna a FSP70/CEL1 was connected to the EUT.
- A Fujitsu Siemens Lifebook S Series laptop PC was used for Data exchange during all tests.

## 3 OPERATIONAL STATES AND PHYSICAL BOUNDARIES

The test was carried out with an unmodified test sample. The EUT was connected to a laptop PC, which operates with a communication software (supplied by the applicant). With this software a data communication between the SePem 01 Master and the PC was set up.

During the tests, the EUT was not labelled.



## 4 APPLICATION OVERVIEW

Application	Frequency range [MHz]	FCC 47 CFR section	Status	Refer page
Radiated emissions (computing device)	30 - 1,000	15.109 (a)	Passed	7 et seq.
Conducted emissions on supply line	0.15 – 30	15.107 (a)	Passed	17 et seq.

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## 5 TEST RESULTS

### 5.1 RADIATED EMISSIONS

#### 5.1.1 METHOD OF MEASUREMENT (RADIATED EMISSIONS)

The radiated emission measurement is subdivided into five stages.

- A preliminary measurement carried out in a fully anechoic chamber with a fixed antenna height in the frequency range 9 kHz to 1 GHz.
- A final measurement carried out on an outdoor test side without reflecting ground plane and a fixed antenna height in the frequency range 9 kHz to 30 MHz.
- A final measurement carried out on an open area test side with reflecting ground plane and various antenna height in the frequency range 30 MHz to 1 GHz.
- A preliminary measurement carried out in a fully anechoic chamber with a variable antenna distance and height in the frequency range 1 GHz to 25 GHz.
- A final measurement carried out in a fully anechoic chamber with a fixed antenna height in the frequency range 1 GHz to 25 GHz.

All measurements will be carried out with the EUT working on the middle and upper and lower edge of the assigned frequency band. For this reason the hopping function of the EUT has to be disabled.

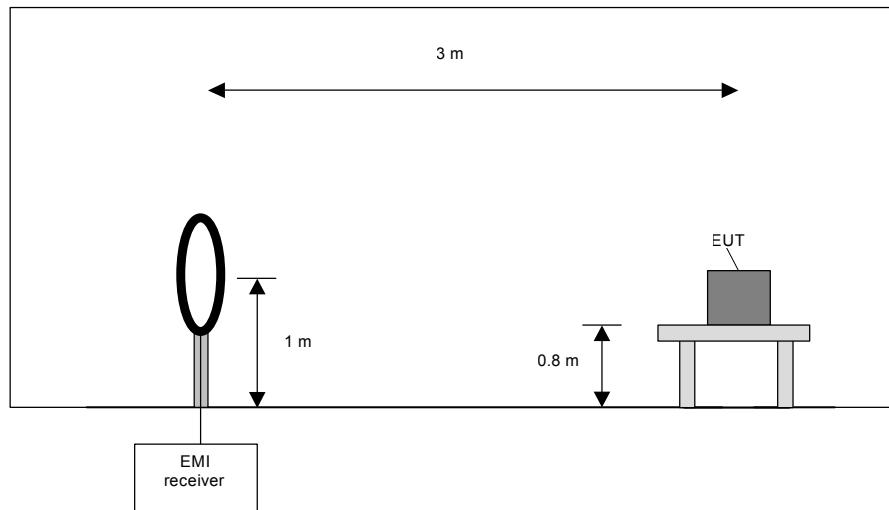
##### Preliminary measurement (9 kHz to 30 MHz):

In the first stage a preliminary measurement will be performed in a shielded room with a measuring distance of 3 meters. Tabletop devices will set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm. Floor-standing devices will be placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 [1].

The frequency range 9 kHz to 30 MHz will be monitored with a spectrum analyser while the system and its cables will be manipulated to find out the configuration with the maximum emission levels if applicable. The EMI Receiver will be set to MAX Hold mode. The EUT and the measuring antenna will be rotated around their vertical axis to found the maximum emissions.

The resolution bandwidth of the spectrum analyser will be set to the following values:

Frequency range	Resolution bandwidth
9 kHz to 150 kHz	200 Hz
150 kHz to 30 MHz	10 kHz



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Preliminary measurement procedure:

Prescans were performed in the frequency range 9 kHz to 150 kHz and 150 kHz to 30 MHz.

The following procedure will be used:

- 1) Monitor the frequency range at horizontal polarisation and a EUT azimuth of 0 °.
- 2) Manipulate the system cables within the range to produce the maximum level of emission.
- 3) Rotate the EUT by 360 ° to maximize the detected signals.
- 4) Make a hardcopy of the spectrum.
- 5) Measure the frequencies of highest detected emission with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
- 6) Repeat steps 1) to 5) with the other orthogonal axes of the EUT (if handheld equipment).
- 7) Rotate the measuring antenna and repeat steps 1) to 5).

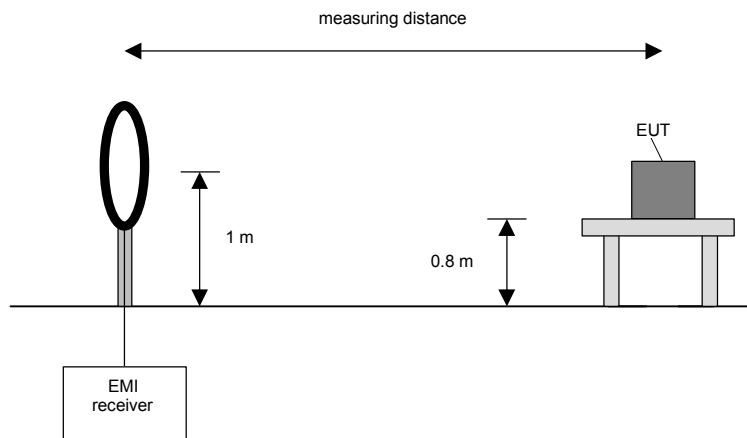
Final measurement (9 kHz to 30 MHz):

In the second stage a final measurement will be performed on an open area test site with no conducting ground plane in a measuring distances of 3 m, 10 m and 30 m. In the case where larger measuring distances are required the results will be 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 a EMI Receiver set to Quasi Peak detector except for the frequency bands 9 kHz to 90 kHz and 110 kHz to 490 kHz where an average detector will be used according Section 15.209 (d) [2].

On the during the preliminary measurement detected frequencies the final measurement will be performed while rotating the EUT and the measuring antenna in the range of 0 ° to 360 ° around their vertical axis until the maximum value is found.

The resolution bandwidth of the EMI Receiver will be set to the following values:

Frequency range	Resolution bandwidth
9 kHz to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz



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Final measurement procedure:

The following procedure will be used:

- 1) Monitor the frequency range with the measuring antenna at vertical orientation parallel to the EUT at an azimuth of 0 °.
- 2) Rotate the EUT by 360 ° to maximize the detected signals and note the azimuth and orientation.
- 3) Rotate the measuring antenna to find the maximum and note the value.
- 4) Rotate the measuring antenna and repeat steps 1) to 3) until the maximum value is found.
- 5) Repeat steps 1) to 4) with the other orthogonal axes of the EUT (if handheld equipment application).

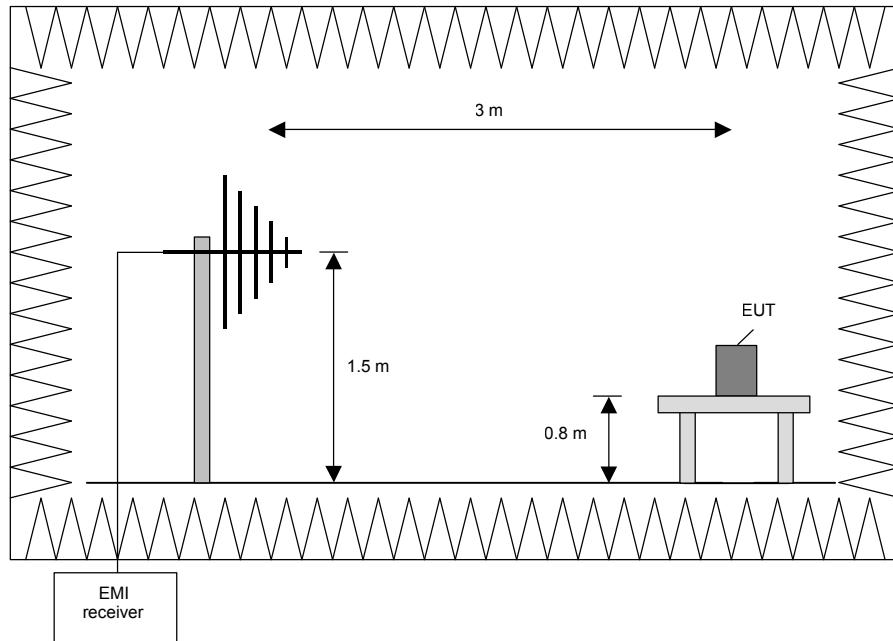
**Preliminary measurement (30 MHz to 1 GHz)**

In the first stage a preliminary measurement will be performed in a fully anechoic chamber with a measuring distance of 3 meter. Tabletop devices will set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm. Floor-standing devices will be placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 [1].

The frequency range 30 MHz to 1 GHz will be measured with an EMI Receiver set to MAX Hold mode and a resolution bandwidth of 100 kHz. The measurement will be performed in horizontal and vertical polarisation of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 ° to 360 °.

The resolution bandwidth of the EMI Receiver will be set to the following values:

Frequency range	Resolution bandwidth
30 MHz to 230 MHz	100 kHz
230 MHz to 1 GHz	100 kHz



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Procedure preliminary measurement:

Prescans were performed in the frequency range 30 MHz to 230 MHz and 230 MHz to 1 GHz. The following procedure will be used:

1. Monitor the frequency range at horizontal polarisation and a EUT azimuth of 0 °.
2. Manipulate the system cables within the range to produce the maximum level of emission.
3. Rotate the EUT by 360 ° to maximize the detected signals.
4. Make a hardcopy of the spectrum.
5. Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
6. Repeat 1) to 4) with the other orthogonal axes of the EUT (if handheld equipment).
7. Repeat 1) to 5) with the vertical polarisation of the measuring antenna.

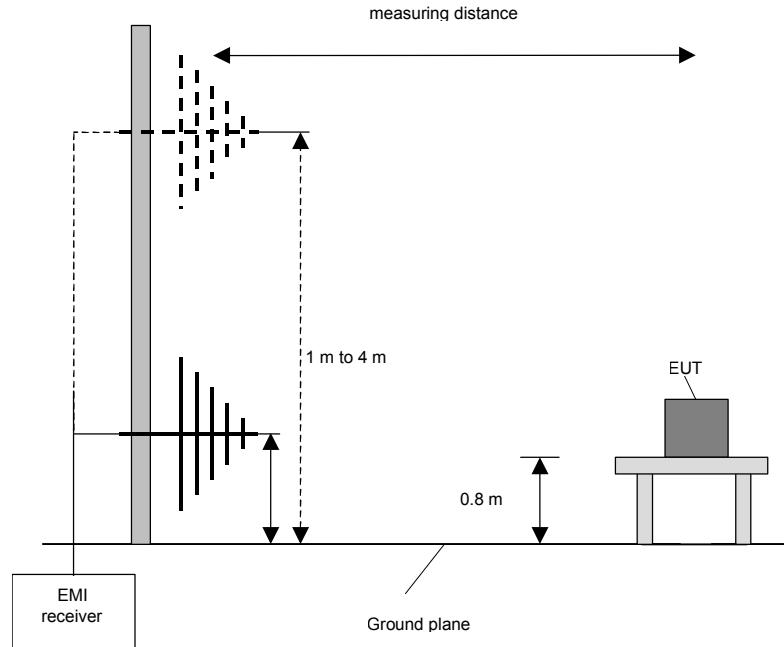
Final measurement (30 MHz to 1 GHz)

A final measurement on an open area test site will be performed on selected frequencies found in the preliminary measurement. During this test the EUT will be rotated in the range of

0 ° to 360 °, the measuring antenna will be set to horizontal and vertical polarisation and raised and lowered in the range from 1 m to 4 m to find the maximum level of emissions.

The resolution bandwidth of the EMI Receiver will be set to the following values:

Frequency range	Resolution bandwidth
30 MHz to 1 GHz	120 kHz



TEST REPORT REFERENCE: F060942E02

Procedure final measurement:

The following procedure will be used:

- 1) Measure on the selected frequencies at an antenna height of 1 m and a EUT azimuth of 23 °.
- 2) Move the antenna from 1 m to 4 m and note the maximum value at each frequency.
- 3) Rotate the EUT by 45 ° and repeat 2) until an azimuth of 337 ° is reached.
- 4) Repeat 1) to 3) for the other orthogonal antenna polarization.
- 5) Move the antenna and the turntable to the position where the maximum value is detected.
- 6) Measure while moving the antenna slowly +/- 1 m.
- 7) Set the antenna to the position where the maximum value is found.
- 8) Measure while moving the turntable +/- 45 °.
- 9) Set the turntable to the azimuth where the maximum value is found.
- 10) Measure with Final detector and note the value.
- 11) Repeat 5) to 10) for each frequency.
- 12) Repeat 1) to 11) for each orthogonal axes of the EUT (if handheld equipment).
- 13) Replace the EUT by a suitable substitution antenna and connect this antenna to a signal generator.
- 14) Set the turntable to the azimuth and the antenna to the position where the maximum value is found
- 15) Variate the output power for each frequency, until the level of the EUTs emission is found.
- 16) Note the output power of the signal generator.

**Preliminary and final measurement (1 GHz to 25 GHz)**

This measurement will be performed in a fully anechoic chamber. Tabletop devices will set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm. Floor-standing devices will be placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 [1].

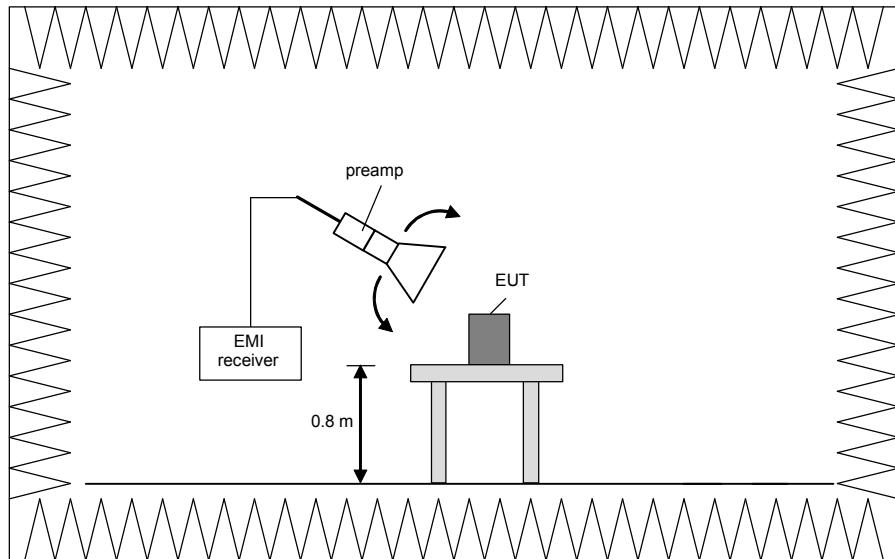
**Preliminary measurement (1 GHz to 25 GHz)**

The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The spectrum analyser set to MAX Hold mode and a resolution bandwidth of 100 kHz. The measurement will be performed in horizontal and vertical polarisation of the measuring antenna, the antenna close to the EUT and while moving the antenna over all sides of the EUT. With the spectrum analyser in CLEAR / WRITE mode the cone of the emission should be found and than the measuring distance will be set to 3 m with the receiving antenna moving in this cone of emission. At this position the final measurement will be carried out.

The resolution bandwidth of the EMI Receiver will be set to the following values:

Frequency range	Resolution bandwidth
1 GHz to 4 GHz	100 kHz
4 GHz to 12 GHz	100 kHz
12 GHz to 18 GHz	100 kHz
18 GHz to 25 GHz	100 kHz

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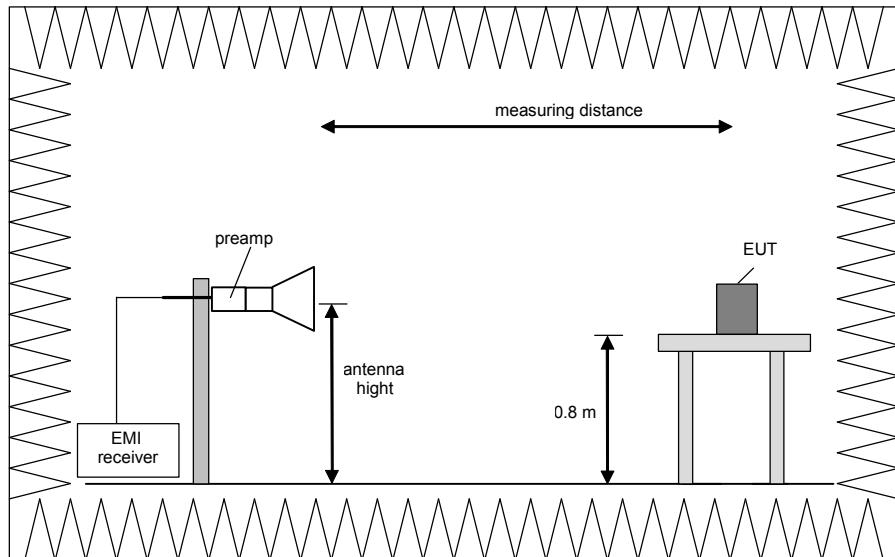


#### Final measurement (1 GHz to 25 GHz)

The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1 MHz. The measurement will be performed in horizontal and vertical polarisation of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 ° to 360 ° in order to have the antenna inside the cone of radiation.

The resolution bandwidth of the EMI Receiver will be set to the following values:

Frequency range	Resolution bandwidth
1 GHz to 4 GHz	1 MHz
4 GHz to 12 GHz	1 MHz
12 GHz to 18 GHz	1 MHz
18 GHz to 25 GHz	1 MHz



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Procedure of measurement:

The measurements were performed in the frequency range 1 GHz to 4 GHz, 4 GHz to 12 GHz, 12 GHz to 18 GHz and 18 GHz to 25 GHz.

The following procedure will be used:

- 1) Monitor the frequency range at horizontal polarisation and move the antenna over all sides of the EUT (if necessary move the EUT to another orthogonal axis).
- 2) Change the antenna polarisation and repeat 1) with vertical polarisation.
- 3) Make a hardcopy of the spectrum.
- 4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
- 5) Change the analyser mode to Clear / Write and found the cone of emission.
- 6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3 m and the antenna will be still inside the cone of emission.
- 7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarisation and azimuth and the peak and average detector, which causes the maximum emission.
- 8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.
- 9) Replace the EUT by a suitable substitution antenna and connect this antenna to a signal generator.
- 10) Set the turntable to the azimuth to the position where the maximum value is found
- 11) Variate the output power for each frequency, until the level of the EUTs emission is found.
- 12) Note the output power of the signal generator.

Step 1) to 6) are defined as preliminary measurement.

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## 5.1.2 TEST RESULTS (RADIATED EMISSIONS)

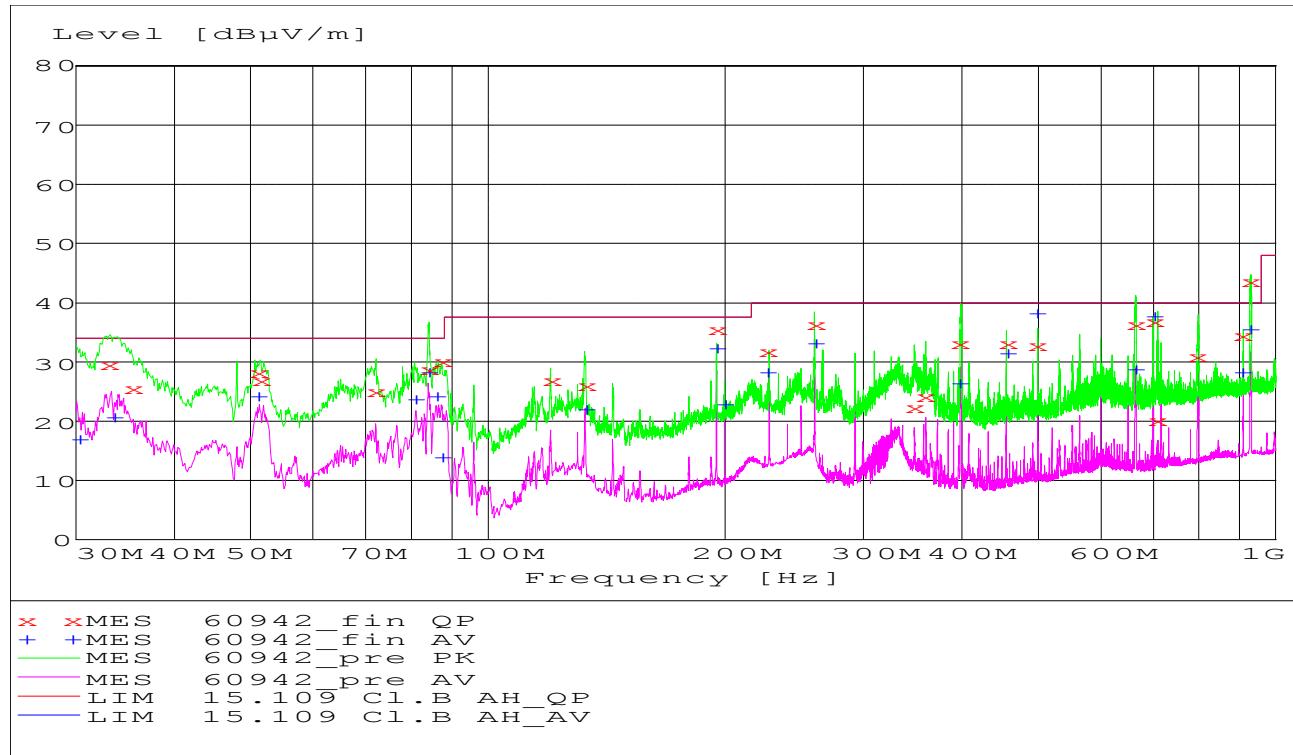
### 5.1.2.1 PRELIMINARY MEASUREMENT (30 MHz to 1 GHz)

Ambient temperature	20 °C	Relative humidity	45 %
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Position of EUT: The EUT was set-up on a non-conducting table of a height of 0.8 m. The distance between EUT and antenna was 3 m. For further information of the set up refer to the pictures in annex A of this test report.

Cable guide: The cables of the EUT were fixed on the non-conducting table. For further information of the cable guide refer to the pictures in annex A of this test report.

Supply voltage: During all measurements the EUT was supplied with 12.0 V DC via the AC / DC adaptor type FW 7555/12.



Data record name: 60942

The following frequencies were found during the preliminary radiated emission test:

30.240 MHz, 32.880 MHz, 33.440 MHz, 35.440 MHz, 50.880 MHz, 51.120 MHz, 51.360 MHz, 72.000 MHz, 81.120 MHz, 84.000 MHz, 84.240 MHz, 86.000 MHz, 87.280 MHz, 120.000 MHz, 132.880 MHz, 195.040 MHz, 199.520 MHz, 227.520 MHz, 260.000 MHz, 347.840 MHz, 360.160 MHz, 398.560 MHz, 455.040 MHz, 499.240 MHz, 664.400 MHz, 664.560 MHz, 698.960 MHz, 708.000 MHz, 797.600 MHz, 910.080 MHz, 929.680 MHz and 930.320 MHz.

These frequencies have to be measured on the open area test site. The results were presented in the following

#### TEST EQUIPMENT USED FOR THE TEST:

29, 31 – 36, 43, 44, 49, 58, 67
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TEST REPORT REFERENCE: F060942E02

### 5.1.2.2 FINAL MEASUREMENT (30 MHz to 1 GHz)

Ambient temperature	20 °C	Relative humidity	45 %
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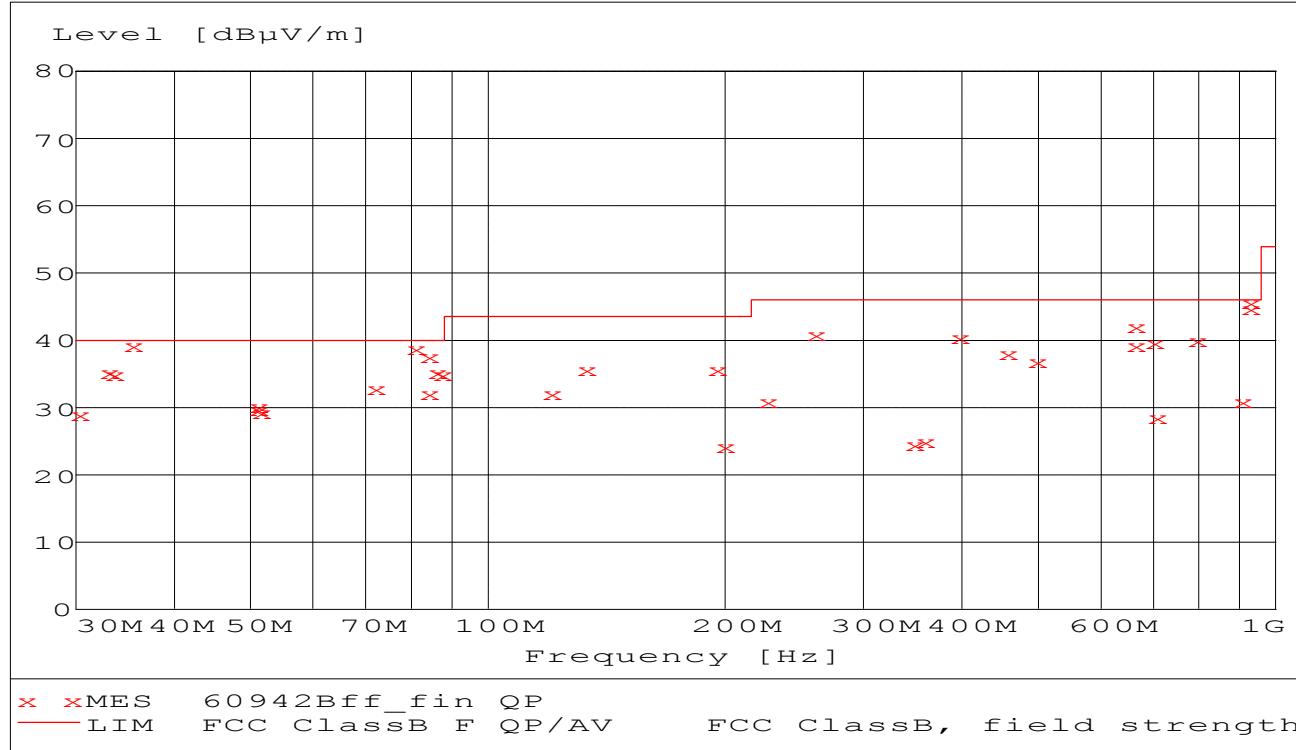
Position of EUT: The EUT was set-up on a non-conducting table of a height of 0.8 m. The distance between EUT and antenna was 3 m. For further information of the set up refer to the pictures in annex A of this test report.

Cable guide: The cables of the EUT were fixed on the non-conducting table. For further information of the cable guide refer to the pictures in annex A of this test report.

Supply voltage: During all measurements the EUT was supplied with 12.0 V DC via the AC / DC adaptor type FW 7555/12.

Resolution bandwidth: For all measurements a resolution bandwidth of 120 kHz was used.

The measured points and the limit line in the following diagram refer to the standard measurement of the emitted interference in compliance with the above mentioned standard. The measured points marked with an x are the measured results of the standard subsequent measurement on the open area test site.



Data record name: 60942Bff

The results of the standard subsequent measurement on the open area test site are indicated in the table below. The limits as well as the measured results (levels) refer to the above mentioned standard while taking account of the specified requirements for a 3 m measuring distance.

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**Result measured with the quasipeak detector:**

(These values are marked in the above diagram by an x)

Frequency MHz	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Readings dB $\mu$ V	Antenna factor dB/m	Cable loss dB	Height cm	Azimuth deg	Pol.
30.240	28.9	40.0	11.1	8.8	19.5	0.6	141.0	275.0	Vert.
32.880	35.3	40.0	4.7	16.4	18.3	0.6	100.0	338.0	Vert.
33.440	34.9	40.0	5.1	16.2	18.1	0.6	100.0	3.0	Vert.
35.440	39.4	40.0	0.6	21.4	17.4	0.6	100.0	359.0	Vert.
50.880	30.0	40.0	10.0	20.5	8.7	0.8	109.0	333.0	Vert.
51.120	30.2	40.0	9.8	20.8	8.6	0.8	100.0	107.0	Vert.
51.360	29.3	40.0	10.7	20.0	8.5	0.8	100.0	112.0	Vert.
72.000	33.2	40.0	6.8	25.5	6.8	0.9	128.0	337.0	Vert.
81.120	39.0	40.0	1.0	29.8	8.2	1.0	102.0	125.0	Vert.
84.000	32.2	40.0	7.8	22.4	8.7	1.1	111.0	110.0	Vert.
30.240	28.9	40.0	11.1	8.8	19.5	0.6	141.0	275.0	Vert.
84.240	37.6	40.0	2.4	27.8	8.7	1.1	111.0	100.0	Vert.
86.000	35.2	40.0	4.8	25.0	9.1	1.1	123.0	157.0	Vert.
87.280	35.1	40.0	4.9	24.7	9.3	1.1	122.0	157.0	Vert.
120.000	32.1	43.5	11.4	18.5	12.4	1.2	100.0	82.0	Vert.
132.880	35.8	43.5	7.7	22.5	12.0	1.3	106.0	338.0	Vert.
195.040	35.8	43.5	7.7	25.4	8.9	1.5	125.0	292.0	Hor.
199.520	24.3	43.5	19.2	13.9	8.9	1.5	106.0	337.0	Hor.
227.520	31.0	46.0	15.0	19.2	10.2	1.6	133.0	292.0	Hor.
260.000	41.1	46.0	4.9	26.8	12.5	1.8	149.0	247.0	Vert.
347.840	24.6	46.0	21.4	8.3	14.3	2.0	100.0	67.0	Hor.
360.160	25.1	46.0	20.9	8.7	14.3	2.1	100.0	55.0	Hor.
398.560	40.4	46.0	5.6	22.6	15.6	2.2	100.0	112.0	Hor.
455.040	38.2	46.0	7.8	19.1	16.7	2.4	106.0	247.0	Vert.
499.240	37.1	46.0	8.9	17.2	17.4	2.5	169.0	295.0	Hor.
664.400	42.2	46.0	3.8	19.6	19.7	2.9	111.0	180.0	Vert.
664.560	39.3	46.0	6.7	16.7	19.7	2.9	111.0	182.0	Vert.
698.960	39.8	46.0	6.2	16.8	20.0	3.0	100.0	108.0	Vert.
708.000	28.7	46.0	17.3	5.3	20.4	3.0	111.0	23.0	Hor.
797.600	40.0	46.0	6.0	15.5	21.3	3.2	100.0	126.0	Vert.
910.080	30.9	46.0	15.1	4.9	22.6	3.4	125.0	249.0	Hor.
929.680	44.7	46.0	1.3	17.8	23.5	3.4	156.0	287.0	Vert.
930.320	45.6	46.0	0.4	18.7	23.5	3.4	170.0	212.0	Vert.
Measurement uncertainty					+2.2 dB / -3.6 dB				

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:

14 – 20, 60, 61, 63

TEST REPORT REFERENCE: F060942E02

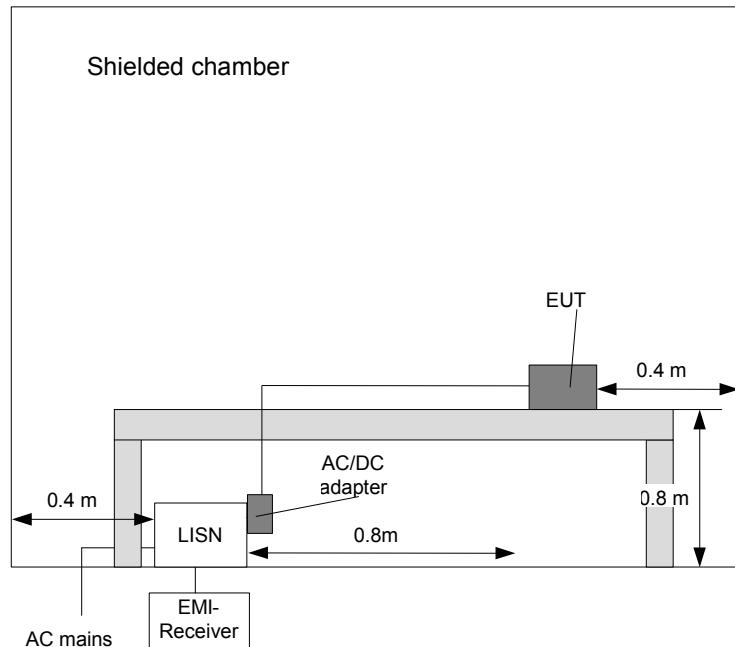
## 5.2 CONDUCTED EMISSIONS ON POWER SUPPLY LINES (150 kHz to 30 MHz)

### 5.2.1 METHOD OF MEASUREMENT

This test will be carried out in a shielded chamber. Tabletop devices will set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm above the ground plane. Floor-standing devices will be placed directly on the ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 [1].

The frequency range 150 kHz to 30 MHz will be measured with an EMI Receiver set to MAX Hold mode with peak and average detector and a resolution bandwidth of 9 kHz. A scan will be carried out on the phase (or plus pole in case of DC powered devices) of the AC mains network. If levels detected 10 dB below the appropriate limit, this emission will be measured with the average and quasi-peak detector on all lines.

Frequency range	Resolution bandwidth
150 kHz to 30 MHz	9 kHz



TEST REPORT REFERENCE: F060942E02

### 5.2.2 TEST RESULTS (CONDUCTED EMISSIONS ON POWER SUPPLY LINES)

Ambient temperature	20 °C	Relative humidity	41 %
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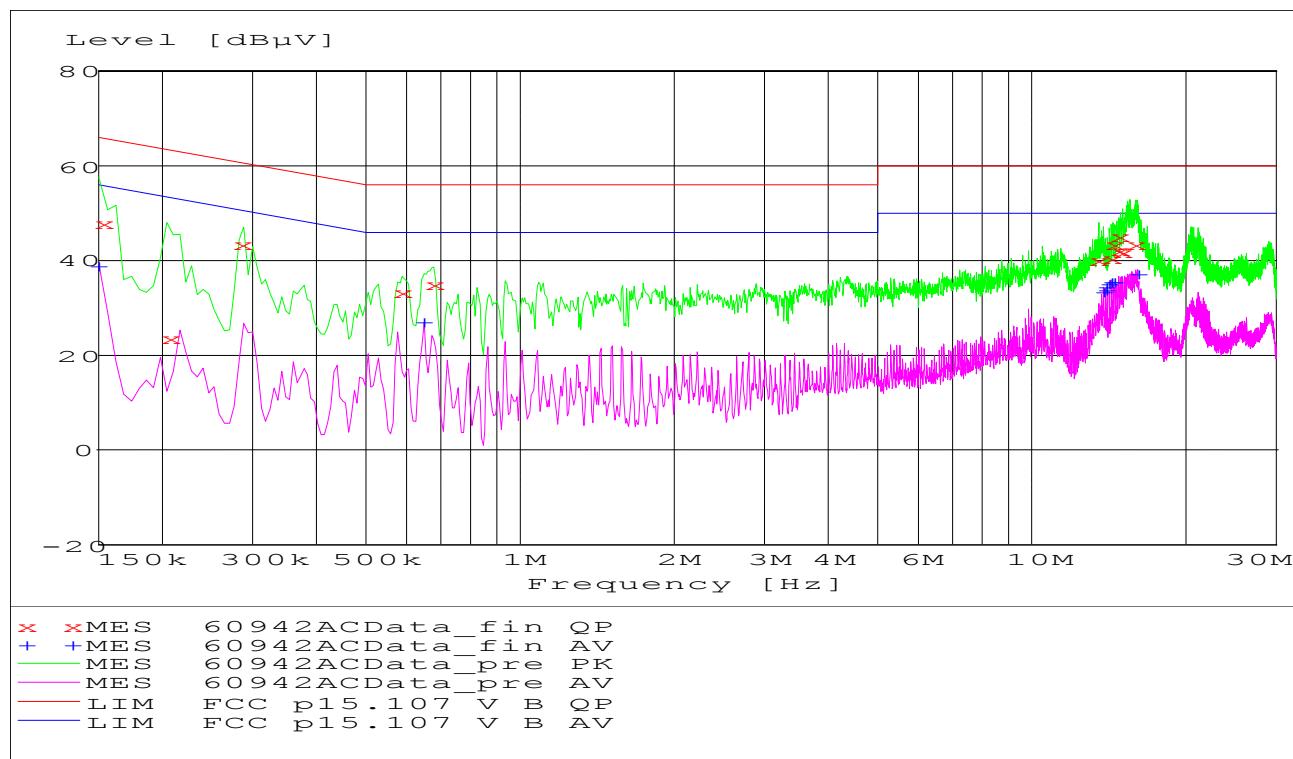
Position of EUT: The EUT was set-up on a non-conducting table of a height of 0.8 m.

Cable guide: The cable of the EUT was fixed on the non-conducting table. For further information of the cable guide refer to the pictures in annex A of this test report.

Test record: All results are shown in the following.

Supply voltage: During all measurements the EUT was supplied with 12 V DC via an AC/DC adaptor type FW75550/12 at an AC mains network with 120 V AC / 60 Hz.

The curves in the diagram only represent for each frequency point the maximum measured value of all preliminary measurements which were made for each power supply line. The top measured curve represents the peak measurement and the bottom measured curve the average measurement. The quasi-peak measured points are marked by an x and the average measured points by an +.



Data record name: 60942ACData

TEST REPORT REFERENCE: F060942E02

**Result measured with the quasipeak detector:**

(These values are marked in the above diagram by an x)

Frequency MHz	Level dB $\mu$ V	Transducer dB	Limit dB $\mu$ V	Margin dB	Line	PE
0.152610	48.3	2.0	65.9	17.6	N	FLO
0.207150	23.9	1.0	63.3	39.5	N	FLO
0.286440	43.5	0.9	60.6	17.1	L1	FLO
0.589920	33.3	0.8	56.0	22.7	N	FLO
0.677040	35.4	0.8	56.0	20.6	L1	FLO
13.524990	40.2	1.8	60.0	19.8	N	FLO
14.276400	40.7	1.9	60.0	19.3	L1	FLO
14.403300	43.5	1.9	60.0	16.5	N	FLO
14.809560	42.3	1.9	60.0	17.7	N	FLO
14.922150	45.4	1.9	60.0	14.6	N	FLO
15.065160	42.1	1.9	60.0	17.9	L1	FLO
16.001160	43.8	2.0	60.0	16.2	L1	FLO

Data record name: 60942ACData\_fin QP

**Result measured with the average detector:**

(These values are marked in the above diagram by an +)

Frequency MHz	Level dB $\mu$ V	Transducer dB	Limit dB $\mu$ V	Margin dB	Line	PE
0.150000	39.2	2.1	56.0	16.8	N	FLO
0.645630	27.2	0.8	46.0	18.8	N	FLO
13.782570	33.4	1.9	50.0	16.6	N	FLO
13.907580	34.3	1.8	50.0	15.7	N	FLO
14.031960	34.2	1.8	50.0	15.8	N	FLO
14.156880	35.1	1.9	50.0	14.9	N	FLO
14.280540	35.5	1.9	50.0	14.5	N	FLO
14.405550	35.6	1.9	50.0	14.4	N	FLO
16.064340	37.6	2.0	50.0	12.4	N	FLO

Data record name: 60942ACData\_fin AV

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:

1 – 3, 5, 6

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## 6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal. due
1	Shielded chamber M4	-	Siemens	B83117S1-X158	480088	Weekly verification (system cal.)	
2	Measuring receiver	ESAI	Rohde & Schwarz	831953/001 833181/018	480025 480026	02/27/2008	02/2010
3	LISN	NSLK8128	Schwarzbeck	8128155	480058	01/09/2008	01/2009
5	AC-filter	B84299-D87-E3	Siemens	930262292	480097	Weekly verification (system cal.)	
6	EMI-Software	ES-K1	Rohde & Schwarz	-	480111	-	-
14	Open area test site	-	Phoenix Test-Lab	-	480085	Weekly verification (system cal.)	
15	Measuring receiver	ESCS30	Rohde & Schwarz	828985/014	480270	02/27/2008	02/2010
16	Controller	HD100	Deisel	100/670	480139	-	-
17	Turntable	DS420HE	Deisel	420/620/80	480087	-	-
18	Antenna support	AS615P	Deisel	615/310	480086	-	-
19	Antenna	CBL6111 A	Chase	1643	480147	08/01/2007	08/2012
18	Antenna support	AS615P	Deisel	615/310	480086	-	-
19	Antenna	CBL6111 A	Chase	1643	480147	08/01/2007	08/2012
20	EMI Software	ES-K1	Rohde & Schwarz	-	480111	-	-
29	Fully anechoic chamber M20	-	Albatross Projects	B83107-E2439-T232	480303	Weekly verification (system cal.)	
31	Measuring receiver	ESI 40	Rohde & Schwarz	100064	480355	02/25/2008	02/2010
32	Controller	MCU	Maturo GmbH	MCU/043/971107	480832	-	
33	Turntable	DS420HE	Deisel	420/620/80	480315	-	
34	Antenna support	AS615P	Deisel	615/310	480187	-	
35	Antenna	CBL6112 B	Chase	2688	480328	10/11/2005	10/2010
36	Antenna	3115 B	EMCO	9609-4918	480184	09/11/2008	09/2013
43	RF-cable No. 30	RTK 081	Rosenberger	-	410141	Weekly verification (system cal.)	
44	RF-cable No. 31	RTK 081	Rosenberger	-	410142	Weekly verification (system cal.)	
49	Preamplifier	JS3-00101200-23-5A	Miteq	681851	480337	Six month verification (system cal.)	
54	Power supply	TOE 8752-32	Toellner	31566	480010	06/19/2007	06/2009
58	Loop antenna	HFH2-Z2	Rohde & Schwarz	832609/014	480059	02/19/2008	02/2013
60	Signal generator	83650L	Agilent	3844A00554	480333	02/26/2008	02/2010
61	Precision Dipole	HZ 13	Rohde & Schwarz	831782/02	480062	Six month verification (system cal.)	
62	Horn Antenna	3115 A	EMCO	9609-4922	480183	Six month verification (system cal.)	
63	RF-cable No. 1	RTK 081	Rosenberger	-	410093	Weekly verification (system cal.)	
64	Climatic chamber	MK 240	BINDER	05-79022	480462	01/22/2008	07/2009
65	Power Meter	NRVD	Rohde & Schwarz	828110/026	480267	02/26/2008	02/2010
66	Thermal Power Sensor	NRV-Z51	Rohde & Schwarz	825489/004	480247	02/22/2008	02/2010
67	High Pass Filter	WHJS1000C11/60EF	Wainwright Instruments GmbH	1	480413	-	-

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## 7 LIST OF ANNEXES

ANNEX A	PHOTOGRAPHS OF THE TEST SET-UPS:	4 pages
	SePem 01 Master, test setup fully anechoic chamber	60942_18.jpg
	SePem 01 Master, test setup fully anechoic chamber	60942_17.jpg
	SePem 01 Master, test setup open area test site	60942_21.jpg
	SePem 01 Master, test setup shielded chamber	60942_23.jpg
ANNEX B	EXTERNAL PHOTOGRAPHS OF THE TEST SAMPLE:	3 pages
	SePem 01 Master, 3-D-view 1	60942_a.jpg
	SePem 01 Master, 3-D view 2	60942_b.jpg
	SePem 01 Master, detail view type plate	60942_d.jpg
ANNEX C	INTERNAL PHOTOGRAPHS OF THE TEST SAMPLE:	9 pages
	SePem 01 Master, internal view	60942_e.jpg
	SePem 01 Master, controller PCB, top view	60942_f.jpg
	SePem 01 Master, controller PCB, bottom view	60942_g.jpg
	SePem 01 Master, display PCB, top view	60942_h.jpg
	SePem 01 Master, main PCB, top view	60942_n.jpg
	SePem 01 Master, main PCB, detail view to rf-part, cover removed	60942_m.jpg
	SePem 01 Master, main PCB, bottom view	60942_o.jpg
	SePem 01 Master, contact PCB, top view	60942_i.jpg
	SePem 01 Master, contact PCB, bottom view	60942_l.jpg