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Test Report

Report Number: F136015E4, 3rd version

Applicant:

Miele & Cie. KG Werk Oelde

Manufacturer:

Miele & Cie. KG Werk Oelde

Equipment under Test (EUT):

HR1954 with Microwave oven inside

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-17186-01-01
D-PL-17186-01-02
D-PL-17186-01-03

Laboratory (CAB) accredited by
Deutsche Akkreditierungsstelle GmbH (DAkkS)
in compliance with DIN EN ISO/IEC 17025
under the Reg. No. D-PL-17186-01-02,
FCC Test site registration number 90877 and
Industry Canada Test site registration IC3469A-1

REFERENCES

[1] ANSI C63.4-2009 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 CFR 47 Part 18 (August 2013) Radio Frequency Devices

[3] FCC/OST MP-5 (1986) FCC methods of measurement of radio noise emissions from industrial, scientific and medical equipment.

TEST RESULT

The requirements of the tests performed as shown in the overview (clause 4) were fulfilled by the equipment under test.
The complete test results are presented in the following.

	Name	Signature	Date
Test engineer:	Thomas KÜHN		30 October 2014
Authorized reviewer:	Bernd STEINER		30 October 2014

RESERVATION

This test report is only valid in its original form.

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1 Identification

1.1 Applicant

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Country:	Germany
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Phone:	+49 52 45 91 – 74 615
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eMail Address:	andreas.fabrizius@miele.de
Applicant represented during the test by the following person:	Mr. Andreas FABRIZIUS

1.2 Manufacturer

Name:	Miele & Cie. KG Werk Oelde
Address:	Carl-Miele-Platz 1 59302 Oelde
Country:	Germany
Name for contact purposes:	Mr. Andreas FABRIZIUS
Phone:	+49 52 45 91 – 74 615
Fax:	+49 52 45 91 – 78 46 15
eMail Address:	andreas.fabrizius@miele.de
Manufacturer represented during the test by the following person:	Mr. Andreas FABRIZIUS

1.3 Test laboratory

The tests were carried out at:

PHOENIX TESTLAB GmbH
Königswinkel 10
32825 Blomberg
Germany

accredited by Deutsche Akkreditierungsstelle GmbH (DAkkS) in compliance with DIN EN ISO/IEC 17025 under Reg. No. D-PL-17186-01-02, FCC Test site registration number.

1.4 EUT (Equipment Under Test)

Test object: *	Kitchen oven with Microwave oven inside
Type: *	HR1954
FCC ID: *	SSVSKM4801
Serial number of kitchen oven: *	00/098939962
Highest / lowest internal frequency: *	2445 MHz / 32.768 kHz

1.5 Technical data of equipment

Operating frequency: *	2445 MHz					
Magnetron type: *	2M248H(ML)					
Rated power input: *	1600 W					
Rated microwave power: *	1000 W					
Power Supply:	AC-mains (120 V AC / 60 Hz) (HR1954), two phases either with 120 ° or 180 ° phase angle					
Supply Voltage: *	U_{Nom} =	120 VAC	U_{Min}=	U_{Nom} -15%	U_{Max}=	U_{Nom} +15%
Temperature range: *	0 °C to 85 °C					
Ancillaries to be tested with: *	None					

* declared by the applicant.

The following external I/O cables were used:

Identification	Connector		Length
	EUT	Ancillary	
Power supply	5 pole CEE 16 (mounted for testing)	-	1.5 m
-	-	-	-

*: Length during the test if no other specified.

1.6 Dates

Date of receipt of test sample:	07 January 2014
Start of test:	13 January 2014
End of test:	24 January 2014

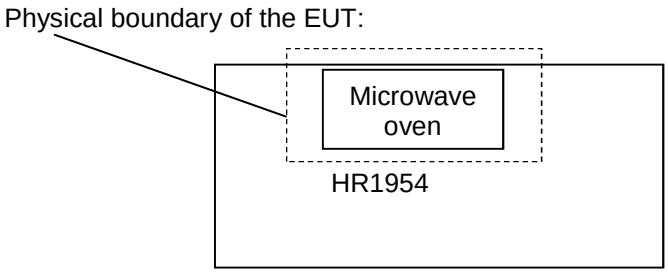
2 Operational states

The EUT is a floor standing kitchen oven with a separate microwave oven inside. The oven was supplied by an AC-mains network with 120 VAC / 60 Hz during all tests. Object of this test report is the CFR 47 Part 18 transmitter (the microwave oven).

For detail information of the functionality of the EUT please refer the functional description of the applicant.

The following operation modes were used during the tests:

Operation mode	Description of the operation mode
3	Microwave operation with a two phases AC-Mains network with 120 ° phase angle ($U_{mains} = \sqrt{3} \times U_{nom} = \sqrt{3} \times 120$ VAC = 208 VAC)
4	Microwave operation with a two phases AC-Mains network with 180 ° phase angle ($U_{mains} = 2 \times U_{nom} = 2 \times 120$ VAC = 240 VAC)



3 Additional information

During the tests the EUT was not labelled as required by FCC / IC.

The H1954 contains also a kitchen oven with a temperature sensor, which is tested in accordance to FCC 47 CFR Part 15. The results of these measurements are presented in a separate test report with the PHOENIX TEST GmbH test report reference F136015E3.

4 Overview

Application	CFR section	Status	Refer page
Radiation Hazard	FCC/OST MP-5, OET Bulletin 56	Passed	8
Power Output	FCC/OST MP-5	Passed	9
Operating frequencies	18.301, 18.303	Passed	11 et seq.
Field strength limits (Spurious and harmonic emissions)	18.305	Passed	22 et seq.
AC line conducted emissions	18.307	Passed	26 et seq.

5 Test results

5.1 Radiation hazard

5.1.1 Method of measurement (radiation hazard)

The EUT was supplied with a two phase AC mains network with 120 VAC / 60 Hz / 120 °. It was set into operation with its maximum power and a load of 1000 ml of water was located in the center of the oven. The leakage radiation was measured on all sides of the EUT using the field probe.

Test set-up:

5.1.2 Test results (radiation hazard))

Ambient temperature	20 °C

Relative humidity	52 %

Maximum power density	Limit	Result
0.24 mW/cm^2	1.0 mW/cm^2	Passed
Measurement uncertainty		± 1.5 dB

TEST EQUIPMENT USED FOR THE TEST:
170, 186, 187, 189, 190

5.2 Output / input power

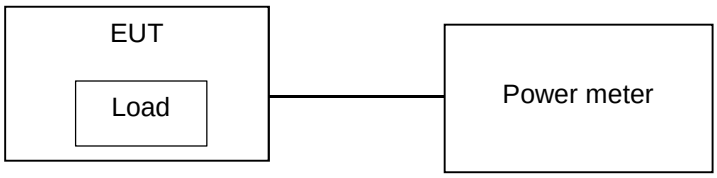
5.2.1 Method of measurement (output / input power)

The power consumption of the EUT was measured with power analyser and compared with the manufacturers declared nominal power. The power output was measured by the calorimetric method, using a load of 1000 ml of water with the beaker located in the center of the oven. The output power was calculated from the measured temperature rise of the load over a period of time using the following formula:

$$P = \left(4.187 \times m_W \times \left(T_2 - T_1\right) + 0.55 \times m_C \times \left(T_2 - T_0\right)\right) \div t$$

Where
P = Output power in W,
m_W = Mass of water in g,
m_C = Mass of beaker in g,
T_0 = Ambient temperature in °C,
T_1 = Starting temperature in °C,
T_2 = Final temperature in °C,
t = Time in sec.

Test set-up:



5.2.2 Test results (output power)

Ambient temperature	20 °C

Relative humidity	52 %

RF output power measurement						
Mass of water	Mass of beaker	Ambient temperature	Starting temperature	Final temperature	Time	Calculated RF power
1010 g	150 g	20.0 °C	15.9 °C	28.3 °C	60 s	888.4 W

Input power measurement				
Load	Input Voltage	Input current	Power consumption	Rated power input (manufacturers declaration)
1000 ml	L1 – N: 120 VAC L2 – N: 120 VAC L1 – L2: 240 VAC	L1: 7.4 A L2: 7.7 A	L1:825 W L2: 857 W L1 + L2: 1682 W	1600 W

TEST EQUIPMENT USED FOR THE TEST:
186, 187, 189, 190, 200

5.3 Operating frequencies

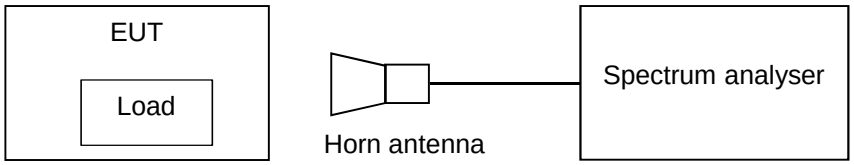
5.3.1 Method of measurement (operating frequencies)

The measurement was carried out in accordance to the FCC/OST MP 5 [3]. The frequency was measured with the help of a spectrum analyser and a horn antenna, positioned in a 1 m distance to the EUTs front.

The frequency measurements were carried out as function of the supply voltage / phase angle and load with the following variations:

- Supply voltage range: 80 % to 125 % of the nominal supply voltage,
- Phase angle 120 ° and 180 °,
- Load from 1000 ml to 200 ml.

Test set-up:



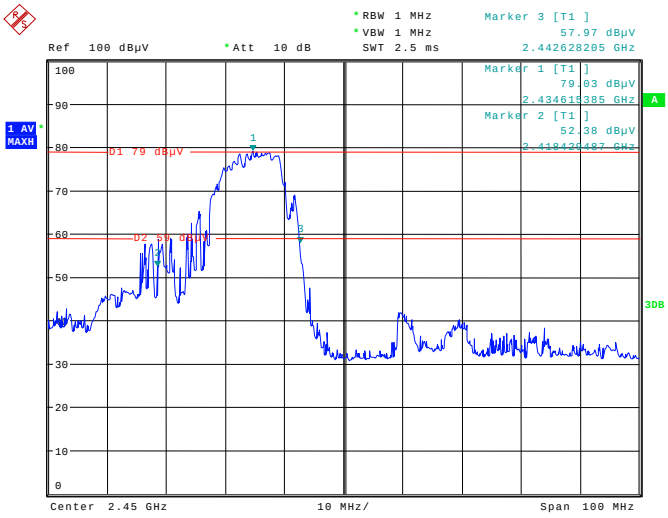
Limits:

ISM frequency	Tolerance
2450 MHz	± 50.0 MHz

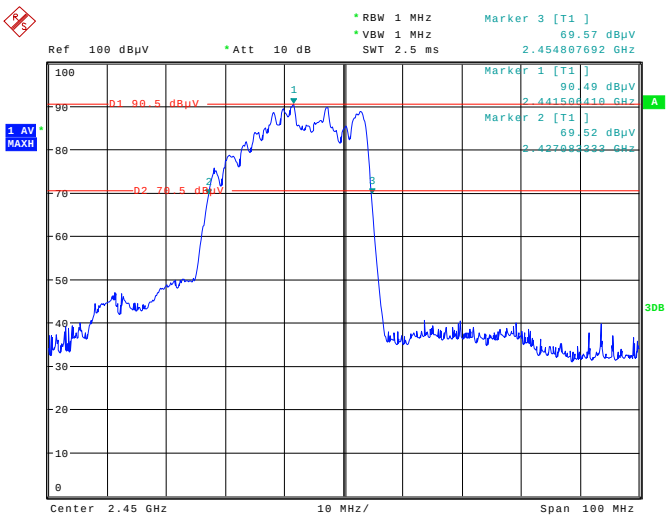
5.3.2 Test results (operation frequency)

Ambient temperature	20 °C		Relative humidity	52 %

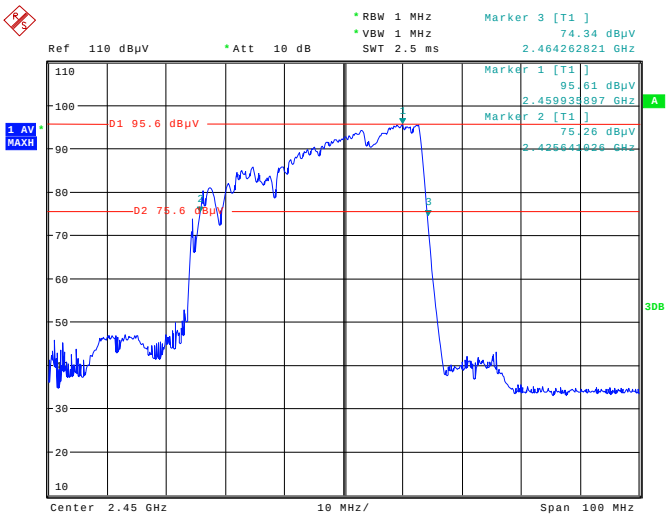
136015_90.wmf: Operation frequency with 96 VAC, 120 ° and 1000 ml load:



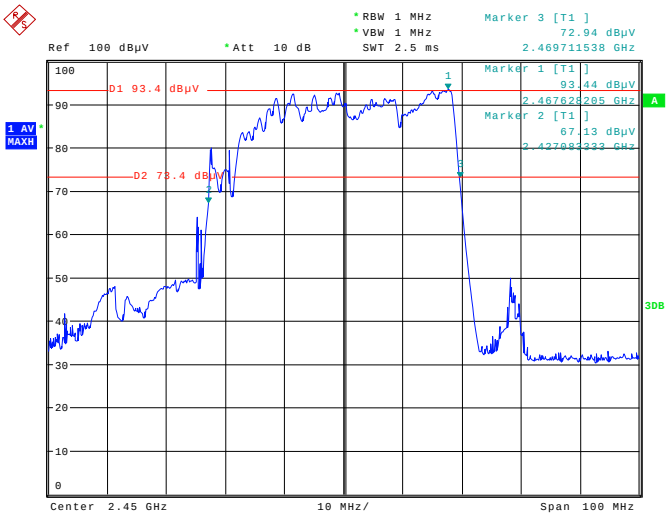
136015_91.wmf: Operation frequency with 108 VAC, 120 ° and 1000 ml load:



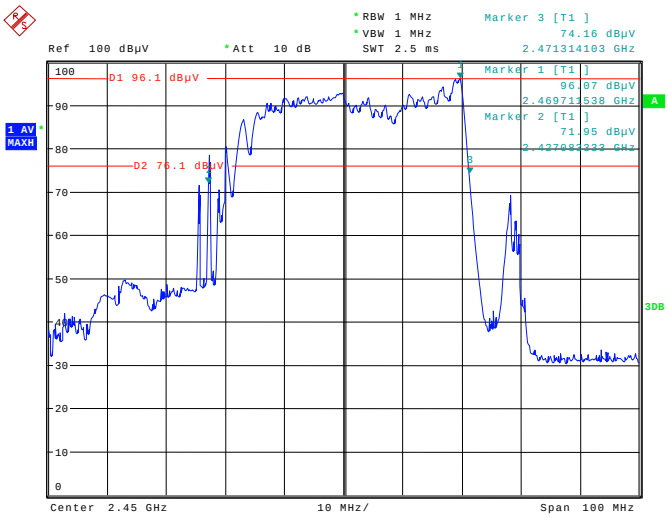
136015_85.wmf: Operation frequency with 120 VAC, 120 ° and 1000 ml load:



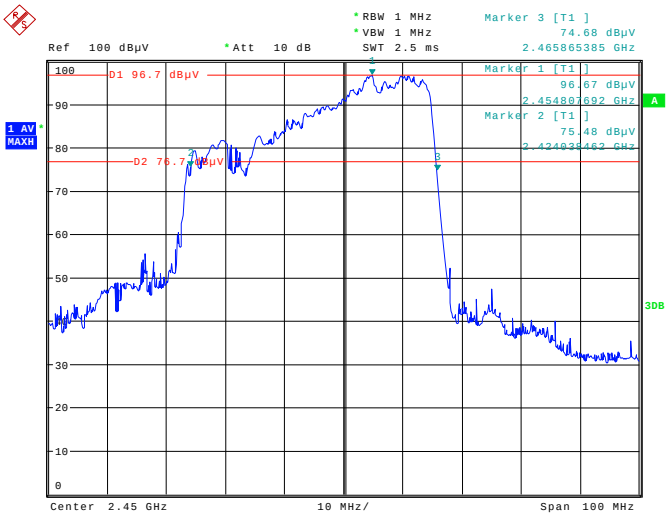
136015_92.wmf: Operation frequency with 135 VAC, 120 ° and 1000 ml load:



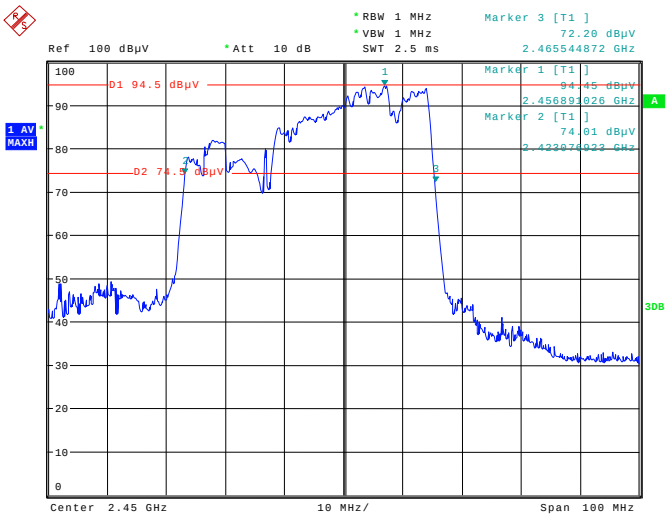
136015_93.wmf: Operation frequency with 150 VAC, 120 ° and 1000 ml load:



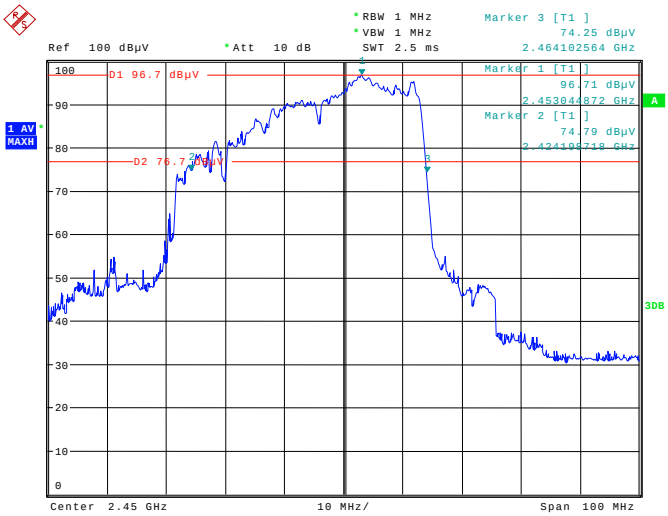
136015_97.wmf: Operation frequency with 96 VAC, 180 ° and 1000 ml load:



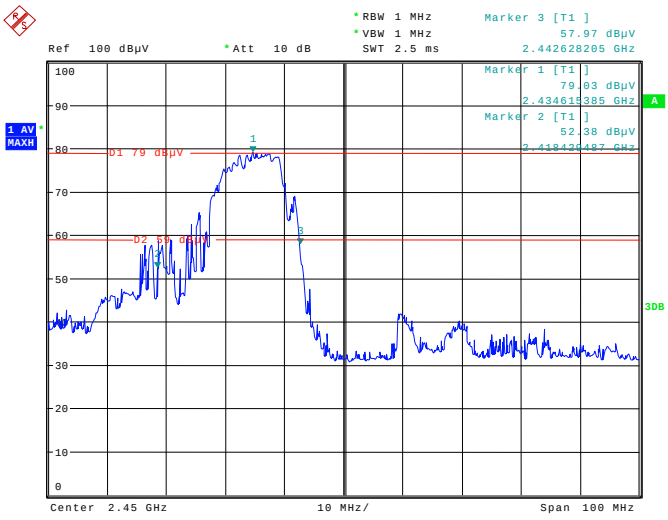
136015_96.wmf: Operation frequency with 108 VAC, 180 ° and 1000 ml load:



136015_80.wmf: Operation frequency with 120 VAC, 180 ° and 1000 ml load:

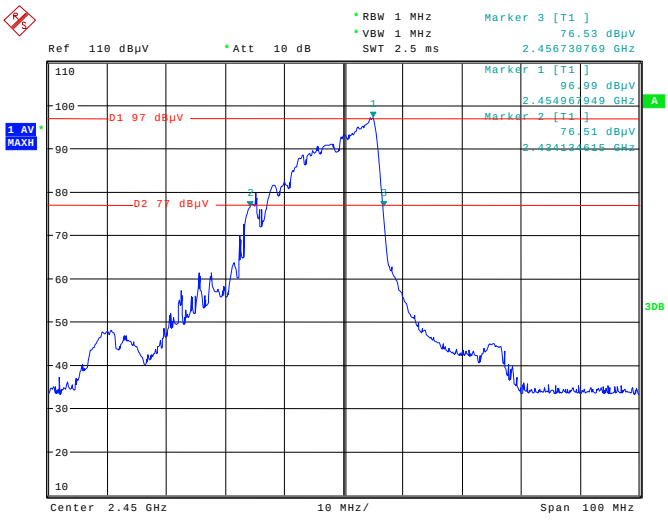


136015_95.wmf: Operation frequency with 135 VAC, 180 ° and 1000 ml load:

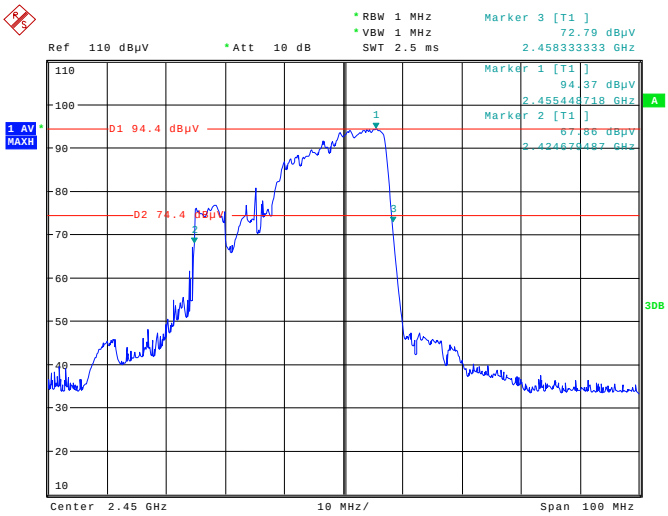


136015_94.wmf: Operation frequency with 150 VAC, 180 ° and 1000 ml load:

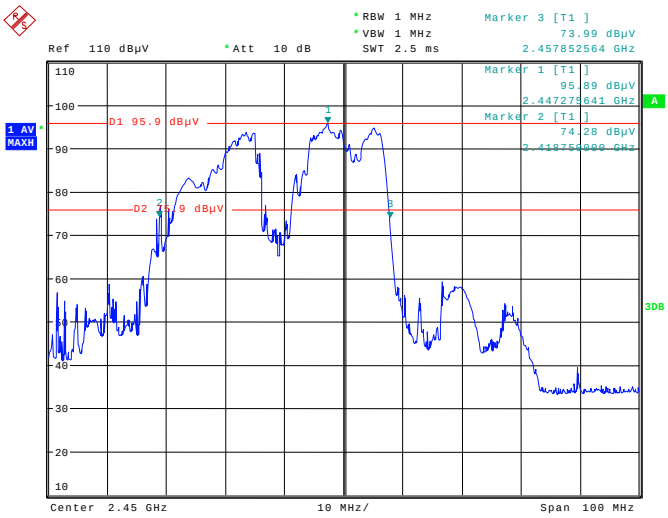
136015_86.wmf: Operation frequency with 120 VAC, 120 ° and 800 ml load:



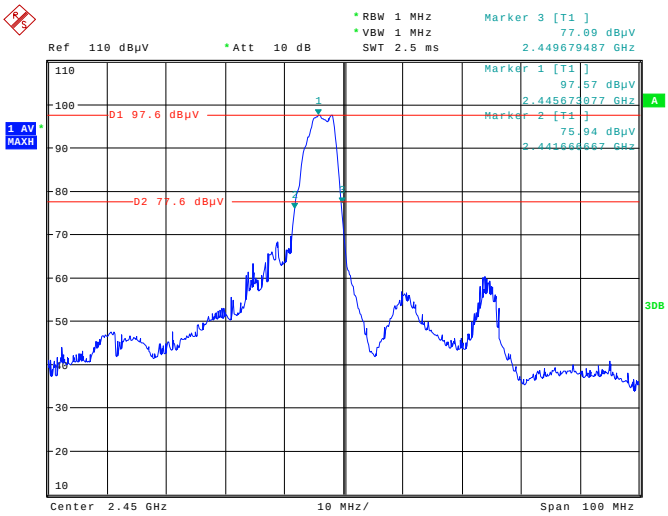
136015_87.wmf: Operation frequency with 120 VAC, 120 ° and 600 ml load:



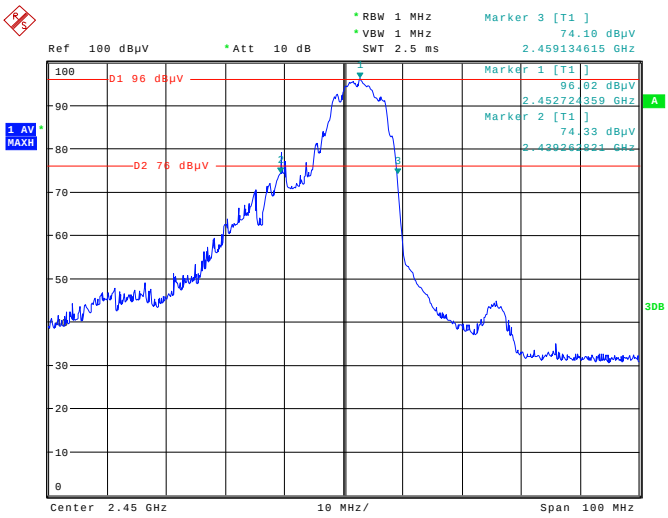
136015_88.wmf: Operation frequency with 120 VAC, 120 ° and 400 ml load:



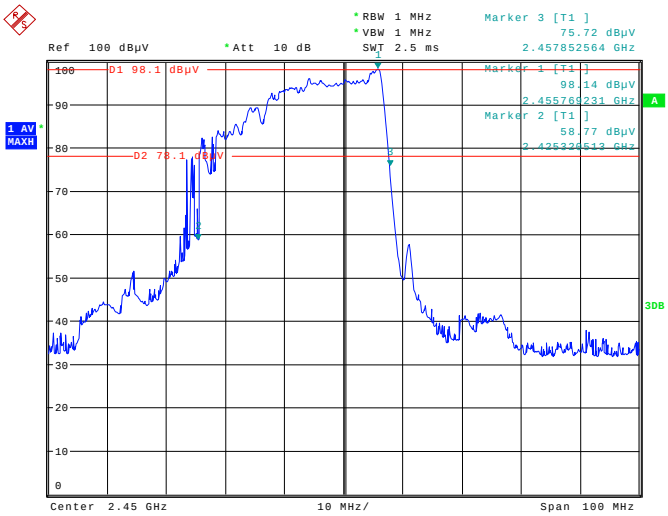
136015_89.wmf: Operation frequency with 120 VAC, 120 ° and 200 ml load:



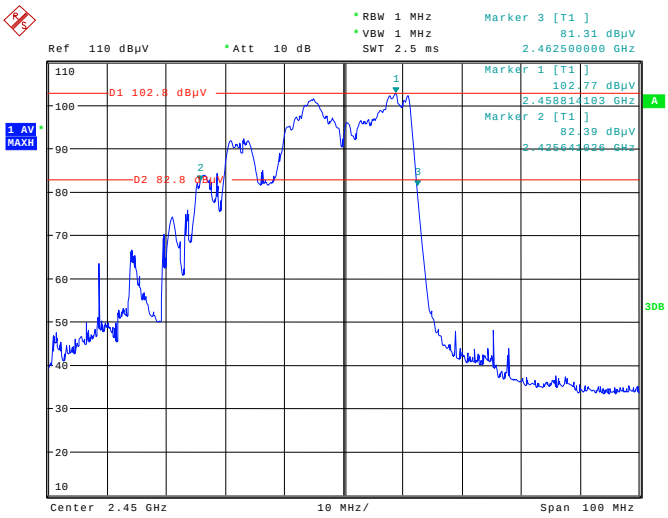
136015_81.wmf: Operation frequency with 120 VAC, 180 ° and 800 ml load:



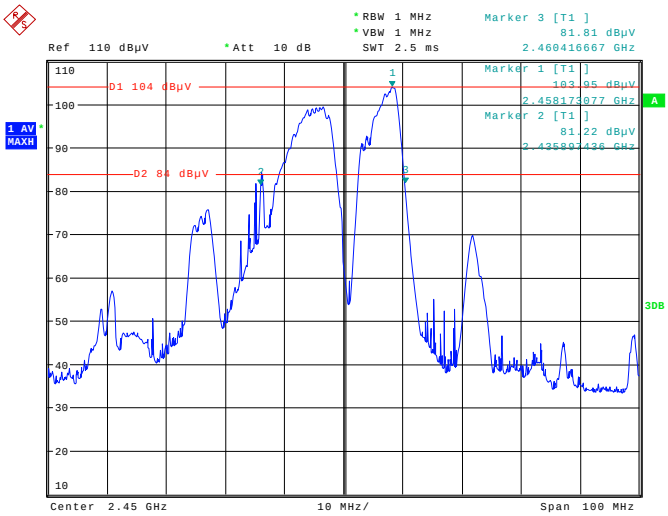
136015_82.wmf: Operation frequency with 120 VAC, 180 ° and 600 ml load:



136015_83.wmf: Operation frequency with 120 VAC, 180 ° and 400 ml load:



136015_84.wmf: Operation frequency with 120 VAC, 180 ° and 200 ml load:



Operation frequencies with 1000 ml load, phase angle 120 °				
Supply voltage	Peak frequency	Lower frequency	Upper frequency	20 dB bandwidth
96 VAC	2434.615 MHz	2418.430 MHz	2442.628 MHz	24.198 MHz
108 VAC	2441.506 MHz	2427.083 MHz	2454.808 MHz	27.725 MHz
120 VAC	2459.936 MHz	2425.641 MHz	2464.263 MHz	38.622 MHz
135 VAC	2467.628 MHz	2427.083 MHz	2469.712 MHz	42.629 MHz
150 VAC	2469.711 MHz	2427.083 MHz	2471.314 MHz	44.231 MHz

Operation frequencies with 1000 ml load, phase angle 180 °				
Supply voltage	Peak frequency	Lower frequency	Upper frequency	20 dB bandwidth
96 VAC	2454.808 MHz	2424.038 MHz	2465.865 MHz	41.827 MHz
108 VAC	2456.891 MHz	2423.076 MHz	2465.545 MHz	42.469 MHz
120 VAC	2453.045 MHz	2424.199 MHz	2464.103 MHz	39.904 MHz
135 VAC	2454.167 MHz	2426.442 MHz	2466.506 MHz	40.064 MHz
150 VAC	2446.154 MHz	2425.321 MHz	2463.782 MHz	38.461 MHz

Operation frequencies with 120 VAC, phase angle 120 °				
Load	Peak frequency	Lower frequency	Upper frequency	20 dB bandwidth
1000 ml	2459.936 MHz	2425.641 MHz	2464.263 MHz	38.622 MHz
800 ml	2454.968 MHz	2434.135 MHz	2456.731 MHz	22.596 MHz
600 ml	2455.449 MHz	2424.680 MHz	2458.333 MHz	33.653 MHz
400 ml	2447.276 MHz	2418.750 MHz	2457.853 MHz	39.103 MHz
200 ml	2449.679 MHz	2441.667 MHz	2449.679 MHz	8.012 MHz

Operation frequencies with 120 VAC, phase angle 180 °				
Load	Peak frequency	Lower frequency	Upper frequency	20 dB bandwidth
1000 ml	2453.045 MHz	2424.109 MHz	2464.103 MHz	39.994 MHz
800 ml	2452.724 MHz	2430.263 MHz	2459.135 MHz	28.872 MHz
600 ml	2455.769 MHz	2425.321 MHz	2457.853 MHz	32.532 MHz
400 ml	2458.814 MHz	2425.641 MHz	2462.500 MHz	36.859 MHz
200 ml	2458.173 MHz	2435.807 MHz	2460.417 MHz	24.610 MHz

TEST EQUIPMENT USED FOR THE TEST:
6, 36, 45, 186, 187, 189, 190

5.4 Radiated emissions

5.4.1 Method of measurement (Radiated emissions)

The measurement techniques which will be used by the FCC to determine compliance with the technical requirements of this part are set out in FCC Measurement Procedure MP–5, ‘‘Methods of Measurements of Radio Noise Emissions from ISM equipment’’. Although the procedures in MP–5 are not mandated, manufacturers are encouraged to follow the same techniques which will be used by the FCC.

Section 18.309 Frequency range of measurements:

For field strength measurements:

Frequency band in which device operates (MHz)	Range of frequency measurements	
	Lowest frequency	Highest frequency
Below 1.705	Lowest frequency generated in the device, but not lower than 9 kHz.	30 MHz.
1.705 to 30	Lowest frequency generated in the device, but not lower than 9 kHz.	400 MHz.
30 to 500	Lowest frequency generated in the device or 25 MHz, whichever is lower.	Tenth harmonic or 1,000 MHz, whichever is higher.
500 to 1000	Lowest frequency generated in the device or 100 MHz, whichever is lower.	Tenth harmonic.
Above 1000	do	Tenth harmonic or highest detectable emission.

OET MP-5
Section 2.2.2
For radio noise meters or spectrum analysers which include weighting circuits, the detector function shall be linear. The detector function selector shall be set to average, unless otherwise specified for a given device. For RF lighting devices, the measuring instrument shall have the detector function set to the CISPR quasi-peak function. The 6 dB bandwidth of the measuring instrument shall not be less than:

- 200 Hz for measurements below 150 kHz
- 9 kHz for measurements from 150 kHz to 30 MHz
- 100 kHz for measurements from 30 MHz to 1000 MHz
- 1 MHz for measurements above 1000 MHz

Post detector video filters, if used, shall be wide enough not to affect the peak detector reading. Alternatively, field strength meters and spectrum analysers without weighting circuits may be employed, provided measurements are made on the peak basis and recorded as observed.

OET MP-5
Section 2.2.6 Antenna-to-test unit distance

Measurements shall be made at the distance at which the limits are specified, to extent possible. […] The Commission as an alternative shall accept measurements at a closer fixed distance, provided l/d is used as an attenuation law factor (where d is the distance measured in appropriate units). […] When measurements were carried out at other distances, an extrapolation factor of 20 dB/decade was used.

OET MP-5
Section 4.1 Load for microwave ovens

- Load for measurement of radiation on second and third harmonic: Two loads, one of 700 and the other with 300 ml, of water are used. Each load is tested both with the beaker located in the center of the oven and with it in the right front corner.
- Load for all other measurements: 700 milliliters of water, with the beaker located in the center of the oven.

Test charateristics

Frequency range	Receiver bandwidth	Test distance	Test site	Antenna height
30 MHz to 1 GHz	120 kHz	3 m	Open area test site	1 m to 4 m
1 GHz to 12 GHz	1 MHz	3 m	Fully anechoic chamber	1.5 m
12 GHz to 25 GHz	1 MHz	3 m	Fully anechoic chamber	1.0 m

5.4.2 Test results (radiated emissions)

Ambient temperature	20 °C	Relative humidity	52 %

Position of EUT: The EUT was set-up on a non-conducting support of a height of 0.1 m. The distance between EUT and antenna was 3 m.

Cable guide: The cable of the EUT runs vertically to the false floor. For further information of the EUT set-up refer to the pictures in annex A of this test report.

Test record: During the test, the EUT transmits continuously. All results are shown in the following.

Calculation of the filed strength limit:

According to CFR47 §18.305 the field strength has to be calculated with the following formula: 25×SQRT(power/500).

With a measured power of 888.4 W the limit is calculated as follows:

25 x SQRT(888.4/500) = 33.3 µV/m or 30.5 dBµV/m at 300 m distance

Field strength calculation:

All measurements were made with 3 m measurement distance. Therefore the measured field strength was corrected by a distance correction factor was follows:

$F_{SL} = F_{ST} + DC$

Where
F_{SL} = Field strength in dBµV/m;
F_{ST} = Field strength at measurement distance in dBµV/m
DC = Distance correction factor in dB, which is calculated with
DC = 20 log (test distance in m / specified distance in m) = -40 dB

So the result was calculated as following:

Result [dBµV/m] = reading [dBµV] + cable loss [dB] + antenna factor [dB/m] – Preamp [dB] + DC [dB]

During the measurement the EUT was supplied by AC mains with 120 VAC / 60 Hz (120 ° phase angle), because there was no measurable difference to the supply with 120 VAC / 60 Hz (180 ° phase angle).

Spurious emissions below 1 GHz										
Frequency MHz	Receiver bandwidth / Dectector	Load / location ml	Readings dBµV	Antenna factor dB/m	Cable loss dB	DC dB	Result dBµV/m	Limit dBµV/m	Margin dB	Pol.
96.290	120 kHz /AV	700 / c	9.8	10.6	1.1	-40.0	-18.5	30.5	49.0	Vert.
126.254	120 kHz /AV	700 / c	4.6	12.3	1.2	-40.0	-21.9	30.5	51.7	Vert.
288.000	120 kHz /AV	700 / c	14.8	12.9	1.9	-40.0	-10.4	30.5	40.9	Vert.
384.000	120 kHz /AV	700 / c	13.2	15.2	2.2	-40.0	-9.4	30.5	39.9	Vert.
528.000	120 kHz /AV	700 / c	16.3	17.9	2.6	-40.0	-3.2	30.5	33.7	Vert.
891.795	120 kHz /AV	700 / c	-7.3	22.2	3.5	-40.0	-21.6	30.5	52.0	Vert.
Measurement uncertainty				+2.2 dB / -3.6 dB						

Spurious emissions above 1 GHz											
Frequency MHz	Receiver bandwidth / Dectector	Load / location ml	Readings dBµV	Antenna factor dB/m	Preamp [dB]	Cable loss dB	DC dB	Result dBµV/m	Limit dBµV/m	Margin dB	Pol.
1555.1	1 MHz /AV	700 / c	5.0	25.3	0.0	3.0	-40.0	-6.7	30.5	37.2	Vert.
2262.7	1 MHz /AV	700 / c	4.8	27.7	0.0	3.5	-40.0	-4.0	30.5	34.5	Hor.
2346.8	1 MHz /AV	700 / c	11.1	28.1	0.0	3.6	-40.0	2.8	30.5	27.7	Vert.
2900.9	1 MHz /AV	700 / c	6.8	29.4	0.0	4.1	-40.0	0.3	30.5	30.2	Hor.
3457.3	1 MHz /AV	700 / c	2.7	31.1	0.0	4.4	-40.0	-1.8	30.5	32.3	Vert.
4448.8	1 MHz /AV	700 / c	26.5	32.2	25.9	5.1	-40.0	-2.1	30.5	32.6	Hor.
4904.2	1 MHz /AV	300 / rfc	57.0	32.8	25.6	5.3	-40.0	29.5	30.5	1.0	Vert.
6899.8	1 MHz /AV	700 / c	29.9	35.1	24.8	6.4	-40.0	6.6	30.5	23.9	Vert.
7392.2	1 MHz /AV	300 / rfc	39.6	36.3	24.5	6.8	-40.0	18.2	30.5	12.3	Vert.
8255.8	1 MHz /AV	700 / c	3.3	36.8	24.2	7.3	-40.0	-16.7	30.5	47.2	Vert.
3996.6	1 MHz /AV	700 / c	21.2	32.5	26.1	4.8	-40.0	-7.6	30.5	38.1	Vert.
14692.0	1 MHz /AV	700 / c	25.3	33.7	26.6	2.5	-40.0	-14.7	30.5	45.2	Hor.
12261.0	1 MHz /AV	700 / c	27.9	33.7	25.9	2.5	-40.0	-1.8	30.5	32.3	Vert.
17154.0	1 MHz /AV	700 / c	39.7	33.8	27.4	2.5	-40.0	8.6	30.5	21.9	Hor.
18158.0	1 MHz /AV	700 / c	32.0	37.0	37.7	2.5	-40.0	-6.2	30.5	36.7	Vert.
19582.0	1 MHz /AV	700 / c	33.6	37.1	38.2	2.5	-40.0	-5.0	30.5	35.5	Vert.
20624.0	1 MHz /AV	700 / c	39.1	37.1	38.3	2.5	-40.0	0.4	30.5	30.1	Vert.
22074.0	1 MHz /AV	700 / c	32.4	37.2	38.3	2.5	-40.0	-6.2	30.5	36.7	Vert.
Measurement uncertainty				+2.2 dB / -3.6 dB							

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:

16 – 20, 29, 31 – 37, 39, 44 - 46, 50, 51, 142, 156, 170, 186, 187, 189, 190, 200

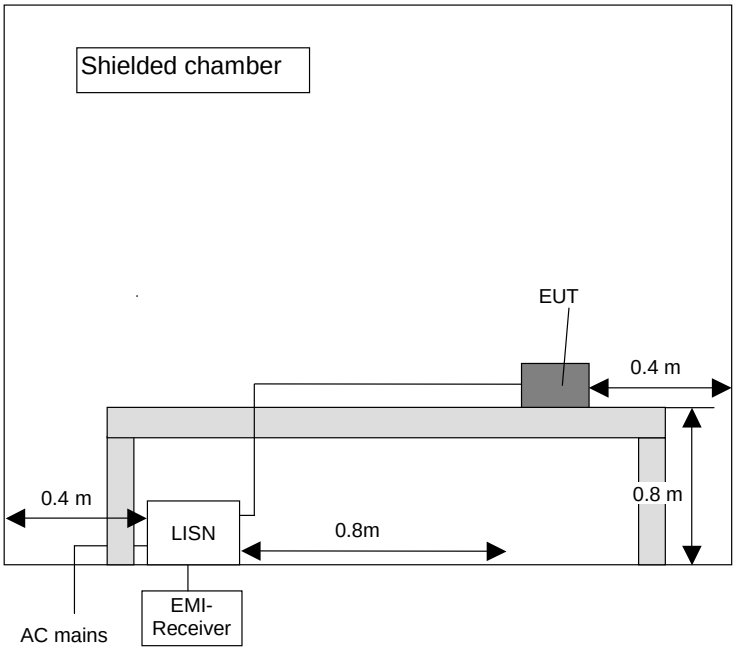
5.5 Conducted emissions on power supply lines (150 kHz to 30 MHz)

5.5.1 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 C63.4-2009 [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 appropriable 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



5.5.2 Test results (conducted emissions on power supply lines)

Ambient temperature	21 °C	Relative humidity	28 %

Position of EUT: The EUT was set-up on a non-conducting table of a height of 0.1 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.

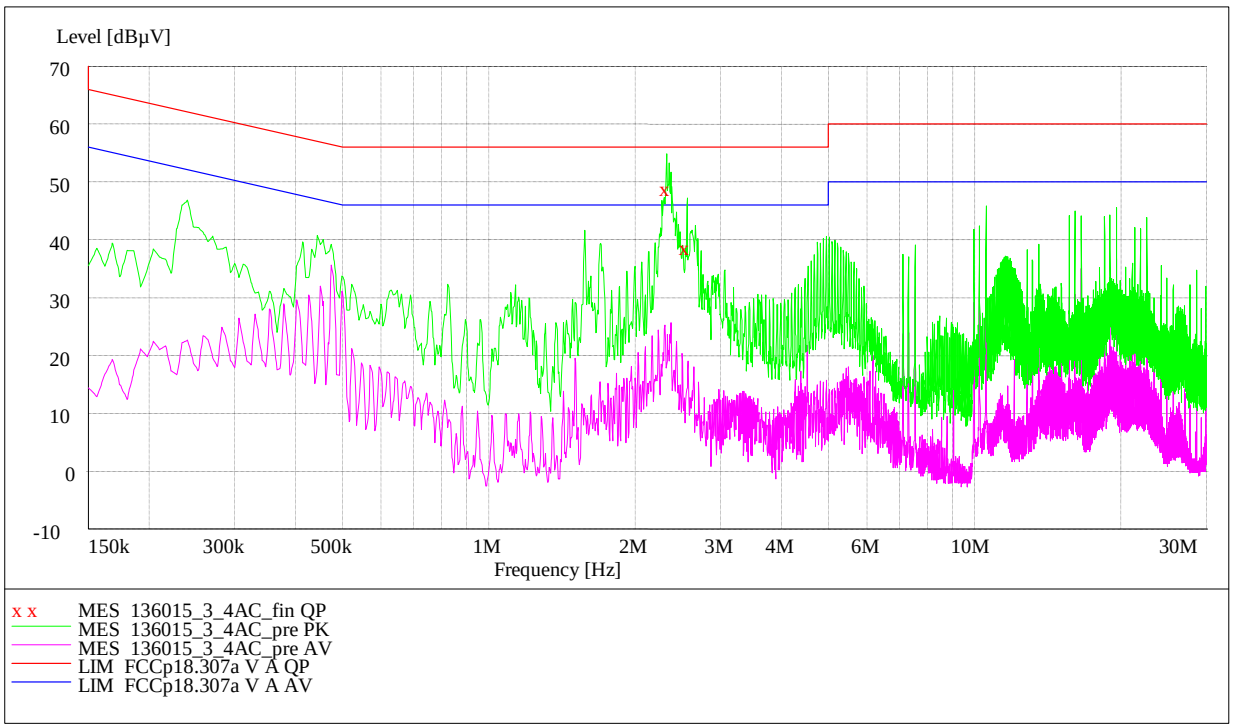
Test record: All results are shown in the following. This test was carried out in normal hopping mode of the EUT.

Supply voltage: The EUT was supplied by AC mains with 120 VAC / 60 Hz (180 ° phase angle).

Load: A load of 700 ml of water was use, the beaker was located in the center of the oven.

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 a “+”.

136015_3_4AC: EUT without transmitter (operation mode 4):



Result measured with the quasi-peak detector (marked by an x):

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
2.328901	49.3	0.7	56.0	6.7	L1	FLO
2.561101	39.0	0.7	56.0	17.0	L1	GND

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:
1 - 4, 20, 186, 187, 189, 190

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 AG	B83117-S1-X158	480088	Weekly verification (system cal.)	
2	EMI Receiver	ESIB 26	Rohde & Schwarz	1088.7490	481182	03/09/2012	03/2014
3	LISN	NSLK8128	Schwarzbeck	8128161	480138	05/04/2012	04/2014
4	High pass filter	HR 0.13-5ENN	FSY Microwave Inc.	DC 0109 SN 002	480340	Weekly verification (system cal.)	
6	Spectrum analyser	FSU	Rohde & Schwarz	200125	480956	02/15/2012	02/2014
14	Open area test site	-	Phoenix Test-Lab	-	480085	Weekly verification (system cal.)	
15	EMI Receiver	ESIB 26	Rohde & Schwarz	1088.7490	481182	03/09/2012	03/2014
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 D	Chase	22921	480674	08/27/2011	08/2014
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	02/13/2013	02/2014
32	Controller	MCU	Maturo	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	04/21/2010	04/2014
36	Horn Antenna	3115 A	EMCO	9609-4918	480183	11/09/2011	11/2014
37	Standard Gain Horn 11.9 GHz – 18 GHz	18240-20	Flann Microwave	483	480294	Six month verification (system cal.)	
39	Standard Gain Horn 17.9 GHz – 26.7 GHz	20240-20	Flann Microwave	411	480297	Six month verification (system cal.)	
45	RF-cable No. 40	Sucoflex 106B	Suhner	0708/6B	481330	Weekly verification (system cal.)	
46	RF-cable 1 m	KPS-1533-400-KPS	Insulated Wire	-	480301	Six month verification (system cal.)	
50	Preamplifier	JS3-12001800-16-5A	Miteq	571667	480343	Six month verification (system cal.)	
51	Preamplifier	JS3-18002600-20-5A	Miteq	658697	480342	Six month verification (system cal.)	
142	RF-cable No. 36	Sucoflex 106B	Huber + Suhner	-	480865	Weekly verification (system cal.)	
156	Preamplifier	JS3-00101200-23-5A	Miteq	681851	480337	Weekly verification (system cal.)	
170	EM Radiation Meter	EMR-300	Wandel & Goltermann	R-0033	480272	02/14/2012	02/2014
186, 187	Power amplifier	EP4500/B	Spitzenberger & Spies	B5960, B5963	480036, 480039	Six-month verification (system cal.)	

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal. due
189, 190	DC source	NT-EP4500	Spitzenberger & Spies	B5961, B5964	480037, 480040	Six-month verification (system cal.)	
200	Digital thermometer	54-II	Fluke	91010014	480779	03/24/2013	03/2014

7 Report history

Report Number	Date	Comment
F136015E4	20 January 2014	Document created
F132604E4, 2nd version	23 May 2014	Change of the FCC ID
F132604E4, 3rd version	30 October 2014	Change of the FCC ID

8 List of annexes

ANNEX A TEST SETUP PHOTOGRAPHS 6 pages

136015_3_2.JPG: HR1954, test set-up fully anechoic chamber
136015_3_10.JPG: HR1954, test set-up fully anechoic chamber
136015_3_11.JPG: HR1954, test set-up fully anechoic chamber
136015_3_12.JPG: HR1954, test set-up fully anechoic chamber
136015_3_16.JPG: HR1954, test set-up open area test site
136015_3_13.JPG: HR1954, test set-up shielded chamber

ANNEX B EXTERNAL PHOTOGRAPHS 3 pages

136015_3_k.JPG: HR1954, 3-D-view 1
136015_3_l.JPG: HR1954, 3-D.view 2
136015_3_n.JPG: HR1954, cooking chamber (door opened)

ANNEX C INTERNAL PHOTOGRAPHS 3 pages

136015_3_g.JPG: HR1954, internal view 1 (cover removed)
136015_3_d.JPG: HR1954, internal view 2 (rear cover removed)
136015_3_j.JPG: HR1954, type plate