PHOENIX TESTLAB

Königswinkel 10
32825 Blomberg
Germany
Phone +49 5235 9500-0
Fax +49 5235 9500-10

TEST REPORT

Test Report Reference: R71641 Edition 1

Equipment under Test: AWR100

FCC ID: QG2AWR100

Serial Number: 0000000247

Applicant: Agrident GmbH

Manufacturer: Agrident GmbH

Test Laboratory
(CAB)
accredited by
DATech GmbH
in compliance with DIN EN ISO/IEC 17025
under the
Reg. No. DAT-P-105/99-21
and
FCC Test site registration number 90877

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1 IDENTIFICATION

1.1 APPLICANT

Name:	agrident GmbH
Address:	Steinklippenstrasse 10 30890 Barsinghausen
Country:	Germany
Name for contact purposes:	Mr. Helmut Ruppert
Tel:	+49 51 05 52 06 14
Fax:	+49 51 05 52 06 16
e-mail address:	mail@agrident.com

1.2 MANUFACTURER

Name:	agrident GmbH
Address:	Steinklippenstrasse 10 30890 Barsinghausen
Country:	Germany
Name for contact purposes:	Mr. Helmut Ruppert
Tel:	+49 51 05 52 06 14
Fax:	+49 51 05 52 06 16
e-mail address:	mail@agrident.com

1.3 DATES

Date of receipt of test sample:	16 August 2007
Start of test:	17 August 2007
End of test:	06 September 2007

1.4 TEST LABORATORY

The tests were carried out at: **PHOENIX TESTLAB GmbH**
Königswinkel 10
D-32825 Blomberg **Phone: +49 (0) 52 35 / 95 00-0**
Germany **Fax: +49 (0) 52 35 / 95 00-10**

accredited by DATech GmbH in compliance with DIN EN ISO/IEC 17025 under Reg. No. DAT-P-105/99-21 and FCC Test site registration number 90877

Test engineer:	Thomas KÜHN		13 September 2007
	Name	Signature	Date
Test report checked:	Bernd STEINER		13 September 2007
	Name	Signature	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

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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 CFR 47 Part 15 (May 2007)** Radio Frequency Devices

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.

2 TECHNICAL DATA OF EQUIPMENT

2.1 DEVICE UNDER TEST

Type of equipment:	134 kHz Reader
Type designation:	AWR100
FCC ID:	QG2AWR100
Serial No.:	0000000247
Lowest internal frequency:	134 kHz
Highest internal frequency:	15.56 MHz
Antenna type:	Integral
Supply Voltage:	9.6 V by internal battery

The following external I/O cables were used:

Cable	Length	Shielding	Connector
RS 232 and DC in *	1.6 m	Yes	5 pole customised connector
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

*: This line was connected during the measurements for CFR 47 part 15 B compliance and are documented in Annex D of this test report.

2.2 PERIPHERY DEVICES

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

FDX transponder type DTD 530.

2.3 SPECIAL EMC MEASURES

The following EMC measures were necessary to reach the documented results:

None

3 OPERATIONAL STATES AND PHYSICAL BOUNDARIES

During all tests the EUT was supplied with a DC supply voltage by the internal battery.

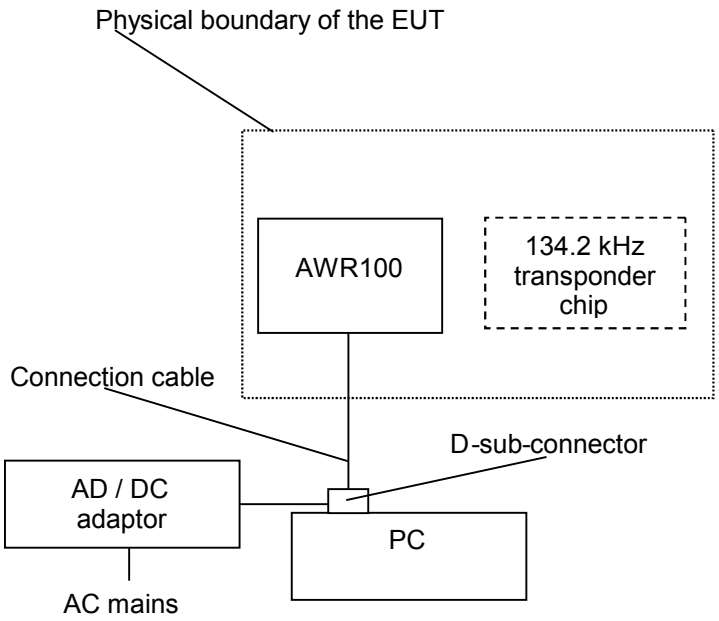
If not otherwise stated, the tests were carried out with the EUT powered on and reading continuously a transponder. The EUT will power down after 10 seconds if no transponder is presented.

The EUT is a battery powered device. The conducted emission measurement on AC mains were carried out while the internal battery was charged, the EUT was reading a transponder and exchanges data with a laptop PC, which was connected to the RS 232 interface. Pretests have shown that this configuration caused the highest emissions on the AC mains.

For the whole frequency range a preliminary measurement in a fully anechoic chamber with a measuring distance of 3 m was carried out to determine the frequencies, which were radiated by the EUT.
The final measurements on the detected frequencies were carried out on an outdoor test site without ground plane (for the frequency range 9 kHz to 30 MHz) and on an open area test site with ground plane (for the frequency range 30 MHz to 1 GHz).

During the tests, the EUT was not labelled with a FCC-label.

The physical boundaries of the Equipment Under Test are shown below.



4 LIST OF TEST MODULES

Conducted emissions FCC 47 CFR Part 15 section 15.207 (a)[2]					
Application	Frequency range	Limits	Reference standard	Remark	Status
On AC supply line	0.15 to 0.5 MHz 0.5 to 5 MHz 5 to 30 MHz	66 to 56 dBµV (QP) * 56 to 46 dBµV (AV) * 56 dBµV (QP) 46 dBµV (AV) 60 dBµV (QP) 50 dBµV (AV)	ANSI C63.4 (2003)	-	Passed
*: Decreases with the logarithm of the frequency					
Radiated emissions FCC 47 CFR Part 15 section 15.209 [2]					
Application	Frequency range	Limits (microvolts/meter)	Reference standard	Remark	Status
Intentional radiator	0.009 to 0.49 MHz 0.490 to 1.705 MHz 1.705 to 30.0 MHz 30 to 88 MHz 88 to 216 MHz 216 to 960 MHz 960 to 1000 MHz	2400/f(kHz) at 300 m 24000/f(kHz) at 30 m 30.0 dBµV/m at 30 m 40.0 dBµV/m at 3 m 43.5 dBµV/m at 3 m 46.0 dBµV/m at 3 m 54.0 dBµV/m at 3 m	ANSI C63.4 (2003)	-	Passed
Antenna requirement FCC 47 CFR Part 15 section 15.203 [2]					
					Status
The EUT has an integrated antenna only.					Fulfilled

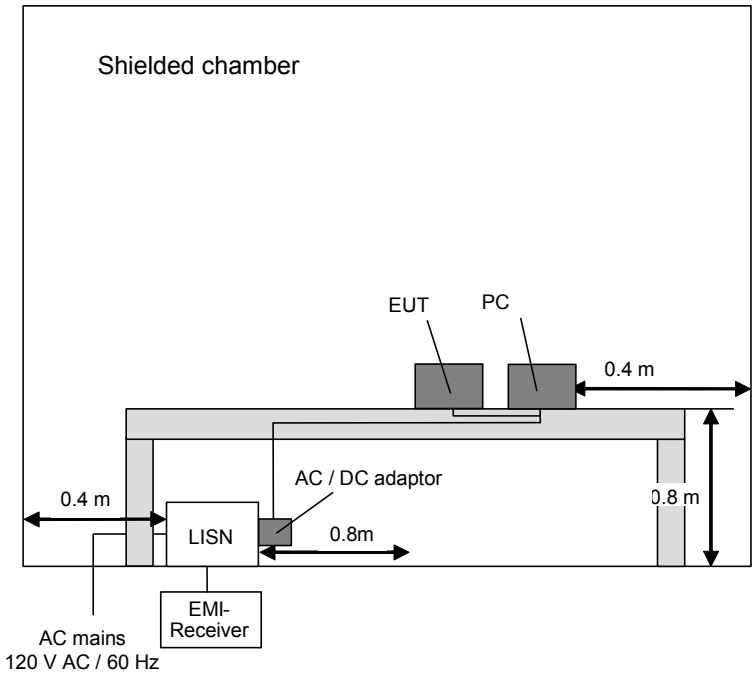
5 METHOD OF MEASUREMENT

5.1 CONDUCTED EMISSIONS ON POWER SUPPLY LINES (150 KHZ TO 30 MHZ)

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 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



5.2 RADIATED EMISSIONS 9 kHz to 30 MHz

The radiated emission measurement is divided into two stages.

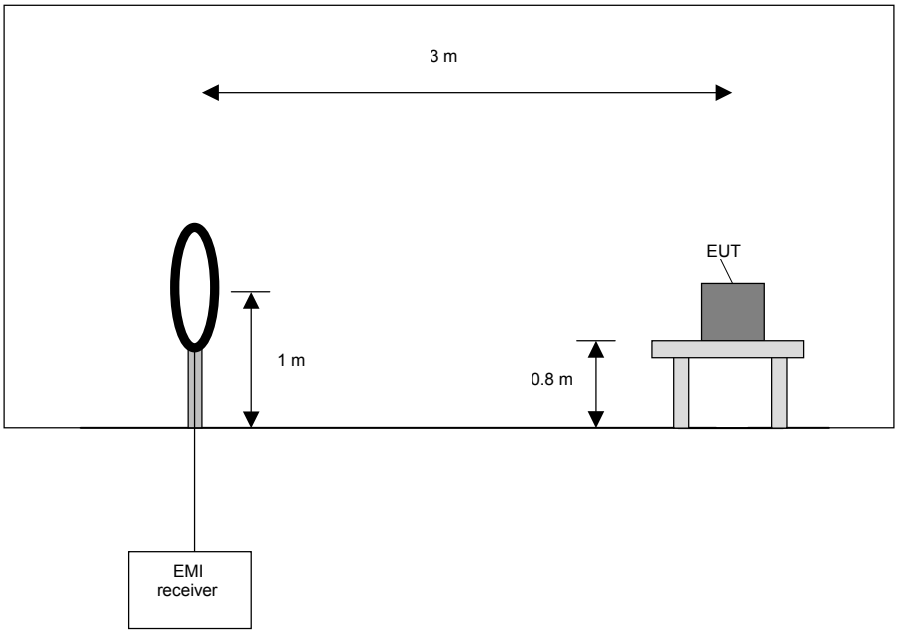
Preliminary measurement:

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



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 4) with the other orthogonal axes of the EUT.
7) Rotate the measuring antenna and repeat steps 1) to 5).

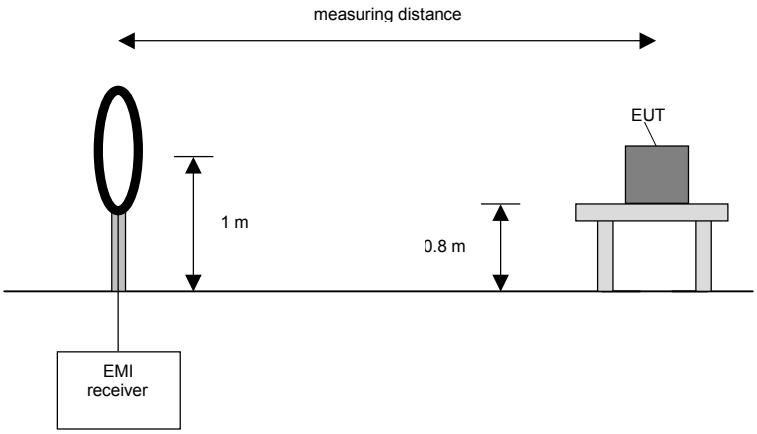
Final measurement:

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



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 applicable (handheld equipment).

5.3 RADIATED EMISSIONS 30 MHz to 1 GHz

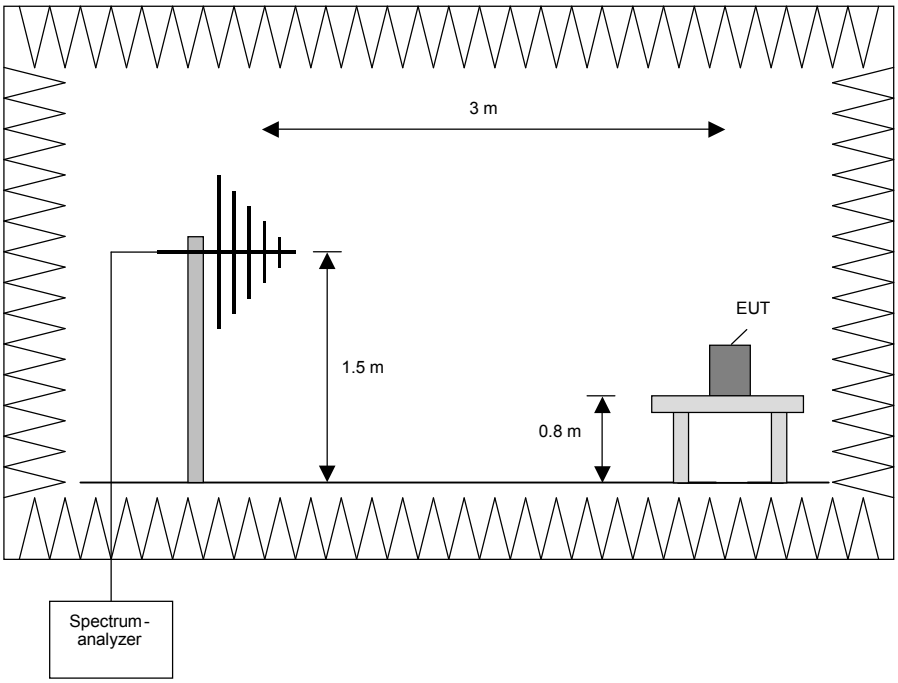
The radiated emission measurement is divided into two stages.

Preliminary measurement:
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 1 GHz	100 kHz



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:

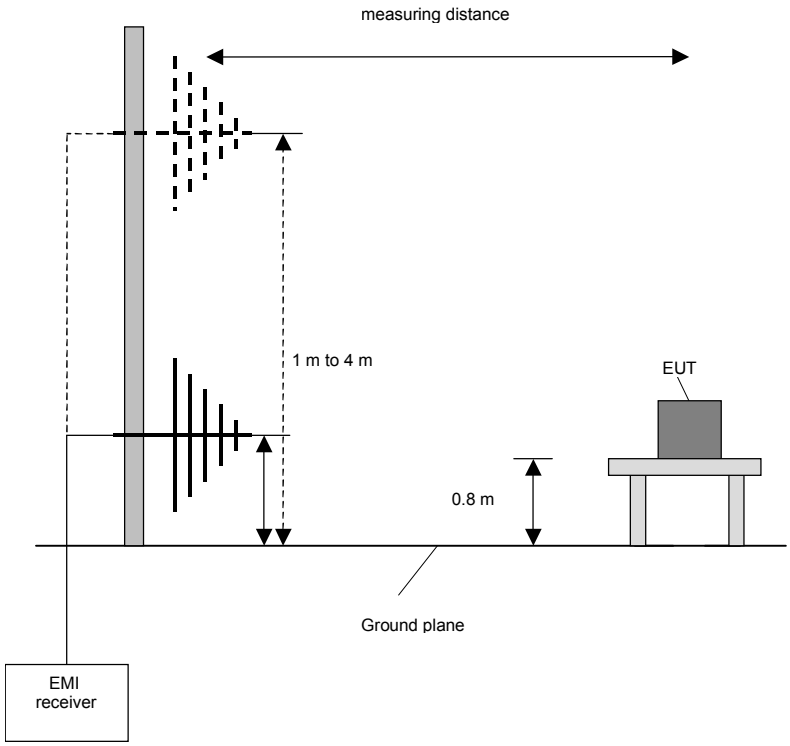
1. Monitor the frequency range at horizontal polarisation and a EUT azimuth of 0 °.
2. Manipulate the system cables within the range to produce the maximum level of emission.
3. Rotate the EUT by 360 ° to maximize the detected signals.
4. Make a hardcopy of the spectrum.
5. Measure the frequency of 3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

Final Measurement:

In the second stage 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



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 (QP or AV) 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.

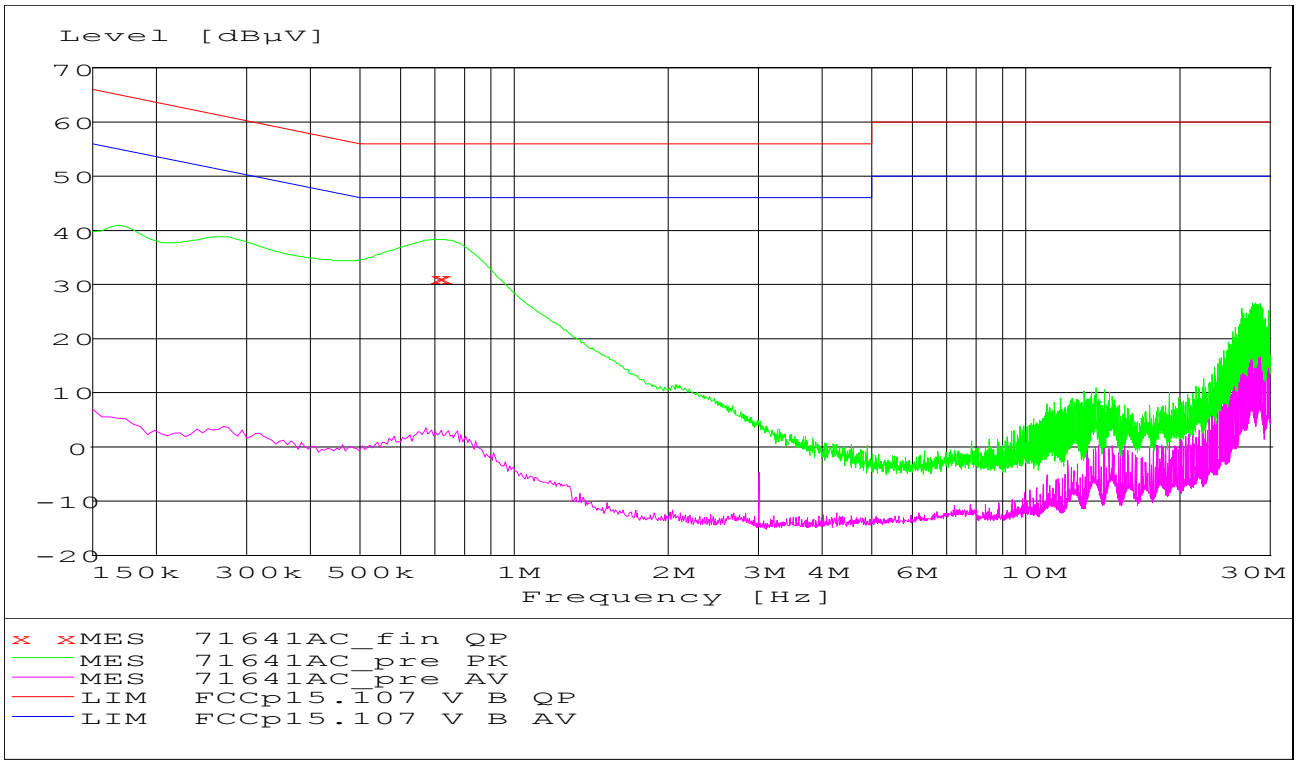
6 TEST RESULTS EMISSION TEST

6.1 CONDUCTED EMISSION MEASUREMENT ON AC MAINS (150 kHz to 30 MHz)

Ambient temperature:	21 °C	Relative humidity:	50 %

Position of EUT:	The EUT was set-up on a wooden table of a height of 0.8 m.
Cable guide:	The cable of the EUT was fixed on the wooden table. For further information of the cable guide refer to the pictures in annex E of this test report.
Test record:	The test was carried out in data communication and charging mode of the EUT (with reading a TAG). All results are shown in the following.
Power supply:	During this test the EUT was powered by an AC/DC type FW3288, which was connected to AC mains with 115 V /60 Hz.
Measurement uncertainty:	+3.6 dB / -4.5 dB

Title:	AC Powerline Conducted Emission Test with protective ground conductor simulating network
EUT:	AWR100
Manufacturer:	Agrident GmbH
Operating Condition:	Reading TAG, data transfer, charging
Test site:	PHOENIX TEST-LAB Blomberg M4
Operator:	Th. KÜHN
Test Specification:	Using power supply type FW 3288, powered with external 115 V AC 60 Hz
Comment:	Connected to Laptop PC



Data record name: 71641AC

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.714000	31.50	0.2	56.0	24.5	L1	FLO
0.720000	31.50	0.2	56.0	24.5	L1	FLO

Data record name: 71641AC2_fin QP

Test: Passed

TEST EQUIPMENT USED:
1 - 3, 5, 6

6.2 PRELIMINARY RADIATED EMISSION TEST (9 kHz to 30 MHz)

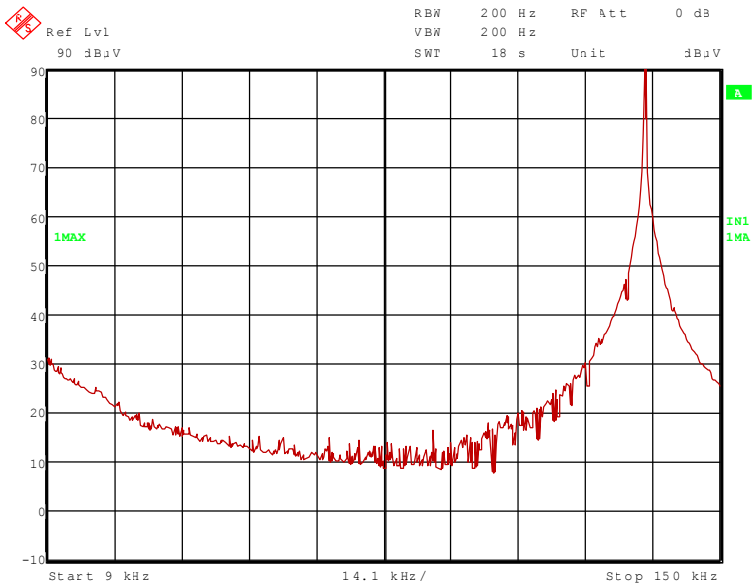
Ambient temperature:	21 °C	Relative humidity:	51 %

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.

Cable guide: No cables are connected to the EUT. For details of the test set-up refer to the pictures in annex A of this test report.

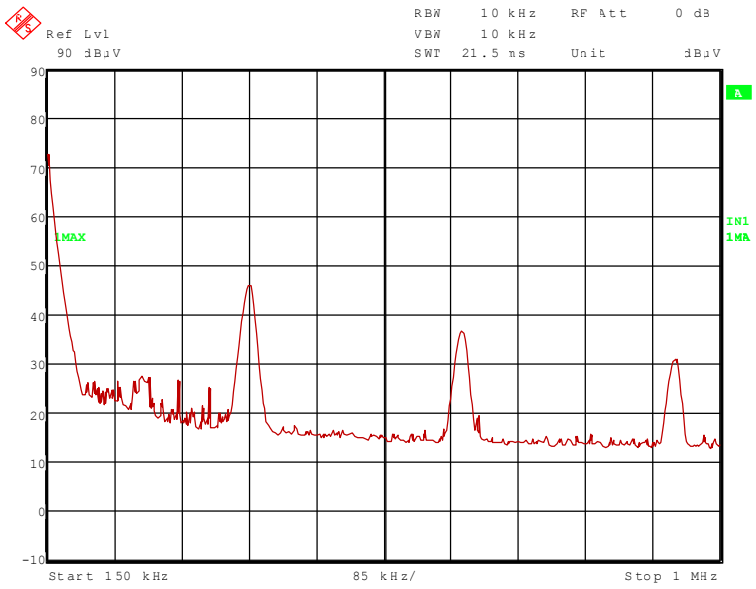
Test record: The test was carried out in continuous reading transponder mode of the EUT. All results are shown in the following.

71641_1.wmf: Spurious emissions from 9 kHz to 150 kHz:

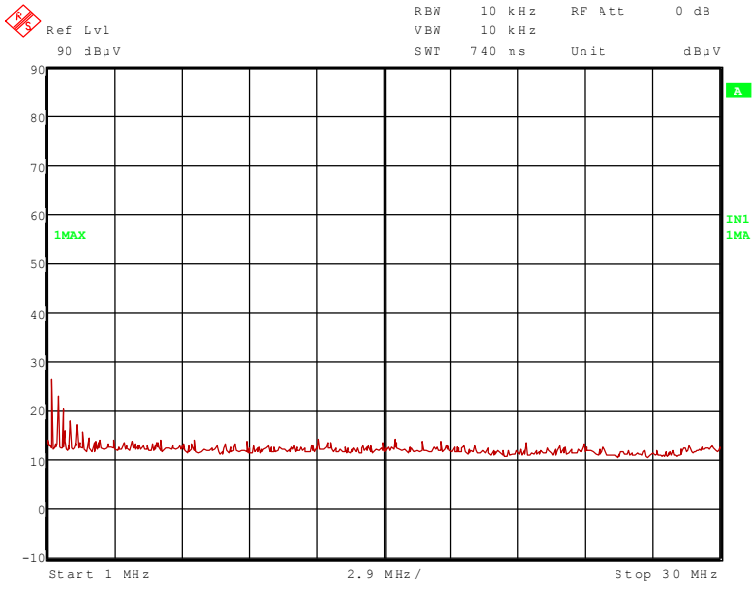


TEST EQUIPMENT USED THE TEST:
29, 31 – 33, 54, 56

71641_2.wmf: Spurious emissions from 150 kHz to 1 MHz:



71641_3.wmf: Spurious emissions from 1 MHz to 30 MHz:



The following emission was found according to FCC 47 CFR Part 15 section 15.209 (a).

134.218 kHz, 402.654 kHz, 671.090 kHz, 939.449 kHz, 1207.962 kHz and 1476.398 kHz.

These frequencies have to be measured on the outdoor test site. The result of this final measurement is shown in subclause 6.4 of this test report.

6.3 PRELIMINARY RADIATED EMISSION TEST (30 MHz to 1 GHz)

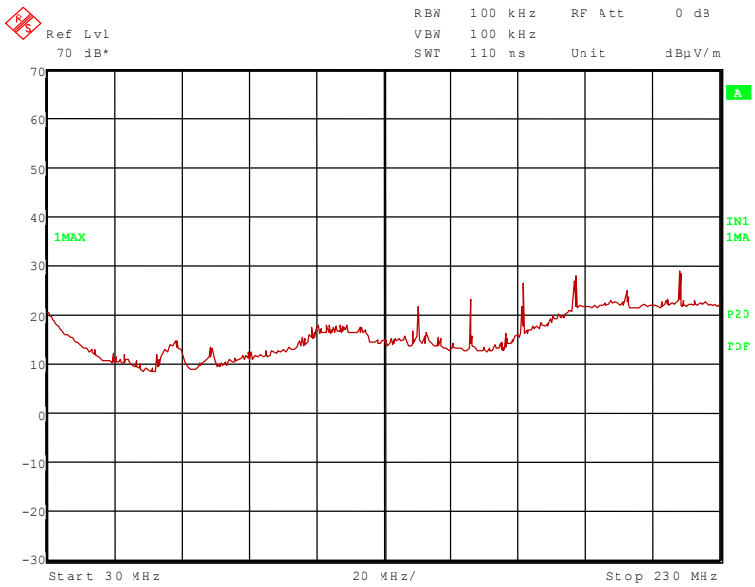
Ambient temperature:	21 °C	Relative humidity:	51 %

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.

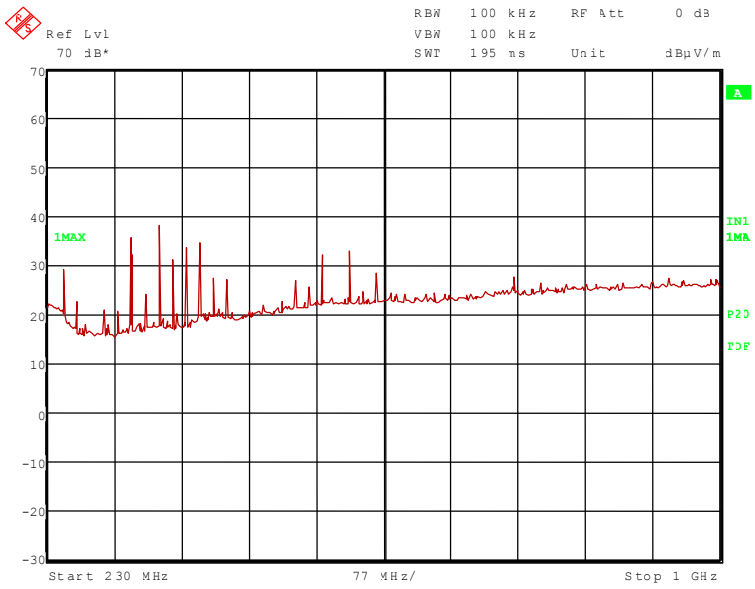
Cable guide: No cables are connected to the EUT. For details of the test set-up refer to the pictures in annex A of this test report.

Test record: The test was carried out in continuous reading transponder mode of the EUT. All results are shown in the following.

71641_4.wmf: Spurious emissions from 30 MHz to 230 MHz:



71641_5.wmf: Spurious emissions from 230 MHz to 1 GHz:



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

155.679 MHz, 187.817 MHz, 217.966 MHz, 358.087 MHz, 389.225 MHz and 575.053 MHz.

The following frequency was found inside the restricted bands according to FFC 47 CFR Part 15 section 15.205 [2].

171.248 MHz, 326.949 MHz and 404.794 MHz.

These frequencies have to be measured on the open area test site. The results of this final measurement are shown in subclause 6.5 of this test report.

TEST EQUIPMENT USED FOR THE TEST:
29, 31 – 35, 43

6.4 FINAL RADIATED EMISSION TEST (9 kHz to 30 MHz)

Ambient temperature:	12 °C	Relative humidity:	59 %

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.

Cable guide: No cables are connected to the EUT. For details of the test set-up refer to the pictures in annex A of this test report.

Test record: The test was carried out in continuous reading transponder mode of the EUT. All results are shown in the following.

Test results: The test results were calculated with the following formula:

Result [dBµV/m] = reading [dBµV] + antenna factor [dB/m]

Method of calculation:

In case where it was possible to measure at least two EUT to antenna distances, with the results a graphical interpolation was done to calculate the linear equation. The linear equation was used to calculate the emission level at the required distance.

If a measurement was only possible at one EUT to antenna distance, the 40 dB / decade correction factor was be used to calculate the limit value at the used measurement distance.

In order to increase the measurement accuracy the calculation of the linear equation should be used.

Results with using linear equation				
Frequency 134.218 kHz				
Result [dBµV/m]	Readings [dBµV]	Antenna factor * [dB/m]	Distance [m]	Detector
93.5	73.5	20.0	3	AV
66.2	46.2	20.0	10	AV
50.0	30.0	20.0	30	AV
A graphical interpolation with these values was done and the linear equation was calculated to y = -43.639x + 112.87. With x = log 300 the Field strength value in 300 m is calculated to 4.8 dBµV/m				
Result [dBµV/m]	Limit [dBµV/m]		Margin [dB]	
4.8	25.0		20.2	
Frequency 402.654 kHz				
Result [dBµV/m]	Readings [dBµV]	Antenna factor * [dB/m]	Distance [m]	Detector
52.0	32.0	20.0	3	AV
31.4	11.4	20.0	10	AV
A graphical interpolation with these values was done and the linear equation was calculated to y = -39.397x + 70.797. With x = log 300 the Field strength value in 300 m is calculated to -26.8 dBµV/m				
Result [dBµV/m]	Limit [dBµV/m]		Margin [dB]	
-26.8	15.5		42.3	
Frequency 671.090 kHz				
Result [dBµV/m]	Readings [dBµV]	Antenna factor * [dB/m]	Distance [m]	Detector
55.0	35.0	20.0	3	QP
29.5	9.5	20.0	10	QP
A graphical interpolation with these values was done and the linear equation was calculated to y = -48.768x + 78.268. With x = log 30 the Field strength value in 30 m is calculated to 6.2 dBµV/m				
Result [dBµV/m]	Limit [dBµV/m]		Margin [dB]	
6.2	31.1		24.9	

Results with using 40 dB / decade correction factor							
Frequency	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Reading [dBµV/m]	Detector	Antenna factor * [dB/m]	Distance [m]
939.449	52.0	68.1	16.1	32.0	QP	20.0	3
1207.962	50.0	66.0	16.0	30.0	QP	20.0	3
1476.398	48.0	64.2	16.2	28.0	QP	20.0	3
Measurement uncertainty				+2.2 dB / -3.6 dB			

*: Cable loss included

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:
55 – 57

6.5 FINAL RADIATED EMISSION TEST (30 MHz to 1 GHz)

Ambient temperature:	21 °C	Relative humidity:	55 %

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.

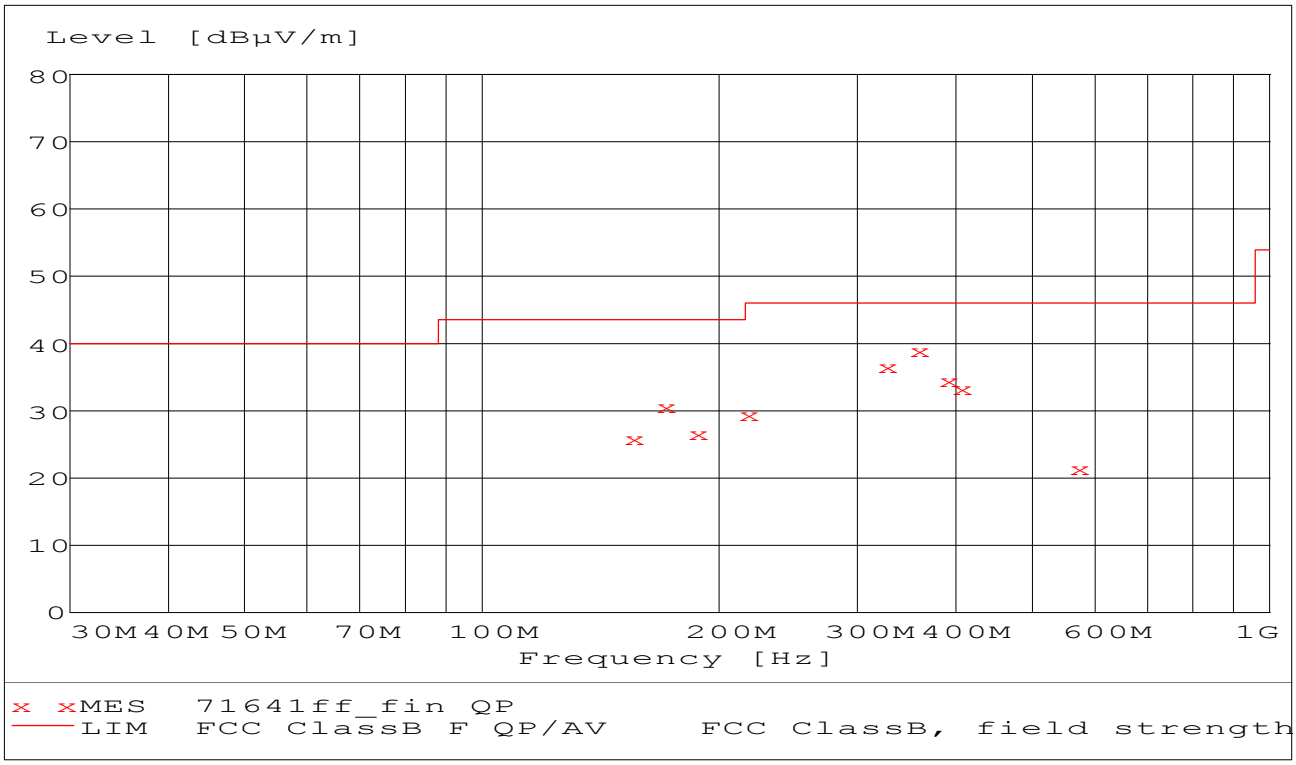
Cable guide: No cables are connected to the EUT. For details of the test set-up refer to the pictures in annex A of this test report.

Test record: The test was carried out in continuous reading transponder mode of the EUT. All results are shown in the following.

Test results: The test results were calculated with the following formula:

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

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 x are the measured results of the standard final measurement on the open area test site.



Data record name: 71641ff

The results of the standard final 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.

The measurement time with the quasi-peak measuring detector is 1 second.

Result measured with the quasipeak detector:

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

Spurious emissions outside restricted bands									
Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor dB/m	Cable loss dB	Height cm	Azimuth deg	Pol.
155.679	26.1	43.5	17.4	13.7	11.6	0.8	225.0	309.0	Horizontal
187.817	26.8	43.5	16.7	16.9	9.1	0.8	109.0	123.0	Horizontal
217.966	29.4	46.0	16.6	19.0	9.5	0.9	125.0	114.0	Horizontal
358.087	38.9	46.0	7.1	23.4	14.3	1.2	100.0	258.0	Horizontal
389.225	34.8	46.0	11.2	18.2	15.4	1.2	100.0	269.0	Horizontal
575.053	21.6	46.0	24.4	0.9	19.2	1.5	107.0	89.0	Horizontal
Spurious emissions in restricted bands									
Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor dB/m	Cable loss dB	Height cm	Azimuth deg	Pol.
171.248	30.7	43.5	12.8	19.8	10.1	0.8	175.0	273.00	Horizontal
326.949	36.8	46.0	9.2	22.1	13.6	1.1	100.0	269.0	Horizontal
404.794	33.5	46.0	12.5	16.5	15.8	1.2	110.0	227.0	Horizontal
Measurement uncertainty				+2.2 dB / -3.6 dB					

The test results were calculated with the following formula:

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

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:
14 - 20

7 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

Emission measurement at AC mains and DC in / out ports at M4					
No.	Test equipment	Type	Manufacturer	Serial No.	PM-No
1	Shielded chamber M4	-	Siemens	B83117S1-X158	480088
2	Measuring receiver	ESAI	Rohde & Schwarz	831953/001 833181/018	480025 480026
3	LISN	NSLK8128	Schwarzbeck	8128155	480058
4	LISN	NSLK 8128-	Schwarzbeck	8128161	480138
5	AC-filter	B84299-D87-E3	Siemens	930262292	480097
6	EMI-Software	ES-K1	Rohde & Schwarz	-	480111

Radiated emission measurement at M5					
No.	Test equipment	Type	Manufacturer	Serial No.	PM-No
7	Fully anechoic chamber M5	-	Siemens	B83177-S1-X156	480073
8	Measuring receiver	ESVS30	Rohde & Schwarz	829673/012	480024
9	Controller	HD100	Deisel	100/324	480067
10	Antenna support	MA240	Deisel	228/314	480069
11	Turntable	DS412	Deisel	412/317	480070
12	Antenna	CBL6112C	Chase	2689	480327
13	EMI Software	ES-K1	Rohde & Schwarz	-	480111

Radiated emission measurement at M6					
No.	Test equipment	Type	Manufacturer	Serial No.	PM-No
14	Open area test site	-	Phoenix Test-Lab	-	480085
15	Measuring receiver	ESVS30	Rohde & Schwarz	829673/012	480024
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
20	EMI Software	ES-K1	Rohde & Schwarz	-	480111

Radiated emission measurement at M8					
No.	Test equipment	Type	Manufacturer	Serial No.	PM-No
21	Fully anechoic chamber M8	-	Siemens	B83117-E7019-T231	480190
22	Measuring receiver	ESMI	Rohde & Schwarz	843977/001 843530/018	480179 480180
23	Measuring receiver	ESCS 30	Rohde & Schwarz	828985/014	480270
24	Controller	HD100	Deisel	100/427	480181
25	Turntable	DS420	Deisel	420/435/97	480186
26	Antenna support	AS615P	Deisel	615/310	480187
27	Antenna	CBL6112 A	Chase	2034	480185
28	EMI Software	ES-K1	Rohde & Schwarz	-	480111

Radiated emission measurement at M20					
No.	Test equipment	Type	Manufacturer	Serial No.	PM-No
29	Fully anechoic chamber M20	-	Albatross Projects	B83107-E2439-T232	480303
30	Measuring receiver	ESMI	Rohde & Schwarz	843977/001 843530/018	480179 480180
31	Measuring receiver	ESI 40	Rohde & Schwarz	100064	480355
32	Controller	HD100	Deisel	100/670	480326
33	Turntable	DS420HE	Deisel	420/620/80	480315
34	Antenna support	AS615P	Deisel	615/310	480187
35	Antenna	CBL6112 B	Chase	2688	480328
36	Antenna	3115 A	EMCO	9609-4918	480183
37	Standard Gain Horn 11.9 GHz – 18 GHz	18240-20	Flann Microwave	483	480294
38	Standard Gain Horn 11.9 GHz – 18 GHz	18240-20	Flann Microwave	482	480295
39	Standard Gain Horn 17.9 GHz – 26.7 GHz	20240-20	Flann Microwave	411	480297
40	Standard Gain Horn 17.9 GHz – 26.7 GHz	20240-20	Flann Microwave	410	480296
41	Standard Gain Horn 26.4 GHz – 40.1 GHz	22240-20	Flann Microwave	469	480299

No.	Test equipment	Type	Manufacturer	Serial No.	PM-No
42	Standard Gain Horn 26.4 GHz – 40.1 GHz	22240-20	Flann Microwave	468	480298
43	RF-cable No. 30	RTK 081	Rosenberger	-	410141
44	RF-cable No. 31	RTK 081	Rosenberger	-	410142
45	RF-cable 1m	KPS-1533-400-KPS	Insulated Wire	-	480300
46	RF-cable 1m	KPS-1533-400-KPS	Insulated Wire	-	480301
47	RF-cable 2m	KPS-1533-400-KPS	Insulated Wire	-	480302
48	RF-cable No. 5	RTK 081	Rosenberger		410097
49	Preamplifier	JS3-00101200-23-5A	Miteq	681851	480337
50	Preamplifier	JS3-12001800-16-5A	Miteq	571667	480343
51	Preamplifier	JS3-18002600-20-5A	Miteq	658697	480342
52	Preamplifier	JS3-26004000-25-5A	Miteq	563593	480344
53	EMI Software	ES-K1	Rohde & Schwarz	-	480111

Ancillary equipment used for testing					
No.	Test equipment	Type	Manufacturer	Serial No.	PM-No
54	Power supply	TOE 8852	Toellner	51712	480233
55	Outdoor test site	-	Phoenix Test-Lab	-	480293
56	Loop antenna	HFH2-Z2	Rohde & Schwarz	832609/014	480059
57	EMI test receiver	ESPC	Rohde & Schwarz	843756/006	480150
58	Loop Antenna ∅ = 225 mm	-	Phoenix Test-Lab	-	410085
59	RF-cable No. 10	RG223	Phoenix-Test-Lab	-	410102
60	AC power source / analyser	6813A	Hewlett Packard	3524A-00484	480155
61	Climatic chamber	MK 240	BINDER	05-79022	480462

All used measurement equipment was calibrated (if necessary). The calibration intervals and the calibration history will be given out on request.

8 LIST OF ANNEXES

ANNEX A	**PHOTOGRAPHS OF THE TEST SET-UPS**:	**6 pages**
	AWR100, test set-up fully anechoic chamber	71641_b.jpg
	AWR100, test set-up fully anechoic chamber	71641_a.jpg
	AWR100, test set-up fully anechoic chamber	71641_d.jpg
	AWR100, test set-up outdoor test-site	71641_g.jpg
	AWR100, test set-up open area test-site	71641_e.jpg
	AWR100, test set-up conducted emission measurement	71641_m.jpg
ANNEX B	**EXTERNAL PHOTOGRAPHS OF THE TEST SAMPLE**:	**4 pages**
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	AWR100, 3-D-view 2	71641_2.jpg
	AWR100, type plate view	71641_3.jpg
	AWR100, connector view	71641_4.jpg
ANNEX C	**INTERNAL PHOTOGRAPHS OF THE TEST SAMPLE**:	**17 pages**
	ASR700, internal view	70543_6.jpg
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	AWR100, internal view	71641_12.jpg
	AWR100, connector PCB, top view	71641_6.jpg
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ANNEX D **MEASUREMENT RESULTS OF THE UNINTENTIONAL RADIATOR PART**

In this Annex the results of the spurious emission measurement of the EUT with PC communication and charging in accordance to the FCC CFR 47 Part 15 section 107 and 109 are documented. This Annex is not intended to be part of the documentation, which will be reviewed by a TCB.

ANNEX E	**TEST SET-UP PHOTOGRAPHS OF THE UNINTENTIONAL RADIATOR PART**	
	AWR100, test set-up fully anechoic chamber	71641_j.jpg
	AWR100, test set-up fully anechoic chamber	71641_i.jpg
	AWR100, test set-up open area test-site	71641_k.jpg
	AWR100, test set-up conducted emission measurement	71641_l.jpg