



Inter**Lab**[®]

Final Report on

Cinterion Cellular Module EGS5

HW: B2.0.2

SW: rev. 00.060

Report Reference: MDE_CINTE_0810_EGS5_FCCa

Date: February 04, 2009

Test Laboratory:

7 layers AG
Borsigstr. 11
40880 Ratingen
Germany



DAT-P-192/99-01

Note:

The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the test laboratory.

7 layers AG
Borsigstrasse 11
40880 Ratingen, Germany
Phone: +49 (0) 2102 749 0
Fax: +49 (0) 2102 749 350
www.7Layers.com

Aufsichtsratsvorsitzender •
Chairman of the Supervisory Board:
Markus Becker
Vorstand • Board:
Dr. Hans-Jürgen Meckelburg
René Schildknecht

Registergericht • registered in:
Düsseldorf, HRB 44096
USt-IdNr • VAT No:
DE 203159652
TAX No. 14 7/58 69/0385

1 Administrative Data

1.1 Project Data

Project Responsible: Holger Leutfeld
Date Of Test Report: 2009/02/03
Date of first test: 2009/01/29
Date of last test: 2009/01/30

1.2 Applicant Data

Company Name: Cinterion Wireless Modules GmbH
Street: Siemensdamm 50
City: 13629 Berlin
Country: Germany
Contact Person: Mr. Thorsten Liebig
Department: Approval and Standardization
Phone: +49 3031102 8241
Fax: +49 30311028305
E-Mail: thorsten.liebig@cinterion.com

1.3 Test Laboratory Data

The following list shows all places and laboratories involved for test result generation:

7 layers DE

Company Name : 7 layers AG
Street : Borsigstrasse 11
City : 40880 Ratingen
Country : Germany
Contact Person : Mr. Michael Albert
Phone : +49 2102 749 201
Fax : +49 2102 749 444
E Mail : michael.albert@7Layers.de

Laboratory Details

| <i>Lab ID</i> | <i>Identification</i> | <i>Responsible</i> | <i>Accreditation Info</i> |
|---------------|-----------------------|---|--------------------------------------|
| Lab 1 | Conducted Emissions | Mr. Robert Machulec Mr. Andreas Petz | DAR-Registration no. DAT-P-192/99-01 |
| Lab 2 | Radiated Emissions | Mr. Robert Machulec Mr. Andreas Petz | DAR-Registration no. DAT-P-192/99-01 |

1.4 Signature of the Testing Responsible



Dr. Michael Küppers
responsible for tests performed in: Lab 1, Lab 2

1.5 Signature of the Accreditation Responsible



Accreditation scope responsible person
responsible for Lab 1, Lab 2

2 Test Object Data

2.1 General OUT Description

The following section lists all OUTs (Object's Under Test) involved during testing.

OUT: Cinterion Cellular Module EGS5

Type / Model / Family: Cinterion Cellular Module EGS5
HW: B2.0.2
SW: rev. 00.060

Product Category: Module

Manufacturer:
Company Name: see applicant

Parameter List:

| <i>Parameter name</i> | <i>Value</i> |
|-----------------------|--------------|
|-----------------------|--------------|

2.2 Detailed Description of OUT Samples

Sample : A01

| | | | |
|---------------------------|--------------------------------|---------------------|--------|
| <i>OUT Identifier</i> | Cinterion Cellular Module EGS5 | | |
| <i>Sample Description</i> | | | |
| <i>Serial No.</i> | 022540 | | |
| <i>HW Status</i> | B2.0.2 | | |
| <i>SW Status</i> | rev. 00.060 | | |
| <i>Date of Receipt</i> | 2009/01/28 | | |
| <i>Low Voltage</i> | 3.2 V | <i>Low Temp.</i> | -10 °C |
| <i>High Voltage</i> | 4.5 V | <i>High Temp.</i> | 55 °C |
| <i>Nominal Voltage</i> | 4.5 V | <i>Normal Temp.</i> | 21 °C |

2.3 OUT Features

Features for OUT: Cinterion Cellular Module EGS5

| <i>Designation</i> | <i>Description</i> | <i>Allowed Values</i> | <i>Supported Value(s)</i> |
|-----------------------------------|--|-----------------------|---------------------------|
| Features for scope: FCC_v2 | | | |
| AC | The OUT is powered by or connected to AC Mains | | |
| DC | The OUT is powered by or connected to DC Mains | | |
| GSM850 | EUT supports GSM850 band 824MHz - 849MHz | | |
| PantC | permanent fixed antenna connector, which may be built-in, designed as an indispensable part of the equipment | | |
| PCS1900 | EUT supports PCS1900 band 1850MHz - 1910MHz | | |

2.4 Auxiliary Equipment

| <i>AE No.</i> | <i>Type Designation</i> | <i>Serial No.</i> | <i>HW Status</i> | <i>SW Status</i> | <i>Description</i> |
|---------------|-------------------------|-------------------|------------------|------------------|--------------------|
| AE 02 | | | | | Flex cable |
| AE 04 | | | | | Shielded housing |
| AE 03 | | | | | Test Antenna |
| AE 06 | ADP-80NB | | | | AC adapter |
| AE 09 | Cherry RS 6000 | | | | Keyboard |
| AE 01 | DSB75_B1.1_0152 | | | | Evaluation board |
| AE 08 | Epson Stylus C84 | | | | Printer |
| AE 05 | LG Flatron L1740BQ | | | | TFT display |
| AE 07 | Toshiba PTM91E-02800TGR | 87060248H | | | Laptop |

2.5 Operating Mode(s)

| <i>Ref.-No.</i> | <i>Description</i> |
|-----------------|--|
| 01 | Device is transmitting on traffic channel 661, GSM 1900. |

2.6 Setups used for Testing

For each setup a relation is given to determine if and which samples and auxiliary equipment is used. The left side list all OUT samples and the right side lists all auxiliary equipment for the given setup.

| <i>Setup No.</i> | <i>List of OUT samples</i> | <i>List of auxiliary equipment</i> | |
|--------------------|----------------------------|------------------------------------|-----------------------|
| <i>Sample No.</i> | <i>Sample Description</i> | <i>AE No.</i> | <i>AE Description</i> |
| C01_FCC15b | | | |
| <i>Sample: A01</i> | | AE 02 | Flex cable |
| | | AE 04 | Shielded housing |
| | | AE 03 | Test Antenna |
| | | AE 06 | AC adapter |
| | | AE 09 | Keyboard |
| | | AE 01 | Evaluation board |
| | | AE 08 | Printer |
| | | AE 05 | TFT display |
| | | AE 07 | Laptop |

3 Results

3.1 General

Documentation of tested devices:

Available at the test laboratory.

Interpretation of the test results:

The results of the inspection are described on the following pages, where 'Conformity' or 'Passed' means that the certification criteria were verified and that the tested device is conform to the applied standard.

In cases where 'Declaration' is printed, the required documents are available in the manufacturers product documentation.

In cases where 'not applicable' is printed, the test case requirements are not relevant to the specific equipment implementation.

3.2 List of the Applicable Body

(Body for Scope: FCC_v2)

| <i>Designation</i> | <i>Description</i> |
|---|--|
| FCC47CFRChIPART15bRADIO FREQUENCY DEVICES | Part 15, Subpart B - Unintentional Radiators |

3.3 List of Test Specification

| | |
|----------------------------|---|
| <i>Test Specification:</i> | FCC part 2 and 15 |
| <i>Date / Version</i> | 2007/10/01 Version: 10-1-07 Edition |
| <i>Title:</i> | PART 2 - GENERAL RULES AND REGULATIONS PART 15 - RADIO FREQUENCY DEVICES |



3.4 Summary

| <i>Test Case Identifier / Name</i> <i>Test (condition)</i> | <i>Result</i> | <i>Date of Test</i> | <i>Lab</i> <i>Ref.</i> | <i>Setup</i> |
|--|--------------------|---------------------|---------------------------|--------------|
| 15b.1 Conducted Emissions (AC Power Line) §15.107 15b.1; Mode = transmit | Passed | 2009/01/30 | Lab 1 | C01_FCC15b |
| | operating mode: 01 | | | |
| 15b.2 Spurious Radiated Emissions §15.109 15b.2; Mode = transmit | Passed | 2009/01/29 | Lab 2 | C01_FCC15b |
| | operating mode: 01 | | | |

3.5 Detailed Results

3.5.1 15b.1 Conducted Emissions (AC Power Line) §15.107

Test: 15b.1; Mode = transmit

| | |
|--|---|
| <i>Result:</i> | Passed |
| <i>Setup No.:</i> | C01_FCC15b |
| <i>Date of Test:</i> | 2009/01/30 15:09 |
| <i>Body:</i> | FCC47CFRChIPART15bRADIO FREQUENCY DEVICES |
| <i>Test Specification:</i> | FCC part 2 and 15 |
| <i>Test Equipment Environmental Conditions</i> | |
| <i>Temperature:</i> | 24°C |
| <i>Air Pressure:</i> | 1023hPa |
| <i>Rel. Humidity:</i> | 31% |

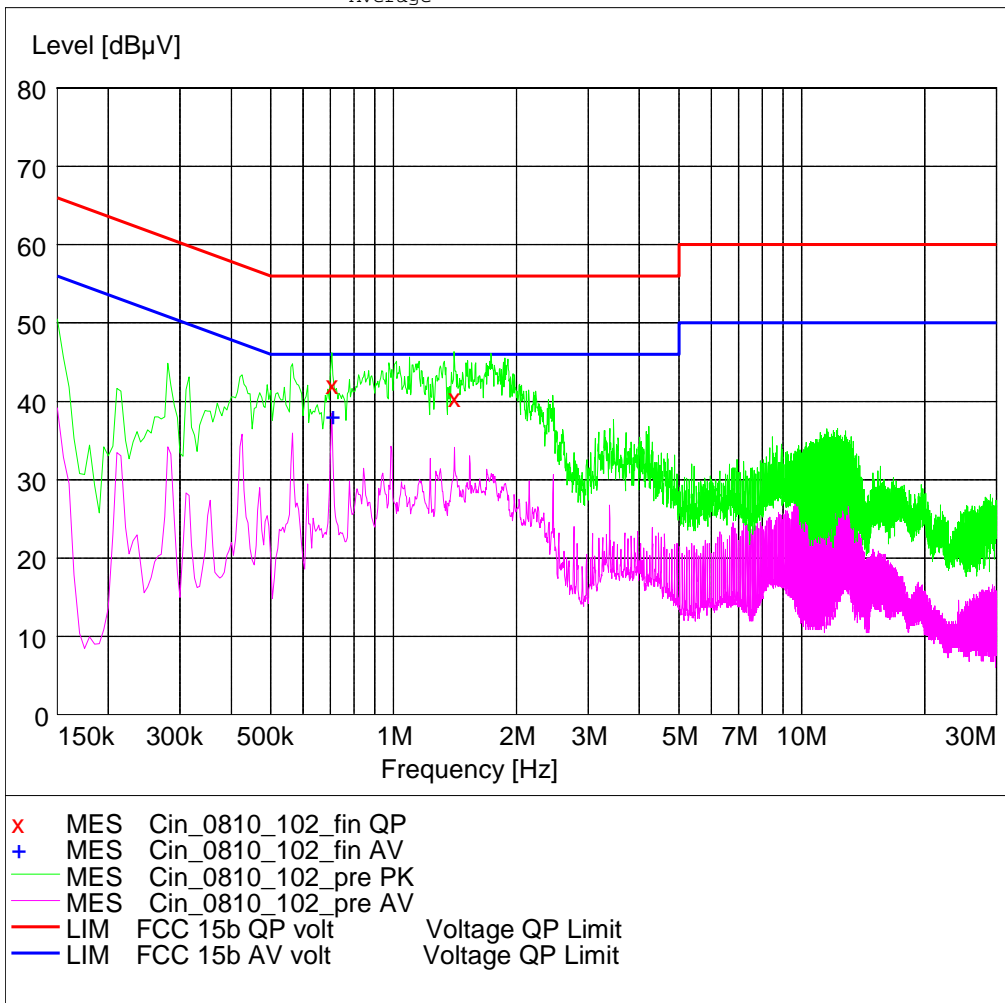
Detailed Results:

AC MAINS CONDUCTED

EUT: EGS5 (CZ020a01)
 Manufacturer: Cinterion
 Operating Condition: GSM1900 TCH661; normal voltage = 4,5V
 Test Site: 7 layers Ratingen
 Operator: Doe
 Test Specification: ANSI C63.4; FCC 15.107 / 15.207
 Comment: Horizontal EUT position
 Start of Test: 30.01.2009 / 13:45:20

SCAN TABLE: "FCC Voltage"

| Start | Stop | Step | FCC Voltage | Detector | Meas. Time | IF Bandw. | Transducer |
|-----------|----------|---------|-------------|----------|------------|-----------|------------|
| 150.0 kHz | 30.0 MHz | 5.0 kHz | MaxPeak | 20.0 ms | 9 kHz | ESH3-Z5 | |
| Average | | | | | | | |



MEASUREMENT RESULT: "Cin_0810_102_fin QP"

| Frequency | Level | Transd | Limit | Margin | Line | PE |
|-----------|-------|--------|-------|--------|------|-----|
| MHz | dBµV | dB | dBµV | dB | | |
| 0.705000 | 42.40 | 10.1 | 56 | 13.6 | N | GND |
| 1.405000 | 40.70 | 10.0 | 56 | 15.3 | N | GND |

MEASUREMENT RESULT: "Cin_0810_102_fin AV"

| Frequency | Level | Transd | Limit | Margin | Line | PE |
|-----------|-------|--------|-------|--------|------|-----|
| MHz | dBµV | dB | dBµV | dB | | |
| 0.705000 | 38.40 | 10.1 | 46 | 7.6 | N | GND |



3.5.2 15b.2 Spurious Radiated Emissions §15.109

Test: 15b.2; Mode = transmit

| | |
|--|---|
| <i>Result:</i> | Passed |
| <i>Setup No.:</i> | C01_FCC15b |
| <i>Date of Test:</i> | 2009/01/29 21:05 |
| <i>Body:</i> | FCC47CFRChIPART15bRADIO FREQUENCY DEVICES |
| <i>Test Specification:</i> | FCC part 2 and 15 |
| <i>Test Equipment Environmental Conditions</i> | |
| <i>Temperature:</i> | 25°C |
| <i>Air Pressure:</i> | 1022hPa |
| <i>Rel. Humidity:</i> | 30% |

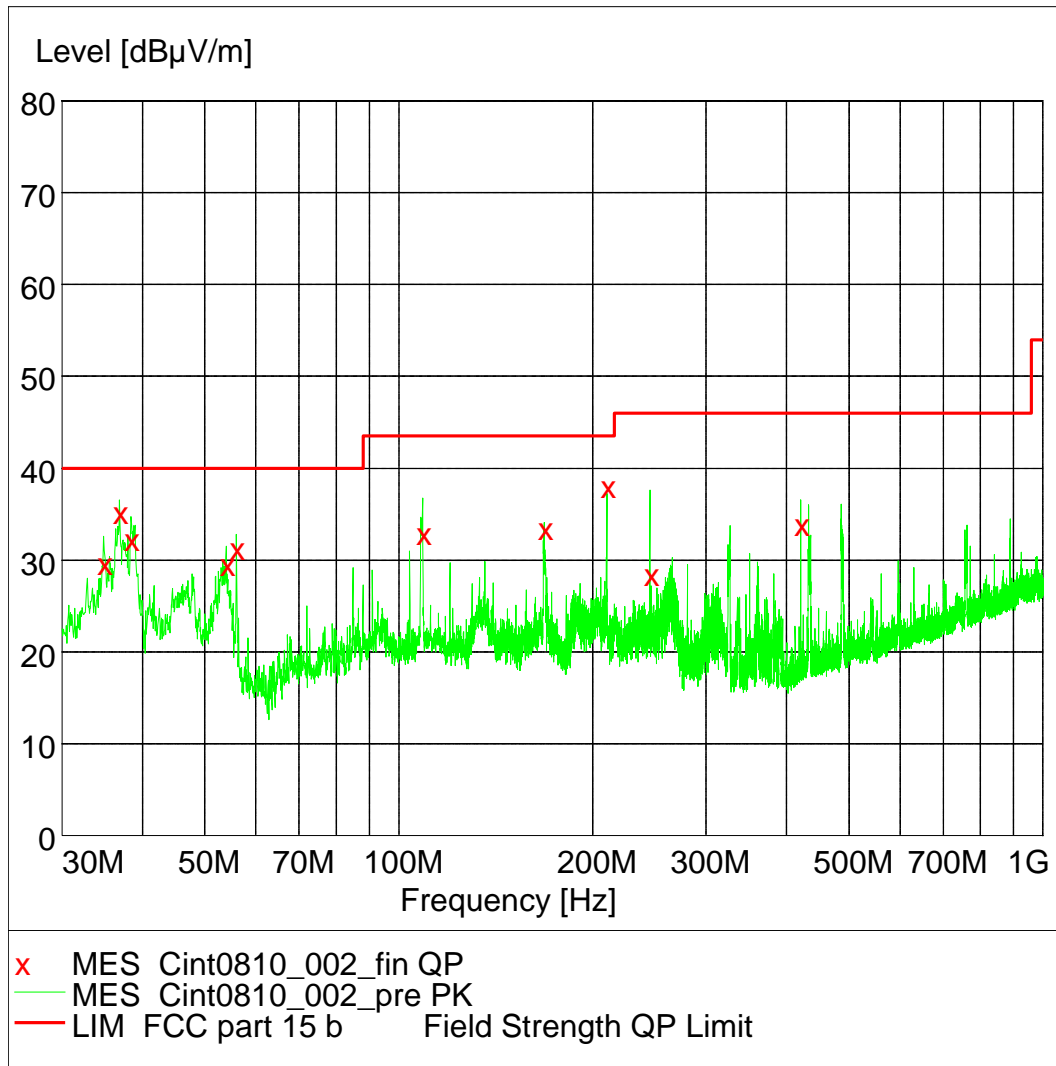
Detailed Results:

EMI RADIATED TEST

EUT: EGS5 (CZ020a01)
 Manufacturer: Cinterion
 Operating Condition: GSM 1900 TCH 661, nomal voltage
 Test Site: 7 layers, Ratingen
 Operator: Mom
 Test Specification: FCC part 15 b
 Comment: Horizontal EUT position
 Start of Test: 29.01.2009 / 20:15:46

SCAN TABLE: "FCC part 15 b"

| Short Description: | | FCC part 15 b | | | | |
|--------------------|-----------|---------------|----------|------------|-----------|------------|
| Start | Stop | Step | Detector | Meas. Time | IF Bandw. | Transducer |
| Frequency | Frequency | Width | | | | |
| 30.0 MHz | 1.0 GHz | 60.0 kHz | MaxPeak | 1.0 ms | 120 kHz | HL562 |





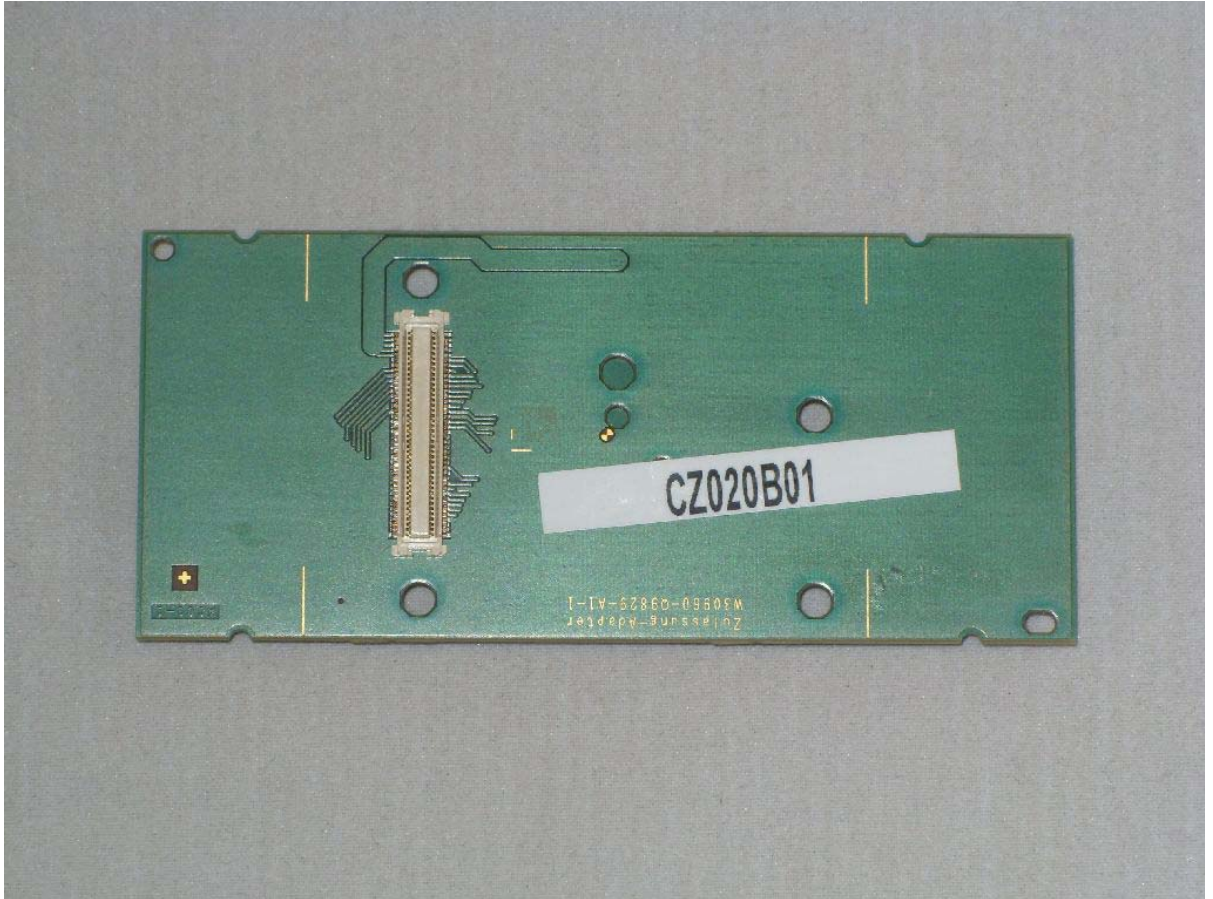
MEASUREMENT RESULT: "Cint0810_002_fin QP"

29.01.2009 21:23

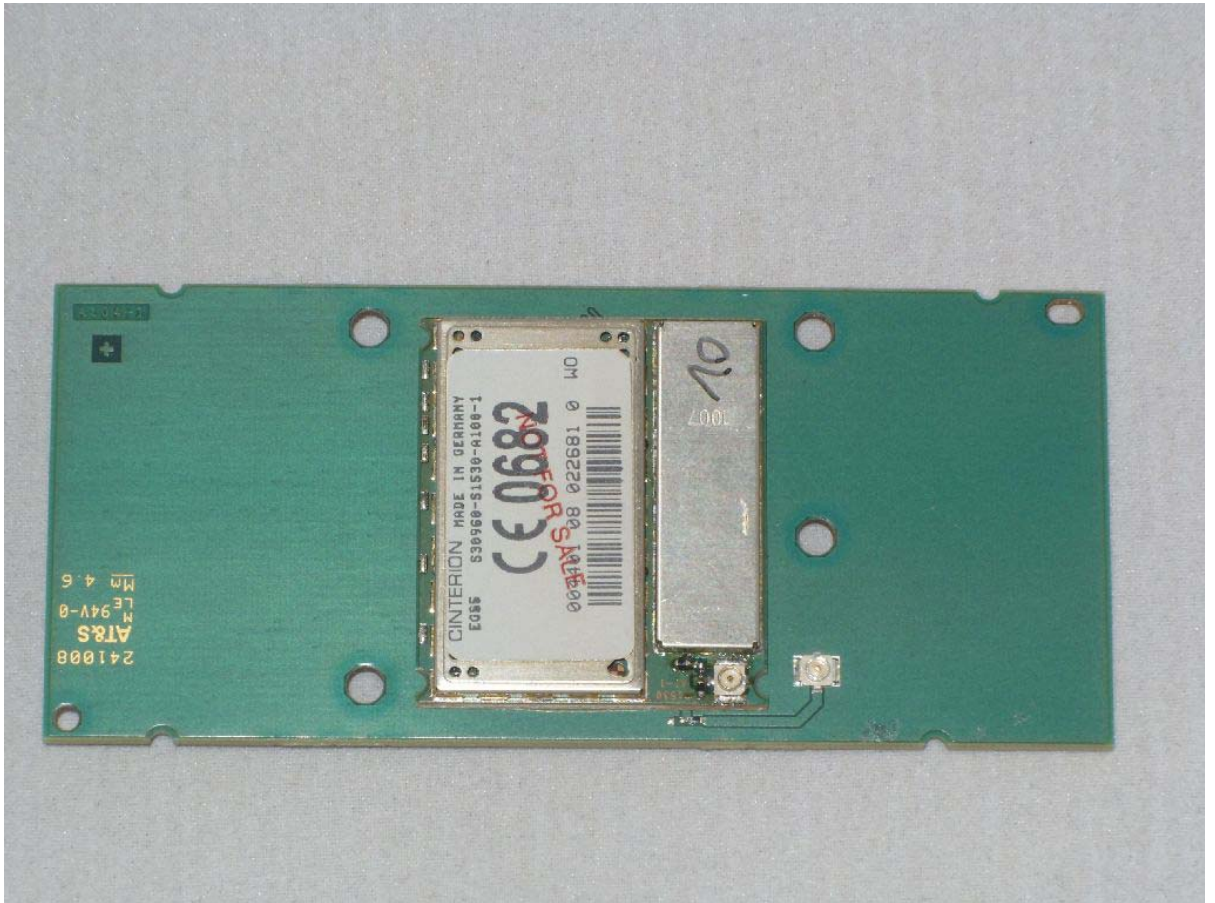
| Frequency MHz | Level dBµV/m | Transd dB | Limit dBµV/m | Margin dB | Height cm | Azimuth deg | Polarisation |
|------------------|-----------------|--------------|-----------------|--------------|--------------|----------------|--------------|
| 34.800000 | 30.00 | 17.7 | 40.0 | 10.0 | 100.0 | 0.00 | VERTICAL |
| 36.840000 | 35.50 | 16.4 | 40.0 | 4.5 | 100.0 | 292.00 | VERTICAL |
| 38.400000 | 32.60 | 15.5 | 40.0 | 7.4 | 100.0 | 338.00 | VERTICAL |
| 53.940000 | 29.80 | 5.9 | 40.0 | 10.2 | 110.0 | 247.00 | VERTICAL |
| 55.980000 | 31.60 | 4.7 | 40.0 | 8.4 | 126.0 | 276.00 | VERTICAL |
| 108.840000 | 33.20 | 10.1 | 43.5 | 10.3 | 109.0 | 157.00 | VERTICAL |
| 168.180000 | 33.70 | 8.1 | 43.5 | 9.8 | 280.0 | 337.00 | HORIZONTAL |
| 210.360000 | 38.30 | 8.8 | 43.5 | 5.2 | 138.0 | 306.00 | HORIZONTAL |
| 245.400000 | 28.80 | 10.4 | 46.0 | 17.2 | 114.0 | 247.00 | HORIZONTAL |
| 420.720000 | 34.10 | 15.5 | 46.0 | 11.9 | 142.0 | 0.00 | VERTICAL |

4 Annex

4.1 Additional Information for OUT Description



front view

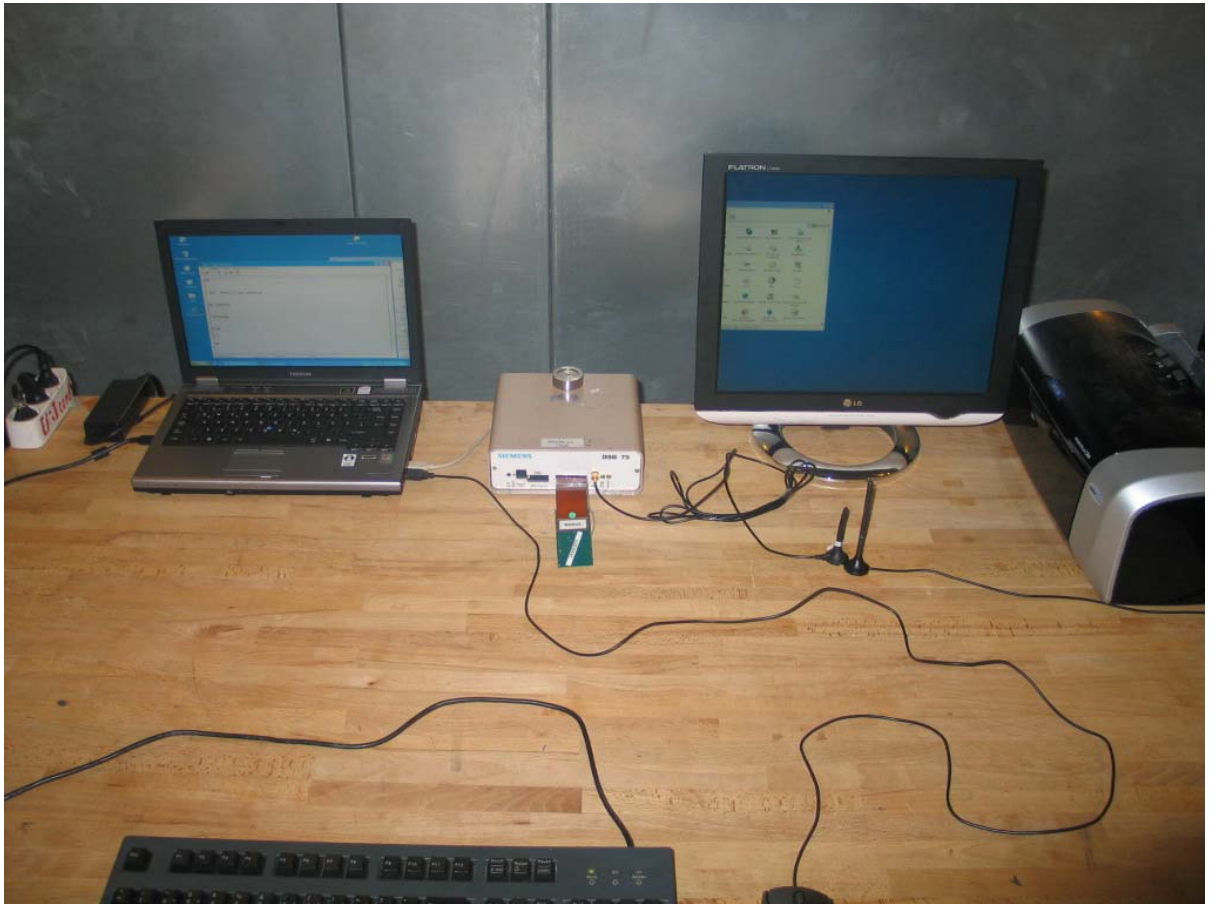


back view

4.2 Additional Information for Report



setup for radiated testing



setup for conducted testing

Test Description

Conducted emissions (AC power line)

Standard FCC Part 15, 10-1-07
Subpart B

The test was performed according to: ANSI C 63.4, 2003

Test Description

The test set-up was made in accordance to the general provisions of ANSI C 63.4-2003. The Equipment Under Test (EUT) was setup in a shielded room to perform the conducted emissions measurements in a typical installation configuration. The EUT was powered from 50 μ H || 50 Ohm Line Impedance Stabilization Network (LISN). The LISN's unused connections were terminated with 50 Ohm loads.

The measurement procedure consists of two steps. It is implemented into the EMI test software ES-K1 from R&S.

Step 1: Preliminary scan

Intention of this step is, to determine the conducted EMI-profile of the EUT.

EMI receiver settings:

- Detector: Peak - Maxhold
- Frequency range: 150 kHz – 30 MHz
- Frequency steps: 5 kHz
- IF-Bandwidth: 9 kHz
- Measuring time / Frequency step: 20 ms
- Measurement on phase + neutral lines of the power cords

On basis of this preliminary scan the highest amplitudes and the corresponding frequencies relative to the limit are identified. Emissions above the limit and emissions which are in the 10 dB range below the limit are considered.

Step 2: Final measurement

Intention of this step is, to determine the highest emissions with the settings defined in the test specification for the frequencies identified in step 1.

EMI receiver settings:

- Detector: Quasi-Peak
- IF - Bandwidth: 9 kHz
- Measuring time: 1 s / frequency

At each frequency determined in step 1, four measurements are performed in the following combinations:

- 1) Neutral lead - reference ground (PE grounded)
- 2) Phase lead - reference ground (PE grounded)
- 3) Neutral lead - reference ground (PE floating)
- 4) Phase lead - reference ground (PE floating)

The highest value is reported.

Test Requirements / Limits

If not stated within the measurement plot and/or test result, class B limits are applied.

FCC Part 15, Subpart B, §15.107, Class B Limit

| Frequency Range (MHz) | QP Limit (dB μ V) | AV Limit (dB μ V) |
|-----------------------|-----------------------|-----------------------|
| 0.15 – 0.5 | 66 to 56 | 56 to 46 |
| 0.5 – 5 | 56 | 46 |
| 5 – 30 | 60 | 50 |

FCC Part 15, Subpart B, §15.107, Class A Limit

| Frequency Range (MHz) | QP Limit (dBµV) | AV Limit (dBµV) |
|-----------------------|-----------------|-----------------|
| 0.15 - 0.5 | 79 | 66 |
| 0.5 - 30 | 73 | 60 |

Used conversion factor: Limit (dBµV) = 20 log (Limit (µV)/1µV).

NOTE: a missing result table in the corresponding test report section means, that no final measurement was performed because no relevant frequencies (peaks) were found in the preliminary scan.

Spurious radiated emissions

Standard FCC Part 15, 10-1-07, Subpart B

The test was performed according to: ANSI C 63.4, 2003

Test Description

Measurement below 1 GHz:

The test set-up was made in accordance to the general provisions of ANSI C 63.4-2003. The Equipment Under Test (EUT) was set up on a non-conductive table 1.0 x 2.0 m in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna.

The radiated emissions measurements were made in a typical installation configuration. The measurement procedure is implemented into the EMI test software ES-K1 from R&S.

Step 1: Preliminary scan (test to identify the highest amplitudes relative to the limit)

Intention of this step is, to determine the radiated EMI-profile of the EUT.

Settings for step 1:

- Detector: Peak-Maxhold
- Frequency range: 30 – 1000 MHz
- Frequency steps: 60 kHz
- IF-Bandwidth: 120 kHz
- Measuring time / Frequency step: 100 µs
- Turntable angle range: -180° to 180°
- Turntable step size: 90°
- Height variation range: 1 – 3 m
- Height variation step size: 2 m
- Polarisation: Horizontal + Vertical

On basis of this preliminary scan the highest amplitudes and the corresponding frequencies relative to the limit are identified. Emissions above the limit and emissions which are in the 10 dB range below the limit are considered.

Step 2:

A further measurement will be performed on the frequencies determined in step 1. Intention of this step is, to find out the approximate turntable angle and antenna height for each frequency.

Settings for step 2:

- Detector: Peak – Maxhold
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 100 ms
- Turntable angle range: -180° to 180°
- Turntable step size: 45°
- Height variation range: 1 – 4 m
- Height variation step size: 0.5 m
- Polarisation: horizontal + vertical

After this step the EMI test system has determined the following values for each frequency (of step 1):

- Frequency
- Azimuth value (of turntable)
- Antenna height

The last two values have now the following accuracy:

- Azimuth value (of turntable): 45°
- Antenna height: 0.5 m

Step 3: final measurement

In this step the accuracy of the turntable azimuth and antenna height will be improved. This is necessary to

find out the maximum value of every frequency.

For each frequency, which was determined the turntable azimuth and antenna height will be adjusted. The turntable azimuth will be slowly varied by +/- 22.5° around this value. During this action the value of emission is continuously measured. The turntable azimuth at the highest emission will be recorded and adjusted. In this position the antenna height is also slowly varied by +/- 25 cm around the antenna height determined. During this action the value of emission is also continuously measured. The antenna height of the highest emission will also be recorded and adjusted.

- Detector: Peak – Maxhold
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 100ms
- Turntable angle range: -22.5° to + 22.5 ° around the determined value
- Height variation range: -0.25m to + 0.25m around the determined value

Step 4: Final measurement (with QP detector)

With the settings determined in step 3, the final measurement will be performed:

EMI receiver settings for step 4:

- Detector: Quasi-Peak(< 1GHz)
- Measured frequencies: in step 3 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 1 s

Measurement above 1 GHz:

The following modifications apply to the measurement procedure for the frequency range above 1 GHz: The measurement distance was reduced to 1 m. The results were extrapolated by the extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements, inverse-linear-distance-squared for the power density measurements). Due to the fact that in this frequency range a double ridged wave guided horn antenna (up to 18 GHz) and a horn antenna (18–25 GHz) are used, the steps 2-4 as described before, are omitted. Step 1 was performed at one height of the receiving antenna only.

Detector: Peak, Average (simultaneously)

RBW = VBW = 1 MHz; above 7 GHz 100 kHz

Test Requirements / Limits

If not stated within the measurement plot and/or test result, class B limits are applied.

FCC Part 15, Subpart B, §15.109, Radiated Emission Limits

Frequency Range (MHz): Class B Limit (dBµV/m)

| Frequency Range (MHz) | Class B Limit (dBµV/m) |
|-----------------------|------------------------|
| 30 – 88 | 40.0 |
| 88 – 216 | 43.5 |
| 216 – 960 | 46.0 |
| above 960 | 54.0 |

Frequency Range (MHz) Class A Limit (dBµV/m) / @ 3m !

| | |
|-----------|------|
| 30 - 88 | 49.5 |
| 88 - 216 | 54.0 |
| 216 - 960 | 56.9 |
| above 960 | 60.0 |

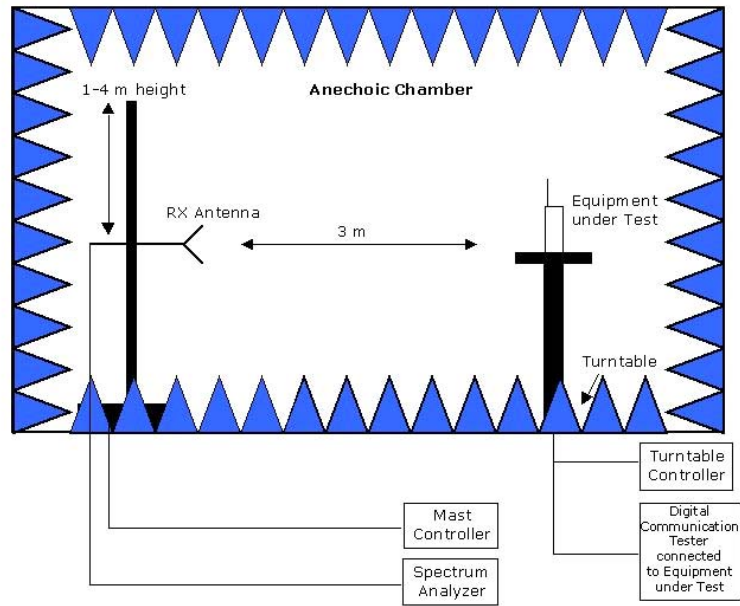
§15.35(b)

..., there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit....

Used conversion factor: Limit (dBµV/m) = 20 log (Limit (µV/m)/1µV/m)

NOTE: a missing result table in the corresponding test report section means, that no final measurement was performed because no relevant frequencies (peaks) were found in the preliminary scan.

Setup Drawings



Remark: Depending on the frequency range suitable antenna types, attenuators or preamplifiers are used.

Setup in the Anechoic chamber. For measurements below 1 GHz the ground was replaced by a conducting ground plane.

Test Equipment

EUT Digital Signalling System

| Equipment | Type | Serial No. | Manufacturer | Cal. data | Next cal. |
|---|--------|------------|-----------------|-----------|-----------|
| Digital Radio Communication Tester | CMD 55 | 831050/020 | Rohde & Schwarz | 07.10.08 | 07.10.11 |
| Signalling Unit for Bluetooth | PTW60 | 100004 | Rohde & Schwarz | - | N/A *) |
| Universal Radio Communication Tester | CMU200 | 102366 | Rohde & Schwarz | 22.09.07 | 22.09.09 |
| Universal Radio Communication Tester | CMU200 | 837983/052 | Rohde & Schwarz | 22.09.07 | 22.09.09 |
| Signalling Unit for Bluetooth | CBT | 100589 | Rohde & Schwarz | 14.08.08 | N/A *) |
| Signalling Unit for GPS | SMU200 | 100912 | Rohde & Schwarz | 28.10.08 | N/A *) |

*) N/A – only used for signalling

EMI Test System

| Equipment | Type | Serial No. | Manufacturer | Cal. data | Next cal. |
|------------------|--------|-------------|-----------------|-----------|-----------|
| EMI Analyzer | ESI 26 | 830482/004 | Rohde & Schwarz | 06.12.07 | 06.12.09 |
| Signal Generator | SMR 20 | 846834/008 | Rohde & Schwarz | 05.12.07 | 05.12.09 |
| AC Power Source | 6404 | 64040000B04 | Croma ATE INC. | 01.06.08 | 01.06.11 |

EMI Radiated Auxiliary Equipment

| Equipment | Type | Serial No. | Manufacturer | Cal. data | Next cal. |
|------------------------------------|--------------------------|----------------------|---------------------------|-----------|--|
| Antenna mast 4m | MA 240 | 240/492 | HD GmbH H. Deisel | - | - |
| Biconical dipole | VUBA 9117 | 9117108 | Schwarzbeck | 27.10.08 | 27.10.13 |
| Broadband Amplifier 18MHz-26GHz | JS4- 18002600-32 | 849785 | Miteq | 12.11.08 | 12.05.09 |
| Broadband Amplifier 30MHz-18GHz | JS4- 00101800-35 | 896037 | Miteq | 12.11.08 | 12.05.09 |
| Broadband Amplifier 45MHz-27GHz | JS4- 00102600-42 | 619368 | Miteq | 12.11.08 | 12.05.09 |
| Cable "ESI to EMI Antenna" | EcoFlex10 | W18.01-2 W38.01-2 | Kabel Kusch | 12.11.08 | 12.05.09 |
| Cable "ESI to Horn Antenna" | UFB311A UFB293C | W18.02-2 W38.02-2 | Rosenberger- Microcoax | 12.11.08 | 12.05.09 |
| Double-ridged horn | HF 906 | 357357/002 | Rohde & Schwarz | 12.05.06 | 12.05.09 |
| Double-ridged horn | HF 906 | 357357/001 | Rohde & Schwarz | 20.01.04 | N/A – spare antenna |
| High Pass Filter | 5HC3500/127 50-1.2-KK | 200035008 | Trilithic | 12.11.08 | 12.05.09 |
| High Pass Filter | 5HC2700/127 50-1.5-KK | 9942012 | Trilithic | 12.11.08 | 12.05.09 |
| High Pass Filter | 4HC1600/127 50-1.5-KK | 9942011 | Trilithic | 12.11.08 | 12.05.09 |
| High Pass Filter | WHKX 7.0/18G-8SS | 9 | Wainwright | 12.11.08 | 12.11.08 |
| KUEP pre amplifier | Kuep 00304000 | 001 | 7 layers AG | - | N/A – spare antenna |
| Log.-per. Antenna | HL 562 Ultralog | 830547/003 | Rohde & Schwarz | 17.05.06 | 17.05.09 |
| Loop Antenna | HFH2-Z2 | 829324/006 | Rohde & Schwarz | 19.08.02 | N/A – only used for pre- testing |
| Pyramidal Horn Antenna 26.5 GHz | Model 3160- 09 | 9910-1184 | EMCO | 28.02.08 | N/A (Stand. Gain Horn) |
| Pyramidal Horn Antenna 40 GHz | Model 3160- 10 | 00086675 | EMCO | 18.12.07 | N/A (Stand. Gain Horn) |

EMI Conducted Auxiliary Equipment

| Equipment | Type | Serial No. | Manufacturer | Cal. data | Next cal. |
|---------------------|-------------|-------------------|---------------------|------------------|------------------|
| Cable "LISN to ESI" | RG214 | W18.03+W48.03 | Huber+Suhner | 12.11.08 | 12.05.09 |
| Two-Line V-Network | ESH 3-Z5 | 828304/029 | Rohde & Schwarz | 13.10.08 | 13.10.11 |
| Two-Line V-Network | ESH 3-Z5 | 829996/002 | Rohde & Schwarz | - | - |
| Four-Line Network | ENY41 | 838119/004 | Rohde & Schwarz | 06.03.08 | 05.03.11 |

Auxiliary Test Equipment

| Equipment | Type | Serial No. | Manufacturer | Cal. data | Next cal. |
|--|-------------------------|-------------------|---|------------------|------------------|
| Broadband Resist. Power Divider N | 1506A / 93459 | LM390 | Weinschel | - | - |
| Broadband Resist. Power Divider SMA | 1515 / 93459 | LN673 | Weinschel | - | - |
| Digital Multimeter | 177 | 86670383 | Fluke | 01.08.08 | 31.07.10 |
| Digital Oscilloscope | TDS 784C | B021311 | Tektronix | - | - |
| Fibre optic link Satellite | FO RS232 Link | 181-018 | Pontis | - | - |
| Fibre optic link Transceiver | FO RS232 Link | 182-018 | Pontis | - | - |
| I/Q Modulation Generator | AMIQ-B1 | 832085/018 | Rohde & Schwarz | - | - |
| Notch Filter ultra stable | WRCA800/960 -6E | 24 | Wainwright | - | - |
| Temperature Chamber | VT 4002 | 58566002150010 | Vötsch | 29.02.08 | 28.02.09 |
| Temperature Chamber | KWP 120/70 | 59226012190010 | Weiss | 29.02.08 | 28.02.09 |
| ThermoHygro Datalogger 03 | Opus10 THI (8152.00) | 7482 | Lufft Mess- und Regeltechnik GmbH | 22.01.09 | 21.01.10 |
| Spectrum Analyzer 9 kHz to 3 GHz | FSP3 | 838164/004 | Rohde & Schwarz | 06.10.08 | 06.10.11 |
| Spectrum Analyzer 9 kHz to 3 GHz | FSP3 | 836722/011 | Rohde & Schwarz | 06.10.08 | 05.10.11 |
| Signal Analyzer 20 Hz to 26.5 GHz | FSIQ26 | 840061/005 | Rohde & Schwarz | 02.10.08 | 02.10.11 |

Anechoic Chamber

| Equipment | Type | Serial No. | Manufacturer | Cal. data | Next cal. |
|--------------------------------------|-------------------------|-------------------|---|------------------|------------------|
| Air Compressor (pneumatic) | | | Atlas Copco | - | - |
| Controller | MCU | 1520506 | Maturo GmbH | - | - |
| EMC Camera | CE-CAM/1 | | CE-SYS | - | - |
| EMC Camera for observation of EUT | CCD-400E | 0005033 | Mitsubishi | - | - |
| Filter ISDN | B84312-C110- E1 | | Siemens & Matsushita | - | - |
| Filter telephone systems / modem | B84312-C40- B1 | | Siemens & Matsushita | - | - |
| Filter Universal 1A | B84312-C30- H3 | | Siemens & Matsushita | - | - |
| Fully/Semi AE Chamber | 10.58x6.38x6 | | Frankonia | - | - |
| Turntable | DS 420S | 420/573/99 | HD GmbH, H.Deisel | - | - |
| Valve Control Unit (pneum.) | VE 615P | 615/348/99 | HD GmbH, H.Deisel | - | - |
| ThermoHygro Datalogger 12 | Opus10 THI (8152.00) | 12482 | Lufft Mess- und Regeltechnik GmbH | 05.08.08 | 04.08.09 |
| ThermoAirpressure Datalogger 13 | Opus10 TPR (8253.00) | 13936 | Lufft Mess- und Regeltechnik GmbH | 22.01.09 | 21.01.10 |

7 layers InterLab Bluetooth RF Test Solution - Setup C – Bluetooth BDR and EDR RF Conformance Test System

| Equipment | Type | Serial No. | Manufacturer | Cal. data | Next cal. |
|---------------------------|----------------------|-------------------|-----------------------------------|------------------|------------------|
| Power Meter | NRVD | 832025/059 | Rohde & Schwarz | 17.06.08 | 15.06.09 |
| Power Sensor A | NRV-Z1 | 832279/013 | Rohde & Schwarz | 18.06.08 | 17.06.09 |
| Power Supply | E3632A | MY40003776 | Agilent | - | - |
| Power Supply | PS-2403D | - | Conrad | - | - |
| Power Supply | NGSM 32/10 | 2725 | Rohde & Schwarz | 28.04.08 | 27.04.09 |
| Rubidium Frequency Normal | MFS | 002 | Datum GmbH | 18.06.08 | 17.06.09 |
| Signal Analyzer FSIQ26 | FSIQ26 | 832695/007 | Rohde & Schwarz | 23.08.07 | 23.08.09 |
| Signal Generator | SMP 03 | 833680/003 | Rohde & Schwarz | 04.07.06 | 04.07.09 |
| Signal Generator | SMIQ03B | 832870/017 | Rohde & Schwarz | 24.05.07 | 24.05.10 |
| Signal Switching Unit | TOCT | 030106 | 7 layers Inc. | - | - |
| Signalling Unit | CBT | 100302 | Rohde & Schwarz | 07.05.08 | 06.05.09 |
| ThermoHygro Datalogger 04 | Opus10 THI (8152.00) | 7481 | Lufft Mess- und Regeltechnik GmbH | 22.01.09 | 21.01.10 |
| Temperature Chamber | KWP 120/70 | 59226012190010 | Weiss | 29.02.08 | 28.02.09 |

5 Index

| | | |
|-------|---|----|
| 1 | Administrative Data | 2 |
| 1.1 | Project Data | 2 |
| 1.2 | Applicant Data | 2 |
| 1.3 | Test Laboratory Data | 2 |
| 1.4 | Signature of the Testing Responsible | 2 |
| 1.5 | Signature of the Accreditation Responsible | 3 |
| 2 | Test Object Data | 3 |
| 2.1 | General OUT Description | 3 |
| 2.2 | Detailed Description of OUT Samples | 3 |
| 2.3 | OUT Features | 4 |
| 2.4 | Auxiliary Equipment | 4 |
| 2.5 | Operating Mode(s) | 4 |
| 2.6 | Setups used for Testing | 5 |
| 3 | Results | 5 |
| 3.1 | General | 5 |
| 3.2 | List of the Applicable Body | 5 |
| 3.3 | List of Test Specification | 5 |
| 3.4 | Summary | 6 |
| 3.5 | Detailed Results | 7 |
| 3.5.1 | 15b.1 Conducted Emissions (AC Power Line) §15.107 | 7 |
| 3.5.2 | 15b.2 Spurious Radiated Emissions §15.109 | 9 |
| 4 | Annex | 12 |
| 4.1 | Additional Information for OUT Description | 12 |
| 4.2 | Additional Information for Report | 14 |
| 5 | Index | 23 |