InterLab®

MID card
GSM / UMTS Module

Report Reference: ODE_MUS_INTERDIG_0801_FCCc
Test Specification FCC15b

Date: August 03, 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.

1 Administrative Data

1.1 Project Data

Project Responsible:	Holger Leutfeld
Date Of Test Report:	2009/08/03
Date of first test:	2009/07/21
Date of last test:	2009/07/23

1.2 Applicant Data

Company Name: InterDigital Communications, LLC

Street:	2 Huntington Quadrangle 4th Floor, South Wing
City:	Melville, NY 11747-4508
Country:	USA

Contact Person: Mr. Joseph Bruzzese

Phone:	+1 514-904-6300
Fax:	+1 514-904-6344

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

Lab ID	*Identification*	*Responsible*	*Accreditation Info*
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 MACHULEC

2 Test Object Data

2.1 General OUT Description

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

OUT: MID card
GSM / UMTS Module

Product Category:	Module
Manufacturer:	
Company Name:	see applicant
Parameter List:	
Parameter name	*Value*
Antenna gain 1900 band	not specified (dBi)
Antenna gain 850 band	not specified (dBi)
DC Power Supply	12 (V)
highest channel	251 (848.8MHz) for GSM850, 810 (1909.8MHz) for GSM1900, 4233 (846.6MHz) for FDD5, 9538 (1907.6MHz) for FDD2, 1513 (1752.6MHz) for FDD4
lowest channel	128 (824.2MHz) for GSM850, 512 (1850.2MHz) for GSM1900, 4132 (826.4MHz) for FDD5, 9262 (1852.4MHz)for FDD2, 1312 (1712.4MHz) for FDD4
mid channel	190 (836.6MHz) for GSM850, 661 (1880.0MHz) for GSM1900, 4183 (836.6MHz) for FDD5, 9400 (1880MHz) for FDD2, 1412 (1732.4MHz)/1450 (1740.0MHz) for FDD4

2.2 Detailed Description of OUT Samples

Sample : H14

OUT Identifier	MID card GSM / UMTS Module		
Sample Description			
HW Status	MID Spin 1		
SW Status	4.3.5.0.NB.V04_CR10808		
Low Voltage	3.2 V	*Low Temp.*	-10 °C
High Voltage	4.2 V	*High Temp.*	+55 °C
Nominal Voltage	3.3 V	*Normal Temp.*	+23 °C

2.3 OUT Features

Features for OUT: MID card
GSM / UMTS Module

Designation	*Description*	*Allowed Values*	*Supported Value(s)*
Features for scope: FCC_v2			
DC	The OUT is powered by or connected to DC Mains		
EDGE850	EUT supports EDGE in the band 824 MHz - 849 MHz		
EDGE1900	EUT supports EDGE in the band 1850 MHz - 1910 MHz		
FDD2	EUT supports UMTS FDD2 in the band 1850 MHz - 1910 MHz		
FDD5	EUT supports UMTS FDD5 in the band 824 MHz - 849 MHz		
GSM850	EUT supports GSM850 band 824MHz - 849MHz		
HSUPA-FDD2	EUT supports UMTS FDD2 HSUPA in the band 1850 MHz - 1910 MHz		
HSUPA-FDD5	EUT supports UMTS FDD5 HSUPA in the band 824 MHz - 849 MHz		
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

AE No.	*Type Designation*	*Serial No.*	*HW Status*	*SW Status*	*Description*
AE 01					Antenna
AE 03					external Antenna
AE 02					Test cradle
AE 06	ADP-80NB				AC Adapter
AE 08	Cherry RS 6000				Keyboard
AE 07	Epson Stylus Color				Printer
AE 05	Fujitsu Siemens Lifebook C1410				Laptop
AE 04	LG Flatron L1740BQ				TFT display

2.5 Operating Mode(s)

Ref.-No.	*Description*
01	The device is transmitting on traffic channel 661, GSM1900

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.

Setup No.	*List of OUT samples*		*List of auxiliary equipment*	
	Sample No.	*Sample Description*	*AE No.*	*AE Description*
H14 FCC 15b	**(set-up for FCC 15b test with peripheral equipment)**			
	Sample: H14		AE 01	Antenna
			AE 03	external Antenna
			AE 02	Test cradle
			AE 06	AC Adapter
			AE 08	Keyboard
			AE 07	Printer
			AE 05	Laptop
			AE 04	TFT display

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)

Designation	*Description*
FCC47CFRChIPART15bRADIO FREQUENCY DEVICES	Part 15, Subpart B - Unintentional Radiators

3.3 List of Test Specification

Test Specification:	**FCC part 2 and 15**
Date / Version	2009/03/26 Version: 10-1-08 Edition
Title:	PART 2 - GENERAL RULES AND REGULATIONS PART 15 - RADIO FREQUENCY DEVICES

3.4 Summary

Test Case Identifier / Name *Test (condition)*	*Result*	*Date of Test*	*Lab Ref.*	*Setup*
15b.1 Conducted Emissions (AC Power Line) §15.107				
15b.1; Mode = transmit	Passed operating mode: 01	2009/07/21	Lab 1	H14 FCC 15b
15b.2 Spurious Radiated Emissions §15.109				
15b.2; Mode = transmit	Passed operating mode: 01	2009/07/23	Lab 2	H14 FCC 15b

3.5 Detailed Results

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

Test: 15b.1; Mode = transmit

Result:	Passed
Setup No.:	H14 FCC 15b
Date of Test:	2009/07/21 17:20
Body:	FCC47CFRChIPART15bRADIO FREQUENCY DEVICES
Test Specification:	FCC part 2 and 15

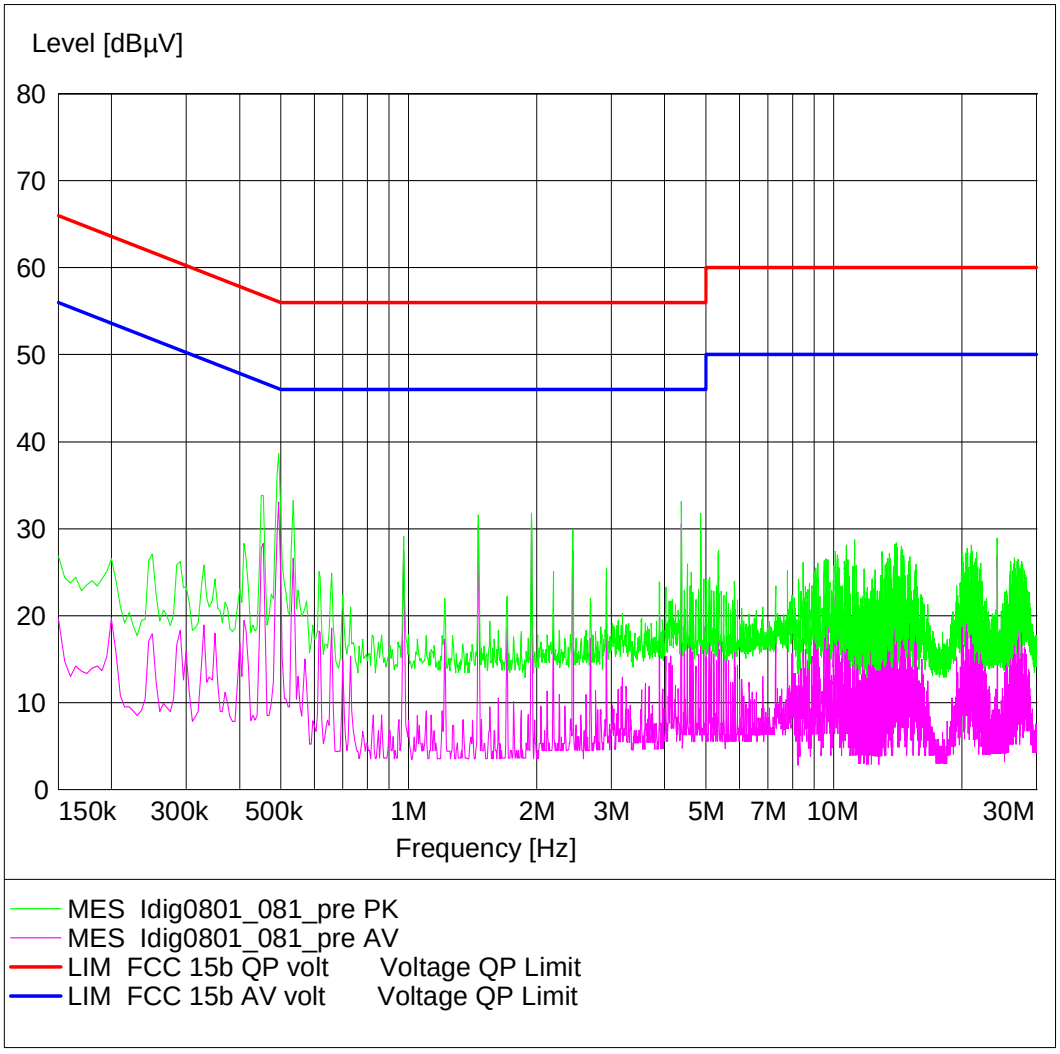
Detailed Results:

AC MAINS CONDUCTED

```
EUT:                  I6071MID (H3040h14) / 21.07.2009
Manufacturer:         Inter Digital
Operating Condition:  GSM 1900 TCH 661, voltage = 3,3V
Test Site:            7 layers Ratingen
Operator:             Groe
Test Specification:   ANSI C63.4; FCC 15.107 / 15.207
Comment:
Start of Test:        21.07.2009 / 14:38:49
```

SCAN TABLE: "FCC Voltage"

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



3.5.2 15b.2 Spurious Radiated Emissions §15.109

Test: 15b.2; Mode = transmit

Result:	Passed
Setup No.:	H14 FCC 15b
Date of Test:	2009/07/23 6:39
Body:	FCC47CFRChIPART15bRADIO FREQUENCY DEVICES
Test Specification:	FCC part 2 and 15

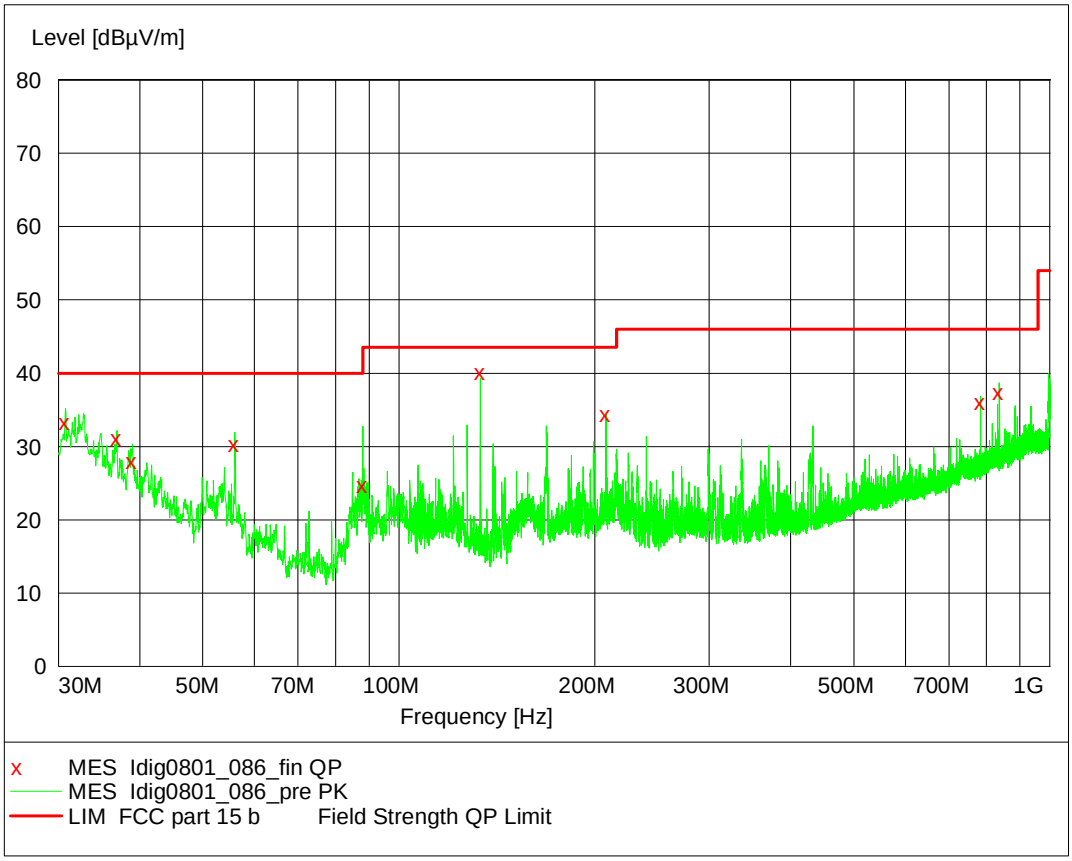
Detailed Results:

EMI RADIATED TEST

```
EUT:               I6071MID (H3040h14)
Manufacturer:       Inter Digital
Operating Condition: GSM 1900 TCH 661
Test Site:          7 layers, Ratingen
Operator:           Groe
Test Specification:  FCC part 15 b
Comment:           Horizontal EUT position
Start of Test:      23.07.2009 / 12:34:02
```

SCAN TABLE: "FCC part 15 b"

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



MEASUREMENT RESULT: "Idig0801_086_fin QP"

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
30.720000	33.40	20.1	40.0	6.6	100.0	136.00	VERTICAL
36.900000	31.10	16.5	40.0	8.9	100.0	81.00	VERTICAL
39.000000	28.00	15.3	40.0	12.0	100.0	67.00	VERTICAL
55.980000	30.30	4.9	40.0	9.7	175.0	50.00	VERTICAL
87.960000	24.70	9.7	40.0	15.3	127.0	259.00	VERTICAL
133.440000	40.20	9.7	43.5	3.3	215.0	0.00	HORIZONTAL
208.020000	34.40	9.1	43.5	9.1	202.0	189.00	HORIZONTAL
783.000000	36.00	23.7	46.0	10.0	100.0	0.00	VERTICAL
837.000000	37.50	24.7	46.0	8.5	100.0	0.00	VERTICAL

4 Test Equipment Details

4.1 List of Used Test Equipment

The calibration, hardware and software states are shown for the testing period.

Test Equipment Anechoic Chamber

Lab ID:	**Lab 2**
Manufacturer:	Frankonia
Description:	Anechoic Chamber for radiated testing
Type:	10.58x6.38x6

Calibration Details	*Last Execution*	*Next Exec.*
FCC renewal	2006/12/19	2009/12/19
IC renewal	2009/01/21	2011/01/20
FCC renewal	2009/01/07	2011/01/06

Single Devices for Anechoic Chamber

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
Air compressor	none	-	Atlas Copco
Anechoic Chamber	10.58 x 6.38 x 6	none	Frankonia
	Calibration Details		*Last Execution* *Next Exec.*
	FCC listing 96716 3m Part15/18		2009/01/07 2011/01/06
	ANSI C64.3 NSA		2009/01/21 2011/01/20
Controller Innco 2000	CO 2000	CO2000/328/1247 0406/L	Innco innovative constructions GmbH
EMC camera	CE-CAM/1	-	CE-SYS
EMC camera Nr.2	CCD-400E	0005033	Mitsubishi
Filter ISDN	B84312-C110-E1		Siemens&Matsushita
Filter Universal 1A	BB4312-C30-H3	-	Siemens&Matsushita

Test Equipment Auxiliary Equipment for Conducted emissions

Lab ID:	**Lab 1**
Manufacturer:	Rohde & Schwarz GmbH & Co.KG
Description:	EMI Conducted Auxiliary Equipment

Single Devices for Auxiliary Equipment for Conducted emissions

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
Cable "LISN to ESI"	RG214	W18.03+W48.03	Huber&Suhner
Coupling-Decoupling-Network	CDN ENY41	100002	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution* *Next Exec.*
	Standard Calibration		2008/03/06 2011/03/05
Two-Line V-Network	ESH 3-Z5	828304/029	Rohde & Schwarz GmbH & Co. KG
Two-Line V-Network	ESH 3-Z5	829996/002	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution* *Next Exec.*
	DKD calibration		2008/10/13 2011/10/12

Test Equipment Auxiliary Equipment for Radiated emissions

Lab ID: **Lab 2**
Description: Equipment for emission measurements
Serial Number: see single devices

Single Devices for Auxiliary Equipment for Radiated emissions

Single Device Name	*Type*	*Serial Number*	*Manufacturer*	
Antenna mast	AS 620 P		HD GmbH	
Biconical dipole	VUBA 9117	9117108	Schwarzbeck	
	Calibration Details		*Last Execution*	*Next Exec.*
	Standard Calibration		2008/10/27	2013/10/26
Broadband Amplifier 18MHz-26GHz	JS4-18002600-32-5P	849785	Miteq	
	Calibration Details		*Last Execution*	*Next Exec.*
	Path Calibration		2009/05/18	2009/11/17
Broadband Amplifier 1GHz-4GHz	AFS4-01000400-1Q-10P-4	-	Miteq	
	Calibration Details		*Last Execution*	*Next Exec.*
	Path Calibration		2009/05/18	2009/11/17
Broadband Amplifier 30MHz-18GHz	JS4-00101800-35-5P	896037	Miteq	
	Calibration Details		*Last Execution*	*Next Exec.*
	Path Calibration		2009/05/18	2009/11/17
Cable "ESI to EMI Antenna"	EcoFlex10	W18.01-2+W38.01-2	Kabel Kusch	
	Calibration Details		*Last Execution*	*Next Exec.*
	Path Calibration		2009/05/18	2009/11/17
Cable "ESI to Horn Antenna"	UFB311A+UFB293C	W18.02-2+W38.02-2	Rosenberger Micro-Coax	
	Calibration Details		*Last Execution*	*Next Exec.*
	Path Calibration		2009/05/18	2009/11/17
Double-ridged horn	HF 906	357357/001	Rohde & Schwarz GmbH & Co. KG	
	Calibration Details		*Last Execution*	*Next Exec.*
	Standard Calibration		2009/04/16	2012/04/15
Double-ridged horn	HF 906	357357/002	Rohde & Schwarz GmbH & Co. KG	
	Calibration Details		*Last Execution*	*Next Exec.*
	Standard Calibration		2009/04/28	2012/04/27
Dreheinheit	DE 325		HD GmbH	
High Pass Filter	4HC1600/12750-1.5-KK	9942011	Trilithic	
	Calibration Details		*Last Execution*	*Next Exec.*
	Path Calibration		2009/05/18	2009/11/17
High Pass Filter	5HC2700/12750-1.5-KK	9942012	Trilithic	
	Calibration Details		*Last Execution*	*Next Exec.*
	Path Calibration		2009/05/18	2009/11/17
High Pass Filter	5HC3500/12750-1.2-KK	200035008	Trilithic	
	Calibration Details		*Last Execution*	*Next Exec.*
	Path Calibration		2009/05/18	2009/11/17
Log.-per. Antenna	HL 562 Ultralog	830547/003	Rohde & Schwarz GmbH & Co. KG	
	Calibration Details		*Last Execution*	*Next Exec.*

Single Devices for Auxiliary Equipment for Radiated emissions (continued)

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
	Standard Calibration		2009/05/27 2012/05/26
Loop Antenna	HFH2-Z2	829324/006	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution Next Exec.*
	DKD calibration		2008/10/07 2011/10/06
Pyramidal Horn Antenna 26,5 GHz	3160-09	00083069	EMCO Elektronik GmbH
Pyramidal Horn Antenna 40 GHz	3160-10	00086675	EMCO Elektronik GmbH

Test Equipment Digital Signalling Devices

Lab ID: **Lab 1, Lab 2**
Description: Signalling equipment for various wireless technologies.

Single Devices for Digital Signalling Devices

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
Bluetooth Signalling Unit CBT	1153.9000.35	100302	Rohde & Schwarz GmbH & Co.KG
	Calibration Details		*Last Execution Next Exec.*
	Standard Calibration		2009/04/28 2011/04/27
Digital Radio Communication Tester	CMD 55	831050/020	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution Next Exec.*
	standard calibration		2008/10/07 2010/10/06
Digital Radio Test Set	6103E	2359	Racal Instruments, Ltd.
Universal Radio Communication Tester	CMU 200	837983/052	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution Next Exec.*
	Standard calibration		2008/12/01 2011/11/30
	HW/SW Status		*Date of Start Date of End*
	HW options: B11, B21V14, B21-2, B41, B52V14, B52-2, B53-2, B54V14, B56V14, B68 3v04, B95, PCMCIA, U65V02 SW options: K21 4v11, K22 4v11, K23 4v11, K24 4v11, K27 4v10, K28 4v10, K42 4v11, K43 4v11, K53 4v10, K65 4v10, K66 4v10, K68 4v10, Firmware: µP1 8v40 01.12.05 ---		2007/01/02
	SW: K62, K69		2008/11/03
Vector Signal Generator	SMU200A	100912	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution Next Exec.*
	standard calibration		2008/10/28 2011/10/27

Test Equipment Emission measurement devices

Lab ID:	**Lab 1, Lab 2**
Description:	Equipment for emission measurements
Serial Number:	see single devices

Single Devices for Emission measurement devices

Single Device Name	*Type*	*Serial Number*	*Manufacturer*
Personal Computer	Dell		Dell
Signal Generator	SMR 20	846834/008	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution* *Next Exec.*
	Standard Calibration		2007/12/05 2010/12/04
Spectrum Analyzer	ESIB 26	830482/004	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution* *Next Exec.*
	Standard Calibration		2007/12/06 2009/12/05

Test Equipment Shielded Room 02

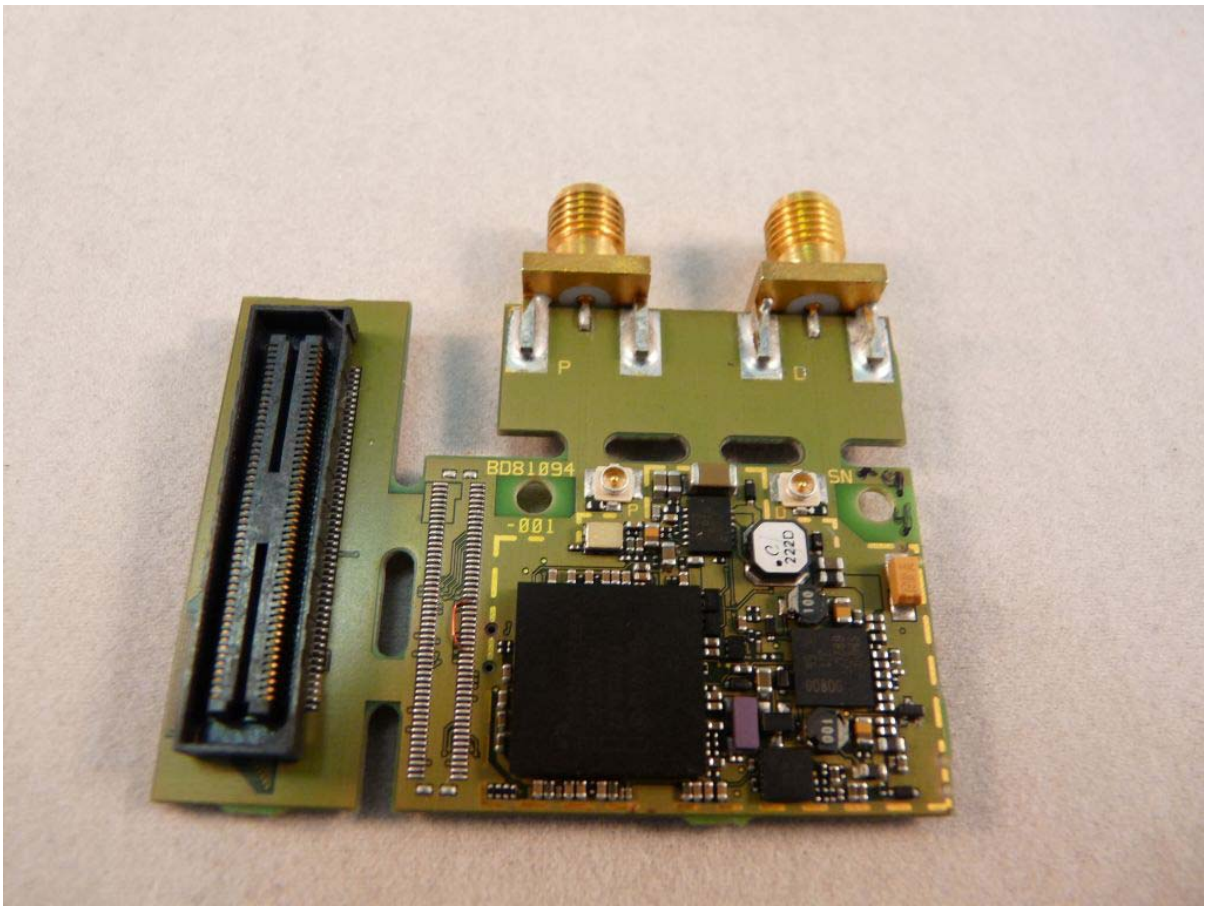
Lab ID:	**Lab 1**
Manufacturer:	Frankonia
Description:	Shielded Room for conducted testing
Type:	12 qm
Serial Number:	none

4.2 Laboratory Environmental Conditions

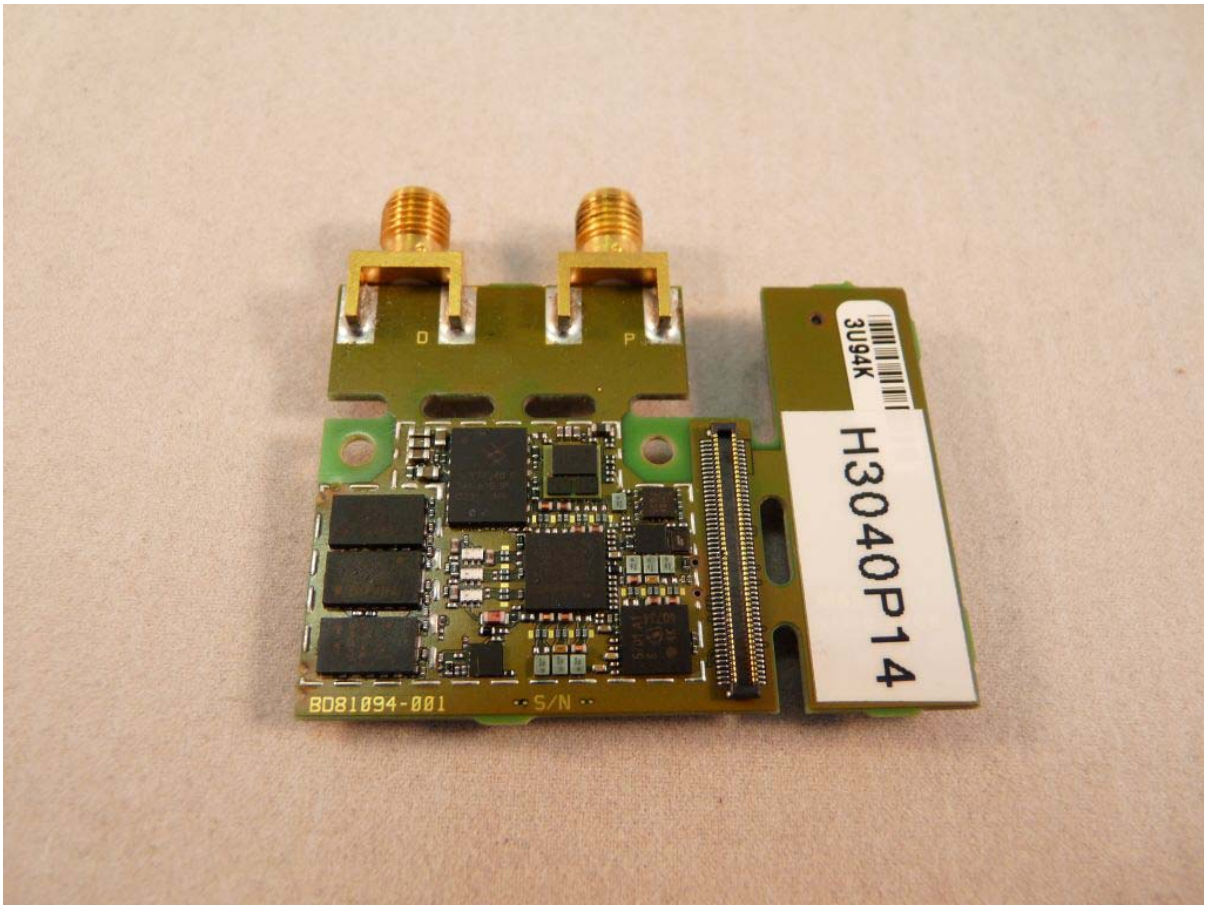
Laboratory	*Date*	*Temperature*	*Humidity*	*Air Pressure*
Lab 1	2009/07/21	29 °C	38 %	1003 hPa
Lab 2	2009/07/23	28 °C	50 %	1000 hPa

5 Annex

5.1 Additional Information for Sample Description

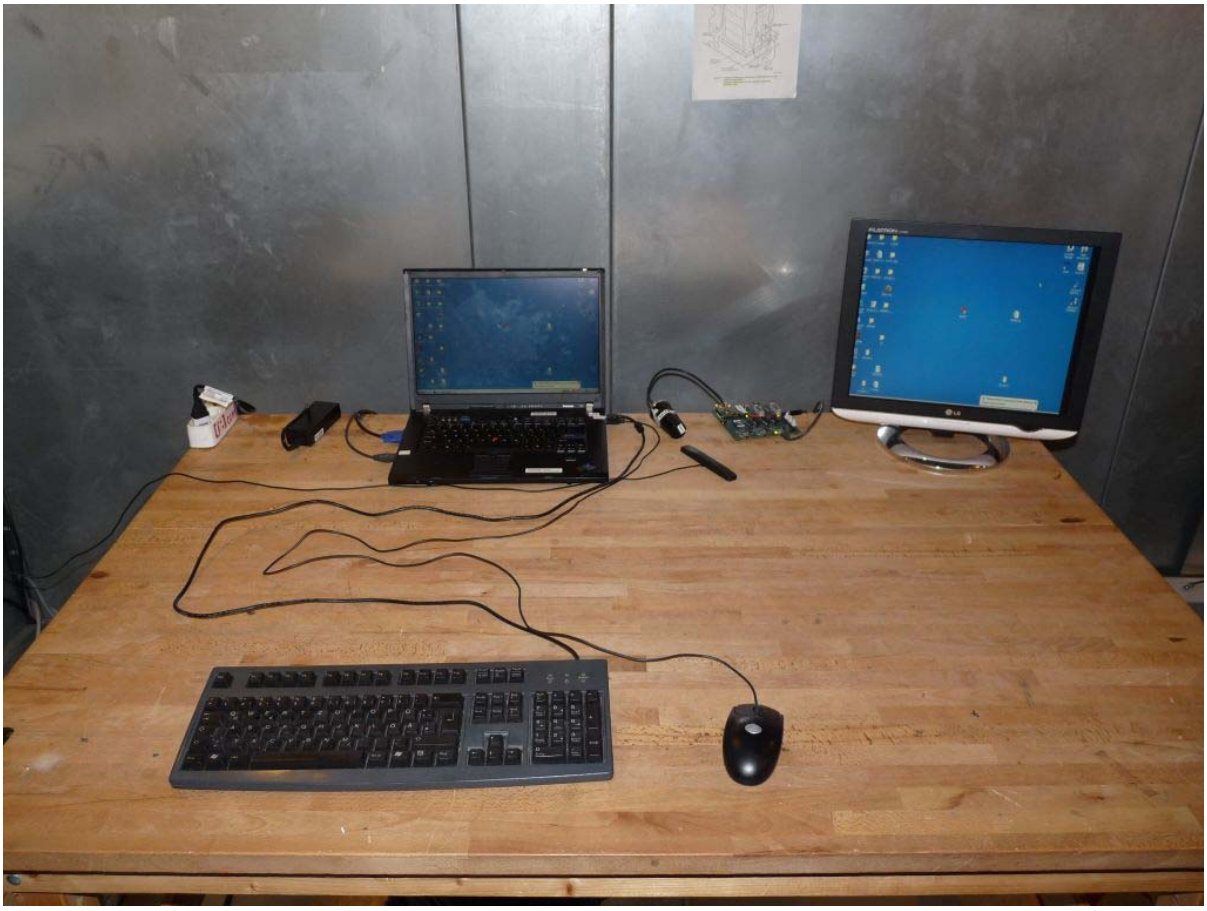


module bottom side

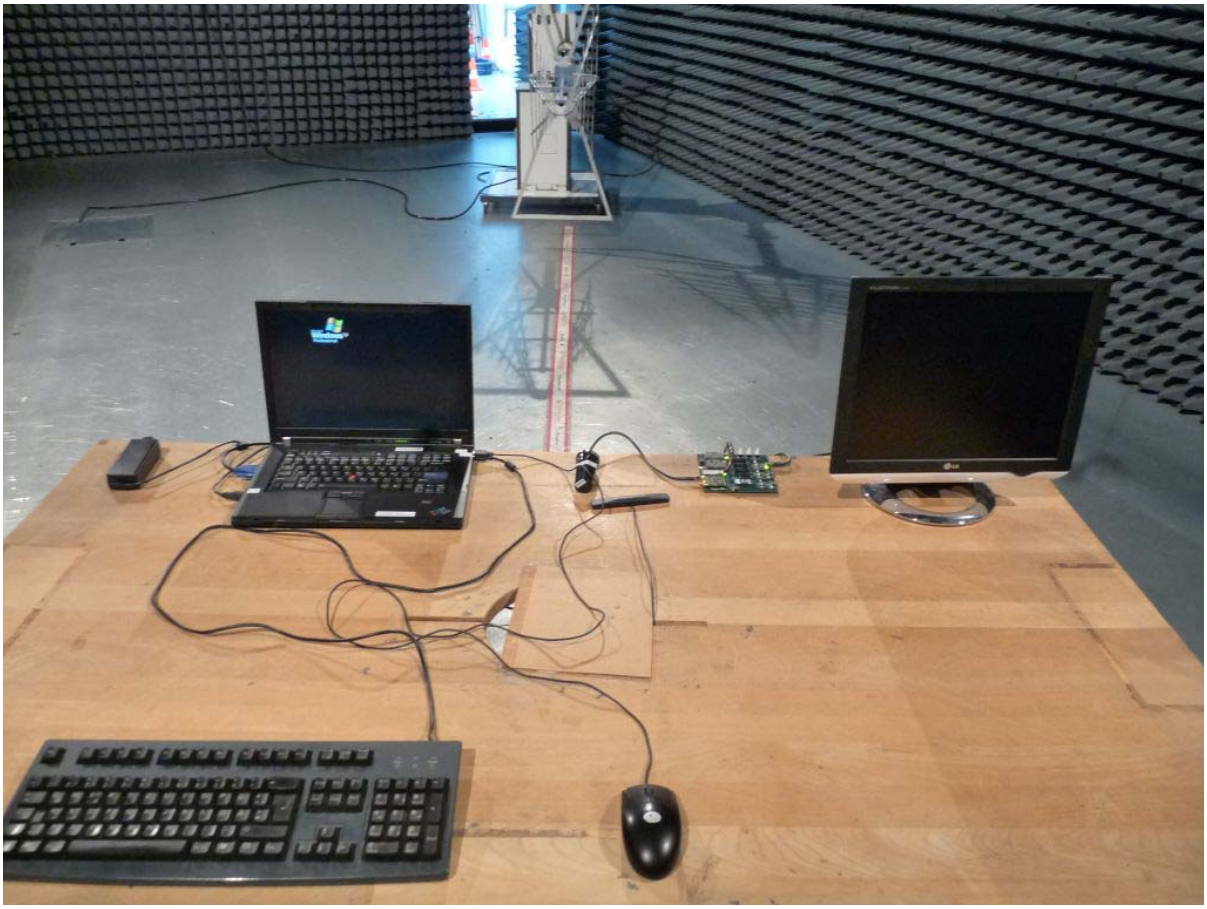


module top side

5.2 Additional Information for Test Plan



setup for the test Conducted Emissions



5.3 Additional Information for Report

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Setup Drawings

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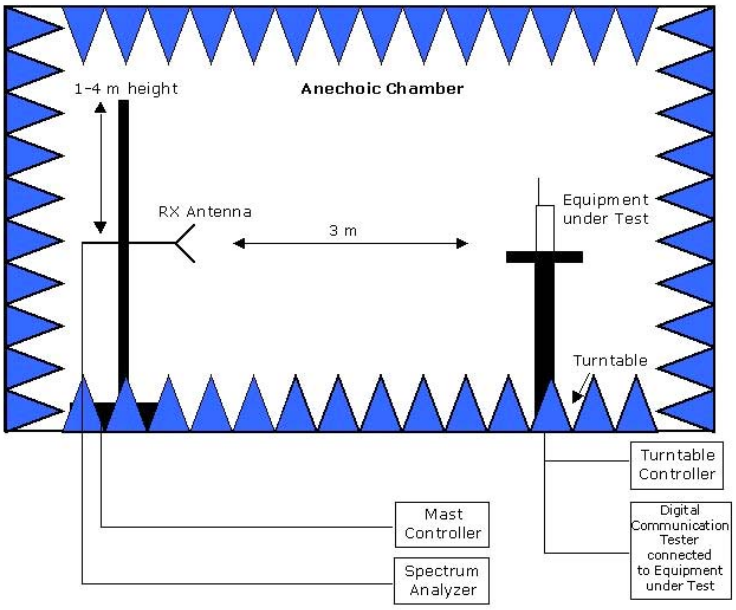

Remark: Depending on the frequency range suitable antenna types, attenuators or preamplifiers are used.

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

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6 Index