InterLab®

Final Report on

Motorola VC6000
HW: Rev A
SW: v2.05 (SV01) + Windows mobile 6.1

Report Reference: MDE_MOT_0805_FCCaa_FCC15B

Date: September 29, 2008

Test Laboratory:

Deutscher Akkreditierungs Rat DAR

DAT-P-192/99-01

7 layers AG
Borsigstr. 11
40880 Ratingen
Germany

1 Administrative Data

1.1 Project Data

Project Responsible:	Oliver Wagener
Date Of Test Report:	2008/09/29
Date of first test:	2008/07/16
Date of last test:	2008/08/20

1.2 Applicant Data

Company Name:	Motorola Ltd.
Street:	Redwood, Crockford Lane Chineham Business Park
City:	Basingstoke RG24 8WQ
Country:	United Kingdom
Contact Person:	Mr. Roger Hawker
Function:	Regulatory Compliance
Department:	Motorola - Enterprise Mobility
Phone:	+44 1256 790586
Mobile:	+44 7879 667800
E-Mail:	Roger.Hawker@motorola.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

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

on behalf of Andreas Petz

7 layers

Andreas Petz

responsible for tests performed in: Lab 1, Lab 2

7 layers AG Borsigstr. 11
40880 Ratingen, Germany
Phone +49 (0)2102 749 0

1.5 Signature of the Accreditation Responsible

Accreditation scope responsible person
responsible for Lab 1, Lab 2

7 layers AG, Borsigstr. 11
40880 Ratingen, Germany
Phone +49 (0)2102 749 0

2 Test Object Data

2.1 General OUT Description

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

OUT: VC6096

Type / Model / Family:	Motorola VC6000 HW: Rev A SW: v2.05 (SV01) + Windows mobile 6.1
Product Category:	Mobile Computer
Manufacturer:	
Company Name:	please see applicant data
Contact Person:	please see applicant data

Ancillary Equipment: ACCCAB01

Type / Model / Family:	50 pin Accessory Cable
Product Category:	Computer Accessory

Ancillary Equipment: ACLIN01

Type / Model / Family:	US AC line cord (for Desktop Power Supply)
Product Category:	Computer Accessory

Ancillary Equipment: CANBUS01

Type / Model / Family:	Can Bus Board
Product Category:	Computer Accessory

Ancillary Equipment: CLAPS01

Type / Model / Family:	Cigarette Lighter Adapter (CLA) Vehicle power supply
Product Category:	Computer Accessory

Ancillary Equipment: COCAB01

Type / Model / Family:	Combination Cable
Product Category:	Computer Accessory

Ancillary Equipment: DESPS01

Type / Model / Family:	Desktop Power Supply
Product Category:	Computer Accessory

Ancillary Equipment: TMCAB01

Type / Model / Family:	Vehicle Bus Telemetry Cable
Product Category:	Computer Accessory

2.2 Detailed Description of OUT Samples

Sample : d01

OUT Identifier	VC6096		
Sample Description			
Serial No.	8149500000012		
HW Status	Rev A		
SW Status	v2.05 + Win mobile 6.0		
Date of Receipt	2008/07/11		
Low Voltage	10 V	*Low Temp.*	-20 °C
High Voltage	33 V	*High Temp.*	+60 °C
Nominal Voltage	14.5 V	*Normal Temp.*	+25 °C

Sample : ACCCAB01

OUT Identifier	ACCCAB01
Sample Description	50 pin Accessory Cable
Serial No.	3089906V60

Sample : ACLIN01

OUT Identifier	ACLIN01
Sample Description	US AC line cord (for Desktop Pw)
Serial No.	50-16000-221R
Date of Receipt	2008/07/11

Sample : CANBUS01

OUT Identifier	CANBUS01
Sample Description	Can Bus Board
Date of Receipt	2008/07/11

Sample : CLAPS01

OUT Identifier	CLAPS01
Sample Description	Cigarette Lighter Adapter (CLA)
Serial No.	3071815Y17
Date of Receipt	2008/07/11

Sample : COCAB01

OUT Identifier	COCAB01
Sample Description	Combination Cable
Serial No.	3071815Y15
Date of Receipt	2008/07/11

Sample : DESPS01

OUT Identifier	DESPS01
Sample Description	Desktop Power Supply
Serial No.	0102246H51
Date of Receipt	2008/07/11

Sample : TMCAB01

OUT Identifier	TMCAB01
Sample Description	Vehicle Bus Telemetry Cable
Serial No.	3089906V63
Date of Receipt	2008/07/11

2.3 OUT Features

Features for OUT: VC6096

Designation	*Description*	*Allowed Values*	*Supported Value(s)*
Features for scope: FCC_v2			
AC	The OUT is powered by or connected to AC Mains		
BT	EUT supports Bluetooth data rate of 1 Mbps with GFSK modulation in the band 2400 MHz - 2483.5 MHz		
DC	The OUT is powered by or connected to DC Mains		
Eant	removable antenna supplied and type tested with the radio equipment, designed as an indispensable part of the equipment		
EDGE850	EUT supports EDGE in the band 824 MHz - 849 MHz		
EDGE1900	EUT supports EDGE in the band 1850 MHz - 1910 MHz		
EDR2	EUT supports Bluetooth using data rate of 2 Mbps with PI/4 DQPSK modulation in the band 2400 MHz - 2483.5 MHz		
EDR3	EUT supports Bluetooth using data rate of 3 Mbps with 8DPSK modulation in the band 2400 MHz - 2483.5 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		
HSDPA-FDD2	EUT supports UMTS FDD2 HSDPA in the band 1850 MHz - 1910 MHz		
HSDPA-FDD5	EUT supports UMTS FDD5 HSDPA 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		
Wa1	EUT supports WLAN in mode a in the band 5150 MHz - 5250 MHz		
Wa2	EUT supports WLAN in mode a in the band 5250 MHz - 5350 MHz		
Wa3	EUT supports WLAN in mode a in the band 5470 MHz - 5725 MHz		
Wa4	EUT supports WLAN in mode a in the band 5725 MHz - 5825 MHz		
Wb	EUT supports WLAN in mode b in the band 2400 MHz - 2483.5 MHz		
Wg	EUT supports WLAN in mode g in the band 2400 MHz - 2483.5 MHz		

2.4 Auxiliary Equipment

AE No.	*Type Designation*	*Serial No.*	*HW Status*	*SW Status*	*Description*
AE 4ISNLan	Rhode & Schwarz ENY41	100002	-	-	4-Wire ISN for LAN
AE KEYB_01	RS 6000 USB ON	G 0000273 2P28	-	-	Keyboard Cherry
AE USB_ST1	SanDisk cruzer micro 1 GB				USB Memory Stick
AE USB_ST2	SanDisk cruzer micro 4 GB				USB Memory Stick
AE USB_Ca1	standard cable				USB Cable

2.5 Operating Mode(s)

Ref.-No.	*Description*
19iBTi	GSM 1900 idle + BT idle + GPS receiver active
85B8052	GSM850 + BT BDR TX on 2480MHz + WLAN on 5200MHz

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*
fcc15b_cond_ac	**(computer peripheral setup for FCC 15B cond. with AC supply)**			
	Sample: ACLIN01	US AC line cord (for Desktop Pw)	AE USB_ST1	USB Memory Stick
	Sample: DESPS01	Desktop Power Supply	AE USB_ST2	USB Memory Stick
	Sample: d01			
fcc15b_rad_ac	**(computer peripheral setup for FCC 15B rad. with AC supply)**			
	Sample: ACLIN01	US AC line cord (for Desktop Pw)	AE 4ISNLan	4-Wire ISN for LAN
	Sample: DESPS01	Desktop Power Supply	AE KEYB_01	Keyboard Cherry
	Sample: d01		AE USB_ST1	USB Memory Stick
			AE USB_Ca1	USB Cable
fcc15b_rad_dc	**(computer peripheral setup for FCC 15B rad. with DC supply)**			
	Sample: ACCCAB01	50 pin Accessory Cable	AE USB_ST1	USB Memory Stick
	Sample: CANBUS01	Can Bus Board	AE USB_ST2	USB Memory Stick
	Sample: CLAPS01	Cigarette Lighter Adapter (CLA)		
	Sample: COCAB01	Combination Cable		
	Sample: TMCAB01	Vehicle Bus Telemetry Cable		
	Sample: d01			

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.
Note:	The test were performed with the VC6096. the VC 6000 is a variant of the VC6096. The only difference is that the WWAN, the WLAN radion and the GPS is removed.

3.2 List of the Applicable Body

(Body for Scope: FCC_v2)

Designation	*Description*
FCC47CFRChIPART15bRADIO FREQUENCY DEVICES	Subpart B - Unintentional Radiators

3.3 List of Test Specification

Test Specification:	**FCC part 2 and 15**
Date / Version	2007/10/01 Version: 10-1-07 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; Operating mode = transmit	Passed operating mode: 85B8052	2008/08/16	Lab 1	fcc15b_cond_ac
15b.2 Spurious Radiated Emissions §15.109				
15b.2; Operating mode = transmit	Passed operating mode: 19iBTi	2008/07/16	Lab 2	fcc15b_rad_ac
15b.2; Mode = transmit	Passed operating mode: 19iBTi	2008/08/20	Lab 2	fcc15b_rad_dc

3.5 Detailed Results

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

Test: 15b.1; Operating mode = transmit

Result:	Passed
Setup No.:	fcc15b_cond_ac
Date of Test:	2008/08/16 10:12
Body:	FCC47CFRChIPART15bRADIO FREQUENCY DEVICES
Test Specification:	FCC part 2 and 15

Test Equipment Environmental Conditions

Temperature:	27°C
Air Pressure:	1014hPa
Rel. Humidity:	34%

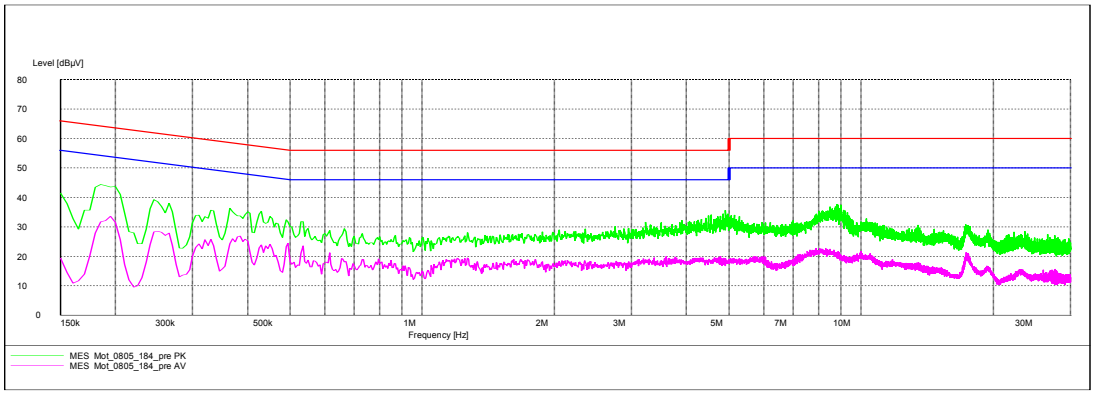
Detailed Results:

AC MAINS CONDUCTED

```
EUT:                VC6096 (AB740d01)
Manufacturer:       Motorola
Operating Condition: Setup office_01; GSM850, BT BDR TX on 2480MHz; WLAN at 5200MHz
Test Site:          7 layers Ratingen
Operator:           Doe
Test Specification: ANSI C63.4; FCC 15.107 / 15.207
Comment:
Start of Test:      16.08.2008 / 10:33:24
```

SCAN TABLE: "FCC Voltage"

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



3.5.2 15b.2 Spurious Radiated Emissions §15.109

Test: 15b.2; Operating mode = transmit

Result:	Passed
Setup No.:	fcc15b_rad_ac
Date of Test:	2008/07/16 12:18
Body:	FCC47CFRChIPART15bRADIO FREQUENCY DEVICES
Test Specification:	FCC part 2 and 15

Test Equipment Environmental Conditions

Temperature:	27°C
Air Pressure:	1014hPa
Rel. Humidity:	34%

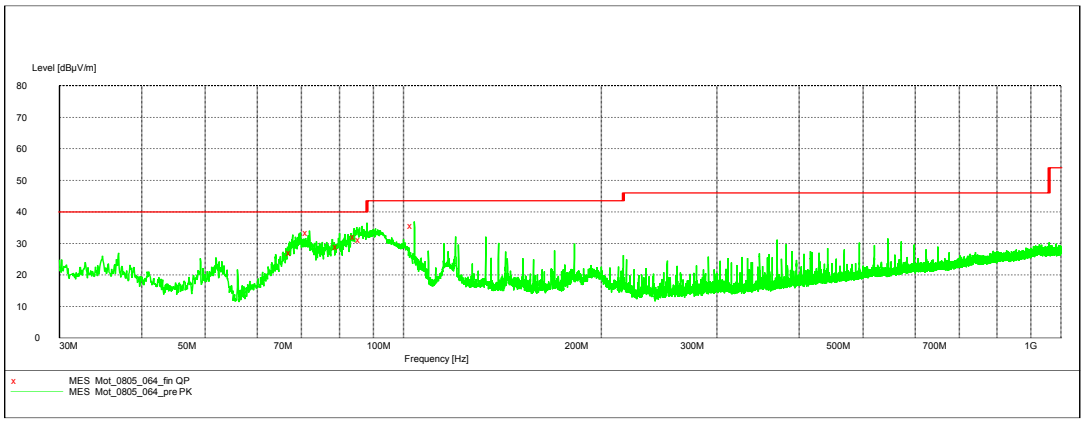
Detailed Results:

EMI RADIATED TEST

```
EUT:                VC6096 (AB740d01) / 2008-07-16
Manufacturer:       Motorola
Operating Condition: GSM 1900 idle + BT idle ,120V 60Hz, with keyboard
Test Site:          7 layers, Ratingen
Operator:           Doe
Test Specification: FCC part 15 b
Comment:            Horizontal EUT position
Start of Test:      16.07.2008 / 15:39:14
```

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
```



Test: 15b.2; Mode = transmit

Result:	Passed
Setup No.:	fcc15b_rad_dc
Date of Test:	2008/08/20 18:40
Body:	FCC47CFRChIPART15bRADIO FREQUENCY DEVICES
Test Specification:	FCC part 2 and 15

Test Equipment Environmental Conditions

Temperature:	27°C
Air Pressure:	1014hPa
Rel. Humidity:	34%

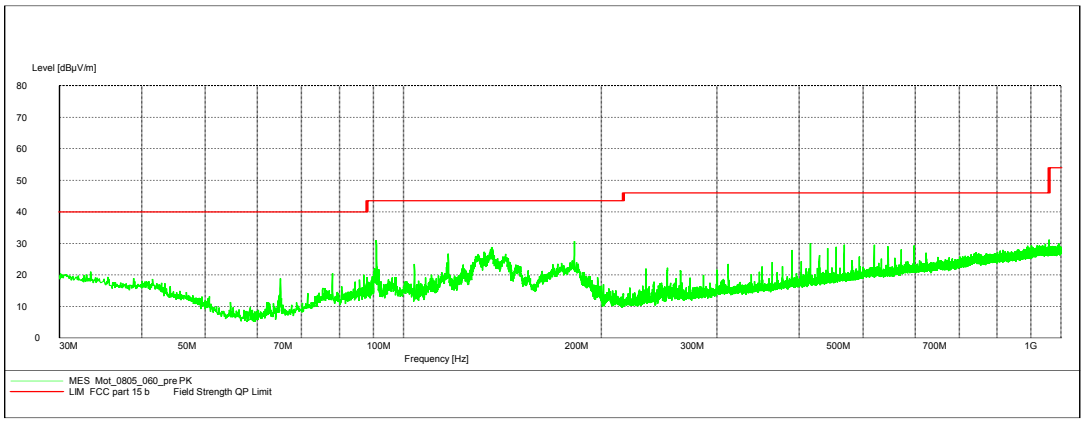
Detailed Results:

EMI RADIATED TEST

```
EUT:               VC6096 (AB740d01) / 2008-07-16
Manufacturer:       Motorola
Operating Condition: GSM 1900 idle + BT idle + GPS active
Test Site:          7 layers, Ratingen
Operator:          Sli
Test Specification:  FCC part 15 b
Comment:           Horizontal EUT position
Start of Test:      16.07.2008 / 11:43:49
```

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
```



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*
FCC renewal	2006/12/19
IC renewal	2007/01/03

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
Controller	CO 2000	CO2000/328/12470 406/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 telephone systems / modem	BB4312-C40-B1	-	Siemens&Matsushita
Filter Universal 1A	BB4312-C30-H3	-	Siemens&Matsushita
Turntable	DS 420S	420/573/99	HD GmbH
Valuve Control Unit	VE 615P	615/348/99	HD GmbH

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
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*
standard calibration	2005/11/29

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
Antenna mast 4m	MA 240	240/492	HD GmbH
Biconical dipole	VUBA 9117	9117108	Schwarzbeck
Broadband Amplifier 18MHz-26GHz	JS4-18002600-32-5P	849785	Miteq
	Calibration Details		*Last Execution*
	Path Calibration		2008/02/06
Broadband Amplifier 1GHz-4GHz	AFS4-01000400-1Q-10P-4	-	Miteq
	Calibration Details		*Last Execution*
	Path Calibration		2008/02/06
Broadband Amplifier 30MHz-18GHz	JS4-00101800-35-5P	896037	Miteq
	Calibration Details		*Last Execution*
	Path Calibration		2008/02/06
Cable "ESI to EMI Antenna"	EcoFlex10	W18.01-2+W38.01-2	Kabel Kusch
	Calibration Details		*Last Execution*
	Path Calibration		2008/02/06
Cable "ESI to Horn Antenna"	UFB311A+UFB293C	W18.02-2+W38.02-2	Rosenberger Micro-Coax
	Calibration Details		*Last Execution*
	Path Calibration		2008/02/06
Double-ridged horn	HF 906	357357/001	Rohde & Schwarz GmbH & Co. KG
Double-ridged horn	HF 906	357357/002	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution*
	Standard Calibration		2006/05/12
Dreheinheit	DE 325		HD GmbH
High Pass Filter	4HC1600/12750-1.5-KK	9942011	Trilithic
	Calibration Details		*Last Execution*
	Path Calibration		2008/02/06
High Pass Filter	5HC2700/12750-1.5-KK	9942012	Trilithic
	Calibration Details		*Last Execution*
	Path Calibration		2008/02/06
High Pass Filter	5HC3500/12750-1.2-KK	200035008	Trilithic
	Calibration Details		*Last Execution*
	Path Calibration		2008/02/06
Log.-per. Antenna	HL 562 Ultralog	830547/003	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution*
	Standard Calibration		2006/05/17
Loop Antenna	HFH2-Z2	829324/006	Rohde & Schwarz GmbH & Co. KG

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*
	Standard Calibration		2008/05/07
Digital Radio Communication Tester	CMD 55	831050/020	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution*
	Standard calibration		2005/12/01
Signalling Unit for Bluetooth Spurious Emissions	PTW60	100004	Rohde & Schwarz GmbH & Co. KG
Universal Radio Communication Tester	CMU 200	102366	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution*
	Standard calibration		2007/09/22
	HW/SW Status		*Date of Start* / *Date of End*
	Hardware: B11, B21V14, B21-2, B41, B52V14, B52-2, B53-2, B56V14, B68 3v04, PCMCIA, U65V04 Software: K21 4v21, K22 4v21, K23 4v21, K24 4v21, K42 4v21, K43 4v21, K53 4v21, K56 4v22, K57 4v22, K58 4v22, K59 4v22, K61 4v22, K62 4v22, K63 4v22, K64 4v22, K65 4v22, K66 4v22, K67 4v22, K68 4v22, K69 4v22 Firmware: µP1 8v50 02.05.06 ---		2007/07/16
Universal Radio Communication Tester	CMU 200	837983/052	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution*
	Standard calibration		2007/05/29
	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

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*
Comparison Noise Emitter	CNE III	99/016	York EMC Services Ltd
EMI Analyzer	ESIB 26	830482/004	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution*
	Standard Calibration		2007/12/06
Personal Computer	Dell		Dell
Signal Generator	SMR 20	846834/008	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		*Last Execution*
	Standard Calibration		2007/12/05

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	2008/08/16	27 °C	34 %	1014 hPa
Lab 2	2008/07/16	27 °C	34 %	1014 hPa
	2008/08/20	27 °C	34 %	1014 hPa

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