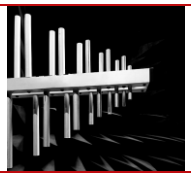
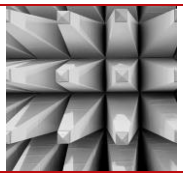




CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test report no.: 1-3314-01-06/11

DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-01

Testing laboratory

CETECOM ICT Services GmbH
Untertuerkheimer Strasse 6 – 10
66117 Saarbruecken / Germany
Phone: + 49 681 5 98 - 0
Fax: + 49 681 5 98 - 9075
Internet: http://www.cetecom.com
e-mail: ict@cetecom.com

Accredited test laboratory:
The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025
DAR registration number: D-PL-12076-01-01

Area of Testing: Radio/Satellite Communications

Applicant

Research In Motion Limited
305 Phillip Street
Waterloo, ON N2L 3W8 / Canada
Phone: +1-519-888-7465
Fax: +1-519-888-6906
Contact: Masud Attayi
e-mail: mattayi@rim.com
Phone: +1-519-888-7465

Manufacturer

Research In Motion Limited
305 Phillip Street
Waterloo, ON N2L 3W8 / Canada

Test standard/s

47 CFR Part 15	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices
RSS - 210 Issue 8	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

For further applied test standards please refer to section 3 of this test report.

Test item

Kind of test item:	**Mobile phone with GSM / GPRS / Edge, WCDMA / HSDPA, Bluetooth® 2.1 EDR, WLAN b / g / n – HT20, NFC, GPS**
Model name:	**RDD71UW**
Frequency:	**ISM – band 2400 MHz to 2483.5 MHz (BT - lowest channel 2402 MHz; highest channel 2480 MHz / WLAN- lowest channel 2412 MHz; highest channel 2462 MHz) GSM band 824.2 – 848.8 MHz (836.4 MHz – middle channel 189) GSM band 1850.2 – 1909.8 MHz (1880 MHz – middle channel 661) UMTS / WCDMA band 1712.4 – 1752.6 MHz (1732.4 MHz – middle 1412)**
Power supply:	**3.7 V DC by battery EM1 + charger PSM04R-050CHW2**
FCC ID:	**L6ARDD70UW**
IC:	**2503A-RDD70UW**
Temperature range:	**-/-**

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test performed:
cn=Marco Bertolino, o=CETECOM ICT Services GmbH, ou=BTL-100826, email=marco.bertolino@cetecom.com, c=DE
2011.05.24 06:13:34 +02'00'
Marco Bertolino

Test report authorised:
cn=Stefan Boes, o=Cetecom ICT Services GmbH, ou=BOE-100817, email=Stefan.Boes@cetecom.com, c=DE
2011.05.24 08:21:17 +02'00'
Stefan Bös

1 Table of contents

2 General information

2.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM ICT Services GmbH.
This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

2.2 Application details

Date of receipt of order:	2011-04-15
Date of receipt of test item:	2011-04-21
Start of test:	2011-04-25
End of test:	2011-04-25
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Version	Test standard description
47 CFR Part 15	2009-10	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices
RSS - 210 Issue 8	2010-12	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

4 Test environment

Temperature:	T_{nom}	+24 °C	during room temperature tests
	T_{max}	-/- °C	during high temperature test
	T_{min}	-/- °C	during low temperature test
Relative humidity content:		40 %	
Air pressure:		not relevant for this kind of testing	
Power supply:	V_{nom}	3.7 V	DC by battery EM1 + charger PSM04R-050CHW2
	V_{max}	-/- V	
	V_{min}	-/- V	

5 Test item

Kind of test item	:	Mobile phone with GSM / GPRS / Edge, WCDMA / HSDPA, Bluetooth® 2.1 EDR, WLAN b / g / n – HT20, NFC, GPS
Type identification	:	RDD71UW
S/N serial number	:	Sample 23 CER-39234-001 IMEI: 004402240593164 PIN: 27269C44
HW hardware status	:	Rev1
SW software status	:	8.0.0.167
Frequency band [MHz]	:	Bluetooth® ISM – band 2400 MHz to 2483.5 MHz (lowest channel 2402 MHz; highest channel 2480 MHz) WLAN ISM – band 2400 MHz to 2483.5 MHz (lowest channel 2412 MHz; highest channel 2462 MHz) GSM band 824.2 – 848.8 MHz (836.4 MHz – middle channel 189) PCS band 1850.2 – 1909.8 MHz (1880 MHz – middle channel 661) UMTS / WCDMA band 1712.4 – 1752.6 MHz (1732.4 MHz – middle 1412)
Type of modulation	:	FHSS technology with GFSK, Pi/4 DQPSK and 8 DPSK modulation. DSSS & OFDM technology with BPSK, QPSK, 16 – & 64 – QAM modulation. GSM / PCS technology with GMSK modulation. UMTS / WCDMA technology with QPSK modulation.
Number of channels	:	Bluetooth® 79 WLAN 11
Antenna	:	Integrated PCB antenna
Power supply	:	3.7 V DC by battery EM1 + charger PSM04R-050CHW2
Temperature range	:	No information available!

6 Test laboratories sub-contracted

None

7 Summary of measurement results

☒ **No deviations from the technical specifications were ascertained**

☐ There were deviations from the technical specifications ascertained

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15 RSS 210, Issue 8, Annex 8	Passed	2011-05-23	Delta tests according to customer test plan!

Test specification clause	Test case	Temperature conditions	Power source voltages	Mode	Pass	Fail	NA	NP	Results (max.)
§15.247(d) RSS-210	TX spurious emissions radiated	Nominal	Nominal	Mode 1 Mode 2 Mode 3	☒ ☒ ☒	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	complies
§15.209(a) RSS-Gen	TX spurious emissions radiated < 30 MHz	Nominal	Nominal	Mode 1 Mode 2 Mode 3	☒ ☒ ☒	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	complies

Note: NA = Not Applicable; NP = Not Performed

Note:

Mode 1: GSM 850 + BT GFSK + WiFi DSSS / b – mode

Mode 2: PCS 1900 + BT Pi/4 DQPSK + WiFi OFDM / g – mode

Mode 3: UMTS FDD 4 + BT 8 DPSK + WiFi OFDM / n – mode

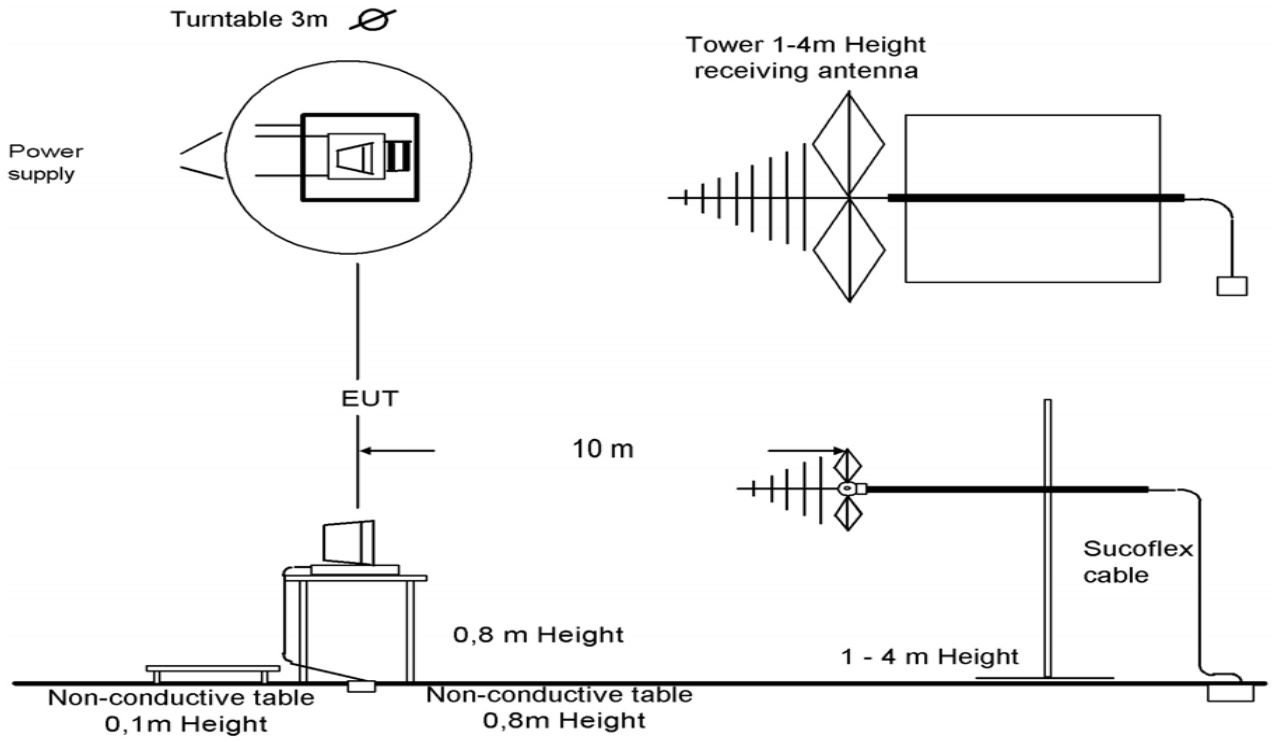
8 RF measurement testing

8.1 Description of test setup

8.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2009 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-2009 clause 4.2.
Antennas are confirmed with ANSI C63.2-1996 item 15.

Semi anechoic chamber



Picture 1: Diagram radiated measurements

9 kHz - 30 MHz:	active loop antenna
30 MHz – 1 GHz:	tri-log antenna
> 1 GHz:	horn antenna

All measurements are done in accordance with the Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems DA 00-705 and Appendix A “BLUETOOTH® APPROVALS”
The EUT is powered by an external power supply with nominal voltage. The signalling is performed from outside the chamber with a signalling unit (CMU200 or other) by air link using signalling antenna.

8.2 Additional comments

The Bluetooth® word mark and logos are owned by the Bluetooth SIG Inc. and any use of such marks by Cetecom ICT Services GmbH is under license.

Reference documents: None

Special test descriptions: Customer test plan

Mode 1: GSM 850 + BT GFSK + WiFi DSSS / b – mode

Mode 2: PCS 1900 + BT Pi/4 DQPSK + WiFi OFDM / g – mode

Mode 3: UMTS FDD 4 + BT 8 DPSK + WiFi OFDM / n – mode

WLAN settings:

1 Mbps and power level 18000 (DSSS / b - mode)

6 Mbps and power level 18000 (OFDM / g - mode)

MCS0 and power level 18000 (OFDM / n - mode)

Configuration descriptions: TX tests: were performed with x-DH5 packets and static PRBS pattern payload.
RX/Standby tests: BT test mode enabled, scan enabled, TX Idle

Test mode:

☒ Bluetooth Test mode loop back enabled
(EUT is controlled over CBT/CMU)

☒ Special software is used.
EUT is transmitting pseudo random data by itself

9 Measurement results

9.1 TX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in transmit mode.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	Sweep: 100 kHz Remeasurement: 10 Hz
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Span:	30 MHz to 26 GHz
Trace-Mode:	Max Hold
Measured Modulation:	☒ GFSK ☒ Pi/4 DQPSK ☒ 8DPSK ☒ DSSS ☒ OFDM / g – mode ☒ OFDM / n – mode ☒ GMSK

The modulation with the highest output power was used to perform the transmitter spurious emissions. If spurious were detected a re-measurement was performed on the detected frequency with each modulation.

Limits:

FCC	IC	
CFR Part 15.247(d)	RSS 210, Issue 8	
TX spurious emissions radiated		
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).		
§15.209		
Frequency (MHz)	Field strength (dBµV/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Results:

Mode 1: GSM 850 (middle channel) + BT GFSK (lowest channel) + WiFi DSSS / b – mode (highest channel)

TX spurious emissions radiated [dBµV/m]		
Mode 1		
F [MHz]	Detector	Level [dBµV/m]
Emissions are not rated! Please take a look at the plots!		
Measurement uncertainty		± 3 dB

Result: **The result of the measurement is passed.**

Results:

Mode 2: PCS 1900 (middle channel) + BT Pi/4 DQPSK (lowest channel) + WiFi OFDM / g – mode (highest channel)

TX spurious emissions radiated [dBµV/m]		
Mode 2		
F [MHz]	Detector	Level [dBµV/m]
Emissions are not rated! Please take a look at the plots!		
Measurement uncertainty		± 3 dB

Result: **The result of the measurement is passed.**

Results:

Mode 3: UMTS FDD 4 (middle channel) + BT 8 DPSK (lowest channel) + WiFi OFDM / n – mode (highest channel)

TX spurious emissions radiated [dBµV/m]		
Mode 3		
F [MHz]	Detector	Level [dBµV/m]
Emissions are not rated! Please take a look at the plots!		
Measurement uncertainty		± 3 dB

Result: **The result of the measurement is passed.**

Plots:

Mode 1: GSM 850 (middle channel) + BT GFSK (lowest channel) + WiFi DSSS / b – mode (highest channel)

Plot 1: 30 MHz to 1 GHz, vertical & horizontal polarization

CETECOM ICT Services GmbH

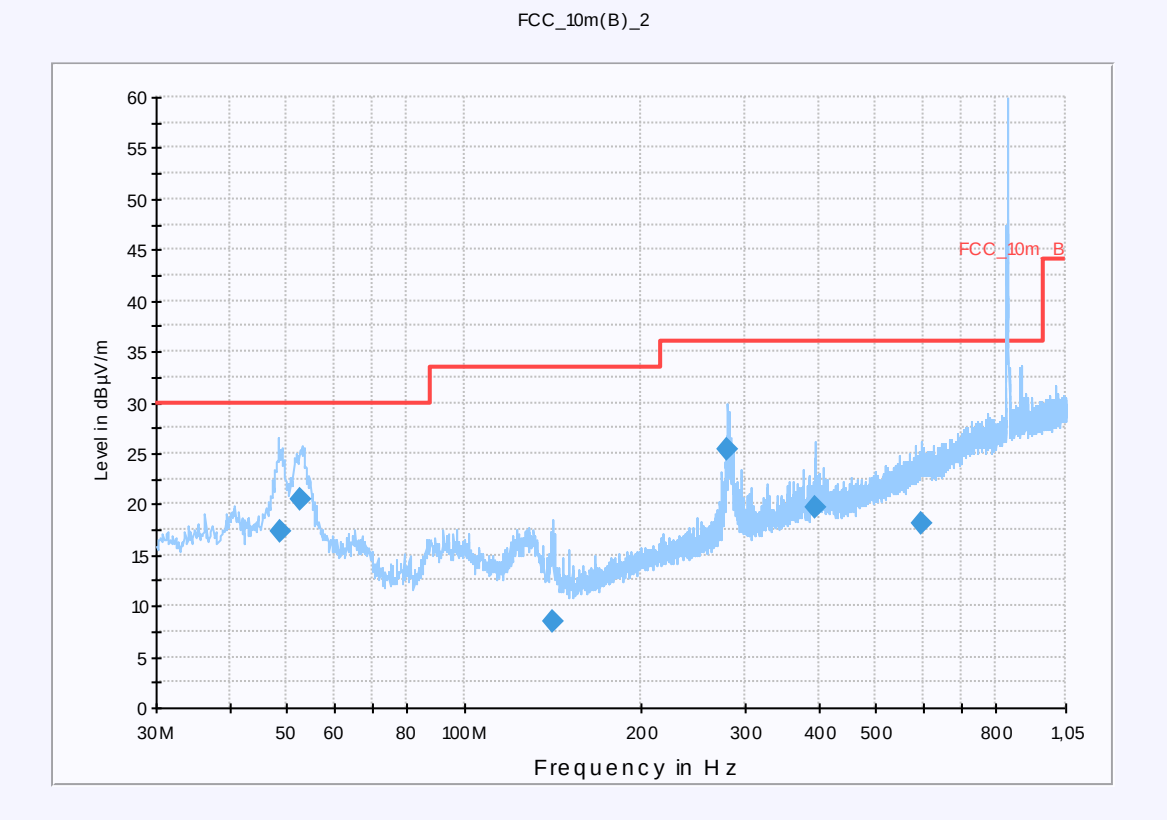
Common Information

EUT:	RDD71UW 148 + Captive cable charger Rev4.0
Serial Number:	CER-39234-001 Rev1 11-Apr-11(sample 23) + DW-17957-003
Test Description:	FCC Part 15 C
Operating Conditions:	GSM 850 MHz CH 189), BT DH5 CH 0, WLAN b mode CH 11 1Mbps
Operator Name:	LANGER
Comment:	AC 115 V / 60 Hz, Peaks around 850 MHz from carrier

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 2 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

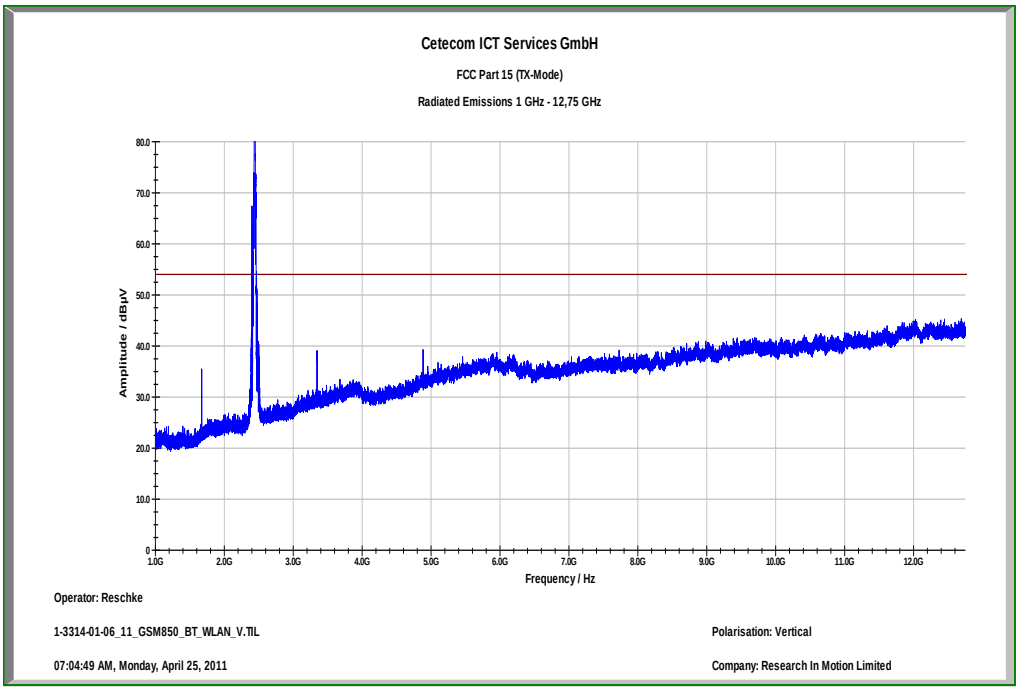
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
48.816300	17.3	15000.000	120.000	160.0	V	22.0	13.3	12.7	30.0	
52.874700	20.4	15000.000	120.000	100.0	V	321.0	13.1	9.6	30.0	
141.565800	8.5	15000.000	120.000	100.0	V	273.0	8.7	25.0	33.5	
280.520850	25.3	15000.000	120.000	351.0	H	38.0	14.1	10.7	36.0	
394.975500	19.6	15000.000	120.000	260.0	H	221.0	16.8	16.4	36.0	
597.075450	18.2	15000.000	120.000	109.0	H	308.0	20.7	17.8	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

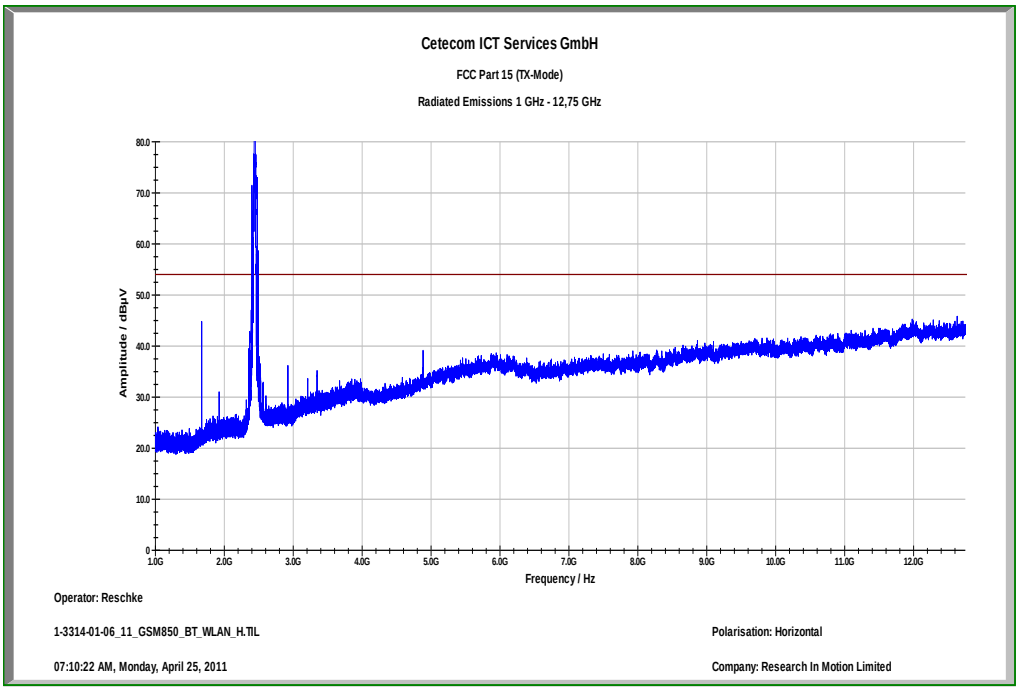
	Subrange 1
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.10.00

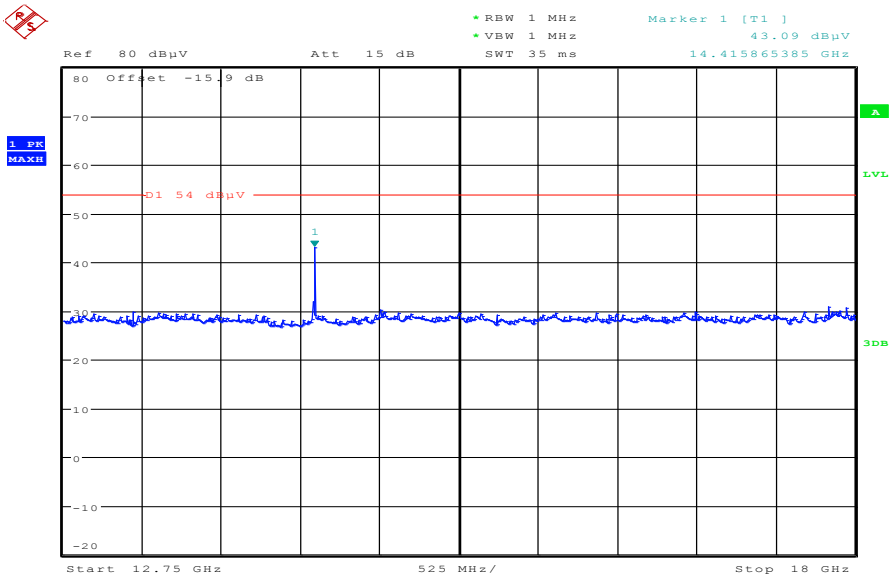
Plot 2: 1 GHz to 12.75 GHz, vertical polarization



Plot 3: 1 GHz to 12.75 GHz, horizontal polarization

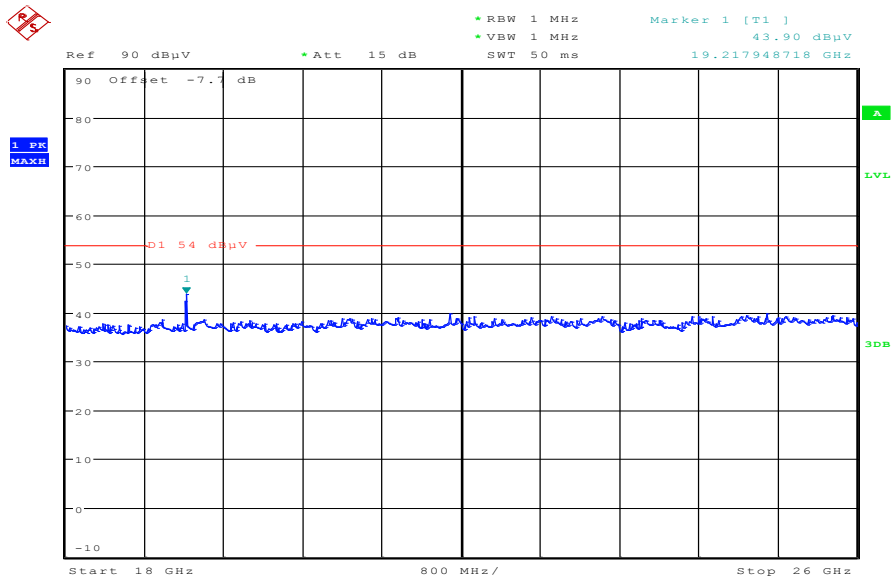


Plot 4: 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.APR.2011 12:29:25

Plot 5: 18 GHz to 26 GHz, vertical & horizontal polarization



Plots:

Mode 2: PCS 1900 (middle channel) + BT Pi/4 DQPSK (lowest channel) + WiFi OFDM / g – mode (highest channel)

Plot 1: 30 MHz to 1 GHz, vertical & horizontal polarization

CETECOM ICT Services GmbH

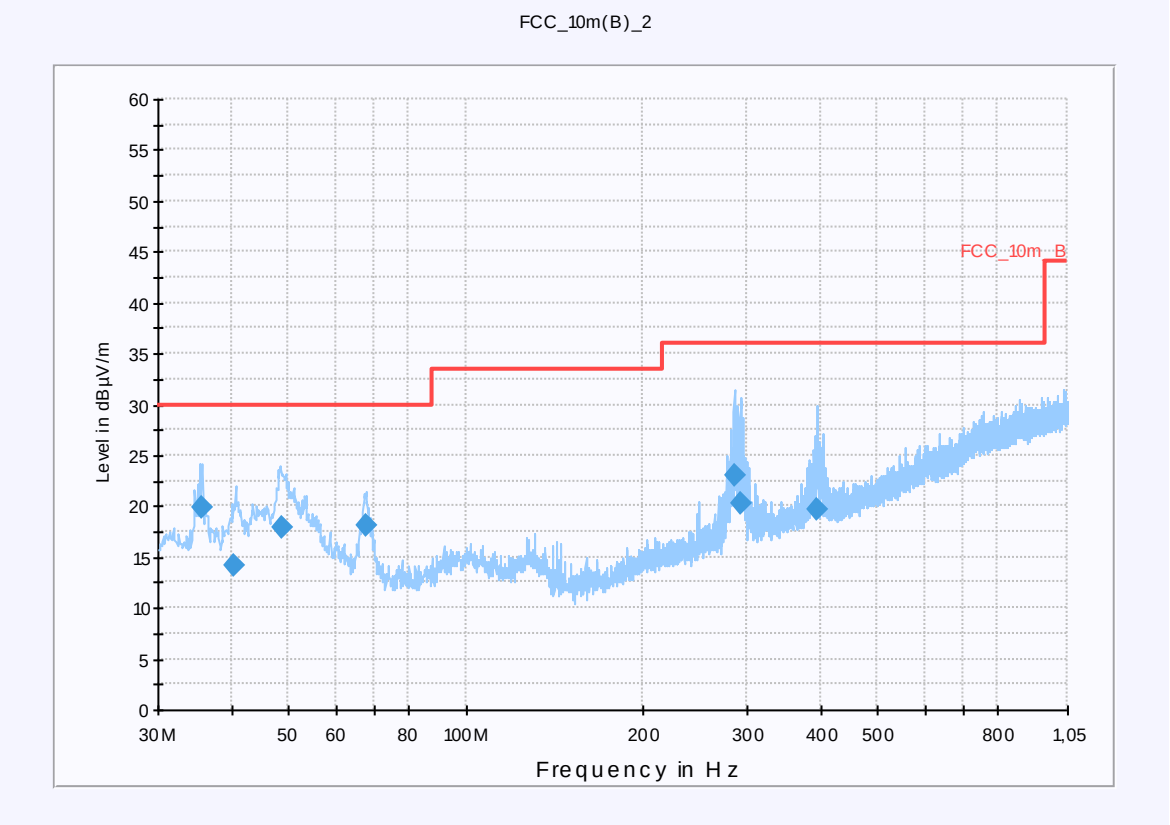
Common Information

EUT:	RDD71UW 148 + Captive cable charger Rev4.0
Serial Number:	CER-39234-001 Rev1 11-Apr-11(sample 23) + DW-17957-003
Test Description:	FCC Part 15 C
Operating Conditions:	GSM 1900 traffic CH 661, BT 2-DH5 CH 0, WLAN g mode CH 11 6 Mbps
Operator Name:	LANHennemannGER
Comment:	AC 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 2 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

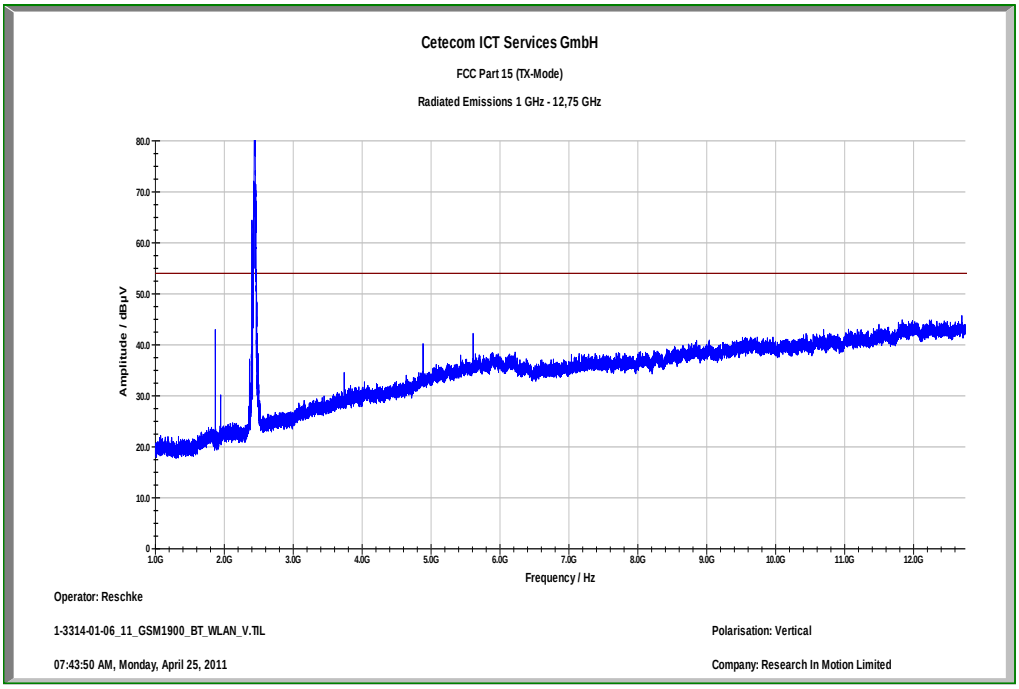
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.705700	19.8	15000.000	120.000	149.0	V	50.0	13.1	10.2	30.0	
40.295250	14.2	15000.000	120.000	108.0	V	153.0	13.4	15.8	30.0	
48.627750	18.0	15000.000	120.000	100.0	V	15.0	13.3	12.0	30.0	
67.693200	18.0	15000.000	120.000	217.0	V	106.0	9.8	12.0	30.0	
285.139200	23.1	15000.000	120.000	400.0	H	296.0	14.2	12.9	36.0	
293.496000	20.3	15000.000	120.000	200.0	H	248.0	14.4	15.7	36.0	
395.385150	19.7	15000.000	120.000	100.0	V	33.0	16.8	16.3	36.0	

Hardware Setup: **EMI radiated\Electric Field (NOS) - [EMI radiated]**

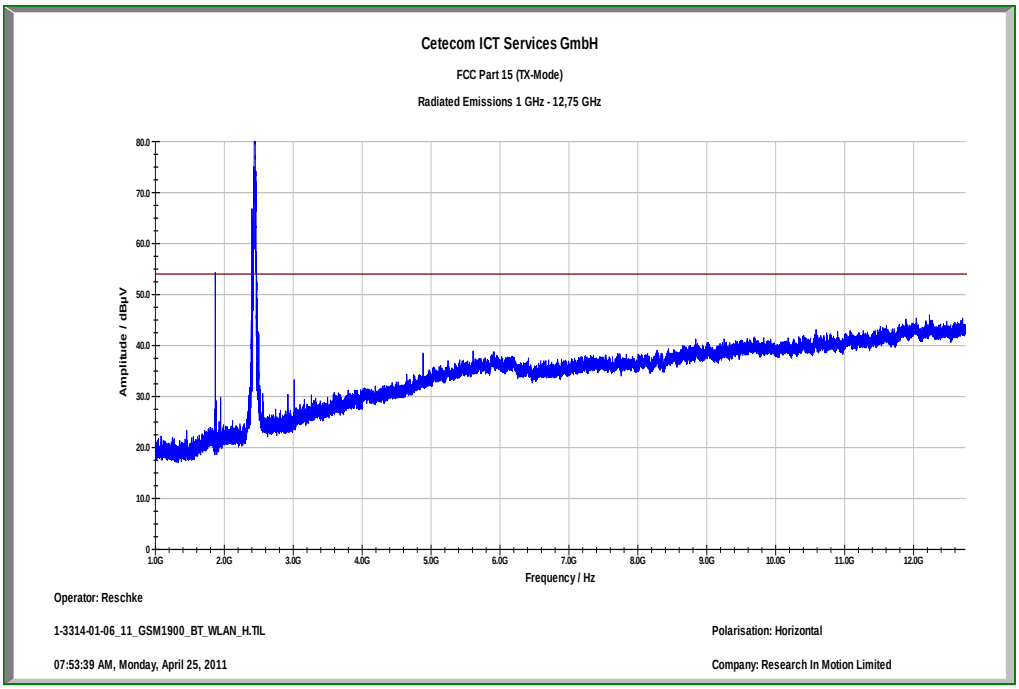
	Subrange 1
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.10.00

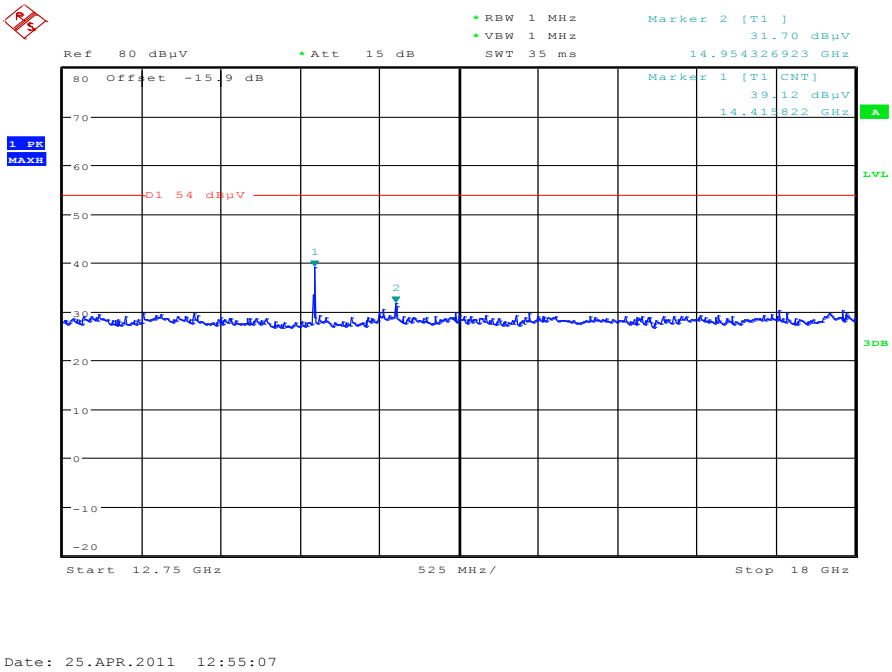
Plot 2: 1 GHz to 12.75 GHz, vertical polarization



Plot 3: 1 GHz to 12.75 GHz, horizontal polarization

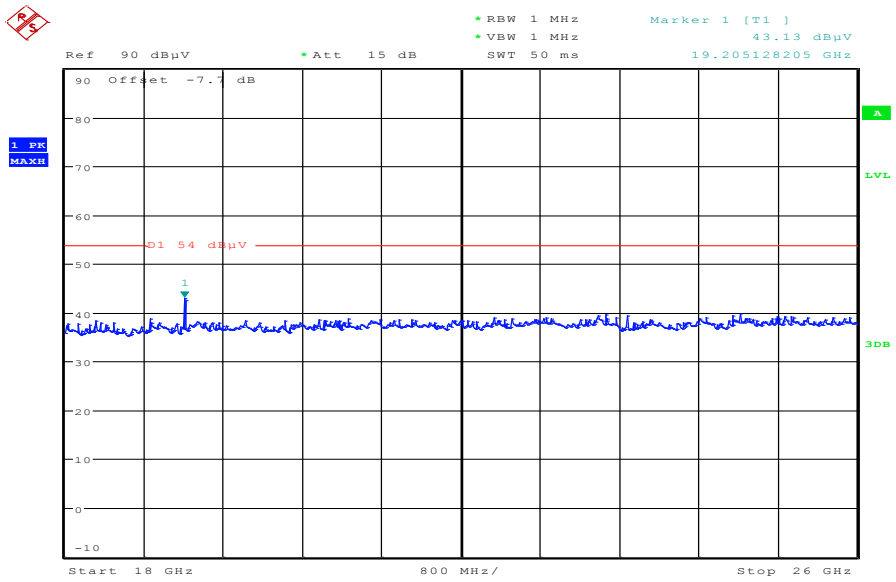


Plot 4: 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.APR.2011 12:55:07

Plot 5: 18 GHz to 26 GHz, vertical & horizontal polarization



Plots:

Mode 3: UMTS FDD 4 (middle channel) + BT 8 DPSK (lowest channel) + WiFi OFDM / n – mode (highest channel)

Plot 1: 30 MHz to 1 GHz, vertical & horizontal polarization

CETECOM ICT Services GmbH

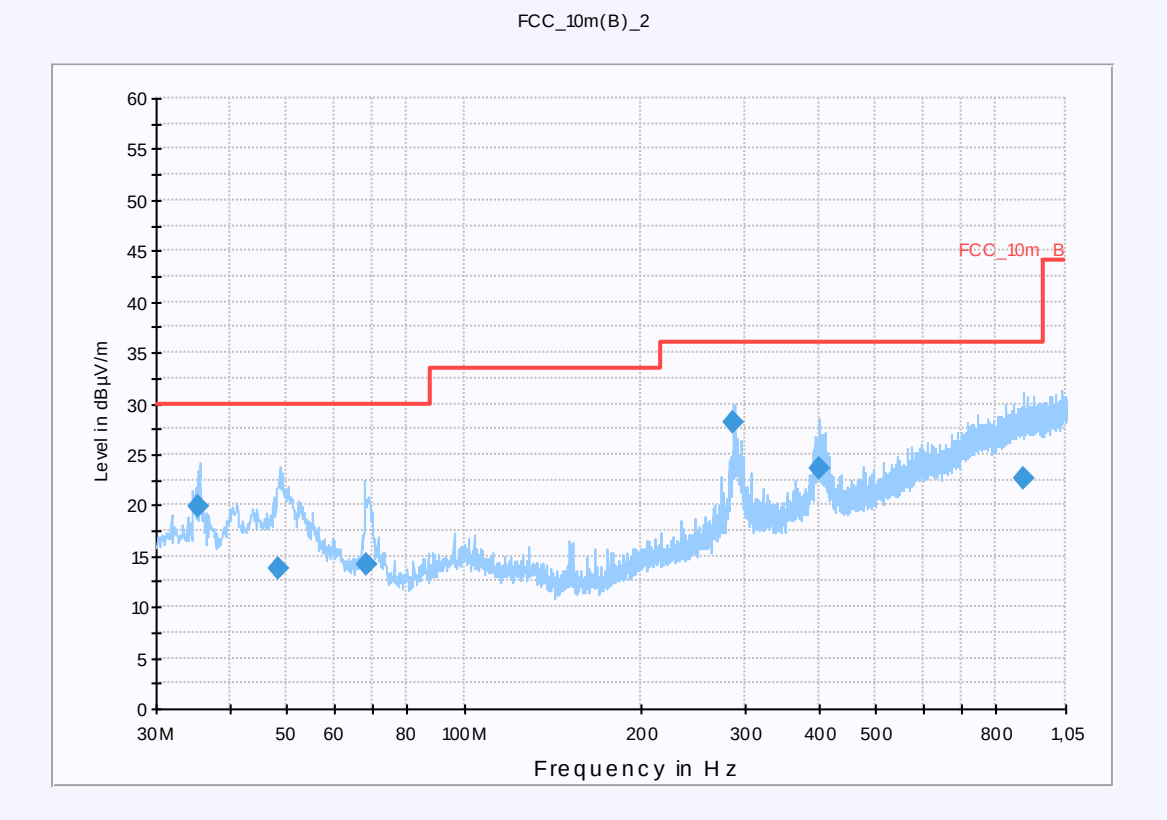
Common Information

EUT:	RDD71UW 148 + Captive cable charger Rev4.0
Serial Number:	CER-39234-001 Rev1 11-Apr-11(sample 23) + DW-17957-003
Test Description:	FCC Part 15 C
Operating Conditions:	UMTS FDD IV traffic CH 1412, BT 3-DH5 CH 0, WLAN n mode CH 11 6 Mbps
Operator Name:	Hennemann
Comment:	AC 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 2 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

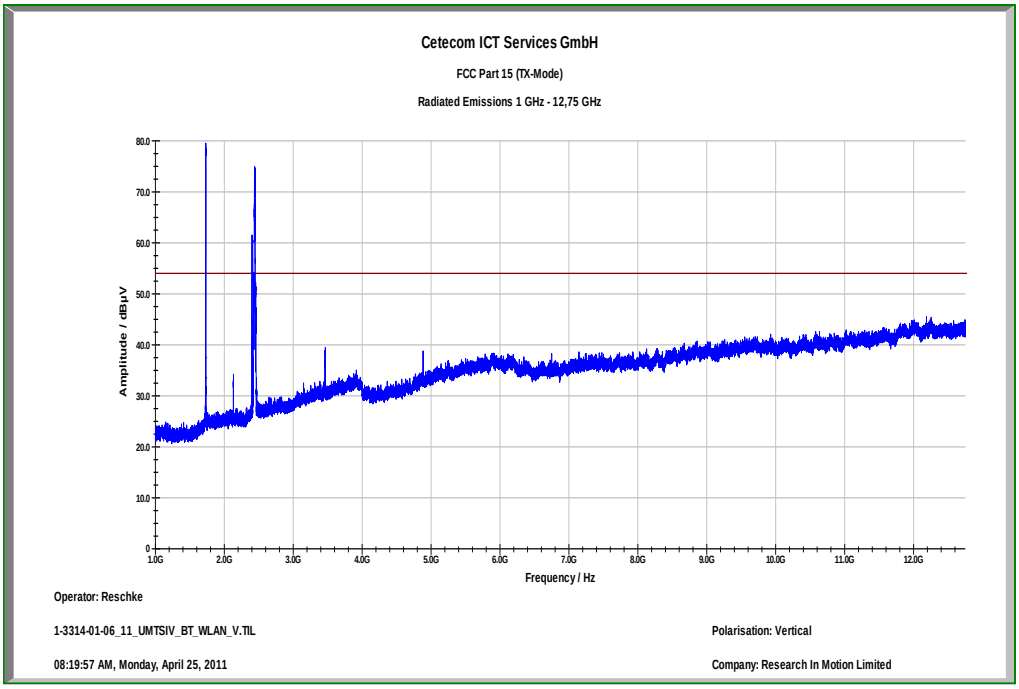
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.350800	19.8	15000.000	120.000	108.0	V	80.0	13.1	10.2	30.0	
48.560250	13.7	15000.000	120.000	100.0	V	-4.0	13.3	16.3	30.0	
68.350200	14.2	15000.000	120.000	400.0	V	34.0	9.7	15.8	30.0	
287.123400	28.1	15000.000	120.000	300.0	H	312.0	14.2	7.9	36.0	
401.493150	23.7	15000.000	120.000	100.0	V	137.0	16.9	12.3	36.0	
889.367850	22.5	15000.000	120.000	107.0	V	228.0	25.1	13.5	36.0	

Hardware Setup: **EMI radiated\Electric Field (NOS) - [EMI radiated]**

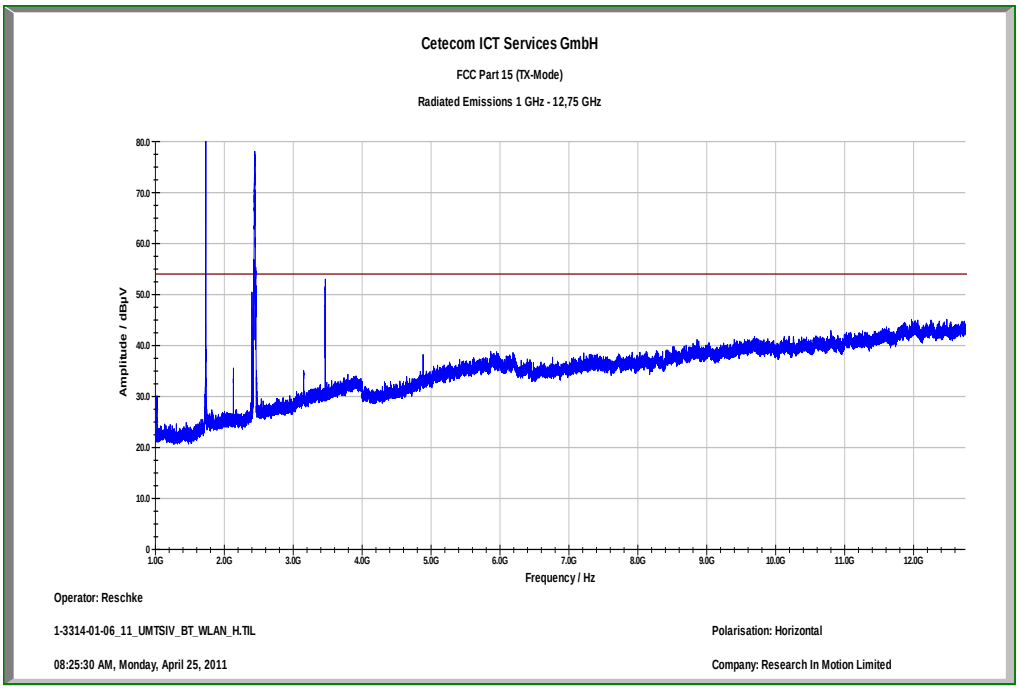
	Subrange 1
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.10.00

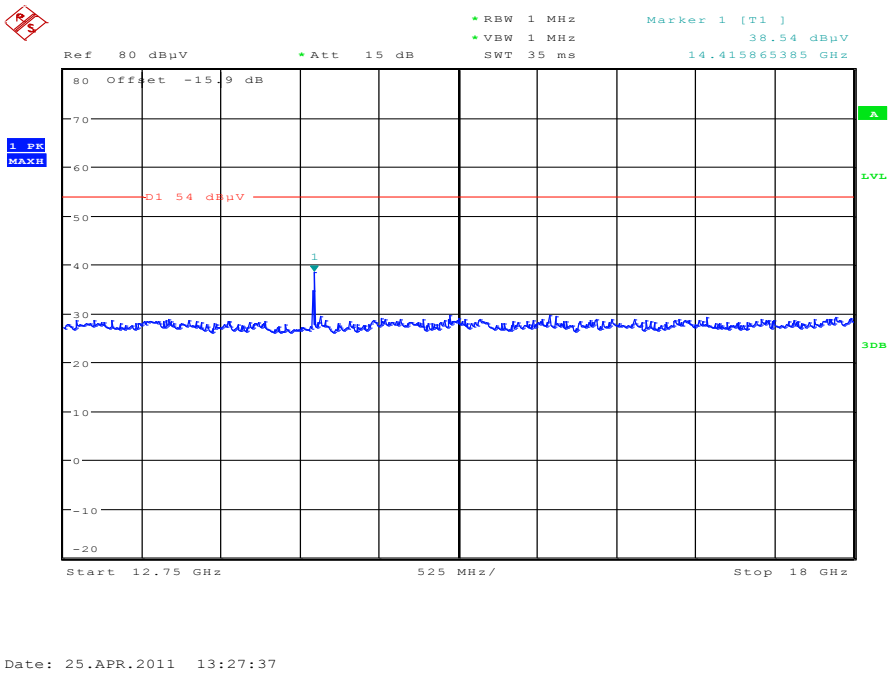
Plot 2: 1 GHz to 12.75 GHz, vertical polarization



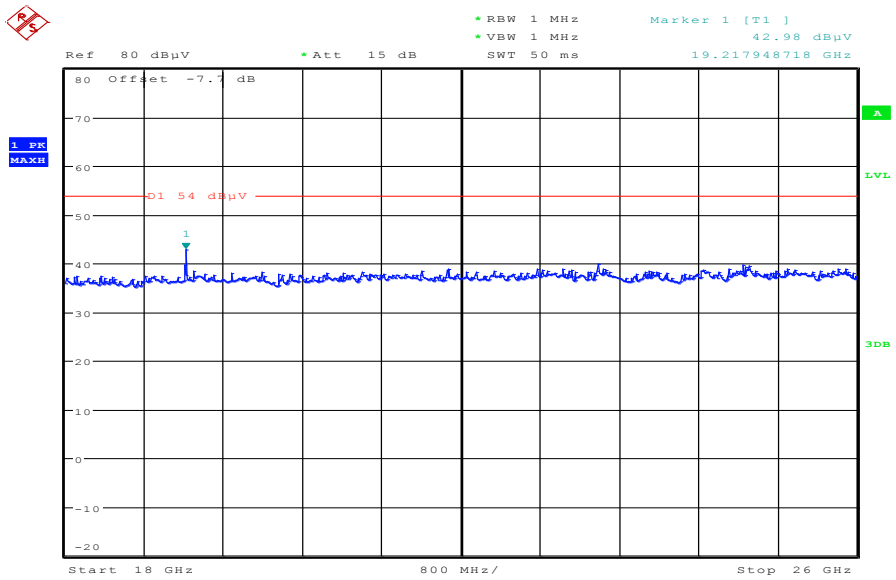
Plot 3: 1 GHz to 12.75 GHz, horizontal polarization



Plot 4: 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 5: 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.APR.2011 13:31:20

9.2 TX spurious emissions radiated < 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi peak
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

Limits:

FCC		IC
CFR Part 15.209(a)		RSS 210, Issue 8
TX spurious emissions radiated < 30 MHz		
Frequency (MHz)	Field strength (dBµV/m)	Measurement distance
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Result:

Mode 1: GSM 850 (middle channel) + BT GFSK (lowest channel) + WiFi DSSS / b – mode (highest channel)

TX spurious emissions radiated < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No critical peaks found.		
Measurement uncertainty	± 3 dB	

Result: **The result of the measurement is passed.**

Result:

Mode 2: PCS 1900 (middle channel) + BT Pi/4 DQPSK (lowest channel) + WiFi OFDM / g – mode (highest channel)

TX spurious emissions radiated < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No critical peaks found.		
Measurement uncertainty	± 3 dB	

Result: **The result of the measurement is passed.**

Result:

Mode 3: UMTS FDD 4 (middle channel) + BT 8 DPSK (lowest channel) + WiFi OFDM / n – mode (highest channel)

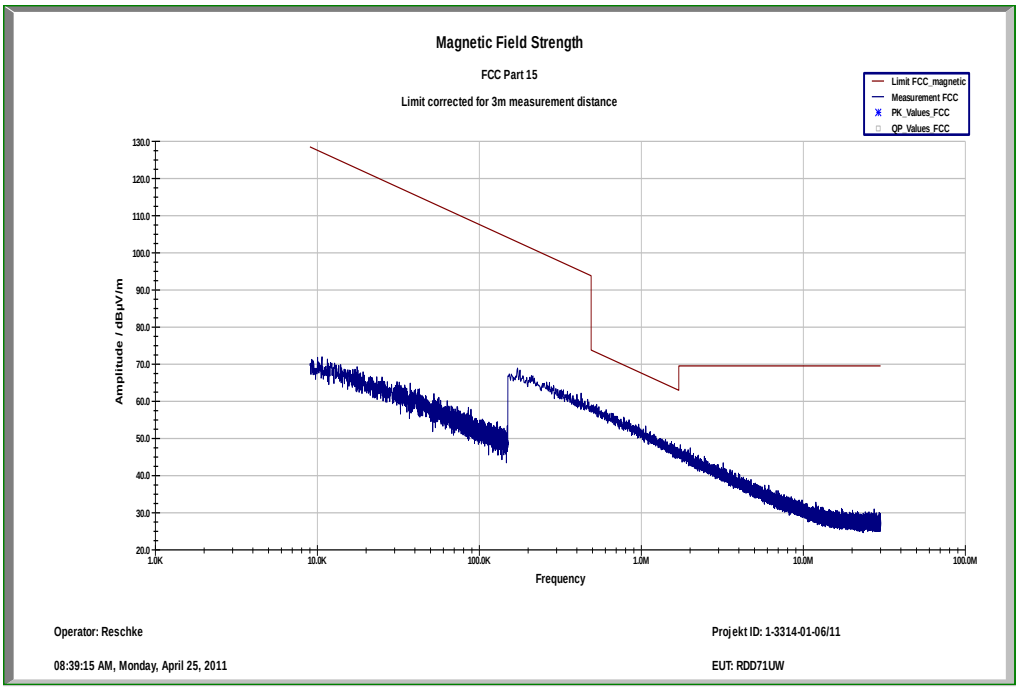
TX spurious emissions radiated < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No critical peaks found.		
Measurement uncertainty	± 3 dB	

Result: **The result of the measurement is passed.**

Plots:

Mode 1: GSM 850 (middle channel) + BT GFSK (lowest channel) + WiFi DSSS / b – mode (highest channel)

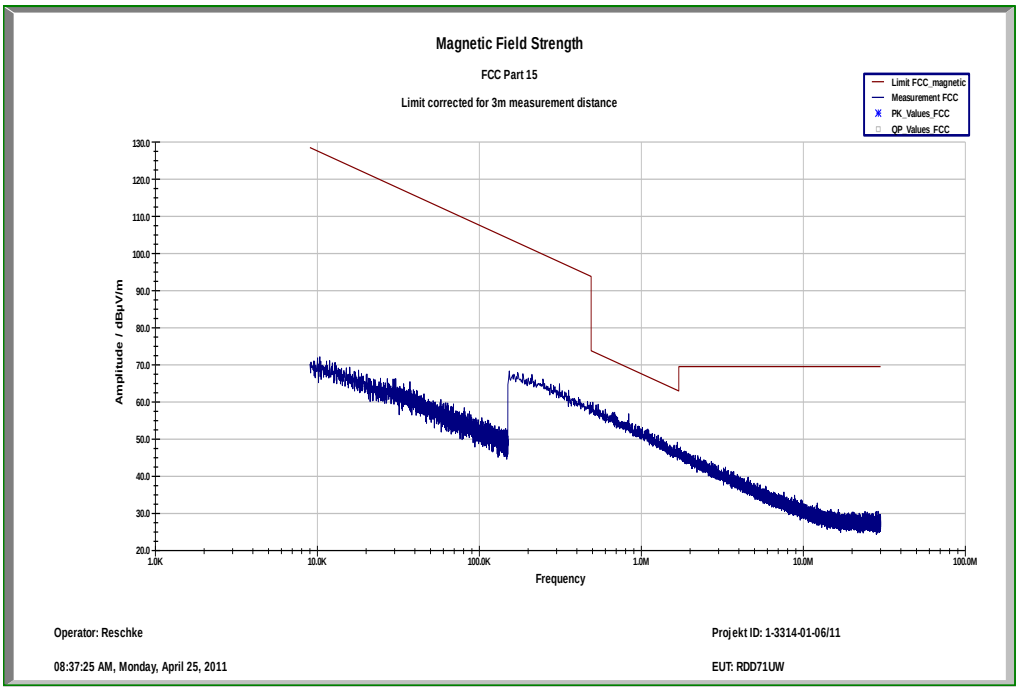
Plot 1: 9 kHz to 30 MHz



Plots:

Mode 2: PCS 1900 (middle channel) + BT Pi/4 DQPSK (lowest channel) + WiFi OFDM / g – mode (highest channel)

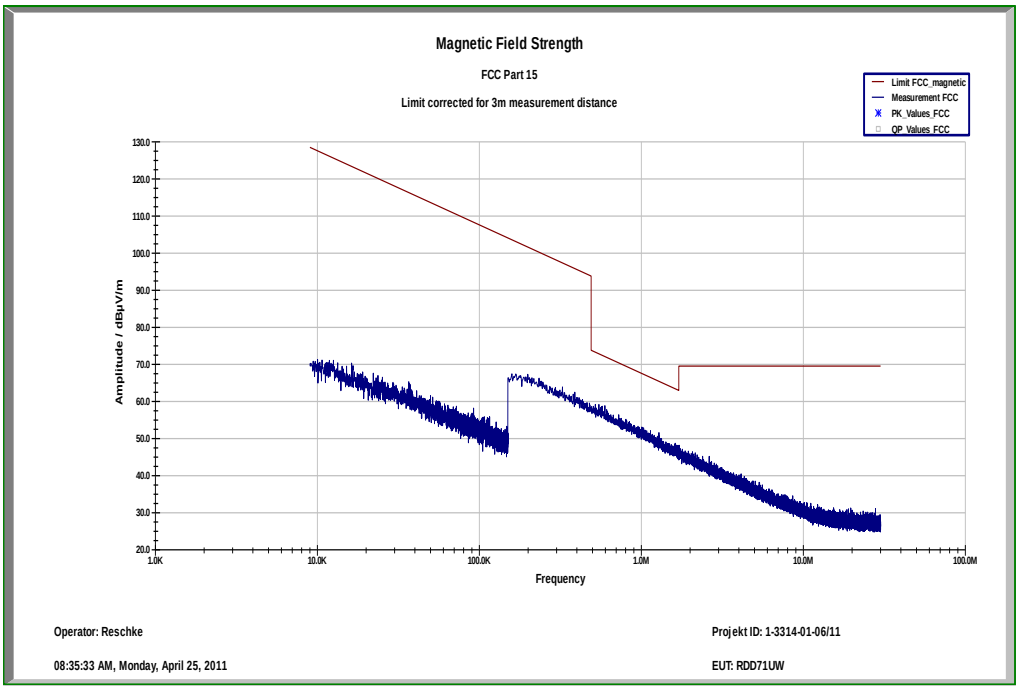
Plot 1: 9 kHz to 30 MHz



Plots:

Mode 3: UMTS FDD 4 (middle channel) + BT 8 DPSK (lowest channel) + WiFi OFDM / n – mode (highest channel)

Plot 1: 9 kHz to 30 MHz



10 Test equipment and ancillaries used for tests

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
2	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B5979	300000210	ne		
3	n. a.	EMI Test Receiver	ESCI 1166.5950.03	R&S	100083	300003312	k	05.01.2011	05.01.2013
4	n. a.	Analyzer-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	k	01.06.2009	01.06.2011
5	n. a.	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379	ev		
6	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
7	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
8	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
9	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	01.04.2010	01.04.2012
10	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	10.01.2011	10.01.2013
11	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vlKl!	05.03.2009	05.09.2011
12	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
13	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996		23.03.2009	
14	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
15	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
16	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
17	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
18	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
19	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
20	n. a.	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
21	n. a.	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Technologies	MY48250080	300003812	k	08.09.2010	08.09.2012
22	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	vlKl!	08.09.2010	08.09.2012
23	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vlKl!	17.12.2008	17.12.2011
24	11b	Microwave System	83017A	HP Meßtechnik	00419	300002268	ev	10.03.2011	

		Amplifier, 0.5-26.5 GHz; 25 dB gain							
25	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda		300000787	ne		
26	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300002442	ne		
27	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	ve	01.07.2010	01.07.2012
28	n. a.	Universal Communication Tester	CMU200	R&S	832221/055	300002862	k	20.03.2008	20.03.2011
29	n. a.	Universal Communication Tester	CMU200	R&S	103992	300003231	vlKl!	30.06.2010	30.06.2012
30	n. a.	Universal Communication Tester	CMU200	R&S	106240	300003321	vlKl!	14.09.2010	14.09.2012
31	n. a.	CBT (Bluetooth Tester + EDR Signalling)	CBT 1153.9000K35, CBT-B55, CBT-K55	R&S	100313	300003516	vlKl!	13.09.2010	13.09.2012

Agenda: Kind of Calibration

k	calibration / calibrated
ne	not required (k, ev, izw, zw not required)
ev	periodic self verification
Ve	long-term stability recognized
vlkl!	Attention: extended calibration interval
NK!	Attention: not calibrated
EK	limited calibration
zw	cyclical maintenance (external cyclical maintenance)
izw	internal cyclical maintenance
g	blocked for accredited testing
*)	next calibration ordered / currently in progress

Annex A Document history

Version	Applied changes	Date of release
1.0	Initial release	2011-05-05

Annex B Further information

Glossary

DUT	-	Device under Test
EMC	-	Electromagnetic Compatibility
EUT	-	Equipment under Test
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	not applicable
S/N	-	Serial Number
SW	-	Software