

# RADIO TEST REPORT

No. 1307119-1 Ed. 4

## RF performance

### EQUIPMENT UNDER TEST

Equipment : Radio base station  
Product name : RBS 6401 B2, WCDMA  
Product number : KRD 901 040/\*  
\* denotes 0 - 6 depending on  
different HW and SW configurations  
Product configuration: Single-RAT WCDMA + Wi-Fi + CPE V4, B2  
Manufacturer : Oy LM Ericsson AB  
Tested by request of : Oy LM Ericsson AB

### SUMMARY

All selected test cases specified in this report comply with the requirements according to the following standards:

47 CFR part 2 (2009)  
47 CFR Part 24 (2012), Subpart E  
47 CFR Part 15 (2012), Subpart B  
RSS-133, Issue 6 (2012)  
RSS-Gen, Issue 3 (2010)  
ICES-003, Issue 5 (2012)

Date of issue: 2013-11-20

Tested by:   
Matti Virkki

Approved by:   
Niklas Boström

Laboratories are accredited by the Swedish Board for Accreditation and Conformity Assessment (SWEDAC) under the terms of Swedish legislation. The accredited laboratory activities meet the requirements in SS-EN ISO/IEC 17025 (2005). This report may not be reproduced other than in full, except with the prior written approval by Intertek Semko.

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

**Revision History**

<b>Edition</b>	<b>Date</b>	<b>Description</b>
<b>1</b>	<b>2013-09-13</b>	<b>First release</b>
<b>2</b>	<b>2013-09-17</b>	<b>Product configuration corrected</b>
<b>3</b>	<b>2013-11-19</b>	<b>EIRP measurements added</b>
<b>4</b>	<b>2013-11-20</b>	<b>Editorial and product configuration corrections</b>

## CONTENTS

	Page
<b>1 CLIENT INFORMATION .....</b>	<b>5</b>
<b>2 EQUIPMENT UNDER TEST (EUT).....</b>	<b>5</b>
2.1 IDENTIFICATION OF THE EUT ACCORDING TO THE MANUFACTURER/CLIENT DECLARATION.....	5
2.2 DESCRIPTION OF THE EUT .....	6
2.3 TEST SETUP BLOCK DIAGRAM.....	6
2.4 EXTERNAL CABLES CONNECTED TO THE EUT:.....	7
2.5 AUXILIARY EQUIPMENT.....	7
2.6 EUT HARDWARE LIST.....	8
2.7 EUT SOFTWARE.....	8
2.8 MODIFICATION DURING THE TESTS.....	8
<b>3 TEST SPECIFICATIONS.....</b>	<b>9</b>
3.1 STANDARDS .....	9
3.2 ADDITIONS, DEVIATIONS AND EXCLUSIONS FROM STANDARDS AND ACCREDITATION .....	9
3.3 TEST SITE .....	9
3.4 TEST CONDITIONS .....	9
<b>4 TEST SUMMARY .....</b>	<b>10</b>
<b>5 TRANSMITTER EQUIVALENT ISOTROPIC RADIATED POWER.....</b>	<b>11</b>
5.1 TEST SPECIFICATIONS.....	11
5.2 OPERATION MODE.....	11
5.3 TEST EQUIPMENT .....	12
5.4 MEASUREMENT SET-UP .....	13
5.5 DATA SUMMARY .....	14
<b>6 TRANSMITTER RADIATED SPURIOUS EMISSIONS .....</b>	<b>15</b>
6.1 TEST SPECIFICATIONS.....	15
6.2 TEST EQUIPMENT .....	15
6.3 OPERATION MODE .....	16
6.4 MEASUREMENT SET-UP .....	17
6.5 PREVIEW SWEEPS.....	18
6.6 DATA SUMMARY .....	19
<b>7 RECEIVER RADIATED SPURIOUS EMISSIONS.....</b>	<b>20</b>
7.1 TEST SPECIFICATIONS.....	20
7.2 TEST EQUIPMENT .....	20
7.3 OPERATION MODE .....	20
7.4 MEASUREMENT SET-UP .....	20
7.5 PREVIEW SWEEPS.....	21
7.6 DATA SUMMARY .....	22
<b>8 AC LINE CONDUCTED EMISSION, 150 KHZ TO 30 MHZ.....</b>	<b>23</b>
8.1 TEST SPECIFICATIONS.....	23
8.2 TEST EQUIPMENT .....	23
8.3 OPERATION MODE .....	23
8.4 MEASUREMENT SET-UP .....	23
8.5 PREVIEW SWEEPS.....	25
8.6 DATA SUMMARY .....	25
<b>9 UNCERTAINTIES SUMMARY.....</b>	<b>26</b>
<b>10 PHOTO OF THE EUT.....</b>	<b>27</b>



## 1 CLIENT INFORMATION

The EUT has been tested by request of

Company: Oy LM Ericsson AB  
Elektroniikkatie 10  
FI-90590 Oulu  
FINLAND

Name of contact: Mika Savilakso  
LMF/TX  
Phone +358 9 299 3714

Client observer : Mika Savilakso and Jarno Seppänen

## 2 EQUIPMENT UNDER TEST (EUT)

### 2.1 Identification of the EUT according to the manufacturer/client declaration

Equipment: Radio base station  
Product name: RBS 6401 B2, WCDMA  
Product number: KRD 901 040/\*  
\* denotes 0 - 6 depending on  
different HW and SW configurations  
Product configuration: Single-RAT WCDMA + Wi-Fi + CPE V4, B2  
Brand name: Ericsson  
Manufacturer: Oy LM Ericsson AB  
Rating/Supplying voltage: 120 V AC, 2.0 A, 60 Hz  
Rating RF output power: 2x1W  
Frequency range: 1900 MHz band 2 1930 – 1990 MHz  
External antenna connector: Yes  
Modulation characteristics: WCDMA (QPSK, 16QAM, 64QAM)

## 2.2 Description of the EUT

The object for test, RBS 6401 B2 is a Pico Base Station for indoor use. RBS 6401 has a maximum output power of 2x1 W (+30 dBm) and has two integrated antennas, alternatively two external antennas. The base station is designed to provide mobile users with a connection to a mobile network.

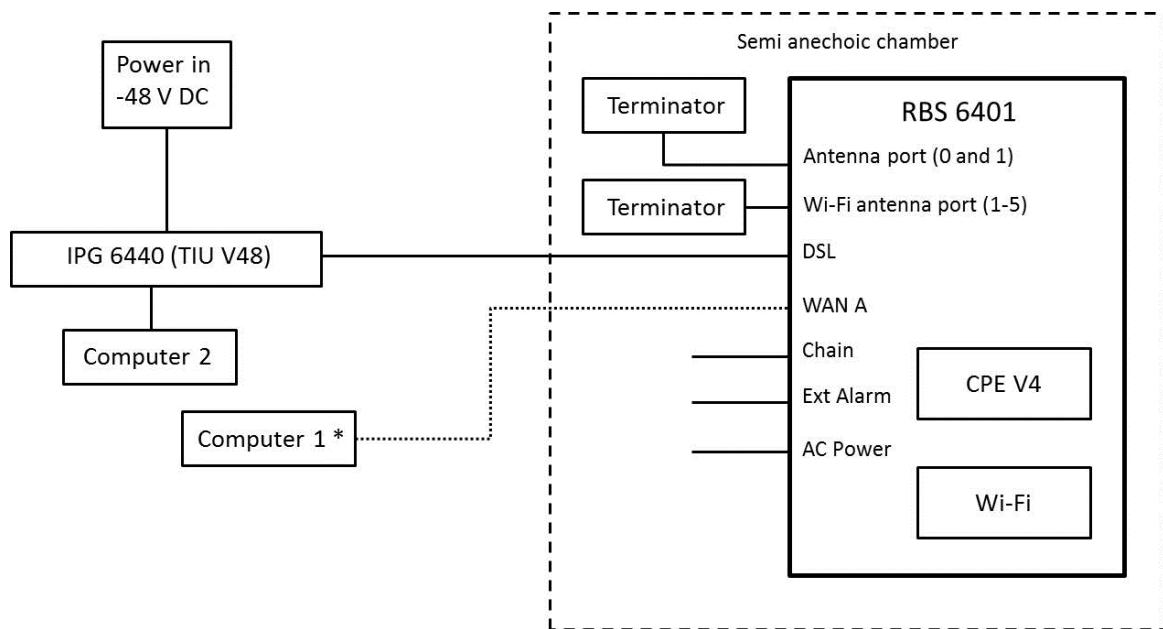
The highest internal frequency of RBS 6401 is FeedBack-LO which is running at 4604.4 MHz.

Also two additional modules are available for RBS 6401. CPE V4 and Wi-Fi modules are options and can be ordered with the RBS 6401 when they are ready assembled by the manufacturer.

The Wi-Fi modules are tested and certified by its manufacturer. The FCC model of Wi-Fi is used in these tests.

CPE V4 is connected to TIU (IPG 6440) and will be tested and certified by its manufacturer. The connection between CPE V4 and TIU is a copper-pair cable, with 1 to 4 pairs. During the performed tests a four-pair connection was used.

## 2.3 Test setup block diagram



\*Used only for starting the EUT. Not connected during the test.

**Figure 1: Block diagram of EUT during emission tests**

The tests have been carried out with the EUT arranged according to the alternatives below.

The EUT was supplied with 120 V AC.

Communication: VDSL2 traffic 150 Mbit/s (emission tests),

HW Configuration: See clause 2.6

## 2.4 External cables connected to the EUT:

Port	Type of port	No. of cables	Specifications	Length [m]
AC port	AC power input port	1	Three-core	10
Antenna, port 0	Antenna	1	Coaxial, QMA connector	1
Antenna, port 1	Antenna	1	Coaxial, QMA connector	1
Wi-Fi, Ports	Antenna	5	Coaxial, IPEX connector	0.1
DSL	Signal	1	Unshielded signal cable CAT 6, RJ45	10
CHAIN	Signal	1	Unshielded signal cable CAT 6, RJ45	10
WAN A	Signal	1	Unshielded signal cable CAT 6, RJ45	10
Ext Alarm	Signal	1	Unshielded signal cable 12 wires	15

## 2.5 Auxiliary equipment

Auxiliary equipment is defined as equipment needed for correct operation of the EUT, but not included as part of testing and evaluation of the EUT.

Equipment	Type / Model	Manufacturer	Serial number
Laptop	Compaq nc6120	HP	CNU6101426
Laptop	Compaq 6710b	HP	CNU80332JF
Laptop	Dell Latitude	Dell	CN-OkODNP-12961-21M-02DE-A02
IPG		Ericsson	
SUP	1/BFL 901 009/1	Ericsson	BR81900666
TIU V48	KDU 127 185/1	Ericsson	CU70002515
TCU 02 01	KDU 137 739/1	Ericsson	CD36068566
PSU (for IPG)	ACE650F / AC6-OKKKK-00	Cosel	A091891083672030 00A
2 x Terminators	Termaline, Coaxial resistor 25 W, 50 Ohm / 8080	Bird	34409, 28240

### External cables connected outside the chamber

Port	Type of Port	No of cables	Specifications	Length [m]
DSL	Telecommunication	1	RJ 45, shielded CAT5	15
TN A (TIU)	Telecommunication	1	RJ 45, shielded CAT5	1
WAN A *	Telecommunication	1	RJ 45, unshielded (clamped with Ferrite clamp)	3

\* Used only for starting the RBS 6401 in emission tests.

## 2.6 EUT hardware list

The EUT consists of the following units:

Product name	Product No.	R-State	Serial No.
RBS 6401 B2	KRD 901 040/6	R1B/A	C827284639
PSU – AC	BML 901 304/1	R1A	BR82754411
CPE V4	KDU 127 184/1	R3A	CU70004192
WIFI AP 01 FCC	KRC 161 393/2	R1A	TD3N000021
WIFI AP 01 FCC	KRC 161 393/2	R1A	TD3N000026*

\*In EIRP test setup

## 2.7 EUT software

During the tests the EUT supported the following software:

WCDMA: WWP\_1311.11 24<sup>th</sup> of May 2013

## 2.8 Modification during the tests

No modifications have been made during the tests.

### 3 TEST SPECIFICATIONS

#### 3.1 Standards

47 CFR Part 2 (2009)  
47 CFR Part 24 (2012), Subpart E  
47 CFR Part 15 (2012), Subpart B  
RSS-133, Issue 6 (2012)  
RSS-Gen, Issue 3 (2010)  
ICES-003, Issue 5 (2012)

Test methods in: ANSI/TIA 603-C-2004 and ANSI C63.4-2009

#### 3.2 Additions, deviations and exclusions from standards and accreditation

By request of the client only the radiated spurious emission part of the 47 CFR Parts 2, 24 and RSS-Gen and RSS-133 standards are measured. Other demanded tests are performed by the client in another test house and reported in the corresponding documents.

No other additions, deviations or exclusions have been made from standards and accreditation.

#### 3.3 Test site

Measurements were performed at:

Intertek Semko AB.  
Torshamnsgatan 43,  
P.O. Box 1103  
SE-164 22 Kista

Intertek Semko AB is a FCC listed test site with site registration number 90913  
Intertek Semko AB is a Industry Canada listed test facility with IC assigned code 2042G

Measurement chamber

Measurement Chamber	Type of chamber	IC Site filing #
BJÖRKHALLEN	Semi-anechoic 3m	2042G-1
STORA HALLEN	Semi-anechoic 10m	2042G-2

#### 3.4 Test conditions

If not additionally specified, the tests were performed under the following environmental conditions:

Supplying voltage	120 V
Air temperature	23-24°C
Relative humidity	39-46 %

#### 4 TEST SUMMARY

The results in this report apply only to the sample tested.

Reference	Test	Result	Note
CFR 47, Part 2.1046, Part 24.232 RSS-Gen section 4.8 RSS-133 section 6.4	RF output power	PASS	
CFR 47, Part 2.1049 and RSS-Gen section 4.6	Occupied bandwidth	NT	
CFR 47, Part 2.1051, Part 24.238	Intermodulation	NT	
CFR 47, Part 2.1051, Part 4.238. RSS-Gen section 4.9 RSS-133 section 6.5	Out of band spurious emissions, conducted	NT	
CFR 47, Part 2.1053, Part 24.238 RSS-Gen section 4.9 RSS-133 section 6.5	Transmitter out of band spurious emissions, radiated	PASS	
CFR 47, Part 2.1055 RSS-Gen section 4.7 RSS-133 section 6.3	Frequency stability	NT	
CFR 47, Part 15.109, RSS-Gen section 6.1 ICES-003 section 6.2	Receiver out of band spurious emissions, radiated	PASS	
CFR 47, Part 15.107 and ICES-003 section 6.1	Conducted spurious emissions from AC-Mains	PASS	

NT = Not Tested, by request of the client. These tests are performed by the client in another test house and reported in the corresponding documents.

## 5 TRANSMITTER EQUIVALENT ISOTROPIC RADIATED POWER

Date of test: 2013-11-15 – 2013-11-16

### 5.1 Test specifications

Reference:  
47 CFR 2.1046 and 24.232  
RSS-133 6.5

### 5.2 Operation mode

The RBS was activated for maximum transmit power 2x1 W.

0	1 W (30.0 dBm)	5 MHz	9938/1987.6	9400/1880.0	TM1 QPSK (DL)
1	1 W (30.0 dBm)	5 MHz	9800/1960	9400/1880.0	TM1 QPSK (DL)
1	1 W (30.0 dBm)	5 MHz	9662/1932.4	9400/1880.0	TM1 QPSK (DL)

0	1 W (30.0 dBm)	5 MHz	9938/1987.6	9400/1880.0	TM5 16QAM (DL)
1	1 W (30.0 dBm)	5 MHz	9800/1960	9400/1880.0	TM5 16QAM (DL)
1	1 W (30.0 dBm)	5 MHz	9662/1932.4	9400/1880.0	TM5 16QAM (DL)

0	1 W (30.0 dBm)	5 MHz	9938/1987.6	9400/1880.0	TM6 64QAM (DL)
1	1 W (30.0 dBm)	5 MHz	9800/1960	9400/1880.0	TM6 64QAM(DL)
1	1 W (30.0 dBm)	5 MHz	9662/1932.4	9400/1880.0	TM6 64QAM(DL)

### 5.3 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Cal. due date
10m semianechoic chamber "Stora hallen"	Euroshield	-	30300	--
Measurement software	Rohde & Schwarz	EMC 32	--	--
EMI receiver	Rohde & Schwarz	ESU40	13178	07-2014
Horn antenna	Rohde & Schwarz	HF907	31245	06-2015
Signal generator	Rohde & Schwarz	SMIQ	12792	07-2014
Double ridge horn antenna	EMCO	3115	4936	02-2014

#### 5.4 Measurement set-up

##### Test site: "Stora hallen" Semi-anechoic shielded chamber (30 MHz– 40 GHz)

The radiated output power was measured in a semi-anechoic chamber at a distance of 3 m and the EUT was placed on a non-metallic stand, 0.8 m above the reference ground plane. The specified test mode was enabled. Test set-up photos are given below.

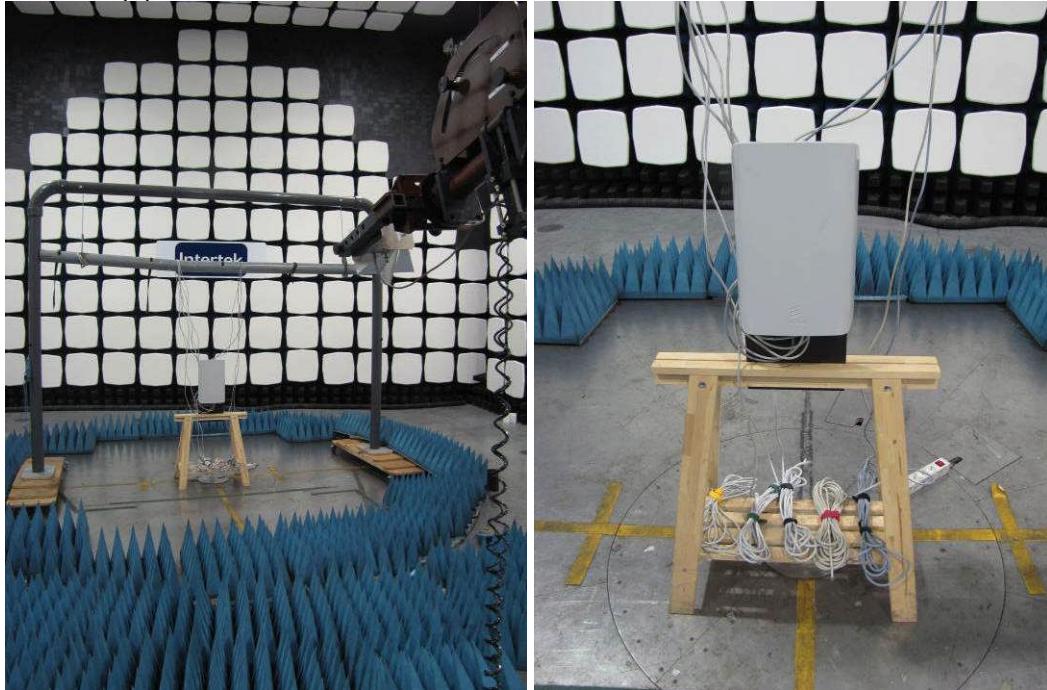
Overview sweeps with peak and average detection of the electric field intensity were performed with the measurement receiver in max-hold. The antenna was tilting towards the EUT. Both horizontal and vertical polarizations were measured. The measurements were made with the EUT rotating 0-360° and antenna height scanning between 1-4m.

When maximum value was found EUT was replaced with calibrated signal source and signal source output was adjusted until maximum reading was reached again. Signal generator output value was recorded and corrected with cable loss and antenna gain to get EIRP.

$$\text{EIRP} = P_{\text{signal gen}} - \text{cable loss} + \text{Antenna gain}$$

The EUT was supplied with 120 V AC (60 Hz) during the test.

Test set-up photos:



## 5.5 Data summary

**TM1**

Frequency	Output power	Output power	Pol.	Limit (RMS)	Limit (RMS)	Margin
MHz	dBm	W	V/H	dBm	W	W
1932.4	36,15	4,12	H	50	100	95,88
1932.4	35,85	3,85	V	50	100	96,15
1960	34,49	2,81	H	50	100	97,19
1960	36,58	4,55	V	50	100	95,45
1987.6	35,48	3,53	V	50	100	96,47
1987.6	36,13	4,10	H	50	100	95,90

**TM5**

Frequency	Output power	Output power	Pol.	Limit (RMS)	Limit (RMS)	Margin
MHz	dBm	W	V/H	dBm	W	W
1932.4	35,15	3,27	V	50	100	96,72
1932.4	35,34	3,42	H	50	100	96,58
1960	36,20	4,17	V	50	100	95,83
1960	36,64	4,62	H	50	100	95,38
1987.6	36,36	4,32	V	50	100	95,67
1987.6	36,32	4,28	H	50	100	95,72

**TM6**

Frequency	Output power	Output power	Pol.	Limit (RMS)	Limit (RMS)	Margin
MHz	dBm	W	V/H	dBm	W	W
1932.4	35,08	3,22	V	50	100	96,78
1932.4	36,64	4,62	H	50	100	95,38
1960	34,82	3,03	V	50	100	96,97
1960	34,72	2,97	H	50	100	97,03
1987.6	35,52	3,57	V	50	100	96,43
1987.6	36,11	4,08	H	50	100	95,92

## 6 TRANSMITTER RADIATED SPURIOUS EMISSIONS

Date of test: 2013-08-26 – 2013-08-28

### 6.1 Test specifications

Reference:

47 CFR 2.1051 and 24.238  
RSS-133 6.5

Spurious emissions should be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log (P)$

This gives a limit at -13 dBm.

The frequency range to be inspected is up to the tenth harmonics of the highest fundamental frequency according to 47 CFR 2.1057.

The field strength limit is calculated using the plane wave relation.

$$GP/4\pi R^2 = E^2 / 120\pi$$

G: antenna gain

P: power (W)

R: measurement distance (m)

-13 dBm EIRP gives a field strength limit of 84.4 dB $\mu$ V/m at a 3m measurement distance in an anechoic chamber.

### 6.2 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Cal. due date
3m semianechoic chamber "Björkhallen"	Siepel	Hermes 3	30900	--
Measurement software	Rohde & Schwarz	EMC 32	--	--
EMI receiver	Rohde & Schwarz	ESI26	32291	07-2014
EMI receiver	Rohde & Schwarz	ESU40	13178	07-2014
Ultra-Log antenna	Rohde & Schwarz	HL562	30711	12-2014
Horn antenna + Pre-amplifier	Bonn Elektronik	BLMA 1826-5A	31247	12-2013
Horn antenna	Rohde & Schwarz	HF907	32307	06-2015
Pre-amplifier	Rohde & Schwarz	TS-PRE1	32306	07-2014
Switching & Control unit	Rohde & Schwarz	OSP130	32300	07-2014
Shielded filter unit	Rohde & Schwarz	OSP-F	32301	07-2014
Turntable & antenna controller	Maturo	NCD	32390	--
Tilting antenna mast	Maturo	TAM 4.0-E	32376	--

### 6.3 Operation mode

The RBS was activated for maximum transmit power 2x1 W.

See below table for detailed radio configurations of the RBS.

#### Top – Bottom carrier

Antenna No.	RF power	Channel BW	UARFCN / Frequency [MHz]		Test model
			Downlink	Uplink	
0	1 W (30.0 dBm)	5 MHz	9938/1987.6	9400/1880.0	TM1 (DL)
1	1 W (30.0 dBm)	5 MHz	9662/1932.4	9400/1880.0	TM1 (DL)

#### Wi-Fi (FCC 2.4 GHz and 5.7 GHz)

The Wi-Fi module was running at maximum power level according to FCC standards. For the EMC measurements the worst case is when 2412 MHz and 5745 MHz radios are running at full power, so those were used in the tests. Power levels are stated at the following table.

			Wi-Fi power level / Frequency (MHz)				
3GPP Band	Wi-Fi		2412	5180	5260	5500	5745
Band 2	FCC	KRC 161 393/2	36	30	30	30	36

#### 6.4 Measurement set-up

##### Test site: "Björkhallen" Semi-anechoic shielded chamber (30 MHz– 26 GHz)

The radiated disturbance electric field intensity was measured in a semi-anechoic chamber at a distance of 3 m and the EUT was placed on a non-metallic stand, 0.8 m above the reference ground plane. The specified test mode was enabled. Test set-up photos are given below.

Overview sweeps with peak and at frequencies above 1 GHz also average detection of the electric field intensity were performed with the measurement receiver in max-hold. The antenna was placed 1.5 m and 3 m above the floor for 30 - 1000 MHz and 1.25 m and 2 m above the floor for 1 - 26 GHz. The antenna was tilting towards the EUT when measured frequencies above 1 GHz. Both horizontal and vertical polarizations were measured. The measurements were repeated with the EUT rotated in 90-degree steps for 30 - 1000 MHz, 45-degree steps for 1 - 18 GHz and 15-degree steps for 18 - 26 GHz.

At the frequencies where high disturbance levels were found a search for max disturbance level was performed. With the EUT and antenna in the worst-case configuration new measurements were carried out with quasi-peak detector for 30 – 1000 MHz and peak and average detection for 1 – 26 GHz.

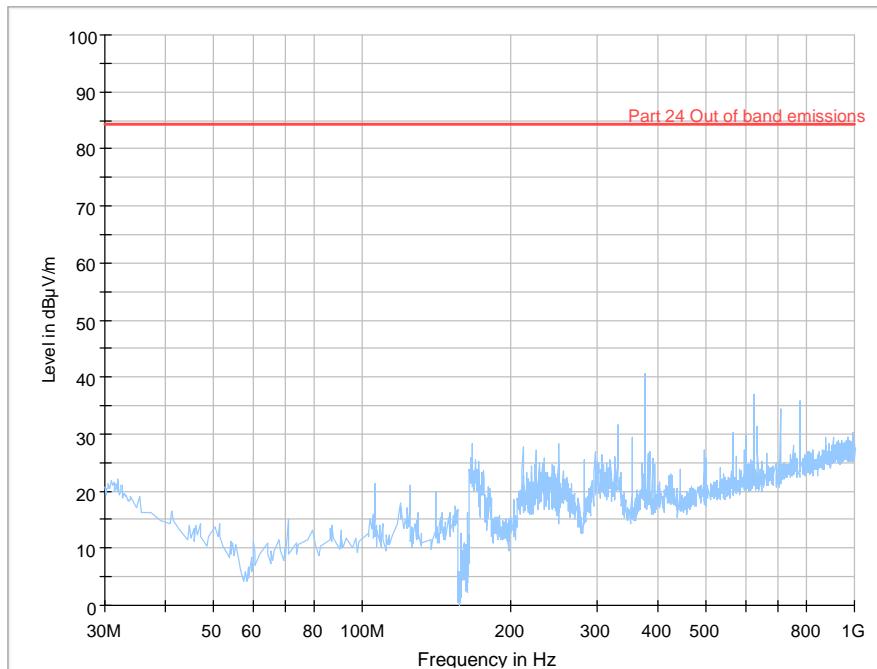
The EUT was supplied with 120 V AC (60 Hz) during the test.

Test set-up photo:

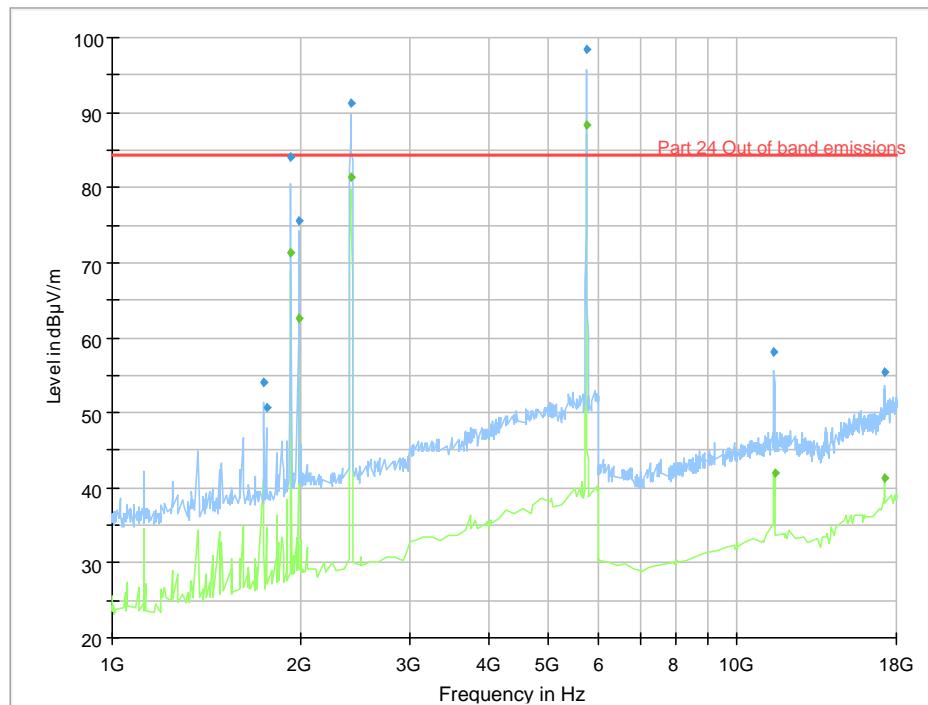


## 6.5 Preview sweeps

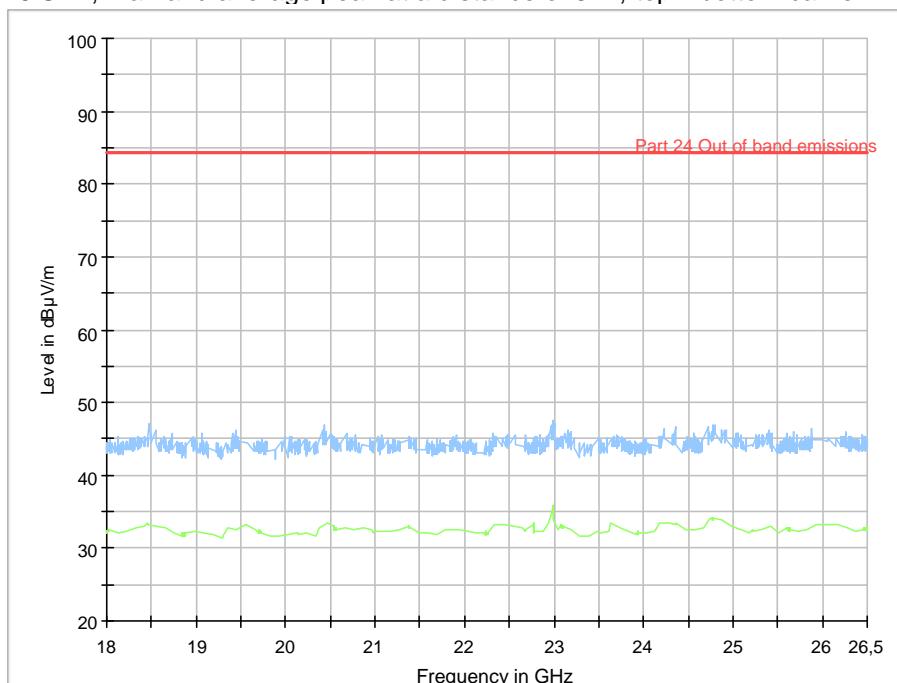
30 – 1000 MHz, max peak at a distance of 3 m, top – bottom carrier.



1-18 GHz, max and average peak at a distance of 3 m, top – bottom carrier.



18-26 GHz, max and average peak at a distance of 3 m, top – bottom carrier.



## 6.6 Data summary

Frequency	Disturbance level	Detector	RBW	Antenna height	Pol.	Azimuth	Limit (RMS)	Margin
MHz	dB $\mu$ V/m	QP / AVG /Peak	kHz	cm	V/H	deg	dB $\mu$ V/m	dB
1750.10	54.2	Peak	1000	188	H	226	84.4	30.2
1766.53	50.6	Peak	1000	177	H	221	84.4	33.8
1931.07*	71.4	AVG	1000	138	V	12	84.4	13.0
1931.67*	84.2	Peak	1000	137	V	11	84.4	0.2
1988.98*	62.7	AVG	1000	127	V	7	84.4	21.7
1989.18*	75.5	Peak	1000	162	V	7	84.4	8.9
2411.22**	81.5	AVG	1000	182	V	8	84.4	2.9
2411.22**	91.2	Peak	1000	184	V	9	84.4	-6.8
5749.90**	88.4	AVG	1000	100	H	267	84.4	-4.0
5750.70**	98.5	Peak	1000	102	H	267	84.4	-14.1
11479.56***	58.1	Peak	1000	122	H	44	84.4	26.3
11480.96***	42.0	AVG	1000	126	H	42	84.4	42.4
17227.25***	42.3	AVG	1000	137	V	40	84.4	42.1
17244.08***	55.5	Peak	1000	123	V	41	84.4	28.9

\* RBS carrier

\*\* Wi-Fi carrier

\*\*\* Harmonics of Wi-Fi carrier

Note: The spurious emissions levels are measured with peak or average detector and the limit is stated with RMS detection. Substitution method is not used because all measured field strength levels are >20 dB below RMS limit.

Example calculation: Measured level [dB $\mu$ V/m] = Analyser reading [dB $\mu$ V] + cable loss [dB] – preamplifier gain [dB] + antenna factor [1/m]

**Fulfil requirements: YES**

## 7 RECEIVER RADIATED SPURIOUS EMISSIONS

### 7.1 Test specifications

Reference:

47 CFR 15.109

IC RSS-GEN Table 2

ICES-003 Table 5, Table 7

Frequency (MHz)	Field strength (dB $\mu$ V/m)	Measurement distance (m)
30 – 88	40.0	3
88 – 216	43.5	3
216 – 960	46.0	3
960 –	54.0	3

### 7.2 Test equipment

See section 6.2.

### 7.3 Operation mode

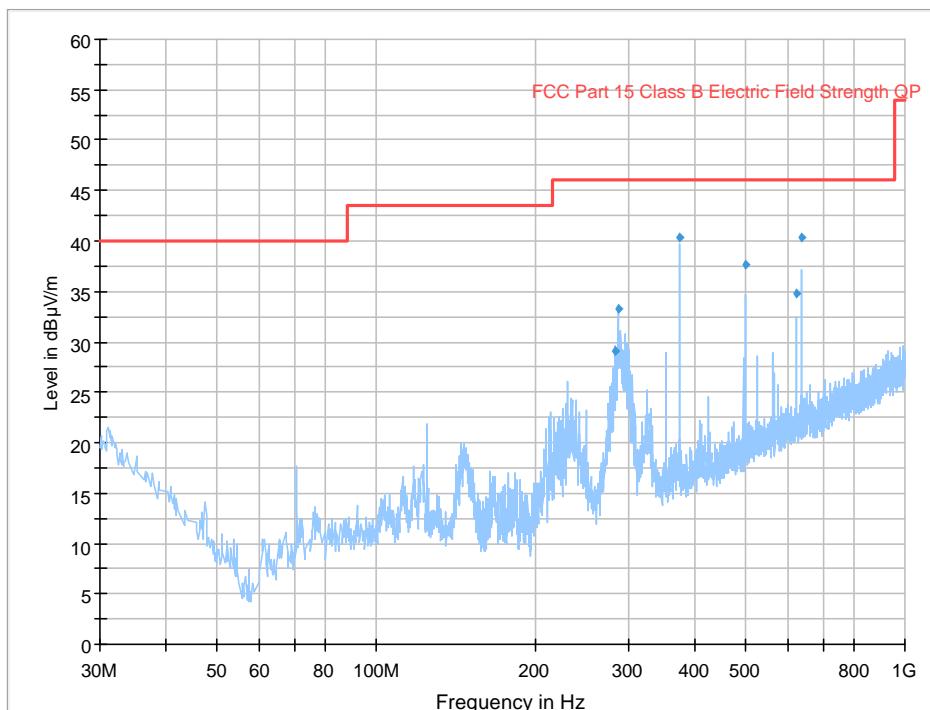
The RBS was in receive mode and Wi-Fi and CPE V4 modules were in idle mode.

### 7.4 Measurement set-up

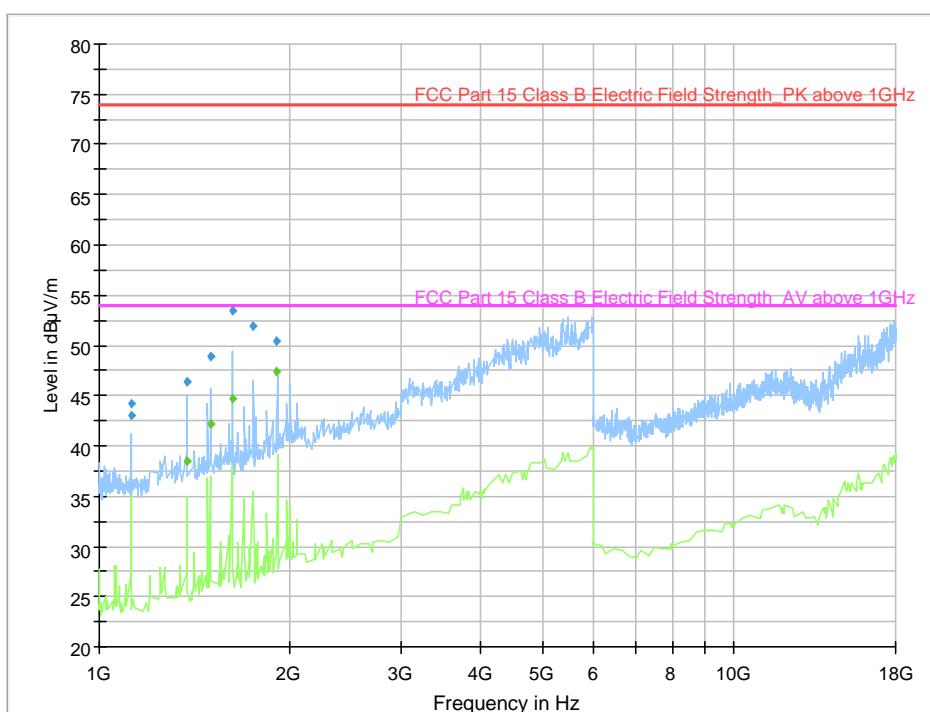
See section 6.4.

## 7.5 Preview sweeps

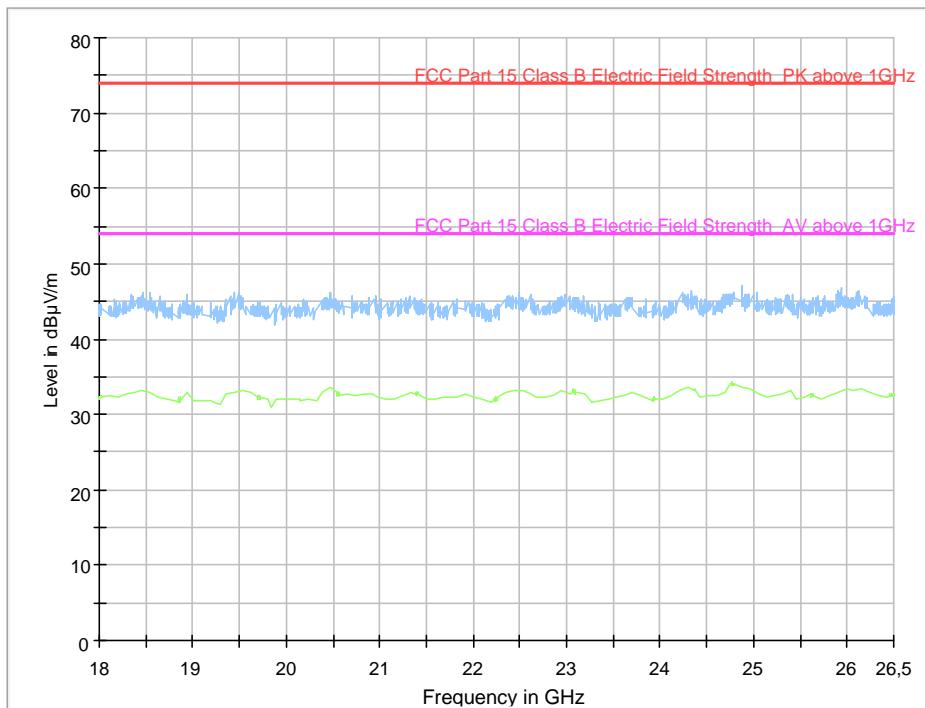
30-1000 MHz, max peak at distance of 3 m.



1-18 GHz, max and average peak at a distance of 3 m.



18-26 GHz, max and average peak at a distance of 3 m.



## 7.6 Data summary

Frequency	Disturbance level	Detector	RBW	Antenna height	Pol.	Azimuth	Limit	Margin
MHz	dBμV/m	QP / AVG /Peak	kHz	cm	V/H	deg	dBμV/m	dB
284.03	29.1	QP	120	129.0	H	309.0	46.0	16.9
286.41	33.3	QP	120	100.0	H	0.0	46.0	12.7
374.99	40.3	QP	120	162.0	V	131.0	46.0	5.7
499.98	37.7	QP	120	168.0	H	217.0	46.0	8.3
624.99	34.9	QP	120	159.0	V	172.0	46.0	11.1
635.89	40.3	QP	120	128.0	V	172.0	46.0	5.7
1125.05	44.3	Peak	1000	201.0	H	159.0	73.9	29.6
1125.05	43.0	Peak	1000	118.0	V	303.0	73.9	30.9
1374.95	38.5	AVG	1000	125.0	V	181.0	53.9	15.4
1374.95	46.4	Peak	1000	117.0	V	179.0	73.9	27.5
1500.00	42.1	AVG	1000	216.0	H	122.0	53.9	11.8
1500.00	48.9	Peak	1000	214.0	H	122.0	73.9	25.0
1625.05	53.4	Peak	1000	252.0	H	143.0	73.9	20.5
1625.05	44.6	AVG	1000	246.0	H	141.0	53.9	9.3
1749.90	51.9	Peak	1000	128.0	H	209.0	73.9	22.0
1907.62	47.4	AVG	1000	170.0	V	26.0	53.9	6.5
1907.82	50.4	Peak	1000	221.0	V	26.0	73.9	23.5

Example calculation:

Measured level [dBμV/m] = Analyser reading [dBμV] + cable loss [dB] – preamplifier gain [dB] + antenna factor [1/m]

**Fulfil requirements: YES**

## 8 AC LINE CONDUCTED EMISSION, 150 KHZ TO 30 MHZ

Date of test: 2013-08-28

### 8.1 Test specifications

Reference:

47 CFR 15.107, Class B limit  
IC RSS-GEN, Table 4  
ICES-003, Table 2

Frequency MHz	Quasi-peak Limit dB $\mu$ V	Average Limit dB $\mu$ V
0.15 – 0.5	66 – 56	56 – 46
0.5 – 1.6	56	46
1.6 – 30	60	50

### 8.2 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Cal. due date
Measurement software	Rohde & Schwarz	EMC 32	--	--
EMI Receiver	Rohde & Schwarz	ESI26	32291	07-2014
LISN	Rohde & Schwarz	ESH3-Z5	2727	07-2014
Pulse limiter	Rohde & Schwarz	ESH3-Z2	32456	07-2014

### 8.3 Operation mode

The RBS was in receive mode and Wi-Fi and CPE V4 modules were in idle mode.

### 8.4 Measurement set-up

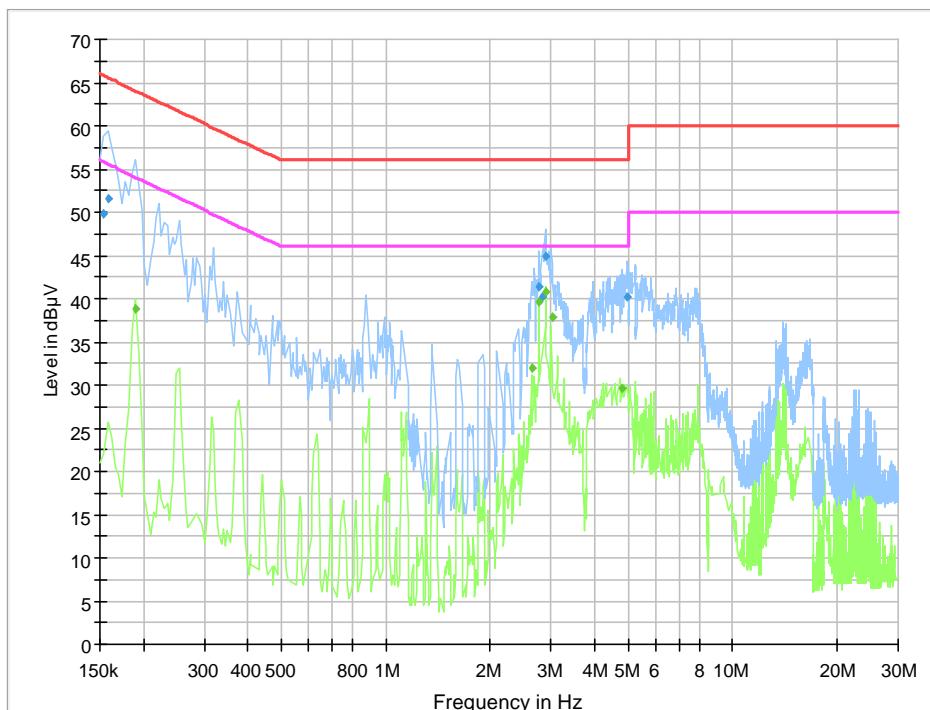
The mains terminal disturbance voltage was measured with the EUT located 0.8 m above the ground plane and 0.4 m from the vertical ground plane. The EUT was connected to an artificial mains network (AMN). The AMN was placed on the ground plane. Amplitude measurements were performed with quasi-peak and average detectors. The EUT was supplied by 120 VAC (60 Hz) during the test.

Test set-up photo:



## 8.5 Preview sweeps

Preview sweeps performed with peak and average detectors.



## 8.6 Data summary

Frequency MHz	Quasi-Peak				Frequency MHz	Average			
	Disturbance level dBμV	Limit dBμV	Margin dB	Disturbance level dBμV		Limit dBμV	Margin dB	Margin dB	
0.15	49.8	65.8	16.0	0.19	38.8	54.0	15.2		
0.16	51.7	65.6	13.9	2.63	32.0	46.0	14.0		
2.76	41.3	56.0	14.7	2.76	39.6	46.0	6.4		
2.83	40.2	56.0	15.8	2.88	40.8	46.0	5.2		
2.88	44.8	56.0	11.2	3.01	37.8	46.0	8.2		
4.98	40.1	56.0	15.9	4.81	29.7	46.0	16.3		

Measured level [dBμV] = Analyser reading [dBμV] + cable loss [dB] + LISN insertion loss [dB]

**Fulfil requirements: YES**

## 9 UNCERTAINTIES SUMMARY

The measurement uncertainty describes the overall uncertainty of the given measured value during operation of the EUT.

Measurement uncertainty is calculated in accordance with EA-4/02-1997.

The measurement uncertainty is given with a confidence of 95% (k=2).

### **Radiated disturbance, field strength, 30 MHz - 1000 MHz**

30 to 300 MHz at 3 m	± 4.7 dB
200 to 1000 MHz at 3 m	± 4.8 dB

### **Radiated disturbance, field strength, 1 to 40 GHz in Semi Anechoic Chambers**

#### **“Stora Hallen” and “Björkhallen”**

1 to 18 GHz with filter or attenuator	± 5.4 dB
1 to 18 GHz without filter or attenuator	± 5.2 dB
18 to 26 GHz without filter or attenuator	± 5.5 dB
26 to 40 GHz without filter or attenuator	± 5.6 dB

### **Continuous conducted disturbances with AMN , 9 kHz to 30 MHz**

± 3.6 dB

## 10 PHOTO OF THE EUT



-- END OF REPORT --