

Date:	ESPOO 05.06.2006	Page: 1 (27)
		Appendices
Number: No. 1 / 1	66937R2	Date of handing in: 01.06.2006  Measured by:
		Timo Hietala, Test Engineer
		Reviewed by:
		Jyrki Leino, Manager

SORT OF EQUIPMENT: **WCDMA Base Station RF module** 

Nokia Flexi BTS RF module 1.7GHz/2.1GHz MARKETING NAME:

TYPE: **FRIB** 

MANUFACTURER: **Nokia Corporation** 

FCC ID: **UAFFRIB-01** 

CLIENT: **Nokia Corporation** 

P.O.Box 319, FI-90651 OULU, FINLAND ADDRESS:

TELEPHONE: +358 7180 08000

**TEST LABORATORY: NET/IMN Oulu** 

FCC REG. NO. 411251

REFERENCE: FCC Part 27, SUBPART L

#### SUMMARY:

In regard to the performed tests the equipment under test fulfils the requirements defined in the test specifications, see page 4 for details

The test results are valid for the tested unit only. Without a written permission of Nemko Oy it is allowed to copy this report as a whole, but not partially.



FCC ID: UAFFRIB-01 Type: FRIB Test report No.: 66937R2

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1.2

FCC ID: UAFFRIB-01 Type: FRIB

Test report No.: 66937R2

# 1. EUT and Accessory Information

#### 1.1 EUT description

The EUT is a WCDMA Base station RF module 1.7GHz/2.1GHz with 1 power amplifier.

EUT and accessories						
Manufacture	er:	Nokia	Nokia			
Model:		FRIB, s/n: L9062000865	5			
Other Units:		System module, FSMB Transmission module, FTIA				
General:		All measurements are tra	aceable to na	itional standards.		
	s were conducted with FCC Part 27,		ipment for t	he purpose of demonstrating		
	New Submission		$\boxtimes$	Production Unit		
	Class II Permissiv	ve Change		Pre-Production Unit		

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE. **NONE** 

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This report applies only to the items tested.



Test report No.: 66937R2

# **Summary of Test Data**

NAME OF TEST	SECTION IN CFR 47	SPEC.	RESULT
RF Power Output	27.50 (d), 2.1046	100 W	Complies
99% Occupied Bandwidth	2.1049, (i)	Unspecified	Complies
Spurious Emissions at Antenna Terminals	27.53(g), 2.1051	- 13 dBm	Complies
Field Strength of Spurious Emissions	27.53(g), 2.1053	- 13 dBm E.I.R.P	Complies
Frequency stability	27.54, 2.1055	± 0.05 ppm <sup>1)</sup>	Complies

Note 1) Limit is the manufacturer's specification

Measurement uncertainty is expressed to a confidence level of 95%.



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# 2. General Equipment Specification

Supply Voltage Input:		48 Vdc		
Frequency Bands: TX:	$\boxtimes$	Block A: 2110 – 21	20 MHz	
		Block B: 2120 – 21	30 MHz	
	$\boxtimes$	Block C: 2130 – 21	35 MHz	
		Block D: 2135 – 21	40 MHz	
		Block E: 2140 – 21	55 MHz	
Frequency Bands: RX:		Block A: 1710 – 17	20 MHz	
, ,		Block B : 1720 – 17	30 MHz	
	$\boxtimes$	Block C : 1730 – 17	35 MHz	
	$\boxtimes$	Block D : 1735 – 17	40 MHz	
		Block E : 1740 – 17	55 MHz	
Type of Modulation and Designator:		W-CDMA (5M00F9W)	GSM (200KG7W)	NADC 40K0DXW)
Maximum No. of Carriers:		1		
Output Impedance:		50 ohms.		
RF Output:		Per channel: 40	W.	
Band Selection:		Software	Duplexer	Fullband



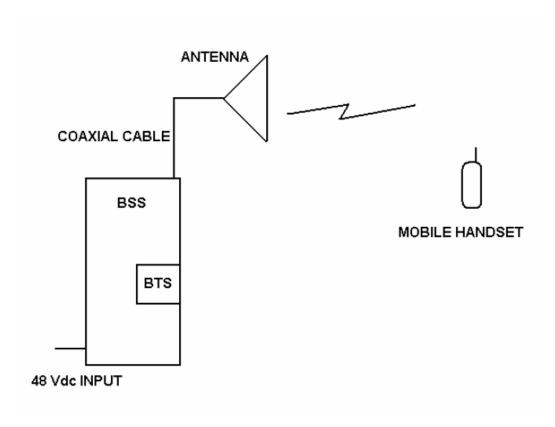
Test report No.: 66937R2

# **System Description**

The BTS performs the radio function of the Base Station System (BSS), and is connected to the Radio Network Controller (RNC) via the Iub interface, and to Mobile Stations (MS) via the Air interface (Antenna). The RNC is further connected to Serving GPRS Support Node (SGSN) or it can be connected to the Mobile Switching Centre (MSC) via IWU (Inter Working Unit).

Setup for testing: The transmitter was set up according to 3GPP TS 25.141 Test Model 1 for all tests except frequency stability. 64 DPCHs at 30 ksps (SF=128) distributed randomly across the code space, at random power levels and random timing offsets, were defined to simulate a realistic operating scenario which may have high PAR (Peak-to-Average Ratio). The transmitter was set up according to 3GPP TS 25.141 Test Model 4 for the frequency stability tests.

# **System Diagram**





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# 3. RF Power Output

NAME OF TEST: RF Power Output PARA.NO.: 27.50 (d) & 2.1046

TESTED BY: Timo Hietala DATE: 01/06/2006

Test Results: Complies.

Measurement Data: Refer to attached plot.

Modulation Type	Frequency	Measured Output	Measured Output
	(MHz)	Power	Power
		(dBm)	(W)
WCDMA	2112.6	45.75	37.58
WCDMA	2132.5	45.65	36.73
WCDMA	2152.4	45.64	36.64

**Equipment used:** 1, 2, 4, 7, 8, 9.

Measurement

Uncertainty:  $\pm 0.7 \text{ dB}.$ 

Temperature: 23 °C.

Relative

Humidity: 35 %.



Test report No.: 66937R2

#### **Test Data – RF Power Output**

Nemko Oy, Finland

Page 1 of 1   Job No.	
Job No.   69937	_
Time Hietala   Relative Humidity (%): 35   35	_
WCDMA TRANSMITTER   Configuration:   TX FULL POWER CENTER CHANNEL   Stample Number:   1	
Tample Number: 1	
Sample Number:   1	
Ref	
Refer to plots   Distance   N/A	
Directional Coupler:   Cable #1:     Cable #2:     Cable #3:   Cable #4:     Cable #4:	
Directional Coupler:	m
Cable #1:	
Cable #2:	
Cable #3:	
Ittenuator #1:	
Mixer:   Mixer:   Mixer:   Mixer:     Mixer:     Mixer:       Mixer:     Mixer:     Mixer:     Mixer:     Mixer:     Mixer:     Mixer:     Mixer:     Mixer:     Mixer:   Mixer:   Mixer:     Mixer:	
Marker 1 [T1]   RBW   30 kHz   RF Att   20 di   34.2 dBm   2.12866000 GHz   SWT   2 s   Unit   di   2.12866000 GHz   30.2 dB Offset   T1   T1   -33.41 dBm   2.12866000 GHz   30.2 dB Offset   T2   CH   BW   4.68480000 MF   45.65 dB   CH   BW   4.68480000 MF   4.684800000 MF   4.68480000 MF   4.684800	
Marker 1 [T1] RBW 30 kHz RF Att 20 di Ref Lv1 -33.41 dBm VBW 300 kHz 34.2 dBm 2.12866000 GHz SWT 2 s Unit di 34.2 30 30.2 dB Offset ▼1 [T1] -3 .41 di 2.12866000 GF  CH PWR 45.65 dF  CH BW 4.68480000 MF	
Marker 1 [T1] RBW 30 kHz RF Att 20 di Ref Lvl	
Ref Lv1	
34.2 dBm 2.12866000 GHz SWT 2 s Unit di 34.2 30 30.2 dB Offset	3
30.2 dB Offset	_
30.2 dB Offset    T1   -33.41 di   2.12866000 GF   45.65 dF   45.6	3m
2.12866000 GH CH PWR 45.65 dH CH BW 4.68480000 MH  -10  -20  -30	Bm A
20 CH PWR 45.65 dB CH BW 4.68480000 MB  10 -10 -20 -30	
20 CH BW 4.68480000 MF  10 -20 -30	m
10 0 -10 -20	
-10 -20 -30	Z
-10 -20 -30	
-10 -20 -30	_
-10 -20 -30	
-10 -20 -30	
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-20 -30	
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-30 mmmm	
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-40	1
-40	
	1
-50	-
-60 CO	1
65.8	_
Center 2.1325 GHz 768 kHz/ Span 7.68 MH	z
1 7777 0006 11.50.00	
ate: 1.JUN.2006 11:59:20	
otes:	



Test report No.: 66937R2

# 4. 99% Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth PARA.NO.: 2.1049, (i)

TESTED BY: Timo Hietala DATE: 01/06/2006

Test Results: Complies.

**Test Data:** See attached plot(s).

	Frequency	Measured 99%
Modulation Type	(MHz)	Occupied Bandwidth
		(MHz)
WCDMA	2132.5	3.9679

**Equipment used:** 1, 2, 4, 7, 8, 9.

Measurement

Uncertainty:  $\pm 0.7 \text{ dB}.$ 

Temperature: 23 °C.

Relative

Humidity: 35 %.



Test report No.: 66937R2

#### Test Data - 99% Occupied Bandwidth

ta Plot			<u>99%</u>	6 Occup	ied Ban	dwidth	•		
e <u>1</u> of <u>1</u>								Comp	olete <u>x</u>
No.:	69937				01/06/2006	_		Prelimina	ary:
cification:	PT27		Temp	erature (°C):	23	-			
ed By:	Timo Hietala		Relative F	lumidity (%):	35	_			
T.:	WCDMA TRAI								
figuration:	TX FULL POW	ER CENTER	CHANNEL						
ple Number									
ation:	NET/IMN Oul	<u>J</u>				Refer to plo		Measurem	
ector type:	Rms	_			VBW:	Refer to ple	ots	Distan	ce: N/A
t Equipme	ent Used								
nna:				Directi	onal Coupler:				
Amp:		_							
r:									
eiver:	1	_							
nuator #1:	7				Cable #4:				
nuator #2:					Mixer:				
tional equip									
surement U	ncertainty:	± 0.7 dB	_						
>		Marker			RBW	30 k		RF Att	20 dB
Ref L	vl		-28	.90 dBm	VBW	300 k	Hz		
	dBm	2	2.13750	000 GHz	SWT	200 m	s T	nit	dBm
30.	2 dB Offs	et				<b>v</b> <sub>1</sub>	[T1]	-2	8.90 dBm
30									0000 GHz
			"W#\\//\V	William	hale washed		2		
		,		]		NA VA	,	3.9879	7595 MHz
20		7	<del>-</del>			$\nabla_{\mathrm{T}}$	[T1]	1	7.72 dBm
		<i> </i>					١	2.13050	0601 GHz
						⊽ೡು	[T1]	2	1.41 dBm
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							1	2.13449	399 GHz
0									
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L 0							1		
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10									
50								1	
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Notes:\_\_



Test report No.: 66937R2

# 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals PARA.NO.: 27.53(g), 2.1051

TESTED BY: Timo Hietala DATE: 01/06/2006

Test Results: Complies.

**Test Data:** See attached plots.

Frequency	Spurious Emission
(MHz)	(dBm)
1363.2	-26.2
4265.0	-32.2
6397.5	-37.0

### **Lower Band Edge**

Frequency	Peak Emission
(MHz)	Level (dBm)
2110.000	-15.1

#### **Upper Band Edge**

Frequency	Peak Emission
(MHz)	Level (dBm)
2155.057	-15.5

**Equipment used:** 1, 2, 3, 4, 7, 8, 9, 12, 13, 14

Measurement

Uncertainty:  $\pm 0.7 \text{ dB}$ .

Temperature: 23 °C.

Relative

Humidity: 35 %.



Test report No.: 66937R2

## **Test Data – Spurious Emissions**

Data Plot	Spurious Emis	ssions at Ar	<u>itenna Tei</u>	<u>minals</u>		
age <u>1</u> of <u>4</u>						olete <u>x</u>
ob No.: 69937	_	Date: 01/0			Prelimina	ary:
pecification: PT27	Tempe	rature (°C): umidity (%):	<u>23</u>			
ested By: Timo Hieta U.T.: WCDMA	TRANSMITTER	umidity (%):	35			
	POWER BOTTOM CHANNEL					
ample Number: 1	POWER BOTTOW CHANNEL					
ocation: NET/IMN	Oulu		RBW: Refer	n nlots	Measurem	ent
etector type: Peak			VBW: Refer			ce: N/A r
	<u>.                                    </u>		VDVV. IXOIOI	o pioto	Diotan	. <u>14/74</u> .
est Equipment Used						
ntenna:		Directional (	-			
re-Amp:		C	able #1:			
ter:		C	able #2:			
eceiver: 1			able #3:			
tenuator #1: 7		C	able #4:			
tenuator #2:			Mixer:			
dditional equipment used:	. 0.7 -ID					
easurement Uncertainty:	± 0.7 dB					
	Marker 1 [T1]		RBW 50	kHz	RF Att	15 dB
Ref Lvl	-15.	09 dBm	VBW 50	kHz		
34.3 dBm	2.110000	00 GHz	SWT 8.5	ms	Unit	dBm
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30.3 dB Of	tiset		<u> </u>	IM WIA I	<u> I MI M. J. I II M</u>	<del>▋▍▋</del> ▍▗▕▜▋■
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10			/ <b>1</b>			
			/ <b>!</b>			
0			/ <b>1</b>			1
			/ <b>1</b>			
0			/ <b>1</b>			
-10			/ <b>1</b>			
0		. 1	/ <b>1</b>			
-10 —D1 -13 dBm-			/ ·			
-10		<u> </u>	/ I			
-10 —D1 -13 dBm		<u> </u>	/ ·			
-10 -D1 -13 dBm-		<u> </u>				
-10 —D1 -13 dBm		<u> </u>				
-10 -D1 -13 dBm-		<u> </u>				
-10 -D1 -13 dBm-		<u> </u>				
-10 -D1 -13 dBm-		<u> </u>				
-10 -D1 -13 dBm-		<u> </u>				
-10 -D1 -13 dBm-		<u> </u>				
-10 -D1 -13 dBm-		<u> </u>				
-10 -D1 -13 dBm		<u> </u>				
-10 —D1 -13 dBm20 —30 —40 —50		<u> </u>				
-10 -D1 -13 dBm						
-10 —D1 -13 dBm		<u> </u>				

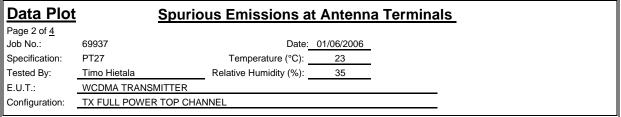
Notes: LOWER BANDEDGE, Tx 2112.6 MHz

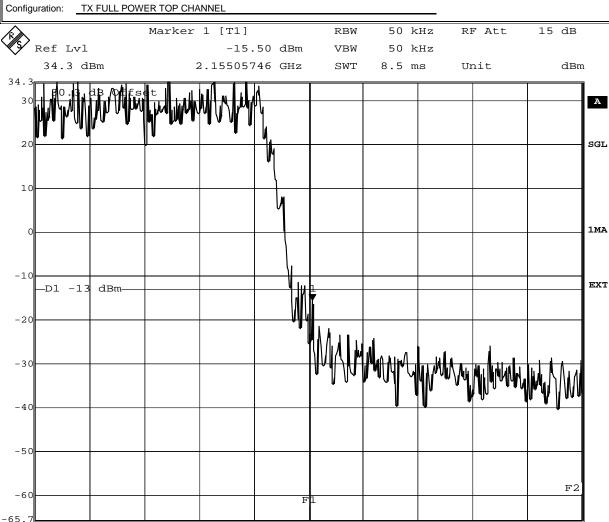


Test report No.: 66937R2

## **Test Data – Spurious Emissions**

Nemko Oy, Finland





819.2 kHz/

Date: 1.JUN.2006 12:44:00

Center 2.155 GHz

Notes: UPPER BANDEDGE, Tx 2152.4 MHz

Span 8.192 MHz



Test report No.: 66937R2

# **Test Data – Spurious Emissions**

ta Plot	I	<u>Spuri</u>	ous Emi	ssions a	t Antenn	a Term	<u>inals</u>		
e <u>3</u> of <u>4</u>								Com	plete <u>x</u>
No.:	69937				01/06/2006	•		Prelimin	ary:
cification:	PT27		Temp	erature (°C): lumidity (%):	23	<u>.</u>			
ted By:	Timo Hietala		Relative H	lumidity (%):	35				
.T.:	WCDMA TRA	NSMITTER							
figuration:	TX FULL POV	WER MIDDLE	CHANNEL						
nple Number									
ation:	NET/IMN Ou	lu			RBW:	Refer to pl	ots	Measuren	nent
ector type:	Peak				VBW:	Refer to pl	ots	Dista	nce: N/A
st Equipme	ent Used								
enna:				Directi	onal Coupler:				
Amp:					Cable #1:				
er:					Cable #2:				
eiver:	1								
nuator #1:	13				Cable #4:				
nuator #2:					Mixer:				
itional equip		. 0.7 -10							
isurement Ui	ncertainty:	± 0.7 dB	_						
>		Marker	1 [T1]		RBW	1 M	Hz	RF Att	26 dB
Ref L	vl		-26.	.16 dBm	VBW	1 M	Hz		
	dBm		1.363226	545 GHz	SWT	5	<u> </u>	Unit	dBr
.9 20.	9 dB Offs	set				<b>v</b> <sub>1</sub>	[T1]	-2	26.16 dBr
30								1.3632	2645 GHz
30						Π-			
						$\nabla_2$	[T1]	4	5.88 dBr
20								2.1310	2204 GHz
20									
10									
0							1		
10									
	13 dBm-								
20				1					
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40									
10									
5.0									
50									
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5 N L									
60 .1									

**Notes:** Tx 2132.5 MHz



Test report No.: 66937R2

# **Test Data – Spurious Emissions**

Data Plo	<u>ot</u>		Spuri	ous Em	issions a	t Antenn	na Terr	ninal	S			
Page <u>4</u> of <u>4</u>										Comp	lete x	
Job No.:	69	937			Date:	01/06/2006			P		ry:	
Specification:	P <sup>-</sup>	Γ27		Tem	perature (°C):	23						
Tested By:		mo Hietala		Relative	Humidity (%):	35	_					
E.U.T.:		CDMA TRAN	ISMITTER	_			_					
Configuration:		K FULL POW		CHANNEL								
Sample Numb		1	LICHIDDLL	OTHUR								
Location:		IET/IMN Oulu				RBW/·	Refer to	nlots	Me	asureme	ant	
Detector type:		Peak	_				Refer to		IVIC		ce: N/A	m
Detector type.		reak	_			VDVV.	Kelel to	piois		Distant	Je. IN/A	m
Test Equipr	nent	Used										
Antenna:					Direct	ional Coupler:						
Pre-Amp:			_									
Filter:		12	_									
Receiver:		1	_			Cable #3:						
Attenuator #1:		14				Cable #4:						
	_	14	_									
Attenuator #2: Additional equ		t used.	_			Mixer:						
Measurement	•		± 0.7 dB									
											0 15	
			Marker	1 [T1]		RBW		MHz	RF A	tt	0 dB	
Ref	Lvl			-32	.15 dBm	VBW	1	MHz				
-4.9	dB	m		4.26252	505 GHz	SWT	2	s	Unit		dBm	ı
-4.9	- 1	dB Offs						1				l
-10	.1	dB Offs	et									A
	-13	dBm										
-20												
-20												
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-30	₹											
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-90												
100												
-100												
-104												
Star	rt 3	GHz			1.8	GHz/				Stop	21 GHz	
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**Notes:** Tx 2132.5 MHz



Test report No.: 66937R2

# 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions PARA.NO.: 27.53(g), 2.1053

TESTED BY: Timo Hietala DATE: 01/06/2006

Test Results: Complies.

**Test Data:** See attached table.

Frequency	Spurious Emission
(MHz)	EIRP (dBm)
4305	-34.5
4915	-36.0

**Equipment used:** 15, 16, 17, 18, 19, 23, 24, 25, 26.

Measurement

Uncertainty: ± 5.2 dB.

Temperature: 23 °C.

Relative

Humidity: 35 %.

NOTE:

The spectrum was searched from 30 MHz to the 10th harmonic of the carrier.



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# **Test Data - Radiated Emissions**

Nemko Oy, Finland

<b>Data Plot</b>		Radiate	ed Emissi	ons	Substit	ution Me	thod			
Page <u>1</u> of <u>1</u>								Complete	х	_
Job No.:	69937			Date:_	01/06/2006			Preliminary:		_
Specification:	PT27		Temperat °) Relative Humi	'C): _	23					
Tested By:	Timo Hietala			%): _	35					
E.U.T.:	WCDMA TRANS	MITTER					_			
Configuration:	TX FULL POWER	R UPPER CH	HANNEL 2152.5	MHz			_			
Sample Number:	1									
Location:	NET/IMN Oulu				RBW:	1 MHz	_	Measurement		
Detector type:	Ave				VBW:	1 MHz	_	Distance:	3	_ m
Test Equipme	nt Used									
Antenna:	17 and 18		D	irectio	onal Coupler:					
Pre-Amp:	24				Cable #1:		_			
Filter:					Cable #2:					
Receiver:	16				Cable #3:					
Attenuator #1:	-				Cable #4:					
Attenuator #2:					Mixer:					
Additional equipm	nent used:	19,23,25 a	and 26							
Measurement Un	certainty:	± 5.2 dB								
				<u> </u>			-			_

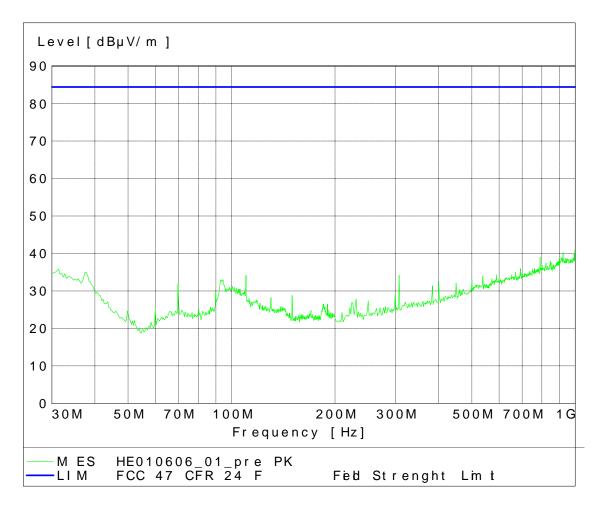
Frequency	Meter Reading	Correction	Gen. Level	Substitution Antenna Gain	EIRP	EIRP	Polarity	Comments
(MHz)	(dBm)	(dB)	(dBm)	(dBi)	(dBm)	(µW)		
4305	-64.59	16.85	-28.1	10.5	-34.5	0.36	VER	
4915	-65.82	17.39	-29.6	11.0	-36.0	0.25	VER	

All other indicated spurious were at least 20 dB below the relevant limit Searched spectrum to the 10<sup>th</sup> harmonic of carrier. Notes:



Test report No.: 66937R2

#### Test Data - Radiated Emissions 30 MHz -1000 MHz



#### Notes:

. 1)Limit line (84.4 dBuV/m) is converted from substitution limit (–13 dBm) to unit dBuV/m in 3 meter measurement distance.



Test report No.: 66937R2

# 7. Frequency stability

NAME OF TEST: Frequency stability PARA.NO.: 27.54, & 2.1055

TESTED BY: Timo Hietala DATE: 02/06/2006

Test Results: Complies.

**Standard Test Frequency:** 2132.5 MHz.

Standard Test Voltage: 48 V DC.

**Equipment used:** 10, 5, 11, 7, 8, 9.

**EUT:** WCDMA TRANSMITTER.

**Configuration:** TX FULL POWER MIDDLE CHANNEL.

Measurement Data: Frequency stability with voltage variation.

Voltage (V DC)	Temp (°C)	Rated (Hz/ppm)	Deviation (Hz)	Deviation (ppm)
48.0	20	106 / 0.05	28	0.013238
55.2	20	106 / 0.05	33	0.015522
40.8	20	106 / 0.05	34	0.015817

Measurement

Uncertainty:  $\pm 0.001 \text{ ppm } (\pm 2.0 \text{ Hz}).$ 

Relative

Humidity: 35 %.



Test report No.: 66937R2

NAME OF TEST: Frequency stability PARA.NO.: 27.54, & 2.1055

TESTED BY: Timo Hietala DATE: 02/06/2006

Test Results: Complies.

**Standard Test Frequency:** 2132.5 MHz.

Standard Test Voltage: 48 V DC.

**Equipment used:** 10, 5, 11, 7, 8, 9.

**EUT:** WCDMA TRANSMITTER.

**Configuration:** TX FULL POWER MIDDLE CHANNEL.

Measurement Data: Frequency stability with temperature variation.

Voltage (V DC)	Temp (°C)	Rated (Hz/ppm)	Deviation (Hz)	Deviation (ppm)
48.0	50	106 / 0.05	10	0.004689
48.0	40	106 / 0.05	24	0.011254
48.0	30	106 / 0.05	42	0.019695
48.0	10	106 / 0.05	54	0.025322
48.0	0	106 / 0.05	66	0.03095
48.0	-10	106 / 0.05	71	0.033294
48.0	-20	106 / 0.05	80	0.037515
48.0	-30	106 / 0.05	94	0.04408

Measurement

Uncertainty:  $\pm 0.001 \text{ ppm } (\pm 2.0 \text{ Hz}).$ 

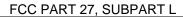


Test report No.: 66937R2

# 8. List of test equipment

Each active test equipment is calibrated annually.

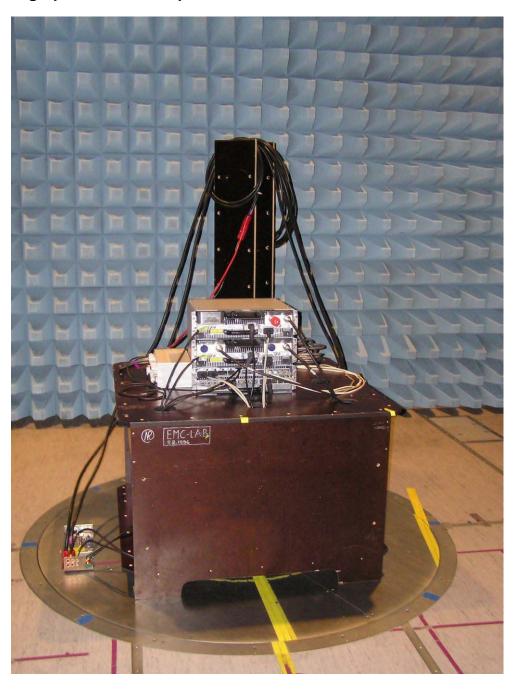
Nr.	Equipment	Name of equipment	Serial number
	Signal analyzer	Rohde & Schwarz:FSIQ26	836702/020
1	,	Tronde & Geriwarz.i Grężo	
2	Network analyzer	Hewlett-Packard:HP8753E	US38431868
3	Network analyzer	Hewlett-Packard:HP8720ES	US39172107
4	Calibration kit	Hewlett-Packard:HP85032B	2919A04843
5	Enviromental chamber	Weiss technick	59226012320010
6	Frequency standard	Datum 8040	23006282
7	Interface Unit	Orbis TX SSU2100A	SSU-0346-999
8	DC power	Sörensen	9950C0085
9	Temperature/humidity meter	VAISALA HMI 31	P3730008
10	Signal analyzer	Rohde & Schwarz:FSIQ26	833370/009
11	Frequency standard	Datum 8040	0041005473
12	High Pass filter	Reactel 9HSX-3/20-S11	0531
13	Attenuator	MCE/Weinschel 67-20-33	BM0633
14	Attenuator	MCE/Weinschel 66-20-34	BM6886
15	Semianechoic chamber	Siemens Matsushita	Product No
		$9m \times 5m \times 6m$	S&M B83317-
		(room 0039)	C6019-T232
16	EMI Test Receiver	R&S ESIB 26	100335
17	LogPer Antenna	R&S HL025	349048/002
			(1-26 GHz)
18	Bilog Antenna	Chase CBL6112B	2694
19	Horn Antenna	Emco 3115	0102A06346
20	Biconical Antenna	R&S HK116	836891/009
21	Dipole VHF	Mess-Elektronik VHA9103	
22	Dipole UHF	Mess-Elektronik UHA9105	
23	Signal Generator	R&S SMR 20	1715
24	Amplifier	Miteq AFSX4	791117
25	Antenna Mast	Deisel HD240	2401323194
26	Mast Controller	Deisel HD100	1001331





FCC ID: UAFFRIB-01 Type: FRIB Test report No.: 66937R2

# 9. Photographs of Test Setup

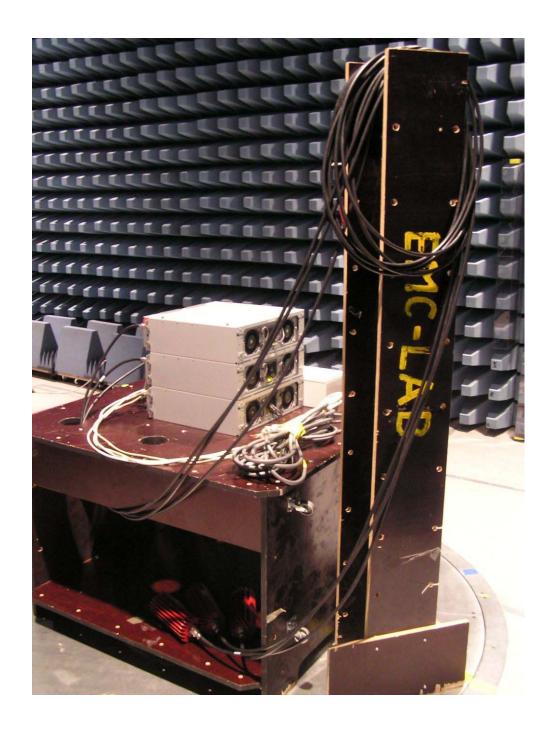






FCC ID: UAFFRIB-01

Type: FRIB Test report No.: 66937R2





Test report No.: 66937R2

#### 10. ANNEX A, TEST DETAILS

NAME OF TEST: RF Power Output PARA. NO.: 2.1046

Minimum Standard: Para. No. 27.50 (d). Base stations are limited to 1640 watts peak

E.I.R.P. with an antenna height up to 300 meters HAAT. In no case may the peak output power of a base station transmitter

exceed 100 watts.

#### **Method Of Measurement:**

CDMA Per ANSI/J-STD-014 TDMA Per ANSI/J-STD-010

#### Detachable Antenna:

The peak power at antenna terminals is measured using an in-line peak power meter or a spectrum analyzer.

#### NAME OF TEST: Occupied Bandwidth

Minimum Standard: Para. No. 2.1049. The 99% occupied bandwidth is the width of a

frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to

0.5% of the emitted power.

#### **Method Of Measurement:**

The 99% occupied bandwidth of the carrier emission is measured using a spectrum analyzer with Resolution Bandwidth set to 1% of the necessary bandwidth of the transmitted carrier.

NAME OF TEST: Spurious Emission at Antenna Terminals PARA. NO.: 2.1051

**Minimum Standard:** Para. No. 27.53(g). On any frequency outside a licensee's

frequency block, the power of any emission shall be attenuated below the transmitter power by at least 43 + 10  $\log$  (P) dB.

## **Method Of Measurement:**

Spectrum analyzer settings:

RBW: 1 MHz VBW: 1 MHz

Within 1 MHz of the upper and lower edges of the assigned band of operation the resolution bandwidth is lowered to 1 % of the 26 dB occupied bandwidth of the transmitted carrier.

PARA. NO.: 2.1049



Test report No.: 66937R2

NAME OF TEST: Field Strength of Spurious Radiation PARA. NO.: 2.1053

Minimum Standard: Para. No.227.53(g). On any frequency outside a licensee's

frequency block, the power of any emission shall be attenuated below the transmitter power by at least 43 + 10 log (P) dB.

**Test Method:** 

TIA/EIA-603-1992. Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to an isotropic. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic.

NAME OF TEST: Frequency Stability PARA. NO.: 2.1055

Minimum Standard: Para. No. 27.54. The frequency stability shall be sufficient to

ensure that the fundamental emission stays within the

authorized frequency block.

#### **Method Of Measurement:**

Frequency Stability With Voltage Variation

The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency error is measure. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation

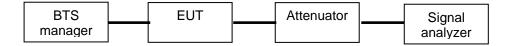
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency error is measured.



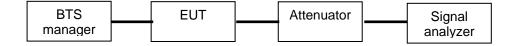
Test report No.: 66937R2

# 11. ANNEX B, TEST DIAGRAMS

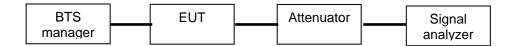
#### RF Power Output PARA. NO.: 2.1046



#### Occupied Bandwidth PARA. NO.: 2.1049



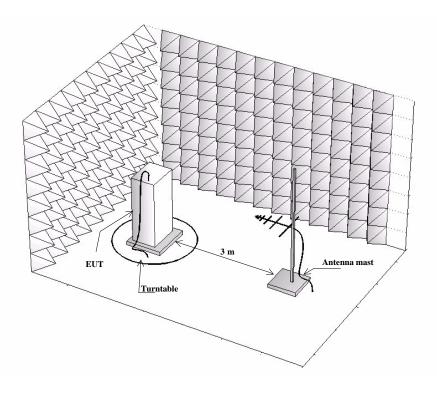
# Spurious Emission at Antenna Terminals PARA. NO.: 2.1051





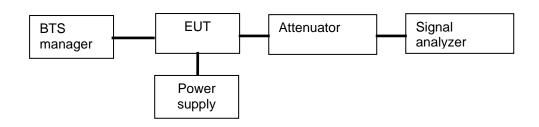
Test report No.: 66937R2

## Field Strength of Spurious Radiation PARA. NO.: 2.1053



# Frequency Stability PARA. NO.: 2.1055

# Frequency Stability With Voltage Variation



## Frequency Stability With Temperature Variation

