



LCIE

Radio test report in extreme conditions for the introduction of UMTS 850MHz Band V

Reference: 60053453-554611-R-TR

Version: A

Status: Approved

Date: 08/Mar/2007

Customer: ALCATEL- LUCENT France
Site de Châteaufort
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Product: UMTS Outdoor2 iBTS & UMTS Indoor2 iBTS

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09/03/2007

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PUBLICATION HISTORY

VERSION	DATE	AUTHOR	MODIFICATION
A	08/Mar/2007	J. PALARD	Creation of the document



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1. INTRODUCTION

This document presents the Radio tests in extreme conditions which have been performed for the introduction of UMTS 850MHz Band V on the UMTS Outdoor2 iBTS and UMTS Indoor2 iBTS.

The tests have been performed on the following BTS:

For radio tests at high temperature, on the UMTS Outdoor2 iBTS configured as follows:

<i>Product</i>	:	UMTS Outdoor2 iBTS
<i>Trademark</i>	:	Nortel
<i>Frequencies</i>	:	UMTS 850MHz
<i>Configuration</i>	:	STSR1+1 (6 UMTS 850MHz MCPA 45W)

For radio tests at low temperature, on the UMTS Indoor2 iBTS configured as follows:

<i>Product</i>	:	UMTS Indoor2 iBTS
<i>Trademark</i>	:	Nortel
<i>Frequencies</i>	:	UMTS 850MHz
<i>Configuration</i>	:	OTOR1 (1 UMTS 850MHz MCPA 45W configured at 30W)

The test were done during Week 06 and 07 of 2007 in the LCIE laboratory at Fontenay Aux Roses (FRANCE)

This document is addressed to all person impacted by the introduction of UMTS 850MHz Band V in Alcatel-Lucent products.

2. RELATED DOCUMENTS

2.1. APPLICABLE STANDARDS

[A1]	3GPP TS 25.141	3 rd generation partnership project: Technical Specification Group Radio Access Networks; Base Station (BS) conformance testing (FDD), Version 6.15 (2006-10)
[A2]	3GPP TS 25.104	3 rd generation partnership project: Technical Specification Group Radio Access Networks; UTRA (BS) FDD ; Radio transmission and reception, Version 6.13.0 (2006-06)
[A3]	EN 301 908-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (EU) for IMT-2000 Third-Generation cellular networks; Part 1: Harmonized EN for IMT-2000, introduction and common requirements, covering essential requirements of article 3.2 of the R&TTE Directive
[A4]	EN 301 908-3	Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (EU) for IMT-2000 Third-Generation cellular networks; Part 3: Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD) (BS) covering essential requirements of article 3.2 of the R&TTE Directive
[A5]	47 CFR Part 1	PRACTICE AND PROCEDURE
[A6]	47 CFR Part 2	FREQUENCY ALLOCATIONS AND RADIO
[A7]	47 CFR Part 22	PUBLIC MOBILE SERVICES
[A8]	47 CFR part 15	RADIO FREQUENCY DEVICES

2.2. REFERENCE DOCUMENTS

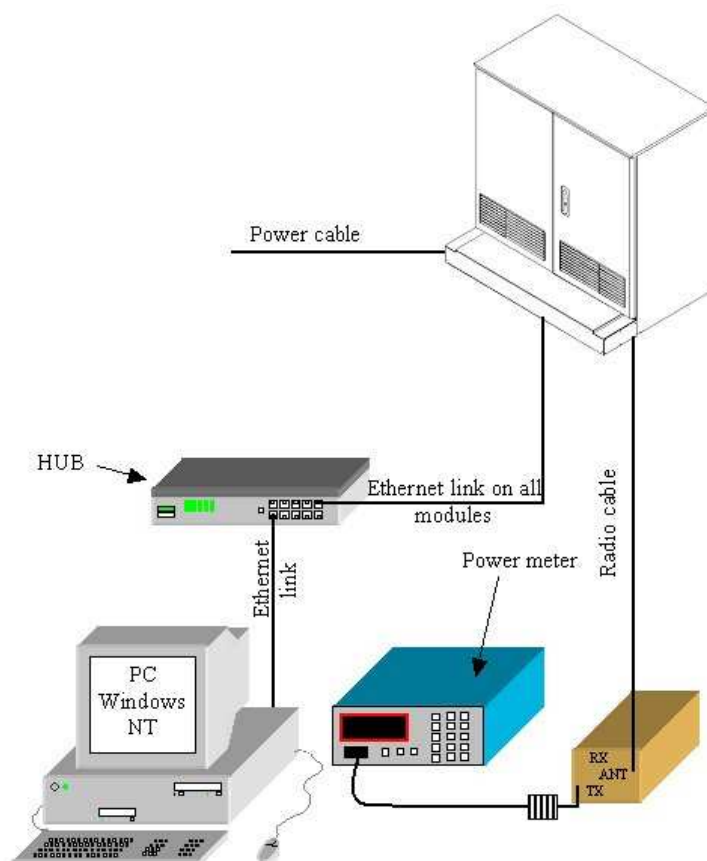
[R1]	UMT/BTS/DPL/020728	UMTS 850 MHz BTS Project Qualification Plan (Ver 01.03/EN)
[R2]	UMT/BTS/DPL/021353	Radio Tests plan for the introduction of UMTS 850MHz Band V (Ver 01.01/EN)
[R3]	UMT/BTS/DJD/021529	Hardware delivery form for 850MHz UMTS Outdoor2 iBTS (Ver 01.02/EN)
[R4]	UMT/BTS/DJD/021686	Hardware delivery form for 850MHz UMTS Indoor2 iBTS (Ver 01.01/EN)

3. APPARATUS USED FOR TESTS

ID	Instrument/Ancillary	Type	Manufacturer	Serial number	Calibration date due
ESG	ESG-D	E4438C	Agilent	571162	12/2007
VSA	VSA	E4406A	Agilent	571313	03/2008
CO	Counter	RACAL 1992	RACAL - DANA	B2083017	08/2007
SG1	High stability signal generator	8657B	HP	A5442019	03/2008
PCM	PCM analyser	ANT 20	W&G	A4040008	07/2008
PM	Power meter	8542C	Gigatronics	A1503009	09/2008
-	Power supply	3 x 5001i	California	A7043043	-
-	Power supply	DHP series	Sorensen	A7043032	-
-	Multimeter	34401A	HP	A1240166	08/2007
-	Powermeter	WT110	Yokogawa	A1502029	10/2007
-	Thermal Recorder	3852A	HP	B4046057	05/2007
-	Climatic chamber	Climats, 30m3	Climats	D1025026	03/2007
-	Thermal Recorder	3852A	HP	B4046056	04/2007
-	Climatic chamber	Climats, 12m3	Climats	D1024020	03/2007

4. DESCRIPTION OF TEST BENCHES

4.1. TEST BENCH USED FOR CLAUSE 6.2.1 OF 3GPP TS 25.141 STANDARD AND FOR CLAUSE 2.1046 AND 22.913 OF FCC PART 22



5. IDENTIFICATION OF EQUIPMENTS UNDER TEST

The radio tests, at high temperature, have been performed on a Base Transceiver Station configured as follows:

Product : UMTS Outdoor2 iBTS
Trademark : NORTEL
Frequencies : UMTS 850MHZ
RF Configuration : STSR1+1 (6 UMTS 850MHz MCPA 45W)

The UMTS Outdoor2 iBTS used to perform the test is described in the following table on the next pages. (For more details, see [R3] Nortel document)

The radio tests, at low temperature, have been performed on a Base Transceiver Station configured as follows:

Product : UMTS Indoor2 iBTS
Trademark : NORTEL
Frequencies : UMTS 850MHZ
RF Configuration : OTOR1 (1 UMTS 850MHz MCPA 45W configured at 30W)

The UMTS Indoor2 iBTS used to perform the test is described in the following table on the next pages. (For more details, see [R4] Nortel document)

5.1. HARDWARE CONFIGURATION OF UMTS OUTDOOR2 IBTS

Note: Exact reference and location of modules used for the RF tests are given in chapter 6.1.

ARTICLE	PEC code	Release	Serial number	Comment
BARE CABINET & ECU	NTT91550	01	NNTMC3002DY9	BTS ID 449256
CAB: PREWIRED W BAT/SBS60 OUT2	NTU770BF	01	NNTMC3002E2W	
xTRM 850	NTBY17BA	P1	CDN200646012	@ip : 136.147.42.110
xTRM 850	NTBY17BA	P1	CDN200646007	@ip : 136.147.42.113
xTRM 850	NTBY17BA	P1	CDN200646008	@ip : 136.147.42.109
iCCM shelf ASSY	NTUM26AF	01	NNTM750543JL	
iCCM2 board	NTUM25CS	01	NNTM750543JJ	@ip : 136.147.43.126
iCCM shelf ASSY	NTUM26AF	01	NNTM750542KH	
iCCM2 board	NTUM25CS	01	NNTM750542KJ	@ip : 136.147.43.131
iCEM2 64	NTUM00CG	D1	CDN200609016	@ip : 136.147.47.108
iCEM2 128	NTUM00DG	01	NNTM750546X0	@ip : 136.147.43.121
iCEM2 128	NTUM00DG	01	NNTM7505319U	@ip : 136.147.43.119
iCEM2 128	NTUM00DG	01	NNTM75053M08	@ip : 136.147.43.122
GPSAM	NTUM24AF	01	NNTM7505479Y	
MCPA 45W 850	NTUM30EA	01	ANDWCS00003T	
MCPA 45W 850	NTUM30EA	01	ANDWCS0000VT	
MCPA 45W 850	NTUM30EA	01	ANDWCS00015T	
MCPA 45W 850	NTUM30EA	01	ANDWCS00002T	
MCPA 45W 850	NTUM30EA	01	ANDWCS00006T	
MCPA 45W 850	NTUM30EA	01	ANDWCS0000YT	
DDM 850	NTUM40HA	D1	FORM01764076	
DDM 850	NTUM40HA	D1	FORM01764061	
DDM 850	NTUM40HA	D1	FORM01764068	
DDM 1900	NTUM42AA	P1	FORM01332168	
DDM 1900	NTUM42AA	P1	FORM01332166	
DDM 1900	NTUM42AA	P1	FORM01332185	

ARTICLE	PEC code	Release	Serial number	Comment
UCPS Rectifier 1400W	NTN070BF	03	ATSNZH141248	Artesyn Rectifier
UCPS Rectifier 1400W	NTN070BF	03	ATSNZH141286	Artesyn Rectifier
UCPS Rectifier 1400W	NTN070BF	03	ATSNZH141245	Artesyn Rectifier
UCPS Rectifier 1000W	NTW703BF	01	ATSNZH122270	Artesyn Rectifier
UCPS Rectifier 1000W	NTW703BF	01	ATSNZH126951	Artesyn Rectifier
ECU W HEATER OPTION	NTT971CQ	01	NNTM7504Y778	
Kit Heater Option: ECU	NTT991VF	01	NNTMG0050E6	
RF ICO	NTU720HG	01	NNTMC3002E3D	
CCU	NTUM44AF	01	ATSNZH100552	
MCA	NTBY90AF	01	NNTMC3002E0X	
ADU	NTT970AF	01	ATSNCR220225	
DDU	NTN066AA	01	ATSNZH104939	
LLPCM	NTU784CF	01	NNTMC3200KBJ	
External Alarm Box	NTU784BF	01	NNTMC3200LZO	
User ICO "4 fuses"	NTT970BF	01	NNTMGT0051EY	

Additional delivery:

ARTICLE	PEC code	Release	Serial number	Comment
UCPS Rectifier 1400W	NTN070BF	03	ATSNZH141247	Artesyn Rectifier
UCPS Rectifier 1400W	NTN070BF	03	ATSNZH141246	Artesyn Rectifier
UCPS Rectifier 1000W	NTW703BF	01	ATSNZH055894	Artesyn Rectifier
UCPS Rectifier 1000W	NTW703BF	01	ATSNZH055895	Artesyn Rectifier
UCPS Rectifier 1000W	NTW703BF	01	ATSNZH055896	Artesyn Rectifier
T1 PCM installation cable	NTQG41HA			Equipped with banana plugs
850 Mhz « Tool DDM »	NTQA38DA	P1	CDN200209003	
2 alarms cables	NTU795AF			CPC : N0086796
UCPS Rectifier filler	NTW70351			
3 DDM Filler				
3 DDM/Bulkhead cables	NTU779EA			Lambda/4 850

5.2. HARDWARE CONFIGURATION OF UMTS INDOOR2 IBTS

Note: Exact reference and location of modules used for the RF tests are given in chapter 6.1.

ARTICLE	PEC code	Release	Serial number	Comment
CAB: PRECAB INDOOR2	NTBY06AF	01	NNTMC3102YLC	RoHS BTS with DBP600 (ID 449078)
Indoor Cooling Unit	NTBY58AF	01	NNTMC3102YRT	
xTRM 850	NTBY17BA	P1	CDN200647002	@ip : 136.147.42.112
xTRM 850	NTBY17BA	P1	CDN200647001	@ip : 136.147.42.105
xTRM 850	NTBY17BA	P1	CDN200646004	@ip : 136.147.42.111
iCCM shelf ASSY	NTUM26AF	01	NNTM75052C5P	
iCCM2 board	NTUM25CS	01	NNTM75052C5O	@ip : 136.147.42.108
iCCM shelf ASSY	NTUM26AF	01	NNTM750542KA	
iCCM2 board	NTUM25CS	01	NNTM750542K1	@ip : 136.147.47.57
iCEM2 64	NTUM00CG	D1	CDN200609011	@ip : 136.147.47.117
iCEM2 128	NTUM00DG	01	NNTM75054HCT	@ip : 136.147.42.106
iCEM2 128	NTUM00DG	01	NNTM75053LZR	@ip : 136.147.47.47
iCEM2 64	NTUM00CG	01	CDN200609015	@ip : 136.147.47.101
GPSAM	NTUM24AF	01	NNTM750545T6	
MCPA 45W 850	NTUM30EA	01	ANDWCS0000TT	
MCPA 45W 850	NTUM30EA	01	ANDWCS0000RT	
MCPA 45W 850	NTUM30EA	01	ANDWCS00007T	
MCPA 45W 850	NTUM30EA	01	ANDWCS00010T	
MCPA 45W 850	NTUM30EA	01	ANDWCS00019T	
MCPA 45W 850	NTUM30EA	01	ANDWCS0001FT	
DDM 850	NTUM40HA	D1	FORM01764059	
DDM 850	NTUM40HA	D1	FORM01764060	
DDM 850	NTUM40HA	D1	FORM01764062	

ARTICLE	PEC code	Release	Serial number	Comment
INTERCO	NTBY76AF	01	NNTMC3102YEX	
DIGITAL SHELF	NTBY72CF	01	NNTMC3102YE9	
MCA	NTBY90AF	01	NNTMC3102YM2	
LPPCM (PCM Lightning protection)	NTBY14BF	01	NNTMC3200MC6	
IEAM (External Alarm Module)	NTBY98AF	01	NNTMC3200NIT	

Additional delivery:

ARTICLE	PEC code	Release	Serial number	Comment
T1 PCM installation cable	NTBY60TA			Equipped with banana plugs
2 alarms cables	NTBY6152			
3 DDM Fillers	NTUM41BF			
2 PA Fillers	NTUM31AG			
6 Digital Fillers	NTUM20MC			
1 CCM1&2/Bulkhead PCM cable	NTBY60GF			
1 TRM3/Interco cable	NTBY60MA			

6. RADIO TESTS ON UMTS OUTDOOR2 IBTS AND UMTS INDOOR2 IBTS FOR INTRODUCTION OF UMTS 850MHZ BAND V

6.1. INTRODUCTION

The UMTS Outdoor2 iBTS has been tested at +50°C in the following configuration **A** :

- STSR1+1 (6 UMTS 850MHz MCPA 45W at 45W)

The UMTS Indoor2 iBTS has been tested at -5°C in the following configuration **B** :

- OTOR1 (1 UMTS 850MHz MCPA 45W configured at 30W)

No tests have been performed on the UMTS Outdoor2 iBTS at -40°C, as the module in the UMTS Outdoor2 iBTS are warmer than the module in the UMTS Indoor2 iBTS when the UMTS Indoor2 iBTS is at -5°C.

No tests have been performed on the UMTS Indoor2 iBTS at +45°C, as the module in the UMTS Indoor2 iBTS are colder than the module in the UMTS Outdoor2 iBTS when the UMTS Outdoor2 iBTS is at +50°C.

In fact, the two more critical configurations have been tested on the UMTS Outdoor2 iBTS and UMTS Indoor2 iBTS.

Note:

For 3GPP Test:

- For STSR1+1 configuration, measure at T frequency performed on sector 1, Alpha main, (MCPA 45W in slot 1), measure at M frequency performed on sector 2, Beta main (MCPA 45W in slot 3), measure at B frequency performed on sector 3, Gamma main (MCPA 45W in slot 5)
- For OTOR1 configuration, measure at B, M, T frequencies performed on sector 1, Alpha main (MCPA 45W in slot 1)

For FCC Test:

- For STSR1+1 configuration, measure only performed at T frequency on sector 1, Alpha main, (MCPA 45W in slot 1)
- For OTOR1 configuration, measure only performed at B frequency on sector 1, Alpha main (MCPA 45W in slot 1)

References of modules used for the radio tests on UMTS Outdoor2 iBTS in STSR1+1 configuration:

Module	PEC code	Serial number
UMTS 850MHz MCPA 45W (slot 1)	NTUM30EA 01	ANDWCS00003T
UMTS 850MHz MCPA 45W (slot 3)	NTUM30EA 01	ANDWCS00015T
UMTS 850MHz MCPA 45W (slot 5)	NTUM30EA 01	ANDWCS00006T
XTRM (slot 3)	NTBY17BA P1	CDN200646012
iCEM-2 128 (Slot 7)	NTUM00DG 01	NNTM750546X0
ICCM-2 (Slot 5)	NTUM25CS 01	NNTM750542KJ

Note: Slot 2, 4 and 6 was also equipped with UMTS 850MHz MCPA 45W (NTUM30EA 01)

References of modules used for the radio tests on UMTS Indoor2 iBTS in OTOR1 configuration:

Module	PEC code	Serial number
UMTS 850MHz MCPA 45W (slot 1)	NTUM30EA 01	ANDWCS0000TT
XTRM (slot 3)	NTBY17BA P1	CDN200647002
iCEM-2 128 (Slot 7)	NTUM00DG 01	NNTM75054HCT
ICCM-2 (Slot 5)	NTUM25CS 01	NNTM75052C5O

6.2. SYNTHESIS OF TESTS RESULTS FOR ALL VARIANTS

For 3GPP TS 25.141:

Identification	Description of UMTS parts	Configuration Code	
		A	B
UMTS Outdoor2 iBTS	STSR1+1 45W (+50°C)	X	
UMTS Indoor2 iBTS	OTOR1 30W (-5°C)		X
Clause number	Description	Test Status (note)	
6.2.1	Base station maximum output power	P	P
6.3	Frequency error (TM4, Pmax-18)	P	P
7.2	Reference sensitivity level	P	P

For FCC part 22:

Identification	Description of UMTS parts	Configuration Code	
		A	B
UMTS Outdoor2 iBTS	STSR1+1 45W (+50°C)	X	
UMTS Indoor2 iBTS	OTOR1 30W (-5°C)		X
Clause number	Description	Test Status (note)	
2.1046 & 22.913	Base station maximum output power	P	P
2.1055 & 22.355	Frequency stability (TM4, Pmax-18)	P	P

Note : P = Pass, F = Fail, NT = Not Tested, N/A = Not Applicable

6.3. TESTS RESULTS OF 3GPP TS 25.141 STANDARD

6.3.1 BASE STATION MAXIMUM OUTPUT POWER (CL. 6.2.1)

6.3.1.1 AT HIGH TEMPERATURE ON UMTS OUTDOOR2 IBTS

Ambient Temperature : +50°C
Configuration code: A
Site configuration type : STSR1+1 (6 UMTS 850MHz MCPA 45W at 45W)
Output power : 46,5 dBm at power amplifier output
Test model: 1, Pmax

Tests results:

Emission frequency	Ambient temperature (°C)	Input voltage (Vac)	BS max output power(dBm)
B	50	187	45,7
B	50	264	45,7
M	50	187	45,9
M	50	264	45,9
T	50	187	45,8
T	50	264	45,8

Requirements of the clause 6.2.1:

Maximum Output Power	
Extreme Conditions	45.0 dBm \pm 1.5 dB

Result

The UMTS Outdoor2 iBTS passed the requirement of this clause.

6.3.1.2 AT LOW TEMPERATURE ON UMTS INDOOR2 IBTS

Ambient Temperature : -5°C
Configuration code: B
Site configuration type : OTOR1 (1 UMTS 850MHz MCPA 45W configured at 30W)
Output power : 44.7 dBm at power amplifier output
Test model: 1, Pmax

Tests results:

Emission frequency	Ambient temperature (°C)	Input voltage (Vdc)	BS max output power(dBm)
B	-5	-40.5	43,9
B	-5	-57	43,9
M	-5	-40.5	44,0
M	-5	-57	44,0
T	-5	-40.5	43,9
T	-5	-57	43,9

Requirements of the clause 6.2.1:

Maximum Output Power	
Extreme conditions	43.2 dBm \pm 1.5 dB

Result

The UMTS Indoor2 iBTS passed the requirement of this clause.

6.3.2 FREQUENCY ERROR FOR TM4, PMAX-18 (CL. 6.3)

6.3.2.1 AT HIGH TEMPERATURE ON UMTS OUTDOOR2 IBTS

Ambient Temperature : +50°C
Configuration code: A
Site configuration type : STSR1+1 (6 UMTS 850MHz MCPA 45W at 45W)
Output power : 46,5 dBm at power amplifier output
Test model: 4, Pmax-18, synchro SCH

Tests results:

Emission frequency	Ambient temperature (°C)	Input voltage (Vac)	Maximal Frequency error (Hz)
B	50	187	22,94
B	50	264	-17,22
M	50	187	25,11
M	50	264	-21,71
T	50	187	-24,60
T	50	264	26,92

Note : Only the maximal value (positive or negative) has been noted in the table, therefore frequency error measurements have been performed during 5 hours for B frequency, 3 hours for M frequency and 20 hours for T frequency. All measurements performed were under 0,05 ppm.

Requirements of the Clause 6.3:

Frequency error	
Extreme conditions	0,05 ppm (0 Hz \pm 45 Hz)

Result

The UMTS Outdoor2 iBTS passed the requirement of this clause.

6.3.2.2 AT LOW TEMPERATURE ON UMTS INDOOR 2 IBTS

Ambient Temperature : -5°C
Configuration code: B
Site configuration type : OTOR1 (1 UMTS 850MHz MCPA 45W configured at 30W)
Output power : 44.7 dBm at power amplifier output
Test model: 4, Pmax-18, synchro SCH

Tests results:

Emission frequency	Ambient temperature (°C)	Input voltage (Vdc)	Maximal Frequency error (Hz)
B	-5	-40.5	-32,18
B	-5	-57	32,62
M	-5	-40.5	30,23
M	-5	-57	-29,7
T	-5	-40.5	25,96
T	-5	-57	-24,27

Note : Only the maximal value (positive or negative) has been noted in the table, therefore frequency error measurements have been performed during 19 hours for B frequency, 15 hours for M frequency and 3 hours for T frequency. All measurements performed were under 0,05 ppm.

Requirements of the Clause 6.3:

Frequency error	
Extreme conditions	0,05 ppm (0 Hz \pm 45 Hz)

Result

The UMTS Indoor2 iBTS passed the requirement of this clause.

6.3.3 REFERENCE SENSITIVITY LEVEL (CL. 7.2)

6.3.3.1 AT HIGH TEMPERATURE ON UMTS OUTDOOR2 IBTS

Ambient Temperature : +50°C
Configuration code: A
Site configuration type : STSR1+1 (6 UMTS 850MHz MCPA 45W at 45W)
Output power : 46,5 dBm at power amplifier output
Test model: 1, Pmax, Useful RX signal at -123dBm

Tests results:

Emission frequency	Ambient temperature (°C)	Input voltage (Vdc)	Max Bit Error Ratio (BER in %)
B	50	187	0,0041
B	50	264	0,0027
M	50	187	0,0137
M	50	264	0,0068
T	50	187	0,0082
T	50	264	0,0096

Note : Only maximum BER measurements has been noted in the table, therefore BER measurements have been performed during 5 hours for B frequency, 15 hours for M frequency and 4 hours for T frequency. All measurements were under 0.1%.

Requirements clause 7.2:

BER	< 0.1%
-----	--------

Result

The UMTS Outdoor2 iBTS passed the requirement of this clause.

6.3.3.2 AT LOW TEMPERATURE ON UMTS INDOOR 2 IBTS

Ambient Temperature : -5°C
Configuration code: B
Site configuration type : OTOR1 (1 UMTS 850MHz MCPA 45W configured at 30W)
Output power : 44.7 dBm at power amplifier output
Test model: 1, Pmax, Useful RX signal at -123dBm

Tests results:

Emission frequency	Ambient temperature (°C)	Input voltage (Vdc)	Max Bit Error Ratio (BER in %)
B	-5	-40.5	0,0041
B	-5	-57	0
M	-5	-40.5	0
M	-5	-57	0
T	-5	-40.5	0,096
T	-5	-57	0,0219

Note : Only maximum BER measurements has been noted in the table, therefore BER measurements have been performed during 3 hours for B frequency, 3 hours for M frequency and 2 days and 16 hours for T frequency. All measurements were under 0.1%.

Requirements clause 7.2:

BER	< 0.1%
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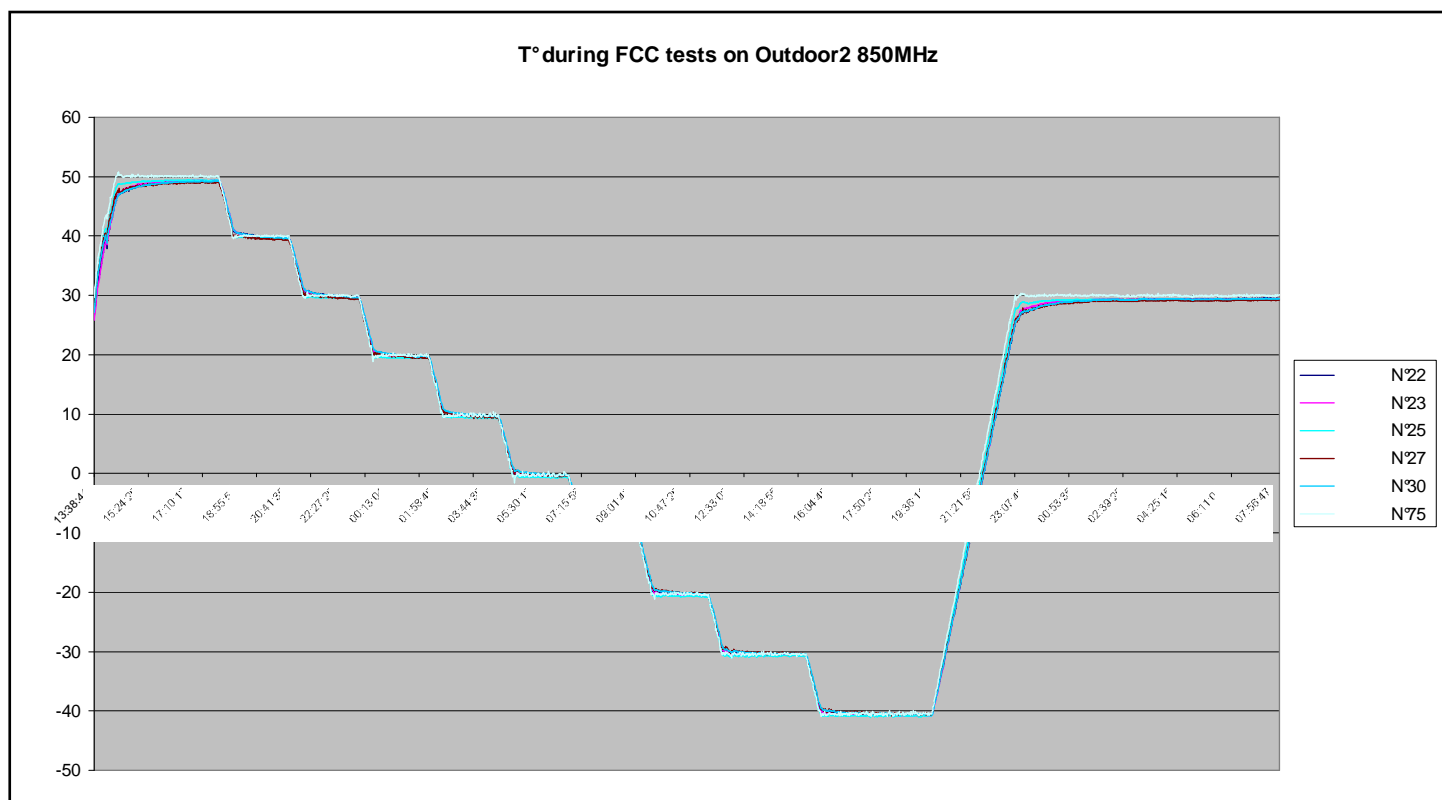
Result

The UMTS Indoor2 iBTS passed the requirement of this clause.

6.4. TESTS RESULTS OF FCC PART 2 & 22 STANDARD

6.4.1 TEMPERATURES DURING FCC TESTS

On UMTS Outdoor2 iBTS



50°C during 4 Hours

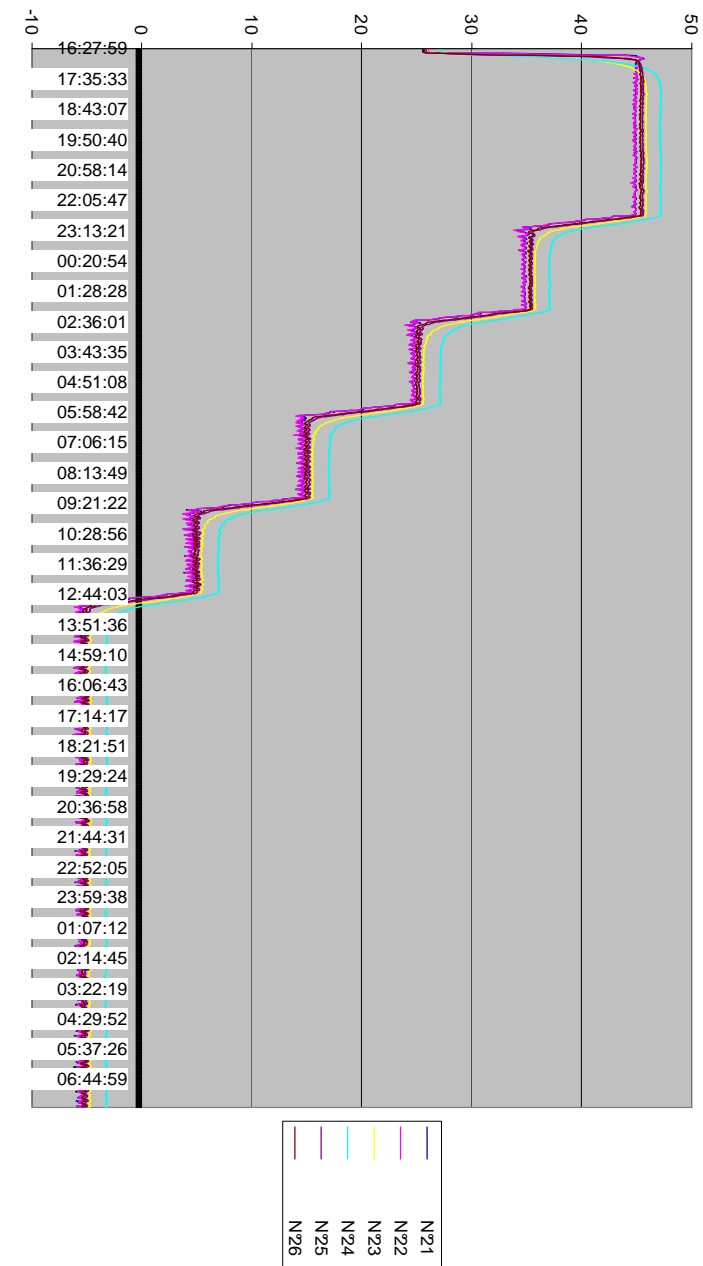
40°C, 30°C, 20°C, 10°C, 0°C, -10°C, -20°C during 2 Hours

-30°C during 3 hours

-40°C during 4 hours

On UMTS Indoor2 BTS

T° during FCC tests on Indoor2 850MHz



45°C during 5 Hours
35°C, 25°C, 15°C, 5°C during 3 Hours
-5°C during 18 hours

6.4.2 BASE STATION MAXIMUM OUTPUT POWER (CL. 2.1046 & 22.913)

6.4.2.1 ON UMTS OUTDOOR2 IBTS

Ambient Temperature : +50°C and -40°C
Configuration code: A
Site configuration type : STSR1+1 (6 UMTS 850MHz MCPA 45W at 45W)
Output power : 46,5 dBm at power amplifier output
Test model: 1, Pmax

Tests results:

Emission frequency	Ambient temperature (°C)	Input voltage (Vac)	BS max output power(dBm)	Nominal Output Power (dBm)
T	50	187	45,8	45.0 dBm \pm 1.5 dB
T	50	264	45,8	45.0 dBm \pm 1.5 dB
T	-40	187	45,9	45.0 dBm \pm 1.5 dB
T	-40	264	45,9	45.0 dBm \pm 1.5 dB

Requirements of the clause 2.1046 & 22.913:

Maximum ERP	
Extreme Conditions	500 watts (57dBm)

Result

The UMTS Outdoor2 iBTS passed the requirement of this clause.

The installation team should verify the conformity to 47 CFR - Chapter I - Part 22 - §22.913 considering the base station output power, the feeder losses and antenna gain.

6.4.2.2 ON UMTS INDOOR2 IBTS

Ambient Temperature : +45°C and -5°C
Configuration code: B
Site configuration type : OTOR1 (1 UMTS 850MHz MCPA 45W configured at 30W)
Output power : 44.7 dBm at power amplifier output
Test model: 1, Pmax

Tests results:

Emission frequency	Ambient temperature (°C)	Input voltage (Vac)	BS max output power(dBm)	Nominal Output Power (dBm)
T	50	187	43,8	43.2 dBm ± 1.5 dB
T	50	264	43,8	43.2 dBm ± 1.5 dB
T	-40	187	43,9	43.2 dBm ± 1.5 dB
T	-40	264	43,9	43.2 dBm ± 1.5 dB

Requirements of the clause 2.1046 & 22.913:

Maximum ERP	
Extreme Conditions	500 watts (57dBm)

Result

The UMTS Indoor2 iBTS passed the requirement of this clause.

The installation team should verify the conformity to 47 CFR - Chapter I - Part 22 - §22.913 considering the base station output power, the feeder losses and antenna gain.

6.4.3 FREQUENCY STABILITY (CL. 2.1055 & 22.355)

6.4.3.1 ON UMTS OUTDOOR2 IBTS

Ambient Temperature : +50°C to -40°C with step of 1 0°C
Configuration code: A
Site configuration type : STSR1+1 (6 UMTS 850MHz MCPA 45W at 45W)
Output power : 46,5 dBm at power amplifier output
Test model: 4, Pmax-18, synchro SCH

Tests results:

Emission frequency	Ambient temperature (°C)	Input voltage (Vac)	Maximal Frequency error (Hz)
T	50	187	22,94
T	50	264	-17,22
T	40	187	-20,43
T	40	264	18,98
T	30	187	-23,67
T	30	264	16,41
T	20	187	22,20
T	20	264	-22,18
T	10	187	19,02
T	10	264	-18,86
T	0	187	-27,43
T	0	264	18,88
T	-10	187	23,74
T	-10	264	-17,88
T	-20	187	16,16
T	-20	264	-17,20
T	-30	187	-23,67
T	-30	264	21,52
T	-40	187	23,75
T	-40	264	-29,31

Note : Frequency error measurements have been performed on the UMTS Outdoor 2 during all the duration of the curve given in clause 6.4.1. Freq error < 1,5 ppm for all measurements.

Requirements of the Clause 2.1055 & 22.355:

Frequency error	
Extreme conditions	1,5 ppm

Result

The UMTS Outdoor2 iBTS passed the requirement of this clause.

6.4.3.2 ON UMTS INDOOR2 IBTS

Ambient Temperature : +40°C to -5°C with step of 10 °C
Configuration code: B
Site configuration type : OTOR1 (1 UMTS 850MHz MCPA 45W configured at 30W)
Output power : 44.7 dBm at power amplifier output
Test model: 4, Pmax-18, synchro SCH

Tests results:

Emission frequency	Ambient temperature (°C)	Input voltage (Vdc)	Maximal Frequency error (Hz)
B	45°C	-40,5Vdc	25,65
B	45°C	-57Vdc	-29,66
B	35°C	-40,5Vdc	21,62
B	35°C	-57Vdc	-25,81
B	25°C	-40,5Vdc	-26,38
B	25°C	-57Vdc	19,52
B	15°C	-40,5Vdc	21,94
B	15°C	-57Vdc	-28,69
B	5°C	-40,5Vdc	-27,74
B	5°C	-57Vdc	25,60
B	-5°C	-40,5Vdc	-32,18
B	-5°C	-57Vdc	32,62

Note : Frequency error measurements have been performed on the UMTS Indoor2 during all the duration of the curve given in clause 6.4.1. Freq error < 1,5 ppm for all measurements.

Requirements of the Clause 2.1055 & 22.355:

Frequency error	
Extreme conditions	1,5 ppm

Result

The UMTS Indoor2 iBTS passed the requirement of this clause.

7. CONCLUSION

The UMTS Outdoor2 iBTS and UMTS Indoor 2 iBTS in UMTS 850MHz Band V comply with requirements of

- Clauses 6.2.1, 6.3, 7.2 of the 3GPP TS 25.141 standard Version 6.15 (2006-10)
- EN 301 908-1 and EN 301 908-3 standards for measurements in extreme environment.
- Clauses 2.1046, 22.913, 2.1055 and 22.355 of FCC part 2 & 22 standard.

8. ABBREVIATIONS AND DEFINITIONS

8.1. ABBREVIATIONS

3GPP	3 rd Generation Partnership Project
A	Ampere
AC	Alternative Current (Power Source)
ADU	AC Distribution Unit
ALPRO	Alarm Protection
ARFCN	Absolute Radio Frequency Channel Number
BER	Bit Error Rate
BLER	Block Error Ratio
BTS	Base Station Transceiver Subsystem or Base Transceiver Station
CFR	Code of Federal Regulations
CPICH	Common Pilot Channel
CSU	Channel Service Unit
DC	Direct Current (Power Source)
DCH	Dedicated Channel
E1	European Standard For PCM Link Interface (2.048mbit/S)
ECU	Environmental Control Unit
ESG	E Signal Generator
ETS	European Telecommunication Standard
ETSI	European Telecommunication Standard Institute
EUT	Equipment Under Test
EVM	Error Vector Magnitude
FCC	Federal Communications Commission
GHz	Giga Hertz
GPSAM	Global Positioning System & Alarm Module
HSDPA	High Speed Downlink Packet Access
HW	Hardware
Hz	Hertz
iBTS	internet Base Station Transceiver Subsystem
iCCM	integrated Core Control Module
iCEM	integrated Channel Element Module
IEA	Integrated External Alarm Module
IEC	International Electro-Technical Commission
iTRM	integrated Transmitter Receiver Module
MCA	Manufacturing Commissioning and Alarm Module
MCPA	Multi-Carrier Power Amplifier
MHz	Mega-Hertz
N.A.	Not Applicable
PA	Power Amplifier
PCM	Pulse Code Modulation
RF	Radio Frequency
RTTE	Radio And Telecommunication Terminal Equipment



RX	Receiver
T1	US Standard For PCM Interface (1.544mbps)
T1 PCM	Pulse Code Modulation at 1.544 MHz
TBC	To Be Confirmed
TBD	To Be Defined
TMA	Tower Mounted Amplifier
TX	Transmitter
UARFCN	Ultra ARFCN
UMTS	Universal Mobile Telecommunication System
UTRA	UMTS Terrestrial Radio Access
V	Volt (V _{dc} with DC) or (V _{ac} with AC)
VSA	Vector Signal Analyser

8.2. DEFINITIONS

B : Bottom UARFCN Downlink (BTS Tx) and Uplink (BTS Rx) frequencies are given as follows : $F_{B \text{ Downlink}} = 871,4 \text{ MHz}$; $F_{B \text{ uplink}} = 826,4 \text{ MHz}$.

M : Middle UARFCN Downlink (BTS Tx) and Uplink (BTS Rx) frequencies are given as follows : $F_{M \text{ Downlink}} = 881 \text{ MHz}$; $F_{M \text{ uplink}} = 836 \text{ MHz}$.

T : Top UARFCN Downlink (BTS Tx) and Uplink (BTS Rx) frequencies are given as follows : $F_{T \text{ Downlink}} = 891,6 \text{ MHz}$; $F_{T \text{ uplink}} = 846,6 \text{ MHz}$.

❧END OF DOCUMENT❧