



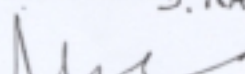
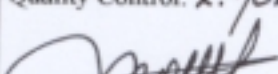
## TEST REPORT

**CFR 47 Part 15  
CFR 47 Part 22  
and CFR 47 24**

**S12000 outdoor (Base + Extension cabinets)**

**N°149017DK**

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Technical control: <i>D. RAND</i> 	<b>GYL technologies</b> ANGERS TECHNOPOLE 1, rue Fleming 49066 ANGERS	Quality Control: <i>L. FONTIEN</i> 
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EMC TEST REPORT
The 25 pages of this report are not sharable

Written by : D.RAUD

6 September 2002

Identification : 149017DK

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APPENDIXES C1 TO C15

## Applicant:

SANMINA SCI  
(Patrick GALOPIN)  
19 rue du Centre - CT506  
Guyancourt  
78928  
FRANCE

## Product description

**Product: S12000 outdoor (Base + Extension cabinets)**

Manufacturer :

NORTEL NETWORKS  
38, rue Paul Cézanne  
Guyancourt  
78928 Yvelines

Responsible of the equipment: (Patrick GALOPIN)

Product type: BTS S12000 OUTDOOR 850/1900 MHz in S222\_222 configuration  
Ref.:NTU406AA (base + extension cabinets)

Manual: none

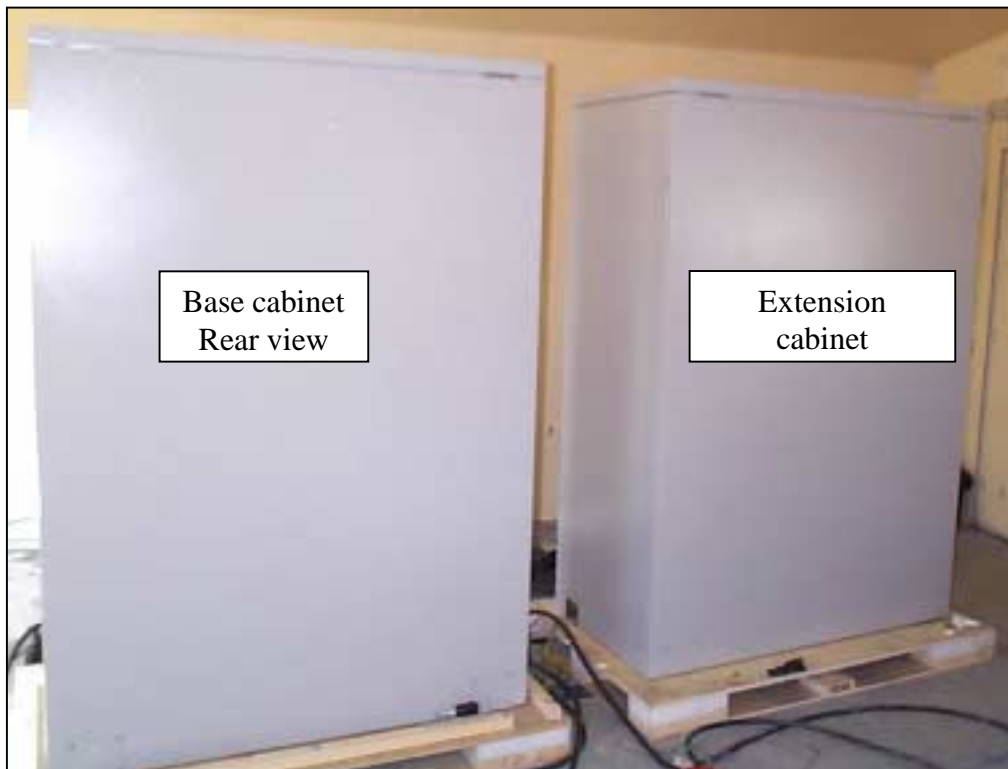
Power supply: 208V/60Hz , tested at 208 V 60 Hz. biphas

## PRODUCT PICTURE:

Extension cabinet  
Front view



Front view base cabinet



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**PRODUCT COMPOSITION:**

See appendixes C10 and C12 to C15

**UTILISATION:**

Base Transceiver Station

**General test conditions**

**AUXILIARY EQUIPMENT:**

Attenuators and 50 ohms load

**WORKING MODE FOR EMISSION TEST**

Measurements are done in transmitter mode (all transmitters at maximum power , in BCCH mode without frequency hopping), and in receiver mode

Channels configuration for the test:

DRX#	Base cabinet		Extension cabinet	
	CHANNE L #	FREQUENCY (MHz)	CHANNEL #	FREQUENCY (MHz)
0	172	878.0	512	1930.2
1	194	882.4	566	1941.0
2	128	869.2	620	1951.8
3	150	873.6	674	1962.6
4	216	886.8	728	1973.4
5	238	891.2	782	1984.2
6	539	1935.6	139	871.4
7	593	1946.4	161	875.8
8	647	1957.2	183	880.2
9	701	1968.0	205	884.6
10	755	1978.8	227	889.0
11	810	1989.8	251	893.8



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## Reference standards choice

The product is information technology equipment . The product standard CFR47 Part 15 has to be used for emission (class B because of residential, commercial and light industry use).

The product is a personal communication service equipment

So, applicable standards are:

CFR47 Part 15 class B (2001)

CFR47 part 22 "Subpart H" (2000)

CFR47 part 24 "Subpart E" (2000)

## Interpretation and remarks:

This equipment conforms to limits standards for EMC measurements.

### IMPORTANT REMARK :

Substitution method was not performed as there was nor spurious emission neither emission within the limits detected in prescan as shown by page 19

The EUT Plot on pages 22 and 25 show measured noise floor levels detected while testing the BTS 12000

## Test according to CFR 47 Part 15 Class B

Tests performed by Olivier ROY at GYL Technologies laboratories, in August 12 to 14 of 2002.

### REFERENCE DOCUMENTATION:

FCC CFR 47 part 15, (2000)  
ANSI C63.4 (1992).

### CONDUCTED DISTURBANCE AT INPUT POWER ACCESS :

#### General measurement conditions.

Conforms to ANSI C63.4.  
Measurement done in free field

#### Limit :

Class B of FCC standard regulation CFR 47 part 15 subpart B for conducted emission limit (§15.107 class B device).

#### Method of measurement.

Method of measurement and test installation according to Section 7 of the ANSI C63.4 measurement standard.



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**Test equipment used :**

APPARATUS	MANUFACTURER	REFERENCE	SERIAL NUMBER	Date of verification
EMI test receiver	Rohde & Schwarz	ESI 7	M02020	Dec-01
LISN (50 $\mu$ H / 5/50ohms)	Rohde & Schwarz	ESH2-Z5	871777/031	Jun-02
LISN (50 $\mu$ H / 5/50ohms)	Rohde & Schwarz	ESH2-Z5	872094/037	Jun-02



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**Results for base cabinet:**

Highest lines.

Neutral

Frequency (MHz)	Quasi-peak (dB $\mu$ V)	QP margin (dB)
7.826	20.0	-28.0
8.410	33.3	-14.7
8.462	25.3	-22.7
9.546	26.7	-21.3
10.102	18.0	-30.0
11.606	30.3	-17.7



Att 30 dB

INPUT 2

Det

ResBW

Meas T

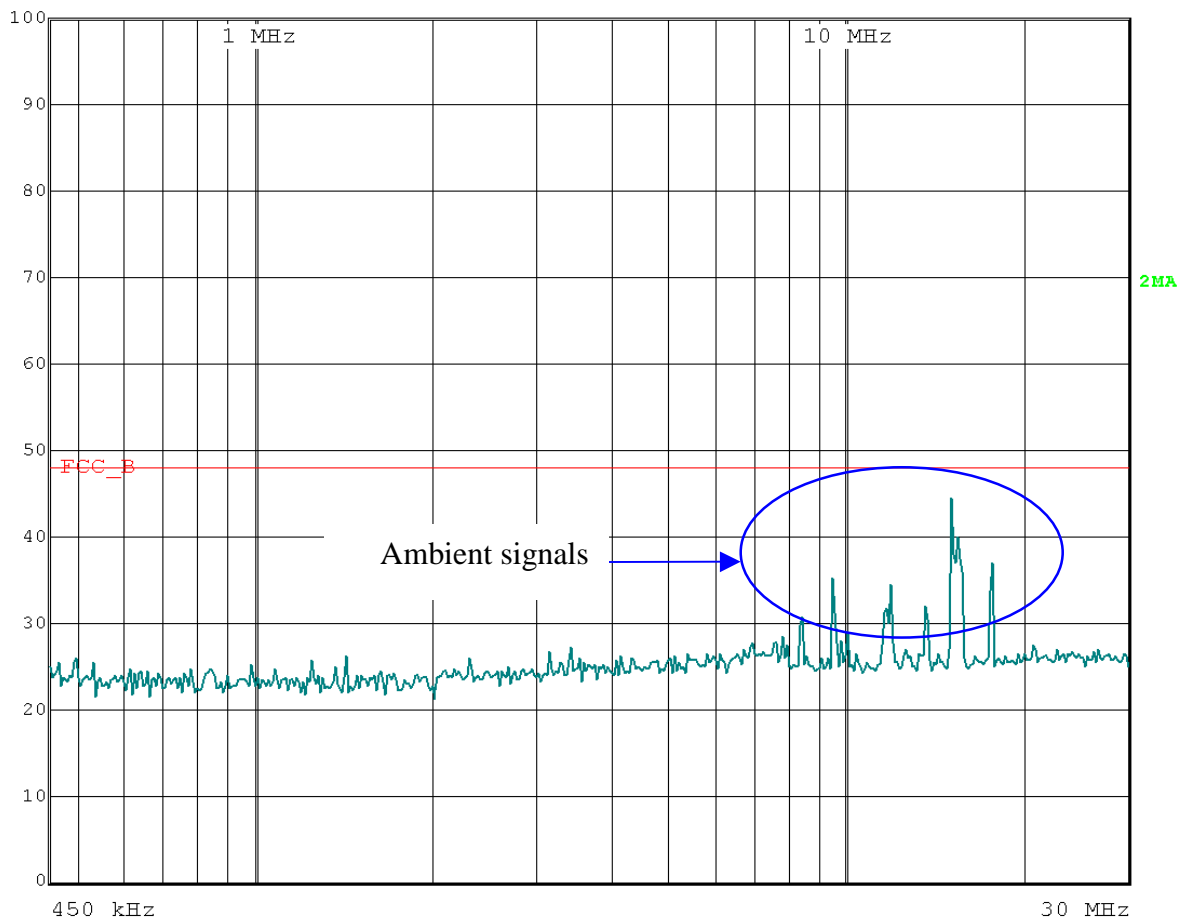
QP Trd

9 kHz

100 ms Unit

condsect

dB $\mu$ V



Date: 12.AUG.2002 17:55:02

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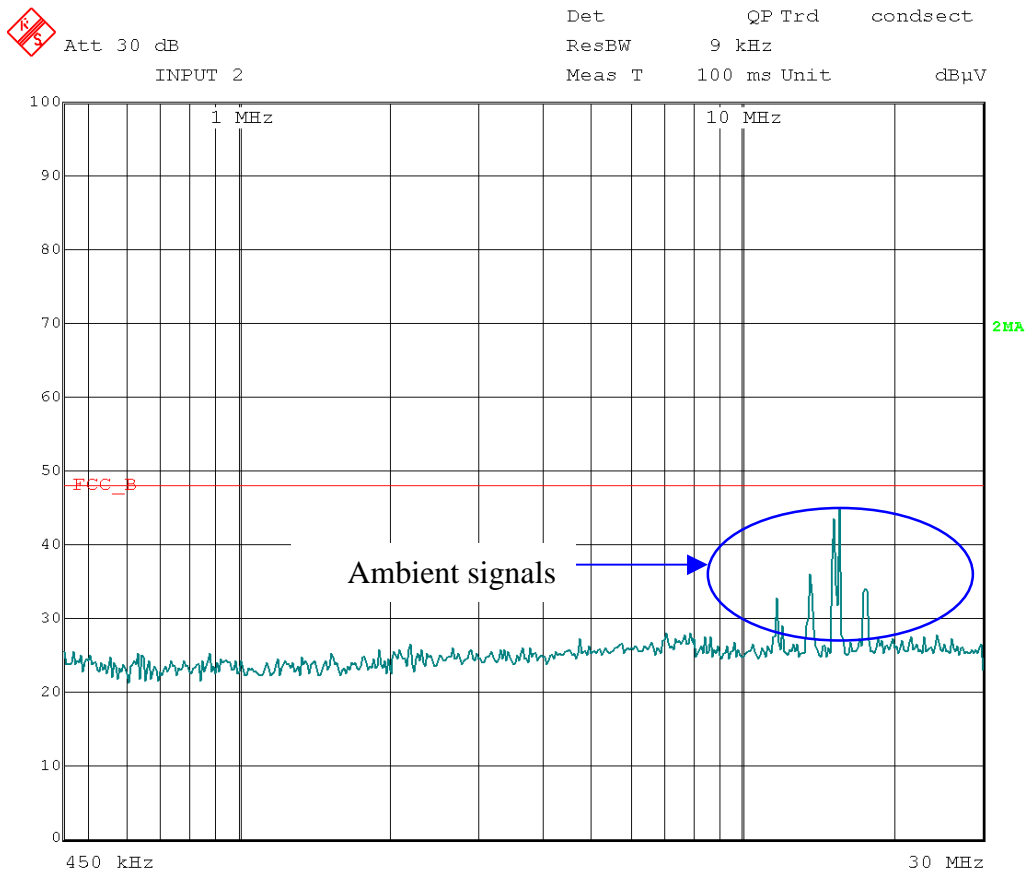
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Live 1

Frequency (MHz)	Quasi-peak (dB $\mu$ V)	QP margin (dB)
12.050	23.1	-24.9
13.418	23.1	-24.9
13.838	17.4	-30.6
15.346	23.4	-24.6
17.514	23.1	-24.9
17.662	24.5	-23.5



Date: 12.AUG.2002 17:58:45

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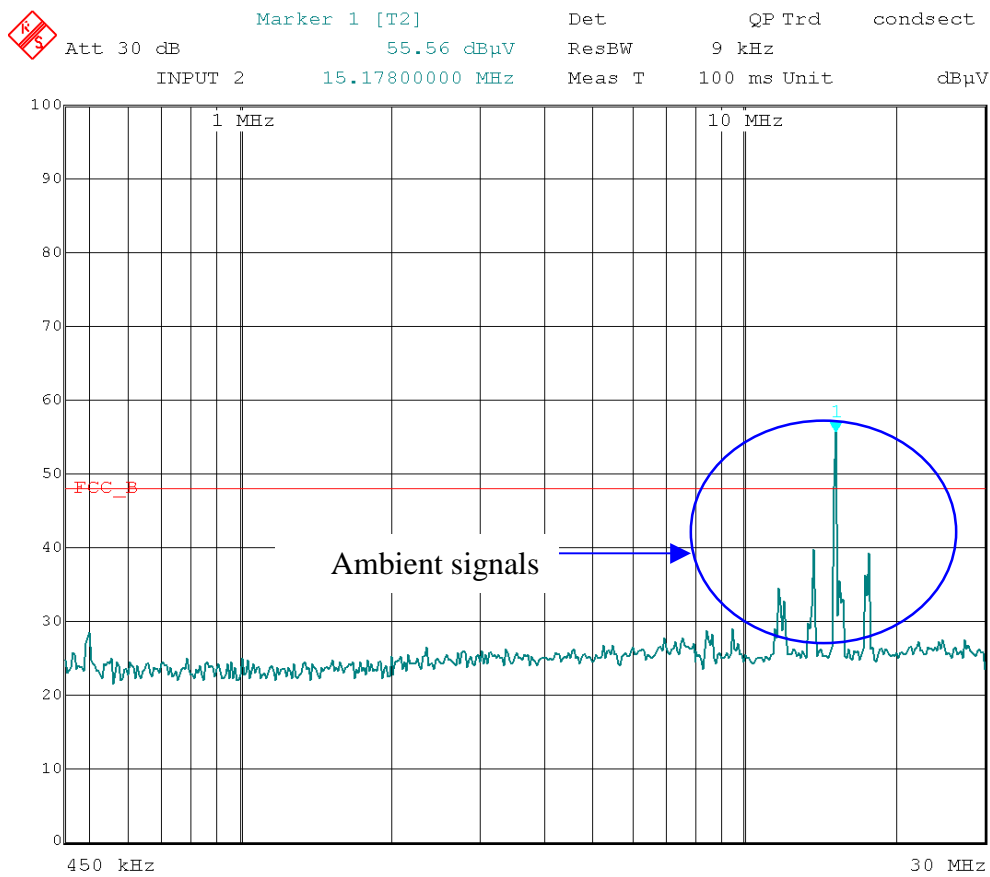
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Live 2

Frequency (MHz)	Quasi-peak (dB $\mu$ V)	QP margin (dB)
0.502	23.4	-24.6
8.466	24.8	-23.2
9.542	28.9	-19.1
11.586	25.8	-22.2
13.418	26.7	-21.3
15.650	27.7	-20.3



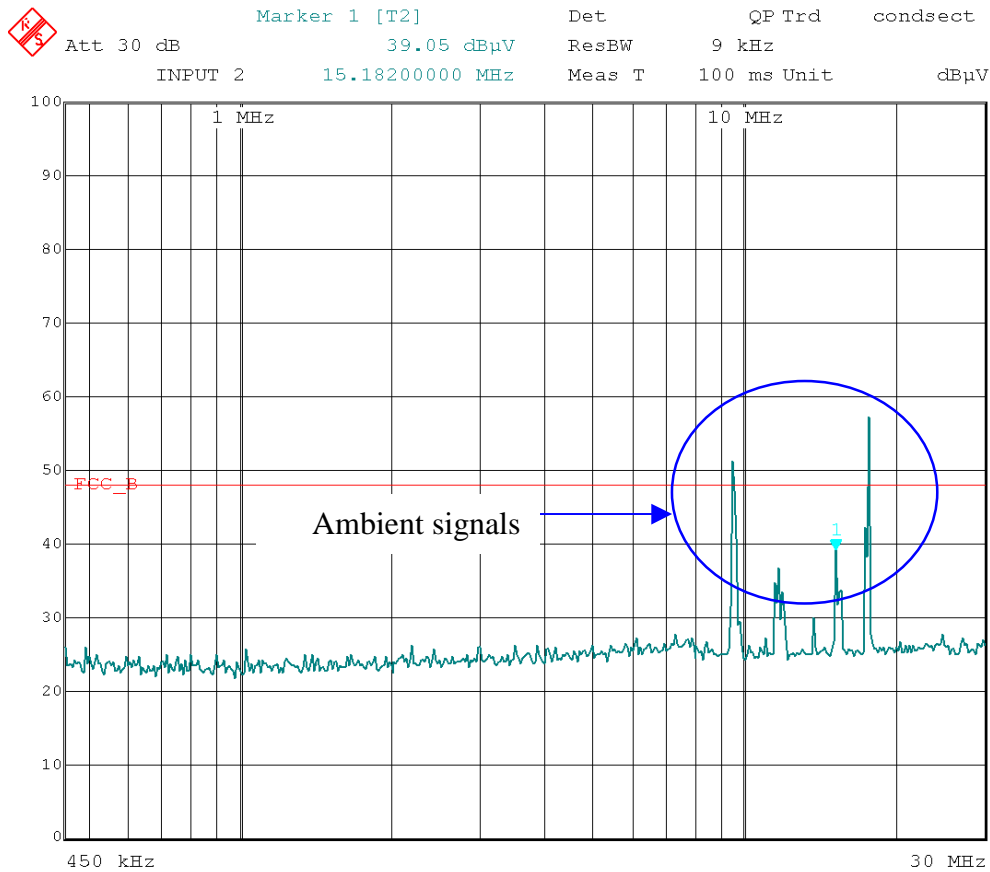
Date: 12.AUG.2002 18:10:42

**Results for extension cabinet:**

Highest lines.

Neutral

Frequency (MHz)	Quasi-peak (dB $\mu$ V)	QP margin (dB)
11.630	24.8	-23.2
11.802	28.6	-19.4
11.990	28.6	-19.4
15.346	27.9	-20.1
15.454	27.1	-20.9
17.734	29.9	-18.1



Date: 12.AUG.2002 18:16:13

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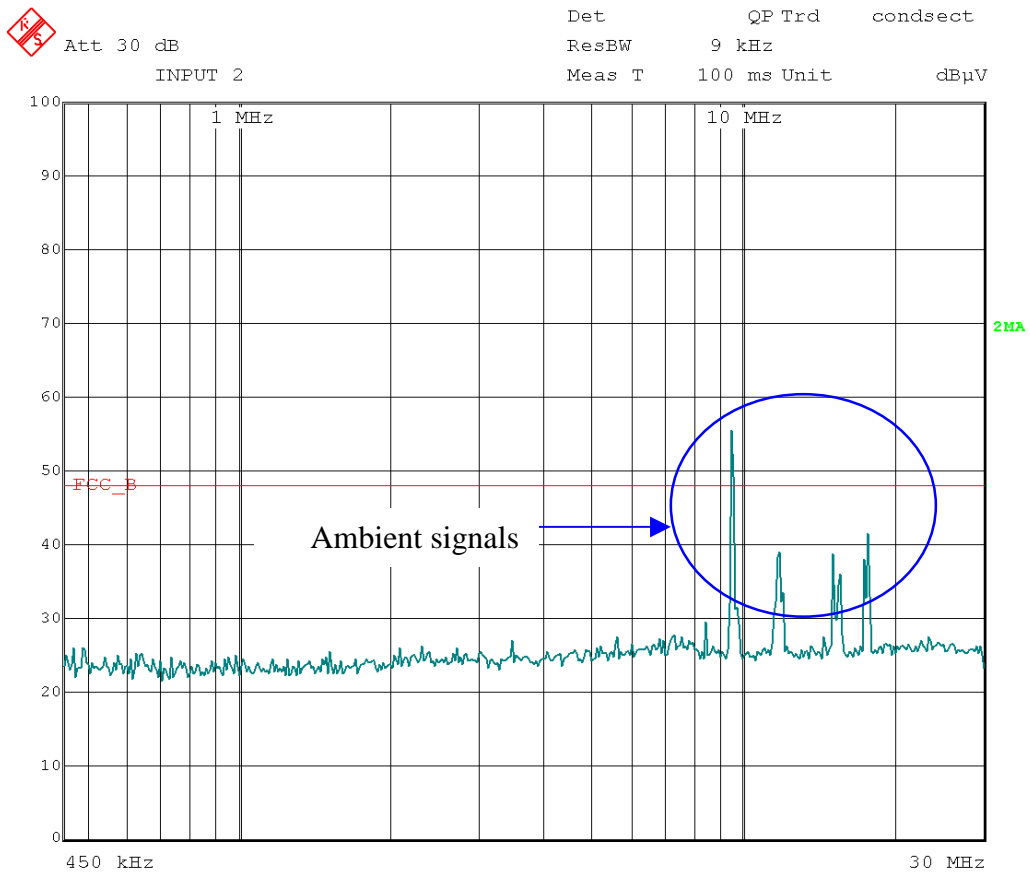
Written by : D.RAUD

6 September 2002

Identification : 149017DK

Live 1

Frequency (MHz)	Quasi-peak (dB $\mu$ V)	QP margin (dB)
8.466	24.5	-23.5
9.866	25.8	-22.2
15.174	24.0	-24.0
15.594	25.6	-22.4
15.650	24.8	-23.2
17.502	23.4	-24.6



Date: 12.AUG.2002 18:20:23

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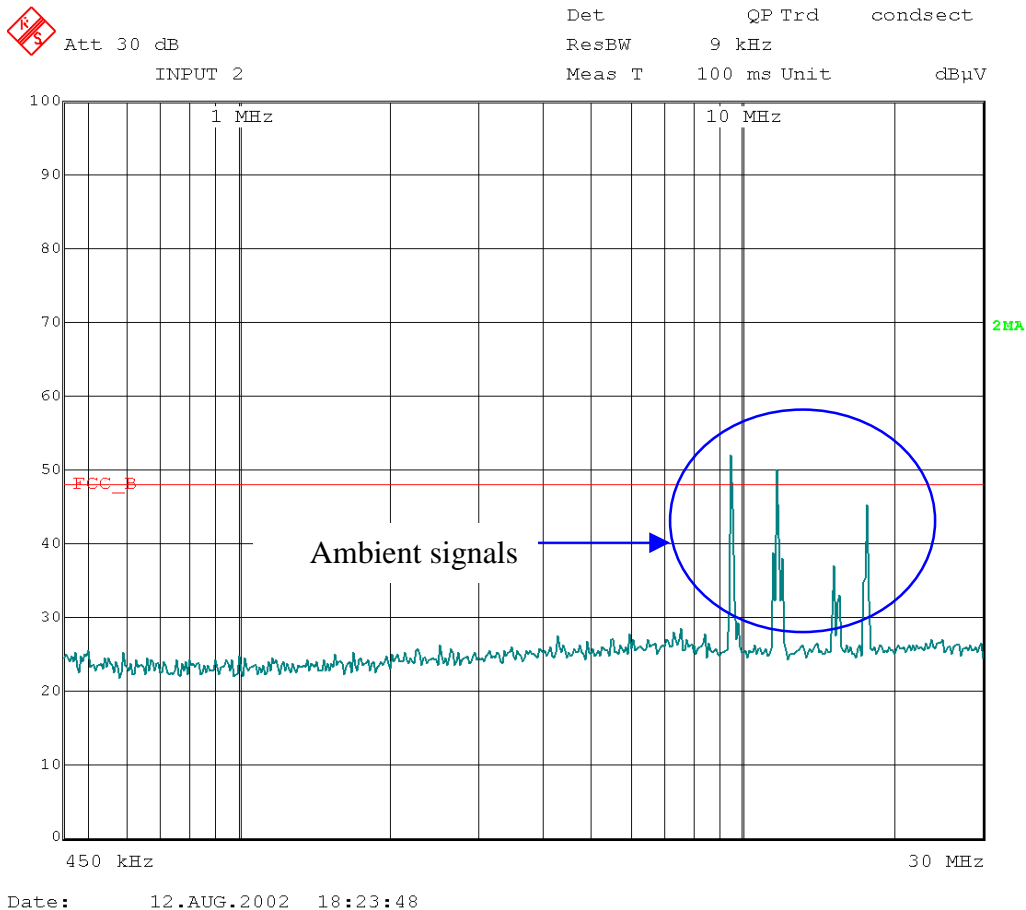
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Live 2

Frequency (MHz)	Quasi-peak (dB $\mu$ V)	QP margin (dB)
7.550	21.3	-26.7
9.462	23.7	-24.3
15.454	22.0	-26.0
15.630	24.8	-23.2
17.738	24.3	-23.7
17.882	19.0	-29.0



**INTERPRETATION AND REMARKS:**

Conform

**RADIATED DISTURBANCE :**

**Limit :**

Class B of FCC standard regulation CFR 47 part 15 subpart B for radiated emission limit (§15.109 class B device) for unintentional radiator and (§15.209 class B device) for intentional radiator

**General measurement conditions.**

Conforms to ANSI C63.4.

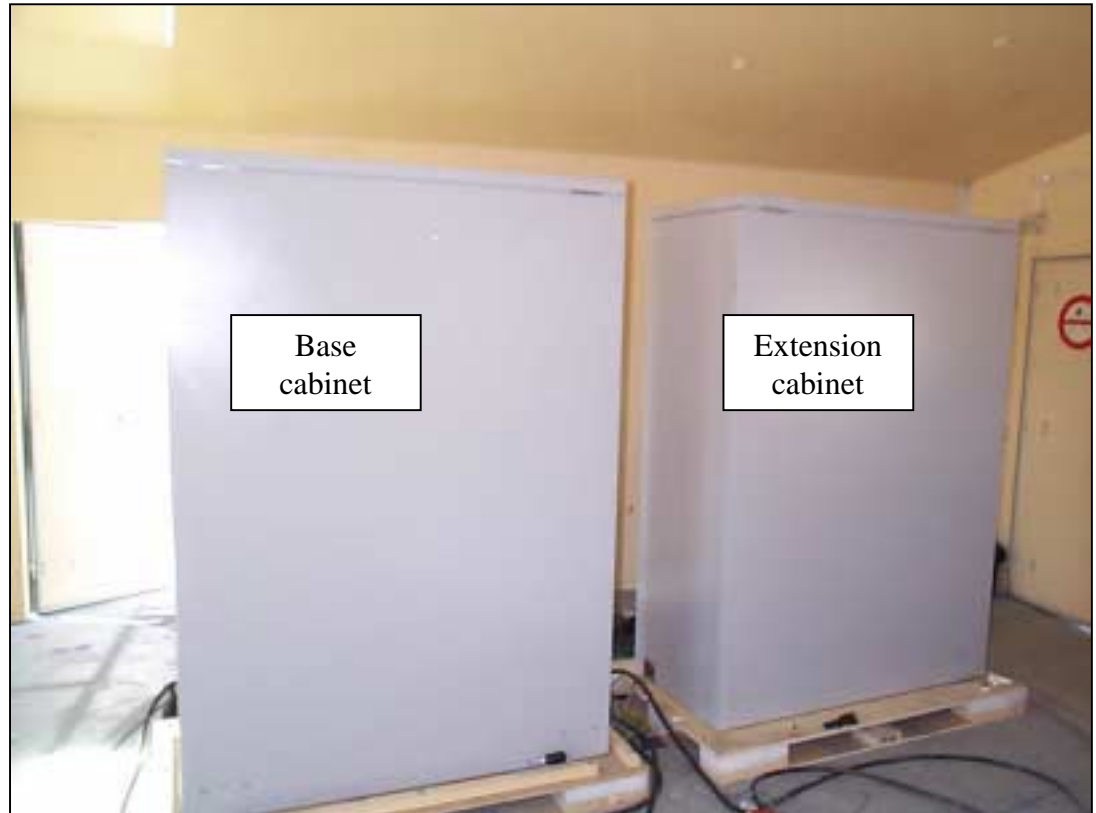
Diagram in 0° position, angles are positives in the reverse clock wise.

Equipment under test.

- Front view



- Rear view



**Method of measurement.**

Method of measurement and test installation according to Section 8 of the ANSI C63.4 measurement standard.

Measurement are done at 10m in a free area.

We try to obtain a maximum at all frequencies by moving the product orientation and antenna polarisation. The height of the antenna can vary from 1 m to 4 m.

**Test equipment used :**

APPARATUS	MANUFACTURER	REFERENCE	SERIAL NUMBER	Date of verification
Free field open area test site				Jul-02
Receiver	Rohde & Schwarz	ESI 7	834638/007	Dec-01
Bilog antenna	CHASE	CBL-6112	2434	Nov-01



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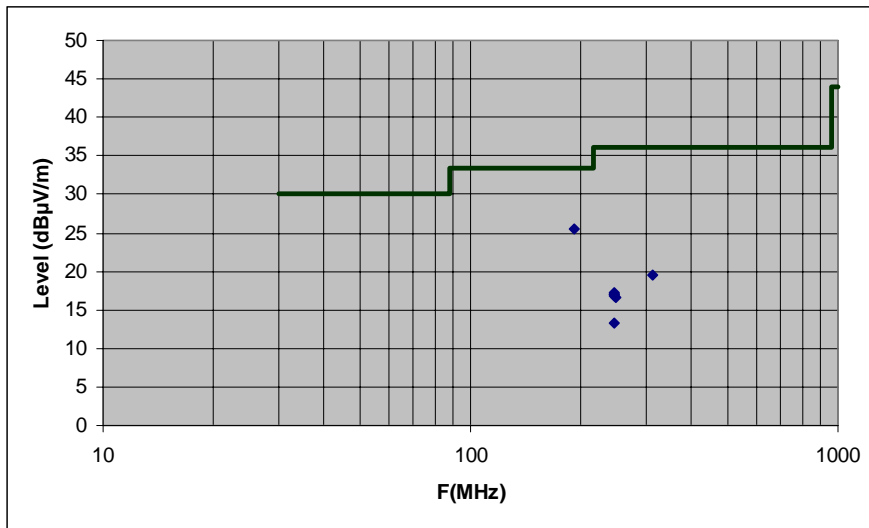
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**Results :**

Highest lines table (spurious signals):

Frequency (MHz)	Quasi-peak (dB $\mu$ V/m)	Std limit (dB $\mu$ V/m)	Margin (dB)	Angle (Deg.)	Site (cm)	Polarisation	Corr Fact.	Comment
192.040	25.5	33.5	-8.0	34	318	H	11.11	
245.124	13.2	36	-22.8	360	359	V	13.77	
245.969	16.9	36	-19.1	58	374	V	13.82	
246.818	17.2	36	-18.8	58	340	V	13.87	
247.018	16.9	36	-19.1	58	333	V	13.89	
247.217	17.1	36	-18.9	58	337	V	13.90	
247.466	16.6	36	-19.4	58	329	V	13.91	
312.013	19.5	36	-16.6	44	278	V	15.15	

No spurious signal found over 312.013 MHz



**INTERPRETATION AND REMARKS:**

Conform

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Measurement at transmitters frequencies (D=10m) for indicative level  
transmitters output connected to resistive 50 ohms loads .

F (MHz)	Peak Level (dB $\mu$ V/m)	Antenna polarity	F (MHz)	Peak Level (dB $\mu$ V/m)	Antenna polarity
878.0	57.86	H	871.4	59.63	H
882.4	49.97	H	875.8	50.75	H
869.2	38.24	H	880.2	70.69	H
873.6	72.78	H	884.6	61.79	H
886.8	35.24	H	889.0	55.24	H
891.2	53.59	H	893.8	49.55	H

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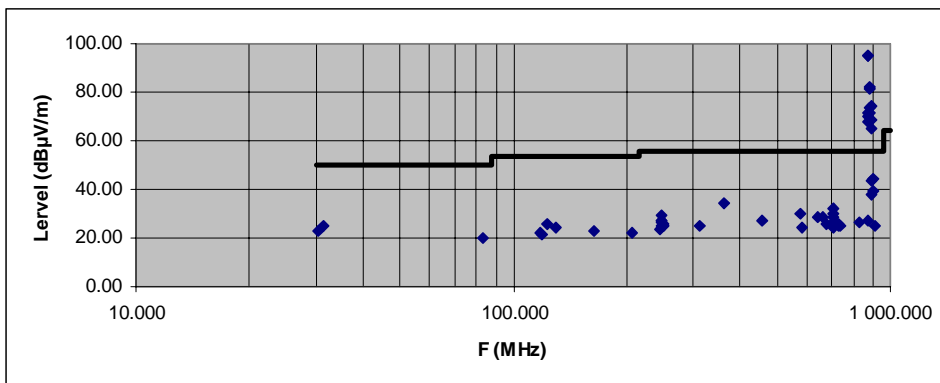
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**Pre-Scan measurement to identify spurious emissions from EUT at D=1m:**

F (MHz)	PK (dBµV/m)	Marge (dB)	Limit (dBµV/m)	Pol	H (cm)	A (°)	FC (dB)	Comments
30.299	22.53	-17.47	50.00	H	100	180	16.54	
31.296	24.75	-15.25	50.00	H	100	180	16.25	
82.884	20.10	-19.90	50.00	H	100	180	8.18	
117.924	21.79	-21.21	53.50	H	100	180	12.94	
118.871	21.37	-21.63	53.50	H	100	180	13.02	
122.659	25.89	-17.11	53.50	H	100	180	13.04	
129.886	24.22	-18.78	53.50	H	100	180	12.77	
164.427	22.84	-20.16	53.50	H	100	180	11.44	
206.545	21.94	-21.06	53.50	H	100	180	11.38	
245.124	23.74	-22.26	56.00	H	100	180	13.77	
245.971	27.24	-18.76	56.00	H	100	180	13.82	
246.818	26.50	-19.50	56.00	H	100	180	13.87	
247.018	29.17	-16.83	56.00	H	100	180	13.89	
247.217	27.04	-18.96	56.00	H	100	180	13.90	
247.466	24.72	-21.28	56.00	H	100	180	13.91	
249.909	25.15	-20.85	56.00	H	100	180	14.06	
250.058	25.92	-20.08	56.00	H	100	180	14.07	
312.013	25.11	-20.89	56.00	H	100	180	15.15	
361.956	34.04	-11.96	56.00	H	100	180	16.89	
457.406	27.40	-18.60	56.00	H	100	180	19.43	
575.285	30.15	-15.85	56.00	H	100	180	20.69	
581.715	24.35	-21.65	56.00	H	100	180	20.72	
639.234	28.56	-17.44	56.00	H	100	180	21.28	
663.309	28.61	-17.39	56.00	H	100	180	21.58	
677.913	25.78	-20.22	56.00	H	100	180	21.75	
702.087	26.08	-19.92	56.00	H	100	180	22.05	
702.436	32.29	-13.71	56.00	H	100	180	22.05	
705.426	24.09	-21.91	56.00	H	100	180	22.09	
706.373	28.36	-17.64	56.00	H	100	180	22.10	
726.261	25.21	-20.79	56.00	H	100	180	22.34	
726.410	26.00	-20.00	56.00	H	100	180	22.34	
732.092	24.86	-21.14	56.00	H	100	180	22.41	
829.735	26.25	-19.75	56.00	H	100	180	22.83	
867.118	26.89	-19.11	56.00	H	100	180	22.31	
869.311	67.86	21.86	56.00	H	100	180	22.28	Transmitter
871.504	71.20	25.20	56.00	H	100	180	22.25	Transmitter
873.647	94.78	48.78	56.00	H	100	180	22.22	Transmitter
875.641	69.73	23.73	56.00	H	100	180	22.19	Transmitter
875.840	94.74	48.74	56.00	H	100	180	22.19	Transmitter
878.083	81.63	35.63	56.00	H	100	180	22.16	Transmitter
880.276	81.87	35.87	56.00	H	100	180	22.13	Transmitter
882.470	71.69	25.69	56.00	H	100	180	22.10	Transmitter
884.663	73.85	27.85	56.00	H	100	180	22.06	Transmitter
886.906	64.65	18.65	56.00	H	100	180	22.03	Transmitter
889.099	68.58	22.58	56.00	H	100	180	22.00	Transmitter
891.292	74.08	28.08	56.00	H	100	180	21.97	Transmitter



## Test according to CFR 47 Part 22

Subpart H: § 22.917

Tests performed by Olivier ROY at GYL Technologies laboratories in August, 14 of 2002.

### REFERENCE DOCUMENTATION:

CFR 47 part 22 (2000)

ANSI C63.4 (1992).

### RADIATED DISTURBANCE :

#### General measurement conditions.

Conforms to Section 8 of the ANSI C63.4 measurement standard.

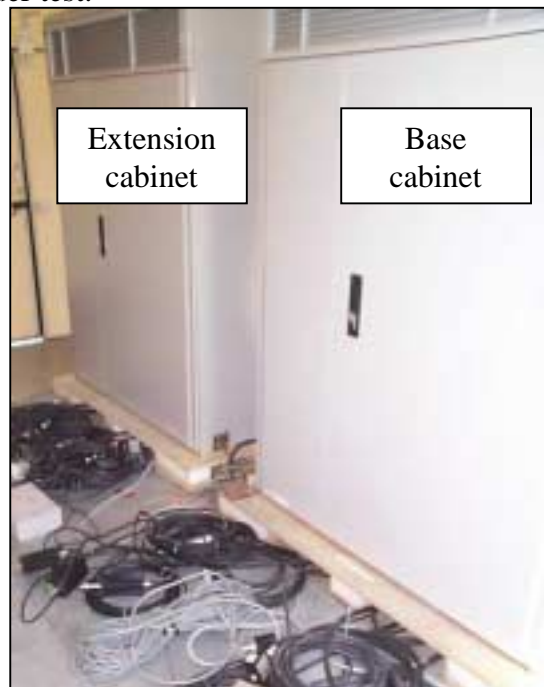
Diagram in 0° position, angles are positives in the reverse clock wise.

### RADIATED DISTURBANCE :

#### General measurement conditions.

Conforms to Section 8 of the ANSI C63.4 measurement standard.

Equipment under test:



#### Method of measurement.

Method of measurement and test installation according ANSI C63.4.

Measurement are done at 1m in a free area.

We try to obtain a maximum at all frequencies by moving the product orientation and antenna polarisation. The height of the antenna can vary from 1 m to 4 m.

Measurements done in transmitter mode ( all transmitters at maximum power 30 W, in BCCH mode without frequency hopping ) and in receiver mode.

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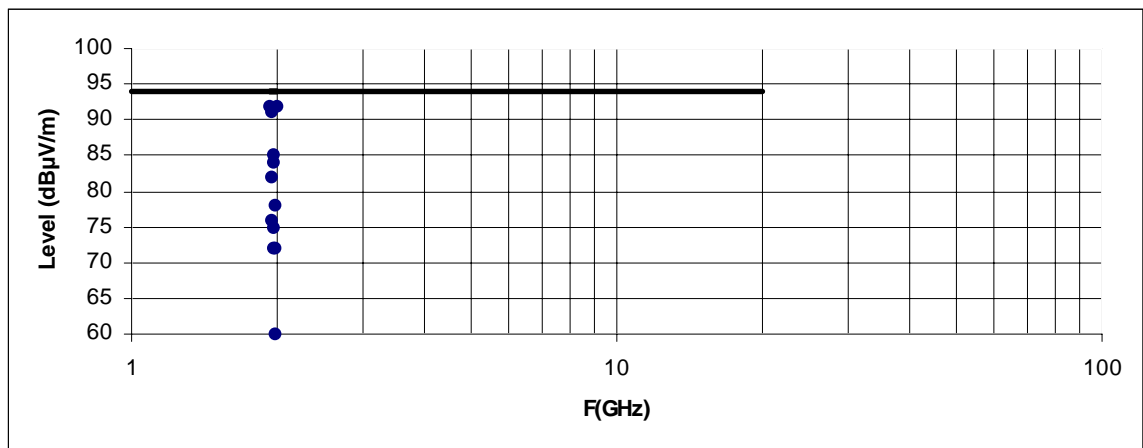
**Test equipment used :**

APPARATUS	MANUFACTURER	REFERENCE	SERIAL NUMBER	Date of verification
Free field open area test site				Jul-02
Horn antenna	EMCO	9504 - 4496	3115	Apr-00
Spectrum analyzer(20Hz-26.5GHz)	Rohde & Schwarz	FSEM30	107 985 00.30	Apr-01

**Results :**

**1 - Measurement at transmitters frequencies for indicative level**  
transmitters output connected to resistive 50 ohms loads.

FREQUENCY ( GHz )	Measure ( dBμV )	AF (A)	Loss cable (B)	Correc.Factor (A)+(B)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1						93.9	
1.9356	46.10	27.9	2	29.9	76.00	93.9	-17.9
1.9464	52.10	27.9	2	29.9	82.00	93.9	-11.9
1.9572	42.10	27.9	2	29.9	72.00	93.9	-21.9
1.9680	45.10	27.9	2	29.9	75.00	93.9	-18.9
1.9788	48.10	27.9	2	29.9	78.00	93.9	-15.9
1.9898	62.10	27.9	2	29.9	92.00	93.9	-1.9
1.9302	62.10	27.9	2	29.9	92.00	93.9	-1.9
1.9410	61.10	27.9	2	29.9	91.00	93.9	-2.9
1.9518	54.10	27.9	2	29.9	84.00	93.9	-9.9
1.9626	55.10	27.9	2	29.9	85.00	93.9	-8.9
1.9734	42.10	27.9	2	29.9	72.00	93.9	-21.9
1.9842	30.10	27.9	2	29.9	60.00	93.9	-33.9
20						93.9	





## Test according to CFR 47 Part 24

Tests performed by Olivier ROY at GYL Technologies laboratories, in August 14 of 2002.

### REFERENCE DOCUMENTATION:

CFR 47 part 24, (2000)  
ANSI C63.4 (1992).

### RADIATED DISTURBANCE :

#### General measurement conditions.

Conforms to Section 8 of the ANSI C63.4 measurement standard.  
Diagram in 0° position, angles are positives in the reverse clock wise.

### RADIATED DISTURBANCE :

#### General measurement conditions.

Conforms to Section 8 of the ANSI C63.4 measurement standard.  
Equipment under test:



#### Method of measurement.

Method of measurement and test installation according ANSI C63.4.

Measurement are done at 1m in a free area.

We try to obtain a maximum at all frequencies by moving the product orientation and antenna polarisation. The height of the antenna can vary from 1 m to 4 m.

Measurements done in transmitter mode ( all transmitters at maximum power 30 W, in BCCH mode without frequency hopping ) and in receiver mode.

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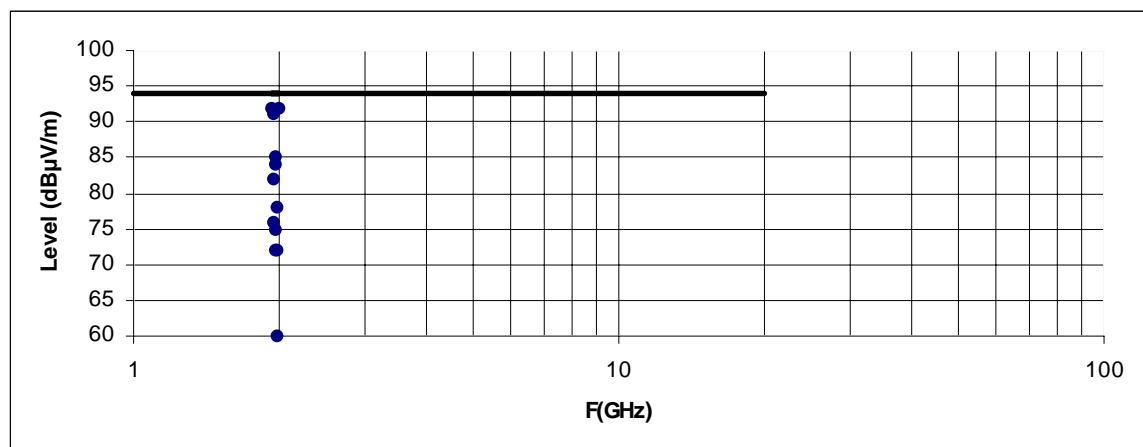
**Test equipment used :**

APPARATUS	MANUFACTURER	REFERENCE	SERIAL NUMBER	Date of verification
Free field open area test site				Jul-02
Horn antenna	EMCO	9504 - 4496	3115	Apr-00
Spectrum analyzer(20Hz-26.5GHz)	Rohde & Schwarz	FSEM30	107 985 00.30	Apr-01

Results :

**1 - Measurement at transmitters frequencies for indicative level**  
transmitters output connected to resistive 50 ohms loads.

FREQUENCY ( GHz )	Measure ( dB $\mu$ V )	AF (A)	Loss cable (B)	Correc.Factor (A)+(B)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1						93.9	
1.9356	46.10	27.9	2	29.9	76.00	93.9	-17.9
1.9464	52.10	27.9	2	29.9	82.00	93.9	-11.9
1.9572	42.10	27.9	2	29.9	72.00	93.9	-21.9
1.9680	45.10	27.9	2	29.9	75.00	93.9	-18.9
1.9788	48.10	27.9	2	29.9	78.00	93.9	-15.9
1.9898	62.10	27.9	2	29.9	92.00	93.9	-1.9
1.9302	62.10	27.9	2	29.9	92.00	93.9	-1.9
1.9410	61.10	27.9	2	29.9	91.00	93.9	-2.9
1.9518	54.10	27.9	2	29.9	84.00	93.9	-9.9
1.9626	55.10	27.9	2	29.9	85.00	93.9	-8.9
1.9734	42.10	27.9	2	29.9	72.00	93.9	-21.9
1.9842	30.10	27.9	2	29.9	60.00	93.9	-33.9
20						93.9	









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## **S12000 Outdoor 850 / 1900 MHz : EMC test Plan**

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**Reference:** Nortel-STP-00395

**Version:** 01-en

**Status:** Approved

**Date:** 05/08/2002

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**Product Name:** S12000 outdoor BTS

**Frequency:** 850 / 1900 MHz

**Discipline:** EMC

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**Author:** P.GALOPIN

**Verified by:** T. LUCHINI

**Approved by:** C. CHANSARD

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## PUBLICATION HISTORY

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<b>VERSION</b>	<b>DATE</b>	<b>AUTHOR</b>	<b>MODIFICATION</b>
01-en	05/08/2002	P.GALOPIN	Creation of the document

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# 1. INTRODUCTION

This objective of this document is to present the test plan for EMC testing on the S12000 BTS Outdoor configured in 850 / 1900 MHz.

This strategy is the following :

- Realize the qualification in the S12000 Outdoor 850/1900 MHz in S222\_222 configuration (Base & Extension cabinet).

The qualification on the S12000 Outdoor BTS will be done according to the FCC Part 15, 22 & 24 as defined by Nortel Networks.

This document presents then the requirements Sanmina needed to ensure the results of the qualification during the qualification phase, and also the tests that will be realized during the two steps described above.

This document applied to :

- Product : S12000 Outdoor
- Manufacturer : Nortel Networks
- Frequencies : 850 / 1900 MHz
- Configuration : S222\_222 (Base & Extension cabinet)

## 2. APPLICABLES DOCUMENTS

[A1]	CFR 47 Part 2	Code of Federal Regulations - Part 2 - Frequency Allocations and Radio Treaty Matters. General Rules and Regulations. Date : June 1996.
[A2]	CFR 47 Part 15	Code of Federal Regulations - Part 15 - Radio Frequency Devices.
[A3]	CFR 47 Part 22	Code of Federal Regulations - Part 22 - Public Mobile Services.
[A4]	CFR 47 Part 24	Code of Federal Regulations - Part 24 - Personal Communications Services. Date : June 1996.

## 3. TEST PLAN SUMMARY

The following table presents the test plan summary for the qualification of the S12000 Outdoor in 850/1900 MHz configuration.

Test	Required	Test Specification	Reference Method	Configuration of the EUT
Radiated Emissions	Yes	FCC Part 15	Section 15.109	S12000 Outdoor in S222_222
Radiated Emissions	Yes	FCC Part 22	Section 22.917	
Radiated Emissions	Yes	FCC Part 24	Section 24.238	
Conducted Emissions	Yes	FCC Part 15	Section 15.107	

## 4. RADIATED EMISSION TESTS

**Standard Coverage** : FCC Part 15.109, FCC Part 22.917 & FCC Part 24.238

**Intend** :

- (a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonics and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of 2.989, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open filed measurements (e.g., a broadcast transmitter installed in a building) measurements will be acceptable of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from half-wave dipole antennas.
- (b) The measurements specified in paragraph (a) of this section shall be made for the following equipment :
  - (1) Those in which the spurious emission are required to be 60 dB or more below the mean power of the transmitter.
  - (2) All equipment operating on frequencies higher than 25 MHz.
  - (3) All equipment where the antenna is an integral part of, and attached directly to the transmitter.
  - (4) Other types of equipment as required, when deemed necessary by the Commission.

**Test Procedure** :

Radiated emission measurement procedures shall be performed as outlined in Section 8 of the ANSI C63.4 measurement standard. The BTS will be tested to the applicable limits of the FCC rules. For radiated emission measurements the measurement distance between the center of the measurement antenna and the equipment under test shall be 3 meters (or less for frequencies above 1 GHz). In order to maximize all emission levels from the equipment, the emissions will be searched with the receive antenna at varied height levels. The equipment shall also be rotated a full 360 degrees on the turntable with the receive antenna at varying height levels (1 to 4 meters). Tests shall be made with the antenna positioned in both the horizontal and vertical planes of polarization. The BTS shall be placed on the turntable as per ANSI C63.4 measurement procedures. Please see the Part 15 test plan as Part 22 & 24 radiated requirements will be tested in conjunction with the Part 15 testing. The spectrum shall be searched to identify emissions. A complete scan of the applicable spectrum shall be completed (up to 10<sup>th</sup> harmonic of fundamental). The transmitter shall then be turned off, with the rest of the equipment powered on. A complete scan of the spectrum shall be done and referred to as "ambient" without the transmitter keyed on. Emissions emanating from the transmitter shall be identified from comparing these two scans. The identified emissions (from the transmitter) shall be measured and the levels recorded with the transmitter keyed on at full rated power output.

**Important remark** :

Substitution measurements must be made on all detected emissions given that the limits for the FCC are given in power measurements. If no emissions are detected, measurements should be made at the noise floor levels for each of the transmitter harmonic frequencies and a statement should be placed in the test report indicating that no emissions were detected.

The equipment was configured as shown in the next figure.

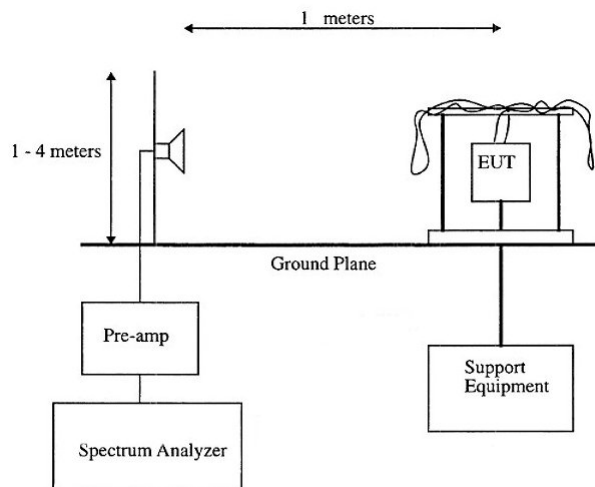


Figure 7 : Test configuration for Radiated Spurious emissions

The BTS was configured to transmit at maximum power (static level 0). Measurements were made according to the procedures outline in ANSI C63.4 The emissions were investigated up to the tenth harmonic of the fundamental emission (20 GHz). The measured level of the emissions was recorded and compared to the limit. The reference level for spurious radiation was taken with reference to an ideal dipole antenna excited by the rated output power according to the following relationship :

$$E(V/m) = \frac{1}{R(m)} * \sqrt{30 * P_t * G}$$

Where,

E = Field Strength in Volts/meter,  
 R = Measurement distance in meters,  
 $P_t$  = Transmitter Rated Power in Watts (30 Watts),  
 G = Gain of ideal Dipole (linear)

Therefore :

$$E(V/m) = \sqrt{30 * 30 * 1.64}$$

E = 38.42 V/m = 151.69 dB $\mu$ V/m

The spurious emissions must be attenuated by at least  $43 + 10 * \text{Log}(30) = 57.7$  dB.

Therefore the field strength limit at 1 meters is :

E = 151.69 dB $\mu$ V/m – 57.7 dB = 93.9 dB $\mu$ V/m



Spectrum Analyzer setting during measurements shall be as following :

Receiver Setting	Pre-Scan (to identify spurious emissions from EUT)	Final Measurements
Detector Type	Peak	Quasi-Peak (CISPR)
Mode	Max Hold	Not Applicable
Bandwidth	100 kHz or 1 MHz (for > 1GHz)	120 kHz*
Amplitude Range	60 dB	20 dB
Measurement Time	Not Applicable	> 1s
Observation Time	Not Applicable	> 15s
Step size	Continuous sweep	Not Applicable
Sweep Time	Coupled	Not Applicable
Measuring Distance	3m for 30 MHz - 1GHz 1m for 1GHz - 20GHz	10m for 30 MHz - 1GHz 1m for 1GHz - 20GHz

**Pass / Fail criteria :**

- For 30 MHz to 1 GHz :  
Measurement distance : **10 m**  
Limit : [30 MHz-88 MHz]    **30 dB $\mu$ V/m**  
          [88 MHz-216 MHz]    **33.5 dB $\mu$ V/m**  
          [216 MHz-960 MHz]   **36 dB $\mu$ V/m**  
          Above 960 MHz        **43.5 dB $\mu$ V/m**
- For 1 GHz to 20 GHz :  
Measurement distance : 1 m    RBw : 1 MHz  
Limit : **93.9 dB $\mu$ V/m**

**S/W Configuration – Traffic data flow :**

All transmitters in the EUT should be transmitting at full power.

The transmitters' operating frequencies should be selected by setting the Absolute Radio Frequency Channel Numbers (ARFCN) equally distributed over the BSS operating band, subject to any restrictions of the configuration of the EUT.

Transmit Power :     All TX at 30 W

## 5. CONDUCTED EMISSIONS TESTS

**Test case name :** Conducted emissions AC

**Standard Coverage :** FCC Part 15.107 (0.45 MHz – 30 MHz)

**Intend :**

Measurement shall be made in the operational mode producing the largest emission in the frequency band being investigated consistent with normal applications.

**Test procedure :**

A measuring receiver shall be connected to each RSIL measurement port in turn and the conducted emission levels recorded. The RSIL measurement ports not being used for measurement shall be terminated with a 50  $\Omega$  (50 $\mu$ H) load.

**Pass / Fail Criteria :**

Limits for conducted emissions AC mode FCC Part 15 Subpart B (0.45 MHz – 30 MHz)

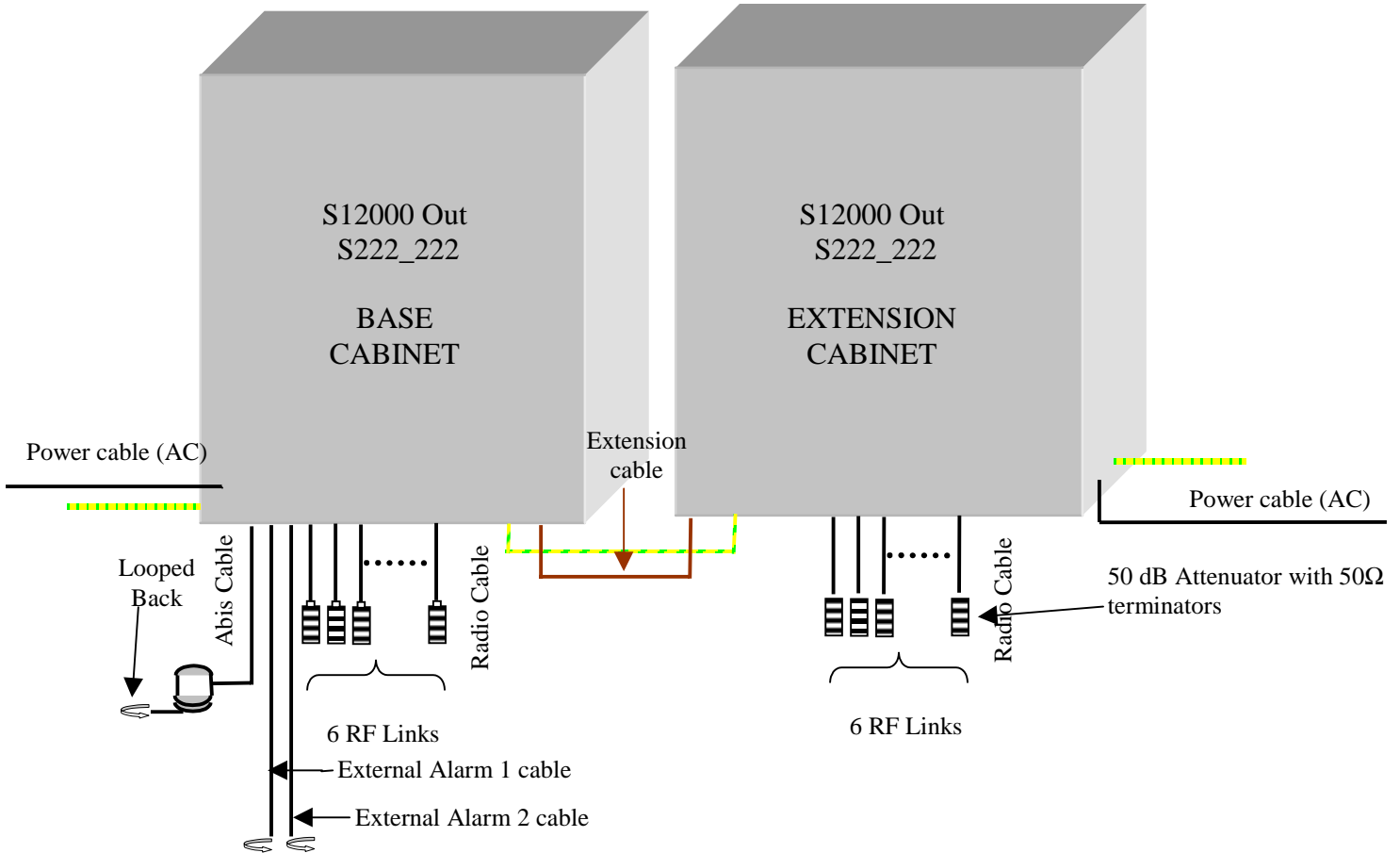
Frequency Range	Quasi Peak Limits
0.45 MHz – 30 MHz	281.8 $\mu$ V (49 dB $\mu$ V)

**S/W Configuration – Traffic data flow :**

All transmitters in the EUT should be transmitting at full power. The transmitters' operating frequencies should be selected by setting the Absolute Radio Frequency Channel Numbers (ARFCN) equally distributed over the BSS operating band, subject to any restrictions of the configuration of the EUT.

## 6. INSTALLATION DIAGRAM

The drawing gives a representation of functional test bench.



The following table presents the list of cable :

S12000 Outdoor Base Cabinet configured in S222_222					
Cables	Description	Length			Quantity
Radio cables	RG214	10 m	Shielded		6
Abis cable	NTQA1717	5.5 m	Shielded		1
Power cable AC	Type H07 RN-F	/	Not Shielded		1
Ground cable	Type H07 VK	/	/		1
External Alarm cables	NTQA1714	5 m	Shielded		2
Equipotentiality braid	NTQA1712	5 m	/		1
Extension cable	NTQA3303	5 m	Shielded		1

S12000 Outdoor Extension Cabinet configured in S222_222					
Cables	Description	Length			Quantity
Radio cables	RG214	10 m	Shielded		6
Power cable AC	Type H07 RN-F	/	Not Shielded		1
Ground cable	Type H07 VK	/	/		1
Equipotentiality braid	/	0.5 m	/		1

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## 7. ABBREVIATIONS AND DEFINITIONS

### 7.1. ABBREVIATIONS

BTS	Base Transceiver Station
DC	Direct Current
DCS	Digital Cellular System
DRX	Driver Receiver unit
EMC	ElectroMagnetic Compatibility
EN	European Norm
ETS	ETSI Standard
EUT	Equipment Under Test
GSM	Global System Mobile
IT	Information Technology
N/A	Not Applicable
RF	Radio Frequency
RXQUAL	Receive Quality
TRX	Transmitter / Receiver

### 7.2. DEFINITIONS

**FCC Part 2** – This part contains the table of frequency allocations and special requirements in international regulations, recommendations, agreements, and treaties. This part also contains standards and procedures concerning the marking and importation of radio frequency devices, and for obtaining equipment authorization.

**FCC Part 15** – This part contains rules setting out the regulations under which an international, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 Devices.

**FCC Part 22** – The purpose of these rule is to establish the requirements and conditions under which domestic common carrier radio stations may be licensed and used in the Public Mobile Services.

**FCC Part 24** – This part states the conditions under which portions of the radio spectrum are made available and licensed for PCS.

**Effective Radiated Power (ERP)** – The product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction.

**Equivalent Isotropically Radiated Power (e.i.r.p.)** – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

**Mean power (of a radio transmitter)** – The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions.

❧END OF DOCUMENT❧

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