SANMINA

Exhibit 4:

Radiated Emissions Test Report

Applicant: Nortel Networks

Class II Permissive Change Application

GYL Technologies

ELECTRO MAGNETIC COMPATIBILITY

LABORATORY

TEST REPORT

Report number :
149003DK

SUBJECT : **EMI measurement about standard FCC CFR 47 part 15 class B and part 24**

CONTRACT :
SANMINA

DATE of report :
November,7 of 2001

CUSTOMER :
P.GALOPIN

EQUIPMENT :
S8000 Outdoor equipped with the modules EDGE SCPA & EDGE DRX 1900 MHz

SIGNATURE

Written by : D.RAUD

Approval : O.ROY

Quality control : L.MONTIEL

GYL Technologies -1 rue Fleming - 49066 ANGERS Cedex 01
Tél. (33) 02 41 36 22 33 - Télécopie (33) 02 41 36 22 23

SUMMARY

1. INFORMATIONS FOR THE TEST

NAME OF EQUIPMENT UNDER TEST :

S8000 Outdoor equipped with the modules EDGE SCPA & EDGE DRX 1900 MHz

COMPANY NAME AND ADDRESS :

SANMINA
19 rue du Centre - CT506
Guyancourt
78928
FRANCE

CUSTOMER NAME :

P.GALOPIN

DATE OF THE TEST :

October, 25 and 26 of 2001

TEST FACILITY :

Gyl Technologies
Angers Technopole
1, rue Fleming
49066 ANGERS cedex 01
France
Tél. 02 41 36 22 33
(Free field emission test site: 18, rue du Nid de Pie)
FCC recognition number I6U

ASSISTANT DURING THE TEST :

P.GALOPIN

TEST DRIVEN BY :

D.RAUD

TEST MANAGER :

Olivier ROY

2. INTRODUCTION

The test is done to verify the compliance of system configuration described §4 versus :
-limits class B of USA standard regulation CFR 47 part 15 subpart B for conducted emissions limits (§15.107 class B device) and radiated emission limits (§15.109 class B device) for unintentional radiator.
-limits of fieldstrength (spurious emission) of USA standard regulation CFR 47 part 24 subpart E (§24.238).

3. DOCUMENTS OF REFERENCE

CFR 47 part 0 to 19, date of 2000
CFR 47 part 20 to 39, date of 2000
ANSI C63.4, date of 1992

4. CONFIGURATION OF THE EQUIPMENT UNDER TEST

HARDWARE :

**** Tested equipment:***
S8000 Outdoor equipped with the modules EDGE SCPA & EDGE DRX 1900 MHz(cabinet without serial n with 48V user module
(Detailed configuration on appendixes C12 and C13)

Interconnections :

4x radio cables type N ; ref RG 214; L= 10m Shielded
1x Alimentation cable ref H07RN-F; L= 5m ; Not Shielded
1x Ground braid of the BTS; L about 2m
1x Abis cable ref: NTQA1717 ; L= 5.5m ;Shielded
1x 48V cable module/bulkhead ref NTQA1713 ; L= 5.5m ;Shielded
1 x Ground wire of 48V module ref NTQA1712 ; L= 5.5m

SOFTWARE : Activity during the test

All transmitters are transmitting at full power
(details on appendix C8)

5. LIST OF MEASUREMENT APPARATUS

APPARATUS	MANUFACTURER	REFERENCE	SERIAL NUMBER	Date of vérification
*RECEIVERS				
Receptive chain :	Hewlett Packard	HP 8574 A	-	-
Q-P Adaptator	Hewlett Packard	HP 85650A	2811A01134	Nov-00
Spectrum analyser	Hewlett Packard	HP 8568 B	2816A116603	Nov-00
Preselector	Hewlett Packard	HP 685685A	287A00784	Nov-00
EMI Software	Hewlett Packard	HP 85869A	-	-
REMS Software for fieldstrength	Hewlett Packard	HP 85879A rev A.02.01	-	-
OPEN AREA TEST SITE				
*NETWORKS Adatpters				
LISN	Rohde & Schwarz	ESH2-Z5	871777/031	Aug-00
LISN	Rohde & Schwarz	ESH2-Z5	872094/037	Aug-00
*ANTENNAS				
Bilog	Chase	CBL6112	2434	Aug-00
Spectrum analyser (20 Hz to 26,5 GHz)	Rohde & Schwarz	FSEM	1079,8500,30	Apr-00
Horn	EMCO	3115	9504-4496	avr-96

6 TEST RESULTS

Test type	Pass the limit	Fail the limit	Appendix
Conduction emission (class B limit):			
AC power line interferences	**x**		**1-1 to 1-4**
DC power line interferences (0/-48Vdc output)	**x**		**1-5 to 1-8**
Emission fieldstrength:			
FCC CFR47 Part 15 (class B limit)	**x**		**2-1**
FCC CFR47 Part 24	**x**		**2-2**

IMPORTANT REMARKS :

Sustitution method was not performed as there was nor spurious emission neither emisssion within the limits detected in prescan as shown by appendix 2-3

7. CONCLUSION

The sample of equipment under test complies with the limits of standards in reference.

Photos of the equipment during AC power line measurement

Photos of the equipment during electric field measurement

Report 149003DK	Appendix C1

S8000 Outdoor equipped with the modules EDGE SCPA & EDGE DRX 1900 MHz : EMC QUALIFICATION TEST PLAN FOR FCC Mark

Reference:	**Nortel/STP/00159**
Version:	**01.01 / EN**
Status:	**Approved**
Date:	**30/Oct/2001**

Product Name:	**S8000 Outdoor**
Frequency :	**1900 MHz**
Discipline:	**EMC**

Author:	**Patrick GALOPIN**
Verified by:	**Thomas LUCHINI**
Approved by:	**Christian CHANSARD**

PUBLICATION HISTORY

VERSION	DATE	AUTHOR	MODIFICATION
01.01/EN	30/10/2001	Patrick GALOPIN	Creation of the document.

CONTENTS

1. INTRODUCTION

1.1. OBJECT

This document presents the tests which will be performed on a GSM 1900 S8000 Outdoor BTS equipped of e-SCPA, e-DRX 1900 Mhz and new EMC doors gaskets.
This document is based on Part 24 of the FCC rules and regulations as they apply to Personal communications systems equipment. The BTS equipments will be classed under Part 24 of the rules as broadband GSM equipment. Measurement requirements for the BTS are taken from FCC Part 2 Subpart J Type acceptance rules (General Rules and Regulations) as required by Part 24, Subpart E of the FCC rules. Emission Measurement Techniques and procedures are based on ANSI C63.4-1992, entitled “Methods of Measurement of Radio Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz”.

2. RELATED DOCUMENTS

2.1. APPLICABLES DOCUMENTS

[A1]	CFR 47 Part 24	Code of Federal Regulations - Part 24 PERSONAL COMMUNICATIONS SERVICES. Date : June 1996.
[A2]	CFR 47 Part 2	Code of Federal Regulations - Part 2 - FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS. GENERAL RULES AND REGULATIONS Date : June 1996.
[A3]	CFR-47-Part15	Code of federal Regulatory. Radio Frequency devices.

2.2. REFERENCE DOCUMENTS

None

3. GENERAL DESCRIPTION OF THE EUT

3.1. GENERAL PRODUCT ARCHITECTURE

Data between e-SCPA and e-DRX are exchanged via a serial link driven by an UART located inside the e-DRX. Control signals are provided for e-SCPA synchronization and presence detection.

3.2. GENERAL PRODUCT ARCHITECTURE

Moreover, the e-SCPA is mounted in an existing rack (one S8000 BTS includes up to 8 e-SCPA).
In the GSM BTS, the RF carriers can be modulated by both GSMK and EDGE modulation standards, on different bursts but on the same carrier.
The eSCPA is connected to the antenna through a duplexer.
A simplified diagram of the eSCPA e-DRX interconnect can be seen in Figure 1.

The output level of each carrier is controlled by a gain control loop (e-DRX+ eSCPA) which adjusts the level at the input of the eSCPA versus its feedback information's level delivered by an output detector located inside the eSCPA.
It also includes a 2dB step attenuator for 12dB (so 6 steps) range "static attenuation".

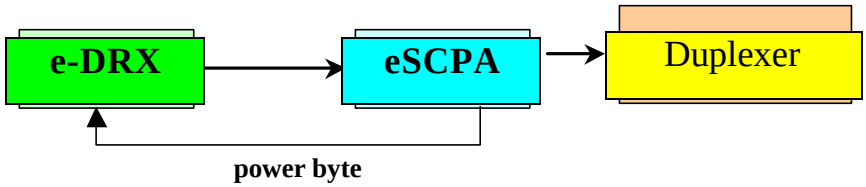


Figure 1 : eSCPA and e-DRX system overview in family S8000 BTS

4. TEST PLAN SUMMARY

Test	Required	Test specification	Reference Method
Radiated emissions	☒	FCC part 15 sub Part 15 B Class B	section 15.109 (30 MHz to 10 GHz) H5
Radiated emissions	☒	FCC part 24	section 24.238 (1 GHz to 20 GHz)
Conducted emissions on AC port AC – 60 Hz – 208 V	☒	FCC part 15	Class B
Conducted emissions on DC port	☒	EN 55022	EN 55022 Class A

5. TEST PLAN

5.1. RADIATED EMISSIONS TESTS

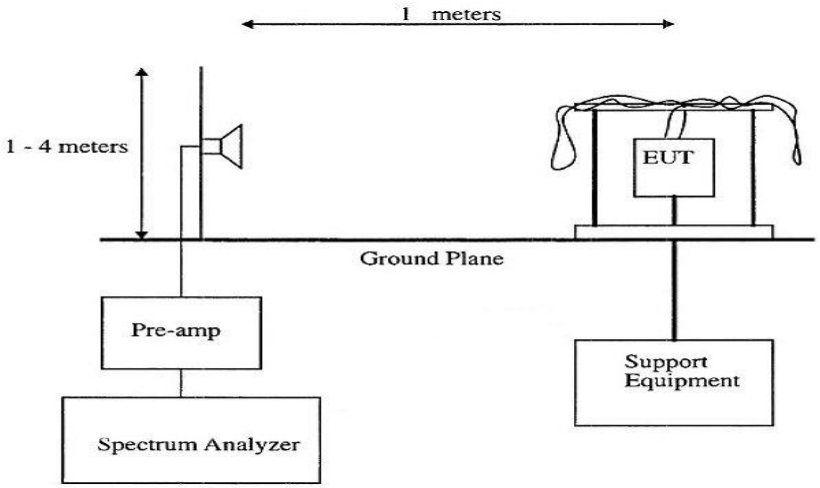
Standard Coverage : FCC Part 24.238 & FCC Part 15.109

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 harmonic 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 field measurements (e.g., a broadcast transmitter installed in a building) measurements will be accepted 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 10 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 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 5th 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.

The equipment was configured as shown in figure 2

Figure 2 : 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 :

$$E\left(\frac{V}{M}\right) = \frac{1}{R(m)} * \sqrt{30 * Pt * G}$$

Where,

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

Therefore :

$$E\left(\frac{V}{M}\right) = \sqrt{30 * 30 * 1.64}$$

E = 38.42 V/m = 151.69 dBµV/m
The spurious emissions must be attenuated by at least 43 + 10*Log(30) = 57.7 dB.
Therefore the field strength limit at 1 meters is :
E = 151.69 dBµV/m - 57.7 dB = 93.9 dBµV/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] **39 dBµV/m**
[88 MHz - 216 MHz] **43.5 dBµV/m**
[216 MHz - 960 MHz] **46 dBµV/m**
Above 960MHz **49.5 dBµV/m**

- For 1 GHz to 20 GHz

measurement distance **1 m**
Limit : **93.9 dBµV/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

6. DOCUMENTATION DELIVERABLES

The report need to contain the minimum following information :

- all the information contained in this document, in order to identity precisely the configuration under test,
- photographs of the equipment under test (as many as different tests, showing open field test site...),
- any deviation from the test methods defined in the relevant standards,
- all calculation formula used during testing (for example, conversion for a test distance of 10m instead of field measurements),
- description of any modifications made to the EUT during testing which are required to acquire compliance,
- instrumentation and antennas calibration dates,
- for radiated and conducted emissions, a table giving the maximum emission levels in absolute and with respect to the limit (margin). Graphical presentation of the results (such as spectrum analyser plots) has to be incorporated.

7. HARDWARE DESCRIPTION OF THE EUT

BTS SUBUNIT	Hardware code	Techn. status	Supplier	Serial Number
MECHANICAL CABINET	NTQA30FA	-	Nortel	-
CBCF	NTQA66EA	01	Nortel	NNTM7500IOMW
CMCF	NTQA66CA	02	Nortel	NNTM7501WGL
CMCF	NTQA66CA	02	Nortel	NNTM7501WG6
CPCMI T1	NTQA66AA	02	Nortel	NNTM7500VC2K
CPCMI T1	NTQA66AA	02	Nortel	NNTM7500UC2T
E-DRX	NTQA88PA	D1	Nortel	CDN2001137012
E-DRX	NTQA88PA	D1	Nortel	CDN2001137013
E-DRX	NTQA88PA	D1	Nortel	CDN2001137011
E-DRX	NTQA88PA	D1	Nortel	CDN2001137010
E-DRX	NTQA88PA	D1	Nortel	CDN2001137001
E-DRX	NTQA88PA	D1	Nortel	CDN2001137015
E-DRX	NTQA88PA	D1	Nortel	CDN2001137009
E-DRX	NTQA88PA	D1	Nortel	CDN2001137008
PA EDGE	NTQA50GA	D21	PowerWave	PWWT01D1F4LP
PA EDGE	NTQA50GA	D2	PowerWave	PWWT01D1F4NP
PA EDGE	NTQA50GA	D2	PowerWave	PWWT01D1F4MP
PA EDGE	NTQA50GA	D2	PowerWave	PWWT01D1F4KP
PA EDGE	NTQA50GA	D2	PowerWave	PWWT01D1F4JP
PA EDGE	NTQA50GA	D2	PowerWave	PWWT01D1F4WP
PA EDGE	NTQA50GA	D2	PowerWave	PWWT01D1F4VP
PA EDGE	NTQA50GA	D2	PowerWave	PWWT01D1F4PP
Splitter	NTQA10AA	02	Nortel	NNTM6100XVHJ
Splitter	NTQA10AA	02	Nortel	NNTM610006JH
Splitter	NTQA10AA	02	Nortel	NNTM6100XVLD
Splitter	NTQA10AA	02	Nortel	NNTM6100XVBT
Splitter	PTQA10AA	P2	Nortel	NNTM61008H4G
Splitter	NTQA10PA	01	Nortel	NNTM7500048S
COMB HDP	NTQA51AA	01	FOREM	NNTM6100L5JK

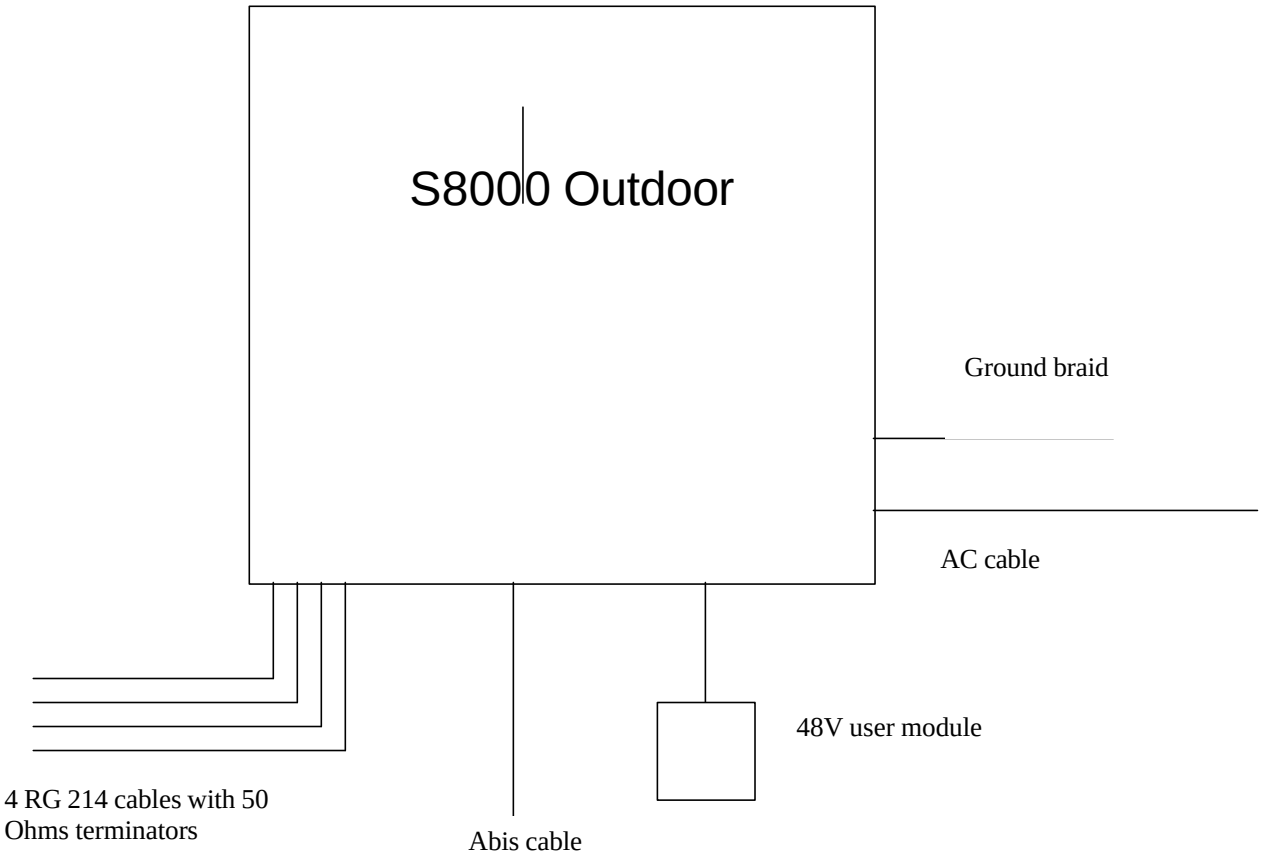
COMB HDP	NTQA51AA	01	FOREM	NNTM6100LPDD
COMB HDP	NTQA51AA	01	FOREM	NNTM6100JTUY
COMB HDP	NTQA51AA	01	FOREM	NNTM6100JWT1
Rectifier Module	NTQA91AA	01	PHILIPS	PITS01079075
Rectifier Module	NTQA91AA	01	PHILIPS	PITS01077037
Rectifier Module	NTQA91AA	01	PHILIPS	PITS01150819
Rectifier Module	NTQA91AA	01	PHILIPS	PITS01079073
Rectifier Module	NTQA91AA	01	PHILIPS	PITS01150830
Rectifier Module	NTQA91AA	01	PHILIPS	PITS01150818
DACS LN Libiert	NTQA97BA	02	LIBIERT	
Doors gaskets	BL 10000		GETELEC	

Cables

Cables	Hardware code	Length	Type	Quantity
Radio cables	RG214	10m	Shielded	4
Abis cable module/bulkhead	NTQA1717	5.5m	Shielded	1
48V cable module/bulkhead	NTQA1713	5.5m	Shielded	1
Alimentation cable	H07RN-F	5m	Not Shielded	1
Ground wire of modules	NTQA1712	5.5m		1

7.1. INSTALLATION DIAGRAM

The drawing gives a representation of functional test bench.



8. ABBREVIATIONS

BTS :	Base Transceiver Station
DC :	Direct Current
DCS :	Digital Cellular System
EDGE:	Enhanced data for GSM evolution
EDRX:	Edge 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

9. 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 marketing 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 intentional, 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 24 - This part states the conditions under which portions of the radio spectrum are made available and licensed for PCS.
Effective Radiated Power (e.r.p.) (in a given direction) - 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

REPORT NUMBER : 149003DK
PRODUCT NAME : S8000 OUTDOOR 1900MHz (e-DRX and e-SCPA)
STANDARD : FCC CFR 47 PART15 CLASS B
MEASUREMENT : AC POWER LINE CONDUCTED PHASE 1
CONDITIONS : 208V/60Hz
DETECTION MODE : PEAK
MEASUREMENTS DONE BY : D.RAUD

==========

25 Oct 2001 10:56:11

==========

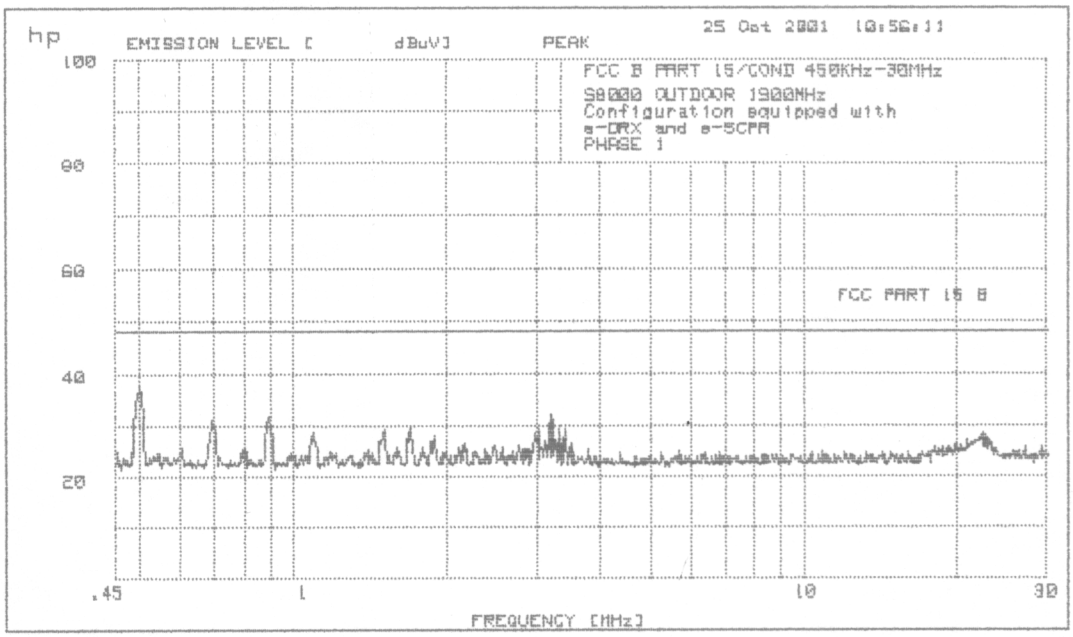
1. SET UP
   1.7 FCC B PART 15/COND 450KHz-30MHz

==========

S8000 OUTDOOR 1900MHz
Configuration equipped with
e-DRX and e-SCPA
PHASE 1

14 highest Peaks above -25 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.5019	37.8	-10.2
2	.6962	30.8	-17.2
3	.8954	31.8	-16.2
4	1.095	28.6	-19.4
5	1.5	28.9	-19.1
6	1.694	29.9	-18.1
7	3.192	30.3	-17.7
8	3.219	32	-16.0
9	3.315	29	-19.0
10	3.414	28.9	-19.1



REPORT NUMBER : 149003OK APPENDIX:1-2
PRODUCT NAME : S8000 OUTDOOR 1900MHz (e-DRX and e-SCPA)
STANDARD : FCC CFR 47 PART15 CLASS B
MEASUREMENT : AC POWER LINE CONDUCTED PHASE 1
CONDITIONS : 208V/60Hz
DETECTION MODE : QUASI-PEAK
MEASUREMENTS DONE BY : D.RAUD

==========

25 Oct 2001 10:56:11

==========

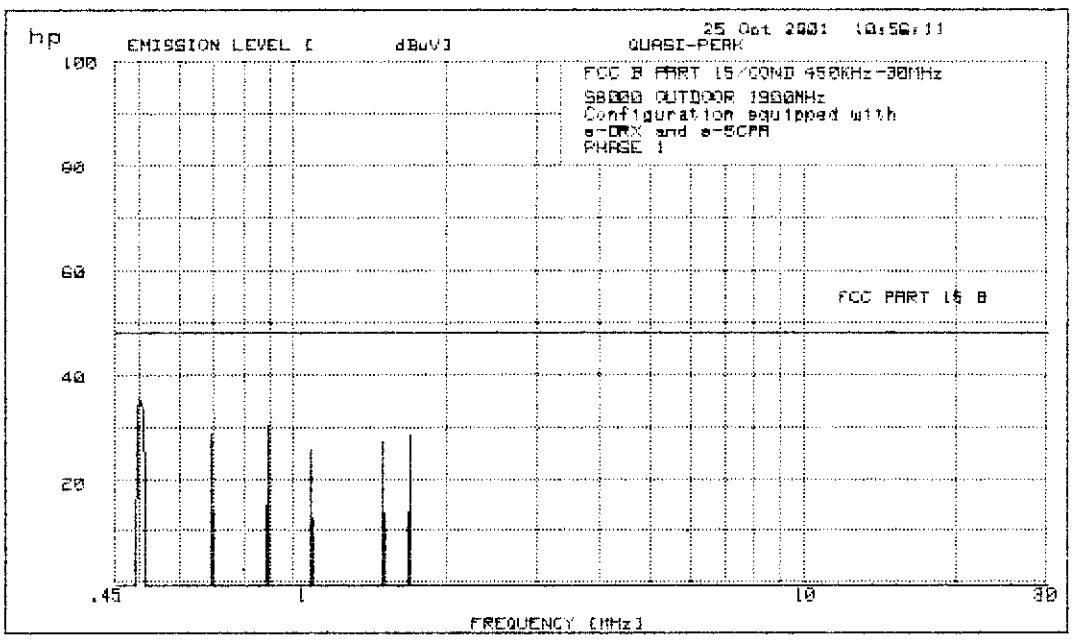
1. SET UP
   1.7 FCC B PART 15/COND 450KHz-30MHz

==========

S8000 OUTDOOR 1900MHz
Configuration equipped with
e-DRX and e-SCPA
PHASE 1

14 highest Quasi-Peaks above -25 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.4998	35.4	-12.6
2	.6962	28.7	-19.3
3	.8954	30.4	-17.6
4	1.091	25.7	-22.3
5	1.494	27.3	-20.7
6	1.694	28.3	-19.7



REPORT NUMBER : 149003DK
PRODUCT NAME : S8000 OUTDOOR 1900MHz (e-DRX and e-SCPA)
STANDARD : FCC CFR 47 PART15 CLASS B
MEASUREMENT : AC POWER LINE CONDUCTED PHASE 2
CONDITIONS : 208V/60Hz
DETECTION MODE : PEAK
MEASUREMENTS DONE BY : D.RAUD

==========

25 Oct 2001 11:27:31

==========

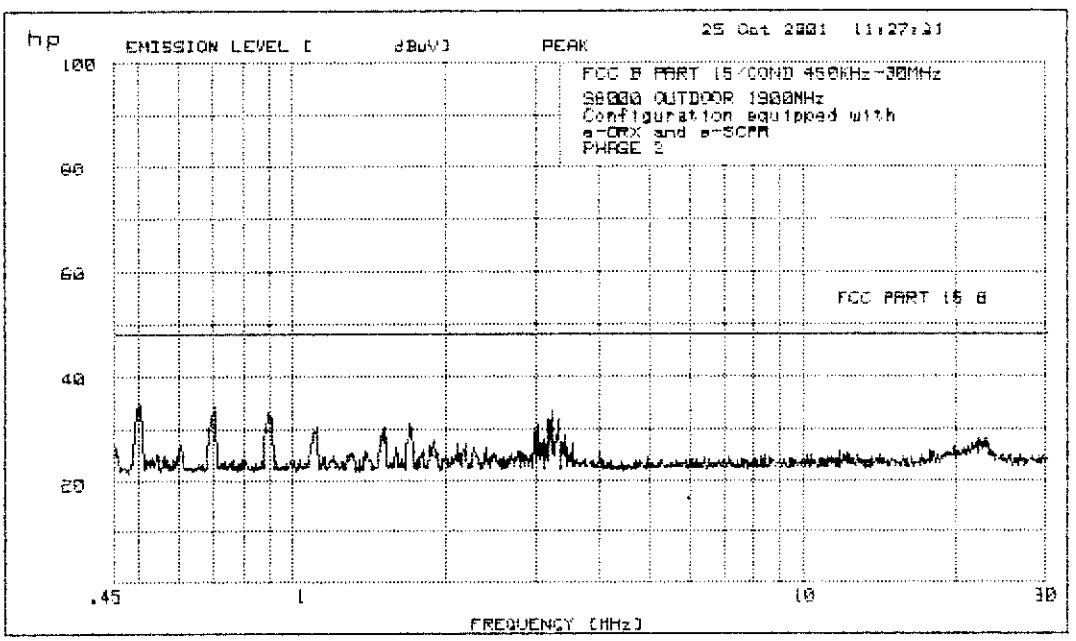
1. SET UP
   1.7 FCC B PART 15/COND 450KHz-30MHz

==========

S8000 OUTDOOR 1900MHz
Configuration equipped with
e-DRX and e-SCPA
PHASE 2

14 highest Peaks above -25 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.504	34.6	-13.4
2	.705	33.9	-14.1
3	.8992	32.8	-15.2
4	1.114	30.2	-17.8
5	1.5	30.1	-17.9
6	1.701	30.9	-17.1
7	3.023	30.5	-17.5
8	3.233	33.3	-14.7
9	3.329	31.6	-16.4
10	3.428	28.6	-19.4



REPORT NUMBER : 149003DK
PRODUCT NAME : S8000 OUTDOOR 1900MHz (e-DRX and e-SCPA)
STANDARD : FCC CFR 47 PART15 CLASS B
MEASUREMENT : AC POWER LINE CONDUCTED PHASE 2
CONDITIONS : 208V/60Hz
DETECTION MODE : QUASI-PEAK
MEASUREMENTS DONE BY : D.RAUD

==========

25 Oct 2001 11:27:31

==========

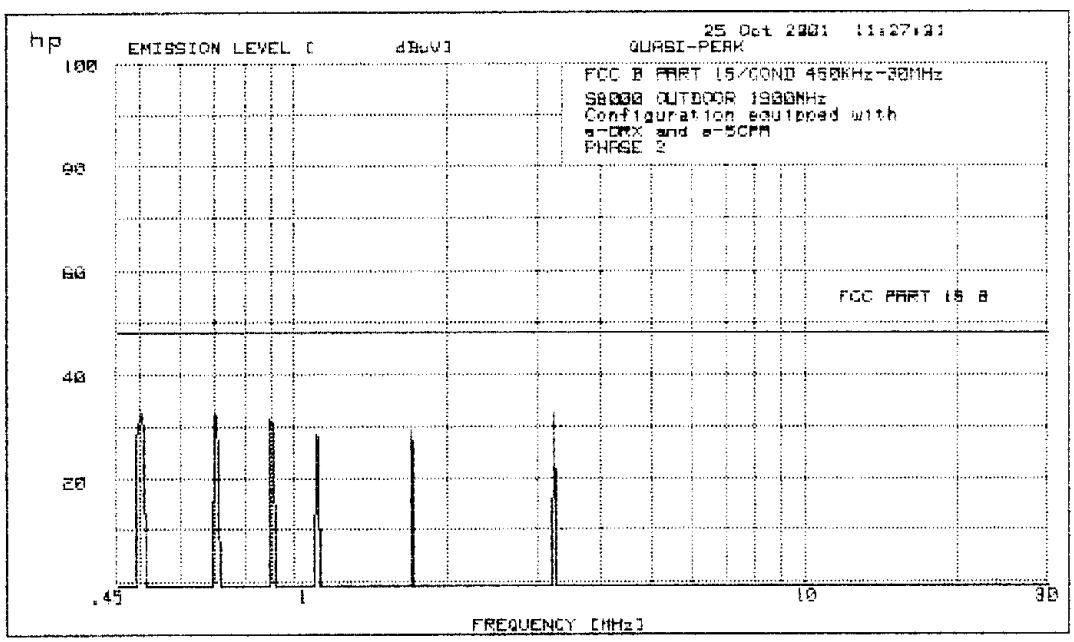
1. SET UP
   1.7 FCC B PART 15/COND 450KHz-30MHz

==========

S8000 OUTDOOR 1900MHz
Configuration equipped with
e-DRX and e-SCPA
PHASE 2

14 highest Quasi-Peaks above -25 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.5019	32.7	-15.3
2	.6991	32.1	-15.9
3	.8992	31.2	-16.8
4	1.109	28.1	-19.9
5	1.701	29.2	-18.8
6	3.233	32.5	-15.5



REPORT NUMBER : 149003DK
PRODUCT NAME : S8000 OUTDOOR 1900MHz (e-DRX and e-SCPA)
STANDARD : FCC CFR 47 PART15 CLASS B
MEASUREMENT : DC POWER LINE CONDUCTED 0V WIRE
CONDITIONS : 208V/60Hz
DETECTION MODE : PEAK
MEASUREMENTS DONE BY : D.RAUD

==========

26 Oct 2001 11:24:40

==========

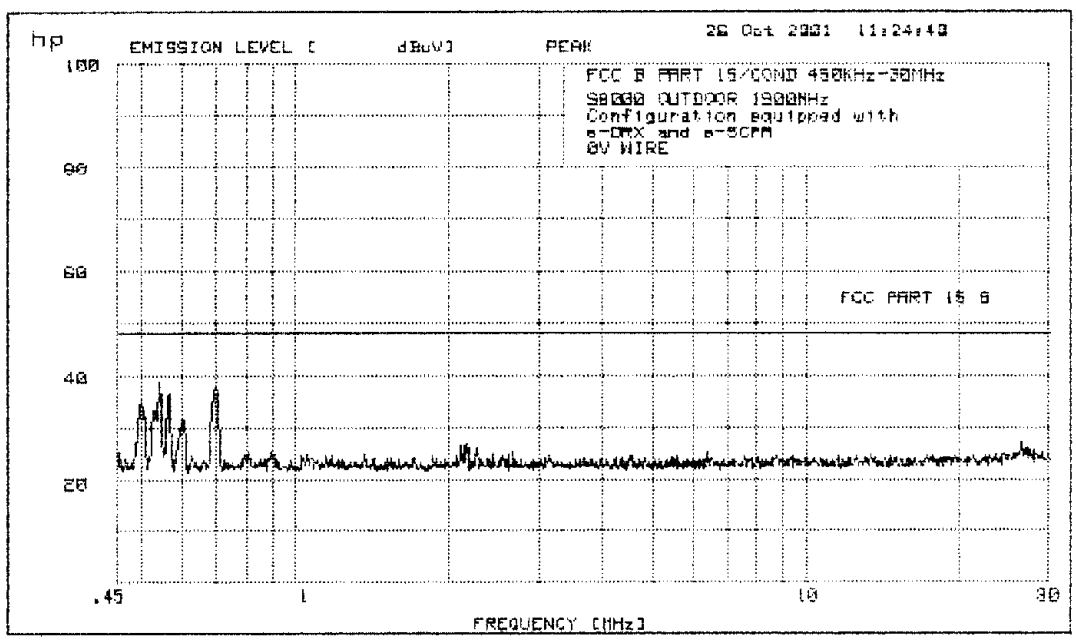
1. SET UP
   1.7 FCC B PART 15/COND 450KHz-30MHz

==========

S8000 OUTDOOR 1900MHz
Configuration equipped with
e-DRX and e-SCPA
0V WIRE

14 highest Peaks above -20 dB of Limit Line #1
peak criteria = 2 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.5019	35.7	-12.3
2	.5435	38.6	-9.4
3	.5568	36.3	-11.7
4	.6011	31.5	-16.5
5	.6991	37.9	-10.1



REPORT NUMBER : 149003DK
PRODUCT NAME : S8000 OUTDOOR 1900MHz (e-DRX and e-SCPA)
STANDARD : FCC CFR 47 PART15 CLASS B
MEASUREMENT : DC POWER LINE CONDUCTED 0V WIRE
CONDITIONS : 208V/60Hz
DETECTION MODE : QUASI-PEAK
MEASUREMENTS DONE BY : D.RAUD

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26 Oct 2001 11:24:40

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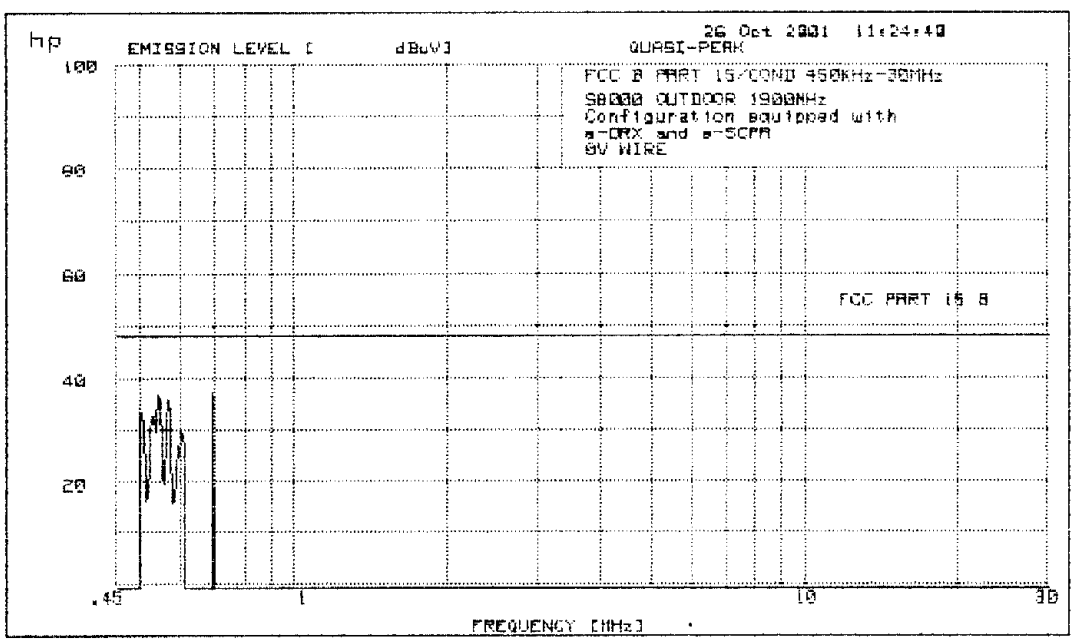
1. SET UP
   1.7 FCC B PART 15/COND 450KHz-30MHz

==========

S8000 OUTDOOR 1900MHz
Configuration equipped with
e-DRX and e-SCPA
0V WIRE

14 highest Quasi-Peaks above -20 dB of Limit Line #1
peak criteria = 2 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.5019	33.4	-14.6
2	.5322	32.5	-15.5
3	.5435	36.8	-11.2
4	.5692	35.7	-12.3
5	.6062	29.2	-18.8
6	.6962	37.2	-10.8



REPORT NUMBER : 149003DK
PRODUCT NAME : S8000 OUTDOOR 1900MHz (e-DRX and e-SCPA)
STANDARD : FCC CFR 47 PART15 CLASS B
MEASUREMENT : BC POWER LINE CONDUCTED -48V WIRE
CONDITIONS : 208V/60Hz
DETECTION MODE : PEAK
MEASUREMENTS DONE BY : D.RAUD

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26 Oct 2001 11:35:19

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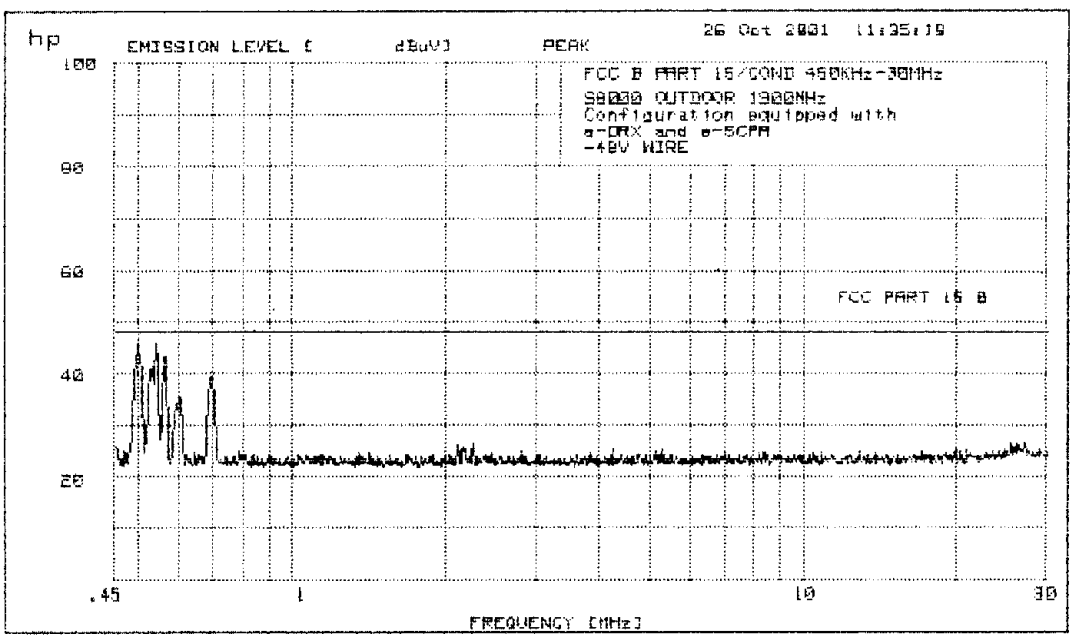
1. SET UP
   1.7 FCC B PART 15/COND 450KHz-30MHz

==========

S8000 OUTDOOR 1900MHz
Configuration equipped with
e-DRX and e-SCPA
-48V WIRE

14 highest Peaks above -25 dB of Limit Line #1
peak criteria = 2 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.5019	45.3	-2.7
2	.53	40.5	-7.5
3	.5435	45.7	-2.3
4	.5644	42.9	-5.1
5	.6036	35.7	-12.3
6	.6962	38.9	-9.1
7	2.116	25.9	-22.1
8	2.17	25.6	-22.4
9	2.263	26.3	-21.7
10	4.246	25.1	-22.9
11	5.282	25.3	-22.7
12	19.97	25.2	-22.8
13	25.58	26.5	-21.5
14	26.23	26.4	-21.6



REPORT NUMBER : 149003DK
PRODUCT NAME : S8000 OUTDOOR 1900MHz (e-DRX and e-SCPA)
STANDARD : FCC CFR 47 PART15 CLASS B
MEASUREMENT : DC POWER LINE CONDUCTED -48V WIRE
CONDITIONS : 208V/60Hz
DETECTION MODE : QUASI-PEAK
MEASUREMENTS DONE BY : D.RAUD

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26 Oct 2001 11:35:19

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1. SET UP
   1.7 FCC B PART 15/COND 450KHz-30MHz

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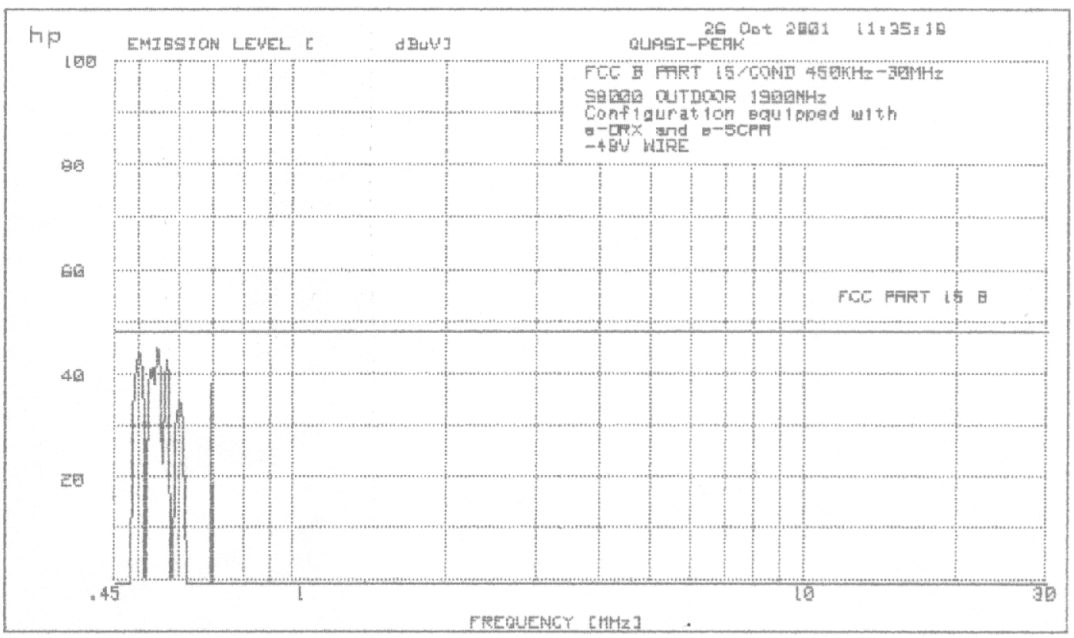
S8000 OUTDOOR 1900MHz
Configuration equipped with
e-DRX and e-SCPA
-48V WIRE

14 highest Quasi-Peaks above -20 dB of Limit Line #1
peak criteria = 2 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.5019	43.6	-4.4
2	.5322	41	-7.0
3	.5458	44.9	-3.1
4	.5692	42.5	-5.5
5	.6036	34.3	-13.7
6	.6962	38	-10.0

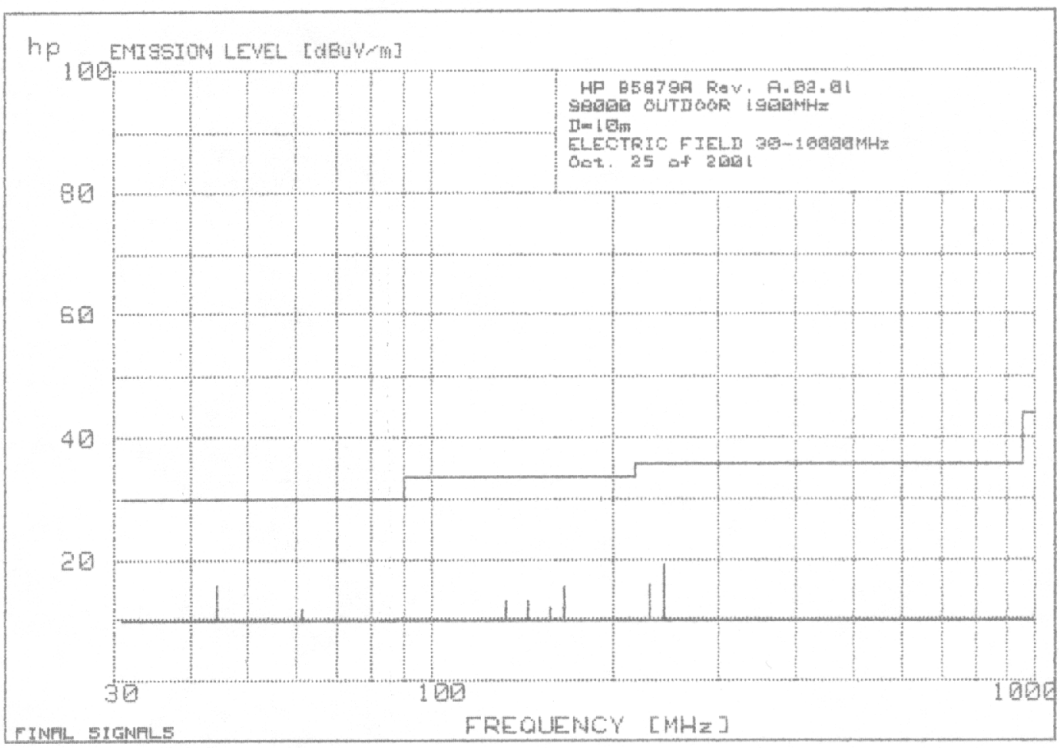


REPORT : 149003DK
PRODUCT NAME : S8000 OUTDOOR 1900MHz (e-DRX and e-SCPA)
STANDARD : FCC CFR47 PART 15 CLASS B (Limit for D=10m)
MEASUREMENT : ELECTRIC FIELD 30-106Hz D=10m
CONDITIONS : 208V/60Hz
DATE : October, 25 of 2001
MEASUREMENT DONE BY : D.RAUD

PRODUCT EMISSIONS

HP 85879A Rev. A.02.01 Data File: E FIELD D=10m 25 Oct 2001 17:02

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORR FACTOR dB	COMMENTS
1	43.001	30.0	15.8	-14.2	QP	V	230	170	12.8	BROAD BAND
2	59.997	30.0	12.1	-17.9	QP	V	230	120	5.8	
3	131.094	33.5	13.4	-20.1	QP	V	150	170	13.1	
4	143.318	33.5	13.4	-20.1	QP	V	120	125	12.6	
5	155.802	33.5	12.2	-21.3	QP	V	120	25	11.9	
6	163.837	33.5	15.7	-17.8	PK	V	180	200	11.6	
7	227.998	36.0	16.0	-20.0	QP	V	120	165	13.1	
8	240.000	36.0	19.0	-17.0	PK	V	120	10	13.9	



No spurious signal over 1000MHz.

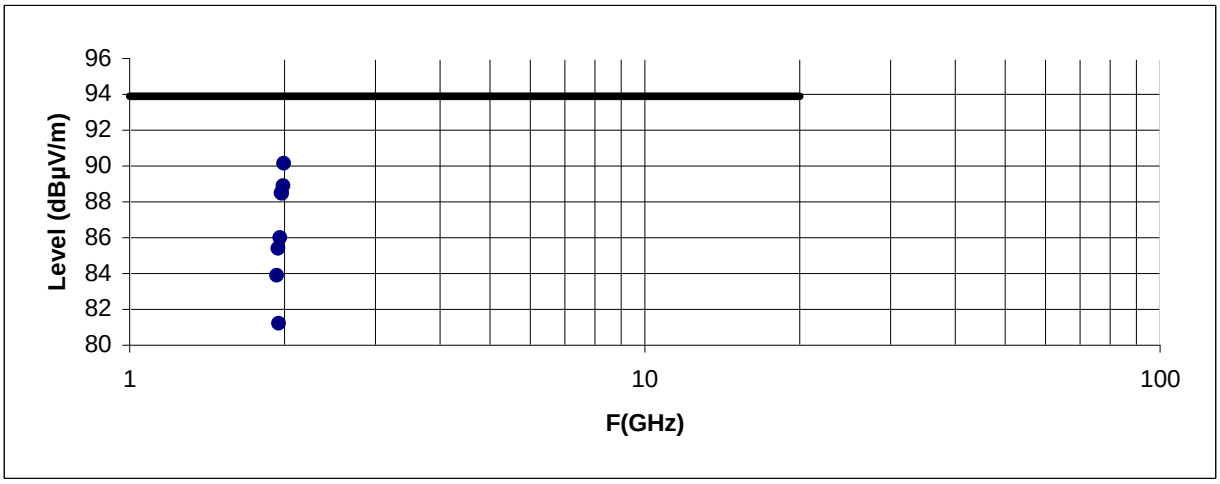
Report number: 149003DK **Appendix 2-2**
PRODUCT NAME: S8000 Outdoor equipped with the modules EDGE SCPA & EDGE DRX 1900 MHz
STANDARD: CFR 47 part 24 subpart E: § 24.238
Electric fieldstrength spurious emissions from 1 GHz to 20 GHz
CONDITIONS Measurements done in transmitter mode (all transmitters at maximum power 30 W, in BCCH mode without frequency hopping) and in receiver mode.
Measurement distance: 1m
Limit = -13.1 dBm (93.9 dBµV/m) for D=1m (RBW=100KHz)
TEST SITE: FREE FIELD AREA
DATE: October, 25 of 2001

MEASUREMENT DONE BY: D.RAUD

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

FREQUENCY (GHz)	Measure (dBµV)	FA A	Loss cable B	Correc.Factor A+B	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1						93,9	
1,9302	54,0	27,9	2	29,9	83,9	93,9	-10,0
1,9398	55,5	27,9	2	29,9	85,4	93,9	-8,5
1,9498	51,3	27,9	2	29,9	81,2	93,9	-12,7
1,9580	56,1	27,9	2	29,9	86,0	93,9	-7,9
1,9670	58,6	27,9	2	29,9	88,5	93,9	-5,4
1,9760	58,6	27,9	2	29,9	88,5	93,9	-5,5
1,9850	59,0	27,9	2	29,9	88,9	93,9	-5,0
1,9898	60,3	27,9	2	29,9	90,2	93,9	-3,8
20						93,9	

Maximum at 0 degre, antenna in horizontal position



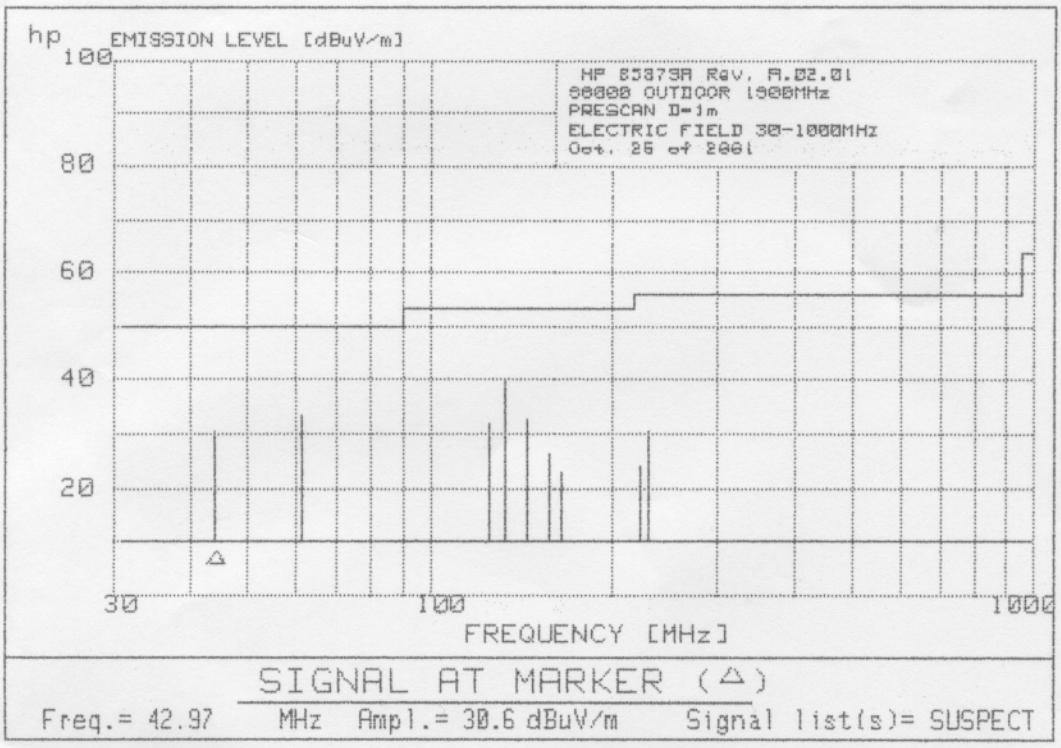
2 - Spurious emissions measurement.
No spurious emission found which level upper to noise level in 100KHz bandwidth (-90 dBm) from 1 GHz to 20 GHz.

REPORT : 149003DK APPENDIX 2-3
PRODUCT NAME : S8000 OUTDOOR 1900MHz (e-DRX and e-SCPA)
STANDARD : FCC CFR47 PART 15 CLASS B (Limit for D=1m)
MEASUREMENT : ELECTRIC FIELD 30MHz-1GHz (PRESCAN) D=1m
10 UPPER LEVEL SIGNALS FOUND DURING PRESCAN MEASUREMENT
CONDITIONS : 208V/60Hz
DATE : October, 25 of 2001
MEASUREMENT DONE BY : D.RAUD

ALL SUSPECTS 25 Oct 2001 16:01:18

No	FREQ MHz	BND LIM	PEAK ABS	ANT P cm	AZ deg	COMMENTS
1	42.97	2	-19 30.6	H100	0	
2	59.996	4	-17 33.4	V100	0	
3	122.96	12	-22 31.9	V100	0	
4	131.01	12	-13 40.3	V100	0	
5	143.384	14	-21 32.7	V100	0	
6	155.811	16	-27 26.2	V100	180	
7	163.82	17	-31 22.8	H100	180	
8	221.06	20	-32 24.1	H100	0	
9	227.99	20	-25 30.5	H100	0	

* denotes a Final List signal



Report number: 149003DK **Appendix 2-4**

PRODUCT NAME: S8000 Outdoor equipped with the modules EDGE SCPA & EDGE DRX 1900 MHz

STANDARD: CFR 47 part 24 subpart E: § 24.238

Electric fieldstrength spurious emissions from 1 GHz to 20 GHz

Measurement: Noise level of spectrum analyser from 1GHz to 20GHz with setup used during CFR 47 part 24 measurement

DATE: October, 25 of 2001

MEASUREMENT DONE BY: D.RAUD