M. Flom Associates, Inc. - Global Compliance Center
3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176
www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

Date:	March 8, 2004
Applicant:	Nokia Corporation Elektroniikkatie 10 Fin-90570 Oulu, Finland
Attention of:	Kare Oksanen, R&D Type Approvals kare.oksanen@nokia.com 011 358 7180 08000; FAX: 011 358 7180 47222
Equipment:	NPL-4
FCC ID:	LJPNPL-4
P.O. Number:	D91-4765684/01/20/2004
FCC Rules:	22H, 24E, Confidentiality

Gentlemen:

Enclosed please find your copies of the Engineering Test Report.

Should you need any clarification, just fax or phone. Thank you again for this order - it has been a pleasure to be of service.

Sincerely yours,

Morton Flom, P. Eng.

enclosure(s)
MF/cva

MFA **M. Flom Associates, Inc. - Global Compliance Center**
3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176
www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

Memo

Date: February 27, 2004

Applicant: Nokia Corporation
Elektroniikkatie 10
Fin-90570
Oulu, Finland

Equipment: NPL-4
FCC ID: LJPNPL-4

Please note that the enclosed Reports reflect the results of tests performed to the currently published Federal Communications Commissions Rules and Regulations.

Should the FCC's Examiners' interpretations request new and unpublished requirements, we will be pleased to provide them. We will invoice you accordingly, i.e. for the time spent on re-testing, providing the amended pages and/or Reports and for the time necessary to be spent on electronic filing. We will of course provide you with copies of any of the additions.

We regret any added expense to the Applicants, but of late the FCC continues to change their requirements without any prior written publication and/or notices.

Sincerely yours,

Morton Flom, P. Eng.

MFA **M. Flom Associates, Inc. - Global Compliance Center**
3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176
www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

Summary of Restrictions

1. All submissions to the FCC are subject to **their** Examiner's interpretation.

2. Please allow from 60 to 90 days before hearing from the FCC with regard to any submission.

3. The FCC can set aside any action; modify or set aside any action, within 30 days. (FCC Rule 1.108, 1.113).

4. Under Rule 2.803, if device is not type accepted/certificated then it must **not** be sold, leased, offered for sale, imported, shipped or distributed or advertised for sale.

5. FCC can revoke its certificates at any time if the equipment does not meet or **continue** to meet their Rules. (Rule Parts 2.927, 2.939).

6. FCC can request a sample at any time (2.936).

M. Flom Associates, Inc.

Morton Flom, P. Eng.

M. Flom Associates, Inc. - Global Compliance Center
3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176
www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

Transmitter Certification

of

FCC ID: LJPNPL-4
Model: NPL-4
S/N of units tested: 004400201663711 and 004400201663638

to

Federal Communications Commission

Rule Part(s) 22H, 24E, Confidentiality

Date Of Report: February 27, 2004

On the Behalf of the Applicant:

Nokia Corporation

At the Request of: P.O. D91-4765684/01/20/2004

Nokia Corporation
Elektroniikkatie 10
Fin-90570
Oulu, Finland

Attention of: Kare Oksanen, R&D Type Approvals
kare.oksanen@nokia.com
011 358 7180 08000; FAX: 011 358 7180 47222

Supervised By: Morton Flom, P. Eng.

List of Exhibits
(FCC **Certification** (Cellular Transmitters) - Revised 9/28/98)

Applicant: Nokia Corporation

FCC ID: LJPNPL-4

By Applicant:

1. Letter of Authorization

2. Identification Drawings, 2.1033(c)(11)
   - __ Label
   - __ Location of Label
   - __ Compliance Statement
   - __ Location of Compliance Statement

3. Photographs, 2.1033(c)(12)

4. Confidentiality Request: 0.457 And 0.459

5. Documentation: 2.1033(c)
   - (3) User Manual
   - (9) Tune Up Info
   - (10) Schematic Diagram
   - (10) Circuit Description
   - Block Diagram
   - Parts List
   - Active Devices

6. Attestation: ESN: Section 22.919

7. Attestation: OET: Section 22.933

By M.F.A. Inc.

A. Testimonial & Statement of Certification

B. Statement of Qualifications

The applicant has been cautioned as to the following:

15.21 Information to User.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Table of Contents

Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

a) **Test Report**

b) Laboratory: M. Flom Associates, Inc.
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044) Chandler, AZ 85225
c) Report Number: d0420048

d) Client: Nokia Corporation
Elektroniikkatie 10
Fin-90570
Oulu, Finland
e) Identification: NPL-4
FCC ID: LJPNPL-4
Description: GSM 850/1800/1900 Cellular Telephone

f) EUT Condition: Not required unless specified in individual tests.
g) Report Date: February 27, 2004
EUT Received: 2004-Feb-23

h, j, k): As indicated in individual tests.
i) Sampling method: No sampling procedure used.
l) Uncertainty: In accordance with MFA internal quality manual.

m) Supervised by:

Morton Flom, P. Eng.

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

Accessories Used During Testing:

Type	Model	MFA Number
Charger	AC-1	S01096
Charger	ACP-12	S01275
Charger	ACP-8	S01250
Charger	ACP-7	S01248
Stereo Headset	HDS-3	S00566
Headset	HS-8	S01097
Fashion Headset	HS-3	S01098
Boom Headset	HDB-4	S00731
Headset	HS-5	S00730
Loopset	LPS-4	S00564
Battery	B2-5B	S01099
Battery	B2-5B	S01100
RF ID Cover	CC-197D	S01101

List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to

22H, 24E, Confidentiality

Sub-Part 2.1033
(c)(1): **Name and Address of Applicant**:

Nokia Corporation
Elektroniikkatie 10
Fin-90570
Oulu, Finland

Manufacturer:

Nokia TMC., Ltd
Yangduck-Dong 973-6
Hwe won-Ku, Masan. Korea

(c)(2): **FCC ID**: LJPNPL-4

Model Number: NPL-4

(c)(3): **Instruction Manual(s)**:

Please See Attached Exhibits

(c)(4): **Type of Emission**: 300KGXW, 300KG7W

(c)(5): **FREQUENCY RANGE, MHz**: 1850.2 to 1909.8
824.2 to 848.8

(c)(6): **Power Rating, Watts**: 29.7 ERP (GSM850/GPRS850)
27.0 ERP (GPRS850)
23.9 ERP (EGPRS850)
29.2 EIRP (GSM1900/GPRS1900)
25.7 EIRP (EGPRS1900)

___ Switchable __x__ Variable ___ N/A

(c)(7): **Maximum Power Rating, Watts**: 7

Subpart 2.1033 (continued)

(c)(8): Voltages & Currents in All Elements in Final RF Stage, Including Final Transistor or Solid State Device:

Collector Current, A	=	2
Collector Voltage, Vdc	=	4.2
Supply Voltage, Vdc	=	3.9

(c)(9): **Tune-Up Procedure**:

Please See Attached Exhibits

(c)(10): **Circuit Diagram/Circuit Description**:
Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

Please See Attached Exhibits

(c)(11): **Label Information**:

Please See Attached Exhibits

(c)(12): **Photographs**:

Please See Attached Exhibits

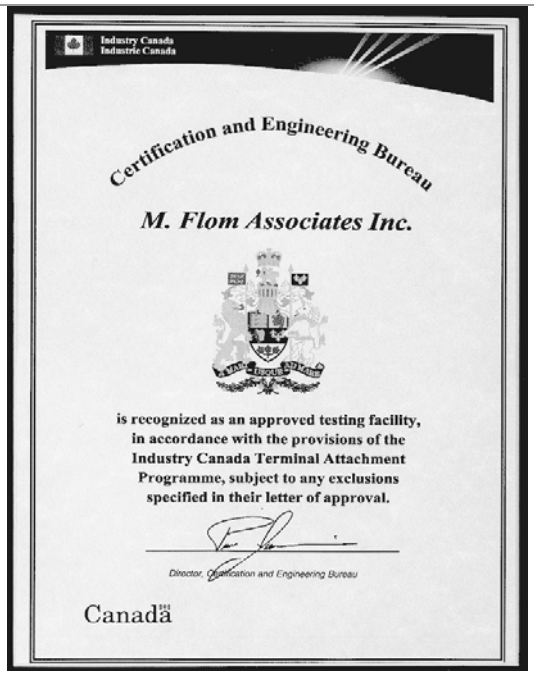
(c)(13): **Digital Modulation Description**:

___ Attached Exhibits
_x_ N/A

(c)(14): **Test and Measurement Data**:

Follows

Industry Canada



Industry Canada
Industrie Canada

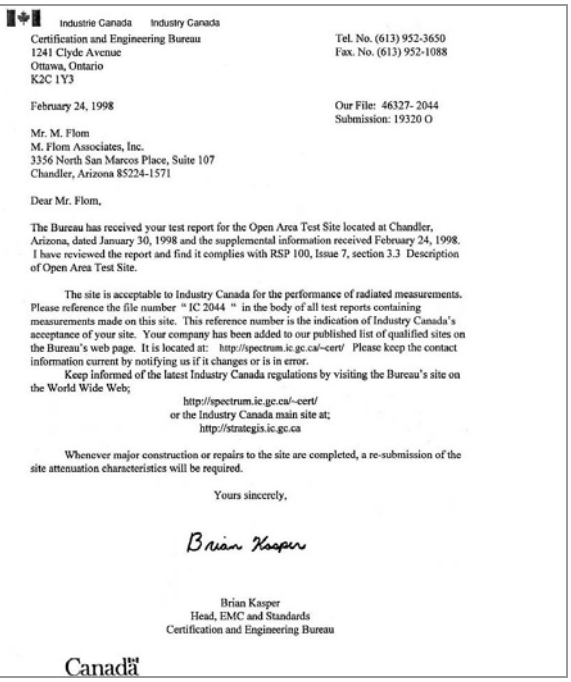
Certification and Engineering Bureau

M. Flom Associates Inc.

is recognized as an approved testing facility, in accordance with the provisions of the Industry Canada Terminal Attachment Programme, subject to any exclusions specified in their letter of approval.

Director, Certification and Engineering Bureau

Canada



Industrie Canada Industry Canada

Certification and Engineering Bureau
1241 Clyde Avenue
Ottawa, Ontario
K2C 1Y3

Tel. No. (613) 952-3650
Fax. No. (613) 952-1088

February 24, 1998

Our File: 46327- 2044
Submission: 19320 O

Mr. M. Flom
M. Flom Associates, Inc.
3356 North San Marcos Place, Suite 107
Chandler, Arizona 85224-1571

Dear Mr. Flom,

The Bureau has received your test report for the Open Area Test Site located at Chandler, Arizona, dated January 30, 1998 and the supplemental information received February 24, 1998. I have reviewed the report and find it complies with RSP 100, Issue 7, section 3.3 Description of Open Area Test Site.

The site is acceptable to Industry Canada for the performance of radiated measurements. Please reference the file number " IC 2044 " in the body of all test reports containing measurements made on this site. This reference number is the indication of Industry Canada's acceptance of your site. Your company has been added to our published list of qualified sites on the Bureau's web page. It is located at: http://spectrum.ic.gc.ca/~cert/ Please keep the contact information current by notifying us if it changes or is in error.

Keep informed of the latest Industry Canada regulations by visiting the Bureau's site on the World Wide Web;

http://spectrum.ic.gc.ca/~cert/
or the Industry Canada main site at;
http://strategis.ic.gc.ca

Whenever major construction or repairs to the site are completed, a re-submission of the site attenuation characteristics will be required.

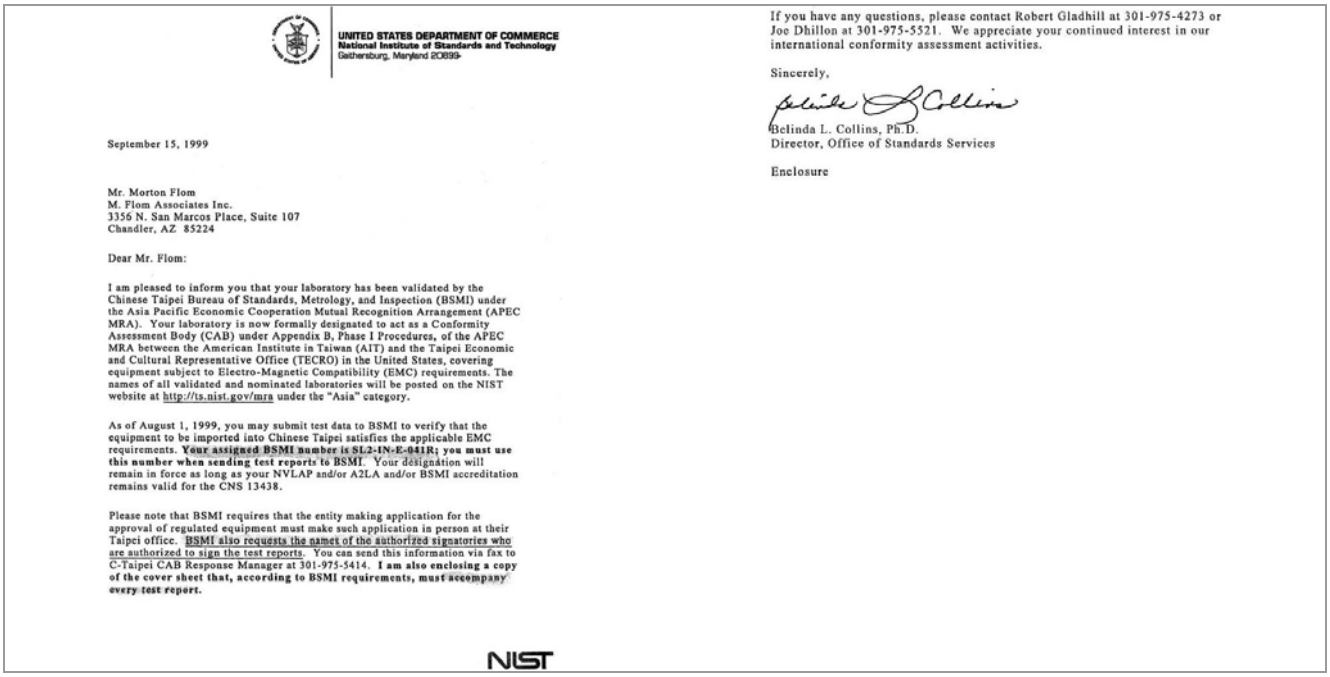
Yours sincerely,

Brian Kasper

Brian Kasper
Head, EMC and Standards
Certification and Engineering Bureau

Canada

NIST



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

September 15, 1999

Mr. Morton Flom
M. Flom Associates Inc.
3356 N. San Marcos Place, Suite 107
Chandler, AZ 85224

Dear Mr. Flom:

I am pleased to inform you that your laboratory has been validated by the Chinese Taipei Bureau of Standards, Metrology, and Inspection (BSMI) under the Asia Pacific Economic Cooperation Mutual Recognition Arrangement (APEC MRA). Your laboratory is now formally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA between the American Institute in Taiwan (AIT) and the Taipei Economic and Cultural Representative Office (TECRO) in the United States, covering equipment subject to Electro-Magnetic Compatibility (EMC) requirements. The names of all validated and nominated laboratories will be posted on the NIST website at http://ts.nist.gov/mra under the "Asia" category.

As of August 1, 1999, you may submit test data to BSMI to verify that the equipment to be imported into Chinese Taipei satisfies the applicable EMC requirements. **Your assigned BSMI number is SL2-IN-E-041R; you must use this number when sending test reports to BSMI.** Your designation will remain in force as long as your NVLAP and/or A2LA and/or BSMI accreditation remains valid for the CNS 13438.

Please note that BSMI requires that the entity making application for the approval of regulated equipment must make such application in person at their Taipei office. BSMI also requests the names of the authorized signatories who are authorized to sign the test reports. You can send this information via fax to C-Taipei CAB Response Manager at 301-975-5414. **I am also enclosing a copy of the cover sheet that, according to BSMI requirements, must accompany every test report.**

If you have any questions, please contact Robert Gladhill at 301-975-4273 or Joe Dhillon at 301-975-5521. We appreciate your continued interest in our international conformity assessment activities.

Sincerely,

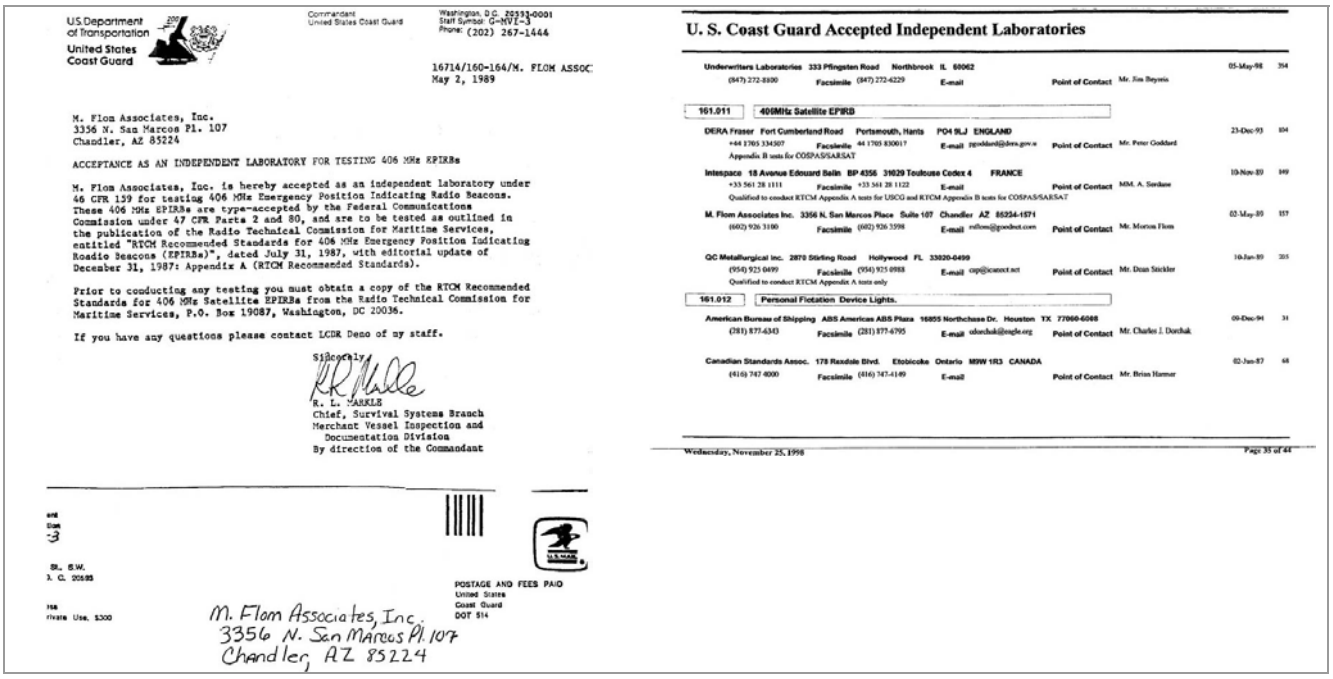
Belinda L. Collins, Ph.D.
Director, Office of Standards Services

Enclosure

NIST

Page Number 5 of 49.

U.S. Coast Guard



U.S. Department of Transportation
United States Coast Guard

Commandant
United States Coast Guard

Washington, D.C. 20593-0001
Staff Symbol: G-MVI-3
Phone: (202) 267-1444

16714/160-164/M. FLOM ASSOC
May 2, 1989

M. Flom Associates, Inc.
3356 N. San Marcos Pl. 107
Chandler, AZ 85224

ACCEPTANCE AS AN INDEPENDENT LABORATORY FOR TESTING 406 MHz EPIRBs

M. Flom Associates, Inc. is hereby accepted as an independent laboratory under 46 CFR 159 for testing 406 MHz Emergency Position Indicating Radio Beacons. These 406 MHz EPIRBs are type-accepted by the Federal Communications Commission under 47 CFR Parts 2 and 80, and are to be tested as outlined in the publication of the Radio Technical Commission for Maritime Services, entitled "RTCM Recommended Standards for 406 MHz Emergency Position Indicating Roadio Beacons (EPIRBs)", dated July 31, 1987, with editorial update of December 31, 1987: Appendix A (RTCM Recommended Standards).

Prior to conducting any testing you must obtain a copy of the RTCM Recommended Standards for 406 MHz Satellite EPIRBs from the Radio Technical Commission for Maritime Services, P.O. Box 19087, Washington, DC 20036.

If you have any questions please contact LCDR Demo of my staff.

Sincerely,

R. L. MARKLE
Chief, Survival Systems Branch
Merchant Vessel Inspection and
Documentation Division
By direction of the Commandant

POSTAGE AND FEES PAID
United States
Coast Guard
DOT 514

M. Flom Associates, Inc.
3356 N. San Marcos Pl. 107
Chandler, AZ 85224

U. S. Coast Guard Accepted Independent Laboratories

Underwriters Laboratories 333 Pfingsten Road Northbrook IL 60062					05-May-98 354
(847) 272-8800	Facsimile (847) 272-6229	E-mail	Point of Contact	Mr. Jim Beyreis	
161.011	**406MHz Satellite EPIRB**				
DERA Fraser Fort Cumberland Road Portsmouth, Hants PO4 9LJ ENGLAND					23-Dec-93 104
+44 1705 334307	Facsimile 44 1705 830017	E-mail pgoddard@dera.gov.u	Point of Contact	Mr. Peter Goddard	
Appendix B tests for COSPAS/SARSAT					
Intespace 18 Avenue Edouard Belin BP 4356 31029 Toulouse Cedex 4 FRANCE					10-Nov-89 049
+33 561 28 1111	Facsimile +33 561 28 1122	E-mail	Point of Contact	MM. A. Sardane	
Qualified to conduct RTCM Appendix A tests for USCG and RTCM Appendix B tests for COSPAS/SARSAT					
M. Flom Associates Inc. 3356 N. San Marcos Place Suite 107 Chandler AZ 85224-1571					02-May-89 037
(602) 926 3100	Facsimile (602) 926 3598	E-mail mflom@goodnet.com	Point of Contact	Mr. Morton Flom	
QC Metallurgical Inc. 2870 Stirling Road Hollywood FL 33020-0499					10-Jan-89 205
(954) 925 0499	Facsimile (954) 925 0988	E-mail cqc@icanect.net	Point of Contact	Mr. Dean Stickler	
Qualified to conduct RTCM Appendix A tests only					
161.012	**Personal Flotation Device Lights.**				
American Bureau of Shipping ABS Americas ABS Plaza 16855 Northchase Dr. Houston TX 77060-6008					09-Dec-94 31
(281) 877-6343	Facsimile (281) 877-6795	E-mail odorchak@eagle.org	Point of Contact	Mr. Charles J. Dorchak	
Canadian Standards Assoc. 178 Rexdale Blvd. Etobicoke Ontario M9W 1R3 CANADA					02-Jun-87 68
(416) 747 4000	Facsimile (416) 747-4149	E-mail	Point of Contact	Mr. Brian Harmer	

Wednesday, November 25, 1998 Page 35 of 44

Sub-part
2.1033(c)(14): **Test and Measurement Data**

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057 and the following individual Parts:

_____ 21 – Domestic Public Fixed Radio Services
_____ 22 – Public Mobile Services
_x_ 22 Subpart H - Cellular Radiotelephone Service
_____ 22.901(d) - Alternative technologies and auxiliary services
_____ 23 – International Fixed Public Radiocommunication services
_x_ 24 – Personal Communications Services
_____ 74 Subpart H - Low Power Auxiliary Stations
_____ 80 – Stations in the Maritime Services
_____ 80 Subpart E - General Technical Standards
_____ 80 Subpart F - Equipment Authorization for Compulsory Ships
_____ 80 Subpart K - Private Coast Stations and Marine Utility Stations
_____ 80 Subpart S - Compulsory Radiotelephone Installations for Small Passenger Boats
_____ 80 Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes
_____ 80 Subpart U - Radiotelephone Installations Required by the Bridge-to-Bridge Act
_____ 80 Subpart V - Emergency Position Indicating Radiobeacons (EPIRB'S)
_____ 80 Subpart W - Global Maritime Distress and Safety System (GMDSS)
_____ 80 Subpart X - Voluntary Radio Installations
_____ 87 – Aviation Services
_____ 90 – Private Land Mobile Radio Services
_____ 94 – Private Operational-Fixed Microwave Service
_____ 95 Subpart A - General Mobile Radio Service (GMRS)
_____ 95 Subpart C - Radio Control (R/C) Radio Service
_____ 95 Subpart D - Citizens Band (CB) Radio Service
_____ 95 Subpart E - Family Radio Service
_____ 95 Subpart F - Interactive Video and Data Service (IVDS)
_____ 97 - Amateur Radio Service
_____ 101 – Fixed Microwave Services

Standard Test Conditions
and
Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2000, section 6.1.9, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

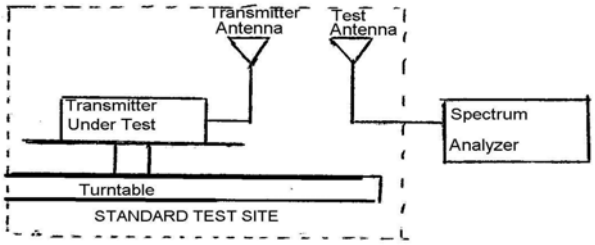
Page Number 8 of 49.

Name of Test: ERP/EIRP Carrier Power (Radiated)

Specification: TIA/EIA 603A (Substitution Method)

2.2.17.1 Definition: The average radiated power of a licensed device is the equivalent power required, when delivered to a half-wave dipole or horn antenna, to produce at a distant point the same average received power as produced by the licensed device.

2.2.17.2 Method of Measurement:
a) Connect the equipment as illustrated. Place the transmitter to be tested on the turntable in the standard test site.



b) Raise and lower the test antenna from 1m to 4m and rotate turntable from 0° to 360°. Record the highest received signal in dB as ET.

c) Replace the transmitter under test with a substitution antenna. The center of the antenna should be at the same location as the transmitter under test. Connect the antenna to a signal generator with a known output power level using the same modulation as with the transmitter. Raise and lower the test antenna like in step b) and record the highest received signal in dB as ES.

d) Calculate radiated power as following:
Radiated power = Level + ET – ES + GainAnt

ET Signal level received from transmitter
ES Signal level received from substitution antenna

RESULTS ATTACHED

Page Number 9 of 49.

Test Results For: ERP/EIRP Carrier Power (Radiated)

Freq MHz	Level dBm	Antenna Gain dBi	ET – ES dBm	Radiated Out dbm	P	Radiated Out Watts	P
GSM850/GPRS850							
824.2	29.7	-0.9dBd	97.7-99.1	27.4 ERP		0.550	
836.4	29.7	-0.6dBd	98.3-98.4	29.0 ERP		0.794	
848.8	29.7	-0.2dBd	98.8-98.6	29.7 ERP		0.933	
GPRS850 – 2 time slots							
824.2	29.7	-0.9dBd	94.3-99.1	24.0 ERP		0.251	
836.4	29.7	-0.6dBd	95.3-98.4	26.0 ERP		0.398	
848.8	29.7	-0.2dBd	96.1-98.6	27.0 ERP		0.501	
EGPRS850							
824.2	23.3	-0.9dBd	93.7-95.2	20.9 ERP		0.123	
836.4	23.7	-0.6dBd	94.3-94.7	22.7 ERP		0.186	
848.8	23.8	-0.2dBd	95.5-95.2	23.9 ERP		0.245	
GSM1900/GPRS1900							
1850.2	23.8	+0.2dBi	86.3-81.1	29.2 EIRP		0.832	
1880.0	23.8	-0.5dBi	85.7-80.4	28.6 EIRP		0.724	
1909.8	24.0	-0.8dBi	86.0-80.6	28.6 EIRP		0.724	
EGPRS1900							
1850.2	19.9	+0.2dBi	85.3-79.7	25.7 EIRP		0.372	
1880.0	19.8	-0.5dBi	83.9-79.1	24.1 EIRP		0.257	
1909.8	19.5	-0.8dBi	84.6-79.1	24.2 EIRP		0.263	

SAMPLE CALCULATION:

P ANT OUT + ANT GAIN + ET – ES = P.O. RADIATED

29.7 - 0.9 + 97.7 – 99.1 = 27.4 dbm ERP

= 0.550 W ERP

ANTENNAS: EMCO 3125-870 dipole s/n 1017 cal. May 02
EMCO 3125-1880 dipole s/n 1010 cal. Oct 02

Name of Test: Emission Masks (Occupied Bandwidth)

Specification: 47 CFR 2.1049(c)(1), 22

Test Equipment: As per attached page

Measurement Procedure

1. The EUT and test equipment were set up as shown on the following page, with the Spectrum Analyzer connected.

2. For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for ±2.5 kHz deviation (or 50% modulation). With level constant, the signal level was increased 16 dB.

3. For EUTs supporting digital modulation, the digital modulation mode was operated to its maximum extent.

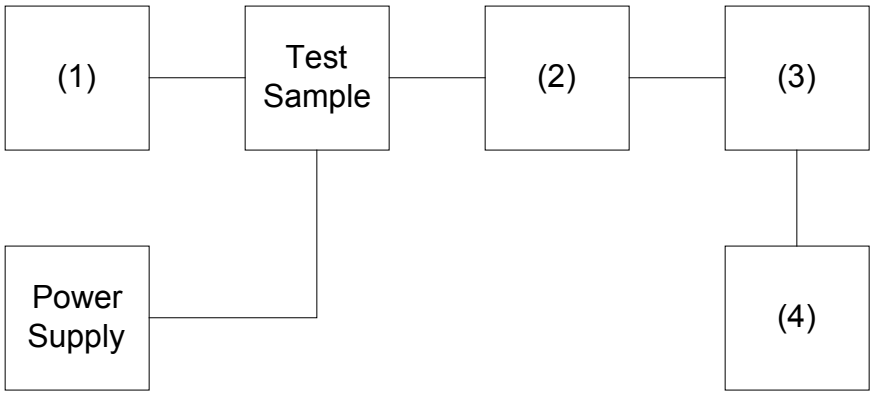
4. The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

5. Measurement Results: Attached

Page Number 11 of 49.

Transmitter Spurious Emission

Test A. Occupied Bandwidth (In-Band Spurious)
Test B. Out-of-Band Spurious

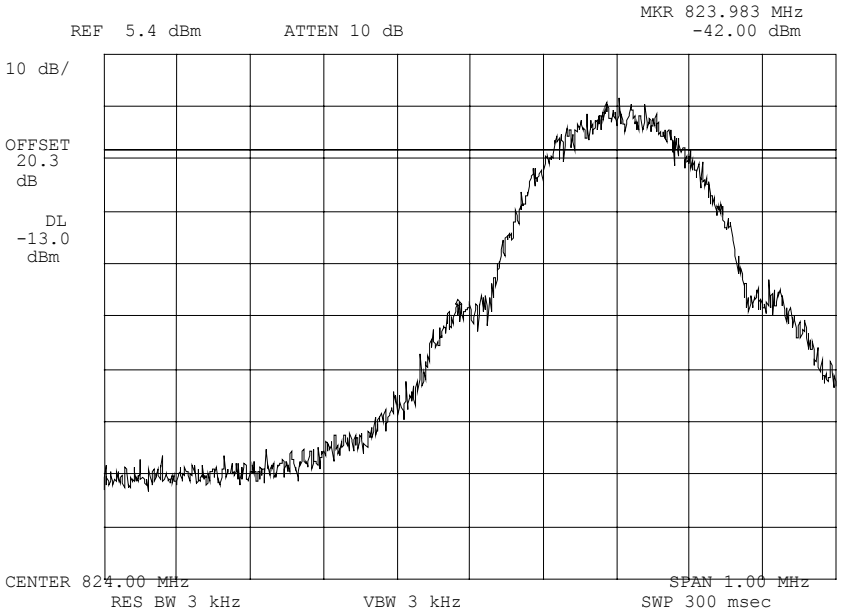


Transmitter Test Set Up

	Asset	Description	s/n
(1) **Audio Oscillator/Generator**			
X	i00017	HP 8903A Audio Analyzer	2216A01753
	i00002	HP 3336B Synthesizer / Level Gen.	1931A01465
(2) **Coaxial Attenuator**			
X	i00231/2	PASTERNACK PE7021-30 (30 dB)	231 or 232
	i0012/3	NARDA 766 (10 dB)	7802 or 7802A
(3) **Filters; Notch, HP, LP, BP**			
	i00126	Eagle TNF-1 Notch Filter	100-250
	i00125	Eagle TNF-1 Notch Filter	50-60
	i00124	Eagle TNF-1 Notch Filter	250-850
(4) **Spectrum Analyzer**			
X	i00048	HP 8566B Spectrum Analyzer	2511A01467
	i00029	HP 8563E Spectrum Analyzer	3213A00104

Page Number 12 of 49.

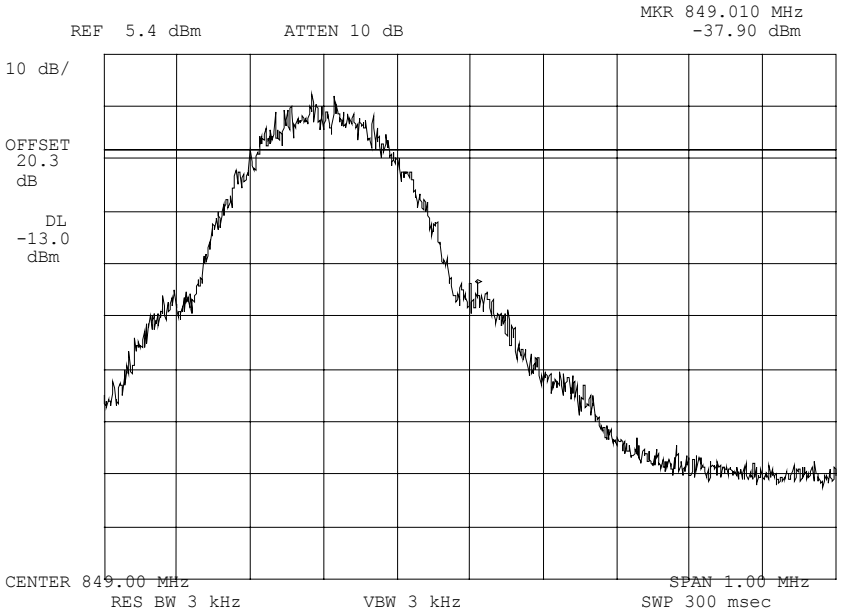
Name of Test: Emission Masks (Occupied Bandwidth)
g0420031: 2004-Feb-23 Mon 10:34:00
State: 1:Low Power



Power: LOW
Modulation: GSM/GPRS 850
LOWER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

Name of Test: Emission Masks (Occupied Bandwidth)
g0420032: 2004-Feb-23 Mon 10:36:00
State: 1:Low Power



Power: LOW
Modulation: GSM/GPRS 850
UPPER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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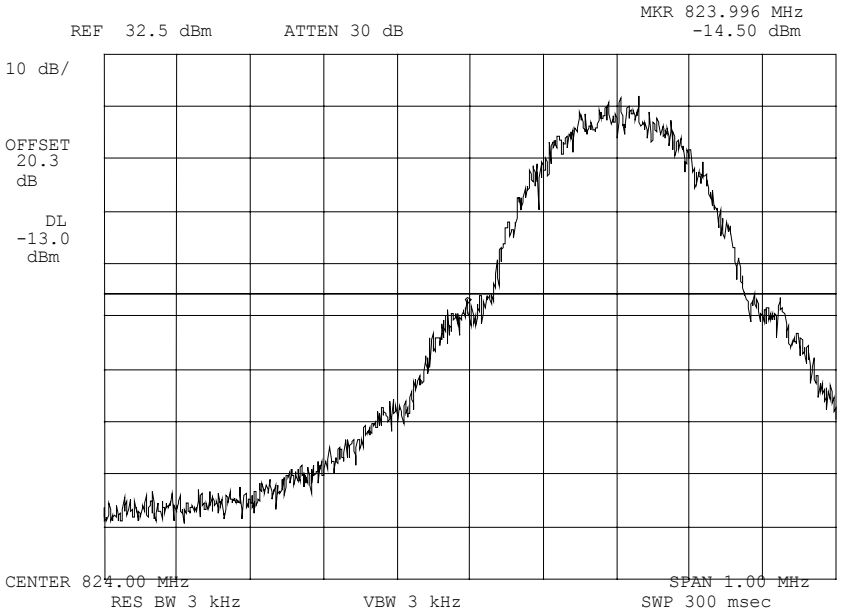
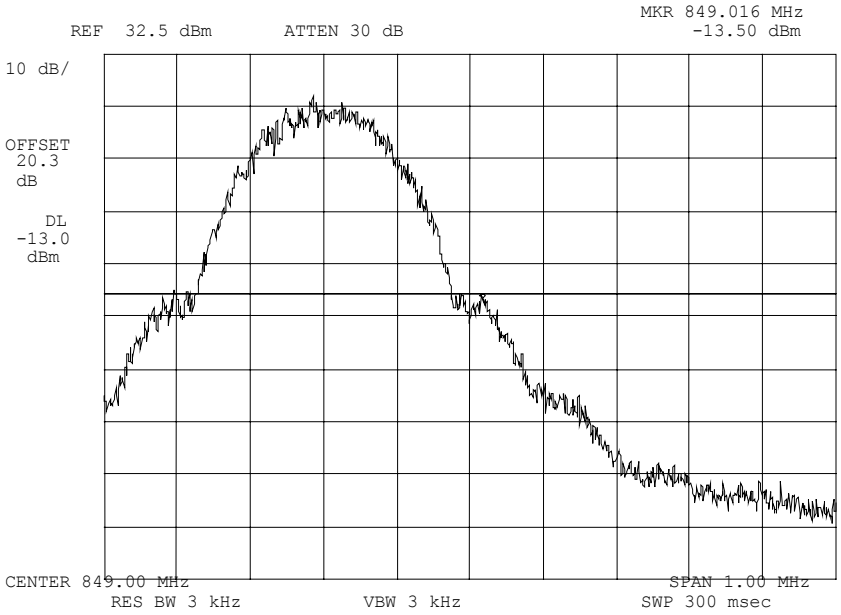
Name of Test: Emission Masks (Occupied Bandwidth)
g0420028: 2004-Feb-23 Mon 10:29:00
State: 2:High Power



Power: HIGH
Modulation: GSM/GPRS 850
LOWER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

Name of Test: Emission Masks (Occupied Bandwidth)
g0420029: 2004-Feb-23 Mon 10:31:00
State: 2:High Power



Power: HIGH
Modulation: GSM/GPRS 850
UPPER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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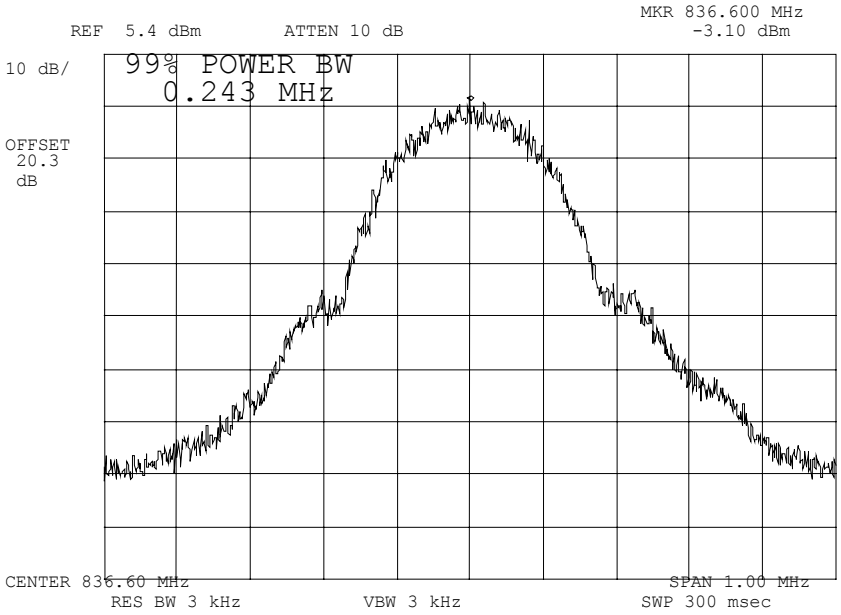
Name of Test: Emission Masks (Occupied Bandwidth)
g0420030: 2004-Feb-23 Mon 10:33:00
State: 1:Low Power



Power: LOW
Modulation: GSM/GPRS 850
99% BANDWIDTH

Performed By: Daniel M. Dillon, Test Engineer

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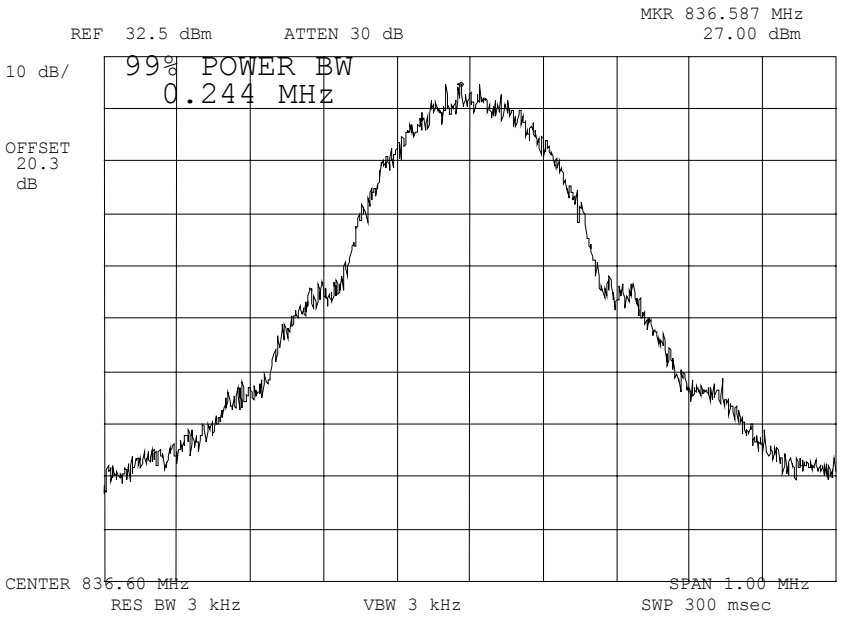
Name of Test: Emission Masks (Occupied Bandwidth)
g0420027: 2004-Feb-23 Mon 10:16:00
State: 2:High Power



Power: HIGH
Modulation: GSM/GPRS 850
99% BANDWIDTH

Performed By: Daniel M. Dillon, Test Engineer

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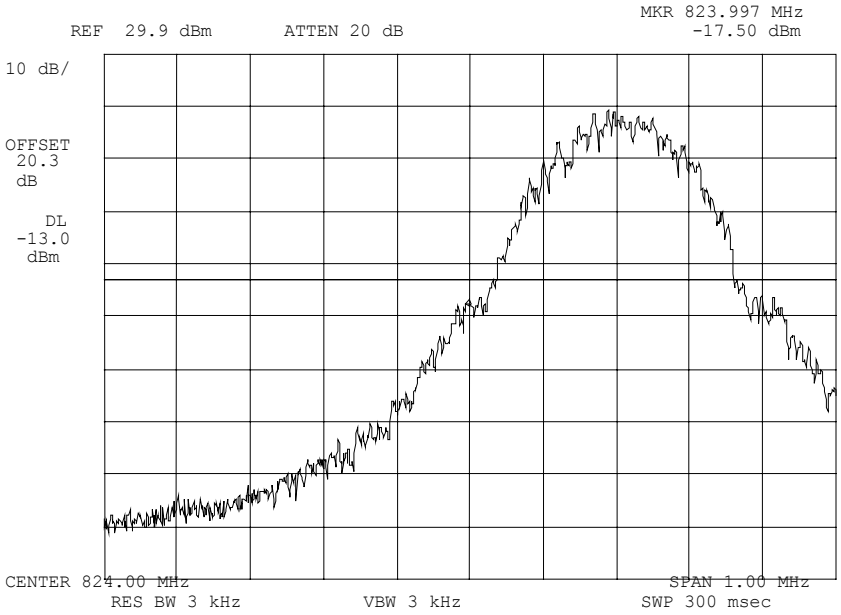
Name of Test: Emission Masks (Occupied Bandwidth)
g0420074: 2004-Feb-25 Wed 15:02:00
State: 2:High Power



Power: HIGH
Modulation: GPRS 850 2-SLOT
LOWER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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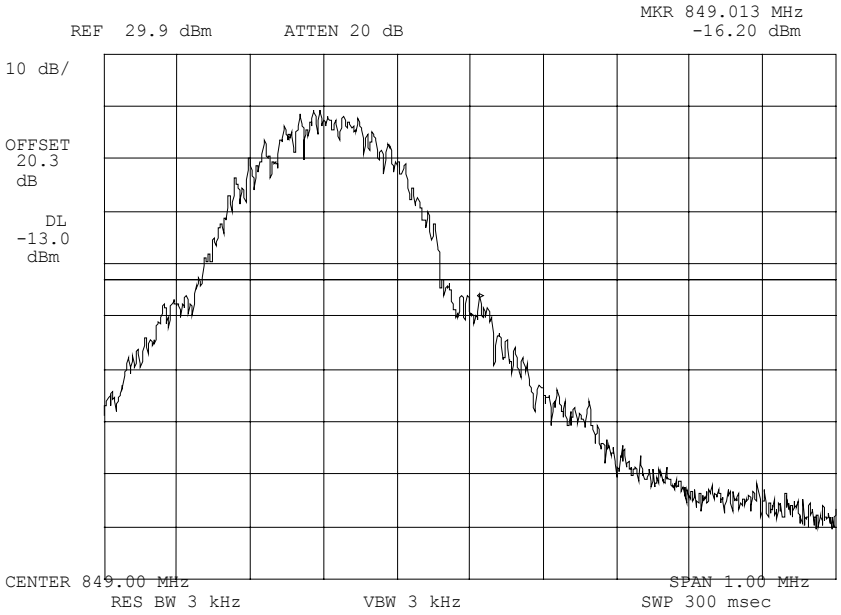
Name of Test: Emission Masks (Occupied Bandwidth)
g0420075: 2004-Feb-25 Wed 15:04:00
State: 2:High Power



Power: HIGH
Modulation: GPRS 850 2-SLOT
UPPER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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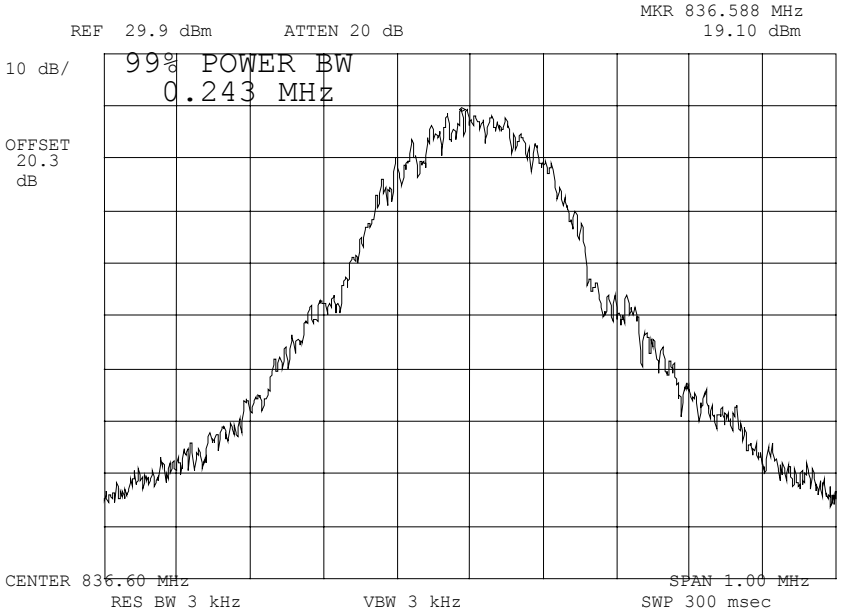
Name of Test: Emission Masks (Occupied Bandwidth)
g0420073: 2004-Feb-25 Wed 15:01:00
State: 2:High Power



Power: HIGH
Modulation: GPRS 850 2-SLOT
99% BANDWIDTH

Performed By: Daniel M. Dillon, Test Engineer

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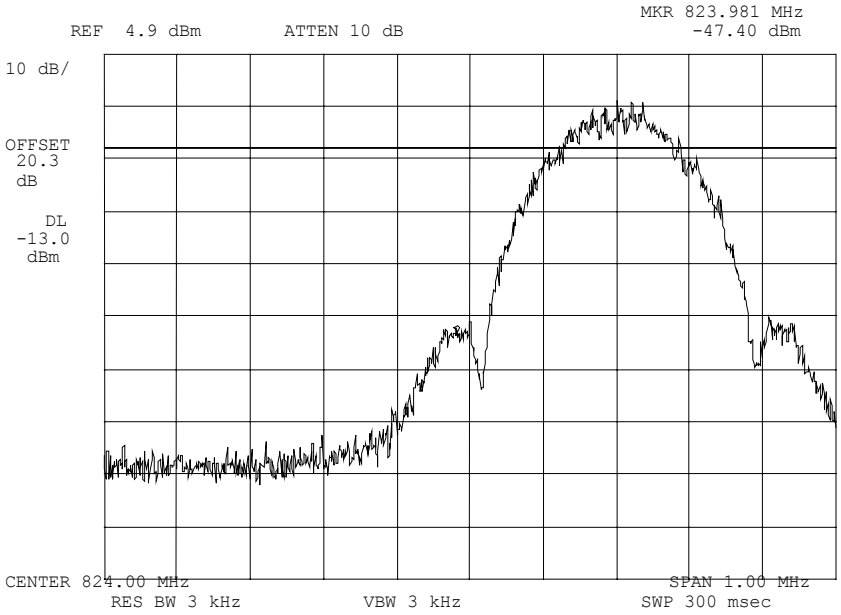
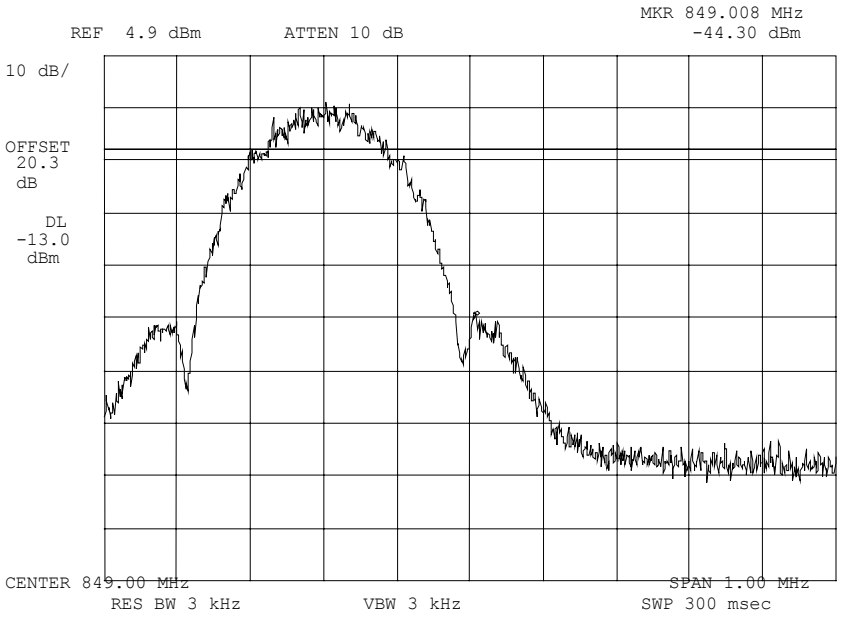
Name of Test: Emission Masks (Occupied Bandwidth)
g0420039: 2004-Feb-23 Mon 10:46:00
State: 1:Low Power



Power: LOW
Modulation: EGPRS 850
LOWER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

Name of Test: Emission Masks (Occupied Bandwidth)
g0420037: 2004-Feb-23 Mon 10:44:00
State: 1:Low Power



Power: LOW
Modulation: EGPRS 850
UPPER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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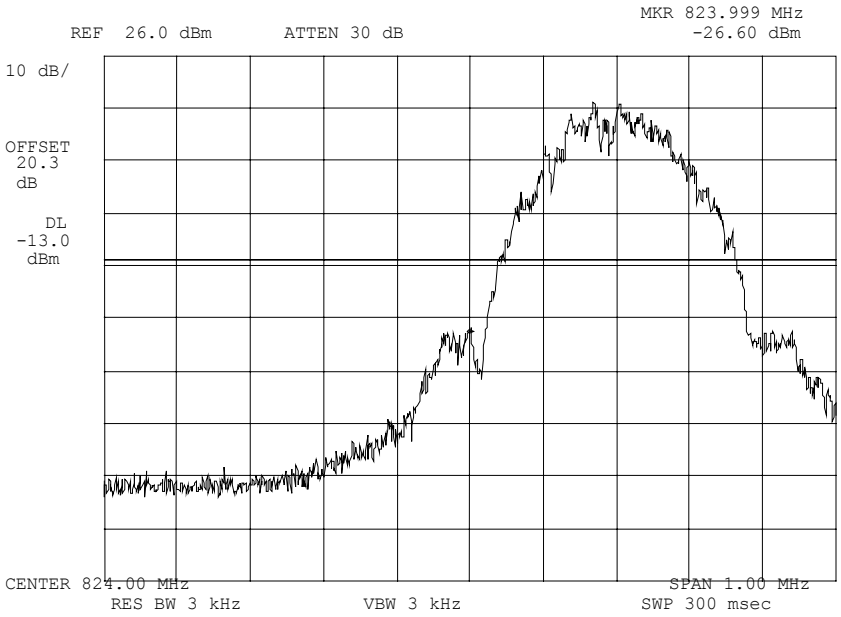
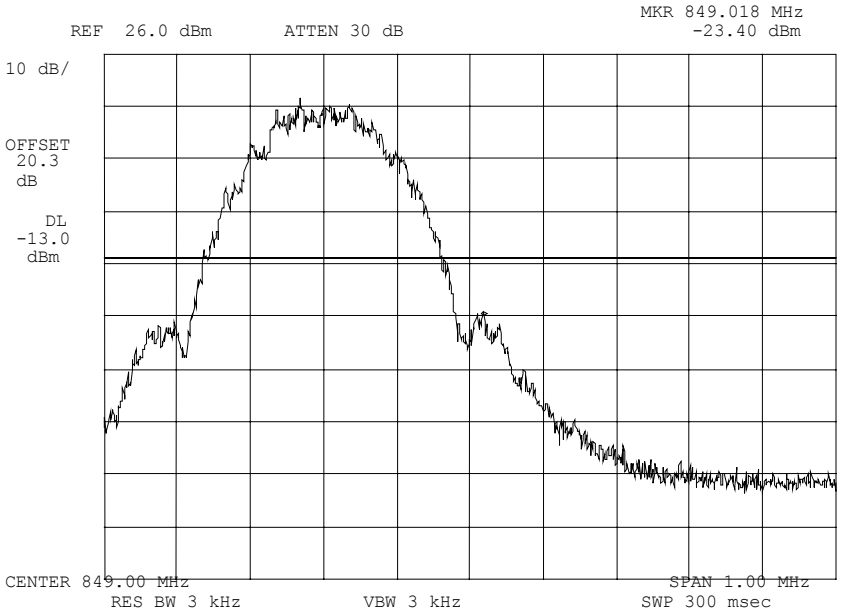
Name of Test: Emission Masks (Occupied Bandwidth)
g0420034: 2004-Feb-23 Mon 10:40:00
State: 2:High Power



Power: HIGH
Modulation: EGPRS 850
LOWER BAND EGDE

Performed By: Daniel M. Dillon, Test Engineer

Name of Test: Emission Masks (Occupied Bandwidth)
g0420036: 2004-Feb-23 Mon 10:43:00
State: 2:High Power



Power: HIGH
Modulation: EGPRS 850
UPPER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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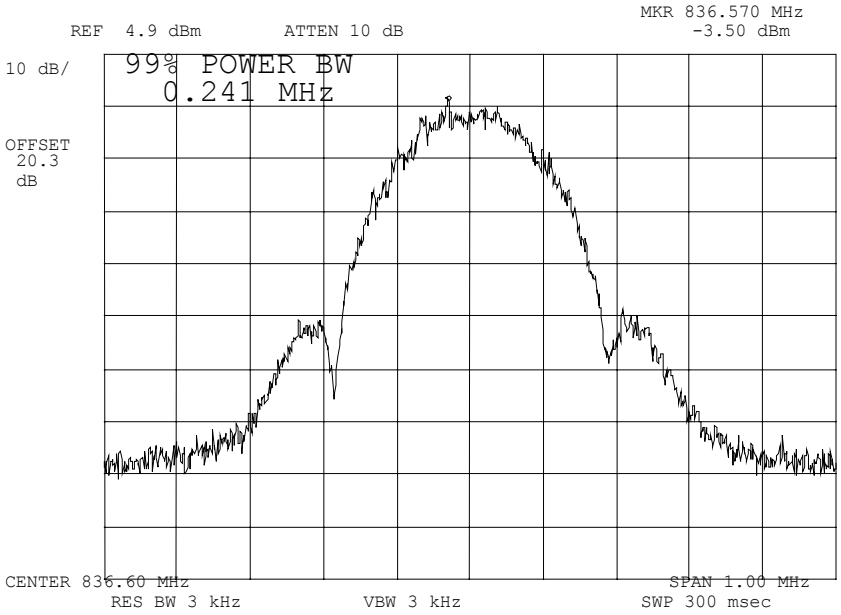
Name of Test: Emission Masks (Occupied Bandwidth)
g0420038: 2004-Feb-23 Mon 10:45:00
State: 1:Low Power



Power: LOW
Modulation: EGPRS 850
99% BANDWIDTH

Performed By: Daniel M. Dillon, Test Engineer

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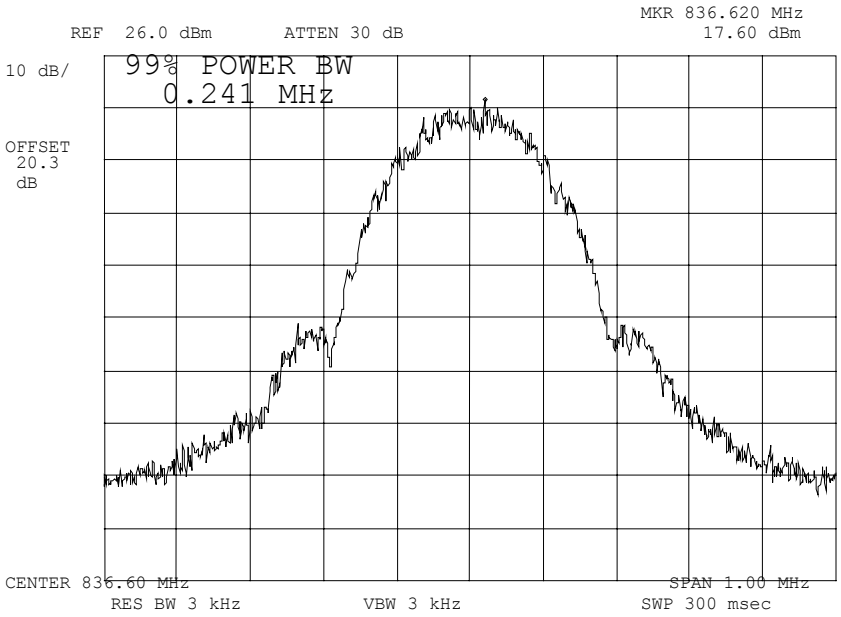
Name of Test: Emission Masks (Occupied Bandwidth)
g0420035: 2004-Feb-23 Mon 10:41:00
State: 2:High Power



Power: HIGH
Modulation: EGPRS 850
99% BANDWIDTH

Performed By: Daniel M. Dillon, Test Engineer

Name of Test: Transmitter Conducted Measurements

Specification: 47 CFR 2.1051: Unwanted (spurious) Emissions
2.1049(c), 24.238(b): Occupied Bandwidth
24: Emissions at Band Edges

Test Equipment: As per previous page

Measurement Procedure

1. The EUT and test equipment were set up as shown on the following page with the Spectrum Analyzer connected.

2. The low and high channels for all RF powers within the designated frequency block(s) were measured.

3. Measurement Results: Attached

Performed By: Daniel M. Dillon, Test Engineer

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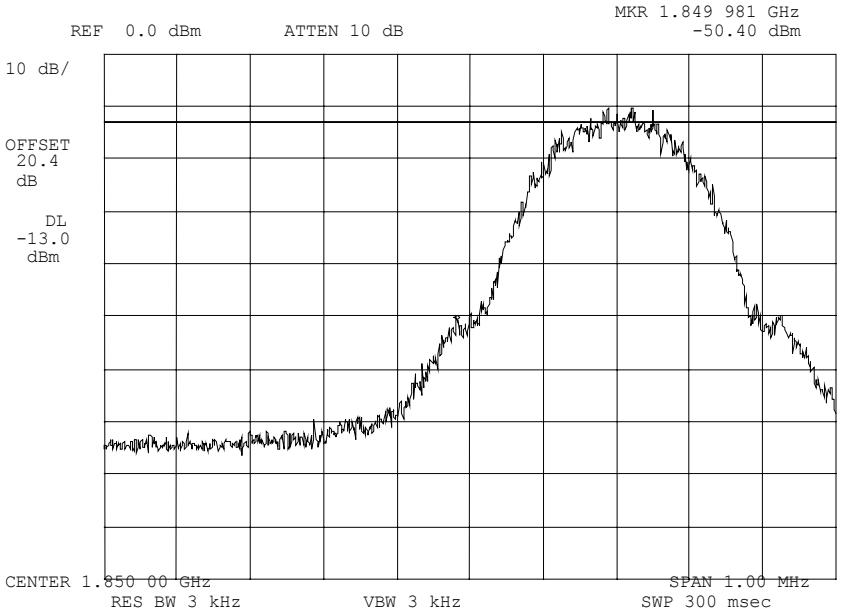
Name of Test: Emission Masks (Occupied Bandwidth)
g0420045: 2004-Feb-23 Mon 11:14:00
State: 1:Low Power



Power: LOW
Modulation: GSM/GPRS 1900
LOWER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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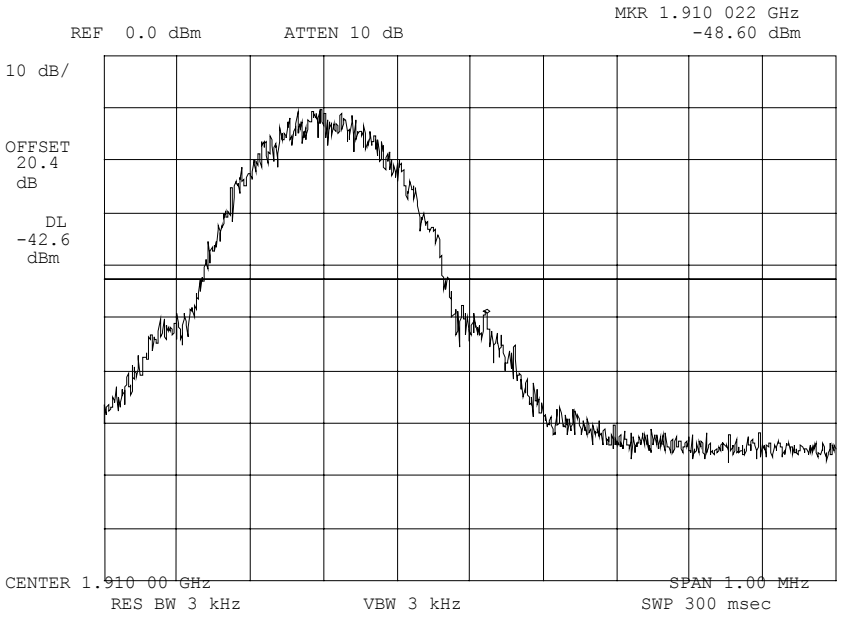
Name of Test: Emission Masks (Occupied Bandwidth)
g0420043: 2004-Feb-23 Mon 11:10:00
State: 1:Low Power



Power: LOW
Modulation: GSM/GPRS 1900
UPPER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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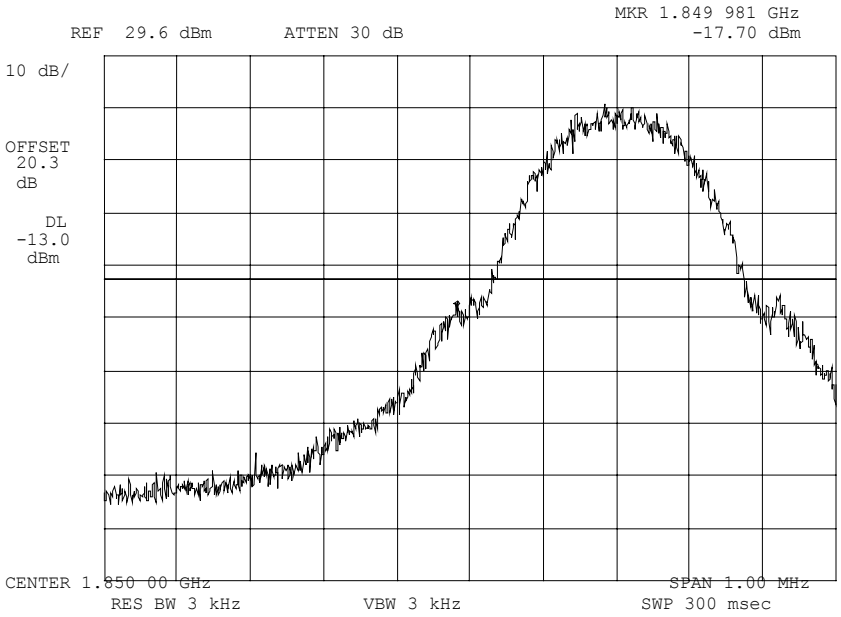
Name of Test: Emission Masks (Occupied Bandwidth)
g0420041: 2004-Feb-23 Mon 11:04:00
State: 2:High Power



Power: HIGH
Modulation: GSM/GPRS 1900
LOWER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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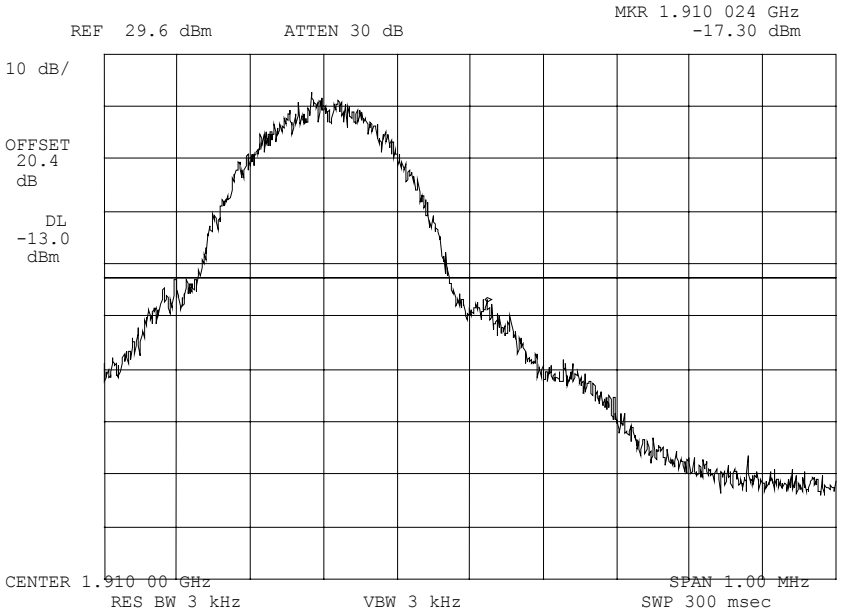
Name of Test: Emission Masks (Occupied Bandwidth)
g0420042: 2004-Feb-23 Mon 11:08:00
State: 2:High Power



Power: HIGH
Modulation: GSM/GPRS 1900
UPPER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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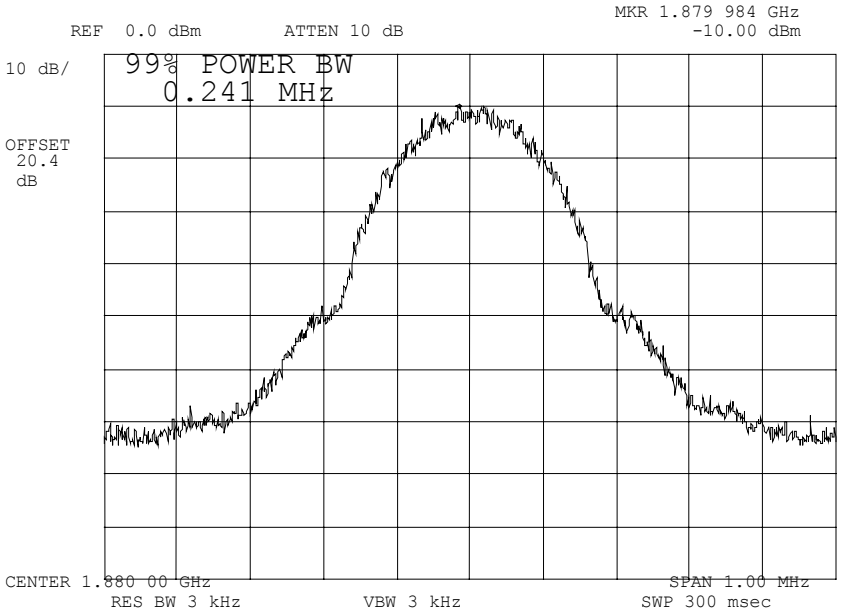
Name of Test: Emission Masks (Occupied Bandwidth)
g0420044: 2004-Feb-23 Mon 11:12:00
State: 1:Low Power



Power: LOW
Modulation: GSM/GPRS 1900
99% BANDWIDTH

Performed By: Daniel M. Dillon, Test Engineer

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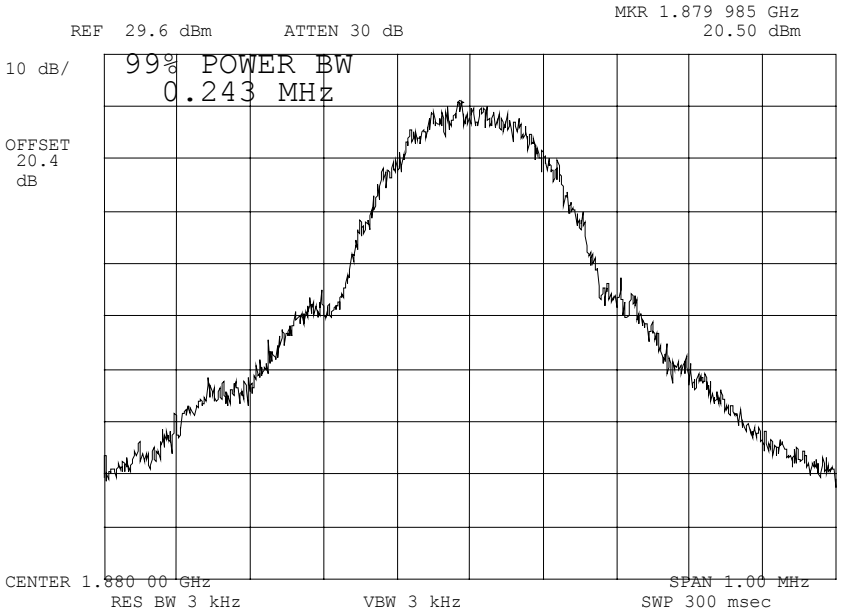
Name of Test: Emission Masks (Occupied Bandwidth)
g0420040: 2004-Feb-23 Mon 11:03:00
State: 2:High Power



Power: HIGH
Modulation: GSM/GPRS 1900
99% BANDWIDTH

Performed By: Daniel M. Dillon, Test Engineer

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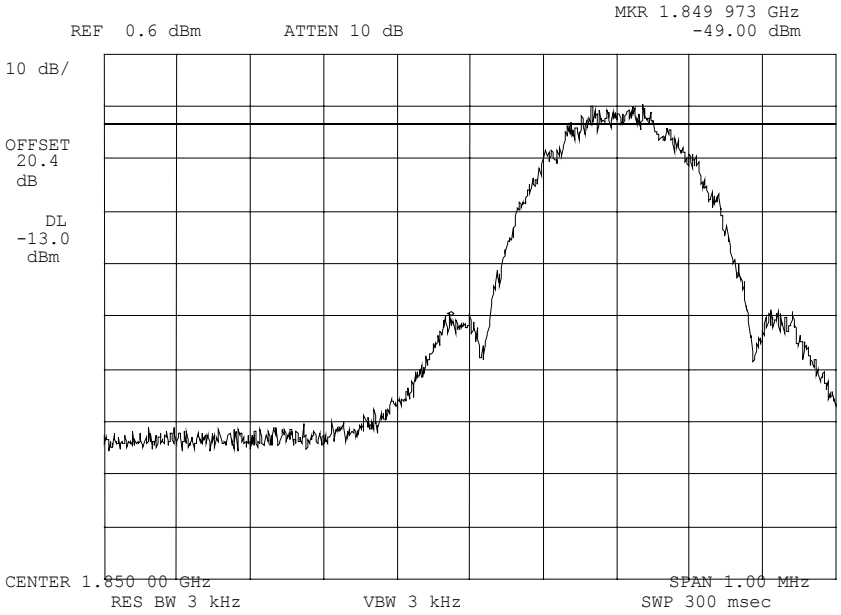
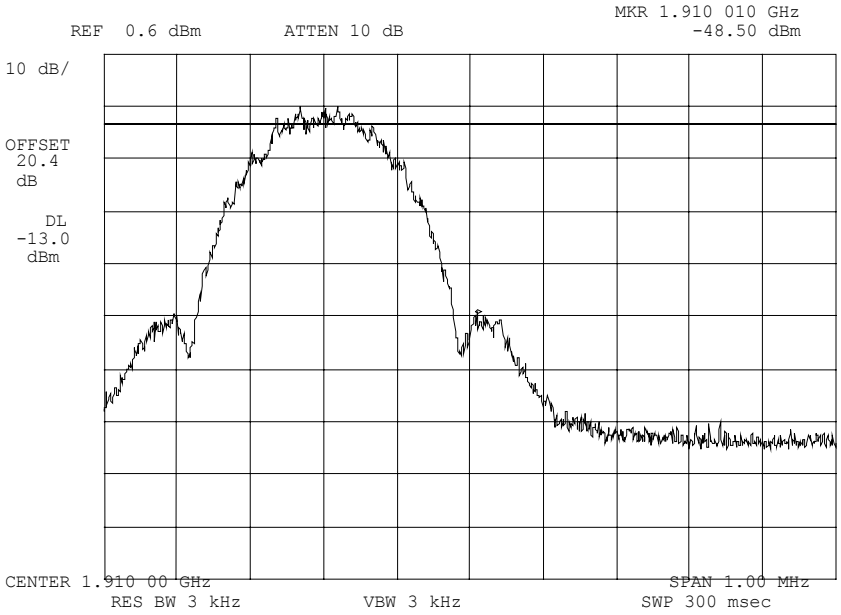
Name of Test: Emission Masks (Occupied Bandwidth)
g0420051: 2004-Feb-23 Mon 11:25:00
State: 1:Low Power



Power: LOW
Modulation: EGPRS 1900
LOWER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

Name of Test: Emission Masks (Occupied Bandwidth)
g0420049: 2004-Feb-23 Mon 11:21:00
State: 1:Low Power



Power: LOW
Modulation: EGPRS 1900
UPPER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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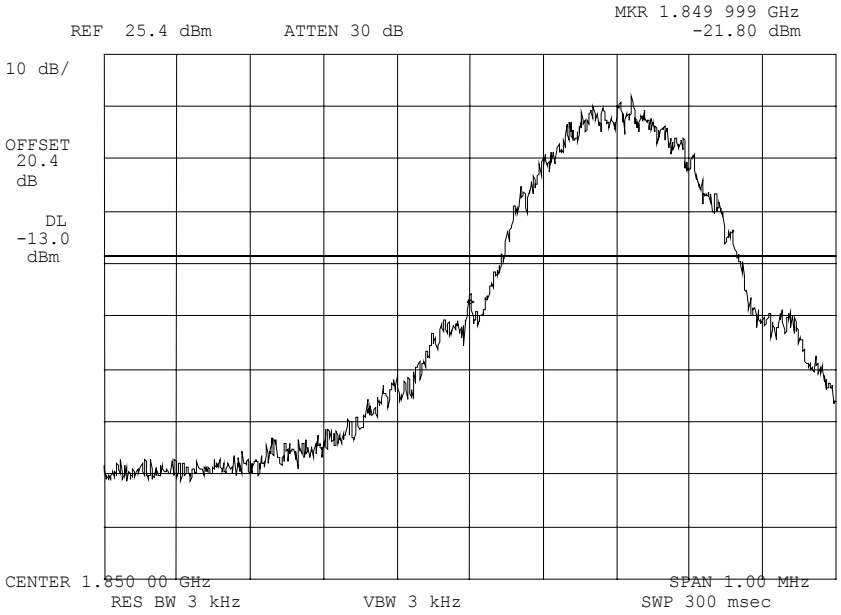
Name of Test: Emission Masks (Occupied Bandwidth)
g0420046: 2004-Feb-23 Mon 11:15:00
State: 2:High Power



Power: HIGH
Modulation: EGPRS 1900
LOWER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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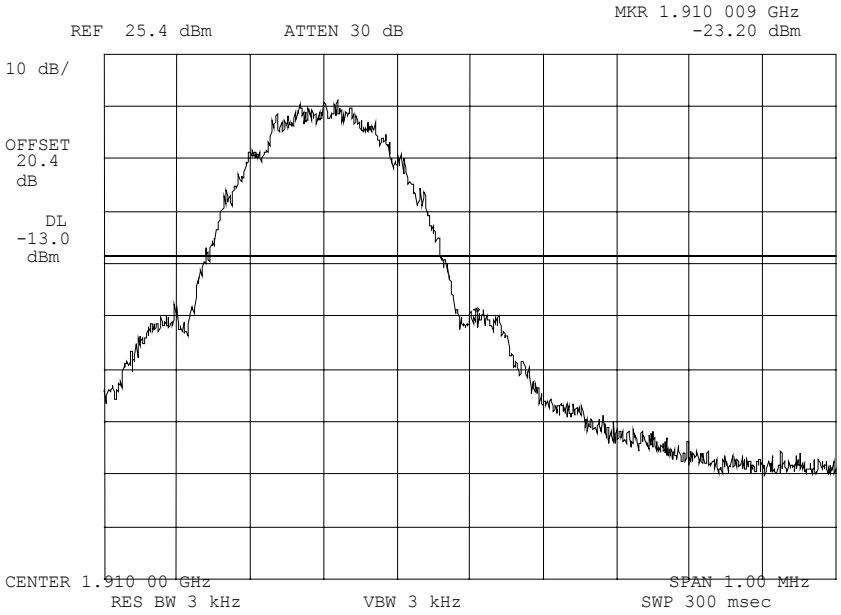
Name of Test: Emission Masks (Occupied Bandwidth)
g0420048: 2004-Feb-23 Mon 11:19:00
State: 2:High Power



Power: HIGH
Modulation: EGPRS 1900
UPPER BAND EDGE

Performed By: Daniel M. Dillon, Test Engineer

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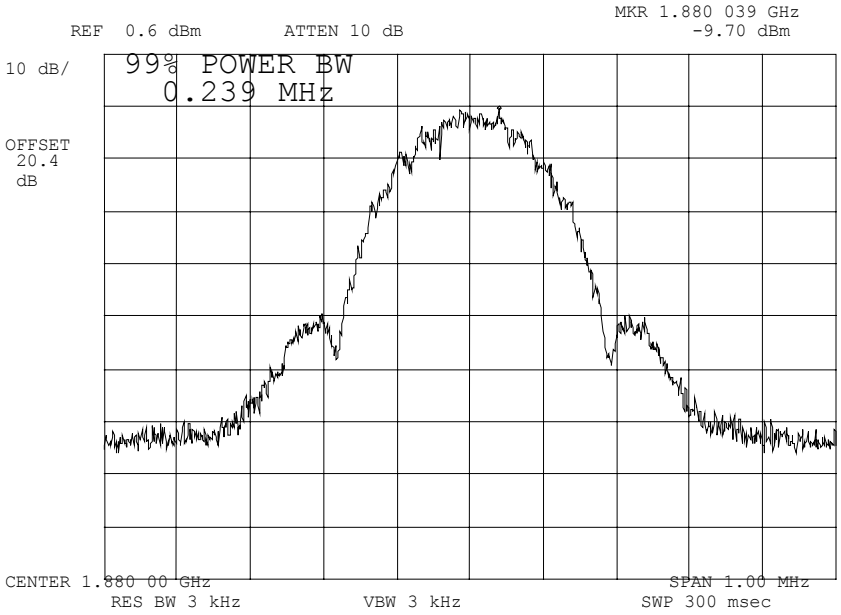
Name of Test: Emission Masks (Occupied Bandwidth)
g0420050: 2004-Feb-23 Mon 11:23:00
State: 1:Low Power



Power: LOW
Modulation: EGPRS 1900
99% BANDWIDTH

Performed By: Daniel M. Dillon, Test Engineer

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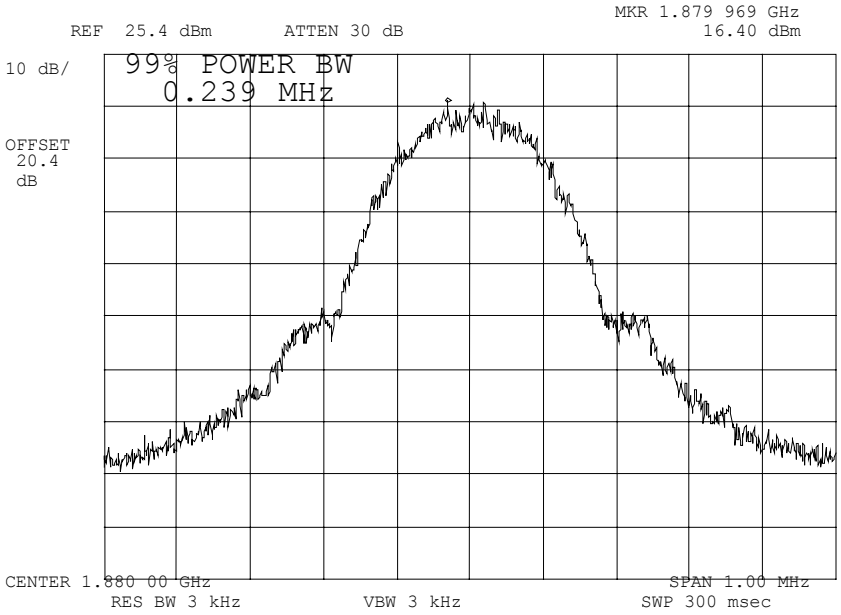
Name of Test: Emission Masks (Occupied Bandwidth)
g0420047: 2004-Feb-23 Mon 11:16:00
State: 2:High Power



Power: HIGH
Modulation: EGPRS 1900
99% BANDWIDTH

Performed By: Daniel M. Dillon, Test Engineer

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Name of Test: Field Strength of Spurious Radiation

Specification: 47 CFR 2.1053(a)

Guide: ANSI/TIA/EIA-603-1992/2001, Paragraph 1.2.12 and Table 16, 47 CFR 22.917

Measurement Procedure

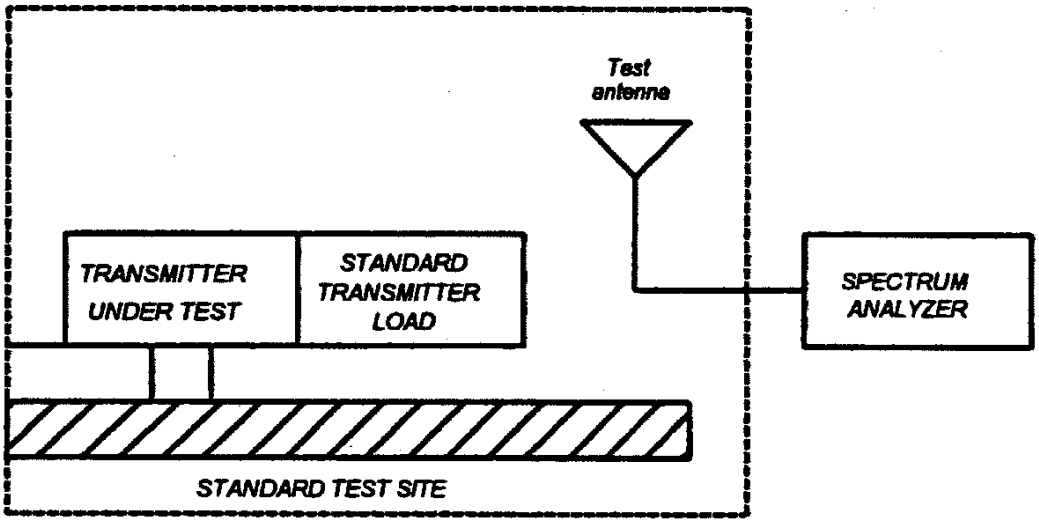
1.2.12.1 Definition: Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

1.2.12.2 Method of Measurement

A) Connect the equipment as illustrated

B) Adjust the spectrum analyzer for the following settings:
1) Resolution Bandwidth 100 kHz (<1 GHZ), 1 MHZ (> 1GHz).
2) Video Bandwidth ≥ 3 times Resolution Bandwidth, or 30 kHz (22.917)
3) Sweep Speed ≤2000 Hz/second
4) Detector Mode = Mean or Average Power

C) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a non-radiating load which is placed on the turntable. The RF cable to this load should be of minimum length.



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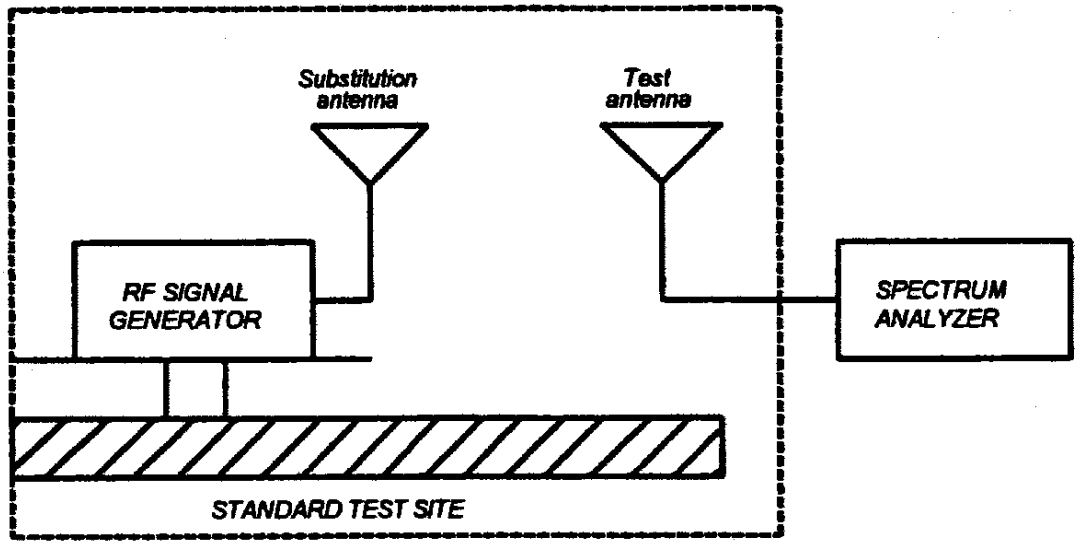
Name of Test: Field Strength of Spurious Radiation (Cont.)

D) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to ± the test bandwidth (see section 1.3.4.4).

E) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.

F) Repeat step E) for each spurious frequency with the test antenna polarized vertically.



G) Reconnect the equipment as illustrated.

H) Keep the spectrum analyzer adjusted as in step B).

I) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

Name of Test: Field Strength of Spurious Radiation (Cont.)

J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

K) Repeat step J) with both antennas vertically polarized for each spurious frequency.

L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps J) and K) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.

M) The levels recorded in step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions dB =
$10\log_{10}$(TX power in watts/0.001) – the levels in step l)

NOTE: It is permissible that other antennas provided can be referenced to a dipole.

Test Equipment:

	Asset	Description	s/n	Cycle (Per ANSI C63.4-1992/2000 Draft, 10.1.4)	Last Cal
Transducer					
	i00088	EMCO 3109-B 25MHz-300MHz	2336	12 mo.	Sep-03
X	i00089	Aprel 2001 200MHz-1GHz	001500	12 mo.	Sep-03
X	i00103	EMCO 3115 1GHz-18GHz	9208-3925	12 mo.	Jan-03
Amplifier					
X	i00028	HP 8449A	2749A00121	12 mo.	May-03
Spectrum Analyzer					
X	i00029	HP 8563E	3213A00104	12 mo.	May-03
X	i00033	HP 85462A	3625A00357	12 mo.	Aug-03
Substitution Generator					
X	i00067	HP 8920A Communication TS	3345U01242	12 mo.	Oct-03
	i00207	HP 8753D Network Analyzer	3410A08514	12 mo.	Jul-03

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Name of Test: Field Strength of Spurious Radiation

GSM/GPRS850

g0420064: 2004-Feb-24 Tue 15:48:00

State: 2:High Power Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	ERP, dBm	ERP, dBc
836.600000	1673.213334	-54.6	≤ -84.3
836.600000	1673.493333	-54.8	≤ -84.5
836.600000	2509.806667	-51	≤ -80.7
836.600000	2509.820001	-51.4	≤ -81.1
836.600000	3346.406667	-45.4	≤ -75.1
836.600000	3346.426668	-50.4	≤ -80.1
836.600000	4183.006667	-44.5	≤ -74.2
836.600000	4183.033335	-44.2	≤ -73.9
836.600000	5019.606667	-45.2	≤ -74.9
836.600000	5019.640002	-45.5	≤ -75.2
836.600000	5856.206667	-43.1	≤ -72.8
836.600000	5856.246669	-43.9	≤ -73.6
836.600000	6692.806667	-43.5	≤ -73.2
836.600000	6692.853336	-44.1	≤ -73.8
836.600000	7529.406667	-41.8	≤ -71.5
836.600000	7529.460003	-42.6	≤ -72.3
836.600000	8366.006667	-38.4	≤ -68.1
836.600000	8366.066670	-39.6	≤ -69.3

EGPRS850

g0420065: 2004-Feb-24 Tue 16:26:00

State: 2:High Power Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	ERP, dBm	ERP, dBc
836.600000	1673.213334	-50.9	≤ -74.8
836.600000	2509.820001	-51	≤ -74.9
836.600000	3346.400000	-49.9	≤ -73.8
836.600000	3346.426668	-50.2	≤ -74.1
836.600000	4183.033335	-45.7	≤ -69.6
836.600000	5019.640002	-44.8	≤ -68.7
836.600000	5856.246669	-44.9	≤ -68.8
836.600000	6692.853336	-46	≤ -69.9
836.600000	7529.460003	-43.5	≤ -67.4
836.600000	8366.066670	-40.1	≤ -64

Performed By: Daniel M. Dillon, Test Engineer

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Name of Test: Field Strength of Spurious Radiation

GSM/GPRS1900

g0420062: 2004-Feb-24 Tue 14:58:00

State: 2:High Power Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	EIRP, dBm	EIRP, dBc
1880.000000	3759.901667	-32.7	≤ -61.9
1880.000000	3759.923333	-32.9	≤ -62.1
1880.000000	5639.903334	-43.3	≤ -72.5
1880.000000	5639.996667	-39.1	≤ -68.3
1880.000000	7519.905001	-39.5	≤ -68.7
1880.000000	7519.996667	-38	≤ -67.2
1880.000000	9399.906668	-34.7	≤ -63.9
1880.000000	9399.996667	-34.9	≤ -64.1
1880.000000	11279.908335	-28.3	≤ -57.5
1880.000000	11279.996667	-28.2	≤ -57.4
1880.000000	13159.910002	-43.9	≤ -73.1
1880.000000	13159.996667	-44.3	≤ -73.5
1880.000000	15039.911669	-38.5	≤ -67.7
1880.000000	15039.996667	-39	≤ -68.2
1880.000000	16919.913336	-47.9	≤ -77.1
1880.000000	16919.996667	-47.6	≤ -76.8

EGPRS1900

Name of Test: Field Strength of Spurious Radiation

g0420063: 2004-Feb-24 Tue 15:21:00

State: 2:High Power Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	EIRP, dBm	EIRP, dBc
1880.000000	3759.791667	-37.4	≤ -63.1
1880.000000	3759.991667	-33.1	≤ -58.8
1880.000000	5639.793334	-44.8	≤ -70.5
1880.000000	7519.795001	-39.7	≤ -65.4
1880.000000	9399.796668	-37	≤ -62.7
1880.000000	11279.798335	-26.5	≤ -52.2
1880.000000	13159.800002	-42.1	≤ -67.8
1880.000000	15039.801669	-39.8	≤ -65.5
1880.000000	16919.803336	-48.1	≤ -73.8

Performed By: Daniel M. Dillon, Test Engineer

Name of Test: Frequency Stability (Temperature Variation)

Specification: 47 CFR 2.1055(a)(1)

Test Conditions: As Indicated

Test Equipment: As per previous page

Measurement Procedure

1. The EUT and test equipment were set up as shown on the following page.

2. With all power removed, the temperature was decreased to –30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.

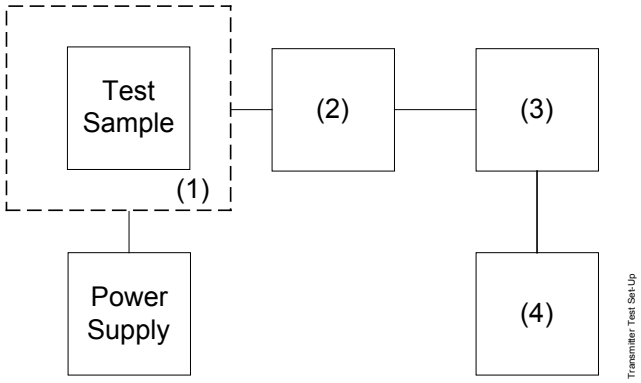
3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.

4. The temperature tests were performed for the worst case.

5. Measurement Results: Attached

Transmitter Test Set-Up

Frequency Stability: Temperature Variation
Frequency Stability: Voltage Variation



	Asset	Description	s/n
(1) **Temperature, Humidity, Vibration**			
X	i00027	Tenney Temp. Chamber	9083-765-234
(2) **Coaxial Attenuator**			
X	i00231/2	PASTERNACK PE7021-30 (30 dB)	231 or 232
	i00122/3	NARDA 766 (10 dB)	7802 or 7802A
(3) **RF Power**			
X	i00067	HP 8920A Communications TS	3345U01242
(4) **Frequency Counter**			
X	i00067	HP 8920A Communications TS	3345U01242

Name of Test: Frequency Stability (Temperature Variation)

GSM/GPRS/EGPRS CELLULAR BAND

°C	Change, Hz	Change, ppm
-30	-15.3	0.0
-20	+21.1	0.0
-10	-17.7	0.0
0	-13.6	0.0
10	+19.4	0.0
20	-18.5	0.0
30	-20.3	0.0
40	+19.0	0.0
50	+27.3	0.0

FCC, GSM/GPRS/EGPRS PCS BAND

°C	Change, Hz	Change, ppm
-30	-39.4	0.0
-20	-36.3	0.0
-10	-39.1	0.0
0	-22.3	0.0
10	-32.4	0.0
20	+18.7	0.0
30	+21.3	0.0
40	+23.2	0.0
50	+24.6	0.0

Name of Test: Frequency Stability (Voltage Variation)

Specification: 47 CFR 2.1055 (b)(1)

Test Equipment: As per previous page

Measurement Procedure

1. The EUT was placed in a temperature chamber at 25±5°C and connected as for "Frequency Stability - Temperature Variation" test.

2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.

3. The variation in frequency was measured for the worst case.

Results: Frequency Stability (Voltage Variation)

FCC, GSM/GPRS/EGPRS CELLULAR BAND

% of STV	Voltage	Frequency, MHz	Change, Hz	Change, ppm
B.E.P.	3.35	836.6000205	+20.5	0.0

FCC, GSM/GPRS/EGPRS PCS BAND

% of STV	Voltage	Frequency, MHz	Change, Hz	Change, ppm
B.E.P.	3.35	1879.9999876	-12.4	0.0

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Name of Test: Necessary Bandwidth and Emission Bandwidth

Specification: 47 CFR 2.202(g)

Modulation = 300KGXW

Necessary Bandwidth:

Necessary Bandwidth (B_N), kHz = 300
(measured at the 99.75% power bandwidth)

Modulation = 300KG7W

Necessary Bandwidth:

Necessary Bandwidth (B_N), kHz = 300
(measured at the 99.75% power bandwidth)

Performed By: Daniel M. Dillon, Test Engineer

END OF TEST REPORT

Testimonial and Statement of Certification

This is to certify that:

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.

2. **That** the technical data supplied with the application was taken under my direction and supervision.

3. **That** the data was obtained on representative units, randomly selected.

4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

Certifying Engineer: Morton Flom, P. Eng.