



Test Report: 6W63258

Applicant: Trilliant Networks
950 Cowie Street
Grandby, QC J2J 1P2

Apparatus: Q2426

FCC ID: TMB-TNIQ2426B

In Accordance With: FCC Part 22 Subpart H
Cellular Radiotelephone Service

Tested By: Nemko Canada Inc.
303 River Road
Ottawa, Ontario
K1V 1H2

A handwritten signature in blue ink, appearing to read 'Jason Nixon'.

Authorized By: Jason Nixon, Telecom Specialist

Date: May 11, 2006

Total Number of Pages: 26

Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 22. Conducted measurements were performed in accordance with ANSI TIA-603-B-2002. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

Apparatus Assessed:	Q2426
Specification:	FCC Part 22 Subpart H Cellular Radiotelephone Service
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release

Author: Xu Jin, Wireless Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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Section 1 : Equipment Under Test

1.1 Product Identification

The Equipment Under Test was identified as follows: Q2426

1.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

Sample No.	Description	Serial No.
1	Radio Q2426	51601004956143939

The first samples were received on: Mar 16, 2006

1.3 Technical Specifications of the EUT

Manufacturer:	Trilliant Networks
Operating Frequency:	824.2-848.8MHz (Channel 128-Channel 251)
Emission Designator:	G7W
Rated Power:	33dBm+/-2dBm
Measured Power:	32.17dBm(conducted power)
Modulation:	GSM/GPRS
Antenna Data:	(1) Whip Antenna 5dBi (2) Patch Antenna 3dBi

Section 2: Test Conditions

2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 2 Subpart J, Equipment Authorization Procedures
FCC Part 22 Subpart H Cellular Radiotelephone Service

2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range : 15 – 30 °C
Humidity range : 20 - 75 %
Pressure range : 86 - 106 kPa
Power supply range : +/- 5% of rated voltages

2.4 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next Cal.
Spectrum Analyzer	Rohde & Schwarz	FSU	FA001877	May 17/06
Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 18/06
Biconical (1) Antenna	EMCO	3109	FA000805	April 22/06
Log Periodic Antenna #1	EMCO	LPA-25	FA000477	Aug. 29/06
Horn Antenna #2	EMCO	3115	FA000825	Dec. 16/06
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	July 14/06
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	July 14/06
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	July 14/06
5.0 - 18GHz Amplifier	Narda	DWT-186N23U40	FA001409	COU
Signal Generator	Rhode & Schwarz	SMR 40	FA001879	July 13/06
Climate Chamber	Thermotron	SM-16C	15649-S	COU
Wireless Communication Test Set	Agilent	8960 Series 10	991428	Feb 10/08

* COU (Calibrate on Use)

Section 3: Observations

3.1 Modifications Performed During Assessment

No modifications were performed during assessment.

3.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

3.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

3.4 Test Deleted

No Tests were deleted from this assessment.

3.5 Additional Observations

There were no additional observations made during this assessment.

Section 4: Results Summary

This section contains the following:

FCC Part 22 Subpart H: Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

- N No: not applicable / not relevant.
- Y Yes: Mandatory i.e. the apparatus shall conform to these tests.
- N/T Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

4.1 FCC Part 22 Subpart H: Test Results

Clause	Test Method	Test Description	Required	Result
22.913(a)	2.1046	Effective Radiated Power Limits	Y	PASS
22.917(b)	2.1049	Occupied bandwidth	Y	PASS
22.917(a)	2.1051	Spurious Emissions at the antenna terminal	Y	PASS
22.917(a)	2.1053	Field strength of spurious radiation	Y	PASS
22.355	2.1055	Frequency stability	Y	PASS

Appendix A : Test Results

Clause 22.913(a) Effective Radiated Power Limits

(a) Maximum ERP. In general, the effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. However, for those systems operating in areas more than 72 km (45 miles) from international borders that:

- (1) Are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census; or,
- (2) Extend coverage on a secondary basis into cellular unserved areas, as those areas are defined in §22.949, the ERP of base transmitters and cellular repeaters of such systems must not exceed 1000 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

Test Conditions:

Sample Number:	1	Temperature:	21°C
Date:	Mar 30, 2006	Humidity:	45%
Modification State:	0	Tester:	Xu Jin
		Laboratory:	Wireless Lab

Test Results: Pass

Test Data: See attached tables

Test Limit: 7W(38.45dBm), ERP

Additional Information:

The test was conducted using spectrum analyser with peak detector. The RBW/VBW setting was 1MHz/3MHz.

(1)Whip Antenna 5dBi, or 2.85dBd

Effective Radiated Power Data -GPRS

EUT Channel	Measured Conducted Output Power (dBm)	Antenna Gain (dBd)	Effective Output Power (dBm)	ERP Limit (dBm)
128	32.07	2.85	34.92	38.45
190	32.14	2.85	34.99	38.45
251	32.15	2.85	35	38.45

Effective Radiated Power Data -GSM

EUT Channel	Measured Conducted Output Power (dBm)	Antenna Gain (dBd)	Effective Output Power (dBm)	ERP Limit (dBm)
128	32.09	2.85	34.94	38.45
190	32.15	2.85	35	38.45
251	32.17	2.85	35.02	38.45

(2) Patch Antenna 3dBi , or 0.85dBd

Effective Radiated Power Data -GPRS

EUT Channel	Measured Conducted Output Power (dBm)	Antenna Gain (dBd)	Effective Output Power (dBm)	ERP Limit (dBm)
128	32.07	0.85	32.92	38.45
190	32.14	0.85	32.99	38.45
251	32.15	0.85	33	38.45

Effective Radiated Power Data -GSM

EUT Channel	Measured Conducted Output Power (dBm)	Antenna Gain (dBd)	Effective Output Power (dBm)	ERP Limit (dBm)
128	32.09	0.85	32.94	38.45
190	32.15	0.85	33	38.45
251	32.17	0.85	33.02	38.45

Clause 22.917(b) Occupied Bandwidth

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Test Conditions:

Sample Number:	1	Temperature:	21°C
Date:	Mar. 30, 2006	Humidity:	45%
Modification State:	0	Tester:	Xu Jin
		Laboratory:	Wireless Lab

Test Results:

See Attached tables and plots.

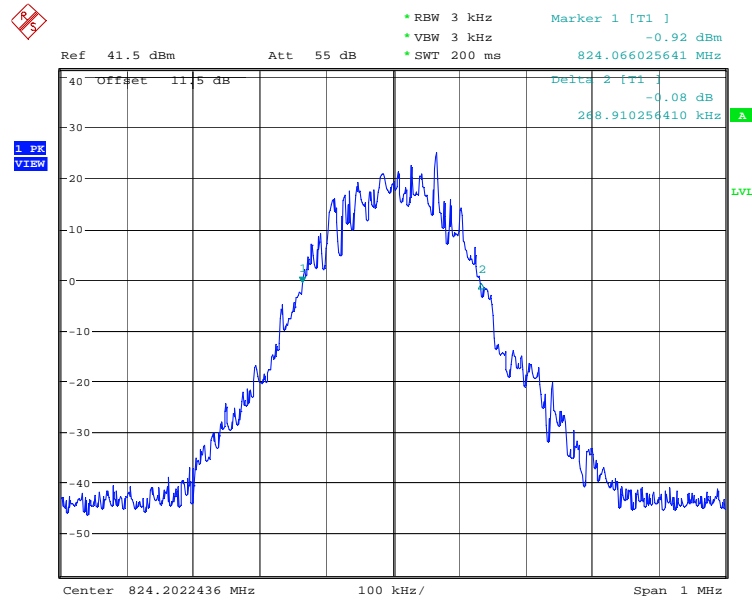
Occupied Bandwidth-GPRS

EUT Channel No.	Measured Occupied Bandwidth (KHz)
128	268.91
190	266.73
251	271.73

Occupied Bandwidth-GSM

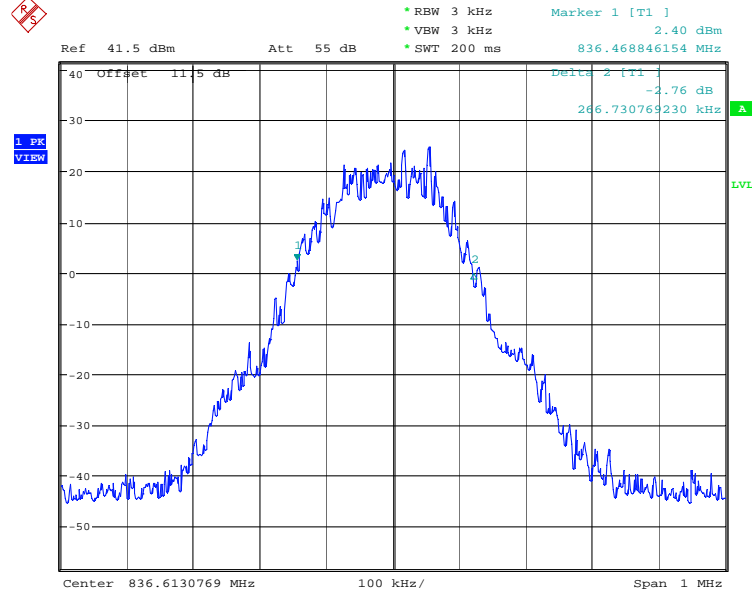
EUT Channel No.	Measured Occupied Bandwidth (KHz)
128	267.31
190	273.14
251	273.33

GPRS -Channel 128



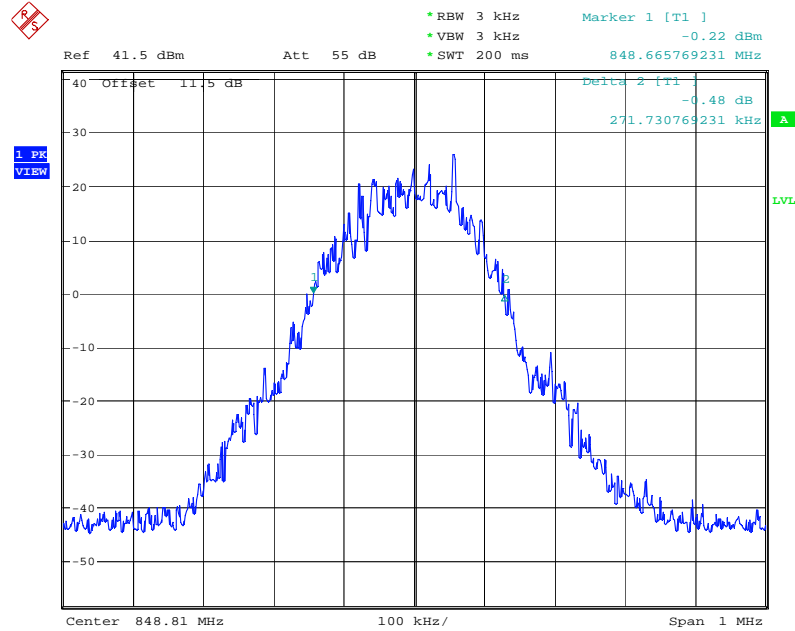
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GPRS-Channel 190



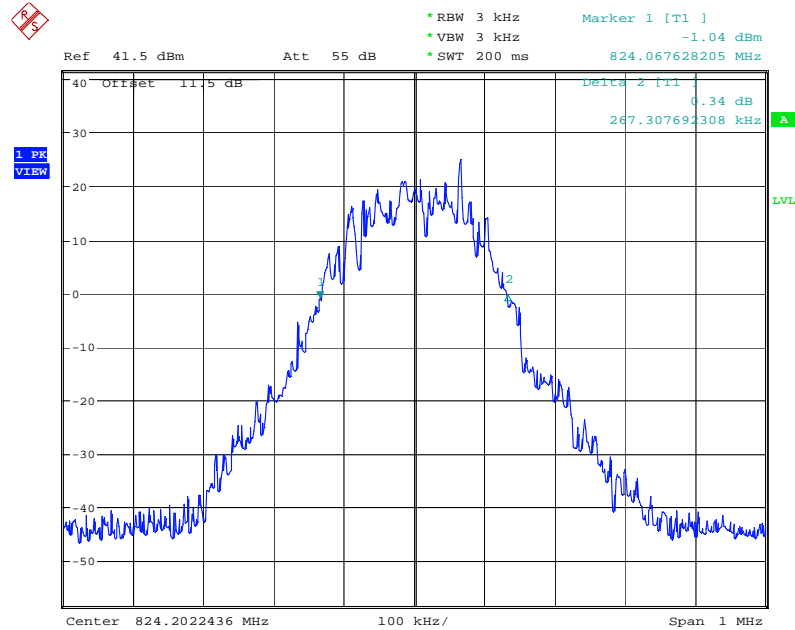
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GPRS-Channel 251



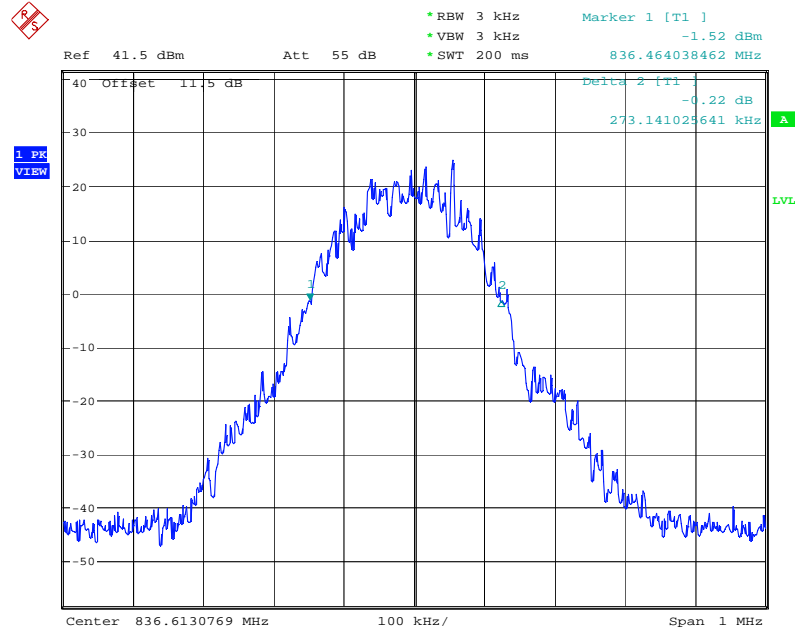
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GSM-Channel 128



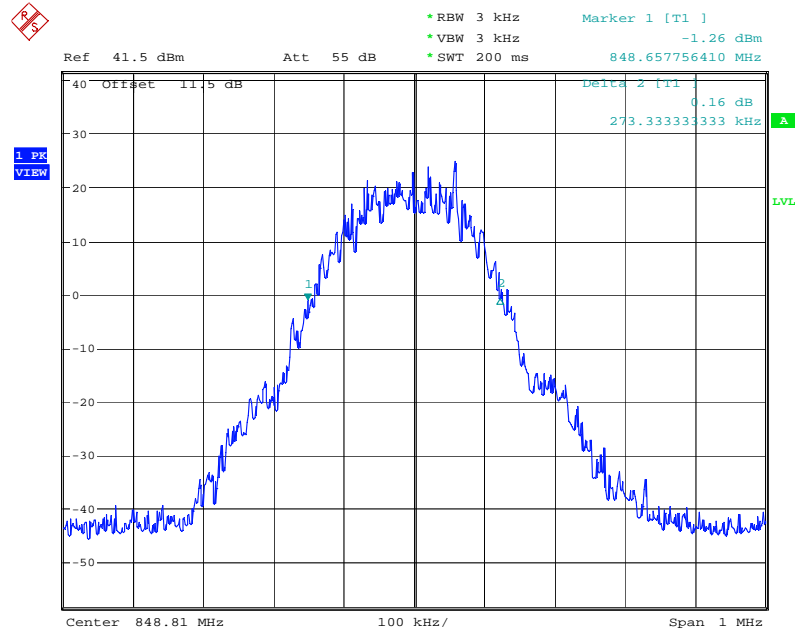
Date: 30.MAR.2006 15:00:58

GSM-Channel 190



Date: 30.MAR.2006 14:38:51

GSM-Channel 251



Date: 30.MAR.2006 15:03:26

Clause 22.917(a) Spurious emissions at the antenna terminal

Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Conditions:

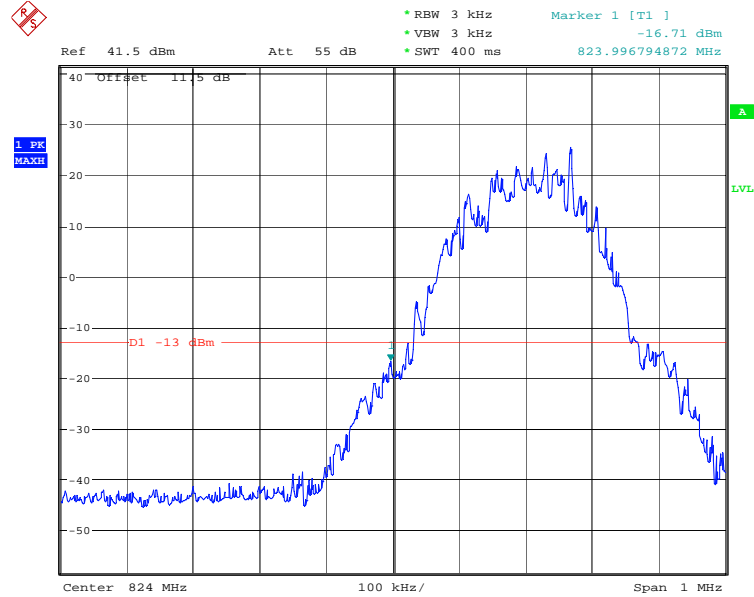
Sample Number:	1	Temperature:	21°C
Date:	Mar. 30,, 2006	Humidity:	45%
Modification State:	0	Tester:	Xu Jin
		Laboratory:	Wireless Lab

Test Results: Complies

Test Data: See Attached Plots.

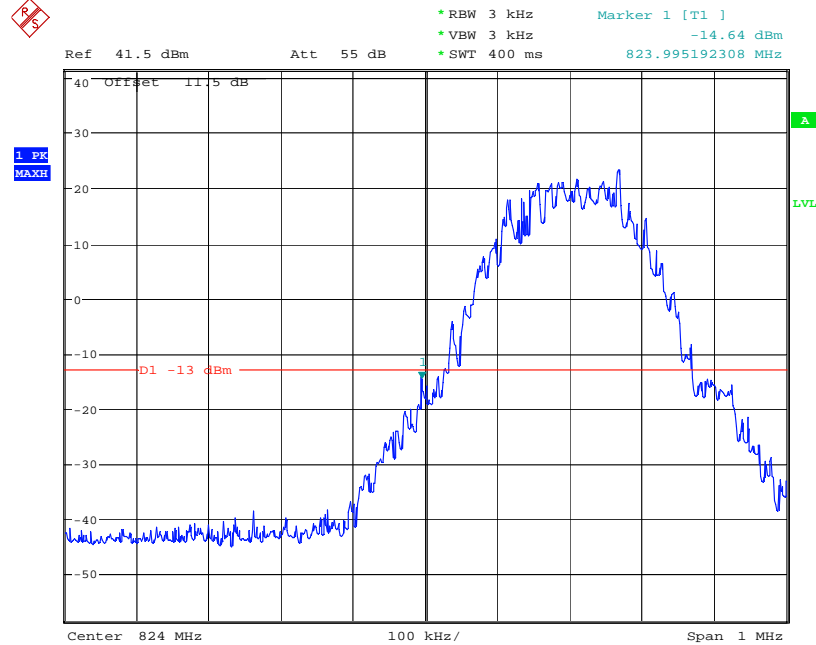
Limit: -13dBm

Band Edge Checking Low Band Edge - Channel 128 GPRS



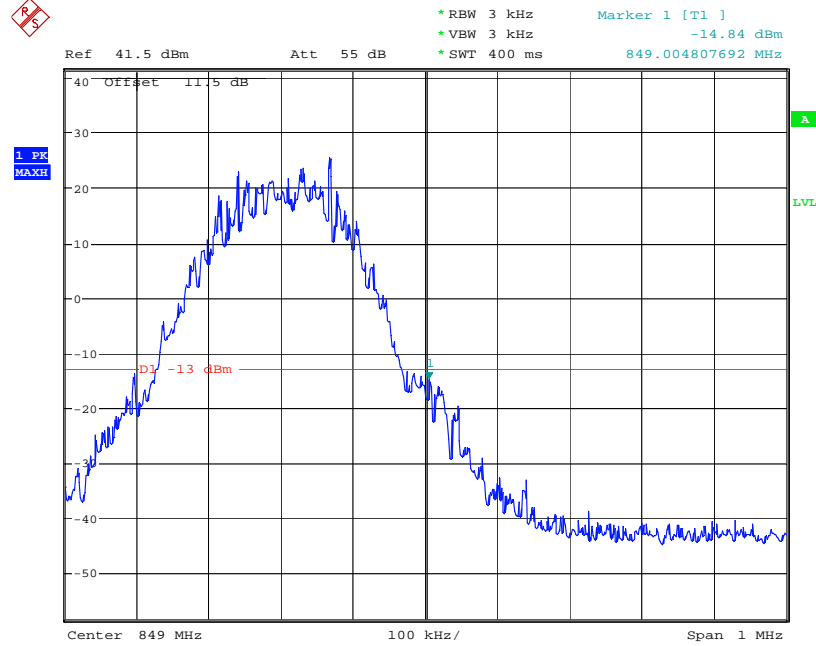
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Low Band Edge - Channel 128 GSM



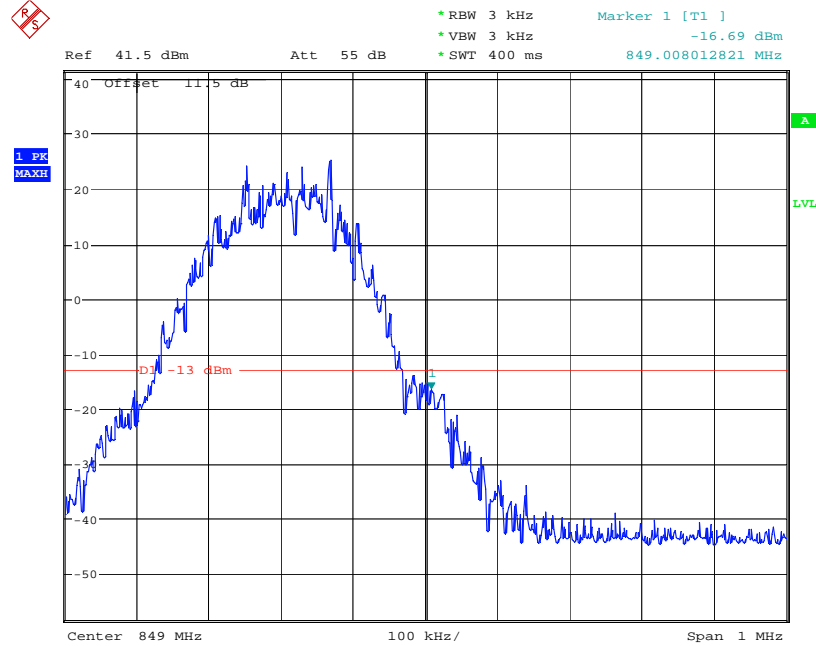
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High Band Edge - Channel 251 GPRS



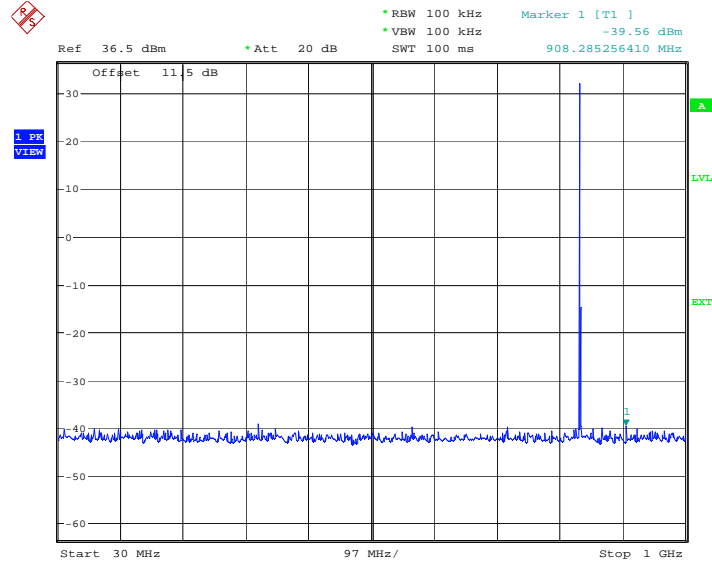
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High Band Edge - Channel 251 GSM

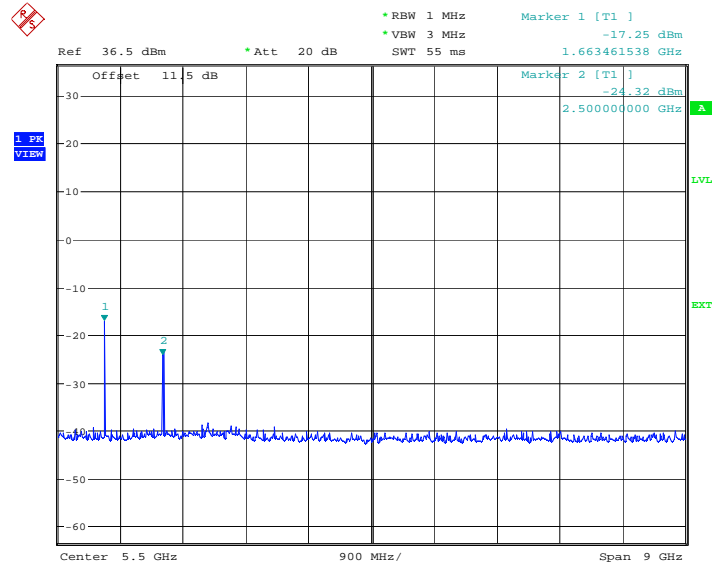


Date: 30.MAR.2006 16:57:28

Channel 190_GPRS

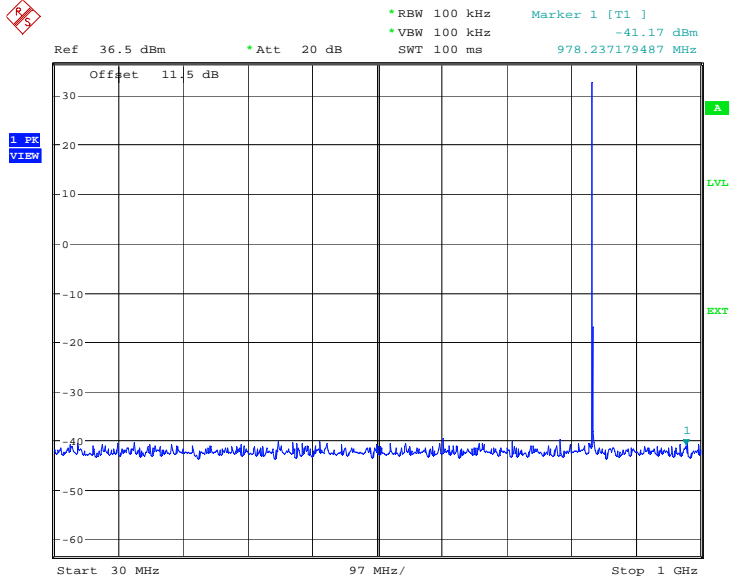


Date: 4.APR.2006 15:59:31

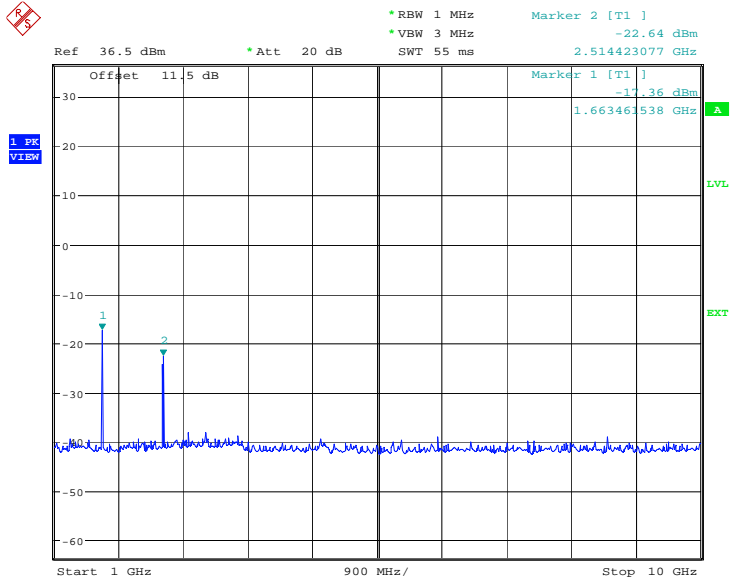


Date: 4.APR.2006 15:58:21

Channel 190_GSM



Date: 4.APR.2006 16:05:20



Date: 4.APR.2006 16:06:22

Clause 22.917(a) Field Strength of Spurious Radiation

Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Conditions:

Sample Number:	1	Temperature:	10°C
Date:	April.3, 2006	Humidity:	50%
Modification State:	0	Tester:	Xu Jin
		Laboratory:	OATS

Test Results:

See Attached Table for Results

Additional Observations:

All measurements were performed using a Peak Detector with 100kHz RBW/VBW below 1GHz and a 1MHz RBW/VBW above 1GHz at a distance of 3 meters.

The Spectrum was searched from 30MHz to the 10th Harmonic. The low, medium and high frequency have been evaluated. Only worst case data was reported

Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBμV)	Sig Sub. Factor (dB)	Signal Substitution Power (dBm)	Limit (dBm)	Margin (dB)	Detector
1648.5600	Horn	H	83.7	-119.2	-35.5	-13	22.5	Peak
1648.5600	Horn	V	80.0	-118.9	-38.9	-13	25.9	Peak
1673.3000	Horn	H	85.5	-119.1	-33.6	-13	20.6	Peak
1673.3000	Horn	V	77.4	-118.6	-41.2	-13	28.2	Peak
1697.7200	Horn	H	83.3	-119.0	-35.7	-13	22.7	Peak
1697.7200	Horn	V	77.0	-118.3	-41.3	-13	28.3	Peak

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
 Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Average = 1.0 MHz RBW
 Below 1GHz, Peak detector with 100 kHz RBW, 100kHz VBW
 Above 1GHz, Peak detector with 1.0MHz RBW, 1.0MHz VBW

Clause 22.355 Frequency Stability

Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1. - Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile >3 watts (ppm)	Mobile <=3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

Test Conditions:

Sample Number:	1	Temperature:	21°C
Date:	April 4, 2006.	Humidity:	50%
Modification State:	0	Tester:	Xu Jin
		Laboratory:	Wireless Lab

Test Results: Complies

Test Conditions Ambient Temperature: 22°C
 Extreme Temperature: -30°C to +50°C
 Extreme Voltage Conditions: +/-15% of 120VAC

Test Limit: 2.5ppm

Test Data: See Attached tables

Channel 190 was chosen for the temperature test.

Frequency Stability Test Data

Test Condition	Measured Frequency (MHz)	Frequency Drift (kHz)	Frequency Drift (ppm)
+21°C, 120VAC	836.667403	---	---
+21°C, 138VAC	836.667694	0.29	0.35
+21°C, 102VAC	836.667845	0.44	0.53
+50°C, 120VAC	836.667689	0.29	0.34
+40°C, 120VAC	836.668103	0.70	0.84
+30°C, 120VAC	836.668248	0.84	1.01
+20°C, 120VAC	836.668153	0.75	0.90
+10°C, 120VAC	836.667040	-0.36	-0.43
0°C, 120VAC	836.667896	0.49	0.59
-10°C, 120VAC	836.668543	1.14	1.36
-20°C, 120VAC	836.668102	0.70	0.84
-30°C, 120VAC	836.668125	0.72	0.86

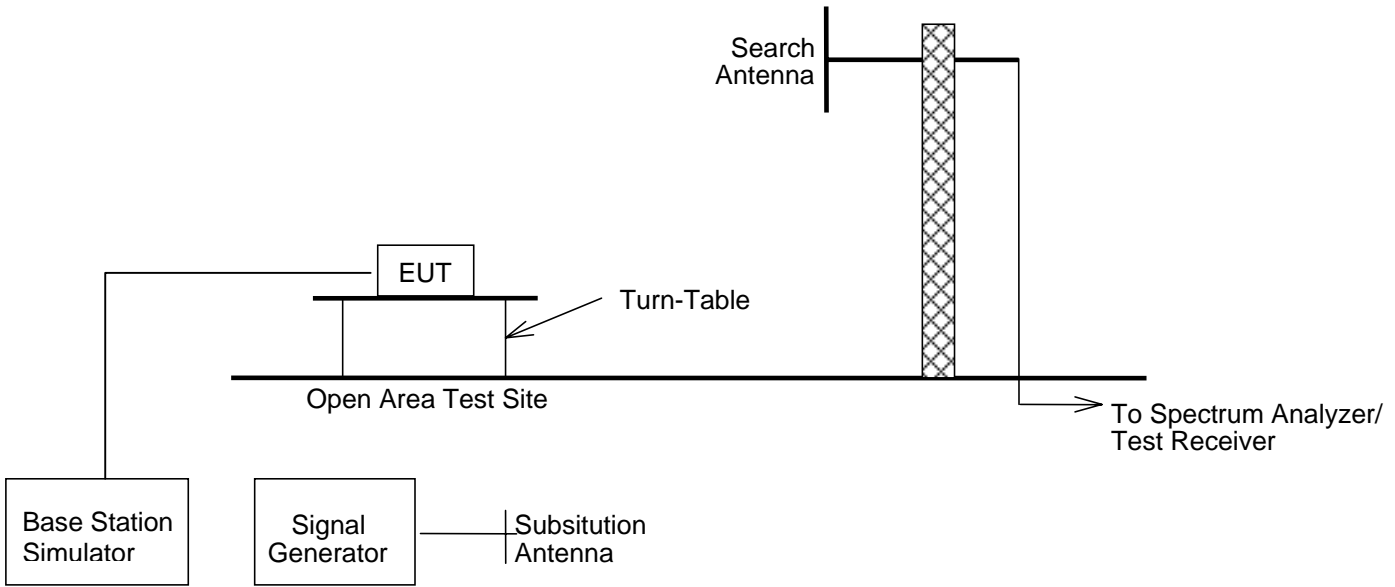
Appendix B: Setup Photographs

Radiated Spurious Emissions Setup:

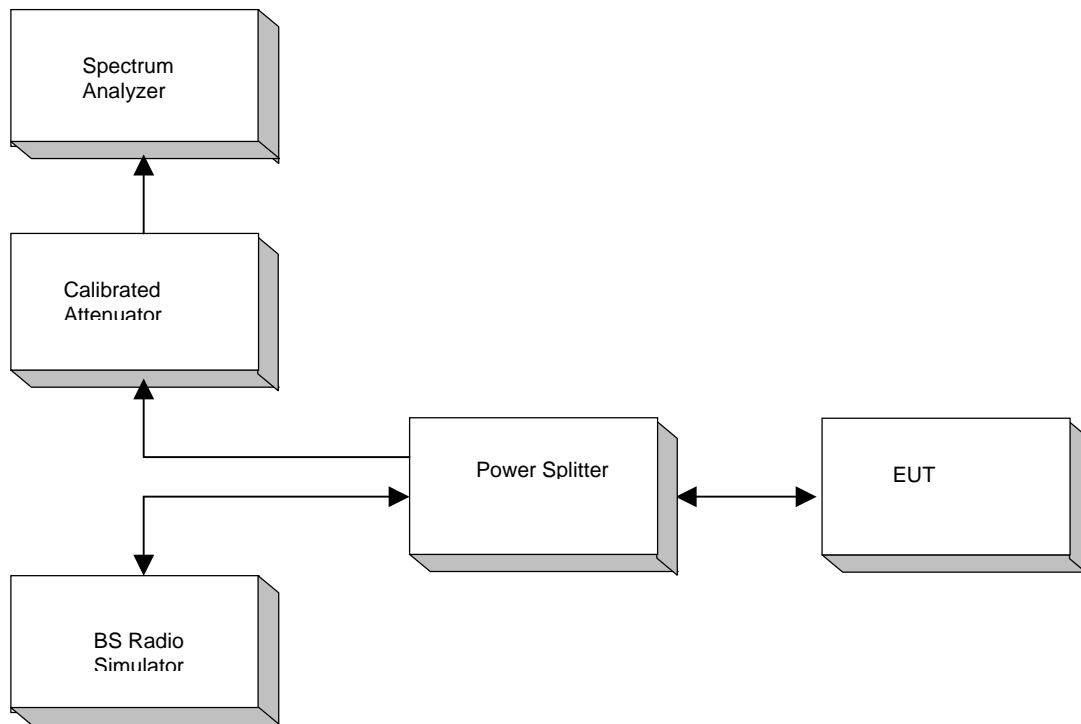


Appendix C: Block Diagram of Test Setups

Test Site For Radiated Emissions



Conducted Measurement



Frequency Stability Test

