CFR 47 Part 2, 22, and 24 Test Report

Test Report Number: WR833.003

Terminal device: FCC ID: QMNRM-125 Model: 6165i Type: RM-125 HW: 2001, SW: AZ 100_05w21.12.nep (Detailed information is listed in section 4).

Originator:	Hai To
Function:	TCC - Dallas – EMC
Version/Status:	1.0 Approved
Location:	QATrax
Date:	26-Oct-05

Change History:

Version	*Date*	*Status*	*Handled By*	*Comments*
0.1	8-Sep-05	Draft	Hai To	
0.2	23-Sep-05	Review	Hai To	
1.0	26-Oct-05	Approved	Michael Sundstrom	

Testing laboratory:

Test & Certification Center (TCC) Dallas
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U.S.A.

Tel. 972-894-5000

Client:

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San Diego
12278 Scripps Summit Dr.
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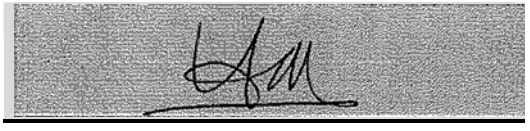
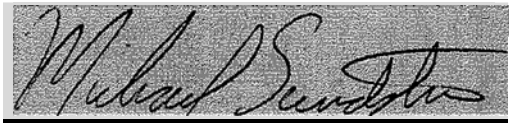
Date and signatures: **26-Oct-05**

For the contents:



Hai To
Test Operator



Michael Sundstrom
Technical Review

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1. GENERAL

1.1 Quality System

The quality system in place for TCC-Dallas conforms to ISO/IEC 17025 and has been audited to the standard by A2LA (American Association of Laboratory Accreditation). TCC - Dallas has also been audited using the ISO 9000 Quality System, as part of Nokia Mobile Phones, Inc., by ABS (American Bureau of Shipping) Quality Evaluations Inc.

TCC-Dallas is a recognized laboratory with the Federal Communications Commission in filing applications for Certification under Parts 15 and 18, Registration Number 100060, and Industry Canada, Registration Number IC 661.

If this report is incremented past 1.0 then include this statement about the previous version:

This Test Report Amendment supplements information as reported in [i.e. ver 1.0]

1.2 List of General Information Required for Certification

This list is in accordance with FCC Rules and Regulations, CFR 47, Part 2, and to 22H, 24E, Confidentiality.

1.2.1 Sub-part 2.1033(c)(1)

Name and Address of Applicant:

Nokia Inc.
San Diego
12278 Scripps Summit Dr.
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Manufacturer:

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1.2.2 Sub-part 2.1033(c)(2)

FCC ID: QMNRM-125

Model No: 6165i

1.2.3 Sub-part 2.1033(c)(3)

Instruction Manual(s): Refer to attached EXHIBITS

1.2.4 Sub-part 2.1033(c)(4)

Type of Emission: 40K0F8W / 40K0F1D / 1M25F9W

1.2.5 Sub-part 2.1033(c)(5)

Frequency Range, MHz: 824.04MHz – 848.97MHz

1851.25MHz – 1908.75MHz

1.2.6 Sub-part 2.1033(c)(6)

Power Rating, Watts: 0.428W AMPS

0.394W CDMA Cellular

0.287W CDMA PCS

☐ Switchable ☒ Variable ☐ N/A

FCC Grant Note: BC- The output power is continuously variable from the value listed in this entry to 5%-10% of the value listed.

1.2.7 Sub-part 2.1033(c)(7)

Maximum Power Rating, Watts: 0.428W

1.2.8 Sub-part 2.1033(c)(8)

Voltages & Currents in all elements in final R.F. Stage, including final transistor or solid-state device:
Collector Current, A = 0.116
Collector Voltage, Vdc = 3.7vdc
Supply Voltage, Vdc = 3.7vdc

1.2.9 Sub-part 2.1033(c)(9)

Tune-up Procedure: Refer to attached EXHIBITS

1.2.10 Sub-part 2.1033(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.
Refer to attached EXHIBITS

1.2.11 Sub-part 2.1033(c)(11)

Label Information: Refer to attached EXHIBITS

1.2.12 Sub-part 2.1033(c)(12)

Photographs: Refer to attached EXHIBITS

1.2.13 Sub-part 2.1033(c)(13)

Digital Modulation Description: N/A

1.2.14 Sub-part 2.1033(c)(14)

Test and Measurement Data: FOLLOWS

1.3 Objective

All tests and measurement data shown was performed to determine whether the selected handset was in compliance as specified in FCC: CFR47 Parts 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, Part 22, and Part 24.

1.4 Test Summary

Test Results: *The test result relates only to those tested devices mentioned in Section 4 of this test report.*

Test Performed	Reference	Section of Report	Complies / Does not comply / Not Tested
RF Power Output (Conducted)	FCC Part 2.1046(a) / 22.913(a) / 24.232(b)(c)	6	Complies
Occupied Bandwidth: Transmitter Conducted Measurements	FCC Part 2.1049(c)(1), 24.238(a)(b)	7	Complies
Spurious Emissions at Antenna Terminals	FCC Part 2.1051	8	Complies

2. STANDARDS BASIS

Testing has been carried out in accordance with:

REF.	Code of the standard	Name of the standard
1	ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.
2	FCC: CFR 47 Part 2	Code of Federal Regulations (CFR) Title 47, Part 2 – Frequency Allocations and Radio Treaty Matters; General Rules and Regulations: Subpart J – Equipment Authorization Procedures
3	FCC: CFR 47 Part 22	Code of Federal Regulations (CFR) Title 47, Part 22 – Public Mobile Services: Subpart H – Cellular Radiotelephone Service
4	FCC: CFR 47 Part 24	Code of Federal Regulations (CFR) Title 47, Part 24 – Personal Communications Services: Subpart E – Broadband PCS
5	RSS-128	800 MHz Dual-Mode TDMA Cellular Telephones
6	RSS-132	800 MHz Cellular Telephones Employing New Technologies
7	RSS-133	2 GHz Personal Communications Services, Industry Canada
8	RSS-212	Test Facilities and Test Methods for Radio Equipment, Industry Canada (Provisional)
9	RSP-100	Radio Equipment Certification Procedure

Note: Unless otherwise stated, (by reference to a version number and a publication date), the latest version of the above documents applies.

Deviations:

Not Applicable.

3. LIST OF ABBREVIATIONS, ACRONYMS AND TERMS

3.1 Abbreviations

dB - decibel

dBc - decibels from carrier

dBm - decibels per milliwatt (absolute measurement)

GHz - gigahertz or 1000000000 hertz

kHz - kilohertz or 1000 hertz

MHz - megahertz or 1000000 hertz

3.2 Acronyms

AMPS - Advanced Mobile Phone System

BSS - Base Station Simulator

CDMA - Code Division Multiple Access

EDRP - Effective Dipole Radiated Power

EIRP - Effective Isotropic Radiated Power

EMC - Electromagnetic Compatibility

EMI - Electromagnetic Interference

ERP - Effective Radiated Power

EUT - Equipment under Test

GSM - Global System for Mobile communications

PCS - Personal Communications Services

RF - Radio Frequency

TDMA - Time Division Multiple Access

3.3 Terms

Base Station Simulator (BSS) - simulates all the necessary signals that a phone would experience while on a live network. There are many types of base station simulators catering for all current protocols, i.e., GSM, AMPS, TDMA, and CDMA.

Cellular - refers to a frequency in the 800MHz band.

PCS - refers to a frequency in the 1900MHz band.

4. EQUIPMENT-UNDER-TEST (EUT)

The results in this report relate only to the items listed below:

4.1 Description of Tested Device(s):

Test Performed	Mode of Operation	Date of Receipt	Condition of Sample	Item	Identifying Information
FCC 2.1049 FCC 2.1051 FCC 22.917 FCC 2.1047 FCC 2.1046	CDMA 800 PCS 1900 AMPS	8-Sep-05	Working	Phone	ESN: 033310858382 Type: RM-125 HW: 2001 SW: AZ 100_05w21.12.nep
N/A	N/A	N/A	N/A	Battery	Type: BL-6C

5. TEST EQUIPMENT LIST

The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items listed can be obtained from the Engineering Services Group within NMP, Product Creation - Dallas. Where relevant, measuring equipment is subjected to in-service checks between testing. TCC - Dallas shall notify clients promptly, in writing, of identification of defective measuring equipment that casts doubt on the validity of results given in this report.

Section of Report	NMP#	Test Equipment	Mfr. #	Model #	Calibration Due Date	Calibration Interval
6,7,8,9,10, 11	02664 02665	EMI Receiver	Agilent	8546A / 85460A	09 Feb 06	12 months
	N/A	6dB Attenuator	Weinshcel	Model 2	09 Feb 06	12 months
6,7,8,9,10, 11	02666	Base Station	R&S	CMU200	25 Jun 06	12 months
	N/a	Power Splitter	HP	33120A		
6,7,8,9,10, 11		Spectrum Analyzer	Agilent	E7405A	29 Dec 06	12 months
6,7,8,9,10, 11	02672	Power Sensor	Agilent	E9304A	21 Nov 05	12 months

6. *FCC PART 2.1046(A), 22.913(A), 24.232(B)(C),* RF POWER OUTPUT (CONDUCTED)

Specification: FCC Part 2.1046(a), 22.913(a), 24.232(b)(c)

6.1 Setup

Testing was performed with the EUT connected to a 6dB splitter and then to the RF Power Meter to measure the conducted RF power output. The base station simulator was connected to the other port of the splitter to establish a call.

6.2 Pass/Fail Criteria

Not Applicable

6.3 Detailed Test Results

Test Technician / Engineer	Hai To
Date of Measurement	8-Sep-05
Temperature	22°C
Humidity	55%RH
Test Result	Was operated at max power and tested in accordance with FCC Part 2.1046(a), 22.913(a), 24.232(b)(c).

PLEASE ENSURE ALL EQUIPMENT USED FOR THIS TEST IS ENTERED INTO SECTION 5.

AMPS ESN 8283

Channel	Freq Max (MHz)	Max (mW)	Max (dBm)
991	824.04 MHz	24.8	301.9
384	836.52 MHz	24.6	288.4
799	848.97 MHz	24.6	288.4

CDMA 800 8283

Channel	Freq Max (MHz)	Max (mW)	Max (dBm)
1013	824.70 MHz	24.8	301.9
384	836.52 MHz	24.7	295.1
777	848.31 MHz	24.7	295.1

CDMA ESN 8283

Channel	Freq Max (MHz)	Max (mW)	Max (dBm)
25	1851.25 MHz	23.0	199.5
600	1880.00 MHz	23.2	208.9
1175	1908.75 MHz	23.1	204.2

7. *FCC PART 2.1049(C)(1), 24.238(A)(B),* OCCUPIED BANDWIDTH (TX CONDUCTED MEASUREMENTS)

Specification: FCC Part 2.1049(c)(1), 24.238(a)(b)

7.1 Setup

Testing was performed with the EUT connected to a 6dB attenuator, 6dB splitter, filter bank and then to the EMI receiver. The base station simulator was connected to the other port of the splitter to establish a call.

7.2 Pass/Fail Criteria

Occupied Bandwidth, Out of Band

Band	Frequency Range (MHz)	FCC Limits (dBm)
Cellular 800, Low Channel	< 824	-13
Cellular 800, High Channel	> 849	-13
PCS 1900, Low Channel	< 1850	-13
PCS 1900, High Channel	> 1910	-13

Occupied Bandwidth, In Band

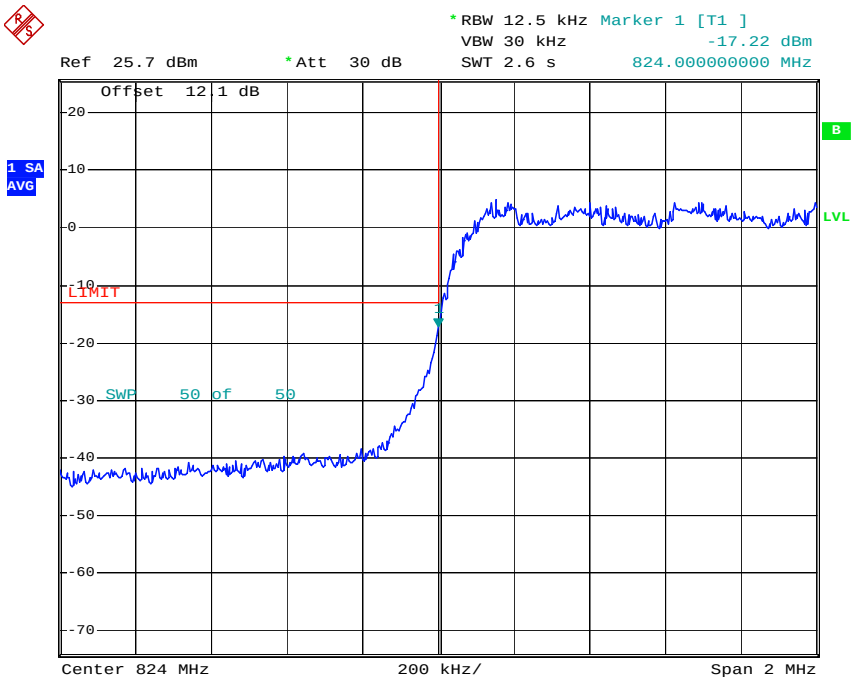
No pass/fail, these plots are used to determine the emission designators.

7.3 Detailed Test Results

Test Technician / Engineer	Hai To
Date of Measurement	9-Sep-05
Temperature	22.0°C
Humidity	42.0 %RH
Test Result	Complies / with FCC Part 2.1049(c)(1), 24.238(a)(b)

Occupied Bandwidth, Out of Band

CDMA 800, Max Power - Channel 1013 (824.70 MHz)



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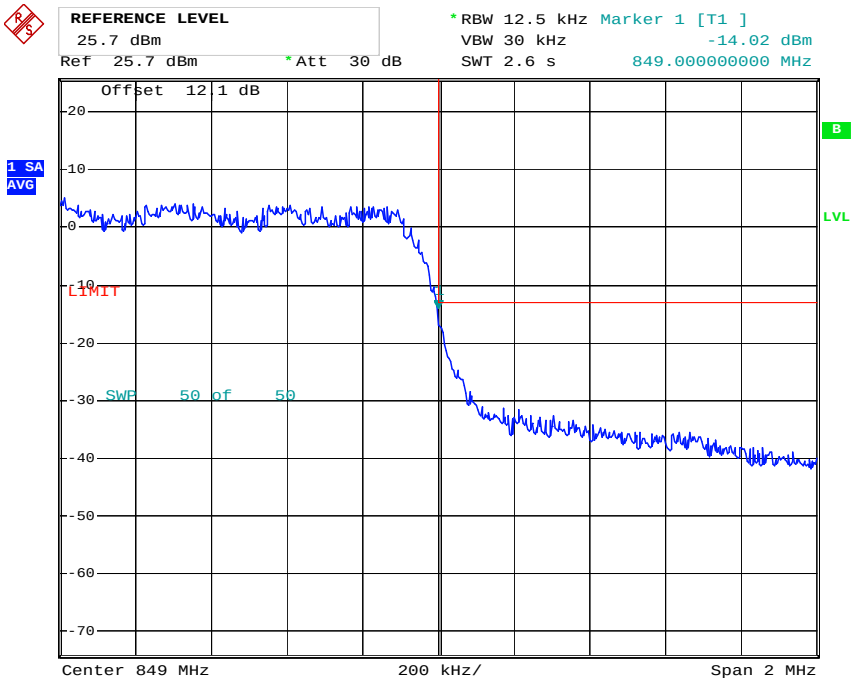
CDMA 800, Max Power - Channel 777 (848.31 MHz)



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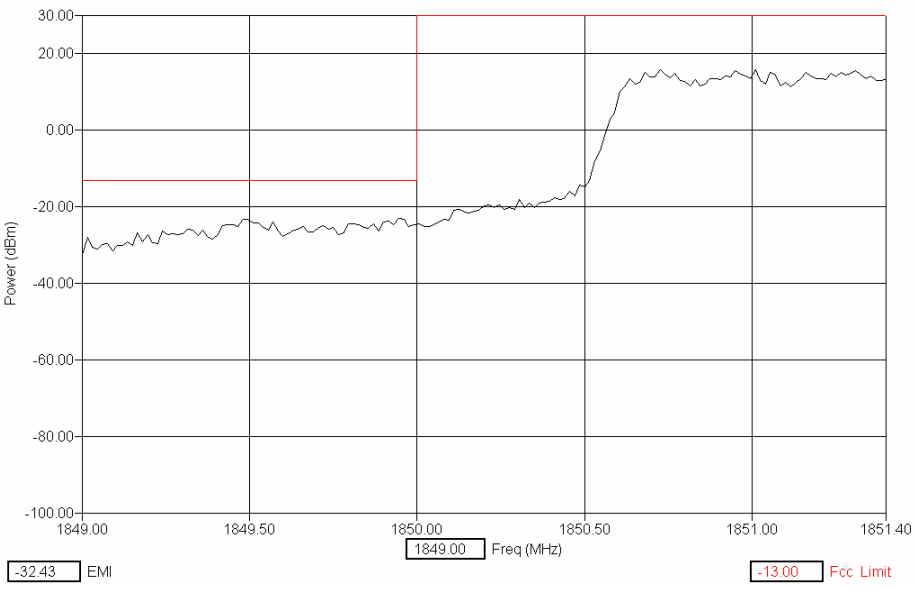
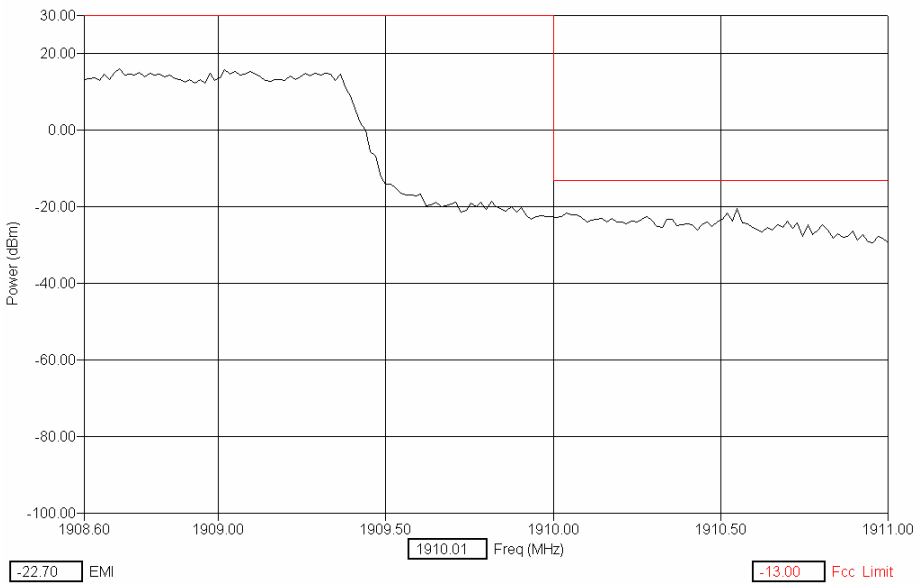
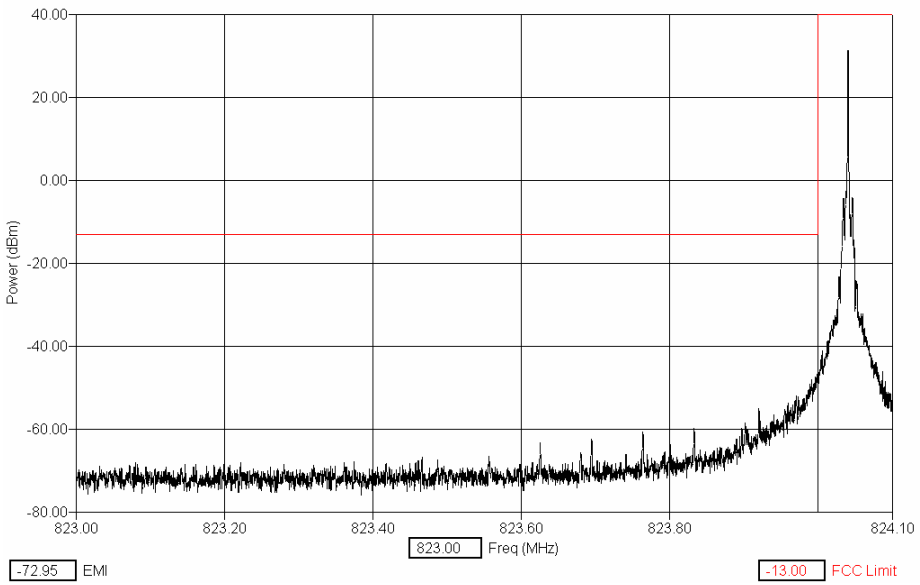
CDMA 1900, Max Power - Channel 25 (1851.25 MHz)



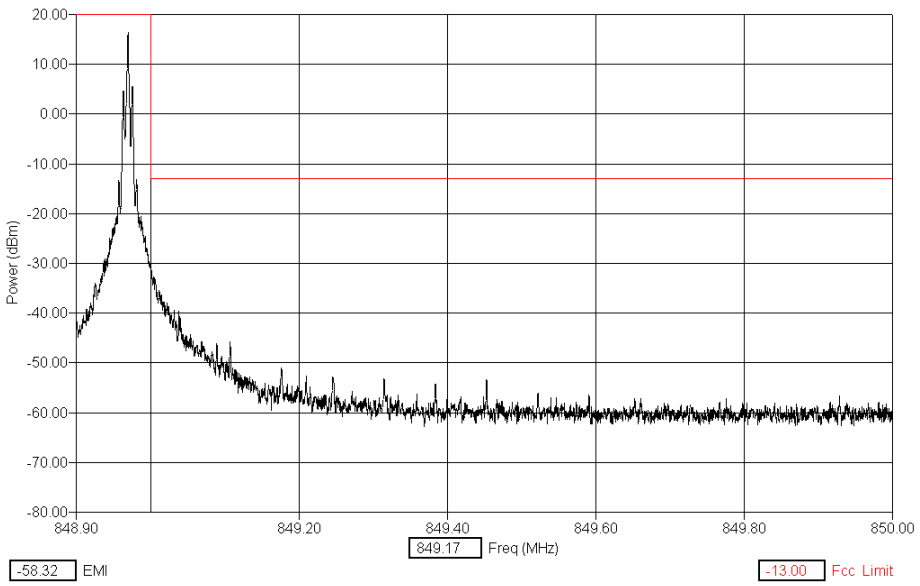
CDMA 800, Max Power - Channel 1175 (1908.75 MHz)



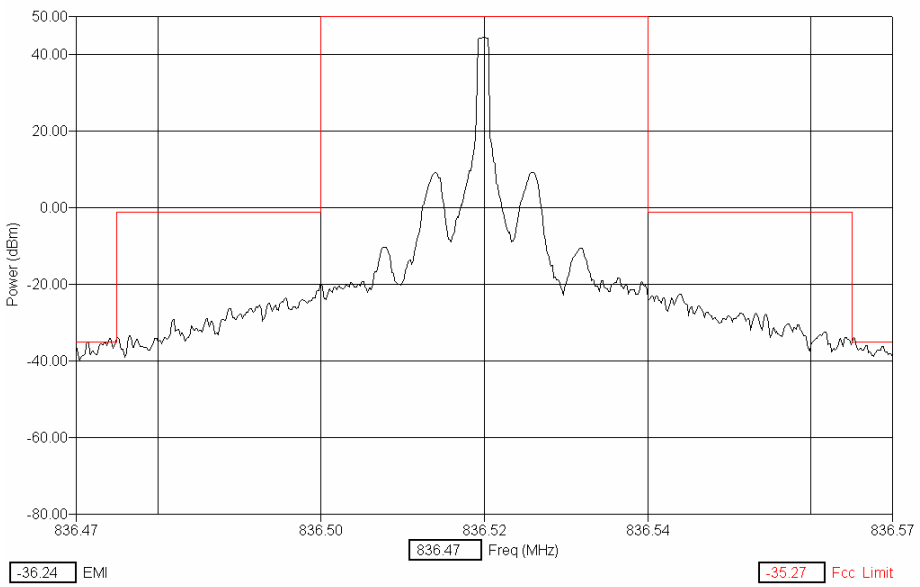
800, AMPS, Max Power - Channel 991 (824.04 MHz)



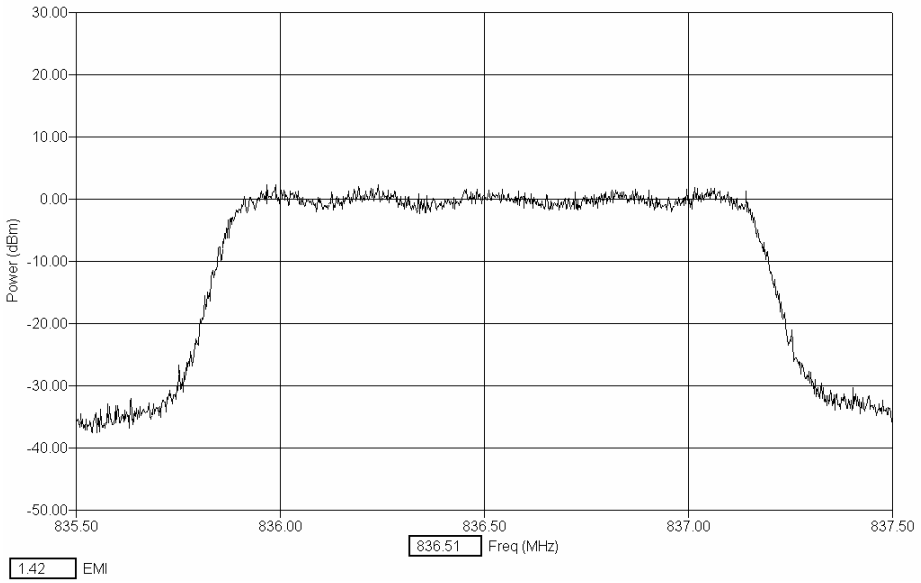
800, AMPS, Max Power - Channel 799 (848.97 MHz)



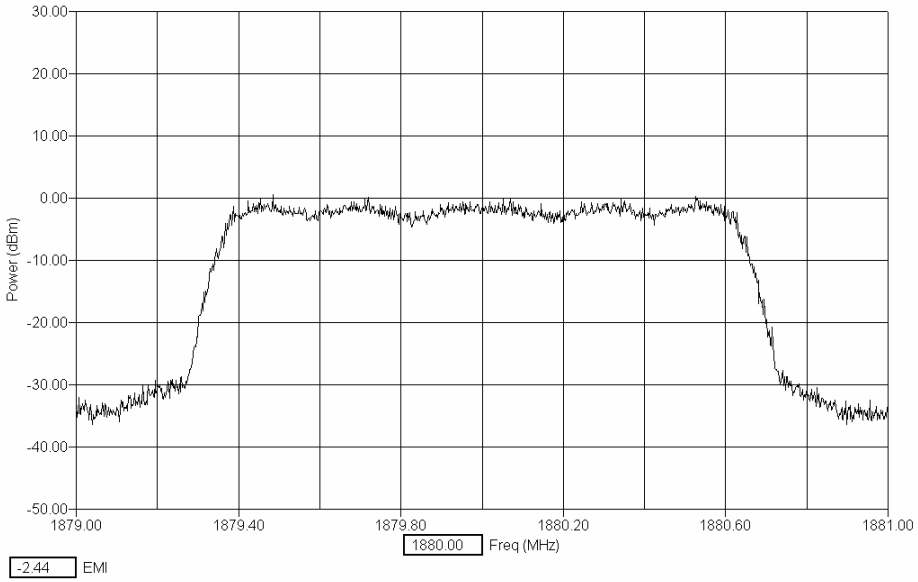
Occupied Bandwidth, In Band; Cellular, AMPS, Channel 384



Occupied Bandwidth, In Band; CDMA 800, Channel 384



Occupied Bandwidth, In Band; PCS 1900, Channel 600



8. *FCC PART 2.1051,* SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Specification: FCC Part 2.1051

8.1 Setup

Testing was performed with the EUT connected to a 6dB attenuator, 6dB splitter, filter bank and then to the EMI receiver. The base station simulator was connected to the other port of the splitter to establish a call. Filters were introduced to reduce or eliminate spurious emission, which could be generated internally in the EMI receiver.

8.2 Pass/Fail Criteria

Band	Frequency Range (MHz)	FCC Limits (dBm)
Cellular / PCS	30 – 20000 *	-13

* Frequency to be investigated up to the 10th harmonic of the highest clock or frequency used.

8.3 Detailed Test Results

Test Technician / Engineer	Hai To
Date of Measurement	9-Sep-05
Temperature	22.0°C
Humidity	42.0 %RH
Test Result	Complies / with FCC Part 2.1051

Note 1: EMI (dBm) = trace (dBuV) + cable loss (dB) + filter loss (dB).

Note 2: measurements were performed with 3MHz RBW/VBW.

CDMA 800 - Channel 777, (848.31 MHz)

Freq (Max) (MHz)	(PEAK) Trace (dBm)	Cable (dB)	Filter (dB)	(PEAK) EMI (dBm)	Limit (dBm)
1696.1	-60.8	0.4	14.59	-45.8	-13.0
2544.5	-57.2	0.6	15.53	-41.1	-13.0
3392.6	-60.9	0.8	16.05	-44.0	-13.0
4241.3	-62.4	0.9	16.35	-45.1	-13.0
5090.7	-62.9	1.1	17.26	-44.5	-13.0
5936.2	-62.4	1.2	22.09	-39.1	-13.0
6786.0	-59.4	1.3	17.96	-40.2	-13.0
7634.1	-58.1	1.3	17.98	-38.8	-13.0
8482.5	-59.6	1.4	18.53	-39.7	-13.0

CDMA 800 - Channel 384, (836.52 MHz)

Freq (Max) (MHz)	(PEAK) Trace (dBm)	Cable (dB)	Filter (dB)	(PEAK) EMI (dBm)	Limit (dBm)
1673.0	-61.1	0.4	14.60	-46.1	-13.0
2510.3	-57.3	0.6	15.65	-41.1	-13.0
3344.5	-61.7	0.8	16.10	-44.8	-13.0
4182.8	-62.2	0.9	16.12	-45.1	-13.0
5020.6	-62.1	1.1	17.16	-43.8	-13.0
5855.4	-62.2	1.2	21.33	-39.7	-13.0
6691.4	-62.1	1.3	17.75	-43.1	-13.0
7529.3	-57.7	1.3	18.06	-38.3	-13.0
8364.5	-59.4	1.4	19.00	-39.0	-13.0

CDMA 800 – Channel 1013, (824.70 MHz)

Freq (Max) (MHz)	(PEAK) Trace (dBm)	Cable (dB)	Filter (dB)	(PEAK) EMI (dBm)	Limit (dBm)
1650.6	-60.2	0.4	14.67	-45.2	-13.0
2475.1	-57.0	0.6	15.46	-40.9	-13.0
3298.9	-61.0	0.8	15.98	-44.2	-13.0
4123.9	-62.4	0.9	16.09	-45.4	-13.0
4949.2	-62.2	1.1	17.03	-44.1	-13.0
5773.6	-62.0	1.2	19.98	-40.9	-13.0
6598.4	-62.4	1.2	18.06	-43.1	-13.0
7420.7	-58.6	1.3	17.98	-39.3	-13.0
8247.5	-58.1	1.4	18.97	-37.7	-13.0

AMPS– Channel 384 (836.52 MHz)

Freq (Max) (MHz)	(PEAK) Trace (dBm)	Cable (dB)	Filter (dB)	(PEAK) EMI (dBm)	Limit (dBm)
1673.3	-59.7	0.4	14.60	-44.7	-13.0
2509.5	-57.1	0.6	15.65	-40.9	-13.0
3346.1	-60.6	0.8	16.10	-43.8	-13.0
4182.2	-60.5	0.9	16.12	-43.5	-13.0
5018.7	-62.4	1.1	17.16	-44.2	-13.0
5854.9	-61.3	1.2	21.33	-38.8	-13.0
6691.9	-62.0	1.3	17.75	-43.0	-13.0
7528.3	-57.8	1.3	18.06	-38.4	-13.0
8366.5	-58.6	1.4	19.00	-38.2	-13.0

AMPS– Channel 991, (824.04 MHz)

Freq (Max) (MHz)	(PEAK) Trace (dBm)	Cable (dB)	Filter (dB)	(PEAK) EMI (dBm)	Limit (dBm)
1648.2	-59.6	0.4	14.67	-44.5	-13.0
2472.2	-56.0	0.6	15.45	-40.0	-13.0
3294.5	-62.1	0.8	16.01	-45.3	-13.0
4121.6	-62.5	0.9	16.13	-45.4	-13.0
4943.8	-61.2	1.1	17.03	-43.2	-13.0
5768.1	-61.9	1.2	19.93	-40.8	-13.0
6593.5	-61.9	1.2	18.06	-42.6	-13.0
7418.1	-57.9	1.3	18.11	-38.4	-13.0
8242.3	-58.3	1.4	18.93	-38.0	-13.0

AMPS– Channel 799, (848.97 MHz

Freq (Max) (MHz)	(PEAK) Trace (dBm)	Cable (dB)	Filter (dB)	(PEAK) EMI (dBm)	Limit (dBm)
1698.7	-61.5	0.4	14.59	-46.5	-13.0
2547.0	-55.8	0.6	15.49	-39.7	-13.0
3395.5	-60.9	0.8	16.02	-44.1	-13.0
4244.9	-62.2	0.9	16.39	-44.9	-13.0
5092.0	-62.7	1.1	17.25	-44.3	-13.0
5943.1	-62.3	1.2	22.11	-39.0	-13.0
6789.8	-58.2	1.3	17.87	-39.0	-13.0
7640.0	-57.7	1.3	17.97	-38.4	-13.0
8489.7	-59.6	1.4	18.55	-39.7	-13.0

CDMA 1900– Channel 600, (1880.00 MHz)

Freq (Max) (MHz)	(PEAK) Trace (dBm)	Cable (dB)	Filter (dB)	(PEAK) EMI (dBm)	Limit (dBm)
3760.6	-60.0	0.86	16.8	-42.4	-13.0
5640.8	-48.5	1.14	18.5	-28.8	-13.0
7518.9	-58.2	1.34	18.1	-38.8	-13.0
9400.2	-58.6	1.49	18.9	-38.1	-13.0
11280.6	-58.8	1.61	20.2	-37.0	-13.0
13161.7	-59.1	1.72	21.8	-35.6	-13.0
15040.2	-56.0	1.81	23.7	-30.5	-13.0
16919.7	-56.6	1.89	25.0	-29.7	-13.0
18799.0	-57.4	1.96	25.1	-30.3	-13.0

CDMA 1900– Channel 25, (1851.25 MHz)

Freq (Max) (MHz)	(PEAK) Trace (dBm)	Cable (dB)	Filter (dB)	(PEAK) EMI (dBm)	Limit (dBm)
3701.8	-61.0	0.85	16.2	-43.9	-13.0
5552.7	-47.8	1.13	18.4	-28.2	-13.0
7405.3	-58.1	1.32	18.4	-38.4	-13.0
9256.5	-59.5	1.48	19.5	-38.5	-13.0
11107.4	-59.3	1.60	20.2	-37.5	-13.0
12958.9	-58.0	1.71	22.6	-33.6	-13.0
14809.1	-55.7	1.80	22.8	-31.1	-13.0
16662.8	-56.7	1.88	23.8	-31.1	-13.0
18513.0	-57.5	1.95	24.9	-30.7	-13.0

CDMA 1900– Channel 1175, (1908.75 MHz)

Freq (Max) (MHz)	(PEAK) Trace (dBm)	Cable (dB)	Filter (dB)	(PEAK) EMI (dBm)	Limit (dBm)
3817.3	-61.1	0.87	16.7	-43.6	-13.0
5725.5	-48.5	1.15	19.4	-28.0	-13.0
7634.5	-58.4	1.35	18.0	-39.1	-13.0
9545.2	-59.8	1.50	20.3	-38.0	-13.0
11454.4	-58.6	1.62	20.5	-36.5	-13.0
13359.3	-55.8	1.73	22.0	-32.0	-13.0
15268.1	-55.9	1.82	23.3	-30.8	-13.0
17179.5	-57.4	1.90	24.3	-31.2	-13.0
19086.5	-57.4	1.97	26.3	-29.1	-13.0