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Certification Test Report

Test Report: 2007 075409 RFFE FCC

Project number: 5409-1

Applicant: Qualcomm Incorporated
5775 Morehouse Drive
San Diego, CA 92121

Equipment Under Test (EUT): RF Amplifier

Model: RFFE1900

Antenna Model: Mobile Mark Antenna (CVS-900/1900) with attenuator

FCC ID: FCC ID # J9CRFFE1900

Industry Canada: 3572A-M200

In Accordance With: FCC Part 24, Subpart E

Tested By: Nemko USA Inc.
11696 Sorrento Valley Road, Suite F
San Diego, CA 92121

Authorized By: *FR, Fleury*
FR. Fleury, Manager

Date: AUGUST 1, 2007

Total Number of Pages: 25

Report Summary

All measurements are traceable to national standards. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 24, Subpart E.

The assessment summary is as follows:

Apparatus Assessed: RFFE1900 RF Amplifier

Specification: FCC Part 24, Subpart E

Compliance Status: Complies

Exclusions: None

Non-compliances: None

Report Release History:

REVISION	DATE	COMMENTS
-	August 1, 2007	Prepared By: Alan Laudani
-	August 1, 2007	Initial Release: FR Fleury

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:

The Qualcomm Radio Frequency Front End (RFFE) is a 1900 MHz, single sector power amplifier, transmitting a macro cell output signal up to 20 watts. The RFFE is 2U in height and mounts into a 19 inch rack. The RFFE is part of a CDMA deployable base station.

1.2 Support Equipment Setup



1.3 Technical Specifications of the EUT

Manufacturer:	Qualcomm Incorporated
Operating Frequency:	1931.25 MHz To 1988.75 MHz
Date Received in Laboratory	July 18, 2007
RF Output (Limit)	Part 24.232 (a): 1640 watts
Emission Designator	1M25F9W

Section 2: Test Conditions

2.1 Specifications

The apparatus was assessed against the following specifications:

- FCC Part 24, Subpart E Broadband PCS

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	:	13-18 °C
Humidity range	:	59-70 %
Pressure range	:	86 - 106 kPa

2.4 Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
529	Antenna, DRWG	EMCO	3115	2505	8/31/2006	08/31/07
765	Antenna Set, Dipole	EMCO	3121C	1214	6/27/2006	06/27/07
836	Signal Generator	Agilent	E8254A	US41140229	7/27/2006	07/27/07
111	Antenna, LPA	EMCO	3146	1382	8/7/2006	08/07/07
110	Antenna, LPA	Electrometrics	LPA-25	1217	12/18/2006	12/18/07
877	Antenna, DRG Horn, .7-18GHz	AH Systems	SAS-571	688	6/20/06	6/20/07
842	Preamp	NA	Nemko	NA	Verified 04/13/2007	
915	EMI Test Receiver 20 Hz- 26.5	Rohde & Schwarz	1088.7490.26	837491/0002	2/6/2007	02/06/08

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

Please refer to Section 4: Results Summary for list of tests deleted or not performed.

3.5 Additional Observations

There were no additional observations made during this assessment.

Section 4: Results Summary

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

Name of Test/Requirements	Para. No.	Result
RF Power Output	2.1046	NA ²
Audio Low Pass Filter Response	2.1047	NA ¹
Audio Frequency Response	2.1047	NA ¹
Modulation Limiting	2.1047	NA ¹
Occupied Bandwidth (WB Data)	2.1049	NA ²
Spurious Emissions at antenna Terminals	2.1051	NA ²
Field Strength of Spurious Emissions	2.1053	COMPLIES
Frequency Stability	2.1055	NA ²
Radiofrequency radiation exposure evaluation: mobile devices	2.1091	NA ²

Footnotes for N/A's:

¹Digital Modulation

²Not tested, see Qualcomm Radio Frequency Front End (RFFE) Type Acceptance Report

Appendix A: Test Results/Requirements

Para. No.: 2.1053 Field Strength of Spurious

Minimum Standard is Part 24.238:

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:		Temperature:	26°C
Date:	7-24-07	Humidity:	48 %
Modification State:	PCS	Tester:	Alan Laudani
		Laboratory:	Nemko SOATS

Test Results:

The maximum spurious field strength in PCS mode is 17.5 dB below the limit @ 3977.50 MHz

Test Data: See attached Tables

Radiated Emissions Data

Job # : 5409-1 Test # : 3
 Page 1 of 1

Client Name : Qualcomm Incorporated
 EUT Name : Power Amplifier
 EUT Model # : RFFE1900
 EUT Serial # : _____
 EUT Config. : PCS Tx Synthesizer

Specification : FCC Part 24 Reference : _____
 Rod. Ant. # : NA Temp. (°C) : 26 Date : 07/24/07
 Bicon Ant.# : NA Humidity (%) : 48 Staff : A. Laudani
 Log Ant.# : NA EUT Voltage : 120
 DRG Ant. # : 529 EUT Frequency : 60 Peak Bandwidth: 1 MHz
 Dipole Ant.#: 758 Phase: 1 Video Bandwidth 1 MHz
 Cable#: 40ft Location: RN# 90579
 Preamp#: 317 Distance: 3m
 Spec An.#: 835 EIRP conversion factor 5.5

Meas. Freq. (MHz)	Vertical (dBuV) pk	Horizontal (dBuV) pk	CF (db)	Max Level (dBm) pk	Spec. Limit (ERIP) (dBm) pk	Margin dB pk	EUT Rotation	Ant. Height	Pass Fail Unc.	Comment
1931.25										
3862.50	51.7	47.8	13.8	-29.8	-13.0	-16.8	B	1.0	Pass	
5793.75	42.7	40.5	20.1	-32.5	-13.0	-19.5	F	1.0	Pass	
7725.00	37.1	35.3	24.5	-33.7	-13.0	-20.7	F	1.0	Pass	
9656.25	NF	NF	31.8	-63.5	-13.0	-50.5			Pass	
11587.50	NF	NF	31.5	-63.8	-13.0	-50.8			Pass	
13518.75	NF	NF	35.8	-59.5	-13.0	-46.5			Pass	
15450.00	NF	NF	37.7	-57.6	-13.0	-44.6			Pass	
17381.25	NF	NF	41.0	-54.3	-13.0	-41.3			Pass	
19312.50	NF	NF	48.6	-46.7	-13.0	-33.7			Pass	
1960.00										
3920.00	53.6	54.7	13.8	-26.8	-13.0	-13.8	B	1.0	Pass	
5880.00	40.6	39.4	20.1	-34.6	-13.0	-21.6	F	1.0	Pass	
7840.00	36.5	21.4	24.5	-34.3	-13.0	-21.3	F	1.0	Pass	
9800.00	NF	NF	31.8	-63.5	-13.0	-50.5			Pass	
11760.00	NF	NF	31.5	-63.8	-13.0	-50.8			Pass	
13720.00	NF	NF	35.8	-59.5	-13.0	-46.5			Pass	
15680.00	NF	NF	37.1	-58.2	-13.0	-45.2			Pass	
17640.00	NF	NF	44.9	-50.4	-13.0	-37.4			Pass	
19600.00	NF	NF	48.6	-46.7	-13.0	-33.7			Pass	
1988.75										
3977.50	57.2	60.6	13.8	-20.9	-13.0	-7.9	B/R	1.0	Pass	
5966.25	39.7	38.7	20.1	-35.5	-13.0	-22.5	B	1.0	Pass	
7955.00	37.8	36.2	24.5	-33.0	-13.0	-20.0	F	1.0	Pass	
9943.75	NF	NF	31.8	-63.5	-13.0	-50.5			Pass	
11932.50	NF	NF	31.5	-63.8	-13.0	-50.8			Pass	
13921.25	NF	NF	35.8	-59.5	-13.0	-46.5			Pass	
15910.00	NF	NF	37.1	-58.2	-13.0	-45.2			Pass	
17898.75	NF	NF	44.9	-50.4	-13.0	-37.4			Pass	
19887.50	NF	NF	48.6	-46.7	-13.0	-33.7			Pass	

Para. No.: 2.1053 Field Strength of Spurious (Substitution Method)

Substitution Method For Radiated Emissions								
Complete	<u>Yes</u>		Job # :	<u>5409-1-QUA</u>		Test # :	<u>1</u>	
Preliminary	<u></u>			Page <u>1</u>		of	<u>1</u>	
Client Name :	<u>Qualcomm Incorporated</u>							
EUT Name :	<u>Power Amplifier</u>							
EUT Model # :	<u>RFFE1900</u>							
EUT Part # :	<u></u>							
EUT Serial # :	<u></u>							
EUT Config. :	<u>Substitution</u>							
Specification :	<u>FCC Part 24</u>					Reference :	<u></u>	
Rod. Ant. #:	<u>NA</u>	Temp. (deg. C) :	<u>26</u>		Date :	<u>7/24/2007</u>		
Bicon Ant. #:	<u>NA</u>	Humidity (%) :	<u>48</u>		Time :	<u></u>		
Log Ant. #:	<u>NA</u>	EUT Voltage :	<u>NA</u>		Staff :	<u>FSCustodio</u>		
DRG Ant. #	<u>877</u>	EUT Frequency :	<u>NA</u>		Photo ID:	<u></u>		
Dipole Ant. #:	<u>NA</u>	Phase:	<u>NA</u>		Peak Bandwidth:	<u>RBW-1MHz, VBW-1MHz</u>		
Cable#:	<u>40ft</u>	Location:	<u>RN# 329550-01</u>			<u></u>		
Preamp#:	<u>NA</u>	Distance:	<u>3m</u>			<u></u>		
Spec An. #:	<u>835</u>							
QP #:	<u>NA</u>							
PreSelect#:	<u>NA</u>							

Frequency mHz	Target		Horn Gain dBi	Cable loss dB	Signal Generator dBm	Total (EIRP) dBm	Spec dBm	Margin dBm	RBW MHz
	Level dBuV/m								
3862.50	51.7		9.37	7.05	-42.30	-39.98	-13	-27.0	1
5793.75	42.7		10.05	9.14	-39.30	-38.39	-13	-25.4	1
3920.00	54.7		9.28	7.48	-38.50	-36.70	-13	-23.7	1
3977.50	60.6		9.15	7.28	-32.40	-30.53	-13	-17.5	1

Appendix B: Setup Photographs

1. Spurious Emissions Setup:



2. Spurious Emissions Setup:



Appendix A: Block Diagram of Test Setups

Test Site For Radiated Emissions

