



Compliance Testing, LLC

Previously Flom Test Lab

RF, EMC and Safety Testing Experts Since 1963

toll-free: (866) 311-3268

fax: (480) 926-3598

<http://www.ComplianceTesting.com>

info@ComplianceTesting.com

Date: August 5, 2010

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

Attention of: Paul Guckian, VP, Regulatory Engineering
Ph: (858) 651-1547
Fax: (619) 658-1562
E-mail: pguckian@qualcom.com

Equipment: Castra without Zigbee

FCC ID: J9CCASTRAW07B

FCC Rules: Part 24

Enclosed please find your copy of the Engineering Test Report for which you are subject to the restrictions as listed on the attached summary.

This Class II Permissive Change Certification Testing was completed on behalf of:
ECotality North America
430 S. 2nd Ave
Phoenix, AZ 85003
Ph: (602) 716-9576

For any additional information please contact us.

Sincerely,

Compliance Testing, LLC



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. (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).



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Test Report

for

FCC ID: J9CCASTRAW07B

Model: Castra without Zigbee

to

Federal Communications Commission

Rule Part(s) 24

Date of report: August 5, 2010

On the Behalf of the Applicant: Qualcomm Incorporated
5775 Morehouse Drive
San Diego, CA 92121

Attention of: Paul Guckian, VP, Regulatory Engineering
Ph: (858) 651-1547
Fax: (619) 658-1562
E-mail: pguckian@qualcom.com

At the Request of: ECotality North America
430 S. 2nd Ave
Phoenix, AZ 85003
Ph: (602) 716-9576

By
Compliance Testing, LLC
3356 N. San Marcos Place, Suite 107
Chandler, Arizona 85225-7176
(866) 311-3268 phone, (480) 926-3598 fax



Test Report Revision History

Revision	Date	Revised By	Reason for revision
1.0	August 5, 2010	J. Erhard	Original Document



The Applicant has been cautioned as to the following:

15.21 Information to the User

The user's 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.



Testimonial and Statement of Certification

This is to Certify:

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 is true and correct.

A handwritten signature in black ink, appearing to read "John Erhard".

Certifying Engineer:

John Erhard: Engineering Manager



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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: 24.



Standard Test Conditions and Engineering Practices

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

In accordance with ANSI/C63.4-2009, 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.

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

A2LA

"A2LA has accredited Compliance Testing, LLC, in Chandler, AZ for technical competence in the field of Electrical testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO 17025:2005 'General Requirements for the Competence of Testing and Calibration Laboratories' and any additional program requirements in the identified field of testing."

Please refer to www.a2la.org for current scope of accreditation.

Certificate number: 2152.01



TESTING CERT# 2152.01

FCC OATS Reg. #933597

IC Reg. # 2044A-1



List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and Part 24

Sub-part 2.1033

(c)(1):

Name and Address of Applicant: Qualcomm Incorporated
5775 Morehouse Drive
San Diego, CA 92121

(c)(2): **FCC ID:** J9CCASTRAW07B

Model Number: Castra without Zigbee

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

Please see attached exhibits

(c)(4): **Type of Emission:** CDMA

(c)(5): **Frequency Range, MHz:** 1851.25 – 1908.75

(c)(6): **Power Rating, Watts:** 0.298

☐ Switchable

☐ Variable

☒ N/A

(c)(7): **Maximum Allowable Power, Watts:** 0.298

DUT Results:

Passes

☒

Fails

☐



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 = 0.7
Collector Voltage, Vdc = 5
Supply Voltage, Vdc = 5

(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
☒ N/A

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

Follows



Test Results Summary

Specification	Test Name	Pass, Fail, N/A	Comments
2.1053	Field Strength of Spurious Radiation	Pass	



Name of Test: Field Strength of Spurious Radiation
Specification: 2.1053
Test Equipment Utilized: i00103, i00331

Engineer: J. Erhard
Test Date: 8/5/2010

Test Procedure

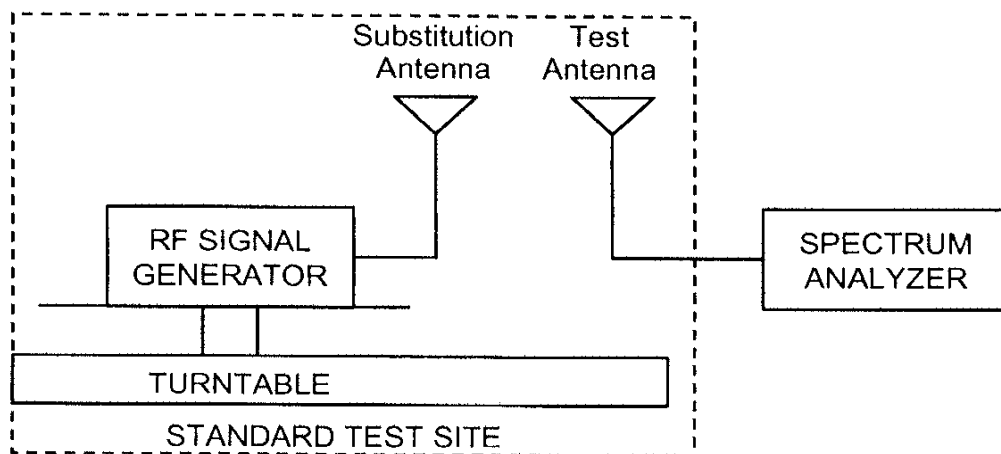
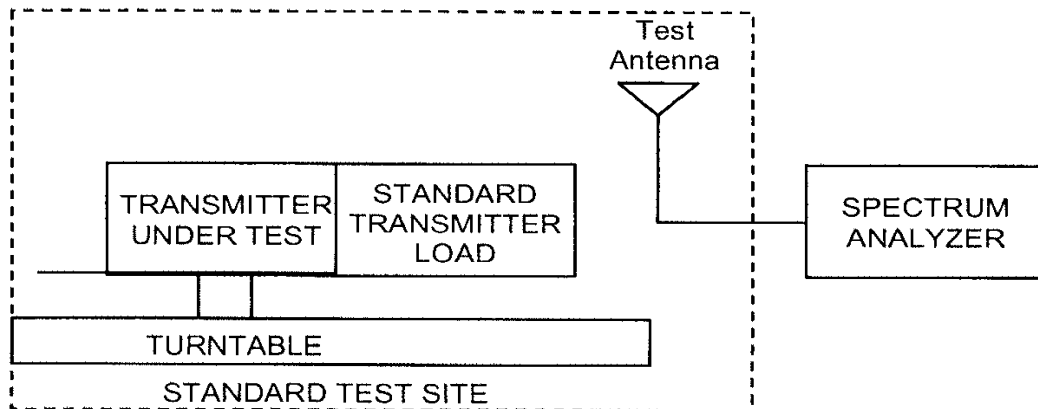
- A) Connect the equipment as illustrated
- B) Adjust the spectrum analyzer for the following settings:
 - 1) Resolution Bandwidth 100 kHz (<1 GHz), 1 MHz (> 1GHz).
 - 2) Video Bandwidth ≥ 3 times Resolution Bandwidth, or 30 kHz
 - 3) Sweep Speed ≤ 2000 Hz/second
 - 4) Detector Mode = Mean or Average 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 that is placed on the turntable. The RF cable to this load should be of minimum length.
- 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 $\pm$ 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.
- 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 = $10\log_{10}(\text{TX power in watts}/0.001)$ – the levels in step I)

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



Test Setup



**Radiated Peak Output Power**

Tuned Frequency MHz	Recorded Measurement dBm	Result
1851.25	18.80	Pass
1880	17.03	Pass
1908.75	13.98	Pass

1851.25 Spurious Emissions Test Results

Emission Frequency (MHz)	Measured Level (dBm)	Limit (dBm) EIRP	Result
3702.5	-33.41	-13	Pass
5553.3	-47.39	-13	Pass
7406.9	-43.32	-13	Pass

1880 Spurious Emissions Test Results

Emission Frequency (MHz)	Measured Level (dBm)	Limit (dBm) EIRP	Result
3760.3	-39.56	-13	Pass
5639.4	-51.55	-13	Pass
7520.9	-43.91	-13	Pass

1908.75 Spurious Emissions Test Results

Emission Frequency (MHz)	Measured Level (dBm)	Limit (dBm) EIRP	Result
3817.5	-35.98	-13	Pass
5726.6	-53.62	-13	Pass
7633.2	-46.89	-13	Pass

No other emissions were detected. All emissions were greater than -13 dBm.



Test Equipment Utilized

Description	MFG	Model Number	CT Asset Number	Last Cal Date	Cal Due Date
Horn Antenna	EMCO	3115	i00103	11/5/2008	11/5/2010
Spectrum Analyzer	Agilent	E4407B	i00331	11/03/09	11/03/10

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT