



Compliance Testing, LLC

Previously Flom Test Lab

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FCC CFR47 Part 90 Test Report

Prepared for: ZheJiang Dahua Technology Co., LTD

Model: DH-HWS200+

Description: Radar Speed Measuring System

FCC ID: ZTSDH-HWS

To

**Federal Communications Commission
Rule Part 90**

Date of Issue: July 18, 2011

On the behalf of the applicant:

**ZheJiang Dahua Technology Co., LTD
1187 Bin'an Road
Hangzhou, Zhejiang 310053**

Attention of:

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Project No: p1150003**

**Greg Corbin
Project Test Engineer**

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All results of this test report relate only to the item(s) there were tested



Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	July 18, 2011	GC	Original Document
2.0	August 4, 2011	AR	Changed Model info per customer request
3.0	September 1, 2011	GC	Added Frequency Stability test data



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Compliance Testing, LLC
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ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009)

The tests results contained within this test report all fall within our scope of accreditation, unless noted in the table below

Please refer to <http://www.compliancetesting.com/labscope.html> for current scope of accreditation.

Testing Certificate Number: **2152.01**



FCC OATS Reg, #933597

IC Reg. #2044A-1

Non-accredited tests contained in this report:

N/A



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 an 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.



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: 90.



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.

Environmental Conditions	
Temperature	Humidity
24.8 – 36.7 deg C	24.3 – 42.2 %

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



List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to Part 90

Sub-part 2.1033

(c)(1):

Name and Address of Applicant: **ZheJiang Dahua Technology Co., LTD**
 1187 Bin'an Road
 Hangzhou, Zhejiang 310053

Manufacturer: **ZheJiang Dahua Technology Co., LTD**

(c)(2): **FCC ID:** ZTSDH-HWS

Model Number: DH-HWS200+

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

Please see attached exhibits

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

(c)(5): **Frequency Range, MHz** 34.761 GHz

(c)(6): **Power Rating, Watts:** 19.75 dBm

 Switchable Variable X N/A

(c)(7): **Maximum Allowable Power, Watts:** 33 dBm, includes 23 dB antenna gain

DUT Results: Passes X 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	=	300 mA
Collector Voltage, Vdc	=	5.5
Supply Voltage,	=	5.5

(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 Result Summary

Specification	Test Name	Pass, Fail, N/A	Comments
90.205(s) 2.1046	Radiated Output Power	Pass	
90.210(b)(3), 2.1053	Field Strength of Spurious Radiation	Pass	
90.210	Emission Masks (Occupied Bandwidth)	Pass	
90.213, 2.1055	Frequency Stability	Pass	

Accessories

Qty	Type	Make, Model	S/N	Description
1	USB Thumb drive	Netac, U228	N/A	USB Thumb drive
1	AC/DC Adapter	HXY-168V3500A	N/A	AC to DC power adapter used to charge battery pack when it is not installed in the EUT
1	Battery	Li 14.8V 10AH	N/A	Lithium Ion Battery Pack
1	cable	Lemo, LM SG060.AAZ	N/A	Patchcord

EUT Description

The EUT is a Mobile Speed Measuring System. It uses a CW radar signal at 34.761 GHz to measure the speed of moving automobiles.

The EUT is powered by a Lithium Battery. The system is supplied with an AC Adapter for charging the battery when the battery is not installed in the EUT.



Radiated Output Power

Name of Test: Radiated Output Power

Specification: 90.205(s), 2.1046

Engineer: Greg Corbin

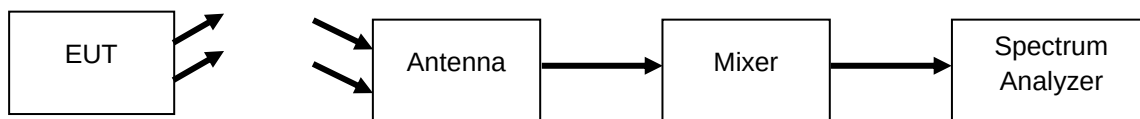
Test Equipment Utilized: i00085, i00193, i00331

Test Date: 7/15/2011

Measurement Procedure

The EUT was tested in an anechoic chamber at a height of 1 meter. The receive horn antenna was 3 meters from the EUT and adjusted for maximum transmit signal from the EUT. The maximum transmit signal was with the antenna in the horizontal position.

Test Setup



Settings

RBW = 1 MHz

VBW = 3 MHz

Detector – Peak

The Antenna correction Factor and Mixer conversion loss were input to the spectrum analyzer as offsets before recording the final data.

Transmitter Peak Output Power

Tuned Frequency GHz	Recorded Measurement dBm	Result
34.761	19.75	Pass



Field Strength of Spurious Radiation

Name of Test: Field Strength of Spurious Radiation

Specification: 90.210(b)(3), 2.1053

Engineer: Greg Corbin

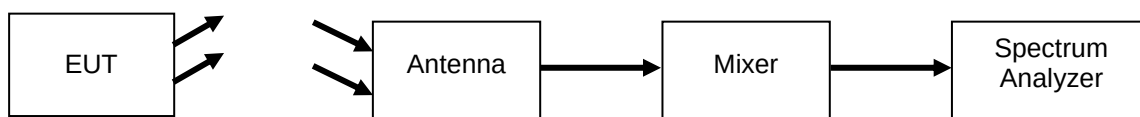
Test Equipment Utilized: i00085, i00193, i00331, i00394

Test Date: 7/15/2011

Measurement Procedure

The EUT was tested in an anechoic chamber at a height of 1 meter. The receive horn antenna was 3 meters from the EUT and adjusted for maximum transmit signal from the EUT. The maximum transmit signal was with the antenna in the horizontal position.

Test Setup



Settings

RBW = 1 MHz

VBW = 3 MHz

Detector – Peak

The Antenna correction Factor and Mixer conversion loss were input to the spectrum analyzer as offsets before recording the final data.

Test Results

Tuned Frequency (GHz)	Emission Frequency (GHz)	Measured Level (dBm)	Limit (dBm) ERP/EIRP	Result
34.761	69.522	-49.3	-13	Pass
34.761	104.283	-54.3	-13	Pass

No other emissions were detected.



Emission Masks (Occupied Bandwidth)

Name of Test: Emission Masks (Occupied Bandwidth)

Specification: 90.210

Engineer: Greg Corbin

Test Equipment Utilized: i00085, i00193, i00331

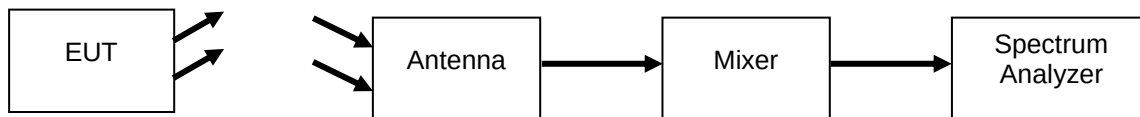
Test Date: 7/15/2011

Measurement Procedure

The EUT was tested in an anechoic chamber at a height of 1 meter. The receive horn antenna was 3 meters from the EUT and adjusted for maximum transmit signal from the EUT. The maximum transmit signal was with the antenna in the horizontal position.

The Antenna correction Factor and Mixer conversion loss were input to the spectrum analyzer as offsets before recording the final data.

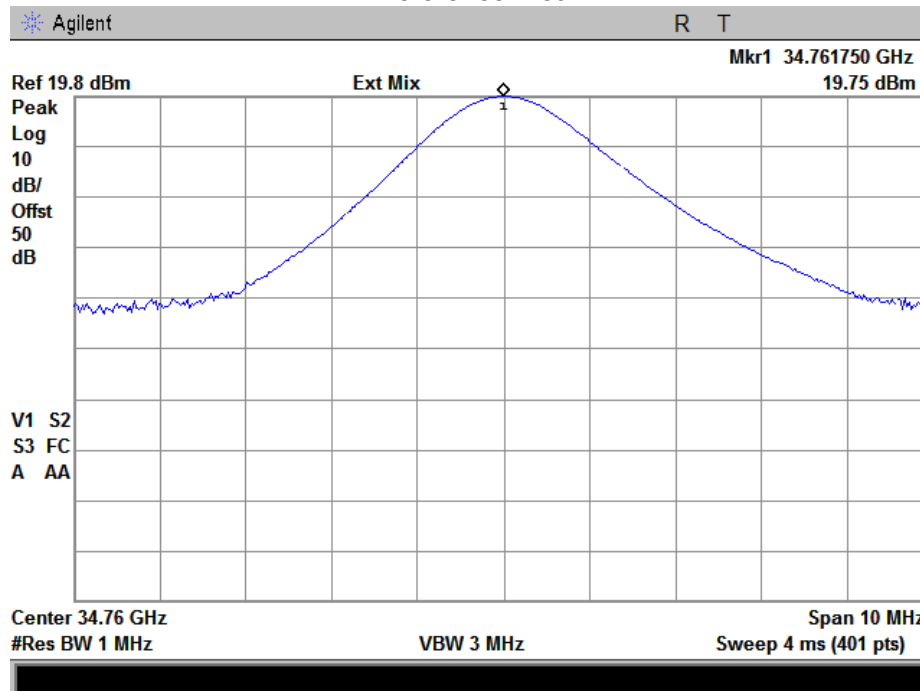
Test Setup



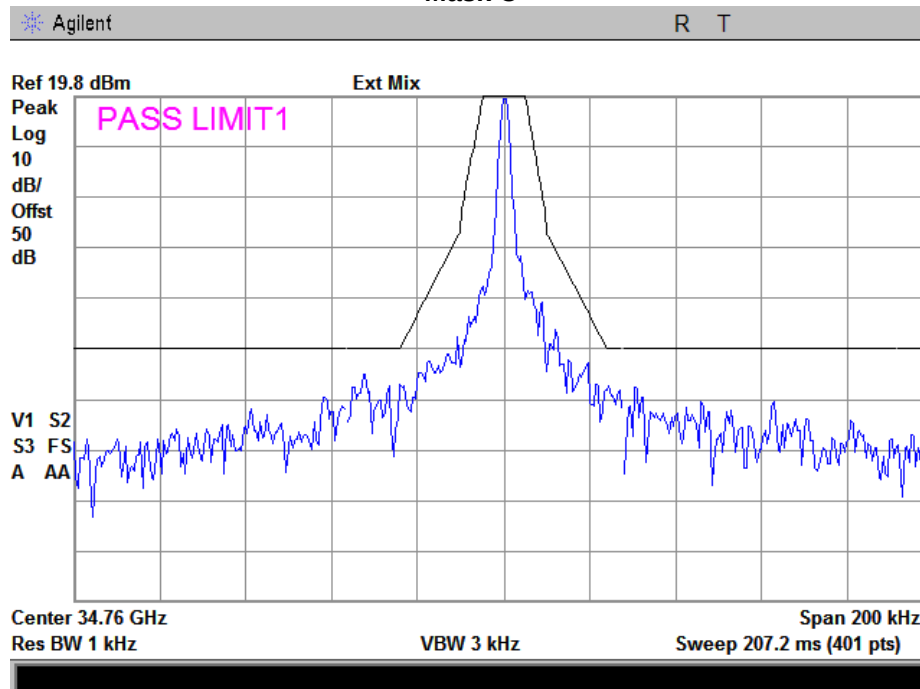


Occupied Bandwidth Plots

Reference Plot



Mask C





Frequency Stability (Temperature Variation)

Name of Test: Frequency Stability (Temperature Variation)

Specification: 90.213, 2.1055(b)

Engineer: Greg Corbin

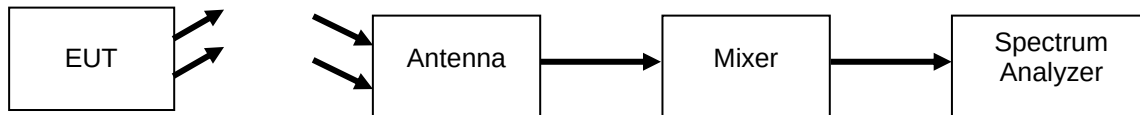
Test Equipment Utilized: i00085, i00193, i00287, i00331, i00343

Test Date: 9/1/2011

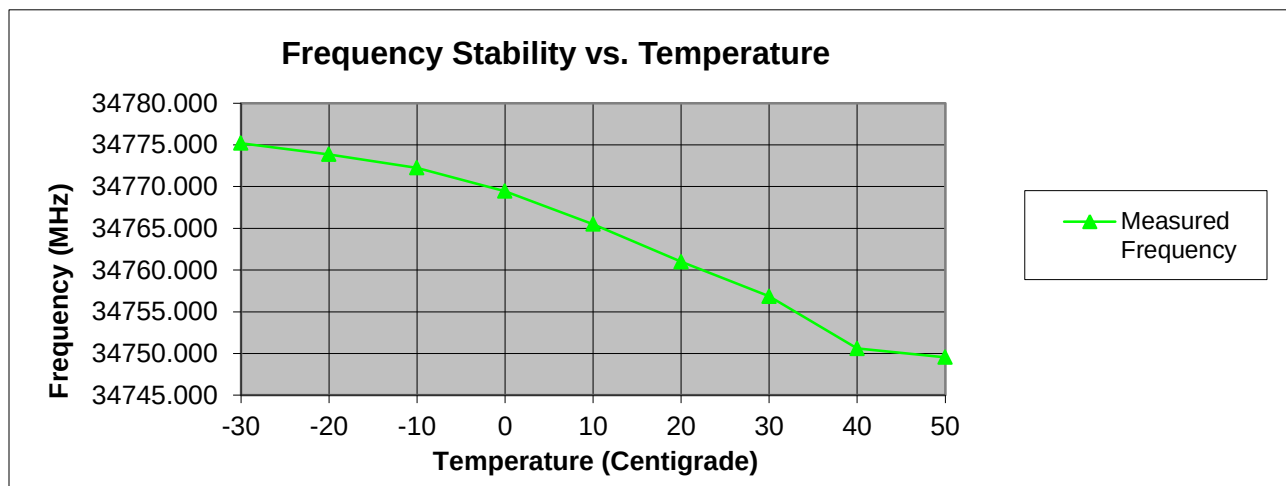
Measurement Procedure

The EUT was placed in an environmental test chamber and the RF output was connected as shown. The temperature was varied from -30°C to 50°C in 10°C increments. After a sufficient time for temperature stabilization the RF output frequency was measured.

Measurement Setup



Measurement Results





Test Equipment Utilized

Description	Manufacturer	Model Number	CT Asset No.	Last Cal Date	Cal Due Date
Horn Antenna	EMCO	3116	i00085	NCR	NCR
Horn Antenna	EMCO	3115	i00103	11/5/10	11/5/12
Harmonic Mixer	HP	11970A	i00193	6/21/11	6/21/12
Bi-Log Antenna	Schaffner	CBL611C	i00267	11/21/09	11/21/11
Humidity / Temp Meter	Newport	IBTHX-W-5	i00282	11/11/10	11/11/11
Temperature Chamber	Tenney	Tenney II Benchmaster	i00287	Verify	9/1/11
Voltmeter	Fluke	87III	i00319	6/20/11	6/20/12
Spectrum Analyzer	Agilent	E4407B	i00331	5/24/11	5/24/12
Data Logger	Fluke	Hydra Data Bucket	i00343	11/18/10	11/18/11
Bi-Log Antenna	Schaffner	CBL 6111D	i00349	5/25/11	5/25/13
Humidity / Temp Meter	Control Company	4189CC	i00355	1/26/11	1/26/12
Standard Gain Horn Kit	Pacific Millimeter Products	Mixer Mdl: MD1A 60 – 90 GHz Horn Mdl: EM 90 – 140 GHz Horn Mdl: FM	i00394	NCR	NCR

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