FCC Test Report

FCC Part 15.225

FOR:

Casio Hitachi Mobile communications Co., Ltd.

MODEL #: CDMA HIY01

FCC ID: TYKNX6490

TEST REPORT #: EMC_ CET10_044_09501_HIY01_15.225
DATE: 2009-05-15

ilac-MRA ACCREDITED Certificate # 2135.01

Bluetooth

Bluetooth Qualification Test Facility (BQTF)

CTIA Authorized Test Lab
LAB CODE 20020328-00

FCC listed
A2LA Accredited

IC recognized # 3462B

***CETECOM* Inc.**
411 Dixon Landing Road ◆ Milpitas, CA 95035 ◆ U.S.A.
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CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686
Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

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1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Part 15.225 of the Code of Federal Regulations.

Company	Description	Model #
Casio Hitachi Mobile Communications Co., Ltd.	**The cellular phone for the global roaming of the CDMA method of 3G equipped with the Bluetooth function and the FeliCa function sold in Japan.**	**CDMA HIY01**

This Report Reviewed by:

Date	Section	Name	Signature
2009-05-15	EMC & Radio	Marc Douat (EMC Project Engineer)	Marc Douat I am approving this document

The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.

This report is prepared by:

Date	Section	Name	Signature
2009-05-15	EMC & Radio	Ahmad Safdari (EMC Project Engineer)	Ahmad Safdari Digitally signed by Ahmad Safdari Reason: I am the author of this document

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	**CETECOM Inc.**
Department:	**EMC**
Address:	**411 Dixon Landing Road Milpitas, CA 95035 U.S.A.**
Telephone:	**+1 (408) 586 6200**
Fax:	**+1 (408) 586 6299**
Responsible Test Lab Manager:	**Heiko Strehlow**
Responsible Project Leader:	**Ahmad Safdari**
Date of test:	**2009-05-11 to 2008-10-13**

2.2 Identification of the Client

APPLICANT	
Applicant (Company Name)	**Casio Hitachi Mobile Communications Co., Ltd.**
Street Address	**2-229-1, Sakuragaoka**
City/Zip Code	**Higashiyamato-shi, Tokyo 207-8501**
Country	**Japan**
Contact Person	**Osamu Hasegawa**
Telephone	**+81-42-516-2184**
Fax	**+81-42-516-2505**
e-mail	**Osamu-hasegawa@ch-mobile.co.jp**

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Name:	**HIY01**
Description:	**The cellular phone for the global roaming of the CDMA method of 3G equipped with the Bluetooth function and the FeliCa function sold in Japan.**

Model No:	**CDMA HIY01**
Antenna Type:	**Integral**
Type(s) of Modulation:	**ASK**
Frequency of Operation:	**13.56MHz**
Field Strength at 13.56MHz at a distance of 30 meters	**10.59 dBµV/m**
Numbers of Channels:	**1**
Equipment Classification: (CLASS)	☐FIXED ☐VEHICULAR ■PORTABLE ☐MODULE
Equipment Classification: (POWER(AC MAINS))	☐110VAC *(GROUND)* ■ 110VAC *(NO GROUND)* ☐12VDC ■ **3.4/3.7/4.2VDC Li battery**

3.2 Identification of the Equipment Under Test (EUT)

EUT #	TYPE	MODEL	SERIAL #	HW Version
1	EUT	CDMA HIY01	SHIDK00104	PWB-6490-MAIN-2AS

SW version: V011

3.3 Identification of Accessory equipment

AE #	TYPE	MODEL
1	AC Adapter	0203PQA
2	HDMI Cables	N/A
3	HDMI JIG	N/A

4 Subject Of Investigation

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Part 15.225 of Title 47 of the Code of Federal Regulations. The maximization of portable equipment is conducted in accordance with ANSI C63.4.

All testing was performed on the product referred to in Section 3 as EUT.

Measurements below 30MHz were performed with a loop antenna at 3 meters then extrapolated to the appropriate measurement distance.

Conducted Emission tests are carried out to show that the EUT complies with FCC15.107 Class B

5 Measurements (Radiated)

5.1 TRANSMITTER SPURIOUS EMISSIONS RADIATED § 15.225/15.209

5.1.1 LIMITS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

***PEAK LIMIT= 74dBuV/m**
***AVG. LIMIT= 54dBuV/m**

NOTE:

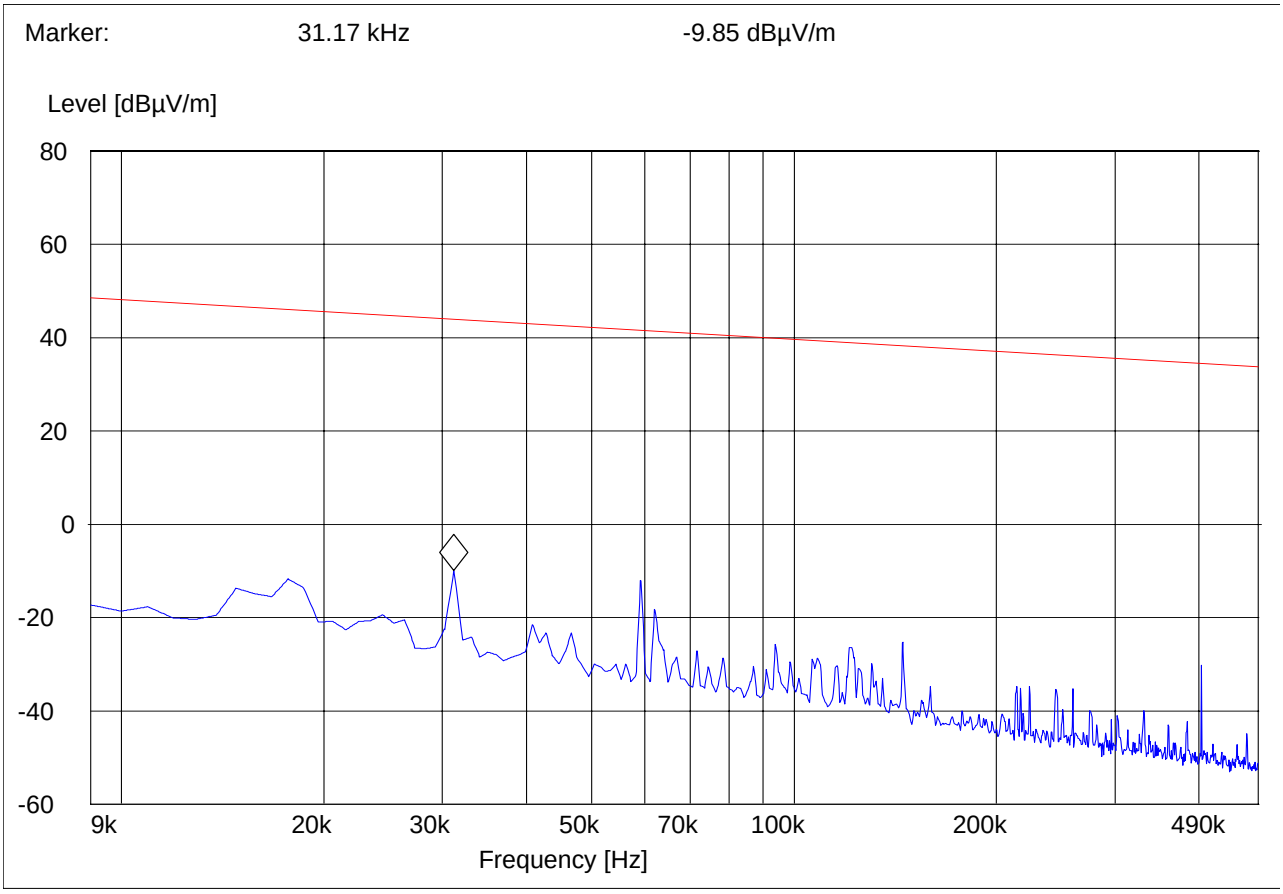
1. The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels.

2. All measurements are done in peak mode using an average limit , unless specified with the plots.

EUT: CDMA HIY01
Customer: Casio Hitachi
Test Mode: RFID
ANT Orientation: Loop
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adapter
Comments:

SWEEP TABLE: "FCC15.209<490k_Loop"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	490.0 kHz	MaxPeak	Coupled	200 Hz	Loop 6512E

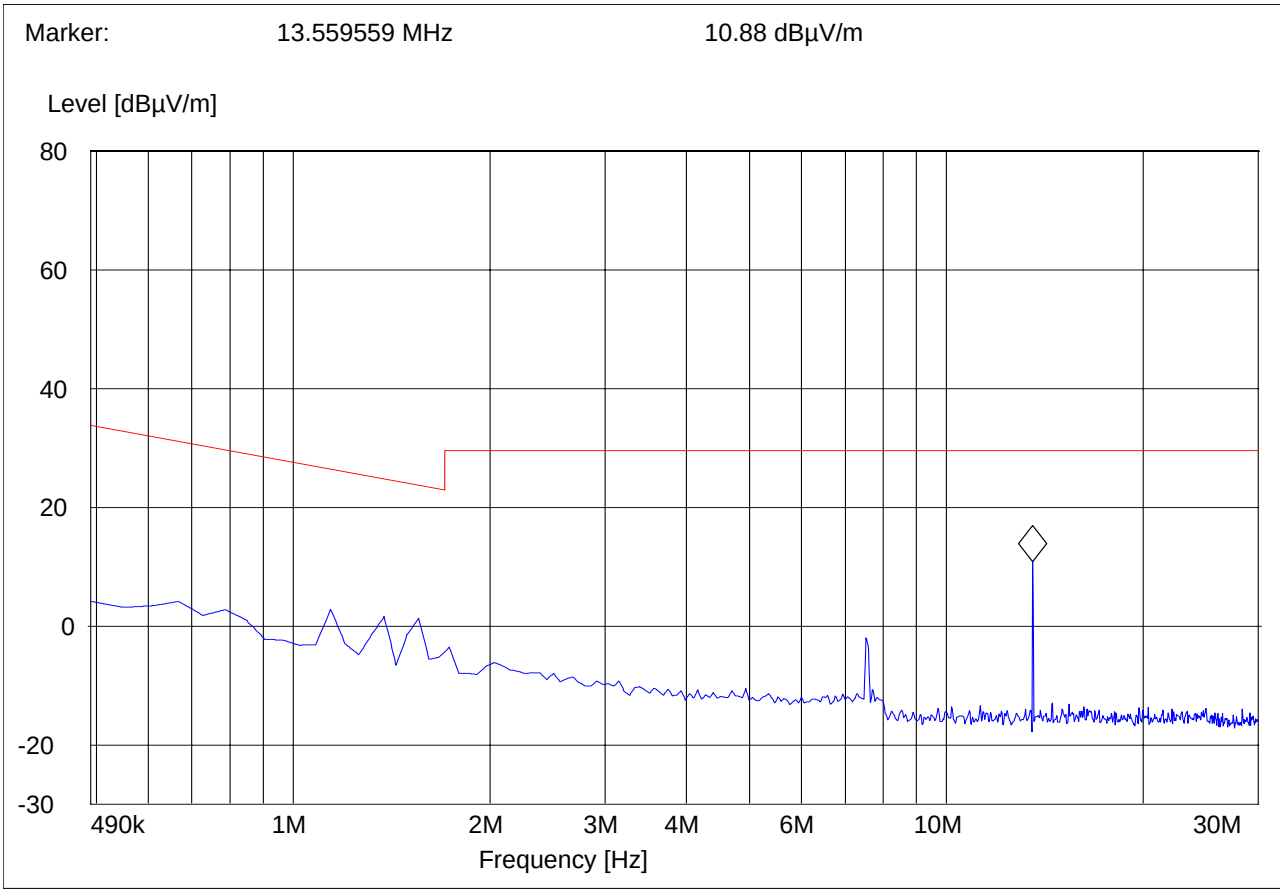


EUT: CDMA HIY01
Customer: Casio Hitachi
Test Mode: RFID
ANT Orientation: Loop
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adapter
Comments:

SWEEP TABLE: "FCC15.209>490k_Loop"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
490.0 kHz	30.0 MHz	MaxPeak	Coupled	10 kHz	Loop 6512E

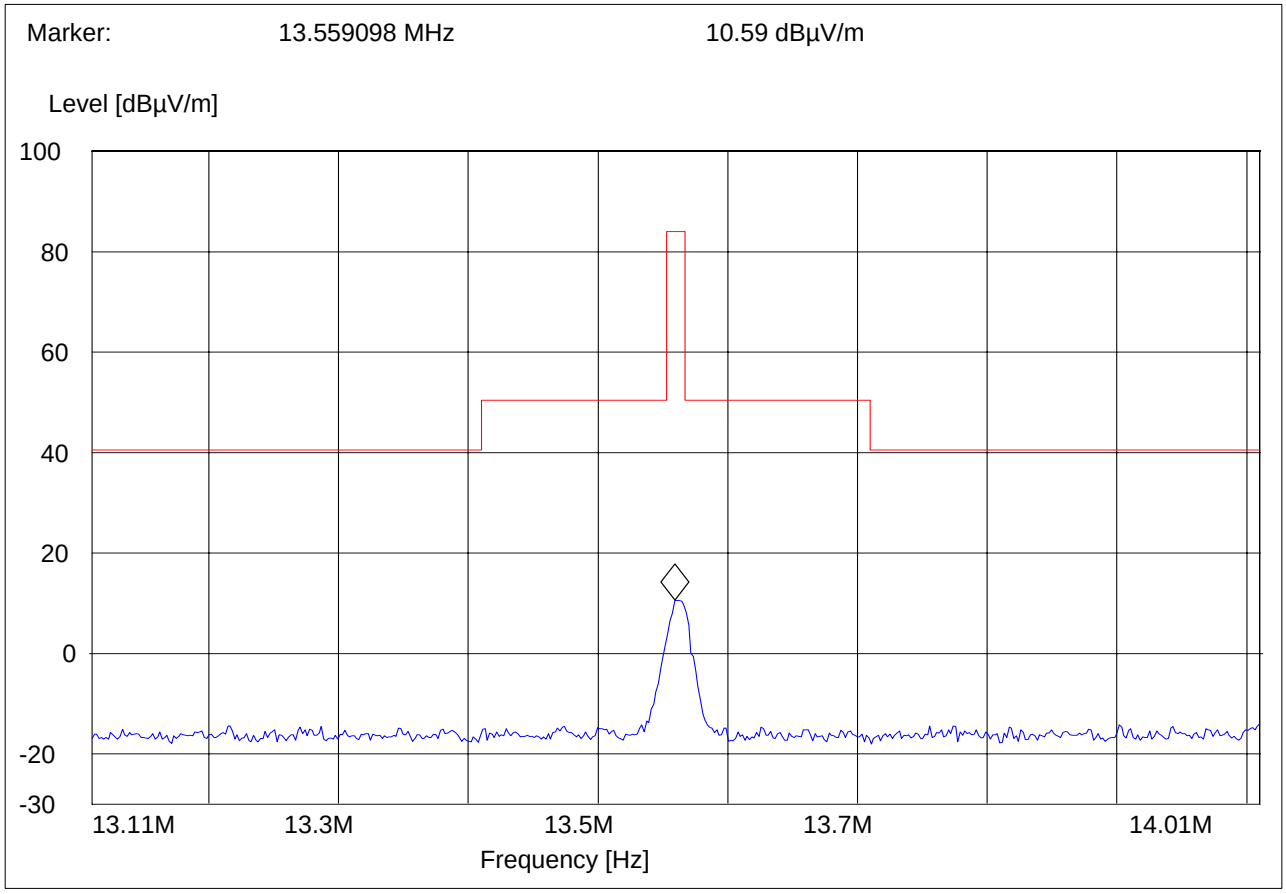
Marker: 13.559559 MHz 10.88 dBµV/m



EUT: CDMA HIY01
Customer: Casio Hitachi
Test Mode: RFID
ANT Orientation: Loop
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adapter
Comments:

SWEEP TABLE: "FCC15.225-13M_Loop"

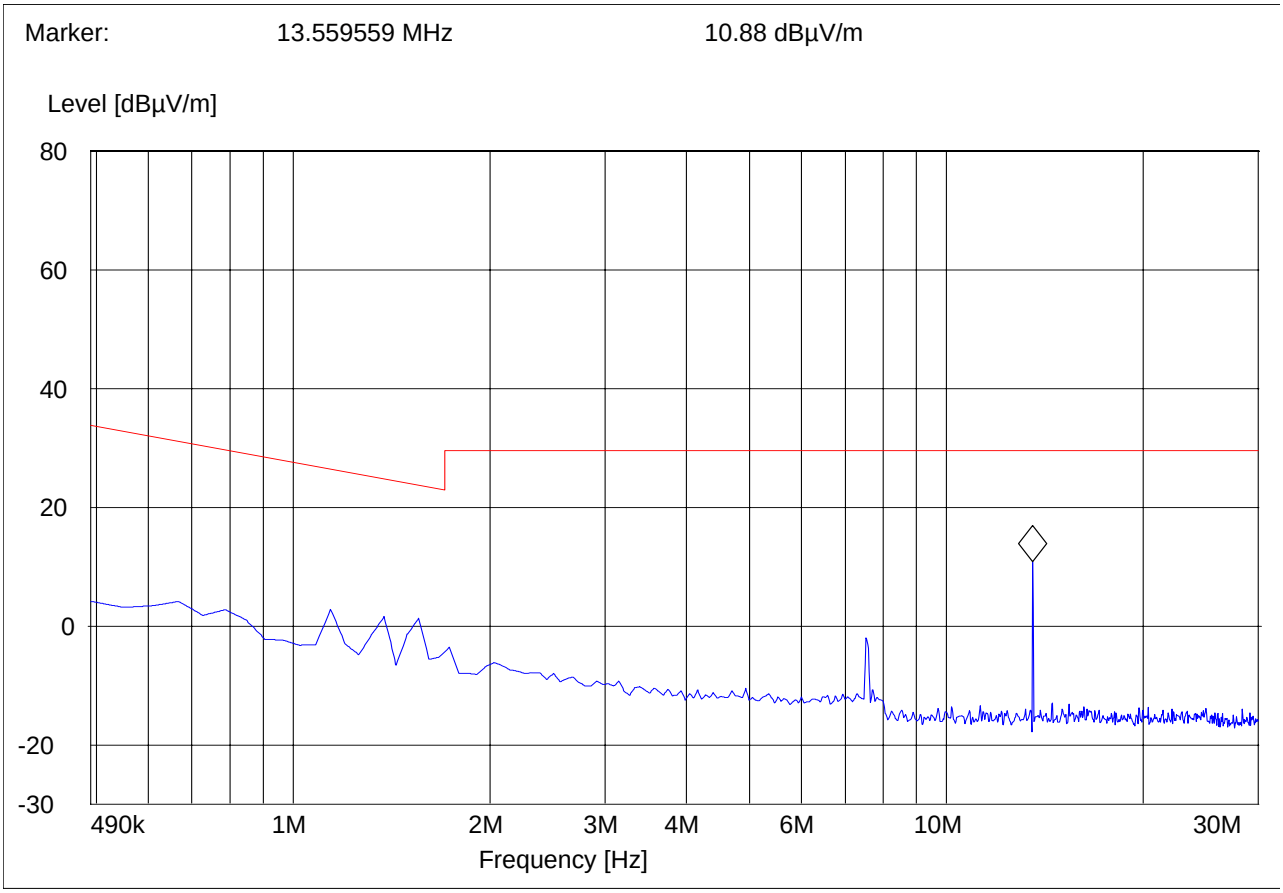
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
13.1 MHz	14.0 MHz	MaxPeak	Coupled	10 kHz	Loop 6512E



EUT: CDMA HIY01
Customer: Casio Hitachi
Test Mode: RFID
ANT Orientation: Loop
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adapter
Comments:

SWEEP TABLE: "FCC15.209>490k_Loop"

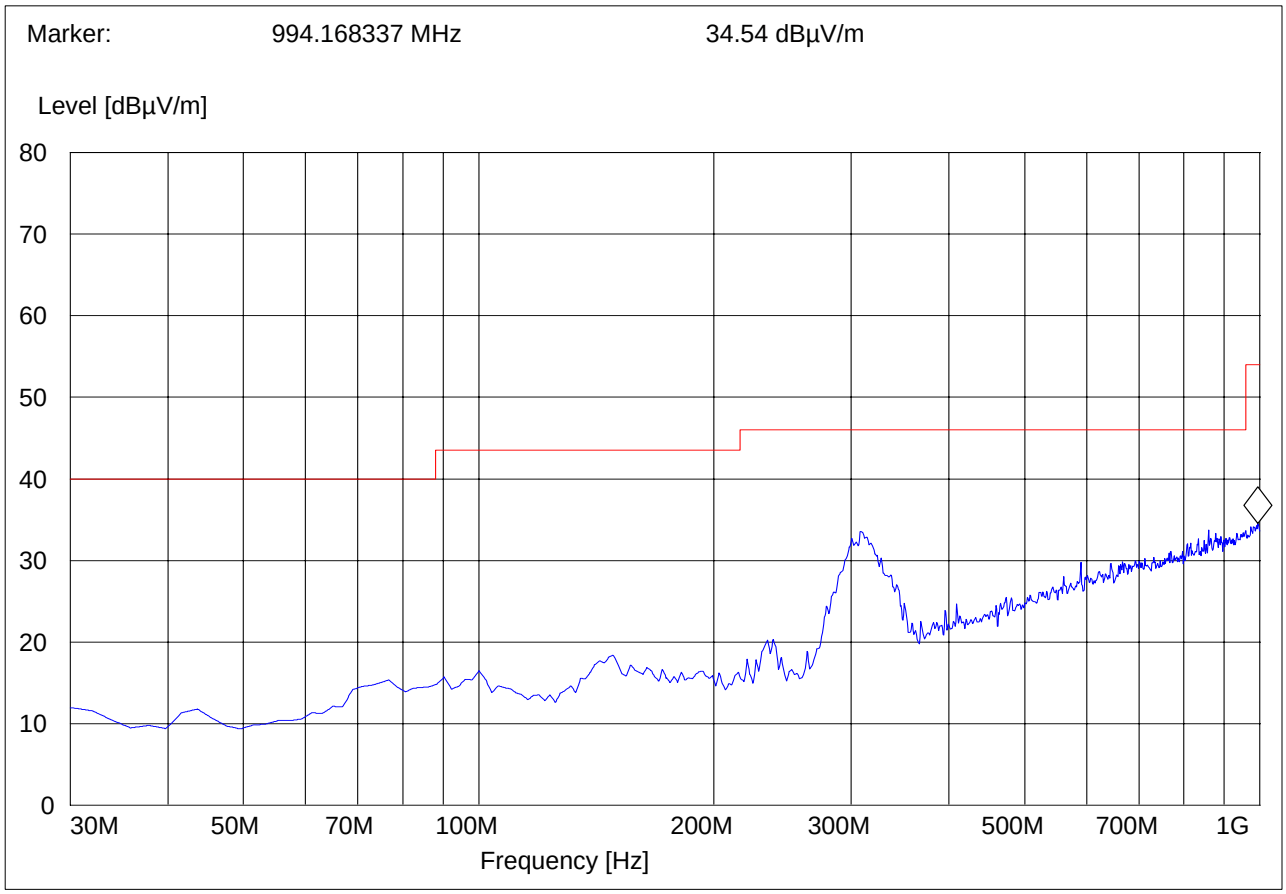
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
490.0 kHz	30.0 MHz	MaxPeak	Coupled	10 kHz	Loop 6512E



EUT: CDMA HIY01
Customer: Casio Hitachi
Test Mode: RFID
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adapter
Comments:

SWEEP TABLE: "FCC15.247_30M-1G_Hor"

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186_Horz



6 AC POWER LINE CONDUCTED EMISSIONS

6.1 LIMIT SUB CLAUSE § 15.207

Technical specification: 15.207 (Revised as of August 20, 2002)

§15.207 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Limit

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50
* Decreases with logarithm of the frequency		

ANALYZER SETTINGS: RBW = 10KHz VBW = 10KHz

6.2 RESULTS:

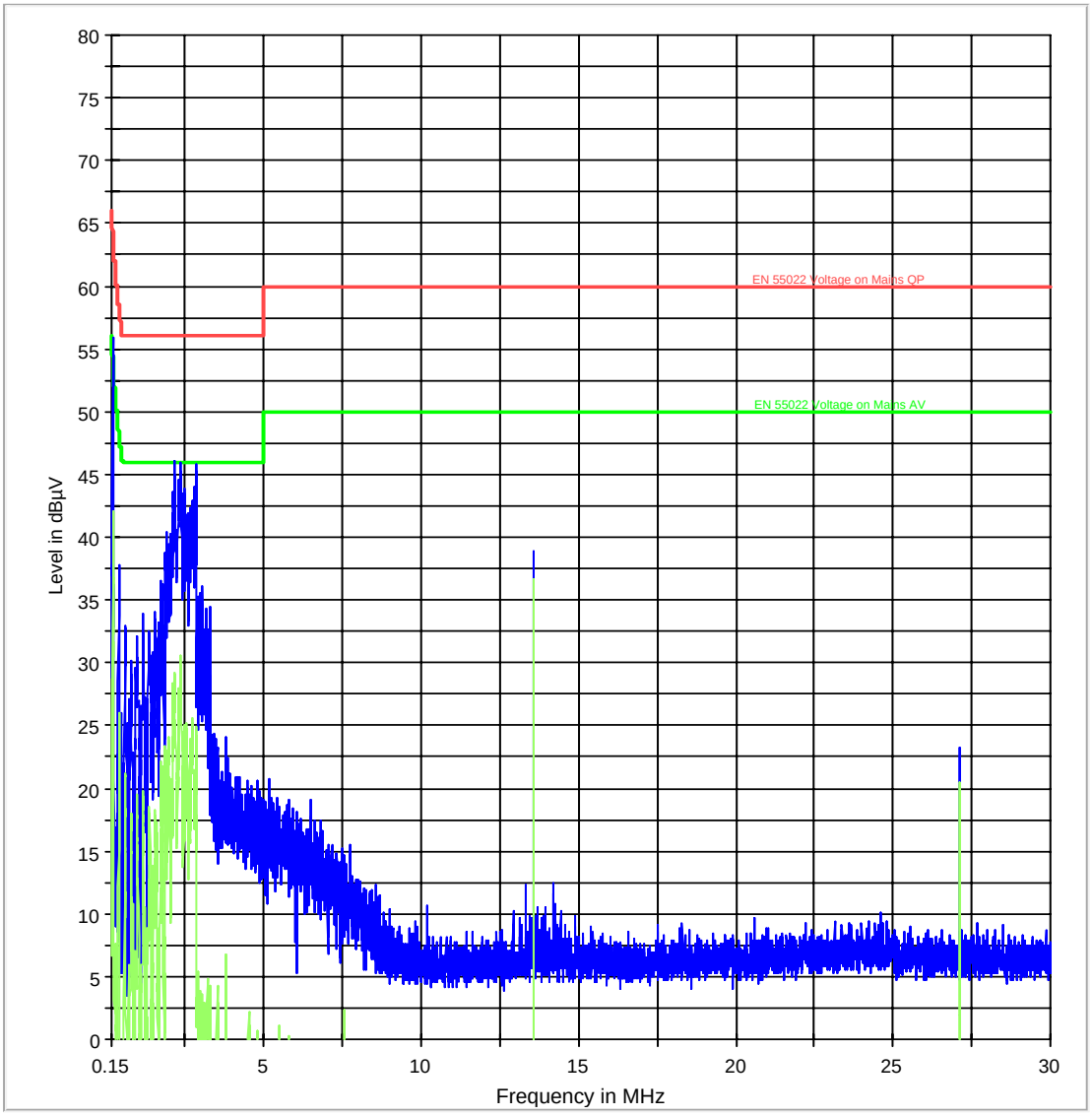
Common Information

Test Description: Conducted Emission
Operating Conditions: Used HDMI, mini SD card; RFID RX

Operator Name: Chris

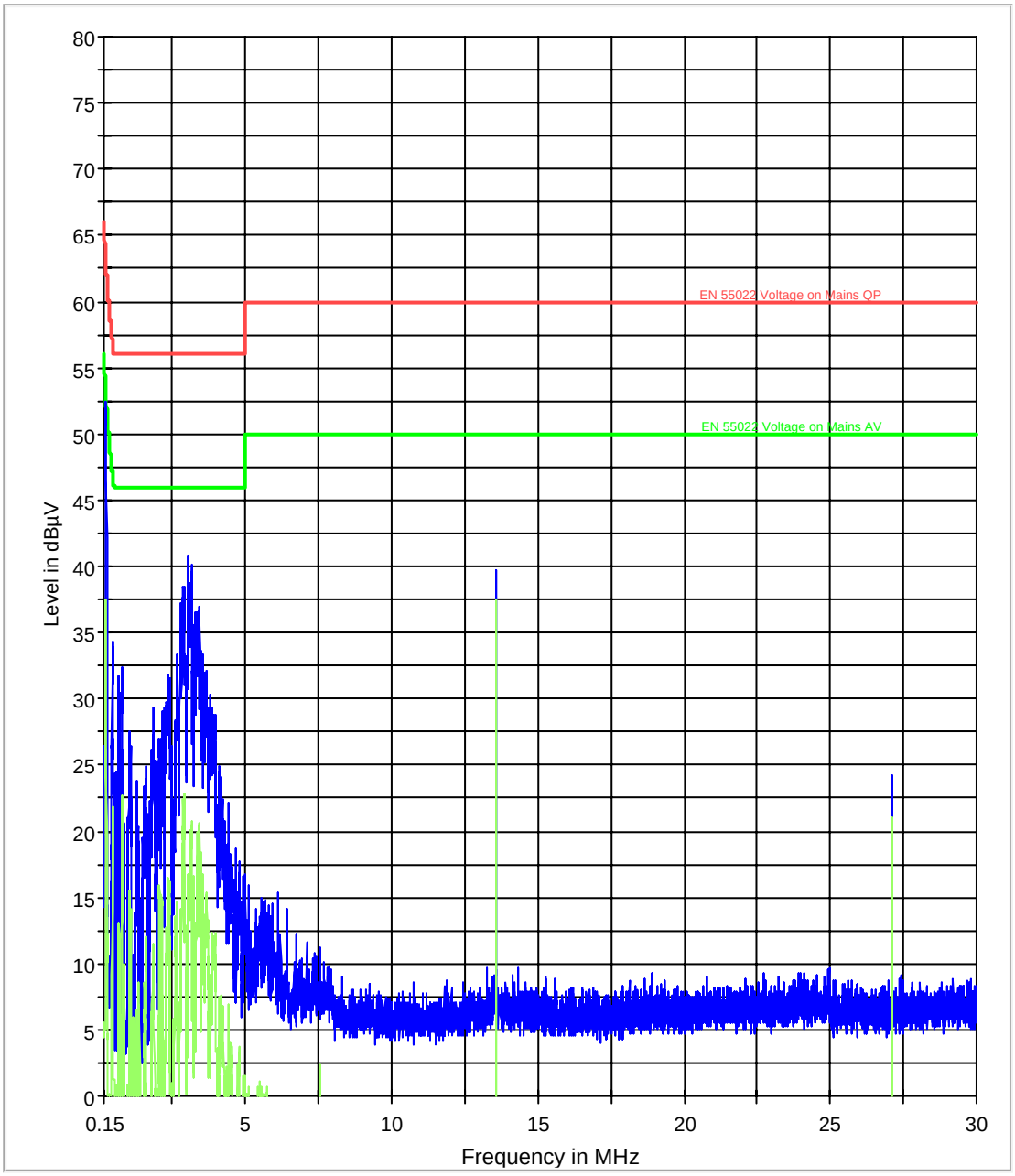
Line

CISPR 22 Mains Conducted - L



Neutral

CISPR 22 Mains Conducted - N



6.3 FREQUENCY TOLERANCE § 15.225

6.3.1 LIMITS

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

6.3.2 RESULTS

Voltage (V)	Freq (MHz)	Error (%)
Low vol.: 3.4V	13.5603212	0.0043%
High vol.: 4.2V	13.5603350	0.0045%

§2.1055 (A)(1

AFC FREQ ERROR vs. TEMPERATURE

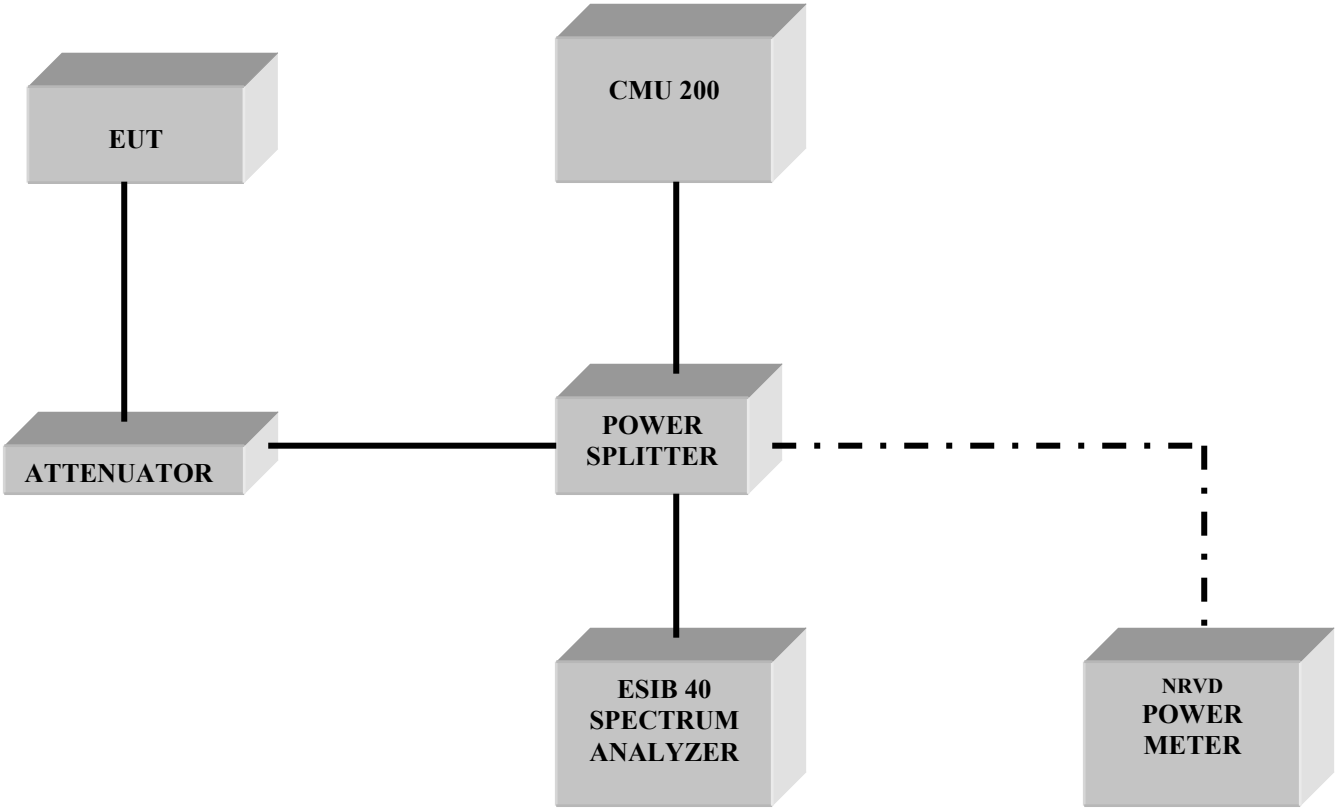
Temperature (°C)	Freq (MHz)	Error (%)
-20	13.5602926	0.0039%
-10	13.5603922	0.0053%
0	13.5602926	0.0039%
+10	13.5603210	0.0043%
+20	13.5603911	0.0053%
+30	13.5603351	0.0045%
+40	13.5602211	0.0029%
+50	13.5604021	0.0054%

7 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

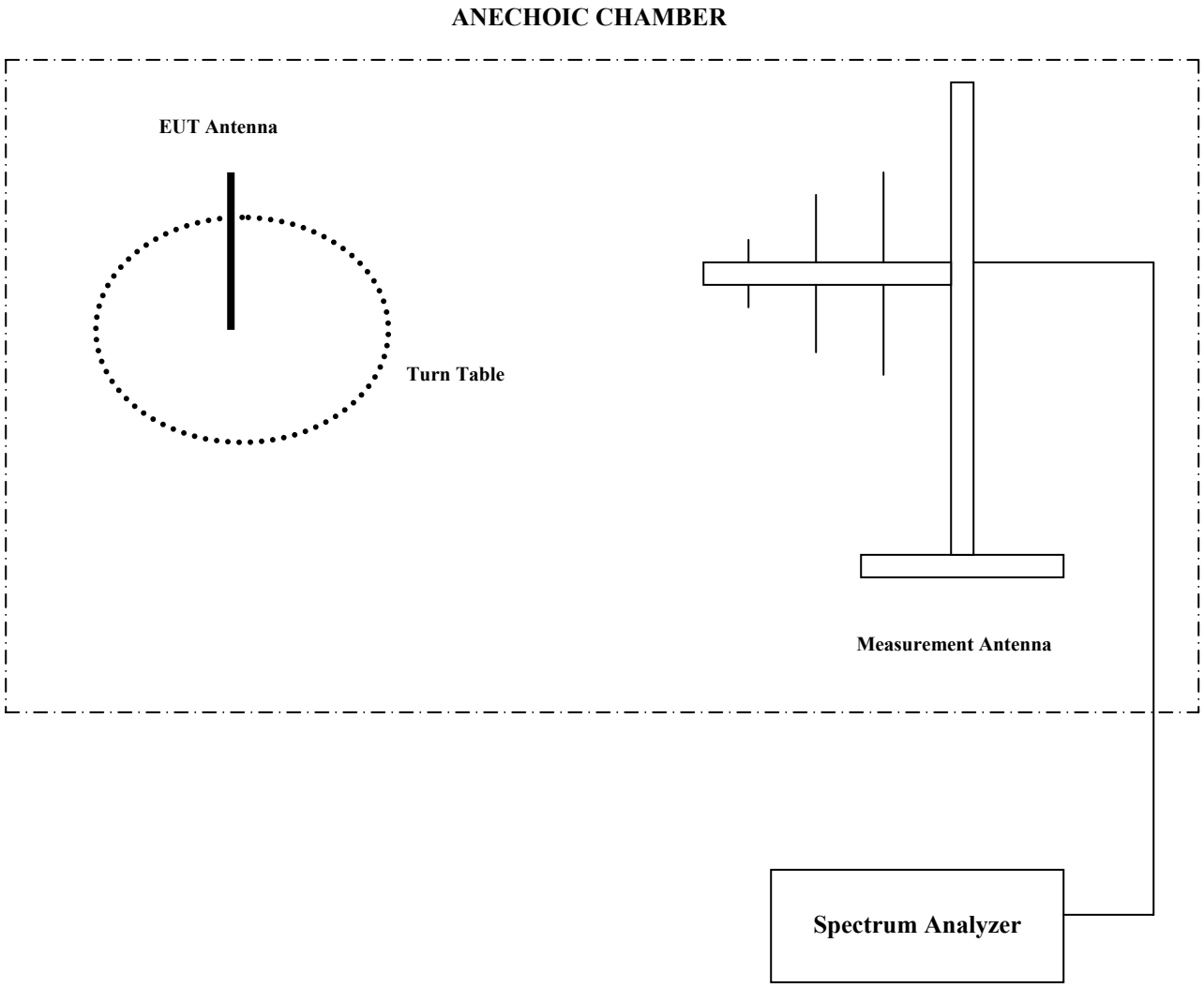
No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2010	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	May 2010	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2010	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2010	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2010	1 year
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2010	1 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2010	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2010	1 year
10	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
11	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
12	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2010	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2010	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2010	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2010	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2010	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2010	2 years

8 BLOCK DIAGRAMS

Conducted Testing



Radiated Testing



9 REPORT HISTORY

2009-05-15 Original Report