

KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER

HEAD OFFICE
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KITA-KU OSAKA 530-0047 JAPAN



IKOMA TESTING LABORATORY
12128 TAKAYAMA-CHO
IKOMA-CITY NARA 630-0101 JAPAN

Corporate Juridical Person

TEST REPORT

Report No.A-031-03-R

Date: 22 April 2003

This test report is to certify that the tested device properly complies with the requirements of:

FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.

All the tests necessary to show compliance to the requirements were performed and these results met the specifications of requirement. The results of this report should not be construed to imply compliance of equipment other than that, which was tested. Unless the laboratory permission, this report should not be copied in part.

1. Applicant

Company Name : Matsushita Electric Industrial Co., Ltd. Panasonic System Solutions Company
Mailing Address : 4-3-1, TSUNASHIMA-HIGASHI, YOKOHAMA-CITY,
KANAGAWA, 223-8639 JAPAN

2. Identification of Tested Device

Type of Device : Other Receiver
Kind of Equipment Authorization : ☒: DoC ☐: Certification ☐: Verification
FCC ID : ACJ9TAWX-CH2050
Device Name : All-in One Headset
Trade Name : Panasonic
Model Number : WX-CH2050
Serial Number : CC0001 ☐: Prototype ☐: Pre-production ☒: Production
Date of Manufacture : April 2003

3. Test Items and Procedure

☒: Radiated Emission Measurement

Above all tests were performed under: ANSI C63.4 – 1992

☒: without deviation, ☐: with deviation (details are found inside of this report)

4. Date of Test

Receipt of Test Sample : 8 April 2003
Condition of Test Sample : ☒: Damage is not found on the set.
☐: Damage is found on the set. (Details are described in this report)
Test Completed on : 15 April 2003



Seiichi Izumi
General Manager / Ikoma Testing Laboratory
NVLAP Approved Signatory

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0. LABORATORY ACCREDITATION AND MEASUREMENT UNCERTAINTY

0.1. Laboratory Accreditation

KEC is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the specific scope of accreditation under Lab Code: 200207-0.

When the test report concerns with the NVLAP accreditation test, the first page of the test report is signed by NVLAP Approved Signatory accompanied by the NVLAP logo.

The report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

0.2. Measurement Uncertainty

The result of a measurement is only an approximation or estimate of the value of a specific quantity. And thus the measurand is complete only when a statement of uncertainty is given.

KEC quotes Measurement Uncertainty (U) of +/- 4.9 dB for Radiated Emissions and
of +/- 2.2 dB for Conducted Emissions.

1. CERTIFICATION OF THE COMPLIANCE

This test report is to certify that the tested device properly complies with the requirements of FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.

KEC evaluation criteria for compliance:

The Product complies, if

the measured results are below the specification limit by a margin more than or equal

$1/2 U$ (2.5 dB) for Radiated Emissions and

U (2.2 dB) for Conducted Emissions.

2. GENERAL INFORMATION

2.1. Product Description

The Panasonic Model No. WX-CH2050 (referred as EUT in this report) is a All-in-One Headset.

(1) Technical Specifications

RX Frequency Range : 468.6125 – 469.3875 MHz
Type of Antenna : Internal Antenna
Type of Circuit : Superheterodyne, 1st IF : 21.4 MHz, 2nd IF : 450 kHz

(2) Contained Oscillator

VCO Clock : 442.2125 – 442.9875 MHz
PLL Clock : 21.85 MHz
CPU Clock : 4.19 MHz
Baseband : 3.58 MHz

(3) Rated Power Supply : DC 3.7V (Li-Ion Battery)

2.2. Characterization and condition of EUT System

☒ : normal, ☐ : not normal (that is)

2.3. Description for Equipment Authorization

- | | |
|--|---|
| (1) Type of device | : ☒ Other Receiver |
| (2) Reference Rule and Specification | : FCC Rule Part 15
☐ Section 15.107 (a)
[in effect immediately prior to September 9, 2002]
☒ Section 15.109 (a) (c) |
| (3) Kind of Equipment Authorization | : ☒ DoC ☐ Certification ☐ Verification |
| (4) Procedure of Application | : ☒ Original Equipment ☐ Modification |
| (5) Highest Frequency used in the Device | : 447.81 MHz (Local Oscillating Frequency) |
| (6) Upper Frequency of Radiated Emission Measurement Range | : 30 MHz up to at least the second harmonic of the
highest local Oscillator frequency generated in the device |

2.4. Test Facility

All tests described in this report were performed by:

Name: KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER (KEC)
IKOMA TESTING LABORATORY

Open Area Test Site	☐ No.1	☐ No.3	☒ No.4
Anechoic Chamber	☐ No.1	☐ No.3	
Shielded Room	☒ No.1	☐ No.2	☐ No.4 ☐ No.5

Address: 12128, Takayama-cho Ikoma-city, Nara, 630-0101 Japan

These test facilities have been filed with the FCC under the criteria of ANSI C63.4-1992.
The KEC has been accredited by the NVLAP (Lab. Code: 200207-0) based on ISO/IEC 17025.
Also the laboratory has been authorized by TUV Product Service (GER) and TUV Rheinland (GER)
based on their criteria for testing laboratory (ISO/IEC 17025.).

3. TESTED SYSTEM

3.1. Test Mode

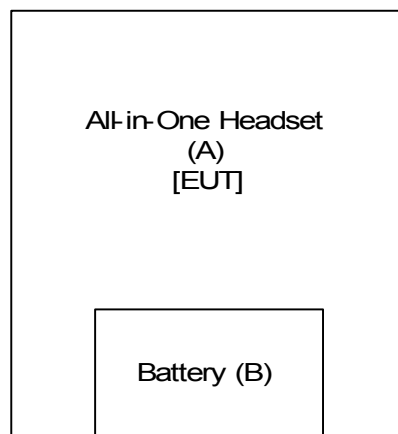
The compliance tests were performed under the following operation mode.

- Continuous Rx

[Note]

- (1) The EUT is not operated without DTMF signal from the “Center Module”.
Therefore, the center module was located a distance sufficient to ensure that it does not contribute to the measured level.
- (2) The compliance tests were performed both of horizontally placed and vertically placed in EUT. As a results, the data of operation mode that produce the maximum emission were reported.

3.2. Block Diagram of EUT System



[Note]

See 3.3 List of EUT System.

3.3. List of EUT System

No	Device Name (Interface)	Model Number (Serial Number)	FCC ID (Trade Name)	Note	Remark
A	All-in-One Headset	WX-CH2050 (CC0001)	ACJ9TAWX-CH2050 (Panasonic)	EUT	
B	Battery Pack	BAT2050 (-)	N/A (Panasonic)		

[Attention]

N/A : Not Applicable

4. RADIATED EMISSION MEASUREMENT

4.1. Test Procedure

(1)	Configure the EUT System in accordance with ANSI C63.4-1992 section 8. ☒: without deviation, ☐: with deviation(details are found below) See also the block diagram and the photographs of EUT System configuration in this report.										
(2)	If the EUT system is connected to a public power network, all power cords for the EUT System are connected the receptacle on the turntable.										
(3)	Warm up the EUT System.										
(4)	Activate the EUT System and run the prepared software for the test, if necessary.										
(5)	To find out the emissions of the EUT System, preliminary radiated measurement are performed at a closer distance than that specified for final radiated measurement using the spectrum analyzer (*1) and the broad band antenna. In the frequency above 1 GHz, it is performed using the spectrum analyzer (*2) and the horn antenna.										
(6)	To find out an EUT System condition, which produces the maximum emission, the configuration of EUT System, the position of the cables, and the operation mode, are changed under normal usage of the EUT.										
(7)	The spectrums are scanned from 30 MHz to the upper frequency of measurement range, and collect the six highest emissions minimum on the spectrum analyzer relative to the limits in the whole range.										
(8)	In final compliance test, the six highest emissions minimum, recorded above, are measured at the specified distance using the broad band antenna or the tuned dipole antenna and the test receiver (*3). In the frequency above 1 GHz, the measurements are performed by the horn antenna and ☐ the test receiver (*4). ☐ the spectrum analyzer(*2) with pre-amplifier.										
[Note]											
(*1)	Spectrum Analyzer Set Up Conditions <table> <tr> <td>Frequency range</td> <td>: 30 - 1000 MHz</td> </tr> <tr> <td>Resolution bandwidth</td> <td>: 100 kHz</td> </tr> <tr> <td>Detector function</td> <td>: Peak mode</td> </tr> </table>	Frequency range	: 30 - 1000 MHz	Resolution bandwidth	: 100 kHz	Detector function	: Peak mode				
Frequency range	: 30 - 1000 MHz										
Resolution bandwidth	: 100 kHz										
Detector function	: Peak mode										
(*2)	Spectrum Analyzer Set Up Conditions <table> <tr> <td>Frequency range</td> <td>: 1 GHz - Upper frequency of measurement range</td> </tr> <tr> <td>Resolution bandwidth</td> <td>: 1 MHz</td> </tr> <tr> <td>Video bandwidth</td> <td>: 1 MHz</td> </tr> <tr> <td>Attenuator</td> <td>: 10 dB</td> </tr> <tr> <td>Detector function</td> <td>: Peak mode</td> </tr> </table>	Frequency range	: 1 GHz - Upper frequency of measurement range	Resolution bandwidth	: 1 MHz	Video bandwidth	: 1 MHz	Attenuator	: 10 dB	Detector function	: Peak mode
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Resolution bandwidth	: 1 MHz										
Video bandwidth	: 1 MHz										
Attenuator	: 10 dB										
Detector function	: Peak mode										
(*3)	Test Receiver Set Up Conditions <table> <tr> <td>Detector function</td> <td>: Quasi-Peak</td> </tr> <tr> <td>IF bandwidth</td> <td>: 120 kHz</td> </tr> </table>	Detector function	: Quasi-Peak	IF bandwidth	: 120 kHz						
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IF bandwidth	: 120 kHz										
(*4)	Test Receiver Set Up Conditions <table> <tr> <td>Detector function</td> <td>: Average</td> </tr> <tr> <td>IF bandwidth</td> <td>: 1 MHz</td> </tr> </table>	Detector function	: Average	IF bandwidth	: 1 MHz						
Detector function	: Average										
IF bandwidth	: 1 MHz										

4.2. Test Results

Measurement Distance ☒: 3m ☐: 10m

Measured Frequency	Antenna Factor	Meter Reading (*1)		Maximum Field Strength	Limit	Margin for Limit
		Horizontal Polarization	Vertical Polarization			
(MHz)	(dB/m)	(dBuV)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)
[Fundamental]						
447.81	21.1	16.7	10.4	37.8	46.0	8.2
[2nd Harmonics]						
895.62	28.1	2.0	2.4	30.5	46.0	15.5

[Note]

- (1) Antenna Factor includes the cable loss.
 (2) * mark in Measured Frequency : Measured with the tuned dipole antenna.
 no mark in Measured Frequency : Measured with the broadband antenna.
 (3) The spectrum was scanned from 30 MHz to 1000MHz.

[Calculation method]

Maximum Field Strength (dBμV/m)

= Meter Reading (at maximum level of Horizontal or Vertical) (dBμV) + Antenna Factor (dB/m)

[Environment]

Temperature : 14°C

Humidity: 61%

[Tested Date/ Tester]

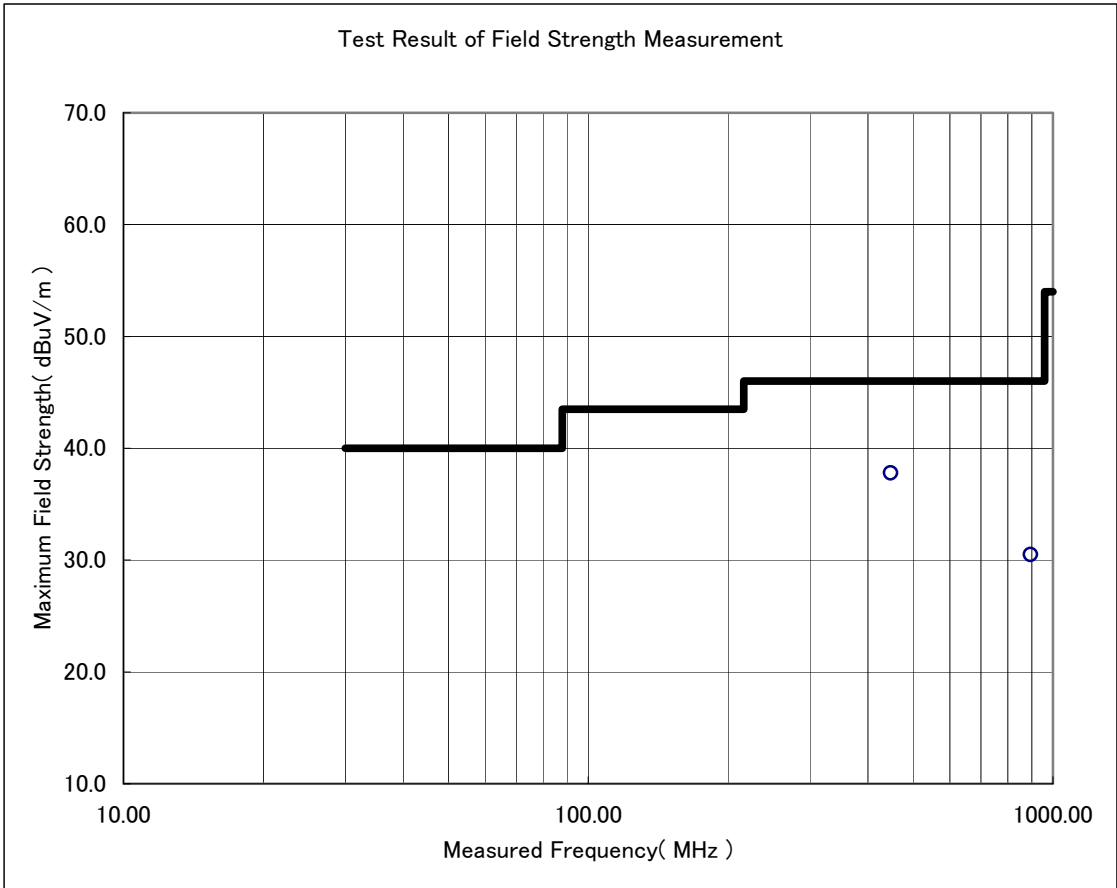
11 April 2003

Signature



Hironobu Matsuyama

Test Results in Graph



[Note]

o : Maximum Field Strength

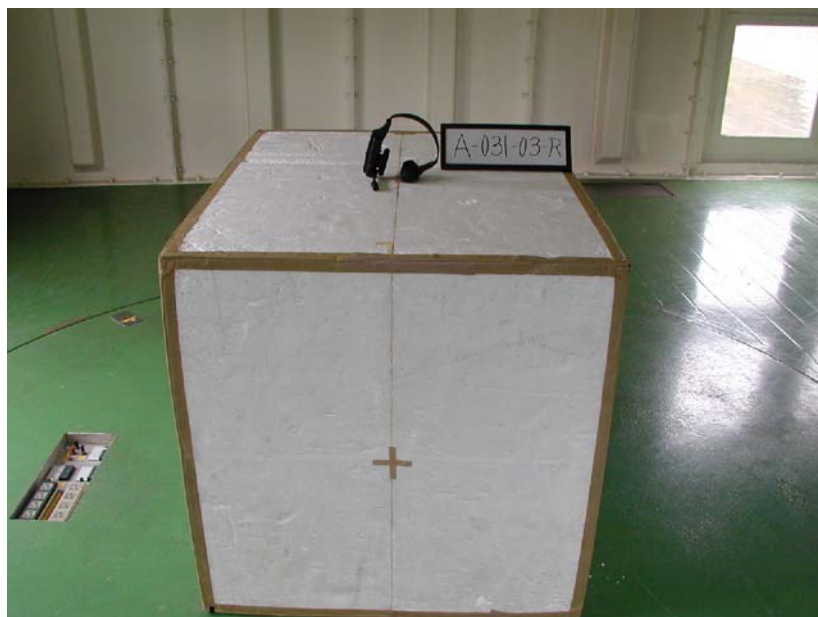
— : Limit Line

4.3. Photographs of EUT System Configuration

Horizontally Placing



Vertically Placing



5. USED TEST EQUIPMENTS AND CALIBRATION STATUS

Equipment	Manufacturer	Model No.	Specifications	KEC Control No.	Test Item (*)	Last Cal.	Next Cal.
Test Receiver	Rohde & Schwarz	ESVS10	Frequency Range 20 MHz - 1 GHz	FS-82	2	2002/10	2003/10
Spectrum Analyzer	Advantest	R3261C	Frequency Range 9 kHz - 2.6 GHz	SA-41	2	2002/11	2003/11
Biconical Antenna	Schwarzbeck	BBA9106	Frequency Range 30MHz - 300MHz	AN-94	2	2003/2	2004/2
Log-Periodic Antenna	Schwarzbeck	UHALP9108A	Frequency Range 300MHz - 1GHz	AN-217	2	2003/2	2004/2
Tuned Dipole Antenna	Kyoritsu	KBA-511AS	Frequency Range 25MHz - 500MHz	AN-135	N/A	2003/2	2005/2
		KBA-611S	Frequency Range 500MHz - 1GHz	AN-137	N/A	2003/2	2005/2

Used Test Site and Site Attenuation Calibration			2	2002/4	2003/4
Open Area Test Site	☒	No4			
EMC M.C. Anechoic Chamber	☐	No1			
	☐	No3			
				2002/4	2003/4
				2002/7	2003/7

[Note]

Test Item (*): 1: Radiated Emission Measurement (30 MHz – 1 GHz)
N/A: Not Applicable

The overall program of calibration and verification of equipment is designed and operated so as to ensure that measurements made by KEC are traceable to national standards of measurement or equivalent abroad.