

ELECTROMAGNETIC EMISSIONS TEST REPORT

FCC Part 15, Subpart C, Section 15.209

Name of Appliances : Remote Control

Model No. (Type) : WH-0M1201A

Test report No. : CSF-11027

Panasonic EMC Standard Site

Panasonic Corporation

Yashiro Sasayama-City,
Hyogo 669-2356
Japan

Tel 079-552-5681

Fax 079-552-5682

Received : August 4, 2011

Completed : August 4, 2011

This test report with appendix consists of 20 pages.
The test results respond to the tested sample only.
It is not allowed to copy this report even partly without the allowance of the test laboratory.
This test report must not be used to claim product endorsement by
NVLAP or any agency of the U.S. Government.



Masayuki Ueda
Chief Engineer of Panasonic EMC Standard Site
Date: August 10, 2011

TABLE OF CONTENTS

	Page
1.0 ENGINEERING TEST REPORT	3
2.0 INTRODUCTION	6
2.1 Purpose	6
2.2 Deviation from the standards	6
2.3 Requirement.....	6
2.3.1 FCC 15.31(e).....	6
2.3.2 FCC 15.203	6
2.3.3 FCC 15.205	6
2.3.4 FCC 15.207	7
2.3.5 FCC 15.209	7
2.4 Short Description of the EUT	8
2.5 Equipment Under Test	8
2.5.1 Operation - mode of the EUT	8
2.5.2 Modification of the EUT.....	8
2.5.3 The Equipment Under Test (EUT) and Peripherals.....	8
2.5.4 Configuration of the Equipment Under Test (EUT) :	9
2.5.5 Block diagram of the Equipment Under Test (EUT) :	10
2.6 Environmental Conditions	10
3.0 TEST SITE DESCRIPTION	10
4.0 TEST INSTRUMENTATION	11
4.1 Table 4-1	11
5.0 TEST EUT SETUP AND CONFIGURATIONS	12
5.1 Technical Requirements	12
5.1.1 Radiated Emission	12
6.0 TEST RESULTS	15
6.1 Radiated Emission	15
6.1.1 Test Data	15
6.1.2 Photograph.....	18

1.0 ENGINEERING TEST REPORT

This report is to certify that the Remote Control, WH-0M1201A from which the following data has been derived properly complies with the requirements of "FCC Rules and Regulations Part 15 Subpart C" as of the date the measurements were made. Any modification to the unit as tested may invalidate the data and void this certification.

1. Applicant : Panasonic Healthcare Co., Ltd.
Hearing Instruments Business Unit
- Address : 600 Saedo-cho, Tsuzuki-ku, Yokohama, Kanagawa
224-8539, Japan
2. Manufacturer : Panasonic Healthcare Co., Ltd
Hearing Instruments Business Unit
- Address : 600 Saedo-cho, Tsuzuki-ku, Yokohama, Kanagawa
224-8539, Japan
3. Factory : Panasonic Healthcare Co., Ltd.
Hearing Instruments Business Unit Saijo Seizousyo
- Address : 247 Fukutake-ko, Saijo, Ehime 793-8510, Japan
4. Description of Appliance
- a. Name of Appliance : Remote Control
- b. Equipment authorization : Certification
- c. FCC ID. : ACJ927151TX
- d. Model No : WH-0M1201A
- e. Serial No. : ES3 No.3462
- f. Date of Manufacture : July 2011
- g. Power Supply : 1.5V DC
- h. EUT Condition : Pre-Production (Client samples)
- i. modulation type : CPFSK
- j. Emission designator : F1D

(continued)

- k. Antenna type : Ferrite Bar Antenna
- l. Operation frequency : 10.597MHz
- m. Oscillating Frequency : 0.298MHz, 4.0MHz (RC Oscillator)

- 5. Measurement Site : Panasonic EMC Standard Site
- 6. Date of Measurement : August 4, 2011

- 7. Summary of Measurement Results
 - a. Voltage Requirements : Compliance
 - b. Antenna Requirements : Compliance
 - c. Restricted Bands of Operation : Compliance
 - d. Conducted Emission : N/A
 - e. Radiated Emission : Compliance
minimum Limit Margin 3.3 dB (QP)
at 32.03 MHz

(continued)

The EUT complied with FCC rules and regulations.
These test results are traceable to the National and International Standards.

Measurement Uncertainty, at time of test, and at least 95% confidence, was estimated to be as follows:

Radiated Emission Measurement : 2.6 dB
Conducted Emission Measurement : 1.9 dB



Masayuki Ueda
Chief Engineer of Panasonic EMC Standard Site
Date: August 10, 2011

2.0 INTRODUCTION

2.1 Purpose

The purpose of this report is to show compliance of the Remote Control, WH-0M1201A to the requirement of Part 15 of the FCC Rules and Regulations (47 CFR, PART 15, Subpart C) and FCC Procedure for Measuring RF Emissions from ANSI C63.4-2003.

2.2 Deviation from the standards

Deviations from or additions to the test method: No deviation or addition

2.3 Requirement

The test requirements for an intentional Radiator are as follows.

In the evaluation, limits for the requirements of the FCC Rules and Regulations, Part 15 Subpart C applies Sections 15.31(e), 15.203, 15.205, 15.207 and 15.209.

2.3.1 FCC 15.31(e)

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

Verdict: (options and interpretation)

The EUT is battery powered and has an internal voltage regulator to supply the RF circuit. Testing was done with a new battery. Hence the EUT complies with the power supply requirements.

2.3.2 FCC 15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Verdict: (options and interpretation)

The EUT has an internal antenna which is not user accessible. Hence it complies with the requirements.

2.3.3 FCC 15.205

Only spurious emissions are permitted in any of the restricted frequency bands, unless otherwise specified.

Verdict: (options and interpretation)

The EUT nominal carrier frequency is 10.597MHz. It was verified during testing that the carrier is fully contained in the unrestricted frequency band 8.41475-12.29MHz.

Therefore only spurious emissions are found in the restricted bands of operation and the EUT complies with the restricted frequency band requirement.

(continued)

2.3.4 FCC 15.207

Conducted emission limits

Frequency (MHz)	Conducted limit (dB μ V)	
	OP	AV
0.15 – 0.50	66.0 – 56.0	56.0 – 46.0
0.50 – 5.00	56.0	46.0
5.00 – 30.00	60.0	50.0

Verdict: (options and interpretation)

The EUT is not intended to be connected to the AC power line network (it is battery powered only). Therefore The AC power line conducted emission on any frequency within the band 150kHz to 30MHz in FCC 15.207 is not applicable.

2.3.5 FCC 15.209

Radiated emission limits (Below 1GHz)

Frequency (MHz)	Field Strength (μ V/m)	Measurement Distance (m)
	QP	
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30.0 – 88.0	100	3
88.0 – 216.0	150	3
216.0 – 960.0	200	3
960.0 – 1000.0	500	3

Frequency (MHz)	Field Strength (dB μ V/m)	Measurement Distance (m)
	QP	
0.009 – 0.490	128.5 – 93.8	3
0.490 – 1.705	73.8 – 62.96	3
1.705 – 30.0	69.5	3
30.0 – 88.0	40.0	3
88.0 – 216.0	43.5	3
216.0 – 960.0	46.0	3
960.0 – 1000.0	53.9	3

The 300m limit below 0.490MHz was extrapolated to a 3m distance using a 80dB correction factor.

The 30m limit below 30MHz was extrapolated to a 3m distance using a 40dB correction factor.

2.4 Short Description of the EUT

The EUT (Equipment Under Test) is a remote control that is used to control the sound volume and memory of a hearing aid system. The EUT incorporates a 10.597MHz transmitter, but no radio receiver.

2.5 Equipment Under Test

2.5.1 Operation - mode of the EUT

The equipment under test was operated during the measurement under following conditions:

EUT transmits (TX mode), with full power, at nominal operating channel (10.597MHz), a continuous modulated signal streaming with highest duty cycle available (71%).

2.5.2 Modification of the EUT

The test laboratory did not modify the EUT during the test.

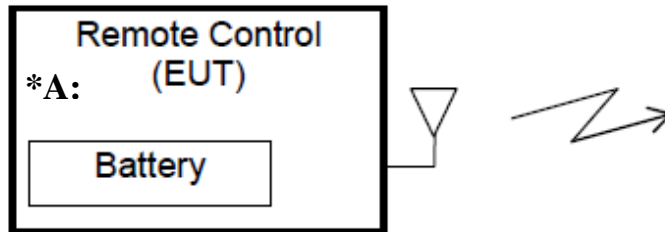
2.5.3 The Equipment Under Test (EUT) and Peripherals

<EUT>

Symbol	Device	Model	Serial No.	Manufacturer
A	Remote Control	WH-0M1201A	ES3 No.3462	Panasonic

2.5.5 Block diagram of the Equipment Under Test (EUT) :

Drawing:



2.6 Environmental Conditions

Radiated Emission Below 1GHz test effort was performed on August 4, 2011.

Temperature:	28	deg. C
Humidity:	65	%
Barometer:	99.5	kPa

3.0 TEST SITE DESCRIPTION

This testing was performed at:

Name of Test Site: Panasonic EMC Standard Site

Address: Yashiro Sasayama-City, Hyogo 669-2356
Japan

Registration/Accreditation: This test site has been accredited by NVLAP.
NVLAP Lab Code: 100428-0
Effective through: December 31, 2011

4.0 TEST INSTRUMENTATION**4.1 Table 4-1**

Test equipment list used to perform the Radiated emission (Below 1GHz)
in the Open Area Site (3m).

No.	Device	Model No.	Serial. No.	Reg. No.	Frequency Range	Last Cal.	Next Cal.
01	Panasonic EMC Standard Site OATS No.1	3m 10m	None	NVLAP Lab Code 100428-0	30MHz-1GHz	July 2011 (Maintenance)	October 2011 (Maintenance)
02	EMI Test Receiver	Rohde & Schwarz ESS	827478/008	230	9kHz-1GHz	February 2011	February 2012
03	Spectrum Analyzer	ADVANTEST R3365	35550049	322	100Hz-8GHz	March 2011	March 2012
03	Biconical Antenna	Schwarzbeck VHA9103B & BBA9106	9103-1847	510	30MHz-300MHz	July 2011	July 2012
04	Logperiodic Antenna	Schwarzbeck UHALP9108A	9108-0313	507-1	300MHz-1GHz	July 2011	July 2012
05	Amplifier	Hewlett Packard 8447D	2944A08559	397	100kHz-1.3GHz	November 2010	November 2011
06	Cable A	None	None	453	150kHz-1GHz	August 2010	August 2011
08	Loop Antenna	EMCO 6502	2123	176	10k-30MHz	May 2011	May 2012

5.0 TEST EUT SETUP AND CONFIGURATIONS

5.1 Technical Requirements

5.1.1 Radiated Emission

FCC 15.209

Radiated emissions must comply with the limits specified in FCC 15.209(a).

Test procedure: ANSI C63.4-2003

The EUT was placed on a nonconductive turntable 0.8m above the ground plane. Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system and the EUT orientation (X, Y, Z) were varied in order to ensure that maximum emission amplitudes were attained.

The spectrum was examined from 9kHz to 1GHz. Final radiated emission measurements were made at 3m distance.

For frequencies between 9kHz and 30MHz, measurements were performed with a loop antenna. At each frequency selected for final measurement, the EUT was rotated 360° and the measuring loop antenna was rotated around its vertical axis in order to determine the emission's maximum level.

For frequencies between 30MHz and 1GHz, measurements were performed with a Biconical and Logperiodic antenna.

At each frequency where a spurious emission was found, the EUT was rotated 360° and the antenna was raised and lowered from 1 to 4m in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations.

Pre-check: Radiated emission levels (Peak value) which have small margin for the regulation were measured by means of spectrum analyzer changing Antenna movement (1-4m) and table rotation (0-360degree).

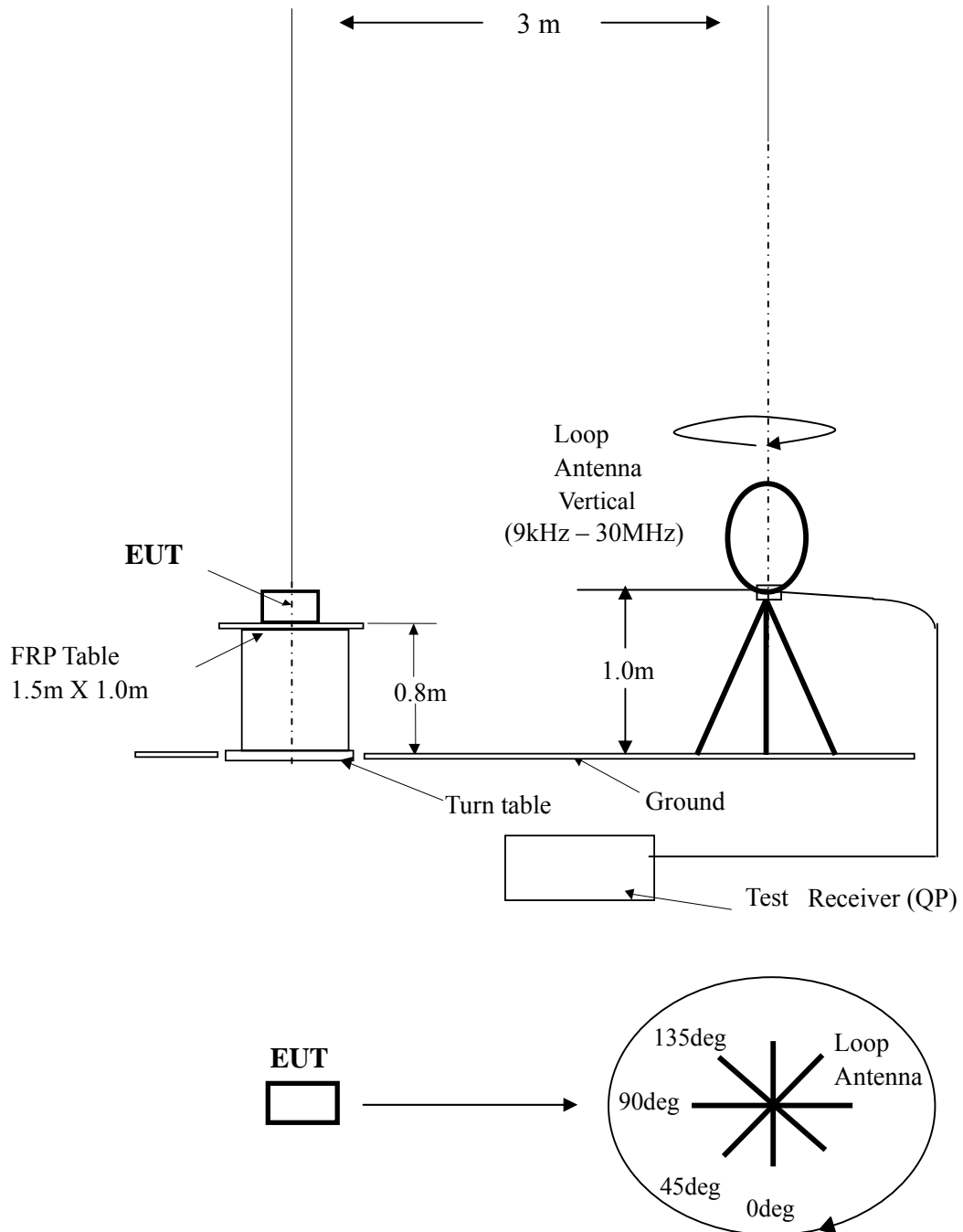
Final measurements were made with a receiver operating in the CISPR quasi-peak detection mode. For frequencies between 150kHz and 30MHz, the spectrum analyzer's 6 dB bandwidth was set to 9kHz. For frequencies between 30MHz and 1GHz, the spectrum analyzer's 6 dB bandwidth was set to 120kHz.

The highest emission amplitudes relative to the appropriate limit were recorded in this report. Emissions other than those mentioned are small or not detectable.

Software for the measurement: PTT EMI96 Rev. E26

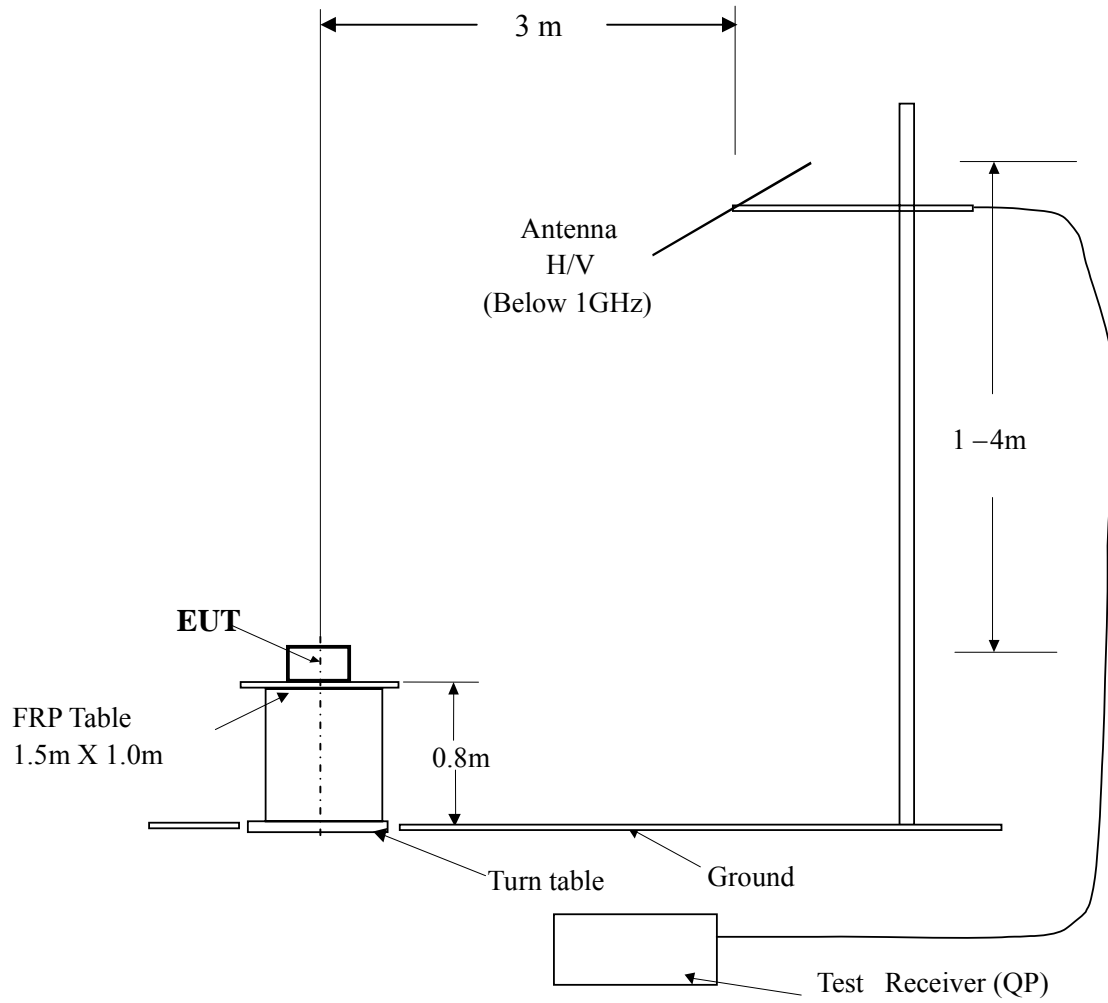
(Continued)

From 9kHz to 30MHz Measurement layout.



(Continued)

From 30MHz to 1GHz Measurement layout.



6.0 TEST RESULTS**6.1 Radiated Emission**

6.1.1 Test Data

Test Equipment: Refer to Table 4-1 (Below 1GHz).

Test Condition of Instrument

EUT Warm-up Time: 30 minutes

Resolution Bandwidth: 200Hz(9k-150kHz) / 9kHz(150k-30M) / 120kHz (30M-1000MHz)

Detector Function : QP (9k-1000MHz)

Date : August 4, 2011

Temp. : 28 deg.C

Humid. : 65 %

The measurements were performed with the maximized emissions condition.

X axis

Frequency (MHz)	*Correction Factor (dB/m)	Reading Value (dB μ V)	Limits Value (dB μ V/m)	*Correction Value (dB μ V/m)	Table Angle (deg)	Antenna Angle (deg)	Margin Value (dB)
		Ver.		Ver.			Ver.
10.675	12.5	45.0	69.5	57.5	99	0	12.0
10.675	12.5	42.8	69.5	55.3	73	45	14.2
10.675	12.5	39.5	69.5	52.0	178	90	17.5
10.675	12.5	42.5	69.5	55.0	129	135	14.5

Y axis

Frequency (MHz)	*Correction Factor (dB/m)	Reading Value (dB μ V)	Limits Value (dB μ V/m)	*Correction Value (dB μ V/m)	Table Angle (deg)	Antenna Angle (deg)	Margin Value (dB)
		Ver.		Ver.			Ver.
10.675	12.5	32.4	69.5	44.9	213	0	24.6
10.675	12.5	30.0	69.5	42.5	192	45	27.0
10.675	12.5	20.9	69.5	33.4	141	90	36.1
10.675	12.5	28.0	69.5	40.5	251	135	29.0

Z axis

Frequency (MHz)	*Correction Factor (dB/m)	Reading Value (dB μ V)	Limits Value (dB μ V/m)	*Correction Value (dB μ V/m)	Table Angle (deg)	Antenna Angle (deg)	Margin Value (dB)
		Ver.		Ver.			Ver.
10.675	12.5	44.9	69.5	57.4	98	0	12.1
10.675	12.5	42.3	69.5	54.8	257	45	14.7
10.675	12.5	38.6	69.5	51.1	16	90	18.4
10.675	12.5	42.2	69.5	54.7	126	135	14.8

* Correction Factor = Antenna Factor + Cable loss

* Correction Value= Reading Value + Correction Factor

(continued)

X axis

Frequency	*Correction Factor	Reading Value		Limits Value	*Correction Value		Margin Value	
		[dB μ V]			[dB μ V/m]		[dB]	
[MHz]	[dB/m]	Hor.	Ver.	[dB μ V/m]	Hor.	Ver.	Hor.	Ver.
31.14	-10.1	40.2	46.2	40.0	30.1	36.1	9.9	3.9
32.03	-10.4	40.8	47.1	40.0	30.4	36.7	9.6	3.3
51.90	-16.6	43.0	49.2	40.0	26.4	32.6	13.6	7.4
53.39	-17.0	43.0	49.1	40.0	26.0	32.1	14.0	7.9
72.66	-20.2	40.6	45.1	40.0	20.4	24.9	19.6	15.1
74.75	-20.2	39.9	44.5	40.0	19.7	24.3	20.3	15.7
160.15	-10.5	36.4	38.3	43.5	25.9	27.8	17.6	15.7

Y axis

Frequency	*Correction Factor	Reading Value		Limits Value	*Correction Value		Margin Value	
		[dB μ V]			[dB μ V/m]		[dB]	
[MHz]	[dB/m]	Hor.	Ver.	[dB μ V/m]	Hor.	Ver.	Hor.	Ver.
31.14	-10.1	36.4	30.8	40.0	26.3	20.7	13.7	19.3
32.03	-10.4	37.2	31.7	40.0	26.8	21.3	13.2	18.7
51.90	-16.6	42.0	35.8	40.0	25.4	19.2	14.6	20.8
53.38	-17.0	42.3	36.6	40.0	25.3	19.6	14.7	20.4
72.66	-20.2	41.6	35.5	40.0	21.4	15.3	18.6	24.7
74.74	-20.2	41.6	34.0	40.0	21.4	13.8	18.6	26.2
160.15	-10.5	40.5	32.4	43.5	30.0	21.9	13.5	21.6

Z axis

Frequency	*Correction Factor	Reading Value		Limits Value	*Correction Value		Margin Value	
		[dB μ V]			[dB μ V/m]		[dB]	
[MHz]	[dB/m]	Hor.	Ver.	[dB μ V/m]	Hor.	Ver.	Hor.	Ver.
31.15	-10.1	40.0	45.9	40.0	29.9	35.8	10.1	4.2
32.03	-10.4	40.7	47.0	40.0	30.3	36.6	9.7	3.4
51.90	-16.6	42.0	49.7	40.0	25.4	33.1	14.6	6.9
53.38	-17.0	42.1	49.8	40.0	25.1	32.8	14.9	7.2
72.66	-20.2	38.2	44.7	40.0	18.0	24.5	22.0	15.5
74.74	-20.2	37.7	44.3	40.0	17.5	24.1	22.5	15.9
160.16	-10.5	33.8	37.8	43.5	23.3	27.3	20.2	16.2

(continued)

- * Correction Factor = Antenna Factor + Cable loss - AMP Gain
- * Correction Value= Reading Value + Correction Factor

Sample of calculated result at 32.03 MHz, as the Minimum Margin point (X axis):

	Correction Factor	=	-10.4 dB/m
+) <u> </u>	<u>Reading Value</u>	=	<u>47.1 dBμV</u>
	Correction Value	=	36.7 dB μ V/m

Minimum Margin: 40.0 – 36.7 = 3.3 dB

The bold character in the table shows the Minimum Margin Point.

(continued)