



Issue Date : June 4, 2004
Page 1 of 15

EMC EMISSION - TEST REPORT

JQA APPLICATION No. : KL80040044

Name of Product : CYCLOCOMPUTER(DOUBLE WIRELESS HEART RATE & SPEED)

Model/Type No. : CC-HR200DW

FCC ID : ON5CC-HR200DW-TX

Applicant : CATEYE CO., LTD.

Address : 2-8-25, Kuwazu, Higashi-Sumiyoshi-Ku, Osaka, Japan

Manufacturer : CATEYE CO., LTD.

Address : 2-8-25, Kuwazu, Higashi-Sumiyoshi-Ku, Osaka, Japan

Receive date of EUT : May 11, 2004

Final Judgement : **Passed**

TEST RESULTS IN THIS REPORT are obtained in use of equipment that is traceable to National Institute of Advanced Industrial Science and Technology(AIST) under METI Japan and National Institute of Information and Communications Technology(NICT) under MPHPT Japan.

THE TEST RESULTS only responds to the test sample. This test report shall not be reproduced except in full.

Authorized by:

Takashi Yamanaka, Director
JQA KITA-KANSAI Testing Center

DIRECTORY

	Page
A) Documentation	
Directory	<u>2</u>
Test Regulation / General Information	<u>3</u>
Test Conditions	<u>4 - 5</u>
Configuration of EUT / Operation mode of the EUT	<u>6 - 7</u>
EUT Modification / Responsible Party / Deviation from Standard	<u>8</u>
Test results / Measurement Uncertainty	<u>9</u>
Summary	<u>10</u>
Test System-Arrangement (Drawings)	<u>11</u>
Preliminary Test and Test-setup (Drawings)	<u>12 - 13</u>
Test-setup (Photographs) at worst case	<u>14</u>
B) Test data	
Electromagnetic Field Radiated Emission 9 kHz - 1000 MHz	<u>15</u>

TEST REGULATION

FCC Rules and Regulations Part 15 Subpart A and C (July 22, 2003)

- ☐ - Class A Digital Device
- ☐ - Class B Digital Device
- ☒ - Intentional Radiator

Test procedure:

Radiated emission test was performed according to the procedures in ANSI C63.4-2001.

GENERAL INFORMATION

Test facility:

- 1) Test Facility located at Kita-Kansai : 1st Open Site (3 m Site)
Test Facility located at Kameoka : 1st Open Site (3, 10 and 30 m, on common plane)
: 2nd Open Site (3 and 10 m, on common plane)

FCC filing No. : 31040/SIT 1300F2

- 2) KITA-KANSAI TESTING CENTER is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance established in Title 15, Part 285 Code of Federal Regulations.
NVLAP Lab Code: 200191-0

Description of the Equipment Under Test (EUT):

- 1) Name : CYCLOCOMPUTER
(DOUBLE WIRELESS HEART RATE & SPEED)
2) Model/Type No. : CC-HR200DW
3) Product Type : Pre-Production (S/N: S000015/S003)
4) Category : Intentional Radiator
5) EUT Authorization : ☐ - Verification ☒ - Certification ☐ - D.o.C.
6) Transmitting Frequency : 25kHz(Speed), 6kHz(Heart Rate)
7) Highest frequency used/generated : 4 MHz
8) Upper frequency of Measurement : 1 GHz
9) Power Rating : DC 6V (Lithium Battery CR2032x2) (Main Body)
DC 3V (Lithium Battery CR2032x1) (Sensor)

Definitions for symbols used in this test report:

- ☒ - Black box indicates that the listed condition, standard or equipment is applicable for this Report.
- ☐ - Blank box indicates that the listed condition, standard or equipment is not applicable for this Report.

TEST CONDITIONS

Magnetic Field Radiated Emission Measurement

was performed in the frequency range of 9 kHz - 30 MHz, in the following test site.

Test location:

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Mino-Shi, Osaka, 562-0027, Japan

● - 1st open test site (3 meters)

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - 1st open test site ○ - 3 m ○ - 10 m ○ - 30 m

○ - 2nd open test site ○ - 3 m ○ - 10 m

Used test instruments:

Model No.	Device ID	Last Cal. Date	Cal. Interval
● - ESCS 30	A - 9	September, 2003	1 Year
○ - ESH 2	A - 2		
○ - ESH 2	A - 3		
● - HFH2-Z2	C - 2	July, 2003	1 Year
○ - HFH2-Z2	C - 3		
● - Cable	H - 28	July, 2003	1 Year
○ - Cable	H - 29		

Environmental conditions:

Temperature: 26 °C Humidity: 59 %

Electromagnetic Field Radiated Emission Measurement

was performed in horizontal and vertical polarization, in the frequency range of 30 MHz - 1000 MHz, in the following test site.

Test location:

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Mino-Shi, Osaka, 562-0027, Japan

● - 1st open test site (3 meters)

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - 1st open test site ○ - 3 m ○ - 10 m ○ - 30 m

○ - 2nd open test site ○ - 3 m ○ - 10 m

Validation of Site Attenuation:

1) Last Confirmed Date : October 9, 2003

2) Interval : 1 Year

Used test instruments:

Model No.	Device ID	Last Cal. Date	Cal. Interval
● - ESV/ESV-Z3	A - 7 / A - 17	November, 2003	1 Year
○ - ESV/ESV-Z3	A - 6 / A - 18		
○ - ESV/ESV-Z3	A - 4 / A - 20		
○ - ESV/ESV-Z3	A - 8 / A - 19		
○ - ESVS 10	A - 5		
○ - KBA-511A	C - 11	August, 2003	1 Year
○ - KBA-611	C - 21		
● - VHA9103/BBA9106	C - 43		
● - UHALP9107	C - 42		
○ - VHA9103/FBAB9177	C - 25		
○ - UHALP9108-A1	C - 28	August, 2003	1 Year
● - Cable	H - 5		

Environmental conditions:

Temperature: 26 °C Humidity: 59 %

CONFIGURATION OF EUT

The Equipment Under Test (EUT) consists of:

Description	Applicant (Manufacturer)	Model No. (Serial No.)	FCC ID
Main Body	CATEYE CO., LTD. (CATEYE CO., LTD.)	CC-HR200DW (S000015)	ON5CC-HR 200DW-TX
Speed Sensor	CATEYE CO., LTD. (CATEYE CO., LTD.)	CC-HR200DW (S003)	
Heart Rate Sensor	CATEYE CO., LTD. (CATEYE CO., LTD.)	CC-HR200DW (S003)	

The measurement was carried out with the following equipment connected:

Description	Grantee/Distributor	Model No. (Serial No.)	FCC ID
Wheel Speed Simulator	CATEYE CO., LTD.	-- (--)	N/A
Heart Rate Simulator	CATEYE CO., LTD.	-- (--)	N/A

Type of Interface Cable(s) and the AC Power Cord used with the EUT:

	Description	Port	Shielded Cable	Shell Material	Ferrite Core	Cable Length
1	Wheel Speed Simulator	--	NO	--	NO	1.0 m
	Speed Sensor	--		--		
2	Heart Rate Simulator	--	NO	--	NO	0.2 m
	Heart Rate Sensor	--		--		

Operation - mode of the EUT:

The Speed Sensor is transmitting the signal of the wheel rotation.

The Heart Rate Sensor is transmitting the signal of the heart rate.

The Main Body is receiving both the signal of the wheel rotation and the signal of the heart rate.

Test system:

The EUT consists of one Main Body, one Speed Sensor and one Heart Rate Sensor.

The Speed Sensor is connected to the wheel speed simulator.

The Heart Rate Sensor is connected to the heart rate simulator.

Special accessories:

None

The used (generated) frequencies in the EUT:

Transmitting frequency(Speed Sensor)	: 25kHz
Transmitting frequency(Heart Rate Sensor)	: 6kHz
Receiving frequency(Main Body)	: 6kHz , 25kHz
Main Body	: 32 kHz, 4MHz
Speed Sensor	: 4MHz
Heart Rate Sensor	: 4MHz

EUT Modification

- - No modifications were conducted by JQA to achieve compliance to applied levels.
- - To achieve compliance to applied levels, the following change(s) were made by JQA during the compliance test.

— The modification(s) will be implemented in all production models of this equipment. —

Applicant : N/A Date : N/A

Typed Name : N/A Position : N/A

Responsible Party

— Responsible Party of Test Item(Product) —

Responsible party :

Contact Person :

Signatory

Deviation from Standard

- - No deviations from the standard described in page 3.
- - The following deviations were employed from the standard described in page 3.

TEST RESULTS

AC Powerline Conducted Emission 150 kHz - 30 MHz

The requirements are	○ - Passed	○ - Not Passed
Min. limit margin	_____ dB at _____ MHz	
Max. limit exceeding	_____ dB at _____ MHz	
Uncertainty of measurement results	_____ dB(2σ)	_____ dB(2σ)

Remarks: Not Applicable

Electromagnetic Field Radiated Emission 9 kHz - 1000 MHz

The requirements are	● - Passed	○ - Not Passed
Min. limit margin	<u>59.2</u> dB at <u>0.025</u> MHz	
Max. limit exceeding	_____ dB at _____ MHz	
Uncertainty of measurement results (9kHz-30MHz)	<u>+ 2.5</u> dB(2σ)	<u>- 2.5</u> dB(2σ)
(30MHz-1GHz)	<u>+ 4.1</u> dB(2σ)	<u>- 4.2</u> dB(2σ)

Remarks: _____

SUMMARY

GENERAL REMARKS :

The EUT was tested according to the requirements of FCC Rules and Regulations Part 15 Subpart A and C (July 22, 2003) under the test configuration, as shown in page 11.

The conclusion for the test items of which are required by the applied regulation is indicated under the final judgement.

FINAL JUDGEMENT :

The "as received" sample;

- - fulfill the test requirements of the regulation mentioned on page 3.
- - fulfill the test requirements of the regulation mentioned on page 3, but with certain qualifications.
- - doesn't fulfill the test regulation mentioned on page 3.

Begin of testing : May 28, 2004

End of testing : May 28, 2004

- JAPAN QUALITY ASSURANCE ORGANIZATION -

Approved by :

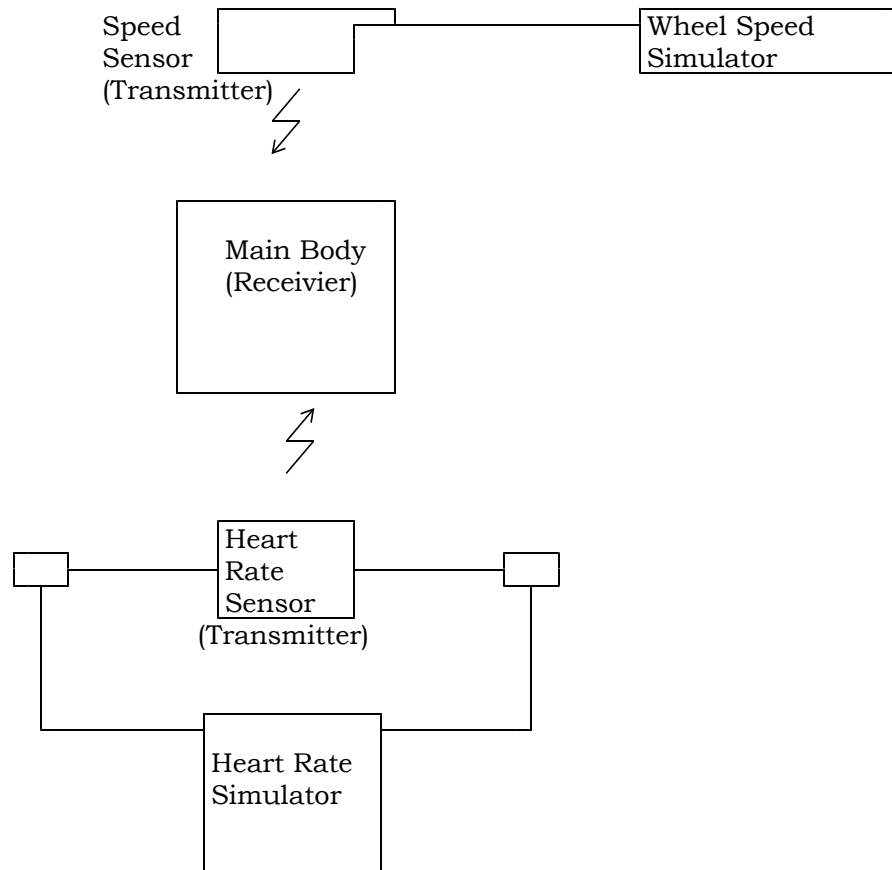
Issued by :



Akio Hosoda
Manager
EMC Div.
JQA KITA-KANSAI Testing Center

Shigeru Kinoshita
Deputy Manager
EMC Div.
JQA KITA-KANSAI Testing Center

Test System-Arrangement (Drawings)



Power Supply:

- A: Main Body DC 6V(Lithium Battery CR2032x2)
- B: Speed Sensor DC 3V(Lithium Battery CR2032x1)
- C: Heart Rate Sensor DC 3V(Lithium Battery CR2032x1)

Preliminary Test and Test-setup(Drawings)

Radiated Emission (Magnetic Field) 9 kHz - 30 MHz:

The preliminary test was performed according to the description of ANSI C63.4-2001 Sec.8.3.1.1 (Exploratory Radiated Emission Measurements) and Sec.6.2.1 (Tabletop Equipment Tests).

The preliminary test was carried out to investigate the frequency of the emission that has the highest amplitude relative to the limits within normal operating modes, cable positions, and a typical system configuration. In order to find out to the maximum emission, the preliminary test and a final test were performed in accordance with the following steps.

Step 1: One operation mode of the test system was setting.

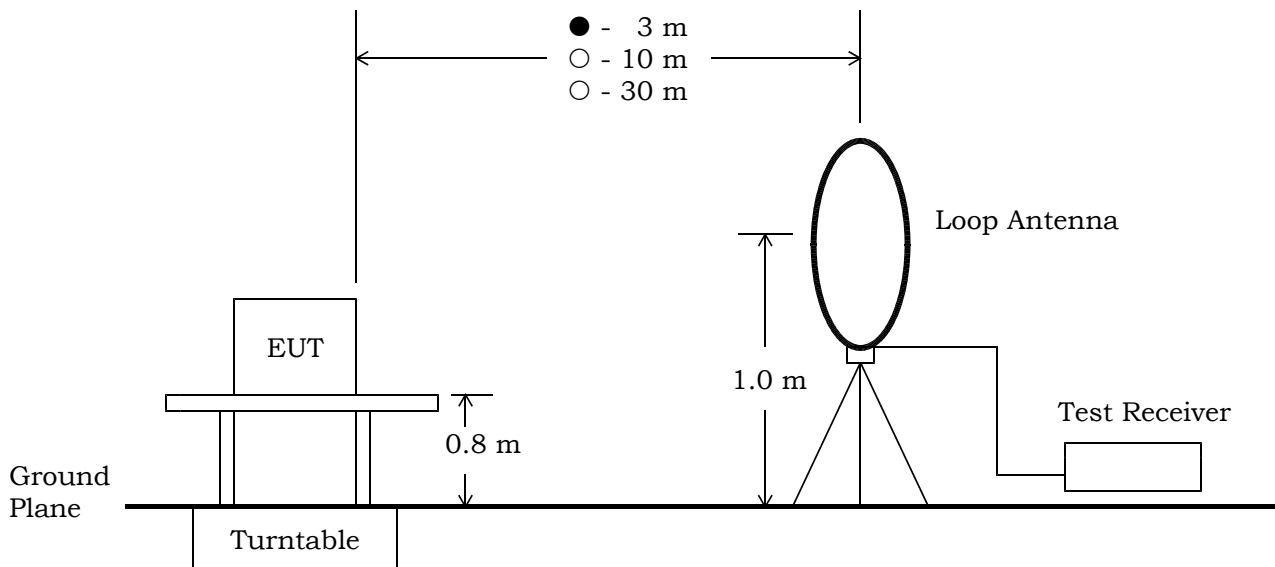
Step 2: In order to investigate the frequencies of maximum emissions, the loop antenna position was approached to the EUT and the significant frequency of the emission's circumstance from the test system were investigated. These data were recorded in the specified frequency band (9 kHz - 30 MHz).

Step 3: Using a test receiver and a loop antenna, the emission's circumstance from the test system was measured in according with ANSI C63.4-2001 Sec.8.3.1.2 (Final Radiated Emission Measurements) at each frequency which was found the higher emission referred to level vs. frequency on the list and which was measured by the loop antenna. The maximum emission was found by rotating three orthogonal axes under a typical system configuration.

Step 4: Return to step 1, if the other operation mode was possible to be setting.

Step 5: The worst result was reported arranging data of which was obtained and performed by one or plural operation modes as the final test.

At the worst point that has the highest amplitude relative to the limit the repeatability of the level was reconfirmed. The photographs of the tests system setup on the worst point were taken and recorded.



Electromagnetic Field Radiated Emission 30 MHz - 1000 MHz:

The preliminary test was performed according to the description of ANSI C63.4-2001 Sec.8.3.1.1 (Exploratory Radiated Emission Measurements) and Sec.6.2.1 (Tabletop Equipment Tests). The preliminary test was carried out to investigate the frequency of the emission that has the highest amplitude relative to the limits within normal operating modes, cable positions, and a typical system configuration. In order to find out to the maximum emission, the preliminary test and a final test were performed in accordance with the following steps.

Step 1: One operation mode of the test system was setting.

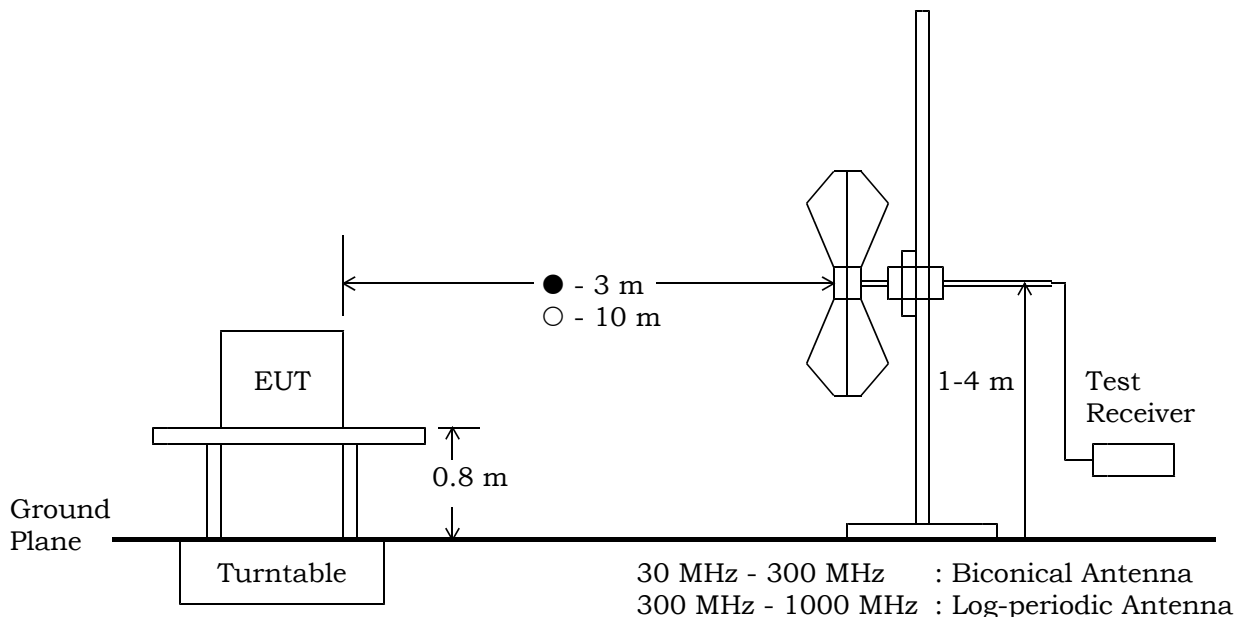
Step 2: Using a test receiver and a test antenna probe, the significant frequency of the emission's circumstance from the test system were investigated. These data were recorded every one of 22 divided bands in the specified frequency band (30 MHz - 1000 MHz).

Step 3: Using a test receiver and a linearly polarized broadband antenna, the emission's circumstance from the test system was measured in according with ANSI C63.4-2001 Sec.8.3.1.2 (Final Radiated Emission Measurements) at each frequency which was found the higher emission referred to level vs. frequency on the list and which was measured by the linearly polarized broadband antenna. The maximum emission was found by changing the cable positions or cable manipulation under a typical system configuration.

Step 4: Return to step 1, if the other operation mode was possible to be setting.

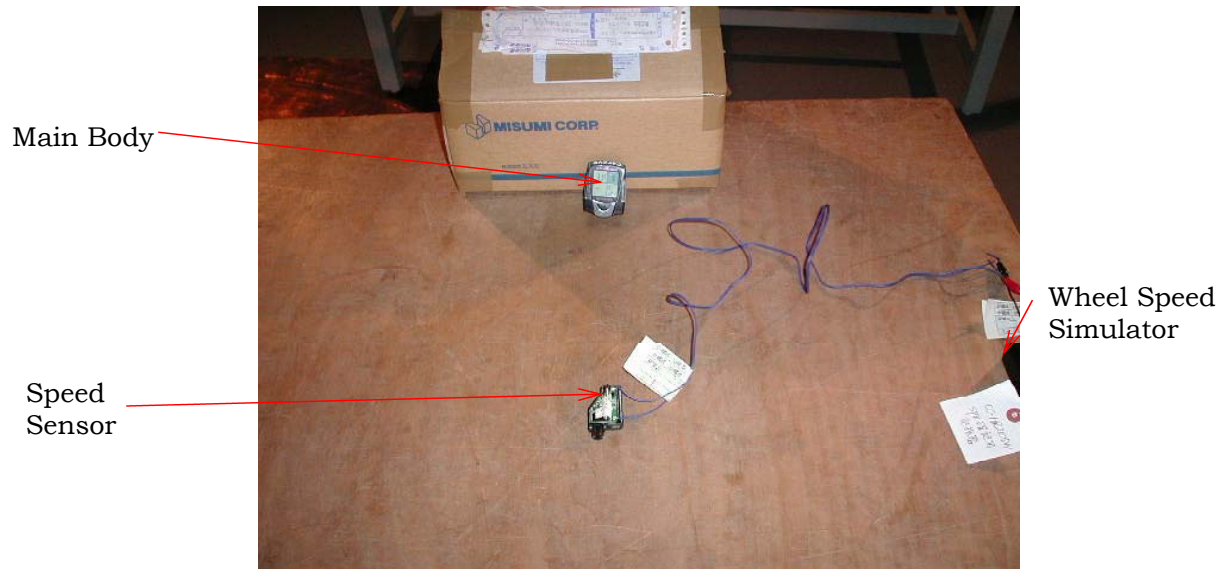
Step 5: The worst result was reported arranging data of which was obtained and performed by one or plural operation modes as the final test.

At the worst point that has the highest amplitude relative to the limit the repeatability of the level was reconfirmed. The photographs of the tests system setup on the the worst point were taken and recorded.



Test-Setup (Photographs) at worst case

Radiated Emission 9kHz - 1000MHz:



Main Body and Speed Sensor



Main Body and Heart Rate Sensor

Electromagnetic Field Radiated Emission Measurement

Intentional Radiator

Opertaing Frequency : 6 kHz & 25kHz

Test Date: May 25, 2004Temp.: 26 °C ; Humi.: 59 %

Frequency [MHz]	Conversion Factor [dB(1/m)]	Meter Readings at 3 m [dB(μV)]	Distance Factor [dB]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)] QP	Margin [dB]	Remarks (Note 2)
0.012	5.3	<30.0	-80.0	46.0	<-44.7	>+90.7	A
0.018	3.3	<30.0	-80.0	42.5	<-46.7	>+89.2	A
0.025	2.4	58.0	-80.0	39.6	-19.6	+59.2	A
0.050	0.8	<30.0	-80.0	33.6	<-49.2	>+82.8	A
0.075	0.6	<30.0	-80.0	30.1	<-49.4	>+79.5	A
0.100	0.4	<30.0	-80.0	27.6	<-49.6	>+77.2	A
0.125	0.2	<30.0	-80.0	25.7	<-49.8	>+75.5	A
0.150	0.2	<30.0	-80.0	24.1	<-49.8	>+73.9	B

Sample of calculated result at 0.025 MHz, as the Minimum Margin point:

Conversion Factor	2.4	dB(1/m)
Meter Reading	58.0	dB(μV)
+ Distance Factor	-80.0	dB (40dB/decade)
Result	-19.6	dB(μV/m)

Minumum Margin : 39.6 - (-19.6) = 59.2(dB)

The point shown on "___" is the Minimum Margin Point.

Note 1:

- 1)The transmitting frequency in the EUT: 6 kHz, 25 kHz
- 2)The upper frequency of the measurement range : 1000 MHz
- 3)The spectrum was scanned 9 kHz to 1000 MHz and all emissions not reported were more than 20dB below the applied limits.
- 4)The Conversion Factor includes the antenna factor and the cable loss.

Remarks:

Note 2	Detector Function	IF Bandwidth
A	CISPR QP	200 Hz
B	CISPR QP	9 kHz
C	CISPR QP	120 kHz

Tester : Shigeru Kinoshita