

EMC EMISSION - TEST REPORT

JQA APPLICATION No. : KL8090454

Name of Product : CYCLOCOMPUTER(CATEYE CORDLESS 2)

Model/Type No. : CC-CL200

FCC ID : ON5CC-CL200-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

Final Judgement : **Passed**

TEST RESULTS IN THIS REPORT are obtained in use of equipment that is traceable to Electro-technical Lab. of MITI Japan and Communications Research Lab. of PTT Japan.

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

JAPAN QUALITY ASSURANCE ORGANIZATION (JQA)
KITA-KANSAI TESTING CENTER
EMC DIVISION



LAB CODE: 200191-0

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	<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</u>
Test-setup (Photographs) at worst case	<u>13</u>
B) Test data	
Conducted Emission	450 kHz - 30 MHz
	<u>N/A</u>
Electromagnetic Field Radiated Emission	9 kHz - 180 kHz
	<u>14</u>

TEST REGULATION

FCC Rules and Regulations Part 15 Subpart A and C (April 16, 1999)

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

Test procedure:

Radiated emission test was performed according to the procedures in ANSI C63.4-1992.

GENERAL INFORMATION

Test facility:

- 1) Test Facility located at Kita-Kansai : 1st and 2nd Open Sites (3 m Site)
Test Facility located at Kameoka Open Site (3, 10 and 30 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(CATEYE CORDLESS 2) |
| 2) Model/Type No. | : CC-CL200 |
| 3) Product Type | : Mass-Production (S/N: A433152) |
| 4) Category | : Intentional Radiator |
| 5) EUT Authorization | : ☐ - Verification ☒ - Certification ☐ - D.o.C. |
| 6) Transmitting frequency | : 18 kHz |
| 7) Power Rating | : DC 3V (Lithium Battery CR2032x1) |

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

AC Powerline Conducted Emission Measurement

was performed in the following test site.

Test location:

KITA-KANSAI Testing Center

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

○ - Shielded room

KAMEOKA EMC Branch

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

○ - Shielded room

○ - On metal plane of open site

Used test instruments and sites:

Model No.	Device ID	Last Cal. Date	Cal. Interval
○ - ESH 3	A - 1		
○ - ESH 2	A - 2		
○ - ESH 2	A - 3		
○ - KNW-407	D - 6		
○ - KNW-408	D - 11		
○ - KNW-242	D - 7		
○ - ESH3-Z5	D - 12		
○ - KNW-341C	D - 13		
○ - KNW-408	D - 14		
○ - KNW-244C	D - 77		
○ - KNW-408	D - 78		
○ - ESH2-Z5	D - 10		
○ - ESH2-Z3	D - 17		
○ - 8568B	A - 10		
○ - 8566B	A - 13		
○ - 8593A	A - 15		
○ - Cable	H - 7		
○ - Cable	H - 8		

Environmental conditions:

Temperature: _____ °C Humidity: _____ %

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 site (3 meters)

● - 2nd site (3 meters)

KAMEOKA EMC Branch

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

○ - 3 meters

○ - 10 meters

○ - 30 meters

Used test instruments:

Model No.	Device ID	Last Cal. Date	Cal. Interval
○ - ESH 3	A - 1		
● - ESH 2	A - 2	May, 1999	1 Year
○ - ESH 2	A - 3		
● - HFH2-Z2	C - 2	February, 1999	1 Year
○ - HFH2-Z2	C - 3		

Environmental conditions:

Temperature: 20 °C Humidity: 50 %

CONFIGURATION OF EUT

The Equipment Under Test (EUT) consists of:

Description	Applicant (Manufacturer)	Model No. (Serial No.)	FCC ID
CYCLOCOMPUTER (CATEYE CORDLESS 2)	CATEYE CO., LTD. (CATEYE CO., LTD.)	CC-CL200 (A433152)	ON5CC-CL200-TX

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

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

No.	Cable	Shielded	Ferrite Core	Length
	None			

Operation - mode of the EUT:

The EUT is transmitting the signal of wheel rotation.

Test system:

The EUT is a wheel rotation sensor(rotation sensor and transmitter), a part of cordless cyclometer.
The EUT was connected to the wheel speed simulator for the simulation of the wheel rotation.

Special accessories:

None

The used (generated) frequencies in the EUT:

Transmitting frequency : 18.0 kHz

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

TEST RESULTS

AC Powerline Conducted Emission 450 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(2 σ)	_____ dB(2 σ)

Remarks: Not Applicable

Electromagnetic Field Radiated Emission 9 kHz - 180 kHz

The requirements are	● - Passed	○ - Not Passed
Min. limit margin	<u>63.5</u> dB at <u>0.0180</u> MHz	
Max. limit exceeding	_____ dB at _____ MHz	
Uncertainty of measurement results	<u>+ 2.5</u> dB(2 σ)	<u>- 2.5</u> dB(2 σ)

Remarks: _____

SUMMARY

GENERAL REMARKS :

The EUT was tested according to the requirements of FCC Rules and Regulations Part 15 Subpart A and C (April 16, 1999) 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 : October 15, 1999

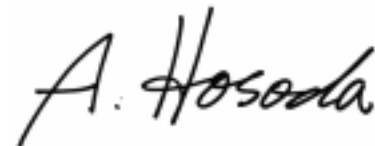
End of testing : October 15, 1999

- JAPAN QUALITY ASSURANCE ORGANIZATION -

Approved Signatory :

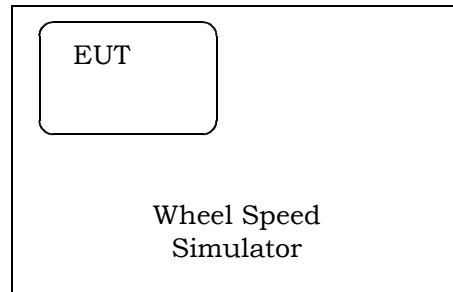


Takashi Yamanaka
Manager
EMC Div.
JQA KITA-KANSAI Testing Center



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

Test System-Arrangement (Drawings)



Power Supply:

A: EUT DC 3V(Lithium Battery CR2032x1)

B: Wheel Speed Simulator DC 6V(Lithium Battery CR2032x2)

Preliminary Test and Test-setup(Drawings)

Electromagnetic Field Radiated Emission 9 kHz - 180 kHz:

The preliminary test was performed according to the description of ANSI C63.4-1992 Sec.8.3.1.1 (Preliminary Radiated Emissions Tests) 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.

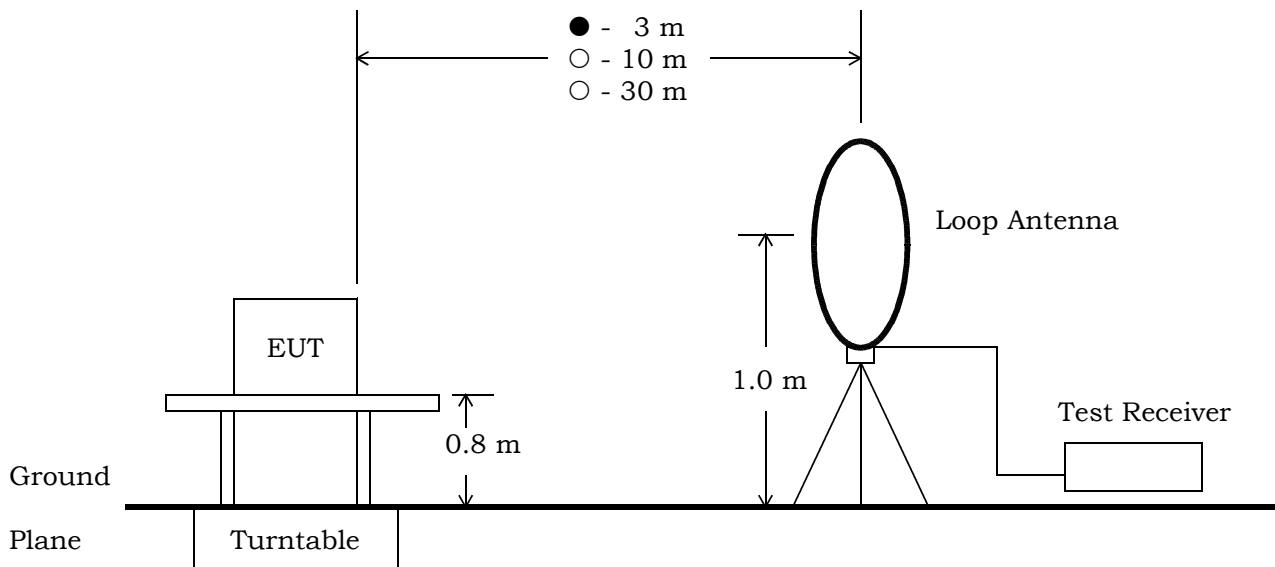
Step 2: In order to investigate the frequencies of maximum emissions, the loop antenna position was approached to the EUT and the significant frequency of the emission's circumstance from the test system were investigated. These data were recorded in the specified frequency band (9 kHz - 65 kHz).

Step 3: Using a test receiver and a loop antenna, the emission's circumstance from the test system was measured in according with ANSI C63.4-1992 Sec.8.3.1.2 (Final Radiated Emissions Tests) 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.

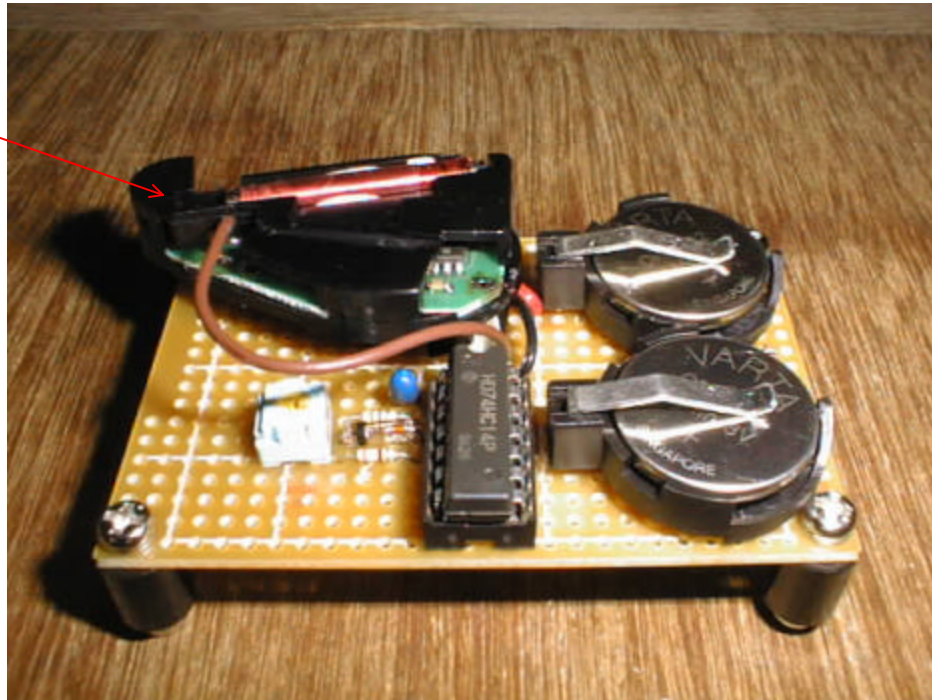
At the worst point that has the highest amplitude relative to the limit the repeatability of the level was reconfirmed. The photographs of the tests system setup on the worst point were taken and recorded.



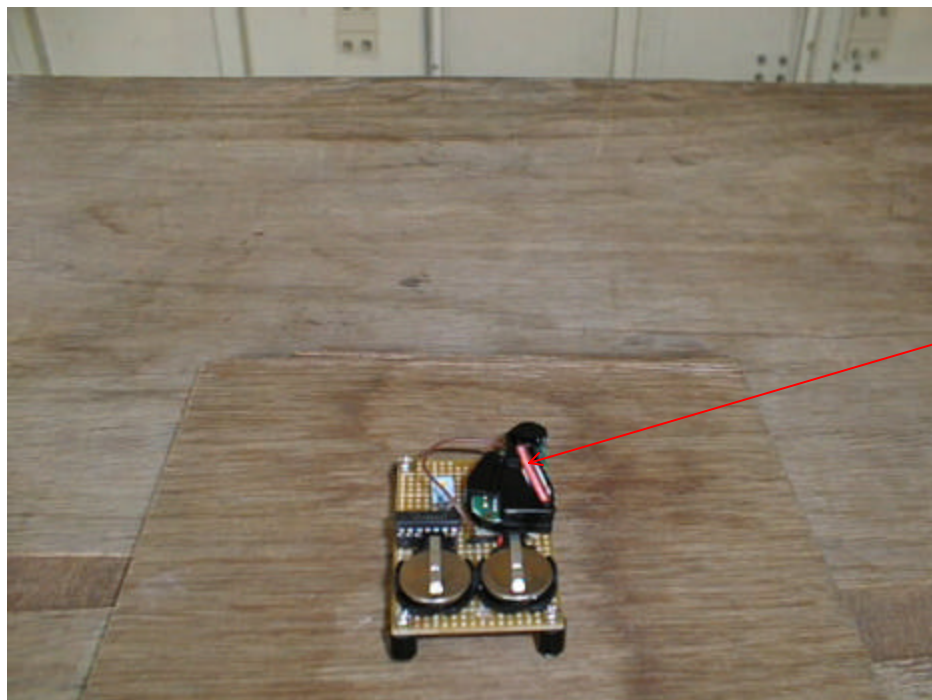
Test-Setup (Photographs) at worst case

Radiated Emission 9kHz - 180kHz:

EUT



View 1



View 2

Electromagnetic Field Radiated Emission Measurement

Intentional Radiator

Operating Frequency : 18.0 kHz

Test Date: October 15, 1999
Temp.: 20 °C ; Humi.: 50 %

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)]		Margin [dB]	Remarks (Note 2)
		Peak	Average			Peak	Average		
0.0180	0.0	59.0	-	-80.0	42.5	-21.0	-	+63.5	B
0.0360	0.0	35.0	-	-80.0	36.5	-45.0	-	+81.5	B
0.0540	0.0	<30.0	-	-80.0	33.0	<-50.0	-	>+83.0	B
0.0720	0.0	<30.0	-	-80.0	30.5	<-50.0	-	>+80.5	B
0.0900	0.0	<30.0	-	-80.0	28.5	<-50.0	-	>+78.5	B
0.1080	0.0	<30.0	-	-80.0	26.9	<-50.0	-	>+76.9	B
0.1260	0.0	<30.0	-	-80.0	25.6	<-50.0	-	>+75.6	B
0.1440	0.0	<30.0	-	-80.0	24.4	<-50.0	-	>+74.4	B
0.1620	0.0	<30.0	-	-80.0	23.4	<-50.0	-	>+73.4	E
0.1800	0.0	<30.0	-	-80.0	22.5	<-50.0	-	>+72.5	E

Sample of calculated result at 0.0180 MHz, as the Minimum Margin point:

Conversion Factor	0.0	dB(1/m)
Meter Reading	59.0	dB(μV)
+) Distance Factor	-80.0	dB (40dB/decade)
Result	-21.0	dB(μV/m)

Minimum Margin : 42.5 - (-21.0) = 63.5(dB)

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

Note 1:

- 1)The transmitting frequency in the EUT: 18.0 kHz
- 2)The upper frequency of the measurement range : 180 kHz
- 3)The spectrum was scanned 9 kHz to 180 kHz 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	Note 2	Detector Function	IF Bandwidth
A	CISPR QP	200 Hz	D	CISPR QP	10 kHz
B	Peak	200 Hz	E	Peak	10 kHz
C	Average	200 Hz	F	Average	10 kHz

Tester Signature : A. Hosoda

Type Name : Akio Hosoda