



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test Report No. : E04OR-040

Applicant : JAWON MEDICAL CO., LTD.

Address : 13Lot, 21 Block, Jinryang Industrial Complex, Kyungsan-City, Kyungbuk, Korea

Manufacturer : JAWON MEDICAL CO., LTD.

Address : 13Lot, 21 Block, Jinryang Industrial Complex, Kyungsan-City, Kyungbuk, Korea

Type of Equipment : Wrist type NIBP

FCC ID. : RIXECHOH

Model Name : Echo H

Multiple Model Name : Echo A, Echo E

Serial Number : N/A

Total page of Report : 12 pages (including this page)

Date of Incoming : September 20, 2004

Date of Issuing : October 12, 2004

SUMMARY

The equipment complies with the regulation; **PART 15 SUBPART B, Class B Computing Device Peripherals.**

This test report contains only the result of a single test of the sample supplied for the examination.

It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by:

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**1. VERIFICATION OF COMPLIANCE**

APPLICANT : JAWON MEDICAL CO., LTD.
ADDRESS : 13Lot, 21 Block, Jinryang Industrial Complex, Kyungsan-City, Kyungbuk, Korea
CONTACT PERSON : Mr. Jong-Hwan, Cho / Senior Engineer
TELEPHONE NO. : +82-53-856-0993
FCC ID : RIXECHOH
MODEL NAME : Echo H
SERIAL NUMBER : N/A
DATE : October 12, 2004

| | |
|---|--|
| DEVICE TYPE | Peripheral Device for Class B Personal Computing Device -UNINTENTIONAL RADIATOR |
| E.U.T. DESCRIPTION | Wrist type NIBP |
| THIS REPORT CONCERNS | ORIGINAL GRANT |
| MEASUREMENT PROCEDURES | ANSI C63.4: 2001 |
| TYPE OF EQUIPMENT TESTED | PRE-PRODUCTION |
| KIND OF EQUIPMENT AUTHORIZATION REQUESTED | CERTIFICATION |
| EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART (S) | PART 15 SUBPART B, SECTION 15.101 |
| MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE | No |
| FINAL TEST WAS CONDUCTED ON | 3 METER OPEN AREA TEST SITE |

- This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 affected by the 15.37(j) transition provisions.
- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



2. GENERAL INFORMATION

2.1 Product Description

The JAWON MEDICAL CO., LTD., Model Echo H (referred to as the EUT in this report) is a Wrist type NIBP that is indicated for use in the noninvasive measurement of systolic and diastolic blood pressure and heart rate in adult age 18 and over, in a home care environment. The Product specification described herein was obtained from product data sheet or user's manual.

| | |
|--|--|
| CHASSIS TYPE | Plastic |
| LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz) | 8 MHz on the main board |
| POWER REQUIREMENT | DC 3V, 500mA from the AAA type battery |
| NUMBER OF LAYERS | 4 Layers |
| EXTERNAL CONNECTORS | USB Connector |

2.2 Model Differences:

- The following list consists of added model name and their difference. The basic and added models are identical except for following difference.

| | Model Name | Model Differences |
|-----------------|------------|---|
| Basic Model | Echo H | - |
| Multiple Models | Echo A | This model does not have transmitting function of result data to PC. |
| | Echo E | This model does not have transmitting function of result data to PC and does not have clock function. |

2.3 Related Submittal(s) / Grant(s)

- Original submittal only

2.4 Test System Details

The model numbers for all the equipments, which were used in the tested system, is:

| Model | Manufacturer | Description | FCC ID | Connected to |
|----------|-------------------------|----------------------|------------|--------------|
| Echo H | JAWON MEDICAL CO., LTD. | Wrist type NIBP(EUT) | RIXECHOH | Notebook PC |
| PP01L | DELL | Notebook PC | DoC | - |
| 2225C | HP | PRINTER | DSI6XU2225 | Notebook PC |
| 020-0470 | CARDINAL | MODEM | GDE0196 | Notebook PC |



2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2001. Radiated testing was performed at a distance of 3 meters from the EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-City, Kyounggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)



3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

| DEVICE TYPE | MANUFACTURER | MODEL/PART NUMBER | FCC ID |
|-------------|--------------|-------------------|--------|
| Main Board | N/A | ECHO-W | N/A |

3.2 EUT exercise Software

- The EUT was operated with normal operating condition and measured data was transmitted to Notebook PC during the test.

3.3 Cable Description

| | Power Cord Shielded (Y/N) | I/O cable Shielded (Y/N) | Length (M) |
|-----------------------|------------------------------|-----------------------------|----------------|
| Wrist type NIBP (EUT) | N | Y | 1.5(P), 1.5(D) |
| NOTEBOOK PC | N | - | 1.8(P) |
| PRINTER | N | Y | 1.8(P), 1.5(D) |
| MODEM | N | N | 1.8(P), 1.5(D) |

* The marked "(D)" means the I/O Cable and "(P)" means the Power Cable.

3.4 Noise Suppression Parts on Cable

| | Ferrite Bead (Y/N) | Location | Metal Hood (Y/N) | Location |
|-----------------------|-----------------------|----------|---------------------|----------|
| Wrist type NIBP (EUT) | N | N/A | Y | BOTH END |
| NOTEBOOK PC | - | - | - | - |
| PRINTER | N | N/A | Y | BOTH END |
| MODEM | N | N/A | Y | BOTH END |

3.5 Equipment Modifications

- None



3.6 Configuration of Test System

Line Conducted Test: The EUT was inserted to USB port of PC and the power line of PC was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4: 2001 7.2.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emission test was conducted using the procedure in ANSI C63.4: 2001 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.

4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

| Operation Mode | The Worse operating condition (Please check one only) |
|---|---|
| Normal operation and data transmission mode | X |

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

| Operation Mode | The Worse operating condition (Please check one only) |
|---|---|
| Normal operation and data transmission mode | X |



5. FINAL RESULT OF MEASURMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level.

5.1 Conducted Emission Test

Humidity Level : 42% Temperature : 20°C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107(a)
 Type of Test : CLASS B
 Result : PASSED BY -12.62 dB at 0.18 MHz

EUT : Wrist type NIBP Date: October 11, 2004

Operating Condition : Normal operation and data transmission mode

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

| Frequency (MHz) | Line | Peak (dBuV) | | Margin (dB) |
|--------------------|------|----------------|------------|----------------|
| | | Emission level | Q.P Limits | |
| 0.16 | N | 45.85 | 65.46 | -19.61 |
| 0.18 | H | 52.10 | 64.72 | -12.62 |
| 0.24 | H | 46.94 | 62.27 | -15.33 |
| 0.30 | H | 41.14 | 60.38 | -19.24 |
| 4.31 | N | 36.22 | 56.00 | -19.78 |
| 4.49 | N | 35.63 | 56.00 | -20.37 |
| Frequency (MHz) | Line | Average (dBuV) | | Margin (dB) |
| | | Emission level | Limits | |
| - | | | | |
| - | | | | |

Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

Average mode was not measured, because Peak values were under the average limit.

See next page for an overview sweep performed with peak detector.



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Testing & Evaluation Lab.

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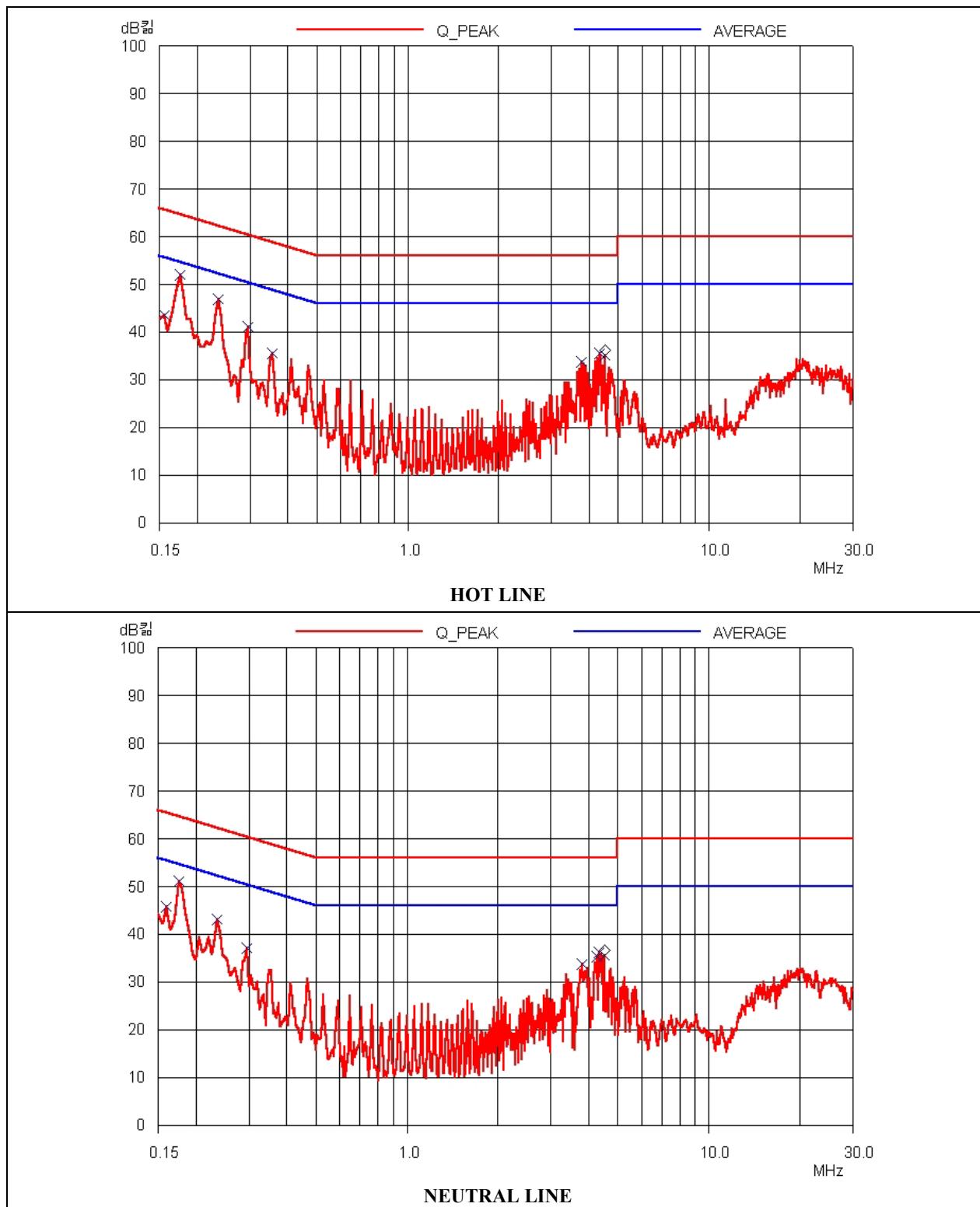
Tested by: Hyun-Suck, Lee / Test Engineer

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FCC-004 (Rev.0)

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**5.2 Radiated Emission Test for Digital mode**

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

| | | |
|-----------------|--|---------------------------|
| Humidity Level | : <u>39 %</u> | Temperature : <u>20°C</u> |
| Limits apply to | : <u>FCC CFR 47, PART 15, SUBPART B, SECTION 15.109(a)</u> | |
| Type of Test | : <u>CLASS B</u> | |
| Result | : <u>PASSED BY -5.24 dB at 540.20 MHz</u> | |

| | | |
|---------------------|---|---------------------|
| EUT | : Wrist type NIBP | Date: September 24, |
| 2004 | | |
| Operating Condition | : Normal operation and data transmission mode | |
| Detector | : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz) | |
| Frequency Range | : 30 MHz – 1000 MHz | |
| Distance | : 3 Meter | |

| Radiated Emission | | Ant | Correction Factors | | Total | FCC CLASS B | |
|-------------------|----------------|------|--------------------|---------------|------------------|-------------------|----------------|
| Freq. (MHz) | Amp. (dBuV) | Pol. | Ant. (dBuV/m) | Cable (dB) | Amp. (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 65.21 | 21.60 | V | 5.83 | 1.40 | 28.83 | 40.00 | -11.17 |
| 172.60 | 14.60 | V | 14.81 | 2.15 | 31.56 | 43.52 | -11.96 |
| 264.30 | 19.20 | H | 17.39 | 2.66 | 39.25 | 46.02 | -6.77 |
| 462.90 | 13.90 | H | 17.16 | 3.51 | 34.57 | 46.02 | -11.45 |
| 540.20 | 18.20 | H | 18.72 | 3.86 | 40.78 | 46.02 | -5.24 |
| 642.50 | 16.30 | H | 19.46 | 4.19 | 39.95 | 46.02 | -6.07 |

Radiated Emission Tabulated Data

Tested by: Hyun-Suck, Lee / Test Engineer



6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)



7. LIST OF TEST EQUIPMENT

| No. | EQUIPMENTS | MFR. | MODEL | SER. NO. | LAST CAL | DUe CAL | USE |
|-----|--------------------------|-------------|-------------|--------------|----------|---------|-----|
| 1. | Test receiver | R/S | ESVS 10 | 827864/005 | DEC/03 | 12MONTH | ■ |
| 2. | Test receiver | R/S | ESHS 10 | 834467/007 | MAY/04 | 12MONTH | ■ |
| 3. | Spectrum analyzer | HP | 8566B | 3407A08547 | JUL/04 | 12MONTH | |
| 4. | Spectrum analyzer | HP | 8568B | 3109A05456 | JUL/04 | 12MONTH | ■ |
| 5. | RF preselector | HP | 85685A | 3107A01264 | APR/04 | 12MONTH | ■ |
| 6. | Quasi-Peak Adapter | HP | 85650A | 3107A01542 | JUL/04 | 12MONTH | ■ |
| 7. | TRILOG Broadband Antenna | Schwarzbeck | VULB9163 | VULB9163 166 | FEB/04 | 12MONTH | |
| 8. | Biconical antenna | EMCO | 3104C | 9109-4443 | MAY/04 | 12MONTH | |
| | | Schwarzbeck | VHA9103 | 91031852 | JAN/04 | | ■ |
| 9. | Log Periodic antenna | EMCO | 3146 | 9109-3213 | FEB/04 | 12MONTH | |
| | | | | 9109-3217 | MAY/04 | | |
| | | Schwarzbeck | 9108-A(494) | 62281001 | JAN/04 | | ■ |
| 10. | LISN | EMCO | 3825/2 | 9109-1867 | JUL/04 | 12MONTH | ■ |
| | | | | 9109-1869 | OCT/03 | | ■ |
| 11. | Position Controller | HD GmbH | HD100 | N/A | N/A | N/A | ■ |
| 12. | Turn Table | HD GmbH | DS420S | N/A | N/A | N/A | ■ |
| 13. | Antenna Master | HD GmbH | MA240 | N/A | N/A | N/A | ■ |