



## RADIO TEST REPORT

Test Report No. : 26FE0177-HOa

Applicant : OMRON Corporation

Type of Equipment : Radio Identification System  
Reader/Writer, Antenna

Model No. : READER/WRITER : V740-BA50C04-US  
ANTENNA : V740-HS03L, V740-HS03LA

Test standard : FCC Part 15 Subpart C  
Section 15.207, Section 15.247: 2006  
(Permissive Change Class II Application)

FCC ID : OZGV740-BA50CX4

Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with the above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.

Date of test:

February 20 to March 25, 2006

Tested by:

  
Makoto Kosaka  
EMC Services

  
Mitsuru Fujimura  
EMC Services

Approved by:

  
Naoki Sakamoto  
Group Leader of EMC Services

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## **SECTION 1: Client information**

Company Name : OMRON Corporation  
Address : 2-2-1, Nishikusatsu, Kusatsu-city, Shiga-pref. 525-0035 Japan  
Telephone Number : +81-77-565-5287  
Facsimile Number : +81-77-565-5553  
Contact Person : Koji Andou

## **SECTION 2: Equipment under test (E.U.T.)**

### **2.1 Identification of E.U.T.**

Type of Equipment : Radio Identification System (Reader/Writer and Antenna)  
Model No. : READER/WRITER: V740-BA50C04-US  
ANTENNA : V740-HS03L, V740-HS03LA  
Serial No. : READER/WRITER: 05090007  
ANTENNA, V740-HS03L: 062001  
V740-HS03LA: 062002  
Rating : AC100 to 240V, 2.3A 50/60Hz(with attached AC Adaptor) DC OUT 24V  
Country of Manufacture : JAPAN  
Receipt Date of Sample : February 15, 2006  
Condition of EUT : Production prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)

### **2.2 Product Description**

Model No: V740-BA50C04-US and V740-HS03L/V740-HS03LA (referred to as the EUT in this report) is the Radio Identification System (Reader/Writer and Antenna).

#### **[Variant model: V740-BA50C04A-US]**

Reader/Writer, V740-BA50C04-US has a variant model, V740-BA50C04A-US, which is the lead-free version of V740-BA50C04-US. As the electrical/radio specifications of those models are identical, the test was performed with V740-BA50C04-US as a representative.

#### **[Changes from the FCC granted (original) model (FCC ID: OZGV740-BA50CX4)]**

1. System Control Software (There is no change in the hardware)
2. Addition of Antenna: V740-HS03L and V740-HS03LA

The test items influenced by the above changes were performed. For details, please see Section 3.2: Procedures and results.

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#### [Specification]

|                            |                                                                                                                                                                                                                                                                                                         |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Feature of EUT             | The V740 Reader/Writer is a modulated frequency hopping RFID reader. It contains two radio sections with two transmitting and receiving ports on each radio to allow multiple antennas to be connected to enhance the coverage area of the RFID reader. Only one antenna can be utilized at any moment. |
| Equipment Type             | Transceiver                                                                                                                                                                                                                                                                                             |
| Frequency Range            | 902.726-927.322MHz                                                                                                                                                                                                                                                                                      |
| Bandwidth                  | 26MHz                                                                                                                                                                                                                                                                                                   |
| Channel specing            | 500kHz                                                                                                                                                                                                                                                                                                  |
| Antenna Type               | Small Liner Antenna                                                                                                                                                                                                                                                                                     |
| Antenna Connector Type     | SMA                                                                                                                                                                                                                                                                                                     |
| Antenna Gain               | +3.0 dBi max                                                                                                                                                                                                                                                                                            |
| ITU Code                   | A1D                                                                                                                                                                                                                                                                                                     |
| Frequency of Operation     | CPU: 266MHz (33.333MHz), PLL: 8.0MHz, 25MHz, 33MHz, 54.24MHz                                                                                                                                                                                                                                            |
| Power Supply               | AC100 to 240V, 2.3A 50/60Hz<br>(with attached AC Adaptor) DC OUT 24V                                                                                                                                                                                                                                    |
| Method of EUT installation | Installed by the professionals                                                                                                                                                                                                                                                                          |

#### [Antenna information]

|                                              |                                   |                                                                            |
|----------------------------------------------|-----------------------------------|----------------------------------------------------------------------------|
| Antenna model number                         | V740-HS03L                        | V740-HS03LA                                                                |
| Difference of antenna                        | With 10dB attenuator              | Without 10dB attenuator<br>(Same as V740-HS03L except for 10dB attenuator) |
| Connection between antenna and Reader/Writer | Cables designated by manufacturer |                                                                            |

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### **SECTION 3: Test specification, procedures & results**

#### **3.1 Test Specification**

|                    |   |                                                                                                                                                                                                                     |
|--------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Specification | : | FCC Part15 Subpart C: 2006                                                                                                                                                                                          |
| Title              | : | FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators<br>Section 15.207 Conducted limits: 2006<br>Section 15.247 Operation within the bands 902-928MHz,<br>2400-2483.5MHz, and 5725-5850MHz: 2006 |

#### **FCC 15.31 (e)**

The supply voltage of AC Adapter as the ancillary equipment was varied between 85 % and 115% of the nominal rated supply voltage (AC 120V), however, there was no difference in power levels in fundamental emission.

The test was performed at the original application (Please refer to UL Apex test report No. 25IE0180-HO-1)

Since there is no influence by the changes from the original Reader/Writer, the test was performed only with the nominal supply voltage (AC120V) for this permissive change application.

#### **FCC Part 15.203 Antenna requirement**

This EUT has the external (particular) antenna connector, and the installation is to be done by the professionals. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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### 3.2 Procedures and results

| No. | Item                         | Test Procedure                                                      | Specification           | Remarks                | Deviation | Worst Margin*0)                                 | Results     |
|-----|------------------------------|---------------------------------------------------------------------|-------------------------|------------------------|-----------|-------------------------------------------------|-------------|
| 1   | Conducted emission           | ANSI C63.4: 2003<br>7. AC powerline conducted emission measurements | Section 15.207          | -                      | N/A       | 3.1dB<br>16.22702MHz, N<br>16.22836MHz, L<br>AV | Complied    |
| 2   | Carrier Frequency Separation | ANSI C63.4: 2003<br>13. Measurement of intentional radiators        | Section15.247 (a)(1)    | Conducted              | N/A       | N/A                                             | N/A*1)      |
| 3   | 20dB Bandwidth               | ANSI C63.4: 2003<br>13. Measurement of intentional radiators        | Section15.247 (a)(1)(i) | Conducted              | N/A       | N/A                                             | N/A*1)      |
| 4   | Number of Hopping Frequency  | ANSI C63.4: 2003<br>13. Measurement of intentional radiators        | Section15.247 (a)(1)(i) | Conducted              | N/A       | N/A                                             | N/A*1)      |
| 5   | Dwell time                   | ANSI C63.4: 2003<br>13. Measurement of intentional radiators        | Section15.247 (a)(1)(i) | Conducted              | N/A       | See data                                        | Complied    |
| 6   | Maximum Peak Output Power    | ANSI C63.4: 2003<br>13. Measurement of intentional radiators        | Section15.247 (b)(2)    | Conducted              | N/A       | See data                                        | Complied*2) |
| 7   | Band Edge Compliance         | ANSI C63.4: 2003<br>13. Measurement of intentional radiators        | Section15.247 (d)       | Conducted/<br>Radiated | N/A       | See data                                        | Complied*3) |
| 8   | Spurious Emission            | ANSI C63.4: 2003<br>13. Measurement of intentional radiators        | Section15.247 (d)       | Conducted/<br>Radiated | N/A       | 7.6dB<br>3.610831GHz<br>Ver, AV                 | Complied*3) |

Note: UL Apex's EMI Work Procedures No.QPM05 and QPM15

\*0) The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

\*1) The test is not applicable, because pre-check found that it was not influenced by the changes from the original model (FCC granted model).

\*2) The test was performed with the normal voltage (AC120V) only, in order to confirm that the power level was within +/- 0.5dB compared to the original model (FCC granted model).

\*3) Conducted test is not applicable, because pre-check found that it was not influenced by the changes from the original model (FCC granted model).

#### Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is  $\pm 1.3\text{dB}$ .

The data listed in this test report has enough margin, more than the site margin.

#### Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is  $\pm 4.5\text{dB}(3\text{m})/\pm 4.7\text{dB}(10\text{m})$ .

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is  $\pm 5.2\text{dB}(3\text{m})/\pm 3.8\text{dB}(10\text{m})$ .

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is  $\pm 6.6\text{dB}$ .

The data listed in this test report has enough margin, more than the site margin.

#### Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is  $\pm 3.0\text{dB}$ .

\*These tests were also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".

\*These tests were performed without any deviations from test procedure except for additions or exclusions.

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### 3.3 Test Location

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|                               | FCC<br>Registration<br>Number | IC Registration<br>Number | Width x Depth x<br>Height (m) | Size of<br>reference ground plane (m) /<br>horizontal conducting plane | Other<br>rooms      |
|-------------------------------|-------------------------------|---------------------------|-------------------------------|------------------------------------------------------------------------|---------------------|
| No.1 semi-anechoic<br>chamber | 313583                        | IC4247A                   | 19.2 x 11.2 x 7.7m            | 7.0 x 6.0m                                                             | Preparation<br>room |
| No.2 semi-anechoic<br>chamber | 846015                        | IC4247A-2                 | 7.5 x 5.8 x 5.2m              | 4.0 x 4.0m                                                             | -                   |
| No.3 shielded room            | -                             | -                         | 4.7 x 7.5 x 2.7m              | 4.7 x 7.5m                                                             | -                   |
| No.4 measurement<br>room      | -                             | -                         | 3.1 x 5.0 x 2.7m              | N/A                                                                    | -                   |

\* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1 and No.2 semi-anechoic and No.3 shielded room.

### 3.4 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

## **SECTION 4: Operation of E.U.T. during testing**

### **4.1 Operating Modes**

The mode is used :           Transmitting mode  
                                   Low Channel (Ch1)       : 902.726MHz  
                                   Mid Channel (Ch25)     : 914.773MHz  
                                   High Channel (Ch50)    : 927.322MHz

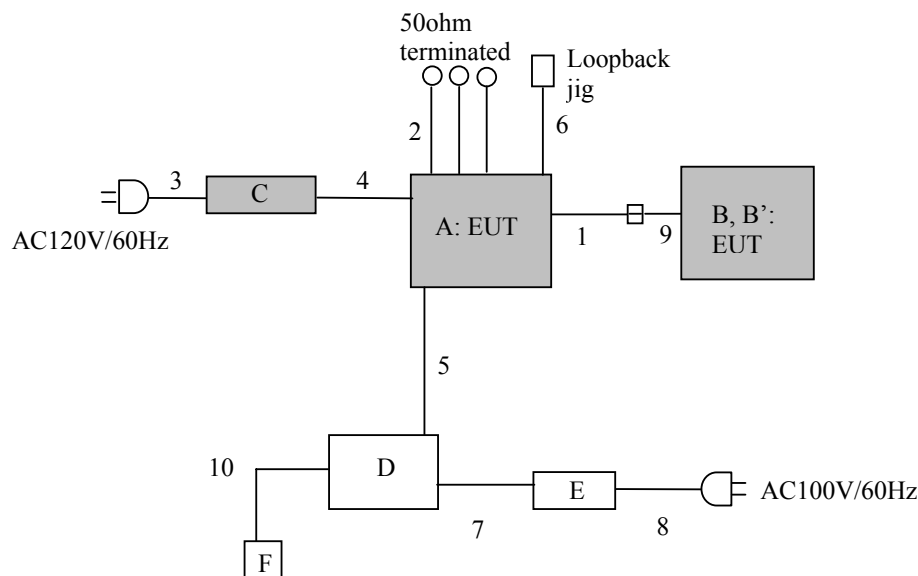
\* Note: Maximum Peak Output Power was tested in order to confirm the power level was within +/- 0.5dB compared to the result at the original model (FCC granted model). The test was performed by the maximum power mode based on user setting manual.

### **4.2 Configuration and peripherals**

According to the specification, there is no simultaneous transmitting and receiving mode even if all ports (4 ports) are filled (for transmitting and receiving from time division). Therefore, the test was performed with one antenna, and others ports were connected to cables or terminated in 50 ohm.

EUT can be set with any tags manufactured by the applicant, OMRON Corporation.  
 The test was performed with and without the tag (M/N: V740-D12P01, type: passive) preliminarily.  
 As the result of the pre-test, the formal test was performed without the tag, which has the maximum radiation.

There are two antennas: V740-HS03L and V740-HS03LA, and all the tests were performed with both of them.



\*The test configuration is set up in the actual usage, which is in the worst conditions of the noise level.

#### Description of EUT and Support equipment

| No. | Item              | Model number    | Serial number | Manufacturer    | FCC ID          |
|-----|-------------------|-----------------|---------------|-----------------|-----------------|
| A   | READER/WRITER     | V740-BA50C04-US | 05090007      | OMRON           | OZGV740-BA50CX4 |
| B   | ANTENNA           | V740-HS03LA     | 062002        | OMRON           | OZGV740-BA50CX4 |
| B'  | ANTENNA           | V740-HS03L      | 062001        | OMRON           | OZGV740-BA50CX4 |
| C   | AC ADAPTER        | SA190A-2438V-P  | 001           | Map Electronics | -               |
| D   | Personal Computer | FMV7NUHWC6      | R0501470      | Fujitsu         | -               |
| E   | AC Adapter        | CA01007-0720    | 002063288A    | Fujitsu         | -               |
| F   | Mouse             | PC-KM5220       | HCA13007653   | Hitachi         | JNZ201213       |

#### List of cables used

| No. | Name                         | Length (m) | Shield |
|-----|------------------------------|------------|--------|
| 1   | Antenna Cable: V740-A01-3.0M | 3.0        | Y      |
| 2   | Antenna Cable: V740-A01-3.0M | 3.0        | Y      |
| 3   | AC adapter cable(AC line)    | 1.8        | N      |
| 4   | AC adapter cable(DC line)    | 1.2        | N      |
| 5   | LAN Cable                    | 5.0        | Y      |
| 6   | RS232C Cable                 | 0.9        | Y      |
| 7   | AC adapter cable(DC line)    | 1.8        | N      |
| 8   | AC adapter cable(AC line)    | 2.0        | N      |
| 9   | Antenna Cable                | 0.5        | Y      |
| 10  | Mouse Cable                  | 1.8        | Y      |

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## **SECTION 5: Conducted Emission**

### **Test Procedure and conditions**

EUT was placed on a platform of nominal size, 1.5m by 0.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

#### For the tests on EUT with other peripherals (as a whole system)

I/O cable and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber or a Measurement Room.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

|                          |                                                  |
|--------------------------|--------------------------------------------------|
| <b>Detector</b>          | <b>: CISPR quasi-peak detector (IF BW 9 kHz)</b> |
| <b>Measurement range</b> | <b>: 0.15-30MHz</b>                              |
| <b>Test data</b>         | <b>: APPENDIX 3</b>                              |
| <b>Test result</b>       | <b>: Pass</b>                                    |

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## **SECTION 6: Spurious Emission**

### **[Radiated]**

#### **Test Procedure**

EUT was placed on a platform of nominal size, 1.5m by 0.5m, raised 80cm above the conducting ground plane. The Radiated Electric Field Strength intensity has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m(Below 10GHz).

The height of the measuring varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver or the Spectrum Analyzer.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

#### **20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.**

|                 |                                          |                                                        |
|-----------------|------------------------------------------|--------------------------------------------------------|
| Frequency       | Below 1GHz                               | Above 1GHz                                             |
| Instrument used | Spectrum Analyzer                        | Spectrum Analyzer                                      |
| Detector        | PK: RBW: 100kHz/ VBW: 300kHz             | PK: RBW:1MHz/VBW: 1MHz                                 |
| IF Bandwidth    | 20dBc : RBW: 100kHz<br>VBW: 300kHz (S/A) | AV: RBW:1MHz/VBW:10Hz<br>20dBc : RBW:100kHz/VBW:300kHz |

The test was performed on EUT in the normal use position.

Test data : APPENDIX 3

Test result : Pass

## **SECTION 7: Maximum Peak Output Power**

#### **Test Procedure**

The Maximum Peak Output Power was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3

Test result : Pass

## **SECTION 8: Dwell time**

#### **Test Procedure**

The Dwell time was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3

Test result : Pass

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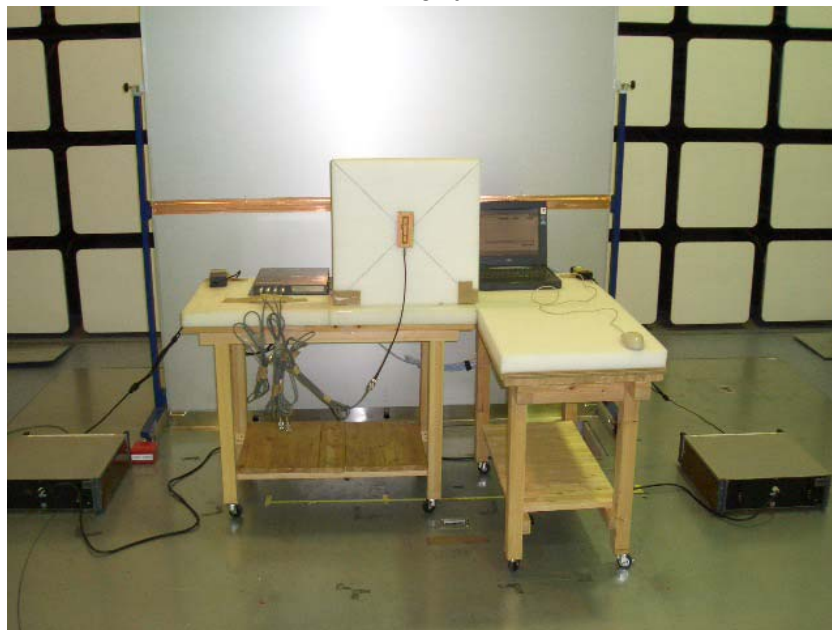
Facsimile : +81 596 24 8124

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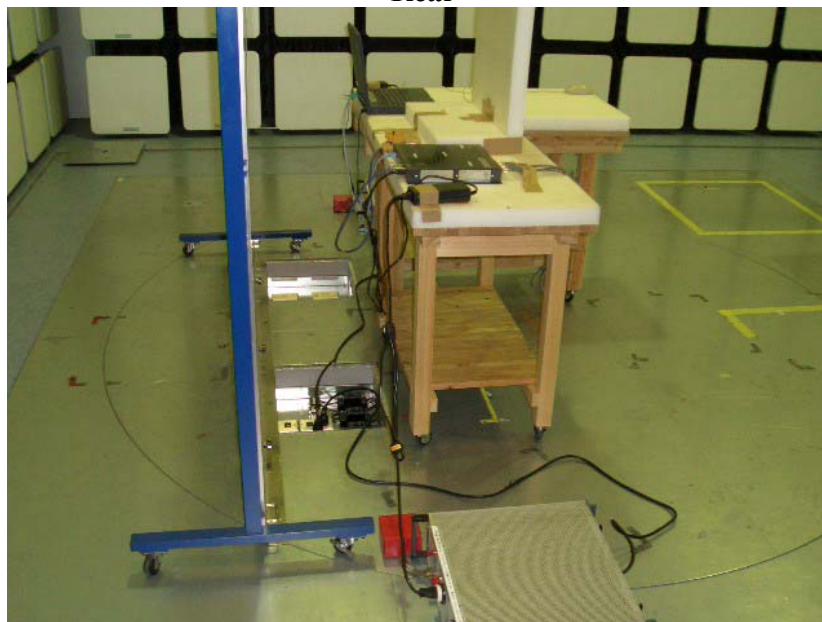
## **APPENDIX 1: Photographs of test setup**

### **Conducted Emission**

**Front**



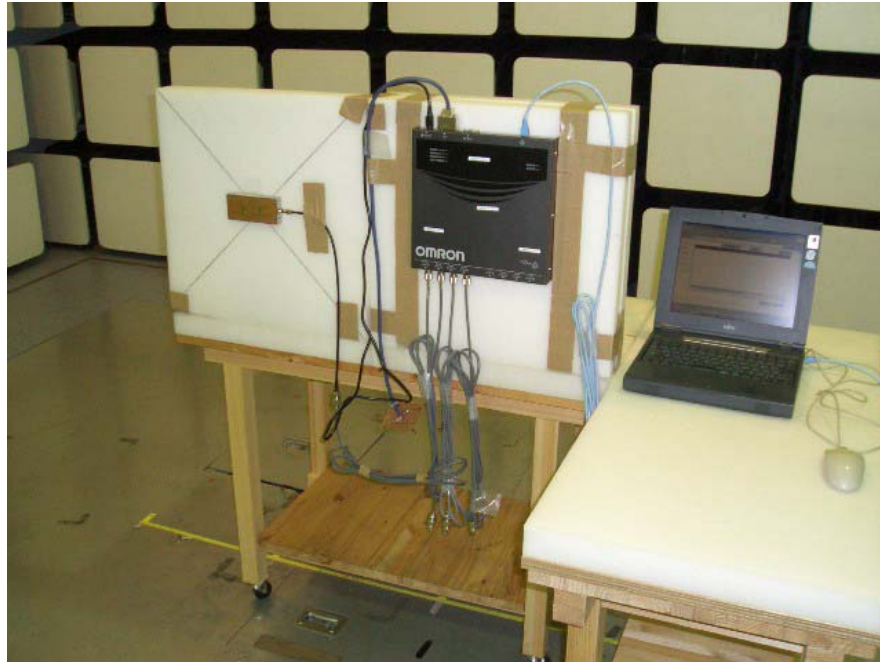
**Rear**



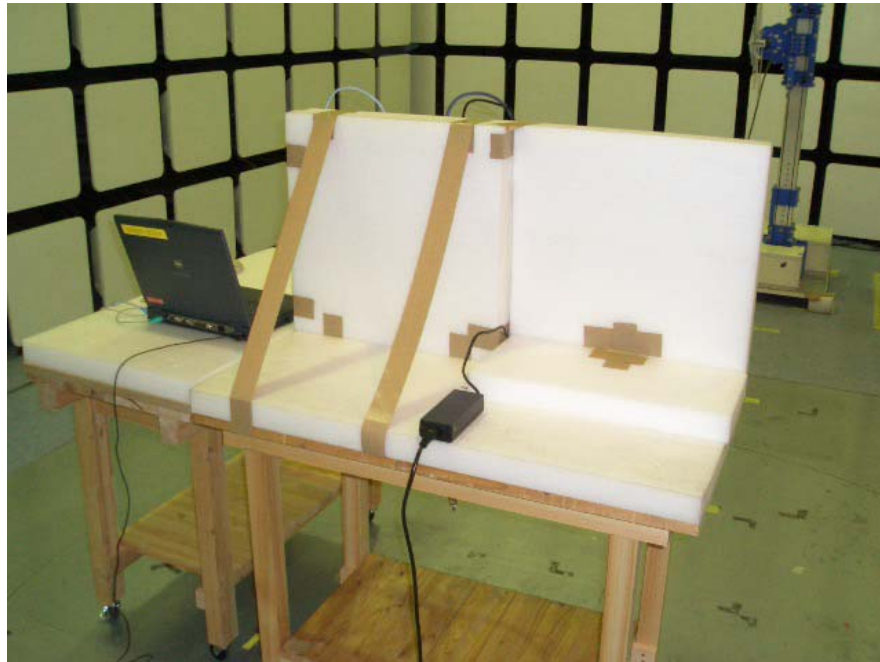
\*The test configuration is set up in the actual usage, which is in the worst conditions of the noise level.

### Spurious Emission (Radiated)

Front



Rear



\*The test configuration is set up in the actual usage, which is in the worst conditions of the noise level.

**Worst Case Position (Horizontal: X-axis/ Vertical:Y-axis)**

**X-axis**



**Y-axis**



**Z-axis**



## **APPENDIX 2:Test instruments**

### **EMI test equipment**

| Control No. | Instrument                    | Manufacturer     | Model No                 | Test Item    | Calibration Date *<br>Interval(month) |
|-------------|-------------------------------|------------------|--------------------------|--------------|---------------------------------------|
| MAEC-02     | Anechoic Chamber              | TDK              | Semi Anechoic Chamber 3m | RE/CE        | 2005/04/11 * 12                       |
| MRENT-23    | Spectrum Analyzer             | Advantest        | R3273                    | CE / RE/ AT  | 2006/01/10 * 12                       |
| MCC-10      | Coaxial cable                 | Storm            | 90-195-394               | RE           | 2005/03/24 * 12                       |
| MCC-16      | Microwave Cable 1G-26.5GHz    | Suhner           | SUCOFLEX 104             | RE           | 2006/02/02 * 12                       |
| MPA-10      | Pre Amplifier                 | Agilent          | 8449B                    | RE           | 2005/09/07 * 12                       |
| MHF-03      | High pass Filter              | Mini-Circuit     | VHF-1320                 | RE           | 2005/12/09 * 12                       |
| MHF-04      | High Pass Filter              | Mini-Circuit     | VHF-1200                 | RE           | 2005/12/09 * 12                       |
| MHA-06      | Horn Antenna                  | Schwarzbeck      | BBHA9120D                | RE           | 2006/01/09 * 12                       |
| MCC-13      | Coaxial Cable                 | Fujikura/Agilent | -                        | CE           | 2005/02/24 * 12                       |
| MTR-02      | Test Receiver                 | Rohde & Schwarz  | ESCS30                   | RE/CE        | 2006/02/02 * 12                       |
| MLS-06      | LISN(AMN)                     | Schwarzbeck      | NSLK8127                 | CE (EUT)     | 2006/02/06 * 12                       |
| MLS-07      | LISN(AMN)                     | Schwarzbeck      | NSLK8127                 | CE (AE)      | 2006/02/06 * 12                       |
| MTA-05      | Termination                   | MCL              | NTRM-50                  | CE           | 2006/02/06 * 12                       |
| MAT-16      | Attenuator(40dB)_9k-12.4GHz N | Weinschel Corp   | MODEL 1                  | AT           | 2006/01/10 * 12                       |
| MBA-02      | Biconical Antenna             | Schwarzbeck      | BBA9106                  | RE           | 2005/10/10 * 12                       |
| MLA-02      | Logperiodic Antenna           | Schwarzbeck      | USLP9143                 | RE           | 2005/10/14 * 12                       |
| MCC-12      | Coaxial Cable                 | Fujikura/Agilent | -                        | RE           | 2005/02/24 * 12                       |
| MAT-07      | Attenuator(6dB)               | Weinschel Corp   | 2                        | RE           | 2005/12/16 * 12                       |
| MPA-09      | Pre Amplifier                 | Agilent          | 8447D                    | RE           | 2005/09/07 * 12                       |
| MOS-02      | Digital Humidity Indicator    | N.T              | NT-1800                  | CE / RE / AT | 2004/11/25 * 24                       |
| MSA-06      | Spectrum Analyzer             | Agilent          | E4408B                   | AT           | 2006/03/25 * 12                       |

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item:

CE: Conducted emission.

RE: Radiated emission.

AT: Except for CE and RE

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### APPENDIX 3: Data of EMI test

#### Conducted Emission (Antenna:V740-HS03L)

##### DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber  
Date : 2006/02/21 03:43:03

Applicant : OMRON Corporation  
Kind of EUT : Radio Identification System  
Model No. : V740-BA50C04-US+V740-HS03L  
Serial No. : 05090007/062001

Report No. : 26FE0177-HD  
Power : AC120V/60Hz  
Temp./Humi. : 24deg. C / 31%  
Operator : Mitsuru Fujimura

Mode / Remarks : Tx ch1 902.726MHz

LIMIT : FCC15C §15.207 (QP)  
FCC15C §15.207 (AV)

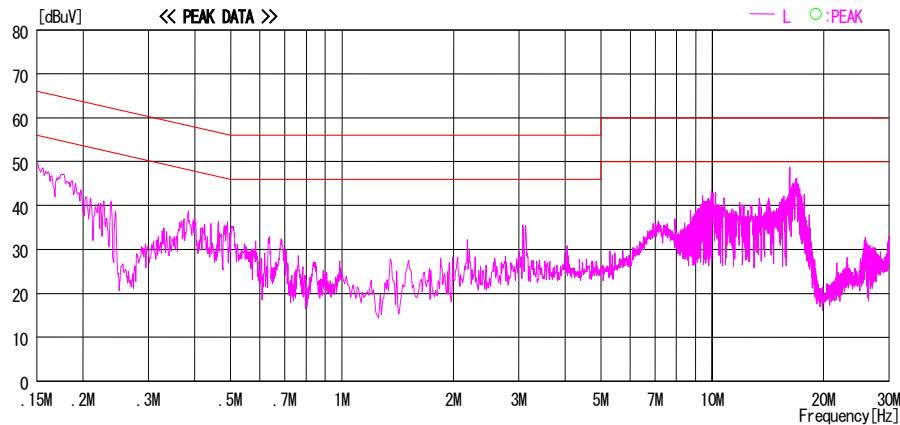
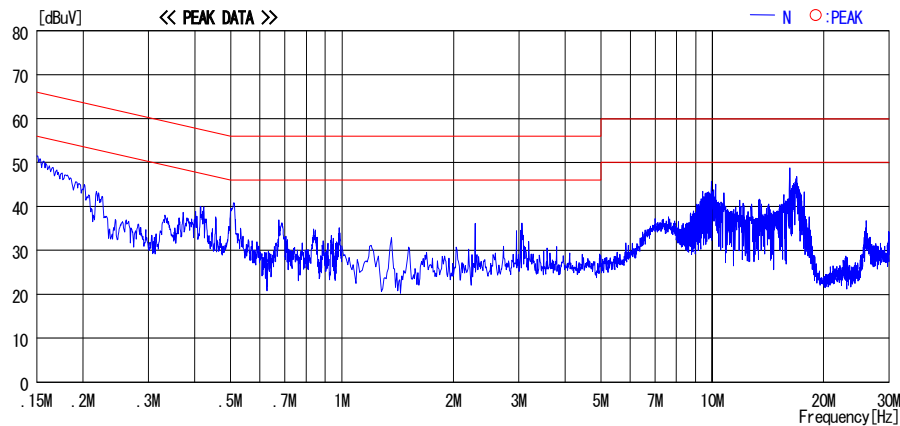


CHART: WITH FACTOR Peak hold data Data is uncorrected. CALCULATION: RESULT=READING+C.F (LISN LOSS+CABLE LOSS)  
Except for the above table : adequate margin data below the limits.

**Conducted Emission**  
**(Antenna:V740-HS03L)**

**DATA OF CONDUCTED EMISSION TEST**

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber  
Date : 2006/02/21 03:47:53

Applicant : OMRON Corporation  
Kind of EUT : Radio Identification System  
Model No. : V740-BA50C04-US+V740-HS03L  
Serial No. : 05090007/062001

Report No. : 26FE0177-HO  
Power : AC120V/60Hz  
Temp./Humi. : 24deg. C / 31%  
Operator : Mitsuru Fujimura

Mode / Remarks : Tx ch25 914.773MHz

LIMIT : FCC15C §15.207 (QP)  
FCC15C §15.207 (AV)

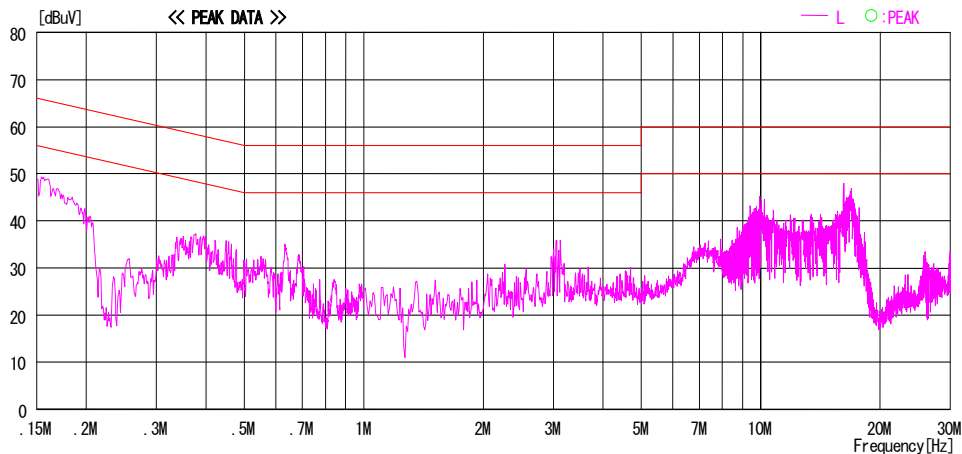
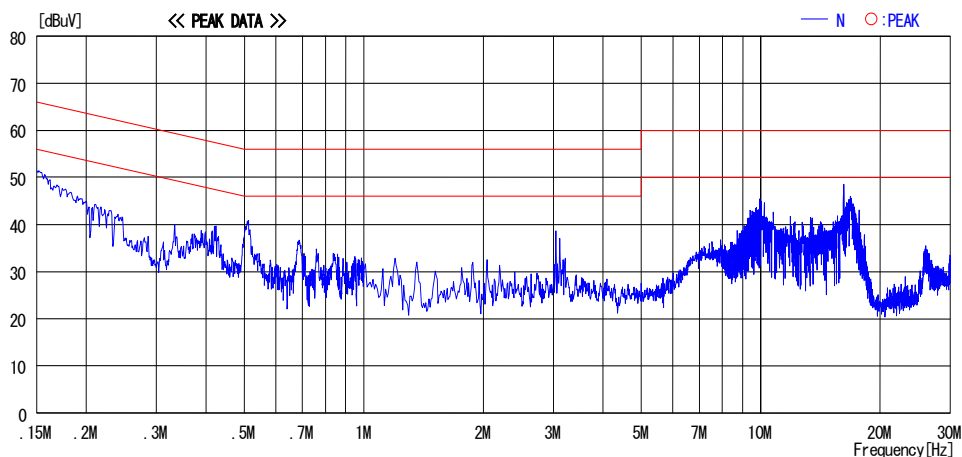


CHART:WITH FACTOR,Peak hold data,Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)  
Except for the above table : adequate margin data below the limits.

**Conducted Emission**  
**(Antenna:V740-HS03L)**

**DATA OF CONDUCTED EMISSION TEST**

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber  
Date : 2006/02/21 03:51:17

Applicant : OMRON Corporation  
Kind of EUT : Radio Identification System  
Model No. : V740-BA50C04-US+V740-HS03L  
Serial No. : 05090007/062001

Report No. : 26FE0177-HO  
Power : AC120V/60Hz  
Temp./Humi. : 24deg. C / 31%  
Operator : Mitsuru Fujimura

Mode / Remarks : Tx ch50 927.322MHz

LIMIT : FCC15C §15.207 (OP)  
FCC15C §15.207 (AV)

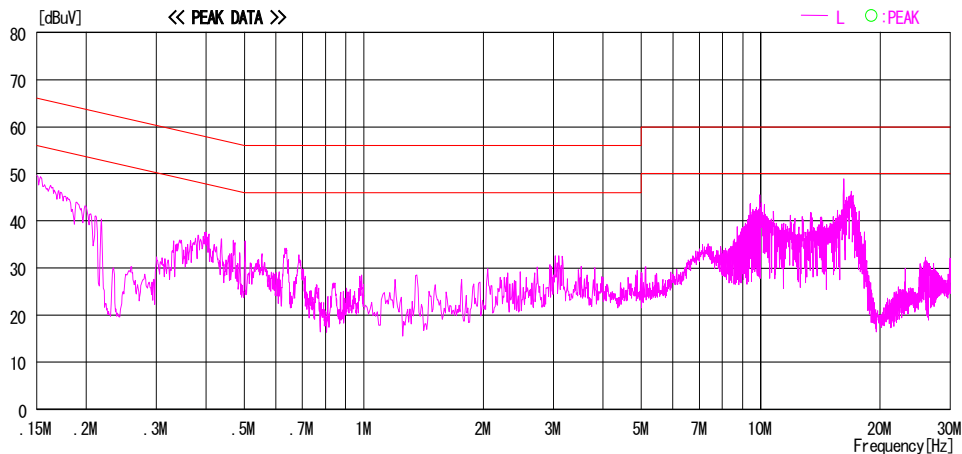
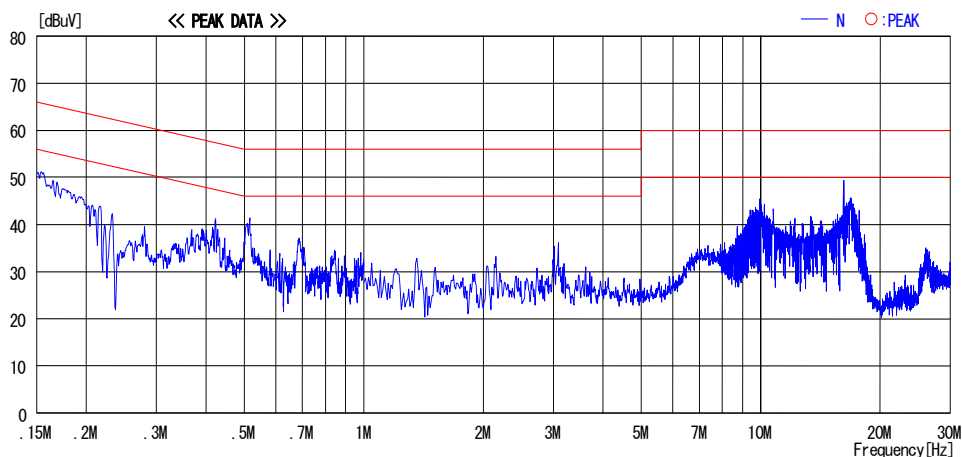


CHART:WITH FACTOR,Peak hold data,Data is uncorrected. CALCURATION:RESULT=READING+C.F (LISN LOSS+CABLE LOSS)  
Except for the above table : adequate margin data below the limits.

**Conducted Emission**  
**(Antenna:V740-HS03LA)**

**DATA OF CONDUCTED EMISSION TEST**

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber  
Date : 2006/02/21 04:00:33

Applicant : OMRON Corporation  
Kind of EUT : Radio Identification System  
Model No. : V740-BA50004-US+V740-HS03LA  
Serial No. : 05090007/062002

Report No. : 26FE0177-HO  
Power : AC120V/60Hz  
Temp./Humi. : 24deg.C / 31%  
Operator : Mitsuru Fujimura

Mode / Remarks : Tx ch1 902.726MHz

LIMIT : FCC15C §15.207 (QP)  
FCC15C §15.207 (AV)

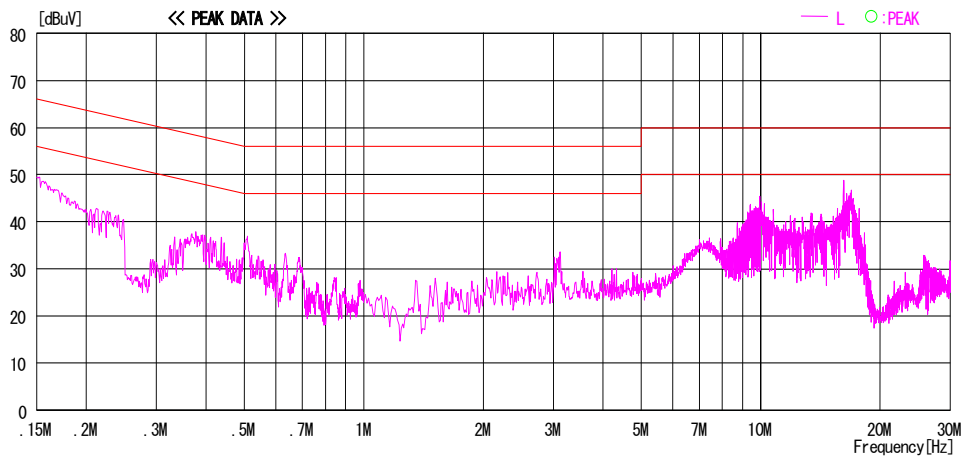
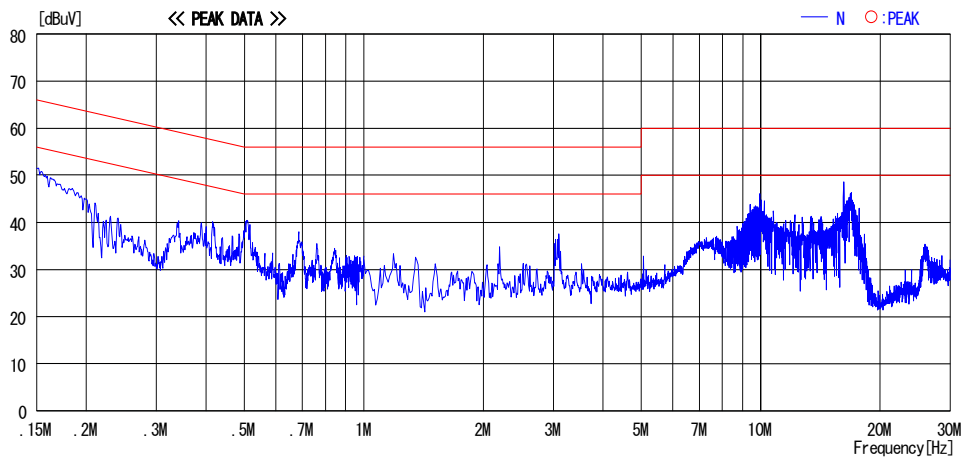


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)  
Except for the above table : adequate margin data below the limits.

**Conducted Emission**  
**(Antenna:V740-HS03LA)**

**DATA OF CONDUCTED EMISSION TEST**

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber  
Date : 2006/02/21 04:04:34

Applicant : OMRON Corporation  
Kind of EUT : Radio Identification System  
Model No. : V740-BA50C04-US+V740-HS03LA  
Serial No. : 05090007/062002

Report No. : 26FE0177-HO  
Power : AC120V/60Hz  
Temp./Humi. : 24deg. C / 31%  
Operator : Mitsuru Fujimura

Mode / Remarks : Tx ch25 914.773MHz

LIMIT : FCC15C §15.207 (QP)  
FCC15C §15.207 (AV)

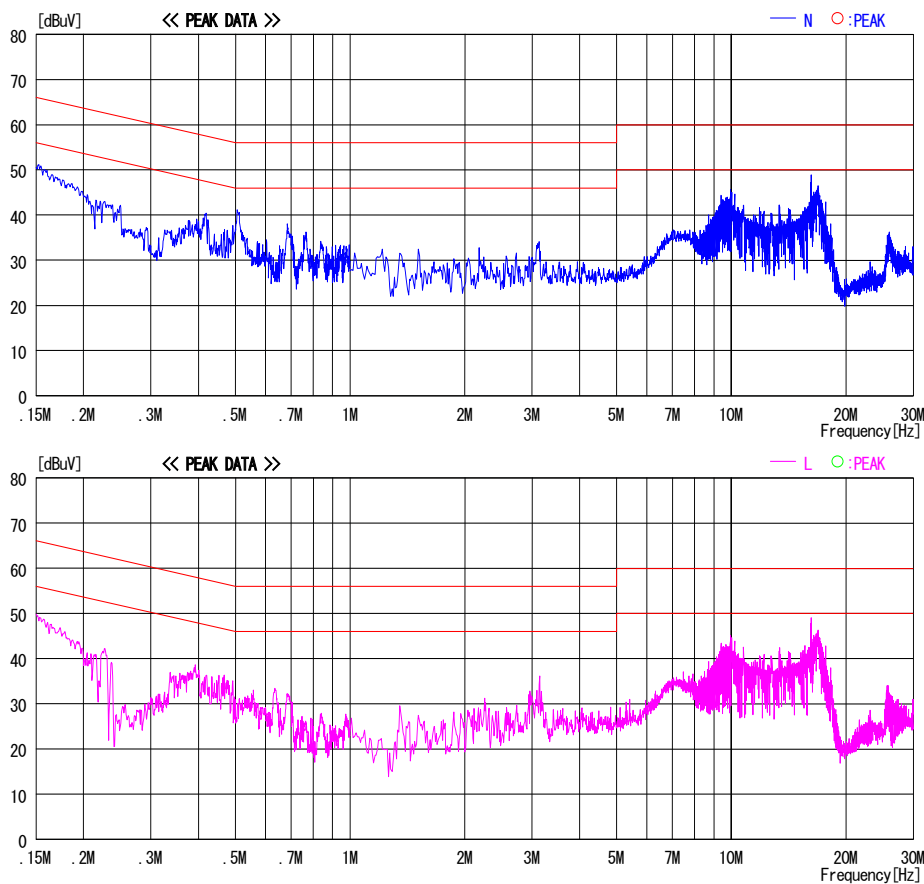


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F (LISN LOSS+CABLE LOSS)  
Except for the above table : adequate margin data below the limits.

**Conducted Emission**  
**(Antenna:V740-HS03LA)**

**DATA OF CONDUCTED EMISSION TEST**

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber  
Date : 2006/02/21 04:08:45

Applicant : OMRON Corporation  
Kind of EUT : Radio Identification System  
Model No. : V740-BA50C04-US-V740-HS03LA  
Serial No. : 05090007/062002

Report No. : 26FE0177-H0  
Power : AC120V/60Hz  
Temp./Humi. : 24deg.C / 31%  
Operator : Mitsuru Fujimura

Mode / Remarks : Tx ch50 927.322MHz

LIMIT : FCC15C §15.207 (QP)  
FCC15C §15.207 (AV)

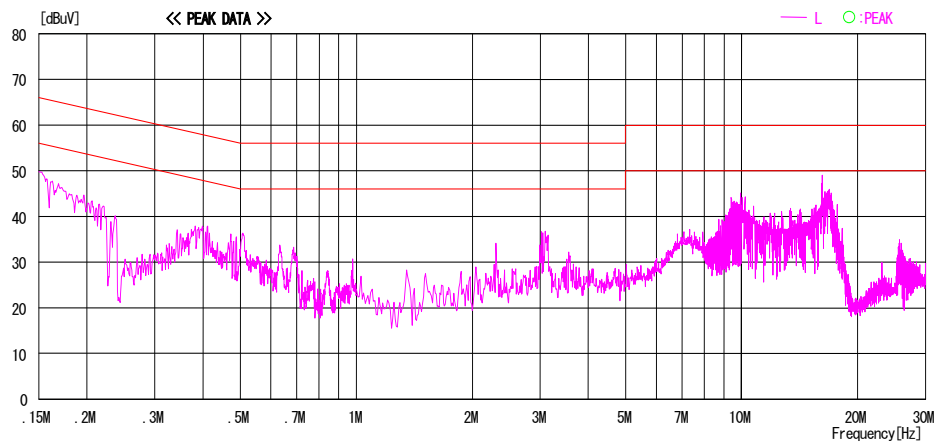
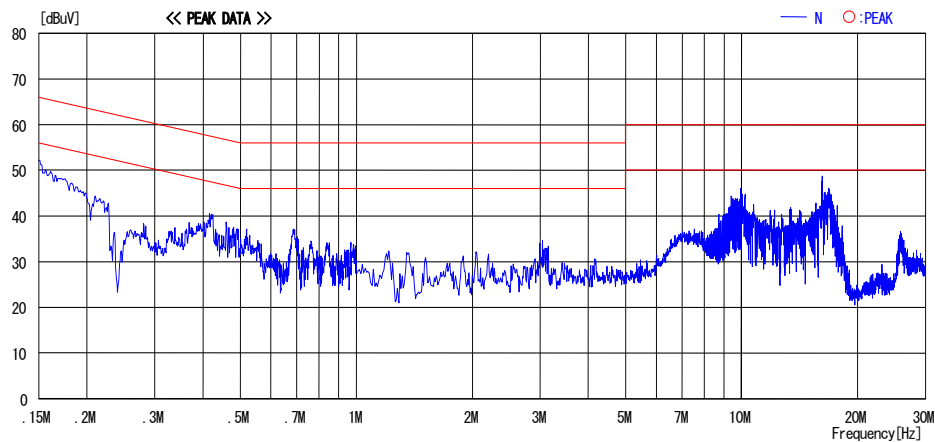


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALOURATION:RESULT-READING+C.F(L:ISN LOSS+CABLE LOSS)  
Except for the above table : adequate margin data below the limits.

Test report No. : 26FE0177-HOa  
Page : 22 of 37  
Issued date : March 6, 2006  
Revised date : March 29, 2006  
FCC ID : OZGV740-BA50CX4

## Conducted Emission (Antenna:V740-HS03LA)

### DATA OF CONDUCTED EMISSION TEST

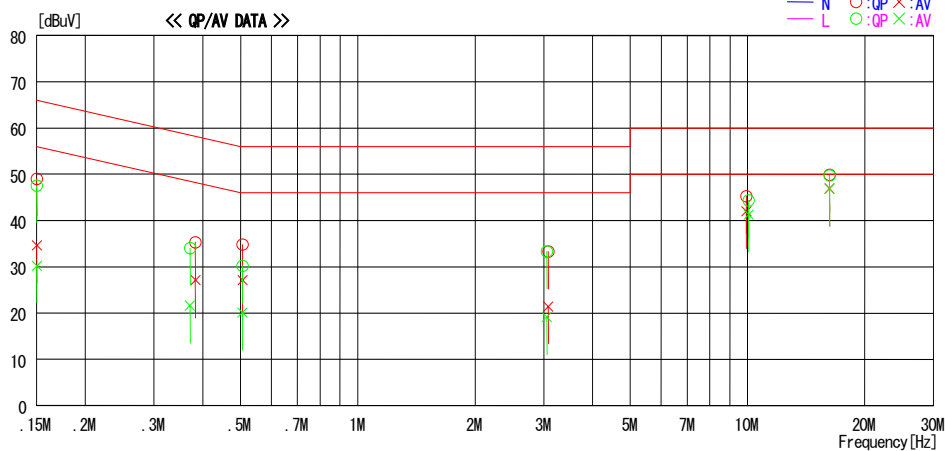
UL Apex Co., Ltd. Head Office EMC Lab. No. 2 Semi Anechoic Chamber  
Date : 2006/02/21 04:00:33

Applicant : OMRON Corporation  
Kind of EUT : Radio Identification System  
Model No. : V740-BA50C04-US+V740-HS03LA  
Serial No. : 05090007/062002

Report No. : 26FE0177-HO  
Power : AC120V/60Hz  
Temp./Humi. : 24deg. C / 31%  
Operator : Mitsuru Fujimura

Mode / Remarks : Tx ch1 902.726MHz

LIMIT : FCC15C §15.207 (QP)  
FCC15C §15.207 (AV)



| Frequency<br>[MHz] | Reading Level |              | Corr.<br>Factor | Results      |              | Limit        |              | Margin     |            | Phase |
|--------------------|---------------|--------------|-----------------|--------------|--------------|--------------|--------------|------------|------------|-------|
|                    | QP<br>[dBuV]  | AV<br>[dBuV] |                 | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dB] | AV<br>[dB] |       |
| 0.15000            | 49.0          | 34.5         | 0.1             | 49.1         | 34.6         | 66.0         | 56.0         | 16.9       | 21.4       | N     |
| 0.38347            | 35.2          | 27.0         | 0.1             | 35.3         | 27.1         | 58.2         | 48.2         | 22.9       | 21.1       | N     |
| 0.50626            | 34.7          | 27.0         | 0.1             | 34.8         | 27.1         | 56.0         | 46.0         | 21.2       | 18.9       | N     |
| 3.08180            | 32.7          | 20.8         | 0.6             | 33.3         | 21.4         | 56.0         | 46.0         | 22.7       | 24.6       | N     |
| 9.93834            | 44.0          | 40.7         | 1.3             | 45.3         | 42.0         | 60.0         | 50.0         | 14.7       | 8.0        | N     |
| 16.22702           | 48.1          | 45.1         | 1.8             | 49.9         | 46.9         | 60.0         | 50.0         | 10.1       | 3.1        | N     |
| 0.15000            | 47.4          | 30.1         | 0.1             | 47.5         | 30.2         | 66.0         | 56.0         | 18.5       | 25.8       | L     |
| 0.37137            | 33.9          | 21.5         | 0.1             | 34.0         | 21.6         | 58.5         | 48.5         | 24.5       | 26.9       | L     |
| 0.50539            | 30.1          | 20.0         | 0.1             | 30.2         | 20.1         | 56.0         | 46.0         | 25.8       | 25.9       | L     |
| 3.05260            | 32.7          | 18.5         | 0.6             | 33.3         | 19.1         | 56.0         | 46.0         | 22.7       | 26.9       | L     |
| 10.06100           | 43.1          | 40.0         | 1.3             | 44.4         | 41.3         | 60.0         | 50.0         | 15.6       | 8.7        | L     |
| 16.22836           | 48.0          | 45.1         | 1.8             | 49.8         | 46.9         | 60.0         | 50.0         | 10.2       | 3.1        | L     |

CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C.F (L1SN LOSS+CABLE LOSS)  
Except for the above table: adequate margin data below the limits.

UL Apex Co., Ltd.  
Head Office EMC Lab.  
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MF060b(01.06.05)

## Dwell time

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

|           |                               |             |                                       |
|-----------|-------------------------------|-------------|---------------------------------------|
| COMPANY   | : OMRON Corporation           | REPORT NO   | : 26FE0177-HO                         |
| EQUIPMENT | : RFID System                 | REGULATION  | : -                                   |
| MODEL     | : V740-BA50C04-US+V740-HS03LA | DATE        | : Feb 20 & Mar 25, 2006               |
| S/ N      | : 05090007/062002             | TEMPERATURE | : 24, 25deg.C                         |
| POWER     | : AC120V/60Hz                 | HUMIDITY    | : 32, 43%                             |
| MODE      | : Transmitting (Hopping On)   | ENGINEER    | : Mitsuru Fujimura<br>: Makoto Kosaka |

| times   | Number of Hoppings/<br>20sec | Length of transmission time<br>AV [msec] | Dwell time<br>[msec] | Result<br>[msec] | Limit<br>[msec] |
|---------|------------------------------|------------------------------------------|----------------------|------------------|-----------------|
| 1       | 18                           | * 16.97                                  | 18.0* 16.97          | 305.46           | 400             |
| 2       | 18                           |                                          |                      |                  |                 |
| 3       | 17                           |                                          |                      |                  |                 |
| 4       | 18                           |                                          |                      |                  |                 |
| 5       | 19                           |                                          |                      |                  |                 |
| Average | 18.0                         |                                          |                      |                  |                 |

### Dwell time factor

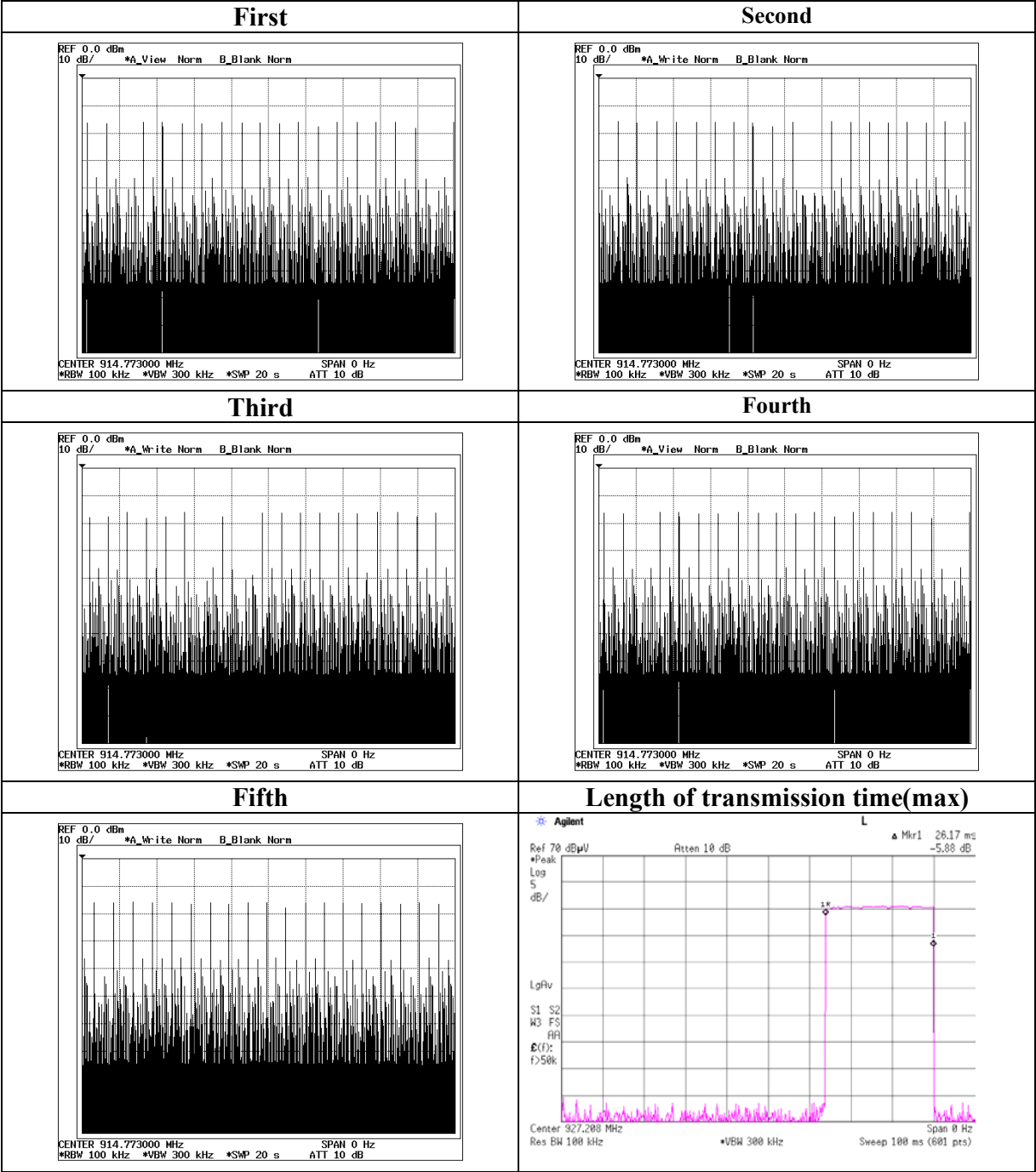
Dwell time factor =  $20\log_{10}(\text{dwell time}/100\text{ms})$

= $20\log_{10}(26.17\text{ms}/100\text{ms})$

=-11.64

\*Remarks: Length of transmission time of the EUT randomly varies from the minimum, 1.75 msec to the maximum, 26.17 msec.  
Therefore, 120 Data sampling (for about 2 minutes) was taken, and the average value was used as the length of transmission time.

Dwell time



### Maximum Peak Output Power

COMPANY : OMRON Corporation  
EQUIPMENT : RFID System  
MODEL : V740-BA50C04-US  
SAMPLE No. : 05090007  
POWER : AC120V/60Hz  
Mode : Transmitting (Hopping Off)

REPORT NO : 26FE0177-HO  
REGULATION : FCC Part 15C 15.247(b)(2)  
TEST DISTANCE : -  
DATE : Feb 20, 2006  
Temperature : 25deg.C  
Humidity : 31%  
ENGINEER : Makoto Kosaka

#### AC120V/60Hz 100%

| CH   | FREQ<br>[MHz] | S/A Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Attn<br>[dB] | Result<br>[dBm] | Limit<br>[1.0W]<br>[dBm] |
|------|---------------|----------------------|-----------------------|--------------|-----------------|--------------------------|
| Low  | 902.73        | -10.22               | 0.00                  | 40.00        | 29.78           | 30.00                    |
| Mid  | 914.77        | -10.33               | 0.00                  | 40.00        | 29.67           | 30.00                    |
| High | 927.32        | -10.59               | 0.00                  | 40.00        | 29.41           | 30.00                    |

#### \*Reference: Original Application, AC120V/60Hz 100%

| CH   | FREQ<br>[MHz] | S/A Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Attn<br>[dB] | Result<br>[dBm] | Limit<br>[1.0W]<br>[dBm] |
|------|---------------|----------------------|-----------------------|--------------|-----------------|--------------------------|
| Low  | 902.73        | -10.15               | 0.00                  | 40.00        | 29.85           | 30.00                    |
| Mid  | 914.77        | -10.14               | 0.00                  | 40.00        | 29.86           | 30.00                    |
| High | 927.32        | -10.50               | 0.00                  | 40.00        | 29.50           | 30.00                    |

Sample Calculation:

Result = S/A Reading + Cable loss + Attenuator

Used Equipment: MAT-16, MRENT-23

\*The result value was calculated with "particular connector + OMRON special cable" terminal.

<The specification of OMRON special cable>

Model Name: V740-A01-3.0M

Cable Loss: 1.5dB

**UL Apex Co., Ltd.**

**Head Office EMC Lab.**

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MF060b(01.06.05)

**Radiated Spurious Emission**  
**(Antenna:V740-HS03L)**

\* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

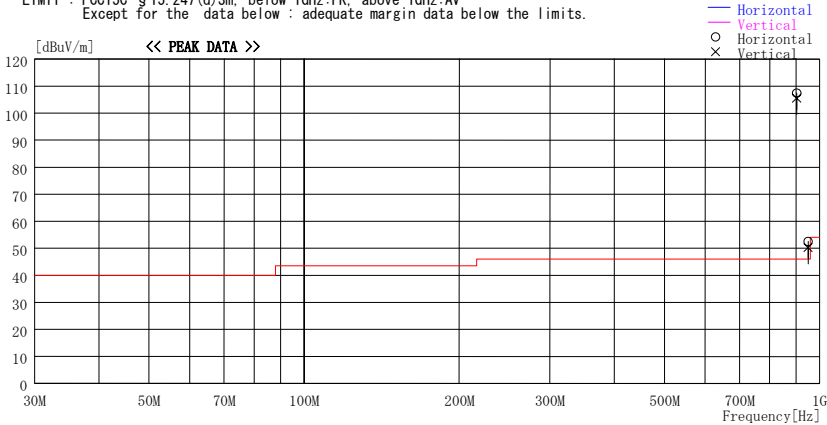
**DATA OF RADIATED EMISSION TEST**

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : OMRON Corporation  
Kind of EUT : Radio Identification System  
Model No. : V740-BA50C04-US+V740-HS03L  
Serial No. : 05090007/062001  
Report No. : 26FE0177-HO  
Power : AC120V/60Hz (DC24V)  
Temp./Humi. : 25deg. C. / 31%  
Operator : Makoto Kosaka

Mode / Remarks : Tx ch1 902.726MHz X-axis(Hor) Y-axis(Ver)without Tag worst S/A RBW100kHz VBW300kHz

LIMIT : FCC15C §15.247(d)3m, below 1GHz:PK, above 1GHz:AV  
Except for the data below : adequate margin data below the limits.



| Frequency<br>[MHz] | Reading<br>[dBuV] | DET | Antenna          | Lossk        | Level<br>[dBuV/m] | Angle<br>[Deg] | Height<br>[cm] | Polar. | Limit<br>[dBuV/m] | Margin<br>[dB] | Comment |
|--------------------|-------------------|-----|------------------|--------------|-------------------|----------------|----------------|--------|-------------------|----------------|---------|
|                    |                   |     | Factor<br>[dB/m] | Gain<br>[dB] |                   |                |                |        |                   |                |         |
| 902.716            | 104.2             | PK  | 20.9             | -17.7        | 107.4             | 315            | 130            | Hori.  |                   |                | Fund    |
| 902.716            | 102.3             | PK  | 20.9             | -17.7        | 105.5             | 29             | 100            | Vert.  |                   |                | Fund    |
| 950.020            | 47.5              | PK  | 22.4             | -17.4        | 52.5              | 24             | 130            | Hori.  |                   |                | 20dBc   |
| 950.020            | 45.2              | PK  | 22.4             | -17.4        | 50.2              | 2              | 100            | Vert.  |                   |                | 20dBc   |

CHART:WITH FACTOR ANT TYPE : ~30MHz LOOP, 30~300MHz BICONICAL, 300MHz~1000MHz LOGPERIODIC, 1000MHz~ HORN  
CALCULATION:RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.

**Radiated Spurious Emission**  
**(Antenna:V740-HS03L)**

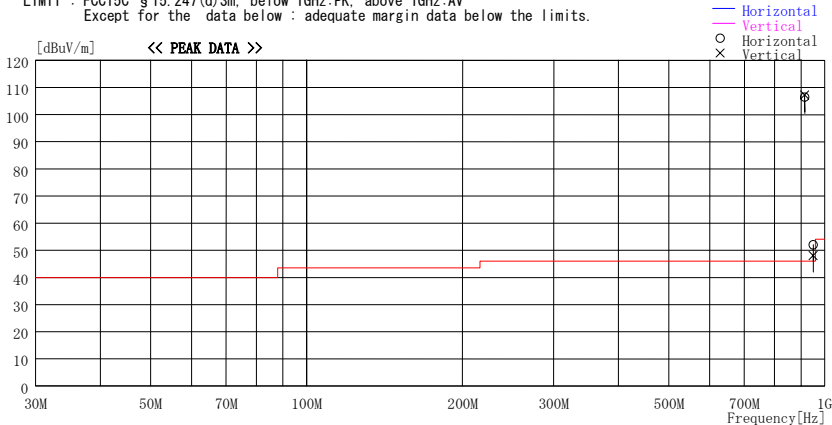
\* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

**DATA OF RADIATED EMISSION TEST**

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : OMRON Corporation  
Kind of EUT : Radio Identification System  
Model No. : V740-BA50C04-US+V740-HS03L  
Serial No. : 05090007/062001  
Report No. : 26FE0177-HO  
Power : AC120V/60Hz (DC24V)  
Temp./Humi. : 25deg.C / 31%  
Operator : Makoto Kosaka  
Mode / Remarks : Tx ch25 914.770MHz X-axis(Hor) Y-axis(Ver)without Tag worst S/A RBW100kHz VBW300kHz

LIMIT : FCC15C §15.247(d)3m, below 1GHz:PK, above 1GHz:AV  
Except for the data below : adequate margin data below the limits.



| Frequency<br>[MHz] | Reading<br>[dBuV] | DET | Antenna          | Loss&        | Level<br>[dBuV/m] | Angle<br>[Deg] | Height<br>[cm] | Polar. | Limit<br>[dBuV/m] | Margin<br>[dB] | Comment |
|--------------------|-------------------|-----|------------------|--------------|-------------------|----------------|----------------|--------|-------------------|----------------|---------|
|                    |                   |     | Factor<br>[dB/m] | Gain<br>[dB] |                   |                |                |        |                   |                |         |
| 914.717            | 102.6             | PK  | 21.3             | -17.4        | 106.5             | 33             | 127            | Hori.  |                   |                | Fund    |
| 914.717            | 103.3             | PK  | 21.3             | -17.4        | 107.2             | 28             | 100            | Vert.  |                   |                | Fund    |
| 950.020            | 47.0              | PK  | 22.4             | -17.4        | 52.0              | 337            | 125            | Hori.  |                   |                | 20dBc   |
| 950.020            | 43.0              | PK  | 22.4             | -17.4        | 48.0              | 1              | 100            | Vert.  |                   |                | 20dBc   |

CHART:WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN  
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.

## Radiated Spurious Emission (Antenna:V740-HS03L)

\* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

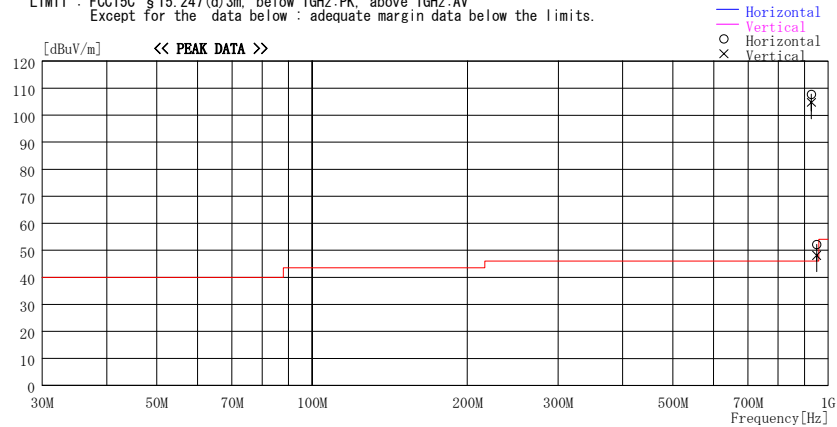
### DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : OMRON Corporation Report No. : 26FE0177-H0  
Kind of EUT : Radio Identification System Power : AC120V/60Hz (DC24V)  
Model No. : V740-BA50C04-US+V740-HS03L Temp./Humi. : 25deg.C. / 31%  
Serial No. : 05090007/062001 Operator : Makoto Kosaka

Mode / Remarks : Tx ch50 927.322MHz X-axis(Hor) Y-axis(Ver)without Tag worst S/A RBW100kHz VBW300kHz

LIMIT : FCC15C §15.247(d)3m, below 1GHz:PK, above 1GHz:AV  
Except for the data below : adequate margin data below the limits.



| Frequency<br>[MHz] | Reading<br>[dBuV] | DET | Antenna          | Lossk        | Level<br>[dBuV/m] | Angle<br>[Deg] | Height<br>[cm] | Polar. | Limit<br>[dBuV/m] | Margin<br>[dB] | Comment |
|--------------------|-------------------|-----|------------------|--------------|-------------------|----------------|----------------|--------|-------------------|----------------|---------|
|                    |                   |     | Factor<br>[dB/m] | Gain<br>[dB] |                   |                |                |        |                   |                |         |
| 927.317            | 103.2             | PK  | 21.7             | -17.3        | 107.6             | 23             | 126            | Hori.  |                   |                | Fund    |
| 927.317            | 100.3             | PK  | 21.7             | -17.3        | 104.7             | 25             | 100            | Vert.  |                   |                | Fund    |
| 950.020            | 47.1              | PK  | 22.4             | -17.4        | 52.1              | 72             | 116            | Hori.  |                   |                | 20dBc   |
| 950.020            | 43.1              | PK  | 22.4             | -17.4        | 48.1              | 2              | 100            | Vert.  |                   |                | 20dBc   |

CHART:WITH FACTOR ANT TYPE : ~30MHz LOOP, 30~300MHz BICONICAL, 300MHz~1000MHz LOGPERIODIC, 1000MHz~ HORN  
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.

**Radiated Spurious Emission**  
**(Antenna:V740-HS03LA)**

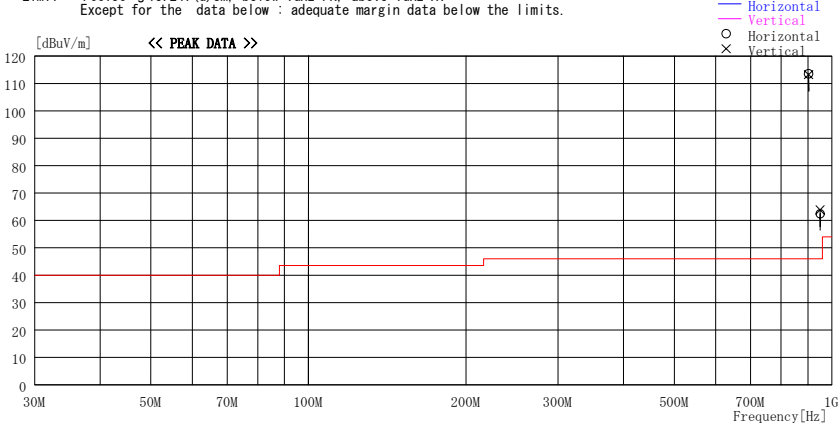
\* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

**DATA OF RADIATED EMISSION TEST**

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : OMRON Corporation  
Kind of EUT : Radio Identification System  
Model No. : V740-BA50C04-US+V740-HS03LA  
Serial No. : 05090007/062002  
Report No. : 26FE0177-H0  
Power : AC120V/60Hz (DC24V)  
Temp./Humi. : 25deg. C. / 31%  
Operator : Makoto Kosaka  
Mode / Remarks : Tx ch1 902.726MHz X-axis(Hor) Y-axis(Ver)without Tag worst S/A RBW100kHz VBW300kHz

LIMIT : FCC15C §15.247(d)3m, below 1GHz:PK, above 1GHz:AV  
Except for the data below : adequate margin data below the limits.



| Frequency | Reading | DET | Antenna |       | Level    | Angle | Height | Polar. | Limit    | Margin | Comment |
|-----------|---------|-----|---------|-------|----------|-------|--------|--------|----------|--------|---------|
|           |         |     | Factor  | Loss  |          |       |        |        |          |        |         |
| [MHz]     | [dBuV]  |     | [dB/m]  | [dB]  | [dBuV/m] | [deg] | [cm]   |        | [dBuV/m] | [dB]   |         |
| 902.716   | 110.3   | PK  | 20.9    | -17.7 | 113.5    | 335   | 127    | Hori.  |          |        | Fund    |
| 902.716   | 110.0   | PK  | 20.9    | -17.7 | 113.2    | 1     | 100    | Vert.  |          |        | Fund    |
| 950.021   | 57.4    | PK  | 22.4    | -17.4 | 62.4     | 335   | 127    | Hori.  |          |        | 20dBc   |
| 950.021   | 58.8    | PK  | 22.4    | -17.4 | 63.8     | 5     | 100    | Vert.  |          |        | 20dBc   |

CHART:WITH FACTOR ANT TYPE : ~30MHz LOOP, 30~300MHz BICONICAL, 300MHz~1000MHz LOGPERIODIC, 1000MHz~ HORN  
CALCULATION:RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN. ) - GAIN (AMP)

20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.

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FCC ID : OZGV740-BA50CX4

## Radiated Spurious Emission (Antenna:V740-HS03LA)

\* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

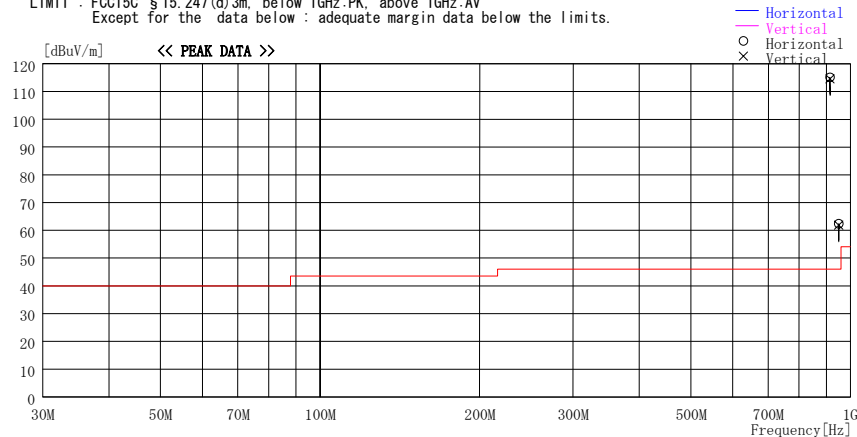
### DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No. 2 Semi Anechoic Chamber

Company : OMRON Corporation Report No. : 26FE0177-H0  
Kind of EUT : Radio Identification System Power : AC120V/60Hz (DC24V)  
Model No. : V740-BA50C04-US+V740-HS03LA Temp./Humi. : 25deg. C. / 31%  
Serial No. : 05090007/062002 Operator : Makoto Kosaka

Mode / Remarks : Tx ch25 914.770MHz X-axis(Hor) Y-axis(Ver)without Tag worst S/A RBW100kHz VBW300kHz

LIMIT : FCC15C §15.247(d)3m, below 1GHz:PK, above 1GHz:AV  
Except for the data below : adequate margin data below the limits.



| Frequency | Reading | DET | Antenna Factor | Loss& Gain | Level    | Angle | Height | Polar. | Limit    | Margin | Comment |
|-----------|---------|-----|----------------|------------|----------|-------|--------|--------|----------|--------|---------|
| [MHz]     | [dBuV]  |     | [dB/m]         | [dB]       | [dBuV/m] | [Deg] | [cm]   |        | [dBuV/m] | [dB]   |         |
| 914.717   | 111.1   | PK  | 21.3           | -17.4      | 115.0    | 20    | 127    | Hori.  |          |        | Fund    |
| 914.717   | 110.6   | PK  | 21.3           | -17.4      | 114.5    | 36    | 100    | Vert.  |          |        | Fund    |
| 950.020   | 57.3    | PK  | 22.4           | -17.4      | 62.3     | 1     | 120    | Hori.  |          |        | 20dBc   |
| 950.020   | 56.9    | PK  | 22.4           | -17.4      | 61.9     | 36    | 100    | Vert.  |          |        | 20dBc   |

CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.

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Revised date : March 29, 2006  
FCC ID : OZGV740-BA50CX4

## Radiated Spurious Emission (Antenna:V740-HS03LA)

\* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

### DATA OF RADIATED EMISSION TEST

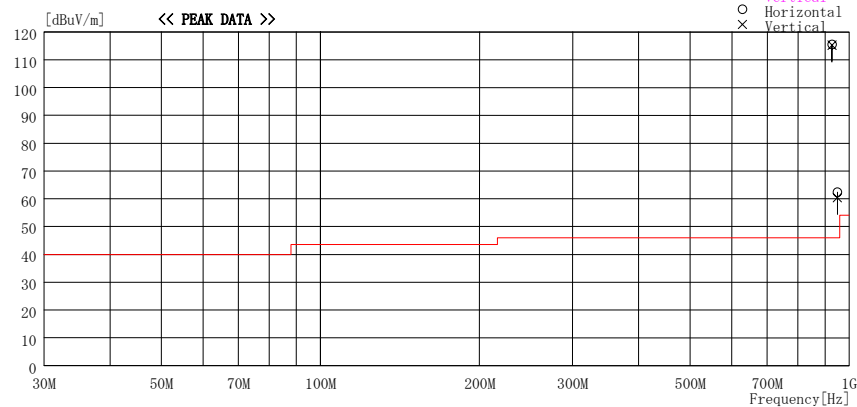
UL Apex Co., Ltd. Head Office EMC Lab. No. 2 Semi Anechoic Chamber

Company : OMRON Corporation  
Kind of EUT : Radio Identification System  
Model No. : V740-BA50C04-US+V740-HS03LA  
Serial No. : 05090007/062002

Report No. : 26FE0177-H0  
Power : AC120V/60Hz (DC24V)  
Temp./Humi. : 25deg. C. / 31%  
Operator : Makoto Kosaka

Mode / Remarks : Tx ch50 927.322MHz X-axis(Hor) Y-axis(Ver)without Tag worst S/A RBW100kHz VBW300kHz

LIMIT : FCC15C § 15.247(d)3m, below 1GHz:PK, above 1GHz:AV  
Except for the data below : adequate margin data below the limits.



| Frequency | Reading | DET | Antenna Factor | Loss & Gain | Level    | Angle | Height | Polar. | Limit    | Margin | Comment |
|-----------|---------|-----|----------------|-------------|----------|-------|--------|--------|----------|--------|---------|
| [MHz]     | [dBuV]  |     | [dB/m]         | [dB]        | [dBuV/m] | [Deg] | [cm]   |        | [dBuV/m] | [dB]   |         |
| 927.317   | 111.1   | PK  | 21.7           | -17.3       | 115.5    | 7     | 120    | Hori.  |          |        | Fund    |
| 927.317   | 110.8   | PK  | 21.7           | -17.3       | 115.2    | 28    | 100    | Vert.  |          |        | Fund    |
| 950.020   | 57.3    | PK  | 22.4           | -17.4       | 62.3     | 1     | 120    | Hori.  |          |        | 20dBc   |
| 950.020   | 55.4    | PK  | 22.4           | -17.4       | 60.4     | 5     | 150    | Vert.  |          |        | 20dBc   |

CHART:WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN  
CALCULATION:RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.

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Revised date : March 29, 2006  
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## **Radiated Spurious Emission** **(Antenna:V740-HS03L)**

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : OMRON Corporation  
EQUIPMENT : RFID System  
MODEL : V740-BA50C04-US+V740-HS03L  
SAMPLE No. : 05090007/062001  
POWER : AC120V/60Hz  
Mode : Transmitting (ch 1: 902.726MHz)

REPORT NO : 26FE0177-HO  
REGULATION : FCC Part 15C 15.247(d)  
TEST DISTANCE : 3m  
DATE : Feb 20, 2006  
Temperature : 24deg.C  
Humidity : 32%

ENGINEER : Mitsuru Fujimura

### **PK DETECT(S/A : RBW 1MHz and VBW 1MHz)**

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.805380      | 61.8        | 61.8 | 28.8                    | 32.6                | 3.0                   | 0.0         | 1.2                       | -                       | 62.2   | 62.2 | 74.0                    | 11.8   | 11.8 |
| 3   | 2.708096      | 49.6        | 49.4 | 31.1                    | 32.3                | 3.6                   | 0.0         | 0.6                       | -                       | 52.6   | 52.4 | 74.0                    | 21.4   | 21.6 |
| 4   | 3.610831      | 53.9        | 55.6 | 31.8                    | 32.0                | 4.3                   | 0.0         | 0.7                       | -                       | 58.7   | 60.4 | 74.0                    | 15.3   | 13.6 |
| 5   | 4.513593      | 44.6        | 43.5 | 33.9                    | 31.9                | 4.9                   | 0.0         | 2.1                       | -                       | 53.6   | 52.5 | 74.0                    | 20.5   | 21.5 |
| 6   | 5.416356      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 7   | 6.319082      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 8   | 7.221808      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 9   | 8.124534      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 10  | 9.027260      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |

### **AV DETECT(S/A : RBW 1MHz and VBW 10Hz)**

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.805380      | 60.4        | 60.5 | 28.8                    | 32.6                | 3.0                   | 0.0         | 1.2                       | -11.6                   | 49.2   | 49.3 | 54.0                    | 4.8    | 4.7  |
| 3   | 2.708096      | 46.1        | 45.6 | 31.1                    | 32.3                | 3.6                   | 0.0         | 0.6                       | -11.6                   | 37.5   | 37.0 | 54.0                    | 16.6   | 17.1 |
| 4   | 3.610831      | 51.3        | 53.2 | 31.8                    | 32.0                | 4.3                   | 0.0         | 0.7                       | -11.6                   | 44.5   | 46.4 | 54.0                    | 9.5    | 7.6  |
| 5   | 4.513630      | 36.1        | 33.6 | 33.9                    | 31.9                | 4.9                   | 0.0         | 2.1                       | -11.6                   | 33.5   | 31.0 | 54.0                    | 20.6   | 23.0 |
| 6   | 5.416356      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 7   | 6.319082      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 8   | 7.221808      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 9   | 8.124534      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 10  | 9.027260      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |

\* Reference data

### **(S/A : RBW 100kHz and VBW 300kHz)**

| No. | FREQ<br>[MHz] | S/A READING |       | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] |   | RESULT |       |  | dBc  |      |
|-----|---------------|-------------|-------|-------------------------|---------------------|-----------------------|-------------|---------------------------|---|--------|-------|--|------|------|
|     |               | HOR         | VER   |                         |                     |                       |             |                           |   | HOR    | VER   |  | HOR  | VER  |
| 1   | 902.716       | 104.2       | 102.3 | 20.9                    | 27.9                | 4.3                   | 5.9         | -                         | - | 107.4  | 105.5 |  | 45.7 | 43.8 |
| 2   | 1805.380      | 61.3        | 61.3  | 28.8                    | 32.6                | 3.0                   | 0.0         | 1.2                       | - | 61.7   | 61.7  |  |      |      |

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + High Pass Filter (or Att)

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*Dwell time factor : See dwell time data page 23.

Used Equipment: MHA-06, MCC-16, MCC-10, MPA-10, MHF-03, MHF-04, MRENT-23

Restricted bands

- \* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
- \* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.
- \* 20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.
- \* For the frequency over the sixth harmonics, the noise from the EUT was not detected.

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Issued date : March 6, 2006  
Revised date : March 29, 2006  
FCC ID : OZGV740-BA50CX4

## Radiated Spurious Emission (Antenna:V740-HS03L)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : OMRON Corporation  
EQUIPMENT : RFID System  
MODEL : V740-BA50C04-US+V740-HS03L  
SAMPLE No. : 05090007/062001  
POWER : AC120V/60Hz  
Mode : Transmitting (ch 25:914.773MHz)

REPORT NO : 26FE0177-HO  
REGULATION : FCC Part 15C 15.247(d)  
TEST DISTANCE : 3m  
DATE : Feb 20, 2006  
Temperature : 24deg.C  
Humidity : 32%

ENGINEER : Mitsuru Fujimura

### PK DETECT(S/A : RBW 1MHz and VBW 1MHz)

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.829444      | 62.6        | 62.2 | 29.1                    | 32.5                | 3.0                   | 0.0         | 1.1                       | -                       | 63.3   | 62.9 | 74.0                    | 10.7   | 11.1 |
| 3   | 2.744345      | 45.4        | 44.8 | 31.2                    | 32.2                | 3.7                   | 0.0         | 0.5                       | -                       | 48.6   | 48.0 | 74.0                    | 25.4   | 26.0 |
| 4   | 3.658885      | 54.7        | 52.5 | 32.0                    | 32.0                | 4.3                   | 0.0         | 0.5                       | -                       | 59.5   | 57.3 | 74.0                    | 14.5   | 16.7 |
| 5   | 4.573536      | 44.5        | 46.1 | 34.2                    | 31.9                | 4.9                   | 0.0         | 2.3                       | -                       | 54.0   | 55.6 | 74.0                    | 20.0   | 18.4 |
| 6   | 5.488638      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 7   | 6.403411      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 8   | 7.318184      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 9   | 8.232957      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 10  | 9.147730      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |

### AV DETECT(S/A : RBW 1MHz and VBW 10Hz)

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.829444      | 61.7        | 61.2 | 29.1                    | 32.5                | 3.0                   | 0.0         | 1.1                       | -11.6                   | 50.8   | 50.3 | 54.0                    | 3.2    | 3.7  |
| 3   | 2.744345      | 36.8        | 35.3 | 31.2                    | 32.2                | 3.7                   | 0.0         | 0.5                       | -11.6                   | 28.4   | 26.9 | 54.0                    | 25.6   | 27.1 |
| 4   | 3.658885      | 52.2        | 49.6 | 32.0                    | 32.0                | 4.3                   | 0.0         | 0.5                       | -11.6                   | 45.4   | 42.8 | 54.0                    | 8.6    | 11.3 |
| 5   | 4.573536      | 36.9        | 39.8 | 34.2                    | 31.9                | 4.9                   | 0.0         | 2.3                       | -11.6                   | 34.8   | 37.7 | 54.0                    | 19.2   | 16.3 |
| 6   | 5.488638      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 7   | 6.403411      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 8   | 7.318184      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 9   | 8.232957      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 10  | 9.147730      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |

\*Reference data

### (S/A : RBW 100kHz and VBW 300kHz)

| No. | FREQ<br>[MHz] | S/A READING |       | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] |   | RESULT |       |  | dBc  |      |
|-----|---------------|-------------|-------|-------------------------|---------------------|-----------------------|-------------|---------------------------|---|--------|-------|--|------|------|
|     |               | HOR         | VER   |                         |                     |                       |             |                           |   | HOR    | VER   |  |      |      |
| 1   | 914.717       | 102.6       | 103.3 | 21.3                    | 27.7                | 4.4                   | 5.9         | -                         | - | 106.5  | 107.2 |  |      |      |
| 2   | 1829.444      | 62.2        | 61.7  | 29.1                    | 32.5                | 3.0                   | 0.0         | 1.1                       | - | 62.9   | 62.4  |  | 43.6 | 44.8 |

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + High Pass Filter (or Att)

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*Dwell time factor : See dwell time data page 23.

Used Equipment: MHA-06, MCC-16, MCC-10, MPA-10, MHF-03,MHF-04, MRENT-23

Restricted bands

- \* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
- \* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.
- \* 20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.
- \* For the frequency over the sixth harmonics, the noise from the EUT was not detected.

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## **Radiated Spurious Emission** **(Antenna:V740-HS03L)**

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : OMRON Corporation  
EQUIPMENT : RFID System  
MODEL : V740-BA50C04-US+V740-HS03L  
SAMPLE No. : 05090007/062001  
POWER : AC120V/60Hz  
Mode : Transmitting (ch 50:927.322MHz)

REPORT NO : 26FE0177-HO  
REGULATION : FCC Part 15C 15.247(d)  
TEST DISTANCE : 3m  
DATE : Feb 20, 2006  
Temperature : 24deg.C  
Humidity : 32%

ENGINEER : Mitsuru Fujimura

### **PK DETECT(S/A : RBW 1MHz and VBW 1MHz)**

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.854610      | 65.6        | 64.7 | 29.4                    | 32.5                | 3.0                   | 0.0         | 1.1                       | -                       | 66.6   | 65.7 | 74.0                    | 7.4    | 8.3  |
| 3   | 2.781920      | 50.0        | 49.7 | 31.3                    | 32.2                | 3.7                   | 0.0         | 0.5                       | -                       | 53.3   | 53.0 | 74.0                    | 20.7   | 21.0 |
| 4   | 3.709220      | 54.6        | 53.2 | 32.2                    | 32.0                | 4.3                   | 0.0         | 0.5                       | -                       | 59.6   | 58.2 | 74.0                    | 14.4   | 15.8 |
| 5   | 4.636585      | 48.4        | 48.8 | 34.7                    | 31.9                | 5.1                   | 0.0         | 2.3                       | -                       | 58.6   | 59.0 | 74.0                    | 15.4   | 15.1 |
| 6   | 5.563932      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 7   | 6.491254      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 8   | 7.418576      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 9   | 8.345898      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 10  | 9.273220      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |

### **AV DETECT(S/A : RBW 1MHz and VBW 10Hz)**

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.854610      | 64.8        | 63.7 | 29.4                    | 32.5                | 3.0                   | 0.0         | 1.1                       | -11.6                   | 54.2   | 53.1 | 54.0                    | -0.2   | 0.9  |
| 3   | 2.781920      | 45.6        | 45.5 | 31.3                    | 32.2                | 3.7                   | 0.0         | 0.5                       | -11.6                   | 37.3   | 37.2 | 54.0                    | 16.7   | 16.8 |
| 4   | 3.709220      | 52.1        | 50.5 | 32.2                    | 32.0                | 4.3                   | 0.0         | 0.5                       | -11.6                   | 45.5   | 43.9 | 54.0                    | 8.5    | 10.1 |
| 5   | 4.636585      | 44.3        | 44.1 | 34.7                    | 31.9                | 5.1                   | 0.0         | 2.3                       | -11.6                   | 42.9   | 42.7 | 54.0                    | 11.1   | 11.4 |
| 6   | 5.563932      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 7   | 6.491254      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 8   | 7.418576      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 9   | 8.345898      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 10  | 9.273220      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |

\*Reference data

### **(S/A : RBW 100kHz and VBW 300kHz)**

| No. | FREQ<br>[MHz] | S/A READING |       | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] |   | RESULT |       |  | dBc  |      |
|-----|---------------|-------------|-------|-------------------------|---------------------|-----------------------|-------------|---------------------------|---|--------|-------|--|------|------|
|     |               | HOR         | VER   |                         |                     |                       |             |                           |   | HOR    | VER   |  | HOR  | VER  |
| 1   | 927.317       | 103.2       | 100.3 | 21.7                    | 27.6                | 4.4                   | 5.9         | -                         | - | 107.6  | 104.7 |  |      |      |
| 2   | 1854.610      | 65.5        | 64.3  | 29.4                    | 32.5                | 3.0                   | 0.0         | 1.1                       | - | 66.5   | 65.3  |  | 41.2 | 39.4 |

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + High Pass Filter (or Att)

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*Dwell time factor : See dwell time data page 23.

Used Equipment: MHA-06, MCC-16, MCC-10, MPA-10, MHF-03,MHF-04, MRENT-23

Restricted bands

- \* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
- \* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.
- \* 20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.
- \* For the frequency over the sixth harmonics, the noise from the EUT was not detected.

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MF060b(01.06.05)

Test report No. : 26FE0177-HOa  
Page : 35 of 37  
Issued date : March 6, 2006  
Revised date : March 29, 2006  
FCC ID : OZGV740-BA50CX4

## Radiated Spurious Emission (Antenna:V740-HS03LA)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : OMRON Corporation  
EQUIPMENT : RFID System  
MODEL : V740-BA50C04-US+V740-HS03LA  
SAMPLE No. : 05090007/062002  
POWER : AC120V/60Hz  
Mode : Transmitting (ch 1: 902.726MHz)

REPORT NO : 26FE0177-HO  
REGULATION : FCC Part 15C 15.247(d)  
TEST DISTANCE : 3m  
DATE : Feb 20, 2006  
Temperature : 24deg.C  
Humidity : 32%

ENGINEER : Mitsuru Fujimura

### PK DETECT(S/A : RBW 1MHz and VBW 1MHz)

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.805380      | 59.3        | 62.4 | 28.8                    | 32.6                | 3.0                   | 0.0         | 1.2                       | -                       | 59.7   | 62.8 | 74.0                    | 14.3   | 11.2 |
| 3   | 2.708096      | 48.9        | 48.6 | 31.1                    | 32.3                | 3.6                   | 0.0         | 0.6                       | -                       | 51.9   | 51.6 | 74.0                    | 22.1   | 22.4 |
| 4   | 3.610831      | 53.2        | 53.4 | 31.8                    | 32.0                | 4.3                   | 0.0         | 0.7                       | -                       | 58.0   | 58.2 | 74.0                    | 16.0   | 15.8 |
| 5   | 4.513593      | 43.4        | 45.4 | 33.9                    | 31.9                | 4.9                   | 0.0         | 2.1                       | -                       | 52.4   | 54.4 | 74.0                    | 21.6   | 19.6 |
| 6   | 5.416356      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 7   | 6.319082      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 8   | 7.221808      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 9   | 8.124534      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 10  | 9.027260      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |

### AV DETECT(S/A : RBW 1MHz and VBW 10Hz)

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.805380      | 58.6        | 61.4 | 28.8                    | 32.6                | 3.0                   | 0.0         | 1.2                       | -11.6                   | 47.4   | 50.2 | 54.0                    | 6.6    | 3.8  |
| 3   | 2.708096      | 45.2        | 45.1 | 31.1                    | 32.3                | 3.6                   | 0.0         | 0.6                       | -11.6                   | 36.6   | 36.5 | 54.0                    | 17.4   | 17.5 |
| 4   | 3.610831      | 51.1        | 51.1 | 31.8                    | 32.0                | 4.3                   | 0.0         | 0.7                       | -11.6                   | 44.3   | 44.3 | 54.0                    | 9.7    | 9.7  |
| 5   | 4.513630      | 34.1        | 38.9 | 33.9                    | 31.9                | 4.9                   | 0.0         | 2.1                       | -11.6                   | 31.5   | 36.3 | 54.0                    | 22.5   | 17.7 |
| 6   | 5.416356      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 7   | 6.319082      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 8   | 7.221808      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 9   | 8.124534      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 10  | 9.027260      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |

\*Reference data

### (S/A : RBW 100kHz and VBW 300kHz)

| No. | FREQ<br>[MHz] | S/A READING |       | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] |   | RESULT |       |  | dBc  |      |
|-----|---------------|-------------|-------|-------------------------|---------------------|-----------------------|-------------|---------------------------|---|--------|-------|--|------|------|
|     |               | HOR         | VER   |                         |                     |                       |             |                           |   | HOR    | VER   |  |      |      |
| 1   | 902.716       | 110.3       | 110.0 | 20.9                    | 27.9                | 4.3                   | 5.9         | -                         | - | 113.5  | 113.2 |  |      |      |
| 2   | 1805.380      | 59.2        | 62.1  | 28.8                    | 32.6                | 3.0                   | 0.0         | 1.2                       | - | 59.6   | 62.5  |  | 53.9 | 50.7 |

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + High Pass Filter (or Att)

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*Dwell time factor : See dwell time data page 23.

Used Equipment: MHA-06, MCC-16, MCC-10, MPA-10, MHF-03, MHF-04, MRENT-23

Restricted bands

- \* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
- \* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.
- \* 20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.
- \* For the frequency over the sixth harmonics, the noise from the EUT was not detected.

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MF060b(01.06.05)

## Radiated Spurious Emission (Antenna:V740-HS03LA)

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : OMRON Corporation  
EQUIPMENT : RFID System  
MODEL : V740-BA50C04-US+V740-HS03LA  
SAMPLE No. : 05090007/062002  
POWER : AC120V/60Hz  
Mode : Transmitting (ch 25:914.773MHz)

REPORT NO : 26FE0177-HO  
REGULATION : FCC Part 15C 15.247(d)  
TEST DISTANCE : 3m  
DATE : Feb 20, 2006  
Temperature : 24deg.C  
Humidity : 32%

ENGINEER : Mitsuru Fujimura

### PK DETECT(S/A : RBW 1MHz and VBW 1MHz)

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.829444      | 61.9        | 64.2 | 29.1                    | 32.5                | 3.0                   | 0.0         | 1.1                       | -                       | 62.6   | 64.9 | 74.0                    | 11.4   | 9.1  |
| 3   | 2.744345      | 45.1        | 44.4 | 31.2                    | 32.2                | 3.7                   | 0.0         | 0.5                       | -                       | 48.3   | 47.6 | 74.0                    | 25.7   | 26.4 |
| 4   | 3.658885      | 53.8        | 51.1 | 32.0                    | 32.0                | 4.3                   | 0.0         | 0.5                       | -                       | 58.6   | 55.9 | 74.0                    | 15.4   | 18.1 |
| 5   | 4.573536      | 44.6        | 45.3 | 34.2                    | 31.9                | 4.9                   | 0.0         | 2.3                       | -                       | 54.1   | 54.8 | 74.0                    | 19.9   | 19.2 |
| 6   | 5.488638      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 7   | 6.403411      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 8   | 7.318184      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 9   | 8.232957      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 10  | 9.147730      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |

### AV DETECT(S/A : RBW 1MHz and VBW 10Hz)

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.829444      | 60.8        | 63.5 | 29.1                    | 32.5                | 3.0                   | 0.0         | 1.1                       | -11.6                   | 49.9   | 52.6 | 54.0                    | 4.1    | 1.4  |
| 3   | 2.744345      | 36.9        | 36.5 | 31.2                    | 32.2                | 3.7                   | 0.0         | 0.5                       | -11.6                   | 28.5   | 28.1 | 54.0                    | 25.5   | 25.9 |
| 4   | 3.658885      | 51.1        | 47.8 | 32.0                    | 32.0                | 4.3                   | 0.0         | 0.5                       | -11.6                   | 44.3   | 41.0 | 54.0                    | 9.7    | 13.0 |
| 5   | 4.573536      | 37.5        | 38.1 | 34.2                    | 31.9                | 4.9                   | 0.0         | 2.3                       | -11.6                   | 35.4   | 36.0 | 54.0                    | 18.6   | 18.0 |
| 6   | 5.488638      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 7   | 6.403411      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 8   | 7.318184      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 9   | 8.232957      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 10  | 9.147730      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |

\*Reference data

### (S/A : RBW 100kHz and VBW 300kHz)

| No. | FREQ<br>[MHz] | S/A READING |       | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] |   | RESULT |       |  | dBc  |      |
|-----|---------------|-------------|-------|-------------------------|---------------------|-----------------------|-------------|---------------------------|---|--------|-------|--|------|------|
|     |               | HOR         | VER   |                         |                     |                       |             |                           |   | HOR    | VER   |  | HOR  | VER  |
| 1   | 914.717       | 111.1       | 110.6 | 21.3                    | 27.7                | 4.4                   | 5.9         | -                         | - | 115.0  | 114.5 |  |      |      |
| 2   | 1829.444      | 61.3        | 64.0  | 29.1                    | 32.5                | 3.0                   | 0.0         | 1.1                       | - | 62.0   | 64.7  |  | 53.0 | 49.8 |

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + High Pass Filter (or Att)

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*Dwell time factor : See dwell time data page 23.

Used Equipment: MHA-06, MCC-16, MCC-10, MPA-10, MHF-03, MHF-04, MRENT-23

Restricted bands

- \* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
- \* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.
- \* 20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.
- \* For the frequency over the sixth harmonics, the noise from the EUT was not detected.

Test report No. : 26FE0177-HOa  
Page : 37 of 37  
Issued date : March 6, 2006  
Revised date : March 29, 2006  
FCC ID : OZGV740-BA50CX4

## **Radiated Spurious Emission** **(Antenna:V740-HS03LA)**

UL Apex Co., Ltd.  
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : OMRON Corporation  
EQUIPMENT : RFID System  
MODEL : V740-BA50C04-US+V740-HS03LA  
SAMPLE No. : 05090007/062002  
POWER : AC120V/60Hz  
Mode : Transmitting (ch 50:927.322MHz)

REPORT NO : 26FE0177-HO  
REGULATION : FCC Part 15C 15.247(d)  
TEST DISTANCE : 3m  
DATE : Feb 20, 2006  
Temperature : 24deg.C  
Humidity : 32%

ENGINEER : Mitsuru Fujimura

### **PK DETECT(S/A : RBW 1MHz and VBW 1MHz)**

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.854610      | 64.9        | 66.4 | 29.4                    | 32.5                | 3.0                   | 0.0         | 1.1                       | -                       | 65.9   | 67.4 | 74.0                    | 8.1    | 6.6  |
| 3   | 2.781920      | 46.8        | 47.7 | 31.3                    | 32.2                | 3.7                   | 0.0         | 0.5                       | -                       | 50.1   | 51.0 | 74.0                    | 23.9   | 23.0 |
| 4   | 3.709220      | 53.0        | 52.4 | 32.2                    | 32.0                | 4.3                   | 0.0         | 0.5                       | -                       | 58.0   | 57.4 | 74.0                    | 16.0   | 16.6 |
| 5   | 4.636585      | 47.1        | 48.0 | 34.7                    | 31.9                | 5.1                   | 0.0         | 2.3                       | -                       | 57.3   | 58.2 | 74.0                    | 16.7   | 15.8 |
| 6   | 5.563932      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 7   | 6.491254      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 8   | 7.418576      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 9   | 8.345898      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |
| 10  | 9.273220      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 74.0                    | -      | -    |

### **AV DETECT(S/A : RBW 1MHz and VBW 10Hz)**

| No. | FREQ<br>[GHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] | dwell<br>Factor<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|-----|---------------|-------------|------|-------------------------|---------------------|-----------------------|-------------|---------------------------|-------------------------|--------|------|-------------------------|--------|------|
|     |               | HOR         | VER  |                         |                     |                       |             |                           |                         | HOR    | VER  |                         | HOR    | VER  |
| 2*  | 1.854610      | 63.8        | 65.5 | 29.4                    | 32.5                | 3.0                   | 0.0         | 1.1                       | -11.6                   | 53.2   | 54.9 | 54.0                    | 0.8    | -0.9 |
| 3   | 2.781920      | 41.7        | 43.4 | 31.3                    | 32.2                | 3.7                   | 0.0         | 0.5                       | -11.6                   | 33.4   | 35.1 | 54.0                    | 20.6   | 18.9 |
| 4   | 3.709220      | 50.6        | 50.0 | 32.2                    | 32.0                | 4.3                   | 0.0         | 0.5                       | -11.6                   | 44.0   | 43.4 | 54.0                    | 10.0   | 10.6 |
| 5   | 4.636585      | 42.2        | 43.5 | 34.7                    | 31.9                | 5.1                   | 0.0         | 2.3                       | -11.6                   | 40.8   | 42.1 | 54.0                    | 13.2   | 11.9 |
| 6   | 5.563932      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 7   | 6.491254      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 8   | 7.418576      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 9   | 8.345898      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |
| 10  | 9.273220      | N/S         | N/S  | -                       | -                   | -                     | -           | -                         | -                       | -      | -    | 54.0                    | -      | -    |

\*Reference data

### **(S/A : RBW 100kHz and VBW 300kHz)**

| No. | FREQ<br>[MHz] | S/A READING |       | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | ATT<br>[dB] | Hi-Pass<br>Filter<br>[dB] |   | RESULT |       |  | dBc  |      |
|-----|---------------|-------------|-------|-------------------------|---------------------|-----------------------|-------------|---------------------------|---|--------|-------|--|------|------|
|     |               | HOR         | VER   |                         |                     |                       |             |                           |   | HOR    | VER   |  | HOR  | VER  |
| 1   | 927.317       | 111.1       | 110.8 | 21.3                    | 27.7                | 4.4                   | 5.9         | -                         | - | 115.0  | 114.7 |  |      |      |
| 2   | 1854.610      | 64.3        | 66.1  | 29.4                    | 32.5                | 3.0                   | 0.0         | 1.1                       | - | 65.3   | 67.1  |  | 49.7 | 47.6 |

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + High Pass Filter (or Att)

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*Dwell time factor : See dwell time data page 23.

Used Equipment: MHA-06, MCC-16, MCC-10, MPA-10, MHF-03, MHF-04, MRENT-23

Restricted bands

- \* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
- \* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.
- \* 20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.
- \* For the frequency over the sixth harmonics, the noise from the EUT was not detected.

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