



EMI TEST REPORT

Test Report No. : 25IE0180-HO-1

Applicant : OMRON Corporation

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

Model No. : READER/WRITER : V740-BA50C24-US
V740-BA50C04-US(variant)
ANTENNA : V740-HS01C, V740-HS01L

Test standard : FCC Part 15 Subpart C
Section 15.207, Section 15.247 : 2005

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:

March 29 to May 28, 2005

Tested by:

Hiroka Umeyama
EMC Service

Approved by:

Naoki Sakamoto
Group Leader of
EMC Service

UL Apex Co., Ltd.

Head Office EMC Lab.

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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-BA50C24-US
ANTENNA : V740-HS01C, V740HS01L
Serial No. : READER/WRITER: RFP-DS-05026 (EX Cept for CE test),
890355 (for CE test)
ANTENNA : RFP-DS-05026 (EX Cept for CE test), 004 (for CE test)
Rating : AC100 to 240V, 2.3A 50/60Hz (with attached AC Adaptor) DC OUT 24V
Country of Manufacture : JAPAN
Receipt Date of Sample : March 28 and May 26, 2005
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model No: V740-BA50C24-US, V740-HS01C/V740HS01L (referred to as the EUT in this report) is the Radio Identification System (Reader/Writer and Antenna).

	Frequency Hopping System (RF-ID)
Equipment Type	Transceiver
Frequency Range	902.726MHz – 927.322MHz
Number of RF Channel And Channel specing	50channel 500kHz
Antenna Type	Patch Antenna
Antenna Connector Type	Reverse-TNC(Reader/Writer) N-type(Antenna)
Antenna Gain	6.0 dBi max
ITU Code	A1D
Type of Modulation	ASK (Frequency Hopping)
Frequency of Operation	CPU: 266MHz (33.333MHz), PLL: 8.0MHz, 25MHz, 33MHz, 54.24MHz
Power Supply	AC100 to 240V, 2.3A 50/60Hz (with attached AC Adaptor) DC OUT 24V
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.

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Remarks:

V740-BA50C04-US is a variant model. The differences is as follows;

The test was made with V740-BA50C24-US which are in utmost connections of antennas and analog boards.

	V740-BA50C24-US (test model)		V740-BA50C04-US (variant)	
connected antennas (antenna designated only by manufacturer)	V740-HS01C circular polarized antenna	V740-HS01L liner polarized antenna	V740-HS01C circular polarized antenna	V740-HS01L liner polarized antenna
The number of connected antennas	4 antennas		2 antennas	
The number of (installation for) Analog board in RF part. (same analog board)	2 pieces		1 piece	
The connection between antenna and Reader/Writer	Cables designated by manufacturer			
The method of EUT installation	Installed only by professionals			

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.

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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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C: 2005

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits: 2005
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz: 2005

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin*0)	Results
1	Conducted emission	ANSI C63.4: 2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A	13.3dB 12.33MHz, L, AV	Complied
2	Carrier Frequency Separation	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section 15.247 (a)(1)	Conducted	N/A	*See data.	Complied
3	20dB Bandwidth	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section 15.247 (a)(1)(i)	Conducted	N/A		Complied
4	Number of Hopping Frequency	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section 15.247 (a)(1)(i)	Conducted	N/A		Complied
5	Dwell time	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section 15.247 (a)(1)(i)	Conducted	N/A		Complied
6	Maximum Peak Output Power	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section 15.247 (b)(2)	Conducted	N/A		Complied
7	Band Edge Compliance	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section 15.247 (d)	Conducted	N/A		Complied
8	Spurious Emission	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section 15.247 (d)	Conducted/ Radiated	N/A	0.6dB 3.659092GHz (AV, VER, Ch25) 4.63661GHz (AV, HOR, Ch50)	Complied

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

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

Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is ± 1.3 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 ± 4.5 dB(3m)/ ± 4.7 dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ± 5.2 dB(3m)/ ± 3.8 dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ± 6 dB.

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is ± 3.0 dB.

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

*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 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-210 (issue 5): 2001 + Amendment: 2002 + Amendment2: 2003 + Amendment3: 2004 + Amendment4: 2004	RSS-210 (issue 5): 2001 + Amendment: 2002 + Amendment2: 2003 + Amendment3: 2004 + Amendment4: 2004	Conducted	N/A	N/A	N/A

3.4 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	IC4247A	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic 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 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.

3.5 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
 Max output mode (30dBm)
 *This equipment can be set up to maximum output power by software according to user manual.
 But this sample can be set up with only 29.86dBm for the maximum power.
 This value can be accepted for FCC tolerance.

4.2 Configuration and peripherals

*Cabling was taken into consideration and test data was taken under worse case conditions.

*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 made with one antenna, and others ports were connected to cables or terminated in 50 ohm.

EUT can be set with any tags manufactured by this applicant, OMRON Corporation.

The test was made with and without the tag (M/N: V740-D12P01, type : passive).

From the result of Carrier and Radiated spurious emission test, the final test was made without this tag in the maximum radiation.

There are V740-HS01C (circular polarized antenna) and V740-HS01L (liner polarized antenna) in this EUT.
They are identical in antenna characteristics.

*We pre-confirmed the above conditions on EUT and performed the final test with the following conditions

Conducted emission test	V740-HS01C	
Radiated emission test	V740-HS01L (below 1GHz)	V740-HS01C (above 1GHz)
Other test	N/A	

<The details>

Conducted emission test : The above conditions did not affect the test result so that the test was made with these conditions in the above table.

Radiated emission test : As for antenna, V740-HS01L (below 1GHz) and V740-HS01C (above 1GHz) had worst margins.

Other tests : Antenna is not used.

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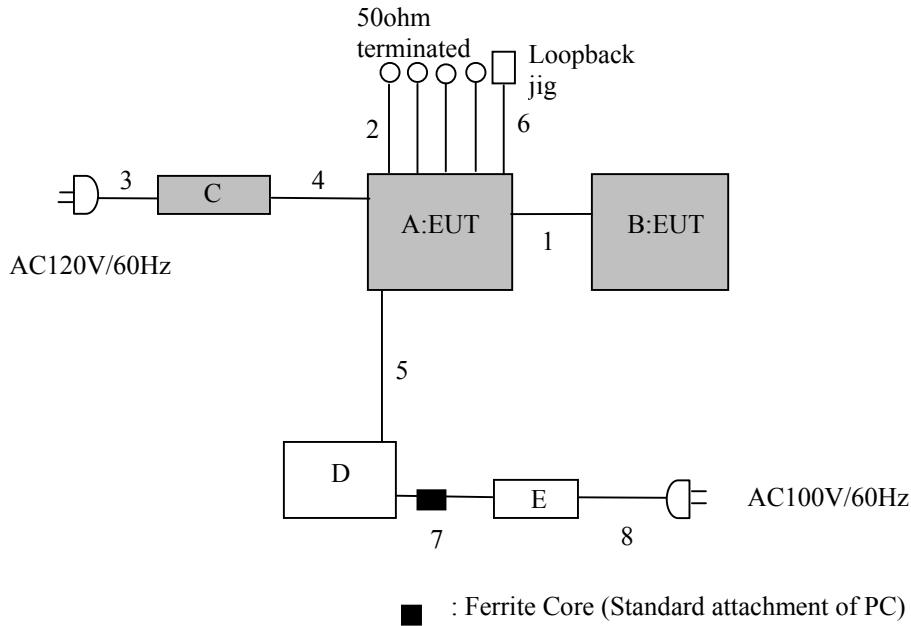
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*The test configuration is set up in the actual usage, which is in the worst conditions of the noise level.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	READER/WRITER	V740-BA50C24-US	RFP-DS-05026	OMRON	OZGV740-BA50CX4
B	ANTENNA	V740-HS01C/L	RFP-DS-05026	OMRON	OZGV740-BA50CX4
C	AC ADAPTER	SA190A-2438V-P	-	Map Electronics	-
D	Personal Computer	2672-C2J	99-PPBWP	IBM	-
E	AC Adapter	02K6810	Z3BJ386769	IBM	-

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	Antenna Cable: V740-A01-3.0M	3.0	Y	Polyvinyl chloride
2	Antenna Cable: V740-A01-3.0M	3.0	Y	Polyvinyl chloride
3	AC adapter cable(AC line)	1.8	N	Polyvinyl chloride
4	AC adapter cable(DC line)	1.2	N	Polyvinyl chloride
5	LAN Cable	5.0	Y	Polyvinyl chloride
6	RS232C Cable	2.5	Y	Polyvinyl chloride
7	AC adapter cable(DC line)	1.8	N	Polyvinyl chloride
8	AC adapter cable(AC line)	1.0	N	Polyvinyl chloride

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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.

1) 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.

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

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SECTION 6: Spurious Emission

[Conducted]

Test Procedure

The Out of Band Emission was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3

Test result : Pass

[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.

Test data : APPENDIX 3

Test result : Pass

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	Test Receiver / Spectrum Analyzer	Spectrum Analyzer
Detector	QP: BW 120kHz(T/R)	PK: RBW:1MHz/VBW: 1MHz
IF Bandwidth	20dBc : RBW: 100kHz VBW: 300kHz (S/A)	AV: RBW:1MHz/VBW:10Hz 20dBc : RBW:100kHz/VBW:300kHz

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

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SECTION 7: 20dB Bandwidth

Test Procedure

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

Test data	: APPENDIX 3
Test result	: Pass

SECTION 8: 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 9: Carrier Frequency Separation

Test Procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 3
Test result	: Pass

SECTION 10: Number of Hopping Frequency

Test Procedure

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 3
Test result	: Pass

SECTION 11: 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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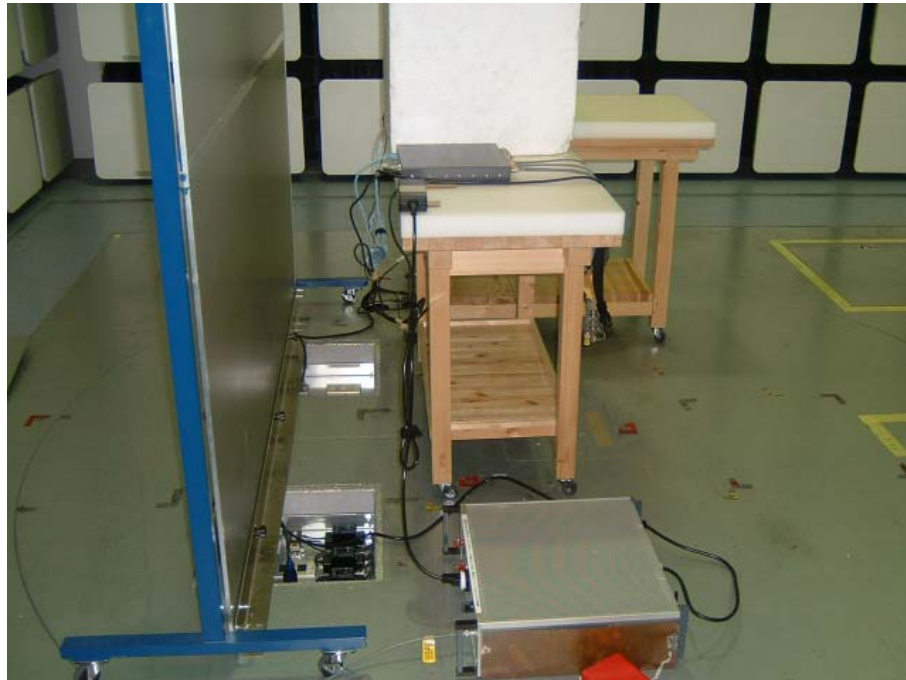
APPENDIX 1: Photographs of test setup

Conducted Emission

Front



Rear



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

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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.

APPENDIX 2:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE/CE/AT	2005/04/11 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE/CE	2005/02/02 * 12
MRENT-14	Spectrum Analyzer	Advantest	R3273	RE/CE/AT	2005/02/21 * 12
MCC-10	Coaxial cable	Storm	90-195-394	RE	2005/03/24 * 12
MCC-04	Microwave Cable 1G-50GHz	Storm	421-011 (90-1394-079)	RE	2005/01/05 * 12
MCC-25	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2004/08/26 * 12
MPA-01	Pre Amplifier	Agilent	8449B	RE	2005/02/05 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2005/01/10 * 12
MHF-03	High pass Filter	Mini-Circuit	VHF-1320	RE	2004/12/09 * 12
MHF-04	High Pass Filter	Mini-Circuit	VHF-1200	RE	2004/12/09 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2004/10/14 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2004/10/14 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2005/02/24 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2004/12/16 * 12
MPA-06	Pre Amplifier	Hewlett Packard	8447D	RE	2004/08/29 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE(EUT)	2005/02/04 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	CE	2005/02/04 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	CE	2005/02/24 * 12
MTA-05	Termination	MCL	NTRM-50	CE	2005/02/03 * 12
MAT-16	Attenuator(40dB)	Weinschel Corp	93459	AT	2005/01/11 * 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

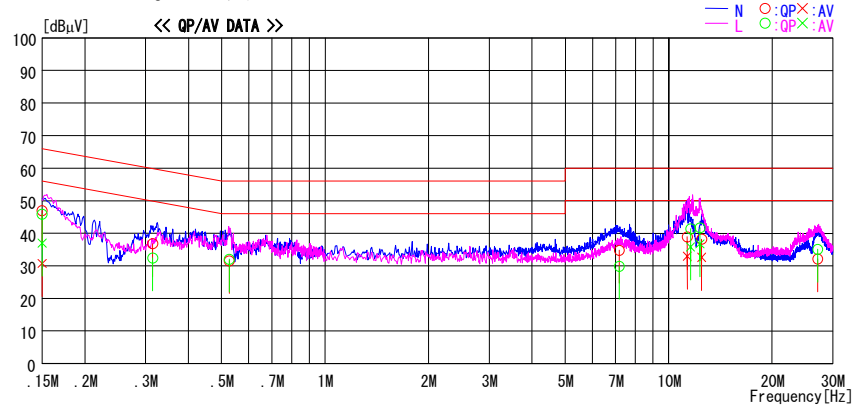
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No. 2 Semi Anechoic Chamber
Date : 2005/03/29 16:42:11

Applicant : OMRON Corporation
Kind of EUT : RFID System
Model No. : V740-BA50C04/24-US, V740-HS01C
Serial No. : 890355, 004
Report No. : 251E0180-HO
Power : AC120V / 60Hz (AC Adapter)
Temp °C/Humi% : 20 / 38
Operator : Hiroka Umeyama

Mode / Remarks: Transmitting Mode(Hopping off) ch1:902.726MHz

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



NO	FREQ [MHz]	READING		C. F [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
1	0.1500	46.9	30.6	0.1	47.0	30.7	66.0	56.0	19.0	25.3	N
2	0.3148	36.7	---	0.1	36.8	---	59.8	---	23.0	---	N
3	0.5262	31.4	---	0.2	31.6	---	56.0	---	24.4	---	N
4	7.1856	33.8	---	1.0	34.8	---	60.0	---	25.2	---	N
5	11.3350	37.6	31.6	1.3	38.9	32.9	60.0	50.0	21.1	17.1	N
6	12.4690	36.9	31.3	1.3	38.2	32.6	60.0	50.0	21.8	17.4	N
7	27.1400	30.0	---	2.1	32.1	---	60.0	---	27.9	---	N
8	0.1500	45.8	36.9	0.1	45.9	37.0	66.0	56.0	20.1	19.0	L
9	0.3148	32.3	---	0.1	32.4	---	59.8	---	27.4	---	L
10	0.5262	31.8	---	0.2	32.0	---	56.0	---	24.0	---	L
11	7.1856	28.9	---	1.0	29.9	---	60.0	---	30.1	---	L
12	11.5800	40.1	34.5	1.3	41.4	35.8	60.0	50.0	18.6	14.2	L
13	12.3300	40.4	35.4	1.3	41.7	36.7	60.0	50.0	18.3	13.3	L
14	27.1400	33.0	---	2.1	35.1	---	60.0	---	24.9	---	L

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

DATA OF CONDUCTED EMISSION TEST

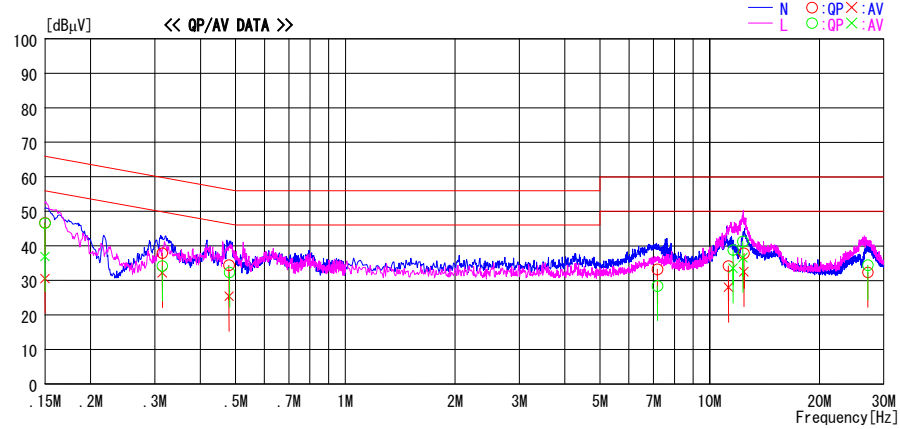
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/03/29 17:08:46

Applicant : OMRON Corporation
Kind of EUT : RFID System
Model No. : V740-BA50C04/24-US, V740-HS01C
Serial No. : 890355, 004

Report No. : 251E0180-HO
Power : AC120V / 60Hz (AC Adapter)
Temp°C/Humi% : 20 / 38
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting Mode(Hopping off) ch25:914.773MHz

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



NO	FREQ [MHz]	READING		C. F	RESULT		LIMIT		MARGIN		PHASE
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
1	0.1500	46.6	30.4	0.1	46.7	30.5	66.0	56.0	19.3	25.5	N
2	0.3148	37.8	32.1	0.1	37.9	32.2	59.8	49.8	21.9	17.6	N
3	0.4800	34.3	25.3	0.1	34.4	25.4	56.3	46.3	21.9	20.9	N
4	7.1856	32.2	—	1.0	33.2	—	60.0	—	26.8	—	N
5	11.2600	32.9	26.7	1.3	34.2	28.0	60.0	50.0	25.8	22.0	N
6	12.4060	36.5	31.2	1.3	37.8	32.5	60.0	50.0	22.2	17.5	N
7	27.1400	30.2	—	2.1	32.3	—	60.0	—	27.7	—	N
8	0.1500	46.5	36.8	0.1	46.6	36.9	66.0	56.0	19.4	19.1	L
9	0.3148	34.1	—	0.1	34.2	—	59.8	—	25.6	—	L
10	0.4810	32.2	—	0.1	32.3	—	56.3	—	24.0	—	L
11	7.1856	27.4	—	1.0	28.4	—	60.0	—	31.6	—	L
12	11.5800	37.5	32.2	1.3	38.8	33.5	60.0	50.0	21.2	16.5	L
13	12.3300	40.0	35.3	1.3	41.3	36.6	60.0	50.0	18.7	13.4	L
14	27.1400	32.3	—	2.1	34.4	—	60.0	—	25.6	—	L

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

DATA OF CONDUCTED EMISSION TEST

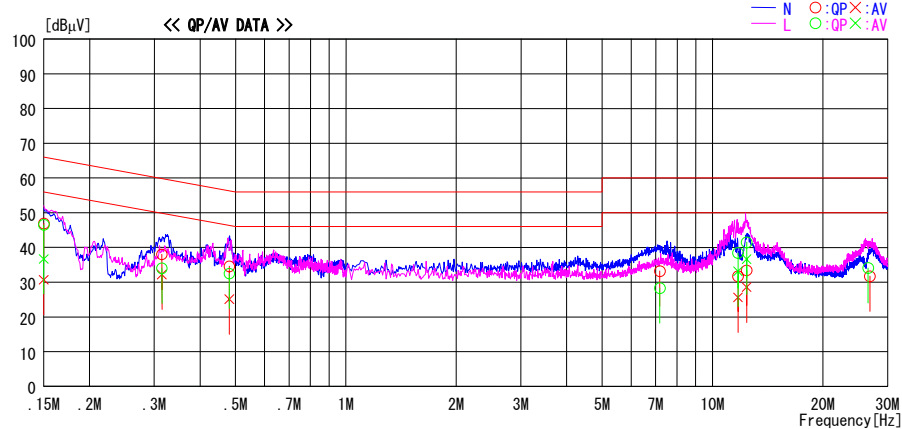
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/03/29 17:21:50

Applicant : OMRON Corporation
Kind of EUT : RFID System
Model No. : V740-BA50C04/24-US, V740-HS01C
Serial No. : 890355, 004

Report No. : 25IE0180-HO
Power : AC120V / 60Hz (AC Adapter)
Temp°C/Humi% : 20 / 38
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting Mode(Hopping off) ch50:927.322MHz

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



NO	FREQ [MHz]	READING		C. F [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
1	0.1500	46.8	30.6	0.1	46.9	30.7	66.0	56.0	19.1	25.3	N
2	0.3148	37.9	32.1	0.1	38.0	32.2	59.8	49.8	21.8	17.6	N
3	0.4810	34.5	25.0	0.1	34.6	25.1	56.3	46.3	21.7	21.2	N
4	7.1852	32.2	---	1.0	33.2	---	60.0	---	26.8	---	N
5	11.7400	30.4	24.3	1.3	31.7	25.6	60.0	50.0	28.3	24.4	N
6	12.3900	32.1	27.2	1.3	33.4	28.5	60.0	50.0	26.6	21.5	N
7	26.8900	29.6	---	2.1	31.7	---	60.0	---	28.3	---	N
8	0.1500	46.4	36.6	0.1	46.5	36.7	66.0	56.0	19.5	19.3	L
9	0.3148	33.9	---	0.1	34.0	---	59.8	---	25.8	---	L
10	0.4810	32.4	---	0.1	32.5	---	56.3	---	23.8	---	L
11	7.1852	27.3	---	1.0	28.3	---	60.0	---	31.7	---	L
12	11.7400	37.1	31.8	1.3	38.4	33.1	60.0	50.0	21.6	16.9	L
13	12.3900	40.2	35.3	1.3	41.5	36.6	60.0	50.0	18.5	13.4	L
14	26.5600	32.0	---	2.1	34.1	---	60.0	---	25.9	---	L

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

Carrier Frequency Separation

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

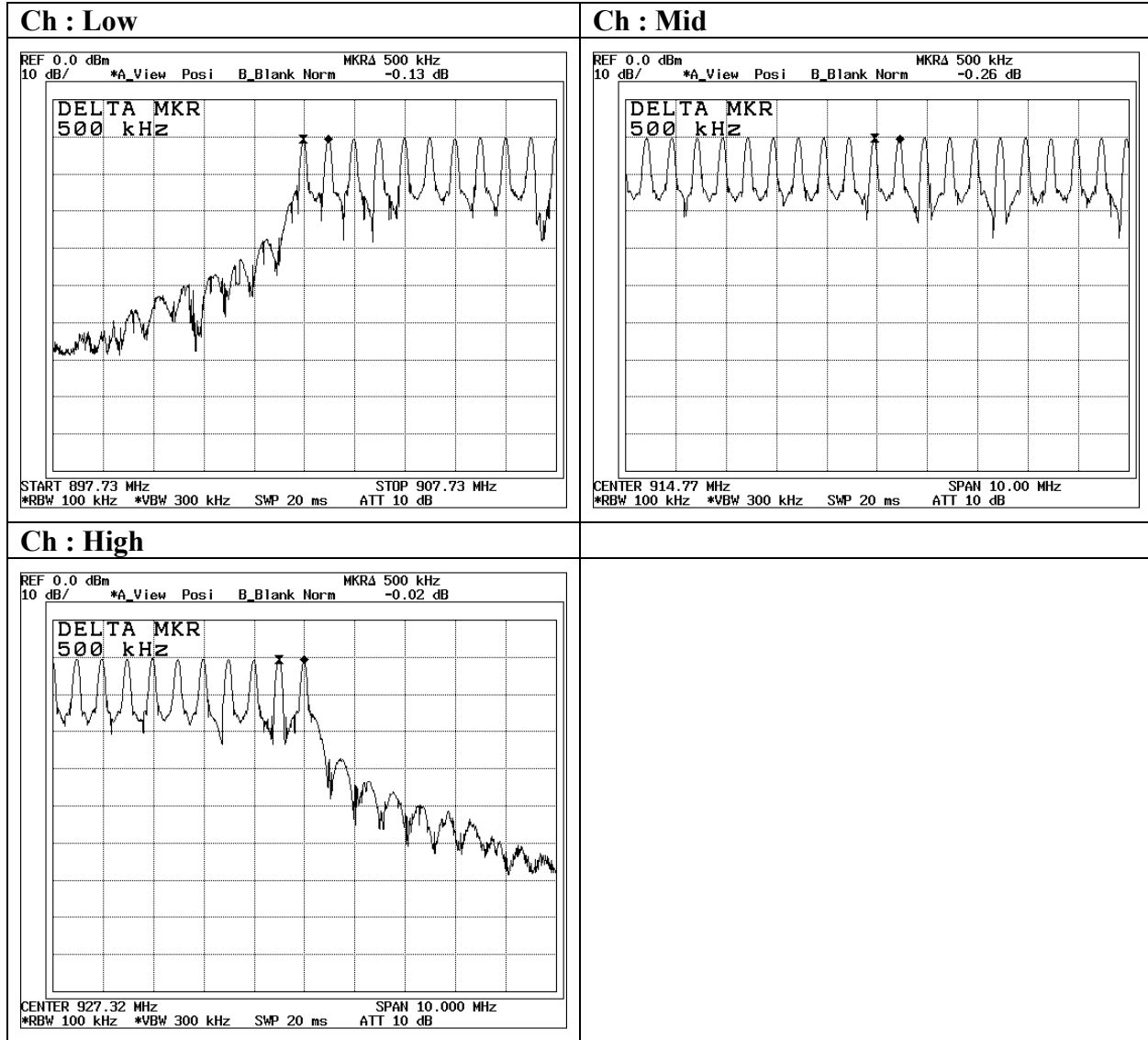
COMPANY : OMRON Corporation
EQUIPMENT : RFID System
MODEL : V740-BA50C04/24-US
S/ N : RFP-DS-05026
POWER : AC120V/60Hz
MODE : Transmitting (Hopping On)

REPORT NO : 25IE0180-HO
REGULATION : FCC Part15C 15.247(a)(1)
DATE : May 28, 2005
TEMPERATURE : 24deg.C
HUMIDITY : 55%
ENGINEER : Hiroka Umeyama

(S/A :span 10MHz, RBW 100kHz,VBW 300kHz, sweep time AUTO)

CH	FREQ	Channel separation	Limit
	[MHz]	[MHz]	
Low	902.726	0.50	>20dB Bandwidth and 25[kHz]
Mid	914.773	0.50	>20dB Bandwidth and 25[kHz]
High	927.322	0.50	>20dB Bandwidth and 25[kHz]

Carrier Frequency Separation



20dB Bandwidth

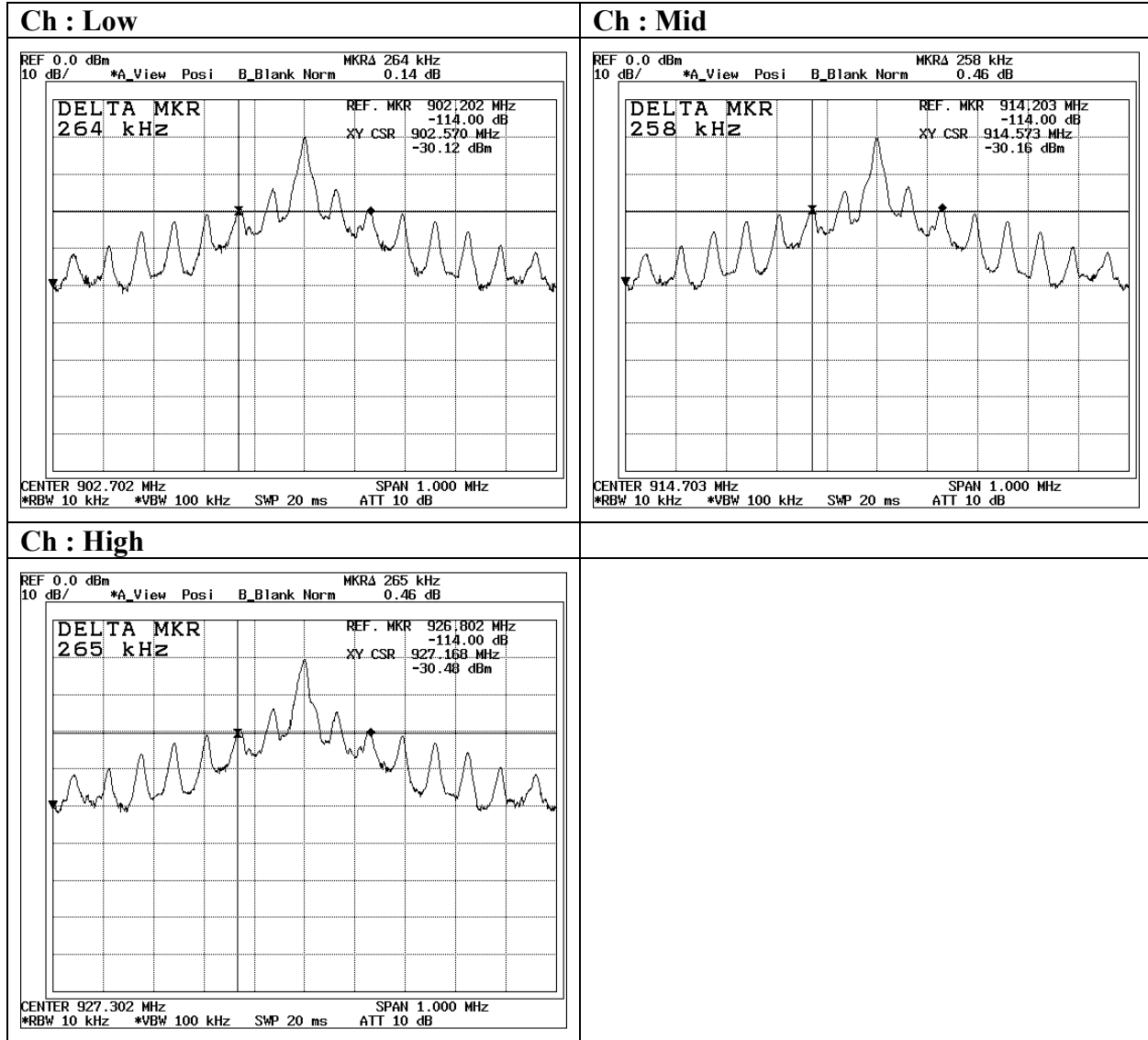
UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: OMRON Corporation	REPORT NO	: 25IE0180-HO
EQUIPMENT	: RFID System	REGULATION	: FCC Part15C 15.247(a)(1)(i)
MODEL	: V740-BA50C04/24-US	DATE	: May 28, 2005
S/N	: RFP-DS-05026	TEMPERATURE	: 24deg.C
POWER	: AC120V/60Hz	HUMIDITY	: 55%
MODE	: Transmitting (Hopping Off)	ENGINEER	: Hiroka Umeyama

PK DETECT(S/A: span 1MHz, RBW 10kHz, VBW 100kHz, sweep time AUTO)

CH	FREQ	20dB Bandwidth	Limit
	[MHz]	[MHz]	[MHz]
Low	902.726	0.264	0.5
Mid	914.773	0.258	0.5
High	927.322	0.265	0.5

20dB Bandwidth



Number of Hopping Frequency

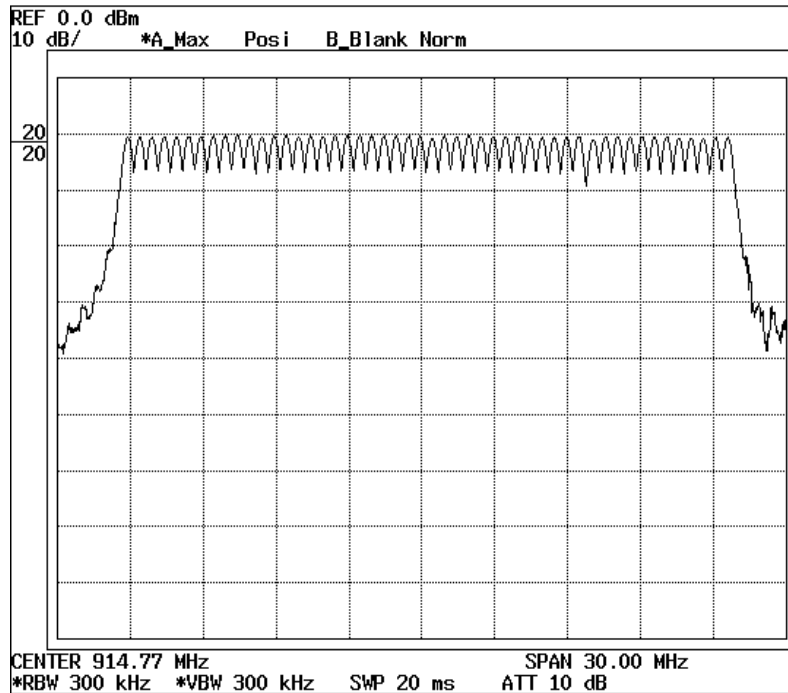
UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : OMRON Corporation
EQUIPMENT : RFID System
MODEL : V740-BA50C04/24-US
S/ N : RFP-DS-05026
POWER : AC120V/60Hz
MODE : Transmitting (Hopping On)

REPORT NO : 25IE0180-HO
REGULATION : FCC Part15C 15.247(a)(1)(i)
DATE : May 28, 2005
TEMPERATURE : 24deg.C
HUMIDITY : 55%
ENGINEER : Hiroka Umeyama

(S/A : RBW 300kHz ,VBW 300kHz, sweep time AUTO)

Mode	Number of channel	Limit
	[time]	[time]
Tx(Hoppng on)	50	≥ 50



Dwell time

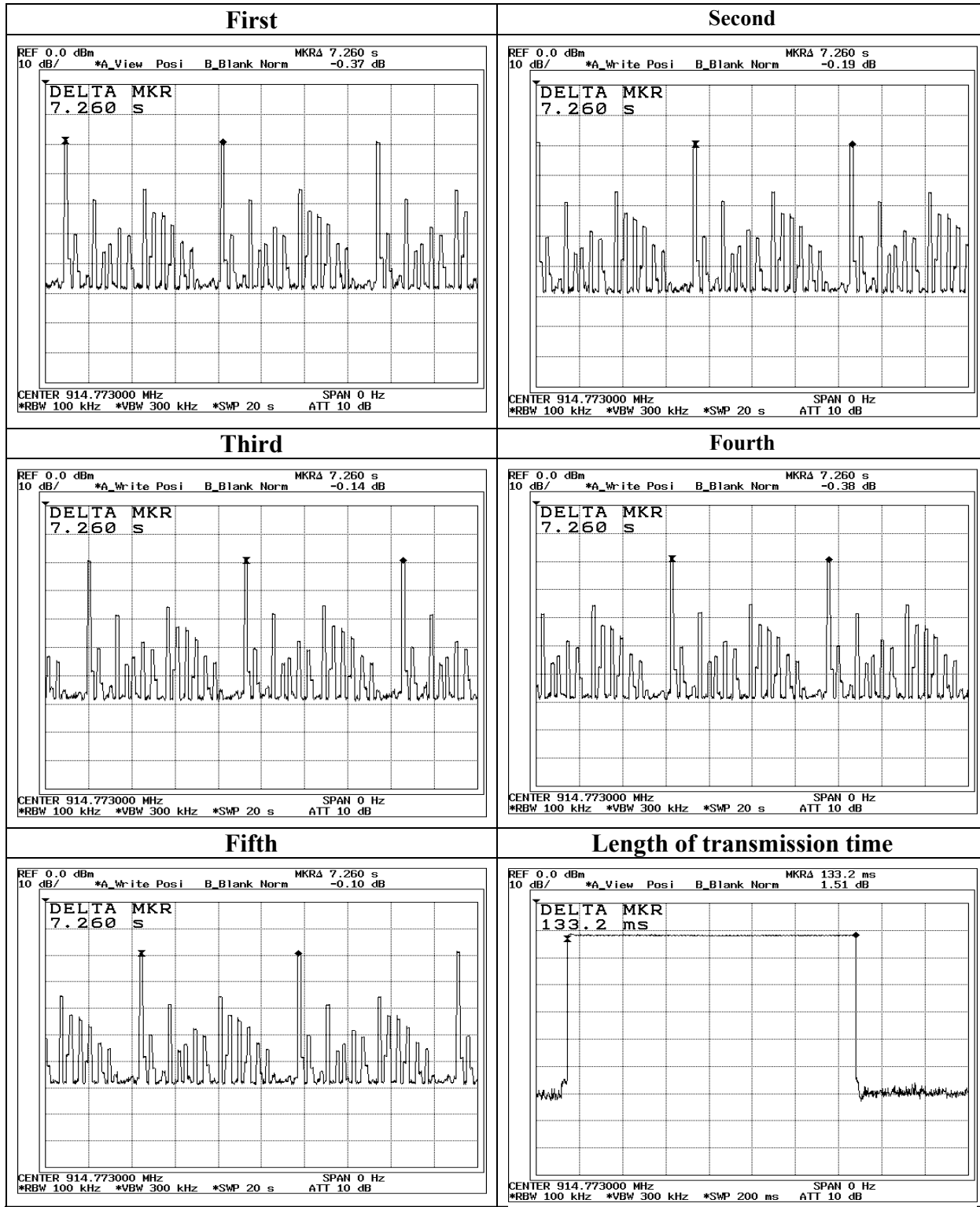
UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: OMRON Corporation	REPORT NO	: 25IE0180-HO
EQUIPMENT	: RFID System	REGULATION	: FCC Part15C 15.247(a)(1)(i)
MODEL	: V740-BA50C04/24-US	DATE	: May 28, 2005
S/ N	: RFP-DS-05026	TEMPERATURE	: 24deg.C
POWER	: AC120V/60Hz	HUMIDITY	: 55%
MODE	: Transmitting (Hopping On)	ENGINEER	: Hiroka Umeyama

times	Number of Hoppings	Length of transmission time [msec]	Dwell time [msec]	Result [msec]	Limit [msec]
1	3	133.2	2.8* 133.2	372.96	400
2	3				
3	3				
4	2				
5	3				
Average	2.8				

EUT has the pulse in around 7.26 seconds interval.
The average time within observation periods (20 seconds: 0.4 * 50ch) is 20 sec/ 7.26 sec = 2.8 times
One transmission time is around 133.2ms.
Dwell time 2.8time * 133.2msec = 372.96msec

Dwell time



Maximum Peak Output Power & Variation of Input AC Power

COMPANY : OMRON Corporation
EQUIPMENT : RFID System
MODEL : V740-BA50C04/24-US
SAMPLE No. : RFP-DS-05026
POWER : AC120V/60Hz
Mode : Transmitting (Hopping Off)

REPORT NO : 25IE0180-HO
REGULATION : FCC Part 15C 15.247(b)(2)
TEST DISTANCE : 3m
DATE : May 27, 2005
Temperature : 25deg.C
Humidity : 52%
ENGINEER : Hiroka Umeyama

AC102V/60Hz 85%

CH	FREQ [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Attn [dB]	Result [dBm]	Limit [1.0W] [dBm]
Low	902.73	-10.27	0.00	40.00	29.73	30.00
Mid	914.77	-10.31	0.00	40.00	29.69	30.00
High	927.32	-10.54	0.00	40.00	29.46	30.00

AC120V/60Hz 100%

CH	FREQ [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Attn [dB]	Result [dBm]	Limit [1.0W] [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

AC138V/60Hz 115%

CH	FREQ [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Attn [dB]	Result [dBm]	Limit [1.0W] [dBm]
Low	902.73	-10.24	0.00	40.00	29.76	30.00
Mid	914.77	-10.20	0.00	40.00	29.80	30.00
High	927.32	-10.60	0.00	40.00	29.40	30.00

Sample Calculation:

Result = S/A Reading + Cable loss + Attenuator

Used Equipment: MAT-16, MRENT-14

*The test was made with the cable terminal. (Particular connector(s) and the cable(s) are supplied by the customer.)

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

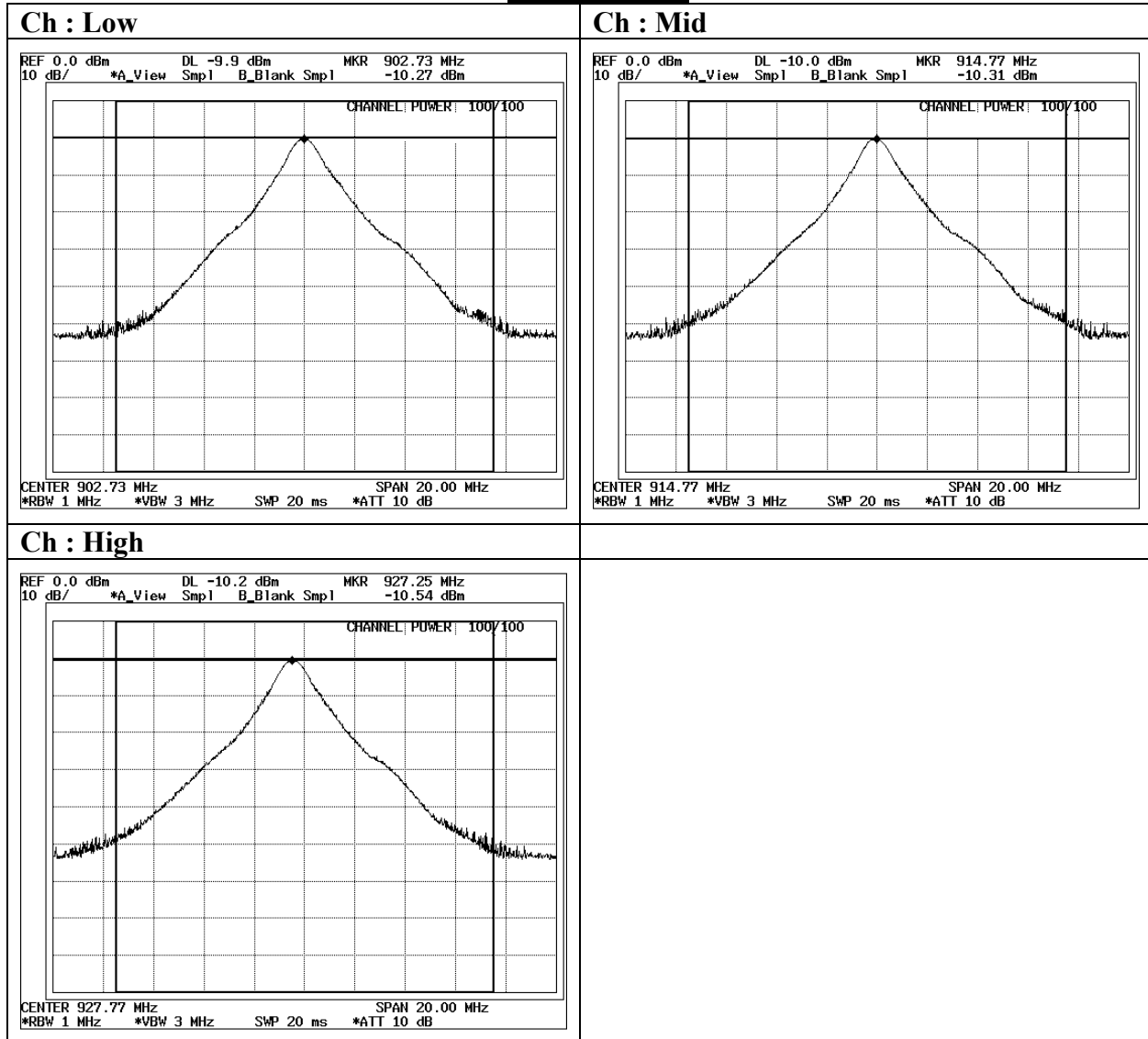
Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(01.06.05)

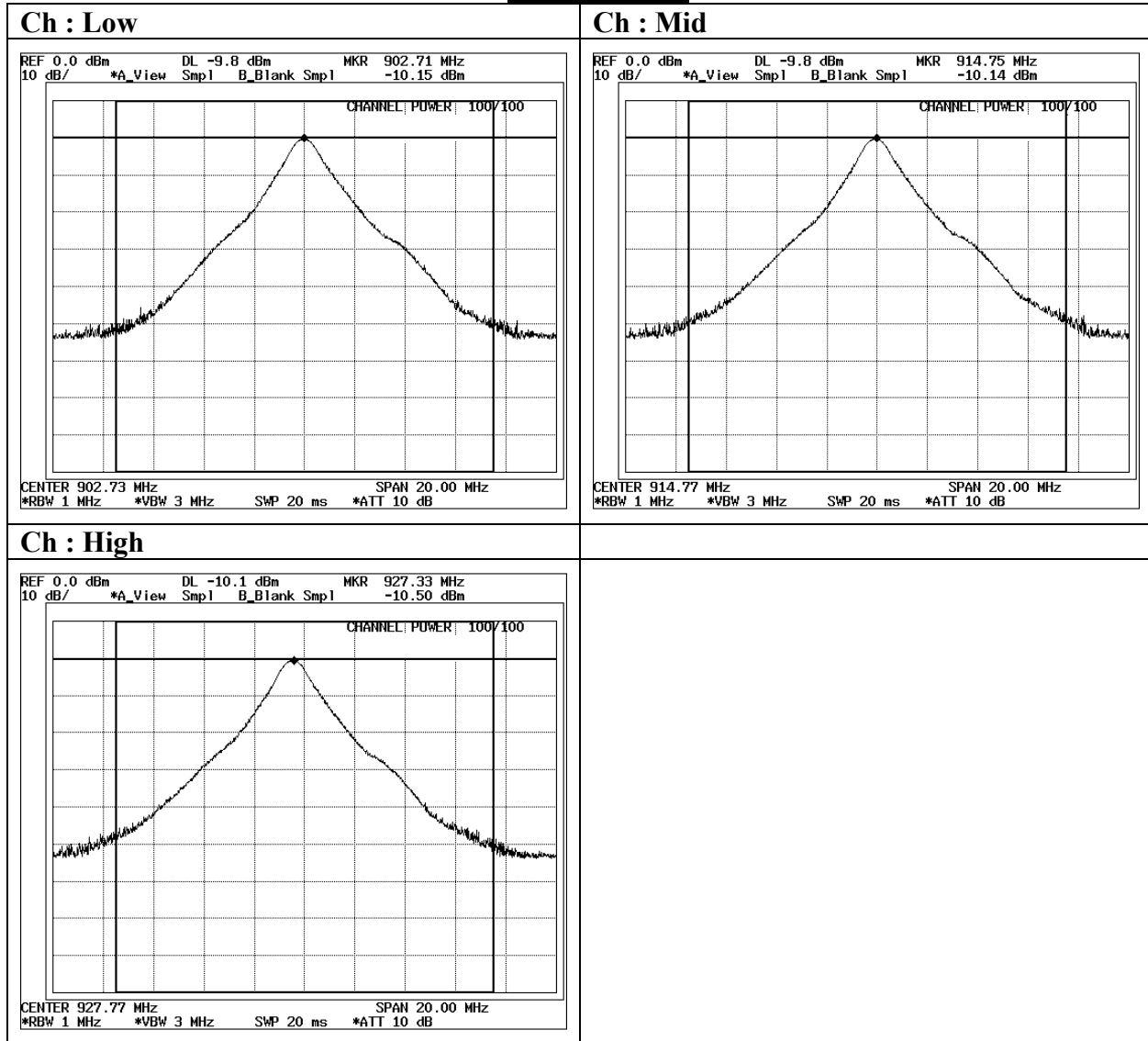
Maximum Peak Output Power & Variation of Input AC Power

AC102V/60Hz



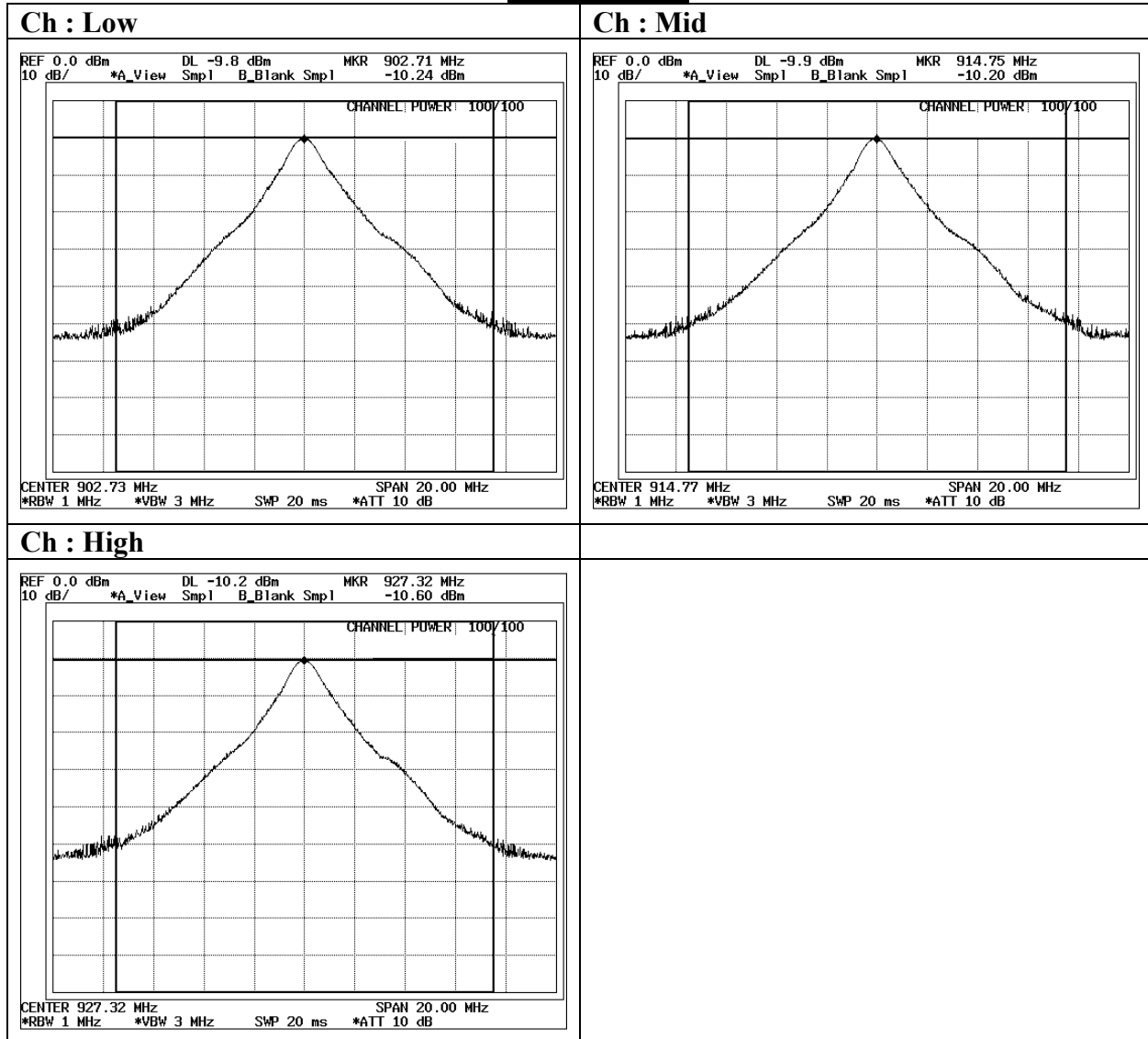
Maximum Peak Output Power & Variation of Input AC Power

AC120V/60Hz



Maximum Peak Output Power & Variation of Input AC Power

AC138V/60Hz



Radiated Spurious Emission

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

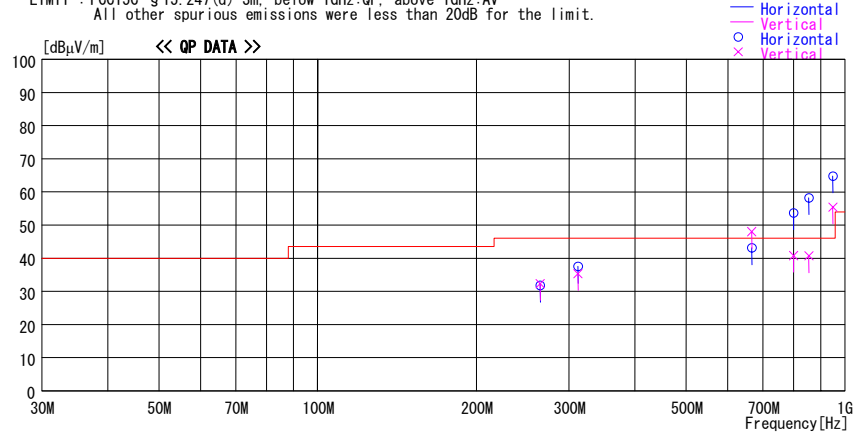
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/05/27 11:39:08

Applicant : OMRON Corporation
Kind of EUT : RFID System
Model No. : V740-BA50C04/24-US, V740-HS01L
Serial No. : RFP-DS-05026, RFP-DS-05026
Report No. : 251E0180-HO
Power : AC120V/60Hz
Temp. / Humi. : 26 / 51
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting Mode ch1:902.726MHz

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING QP [dBμV]	C.F [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]	COMMENT
----- Horizontal -----									
1	264.420	32.8	-1.0	31.8	46.0	14.2	300	129	
2	311.870	41.1	-3.6	37.5			230	0	20dBc RBW:100kHz, VBW:300kHz
3	666.600	41.7	1.4	43.1			100	214	20dBc RBW:100kHz, VBW:300kHz
4	800.030	49.7	4.0	53.7			190	120	20dBc RBW:100kHz, VBW:300kHz
5	855.399	54.1	4.1	58.2			100	0	20dBc RBW:100kHz, VBW:300kHz
6	902.726	121.0	4.4	125.4			100	359	Fund. RBW:100kHz, VBW:300kHz
7	949.990	59.6	5.2	64.8			100	359	20dBc RBW:100kHz, VBW:300kHz
----- Vertical -----									
8	264.430	33.3	-1.0	32.3	46.0	13.7	180	115	
9	311.870	38.9	-3.6	35.3			100	100	20dBc RBW:100kHz, VBW:300kHz
10	666.600	46.6	1.4	48.0			210	150	20dBc RBW:100kHz, VBW:300kHz
11	800.030	36.8	4.0	40.8			150	243	20dBc RBW:100kHz, VBW:300kHz
12	855.399	36.6	4.1	40.7			100	29	20dBc RBW:100kHz, VBW:300kHz
13	902.726	115.3	4.4	119.7			140	356	Fund. RBW:100kHz, VBW:300kHz
14	949.990	50.2	5.2	55.4			100	0	20dBc RBW:100kHz, VBW:300kHz

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

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

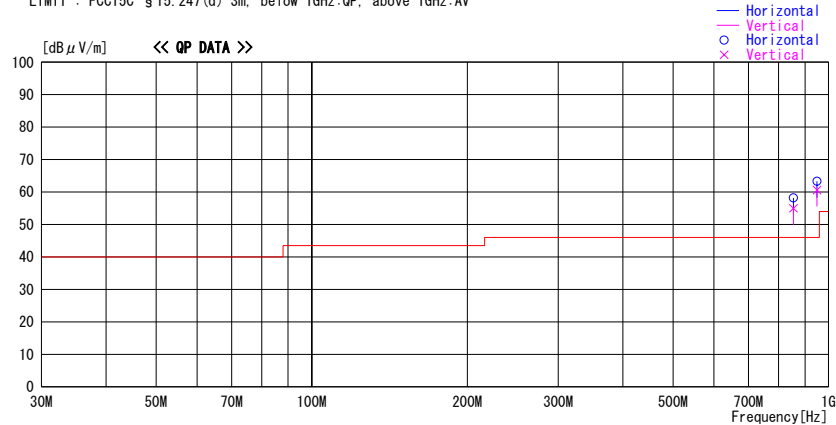
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/05/27 14:24:44

Applicant : OMRON Corporation
Kind of EUT : RFID System
Model No. : V740-BA50C04/24-US, V740-HS01C
Serial No. : RFP-DS-05026, RFP-DS-05026
Report No. : 251E0180-HO
Power : AC120V/60Hz
Temp. / Humi. : 26 / 51
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting Mode ch1:902.726MHz

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



No.	FREQ [MHz]	READING QP [dB μ V]	C. F [dB]	RESULT [dB μ V/m]	LIMIT [dB μ V/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]	COMMENT
----- Horizontal -----									
1	855.399	54.1	4.1	58.2			150	0	20dBc RBW:100kHz, VBW:300kHz
2	902.726	121.2	4.4	125.6			180	0	Fund. RBW:100kHz, VBW:300kHz
3	949.990	58.1	5.2	63.3			100	359	20dBc RBW:100kHz, VBW:300kHz
----- Vertical -----									
4	855.399	50.9	4.1	55.0			240	0	20dBc RBW:100kHz, VBW:300kHz
5	902.726	121.1	4.4	125.5			100	0	Fund. RBW:100kHz, VBW:300kHz
6	949.990	55.4	5.2	60.6			100	0	20dBc RBW:100kHz, VBW:300kHz

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

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

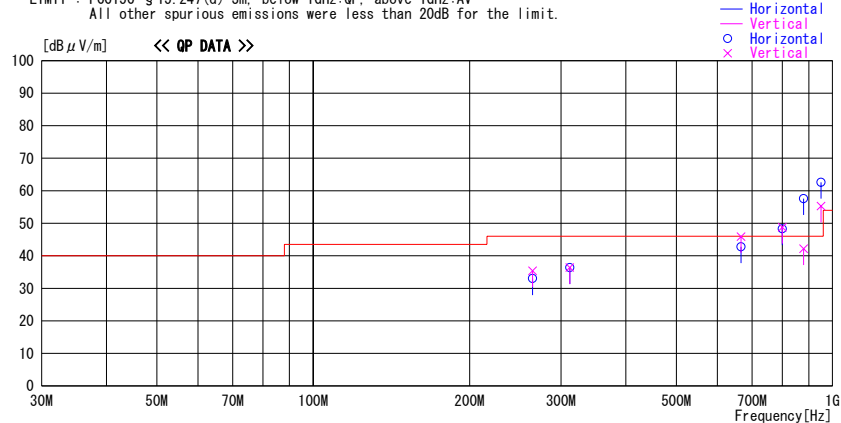
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/05/27 11:39:08

Applicant : OMRON Corporation
Kind of EUT : RFID System
Model No. : V740-BA50C04/24-US, V740-HS01L
Serial No. : RFP-DS-05026, RFP-DS-05026
Report No. : 251E0180-HO
Power : AC120V/60Hz
Temp. / Humi. : 26 / 51
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting Mode ch25:914.773MHz

LIMIT : FCC15C § 15.247(d) 3m, below 1GHz:QP, above 1GHz:AV
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING QP [dB μ V]	C. F [dB]	RESULT [dB μ V/m]	LIMIT [dB μ V/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]	COMMENT
----- Horizontal -----									
1	264.420	34.0	-1.0	33.0	46.0	13.0	300	129	
2	311.870	40.0	-3.6	36.4			230	0	20dBc RBW:100kHz, VBW:300kHz
3	666.600	41.4	1.4	42.8			100	214	20dBc RBW:100kHz, VBW:300kHz
4	800.030	44.3	4.0	48.3			120	120	20dBc RBW:100kHz, VBW:300kHz
5	879.396	53.5	4.1	57.6			100	357	20dBc RBW:100kHz, VBW:300kHz
6	914.773	120.8	4.6	125.4			100	359	Fund. RBW:100kHz, VBW:300kHz
7	949.990	57.4	5.2	62.6			100	359	20dBc RBW:100kHz, VBW:300kHz
----- Vertical -----									
8	264.430	36.4	-1.0	35.4	46.0	10.6	180	115	
9	311.870	40.0	-3.6	36.4			100	100	20dBc RBW:100kHz, VBW:300kHz
10	666.600	44.5	1.4	45.9			210	150	20dBc RBW:100kHz, VBW:300kHz
11	800.030	44.8	4.0	48.8			150	243	20dBc RBW:100kHz, VBW:300kHz
12	879.396	38.1	4.1	42.2			100	29	20dBc RBW:100kHz, VBW:300kHz
13	914.773	114.4	4.6	119.0			140	356	Fund. RBW:100kHz, VBW:300kHz
14	949.990	50.1	5.2	55.3			100	0	20dBc RBW:100kHz, VBW:300kHz

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

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

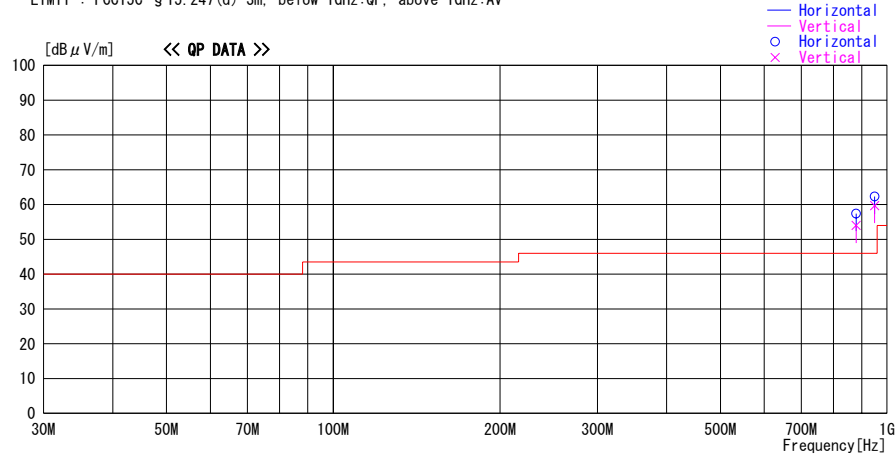
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/05/27 14:35:07

Applicant : OMRON Corporation
Kind of EUT : RFID System
Model No. : V740-BA50C04/24-US, V740-HS01C
Serial No. : RFP-DS-05026, RFP-DS-05026
Report No. : 251E0180-HO
Power : AC120V/60Hz
Temp. / Humi. : 26 / 51
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting Mode ch25:914.773MHz

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



No.	FREQ [MHz]	READING QP [dB μ V]	C.F [dB]	RESULT [dB μ V/m]	LIMIT [dB μ V/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]	COMMENT
----- Horizontal -----									
1	914.773	120.9	4.6	125.5			100	0	Fund. RBW:100kHz, VBW:300kHz
2	949.990	57.1	5.2	62.3			100	0	20dBc RBW:100kHz, VBW:300kHz
3	879.396	53.3	4.1	57.4			100	0	20dBc RBW:100kHz, VBW:300kHz
----- Vertical -----									
4	914.773	120.5	4.6	125.1			100	0	Fund. RBW:100kHz, VBW:300kHz
5	949.990	54.5	5.2	59.7			150	15	20dBc RBW:100kHz, VBW:300kHz
6	879.396	49.9	4.1	54.0			160	0	20dBc RBW:100kHz, VBW:300kHz

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

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

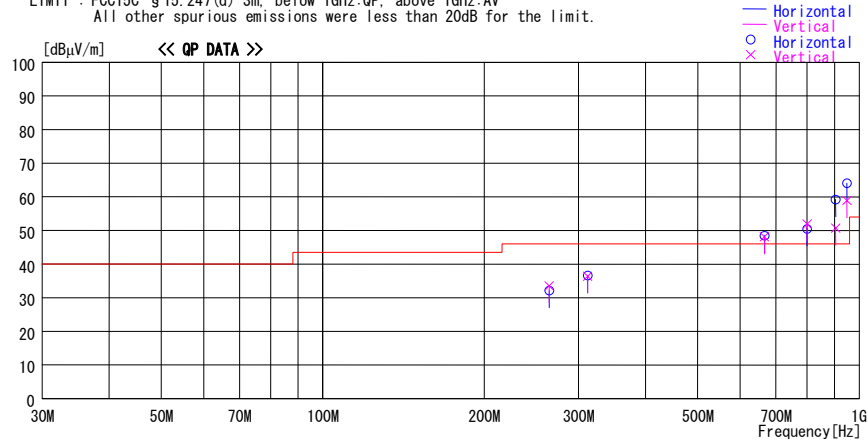
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/05/27 10:24:25

Applicant : OMRON Corporation
Kind of EUT : RFID System
Model No. : V740-BA50C04/24-US, V740-HS01L
Serial No. : RFP-DS-05026, RFP-DS-05026
Report No. : 251E0180-HO
Power : AC120V/60Hz
Temp. / Humi. : 26 / 51
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting Mode ch50:927.322MHz

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING QP [dBμV]	C.F [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]	COMMENT
----- Horizontal -----									
1	264.420	33.1	-1.0	32.1	46.0	13.9	330	359	
2	311.870	40.2	-3.6	36.6			230	0	20dBc RBW:100kHz, VBW:300kHz
3	666.600	47.0	1.4	48.4			100	359	20dBc RBW:100kHz, VBW:300kHz
4	800.030	46.5	4.0	50.5			120	120	20dBc RBW:100kHz, VBW:300kHz
5	904.596	54.7	4.5	59.2			100	5	20dBc RBW:100kHz, VBW:300kHz
6	927.322	121.1	4.8	125.9			100	0	Fund. RBW:100kHz, VBW:300kHz
7	949.990	58.9	5.2	64.1			100	359	20dBc RBW:100kHz, VBW:300kHz
----- Vertical -----									
8	264.420	34.5	-1.0	33.5	46.0	12.5	180	115	
9	311.870	40.0	-3.6	36.4			100	295	20dBc RBW:100kHz, VBW:300kHz
10	666.600	46.7	1.4	48.1			210	150	20dBc RBW:100kHz, VBW:300kHz
11	800.030	47.9	4.0	51.9			150	243	20dBc RBW:100kHz, VBW:300kHz
12	904.596	46.2	4.5	50.7			100	0	20dBc RBW:100kHz, VBW:300kHz
13	927.322	116.5	4.8	121.3			140	356	Fund. RBW:100kHz, VBW:300kHz
14	949.990	53.7	5.2	58.9			100	1	20dBc RBW:100kHz, VBW:300kHz

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

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

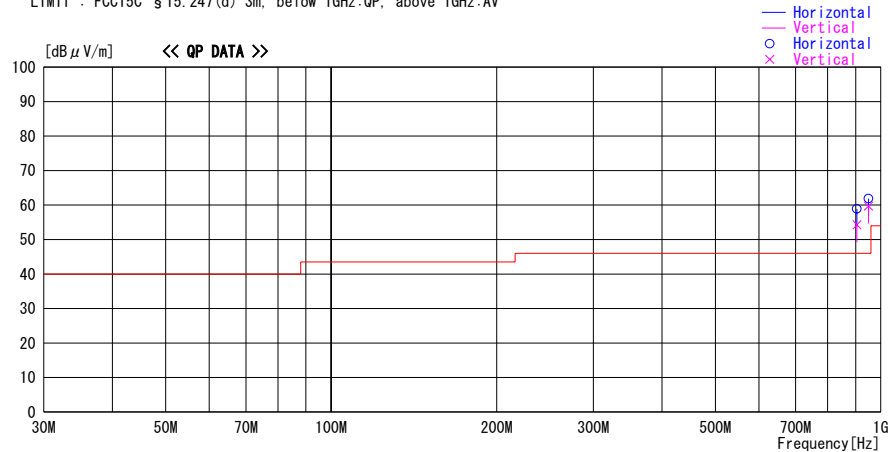
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No. 2 Semi Anechoic Chamber
Date : 2005/05/27 14:49:20

Applicant : OMRON Corporation
Kind of EUT : RFID System
Model No. : V740-BA50C04/24-US, V740-HS01C
Serial No. : RFP-DS-05026, RFP-DS-05026
Report No. : 251E0180-HO
Power : AC120V/60Hz
Temp. / Humi. : 26 / 51
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting Mode ch50:927.322MHz

LIMIT : FCC15C § 15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



No.	FREQ [MHz]	READING QP [dB μ V]	C.F [dB]	RESULT [dB μ V/m]	LIMIT [dB μ V/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]	COMMENT
----- Horizontal -----									
1	904.596	54.4	4.5	58.9			100	341	20dBc RBW:100kHz, VBW:300kHz
2	927.322	121.0	4.8	125.8			100	359	Fund. RBW:100kHz, VBW:300kHz
3	949.990	56.7	5.2	61.9			150	359	20dBc RBW:100kHz, VBW:300kHz
----- Vertical -----									
4	904.596	49.8	4.5	54.3			100	0	20dBc RBW:100kHz, VBW:300kHz
5	927.322	120.8	4.8	125.6			100	355	Fund. RBW:100kHz, VBW:300kHz
6	949.990	54.5	5.2	59.7			100	0	20dBc RBW:100kHz, VBW:300kHz

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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MF060b(01.06.05)

Radiated Spurious Emission

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

COMPANY : OMRON Corporation
EQUIPMENT : RFID System
MODEL : V740-BA50C04/24-US, V740-HS01C
SAMPLE No. : RFP-DS-05026, RFP-DS-05026
POWER : AC120V/60Hz
Mode : Transmitting (ch 1: 902.726MHz)

REPORT NO : 25IE0180-HO
REGULATION : FCC Part 15C 15.247(d)
TEST DISTANCE : 3m
DATE : May 27, 2005
Temperature : 23deg.C
Humidity : 57%

ENGINEER : Hiroka Umeyama

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

No.	FREQ [GHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	Hi-Pass Filter [dB]	dwell Factor [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER							HOR	VER		HOR	VER
		[dBuV]								[dBuV/m]			[dB]	
1	2.708178	52.2	50.8	31.1	36.5	5.2	0.0	0.8	-	52.8	51.4	74.0	21.2	22.6
2	3.610904	48.9	50.5	31.5	36.2	6.4	0.0	1.5	-	52.1	53.7	74.0	21.9	20.3
3	4.513630	46.1	45.5	33.4	36.1	6.8	0.0	3.2	-	53.4	52.8	74.0	20.6	21.2
4	5.416356	42.3	41.6	35.9	35.7	7.4	0.0	1.5	-	51.4	50.7	74.0	22.6	23.3
5	6.319082	42.9	43.2	36.7	35.7	8.3	0.0	2.5	-	54.7	55.0	74.0	19.3	19.0
6	7.221808	42.7	43.2	37.7	35.6	9.4	0.0	4.1	-	58.3	58.8	74.0	15.7	15.2
7	8.124534	43.5	43.4	36.7	35.9	10.0	0.0	4.7	-	59.0	58.9	74.0	15.0	15.1
8	9.027260	43.4	43.1	36.8	36.0	10.3	0.0	6.6	-	61.1	60.8	74.0	12.9	13.2

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

No.	FREQ [GHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	Hi-Pass Filter [dB]	dwell Factor [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER							HOR	VER		HOR	VER
		[dBuV]								[dBuV/m]			[dB]	
1	2.708178	48.5	47.5	31.1	36.5	5.2	0.0	0.8	-	49.1	48.1	54.0	4.9	5.9
2	3.610904	44.6	45.1	31.5	36.2	6.4	0.0	1.5	-	47.8	48.3	54.0	6.2	5.7
3	4.513630	38.3	37.0	33.4	36.1	6.8	0.0	3.2	-	45.6	44.3	54.0	8.4	9.7
4	5.416356	29.7	31.9	35.9	35.7	7.4	0.0	1.5	-	38.8	41.0	54.0	15.2	13.0
5	6.319082	29.8	29.8	36.7	35.7	8.3	0.0	2.5	-	41.6	41.6	54.0	12.4	12.4
6	7.221808	29.7	29.7	37.7	35.6	9.4	0.0	4.1	-	45.3	45.3	54.0	8.7	8.7
7	8.124534	30.1	30.3	36.7	35.9	10.0	0.0	4.7	-	45.6	45.8	54.0	8.4	8.2
8	9.027260	29.8	29.9	36.8	36.0	10.3	0.0	6.6	-	47.5	47.6	54.0	6.5	6.4

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	Hi-Pass Filter [dB]		RESULT			dBc	
		HOR	VER							HOR	VER			
		[dBuV]								[dBuV/m]			[dB]	
1	902.695	121.2	121.1	21.9	27.8	4.4	5.9	-	-	125.6	125.5			
2	1805.420	62.0	64.4	28.0	36.6	4.5	0.0	1.1	-	59.0	61.4		66.6	64.1

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.

Used Equipment: MHA-06, MCC-04, MCC-10, MCC-25, MPA-01, MHF-03, MHF-04, MRENT-14

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.

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MF060b(01.06.05)

Radiated Spurious Emission

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

COMPANY : OMRON Corporation
EQUIPMENT : RFID System
MODEL : V740-BA50C04/24-US, V740-HS01C
SAMPLE No. : RFP-DS-05026, RFP-DS-05026
POWER : AC120V/60Hz
Mode : Transmitting (ch 25:914.773MHz)

REPORT NO : 25IE0180-HO
REGULATION : FCC Part 15C 15.247(d)
TEST DISTANCE : 3m
DATE : May 28, 2005
Temperature : 24deg.C
Humidity : 55%

ENGINEER : Hiroka Umeyama

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

No.	FREQ [GHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	Hi-Pass Filter [dB]	dwell Factor [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER							HOR	VER		HOR	VER
		[dBuV]								[dBuV/m]			[dB]	
1	2.744319	48.5	48.6	31.2	36.5	5.3	0.0	0.7	-	49.2	49.3	74.0	24.8	24.7
2	3.659092	49.9	53.5	31.7	36.3	6.4	0.0	2.0	-	53.7	57.3	74.0	20.3	16.7
3	4.573865	47.7	47.6	33.7	36.0	6.8	0.0	2.3	-	54.5	54.4	74.0	19.5	19.6
4	5.488638	42.2	43.6	35.8	35.8	7.5	0.0	2.7	-	52.4	53.8	74.0	21.6	20.2
5	6.403411	43.2	43.1	36.6	35.8	8.5	0.0	2.7	-	55.2	55.1	74.0	18.8	18.9
6	7.318184	43.1	42.3	37.9	36.0	9.5	0.0	4.5	-	59.0	58.2	74.0	15.0	15.8
7	8.232957	43.4	43.5	36.9	36.1	10.0	0.0	4.2	-	58.4	58.5	74.0	15.6	15.5
8	9.147730	42.7	43.4	36.9	36.1	10.4	0.0	7.6	-	61.5	62.2	74.0	12.5	11.8

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

No.	FREQ [GHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	Hi-Pass Filter [dB]	dwell Factor [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER							HOR	VER		HOR	VER
		[dBuV]								[dBuV/m]			[dB]	
1	2.744319	41.5	41.6	31.2	36.5	5.3	0.0	0.7	-	42.2	42.3	54.0	11.8	11.7
2	3.659092	45.3	49.6	31.7	36.3	6.4	0.0	2.0	-	49.1	53.4	54.0	4.9	0.6
3	4.573865	42.0	41.5	33.7	36.0	6.8	0.0	2.3	-	48.8	48.3	54.0	5.2	5.7
4	5.488638	29.7	34.6	35.8	35.8	7.5	0.0	2.7	-	39.9	44.8	54.0	14.1	9.2
5	6.403411	30.1	30.1	36.6	35.8	8.5	0.0	2.7	-	42.1	42.1	54.0	11.9	11.9
6	7.318184	29.9	29.9	37.9	36.0	9.5	0.0	4.5	-	45.8	45.8	54.0	8.2	8.2
7	8.232957	30.6	30.6	36.9	36.1	10.0	0.0	4.2	-	45.6	45.6	54.0	8.4	8.4
8	9.147730	30.2	30.1	36.9	36.1	10.4	0.0	7.6	-	49.0	48.9	54.0	5.0	5.1

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	Hi-Pass Filter [dB]		RESULT			dBc	
		HOR	VER							HOR	VER			
		[dBuV]								[dBuV/m]			[dB]	
1	914.773	120.9	120.5	22.1	27.8	4.4	5.9	-	-	125.5	125.1			
2	1829.546	64.1	64.5	28.3	36.6	4.5	0.0	1.3	-	61.6	62.0		63.9	63.1

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.

Used Equipment: MHA-06, MCC-04, MCC-10, MCC-25, MPA-01, MHF-03, MHF-04, MRENT-14

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.

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MF060b(01.06.05)

Radiated Spurious Emission

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

COMPANY : OMRON Corporation
EQUIPMENT : RFID System
MODEL : V740-BA50C04/24-US, V740-HS01C
SAMPLE No. : RFP-DS-05026, RFP-DS-05026
POWER : AC120V/60Hz
Mode : Transmitting (ch 50-927.322MHz)

REPORT NO : 25IE0180-HO
REGULATION : FCC Part 15C 15.247(d)
TEST DISTANCE : 3m
DATE : May 27, 2005
Temperature : 23deg.C
Humidity : 57%

ENGINEER : Hiroka Umeyama

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

No.	FREQ [GHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	Hi-Pass Filter [dB]	dwell Factor [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER							HOR	VER		HOR	VER
1	2.781966	54.1	51.1	31.3	36.5	5.4	0.0	0.9	-	55.2	52.2	74.0	18.8	21.8
2	3.709288	50.5	50.9	31.9	36.2	6.5	0.0	1.7	-	54.4	54.8	74.0	19.6	19.2
3	4.636610	51.8	46.3	34.1	36.0	7.0	0.0	2.0	-	58.9	53.4	74.0	15.1	20.6
4	5.563932	42.5	42.9	36.0	35.8	7.5	0.0	3.6	-	53.8	54.2	74.0	20.2	19.8
5	6.491254	42.5	42.7	36.5	35.8	8.6	0.0	2.6	-	54.4	54.6	74.0	19.6	19.4
6	7.418576	43.1	43.4	38.1	36.0	9.5	0.0	4.1	-	58.8	59.1	74.0	15.2	14.9
7	8.345898	43.1	43.3	37.0	36.1	10.1	0.0	5.6	-	59.7	59.9	74.0	14.3	14.1
8	9.273220	43.6	43.2	37.0	36.2	10.5	0.0	6.9	-	61.8	61.4	74.0	12.2	12.6

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

No.	FREQ [GHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	Hi-Pass Filter [dB]	dwell Factor [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER							HOR	VER		HOR	VER
1	2.781966	49.8	46.2	31.3	36.5	5.4	0.0	0.9	-	50.9	47.3	54.0	3.1	6.7
2	3.709288	46.4	47.7	31.9	36.2	6.5	0.0	1.7	-	50.3	51.6	54.0	3.7	2.4
3	4.636610	46.3	39.4	34.1	36.0	7.0	0.0	2.0	-	53.4	46.5	54.0	0.6	7.5
4	5.563932	29.5	30.8	36.0	35.8	7.5	0.0	3.6	-	40.8	42.1	54.0	13.2	11.9
5	6.491254	29.8	30.5	36.5	35.8	8.6	0.0	2.6	-	41.7	42.4	54.0	12.3	11.6
6	7.418576	29.7	29.6	38.1	36.0	9.5	0.0	4.1	-	45.4	45.3	54.0	8.6	8.7
7	8.345898	30.2	30.2	37.0	36.1	10.1	0.0	5.6	-	46.8	46.8	54.0	7.2	7.2
8	9.273220	30.5	30.5	37.0	36.2	10.5	0.0	6.9	-	48.7	48.7	54.0	5.3	5.3

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	Hi-Pass Filter [dB]		RESULT			dBc	
		HOR	VER							HOR	VER		HOR	VER
1	927.322	121.0	120.8	22.3	27.8	4.4	5.9	-	-	125.8	125.6		63.6	61.5
2	1854.644	64.6	66.5	28.6	36.5	4.5	0.0	1.0	-	62.2	64.1			

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.

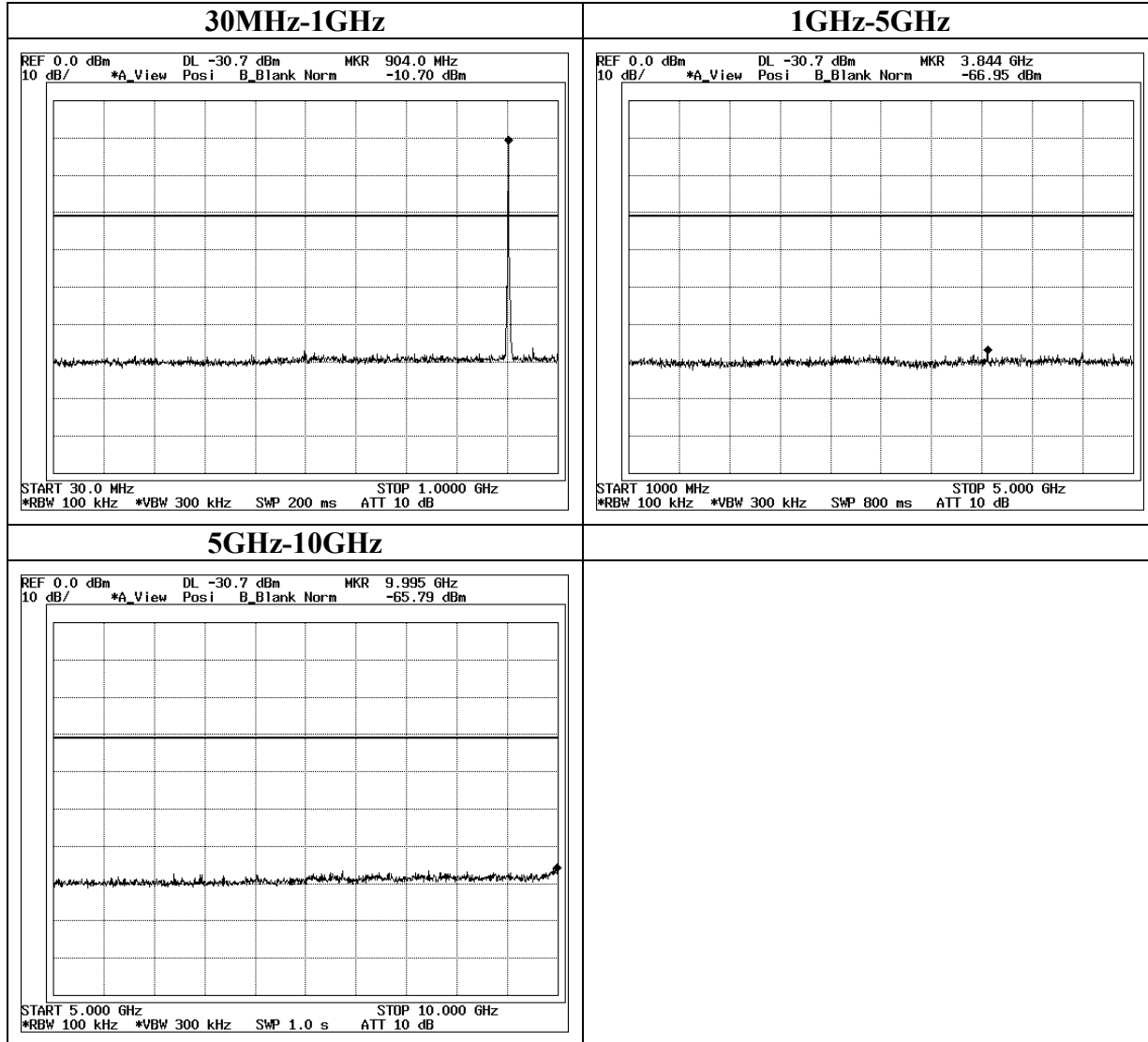
Used Equipment: MHA-06, MCC-04, MCC-10, MCC-25, MPA-01, MHF-03, MHF-04, MRENT-14

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.

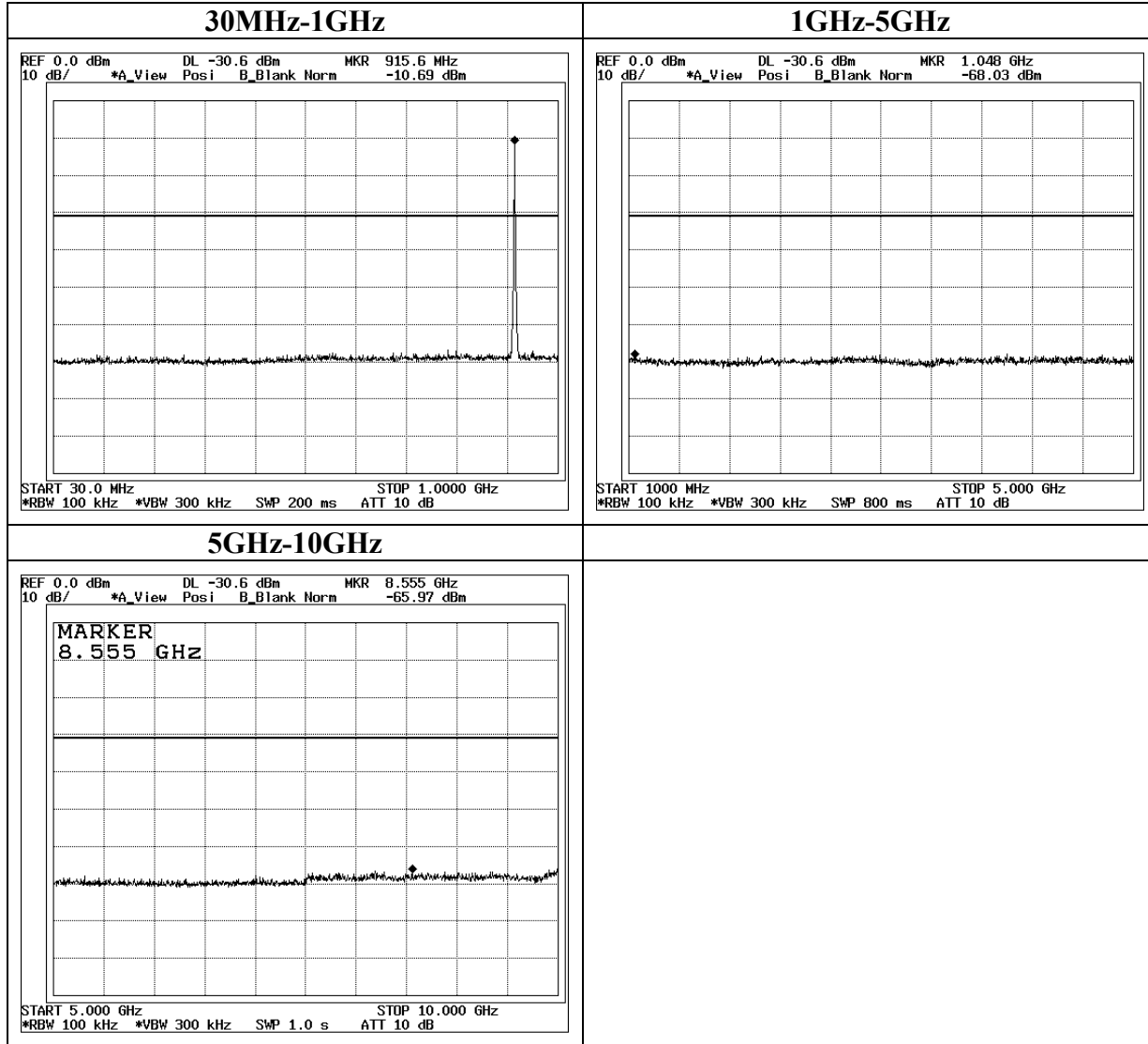
Conducted Spurious Emission

Ch:Low



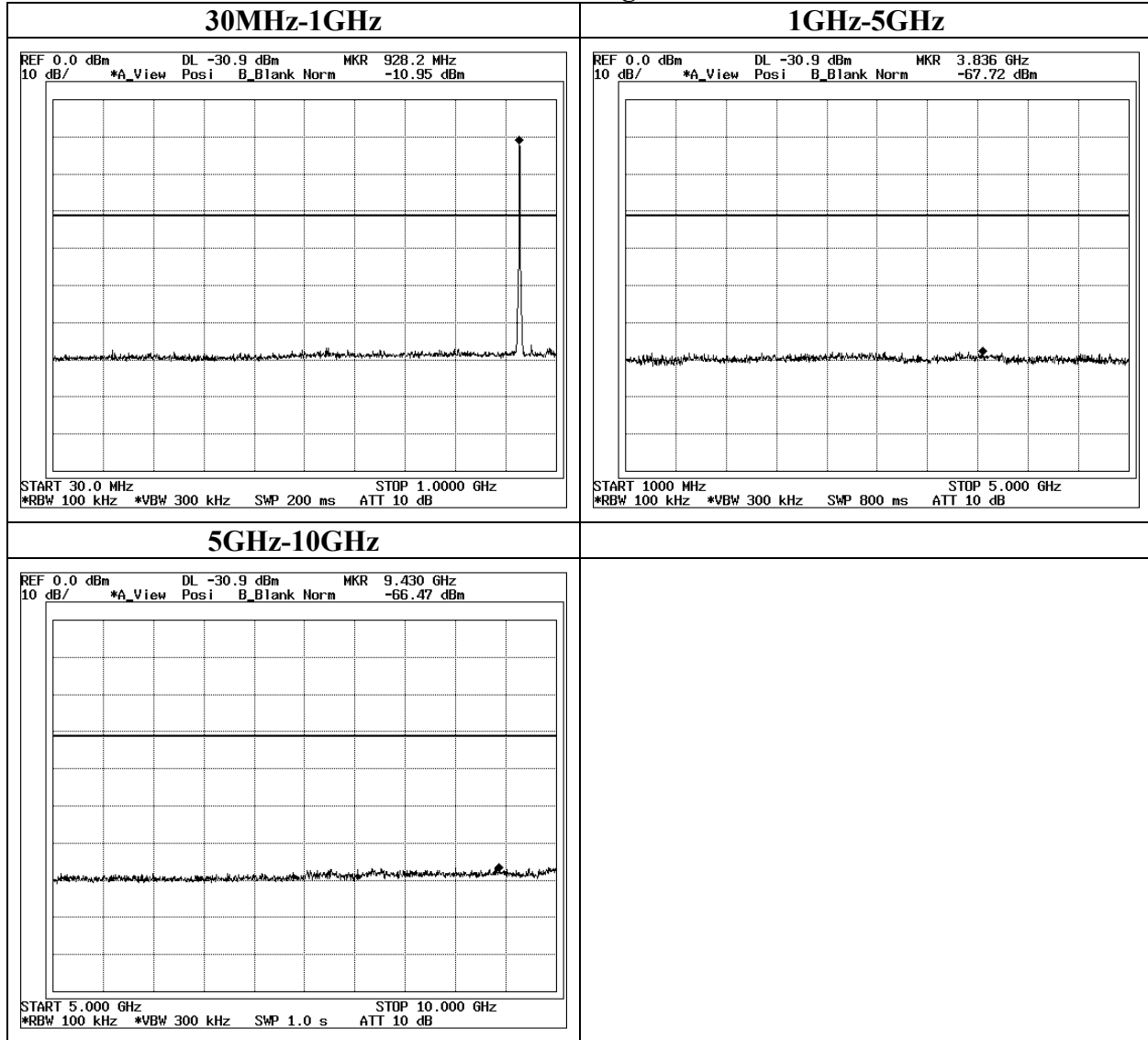
Conducted Spurious Emission

Ch:Mid



Conducted Spurious Emission

Ch:High



UL Apex Co., Ltd.

Head Office EMC Lab.

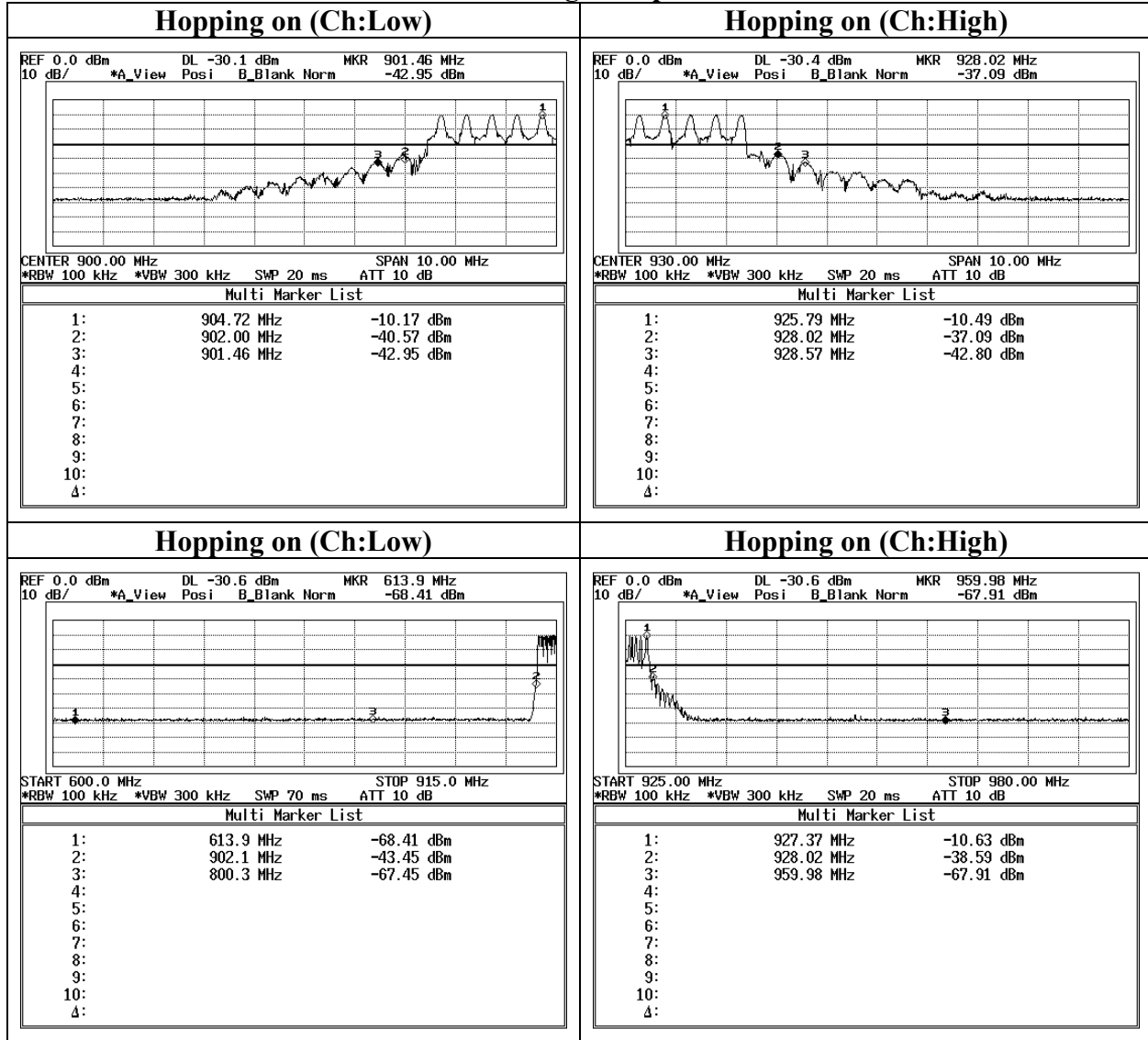
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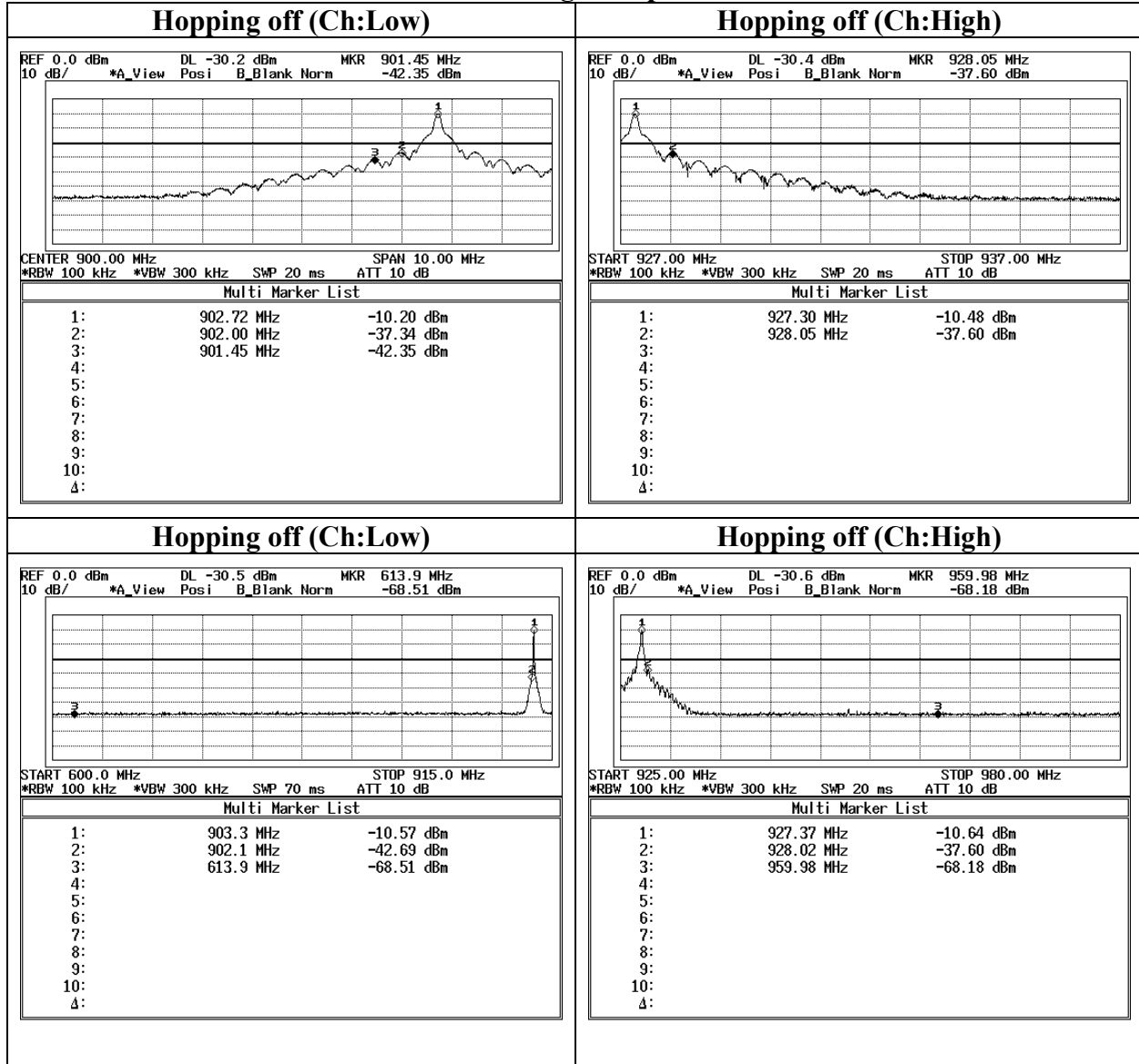
Facsimile : +81 596 24 8124

MF060b(01.06.05)

Conducted Spurious Emission
Band Edge compliance



Conducted Spurious Emission Band Edge compliance



99% Occupied Bandwidth

