



**FCC CFR47 PART 15 SUBPART C  
INDUSTRY CANADA RSS-210 ISSUE 8**

**CERTIFICATION TEST REPORT**

**FOR**

**FOB ASSY BIDIRECTIONAL R/C**

**MODEL NUMBER: GHW-H001**

**FCC ID: OUCGHW-H001**

**REPORT NUMBER: 32AE0249-SH-B-R1**

**ISSUE DATE: September 28, 2011**

*Prepared for*

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JAB Accreditation No. : RTL02610**



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Revision History

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Rev.	Issue Date	Revisions	Revised By
-	09/26/11	Initial Issue	M. Hosaka
1	09/28/11	Correct the description on the table in Section 5 * This report is a revised version of 32AE0249-SH-B. 32AE0249-SH-B is replaced with this report.	M. Hosaka

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** OMRON CORPORATION  
6368 NENJOZAKA, OKUSA  
KOMAKI, AICHI, 485-0802, JAPAN

**EUT DESCRIPTION:** FOB ASSY BIDIRECTIONAL R/C

**MODEL:** GHW-H001

**SERIAL NUMBER:** 2

**DATE TESTED:** September 12 to 21, 2011

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 2.9	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

UL Japan, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Japan, Inc based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Japan, Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Japan, Inc. will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by any government agency.

Approved & Released For UL Japan, Inc. By:                      Tested By:



Go Ishiwata  
Manager of WiSE Japan,  
UL Verification Service



Makoto Hosaka  
Engineer of WiSE Japan,  
UL Verification Service

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN.

UL Japan is accredited by JAB, Laboratory Code RTL02610. The full scope of accreditation can be viewed at

[http://www.jab.or.jp/cgi-bin/jab\\_exam\\_proof\\_i.cgi?page=2&authorization\\_number=RTL02610](http://www.jab.or.jp/cgi-bin/jab_exam_proof_i.cgi?page=2&authorization_number=RTL02610)

## 4. CALIBRATION AND UNCERTAINTY

### MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

### MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY	
Radiated Emission	30MHz-300MHz(3m)	+/- 4.9 dB
	300MHz-1000MHz(3m)	+/- 5.0 dB
	1000MHz- 13GHz(3m)	+/- 4.9 dB

Uncertainty figures are valid to a confidence level of 95% using a coverage factor k=2..

## 5. EQUIPMENT UNDER TEST

### DESCRIPTION OF EUT

The EUT is a FOB ASSY BIDIRECTIONAL R/C operating at 926.85MHz.

### DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an Internal loading antenna with maximum peak gains of -10.44dBi gain.

### SOFTWARE AND FIRMWARE

The test utility software used during testing was EVRemote-Stick\_H Ver. 1.0

### WORST-CASE CONFIGURATION AND MODE

The carrier and spurious was measured in three different orientations X, Y and Z to find worst-case orientation, and final testing for radiated emissions was performed with EUT in following orientation.

	Horizontal	Vertical
Carrier	Z	X
Spurious (below 1GHz)	Z	X
Spurious (above 1GHz)	Y	X

## **DESCRIPTION OF TEST SETUP**

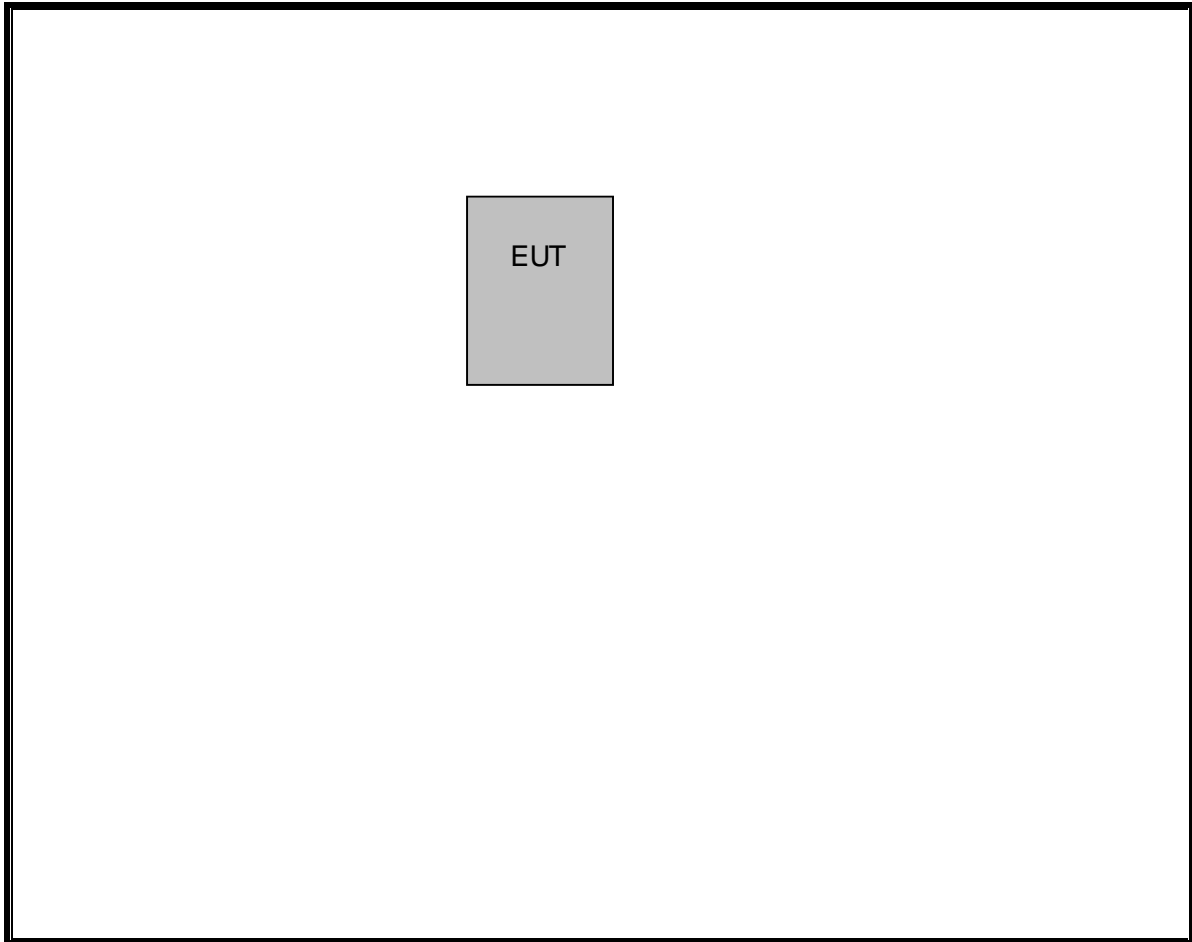
### **SUPPORT EQUIPMENT**

none

### **I/O CABLES**

none

**SETUP DIAGRAM FOR RADIATED TESTS**





## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Control No	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	2011/02/17 * 12
SAT6-01	Attenuator	JFW	50HF-006N	-	RE	2011/02/17 * 12
SAT3-04	Attenuator	JFW	50HF-003N	-	RE	2011/02/17 * 12
SBA-01	Biconical Antenna	Schwarzbeck	BBA9106	91032664	RE	2011/08/17 * 12
SCC-A1/A3/A5/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2011/04/28 * 12
SCC-A2/A4/A6/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2011/04/28 * 12
SLA-01	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0888	RE	2011/08/17 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2011/02/23 * 12
STR-01	Test Receiver	Rohde & Schwaz	ESU40	100093	RE	2010/10/29 * 12
SJM-12	Measure	PROMART	SEN1935	-	RE	-
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2010/09/11 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2011/02/17 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	2011/02/17 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2010/10/15 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2011/04/28 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2010/10/15 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2011/02/23 * 12
STR-03	Test Receiver	Rohde & Schwaz	ES140	100054/040	RE	2011/07/28 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE	-
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2010/09/13 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2011/07/19 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2011/04/28 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2011/05/27 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2011/08/28 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2011/03/07 * 12
SFL-01	Highpass Filter	MICRO-TRONICS	HPM50115	001	RE	2010/12/15 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2010/12/15 * 12
SAT10-04	Attenuator(above1GHz)	Agilent	8493C-010	74863	RE	2010/12/15 * 12

The expiration date of the calibration is the end of the expired month.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test Item:

RE: Radiated emission

## 7. ANTENNA PORT TEST RESULTS

### 20 dB AND 99% BANDWIDTH

#### LIMIT

None; for reporting purposes only.

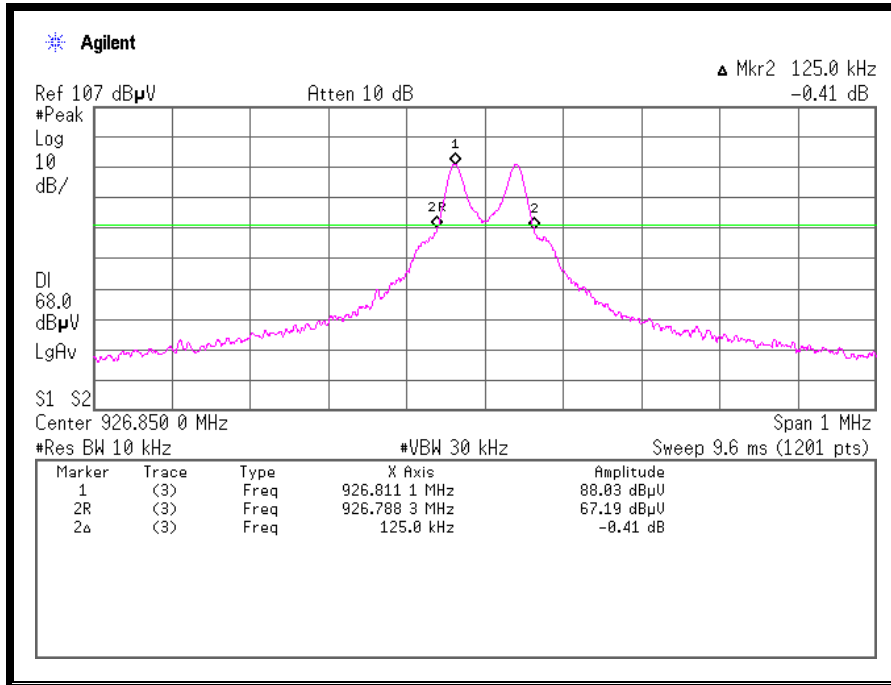
#### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode. The RBW is set to  $\geq 1\%$  of the 20 dB bandwidth. The VBW is set to 3 times the RBW.

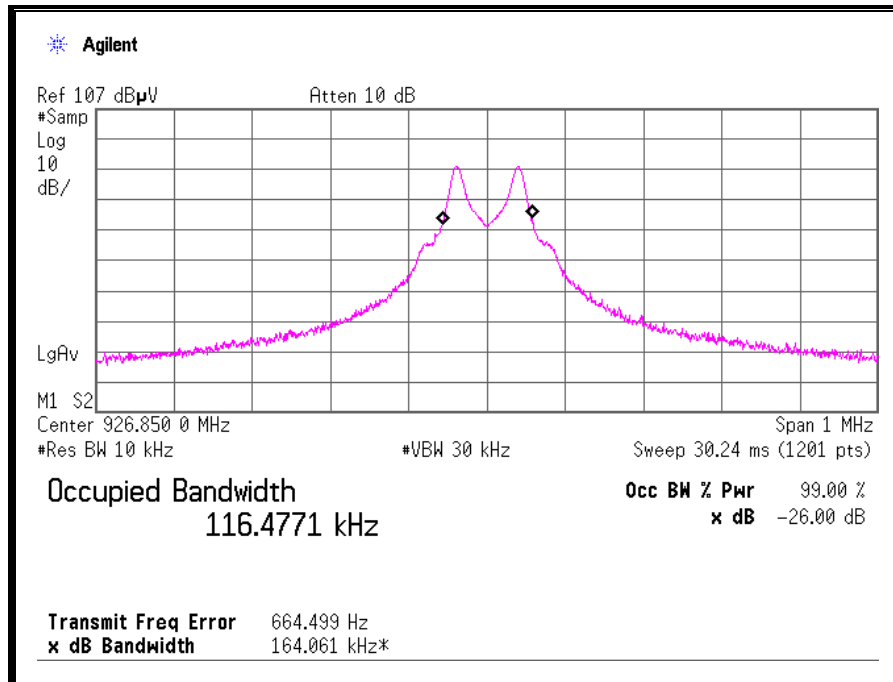
#### RESULTS

Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
926.85	125.0000	116.4771

**20 dB BANDWIDTH**



**99% BANDWIDTH**



## 8. RADIATED TEST RESULTS

### 8.1 LIMITS AND PROCEDURE

#### LIMITS

The field strengths measured at 3meters shall not exceed the following:

Frequency Range (MHz)	Field Strength (mV/m)	
	Fundamental	Harmonics
902 - 928	50	0.5

FCC §15.209

IC RSS-210 Clause 2.6 (Transmitter) & IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

#### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 10 Hz for average measurements.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

## 8.2 TRANSMITTER BELOW 1 GHz (carrier)

<b>DATA OF RADIATED EMISSION TEST</b>													
											UL Japan, Inc. Shonan EMC Lab. No.1 Semi-Anechoic Chamber Date : 2011/09/12		
Company : OMRON CORPORATION			Mode : Teansmitting			Report No. : 32AE0249-SH-B							
Kind of EUT : FOB ASSY BIDIRECTIONAL R/C			Power : DC3.0V			Temp./Humi. : 23deg.C. / 74%RH							
Model No. : GHW-H001													
Serial No. : 2													
Remarks : Hor:Z-axis, Ver:X-axis													
Limit1 : FCC15.249 (a)_below1GHz:QP						Engineer : Makoto Hosaka							
<< QP DATA >>													
No.	Freq. [MHz]	Reading <QP> [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result <QP> [dBuV/m]	Limit <QP> [dBuV/m]	Margin <QP> [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	928.810	60.1	22.4	10.1	0.0	92.6	94.0	1.4	Hori.	100	141	LP	
2	928.850	58.2	22.4	10.1	0.0	90.7	94.0	3.3	Hori.	100	141	LP	
3	928.890	60.1	22.4	10.1	0.0	92.6	94.0	1.4	Hori.	100	141	LP	
4	928.810	57.8	22.4	10.1	0.0	90.3	94.0	3.7	Vert.	119	77	LP	
5	928.850	55.9	22.4	10.1	0.0	88.4	94.0	5.6	Vert.	119	77	LP	
6	928.890	57.8	22.4	10.1	0.0	90.3	94.0	3.7	Vert.	119	77	LP	

Calculation:Result [dBuV/m] =Reading [dBuV] +Ant.Fac [dB/m] +Loss (Cable+ATT) [dB] - Gain (AMP) [dB]  
 Ant.Type=BC:BiConical Antenna LP:Logperiodic Antenna SHA-01: Horn Antenna

## TRANSMITTER BELOW 1 GHz (Spurious)

### DATA OF RADIATED EMISSION TEST

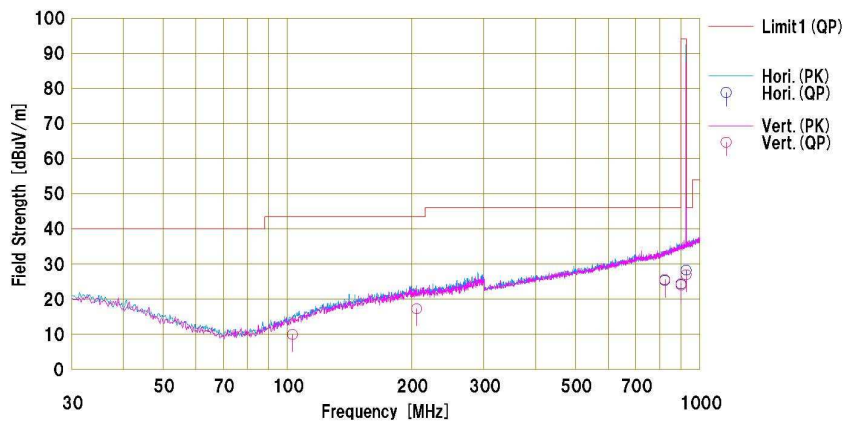
UL Japan, Inc. Shonan EMC Lab. No.1 Semi-Anechoic Chamber  
 Date : 2011/09/12

Company : OMRON CORPORATION  
 Kind of EUT : FOB ASSY BIDIRECTIONAL R/C  
 Model No. : GHW-H001  
 Serial No. : 2  
 Mode : Transmitting  
 Report No. : 32AE0249-SH-B  
 Power : DC3.0V  
 Temp./Humi. : 23deg.C. / 74%RH

Remarks : Hor:Z-axis, Ver:X-axis

Limit1 : FCC15\_249 (a)\_below1GHz:QP

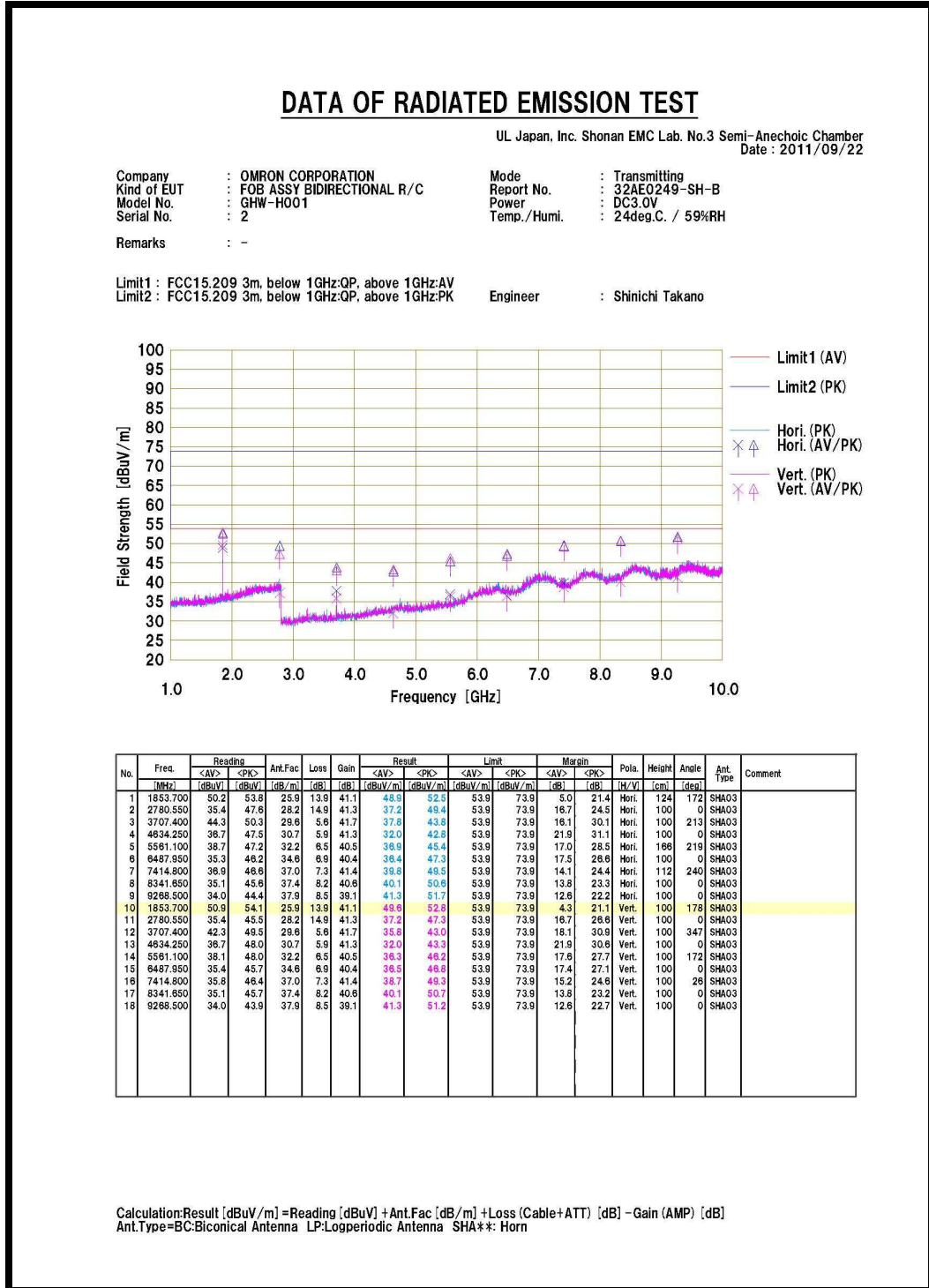
Engineer : Makoto Hosaka



No.	Freq. [MHz]	Reading [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. H/V	Height [cm]	Ante. [deg]	Ant. Type	Comment
1	102.987	23.2	10.5	8.0	31.8	9.9	43.5	33.6	Hori.	200	149	BC	
2	205.968	23.0	18.9	9.0	31.7	17.2	43.5	26.3	Hori.	150	352	BC	
3	823.872	26.2	21.2	9.7	31.8	25.3	46.0	20.7	Hori.	115	144	LP	
4	902.000	23.4	22.2	10.0	31.3	24.3	46.0	21.7	Hori.	100	347	LP	
5	928.000	26.9	22.4	10.1	31.2	28.2	46.0	17.8	Hori.	100	142	LP	
6	102.987	23.2	10.5	8.0	31.8	9.9	43.5	33.6	Vert.	100	45	BC	
7	205.968	23.0	18.9	9.0	31.7	17.2	43.5	26.3	Vert.	100	90	BC	
8	823.872	26.4	21.2	9.7	31.8	25.5	46.0	20.5	Vert.	131	317	LP	
9	902.000	23.1	22.2	10.0	31.3	24.0	46.0	22.0	Vert.	100	17	LP	
10	928.000	25.6	22.4	10.1	31.2	26.9	46.0	18.1	Vert.	116	97	LP	

Calculation:Result [dBuV/m]=Reading [dBuV]+Ant.Fac [dB/m]+Loss (Cable+ATT) [dB]-Gain (AMP) [dB]  
 Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna SHA-01: Horn Antenna

### 8.3 TRANSMITTER ABOVE 1 GHz







### 8.5 RECEIVER ABOVE 1 GHz

