UL Apex Co., Ltd.

EMI TEST REPORT

Test Report No. : 25AE0093-HO-1

Applicant	:	**OMRON Corporation**
Type of Equipment	:	**Immobilizer System/ Receiver of Keyless Entry system**
Model No.	:	**G8C-505M**
Test standard	:	**FCC Part 15 Subpart C Section 15.209, Section 15.205 : 2004**
FCC ID	:	**OUCG8C-505M**
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 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: October 6, 2004

Tested by: K. Adachi
Kenichi Adachi
EMC Service

Approved by :
Naoki Sakamoto
Group Leader of
EMC Service

UL Apex Co., Ltd.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
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SECTION 1: Client information

Company Name	:	OMRON Corporation
Address	:	6368 NENJOZAKA,OKUSA,KOMAKI,AICHI,485-0802 JAPAN
Telephone Number	:	+81-568-78-6394
Facsimile Number	:	+81-568-78-6188
Contact Person	:	Harumi Itatsu

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

2.1 Identification of E.U.T.

Type of Equipment	:	Immobilizer system/ Receiver of Keyless Entry system
Model No.	:	G8C-505M
Serial No.	:	1
Rating	:	DC12.0V
Country of Manufacture	:	JAPAN
Receipt Date of Sample	:	October 1, 2004
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

OMRON Corporation, Model No: G8C-505M (referred to as the EUT in this report) is the Immobilizer system / Receiver of Keyless Entry system.

*This EUT has the Immobilizer System and Receiver of Keyless Entry System inside of the enclosure. As for the each test report, the part of Immobilizer System is in Report No. 25AE0093-HO-1, and the part of the Receiver of Keyless Entry System is in report No. 25AE0094-HO-3.

Clock frequency	8MHz/CPU Clock
Equipment Type	Transmitter
Frequency of operation	125kHz
Type of modulation	Unmodulated carrier
Mode of operation	Simplex
Antenna Type	Key coil antenna
Method of Frequency Generation	Crystal
Operating Temperature	-40 deg. C. - +125 deg. C.

FCC Part 15.31 (e)
The power supply of this EUT is transformed to DC5.0V and provides stable voltage (DC5.0V) constantly to Radio part. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement
Loop Antenna (Tx section) is installed outside the vehicle's key cylinder and users cannot detach it from vehicle. Therefore, the equipment complies with the antenna requirement of Section 15.203.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C : 2004

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.205 Restricted bands of operation : 2004
Section 15.209 Radiated emission limits, general requirements : 2004

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Electric Field Strength of Fundamental Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section 15.209	Radiated	N/A	23.2dB 125.kHz 0 deg. AV 43.0dB 125.0kHz 0 deg. PK	Complied
2	Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section 15.205 FCC Section 15.209	Radiated	N/A	11.9dB 36.254MHz, Vertical	Complied
3	-26dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Reference data	Radiated	N/A	N/A	N/A

Note: UL Apex's EMI Work Procedures No.QPM05.
Uncertainty:
Spurious Emission (Radiated)
The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ±4.5dB(3m)/ ±4.7dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ±5.2dB(3m)/ ±3.8dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ±6.6dB.
Other test except Conducted Emission and Spurious Emission (Radiated)
The measurement uncertainty (with a 95% confidence level) for this test is ±3.0dB.
*In case of the margin below the EMC Head Office's uncertainty.
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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

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	RSS-210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004	Radiated	N/A	N/A	N/A

3.4 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

	Listed date (for FCC)	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	February 01, 2002	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	June 05, 2002	846015	IC4247-2	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

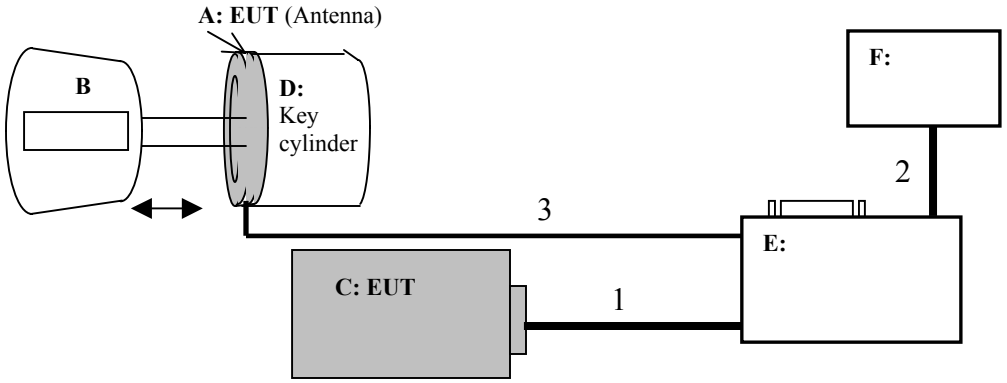
4.1 Operating Modes

The EUT was operated in a manner similar to typical use during the tests.

The mode is used : Continuous Transmitting and Receiving mode

Justification : The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Antenna (Immobilizer)	G8C-505M	1	OMRON Corporation	OUCG8C-505M (EUT)
B	Transponder	-	-	OMRON Corporation	-
C	Immobilizer System/Receiver of Keyless Entry System	G8C-505M	-	OMRON Corporation	OUCG8C-505M (EUT)
D	Key cylinder	-	-	OMRON Corporation	-
E	Simulator	-	-	OMRON Corporation	-
F	Car Battery	40B19L	-	YUASA	-

List of cables used

No.	Item	Length (m)	Shield	Backshell Material
1	Data signal and DC Power cable	1.0	N	Polyvinyl chloride
2	DC Cable	1.0	N	Polyvinyl chloride
3	Data signal and DC Power cable	1.0	N	Polyvinyl chloride

SECTION 5: Radiated emission (Fundamental and Spurious Emission and –26dB Bandwidth)

Test Procedure
The Radiated Electric Field Strength intensity has been measured on No 2 semi anechoic chamber with a ground plane and at a distance of 3m.

Frequency : From 9kHz to 30MHz at distance 3m
The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for each antenna angle 0deg. , 45deg. and 90deg.

Frequency : From 30MHz to 1GHz at distance 3m
The measuring antenna height 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.

Measurements were performed with a QP, PK, and AV detector.
The radiated emission measurements were made with the following detector function of the test receiver.

	From 9kHz to 90kHz and From 110kHz to 150kHz	From 90kHz to 110kHz	From 150kHz to 490kHz	From 490kHz to 30MHz	From 30MHz to 1GHz
Detector Type	PK/AV	QP	PK/AV	QP	QP
IF Bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz

*This EUT is to be installed in vehicles. The antenna of EUT is installed in Key cylinder, and the body of EUT is installed in the front part of vehicles. In the set-up configuration for the tests, the antenna and the body of EUT were set on three positions of X, Y, and Z axis respectively.

- The carrier level (or, noise levels) was (or were) measured at each position of all three axes X, Y and Z, and the position that has the maximum noise was determined.
With the position, the noise levels of all the frequencies were measured.

* Part 15 Section 15.31 (f)(2) (9kHz-30MHz)
[Limit at 3m]=[Limit at 300m]-40 x log (3[m]/300[m])
[Limit at 3m]=[Limit at 30m]-40 x log (3[m]/30[m])

Test data : APPENDIX 3
Test result : Pass

Date: October 6, 2004 Test engineer: Kenichi Adachi

APPENDIX 1: Photographs of test setup

This Page has been submitted for a separate exhibit.

This Page has been submitted for a separate exhibit.

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	1,2,3,4,5	2004/04/12 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	1,2,3	2004/02/03 * 12
MRENT-09	Spectrum Analyzer	Advantest	R3273	1,2,3,4,5	2004/02/18 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	1,2,4,5	2004/02/24 * 12
MPA-06	Pre Amplifier	Hewlett Packard	8447D	1,2,4,5	2004/08/29 * 12
MCC-31	coaxial cable	ULApex	-	1,2,4,5	2004/06/12 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	1,2,4,5	2004/01/08 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	3	2004/02/24 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	3	2003/12/16 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	3	2003/10/15 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	3	2003/10/15 * 12
MCB-02	Car Battery	YUASA	40B19L	1,2,3,4,5	Pre Check

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

Test Item:

Fundamental emission (125kHz) : 1
Spurious emission (9k-30MHz) : 2
Spurious emission (30M-1GHz) : 3
-26dB Bandwidth : 4
99% Occupied Bandwidth : 5

APPENDIX 3: Data of EMI test

Radiated Emission below 30MHz (Fundamental and Spurious emission)

DATA OF MAGNETIC RADIATED EMISSION TEST

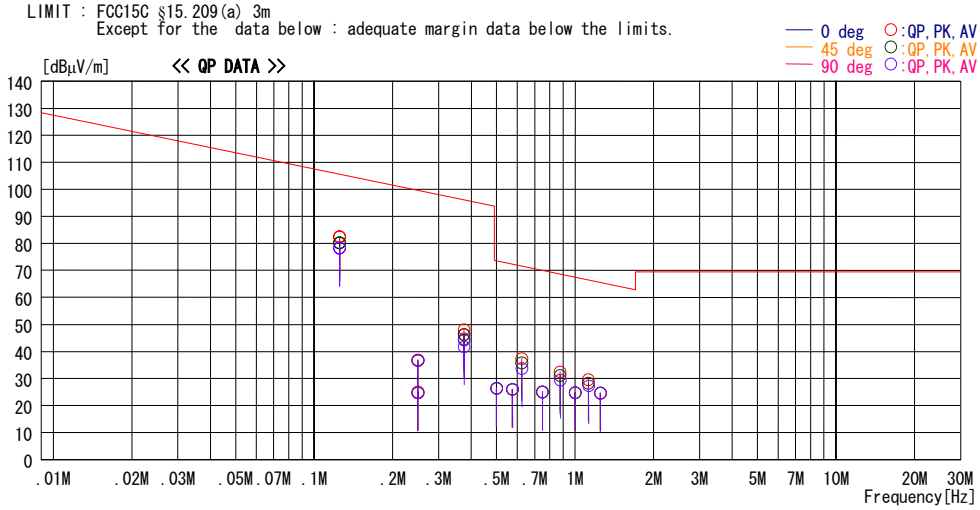
UL Apex Co.,LTD. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/10/06 20:38:33

Applicant : OMRON CORPORATION
Kind of EUT : Immobilizer System
Model No. : G8C-505M
Serial No. : 1

Report No. : 25AE0093-HO
Power : DC 12V
Temp℃/Humi% : 25 / 51
Operator : Kenichi Adachi

Mode / Remarks : Transmitting (125kHz) / EUT Max-axis (X-axis) , Antenna Max-axis (Y-axis)

LIMIT : FCC15C §15.209(a) 3m
Except for the data below : adequate margin data below the limits.



Freq. [MHz]	Reading [dBuV]	DET	Ant.Fac [dB]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dB]	Margin [dB]	Antenna	Table [deg]	Comment
0.12501	89.1	PEAK	19.9	0.0	26.4	82.6	125.6	43.0	0deg	360	(BW:200Hz) (Carrier)
0.12501	86.8	PEAK	19.9	0.0	26.4	80.3	125.6	45.3	45deg	346	(BW:200Hz) (Carrier)
0.12501	84.9	PEAK	19.9	0.0	26.4	78.4	125.6	47.2	90deg	85	(BW:200Hz) (Carrier)
0.12501	88.9	AV	19.9	0.0	26.4	82.4	105.6	23.2	0deg	360	(BW:200Hz) (Carrier)
0.12501	86.7	AV	19.9	0.0	26.4	80.2	105.6	25.4	45deg	346	(BW:200Hz) (Carrier)
0.12501	84.7	AV	19.9	0.0	26.4	78.2	105.6	27.4	90deg	85	(BW:200Hz) (Carrier)
0.25000	44.3	PEAK	19.9	0.0	27.3	36.9	119.5	82.6	0deg	360	(BW:9kHz)
0.25000	32.4	AV	19.9	0.0	27.3	25.0	99.5	74.5	0deg	360	(BW:9kHz)
0.25000	44.1	PEAK	19.9	0.0	27.3	36.7	119.5	82.8	45deg	360	(BW:9kHz)
0.25000	32.1	AV	19.9	0.0	27.3	24.7	99.5	74.8	45deg	360	(BW:9kHz)
0.25000	44.1	PEAK	19.9	0.0	27.3	36.7	119.5	82.8	90deg	360	(BW:9kHz)
0.25000	32.1	AV	19.9	0.0	27.3	24.7	99.5	74.8	90deg	360	(BW:9kHz)
0.37500	55.9	PEAK	19.8	0.0	27.6	48.1	116.0	67.9	0deg	360	(BW:9kHz)
0.37500	54.1	AV	19.8	0.0	27.6	46.3	96.0	49.7	0deg	360	(BW:9kHz)
0.37500	54.0	PEAK	19.8	0.0	27.6	46.2	116.0	69.8	45deg	340	(BW:9kHz)
0.37500	52.0	AV	19.8	0.0	27.6	44.2	96.0	51.8	45deg	340	(BW:9kHz)
0.37500	52.4	PEAK	19.8	0.0	27.6	44.6	116.0	71.4	90deg	85	(BW:9kHz)
0.37500	49.6	AV	19.8	0.0	27.6	41.8	96.0	54.2	90deg	85	(BW:9kHz)
0.50000	34.2	QP	19.8	0.1	27.7	26.4	73.5	47.1	0deg	360	(BW:9kHz)
0.50000	34.2	QP	19.8	0.1	27.7	26.4	73.5	47.1	45deg	360	(BW:9kHz)
0.50000	34.2	QP	19.8	0.1	27.7	26.4	73.5	47.1	90deg	360	(BW:9kHz)
0.57500	33.8	QP	19.8	0.1	27.7	26.0	72.3	46.3	0deg	360	(BW:9kHz)

CHART : WITH FACTOR ANT TYPE : LOOP
CALCULATION : READING + ANT FACTOR + LOSS(CABLE + ATTEN.-AMP.)

DATA OF MAGNETIC RADIATED EMISSION TEST

UL Apex Co.,LTD. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/10/06 20:38:33

Applicant : OMRON CORPORATION
Kind of EUT : Immobilizer System
Model No. : G8C-505M
Serial No. : 1

Report No. : 25AE0093-HO
Power : DC 12V
Temp℃/Humi% : 25 / 51
Operator : Kenichi Adachi

Mode / Remarks : Transmitting (125kHz) / EUT Max-axis (X-axis) , Antenna Max-axis (Y-axis)

LIMIT : FCC15C §15.209(a) 3m
Except for the data below : adequate margin data below the limits.

Freq.	Reading	DET	Ant.Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB]	[dB]	[dB]	[dBuV/m]	[dB]	[dB]		[deg]	
0.57500	33.8	QP	19.8	0.1	27.7	26.0	72.3	46.3	45deg	360	(BW:9kHz)
0.57500	33.8	QP	19.8	0.1	27.7	26.0	72.3	46.3	90deg	360	(BW:9kHz)
0.62500	45.2	QP	19.8	0.1	27.7	37.4	71.6	34.2	0deg	360	(BW:9kHz)
0.62500	43.6	QP	19.8	0.1	27.7	35.8	71.6	35.8	45deg	340	(BW:9kHz)
0.62500	41.5	QP	19.8	0.1	27.7	33.7	71.6	37.9	90deg	85	(BW:9kHz)
0.75000	33.0	QP	19.8	0.0	27.8	25.0	70.0	45.0	0deg	360	(BW:9kHz)
0.75000	33.0	QP	19.8	0.0	27.8	25.0	70.0	45.0	45deg	360	(BW:9kHz)
0.75000	33.0	QP	19.8	0.0	27.8	25.0	70.0	45.0	90deg	360	(BW:9kHz)
0.87500	40.5	QP	19.8	0.0	27.8	32.5	68.6	36.1	0deg	360	(BW:9kHz)
0.87500	39.1	QP	19.8	0.0	27.8	31.1	68.6	37.5	45deg	340	(BW:9kHz)
0.87500	37.4	QP	19.8	0.0	27.8	29.4	68.6	39.2	90deg	85	(BW:9kHz)
1.00000	32.7	QP	19.8	0.1	27.8	24.8	67.5	42.7	0deg	360	(BW:9kHz)
1.00000	32.7	QP	19.8	0.1	27.8	24.8	67.5	42.7	45deg	360	(BW:9kHz)
1.00000	32.7	QP	19.8	0.1	27.8	24.8	67.5	42.7	90deg	360	(BW:9kHz)
1.12500	37.5	QP	19.8	0.1	27.8	29.6	66.4	36.8	0deg	360	(BW:9kHz)
1.12500	36.2	QP	19.8	0.1	27.8	28.3	66.4	38.1	45deg	340	(BW:9kHz)
1.12500	35.2	QP	19.8	0.1	27.8	27.3	66.4	39.1	90deg	85	(BW:9kHz)
1.25000	32.5	QP	19.8	0.1	27.8	24.6	65.5	40.9	0deg	360	(BW:9kHz)
1.25000	32.5	QP	19.8	0.1	27.8	24.6	65.5	40.9	45deg	360	(BW:9kHz)
1.25000	32.5	QP	19.8	0.1	27.8	24.6	65.5	40.9	90deg	360	(BW:9kHz)

CHART : WITH FACTOR ANT TYPE : LOOP
CALCULATION : READING + ANT FACTOR + LOSS(CABLE + ATTEN.-AMP.)

Radiated Emission above 30MHz (Spurious)

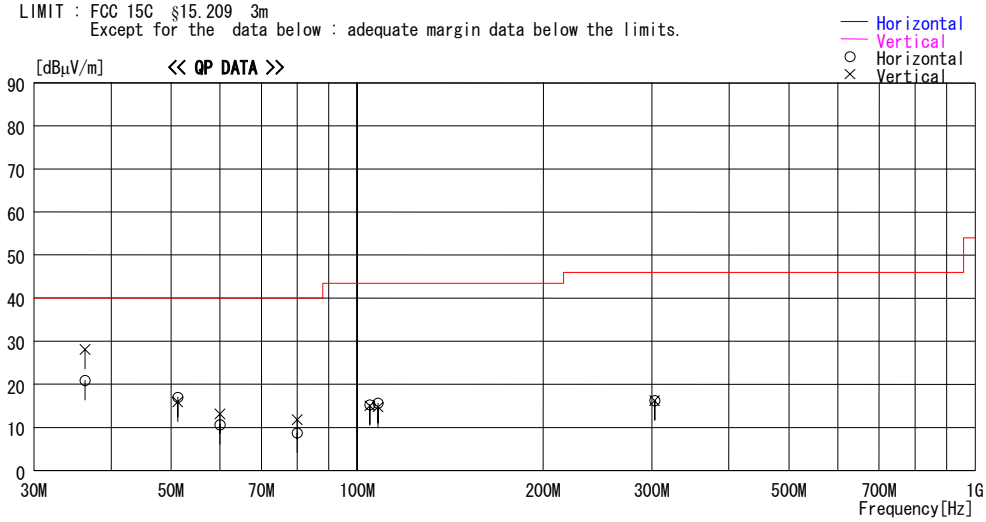
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/10/06 23:24:02

Applicant	: OMRON Corporation	Report No.	: 25AE0093-HO
Kind of EUT	: Immobilizer System	Power	: DC 12.0V
Model No.	: G8C-505M	Temp℃/Humi%	: 25 deg.C / 59 %
Sample No.	: 1	Operator	: Kenichi Adachi

Mode / Remarks : Transmitting 125kHz / EUT Max-axis (X-axis), Antenna Max-axis (Y-axis)

LIMIT : FCC 15C §15.209 3m
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
36.254	33.7	QP	15.7	-21.3	28.1	269	100	Vert.	40.0	11.9
36.254	26.5	QP	15.7	-21.3	20.9	184	300	Hori.	40.0	19.1
51.255	26.9	QP	10.0	-21.0	15.9	302	100	Vert.	40.0	24.1
51.255	28.0	QP	10.0	-21.0	17.0	185	361	Hori.	40.0	23.0
60.003	23.4	QP	8.1	-20.9	10.6	0	182	Hori.	40.0	29.4
60.003	25.9	QP	8.1	-20.9	13.1	0	266	Vert.	40.0	26.9
80.000	22.9	QP	6.3	-20.5	8.7	0	223	Hori.	40.0	31.3
80.000	26.0	QP	6.3	-20.5	11.8	0	262	Vert.	40.0	28.2
104.860	24.5	QP	10.9	-20.4	15.0	0	326	Vert.	43.5	28.5
104.860	24.8	QP	10.9	-20.4	15.3	0	207	Hori.	43.5	28.2
108.138	23.5	QP	11.4	-20.2	14.7	0	209	Vert.	43.5	28.8
108.138	24.4	QP	11.4	-20.2	15.6	0	217	Hori.	43.5	27.9
303.150	20.5	QP	14.2	-18.5	16.2	0	100	Vert.	46.0	29.8
303.150	20.5	QP	14.2	-18.5	16.2	0	100	Hori.	46.0	29.8

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

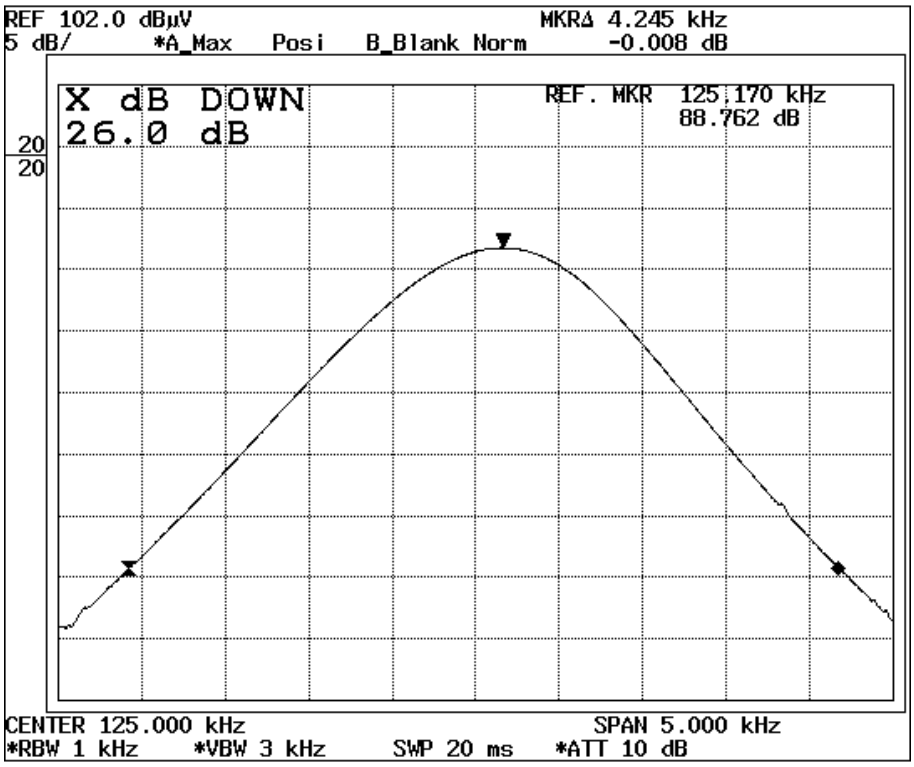
–26dB Bandwidth and 99% Occupied Bandwidth

UL Apex Co., Ltd.
No2 SEMI ANECHOIC CHAMBER

COMPANY	: OMRON CORPORATION	REPORT NO	: 25AE0093-HO
EQUIPMENT	: Immobilizer System	REGULATION	: Reference data
MODEL	: G8C-505M		: /RSS-210
S/ N	: 1	TEST DISTANCE	: 3m
POWER	: DC 12V	DATE	: 10/06/2004
MODE	: Transmitting	TEMPERATURE	: 23 deg. C
		HUMIDITY	: 51%
		ENGINEER	: Kenichi Adachi

FREQ [kHz]	-26dB Bandwidth [kHz]
125.2	4.25

FREQ [kHz]	99% Occupied Bandwidth [kHz]
125.2	4.25



* The measurement result data of 99% Occupied Bandwidth used the measurement result of –26dB Bandwidth.