EMISSION TEST REPORT

Test Report No. : **21BE0029YW-2**

Applicant:	**CALSONIC KANSEI CORP.**
Type of Equipment:	**Keyless Entry System (Receiver)**
Model No.:	**GSTU13**
Test standard:	**FCC Part 15 Subpart B**
Test Result:	**Complies**

The results in this report apply only to the sample tested.

Date of test: September 27, 2000

Tested by: _____

Naoki Sakamoto

Approved by: _____ Issued date: October 5, 2000

Kazutoyo Nakanishi

Section Manager of EMC section

Testing Laboratory

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1 GENERAL INFORMATION

APPLICANT	: CALSONIC KANSEI CORP.
TRADE NAME	: CALSONIC KANSEI
ADDRESS	: 5-24-15 Minamidai, Nakano-ku, Tokyo 164-8602 Japan Tel: +81-283-21-8136 Fax: +81-283-23-9191
REGULATION(S)	: FCC Part 15 Subpart B
MODEL NUMBER	: GSTU13
FCC ID	: KBRGSTU13
SERIAL NUMBER	: -
KIND OF EQUIPMENT	: Keyless Entry System (Receiver)
TESTED DATE	: September 27, 2000
RECEIPT DATE OF SAMPLE	: September 14, 2000
REPORT FILE NUMBER	: 21BE0029YW-2
TEST SITE	: A-PEX Yokowa NO.2 Open Test Site

1.1 Product Description

Model: GSTU13 (referred to as the EUT in this report) is a Keyless Entry System (Receiver).
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The specification is as following :
Local Clack Frequency : 304.3 MHz
Operation Voltage : DC 5V

1.2 Tested Equipment Details

The FCC IDs for all equipment, plus description of all cables used in the tested system are:

Model	FCC ID	Description	Cable description	Backshell Material
(1) CALSONIC KANSEI M/N: GSTU13 (EUT)	KBRGSTU13	Keyless Entry System (Receiver)	Unshielded DC Power Cable	P.V.C
(2) - - -	N/A	DC Power Supply	Unshielded AC Power Cable	-

1.3 Tested Methodology

Radiated testing were performed according to the procedures in FCC/ANSI C63.4 (1992).

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on 108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 Japan.
This site has been fully described in a report submitted to FCC office, and listed on May 15, 2000 (Registration number: 90411).

2 SYSTEM TEST CONFIGURATION

2.1 Operation Environment

Temperature : 23℃
Humidity : 60%
Power supply : DC 5V

2.2 Justification

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

2.3 EUT Exercise Software

The EUT exercise program used during radiated testing was designed to exercise the various system components in a manner similar to typical use.

The sequence is used:

Operation Mode : Running

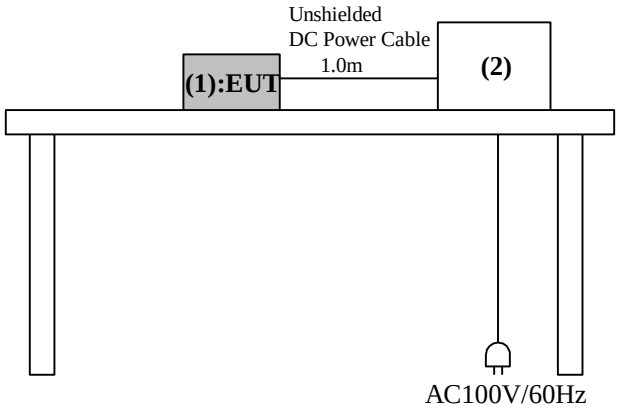
2.4 Test Procedure

Tabletop Equipment Radiated Emissions

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.
The measurement distance was 3m.

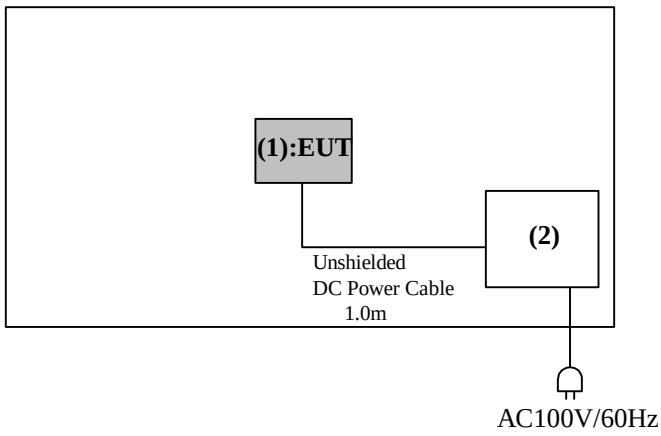
Figure2.1 Configuration of Tested System

Front View



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

Top View



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

3 RADIATED MEASUREMENT PHOTOS

Figure 3.1 Radiated Measurement Photos

3.1 Measurement Uncertainty

Radiated Emission Test

The measurement uncertainty (with a 95% confidence level) for this test was ±3.3dB.

☐ The data listed in this test report may exceed the test limit because it does not have enough margin (more than 3.3dB).

■ The data listed in this test report has enough margin, more than 3.3dB.

4 RADIATED EMISSION DATA

The initial step in collecting radiated data was a spectrum analyzer peak scan of the measurement range (30MHz-3200MHz).
The final data was reported in the worst-case emissions.
The minimum margin to the limit is as follows :

Frequency (MHz)	Receiver Reading (dB μ V)	Correction Factor (dB μ V)	Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB μ V)
32.0	25.4	-4.7	20.7	40.0	19.3

* quasi-peak mode

5.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, Cable Factor and Antenna Pad, and subtracting the Amplifier Gain from the measured reading. The sample calculation is as follows :

FS = RA + AF + CF + AT - AG

where FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Factor
AT = Antenna Pad
AG = Amplifier Gain

Assume a receiver reading of 25.4 dB μ V is obtained. The antenna Factor of 17.9 dB, Cable Factor of 1.0 dB and Antenna Pad of 6.1 dB is added. The Amplifier Gain of 29.7 dB is subtracted, giving a field strength of 20.7 dB μ V/m.

FS = 25.4 + 17.9 + 1.0 + 6.1 – 29.7 = 20.7 dB μ V/m

6 TEST EQUIPMENT USED

	INSTRUMENTS	Mfr.	MODEL	C/N	Calibrated Until
☐	Pre Amplifier	Hewlett Packard	8447D	AF1	November 16, 2000
■	Pre Amplifier	Anritsu	MH648A	AF3	November 16, 2000
■	Pre Amplifier	Hewlett Packard	8449B	AF4	November 16, 2000
☐	Attenuator	Anritsu	MP721B	AT6	June 8, 2001
☐	Biconical Antenna	Schwarzbeck	BBA9106	BA1	April 28, 2001
■	Biconical Antenna	Schwarzbeck	BBA9106	BA3	April 28, 2001
☐	Biconical Antenna	Schwarzbeck	BBA9106	BA5	April 28, 2001
■	Horn Antenna	A.H. Systems	SAS200/571	HA1	February 4, 2001
☐	Logperiodic Antenna	Schwarzbeck	UHAP9108-A	LA6	April 29, 2001
■	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	LA8	April 29, 2001
☐	Loop Antenna	Rohde & Schwarz	HFH2-Z2	LP1	November 3, 2000
☐	LISN	Rohde & Schwarz	ESH2-Z5	LS1	November 15, 2000
☐	LISN	Rohde & Schwarz	ESH3-Z5	LS2	November 15, 2000
☐	LISN	Schwarzbeck	NSLK8127	LS3	November 15, 2000
☐	LISN	Rohde & Schwarz	ESH3-Z5	LS4	November 15, 2000
☐	LISN	Schwarzbeck	NNLK8121	LS5	November 15, 2000
☐	LISN	Rolf Heine	NNB-4/200	LS6	November 15, 2000
☐	LISN	Schwarzbeck	NNLK8126	LS7	November 15, 2000
☐	LISN	Schwarzbeck	NSLK8127	LS10	April 8, 2001
■	Spectrum Analyzer	Hewlett Packard	8567A	SA3	December 13, 2000
☐	Spectrum Analyzer	Hewlett Packard	8567A	SA4	December 13, 2000
■	Spectrum Analyzer	Advantest	R3271	SA5	September 27, 2000
☐	Test Receiver	Rohde & Schwarz	ESHS-20	TR1	March 30, 2001
☐	Test Receiver	Rohde & Schwarz	ESVS-30	TR2	July 13, 2001
■	Test Receiver	Rohde & Schwarz	ESCS30	KTR1	August 7, 2001

■ indicates EMI Test Equipment used.

*All measurement equipment is traceable to national standard.

APPENDIX

A : Test Data

Radiated emissions A1 – A2

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