EMI TEST REPORT

Test Report No. : 24IE0145-HO-3

Applicant	:	**Calsonic Kansei Corp.**
Type of Equipment	:	**Controller of Intelligent Key System**
Model No.	:	**RN001**
Test standard	:	**FCC Part 15 Subpart C 2003 Section 15.209** **FCC Part 15 Subpart B : 2003 Section 15.109**
FCC ID	:	**KBRRN001**
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: June 3, 4 and 5 2004

Tested by:

K. Adachi
Kenichi Adachi
EMC Service

Naoki Sakamoto
EMC Service

Approved by :

Hironobu Shimoji
Group Leader of
EMC Service

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

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SECTION 1: Client information

Company Name	:	Calsonic Kansei Corp.
Address	:	8 Sakae-cho Sano-shi Tochigi 327-0816, Japan
Telephone Number	:	+81-283-21-8407
Facsimile Number	:	+81-283-21-8547
Contact Person	:	Kataro Ohashi

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

2.1 Identification of E.U.T.

Type of Equipment	:	Controller of Intelligent Key System
Model No.	:	RN001
Serial No.	:	1
Rating	:	DC 12V
Country of Manufacture	:	Japan
Receipt Date of Sample	:	May 26, 2004
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model No: RN001 is Controller of Intelligent Key System.
The controller of Intelligent Key System is a transmitter of 125kHz and a receiver of 315MHz. This 315MHz is transmitting from the Key. For the Key unit, see the test report No. 24IE0145-HO-1.

.Equipment Type	:	Transceiver
Rating	:	DC12V (Car battery)

Tx section

Frequency Characteristics	125kHz
Modulation	ASK
Information antenna	External (Bar antenna)

Rx section

Type of Receiver	Single Super Heterodyne
Receiving Frequency	315MHz
Intermediate Frequency	10.7MHz
Information antenna	Integral

FCC 15.31 (e)
This test was performed with the New Battery (DC 12V) and the constant voltage was supplied to this EUT during the tests. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement
The transmitting and receiving antenna of this EUT is installed on the board, which is unremovable. Therefore, this EUT complies with the requirement.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C : 2003
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.209 Radiated emission limits, general requirements

Test Specification : FCC Part 15 Subpart B : 2003
Section 15.109 Radiated emission limits
Title : FCC 47CFR Part15 Radio Frequency Device
Subpart B Unintentional Radiators

Remarks : This equipment adopted section 15.101(b) procedure-「However, receivers indicated as being subject to Declaration of Conformity that are contained within a transceiver, the transmitter portion of which is subject to certification, shall be authorized under the verification procedure.

3.2 Procedures and results

1) FCC Part15 Subpart C : 2003

No.	Item	Test Procedure	Specification	Remarks	Worst margin	Result
1	Electric Field Strength of Fundamental Emission	ANSI C63.4:2003	FCC Section 15.209	Radiated	19.0dB AV 0.125MHz 90 deg.	Complied
2	Electric Field Strength of Spurious Emission	ANSI C63.4:2003	FCC Section 15.205 FCC Section 15.209	Radiated	2.4dB QP 325.697MHz Horizontal	Complied
3	Conducted Emission	ANSI C63.4:2003	FCC Section 15.207(a)	AC Mains only*1)	N/A	N/A
Note: UL Apex's EMI Work procedures No. QPM05 *1) This test is not applicable since the EUT does not have AC power port.						

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

2) FCC Part15 Subpart B : 2003

No.	Item	Test Procedure	Specification	Remarks	Worst margin	Result
1	Radiated emission	ANSI C63.4:2003	FCC Section 15.109(a)	Radiated	2.4dB QP 325.697MHz Horizontal	Complied
2	Conducted Emission	ANSI C63.4:2003	FCC Section 15.107(a)	AC Mains only*1)	N/A	N/A
Note: UL Apex's EMI Work procedures No. QPM05 *1) This test is not applicable since the EUT does not have AC power port.						

*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	RSS210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004	RSS210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004	Conducted	N/A	N/A	N/A

3.4 Confirmation

UL Apex Co., Ltd. hereby confirms that E.U.T., in the configuration tested, complies with the specifications FCC Part 15 Subpart C : 2003 Section 15.209 and FCC Part 15 Subpart B : 2003 Section 15.109(a).

3.5 Uncertainty

Radiated Emission Test
The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ±4.5dB.
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ±5.2dB.
The measurement uncertainty (with a 95% confidence level) for this test using Horn Antenna is ±6.6dB.
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.6 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.

3.7 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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

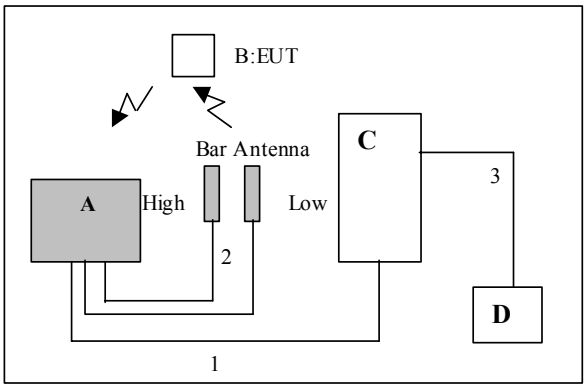
4.1 Operating Modes

The EUT was operated in a manner similar to typical use during the tests.
The mode is used : Transmitting mode/ Receiving mode
(Receiving mode: The test was performed under the signal from the transmitter.)
*The output power from the Bar antenna differs from the place of installation.
The test was made with the following mode with the maximum output power/Antenna (High) and with the minimum output power /Antenna (Low)

1) Antenna output power High & Low (simultaneous Transmitting)
2) Antenna output power High
3) Antenna output power Low

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	Remark	FCC ID
A	Controller of Intelligent Key System	RN001	1	Calsonic Kansei Corp.	EUT	KBRRN001
B	Key of Intelligent Key System	TN001	1	Calsonic Kansei Corp.	-	-
C	Checker	-	-	Calsonic Kansei Corp.	-	-
D	Car Battery	40B19L	A030402	YUASA	-	-

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	Signal and DC cable	1.0	N	Polyvinyl chloride
2	Antenna cable	1.0	N	Polyvinyl chloride
3	DC power supply	0.4	N	Polyvinyl chloride

SECTION 5: Radiated emission (Fundamental and Spurious Emission)

5.1 Operating environment

Test place : No.1 semi anechoic chamber
Temperature : See data
Humidity : See data

Test Procedure
The Radiated Electric Field Strength intensity has been measured on No.1 semi anechoic chamber with a ground plane and at a distance of 10m and on No.2 semi anechoic chamber with a ground plane and at a distance of 3m.

Frequency : From 9kHz to 30MHz at distance 10m
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 2GHz at distance 3m
The measuring antenna height was 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	From 1GHz to 2GHz
Detector Type	PK/AV	QP	PK/AV	QP	QP	PK
IF Bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz	1MHz*

* Spectrum Analyzer : RBW = VBW = 1MHz

- The carrier level (or, noise levels) was (or were) measured at each position of all three axes A, B and C, 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)
9kHz – 490kHz [Limit at 10m]=[Limit at 300m]-40log (10[m]/300[m])
490kHz – 30MHz[Limit at 10m]=[Limit at 30m]-40log (10[m]/30[m])

5.2 Test result

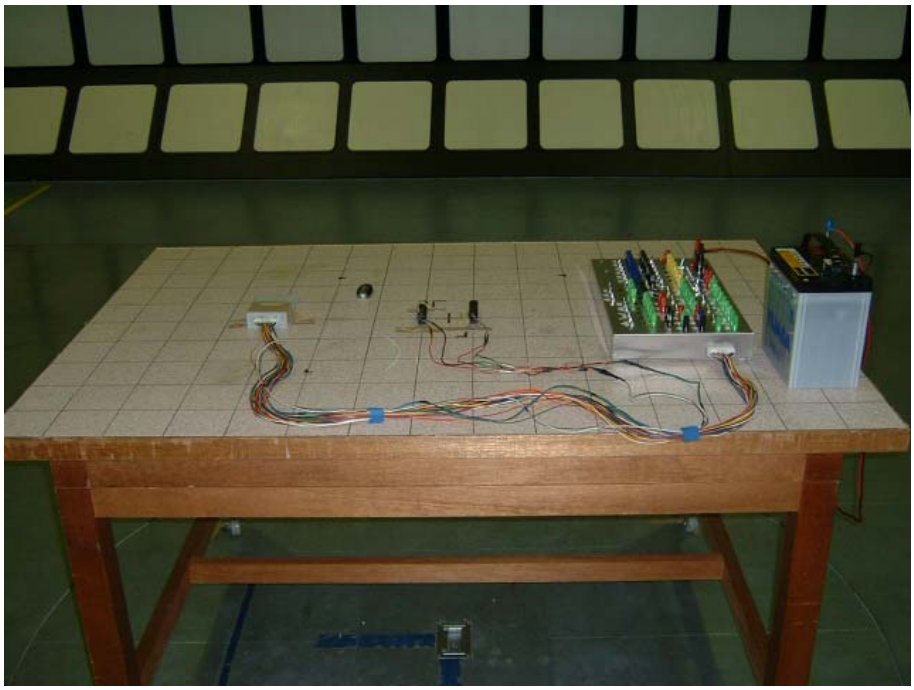
Summary of the test results: Pass

Date: June 3 and 4, 2004 Tested by: Kenichi Adachi and Naoki Sakamoto

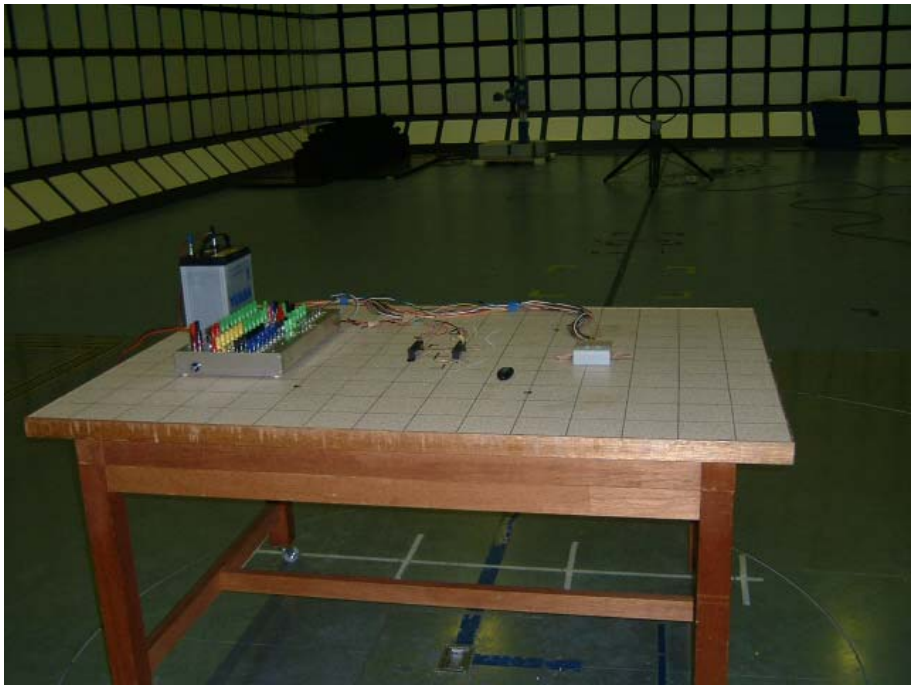
APPENDIX 1: Photographs of test setup

Radiated emission(Worst case position)

Front

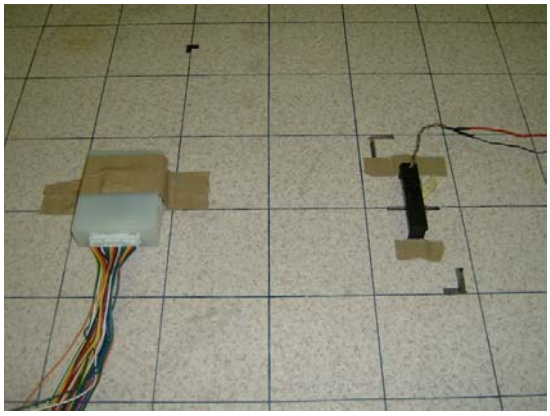


Rear

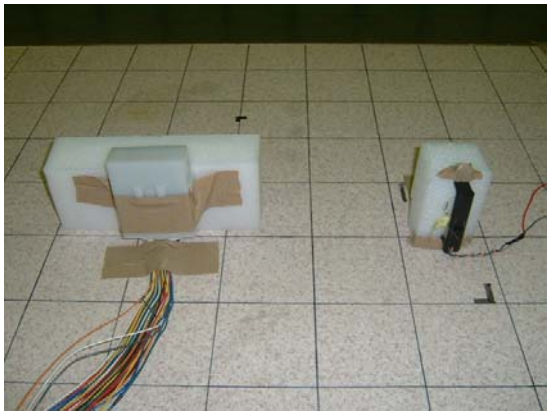


Worst Case Position (Horizontal : X-axis/ Vertical: X-axis)

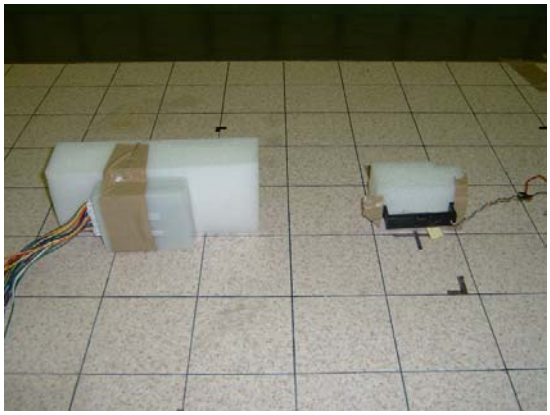
X-axis



Y-axis



Z-axis



APPENDIX 2:Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	ME / RE	2003/12/27 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	ME / RE	2003/11/12 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/ Agilent/TSJ	-	ME	2003/12/24 * 12
MPA-04	Pre Amplifier	Agilent	8447D	ME / RE	2004/05/25 * 12
MCC-08	coaxial cable	-	-	ME	2004/01/26 * 12
MCC-07	coaxial cable	-	-	ME	2004/01/26 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	ME	2004/01/08 * 12
MCC-01	Coaxial Cable	Suhner/storm/Agilent/ TSJ	-	RE	2003/12/19 * 12
MAT-06	Attenuator(6dB)	Weinschel Corp	2	RE	2003/12/16 * 12
MBA-01	Biconical Antenna	Schwarzbeck	BBA9106	RE	2003/10/15 * 12
MLA-01	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2003/10/15 * 12
MCC-05	Microwave Cable	Storm	421-011	RE	2004/01/06 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	RE	2004/03/31 * 12
MCC-23	Microwave Cable	Storm	-	RE	2004/05/01 * 12
MHA-05	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2004/01/10 * 12
MCB-02	Car Battery	YUASA	40B19L	ME / RE	Pre Check

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

Test Item:

RE: Radiated emission ME: Magnetic Radiated emission

APPENDIX 3: Data of EMI test

Radiated Emission (Tx Antenna High and Low)

DATA OF MAGNETIC RADIATED EMISSION TEST

UL Apex Co.,LTD. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/03 13:09:48

Applicant	: CalsonicKansei Corp.	Report No.	: 24IE0145-HO
Kind of EUT	: Controller of Intelligent Key System	Power	: DC 12V , DC 3V
Model No.	: RN001, TN001	Temp./ Humi.	: 22 deg.C. / 53 %
Serial No.	: No.1	Operator	: Naoki Sakamoto

Mode / Remarks : 9kHz-30MHz Tx/Rx AntGain_H&L X_Axis

LIMIT : FCC15C §15.209(a) 10m
Except for the data below : adequate margin data below the limits.

No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB]	LOSS [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA	TABLE [DEG]	
1	0.125	78.3	19.9	-25.5	72.7	104.8	32.1	0°	0	BW 200Hz, PK
2	0.250	44.7	19.9	-26.8	37.8	98.7	60.9	0°	0	BW: 9kHz, PK
3	0.125	67.8	19.9	-25.5	62.2	84.8	22.6	0°	0	BW 200Hz, AV
4	0.250	32.8	19.9	-26.8	25.9	78.7	52.8	0°	0	BW: 9kHz, AV
5	0.125	77.1	19.9	-25.5	71.5	104.8	33.3	45°	326	BW 200Hz, PK
6	0.250	44.2	19.9	-26.8	37.3	98.7	61.4	45°	321	BW: 9kHz, PK
7	0.125	67.1	19.9	-25.5	61.5	84.8	23.3	45°	326	BW 200Hz, AV
8	0.250	32.5	19.9	-26.8	25.6	78.7	53.1	45°	321	BW: 9kHz, AV
9	0.125	76.6	19.9	-25.5	71.0	104.8	33.8	90°	76	BW 200Hz, PK
10	0.250	44.1	19.9	-26.8	37.2	98.7	61.5	90°	75	BW: 9kHz, PK
11	0.125	65.9	19.9	-25.5	60.3	84.8	24.5	90°	76	BW 200Hz, AV
12	0.250	32.2	19.9	-26.8	25.3	78.7	53.4	90°	75	BW: 9kHz, AV

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

Remarks: This is the confirmation data in the simultaneous transmitting mode for the low frequency of High and Low antenna

The result of the simultaneous transmitting mode has no level differences with the data (p15/ Output power (High) and One antenna). The above third harmonics is the base noise so that the test up to the second harmonics was performed.

Radiated Emission (Tx Antenna High and Low)

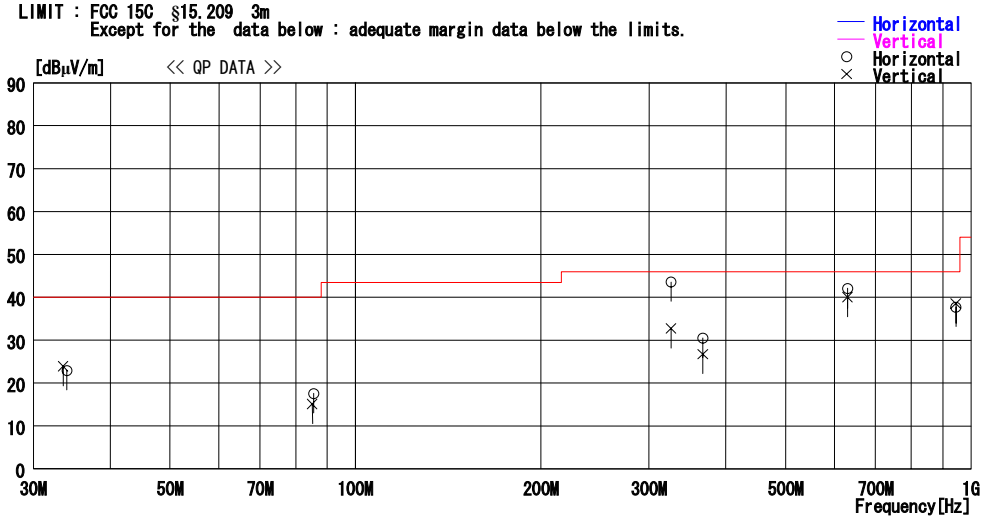
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/04 02:00:13

Applicant : Calsonic Kansei Corp.
Kind of EUT : Controller of Intelligent Key System
Model No. : RN001 , TN001
Sample No. : No.1
Report No. : 24IE0145-HO
Power : DC 12V , DC 3.0V
Temp. /Humi. : 25 deg.C / 46 %
Operator : Kenichi Adachi

Mode / Remarks : Tx:125kHz, Rx, Tx_AntennaGain_High_and_Low, X_Axis,

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



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
——— Horizontal ———										
1	33.982	26.6	16.9	7.2	27.8	22.9	40.0	17.1	329	359
2	85.619	30.5	7.1	7.8	27.8	17.6	40.0	22.4	205	181
3	325.697	45.8	15.3	10.0	27.5	43.6	46.0	2.4	100	148
4	366.404	30.5	16.9	10.6	27.5	30.5	46.0	15.5	100	297
5	629.918	39.2	19.7	12.0	28.8	42.1	46.0	3.9	137	275
6	944.885	31.0	22.1	13.2	28.6	37.7	46.0	8.3	277	280
——— Vertical ———										
7	33.486	27.4	17.1	7.2	27.8	23.9	40.0	16.1	100	107
8	85.112	28.1	7.0	7.8	27.8	15.1	40.0	24.9	168	90
9	325.693	34.9	15.3	10.0	27.5	32.7	46.0	13.3	100	347
10	366.409	26.7	16.9	10.6	27.5	26.7	46.0	19.3	286	359
11	630.031	37.1	19.7	12.0	28.8	40.0	46.0	6.0	100	236
12	944.898	31.8	22.1	13.2	28.6	38.5	46.0	7.5	100	239

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:

Radiated Emission (Tx Antenna High and Low)

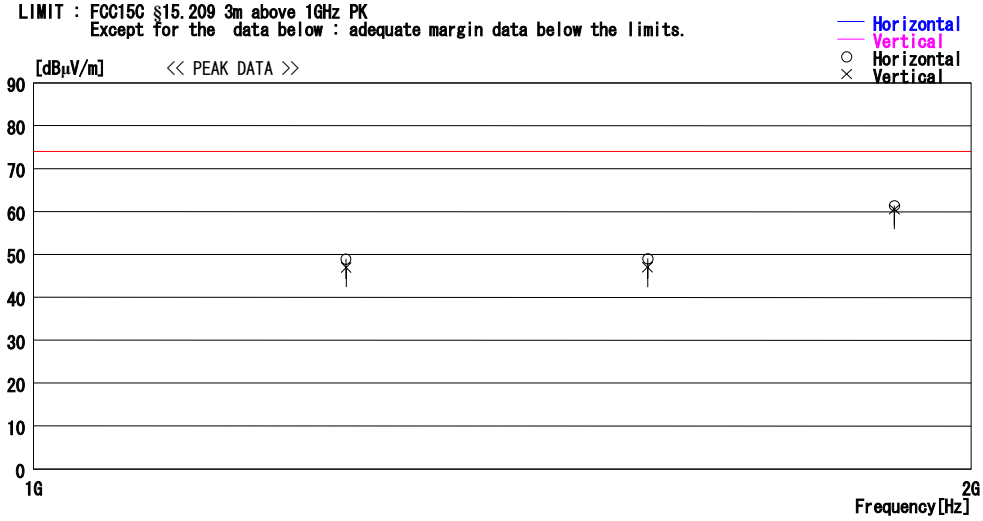
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/04 03:16:34

Applicant	: Calsonic Kansei Corp.	Report No.	: 24IE0145-HO
Kind of EUT	: Controller of Intelligent Key System	Power	: DC 12V , DC 3.0V
Model No.	: RN001 , TN001	Temp. /Humi.	: 25 deg.C / 46 %
Sample No.	: No.1	Operator	: Kenichi Adachi

Mode / Remarks : Tx:125kHz, Rx, Tx_AntennaGain_High_and_Low, X_Axis,

LIMIT : FCC15C §15.209 3m above 1GHz PK
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING PK [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
——— Horizontal ———										
1	1259.867	48.8	23.3	3.9	27.1	48.9	74.0	25.1	100	265
2	1574.819	46.8	25.1	4.4	27.3	49.0	74.0	25.0	100	230
3	1889.758	55.0	29.0	4.9	27.5	61.4	74.0	12.6	100	270
——— Vertical ———										
4	1260.002	46.8	23.3	3.9	27.1	46.9	74.0	27.1	100	180
5	1574.619	44.8	25.1	4.4	27.3	47.0	74.0	27.0	100	180
6	1889.774	54.1	29.0	4.9	27.5	60.5	74.0	13.5	100	180

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:

Radiated Emission (Tx Antenna High and Low)

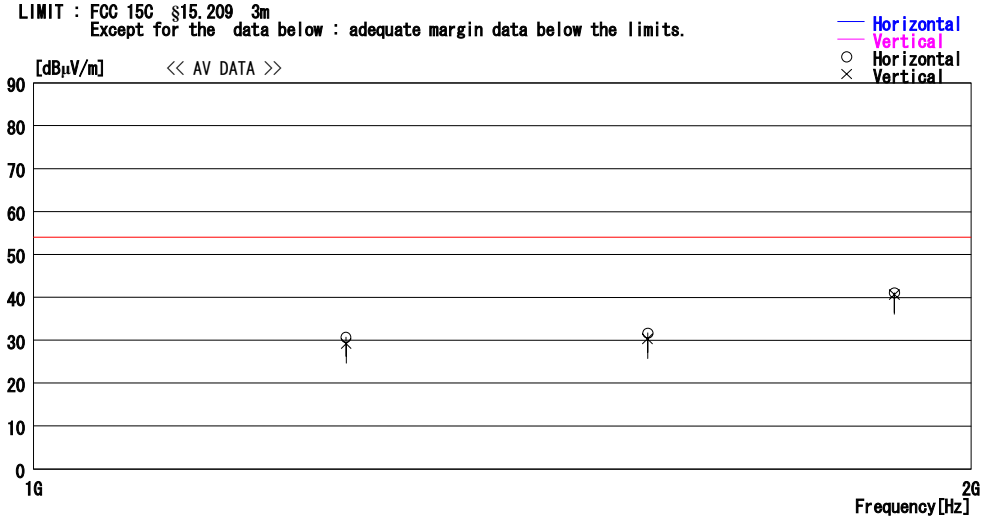
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/04 03:16:34

Applicant : Calsonic Kansei Corp.
Kind of EUT : Controller of Intelligent Key System
Model No. : RN001 , TN001
Sample No. : No.1
Report No. : 24IE0145-HO
Power : DC 12V , DC 3.0V
Temp. /Humi. : 25 deg.C / 46 %
Operator : Kenichi Adachi

Mode / Remarks : Tx:125kHz, Rx, Tx_AntennaGain_High_and_Low, X_Axis,

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



No.	FREQ [MHz]	READING AV [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
——— Horizontal ———										
1	1259.867	30.6	23.3	3.9	27.1	30.7	54.0	23.3	100	265
2	1574.819	29.5	25.1	4.4	27.3	31.7	54.0	22.3	100	230
3	1889.758	34.6	29.0	4.9	27.5	41.0	54.0	13.0	100	270
——— Vertical ———										
4	1260.002	29.1	23.3	3.9	27.1	29.2	54.0	24.8	100	180
5	1574.619	28.1	25.1	4.4	27.3	30.3	54.0	23.7	100	180
6	1889.774	34.2	29.0	4.9	27.5	40.6	54.0	13.4	100	180

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:

Radiated Emission (Tx Antenna High only)

UL Apex Co.,LTD. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/03 16:46:21

Applicant	: CalsonicKansei Corp.	Report No.	: 24IE0145-HO
Kind of EUT	: Controller of Intelligent Key System	Power	: DC 12V , DC 3V
Model No.	: RN001, TN001	Temp./ Humi.	: 22 deg.C. / 53 %
Serial No.	: No.1	Operator	: Naoki Sakamoto

Mode / Remarks : 9kHz-30MHz Tx_Rx AntGain_H X_Axis

LIMIT : FCC15C §15.209(a) 10m
Except for the data below : adequate margin data below the limits.

FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB]	LOSS [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA	TABLE [DEG]	
0.125	78.1	19.9	-25.5	72.5	104.8	32.3	0°	0	BW 200Hz, PK
0.125	69.4	19.9	-25.5	63.8	84.8	21.0	0°	0	BW 200Hz, AV
0.250	44.8	19.9	-26.8	37.9	98.7	60.8	0°	168	BW: 9kHz, PK
0.250	32.4	19.9	-26.8	25.5	78.7	53.2	0°	168	BW: 9kHz, AV
0.375	42.4	19.9	-27.0	35.3	95.2	59.9	0°	149	BW: 9kHz, PK
0.375	30.8	19.9	-27.0	23.7	75.2	51.5	0°	149	BW: 9kHz, AV
0.500	34.7	19.9	-26.9	27.7	52.7	25.0	0°	325	BW: 9kHz, QP
0.625	34.3	19.8	-27.2	26.9	50.8	23.9	0°	0	BW: 9kHz, QP
0.750	33.6	19.8	-27.2	26.2	49.2	23.0	0°	0	BW: 9kHz, QP
0.875	33.1	19.8	-27.2	25.7	47.8	22.1	0°	0	BW: 9kHz, QP
1.000	32.9	19.8	-27.2	25.5	46.7	21.2	0°	0	BW: 9kHz, QP
1.125	32.8	19.8	-27.2	25.4	45.7	20.3	0°	0	BW: 9kHz, QP
1.250	32.8	19.8	-27.3	25.3	44.7	19.4	0°	0	BW: 9kHz, QP
0.125	78.6	19.9	-25.5	73.0	104.8	31.8	45°	326	BW 200Hz, PK
0.250	44.4	19.9	-26.8	37.5	98.7	61.2	45°	307	BW: 9kHz, PK
0.375	43.6	19.9	-27.0	36.5	95.2	58.7	45°	279	BW: 9kHz, PK
0.500	34.6	19.9	-26.9	27.6	52.7	25.1	45°	175	BW: 9kHz, QP
0.125	67.3	19.9	-25.5	61.7	84.8	23.1	45°	326	BW: 200Hz, AV
0.250	32.3	19.9	-26.8	25.4	78.7	53.3	45°	307	BW: 9kHz, AV
0.375	32.3	19.9	-27.0	25.2	75.2	50.0	45°	279	BW: 9kHz, AV
0.625	34.3	19.8	-27.2	26.9	50.8	23.9	45°	281	BW: 9kHz, QP
0.750	33.6	19.8	-27.2	26.2	49.2	23.0	45°	280	BW: 9kHz, QP
0.875	33.4	19.8	-27.2	26.0	47.8	21.8	45°	301	BW: 9kHz, QP
1.000	33.1	19.8	-27.2	25.7	46.7	21.0	45°	320	BW: 9kHz, QP
1.125	32.9	19.8	-27.2	25.5	45.7	20.2	45°	290	BW: 9kHz, QP
1.250	32.8	19.8	-27.3	25.3	44.7	19.4	45°	305	BW: 9kHz, QP
0.125	78.2	19.9	-25.5	72.6	104.8	32.2	90°	287	BW 200Hz, PK
0.250	43.3	19.9	-26.8	36.4	98.7	62.3	90°	285	BW: 9kHz, PK
0.375	43.3	19.9	-27.0	36.2	95.2	59.0	90°	71	BW: 9kHz, PK
0.500	34.7	19.9	-26.9	27.7	52.7	25.0	90°	320	BW: 9kHz, QP

FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB]	LOSS [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA	TABLE [DEG]	
0.125	71.4	19.9	-25.5	65.8	84.8	19.0	90°	287	BW: 200Hz , AV
0.250	32.3	19.9	-26.8	25.4	78.7	53.3	90°	285	BW : 9kHz , AV
0.375	31.0	19.9	-27.0	23.9	75.2	51.3	90°	71	BW : 9kHz , AV
0.625	34.1	19.8	-27.2	26.7	50.8	24.1	90°	86	BW : 9kHz , QP
0.750	33.5	19.8	-27.2	26.1	49.2	23.1	90°	91	BW : 9kHz , QP
0.825	33.5	19.8	-27.2	26.1	48.4	22.3	90°	78	BW : 9kHz , QP
1.000	33.1	19.8	-27.2	25.7	46.7	21.0	90°	67	BW : 9kHz , QP
1.125	32.9	19.8	-27.2	25.5	45.7	20.2	90°	87	BW : 9kHz , QP
1.250	32.8	19.8	-27.3	25.3	44.7	19.4	90°	78	BW : 9kHz , QP

CHART : WITH FACTOR ANT TYPE : LOOP

CALCULATION : READING + ANT FACTOR + LOSS(CABLE + ATTEN.-AMP.)

Page:

Radiated Emission (Tx Antenna High only)

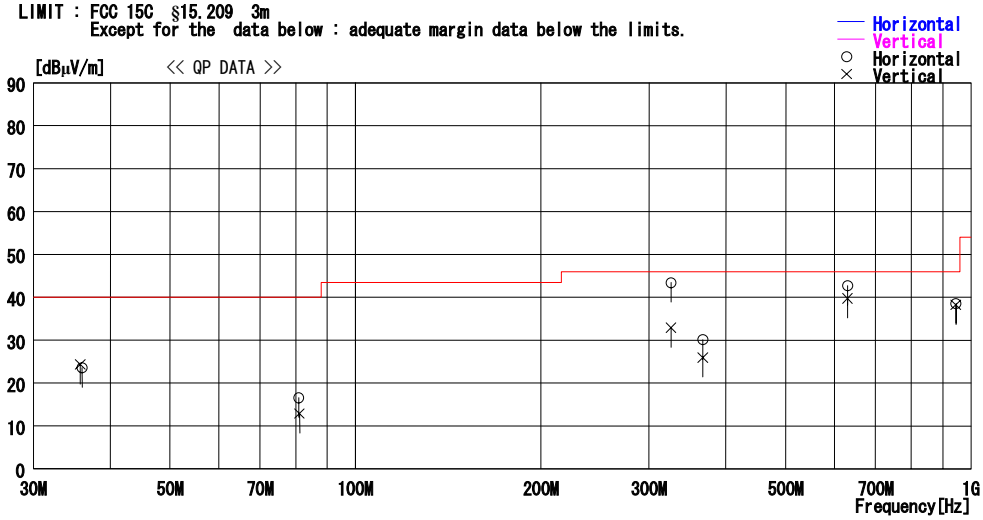
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/04 04:44:12

Applicant : Calsonic Kansei Corp.
Kind of EUT : Controller of Intelligent Key System
Model No. : RN001 , TN001
Sample No. : No.1
Report No. : 24IE0145-HO
Power : DC 12V , DC 3.0V
Temp. /Humi. : 25 deg.C / 46 %
Operator : Kenichi Adachi

Mode / Remarks : Tx:125kHz, Rx, Tx_AntennaGain_High, X_Axis,

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



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
——— Horizontal ———										
1	35.992	28.4	15.9	7.2	27.9	23.6	40.0	16.4	311	359
2	80.863	30.3	6.4	7.7	27.8	16.6	40.0	23.4	251	202
3	325.696	45.6	15.3	10.0	27.5	43.4	46.0	2.6	100	145
4	366.395	30.1	16.9	10.6	27.5	30.1	46.0	15.9	100	292
5	629.925	39.8	19.7	12.0	28.8	42.7	46.0	3.3	124	265
6	944.887	31.8	22.1	13.2	28.6	38.5	46.0	7.5	261	274
——— Vertical ———										
7	35.736	29.0	16.0	7.2	27.9	24.3	40.0	15.7	100	109
8	81.128	26.6	6.4	7.7	27.8	12.9	40.0	27.1	191	87
9	325.689	35.1	15.3	10.0	27.5	32.9	46.0	13.1	100	351
10	366.397	25.9	16.9	10.6	27.5	25.9	46.0	20.1	279	359
11	630.028	36.8	19.7	12.0	28.8	39.7	46.0	6.3	100	233
12	944.883	31.5	22.1	13.2	28.6	38.2	46.0	7.8	100	239

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:

Radiated Emission (Tx Antenna High only)

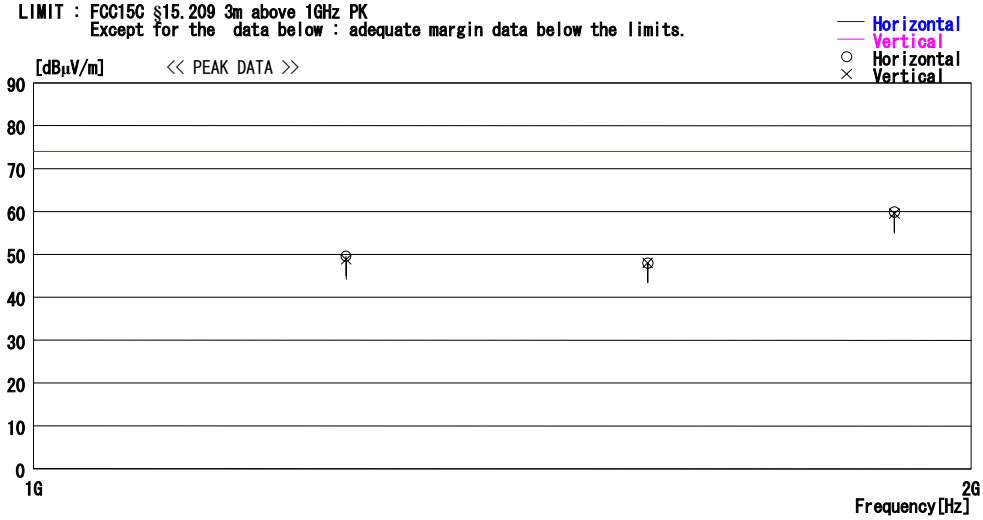
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/04 03:16:34

Applicant : Calsonic Kansei Corp.
Kind of EUT : Controller of Intelligent Key System
Model No. : RN001 , TN001
Sample No. : No.1
Report No. : 24IE0145-HO
Power : DC 12V , DC 3.0V
Temp. /Humi. : 25 deg.C / 46 %
Operator : Kenichi Adachi

Mode / Remarks : Tx:125kHz, Rx, Tx_AntennaGain_High, X_Axis,

LIMIT : FCC15C §15.209 3m above 1GHz PK
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING PK [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
——— Horizontal ———										
1	1259.867	49.5	23.3	3.9	27.1	49.6	74.0	24.4	100	265
2	1574.819	45.8	25.1	4.4	27.3	48.0	74.0	26.0	100	230
3	1889.758	53.5	29.0	4.9	27.5	59.9	74.0	14.1	100	270
——— Vertical ———										
4	1260.002	48.7	23.3	3.9	27.1	48.8	74.0	25.2	100	180
5	1574.840	45.8	25.1	4.4	27.3	48.0	74.0	26.0	100	180
6	1889.774	53.1	29.0	4.9	27.5	59.5	74.0	14.5	100	180

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:

Radiated Emission (Tx Antenna High only)

DATA OF RADIATED EMISSION TEST

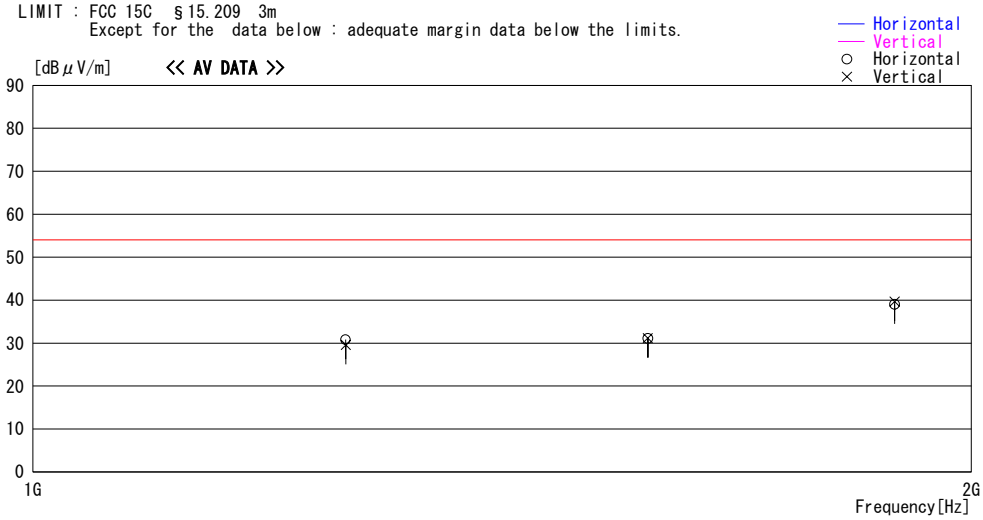
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/04 03:16:34

Applicant : Calsonic Kansei Corp.
Kind of EUT : Keyless Entry System
Model No. : RN001 , TN001
Sample No. : No.1

Report No. : 24IE0145-HO
Power : DC 12V , DC 3.0V
Temp. /Humi. : 25 deg.C / 46 %
Operator : Kenichi Adachi

Mode / Remarks : Tx:125kHz, Rx, Tx_AntennaGain_High, X_Axis,

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



No.	FREQ [MHz]	READING AV [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	1259.867	30.7	23.3	3.9	27.1	30.8	54.0	23.2	100	265
2	1574.819	28.9	25.1	4.4	27.3	31.1	54.0	22.9	100	230
3	1889.758	32.6	29.0	4.9	27.5	39.0	54.0	15.0	100	270
----- Vertical ------										
4	1260.002	29.5	23.3	3.9	27.1	29.6	54.0	24.4	100	180
5	1574.840	29.0	25.1	4.4	27.3	31.2	54.0	22.8	100	180
6	1889.774	33.3	29.0	4.9	27.5	39.7	54.0	14.3	100	180

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:

Radiated Emission (Tx Antenna Low only)

DATA OF MAGNETIC RADIATED EMISSION TEST

UL Apex Co.,LTD. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/03 21:44:39

Applicant : CalsonicKansei Corp.
Kind of EUT : Controller of Intelligent Key System
Model No. : RN001, TN001
Serial No. : No.1
Report No. : 24IE0145-HO
Power : DC 12V , DC 3V
Temp./ Humi. : 22 deg.C. / 53 %
Operator : Kenichi Adachi

Mode / Remarks : 9kHz-30MHz Tx_Rx AntGain_L X_Axis

LIMIT : FCC15C §15.209(a) 10m
Except for the data below : adequate margin data below the limits.

No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB]	LOSS [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA	TABLE [DEG]	
1	0.125	60.5	19.9	-25.5	54.9	104.8	49.9	0°	174	BW 200Hz, PK
2	0.125	50.2	19.9	-25.5	44.6	84.8	40.2	0°	174	BW 200Hz, AV
3	0.250	43.3	19.9	-26.8	36.4	98.7	62.3	0°	174	BW: 9kHz, PK
4	0.250	31.9	19.9	-26.8	25.0	78.7	53.7	0°	174	BW: 9kHz, AV
5	0.375	41.9	19.9	-27.0	34.8	95.2	60.4	0°	174	BW: 9kHz, PK
6	0.375	29.9	19.9	-27.0	22.8	75.2	52.4	0°	174	BW: 9kHz, AV
7	0.500	34.5	19.9	-26.9	27.5	52.7	25.2	0°	174	BW: 9kHz, QP
8	0.625	33.8	19.8	-27.2	26.4	50.8	24.4	0°	174	BW: 9kHz, QP
9	0.750	33.4	19.8	-27.2	26.0	49.2	23.2	0°	174	BW: 9kHz, QP
10	0.875	33.0	19.8	-27.2	25.6	47.8	22.2	0°	174	BW: 9kHz, QP
11	1.000	32.9	19.8	-27.2	25.5	46.7	21.2	0°	174	BW: 9kHz, QP
12	1.125	32.7	19.8	-27.2	25.3	45.7	20.4	0°	174	BW: 9kHz, QP
13	1.250	32.7	19.8	-27.3	25.2	44.7	19.5	0°	174	BW: 9kHz, QP
14	0.125	59.8	19.9	-25.5	54.2	104.8	50.6	45°	320	BW 200Hz, PK
15	0.125	49.3	19.9	-25.5	43.7	84.8	41.1	45°	320	BW 200Hz, AV
16	0.250	43.3	19.9	-26.8	36.4	98.7	62.3	45°	320	BW: 9kHz, PK
17	0.250	31.9	19.9	-26.8	25.0	78.7	53.7	45°	320	BW: 9kHz, AV
18	0.375	41.9	19.9	-27.0	34.8	95.2	60.4	45°	320	BW: 9kHz, PK
19	0.375	29.9	19.9	-27.0	22.8	75.2	52.4	45°	320	BW: 9kHz, AV
20	0.500	34.5	19.9	-26.9	27.5	52.7	25.2	45°	320	BW: 9kHz, QP
21	0.625	33.8	19.8	-27.2	26.4	50.8	24.4	45°	320	BW: 9kHz, QP
22	0.750	33.4	19.8	-27.2	26.0	49.2	23.2	45°	320	BW: 9kHz, QP
23	0.875	33.0	19.8	-27.2	25.6	47.8	22.2	45°	320	BW: 9kHz, QP
24	1.000	32.9	19.8	-27.2	25.5	46.7	21.2	45°	320	BW: 9kHz, QP
25	1.125	32.7	19.8	-27.2	25.3	45.7	20.4	45°	320	BW: 9kHz, QP
26	1.250	32.7	19.8	-27.3	25.2	44.7	19.5	45°	320	BW: 9kHz, QP
27	0.125	59.2	19.9	-25.5	53.6	104.8	51.2	90°	89	BW 200Hz, PK
28	0.125	48.8	19.9	-25.5	43.2	84.8	41.6	90°	89	BW 200Hz, AV
29	0.250	43.3	19.9	-26.8	36.4	98.7	62.3	90°	89	BW: 9kHz, PK
30	0.250	31.9	19.9	-26.8	25.0	78.7	53.7	90°	89	BW: 9kHz, AV

No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB]	LOSS [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA	TABLE [DEG]	
31	0.375	41.9	19.9	-27.0	34.8	95.2	60.4	90°	89	BW: 9kHz , PK
32	0.375	29.9	19.9	-27.0	22.8	75.2	52.4	90°	89	BW: 9kHZ , AV
33	0.500	34.5	19.9	-26.9	27.5	52.7	25.2	90°	89	BW: 9kHz , QP
34	0.625	33.8	19.8	-27.2	26.4	50.8	24.4	90°	89	BW: 9kHz , QP
35	0.750	33.4	19.8	-27.2	26.0	49.2	23.2	90°	89	BW: 9kHz , QP
36	0.875	33.0	19.8	-27.2	25.6	47.8	22.2	90°	89	BW: 9kHz , QP
37	1.000	32.9	19.8	-27.2	25.5	46.7	21.2	90°	89	BW: 9kHz , QP
38	1.125	32.7	19.8	-27.2	25.3	45.7	20.4	90°	89	BW: 9kHz , QP
39	1.250	32.7	19.8	-27.3	25.2	44.7	19.5	90°	89	BW: 9kHz , QP

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

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

Radiated Emission (Tx Antenna Low only)

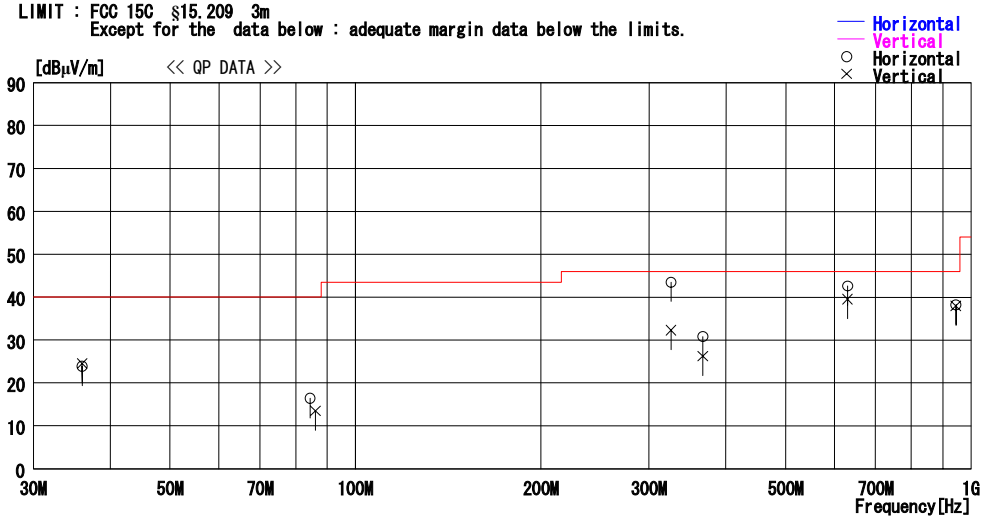
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/04 05:24:35

Applicant : Calsonic Kansei Corp.
Kind of EUT : Controller of Intelligent Key System
Model No. : RN001 , TN001
Sample No. : No.1
Report No. : 24IE0145-HO
Power : DC 12V , DC 3.0V
Temp. /Humi. : 25 deg.C / 46 %
Operator : Kenichi Adachi

Mode / Remarks : Tx:125kHz, Rx, Tx_AntennaGain_Low, X_Axis,

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



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
——— Horizontal ———										
1	35.992	28.7	15.9	7.2	27.9	23.9	40.0	16.1	315	0
2	84.372	29.5	6.9	7.8	27.8	16.4	40.0	23.6	236	209
3	325.696	45.7	15.3	10.0	27.5	43.5	46.0	2.5	100	148
4	366.404	30.8	16.9	10.6	27.5	30.8	46.0	15.2	100	294
5	629.921	39.7	19.7	12.0	28.8	42.6	46.0	3.4	127	267
6	944.891	31.5	22.1	13.2	28.6	38.2	46.0	7.8	266	271
——— Vertical ———										
7	35.993	29.3	15.9	7.2	27.9	24.5	40.0	15.5	100	105
8	86.134	26.3	7.2	7.8	27.8	13.5	40.0	26.5	228	133
9	325.703	34.5	15.3	10.0	27.5	32.3	46.0	13.7	100	350
10	366.418	26.2	16.9	10.6	27.5	26.2	46.0	19.8	271	359
11	630.038	36.6	19.7	12.0	28.8	39.5	46.0	6.5	100	238
12	944.870	31.2	22.1	13.2	28.6	37.9	46.0	8.1	100	232

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:

Radiated Emission (Tx Antenna Low only)

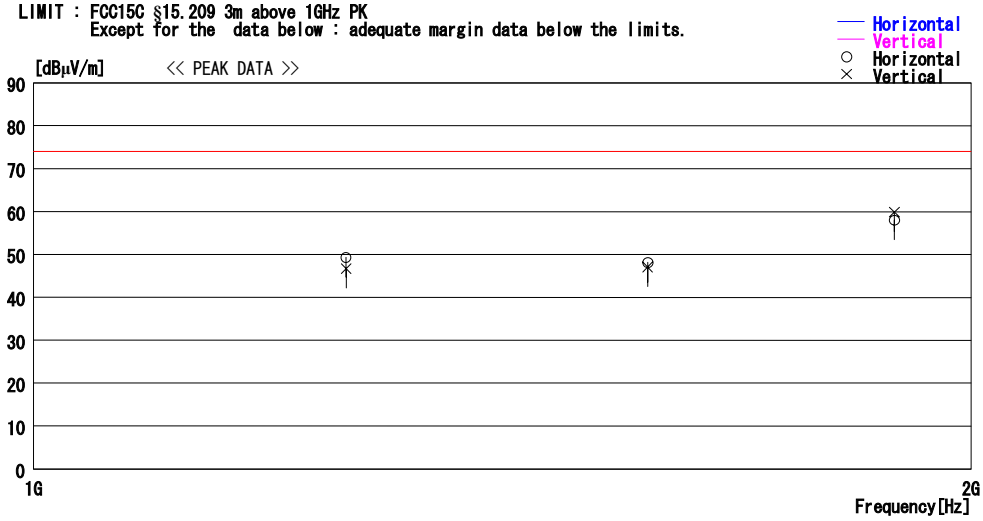
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/04 03:16:34

Applicant : Calsonic Kansei Corp.
Kind of EUT : Controller of Intelligent Key System
Model No. : RN001 , TN001
Sample No. : No.1
Report No. : 24IE0145-HO
Power : DC 12V , DC 3.0V
Temp. /Humi. : 25 deg.C / 46 %
Operator : Kenichi Adachi

Mode / Remarks : Tx:125kHz, Rx, Tx_AntennaGain_Low, X_Axis,

LIMIT : FCC15C §15.209 3m above 1GHz PK
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING PK [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
——— Horizontal ———										
1	1259.867	49.2	23.3	3.9	27.1	49.3	74.0	24.7	100	265
2	1574.819	45.9	25.1	4.4	27.3	48.1	74.0	25.9	100	230
3	1889.758	51.6	29.0	4.9	27.5	58.0	74.0	16.0	100	270
——— Vertical ———										
4	1260.002	46.6	23.3	3.9	27.1	46.7	74.0	27.3	100	180
5	1574.840	44.9	25.1	4.4	27.3	47.1	74.0	26.9	100	180
6	1889.774	53.5	29.0	4.9	27.5	59.9	74.0	14.1	100	180

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:

Radiated Emission (Tx Antenna Low only)

DATA OF RADIATED EMISSION TEST

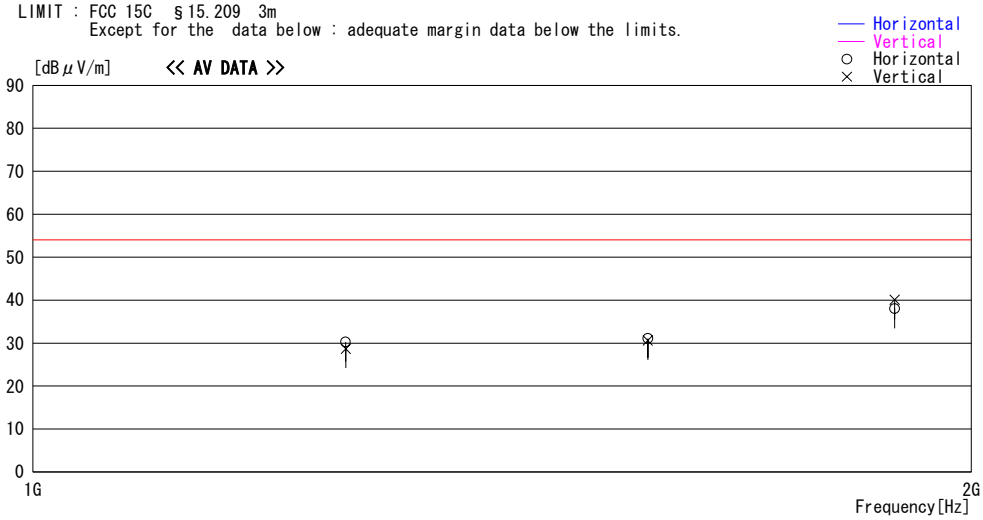
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/04 03:16:34

Applicant : Calsonic Kansei Corp.
Kind of EUT : Keyless Entry System
Model No. : RN001 , TN001
Sample No. : No.1

Report No. : 24IE0145-HO
Power : DC 12V , DC 3.0V
Temp. /Humi. : 25 deg.C / 46 %
Operator : Kenichi Adachi

Mode / Remarks : Tx:125kHz, Rx, Tx_AntennaGain_Low, X_Axis,

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



No.	FREQ [MHz]	READING AV [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	1259.867	30.2	23.3	3.9	27.1	30.3	54.0	23.7	100	265
2	1574.819	28.9	25.1	4.4	27.3	31.1	54.0	22.9	100	230
3	1889.758	31.6	29.0	4.9	27.5	38.0	54.0	16.0	100	270
----- Vertical ------										
4	1260.002	28.6	23.3	3.9	27.1	28.7	54.0	25.3	100	180
5	1574.840	28.4	25.1	4.4	27.3	30.6	54.0	23.4	100	180
6	1889.774	33.7	29.0	4.9	27.5	40.1	54.0	13.9	100	180

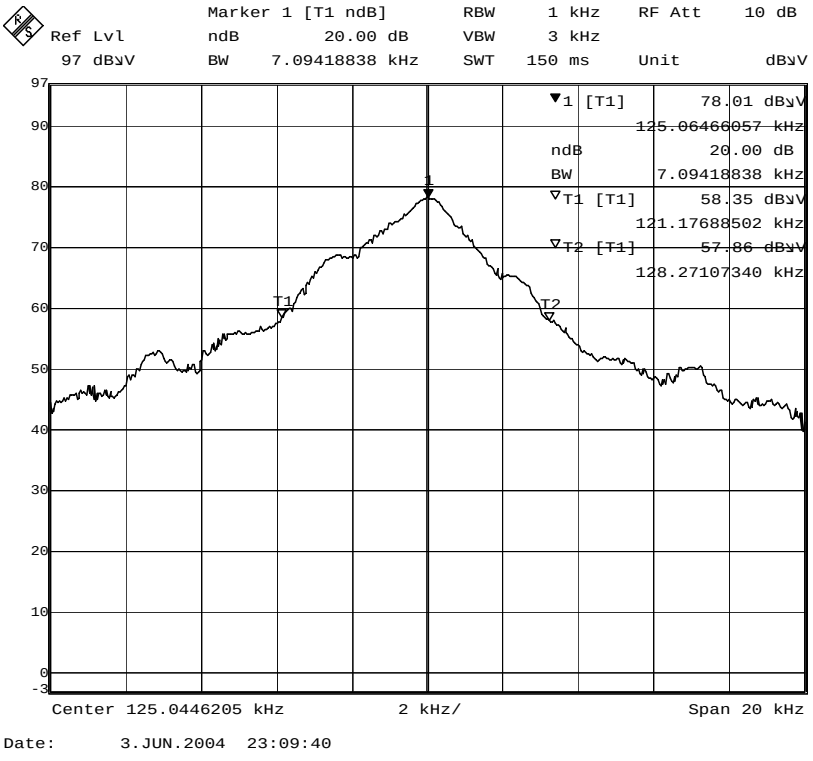
CHART:WITH FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN Page:

–20dB Bandwidth (Tx Antenna High only)

UL Apex Co., Ltd.
No1 SEMI ANECHOIC CHAMBER

COMPANY	:	Calsonic Kansei Corpration	REPORT NO	:	24IE0145-HO
EQUIPMENT	:	Controller of Intelligent Key System	REGULATION	:	FCC15.231(c)
MODEL	:	RN001	TEST DISTANCE	:	10m
S/ N	:	No.1	DATE	:	06/03/2004
POWER	:	DC 12V	TEMPERATURE	:	22 deg. C
MODE	:	Transmitting 125kHz	HUMIDITY	:	53%
			ENGINEER	:	Kenichi Adachi

FREQ [kHz]	-20dB Bandwidth [kHz]
125.0	7.89



99% Occpied Bandwidth (Tx Antenna High only)

UL Apex Co., Ltd.
No1 SEMI ANECHOIC CHAMBER

COMPANY	:	Calsonic Kansei Corpration	REPORT NO	:	24IE0145-HO
EQUIPMENT	:	Controller of Intelligent Key System	REGULATION	:	RSS210
MODEL	:	RN001	TEST DISTANCE	:	10m
S/ N	:	No.1	DATE	:	06/03/2004
POWER	:	DC 12V	TEMPERATURE	:	22 deg. C
MODE	:	Transmitting 125kHz	HUMIDITY	:	53%
			ENGINEER	:	Kenichi Adachi

FREQ [kHz]	99% Occpied Bandwidth [kHz]
125.0	8.70