

APPENDIX 2: Data of EMI test

Radiated Emission below 30MHz (Fundamental and Spurious Emission) MAX ANT1

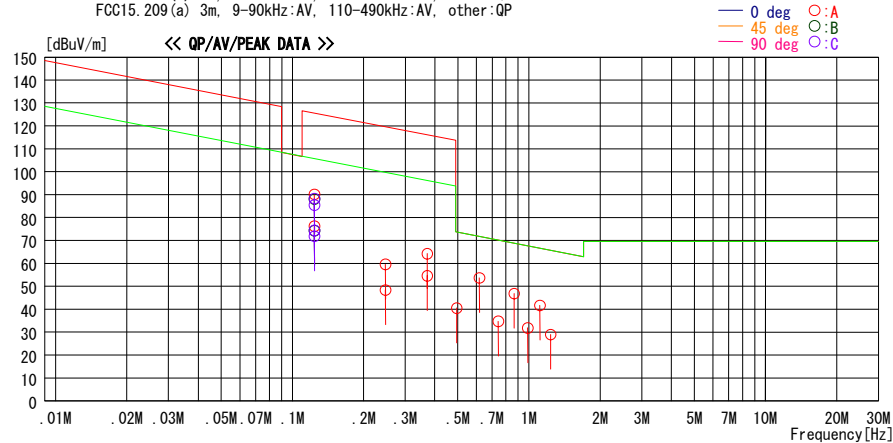
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2009/04/15

Company : Calsonic Kansei Corporation
Kind of EUT : BCM2 for Passive Keyless
Model No. : S57L0
Serial No. : 001
Report No. : 29BE0206-HO-06
Power : DC 12V
Temp./Humi. : 24deg.C. / 38%
Engineer : Kazufumi Nakai

Mode / Remarks : Tx, 125kHz, Ant: MAX ANT1, Worst-axis : X-axis

LIMIT : FCC15. 209(a) 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15. 209(a) 3m, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg]	[deg]	
0.12368	102.6	PEAK	19.7	0.1	32.2	90.2	125.7	35.5	0	A	183 Worst
0.12368	100.5	PEAK	19.7	0.1	32.2	88.1	125.7	37.6	45	B	148
0.12368	97.9	PEAK	19.7	0.1	32.2	85.5	125.7	40.2	90	C	260
0.12368	100.7	PEAK	19.7	0.1	32.2	88.3	125.7	37.4	135	C	208
0.12368	88.7	AV	19.7	0.1	32.2	76.3	105.8	29.5	0	A	183 Worst
0.12368	86.6	AV	19.7	0.1	32.2	74.2	105.8	31.6	45	B	148
0.12368	84.3	AV	19.7	0.1	32.2	71.9	105.8	33.9	90	C	260
0.12368	86.8	AV	19.7	0.1	32.2	74.4	105.8	31.4	135	C	208
0.24737	71.9	PEAK	19.6	0.2	32.2	59.5	119.7	60.2	0	A	166
0.24737	60.8	AV	19.6	0.2	32.2	48.4	99.7	51.3	0	A	166
0.37117	76.6	PEAK	19.5	0.2	32.1	64.2	116.2	52.0	0	A	170
0.37117	67.0	AV	19.5	0.2	32.1	54.6	96.2	41.6	0	A	170
0.49483	53.0	QP	19.4	0.2	32.1	40.5	73.7	33.2	0	A	166
0.61834	66.2	QP	19.4	0.2	32.1	53.7	71.8	18.1	0	A	172
0.74221	47.2	QP	19.4	0.2	32.1	34.7	70.2	35.5	0	A	171
0.86598	59.4	QP	19.4	0.2	32.1	46.9	68.8	21.9	0	A	174
0.98959	44.3	QP	19.3	0.3	32.1	31.8	67.7	35.9	0	A	175
1.11315	54.2	QP	19.3	0.3	32.1	41.7	66.6	24.9	0	A	175
1.23615	41.4	QP	19.4	0.3	32.1	29.0	65.7	36.7	0	A	170

CHART: WITH FACTOR, ANT TYPE: LOOP, Except for the data below: adequate margin data below the limits.
CALCULATION: RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission below 30MHz (Fundamental and Spurious Emission)

MIN ANT

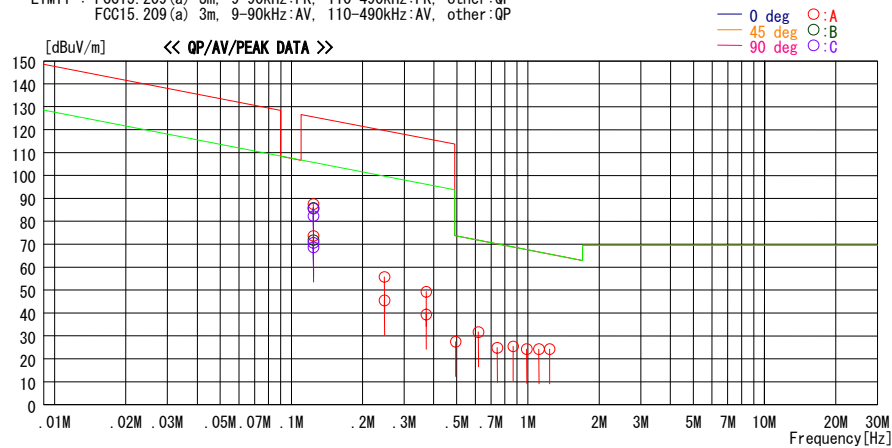
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2009/04/15

Company : Calsonic Kansei Corporation
Kind of EUT : BCM2 for Passive Keyless
Model No. : S57L0
Serial No. : 001
Report No. : 29BE0206-HO-06
Power : DC 12V
Temp./ Humi. : 24deg.C / 38%
Engineer : Kazufumi Nakai

Mode / Remarks : Tx, 125kHz, Ant: MIN ANT, Worst-axis : X-axis

LIMIT : FCC15. 209(a) 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15. 209(a) 3m, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg]	[deg]	
0.12368	100.0	PEAK	19.7	0.1	32.2	87.6	125.7	38.1	0	A	171 Worst
0.12368	98.3	PEAK	19.7	0.1	32.2	85.9	125.7	39.8	45	B	150
0.12368	94.7	PEAK	19.7	0.1	32.2	82.3	125.7	43.4	90	C	250
0.12368	98.0	PEAK	19.7	0.1	32.2	85.6	125.7	40.1	135	C	230
0.12368	86.0	AV	19.7	0.1	32.2	73.6	105.8	32.2	0	A	171 Worst
0.12368	84.2	AV	19.7	0.1	32.2	71.8	105.8	34.0	45	B	150
0.12368	81.0	AV	19.7	0.1	32.2	68.6	105.8	37.2	90	C	250
0.12368	83.0	AV	19.7	0.1	32.2	70.6	105.8	35.2	135	C	230
0.24741	68.2	PEAK	19.6	0.2	32.2	55.8	119.7	63.9	0	A	354
0.24741	57.8	AV	19.6	0.2	32.2	45.4	99.7	54.3	0	A	354
0.37111	61.7	PEAK	19.5	0.2	32.1	49.3	116.2	66.9	0	A	357
0.37111	51.8	AV	19.5	0.2	32.1	39.4	96.2	56.8	0	A	357
0.49488	39.9	QP	19.4	0.2	32.1	27.4	73.7	46.3	0	A	200
0.61855	44.2	QP	19.4	0.2	32.1	31.7	71.8	40.1	0	A	161
0.74233	37.4	QP	19.4	0.2	32.1	24.9	70.2	45.3	0	A	359
0.86605	38.0	QP	19.4	0.2	32.1	25.5	68.8	43.3	0	A	359
0.98978	36.8	QP	19.3	0.3	32.1	24.3	67.7	43.4	0	A	359
1.11351	36.8	QP	19.3	0.3	32.1	24.3	66.6	42.3	0	A	359
1.23723	36.7	QP	19.4	0.3	32.1	24.3	65.7	41.4	0	A	359

CHART: WITH FACTOR, ANT TYPE: LOOP. Except for the data below: adequate margin data below the limits.
CALCULATION: RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission above 30MHz (Spurious Emission)
MAX ANT1

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2009/04/13

Company : Calsonic Kansei Corporation
Kind of EUT : BCM2 for Passive Keyless
Model No. : S57LO
Serial No. : 001

Report No. : 29BE0206-HO-06
Power : DC 12V
Temp./Humi. : 22deg. C. / 49%
Engineer : Keisuke Kawamura

Mode / Remarks: Tx, 125kHz, Ant: MAX ANT1, Worst axis (H:Z-axis, V:Z-axis)

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.

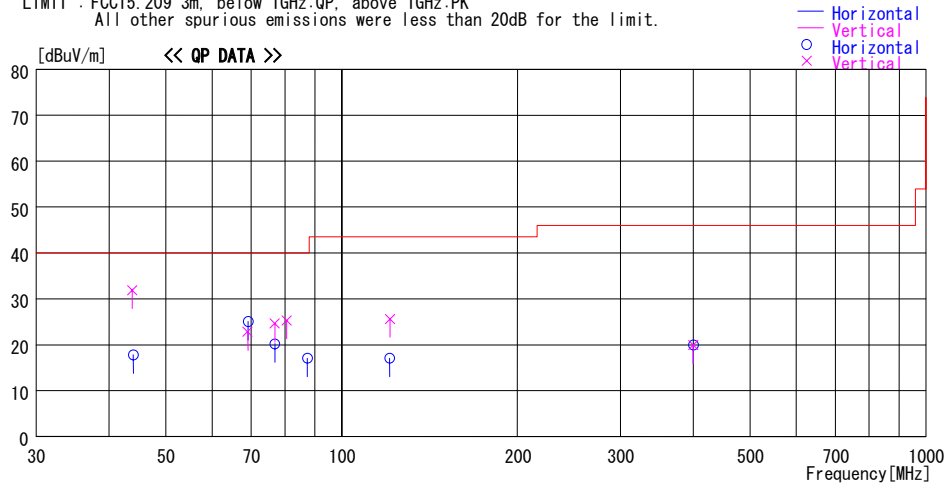


CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz-: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

*The limit is rounded down to one decimal place.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

UL Japan, Inc.

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Radiated Emission above 30MHz (Spurious Emission) MIN ANT

DATA OF RADIATED EMISSION TEST

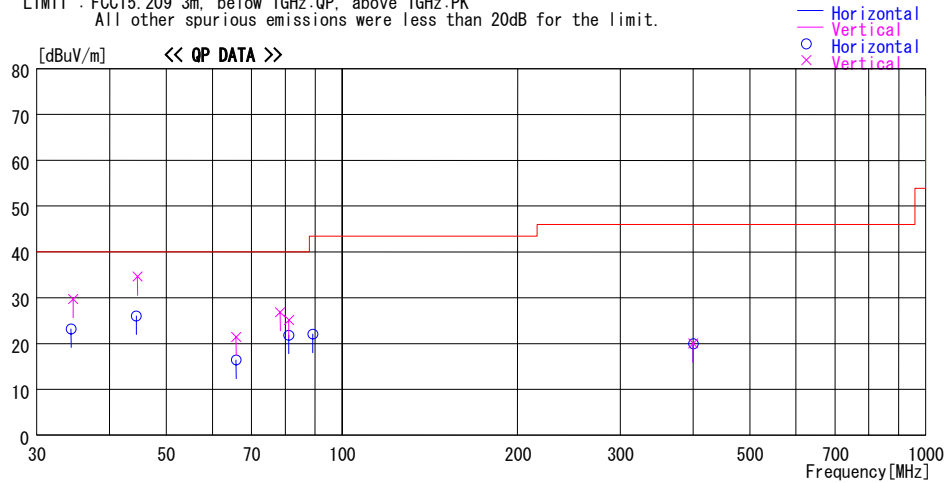
UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2009/04/13

Company : Calsonic Kansei Corporation
Kind of EUT : BCM2 for Passive Keyless
Model No. : S57L0
Serial No. : 001

Report No. : 29BE0206-HO-06
Power : DC 12V
Temp./Humi. : 22deg. C. / 49%
Engineer : Keisuke Kawamura

Mode / Remarks: Tx, 125kHz, Ant: MIN ANT, Worst axis (H:Z-axis, V:Z-axis)

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss &	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
34.378	27.9	QP	17.1	-21.8	23.2	35	323	Hori.	40.0	16.8	
34.625	34.5	QP	17.0	-21.8	29.7	101	100	Vert.	40.0	10.3	
44.398	35.6	QP	12.2	-21.8	26.0	336	314	Hori.	40.0	14.0	
44.649	44.3	QP	12.1	-21.8	34.6	356	100	Vert.	40.0	5.4	
65.912	35.6	QP	7.5	-21.6	21.5	177	100	Vert.	40.0	18.5	
65.923	30.5	QP	7.5	-21.6	16.4	194	300	Hori.	40.0	23.6	
78.412	41.6	QP	6.6	-21.4	26.8	245	100	Vert.	40.0	13.2	
81.129	36.3	QP	6.8	-21.3	21.8	205	231	Hori.	40.0	18.2	
81.136	39.7	QP	6.8	-21.3	25.2	245	100	Vert.	40.0	14.8	
89.174	34.9	QP	8.4	-21.2	22.1	173	339	Hori.	43.5	21.4	
400.000	21.6	QP	17.5	-19.1	20.0	345	100	Vert.	46.0	26.0	
400.000	21.6	QP	17.5	-19.1	20.0	281	100	Hori.	46.0	26.0	

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)

*The limit is rounded down to one decimal place.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

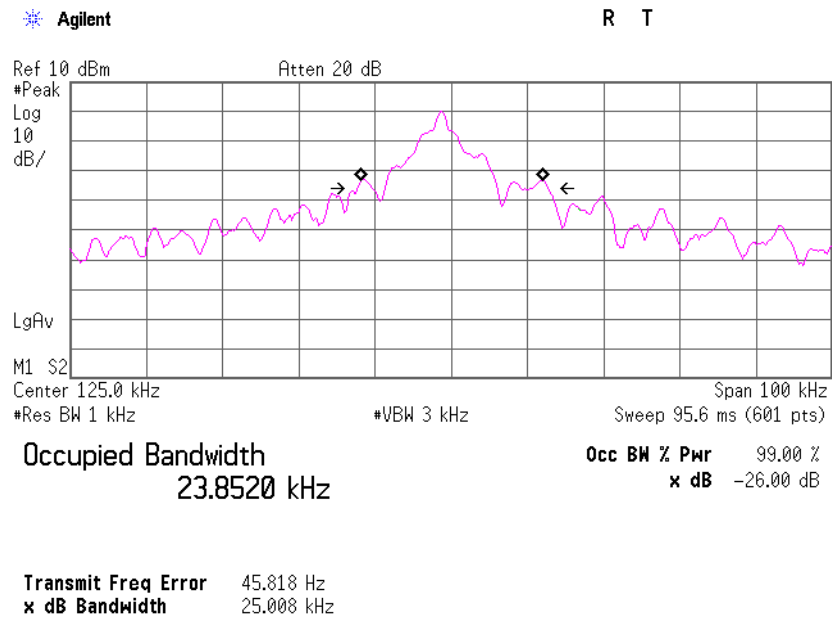
-26dB Bandwidth and 99% Occupied Bandwidth
MAX ANT1

UL Japan, Inc.
Head Office EMC Lab. No.4 Semi Anechoic Chamber

COMPANY : Calsonic Kansei Corporation
EQUIPMENT : BCM2 for Passive Keyless
MODEL : S57L0
S/ N : 001
POWER : DC 12V
MODE : Tx
MAX ANT1

REPORT NO : 29BE0206-HO-06
REGULATION : - / RSS-Gen 4.6.1
TEST DISTANCE : 3m
DATE : 4/15/2009
TEMPERATURE : 24 deg.C
HUMIDITY : 38 %
Engineer : Kazufumi Nakai

FREQ	-26dB Bandwidth	99% Occupied Bandwidth
[kHz]	[kHz]	[kHz]
125.0	25.008	23.852



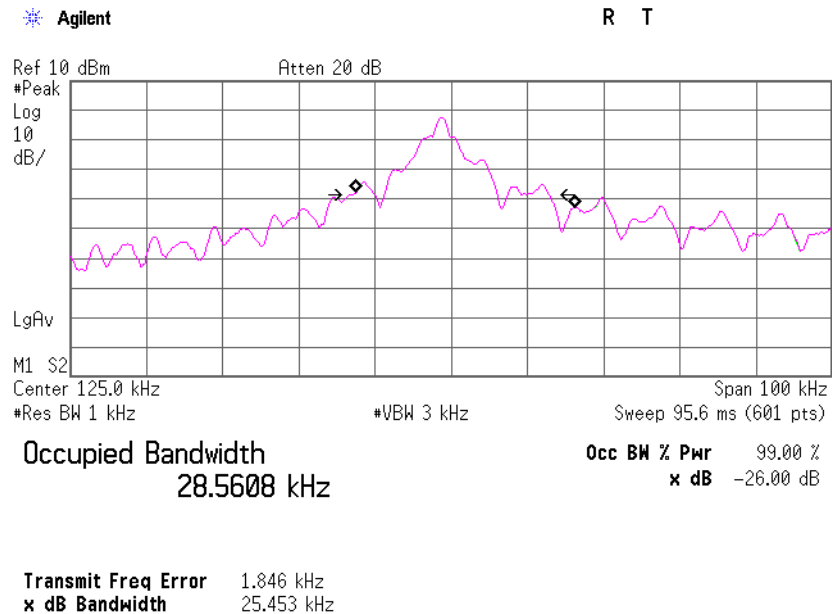
-26dB Bandwidth and 99% Occupied Bandwidth
MIN ANT

UL Japan, Inc.
Head Office EMC Lab. No.4 Semi Anechoic Chamber

COMPANY : Calsonic Kansei Corporation
EQUIPMENT : BCM2 for Passive Keyless
MODEL : S57L0
S/ N : 001
POWER : DC 12V
MODE : Tx
: MIN ANT

REPORT NO : 29BE0206-HO-06
REGULATION : - / RSS-Gen 4.6.1
TEST DISTANCE : 3m
DATE : 4/15/2009
TEMPERATURE : 24 deg.C
HUMIDITY : 38 %
Engineer : Kazufumi Nakai

FREQ	-26dB Bandwidth	99% Occupied Bandwidth
[kHz]	[kHz]	[kHz]
125.0	25.453	28.561



APPENDIX 3: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	836553/009	RE	2008/11/14 * 12
MCC-31	Coaxial cable	UL Japan	-	-	RE	2008/06/20 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2009/03/18 * 12
CUST- MSTW-14	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MAEC-02	Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2008/04/17 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2009/02/05 * 12
MJM-05	Measure	PROMART	SEN1955	-	RE	-
MRENT-62	Spectrum Analyzer	Agilent	E4448A	MY46180856	RE	2008/11/25 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2008/04/02 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2008/10/18 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2008/10/18 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2009/02/16 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2008/11/14 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2008/09/04 * 12
MAEC-04	Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2009/02/03 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE	2009/02/06 * 12
MJM-07	Measure	PROMART	SEN1955	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2008/08/18 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE	2008/10/03 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	-	-	RE	2008/07/03 * 12

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

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

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

Test Item:

RE: Spurious emission

UL Japan, Inc.

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