

APPENDIX 2: Data of EMI test

Radiated Emission below 30MHz (Fundamental and Spurious Emission)

Room antenna

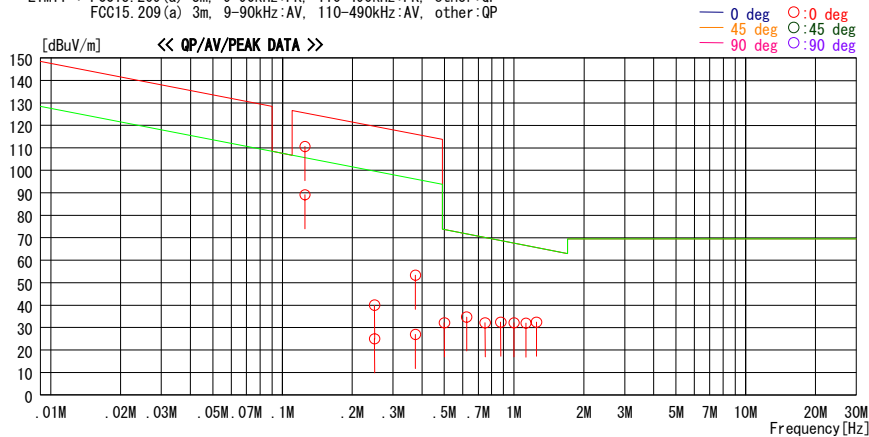
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/10/03

Company : CalsonicKansei Corp. Report No. : 28LE0232-HO-01
Kind of EUT : BCM SYSTEM Power : DC13.5V
Model No. : BNO08 Temp./ Humi. : 25deg. C / 51%
Serial No. : KBRBN008 (Room antenna) Engineer : Tomotaka Sasagawa

Mode / Remarks : Transmitting 125kHz, Wost-axis (Module:X / ANT:X)

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]	
0.12500	90.8	PEAK	19.7	0.2	0.0	110.7	125.6	14.9	0deg	122	
0.12500	69.2	AV	19.7	0.2	0.0	89.1	105.7	16.6	0deg	122	
0.25000	20.1	PEAK	19.7	0.2	0.0	40.0	119.6	79.6	0deg	34	
0.25000	5.1	AV	19.7	0.2	0.0	25.0	99.6	74.6	0deg	34	
0.37500	33.5	PEAK	19.6	0.2	0.0	53.3	116.1	62.8	0deg	43	
0.37500	7.2	AV	19.6	0.2	0.0	27.0	96.1	69.1	0deg	43	
0.50000	12.4	QP	19.6	0.2	0.0	32.2	73.6	41.4	0deg	266	
0.62500	14.8	QP	19.6	0.3	0.0	34.7	71.7	37.0	0deg	312	
0.75000	12.2	QP	19.6	0.3	0.0	32.1	70.1	38.0	0deg	199	
0.87500	12.6	QP	19.6	0.3	0.0	32.5	68.7	36.2	0deg	100	
1.00000	12.3	QP	19.6	0.3	0.0	32.2	67.6	35.4	0deg	0	
1.12500	12.1	QP	19.6	0.3	0.0	32.0	66.5	34.5	0deg	210	
1.25000	12.5	QP	19.6	0.4	0.0	32.5	65.6	33.1	0deg	0	

CHART : WITH FACTOR, ANT TYPE : LOOP... Except for the data below : adequate margin data below the limits.
CALCULATION : READING + ANT FACTOR + LOSS (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)
Door handle antenna

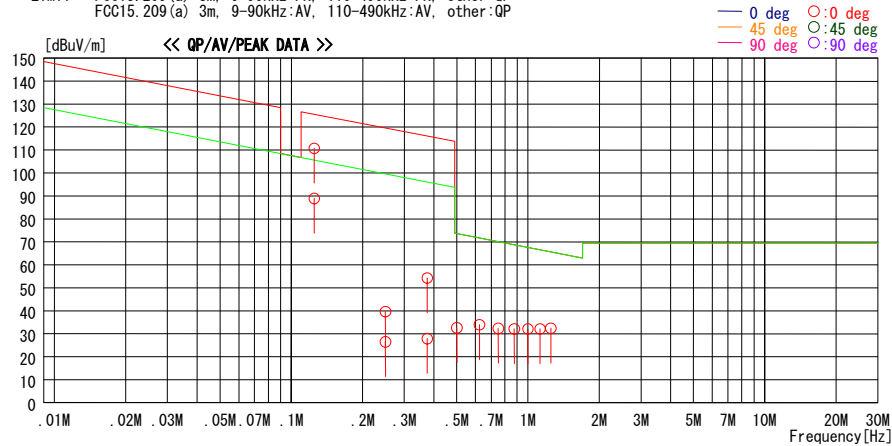
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/10/03

Company : CalsonicKansei Corp. Report No. : 28LE0232-HO-01
Kind of EUT : BCM SYSTEM Power : DC13.5V
Model No. : BN008 Temp./ Humi. : 25deg. C / 51%
Serial No. : KBRBN008 (Door handle antenna) Engineer : Tomotaka Sasagawa

Mode / Remarks : Transmitting 125kHz , Wost-axis (Module:X / ANT:X)

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
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]
0.12500	90.9	PEAK	19.7	0.2	0.0	110.8	125.6	14.8	Odeg	345
0.12500	69.0	AV	19.7	0.2	0.0	88.9	105.7	16.8	Odeg	345
0.25000	19.8	PEAK	19.7	0.2	0.0	39.7	119.6	79.9	Odeg	4
0.25000	6.7	AV	19.7	0.2	0.0	26.6	99.6	73.0	Odeg	4
0.37500	34.5	PEAK	19.6	0.2	0.0	54.3	116.1	61.8	Odeg	5
0.37500	8.1	AV	19.6	0.2	0.0	27.9	96.1	68.2	Odeg	5
0.50000	12.8	QP	19.6	0.2	0.0	32.6	73.6	41.0	Odeg	15
0.62500	14.0	QP	19.6	0.3	0.0	33.9	71.7	37.8	Odeg	233
0.75000	12.4	QP	19.6	0.3	0.0	32.3	70.1	37.8	Odeg	278
0.87500	12.3	QP	19.6	0.3	0.0	32.2	68.7	36.5	Odeg	124
1.00000	12.3	QP	19.6	0.3	0.0	32.2	67.6	35.4	Odeg	7
1.12500	12.2	QP	19.6	0.3	0.0	32.1	66.5	34.4	Odeg	243
1.25000	12.5	QP	19.6	0.4	0.0	32.5	65.6	33.1	Odeg	108

CHART : WITH FACTOR , ANT TYPE : LOOP , Except for the data below : adequate margin data below the limits.
CALCULATION : READING + ANT FACTOR + LOSS (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)
Room antenna

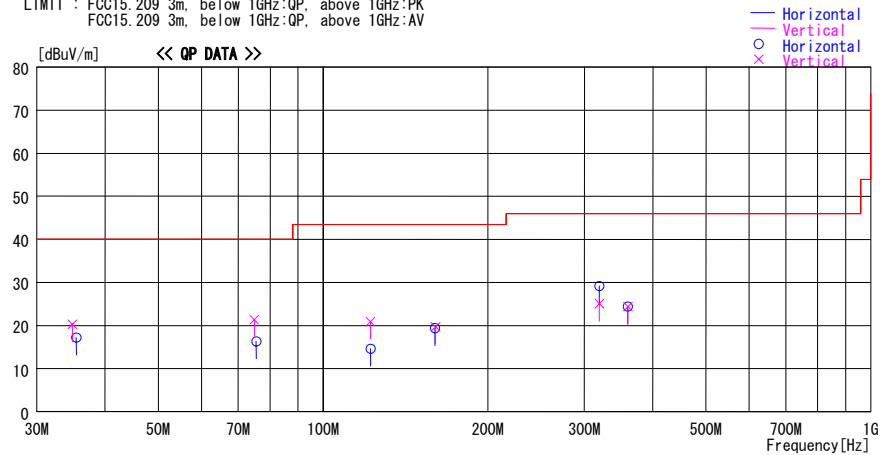
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 2 Semi Anechoic Chamber
Date : 2008/10/03

Company : CalsonicKansei Corp. Report No. : 28LE0232-HO-01
Kind of EUT : BCM SYSTEM Power : DC 12.0V
Model No. : BN008 Temp./Humi. : 24deg. C / 54%
Serial No. : KBRBN008 (Room antenna) Engineer : Tomotaka Sasagawa

Mode / Remarks : Transmitting 125KHz , Worst-axis (Module:X / ANT:X)

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
FCC15.209 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
[MHz]	[dBuV]		Factor	Gain	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
34.870	25.6	QP	16.5	-21.8	20.3	11	100	Vert.	40.0	19.7	
35.411	22.8	QP	16.2	-21.8	17.2	165	100	Hori.	40.0	22.8	
74.910	36.3	QP	6.5	-21.5	21.3	155	100	Vert.	40.0	18.7	
75.451	31.3	QP	6.5	-21.5	16.3	358	100	Hori.	40.0	23.7	
121.984	23.4	QP	12.0	-20.8	14.6	270	100	Hori.	43.5	28.9	
121.984	29.7	QP	12.0	-20.8	20.9	329	100	Vert.	43.5	22.6	
159.860	24.3	QP	15.4	-20.3	19.4	157	100	Hori.	43.5	24.1	
160.401	24.6	QP	15.4	-20.3	19.7	5	100	Vert.	43.5	23.8	
319.639	33.2	QP	15.0	-19.0	29.2	294	100	Hori.	46.0	16.8	
319.639	29.1	QP	15.0	-19.0	25.1	17	100	Vert.	46.0	20.9	
360.321	27.2	QP	16.3	-19.1	24.4	280	100	Hori.	46.0	21.6	
360.321	27.2	QP	16.3	-19.1	24.4	127	100	Vert.	46.0	21.6	

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

-26dB Bandwidth
Room antenna

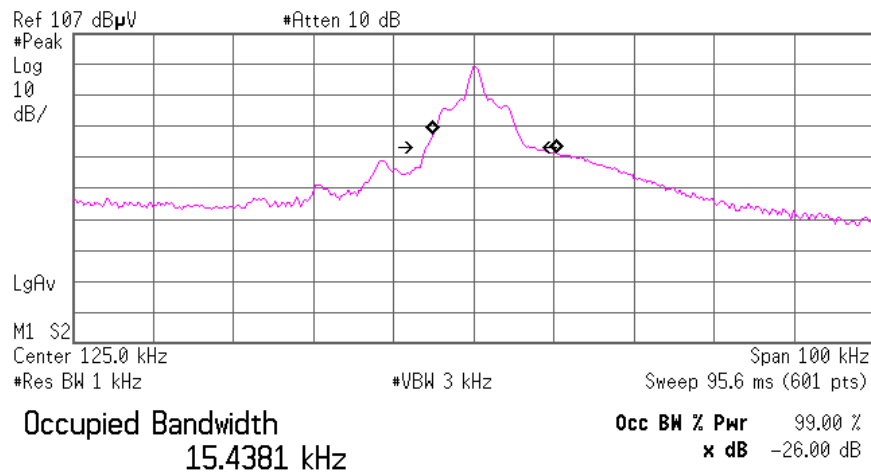
UL Japan, Inc.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : CalsonicKansei Corp.
EQUIPMENT : BCM SYSTEM
MODEL : BN008
S/N : KBRBN008 (Room antenna)
POWER : DC 12V
MODE : Tx
Ant-Max

REPORT NO : 28LE0232-HO-01
REGULATION : Reference data
TEST DISTANCE : 3m
DATE : 10/03/2008
TEMPERATURE : 25 deg.C
HUMIDITY : 51 %
ENGINEER : Tomotaka Sasagawa

	FREQ	-26dB Bandwidth
	[kHz]	[kHz]
	125.0	12.968

Agilent



Transmit Freq Error 2.620 kHz
x dB Bandwidth 12.968 kHz

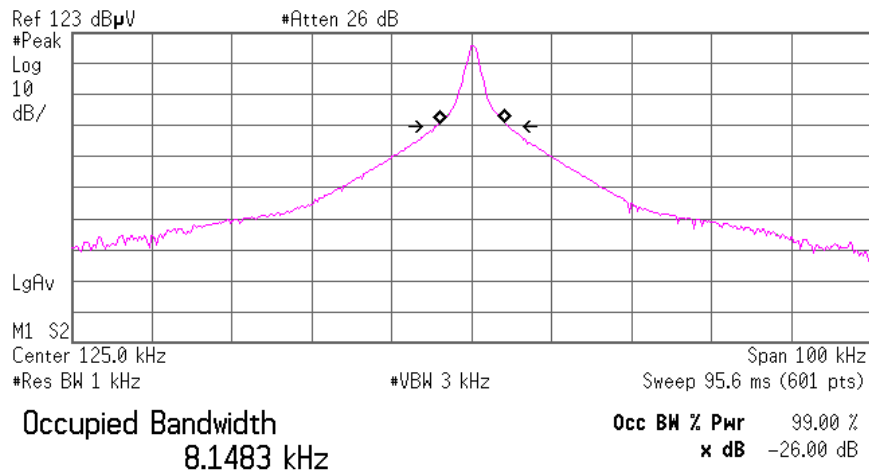
-26dB Bandwidth
Door handle antenna

UL Japan, Inc.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: CalsonicKansei Corp.	REPORT NO	: 28LE0232-HO-01
EQUIPMENT	: BCM SYSTEM	REGULATION	: Reference data
MODEL	: BN008	TEST DISTANCE	: 3m
S/ N	: KBRBN008 (Door handle antenna)	DATE	: 10/03/2008
POWER	: DC 12V	TEMPERATURE	: 25 deg.C
MODE	: Tx	HUMIDITY	: 51 %
	: Ant-Max	ENGINEER	: Tomotaka Sasagawa

	FREQ	-26dB Bandwidth
	[kHz]	[kHz]
	125.0	9.246

Agilent



Transmit Freq Error 87.347 Hz

x dB Bandwidth 9.246 kHz

99% Occupied Bandwidth

Room antenna

UL Japan, Inc.

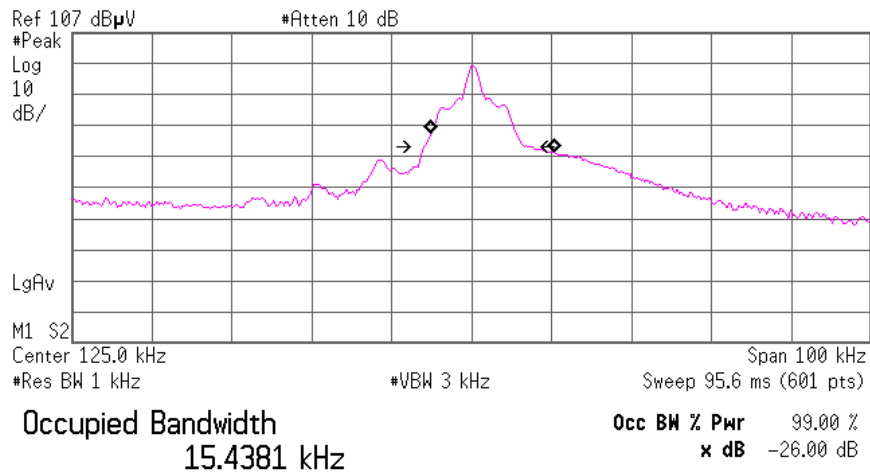
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : CalsonicKansei Corp.
EQUIPMENT : BCM SYSTEM
MODEL : BN008
S/ N : KBRBN008 (Room antenna)
POWER : DC 12V
MODE : Tx
: Ant-Max

REPORT NO : 28LE0232-HO-01
REGULATION : RSS-Gen 4.6.1
TEST DISTANCE : 3m
DATE : 10/03/2008
TEMPERATURE : 25 deg.C
HUMIDITY : 51 %
ENGINEER : Tomotaka Sasagawa

FREQ	99% Occupied Bandwidth
[kHz]	[kHz]
125.0	15.438

Agilent



Transmit Freq Error 2.620 kHz
x dB Bandwidth 12.968 kHz

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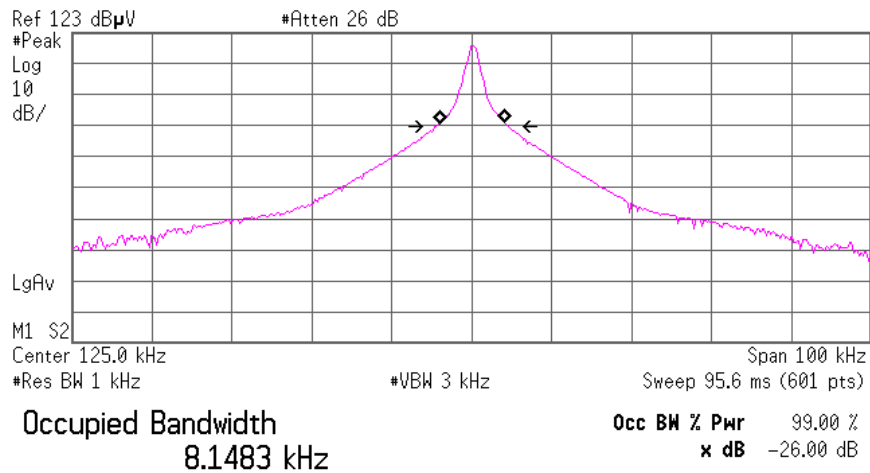
99% Occupied Bandwidth
Door handle antenna

UL Japan, Inc.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: CalsonicKansei Corp.	REPORT NO	: 28LE0232-HO-01
EQUIPMENT	: BCM SYSTEM	REGULATION	: RSS-Gen 4.6.1
MODEL	: BN008	TEST DISTANCE	: 3m
S/ N	: KBRBN008 (Door handle antenna)	DATE	: 10/03/2008
POWER	: DC 12V	TEMPERATURE	: 25 deg.C
MODE	: Tx	HUMIDITY	: 51 %
	: Ant-Max	ENGINEER	: Tomotaka Sasagawa

	FREQ	99% Occupied Bandwidth
	[kHz]	[kHz]
	125.0	8.148

Agilent



Transmit Freq Error 87.347 Hz
x dB Bandwidth 9.246 kHz

APPENDIX 3: 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	RE	2008/04/17 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	RE	2007/12/27 * 12
MJM-05	Measure	PROMART	SEN1955	RE	-
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE	-
MRENT-62	Spectrum Analyzer	Agilent	E4448A	RE	2007/11/27 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	RE	2008/04/02 * 12
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	RE	2007/12/12 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	RE	2008/02/15 * 12
MCC-31	Coaxial cable	UL Japan	-	RE	2008/06/20 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	10/21/2007 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	10/21/2007 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	02/15/2008 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	11/13/2007 * 12
MPA-09	Pre Amplifier	Agilent	8447D	RE	09/04/2008 * 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

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