

**APPENDIX 2: Data of EMI test**

**Conducted Emission  
Battery Charge mode**

**DATA OF CONDUCTED EMISSION TEST**

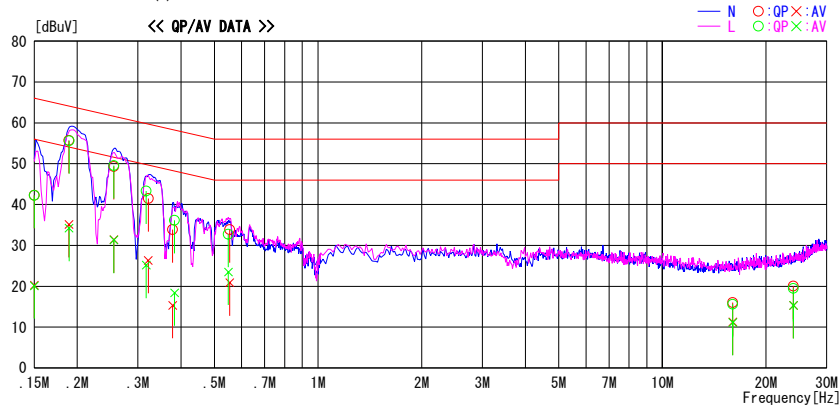
UL Japan, Inc. Head Office EMC Lab. No. 1 Semi Anechoic Chamber  
Date : 2010/11/30

Report No. : 31CE0189-HO-03

Temp./Humi. : 20deg. C. / 33%  
Engineer : Hisayoshi Sato

Mode / Remarks : Battery Charge mode

LIMIT : FCC15.107 (a) QP  
FCC15.107 (a) AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15005	29.2	7.2	13.1	42.3	20.3	66.0	56.0	23.7	35.7	N	
0.18911	42.6	22.1	13.1	55.7	35.2	64.1	54.1	8.4	18.9	N	
0.25530	36.0	18.1	13.3	49.3	31.4	61.6	51.6	12.3	20.2	N	
0.32169	28.2	13.0	13.3	41.5	26.3	59.7	49.7	18.2	23.4	N	
0.37816	20.6	2.0	13.3	33.9	15.3	58.3	48.3	24.4	33.0	N	
0.55382	20.5	7.6	13.3	33.8	20.9	56.0	46.0	22.2	25.1	N	
16.00000	0.9	-3.8	15.1	16.0	11.3	60.0	50.0	44.0	38.7	N	
24.00000	4.5	-0.2	15.5	20.0	15.3	60.0	50.0	40.0	34.7	N	
0.15005	29.2	7.0	13.1	42.3	20.1	66.0	56.0	23.7	35.9	L	
0.18938	42.5	21.1	13.1	55.6	34.2	64.1	54.1	8.5	19.9	L	
0.25531	36.2	18.0	13.3	49.5	31.3	61.6	51.6	12.1	20.3	L	
0.31699	30.0	11.9	13.3	43.3	25.2	59.8	49.8	16.5	24.6	L	
0.38323	22.8	5.1	13.3	36.1	18.4	58.2	48.2	22.1	29.8	L	
0.54897	19.4	10.2	13.3	32.7	23.5	56.0	46.0	23.3	22.5	L	
16.00000	0.5	-4.0	15.1	15.6	11.1	60.0	50.0	44.4	38.9	L	
24.00000	4.0	-0.2	15.5	19.5	15.3	60.0	50.0	40.5	34.7	L	

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT=READING+C.F (LISN LOSS+CABLE LOSS)  
Except for the above table : adequate margin data below the limits.

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

## Radiated Emission Bluetooth I/F continuous

### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2010/11/30

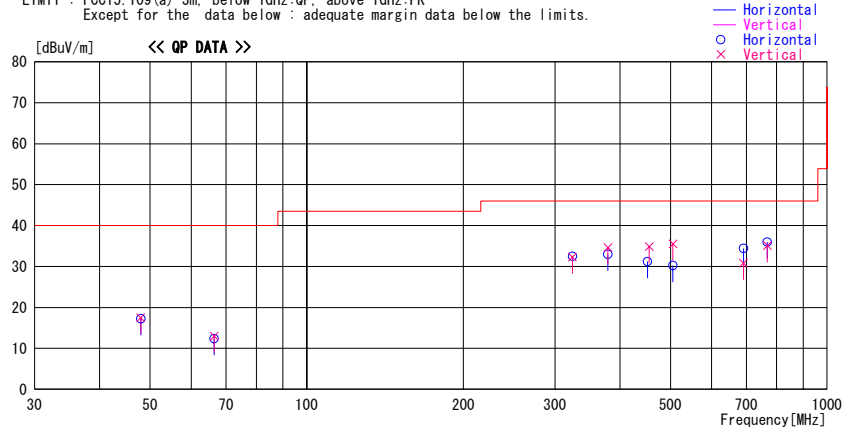
Report No. : 31CE0189-HO-03

Temp./Humi. : 20deg. C. / 33%  
Engineer : Hisayoshi Sato

Mode / Remarks : Bluetooth I/F continuous Printing mode Worst-axis (Hor: X, Ver: X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK

Except for the data below : adequate margin data below the limits.



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]							
48.000	38.5	QP	12.2	-33.5	17.2	0	300	Hori.	40.0	22.8	
66.400	38.5	QP	7.1	-33.2	12.4	0	300	Hori.	40.0	27.6	
48.000	38.8	QP	12.2	-33.5	17.5	168	100	Vert.	40.0	22.5	
66.400	39.1	QP	7.1	-33.2	13.0	168	100	Vert.	40.0	27.0	
324.050	47.0	QP	15.5	-30.0	32.5	97	100	Hori.	46.0	13.5	
324.050	46.8	QP	15.5	-30.0	32.3	17	100	Vert.	46.0	13.7	
379.332	45.3	QP	17.3	-29.6	33.0	108	100	Hori.	46.0	13.0	
379.332	46.9	QP	17.3	-29.6	34.6	179	100	Vert.	46.0	11.4	
451.519	42.0	QP	18.3	-29.1	31.2	358	100	Hori.	46.0	14.8	
455.203	45.7	QP	18.3	-29.1	34.9	207	100	Vert.	46.0	11.2	
505.791	45.7	QP	18.7	-28.9	35.5	328	100	Vert.	46.0	10.5	
505.791	40.4	QP	18.7	-28.9	30.2	63	100	Hori.	46.0	15.8	
768.119	41.3	QP	21.7	-27.0	36.0	250	100	Vert.	46.0	10.0	
768.119	40.4	QP	21.7	-27.0	35.1	204	100	Vert.	46.0	10.9	
690.559	41.1	QP	20.9	-27.6	34.4	185	100	Hori.	46.0	11.6	
690.559	37.5	QP	20.9	-27.6	30.8	325	100	Vert.	46.0	15.2	

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.

## Radiated Emission USB I/F continuous Printing mode

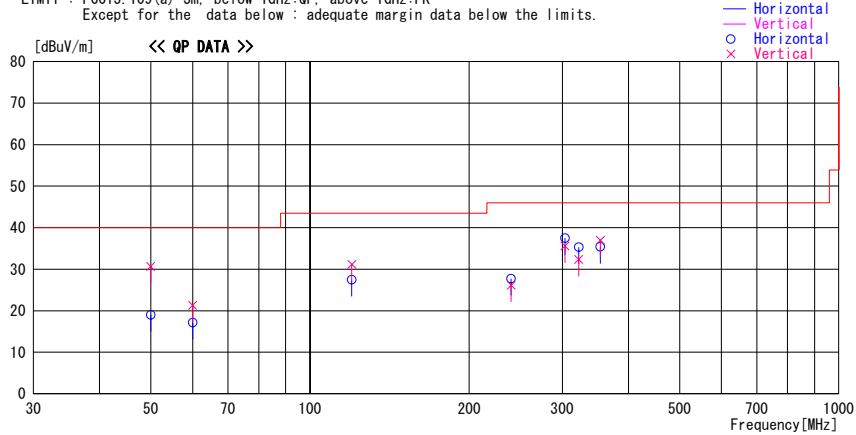
### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2010/12/07

Report No. : 31CE0189-HO-03  
Temp./Humi. : 20deg. C. / 35%  
Engineer : Makoto Kosaka

Mode / Remarks : USB I/F continuous Printing mode Worst-axis (Hor: X, Ver: X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK  
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss& Gain [dB]							
50.000	41.7	QP	10.8	-33.5	19.0	200	203	Hori.	40.0	21.0	
50.000	53.4	QP	10.8	-33.5	30.7	236	100	Vert.	40.0	9.3	
60.000	42.1	QP	8.3	-33.3	17.1	192	263	Hori.	40.0	22.9	
60.000	46.3	QP	8.3	-33.3	21.3	220	100	Vert.	40.0	18.7	
120.000	46.5	QP	13.2	-32.2	27.5	191	152	Hori.	43.5	16.0	
120.000	50.2	QP	13.2	-32.2	31.2	128	100	Vert.	43.5	12.3	
240.036	41.2	QP	17.2	-30.7	27.7	87	157	Hori.	46.0	18.3	
240.036	39.7	QP	17.2	-30.7	26.2	259	100	Vert.	46.0	19.8	
303.460	52.8	QP	14.8	-30.1	37.5	254	100	Hori.	46.0	8.5	
303.460	50.9	QP	14.8	-30.1	35.6	203	139	Vert.	46.0	10.4	
322.200	49.8	QP	15.5	-30.0	35.3	237	100	Hori.	46.0	10.7	
322.200	46.8	QP	15.5	-30.0	32.3	336	100	Vert.	46.0	13.7	
354.048	48.7	QP	16.5	-29.8	35.4	228	287	Hori.	46.0	10.6	
354.048	50.3	QP	16.5	-29.8	37.0	182	130	Vert.	46.0	9.0	

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.

## Radiated Emission IrDA I/F continuous Printing mode

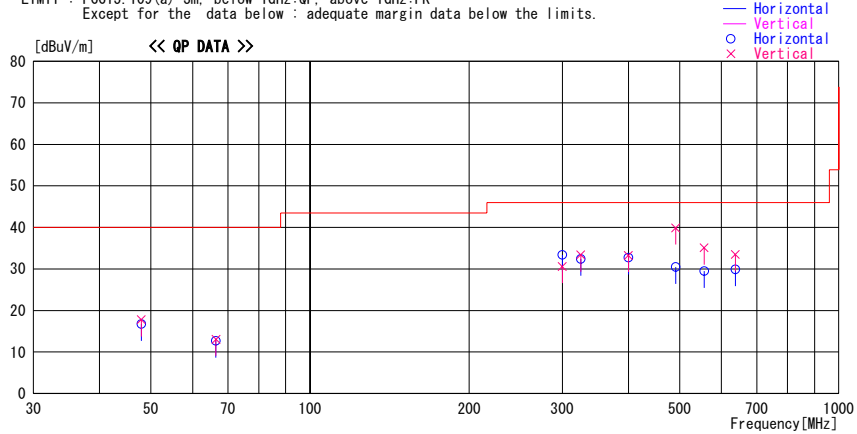
### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2010/11/29

Report No. : 31CE0189-H0-03  
Temp./Humi. : 20deg.C. / 33%  
Engineer : Hisayoshi Sato

Mode / Remarks : IrDA I/F continuous Printing mode Worst-axis (Hor: X, Ver: X)

LIMIT : FCC15.109(a) 3m. below 1GHz:QP, above 1GHz:PK  
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor [dB/m]	Gain [dB]					[dBuV/m]	[dB]	
48.000	38.0	QP	12.2	-33.5	16.7	108	300	Hor i.	40.0	23.3	
48.000	39.1	QP	12.2	-33.5	17.8	355	100	Vert.	40.0	22.2	
66.400	38.8	QP	7.1	-33.2	12.7	1	300	Hor i.	40.0	27.3	
66.400	39.2	QP	7.1	-33.2	13.1	357	100	Vert.	40.0	26.9	
300.016	46.1	QP	14.7	-30.2	30.6	268	155	Vert.	46.0	15.4	
300.016	48.9	QP	14.7	-30.2	33.4	132	100	Hor i.	46.0	12.6	
325.023	46.8	QP	15.6	-30.0	32.4	224	100	Hor i.	46.0	13.6	
325.029	47.8	QP	15.6	-30.0	33.4	331	207	Vert.	46.0	12.6	
399.908	44.2	QP	17.9	-29.4	32.7	110	100	Hor i.	46.0	13.3	
400.023	44.8	QP	17.9	-29.4	33.3	163	110	Vert.	46.0	12.7	
491.366	40.9	QP	18.6	-29.0	30.5	1	100	Hor i.	46.0	15.5	
491.366	50.3	QP	18.6	-29.0	39.9	171	115	Vert.	46.0	6.1	
556.373	44.0	QP	19.6	-28.5	35.1	176	100	Vert.	46.0	10.9	
556.714	38.4	QP	19.6	-28.5	29.5	274	100	Hor i.	46.0	16.5	
637.444	41.0	QP	20.5	-28.0	33.5	353	100	Vert.	46.0	12.5	
637.444	37.4	QP	20.5	-28.0	29.9	4	100	Hor i.	46.0	16.1	

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.

## Radiated Emission Battery Charge mode

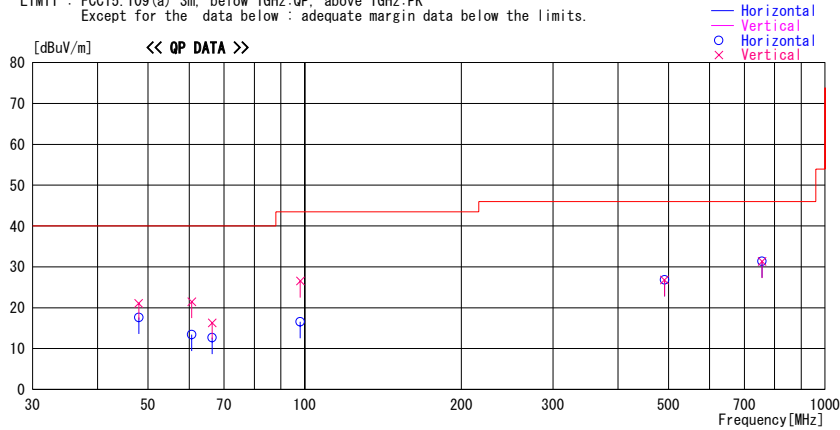
### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2010/11/29

Report No. : 31CE0189-HO-03  
Temp./Humi. : 20deg.C. / 33%  
Engineer : Hisayoshi Sato

Mode / Remarks : Battery Charge mode Worst-axis (Hor: X, Ver: X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK  
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor	Gain							
			[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
48.000	38.9	QP	12.2	-33.5	17.6	0	100	Hori.	40.0	22.4	
48.000	42.4	QP	12.2	-33.5	21.1	230	100	Vert.	40.0	18.9	
60.642	38.8	QP	7.9	-33.3	13.4	0	100	Hori.	40.0	26.6	
60.642	46.9	QP	7.9	-33.3	21.5	226	100	Vert.	40.0	18.5	
66.400	42.4	QP	7.1	-33.2	16.3	230	100	Vert.	40.0	23.7	
66.400	38.8	QP	7.1	-33.2	12.7	0	100	Hori.	40.0	27.3	
98.090	49.3	QP	9.8	-32.6	26.5	294	100	Vert.	43.5	17.0	
98.090	39.4	QP	9.8	-32.6	16.6	144	100	Hori.	43.5	26.9	
491.366	37.2	QP	18.6	-29.0	26.8	27	100	Vert.	46.0	19.2	
491.366	37.2	QP	18.6	-29.0	26.8	249	100	Hori.	46.0	19.2	
756.973	36.8	QP	21.6	-27.1	31.3	27	100	Vert.	46.0	14.7	
756.973	36.9	QP	21.6	-27.1	31.4	249	100	Hori.	46.0	14.6	

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 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.

### **APPENDIX 3: Test instruments**

#### **EMI test equipment**

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-01	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	RE/CE	2010/07/02 * 12
MOS-01	Digital Humidity Indicator	N.T	NT-1800	MOS01	RE/CE	2010/02/09 * 12
MJM-01	Measure	KDS	ES19-55	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MTR-01	Test Receiver	Rohde & Schwarz	ES140	100084	RE/CE	2009/12/17 * 12
MBA-01	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032007	RE	2010/10/16 * 12
KLA-04	Logperiodic Antenna	Schwarzbeck	USLP9143	361	RE	2010/10/16 * 12
MAT-08	Attenuator(6dB)	Weinschel Corp	2	BK7971	RE	2010/11/05 * 12
MCC-01	Coaxial Cable 0.1-3000MHz	Suhner/storm/Agilent/TSJ	-	-	RE	2010/10/14 * 12
MPA-20	Pre Amplifier	Elena	EPA-4020YA	030801	RE	2010/03/23 * 12
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	8127383	CE	2010/07/04 * 12
MTA-06	Terminator	MCL	BTRM-50	1 9951	CE	2010/02/02 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/3D-2W(7.5m)/RG400u(1.5m)/RFM-E421(Switcher)	- /01068(Switcher)	CE	2010/01/05 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2010/02/04 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2010/08/23 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2010/10/11 * 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:**

**CE: Conducted emission**

**RE: Radiated emission**

**UL Japan, Inc.**

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