



EMI TEST REPORT

Test Report No. : 32LE0197-HO-B

Applicant : Sharp Corporation, Communication Systems Group.
Type of Equipment : Cellular Phone
Model No. : 109SH
FCC ID : APYHRO00177
Test standard : FCC Part 15 Subpart B 2011 Class B
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Date of test:

July 20, 2012

Representative test engineer:

Keisuke Kawamura
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Masanori Nishiyama
Leader of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation. *As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

UL Japan, Inc.

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

13-EM-F0429

CONTENTS	PAGE
SECTION 1: Customer information	3
SECTION 2: Equipment under test (E.U.T.)	3
SECTION 3: Test specification, procedures & results	4
SECTION 4: Operation of E.U.T. during testing	6
SECTION 5: Conducted Emission	8
SECTION 6: Radiated Emission	9
APPENDIX 1: Data of EMI test	10
Conducted Emission	10
Radiated Emission	12
APPENDIX 2: Test instruments	16
APPENDIX 3: Photographs of test setup.....	17
Conducted Emission	17
Radiated Emission	18
Worst Case Position (Horizontal: X-axis/ Vertical:X-axis)	20

SECTION 1: Customer information

Company Name : Sharp Corporation, Communication Systems Group.
Address : 2-13-1 Iida Hachihonmatsu HigashiHiroshima-City, Hiroshima,
739-0192 Japan
Telephone Number : +81-82-420-1827
Facsimile Number : +81-82-420-1572
Contact Person : Hiroyuki Uwatoko

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

2.1 Identification of E.U.T.

Type of Equipment : Cellular Phone
Model No. : 109SH
Serial No. : Refer to Section 4, Clause 4.2
Receipt Date of Sample : July 18, 2012
Country of Mass-production : Japan
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product description

Feature of EUT : 109SH is Tri-band (FDD I/FDD VIII/FDD XI) WCDMA & Tri-band
(900/1800/1900) GSM Dual mode Cellular Phone.
The EUT has the function that Bluetooth wireless technology interface
for establishing contact and transmitting data with certain device.
Clock frequencies in the system : CPU:208MHz (Max)
RTC:32.768kHz
Source oscillation: 26MHz / 27.12MHz (FeliCa) / 16.8MHz (GPS) /
32MHz (TV)

UL Japan, Inc.

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

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B: 2012, final revised on May 17, 2012 and effective June 18, 2012

Title : FCC 47CFR Part15 Radio Frequency Device
Subpart B Unintentional Radiators

3.2 Procedures and results

Item	Test Procedure	Limits	Deviation	Worst margin	Result
Conducted emission	ANSI C63.4: 2009 7. AC powerline conducted emission measurements	Class B	N/A	[QP] 11.6dB 3.48333MHz, L [AV] 8.8dB 0.17004MHz, N	Complied
Radiated emission	ANSI C63.4: 2009 8. Radiated emission measurements	Class B	N/A	5.3dB 599.732MHz, Vertical, QP	Complied

*Note: UL Japan, Inc's EMI Work Procedure 13-EM-W0420.

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Test room (semi-anechoic chamber)	Conducted emission (+dB)
	150kHz-30MHz
No.1	3.5dB
No.2	3.6dB
No.3	3.6dB
No.4	3.6dB

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.3dB	5.0dB	5.1dB	4.9dB	5.8dB	4.4dB	4.3dB
No.2	4.3dB	5.2dB	5.1dB	5.0dB	5.7dB	4.3dB	4.2dB
No.3	4.6dB	5.0dB	5.1dB	5.0dB	5.7dB	4.5dB	4.2dB
No.4	4.8dB	5.2dB	5.0dB	5.0dB	5.7dB	5.2dB	4.2dB

*3m/1m/0.5m = Measurement distance

Conducted Emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test(3m)

The data listed in this test report has enough margin, more than the site margin.

UL Japan, Inc.

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

3.5 Test Location

UL Japan, Inc. 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

	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	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test set up, Data of EMI, and Test instruments

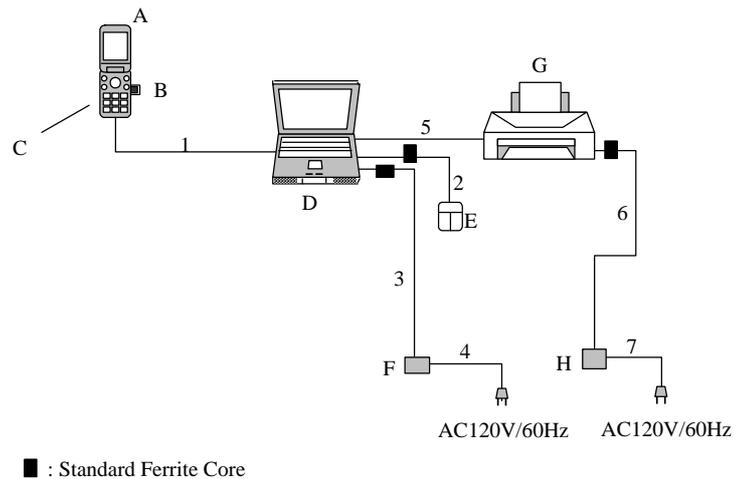
Refer to APPENDIX.

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

4.1 Operating modes

The mode(s) : 1) USB Data Com Mode
The USB data is communicated between EUT and Personal computer (Pair of EUT).
2) Standby Mode
Standby state for USB communication.

4.2 Configuration and peripherals



*Cabling and setup were 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	Remarks
A	Cellular Phone	109SH	004401/11/414567/1	Sharp Corporation	EUT
B	microSD Memory Card	SD-MD008GA	None	TOSHIBA	-
C	Lithium-Ion Battery	SHBDK1	VFA	Sharp Corporation	EUT
D	Personal Computer	PP11L	CN-0D4571-48643-55V-1651	Dell	-
E	Mouse	M-BE55	LZE21450232	Logitec	-
F	AC Adapter(PC)	PA-1650-05D2	CN-0F7970-71615-561-14A1	Dell	-
G	Printer	895Cxi	SG8BL1W16V	Hewlett Packard	-
H	AC Adapter(Printer)	C4557-60004	C8K28B	Hewlett Packard	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Data Cable	0.80	Shielded	Shielded	-
2	Mouse Cable	0.72	Unshielded	Unshielded	-
3	AC Adaptor Cable (PC)	1.76	Unshielded	Unshielded	-
4	AC Power Cable (PC)	0.85	Unshielded	Unshielded	-
5	Parallel Cable	1.65	Shielded	Shielded	-
6	AC Adapter Cable (printer)	2.00	Unshielded	Unshielded	-
7	AC Power Cable (printer)	1.75	Unshielded	Unshielded	-

UL Japan, Inc.

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

SECTION 5: Conducted Emission

5.1 Operating environment

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

5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane.

The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT and its peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from the LISN/AMN and excess AC cable was bundled in center. I/O cables that were connected to the other peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/AMN to the input power source. All unused 50 ohm connectors of the LISN/AMN were resistivity terminated in 50 ohm when not connected to the measuring equipment.

Photographs of the set up are shown in Appendix 1.

Frequency range : 0.15 MHz-30MHz
EUT position : Table top
EUT operation mode : See Clause 4.1

5.3 Test procedure

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT within a semi anechoic chamber. The EUT was connected to a Line Impedance Stabilization Network (LISN)/ Artificial Mains network (AMN). An overview sweep with peak detection has been performed. The measurements have been performed with a quasi-peak detector and if required, with an average detector.

The conducted emission measurements were made with the following detector function of the test receiver.

Detector Type : Quasi-Peak and Average
IF Bandwidth : 9 kHz

5.4 Test result

Summary of the test results: Pass

Date: July 20, 2012

Test engineer: Keisuke Kawamura

UL Japan, Inc.

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

SECTION 6: Radiated Emission

6.1 Operating environment

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

6.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane.

The EUT was set on the edge of the tabletop.

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.

Photographs of the set up are shown in Appendix 1.

6.3 Test conditions

Frequency range : 30MHz-300MHz (Biconical antenna) / 300MHz-1000MHz (Logperiodic antenna)
1GHz-2GHz (Horn antenna)
Test distance : 3m
EUT position : Table top
EUT operation mode : See Clause 4.1

6.4 Test procedure

The height of the measuring antenna 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 with the Test Receiver, or the Spectrum Analyzer.

The radiated emission measurements were made with the following detector function of the test receiver and the Spectrum analyzer.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
IF Bandwidth	QP: BW 120kHz	PK: RBW:1MHz/VBW: 3MHz AV *1): RBW:1MHz/VBW:10Hz

*1) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

- The noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at representative X-axis since no difference was found among each position.

6.5 Test result

Summary of the test results: Pass

Date: July 20, 2012

Test engineer: Keisuke Kawamura

UL Japan, Inc.

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

APPENDIX 1: Data of EMI test

Conducted Emission

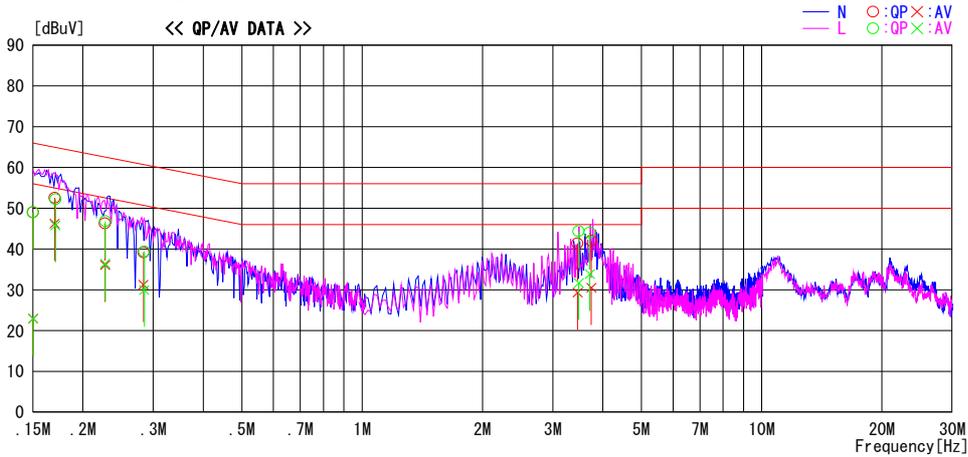
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2012/07/20

Report No. : 32LE0197-HO
Temp./Humi. : 25deg. C / 66% RH
Engineer : Keisuke Kawamura

Mode / Remarks : USB Data Com Mode

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



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15001	35.8	9.8	13.2	49.0	23.0	66.0	56.0	17.0	33.0	N	
0.17004	39.4	33.0	13.2	52.6	46.2	65.0	55.0	12.4	8.8	N	
0.22711	33.1	22.9	13.2	46.3	36.1	62.6	52.6	16.3	16.5	N	
0.28349	25.9	17.9	13.3	39.2	31.2	60.7	50.7	21.5	19.5	N	
3.46130	27.6	15.5	13.8	41.4	29.3	56.0	46.0	14.6	16.7	N	
3.74382	28.2	16.7	13.8	42.0	30.5	56.0	46.0	14.0	15.5	N	
0.15001	35.8	9.8	13.2	49.0	23.0	66.0	56.0	17.0	33.0	L	
0.17072	39.0	32.6	13.2	52.2	45.8	64.9	54.9	12.7	9.1	L	
0.22740	33.6	23.2	13.2	46.8	36.4	62.5	52.5	15.7	16.1	L	
0.28475	26.1	16.7	13.3	39.4	30.0	60.7	50.7	21.3	20.7	L	
3.48333	30.6	17.9	13.8	44.4	31.7	56.0	46.0	11.6	14.3	L	
3.71454	30.2	20.1	13.8	44.0	33.9	56.0	46.0	12.0	12.1	L	

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

*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.

Conducted Emission

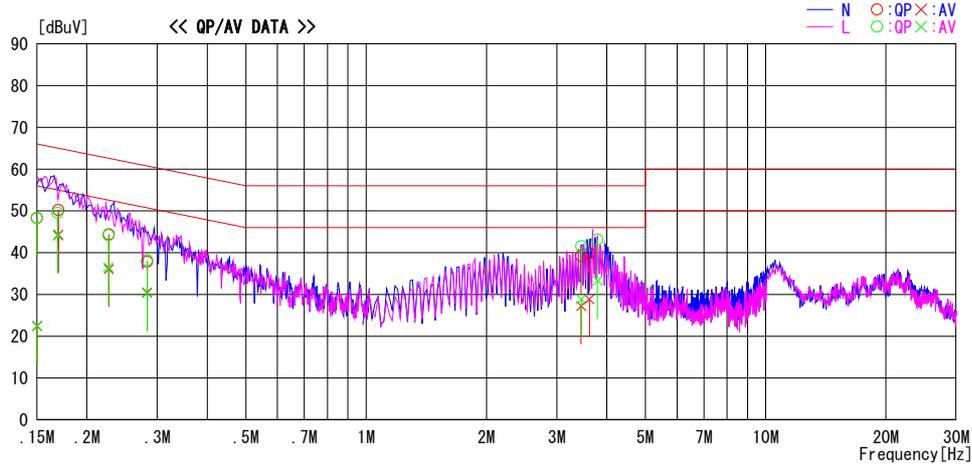
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2012/07/20

Report No. : 32LE0197-HO
Temp./Humi. : 25deg. C / 66% RH
Engineer : Keisuke Kawamura

Mode / Remarks : Standby Mode

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



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15001	35.1	9.2	13.2	48.3	22.4	66.0	56.0	17.7	33.6	N	
0.16967	37.0	31.1	13.2	50.2	44.3	65.0	55.0	14.8	10.7	N	
0.22706	31.2	22.9	13.2	44.4	36.1	62.6	52.6	18.2	16.5	N	
0.28282	24.5	17.2	13.3	37.8	30.5	60.7	50.7	22.9	20.2	N	
3.45211	25.4	13.4	13.8	39.2	27.2	56.0	46.0	16.8	18.8	N	
3.62063	26.0	15.1	13.8	39.8	28.9	56.0	46.0	16.2	17.1	N	
0.15001	35.1	9.3	13.2	48.3	22.5	66.0	56.0	17.7	33.5	L	
0.16911	36.4	30.9	13.2	49.6	44.1	65.0	55.0	15.4	10.9	L	
0.22639	31.0	23.3	13.2	44.2	36.5	62.6	52.6	18.4	16.1	L	
0.28282	24.9	17.0	13.3	38.2	30.3	60.7	50.7	22.5	20.4	L	
3.45425	27.8	15.1	13.8	41.6	28.9	56.0	46.0	14.4	17.1	L	
3.79499	29.3	19.5	13.8	43.1	33.3	56.0	46.0	12.9	12.7	L	

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

*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
(Below 1GHz)

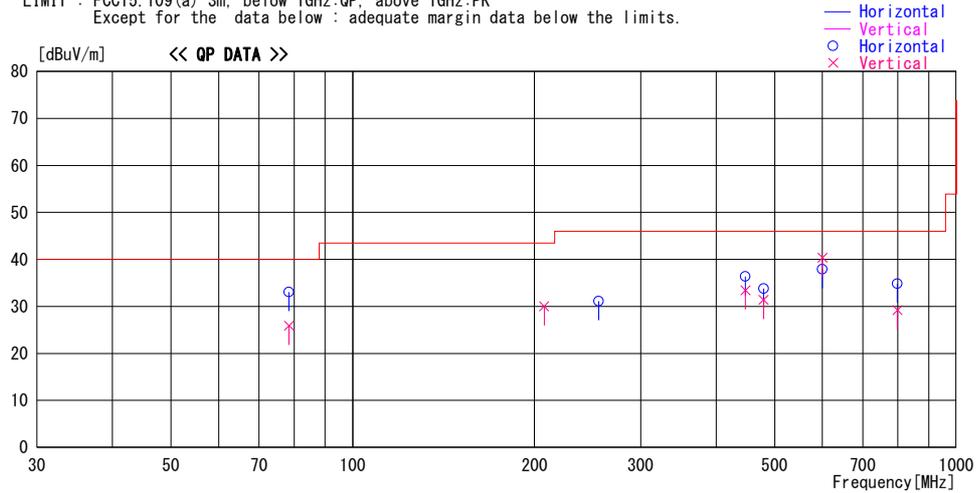
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2012/07/20

Report No. : 32LE0197-HO
Temp./Humi. : 25deg. C / 66% RH
Engineer : Keisuke Kawamura

Mode / Remarks : USB Data Com Mode Worst-Axis(Hori:X / Vert: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]							
78.419	57.1	QP	6.8	-30.8	33.1	309	229	Hori.	40.0	6.9	
78.419	49.9	QP	6.8	-30.8	25.9	160	100	Vert.	40.0	14.1	
207.703	42.6	QP	16.7	-29.3	30.0	26	100	Vert.	43.5	13.5	
255.629	42.2	QP	17.7	-28.8	31.1	160	143	Hori.	46.0	14.9	
447.350	45.3	QP	17.9	-26.8	36.4	312	100	Hori.	46.0	9.6	
447.350	42.3	QP	17.9	-26.8	33.4	167	100	Vert.	46.0	12.6	
479.307	42.2	QP	18.1	-26.5	33.8	314	100	Hori.	46.0	12.2	
479.307	39.8	QP	18.1	-26.5	31.4	184	100	Vert.	46.0	14.6	
599.721	44.0	QP	19.4	-25.5	37.9	115	397	Hori.	46.0	8.1	
599.721	46.5	QP	19.4	-25.5	40.4	351	100	Vert.	46.0	5.6	
798.624	37.2	QP	22.0	-24.4	34.8	268	100	Hori.	46.0	11.2	
798.624	31.6	QP	22.0	-24.4	29.2	167	163	Vert.	46.0	16.8	

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
(Below 1GHz)

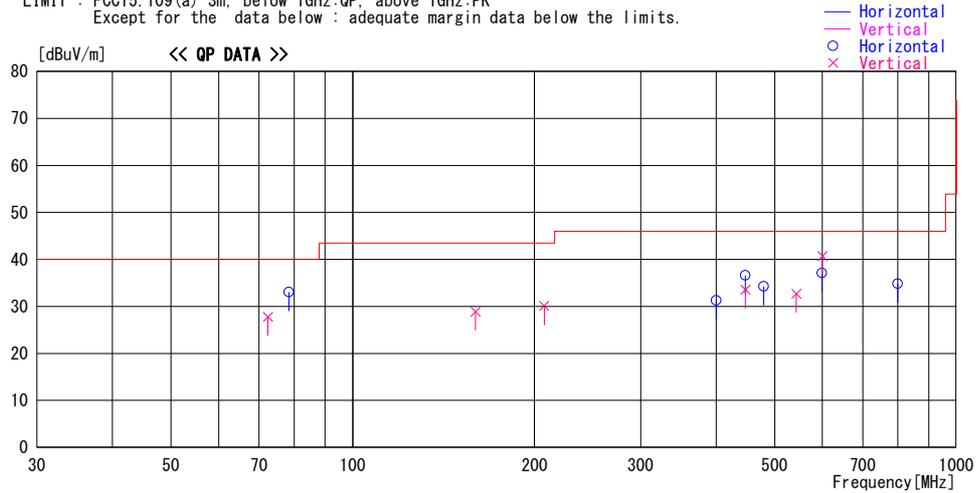
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2012/07/20

Report No. : 32LE0197-HO
Temp./Humi. : 25deg. C / 66% RH
Engineer : Keisuke Kawamura

Mode / Remarks : Standby Mode Worst-Axis(Hori:X / Vert: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]							
72.395	52.1	QP	6.6	-30.9	27.8	260	100	Vert.	40.0	12.2	
78.423	57.1	QP	6.8	-30.8	33.1	315	243	Hori.	40.0	6.9	
159.773	43.5	QP	15.3	-29.9	28.9	143	100	Vert.	43.5	14.6	
207.701	42.7	QP	16.7	-29.3	30.1	28	100	Vert.	43.5	13.4	
399.993	40.9	QP	17.6	-27.2	31.3	0	100	Hori.	46.0	14.7	
447.348	42.5	QP	17.9	-26.8	33.6	170	100	Vert.	46.0	12.4	
447.348	45.5	QP	17.9	-26.8	36.6	313	100	Hori.	46.0	9.4	
479.309	42.7	QP	18.1	-26.5	34.3	311	100	Hori.	46.0	11.7	
543.218	40.0	QP	18.7	-26.0	32.7	328	115	Vert.	46.0	13.3	
599.732	46.8	QP	19.4	-25.5	40.7	349	100	Vert.	46.0	5.3	
599.036	43.2	QP	19.4	-25.5	37.1	115	395	Hori.	46.0	8.9	
799.804	37.2	QP	22.0	-24.4	34.8	260	100	Hori.	46.0	11.2	

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 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
(Above 1GHz)

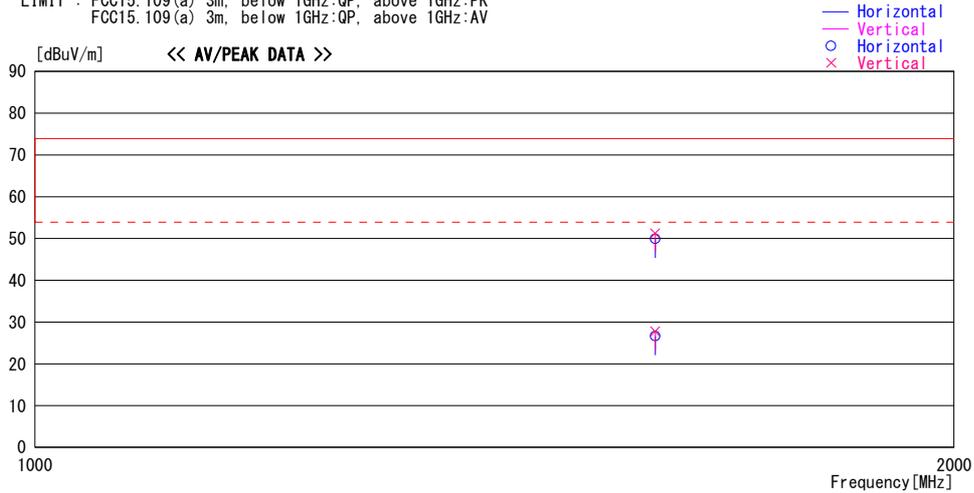
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2012/07/20

Report No. : 32LE0197-H0
Temp./Humi. : 25deg. C / 66% RH
Engineer : Keisuke Kawamura

Mode / Remarks : USB Data Com Mode Worst-Axis(Hori:X / Vert:X)

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



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]							
1596.021	59.0	PK	25.8	-34.8	50.0	287	100	Hori.	73.9	24.0	
1596.021	60.3	PK	25.8	-34.8	51.3	223	100	Vert.	73.9	22.7	
1596.021	36.8	AV	25.8	-34.8	27.8	223	100	Vert.	53.9	26.1	
1596.021	35.7	AV	25.8	-34.8	26.7	287	100	Hori.	53.9	27.2	

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 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
(Above 1GHz)

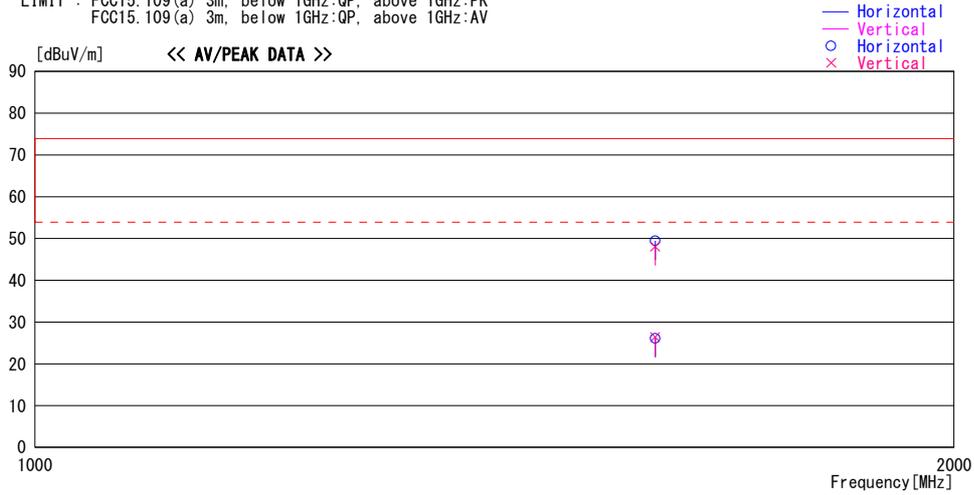
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2012/07/20

Report No. : 32LE0197-H0
Temp./Humi. : 25deg. C / 66% RH
Engineer : Keisuke Kawamura

Mode / Remarks : Standby Mode Worst-Axis(Hori:X / Vert:X)

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



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]							
1596.021	58.5	PK	25.8	-34.8	49.5	294	100	Hori.	73.9	24.4	
1596.021	57.1	PK	25.8	-34.8	48.1	175	100	Vert.	73.9	25.8	
1596.021	35.4	AV	25.8	-34.8	26.4	175	100	Vert.	53.9	27.5	
1596.021	35.1	AV	25.8	-34.8	26.1	294	100	Hori.	53.9	27.8	

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 2: Test instruments

EMI Test Instruments

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	2011/07/10 * 12
MOS-27	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q26	RE/CE	2012/02/08 * 12
MJM-01	Measure	KDS	ES19-55	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MTR-09	EMI Test Reseiver	Rohde & Schwarz	ESU26	100412	RE/CE	2012/06/14 * 12
KBA-05	Biconical Antenna	Schwarzbeck	BBA9106	2513	RE	2011/11/23 * 12
KLA-04	Logperiodic Antenna	Schwarzbeck	USLP9143	361	RE	2011/11/23 * 12
MAT-08	Attenuator(6dB)	Weinschel Corp	2	BK7971	RE	2011/11/02 * 12
MCC-02	Coaxial Cable	Suhner/storm/Agilent/ TSJ	-	-	RE	2011/09/17 * 12
MPA-19	Pre Amplifier	MITEQ	MLA-10K01-B01-35	1237616	RE	2012/02/20 * 12
MHA-05	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	253	RE	2012/06/27 * 12
MCC-134	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336167/4(1m) / 340641(5m)	RE	2011/09/07 * 12
MPA-01	Pre Amplifier	Agilent	8449B	3008A01671	RE	2012/02/28 * 12
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	8127383	CE(AE)	2012/07/17 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	8127364	CE(EUT)	2012/02/09 * 12
MTA-29	Terminator	TME	CT-01	-	CE	2012/01/11 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/ 3D-2W(7.5m)/ RG400u(1.5m)/RFM -E421(Switcher)	-/01068(Switcher)	CE	2012/01/22 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
EST-11	Spectrum Analyzer	Agilent	E4448A	MY46180899	RE	2010/12/22 * 24

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

All equipment is calibrated with valid calibrations. Each measurement data 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 Emissions

RE: Radiated Emissions

UL Japan, Inc.

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