



EMI TEST REPORT

Test Report No. : 11079513H-B

Applicant : Sharp Corporation, Consumer Electronics Company,
Communication Systems Division

Type of Equipment : Cellular Phone

Model No. : 505SH

FCC ID : APYHRO00230

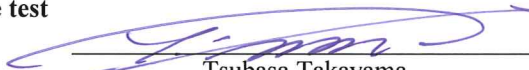
Test regulation : FCC Part 15 Subpart B: 2015 Class B

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 limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This test report covers EMC technical requirements. It does not cover administrative issues such as Manual or non-EMC test related Requirements. (if applicable)

Date of test: December 7, 2015

Representative test engineer:


Tsubasa Takayama
Engineer
Consumer Technology Division

Approved by:


Takahiro Hatakeda
Leader
Consumer Technology Division



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://japan.ul.com/resources/emc_accredited/

UL Japan, Inc.
Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

13-EM-F0429

CONTENTS	PAGE
SECTION 1: Customer information	4
SECTION 2: Equipment under test (E.U.T.)	4
SECTION 3: Test specification, procedures & results	5
SECTION 4: Operation of E.U.T. during testing	8
SECTION 5: Conducted Emission	10
SECTION 6: Radiated Emission	11
APPENDIX 1: Test data	12
Conducted Emission	12
Radiated Emission	14
APPENDIX 2: Test instruments	18
APPENDIX 3: Photographs of test setup.....	19
Conducted Emission	19
Radiated Emission	20
Radiated Emission	21
Worst Case Position (Horizontal: Y-axis / Vertical: Y-axis)	22

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

SECTION 1: Customer information

Company Name : Sharp Corporation, Consumer Electronics Company, Communication Systems Division
Address : 2-13-1 Iida Hachihonmatsu Higashi-hirosima city, Hiroshima, Japan
Telephone Number : +81-82-420-1552
Facsimile Number : +81-82-420-1555
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. : 505SH
Serial No. : Refer to Section 4, Clause 4.2
Receipt Date of Sample : December 3, 2015
Country of Mass-production : China
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 : 505SH is Tri-band FDD-LTE(B1/B3/B8), Dual-band WCDMA(FDD I / VIII) & Tri-band GSM(900 / 1800 / 1900) Multi-mode Cellular Phone.
Clock frequencies in the system : CPU: 1.0944 GHz (max)
Source oscillation: 19.2 MHz, 27.0 MHz (DTV)
RTC: 32.768 kHz

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart B: 2015, final revised on November 23, 2015
*Some parts are effective on and after December 17, 2015 or December 23, 2015.
The revision does not affect the test specification applied to the EUT.

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	FCC: ANSI C63.4: 2009 7. AC powerline conducted emission measurements	Class B	N/A	[QP] 3.3 dB 0.16220 MHz, L [AV] 7.1 dB 0.16220 MHz, L	Complied
Radiated emission	FCC: ANSI C63.4: 2009 8. Radiated emission measurements	Class B	N/A	9.6 dB 55.263 MHz Horizontal, 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.

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

3.4 Uncertainty

EMI

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

Frequency range	Conducted emission using AMN(LISN) (±dB)
0.009 – 0.15MHz	3.5 dB
0.15 – 30MHz	2.9 dB

Polarity	Radiated emission (Below 1GHz)			
	(3 m*)(+dB)		(10 m*)(+dB)	
	30 – 300 MHz	300 – 1000MHz	30 – 300 MHz	300 – 1000MHz
Horizontal	4.8 dB	5.2 dB	4.8 dB	5.0 dB
Vertical	4.5 dB	5.9 dB	4.8 dB	5.1 dB

Radiated emission				
(3 m*)(+dB)		(1 m*)(+dB)	(0.5 m*)(+dB)	(10 m*)(+dB)
1 – 6GHz	6 – 18GHz	10 – 26.5 GHz	26.5 – 40GHz	1 -18 GHz
5.1 dB	5.3 dB	5.1 dB	5.1 dB	5.3 dB

Conducted Emission test

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

Radiated emission test(3 m)

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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

3.5 Test Location

UL Japan, Inc. Ise EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999 Facsimile : +81 596 24 8124

	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	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	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	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	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	4.0 x 4.5 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	-	8.8 x 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	6.2 x 4.7 x 3.0m	4.8 x 4.6m	-

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

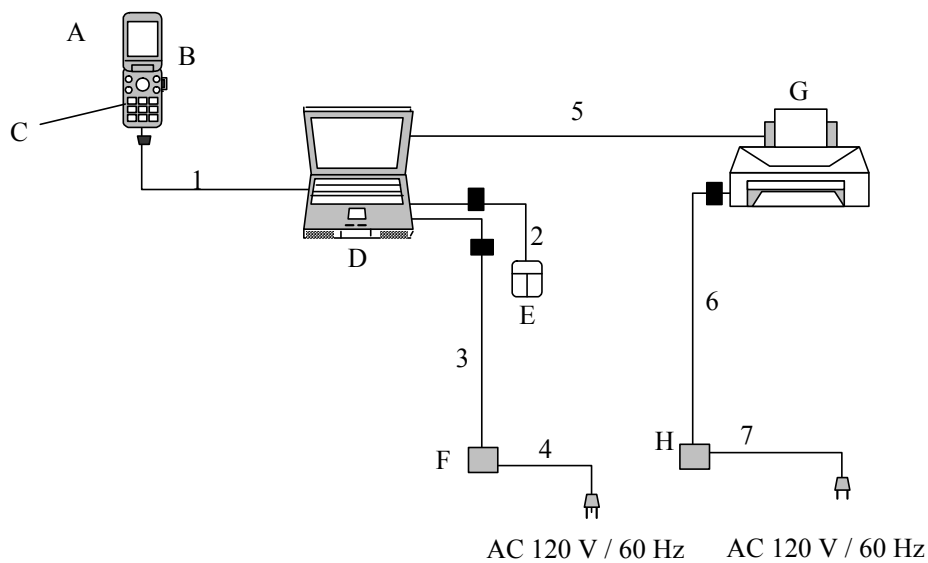
SECTION 4: Operation of E.U.T. during testing

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.

Justification : The system was configured in typical fashion (as a user would normally use it) for testing.

4.2 Configuration and peripherals



■ : Ferrite core which has been standard on support equipment.

*Cabling and setup were taken into consideration and test data was taken under worse case conditions.

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Cellular Phone	505SH	004401/11/566426/6	SHARP	EUT
B	microSD Memory Card	SD-C02G	-	TOSHIBA	-
C	Lithium-Ion Battery	SHBFN1	YJ11A	SHARP	EUT
D	Personal Computer	PP11L	CN-0D4571-48643-58P-1053	Dell	-
E	Mouse	M-UAG120	LZ733B70EVV	TOSHIBA	-
F	AC Adapter(PC)	PA-1650-05D3	CN-0YD637-71615-64Q-2243	Dell	-
G	Printer	895Cxi	SG8BA1W18J	Hewlett Packard	-
H	AC Adapter(Printer)	C4557-60004	C8L01B	Hewlett Packard	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	USB Data Cable	0.95	Shielded	Shielded	-
2	Mouse Cable	0.72	Unshielded	Unshielded	-
3	AC Adapter Cable(PC)	1.76	Unshielded	Unshielded	-
4	AC Power Cable(PC)	0.85	Unshielded	Unshielded	-
5	Parallel Cable	1.85	Shielded	Shielded	-
6	AC Adapter Cable(printer)	2.00	Unshielded	Unshielded	-
7	AC Power Cable(printer)	1.75	Unshielded	Unshielded	-

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

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, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The rear of tabletop was located 40 cm 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 80 cm from any other grounded conducting surface. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm 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 3.

Frequency range	: 0.15 MHz - 30 MHz
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 CISPR AV
IF Bandwidth	: 9 kHz

5.4 Test result

Summary of the test results: Pass

Date: December 7, 2015

Test engineer: Tsubasa Takayama

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, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The EUT was set on the center 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 3.

6.3 Test conditions

Frequency range : 30 MHz - 300 MHz (Biconical antenna) / 300 MHz - 1000 MHz (Logperiodic antenna)
1000 MHz - 6000 MHz (Horn antenna)
Test distance : 3 m
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 4 m 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.

The radiated emission measurements were made with the following detector function of the Test Receiver.

Frequency	Below 1 GHz	Above 1 GHz
Instrument used	Test Receiver	Test Receiver
IF Bandwidth	QP: BW 120 kHz	PK: BW 1 MHz, CISPR AV: BW 1 MHz

The carrier level and 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 the position that has the maximum noise.

6.5 Test result

Summary of the test results: Pass

Date: December 7, 2015

Test engineer: Tsubasa Takayama

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

APPENDIX 1: Test data

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

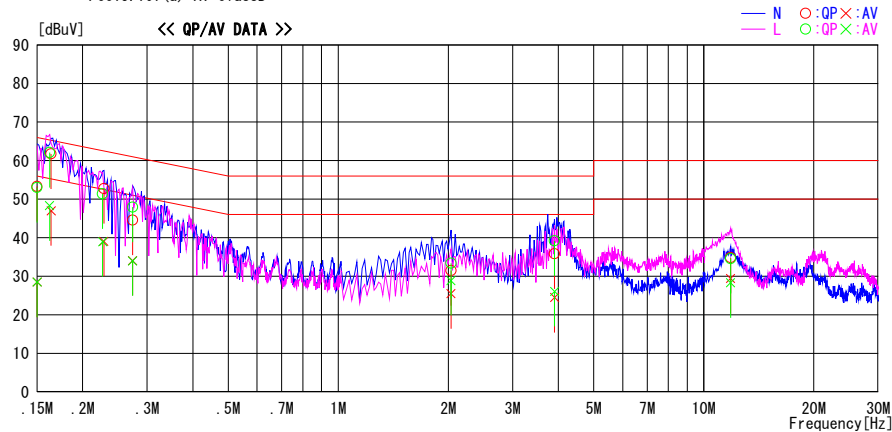
UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/12/07

Report No. : 11079513H

Temp./Humi. : 23deg. C / 31% RH
Engineer : Tsubasa Takayama

Mode / Remarks : USB Date 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]		
0.15000	40.1	15.3	13.2	53.3	28.5	66.0	56.0	12.7	27.5	N	
0.16395	48.5	33.8	13.2	61.7	47.0	65.3	55.3	3.6	8.3	N	
0.22846	39.4	25.8	13.3	52.7	39.1	62.5	52.5	9.8	13.4	N	
0.27379	31.3	20.8	13.3	44.6	34.1	61.0	51.0	16.4	16.9	N	
2.03423	17.9	11.9	13.6	31.5	25.5	56.0	46.0	24.5	20.5	N	
3.90639	21.9	10.6	13.9	35.8	24.5	56.0	46.0	20.2	21.5	N	
11.83847	20.1	14.7	14.7	34.8	29.4	60.0	50.0	25.2	20.6	N	
0.15000	39.8	15.3	13.2	53.0	28.5	66.0	56.0	13.0	27.5	L	
0.16220	48.9	35.1	13.2	62.1	48.3	65.4	55.4	3.3	7.1	L	
0.22671	38.1	25.7	13.3	51.4	39.0	62.6	52.6	11.2	13.6	L	
0.27379	34.6	20.7	13.3	47.9	34.0	61.0	51.0	13.1	17.0	L	
2.03423	19.8	15.3	13.6	33.4	28.9	56.0	46.0	22.6	17.1	L	
3.90639	25.3	12.2	13.9	39.2	26.1	56.0	46.0	16.8	19.9	L	
11.83847	19.9	13.6	14.7	34.6	28.3	60.0	50.0	25.4	21.7	L	

CHART : WITH FACTOR, Peak hold data. CALCULATION : RESULT = READING + C.F (LISN + ATTN + CABLE)
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.

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Emission

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/12/07

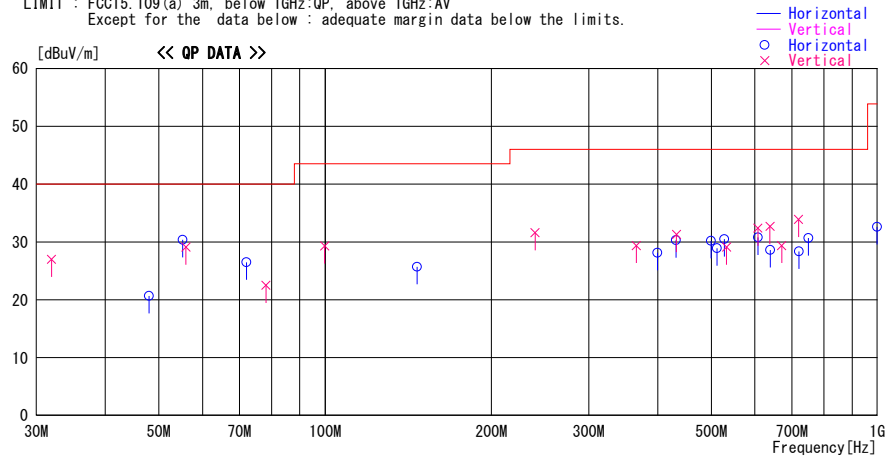
Report No. : 11079513H

Temp./Humi. : 21deg. C / 52% RH
Engineer : Tsubasa Takayama

Mode / Remarks : USB Date Com Mode(Worst axis Hor:Y, Ver:Y)

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

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



Frequency	Reading	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin
			Factor	Gain						
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
31.963	41.9	QP	16.5	-31.4	27.0	233	100	Vert.	40.0	13.0
47.990	40.5	QP	11.4	-31.2	20.7	78	400	Hori.	40.0	19.3
55.263	52.5	QP	8.9	-31.0	30.4	182	346	Hori.	40.0	9.6
55.972	51.4	QP	8.7	-31.0	29.1	165	100	Vert.	40.0	10.9
72.030	51.1	QP	6.2	-30.8	26.5	80	382	Hori.	40.0	13.5
78.156	46.6	QP	6.6	-30.7	22.5	168	100	Vert.	40.0	17.5
99.840	49.8	QP	9.9	-30.4	29.3	182	100	Vert.	43.5	14.2
146.762	40.8	QP	14.6	-29.7	25.7	275	400	Hori.	43.5	17.8
240.000	42.9	QP	17.6	-28.9	31.6	15	100	Vert.	46.0	14.4
365.932	40.5	QP	16.6	-27.7	29.4	17	207	Vert.	46.0	16.6
399.391	37.8	QP	17.6	-27.3	28.1	3	100	Hori.	46.0	17.9
431.983	39.5	QP	17.8	-27.0	30.3	359	100	Hori.	46.0	15.7
432.583	40.5	QP	17.8	-27.0	31.3	123	112	Vert.	46.0	14.7
499.832	38.3	QP	18.1	-26.2	30.2	3	266	Hori.	46.0	15.8
511.823	36.8	QP	18.2	-26.1	28.9	359	161	Hori.	46.0	17.1
527.988	37.9	QP	18.5	-25.9	30.5	51	174	Hori.	46.0	15.5
532.866	36.5	QP	18.5	-25.9	29.1	359	100	Vert.	46.0	16.9
607.216	36.7	QP	19.5	-25.4	30.8	150	182	Hori.	46.0	15.2
607.216	38.3	QP	19.5	-25.4	32.4	348	122	Vert.	46.0	13.6
639.004	38.2	QP	19.8	-25.3	32.7	1	100	Vert.	46.0	13.3
639.085	34.1	QP	19.8	-25.3	28.6	21	183	Hori.	46.0	17.4
670.929	34.5	QP	20.1	-25.2	29.4	0	100	Vert.	46.0	16.6
719.770	38.1	QP	20.7	-24.9	33.9	213	100	Vert.	46.0	12.1
720.845	32.5	QP	20.8	-24.9	28.4	2	140	Hori.	46.0	17.6
749.940	34.1	QP	21.2	-24.6	30.7	21	100	Hori.	46.0	15.3
998.606	31.9	QP	23.4	-22.7	32.6	359	100	Hori.	53.9	21.3

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

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Emission

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/12/07

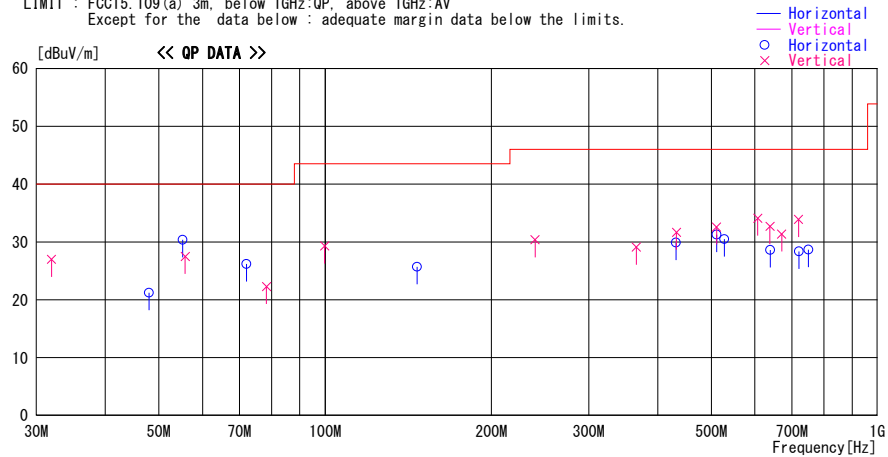
Report No. : 11079513H

Temp./Humi. : 21deg. C / 52% RH
Engineer : Tsubasa Takayama

Mode / Remarks : Standby (Worst axis Hor:Y, Ver:Y)

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

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]
			Factor [dB/m]	Gain [dB]						
31.963	41.9	QP	16.5	-31.4	27.0	233	100	Vert.	40.0	13.0
47.990	41.0	QP	11.4	-31.2	21.2	81	400	Hori.	40.0	18.8
55.263	52.5	QP	8.9	-31.0	30.4	184	348	Hori.	40.0	9.6
55.833	49.8	QP	8.7	-31.0	27.5	182	100	Vert.	40.0	12.5
72.030	50.8	QP	6.2	-30.8	26.2	80	382	Hori.	40.0	13.8
78.325	46.4	QP	6.6	-30.7	22.3	174	100	Vert.	40.0	17.7
99.840	49.8	QP	9.9	-30.4	29.3	182	100	Vert.	43.5	14.2
146.762	40.8	QP	14.6	-29.7	25.7	281	400	Hori.	43.5	17.8
240.000	41.7	QP	17.6	-28.9	30.4	21	100	Vert.	46.0	15.6
365.932	40.2	QP	16.6	-27.7	29.1	12	222	Vert.	46.0	16.9
431.983	39.1	QP	17.8	-27.0	29.9	342	100	Hori.	46.0	16.1
432.583	40.9	QP	17.8	-27.0	31.7	153	121	Vert.	46.0	14.3
511.258	39.2	QP	18.2	-26.1	31.3	213	100	Hori.	46.0	14.7
511.280	40.5	QP	18.2	-26.1	32.6	332	100	Vert.	46.0	13.4
527.988	37.9	QP	18.5	-25.9	30.5	52	174	Hori.	46.0	15.5
607.126	40.0	QP	19.5	-25.4	34.1	15	100	Vert.	46.0	11.9
639.004	38.2	QP	19.8	-25.3	32.7	1	100	Vert.	46.0	13.3
639.085	34.1	QP	19.8	-25.3	28.6	21	183	Hori.	46.0	17.4
671.039	36.5	QP	20.1	-25.2	31.4	1	100	Vert.	46.0	14.6
719.770	38.1	QP	20.7	-24.9	33.9	211	100	Vert.	46.0	12.1
720.845	32.5	QP	20.8	-24.9	28.4	2	140	Hori.	46.0	17.6
749.940	32.1	QP	21.2	-24.6	28.7	25	100	Hori.	46.0	17.3

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

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Emission

DATA OF RADIATED EMISSION TEST

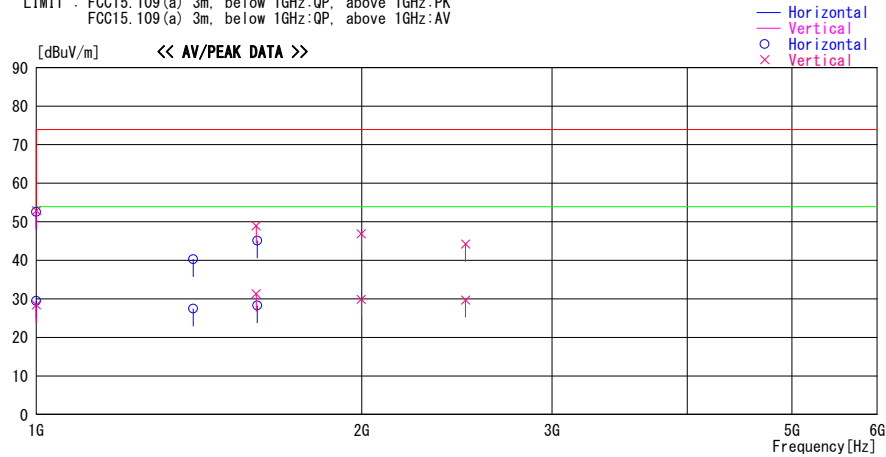
UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/12/07

Report No. : 11079513H

Temp./Humi. : 21deg. C / 52% RH
Engineer : Tsubasa Takayama

Mode / Remarks : USB Data Com Mode(Worst axis Hor:Y, Ver:Y)

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



Frequency	Reading	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin
			Factor	Gain						
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1000.013	39.8	AV	23.7	-35.1	28.4	2	144	Vert.	53.9	25.5
1000.013	64.3	PK	23.7	-35.1	52.9	2	144	Vert.	73.9	21.0
1000.013	64.0	PK	23.7	-35.1	52.6	166	135	Hori.	73.9	21.3
1000.013	40.9	AV	23.7	-35.1	29.5	166	135	Hori.	53.9	24.4
1396.712	49.6	PK	25.0	-34.3	40.3	351	100	Hori.	73.9	33.6
1396.712	36.8	AV	25.0	-34.3	27.5	351	100	Hori.	53.9	26.4
1597.181	57.5	PK	25.6	-34.1	49.0	1	150	Vert.	73.9	24.9
1597.181	39.8	AV	25.6	-34.1	31.3	1	150	Vert.	53.9	22.6
1601.208	36.8	AV	25.6	-34.1	28.3	15	106	Hori.	53.9	25.6
1601.208	53.6	PK	25.6	-34.1	45.1	15	100	Hori.	73.9	28.8
1998.006	54.0	PK	26.5	-33.6	46.9	121	131	Vert.	73.9	27.0
1998.006	37.0	AV	26.5	-33.6	29.9	121	131	Vert.	53.9	24.0
2495.012	50.7	PK	26.9	-33.4	44.2	128	143	Vert.	73.9	29.7
2495.012	36.2	AV	26.9	-33.4	29.7	128	143	Vert.	53.9	24.2

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

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Emission

DATA OF RADIATED EMISSION TEST

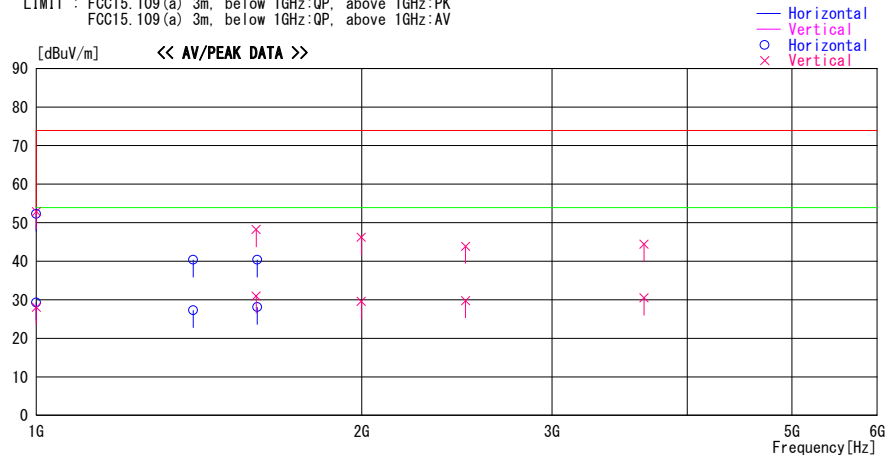
UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/12/07

Report No. : 11079513H

Temp./Humi. : 21deg. C / 52% RH
Engineer : Tsubasa Takayama

Mode / Remarks : Standby (Worst axis Hor:Y, Ver:Y)

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



Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1000.012	39.5	AV	23.7	-35.1	28.1	359	146	Vert.	53.9	25.8
1000.012	64.3	PK	23.7	-35.1	52.9	359	146	Vert.	73.9	21.0
1000.013	63.7	PK	23.7	-35.1	52.3	182	100	Hori.	73.9	21.6
1000.013	40.7	AV	23.7	-35.1	29.3	182	100	Hori.	53.9	24.6
1396.797	49.7	PK	25.0	-34.3	40.4	359	100	Hori.	73.9	33.5
1396.797	36.6	AV	25.0	-34.3	27.3	359	100	Hori.	53.9	26.6
1597.200	56.7	PK	25.6	-34.1	48.2	1	151	Vert.	73.9	25.7
1597.200	39.5	AV	25.6	-34.1	31.0	1	151	Vert.	53.9	22.9
1601.208	36.6	AV	25.6	-34.1	28.1	15	100	Hori.	53.9	25.8
1601.208	48.9	PK	25.6	-34.1	40.4	15	100	Hori.	73.9	33.5
1998.006	53.3	PK	26.5	-33.6	46.2	125	100	Vert.	73.9	27.7
1998.006	36.7	AV	26.5	-33.6	29.6	125	100	Vert.	53.9	24.3
2495.005	50.4	PK	26.9	-33.4	43.9	122	143	Vert.	73.9	30.0
2495.005	36.3	AV	26.9	-33.4	29.8	122	143	Vert.	53.9	24.1
3649.292	47.3	PK	29.7	-32.6	44.4	359	114	Vert.	73.9	29.5
3649.292	33.4	AV	29.7	-32.6	30.5	359	114	Vert.	53.9	23.4

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

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

APPENDIX 2: 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	2015/09/19 * 12
MOS-27	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q26	RE/CE	2015/01/13 * 12
MJM-25	Measure	KOMELON	KMC-36	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MTR-09	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	RE/CE	2015/06/08 * 12
KBA-05	Biconical Antenna	Schwarzbeck	BBA9106	2513	RE	2015/11/02 * 12
KLA-04	Logperiodic Antenna	Schwarzbeck	USLP9143	361	RE	2015/11/03 * 12
MAT-08	Attenuator(6dB)	Weinschel Corp	2	BK7971	RE	2015/11/10 * 12
MCC-02	Coaxial Cable	Suhner/storm/Agilent/TSJ	-	-	RE	2015/09/29 * 12
MPA-19	Pre Amplifier	MITEQ	MLA-10K01-B01-35	1237616	RE	2015/02/03 * 12
MMM-03	Digital Tester	Fluke	FLUKE 26-3	78030621	RE/CE	2015/08/19 * 12
MHA-05	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	253	RE	2015/05/18 * 12
MPA-01	Pre Amplifier	Agilent	8449B	3008A01671	RE	2015/02/04 * 12
MCC-165	Microwave Cable	Junkosha	MWX221	1203S213(1m) / 1311S166(5m)	RE	2015/11/10 * 12
MLS-24	LISN(AMN)	Schwarzbeck	NSLK8127	8127-731	CE(EUT)	2015/07/17 * 12
MLS-26	LISN(AMN)	Schwarzbeck	NSLK8127	8127-732	CE(AE)	2015/07/17 * 12
MTA-30	Terminator	TME	CT-01	-	CE	2015/01/19 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/3D-2W(7.5m)/RG400u(1.5m)/RFM-E421(Switcher)	-/01068 (Switcher)	CE	2015/09/29 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2015/01/29 * 12

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 emission

RE: Radiated emission

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124