



EMI TEST REPORT

Test Report No. : 10636726H-I-R1

Applicant : Panasonic Mobile Communications Development of Europe Ltd

Type of Equipment : Digital Camera

Model No. : DMC-CM1

FCC ID : UCE314062A

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)
7. This report is a revised version of 10636726H-I. 10636726H-I is replaced with this report.

Date of test: February 9 to 15, 2015

Representative test engineer:

Shinichi Miyazono

Engineer

Consumer Technology Division

Approved by:

Takayuki Shimada

Engineer

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://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

13-EM-F0429

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SECTION 1: Customer information

Company Name : Panasonic Mobile Communications Development of Europe Ltd
Address : Willoughby Road, Bracknell Berkshire RG12 8FP, UK
Telephone Number : +44 (0) 1344 706774
Facsimile Number : +44 (0) 1344 706796
Contact Person : Andrew James

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

2.1 Identification of E.U.T.

Type of Equipment : Digital Camera
Model No. : DMC-CM1
Serial No. : Refer to Section 4, Clause 4.2
Rating : AC120V/60Hz (AC Adaptor)
DC3.8V (Battery)
Receipt Date of Sample : January 7, 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

General Specification

Power Supply (radio part input) : Cellular PA: 3.0V-4.2V (Depend on Battery voltage)
Cellular other RF part: 1.3V, 1.8V, 2.05V, 2.7V (Regulated voltage)
WLAN 5GHz Front-end module: 3.0V-4.2V (Depend on Battery voltage)
WLAN/BT other RF part: 1.3V, 1.8V, 3.0V (Regulated voltage)
Clock frequency(ies) in the system : 2.26GHz (Max)
See below table for other clock frequencies

Frequency	Device
32.768kHz	MSM8974AB
32.768kHz (X'tal)	BUYD2206
27.0MHz	TC358764AXBG, XO2-256-64UCBGA, BUYD2206
48.0MHz (X'tal)	WCN3680
24.0MHz	MSM8974AB, Sub Camera
19.2MHz	WTR1625L, MSM8974AB
19.2MHz (X'tal)	PM8941
9.6MHz	WCD9320
72MHz	Main Camera
27.12MHz	NFC IC

Hardware / Software version : Rev. PR / QRCT Version 3.0.32.0

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Radio Specification

	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n/ac (20 M band)	IEEE802.11n/ac (40 M band)	IEEE802.11ac (80 M band)
Frequency of operation	2412-2462MHz	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5825MHz	5190-5230MHz 5270-5310MHz 5510-5670MHz 5755-5795MHz	5210MHz 5290MHz 5530-5610MHz 5775MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)		OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM)
Channel spacing	5MHz		20MHz	40MHz	80MHz
Antenna type	Monopole				
Antenna Connector type	Spring type				
Antenna Gain	2.4GHz: -5.40dBi W52: -3.0dBi, W53: -3.5dBi, W56: -1.5dBi, W58: -1.8dBi				

	Bluetooth Ver.4.0 with EDR function	GSM	W-CDMA	LTE
Frequency of operation	2402-2480MHz	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz	[Up Link] Band II: 1850 – 1910MHz Band IV: 1710 – 1755MHz Band V: 824 – 849MHz [Down Link] Band II: 1930 – 1990MHz Band IV: 2110 – 2155MHz Band V: 869 – 894MHz	[Up Link] Band II: 1850 – 1910MHz Band IV: 1710 – 1755MHz Band V: 824 – 849MHz Band VII: 2500 – 2570MHz Band X VII: 704 – 716MHz [Down Link] Band II: 1930 – 1990MHz Band IV: 2110 – 2155MHz Band V: 869 – 894MHz Band VII: 2620 – 2690MHz Band X VII: 734 – 746MHz
Type of modulation	BT: FHSS (GFSK, $\pi/4$ -DQPSK, 8-DPSK) LE: GFSK	GMSK, 8PSK	QPSK	QPSK, 16QAM
Channel spacing	BT: 1MHz LE: 2MHz	200kHz	200kHz	100kHz
Antenna type	Monopole	Monopole	Main: Monopole Sub: Monopole	
Antenna Connector type	Spring type	Spring type	Main: Spring type Sub: Spring type	
Antenna Gain	-5.40dBi	GSM850: -0.9dBi PCS: 0.5dBi	Band II: 0.5dBi Band IV: 0.6dBi Band V: -0.9dBi	Band II: 0.5dBi Band IV: 0.6dBi Band V: -0.9dBi Band VII: -0.2dBi Band X VII: -1.5dBi

	NFC	GPS/GLONASS
Frequency of operation	13.56MHz	GPS: 1575.42MHz GLONASS: 1597.55-1605.89MHz
Type of modulation	ASK	GPS: BPSK GLONASS: BPSK
Channel spacing	-	GLONASS: 0.5625MHz
Antenna type	Loop	Monopole
Antenna Connector type	Spring type	Spring type
Antenna Gain	N/A	-2.9dBi

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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 January 21, 2015

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] 3.1dB 0.18792MHz, L [AV] 3.8dB 0.18792MHz, L	Complied
Radiated emission	FCC: ANSI C63.4: 2009 8. Radiated emission measurements	Class B	N/A	0.3dB 215.999MHz, QP, Horizontal	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	3.5dB
No.3	3.6dB
No.4	3.5dB

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	4.0dB	5.1dB	5.0dB	5.1dB	6.0dB	4.9dB	4.3dB
No.2	3.9dB	5.2dB	5.0dB	4.9dB	5.9dB	4.7dB	4.2dB
No.3	4.3dB	5.1dB	5.2dB	5.2dB	6.0dB	4.8dB	4.2dB
No.4	4.6dB	5.2dB	5.0dB	5.2dB	6.0dB	5.7dB	4.2dB

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

Conducted Emission test

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Radiated emission test(3m)

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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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 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

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

Refer to APPENDIX.

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Facsimile : +81 596 24 8124

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

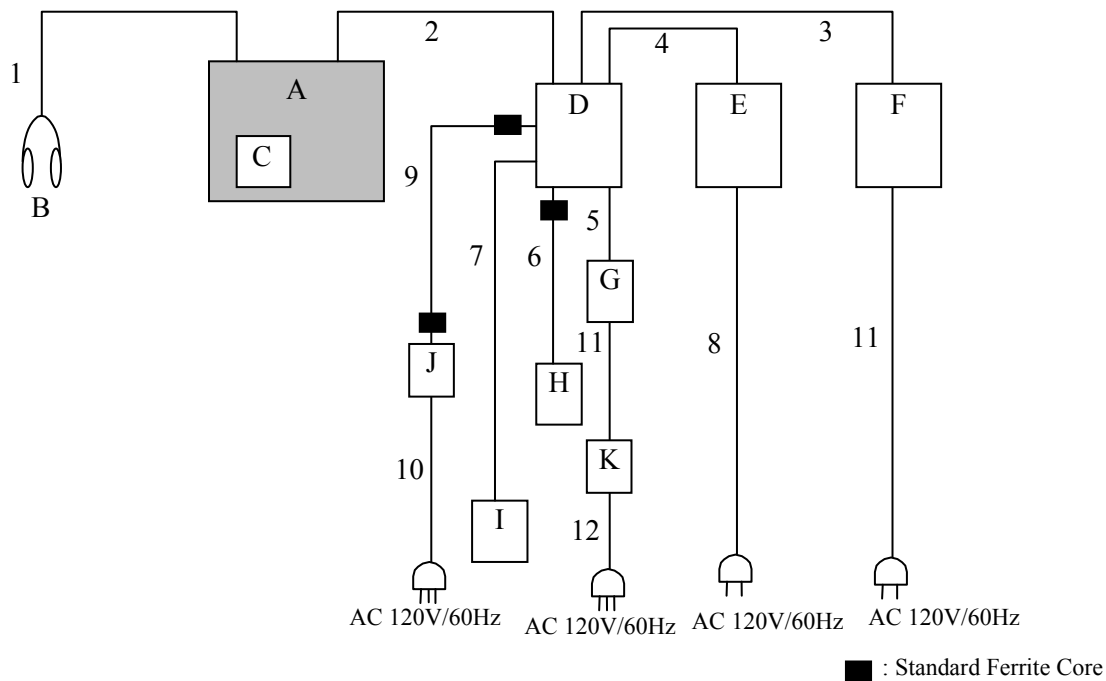
4.1 Operating modes

The modes:

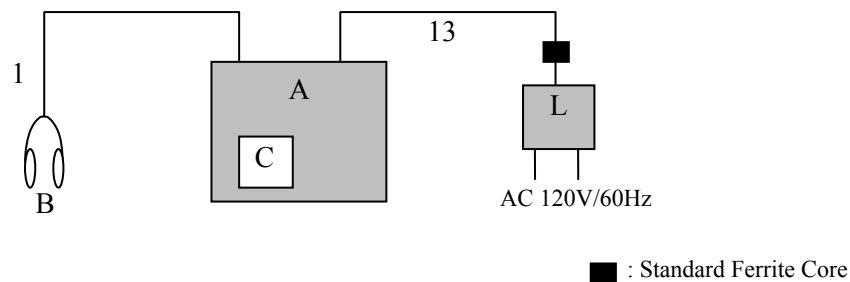
- 1) Camera View + USB Communication + microSD card Access
- 2) Charging + microSD card Access

4.2 Configuration and peripherals

[Operation mode 1]



[Operation mode 2]



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

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Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Digital Camera	DMC-CM1	No.1	Panasonic	EUT
B	Earphone	-	-	Panasonic	-
C	Micro SD Card	02GUECA-MB	-	Panasonic	-
D	Personal Computer	OPTIPLEX	B14N9BX	DELL	-
E	Monitor	E248WFPb	CN-0XT086-74261-819-1EUS	DELL	-
F	INTELLIGENTY FAX & DATA MODEM	MNP10	4C04302	Panasonic	-
G	Printer	HP Business Inkjet 1200	TH6234401Q	HP	-
H	Keyboard	SK-8115	CN-0DJ319-71616-6AA-03MR	DELL	-
I	Mouse	MO56UC	F19010K9	DELL	-
J	AC/DC Adaptor	DA-2 Series	XDW0508126952	DELL	-
K	AC Adaptor	AC POWER Adapter	E151BU01YW02L	HP	-
L	AC Adaptor	VSK0825	SPP001154	Panasonic	EUT

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Earphone Cable	1.2	Unshielded	Unshielded	-
2	USB Cable	1.5	Shielded	Shielded	-
3	Serial Cable	1.5	Shielded	Shielded	-
4	DVI Cable	2.0	Shielded	Shielded	-
5	Printer Cable	2.0	Shielded	Shielded	-
6	USB Cable	2.0	Shielded	Shielded	-
7	USB Cable	1.8	Shielded	Shielded	-
8	AC Cable	1.7	Unshielded	Unshielded	-
9	DC Cable	1.8	Unshielded	Unshielded	-
10	AC Cable	2.0	Unshielded	Unshielded	-
11	DC Cable	1.7	Unshielded	Unshielded	-
12	AC Cable	1.8	Unshielded	Unshielded	-
13	DC Cable	1.2	Unshielded	Unshielded	-

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

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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 2.0m / 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 3.

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 CISPR AV
IF Bandwidth : 9 kHz

5.4 Test result

Summary of the test results: Pass

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 2.0m, raised 0.8m above the conducting ground plane. The EUT was set on the center 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 3.

6.3 Test conditions

Frequency range : 30MHz-300MHz (Biconical antenna) / 300MHz-1000MHz (Logperiodic antenna)
1000MHz -12000MHz (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.
The radiated emission measurements were made with the following detector function of the Test Receiver.

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

- 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

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

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APPENDIX 1: Data of EMI test

Conducted Emission (Camera View + USB Communication + microSD card Access Mode)

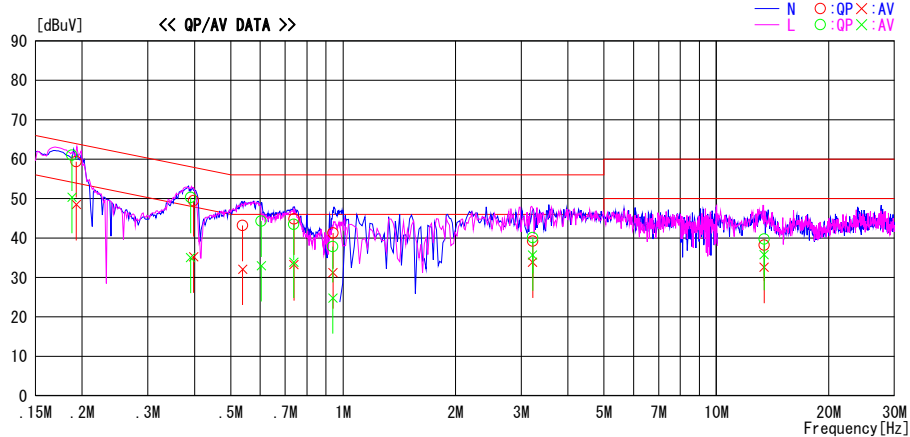
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/02/15

Report No. : 10636726H
Power : AC 120V / 60Hz
Temp./Humi. : 22deg. C / 42% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : Camera View + USB Communication microSD card Access

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



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]		
0.19305	46.2	35.3	13.2	59.4	48.5	63.9	53.9	4.5	5.4	N	
0.39778	36.2	21.9	13.3	49.5	35.2	57.9	47.9	8.4	12.7	N	
0.53859	29.9	18.8	13.3	43.2	32.1	56.0	46.0	12.8	13.9	N	
0.73902	31.4	19.8	13.4	44.8	33.2	56.0	46.0	11.2	12.8	N	
0.93953	27.9	17.8	13.4	41.3	31.2	56.0	46.0	14.7	14.8	N	
3.22118	25.4	20.1	13.8	39.2	33.9	56.0	46.0	16.8	12.1	N	
13.42171	23.5	17.9	14.7	38.2	32.6	60.0	50.0	21.8	17.4	N	
0.18792	47.8	37.1	13.2	61.0	50.3	64.1	54.1	3.1	3.8	L	
0.39055	37.0	21.8	13.3	50.3	35.1	58.1	48.1	7.8	13.0	L	
0.60385	31.0	19.7	13.3	44.3	33.0	56.0	46.0	11.7	13.0	L	
0.73795	30.1	20.5	13.4	43.5	33.9	56.0	46.0	12.5	12.1	L	
0.93883	24.4	11.4	13.4	37.8	24.8	56.0	46.0	18.2	21.2	L	
3.22083	26.3	21.9	13.8	40.1	35.7	56.0	46.0	15.9	10.3	L	
13.42194	25.0	21.1	14.7	39.7	35.8	60.0	50.0	20.3	14.2	L	

CHART : WITH FACTOR, Peak hold data. CALCULATION : RESULT[dBuV] = READING[dBuV] + C.F[dB] (LISN + CABLE + ATTEN.)
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

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Conducted Emission (Charging + microSD card Access Mode)

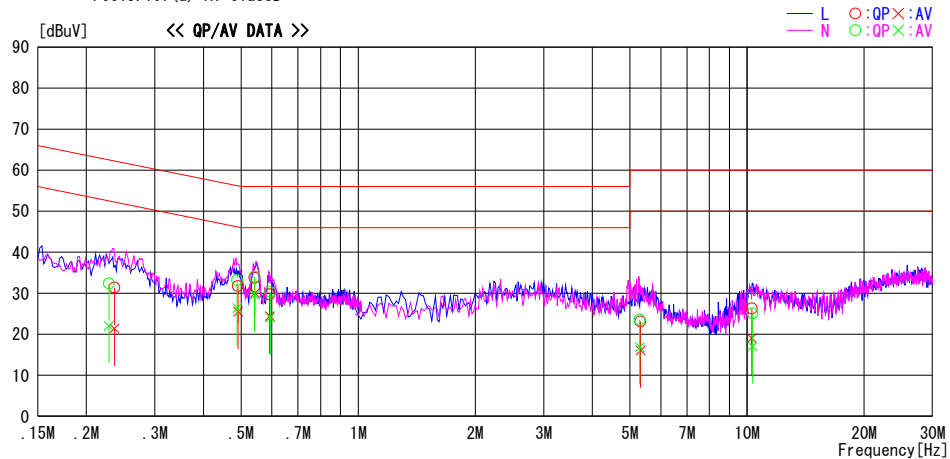
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/02/15

Report No. : 10636726H
Power : AC 120V / 60Hz
Temp./Humi. : 22deg. C / 42% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : Charging + microSD card Access

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



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]		
0.23619	18.1	8.1	13.3	31.4	21.4	62.2	52.2	30.8	30.8	L	
0.49090	18.4	12.2	13.3	31.7	25.5	56.2	46.2	24.5	20.7	L	
0.54213	20.3	16.7	13.4	33.7	30.1	56.0	46.0	22.3	15.9	L	
0.59191	16.3	11.0	13.4	29.7	24.4	56.0	46.0	26.3	21.6	L	
5.31864	8.8	1.8	14.3	23.1	16.1	60.0	50.0	36.9	33.9	L	
10.27443	11.3	4.1	15.0	26.3	19.1	60.0	50.0	33.7	30.9	L	
0.22849	19.1	8.8	13.3	32.4	22.1	62.5	52.5	30.1	30.4	N	
0.48867	19.9	13.1	13.3	33.2	26.4	56.2	46.2	23.0	19.8	N	
0.54175	20.6	16.2	13.4	34.0	29.6	56.0	46.0	22.0	16.4	N	
0.59385	16.9	10.7	13.4	30.3	24.1	56.0	46.0	25.7	21.9	N	
5.29598	9.3	2.6	14.3	23.6	16.9	60.0	50.0	36.4	33.1	N	
10.32344	10.1	2.1	15.0	25.1	17.1	60.0	50.0	34.9	32.9	N	

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

Radiated Emission
(Camera View + USB Communication + microSD card Access Mode)
Below 1GHz

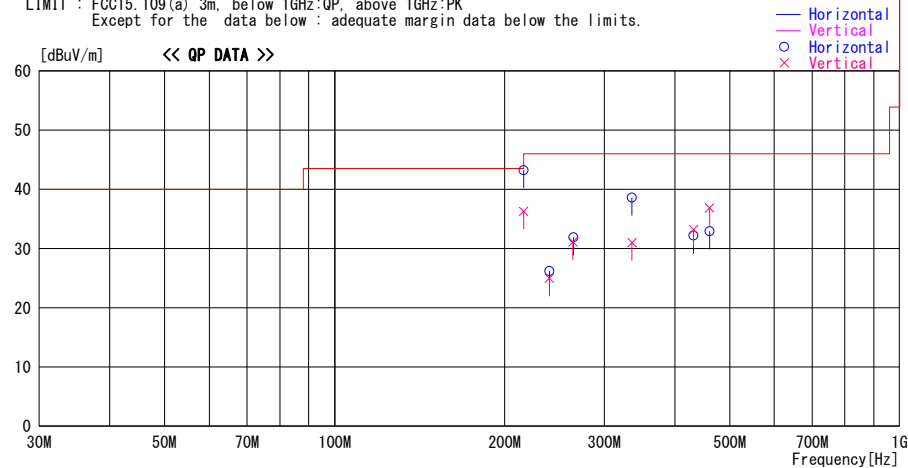
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/02/13

Report No. : 10636726H
Power : AC 120V / 60Hz
Temp./Humi. : 21deg. C / 30% RH
Engineer : Shinichi Miyazono

Mode / Remarks : Camera View + USB Communication + microSD card Access Worst-Axis(Hori:Z Vert:Z)

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



Frequency	Reading	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
[MHz]	[dBuV]		Factor	Gain	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
215.999	48.8	QP	16.6	-22.2	43.2	179	150	Hori.	43.5	0.3	
215.999	41.9	QP	16.6	-22.2	36.3	311	100	Vert.	43.5	7.2	
239.998	31.2	QP	17.0	-22.0	26.2	209	300	Hori.	46.0	19.8	
239.998	30.0	QP	17.0	-22.0	25.0	9	100	Vert.	46.0	21.0	
263.994	35.0	QP	17.9	-21.8	31.1	353	100	Vert.	46.0	14.9	
264.828	35.8	QP	17.9	-21.8	31.9	122	178	Hori.	46.0	14.1	
335.993	44.2	QP	15.6	-21.2	38.6	177	136	Hori.	46.0	7.4	
335.993	36.6	QP	15.6	-21.2	31.0	346	241	Vert.	46.0	15.0	
431.989	35.1	QP	17.7	-20.6	32.2	229	100	Hori.	46.0	13.8	
431.989	36.1	QP	17.7	-20.6	33.2	174	159	Vert.	46.0	12.8	
460.795	35.4	QP	17.8	-20.3	32.9	331	100	Hori.	46.0	13.1	
460.795	39.4	QP	17.8	-20.3	36.9	172	164	Vert.	46.0	9.1	

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.

Radiated Emission (Charging + microSD card Access Mode) Below 1GHz

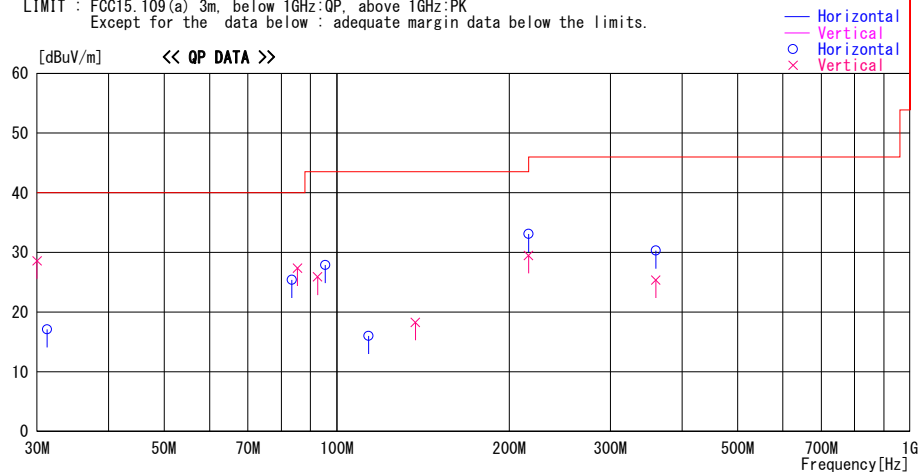
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/02/09

Report No. : 10636726H
Power : AC 120V / 60Hz
Temp./Humi. : 21deg. C / 30% RH
Engineer : Shinichi Miyazono

Mode / Remarks : Charging + microSD card Access Worst-Axis (Hori:Z / Vert:Z)

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
30.000	42.9	QP	17.2	-31.5	28.6	139	100	Vert.	40.0	11.4	
31.242	31.6	QP	16.9	-31.4	17.1	207	220	Hori.	40.0	22.9	
83.492	48.7	QP	7.3	-30.6	25.4	123	362	Hori.	40.0	14.6	
85.370	50.4	QP	7.6	-30.6	27.4	164	100	Vert.	40.0	12.6	
92.572	47.6	QP	8.8	-30.5	25.9	133	100	Vert.	43.5	17.6	
95.492	49.0	QP	9.3	-30.4	27.9	277	326	Hori.	43.5	15.6	
113.617	34.4	QP	11.8	-30.2	16.0	213	303	Hori.	43.5	27.5	
137.134	34.1	QP	14.1	-29.9	18.3	305	100	Vert.	43.5	25.2	
215.999	45.7	QP	16.6	-29.2	33.1	214	152	Hori.	43.5	10.4	
215.999	42.1	QP	16.6	-29.2	29.5	6	100	Vert.	43.5	14.0	
359.998	36.9	QP	16.3	-27.8	25.4	298	132	Vert.	46.0	20.6	
359.998	41.8	QP	16.3	-27.8	30.3	326	100	Hori.	46.0	15.7	

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.

Radiated Emission
(Camera View + USB Communication + microSD card Access Mode)
Above 1GHz

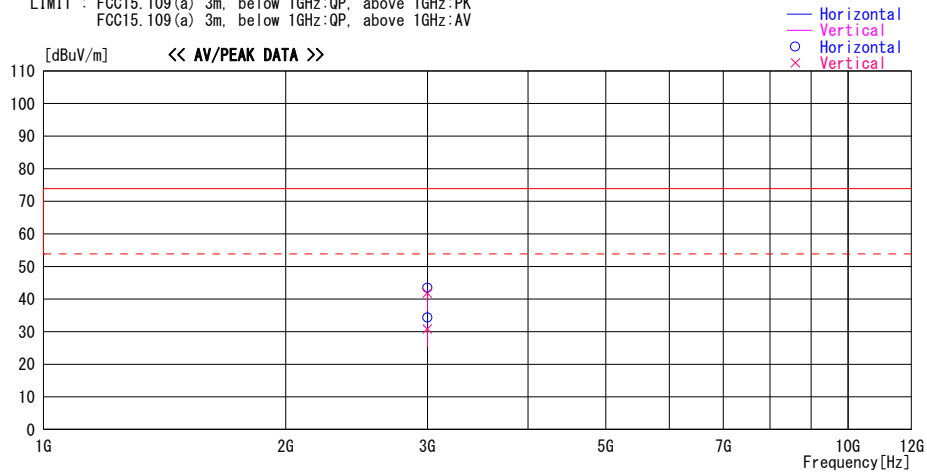
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/02/13

Report No. : 10636726H
Power : AC 120V / 60Hz
Temp./Humi. : 22deg. C / 32% RH
Engineer : Takumi Shimada

Mode / Remarks : Camera View + USB Communication microSD card Access Axis Z

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	Margin	Comment
			Factor [dB/m]	Gain [dB]					[dBuV/m]	[dB]	
3000.110	49.3	PK	27.6	-33.4	43.5	123	138	Hori.	73.9	30.4	
3000.110	47.6	PK	27.6	-33.4	41.8	128	100	Vert.	73.9	32.1	
3000.110	40.2	AV	27.6	-33.4	34.4	123	138	Hori.	53.9	19.5	
3000.110	36.7	AV	27.6	-33.4	30.9	128	100	Vert.	53.9	23.0	

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
(Charging + microSD card Access Mode)
Above 1GHz

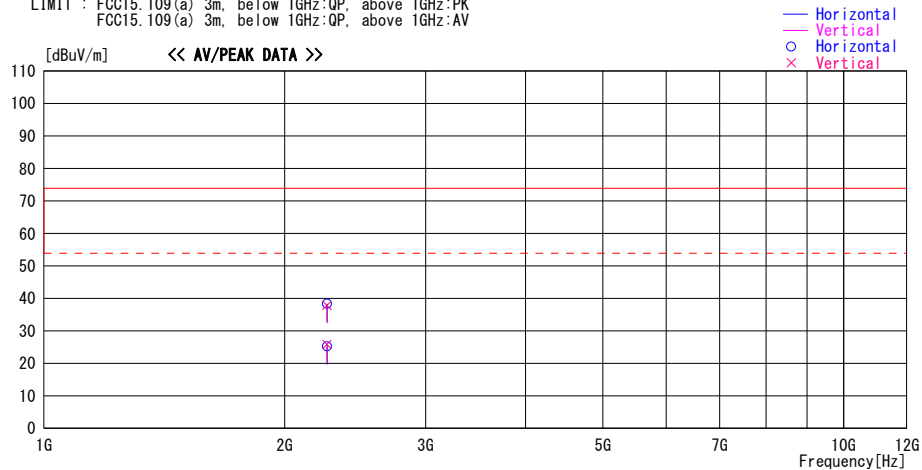
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/02/14

Report No. : 10636726H
Power : AC 120V / 60Hz
Temp./Humi. : 22deg. C / 32% RH
Engineer : Takumi Shimada

Mode / Remarks : Charging + microSD Card Access Axis Z

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	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
2260.000	45.5	PK	26.5	-33.6	38.4	0	100	Hori.	73.9	35.5	
2260.000	32.3	AV	26.5	-33.6	25.2	0	100	Hori.	53.9	28.7	
2260.000	45.0	PK	26.5	-33.6	37.9	0	100	Vert.	73.9	36.0	
2260.000	32.9	AV	26.5	-33.6	25.8	0	100	Vert.	53.9	28.1	

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

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	2014/09/01 * 12
MOS-27	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q26	RE/CE	2015/01/13 * 12
MJM-21	Measure	KOMELON	KMC-36	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MHA-05	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	253	RE	2014/05/16 * 12
MPA-01	Pre Amplifier	Agilent	8449B	3008A01671	RE	2015/02/04 * 12
MCC-165	Microwave Cable	Junkosha	MWX221	1203S213(1m) / 1311S166(5m)	RE	2014/11/11 * 12
MTR-09	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	RE	2014/06/06 * 12
MLS-25	LISN(AMN)	Schwarzbeck	NSLK8127	8127-731	CE(EUT)	2014/07/09 * 12
MLS-26	LISN(AMN)	Schwarzbeck	NSLK8127	8127-732	CE(AE)	2014/07/09 * 12
MLS-24	LISN(AMN)	Schwarzbeck	NSLK8127	8127-730	CE(EUT)	2014/07/10 * 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	2014/09/12 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2015/01/29 * 12
KBA-05	Biconical Antenna	Schwarzbeck	BBA9106	2513	RE	2014/11/22 * 12
KLA-04	Logperiodic Antenna	Schwarzbeck	USLP9143	361	RE	2014/11/22 * 12
MAT-08	Attenuator(6dB)	Weinschel Corp	2	BK7971	RE	2014/11/20 * 12
MCC-02	Coaxial Cable	Suhner/storm/Agilent/T SJ	-	-	RE	2014/09/12 * 12
MPA-19	Pre Amplifier	MITEQ	MLA-10K01-B01-35	1237616	RE	2015/02/03 * 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