



EMI TEST REPORT

Test Report No. : 4786001719H-C-R1

Applicant : NEC Corporation of America
Type of Equipment : Digital Portable Cellular Telephone
Model No. : KMP7R4H1-6A
FCC ID : A98-FQM6833
Test standard : FCC Part 15 Subpart B: 2012 Class B
Test Result : Complied

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4. The test results in this test report are traceable to the national or international standards.
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6. This report is a revised version of 4786001719H-C. 4786001719H-C is replaced with this report.

Date of test: December 18, 2012

Representative test engineer:

T. Sasagawa

Tomotaka Sasagawa
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service



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

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13-EM-F0429

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SECTION 1: Customer information

Company Name : NEC Corporation of America
Address : Radio Communications Systems Division
6535N. State Highway 161, Irving, TX 75039-2402 USA
Telephone Number : +1 214 262 4241
Facsimile Number : +1 214 262 4225
Contact Person : Sanjay Wadhwa

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

2.1 Identification of E.U.T.

Type of Equipment : Digital Portable Cellular Telephone
Model No. : KMP7R4H1-6A
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 3.8V (DC 3.4 - 4.2V)
Receipt Date of Sample : December 10, 2012
Country of Mass-production : Japan
Condition of EUT : Production prototype
Modification of EUT : No Modification by the test lab

2.2 Product description

Model No: KMP7R4H1-6A, (referred to as the EUT in this report), is the Digital Portable Cellular Telephone.

Maximum frequency generated or used by the EUT: 1.5GHz

Radio Specification [1/2]

Bluetooth (Ver.2.1 + EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern Antenna
Antenna Gain	-3.0 dBi

Low Energy (Ver.4.0)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern antenna
Antenna Gain	-3.0 dBi

WLAN (IEEE802.11b/g/n (SISO/HT20))

Equipment Type	Transceiver
Frequency of Operation	2412-2462MHz
Type of Modulation	DSSS, OFDM
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern antenna
Antenna Gain	-3.0 dBi

GSM

Equipment Type	Transceiver
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz
Type of Modulation	GMSK
Emission Designator	GSM850: 254KGXW, PCS: 259KGXW
Channel spacing	200kHz
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern antenna
Antenna Gain	+2.5dBi (PCS), 0.0dBi (GSM850)

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Radio Specification [2/2]

WCDMA

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band V: 824 – 849MHz [Down Link] Band V: 869 – 894MHz
Type of Modulation	HPSK
Emission Designator	4M16F9W
Channel spacing	5MHz
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern antenna
Antenna Gain	0 dBi

GPS

Equipment Type	Receiver
Receiver Type	Direct Downconversion
Frequency of Operation	1575.42MHz
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern antenna
Antenna Gain	-3.0dBi

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B: 2012, final revised on August 13, 2012 and effective September 12, 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	FCC: ANSI C63.4: 2003 7. AC powerline conducted emission measurements	Class B	N/A	[QP] 17.3dB 0.28251MHz, L [AV] 18.0dB 0.20928MHz, N	Complied
Radiated emission	FCC: ANSI C63.4: 2003 8. Radiated emission measurements	Class B	N/A	1.6dB 431.863MHz, QP Vertical	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 report meets the limits unless the uncertainty is taken into consideration.

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3.5 Test Location

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	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 Data of EMI, Test instruments, and Test set up

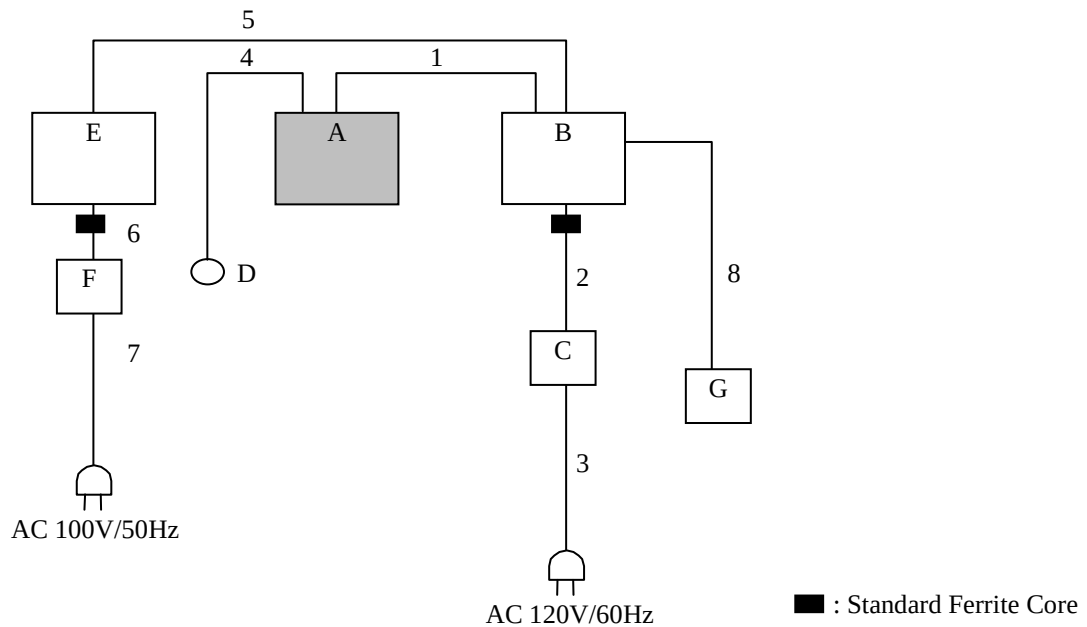
Refer to APPENDIX.

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

4.1 Operating modes

Mode	Remarks
USB Communication mode	*EUT copied the data that was into the Micro SD memory onto laptop PC through the USB cable.

4.2 Configuration and peripherals



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

*It was preliminary confirmed that there was no difference in emission level due to a standard ferrite core.

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Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Digital Portable Cellular Telephone	KMP7R4H1-6A	004401201130156	NEC Corporation of America	EUT
B	Laptop PC	2373T49	L316W54	IBM	DoC
C	AC Adaptor	92P1020	11S92P1020Z1Z9RM63A76X	IBM	DoC
D	Earphone	-	-	NEC Corporation of America	-
E	Printer	Desk Jet 840C	CN0B11C1H2	Hewlett Packard	DoC
F	AC Adapter	C6409-60014	0049R0D	Hewlett Packard	DoC
G	Mouse	MO56UOA	G01008Z	DELL	Doc

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	USB Cable	2.0	Shielded	Shielded	-
2	DC Cable	1.8	Unshielded	Unshielded	-
3	AC Cable	1.9	Unshielded	Unshielded	-
4	Earphone Cable	0.7	Unshielded	Unshielded	-
5	Printer Cable	3.0	Shielded	Shielded	-
6	DC Cable	2.0	Unshielded	Unshielded	-
7	AC Cable	1.0	Unshielded	Unshielded	-
8	Mouse Cable	1.4	Shielded	Shielded	-

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SECTION 5: Conducted Emission

5.1 Operating environment

Test place : No.2 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 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 Average
IF Bandwidth : 9 kHz

5.4 Test result

Summary of the test results: Pass

Date: December 18, 2012

Test engineer: Tomotaka Sasagawa

UL Japan, Inc.

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SECTION 6: Radiated Emission

6.1 Operating environment

Test place : No.2 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 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 -8000MHz (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 the position that has the maximum noise.

6.5 Test result

Summary of the test results: Pass

Date: December 18, 2012

Test engineer: Tomotaka Sasagawa

UL Japan, Inc.

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APPENDIX 1: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2012/12/18

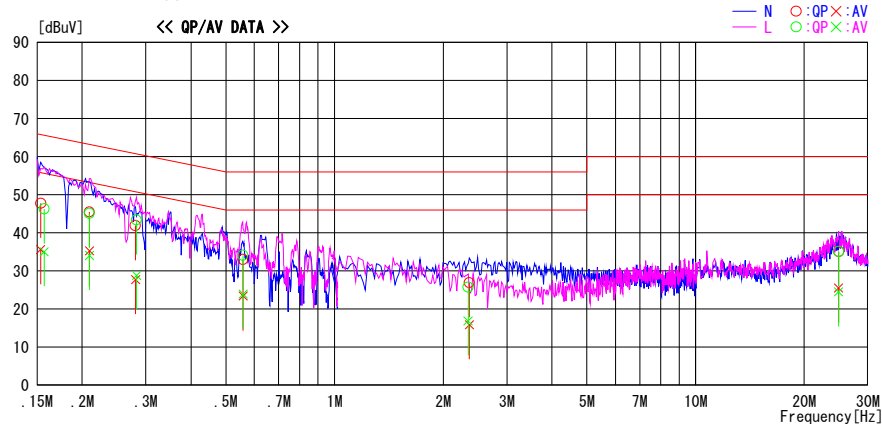
Report No. : 4786001719H

23deg. C / 34% RH

Temp./Humi. : 23deg. C / 34% RH
Engineer : Tomotaka Sasagawa

Mode / Remarks : USB communication 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]		
0.15349	34.5	22.4	13.2	47.7	35.6	65.8	55.8	18.1	20.2	N	
0.20928	32.3	22.0	13.2	45.5	35.2	63.2	53.2	17.7	18.0	N	
0.28076	28.7	14.5	13.2	41.9	27.7	60.8	50.8	18.9	23.1	N	
0.55798	19.8	10.2	13.2	33.0	23.4	56.0	46.0	23.0	22.6	N	
2.36140	13.3	2.3	13.6	26.9	15.9	56.0	46.0	29.1	30.1	N	
24.89704	19.8	10.2	15.3	35.1	25.5	60.0	50.0	24.9	24.5	N	
0.15697	33.1	21.9	13.2	46.3	35.1	65.6	55.6	19.3	20.5	L	
0.20928	31.9	20.9	13.2	45.1	34.1	63.2	53.2	18.1	19.1	L	
0.28251	30.2	15.6	13.2	43.4	28.8	60.7	50.7	17.3	21.9	L	
0.55798	20.9	10.8	13.2	34.1	24.0	56.0	46.0	21.9	22.0	L	
2.34322	12.2	3.4	13.5	25.7	16.9	56.0	46.0	30.3	29.1	L	
24.89704	19.8	9.2	15.3	35.1	24.5	60.0	50.0	24.9	25.5	L	

CHART:WITH FACTOR, Peak hold data. CALCULATION: RESULT=READING+C.F (L1SN LOSS + ATTEN LOSS + CABLE 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

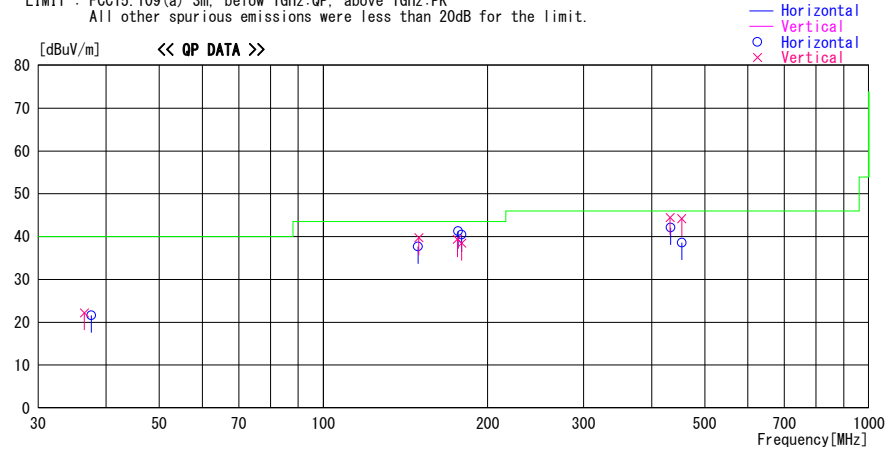
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 2 Semi Anechoic Chamber
Data : 2012/12/18

Report No. : 4786001719H
Temp./Humi. : 23deg. C / 34% RH
Engineer : Tomotaka Sasagawa

Mode / Remarks : USB communication mode

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency	Reading	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
[MHz]	[dBuV]		Factor	Gain	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
36.493	28.2	QP	15.8	-21.8	22.2	290	100	Vert.	40.0	17.8	
37.575	28.0	QP	15.4	-21.8	21.6	349	189	Hori.	40.0	18.4	
149.038	43.2	QP	14.9	-20.4	37.7	135	211	Hori.	43.5	5.8	
149.579	45.2	QP	14.9	-20.4	39.7	129	100	Vert.	43.5	3.8	
176.092	43.3	QP	16.0	-20.0	39.3	200	100	Vert.	43.5	4.2	
176.633	45.2	QP	16.0	-20.0	41.2	78	177	Hori.	43.5	2.3	
179.338	42.3	QP	16.1	-20.0	38.4	206	100	Vert.	43.5	5.1	
179.338	44.3	QP	16.1	-20.0	40.4	83	100	Hori.	43.5	3.1	
431.863	45.8	QP	17.6	-19.0	44.4	192	100	Vert.	46.0	1.6	
433.266	43.5	QP	17.6	-19.0	42.1	227	100	Hori.	46.0	3.9	
454.308	39.9	QP	17.7	-19.0	38.6	131	100	Hori.	46.0	7.4	
454.308	45.5	QP	17.7	-19.0	44.2	136	100	Vert.	46.0	1.8	

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

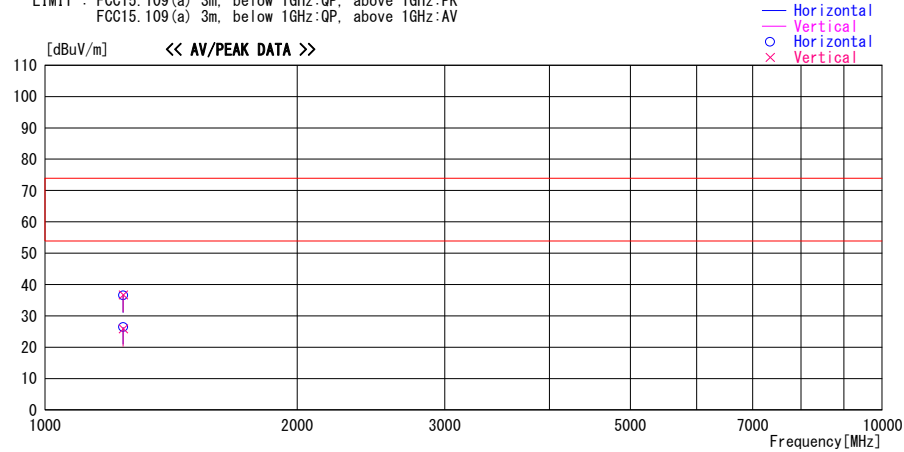
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Data : 2012/12/18

Report No. : 4786001719H
Temp./Humi. : 23deg. C / 34% RH
Engineer : Tomotaka Sasagawa

Mode / Remarks : USB Communication mode

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]							
1240.000	45.0	PK	25.6	-34.0	36.6	0	100	Hori.	73.9	37.3	
1240.000	45.1	PK	25.6	-34.0	36.7	0	100	Vert.	73.9	37.2	
1240.000	34.9	AV	25.6	-34.0	26.5	0	100	Hori.	53.9	27.4	
1240.000	34.2	AV	25.6	-34.0	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(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 equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date	Expiration date of the calibration
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE/CE	2012/06/29	2013/06/30
MOS-22	Thermo-Hygrometer	Custom	CTH-201	3	RE/CE	2012/02/06	2013/02/28
MJM-14	Measure	KOMELON	KMC-36	-	RE/CE	-	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE/CE	2012/04/06	2013/04/30
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE/CE	2012/04/03	2013/04/30
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2012/10/08	2013/10/31
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2012/10/08	2013/10/31
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2012/02/16	2013/02/28
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2012/11/06	2013/11/30
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2012/09/11	2013/09/30
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22	2013/02/28
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25	2013/01/31
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2012/09/05	2013/09/30
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE(EUT)	2013/01/07	2014/01/31
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	8127364	CE(AE)	2013/01/07	2014/01/31
MTA-31	Terminator	TME	CT-01	-	CE	2012/01/11	2013/01/31
MCC-13	Coaxial Cable	Fujikura	3D-2W(12m)/ 5D-2W(5m)/ 5D-2W(0.8m)/ 5D-2W(1m)	-	CE	2012/02/16	2013/02/28
MAT-65	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28	2013/01/31

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

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