



# **RADIO TEST REPORT**

**Test Report No.: 31EE0214-HO-01-B**

**Applicant** : NEC CASIO Mobile Communications, Ltd.  
**Type of Equipment** : Digital Portable Cellular Telephone  
**Model No.** : KMP7N4Y1-2A  
**Test regulation** : FCC Part 24 Subpart E: 2008  
**FCC ID** : A98-TBP4266  
**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 to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

**Date of test:**

January 22 to 29, 2011

**Representative  
test engineer:**

Katsunori Okai

Engineer of WiSE Japan,  
UL Verification Service

**Approved by:**

Takahiro Hatakeda

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>

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MF058b (12.01.11)

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## **SECTION 1: Customer information**

Company Name : NEC CASIO Mobile Communications, Ltd.  
Address : 1753 Shimonumabe, Nakahara-ku, Kawasaki, Kanagawa 211-8666 Japan  
Telephone Number : +81-44-455-8045  
Facsimile Number : +81-44-455-8025  
Contact Person : Kazuhiro Kurihara

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

### **2.1 Identification of E.U.T.**

Type of Equipment : Digital Portable Cellular Telephone  
Model No. : KMP7N4Y1-2A  
Serial No. : Refer to Section 4, Clause 4.2  
Rating : DC 3.8V  
Receipt Date of Sample : January 22, 2011  
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: KMP7N4Y1-2A, (referred to as the EUT in this report), is the Digital Portable Cellular Telephone.

### **Radio Specification**

#### **Bluetooth (Ver.2.1 + EDR)**

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Other Clock Frequency	19.2MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Connector Type	Integrated antenna

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

Equipment Type	Transceiver
Frequency of Operation	2400-2483.5MHz
Other Clock Frequency	19.2MHz
Type of Modulation	DSSS, OFDM
Antenna Connector Type	Integrated antenna

#### **GSM**

Equipment Type	Transceiver
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz
Other Clock Frequency	19.2MHz
Type of Modulation	GMSK
Channel spacing	200kHz
Antenna Connector Type	Integrated antenna

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#### **W-CDMA**

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band V: 824 – 849MHz [Down Link] Band V: 869 – 894MHz
Other Clock Frequency	19.2MHz
Type of Modulation	QPSK
Channel spacing	5MHz
Antenna Connector Type	Integrated antenna

#### **GPS**

Equipment Type	Receiver
Receiver Type	Direct Downconversion
Frequency of Operation	1575.42MHz
Other Clock Frequency	19.2MHz
Antenna Connector Type	Integrated antenna

#### **RFID**

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK
Antenna Connector Type	Integrated antenna

\*This test report applies for GSM(PCS).

## SECTION 3: Test specification, procedures & results

### 3.1 Test Specification

Test Specification : FCC Part 24 Subpart E: 2008, final revised on May 2, 2008  
Title : FCC 47CFR Part 24 Subpart E  
Broadband PCS

### 3.2 Procedures and results

Item	Test Specification & Procedure	Remarks	Deviation	Worst margin	Results
RF Output Power(Conducted/ Radiated) (Conducted Output Power / Equivalent isotropic radiated power(EIRP))	FCC 2.1046 FCC 24.232(c)	Conducted/ Radiated	N/A	-	Complied
Emission Bandwidth, 99% Occupied Bandwidth	FCC 2.1049 FCC 24.238(b)	Conducted	N/A	-	Complied
Band-Edge	FCC 2.1051 FCC 24.238	Conducted/ Radiated	N/A	[Conducted] 4.47dB 1849.9765MHz [Radiated] 2.3dB 1849.99MHz, Horizontal	Complied
Spurious Emission(Conducted)	FCC 2.1051 FCC 24.238	Conducted	N/A	-	Complied
Spurious Emission(Radiated)	FCC 2.1053 FCC 24.238	Radiated	N/A	No signal detected	Complied
Frequency Stability (Temperature Variation)	FCC 2.1055(a)(1)(b) FCC 24.235	Conducted	N/A	-	Complied
Frequency Stability (Voltage Variation)	FCC 2.1055(d)(1)(2) FCC 24.235	Conducted	N/A	-	Complied

Note: UL Japan's EMI Work Procedures No. QPM05

\*These tests were also referred to ANSI/TIA 603-C-2004 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards."

\*These tests were performed without any deviations from test procedure except for additions or exclusions.

### 3.3 Uncertainty

#### EMI

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

Radiated Emission (EUT height: 0.8m) (±dB)	
Measurement Distance 3m	
25MHz-300MHz	5.4dB
300MHz-1000MHz	4.0dB
1GHz-12.75GHz	4.4dB

Power meter (±dB)	
Below 1GHz	Above 1GHz
1.0dB	1.0dB

Antenna terminal conducted emission and Power density (±dB)			Antenna terminal conducted emission (±dB)		Channel power (±dB)
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.0dB	1.1dB	2.7dB	3.2dB	3.3dB	1.5dB

#### 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.

### 3.4 Test Location

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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.

### 3.5 Test set up, Test instruments and Data of EMI

Refer to APPENDIX.

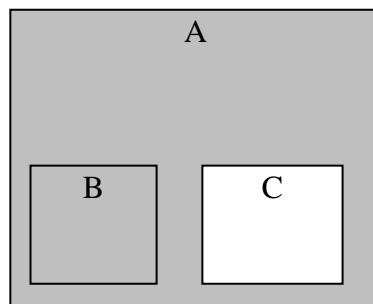


## **SECTION 4: Operation of E.U.T. during testing**

### **4.1 Operating Modes**

Test	Operating mode	Power Control	Tested frequency	Channel
RF output Power(Conducted)	Transmitting (Tx) (GSM, GMSK) Transmitting (Tx) (GPRS, GMSK)	Max	1850.2MHz 1880.0MHz 1909.8MHz	512 661 810
RF output Power(Radiated), Emission Bandwidth, 99% Occupied bandwidth, Spurious Emission	Transmitting (Tx) (GSM, GMSK)	Max	1850.2MHz 1880.0MHz 1909.8MHz	512 661 810
Band Edge	Transmitting (Tx) (GSM, GMSK)	Max	1850.2MHz 1910.0MHz	512 810
Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) (GSM, GMSK)	Max	1880.0MHz	661

### **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	Remark
A	Digital Portable Cellular Telephone	KMP7N4Y1-2A	004401200620132 004401200620322	NEC CASIO Mobile Communications, Ltd.	EUT
B	Battery	N27	-	NEC CASIO Mobile Communications, Ltd.	EUT
C	micro SD	1GB	SR9FB014582	Panasonic	-

## **SECTION 5: RF Output Power(Conducted/Radiated)**

[Conducted : Conducted Output Power]

### **Test Procedure**

The RF output power was measured with a power meter and an attenuator at the antenna port.

<b>Test data</b>	:	<b>APPENDIX 2</b>
<b>Test result</b>	:	<b>Pass</b>

[Radiated : Equivalent isotropic radiated power(EIRP)]

### **Test Procedure**

- 1) EUT was placed on a platform of nominal size, 1.0 by 0.5m, raised 80cm above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength intensity has been measured in a semi anechoic chamber with a ground plane and at a distance of 3m.  
The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
- 2) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height as the EUT. The frequency above 1GHz of the Substitution antenna was used with Horn antenna calibrated with the Half wave dipole antenna, which is harmonized with the measured frequency in 1).  
The Substitution Antenna was connected with the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field is equal to the measured value in 1).  
The measuring antenna height varied between 1 and 4m to obtain the maximum receiving level.  
Its Output power of Signal Generator was recorded.
- 3) Equivalent isotropic radiated power(EIRP) was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).

- The carrier level and noise levels were confirmed at each position of X, Y and Z axis of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

<b>Test data</b>	:	<b>APPENDIX 2</b>
<b>Test result</b>	:	<b>Pass</b>

## **SECTION 6: Bandwidth (Conducted)**

### **Test Procedure**

The Emission Bandwidth and 99% Occupied Bandwidth was measured with a spectrum analyzer and attenuator connected to the antenna port.

Test data	:	APPENDIX 2
Test result	:	Pass

## **SECTION 7: Spurious Emission and Band-Edge (Conducted/ Radiated)**

[Conducted]

### **Test Procedure**

The Spurious Emission and Band-Edge was measured with a spectrum analyzer and attenuator connected to the antenna port.

Test data	:	APPENDIX 2
Test result	:	Pass

[Radiated]

### **Test Procedure**

- 1) EUT was placed on a platform of nominal size, 1.0m by 0.5m, raised 80cm above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength intensity has been measured in a semi anechoic chamber with a ground plane and at a distance of 3m.  
The measuring antenna height was varied between 1 to 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
- 2) Exchanged the EUT to the Substitution Antenna, the antenna was set for the same height as EUT on the table.  
The frequency below 1GHz of the Substitution antenna was used as the Half wave dipole antenna and Shorted dipole antenna calibrated with the Half wave dipole antenna, which is harmonized with the measured frequency in 1). The frequency above 1GHz of the Substitution antenna was used with Horn antenna calibrated with the Half wave dipole antenna.  
The Substitution antenna was connected with the Signal Generator, and the polarized electromagnetic radiation of the Substitution antenna was matched with the one of the measuring antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field is equal to the measured value in 1).  
The measuring antenna height varied between 1 and 4m to obtain the maximum receiving level.  
Its Output power of Signal Generator was recorded.
- 3) Equivalent isotropic radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).

- The carrier level and noise levels were confirmed at each position of X, Y and Z axis of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Test data	:	APPENDIX 2
Test result	:	Pass

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## **SECTION 8: Frequency Stability(Temperature/Voltage Variation)**

### **Test Procedure**

The Frequency Stability was measured with a Wireless Communication Test Set and attenuator connected to the antenna port.

The Frequency Drift was measured with the 10 deg. C. steps from -30 deg. C. to 50 deg. C., and it is presented as the ppm unit. The Frequency Drift was measured with the normal temperature (20 deg. C.) and Voltage tolerance (DC3.4V to DC4.37V), and it is presented as the ppm unit.

Temperature	: -30deg.C to +50deg.C (10 deg. C. step)
Voltage	: Vnom:DC3.8V, Vmin:DC3.4V, Vmax:DC4.37V

In case of the voltage supply below DC 3.4V, the EUT stops operation by low battery detection function. Therefore, Frequency Stability test was performed under the above condition.

Test data	:	<b>APPENDIX 2</b>
Test result	:	<b>Pass</b>

## **APPENDIX 1: Photographs of test setup**

## **APPENDIX 2: Data of EMI test**

### **RF Output Power (Conducted)** **Conducted Output Power**

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	31EE0214-HO-01
Date	01/22/2011
Temperature/ Humidity	24 deg.C./ 39%
Engineer	Katsunori Okai
Mode	Tx

Mode	Ch	Frequency [MHz]	P/M (PK) Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]
GSM (GMSK)	Low	1850.2	17.15	10.09	3.35	30.59
	Mid	1880.0	17.42	10.09	3.35	30.86
	High	1909.8	17.46	10.09	3.36	30.91
GPRS (GMSK)	Low	1850.2	16.86	10.09	3.35	30.30
	Mid	1880.0	17.18	10.09	3.35	30.62
	High	1909.8	17.20	10.09	3.36	30.65

Results = P/M Reading + Atten.Loss + Cable Loss

**RF Output Power (Radiated)**  
**Equivalent Isotropically Radiated Power(EIRP)**

Report No. 31EE0214-HO-01  
Test place Head Office EMC Lab.  
Semi Anechoic Chamber No.2  
Date 01/27/2011  
Temperature / Humidity 25 deg. C. / 30 %  
Engineer Kazuya Yoshioka  
Mode Tx

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]	
1850.20	95.4	92.5	20.4	15.4	3.29	10.02	0.00	27.1	22.1	33.0	5.9	10.9	139	209	100	136	
1880.00	93.7	91.1	18.7	14.5	3.31	10.19	0.00	25.6	21.4	33.0	7.4	11.6	100	211	100	28	
1909.80	93.9	91.0	19.2	15.1	3.33	10.36	0.00	26.2	22.1	33.0	6.8	10.9	100	204	100	31	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-20GHz)

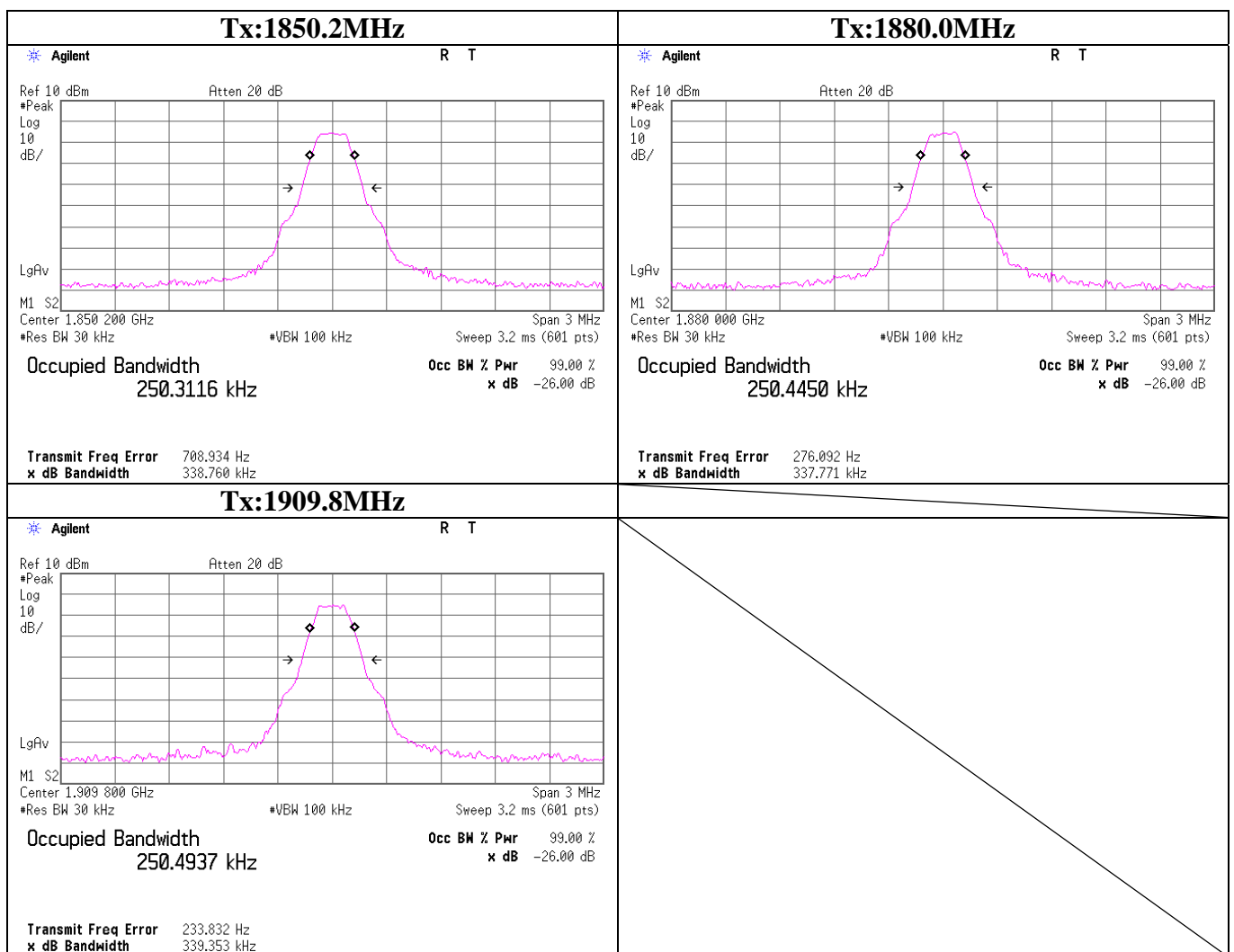
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-20GHz)

Detector : S/A PK (RBW: 3MHz , VBW: 8MHz)

## Bandwidth(Conducted)

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	31EE0214-HO-01
Date	01/23/2011
Temperature/ Humidity	20 deg.C./ 56%
Engineer	Katsunori Okai
Mode	Tx

CH	FREQ	26dB Bandwidth	99% OBW	Limit
	[MHz]	[kHz]	[kHz]	[kHz]
Low	1850.2	338.760	250.3116	-
Mid	1880.0	337.771	250.4450	-
High	1909.8	339.353	250.4937	-





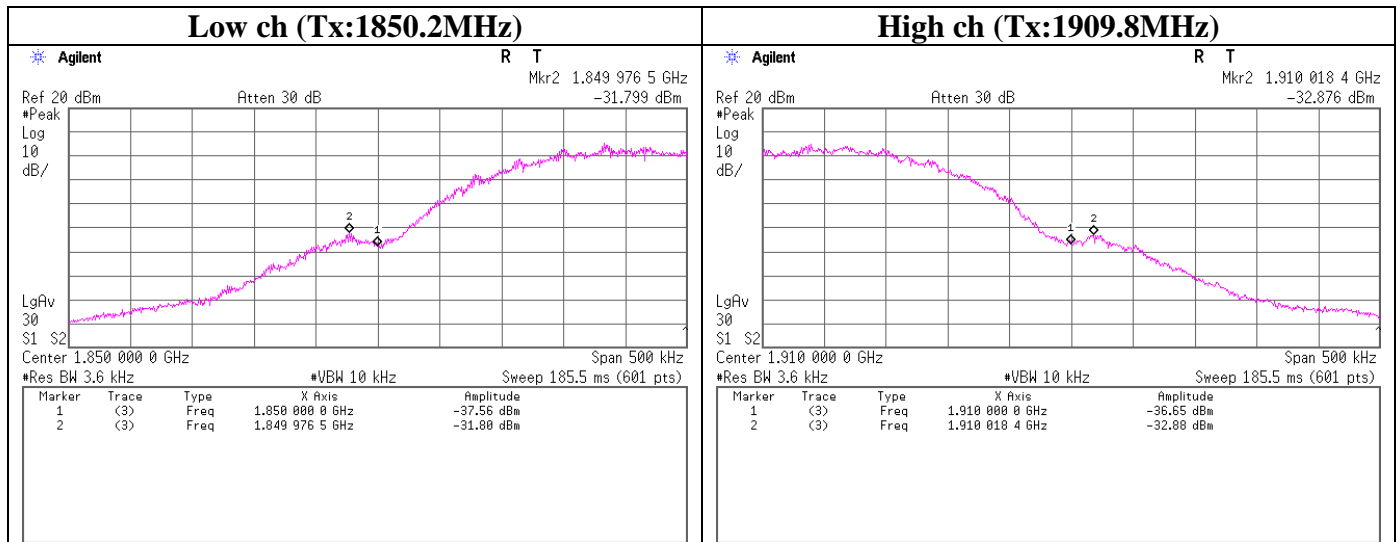
## Band-Edge(Conducted)

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	31EE0214-HO-01
Date	01/23/2011
Temperature/ Humidity	20 deg.C./ 56%
Engineer	Katsunori Okai
Mode	Tx

Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
1849.9765	-31.80	10.09	4.24	-17.47	-13.0	4.47
1850.0000	-37.56	10.09	4.24	-23.23	-13.0	10.23
1910.0000	-36.65	10.09	4.26	-22.30	-13.0	9.30
1910.0184	-32.88	10.09	4.26	-18.53	-13.0	5.53

VIDEO AV 30 times

Sample Calculation : Result = Reading + Atten. + Cable Loss



## Band-Edge (Radiated)

Report No. 31EE0214-HO-01  
Test place Head Office EMC Lab.  
Semi Anechoic Chamber No.2  
Date 01/27/2011  
Temperature / Humidity 25 deg. C. / 30 %  
Engineer Kazuya Yoshioka  
Mode Tx

Frequency  [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]	
1849.99	52.8	49.5	-22.0	-27.6	3.29	10.02	0.00	-15.3	-20.9	-13.0	2.3	7.9	139	209	100	136	
1850.00	49.5	46.5	-25.3	-30.6	3.29	10.02	0.00	-18.6	-23.9	-13.0	5.6	10.9	139	209	100	136	
1910.00	48.4	45.0	-26.4	-31.0	3.33	10.36	0.00	-19.4	-24.0	-13.0	6.4	11.0	100	204	100	31	
1910.02	51.0	48.9	-23.8	-27.1	3.33	10.36	0.00	-16.8	-20.1	-13.0	3.8	7.1	100	204	100	31	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-20GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-20GHz)

Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Detector : S/A PK (RBW: 3.6kHz, VBW: 10kHz)

### **Spurious Emission (Conducted)**

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	31EE0214-HO-01
Date	01/23/2011
Temperature/ Humidity	20 deg.C./ 56%
Engineer	Katsunori Okai
Mode	Tx

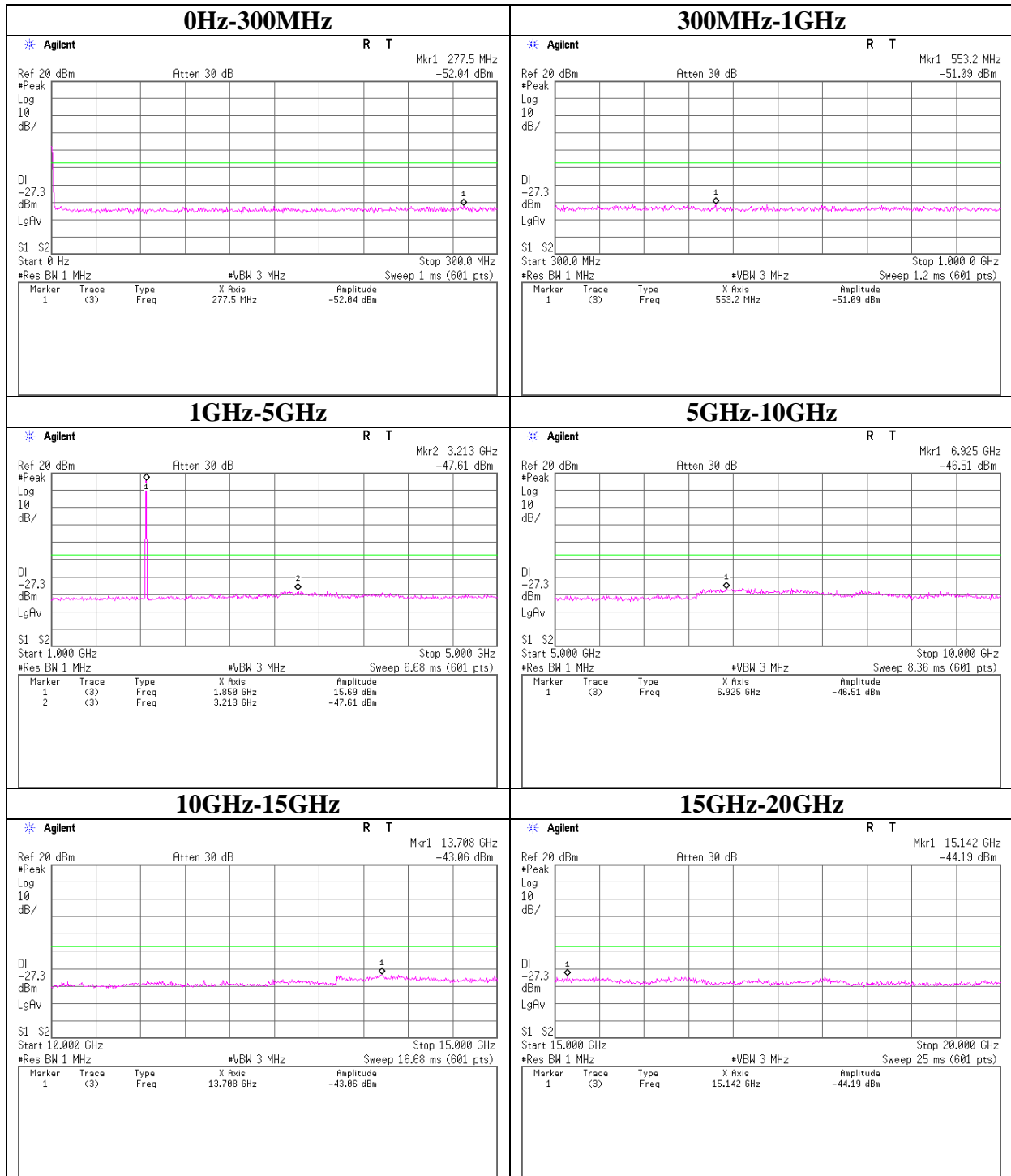
#### **Limit Line**

Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line [dBm]
1850.2	-13.0	10.09	4.24	-27.3
1880	-13.0	10.09	4.25	-27.3
1909.8	-13.0	10.09	4.26	-27.4

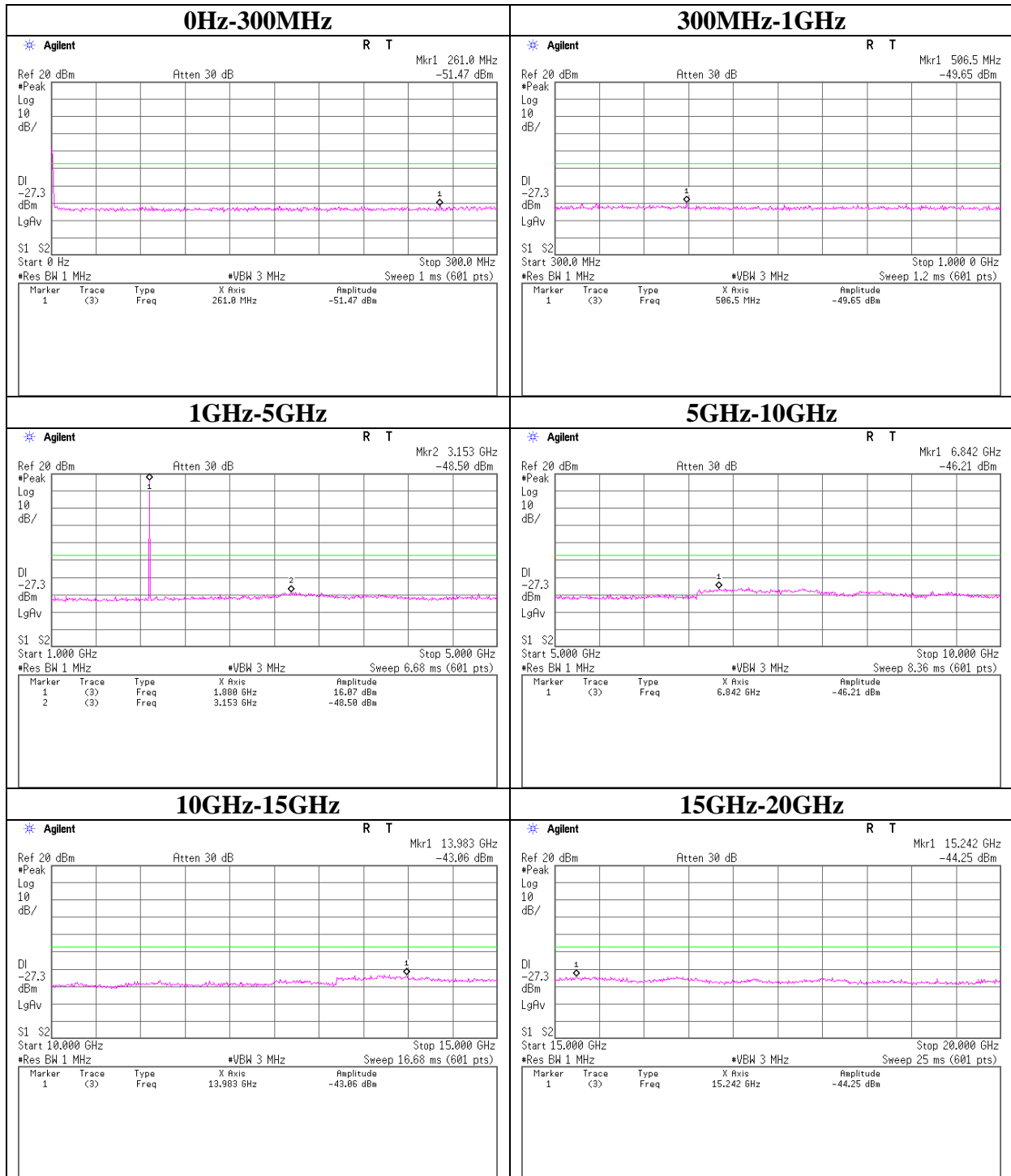
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss

\*All the spurious noises were below the above limit line.

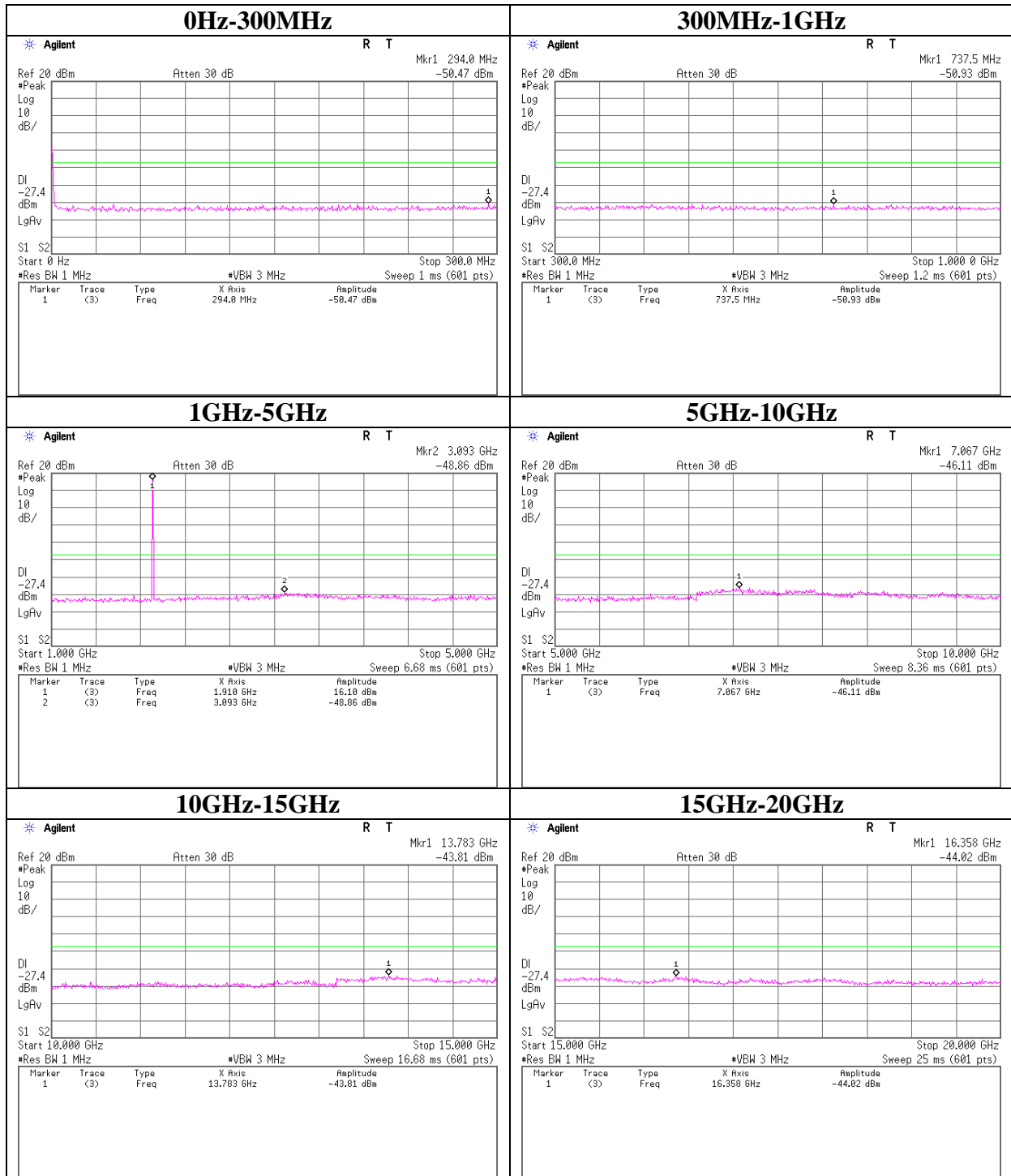
**Spurious Emission (Conducted)**  
**Tx:1850.2MHz**



**Spurious Emission (Conducted)**  
**Tx:1880.0MHz**



**Spurious Emission (Conducted)**  
**Tx:1909.8MHz**



**Spurious Emission (Radiated)**  
**Tx:1850.2MHz**

Report No.	31EE0214-HO-01	
Test place	Head Office EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	01/27/2011	01/29/2011
Temperature / Humidity	25 deg. C. / 30 %	24 deg. C. / 31 %
Engineer	Kazuya Yoshioka (Above 1GHz)	Takeshi Choda (Blow 1GHz)
Mode	Tx	

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal Rx Ant. Turn Height Table		Vertical Rx Ant. Turn Height Table		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
800.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)

Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

NS : No signal detect.

Detector : S/A PK(RBW:1MHz/VBW:3MHz)

**Spurious Emission (Radiated)**  
**Tx:1880.0MHz**

Report No.	31EE0214-HO-01	
Test place	Head Office EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	01/27/2011	01/29/2011
Temperature / Humidity	25 deg. C. / 30 %	24 deg. C. / 31 %
Engineer	Kazuya Yoshioka (Above 1GHz)	Takeshi Choda (Blow 1GHz)
Mode	Tx	

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal Rx Ant. Turn Height Table		Vertical Rx Ant. Turn Height Table		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
800.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)

Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

NS : No signal detect.

Detector : S/A PK(RBW:1MHz/VBW:3MHz)



**Spurious Emission (Radiated)**  
**Tx:1909.8MHz**

Report No.	31EE0214-HO-01	
Test place	Head Office EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	01/27/2011	01/29/2011
Temperature / Humidity	25 deg. C. / 30 %	24 deg. C. / 31 %
Engineer	Kazuya Yoshioka (Above 1GHz)	Takeshi Choda (Blow 1GHz)
Mode	Tx	

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal Rx Ant. Turn Height Table		Vertical Rx Ant. Turn Height Table		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
800.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)

Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

NS : No signal detect.

Detector : S/A PK(RBW:1MHz/VBW:3MHz)

**Frequency Stability (Temperature/Voltage Variation)**

Test place                      Head Office EMC Lab. No.6 Measurement Room  
Report No.                    31EE0214-HO-01  
Date                            01/24/2011  
Temperature/ Humidity      20 deg.C./ 32%  
Engineer                      Hironobu Ohnishi  
Mode                            Tx

Temp. [deg.C]	Volt. [V]	Frequency Error [Hz]	Frequency Error [ppm]	Remark
-30.0	3.80	61.05	0.073	-
-20.0	3.80	54.17	0.065	-
-10.0	3.80	110.57	0.132	-
0.0	3.80	52.49	0.063	-
10.0	3.80	25.12	0.030	-
20.0	3.80	-25.15	-0.030	-
30.0	3.80	-17.54	-0.021	-
40.0	3.80	-12.85	-0.015	-
50.0	3.80	-17.36	-0.021	-

Temp. [deg.C]	Volt. [V]	Frequency Error [Hz]	Frequency Error [ppm]	Remark
20.0	4.37	-15.87	-0.019	-
20.0	3.80	-25.15	-0.030	-
20.0	3.40	12.98	0.016	Battery End Point

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

#### **EMI test equipment**

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2010/05/19 * 12
MCC-116	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	290221/4	AT	2010/08/05 * 12
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2010/03/01 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2010/08/20 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2010/08/20 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2010/02/03 * 12
MPSC-01	Power splitters/Combiners	Mini-Circuit	ZFSC-2-2500	0124	AT	2010/09/17 * 12
MURC-02	Wireless Communication Test Set	Agilent	E5515C	GB47050683	AT	2009/10/20 * 36
MURC-03	Radio Communication Analyzer	Anritsu	MT8815B	6200711471	AT/RE	Pre Check
MCH-04	Temperature and Humidity Chamber	Tabai Espec	PL-2KP	14015723	AT	2010/08/03 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2010/09/01 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2010/02/09 * 12
MJM-05	Measure	PROMART	SEN1955	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2010/11/30 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2011/01/16 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2010/09/30 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2010/05/07 * 12
MCC-57	Microwave Cable	Suhner	SUCOFLEX104	267195/4(0.6m) / 292411(5m)	RE	2010/11/26 * 12
MCC-77	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278942/4	RE	2010/12/02 * 12
MHF-18	High Pass Filter 3.5-18.0GHz	TOKIMEC	TF323DCA	7002	RE	2010/09/21 * 12
MCC-129	Microwavel Cable(1-33GHz)	HUBER+SUHNER	SF103/11PC3.5-31	54307/3	RE	2011/01/06 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2010/05/07 * 12
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2010/08/20 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2010/10/11 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2010/10/11 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2010/02/22 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2010/11/05 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2010/09/09 * 12

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

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item:

RE: Radiated Emission

AT: Antenna Terminal Conducted

**UL Japan, Inc.**

**Head Office EMC Lab.**

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