RADIO TEST REPORT

Test Report No.: 32EE0075-HO-B-R1

Applicant	:	**NEC Corporation of America**
Type of Equipment	:	**Digital Portable Cellular Telephone**
Model No.	:	**KMP7N4AC1-3A**
Test regulation	:	**FCC Part 24 Subpart E: 2008**
FCC ID	:	**A98-QOE9653**
Test Result	:	**Complied**

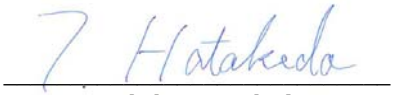
1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national 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.
6. This report is a revised version of 32EE0075-HO-B. 32EE0075-HO-B is replaced with this report.

Date of test: December 15 to 22, 2011

Representative test engineer:

Keisuke Kawamura
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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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.	:	KMP7N4AC1-3A
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.8V
Receipt Date of Sample	:	December 15, 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: KMP7N4AC1-3A, (referred to as the EUT in this report), is the Digital Portable Cellular Telephone.

Radio Specification [1/2]

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

Low Energy (Ver.4.0)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Other Clock Frequency	19.2MHz
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Connector Type	Integrated antenna

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

Equipment Type	Transceiver
Frequency of Operation	2412-2462MHz
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

Radio Specification [2/2]

WCDMA

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	HPSK
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
Peak to Average power Ratio	FCC 24.232(d)	Conducted	N/A	-	Complied
Emission Bandwidth, 99% Occupied Bandwidth	FCC 2.1049 FCC 24.238	Conducted	N/A	-	Complied
Band-Edge	FCC 2.1051 FCC 2.1053 FCC 24.238	Conducted/ Radiated	N/A	[Conducted] 3.86dB 1910.0201MHz [Radiated] 3.7dB 1910.02MHz, 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	23.7dB 13368.60MHz, Horizontal	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. 13-EM-W0420					

*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

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

Radiated emission test(3m)
The data listed in this test report has enough margin, more than the site margin.

3.4 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

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

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

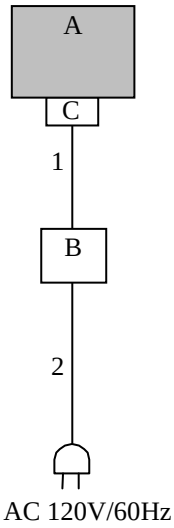
Refer to APPENDIX.

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) Peak to Average power Ratio (Conducted)	Transmitting (Tx) (GSM, GMSK) Transmitting (Tx) (GPRS, GMSK)	Max	1850.2MHz 1880.0MHz 1909.8MHz	512 661 810
RF output Power(Radiated), 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
Emission Bandwidth, Bandwidth (Conducted), Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) (GSM, GMSK)	Max	1880.0MHz	661

4.2 Configuration and peripherals



* Setup was 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	KMP7N4AC1-3A	004401200840185 *1) 004401200840169 *1) 004401200840193 *2)	NEC Corporation of America	EUT
B	AC Adaptor	MAS-BH0008-A002	-	MITSUMI	-
C	Micro USB	FOMA charging microUSB adapter N01	-	NEC Corporation of America	-

*1) Used for Antenna Terminal Conducted test
*2) Used for Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	1.6	Shielded	Shielded	-
2	AC Cable	1.2	Unshielded	Unshielded	-

SECTION 5: RF Output Power(Conducted/Radiated)

[Conducted : Conducted Output Power]

Test Procedure

The RF output power was measured with a Wireless Communication Test Set at the antenna port.

Test data : APPENDIX 1
Test result : Pass

[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.

Test data : APPENDIX 1
Test result : Pass

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 1
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 1
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 1
Test result : Pass

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 DC4.2V), 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:DC4.2V

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 : APPENDIX 1
Test result : Pass

APPENDIX 1: Data of EMI test

RF Output Power (Conducted)

Conducted Output Power

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32EE0075-HO
Date	12/16/2011
Temperature/ Humidity	22 deg. C / 38% RH
Engineer	Katsunori Okai
Mode	Tx

Mode	Ch	Frequency [MHz]	Reading Average frame power [dBm]	Cable Loss [dB]	Result [dBm]
GSM (GMSK)	Low	1850.2	26.32	4.35	30.67
	Mid	1880.0	26.83	4.35	31.18
	High	1909.8	26.75	4.35	31.10
GPRS (GMSK)	Low	1850.2	26.27	4.35	30.62
	Mid	1880.0	26.80	4.35	31.15
	High	1909.8	26.71	4.35	31.06

Results = P/M Reading + Cable Loss

RF Output Power (Radiated)

Equivalent Isotropically Radiated Power(EIRP)

Report No.	32EE0075-HO
Test place	Head Office EMC Lab.
Semi Anechoic Chamber	No.4
Date	12/21/2011
Temperature / Humidity	25 deg. C / 28 % RH
Engineer	Keisuke Kawamura
Mode	Tx

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.20	98.4	99.2	23.2	22.6	3.2	10.2	0.0	30.1	29.5	33.0	**2.9**	**3.5**	113	323	100	79	
1880.00	99.1	97.7	24.3	21.7	3.2	10.3	0.0	31.4	28.8	33.0	**1.6**	**4.3**	110	336	100	306	
1909.80	99.2	97.6	24.4	22.2	3.3	10.5	0.0	31.6	29.4	33.0	**1.4**	**3.6**	111	334	100	154	

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: 3MHz , VBW: 8MHz)

Peak to Average power Ratio (Conducted)

Report No.	32EE0075-HO
Test place	Head Office EMC Lab. No.6 Measurement Room
Date	12/22/2011
Temperature / Humidity	23deg. C / 32% RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK)
	Tx GPRS(GMSK)

Mode	Channel	Frequency [MHz]	Peak to Average power Ratio [dB]	Limit [dB]
GSM	512	1850.20	0.166	13
	661	1880.00	0.109	13
	810	1909.80	0.114	13
GPRS	512	1850.20	0.172	13
	661	1880.00	0.106	13
	810	1909.80	0.152	13

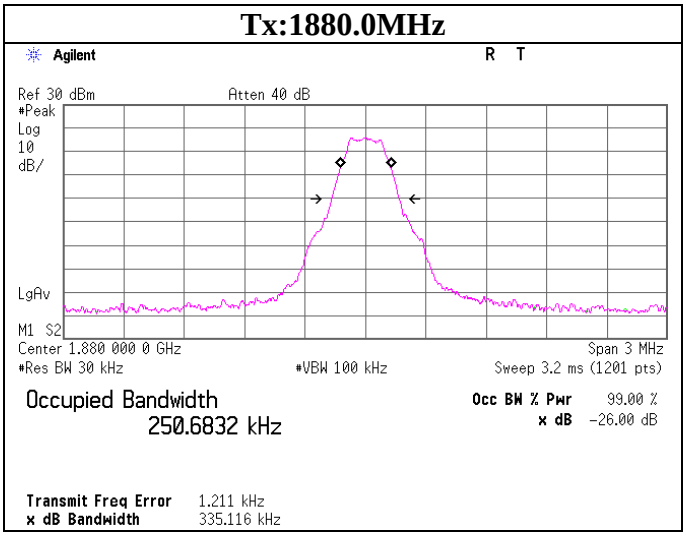
*In order to decide the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth, an average and a peak trace were used on a spectrum analyzer .

Bandwidth(Conducted)

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32EE0075-HO
Date	12/15/2011
Temperature/ Humidity	20 deg. C / 40% RH
Engineer	Katsunori Okai
Mode	Tx

CH	FREQ [MHz]	26dB Bandwidth [kHz]	99% OBW [kHz]	Limit [kHz]
Mid	1880.0	335.116	250.6832	-

Tx:1880.0MHz



Band-Edge(Conducted)

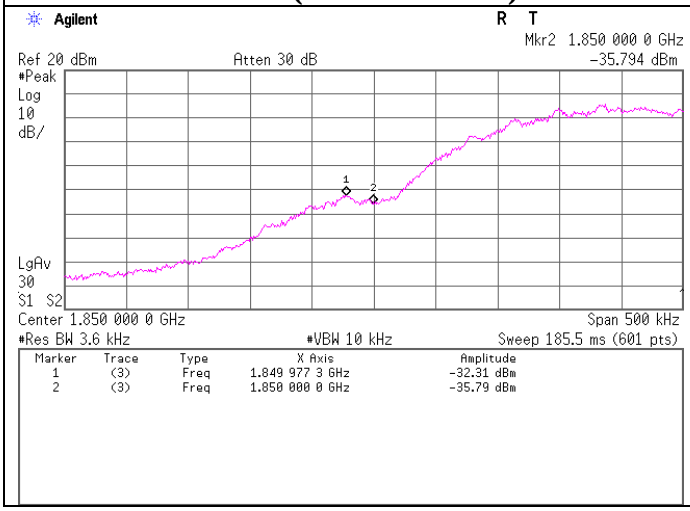
Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32EE0075-HO
Date	12/15/2011
Temperature/ Humidity	20 deg. C / 40% RH
Engineer	Katsunori Okai
Mode	Tx

Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
1849.9773	-32.31	10.02	4.89	-17.40	-13.0	4.40
1850.0000	-35.79	10.02	4.89	-20.88	-13.0	7.88
1910.0000	-34.87	10.02	4.89	-19.96	-13.0	6.96
1910.0201	-31.77	10.02	4.89	-16.86	-13.0	3.86

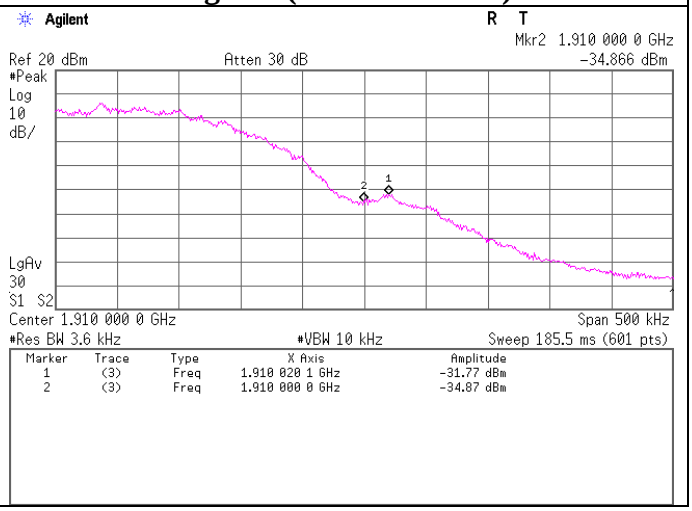
VIDEO AV 30 times

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

Low ch (Tx:1850.2MHz)



High ch (Tx:1909.8MHz)



Band-Edge (Radiated)

Report No.	32EE0075-HO
Test place	Head Office EMC Lab.
Semi Anechoic Chamber	No.4
Date	12/21/2011
Temperature / Humidity	25 deg. C / 28 % RH
Engineer	Keisuke Kawamura
Mode	Tx

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1849.98	47.9	48.8	-27.4	-27.9	3.2	10.2	0.0	-20.5	-21.0	-13.0	7.5	8.0	113	323	100	79	
1850.00	43.8	45.1	-31.5	-31.5	3.2	10.2	0.0	-24.6	-24.6	-13.0	11.6	11.6	113	323	100	79	
1910.00	42.4	40.2	-32.5	-35.5	3.3	10.5	0.0	-25.3	-28.3	-13.0	12.3	15.3	111	334	100	154	
1910.02	51.0	48.9	-23.9	-26.9	3.3	10.5	0.0	-16.7	-19.7	-13.0	3.7	6.7	111	334	100	154	

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 AV (RBW: 3.6kHz , VBW: 10kHz)

Spurious Emission (Conducted)

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32EE0075-HO
Date	12/15/2011
Temperature/ Humidity	20 deg. C / 40% RH
Engineer	Katsunori Okai
Mode	Tx

Limit Line

Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line [dBm]
1850.2	-13.0	10.02	4.89	-27.9
1880	-13.0	10.02	4.88	-27.9
1909.8	-13.0	10.02	4.89	-27.9

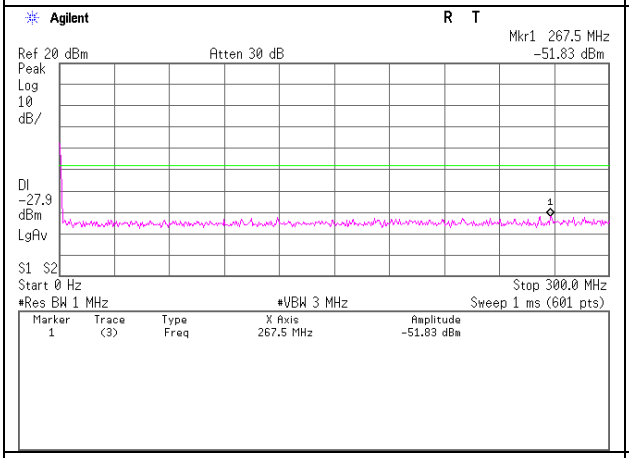
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss

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

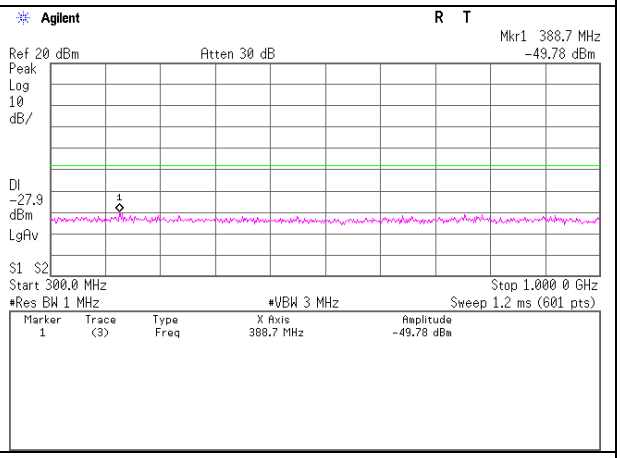
Spurious Emission (Conducted)

Tx:1850.2MHz

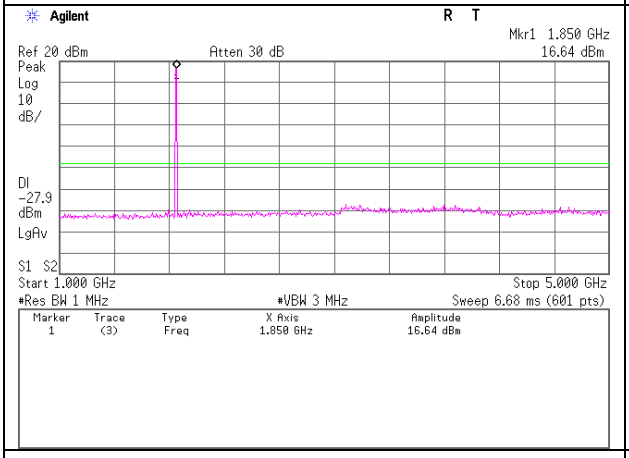
0Hz-300MHz



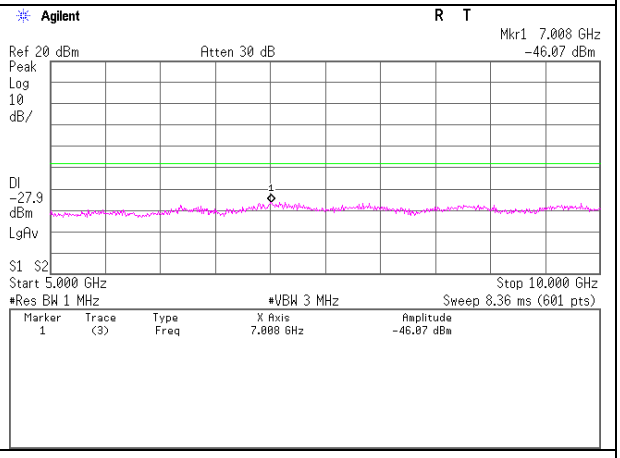
300MHz-1GHz



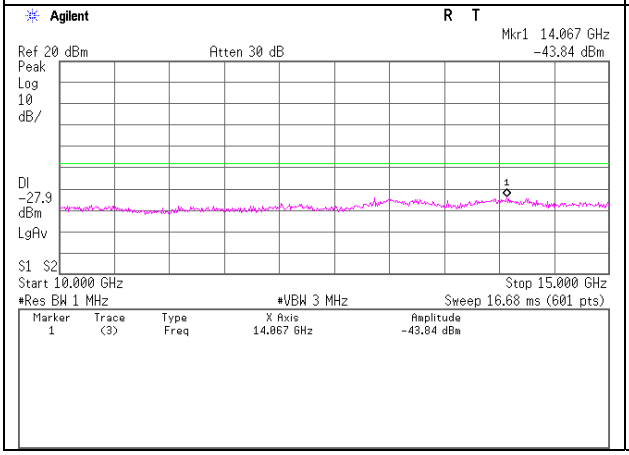
1GHz-5GHz



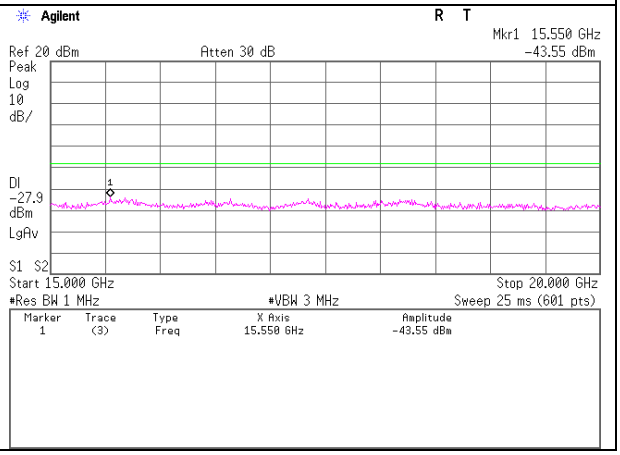
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



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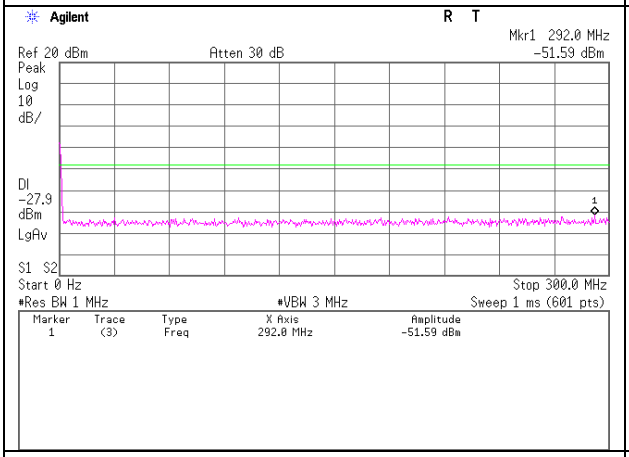
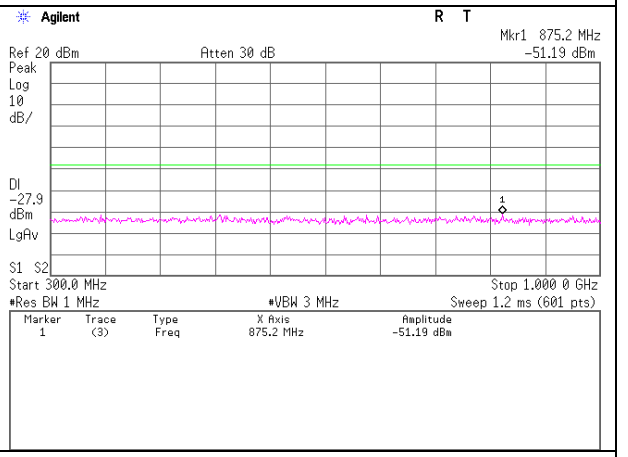
Spurious Emission (Conducted)

Tx:1880.0MHz

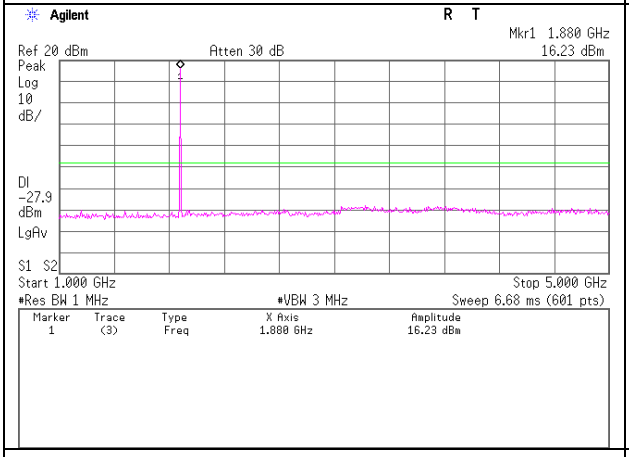
0Hz-300MHz



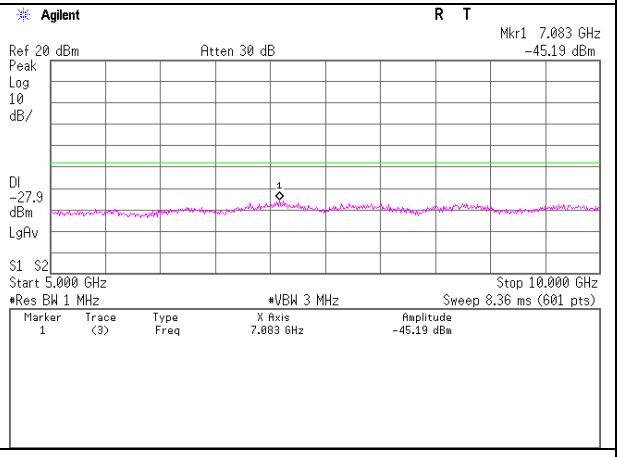
300MHz-1GHz



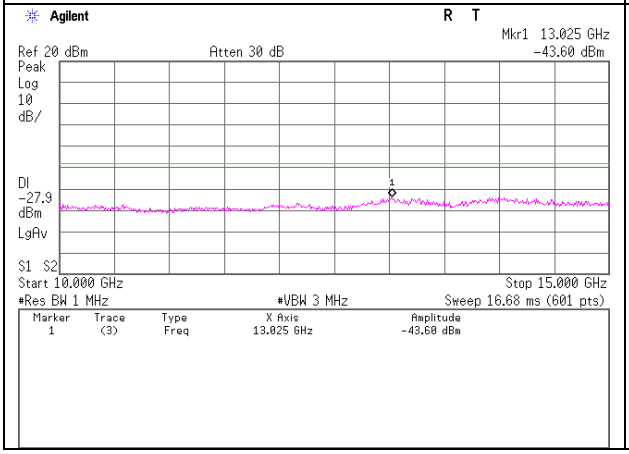
1GHz-5GHz



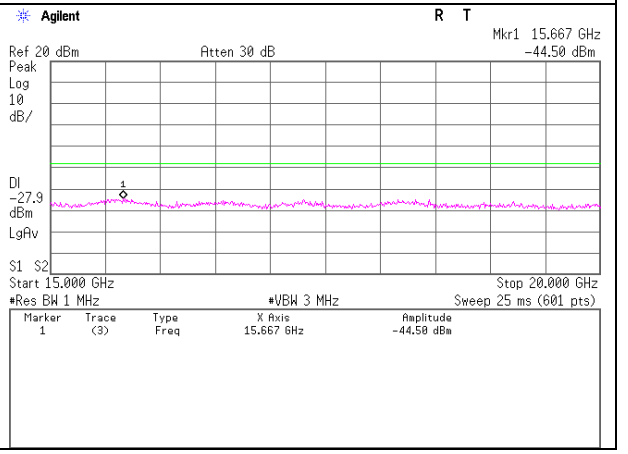
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



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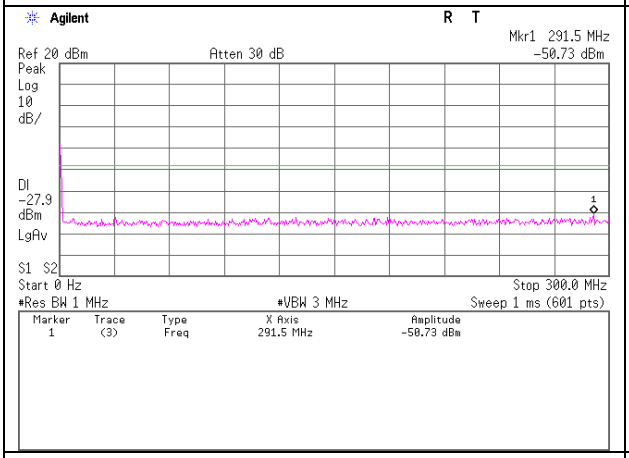
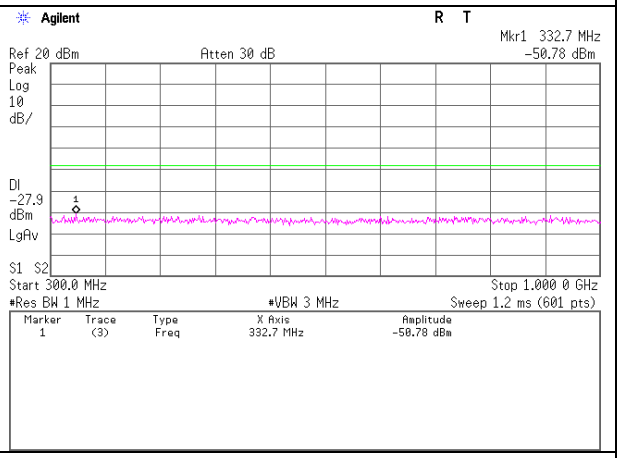
Spurious Emission (Conducted)

Tx:1909.8MHz

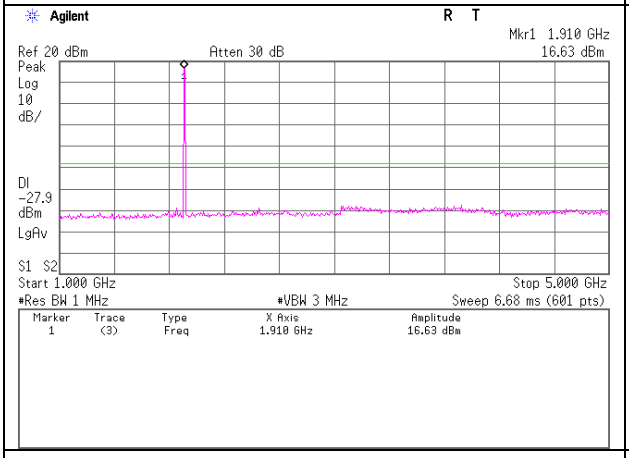
0Hz-300MHz



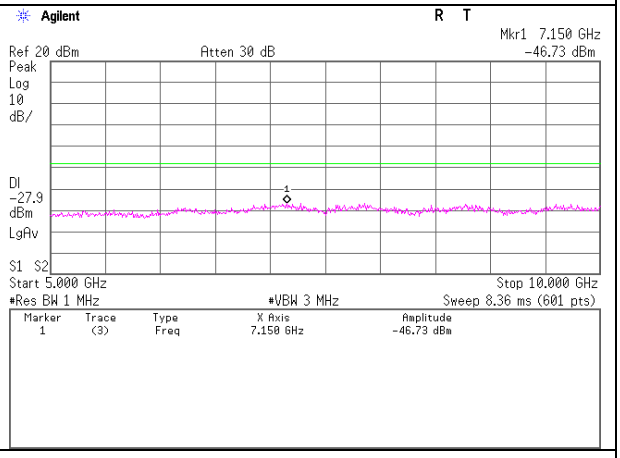
300MHz-1GHz



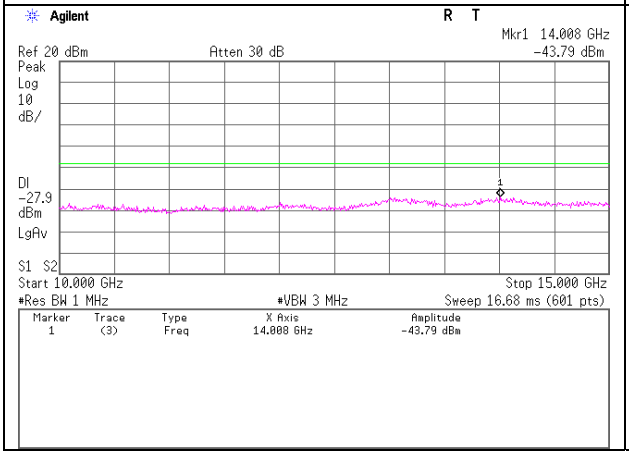
1GHz-5GHz



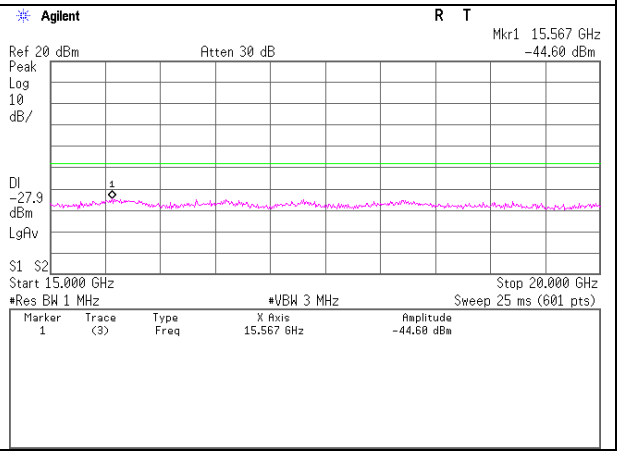
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



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Spurious Emission (Radiated)

Report No.	32EE0075-HO		
Test place	Head Office EMC Lab.		
Semi Anechoic Chamber	No.4	No.4	No.4
Date	12/19/2011	12/21/2011	12/22/2011
Temperature / Humidity	26 deg. C / 28 % RH	25 deg. C / 28 % RH	24 deg. C / 29 % RH
Engineer	Keisuke Kawamura	Keisuke Kawamura	Keisuke Kawamura
	Below 1GHz	1G-10GHz	10G-20GHz
Mode	Tx		

Tx 1850.2MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP)	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER	[dBm]	HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
5550.60	52.7	48.3	-45.4	-53.5	5.6	12.8	0.0	-38.2	-46.3	-13.0	25.2	33.3	100	285	100	154	

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

Tx 1880.0MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP)	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER	[dBm]	HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
5640.00	50.5	48.2	-48.5	-54.0	5.6	12.9	0.0	-41.2	-46.7	-13.0	28.2	33.7	100	318	100	273	
13160.00	49.4	50.9	-43.8	-43.1	9.1	13.0	0.0	-39.9	-39.2	-13.0	26.9	26.2	100	202	107	233	

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

Tx 1909.8MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP)	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER	[dBm]	HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
5729.40	48.9	49.4	-51.7	-51.8	5.6	13.0	0.0	-44.3	-44.4	-13.0	31.3	31.4	100	311	100	281	
13368.60	54.6	54.3	-40.2	-41.2	9.1	12.7	0.0	-36.7	-37.7	-13.0	23.7	24.7	100	187	100	247	

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).
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.	32EE0075-HO
Date	12/22/2011
Temperature/ Humidity	22deg. C / 32% RH
Engineer	Yutaka Yoshida
Mode	Tx

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Remark
-30	3.80	1879.99994988	-36.80	-0.020	-
-20	3.80	1880.00006790	81.22	0.043	-
-10	3.80	1880.00004811	61.43	0.033	-
0	3.80	1880.00004188	55.20	0.029	-
10	3.80	1880.00004223	55.55	0.030	-
20	3.80	1879.99998668	-	-	Reference
30	3.80	1879.99998271	-3.97	-0.002	-
40	3.80	1879.99997746	-9.22	-0.005	-
50	3.80	1879.99997741	-9.27	-0.005	-

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Remark
20	4.20	1880.00001026	23.58	0.013	-
20	3.80	1879.99998668	-	-	Reference
20	3.40	1879.99997663	-10.05	-0.005	Battery End Point

APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date	Expiration date of the calibration
MOS-24	Thermo-Hygrometer	Custom	CTH-201	0005	AT	2011/02/23	2012/02/29
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	AT	2011/04/08	2012/04/30
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2011/10/28	2012/10/31
MAT-25	Attenuator(10dB) (above1GHz)	Agilent	8493C	71642	AT	2011/06/23	2012/06/31
MCC-97	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	30818/2	AT	2011/05/27	2012/05/31
MPSC-01	Power splitters/Combiners	Mini-Circuit	ZFSC-2-2500	0124	AT	2011/09/27	2012/09/30
MCH-04	Temperature and Humidity Chamber	Tabai Espec	PL-2KP	14015723	AT	2011/08/22	2012/08/31
MURC-02	Wireless Communication Test Set	Agilent	E5515C	GB47050683	AT	2011/11/26	2012/11/30
MPSC-02	Power Splitters/Combiners	Mini-Circuit	ZFSC-2-10G	0127	AT	Pre Check	Pre Check
MCC-96	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	30817/2	AT	2011/05/27	2012/05/31
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2011/02/15	2012/02/29
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2011/02/23	2012/02/29
MMM-14	DIGIITAL HiTESTER	Hioki	3805	070500641	AT	2011/06/06	2012/06/31
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2011/02/22	2012/02/29
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2011/02/23	2012/02/29
MJM-15	Measure	KOMELON	KMC-36	-	RE	-	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2011/11/23	2012/11/30
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2011/05/23	2012/05/31
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2011/09/07	2012/09/30
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2011/03/10	2012/03/31
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2011/05/16	2012/05/31
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2011/03/01	2012/03/31
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE	2011/02/23	2012/02/29
MJM-07	Measure	PROMART	SEN1955	-	RE	-	-
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2011/11/16	2012/11/30
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2011/11/16	2012/11/30
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2011/03/25	2012/03/31
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2011/11/02	2012/11/30

EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date	Expiration date of the calibration
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2011/03/04	2012/03/31
MSG-09	Signal Generator	Wiltron	68247B	674005	RE	2011/02/05	2012/02/29
MDA-04	Dipole Antenna	Schwarzbeck	UHAP	992	RE	2011/10/15	2012/10/31
MCC-127	Coaxial Cable	UL Japan	-	-	RE	2011/07/04	2012/07/31
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2011/08/11	2012/08/31
MCC-56	Microwave Cable	Suhner	SUCOFLEX104	270875/4(1m) / 284655(5m)	RE	2011/03/02	2012/03/31
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2011/03/10	2012/03/31
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2011/01/16	2012/01/31
MCC-130	Microwave Cable (1-33GHz)	HUBER+SUHNER	SF103/11PC3.5-31/11PC3.5-31/8.0m	54308/3	RE	2011/01/20	2012/01/31
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2011/08/30	2012/08/31
MHA-17	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170307	RE	2011/06/17	2012/06/31

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:

RE: Radiated Emission
AT: Antenna Terminal Conducted