



RADIO TEST REPORT

Test Report No.: 4786001719H-B-R1

Applicant : NEC Corporation of America
Type of Equipment : Digital Portable Cellular Telephone
Model No. : KMP7R4H1-6A
Test regulation : FCC Part 24 Subpart E: 2008
FCC ID : A98-FQM6833
Test Result : Complied

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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.
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6. This report is a revised version of 4786001719H-B. 4786001719H-B is replaced with this report.

Date of test:

December 11 to 20, 2012

**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

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 4786001719H-B

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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 - 4.2 V)
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.

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)

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

*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] 3.67dB 1849.9744MHz [Radiated] 13.0dB 1910.02MHz, Vertical	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	32.8dB 5729.40MHz, 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	
30MHz-300MHz	5.5dB
300MHz-1000MHz	4.2dB
1GHz-12.75GHz	4.6dB

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

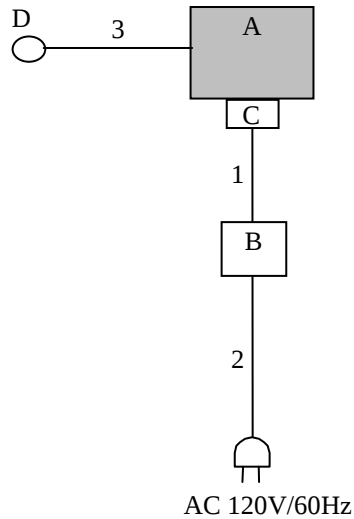
Refer to APPENDIX.

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 (Conducted / Radiated)	Transmitting (Tx) (GSM, GMSK) *1)	Max	1850.2MHz 1880.0MHz 1909.8MHz	512 661 810
Band Edge (Conducted)	Transmitting (Tx) (GSM, GMSK) Transmitting (Tx) (GPRS, GMSK)	Max	1850.2MHz 1910.0MHz	512 810
Band Edge (Radiated)	Transmitting (Tx) (GSM, GMSK) *1)	Max	1850.2MHz 1910.0MHz	512 810
Emission Bandwidth, 99% Occupied Bandwidth, Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) (GSM, GMSK) *1)	Max	1880.0MHz	661
*1) The mode was used for testing as a representative, because it had the worst RF output Power (Conducted).				

4.2 Configuration and peripherals



* Cabling and setup(s) 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	KMP7R4H1-6A	004401201130115 *1) 004401201130149 *2) 004401201130156 *3)	NEC Corporation of America	EUT
B	AC Adaptor	MAS-BH0008-A002	-	MITSUMI	-
C	Micro USB	FOMA charging microUSB adapter N01	-	NEC Corporation of America	-
D	Earphone	-	-	NEC Corporation of America	-

*1) Used for Antenna Terminal Conducted test

*2) Used for Radiated Emission test (Above 1GHz)

*3) Used for Radiated Emission test (Below 1GHz)

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	1.6	Shielded	Shielded	-
2	AC Cable	0.6	Unshielded	Unshielded	-
3	Earphone Cable	0.7	Unshielded	Unshielded	-

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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, 0.5 by 1.0m, 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, 0.5 by 1.0m, 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

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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 DC4.2V), 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

As the operating input voltage of the EUT is between DC3.4V to 4.2V (nominal voltage: DC3.8V), 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
Project No.	4786001719H
Date	12/20/2012
Temperature/ Humidity	22deg. C / 41% RH
Engineer	Katsunori Okai
Mode	Tx GSM(GMSK)

Mode	Ch	Frequency [MHz]	Reading Average frame power [dBm]	Cable Loss [dB]	Result [dBm]
GSM (GMSK)	Low	1850.2	30.46	0.87	31.33
	Mid	1880.0	30.28	0.88	31.16
	High	1909.8	29.98	0.88	30.86
GPRS (GMSK)	Low	1850.2	30.45	0.87	31.32
	Mid	1880.0	30.27	0.88	31.15
	High	1909.8	29.97	0.88	30.85

Results = Reading + Cable Loss

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

Report No. 4786001719H
Test place Head Office EMC Lab.
Semi Anechoic Chamber No.2
Date 12/17/2012
Temperature / Humidity 23deg. C / 32 % RH
Engineer Yutaka Yoshida
Mode Tx GSM(GMSK)

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	90.5	92.1	15.4	14.8	4.0	10.0	0.0	21.5	20.8	33.0	11.5	12.2	104	218	109	248	
1880.00	92.0	92.5	17.5	15.5	4.0	10.2	0.0	23.6	21.7	33.0	9.4	11.3	102	219	105	248	
1909.80	89.8	91.3	15.0	14.8	4.0	10.3	0.0	21.2	21.1	33.0	11.8	11.9	100	219	101	244	

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:3MHz/VBW:8MHz)

* Radiated RF Output Power level became lower than conducted RF Output Power level
due to the transmitting characteristics of the built-in antenna.

Peak to Average power Ratio (Conducted)

Test place Head Office EMC Lab. No.6 Measurement Room
Project No. 4786001719H
Date 12/13/2012
Temperature/ Humidity 21deg. C / 38% RH
Engineer Katsunori Okai
Mode Tx GSM(GMSK)
 Tx GPRS(GMSK)

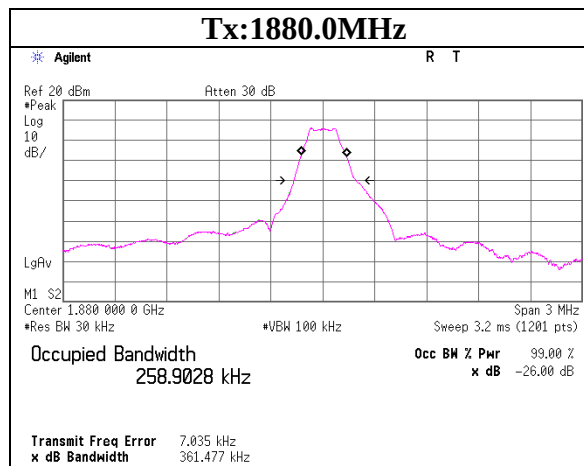
Mode	Channel	Frequency [MHz]	Peak to Average power Ratio [dB]	Limit [dB]
GSM (GMSK)	512	1850.20	0.07	13
	661	1880.00	0.04	13
	810	1909.80	0.03	13
GPRS (GMSK)	512	1850.20	0.07	13
	661	1880.00	0.04	13
	810	1909.80	0.04	13

*In order to decide the largest deviation between the average and the peak power of the EUT in a bandwidth, an average and a peak trace of the spectrum analyzer was used for GSM Signals.

Bandwidth(Conducted)

Test place	Head Office EMC Lab. No.6 Measurement Room
Project No.	4786001719H
Date	12/13/2012
Temperature/ Humidity	21deg. C / 38% RH
Engineer	Katsunori Okai
Mode	Tx GSM(GMSK)

Mode	FREQ	26dB Bandwidth	99% OBW	Limit
	[MHz]	[kHz]	[kHz]	[kHz]
GSM	1880.0	361.477	258.9028	-



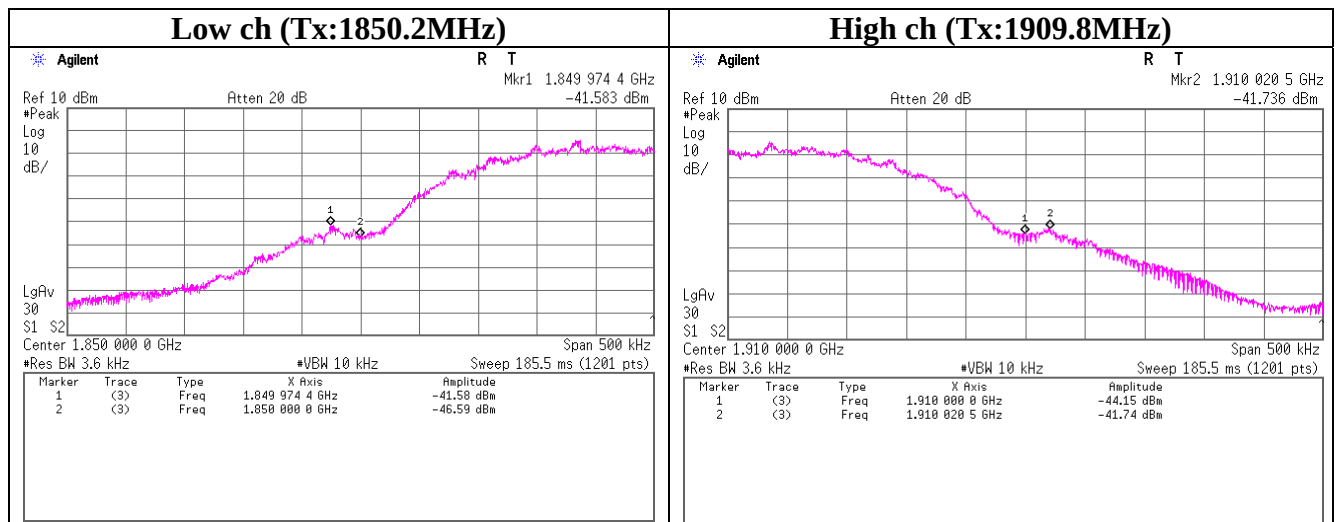
Band-Edge(Conducted)

Test place	Head Office EMC Lab. No.6 Measurement Room
Project No.	4786001719H
Date	12/11/2012
Temperature/ Humidity	22deg. C / 41% RH
Engineer	Katsunori Okai
Mode	Tx GSM(GMSK)

Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
1849.9744	-41.58	19.99	4.92	-16.67	-13.0	3.67
1850.0000	-46.59	19.99	4.92	-21.68	-13.0	8.68
1910.0000	-44.15	20.01	4.95	-19.19	-13.0	6.19
1910.0205	-41.74	20.01	4.95	-16.78	-13.0	3.78

VIDEO AV 30 times

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



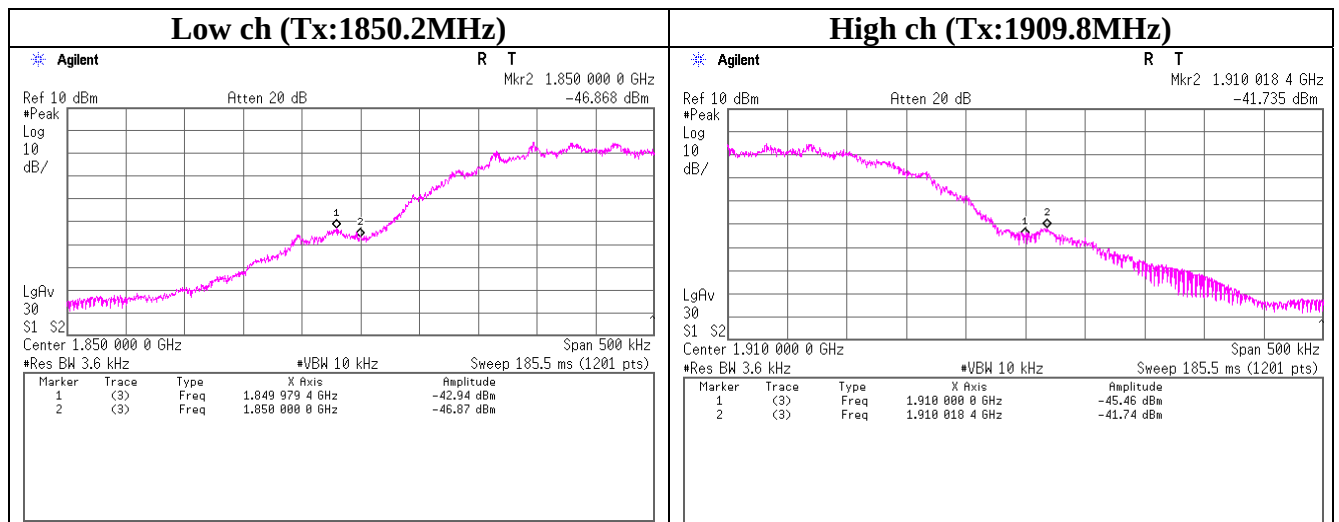
Band-Edge(Conducted)

Test place	Head Office EMC Lab. No.6 Measurement Room
Project No.	4786001719H
Date	12/11/2012
Temperature/ Humidity	22deg. C / 41% RH
Engineer	Katsunori Okai
Mode	Tx GPRS(GMSK)

Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
1849.9794	-42.94	19.99	4.92	-18.03	-13.0	5.03
1850.0000	-46.87	19.99	4.92	-21.96	-13.0	8.96
1910.0000	-45.46	20.01	4.95	-20.50	-13.0	7.50
1910.0184	-41.74	20.01	4.95	-16.78	-13.0	3.78

VIDEO AV 30 times

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



Band-Edge (Radiated)

Report No. 4786001719H
Test place Head Office EMC Lab.
Semi Anechoic Chamber No.2
Date 12/17/2012
Temperature / Humidity 23deg. C / 32 % RH
Engineer Yutaka Yoshida
Mode Tx GSM(GMSK)

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.]	
1849.98	42.1	43.5	-33.1	-33.9	4.0	10.0	0.0	-27.1	-27.9	-13.0	14.1	14.9	104	218	109	248	
1850.00	40.7	41.1	-34.5	-36.3	4.0	10.0	0.0	-28.5	-30.3	-13.0	15.5	17.3	104	218	109	248	
1910.00	36.3	38.3	-38.7	-38.4	4.0	10.3	0.0	-32.4	-32.1	-13.0	19.4	19.1	100	219	101	244	
1910.02	42.6	44.4	-32.4	-32.3	4.0	10.3	0.0	-26.1	-26.0	-13.0	13.1	13.0	100	219	101	244	

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 : Tx : S/A AV(RBW:3.6kHz/VBW:10kHz)

Spurious Emission (Conducted)

Test place Head Office EMC Lab. No.6 Measurement Room
Project No. 4786001719H
Date 12/13/2012
Temperature/ Humidity 21deg. C / 38% RH
Engineer Keisuke Kawamura
Mode Tx GSM(GMSK)

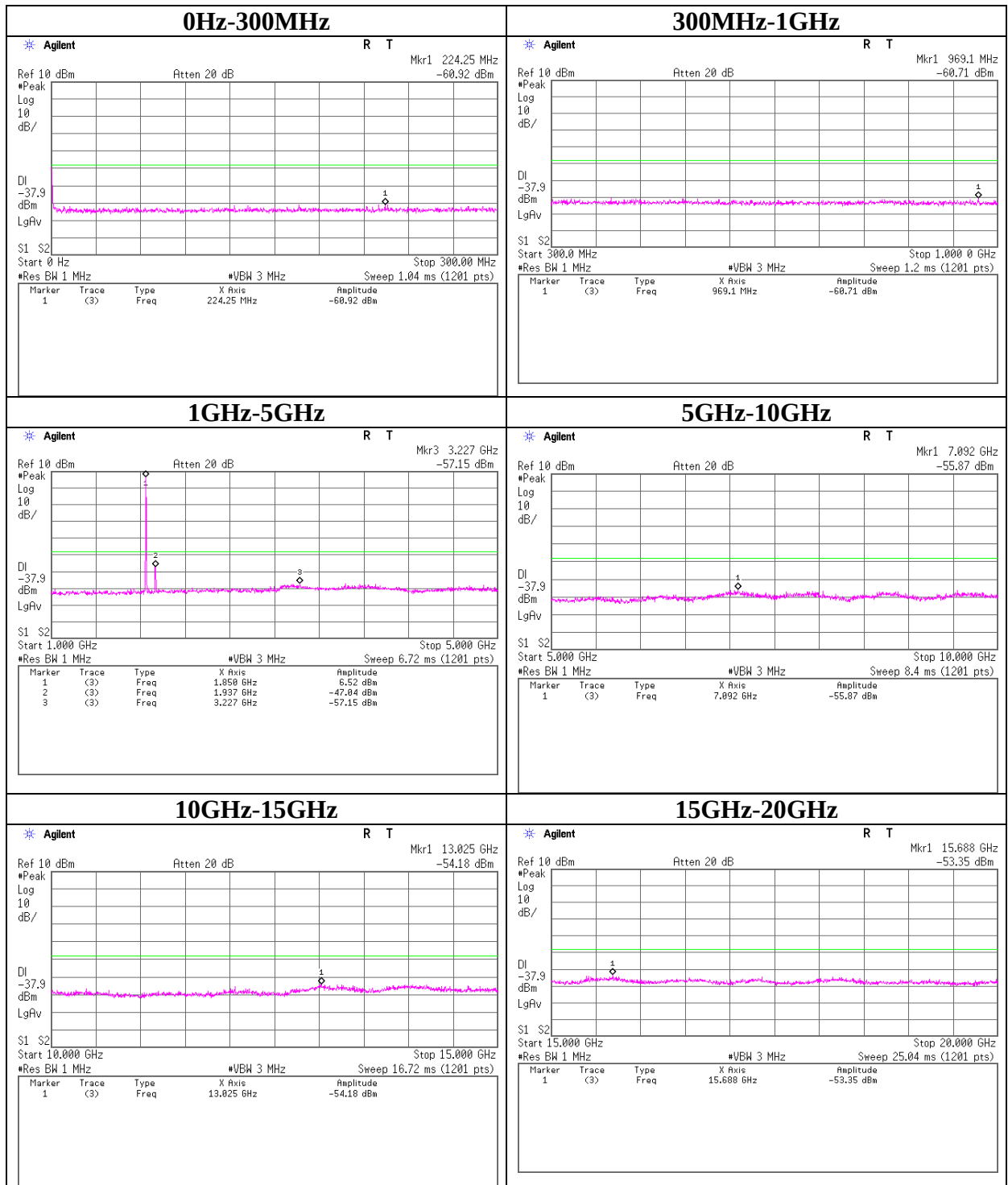
Limit Line

Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line [dBm]
1850.2	-13.0	19.99	4.92	-37.9
1880.0	-13.0	19.99	4.93	-37.9
1909.8	-13.0	20.01	4.94	-38.0

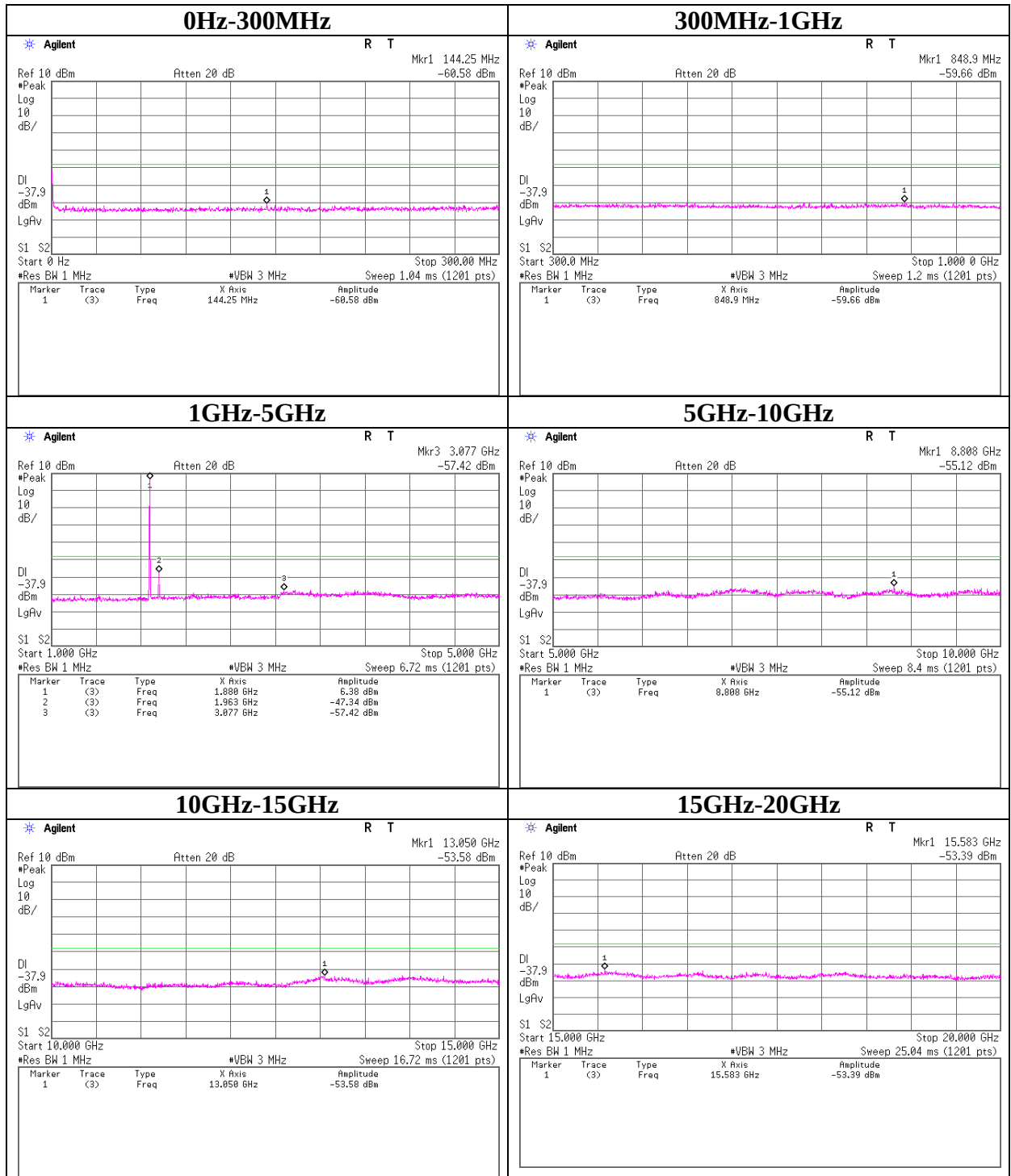
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss

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

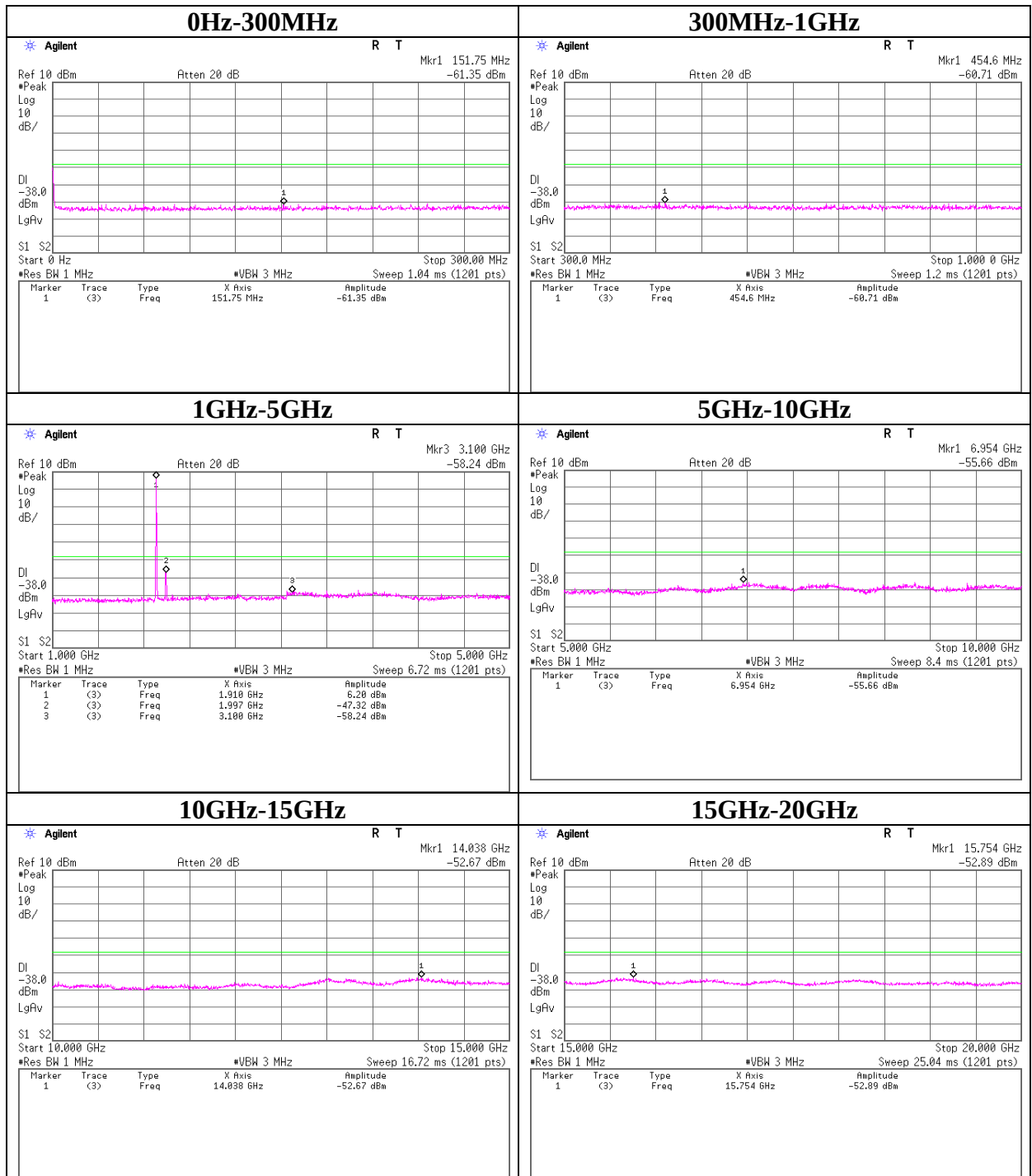
Spurious Emission (Conducted) GSM Tx:1850.2MHz



Spurious Emission (Conducted)
GSM Tx:1880.0MHz



Spurious Emission (Conducted)
GSM Tx:1909.8MHz



Spurious Emission (Radiated)

Report No.	4786001719H	
Test place	Head Office EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	12/17/2012	12/17/2012
Temperature / Humidity	23deg. C / 32 % RH	22deg. C / 25 % RH
Engineer	Yutaka Yoshida	Katsunori Okai
	Above 1GHz	Below 1GHz
Mode	Tx GSM(GMSK)	

Tx 1850.2MHz

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 [cm] [deg.]		Vertical Rx Ant. Turn Height Table [cm] [deg.]		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER					
3700.40	45.6	44.8	-57.7	-59.1	4.7	12.3	0.0	-50.1	-51.5	-13.0	37.1	38.5	100	211	100	156	
5550.60	44.6	44.3	-54.2	-56.3	5.7	13.4	0.0	-46.6	-48.7	-13.0	33.6	35.7	100	165	100	131	
7400.80	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
9251.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
11101.20	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
12951.40	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
14801.60	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
16651.80	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
18502.00	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)

Report No.	4786001719H	
Test place	Head Office EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	12/17/2012	12/17/2012
Temperature / Humidity	23deg. C / 32 % RH	22deg. C / 25 % RH
Engineer	Yutaka Yoshida	Katsunori Okai
	Above 1GHz	Below 1GHz
Mode	Tx GSM (GSMK)	

Tx 1880.0MHz

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.]	
3760.00	47.1	45.4	-55.9	-58.9	4.7	12.3	0.0	-48.4	-51.4	-13.0	35.4	38.4	100	191	100	150	
5640.00	44.7	44.9	-54.6	-56.0	5.8	13.4	0.0	-47.0	-48.4	-13.0	34.0	35.4	100	231	100	345	
7520.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
9400.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
11280.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
13160.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
15040.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
16920.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
18800.00	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)

Report No.	4786001719H	
Test place	Head Office EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	12/17/2012	12/17/2012
Temperature / Humidity	23deg. C / 32 % RH	22deg. C / 25 % RH
Engineer	Yutaka Yoshida	Katsunori Okai
	Above 1GHz	Below 1GHz
Mode	Tx GSM (GSMK)	

Tx 1909.8MHz

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.]	
3819.60	47.6	46.8	-55.0	-56.7	4.8	12.2	0.0	-47.5	-49.2	-13.0	34.5	36.2	127	194	131	158	
5729.40	45.4	44.8	-53.4	-56.1	5.8	13.4	0.0	-45.8	-48.5	-13.0	32.8	35.5	100	233	100	267	
7639.20	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
9549.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
11458.80	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
13368.60	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
15278.40	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
17188.20	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
19098.00	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. 4786001719H
Date 12/20/2012
Temperature/ Humidity 22deg. C / 33% RH
Engineer Keisuke Kawamura
Mode Tx GSM(GMSK)

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Remark
-30	3.80	1879.9999778	-2.0	-0.0011	-
-20	3.80	1880.0000199	40.1	0.0213	-
-10	3.80	1879.9999795	-0.3	-0.0002	-
0	3.80	1879.9999821	2.3	0.0012	-
10	3.80	1879.9999780	-1.8	-0.0010	-
20	3.80	1879.9999798	0.0	0.0000	Reference
30	3.80	1880.0000281	48.3	0.0257	-
40	3.80	1880.0000224	42.6	0.0227	-
50	3.80	1880.0000222	42.4	0.0226	-

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Remark
20	4.20	1879.9999707	-9.1	-0.0048	-
20	3.80	1879.9999798	0.0	0.0000	Reference
20	3.40	1880.0000197	39.9	0.0212	-

APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date	Expiration date of the calibration
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2012/02/06	2013/02/28
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	AT	2012/04/06	2013/04/30
MURC-02	Wireless Communication Test Set	Agilent	E5515C	GB47050683	AT	2012/12/19	2013/12/31
MCC-35	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2012/09/05	2013/09/30
MAT-25	Attenuator(10dB) (above1GHz)	Agilent	8493C	71642	AT	2012/06/27	2013/06/30
MPSC-01	Power splitters/Combiners	Mini-Circuit	ZFSC-2-2500	0124	AT	2012/09/12	2013/09/30
MCC-36	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2012/09/05	2013/09/30
MAT-24	Attenuator(10dB) (above1GHz)	Agilent	8493C	71389	AT	2012/06/27	2013/06/30
MURC-03	Radio Communication Analyzer	Anritsu	MT8815B	6200711471	AT	2012/12/19	2013/12/31
MCC-138	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37953/2	AT	2012/10/17	2013/10/31
MCH-04	Temperature and Humidity Chamber	Tabai Espec	PL-2KP	14015723	AT	2012/08/01	2013/08/31
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29	2013/06/30
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2012/11/20	2013/11/30
MURC-05	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	127576	RE	2012/10/04	2013/10/31
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22	2013/02/28
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2012/09/05	2013/09/30
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2012/05/30	2013/05/31
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25	2013/01/31
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2012/02/22	2013/02/28
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2012/02/06	2013/02/28
MJM-14	Measure	KOMELON	KMC-36	-	RE	-	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-	-
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
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2012/07/23	2013/07/31
MCC-130	Microwave Cable (1-33GHz)	HUBER+SUHNER	SF103/ 11PC3.5-31/ 11PC3.5-31/8.0m	54308/3	RE	2012/01/05	2013/01/31
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2012/05/25	2013/05/31

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

UL Japan, Inc.

Head Office EMC Lab.

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