



RADIO TEST REPORT

Test Report No.: 31HE0196-HO-F

Applicant : NEC CASIO Mobile Communications, Ltd.
Type of Equipment : Digital Portable Cellular Telephone
Model No. : KMP7N4Y1-1A
Test regulation : FCC Part 24 Subpart E: 2008
FCC ID : A98-PUL1905
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.
5. This FCC ID: A98-PUL1905 is electrically identical to the previously certified FCC ID: A98-TBP4266.
6. 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 April 2, 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

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13-EM-F0429

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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. : KMP7N4Y1-1A
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: KMP7N4Y1-1A, (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	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

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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	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
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] 3.3dB 1849.98MHz, 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	19.2dB 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	
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

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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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.

3.5 Test set up, Test instruments and Data of EMI

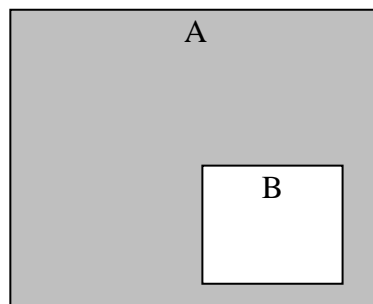
Refer to APPENDIX.

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	KMP7N4Y1-1A	004401200680128 *1) 004401200680136 *2) 004401200620132 *3)	NEC CASIO Mobile Communications, Ltd.	EUT
B	micro SD	1GB	SR9FB014582	Panasonic	-

*1) Used for RF Output Power (Conducted) test.

*2) Used for Band-Edge(Radiated), Spurious Emission(Radiated) and RF Output Power (Radiated) tests.

*3) Used for all tests except for RF Output Power (Conducted/Radiated), Band-Edge(Radiated) and Spurious Emission(Radiated) tests.

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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 power meter and an attenuator at the antenna port.

Test data	:	APPENDIX 2
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 2
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 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	:	APPENDIX 2
Test result	:	Pass

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.11 Measurement Room
Report No.	31HE0196-HO
Date	04/01/2011
Temperature/ Humidity	27 deg.C./ 38%RH
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	7.83	20.06	4.02	31.91
	Mid	1880.0	7.78	20.06	4.08	31.92
	High	1909.8	7.61	20.06	4.04	31.71
GPRS (GMSK)	Low	1850.2	7.61	20.06	4.02	31.69
	Mid	1880.0	7.70	20.06	4.08	31.84
	High	1909.8	7.55	20.06	4.04	31.65

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

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

Test place : Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 31HE0196-HO
Date : 04/01/2011
Temperature / Humidity : 25 deg. C. / 23 %RH
Engineer : Satofumi Matsuyama
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 [cm] [deg.]		Vertical Rx Ant. Turn Height Table [cm] [deg.]		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER					
1850.20	96.4	95.1	21.3	18.2	3.3	10.2	0.0	28.2	25.1	33.0	4.8	7.9	139	209	100	136	
1880.00	93.8	91.3	18.8	15.5	3.3	10.3	0.0	25.8	22.5	33.0	7.2	10.5	100	211	100	28	
1909.80	93.8	92.4	18.9	17.1	3.3	10.4	0.0	26.0	24.2	33.0	7.0	8.8	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)

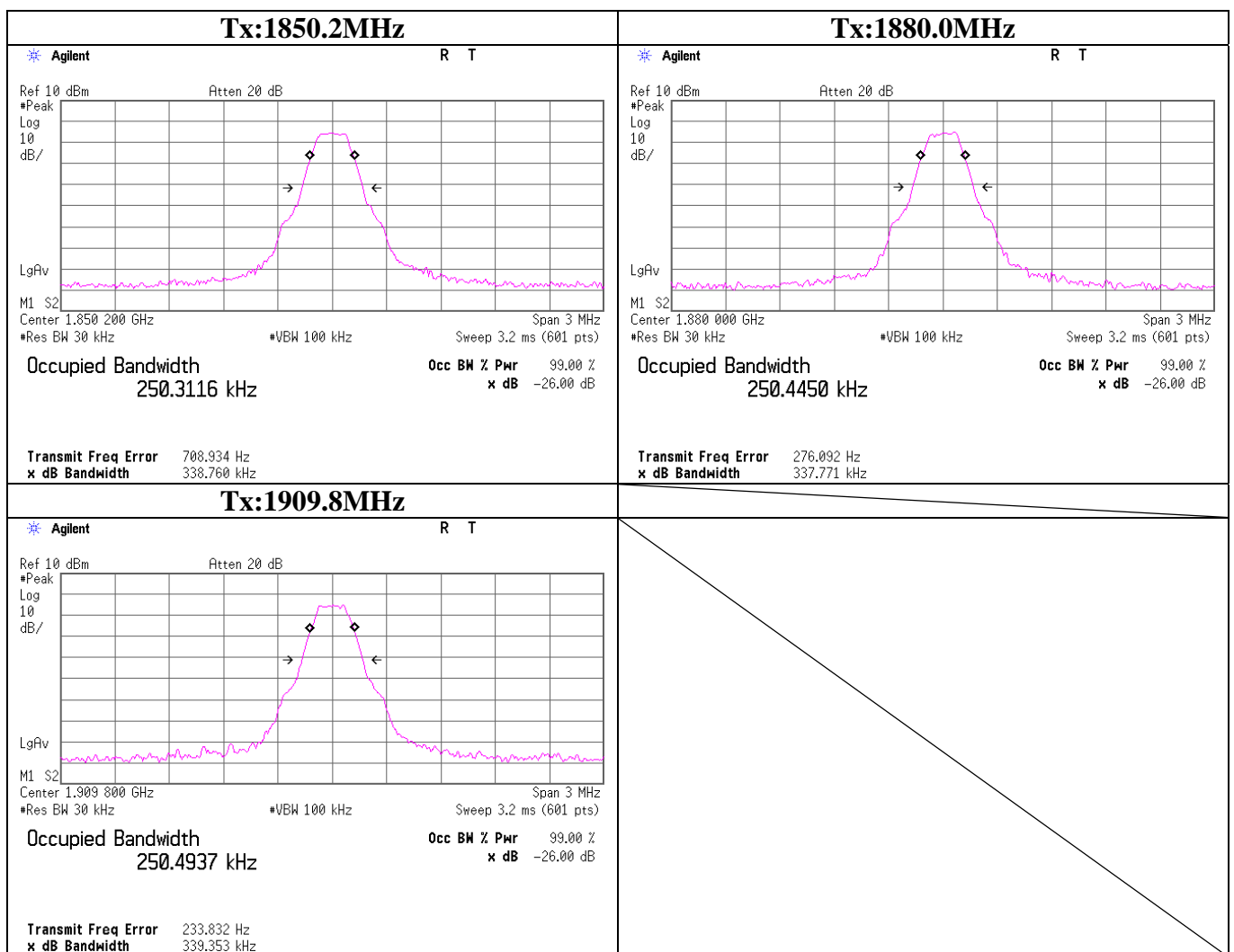
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-20GHz)

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

Bandwidth(Conducted)

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	31HE0196-HO
Date	01/23/2011
Temperature/ Humidity	20 deg.C./ 56%RH
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	-



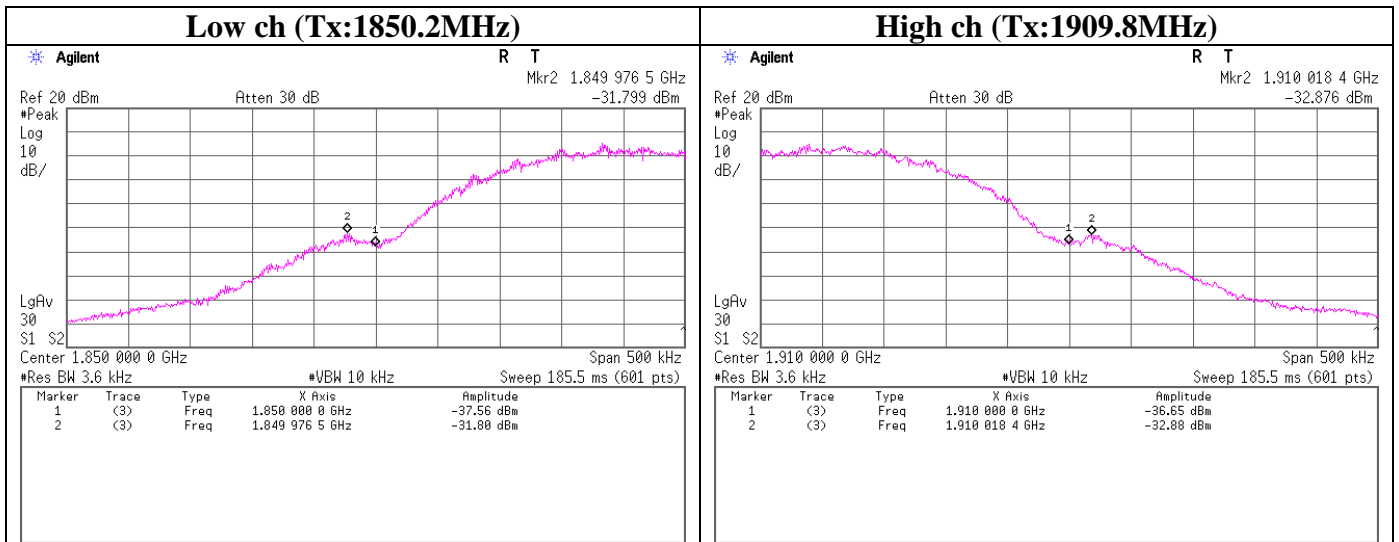
Band-Edge(Conducted)

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	31HE0196-HO
Date	01/23/2011
Temperature/ Humidity	20 deg.C./ 56%RH
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)

Test place	Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No.	31HE0196-HO
Date	04/01/2011
Temperature / Humidity	25 deg. C. / 23 %RH
Engineer	Satofumi Matsuyama
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.]	
1849.98	52.2	51.3	-23.2	-25.8	3.29	10.17	0.00	-16.3	-18.9	-13.0	3.3	5.9	139	209	100	136	
1850.00	51.3	50.9	-24.1	-26.2	3.29	10.17	0.00	-17.2	-19.3	-13.0	4.2	6.3	139	209	100	136	
1910.00	48.7	48.5	-26.3	-27.0	3.33	10.43	0.00	-19.2	-19.9	-13.0	6.2	6.9	100	204	100	31	
1910.02	49.7	49.2	-25.3	-26.3	3.33	10.43	0.00	-18.2	-19.2	-13.0	5.2	6.2	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.	31HE0196-HO
Date	01/23/2011
Temperature/ Humidity	20 deg.C./ 56%RH
Engineer	Katsunori Okai
Mode	Tx

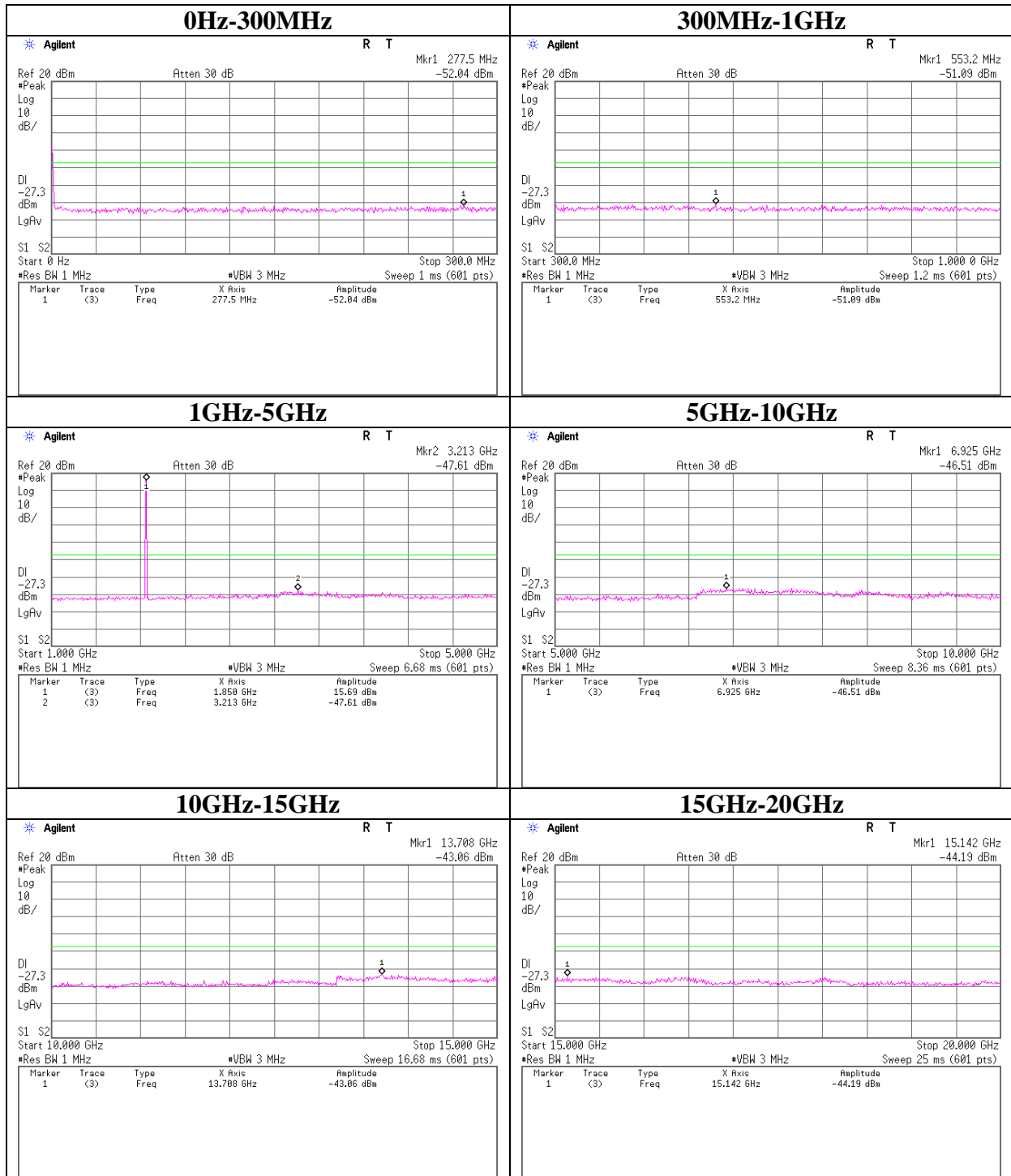
Limit Line

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

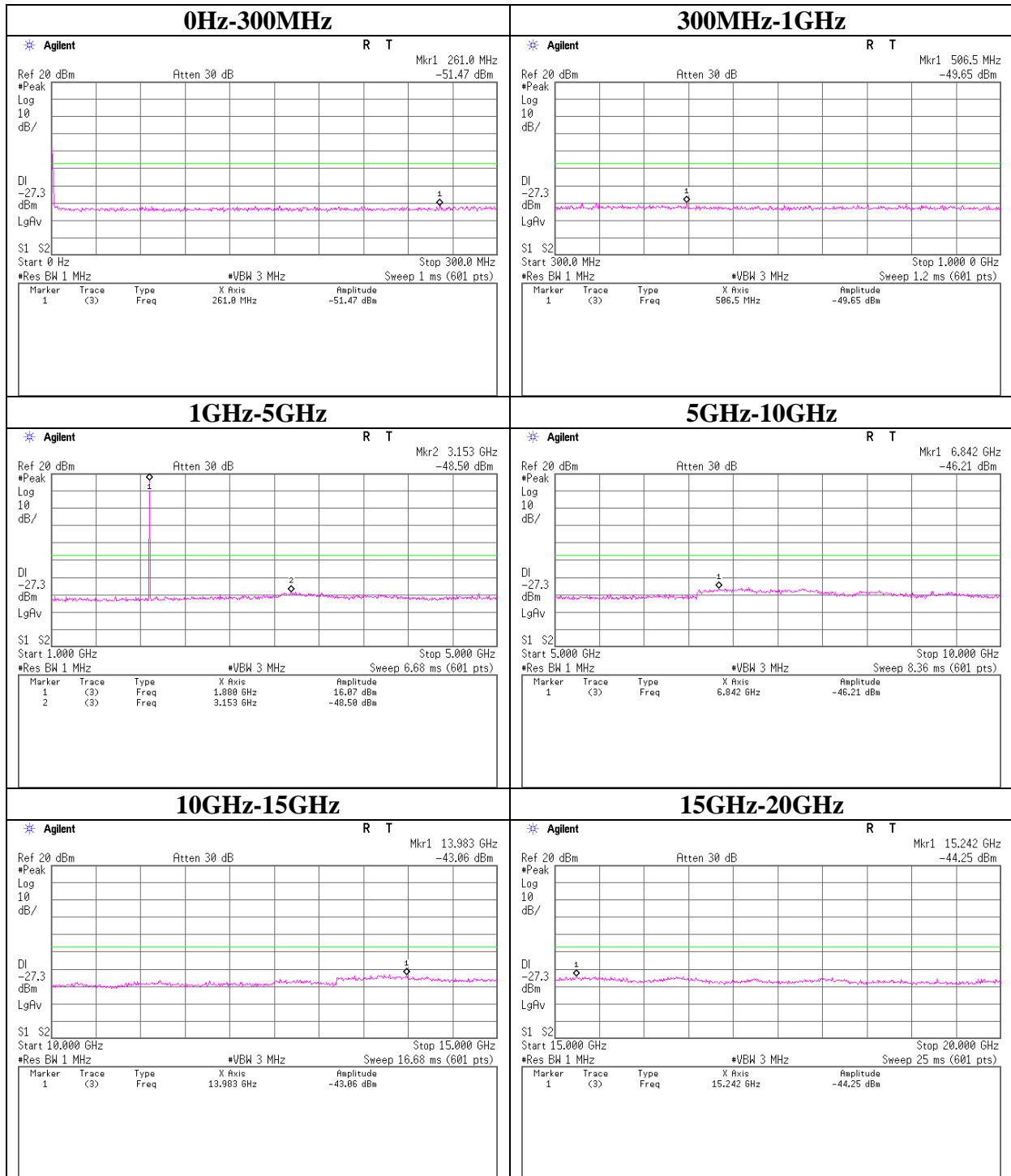
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss

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

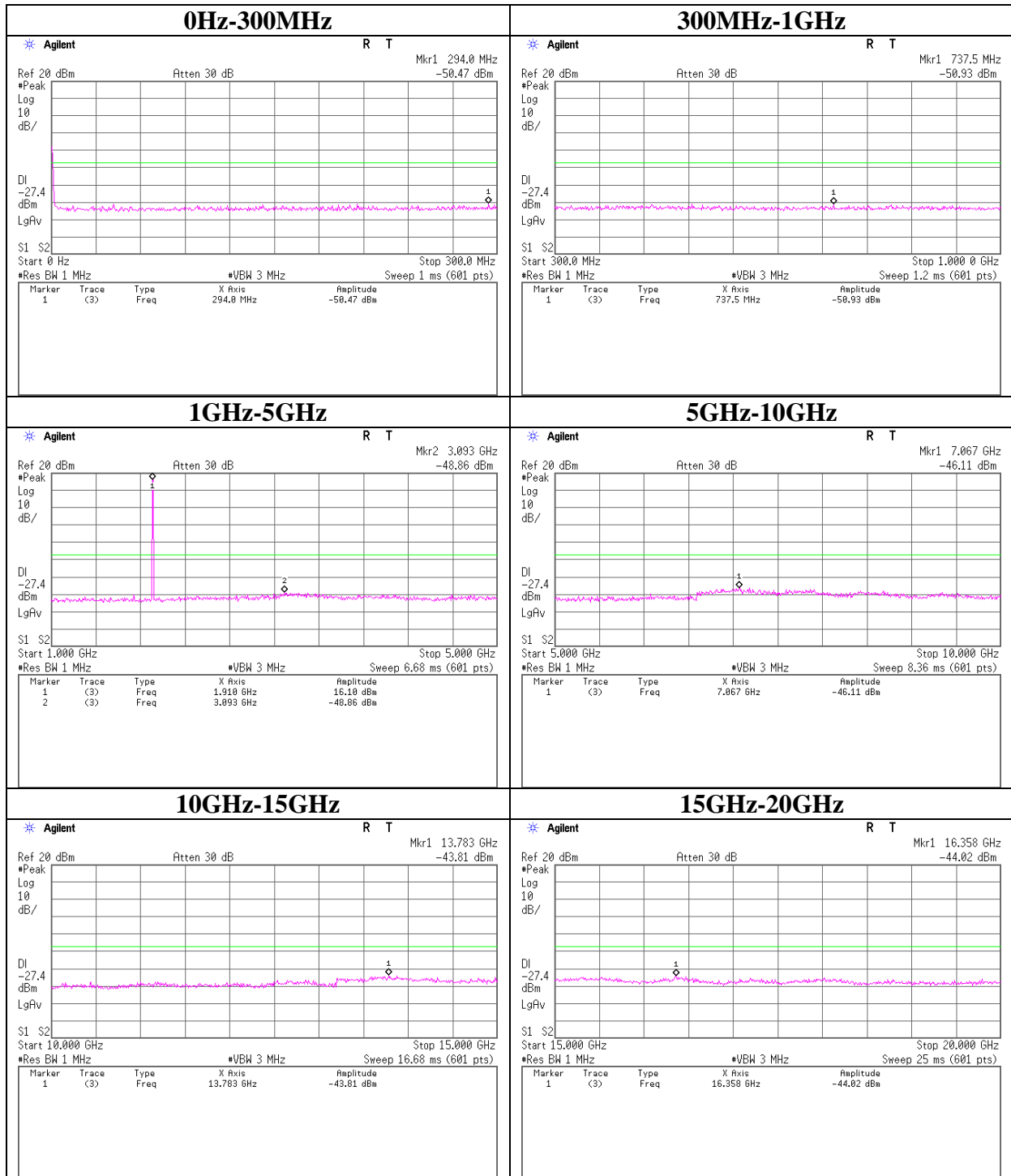
Spurious Emission (Conducted)
Tx:1850.2MHz



Spurious Emission (Conducted)
Tx:1880.0MHz



Spurious Emission (Conducted)
Tx:1909.8MHz



Spurious Emission (Radiated)
Tx:1850.2MHz

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 31HE0196-HO
Date 04/01/2011 04/02/2011
Temperature / Humidity 25 deg. C. / 23 % 25 deg. C. / 23 %
Engineer Satofumi Matsuyama Takayuki Shimada
(Above 1GHz) (Below 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		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
3700.40	56.3	48.9	-47.1	-57.0	4.7	12.2	0.0	-39.7	-49.6	-13.0	26.7	36.6	100	149	100	274	
5550.60	58.4	52.7	-39.9	-47.6	5.8	12.6	0.0	-33.2	-40.9	-13.0	20.2	27.9	100	180	100	152	
7400.80	45.3	45.5	-53.7	-54.3	6.8	10.8	0.0	-49.7	-50.3	-13.0	36.7	37.3	100	175	100	180	

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)

Spurious Emission (Radiated)
Tx:1880.0MHz

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 31HE0196-HO
Date 04/01/2011 04/02/2011
Temperature / Humidity 25 deg. C. / 23 % 25 deg. C. / 23 %
Engineer Satofumi Matsuyama Takayuki Shimada
(Above 1GHz) (Below 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.]	
3760.00	50.6	46.6	-54.1	-59.7	4.8	12.1	0.0	-46.7	-52.3	-13.0	33.7	39.3	119	165	100	275	
5640.00	59.4	54.8	-39.0	-45.2	5.9	12.6	0.0	-32.3	-38.5	-13.0	19.3	25.5	100	176	130	180	
7520.00	46.9	45.2	-50.8	-54.7	6.9	10.7	0.0	-47.0	-50.9	-13.0	34.0	37.9	167	134	103	177	

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)

Spurious Emission (Radiated)
Tx:1909.8MHz

Test place	Head Office EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	31HE0196-HO		
Date	04/01/2011	04/02/2011	
Temperature / Humidity	25 deg. C. / 23 %	25 deg. C. / 23 %	
Engineer	Satofumi Matsuyama	Takayuki Shimada	
	(Above 1GHz)	(Below 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		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	58.8	48.4	-43.8	-57.3	4.8	12.1	0.0	-36.5	-50.0	-13.0	23.5	37.0	100	158	100	37	
5729.40	58.9	56.2	-38.8	-42.6	5.9	12.6	0.0	-32.2	-36.0	-13.0	19.2	23.0	100	171	153	186	
7639.20	44.8	45.0	-54.9	-54.9	6.9	10.7	0.0	-51.1	-51.1	-13.0	38.1	38.1	100	101	100	165	

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. 31HE0196-HO
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 *1)
MURC-03	Radio Communication Analyzer	Anritsu	MT8815B	6200711471	RE/AT	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	2011/02/23 * 12
MJM-05	Measure	PROMART	SEN1955	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE/AT	2011/02/15 * 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
MCC-56	Microwave Cable	Suhner	SUCOFLEX104	270875/4(1m) / 284655(5m)	RE	2011/03/02 * 12
MHF-18	High Pass Filter 3.5-18.0GHz	TOKIMEC	TF323DCA	7002	RE	2010/09/21 * 12
MCC-77	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278942/4	RE	2010/12/02 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2011/01/16 * 12
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2010/08/20 * 12
MCC-129	Microwave Cable(1-33GHz)	HUBER+SUHNER	SF103/11PC3.5-31	54307/3	RE	2011/01/06 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2010/08/08 * 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	2011/02/18 * 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
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2010/12/13 * 12
MURC-02	Wireless Communication Test Set	Agilent	E5515C	GB47050683	AT	2009/10/20 * 36
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2010/09/10 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2010/09/10 * 12
MAT-20	Attenuator(10dB)(above 1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2011/01/06 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2011/03/14 * 12
MPSC-01	Power splitters/Combiners	Mini-Circuit	ZFSC-2-2500	0124	AT	2010/09/17 * 12

*1) This test equipment was used for the tests before the expiration date of the calibration.

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.

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