

## APPENDIX 2: Data of EMI test

### RF Output Power (Conducted)

#### Conducted Output Power PCS1900

Test place                      Head Office EMC Lab. No.11 Measurement Room  
Report No.                      31HE0013-HO-01  
Date                              03/25/2011  
Temperature/ Humidity        20 deg.C / 40% RH  
Engineer                        Katsunori Okai  
Mode                              Tx

Mode	Ch	Frequency [MHz]	Reading AVG [dBm]	Cable Loss [dB]	Result [dBm]
GPRS (GMSK)	512	1850.2	23.57	5.30	28.87
	661	1880.0	23.97	5.30	29.27
	810	1909.8	24.83	5.30	30.13
EGPRS (8PSK)	512	1850.2	20.17	5.30	25.47
	661	1880.0	20.47	5.30	25.77
	810	1909.8	21.18	5.30	26.48

Results = Reading + Cable Loss

**RF Output Power (Conducted)**  
**Conducted Output Power**  
**W-CDMA Band II**

Test place                      Head Office EMC Lab. No.11 Measurement Room  
Report No.                      31HE0013-HO-01  
Date                              03/25/2011  
Temperature/ Humidity      20 deg.C / 40% RH  
Engineer                        Katsunori Okai  
Mode                              Tx

Mode	Ch	Frequency	Reading	Loss	Result
			AVG		
		[MHz]	[dBm]	[dB]	[dBm]
RMC	9262	1852.4	-1.14	24.45	23.31
12.2kbps	9400	1880.0	-1.01	24.45	23.44
	9538	1907.6	-1.10	24.45	23.35
HSDPA	9262	1852.4	-1.93	24.45	22.52
Subtest1	9400	1880.0	-1.79	24.45	22.66
	9538	1907.6	-1.87	24.45	22.58
HSDPA	9262	1852.4	-1.93	24.45	22.52
Subtest2	9400	1880.0	-1.79	24.45	22.66
	9538	1907.6	-1.85	24.45	22.60
HSDPA	9262	1852.4	-2.37	24.45	22.08
Subtest3	9400	1880.0	-2.26	24.45	22.19
	9538	1907.6	-2.31	24.45	22.14
HSDPA	9262	1852.4	-2.34	24.45	22.11
Subtest4	9400	1880.0	-2.25	24.45	22.20
	9538	1907.6	-2.30	24.45	22.15
HSUPA	9262	1852.4	-1.88	24.45	22.57
Subtest1	9400	1880.0	-1.74	24.45	22.71
	9538	1907.6	-1.85	24.45	22.60
HSUPA	9262	1852.4	-3.86	24.45	20.59
Subtest2	9400	1880.0	-3.69	24.45	20.76
	9538	1907.6	-3.78	24.45	20.67
HSUPA	9262	1852.4	-3.06	24.45	21.39
Subtest3	9400	1880.0	-2.70	24.45	21.75
	9538	1907.6	-2.78	24.45	21.67
HSUPA	9262	1852.4	-3.82	24.45	20.63
Subtest4	9400	1880.0	-3.71	24.45	20.74
	9538	1907.6	-3.83	24.45	20.62
HSUPA	9262	1852.4	-1.84	24.45	22.61
Subtest5	9400	1880.0	-1.74	24.45	22.71
	9538	1907.6	-1.80	24.45	22.65

Results = Reading + Loss

**RF Output Power (Radiated)**  
**Equivalent Isotropically Radiated Power(EIRP)**  
**PCS1900**

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber  
Report No. : 31HE0013-HO-01  
Date : 04/19/2011  
Temperature / Humidity : 23deg. C / 41% RH  
Engineer : Takayuki Shimada  
Mode : Tx GPRS(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	97.6	98.4	22.5				22.7	3.3		10.0	0.0	29.2	29.4	33.0	3.8	
1880.00	98.5	99.3	23.4	23.8	3.3	10.2	0.0	30.3	30.7	33.0	2.7	2.3	118	340	100	65	
1909.80	97.7	98.5	22.6	22.9	3.3	10.4	0.0	29.6	29.9	33.0	3.4	3.1	115	33	100	64	

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)

**RF Output Power (Radiated)**  
**Equivalent Isotropically Radiated Power(EIRP)**  
**PCS1900**

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber  
Report No. : 31HE0013-HO-01  
Date : 04/19/2011  
Temperature / Humidity : 23deg. C / 41% RH  
Engineer : Takayuki Shimada  
Mode : Tx EGPRS(8PSK)

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	97.0	97.2	21.9				21.5	3.3		10.0	0.0	28.6	28.2	33.0	4.4	
1880.00	97.8	97.4	22.7	21.9	3.3	10.2	0.0	29.6	28.8	33.0	3.4	4.2	118	340	100	65	
1909.80	97.8	98.1	22.7	22.5	3.3	10.4	0.0	29.7	29.5	33.0	3.3	3.5	115	33	100	67	

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)

**RF Output Power (Radiated)**  
**Equivalent Isotropically Radiated Power(EIRP)**  
**W-CDMA Band II**

Test place : Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 31HE0013-HO-01  
Date : 04/22/2011  
Temperature / Humidity : 26deg. C / 37% RH  
Engineer : Hironobu Ohnishi  
Mode : Tx W-CDMA (RMC12.2kbps)

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	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]
1852.40	96.4	96.3	20.1	19.5	3.3	10.2	0.0	27.0	26.4	33.0	6.0	6.6	113	331	100	58			
1880.00	95.8	96.3	19.5	19.6	3.3	10.3	0.0	26.5	26.6	33.0	6.5	6.4	112	346	100	62			
1907.60	95.7	95.3	19.3	18.7	3.3	10.4	0.0	26.4	25.8	33.0	6.6	7.2	112	346	130	304			

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: 5MHz , VBW: 50MHz)

**Peak to Average power Ratio (Radiated)**

Report No. 31HE0013-HO-01  
Test place Head Office EMC Lab.  
Semi Anechoic Chamber No.4 No.3  
Date 04/19/2011 04/22/2011  
Temperature / Humidity 23 deg. C / 41 % RH 26 deg. C / 37 % RH  
Engineer Takayuki Shimada Hironobu Ohnishi  
Mode Tx GPRS(GMSK), EGPRS(8PSK) Tx W-CDMA(RMC12.2kbps)

Mode	Channel	Frequency [MHz]	Peak to Average power Ratio [dB]	Limit [dB]
GPRS (GMSK)	512	1850.20	0.028	13
	661	1880.00	0.044	13
	810	1909.80	0.031	13
EGPRS (8PSK)	512	1850.20	3.373	13
	661	1880.00	3.000	13
	810	1909.80	2.751	13
W-CDMA (RMC 12.2kbps)	9262	1852.40	2.994	13
	9400	1880.00	3.493	13
	9538	1907.60	3.012	13

**Band-Edge (Radiated)**  
**PCS1900**

Test place : Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 31HE0013-HO-01  
Date : 05/05/2011  
Temperature / Humidity : 22deg. C / 40% RH  
Engineer : Katsunori Okai  
Mode : Tx GPRS(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	HOR	VER	Rx Ant.	Turn		Rx Ant.	Turn
															Height	Table		Height	Table
1849.99	47.5	43.8	-28.3	-33.9	3.29	10.16	0.00	-21.4	-27.0	-13.0	8.4	14.0	141	292	107	33			
1850.00	44.1	41.0	-31.8	-36.7	3.29	10.16	0.00	-24.9	-29.8	-13.0	11.9	16.8	141	292	107	33			
1910.00	45.1	41.5	-30.3	-35.3	3.33	10.45	0.00	-23.2	-28.2	-13.0	10.2	15.2	147	124	100	117			
1910.02	49.9	45.7	-25.5	-31.0	3.33	10.45	0.00	-18.4	-23.9	-13.0	5.4	10.9	147	124	100	117			

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

**Band-Edge (Radiated)**  
**PCS1900**

Test place : Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 31HE0013-HO-01  
Date : 05/05/2011  
Temperature / Humidity : 22deg. C / 40% RH  
Engineer : Katsunori Okai  
Mode : Tx EGPRS(8PSK)

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	HOR	VER	Rx Ant.	Turn		Rx Ant.	Turn
															Height	Table		Height	Table
1849.98	42.2	41.2	-33.7	-36.5	3.29	10.16	0.00	-26.8	-29.6	-13.0	13.8	16.6	151	134	105	34			
1850.00	37.4	35.0	-38.5	-42.7	3.29	10.16	0.00	-31.6	-35.8	-13.0	18.6	22.8	151	134	105	34			
1910.00	41.4	39.0	-33.9	-37.7	3.33	10.45	0.00	-26.8	-30.6	-13.0	13.8	17.6	140	107	104	34			
1910.02	45.8	43.9	-29.6	-32.8	3.33	10.45	0.00	-22.5	-25.7	-13.0	9.5	12.7	140	107	104	34			

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

**Band Edge (Radiated)**  
**W-CDMA Band II**

Test place : Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 31HE0013-HO-01  
Date : 04/22/2011  
Temperature / Humidity : 26deg. C / 37% RH  
Engineer : Hironobu Ohnishi  
Mode : Tx W-CDMA (RMC12.2kbps)

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	HOR	VER	Rx Ant. Height	Turn Table		Rx Ant. Height	Turn Table
															[cm]	[deg.]		[cm]	[deg.]
1850.00	54.5	54.4	-21.4	-22.2	3.29	10.17	0.00	-14.5	-15.3	-13.0	1.5	2.3	113	331	100	58			
1910.00	52.4	51.0	-23.5	-25.3	3.33	10.43	0.00	-16.4	-18.2	-13.0	3.4	5.2	112	346	130	304			

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 A V (RBW: 47kHz, VBW: 150kHz)

**Spurious Emission (Radiated)**  
**PCS1900 / Tx:1850.2MHz**

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber  
Report No. : 31HE0013-HO-01  
Date : 04/19/2011                      04/25/2011                      04/22/2011  
Temperature / Humidity : 23deg. C / 41% RH      25deg. C / 33% RH      24deg. C / 40% RH  
Engineer : Takayuki Shimada      Takumi Shimada      Katsunori Okai  
(Above 1GHz)      (Below 1GHz)      (Above 1GHz)  
Mode : Tx GPRS(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.]	
	3700.40	56.6	58.5	-45.9				-44.4	4.7		12.1	0.0	-38.5	-37.0	-13.0	25.5	
5550.60	48.5	45.8	-52.1	-57.4	5.8	12.8	0.0	-45.2	-50.5	-13.0	32.2	37.5	100	329	100	216	
7400.80	54.7	51.8	-39.0	-43.5	6.8	11.4	0.0	-34.4	-38.9	-13.0	21.4	25.9	105	37	109	315	
9251.00	44.2	45.8	-52.8	-53.1	7.7	12.2	0.0	-48.3	-48.6	-13.0	35.3	35.6	100	160	129	184	

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)**  
**PCS1900 / Tx:1880.0MHz**

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber  
Report No. : 31HE0013-HO-01  
Date : 04/19/2011                      04/25/2011                      04/22/2011  
Temperature / Humidity : 23deg. C / 41% RH      25deg. C / 33% RH      24deg. C / 40% RH  
Engineer : Takayuki Shimada      Takumi Shimada      Katsunori Okai  
(Above 1GHz)      (Below 1GHz)      (Above 1GHz)  
Mode : Tx GPRS(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.]	
	3760.00	57.4	58.1	-45.3				-44.1	4.8		12.0	0.0	-38.0	-36.8	-13.0	25.0	
5640.00	49.4	48.3	-49.9	-52.8	5.9	12.9	0.0	-42.9	-45.8	-13.0	29.9	32.8	100	348	100	183	
7520.00	55.2	56.7	-38.9	-37.4	6.9	11.2	0.0	-34.6	-33.1	-13.0	21.6	20.1	104	39	184	208	
9400.00	44.2	46.2	-52.4	-52.3	7.7	12.3	0.0	-47.9	-47.8	-13.0	34.9	34.8	100	177	100	193	

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)**  
**PCS1900 / Tx:1909.8MHz**

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber  
Report No. : 31HE0013-HO-01  
Date : 04/19/2011                      04/25/2011                      04/22/2011  
Temperature / Humidity : 23deg. C / 41% RH      25deg. C / 33% RH      24deg. C / 40% RH  
Engineer : Takayuki Shimada      Takumi Shimada      Katsunori Okai  
Mode : (Above 1GHz)      (Below 1GHz)      (Above 1GHz)  
Tx GPRS(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	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]
3819.60	54.7	58.2	-48.0	-43.6	4.8	12.0	0.0	-40.8	-36.4	-13.0	27.8	23.4	100	56	101	67			
5729.40	51.9	53.0	-46.4	-46.8	5.9	12.9	0.0	-39.4	-39.8	-13.0	26.4	26.8	100	344	103	179			
7639.20	56.0	53.9	-38.6	-41.8	6.9	11.2	0.0	-34.3	-37.5	-13.0	21.3	24.5	103	39	107	211			
9549.00	44.0	47.1	-52.7	-47.1	7.8	12.2	0.0	-48.3	-42.7	-13.0	35.3	29.7	107	171	111	187			

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)**  
**W-CDMA Band II / Tx: 1852.4MHz**

Test place : Head Office EMC Lab.  
Semi Anechoic Chamber : No.3  
Report No. : 31HE0013-HO-01  
Date : 04/25/2011  
Temperature / Humidity : 25deg. C / 33% RH  
Engineer : Takumi Shimada

Mode : Tx W-CDMA(RMC12.2kbps)

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	HOR	VER	Rx Ant.	Turn		Rx Ant.	Turn
															Height	Table		Height	Table
3704.80	57.6	59.5	-43.9	-43.2	4.7	12.3	0.0	-36.3	-35.6	-13.0	23.3	22.6	100	329	100	291			
5557.20	55.4	54.6	-42.7	-45.4	5.8	12.9	0.0	-35.7	-38.4	-13.0	22.7	25.4	100	83	115	159			
7409.60	47.9	50.1	-48.4	-47.8	6.8	11.2	0.0	-44.0	-43.4	-13.0	31.0	30.4	100	37	148	144			
9262.00	44.9	46.7	-48.1	-45.9	7.7	11.8	0.0	-43.9	-41.7	-13.0	30.9	28.7	100	0	100	159			

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)**  
**W-CDMA Band II / Tx: 1880.0MHz**

Test place : Head Office EMC Lab.  
Semi Anechoic Chamber : No.3  
Report No. : 31HE0013-HO-01  
Date : 04/25/2011  
Temperature / Humidity : 25deg. C / 33% RH  
Engineer : Takumi Shimada

Mode : Tx W-CDMA(RMC12.2kbps)

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	HOR	VER	Rx Ant.	Turn		Rx Ant.	Turn
															Height	Table		Height	Table
3760.00	58.8	58.9	-43.2	-44.3	4.8	12.2	0.0	-35.7	-36.8	-13.0	22.7	23.8	100	334	100	5			
5640.00	53.3	53.1	-45.0	-47.1	5.9	12.9	0.0	-38.0	-40.1	-13.0	25.0	27.1	116	212	100	339			
7520.00	50.1	48.1	-46.3	-49.8	6.9	11.1	0.0	-42.1	-45.6	-13.0	29.1	32.6	100	79	100	222			
9400.00	44.6	43.4	-49.1	-49.9	7.7	11.9	0.0	-45.0	-45.8	-13.0	32.0	32.8	100	0	100	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).

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

**Spurious Emission (Radiated)**  
**W-CDMA Band II / Tx: 1907.6MHz**

Test place : Head Office EMC Lab.  
Semi Anechoic Chamber : No.3  
Report No. : 31HE0013-HO-01  
Date : 04/25/2011  
Temperature / Humidity : 25deg. C / 33% RH  
Engineer : Takumi Shimada  
Mode : Tx W-CDMA(RMC12.2kbps)

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	HOR	VER	Rx Ant.	Turn		Rx Ant.	Turn
															Height [cm]	Table [deg.]		Height [cm]	Table [deg.]
3815.20	65.3	62.1	-35.9	-40.3	4.8	12.2	0.0	-28.5	-32.9	-13.0	15.5	19.9	100	325	100	60			
5722.80	56.5	58.4	-41.0	-41.0	5.9	13.0	0.0	-34.0	-34.0	-13.0	21.0	21.0	100	298	100	194			
7630.40	49.3	48.1	-46.1	-48.8	6.9	11.1	0.0	-41.9	-44.6	-13.0	28.9	31.6	100	77	100	210			
9538.00	43.5	44.2	-51.3	-50.2	7.8	11.8	0.0	-47.3	-46.2	-13.0	34.3	33.2	100	0	100	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).

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

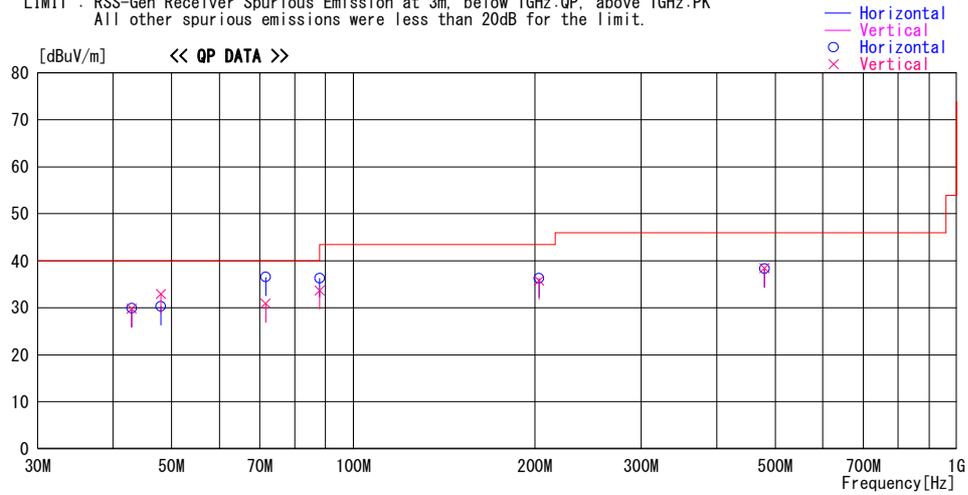
**Spurious Emission (Radiated)**  
**PCS1900**  
**GPRS Mode / Rx:1880.0MHz**

**DATA OF RADIATED EMISSION TEST**

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Date : 2011/04/22

Report No. : 31HE0013-H0-01  
Temp./Humi. : 25deg.C / 31% RH  
Engineer : Hironobu Ohnishi

LIMIT : RSS-Gen Receiver Spurious Emission at 3m, below 1GHz:QP, above 1GHz:PK  
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
42.950	39.9	QP	14.9	-24.9	29.9	342	359	Hori.	40.0	10.1	
42.950	39.8	QP	14.9	-24.9	29.8	89	100	Vert.	40.0	10.2	
48.004	42.7	QP	12.4	-24.8	30.3	344	398	Hori.	40.0	9.7	
48.004	45.3	QP	12.4	-24.8	32.9	303	100	Vert.	40.0	7.1	
71.588	54.4	QP	6.5	-24.4	36.5	264	254	Hori.	40.0	3.5	
71.588	48.8	QP	6.5	-24.4	30.9	279	100	Vert.	40.0	9.1	
87.999	52.6	QP	7.8	-24.1	36.3	63	206	Hori.	40.0	3.7	
87.999	50.0	QP	7.8	-24.1	33.7	266	100	Vert.	40.0	6.3	
203.291	42.4	QP	16.8	-22.9	36.3	296	164	Hori.	43.5	7.2	
203.291	41.9	QP	16.8	-22.9	35.8	319	141	Vert.	43.5	7.7	
479.980	41.2	QP	18.0	-20.9	38.3	322	165	Hori.	46.0	7.7	
479.980	41.3	QP	18.0	-20.9	38.4	325	166	Vert.	46.0	7.6	

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz-: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

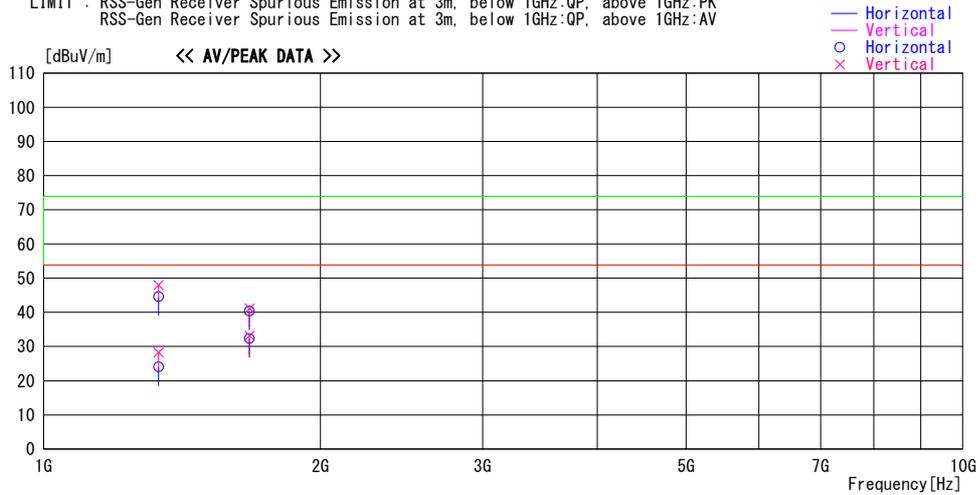
**Spurious Emission (Radiated)**  
**PCS1900**  
**GPRS Mode / Rx:1880.0MHz**

**DATA OF RADIATED EMISSION TEST**

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber  
Date : 2011/04/20

Report No. : 31HE0013-H0-01  
Temp./Humi. : 24deg. C / 31% RH  
Engineer : Hironobu Ohnishi

LIMIT : RSS-Gen Receiver Spurious Emission at 3m, below 1GHz:QP, above 1GHz:PK  
RSS-Gen Receiver Spurious Emission at 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
1333.160	51.3	PK	25.2	-31.9	44.6	63	100	Hori.	73.9	29.3	
1333.160	30.7	AV	25.2	-31.9	24.0	63	100	Hori.	53.9	29.9	
1333.160	54.7	PK	25.2	-31.9	48.0	351	100	Vert.	73.9	25.9	
1333.160	35.0	AV	25.2	-31.9	28.3	351	100	Vert.	53.9	25.6	
1674.000	44.9	PK	26.3	-30.9	40.3	248	141	Hori.	73.9	33.6	
1674.000	36.9	AV	26.3	-30.9	32.3	248	141	Hori.	53.9	21.6	
1674.000	45.8	PK	26.3	-30.9	41.2	355	101	Vert.	73.9	32.7	
1674.000	37.8	AV	26.3	-30.9	33.2	355	101	Vert.	53.9	20.7	

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz-: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

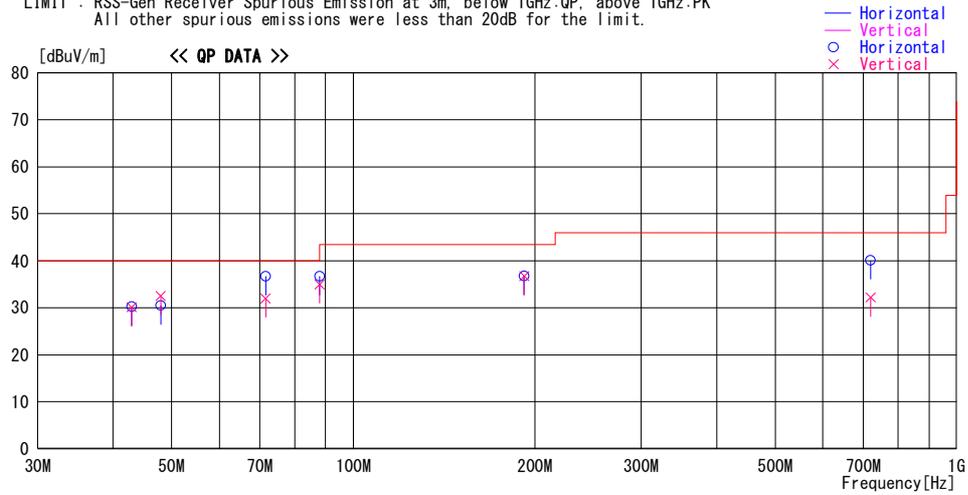
**Spurious Emission (Radiated)**  
**W-CDMA Band II**  
**W-CDMA(RMC12.2kbps) Mode / Rx: 1880.0MHz**

**DATA OF RADIATED EMISSION TEST**

UL Japan, Inc. Head Office EMC Lab. No. 3 Semi Anechoic Chamber  
Date : 2011/04/22

Report No. : 31HE0013-H0-01  
Temp./Humi. : 25deg. C / 31% RH  
Engineer : Hironobu Ohnishi

LIMIT : RSS-Gen Receiver Spurious Emission at 3m, below 1GHz:QP, above 1GHz:PK  
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
42.954	40.2	QP	14.9	-24.9	30.2	353	331	Hori.	40.0	9.8	
42.954	40.1	QP	14.9	-24.9	30.1	94	100	Vert.	40.0	9.9	
47.998	42.9	QP	12.4	-24.8	30.5	338	388	Hori.	40.0	9.5	
47.998	44.9	QP	12.4	-24.8	32.5	295	100	Vert.	40.0	7.5	
71.591	54.6	QP	6.5	-24.4	36.7	270	259	Hori.	40.0	3.3	
71.591	49.9	QP	6.5	-24.4	32.0	299	100	Vert.	40.0	8.0	
87.999	53.0	QP	7.8	-24.1	36.7	64	208	Hori.	40.0	3.3	
87.999	51.3	QP	7.8	-24.1	35.0	267	100	Vert.	40.0	5.0	
191.998	43.5	QP	16.3	-23.0	36.8	47	170	Hori.	43.5	6.7	
191.998	43.4	QP	16.3	-23.0	36.7	16	100	Vert.	43.5	6.8	
720.010	38.8	QP	20.7	-19.4	40.1	34	111	Hori.	46.0	5.9	
720.010	30.9	QP	20.7	-19.4	32.2	19	137	Vert.	46.0	13.8	

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz-: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

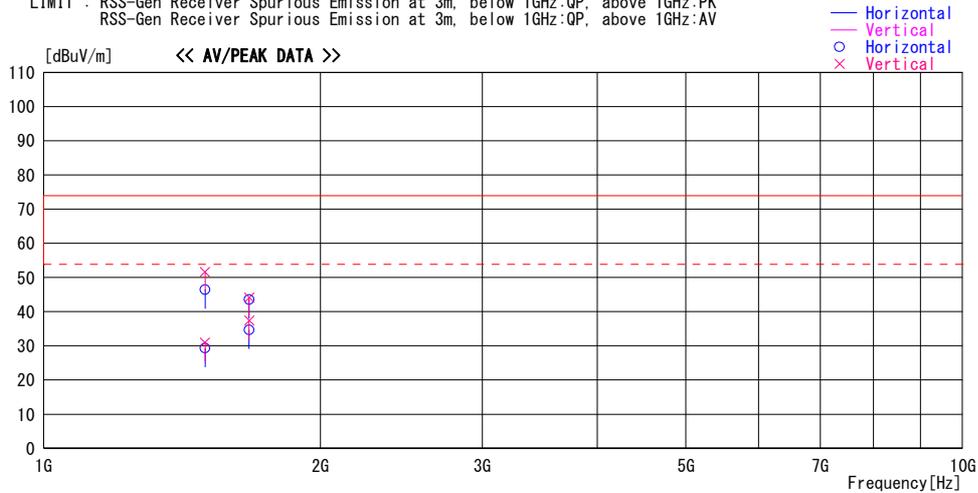
**Spurious Emission (Radiated)**  
**W-CDMA Band II**  
**W-CDMA(RMC12.2kbps) Mode / Rx: 1880.0MHz**

**DATA OF RADIATED EMISSION TEST**

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Date : 2011/04/21

Report No. : 31HE0013-H0-01  
Temp./Humi. : 25deg.C / 31% RH  
Engineer : Hironobu Ohnishi

LIMIT : RSS-Gen Receiver Spurious Emission at 3m, below 1GHz:QP, above 1GHz:PK  
RSS-Gen Receiver Spurious Emission at 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
1498.000	51.8	PK	26.8	-32.1	46.5	255	100	Hori.	73.9	27.4	
1498.000	34.6	AV	26.8	-32.1	29.3	255	100	Hori.	53.9	24.6	
1498.000	56.9	PK	26.8	-32.1	51.6	2	100	Vert.	73.9	22.3	
1498.000	36.3	AV	26.8	-32.1	31.0	2	100	Vert.	53.9	22.9	
1674.000	47.8	PK	27.4	-31.6	43.6	251	120	Hori.	73.9	30.3	
1674.000	38.9	AV	27.4	-31.6	34.7	251	120	Hori.	53.9	19.2	
1674.000	48.4	PK	27.4	-31.6	44.2	340	100	Vert.	73.9	29.7	
1674.000	41.6	AV	27.4	-31.6	37.4	340	100	Vert.	53.9	16.5	

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz-: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

### APPENDIX 3: Test instruments

#### EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2011/03/01 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE	2011/02/23 * 12
MJM-07	Measure	PROMART	SEN1955	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2011/02/15 * 12
MURC-01	Universal Radio communication Tester	Rohde & Schwarz	CMU200	106223	RE	Pre Check
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2010/08/08 * 12
MCC-56	Microwave Cable	Suhner	SUCOFLEX104	270875/4(1m) / 284655(5m)	RE	2011/03/02 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2011/03/10 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2010/05/19 * 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-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2010/05/07 * 12
MURC-03	Radio Communication Analyzer	Anritsu	MT8815B	6200711471		Pre Check
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2011/02/22 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2011/02/23 * 12
MJM-06	Measure	PROMART	SEN1955	-	RE	-
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	RE	2010/11/18 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2010/08/23 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2010/10/11 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2010/10/11 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2010/07/06 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2010/11/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2011/03/04 * 12
MCC-58	Microwave Cable	Suhner	SUCOFLEX104	246770(1m) / 250655(5m)	RE	2011/03/02 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2011/03/10 * 12
MSG-05	Signal Generator	Agilent	E4438C	MY45090353	RE	2010/08/19 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA917030 6	RE	2010/05/07 * 12

**EMI test equipment (2/2)**

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MCC-76	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278967/4	RE	2010/12/03 * 12
MHF-19	High Pass Filter 3.5-18.0GHz	TOKIMEC	TF323DCA	602	RE	2010/09/21 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2010/05/19 * 12
MCC-116	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	290221/4	AT	2010/08/05 * 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
MPD-01	PowerDivider DC to 26.5GHz	Agilent	11636B	52258	AT	2011/03/17 * 12
MURC-02	Wireless Communication Test Set	Agilent	E5515C	GB47050683	RE/AT	2009/10/20 * 36

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 test**

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**UL Japan, Inc.**

**Head Office EMC Lab.**

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