RADIO TEST REPORT

Test Report No.: 10004954H-B-R1

Applicant	:	**Sony Corporation**
Type of Equipment	:	**Personal Computer**
Model No.	:	**SVD132A1WL**
Test regulation	:	**FCC Part 24 Subpart E: 2008**
FCC ID	:	**AK8SVD132A1WL**
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 10004954H-B. 10004954H-B is replaced with this report.

Date of test: February 28 to April 8, 2013

Representative test engineer:
Yutaka Yoshida
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

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

REVISION HISTORY

Original Test Report No.: 10004954H-B

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10004954H-B	May 7, 2013	-	-
1	10004954H-B-R1	May 17, 2013	P. 4, 6	Added the information about NFC module in section 2.2

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	Sony Corporation.
Address	:	1-7-1 Konan, Minato-ku, Tokyo, 399-8282 Japan
Telephone Number	:	+81-3-6748-2569
Facsimile Number	:	+81-3-6748-2574
Contact Person	:	Hirofumi Kojima

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

2.1 Identification of E.U.T.

Type of Equipment	:	Personal Computer
Model No.	:	SVD132A1WL
Serial No.	:	Refer to Clause 4.2
Rating	:	INPUT: 100-240V, 1.2A, 50/60Hz OUTPUT: DC 10.5V, 3.8A, 39.9W DC 5V, 1A, 5W
Receipt Date of Sample	:	February 28, 2013
Country of Mass-production	:	Japan
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

General Specification

Feature of EUT	This model is co-located with Wireless LAN and Bluetooth module(IEEE802.11 a/b/g/n, Bluetooth) and Wireless-WAN module(GSM850/PCS/UMTS/LTE) and NFC module. Each antenna is included in the Personal computer. This model can co-operate Wireless LAN(5GHz band) + Bluetooth + Wireless WAN + NFC.
Operation Clock	CPU: 1.0GHz

Radio Specification

Bluetooth (BDR/EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Type	PIFA
Antenna Gain	-0.56 dBi (peak) (Including Cable Loss)

Bluetooth (Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	GFSK
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Type	PIFA
Antenna Gain	-0.56 dBi (peak) (Including Cable Loss)

WLAN (IEEE802.11a/b/g/n-20)

Equipment Type	Transceiver	
Frequency of Operation	2412-2462MHz	5180-5320MHz 5500-5700MHz * 5745-5825MHz
Type of Modulation	DSSS, OFDM	OFDM
Bandwidth & Channel spacing	20MHz & 5MHz	20MHz & 20MHz
Antenna Type	PIFA	
Antenna Gain	Ant 0: -0.56dBi (peak) Ant 1: -4.07dBi (peak) (Including Cable Loss)	Ant 0: 5150-5350MHz -0.46dBi (peak) 5470-5725MHz -1.25dBi (peak) 5825-5850MHz -2.63dBi (peak) Ant 1: 5150-5350MHz +1.32dBi (peak) 5470-5725MHz +1.20dBi (peak) 5825-5850MHz -2.73dBi (peak) (Including Cable Loss)

*5600MHz-5640MHz is not used in Canada.

WLAN (IEEE802.11n-40)

Equipment Type	Transceiver	
Frequency of Operation	2422-2452MHz	5190-5310MHz 5510-5670MHz * 5755-5795MHz
Type of Modulation	OFDM	OFDM
Bandwidth & Channel spacing	40MHz & 5MHz	40MHz & 40MHz
Antenna Type	PIFA	
Antenna Gain	Ant 0: -0.56dBi (peak) Ant 1: -4.07dBi (peak) (Including Cable Loss)	Ant 0: 5150-5350MHz -0.46dBi (peak) 5470-5725MHz -1.25dBi (peak) 5825-5850MHz -2.63dBi (peak) Ant 1: 5150-5350MHz +1.32dBi (peak) 5470-5725MHz +1.20dBi (peak) 5825-5850MHz -2.73dBi (peak) (Including Cable Loss)

*5590MHz-5630MHz is not used in Canada.

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 , 8PSK
Emission Designator	GSM850: 249KGXW, 248KG7W PCS: 247KGXW, 247KG7W
Antenna Type	PIFA
Antenna Gain	GSM850: 824-849MHz: +0.64dBi (peak) PCS: 1850-1910MHz: +1.21dBi (peak) (Including Cable Loss)

W-CDMA

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band V: 824 – 849MHz Band II: 1850 – 1910MHz [Down Link] Band V: 869 – 894MHz Band II: 1930 – 1990MHz
Type of Modulation	QPSK
Emission Designator	Band V: 4M17F9W Band II: 4M16F9W
Antenna Type	PIFA
Antenna Gain	Band V: 824-849MHz: +0.64dBi (peak) Band II: 1850-1910MHz: +1.21dBi (peak) (Including Cable Loss)

LTE

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band IV: 1710 – 1755MHz Band X VII: 704 – 716MHz [Down Link] Band IV: 2110 – 2155MHz Band X VII: 734 – 746MHz
Type of Modulation	QPSK, 16QAM
Emission Designator	Band IV: 1M11G7D, 1M09W7D, 2M71G7D, 2M70W7D, 4M50G7D, 4M50W7D, 8M97G7D, 8M98W7D, 13M43G7D, 13M45W7D, 17M95G7D, 17M95W7D Band X VII: 4M51G7D, 4M52W7D, 8M96G7D, 8M97W7D
Antenna Type	PIFA
Antenna Gain	Band IV: 1710-1755MHz: +1.21dBi (peak) Band X VII: 704-716MHz: -1.35dBi (peak) (Including Cable Loss)

NFC (FCC ID: NKR-DFCN67H)

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK

*This test report applies for GSM(PCS) and W-CDMA(Band II).

*NFC module was operated by polling mode during the testing.

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	**PCS** [Conducted] 4.38dB 1849.9782MHz [Radiated] 4.1dB 1910.02MHz, Horizontal **W-CDMA** [Conducted] 9.18dB 1850.0000MHz [Radiated] 8.0dB 1850.00Mz, 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	**PCS** 15.7dB 5640.00MHz, Horizontal **W-CDMA** 28.0dB 5640.00MHz, 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 also referred to KDB 971168 D01 "Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems"
*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
Measurement Distance 1m	
1GHz-18GHz	5.3dB
15GHz-26.5GHz	3.7dB
26.5GHz-40GHz	3.7dB

Power meter (±dB)	
Below 1GHz	Above 1GHz
0.7dB	1.5dB

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	
1.5dB	1.7dB	2.8dB	2.8dB	2.9dB	2.6dB

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 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
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999 Facsimile : +81 596 24 8124

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

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

3.5 Test set up, Test instruments and Data of EMI

Refer to APPENDIX.

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

4.1 Operating Modes

<PCS1900>

Test	Operating mode	Power Control	Tested frequency	Channel
RF output Power(Conducted) Peak to Average power Ratio (Conducted)	Transmitting (Tx) (GPRS, GMSK, 1slot, CS-1) Transmitting (Tx) (EGPRS, 8PSK, 1slot, MCS-5)	Max (PCL=0)	1850.2MHz 1880.0MHz 1909.8MHz	512 661 810
RF output Power(Radiated)	Transmitting (Tx) (GPRS, GMSK, 1slot, CS-1) Transmitting (Tx) (EGPRS, 8PSK, 1slot, MCS-5)	Max (PCL=0)	1850.2MHz 1880.0MHz 1909.8MHz	512 661 810
Emission Bandwidth, 99% Occupied bandwidth,	Transmitting (Tx) (GPRS, GMSK, 1slot, CS-1) Transmitting (Tx) (EGPRS, 8PSK, 1slot, MCS-5)	Max (PCL=0)	1880.0MHz	661
Band Edge(Conducted)	Transmitting (Tx) (GPRS, GMSK, 1slot, CS-1) Transmitting (Tx) (EGPRS, 8PSK, 1slot, MCS-5)	Max (PCL=0)	1850.2MHz 1909.8MHz	512 810
Band Edge(Radiated)	Transmitting (Tx) (GPRS, GMSK, 1slot, CS-1) *1)	Max (PCL=0)	1850.2MHz 1909.8MHz	512 810
Spurious Emission(Conducted)	Transmitting (Tx) (GPRS, GMSK, 1slot, CS-1) Transmitting (Tx) (EGPRS, 8PSK, 1slot, MCS-5)	Max (PCL=0)	1850.2MHz 1880.0MHz 1909.8MHz	512 661 810
Spurious Emission(Radiated)	Transmitting (Tx) (GPRS, GMSK, 1slot, CS-1) *1)	Max (PCL=0)	1850.2MHz 1880.0MHz 1909.8MHz	512 661 810
Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) (GPRS, GMSK, 1slot, CS-1) *1)	Max (PCL=0)	1880.0MHz	661

[GPRS, EGPRS]
*Single slot (1 slot) which had the highest burst power was tested as a representative.
*1) The mode was used for testing as a representative, because it had the highest RF output Power (Conducted).

<W-CDMA Band II>

Test	Operating mode	Power Control	Tested frequency	Channel
RF output Power (Conducted)	Transmitting (Tx) W-CDMA (RMC12.2kbps) Transmitting (Tx) W-CDMA (HSDPA Subtest 1-4) Transmitting (Tx) W-CDMA (HSUPA Subtest 1-5)	See Section 4.1.1	1852.4 MHz 1880.0 MHz 1907.6 MHz	9262 9400 9538
RF output Power (Radiated), Spurious Emission (Conducted/Radiated), Peak to Average power Ratio (Conducted)	Transmitting (Tx) W-CDMA (RMC12.2kbps) *1)	TPC All Up bits(Max)	1852.4 MHz 1880.0 MHz 1907.6 MHz	9262 9400 9538
Band Edge (Conducted/Radiated)	Transmitting (Tx) W-CDMA (RMC12.2kbps) *1)	TPC All Up bits(Max)	1852.4 MHz 1907.6 MHz	9262 9538
Emission Bandwidth, 99% Occupied bandwidth, Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) W-CDMA (RMC12.2kbps) *1)	TPC all up bits (MAX)	1880.0 MHz	9400

*The WCDMA and HSPA modes of EUT were verified on each channel and "sub-tests" according to section 4.1.1.
(Also refer to Release-6 procedures in section5.2 of 3GPP TS 34.121.)
*1) The mode was used for testing as a representative, because it had the highest RF output Power (Conducted).

4.1.1 Explanation of theRel-99 WCDMA and Rel-6 HSPA measurement mode

3GPP defines UE Test Modes and Channel Configurations for Regulatory Testing.

- **UE Test Modes:**
  Test Mode 1(Data Loopback Test)
- **Channel Configurations:**
  R99 – 12.2kpbs Reference Measurement Channel (RMC) channel
  HSDPA – Fixed Reference Channel (FRC)
  HSUPA – New HSUPA channel configuration (HSDPA data from DL is looped back onto UL)
- **Procedure to configure UE to transmit maximum power:**
  Rel99: 3GPP TS 34.121 section 5.2
  HSDPA Rel5: 3GPP TS 34.121 section 5.2A
  HSDPA Rel6: 3GPP TS 34.121 section 5.2AA
  HSUPA Rel6: 3GPP TS 34.121 section 5.2B

  * About Rel-99 and HSDPA testing, test equipment send “all up bits” forcing UE max power

(1) Explanation for HSDPA/HSPA Subtests

3GPP TS 34.121 defines test requirements and procedures for testing all variations of WCDMA. 3GPP TS 34.121 defines 4 HSDPA test configurations and 5 HSPA test configurations (“Subtests”) for various RF Conformance tests. The Following table shows Release 5 HSDPA and Release 6 HSPA Subtest Configurations per 3GPP TS 34.121.

[HSDPA]

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

[HSUPA]

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

(2) Maximum Output Power Verification

[HSDPA]
Maximum output power was verified on High, Middle and Low channels according to the Release 5 procedures described in section 5.2 of 3GPP TS 34.121, using an FRC with H-set 1 and 12.2kbps RMC with TPC (transmit power control) set to all "1's". Output power was measured according requirements for HS-DPCCH Sub-test 1-4.

[HSUPA]
Maximum output power was verified on the High, Middle and Low channels according to Release 6 procedures in section 5.2 of 3GPP TS 34.121, using the appropriate RMC, FRC and E-DCH configurations. When E-DCH was active, inner loop power control with power control algorithm 2 was used to maintain E-TFCI requirements. Output power for the applicable HSPA modes was measured for E-DCH Sub-test 1-5.

(3) Test Equipment Setting Summary Table

The following table is the key parameters that was configured in test equipment.

Subtest	Mode	Loopback Mode	Rel99 RMC	HSDPA FRC	HSUPA Test	Common Setting		βc/βd	MPR	Power Class 3 limit
						βc	βd			
	Rel99	Test Mode 1	12.2kbps RMC	-	-	-	-	8/15	-	24(+1.7/ -3.7dB)
1	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	-	2/15	15/15	2/15	0	24(+1.7/ -3.7dB)
2	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	-	12/15	15/15	12/15	0	24(+1.7/ -3.7dB)
3	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	-	15/15	8/15	15/8	0.5	23.5(+2.2/ -3.7dB)
4	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	-	15/15	4/15	15/4	0.5	23.5(+2.2/ -3.7dB)
1	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	HSUPA Loopback	11/15	15/15	11/15	0	24(+1.7/ -3.7dB)
2	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	HSUPA Loopback	6/15	15/15	6/15	2	22(+3.7/ -3.7dB)
3	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	HSUPA Loopback	15/15	9/15	15/9	1	23(+2.7/ -3.7dB)
4	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	HSUPA Loopback	2/15	15/15	2/15	2	22(+3.7/ -3.7dB)
5	Rel6 HSUPA	Test Mode 1	12.2kbps RMC	H-Set 1 (QPSK)	HSUPA Loopback	15/15	15/15	15/15	0	24(+1.7/ -3.7dB)

Subtest	HSDPA Specific Settings						
	ΔACK	ΔNACK	ΔCQI	Ack-Nack repetition factor	CQI Feedback	CQI Repetition Factor	Ahs=βhs/βc
Rel 6 HSDPA							
1	8	8	8	3	4ms	2	30/15
2	8	8	8	3	4ms	2	30/15
3	8	8	8	3	4ms	2	30/15
4	8	8	8	3	4ms	2	30/15

Subtest	HSDPA Specific Settings							HSUPA Specific Settings			HSUPA Additional Info	
	ΔACK	ΔNACK	ΔCQI	Ack-Nack repetition factor	CQI Feedback	CQI Repetition Factor	Ahs=βhs/βc	ΔE-DPCCH	ΔHARQ	AG Index	ETFCI (form TS34.121 Table C.11.1.3)	Associated Max UL Data Rate kbps
Rel 6 HSPA												
1	8	8	8	3	4ms	2	30/15	6	0	20	75	242.1
2	8	8	8	3	4ms	2	30/15	8	0	12	67	174.9
3	8	8	8	3	4ms	2	30/15	8	0	15	92	482.8
4	8	8	8	3	4ms	2	30/15	5	0	17	71	205.8
5	8	8	8	3	4ms	2	30/15	7	0	21	81	308.9

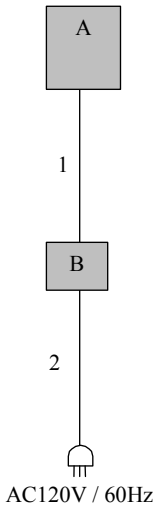
HSUPA Reference E-TFCI Parameters
[Subtest 1, 2, 4, 5]

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	5 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Reference E-TFCI	71
- Reference E-TFCI PO	23
- Reference E-TFCI	75
- Reference E-TFCI PO	26
- Reference E-TFCI	81
- Reference E-TFCI PO	27

[Subtest 3]

Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	2 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	92
- Reference E-TFCI PO	18

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	Remarks
A	Personal Computer	SVD132A1WL	XTS3-23 *1) XTS2-17 *2) XTS2-18 *3) XTS2-1 12 *4)	SONY	EUT
B	AC Adaptor	VGP-AC10V10	000006701 0000346	SONY	EUT

*1) Used for Radiated Emission test
*2) Used for RF Output Power (Conducted) test
*3) Used for Frequency stability tests
*4) Used for Antenna Terminal Conducted test except for RF Output Power (Conducted) and Frequency stability tests

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.7	Unshielded	Unshielded	-
2	AC Cable	1.5	Unshielded	Unshielded	-

SECTION 5: RF Output Power(Conducted/Radiated)

[Conducted: Conducted Output Power]

Test Procedure

The RF output power (conducted) was measured with a Wideband Radio Communication Tester and an attenuator at the antenna port.

[Radiated : Equivalent isotropic radiated power(EIRP)]

Test Procedure

1) EUT was placed on a urethane platform of nominal size, 0.5 m 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 with Laptop and Tablet Styles 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.

[Radiated]
Test Procedure

1) EUT was placed on a urethane platform of nominal size, 0.5 m 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 with Laptop and Tablet Styles 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 (AC 102V to AC 138V), and it is presented as the ppm unit.

Temperature	:	-30deg. C to +50deg. C (10 deg. C step)
Voltage	:	Normal Voltage AC 120V
		Maximum Voltage AC 138V(AC 120V +15%)
		Minimum Voltage AC 102V (AC 120V -15%)

As the operating input voltage of the EUT is between AC 102V to AC 138V (nominal voltage: AC 120V), 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
PCS1900

Test place	Head Office EMC Lab. No.7 Shielded Room
Report No.	10004954H
Date	02/28/2013
Temperature/ Humidity	23deg. C / 44% RH
Engineer	Yutaka Yoshida
Mode	Tx GPRS(GMSK), 1slot, CS-1, PCL=0
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

Mode		Ch	Frequency [MHz]	Reading Average burst power [dBm]	Cable Loss [dB]	Result [dBm]
GPRS (CS-1)	1slot	512	1850.2	22.04	7.71	29.75
		661	1880.0	22.06	7.76	29.82
		810	1909.8	21.79	7.74	29.53
EGPRS (MCS-5)	1slot	512	1850.2	17.66	7.71	25.37
		661	1880.0	17.71	7.76	25.47
		810	1909.8	17.65	7.74	25.39

Results = Reading + Cable Loss

RF Output Power (Conducted)

Conducted Output Power
W-CDMA Band II

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	03/08/2013
Temperature/ Humidity	24deg. C / 49% RH
Engineer	Yutaka Yoshida
Mode	Tx W-CDMA

Mode	Ch	Frequency [MHz]	Reading AVG [dBm]	Cable Loss [dB]	Result [dBm]
RMC 12.2kbps	9262	1852.4	21.66	1.54	23.20
	9400	1880.0	21.82	1.59	23.41
	9538	1907.6	21.49	1.57	23.06
HSDPA Subtest1	9262	1852.4	20.49	1.54	22.03
	9400	1880.0	20.62	1.59	22.21
	9538	1907.6	20.36	1.57	21.93
HSDPA Subtest2	9262	1852.4	20.54	1.54	22.08
	9400	1880.0	20.61	1.59	22.20
	9538	1907.6	20.40	1.57	21.97
HSDPA Subtest3	9262	1852.4	20.10	1.54	21.64
	9400	1880.0	20.12	1.59	21.71
	9538	1907.6	19.88	1.57	21.45
HSDPA Subtest4	9262	1852.4	20.08	1.54	21.62
	9400	1880.0	20.16	1.59	21.75
	9538	1907.6	19.88	1.57	21.45
HSUPA Subtest1	9262	1852.4	20.08	1.54	21.62
	9400	1880.0	20.33	1.59	21.92
	9538	1907.6	20.14	1.57	21.71
HSUPA Subtest2	9262	1852.4	19.47	1.54	21.01
	9400	1880.0	19.61	1.59	21.20
	9538	1907.6	19.27	1.57	20.84
HSUPA Subtest3	9262	1852.4	19.35	1.54	20.89
	9400	1880.0	19.83	1.59	21.42
	9538	1907.6	19.24	1.57	20.81
HSUPA Subtest4	9262	1852.4	19.87	1.54	21.41
	9400	1880.0	19.95	1.59	21.54
	9538	1907.6	19.66	1.57	21.23
HSUPA Subtest5	9262	1852.4	20.20	1.54	21.74
	9400	1880.0	20.31	1.59	21.90
	9538	1907.6	20.07	1.57	21.64

Results = Reading + Cable Loss

*The enhanced power reduction may result in around 1dB of variance from the MPR target values depending on HSPA channel configuration (e.g. 34.121 subtest) and characteristics of hardware RF design.

RF Output Power (Radiated)

Equivalent Isotropically Radiated Power(EIRP)

PCS1900

Report No. 10004954H
Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date 03/19/2013
Temperature / Humidity 22deg. C / 32% RH
Engineer Katsunori Okai
Mode Tx GPRS(GMSK), 1slot, CS-1, PCL=0

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	100.0	98.2	25.4	21.4	3.3	10.1	0.0	32.2	28.2	33.0	0.8	4.8	100	244	111	113	
1880.00	99.9	98.8	25.3	22.7	3.3	10.3	0.0	32.3	29.6	33.0	0.7	3.4	100	248	111	111	
1909.80	99.4	98.9	24.8	23.2	3.4	10.4	0.0	31.9	30.3	33.0	1.1	2.7	100	240	106	114	

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)

Report No. 10004954H
Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date 03/19/2013
Temperature / Humidity 22deg. C / 32% RH
Engineer Katsunori Okai
Mode Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

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	96.2	23.8	19.4	3.3	10.1	0.0	30.6	26.2	33.0	2.4	6.8	100	238	107	111	
1880.00	98.3	96.8	23.7	20.7	3.3	10.3	0.0	30.7	27.6	33.0	2.3	5.4	100	241	113	114	
1909.80	98.1	97.1	23.5	21.4	3.4	10.4	0.0	30.6	28.5	33.0	2.4	4.5	100	237	109	114	

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

Report No.	10004954H
Test place	Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date	03/19/2013
Temperature / Humidity	22deg. C / 32% RH
Engineer	Katsunori Okai
Mode	Tx W-CDMA (RMC12.2kbps), All Up Bits

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.]	
1852.40	96.4	94.4	21.8	17.5	3.3	10.1	0.0	28.6	24.3	33.0	4.4	8.7	100	242	113	115	
1880.00	96.1	94.1	21.5	17.9	3.3	10.3	0.0	28.5	24.8	33.0	4.6	8.2	100	244	109	116	
1907.60	95.6	94.4	20.9	18.6	3.4	10.4	0.0	28.0	25.7	33.0	5.0	7.4	100	235	100	80	

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 (Conducted)

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	03/22/2013
Temperature/ Humidity	21deg. C / 22% RH
Engineer	Yutaka Yoshida
Mode	Tx GPRS(GMSK), 1slot, CS-1, PCL=0
	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0
	Tx W-CDMA(RMC12.2kbps), All Up Bits

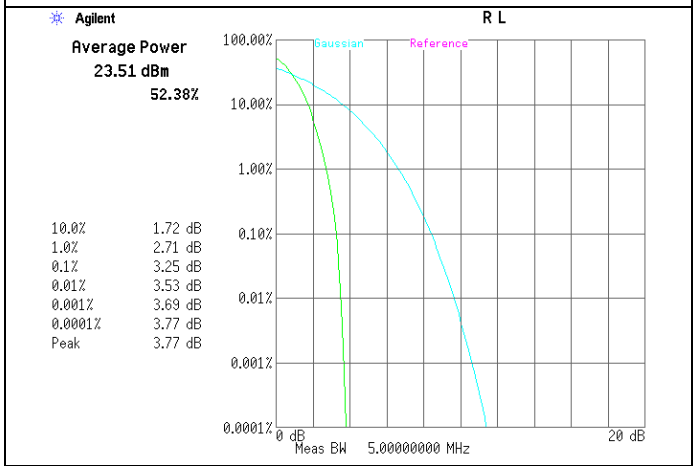
Mode	Channel	Frequency [MHz]	Peak to Average Power Ratio [dB]	Limit [dB]
GPRS *1)	512	1850.20	0.147	13
	661	1880.00	0.163	13
	810	1909.80	0.165	13
EGPRS *1)	512	1850.20	3.780	13
	661	1880.00	3.667	13
	810	1909.80	3.606	13
W-CDMA *2)	9262	1852.40	3.25	13
	9400	1880.00	3.32	13
	9538	1907.60	3.24	13

*In order to decide the largest deviation between the average and the peak power of the EUT in a bandwidth,
*1) an average and a peak trace of the spectrum analyzer was used for GSM Signals ;
*2) Complementary Cumulative Distribution Function (CCDF) curves of the spectrum analyzer were used for W-CDMA Signals.

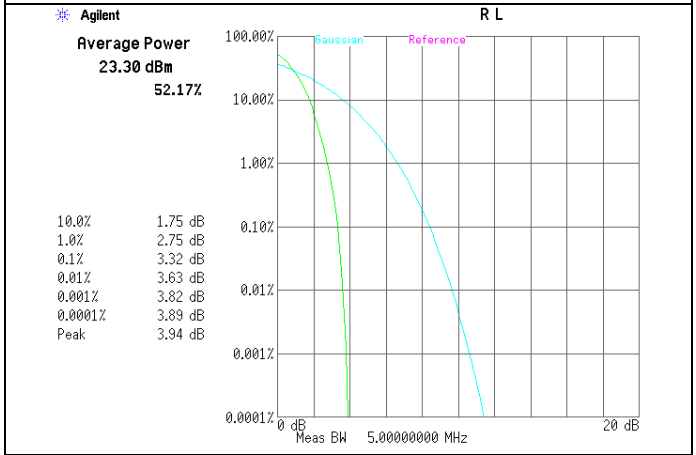
Peak to Average power Ratio (Conducted)
W-CDMA Band II

W-CDMA

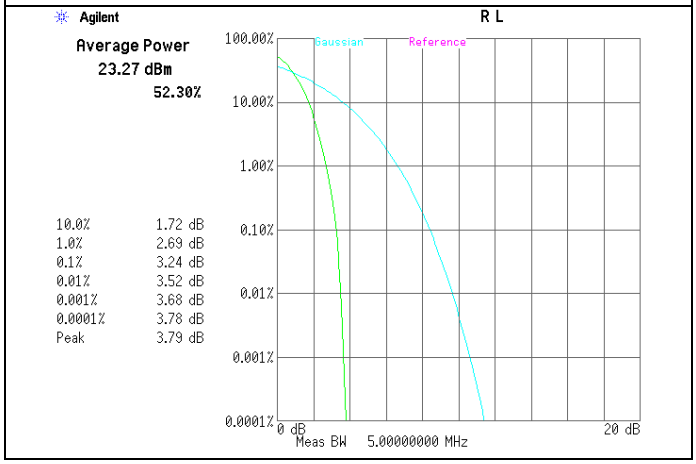
1852.4MHz



1880.00MHz



1907.6MHz



*Set the spectrum analyzer radio mode to 3GPP W-CDMA (Power Stat CCDF)

Bandwidth(Conducted)

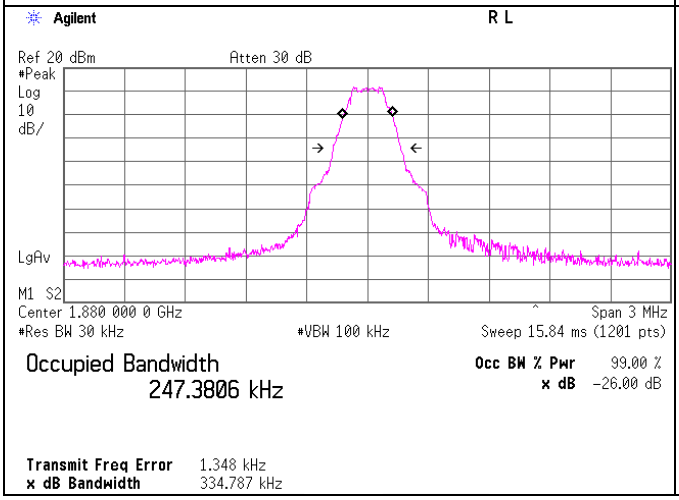
PCS1900

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	03/22/2013
Temperature/ Humidity	21deg. C / 22% RH
Engineer	Yutaka Yoshida
Mode	Tx GPRS(GMSK), 1slot, CS-1, PCL=0
	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

Mode	CH	FREQ [MHz]	26dB Bandwidth [kHz]	99% OBW [kHz]	Limit [kHz]
GPRS	Mid	1880.0	334.787	247.3806	-
EGPRS	Mid	1880.0	326.305	247.0987	-

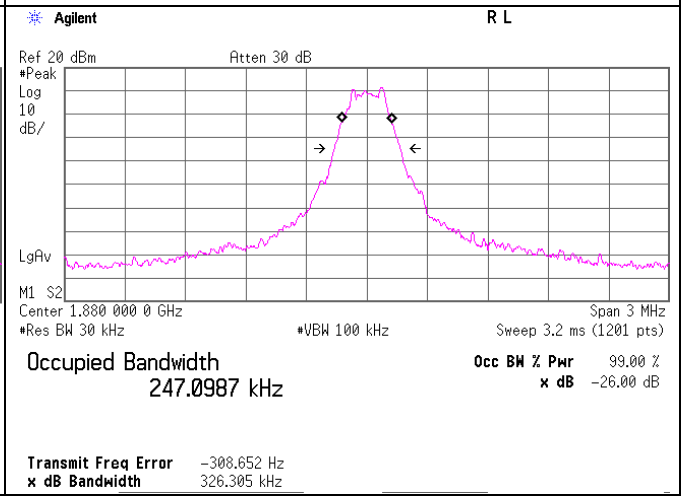
GPRS

Tx:1880.0MHz



EGPRS

Tx:1880.0MHz



UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

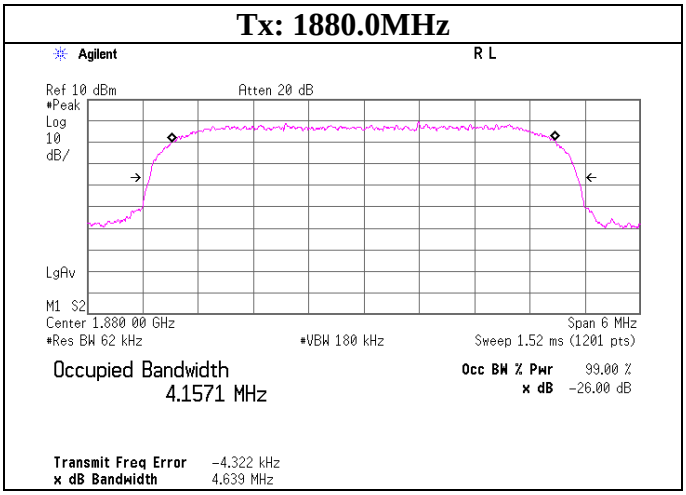
Bandwidth(Conducted)

W-CDMA Band II

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	03/22/2013
Temperature/ Humidity	21deg. C / 22% RH
Engineer	Yutaka Yoshida
Mode	Tx W-CDMA(RMC12.2kbps), All Up Bits

CH	FREQ [MHz]	26dB Bandwidth [MHz]	99% OBW [MHz]	Limit [kHz]
Mid	1880.0	4.639	4.1571	-

Tx: 1880.0MHz



Band-Edge(Conducted)

PCS1900

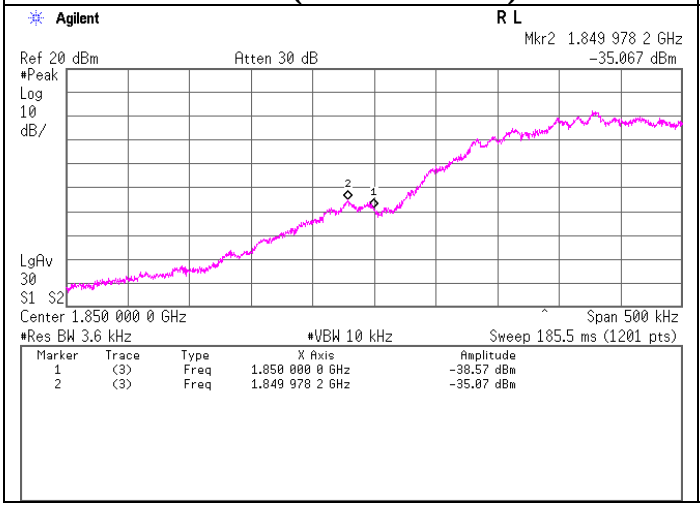
Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	03/22/2013
Temperature/ Humidity	21deg. C / 22% RH
Engineer	Yutaka Yoshida
Mode	Tx GPRS(GMSK), 1slot, CS-1, PCL=0

Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
1849.9782	-35.07	9.96	7.73	-17.38	-13.0	4.38
1850.0000	-38.57	9.96	7.73	-20.88	-13.0	7.88
1910.0000	-42.26	9.97	7.76	-24.53	-13.0	11.53
1910.0205	-36.51	9.97	7.76	-18.78	-13.0	5.78

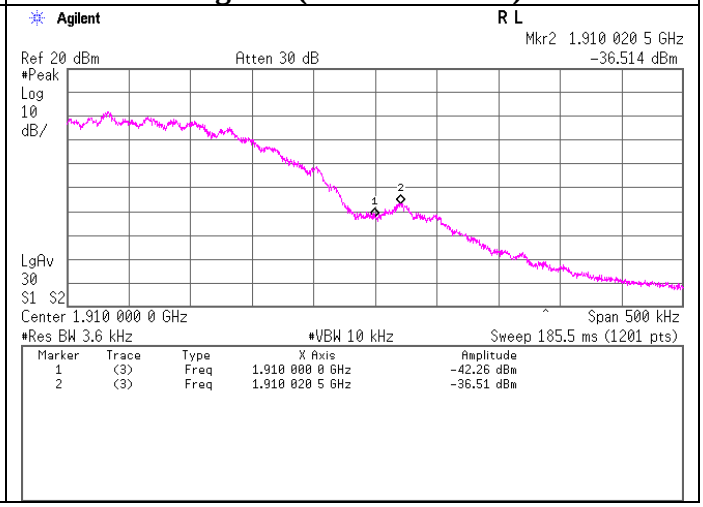
VIDEO AV 30 times

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

Low ch (Tx:1850.2MHz)



High ch (Tx:1909.8MHz)



Band-Edge(Conducted)

PCS1900

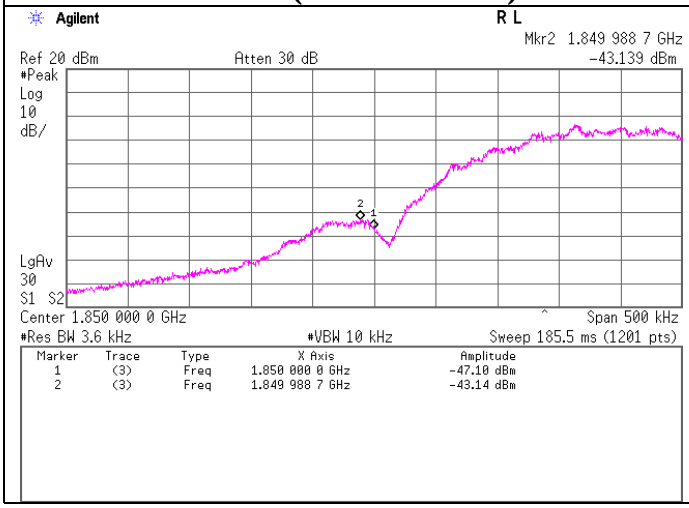
Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	03/22/2013
Temperature/ Humidity	21deg. C / 22% RH
Engineer	Yutaka Yoshida
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
1849.9887	-43.14	9.96	7.73	-25.45	-13.0	12.45
1850.0000	-47.10	9.96	7.73	-29.41	-13.0	16.41
1910.0000	-45.79	9.97	7.76	-28.06	-13.0	15.06
1910.0335	-43.60	9.97	7.76	-25.87	-13.0	12.87

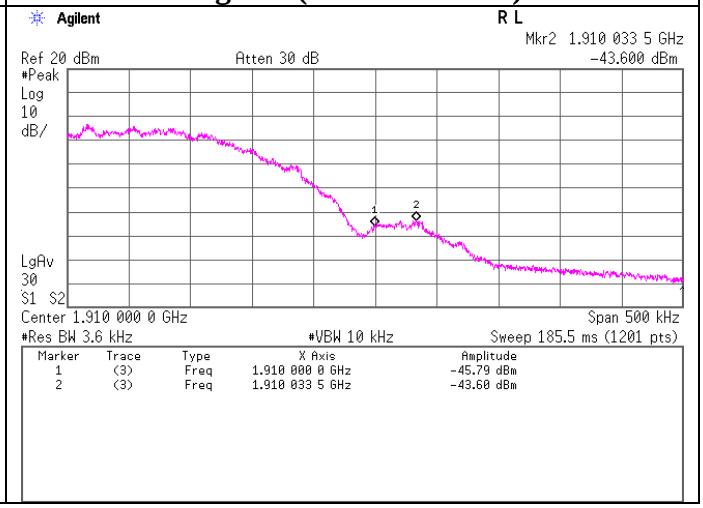
VIDEO AV 30 times

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

Low ch (Tx:1850.2MHz)



High ch (Tx:1909.8MHz)



UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

Band-Edge(Conducted)

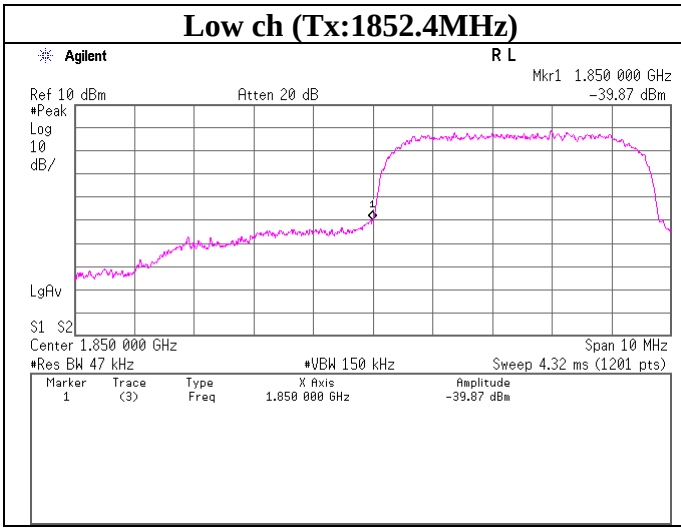
W-CDMA Band II

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	03/22/2013
Temperature/ Humidity	21deg. C / 22% RH
Engineer	Yutaka Yoshida
Mode	Tx W-CDMA(RMC12.2kps), All Up Bits

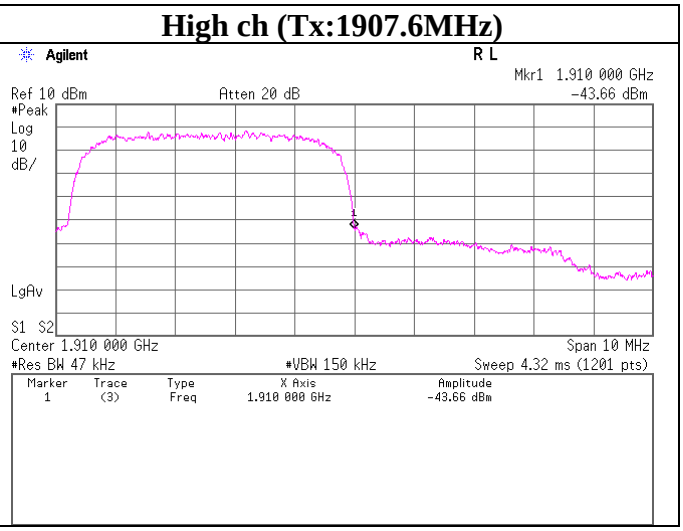
Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
1850.0000	-39.87	9.96	7.73	-22.18	-13.0	9.18
1910.0000	-43.66	9.97	7.76	-25.93	-13.0	12.93

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

Low ch (Tx:1852.4MHz)



High ch (Tx:1907.6MHz)



Band-Edge (Radiated)

PCS1900

Report No.	10004954H
Test place	Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date	03/19/2013
Temperature / Humidity	22deg. C / 32% RH
Engineer	Katsunori Okai
Mode	Tx GPRS(GMSK), 1slot, CS-1, PCL=0

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.]	
1849.98	49.9	47.2	-24.5	-29.4	3.32	10.11	0.00	-17.8	-22.6	-13.0	4.8	9.6	100	244	111	113	
1850.00	45.5	42.8	-28.9	-33.8	3.32	10.11	0.00	-22.2	-27.0	-13.0	9.2	14.0	100	244	111	113	
1910.00	43.5	43.4	-31.0	-32.1	3.36	10.42	0.00	-23.9	-25.1	-13.0	10.9	12.1	100	240	106	114	
1910.02	50.3	50.3	-24.2	-25.2	3.36	10.42	0.00	-17.1	-18.2	-13.0	4.1	5.2	100	240	106	114	

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)

Band Edge (Radiated)

W-CDMA Band II

Report No.	10004954H
Test place	Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date	03/19/2013
Temperature / Humidity	22deg. C / 32% RH
Engineer	Katsunori Okai
Mode	Tx W-CDMA (RMC12.2kbps), All Up Bits

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.]	
1850.00	46.6	45.5	-27.8	-31.2	3.32	10.11	0.00	-21.0	-24.4	-13.0	8.0	11.4	100	242	113	115	
1910.00	45.3	43.5	-29.2	-32.0	3.36	10.42	0.00	-22.2	-25.0	-13.0	9.2	12.0	100	235	100	80	

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: 47kHz , VBW: 150kHz)

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

Spurious Emission (Conducted)

PCS1900

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	03/22/2013
Temperature/ Humidity	21deg. C / 22% RH
Engineer	Yutaka Yoshida
Mode	Tx GPRS(GMSK), 1slot, CS-1, PCL=0

Limit Line

Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line [dBm]
1850.2	-13.0	9.96	7.73	-30.7
1880.0	-13.0	9.96	7.78	-30.7
1909.8	-13.0	9.96	7.76	-30.7

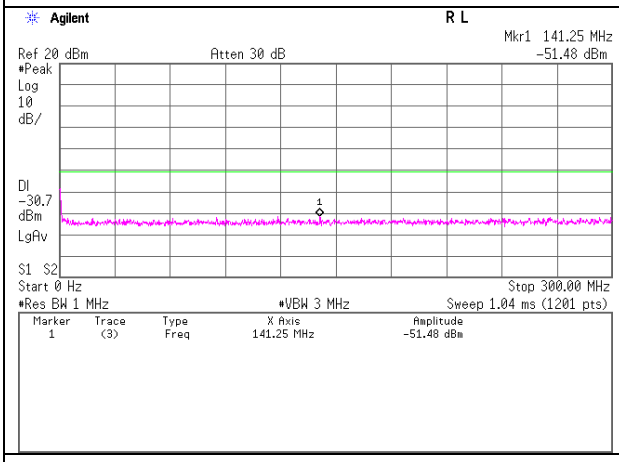
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss

Spurious Emission (Conducted)

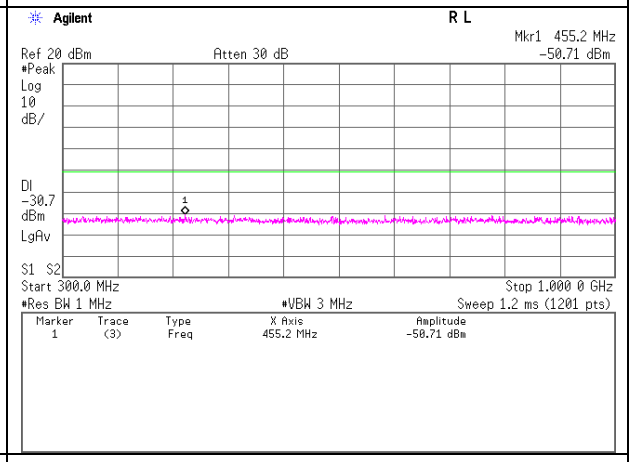
GPRS

Tx:1850.2MHz

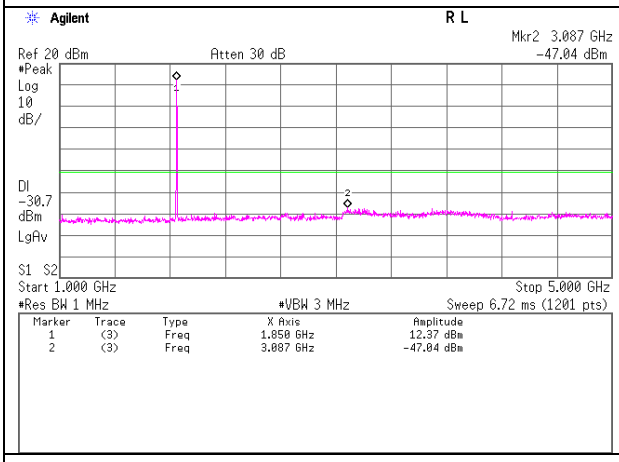
0Hz-300MHz



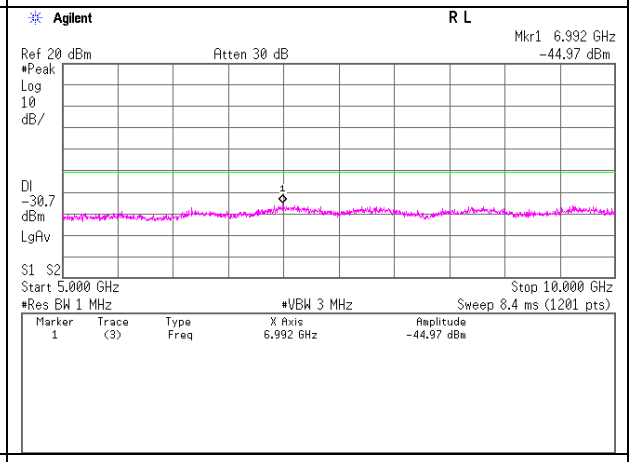
300MHz-1GHz



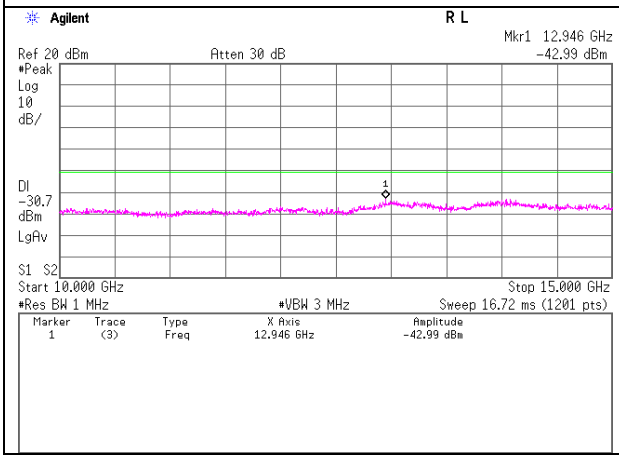
1GHz-5GHz



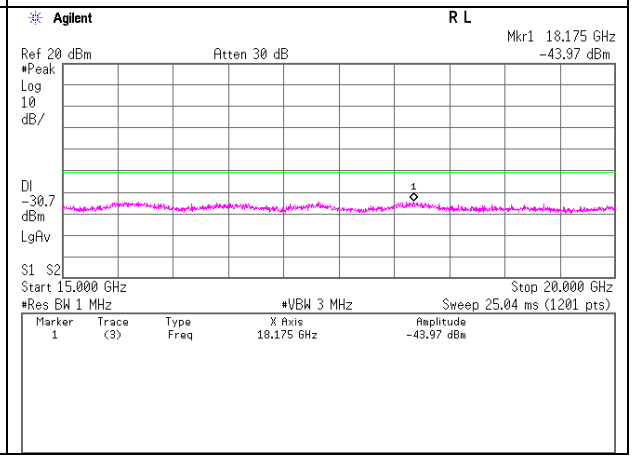
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz

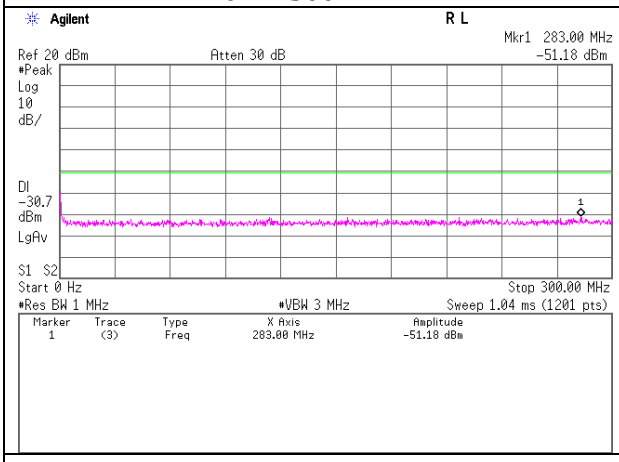


Spurious Emission (Conducted)

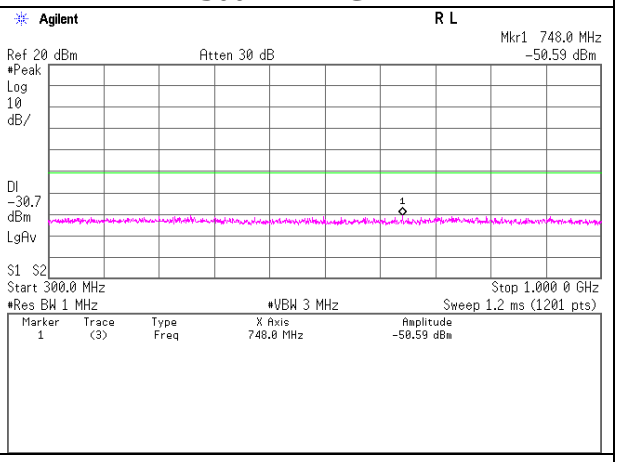
GPRS

Tx:1880.0MHz

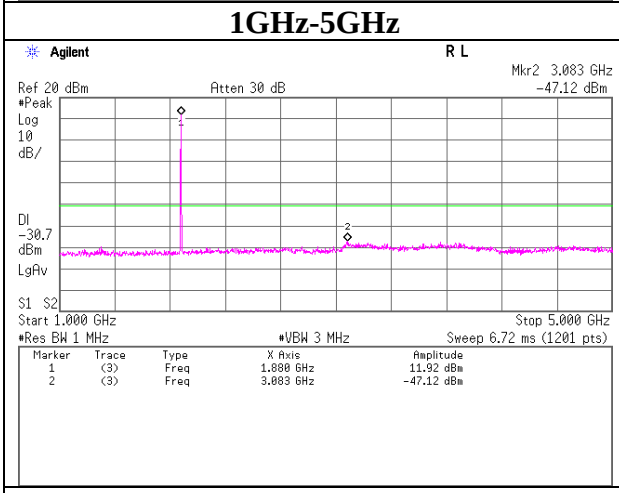
0Hz-300MHz



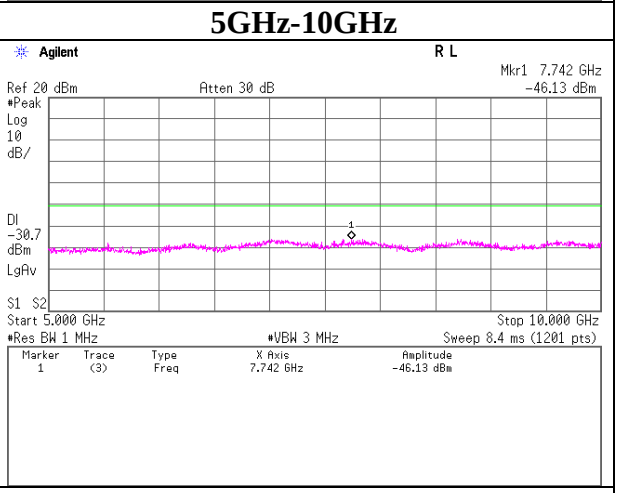
300MHz-1GHz



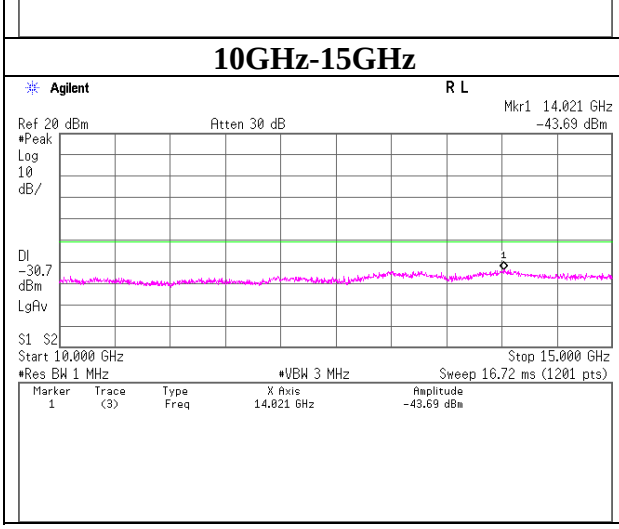
1GHz-5GHz



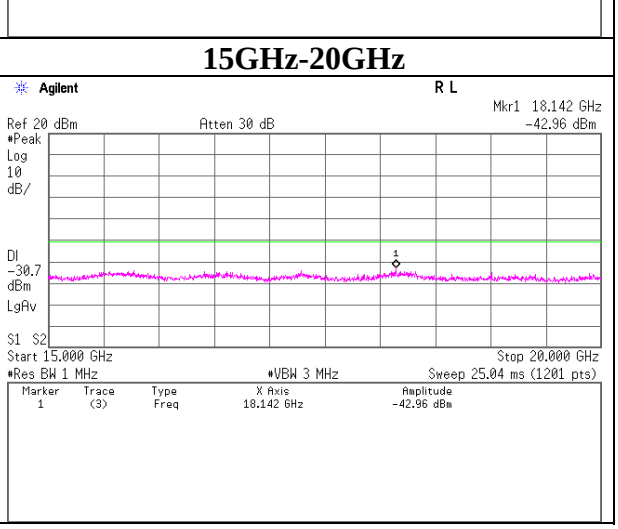
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz

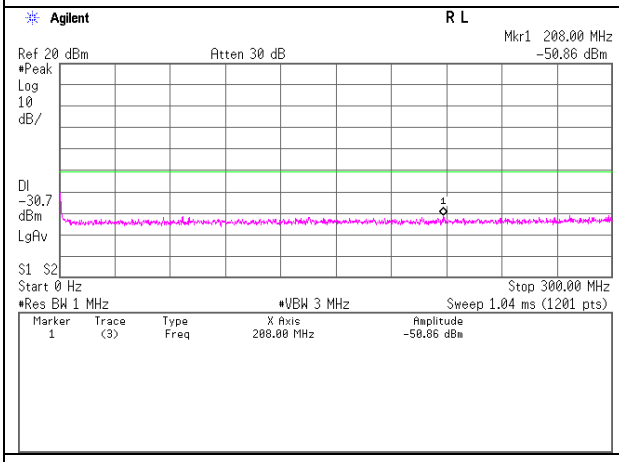


Spurious Emission (Conducted)

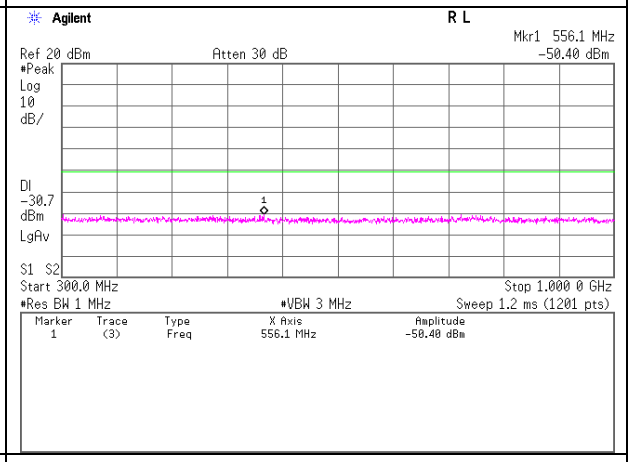
GPRS

Tx:1909.8MHz

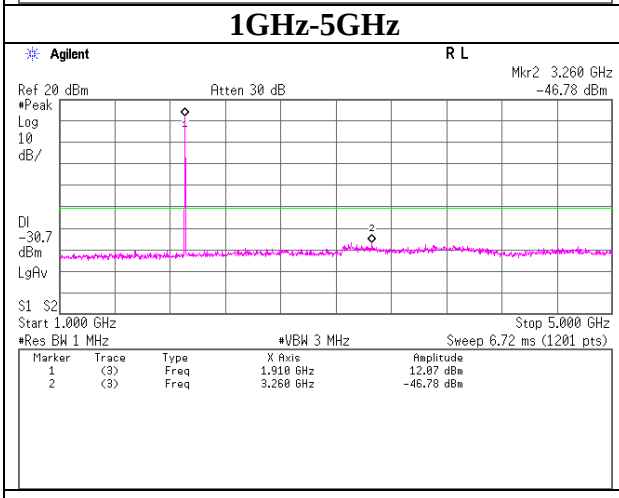
0Hz-300MHz



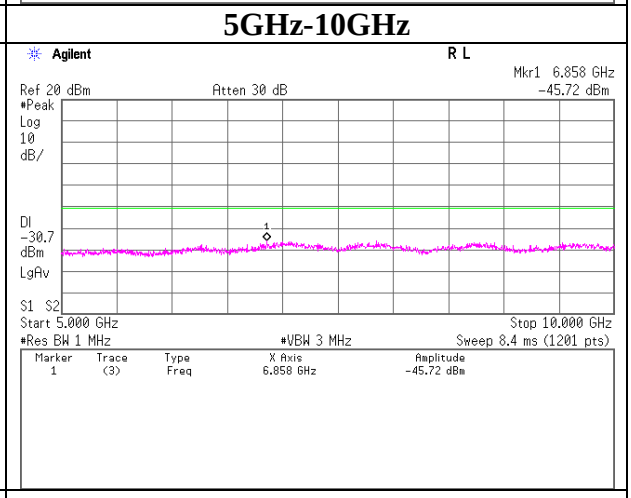
300MHz-1GHz



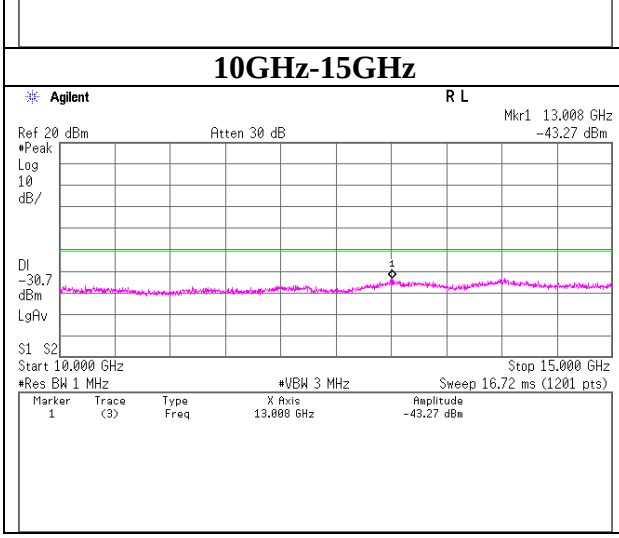
1GHz-5GHz



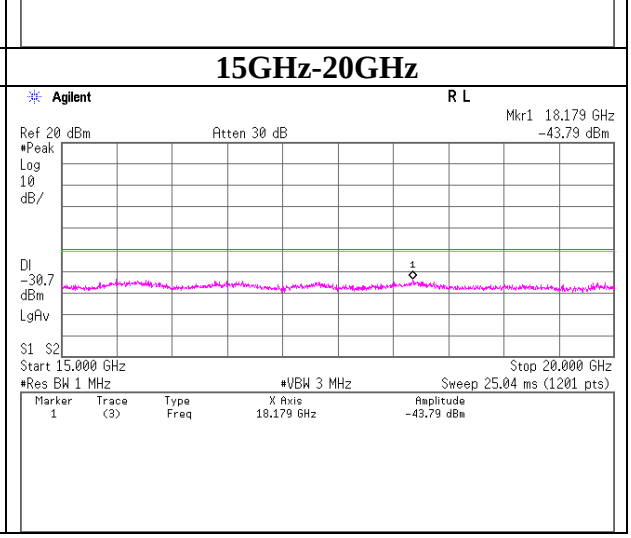
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



Spurious Emission (Conducted)

PCS1900

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	03/22/2013
Temperature/ Humidity	21deg. C / 22% RH
Engineer	Yutaka Yoshida
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

Limit Line

Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line [dBm]
1850.2	-13.0	9.96	7.73	-30.7
1880.0	-13.0	9.96	7.78	-30.7
1909.8	-13.0	9.96	7.76	-30.7

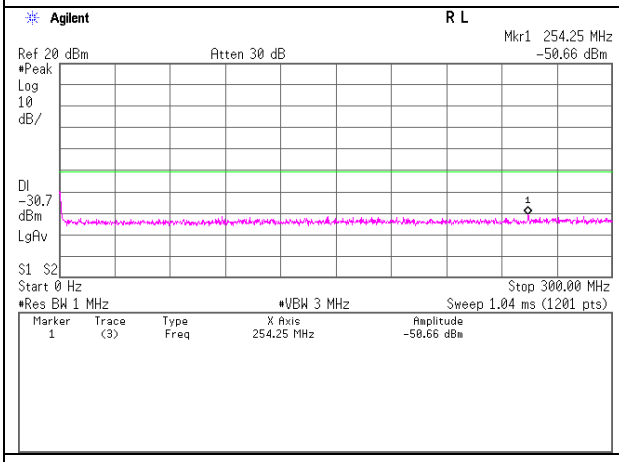
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss

Spurious Emission (Conducted)

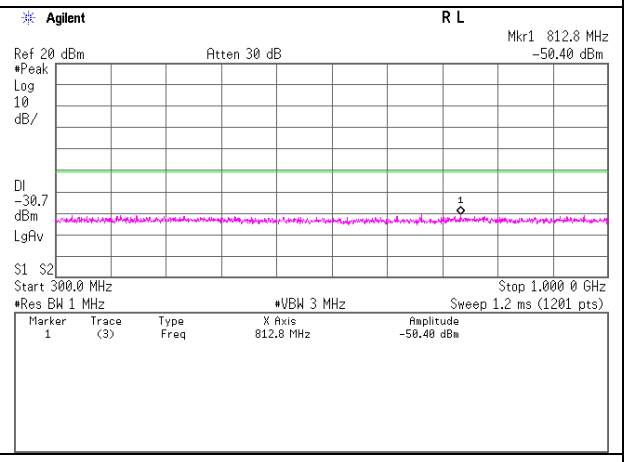
EGPRS

Tx:1850.2MHz

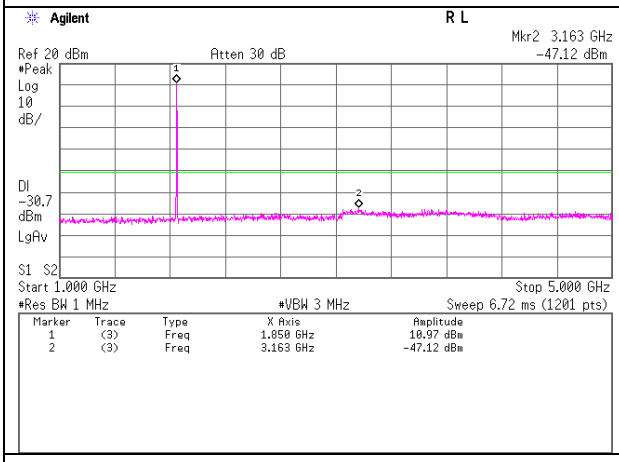
0Hz-300MHz



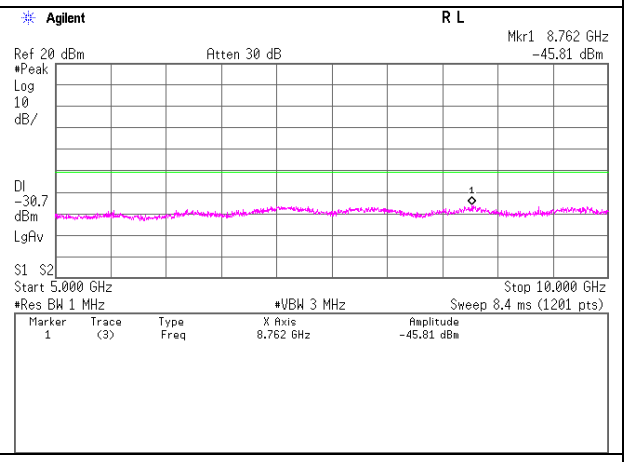
300MHz-1GHz



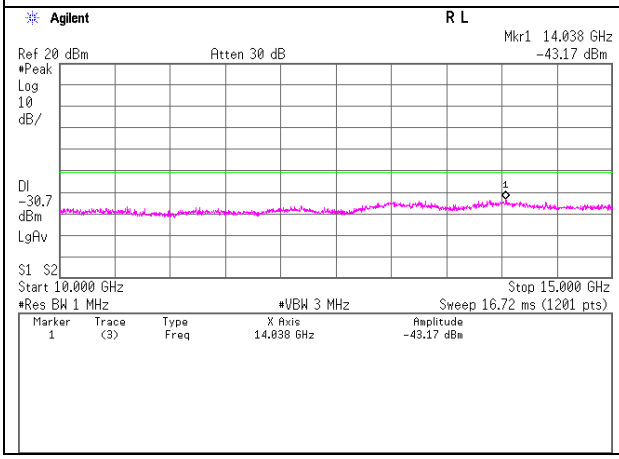
1GHz-5GHz



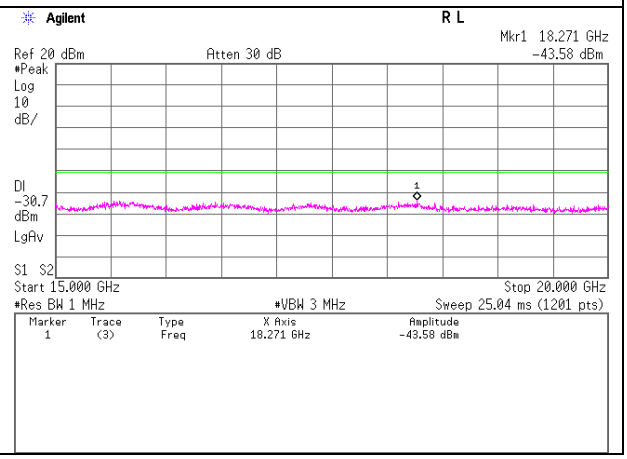
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz

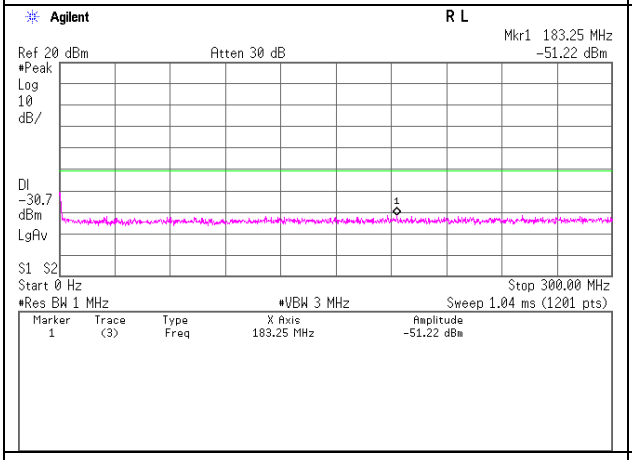


Spurious Emission (Conducted)

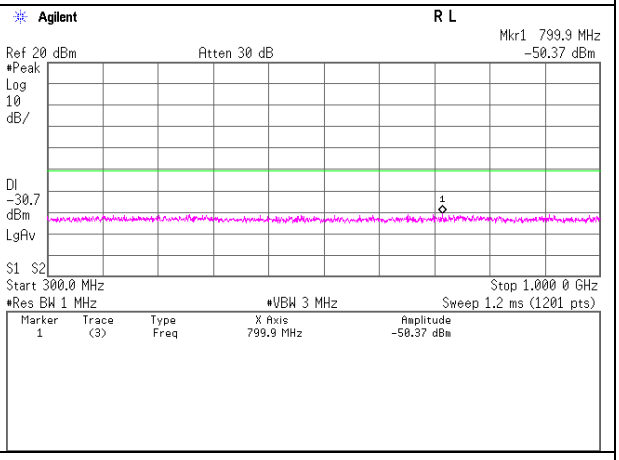
EGPRS

Tx:1880.0MHz

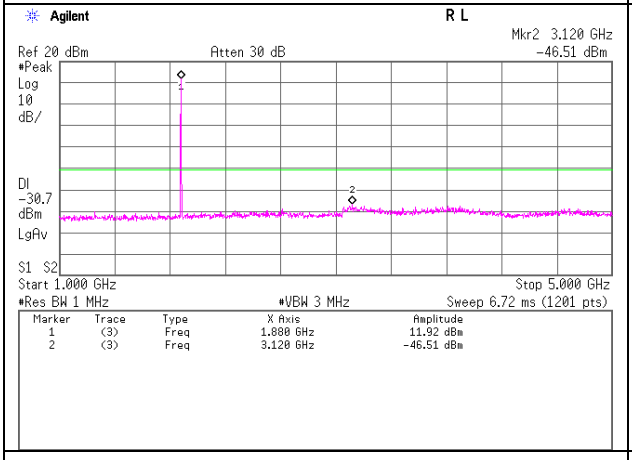
0Hz-300MHz



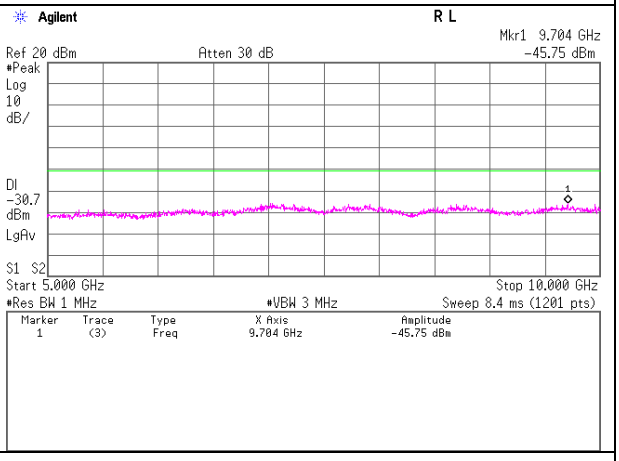
300MHz-1GHz



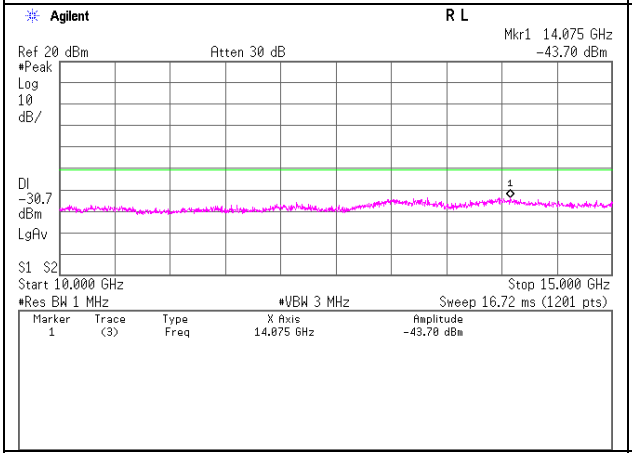
1GHz-5GHz



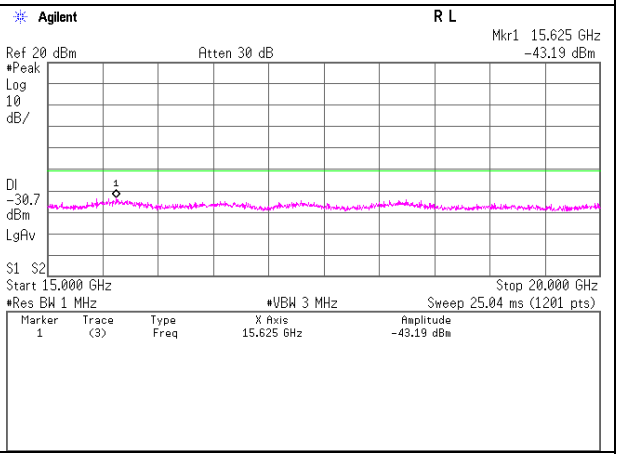
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz

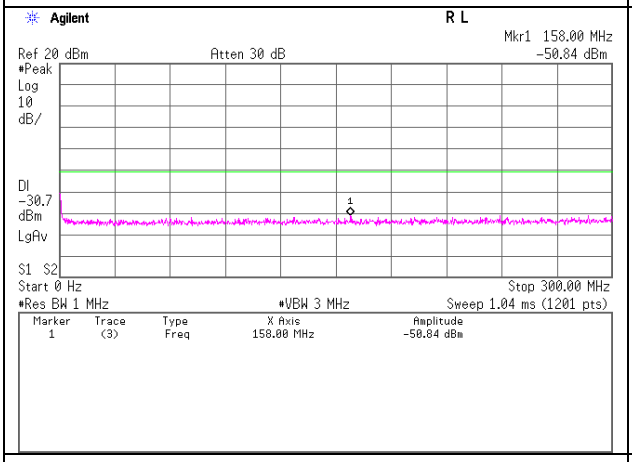


Spurious Emission (Conducted)

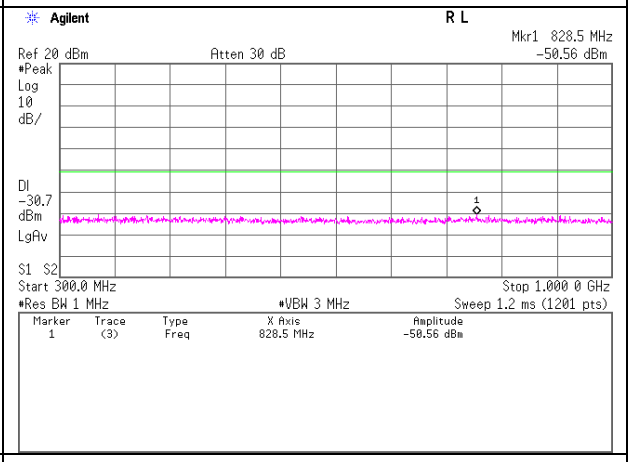
EGPRS

Tx:1909.8MHz

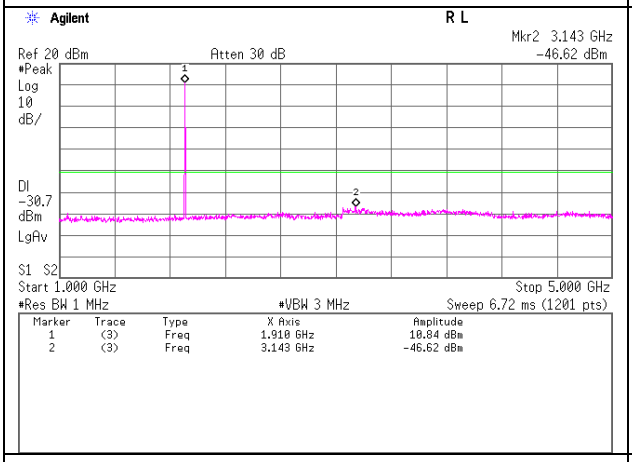
0Hz-300MHz



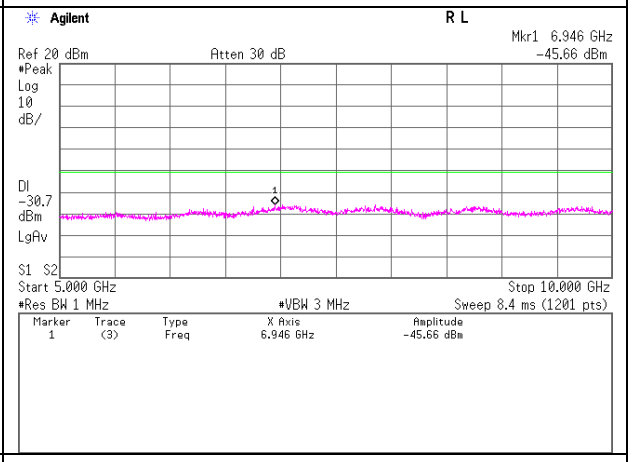
300MHz-1GHz



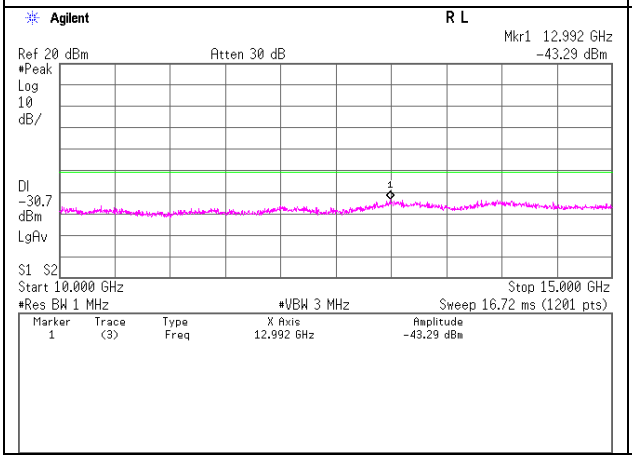
1GHz-5GHz



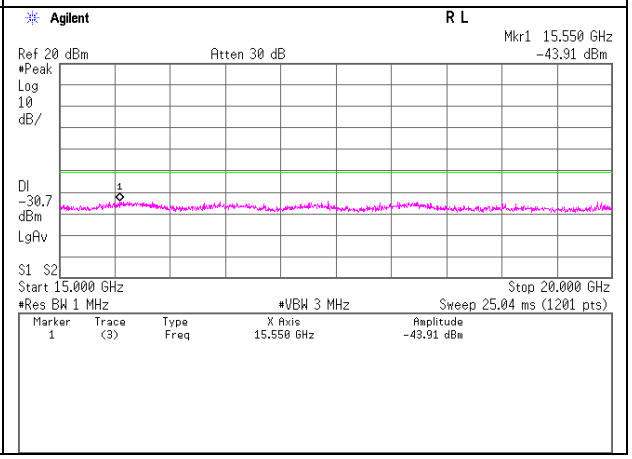
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



Spurious Emission (Conducted)

W-CDMA Band II

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	03/22/2013
Temperature/ Humidity	21deg.C / 22% RH
Engineer	Yutaka Yoshida
Mode	Tx W-CDMA(RMC12.2kbps), All Up Bits

Limit Line

Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line [dBm]
1852.4	-13.0	9.96	7.73	-30.7
1880.0	-13.0	9.96	7.78	-30.7
1907.6	-13.0	9.96	7.76	-30.7

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

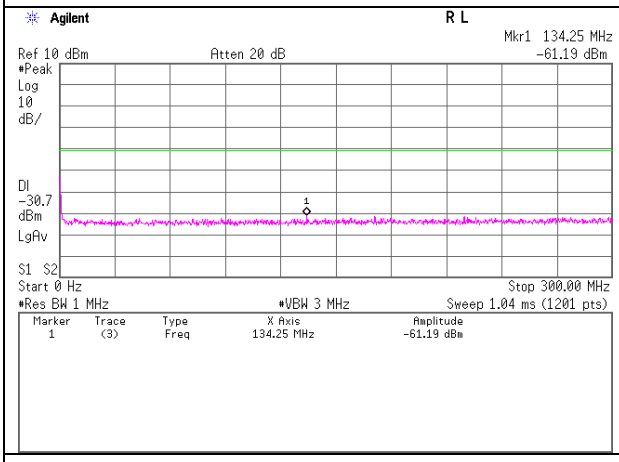
UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

Spurious Emission (Conducted)

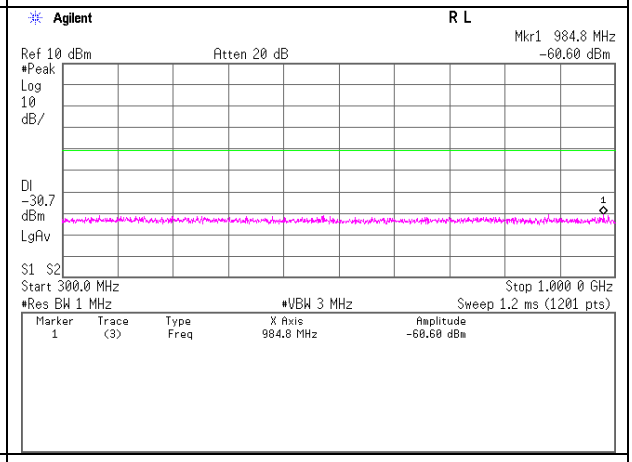
W-CDMA Band II

Tx:1852.4MHz

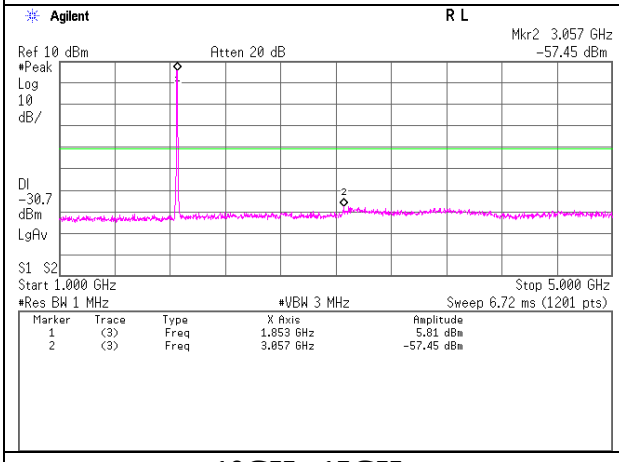
0Hz-300MHz



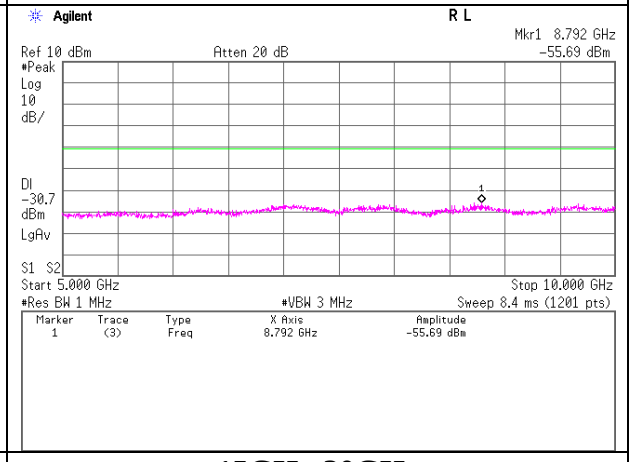
300MHz-1GHz



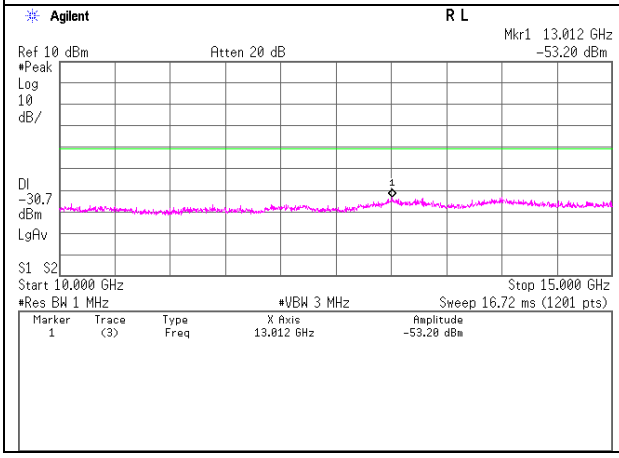
1GHz-5GHz



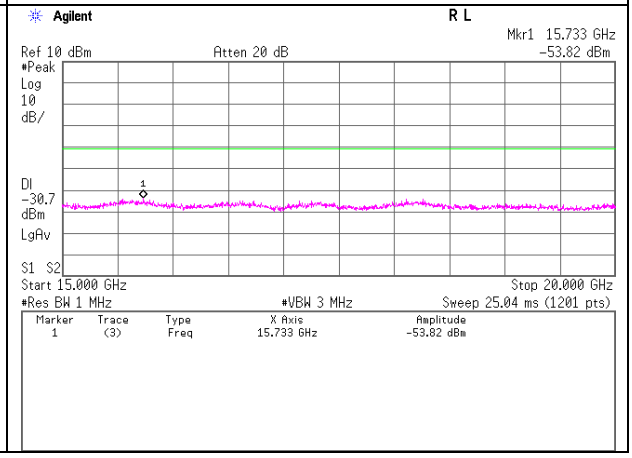
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz

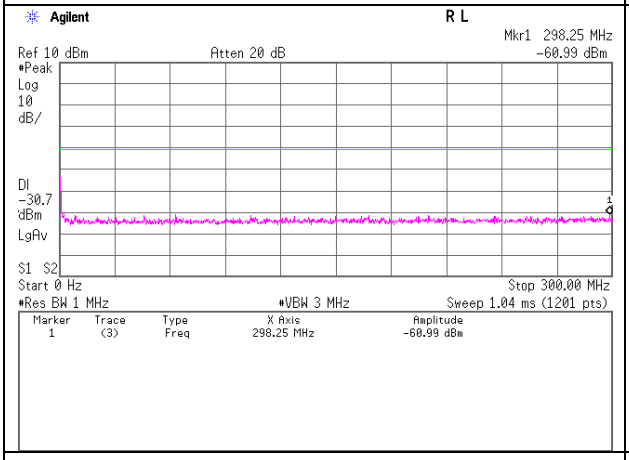


Spurious Emission (Conducted)

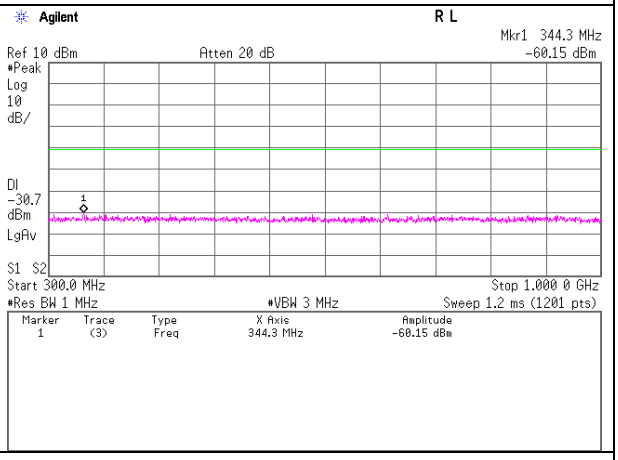
W-CDMA Band II

Tx:1880.0MHz

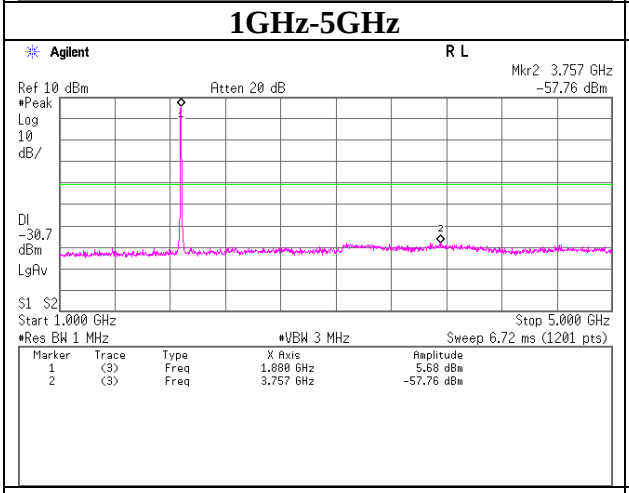
0Hz-300MHz



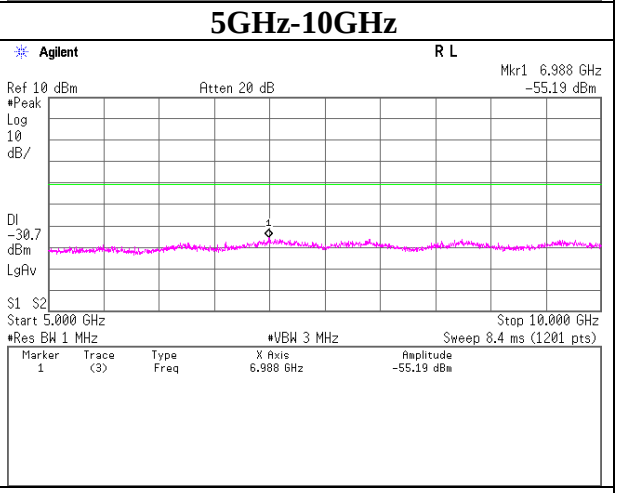
300MHz-1GHz



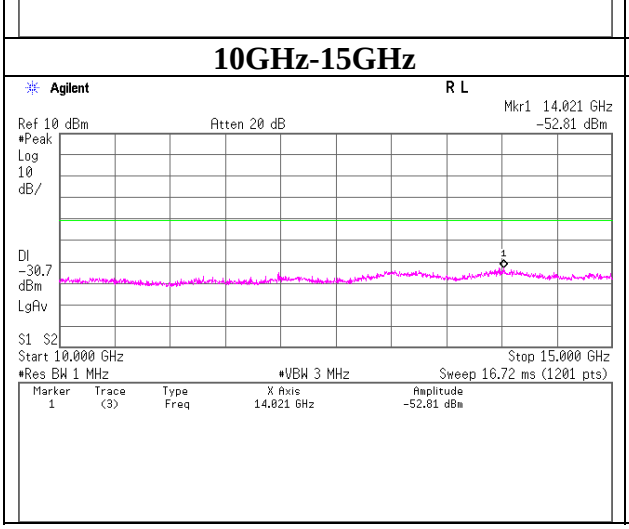
1GHz-5GHz



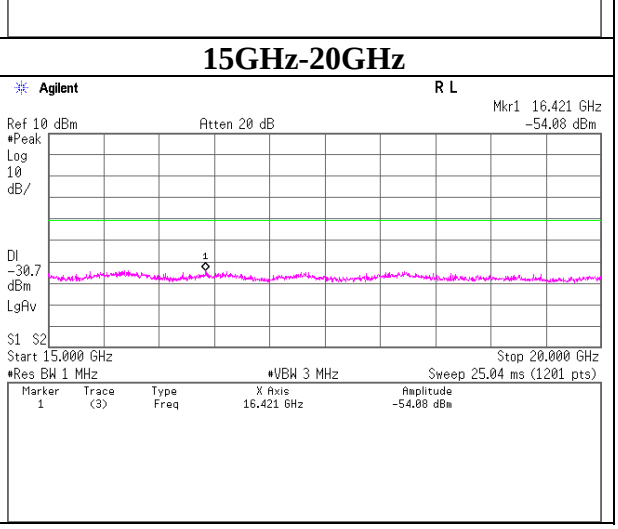
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz

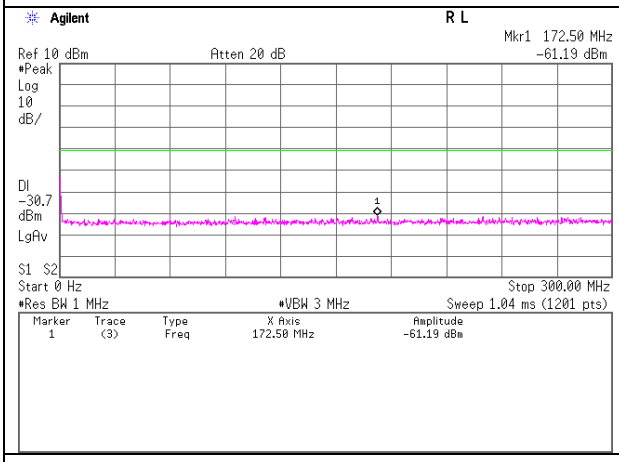


Spurious Emission (Conducted)

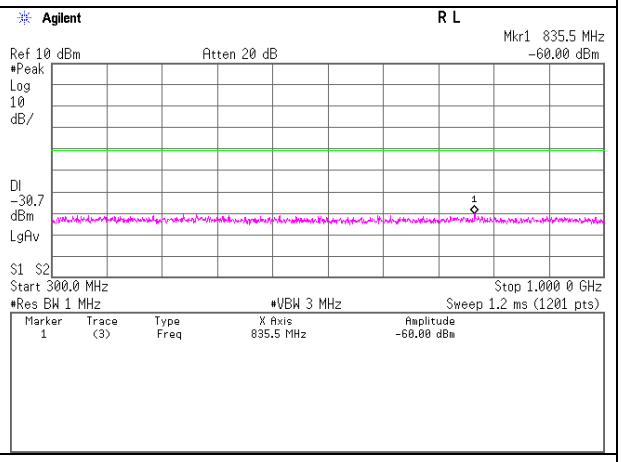
W-CDMA Band II

Tx:1907.6MHz

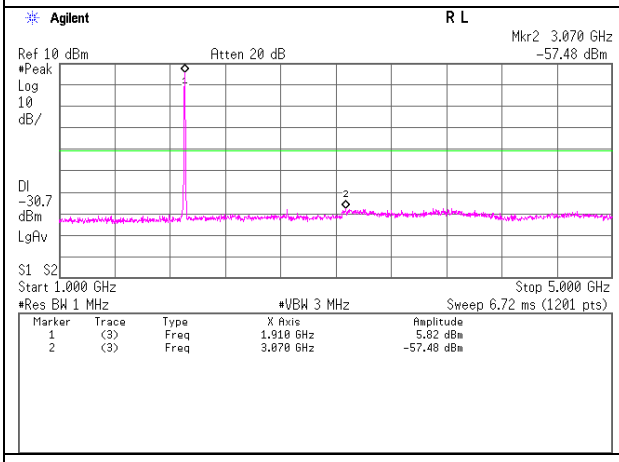
0Hz-300MHz



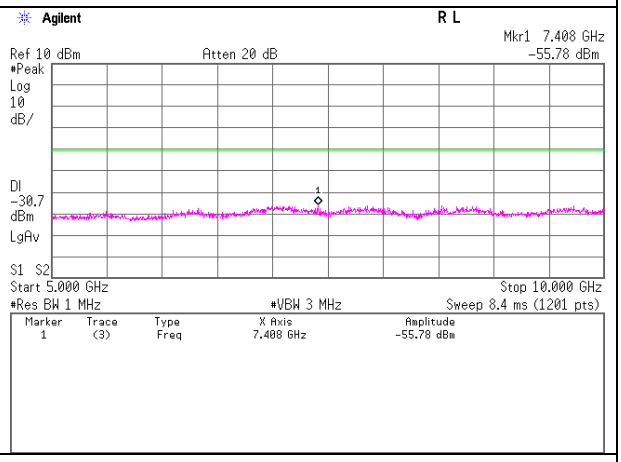
300MHz-1GHz



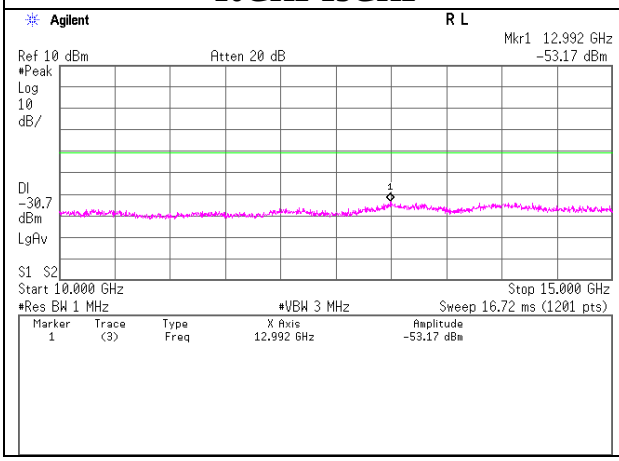
1GHz-5GHz



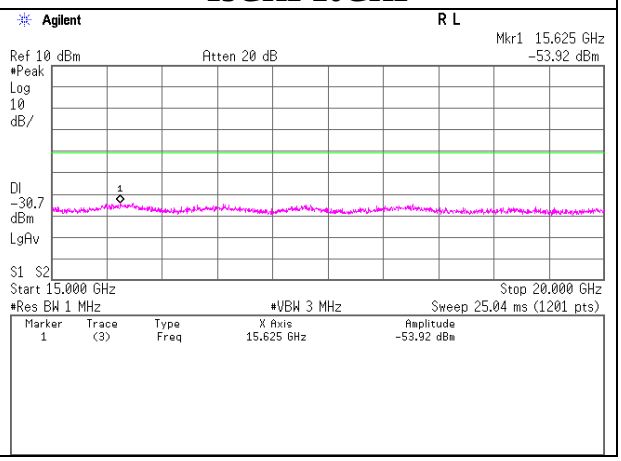
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



Spurious Emission (Radiated)

PCS1900

Report No.	10004954H
Test place	Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date	03/19/2013
Temperature / Humidity	22deg. C / 32% RH
Engineer	Katsunori Okai
Mode	Tx GPRS(GMSK), 1slot, CS-1, PCL=0

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.]	
3700.40	49.7	48.5	-53.4	-55.2	4.7	12.4	0.0	-45.7	-47.6	-13.0	32.7	34.6	101	128	103	98	
5550.60	63.0	61.9	-36.1	-38.7	5.9	12.8	0.0	-29.2	-31.7	-13.0	16.2	18.7	105	169	101	266	
7400.80	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Tx 1880MHz

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.]	
3760.00	49.5	48.8	-53.4	-55.4	4.8	12.4	0.0	-45.8	-47.8	-13.0	32.8	34.8	100	192	105	264	
5640.00	63.3	60.4	-35.7	-40.6	5.9	12.9	0.0	-28.7	-33.7	-13.0	15.7	20.7	104	171	100	268	
7520.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

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.]	
3819.60	48.9	47.0	-53.8	-56.8	4.8	12.4	0.0	-46.2	-49.2	-13.0	33.2	36.2	101	210	103	122	
5729.40	61.5	56.7	-37.5	-44.1	6.0	13.0	0.0	-30.5	-37.1	-13.0	17.5	24.1	100	175	112	68	
7639.20	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).
Detector : S/A PK(RBW:1MHz/VBW:3MHz)
NS : No Signal detect

Spurious Emission (Radiated)

W-CDMA Band II

Report No.	10004954H
Test place	Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date	03/19/2013
Temperature / Humidity	21deg. C / 52% RH
Engineer	Keisuke Kawamura
Mode	Tx W-CDMA(RMC12.2kbps), All Up Bits

Tx: 1852.4MHz

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.]	
3704.80	53.9	53.5	-50.1	-51.5	4.8	12.4	0.0	-42.5	-43.9	-13.0	29.5	30.9	103	129	100	188	
5557.20	50.7	50.7	-50.2	-52.2	5.9	12.8	0.0	-43.3	-45.3	-13.0	30.3	32.3	103	126	100	295	

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) [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.]	
3760.00	54.8	54.3	-49.5	-50.8	5.9	12.9	0.0	-42.5	-43.8	-13.0	29.5	30.8	100	101	101	314	
5640.00	54.6	51.6	-45.2	-51.0	6.9	11.1	0.0	-41.0	-46.8	-13.0	28.0	33.8	100	142	100	121	

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: 1907.6MHz

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.]	
3815.20	48.4	48.5	-58.2	-58.9	4.8	12.4	0.0	-50.6	-51.3	-13.0	37.6	38.3	100	140	100	317	
5722.80	50.6	48.6	-50.1	-56.0	6.0	13.0	0.0	-43.1	-49.0	-13.0	30.1	36.0	101	177	100	299	

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)

PCS1900 / Tx: 1880.0MHz

Test place	Head Office EMC Lab. No.7 shielded room
Report No.	10004954H
Date	04/08/2013
Temperature/ Humidity	20 deg. C / 30% RH
Engineer	Katsunori Okai
Mode	Tx GPRS(GMSK), 1slot, CS-1, PCL=5

Temp. [deg.C]	Volt. [%]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30	100	1879.99998134	5.70	0.0030	2.5
-20	100	1879.99997486	-0.78	-0.0004	2.5
-10	100	1879.99997810	2.46	0.0013	2.5
0	100	1879.99997863	2.99	0.0016	2.5
10	100	1879.99997694	1.30	0.0007	2.5
20	100	1879.99997564	0.00	0.0000	Reference
30	100	1879.99997797	2.33	0.0012	2.5
40	100	1879.99997434	-1.30	-0.0007	2.5
50	100	1879.99997831	2.67	0.0014	2.5

Temp. [deg.C]	Volt. [%]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	115	1879.99997644	0.80	0.0004	2.5
20	100	1879.99997564	0.00	0.0000	Reference
20	85	1879.99997665	1.01	0.0005	2.5

Frequency Stability (Temperature/Voltage Variation)

W-CDMA Band II / Tx: 1880.0MHz

Test place	Head Office EMC Lab. No.7 shielded room
Report No.	10004954H
Date	04/08/2013
Temperature/ Humidity	20 deg. C / 30% RH
Engineer	Katsunori Okai
Mode	Tx W-CDMA(RMC12.2kbps), All Up Bits

Temp. [deg.C]	Volt. [%]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30	100	1879.9999904	0.9	0.00048	2.5
-20	100	1879.9999907	1.2	0.00064	2.5
-10	100	1879.9999901	0.6	0.00032	2.5
0	100	1879.9999897	0.2	0.00011	2.5
10	100	1879.9999890	-0.5	0.00027	2.5
20	100	1879.9999895	0.0	0.00000	Reference
30	100	1879.9999888	-0.7	-0.00037	2.5
40	100	1879.9999887	-0.8	-0.00043	2.5
50	100	1879.9999893	-0.2	-0.00011	2.5

Temp. [deg.C]	Volt. [%]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	115	1879.9999885	-1.0	-0.00053	2.5
20	100	1879.9999895	0.0	0.00000	Reference
20	85	1879.99998880	-0.7	-0.00037	2.5

APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2013/02/26 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	RE	2012/06/19 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2012/10/08 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2012/10/08 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2013/02/06 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2012/11/06 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2012/09/11 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE/AT	2013/04/03 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2013/02/15 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2013/01/10 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2013/02/15 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2012/09/05 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2012/11/20 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2012/05/30 * 12
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2012/07/23 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2012/08/17 * 12
MCC-130	Microwave Cable (1-33GHz)	HUBER+SUHNER	SF103/ 11PC3.5-31/ 11PC3.5-31/8.0m	54308/3	RE	2013/01/29 * 12
MRF-02	Band Rejection Filter (1850-1910MHz)	TOKYO KEIKI	1850-1910MHz	-	RE	2012/06/05 * 12
MCC-98	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	30819/2	RE	2012/05/09 * 12
MURC-05	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	127576	RE/AT	2012/10/04 * 12
MPD-01	PowerDivider DC to 26.5GHz	Agilent	11636B	52258	AT	2013/03/28 * 12
MAT-24	Attenuator(10dB) (above1GHz)	Agilent	8493C	71389	AT	2012/06/27 * 12
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2012/10/19 * 12
MOS-04	Digital Humidity Indicator	N.T	NT-1800	MOS04	AT	2013/02/26 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2013/02/26 * 12
MURC-02	Wireless Communication Test Set	Agilent	E5515C	GB47050683	RE/AT	2012/12/19 * 12
MURC-03	Radio Communication Analyzer	Anritsu	MT8815B	6200711471	RE/AT	2012/12/19 * 12
MCH-06	Temperature and Humidity Chamber	Tabai Espec	PL-1KT	14007630	AT	2012/04/20 * 12

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 test