RADIO TEST REPORT

Test Report No.: 4786001719H-A-R1

Applicant	:	**NEC Corporation of America**
Type of Equipment	:	**Digital Portable Cellular Telephone**
Model No.	:	**KMP7R4H1-6A**
Test regulation	:	**FCC Part 22 Subpart H: 2006**
FCC ID	:	**A98-FQM6833**
Test Result	:	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with 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 4786001719H-A. 4786001719H-A is replaced with this report.

Date of test: December 11 to 20, 2012

Representative test engineer:

Katsunori Okai
Engineer of WiSE Japan,
UL Verification Service

Approved by:

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Leader of WiSE Japan,
UL Verification Service

NVLAP LAB CODE: 200572-0

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REVISION HISTORY

Original Test Report No.: 4786001719H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	4786001719H-A	January 23, 2013	-	-
1	4786001719H-A-R1	January 30, 2013	P18	Corrected the explanatory sentence about voltage in Section 8.
2	4786001719H-A-R1	January 30, 2013	P22, 23	Corrected RF Output Power (Radiated) data

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SECTION 1: Customer information

Company Name	:	NEC Corporation of America
Address	:	Radio Communications Systems Division 6535N. State Highway 161, Irving, TX 75039-2402 USA
Telephone Number	:	+1 214 262 4241
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Contact Person	:	Sanjay Wadhwa

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

2.1 Identification of E.U.T.

Type of Equipment	:	Digital Portable Cellular Telephone
Model No.	:	KMP7R4H1-6A
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.8V (DC 3.4 - 4.2V)
Receipt Date of Sample	:	December 10, 2012
Country of Mass-production	:	Japan
Condition of EUT	:	Production prototype
Modification of EUT	:	No Modification by the test lab

2.2 Product description

Model No: KMP7R4H1-6A, (referred to as the EUT in this report), is the Digital Portable Cellular Telephone.

Radio Specification [1/2]

Bluetooth (Ver.2.1 + EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern Antenna
Antenna Gain	-3.0 dBi

Low Energy (Ver.4.0)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern antenna
Antenna Gain	-3.0 dBi

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

Equipment Type	Transceiver
Frequency of Operation	2412-2462MHz
Type of Modulation	DSSS, OFDM
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern antenna
Antenna Gain	-3.0 dBi

GSM

Equipment Type	Transceiver
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz
Type of Modulation	GMSK
Emission Designator	GSM850: 254KGXW, PCS: 259KGXW
Channel spacing	200kHz
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern antenna
Antenna Gain	+2.5dBi (PCS), 0.0dBi (GSM850)

Radio Specification [2/2]

WCDMA

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band V: 824 – 849MHz [Down Link] Band V: 869 – 894MHz
Type of Modulation	HPSK
Emission Designator	4M16F9W
Channel spacing	5MHz
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern antenna
Antenna Gain	0 dBi

GPS

Equipment Type	Receiver
Receiver Type	Direct Downconversion
Frequency of Operation	1575.42MHz
Antenna Connector Type	Integrated antenna
Antenna Type	Pattern antenna
Antenna Gain	-3.0dBi

*This test report applies for GSM(GSM850) and W-CDMA.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 22 Subpart H: 2006, final revised on November 29, 2006
Title : FCC 47CFR Part 22 Subpart H
Cellular Radiotelephone Service

3.2 Procedures and results

Item	Test Specification & Procedure	Remarks	Deviation	Worst margin	Results
RF Output Power(Conducted/ Radiated) (Conducted Output Power / Effective radiated power(ERP))	FCC 2.1046 FCC 22.913(a)(2)	Conducted/ Radiated	N/A	-	Complied
Emission Bandwidth, 99% Occupied Bandwidth	FCC 2.1049 FCC 22.917	Conducted	N/A	-	Complied
Band-Edge	FCC 2.1051 FCC 2.1053 FCC 22.917	Conducted/ Radiated	N/A	**GSM** [Conducted] 1.37dB 849.019MHz [Radiated] 8.0dB 823.98MHz, Vert. **W-CDMA** [Conducted] 13.05dB 824.000MHz [Radiated] 19.3dB 849.03MHz, Vert.	Complied
Spurious Emission(Conducted)	FCC 2.1051 FCC 22.917	Conducted	N/A	-	Complied
Spurious Emission(Radiated)	FCC 2.1053 FCC 22.917	Radiated	N/A	**GSM** 17.9dB 2472.6MHz, Vert. **W-CDMA** 32.2 dB 2479.20MHz, Vert.	Complied
Frequency Stability (Temperature Variation)	FCC 2.1055(a)(1)(b) FCC 22.355	Conducted	N/A	-	Complied
Frequency Stability (Voltage Variation)	FCC 2.1055(d)(1)(2) FCC 22.355	Conducted	N/A	-	Complied
Note: UL Japan's EMI Work Procedures No. 13-EM-W0420					

*These tests were also referred to ANSI/TIA 603-C-2004 " Land Mobile FM or PM Communications Equipment Measurement and Performance Standards."
*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Uncertainty

EMI
The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Radiated Emission (EUT height: 0.8m) (±dB)	
Measurement Distance 3m	
30MHz-300MHz	5.5dB
300MHz-1000MHz	4.2dB
1GHz-12.75GHz	4.6dB

Power meter (±dB)	
Below 1GHz	Above 1GHz
1.0dB	1.0dB

Antenna terminal conducted emission and Power density (±dB)			Antenna terminal conducted emission (±dB)		Channel power (±dB)
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.0dB	1.1dB	2.7dB	3.2dB	3.3dB	1.5dB

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

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

3.4 Test Location

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

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

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

Refer to APPENDIX.

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

4.1 Operating Modes

<GSM850>

Test	Operating mode	Power control	Tested frequency	Channel
RF output Power(Conducted), Peak to Average power Ratio (Conducted)	Transmitting (Tx) (GSM, GMSK) Transmitting (Tx) (GPRS, GMSK)	Max	824.2MHz 836.6MHz 848.8MHz	128 190 251
RF output Power (Radiated),	Transmitting (Tx) (GSM, GMSK) *1)	Max	824.2MHz 836.6MHz 848.8MHz	128 190 251
Spurious Emission	Transmitting (Tx) (GSM, GMSK) *1)			
Band Edge (Conducted)	Transmitting (Tx) (GSM, GMSK) Transmitting (Tx) (GPRS, GMSK)	Max	824.2MHz 848.8MHz	128 251
Band Edge (Radiated)	Transmitting (Tx) (GSM, GMSK) *1)	Max	824.2MHz 848.8MHz	128 251
Emission Bandwidth, 99% Occupied Bandwidth, Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) (GSM, GMSK) *1)	Max	836.6MHz	190

*1) The mode was used for testing as a representative, because it had the worst RF output Power (Conducted).

<W-CDMA>

Test	Operating mode	Power Control	Tested frequency	Channel
RF output Power(Conducted)	Transmitting (Tx) W-CDMA (RMC12.2kbps), Transmitting (Tx) W-CDMA (AMR), Transmitting (Tx) W-CDMA (HSDPA Subtest 1-4), Transmitting (Tx) W-CDMA (HSUPA Subtest 1-5)	See Section 4.1.1	826.4MHz 836.6MHz 846.6MHz	4132 4183 4233
RF output Power (Radiated), Spurious Emission, Peak to Average power Ratio (Conducted)	Transmitting (Tx) W-CDMA (RMC12.2kbps) *1)	TPC all up bits (MAX)	826.4MHz 836.6MHz 846.6MHz	4132 4183 4233
Band Edge	Transmitting (Tx) W-CDMA (RMC12.2kbps) *1)	TPC all up bits (MAX)	826.4MHz 846.6MHz	4132 4233
Emission Bandwidth, 99% Occupied Bandwidth, Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) W-CDMA (RMC12.2kbps) *1)	TPC all up bits (MAX)	836.6MHz	4183

*1) The mode was used for testing as a representative, because it had the worst RF output Power (Conducted).
*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.)

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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 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

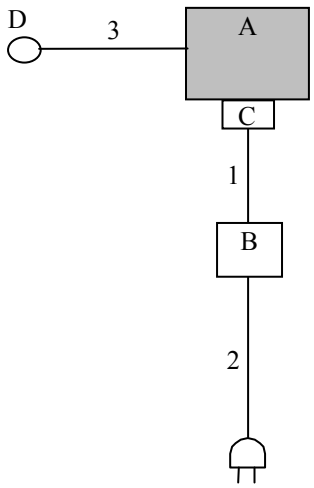
HSUPA Reference E-TFCI Parameters
[Subtest 1,2,4,5]

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	Remark
A	Digital Portable Cellular Telephone	KMP7R4H1-6A	004401201130115 *1) 004401201130149 *2) 004401201130156 *3)	NEC Corporation of America	EUT
B	AC Adaptor	MAS-BH0008-A002	-	MITSUMI	-
C	Micro USB	FOMA charging microUSB adapter N01	-	NEC Corporation of America	-
D	Earphone	-	-	NEC Corporation of America	-

*1) Used for Antenna Terminal Conducted test
*2) Used for Radiated Emission tests (RF Output Power, Band-Edge and Spurious Emission(Above 1GHz))
*3) Used for Radiated Emission tests (Spurious Emission (Below 1GHz))

List of cables used

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

SECTION 5: RF Output Power (Conducted/Radiated)

[Conducted : Conducted Output Power]

Test Procedure

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

[Radiated : Effective radiated power(ERP)]

Test Procedure

1) EUT was placed on a 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 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, 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) Effective radiated power(ERP) was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).

- The carrier level and noise levels were confirmed at each position of X, Y and Z axis of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Test data : APPENDIX 1
Test result : Pass

SECTION 6: Bandwidth (Conducted)

Test Procedure
The Emission Bandwidth and 99% Occupied Bandwidth was measured with a spectrum analyzer and attenuator connected to the antenna port.

Test data : APPENDIX 1
Test result : Pass

SECTION 7: Spurious Emission and Band-Edge (Conducted/Radiated)

[Conducted]
Test Procedure
The Spurious Emission and Band-Edge was measured with a spectrum analyzer and attenuator connected to the antenna port.

Test data : APPENDIX 1
Test result : Pass

[Radiated]
Test Procedure
1) EUT was placed on a platform of nominal size, 0.5m 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 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) Effective 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).
For the usage of the antenna (Shorted dipole and Horn antenna) except for the Half wave dipole antenna (2.15dBi) for the Substitution antenna, the Effective radiated power was calculated by compensating the finite difference in the antenna gain of the Half wave dipole antenna, and Substitution antenna.

- The carrier level and noise levels were confirmed at each position of X, Y and Z axis of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Test data : APPENDIX 1
Test result : Pass

SECTION 8: Frequency Stability(Temperature/Voltage Variation)

Test Procedure
The Frequency Stability was measured with a Wireless Communication Test Set and attenuator connected to the antenna port.
The Frequency Drift was measured with the 10 deg. C. steps from –30 deg. C. to 50 deg. C., and it is presented as the ppm unit. The Frequency Drift was measured with the normal temperature (20 deg. C.) and Voltage tolerance (DC3.4V to DC4.2V), and it is presented as the ppm unit.

Temperature : –30deg.C to +50deg.C (10 deg. C. step)
Voltage : Vnom:DC3.8V, Vmin:DC3.4V, Vmax:DC4.2V

As the operating input voltage of the EUT is between DC3.4V to 4.2V (nominal voltage: DC3.8V), Frequency Stability test was performed under the above condition.

Test data : APPENDIX 1
Test result : Pass

APPENDIX 1: Data of EMI test

RF Output Power (Conducted)

Conducted Output Power
GSM Mode

Test place	Head Office EMC Lab. No.6 Measurement Room
Project No.	4786001719H
Date	12/20/2012
Temperature/ Humidity	22deg. C / 41% RH
Engineer	Katsunori Okai
Mode	Tx

Mode	Ch	Frequency [MHz]	Reading Average frame power [dBm]	Cable Loss [dB]	Result [dBm]
GSM (GMSK)	Low	824.2	33.35	0.54	33.89
	Mid	836.6	33.48	0.54	34.02
	High	848.8	33.59	0.54	34.13
GPRS (GMSK)	Low	824.2	33.32	0.54	33.86
	Mid	836.6	33.46	0.54	34.00
	High	848.8	33.55	0.54	34.09

Results = Reading + Cable Loss

RF Output Power (Conducted)

Conducted Output Power
W-CDMA Mode

Test place	Head Office EMC Lab. No.2 Preparation Room
Project No.	4786001719H
Date	12/20/2012
Temperature/ Humidity	22deg. C / 41% RH
Engineer	Yutaka Yoshida
Mode	Tx

Mode	Ch	Frequency [MHz]	Reading AVG [dBm]	Cable Loss [dB]	Result [dBm]
RMC 12.2kbps	Low	826.4	23.76	0.73	24.49
	Mid	836.6	23.66	0.73	24.39
	High	846.6	23.70	0.73	24.43
AMR	Low	826.4	23.74	0.73	24.47
	Mid	836.6	23.65	0.73	24.38
	High	846.6	23.68	0.73	24.41
HSDPA Subtest 1	Low	826.4	23.47	0.73	24.20
	Mid	836.6	23.44	0.73	24.17
	High	846.6	23.43	0.73	24.16
HSDPA Subtest 2	Low	826.4	23.73	0.73	24.46
	Mid	836.6	23.41	0.73	24.14
	High	846.6	23.47	0.73	24.20
HSDPA Subtest 3	Low	826.4	23.33	0.73	24.06
	Mid	836.6	22.99	0.73	23.72
	High	846.6	23.31	0.73	24.04
HSDPA Subtest 4	Low	826.4	23.36	0.73	24.09
	Mid	836.6	23.04	0.73	23.77
	High	846.6	23.28	0.73	24.01
HSUPA Subtest 1	Low	826.4	22.63	0.73	23.36
	Mid	836.6	23.26	0.73	23.99
	High	846.6	22.59	0.73	23.32
HSUPA Subtest 2	Low	826.4	21.38	0.73	22.11
	Mid	836.6	21.52	0.73	22.25
	High	846.6	21.37	0.73	22.10
HSUPA Subtest 3	Low	826.4	21.71	0.73	22.44
	Mid	836.6	21.58	0.73	22.31
	High	846.6	21.65	0.73	22.38
HSUPA Subtest 4	Low	826.4	21.40	0.73	22.13
	Mid	836.6	21.58	0.73	22.31
	High	846.6	20.94	0.73	21.67
HSUPA Subtest 5	Low	826.4	23.39	0.73	24.12
	Mid	836.6	22.63	0.73	23.36
	High	846.6	23.11	0.73	23.84

Results = Reading + Cable Loss

MPR Explanation

The product implements an Enhanced MPR (E-MPR) software algorithm that also considers power compression (Scaling), a requirement per 3GPP 25.214 section 5.1.2.6, to generate a more accurate Cubic Metric (CM) value that is used to determine the magnitude of power reduction for HSPA signals. The Enhanced MPR solution can introduce a deviation of the actual observed power reduction from the MPR target values configured for a device.

In the power scaling process defined by 3GPP TS 25.214, the channel beta values are modified as the transmitted signal approaches maximum power to ensure that the transmit power does not exceed the maximum rated transmit power and is also compliant with emissions requirements. The power scaling process considers the software-defined MPR target values based on the CM for the signal to be transmitted to determine the required power reduction for a given signal. The actual CM value of the signal transmitted after power scaling, however, is often different from the estimated CM value used in the power reduction algorithm.

An accurate CM value is desirable as the goal of power reduction is to maintain compliance with emissions limits. By using a more accurate CM value, the E-MPR process minimizes the magnitudes of power reduction required to maintain emissions compliance whereas the legacy MPR software may incorporate a magnitude of power reduction that is higher than is required for emissions compliance.

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)

Effective radiated power(ERP)
GSM Mode

Report No.	4786001719H
Test place	Head Office EMC Lab.
Semi Anechoic Chamber	No.2
Date	12/14/2012
Temperature / Humidity	23deg. C / 22 % RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK)

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [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.]	
824.20	95.7	92.4	40.2	40.7	5.7	2.15	10.0	24.5	25.0	38.4	13.9	13.4	113	95	138	222	
836.60	95.4	92.1	40.2	40.1	5.8	2.15	10.0	24.4	24.3	38.4	14.0	14.1	100	99	139	227	
848.80	91.8	92.5	37.1	40.1	5.8	2.15	10.1	21.2	24.2	38.4	17.2	14.2	110	99	127	269	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : S/A PK (RBW: 3MHz, VBW: 8MHz)

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

RF Output Power (Radiated)

Effective radiated power(ERP)
W-CDMA (RMC12.2kbps) Mode

Report No.	4786001719H
Test place	Head Office EMC Lab.
Semi Anechoic Chamber	No.2
Date	12/14/2012
Temperature / Humidity	23deg. C / 22 % RH
Engineer	Yutaka Yoshida
Mode	Tx W-CDMA(RMC12.2kbps)

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [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.]	
826.40	87.8	84.5	31.7	33.2	5.7	2.15	10.0	16.0	17.5	38.4	22.5	21.0	100	88	136	313	
836.60	88.4	85.6	32.3	33.9	5.8	2.15	10.0	16.5	18.1	38.4	21.9	20.3	100	101	136	299	
846.60	87.2	85.8	30.3	33.5	5.8	2.15	10.1	14.5	17.7	38.4	24.0	20.8	113	103	133	265	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : S/A PK (RBW: 5MHz, VBW: 50MHz)

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

Peak to Average power Ratio (Conducted)

Test place	Head Office EMC Lab. No.6 Measurement Room
Project No.	4786001719H
Date	12/13/2012
Temperature/ Humidity	21deg. C / 38% RH
Engineer	Katsunori Okai
Mode	Tx GSM(GMSK)
	Tx GPRS(GMSK)
	Tx W-CDMA(RMC12.2kbps)

Mode	Channel	Frequency [MHz]	Peak to Average power Ratio [dB]
GSM *1)	128	824.2	0.03
	190	836.6	0.05
	251	848.8	0.05
GPRS *1)	128	824.2	0.03
	190	836.6	0.05
	251	848.8	0.05
W-CDMA *2)	4132	826.4	2.80
	4183	836.6	2.85
	4233	846.6	2.77

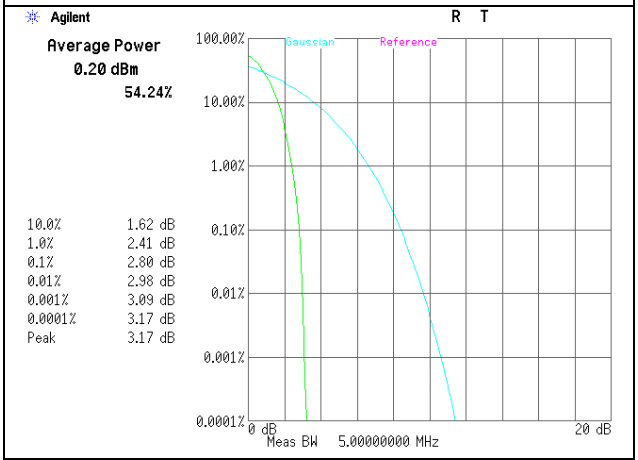
*In order to decide the largest deviation between the average and the peak power of the EUT in a bandwidth,
*1) an average and a peak trace of the spectrum analyzer was used for GSM Signals ;
*2) Complementary Cumulative Distribution Function (CCDF) curves of the spectrum analyzer were used for W-CDMA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

Peak to Average power Ratio (Coducted)

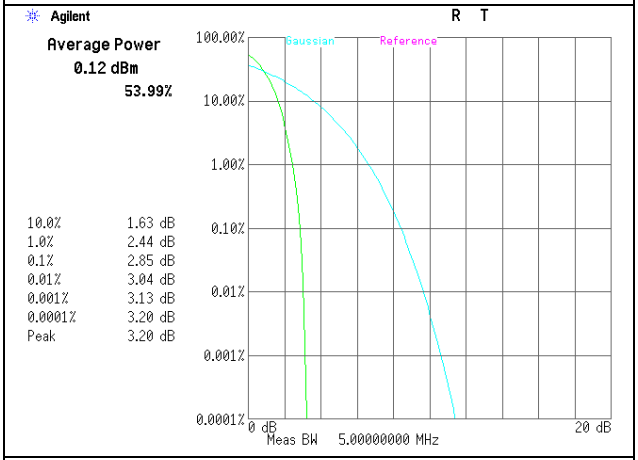
W-CDMA Band V

W-CDMA

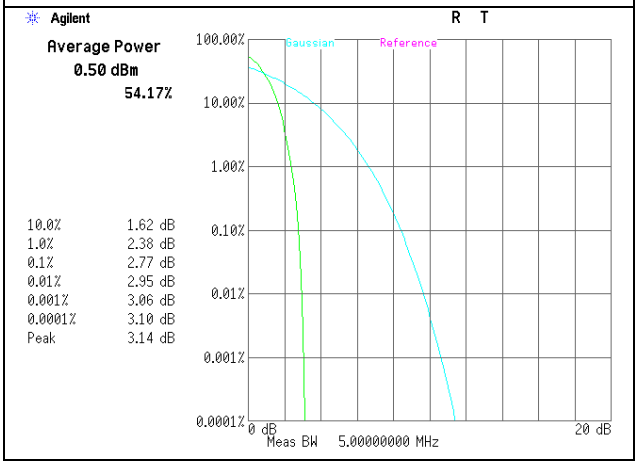
826.4MHz



836.6MHz



846.6MHz



*Set the spectrum analyzer radio mode to 3GPP WCDMA (CCDF)

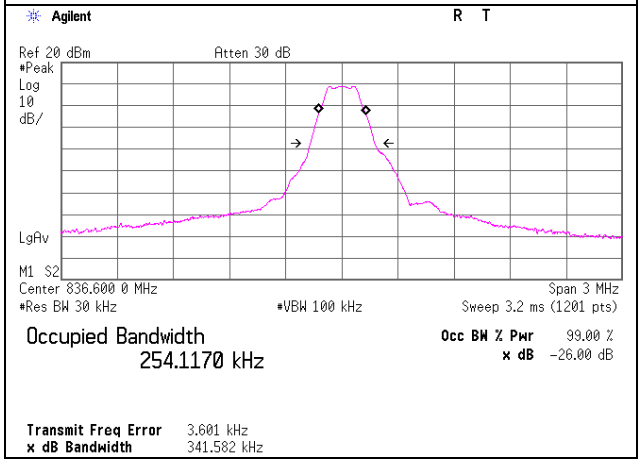
Bandwidth(Conducted)

GSM Mode

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

Mode	FREQ [MHz]	26dB Bandwidth [kHz]	99% OBW [kHz]	Limit [kHz]
GSM	836.6	341.582	254.1170	-

Tx:836.6MHz



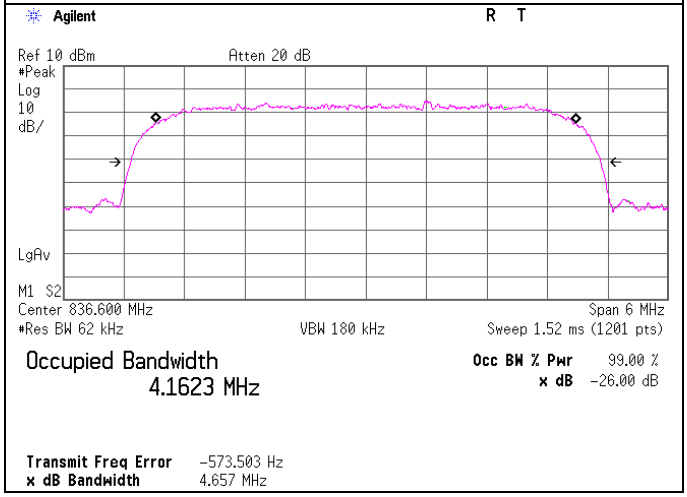
Bandwidth(Conducted)

W-CDMA (RMC12.2kbps) Mode

Test place	Head Office EMC Lab. No.6 Measurement Room
Project No.	4786001719H
Date	12/13/2012
Temperature/ Humidity	21deg. C / 38% RH
Engineer	Katsunori Okai
Mode	Tx W-CDMA(RMC12.2kbps)

CH	FREQ [MHz]	26dB Bandwidth [MHz]	99% OBW [MHz]	Limit [MHz]
Mid	836.6	4.657	4.1623	-

Tx: 836.6MHz



Band Edge (Conducted)

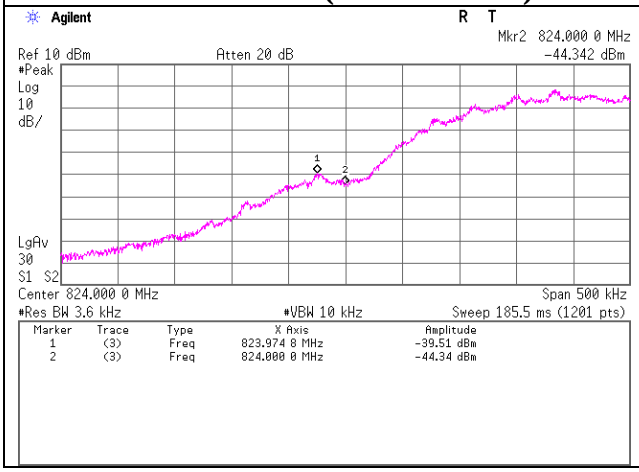
Test place	Head Office EMC Lab. No.6 Measurement Room
Project No.	4786001719H
Date	12/11/2012
Temperature/ Humidity	22deg. C / 41% RH
Engineer	Katsunori Okai
Mode	Tx GSM(GMSK)

Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
823.975	-39.51	19.93	4.37	-15.21	-13.0	2.21
824.000	-44.34	19.93	4.37	-20.04	-13.0	7.04
849.000	-41.76	19.93	4.37	-17.46	-13.0	4.46
849.019	-38.67	19.93	4.37	-14.37	-13.0	1.37

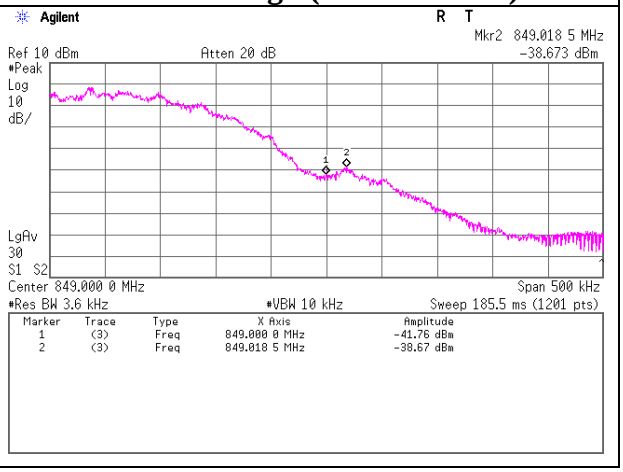
VIDEO AV 30 times

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

GSM Ch: Low (Tx:824.2MHz)



GSM Ch: High (Tx:848.8MHz)



Band Edge (Conducted)

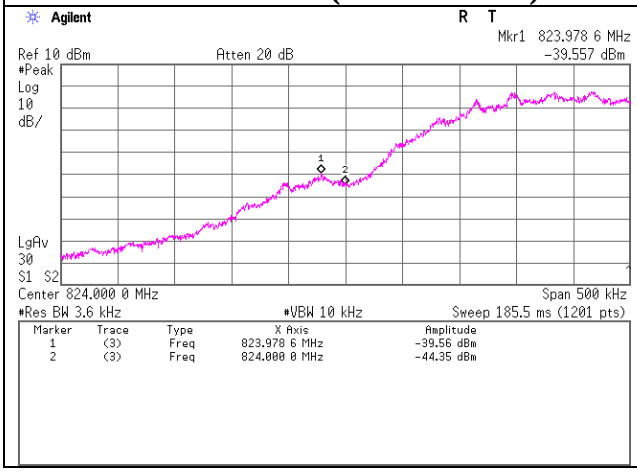
Test place	Head Office EMC Lab. No.6 Measurement Room
Project No.	4786001719H
Date	12/11/2012
Temperature/ Humidity	22deg. C / 41% RH
Engineer	Katsunori Okai
Mode	Tx GPRS(GMSK)

Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
823.979	-39.56	19.93	4.37	-15.26	-13.0	2.26
824.000	-44.35	19.93	4.37	-20.05	-13.0	7.05
849.000	-43.38	19.93	4.37	-19.08	-13.0	6.08
849.016	-38.71	19.93	4.37	-14.41	-13.0	1.41

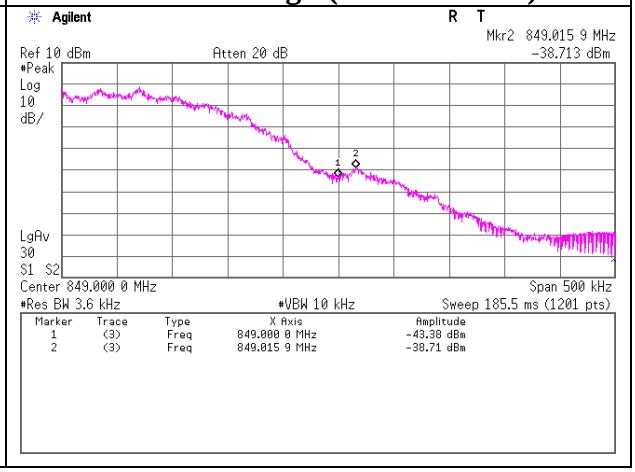
VIDEO AV 30 times

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

GPRS Ch: Low (Tx:824.2MHz)



GPRS Ch: High (Tx:848.8MHz)



Band Edge (Conducted)

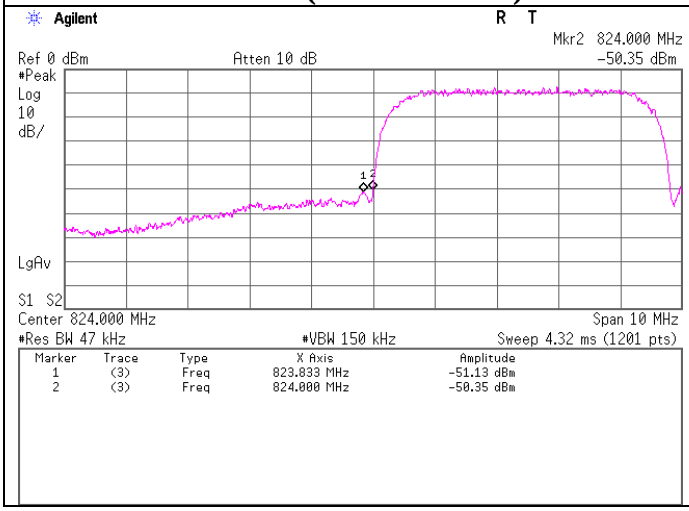
W-CDMA (RMC12.2kbps) Mode

Test place	Head Office EMC Lab. No.6 Measurement Room
Project No.	4786001719H
Date	12/13/2012
Temperature/ Humidity	21deg. C / 38% RH
Engineer	Katsunori Okai
Mode	Tx W-CDMA(RMC12.2kbps)

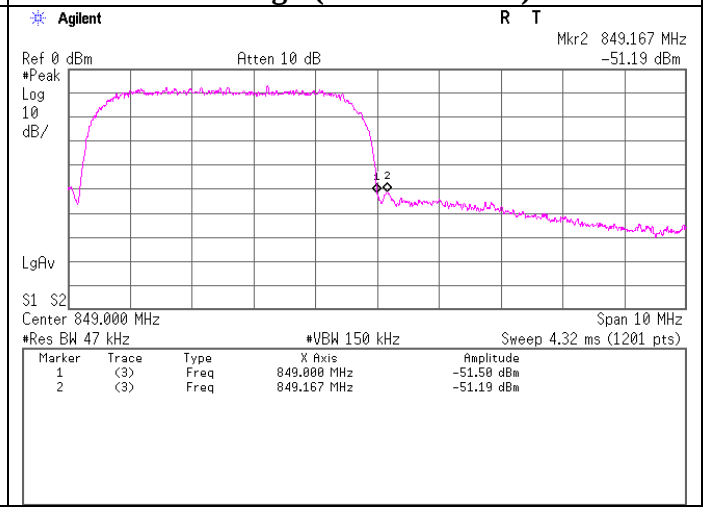
Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
823.833	-51.13	19.93	4.37	-26.83	-13.0	13.83
824.000	-50.35	19.93	4.37	-26.05	-13.0	13.05
849.000	-51.50	19.93	4.37	-27.20	-13.0	14.20
849.167	-51.19	19.93	4.37	-26.89	-13.0	13.89

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

Ch: Low (Tx: 826.4MHz)



Ch: High (Tx: 846.6MHz)



Band Edge (Radiated)

GSM Mode

Report No.	4786001719H
Test place	Head Office EMC Lab.
Semi Anechoic Chamber	No.2
Date	12/14/2012
Temperature / Humidity	23deg. C / 22 % RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK)

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [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.]	
823.98	47.5	44.2	-6.7	-5.3	5.7	2.15	10.0	-22.4	-21.0	-13.0	9.4	8.0	113	95	138	222	
824.00	44.6	41.9	-9.6	-7.6	5.7	2.15	10.0	-25.3	-23.3	-13.0	12.3	10.3	113	95	138	222	
849.00	38.0	39.1	-15.4	-11.5	5.8	2.15	10.1	-31.3	-27.4	-13.0	18.3	14.4	110	99	127	269	
849.02	44.2	45.2	-9.2	-5.4	5.8	2.15	10.1	-25.1	-21.3	-13.0	12.1	8.3	110	99	127	269	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : S/A AV (RBW: 3.6kHz, VBW: 10kHz)

Band Edge (Radiated)

W-CDMA (RMC12.2kbps) Mode

Report No.	4786001719H
Test place	Head Office EMC Lab.
Semi Anechoic Chamber	No.2
Date	12/14/2012
Temperature / Humidity	23deg. C / 22 % RH
Engineer	Yutaka Yoshida
Mode	Tx W-CDMA(RMC12.2kbps)

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [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.]	
823.83	38.4	33.0	-15.8	-16.7	5.7	2.15	10.0	-31.6	-32.4	-13.0	18.6	19.4	100	88	136	313	
824.00	36.0	32.1	-18.2	-17.6	5.7	2.15	10.0	-34.0	-33.3	-13.0	21.0	20.3	100	88	136	313	
849.00	34.5	32.6	-19.0	-18.2	5.8	2.15	10.1	-34.9	-34.0	-13.0	21.9	21.0	113	103	133	265	
849.03	36.8	34.3	-16.7	-16.5	5.8	2.15	10.1	-32.6	-32.3	-13.0	19.6	19.3	113	103	133	265	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : S/A PK (RBW: 47kHz, VBW: 150kHz)

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Spurious Emission (Conducted)

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

Limit Line

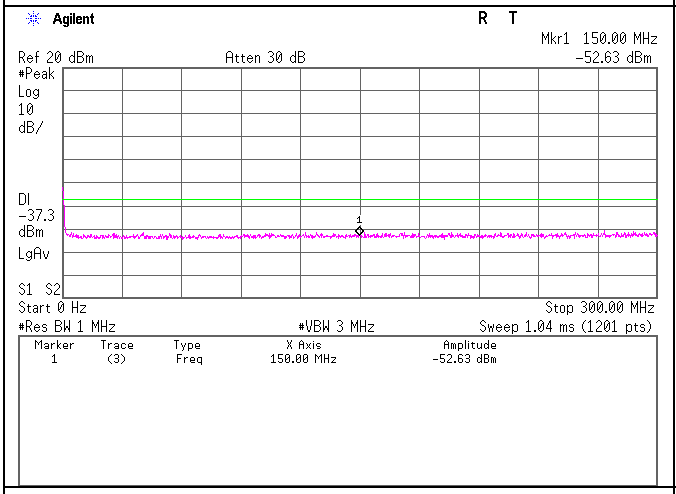
Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line [dBm]
824.2	-13.0	19.93	4.37	-37.3
836.6	-13.0	19.93	4.37	-37.3
848.8	-13.0	19.93	4.37	-37.3

Sample Calculation : Limit Line = Limit - Atten. - Cable Loss
*All the spurious noises were below the above limit line.

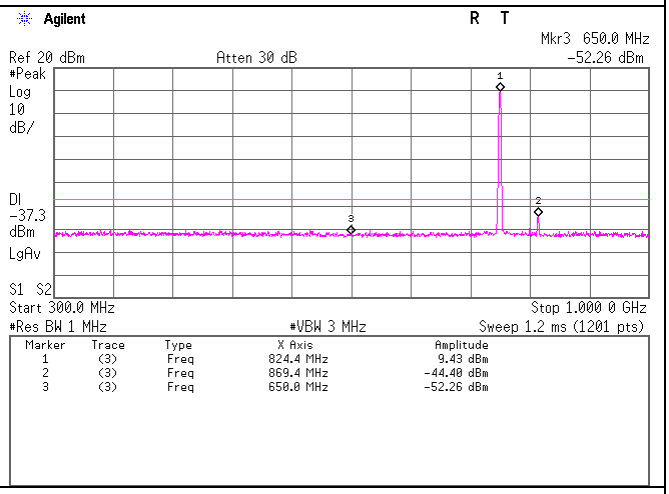
Spurious Emission (Conducted)

GSM Mode / Tx:824.2MHz

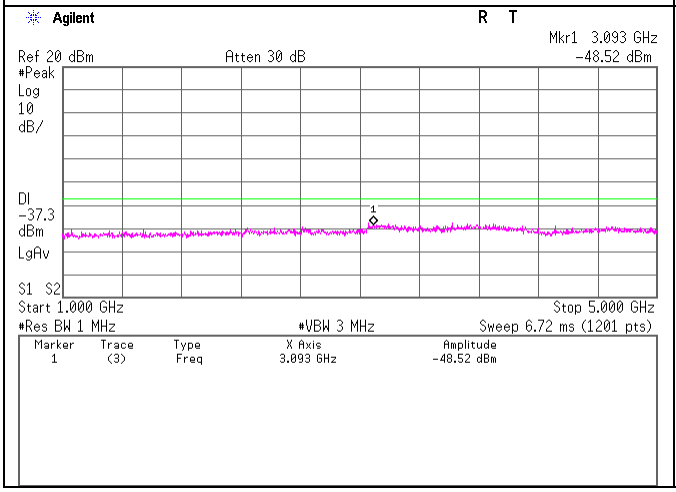
0Hz-300MHz



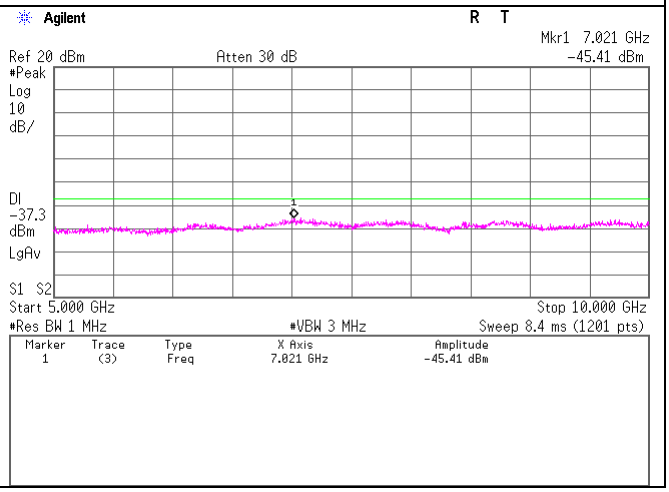
300MHz-1GHz



1GHz-5GHz



5GHz-10GHz



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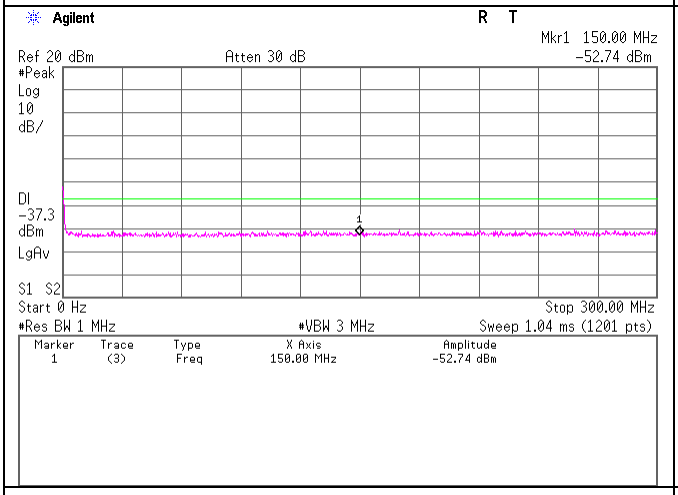
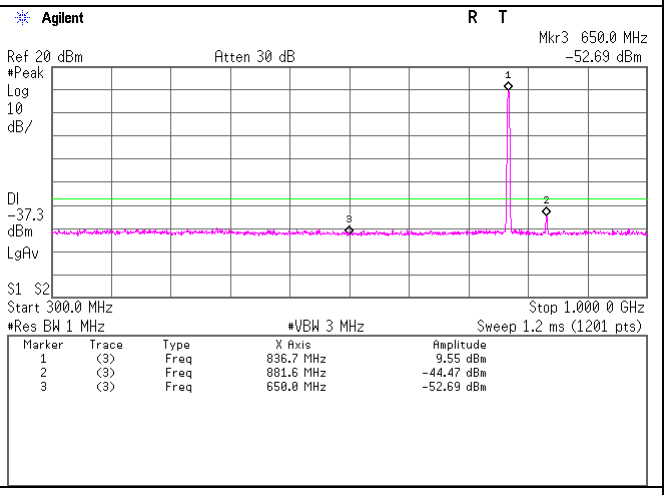
Spurious Emission (Conducted)

GSM Mode / Tx:836.6MHz

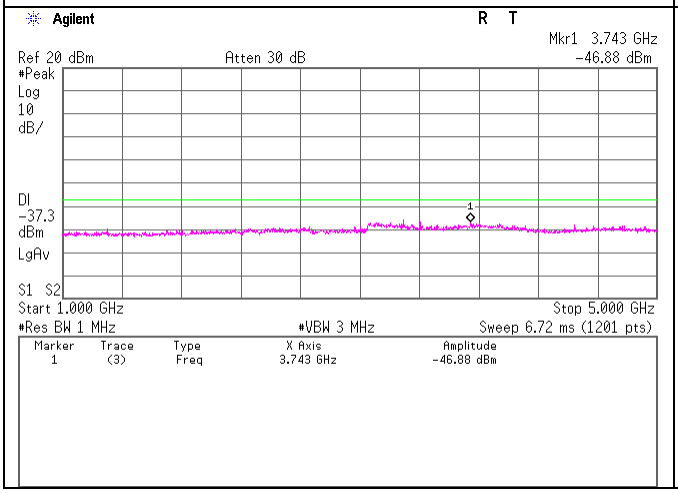
0Hz-300MHz



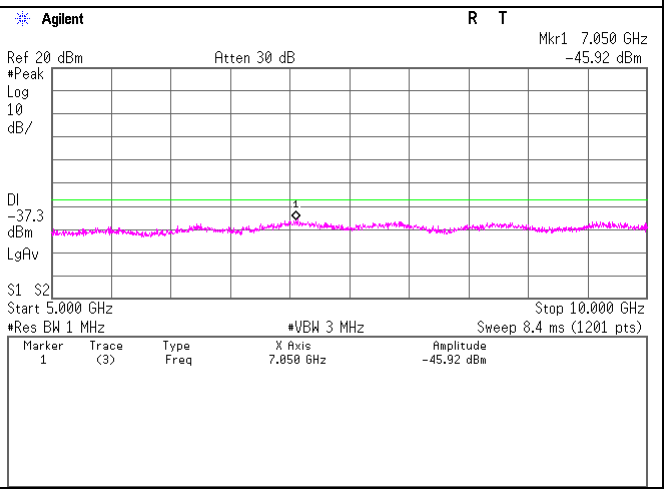
300MHz-1GHz



1GHz-5GHz



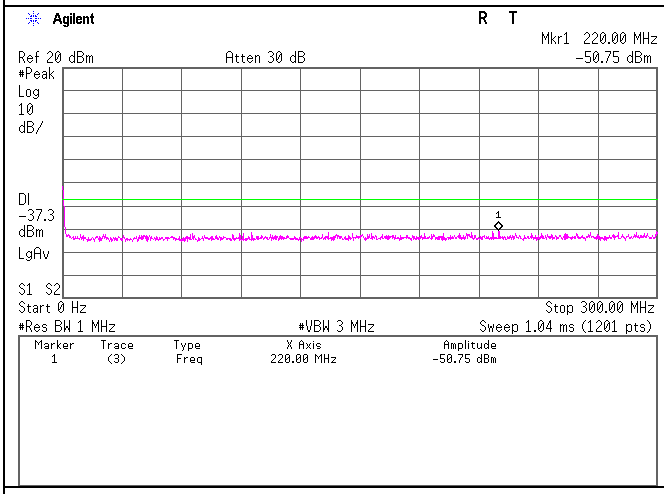
5GHz-10GHz



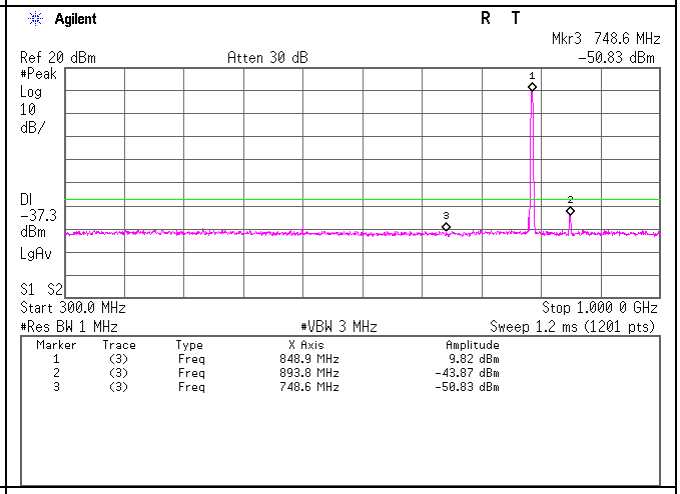
Spurious Emission (Conducted)

GSM Mode / Tx:848.8MHz

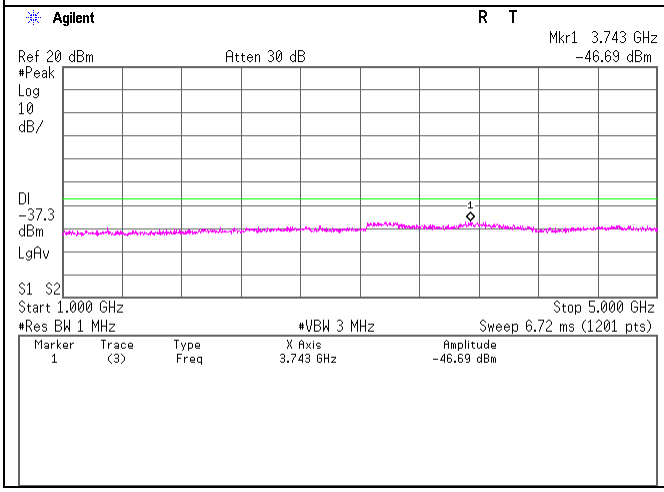
0Hz-300MHz



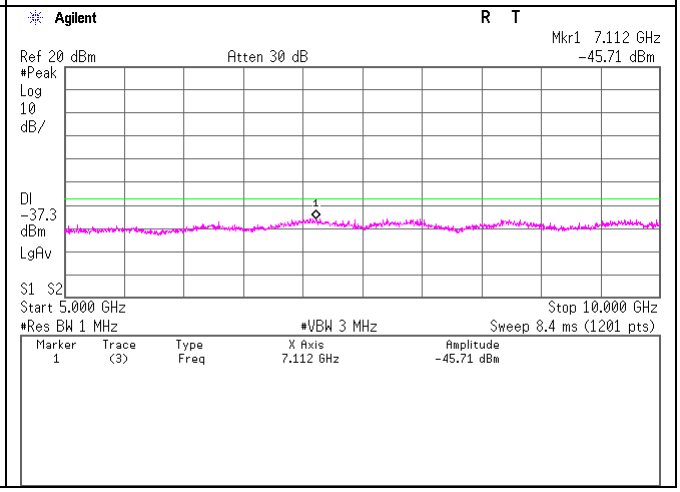
300MHz-1GHz



1GHz-5GHz



5GHz-10GHz



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Spurious Emission (Conducted)

W-CDMA (RMC12.2kbps) Mode

Test place	Head Office EMC Lab. No.6 Measurement Room
Project No.	4786001719H
Date	12/13/2012
Temperature/ Humidity	21deg. C / 38% RH
Engineer	Keisuke Kawamura
Mode	Tx W-CDMA(RMC12.2kbps)

Limit Line

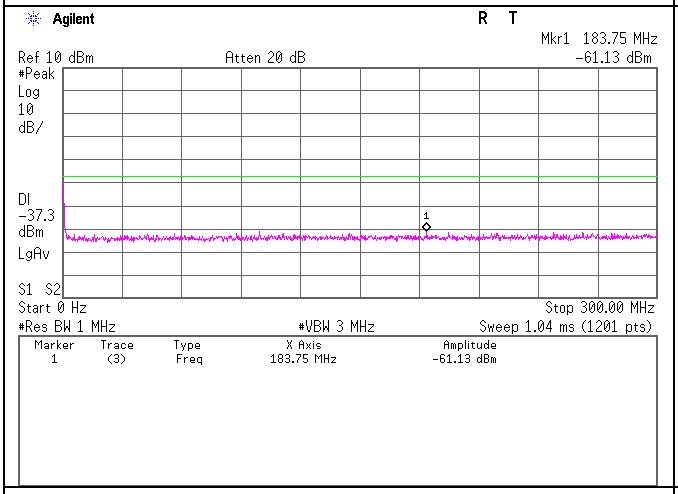
Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line [dBm]
826.4	-13.0	19.93	4.37	-37.3
836.6	-13.0	19.93	4.37	-37.3
846.6	-13.0	19.93	4.37	-37.3

Sample Calculation : Limit Line = Limit - Atten. - Cable Loss
*All the spurious noises were below the above limit line.

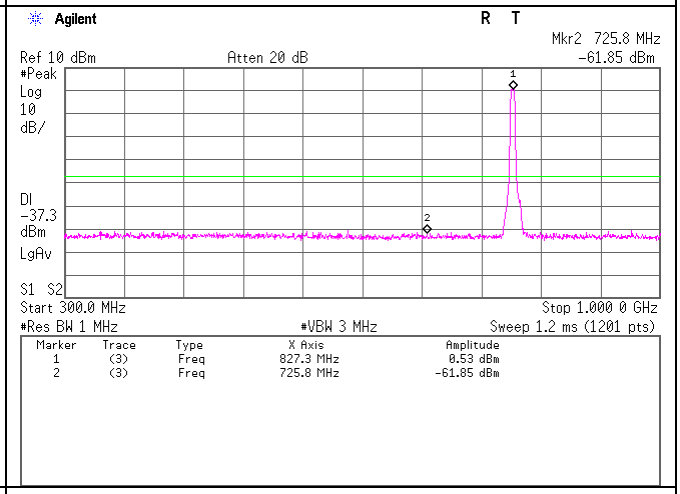
Spurious Emission (Conducted)

W-CDMA(RMC12.2kbps) Mode / Tx: 826.4MHz

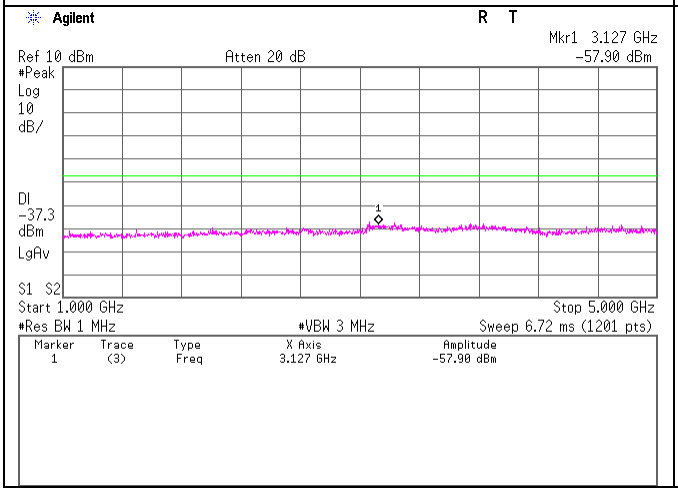
0Hz-300MHz



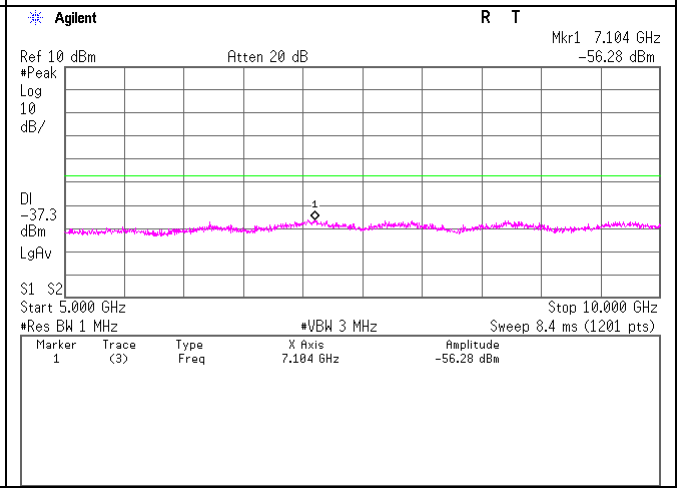
300MHz-1GHz



1GHz-5GHz



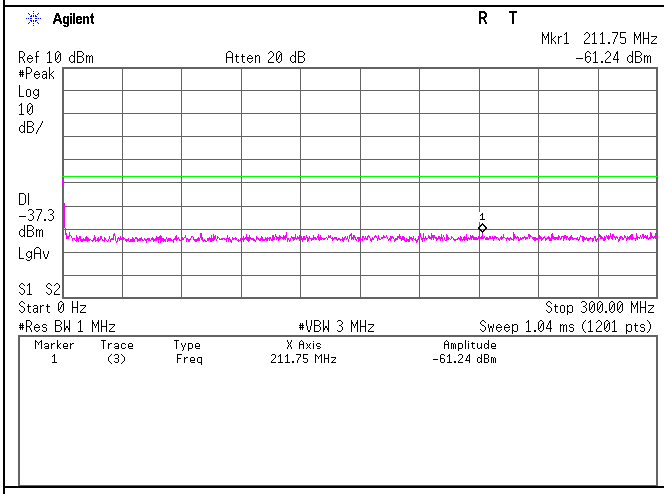
5GHz-10GHz



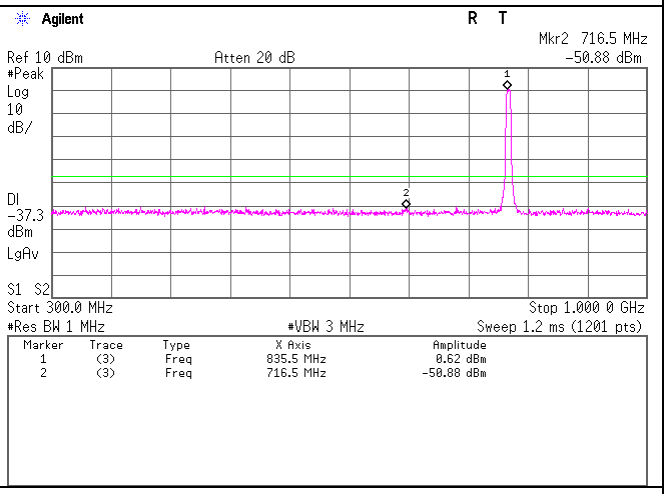
Spurious Emission (Conducted)

W-CDMA(RMC12.2kbps) Mode / Tx: 836.6MHz

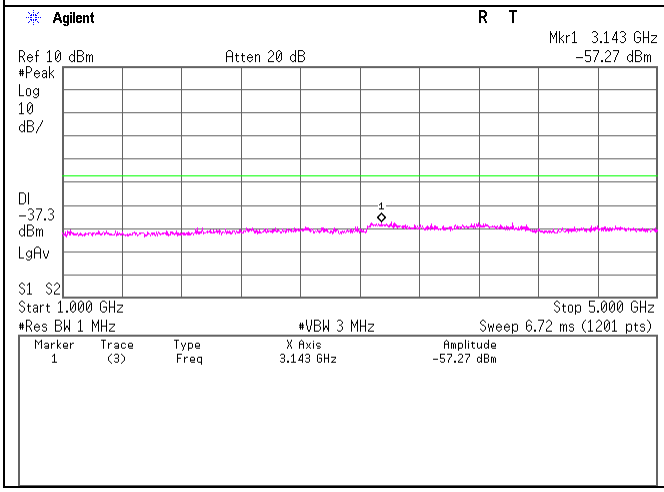
0Hz-300MHz



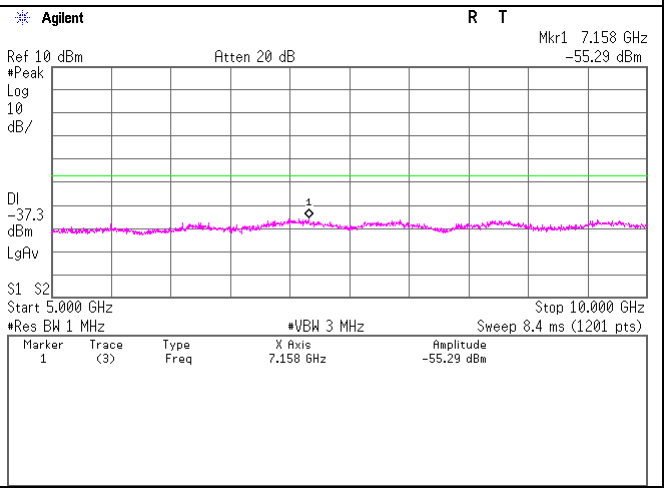
300MHz-1GHz



1GHz-5GHz



5GHz-10GHz



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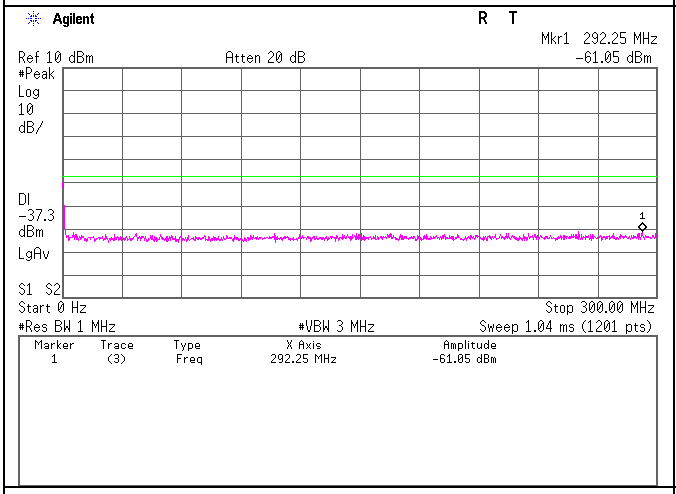
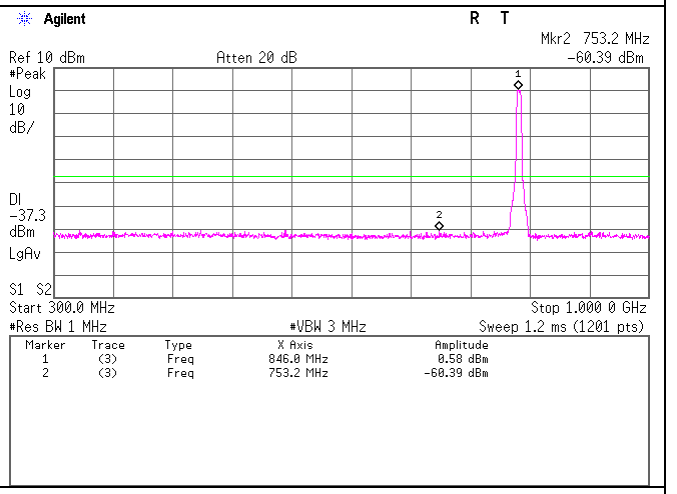
Spurious Emission (Conducted)

W-CDMA(RMC12.2kbps) Mode / Tx: 846.6MHz

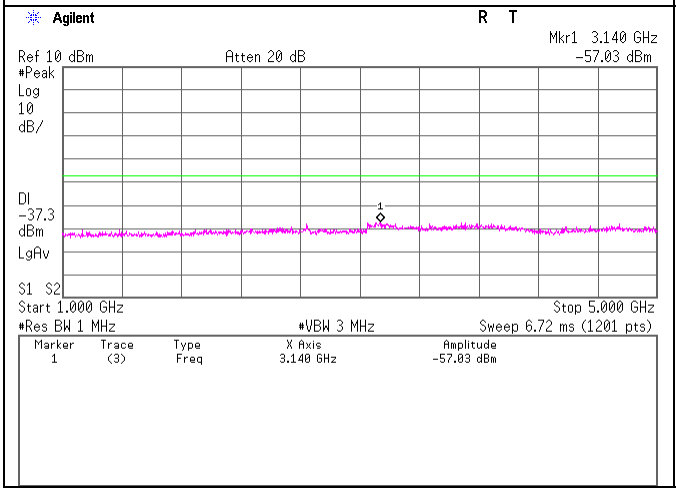
0Hz-300MHz



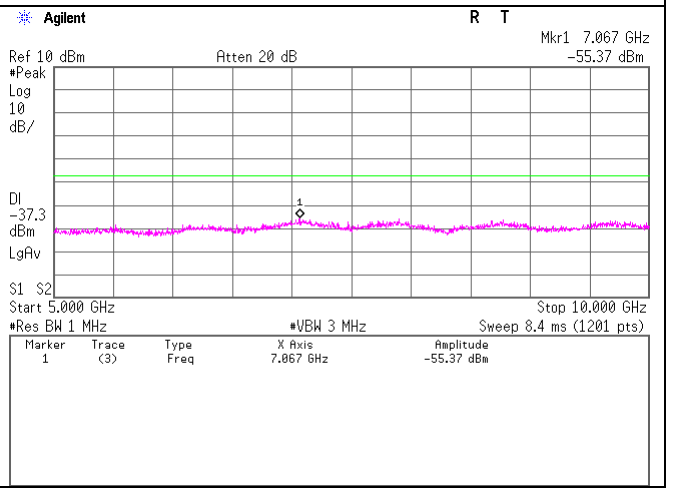
300MHz-1GHz



1GHz-5GHz



5GHz-10GHz



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Spurious Emission (Radiated)

GSM Mode

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

Tx : 824.2MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [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.]	
1648.40	60.6	60.4	-50.3	-51.2	3.8	9.1	0.0	-47.2	-48.0	-13.0	34.2	35.0	132	183	100	243	
2472.60	64.1	73.4	-44.8	-35.2	4.4	10.9	0.0	-40.5	-30.9	-13.0	27.5	17.9	100	326	100	164	
3296.80	48.6	53.5	-58.4	-53.9	4.4	11.9	0.0	-53.0	-48.5	-13.0	40.0	35.5	131	351	108	220	
4121.00	46.2	51.6	-57.5	-51.7	5.0	12.1	0.0	-52.5	-46.6	-13.0	39.5	33.6	100	140	144	322	
4945.20	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
5769.40	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6593.60	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
7417.80	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
8242.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : S/A PK (RBW : 1MHz, VBW : 3MHz)

Spurious Emission (Radiated)

GSM Mode

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

Tx : 836.6MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [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.]	
1673.20	57.0	61.4	-53.5	-50.3	3.8	9.2	0.0	-50.3	-47.1	-13.0	37.3	34.1	122	195	127	247	
2509.80	67.9	67.9	-41.0	-40.5	4.4	10.9	0.0	-36.7	-36.2	-13.0	23.7	23.2	100	326	100	184	
3346.40	57.6	49.0	-49.6	-58.0	4.5	12.0	0.0	-44.2	-52.6	-13.0	31.2	39.6	128	197	100	193	
4183.00	46.4	47.6	-57.2	-55.1	5.0	12.1	0.0	-52.2	-50.1	-13.0	39.2	37.1	100	211	100	190	
5019.60	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
5856.20	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6692.80	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
7529.40	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
8366.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : S/A PK (RBW: 1MHz, VBW: 3MHz)

Spurious Emission (Radiated)

GSM Mode

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

Tx : 848.8MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [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.]	
1697.60	53.8	55.3	-56.4	-56.8	3.8	9.4	0.0	-53.1	-53.4	-13.0	40.1	40.4	115	307	151	252	
2546.40	60.2	65.3	-48.5	-42.6	4.4	10.9	0.0	-44.1	-38.2	-13.0	31.1	25.2	100	324	104	114	
3395.20	48.2	47.5	-59.1	-59.1	4.5	12.1	0.0	-53.6	-53.6	-13.0	40.6	40.6	105	305	100	193	
4244.00	46.4	48.0	-55.7	-53.9	5.0	12.1	0.0	-50.8	-49.0	-13.0	37.8	36.0	123	16	109	123	
5092.80	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
5941.60	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6790.40	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
7639.20	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
8488.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : S/A PK (RBW: 1MHz, VBW: 3MHz)

Spurious Emission (Radiated)

W-CDMA(RMC12.2kbps) Mode

Report No.	4786001719H	
Test place	Head Office EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	12/14/2012	12/17/2012
Temperature / Humidity	23deg. C / 22 % RH	22deg. C / 25 % RH
Engineer	Yutaka Yoshida	Katsunori Okai
	Above 1GHz	Below 1GHz
Mode	Tx W-CDMA(RMC12.2kbps)	

Tx : 826.4MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [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.]	
1652.80	48.6	49.3	-62.1	-62.7	3.8	9.1	0.0	-58.9	-59.5	-13.0	45.9	46.5	100	194	110	288	
2479.20	53.8	59.3	-54.8	-49.5	4.4	10.9	0.0	-50.6	-45.2	-13.0	37.6	32.2	100	334	100	179	
3305.60	45.5	45.3	-61.5	-62.2	4.4	12.0	0.0	-56.1	-56.8	-13.0	43.1	43.8	100	0	100	0	
4132.00	NS	46.0	-	-56.8	5.0	12.1	0.0	-	-51.8	-13.0	-	38.8	-	-	140	169	
4958.40	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
5784.80	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6611.20	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
7437.60	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
8264.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : S/A PK (RBW: 1MHz , VBW: 3MHz)

Spurious Emission (Radiated)

W-CDMA(RMC12.2kbps) Mode

Report No.	4786001719H	
Test place	Head Office EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	12/14/2012	12/17/2012
Temperature / Humidity	23deg. C / 22 % RH	22deg. C / 25 % RH
Engineer	Yutaka Yoshida	Katsunori Okai
	Above 1GHz	Below 1GHz
Mode	Tx W-CDMA(RMC12.2kbps)	

Tx : 836.6MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP)	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.]	
1673.32	48.4	49.1	-62.0	-62.7	3.8	9.2	0.0	-58.8	-59.4	-13.0	45.8	46.4	100	237	108	128	
2509.80	49.7	57.0	-59.1	-51.5	4.4	10.9	0.0	-54.8	-47.2	-13.0	41.8	34.2	100	331	100	175	
3346.40	46.0	46.9	-61.0	-60.3	4.5	12.0	0.0	-55.6	-54.8	-13.0	42.6	41.8	120	154	140	218	
4183.00	45.8	45.2	-57.7	-57.4	5.0	12.1	0.0	-52.8	-52.5	-13.0	39.8	39.5	127	12	121	143	
5019.60	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
5856.20	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6692.80	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
7529.40	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
8366.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : S/A PK (RBW: 1MHz , VBW: 3MHz)

Spurious Emission (Radiated)

W-CDMA(RMC12.2kbps) Mode

Report No.	4786001719H	
Test place	Head Office EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	12/14/2012	12/17/2012
Temperature / Humidity	23deg. C / 22 % RH	22deg. C / 25 % RH
Engineer	Yutaka Yoshida	Katsunori Okai
	Above 1GHz	Below 1GHz
Mode	Tx W-CDMA(RMC12.2kbps)	

Tx : 846.6MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [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.]	
1693.20	50.4	49.9	-60.0	-62.6	3.8	9.3	0.0	-56.7	-59.2	-13.0	43.7	46.2	100	182	100	234	
2539.80	48.0	56.3	-61.0	-51.9	4.4	10.9	0.0	-56.7	-47.6	-13.0	43.7	34.6	100	257	118	160	
3386.40	45.9	46.3	-61.2	-60.5	4.5	12.1	0.0	-55.7	-55.0	-13.0	42.7	42.0	128	293	100	200	
4233.00	45.7	NS	-57.3	-	5.0	12.1	0.0	-52.4	-	-13.0	39.4	-	100	20	-	-	
5079.60	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
5926.20	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6772.80	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
7619.40	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
8466.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : S/A PK (RBW: 1MHz , VBW: 3MHz)

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Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
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Frequency Stability(Temperature/Voltage Variation)

GSM Mode / Tx:836.6MHz

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	4786001719H
Date	12/20/2012
Temperature/ Humidity	22deg. C / 33% RH
Engineer	Keisuke Kawamura
Mode	Tx GSM(GMSK)

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30	3.80	836.6000194	-4.0	-0.0048	2.5
-20	3.80	836.6000213	-2.1	-0.0025	2.5
-10	3.80	836.6000266	3.2	0.0038	2.5
0	3.80	836.6000316	8.2	0.0098	2.5
10	3.80	836.6000237	0.3	0.0004	2.5
20	3.80	836.6000234	0.0	0.0000	Reference
30	3.80	836.6000253	1.9	0.0023	2.5
40	3.80	836.6000217	-1.7	-0.0020	2.5
50	3.80	836.6000183	-5.1	-0.0061	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	4.20	836.6000232	-0.2	-0.0002	2.5
20	3.80	836.6000234	0.0	0.0000	Reference
20	3.40	836.6000283	4.9	0.0059	2.5

Frequency Stability(Temperature/Voltage Variation)

W-CDMA(RMC12.2kbps) Mode / Tx: 836.6MHz

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	4786001719H
Date	12/20/2012
Temperature/ Humidity	22deg. C / 33% RH
Engineer	Keisuke Kawamura
Mode	Tx W-CDMA(RMC12.2kbps)

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30	3.80	836.6000025	6.9	0.0082	2.5
-20	3.80	836.6000032	7.6	0.0091	2.5
-10	3.80	836.6000024	6.8	0.0081	2.5
0	3.80	836.6000023	6.7	0.0080	2.5
10	3.80	836.5999972	1.6	0.0019	2.5
20	3.80	836.5999956	0.0	0.0000	Reference
30	3.80	836.5999972	1.6	0.0019	2.5
40	3.80	836.6000031	7.5	0.0090	2.5
50	3.80	836.5999971	1.5	0.0018	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	4.20	836.5999964	0.8	0.0010	2.5
20	3.80	836.5999956	0.0	0.0000	Reference
20	3.40	836.5999969	1.3	0.0016	2.5

APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date	Expiration date of the calibration
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2012/02/06	2013/02/28
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	AT	2012/04/06	2013/04/30
MURC -02	Wireless Communication Test Set	Agilent	E5515C	GB47050683	AT	2012/12/19	2013/12/31
MCC-35	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2012/09/05	2013/09/30
MAT-17	Attenuator(20dB) DC-1GHz N	Weinschel Corp	MODEL 1	BG0143	AT	2012/01/10	2013/01/31
MPSC-01	Power splitters/ Combiners	Mini-Circuit	ZFSC-2-2500	0124	AT	2012/09/12	2013/09/30
MCC-36	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2012/09/05	2013/09/30
MURC -03	Radio Communication Analyzer	Anritsu	MT8815B	6200711471	AT	2012/12/19	2013/12/31
MCC-138	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37953/2	AT	2012/10/17	2013/10/31
MCH-04	Temperature and Humidity Chamber	Tabai Espec	PL-2KP	14015723	AT	2012/08/01	2013/08/31
MCC-64	Coaxial Cable	UL Japan	-	-	AE	2012/03/22	2013/03/31
MAEC -02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29	2013/06/30
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2012/11/20	2013/11/30
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2012/10/08	2013/10/31
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2012/02/16	2013/02/28
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2012/11/06	2013/11/30
MURC -05	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	127576	RE	2012/10/04	2013/10/31
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22	2013/02/28
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2012/09/05	2013/09/30
MBF-13	Band Pass Filter	M-CiTY	BPF0850-01	UL0011	RE	2012/09/12	2013/09/30
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2012/05/30	2013/05/31
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25	2013/01/31
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2012/02/06	2013/02/28
MJM-14	Measure	KOMELON	KMC-36	-	RE	-	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-	-

EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date	Expiration date of the calibration
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2012/10/08	2013/10/31
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2012/09/11	2013/09/30
MCC-64	Coaxial Cable	UL Japan	-	-	RE	2012/03/22	2013/03/31
MRF-04	Band Rejection Filter(824-849MHz)	TOKYO KEIKI	824-849MHz	-	RE	2012/07/25	2013/07/31
YTSSG03	Signal Generator	Rohde & Schwarz	SMT02	51400043	RE	2012/08/01	2013/08/31
MCC-125	Coaxial Cable	UL Japan	-	-	RE	2012/07/23	2013/07/31
MDA-04	Dipole Antenna	Schwarzbeck	UHAP	992	RE	2012/10/21	2013/10/31
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2012/07/23	2013/07/31
MCC-130	Microwave Cable (1-33GHz)	HUBER+SUHNER	SF103/11PC3.5-31/11PC3.5-31/8.0m	54308/3	RE	2012/01/05	2013/01/31
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2012/05/25	2013/05/31

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.
Test Item:
RE: Radiated Emission
AT: Antenna Terminal Conducted