



RADIO TEST REPORT

Test Report No.: 32BE0278-HO-O-R1

Applicant : SAMSUNG ELECTRONICS CO., LTD.
Type of Equipment : Cellular/PCS GSM/GPRS/EDGE, Cellular/PCS WCDMA Tablet with 802.11abgn, BT3.0
Model No. : GT-P6200L
Test standard : FCC Part 24 Subpart E: 2008
FCC ID : A3LGTP6200L
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This 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 32BE0278-HO-O. 32BE0278-HO-O is replaced with this report.

Date of test: September 30 to October 14, 2011

Representative test engineer:

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UL Verification Service



NVLAP LAB CODE: 200572-0

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SECTION 1: Customer information

Company Name : SAMSUNG ELECTRONICS CO., LTD.
Address : 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY,
GYEONGGI-DO 443-742, SOUTH KOREA

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

2.1 Identification of E.U.T.

Type of Equipment : Cellular/PCS GSM/GPRS/EDGE, Cellular/PCS WCDMA Tablet with
802.11abgn, BT3.0
Model No. : GT-P6200L
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC4.0V
Receipt Date of Sample : September 27, 2011
Modification of EUT : No Modification by the test lab

2.2 Product Description

Radio Specification

Bluetooth

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Type	PIFA
Antenna Gain	-0.63 dBi

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

Equipment Type	Transceiver	
Frequency of Operation	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5825MHz
Type of Modulation	DSSS, OFDM	OFDM
Bandwidth & Channel spacing	20MHz & 5MHz	20MHz & 20MHz
Antenna Type	SEMI-PIFA	
Antenna Gain	2.4G: -2.85dBi	5G: -4.15dBi

WLAN (IEEE802.11n-40)

Equipment Type	Transceiver
Frequency of Operation	5190-5230MHz 5270-5310MHz 5510-5670MHz 5755-5795MHz
Type of Modulation	OFDM
Bandwidth & Channel spacing	40MHz & 40MHz
Antenna Type	SEMI-PIFA
Antenna Gain	-4.15dBi

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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: 248KGXW, 248KG7W PCS: 254KGXW, 250KG7W
Antenna Type	PIFA
Antenna Gain	GSM850: -5.86dBi PCS: -4.02dBi

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: 4M05F9W Band II: 4M06F9W
Antenna Type	PIFA
Antenna Gain	Band V: -5.86dBi Band II: -4.02dBi

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	GSM [Conducted] 5.99dB 1849.9782MHz [Radiated] 6.1dB 1910.02MHz, Vertical W-CDMA [Conducted] 5.0dB 1910.1170MHz [Radiated] 5.1dB 1910.00MHz, 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	GSM 16.0dB 12951.40MHz, Horizontal W-CDMA 36.3dB 7520.00MHz, 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 performed without any deviations from test procedure except for additions or exclusions.

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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	5.4dB
300MHz-1000MHz	4.0dB
1GHz-12.75GHz	4.4dB

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

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

Conducted emission test

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

Radiated emission test(3m)

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.4 Test Location

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

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

3.5 Test set up, Test instruments and Data of EMI

Refer to APPENDIX.

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

4.1 Operating Modes

<PCS1900>

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

<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 (AMR) 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)	TPC All Up Bits(Max)	1852.4 MHz 1880.0 MHz 1907.6 MHz	9262 9400 9538
Peak to Average power Ratio (Conducted)	Transmitting (Tx) W-CDMA (RMC12.2kbps)	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)	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)	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 section 5.2 of 3GPP TS 34.121.)

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4.1.1 Explanation of the Rel-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} (Note 1, 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	15/15	64	12/15	24/15	1.0	0.0
	(Note 4)	(Note 4)		(Note 4)			
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: $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

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 $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCCH, 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 $\beta_c = 11/15$ and $\beta_d = 15/15$.

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[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} (Note 1)	β_{oc}	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	209/25	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_{ed1} : 47/15 β_{ed2} : 47/15	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 $\Delta_{CQI} = 30/15$ with $\beta_{br} = 30/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{br}/\beta_c = 24/15$. 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 $\beta_c = 10/15$ and $\beta_d = 15/15$.

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 $\beta_c = 14/15$ and $\beta_d = 15/15$.

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.

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(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		β_c/β_d	MPR	Power Class 3 limit
						β_c	β_d			
	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						
	Δ ACK	Δ NACK	Δ CQI	Ack-Nack repetition factor	CQI Feedback	CQI Repetition Factor	Ahs= β hs/ β c
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	
	Δ ACK	Δ NACK	Δ CQI	Ack-Nack repetition factor	CQI Feedback	CQI Repetition Factor	Ahs= β hs/ β c	Δ E-DPCCH	Δ HARQ	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

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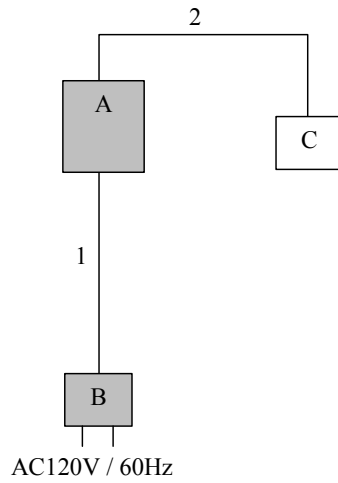
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4.2 Configuration and peripherals



* 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	Cellular/PCS GSM/GPRS/EDGE, Cellular/PCS WCDMA Tablet with 802.11abgn, BT3.0	GT-P6200L	R2DB815120W *1) R2DB815125K *2)	SAMSUNG	EUT
B	AC Adapter	ETA-P11X	-	SAMSUNG	EUT
C	Ear phone	-	-	SAMSUNG	-

*1) Used for Antenna Terminal Conducted test

*2) Used for Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Cable	1.0	Shielded	Shielded	-
2	Ear phone Cable	1.2	Unshielded	Unshielded	-

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SECTION 5: RF Output Power(Conducted/Radiated)

[Conducted: Conducted Output Power]

Test Procedure

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

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

[Radiated : Equivalent isotropic radiated power(EIRP)]

Test Procedure

- 1) EUT was placed on a platform of nominal size, 0.5 by 1.0m, raised 80cm above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength intensity has been measured in a semi anechoic chamber with a ground plane and at a distance of 3m. The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
- 2) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height as the EUT. The frequency above 1GHz of the Substitution antenna was used with Horn antenna calibrated with the Half wave dipole antenna, which is harmonized with the measured frequency in 1). The Substitution Antenna was connected with the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field is equal to the measured value in 1). The measuring antenna height varied between 1 and 4m to obtain the maximum receiving level. Its Output power of Signal Generator was recorded.
- 3) Equivalent isotropic radiated power(EIRP) was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).

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

Test data : **APPENDIX 1**
Test result : **Pass**

SECTION 6: Bandwidth (Conducted)

Test Procedure

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

Test data : **APPENDIX 1**
Test result : **Pass**

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

[Conducted]

Test Procedure

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

[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 was varied between 1 to 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
- 2) Exchanged the EUT to the Substitution Antenna, the antenna was set for the same height as EUT on the table.
The frequency below 1GHz of the Substitution antenna was used as the Half wave dipole antenna and Shorted dipole antenna calibrated with the Half wave dipole antenna, which is harmonized with the measured frequency in 1). The frequency above 1GHz of the Substitution antenna was used with Horn antenna calibrated with the Half wave dipole antenna.
The Substitution antenna was connected with the Signal Generator, and the polarized electromagnetic radiation of the Substitution antenna was matched with the one of the measuring antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field is equal to the measured value in 1).
The measuring antenna height varied between 1 and 4m to obtain the maximum receiving level.
Its Output power of Signal Generator was recorded.
- 3) Equivalent isotropic radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).

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

Test data : **APPENDIX 1**
Test result : **Pass**

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SECTION 8: Frequency Stability(Temperature/Voltage Variation)

Test Procedure

The Frequency Stability was measured with a Wireless Communication Test Set and attenuator connected to the antenna port.

The Frequency Drift was measured with the 10 deg. C. steps from -30 deg. C. to 50 deg. C., and it is presented as the ppm unit. The Frequency Drift was measured with the normal temperature (20 deg. C.) and Voltage tolerance (DC3.7V to DC4.2V), and it is presented as the ppm unit.

Temperature : -30deg.C to +50deg.C (10 deg. C. step)
Voltage : Vnom:DC4.0V, Vmin:DC3.7V, Vmax:DC4.2V

As the operating input voltage of the EUT is between DC3.7V to 4.2V (nominal voltage: DC4.0V), 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.11 Measurement Room
Report No. 32BE0278-HO-O
Date 10/11/2011
Temperature/ Humidity 23deg.C / 54% RH
Engineer Yutaka Yoshida
Mode Tx GSM(GMSK), 1slot, PCL=0
Mode Tx GPRS(GMSK), 1slot, CS-1, PCL=0
Mode Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

Mode	Ch	Frequency [MHz]	Reading	Cable Loss [dB]	Result [dBm]
			Average frame power [dBm]		
GSM	512	1850.2	25.48	3.89	29.37
	661	1880.0	25.49	3.89	29.38
	810	1909.8	25.48	3.89	29.37
GPRS	512	1850.2	25.48	3.89	29.37
	661	1880.0	25.49	3.89	29.38
	810	1909.8	25.47	3.89	29.36
EGPRS	512	1850.2	21.54	3.89	25.43
	661	1880.0	21.53	3.89	25.42
	810	1909.8	21.54	3.89	25.43

Results = Reading + Cable Loss

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

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 32BE0278-HO-O
Date 09/30/2011
Temperature/ Humidity 22deg.C / 52% RH
Engineer Yutaka Yoshida
Mode Tx W-CDMA

Mode	Ch	Frequency [MHz]	Reading AVG [dBm]	Cable Loss [dB]	Result [dBm]
RMC 12.2kbps	Low	1852.4	21.52	0.26	21.78
	Mid	1880.0	21.34	0.26	21.60
	High	1907.6	21.40	0.26	21.66
AMR	Low	1852.4	21.40	0.26	21.66
	Mid	1880.0	21.34	0.26	21.60
	High	1907.6	21.38	0.26	21.64
HSDPA Subtest 1	Low	1852.4	21.48	0.26	21.74
	Mid	1880.0	21.33	0.26	21.59
	High	1907.6	21.42	0.26	21.68
HSDPA Subtest 2	Low	1852.4	21.20	0.26	21.46
	Mid	1880.0	21.04	0.26	21.30
	High	1907.6	21.15	0.26	21.41
HSDPA Subtest 3	Low	1852.4	20.94	0.26	21.20
	Mid	1880.0	20.77	0.26	21.03
	High	1907.6	20.90	0.26	21.16
HSDPA Subtest 4	Low	1852.4	20.68	0.26	20.94
	Mid	1880.0	20.53	0.26	20.79
	High	1907.6	20.64	0.26	20.90
HSUPA Subtest 1	Low	1852.4	20.34	0.26	20.60
	Mid	1880.0	20.33	0.26	20.59
	High	1907.6	20.31	0.26	20.57
HSUPA Subtest 2	Low	1852.4	19.50	0.26	19.76
	Mid	1880.0	19.01	0.26	19.27
	High	1907.6	19.11	0.26	19.37
HSUPA Subtest 3	Low	1852.4	20.24	0.26	20.50
	Mid	1880.0	20.06	0.26	20.32
	High	1907.6	20.04	0.26	20.30
HSUPA Subtest 4	Low	1852.4	19.75	0.26	20.01
	Mid	1880.0	19.54	0.26	19.80
	High	1907.6	19.60	0.26	19.86
HSUPA Subtest 5	Low	1852.4	20.41	0.26	20.67
	Mid	1880.0	20.42	0.26	20.68
	High	1907.6	20.46	0.26	20.72

*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. 32BE0278-HO-O
Test place Head Office EMC Lab. No.2 and 4 Semi Anechoic Chamber
Date 10/02/2011 10/14/2011
Temperature / Humidity 23deg. C / 43% RH 23deg. C / 69% RH
Engineer Keisuke Kawamura Katsunori Okai
Mode Tx GSM(GMSK), 1slot, PCL=0

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]
1880.00	98.9	99.7	23.6	23.4	3.3	10.3	0.0	30.6	30.4	33.0	2.4	2.6	100	139	110	77			
1909.80	97.5	99.5	22.3	22.8	3.3	10.4	0.0	29.4	29.9	33.0	3.6	3.1	100	132	114	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-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK(RBW:3MHz/VBW:8MHz)

Report No. 32BE0278-HO-O
Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date 10/14/2011
Temperature / Humidity 23deg. C / 69% RH
Engineer Katsunori Okai
Mode Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]
1880.00	96.5	99.9	21.9	22.9	3.3	10.3	0.0	28.9	29.9	33.0	4.1	3.1	111	345	113	115			
1909.80	96.7	99.5	21.9	22.8	3.3	10.4	0.0	29.0	29.9	33.0	4.0	3.1	107	334	114	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-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK (RBW: 3MHz, VBW: 8MHz)

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

Test place : Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 32BE0278-HO-O
Date : 10/01/2011
Temperature / Humidity : 25deg. C / 60% RH
Engineer : Satofumi Matsuyama
Mode : Tx W-CDMA (RMC12.2kbps), All Up Bits

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]
1852.40	95.6	95.6	19.9	17.7	3.3	10.2	0.0	26.8	24.6	33.0	6.2	8.4	100	28	118	130			
1880.00	94.6	94.4	19.2	17.2	3.3	10.3	0.0	26.2	24.2	33.0	6.8	8.8	100	25	119	131			
1907.60	93.7	94.4	18.6	17.5	3.3	10.4	0.0	25.7	24.6	33.0	7.3	8.4	100	24	115	130			

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)

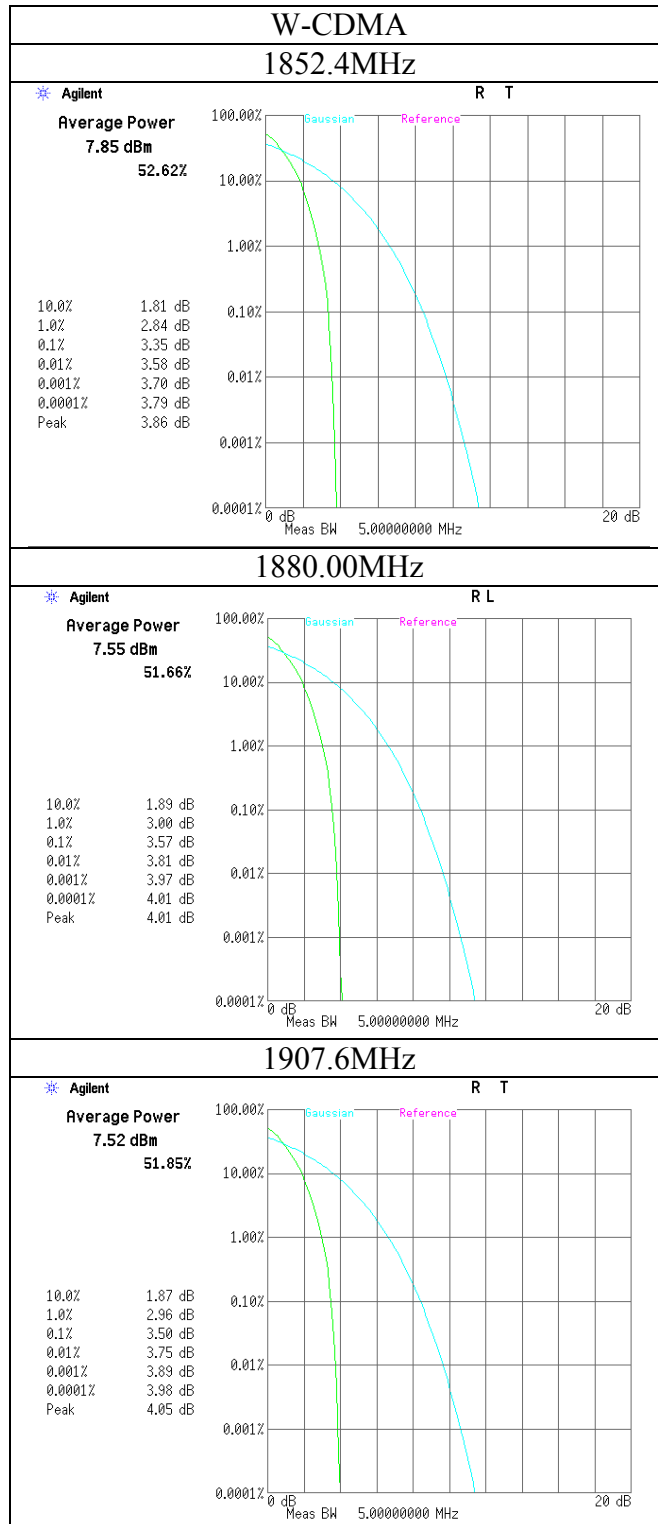
Detector : S/A PK (RBW: 5MHz, VBW: 50MHz)

Peak to Average power Ratio (Conducted)

Report No. 32BE0278-HO-O
Test place Head Office EMC Lab. No.7 Shielded Room
Date 10/10/2011
Temperature / Humidity 23deg. C / 50% RH
Engineer Yutaka Yoshida
Mode Tx GSM(GMSK), 1slot, PCL=0
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]
GSM	512	1850.20	0.061	13
	661	1880.00	0.064	13
	810	1909.80	0.054	13
GPRS	512	1850.20	0.042	13
	661	1880.00	0.060	13
	810	1909.80	0.050	13
EGPRS	512	1850.20	4.193	13
	661	1880.00	4.289	13
	810	1909.80	4.133	13
W-CDMA	9262	1852.40	3.35	13
	9400	1880.00	3.57	13
	9538	1907.60	3.50	13

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

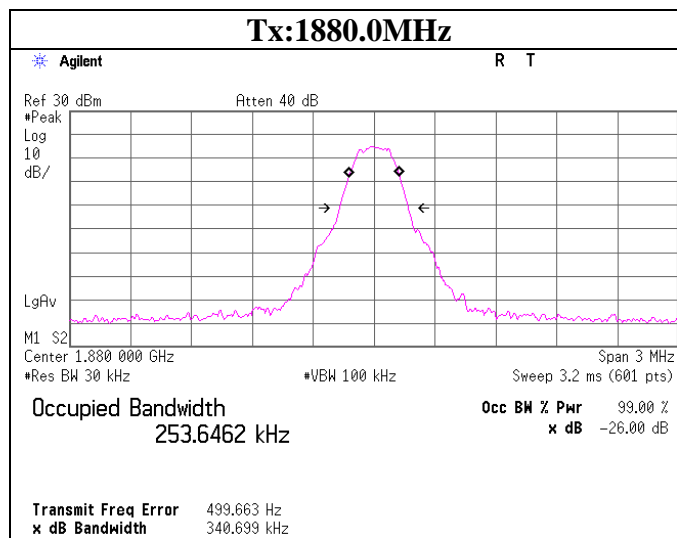


*Set the spectrum analyzer radio mode to 3GPP WCDMA (CCDF)

Bandwidth(Conducted)
PCS1900

Test place	Head Office EMC Lab. No.7 Shielded Room
Report No.	32BE0278-HO-O
Date	10/10/2011
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK), 1slot, PCL=0

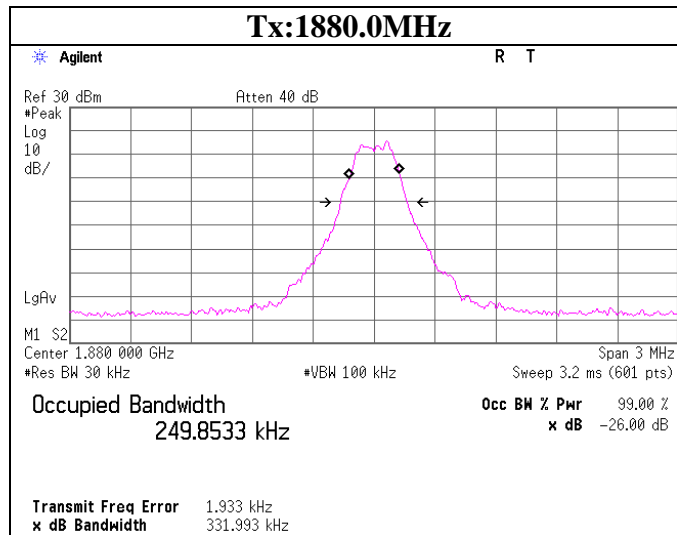
CH	FREQ [MHz]	26dB Bandwidth [kHz]	99% OBW [kHz]	Limit [kHz]
Mid	1880.0	340.699	253.6462	-



Bandwidth(Conducted)
PCS1900

Test place	Head Office EMC Lab. No.7 Shielded Room
Report No.	32BE0278-HO-O
Date	10/10/2011
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Yutaka Yoshida
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

CH	FREQ	26dB Bandwidth	99% OBW	Limit
	[MHz]	[kHz]	[kHz]	[kHz]
Mid	1880.0	331.993	249.8533	-

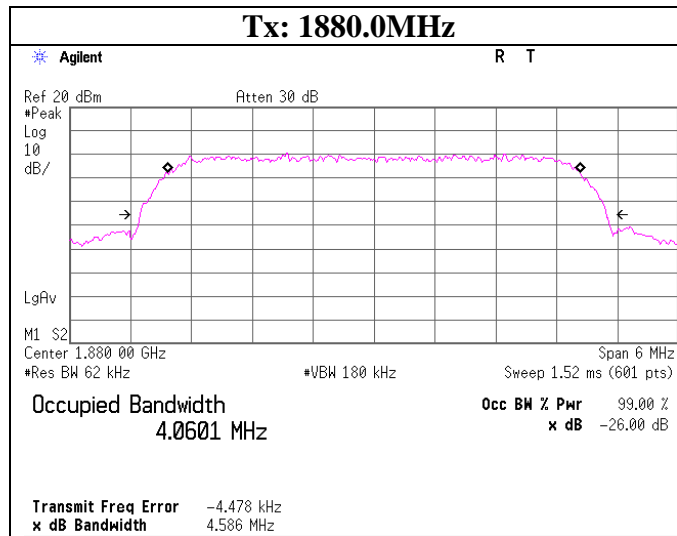


Bandwidth(Conducted)

W-CDMA Band II

Test place	Head Office EMC Lab. No.7 Shielded Room
Report No.	32BE0278-HO-O
Date	10/10/2011
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Yutaka Yoshida
Mode	Tx W-CDMA(RMC12.2kbps), All Up Bits

CH	FREQ	26dB Bandwidth	99% OBW	Limit
	[MHz]	[MHz]	[MHz]	[kHz]
Mid	1880.0	4.586	4.0601	-



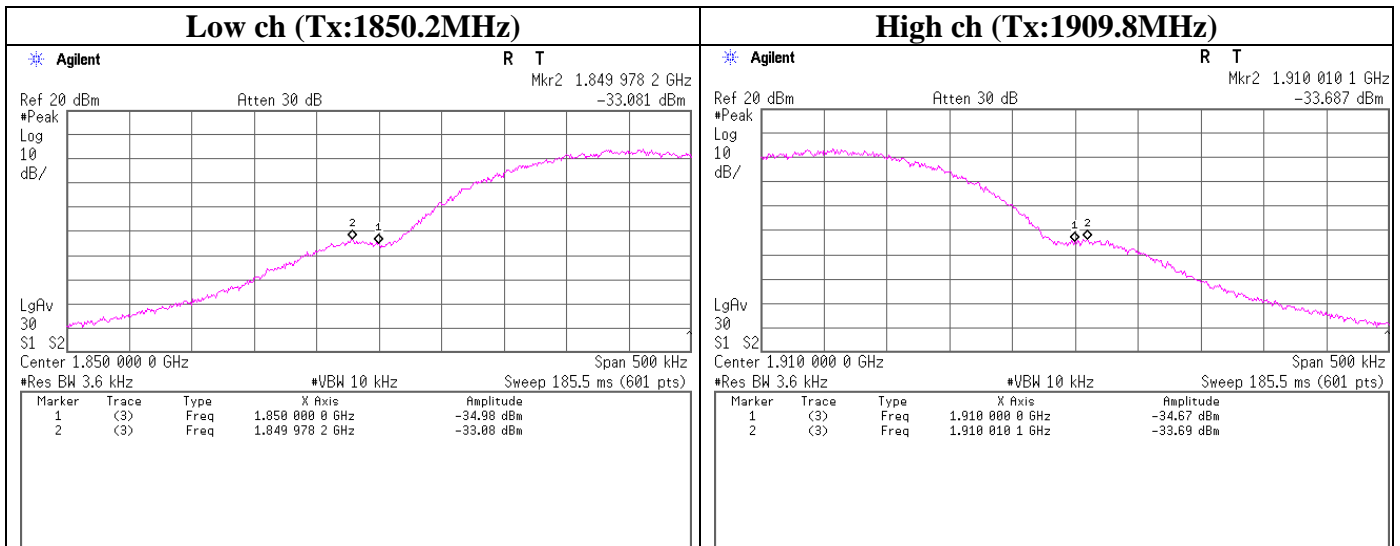
Band-Edge(Conducted)
PCS1900

Test place	Head Office EMC Lab. No.7 Shielded Room
Report No.	32BE0278-HO-O
Date	10/10/2011
Temperature/ Humidity	23deg. C/ 50% RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK), 1slot, PCL=0

Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
1849.9782	-33.08	10.07	4.02	-18.99	-13.0	5.99
1850.0000	-34.98	10.07	4.02	-20.89	-13.0	7.89
1910.0000	-34.67	10.07	4.02	-20.58	-13.0	7.58
1910.0101	-33.69	10.07	4.02	-19.60	-13.0	6.60

VIDEO AV 30 times

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



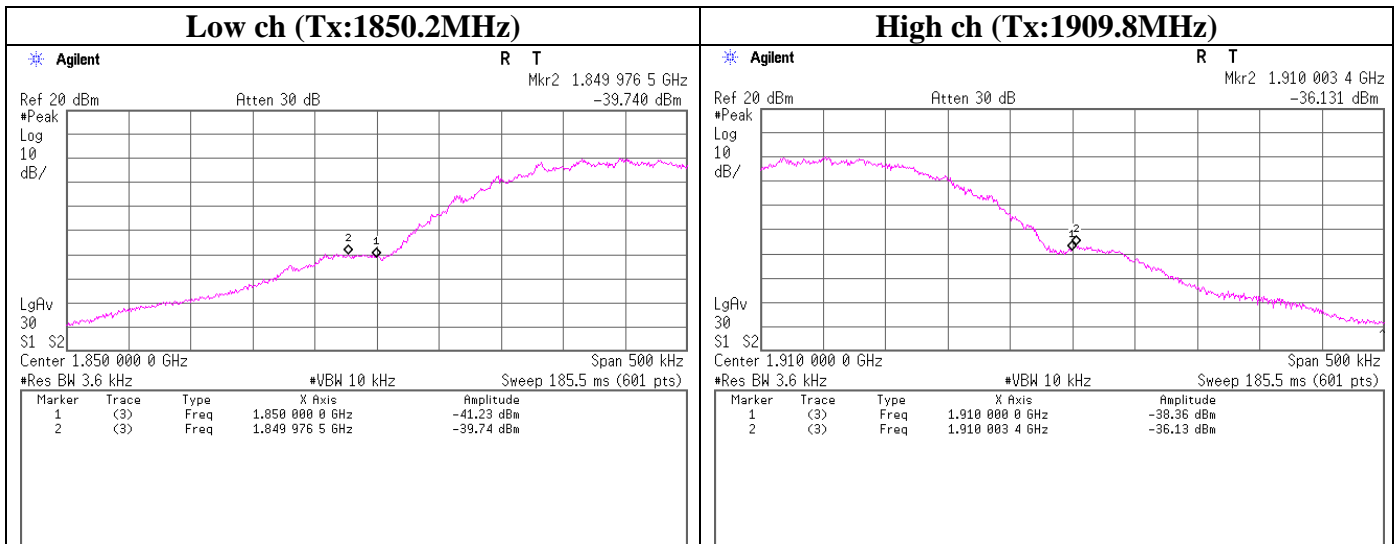
Band-Edge(Conducted)
PCS1900

Test place	Head Office EMC Lab. No.7 Shielded Room
Report No.	32BE0278-HO-O
Date	10/10/2011
Temperature/ Humidity	23deg. C/ 50% 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]
1849.9765	-39.74	10.07	4.02	-25.65	-13.0	12.65
1850.0000	-41.23	10.07	4.02	-27.14	-13.0	14.14
1910.0000	-38.36	10.07	4.02	-24.27	-13.0	11.27
1910.0034	-36.13	10.07	4.02	-22.04	-13.0	9.04

VIDEO AV 30 times

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



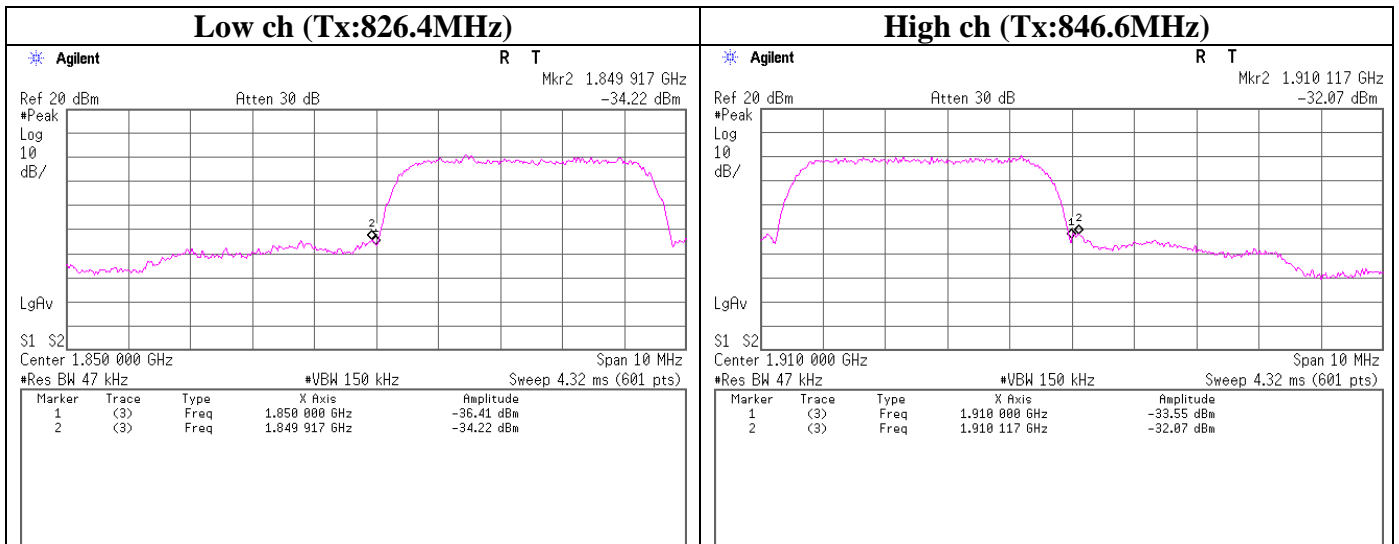
Band-Edge(Conducted)
W-CDMA Band II

Test place	Head Office EMC Lab. No.7 Shielded Room
Report No.	32BE0278-HO-O
Date	10/10/2011
Temperature/ Humidity	23deg.C / 50% 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]
1849.9170	-34.22	10.07	4.02	-20.13	-13.0	7.1
1850.0000	-36.41	10.07	4.02	-22.32	-13.0	9.3
1910.0000	-33.55	10.07	4.02	-19.46	-13.0	6.5
1910.1170	-32.07	10.07	4.02	-17.98	-13.0	5.0

VIDEO AV 30 times

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



Band-Edge (Radiated)
PCS1900

Report No. 32BE0278-HO-O
Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date 10/02/2011
Temperature / Humidity 23deg. C / 43% RH
Engineer Keisuke Kawamura
Mode Tx GSM(GMSK), 1slot, PCL=0

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]	
	1849.98	49.5	44.9	-26.3				-31.5	3.3		10.2	0.0	-19.4	-24.7	-13.0	6.4	
1850.00	46.0	41.4	-31.5	-35.0	3.3	10.2	0.0	-24.7	-28.1	-13.0	11.7	15.1	124	33	100	199	
1910.00	42.3	43.1	-32.8	-33.2	3.3	10.4	0.0	-25.7	-26.1	-13.0	12.7	13.1	100	132	105	56	
1910.02	47.7	50.2	-27.4	-26.1	3.3	10.4	0.0	-20.3	-19.1	-13.0	7.3	6.1	100	132	105	56	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Tx : S/A PK(RBW:3.6kHz/VBW:10kHz)

Band Edge (Radiated)
W-CDMA Band II

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 32BE0278-HO-O
Date 10/01/2011
Temperature / Humidity 25deg. C / 60% RH
Engineer Satofumi Matsuyama
Mode Tx W-CDMA (RMC12.2kbps), All Up Bits

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]	
	1850.00	50.0	49.4	-25.7				-28.5	3.29		10.15	0.00	-18.8	-21.6	-13.0	5.8	
1910.00	50.0	51.0	-25.2	-25.7	3.33	10.40	0.00	-18.1	-18.6	-13.0	5.1	5.6	100	24	115	130	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-20GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-20GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A AV (RBW: 47kHz, VBW: 150kHz)

Spurious Emission (Conducted)

PCS1900

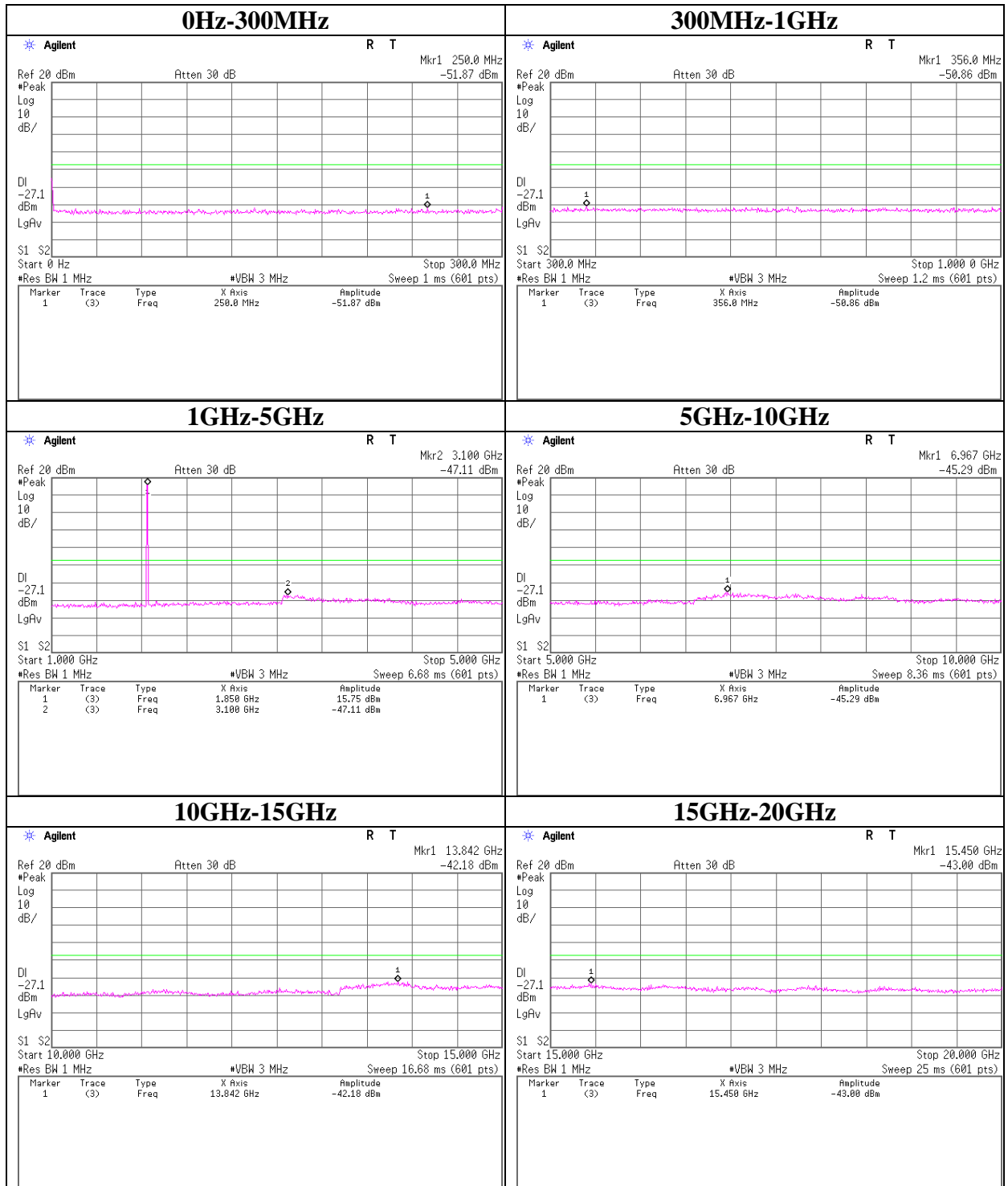
Test place Head Office EMC Lab. No.7 Shielded Room
Report No. 32BE0278-HO-O
Date 10/10/2011
Temperature/ Humidity 23deg. C / 50% RH
Engineer Yutaka Yoshida
Mode Tx GSM(GMSK), 1slot, PCL=0

Limit Line

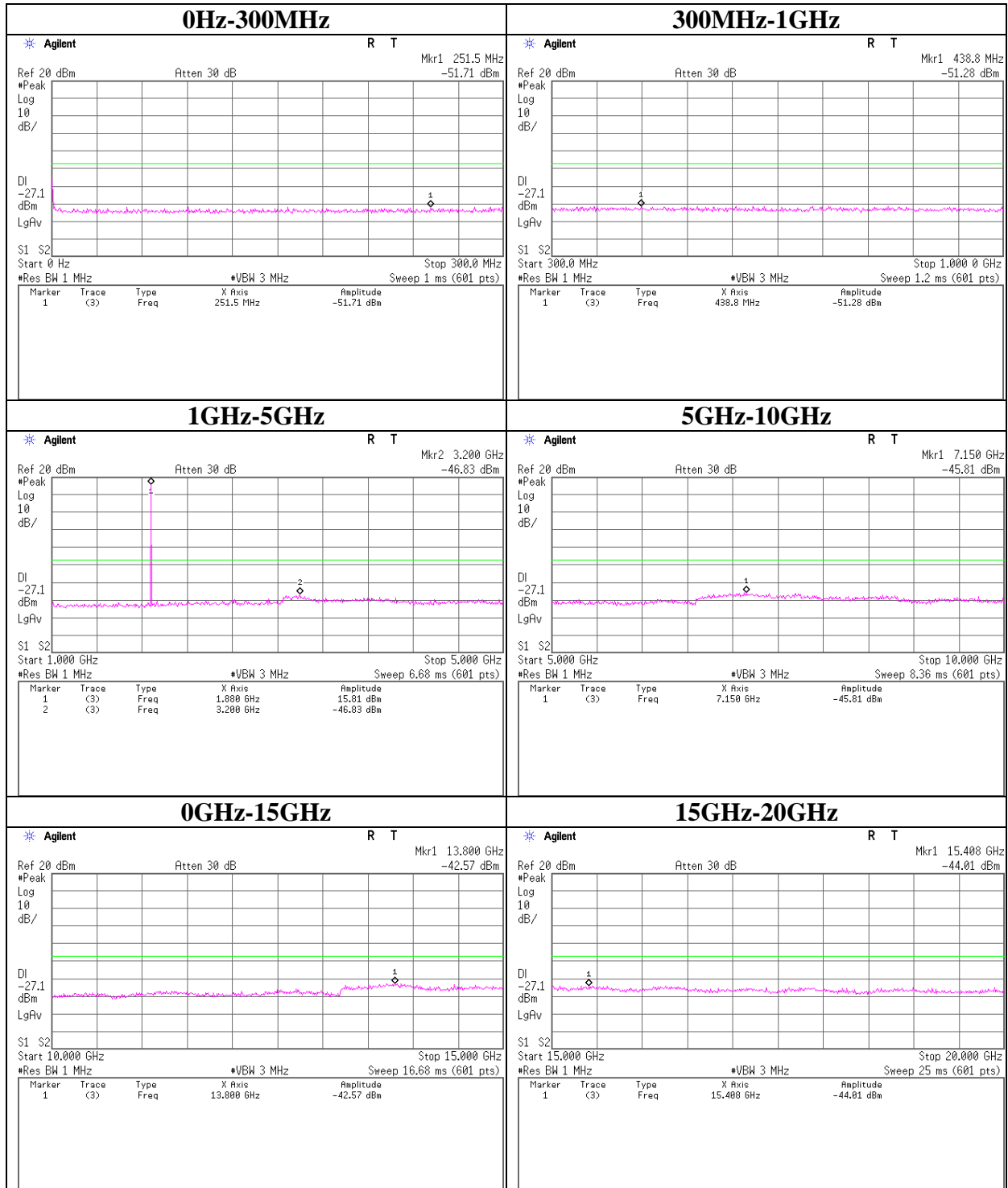
Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line [dBm]
1850.2	-13.0	10.07	4.02	-27.1
1880.0	-13.0	10.07	4.02	-27.1
1909.8	-13.0	10.07	4.02	-27.1

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

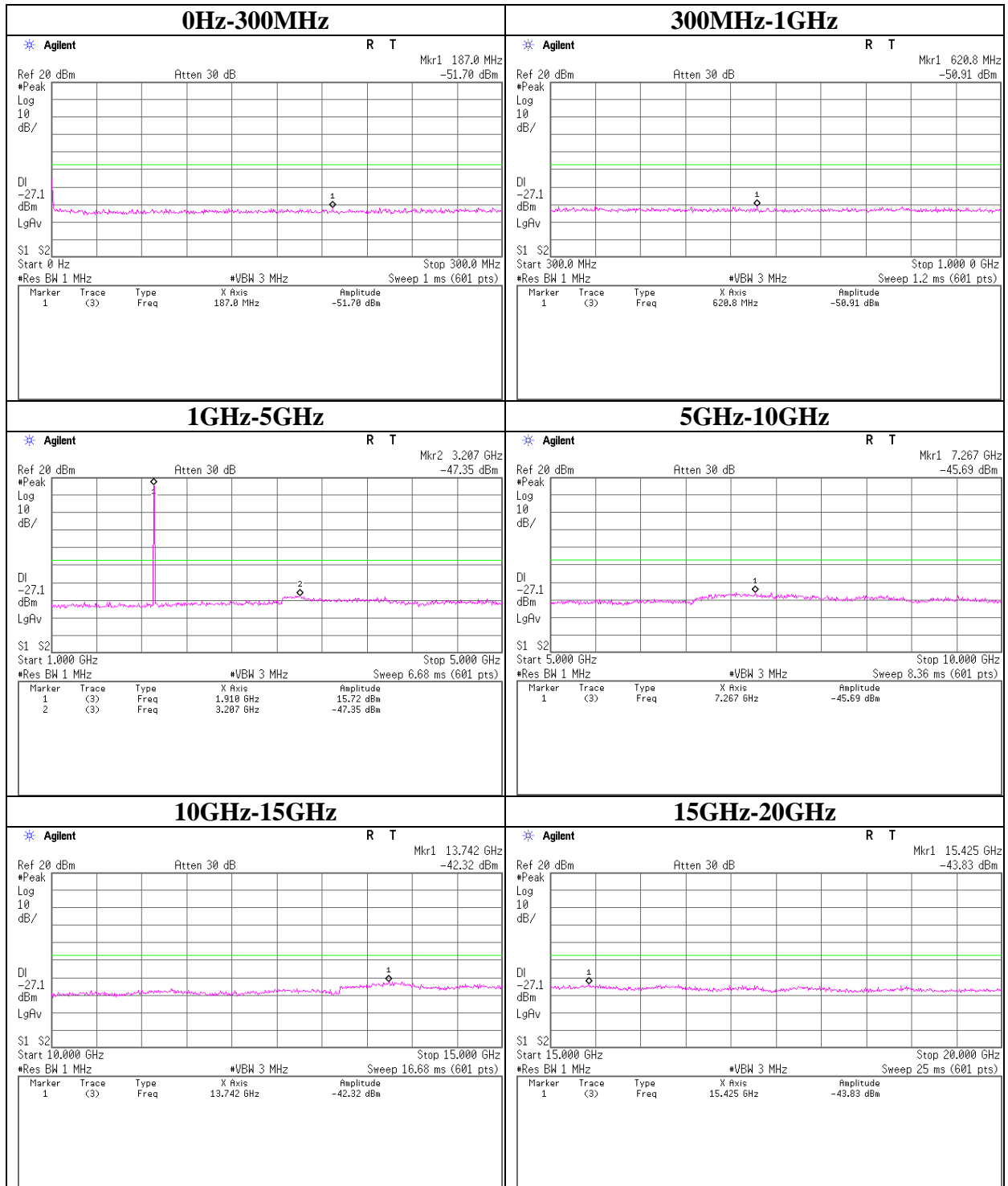
Spurious Emission (Conducted)
GSM
Tx:1850.2MHz



Spurious Emission (Conducted)
GSM
Tx:1880.0MHz



Spurious Emission (Conducted)
GSM
Tx:1909.8MHz



Spurious Emission (Conducted)
PCS1900

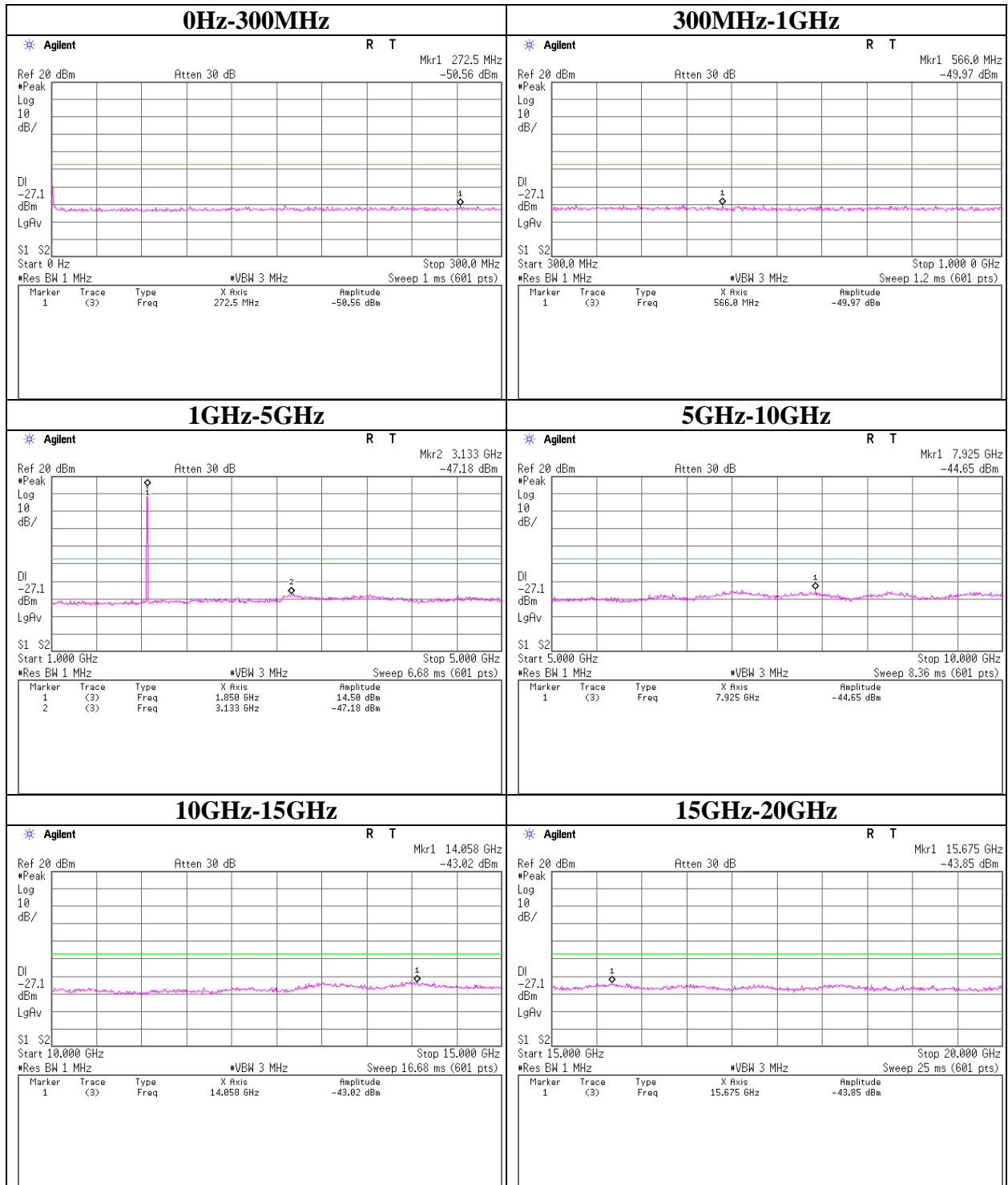
Test place Head Office EMC Lab. No.7 Shielded Room
Report No. 32BE0278-HO-O
Date 10/10/2011
Temperature/ Humidity 23deg. C / 50% RH
Engineer Yutaka Yoshida
Mode Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

Limit Line

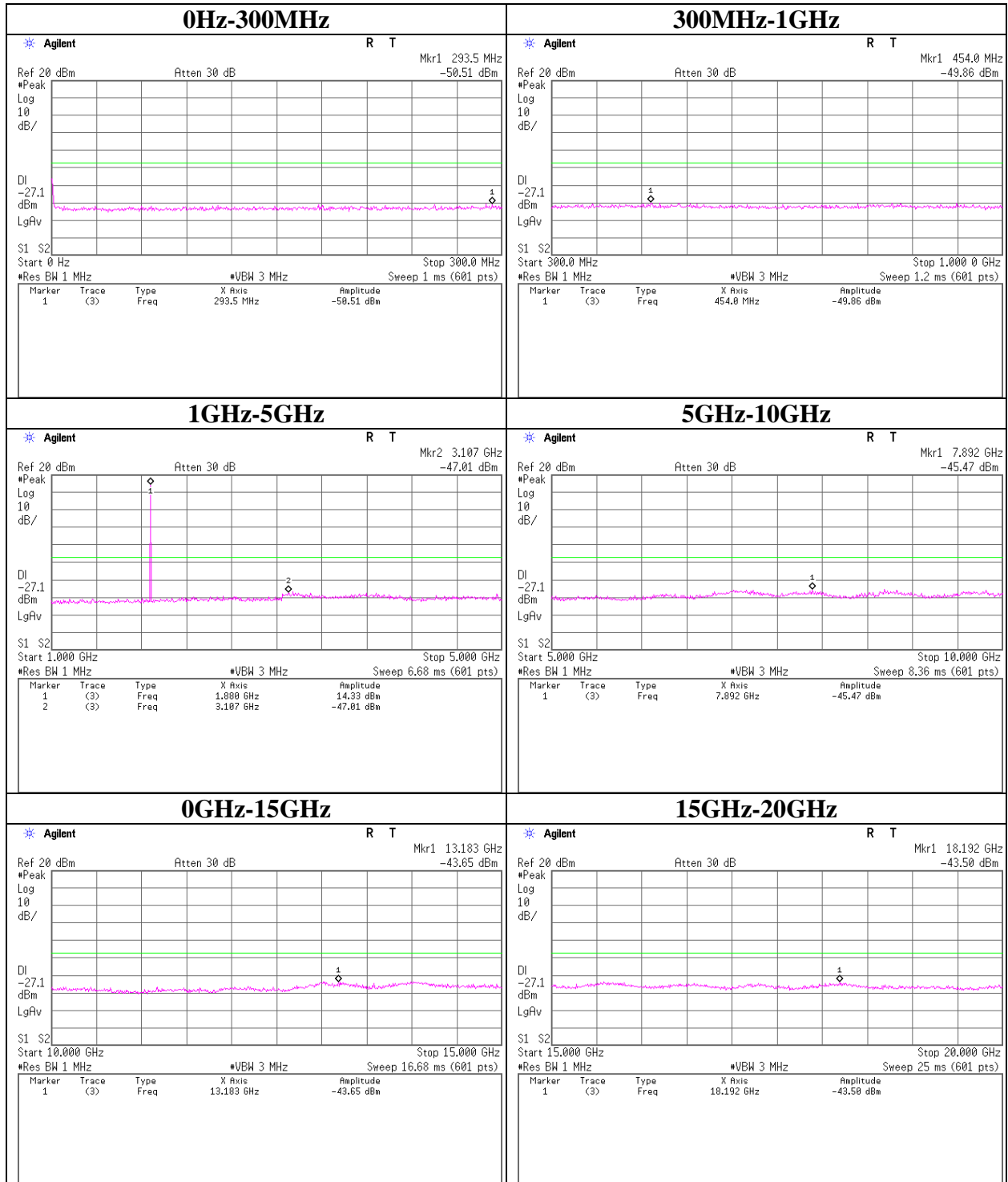
Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line [dBm]
1850.2	-13.0	10.07	4.02	-27.1
1880.0	-13.0	10.07	4.02	-27.1
1909.8	-13.0	10.07	4.02	-27.1

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

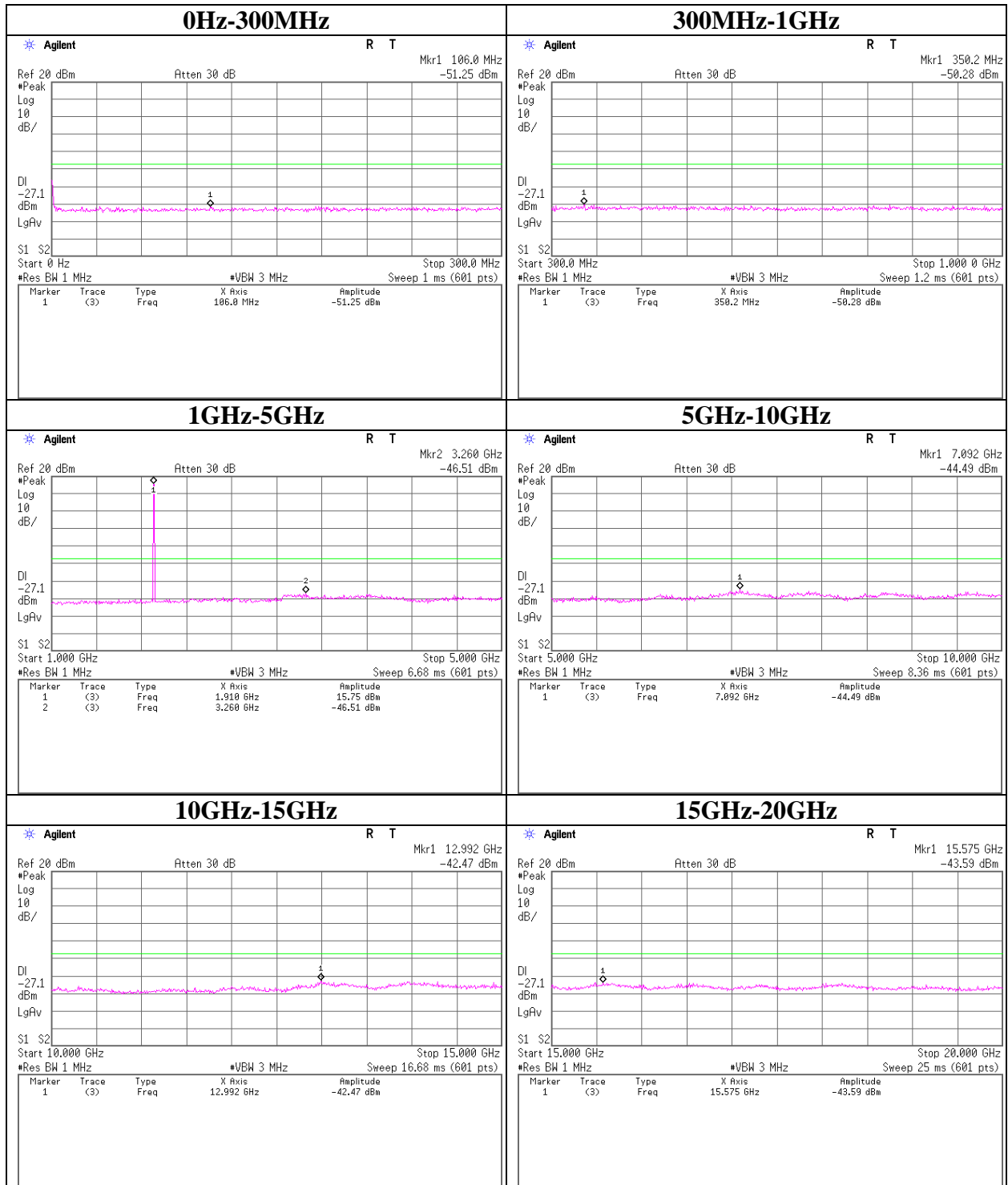
Spurious Emission (Conducted)
EGPRS
Tx:1850.2MHz



Spurious Emission (Conducted)
EGPRS
Tx:1880.0MHz



Spurious Emission (Conducted)
EGPRS
Tx:1909.8MHz



Spurious Emission (Conducted)
W-CDMA Band II

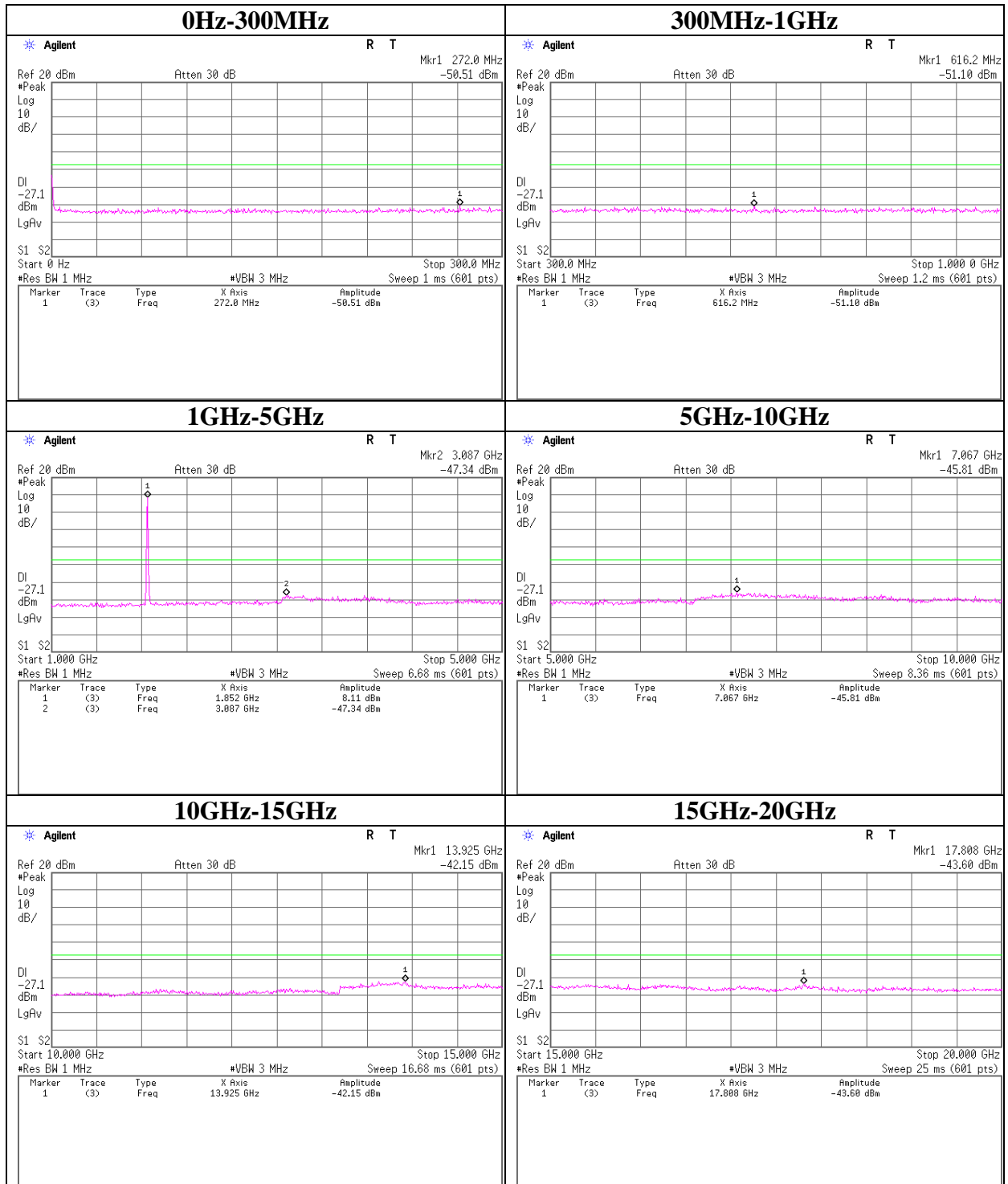
Test place Head Office EMC Lab. No.7 Shielded Room
Report No. 32BE0278-HO-O
Date 10/10/2011
Temperature/ Humidity 23deg. C / 50% RH
Engineer Yutaka Yoshida
Mode Tx W-CDMA(RMC12.2kbps), All Up Bits

Limit Line

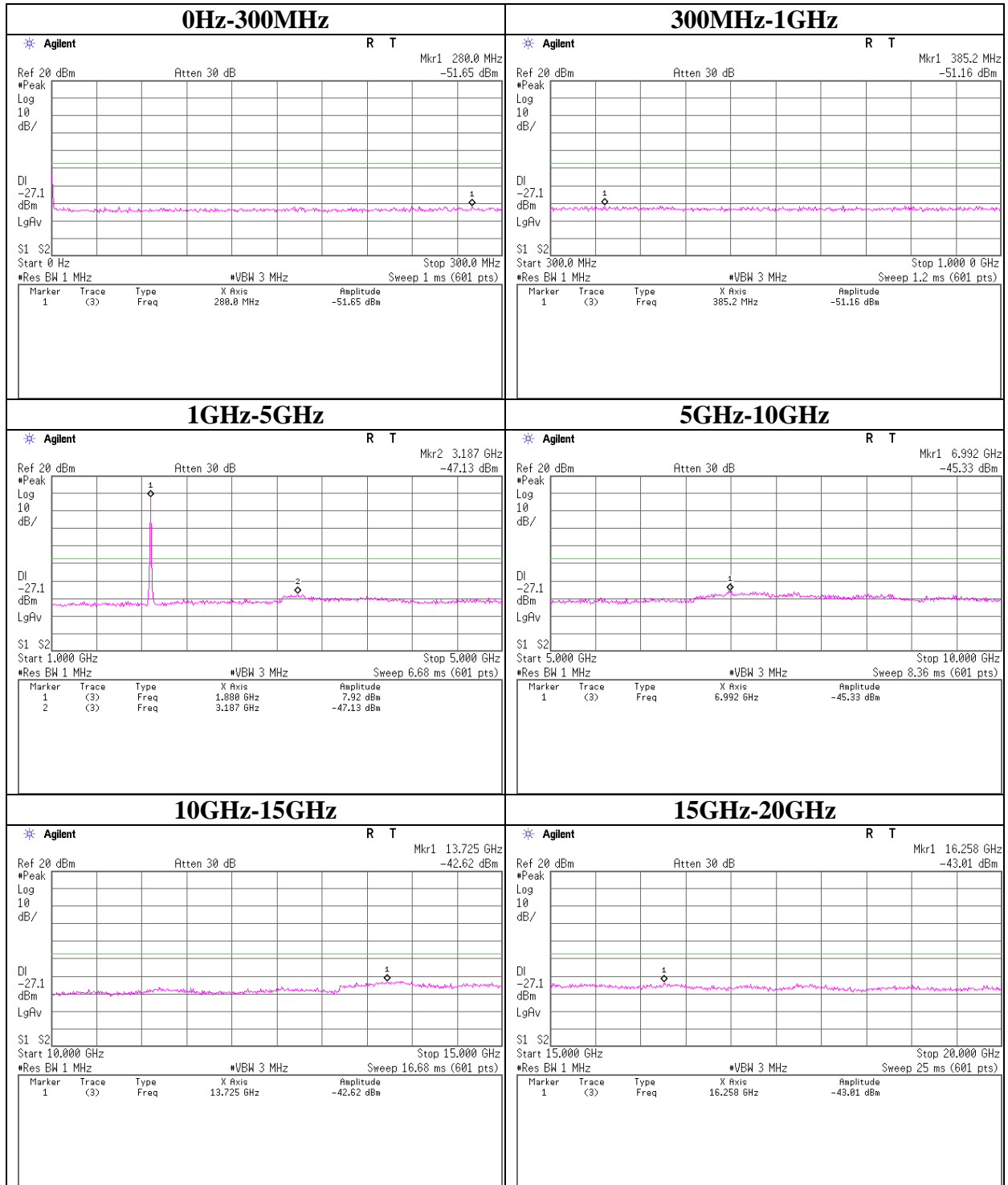
Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line [dBm]
1852.4	-13.0	10.07	4.02	-27.1
1880.0	-13.0	10.07	4.02	-27.1
1907.6	-13.0	10.07	4.02	-27.1

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

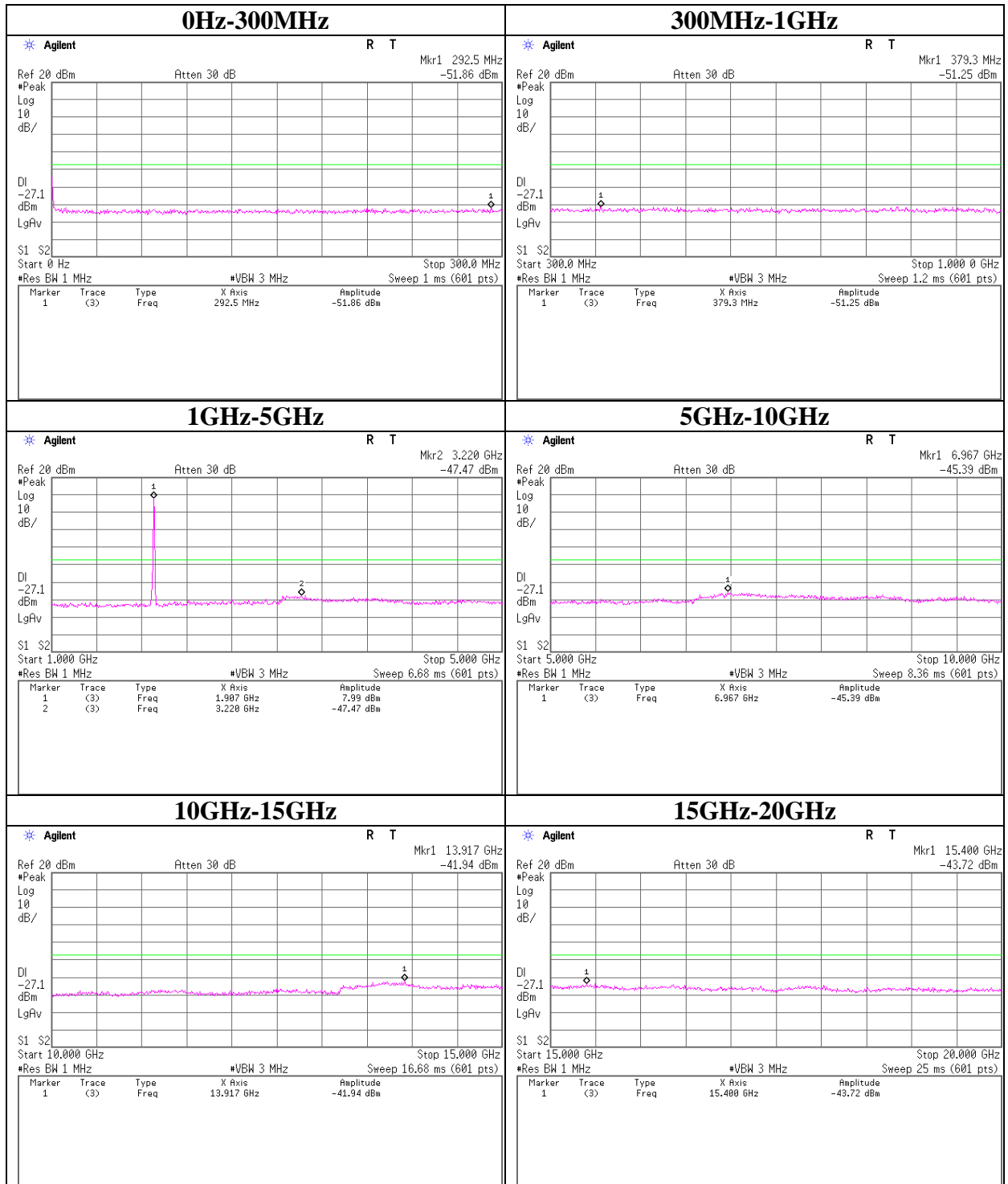
Spurious Emission (Conducted)
W-CDMA Band II
Tx:1852.4MHz



Spurious Emission (Conducted)
W-CDMA Band II
Tx:1880.0MHz



Spurious Emission (Conducted)
W-CDMA Band II
Tx:1907.6MHz



Spurious Emission (Radiated)

PCS1900

Report No. 32BE0278-HO-O
Test place Head Office EMC Lab.
Semi Anechoic Chamber No.2 No.2
Date 9/30/2011 10/02/2011
Temperature / Humidity 20deg. C / 67% RH 23deg. C / 43% RH
Engineer Keisuke Kawamura Keisuke Kawamura
(Below 1GHz) (Above 1GHz)
Mode Tx GSM(GMSK), 1slot, PCL=0

Tx 1850.2MHz

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks				
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	HOR	VER		Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]

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 1880MHz

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks				
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	HOR	VER		Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]

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 1909.8MHz

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]

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)

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Spurious Emission (Radiated)
W-CDMA Band II

Test place : Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 32BE0278-HO-O
Date : 10/01/2011 10/01/2011
Temperature / Humidity : 25deg. C / 60% RH 23deg. C / 57% RH
Engineer : Satofumi Matsuyama Takumi Shimada
(Above 1GHz) (Below 1GHz)
Mode : Tx W-CDMA(RMC12.2kbps), All Up Bits

Tx: 1852.4MHz

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant.	Turn		Rx Ant.	Turn
															Height	Table		Height	Table
3704.80	44.2	44.9	-68.5	-69.2	4.7	12.7	0.0	-60.5	-61.2	-13.0	47.5	48.2	111	61	100	268			
5557.20	45.1	44.9	-61.5	-63.4	5.8	13.8	0.0	-53.6	-55.5	-13.0	40.6	42.5	111	211	128	173			
7409.60	45.8	46.4	-54.2	-54.1	6.8	11.1	0.0	-49.9	-49.8	-13.0	36.9	36.8	100	154	103	144			

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 [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant.	Turn		Rx Ant.	Turn
															Height	Table		Height	Table
3760.00	46.3	45.9	-66.4	-68.2	4.8	12.7	0.0	-58.5	-60.3	-13.0	45.5	47.3	136	122	100	171			
5640.00	46.1	44.8	-60.5	-63.5	5.9	13.8	0.0	-52.6	-55.6	-13.0	39.6	42.6	125	203	100	209			
7520.00	46.5	45.3	-53.5	-55.2	6.9	11.0	0.0	-49.3	-51.0	-13.0	36.3	38.0	100	224	102	152			

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 [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant.	Turn		Rx Ant.	Turn
															Height	Table		Height	Table
3815.20	45.5	46.3	-67.2	-67.8	4.8	12.6	0.0	-59.4	-60.0	-13.0	46.4	47.0	100	220	100	213			
5722.80	46.0	45.8	-60.6	-62.4	5.9	13.8	0.0	-52.7	-54.5	-13.0	39.7	41.5	115	208	114	203			
7630.40	46.3	45.0	-53.7	-55.5	6.9	11.2	0.0	-49.4	-51.2	-13.0	36.4	38.2	145	241	109	189			

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. 32BE0278-HO-O
Date 10/08/2011
Temperature/ Humidity 24deg. C / 41% RH
Engineer Keisuke Kawamura
Mode Tx GSM(GMSK), 1slot, PCL=0

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30.0	4.00	1880.00001165	6.32	0.003	2.5
-20.0	4.00	1880.00002139	3.42	0.002	2.5
-10.0	4.00	1880.00002121	3.24	0.002	2.5
0.0	4.00	1880.00001453	3.44	0.002	2.5
10.0	4.00	1880.00001955	1.58	0.001	2.5
20.0	4.00	1880.00001797	0.00	0.000	Reference
30.0	4.00	1880.00002310	5.13	0.003	2.5
40.0	4.00	1880.00001565	2.32	0.001	2.5
50.0	4.00	1880.00002317	5.20	0.003	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20.0	4.20	1880.00001271	5.26	0.003	2.5
20.0	4.00	1880.00001797	0.00	0.000	Reference
20.0	3.70	1880.00002076	2.79	0.001	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. 32BE0278-HO-O
Date 10/08/2011
Temperature/ Humidity 24deg. C / 41% RH
Engineer Keisuke Kawamura
Mode Tx W-CDMA(RMC12.2kbps), All Up Bits

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30.0	4.00	1879.99998751	24.02	0.013	2.5
-20.0	4.00	1880.00001199	0.46	0.000	2.5
-10.0	4.00	1880.00001193	0.40	0.000	2.5
0.0	4.00	1880.00000978	1.75	0.001	2.5
10.0	4.00	1879.99998087	30.66	0.016	2.5
20.0	4.00	1880.00001153	0.00	0.000	Reference
30.0	4.00	1879.99999040	21.13	0.011	2.5
40.0	4.00	1880.00001089	0.64	0.000	2.5
50.0	4.00	1880.00000966	1.87	0.001	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20.0	4.20	1880.00000904	2.49	0.001	2.5
20.0	4.00	1880.00001153	0.00	0.000	Reference
20.0	3.70	1879.99999174	19.79	0.011	2.5

APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2010/12/13 * 12
MURC-02	Wireless Communication Test Set	Agilent	E5515C	GB47050683	AT	2009/10/20 * 36
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2011/09/13 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2011/09/13 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2011/03/14 * 12
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2011/03/14 * 12
MPSC-01	Power splitters/Combiners	Mini-Circuit	ZFSC-2-2500	0124	AT	2011/09/27 * 12
MAT-24	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71389	AT	2011/06/23 * 12
MCC-91	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	30812/2	AT	2011/05/27 * 12
MCC-96	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	30817/2	AT	2011/05/27 * 12
MAT-25	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71642	AT	2011/06/23 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2011/06/21 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2011/02/23 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE/AT	2010/11/30 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2011/09/10 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2011/09/10 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2011/02/18 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2010/11/05 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2011/09/26 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2011/01/16 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2011/09/21 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2011/09/06 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2011/05/16 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2011/05/23 * 12
MCC-129	Microwave Cable(1-33GHz)	HUBER+SUHNER	SF103/11PC3.5-31	54307/3	RE	2011/01/06 * 12
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2011/08/30 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2011/01/16 * 12
MSG-09	Signal Generator	Wiltron	68247B	674005	RE	2011/02/05 * 12
MDA-04	Dipole Antenna	Schwarzbeck	UHAP	992	RE	2010/10/16 * 12
MOS-04	Digital Humidity Indicator	N.T	NT-1800	MOS04	AT	2011/02/23 * 12
MURC-02	Wireless Communication Test Set	Agilent	E5515C	GB47050683	AT	2009/10/20 * 36

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EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2011/03/14 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2011/03/14 * 12
MCC-97	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	30818/2	AT	2011/05/27 * 12
MCC-98	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	30819/2	AT	2011/05/27 * 12
MPSC-01	Power splitters/Combiners	Mini-Circuit	ZFSC-2-2500	0124	AT	2011/09/27 * 12
KCH-01	Temperature and Humidity Chamber	Tabai Espec	PL-1KT	14007630	AT	2011/04/27 * 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

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