RADIO TEST REPORT

Test Report No.: 10636726H-E-R3

Applicant	:	**Panasonic Mobile Communications Development of Europe Ltd**
Type of Equipment	:	**Digital Camera**
Model No.	:	**DMC-CM1**
Test regulation	:	**FCC Part 24 Subpart E: 2013**
FCC ID	:	**UCE314062A**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 10636726H-E-R2. 10636726H-E-R2 is replaced with this report.

Date of test: January 14 to March 17, 2015

Representative test engineer:

Yutaka Yoshida
Engineer
Consumer Technology Division

Approved by:

Takahiro Hatakeda
Leader
Consumer Technology Division

NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

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

REVISION HISTORY

Original Test Report No.: 10636726H-E

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10636726H-E	February 20, 2015	-	-
1	10636726H-E-R1	March 5, 2015	P.4	Correction of rating
2	10636726H-E-R2	March 17, 2015	P.40, 41	Addition of LTE PAPR Worst Mode RB configurations data
3	10636726H-E-R3	March 23, 2015	P.37	Correction of test data

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

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	Panasonic Mobile Communications Development of Europe Ltd
Address	:	Willoughby Road, Bracknell Berkshire RG12 8FP, UK
Telephone Number	:	+44 (0) 1344 706774
Facsimile Number	:	+44 (0) 1344 706796
Contact Person	:	Andrew James

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

2.1 Identification of E.U.T.

Type of Equipment	:	Digital Camera
Model No.	:	DMC-CM1
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	AC120V/60Hz (AC Adaptor) DC3.8V (Battery)
Receipt Date of Sample	:	January 7, 2015
Country of Mass-production	:	China
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

General Specification

Power Supply (radio part input)	:	Cellular PA: 3.0V-4.2V (Depend on Battery voltage) Cellular other RF part: 1.3V, 1.8V, 2.05V, 2.7V (Regulated voltage) WLAN 5GHz Front-end module: 3.0V-4.2V (Depend on Battery voltage) WLAN/BT other RF part: 1.3V, 1.8V, 3.0V (Regulated voltage)
Clock frequency(ies) in the system	:	2.26GHz (Max) See below table for other clock frequencies

Frequency	Device
32.768kHz	MSM8974AB
32.768kHz (X'tal)	BUYD2206
27.0MHz	TC358764AXBG, XO2-256-64UCBGA, BUYD2206
48.0MHz (X'tal)	WCN3680
24.0MHz	MSM8974AB, Sub Camera
19.2MHz	WTR1625L, MSM8974AB
19.2MHz (X'tal)	PM8941
9.6MHz	WCD9320
72MHz	Main Camera
27.12MHz	NFC IC

Hardware / Software version	:	Rev. PR / QRCT Version 3.0.32.0

Radio Specification

	IEEE802.11b	**IEEE802.11g/n (20 M band)**	**IEEE802.11a/n/ac (20 M band)**	**IEEE802.11n/ac (40 M band)**	**IEEE802.11ac (80 M band)**
Frequency of operation	2412-2462MHz	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5825MHz	5190-5230MHz 5270-5310MHz 5510-5670MHz 5755-5795MHz	5210MHz 5290MHz 5530-5610MHz 5775MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)		OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM)
Channel spacing	5MHz		20MHz	40MHz	80MHz
Antenna type	Monopole				
Antenna Connector type	Spring type				
Antenna Gain	2.4GHz: -5.40dBi W52: -3.0dBi, W53: -3.5dBi, W56: -1.5dBi, W58: -1.8dBi				

	Bluetooth Ver.4.0 with EDR function	**GSM**	**W-CDMA**	**LTE**
Frequency of operation	2402-2480MHz	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz	[Up Link] Band II: 1850 – 1910MHz Band IV: 1710 – 1755MHz Band V: 824 – 849MHz [Down Link] Band II: 1930 – 1990MHz Band IV: 2110 – 2155MHz Band V: 869 – 894MHz	[Up Link] Band II: 1850 – 1910MHz Band IV: 1710 – 1755MHz Band V: 824 – 849MHz Band VII: 2500 – 2570MHz Band X VII: 704 – 716MHz [Down Link] Band II: 1930 – 1990MHz Band IV: 2110 – 2155MHz Band V: 869 – 894MHz Band VII: 2620 – 2690MHz Band X VII: 734 – 746MHz
Type of modulation	BT: FHSS (GFSK, π/4-DQPSK, 8-DPSK) LE: GFSK	GMSK , 8PSK	QPSK	QPSK, 16QAM
Channel spacing	BT: 1MHz LE: 2MHz	200kHz	200kHz	100kHz
Antenna type	Monopole	Monopole	Main: Monopole Sub: Monopole	
Antenna Connector type	Spring type	Spring type	Main: Spring type Sub: Spring type	
Antenna Gain	-5.40dBi	GSM850: -0.9dBi PCS: 0.5dBi	Band II: 0.5dBi Band IV: 0.6dBi Band V: -0.9dBi	Band II: 0.5dBi Band IV: 0.6dBi Band V: -0.9dBi Band VII: -0.2dBi Band X VII: -1.5dBi

	NFC	**GPS/GLONASS**
Frequency of operation	13.56MHz	GPS: 1575.42MHz GLONASS: 1597.55-1605.89MHz
Type of modulation	ASK	GPS: BPSK GLONASS: BPSK
Channel spacing	-	GLONASS: 0.5625MHz
Antenna type	Loop	Monopole
Antenna Connector type	Spring type	Spring type
Antenna Gain	N/A	-2.9dBi

*This test report applies for GSM (PCS1900), W-CDMA (Band II), and LTE (Band II).

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 24 Subpart E: 2013, final revised on April 11, 2013
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] 11.49dB 1849.9853MHz [Radiated] 13.8dB 1850.00MHz, Vertical 1910.00MHz, Horizontal **W-CDMA** [Conducted] 20.95dB 1910.000MHz [Radiated] 10.2dB 1910.00MHz, Horizontal **LTE** [Conducted] 7.74dB 1850.00MHz [Radiated] 5.6dB 1910.00MHz, Vertical	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** 17.9dB 3700.40MHz, Horizontal **W-CDMA** 22.8dB 7520.00MHz, Horizontal **LTE** 15.6dB 14812.00MHz, Vertical	Complied
Frequency Stability (Temperature Variation)	FCC 2.1055(a)(1)(b) FCC 24.235	Conducted	N/A	-	Complied
Frequency Stability (Voltage Variation)	FCC 2.1055(d)(1)(2) FCC 24.235	Conducted	N/A	-	Complied
Note: UL Japan's EMI Work Procedures No. 13-EM-W0420					

*These tests were also referred to ANSI/TIA 603-C-2004 " Land Mobile FM or PM Communications Equipment Measurement and Performance Standards."
*These tests were also referred to KDB 971168 D01 "Power Meas License Digital Systems v02r02"
*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Uncertainty

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

Radiated Emission (EUT height: 0.8m) (±dB)	
Measurement Distance 3m	
30MHz-300MHz	5.5dB
300MHz-1000MHz	4.2dB
1GHz-12.75GHz	4.6dB
Measurement Distance 1m	
1GHz-18GHz	5.3dB
15GHz-26.5GHz	3.7dB
26.5GHz-40GHz	3.7dB

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

Antenna terminal conducted emission and Power density (±dB)			**Antenna terminal conducted emission (±dB)**		**Channel power (±dB)**
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.5dB	1.7dB	2.8dB	2.8dB	2.9dB	2.6dB

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

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

3.4 Test Location

UL Japan, Inc. Ise EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999 Facsimile : +81 596 24 8124

	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	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	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	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	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	4.0 x 4.5 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	-	8.8 x 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	6.2 x 4.7 x 3.0m	4.8 x 4.6m	-

* 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)	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), Peak to Average power Ratio (Conducted), Spurious Emission(Conducted/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, Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) (GSM, GMSK, 1slot) Transmitting (Tx) (EGPRS, 8PSK, 1slot, MCS-5)	Max (PCL=0)	1880.0MHz	661
Band Edge(Conducted/Radiated)	Transmitting (Tx) (GSM, GMSK, 1slot) Transmitting (Tx) (EGPRS, 8PSK, 1slot, MCS-5)	Max (PCL=0)	1850.2MHz 1909.8MHz	512 810

*Single slot (1 slot) which had the highest frame power was tested as a representative.

<W-CDMA Band II>

Test	Operating mode	Power Control	Tested frequency	Uplink Channel
RF output Power(Conducted)	Transmitting (Tx) W-CDMA (RMC12.2kbps) Transmitting (Tx) W-CDMA (HSDPA Subtest 1-4) Transmitting (Tx) W-CDMA (DC-HSDPA Subtest 1-4) Transmitting (Tx) W-CDMA (HSUPA Subtest 1-5) Transmitting (Tx) W-CDMA (HSPA+ (16QAM) Subtest 1)	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
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 W-CDMA, HSDPA, HSUPA, HSPA+ (16QAM), and DC-HSDPA 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.)

<LTE Band II> (1/3)

Test	Modulation	Bandwidth	UL RB Config.	Power Control	Tested frequency[MHz]	Uplink Channel	
RF Output Power (Conducted)	QPSK 16QAM	20MHz	1/0	TPC All 1(MAX)	1860.0	18700	Low
			1/49		1880.0	18900	Mid
			1/99		1900.0	19100	High
			50/0				
			50/24				
			50/49				
			100/0				
		15MHz	1/0	TPC All 1(MAX)	1857.5	18675	Low
			1/37		1880.0	18900	Mid
			1/74		1902.5	19125	High
			36/0				
			36/19				
			36/39				
			75/0				
		10MHz	1/0	TPC All 1(MAX)	1855.0	18650	Low
			1/24		1880.0	18900	Mid
			1/49		1905.0	19150	High
			25/0				
			25/12				
			25/24				
			50/0				
		5MHz	1/0	TPC All 1(MAX)	1852.5	18625	Low
			1/12		1880.0	18900	Mid
			1/24		1907.5	19175	High
			12/0				
			12/6				
			12/11				
			25/0				
		3MHz	1/0	TPC All 1(MAX)	1851.5	18615	Low
			1/7		1880.0	18900	Mid
			1/14		1908.5	19185	High
			8/0				
			8/4				
			8/7				
			15/0				
		1.4MHz	1/0	TPC All 1(MAX)	1850.7	18607	Low
			1/2		1880.0	18900	Mid
			1/5		1909.3	19193	High
			3/0				
			3/1				
			3/3				
			6/0				

<LTE Band II> (2/3)

Test	Modulation	Bandwidth	UL RB Config.	Power Control	Tested frequency[MHz]	Uplink Channel	
RF Output Power(Radiated) (Equivalent Isotropic Radiated Power(EIRP))	QPSK	20MHz	1/0 *1)	TPC All 1(MAX)	1860.0	18700	Low
			1/49 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/99 *1)	TPC All 1(MAX)	1900.0	19100	High
		15MHz	1/0 *1)	TPC All 1(MAX)	1857.5	18675	Low
			1/0 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/74 *1)	TPC All 1(MAX)	1902.5	19125	High
		10MHz	1/49 *1)	TPC All 1(MAX)	1855.0	18650	Low
			1/0 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/49 *1)	TPC All 1(MAX)	1905.0	19150	High
		5MHz	1/12 *1)	TPC All 1(MAX)	1852.5	18625	Low
			1/0 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/24 *1)	TPC All 1(MAX)	1907.5	19175	High
		3MHz	1/14 *1)	TPC All 1(MAX)	1851.5	18615	Low
			1/14 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/14 *1)	TPC All 1(MAX)	1908.5	19185	High
		1.4MHz	3/0 *1)	TPC All 1(MAX)	1850.7	18607	Low
			1/0 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			3/1 *1)	TPC All 1(MAX)	1909.3	19193	High
	16QAM	20MHz	1/49 *1)	TPC All 1(MAX)	1860.0	18700	Low
			1/49 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/99 *1)	TPC All 1(MAX)	1900.0	19100	High
		15MHz	1/74 *1)	TPC All 1(MAX)	1857.5	18675	Low
			1/0 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/74 *1)	TPC All 1(MAX)	1902.5	19125	High
		10MHz	1/49 *1)	TPC All 1(MAX)	1855.0	18650	Low
			1/0 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/49 *1)	TPC All 1(MAX)	1905.0	19150	High
		5MHz	1/0 *1)	TPC All 1(MAX)	1852.5	18625	Low
			1/0 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/24 *1)	TPC All 1(MAX)	1907.5	19175	High
		3MHz	1/0 *1)	TPC All 1(MAX)	1851.5	18615	Low
			1/0 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/14 *1)	TPC All 1(MAX)	1908.5	19185	High
		1.4MHz	1/0 *1)	TPC All 1(MAX)	1850.7	18607	Low
			1/0 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/0 *1)	TPC All 1(MAX)	1909.3	19193	High
Peak to Average Power	QPSK	20MHz	100/0	TPC All 1(MAX)	1860.0	18700	Low
Ratio(Conducted)	16QAM				1880.0	18900	Mid
					1900.0	19100	High
		15MHz	75/0	TPC All 1(MAX)	1857.5	18675	Low
					1880.0	18900	Mid
					1902.5	19125	High
		10MHz	50/0	TPC All 1(MAX)	1855.0	18650	Low
					1880.0	18900	Mid
					1905.0	19150	High
		5MHz	25/0	TPC All 1(MAX)	1852.5	18625	Low
					1880.0	18900	Mid
					1907.5	19175	High
		3MHz	15/0	TPC All 1(MAX)	1851.5	18615	Low
					1880.0	18900	Mid
					1908.5	19185	High
		1.4MHz	6/0	TPC All 1(MAX)	1850.7	18607	Low
					1880.0	18900	Mid
					1909.3	19193	High

<LTE Band II> (3/3)

Test	Modulation	Bandwidth	UL RB Config.	Power Control	Tested frequency[MHz]	Uplink Channel	
Bandwidth(Conducted)	QPSK 16QAM	20MHz	100/0	TPC All 1(MAX)	1880.0	18900	Mid
		15MHz	75/0				
		10MHz	50/0				
		5MHz	25/0				
		3MHz	15/0				
		1.4MHz	6/0				
Band Edge(Conducted)	QPSK 16QAM	20MHz	100/0	TPC All 1(MAX)	1860.0	18700	Low
			100/0	TPC All 1(MAX)	1900.0	19100	High
			1/0	TPC All 1(MAX)	1860.0	18700	Low
			1/99	TPC All 1(MAX)	1900.0	19100	High
		15MHz	75/0	TPC All 1(MAX)	1857.5	18675	Low
			75/0	TPC All 1(MAX)	1902.5	19125	High
			1/0	TPC All 1(MAX)	1857.5	18675	Low
			1/74	TPC All 1(MAX)	1902.5	19125	High
		10MHz	50/0	TPC All 1(MAX)	1855.0	18650	Low
			50/0	TPC All 1(MAX)	1905.0	19150	High
			1/0	TPC All 1(MAX)	1855.0	18650	Low
			1/49	TPC All 1(MAX)	1905.0	19150	High
		5MHz	25/0	TPC All 1(MAX)	1852.5	18625	Low
			25/0	TPC All 1(MAX)	1907.5	19175	High
			1/0	TPC All 1(MAX)	1852.5	18625	Low
			1/24	TPC All 1(MAX)	1907.5	19175	High
		3MHz	15/0	TPC All 1(MAX)	1851.5	18615	Low
			15/0	TPC All 1(MAX)	1908.5	19185	High
			1/0	TPC All 1(MAX)	1851.5	18615	Low
			1/14	TPC All 1(MAX)	1908.5	19185	High
		1.4MHz	6/0	TPC All 1(MAX)	1850.7	18607	Low
			6/0	TPC All 1(MAX)	1909.3	19193	High
			1/0	TPC All 1(MAX)	1850.7	18607	Low
			1/5	TPC All 1(MAX)	1909.3	19193	High
Band Edge(Radiated)	QPSK 16QAM	5MHz *2)	25/0	TPC All 1(MAX)	1852.5	18625	Low
			25/0	TPC All 1(MAX)	1907.5	19175	High
			1/0	TPC All 1(MAX)	1852.5	18625	Low
			1/24	TPC All 1(MAX)	1907.5	19175	High
Spurious Emission(Conducted)	QPSK	3MHz *4)	1/14 *1)	TPC All 1(MAX)	1851.5	18615	Low
Spurious Emission(Radiated)			1/14 *1)	TPC All 1(MAX)	1880.0	18900	Mid
			1/14 *1)	TPC All 1(MAX)	1908.5	19185	High
Frequency Stability (Temperature/ Voltage Variation)	QPSK 16QAM	20MHz *3)	100/0	TPC All 1(MAX)	1880.0	18900	Mid

*1) The UL RB Configration was used for testing as a representative, because it had the highest RF output power (conducted).
*2) Test was performed with BW:5MHz as a representative as it had the highest result at Band edge (conducted) test.
*3) The widest bandwidth was chosen for testing as a representative.
*4) The Bandwidth was used for testing as a representative, because it had the highest RF output power (conducted).

4.1.1 Explanation of theRel-99 WCDMA, Rel-6 HSPA, Rel-7 HSPA+ and Rel-8 DC-HSDPA 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
  HSPA+ Rel7: Power is measured for HSPA+ that supports uplink 16 QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1.
  DC-HSDPA Rel8:
  Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

  * 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, Release 6 HSPA, Release 7 HSPA+, Release 8 DC-HSDPA Subtest Configurations per 3GPP TS 34.121.

[HSDPA and DC-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.

*HSDPA: H-set1, DC-HSDPA: H-set12

C.8.1.12 Fixed Reference Channel Definition H-Set 12

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Proces ses	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

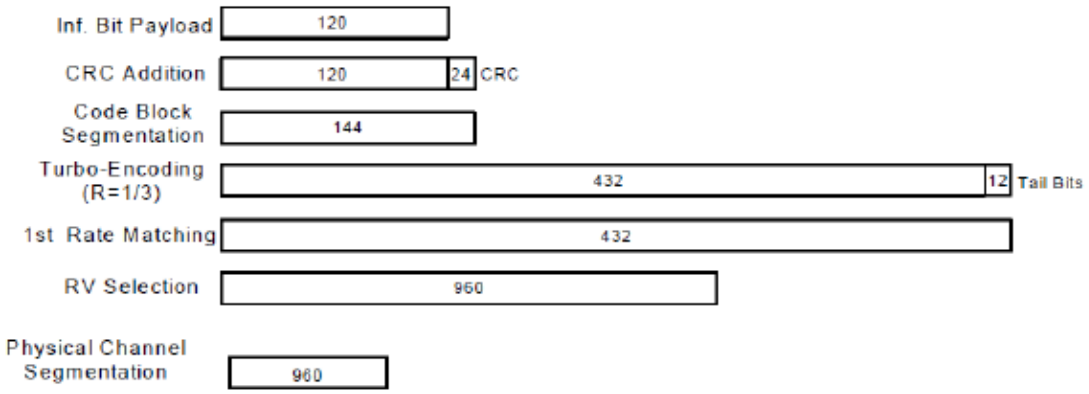


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

[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.

[HSPA+]

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	$\beta_{ed}1$: 30/15 $\beta_{ed}2$: 30/15	$\beta_{ed}3$: 24/15 $\beta_{ed}4$: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

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.

[HSPA+]
Power is measured for HSPA+ that supports uplink 16 QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1.

[DC-HSDPA]
Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

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]

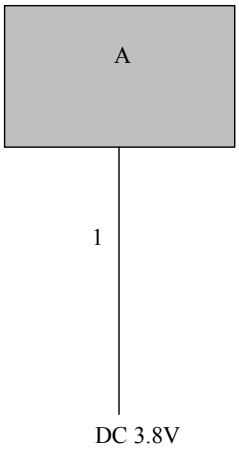
Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	5 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Reference E-TFCI	71
- Reference E-TFCI PO	23
- Reference E-TFCI	75
- Reference E-TFCI PO	26
- Reference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

[Subtest 3]

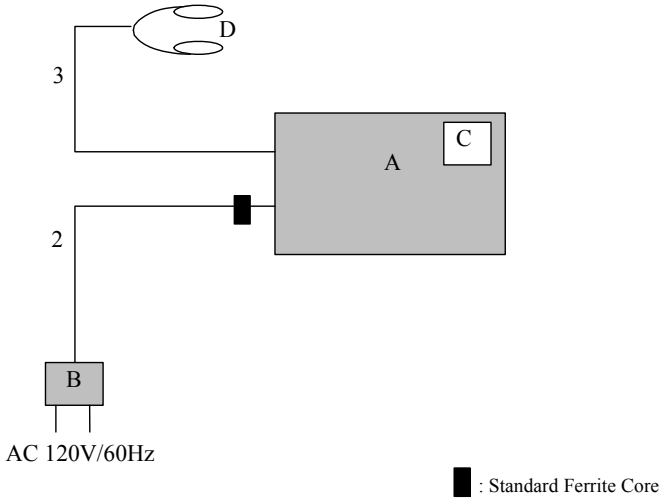
Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	2 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	92
- Reference E-TFCI PO	18

4.2 Configuration and peripherals

[Antenna terminal conducted test]



[All tests except for antenna terminal conducted test]



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Digital Camera	DMC-CM1	004401221416114 *1) 004401221415512 *2)	Panasonic	EUT
B	AC Adaptor	VSK0825	k4000106PH	Panasonic	EUT
C	Micro SD Card	02GUECA-MB	-	Panasonic	-
D	Earphone	-	-	Panasonic	-

*1) Used for antenna terminal conducted test.
*2) Used for all tests except for antenna terminal conducted test.

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	2.0	Unshielded	Unshielded	-
2	DC Cable	1.2	Unshielded	Unshielded	-
3	Earphone Cable	1.2	Unshielded	Unshielded	-

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.

[Radiated : Equivalent isotropic radiated power(EIRP)]
Test Procedure

1) EUT was placed on a urethane platform of nominal size, 1.0 m by 0.5m, raised 80cm above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The Radiated Electric Field Strength intensity has been measured in a semi anechoic chamber with a ground plane and at a distance of 3m.
The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

2) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height as the EUT. The frequency above 1GHz of the Substitution antenna was used with Horn antenna calibrated with the Half wave dipole antenna, which is harmonized with the measured frequency in 1).
The Substitution Antenna was connected with the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field is equal to the measured value in 1).
The measuring antenna height varied between 1 and 4m to obtain the maximum receiving level.
Its Output power of Signal Generator was recorded.

3) Equivalent isotropic radiated power(EIRP) was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).

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

Test data : APPENDIX 1
Test result : Pass

SECTION 6: Bandwidth (Conducted)

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

Test data : APPENDIX 1
Test result : Pass

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

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

[Radiated]
Test Procedure
1) EUT was placed on a urethane platform of nominal size, 1.0 m by 0.5m, raised 80cm above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The Radiated Electric Field Strength intensity has been measured in a semi anechoic chamber with a ground plane and at a distance of 3m.
The measuring antenna height was varied between 1 to 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

2) Exchanged the EUT to the Substitution Antenna, the antenna was set for the same height as EUT on the table.
The frequency below 1GHz of the Substitution antenna was used as the Half wave dipole antenna and Shorted dipole antenna calibrated with the Half wave dipole antenna, which is harmonized with the measured frequency in 1). The frequency above 1GHz of the Substitution antenna was used with Horn antenna calibrated with the Half wave dipole antenna.
The Substitution antenna was connected with the Signal Generator, and the polarized electromagnetic radiation of the Substitution antenna was matched with the one of the measuring antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field is equal to the measured value in 1).
The measuring antenna height varied between 1 and 4m to obtain the maximum receiving level.
Its Output power of Signal Generator was recorded.

3) Equivalent isotropic radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).

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

Test data : APPENDIX 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 (DC 3.0V to DC 4.2V), and it is presented as the ppm unit.

Temperature : -30deg.C to +50deg.C (10 deg. C. step)
Voltage : Vnom:DC3.8V, Vmin:DC3.0V, Vmax:DC4.2V (Battery Output)

As the operating input voltage of the EUT is between DC 3.0V to DC 4.2V (nominal voltage: DC 3.8V), 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
PCS1900

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/14/2015
Temperature/ Humidity	21deg. C / 32% 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

Mode	Ch	Frequency [MHz]	Reading Average frame power [dBm]	Cable Loss [dB]	Result [dBm]
GSM	512	1850.2	24.16	6.36	30.52
	661	1880.0	24.15	6.36	30.51
	810	1909.8	23.87	6.36	30.23
GPRS	512	1850.2	24.13	6.36	30.49
	661	1880.0	24.11	6.36	30.47
	810	1909.8	23.84	6.36	30.20
EGPRS	512	1850.2	19.94	6.36	26.30
	661	1880.0	20.12	6.36	26.48
	810	1909.8	19.36	6.36	25.72

Results = Reading + Cable Loss

RF Output Power (Conducted)

Conducted Output Power

W-CDMA Band II

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/26/2015
Temperature/ Humidity	22deg. C / 48% RH
Engineer	Yutaka Yoshida
Mode	Tx W-CDMA

Mode	Ch	Frequency [MHz]	Result [dBm]
RMC 12.2kbps	Low	1852.4	23.88
	Mid	1880.0	23.68
	High	1907.6	23.55
HSDPA Subtest 1	Low	1852.4	22.84
	Mid	1880.0	22.66
	High	1907.6	22.67
HSDPA Subtest 2	Low	1852.4	22.81
	Mid	1880.0	22.66
	High	1907.6	22.67
HSDPA Subtest 3	Low	1852.4	22.31
	Mid	1880.0	22.27
	High	1907.6	22.18
HSDPA Subtest 4	Low	1852.4	22.30
	Mid	1880.0	22.25
	High	1907.6	22.18
DC-HSDPA Subtest 1	Low	1852.4	22.62
	Mid	1880.0	22.68
	High	1907.6	22.56
DC-HSDPA Subtest 2	Low	1852.4	22.79
	Mid	1880.0	22.66
	High	1907.6	22.63
DC-HSDPA Subtest 3	Low	1852.4	22.27
	Mid	1880.0	22.15
	High	1907.6	22.14
DC-HSDPA Subtest 4	Low	1852.4	22.36
	Mid	1880.0	22.15
	High	1907.6	22.17
HSUPA Subtest 1	Low	1852.4	22.50
	Mid	1880.0	22.26
	High	1907.6	22.27
HSUPA Subtest 2	Low	1852.4	21.01
	Mid	1880.0	21.07
	High	1907.6	21.02
HSUPA Subtest 3	Low	1852.4	21.30
	Mid	1880.0	21.27
	High	1907.6	21.38
HSUPA Subtest 4	Low	1852.4	21.68
	Mid	1880.0	21.53
	High	1907.6	21.39
HSUPA Subtest 5	Low	1852.4	22.70
	Mid	1880.0	22.66
	High	1907.6	22.65
HSPA+ (16QAM) Subtest 1	Low	1852.4	20.84
	Mid	1880.0	20.85
	High	1907.6	20.85

*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 (Conducted)

Conducted Output Power

LTE Band II

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/14/2015
Temperature/ Humidity	24deg. C / 33% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK, 16QAM)

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
20	18700	1860	QPSK	1	0	0	0	22.96
				1	49	0	0	22.95
				1	99	0	0	22.84
				50	0	1	1	22.02
				50	24	1	1	22.06
				50	49	1	1	22.06
				100	0	1	1	22.12
			16QAM	1	0	1	1	22.14
				1	49	1	1	22.17
				1	99	1	1	22.06
				50	0	2	2	20.94
				50	24	2	2	21.02
				50	49	2	2	21.05
				100	0	2	2	21.04
	18900	1880	QPSK	1	0	0	0	22.70
				1	49	0	0	22.73
				1	99	0	0	22.66
				50	0	1	1	21.94
				50	24	1	1	21.87
				50	49	1	1	21.91
				100	0	1	1	21.85
			16QAM	1	0	1	1	21.92
				1	49	1	1	21.98
				1	99	1	1	21.92
				50	0	2	2	20.96
				50	24	2	2	20.89
				50	49	2	2	20.92
				100	0	2	2	20.88
	19100	1900	QPSK	1	0	0	0	22.59
				1	49	0	0	22.66
				1	99	0	0	22.77
				50	0	1	1	21.78
				50	24	1	1	21.80
				50	49	1	1	21.72
				100	0	1	1	21.85
			16QAM	1	0	1	1	21.81
				1	49	1	1	21.89
				1	99	1	1	22.03
				50	0	2	2	20.86
				50	24	2	2	20.85
				50	49	2	2	20.79
				100	0	2	2	20.91

RF Output Power (Conducted)

Conducted Output Power

LTE Band II

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/14/2015
Temperature/ Humidity	24deg. C / 33% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK, 16QAM)

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
15	18675	1857.5	QPSK	1	0	0	0	23.07
				1	37	0	0	23.00
				1	74	0	0	23.05
				36	0	1	1	22.02
				36	19	1	1	22.07
				36	39	1	1	22.17
				75	0	1	1	22.11
			16QAM	1	0	1	1	21.86
				1	37	1	1	21.87
				1	74	1	1	21.87
				36	0	2	2	20.92
				36	19	2	2	20.99
				36	39	2	2	21.05
				75	0	2	2	21.03
	18900	1880	QPSK	1	0	0	0	22.92
				1	37	0	0	22.89
				1	74	0	0	22.83
				36	0	1	1	21.88
				36	19	1	1	21.86
				36	39	1	1	21.88
				75	0	1	1	21.94
			16QAM	1	0	1	1	21.74
				1	37	1	1	21.67
				1	74	1	1	21.58
				36	0	2	2	20.80
				36	19	2	2	20.78
				36	39	2	2	20.82
				75	0	2	2	20.88
	19125	1902.5	QPSK	1	0	0	0	22.88
				1	37	0	0	22.80
				1	74	0	0	22.93
				36	0	1	1	21.79
				36	19	1	1	21.90
				36	39	1	1	21.84
				75	0	1	1	21.90
			16QAM	1	0	1	1	21.60
				1	37	1	1	21.51
				1	74	1	1	21.68
				36	0	2	2	20.77
				36	19	2	2	20.79
				36	39	2	2	20.76
				75	0	2	2	20.81

RF Output Power (Conducted)

Conducted Output Power

LTE Band II

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/14/2015
Temperature/ Humidity	24deg. C / 33% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK, 16QAM)

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
10	18650	1855	QPSK	1	0	0	0	23.11
				1	24	0	0	23.01
				1	49	0	0	23.14
				25	0	1	1	22.13
				25	12	1	1	22.04
				25	24	1	1	22.12
				50	0	1	1	22.05
			16QAM	1	0	1	1	21.86
				1	24	1	1	21.78
				1	49	1	1	21.96
				25	0	2	2	21.03
				25	12	2	2	20.93
				25	24	2	2	20.95
				50	0	2	2	20.95
	18900	1880	QPSK	1	0	0	0	22.96
				1	24	0	0	22.91
				1	49	0	0	22.86
				25	0	1	1	21.86
				25	12	1	1	21.81
				25	24	1	1	21.92
				50	0	1	1	21.90
			16QAM	1	0	1	1	21.73
				1	24	1	1	21.62
				1	49	1	1	21.55
				25	0	2	2	20.80
				25	12	2	2	20.85
				25	24	2	2	20.84
				50	0	2	2	20.80
	19150	1905	QPSK	1	0	0	0	22.83
				1	24	0	0	22.81
				1	49	0	0	23.02
				25	0	1	1	21.87
				25	12	1	1	21.80
				25	24	1	1	21.81
				50	0	1	1	21.80
			16QAM	1	0	1	1	21.65
				1	24	1	1	21.56
				1	49	1	1	21.68
				25	0	2	2	20.83
				25	12	2	2	20.74
				25	24	2	2	20.84
				50	0	2	2	20.81

RF Output Power (Conducted)

Conducted Output Power

LTE Band II

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/14/2015
Temperature/ Humidity	24deg. C / 33% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK, 16QAM)

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
5	18625	1852.5	QPSK	1	0	0	0	22.93
				1	12	0	0	22.94
				1	24	0	0	22.89
				12	0	1	1	22.04
				12	6	1	1	22.11
				12	11	1	1	22.10
				25	0	1	1	22.13
			16QAM	1	0	1	1	21.89
				1	12	1	1	21.88
				1	24	1	1	21.83
				12	0	2	2	21.02
				12	6	2	2	21.05
				12	11	2	2	21.05
				25	0	2	2	21.10
	18900	1880	QPSK	1	0	0	0	22.95
				1	12	0	0	22.87
				1	24	0	0	22.88
				12	0	1	1	21.87
				12	6	1	1	21.83
				12	11	1	1	21.83
				25	0	1	1	21.83
			16QAM	1	0	1	1	21.70
				1	12	1	1	21.63
				1	24	1	1	21.70
				12	0	2	2	20.88
				12	6	2	2	20.85
				12	11	2	2	20.85
				25	0	2	2	20.92
	19175	1907.5	QPSK	1	0	0	0	22.81
				1	12	0	0	22.81
				1	24	0	0	22.95
				12	0	1	1	21.83
				12	6	1	1	21.76
				12	11	1	1	21.85
				25	0	1	1	21.81
			16QAM	1	0	1	1	21.57
				1	12	1	1	21.57
				1	24	1	1	21.71
				12	0	2	2	20.83
				12	6	2	2	20.84
				12	11	2	2	20.87
				25	0	2	2	20.88

RF Output Power (Conducted)

Conducted Output Power

LTE Band II

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/14/2015
Temperature/ Humidity	24deg. C / 33% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK, 16QAM)

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
3	18615	1851.5	QPSK	1	0	0	0	23.13
				1	7	0	0	23.09
				1	14	0	0	23.21
				8	0	1	1	22.10
				8	4	1	1	22.06
				8	7	1	1	22.11
				15	0	1	1	22.14
			16QAM	1	0	1	1	21.93
				1	7	1	1	21.83
				1	14	1	1	21.91
				8	0	2	2	21.03
				8	4	2	2	21.04
				8	7	2	2	21.04
				15	0	2	2	21.04
	18900	1880	QPSK	1	0	0	0	22.90
				1	7	0	0	22.92
				1	14	0	0	22.94
				8	0	1	1	21.87
				8	4	1	1	21.85
				8	7	1	1	21.87
				15	0	1	1	21.84
			16QAM	1	0	1	1	21.68
				1	7	1	1	21.66
				1	14	1	1	21.66
				8	0	2	2	20.85
				8	4	2	2	20.84
				8	7	2	2	20.85
				15	0	2	2	20.88
	19185	1908.5	QPSK	1	0	0	0	22.88
				1	7	0	0	22.87
				1	14	0	0	23.03
				8	0	1	1	21.84
				8	4	1	1	21.83
				8	7	1	1	21.87
				15	0	1	1	21.82
			16QAM	1	0	1	1	21.63
				1	7	1	1	21.63
				1	14	1	1	21.69
				8	0	2	2	20.83
				8	4	2	2	20.83
				8	7	2	2	20.85
				15	0	2	2	20.87

RF Output Power (Conducted)

Conducted Output Power

LTE Band II

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/14/2015
Temperature/ Humidity	24deg. C / 33% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK, 16QAM)

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
1.4	18607	1850.7	QPSK	1	0	0	0	23.07
				1	2	0	0	22.99
				1	5	0	0	23.06
				3	0	0	0	23.13
				3	1	0	0	23.09
				3	3	0	0	23.01
				6	0	1	1	22.15
			16QAM	1	0	1	1	22.17
				1	2	1	1	22.12
				1	5	1	1	22.16
				3	0	1	1	22.04
				3	1	1	1	22.00
				3	3	1	1	22.00
				6	0	2	2	21.09
	18900	1880	QPSK	1	0	0	0	22.91
				1	2	0	0	22.80
				1	5	0	0	22.87
				3	0	0	0	22.86
				3	1	0	0	22.85
				3	3	0	0	22.86
				6	0	1	1	21.87
			16QAM	1	0	1	1	21.91
				1	2	1	1	21.86
				1	5	1	1	21.86
				3	0	1	1	21.78
				3	1	1	1	21.77
				3	3	1	1	21.75
				6	0	2	2	20.92
	19193	1909.3	QPSK	1	0	0	0	22.92
				1	2	0	0	22.83
				1	5	0	0	22.92
				3	0	0	0	22.86
				3	1	0	0	22.93
				3	3	0	0	22.90
				6	0	1	1	21.88
			16QAM	1	0	1	1	21.89
				1	2	1	1	21.85
				1	5	1	1	21.86
				3	0	1	1	21.81
				3	1	1	1	21.78
				3	3	1	1	21.77
				6	0	2	2	20.92

RF Output Power (Radiated)

Equivalent Isotropically Radiated Power(EIRP)

PCS1900

Report No.	10636726H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	01/20/2015
Temperature / Humidity	24deg. C / 37% RH
Engineer	Satofumi Matsuyama
Mode	Tx GSM(GMSK), 1slot, PCL=0

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.20	96.2	100.9	21.0	25.3	3.6	9.7	0.0	27.2	31.5	33.0	5.8	1.5	145	351	100	244	
1880.00	99.2	100.3	24.3	24.8	3.6	9.9	0.0	30.6	31.1	33.0	2.4	1.9	150	178	100	244	
1909.80	100.6	99.3	25.8	24.8	3.6	10.0	0.0	32.2	31.2	33.0	0.8	1.8	114	199	100	248	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-20GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-20GHz)
Detector : S/A PK (RBW: 3MHz , VBW: 8MHz)

Report No.	10636726H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	01/20/2015
Temperature / Humidity	24deg. C / 37% RH
Engineer	Satofumi Matsuyama
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.20	96.3	101.3	21.1	25.7	3.6	9.7	0.0	27.3	31.9	33.0	5.7	1.1	149	347	100	243	
1880.00	99.1	100.9	24.2	25.4	3.6	9.9	0.0	30.5	31.7	33.0	2.5	1.3	149	177	100	244	
1909.80	100.3	99.5	25.5	25.0	3.6	10.0	0.0	31.9	31.4	33.0	1.1	1.6	114	202	100	248	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-20GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-20GHz)
Detector : S/A PK (RBW: 3MHz , VBW: 8MHz)

RF Output Power (Radiated)

Equivalent Isotropically Radiated Power(EIRP)

W-CDMA Band II

Report No.	10636726H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	01/20/2015
Temperature / Humidity	24deg. C / 38% RH
Engineer	Satofumi Matsuyama
Mode	Tx W-CDMA (RMC12.2kbps), All Up Bits

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1852.40	96.5	96.4	21.3	20.8	3.6	9.7	0.0	27.5	27.0	33.0	5.5	6.0	116	184	100	244	
1880.00	96.1	95.5	21.2	20.0	3.6	9.9	0.0	27.5	26.3	33.0	5.5	6.7	152	181	100	245	
1907.60	95.6	96.0	20.8	20.5	3.6	10.0	0.0	27.2	26.9	33.0	5.8	6.1	110	184	100	247	

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)

RF Output Power (Radiated)

Equivalent Isotropically Radiated Power(EIRP)
LTE Band II

Report No.	10636726H
Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Date	01/26/2015
Temperature / Humidity	23deg. C / 32 % RH
Engineer	Tsubasa Takayama
Mode	Tx LTE (QPSK), Tx LTE (16QAM)

[BW 1.4MHz, QPSK]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.70	92.0	93.1	16.8	17.4	3.6	9.7	0.0	23.0	23.6	30.0	7.0	6.4	112	13	100	86	RB3-0
1878.95	93.4	94.0	18.1	17.5	3.6	9.9	0.0	24.4	23.8	30.0	5.6	6.2	114	359	100	184	RB1-0
1909.30	93.4	94.1	18.3	18.4	3.6	10.0	0.0	24.7	24.8	30.0	5.3	5.2	111	359	100	180	RB3-1

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 : Spectrum Analyzer RMS Average (RBW: 30kHz , VBW: 91kHz)

[BW 1.4MHz, 16QAM, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.70	91.6	92.9	16.4	17.2	3.6	9.7	0.0	22.6	23.4	30.0	7.4	6.6	112	2	101	81	RB1-0
1878.95	92.4	92.9	17.1	16.4	3.6	9.9	0.0	23.4	22.7	30.0	6.6	7.3	112	13	100	185	RB1-0
1909.30	90.7	92.5	15.5	16.8	3.6	10.0	0.0	21.9	23.2	30.0	8.1	6.8	112	350	100	194	RB1-0

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer RMS Average (RBW: 30kHz , VBW: 91kHz)

RF Output Power (Radiated)

Equivalent Isotropically Radiated Power(EIRP)
LTE Band II

Report No.	10636726H
Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Date	01/26/2015
Temperature / Humidity	23deg. C / 32 % RH
Engineer	Tsubasa Takayama
Mode	Tx LTE (QPSK), Tx LTE (16QAM)

[BW 3MHz, QPSK, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1851.50	94.5	94.4	19.3	18.4	3.6	9.7	0.0	25.5	24.6	30.0	4.5	5.4	114	10	100	183	RB1-14
1880.00	93.7	94.1	18.4	18.2	3.6	9.9	0.0	24.7	24.5	30.0	5.3	5.5	114	9	100	192	RB1-14
1908.50	92.9	93.1	17.7	17.3	3.6	10.0	0.0	24.1	23.7	30.0	5.9	6.3	112	10	100	191	RB1-14

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 : Spectrum Analyzer RMS Average (RBW: 30kHz , VBW: 91kHz)

[BW 3MHz, 16QAM, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1851.50	93.6	93.6	18.4	17.6	3.6	9.7	0.0	24.6	23.8	30.0	5.4	6.2	114	12	100	188	RB1-0
1880.00	93.1	93.3	17.8	17.4	3.6	9.9	0.0	24.1	23.7	30.0	5.9	6.3	112	12	100	191	RB1-0
1908.50	94.2	92.6	19.0	16.8	3.6	10.0	0.0	25.4	23.2	30.0	4.6	6.8	113	8	100	192	RB1-14

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 : Spectrum Analyzer RMS Average (RBW: 30kHz , VBW: 91kHz)

RF Output Power (Radiated)

Equivalent Isotropically Radiated Power(EIRP)
LTE Band II

Report No.	10636726H
Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Date	01/26/2015
Temperature / Humidity	23deg. C / 32 % RH
Engineer	Tsubasa Takayama
Mode	Tx LTE (QPSK), Tx LTE (16QAM)

[BW 5MHz, QPSK, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1852.50	93.3	94.3	18.1	18.4	3.6	9.7	0.0	24.3	24.6	30.0	5.7	5.4	112	359	100	92	RB1-12
1880.00	93.9	92.8	18.6	16.9	3.6	9.9	0.0	24.9	23.2	30.0	5.1	6.8	114	13	100	73	RB1-0
1907.50	93.4	94.2	18.4	18.2	3.6	10.0	0.0	24.8	24.6	30.0	5.2	5.4	110	8	100	192	RB1-24

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 : Spectrum Analyzer RMS Average (RBW: 200kHz , VBW: 620kHz)

[BW 5MHz, 16QAM, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1852.50	92.6	93.2	17.4	17.3	3.6	9.7	0.0	23.6	23.5	30.0	6.4	6.5	112	11	100	6	RB1-0
1880.00	92.8	92.1	17.5	16.2	3.6	9.9	0.0	23.8	22.5	30.0	6.2	7.5	113	11	100	74	RB1-0
1907.50	92.5	92.9	17.5	16.9	3.6	10.0	0.0	23.9	23.3	30.0	6.1	6.7	108	10	100	196	RB1-24

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 : Spectrum Analyzer RMS Average (RBW: 200kHz , VBW: 620kHz)

RF Output Power (Radiated)

Equivalent Isotropically Radiated Power(EIRP)
LTE Band II

Report No.	10636726H
Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Date	01/26/2015
Temperature / Humidity	23deg. C / 32 % RH
Engineer	Tsubasa Takayama
Mode	Tx LTE (QPSK), Tx LTE (16QAM)

[BW 10MHz, QPSK, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1855.00	93.6	94.1	18.6	18.1	3.6	9.8	0.0	24.8	24.3	30.0	5.2	5.7	118	14	100	84	RB1-49
1880.00	92.6	94.3	17.3	18.3	3.6	9.9	0.0	23.6	24.6	30.0	6.4	5.4	114	18	100	197	RB1-0
1905.00	93.6	94.1	18.7	18.2	3.6	10.0	0.0	25.1	24.6	30.0	4.9	5.4	109	13	100	192	RB1-49

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 : Spectrum Analyzer RMS Average (RBW: 200kHz , VBW: 620kHz)

[BW 10MHz, 16QAM, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1855.00	94.4	93.7	19.4	17.7	3.6	9.8	0.0	25.6	23.9	30.0	4.4	6.1	117	15	100	76	RB1-49
1880.00	91.6	92.9	16.3	16.9	3.6	9.9	0.0	22.6	23.2	30.0	7.4	6.8	113	21	100	8	RB1-0
1905.00	92.7	92.6	17.8	16.7	3.6	10.0	0.0	24.2	23.1	30.0	5.8	6.9	108	14	100	195	RB1-49

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 : Spectrum Analyzer RMS Average (RBW: 200kHz , VBW: 620kHz)

RF Output Power (Radiated)

Equivalent Isotropically Radiated Power(EIRP)
LTE Band II

Report No.	10636726H
Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Date	01/26/2015
Temperature / Humidity	23deg. C / 32 % RH
Engineer	Tsubasa Takayama
Mode	Tx LTE (QPSK), Tx LTE (16QAM)

[BW 15MHz, QPSK, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1857.50	93.0	94.5	18.0	18.7	3.6	9.8	0.0	24.2	24.9	30.0	5.8	5.1	115	22	100	87	RB1-0
1880.00	93.7	93.9	18.4	18.5	3.6	9.9	0.0	24.7	24.8	30.0	5.3	5.2	113	18	100	189	RB1-0
1902.50	94.0	93.3	19.1	17.7	3.6	10.0	0.0	25.5	24.1	30.0	4.5	5.9	109	12	100	193	RB1-74

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 : Spectrum Analyzer RMS Average (RBW: 200kHz , VBW: 620kHz)

[BW 15MHz, 16QAM, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1857.50	92.1	92.7	17.1	16.9	3.6	9.8	0.0	23.3	23.1	30.0	6.7	6.9	116	21	100	198	RB1-74
1880.00	92.5	92.7	17.2	17.3	3.6	9.9	0.0	23.5	23.6	30.0	6.5	6.4	112	21	100	191	RB1-0
1902.50	93.0	92.5	18.1	16.9	3.6	10.0	0.0	24.5	23.3	30.0	5.5	6.7	107	10	100	196	RB1-74

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 : Spectrum Analyzer RMS Average (RBW: 200kHz , VBW: 620kHz)

RF Output Power (Radiated)

Equivalent Isotropically Radiated Power(EIRP)
LTE Band II

Report No.	10636726H
Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Date	01/26/2015
Temperature / Humidity	23deg. C / 32 % RH
Engineer	Tsubasa Takayama
Mode	Tx LTE (QPSK), Tx LTE (16QAM)

[BW 20MHz, QPSK, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1860.00	93.3	93.4	18.7	18.3	3.6	9.8	0.0	24.9	24.5	30.0	5.1	5.5	115	9	100	191	RB1-0
1880.00	94.2	92.5	19.1	17.1	3.6	9.9	0.0	25.4	23.4	30.0	4.6	6.6	112	12	100	201	RB1-49
1900.00	94.6	92.0	19.8	16.5	3.6	10.0	0.0	26.2	22.9	30.0	3.8	7.1	109	11	100	199	RB1-99

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 : Spectrum Analyzer RMS Average (RBW: 200kHz , VBW: 620kHz)

[BW 20MHz, 16QAM, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1860.00	93.6	92.8	19.0	17.7	3.6	9.8	0.0	25.2	23.9	30.0	4.8	6.1	114	11	100	194	RB1-49
1880.00	93.2	91.2	18.1	18.4	3.6	9.9	0.0	24.4	24.7	30.0	5.6	5.3	113	13	100	202	RB1-49
1900.00	92.8	91.1	18.0	17.4	3.6	10.0	0.0	24.4	23.8	30.0	5.6	6.2	109	11	100	193	RB1-99

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 : Spectrum Analyzer RMS Average (RBW: 200kHz , VBW: 620kHz)

Peak to Average power Ratio (Conducted)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/4/2015
Temperature/ Humidity	22deg. C / 48% RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK), 1slot, PCL=0
Mode	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 *1)	512	1850.20	0.166	13
	661	1880.00	0.109	13
	810	1909.80	0.114	13
EGPRS *1)	512	1850.20	2.578	13
	661	1880.00	2.111	13
	810	1909.80	2.230	13
W-CDMA *2)	9262	1852.40	3.14	13
	9400	1880.00	3.14	13
	9538	1907.60	3.01	13

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

Peak to Average power Ratio (Conducted)
LTE PAPR Worst Mode RB configurations

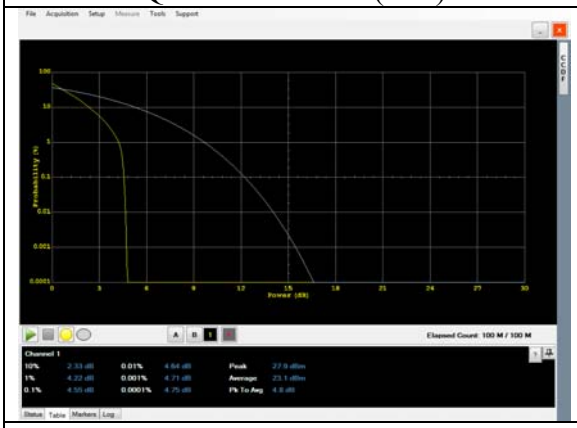
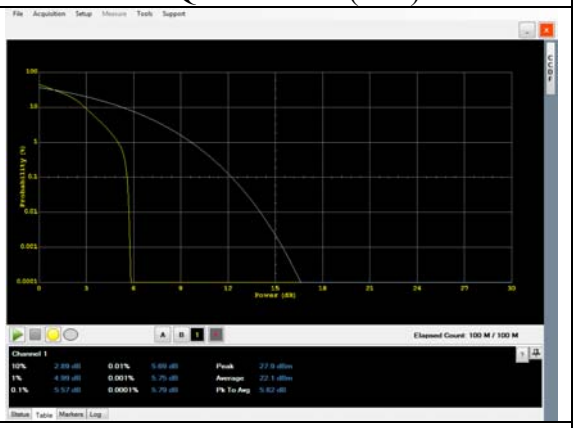
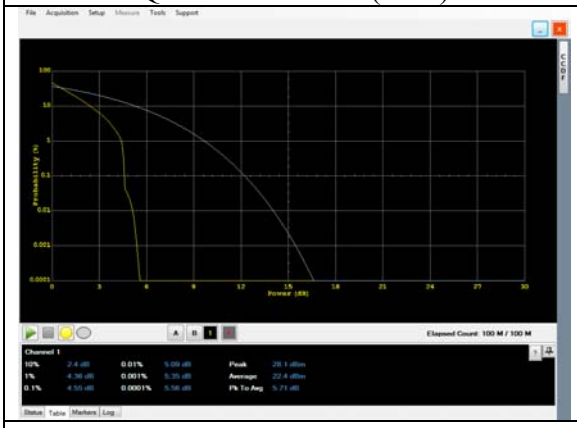
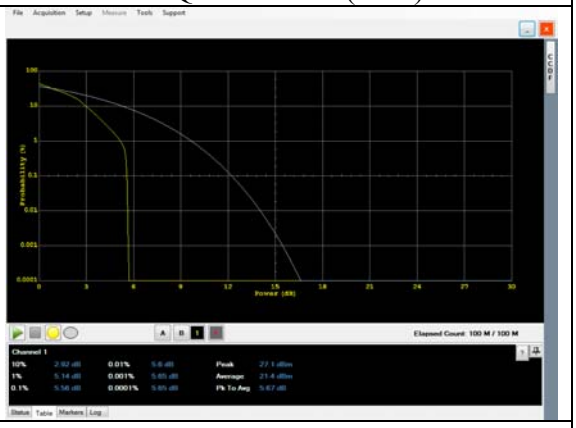
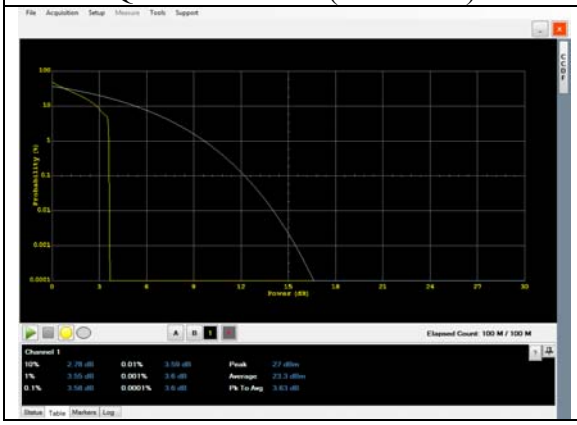
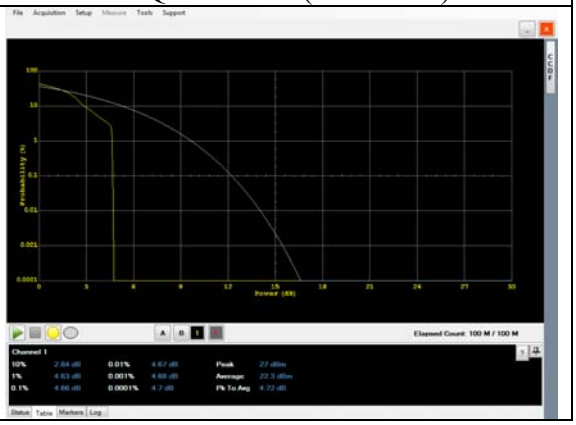
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	03/17/2015
Temperature/ Humidity	21deg.C / 45% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE (QPSK / 16QAM)

Channel	Frequency [MHz]	Bandwidth [MHz]	Moduration	RB Config.	Peak to Average Power Ratio [dB]	Worst Mode
18900	1880.00	20	QPSK	100-0	4.55	QPSK Worst
				50-24	4.55	
				1-49	3.58	
			16QAM	100-0	5.57	16QAM Worst
				50-24	5.56	
				1-49	4.66	

*In order to decide the largest deviation between the average and the peak power of the EUT in a bandwidth,
*1) Complementary Cumulative Distribution Function (CCDF) option in wideband power meter was used for LTE Signals.

Peak to Average power Ratio (Conducted)
LTE PAPR Worst Mode RB configurations

LTE Band II

20MHz BW	
1880.0MHz	
QPSK : RB 100-0(Full)	16QAM : 100-0(Full)
	
QPSK : RB 50-24(50%)	16QAM : 50-24(50%)
	
QPSK : RB 1-49(Minimum)	16QAM : 1-49(Minimum)
	

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

Peak to Average power Ratio (Conducted)

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10636726H
Date 01/26/2015
Temperature/ Humidity 24deg. C / 33% RH
Engineer Yutaka Yoshida
Mode Tx LTE (QPSK / 16QAM)

Band II

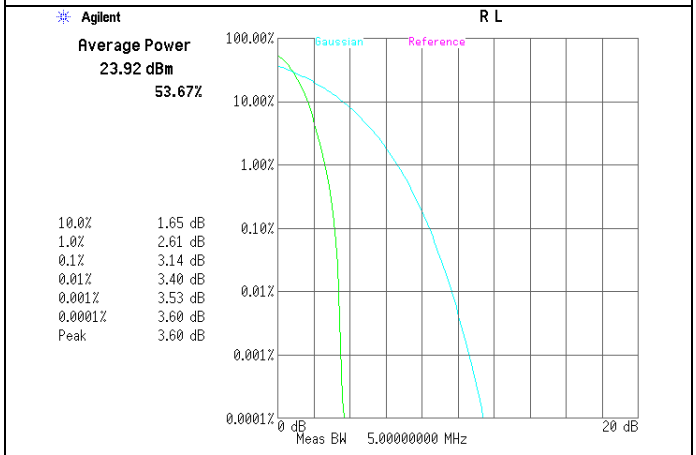
Mode	Channel	Frequency [MHz]	Peak to Average power Ratio [dB]
LTE	18700	1860.00	5.32
20MHz BW	18900	1880.00	4.55
QPSK	19100	1900.00	5.30
LTE	18700	1860.00	6.11
20MHz BW	18900	1880.00	5.57
16QAM	19100	1900.00	6.16
LTE	18675	1857.50	5.51
15MHz BW	18900	1880.00	4.67
QPSK	19125	1902.50	5.46
LTE	18675	1857.50	6.20
15MHz BW	18900	1880.00	5.65
16QAM	19125	1902.50	6.08
LTE	18650	1855.00	5.31
10MHz BW	18900	1880.00	4.75
QPSK	19150	1905.00	4.65
LTE	18650	1855.00	6.11
10MHz BW	18900	1880.00	5.75
16QAM	19150	1905.00	5.67
LTE	18625	1852.50	5.40
5MHz BW	18900	1880.00	4.74
QPSK	19175	1907.50	5.23
LTE	18625	1852.50	6.19
5MHz BW	18900	1880.00	5.82
16QAM	19175	1907.50	5.91
LTE	18615	1851.50	5.37
3MHz BW	18900	1880.00	4.80
QPSK	19185	1908.50	5.38
LTE	18615	1851.50	6.21
3MHz BW	18900	1880.00	5.87
16QAM	19185	1908.50	6.14
LTE	18670	1850.70	5.34
1.4MHz BW	18900	1880.00	4.74
QPSK	19193	1909.30	5.26
LTE	18670	1850.70	6.19
1.4MHz BW	18900	1880.00	5.79
16QAM	19193	1909.30	6.06

Peak to Average power Ratio (Conducted)

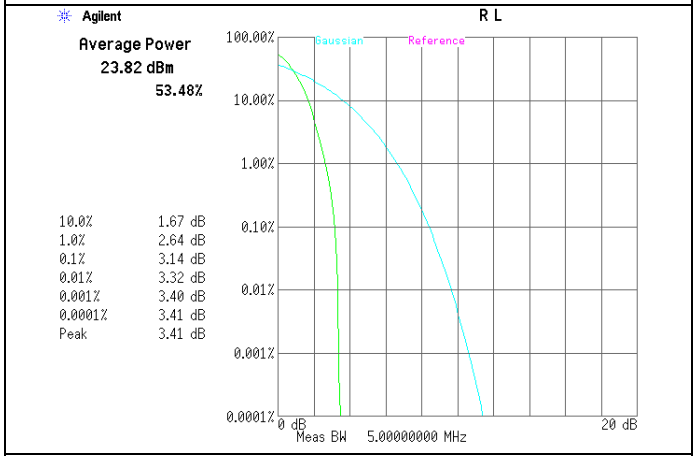
W-CDMA Band II

W-CDMA

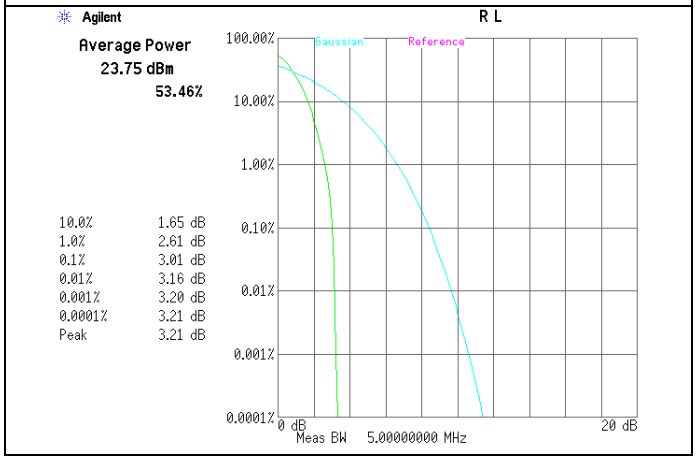
1852.4MHz



1880.00MHz

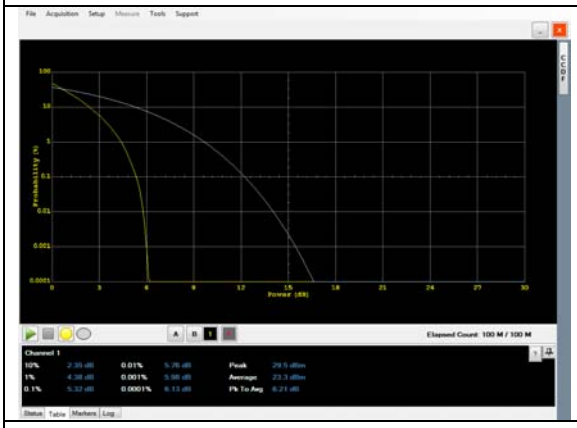
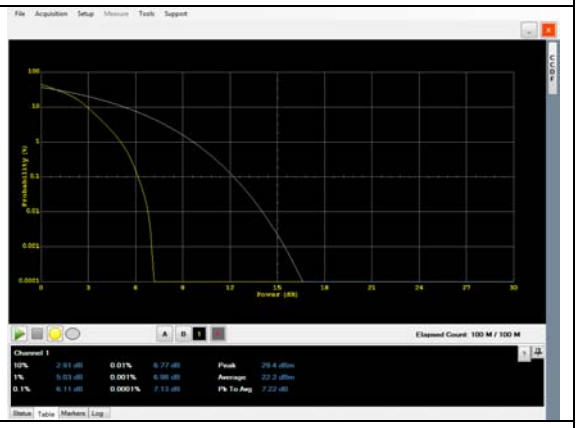
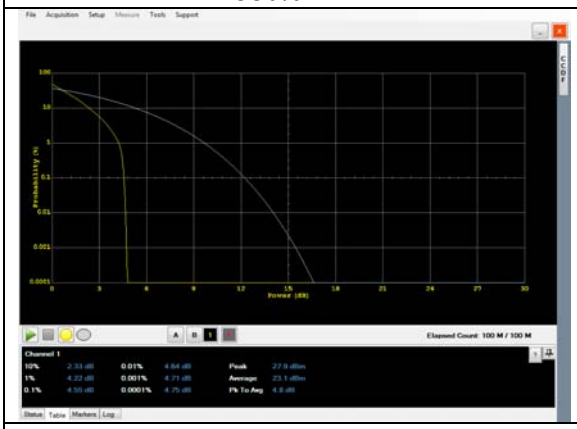
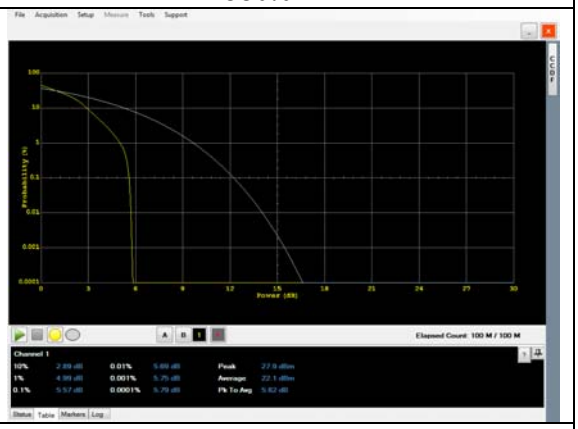
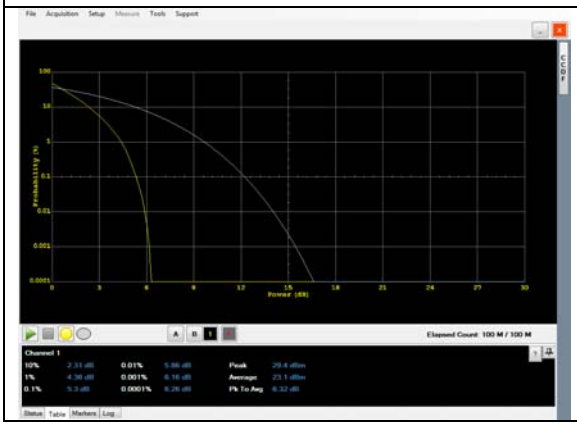
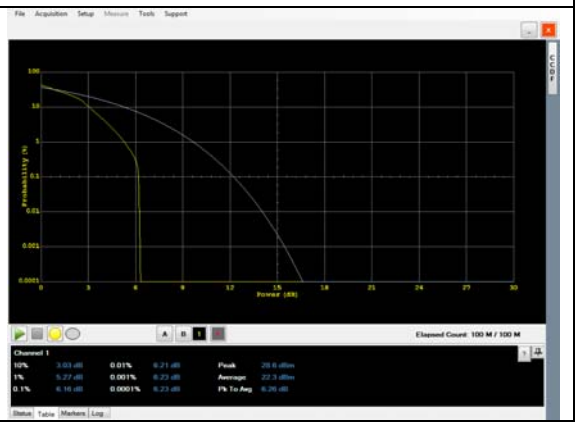


1907.6MHz



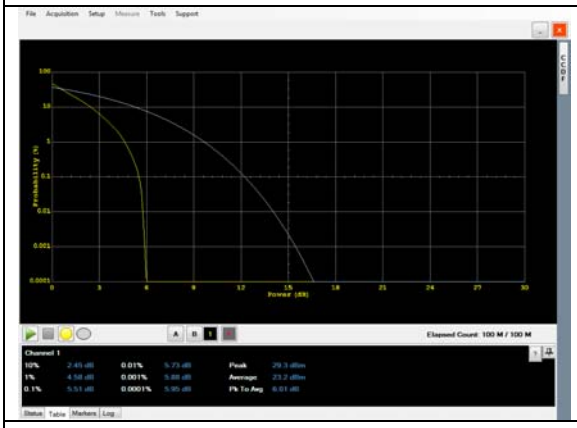
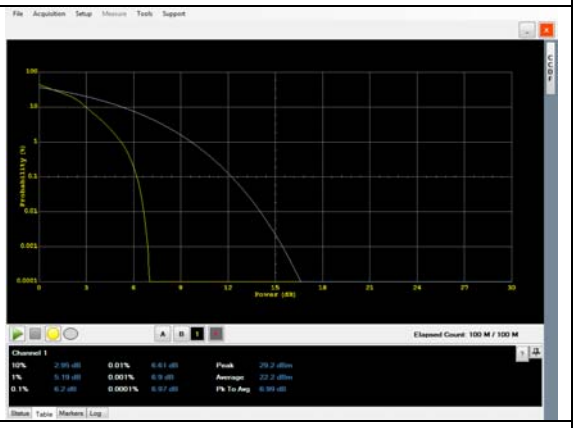
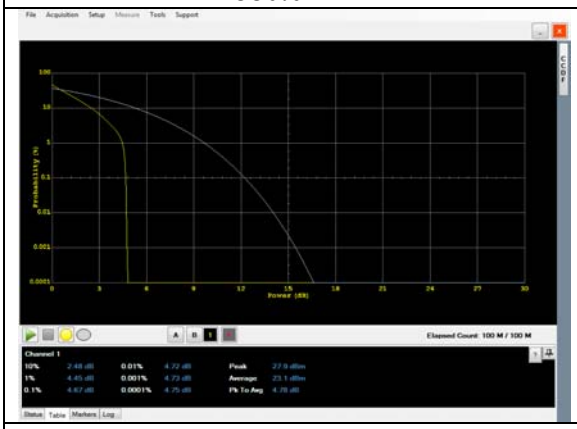
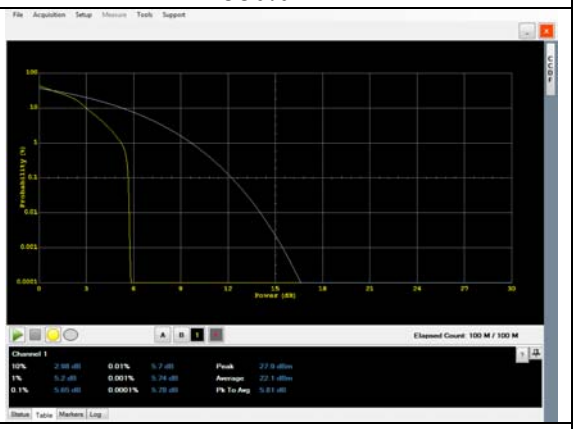
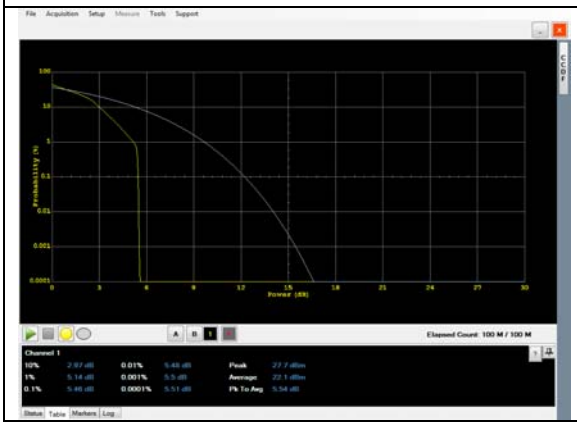
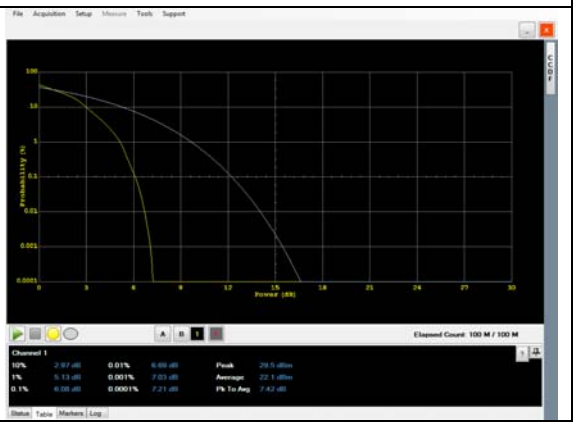
*Set the spectrum analyzer radio mode to 3GPP W-CDMA (Power Stat CCDF)

Peak to Average power Ratio (Conducted)
LTE Band II

20MHz BW	
QPSK : RB full(100%)	16QAM : RB full(100%)
1860.0MHz	1860.0MHz
	
1880.0MHz	1880.0MHz
	
1900.0MHz	1900.0MHz
	

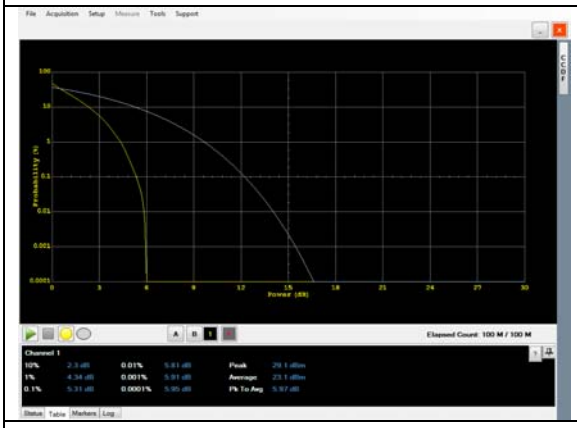
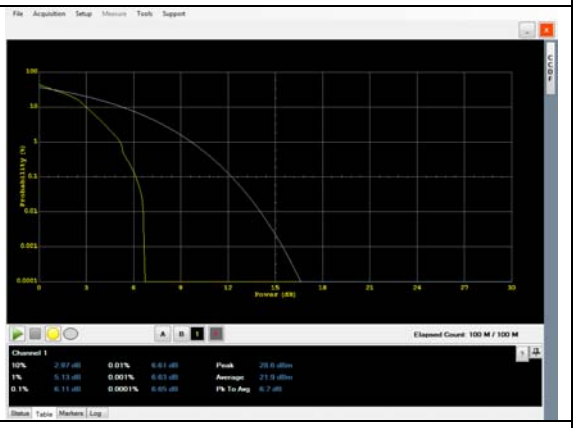
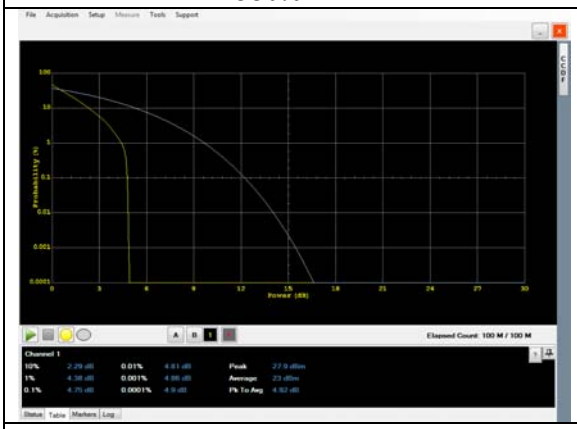
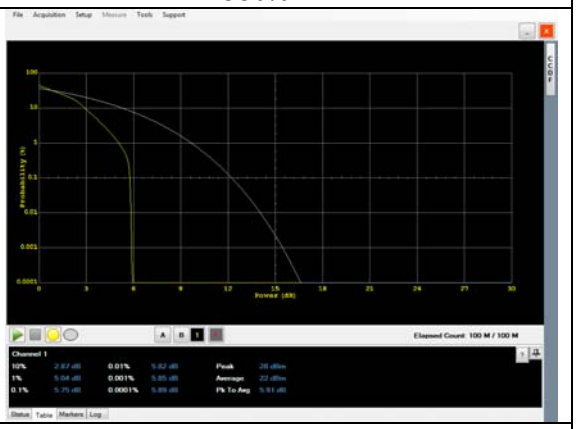
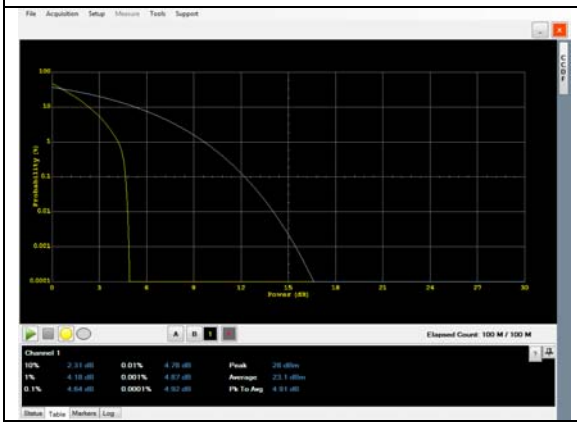
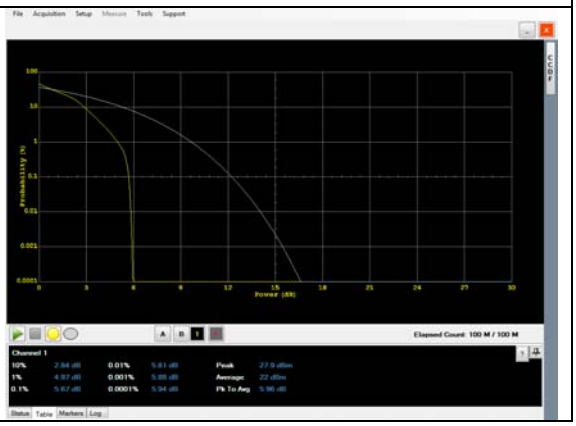
*Set the wideband power meter to CCDF measurement mode

Peak to Average power Ratio (Conducted)
LTE Band II

15MHz BW	
QPSK : RB full(100%)	16QAM : RB full(100%)
1857.5MHz	1857.5MHz
	
1880.0MHz	1880.0MHz
	
1902.5MHz	1902.5MHz
	

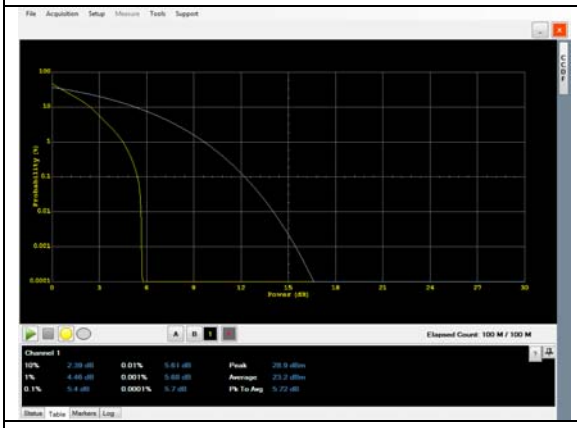
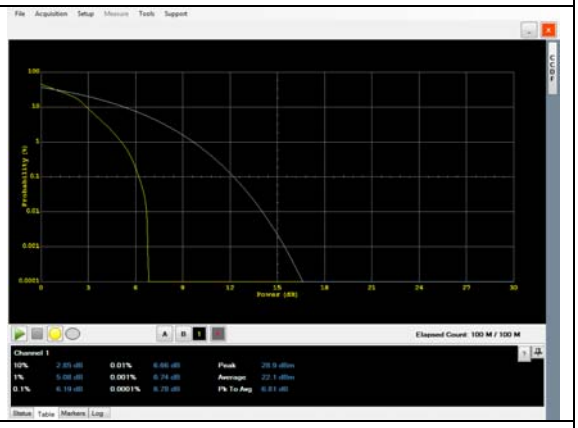
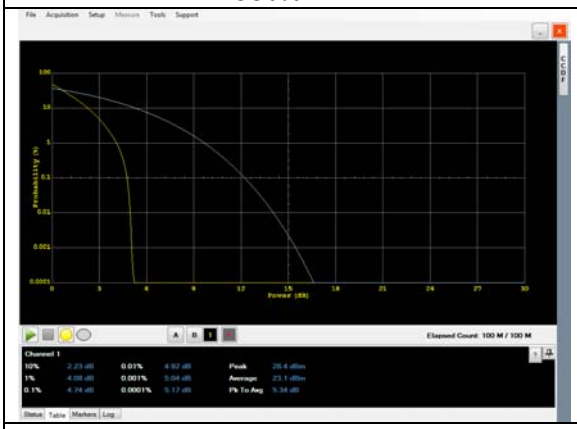
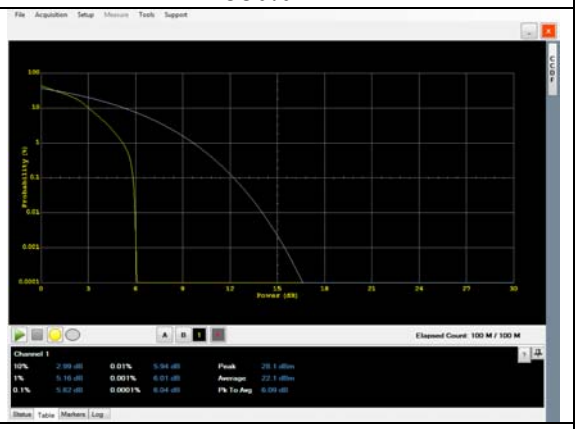
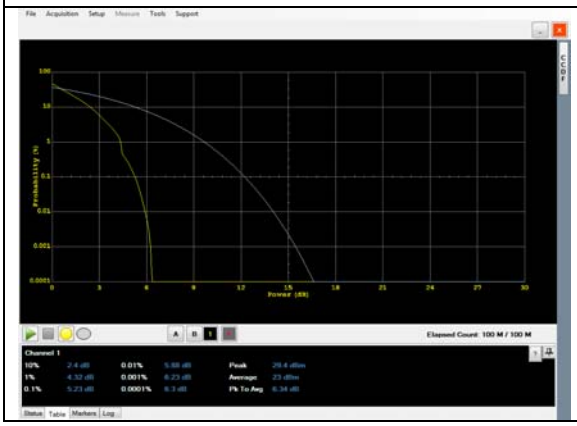
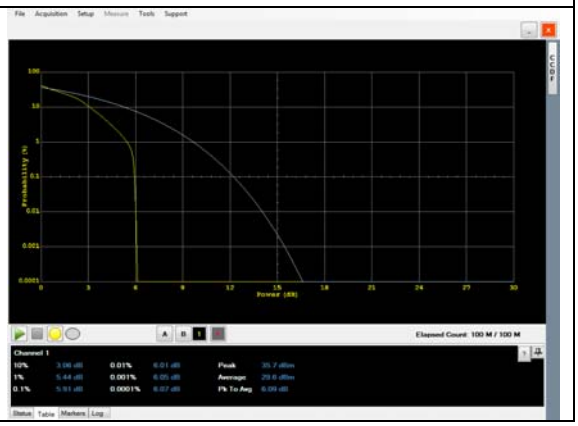
*Set the wideband power meter to CCDF measurement mode

Peak to Average power Ratio (Conducted)
LTE Band II

10MHz BW	
QPSK : RB full(100%)	16QAM : RB full(100%)
1855.0MHz	1855.0MHz
	
1880.0MHz	1880.0MHz
	
1905.0MHz	1905.0MHz
	

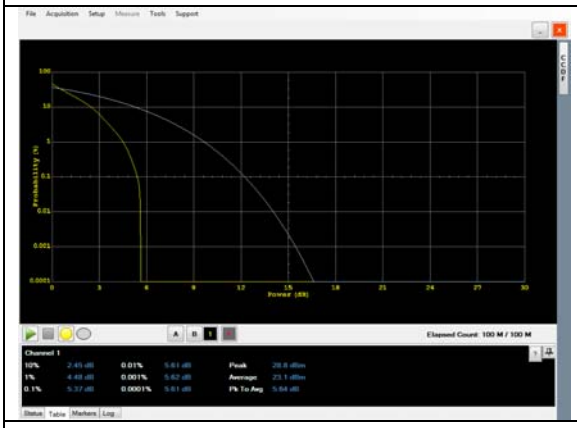
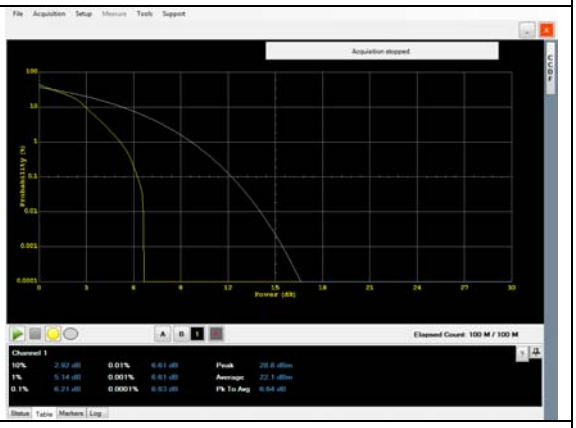
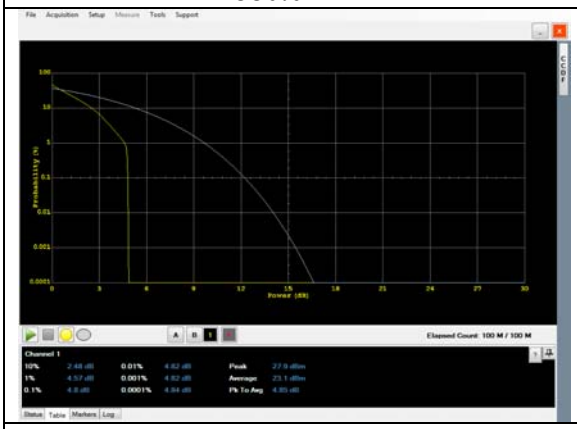
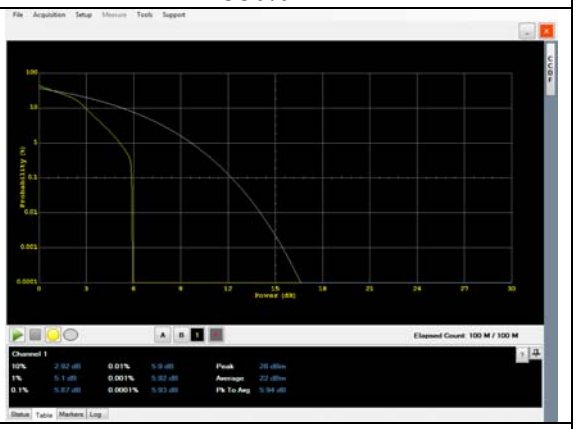
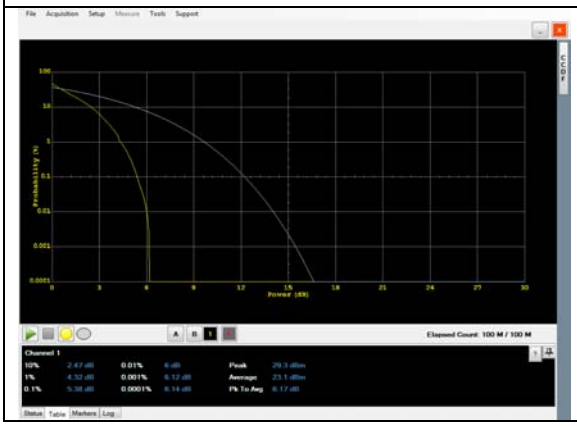
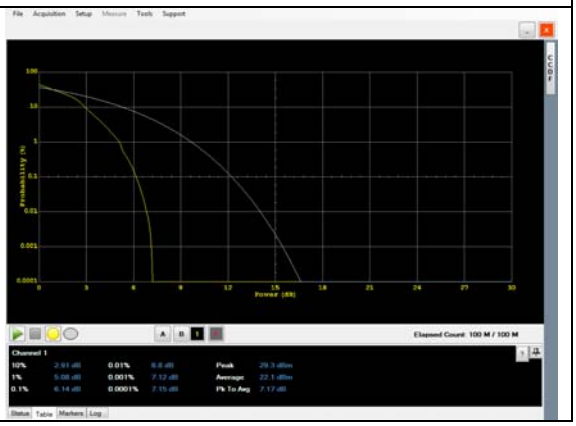
*Set the wideband power meter to CCDF measurement mode

Peak to Average power Ratio (Conducted)
LTE Band II

5MHz BW	
QPSK : RB full(100%)	16QAM : RB full(100%)
1852.5MHz	1852.5MHz
	
1880.0MHz	1880.0MHz
	
1907.5MHz	1907.5MHz
	

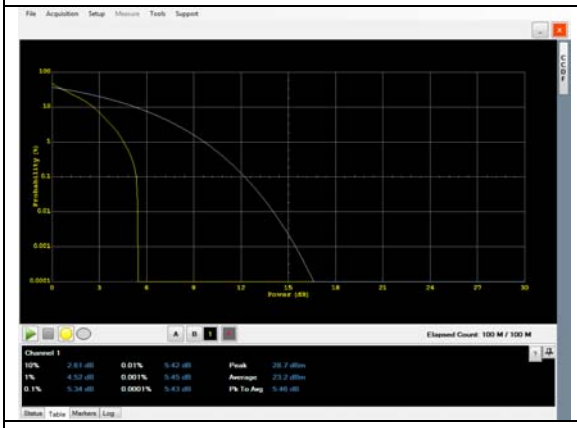
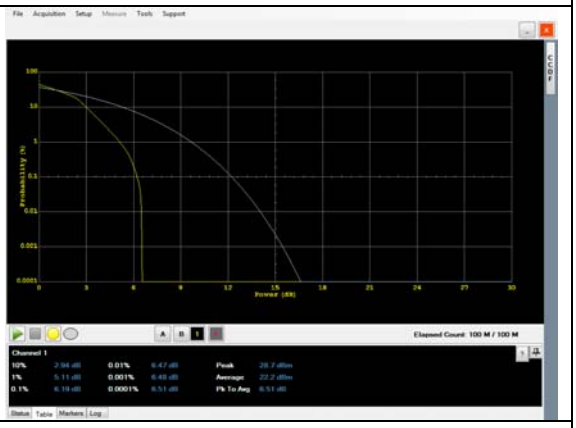
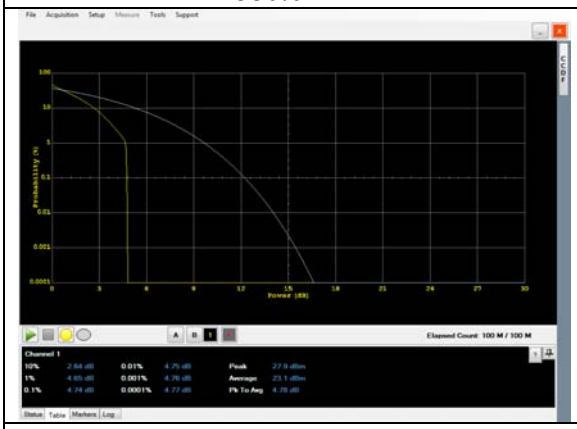
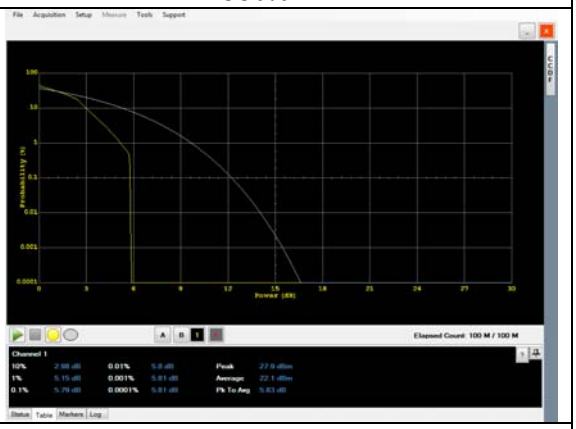
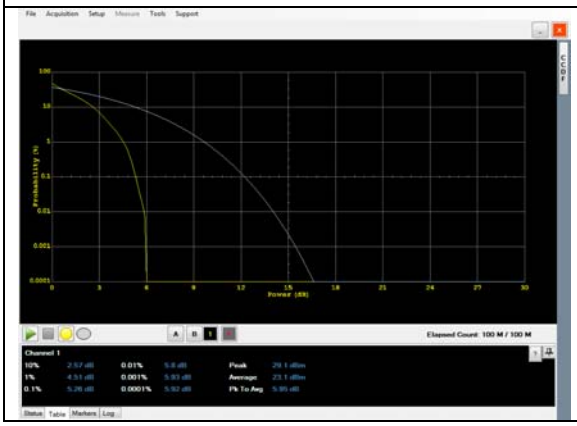
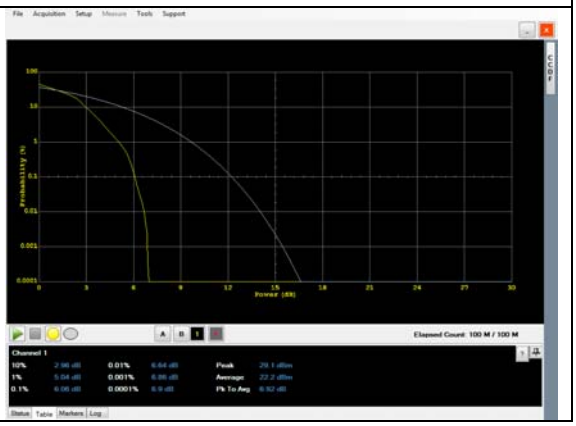
*Set the wideband power meter to CCDF measurement mode

Peak to Average power Ratio (Conducted)
LTE Band II

3MHz BW	
QPSK : RB full(100%)	16QAM : RB full(100%)
1851.5MHz	1851.5MHz
	
1880.0MHz	1880.0MHz
	
1908.5MHz	1908.5MHz
	

*Set the wideband power meter to CCDF measurement mode

Peak to Average power Ratio (Conducted)
LTE Band II

1.4MHz BW	
QPSK : RB full(100%)	16QAM : RB full(100%)
1850.7MHz	1850.7MHz
	
1880.0MHz	1880.0MHz
	
1909.3MHz	1909.3MHz
	

*Set the wideband power meter to CCDF measurement mode

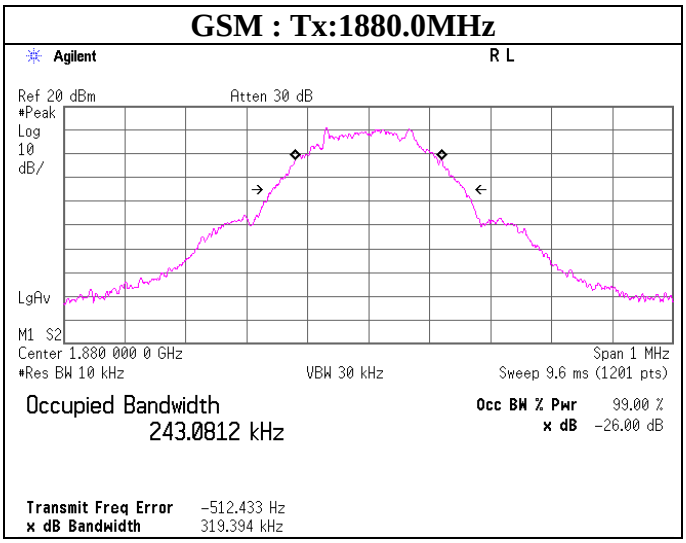
Bandwidth(Conducted)

PCS1900

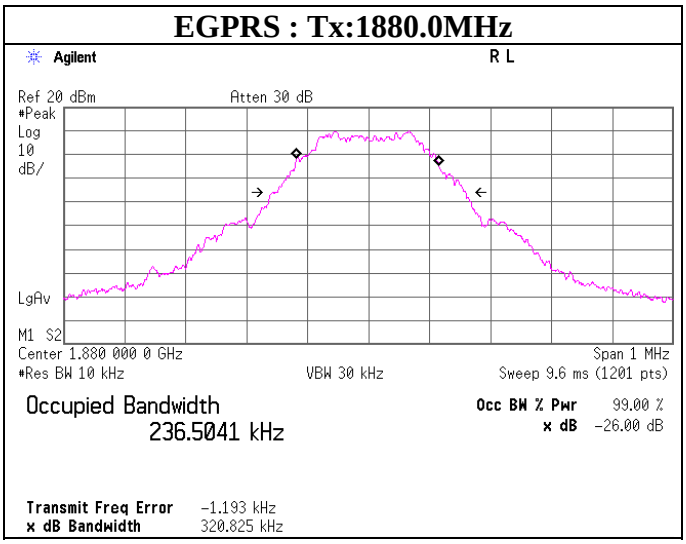
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/04/2015
Temperature/ Humidity	22deg. C / 48% RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK), 1slot, PCL=0
	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

Mode	CH	FREQ [MHz]	26dB Bandwidth [kHz]	99% OBW [kHz]	Limit [kHz]
GSM	Mid	1880.0	319.394	243.0812	-
EGPRS	Mid	1880.0	320.825	236.5041	-

GSM : Tx:1880.0MHz



EGPRS : Tx:1880.0MHz



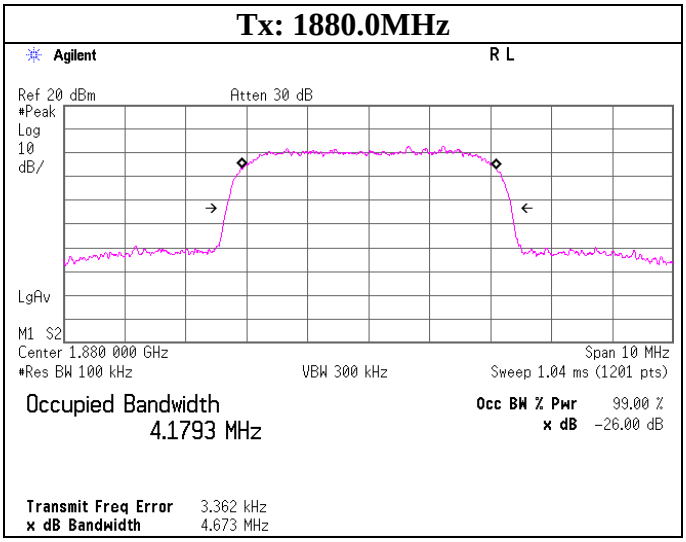
Bandwidth(Conducted)

W-CDMA Band II

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/04/2015
Temperature/ Humidity	22deg. C / 48% RH
Engineer	Yutaka Yoshida
Mode	Tx W-CDMA(RMC12.2kbps), All Up Bits

CH	FREQ [MHz]	26dB Bandwidth [MHz]	99% OBW [MHz]	Limit [kHz]
Mid	1880.0	4.673	4.1793	-

Tx: 1880.0MHz



Bandwidth(Conducted)

LTE Band II

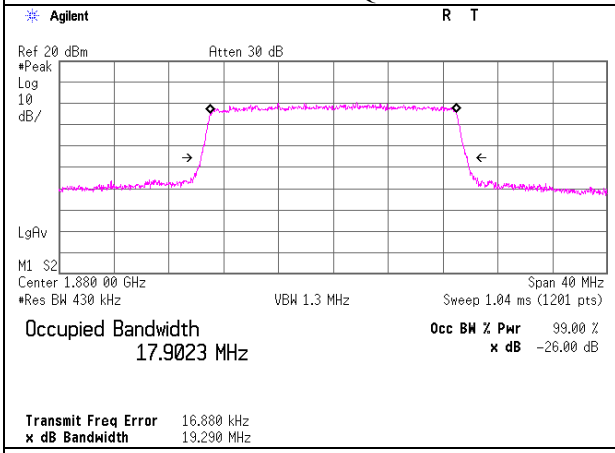
Report No. 10636726H
Test place Ise EMC Lab. No.6 Measurement Room
Date 01/27/2015
Temperature / Humidity 20 deg. C / 49 % RH
Engineer Yutaka Yoshida
Mode Tx LTE
(QPSK / 16QAM)

BW	UL RB Allocation	UL RB Start	Frequency [MHz]	Mode	26dB Bandwidth [MHz]	99% OBW [MHz]
20MHz	100	0	1880.0	QPSK	19.290	17.9023
				16QAM	19.454	17.9290
15MHz	75	0	1880.0	QPSK	14.595	13.4502
				16QAM	14.595	13.4306
10MHz	50	0	1880.0	QPSK	9.918	8.9970
				16QAM	9.807	8.9854
5MHz	25	0	1880.0	QPSK	4.966	4.5176
				16QAM	4.954	4.5026
3MHz	15	0	1880.0	QPSK	2.993	2.7062
				16QAM	2.992	2.7052
1.4MHz	6	0	1880.0	QPSK	1.300	1.0908
				16QAM	1.296	1.0983

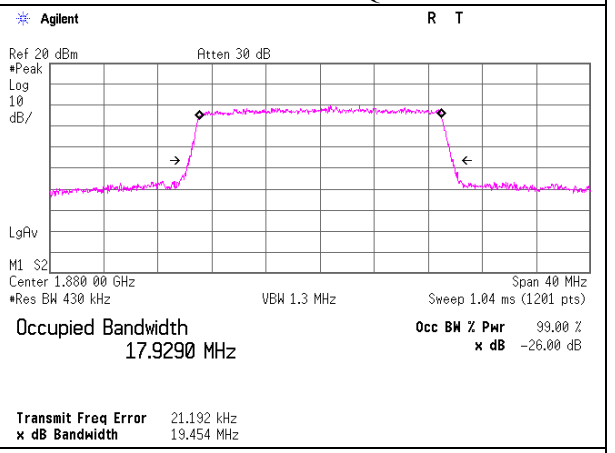
Bandwidth(Conducted)

LTE Band II

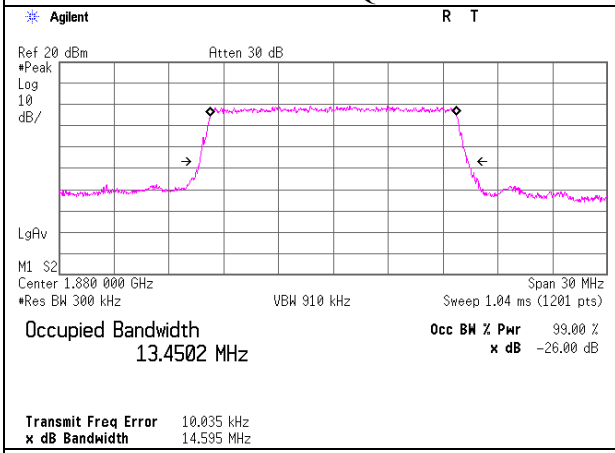
20MHz BW / QPSK



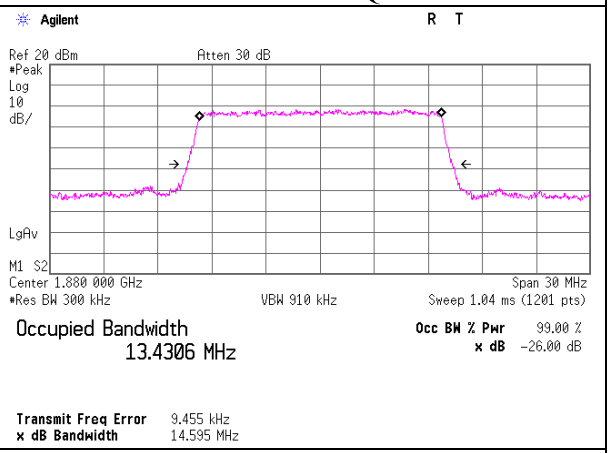
20MHz BW / 16QAM



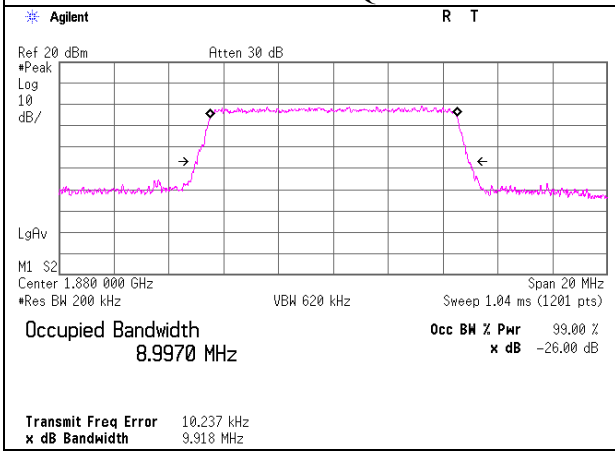
15MHz BW / QPSK



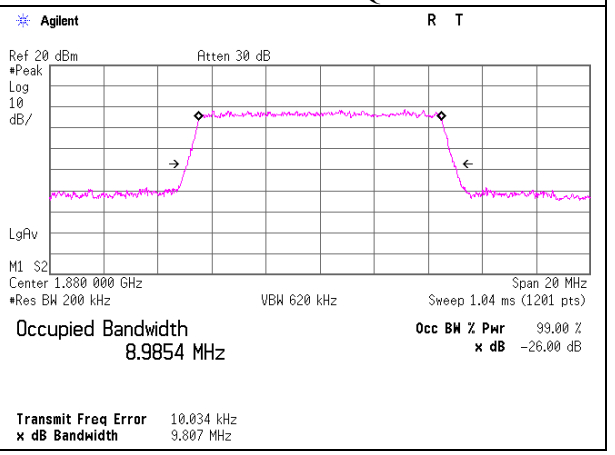
15MHz BW / 16QAM



10MHz BW / QPSK



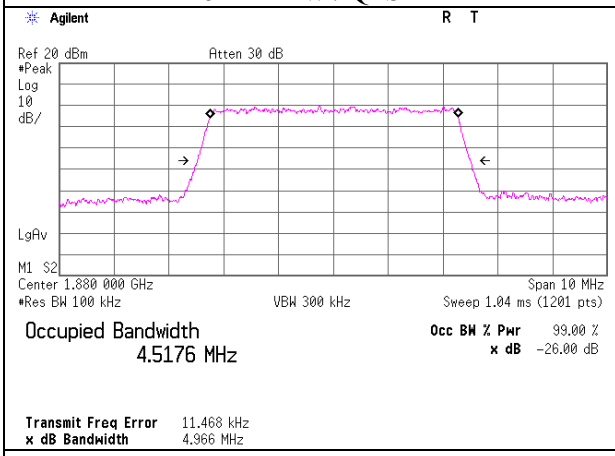
10MHz BW / 16QAM



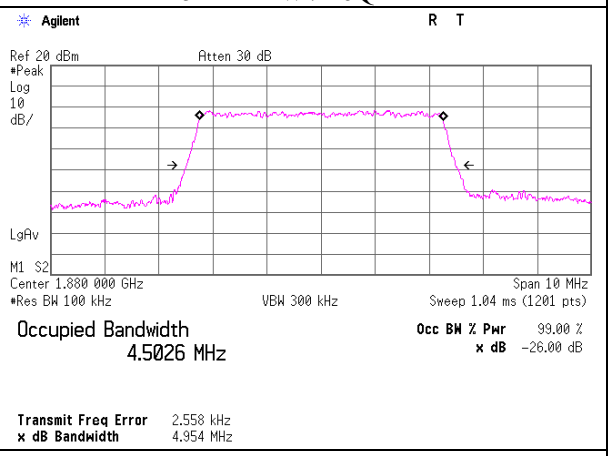
Bandwidth(Conducted)

LTE Band II

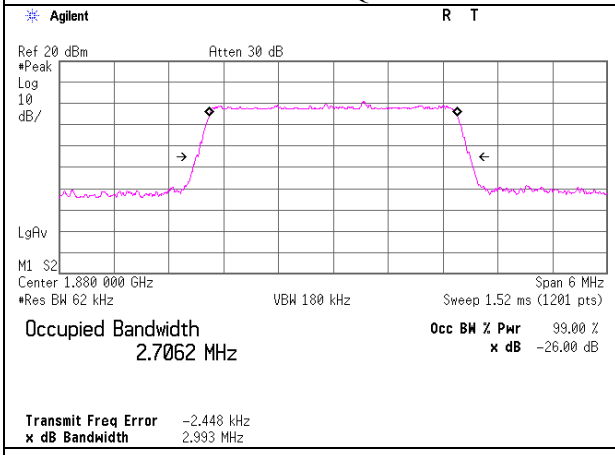
5MHz BW / QPSK



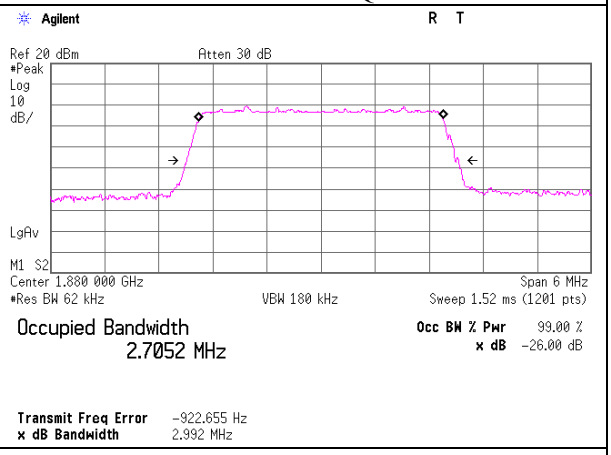
5MHz BW / 16QAM



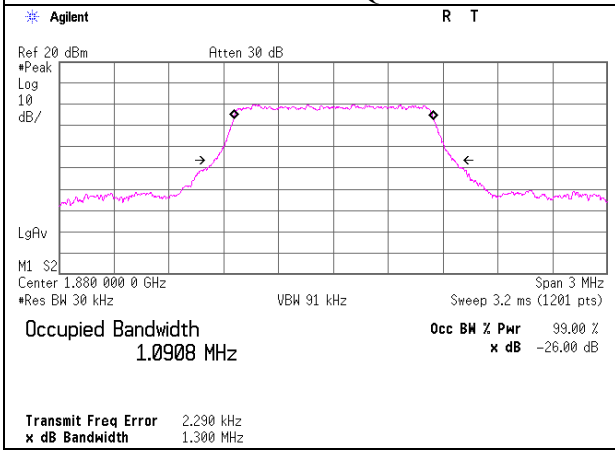
3MHz BW / QPSK



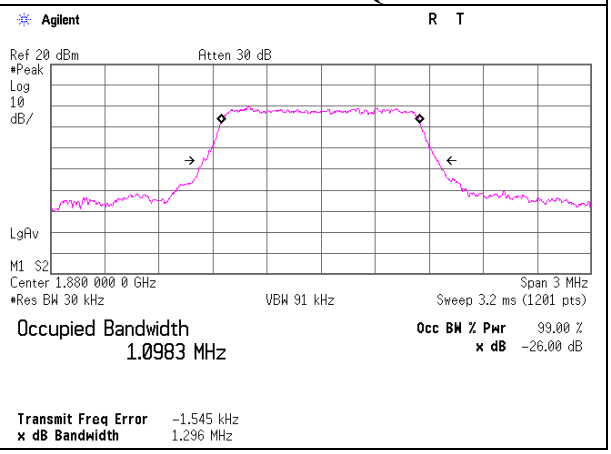
3MHz BW / 16QAM



1.4MHz BW / QPSK



1.4MHz BW / 16QAM



Band-Edge(Conducted)

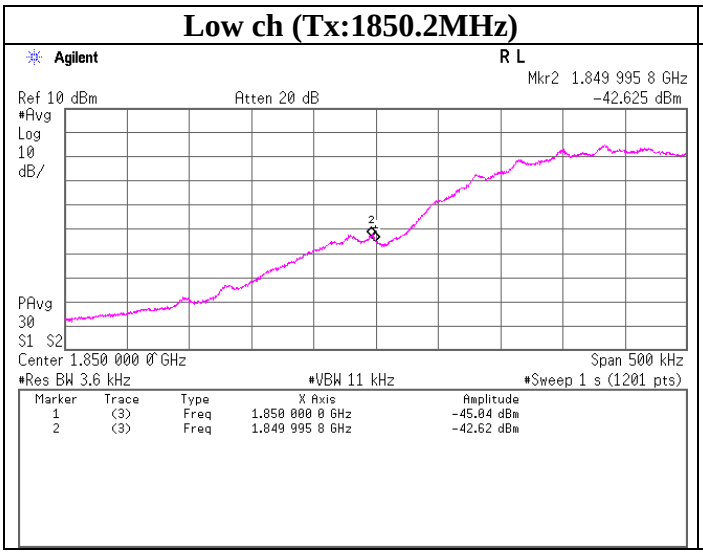
PCS1900

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/04/2015
Temperature/ Humidity	22deg. C / 48% RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK), 1slot, PCL=0

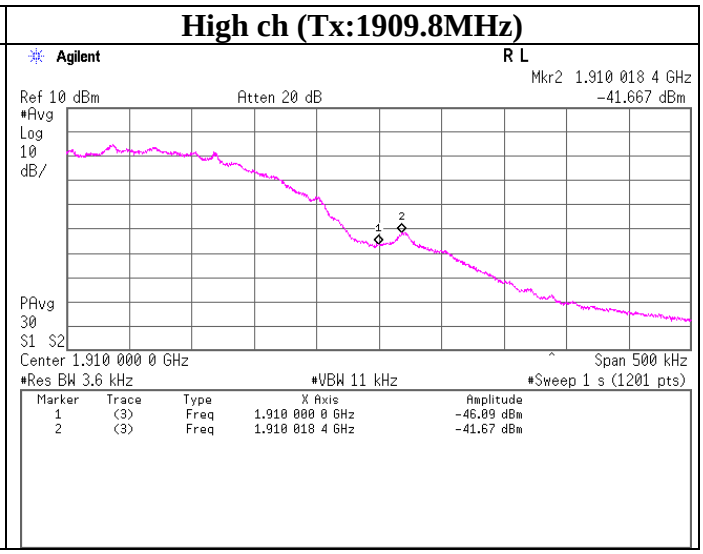
Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
1849.9958	-42.62	10.02	6.80	-25.80	-13.0	12.80
1850.0000	-45.04	10.02	6.80	-28.22	-13.0	15.22
1910.0000	-46.09	10.02	6.82	-29.25	-13.0	16.25
1910.0184	-41.67	10.02	6.82	-24.83	-13.0	11.83

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

Low ch (Tx:1850.2MHz)



High ch (Tx:1909.8MHz)



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

Band-Edge(Conducted)

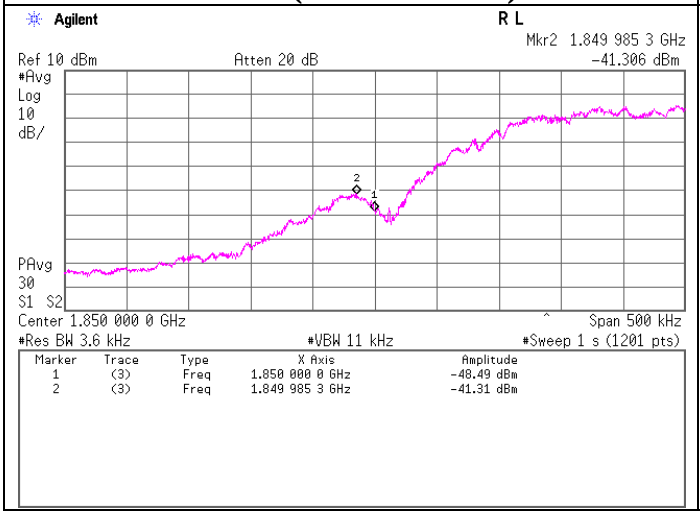
PCS1900

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/04/2015
Temperature/ Humidity	22deg. C / 48% RH
Engineer	Yutaka Yoshida
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

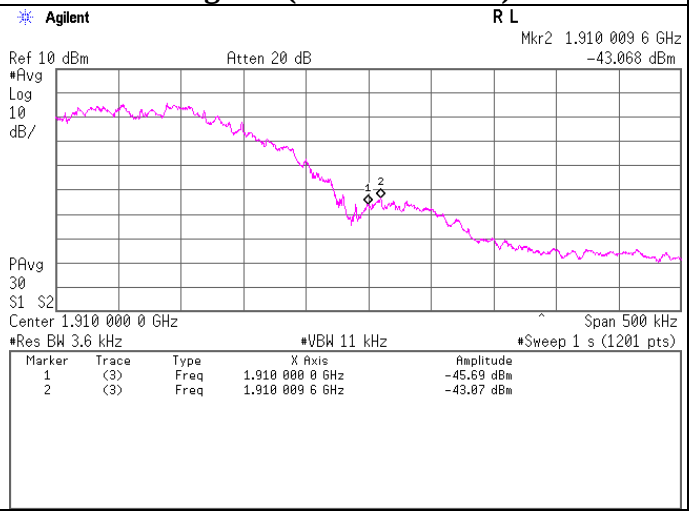
Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
1849.9853	-41.31	10.02	6.80	-24.49	-13.0	11.49
1850.0000	-48.49	10.02	6.80	-31.67	-13.0	18.67
1910.0000	-45.69	10.02	6.82	-28.85	-13.0	15.85
1910.0096	-43.07	10.02	6.82	-26.23	-13.0	13.23

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

Low ch (Tx:1850.2MHz)



High ch (Tx:1909.8MHz)



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

Band-Edge(Conducted)

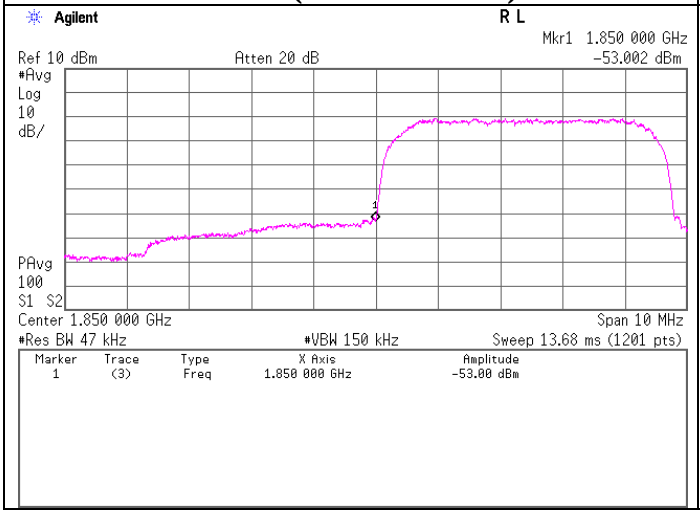
W-CDMA Band II

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/04/2015
Temperature/ Humidity	22deg. C / 48% RH
Engineer	Yutaka Yoshida
Mode	Tx W-CDMA(RMC12.2kbps), All Up Bits

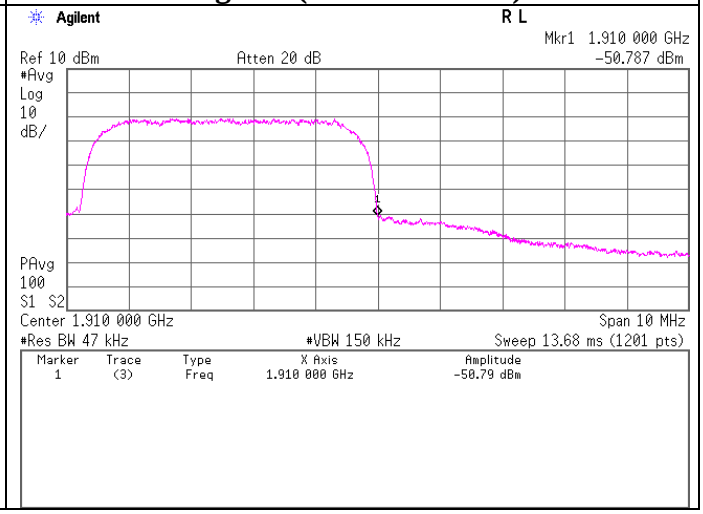
Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
1850.000	-53.00	10.02	6.80	-36.18	-13.0	23.18
1910.000	-50.79	10.02	6.82	-33.95	-13.0	20.95

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

Low ch (Tx:1852.4MHz)



High ch (Tx:1907.6MHz)



Band-Edge(Conducted)

LTE Band II

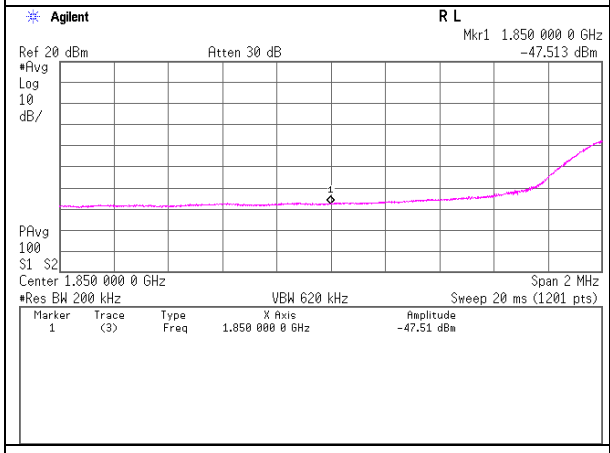
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 20MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
100	0	1850.00	-47.51	10.02	6.80	-30.69	-13.0	17.69
	0	1910.00	-46.28	10.02	6.82	-29.44	-13.0	16.44
1	0	1850.00	-49.38	10.02	6.80	-32.56	-13.0	19.56
	99	1910.00	-49.46	10.02	6.82	-32.62	-13.0	19.62

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

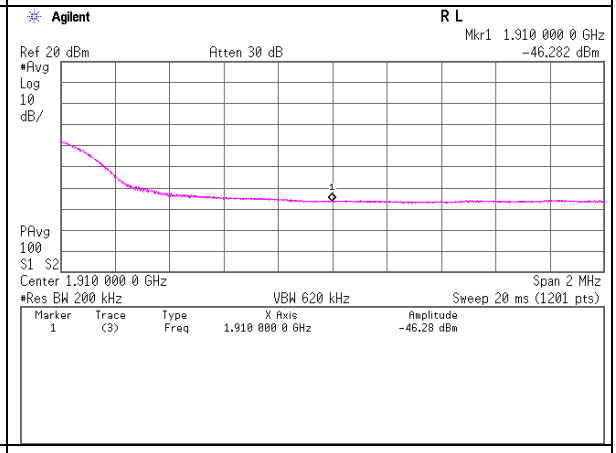
Low ch (Tx:1860.0MHz)

RB 100-0

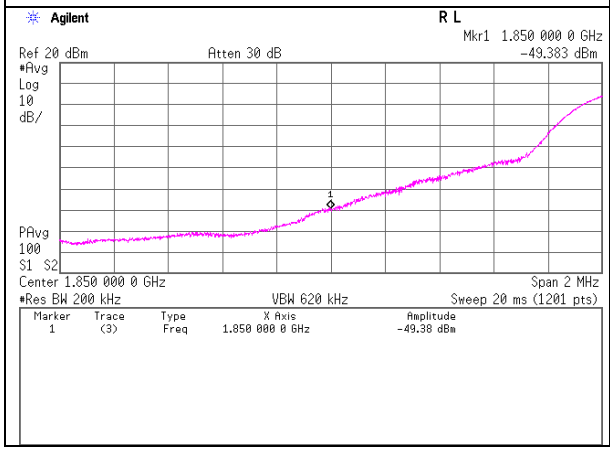


High ch (Tx:1900.0MHz)

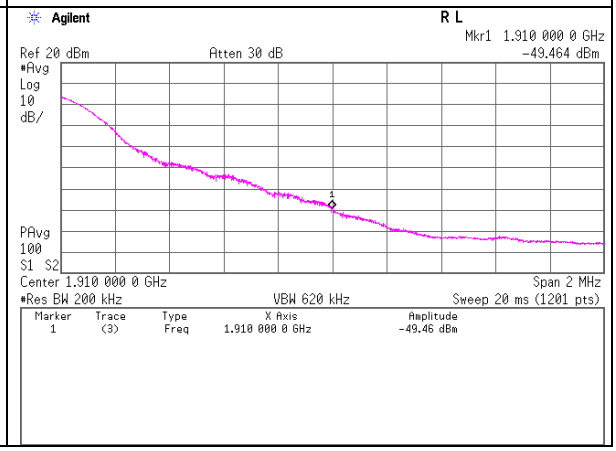
RB 100-0



RB 1-0



RB 1-99



Band-Edge(Conducted)

LTE Band II

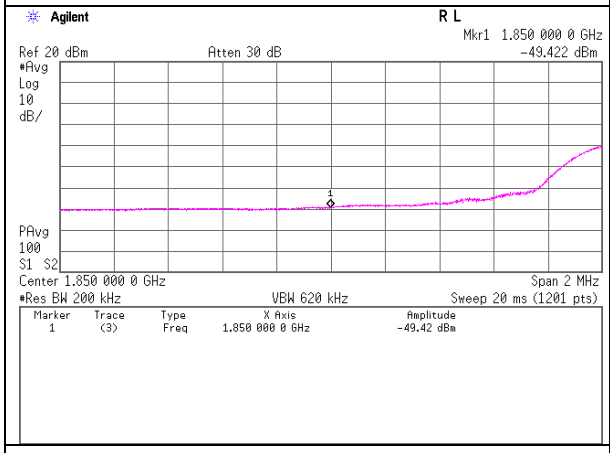
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(16QAM), BW 20MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
100	0	1850.00	-49.42	10.02	6.80	-32.60	-13.0	19.60
	0	1910.00	-47.75	10.02	6.82	-30.91	-13.0	17.91
1	0	1850.00	-49.69	10.02	6.80	-32.87	-13.0	19.87
	99	1910.00	-49.86	10.02	6.82	-33.02	-13.0	20.02

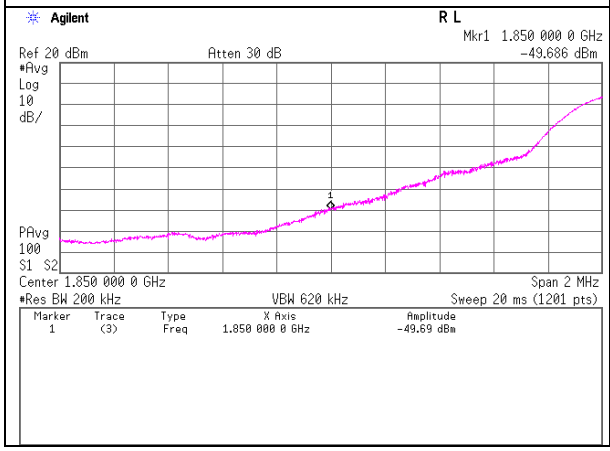
Sample Calculation : Result = Reading + Atten. + Cable Loss

Low ch (Tx:1860.0MHz)

RB 100-0

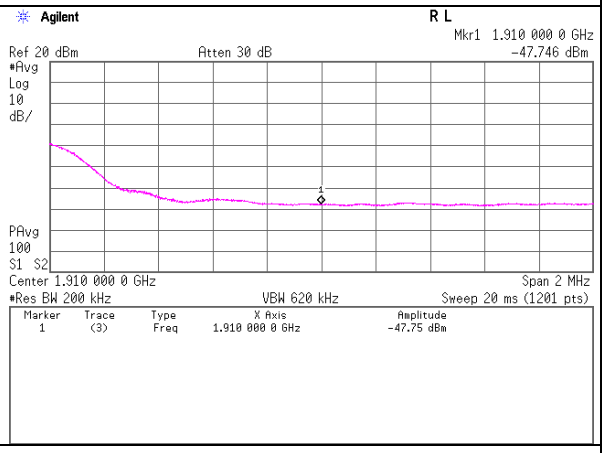


RB 1-0

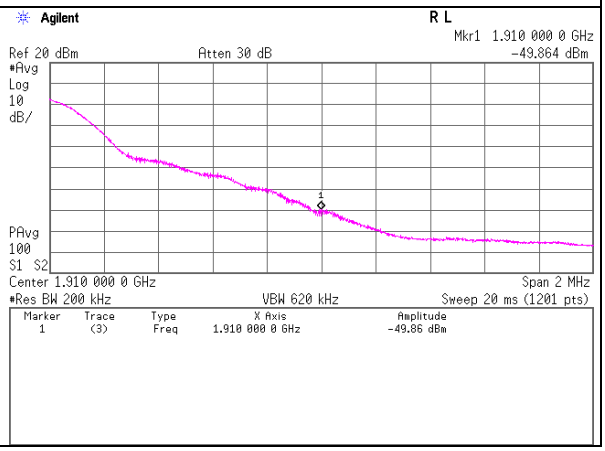


High ch (Tx:1900.0MHz)

RB 100-0



RB 1-99



Band-Edge(Conducted)

LTE Band II

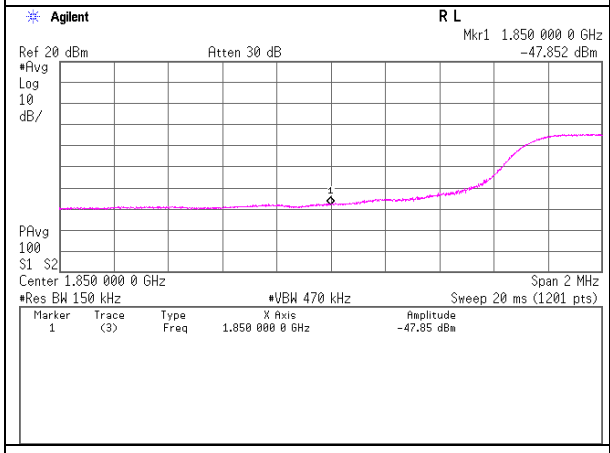
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 15MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
75	0	1850.00	-47.85	10.02	6.80	-31.03	-13.0	18.03
	0	1910.00	-48.30	10.02	6.82	-31.46	-13.0	18.46
1	0	1850.00	-45.46	10.02	6.80	-28.64	-13.0	15.64
	74	1910.00	-45.38	10.02	6.82	-28.54	-13.0	15.54

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

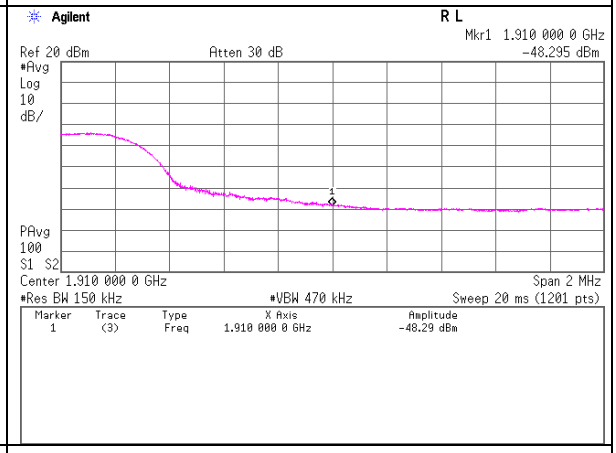
Low ch (Tx:1857.5MHz)

RB 75-0

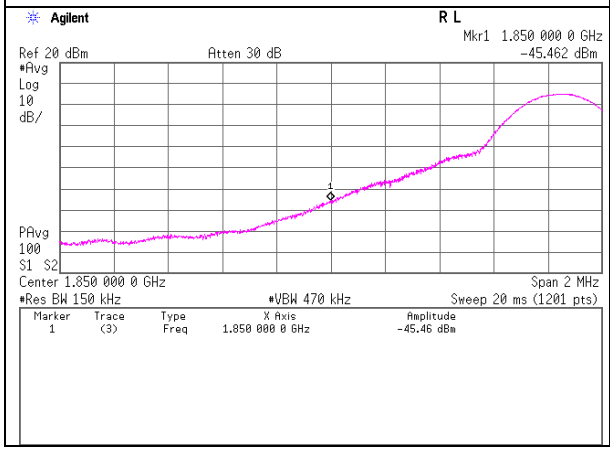


High ch (Tx:1902.5MHz)

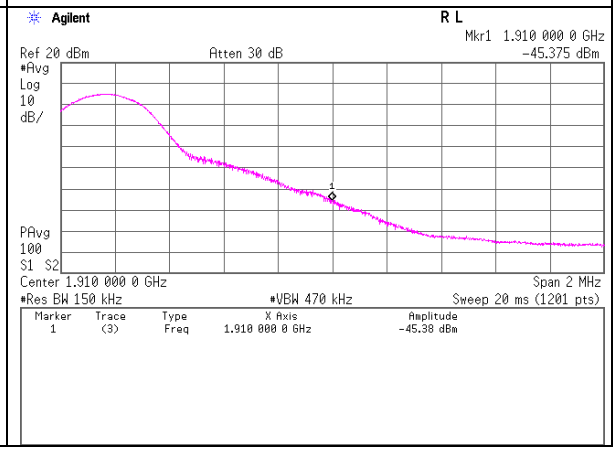
RB 75-0



RB 1-0



RB 1-74



Band-Edge(Conducted)

LTE Band II

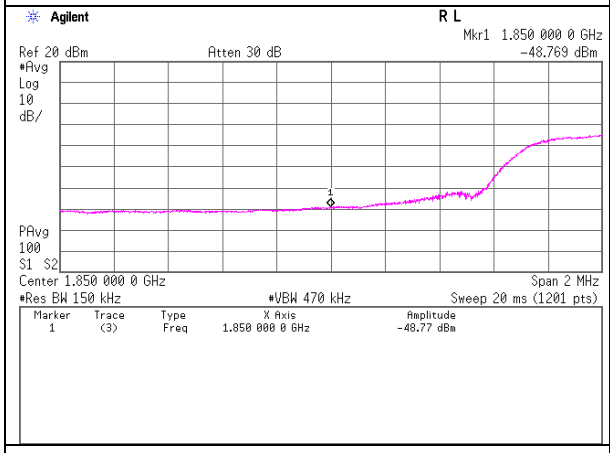
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(16QAM), BW 15MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
75	0	1850.00	-48.77	10.02	6.80	-31.95	-13.0	18.95
	0	1910.00	-49.07	10.02	6.82	-32.23	-13.0	19.23
1	0	1850.00	-44.81	10.02	6.80	-27.99	-13.0	14.99
	74	1910.00	-45.73	10.02	6.82	-28.89	-13.0	15.89

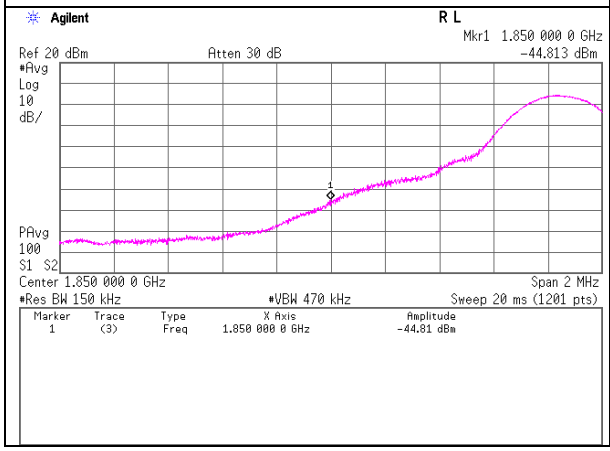
Sample Calculation : Result = Reading + Atten. + Cable Loss

Low ch (Tx:1857.5MHz)

RB 75-0

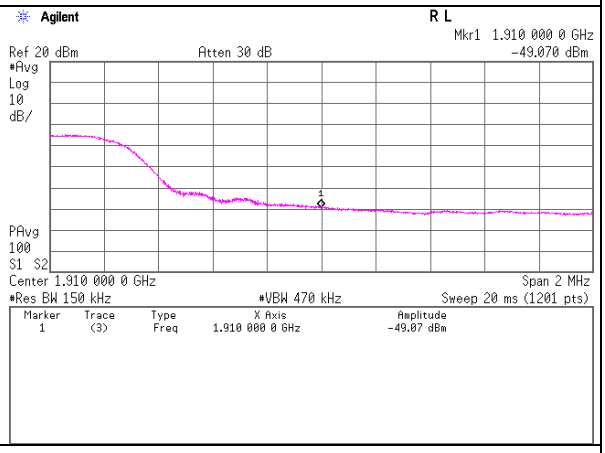


RB 1-0

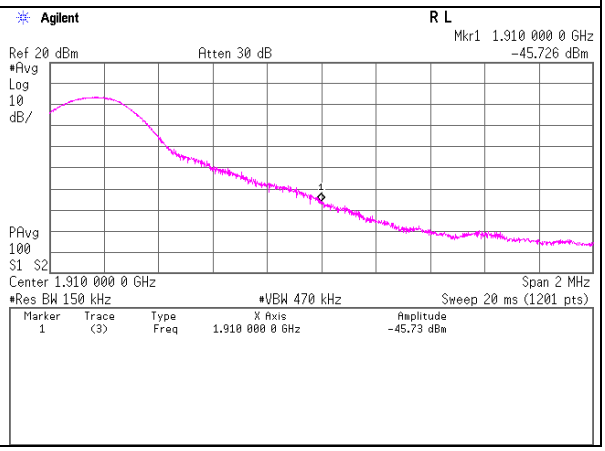


High ch (Tx:1902.5MHz)

RB 75-0



RB 1-74



Band-Edge(Conducted)

LTE Band II

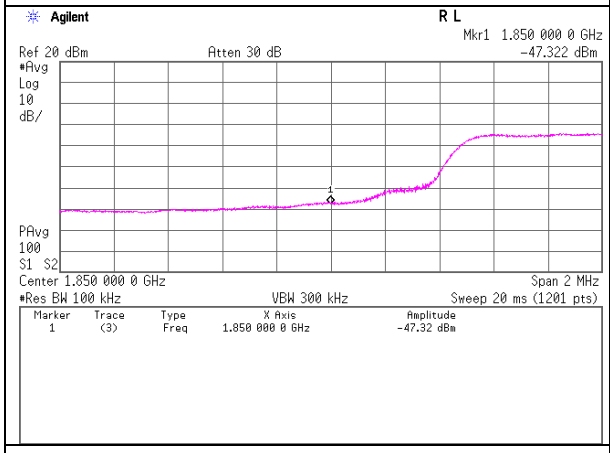
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 10MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
50	0	1850.00	-47.32	10.02	6.80	-30.50	-13.0	17.50
	0	1910.00	-48.19	10.02	6.82	-31.35	-13.0	18.35
1	0	1850.00	-49.35	10.02	6.80	-32.53	-13.0	19.53
	49	1910.00	-47.67	10.02	6.82	-30.83	-13.0	17.83

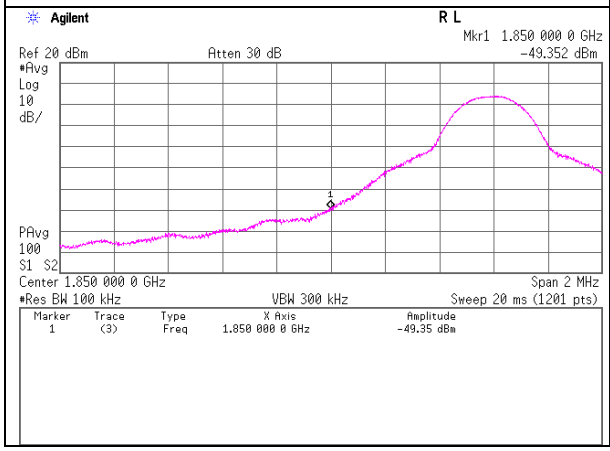
Sample Calculation : Result = Reading + Atten. + Cable Loss

Low ch (Tx:1855.0MHz)

RB 50-0

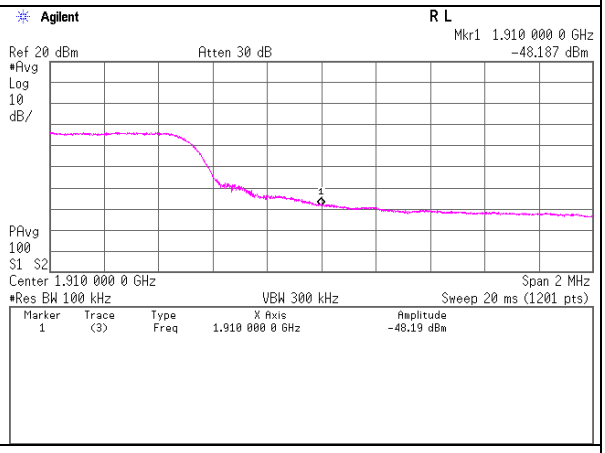


RB 1-0

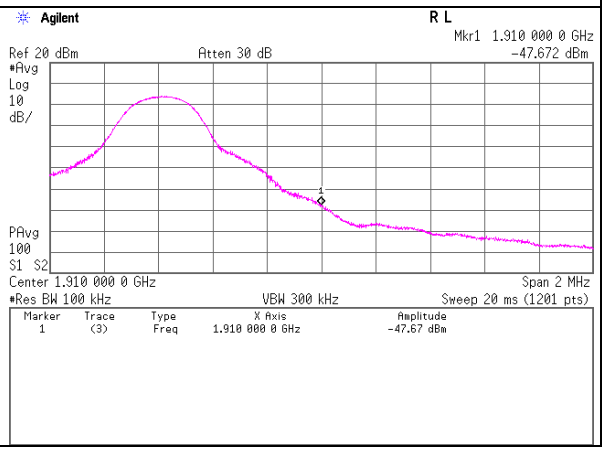


High ch (Tx:1905.0MHz)

RB 50-0



RB 1-49



Band-Edge(Conducted)

LTE Band II

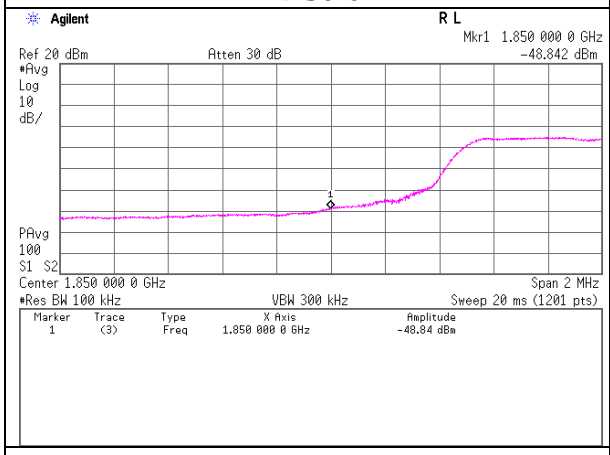
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(16QAM), BW 10MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
50	0	1850.00	-48.84	10.02	6.80	-32.02	-13.0	19.02
	0	1910.00	-48.79	10.02	6.82	-31.95	-13.0	18.95
1	0	1850.00	-48.78	10.02	6.80	-31.96	-13.0	18.96
	49	1910.00	-49.37	10.02	6.82	-32.53	-13.0	19.53

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

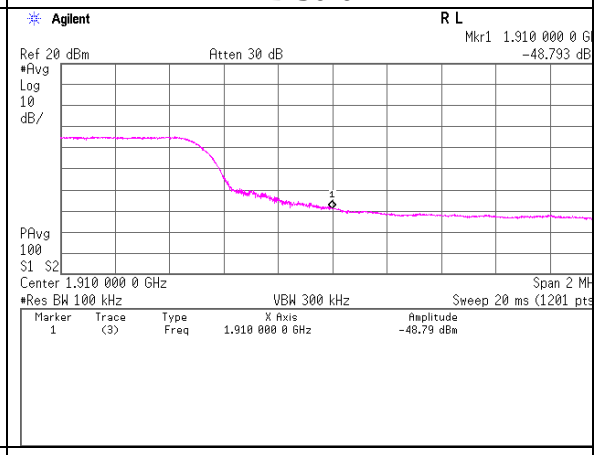
Low ch (Tx:1855.0MHz)

RB 50-0

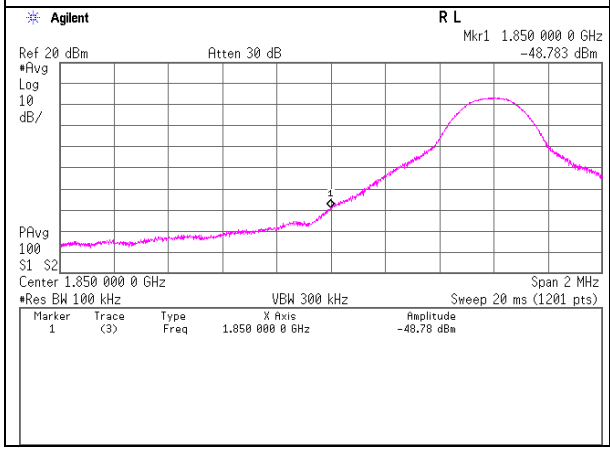


High ch (Tx:1905.0MHz)

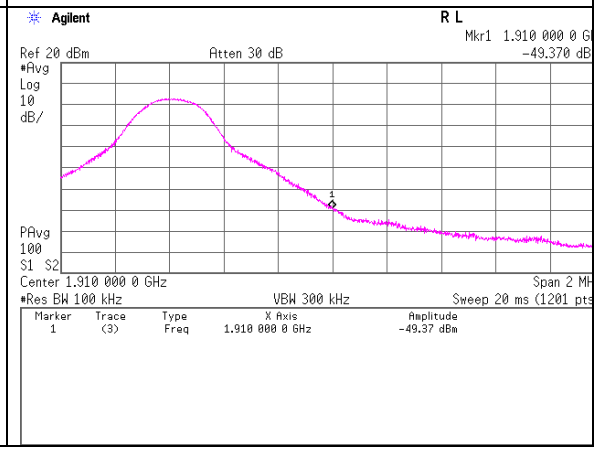
RB 50-0



RB 1-0



RB 1-49



Band-Edge(Conducted)

LTE Band II

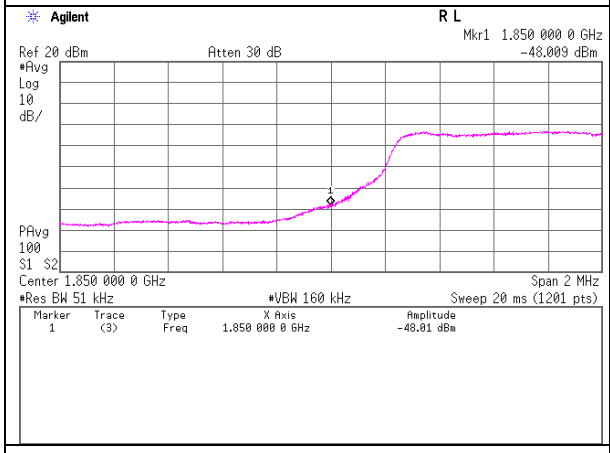
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 5MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
25	0	1850.00	-48.01	10.02	6.80	-31.19	-13.0	18.19
	0	1910.00	-46.60	10.02	6.82	-29.76	-13.0	16.76
1	0	1850.00	-37.56	10.02	6.80	-20.74	-13.0	7.74
	24	1910.00	-38.17	10.02	6.82	-21.33	-13.0	8.33

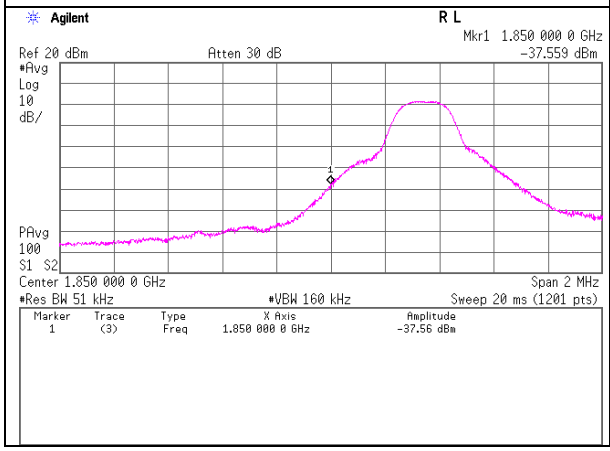
Sample Calculation : Result = Reading + Atten. + Cable Loss

Low ch (Tx:1852.5MHz)

RB 25-0

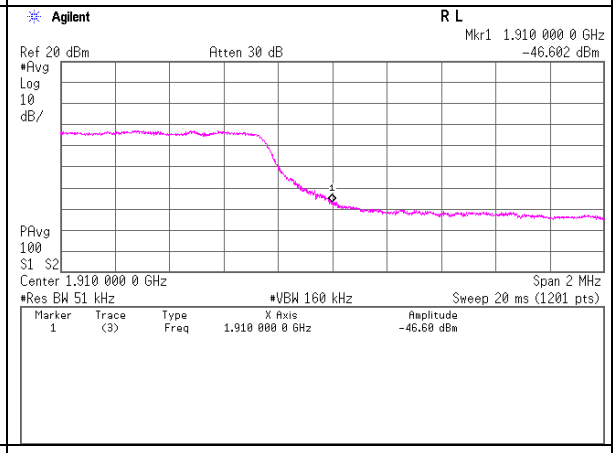


RB 1-0

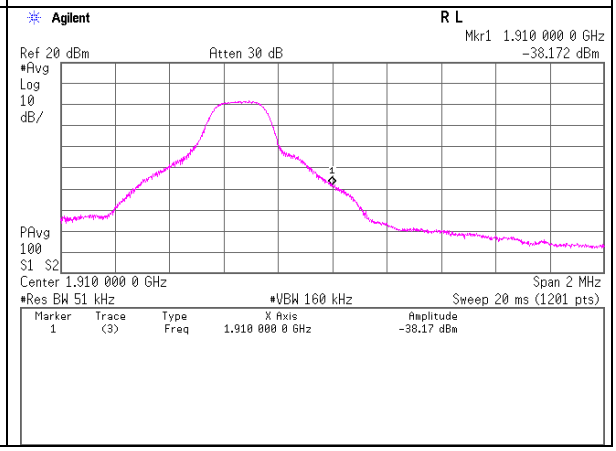


High ch (Tx:1907.5MHz)

RB 25-0



RB 1-24



Band-Edge(Conducted)

LTE Band II

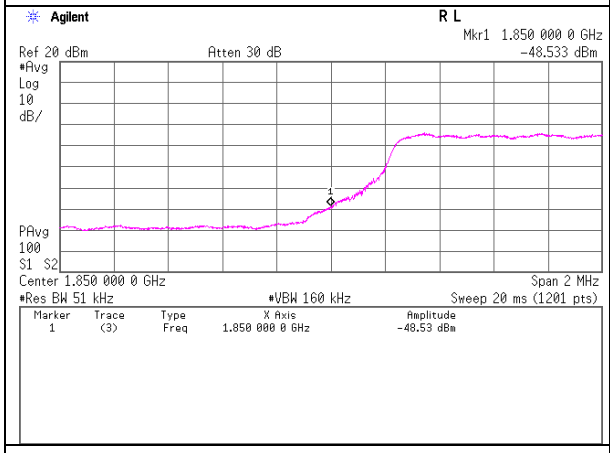
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(16QAM), BW 5MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
25	0	1850.00	-48.53	10.02	6.80	-31.71	-13.0	18.71
	0	1910.00	-46.97	10.02	6.82	-30.13	-13.0	17.13
1	0	1850.00	-37.58	10.02	6.80	-20.76	-13.0	7.76
	24	1910.00	-38.30	10.02	6.82	-21.46	-13.0	8.46

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

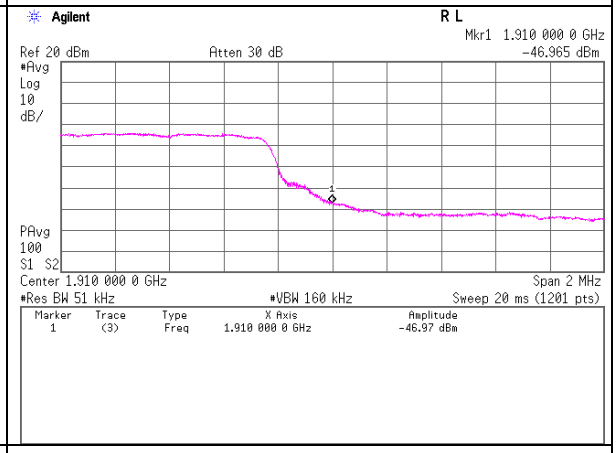
Low ch (Tx:1852.5MHz)

RB 25-0

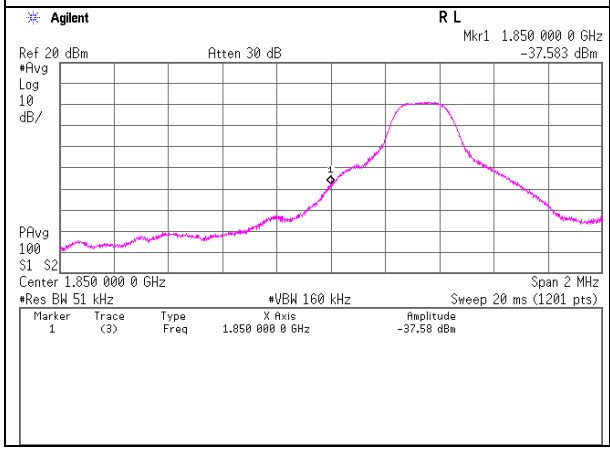


High ch (Tx:1907.5MHz)

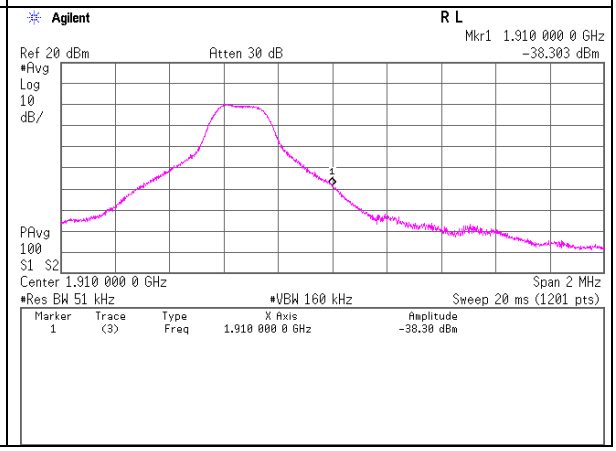
RB 25-0



RB 1-0



RB 1-24



Band-Edge(Conducted)

LTE Band II

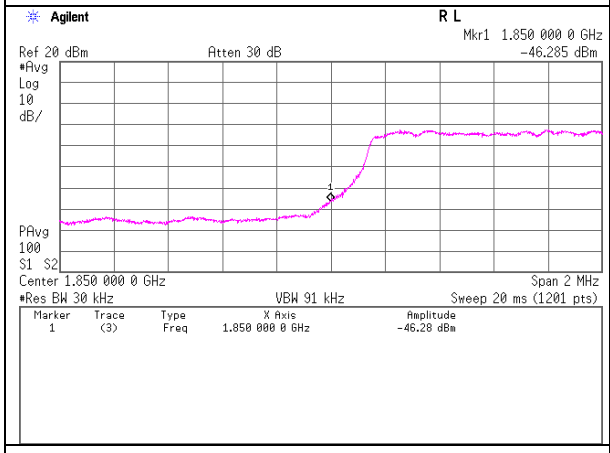
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 3MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
15	0	1850.00	-46.29	10.02	6.80	-29.47	-13.0	16.47
	0	1910.00	-43.91	10.02	6.82	-27.07	-13.0	14.07
1	0	1850.00	-38.66	10.02	6.80	-21.84	-13.0	8.84
	14	1910.00	-38.49	10.02	6.82	-21.65	-13.0	8.65

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

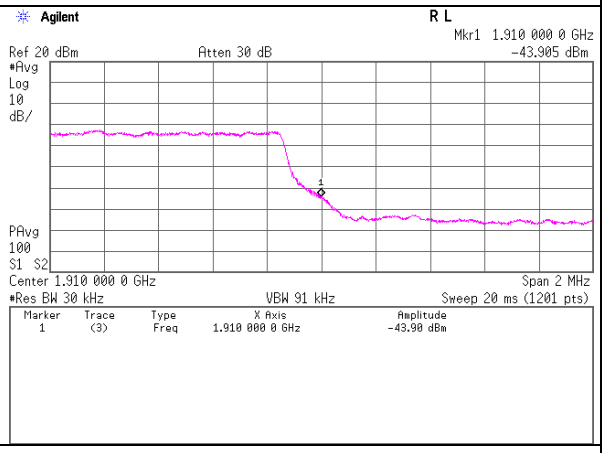
Low ch (Tx:1851.5MHz)

RB 15-0

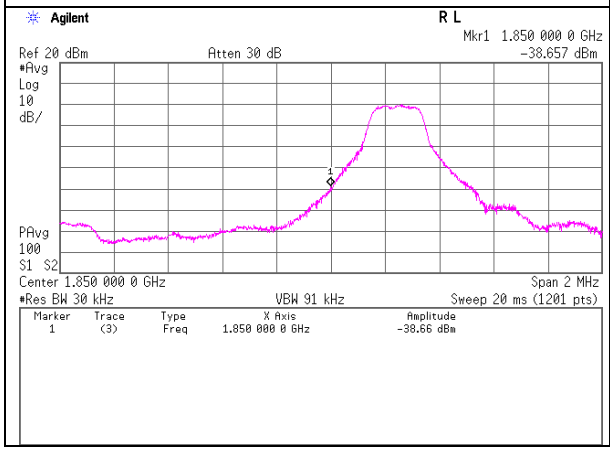


High ch (Tx:1908.5MHz)

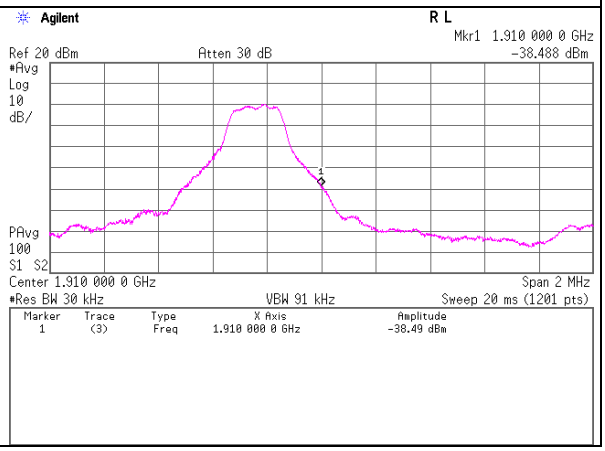
RB 15-0



RB 1-0



RB 1-14



Band-Edge(Conducted)

LTE Band II

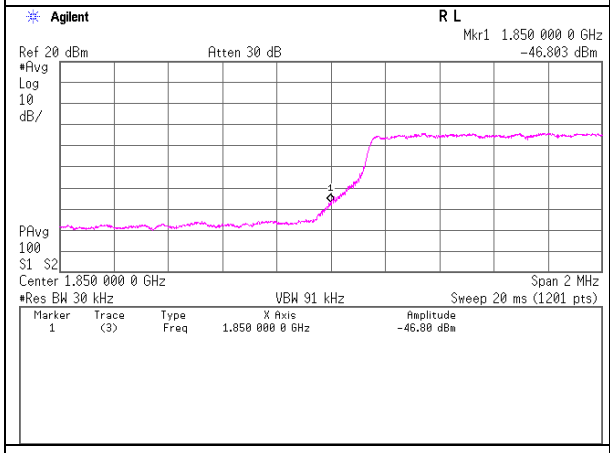
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(16QAM), BW 3MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
15	0	1850.00	-46.80	10.02	6.80	-29.98	-13.0	16.98
	0	1910.00	-44.90	10.02	6.82	-28.06	-13.0	15.06
1	0	1850.00	-39.70	10.02	6.80	-22.88	-13.0	9.88
	14	1910.00	-39.28	10.02	6.82	-22.44	-13.0	9.44

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

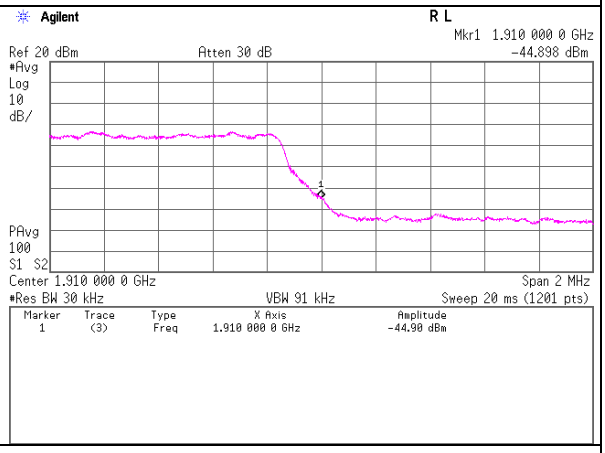
Low ch (Tx:1851.5MHz)

RB 15-0

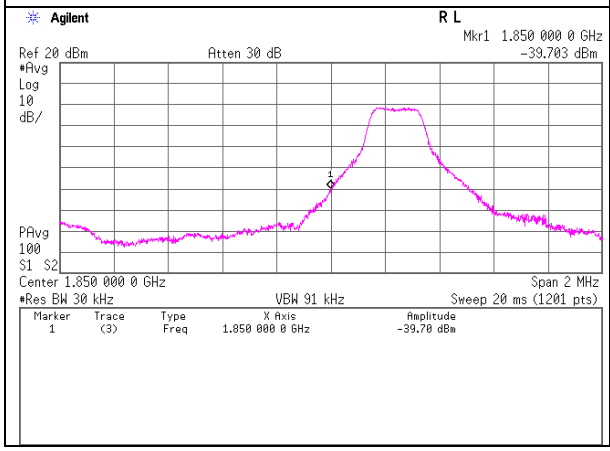


High ch (Tx:1908.5MHz)

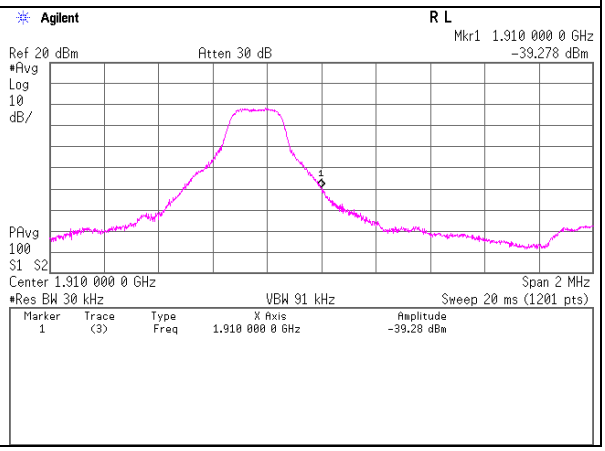
RB 15-0



RB 1-0



RB 1-14



Band-Edge(Conducted)

LTE Band II

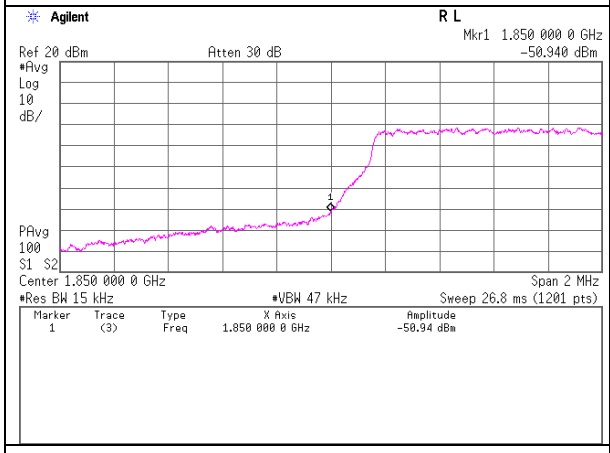
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 1.4MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
6	0	1850.00	-50.94	10.02	6.80	-34.12	-13.0	21.12
	0	1910.00	-49.17	10.02	6.82	-32.33	-13.0	19.33
1	0	1850.00	-43.34	10.02	6.80	-26.52	-13.0	13.52
	5	1910.00	-42.99	10.02	6.82	-26.15	-13.0	13.15

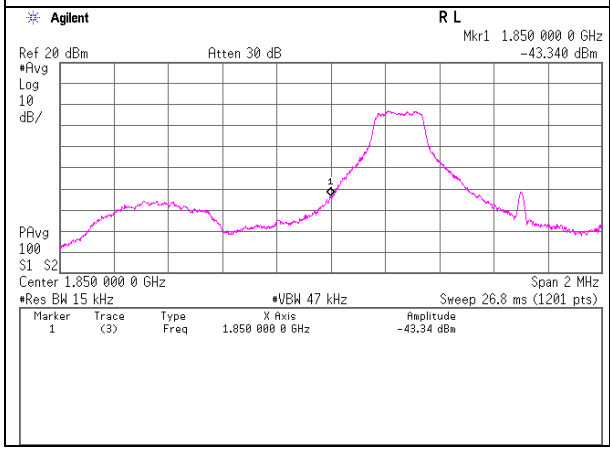
Sample Calculation : Result = Reading + Atten. + Cable Loss

Low ch (Tx:1850.7MHz)

RB 6-0

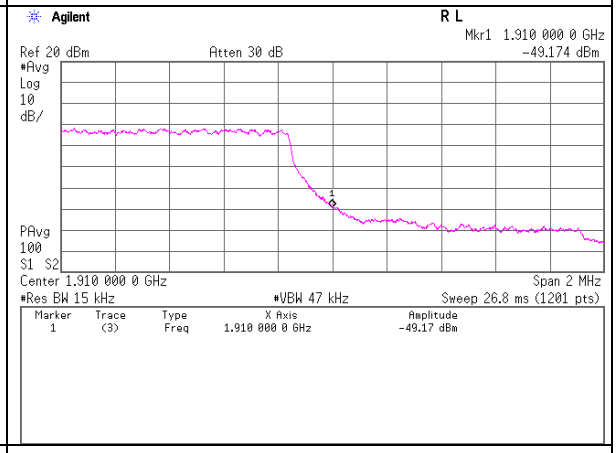


RB 1-0

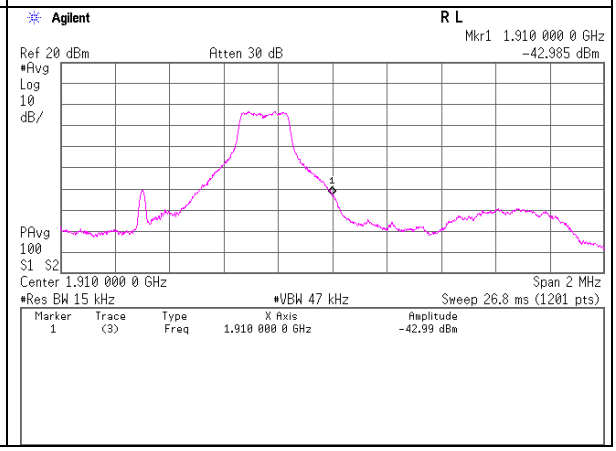


High ch (Tx:1909.3MHz)

RB 6-0



RB 1-5



Band-Edge(Conducted)

LTE Band II

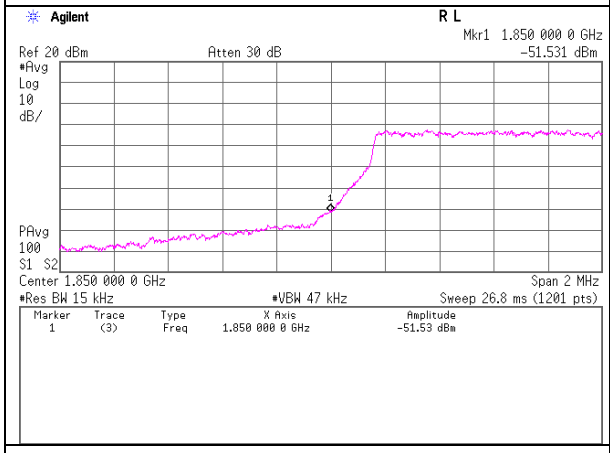
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(16QAM), BW 1.4MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
6	0	1850.00	-51.53	10.02	6.80	-34.71	-13.0	21.71
	0	1910.00	-49.71	10.02	6.82	-32.87	-13.0	19.87
1	0	1850.00	-42.78	10.02	6.80	-25.96	-13.0	12.96
	5	1910.00	-44.81	10.02	6.82	-27.97	-13.0	14.97

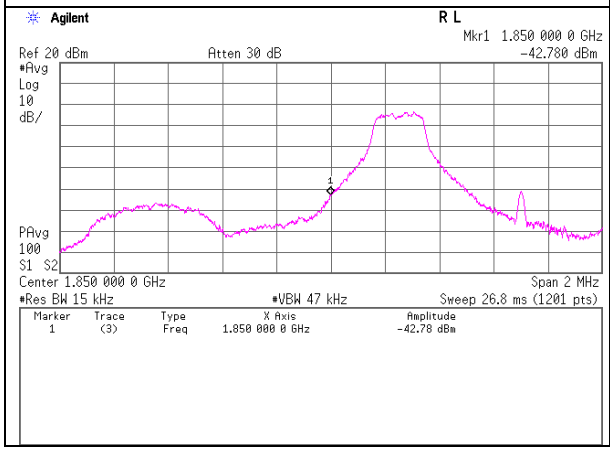
Sample Calculation : Result = Reading + Atten. + Cable Loss

Low ch (Tx:1850.7MHz)

RB 6-0

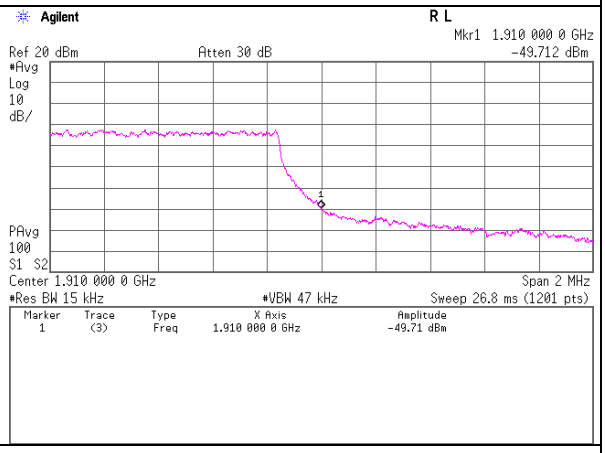


RB 1-0

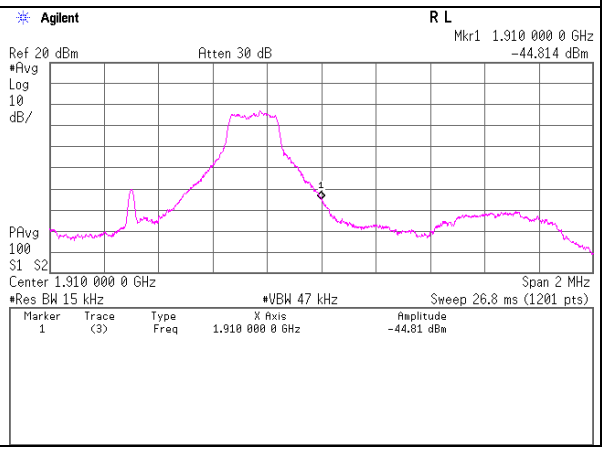


High ch (Tx:1909.3MHz)

RB 6-0



RB 1-5



Band-Edge (Radiated)

PCS1900

Report No.	10636726H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	01/20/2015
Temperature / Humidity	24deg. C / 37% RH
Engineer	Satofumi Matsuyama
Mode	Tx GSM(GMSK), 1slot, PCL=0

GSM

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.00	36.1	42.2	-38.4	-33.0	3.55	9.73	0.00	-32.2	-26.8	-13.0	19.2	13.8	145	351	100	244	Tx 1850.2MHz
1910.00	40.8	39.3	-33.2	-35.5	3.60	10.03	0.00	-26.8	-29.1	-13.0	13.8	16.1	114	199	100	248	Tx 1909.8MHz

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

Report No.	10636726H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	01/20/2015
Temperature / Humidity	24deg. C / 37% RH
Engineer	Satofumi Matsuyama
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0

EGPRS

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.00	38.3	39.1	-36.2	-36.1	3.55	9.73	0.00	-30.0	-29.9	-13.0	17.0	16.9	149	347	100	243	Tx 1850.2MHz
1910.00	37.1	41.1	-36.9	-33.7	3.60	10.03	0.00	-30.5	-27.3	-13.0	17.5	14.3	114	202	100	248	Tx 1909.8MHz

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

Band Edge (Radiated)

W-CDMA Band II

Report No.	10636726H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	01/20/2015
Temperature / Humidity	24deg. C / 38% RH
Engineer	Satofumi Matsuyama
Mode	Tx W-CDMA (RMC12.2kbps), All Up Bits

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.00	42.3	42.6	-32.2	-32.6	3.55	9.73	0.00	-26.0	-26.4	-13.0	13.0	13.4	116	184	100	244	Tx 1852.4MHz
1910.00	44.4	44.3	-29.6	-30.5	3.60	10.03	0.00	-23.2	-24.1	-13.0	10.2	11.1	110	184	100	247	Tx 1907.6MHz

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)

Band Edge (Radiated)

LTE Band II

Report No.	10636726H
Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Date	01/29/2015
Temperature / Humidity	22deg. C / 31% RH
Engineer	Hironobu Ohnishi
Mode	Tx LTE(QPSK), BW 5MHz

[QPSK, 100% RB allocation]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.00	45.0	46.3	-30.1	-29.8	3.6	9.7	0.0	-23.9	-23.6	-13.0	10.9	10.6	119	269	132	279	RB 25-0, Tx 1852.5MHz
1910.00	45.3	46.9	-29.6	-29.2	3.6	10.0	0.0	-23.1	-22.8	-13.0	10.1	9.8	112	284	127	277	RB 25-0, Tx 1907.5MHz

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-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).
Detector : Spectrum Analyzer RMS Average (RBW: 51kHz , VBW: 160kHz)

[QPSK, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.00	47.1	48.6	-28.0	-27.5	3.6	9.7	0.0	-21.8	-21.3	-13.0	8.8	8.3	119	269	132	279	RB 1-0, Tx 1852.5MHz
1910.00	48.3	51.0	-26.6	-25.1	3.6	10.0	0.0	-20.1	-18.6	-13.0	7.1	5.6	112	284	127	277	RB 1-24, Tx 1907.5MHz

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-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).
Detector : Spectrum Analyzer RMS Average (RBW: 51kHz , VBW: 160kHz)

Band Edge (Radiated)

LTE Band II

Report No.	10636726H
Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Date	01/29/2015
Temperature / Humidity	22deg. C / 31% RH
Engineer	Hironobu Ohnishi
Mode	Tx LTE(16QAM), BW 5MHz

[16QAM, 100% RB allocation]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.00	44.0	44.6	-31.1	-31.5	3.6	9.7	0.0	-24.9	-25.3	-13.0	11.9	12.3	119	269	132	279	RB 25-0, Tx 1852.5MHz
1910.00	44.0	45.5	-30.8	-30.6	3.6	10.0	0.0	-24.4	-24.2	-13.0	11.4	11.2	112	284	127	277	RB 25-0, Tx 1907.5MHz

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-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).
Detector : Spectrum Analyzer RMS Average (RBW: 51kHz , VBW: 160kHz)

[16QAM, 1 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1850.00	46.8	48.4	-28.3	-27.7	3.6	9.7	0.0	-22.1	-21.5	-13.0	9.1	8.5	119	269	132	279	RB 1-0, Tx 1852.5MHz
1910.00	47.1	49.4	-27.8	-26.7	3.6	10.0	0.0	-21.4	-20.3	-13.0	8.4	7.3	112	284	127	277	RB 1-24, Tx 1907.5MHz

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-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).
Detector : Spectrum Analyzer RMS Average (RBW: 51kHz , VBW: 160kHz)

Spurious Emission (Conducted)

PCS1900

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/04/2015
Temperature/ Humidity	22deg.C / 49% 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 *1) *2) [dBm]
1850.2	-13.0	10.02	6.80	-29.8
1880.0	-13.0	10.02	6.81	-29.8
1909.8	-13.0	10.02	6.82	-29.8

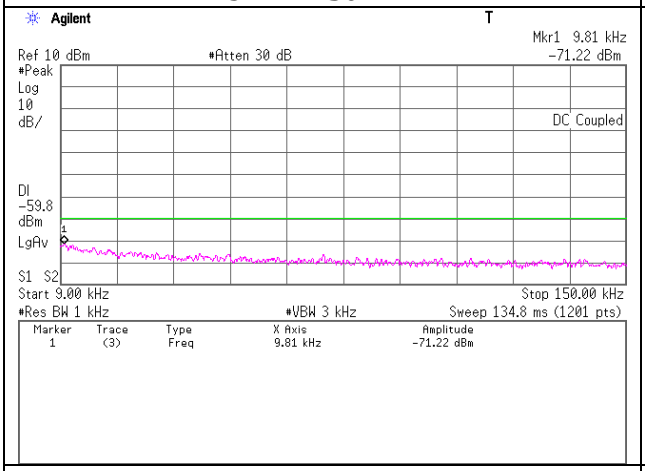
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss
*1)9k-150kHz : RBW factor was applied to Limit Line. (RBW factor=10log(1kHz/1MHz)
*2)150kHz-30MHz : RBW factor was applied to Limit Line. (RBW factor=10log(10kHz/1MHz)

Spurious Emission (Conducted)

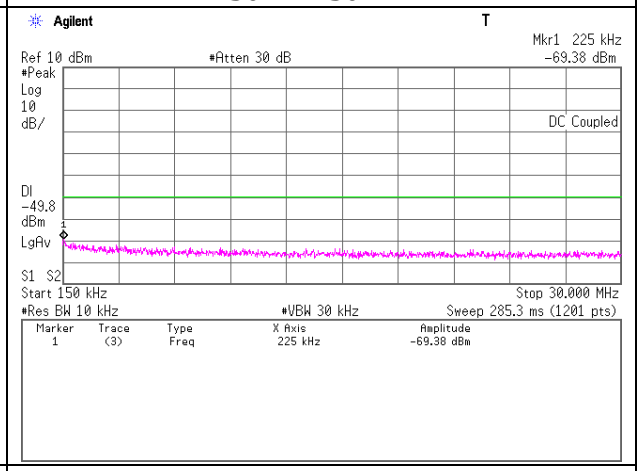
GSM

Tx:1850.2MHz

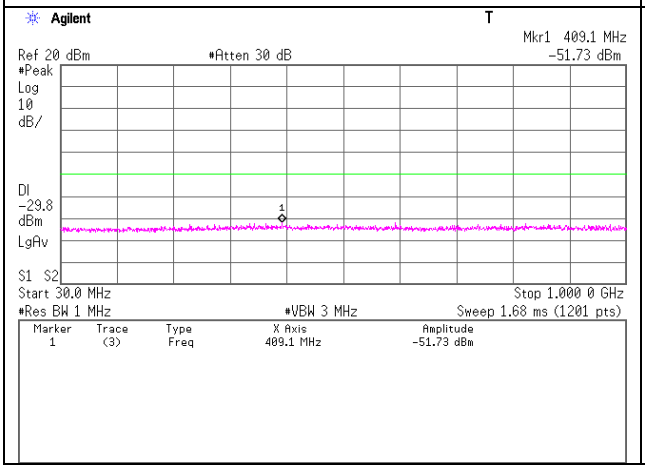
9kHz-150kHz



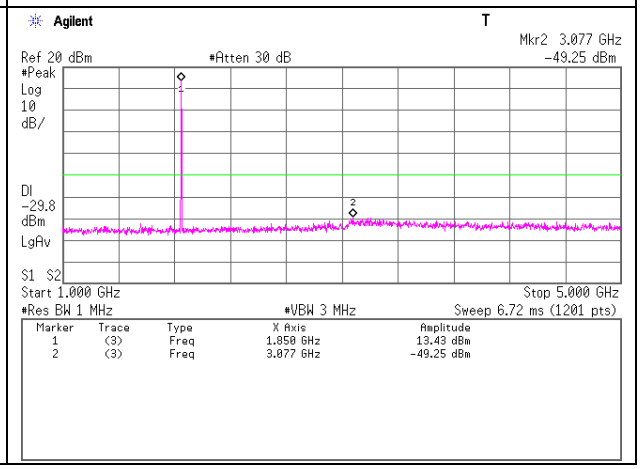
150kHz-30MHz



30MHz-1GHz



1GHz-5GHz

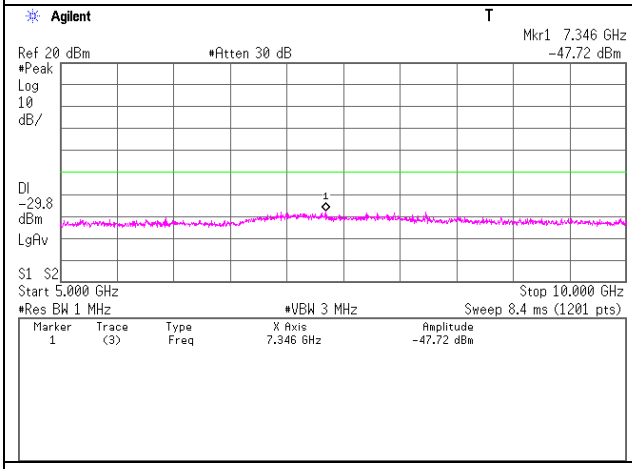


Spurious Emission (Conducted)

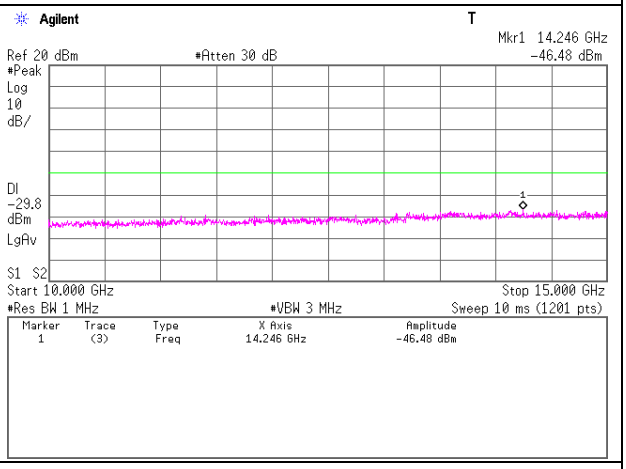
GSM

Tx:1850.2MHz

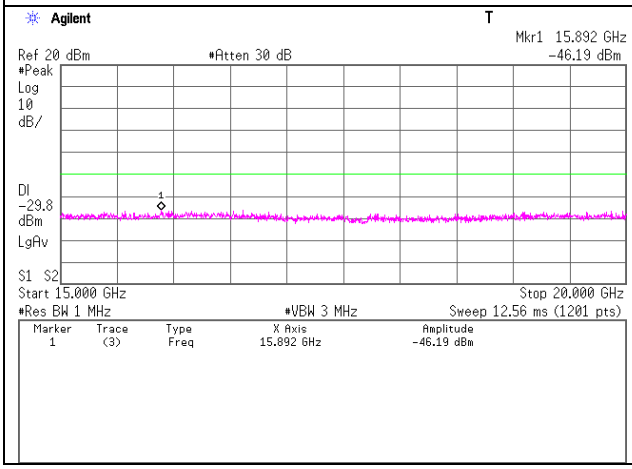
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz

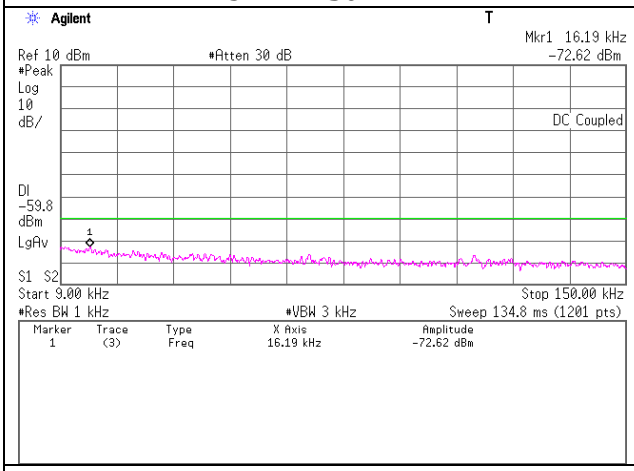


Spurious Emission (Conducted)

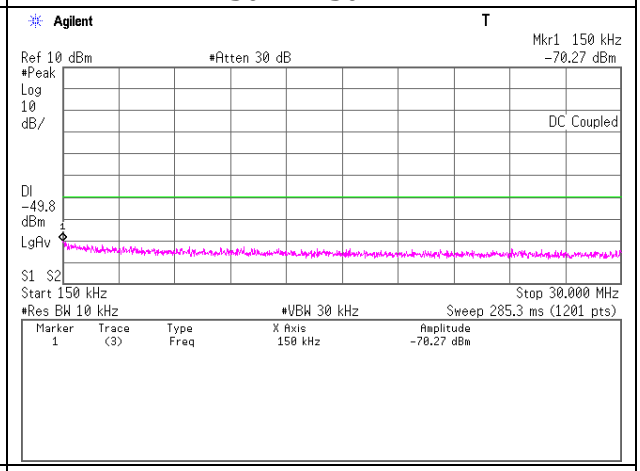
GSM

Tx:1880.0MHz

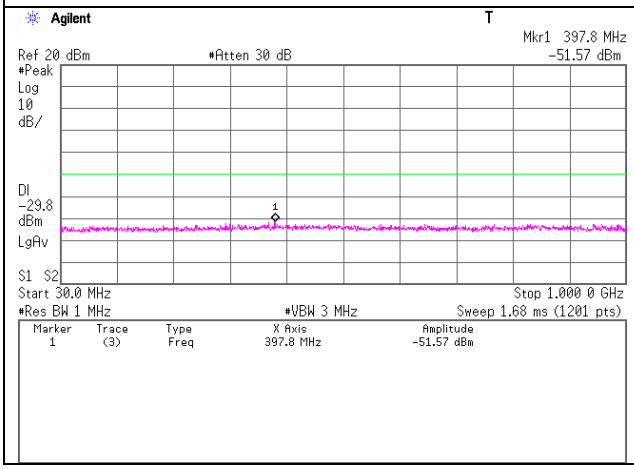
9kHz-150kHz



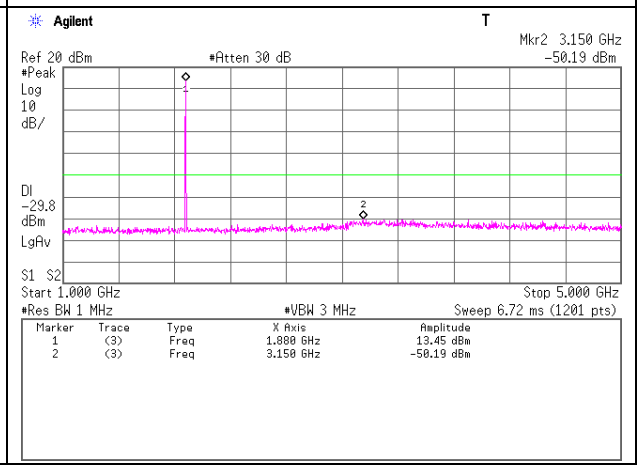
150kHz-30MHz



30MHz-1GHz



1GHz-5GHz

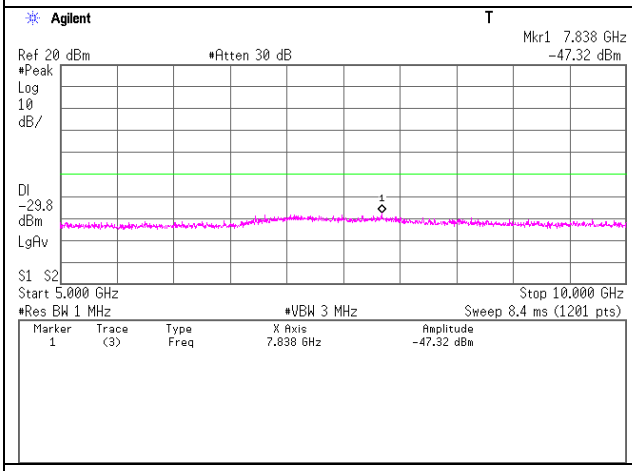


Spurious Emission (Conducted)

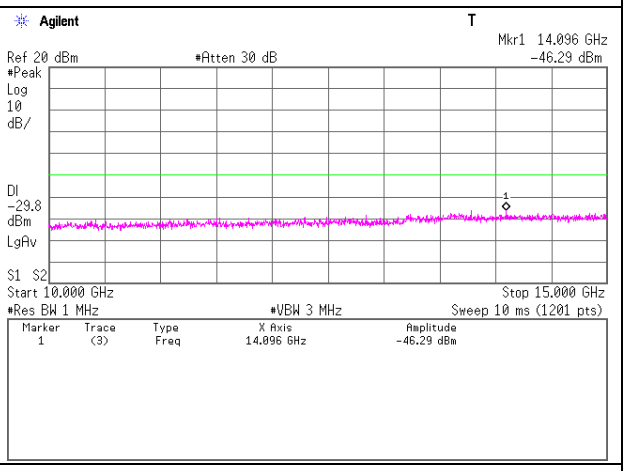
GSM

Tx:1880.0MHz

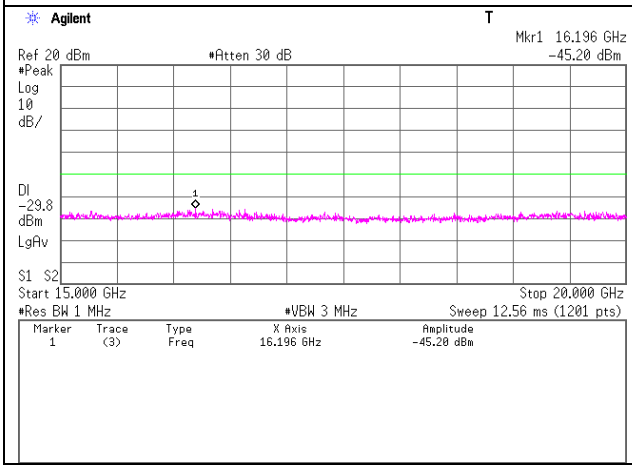
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz

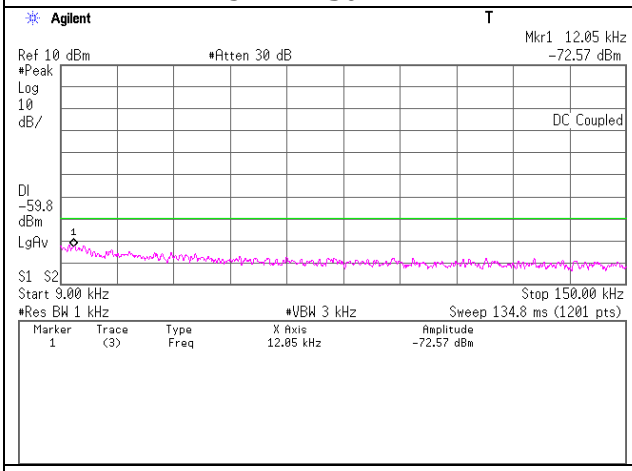


Spurious Emission (Conducted)

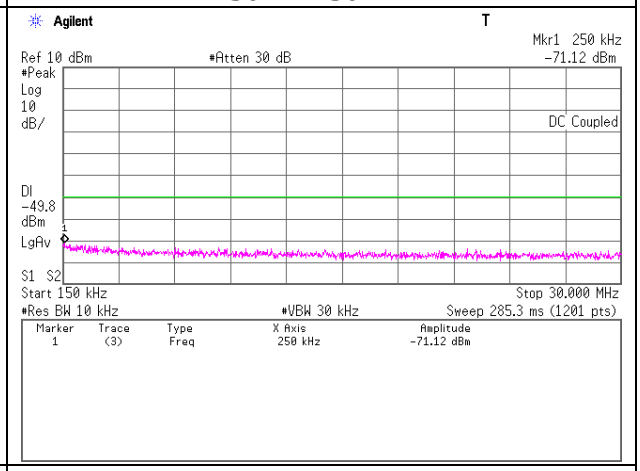
GSM

Tx:1909.8MHz

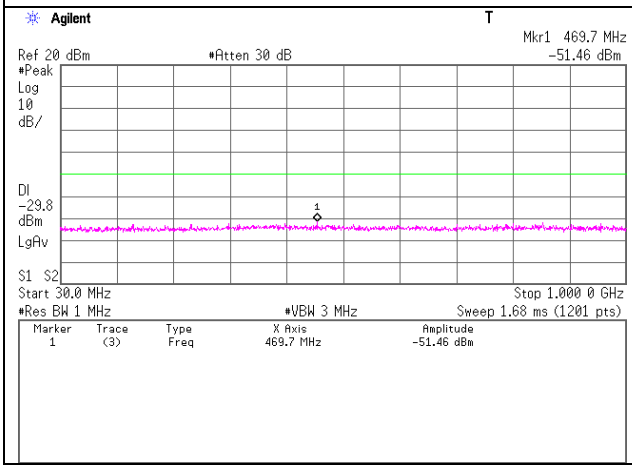
9kHz-150kHz



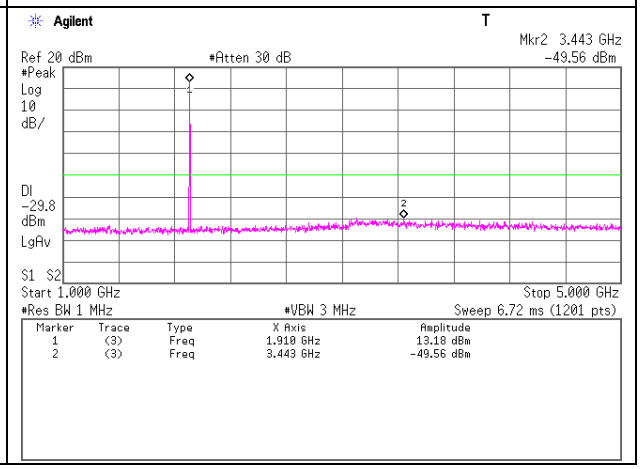
150kHz-30MHz



30MHz-1GHz



1GHz-5GHz

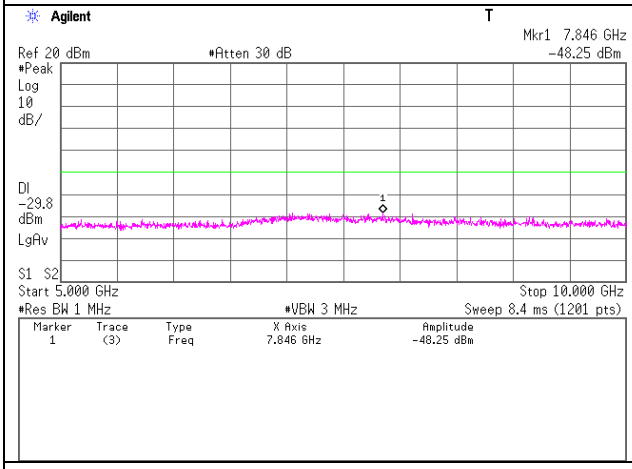


Spurious Emission (Conducted)

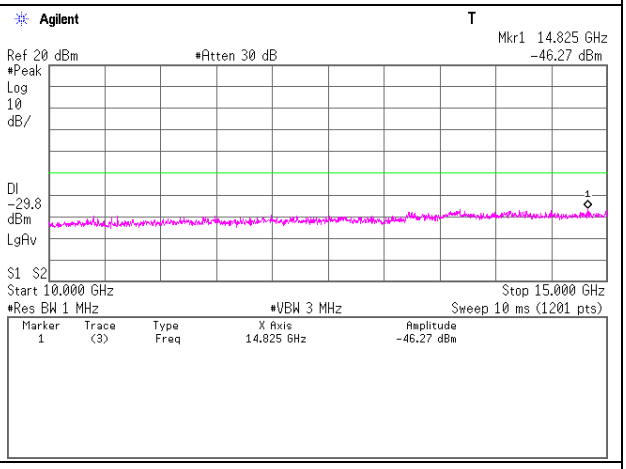
GSM

Tx:1909.8MHz

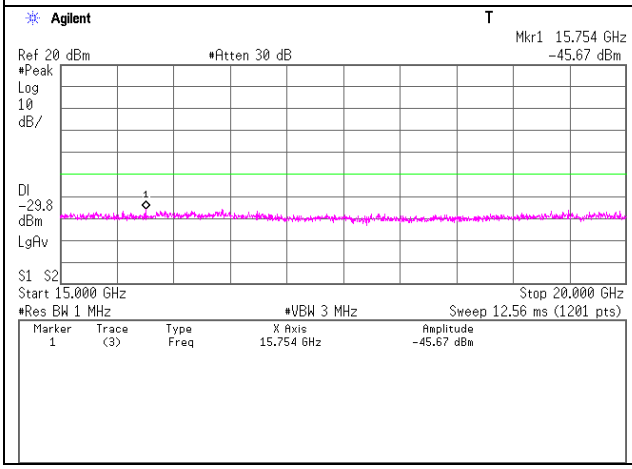
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



Spurious Emission (Conducted)

PCS1900

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/04/2015
Temperature/ Humidity	22deg.C / 49% 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 *1) *2) [dBm]
1850.2	-13.0	10.02	6.80	-29.8
1880.0	-13.0	10.02	6.81	-29.8
1909.8	-13.0	10.02	6.82	-29.8

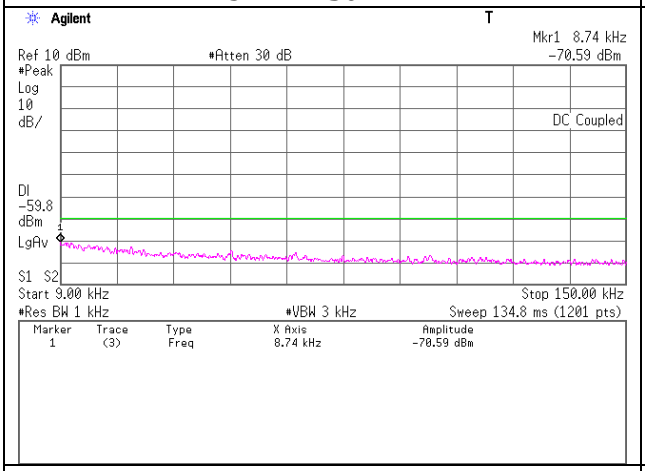
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss
*1)9k-150kHz : RBW factor was applied to Limit Line. (RBW factor=10log(1kHz/1MHz)
*2)150kHz-30MHz : RBW factor was applied to Limit Line. (RBW factor=10log(10kHz/1MHz)

Spurious Emission (Conducted)

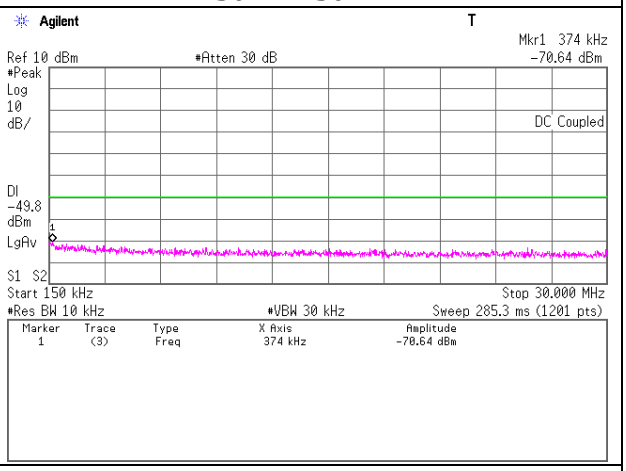
EGPRS

Tx:1850.2MHz

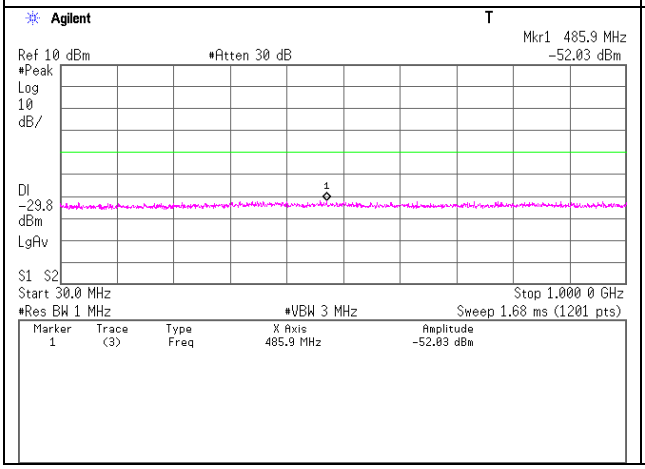
9kHz-150kHz



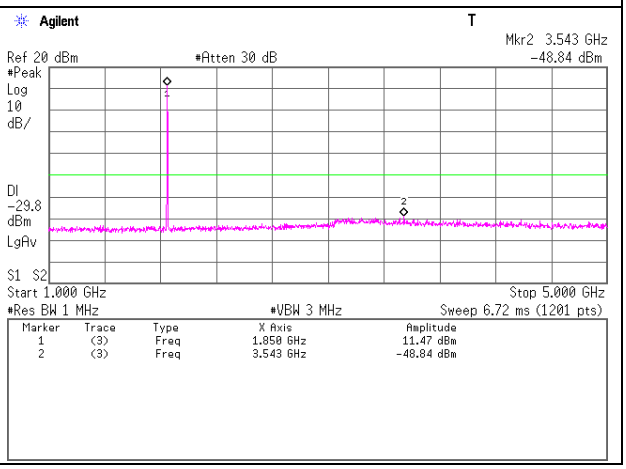
150kHz-30MHz



30MHz-1GHz

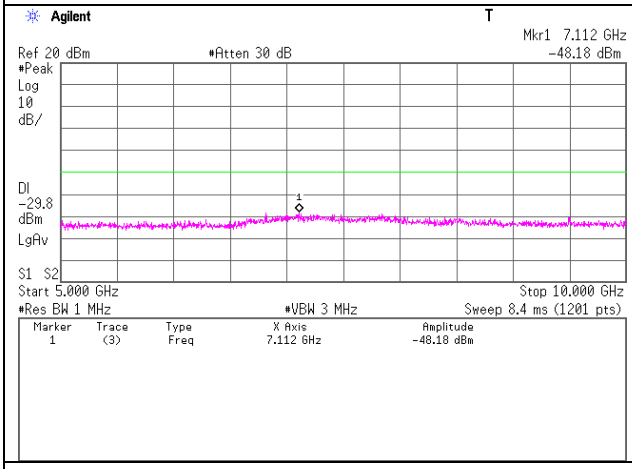


1GHz-5GHz

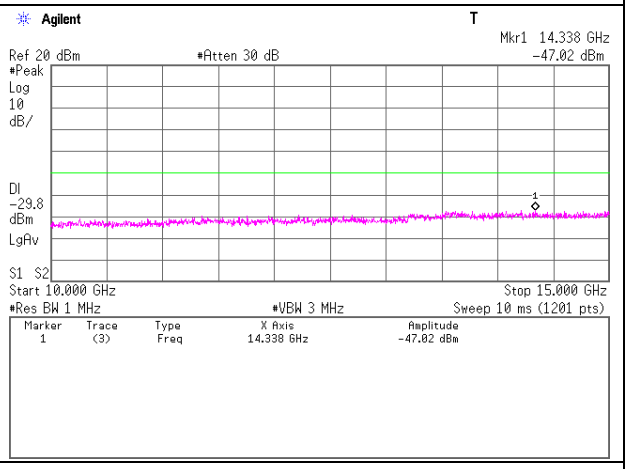


Spurious Emission (Conducted)
EGPRS
Tx:1850.2MHz

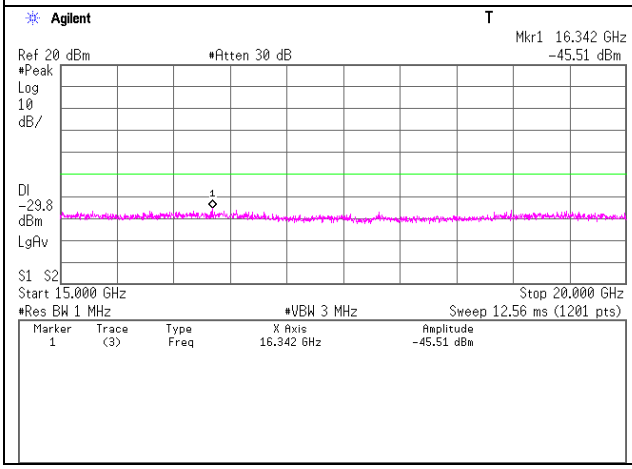
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz

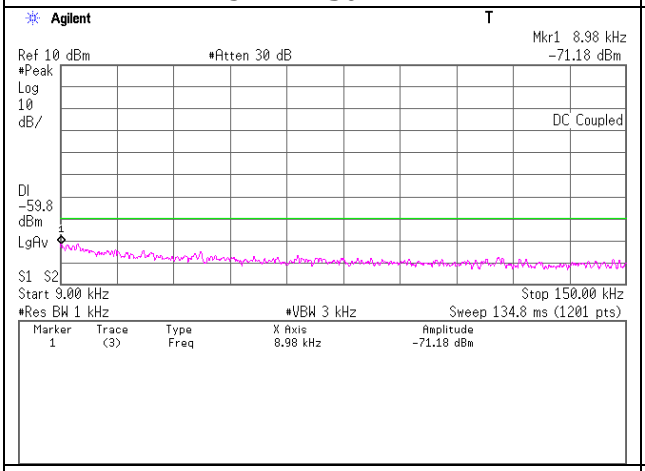


Spurious Emission (Conducted)

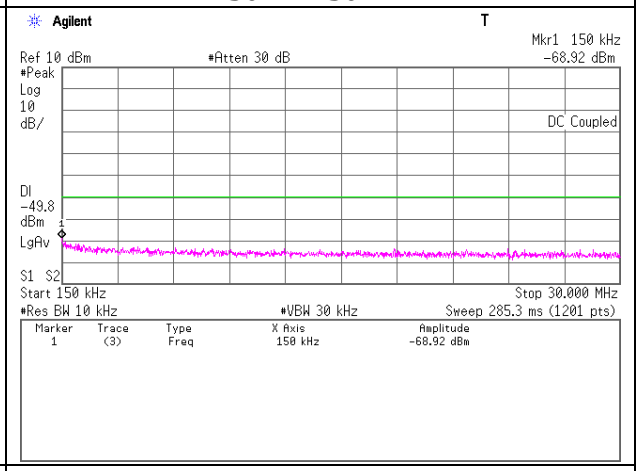
EGPRS

Tx:1880.0MHz

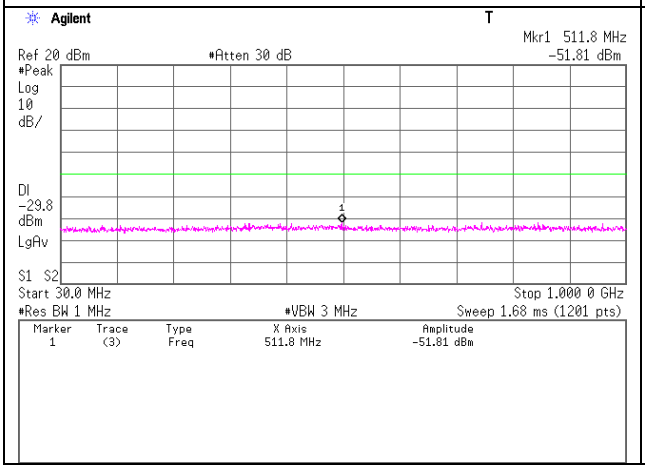
9kHz-150kHz



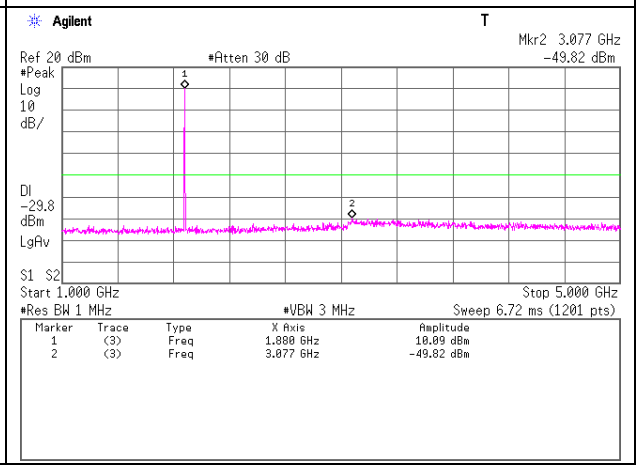
150kHz-30MHz



30MHz-1GHz

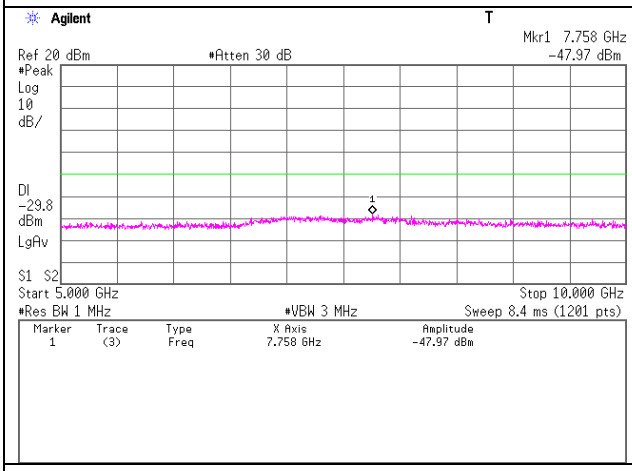


1GHz-5GHz

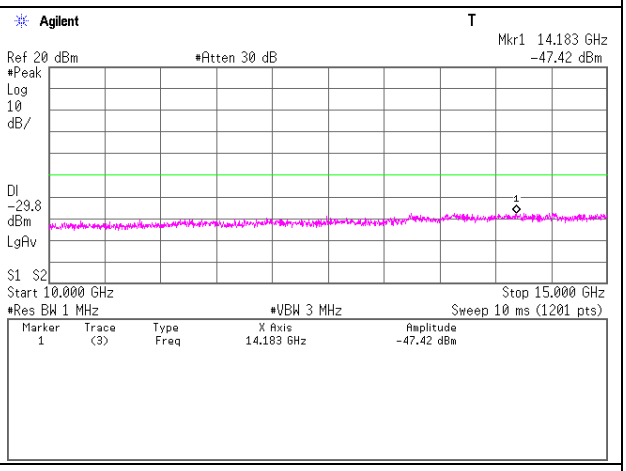


Spurious Emission (Conducted)
EGPRS
Tx:1880.0MHz

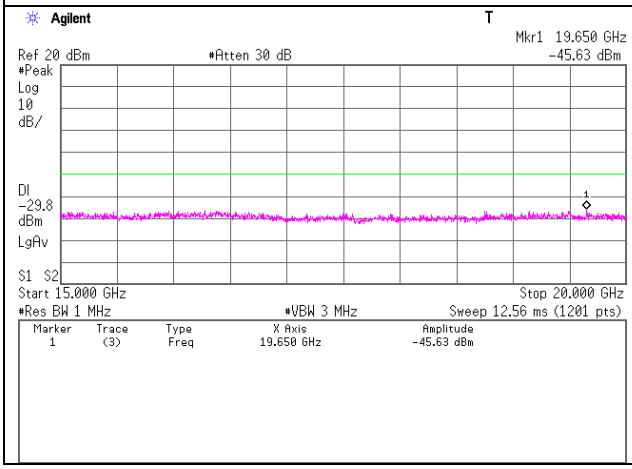
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz

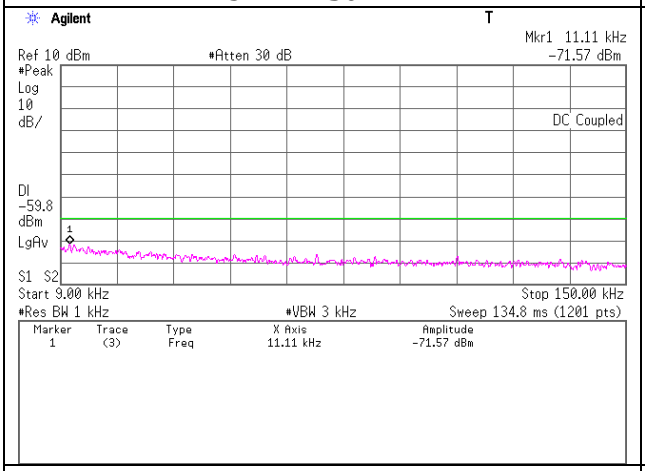


Spurious Emission (Conducted)

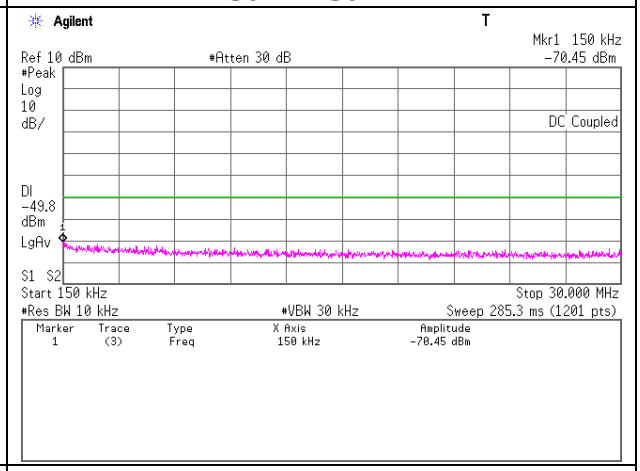
EGPRS

Tx:1909.8MHz

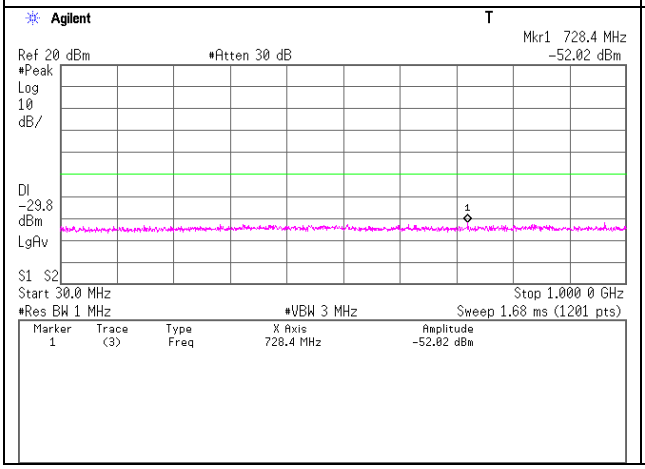
9kHz-150kHz



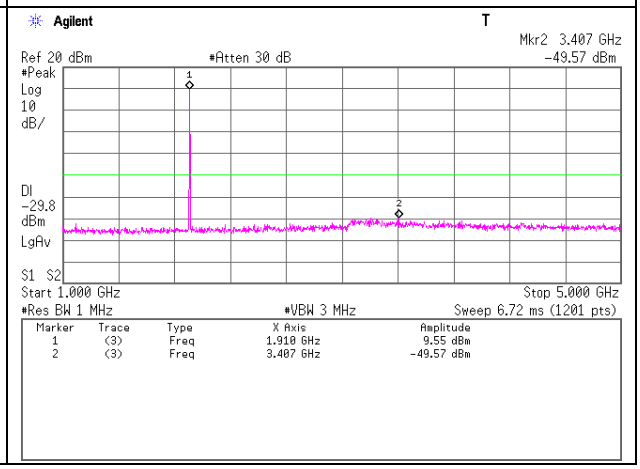
150kHz-30MHz



30MHz-1GHz

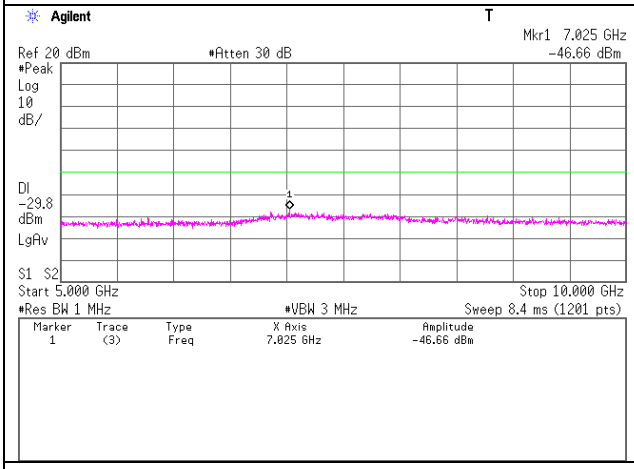


1GHz-5GHz

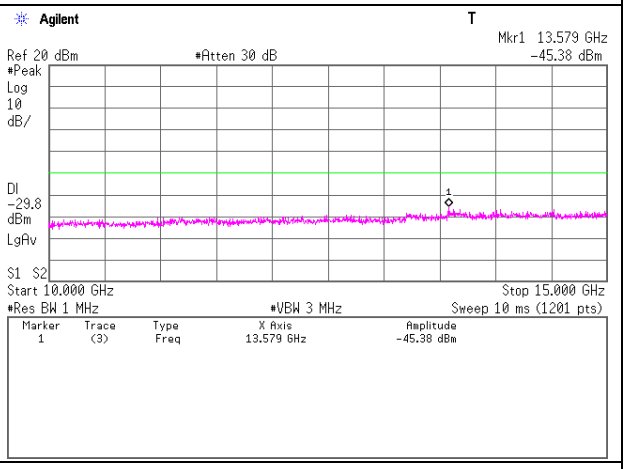


Spurious Emission (Conducted)
EGPRS
Tx:1909.8MHz

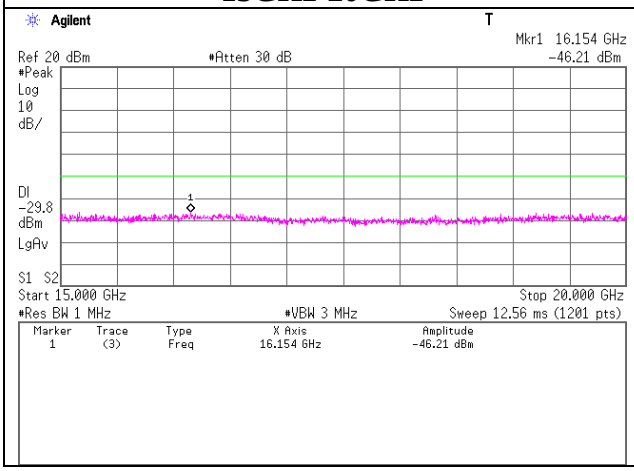
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



Spurious Emission (Conducted)

W-CDMA Band II

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/04/2015
Temperature/ Humidity	22deg. C / 48% 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 *1) *2) [dBm]
1852.4	-13.0	10.02	6.80	-29.8
1880.0	-13.0	10.02	6.81	-29.8
1907.6	-13.0	10.02	6.82	-29.8

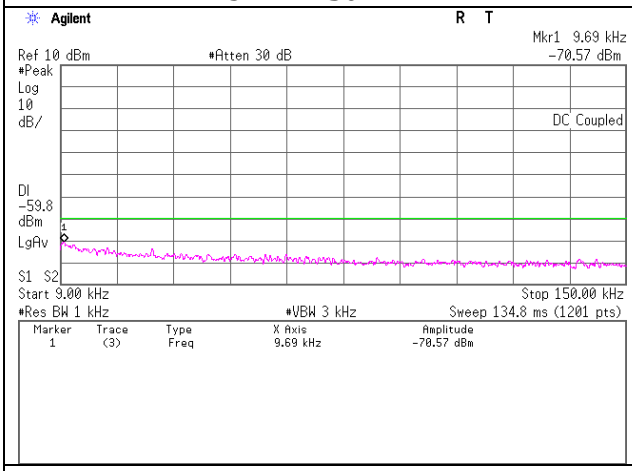
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss

*1)9k-150kHz : RBW factor was applied to Limit Line. (RBW factor=10log(1kHz/1MHz)

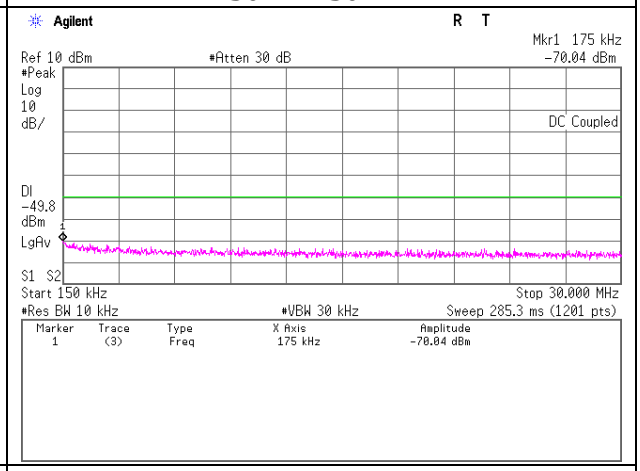
*2)150kHz-30MHz : RBW factor was applied to Limit Line. (RBW factor=10log(10kHz/1MHz)

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

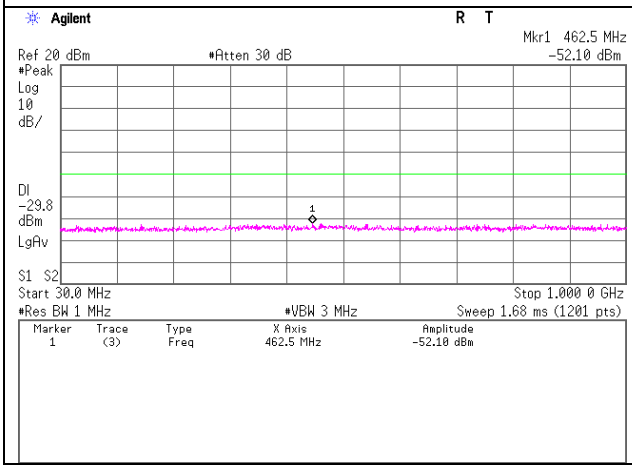
9kHz-150kHz



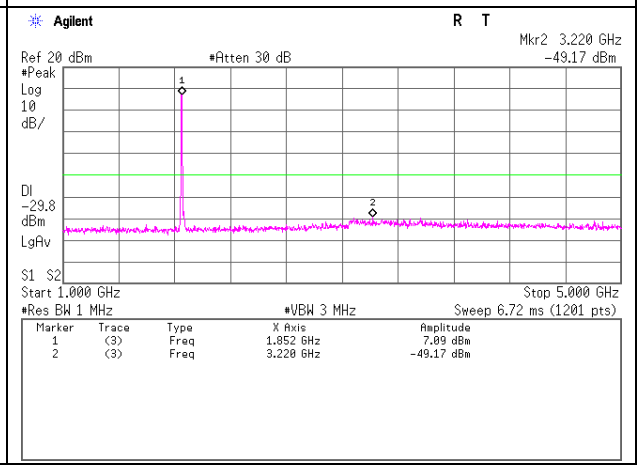
150kHz-30MHz



30MHz-1GHz

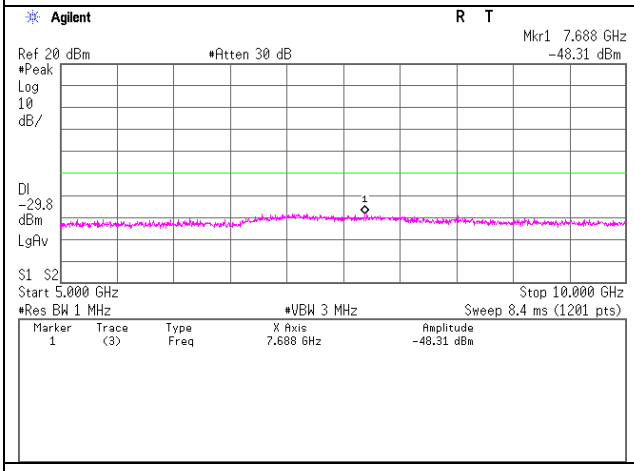


1GHz-5GHz

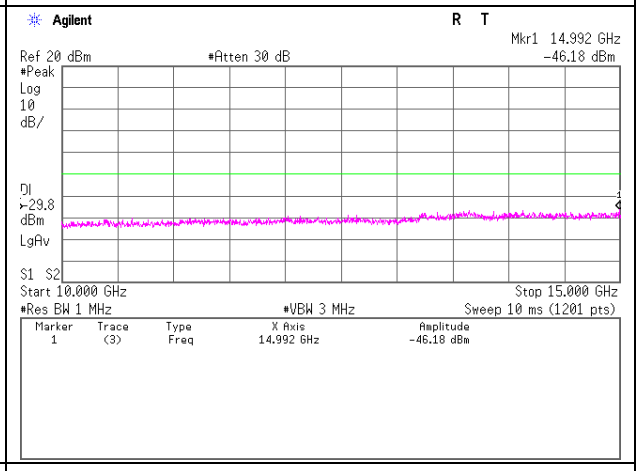


Spurious Emission (Conducted)
W-CDMA Band II
Tx:1852.4MHz

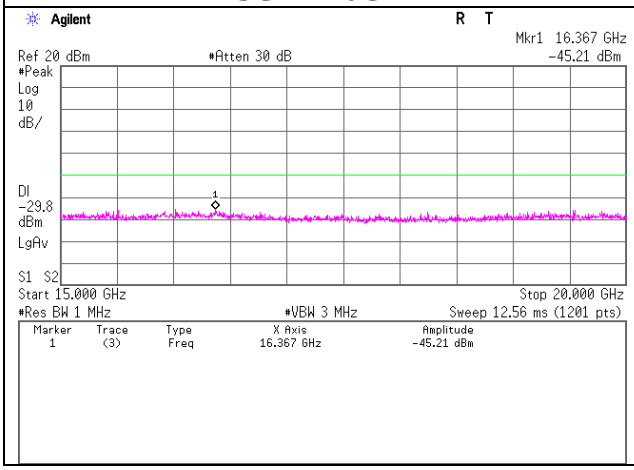
5GHz-10GHz



10GHz-15GHz

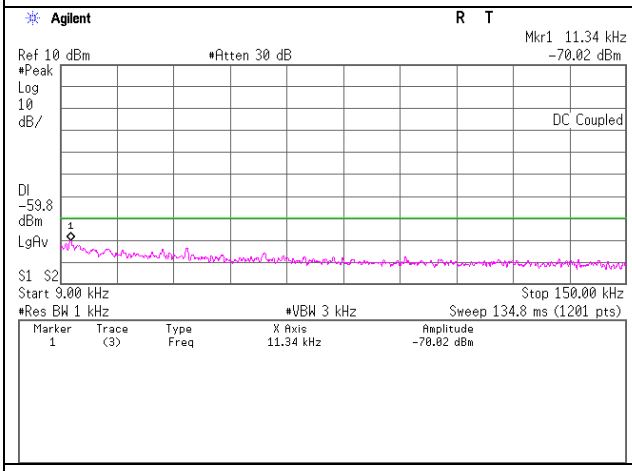


15GHz-20GHz

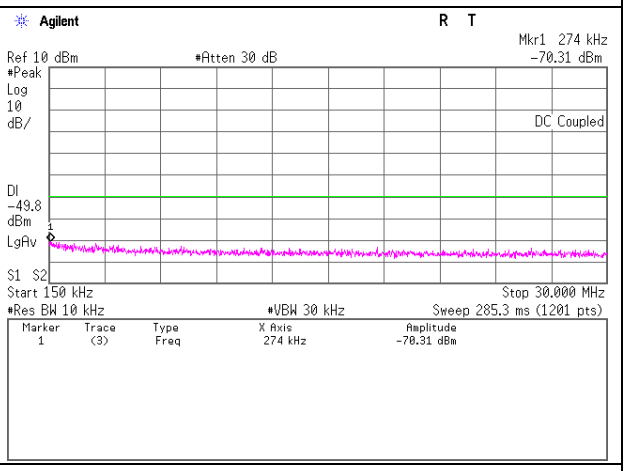


Spurious Emission (Conducted)
W-CDMA Band II
Tx:1880.0MHz

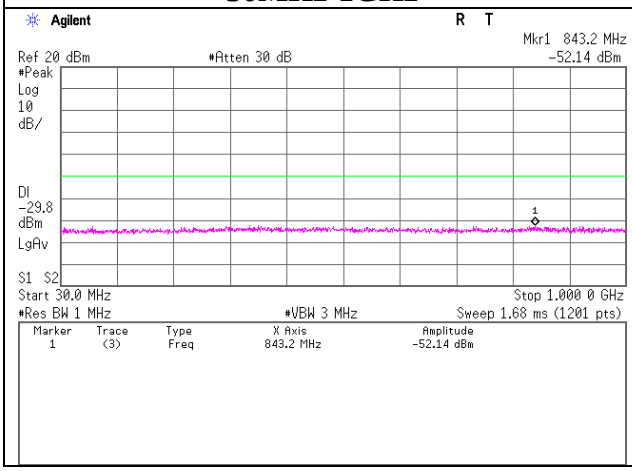
9kHz-150kHz



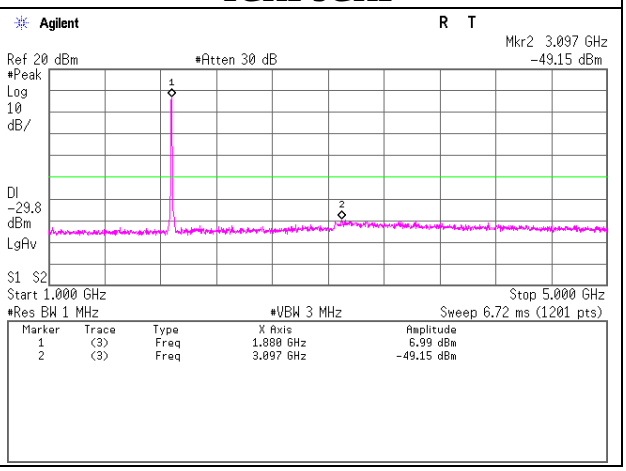
150kHz-30MHz



30MHz-1GHz

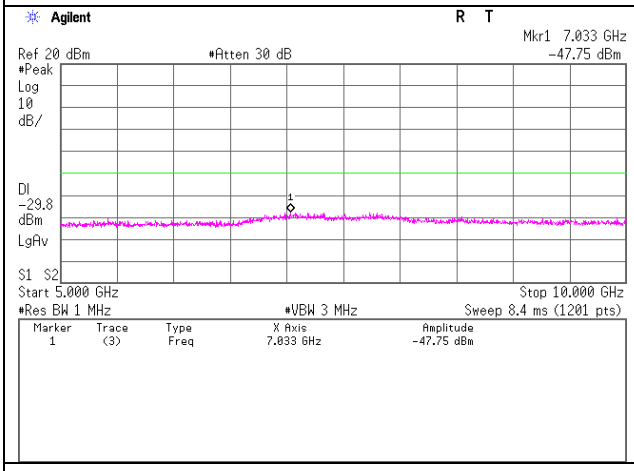


1GHz-5GHz

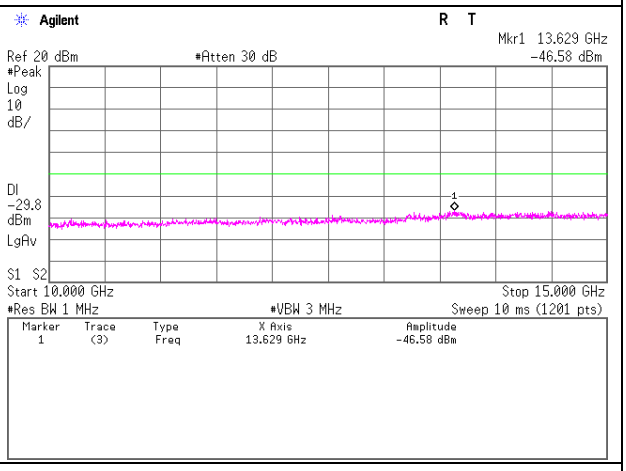


Spurious Emission (Conducted)
W-CDMA Band II
Tx:1880.0MHz

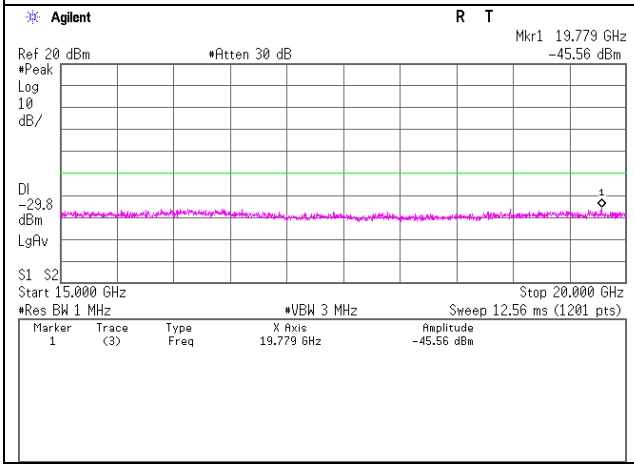
5GHz-10GHz



10GHz-15GHz

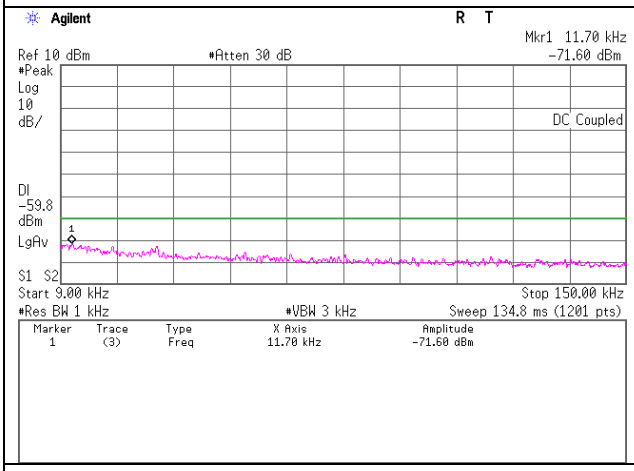


15GHz-20GHz

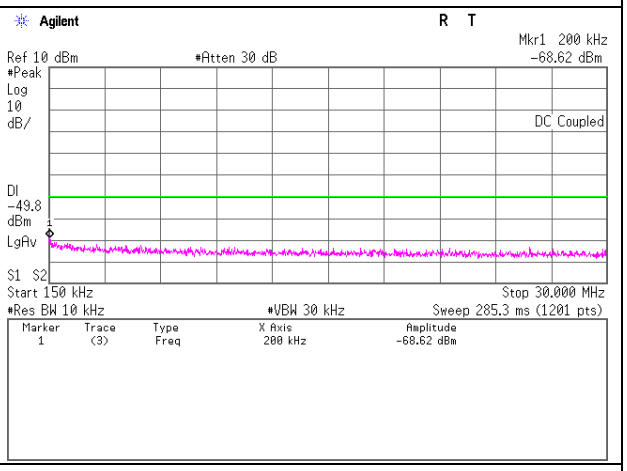


Spurious Emission (Conducted)
W-CDMA Band II
Tx:1907.6MHz

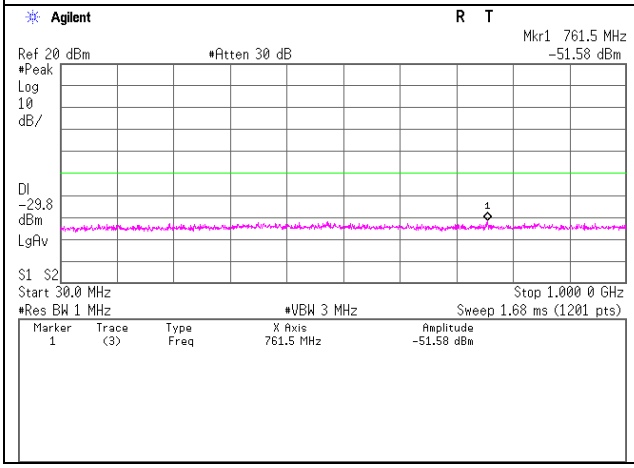
9kHz-150kHz



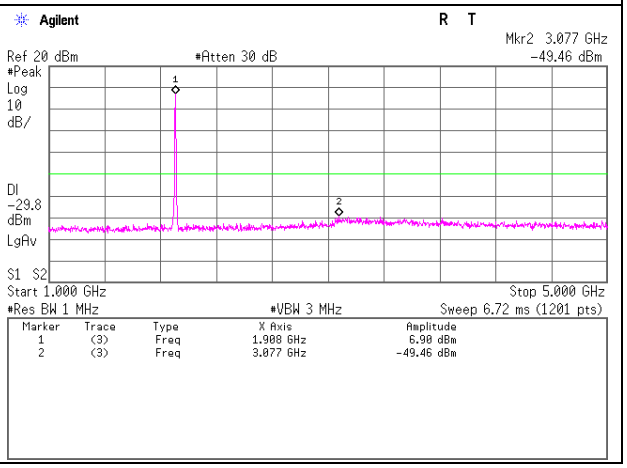
150kHz-30MHz



30MHz-1GHz

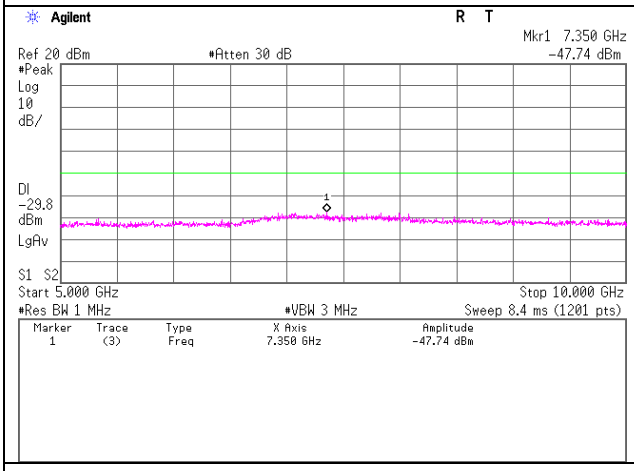


1GHz-5GHz

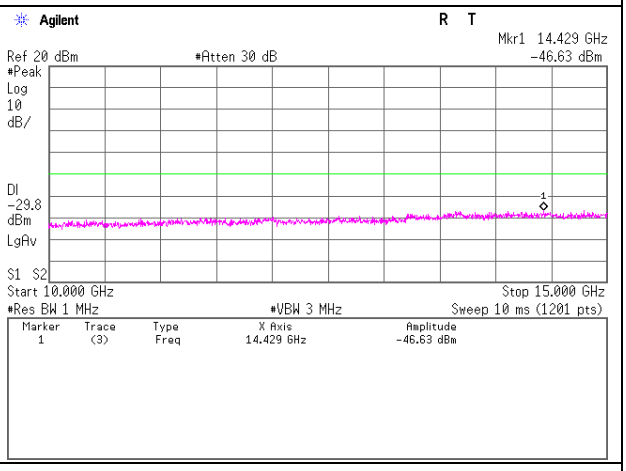


Spurious Emission (Conducted)
W-CDMA Band II
Tx:1907.6MHz

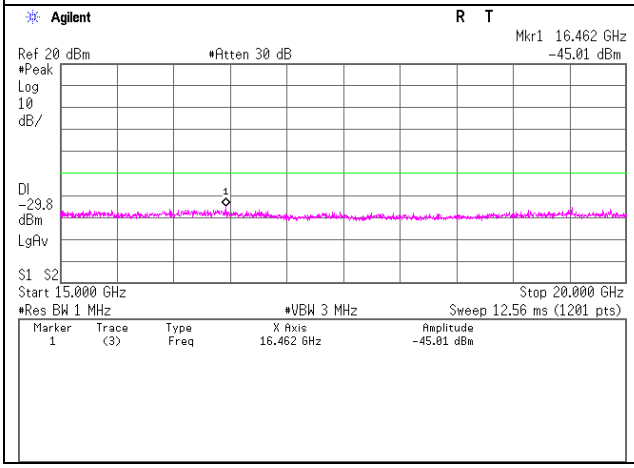
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



Spurious Emission (Conducted)

LTE Band II

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/06/2015
Temperature/ Humidity	23deg. C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 3MHz
	Low ch RB1-14, Mid ch RB1-14, High ch RB 1-14

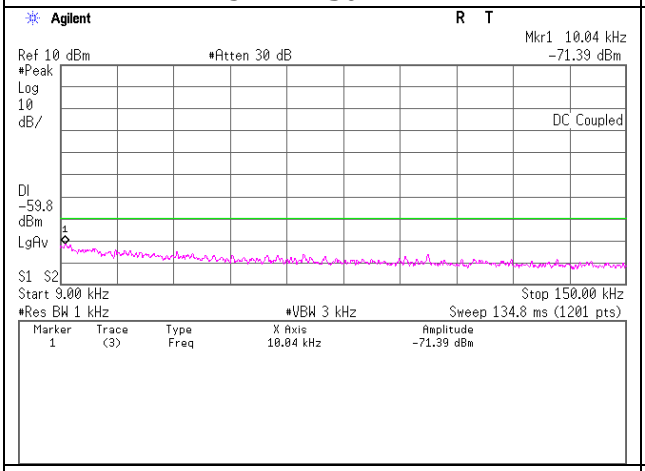
Limit Line

Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line *1) *2) [dBm]
1851.5	-13.0	10.02	6.80	-29.8
1880.0	-13.0	10.02	6.81	-29.8
1908.5	-13.0	10.02	6.82	-29.8

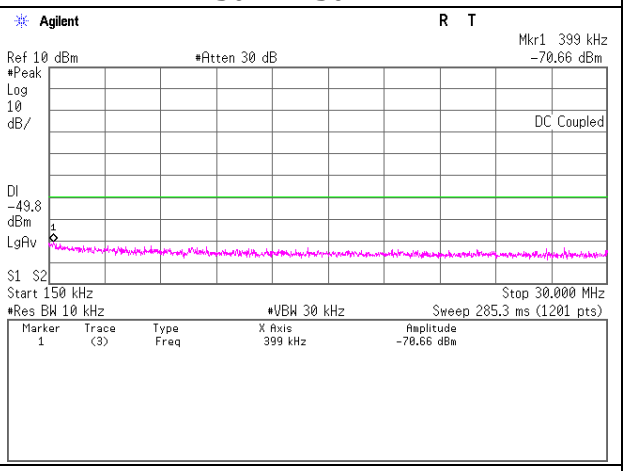
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss
*1)9k-150kHz : RBW factor was applied to Limit Line. (RBW factor=10log(1kHz/1MHz)
*2)150kHz-30MHz : RBW factor was applied to Limit Line. (RBW factor=10log(10kHz/1MHz)

Spurious Emission (Conducted)
LTE Band II
Tx: 1851.5MHz

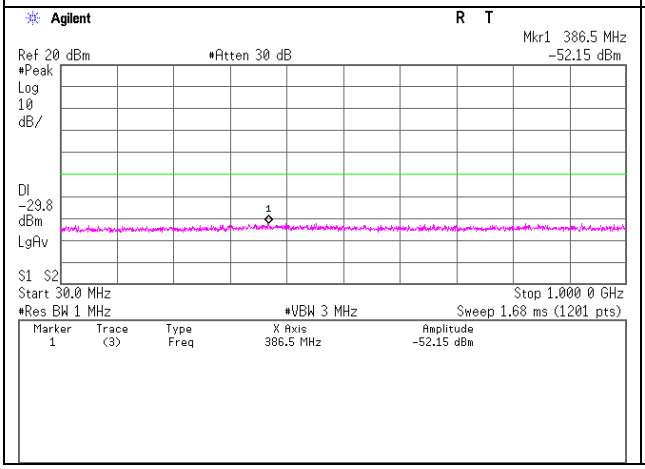
9kHz-150kHz



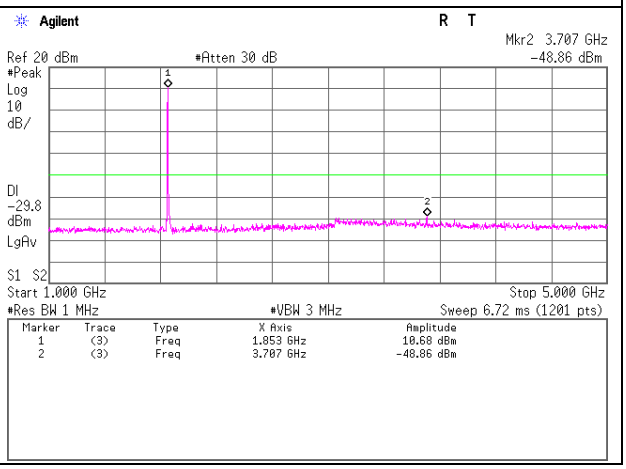
150kHz-30MHz



30MHz-1GHz

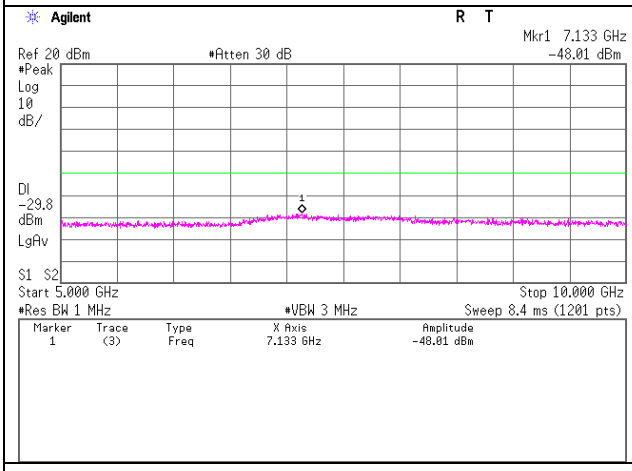


1GHz-5GHz

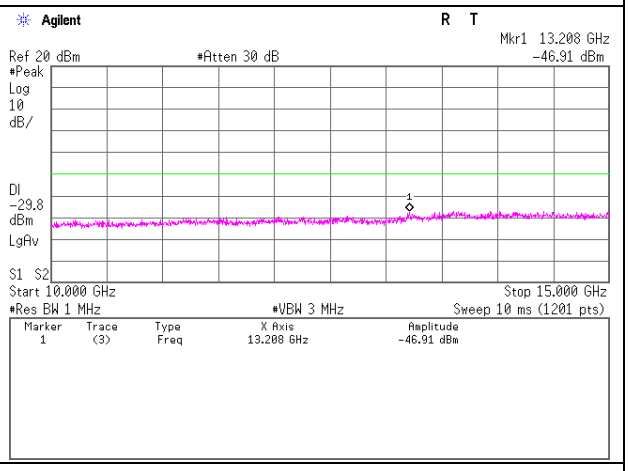


Spurious Emission (Conducted)
LTE Band II
Tx: 1851.5MHz

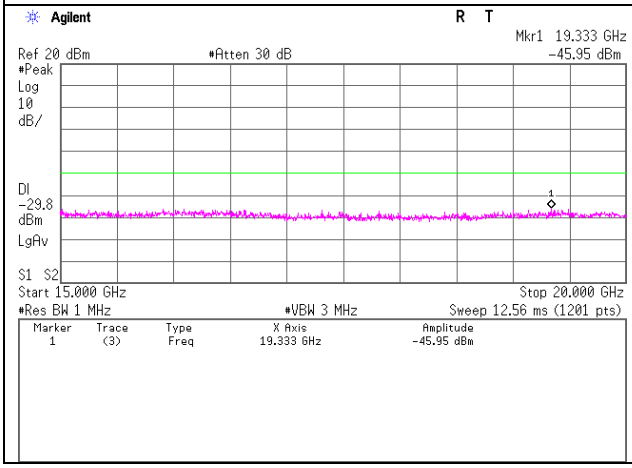
5GHz-10GHz



10GHz-15GHz

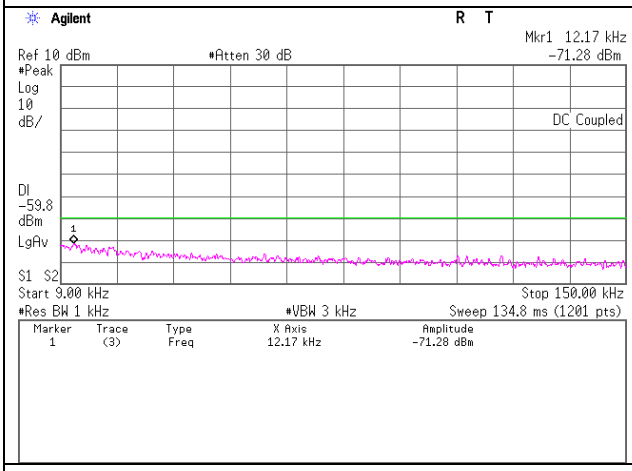


15GHz-20GHz

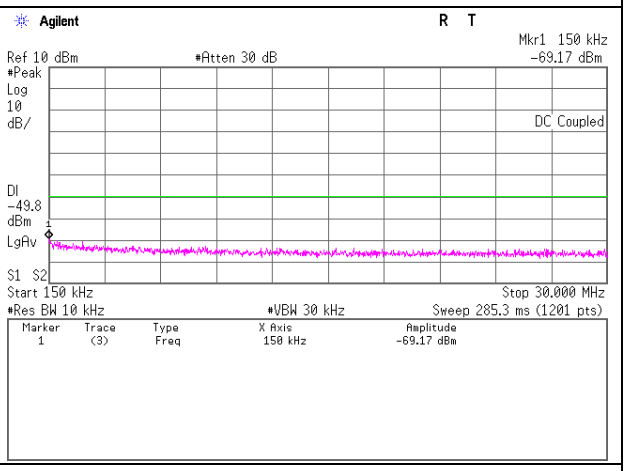


Spurious Emission (Conducted)
LTE Band II
Tx: 1880.0MHz

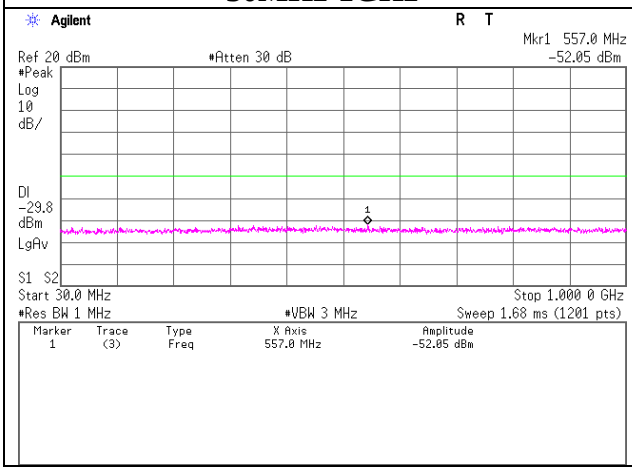
9kHz-150kHz



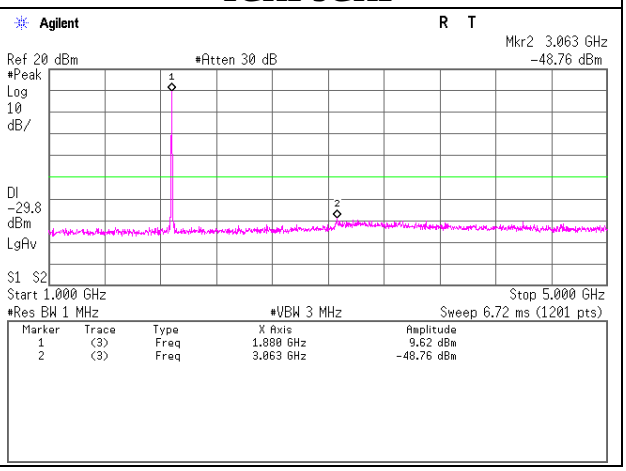
150kHz-30MHz



30MHz-1GHz

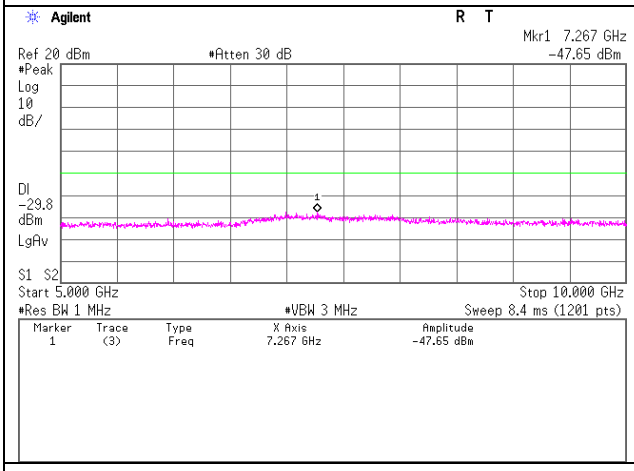


1GHz-5GHz

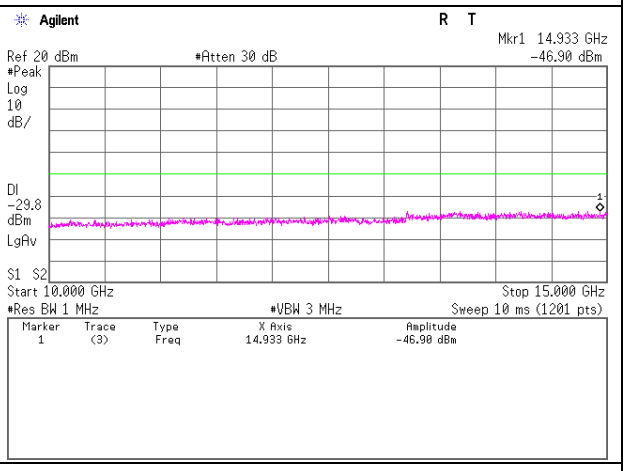


Spurious Emission (Conducted)
LTE Band II
Tx: 1880.0MHz

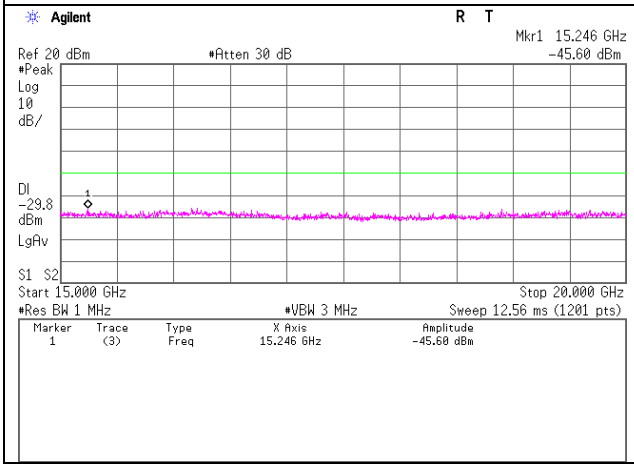
5GHz-10GHz



10GHz-15GHz

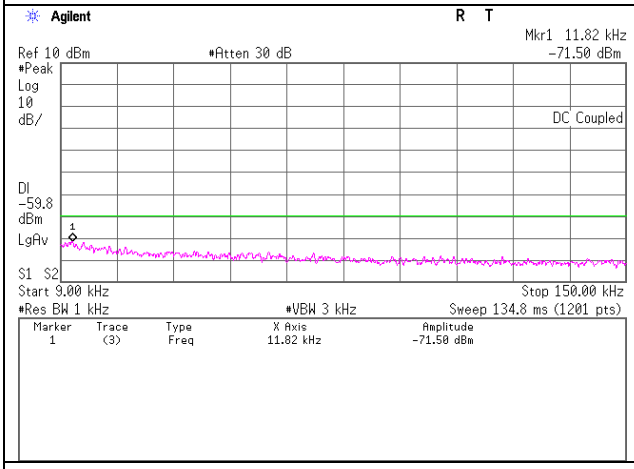


15GHz-20GHz

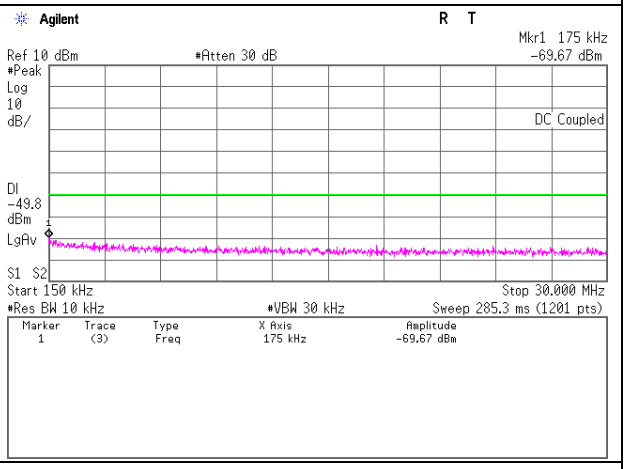


Spurious Emission (Conducted)
LTE Band II
Tx: 1908.5MHz

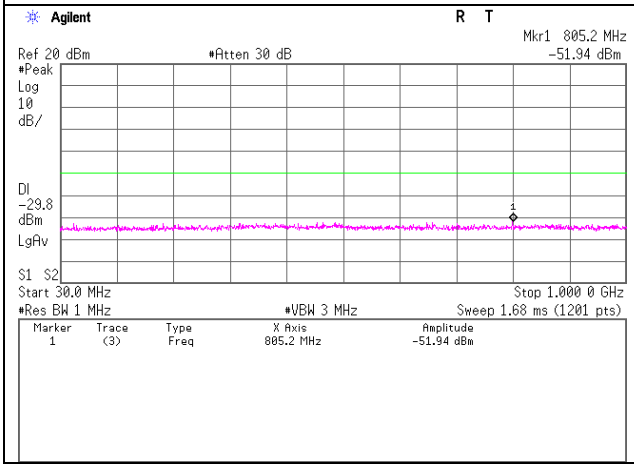
9kHz-150kHz



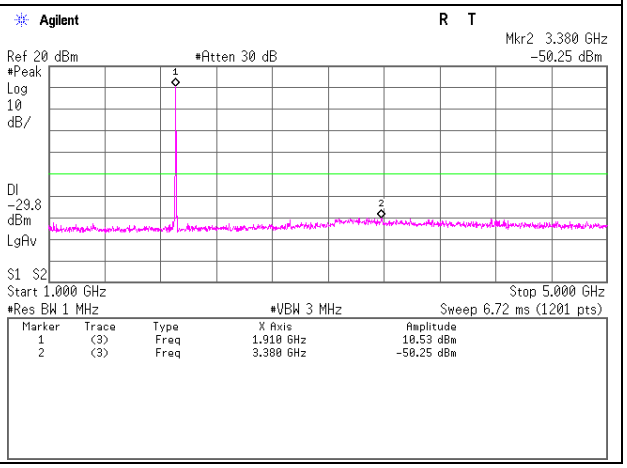
150kHz-30MHz



30MHz-1GHz

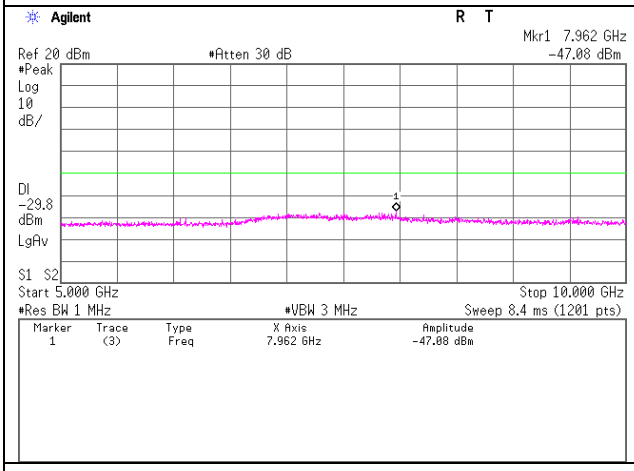


1GHz-5GHz

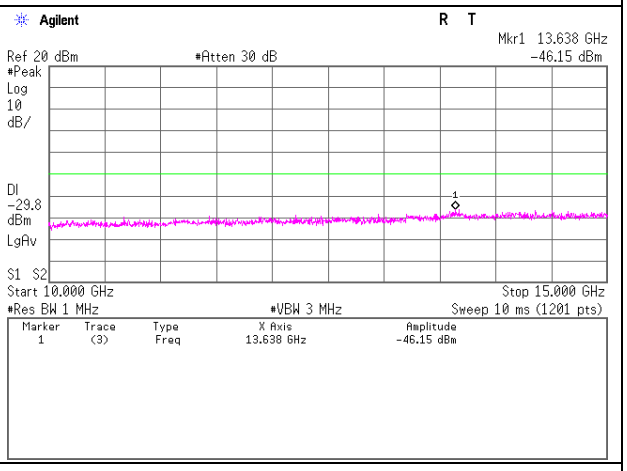


Spurious Emission (Conducted)
LTE Band II
Tx: 1908.5MHz

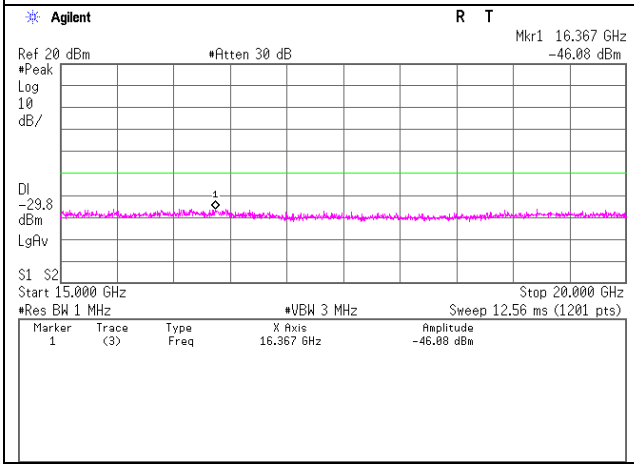
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



Spurious Emission (Radiated)

PCS1900

Report No.	10636726H	
Test place	Ise EMC Lab. No.3 and No.2 Semi Anechoic Chamber	
Date	01/20/2015	01/22/2015
Temperature / Humidity	24deg. C / 37% RH	23deg. C / 31% RH
Engineer	Satofumi Matsuyama	Keisuke Kawamura
Mode	Tx GSM(GMSK), 1slot, PCL=0	

Tx 1850.2MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP)	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER	[dBm]	HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
3700.40	62.0	59.2	-38.2	-42.1	5.1	12.0	0.0	-31.3	-35.2	-13.0	18.3	22.2	105	312	100	313	
9251.00	49.0	48.0	-44.1	-46.4	8.4	11.7	0.0	-40.8	-43.1	-13.0	27.8	30.1	169	0	103	14	
11101.20	57.6	53.2	-39.5	-45.2	9.3	10.8	0.0	-38.0	-43.7	-13.0	25.0	30.7	100	11	100	14	
12951.40	47.9	48.5	-54.0	-53.8	9.9	12.9	0.0	-51.0	-50.8	-13.0	38.0	37.8	100	26	100	353	
14801.60	48.0	48.7	-51.3	-50.1	10.9	13.3	0.0	-48.9	-47.7	-13.0	35.9	34.7	100	302	100	24	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK(RBW:1MHz/VBW:3MHz)
NS :Non Signal detect

Tx 1880MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP)	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER	[dBm]	HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
3760.00	60.3	62.0	-40.3	-39.1	5.2	12.1	0.0	-33.4	-32.2	-13.0	20.4	19.2	107	55	100	311	
7520.00	58.3	59.2	-34.3	-33.9	7.5	10.4	0.0	-31.4	-31.0	-13.0	18.4	18.0	100	296	100	341	
9400.00	46.7	46.4	-46.5	-47.0	8.5	11.4	0.0	-43.6	-44.1	-13.0	30.6	31.1	165	0	100	14	
11280.00	53.8	52.4	-44.1	-45.5	9.3	10.8	0.0	-42.6	-44.0	-13.0	29.6	31.0	100	9	100	10	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK(RBW:1MHz/VBW:3MHz)
NS :Non Signal detect

Tx 1909.8MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP)	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER	[dBm]	HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
3819.60	59.9	57.1	-39.8	-43.9	5.2	12.1	0.0	-32.9	-37.0	-13.0	19.9	24.0	100	58	100	312	
7639.20	58.0	59.1	-34.8	-34.3	7.5	10.6	0.0	-31.8	-31.3	-13.0	18.8	18.3	100	295	100	342	
11458.80	51.5	49.7	-46.0	-49.7	9.4	10.8	0.0	-44.6	-48.3	-13.0	31.6	35.3	100	8	100	9	
13368.60	49.5	48.0	-48.7	-53.2	10.2	12.5	0.0	-46.4	-50.9	-13.0	33.4	37.9	100	326	100	147	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK(RBW:1MHz/VBW:3MHz)
NS :Non Signal detect

Spurious Emission (Radiated)

PCS1900

Report No.	10636726H	
Test place	Ise EMC Lab. No.3 and No.2 Semi Anechoic Chamber	
Date	01/20/2015	01/22/2015
Temperature / Humidity	24deg. C / 37% RH	23deg. C / 31% RH
Engineer	Satofumi Matsuyama	Keisuke Kawamura
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=0	

Tx 1850.2MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP)	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER	[dBm]	HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
3700.40	62.4	59.6	-37.8	-41.7	5.1	12.0	0.0	-30.9	-34.8	-13.0	17.9	21.8	108	313	100	312	
9251.00	47.9	47.4	-45.1	-47.0	8.4	11.7	0.0	-41.8	-43.7	-13.0	28.8	30.7	161	0	109	11	
11101.20	57.8	53.2	-39.3	-45.2	9.3	10.8	0.0	-37.8	-43.7	-13.0	24.8	30.7	100	12	100	15	
14801.60	48.1	47.6	-51.2	-51.2	10.9	13.3	0.0	-48.8	-48.8	-13.0	35.8	35.8	100	302	100	26	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK(RBW:1MHz/VBW:3MHz)
NS :Non Signal detect

Tx 1880MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP)	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER	[dBm]	HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
3760.00	60.8	56.4	-39.8	-44.7	5.2	12.1	0.0	-32.9	-37.8	-13.0	19.9	24.8	106	56	100	309	
7520.00	57.7	59.0	-34.9	-34.1	7.5	10.4	0.0	-32.0	-31.2	-13.0	19.0	18.2	100	312	100	343	
11280.00	55.4	52.6	-42.5	-42.8	9.3	10.8	0.0	-41.0	-41.3	-13.0	28.0	28.3	100	7	100	11	
15040.00	49.1	48.5	-50.9	-51.0	11.0	13.7	0.0	-48.1	-48.2	-13.0	35.1	35.2	100	300	100	334	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK(RBW:1MHz/VBW:3MHz)
NS :Non Signal detect

Tx 1909.8MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP)	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER	[dBm]	HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
3819.60	59.7	59.1	-40.0	-41.9	5.2	12.1	0.0	-33.1	-35.0	-13.0	20.1	22.0	100	56	100	311	
7639.20	58.1	59.0	-34.7	-34.4	7.5	10.6	0.0	-31.7	-31.4	-13.0	18.7	18.4	100	293	100	342	
11458.80	50.5	49.5	-47.7	-51.7	9.4	10.8	0.0	-46.3	-50.3	-13.0	33.3	37.3	100	8	100	12	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK(RBW:1MHz/VBW:3MHz)
NS :Non Signal detect

Spurious Emission (Radiated)

W-CDMA Band II

Report No.	10636726H
Test place	Ise EMC Lab. No.3 and No.2 Semi Anechoic Chamber
Date	01/20/2015 01/22/2015
Temperature / Humidity	24deg. C / 38% RH 23deg. C / 31% RH
Engineer	Satofumi Matsuyama Keisuke Kawamura
Mode	Tx W-CDMA(RMC12.2kbps), All Up Bits

Tx: 1852.4MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
3704.80	51.2	49.1	-48.5	-52.3	5.1	12.0	0.0	-41.6	-45.4	-13.0	28.6	32.4	134	43	100	36	
11114.40	53.5	49.9	-43.5	-48.3	9.3	10.8	0.0	-42.0	-46.8	-13.0	29.0	33.8	100	2	100	353	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK(RBW:1MHz/VBW:3MHz)

Tx: 1880.0MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
3760.00	48.0	49.8	-52.6	-51.3	5.2	12.1	0.0	-45.7	-44.4	-13.0	32.7	31.4	100	344	100	7	
7520.00	53.9	52.9	-38.7	-40.2	7.5	10.4	0.0	-35.8	-37.3	-13.0	22.8	24.3	100	326	100	337	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK(RBW:1MHz/VBW:3MHz)

Tx: 1907.6MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (EIRP) [dBm]		Limit (EIRP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
3815.20	48.8	45.1	-50.9	-55.9	5.2	12.1	0.0	-44.0	-49.0	-13.0	31.0	36.0	100	57	121	171	
7630.40	51.5	52.0	-40.9	-40.7	7.5	10.5	0.0	-37.9	-37.7	-13.0	24.9	24.7	100	323	100	142	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-40GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-40GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK(RBW:1MHz/VBW:3MHz)

Spurious Emission (Radiated)

LTE Band II

Report No.	10636726H	
Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber	
Date	01/27/2015	01/28/2015
Temperature / Humidity	23 deg. C / 35 % RH	22 deg. C / 31 % RH
	Above 1GHz	Below 1GHz
Engineer	Tsubasa Takayama	Tsubasa Takayama
Mode	Tx LTE(QPSK) Band II, BW 3MHz	

Tx : 1851.5MHz (RB1-14)

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.]	
3703.00	58.7	62.0	-48.4	-44.5	5.1	12.0	0.0	-43.6	-39.7	-13.0	30.6	26.7	110	192	100	188	
5554.50	59.6	58.3	-40.4	-44.0	6.3	12.4	0.0	-36.4	-40.0	-13.0	23.4	27.0	100	17	109	231	
7406.00	59.1	61.5	-33.8	-30.9	7.4	10.6	0.0	-32.7	-29.8	-13.0	19.7	16.8	103	122	115	123	
9257.50	47.7	48.3	-46.2	-45.9	8.4	11.7	0.0	-45.1	-44.8	-13.0	32.1	31.8	100	324	102	172	
11109.00	54.1	57.1	-40.9	-39.2	9.3	10.8	0.0	-41.5	-39.8	-13.0	28.5	26.8	100	86	100	182	
12960.50	59.3	62.1	-33.1	-31.4	9.9	12.9	0.0	-32.3	-30.6	-13.0	19.3	17.6	100	82	100	211	
14812.00	52.6	60.9	-42.0	-28.8	10.9	13.3	0.0	-41.8	-28.6	-13.0	28.8	15.6	100	102	100	182	
16663.50	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
18515.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Tx : 1880.0MHz (RB1-14)

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.]	
3760.00	54.6	57.4	-52.2	-49.2	5.2	12.1	0.0	-47.5	-44.5	-13.0	34.5	31.5	102	251	100	271	
5640.00	62.4	60.0	-37.2	-42.6	6.4	12.5	0.0	-33.3	-38.7	-13.0	20.3	25.7	110	122	102	196	
7520.00	62.5	61.9	-30.6	-30.4	7.5	10.4	0.0	-29.8	-29.6	-13.0	16.8	16.6	101	34	124	182	
9400.00	47.0	47.4	-46.9	-46.2	8.5	11.4	0.0	-46.1	-45.4	-13.0	33.1	32.4	100	35	102	167	
11280.00	54.8	54.1	-40.3	-40.0	9.3	10.8	0.0	-41.0	-40.7	-13.0	28.0	27.7	100	91	100	189	
13160.00	54.3	58.7	-37.8	-34.1	10.0	12.7	0.0	-37.3	-33.6	-13.0	24.3	20.6	100	85	100	198	
15040.00	45.6	49.8	-47.8	-39.7	11.0	13.7	0.0	-47.2	-39.1	-13.0	34.2	26.1	100	0	100	182	
16920.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
18800.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Tx : 1908.5MHz (RB1-14)

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.]	
3817.00	56.3	58.5	-50.2	-48.1	5.2	12.1	0.0	-45.5	-43.4	-13.0	32.5	30.4	102	242	100	281	
5725.50	66.4	62.5	-34.5	-40.3	6.5	12.5	0.0	-30.6	-36.4	-13.0	17.6	23.4	100	12	100	21	
7634.00	55.4	55.9	-37.3	-35.8	7.5	10.5	0.0	-36.4	-34.9	-13.0	23.4	21.9	101	23	105	172	
9542.50	48.9	49.8	-44.6	-44.1	8.5	11.2	0.0	-44.1	-43.6	-13.0	31.1	30.6	100	14	101	182	
11451.00	52.9	51.2	-42.3	-43.3	9.4	10.8	0.0	-43.1	-44.1	-13.0	30.1	31.1	100	92	100	182	
13359.50	62.9	61.9	-30.5	-32.6	10.2	12.5	0.0	-30.4	-32.5	-13.0	17.4	19.5	100	88	100	182	
15268.00	49.8	52.3	-42.6	-38.9	11.1	14.4	0.0	-41.4	-37.7	-13.0	28.4	24.7	100	0	100	174	
17176.50	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
19085.00	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-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).
NS : No signal detect.
Detector : S/A PK(RBW:1MHz/VBW:3MHz)

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

Frequency Stability (Temperature/Voltage Variation)

PCS1900 / Tx: 1880.0MHz

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/09/2015
Temperature/ Humidity	19 deg. C / 51% RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK), 1slot, PCL=5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30	3.80	1880.0000605	14.4	0.0076	2.5
-20	3.80	1880.0000664	20.3	0.0108	2.5
-10	3.80	1880.0000589	12.7	0.0068	2.5
0	3.80	1880.0000579	11.8	0.0062	2.5
10	3.80	1880.0000181	-28.1	-0.0149	2.5
20	3.80	1880.0000462	0.0	0.0000	Reference
30	3.80	1880.0000587	12.5	0.0066	2.5
40	3.80	1880.0000577	11.5	0.0061	2.5
50	3.80	1880.0000578	11.6	0.0062	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	4.20	1880.0000450	-1.1	-0.0006	2.5
20	3.80	1880.0000462	0.0	0.0000	Reference
20	3.00	1880.0000541	7.9	0.0042	2.5

Frequency Stability (Temperature/Voltage Variation)

PCS1900 / Tx: 1880.0MHz

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/09/2015
Temperature/ Humidity	19 deg. C / 51% RH
Engineer	Yutaka Yoshida
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30	3.80	1880.0000566	-5.6	-0.0030	2.5
-20	3.80	1880.0000183	-43.9	-0.0234	2.5
-10	3.80	1880.0000163	-45.9	-0.0244	2.5
0	3.80	1880.0000190	-43.3	-0.0230	2.5
10	3.80	1880.0000171	-45.1	-0.0240	2.5
20	3.80	1880.0000622	0.0	0.0000	Reference
30	3.80	1880.0000170	-45.2	-0.0240	2.5
40	3.80	1880.0000587	-3.5	-0.0019	2.5
50	3.80	1880.0000592	-3.0	-0.0016	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	4.20	1880.0000555	-6.7	-0.0036	2.5
20	3.80	1880.0000622	0.0	0.0000	Reference
20	3.00	1880.0000632	1.0	0.0005	2.5

Frequency Stability (Temperature/Voltage Variation)

W-CDMA Band II / Tx: 1880.0MHz

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/09/2015
Temperature/ Humidity	19 deg. C / 51% RH
Engineer	Yutaka Yoshida
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	3.80	1880.0000028	-0.9	-0.0005	2.5
-20	3.80	1880.0000020	-1.7	-0.0009	2.5
-10	3.80	1880.0000032	-0.5	-0.0003	2.5
0	3.80	1880.0000021	-1.6	-0.0009	2.5
10	3.80	1880.0000027	-1.1	-0.0006	2.5
20	3.80	1880.0000037	0.0	0.0000	Reference
30	3.80	1880.0000024	-1.3	-0.0007	2.5
40	3.80	1880.0000021	-1.6	-0.0008	2.5
50	3.80	1880.0000017	-2.0	-0.0011	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	4.20	1880.0000020	-1.7	-0.0009	2.5
20	3.80	1880.0000037	0.0	0.0000	Reference
20	3.00	1880.0000035	-0.3	-0.0001	2.5

Frequency Stability (Temperature/Voltage Variation)

LTE Band II / Tx: 1880.0MHz

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/09/2015
Temperature/ Humidity	19 deg. C / 51% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 20MHz

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30	3.80	1880.0000011	-0.6	-0.0003	2.5
-20	3.80	1880.0000036	1.8	0.0010	2.5
-10	3.80	1880.0000013	-0.4	-0.0002	2.5
0	3.80	1880.0000018	0.0	0.0000	2.5
10	3.80	1880.0000018	0.1	0.0000	2.5
20	3.80	1880.0000017	0.0	0.0000	Reference
30	3.80	1880.0000010	-0.8	-0.0004	2.5
40	3.80	1880.0000011	-0.6	-0.0003	2.5
50	3.80	1880.0000010	-0.7	-0.0004	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	4.20	1880.0000002	-1.5	-0.0008	2.5
20	3.80	1880.0000017	0.0	0.0000	Reference
20	3.00	1880.0000016	-0.2	-0.0001	2.5

Frequency Stability (Temperature/Voltage Variation)

LTE Band II / Tx: 1880.0MHz

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	02/09/2015
Temperature/ Humidity	19 deg. C / 51% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(16QAM), BW 20MHz

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30	3.80	1880.0000005	-0.3	-0.0001	2.5
-20	3.80	1880.0000023	1.6	0.0008	2.5
-10	3.80	1880.0000022	1.4	0.0007	2.5
0	3.80	1880.0000027	1.9	0.0010	2.5
10	3.80	1880.0000016	0.9	0.0005	2.5
20	3.80	1880.0000008	0.0	0.0000	Reference
30	3.80	1880.0000024	1.6	0.0008	2.5
40	3.80	1880.0000011	0.3	0.0002	2.5
50	3.80	1880.0000007	-0.1	-0.0001	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	4.20	1880.0000009	0.2	0.0001	2.5
20	3.80	1880.0000008	0.0	0.0000	Reference
20	3.00	1880.0000002	-0.5	-0.0003	2.5

APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2014/02/27 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2015/01/13 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2014/11/12 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2014/05/26 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2014/05/26 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2014/03/24 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2014/05/26 * 12
MRF-02	Band Rejection Filter(1850-1910MHz)	TOKYO KEIKI	1850-1910MHz	-	RE	2014/10/02 * 12
MCC-79	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278923/4	RE	2014/12/15 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2014/06/25 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2015/01/13 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2014/10/18 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2014/10/18 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2014/02/20 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2014/11/11 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2014/09/26 * 12
MRENT-116	Spectrum Analyzer	Agilent	E4440A	MY46187620	RE	2014/03/05 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2014/02/21 * 12
MCC-166	Microwave Cable	Junkosha	MWX221	1303S120(1m) / 1311S167(5m)	RE	2014/09/24 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2015/01/28 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2014/05/21 * 12
MRF-02	Band Rejection Filter(1850-1910MHz)	TOKYO KEIKI	1850-1910MHz	-	RE	2014/10/02 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE(MW)	2014/02/21 * 12
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2014/07/23 * 12
MCC-130	Microwave Cable(1-30GHz)	HUBER+SUHNER	SF103/11PC3.5-31/11PC3.5-31/8.0m	54308/3	RE	2015/01/07 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2014/08/12 * 12
MURC-05	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	127576	AT	2014/11/25 * 12
MPD-03	Power Divider DC-12.4GHz	SUHNER	4901.19.A	-	AT	2014/05/14 * 12
MCC-93	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	30814/2	AT	2014/05/14 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	1401	AT	2015/01/13 * 12
MAT-25	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71642	AT	2014/06/12 * 12
MCC-144	Microwave Cable	Junkosha	MWX221	1207S407	AT	2014/08/08 * 12
MSA-16	Spectrum Analyzer	Agilent	E4440A	MY46186390	AT	2014/02/28 * 12
MPM-16	Power Meter	Agilent	8990B	MY51000271	AT	2014/04/04 * 12
MPSE-22	Power sensor	Agilent	N1923A	MY54070003	AT	2014/04/04 * 12
MCH-04	Temperature and Humidity Chamber	Tabai Espec	PL-2KP	14015723	AT	2014/08/06 * 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