RADIO TEST REPORT

Test Report No. : 10636726H-D-R2

Applicant	:	**Panasonic Mobile Communications Development of Europe Ltd**
Type of Equipment	:	**Digital Camera**
Model No.	:	**DMC-CM1**
Test regulation	:	**FCC Part 22 Subpart H: 2014**
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 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-D-R1. 10636726H-D-R1 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

REVISION HISTORY

Original Test Report No.: 10636726H-D

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10636726H-D	February 20, 2015	-	-
1	10636726H-D-R1	March 5, 2015	P.4	Correction of rating
2	10636726H-D-R2	March 17, 2014	P.35, 36	Addition of LTE PAPR Worst Mode RB configurations 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

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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 (GSM850), W-CDMA (Band V), and LTE (Band V).

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 22 Subpart H: 2014, final revised on December 5, 2014
Title : FCC 47CFR Part 22 Subpart H
Cellular Radiotelephone Service

3.2 Procedures and results

Item	Test Specification & Procedure	Remarks	Deviation	Worst margin	Results
RF Output Power(Conducted/ Radiated) (Conducted Output Power / Effective radiated power(ERP))	FCC 2.1046 FCC 22.913(a)(2)	Conducted/ Radiated	N/A	-	Complied
Emission Bandwidth, 99% Occupied Bandwidth	FCC 2.1049 FCC 22.917	Conducted	N/A	-	Complied
Band-Edge	FCC 2.1051 FCC 2.1053 FCC 22.917	Conducted/ Radiated	N/A	**GSM** [Conducted] 4.94dB 849.0176MHz [Radiated] 3.2dB 823.99MHz, Vertical **W-CDMA** [Conducted] 19.29dB 849.000MHz [Radiated] 4.8dB 849.07MHz, Vertical **LTE** [Conducted] 8.75dB 849.0000MHz [Radiated] 11.1dB 824.00MHz, Vertical	Complied
Spurious Emission(Conducted)	FCC 2.1051 FCC 22.917	Conducted	N/A	-	Complied
Spurious Emission(Radiated)	FCC 2.1053 FCC 22.917	Radiated	N/A	**GSM** 23.3dB 2509.80MHz, Horizontal **W-CDMA** 27.1dB 1673.20MHz, Vertical **LTE** 27.0dB 1688.00MHz, Horizontal	Complied
Frequency Stability (Temperature Variation)	FCC 2.1055(a)(1)(b) FCC 22.355	Conducted	N/A	-	Complied
Frequency Stability (Voltage Variation)	FCC 2.1055(d)(1)(2) FCC 22.355	Conducted	N/A	-	Complied
Note: UL Japan's EMI Work Procedures No. 13-EM-W0420					

*These tests were also referred to ANSI/TIA 603-C-2004 " Land Mobile FM or PM Communications Equipment Measurement and Performance Standards."
*These tests were 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

<GSM850>

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=5)	824.2MHz 836.6MHz 848.8MHz	128 190 251
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=5)	824.2MHz 836.6MHz 848.8MHz	128 190 251
Bandwidth (Conducted), Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) (GSM, GMSK, 1slot) Transmitting (Tx) (EGPRS, 8PSK, 1slot, MCS-5)	Max (PCL=5)	836.6MHz	190
Band-Edge (Conducted/Radiated)	Transmitting (Tx) (GSM, GMSK, 1slot) Transmitting (Tx) (EGPRS, 8PSK, 1slot, MCS-5)	Max (PCL=5)	824.2MHz 848.8MHz	128 251

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

<W-CDMA Band V>

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	826.4MHz 836.6MHz 846.6MHz	4132 4183 4233
RF output Power (Radiated), Spurious Emission (Conducted/Radiated), Peak to Average power Ratio (Conducted)	Transmitting (Tx) W-CDMA (RMC12.2kbps) *1)	TPC all up bits(MAX)	826.4MHz 836.6MHz 846.6MHz	4132 4183 4233
Bandwidth (Conducted)	Transmitting (Tx) W-CDMA (RMC12.2kbps) *1)	TPC all up bits(MAX)	836.6MHz	4183
Band-Edge (Conducted/Radiated)	Transmitting (Tx) W-CDMA (RMC12.2kbps) *1)	TPC all up bits(MAX)	826.4MHz 846.6MHz	4132 4233
Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) W-CDMA (RMC12.2kbps) *1)	TPC all up bits(MAX)	836.6MHz	4183

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

<LTE Band V> 1/2

Test	Modulation	Bandwidth	UL RB Config.	Power Control	Tested frequency[MHz]	Uplink Channel	
RF Output Power (Conducted)	QPSK 16QAM	10MHz	1/0	TPC All 1(MAX)	829.0	20450	Low
			1/24		836.5	20525	Mid
			1/49		844.0	20600	High
			25/0				
			25/12				
			25/24				
			50/0				
		5MHz	1/0	TPC All 1(MAX)	826.5	20425	Low
			1/12		836.5	20525	Mid
			1/24		846.5	20625	High
			12/0				
			12/6				
			12/11				
			25/0				
		3MHz	1/0	TPC All 1(MAX)	825.5	20415	Low
			1/7		836.6	20525	Mid
			1/14		847.5	20635	High
			8/0				
			8/4				
			8/7				
			15/0				
		1.4MHz	1/0	TPC All 1(MAX)	824.7	20407	Low
			1/2		836.5	20525	Mid
			1/5		848.3	20643	High
			3/0				
			3/1				
			3/3				
			6/0				
RF Output Power(Radiated) (Effective Radiated Power)	QPSK	10MHz	1/0 *1)	TPC All 1(MAX)	829.0	20450	Low
			1/24 *1)	TPC All 1(MAX)	836.5	20525	Mid
			1/49 *1)	TPC All 1(MAX)	844.0	20600	High
		5MHz	1/0 *1)	TPC All 1(MAX)	826.5	20425	Low
			1/24 *1)	TPC All 1(MAX)	836.5	20525	Mid
			1/24 *1)	TPC All 1(MAX)	846.5	20625	High
		3MHz	1/0 *1)	TPC All 1(MAX)	825.5	20415	Low
			1/14 *1)	TPC All 1(MAX)	836.6	20525	Mid
			1/14 *1)	TPC All 1(MAX)	847.5	20635	High
		1.4MHz	3/0 *1)	TPC All 1(MAX)	824.7	20407	Low
			3/3 *1)	TPC All 1(MAX)	836.5	20525	Mid
			1/0 *1)	TPC All 1(MAX)	848.3	20643	High
	16QAM	10MHz	1/0 *1)	TPC All 1(MAX)	829.0	20450	Low
			1/49 *1)	TPC All 1(MAX)	836.5	20525	Mid
			1/49 *1)	TPC All 1(MAX)	844.0	20600	High
		5MHz	1/0 *1)	TPC All 1(MAX)	826.5	20425	Low
			1/24 *1)	TPC All 1(MAX)	836.5	20525	Mid
			1/24 *1)	TPC All 1(MAX)	846.5	20625	High
		3MHz	1/0 *1)	TPC All 1(MAX)	825.5	20415	Low
			1/0 *1)	TPC All 1(MAX)	836.6	20525	Mid
			1/0 *1)	TPC All 1(MAX)	847.5	20635	High
		1.4MHz	1/0 *1)	TPC All 1(MAX)	824.7	20407	Low
			1/0 *1)	TPC All 1(MAX)	836.5	20525	Mid
			1/0 *1)	TPC All 1(MAX)	848.3	20643	High

<LTE Band V> 2/2

Test	Modulation	Bandwidth	UL RB Config.	Power Control	Tested frequency[MHz]	Uplink Channel	
Peak to Average Power Ratio(Conducted)	QPSK 16QAM	10MHz	50/0	TPC All 1(MAX)	829.0	20450	Low
					836.5	20525	Mid
					844.0	20600	High
		5MHz	25/0	TPC All 1(MAX)	826.5	20425	Low
					836.5	20525	Mid
					846.5	20625	High
		3MHz	15/0	TPC All 1(MAX)	825.5	20415	Low
					836.6	20525	Mid
					847.5	20635	High
		1.4MHz	6/0	TPC All 1(MAX)	824.7	20407	Low
					836.5	20525	Mid
					848.3	20643	High
Bandwidth(Conducted)	QPSK 16QAM	10MHz	50/0	TPC All 1(MAX)	836.5	20525	Mid
		5MHz	25/0				
		3MHz	15/0				
		1.4MHz	6/0				
Band Edge(Conducted)	QPSK 16QAM	10MHz	50/0	TPC All 1(MAX)	829.0	20450	Low
			50/0	TPC All 1(MAX)	844.0	20600	High
			1/0	TPC All 1(MAX)	829.0	20450	Low
			1/49	TPC All 1(MAX)	844.0	20600	High
		5MHz	25/0	TPC All 1(MAX)	826.5	20425	Low
			25/0	TPC All 1(MAX)	846.5	20625	High
			1/0	TPC All 1(MAX)	826.5	20425	Low
			1/24	TPC All 1(MAX)	846.5	20625	High
		3MHz	15/0	TPC All 1(MAX)	825.5	20415	Low
			15/0	TPC All 1(MAX)	847.5	20635	High
			1/0	TPC All 1(MAX)	825.5	20415	Low
			1/14	TPC All 1(MAX)	847.5	20635	High
		1.4MHz	6/0	TPC All 1(MAX)	824.7	20407	Low
			6/0	TPC All 1(MAX)	848.3	20643	High
			1/0	TPC All 1(MAX)	824.7	20407	Low
			1/5	TPC All 1(MAX)	848.3	20643	High
Band Edge(Radiated)	QPSK 16QAM	3MHz *2)	15/0	TPC All 1(MAX)	825.5	20415	Low
			15/0	TPC All 1(MAX)	847.5	20635	High
			1/0	TPC All 1(MAX)	825.5	20415	Low
			1/14	TPC All 1(MAX)	847.5	20635	High
Spurious Emission(Conducted) Spurious Emission(Radiated)	QPSK	10MHz *4)	1/0 *1)	TPC All 1(MAX)	829.0	20450	Low
			1/24 *1)	TPC All 1(MAX)	836.5	20525	Mid
			1/49 *1)	TPC All 1(MAX)	844.0	20600	High
Frequency Stability (Temperature/ Voltage Variation)	QPSK 16QAM	10MHz *3)	50/0	TPC All 1(MAX)	836.5	20525	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:3MHz 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 $\beta_{hs} = 30/15 * \beta_c$.

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

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	Processes	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.		

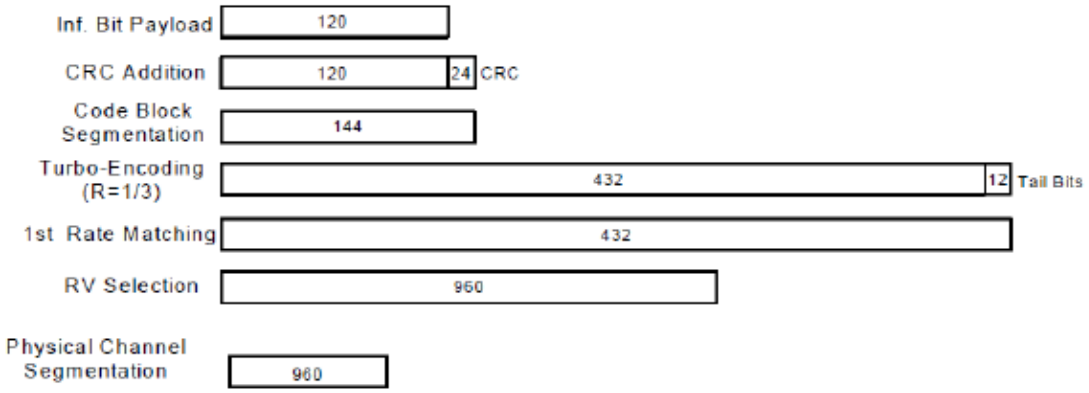


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

[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]

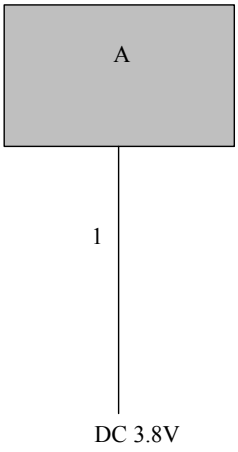
Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	5 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	67
- Reference E-TFCI PO	18
- Reference E-TFCI	71
- Reference E-TFCI PO	23
- Reference E-TFCI	75
- Reference E-TFCI PO	26
- Reference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

[Subtest 3]

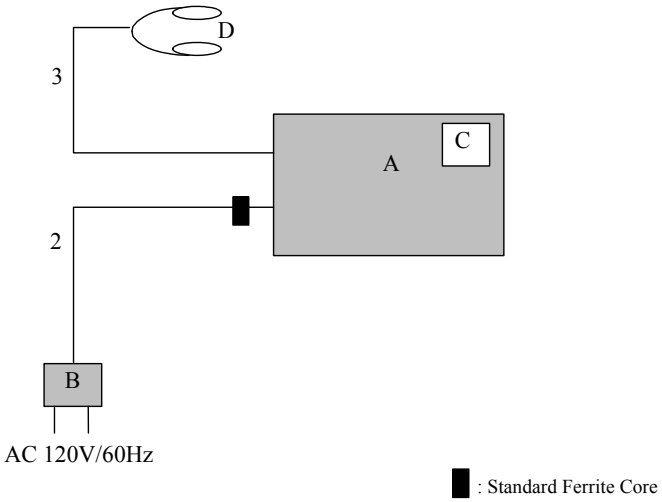
Information Element	Value/Remark
E-DCH info	Uplink DPCH info
- E-DPDCH info	
- Reference E-TFCIs	2 E-TFCIs
- Reference E-TFCI	11
- Reference E-TFCI PO	4
- Reference E-TFCI	92
- Reference E-TFCI PO	18

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: Effective radiated power(ERP)]

Test Procedure

1) EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5m, 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 antenna was set for the same height as EUT on the table.
The frequency below 1GHz of the Substitution Antenna was used as the Half wave dipole Antenna, which is harmonized with the measured frequency in 1).
The Substitution Antenna was connected with the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field is equal to the measured value in 1).
The measuring antenna height varied between 1 and 4m to obtain the maximum receiving level.
Its Output power of Signal Generator was recorded.

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

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

Test data : APPENDIX 1
Test result : Pass

SECTION 6: Bandwidth (Conducted)

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

Test data : APPENDIX 1
Test result : Pass

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

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

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

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

3) Effective radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).
For the usage of the antenna (Shorted dipole and Horn antenna) except for the Half wave dipole antenna (2.15dBi) for the Substitution antenna, the Effective radiated power was calculated by compensating the finite difference in the antenna gain of the Half wave dipole antenna, and Substitution antenna.

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

Test data : APPENDIX 1
Test result : Pass

SECTION 8: Frequency Stability(Temperature/Voltage Variation)

Test Procedure

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

The Frequency Drift was measured with the 10 deg. C. steps from –30 deg. C. to 50 deg. C., and it is presented as the ppm unit. The Frequency Drift was measured with the normal temperature (20 deg. C.) and Voltage tolerance (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
GSM850

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=5
	Tx GPRS(GMSK), 1slot, CS-1, PCL=5
	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=5

Mode	Ch	Frequency [MHz]	Reading Average Burst Power [dBm]	Cable Loss [dB]	Result [dBm]
GSM	128	824.2	26.74	6.32	33.06
	190	836.6	26.57	6.32	32.89
	251	848.8	26.38	6.32	32.70
GPRS	128	824.2	26.74	6.32	33.06
	190	836.6	26.56	6.32	32.88
	251	848.8	26.37	6.32	32.69
EGPRS	128	824.2	22.81	6.32	29.13
	190	836.6	22.62	6.32	28.94
	251	848.8	22.34	6.32	28.66

Results = Reading + Cable Loss

RF Output Power (Conducted)

Conducted Output Power
W-CDMA Band V

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 AV [dBm]
RMC 12.2kbps	Low	826.4	23.78
	Mid	836.6	23.65
	High	846.6	23.66
HSDPA Subtest 1	Low	826.4	22.81
	Mid	836.6	22.74
	High	846.6	22.64
HSDPA Subtest 2	Low	826.4	22.80
	Mid	836.6	22.73
	High	846.6	22.63
HSDPA Subtest 3	Low	826.4	22.30
	Mid	836.6	22.24
	High	846.6	22.14
HSDPA Subtest 4	Low	826.4	22.30
	Mid	836.6	22.24
	High	846.6	22.13
DC-HSDPA Subtest 1	Low	826.4	22.76
	Mid	836.6	22.71
	High	846.6	22.64
DC-HSDPA Subtest 2	Low	826.4	22.85
	Mid	836.6	22.77
	High	846.6	22.72
DC-HSDPA Subtest 3	Low	826.4	22.30
	Mid	836.6	22.26
	High	846.6	22.22
DC-HSDPA Subtest 4	Low	826.4	22.30
	Mid	836.6	22.26
	High	846.6	22.22
HSUPA Subtest 1	Low	826.4	22.65
	Mid	836.6	22.45
	High	846.6	22.27
HSUPA Subtest 2	Low	826.4	21.13
	Mid	836.6	21.11
	High	846.6	21.04
HSUPA Subtest 3	Low	826.4	21.35
	Mid	836.6	21.33
	High	846.6	21.27
HSUPA Subtest 4	Low	826.4	22.26
	Mid	836.6	21.44
	High	846.6	21.36
HSUPA Subtest 5	Low	826.4	22.77
	Mid	836.6	22.75
	High	846.6	22.63
HSPA+ (16QAM) Subtest 1	Low	826.4	20.84
	Mid	836.6	20.88
	High	846.6	20.84

*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 V

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/15/2015
Temperature/ Humidity	23deg.C / 46% 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	20450	829	QPSK	1	0	0	0	22.91
				1	24	0	0	22.74
				1	49	0	0	22.69
				25	0	1	1	21.69
				25	12	1	1	21.68
				25	24	1	1	21.65
				50	0	1	1	21.68
			16QAM	1	0	1	1	21.68
				1	24	1	1	21.48
				1	49	1	2	21.41
				25	0	2	2	20.74
				25	12	2	2	20.72
				25	24	2	2	20.70
				50	0	2	2	20.70
	20525	836.5	QPSK	1	0	0	0	22.62
				1	24	0	0	22.83
				1	49	0	0	22.74
				25	0	1	1	21.66
				25	12	1	1	21.65
				25	24	1	1	21.65
				50	0	1	1	21.64
			16QAM	1	0	1	1	21.39
				1	24	1	1	21.47
				1	49	1	1	21.53
				25	0	2	2	20.69
				25	12	2	2	20.63
				25	24	2	2	20.70
				50	0	2	2	20.64
	20600	844	QPSK	1	0	0	0	22.66
				1	24	0	0	22.70
				1	49	0	0	22.75
				25	0	1	1	21.61
				25	12	1	1	21.63
				25	24	1	1	21.65
				50	0	1	1	21.65
			16QAM	1	0	1	1	21.40
				1	24	1	1	21.39
				1	49	1	1	21.48
				25	0	2	2	20.64
				25	12	2	2	20.67
				25	24	2	2	20.70
				50	0	2	2	20.68

RF Output Power (Conducted)

Conducted Output Power
LTE Band V

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/15/2015
Temperature/ Humidity	23deg.C / 46% 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	20425	826.5	QPSK	1	0	0	0	22.84
				1	12	0	0	22.67
				1	24	0	0	22.73
				12	0	1	1	21.76
				12	6	1	1	21.72
				12	11	1	1	21.72
				25	0	1	1	21.72
			16QAM	1	0	1	1	21.56
				1	12	1	1	21.49
				1	24	1	1	21.51
				12	0	2	2	20.77
				12	6	2	2	20.77
				12	11	2	2	20.78
				25	0	2	2	20.79
	20525	836.5	QPSK	1	0	0	0	22.58
				1	12	0	0	22.62
				1	24	0	0	22.72
				12	0	1	1	21.61
				12	6	1	1	21.64
				12	11	1	1	21.60
				25	0	1	1	21.60
			16QAM	1	0	1	2	21.34
				1	12	1	1	21.43
				1	24	1	1	21.48
				12	0	2	2	20.70
				12	6	2	2	20.69
				12	11	2	2	20.67
				25	0	2	2	20.86
	20625	846.5	QPSK	1	0	0	0	22.65
				1	12	0	0	22.66
				1	24	0	0	22.71
				12	0	1	1	21.58
				12	6	1	1	21.58
				12	11	1	1	21.65
				25	0	1	1	21.63
			16QAM	1	0	1	1	21.42
				1	12	1	1	21.39
				1	24	1	1	21.47
				12	0	2	2	20.68
				12	6	2	2	20.71
				12	11	2	2	20.72
				25	0	2	2	20.74

RF Output Power (Conducted)

Conducted Output Power
LTE Band V

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/15/2015
Temperature/ Humidity	23deg.C / 46% 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	20415	825.5	QPSK	1	0	0	0	22.90
				1	7	0	0	22.76
				1	14	0	0	22.80
				8	0	1	1	21.65
				8	4	1	1	21.65
				8	7	1	1	21.70
				15	0	1	1	21.75
			16QAM	1	0	1	1	21.67
				1	7	1	1	21.52
				1	14	1	1	21.55
				8	0	2	2	20.74
				8	4	2	2	20.75
				8	7	2	2	20.78
				15	0	2	2	20.78
	20525	836.5	QPSK	1	0	0	0	22.74
				1	7	0	0	22.71
				1	14	0	0	22.76
				8	0	1	1	21.65
				8	4	1	1	21.65
				8	7	1	1	21.63
				15	0	1	1	21.63
			16QAM	1	0	1	1	21.53
				1	7	1	1	21.47
				1	14	1	1	21.48
				8	0	2	2	20.73
				8	4	2	2	20.67
				8	7	2	2	20.67
				15	0	2	2	20.70
	20635	847.5	QPSK	1	0	0	0	22.69
				1	7	0	0	22.69
				1	14	0	0	22.73
				8	0	1	1	21.66
				8	4	1	1	21.64
				8	7	1	1	21.63
				15	0	1	1	21.60
			16QAM	1	0	1	1	21.47
				1	7	1	1	21.42
				1	14	1	1	21.46
				8	0	2	2	20.67
				8	4	2	2	20.66
				8	7	2	2	20.70
				15	0	2	2	20.71

RF Output Power (Conducted)

Conducted Output Power
LTE Band V

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/15/2015
Temperature/ Humidity	23deg.C / 46% 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	20407	824.7	QPSK	1	0	0	0	22.83
				1	2	0	0	22.79
				1	5	0	0	22.79
				3	0	0	0	22.88
				3	1	0	0	22.85
				3	3	0	0	22.75
				6	0	1	1	21.80
			16QAM	1	0	1	1	21.93
				1	2	1	1	21.84
				1	5	1	1	21.77
				3	0	1	1	21.82
				3	1	1	1	21.77
				3	3	1	1	21.63
				6	0	2	2	20.86
	20525	836.5	QPSK	1	0	0	0	22.68
				1	2	0	0	22.61
				1	5	0	0	22.68
				3	0	0	0	22.59
				3	1	0	0	22.62
				3	3	0	0	22.69
				6	0	1	1	21.71
			16QAM	1	0	1	1	21.67
				1	2	1	1	21.63
				1	5	1	1	21.66
				3	0	1	1	21.58
				3	1	1	1	21.57
				3	3	1	1	21.58
				6	0	2	2	20.75
	20643	848.3	QPSK	1	0	0	0	22.65
				1	2	0	0	22.58
				1	5	0	0	22.62
				3	0	0	0	22.60
				3	1	0	0	22.64
				3	3	0	0	22.63
				6	0	1	1	21.63
			16QAM	1	0	1	1	21.70
				1	2	1	1	21.64
				1	5	1	1	21.68
				3	0	1	1	21.55
				3	1	1	1	21.56
				3	3	1	1	21.55
				6	0	2	2	20.73

RF Output Power (Radiated)

Effective radiated power(ERP)
GSM850

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	01/20/2015
Temperature / Humidity	23 deg. C /35% RH
Engineer	Takumi Shimada
Mode	Tx GSM(GMSK) 1slot, PCL=5

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
824.20	92.8	90.0	41.5	41.4	4.8	2.2	10.0	26.7	26.6	38.4	11.7	11.8	200	180	129	0	
836.60	92.5	88.8	41.4	41.0	4.8	2.2	10.0	26.5	26.1	38.4	11.9	12.3	205	170	136	0	
848.80	91.3	89.7	40.8	41.9	4.9	2.2	10.1	25.9	27.0	38.4	12.5	11.4	200	173	129	302	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer PK (RBW: 3MHz , VBW: 8MHz)

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	01/20/2015
Temperature / Humidity	23 deg. C /35% RH
Engineer	Takumi Shimada
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=5

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
824.20	92.8	90.0	41.4	41.4	4.8	2.2	10.0	26.6	26.6	38.4	11.8	11.8	200	180	131	0	
836.60	92.2	88.8	41.1	41.0	4.8	2.2	10.0	26.2	26.1	38.4	12.2	12.3	200	177	132	0	
848.80	90.7	89.3	40.2	41.5	4.9	2.2	10.1	25.3	26.6	38.4	13.1	11.8	200	181	134	304	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer PK (RBW: 3MHz , VBW: 8MHz)

RF Output Power (Radiated)

Effective radiated power(ERP)
W-CDMA Band V

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	01/21/2015
Temperature / Humidity	23 deg. C / 37% RH
Engineer	Koji Yamamoto
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 (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
826.40	87.7	83.0	29.3	25.8	4.8	2.15	10.0	14.5	11.0	38.4	23.9	27.4	111	146	100	49	
836.60	87.1	82.6	28.8	25.6	4.8	2.15	10.0	13.9	10.7	38.4	24.5	27.7	106	147	100	51	
846.60	87.2	84.8	29.0	26.1	4.9	2.15	10.1	14.1	11.2	38.4	24.3	27.2	107	149	132	306	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : S/A PK (RBW: 5MHz , VBW: 50MHz)

RF Output Power (Radiated)

Effective radiated power(ERP)
LTE Band V

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	01/28/2015
Temperature / Humidity	22 deg. C / 25% RH
Engineer	Hironobu Ohnishi
Mode	Tx LTE(QPSK, 16QAM)

[BW 1.4MHz, QPSK, 1 or 3 RB]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
824.70	86.2	85.1	32.6	35.0	5.8	2.2	10.0	16.8	19.1	38.4	21.6	19.3	110	167	138	322	RB 3-0
836.50	85.9	84.6	32.5	34.5	5.9	2.2	10.0	16.6	18.6	38.4	21.8	19.8	110	167	138	322	RB 3-3
848.30	86.2	84.9	33.7	34.7	5.9	2.2	10.1	17.8	18.8	38.4	20.6	19.6	110	167	138	322	RB 1-0

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-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), Bandpower

[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 (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
824.70	84.8	83.9	31.2	33.8	5.8	2.2	10.0	15.3	18.0	38.4	23.1	20.4	110	167	138	322	RB 1-0
836.50	84.7	83.6	31.2	33.5	5.9	2.2	10.0	15.3	17.6	38.4	23.1	20.8	110	167	138	322	RB 1-0
848.30	84.8	83.9	32.3	33.7	5.9	2.2	10.1	16.4	17.7	38.4	22.0	20.7	110	167	138	322	RB 1-0

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-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), Bandpower

RF Output Power (Radiated)

Effective radiated power(ERP)
LTE Band V

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	01/28/2015
Temperature / Humidity	22 deg. C / 25% RH
Engineer	Hironobu Ohnishi
Mode	Tx LTE(QPSK, 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 (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Height	Horizontal Turn Table	Vertical Rx Ant. Height	Vertical Turn Table	Remarks
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
825.50	86.2	85.2	32.6	35.1	5.8	2.2	10.0	16.8	19.3	38.4	21.6	19.1	110	167	138	322	RB 1-0
836.50	84.9	84.9	31.4	34.8	5.9	2.2	10.0	15.5	18.9	38.4	22.9	19.5	110	167	138	322	RB 1-14
847.50	84.9	85.0	32.4	34.9	5.9	2.2	10.1	16.5	18.9	38.4	21.9	19.5	110	167	138	322	RB 1-14

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-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), Bandpower

[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 (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Height	Horizontal Turn Table	Vertical Rx Ant. Height	Vertical Turn Table	Remarks
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
825.50	85.0	83.9	31.4	33.8	5.8	2.2	10.0	15.5	17.9	38.4	22.9	20.5	110	167	138	322	RB 1-0
836.50	84.9	83.6	31.5	33.5	5.9	2.2	10.0	15.6	17.6	38.4	22.8	20.8	110	167	138	322	RB 1-0
847.50	85.3	84.0	32.7	33.8	5.9	2.2	10.1	16.8	17.8	38.4	21.6	20.6	110	167	138	322	RB 1-0

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-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), Bandpower

RF Output Power (Radiated)

Effective radiated power(ERP)
LTE Band V

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	01/28/2015
Temperature / Humidity	22 deg. C / 25% RH
Engineer	Hironobu Ohnishi
Mode	Tx LTE(QPSK, 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 (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
826.50	86.3	85.3	32.7	35.1	5.8	2.2	10.0	16.9	19.3	38.4	21.5	19.1	110	167	138	322	RB 1-0
836.50	86.3	85.0	32.8	34.9	5.9	2.2	10.0	16.9	19.0	38.4	21.5	19.4	110	167	138	322	RB 1-24
846.50	86.3	85.1	33.8	34.9	5.9	2.2	10.1	17.8	18.9	38.4	20.6	19.5	110	167	138	322	RB 1-24

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-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), Bandpower

[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 (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
826.50	84.9	84.0	31.3	33.8	5.8	2.2	10.0	15.4	18.0	38.4	23.0	20.4	110	167	138	322	RB 1-0
836.50	85.0	83.7	31.5	33.6	5.9	2.2	10.0	15.6	17.7	38.4	22.8	20.7	110	167	138	322	RB 1-24
846.50	84.8	83.8	32.3	33.6	5.9	2.2	10.1	16.3	17.6	38.4	22.1	20.8	110	167	138	322	RB 1-24

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-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), Bandpower

RF Output Power (Radiated)

Effective radiated power(ERP)
LTE Band V

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	01/28/2015
Temperature / Humidity	22 deg. C / 25% RH
Engineer	Hironobu Ohnishi
Mode	Tx LTE(QPSK, 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 (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.]	
829.00	86.1	85.1	32.4	35.0	5.8	2.2	10.0	16.6	19.2	38.4	21.8	19.2	110	167	138	322	RB 1-0
836.50	86.1	83.7	32.7	33.6	5.9	2.2	10.0	16.8	17.7	38.4	21.6	20.7	110	167	138	322	RB 1-24
844.00	86.2	85.1	33.6	34.9	5.9	2.2	10.1	17.7	19.0	38.4	20.7	19.4	110	167	138	322	RB 1-49

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-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), Bandpower

[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 (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.]	
829.00	84.7	83.6	31.0	33.5	5.8	2.2	10.0	15.2	17.7	38.4	23.2	20.7	110	167	138	322	RB 1-0
836.50	84.8	83.8	31.4	33.7	5.9	2.2	10.0	15.5	17.8	38.4	22.9	20.6	110	167	138	322	RB 1-49
844.00	85.0	83.9	32.4	33.7	5.9	2.2	10.1	16.5	17.8	38.4	21.9	20.6	110	167	138	322	RB 1-49

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-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), Bandpower

Peak to Average power Ratio (Conducted)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/19/2015 , 02/4/2015
Temperature/ Humidity	23deg.C / 31% RH , 22deg.C / 48% RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK), 1slot, PCL=5
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=5
	Tx W-CDMA(RMC12.2kbps), All Up Bits

Mode	Channel	Frequency [MHz]	Peak to Average power Ratio [dB]
GSM *1)	128	824.20	0.02
	190	836.60	0.04
	251	848.80	0.07
EGPRS *1)	128	824.20	2.77
	190	836.60	2.55
	251	848.80	2.41
W-CDMA *2)	4132	826.40	3.12
	4183	836.60	3.15
	4233	846.60	3.07

*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

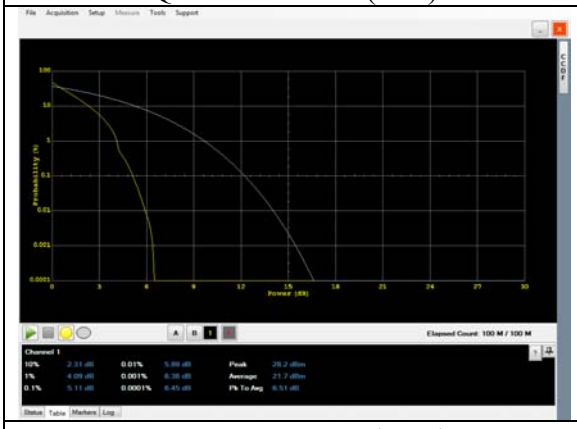
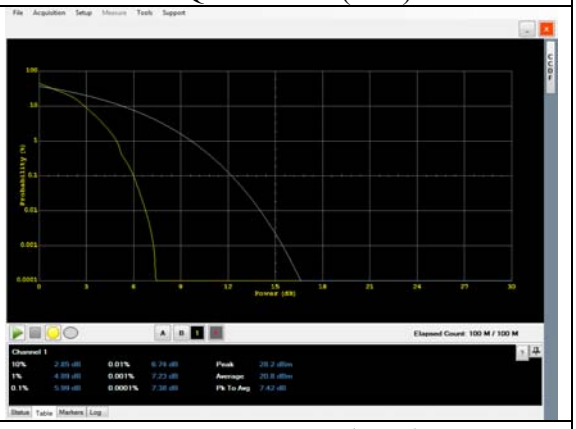
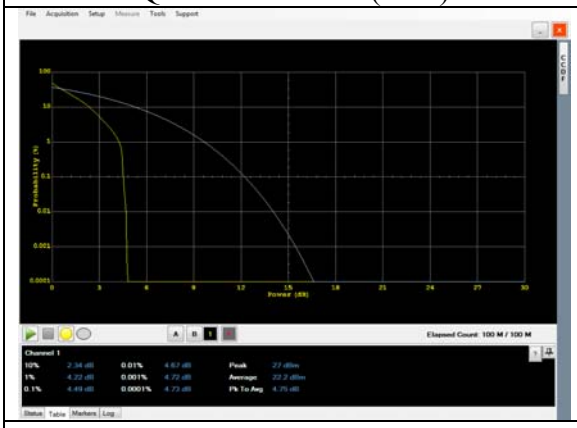
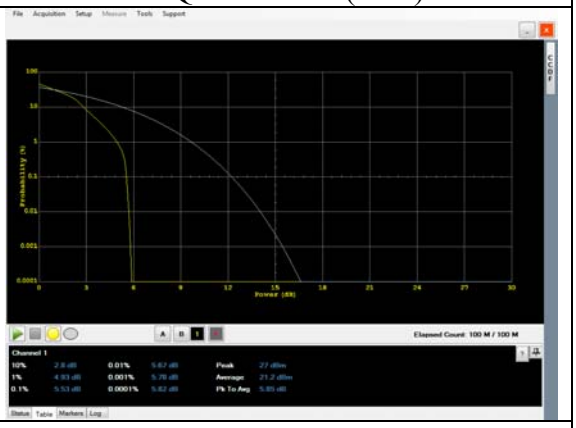
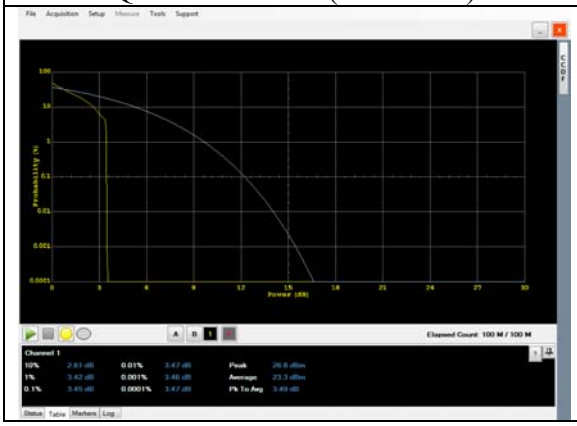
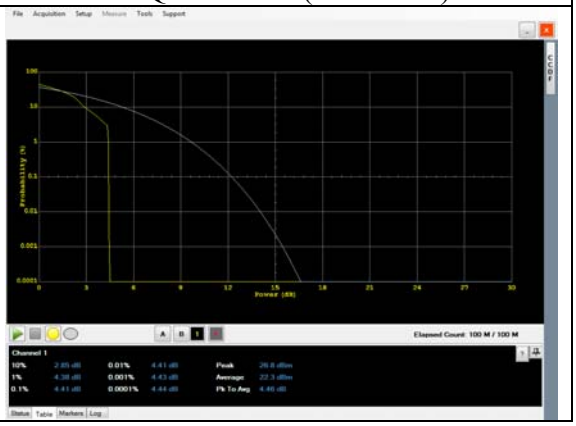
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	03/17/2015
Temperature/ Humidity	21deg.C / 45% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE (QPSK / 16QAM)

Channel	Frequency [MHz]	Bandwidth [MHz]	Moduration	RB Config.	Peak to Average Power Ratio [dB]	Worst Mode
20525	836.50	10	QPSK	50-0	5.11	QPSK Worst
				25-12	4.49	
				1-24	3.45	
			16QAM	50-0	5.99	16QAM Worst
				25-12	5.53	
				1-24	4.41	

*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 V

10MHz BW	
836.5MHz	
QPSK : RB 50-0(Full)	16QAM : 50-0(Full)
	
QPSK : RB 25-12(50%)	16QAM : 25-12(50%)
	
QPSK : RB 1-24(Minimum)	16QAM : 1-24(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 01/26/2014
Temperature/ Humidity 24deg.C / 33% RH
Engineer Yutaka Yoshida
Mode Tx LTE (QPSK / 16QAM)

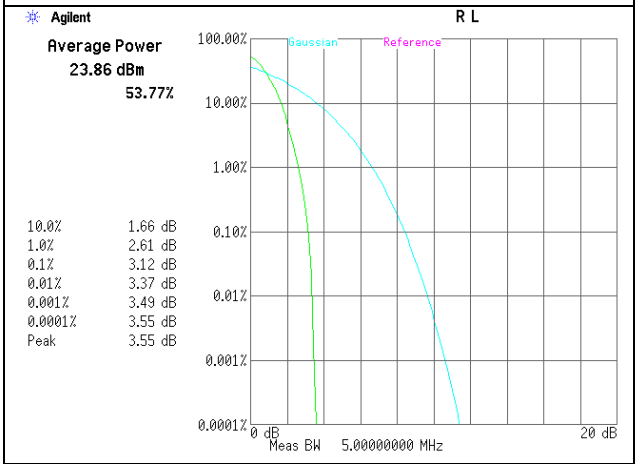
Mode	Channel	Frequency [MHz]	Peak to Average Power Ratio [dB]
LTE	20450	829.00	4.33
10MHz BW	20525	836.50	5.11
QPSK	20600	844.00	5.37
LTE	20450	829.00	5.30
10MHz BW	20525	836.50	5.99
16QAM	20600	844.00	6.11
LTE	20425	826.50	5.43
5MHz BW	20525	836.50	5.41
QPSK	20625	846.50	5.42
LTE	20425	826.50	6.33
5MHz BW	20525	836.50	6.27
16QAM	20625	846.50	6.26
LTE	20415	825.50	5.45
3MHz BW	20525	836.50	5.33
QPSK	20635	847.50	5.40
LTE	20415	825.50	6.31
3MHz BW	20525	836.50	6.07
16QAM	20635	847.50	6.24
LTE	20407	824.70	5.38
1.4MHz BW	20525	836.50	5.43
QPSK	20643	848.30	5.38
LTE	20407	824.70	6.27
1.4MHz BW	20525	836.50	6.25
16QAM	20643	848.30	6.18

*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.

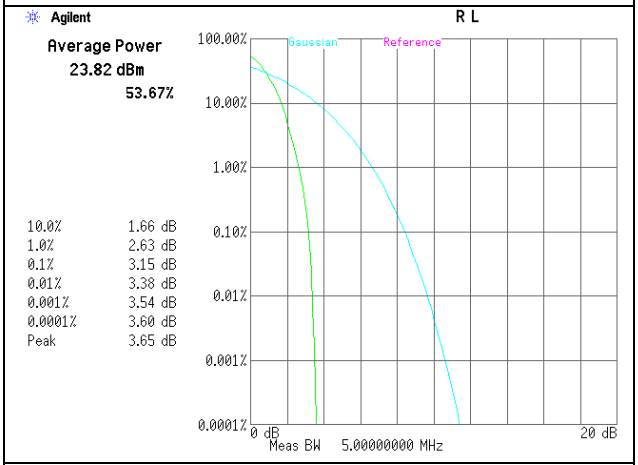
Peak to Average power Ratio (Conducted)
W-CDMA Band V

W-CDMA

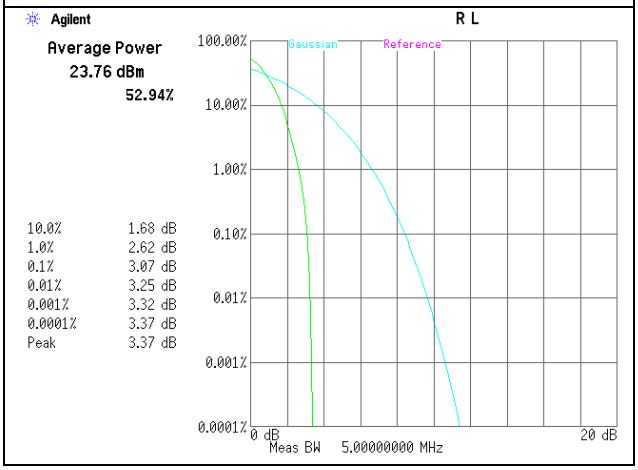
826.4MHz



836.6MHz

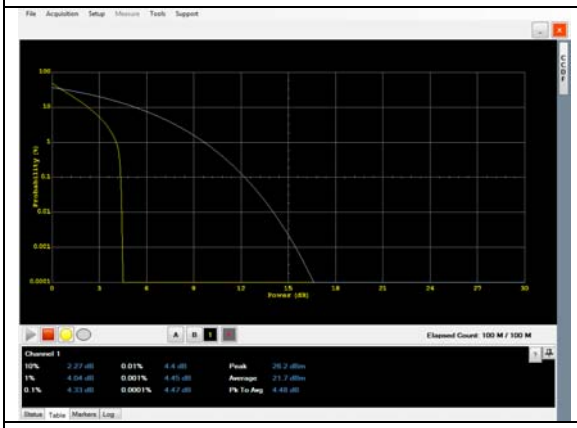
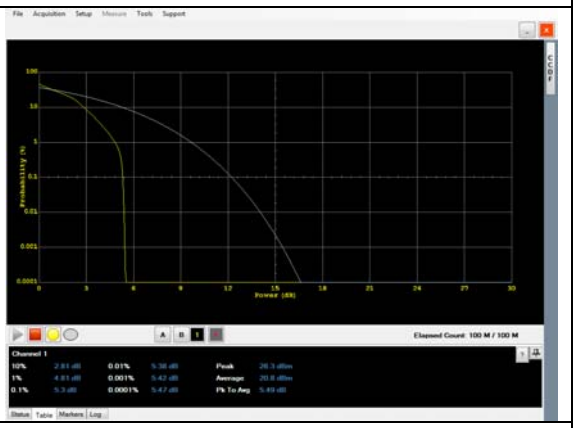
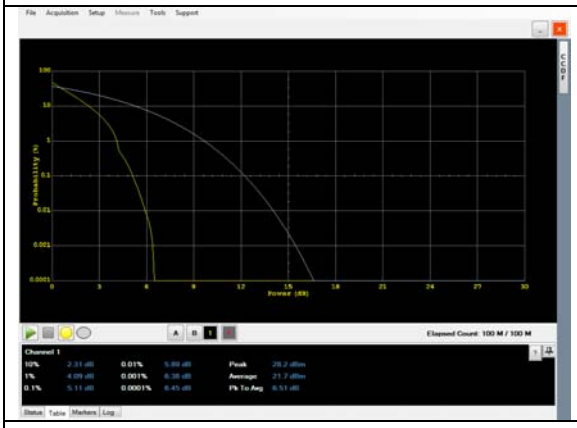
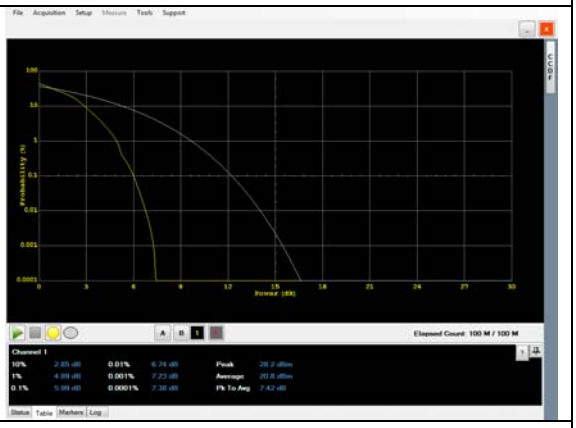
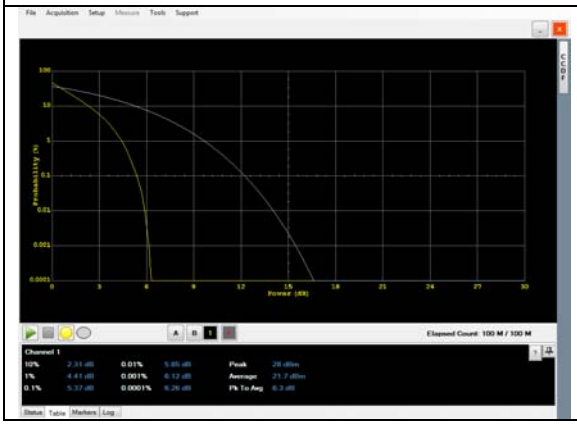
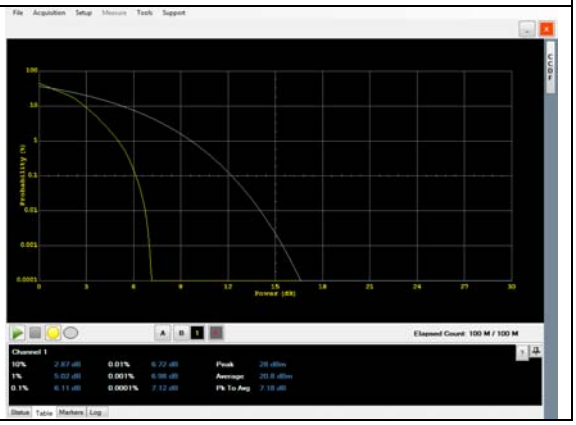


846.6MHz



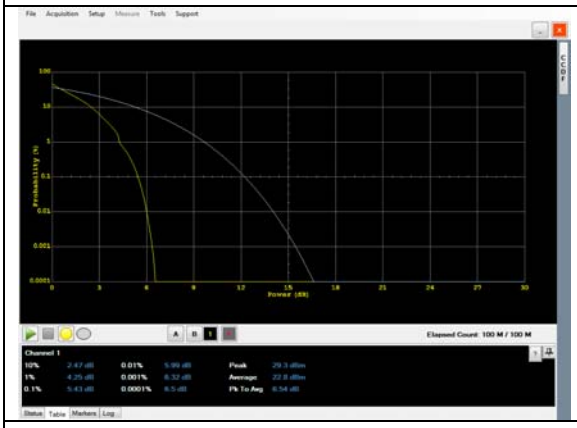
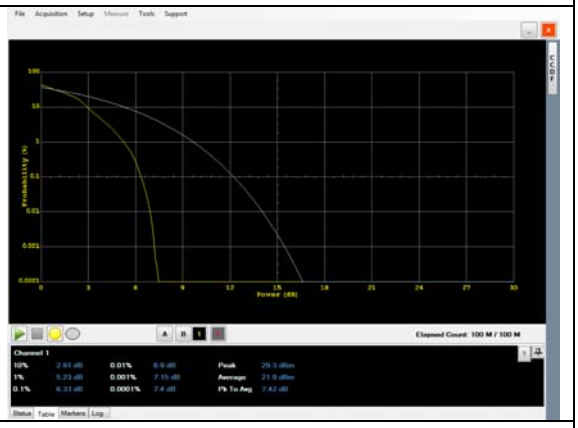
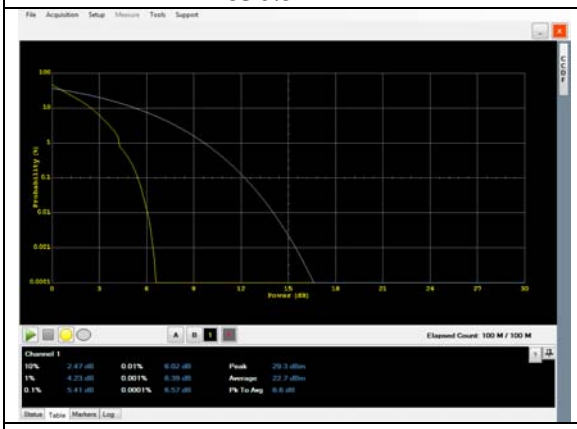
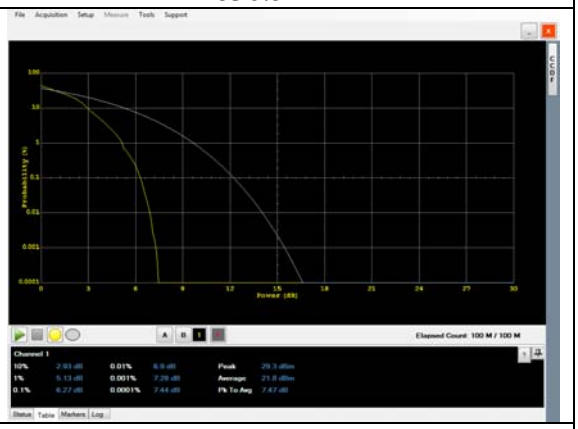
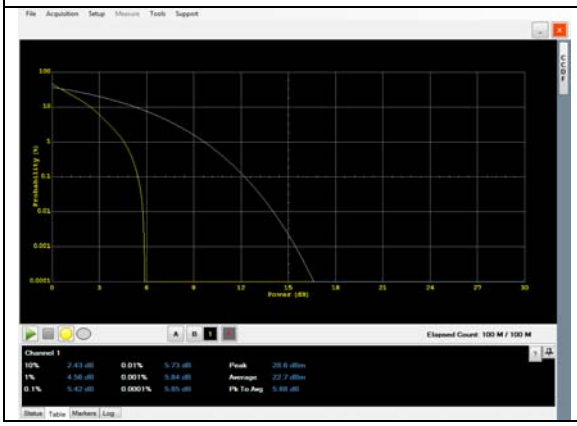
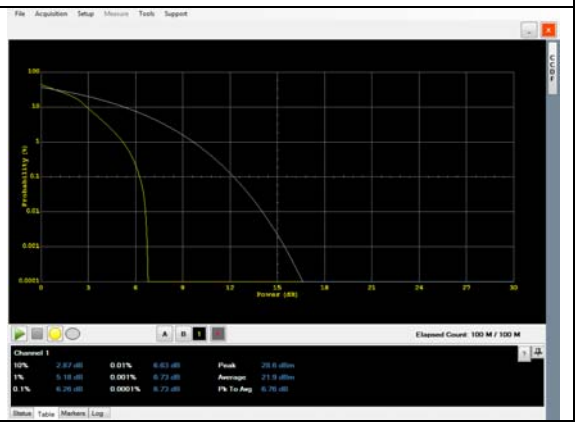
*Set the spectrum analyzer radio mode to 3GPP W-CDMA (Power Stat CCDF)

Peak to Average power Ratio (Conducted)
LTE Band V

10MHz BW	
QPSK : RB full(100%)	16QAM : RB full(100%)
829.0MHz	829.0MHz
	
836.5MHz	836.5MHz
	
844.0MHz	844.0MHz
	

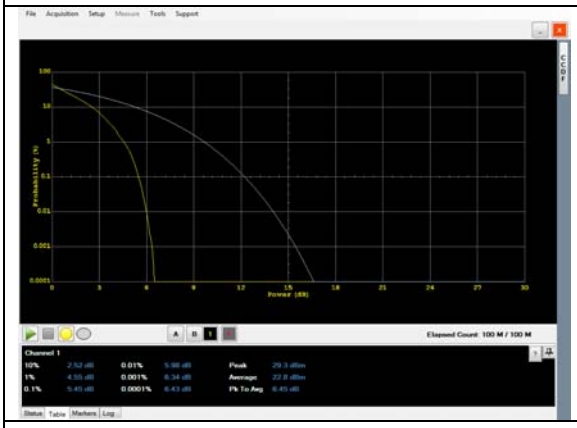
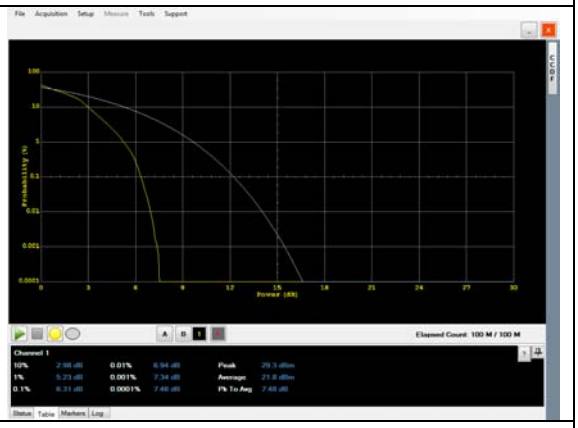
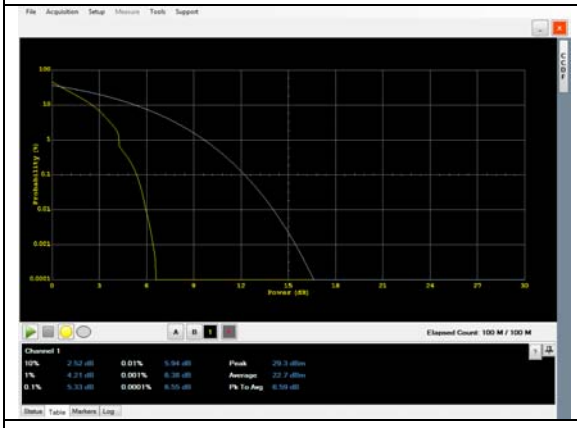
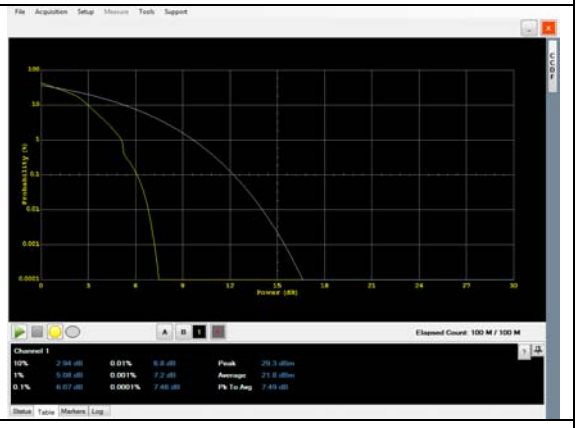
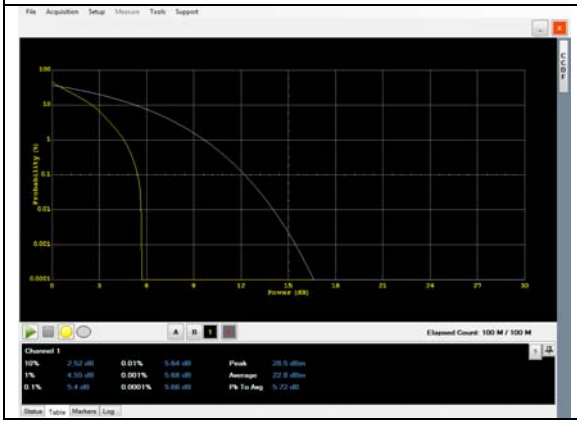
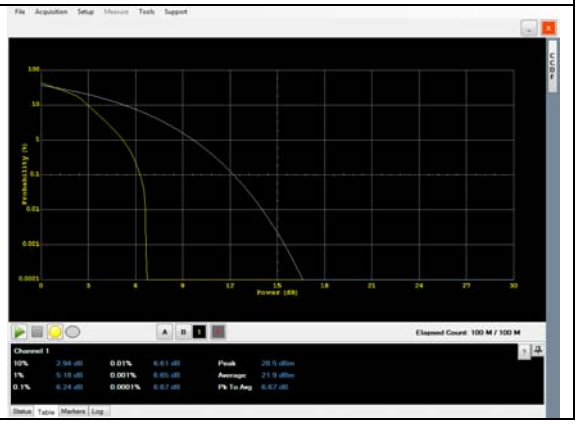
*Set the wideband power meter to CCDF measurement mode

Peak to Average power Ratio (Conducted)
LTE Band V

5MHz BW	
QPSK : RB full(100%)	16QAM : RB full(100%)
826.5MHz	826.5MHz
	
836.5MHz	836.5MHz
	
846.5MHz	846.5MHz
	

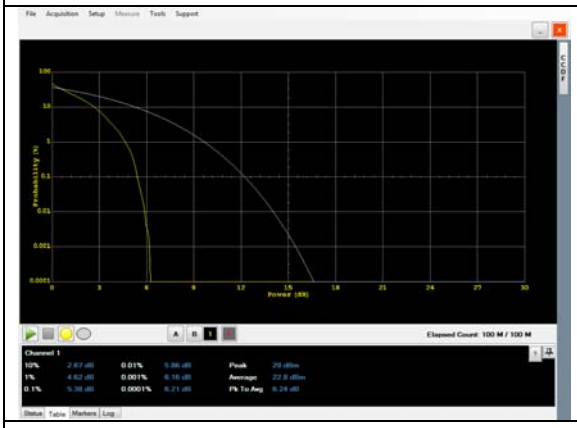
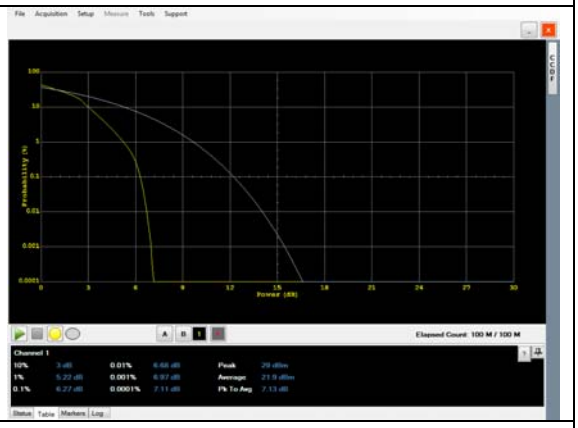
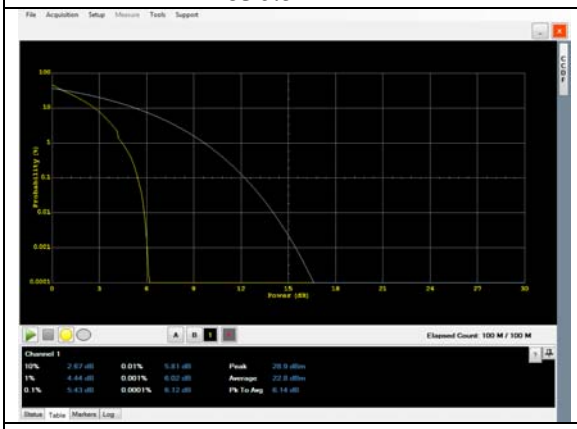
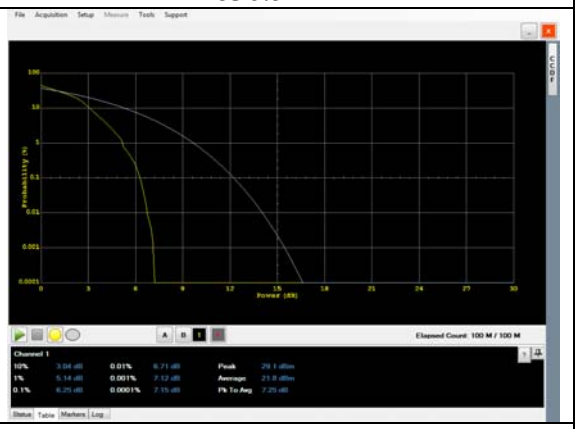
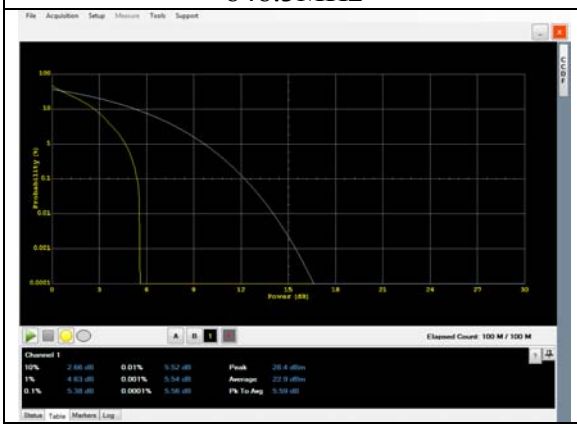
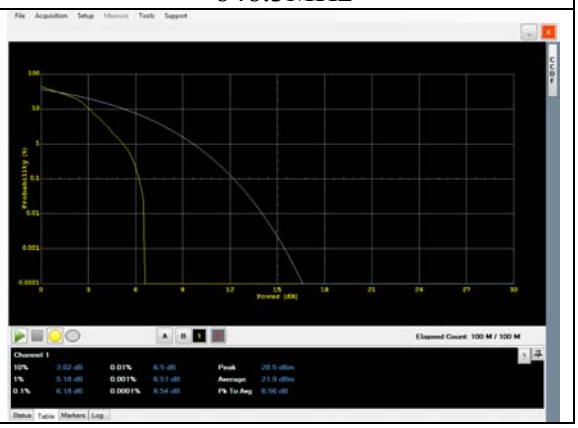
UL Japan, Inc.
Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

Peak to Average power Ratio (Conducted)
LTE Band V

3MHz BW	
QPSK : RB full(100%)	16QAM : RB full(100%)
825.5MHz	825.5MHz
	
836.5MHz	836.5MHz
	
847.5MHz	847.5MHz
	

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)
LTE Band V

1.4MHz BW	
QPSK : RB full(100%)	16QAM : RB full(100%)
824.7MHz	824.7MHz
	
836.5MHz	836.5MHz
	
848.3MHz	848.3MHz
	

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

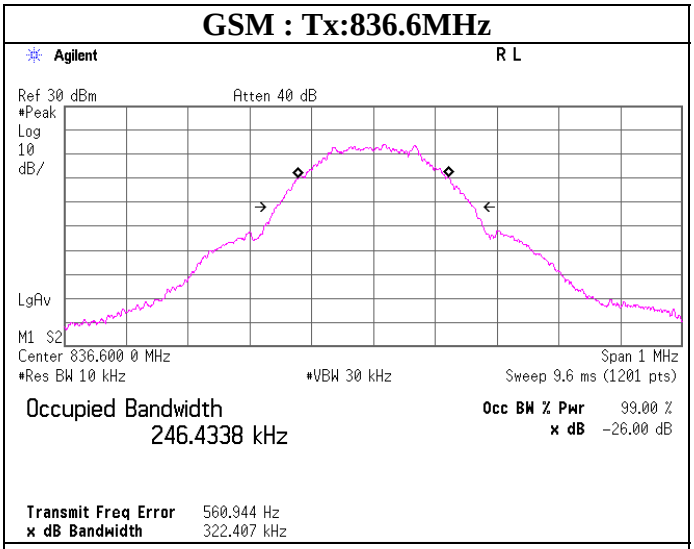
Bandwidth(Conducted)

GSM850

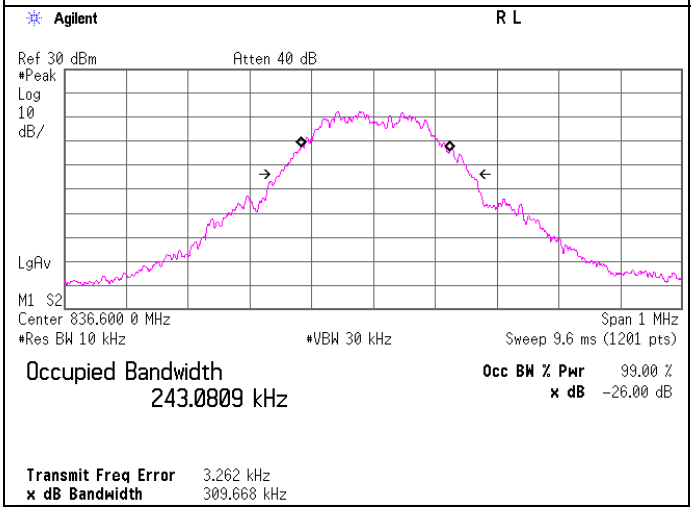
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/19/2014
Temperature/ Humidity	23deg.C / 31% RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK), 1slot, PCL=5
	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=5

Mode	CH	FREQ [MHz]	26dB Bandwidth [kHz]	99% OBW [kHz]	Limit [kHz]
GSM	Mid	836.6	322.407	246.4338	-
EGPRS	Mid	836.6	309.668	243.0809	-

GSM : Tx:836.6MHz



EGPRS : Tx:836.6MHz



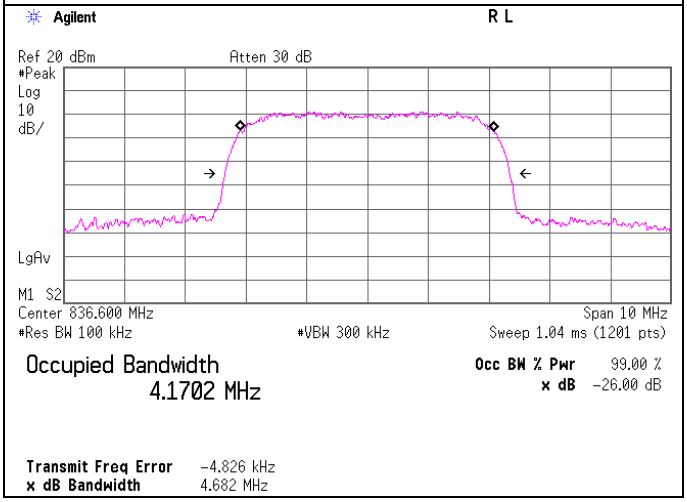
Bandwidth(Conducted)

W-CDMA Band V

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 [MHz]
Mid	836.6	4.682	4.1702	-

Tx: 836.6MHz



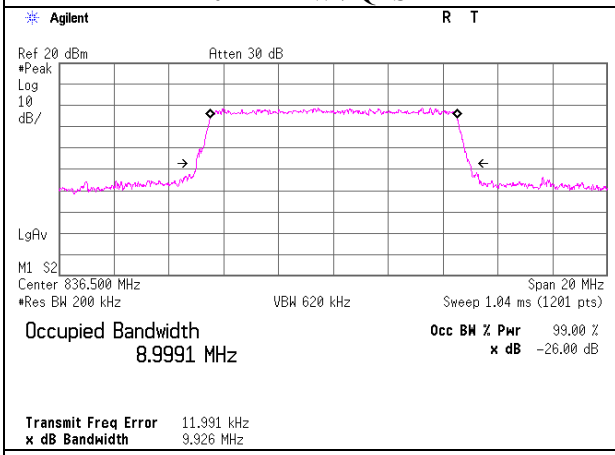
Bandwidth(Conducted)

LTE Band V

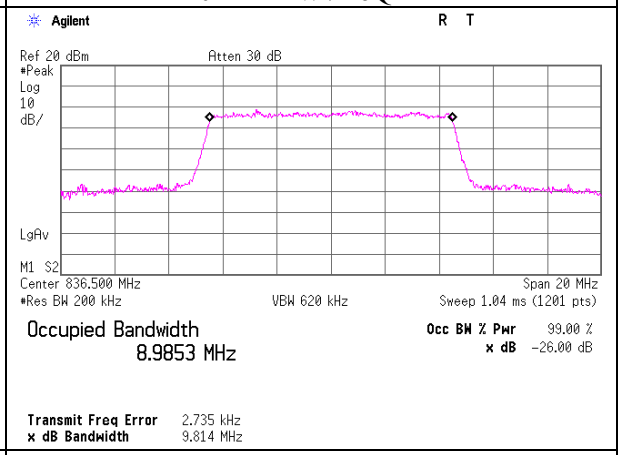
Report No.	10636726H
Test place	Ise EMC Lab. No.6 Measurement Room
Date	01/27/2015
Temperature / Humidity	20 deg. C / 49 % RH
Engineer	Yutaka Yoshida
Mode	Tx LTE (QPSK / 16QAM)

BW	UL RB Allocation	UL RB Start	Frequency [MHz]	Mode	26dB Bandwidth [MHz]	99% OBW [MHz]
10MHz	50	0	836.5	QPSK	9.926	8.9991
				16QAM	9.814	8.9853
5MHz	25	0	836.5	QPSK	4.960	4.5140
				16QAM	4.982	4.5023
3MHz	15	0	836.5	QPSK	2.977	2.7027
				16QAM	2.960	2.7017
1.4MHz	6	0	836.5	QPSK	1.298	1.0908
				16QAM	1.294	1.0971

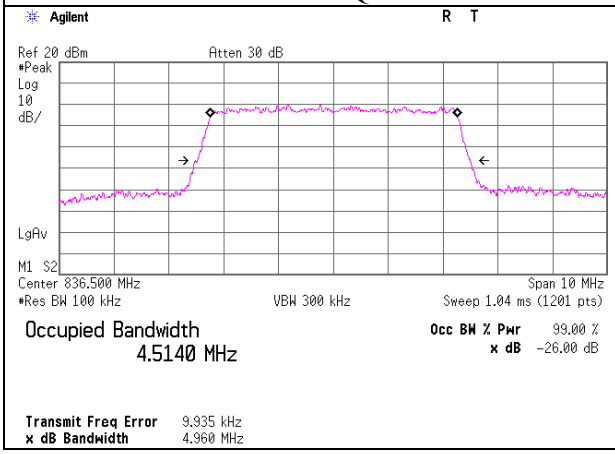
10MHz BW / QPSK



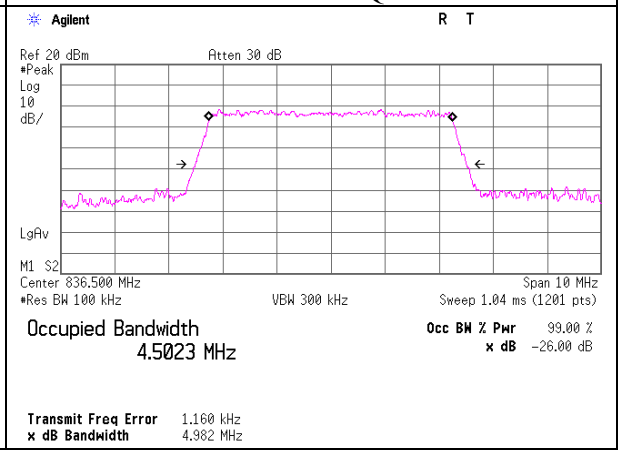
10MHz BW / 16QAM



5MHz BW / QPSK



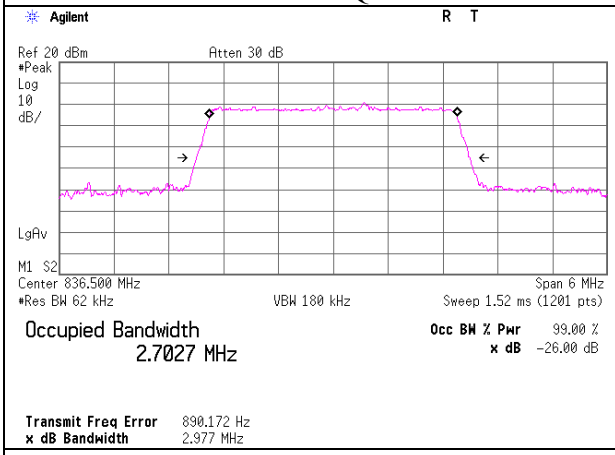
5MHz BW / 16QAM



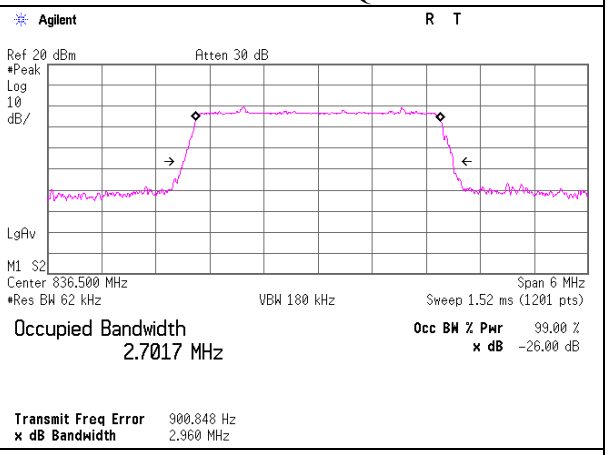
Bandwidth(Conducted)

LTE Band V

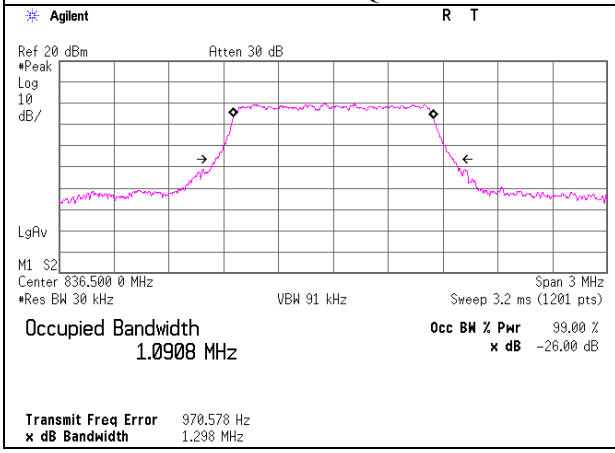
3MHz BW / QPSK



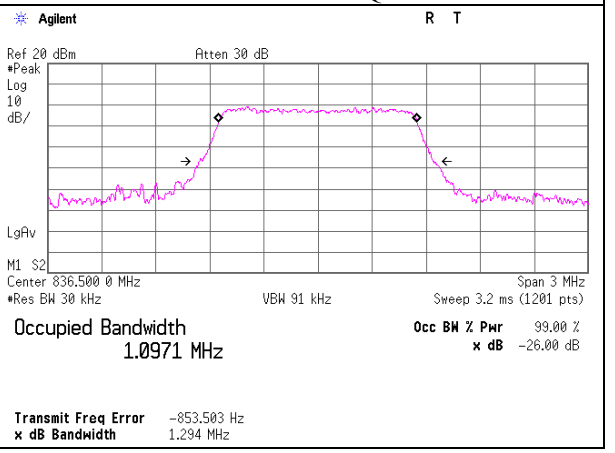
3MHz BW / 16QAM



1.4MHz BW / QPSK



1.4MHz BW / 16QAM



Band-Edge(Conducted)

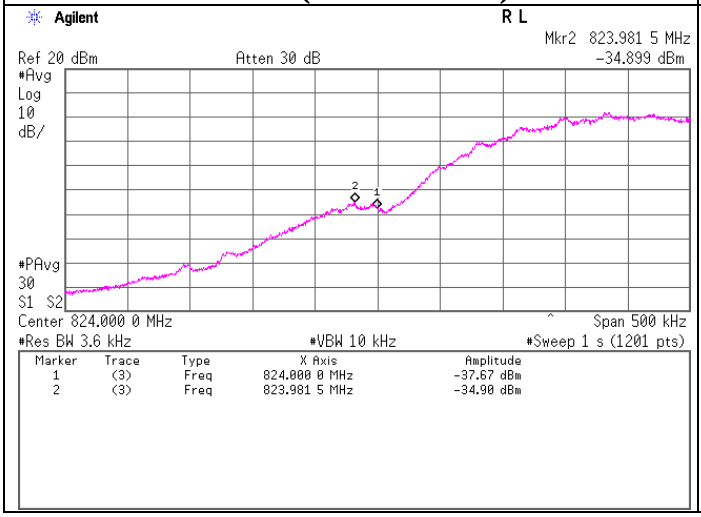
GSM850

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/19/2015
Temperature/ Humidity	23deg.C / 31% RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK), 1slot, PCL=5

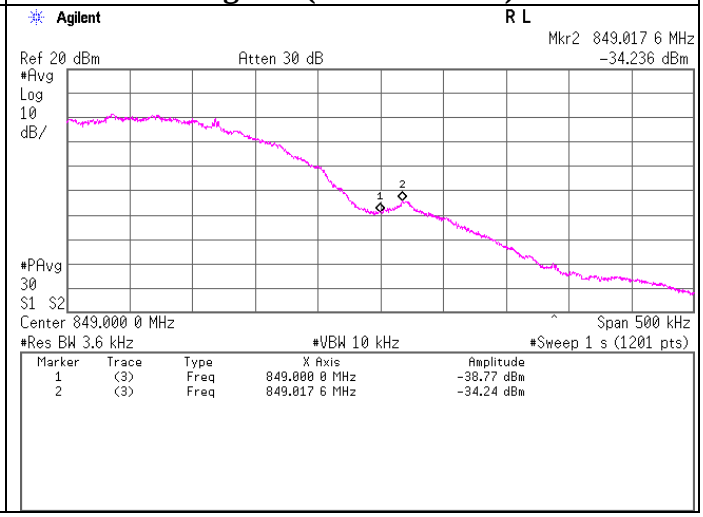
Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
823.9815	-34.90	10.00	6.30	-18.60	-13.0	5.60
824.0000	-37.67	10.00	6.30	-21.37	-13.0	8.37
849.0000	-38.77	10.00	6.30	-22.47	-13.0	9.47
849.0176	-34.24	10.00	6.30	-17.94	-13.0	4.94

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

Low ch (Tx:824.2MHz)



High ch (Tx:848.8MHz)



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)

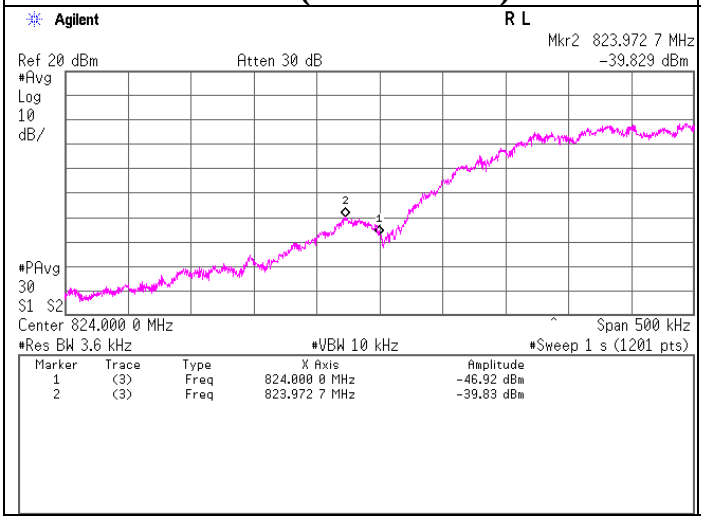
GSM850

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/19/2015
Temperature/ Humidity	23deg.C / 31% RH
Engineer	Yutaka Yoshida
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=5

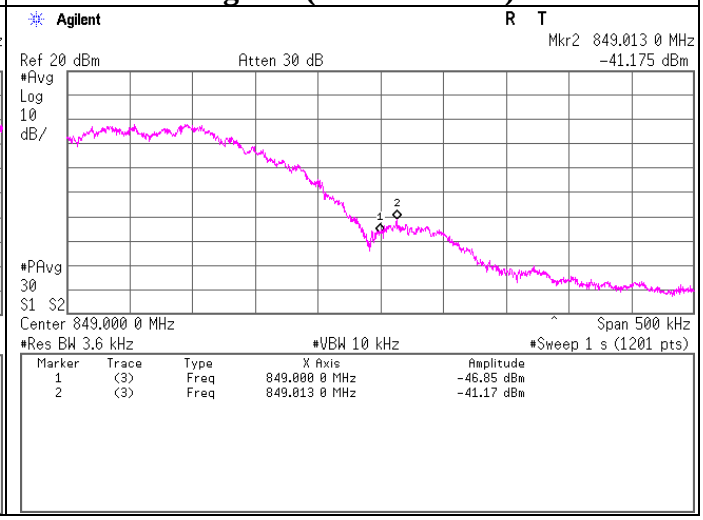
Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
823.9727	-39.83	10.00	6.30	-23.53	-13.0	10.53
824.0000	-46.92	10.00	6.30	-30.62	-13.0	17.62
849.0000	-46.85	10.00	6.30	-30.55	-13.0	17.55
849.0130	-41.18	10.00	6.30	-24.88	-13.0	11.88

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

Low ch (Tx:824.2MHz)



High ch (Tx:848.8MHz)



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)

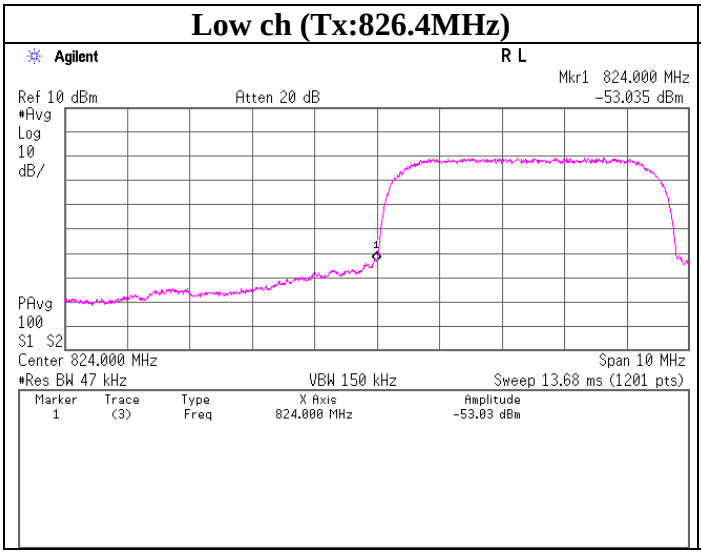
W-CDMA Band V

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

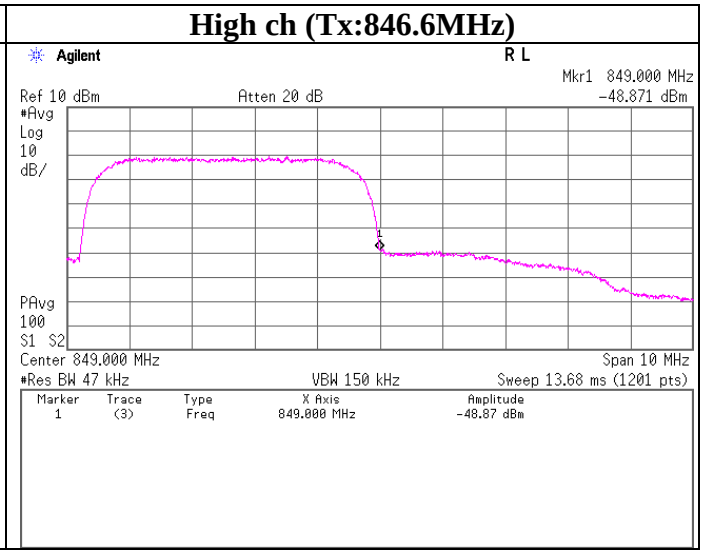
Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
824.000	-53.04	10.00	6.58	-36.46	-13.0	23.46
849.000	-48.87	10.00	6.58	-32.29	-13.0	19.29

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

Low ch (Tx:826.4MHz)



High ch (Tx:846.6MHz)



Band-Edge(Conducted)

LTE Band V

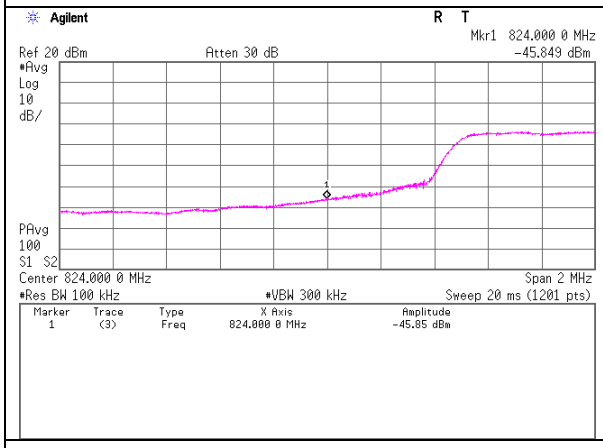
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg.C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 10MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
50	0	824.0000	-45.85	10.00	6.58	-29.27	-13.0	16.27
	0	849.0000	-48.14	10.00	6.58	-31.56	-13.0	18.56
1	0	824.0000	-49.17	10.00	6.58	-32.59	-13.0	19.59
	49	849.0000	-48.63	10.00	6.58	-32.05	-13.0	19.05

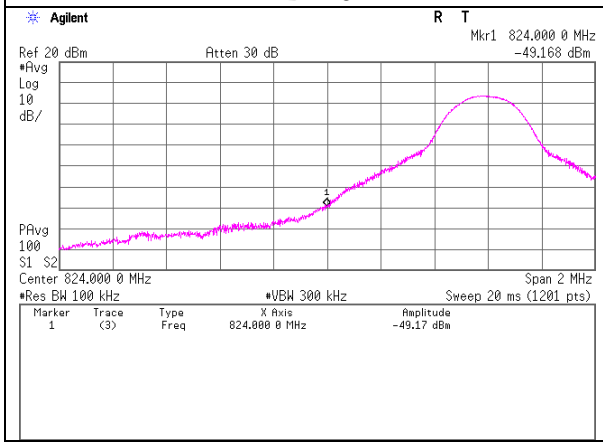
Sample Calculation : Result = Reading + Atten. + Cable Loss

Low ch (Tx:829.0MHz)

RB 50-0

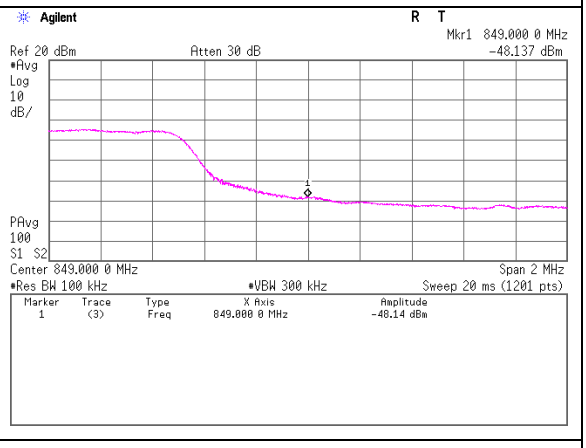


RB 1-0

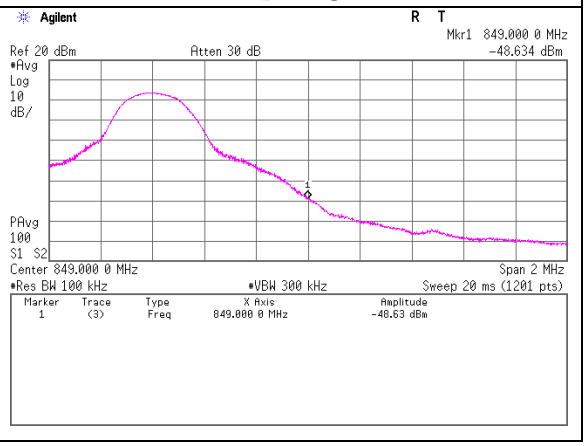


High ch (Tx:844.0MHz)

RB 50-0



RB 1-49



Band-Edge(Conducted)

LTE Band V

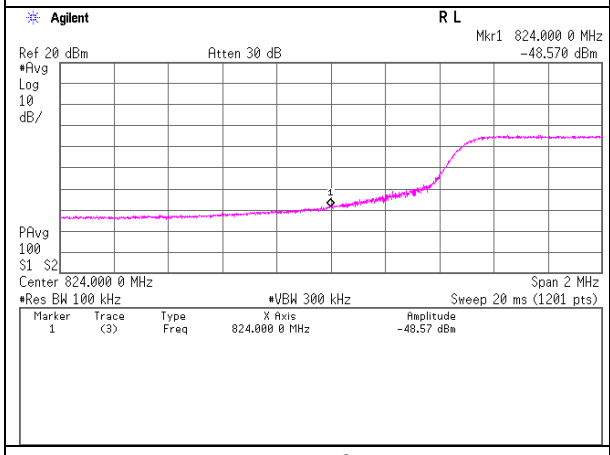
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg.C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(16QAM), BW 10MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
50	0	824.0000	-48.57	10.00	6.58	-31.99	-13.0	18.99
	0	849.0000	-50.82	10.00	6.58	-34.24	-13.0	21.24
1	0	824.0000	-47.63	10.00	6.58	-31.05	-13.0	18.05
	49	849.0000	-49.86	10.00	6.58	-33.28	-13.0	20.28

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

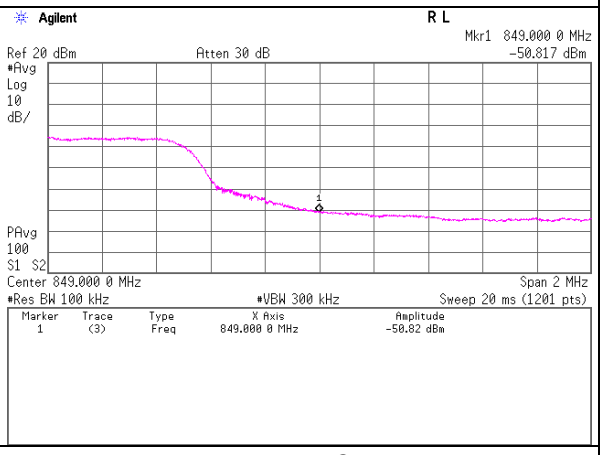
Low ch (Tx:829.0MHz)

RB 50-0

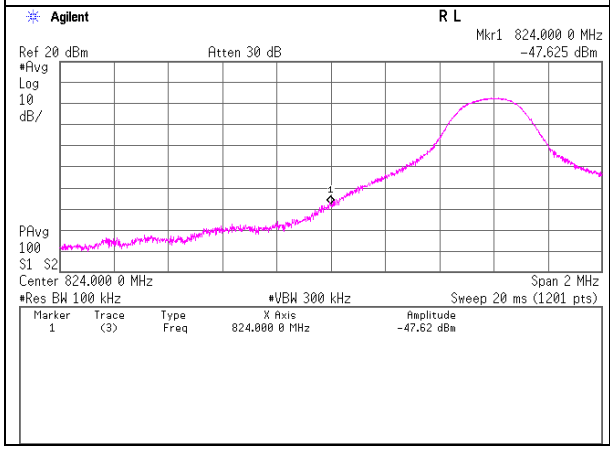


High ch (Tx:844.0MHz)

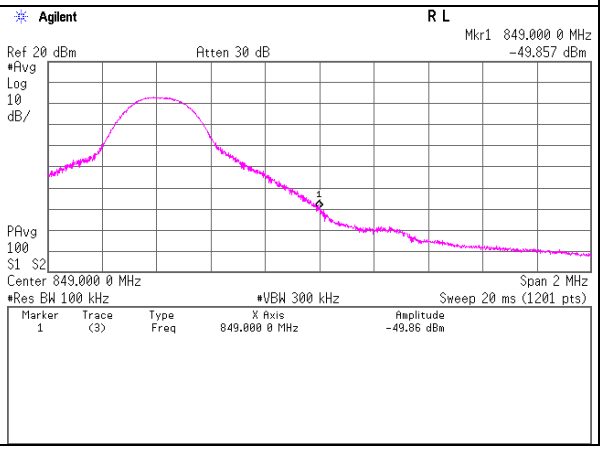
RB 50-0



RB 1-0



RB 1-49



Band-Edge(Conducted)

LTE Band V

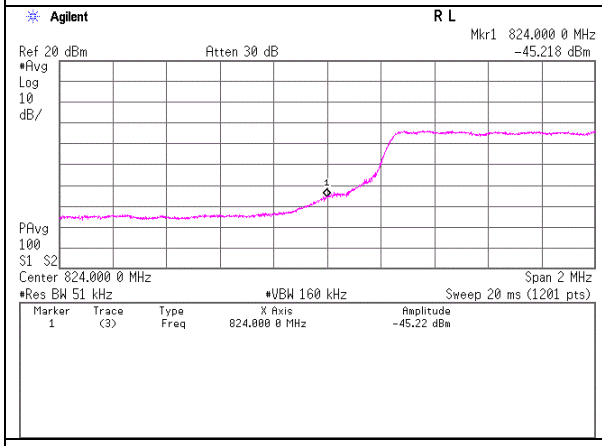
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg.C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 5MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
25	0	824.0000	-45.22	10.00	6.58	-28.64	-13.0	15.64
	0	849.0000	-46.21	10.00	6.58	-29.63	-13.0	16.63
1	0	824.0000	-40.97	10.00	6.58	-24.39	-13.0	11.39
	24	849.0000	-39.55	10.00	6.58	-22.97	-13.0	9.97

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

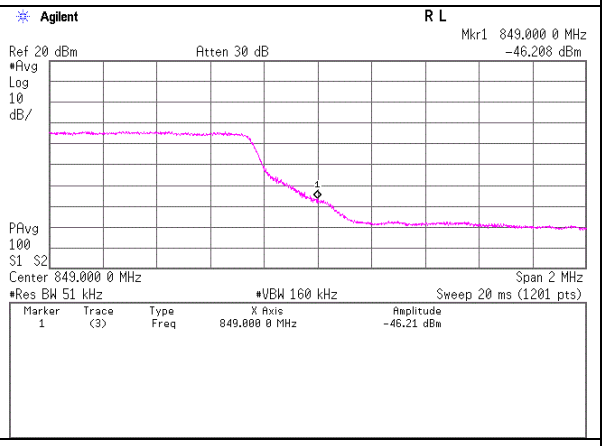
Low ch (Tx:826.5MHz)

RB 25-0

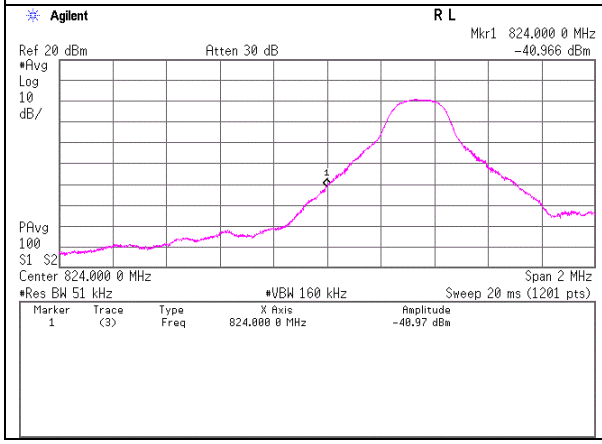


High ch (Tx:846.5MHz)

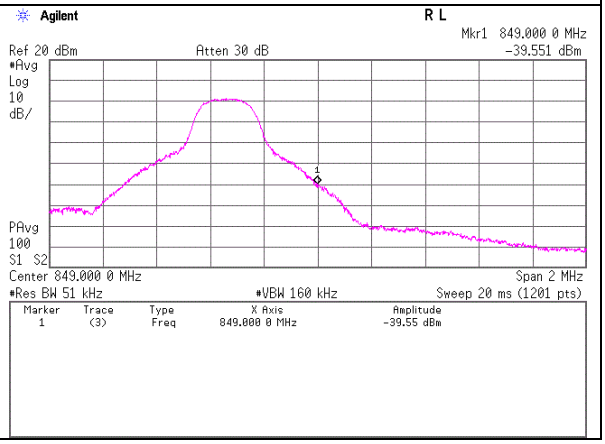
RB 25-0



RB 1-0



RB 1-24



Band-Edge(Conducted)

LTE Band V

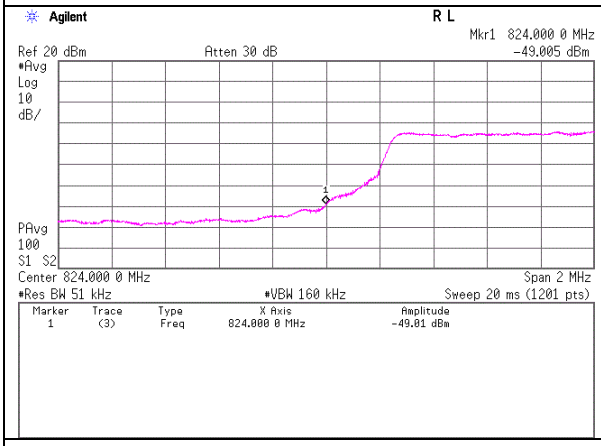
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg.C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(16QAM), BW 5MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
25	0	824.0000	-49.01	10.00	6.58	-32.43	-13.0	19.43
	0	849.0000	-48.77	10.00	6.58	-32.19	-13.0	19.19
1	0	824.0000	-39.73	10.00	6.58	-23.15	-13.0	10.15
	24	849.0000	-39.52	10.00	6.58	-22.94	-13.0	9.94

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

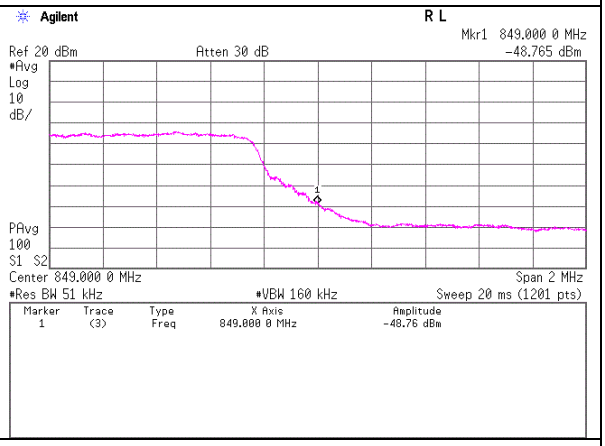
Low ch (Tx:826.5MHz)

RB 25-0

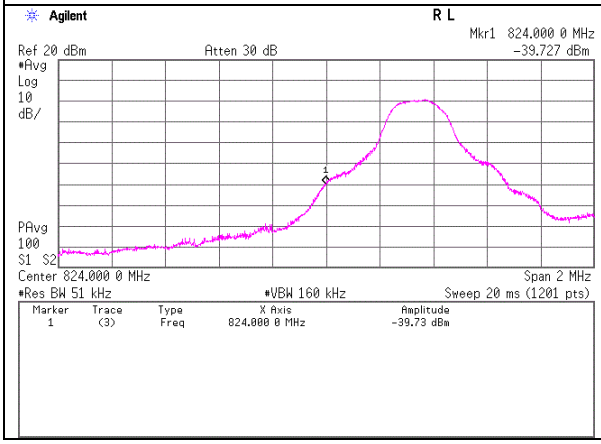


High ch (Tx:846.5MHz)

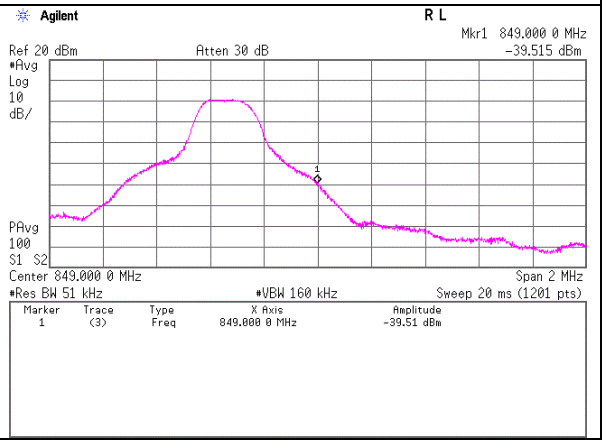
RB 25-0



RB 1-0



RB 1-24



Band-Edge(Conducted)

LTE Band V

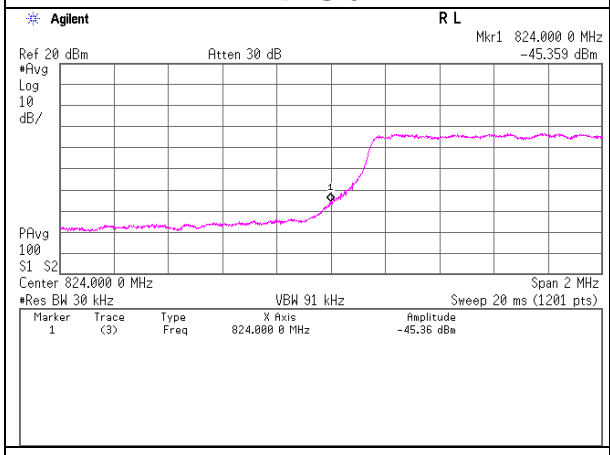
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg.C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 3MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
15	0	824.0000	-45.36	10.00	6.58	-28.78	-13.0	15.78
	0	849.0000	-47.68	10.00	6.58	-31.10	-13.0	18.10
1	0	824.0000	-40.30	10.00	6.58	-23.72	-13.0	10.72
	14	849.0000	-38.33	10.00	6.58	-21.75	-13.0	8.75

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

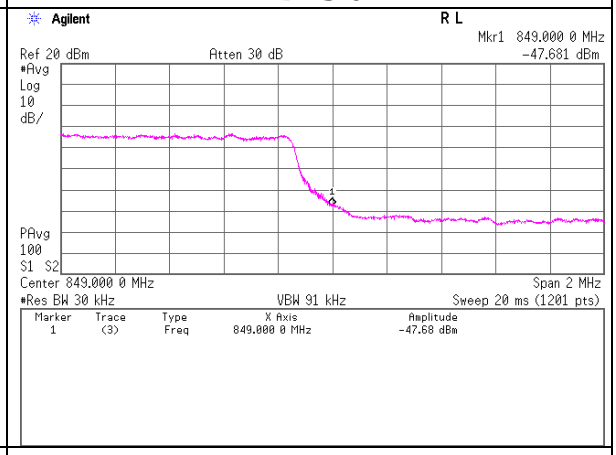
Low ch (Tx:825.5MHz)

RB 15-0

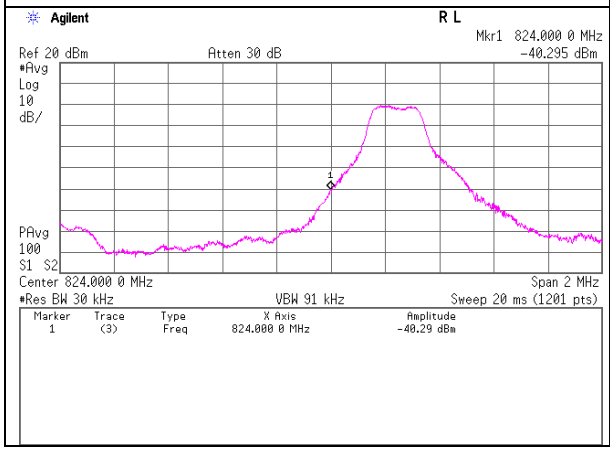


High ch (Tx:847.5MHz)

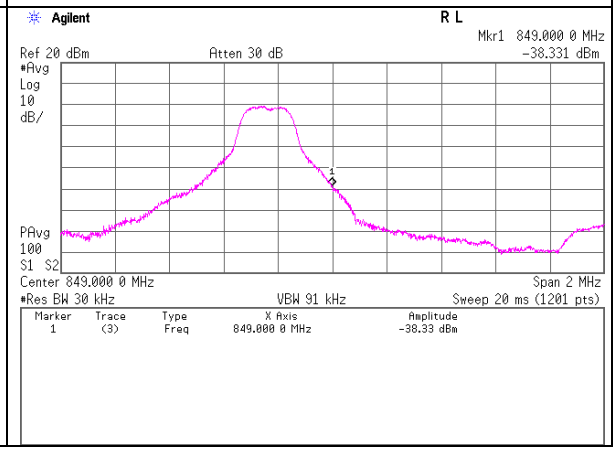
RB 15-0



RB 1-0



RB 1-14



Band-Edge(Conducted)

LTE Band V

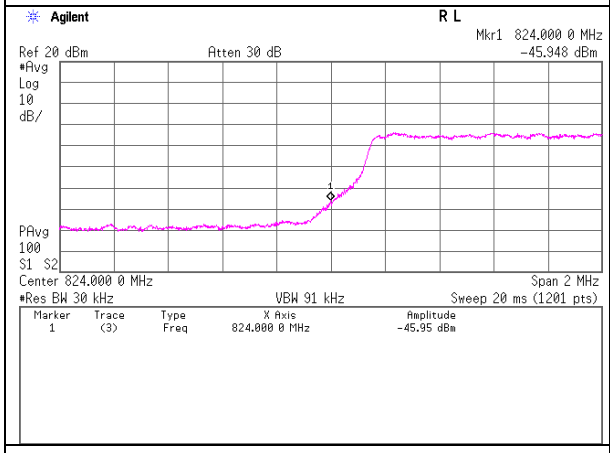
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg.C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(16QAM), BW 3MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
15	0	824.0000	-45.95	10.00	6.58	-29.37	-13.0	16.37
	0	849.0000	-46.73	10.00	6.58	-30.15	-13.0	17.15
1	0	824.0000	-42.74	10.00	6.58	-26.16	-13.0	13.16
	14	849.0000	-42.09	10.00	6.58	-25.51	-13.0	12.51

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

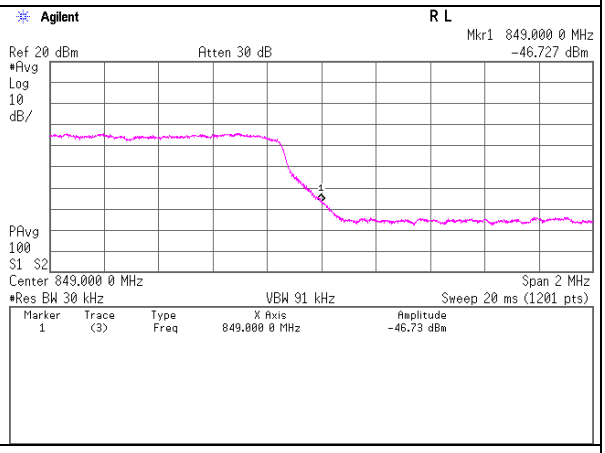
Low ch (Tx:825.5MHz)

RB 15-0

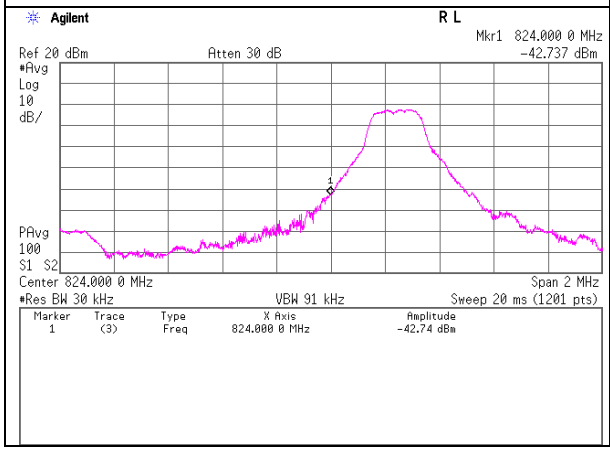


High ch (Tx:847.5MHz)

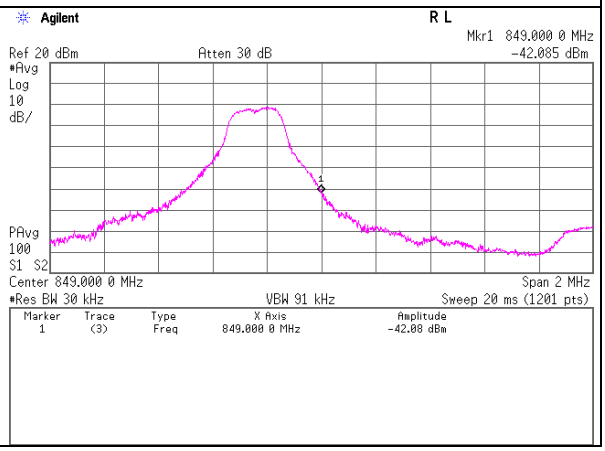
RB 15-0



RB 1-0



RB 1-14



Band-Edge(Conducted)

LTE Band V

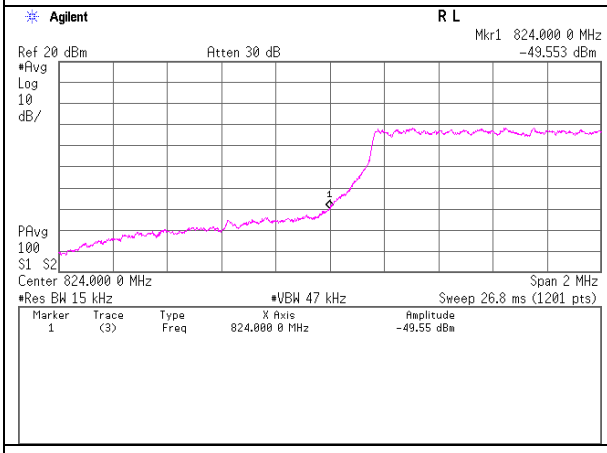
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg.C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(QPSK), BW 1.4MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
6	0	824.0000	-49.55	10.00	6.58	-32.97	-13.0	19.97
	0	849.0000	-50.11	10.00	6.58	-33.53	-13.0	20.53
1	0	824.0000	-43.71	10.00	6.58	-27.13	-13.0	14.13
	5	849.0000	-44.05	10.00	6.58	-27.47	-13.0	14.47

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

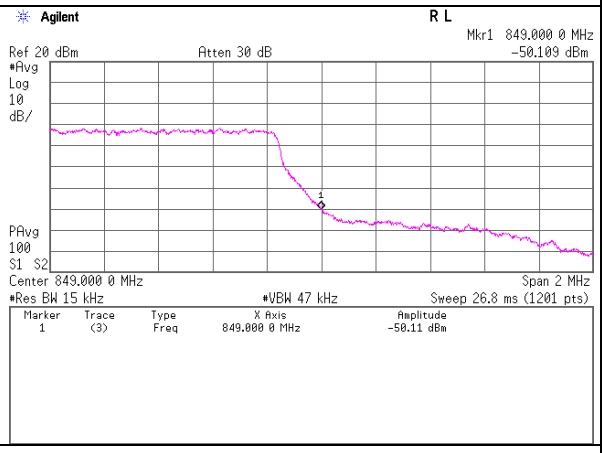
Low ch (Tx:824.7MHz)

RB 6-0

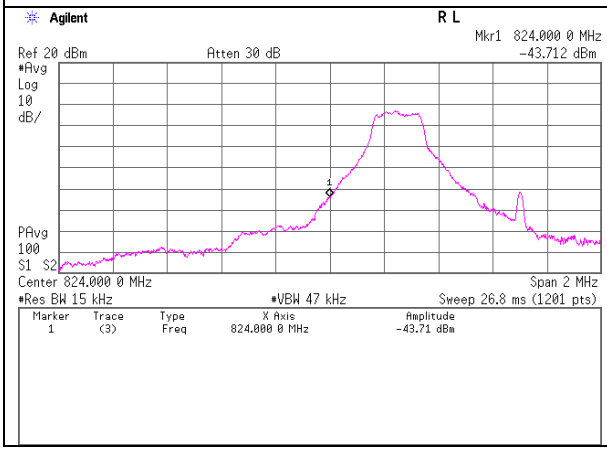


High ch (Tx:848.3MHz)

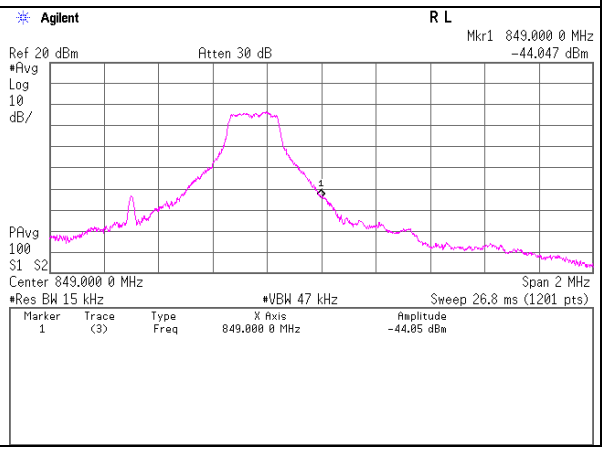
RB 6-0



RB 1-0



RB 1-5



Band-Edge(Conducted)

LTE Band V

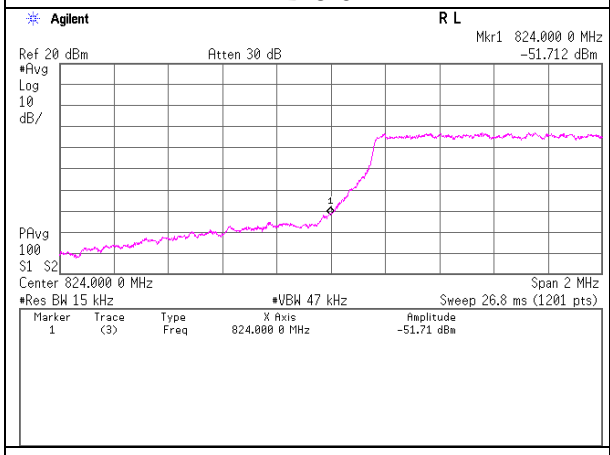
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/28/2015
Temperature/ Humidity	22deg.C / 46% RH
Engineer	Yutaka Yoshida
Mode	Tx LTE(16QAM), BW 1.4MHz

RB Size	RB Start	Frequency [MHz]	Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
6	0	824.0000	-51.71	10.00	6.58	-35.13	-13.0	22.13
	0	849.0000	-51.42	10.00	6.58	-34.84	-13.0	21.84
1	0	824.0000	-44.88	10.00	6.58	-28.30	-13.0	15.30
	5	849.0000	-44.52	10.00	6.58	-27.94	-13.0	14.94

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

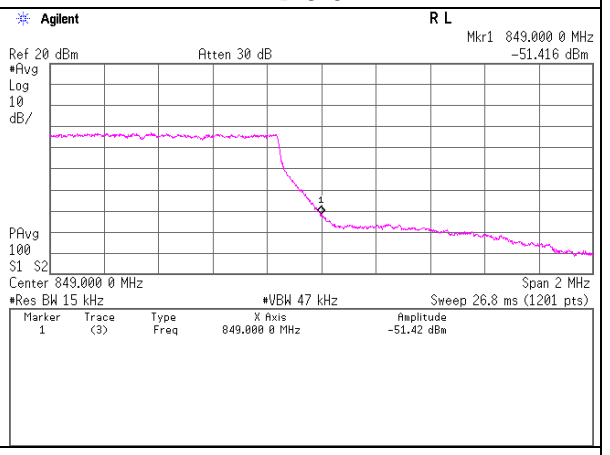
Low ch (Tx:824.7MHz)

RB 6-0

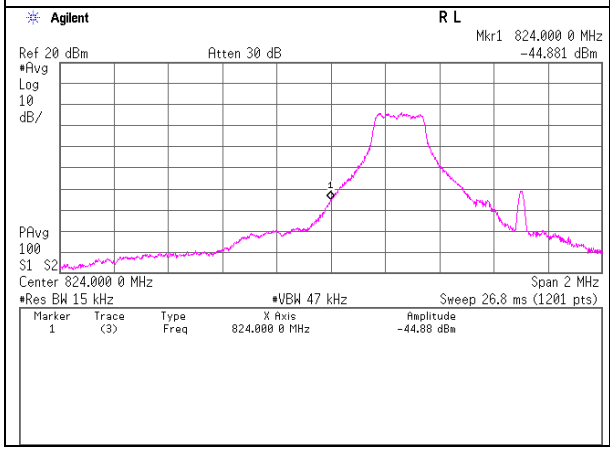


High ch (Tx:848.3MHz)

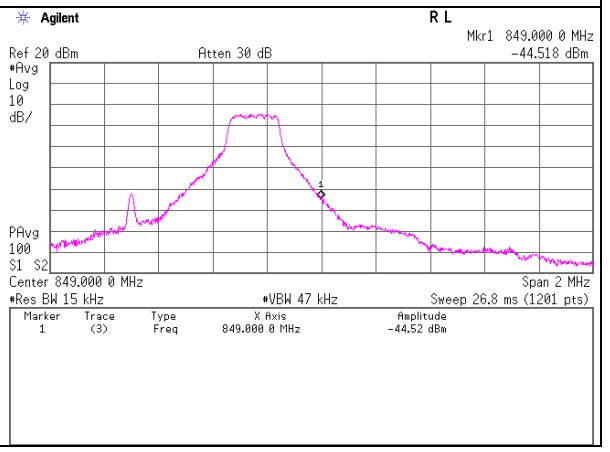
RB 6-0



RB 1-0



RB 1-5



Band Edge (Radiated)

GSM850

Report No. 10636726H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4
Date 01/20/2015
Temperature / Humidity 23 deg. C /35% RH
Engineer Takumi Shimada
Mode Tx GSM(GMSK) 1slot, PCL=5

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
823.99	50.9	48.3	-1.7	-1.4	4.8	2.2	10.0	-16.5	-16.2	-13.0	3.5	3.2	200	180	129	0	Tx 824.2MHz
824.00	46.3	45.4	-6.3	-4.3	4.8	2.2	10.0	-21.1	-19.1	-13.0	8.1	6.1	200	180	129	0	Tx 824.2MHz
849.00	43.8	43.0	-7.7	-6.0	4.9	2.2	10.1	-22.6	-20.9	-13.0	9.6	7.9	200	173	129	302	Tx 848.8MHz
849.01	46.5	46.2	-5.0	-2.8	4.9	2.2	10.1	-19.9	-17.7	-13.0	6.9	4.7	200	173	129	302	Tx 848.8MHz

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer PK (RBW: 3.6kHz , VBW: 10kHz)

Report No. 10636726H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4
Date 01/20/2015
Temperature / Humidity 23 deg. C /35% RH
Engineer Takumi Shimada
Mode Tx EGPRS(8PSK), 1slot, MCS-5, PCL=5

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
823.99	48.9	46.3	-3.7	-3.4	4.8	2.2	10.0	-18.5	-18.2	-13.0	5.5	5.2	200	180	131	0	Tx 824.2MHz
824.00	46.2	43.5	-6.4	-6.2	4.8	2.2	10.0	-21.2	-21.0	-13.0	8.2	8.0	200	180	131	0	Tx 824.2MHz
849.00	43.8	43.1	-7.7	-5.9	4.9	2.2	10.1	-22.6	-20.8	-13.0	9.6	7.8	200	181	134	304	Tx 848.8MHz
849.01	45.7	45.1	-5.8	-3.9	4.9	2.2	10.1	-20.7	-18.8	-13.0	7.7	5.8	200	181	134	304	Tx 848.8MHz

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer PK (RBW: 3.6kHz , VBW: 10kHz)

Band Edge (Radiated)

W-CDMA Band V

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	01/21/2015
Temperature / Humidity	23 deg. C / 37% RH
Engineer	Koji Yamamoto
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 (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
823.96	48.8	44.5	-4.3	-4.5	4.8	2.15	10.0	-19.1	-19.3	-13.0	6.1	6.3	111	146	100	49	Tx 826.4MHz
824.00	48.2	43.9	-4.7	-5.1	4.8	2.15	10.0	-19.5	-19.9	-13.0	6.5	6.9	111	146	100	49	Tx 826.4MHz
849.00	47.5	45.5	-4.8	-4.3	4.9	2.15	10.1	-19.7	-19.2	-13.0	6.7	6.2	107	149	132	306	Tx 846.6MHz
849.07	48.1	46.9	-4.2	-2.9	4.9	2.15	10.1	-19.1	-17.8	-13.0	6.1	4.8	107	149	132	306	Tx 846.6MHz

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

Band Edge (Radiated)

LTE Band V

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	01/29/2015
Temperature / Humidity	22 deg. C /31% RH
Engineer	Hironobu Ohnishi
Mode	Tx LTE(QPSK), BW 3MHz

[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 (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Height	Horizontal Turn Table	Vertical Rx Ant. Height	Vertical Turn Table	Remarks
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
824.00	38.7	37.2	-14.9	-12.9	5.8	2.2	10.0	-30.8	-28.8	-13.0	17.8	15.8	110	167	138	322	RB 15-0, Tx 825.5MHz
849.00	39.6	39.7	-13.0	-10.5	5.9	2.2	10.1	-28.9	-26.5	-13.0	15.9	13.5	110	167	138	322	RB 15-0, Tx 847.5MHz

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer RMS Average (RBW: 30kHz, VBW: 91kHz)

[QPSK, 1 RB]

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 Rx Ant. Height	Horizontal Turn Table	Vertical Rx Ant. Height	Vertical Turn Table	Remarks
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
824.00	43.0	41.9	-10.6	-8.2	5.8	2.2	10.0	-26.4	-24.1	-13.0	13.4	11.1	110	167	138	322	RB 1-0, Tx 825.5MHz
849.00	40.5	40.7	-12.0	-9.5	5.9	2.2	10.1	-28.0	-25.4	-13.0	15.0	12.4	110	167	138	322	RB 1-14, Tx 847.5MHz

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer RMS Average (RBW: 30kHz, VBW: 91kHz)

Band Edge (Radiated)

LTE Band V

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	01/29/2015
Temperature / Humidity	22 deg. C /31% RH
Engineer	Hironobu Ohnishi
Mode	Tx LTE(16QAM), BW 3MHz

[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 (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Height	Horizontal Turn Table	Vertical Rx Ant. Height	Vertical Turn Table	Remarks
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
824.00	37.9	36.2	-15.7	-13.9	5.8	2.2	10.0	-31.6	-29.7	-13.0	18.6	16.7	110	167	138	322	RB 15-0, Tx 825.5MHz
849.00	39.0	38.9	-13.5	-11.3	5.9	2.2	10.1	-29.5	-27.3	-13.0	16.5	14.3	110	167	138	322	RB 15-0, Tx 847.5MHz

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer RMS Average (RBW: 30kHz , VBW: 91kHz)

[16QAM, 1 RB]

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 Rx Ant. Height	Horizontal Turn Table	Vertical Rx Ant. Height	Vertical Turn Table	Remarks
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
824.00	42.3	41.6	-11.4	-8.5	5.8	2.2	10.0	-27.2	-24.3	-13.0	14.2	11.3	110	167	138	322	RB 1-0, Tx 825.5MHz
849.00	38.8	38.2	-13.7	-12.0	5.9	2.2	10.1	-29.7	-28.0	-13.0	16.7	15.0	110	167	138	322	RB 1-14, Tx 847.5MHz

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer RMS Average (RBW: 30kHz , VBW: 91kHz)

Spurious Emission (Conducted)

GSM850

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/19/2015
Temperature/ Humidity	23deg.C / 31% RH
Engineer	Yutaka Yoshida
Mode	Tx GSM(GMSK), 1slot, PCL=5

Limit line :

Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line *1) *2) [dBm]
824.2	-13.0	10.00	6.30	-29.3
836.6	-13.0	10.00	6.30	-29.3
848.8	-13.0	10.00	6.30	-29.3

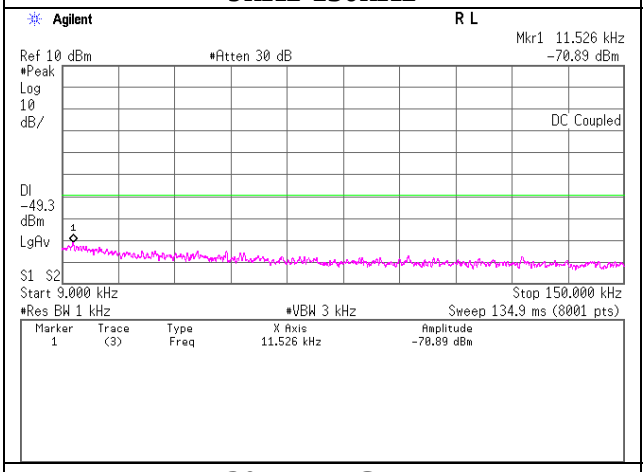
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss
*1)9k-150kHz : RBW factor was applied to Limit Line. (RBW factor=10log(1kHz/100kHz)
*2)150kHz-30MHz : RBW factor was applied to Limit Line. (RBW factor=10log(10kHz/100kHz)

Spurious Emission (Conducted)

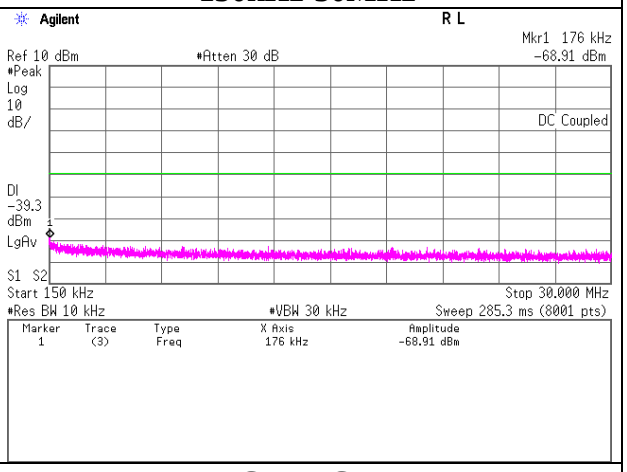
GSM

Tx:824.2MHz

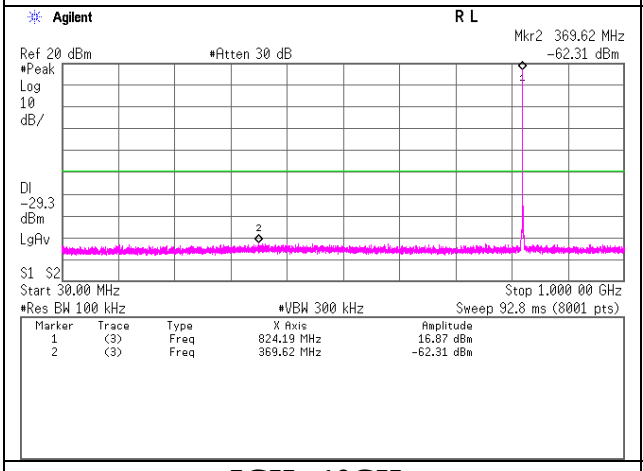
9kHz-150kHz



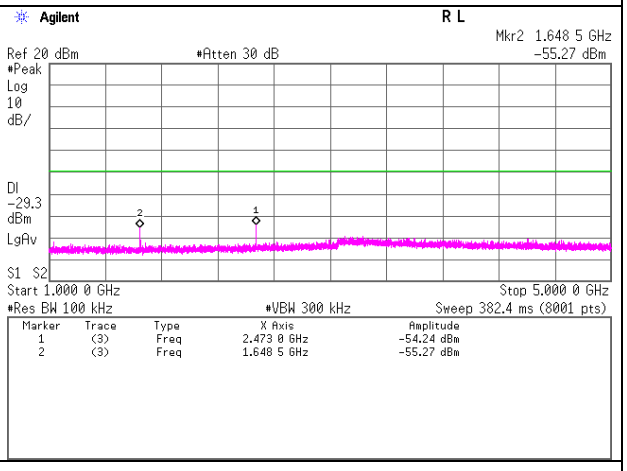
150kHz-30MHz



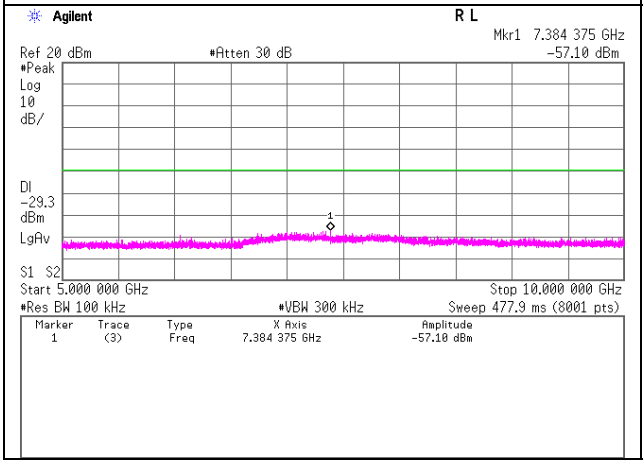
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz



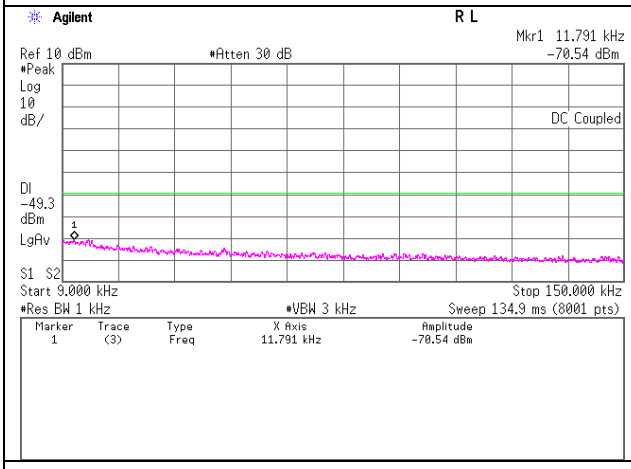
UL Japan, Inc.
Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

Spurious Emission (Conducted)

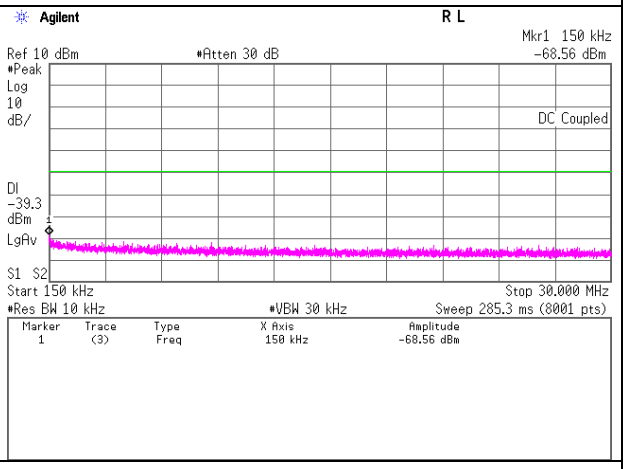
GSM

Tx:836.6MHz

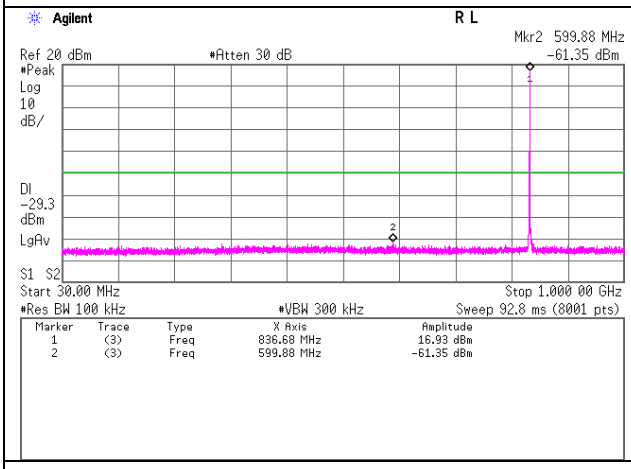
9kHz-150kHz



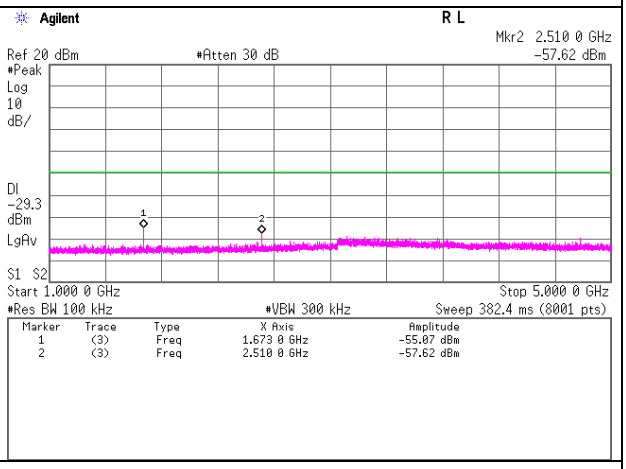
150kHz-30MHz



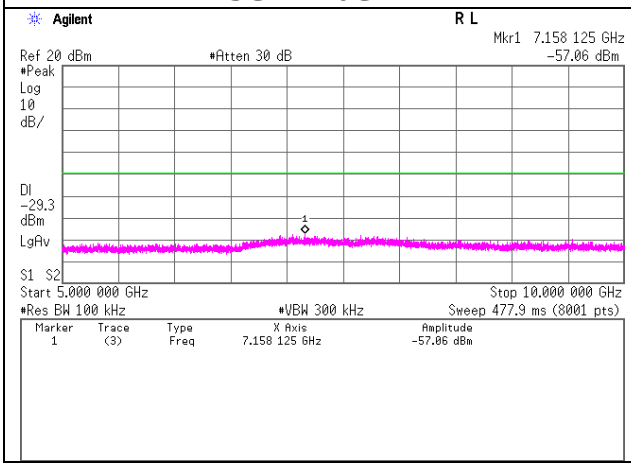
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz

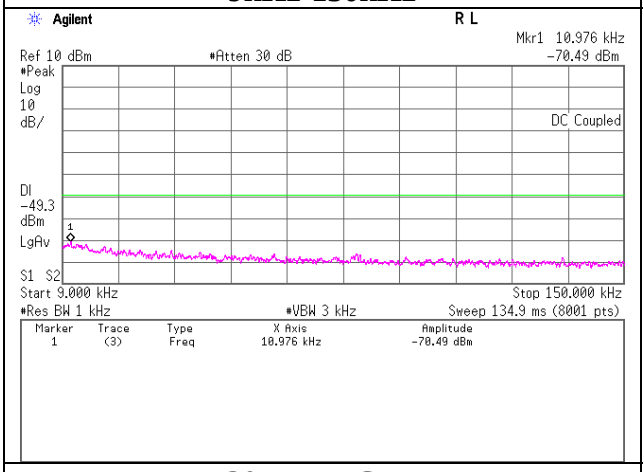


Spurious Emission (Conducted)

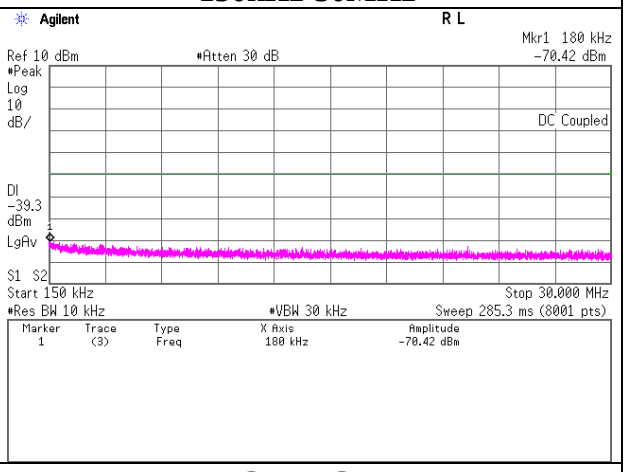
GSM

Tx:848.8MHz

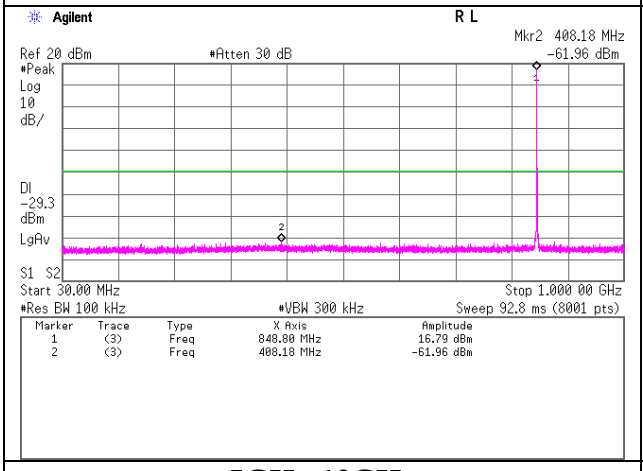
9kHz-150kHz



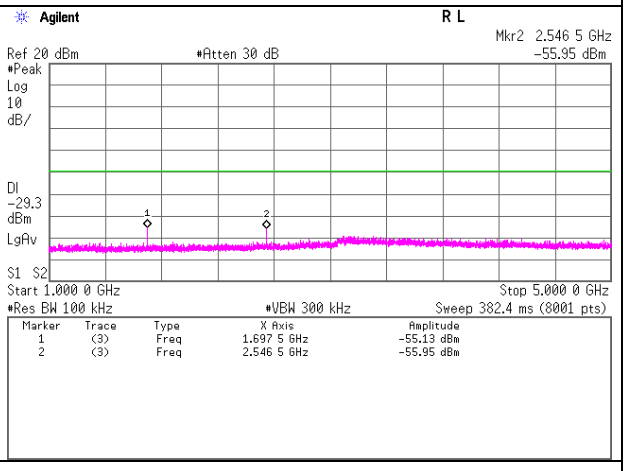
150kHz-30MHz



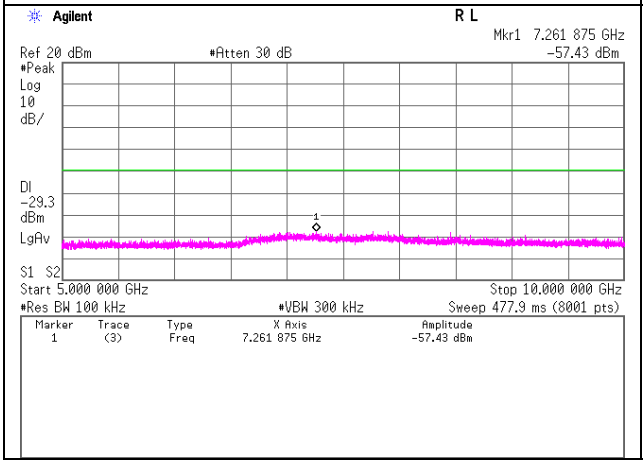
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz



Spurious Emission (Conducted)

GSM850

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10636726H
Date	01/19/2015
Temperature/ Humidity	23deg.C / 31% RH
Engineer	Yutaka Yoshida
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=5

Limit line :

Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line *1) *2) [dBm]
824.2	-13.0	10.00	6.30	-29.3
836.6	-13.0	10.00	6.30	-29.3
848.8	-13.0	10.00	6.30	-29.3

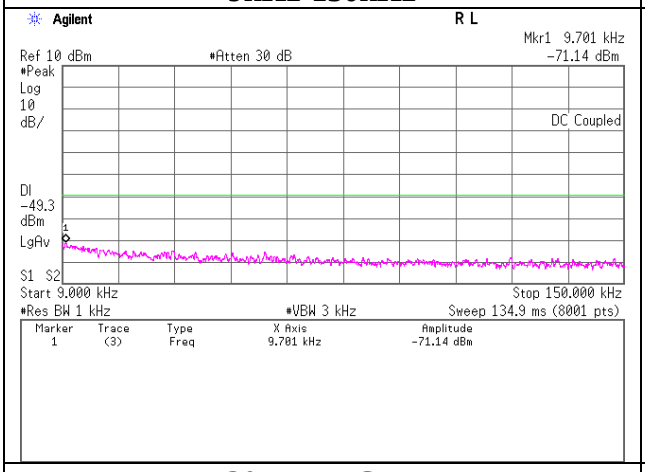
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss
*1)9k-150kHz : RBW factor was applied to Limit Line. (RBW factor=10log(1kHz/100kHz)
*2)150kHz-30MHz : RBW factor was applied to Limit Line. (RBW factor=10log(10kHz/100kHz)

Spurious Emission (Conducted)

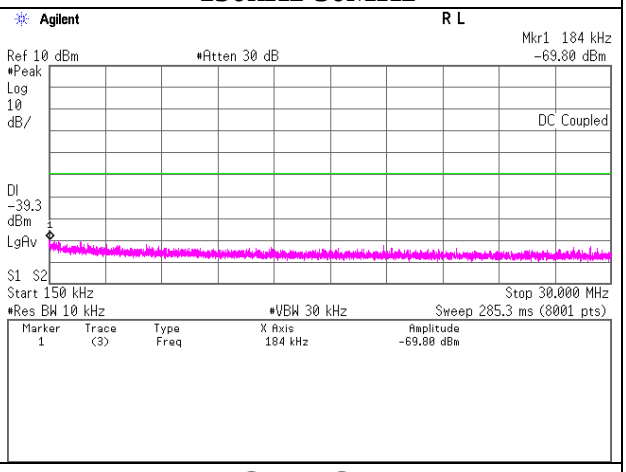
EGPRS

Tx:824.2MHz

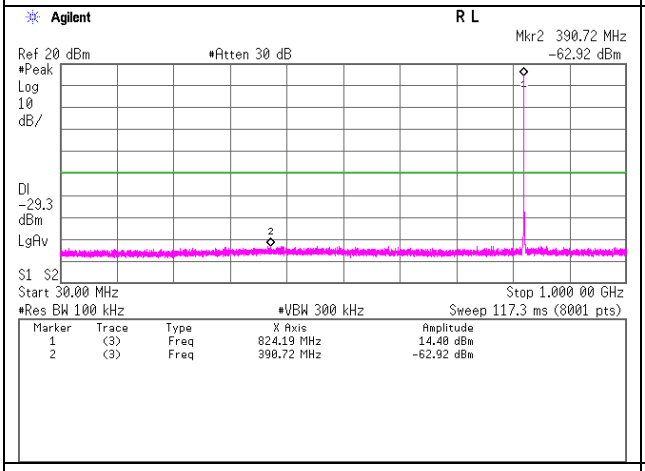
9kHz-150kHz



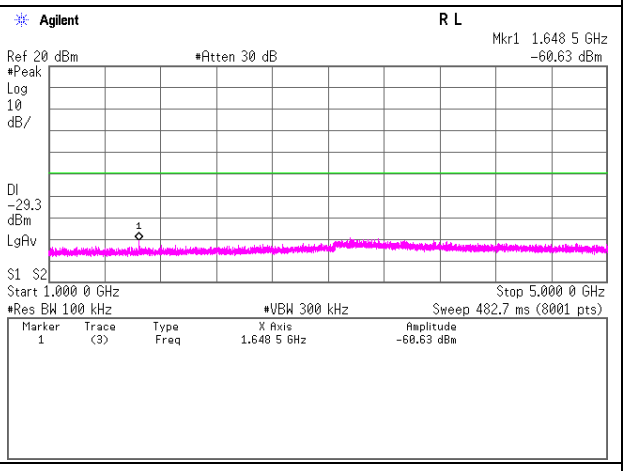
150kHz-30MHz



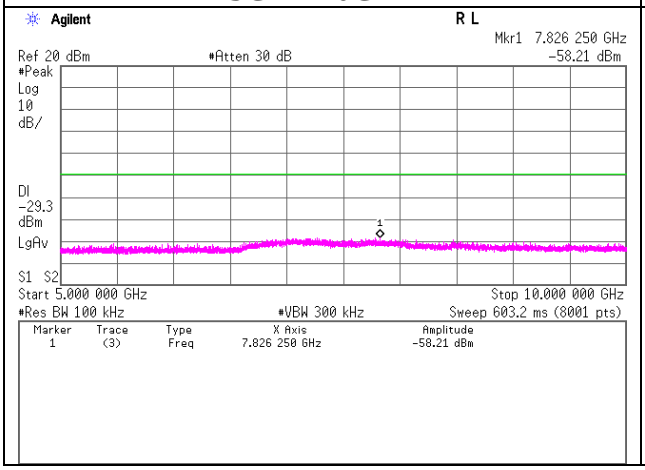
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz

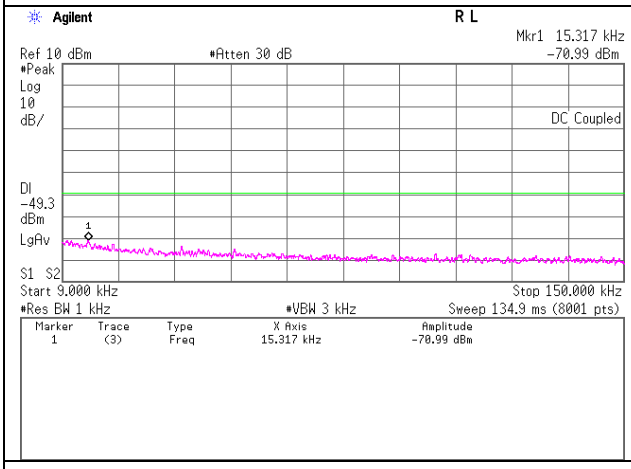


Spurious Emission (Conducted)

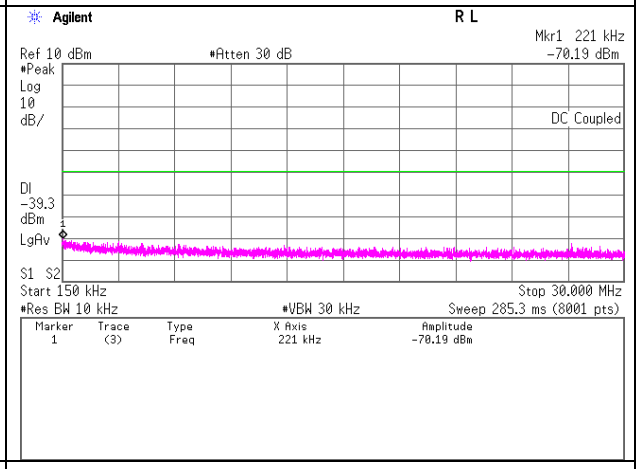
EGPRS

Tx:836.6MHz

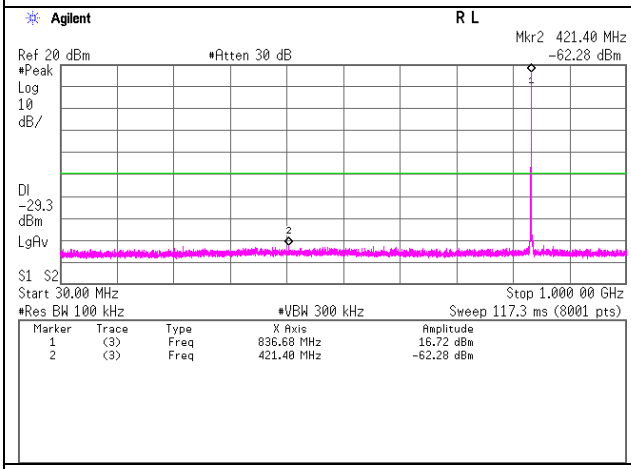
9kHz-150kHz



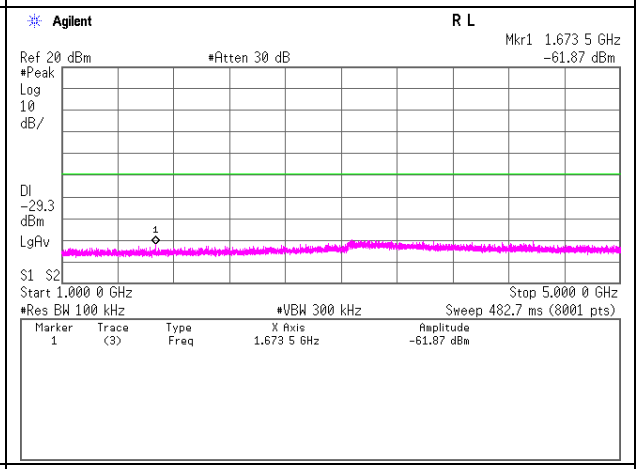
150kHz-30MHz



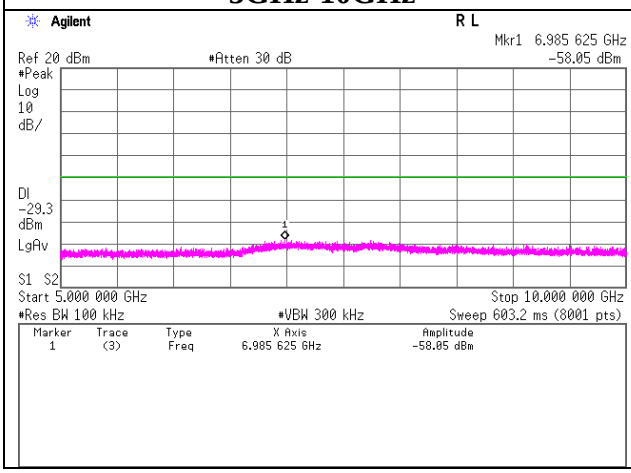
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz

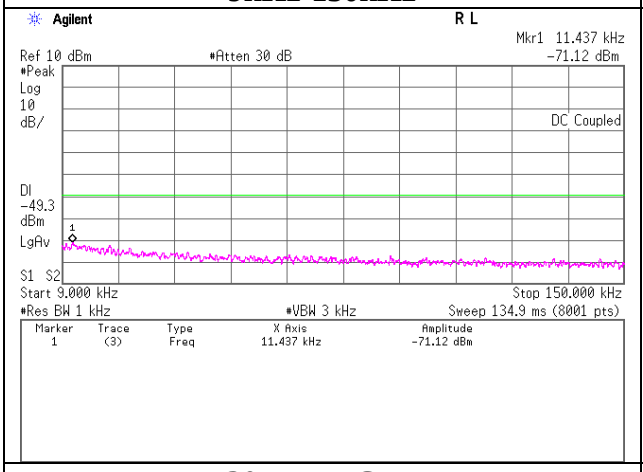


Spurious Emission (Conducted)

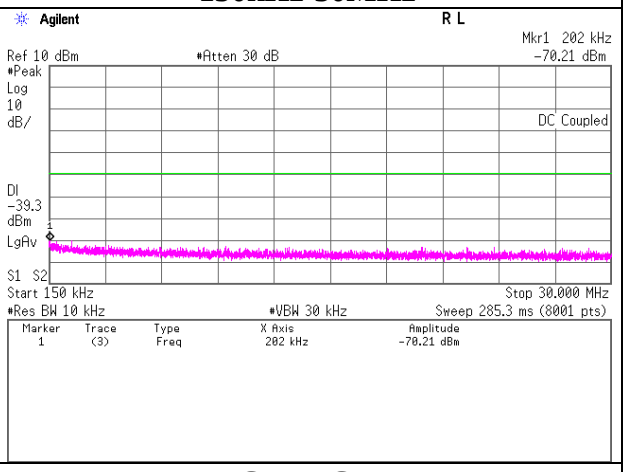
EGPRS

Tx:848.8MHz

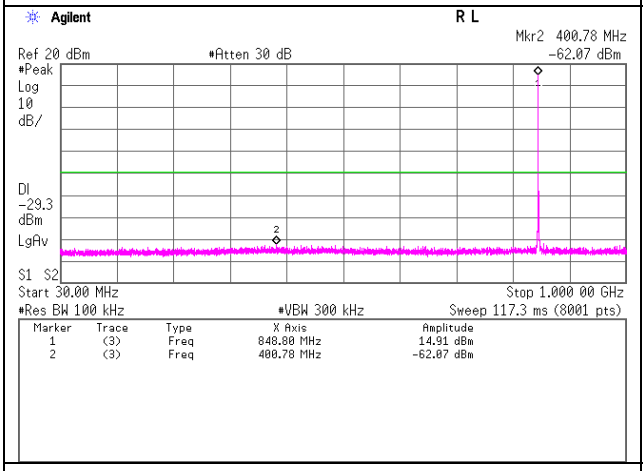
9kHz-150kHz



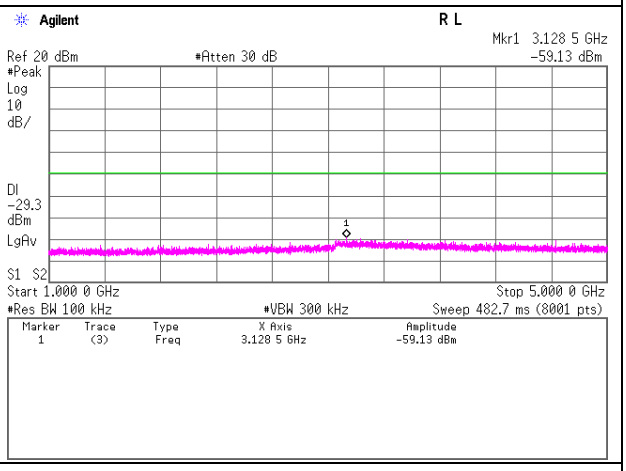
150kHz-30MHz



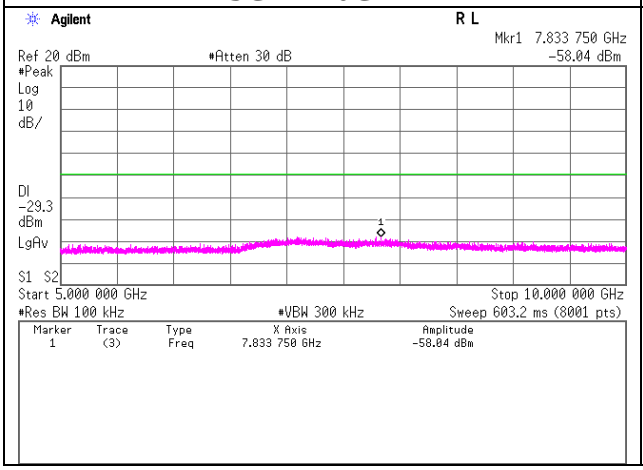
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz



Spurious Emission (Conducted)

W-CDMA Band V

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]
826.4	-13.0	10.00	6.58	-29.6
836.6	-13.0	10.00	6.58	-29.6
846.6	-13.0	10.00	6.58	-29.6

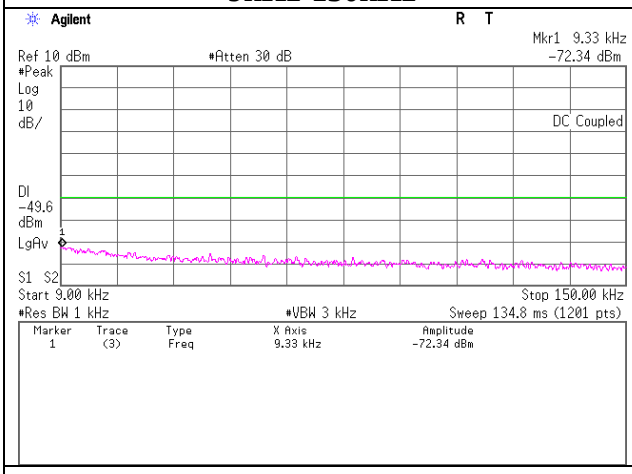
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss
*1)9k-150kHz : RBW factor was applied to Limit Line. (RBW factor=10log(1kHz/100kHz)
*2)150kHz-30MHz : RBW factor was applied to Limit Line. (RBW factor=10log(10kHz/100kHz)

Spurious Emission (Conducted)

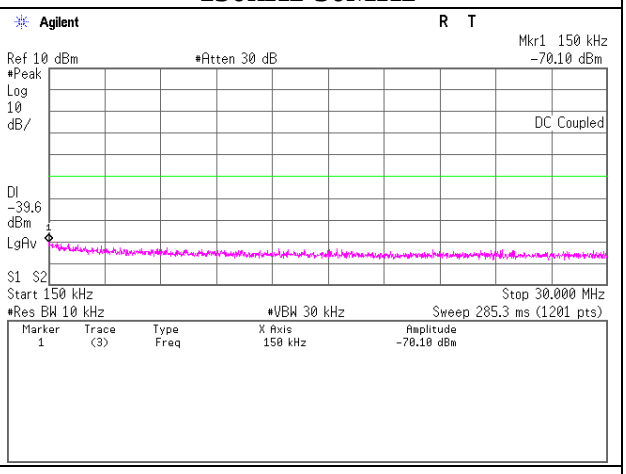
W-CDMA

Tx: 826.4MHz

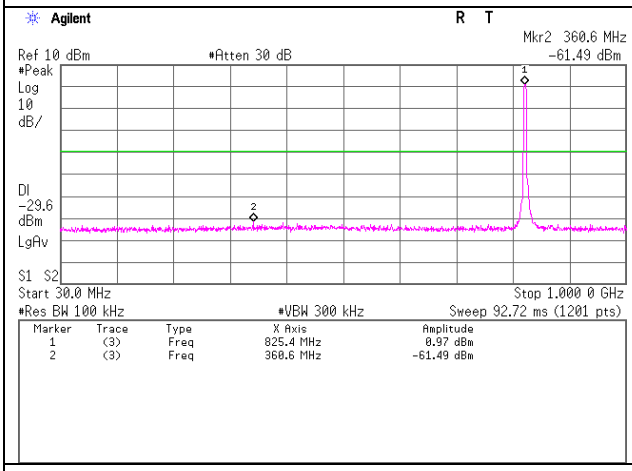
9kHz-150kHz



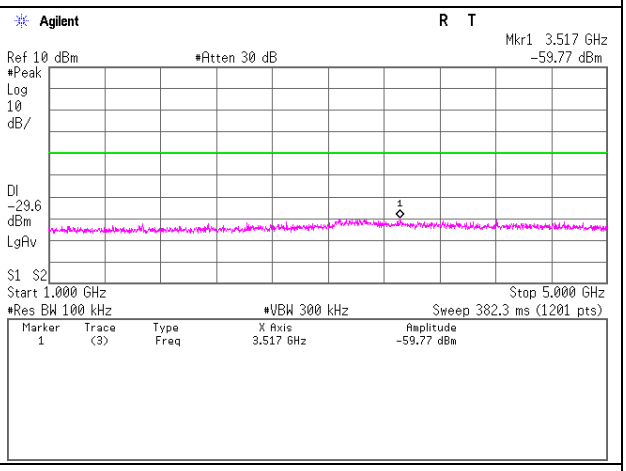
150kHz-30MHz



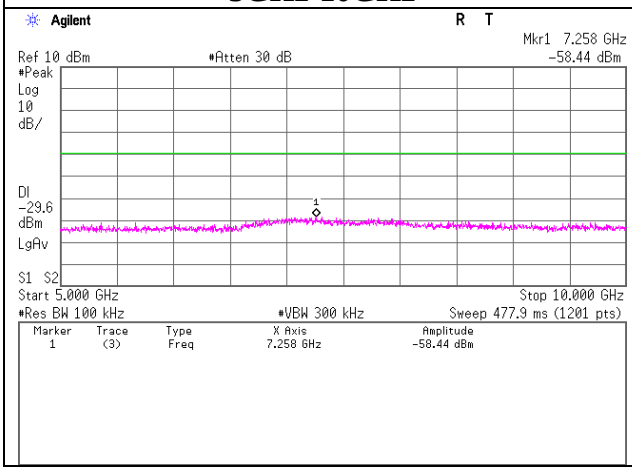
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz

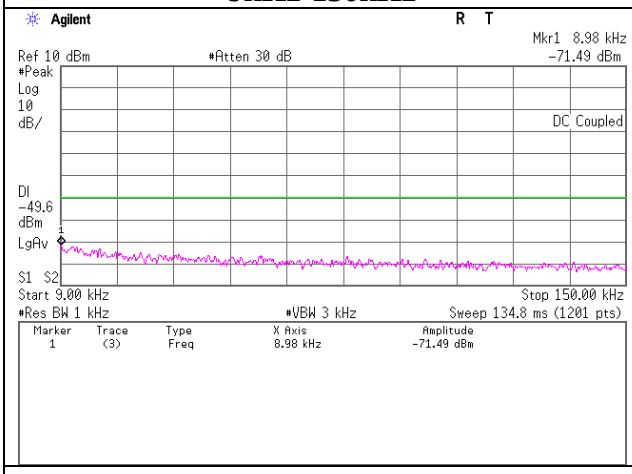


Spurious Emission (Conducted)

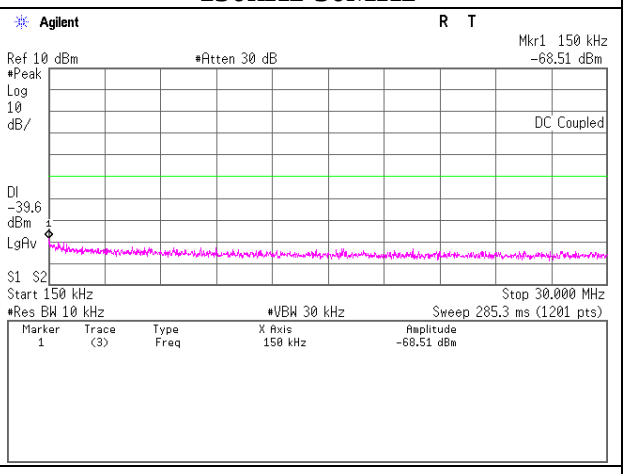
W-CDMA

Tx: 836.6MHz

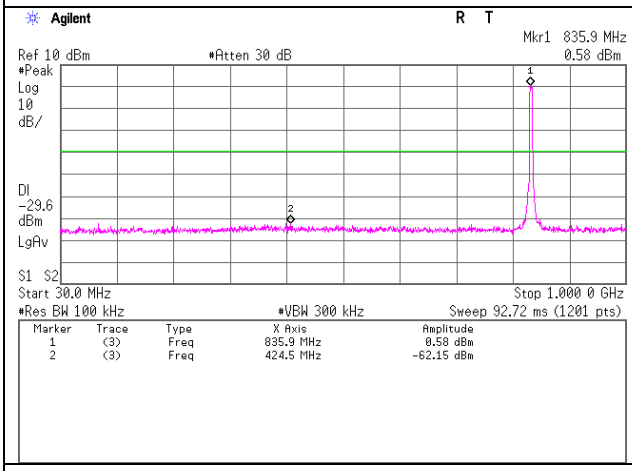
9kHz-150kHz



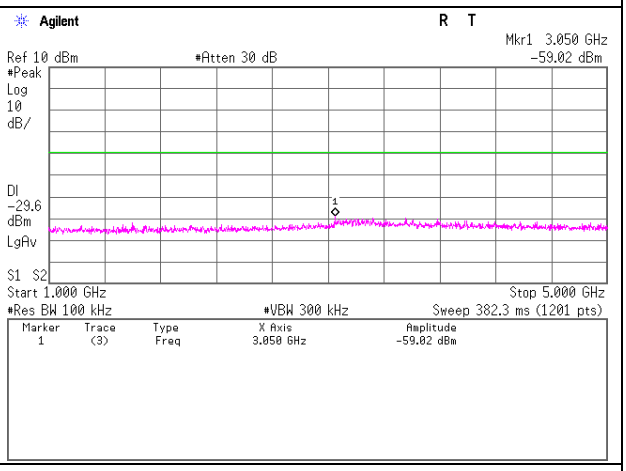
150kHz-30MHz



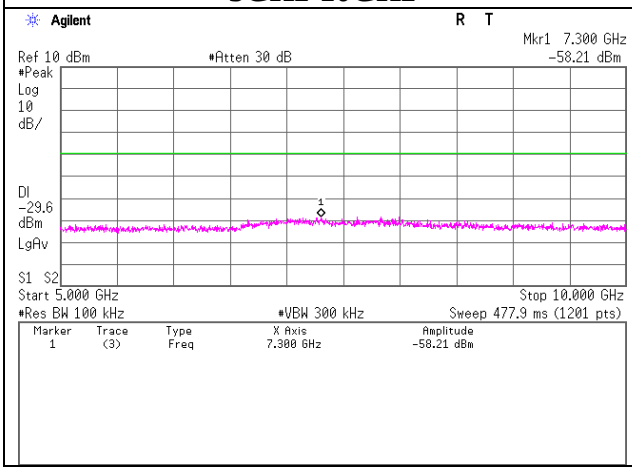
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz

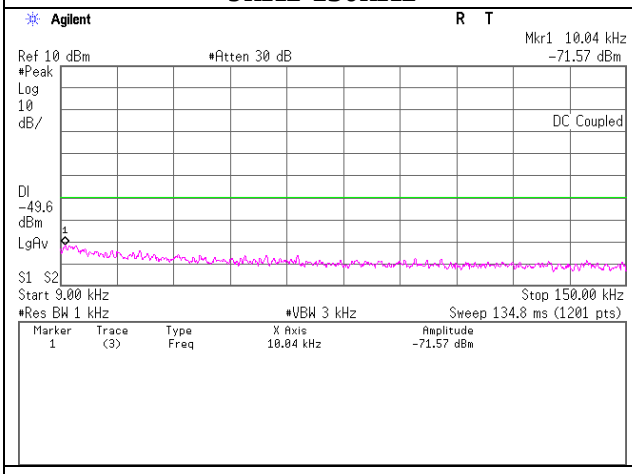


Spurious Emission (Conducted)

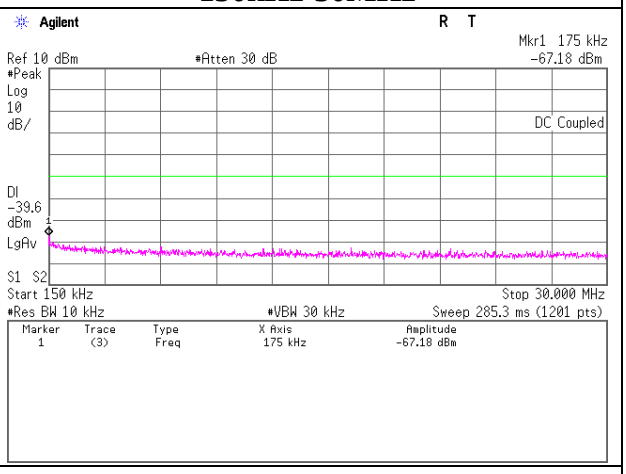
W-CDMA

Tx: 846.6MHz

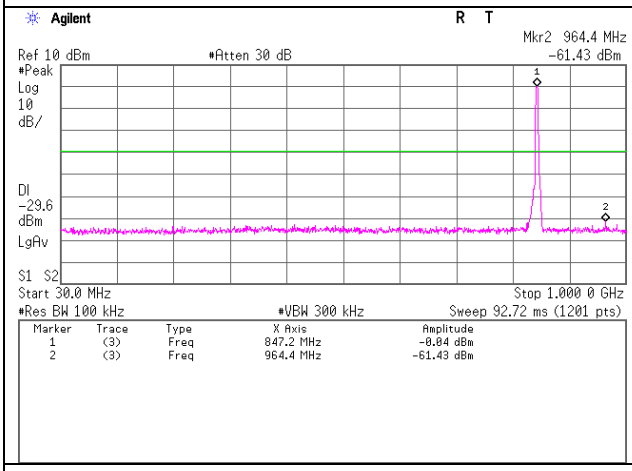
9kHz-150kHz



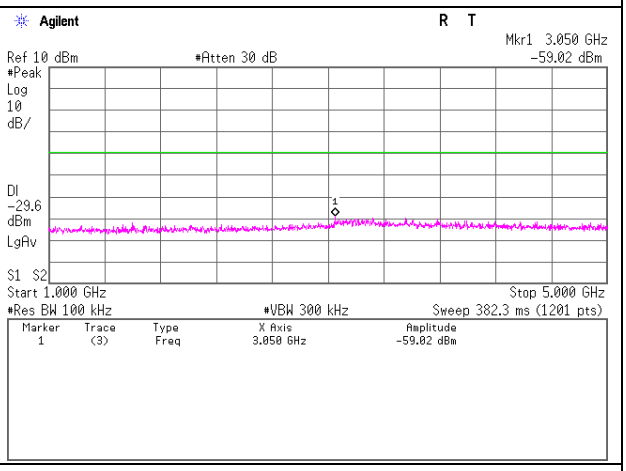
150kHz-30MHz



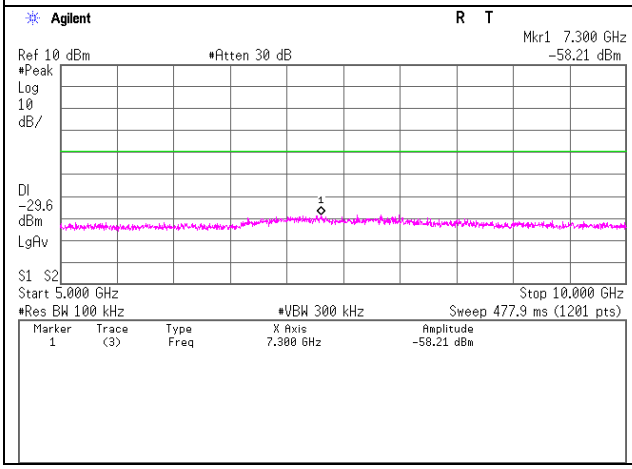
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz



Spurious Emission (Conducted)

LTE Band V

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 LTE(QPSK), BW 10MHz
	Low ch RB1-0, Mid ch RB1-24, High ch RB 1-49

Limit line:

Tx Frequency [MHz]	Limit [dBm]	Atten. [dB]	Cable Loss [dB]	Limit Line *1) *2) [dBm]
829	-13.0	10.00	6.58	-29.6
836.5	-13.0	10.00	6.58	-29.6
844	-13.0	10.00	6.58	-29.6

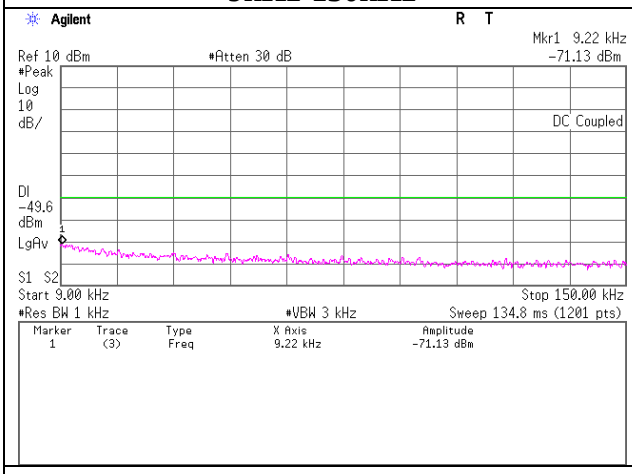
Sample Calculation : Limit Line = Limit - Atten. - Cable Loss
*1)9k-150kHz : RBW factor was applied to Limit Line. (RBW factor=10log(1kHz/100kHz)
*2)150kHz-30MHz : RBW factor was applied to Limit Line. (RBW factor=10log(10kHz/100kHz)

Spurious Emission (Conducted)

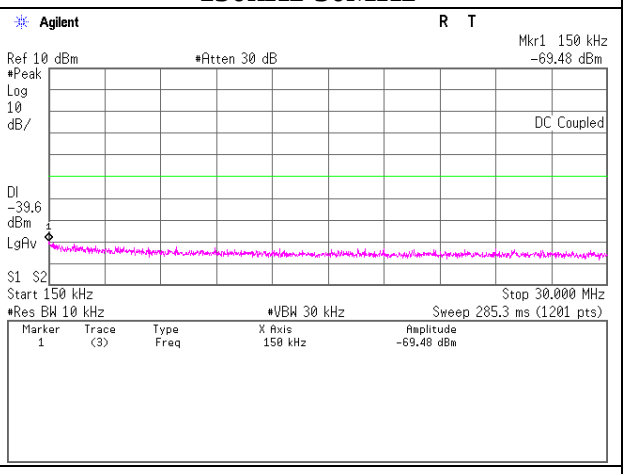
LTE Band V

Tx: 829.0MHz

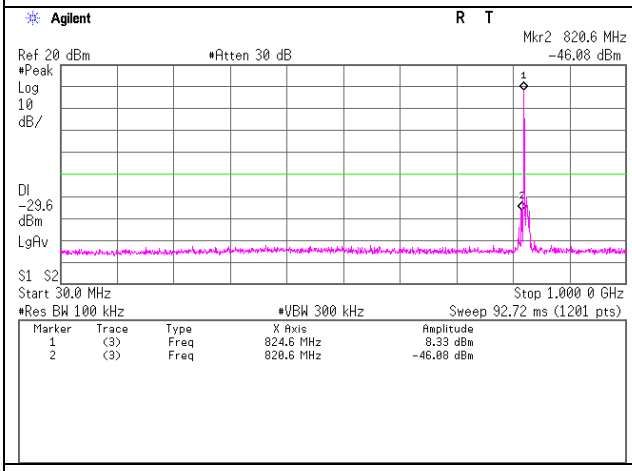
9kHz-150kHz



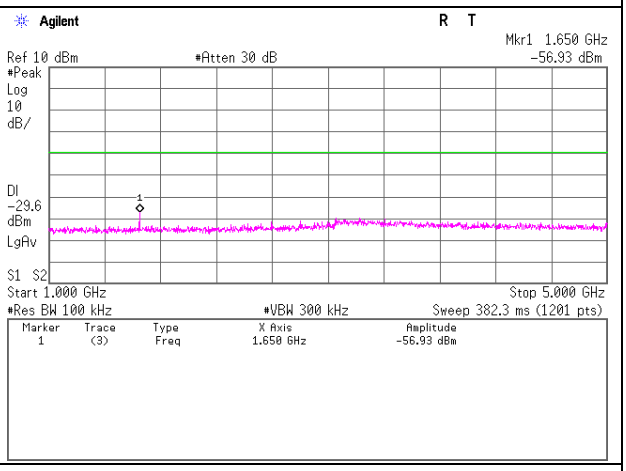
150kHz-30MHz



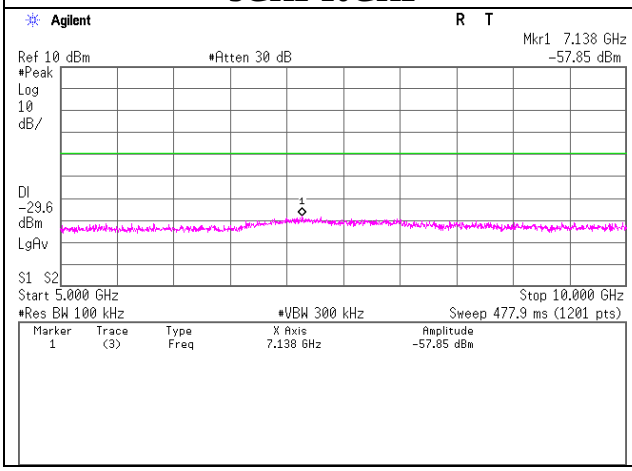
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz

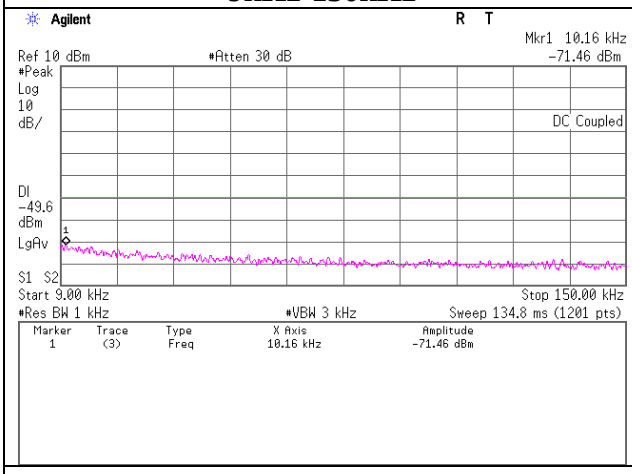


Spurious Emission (Conducted)

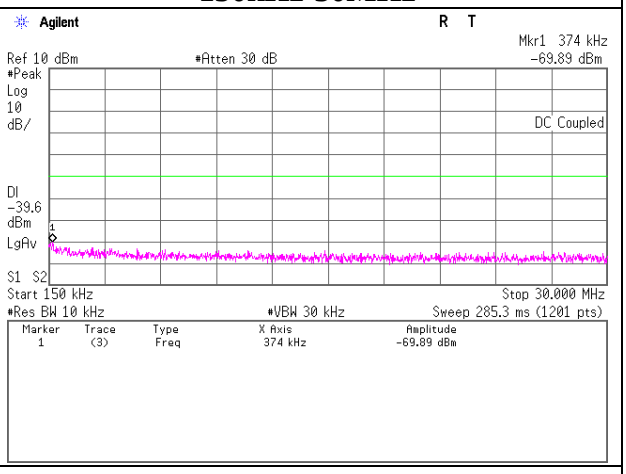
LTE Band V

Tx: 836.5MHz

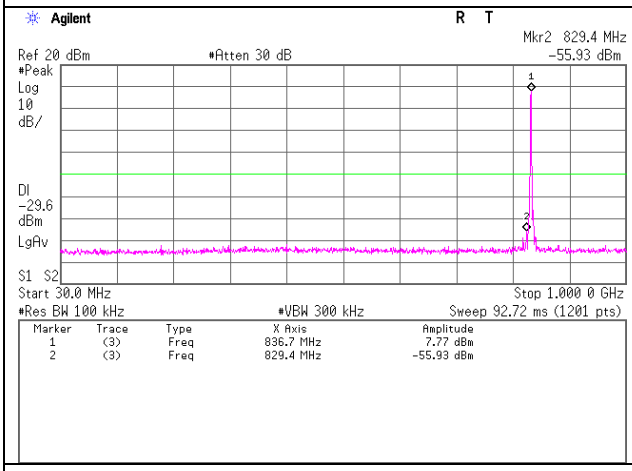
9kHz-150kHz



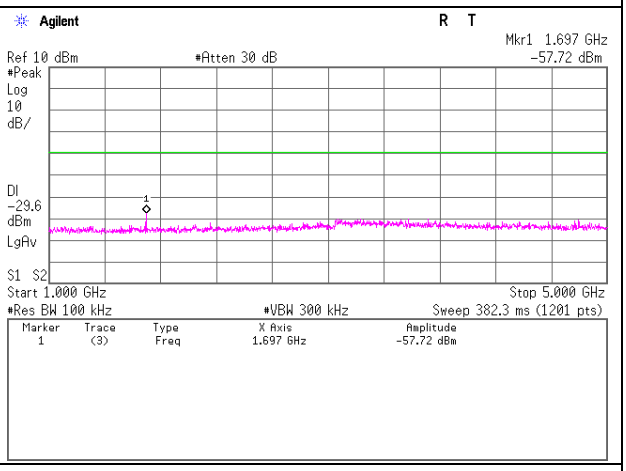
150kHz-30MHz



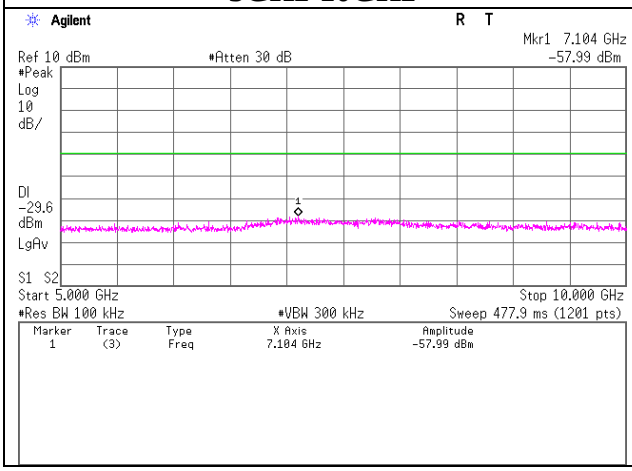
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz

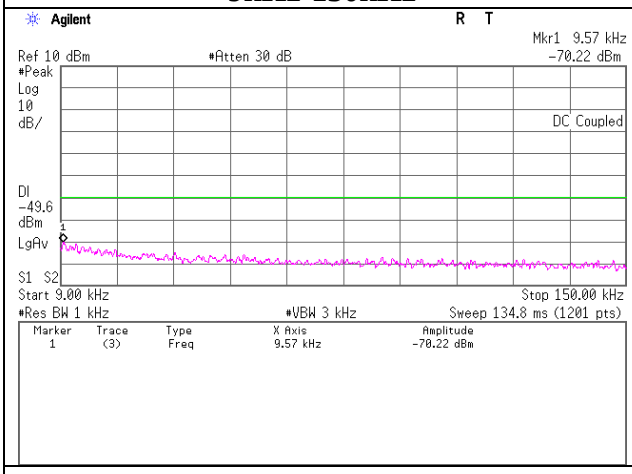


Spurious Emission (Conducted)

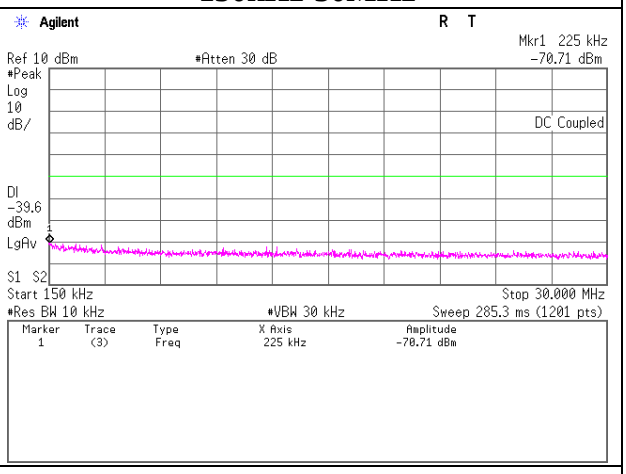
LTE Band V

Tx: 844.0MHz

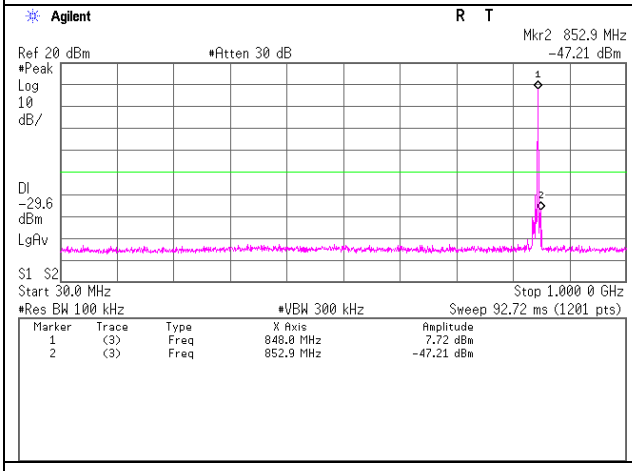
9kHz-150kHz



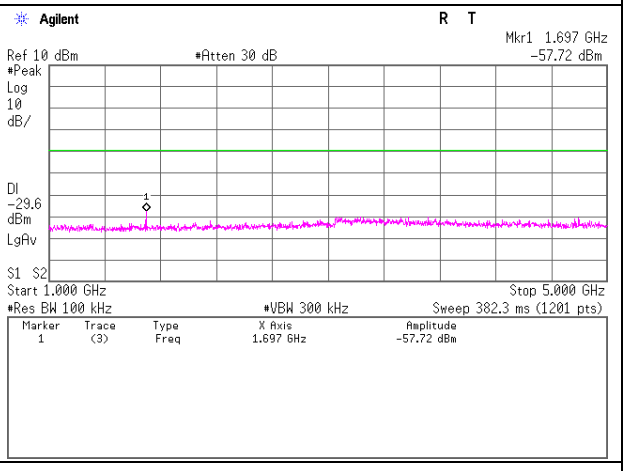
150kHz-30MHz



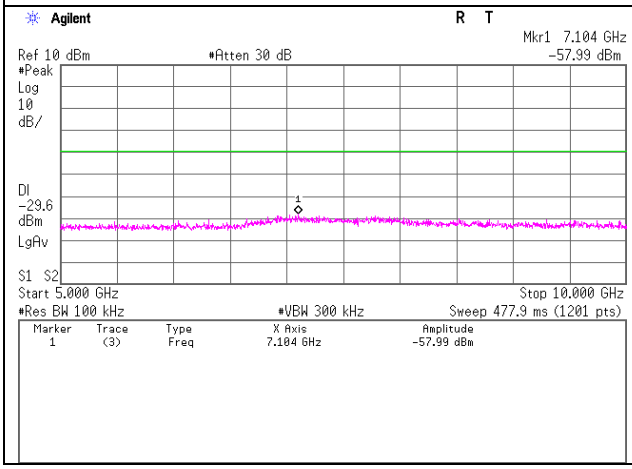
30MHz-1GHz



1GHz-5GHz



5GHz-10GHz



Spurious Emission (Radiated)

GSM850

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	01/21/2015
Temperature / Humidity	23 deg. C / 35 % RH
Engineer	Takumi Shimada
Mode	Tx GSM(GMSK), 1slot, PCL=5

Tx : 824.2MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1648.40	58.1	61.3	-50.9	-45.3	3.4	9.0	0.0	-47.5	-41.9	-13.0	34.5	28.9	100	228	100	0	
2472.60	61.2	55.6	-44.4	-49.6	4.1	11.3	0.0	-39.3	-44.5	-13.0	26.3	31.5	200	45	100	172	
3296.80	41.6	42.2	-76.5	-74.3	4.8	12.5	0.0	-71.0	-68.8	-13.0	58.0	55.8	100	0	100	0	
4121.00	45.6	47.4	-61.5	-54.5	5.4	12.6	0.0	-56.5	-49.5	-13.0	43.5	36.5	152	335	100	0	
4945.20	40.9	47.8	-75.0	-54.3	6.0	13.0	0.0	-70.2	-49.5	-13.0	57.2	36.5	100	268	100	0	
5769.40	44.5	47.8	-55.5	-51.3	6.5	13.5	0.0	-50.7	-46.5	-13.0	37.7	33.5	100	252	105	0	
6593.60	43.5	45.8	-55.8	-51.9	7.0	12.6	0.0	-52.3	-48.4	-13.0	39.3	35.4	100	211	105	300	

Tx : 836.6MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1673.20	57.1	60.4	-51.5	-49.0	3.4	9.1	0.0	-48.0	-45.5	-13.0	35.0	32.5	173	258	184	276	
2509.80	63.9	62.3	-41.4	-42.3	4.1	11.4	0.0	-36.3	-37.2	-13.0	23.3	24.2	178	89	100	7	
3346.40	59.2	55.2	-45.0	-49.5	4.9	12.6	0.0	-39.4	-43.9	-13.0	26.4	30.9	163	26	100	0	
4183.00	43.6	45.1	-60.5	-60.1	5.5	12.6	0.0	-55.5	-55.1	-13.0	42.5	42.1	100	0	100	0	

Tx : 848.8MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1697.60	62.1	63.7	-45.4	-45.6	3.4	9.2	0.0	-41.8	-42.0	-13.0	28.8	29.0	130	224	100	53	
2546.40	59.4	55.4	-46.4	-49.1	4.2	11.4	0.0	-41.4	-44.1	-13.0	28.4	31.1	158	10	100	0	
3395.20	42.5	46.3	-70.4	-60.5	4.9	12.8	0.0	-64.7	-54.8	-13.0	51.7	41.8	100	0	100	0	
5941.60	41.5	44.7	-64.7	-57.6	6.6	13.6	0.0	-59.9	-52.8	-13.0	46.9	39.8	100	156	100	0	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer PK (RBW: 1MHz , VBW: 3MHz)

Spurious Emission (Radiated)

GSM850

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	01/21/2015
Temperature / Humidity	23 deg. C / 35 % RH
Engineer	Takumi Shimada
Mode	Tx EGPRS(8PSK), 1slot, MCS-5, PCL=5

Tx : 824.2MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1648.40	58.9	63.5	-50.1	-43.1	3.4	9.0	0.0	-46.7	-39.7	-13.0	33.7	26.7	100	221	100	50	
2472.60	57.1	53.7	-48.5	-51.5	4.1	11.3	0.0	-43.4	-46.4	-13.0	30.4	33.4	200	45	100	157	

Tx : 836.6MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1673.20	61.0	61.7	-47.6	-47.7	3.4	9.1	0.0	-44.1	-44.2	-13.0	31.1	31.2	133	221	100	0	
2509.80	53.7	62.3	-51.6	-51.9	4.1	11.4	0.0	-46.5	-46.8	-13.0	33.5	33.8	198	19	116	160	

Tx : 848.8MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1697.60	58.7	61.3	-48.8	-48.0	3.4	9.2	0.0	-45.2	-44.4	-13.0	32.2	31.4	100	144	100	0	
2546.40	57.1	52.8	-48.7	-51.7	4.2	11.4	0.0	-43.7	-46.7	-13.0	30.7	33.7	116	143	100	283	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer PK (RBW: 1MHz , VBW: 3MHz)

Spurious Emission (Radiated)

W-CDMA Band V

Report No.	10636726H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	01/21/2015
Temperature / Humidity	23 deg. C / 35 % RH
Engineer	Takumi Shimada
Mode	Tx W-CDMA(RMC12.2kbps),All Up Bits

Tx : 826.4MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1648.40	52.9	55.1	-56.1	-51.5	3.4	9.0	0.0	-52.7	-48.1	-13.0	39.7	35.1	100	183	100	140	
2472.60	44.4	44.9	-61.2	-60.3	4.1	11.3	0.0	-56.1	-55.2	-13.0	43.1	42.2	100	78	100	28	

Tx : 836.6MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1673.20	62.6	65.8	-46.0	-43.6	3.4	9.1	0.0	-42.5	-40.1	-13.0	29.5	27.1	100	240	100	140	
2509.80	46.5	43.4	-58.8	-70.9	4.1	11.4	0.0	-53.7	-65.8	-13.0	40.7	52.8	100	0	100	0	

Tx : 846.6MHz

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1697.60	58.9	59.3	-48.6	-50.0	3.4	9.2	0.0	-45.0	-46.4	-13.0	32.0	33.4	100	145	124	187	
2546.40	45.9	43.2	-59.9	-61.3	4.2	11.4	0.0	-54.9	-56.3	-13.0	41.9	43.3	100	0	100	0	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Detector : Spectrum Analyzer PK (RBW: 1MHz , VBW: 3MHz)

Spurious Emission (Radiated)

LTE Band V

Report No.	10636726H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
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 V, BW 10MHz	

Tx : 829.0MHz (RB1-0)

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.]	
1658.00	67.2	58.6	-45.2	-52.7	3.4	8.7	0.0	-42.0	-49.5	-13.0	29.0	36.5	102	345	100	181	
2487.00	49.2	48.9	-59.6	-61.5	4.1	10.2	0.0	-55.7	-57.6	-13.0	42.7	44.6	102	312	102	189	
3316.00	46.9	46.9	-61.4	-62.2	4.8	11.7	0.0	-56.7	-57.5	-13.0	43.7	44.5	100	332	104	186	
4145.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
4974.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
5803.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6632.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
7461.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
8290.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Tx : 836.5MHz (RB1-24)

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1673.00	68.9	61.2	-43.7	-49.5	3.4	8.8	0.0	-40.5	-46.3	-13.0	27.5	33.3	101	342	100	186	
2509.50	51.2	52.9	-55.5	-56.7	4.1	10.2	0.0	-51.6	-52.8	-13.0	38.6	39.8	102	314	104	189	
3346.00	46.4	46.0	-61.9	-63.1	4.9	11.7	0.0	-57.2	-58.4	-13.0	44.2	45.4	100	333	102	188	
4182.50	NS	NS	-	-	5.5	12.1	0.0	-	-	-13.0	-	-	-	-	-	-	
5019.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
5855.50	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6692.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
7528.50	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
8365.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Tx : 844.0MHz (RB1-49)

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.]	
1688.00	68.9	62.3	-43.3	-48.4	3.4	8.9	0.0	-40.0	-45.1	-13.0	27.0	32.1	101	342	100	182	
2532.00	50.2	51.2	-56.5	-57.9	4.2	10.3	0.0	-52.5	-53.9	-13.0	39.5	40.9	102	314	103	188	
3376.00	46.5	46.9	-62.0	-62.2	4.9	11.8	0.0	-57.3	-57.5	-13.0	44.3	44.5	100	333	102	188	
4220.00	45.4	45.1	-62.9	-62.5	5.5	12.1	0.0	-58.4	-58.0	-13.0	45.4	45.0	100	333	105	176	
5064.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
5908.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6752.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
7596.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
8440.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

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

Frequency Stability(Temperature/Voltage Variation)

GSM850 / Tx: 836.6MHz

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	836.6000274	16.3	0.0195	2.5
-20	3.80	836.6000240	12.9	0.0155	2.5
-10	3.80	836.6000168	5.8	0.0069	2.5
0	3.80	836.6000242	13.1	0.0157	2.5
10	3.80	836.6000172	6.2	0.0074	2.5
20	3.80	836.6000111	0.0	0.0000	Reference
30	3.80	836.6000130	2.0	0.0024	2.5
40	3.80	836.6000190	7.9	0.0095	2.5
50	3.80	836.6000187	7.6	0.0091	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	4.20	836.6000084	-2.6	-0.0032	2.5
20	3.80	836.6000111	0.0	0.0000	Reference
20	3.00	836.6000111	0.0	0.0000	2.5

Frequency Stability(Temperature/Voltage Variation)

GSM850 / Tx: 836.6MHz

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	836.6000230	4.1	0.0049	2.5
-20	3.80	836.6000145	-4.5	-0.0053	2.5
-10	3.80	836.6000202	1.2	0.0015	2.5
0	3.80	836.6000162	-2.7	-0.0032	2.5
10	3.80	836.6000165	-2.5	-0.0029	2.5
20	3.80	836.6000189	0.0	0.0000	Reference
30	3.80	836.6000213	2.4	0.0029	2.5
40	3.80	836.6000208	1.9	0.0023	2.5
50	3.80	836.6000189	-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	836.6000230	4.1	0.0049	2.5
20	3.80	836.6000189	0.0	0.0000	Reference
20	3.00	836.6000213	2.4	0.0029	2.5

Frequency Stability(Temperature/Voltage Variation)

W-CDMA Band V / Tx: 836.6MHz

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	836.5999990	-0.6	-0.0007	2.5
-20	3.80	836.5999996	0.0	0.0000	2.5
-10	3.80	836.6000000	0.4	0.0005	2.5
0	3.80	836.6000000	0.4	0.0005	2.5
10	3.80	836.5999999	0.3	0.0004	2.5
20	3.80	836.5999996	0.0	0.0000	Reference
30	3.80	836.5999997	0.1	0.0001	2.5
40	3.80	836.5999995	-0.1	-0.0001	2.5
50	3.80	836.5999996	0.0	0.0000	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	4.20	836.5999997	0.1	0.0001	2.5
20	3.80	836.5999996	0.0	0.0000	Reference
20	3.00	836.6000000	0.4	0.0005	2.5

Frequency Stability(Temperature/Voltage Variation)

LTE Band V / Tx: 836.5MHz

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 10MHz, RB50-0

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30	3.80	836.4999985	-0.2	-0.0003	2.5
-20	3.80	836.4999992	0.5	0.0006	2.5
-10	3.80	836.5000002	1.4	0.0017	2.5
0	3.80	836.4999995	0.8	0.0009	2.5
10	3.80	836.4999993	0.5	0.0006	2.5
20	3.80	836.4999987	0.0	0.0000	Reference
30	3.80	836.4999979	-0.9	-0.0011	2.5
40	3.80	836.4999980	-0.7	-0.0009	2.5
50	3.80	836.4999984	-0.3	-0.0003	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	4.20	836.4999976	-1.2	-0.0014	2.5
20	3.80	836.4999987	0.0	0.0000	Reference
20	3.00	836.4999988	0.1	0.0001	2.5

Frequency Stability(Temperature/Voltage Variation)

LTE Band V / Tx: 836.5MHz

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 10MHz, RB50-0

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
-30	3.80	836.4999983	-0.3	-0.0004	2.5
-20	3.80	836.4999996	1.0	0.0012	2.5
-10	3.80	836.4999999	1.3	0.0015	2.5
0	3.80	836.4999995	0.9	0.0011	2.5
10	3.80	836.4999991	0.5	0.0006	2.5
20	3.80	836.4999986	0.0	0.0000	Reference
30	3.80	836.4999984	-0.2	-0.0003	2.5
40	3.80	836.4999993	0.6	0.0008	2.5
50	3.80	836.4999990	0.4	0.0004	2.5

Temp. [deg.C]	Volt. [V]	Frequency Reading [MHz]	Frequency Error [Hz]	Frequency Error [ppm]	Limit [ppm]
20	4.20	836.4999985	-0.1	-0.0001	2.5
20	3.80	836.4999986	0.0	0.0000	Reference
20	3.00	836.4999982	-0.4	-0.0004	2.5

APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2014/02/28 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	RE	2015/01/13 * 12
MJM-23	Measure	ASKUL	-	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	100084	RE	2014/11/10 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2014/11/22 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2014/11/22 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2014/06/02 * 12
MAT-68	Attenuator	Anritsu	MP721B	6200961025	RE	2014/11/11 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2014/03/14 * 12
YTSSG03	Signal Generator	Rohde & Schwarz	SMT02	51400043	RE	2014/08/18 * 12
MCC-127	Coaxial Cable	UL Japan	-	-	RE	2014/07/15 * 12
MDA-03	Dipole Antenna	Schwarzbeck	UHAP	991	RE	2014/10/06 * 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
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
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
MCC-125	Coaxial Cable	UL Japan	-	-	RE	2014/07/15 * 12
SURC-01	Radio Communication Analyzer	Anritsu	MT8820C	6201274351	RE	2014/05/20 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2014/08/12 * 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
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2014/07/23 * 12
MHF-27	High Pass Filter(1.1-10GHz)	TOKYO KEIKI	TF219CD1	1001	RE	2015/01/23 * 12
MURC-05	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	127576	AT	2014/11/25 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2014/10/16 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2014/10/15 * 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