

# TEST REPORT

For

**Mobile Phone**

In conformity with

**FCC CFR 47 Part15**

**Model: KYY04**

**FCC ID: JOYKYY04**

**Test Item: Mobile Phone**

**Report No: RY1205Z27R1**

**Issue Date: 27 May, 2012**

**Prepared for**

KYOCERA Corporation  
Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku, Yokohama-shi,  
Kanagawa 224-8502, Japan

**Prepared by**

RF Technologies Ltd.  
472, Nippa-cho, Kohoku-ku, Yokohama, 223-0057, Japan  
Telephone: +81+(0)45- 534-0645  
FAX: +81+(0)45- 534-0646

**This report shall not be reproduced, except in full, without the written permission of RF Technologies Ltd. The test results in this report apply only to the sample tested. RF Technologies Ltd. is managed to ISO17025 and has the necessary knowledge and test facilities for testing according to the referenced standards.**

## Table of contents

<b>1</b>	<b>General information.....</b>	<b>3</b>
1.1	Product description .....	3
1.2	Test(s) performed/ Summary of test result .....	3
1.3	Test facility .....	4
1.4	Measurement uncertainty.....	4
1.5	Summary of test results.....	5
1.5.1	Table of test summary.....	5
1.6	Setup of equipment under test (EUT) .....	5
1.6.1	Test configuration of EUT .....	5
1.6.2	Operating condition: .....	5
1.6.3	Setup diagram of tested system:.....	6
1.7	Equipment modifications .....	6
1.8	Deviation from the standard .....	6
<b>2</b>	<b>Test procedure and test data .....</b>	<b>7</b>
2.1	Transmitter Radiated spurious emissions .....	7
2.1.1	Below 30 MHz.....	9
2.1.2	Between 30 – 1000 MHz .....	10
2.1.3	Above 1000 MHz.....	12
<b>3</b>	<b>Test setup photographs .....</b>	<b>13</b>
3.1	Definition of the EUT axis and EUT style.....	13
3.2	Radiated spurious emissions .....	15
<b>4</b>	<b>List of utilized test equipment/ calibration .....</b>	<b>16</b>

## History

Report No.	Date	Revisions	Issued By
RY1205Z27R1	27 May, 2012	Initial Issue	K. Ohnishi

## 1 General information

### 1.1 Product description

Test item : Mobile phone  
Manufacturer : KYOCERA Corporation, Hokkaido Kitami Plant  
Address : 30 Hoji, Kitami, Hokkaido 099-1595 Japan  
Model : KYY04  
FCC ID : JOYKYY04  
Serial numbers : 352280050026720  
Frequency range : 5150-5250MHz (W52), 5250-5350MHz (W53), 5470-5725MHz (W56)  
Oscillator frequencies : 37.4 MHz, 19.2 MHz  
Type of Modulation : OFDM  
Antenna Gain : 0 dBi (Internal)  
Receipt date of EUT : 25 May, 2012  
Nominal power source voltages : DC 3.8V (Battery)

### 1.2 Test(s) performed/ Summary of test result

Test specification(s) : FCC CFR 47. Part 15 (October 1, 2010)  
Test method(s) : ANSI C63.4: 2003  
Test(s) started : 25 May, 2012  
Test(s) completed : 26 May, 2012  
Purpose of test(s) : Grant for Certification of FCC

Summary of test result : Complied

Note: The above judgment is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result.

The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory.

Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

Test engineer

:   
K. Ohnishi  
EMC testing Department

Reviewer

:   
T. Ikegami  
Manager  
EMC testing Department

### 1.3 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at RF Technologies Ltd., located in 472, Nippa-cho, Kohoku-ku, Yokohama, 223-0057, Japan, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948, per October 1, 2010. The description of the test facilities has been filed under registration number 319924 at the Office of the Federal Communications Commission. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at <http://www.fcc.gov>.

Registered by Voluntary Control Council for Interference by Information Technology Equipment (VCCI)

Each registered facility number is as follows;

Test site (Semi-Anechoic chamber 3m) R-2393

Test site (Shielded room) C-2617

Registered by Industry Canada (IC): The registered facility number is as follows;

Test site No. 1 (Semi-Anechoic chamber 3m): 6974A-1

### 1.4 Measurement uncertainty

The treatment of uncertainty is based on the general matters on the definition of uncertainty in “Guide to the expression of uncertainty in measurement (GUM)” published by ISO. The Lab’s uncertainty is determined by referring UKAS Publication LAB34: 2002 “The Expression of Uncertainty in EMC Testing” and CISPR16-4-2: 2003 “Uncertainty in EMC Measurements”.

The uncertainty of the measurement result in the level of confidence of approximately 95% ( $k=2$ ) is as follows;

Radiated emission (9 kHz - 30 MHz): +/- 2.8dB

Radiated emission (30 MHz - 1000 MHz): +/- 5.9dB

Radiated emission (1GHz -): +/- 5.9dB

## 1.5 Summary of test results

### 1.5.1 Table of test summary

Requirement of;	Section in FCC15	Result	Section in this report
1.5.1 Transmitter Radiated Spurious Emissions	15.205(b)/15.209/15.409	Complied	2.1

## 1.6 Setup of equipment under test (EUT)

### 1.6.1 Test configuration of EUT

#### Equipment(s) under test:

	Item	Brand	Model No.	Serial No.	Remarks
A	Mobile phone	KYOCERA	KYY04	352280050026720	EUT
B	Li-ion Battery Pack	au	KYY04UAA	-	3.7V, 1500mAh

#### Support Equipment(s):

	Item	Manufacturer	Model No.	Serial No.
C	AC Adapter	Hoshiden	0301PQA	-

#### Connected cable(s):

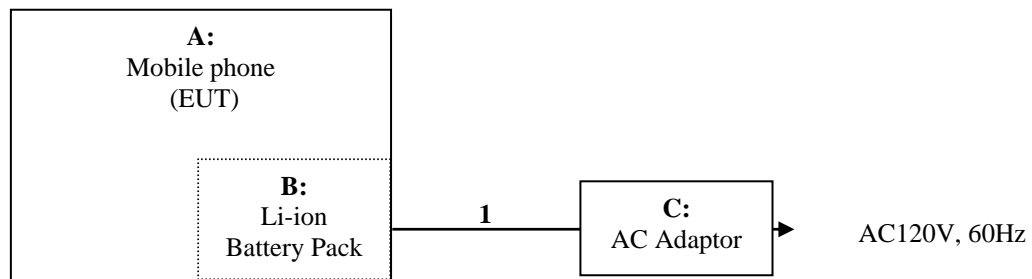
No.	Item	Identification (Manu.e.t.c)	Shielded YES / NO	Ferrite Core YES / NO	Connector Type Shielded YES / NO	Length (m)
1	DC power cable	-	No	No	No	1.0

### 1.6.2 Operating condition:

#### Operating mode:

The EUT was tested under the following test mode prepared by the applicant:

- (1-1) 802.11a (Data rate: 6, 9, 12, 18, 24, 36, 48, 54Mbps)
  - Continuous transmission (W52: 5180, 5200, 5240MHz)
  - Continuous transmission (W53: 5260, 5300, 5320MHz)
  - Continuous transmission (W56: 5500, 5600, 5700MHz)
- (1-2) 802.11n (Data rate: 7.22, 14.44, 21.67, 28.89, 43.33, 57.78, 65, 72.22Mbps)
  - Continuous transmission (W52: 5180, 5200, 5240MHz)
  - Continuous transmission (W53: 5260, 5300, 5320MHz)
  - Continuous transmission (W56: 5500, 5600, 5700MHz)

**1.6.3 Setup diagram of tested system:****1.7 Equipment modifications**

No modifications have been made to the equipment in order to achieve compliance with the applicable standards described in clause 1.2.

**1.8 Deviation from the standard**

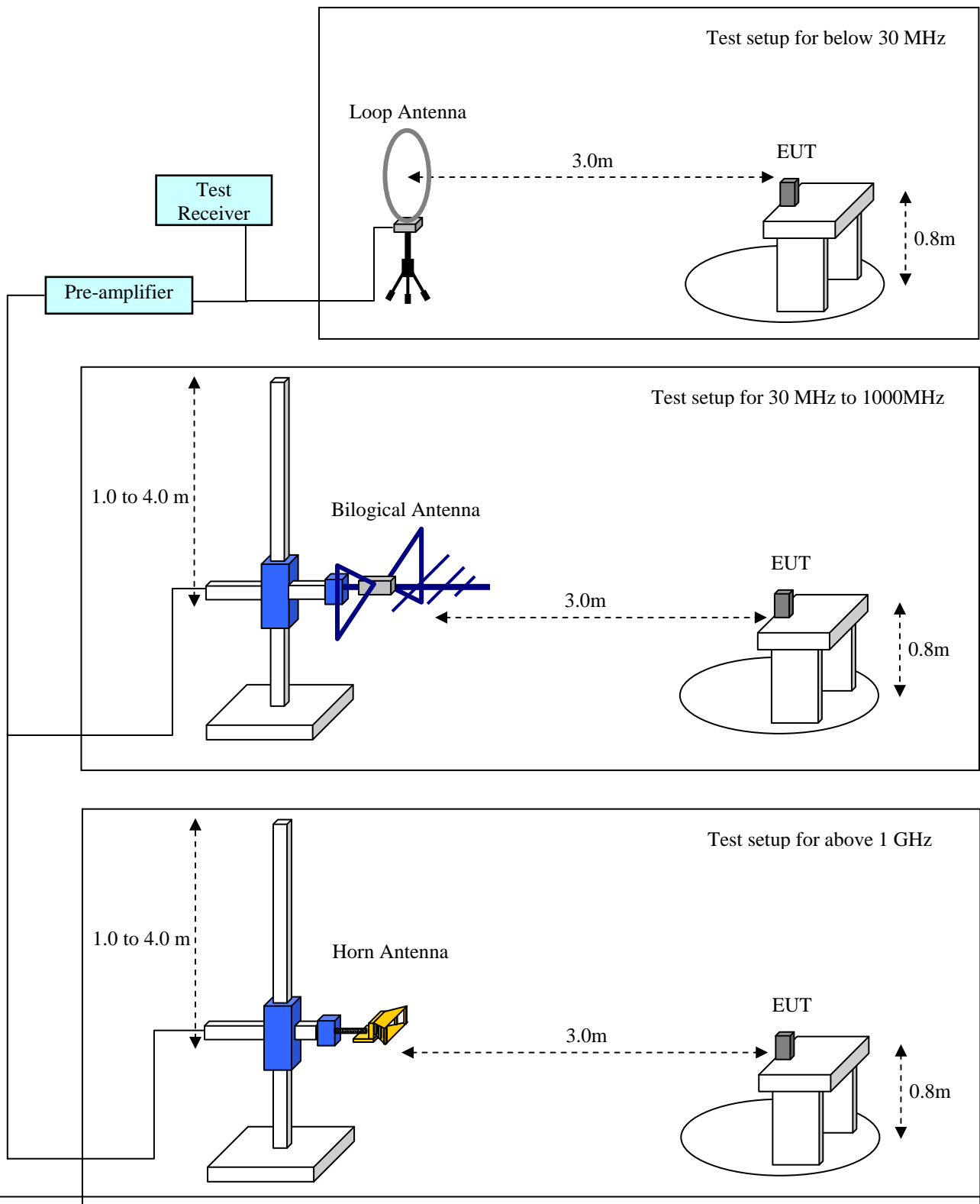
No deviations from the standards described in clause 1.2.

## 2 Test procedure and test data

### 2.1 Transmitter Radiated spurious emissions

#### Test setup

Test setup was implemented according to the method of ANSI C63.4: 2003 clause 6 “General requirements for EUT equipment arrangements and operation”, clause 8.2 and Annex H.3 “Radiated emission measurements setup”.



## Test procedure

Measurement procedures were implemented according to the method of ANSI C63.4: 2003 clauses 8.2. The EUT is placed on a non-conducted table which is 0.8m height from a ground plane and the measurement antenna to EUT distance is 3 meters. The turn table is rotated for 360 degrees to determine the maximum emission level. In the frequency range of 9 kHz to 30 MHz, a calibrated loop antenna was positioned with its plane vertical at the distance 3m from the EUT with an extrapolation of corrected distance factor and rotated about its vertical axis for maximum response at each azimuth about the EUT. For certain applications, the loop antenna also needs to be positioned horizontally. The center of the loop shall be 1 m above the ground. In the frequency above 30 MHz, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. EUT is placed at three different orientations (X, Y and Z axis) in order to find the worst orientation. The spectrum analyzer and receiver are set to the followings;

Below 30 MHz:	RBW=10 kHz, VBW= 30 kHz Final measurement is carried out with a receiver RBW of 9 kHz (QP)
Between 30 - 1000 MHz:	RBW=100 kHz, VBW= 300 kHz Final measurement is carried out with a receiver RBW of 120 kHz (QP)
Above 1000 MHz:	Peak measurement- RBW=1 MHz, VBW= 1 MHz Average measurement – RBW=1 MHz, VBW=10 Hz

## Applicable rule and limitation

§15.205 restricted bands of operation

Except as shown in paragraph 15.205 (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.490 - 0.510	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(1)

15.205(b) except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



15.209 (a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

In the emission table above, the tighter limit applies at the band edges.

The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz.

Radiated emission limits in the above bands are based on measurements employing an average detector.

**Test results** - Complied with requirement.

## Test Data

### 2.1.1 Below 30 MHz

**Test equipment used (refer to List of utilized test equipment)**

LP01	CL11	TR06	
------	------	------	--

Tested Date: 26 May, 2012

Temperature: 21 °C  
Humidity: 58 %  
Atmos. Press: 1010 hPa

## Result

**There is no spurious emission with levels of more than 20 dB below the applicable limit**

**2.1.2 Between 30 – 1000 MHz****Test equipment used (refer to List of utilized test equipment)**

BI01	LA01	CL11	BRF8	CL28	PR08	TR06
------	------	------	------	------	------	------

Tested Date: 26 May, 2012

Temperature: 21 °C

Humidity: 58 %

Atmos. Press: 1010 hPa

Operating mode: Continuous Communication (802.11a, 6Mbps, 5300MHz: Worst configuration)

EUT position: Y-plane (Maximum position)

Measurement distance: 3 m

No.	Frequency [MHz]	Reading [dBuV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna Polarization
1	30.266	46.5	18.6	6.9	49.8	22.2	40.0	17.8	Vert.
2	49.414	52.6	11.6	7.3	49.8	21.7	40.0	18.3	Vert.
3	125.199	50.5	13.3	8.4	49.8	22.4	43.5	21.1	Hori.
<b>4</b>	<b>125.319</b>	<b>54.5</b>	<b>13.3</b>	<b>8.4</b>	<b>49.8</b>	<b>26.4</b>	<b>43.5</b>	<b>17.1</b>	<b>Vert.</b>
5	128.074	46.5	13.6	8.4	49.8	18.7	43.5	24.8	Vert.
6	166.727	46.0	15.5	8.8	49.8	20.5	43.5	23.0	Hori.

**Calculation method**

The Correction Factors and RESULT are calculated as followings.

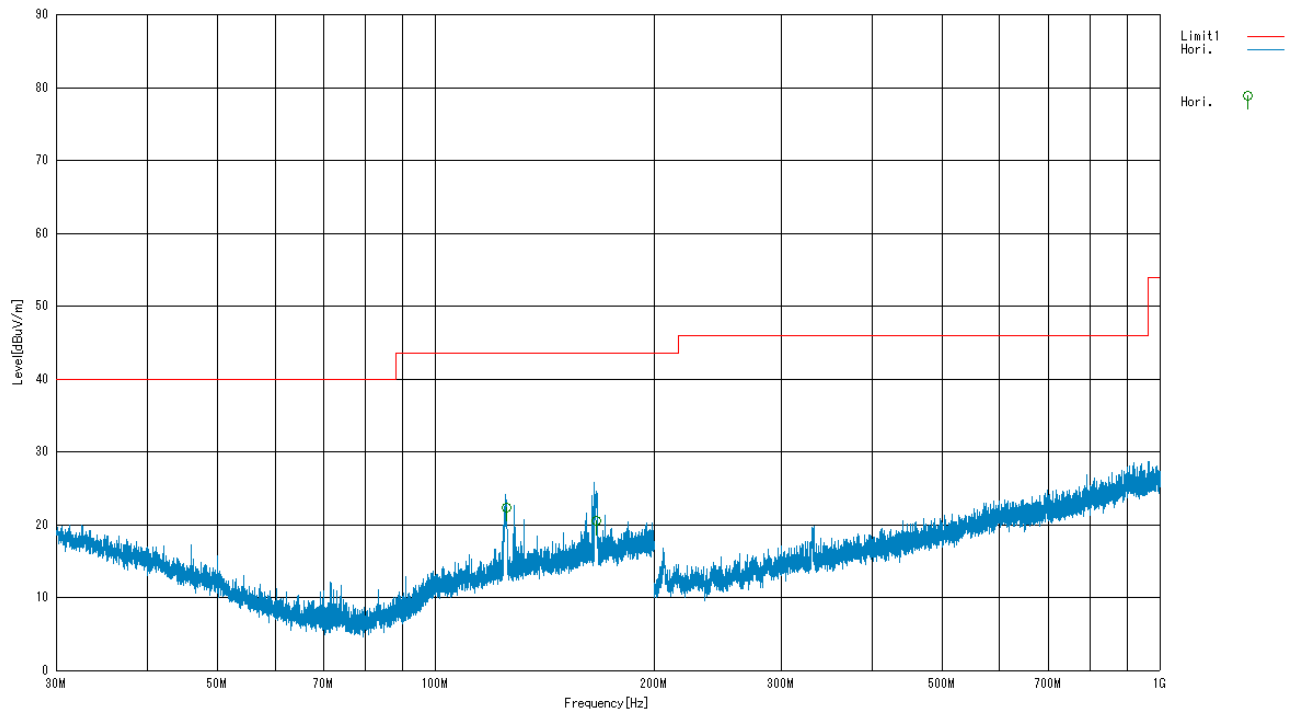
$$\text{Correction Factor [dB/m]} = \text{FACTOR [dB/m]} + \text{LOSS [dB]} - \text{GAIN [dB]}$$
$$\text{RESULT [dBuV/m]} = \text{READING [dBuV]} + \text{Correction Factor [dB/m]}$$

Sample calculation at 331.439 MHz vertical result as follow:

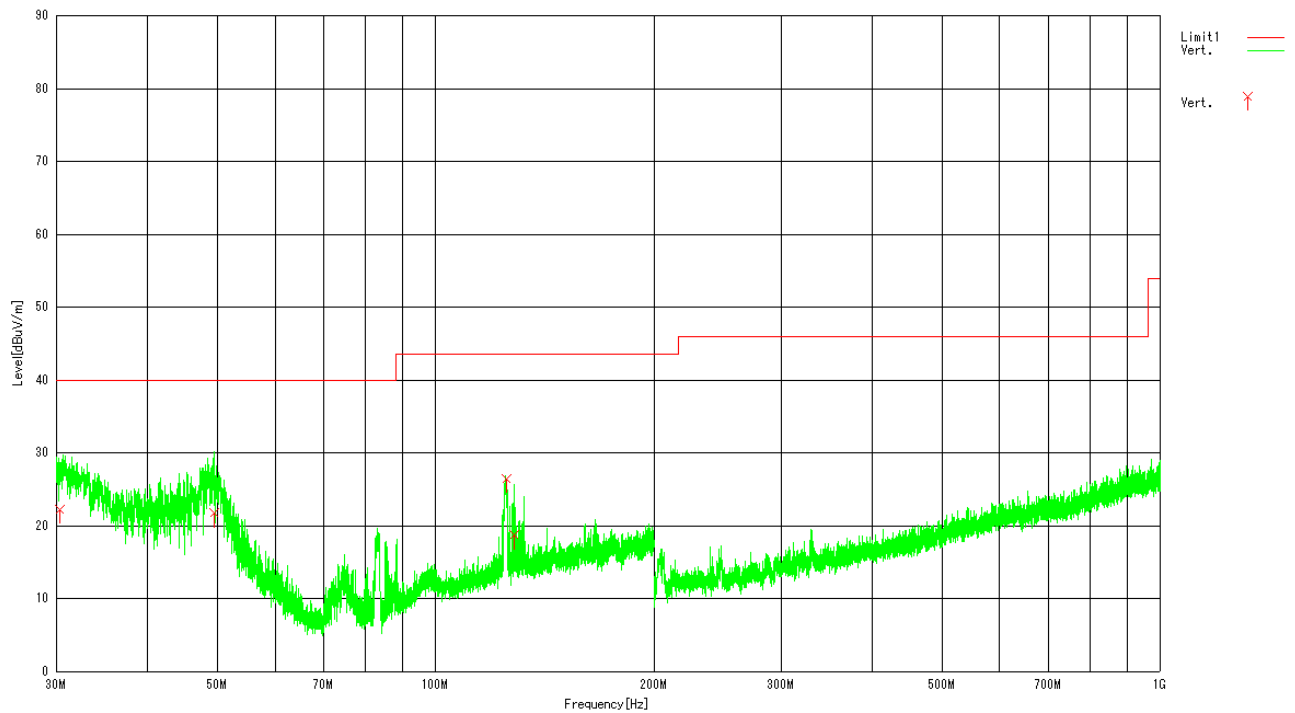
$$\text{Result [dBuV/m]} = \text{Reading} + \text{C.F} = 54.5 + 13.6 + 8.4 - 49.8 = 26.4$$
$$\text{Margin} = \text{Limit} - \text{Result} = 43.5 - 26.4 = 17.1 \text{ [dB]}$$

## Graphical express of test result (30MHz-1000MHz)

### Antenna polarization: Horizontal



### Antenna polarization: Vertical



## 2.1.3 Above 1000 MHz

### Test equipment used (refer to List of utilized test equipment)

AC01	BRF8	CL23	CL24	CL28	CL40	CL41	DH01	HPF5
PR12	PR20	SH01	SH03	TR06	SA09R	CH01		

### Harmonics and Spurious Emission above 1000 MHz (Worst configuration)

Tested Date: 25 May, 2012

Temperature: 21 °C  
Humidity: 60 %  
Atmos. Press: 1008 hPa

Operating mode: Continuous Communication (W56: 802.11a, 6Mbps, 5500MHz: Worst configuration)

EUT position: Y-plane (Maximum position)

Measurement distance: 3 m

There are no spurious emissions other than listed below;

No.	Frequency [MHz]	Reading		C.F. [dB]	Result		Limit		Margin		Polarization
		Peak [dBuV]	Ave [dBuV]		Peak [dBuV]	Ave [dBuV]	Peak [dBuV]	Ave [dBuV]	Peak [dB]	Ave [dB]	
1	3666.632	51.1	46.8	-1.1	50.0	45.7	73.9	53.9	23.9	8.2	Hori.
2	3666.632	50.8	46.8	-1.1	49.7	45.7	73.9	53.9	24.2	8.2	Vert.
3	5460.000	43.8	30.0	13.3	57.1	43.3	73.9	53.9	16.8	10.6	Hori.

Tested Date: 26 May, 2012

Temperature: 21 °C  
Humidity: 58 %  
Atmos. Press: 1010 hPa

Operating mode: Continuous Communication (W52: 802.11a, 6Mbps, 5240MHz: Worst configuration)

EUT position: Y-plane (Maximum position)

Measurement distance: 3 m

There are no spurious emissions other than listed below;

No.	Frequency [MHz]	Reading		C.F. [dB]	Result		Limit		Margin		Polarization
		Peak [dBuV]	Ave [dBuV]		Peak [dBuV]	Ave [dBuV]	Peak [dBuV]	Ave [dBuV]	Peak [dB]	Ave [dB]	
1	3493.303	49.8	-	-1.4	48.4	-	68.2	-	19.8	-	Hori.
2	3493.303	50.2	-	-1.4	48.8	-	68.2	-	19.4	-	Vert.
3	5150.000	46.2	29.8	13.3	59.5	43.1	73.9	53.9	14.4	10.8	Hori.
4	10480.000	47.8	-	10.1	57.9	-	68.2	-	10.3	-	Hori.
5	10480.000	45.8	-	10.1	55.9	-	68.2	-	12.3	-	Vert.

Operating mode: Continuous Communication (W53: 802.11a, 6Mbps, 5320MHz: Worst configuration)

EUT position: Y-plane (Maximum position)

Measurement distance: 3 m

There are no spurious emissions other than listed below;

No.	Frequency [MHz]	Reading		C.F. [dB]	Result		Limit		Margin		Polarization
		Peak [dBuV]	Ave [dBuV]		Peak [dBuV]	Ave [dBuV]	Peak [dBuV]	Ave [dBuV]	Peak [dB]	Ave [dB]	
1	3546.634	50.9	-	-1.3	49.6	-	68.2	-	18.6	-	Hori.
2	3546.634	50.7	-	-1.3	49.4	-	68.2	-	18.8	-	Vert.
3	5350.000	47.7	30.1	13.0	60.7	43.1	73.9	53.9	13.2	10.8	Hori.
4	10640.000	45.2	31.6	10.3	55.5	41.9	73.9	53.9	18.4	12.0	Hori.
5	10640.000	46.7	32.6	10.3	57.0	42.9	73.9	53.9	16.9	11.0	Vert.

## 4 List of utilized test equipment/ calibration

RFT ID No.	Kind of Equipment and Precision	Manufacturer	Model No.	Serial Number	Calibration Date	Calibrated until
AC01(EM)	Anechoic Chamber (1st test room)	JSE	203397C	-	2012/04/21	2013/04/30
AC01(EG)	Anechoic Chamber (1st test room)	JSE	203397C	-	2011/11/12	2012/11/30
BI01	Biconical Antenna	SCHWARZBECK	VHA9103 & BBA9106	2359	2012/03/12	2013/03/31
BRF8	Band Reject Filter (WLAN_5G)	M-City	BRF5512-01	RF0007-01	2010/10/14	2012/10/31
CL11	Antenna Cable for RE	RFT	-	-	2011/10/27	2012/10/31
CL23	RF Cable 0.5m	SUHNER	SUCOFLEX104PE	48773	2011/06/17	2012/06/30
CL24	RF Cable 5.0m	SUHNER	SUCOFLEX104PE	48775	2011/06/17	2012/06/30
CL28	RF Cable 1.0m	SUHNER	SUCOFLEX104PE	75769	2011/08/08	2012/08/31
CL40	RF Cable 1.0m (40GHz)	SUHNER	SUCOFLEX102	35102	2011/02/02	2013/02/28
CL41	RF Cable 1.0m (40GHz)	SUHNER	SUCOFLEX102	35107	2011/02/02	2013/02/28
CH01	Conical Horn Antenna (12-18GHz)	ETS-Lindgren	3163-05	00126641	2010/07/07	2012/07/31
DH01	DRG Horn Antenna	A.H. Systems	SAS-571	785	2012/01/27	2014/01/31
HPF5	High Pass Filter (7000MHz)	Tokyo KEIKI	TF27MCCZGA	9001	2010/10/14	2012/10/31
LA05	Logperiodic Antenna	SCHWARZBECK	VUSLP9111B	070	2012/03/12	2013/03/31
PR08	Pre. Amplifier	Sonoma Instrument	315	263504	2012/01/11	2013/01/31
PR12	Pre. Amplifier (1-26G)	Agilent Technologies	8449B	3008A02513	2012/01/24	2013/01/31
PR20	Pre. Amplifier (26-40G)	RFT	SL40-B2510	0001	2011/02/03	2013/02/28
SA09R	Spectrum Analyzer	Agilent	E4448A	MY48250086	2011/12/01	2012/12/31
SH03	Standard Horn Antenna (26-40G)	A.H. Systems	SAS-573	150	2011/02/03	2013/02/28
SH01	Standard Horn Antenna (18-26G)	A.H. Systems	SAS-572	208	2010/07/13	2012/07/31
TR06	Test Receiver (F/W : 3.93 SP2)	Rohde & Schwarz	ESU26	100002	2011/09/16	2012/09/30

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.