

## TEST REPORT

**Applicant** : Sharp Corporation, Communication Systems Group  
**Address** : 2-13-1, Iida Hachihonmatsu, Higashi-Hiroshima City, Hiroshima,  
739-0192, JAPAN

**Products** : Cellular Phone  
**Model No.** : 202SHe  
**SERIAL NO.** : 004401/11/466110/7  
004401/11/466082/8

**FCC ID** : APYHRO00183

**Test Standard** : CFR 47 FCC Rules and Regulations Part 15

**Test Results** : **Passed**

**Date of Test** : December 12 ~ 13, 2012



A handwritten signature in black ink, appearing to read 'K. Shibata', is written over a horizontal line.

Kousei Shibata  
Manager  
Japan Quality Assurance Organization  
KITA-KANSAI Testing Center  
SAITO EMC Branch  
7-3-10, Saito-asagi, Ibaraki-shi, Osaka 567-0085, Japan

- The measurement values stated in Test Report was made with traceable to National Institute of Advanced Industrial Science and Technology (AIST) of Japan and National Institute of Information and Communications Technology (NICT) of Japan.
- The applicable standard, testing condition and testing method which were used for the tests are based on the request of the applicant.
- The test results presented in this report relate only to the offered test sample.
- The contents of this test report cannot be used for the purposes, such as advertisement for consumers.
- This test report shall not be reproduced except in full without the written approval of JQA.
- VLAC does not approve, certify or warrant the product by this test report.

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**DEFINITIONS FOR ABBREVIATION AND SYMBOLS USED IN THIS TEST REPORT****EUT** : Equipment Under Test**AE** : Associated Equipment**N/A** : Not Applicable**N/T** : Not Tested**EMC** : Electromagnetic Compatibility**EMI** : Electromagnetic Interference**EMS** : Electromagnetic Susceptibility - indicates that the listed condition, standard or equipment is applicable for this report. - indicates that the listed condition, standard or equipment is not applicable for this report.

## 1 Description of the Equipment Under Test

1. Manufacturer : Sharp Corporation, Communication Systems Group  
2-13-1, Iida Hachihonmatsu, Higashi-Hiroshima City, Hiroshima,  
739-0192, JAPAN
2. Products : Cellular Phone
3. Model No. : 202SHe
4. Serial No. : 004401/11/466110/7  
: 004401/11/466082/8
5. Product Type : Pre-production
6. Date of Manufacture : November, 2012
7. Power Rating : 4.0VDC (Lithium-ion BatterySHBCU1 770mAh)
8. EUT Grounding : None
9. Transmitting Frequency : 2402.0 MHz(00CH) –2480.0MHz(78CH)
10. Receiving Frequency : 2402.0 MHz(00CH) –2480.0MHz(78CH)
11. Max. RF Output Power : 1.14dBm(Measure Value)
12. Category : Spread Spectrum Transmitter(FHSS)
13. EUT Authorization : Certification
14. Received Date of EUT : December 7, 2012

### 15. Channel Plan

The carrier spacing is 1 MHz.

The carrier frequency is designated by the absolute frequency channel number (ARFCN).

The carrier frequency is expressed in the equation shown as follows:

Transmitting Frequency (in MHz) = 2402.0 + n

Receiving Frequency (in MHz) = 2402.0 + n

where, n : channel number ( $0 \leq n \leq 78$ )

## 2 Summary of Test Results

Applied Standard : CFR 47 FCC Rules and Regulations Part 15  
Subpart C – Intentional Radiators

The EUT described in clause 1 was tested according to the applied standard shown above.  
Details of the test configuration is shown in clause 6.

The conclusion for the test items of which are required by the applied standard is indicated under the test result.

- The test result was **passed** for the test requirements of the applied standard.
- The test result was **failed** for the test requirements of the applied standard.
- The test result was **not judged** the test requirements of the applied standard.

In the approval of test results,

- Determining compliance with the limits in this report was based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- No deviations were employed from the applied standard.
- No modifications were conducted by JQA to achieve compliance to the limitations.

Reviewed by:

Tested by:



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Shigeru Kinoshita  
Deputy Manager  
JQA KITA-KANSAI Testing Center  
SAITO EMC Branch



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Shigeru Osawa  
Deputy Manager  
JQA KITA-KANSAI Testing Center  
SAITO EMC Branch

### 3 Test Procedure

Test Requirements : §15.247, §15.207 and §15.209

Test Procedure : ANSI C63.4-2003

The tests were performed with reference to the FCC Public Notice DA 00-705, released March 30, 2000.  
The test set-up was made in accordance to the general provisions of ANSI C63.4-2003.

### 4 Test Location

Japan Quality Assurance Organization (JQA)  
KITA-KANSAI Testing Center  
7-7, Ishimaru, 1-chome, Minoh-shi, Osaka, 562-0027, Japan  
SAITO EMC Branch  
7-3-10, Saito-asagi, Ibaraki-shi, Osaka 567-0085, Japan

### 5 Recognition of Test Laboratory

JQA KITA-KANSAI Testing Center SAITO EMC Branch is accredited under ISO/IEC 17025 by following accreditation bodies and the test facility is registered by the following bodies.

VLAC Accreditation No. : VLAC-001-2 (Expiry date : March 30, 2014)  
VCCI Registration No. : A-0002 (Expiry date : March 30, 2014)  
BSMI Registration No. : SL2-IN-E-6006, SL2-A1-E-6006 (Expiry date : September 14, 2013)  
IC Registration No. : 2079E-3, 2079E-4 (Expiry date : July 20, 2014)

Accredited as conformity assessment body for Japan electrical appliances and material law by METI.  
(Expiry date : February 22, 2013)

## 6 Details of the Equipment Under Test

### 6.1 Operating Condition

Transmitting/Receiving

Bluetooth 2.1 + EDR

Transmitting frequency : 2402.0 MHz(0CH) – 2480.0 MHz(78CH)

Receiver frequency : 2402.0 MHz(0CH) – 2480.0 MHz(78CH)

The test were carried under 1 mode shown as follows:

1. Standard+EDR

Modulation Type

1. DH1/ DH3/ DH5 Packet (Modulation Type : GFSK)

2. 2DH1/ 2DH3/ 2DH5 Packet (Modulation Type : pi/4-DQPSK)

3. 3DH1/ 3DH3/ 3DH5 Packet (Modulation Type : 8DPSK)

Other Clock Frequency

32.768 kHz, 26.0 MHz

The EUT was rotated through three orthogonal axis (X, Y and Z axis) in radiated measurement.

The EUT with temporary antenna port was used in conducted measurement.

## 6.2 Test Configuration

The equipment under test (EUT) consists of :

	Item	Manufacturer	Model No.	Serial No.	FCC ID
A	Cellular Phone	Sharp	202SHe	004401/11/4 66110/7*1) 004401/11/4 66082/8*2)	APYHRO00183
B	Lithium-ion Battery	Sharp	SHBCU1	--	N/A
C	AC Adapter	Sharp	ZTDAA1	--	N/A
D	Headset (Include Conversion cable)	Softbank Mobile	ZTCAA1	--	N/A

\*1) Used for AC Powerline Conducted Emission and Field Strength of Spurious Emission

\*2) Used for Antenna Conducted Emission

The auxiliary equipment used for testing :

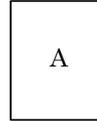
None

Type of Cable:

No.	Description	Identification (Manu. etc.)	Connector Shielded	Cable Shielded	Ferrite Core	Length (m)
1	DC Power Cord	--	--	NO	NO	1.5
2	Headset Cable	--	--	NO	NO	0.6

**6.3 Test Arrangement (Drawings)**

a) Single Unit

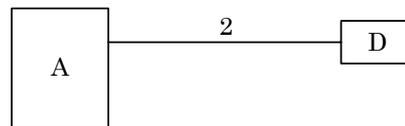


b) AC Adapter used



120VAC 60Hz

c) Headset used



## 7 Details of the Test Item

### 7.1 Channel Separation

For the requirements,  - Applicable  - Tested.  - Not tested by applicant request.]  
 - Not Applicable

For the limits,  - Passed  - Failed  - Not judged

#### 7.1.1 Worst Point and Measurement Uncertainty

Channel Separation is 1.002 MHz  
Channel Separation(Inquiry) is 2.000 MHz

Uncertainty of Measurement Results +/-0.9 %(2σ)

Remarks : \_\_\_\_\_

#### 7.1.2 Test Site

KITA-KANSAI Testing Center

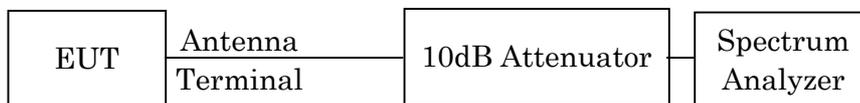
Test site : SAITO  - Anechoic chamber (A1)  - Measurement room (M1)  
 - Measurement room (M2)  - Measurement room (M3)  
 - Shielded room (S1)  - Shielded room (S2)  
 - Shielded room (S3)  - Shielded room (S4)

### 7.1.3 Test Instruments

Type	Model	Manufacturer	ID No.	Last Cal.	Interval
Spectrum Analyzer	E4446A	Agilent	A-39	2012/9	1 Year
Attenuator	54A-10	Weinschel	D-28	2012/9	1 Year
RF Cable	SUCOFLEX102	SUHNER	C-52	2012/7	1 Year

### 7.1.4 Test Method and Test Setup (Diagrammatic illustration)

The test system is shown as follows:



The setting of the spectrum analyzer are shown as follows:

Res. Bandwidth	100 kHz
Video Bandwidth	300 kHz
Span	3 MHz / 5 MHz
Sweep Time	AUTO
Trace	Maxhold

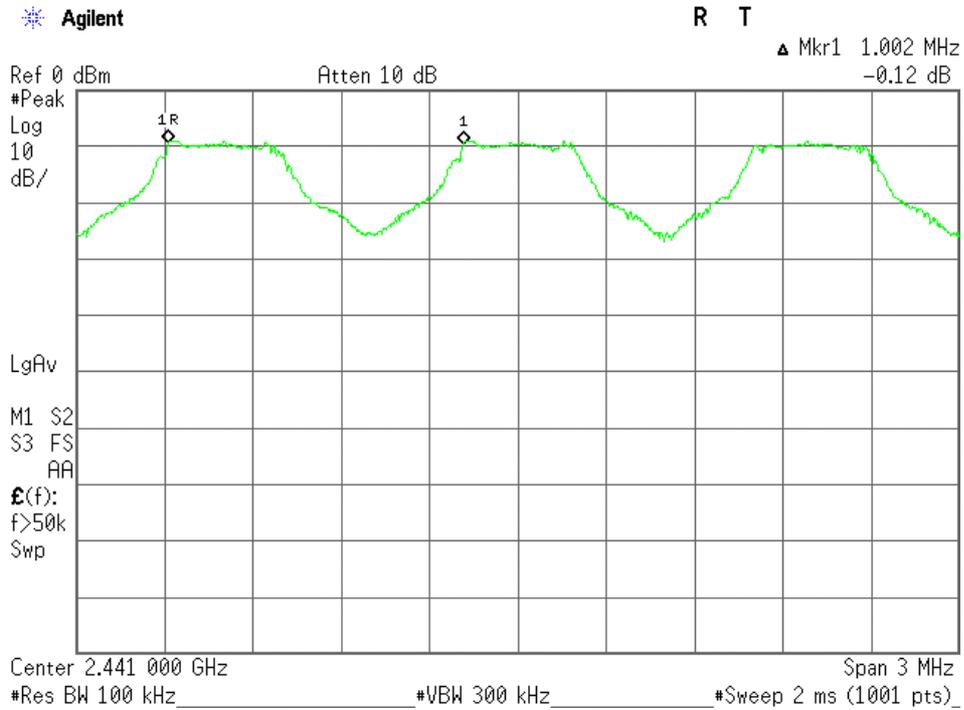
### 7.1.5 Test Data

Test Date : December 12, 2012

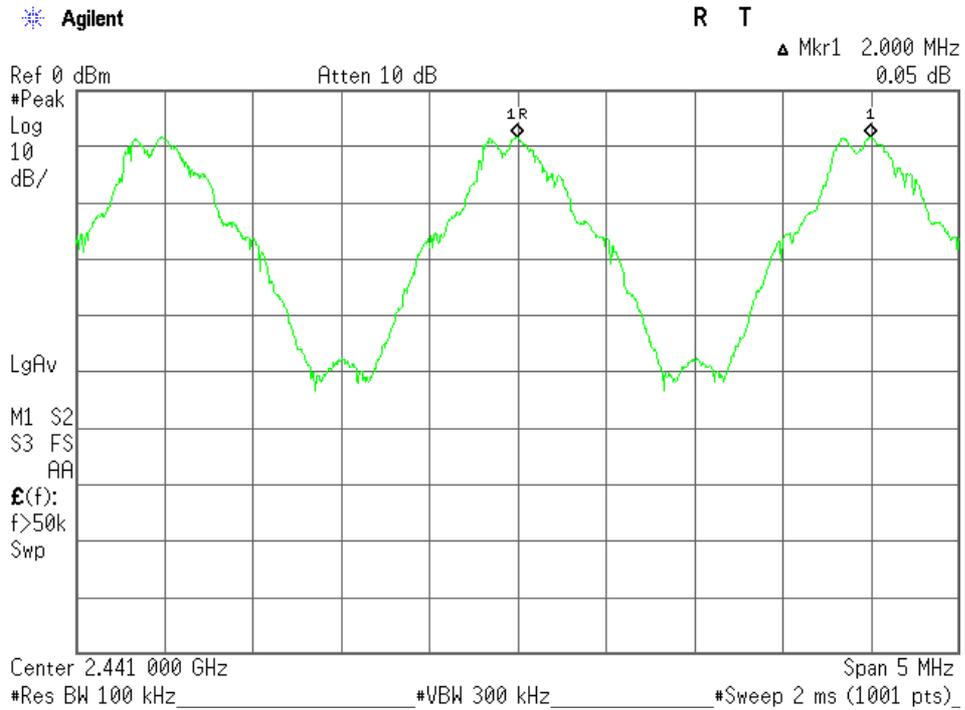
Temp.:20°C, Humi:31%

Mode of EUT	Channel Separation (MHz)
Hopping	1.002
Inquiry	2.000

Mode of EUT : Hopping



Mode of EUT : Inquiry



**7.2 Minimum Hopping Channel**

For the requirements,  - Applicable  - Tested.  - Not tested by applicant request.]  
 - Not Applicable

For the limits,  - Passed  - Failed  - Not judged

**7.2.1 Worst Point and Measurement Uncertainty**

Number of Channel is	<u>79</u>
Number of Channel (Inquiry) is	<u>32</u>
Number of Channel (AFH) is	<u>20</u>

Remarks : \_\_\_\_\_

**7.2.2 Test Site**

KITA-KANSAI Testing Center

Test site : SAITO

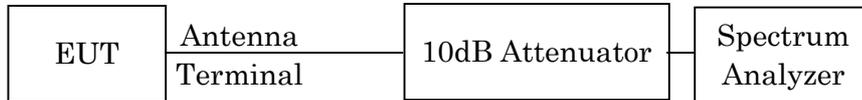
<input type="checkbox"/> - Anechoic chamber (A1)	<input type="checkbox"/> - Measurement room (M1)
<input type="checkbox"/> - Measurement room (M2)	<input type="checkbox"/> - Measurement room (M3)
<input type="checkbox"/> - Shielded room (S1)	<input type="checkbox"/> - Shielded room (S2)
<input type="checkbox"/> - Shielded room (S3)	<input checked="" type="checkbox"/> - Shielded room (S4)

**7.2.3 Test Instruments**

Type	Model	Manufacturer	ID No.	Last Cal.	Interval
Spectrum Analyzer	E4446A	Agilent	A-39	2012/9	1 Year
Attenuator	54A-10	Weinschel	D-28	2012/9	1 Year
RF Cable	SUCOFLEX102	SUHNER	C-52	2012/7	1 Year

**7.2.4 Test Method and Test Setup (Diagrammatic illustration)**

The test system is shown as follows:



The setting of the spectrum analyzer are shown as follows:

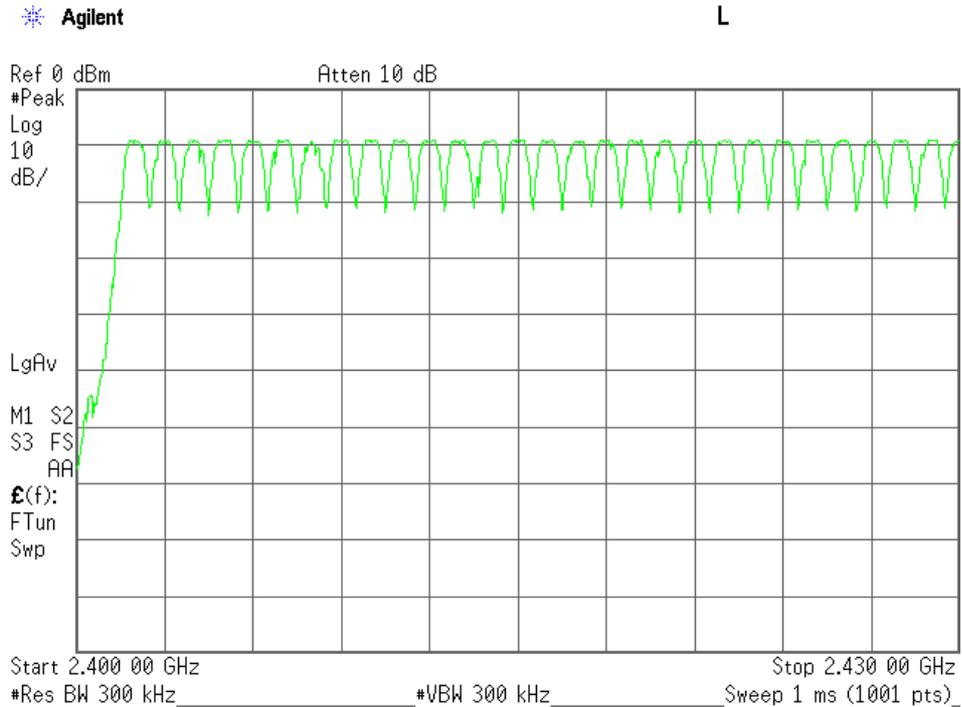
Res. Bandwidth	300 kHz
Video Bandwidth	300 kHz
Span	30 MHz
Sweep Time	AUTO
Trace	Maxhold

**7.2.5 Test Data**

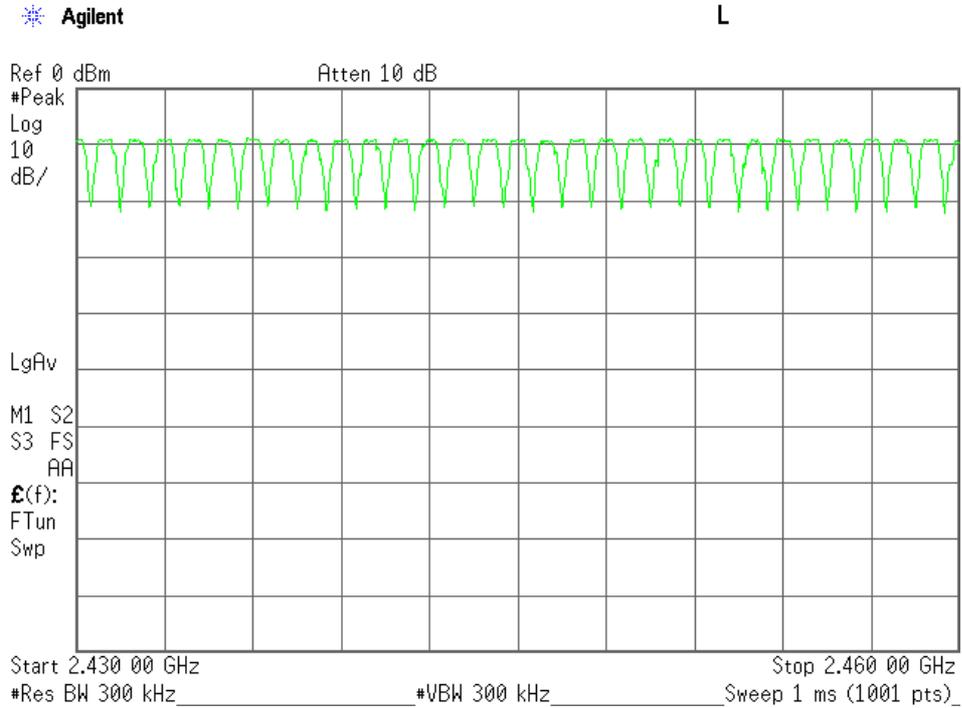
Test Date : December 12, 2012  
Temp.:20°C, Humi:31%

Mode of EUT	Minimum Hopping Channel
Hopping	79
Inquiry	32
AFH(minimum)	20

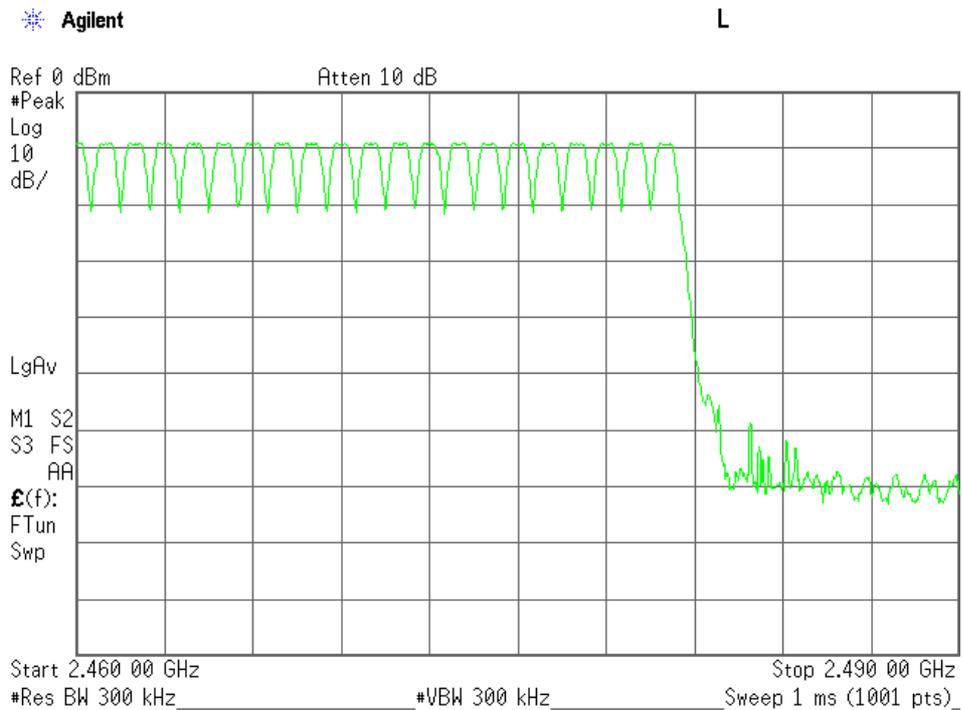
Mode of EUT : Hopping(1/3)



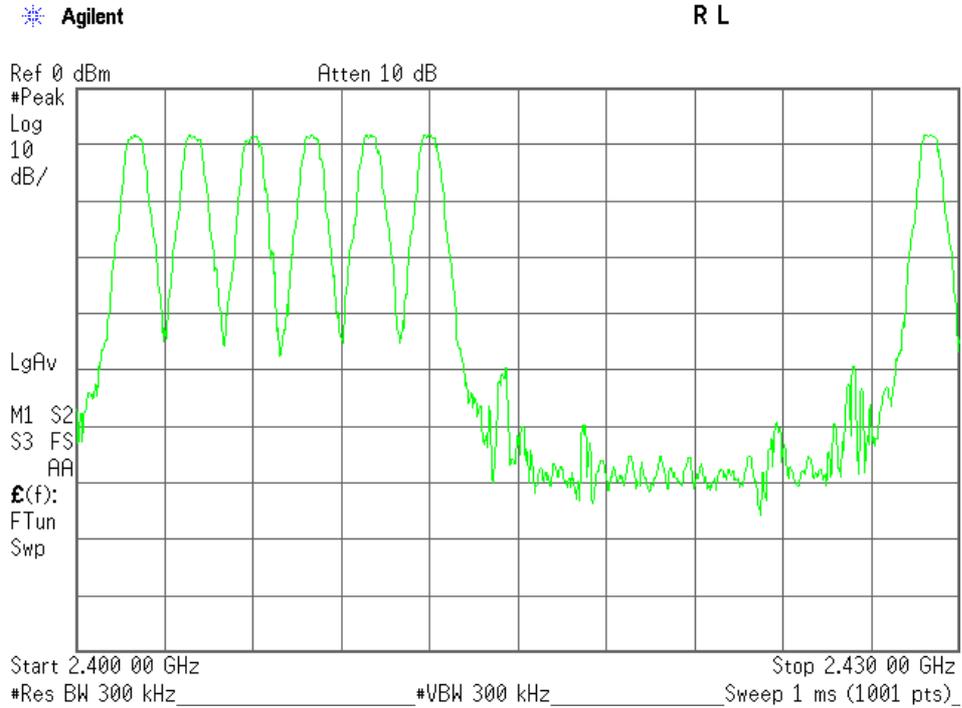
Mode of EUT : Hopping(2/3)



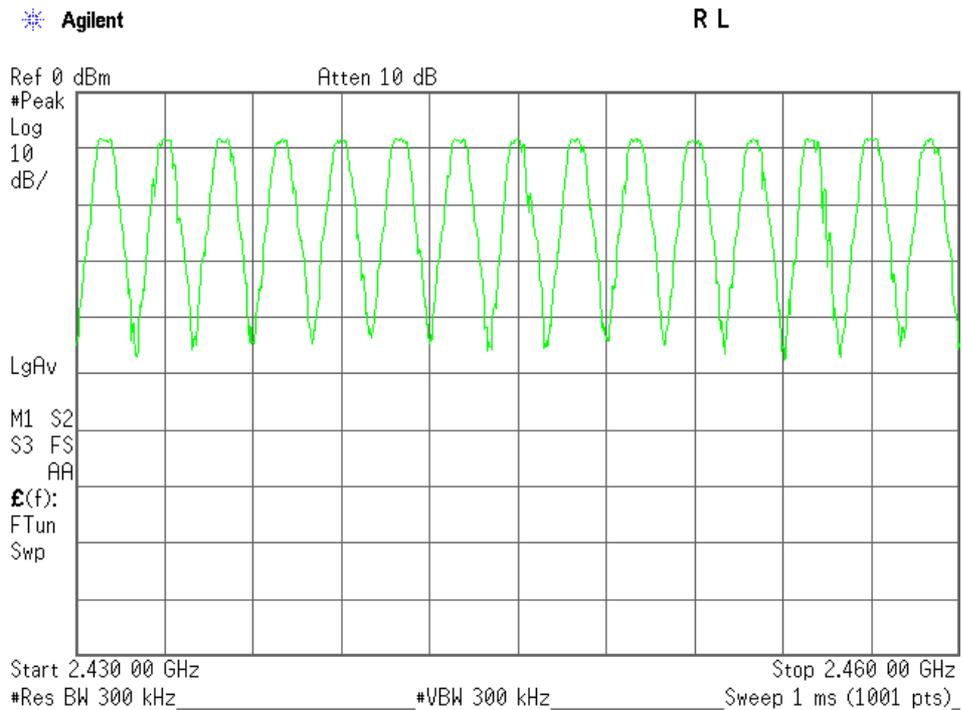
Mode of EUT : Hopping(3/3)



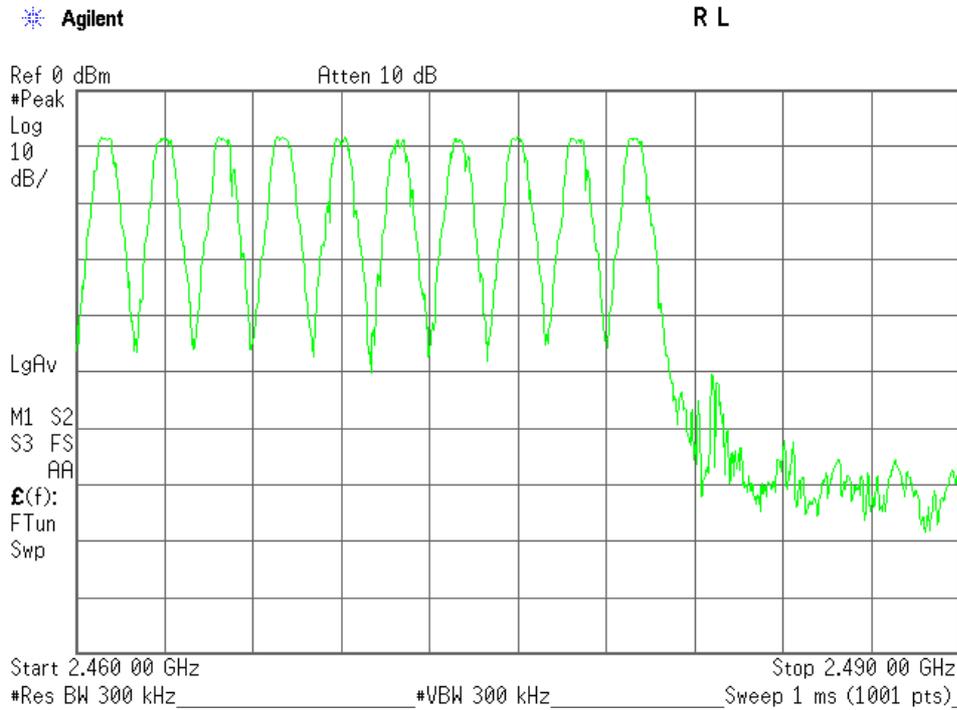
### Mode of EUT : Inquiry(1/3)



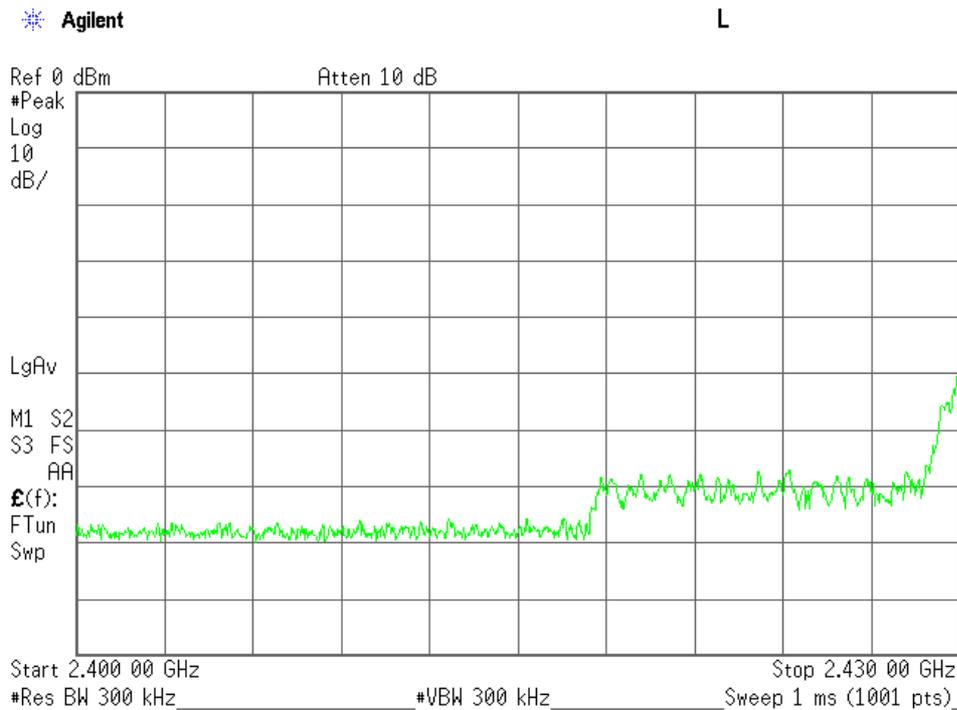
### Mode of EUT : Inquiry(2/3)



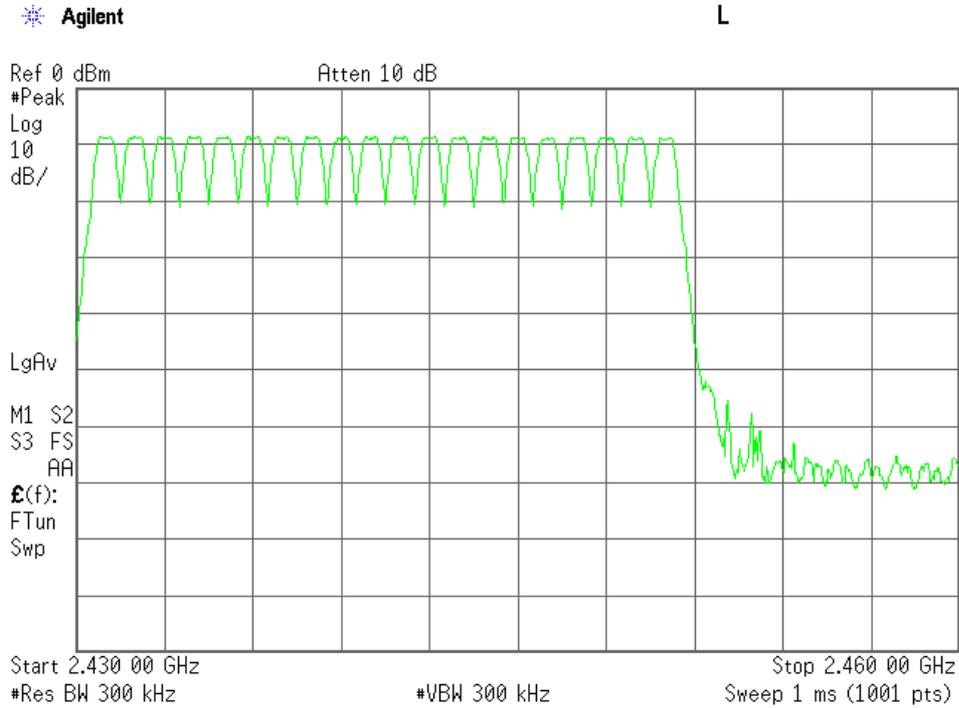
Mode of EUT : Inquiry(3/3)



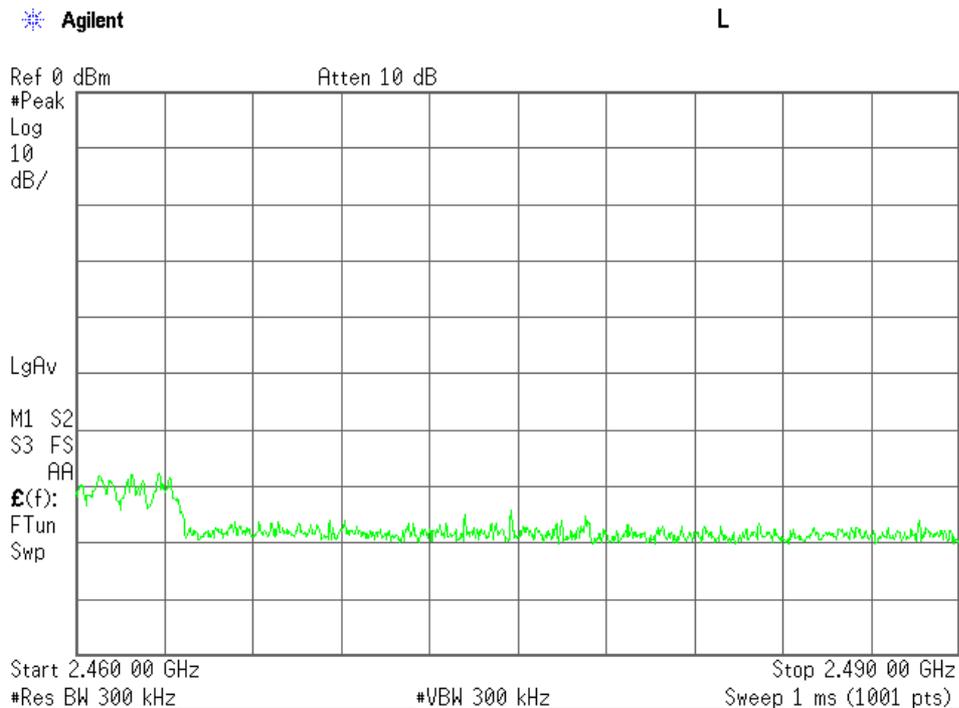
Mode of EUT : AFH(minimum)(1/3)



Mode of EUT : AFH(minimum) (2/3)



Mode of EUT : AFH(minimum) (3/3)



### 7.3 Occupied Bandwidth

For the requirements,  - Applicable  - Tested.  - Not tested by applicant request.]  
 - Not Applicable

For the limits,  - Passed  - Failed  - Not judged

#### 7.3.1 Worst Point and Measurement Uncertainty

The 99% Bandwidth is 1201.7 kHz at 2480.0 MHz  
The 20dB Bandwidth is 1316.0 kHz at 2441.0 MHz

Uncertainty of Measurement Results +/-0.9 %(2 $\sigma$ )

Remarks : \_\_\_\_\_

#### 7.3.2 Test Site

KITA-KANSAI Testing Center

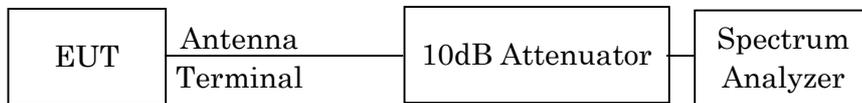
Test site : SAITO  - Anechoic chamber (A1)  - Measurement room (M1)  
 - Measurement room (M2)  - Measurement room (M3)  
 - Shielded room (S1)  - Shielded room (S2)  
 - Shielded room (S3)  - Shielded room (S4)

**7.3.3 Test Instruments**

Type	Model	Manufacturer	ID No.	Last Cal.	Interval
Spectrum Analyzer	E4446A	Agilent	A-39	2012/9	1 Year
Attenuator	54A-10	Weinschel	D-28	2012/9	1 Year
RF Cable	SUCOFLEX102	SUHNER	C-52	2012/7	1 Year

**7.3.4 Test Method and Test Setup (Diagrammatic illustration)**

The test system is shown as follows:



The setting of the spectrum analyzer are shown as follows:

Res. Bandwidth	10 kHz
Video Bandwidth	30 kHz
Span	3 MHz
Sweep Time	AUTO
Trace	Maxhold

### 7.3.5 Test Data

Mode of EUT : Standard+EDR

Test Date : December 12, 2012

Temp.:20°C, Humi:31%

The resolution bandwidth was set to about 1% of emission bandwidth, -20dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

1)Packet Setting : DH5(Modulation type : GFSK)

Channel	Frequency (MHz)	99% Bandwidth (kHz)	-20dBc Bandwidth (kHz)
00	2402.0	862.1	927.5
39	2441.0	861.3	926.2
78	2480.0	860.5	925.7

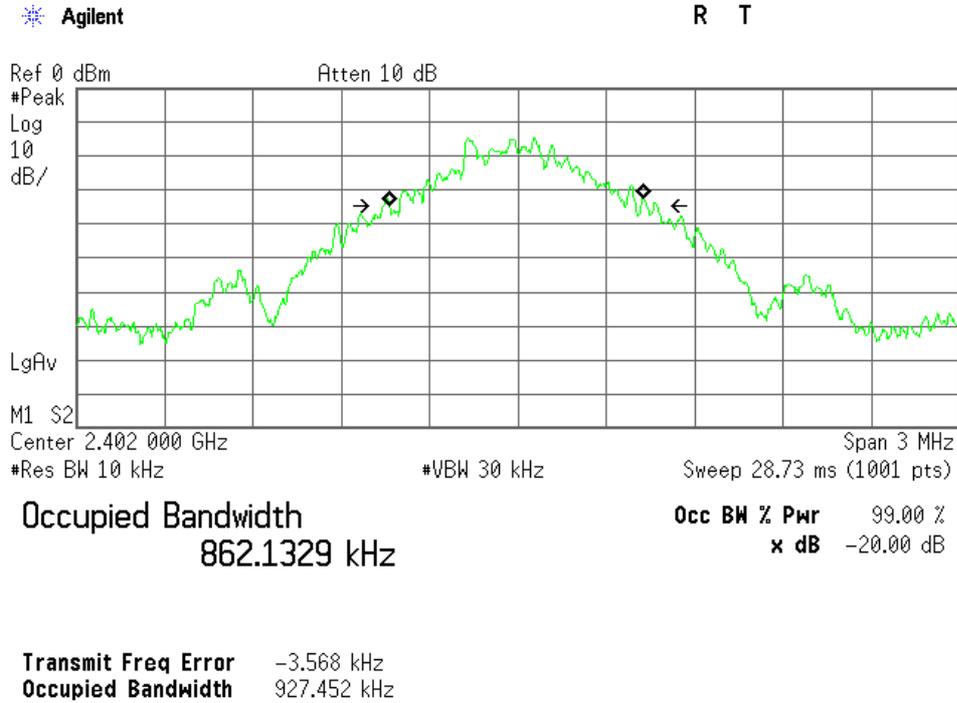
2)Packet Setting : 2DH5(Modulation type : pi/4-DQPSK)

Channel	Frequency (MHz)	99% Bandwidth (kHz)	-20dBc Bandwidth (kHz)
00	2402.0	1185.7	1314.0
39	2441.0	1186.7	1316.0
78	2480.0	1184.3	1315.0

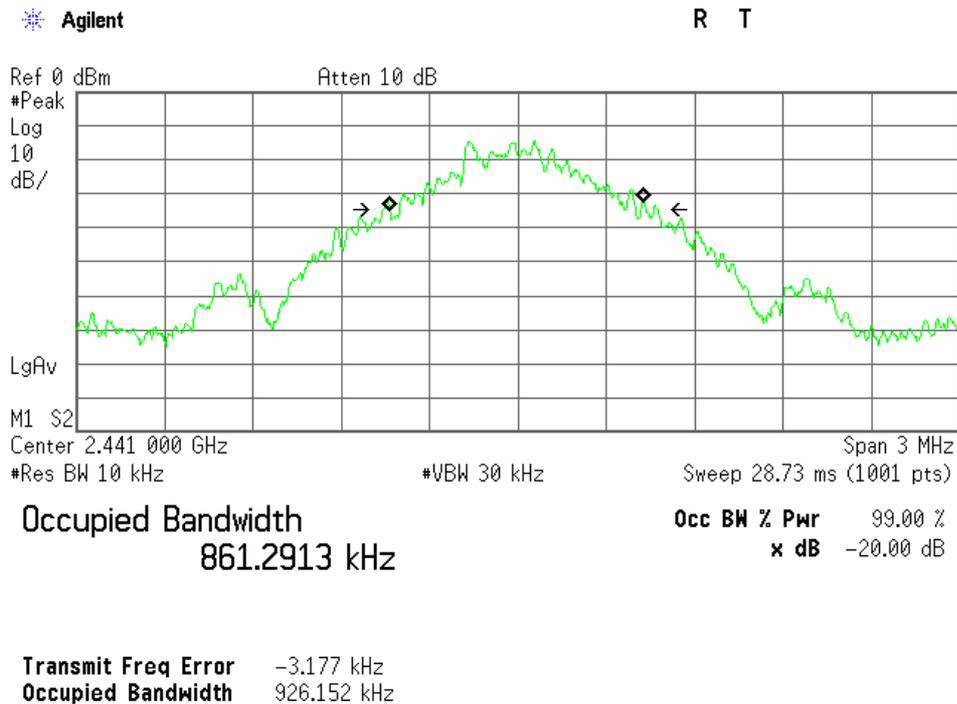
3)Packet Setting : 3 DH5(Modulation type : 8DPSK)

Channel	Frequency (MHz)	99% Bandwidth (kHz)	-20dBc Bandwidth (kHz)
00	2402.0	1193.1	1262.0
39	2441.0	1195.5	1262.0
78	2480.0	1201.7	1264.0

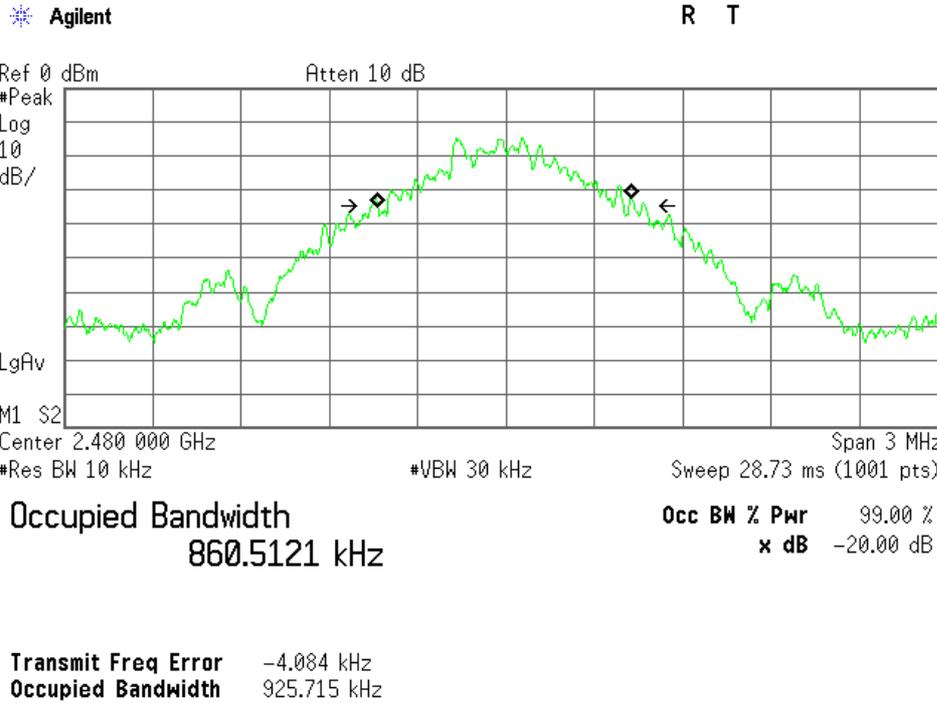
1) Packet Setting : DH5 (Modulation type : GFSK)  
 Low Channel



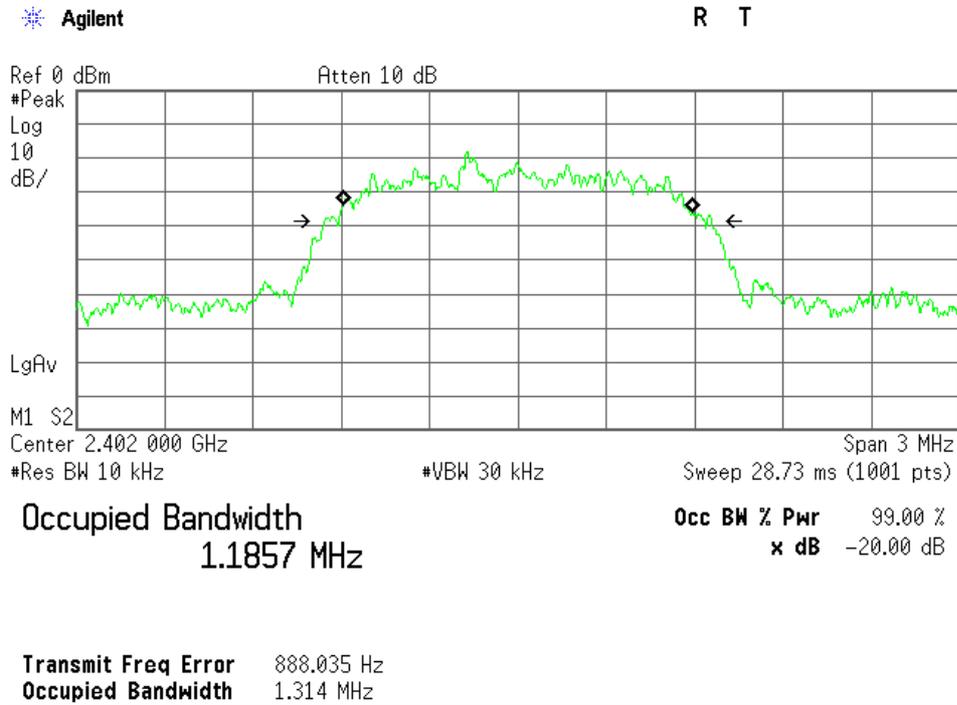
Middle Channel



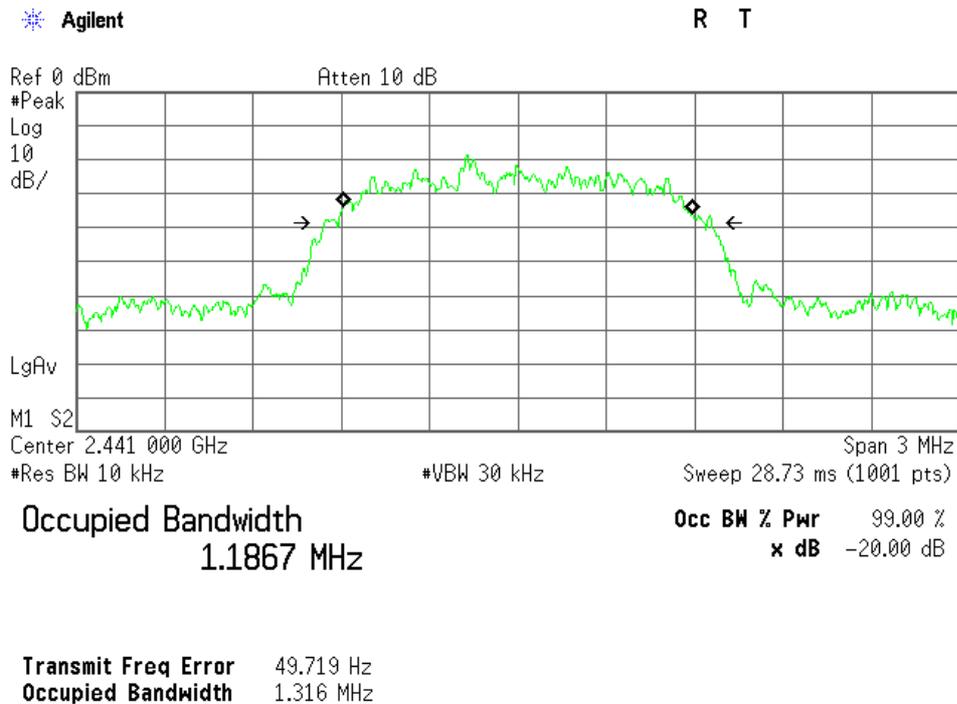
## High Channel



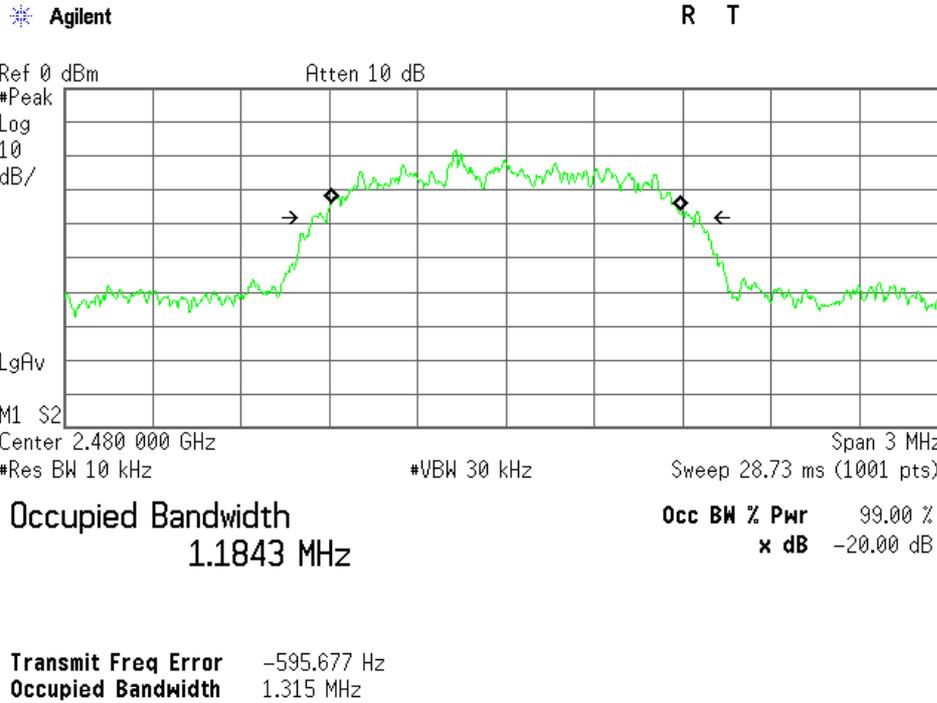
2) Packet Setting : 2DH5 (Modulation type : pi/4-DQPSK)  
 Low Channel



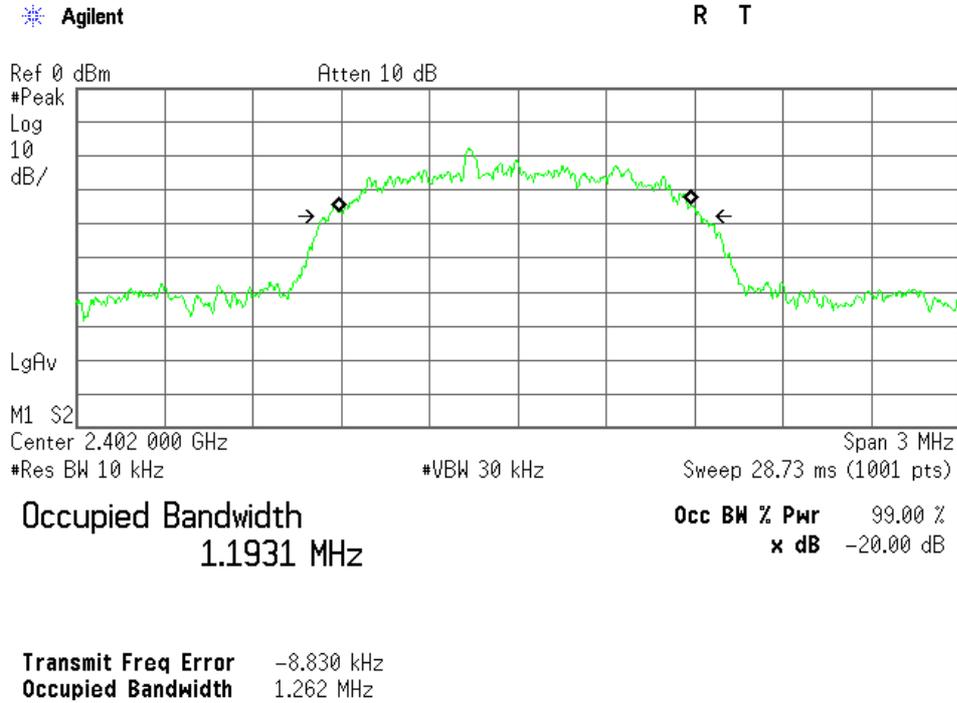
Middle Channel



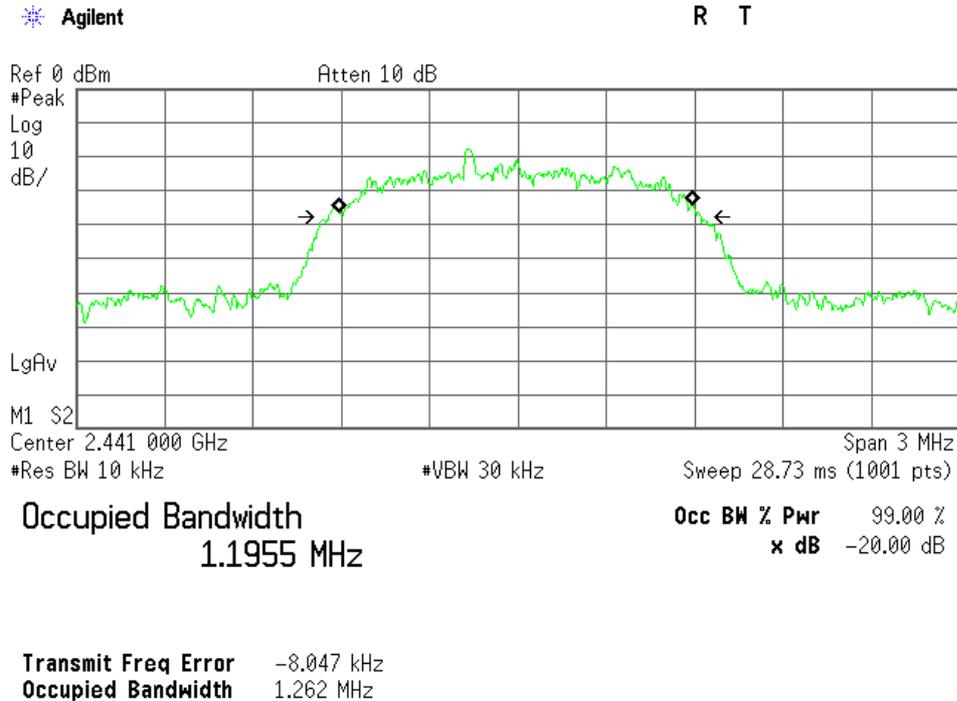
## High Channel



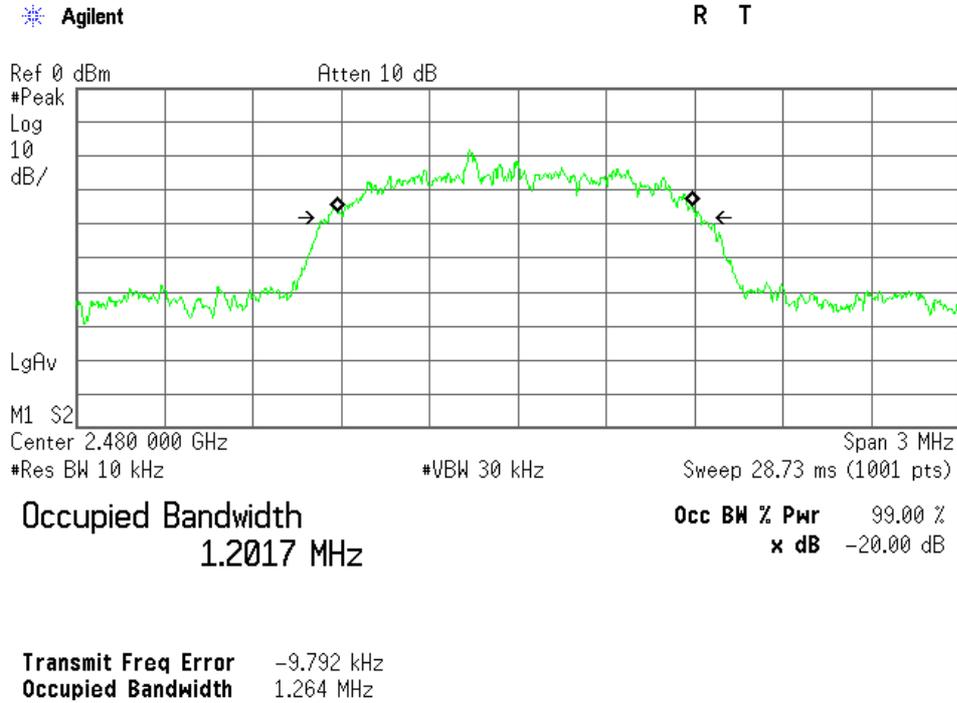
3)Packet Setting : 3 DH5(Modulation type : 8DPSK)  
 Low Channel



Middle Channel



## High Channel



**7.4 Dwell Time**

For the requirements,  - Applicable  - Tested.  - Not tested by applicant request.]  
 - Not Applicable

For the limits,  - Passed  - Failed  - Not judged

**7.4.1 Worst Point and Measurement Uncertainty**

Dwell Time is	<u>308.4</u>	msec
Dwell Time (Inquiry) is	<u>71.4</u>	msec
Dwell Time (AFH) is	<u>308.5</u>	msec

Uncertainty of Measurement Results +/-0.6 %(2 $\sigma$ )

Remarks : \_\_\_\_\_

**7.4.2 Test Site**

KITA-KANSAI Testing Center

Test site : SAITO

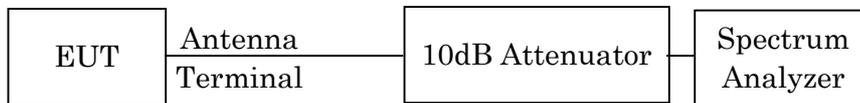
<input type="checkbox"/> - Anechoic chamber (A1)	<input type="checkbox"/> - Measurement room (M1)
<input type="checkbox"/> - Measurement room (M2)	<input type="checkbox"/> - Measurement room (M3)
<input type="checkbox"/> - Shielded room (S1)	<input type="checkbox"/> - Shielded room (S2)
<input type="checkbox"/> - Shielded room (S3)	<input checked="" type="checkbox"/> - Shielded room (S4)

**7.4.3 Test Instruments**

Type	Model	Manufacturer	ID No.	Last Cal.	Interval
Spectrum Analyzer	E4446A	Agilent	A-39	2012/9	1 Year
Attenuator	54A-10	Weinschel	D-28	2012/9	1 Year
RF Cable	SUCOFLEX102	SUHNER	C-52	2012/7	1 Year

**7.4.4 Test Method and Test Setup (Diagrammatic illustration)**

The test system is shown as follows:



The setting of the spectrum analyzer are shown as follows:

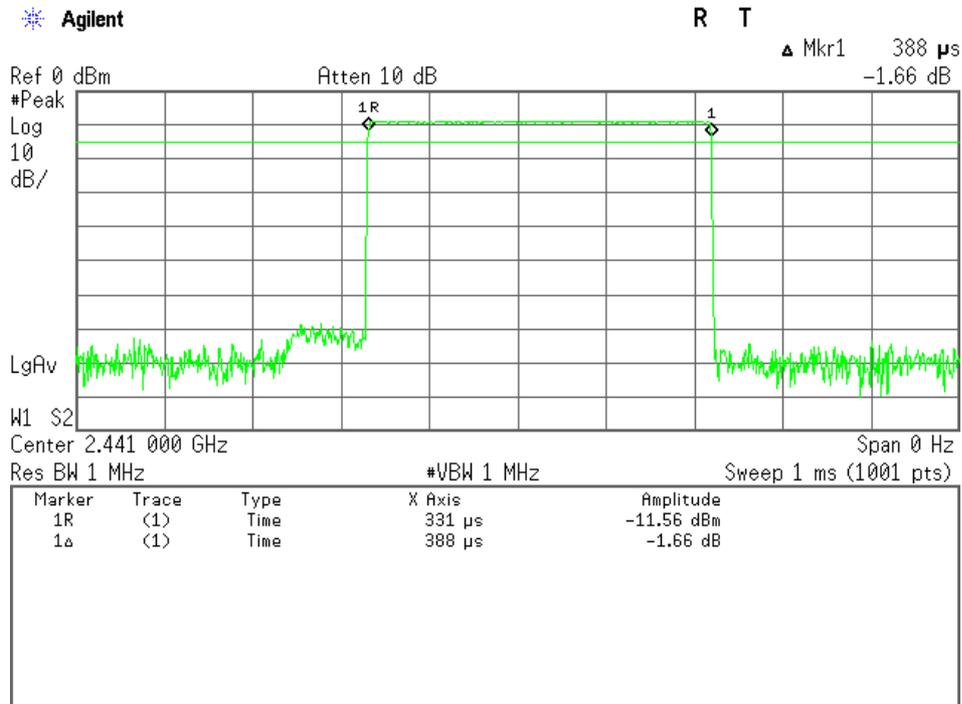
Res. Bandwidth	1 MHz
Video Bandwidth	1 MHz
Span	Zero Span

### 7.4.5 Test Data

Test Date : December 12, 2012  
 Temp.:20°C, Humi:31%

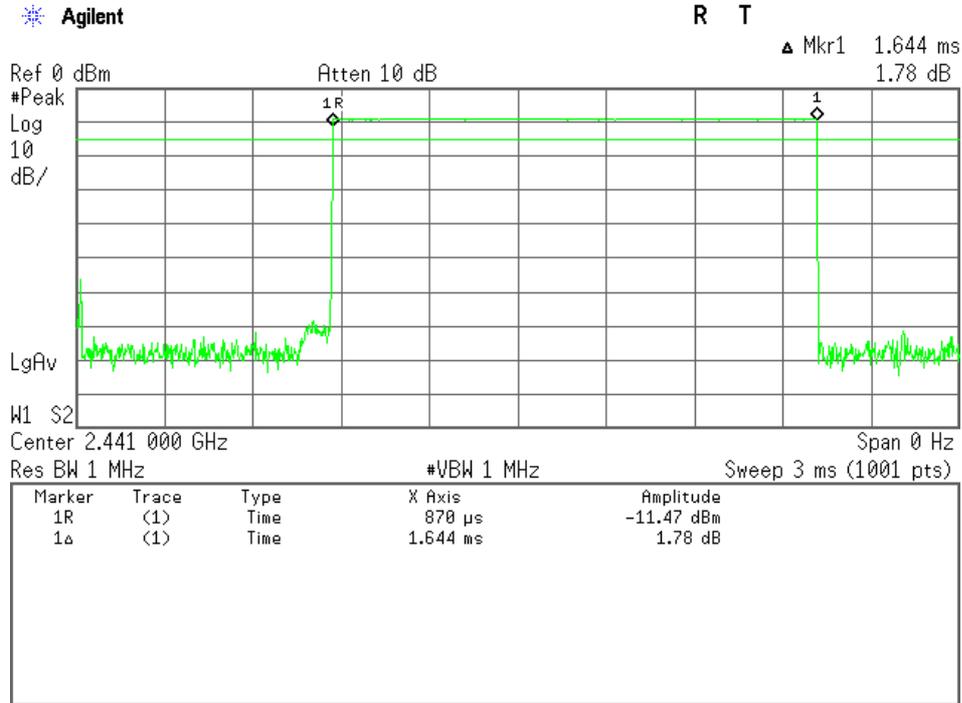
Mode of EUT	Dwell Time (msec)
DH1	124.2
DH3	263.0
DH5	308.4
Inquiry	71.4

DH1(Modulation type : GFSK)



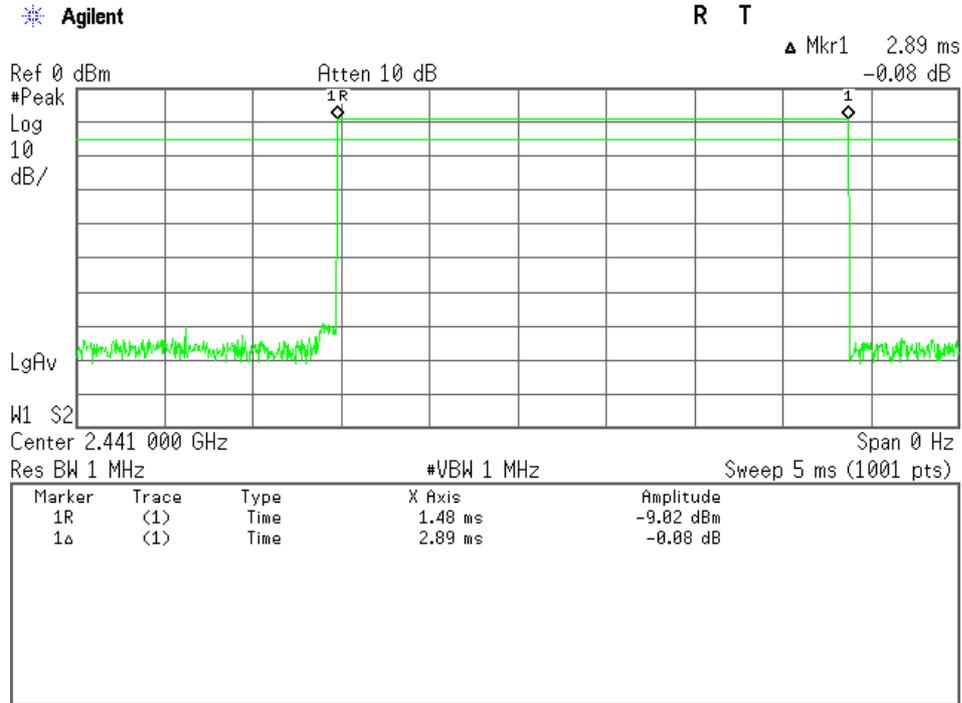
Note : The system makes worst case 1600 hops per second or 1 time slot has a length of 625 μs with 79 channels. A DH1 Packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 800 hops per second with 79 channels. So the system has each channel 10.1266 times per second and so for 31.6 seconds the system have 320.0 times of appearance.  
 Each tx-time per appearance is 0.388 ms.  
 Dwell time = 320.0 \* 0.388 = 124.2 ms

DH3(Modulation type : GFSK)



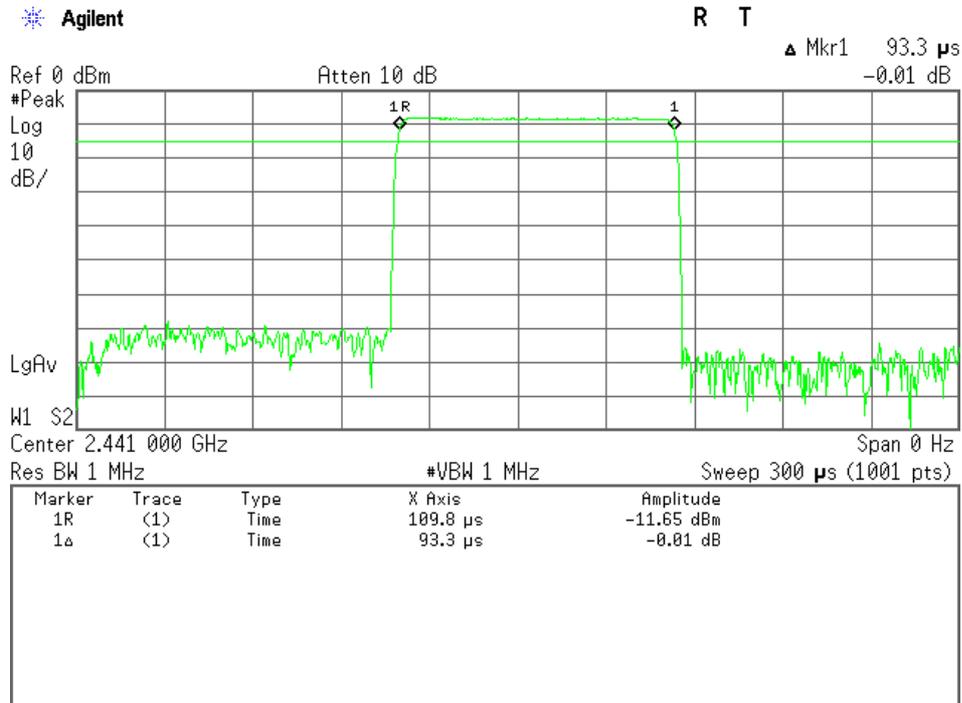
Note : A DH3 Packet need 3 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 400 hops per second with 79 channels. So the system have each channel 5.063 times per second and so for 31.6 seconds the system have 160.0 times of appearance. Each tx-time per appearance is 1.644 ms.  
 Dwell time = 160.0 \* 1.644 = 263.0 ms

DH5(Modulation type : GFSK)



Note : A DH5 Packet need 5 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 266.667 hops per second with 79 channels. So the system have each channel 3.3755 times per second and so for 31.6 seconds the system have 106.7 times of appearance. Each tx-time per appearance is 2.89 ms.  
 Dwell time = 106.7 \* 2.89 = 308.4 ms

Inquiry



Note : The system have 32 hopping channel in Inquiry mode.

The time period = 32 \* 0.4 = 12.8 seconds

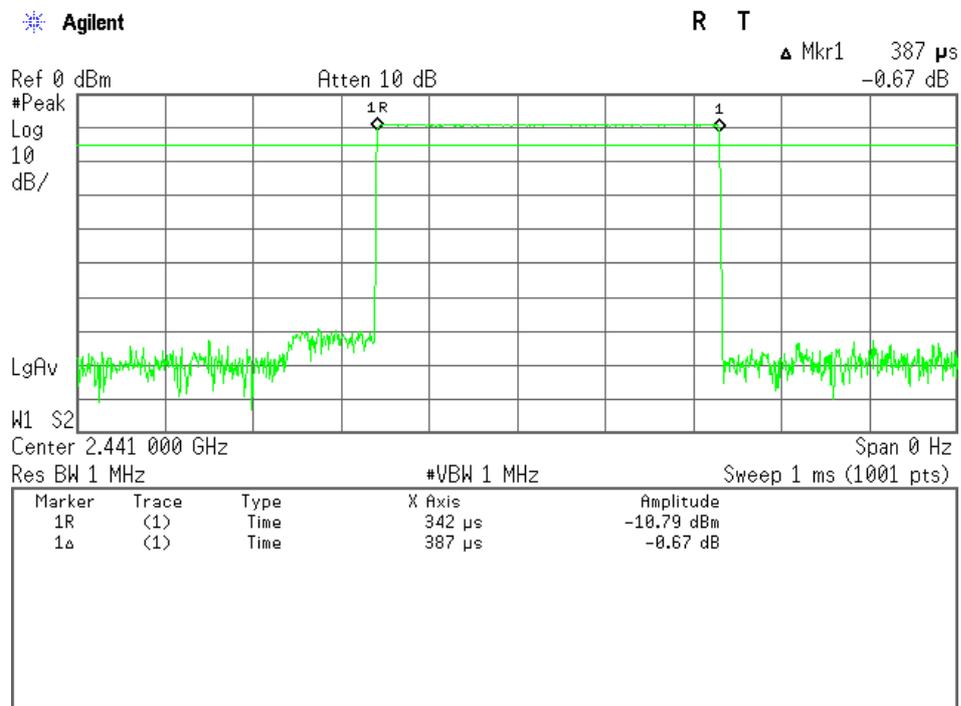
In maximum case the Bluetooth system have three blocks of 2560 ms in 12.8 s period. One block has 256 burst at each hopping channel.

Each tx-time per appearance is 0.093 ms.

Dwell time = 0.093 \* 256 \* 3 = 71..4 ms

Mode of EUT	Dwell Time (msec)
DH1(AFH)	123.8
DH3(AFH)	262.6
DH5(AFH)	308.5

DH1(AFH mode, Modulation type : GFSK)

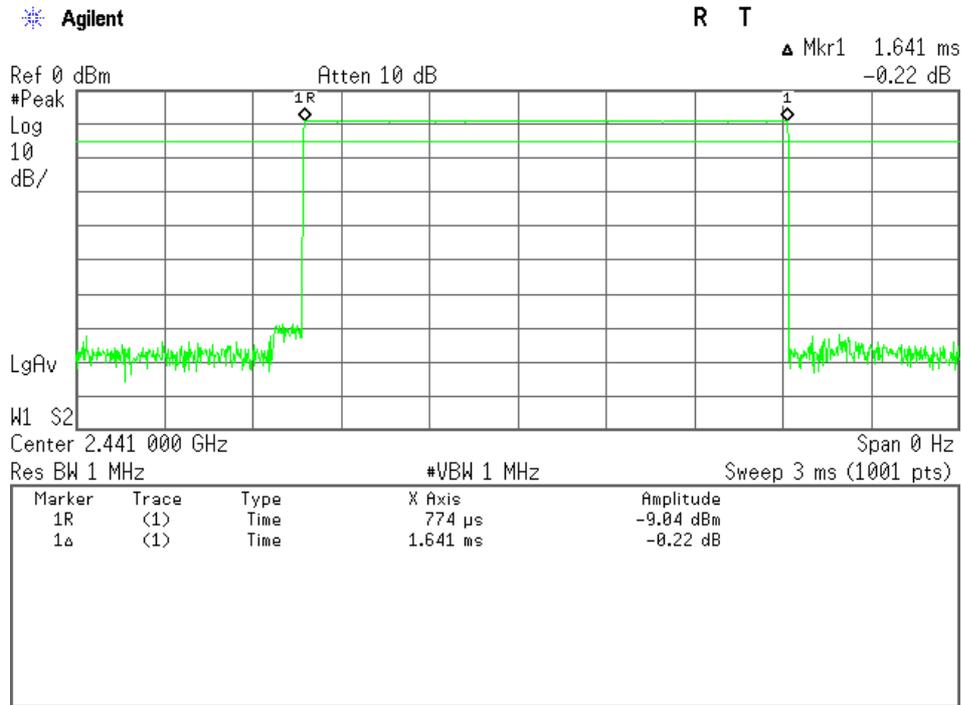


Note : The system makes worst case 1600 hops per second or 1 time slot has a length of 625 μs with 79 channels. A DH1 Packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 800 hops per second with 20 channels. So the system has each channel 40 times per second and so for 8 seconds the system have 320.0 times of appearance.

Each tx-time per appearance is 0.387 ms.

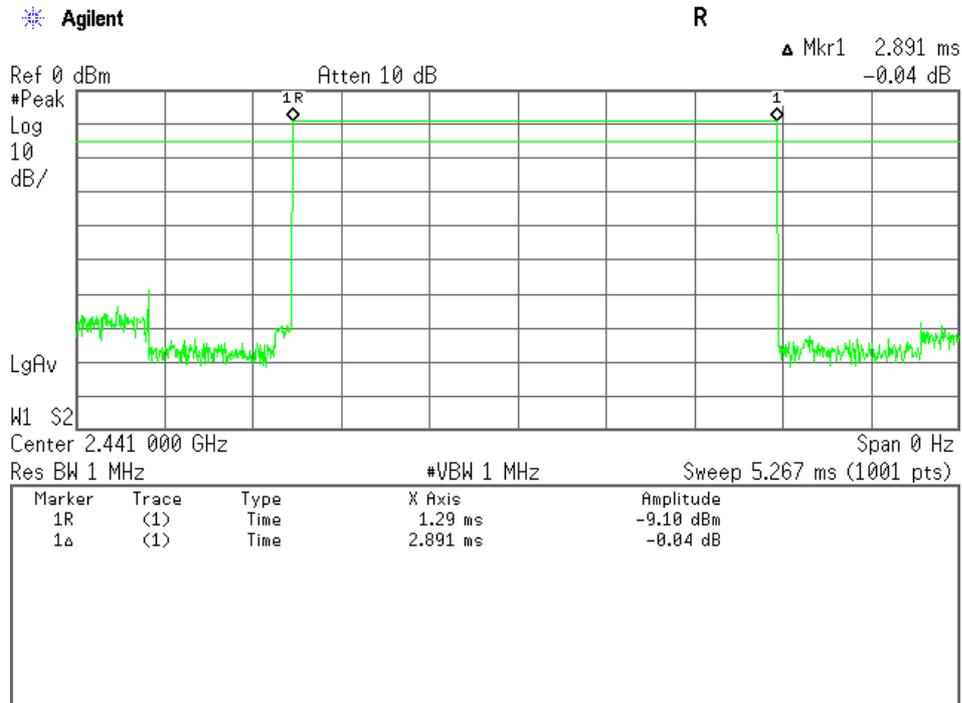
Dwell time = 320.0 \* 0.387 = 123.8 ms

DH3(AFH mode, Modulation type : GFSK)



Note : A DH3 Packet need 3 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 400 hops per second with 20 channels. So the system have each channel 20 times per second and so for 8 seconds the system have 160.0 times of appearance. Each tx-time per appearance is 1.641 ms. Dwell time = 160.0 \* 1.641 = 262.6 ms

DH5(AFH mode, Modulation type : GFSK)



Note : A DH5 Packet need 5 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 266.667 hops per second with 20 channels. So the system have each channel 13.33335 times per second and so for 8 seconds the system have 106.7 times of appearance. Each tx-time per appearance is 2.891 ms.  
 Dwell time = 106.7 \* 2.891 = 308.5 ms

**7.5 Peak Output Power(Conduction)**

For the requirements,  - Applicable  - Tested.  - Not tested by applicant request.]  
 - Not Applicable

For the limits,  - Passed  - Failed  - Not judged

**7.5.1 Worst Point and Measurement Uncertainty**

Peak Output Power is 1.14 dBm at 2441.0 MHz

Uncertainty of Measurement Results at Amplitude +/-0.8 dB(2 $\sigma$ )

Remarks : \_\_\_\_\_

**7.5.2 Test Site**

KITA-KANSAI Testing Center

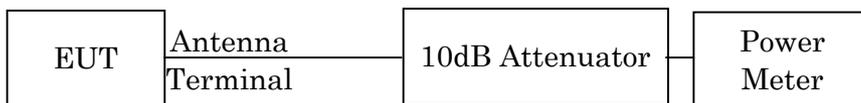
Test site : SAITO  - Anechoic chamber (A1)  - Measurement room (M1)  
 - Measurement room (M2)  - Measurement room (M3)  
 - Shielded room (S1)  - Shielded room (S2)  
 - Shielded room (S3)  - Shielded room (S4)

### 7.5.3 Test Instruments

Type	Model	Manufacturer	ID No.	Last Cal.	Interval
Power Meter	N1911A	Agilent	B-63	2012/7	1 Year
Power Sensor	N1921A	Agilent	B-64	2012/7	1 Year
Attenuator	54A-10	Weinschel	D-28	2012/9	1 Year
RF Cable	SUCOFLEX102	SUHNER	C-52	2012/7	1 Year

### 7.5.4 Test Method and Test Setup (Diagrammatic illustration)

The Conducted RF Power Output was measured with a power meter, one 10dB attenuator and a short, low loss cable.



**7.5.5 Test Data**

1)DH5(Modulation type : GFSK)

Test Date: December 12, 2012  
Temp.: 20 °C, Humi: 31 %

CH	Transmitting Frequency	Correction Factor [dB]	Meter Reading [dBm]	Conducted Peak Output Power		Limits [dBm]	Margin [dB]
	[MHz]			[dBm]	[mW]		
00	2402	10.04	-8.91	1.13	1.30	20.97	+19.84
39	2441	10.04	-8.90	1.14	1.30	20.97	+19.83
78	2480	10.04	-8.96	1.08	1.28	20.97	+19.89

Calculated result at 2441.000 MHz, as the worst point shown on underline:  
 Correction Factor = 10.04 dB  
 + ) Meter Reading = -8.90 dBm  
 Result = 1.14 dBm = 1.30 mW  
 Minimum Margin: 20.97 - 1.14 = 19.83 (dB)

NOTES  
 1. The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.  
 2. Setting of measuring instrument(s) :

Detector Function	Video B.W.
Peak	Off

2)2DH5(Modulation type : pi/4-DQPSK)

Test Date: December 12, 2012  
 Temp.: 20 °C, Humi: 31 %

Transmitting Frequency		Correction Factor [dB]	Meter Reading [dBm]	Conducted Peak Output Power		Limits [dBm]	Margin [dB]
CH	[MHz]			[dBm]	[mW]		
00	2402	10.04	-9.87	0.17	1.04	20.97	+20.80
39	2441	10.04	-9.88	0.16	1.04	20.97	+20.81
78	2480	10.04	-9.95	0.09	1.02	20.97	+20.88

Calculated result at 2402.000 MHz, as the worst point shown on underline:

Correction Factor	=	10.04 dB
+ ) Meter Reading	=	-9.87 dBm
Result	=	0.17 dBm = 1.04 mW

Minimum Margin: 20.97 - 0.17 = 20.80 (dB)

NOTES

- The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.
- Setting of measuring instrument(s) :

Detector Function	Video B.W.
Peak	Off

3)3DH5(Modulation type : 8DPSK)

Test Date: December 12, 2012  
Temp.: 20 °C, Humi: 31 %

CH	Transmitting Frequency	Correction Factor	Meter Reading	Conducted		Limits	Margin
	[MHz]			Peak Output Power	[dBm]		
		[dB]	[dBm]	[dBm]		[dBm]	[dB]
00	2402	10.04	-9.44	0.60	1.15	20.97	+20.37
39	2441	10.04	-9.46	0.58	1.14	20.97	+20.39
78	2480	10.04	-9.51	0.53	1.13	20.97	+20.44

Calculated result at 2402.000 MHz, as the worst point shown on underline:

Correction Factor	=	10.04 dB
+ ) Meter Reading	=	-9.44 dBm
Result	=	0.60 dBm = 1.15 mW

Minimum Margin: 20.97 - 0.60 = 20.37 (dB)

NOTES

- The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.
- Setting of measuring instrument(s) :

Detector Function	Video B.W.
Peak	Off

**7.6 Peak Power Density(Conduction)**

For the requirements,  - Applicable  - Tested.  - Not tested by applicant request.]  
 - Not Applicable

For the limits,  - Passed  - Failed  - Not judged

**7.7 Spurious Emissions(Conduction)**

For the requirements,  - Applicable  - Tested.  - Not tested by applicant request.]  
 - Not Applicable

For the limits,  - Passed  - Failed  - Not judged

**7.7.1 Worst Point and Measurement Uncertainty**

Uncertainty of Measurement Results	9 kHz – 1GHz	<u>+/-1.0</u>	dB(2 $\sigma$ )
	1GHz – 18GHz	<u>+/-1.2</u>	dB(2 $\sigma$ )
	18GHz – 40GHz	<u>+/-1.6</u>	dB(2 $\sigma$ )

Remarks : \_\_\_\_\_

**7.7.2 Test Site**

KITA-KANSAI Testing Center

Test site : SAITO

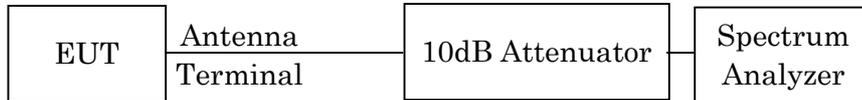
<input type="checkbox"/> - Anechoic chamber (A1)	<input type="checkbox"/> - Measurement room (M1)
<input type="checkbox"/> - Measurement room (M2)	<input type="checkbox"/> - Measurement room (M3)
<input type="checkbox"/> - Shielded room (S1)	<input type="checkbox"/> - Shielded room (S2)
<input type="checkbox"/> - Shielded room (S3)	<input checked="" type="checkbox"/> - Shielded room (S4)

**7.7.3 Test Instruments**

Type	Model	Manufacturer	ID No.	Last Cal.	Interval
Spectrum Analyzer	E4446A	Agilent	A-39	2012/9	1 Year
Attenuator	54A-10	Weinschel	D-28	2012/9	1 Year
RF Cable	SUCOFLEX102	SUHNER	C-52	2012/7	1 Year

**7.7.4 Test Method and Test Setup (Diagrammatic illustration)**

The test system is shown as follows:



The setting of the spectrum analyzer are shown as follows:

Frequency Range	30 MHz - 25 GHz	Band-Edge
Res. Bandwidth	100 kHz	100 kHz
Video Bandwidth	300 kHz	300 kHz
Sweep Time	AUTO	AUTO
Trace	Maxhold	Maxhold

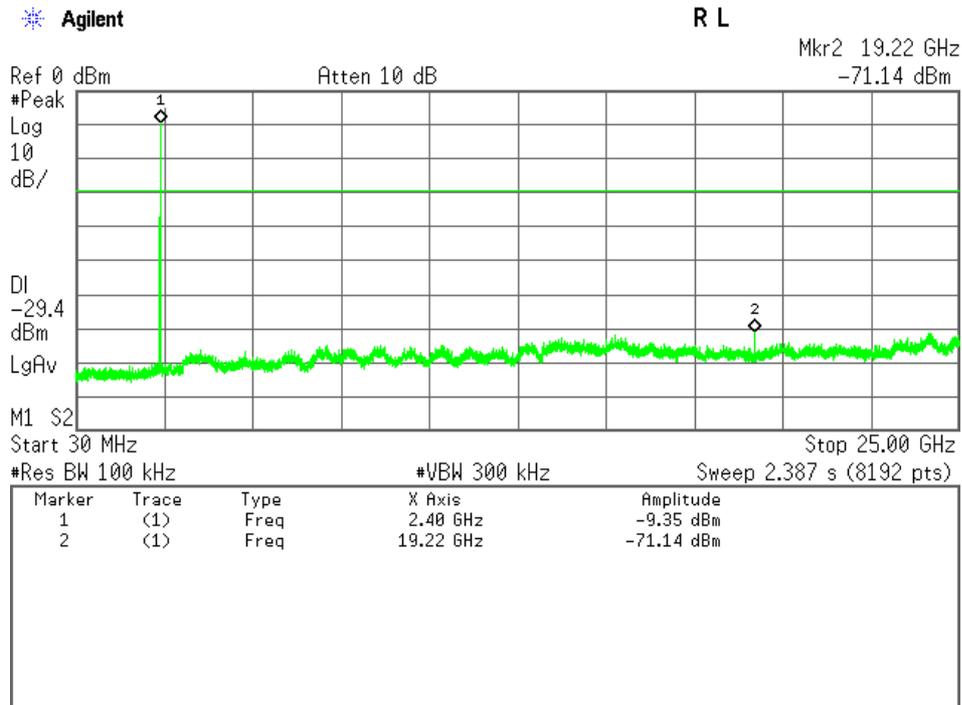
## 7.7.5 Test Data

Test Date : December 12, 2012

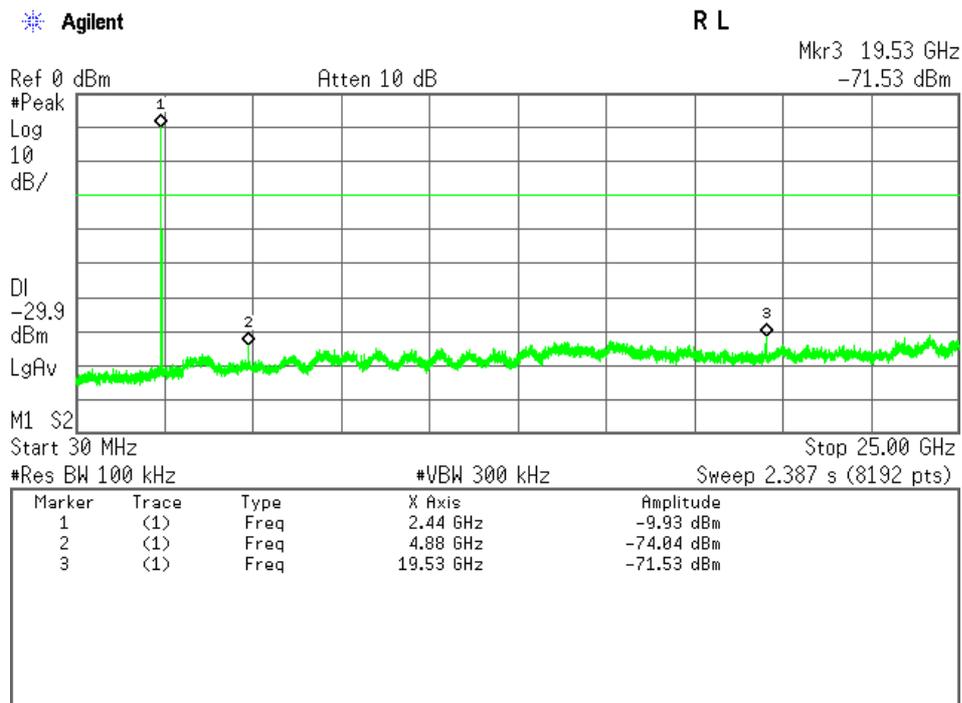
Temp.:20°C, Humi:31%

Mode of EUT : Standard+EDR

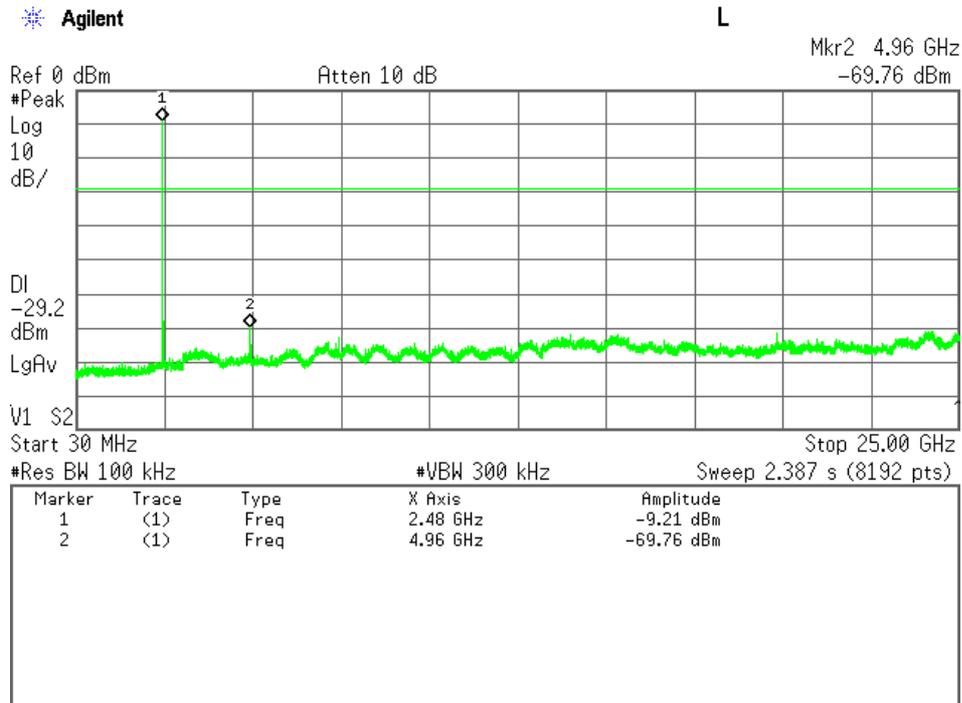
### Low Channel



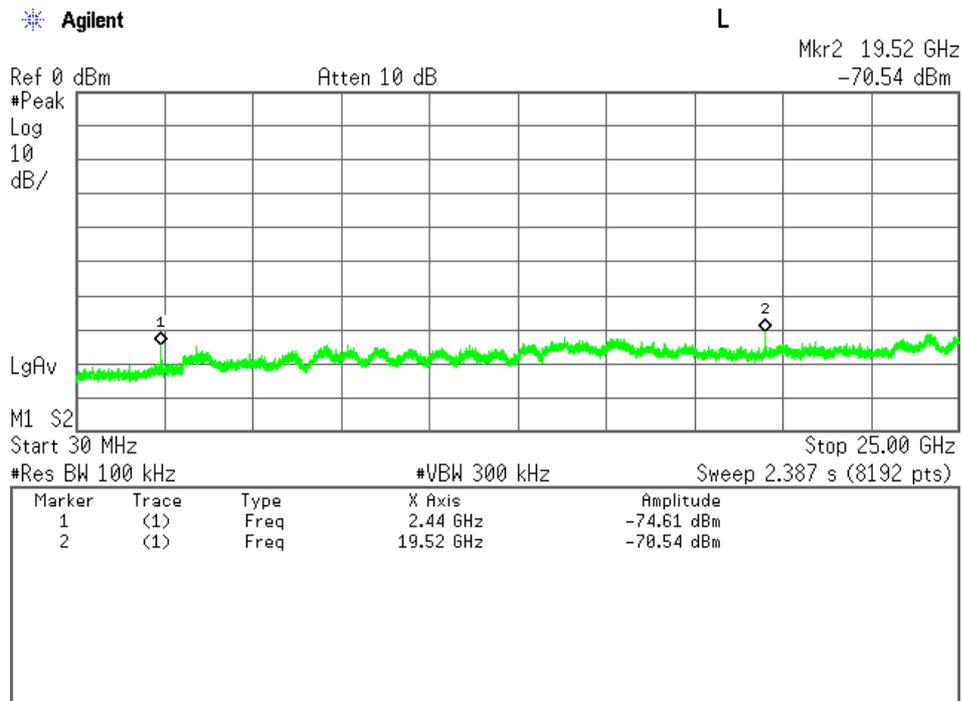
### Middle Channel



## High Channel

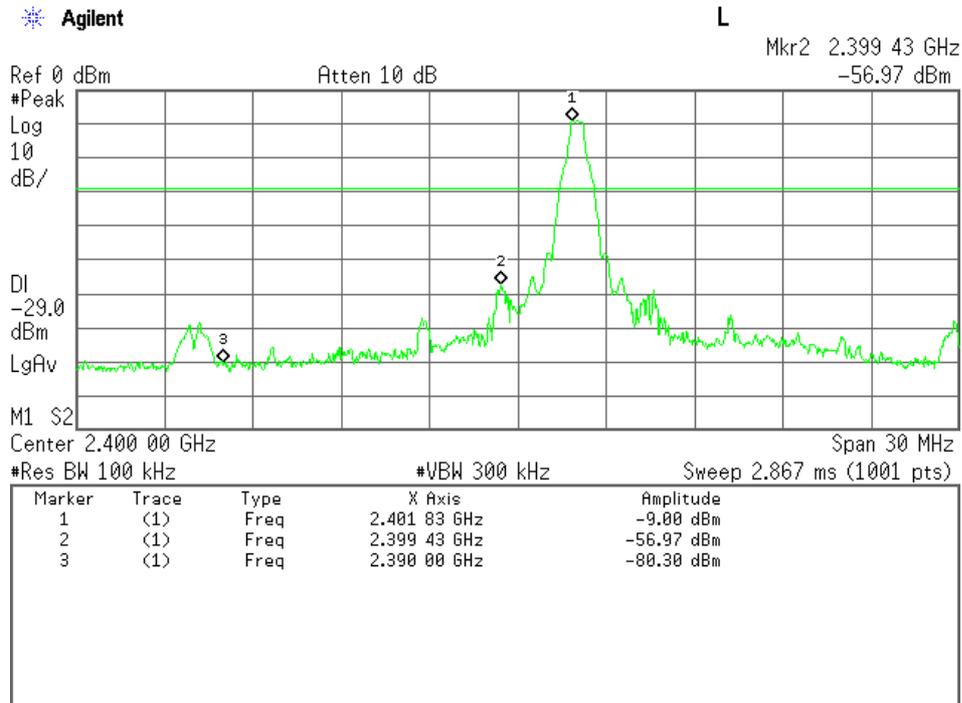


## Receiving(Middle Channel)

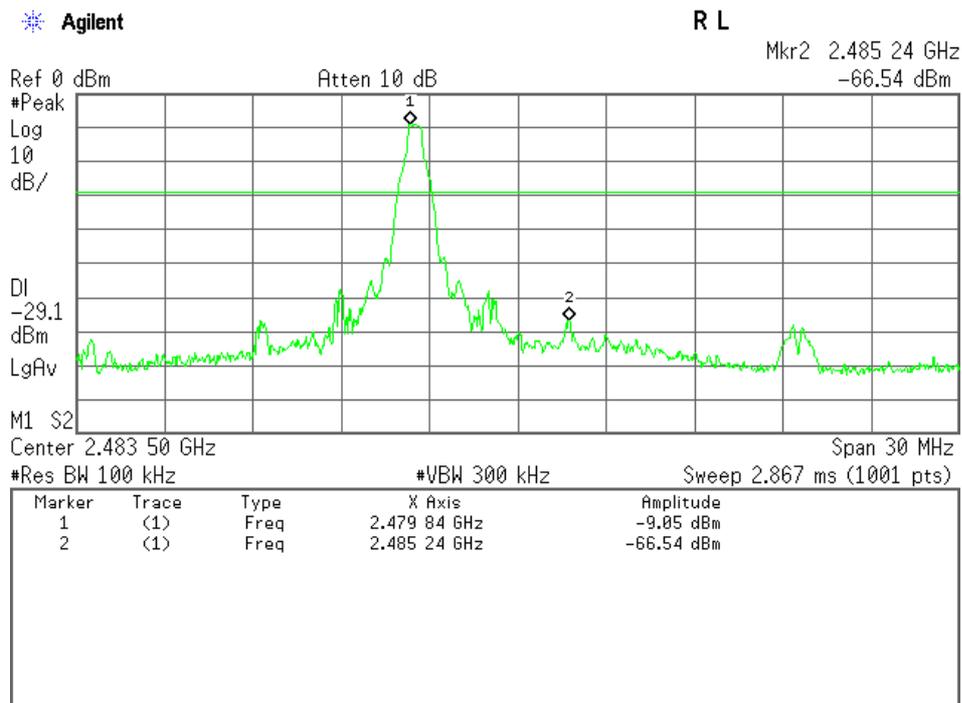


## Band-Edge Emission

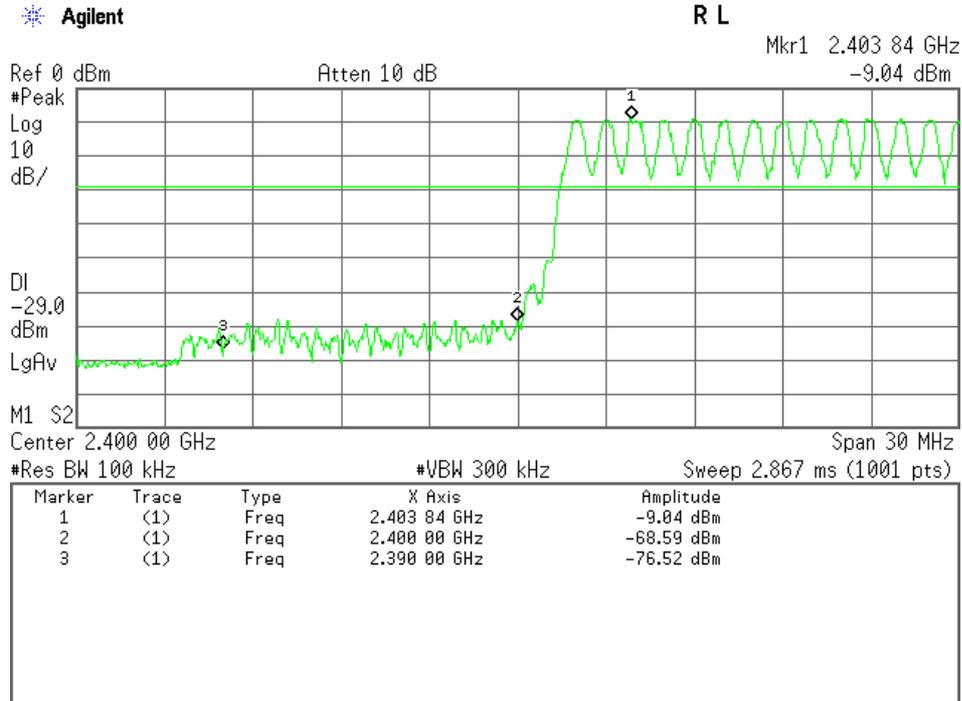
### Low Channel(Hopping off), Band-Edge Emission



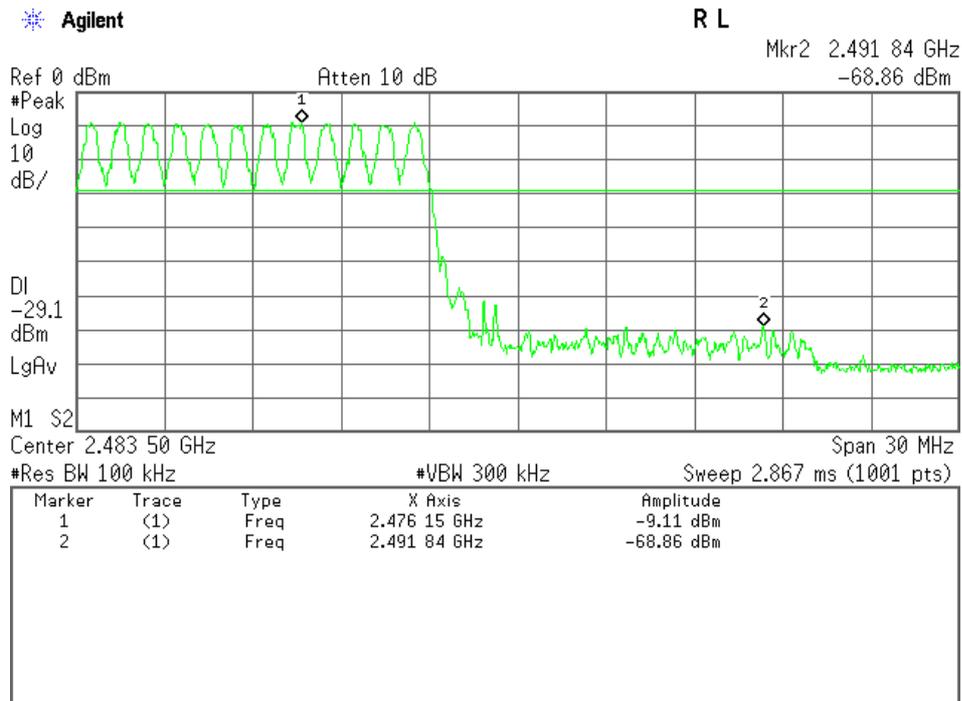
### High Channel(Hopping off), Band-Edge Emission



### Low Channel(Hopping on), Band-Edge Emission



### High Channel(Hopping on), Band-Edge Emission



**7.8 AC Powerline Conducted Emission**

For the requirements,  - Applicable  - Tested.  - Not tested by applicant request.]  
 - Not Applicable

For the limits,  - Passed  - Failed  - Not judged

**7.8.1 Worst Point and Measurement Uncertainty**

Min. Limit Margin (Quasi-Peak) 30.6 dB at 0.28 MHz

Uncertainty of Measurement Results +/-2.7 dB(2 $\sigma$ )

Remarks : \_\_\_\_\_

**7.8.2 Test Site**

KITA-KANSAI Testing Center

Test site : SAITO  - Anechoic chamber (A1)  - Measurement room (M1)  
 - Measurement room (M2)  - Measurement room (M3)  
 - Shielded room (S1)  - Shielded room (S2)  
 - Shielded room (S3)  - Shielded room (S4)

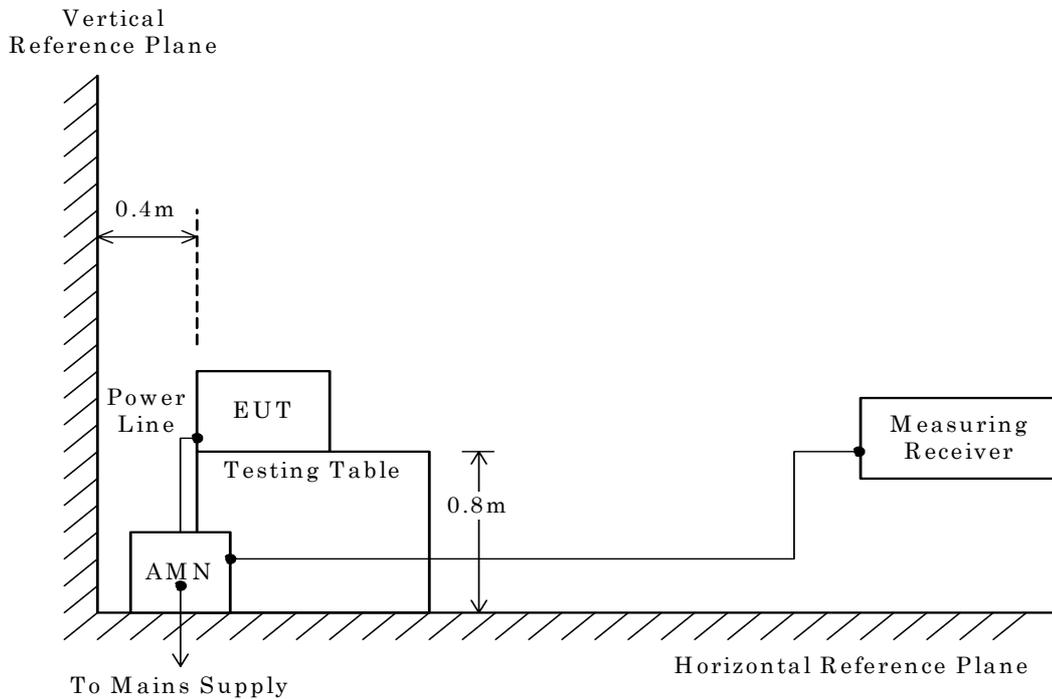
**7.8.3 Test Instruments**

Type	Model	Manufacturer	ID No.	Last Cal.	Interval
Test Receiver	ESU 26	Rohde & Schwarz	A-6	2012/4	1 Year
AMN (main)	ESH3-Z5	Rohde & Schwarz	D-12	2012/8	1 Year
RF Cable	RG223/U	SUHNER	H-35	2012/6	1 Year

**7.8.4 Test Method and Test Setup (Diagrammatic illustration)**

The preliminary tests were performed using the scan mode of test receiver or spectrum analyzer to observe the emissions characteristics of the EUT.  
 The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.  
 This configurations was used for final tests.

– Side View –



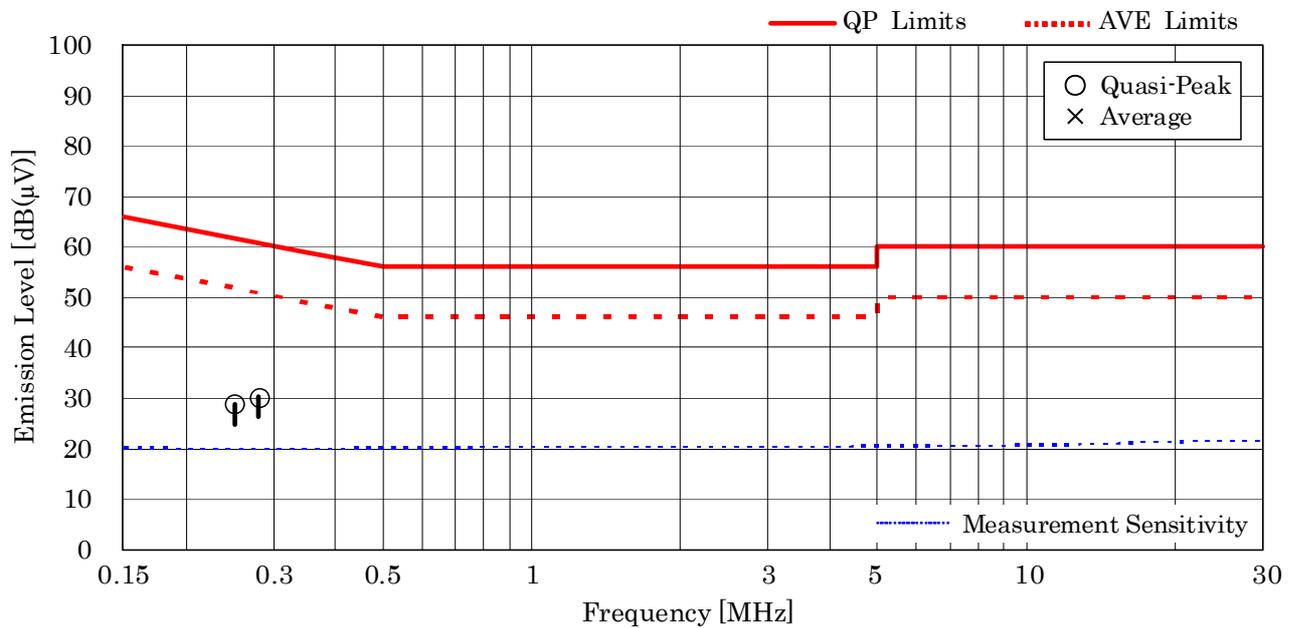
NOTE  
 AMN : Artificial Mains Network

### 7.8.5 Test Data

Mode of EUT : All modes have been investigated and the worst case mode for channel (39ch: 2441MHz) has been listed.

Test Date: December 13, 2012  
Temp.: 22 °C, Humi.: 35 %

Frequency [MHz]	Corr. Factor [dB]	Meter Readings [dB(μV)]				Limits [dB(μV)]		Results [dB(μV)]		Margin [dB]	Remarks
		VA QP	AVE	VB QP	AVE	QP	AVE	QP	AVE		
0.25	10.1	18.8	--	16.3	--	61.8	51.8	28.9	--	+32.9	-
0.28	10.1	20.1	--	18.2	--	60.8	50.8	30.2	--	+30.6	-
1.74	10.3	< 10.0	--	< 10.0	--	56.0	46.0	< 20.3	--	> +35.7	-



#### NOTES

1. The spectrum was checked from 0.15 MHz to 30 MHz.
2. The correction factor includes the AMN insertion loss and the cable loss.
3. The symbol of "<" means "or less".
4. The symbol of ">" means "more than".
5. The symbol of "--" means "not applicable".
6. Calculated result at 0.28 MHz, as the worst point shown on underline:  
 Correction Factor + Meter Reading = 10.1 + 20.1 = 30.2 dB(μV)
7. QP : Quasi-Peak Detector / AVE : Average Detector
8. Test receiver setting(s) : CISPR QP 9 kHz / Average 9 kHz

**7.9 Radiated Emission**The requirements are  - Applicable  - Tested.  - Not tested by applicant request.] - Not Applicable - Passed  - Failed  - Not judged**7.9.1 Worst Point and Measurement Uncertainty**Min. Limit Margin (Average) >5.4 dB at 22320.0 MHz

Uncertainty of Measurement Results	9 kHz – 30 MHz	<u>+/-1.9</u>	<u>dB(2<math>\sigma</math>)</u>
	30 MHz – 300 MHz	<u>+/-4.3</u>	<u>dB(2<math>\sigma</math>)</u>
	300 MHz – 1000 MHz	<u>+/-5.4</u>	<u>dB(2<math>\sigma</math>)</u>
	1 GHz – 6 GHz	<u>+/-4.6</u>	<u>dB(2<math>\sigma</math>)</u>
	6 GHz – 18 GHz	<u>+/-5.2</u>	<u>dB(2<math>\sigma</math>)</u>
	18 GHz – 40 GHz	<u>+/-5.4</u>	<u>dB(2<math>\sigma</math>)</u>

Remarks : \_\_\_\_\_

**7.9.2 Test Site**

KITA-KANSAI Testing Center SAITO EMC Branch

 - Anechoic chamber A1 - Anechoic chamber A2

### 7.9.3 Test Instruments

Type	Model	Manufacturer	ID No.	Last Cal.	Interval
Test Receiver	ESU26	Rohde & Schwarz	A-6	2012/4	1 Year
Loop Antenna	HFH2-Z2	Rohde & Schwarz	C-2	2012/8	1 Year
RF Cable	RG213/U	SUHNER	H-28	2012/8	1 Year
Biconical Antenna	VHA9103/BBA9106	Schwarzbeck	C-30	2012/5	1 Year
Log-periodic Antenna	UHALP9108-A1	Schwarzbeck	C-31	2012/5	1 Year
RF Cable	S 10162 B-11 etc.	SUHNER	H-4	2012/3	1 Year
Site Attenuation	--	----	H-15	2012/2	1 Year
Pre-Amplifier	WJ-6882-824	Watkins Johnson	A-21	2012/1	1 Year
Pre-Amplifier	WJ-6611-513	Watkins Johnson	A-23	2012/1	1 Year
Pre-Amplifier	BZ1840LD1	B&Z	A-29	2012/1	1 Year
Pre-Amplifier	DBL-0618N515	DBS Microwave	A-33	2012/1	1 Year
Horn Antenna	91888-2	EATON	C-41-1	2012/6	1 Year
Horn Antenna	91889-2	EATON	C-41-2	2012/6	1 Year
Horn Antenna	3160-04	EMCO	C-55	2011/6	2 Years
Horn Antenna	3160-05	EMCO	C-56	2011/6	2 Years
Horn Antenna	3160-06	EMCO	C-57	2011/6	2 Years
Horn Antenna	3160-07	EMCO	C-58	2011/6	2 Years
Horn Antenna	3160-08	EMCO	C-59	2011/6	2 Years
Horn Antenna	3160-09	EMCO	C-48	2011/6	2 Years
Attenuator	54A-10	Weinschel	D-29	2012/9	1 Year
Attenuator	54A-10	Weinschel	D-30	2012/9	1 Year
Band Rejection Filter	BRM50701	MICRO-TRONICS	D-93	2012/2	1 Year
RF Cable	SUCOFLEX102	SUHNER	C-52	2012/7	1 Year
RF Cable	SUCOFLEX104	SUHNER	C-66	2012/1	1 Year
RF Cable	SUCOFLEX104	SUHNER	C-67	2012/1	1 Year
RF Cable	SUCOFLEX102EA	SUHNER	C-69	2012/1	1 Year
SVSWR	--	----	H-19	2012/2	1 Year

**7.9.4 Test Method and Test Setup (Diagrammatic illustration)**

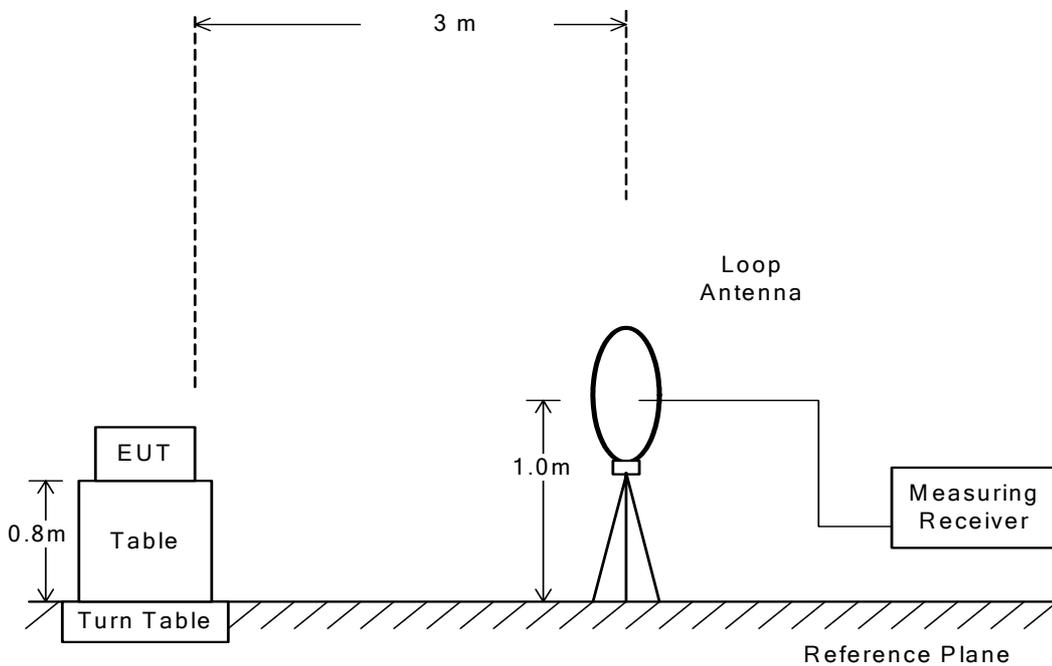
**7.9.4.1 Radiated Emission 9 kHz – 30 MHz**

The preliminary tests were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration(in X, Y and Z axis), cable configuration and mode of operation were determined for producing the maximum level of emissions.

This configurations was used for the final tests.

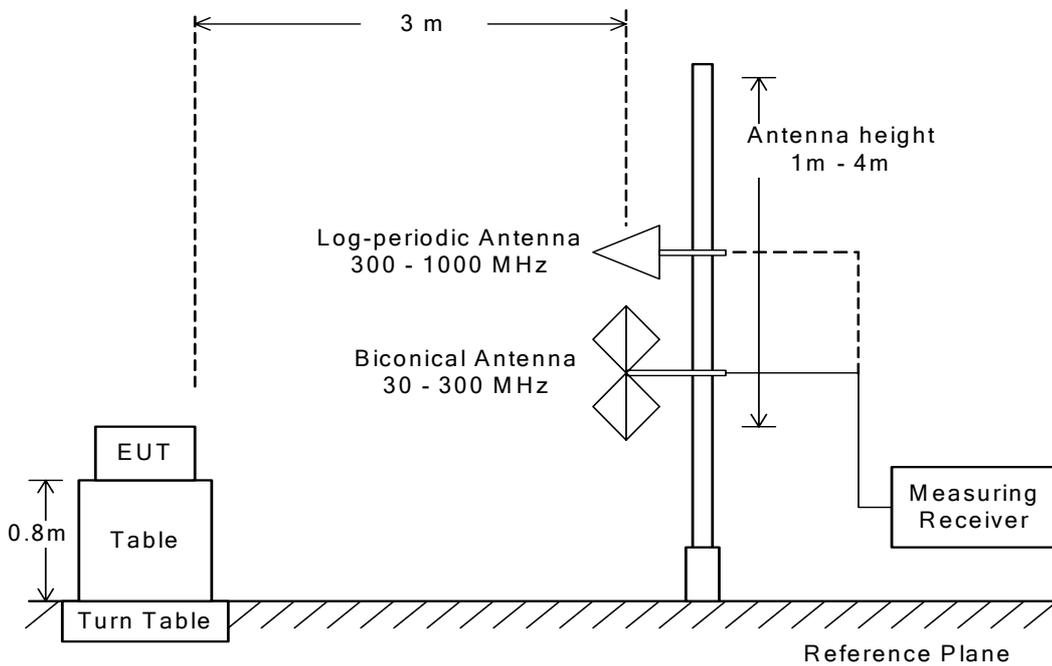
– Side View –



**7.9.4.2 Radiated Emission 30 MHz – 1000 MHz**

The preliminary tests were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.  
 The EUT configuration(in X, Y and Z axis), cable configuration and mode of operation were determined for producing the maximum level of emissions.  
 This configurations was used for the final tests.

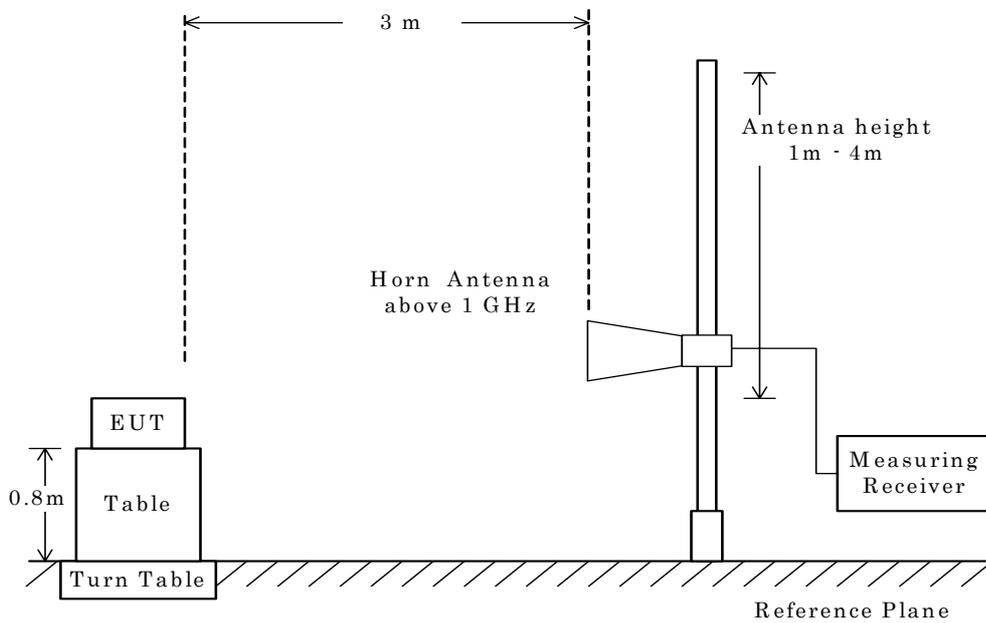
– Side View –



**7.9.4.3 Radiated Emission above 1 GHz**

The preliminary tests were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.  
 The EUT configuration(in X, Y and Z axis), cable configuration and mode of operation were determined for producing the maximum level of emissions.  
 This configurations was used for the final tests.

– Side View –



**NOTE**

The antenna height is scanned depending on the EUT's size and mounting height.

**7.9.5 Test Data**

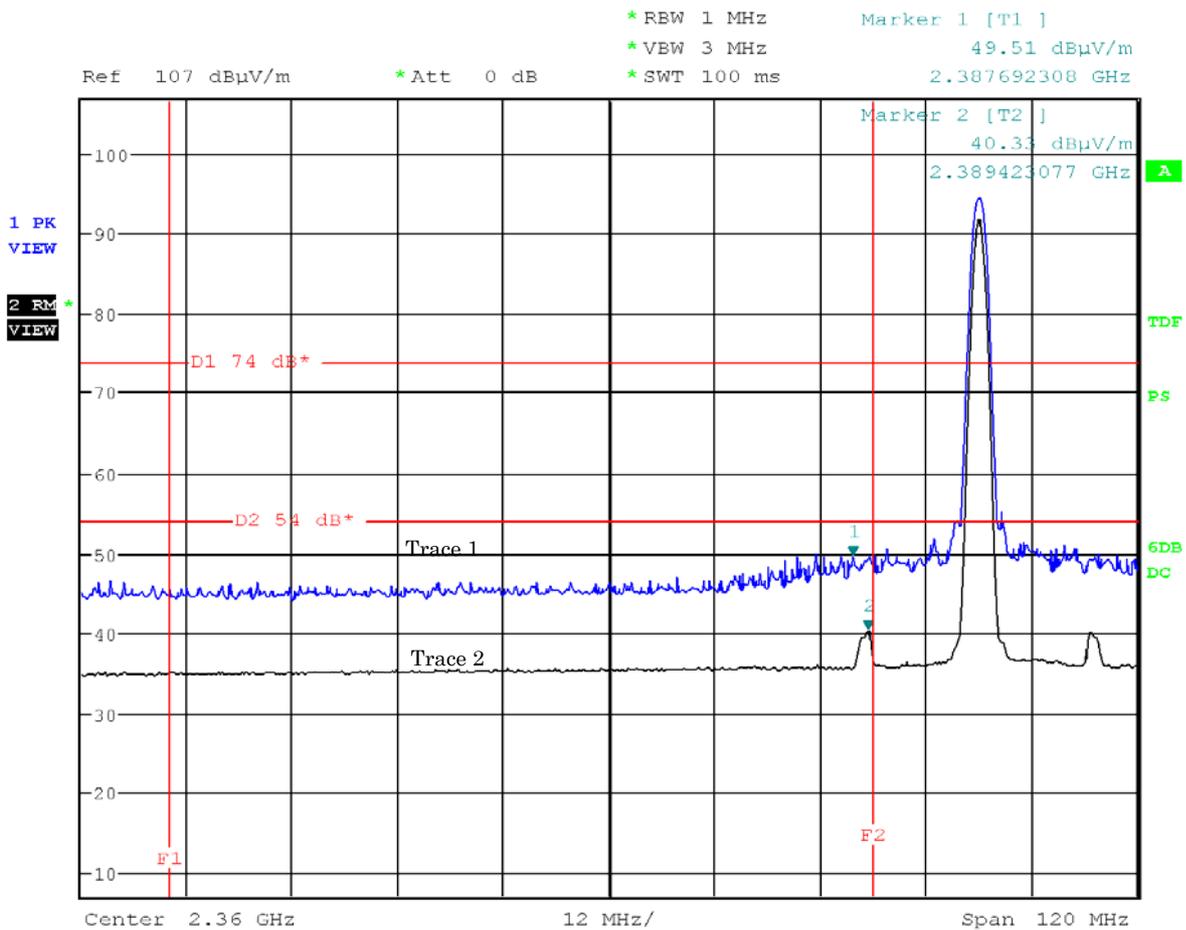
**7.9.5.1 Band-edge Compliance**

Test Date : December 12, 2012

Temp.:20°C, Humi:38%

Mode of EUT : Standard/EDR, Hopping off (0ch: 2402 MHz) (worst case)

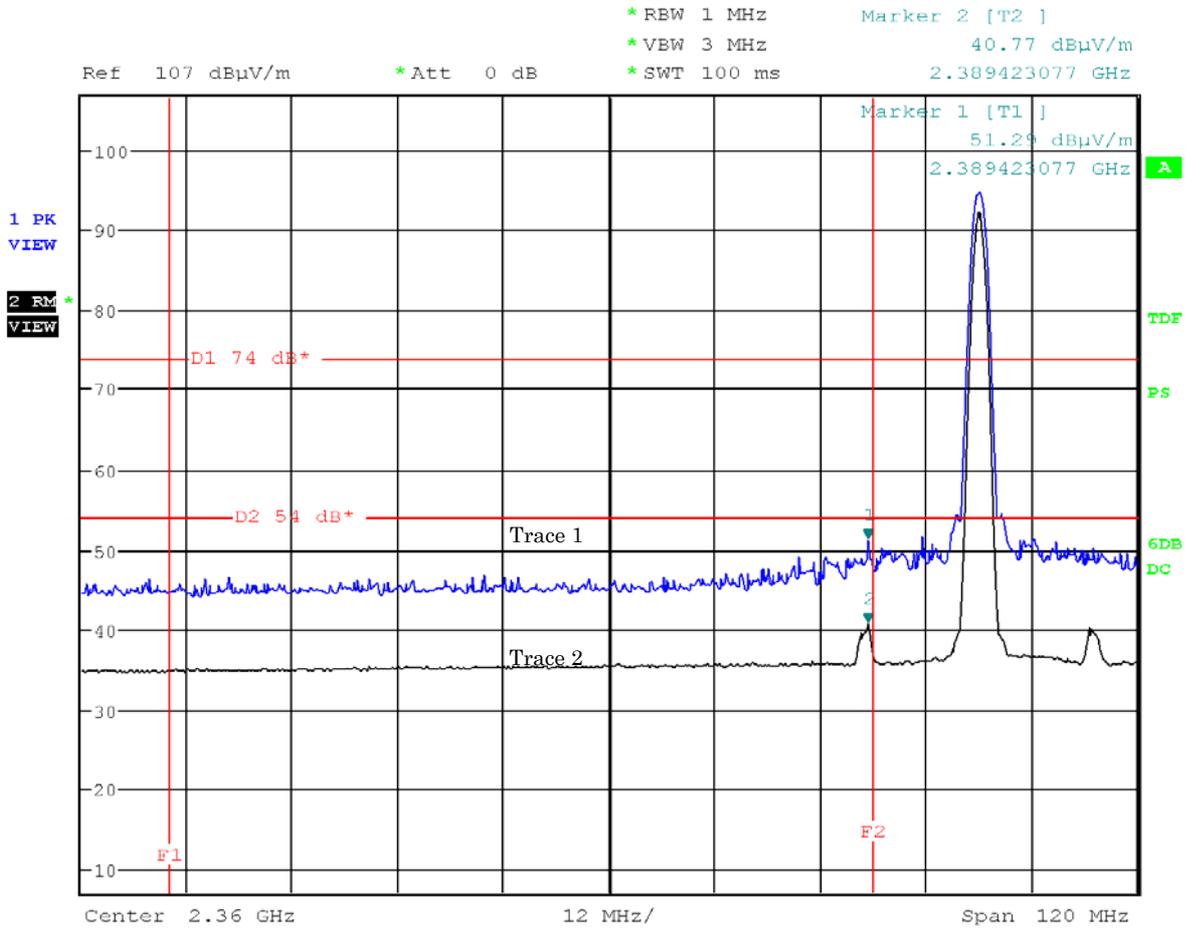
Antenna Polarization : Horizontal



Note: The trace 1 is Peak detection. The trace 2 is RMS detection.

Mode of EUT : Standard/EDR, Hopping off (0ch: 2402 MHz) (worst case)

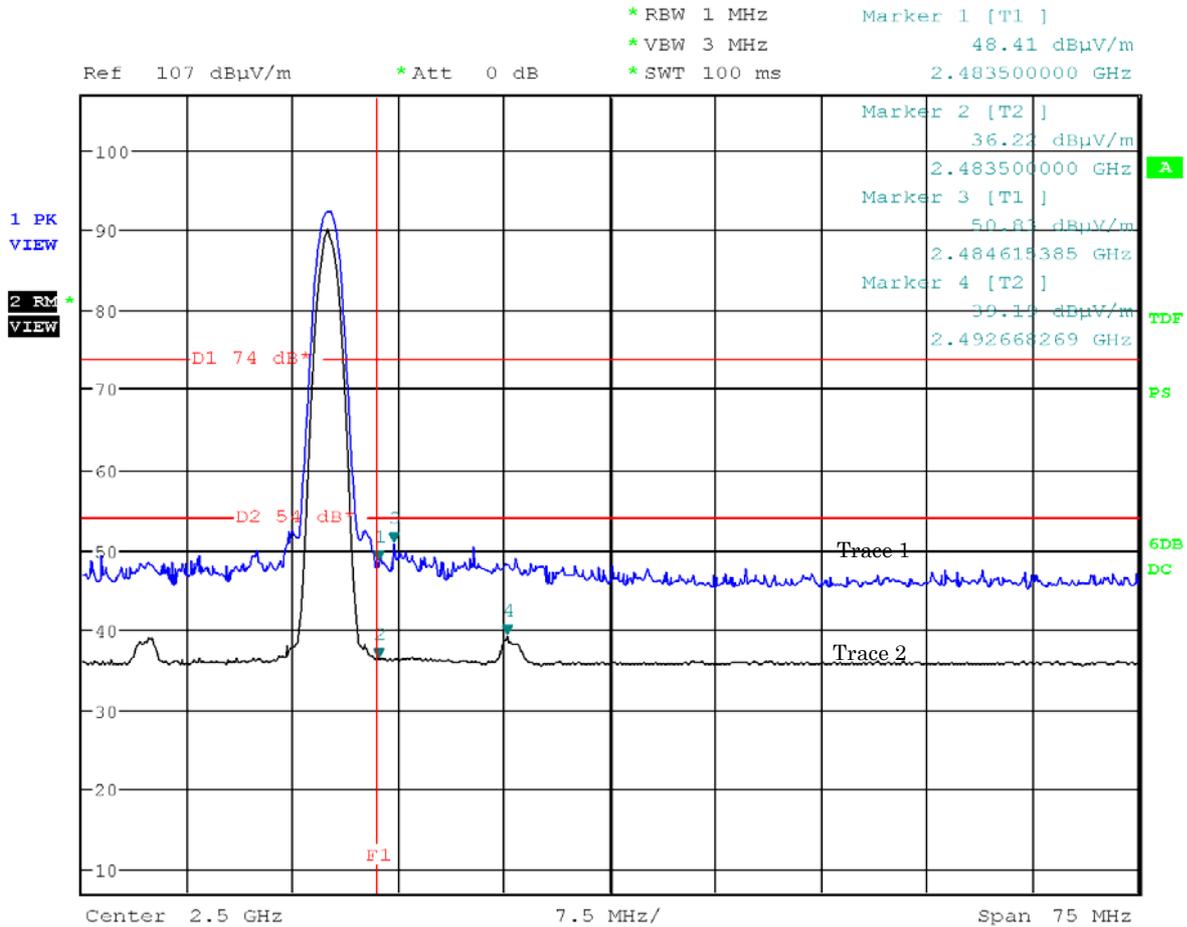
Antenna Polarization : Vertical



Note: The trace 1 is Peak detection. The trace 2 is RMS detection.

Mode of EUT : Standard/EDR, Hopping off (78ch: 2480 MHz) (worst case)

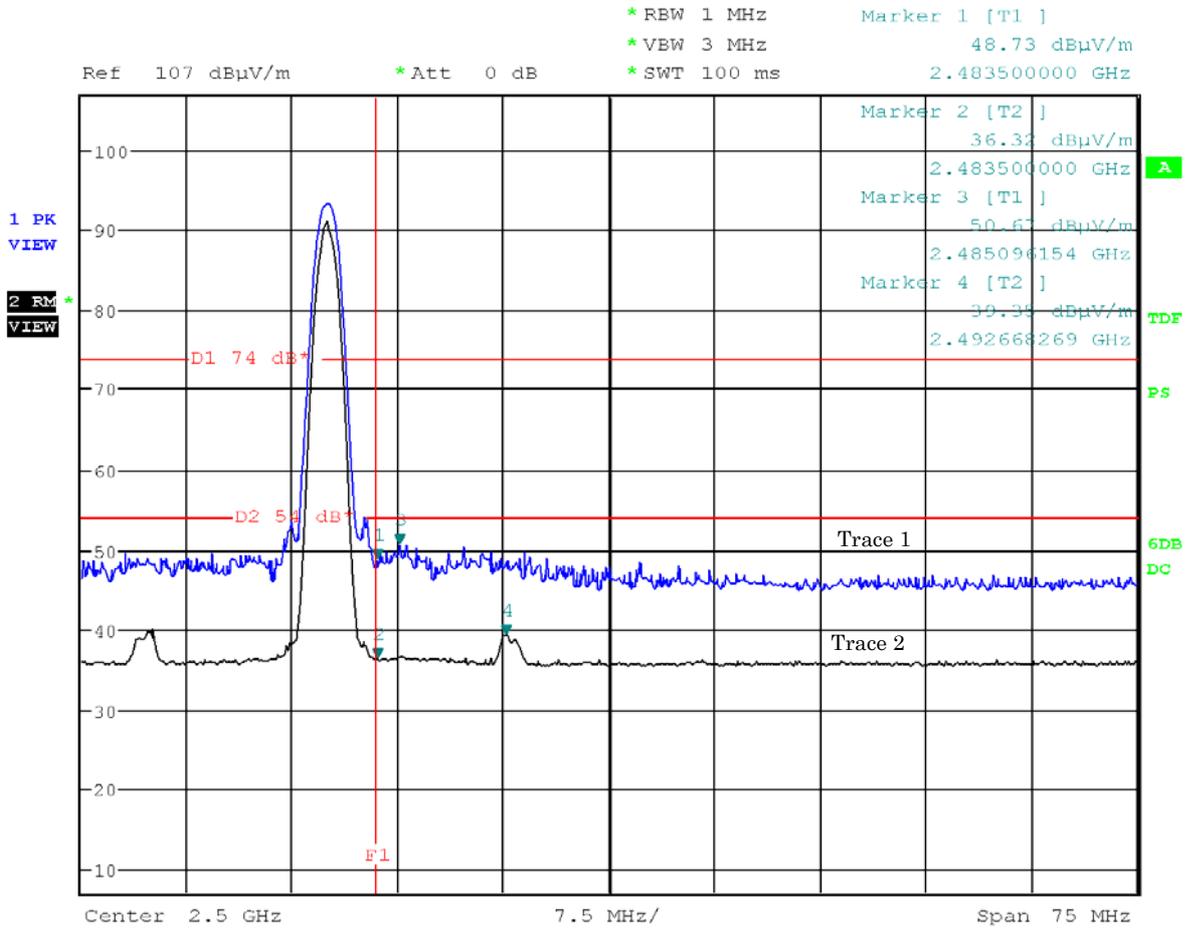
Antenna Polarization : Horizontal



Note: The trace 1 is Peak detection. The trace 2 is RMS detection.

Mode of EUT : Standard/EDR, Hopping off (78ch: 2480 MHz) (worst case)

Antenna Polarization : Vertical



Note: The trace 1 is Peak detection. The trace 2 is RMS detection.

**7.9.5.2 Other Spurious Emission (9kHz – 30MHz)**

Test Date : December 12, 2012  
 Temp.:20°C, Humi:38%

Mode of EUT : All modes have been investigated and the worst case mode has been listed.  
 Results : No spurious emissions in the range 20dB below the limit.

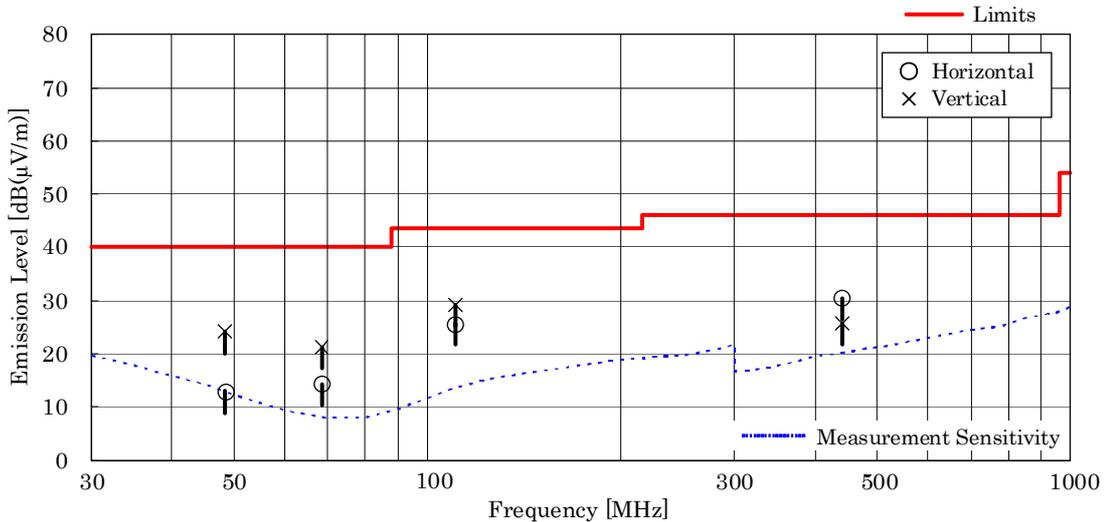
**7.9.5.3 Other Spurious Emission (30MHz – 1000MHz)**

Mode of EUT : All modes have been investigated and the worst case mode has been listed.

Test Date: December 12, 2012  
 Temp.: 20 °C, Humi: 38 %

Test condition : Bluetooth Tx 2402MHz

Frequency [MHz]	Antenna Factor [dB(1/m)]	Cable Loss [dB]	Meter Readings [dB(μV)]		Limits [dB(μV/m)]	Results [dB(μV/m)]		Margin [dB]	Remarks
			Hori.	Vert.		Hori.	Vert.		
48.4	11.8	1.1	0.0	11.2	40.0	12.9	24.1	+15.9	-
68.4	6.8	1.3	6.2	13.2	40.0	14.3	21.3	+18.7	-
110.3	11.8	1.7	12.1	15.6	43.5	25.6	29.1	+14.4	-
441.3	16.6	3.5	10.3	5.6	46.0	30.4	25.7	+15.6	-



**NOTES**

1. Test Distance : 3 m
2. The spectrum was checked from 30 MHz to 1000 MHz.
3. The cable factor is consist of several combination conductor cables.
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. Calculated result at 110.3 MHz, as the worst point shown on underline:  
 Antenna Factor + Cable Loss + Meter Reading = 11.8 + 1.7 + 15.6 = 29.1 dB(μV/m)
7. Test receiver setting(s) : CISPR QP 120 kHz (QP : Quasi-Peak)

**7.9.5.4 Other Spurious Emission (Above 1000MHz)**

Mode of EUT : Standard/EDR (worst case)

Test Date: December 13, 2012  
 Temp.: 23 °C, Humi: 30 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings [dB(μV)]				Limits [dB(μV/m)]		Results [dB(μV/m)]		Margin [dB]	Remarks
			Horizontal		Vertical		PK	AVE	PK	AVE		
<b>Test condition : Tx Low Ch</b>												
4804.0	27.3	-21.2	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.1	< 36.1	> +17.9	A/B
12010.0	33.6	-27.3	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.3	< 36.3	> +17.7	A/B
19216.0	40.2	-22.8	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 57.4	< 47.4	> + 6.6	A/B
<b>Test condition : TX Middle Ch</b>												
4882.0	27.3	-21.3	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.0	< 36.0	> +18.0	A/B
7323.0	29.9	-19.6	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 50.3	< 40.3	> +13.7	A/B
12205.0	33.5	-26.9	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.6	< 36.6	> +17.4	A/B
19528.0	40.3	-22.7	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 57.6	< 47.6	> + 6.4	A/B
<b>Test condition : TX High Ch</b>												
4960.0	27.3	-21.4	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 45.9	< 35.9	> +18.1	A/B
7440.0	29.9	-19.5	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 50.4	< 40.4	> +13.6	A/B
12400.0	33.5	-26.7	< 40.0	< 30.0	40.0	< 30.0	74.0	54.0	< 46.8	< 36.8	> +17.2	A/B
19840.0	40.3	-22.6	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 57.7	< 47.7	> + 6.3	A/B
22320.0	40.4	-21.8	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 58.6	< 48.6	> + 5.4	A/B

Calculated result at 22320.0 MHz, as the worst point shown on underline:

Antenna Factor = 40.4 dB(1/m)  
 Corr. Factor = -21.8 dB  
 +) Meter Reading = <30.0 dB(μV)  
Result = <48.6 dB(μV/m)  
 Minimum Margin: 54.0 - <48.6 = >5.4 (dB)

**NOTES**

- Test Distance : 3 m
- The spectrum was checked from 1 GHz to 25 GHz (10th harmonic of the highest fundamental frequency).
- The correction factor is shown as follows:  
 Corr. Factor [dB] = Cable Loss + 20dB Pad Att. - Pre-Amp. Gain [dB] (1.0 - 7.6GHz)  
 Corr. Factor [dB] = Cable Loss + 10dB Pad Att. - Pre-Amp. Gain [dB] (7.6 - 18.0GHz)  
 Corr. Factor [dB] = Cable Loss - Pre-Amp. Gain [dB] (over 18 GHz)
- The symbol of "<" means "or less".
- The symbol of ">" means "more than".
- PK : Peak Detector / AVE : Average Detector
- Setting of measuring instrument(s) :

	Detector Function	Resolution B.W.	Video B.W.	Sweep Time
A	Peak	1 MHz	3 MHz	AUTO
B	RMS	1 MHz	3 MHz	AUTO

Mode of EUT : Standard/EDR (worst case)

Test Date: December 13, 2012  
 Temp.: 23 °C, Humi: 30 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings [dB(μV)]				Limits [dB(μV/m)]		Results [dB(μV/m)]		Margin [dB]	Remarks
			Horizontal		Vertical		PK	AVE	PK	AVE		
			PK	AVE	PK	AVE	PK	AVE	PK	AVE		
<b>Test condition : RX Middle Ch</b>												
2441.0	21.3	-22.2	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 39.1	< 29.1	> +24.9	A/B
4882.0	27.3	-21.6	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 45.7	< 35.7	> +18.3	A/B
7323.0	29.9	-19.9	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 50.0	< 40.0	> +14.0	A/B

Calculated result at 7323.0 MHz, as the worst point shown on underline:

Antenna Factor = 29.9 dB(1/m)  
 Corr. Factor = -19.9 dB  
 +) Meter Reading = <30.0 dB(μV)  
 Result = <40.0 dB(μV/m)  
 Minimum Margin: 54.0 - <40.0 = >14.0 (dB)

NOTES

- Test Distance : 3 m
- The spectrum was checked from 1 GHz to 7.5 GHz .
- The correction factor is shown as follows:  
 Corr. Factor [dB] = Cable Loss + 20dB Pad Att. - Pre-Amp. Gain [dB] (1.0 - 7.6GHz)
- The symbol of "<" means "or less".
- The symbol of ">" means "more than".
- PK : Peak Detector / AVE : Average Detector
- Setting of measuring instrument(s) :

	Detector Function	Resolution B.W.	Video B.W.	Sweep Time
A	Peak	1 MHz	3 MHz	AUTO
B	RMS	1 MHz	3 MHz	AUTO