JQA File No. : KL80130029
Issue Date : May 9, 2013

TEST REPORT

Applicant	:	Sharp Corporation, Communication Systems Division
Address	:	2-13-1, Iida Hachihonmatsu, Higashi-Hiroshima City, Hiroshima, 739-0192, JAPAN
Products	:	Cellular Phone
Model No.	:	SH-07E
SERIAL NO.	:	004401114755321 004401114755537
FCC ID	:	APYHRO00190
Test Standard	:	CFR 47 FCC Rules and Regulations Part 15
Test Results	:	**Passed**
Date of Test	:	April 23 ~ 30, 2013

ilac-MRA VLAC Lab Accreditation VLAC-001-2

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.

TABLE OF CONTENTS

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.	:	SH-07E
4.	Serial No.	:	004401114755321
		:	004401114755537
5.	Product Type	:	Pre-production
6.	Date of Manufacture	:	April, 2013
7.	Power Rating	:	4.0VDC (Lithium-ion Battery Pack SH42 2100mAh)
8.	EUT Grounding	:	None
9.	Transmitting Frequency	:	2402.0 MHz(00CH) –2480.0MHz(78CH/39CH)
10.	Receiving Frequency	:	2402.0 MHz(00CH) –2480.0MHz(78CH/39CH)
11.	Max. RF Output Power	:	-1.57dBm(Measure Value)
12.	Category	:	Spread Spectrum Transmitter(FHSS)/DTS
13.	EUT Authorization	:	Certification
14.	Received Date of EUT	:	April 19, 2013

15. Channel Plan

The carrier spacing is 1 MHz/2MHz.
The carrier frequency is designated by the absolute frequency channel number (ARFCN).
The carrier frequency is expressed in the equation shown as follows:

Normal Mode:
Transmitting Frequency (in MHz) = 2402.0 + n
Receiving Frequency (in MHz) = 2402.0 + n
where, n : channel number ($0 \leq n \leq 78$)

Low Energy Mode:
Transmitting Frequency (in MHz) = 2402.0 + 2*n
Receiving Frequency (in MHz) = 2402.0 + 2*n
where, n : channel number ($0 \leq n \leq 39$)

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:

S. Kino

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

Tested by:

Shigeru Osawa

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 and the FCC KDB 558074 D01 DTS Meas Guidance v03, released April 9, 2013. 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-IS-E-6006, 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, 2016)

6 Details of the Equipment Under Test

6.1 Operating Condition

Transmitting/Receiving
Bluetooth 4.0 + EDR + LE
Transmitting frequency : 2402.0 MHz(0CH) – 2480.0 MHz(78CH/39CH)
Receiver frequency : 2402.0 MHz(0CH) – 2480.0 MHz(78CH/39CH)

The test were carried under 2 mode shown as follows:
1. Standard+EDR
2. Low Energy

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)
4. LE Packet (Modulation Type : GFSK)

Other Clock Frequency
32.768 kHz, 19.2 MHz, 27 MHz, 27.12 MHz, 37.4 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	SH-07E	004401114755321*1) 004401114755537*2)	APYHRO00190
B	Lithium-ion Battery	Sharp	SH42	--	N/A
C	AC Adapter	Fujitsu Corporation	04	VJA	N/A
D	Stereo Handsfree	Sharp	SHLDL1	--	N/A
E	Handsfree Conversion cable	Sharp	SH-07E(Option)	--	N/A

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

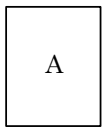
The auxiliary equipment used for testing :
None

Type of Cable:

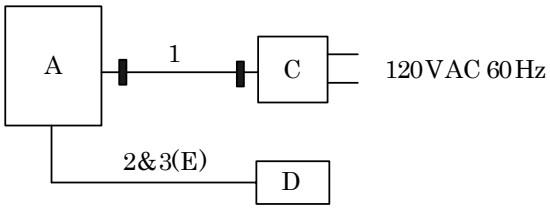
No.	Description	Identification (Manu. etc.)	Connector Shielded	Cable Shielded	Ferrite Core	Length (m)
1	USB conversion cable	--	--	NO	YES	1.1
2	Handsfree Cable	--	--	NO	NO	1.5
3	Handsfree Conversion cable	--	--	NO	NO	0.3

6.3 Test Arrangement (Drawings)

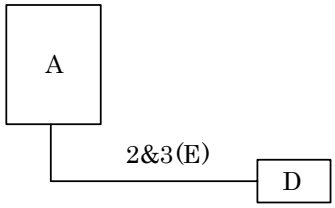
a) Single Unit



b) AC Adapter used



c) Handsfree used



▌:Ferrite Core

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

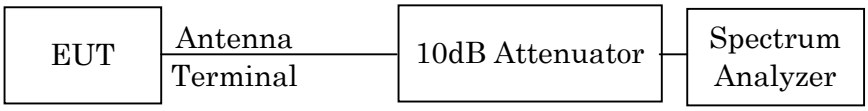
Test site : SAITO
☐ - Anechoic chamber (A1) ☐ - Measurement room (M1)
☐ - Measurement room (M2) ☐ - Measurement room (M3)
☐ - Shielded room (S1) ☐ - Shielded room (S2)
☐ - Shielded room (S3) ☒ - Shielded room (S4)

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:

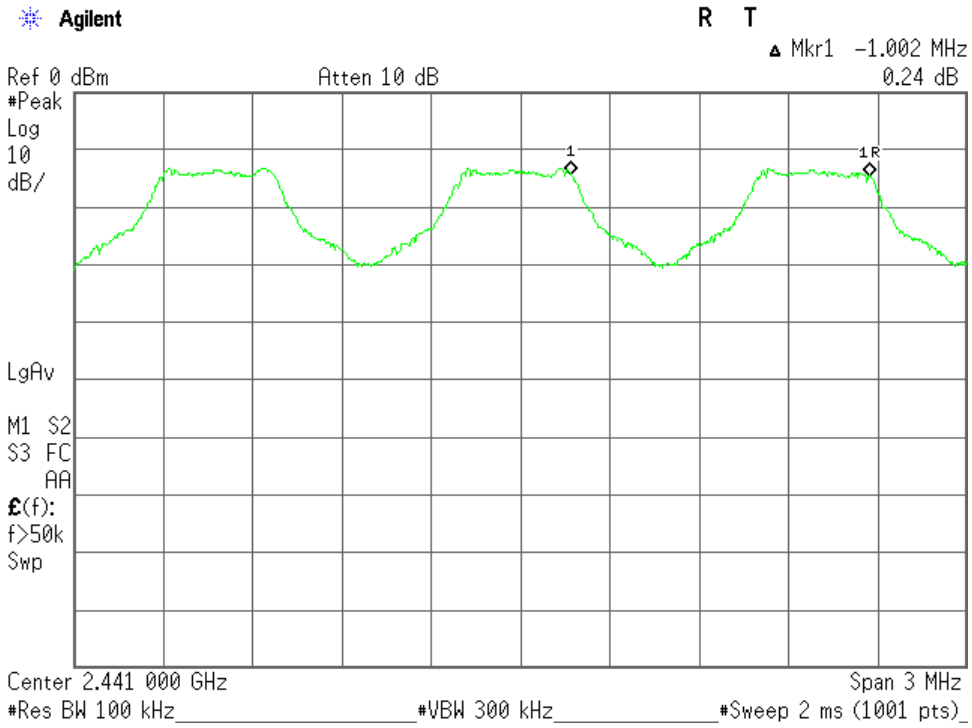
Res. Bandwidth	100 kHz
Video Bandwidth	300 kHz
Span	3 MHz / 5 MHz
Sweep Time	AUTO
Trace	Maxhold

7.1.5 Test Data

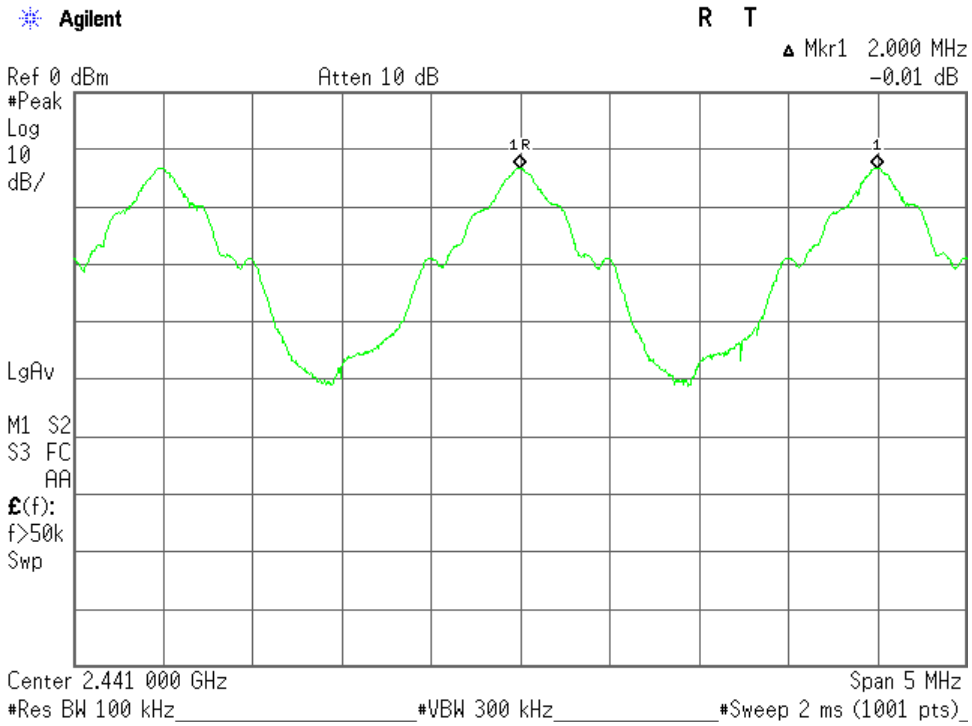
Test Date : April 24, 2013
Temp.:19°C, Humi:62%

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	79
Number of Channel (Inquiry) is	32
Number of Channel (AFH) is	20

Remarks : _____

7.2.2 Test Site

KITA-KANSAI Testing Center

Test site : SAITO

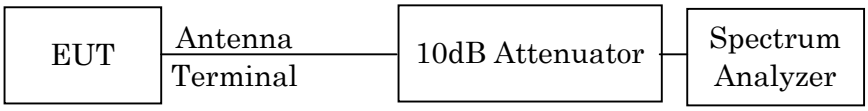
☐ - Anechoic chamber (A1) ☐ - Measurement room (M1)
☐ - Measurement room (M2) ☐ - Measurement room (M3)
☐ - Shielded room (S1) ☐ - Shielded room (S2)
☐ - Shielded room (S3) ☒ - Shielded room (S4)

7.2.3 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:

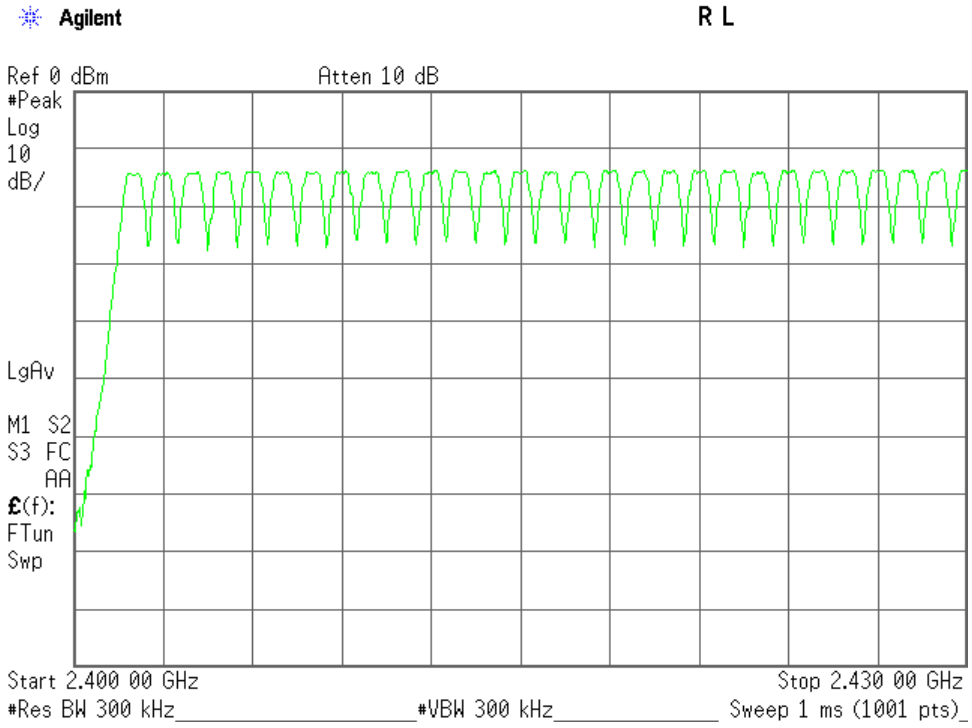
Res. Bandwidth	300 kHz
Video Bandwidth	300 kHz
Span	30 MHz
Sweep Time	AUTO
Trace	Maxhold

7.2.5 Test Data

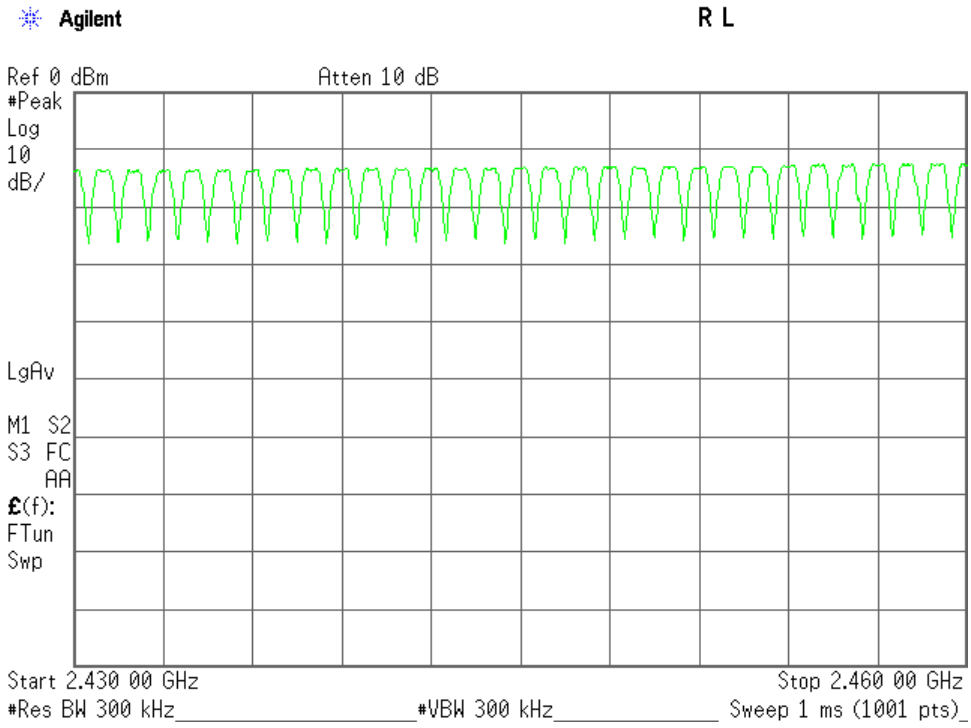
Test Date : April 24, 2013
Temp.:19°C, Humi:32%

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

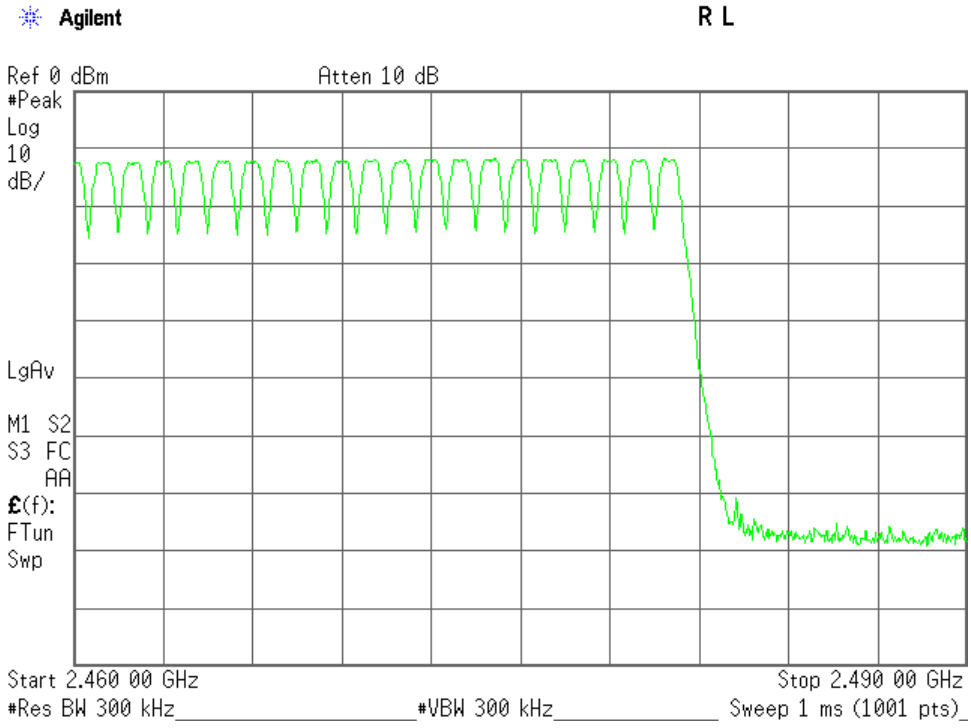
Mode of EUT : Hopping(1/3)



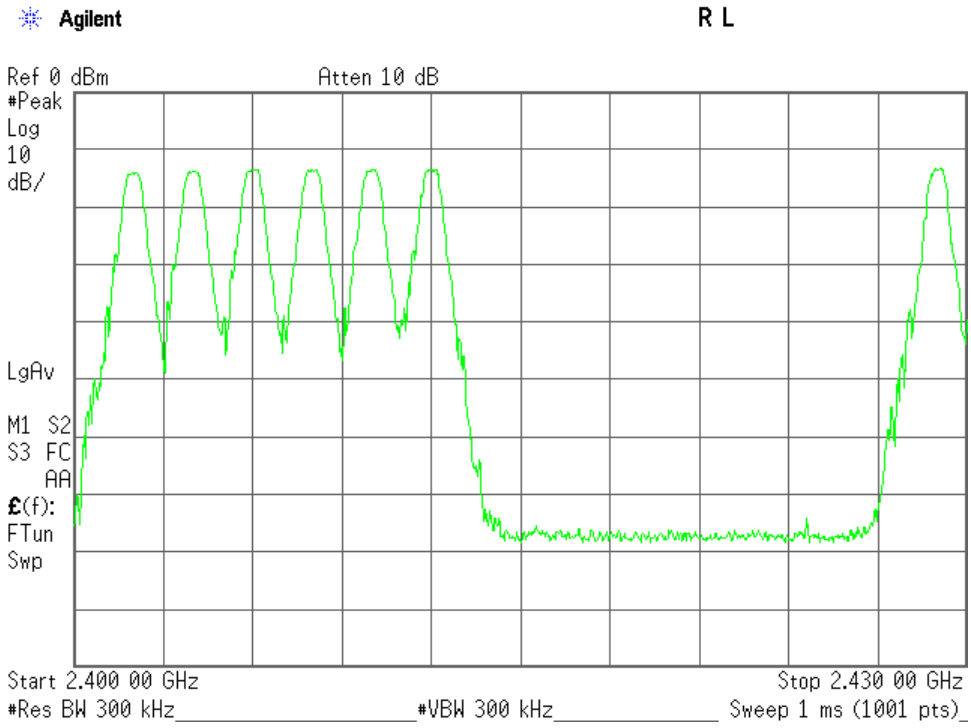
Mode of EUT : Hopping(2/3)



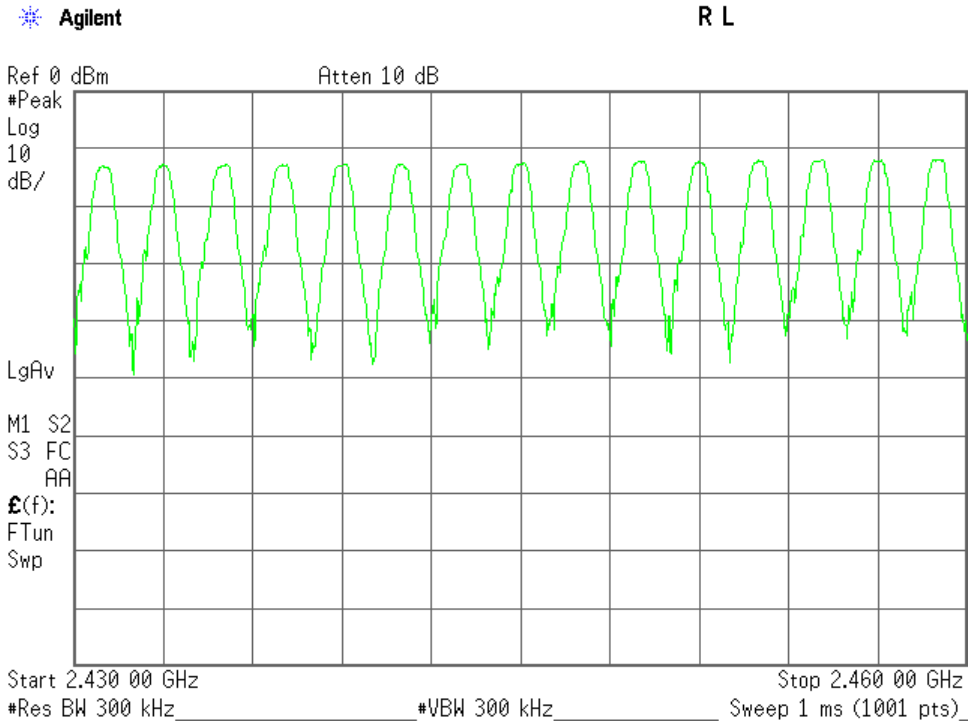
Mode of EUT : Hopping(3/3)



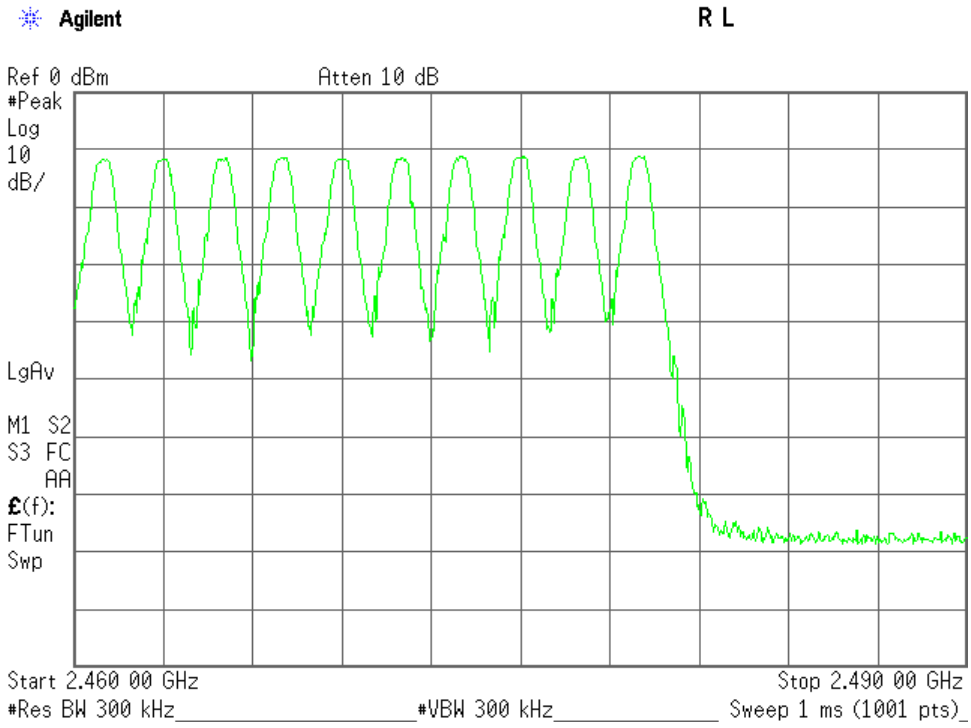
Mode of EUT : Inquiry(1/3)



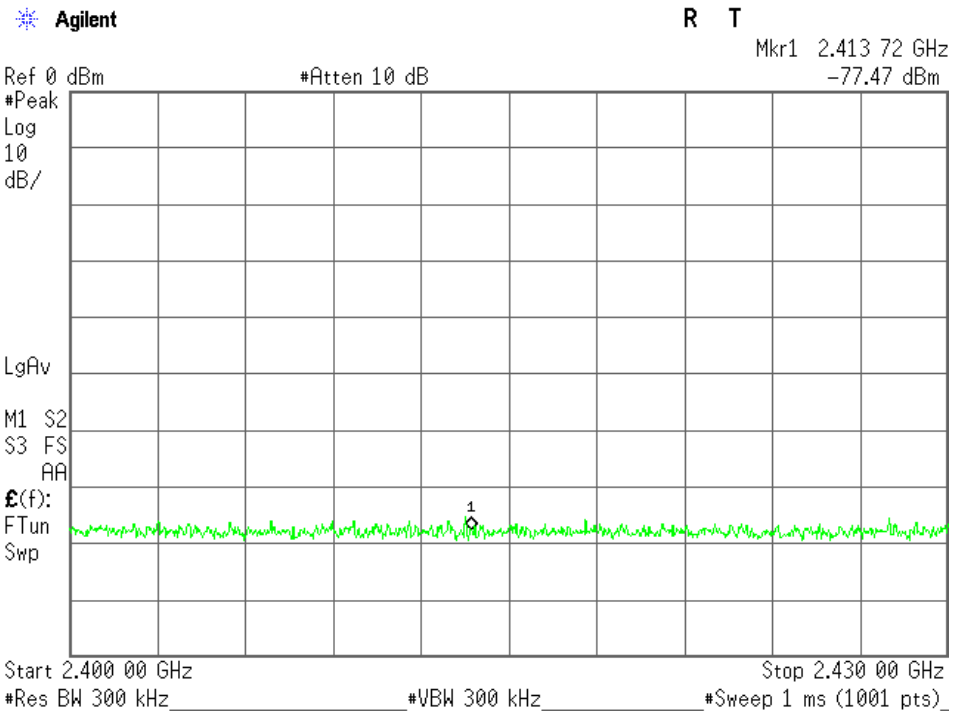
Mode of EUT : Inquiry(2/3)



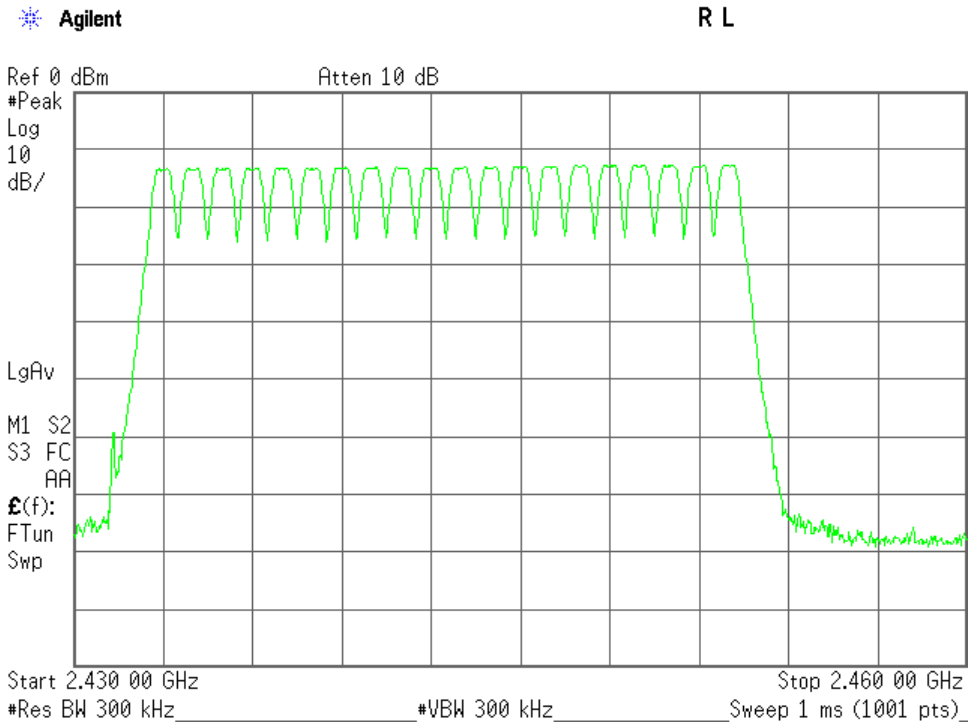
Mode of EUT : Inquiry(3/3)



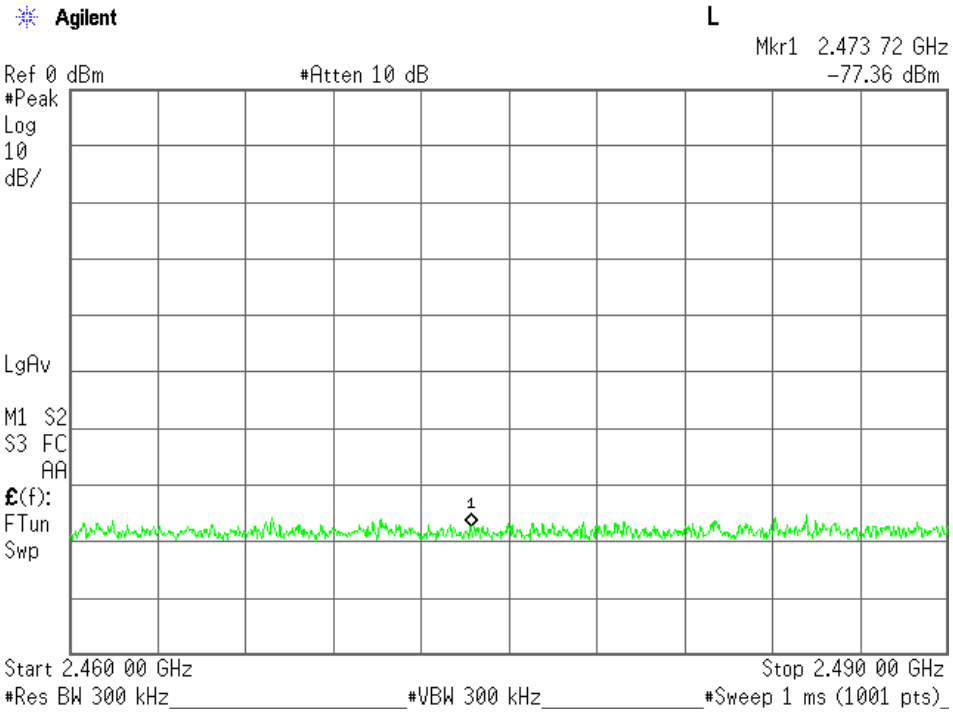
Mode of EUT : AFH(minimum)(1/3)



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	1217.9	kHz	at	2441.0	MHz
The 20dB Bandwidth is	1347.0	kHz	at	2441.0	MHz
The 6dB Bandwidth is	631.3	kHz	at	2402.0	MHz

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

Remarks :

7.3.2 Test Site

KITA-KANSAI Testing Center

Test site : SAITO

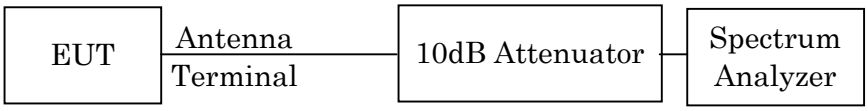
☐ - Anechoic chamber (A1) ☐ - Measurement room (M1)
☐ - Measurement room (M2) ☐ - Measurement room (M3)
☐ - Shielded room (S1) ☐ - Shielded room (S2)
☐ - Shielded room (S3) ☒ - Shielded room (S4)

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 : April 24, 2013
Temp.:19°C, Humi:62%

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	876.4	920.9
39	2441.0	879.8	921.3
78	2480.0	875.8	922.6

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

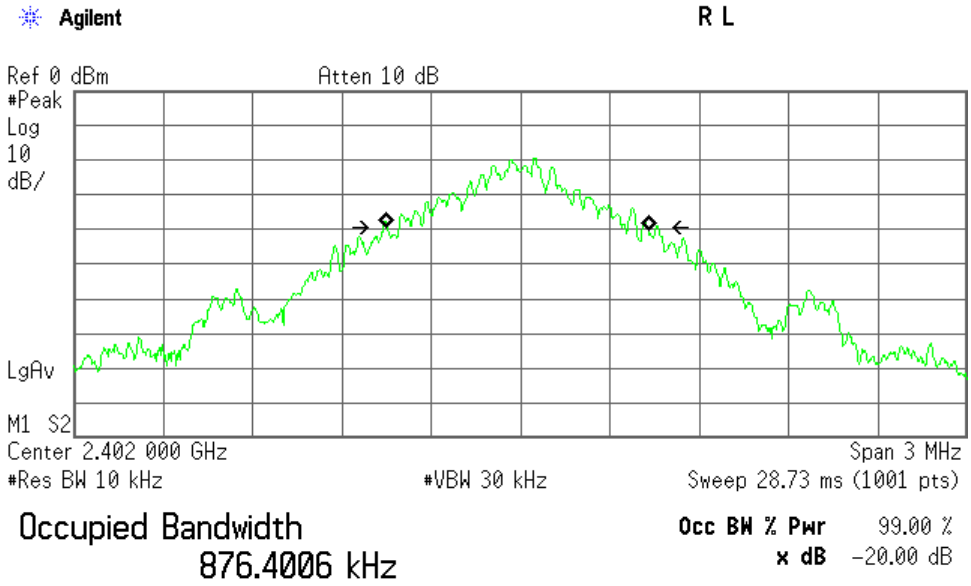
Channel	Frequency (MHz)	99% Bandwidth (kHz)	-20dBc Bandwidth (kHz)
00	2402.0	1206.4	1318.0
39	2441.0	1208.3	1335.0
78	2480.0	1209.6	1317.0

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

Channel	Frequency (MHz)	99% Bandwidth (kHz)	-20dBc Bandwidth (kHz)
00	2402.0	1209.5	1285.0
39	2441.0	1217.9	1347.0
78	2480.0	1209.0	1266.0

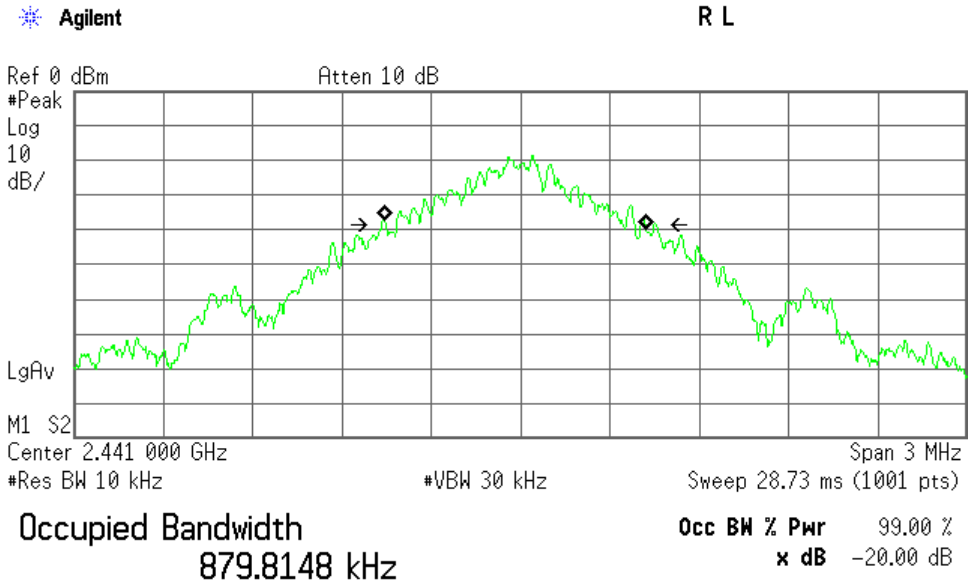
1)Packet Setting : DH5(Modulation type : GFSK)

Low Channel



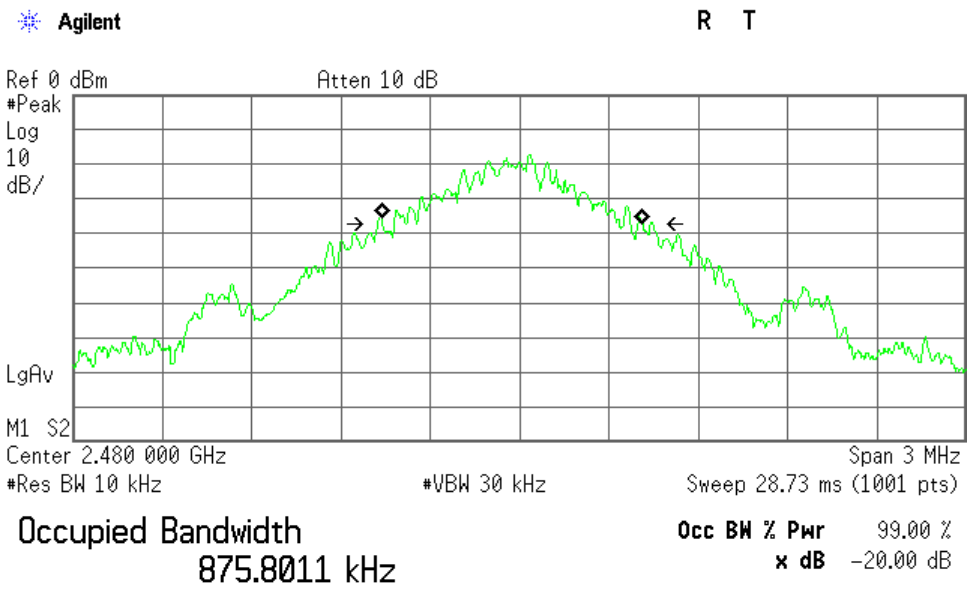
Transmit Freq Error	-10.473 kHz
Occupied Bandwidth	920.899 kHz

Middle Channel



Transmit Freq Error	-17.430 kHz
Occupied Bandwidth	921.329 kHz

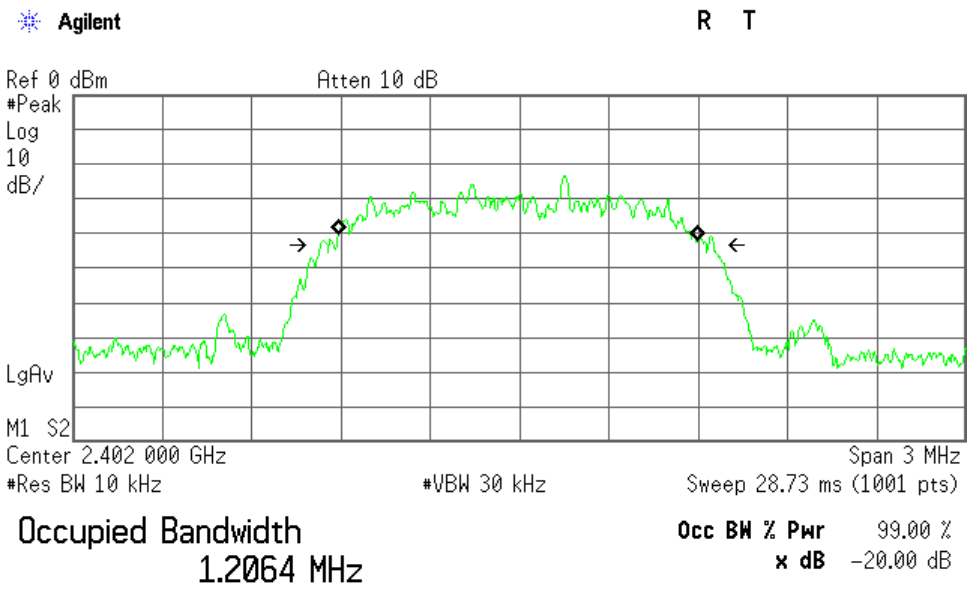
High Channel



Transmit Freq Error	-25.404 kHz
Occupied Bandwidth	922.561 kHz

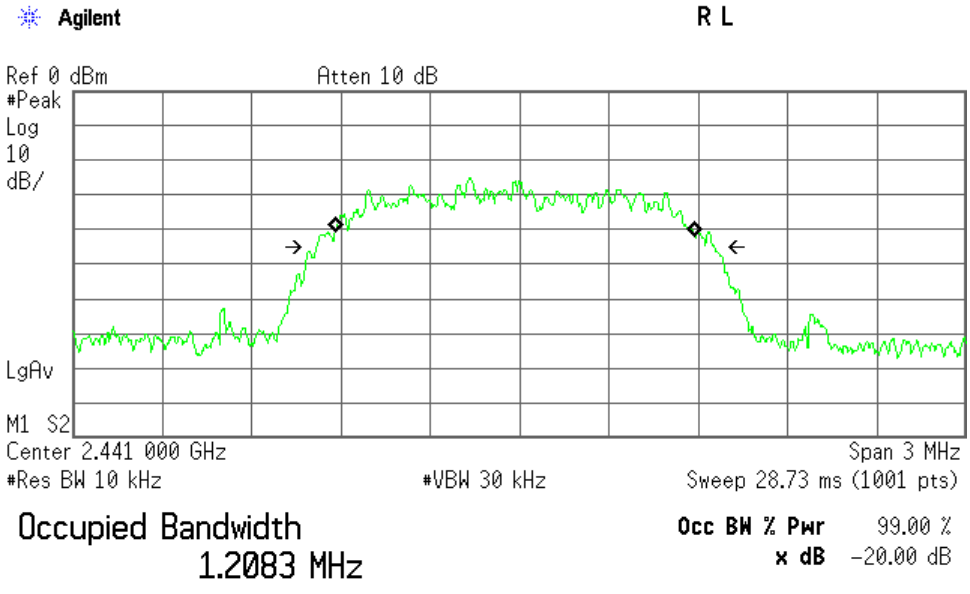
2)Packet Setting : 2DH5(Modulation type : pi/4-DQPSK)

Low Channel



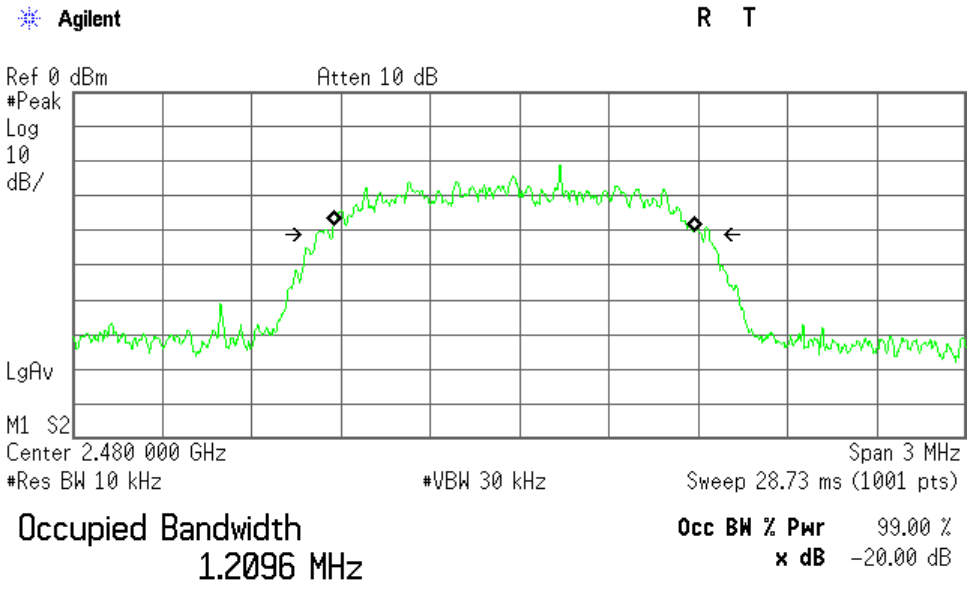
Transmit Freq Error	-4.720 kHz
Occupied Bandwidth	1.318 MHz

Middle Channel



Transmit Freq Error	-14.955 kHz
Occupied Bandwidth	1.335 MHz

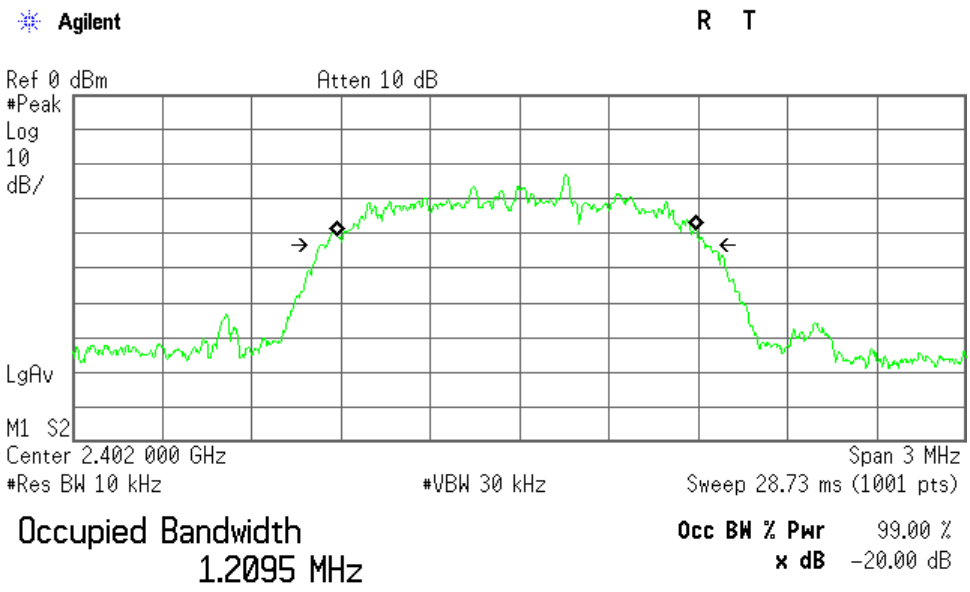
High Channel



Transmit Freq Error	-20.142 kHz
Occupied Bandwidth	1.317 MHz

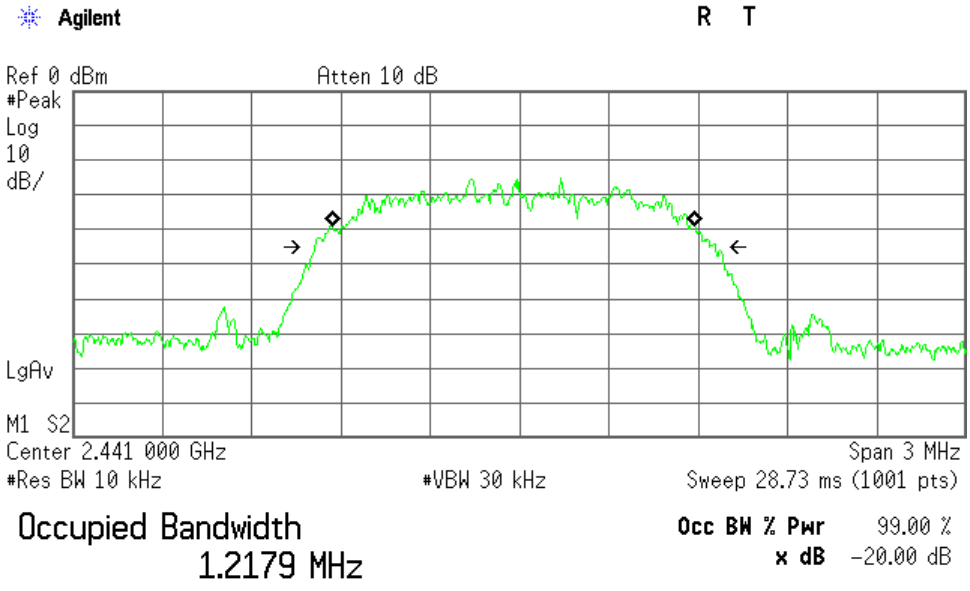
3)Packet Setting : 3 DH5(Modulation type : 8DPSK)

Low Channel



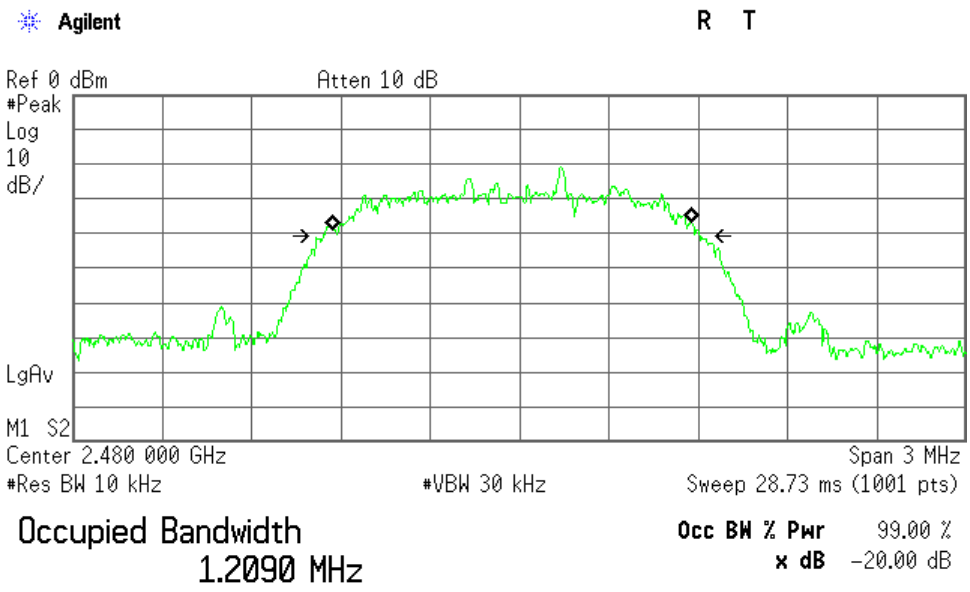
Transmit Freq Error -11.541 kHz
Occupied Bandwidth 1.285 MHz

Middle Channel



Transmit Freq Error -20.604 kHz
Occupied Bandwidth 1.347 MHz

High Channel



Transmit Freq Error	-24.479 kHz
Occupied Bandwidth	1.266 MHz

Mode of EUT : Low Energy

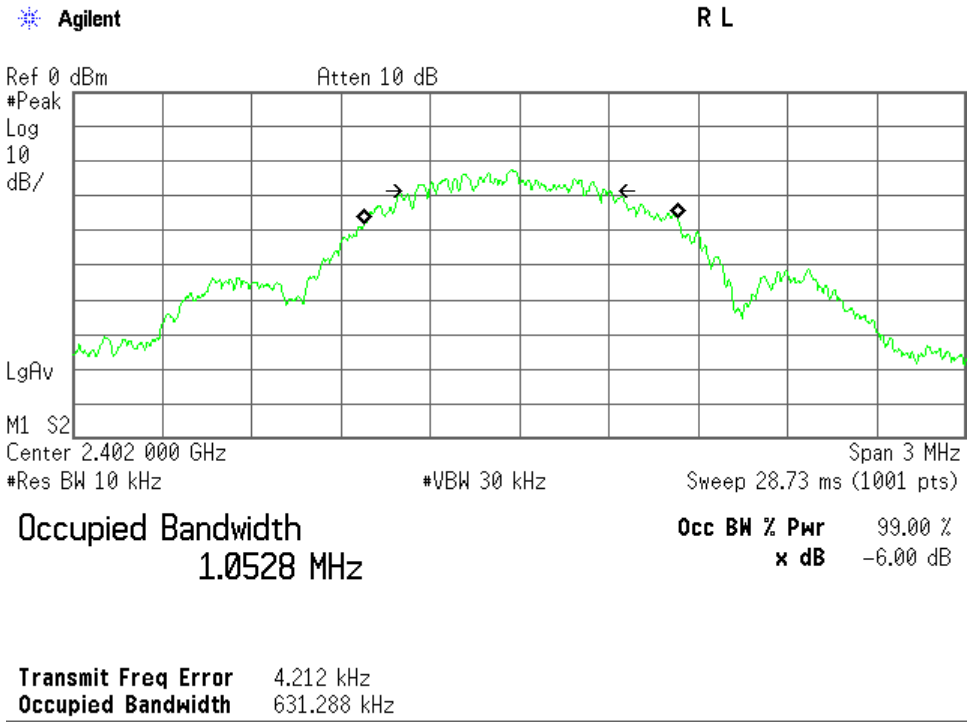
Test Date : April 24, 2013
Temp.:19°C, Humi:62%

The resolution bandwidth was set to about 1% of emission bandwidth, -6dBc 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.

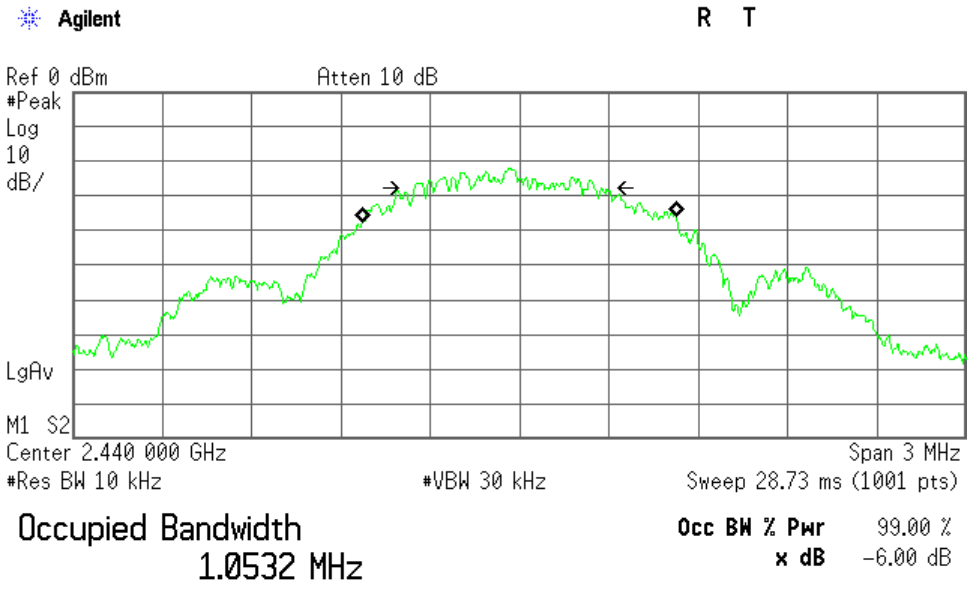
1)Packet Setting : LE (Modulation type : GFSK)

Channel	Frequency (MHz)	99% Bandwidth (kHz)	-6dBc Bandwidth (kHz)
00	2402.0	1052.8	631.3
19	2440.0	1053.2	630.6
39	2480.0	1053.0	630.6

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

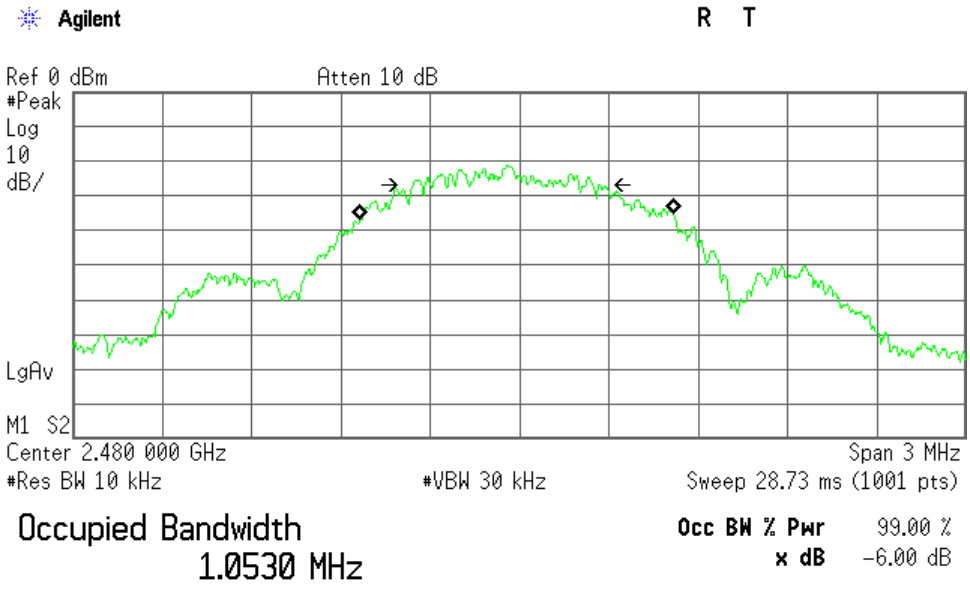


Middle Channel



Transmit Freq Error	-2.694 kHz
Occupied Bandwidth	630.626 kHz

High Channel



Transmit Freq Error	-9.598 kHz
Occupied Bandwidth	630.567 kHz

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	308.4	msec
Dwell Time (Inquiry) is	64.7	msec
Dwell Time (AFH) is	307.3	msec

Uncertainty of Measurement Results +/-0.6 %(2σ)

Remarks :

7.4.2 Test Site

KITA-KANSAI Testing Center

Test site : SAITO

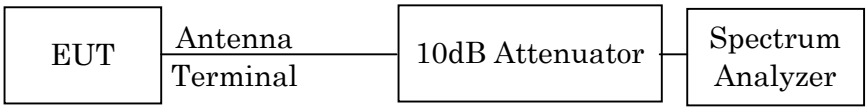
☐ - Anechoic chamber (A1) ☐ - Measurement room (M1)
☐ - Measurement room (M2) ☐ - Measurement room (M3)
☐ - Shielded room (S1) ☐ - Shielded room (S2)
☐ - Shielded room (S3) ☒ - Shielded room (S4)

7.4.3 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:

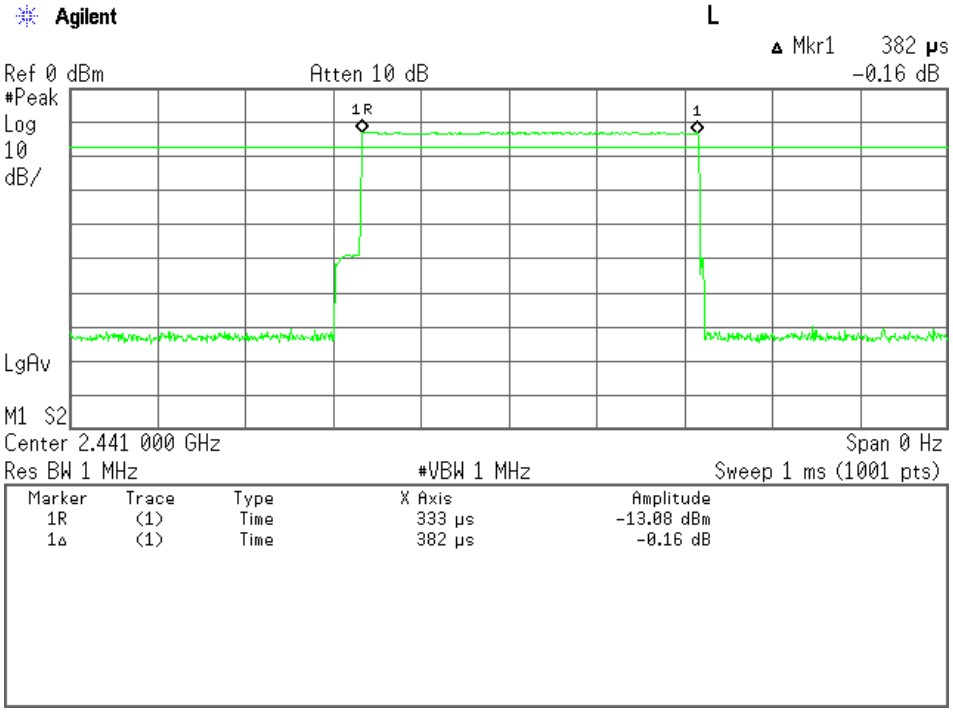
Res. Bandwidth	1 MHz
Video Bandwidth	1 MHz
Span	Zero Span

7.4.5 Test Data

Test Date : April 24, 2013
Temp.:19°C, Humi:62%

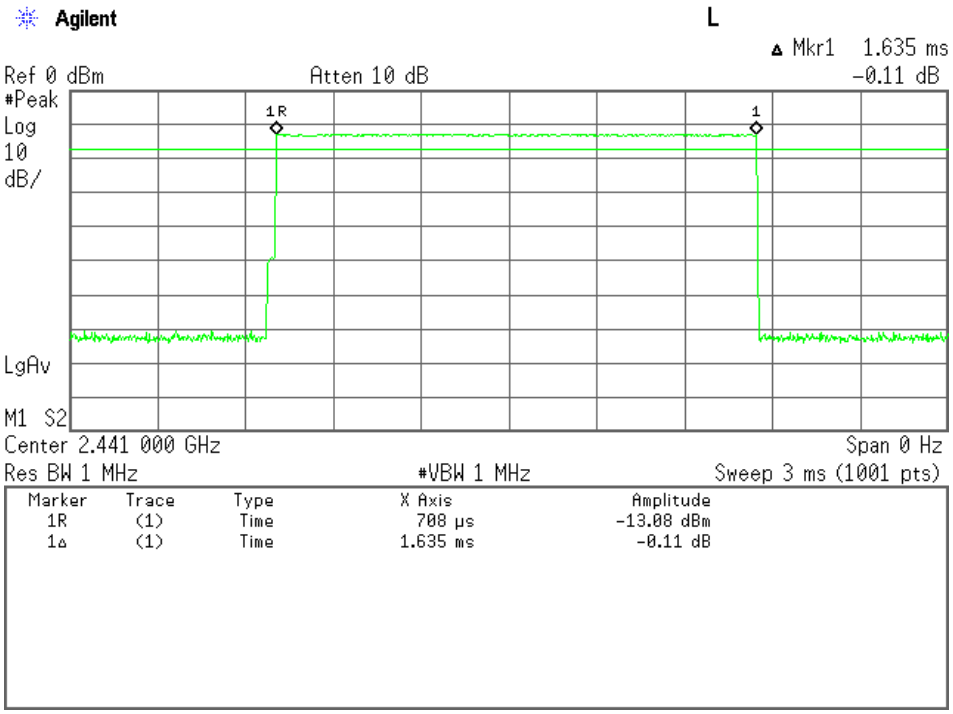
Mode of EUT	Dwell Time (msec)
DH1	122.2
DH3	261.6
DH5	308.4
Inquiry	64.7

DH1(Modulation type : GFSK)



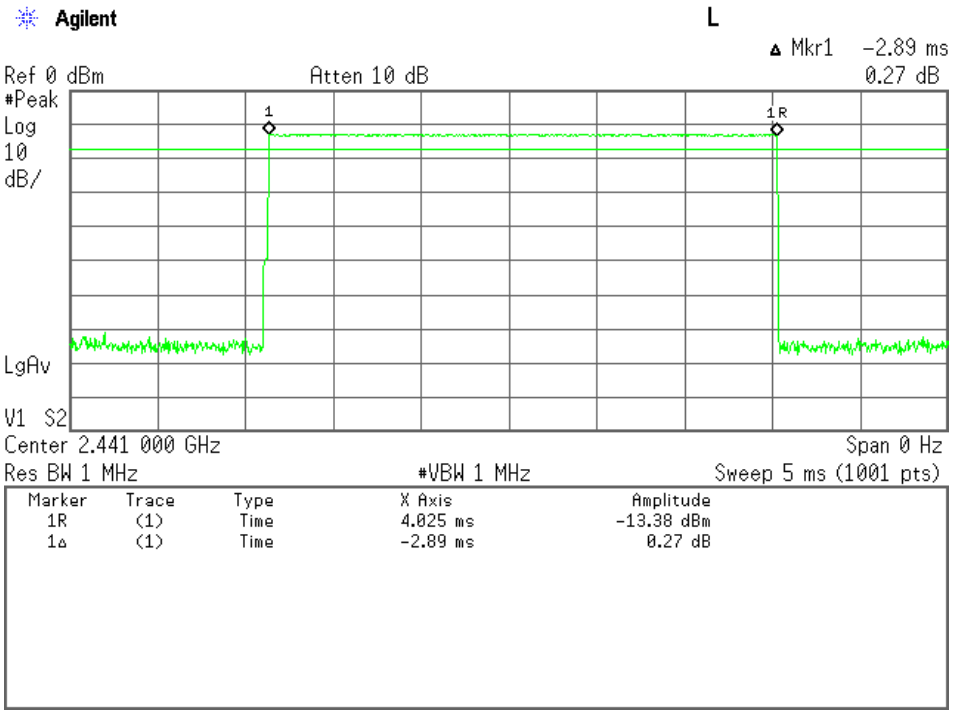
Note : The system makes worst case 1600 hops per second or 1 time slot has a length of 625 µs with 79 channels. A DH1 Packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 800 hops per second with 79 channels. So the system has each channel 10.1266 times per second and so for 31.6 seconds the system have 320.0 times of appearance.
Each tx-time per appearance is 0.382 ms.
Dwell time = 320.0 * 0.382 = 122.2 ms

DH3(Modulation type : GFSK)



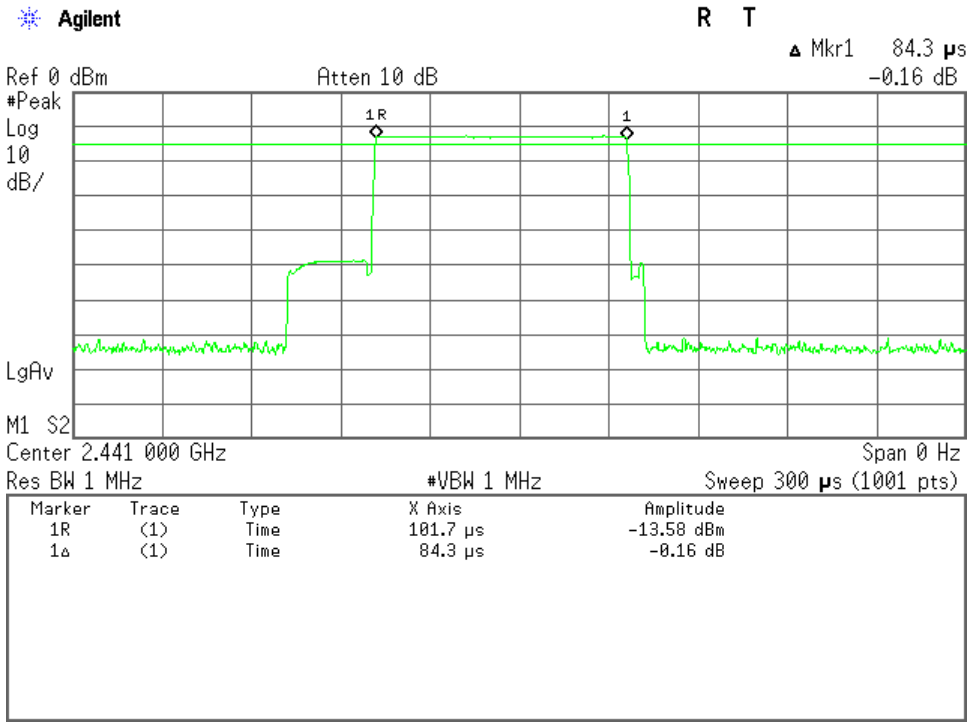
Note : A DH3 Packet need 3 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 400 hops per second with 79 channels. So the system have each channel 5.063 times per second and so for 31.6 seconds the system have 160.0 times of appearance.
Each tx-time per appearance is 1.635 ms.
Dwell time = 160.0 * 1.635 = 261.6 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

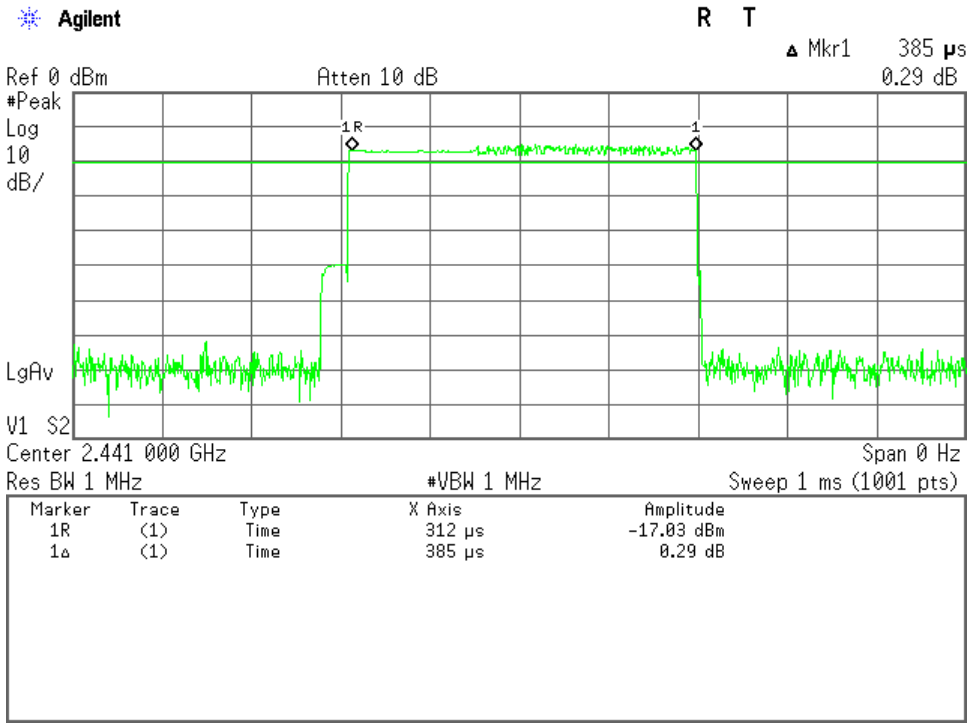
Inquiry



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 0.0843 ms.
Dwell time = 0.0843 * 256 * 3 = 64.7 ms

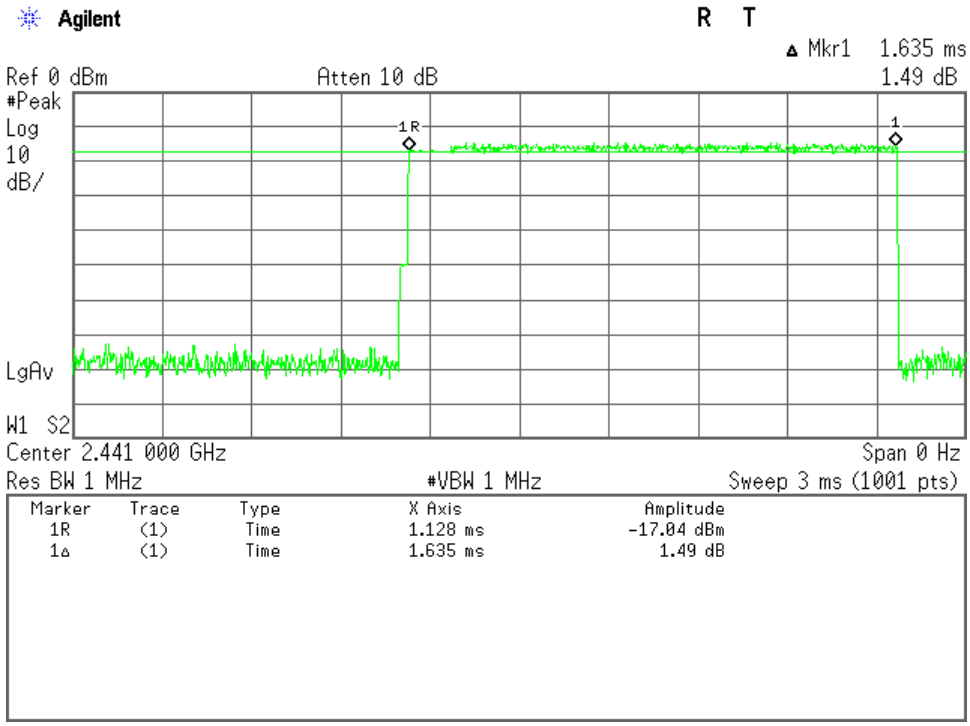
Mode of EUT	Dwell Time (msec)
DH1(AFH)	123.2
DH3(AFH)	261.6
DH5(AFH)	307.3

DH1(AFH mode, Modulation type : GFSK)



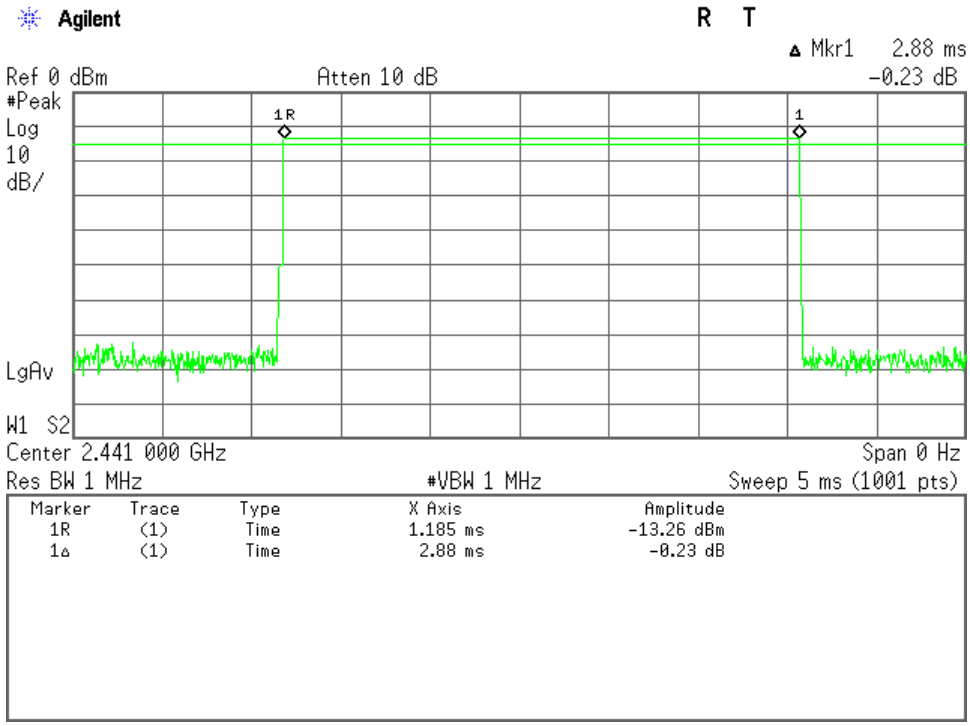
Note : The system makes worst case 1600 hops per second or 1 time slot has a length of 625 µs with 79 channels. A DH1 Packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 800 hops per second with 20 channels. So the system has each channel 40 times per second and so for 8 seconds the system have 320.0 times of appearance.
Each tx-time per appearance is 0.385 ms.
Dwell time = 320.0 * 0.385 = 123.2 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 1.635 ms.
Dwell time = 160.0 * 1.635 = 261.6 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 2.88 ms.
Dwell time = 106.7 * 2.88 = 307.3 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 -1.57 dBm at 2480.0 MHz

Uncertainty of Measurement Results at Amplitude +/-0.8 dB(2σ)

Remarks :

7.5.2 Test Site

KITA-KANSAI Testing Center

Test site : SAITO

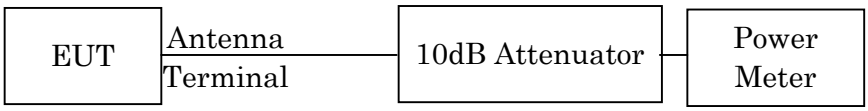
☐ - Anechoic chamber (A1) ☐ - Measurement room (M1)
☐ - Measurement room (M2) ☐ - Measurement room (M3)
☐ - Shielded room (S1) ☐ - Shielded room (S2)
☐ - Shielded room (S3) ☒ - Shielded room (S4)

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: April 23, 2013
Temp.: 21 °C, Humi: 32 %

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Output Power		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
00	2402	9.89	-13.46	-3.57	0.44	20.97	+24.54
39	2441	9.89	-14.62	-4.73	0.34	20.97	+25.70
78	2480	9.89	-11.51	-1.62	0.69	20.97	+22.59

Calculated result at 2480.000 MHz, as the worst point shown on underline:

	Correction Factor	=	9.89 dB	
+)	Meter Reading	=	-11.51 dBm	
	Result	=	-1.62 dBm	= 0.69 mW

Minimum Margin: 20.97 - -1.62 = 22.59 (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: April 23, 2013
Temp.: 21 °C, Humi: 32 %

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Output Power		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
00	2402	9.89	-14.38	-4.49	0.36	20.97	+25.46
39	2441	9.89	-13.81	-3.92	0.41	20.97	+24.89
78	2480	9.89	-12.70	-2.81	0.52	20.97	+23.78

Calculated result at 2480.000 MHz, as the worst point shown on underline:

Correction Factor	=	9.89 dB	
+) Meter Reading	=	-12.70 dBm	
Result	=	-2.81 dBm	= 0.52 mW

Minimum Margin: 20.97 - -2.81 = 23.78 (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

3)3DH5(Modulation type : 8DPSK)

Test Date: April 23, 2013
Temp.: 21 °C, Humi: 32 %

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Output Power		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
00	2402	9.89	-14.24	-4.35	0.37	20.97	+25.32
39	2441	9.89	-13.48	-3.59	0.44	20.97	+24.56
78	2480	9.89	-12.36	-2.47	0.57	20.97	+23.44

Calculated result at 2480.000 MHz, as the worst point shown on underline:

Correction Factor	=	9.89 dB	
+) Meter Reading	=	-12.36 dBm	
Result	=	-2.47 dBm	= 0.57 mW

Minimum Margin: 20.97 - -2.47 = 23.44 (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

4)LE(Modulation type : GFSK)

Test Date: April 23, 2013
Temp.: 21 °C, Humi: 32 %

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Output Power		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
00	2402	9.89	-12.75	-2.86	0.52	30.00	+32.86
19	2440	9.89	-12.27	-2.38	0.58	30.00	+32.38
39	2480	9.89	-11.46	-1.57	0.70	30.00	+31.57

Calculated result at 2480.000 MHz, as the worst point shown on underline:

Correction Factor	=	9.89 dB	
+) Meter Reading	=	-11.46 dBm	
Result	=	-1.57 dBm	= 0.70 mW

Minimum Margin: 30.00 - -1.57 = 31.57 (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

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**

7.6.1 Worst Point and Measurement Uncertainty

Peak Power Density is -14.45 dBm at 2480.0 MHz

Uncertainty of Measurement Results at Amplitude +/-1.2 dB(2σ)

Remarks :

7.6.2 Test Site

KITA-KANSAI Testing Center

Test site : SAITO

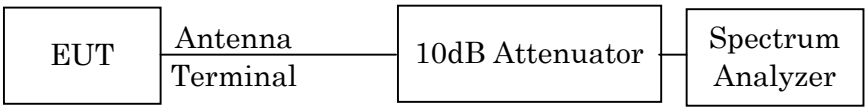
☐ - Anechoic chamber (A1) ☐ - Measurement room (M1)
☐ - Measurement room (M2) ☐ - Measurement room (M3)
☐ - Shielded room (S1) ☐ - Shielded room (S2)
☐ - Shielded room (S3) ☒ - Shielded room (S4)

7.6.3 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

7.6.4 Test Method and Test Setup (Diagrammatic illustration)

The test system is shown as follows:



7.6.5 Test Data

LE(Modulation type : GFSK)

Test Date: April 23, 2013
Temp.: 21 °C, Humi: 32 %

Transmitting Frequency		Correction Factor	BWCF	Meter Reading	Conducted Peak Power Density		Limits	Margin
CH	[MHz]	[dB]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
00	2402	9.89	-10.00	-15.76	-15.87	0.03	8.00	+23.87
19	2440	9.89	-10.00	-15.29	-15.40	0.03	8.00	+23.40
39	2480	9.89	-10.00	-14.34	-14.45	0.04	8.00	+22.45

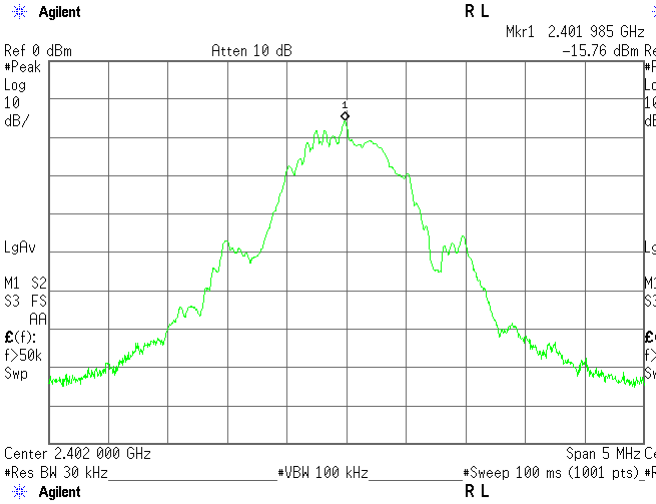
Calculated result at 2480.000 MHz, as the worst point shown on underline:

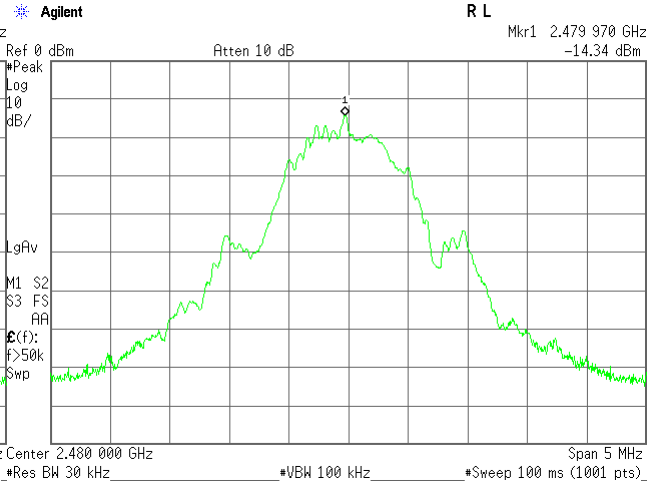
Correction Factor	=	9.89	dB
BWCF	=	-10.00	dB
+) Meter Reading	=	-14.34	dBm
Result	=	-14.45	dBm = 0.04 mW

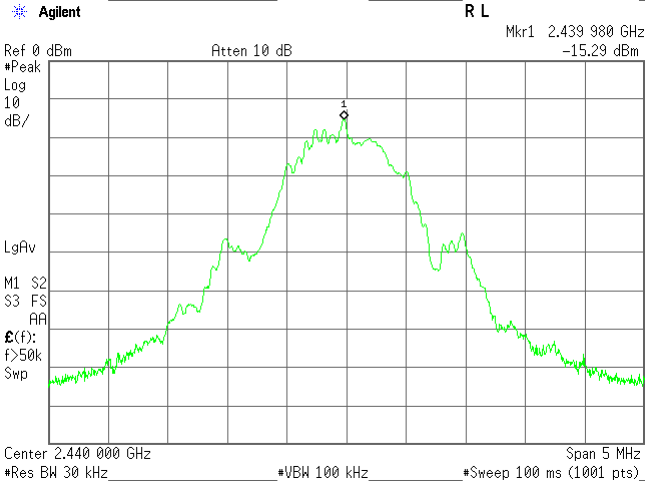
Minimum Margin: 8.00 - -14.45 = 22.45 (dB)

NOTES
1. The peak power density complied with the limit without BWCF.
2. The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.
3. BWCF(bandwidth correction factor) = 10 log (3 kHz/30 kHz) = -10.0 dB
4. Setting of measuring instrument(s) :

Detector Function	RES B.W.	Video B.W.
Peak	30kHz	100kHz







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	+/-1.0	dB(2σ)
1GHz – 18GHz	+/-1.2	dB(2σ)
18GHz – 40GHz	+/-1.6	dB(2σ)

Remarks : _____

7.7.2 Test Site

KITA-KANSAI Testing Center

Test site : SAITO

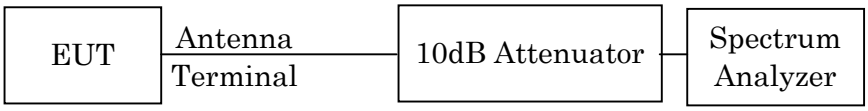
☐ - Anechoic chamber (A1)
☐ - Measurement room (M1)
☐ - Measurement room (M2)
☐ - Measurement room (M3)
☐ - Shielded room (S1)
☐ - Shielded room (S2)
☐ - Shielded room (S3)
☒ - Shielded room (S4)

7.7.3 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:

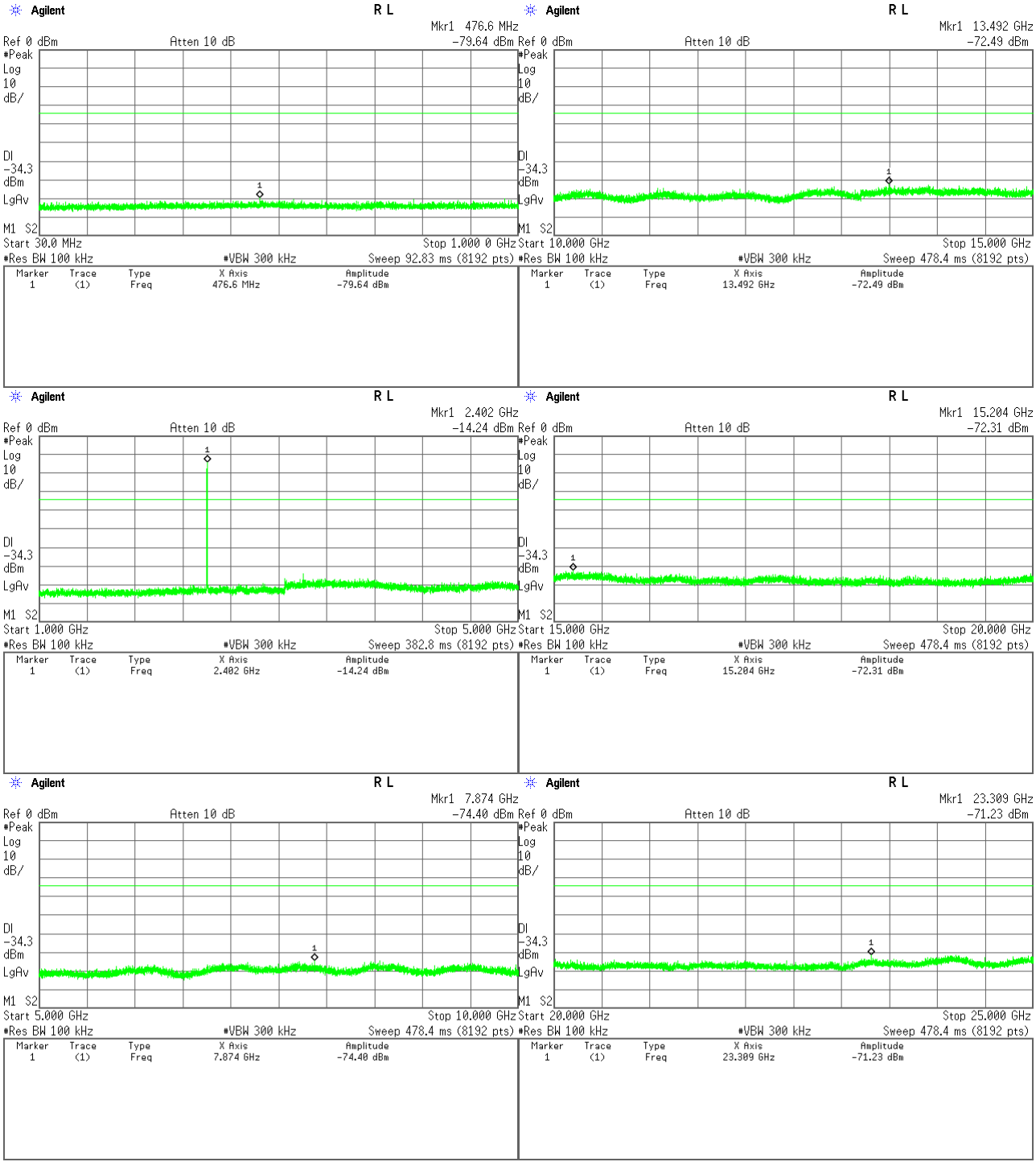
Frequency Range	30 MHz - 25 GHz	Band-Edge
Res. Bandwidth	100 kHz	100 kHz
Video Bandwidth	300 kHz	300 kHz
Sweep Time	AUTO	AUTO
Trace	Maxhold	Maxhold

7.7.5 Test Data

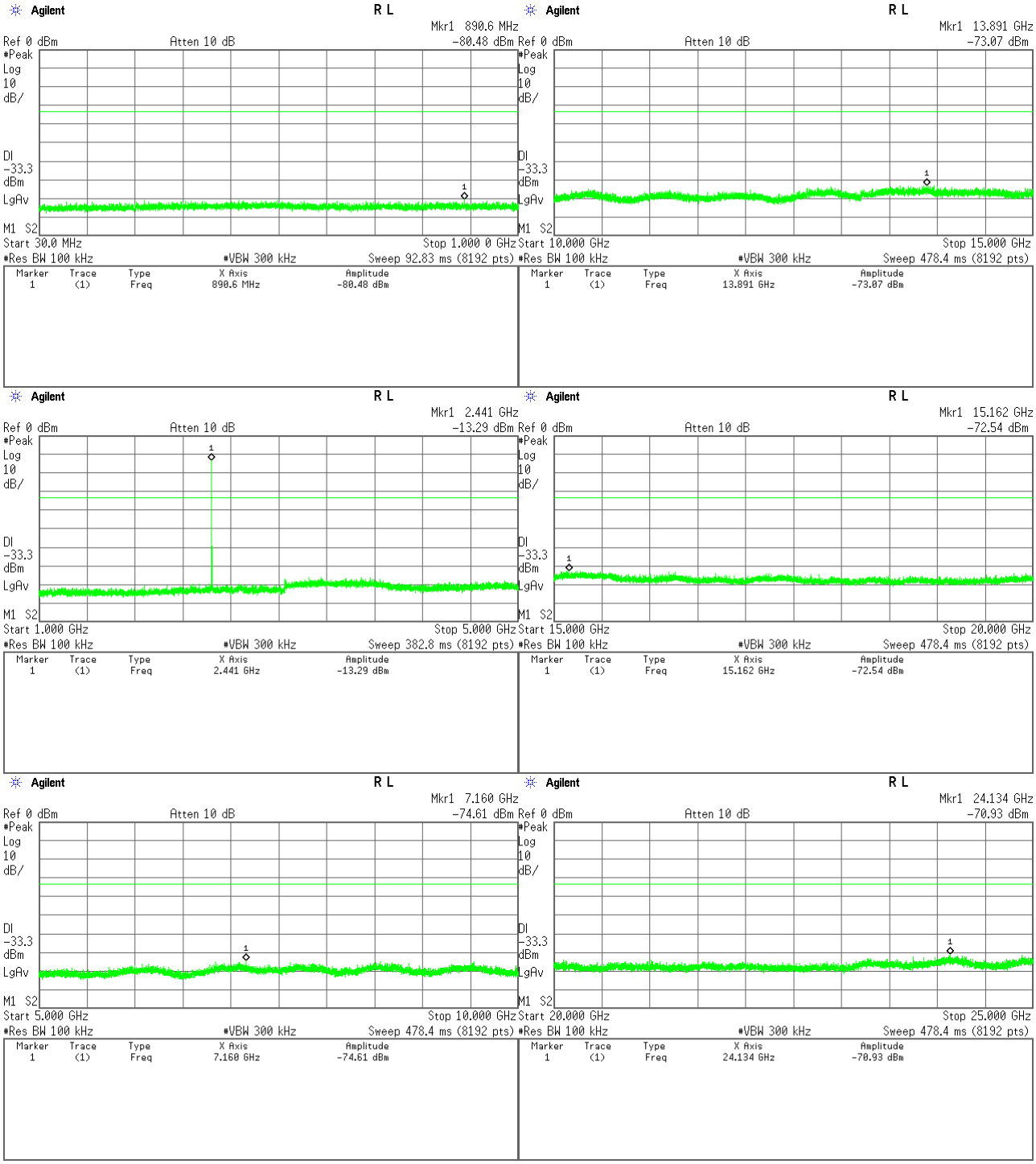
Test Date : April 24, 2013
Temp.:19°C, Humi:62%

1) Mode of EUT : Standard+EDR

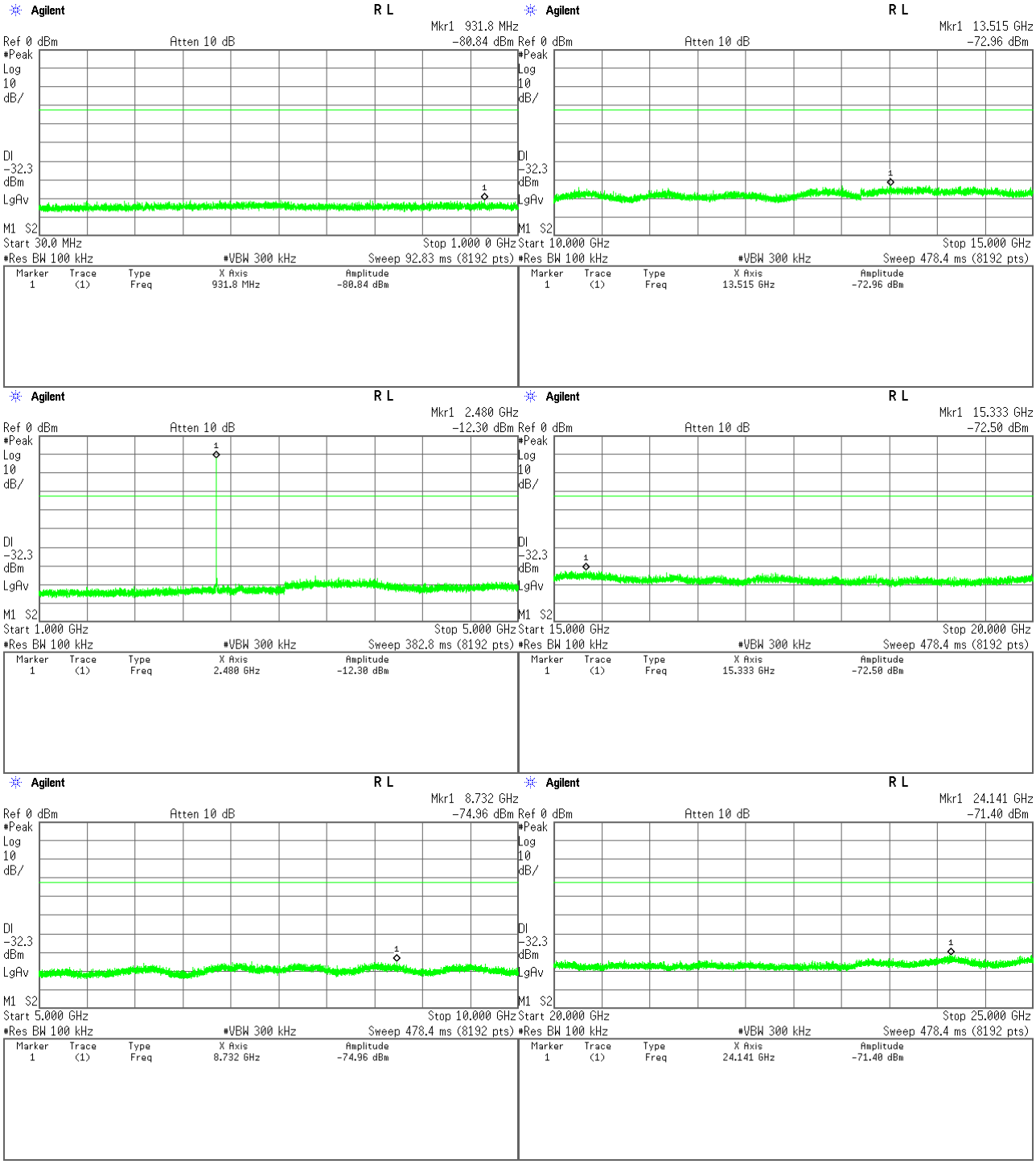
Low Channel



Middle Channel

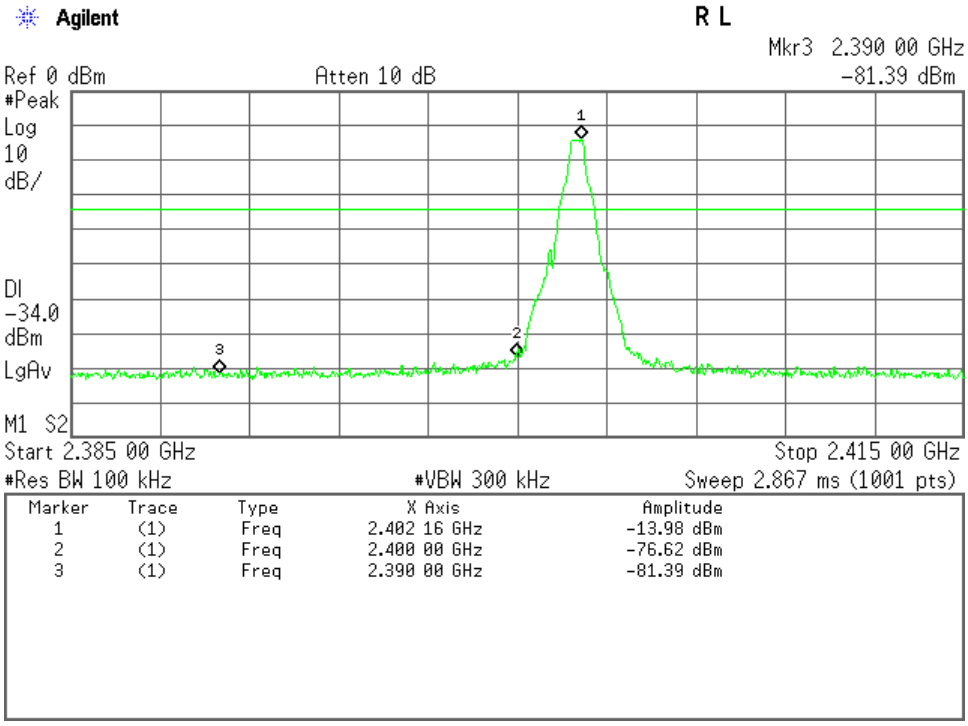


High Channel

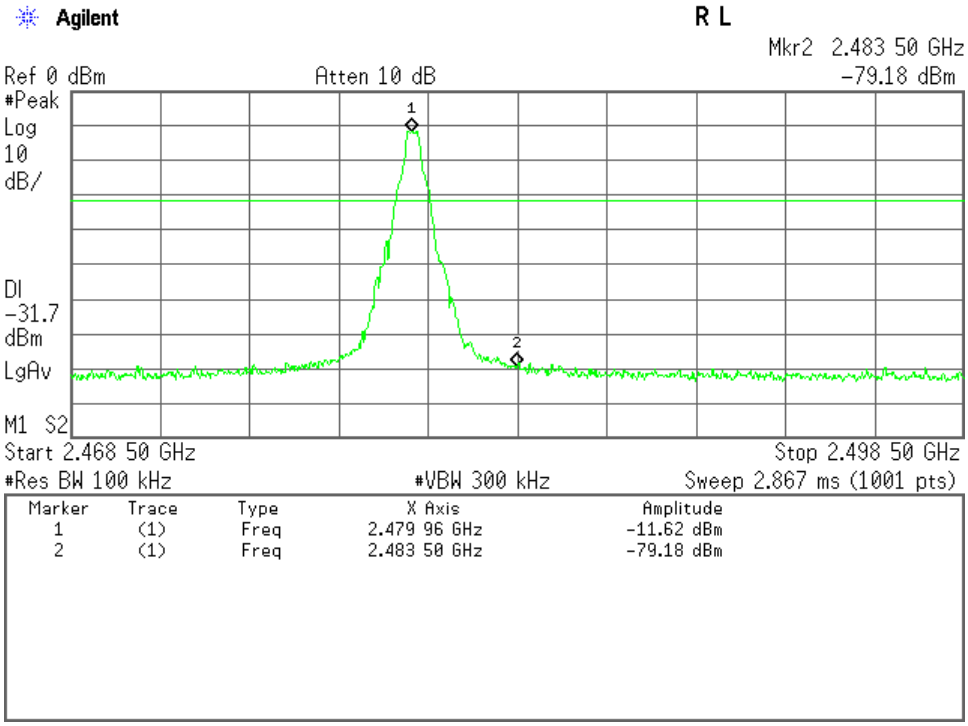


Band-Edge Emission

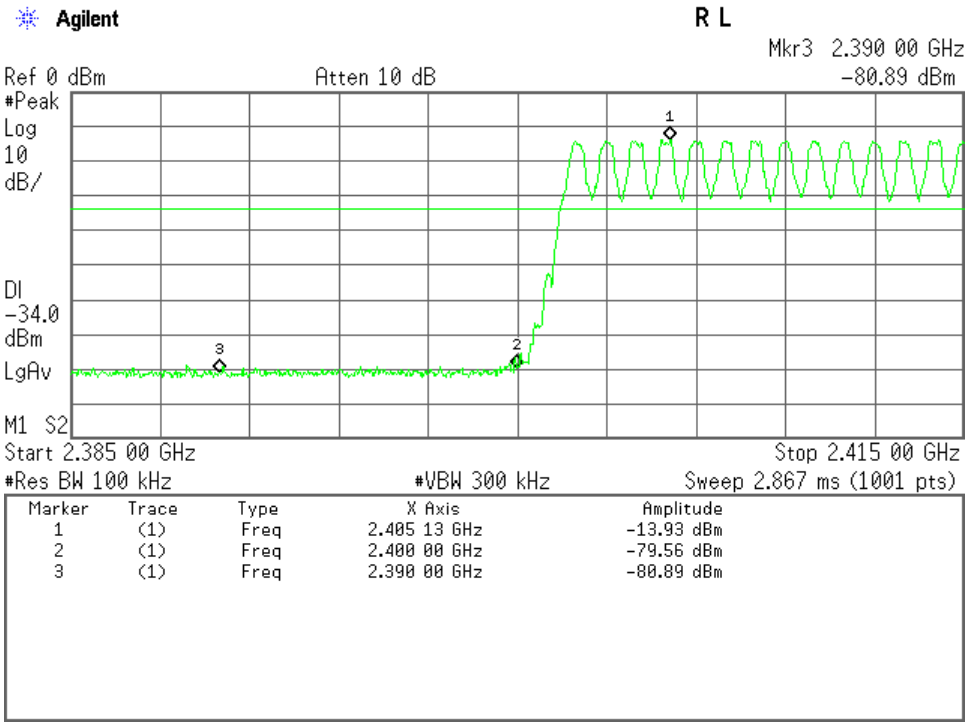
Low Channel(Hopping off), Band-Edge Emission



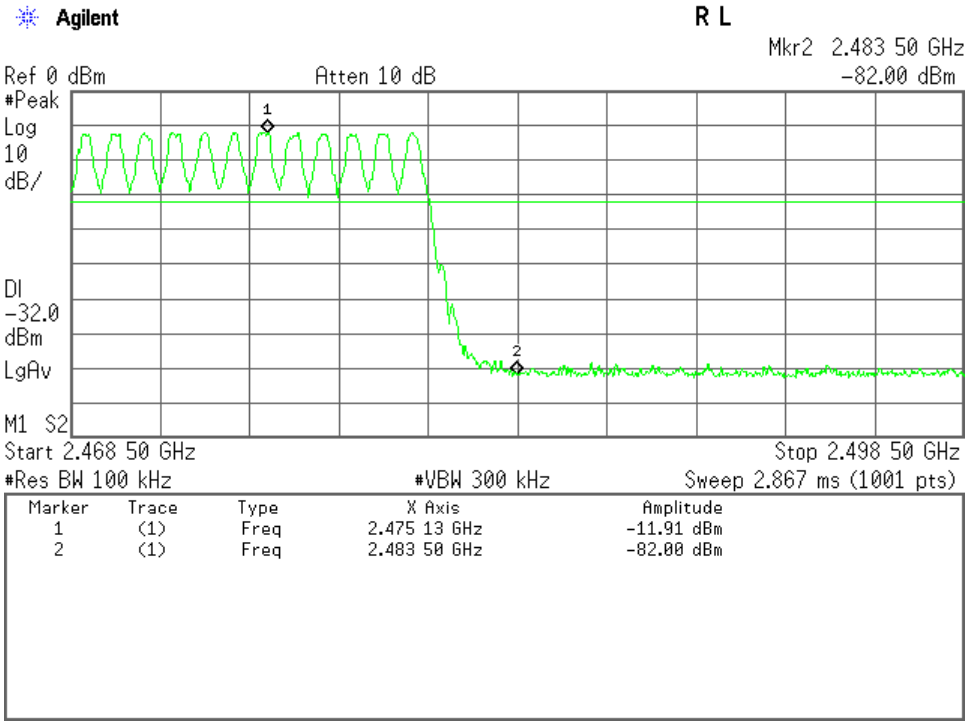
High Channel(Hopping off), Band-Edge Emission



Low Channel(Hopping on), Band-Edge Emission

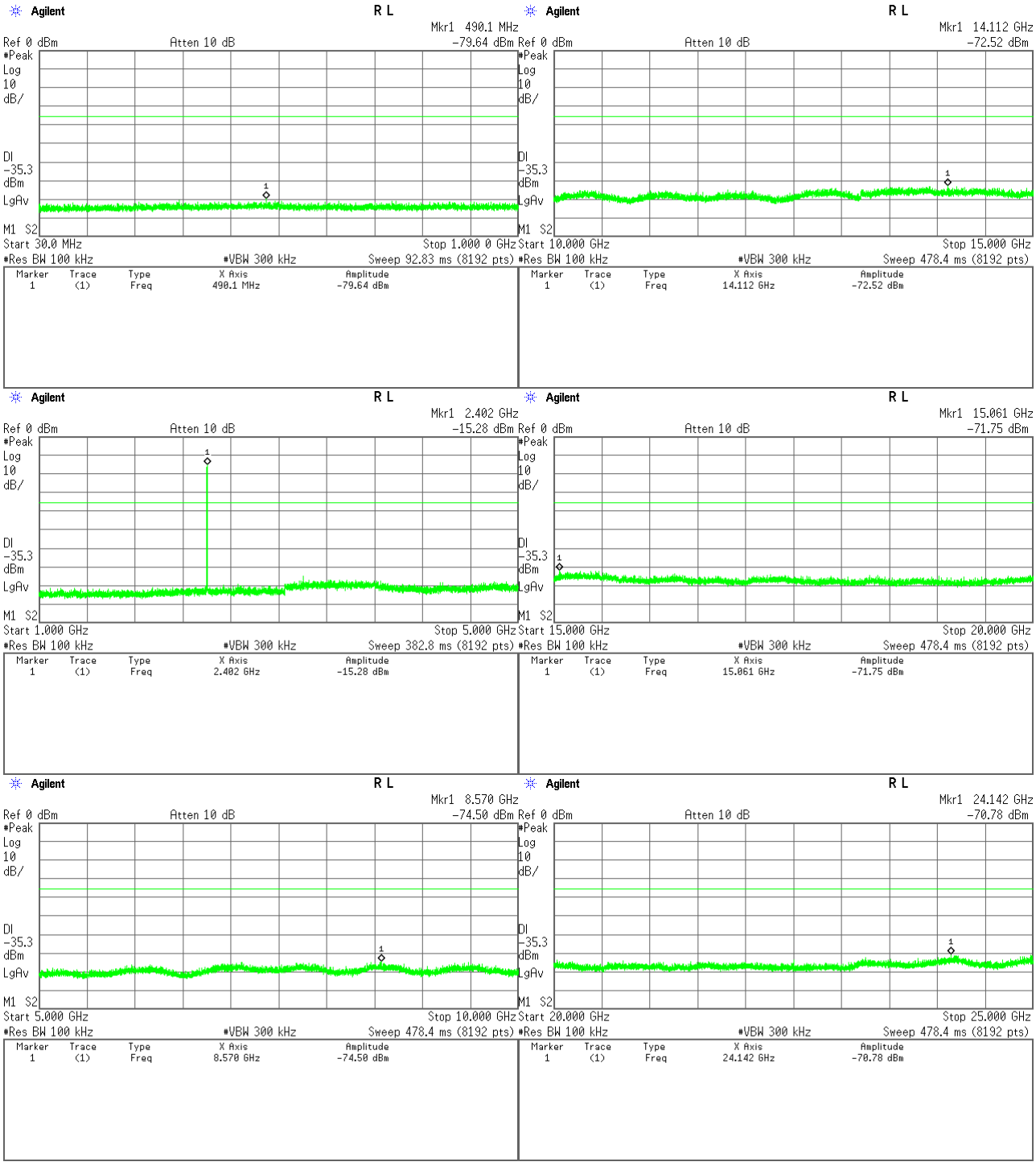


High Channel(Hopping on), Band-Edge Emission

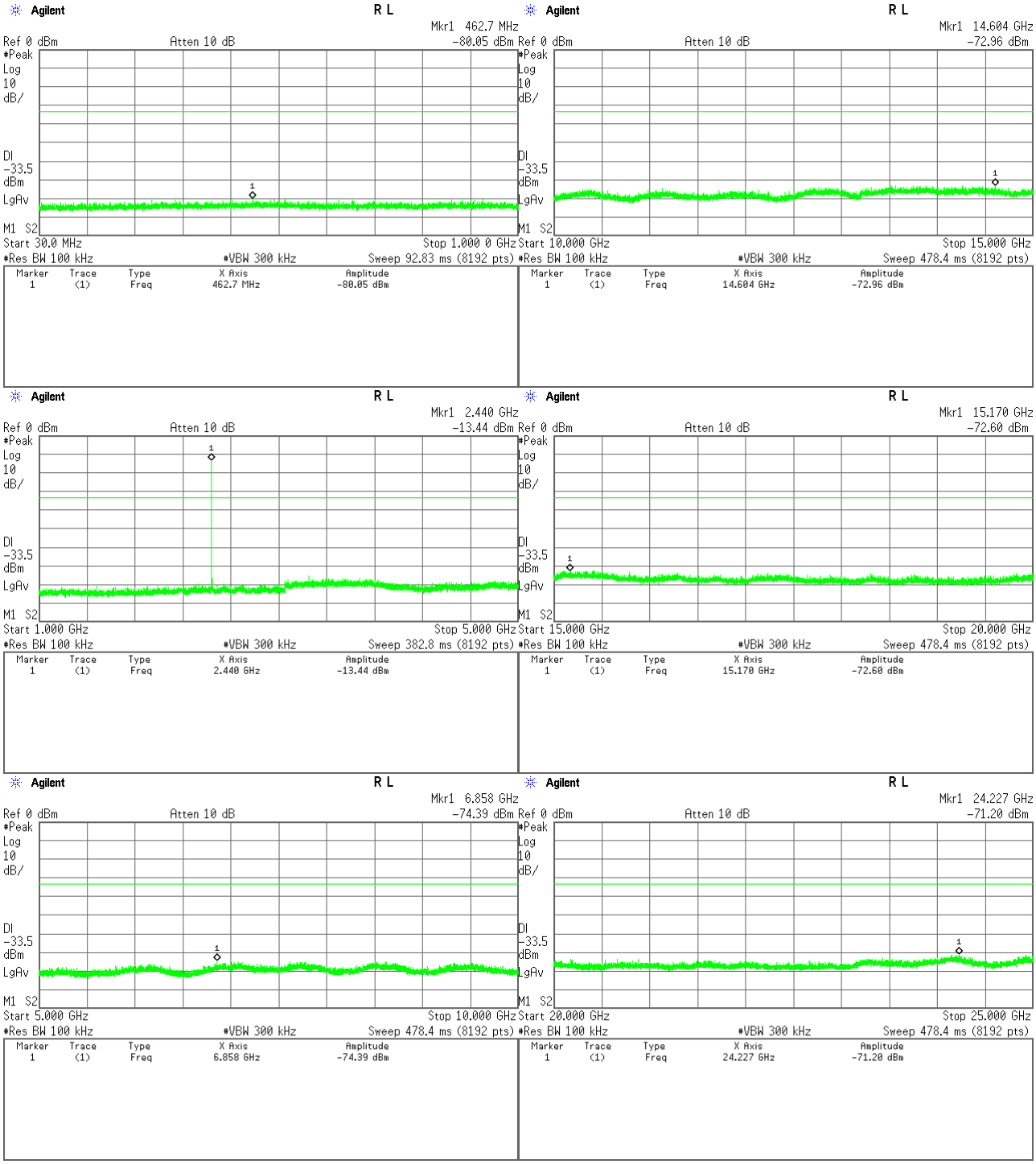


2) Mode of EUT : Low Energy

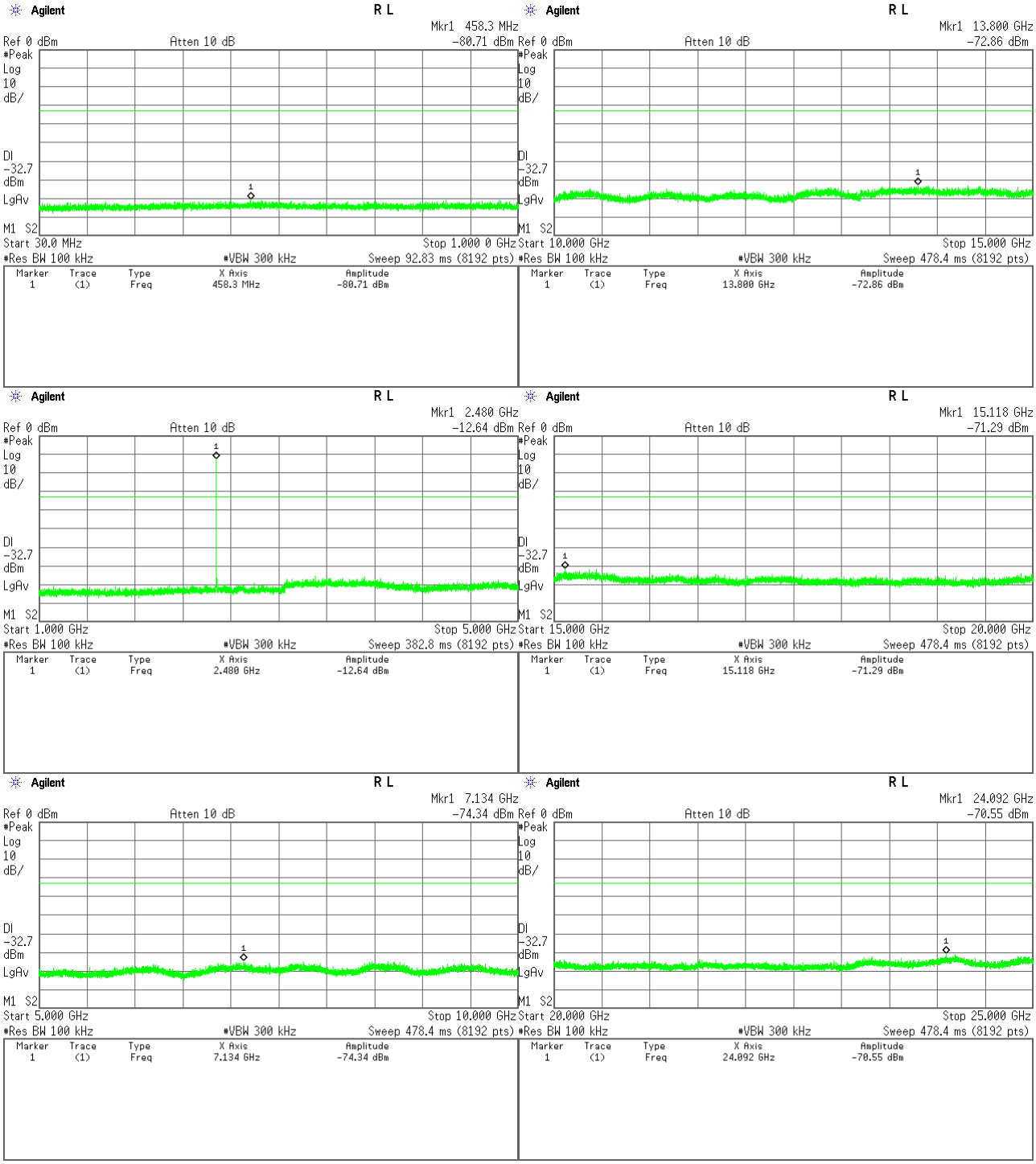
Low Channel



Middle Channel

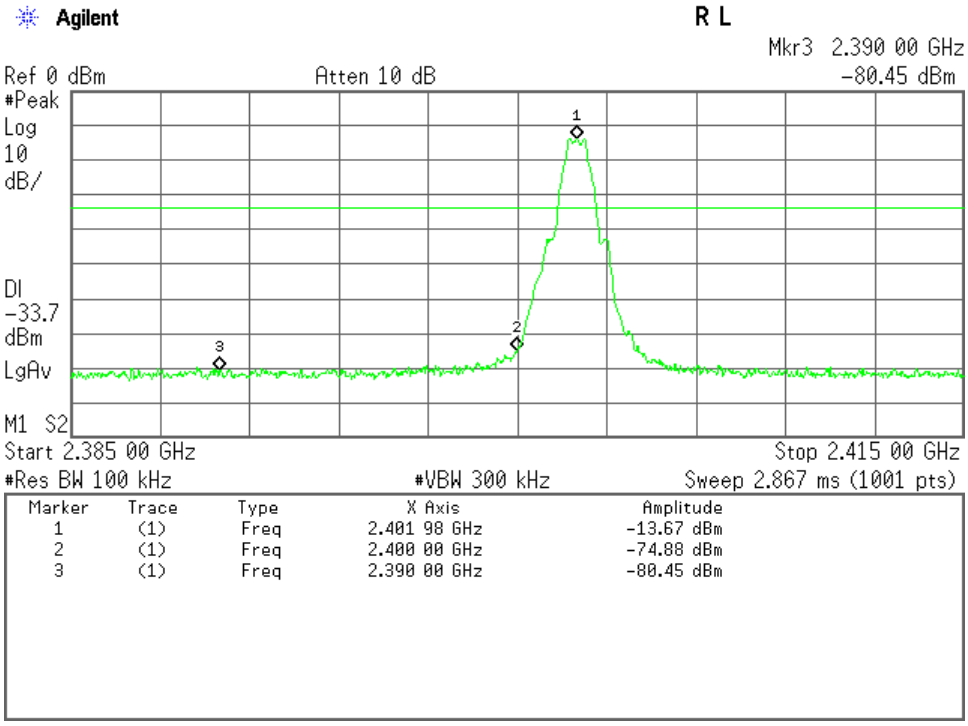


High Channel

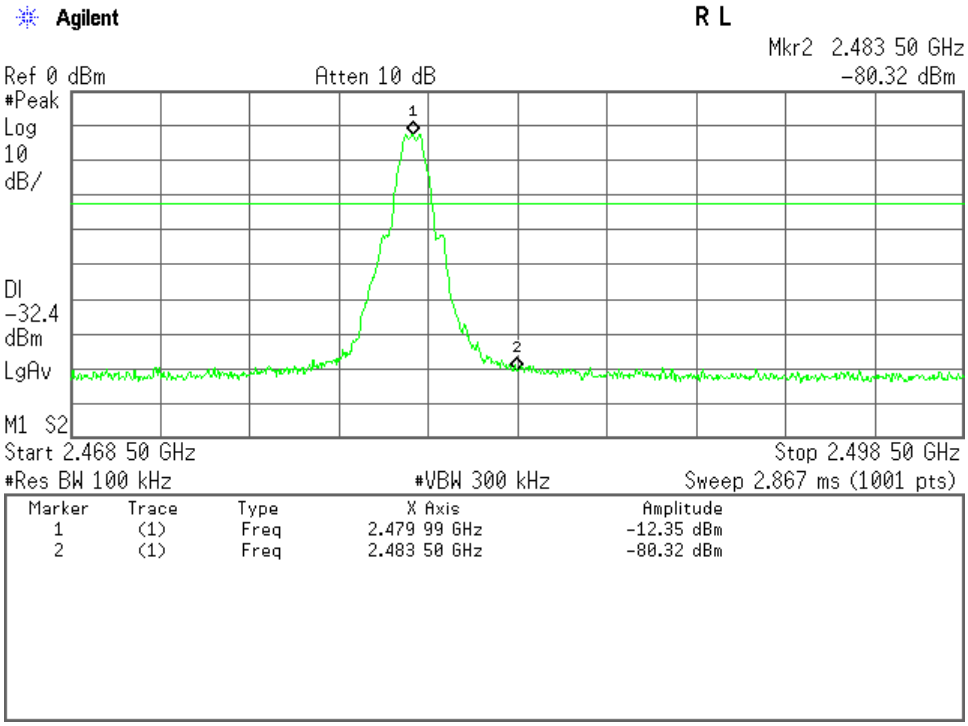


Band-Edge Emission

Low Channel, Band-Edge Emission



High Channel, 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) 20.8 dB at 0.48 MHz

Uncertainty of Measurement Results +/-2.7 dB(2σ)

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)

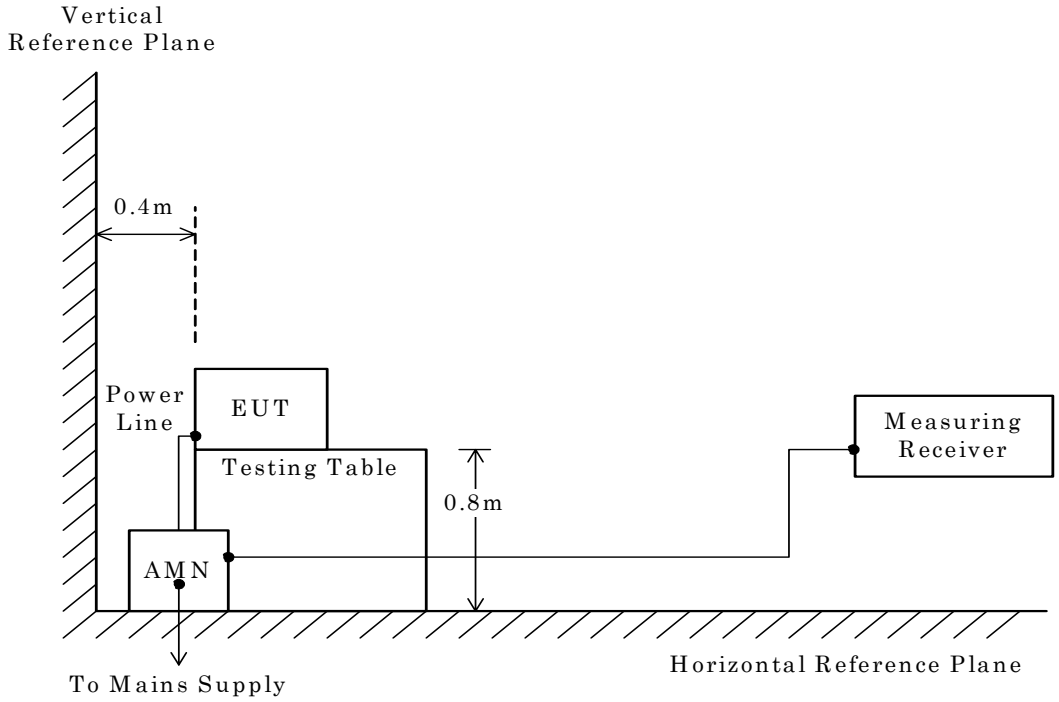
7.8.3 Test Instruments

Type	Model	Manufacturer	ID No.	Last Cal.	Interval
Test Receiver	ESU 26	Rohde & Schwarz	A-6	2013/4	1 Year
AMN (main)	ESH3-Z5	Rohde & Schwarz	D-12	2012/8	1 Year
RF Cable	RG223/U	SUHNER	H-9	2012/7	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 –



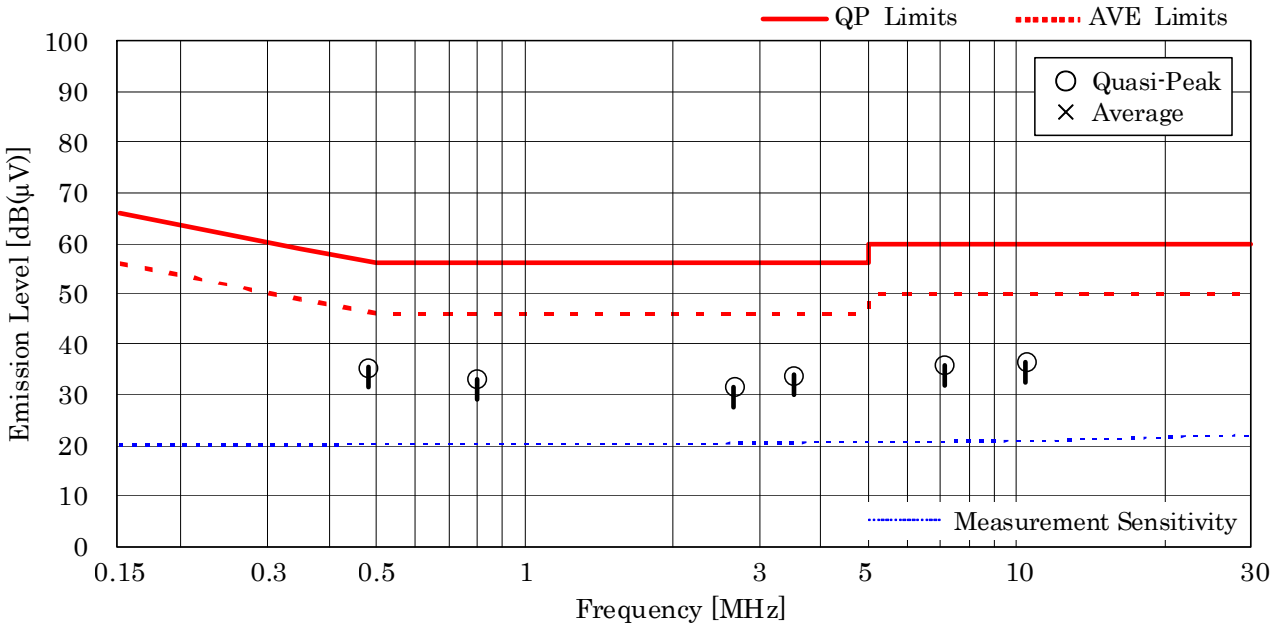
NOTE
AMN : Artificial Mains Network

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: April 30, 2013
Temp.: 24 °C, Humi.: 52 %

Frequency [MHz]	Corr. Factor [dB]	Meter Readings [dB(μV)] VA QP	VA AVE	VB QP	VB AVE	Limits [dB(μV)] QP	Limits [dB(μV)] AVE	Results [dB(μV)] QP	Results [dB(μV)] AVE	Margin [dB]	Remarks
0.48	10.3	15.2	--	25.2	--	56.3	46.3	35.5	--	+20.8	-
0.80	10.3	16.2	--	22.9	--	56.0	46.0	33.2	--	+22.8	-
2.66	10.4	21.2	--	19.8	--	56.0	46.0	31.6	--	+24.4	-
3.52	10.4	23.5	--	21.2	--	56.0	46.0	33.9	--	+22.1	-
7.13	10.7	20.4	--	25.2	--	60.0	50.0	35.9	--	+24.1	-
10.45	10.9	23.4	--	25.6	--	60.0	50.0	36.5	--	+23.5	-



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 0.48 MHz, as the worst point shown on underline:
   Correction Factor + Meter Reading = 10.3 + 25.2 = 35.5 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) >5.5 dB at 22320.0 MHz

Uncertainty of Measurement Results

9 kHz – 30 MHz	+/-1.9	dB(2σ)
30 MHz – 300 MHz	+/-4.3	dB(2σ)
300 MHz – 1000 MHz	+/-5.4	dB(2σ)
1 GHz – 6 GHz	+/-4.6	dB(2σ)
6 GHz – 18 GHz	+/-5.2	dB(2σ)
18 GHz – 40 GHz	+/-5.4	dB(2σ)

Remarks :

7.9.2 Test Site

KITA-KANSAI Testing Center SAITO EMC Branch

☐ - Anechoic chamber A1 ☒ - Anechoic chamber A2

7.9.3 Test Instruments

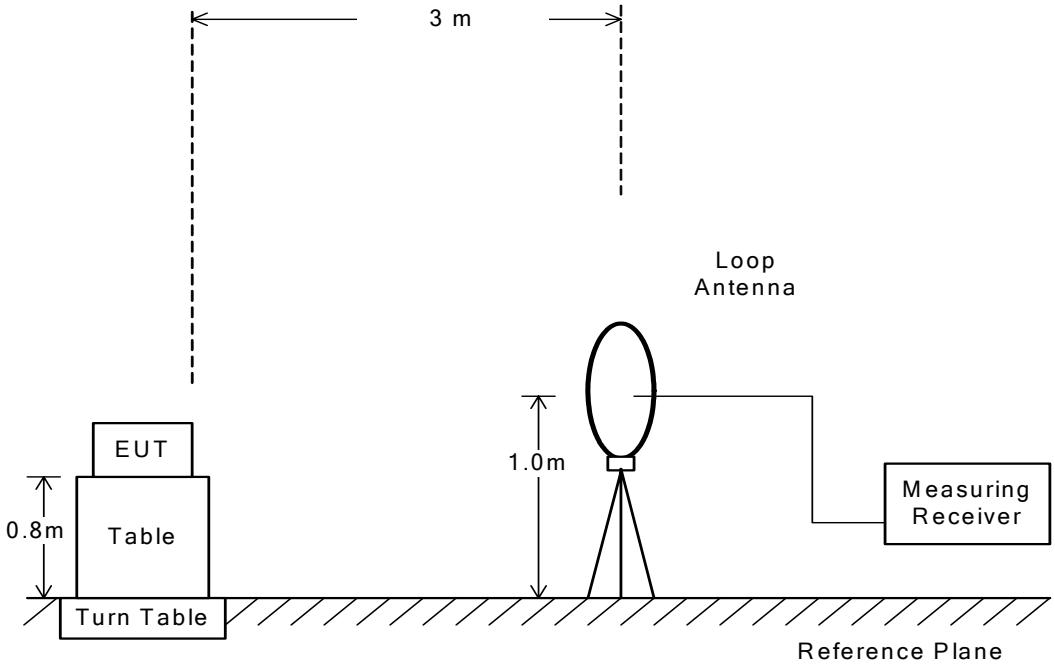
Type	Model	Manufacturer	ID No.	Last Cal.	Interval
Test Receiver	ESU 26	Rohde & Schwarz	A-6	2013/4	1 Year
AMN (main)	HFH2-Z2	Rohde & Schwarz	C-2	2012/8	1 Year
RF Cable	RG213/U	SUHNER	H-28	2012/8	1 Year
Biconical Antenna	VHA9103/BBA9106	Schwarzbeck	C-30	2012/5	1 Year
Log-periodic Antenna	UHALP9108-A1	Schwarzbeck	C-31	2012/5	1 Year
RF Cable	S 10162 B-11 etc.	SUHNER	H-4	2013/4	1 Year
Site Attenuation	--	----	H-15	2013/2	1 Year
Pre-Amplifier	WJ-6882-824	Watkins Johnson	A-21	2013/2	1 Year
Pre-Amplifier	WJ-6611-513	Watkins Johnson	A-23	2013/2	1 Year
Pre-Amplifier	BZ1840LD1	B&Z	A-29	2013/2	1 Year
Pre-Amplifier	DBL-0618N515	DBS Microwave	A-33	2013/2	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	2-10	Weinschel	D-79	2012/11	1 Year
Band Rejection Filter	BRM50701	MICRO-TRONICS	D-93	2013/2	1 Year
RF Cable	SUCOFLEX102	SUHNER	C-52	2012/7	1 Year
RF Cable	SUCOFLEX104	SUHNER	C-66	2013/2	1 Year
RF Cable	SUCOFLEX104	SUHNER	C-67	2013/2	1 Year
RF Cable	SUCOFLEX102EA	SUHNER	C-69	2013/2	1 Year
SVSWR	--	----	H-19	2013/2	1 Year
Pre-Amplifier	310N	SONOMA	A-17	2013/4	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.

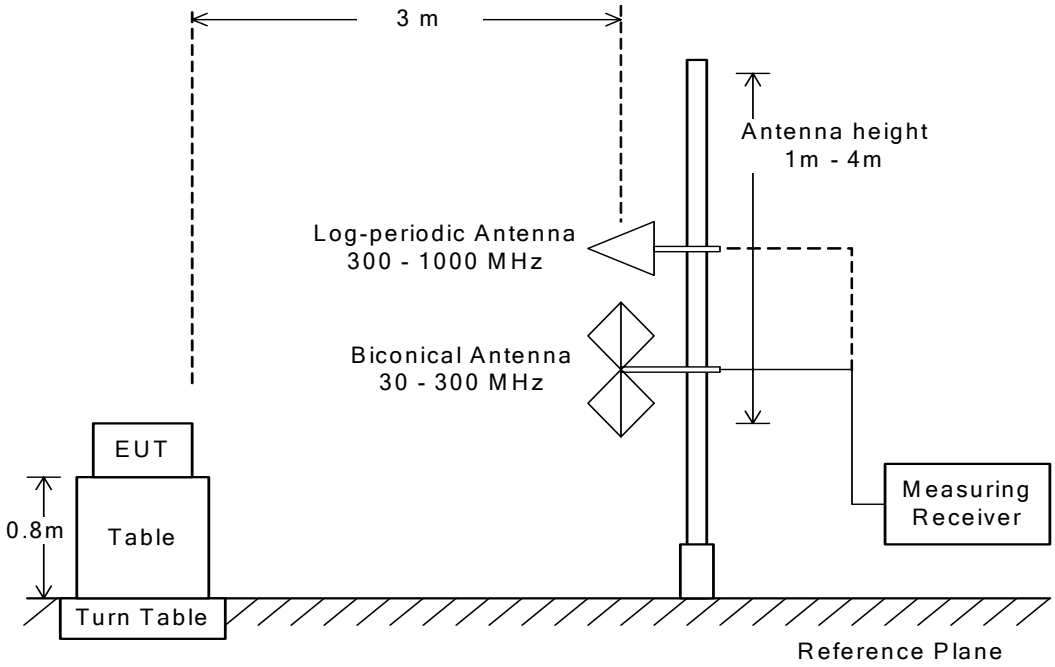
– Side View –



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.

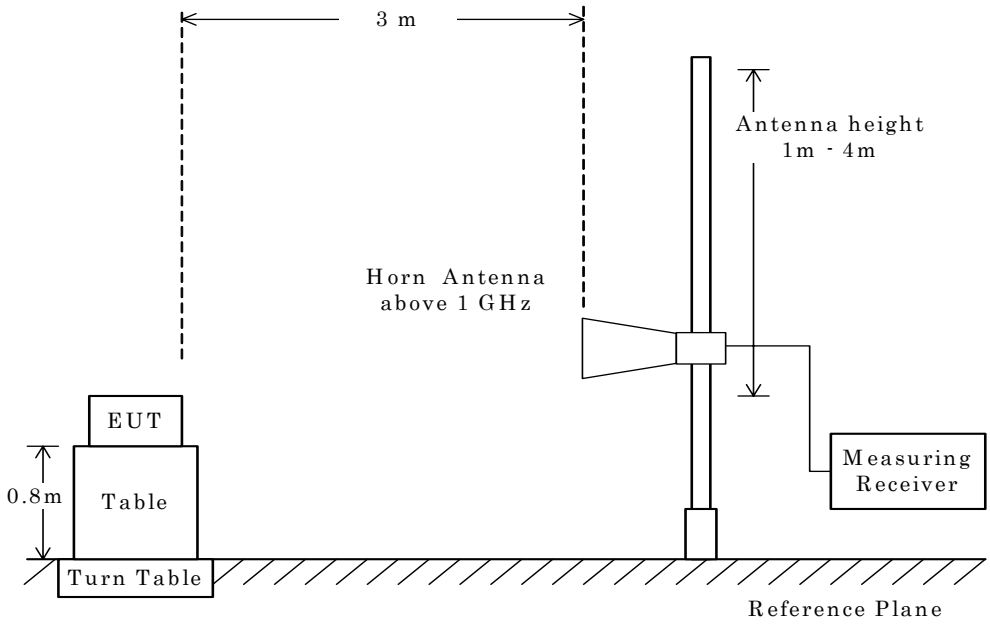
– Side View –



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 –



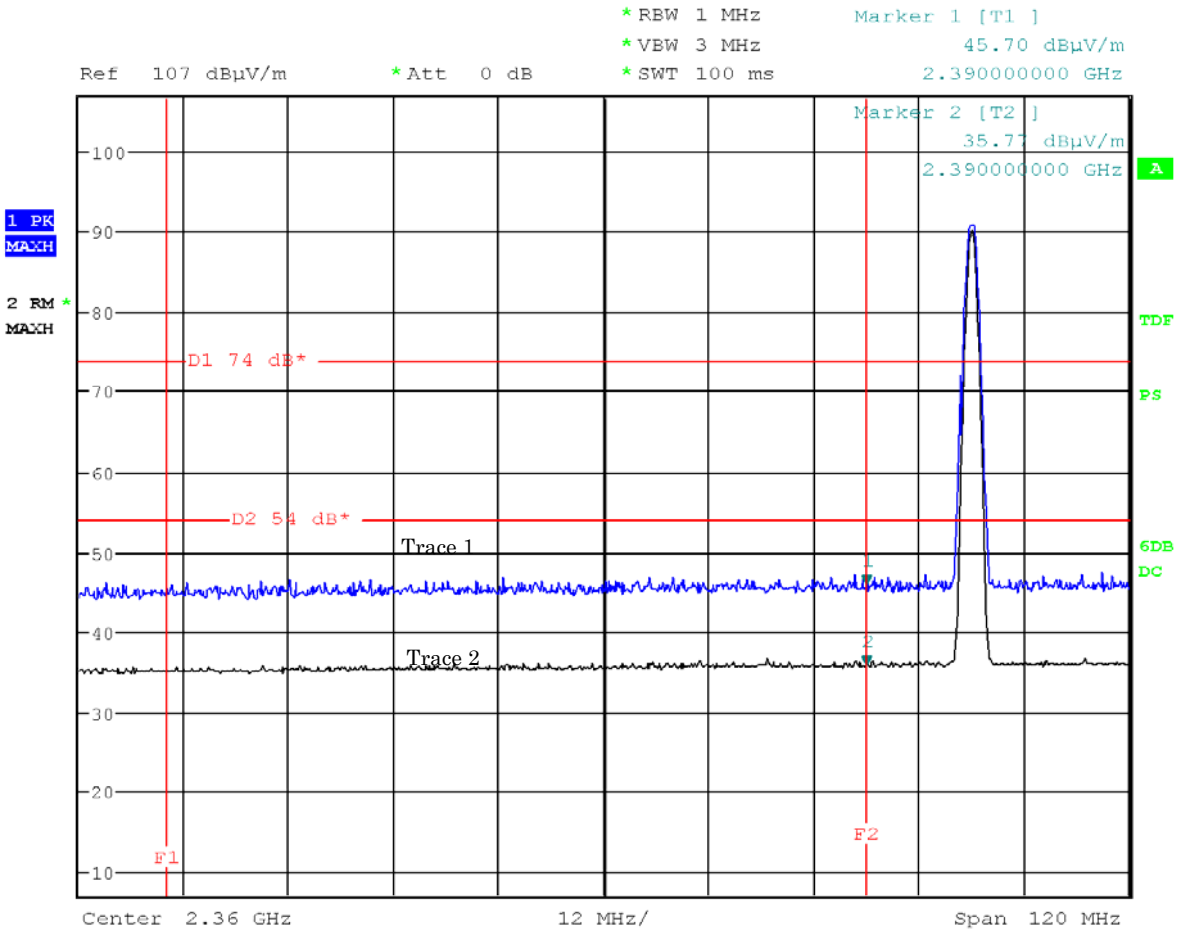
NOTE
The antenna height is scanned depending on the EUT's size and mounting height.

7.9.5 Test Data

7.9.5.1 Band-edge Compliance

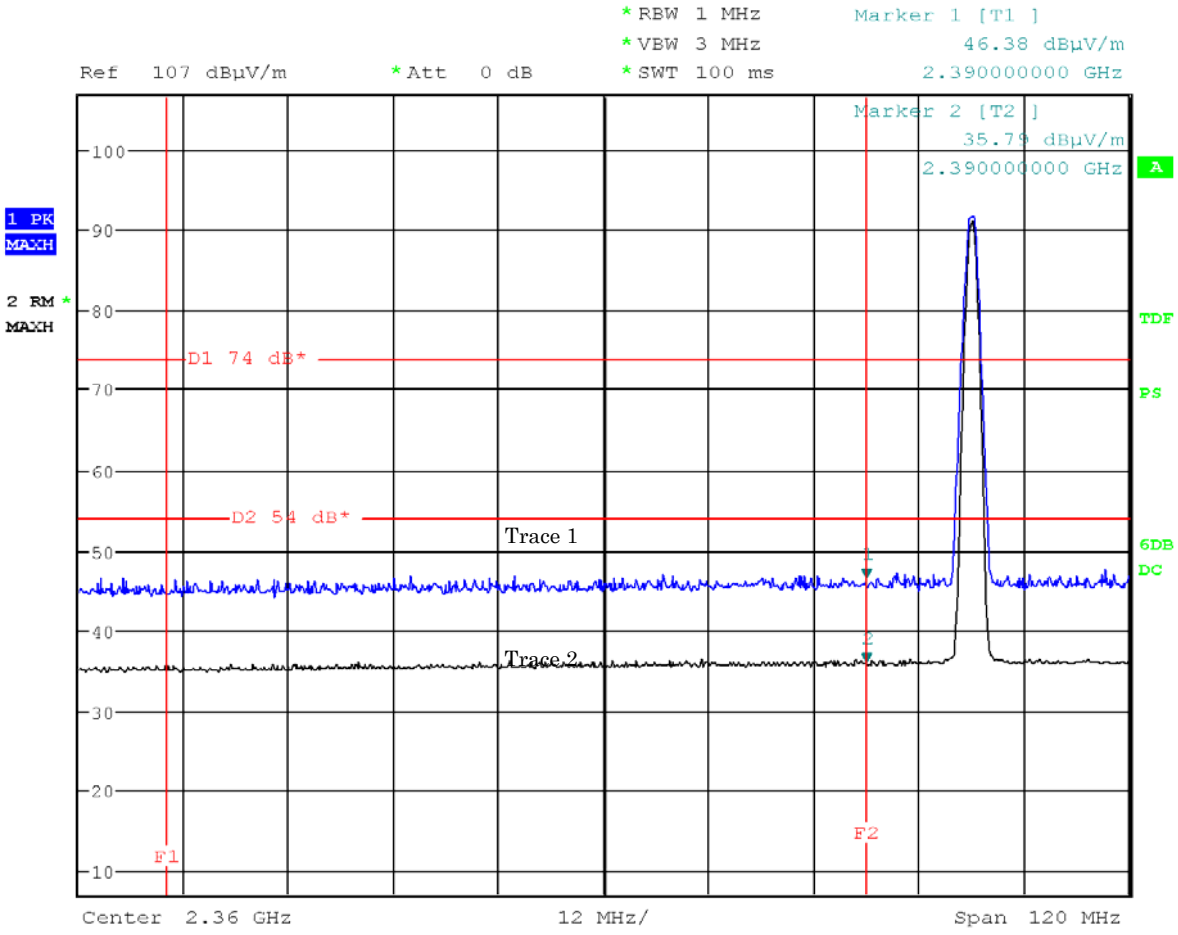
Test Date : April 24, 2013
Temp.:24°C, Humi:44%

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



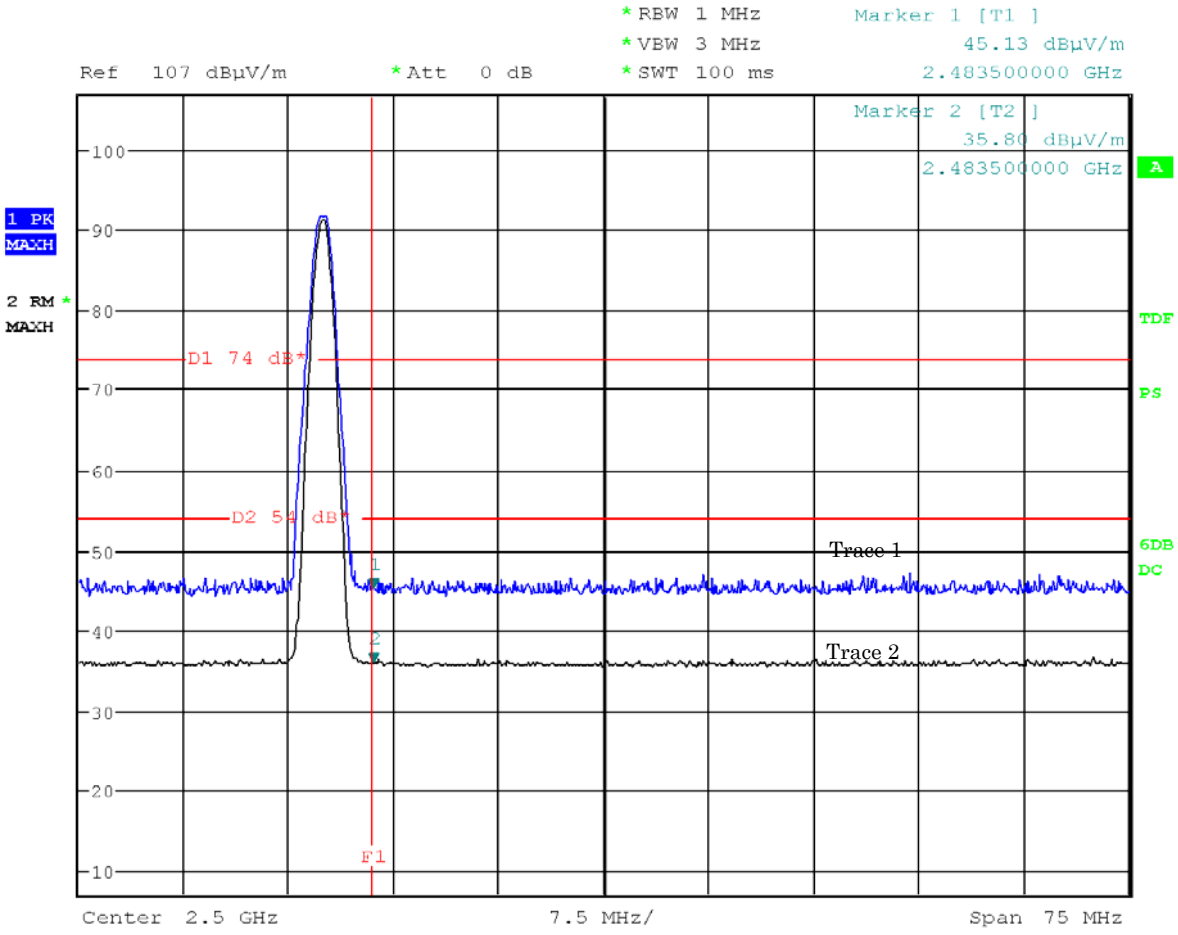
Note: The trace 1 is Peak detection. The trace 2 is RMS detection.

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



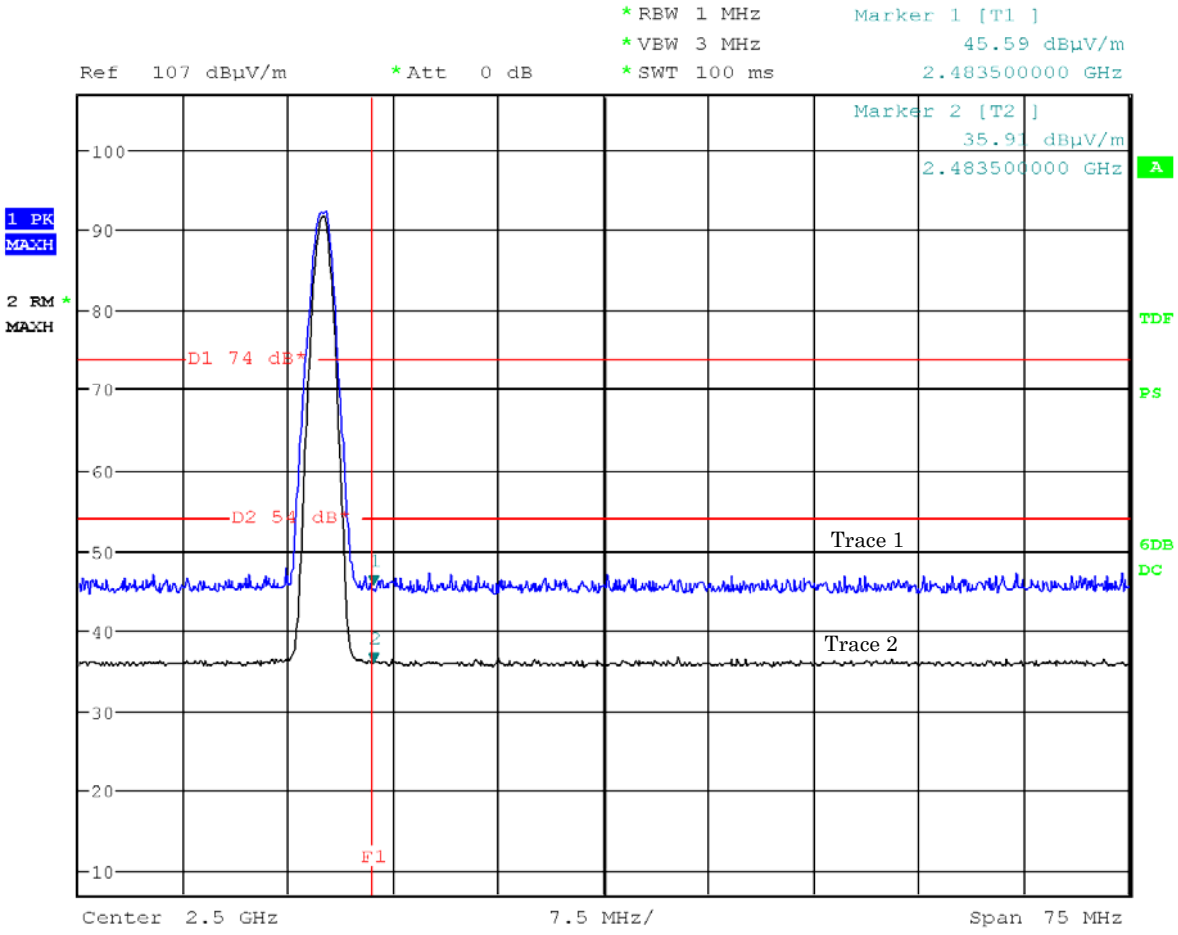
Note: The trace 1 is Peak detection. The trace 2 is RMS detection.

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



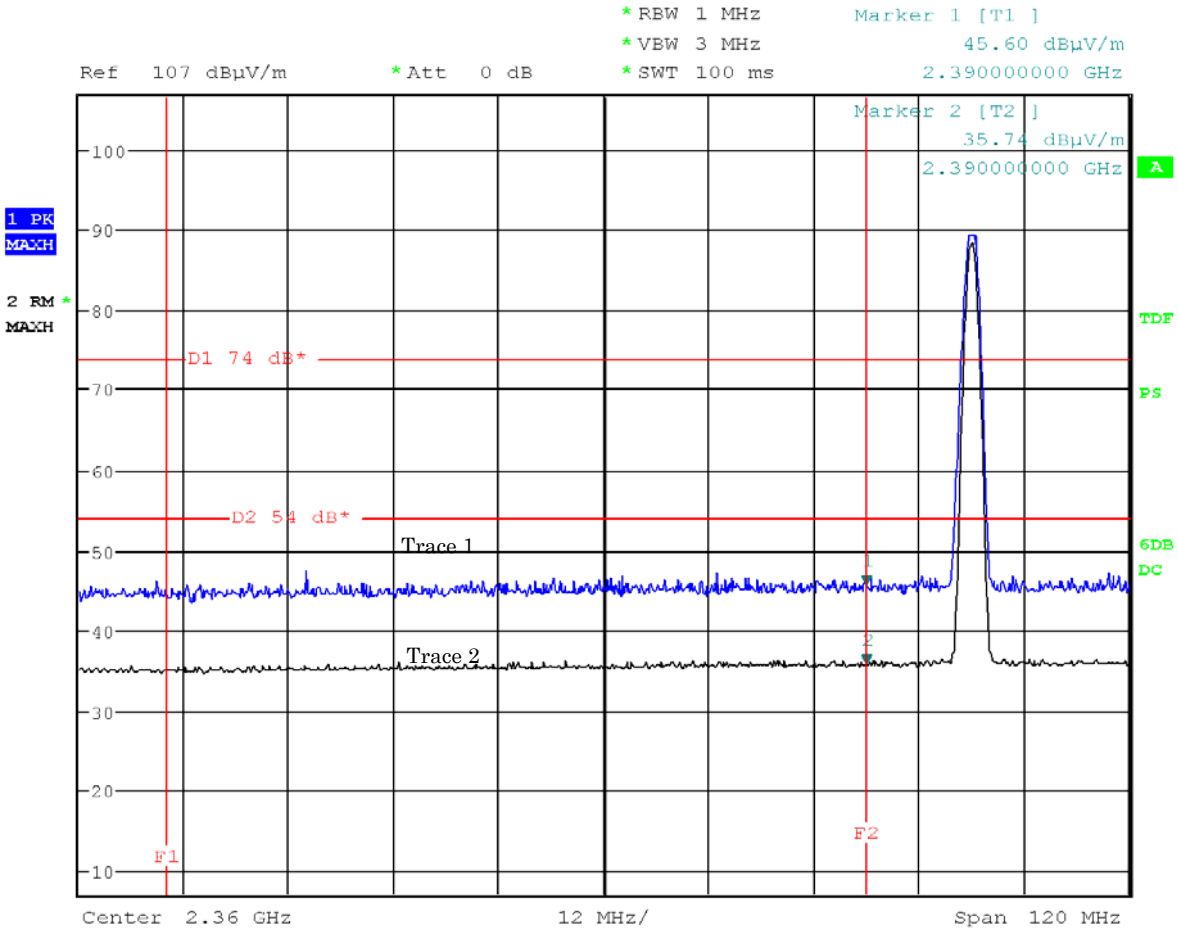
Note: The trace 1 is Peak detection. The trace 2 is RMS detection.

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



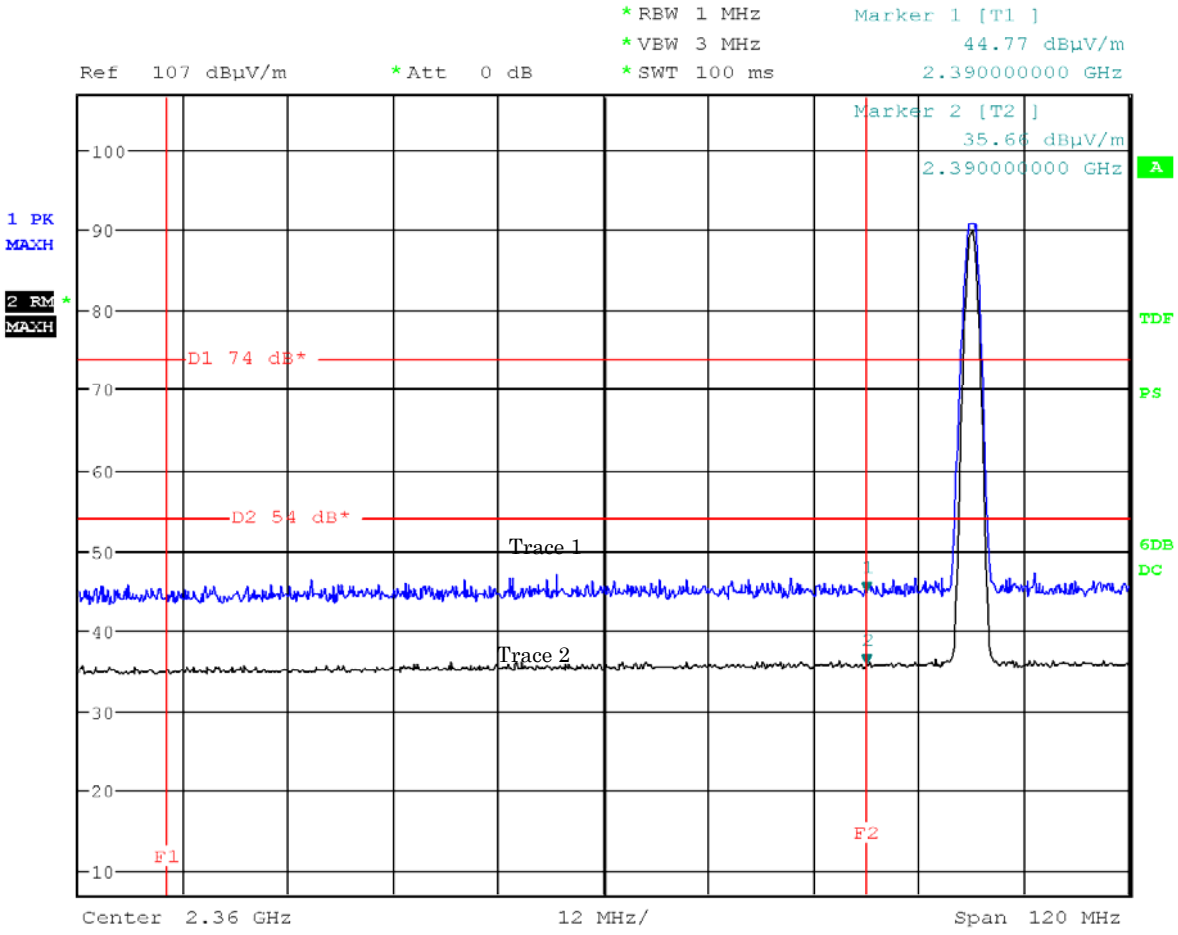
Note: The trace 1 is Peak detection. The trace 2 is RMS detection.

Mode of EUT : Low Energy, Hopping off (0ch: 2402 MHz) (worst case)
Antenna Polarization : Horizontal



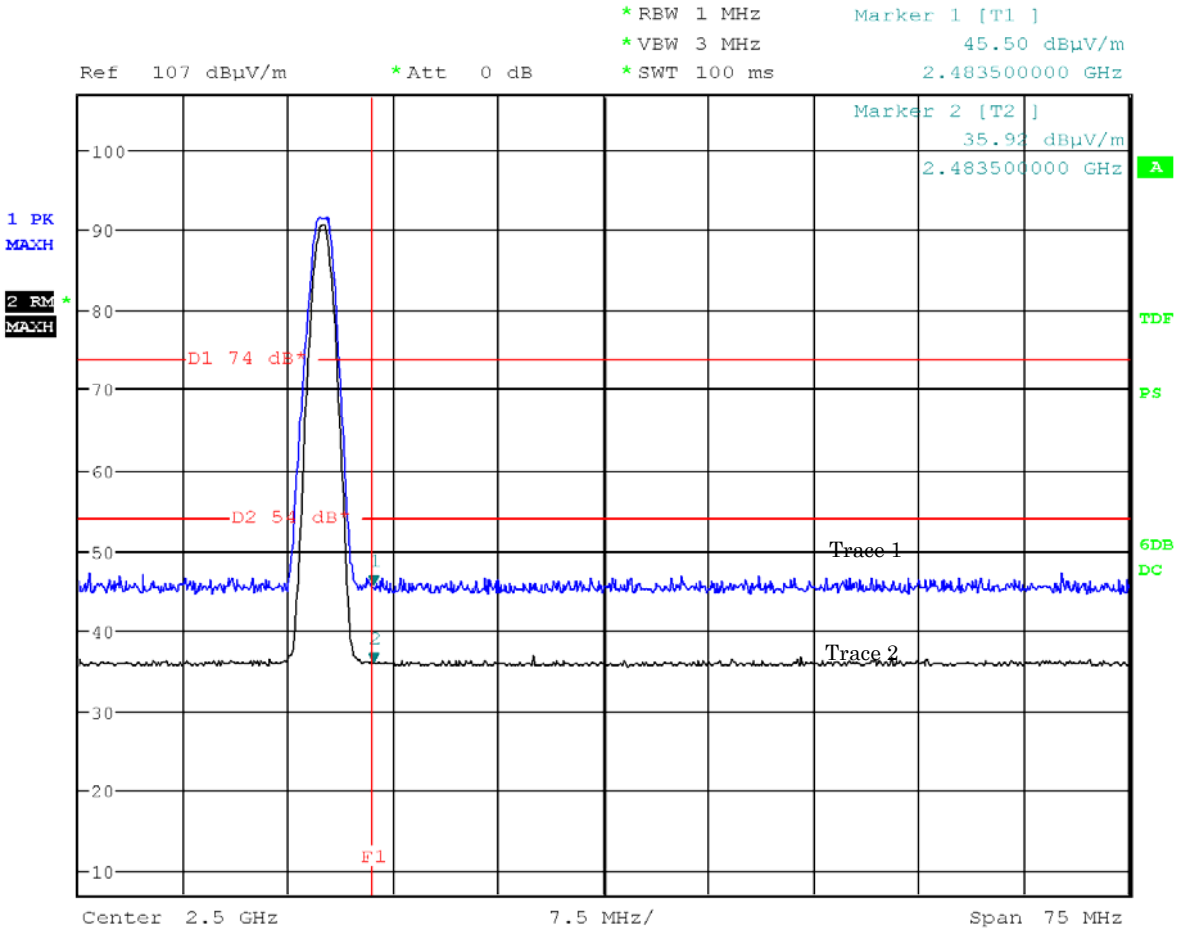
Note: The trace 1 is Peak detection. The trace 2 is RMS detection.

Mode of EUT : Low Energy, Hopping off (0ch: 2402 MHz) (worst case)
Antenna Polarization : Vertical



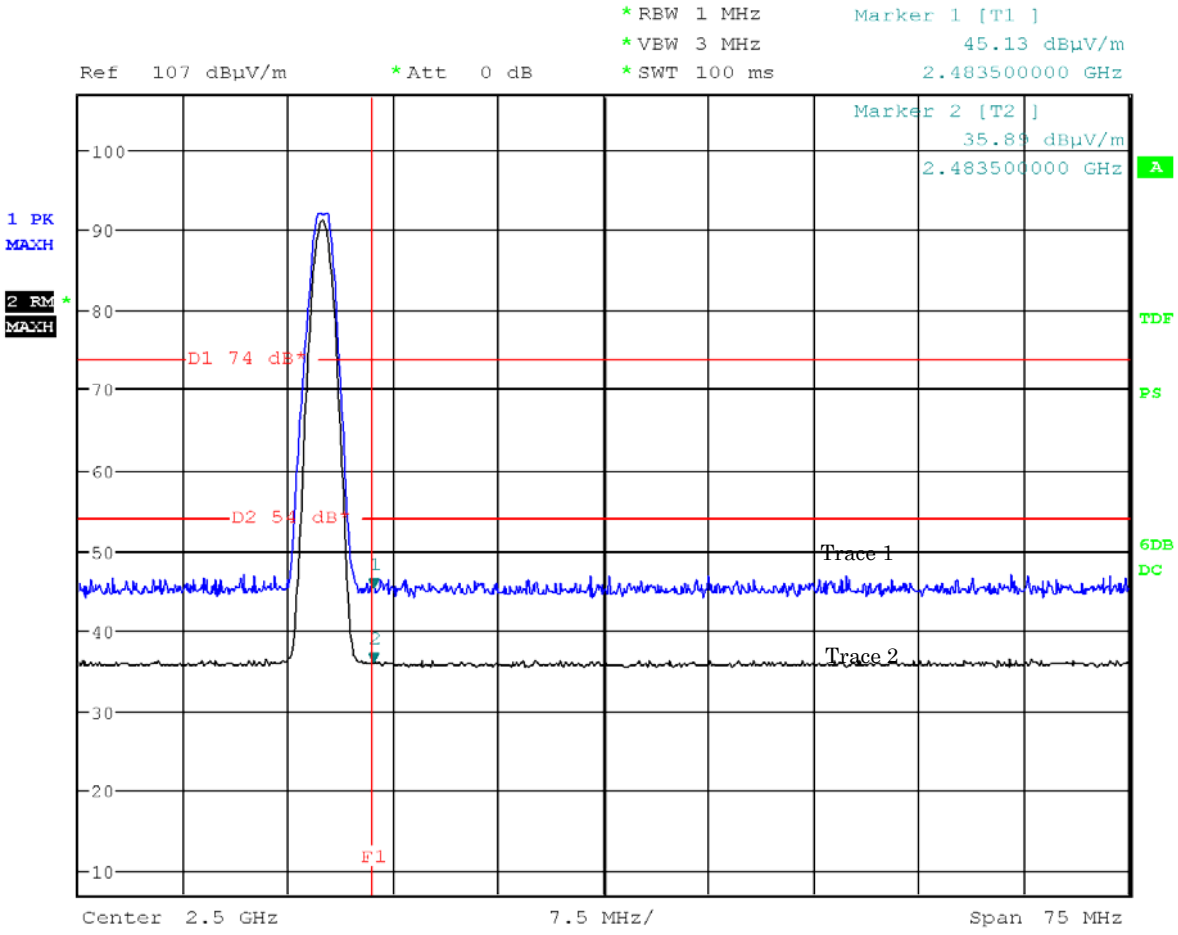
Note: The trace 1 is Peak detection. The trace 2 is RMS detection.

Mode of EUT : Low Energy, Hopping off (39ch: 2480 MHz) (worst case)
Antenna Polarization : Horizontal



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

Mode of EUT : Low Energy, Hopping off (39ch: 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 : April 26, 2013
Temp.:24°C, Humi:52%

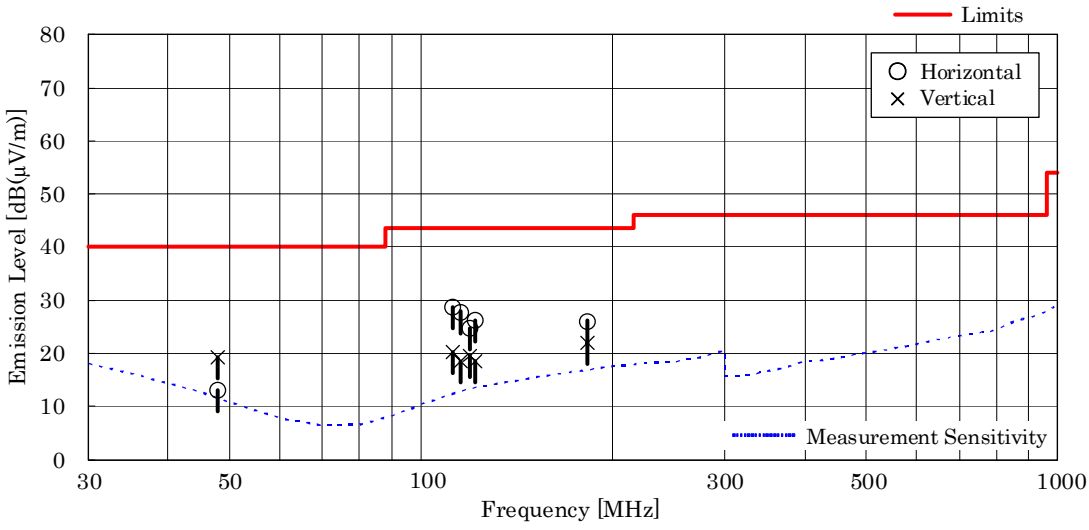
Mode of EUT : All modes have been investigated and the worst case mode has been listed.
Results : No spurious emissions in the range 20dB below the limit.

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: April 26, 2013
Temp.: 24 °C, Humi: 48 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Cable Loss [dB]	Meter Readings [dB(μV)] Hori.	Meter Readings [dB(μV)] Vert.	Limits [dB(μV/m)]	Results [dB(μV/m)] Hori.	Results [dB(μV/m)] Vert.	Margin [dB]	Remarks
47.9	12.0	-27.4	28.5	34.6	40.0	13.1	19.2	+20.8	-
111.9	12.0	-26.7	43.4	34.9	43.5	28.7	20.2	+14.8	-
115.1	12.4	-26.7	42.1	32.9	43.5	27.8	18.6	+15.7	-
119.0	12.9	-26.7	38.6	33.4	43.5	24.8	19.6	+18.7	-
121.6	13.1	-26.6	39.7	32.1	43.5	26.2	18.6	+17.3	-
182.4	16.0	-26.1	36.2	32.0	43.5	26.1	21.9	+17.4	-



NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 30 MHz to 1000 MHz.
3. The symbol of "<" means "or less".
4. The symbol of ">" means "more than".
5. Calculated result at 111.9 MHz, as the worst point shown on underline:
   Antenna Factor + Cable Loss + Meter Reading = 12.0 + -26.7 + 43.4 = 28.7 dB(μV/m)
6. 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: April 25, 2013
Temp.: 25 °C, Humi: 42 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings [dB(μV)] Horizontal PK	Horizontal AVE	Vertical PK	Vertical AVE	Limits [dB(μV/m)] PK	Limits AVE	Results [dB(μV/m)] PK	Results AVE	Margin [dB]	Remarks
Test condition : Tx Low Ch												
4804.0	27.3	-21.1	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.2	< 36.2	> +17.8	A/B
12010.0	33.6	-27.2	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.4	< 36.4	> +17.6	A/B
19216.0	40.2	-22.9	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 57.3	< 47.3	> + 6.7	A/B
Test condition : TX Middle Ch												
4882.0	27.3	-21.2	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.1	< 36.1	> +17.9	A/B
7323.0	29.9	-19.5	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 50.4	< 40.4	> +13.6	A/B
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
Test condition : TX High Ch												
4960.0	27.3	-21.3	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.0	< 36.0	> +18.0	A/B
7440.0	29.9	-19.4	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 50.5	< 40.5	> +13.5	A/B
12400.0	33.5	-26.6	< 40.0	< 30.0	40.0	< 30.0	74.0	54.0	< 46.9	< 36.9	> +17.1	A/B
19840.0	40.3	-22.7	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 57.6	< 47.6	> + 6.4	A/B
22320.0	40.4	-21.9	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 58.5	< 48.5	> + 5.5	A/B

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

	Antenna Factor	=	40.4 dB(1/m)
	Corr. Factor	=	-21.9 dB
+)	Meter Reading	=	<30.0 dB(μV)
	Result	=	<48.5 dB(μV/m)

Minimum Margin: 54.0 - <48.5 = >5.5 (dB)

NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 1 GHz to 25 GHz (10th harmonic of the highest fundamental frequency).
3. 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)
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. PK : Peak Detector / AVE : Average Detector
7. 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: April 25, 2013
Temp.: 25 °C, Humi: 42 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings [dB(μV)] Horizontal PK	Horizontal AVE	Vertical PK	Vertical AVE	Limits [dB(μV/m)] PK	Limits AVE	Results [dB(μV/m)] PK	Results AVE	Margin [dB]	Remarks
Test condition : RX Middle Ch												
2441.0	21.3	-21.8	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 39.5	< 29.5	> +24.5	A/B
4882.0	27.3	-21.5	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 45.8	< 35.8	> +18.2	A/B
7323.0	29.9	-19.8	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 50.1	< 40.1	> +13.9	A/B

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

	Antenna Factor	=	29.9 dB(1/m)
	Corr. Factor	=	-19.8 dB
+)	Meter Reading	=	<30.0 dB(μV)
	Result	=	<40.1 dB(μV/m)

Minimum Margin: 54.0 - <40.1 = >13.9 (dB)

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

Test Date: April 25, 2013
Temp.: 25 °C, Humi: 42 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings [dB(μV)] Horizontal PK	Horizontal AVE	Vertical PK	Vertical AVE	Limits [dB(μV/m)] PK	Limits AVE	Results [dB(μV/m)] PK	Results AVE	Margin [dB]	Remarks
Test condition : Tx Low Ch												
4804.0	27.3	-21.1	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.2	< 36.2	> +17.8	A/B
12010.0	33.6	-27.2	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.4	< 36.4	> +17.6	A/B
19216.0	40.2	-22.9	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 57.3	< 47.3	> + 6.7	A/B
Test condition : TX Middle Ch												
4880.0	27.3	-21.2	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.1	< 36.1	> +17.9	A/B
7320.0	29.9	-19.6	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 50.3	< 40.3	> +13.7	A/B
12200.0	33.5	-26.9	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.6	< 36.6	> +17.4	A/B
19520.0	40.2	-22.7	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 57.5	< 47.5	> + 6.5	A/B
Test condition : TX High Ch												
4960.0	27.3	-21.3	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 46.0	< 36.0	> +18.0	A/B
7440.0	29.9	-19.4	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 50.5	< 40.5	> +13.5	A/B
12400.0	33.5	-26.6	< 40.0	< 30.0	40.0	< 30.0	74.0	54.0	< 46.9	< 36.9	> +17.1	A/B
19840.0	40.3	-22.7	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 57.6	< 47.6	> + 6.4	A/B
22320.0	40.4	-21.9	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 58.5	< 48.5	> + 5.5	A/B

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

	Antenna Factor	=	40.4 dB(1/m)
	Corr. Factor	=	-21.9 dB
+)	Meter Reading	=	<30.0 dB(μV)
	Result	=	<48.5 dB(μV/m)

Minimum Margin: 54.0 - <48.5 = >5.5 (dB)

NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 1 GHz to 25 GHz (10th harmonic of the highest fundamental frequency).
3. 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)
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. PK : Peak Detector / AVE : Average Detector
7. 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 : Low Energy

Test Date: April 25, 2013
Temp.: 25 °C, Humi: 42 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings [dB(μV)] Horizontal PK	Horizontal AVE	Vertical PK	Vertical AVE	Limits [dB(μV/m)] PK	Limits AVE	Results [dB(μV/m)] PK	Results AVE	Margin [dB]	Remarks
Test condition : RX Middle Ch												
2440.0	21.3	-21.8	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 39.5	< 29.5	> +24.5	A/B
4880.0	27.3	-21.5	< 40.0	< 30.0	< 40.0	< 30.0	74.0	54.0	< 45.8	< 35.8	> +18.2	A/B
7320.0	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 7320.0 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
1. Test Distance : 3 m
2. The spectrum was checked from 1 GHz to 7.5 GHz .
3. The correction factor is shown as follows:
   Corr. Factor [dB] = Cable Loss + 20dB Pad Att. - Pre-Amp. Gain [dB] (1.0 - 7.6GHz)
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. PK : Peak Detector / AVE : Average Detector
7. 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