



# RADIO TEST REPORT

**Test Report No.: 32JE0183-SH-01-A**

**Applicant** : Sony Corporation  
**Type of Equipment** : AV Center  
**Model No.** : XAV-701HD  
**FCC ID** : AK8XAV701HD  
**Test regulation** : FCC Part15 Subpart C: 2012  
**Test result** : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

**Date of test:** May 25 to June 7, 2012

**Representative  
test engineer:**

Makoto Hosaka  
Engineer of WiSE Japan,  
UL Verification Service

**Approved by :**

Toyokazu Imamura  
Leader of WiSE Japan,  
UL Verification Service

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 There is no testing item of "Non-accreditation".



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13-EM-F0429



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## **SECTION 1: Customer information**

Company Name : Sony Corporation  
Brand Name : SONY  
Address : Shinagawa INTERCITY C Tower 2-15-3, Konan Minato-ku, Tokyo, 108-6201  
Japan  
Telephone Number : +81-3-5769-5640  
Facsimile Number : +81-3-5769-5996  
Contact Person : Kazunaga Kinjo

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

### **2.1 Identification of E.U.T.**

Type of Equipment : AV Center  
Model No. : XAV-701HD  
Serial No. : Refer to 4.2 of this report.  
Rating : DC12V  
Country of Mass-production : Thailand  
Condition of EUT : Production prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)  
Modification of EUT : No modification by the test lab.  
Receipt Date of Sample : May 11, 2012

### **2.2 Product description**

Model: XAV-701HD (referred to as the EUT in this report) is an AV Center.

Clock frequency(ies) in the system : 32.768kHz, 6MHz, 10MHz, 11.2896MHz, 24MHz, 27MHz, 30MHz, 32MHz, 36.48MHz

Bluetooth specification:

Equipment type : Transceiver  
Frequency of operation : 2402-2480MHz  
Bandwidth & channel spacing : 79MHz & 1MHz  
Type of modulation : FHSS  
Antenna type : Surface mountable chip (MITSUBISHI AMD0302-ST01 SMD)  
Antenna connector type : None  
Antenna gain with cable loss : -7.6dBi  
ITU code : F1D, G1D  
Operation temperature range : -20 to +60 deg.C.

FCC 15.31 (e)

The equipment provides the Bluetooth transmitter with stable power supply (DC 3.3 V), therefore, the equipment complies with power supply regulation.

FCC 15.203

The equipment and its antenna comply with this requirement since this antenna is built in the equipment and it cannot be replaced by end users.

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**SECTION 3: Test specification, procedures & results****3.1 Test specification**

Test specification : FCC Part 15 Subpart C: 2012, final revised on March 30, 2012  
and effective April 30, 2012

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.207 Conducted limits  
Section 15.209 Radiated emission limits, general requirements  
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,  
and 5725-5850MHz

The EUT has been tested for compliance with FCC Part 15 Subpart B. Refer to the test report 32JE0183-SH-01-C.

**3.2 Procedures & Results**

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2009 7. AC powerline conducted emission measurements	FCC 15.207	-	N/A *1)	N/A	N/A
Carrier frequency separation	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(1)	Conducted	N/A	*See data.	Complied
20dB bandwidth	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(1)	Conducted	N/A		-
Number of hopping frequency	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(1)(iii)	Conducted	N/A		Complied
Dwell time	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(1)(iii)	Conducted	N/A		Complied
Maximum peak output power	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (b)(1)	Conducted	N/A		Complied
Band edge compliance & Spurious emission	FCC Public Notice DA 00-705 & ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (d) 15.209	Conducted/ Radiated	N/A		7.3dB Freq.: 462.005MHz Detection: Quasi-Peak Polarization: Horizontal Mode: Tx 2402MHz, DH5

Note: UL Japan's Work Procedures No. 13-EM-W0420 and 13-EM-W0422

\*1) The test is not applicable since the EUT does not have AC Mains.

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**3.3 Addition to standard**

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.4:2009 13. Measurement of intentional radiators, RSS-Gen 4.6.1	-	Conducted	-	-

Note: UL Japan's Work Procedures No. 13-EM-W0420 and 13-EM-W0422

\* Other than above, no addition, exclusion nor deviation has been made from the standard.

**3.4 Uncertainty**

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

Item	Frequency range	No.1 SAC <sup>*1</sup> /SR <sup>*2</sup> (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
<b>Radiated emission (Measurement distance: 3m)</b>	9kHz-30MHz	3.7 dB	3.7 dB	3.6 dB
	30MHz-300MHz	4.9 dB	5.1 dB	5.0 dB
	300MHz-1GHz	5.0 dB	5.2 dB	5.0 dB
	1GHz-15GHz	4.8 dB	4.8 dB	4.9 dB
<b>Radiated emission (Measurement distance: 1m)</b>	15GHz-18GHz	5.6 dB	5.6 dB	5.6 dB
	18GHz-40GHz	4.8 dB	4.3 dB	4.4 dB

\*1: SAC=Semi-Anechoic Chamber

\*2: SR= Shielded Room is applied besides radiated emission

**Radiated emission test**

The data listed in this test report has enough margin, more than site margin.

**Antenna port conducted test**

Power measurement uncertainty above 1GHz for this test was: (±) 1.5dB

Spurious emission (Conducted) measurement (below 1GHz) uncertainty for this test was: (±) 1.7dB

Spurious emission (Conducted) measurement (1G-3GHz) uncertainty for this test was: (±) 2.3dB

Spurious emission (Conducted) measurement (3G-18GHz) uncertainty for this test was: (±) 3.0dB

Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.9dB

Bandwidth measurement uncertainty for this test was: (±) 5.4%

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### 3.5 Test location

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JAB Accreditation No. : RTL02610

	FCC Registration No.	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
<input checked="" type="checkbox"/> No.1 Semi-anechoic chamber	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
<input type="checkbox"/> No.2 Semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
<input type="checkbox"/> No.3 Semi-anechoic chamber	697847	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
<input type="checkbox"/> No.4 Full-anechoic chamber	-	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
<input type="checkbox"/> No.1 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
<input type="checkbox"/> No.2 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
<input type="checkbox"/> No.3 shielded room	-	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
<input type="checkbox"/> No.4 shielded room	-	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
<input checked="" type="checkbox"/> No.5 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
<input type="checkbox"/> No.6 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-

### 3.6 Test setup, Data of radio test & Test instruments

Refer to Appendix 1 to 3.

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## **SECTION 4: Operation of E.U.T. during testing**

### **4.1 Operating mode**

The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

<b>Test item</b>	<b>Operating mode</b>	<b>Tested frequency</b>
Carrier frequency separation	Transmitting Hopping ON (DH5/3DH5)/Inquiry, Payload: PRBS9	-
20dB bandwidth	Transmitting Hopping OFF (DH5/3DH5)/Inquiry, Payload: PRBS9	2402MHz, 2441MHz, 2480MHz
Number of hopping frequency	Transmitting Hopping ON (DH5/3DH5)/Inquiry, Payload: PRBS9	-
Dwell time	Transmitting (Hopping ON) -DH1, -DH3, -DH5 -3DH1, -3DH3, -3DH5 -Inquiry	-
Maximum peak output power	Transmitting Hopping OFF (DH5/3DH5)/Inquiry, Payload: PRBS9 -DH5 -2DH5 -3DH5	2402MHz, 2441MHz, 2480MHz
Band edge compliance & Spurious emission (Conducted)	Transmitting (DH5/3DH5), Payload: PRBS9 -Hopping ON/Inquiry -Hopping OFF	Band edge compliance: 2402MHz, 2480MHz
(Radiated)	Transmitting (DH5/3DH5), Payload: PRBS9	Spurious emission: 2402MHz, 2441MHz, 2480MHz
99% occupied bandwidth	Transmitting (DH5/3DH5), Payload: PRBS9 -Hopping ON -Hopping OFF	2402MHz, 2441MHz, 2480MHz

\*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload (except Dwell time test)

\*Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not affect the output power and bandwidth of the EUT.

As this device had AFH mode and frequency separation could not meet the requirement of over 20dB BW without 2/3 relaxation, 125mW power limit was applied to it.

EUT has the power settings by the software as follows;

Power settings: BDR: Ext.=255, Int.=44

EDR: Ext.=255, Int.=48

Software: CSR BlueSuite BlueTest Version 1.24

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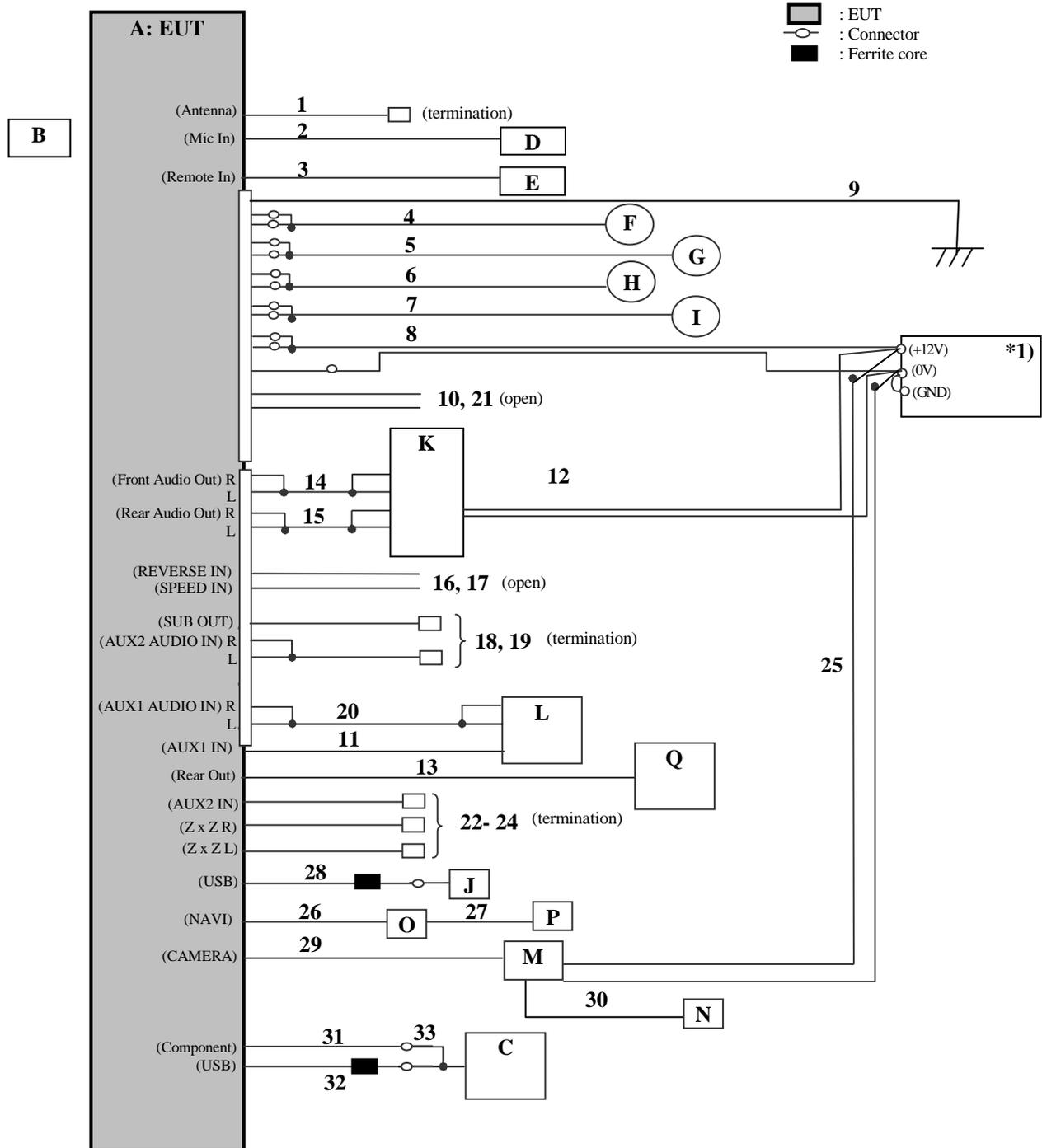
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## 4.2 Configuration and peripherals



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

\*1) DC power supply (Model No.: PAN35-10A) was used for DC 12V input.

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**Description of EUT and support equipment**

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	AV Center	XAV-701HD	*2)	Sony	EUT
B	Remote Controller	RM-X271	-	Sony	-
C	iPod Touch	A1367	C3RG9YNHDCP7	Apple	-
D	Microphone	XA-MC10	-	Sony	-
E	Wired Remote Controller	RM-X4S	-	Sony	-
F	Speaker 1	1-544-814-31	-	Aiwa	-
G	Speaker 2	1-544-814-31	-	Aiwa	-
H	Speaker 3	XS-F1611	-	Sony	-
I	Speaker 4	XS-F1611	-	Sony	-
J	GPS Unit	1MJ01/1MJ00	DJ1440K01566	TomTom	-
K	Stereo Power Amplifier	XM-423SL	0020316	Sony	-
L	Digital Video Cassette Recorder	GV-D900	30729	Sony	-
M	Rear View CCD Camera	HCE-C100	W80316932	ALPINE	-
N	Rear View CCD Camera	HCE-C100	W80316932	ALPINE	-
O	SIRIUS XM Connect Vehicle Tuner	SXV100	1113	SIRIUS	-
P	Antenna	XVANT1	1046	SIRIUS	-
Q	Mobile Monitor	XVM-B62	3504390	Sony	-

\*2) 22: for Antenna terminal conducted tests, 46: for Radiated emission tests

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**List of cables used**

No.	Cable name	Length (m)	Shield		Remarks
			Cable	Connector	
1	FM antenna	1.0	Shielded	Shielded	-
2	External Microphone	4.0	Unshielded	Unshielded	-
3	Remote	2.0	Unshielded	Unshielded	-
4	Speaker (1)	0.15+2.0	Unshielded	Unshielded	-
5	Speaker (2)	0.15+2.0	Unshielded	Unshielded	-
6	Speaker (3)	0.15+2.0	Unshielded	Unshielded	-
7	Speaker (4)	0.15+2.0	Unshielded	Unshielded	-
8	DC Power	0.15+1.5	Unshielded	Unshielded	-
9	Parking Brake	2.0	Unshielded	Unshielded	-
10	Illumination	0.2	Unshielded	Unshielded	-
11	AUX1 IN	1.5	Unshielded	Unshielded	-
12	DC Power	1.9	Unshielded	Unshielded	-
13	Monitor	4.6	Shielded	Shielded	-
14	Audio (Front Audio Out)	0.15+5.0	Shielded	Shielded	-
15	Audio (Rear Audio Out)	0.15+5.0	Shielded	Shielded	-
16	REVERSE IN	0.2	Unshielded	Unshielded	-
17	SPEED IN	0.2	Unshielded	Unshielded	-
18	SUB OUT	0.15+1.5	Shielded	Shielded	-
19	AUX2 AUDIO IN	0.15+1.5	Shielded	Shielded	-
20	AUX1 AUDIO IN	0.15+1.5	Shielded	Shielded	-
21	REM OUT	0.2	Unshielded	Unshielded	-
22	AUX2 IN	1.5	Shielded	Shielded	-
23	Z x Z R	1.5	Shielded	Shielded	-
24	Z x Z L	1.5	Shielded	Shielded	-
25	DC Power	1.0	Unshielded	Unshielded	-
26	Signal	0.6	Shielded	Shielded	-
27	Antenna	6.8	Shielded	Shielded	-
28	USB2	1.5+0.1	Shielded	Shielded	-
29	CAMERA	1.5	Shielded	Shielded	-
30	CCD CAMERA	3.0	Unshielded	Unshielded	-
31	Component	0.15	Shielded	Shielded	-
32	USB1	1.5	Shielded	Shielded	-
33	iPod	2.2 / 0.9	Shielded	Shielded	Component / USB

\* All cables used for the measurement are exclusive use or marketed.

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### **SECTION 5: Carrier frequency separation**

#### **Test procedure**

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

Refer to APPENDIX 1

### **SECTION 6: 20dB bandwidth & Occupied bandwidth (99%)**

#### **Test procedure**

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

The channel separation in Hopping mode and Inquiry mode was separated by 25kHz and 2/3 of the 20dB bandwidth.

Summary of the test results: Pass

Refer to APPENDIX 1

### **SECTION 7: Number of hopping frequency**

#### **Test procedure**

The number of hopping frequency was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

Refer to APPENDIX 1

### **SECTION 8: Dwell time**

#### **Test procedure**

The dwell time was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

Refer to APPENDIX 1

### **SECTION 9: Maximum peak output power**

#### **Test procedure**

The maximum peak output power was measured with a power meter connected to the antenna port.

Summary of the test results: Pass

Refer to APPENDIX 1

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## **SECTION 10: Spurious emissions (Radiated)**

### **10.1 Operating environment**

The test was carried out in No.3 semi-anechoic chamber.

Temperature : See test data (APPENDIX 2)  
Humidity : See test data (APPENDIX 2)

### **10.2 Test configuration**

EUT was placed on a platform of nominal size, 1m by 2.0m, raised 0.8m above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity. The rear of EUT was aligned and flushed with rear of tabletop. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 0.3 to 0.4m long and were hanged at a 0.4m height to the ground plane. Photographs of the set up are shown in Appendix 1.

### **10.3 Test conditions**

Frequency range : 30MHz to 25GHz  
Test distance : 3m (below 13GHz) / 1m (above 13GHz)  
EUT position : Table top

### **10.4 Test procedure**

The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane and at a distance of 3m (below 15GHz) / 1m (above 15GHz) (Refer to Figure 1). Measurements were performed with quasi-peak, peak and average detector. The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. The measurements were performed for both vertical and horizontal antenna polarization.

The radiated emission measurements were made with the following detection of the test receiver.

Frequency	30 - 1000MHz	1 - 25GHz	
Detection Type	: Quasi-Peak	Peak	* Average
IF Bandwidth	: 120kHz	RBW:1MHz/VBW:3MHz	RBW:1MHz/VBW:10Hz

\* When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold. Although 00-705 accepts VBW=10Hz for AV measurements, confirmed that superfluous smoothing was not performed.

The carrier level and noise levels were confirmed at angle of 0 to 45 deg. based on the product specification to see the position of maximum noise, and the test was made at the position (0 deg.) that has the maximum noise.

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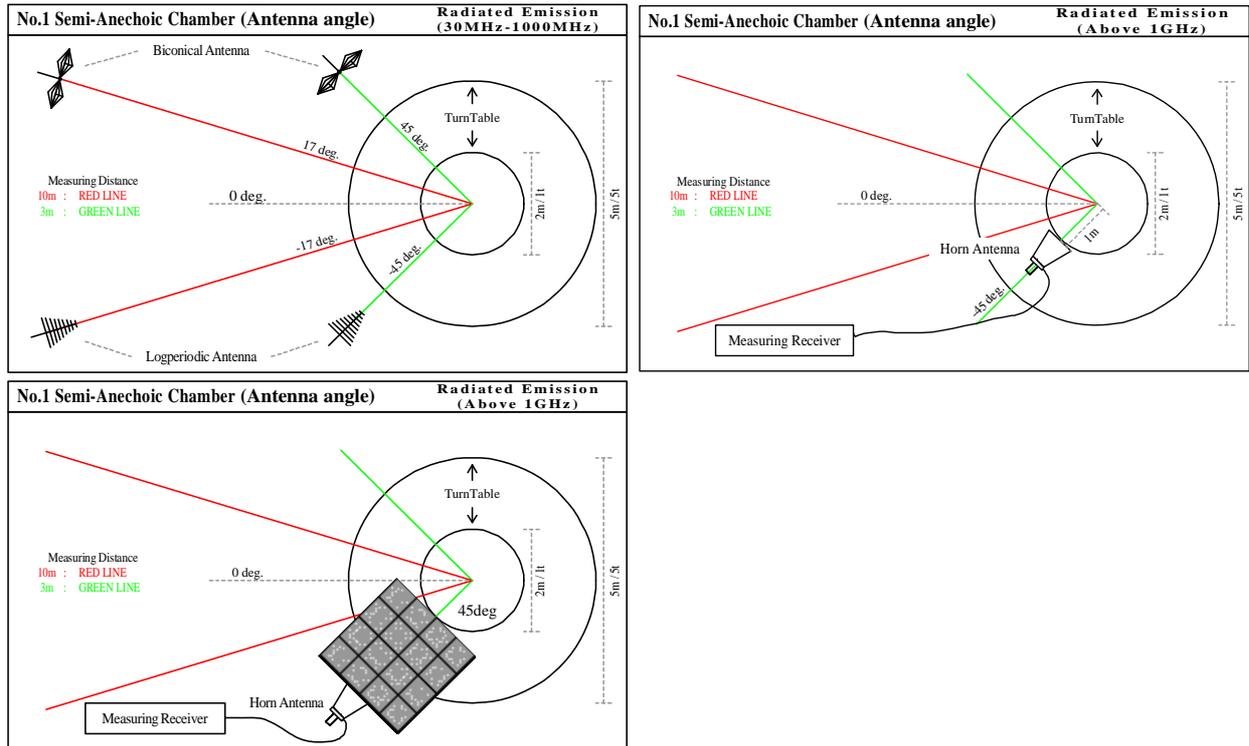
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**Figure 1. Antenna angle**



### 10.5 Band edge

Band edge level is below the limits of FCC 15.209. Refer to the data.

### 10.6 Results

Summary of the test results : Pass \*No noise was detected above the 3rd order harmonics.

Refer to APPENDIX 1

## **SECTION 11: Spurious emissions (Antenna port conducted)**

### **Test procedure**

The spurious emissions were measured with a spectrum analyzer connected to the antenna port.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.

Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.

(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=10kHz)

Summary of the test results: Pass

Refer to APPENDIX 1

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## **Contents of appendixes**

### **APPENDIX 1: Test data**

20dB bandwidth and Carrier frequency separation  
Number of hopping frequency  
Dwell time  
Maximum peak output power  
Radiated emission  
Spurious emission (Antenna port conducted)  
Occupied bandwidth

### **APPENDIX 2: Test instruments**

Test instruments

### **APPENDIX 3: Photographs of test setup**

Radiated emission

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## APPENDIX 1: Data of Radio tests

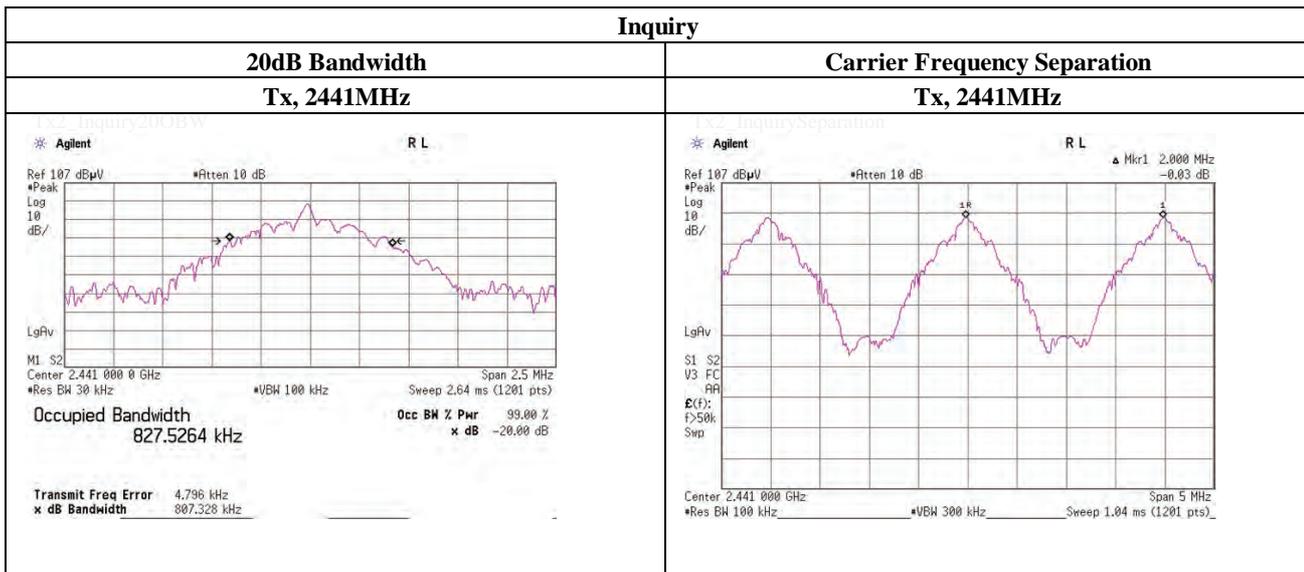
### 20dB Bandwidth and Carrier Frequency Separation

Test place                      UL Japan, Inc. Shonan EMC Lab.                      No.5 Shielded Room  
 Date                              May 25, 2012  
 Temperature / Humidity      23 deg.C      , 46 %RH  
 Engineer                        Makoto Hosaka  
 Mode                              Tx, Bluetooth, BDR, PRBS9

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	0.925	1.000	$\geq 0.617$
DH5	2441.0	0.925	1.000	$\geq 0.617$
DH5	2480.0	0.932	1.000	$\geq 0.621$
Inquiry	2441.0	0.807	2.000	$\geq 0.538$

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.



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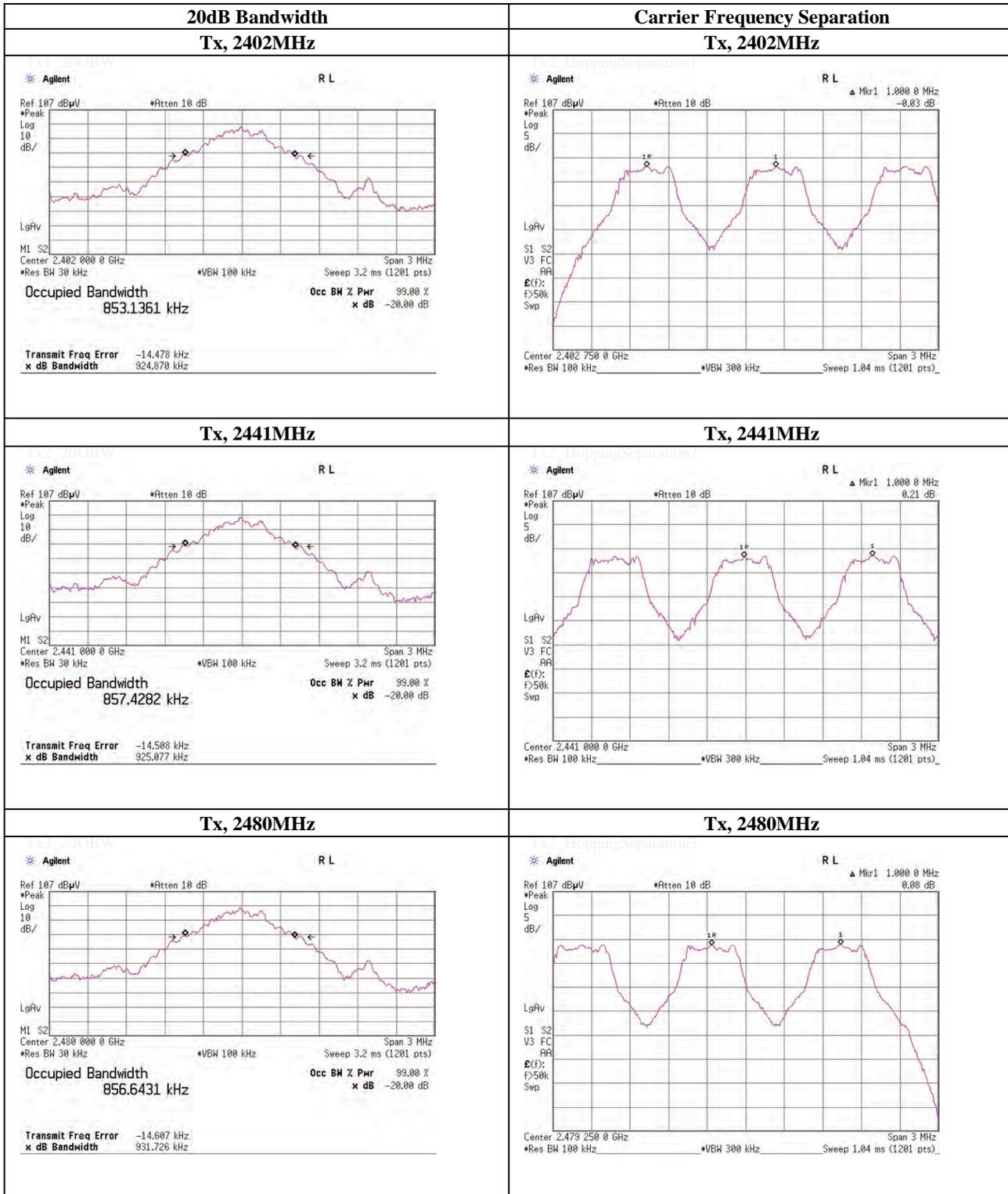
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## 20dB Bandwidth and Carrier Frequency Separation

### Tx, Bluetooth, BDR, PRBS9



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## 20dB Bandwidth and Carrier Frequency Separation

Test place                      UL Japan, Inc. Shonan EMC Lab.                      No.5 Shielded Room  
 Date                                May 25, 2012  
 Temperature / Humidity        23 deg.C        , 46 %RH  
 Engineer                         Makoto Hosaka  
 Mode                                Tx, Bluetooth, EDR, PRBS9

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
3-DH5	2402.0	1.270	1.000	>= 0.847
3-DH5	2441.0	1.267	1.000	>= 0.845
3-DH5	2480.0	1.260	1.000	>= 0.840

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

**UL Japan, Inc.**

**Shonan EMC Lab.**

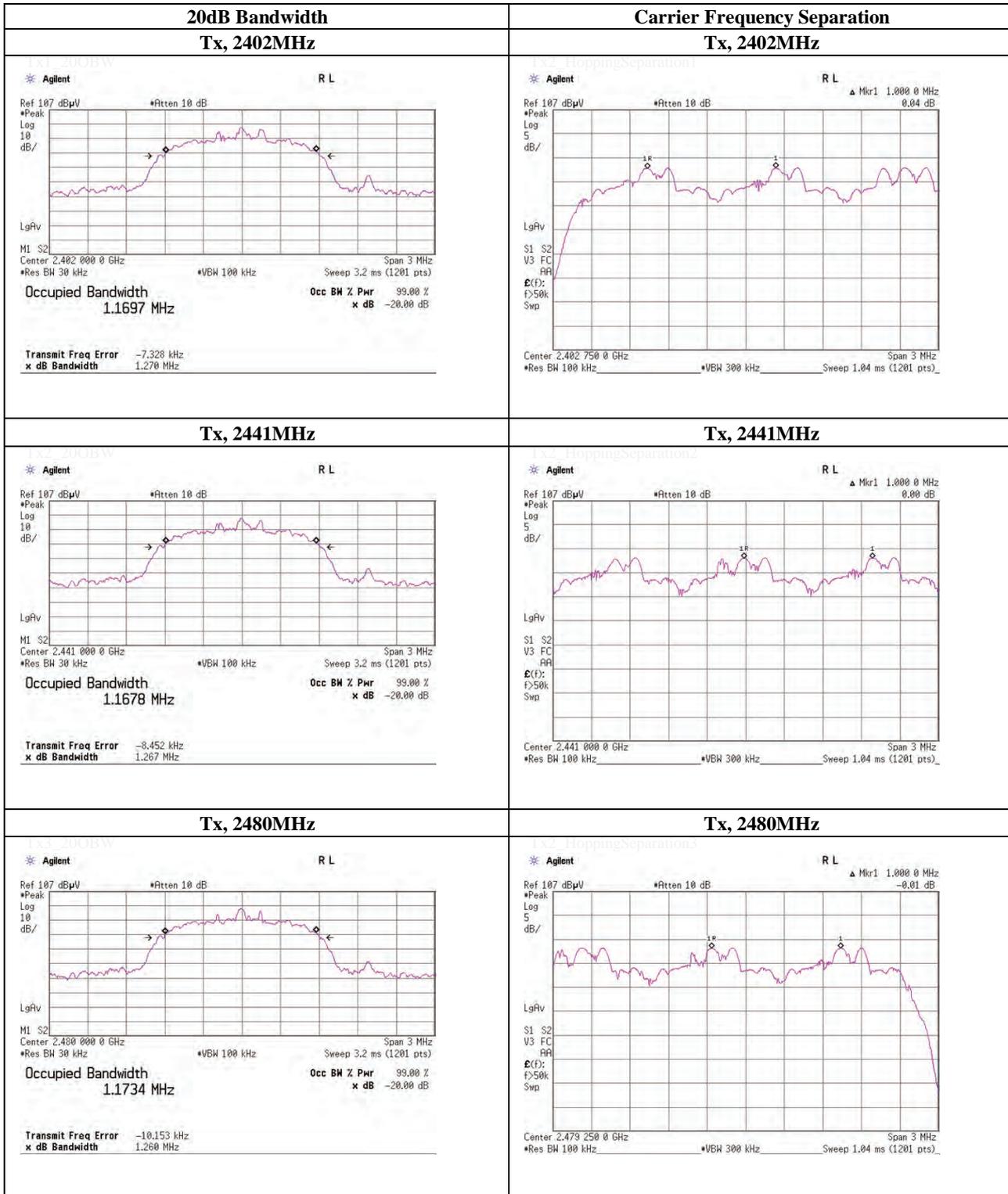
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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Facsimile : +81 463 50 6401

## 20dB Bandwidth and Carrier Frequency Separation

### Tx, Bluetooth, EDR, PRBS9



**UL Japan, Inc.**

**Shonan EMC Lab.**

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

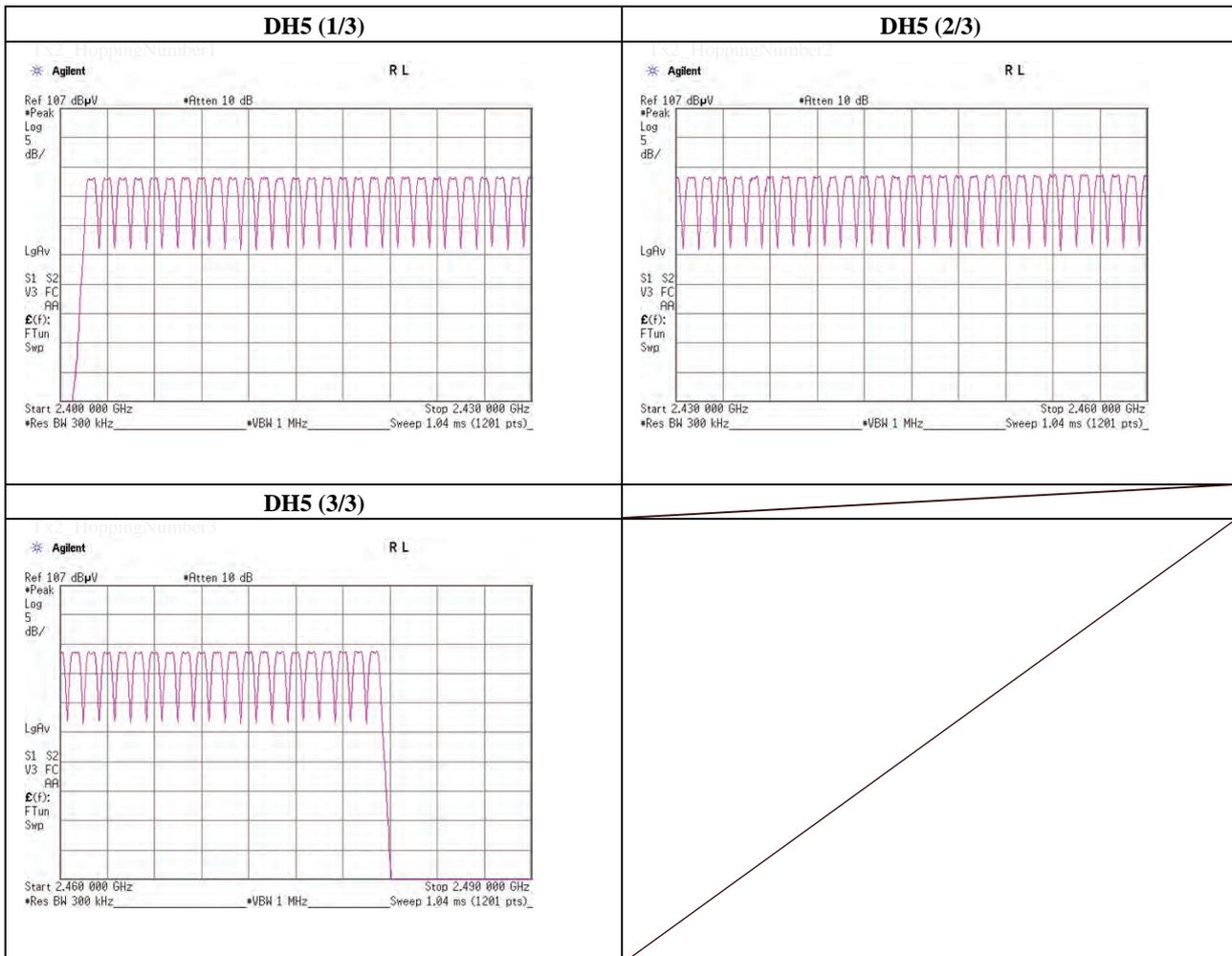
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

### Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	May 25, 2012	
Temperature / Humidity	23 deg.C , 46 %RH	
Engineer	Makoto Hosaka	
Mode	Tx, Bluetooth, BDR, PRBS9	

Mode	Number of Channel [times]	Limit [times]
DH5	79	>= 15

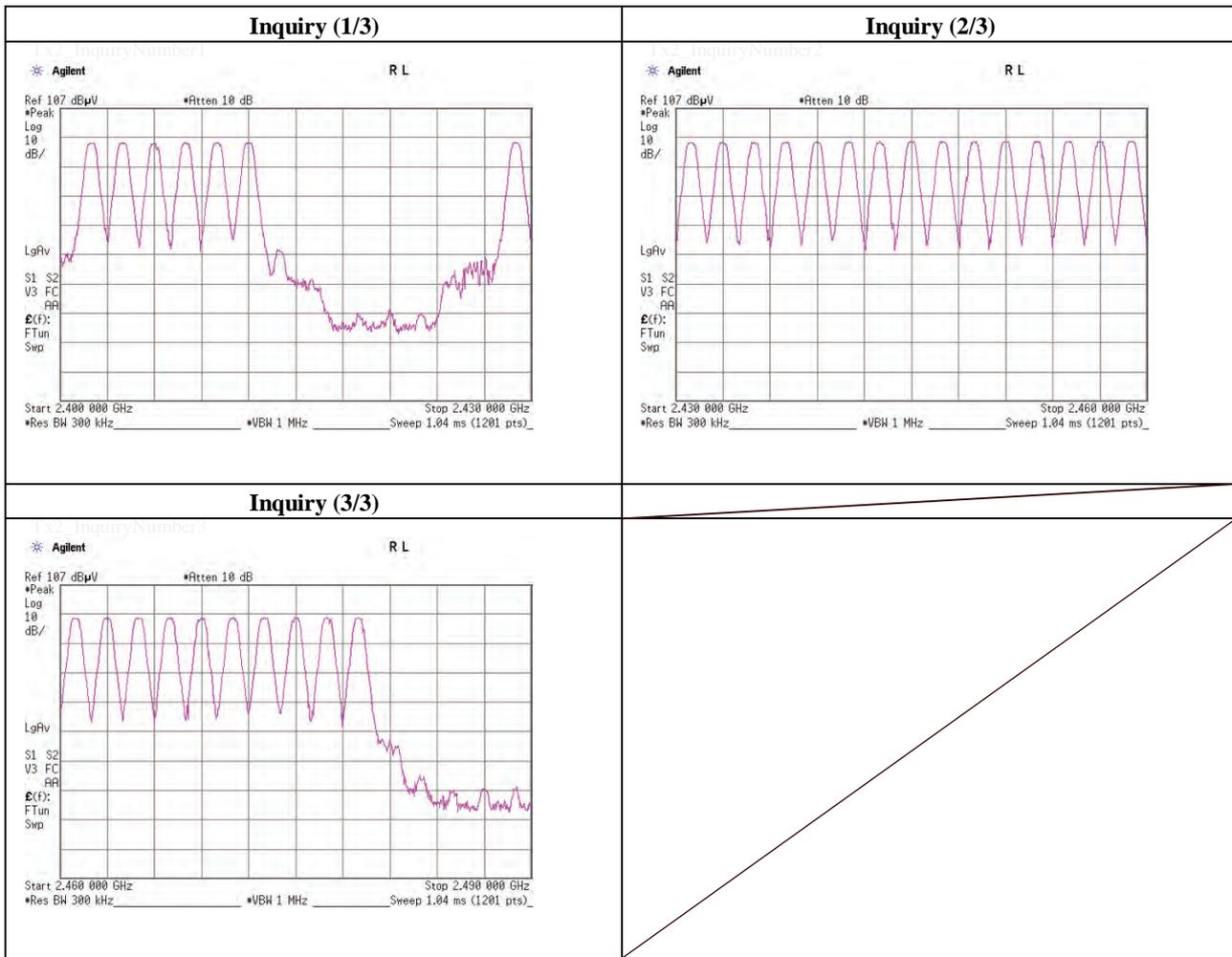


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### Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	May 25, 2012	
Temperature / Humidity	23 deg.C , 46 %RH	
Engineer	Makoto Hosaka	
Mode	Tx, Bluetooth, Inquiry	

Mode	Number of Channel [times]	Limit [times]
Inquiry	32	>= 15

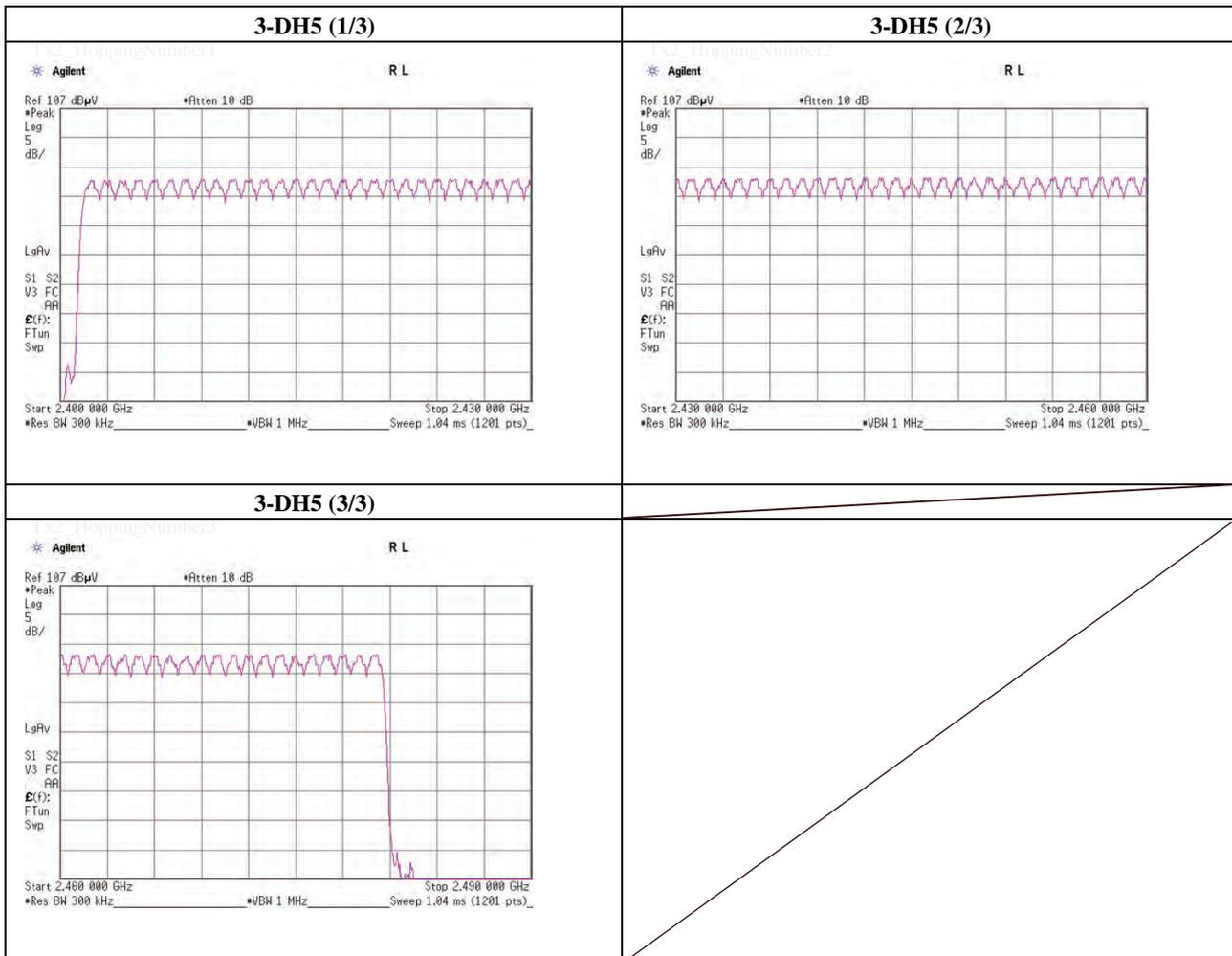


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### Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	May 25, 2012	
Temperature / Humidity	23 deg.C , 46 %RH	
Engineer	Makoto Hosaka	
Mode	Tx, Bluetooth, EDR, PRBS9	

Mode	Number of Channel [times]	Limit [times]
3-DH5	79	>= 15

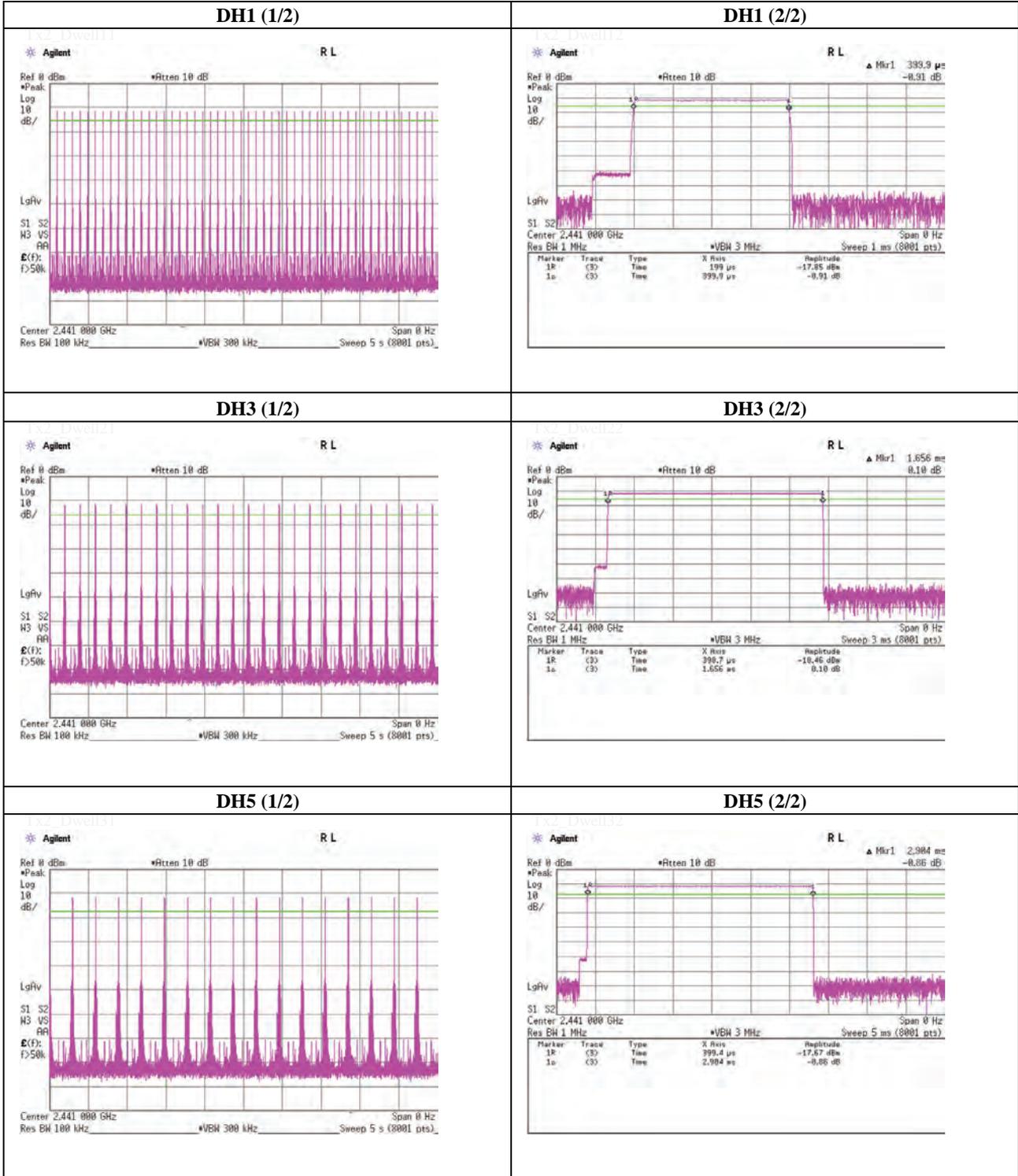


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### Dwell time

Tx, Bluetooth, BDR, PRBS9



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## Dwell Time

Test place           UL Japan, Inc. Shonan EMC Lab.    No.5 Shielded Room  
 Date                 May 25, 2012  
 Temperature / Humidity 23 deg.C   , 46 %RH  
 Engineer            Makoto Hosaka  
 Mode                Tx, Bluetooth, EDR, PRBS9

Mode	Number of transmission in a 31.6 (79 Hopping x 0.4)			Length of transmission time [msec]	Result [msec]	Limit [msec]
3-DH1	50.0	/ 5.0 sec.	x 31.6 sec. = 316 times	0.414	131	400
3-DH3	26.0	/ 5.0 sec.	x 31.6 sec. = 165 times	1.664	274	400
3-DH5	17.0	/ 5.0 sec.	x 31.6 sec. = 108 times	2.915	315	400

Sample Calculation

Result = Number of transmission x Length of transmission time

**UL Japan, Inc.**

**Shonan EMC Lab.**

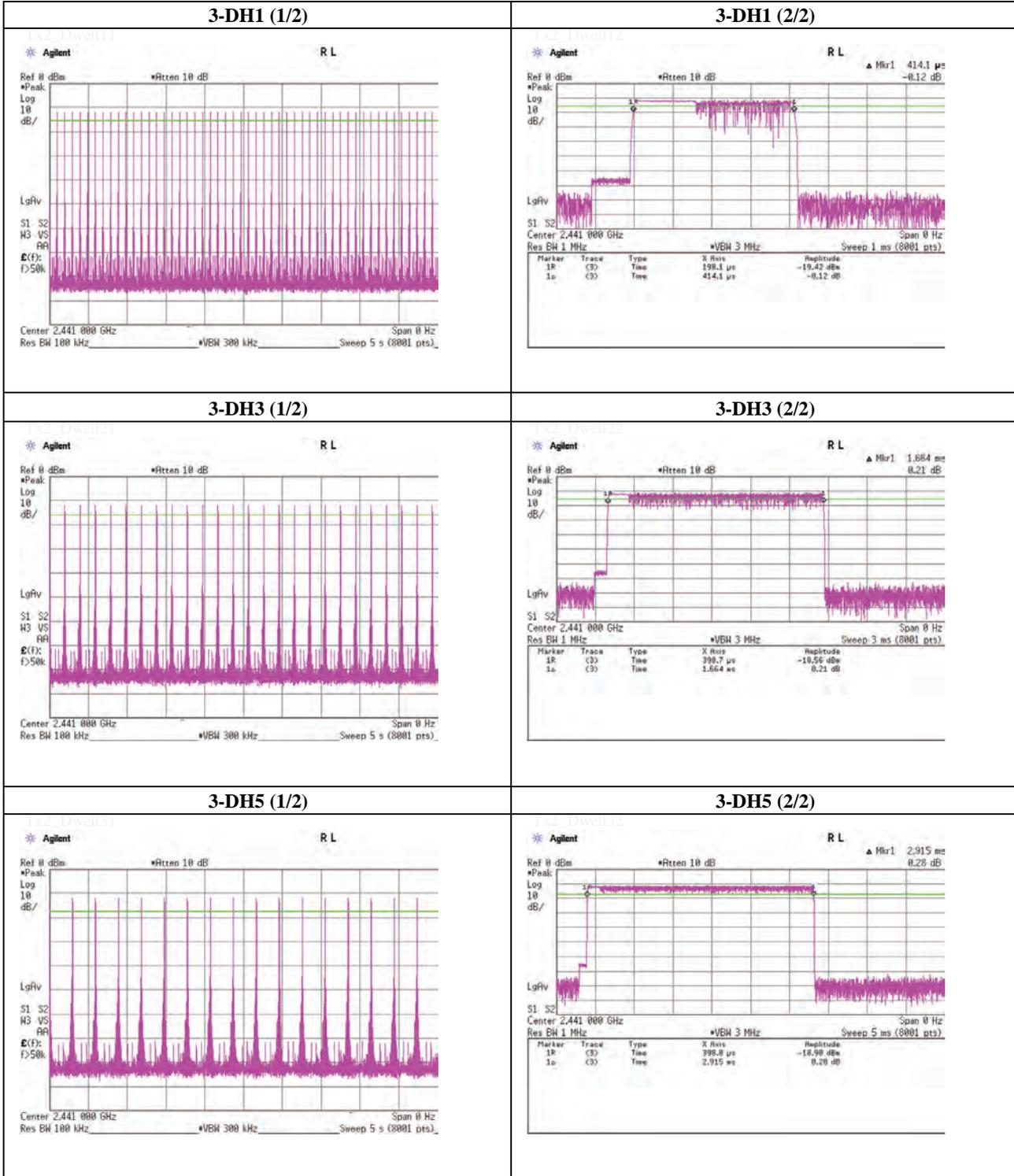
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## Dwell time

Tx, Bluetooth, EDR, PRBS9



**UL Japan, Inc.**

**Shonan EMC Lab.**

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## Peak Output Power (Conducted)

Test place           UL Japan, Inc. Shonan EMC Lab.       No.5 Shielded Room  
 Date                 May 25, 2012  
 Temperature / Humidity   23 deg.C     , 46 %RH  
 Engineer            Makoto Hosaka  
 Mode                Tx, Bluetooth

(\* P/M: Power Meter with power sensor)

	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-11.44	1.95	9.68	0.19	1.04	20.97	125	20.78
DH5	2441.0	-11.12	1.96	9.68	0.52	1.13	20.97	125	20.45
DH5	2480.0	-10.82	1.97	9.68	0.83	1.21	20.97	125	20.14
2-DH5	2402.0	-10.93	1.95	9.68	0.70	1.17	20.97	125	20.27
2-DH5	2441.0	-10.65	1.96	9.68	0.99	1.26	20.97	125	19.98
2-DH5	2480.0	-10.61	1.97	9.68	1.04	1.27	20.97	125	19.93
3-DH5	2402.0	-10.87	1.95	9.68	0.76	1.19	20.97	125	20.21
3-DH5	2441.0	-10.57	1.96	9.68	1.07	1.28	20.97	125	19.90
3-DH5	2480.0	-10.50	1.97	9.68	1.15	1.30	20.97	125	19.82

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

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 Facsimile   : +81 463 50 6401

## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.1 Semi Anechoic Chamber  
Date                           June 6, 2012   June 7, 2012  
Temperature / Humidity    20 deg.C , 46 %RH                                   24 deg.C , 48 %RH  
Engineer                    Hikaru Shirasawa                                   Makoto Hosaka  
Mode                         Tx,    2402 MHz  
                                  Tx, Bluetooth, BDR, PRBS9

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	47.985	QP	35.5	11.9	7.3	31.8	22.9	40.0	17.1	300	125	
Hori.	121.373	QP	34.0	13.1	8.0	31.8	23.3	43.5	20.2	265	312	
Hori.	216.002	QP	35.5	16.6	9.4	31.7	29.8	46.0	16.2	150	88	
Hori.	462.005	QP	45.4	17.0	8.1	31.8	38.7	46.0	7.3	100	88	
Hori.	2390.000	PK	47.8	28.2	13.9	40.7	49.2	73.9	24.7	100	172	
Hori.	2400.000	PK	50.7	28.2	13.9	40.7	52.1	73.9	21.8	100	172	
Hori.	4804.000	PK	49.1	31.2	6.4	41.6	45.1	73.9	28.8	100	94	
Hori.	7206.000	PK	48.5	36.1	7.7	41.2	51.1	73.9	22.8	100	0	
Hori.	9608.000	PK	46.8	38.6	8.8	40.4	53.8	73.9	20.1	100	0	
Hori.	12010.000	PK	46.5	39.5	10.1	39.4	56.7	73.9	17.2	100	0	
Hori.	2390.000	AV	34.3	28.2	13.9	40.7	35.7	53.9	18.2	100	172	AV: VBW10Hz
Hori.	2400.000	AV	34.8	28.2	13.9	40.7	36.2	53.9	17.7	100	172	AV: VBW10Hz
Hori.	4804.000	AV	38.9	31.2	6.4	41.6	34.9	53.9	19.0	100	94	AV: VBW10Hz
Hori.	7206.000	AV	35.1	36.1	7.7	41.2	37.7	53.9	16.2	100	0	AV: VBW10Hz
Hori.	9608.000	AV	33.8	38.6	8.8	40.4	40.8	53.9	13.1	100	0	AV: VBW10Hz
Hori.	12010.000	AV	33.1	39.5	10.1	39.4	43.3	53.9	10.6	100	0	AV: VBW10Hz
Vert.	36.696	QP	35.0	16.2	6.9	31.8	26.3	40.0	13.7	100	75	
Vert.	39.514	QP	40.0	15.0	7.0	31.8	30.2	40.0	9.8	100	3	
Vert.	138.301	QP	34.6	14.1	8.4	31.8	25.3	43.5	18.2	100	292	
Vert.	675.002	QP	38.5	19.9	9.1	32.0	35.5	46.0	10.5	120	327	
Vert.	2390.000	PK	48.6	28.2	13.9	40.7	50.0	73.9	23.9	105	282	
Vert.	2400.000	PK	49.5	28.2	13.9	40.7	50.9	73.9	23.0	105	282	
Vert.	4804.000	PK	49.8	31.2	6.4	41.6	45.8	73.9	28.1	100	137	
Vert.	7206.000	PK	48.7	36.1	7.7	41.2	51.3	73.9	22.6	100	0	
Vert.	9608.000	PK	46.2	38.6	8.8	40.4	53.2	73.9	20.7	100	0	
Vert.	12010.000	PK	46.3	39.5	10.1	39.4	56.5	73.9	17.4	100	0	
Vert.	2390.000	AV	34.3	28.2	13.9	40.7	35.7	53.9	18.2	105	282	AV: VBW10Hz
Vert.	2400.000	AV	35.1	28.2	13.9	40.7	36.5	53.9	17.4	105	282	AV: VBW10Hz
Vert.	4804.000	AV	37.0	31.2	6.4	41.6	33.0	53.9	20.9	100	137	AV: VBW10Hz
Vert.	7206.000	AV	35.1	36.1	7.7	41.2	37.7	53.9	16.2	100	0	AV: VBW10Hz
Vert.	9608.000	AV	33.6	38.6	8.8	40.4	40.6	53.9	13.3	100	0	AV: VBW10Hz
Vert.	12010.000	AV	33.2	39.5	10.1	39.4	43.4	53.9	10.5	100	0	AV: VBW10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor :           15GHz -40GHz :                            20log(3.0m/1.0m)= 9.5dB



## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.1 Semi Anechoic Chamber  
 Date                         June 6, 2012   June 7, 2012  
 Temperature / Humidity   20 deg.C , 46 %RH                                 24 deg.C , 48 %RH  
 Engineer                    Hikaru Shirasawa                                    Makoto Hosaka  
 Mode                         Tx,   2480 MHz  
                                   Tx, Bluetooth, BDR, PRBS9

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	124.198	QP	33.7	13.2	8.1	31.8	23.2	43.5	20.3	250	311	
Hori.	216.001	QP	34.8	16.6	9.4	31.7	29.1	46.0	16.9	150	88	
Hori.	462.001	QP	44.6	17.0	8.1	31.8	37.9	46.0	8.1	100	87	
Hori.	2483.500	PK	47.9	28.7	14.0	40.7	49.9	73.9	24.0	145	93	
Hori.	4960.000	PK	51.5	31.6	6.5	41.4	48.2	73.9	25.7	100	170	
Hori.	7440.000	PK	49.5	36.3	8.2	41.3	52.7	73.9	21.2	100	0	
Hori.	9920.000	PK	48.8	38.9	9.0	40.3	56.4	73.9	17.5	100	0	
Hori.	12400.000	PK	47.2	39.7	10.3	39.0	58.2	73.9	15.7	100	0	
Hori.	2483.500	AV	37.3	28.7	14.0	40.7	39.3	53.9	14.6	145	93	AV: VBW10Hz
Hori.	4960.000	AV	37.8	31.6	6.5	41.4	34.5	53.9	19.4	100	170	AV: VBW10Hz
Hori.	7440.000	AV	36.4	36.3	8.2	41.3	39.6	53.9	14.3	100	0	AV: VBW10Hz
Hori.	9920.000	AV	35.7	38.9	9.0	40.3	43.3	53.9	10.6	100	0	AV: VBW10Hz
Hori.	12400.000	AV	34.4	39.7	10.3	39.0	45.4	53.9	8.5	100	0	AV: VBW10Hz
Vert.	36.689	QP	33.0	16.1	7.0	31.8	24.3	40.0	15.7	100	354	
Vert.	39.515	QP	39.0	15.0	7.0	31.8	29.2	40.0	10.8	100	354	
Vert.	138.303	QP	34.4	14.1	8.4	31.8	25.1	43.5	18.4	100	278	
Vert.	675.000	QP	38.8	19.9	9.1	32.0	35.8	46.0	10.2	121	325	
Vert.	2483.500	PK	49.8	28.7	14.0	40.7	51.8	73.9	22.1	103	291	
Vert.	4960.000	PK	52.0	31.6	6.5	41.4	48.7	73.9	25.2	100	62	
Vert.	7440.000	PK	50.4	36.3	8.2	41.3	53.6	73.9	20.3	100	0	
Vert.	9920.000	PK	49.4	38.9	9.0	40.3	57.0	73.9	16.9	100	0	
Vert.	12400.000	PK	47.1	39.7	10.3	39.0	58.1	73.9	15.8	100	0	
Vert.	2483.500	AV	37.6	28.7	14.0	40.7	39.6	53.9	14.3	103	291	AV: VBW10Hz
Vert.	4960.000	AV	38.0	31.6	6.5	41.4	34.7	53.9	19.2	100	62	AV: VBW10Hz
Vert.	7440.000	AV	36.6	36.3	8.2	41.3	39.8	53.9	14.1	100	0	AV: VBW10Hz
Vert.	9920.000	AV	35.6	38.9	9.0	40.3	43.2	53.9	10.7	100	0	AV: VBW10Hz
Vert.	12400.000	AV	34.2	39.7	10.3	39.0	45.2	53.9	8.7	100	0	AV: VBW10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor :           15GHz -40GHz :                                 20log(3.0m/1.0m)= 9.5dB

## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.1 Semi Anechoic Chamber  
 Date                         June 6, 2012   June 7, 2012  
 Temperature / Humidity   20 deg.C , 46 %RH                                 24 deg.C , 48 %RH  
 Engineer                   Hikaru Shirasawa                                     Makoto Hosaka  
 Mode                        Tx,   2402 MHz  
                                   Tx, Bluetooth, EDR, PRBS9

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	215.999	QP	33.8	16.6	9.4	31.7	28.1	43.5	15.4	200	87	
Hori.	462.009	QP	44.9	17.0	8.1	31.8	38.2	46.0	7.8	100	100	
Hori.	2390.000	PK	47.4	28.2	13.9	40.7	48.8	73.9	25.1	100	172	
Hori.	2400.000	PK	52.8	28.2	13.9	40.7	54.2	73.9	19.7	100	172	
Hori.	4804.000	PK	50.1	31.2	6.4	41.6	46.1	73.9	27.8	100	192	
Hori.	7206.000	PK	48.4	36.1	7.7	41.2	51.0	73.9	22.9	100	0	
Hori.	9608.000	PK	46.6	38.6	8.8	40.4	53.6	73.9	20.3	100	0	
Hori.	12010.000	PK	46.4	39.5	10.1	39.4	56.6	73.9	17.3	100	0	
Hori.	2390.000	AV	34.3	28.2	13.9	40.7	35.7	53.9	18.2	100	172	AV: VBW10Hz
Hori.	2400.000	AV	37.8	28.2	13.9	40.7	39.2	53.9	14.7	100	172	AV: VBW10Hz
Hori.	4804.000	AV	37.0	31.2	6.4	41.6	33.0	53.9	20.9	100	192	AV: VBW10Hz
Hori.	7206.000	AV	34.9	36.1	7.7	41.2	37.5	53.9	16.4	100	0	AV: VBW10Hz
Hori.	9608.000	AV	33.5	38.6	8.8	40.4	40.5	53.9	13.4	100	0	AV: VBW10Hz
Hori.	12010.000	AV	33.0	39.5	10.1	39.4	43.2	53.9	10.7	100	0	AV: VBW10Hz
Vert.	36.696	QP	35.3	16.1	7.0	31.8	26.6	40.0	13.4	100	239	
Vert.	39.513	QP	40.3	15.0	7.0	31.8	30.5	40.0	9.5	100	237	
Vert.	104.434	QP	38.2	10.8	8.0	31.8	25.2	43.5	18.3	100	294	
Vert.	138.299	QP	34.9	14.1	8.4	31.8	25.6	43.5	17.9	100	303	
Vert.	675.002	QP	38.4	19.9	9.1	32.0	35.4	46.0	10.6	120	327	
Vert.	2390.000	PK	46.8	28.2	13.9	40.7	48.2	73.9	25.7	100	346	
Vert.	2400.000	PK	52.4	28.2	13.9	40.7	53.8	73.9	20.1	100	346	
Vert.	4804.000	PK	50.2	31.2	6.4	41.6	46.2	73.9	27.7	100	37	
Vert.	7206.000	PK	48.3	36.1	7.7	41.2	50.9	73.9	23.0	100	0	
Vert.	9608.000	PK	46.3	38.6	8.8	40.4	53.3	73.9	20.6	100	0	
Vert.	12010.000	PK	46.6	39.5	10.1	39.4	56.8	73.9	17.1	100	0	
Vert.	2390.000	AV	34.5	28.2	13.9	40.7	35.9	53.9	18.0	100	346	AV: VBW10Hz
Vert.	2400.000	AV	36.5	28.2	13.9	40.7	37.9	53.9	16.0	100	346	AV: VBW10Hz
Vert.	4804.000	AV	39.7	31.2	6.4	41.6	35.7	53.9	18.2	100	37	AV: VBW10Hz
Vert.	7206.000	AV	35.1	36.1	7.7	41.2	37.7	53.9	16.2	100	0	AV: VBW10Hz
Vert.	9608.000	AV	33.6	38.6	8.8	40.4	40.6	53.9	13.3	100	0	AV: VBW10Hz
Vert.	12010.000	AV	33.4	39.5	10.1	39.4	43.6	53.9	10.3	100	0	AV: VBW10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor :           15GHz -40GHz :                                 20log(3.0m/1.0m)= 9.5dB



## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.1 Semi Anechoic Chamber  
 Date                         June 6, 2012   June 7, 2012  
 Temperature / Humidity   20 deg.C , 46 %RH                                 24 deg.C , 48 %RH  
 Engineer                    Hikaru Shirasawa                                 Makoto Hosaka  
 Mode                         Tx,                         2480 MHz  
                                   Tx, Bluetooth, EDR, PRBS9

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	132.003	QP	36.6	13.7	8.3	31.8	26.8	43.5	16.7	150	182	
Hori.	462.014	QP	45.2	17.0	8.1	31.8	38.5	46.0	7.5	100	65	
Hori.	2483.500	PK	47.7	28.7	14.0	40.7	49.7	73.9	24.2	161	94	
Hori.	4960.000	PK	49.4	31.6	6.5	41.4	46.1	73.9	27.8	100	120	
Hori.	7440.000	PK	48.3	36.3	8.2	41.3	51.5	73.9	22.4	100	0	
Hori.	9920.000	PK	47.9	38.9	9.0	40.3	55.5	73.9	18.4	100	0	
Hori.	12400.000	PK	46.9	39.7	10.3	39.0	57.9	73.9	16.0	100	0	
Hori.	2483.500	AV	36.8	28.7	14.0	40.7	38.8	53.9	15.1	161	94	AV: VBW10Hz
Hori.	4960.000	AV	36.6	31.6	6.5	41.4	33.3	53.9	20.6	100	120	AV: VBW10Hz
Hori.	7440.000	AV	35.7	36.3	8.2	41.3	38.9	53.9	15.0	100	0	AV: VBW10Hz
Hori.	9920.000	AV	34.8	38.9	9.0	40.3	42.4	53.9	11.5	100	0	AV: VBW10Hz
Hori.	12400.000	AV	33.7	39.7	10.3	39.0	44.7	53.9	9.2	100	0	AV: VBW10Hz
Vert.	36.692	QP	34.0	16.1	7.0	31.8	25.3	40.0	14.7	100	192	
Vert.	39.517	QP	38.7	15.0	7.0	31.8	28.9	40.0	11.1	100	8	
Vert.	101.613	QP	42.3	10.4	8.0	31.8	28.9	43.5	14.6	100	300	
Vert.	104.470	QP	42.0	10.8	8.0	31.8	29.0	43.5	14.5	100	175	
Vert.	675.000	QP	38.2	19.9	9.1	32.0	35.2	46.0	10.8	121	321	
Vert.	2483.500	PK	48.4	28.7	14.0	40.7	50.4	73.9	23.5	104	282	
Vert.	4960.000	PK	50.6	31.6	6.5	41.4	47.3	73.9	26.6	100	194	
Vert.	7440.000	PK	48.9	36.3	8.2	41.3	52.1	73.9	21.8	100	0	
Vert.	9920.000	PK	48.6	38.9	9.0	40.3	56.2	73.9	17.7	100	0	
Vert.	12400.000	PK	46.7	39.7	10.3	39.0	57.7	73.9	16.2	100	0	
Vert.	2483.500	AV	36.9	28.7	14.0	40.7	38.9	53.9	15.0	104	282	AV: VBW10Hz
Vert.	4960.000	AV	37.7	31.6	6.5	41.4	34.4	53.9	19.5	100	194	AV: VBW10Hz
Vert.	7440.000	AV	35.8	36.3	8.2	41.3	39.0	53.9	14.9	100	0	AV: VBW10Hz
Vert.	9920.000	AV	34.9	38.9	9.0	40.3	42.5	53.9	11.4	100	0	AV: VBW10Hz
Vert.	12400.000	AV	33.9	39.7	10.3	39.0	44.9	53.9	9.0	100	0	AV: VBW10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

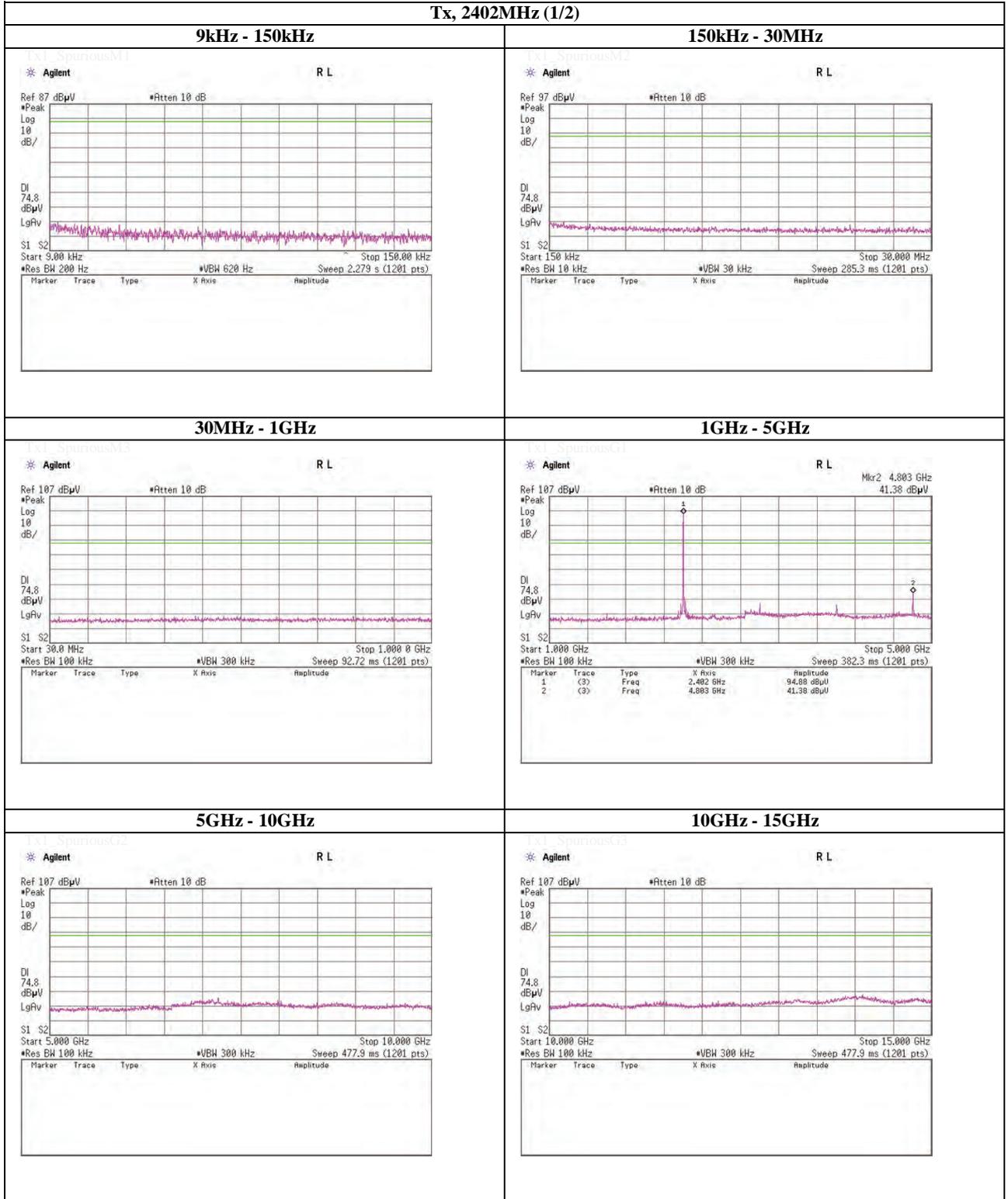
\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor :           15GHz -40GHz :                   20log(3.0m/1.0m)= 9.5dB

### Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2402MHz (1/2)



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### Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2402MHz (2/2)

15GHz - 20GHz	20GHz - 25GHz																				
<div style="text-align: center;">* Agilent R L</div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Marker	Trace	Type	X Axis	Amplitude						<div style="text-align: center;">* Agilent R L</div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Marker	Trace	Type	X Axis	Amplitude					
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<p>Tx1_SpuriousCb</p>																					

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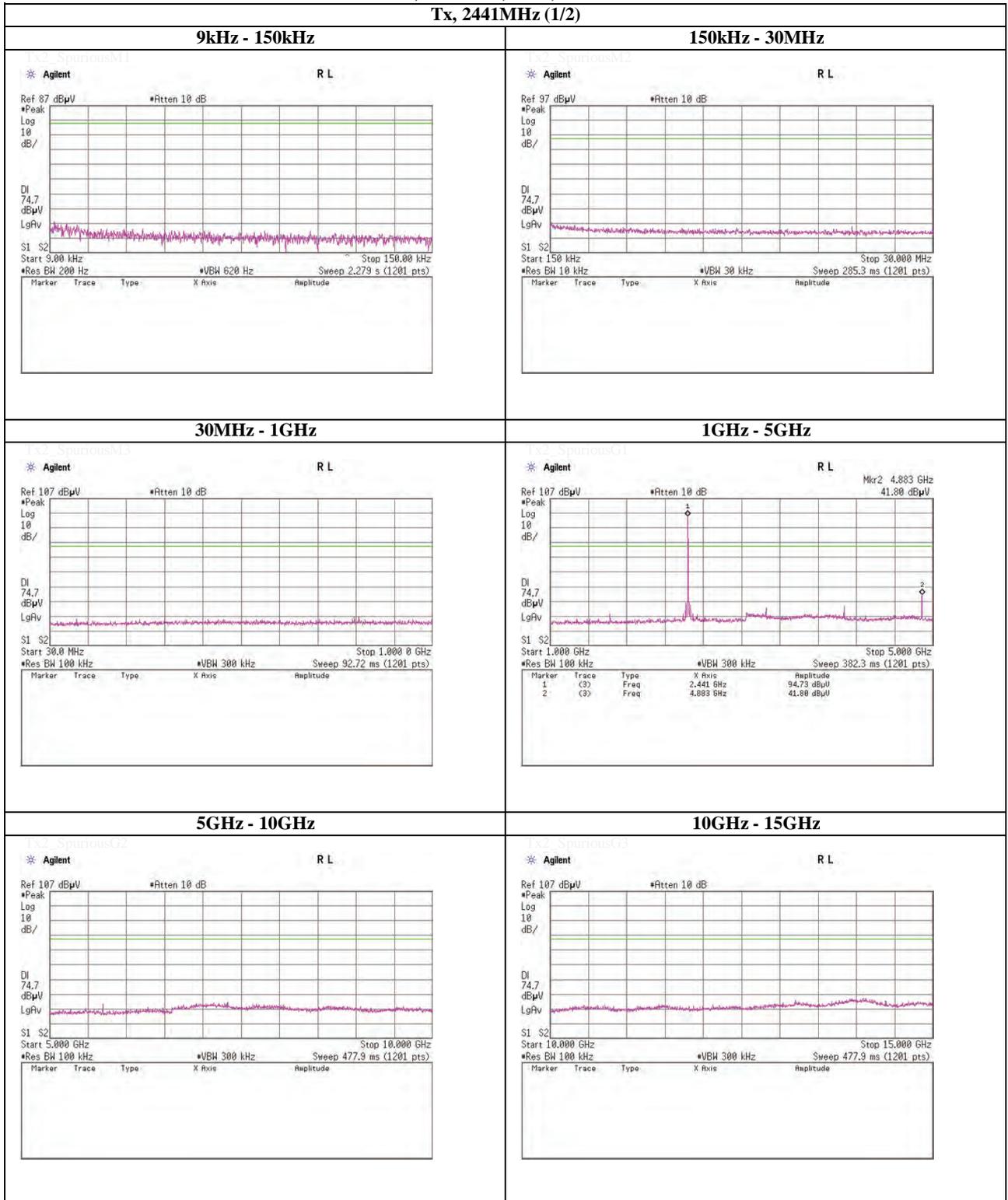
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### Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2441MHz (1/2)



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**Spurious emission (Conducted)**

**Tx, Bluetooth, BDR, PRBS9**

**Tx, 2441MHz (2/2)**

15GHz - 20GHz	20GHz - 25GHz
<p>Some frequencies detected spurious emission by conducted measurement on the antenna terminal, but the spurious emission of the frequencies were not detected by radiated emission measurement. Therefore, it did not display in the table as data. (ex. 1.628GHz, 3.256GHz, 4.070GHz)</p>	
<p>Tx2_SpuriousCh</p>	

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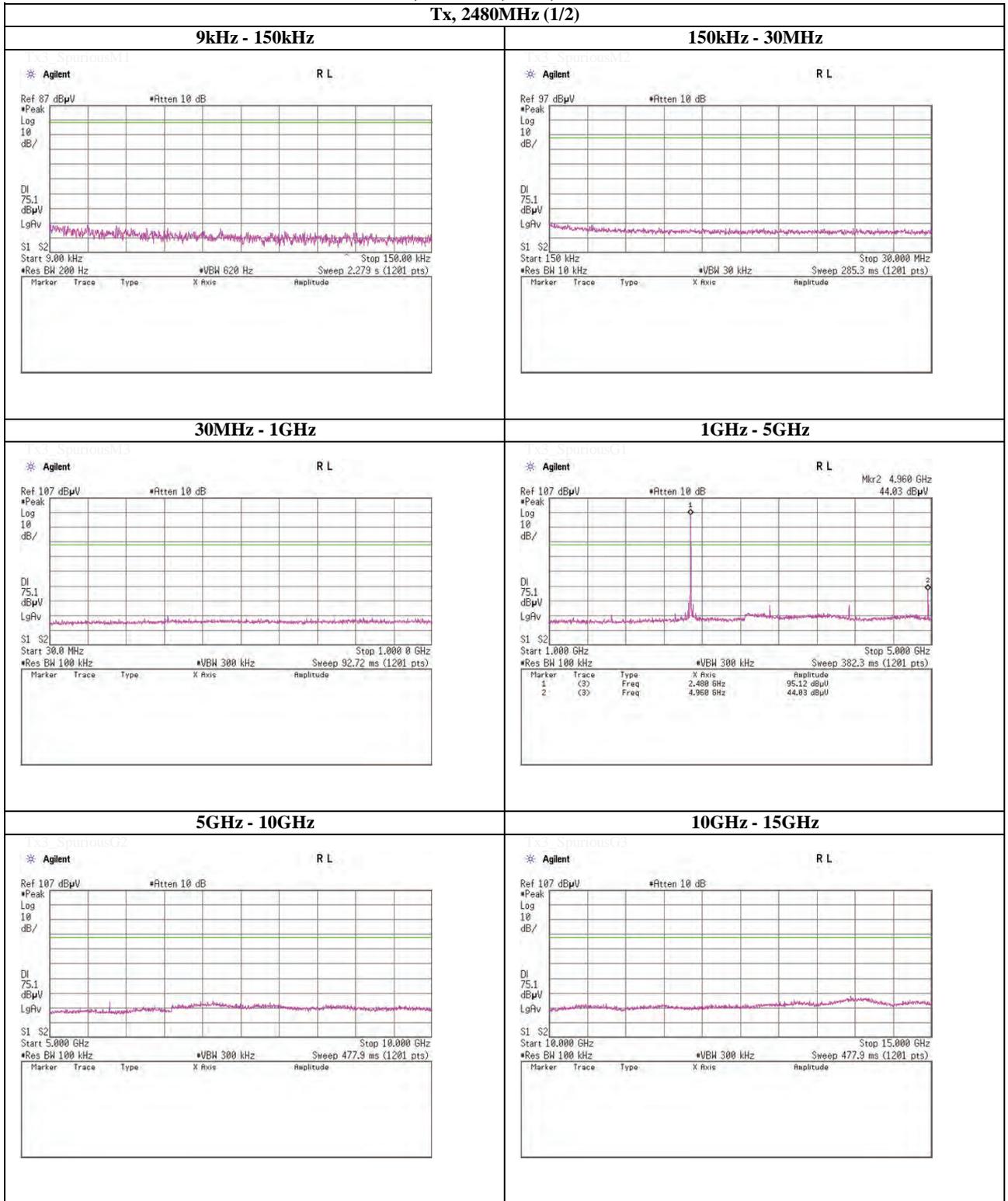
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## Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2480MHz (1/2)



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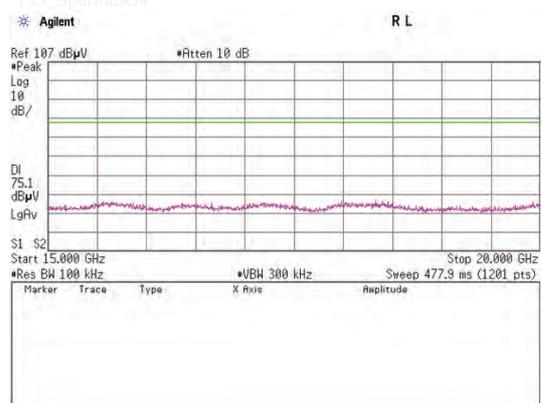
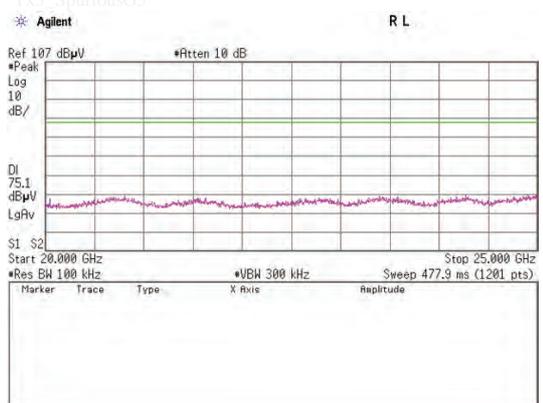
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**Spurious emission (Conducted)**

**Tx, Bluetooth, BDR, PRBS9**

**Tx, 2480MHz (2/2)**

15GHz - 20GHz	20GHz - 25GHz
	
<p>Some frequencies detected spurious emission by conducted measurement on the antenna terminal, but the spurious emission of the frequencies were not detected by radiated emission measurement. Therefore, it did not display in the table as data. (ex. 1.653GHz, 3.307GHz, 4.133GHz)</p>	
<p>Tx3_SpuriousCh</p>	

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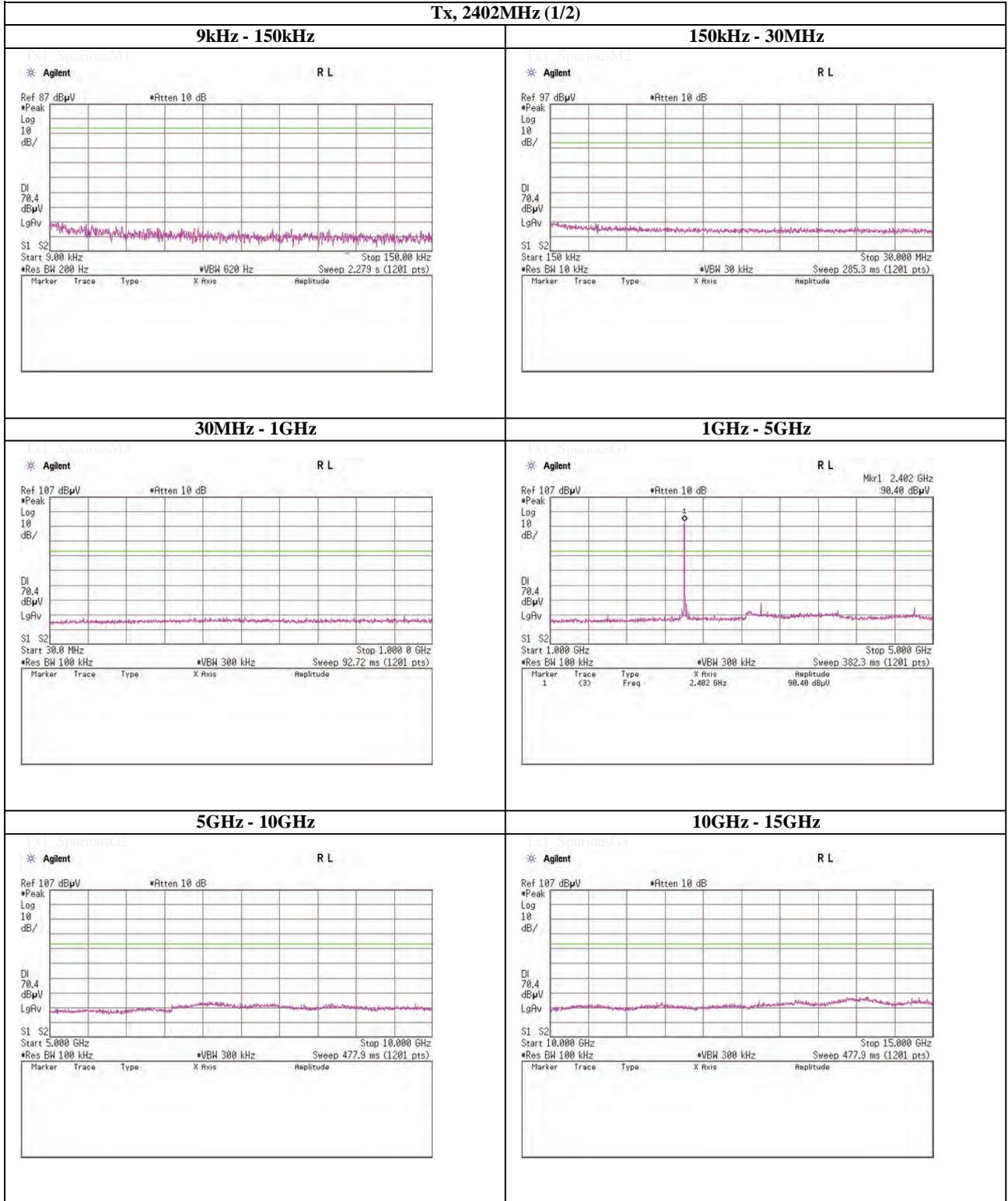
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### Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2402MHz (1/2)



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### Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2402MHz (2/2)

15GHz - 20GHz	20GHz - 25GHz																				
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<p>Tx1_SpuriousCis</p>																					

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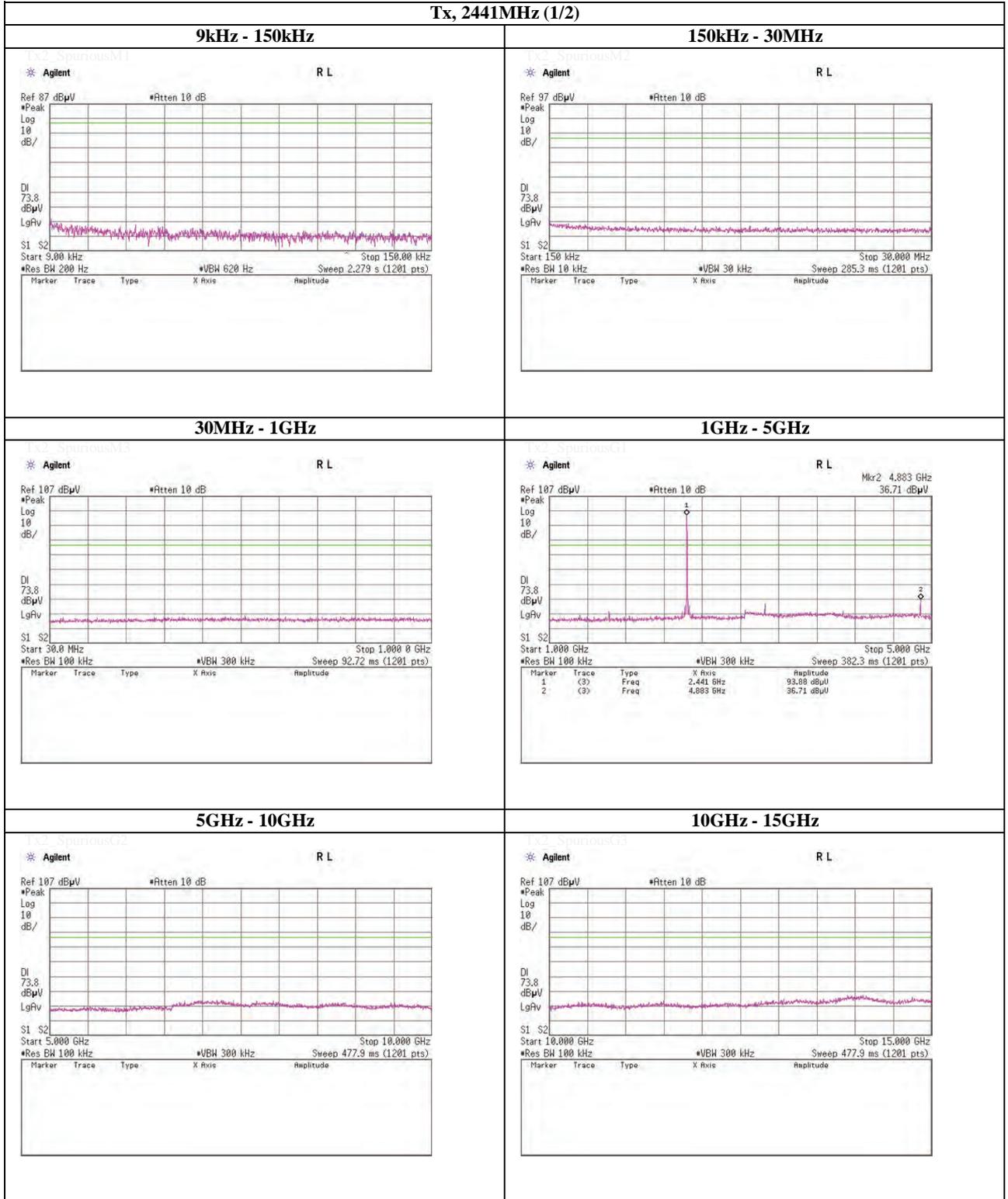
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### Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2441MHz (1/2)



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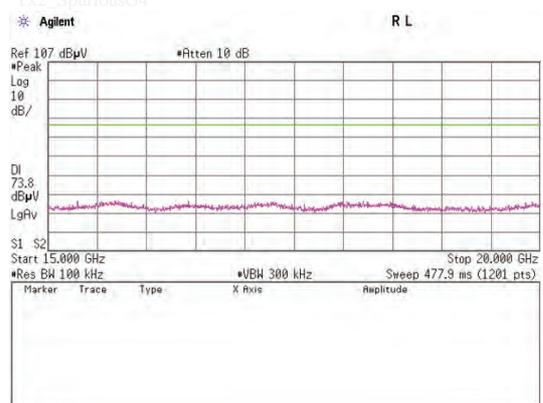
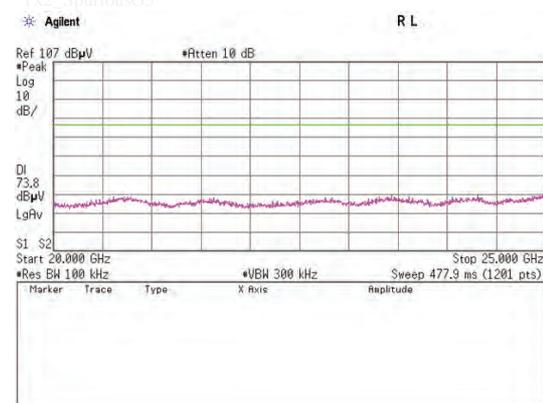
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### Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2441MHz (2/2)

15GHz - 20GHz	20GHz - 25GHz
<div style="text-align: center;">* Agilent R L</div> 	<div style="text-align: center;">* Agilent R L</div> 
<p>Some frequencies detected spurious emission by conducted measurement on the antenna terminal, but the spurious emission of the frequencies were not detected by radiated emission measurement. Therefore, it did not display in the table as data. (ex. 1.628GHz, 3.256GHz, 4.070GHz)</p>	
<div style="text-align: center;">Tx2_SpuriousCb</div>	

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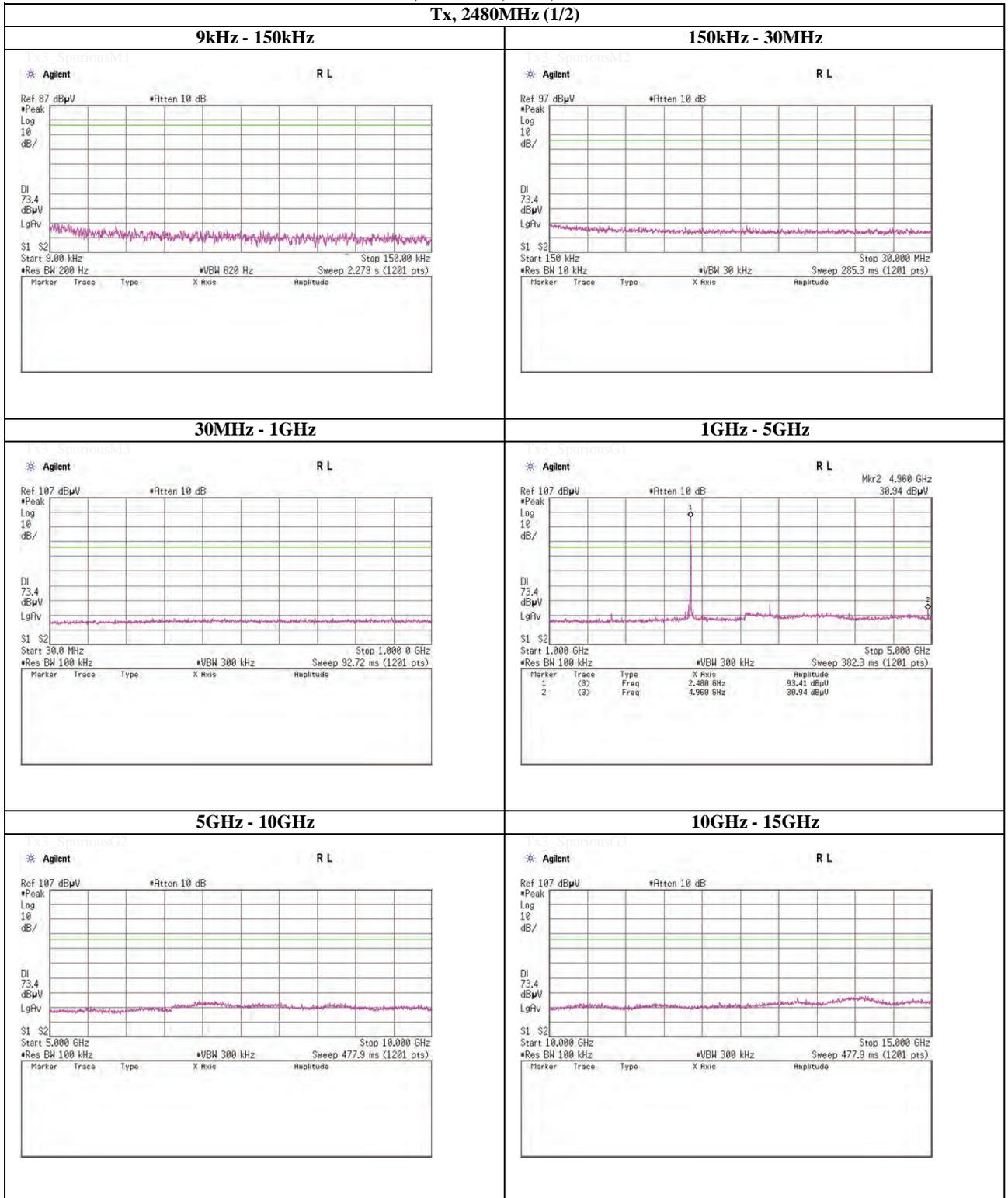
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### Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2480MHz (1/2)



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### Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2480MHz (2/2)

15GHz - 20GHz	20GHz - 25GHz																				
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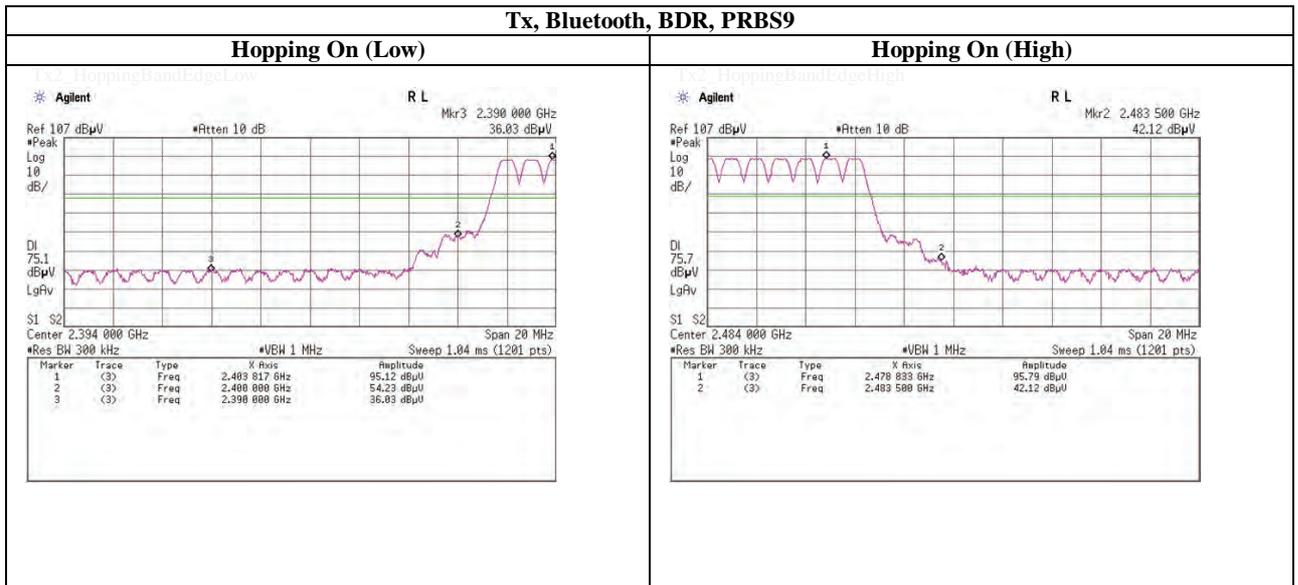
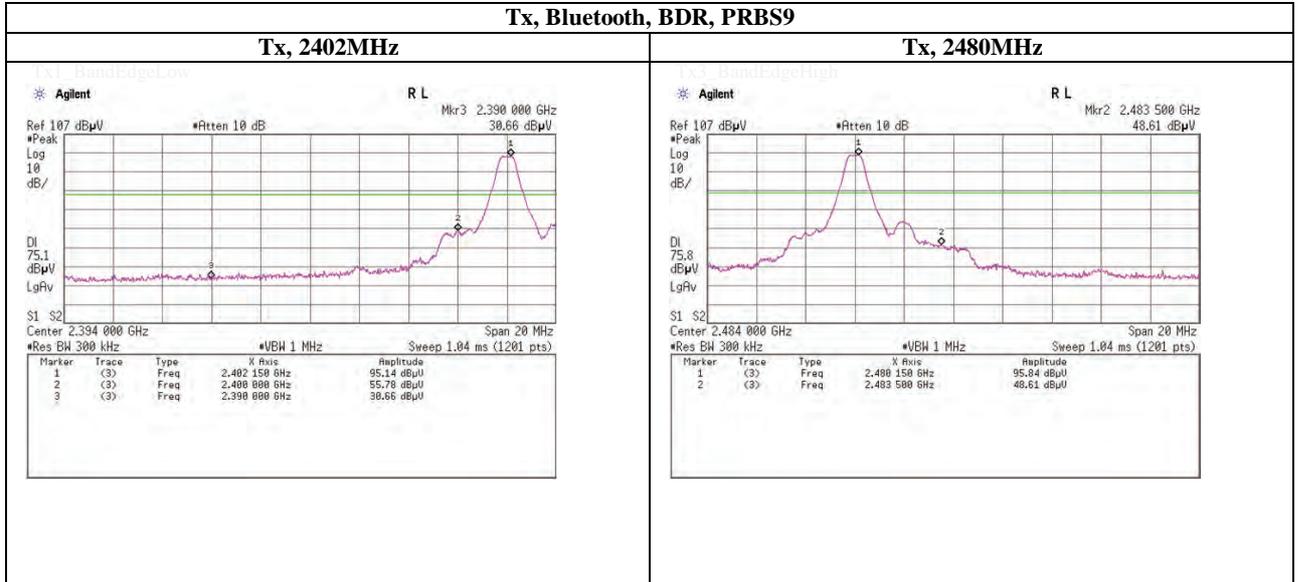
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## Spurious emission (Conducted)

### Band Edge compliance



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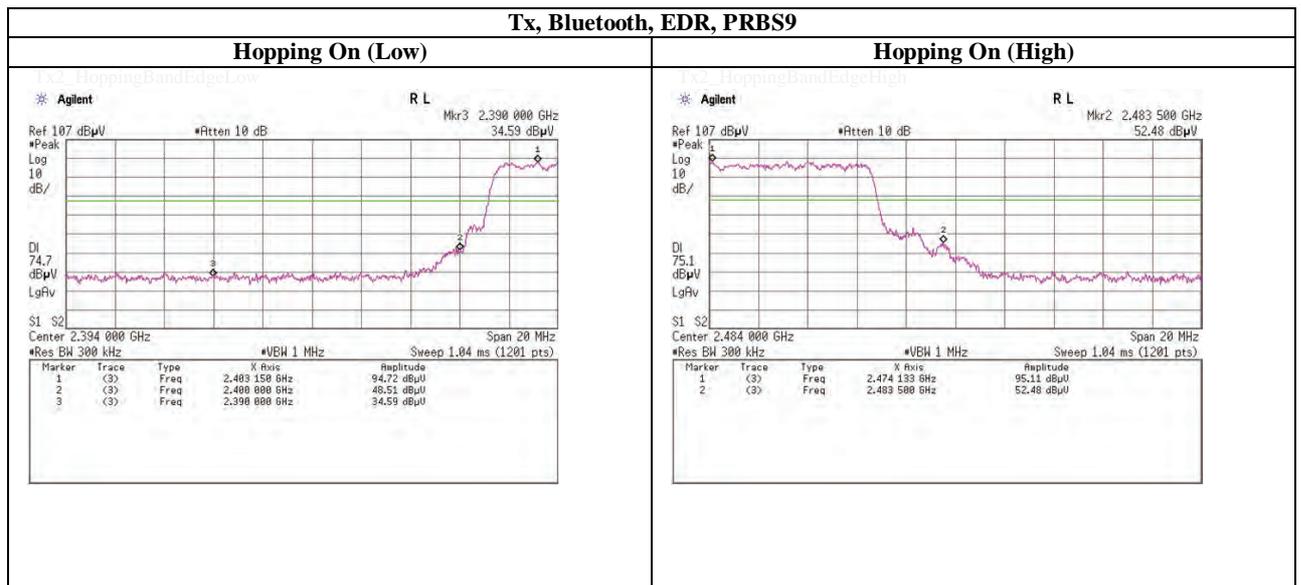
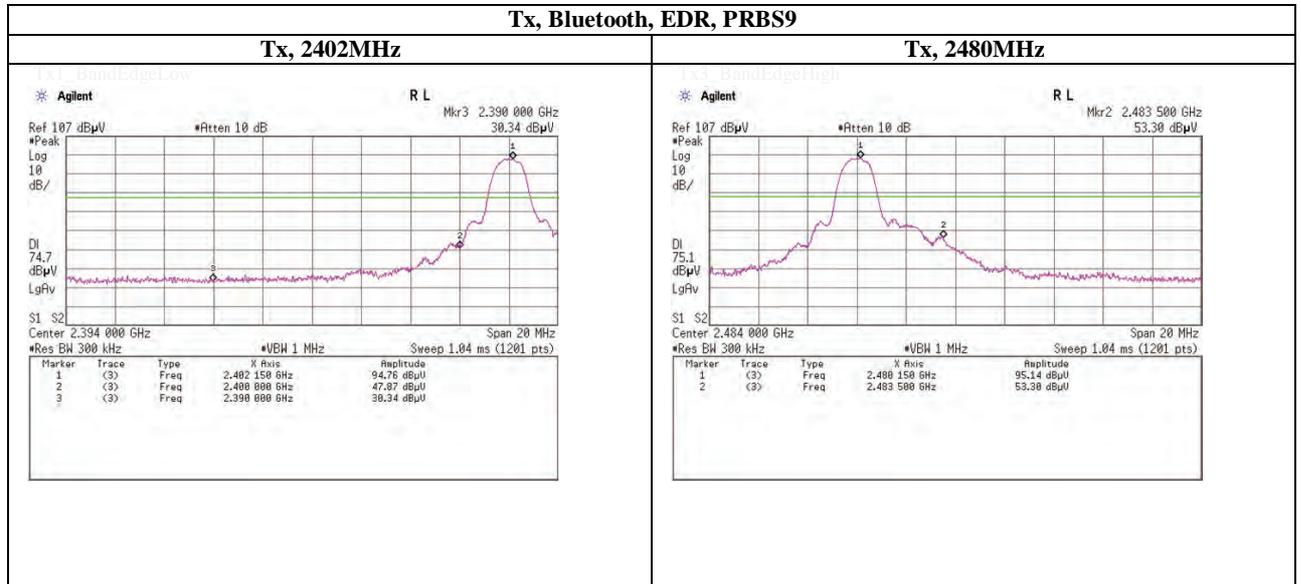
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## Spurious emission (Conducted)

### Band Edge compliance



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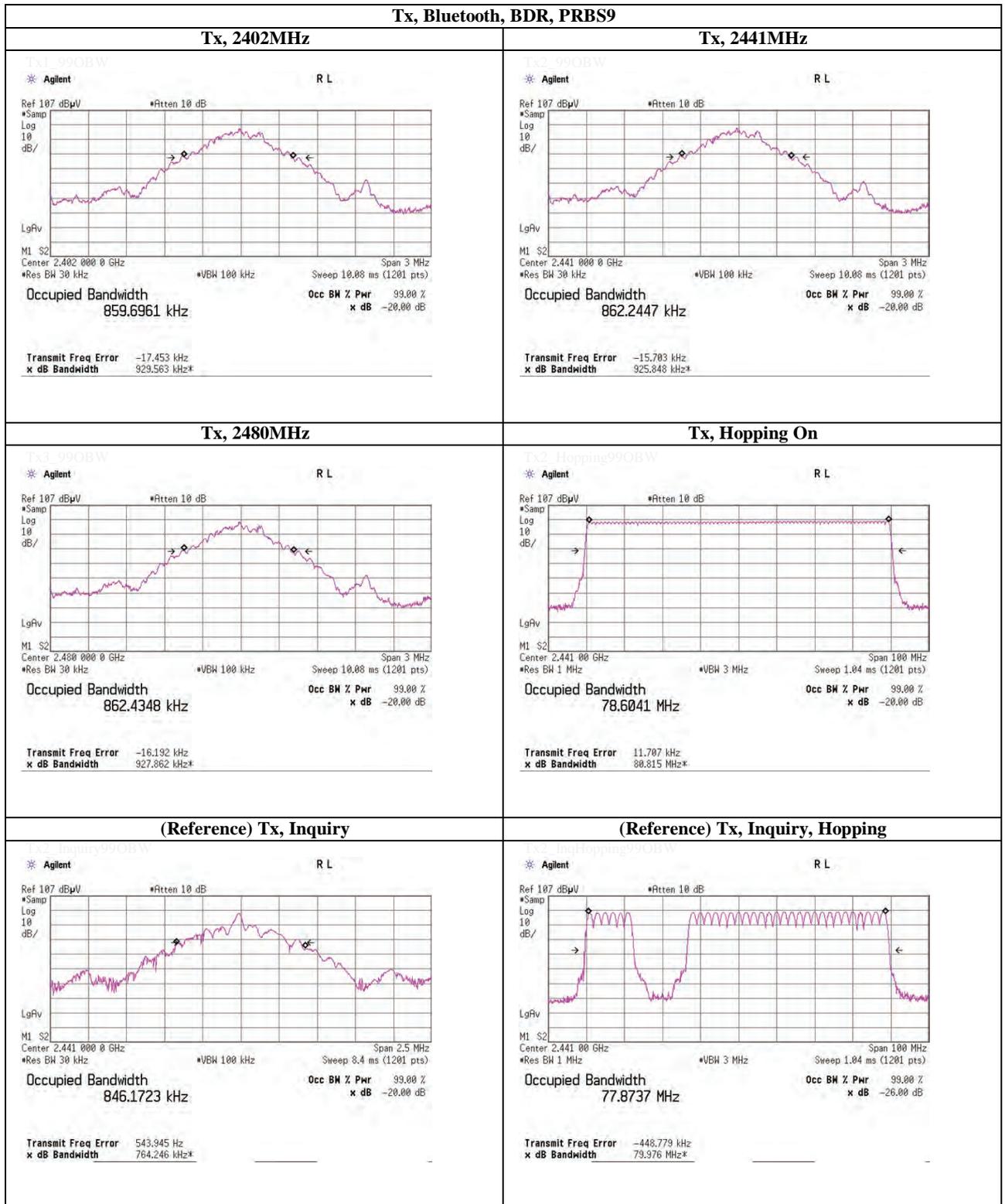
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### 99% Occupied Bandwidth



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### 99% Occupied Bandwidth

Tx, Bluetooth, EDR, PRBS9	
Tx, 2402MHz	Tx, 2441MHz
<p><b>Tx1_990BW</b></p> <p>* Agilent</p> <p style="text-align: right;">R L</p> <p>Ref 107 dBµV *Atten 10 dB</p> <p>*Samp Log 10 dB/ LgAv</p> <p>MI S2 Center 2.402 000 0 GHz *VBW 100 kHz Sweep 10.00 ms (1201 pts) Span 3 MHz</p> <p>*Res BW 30 kHz</p> <p><b>Occupied Bandwidth</b> 1.1707 MHz</p> <p><b>Occ BN % Pwr</b> 99.00 % x dB -20.00 dB</p> <p><b>Transmit Freq Error</b> -8.240 kHz <b>x dB Bandwidth</b> 1.262 MHz*</p>	<p><b>Tx2_990BW</b></p> <p>* Agilent</p> <p style="text-align: right;">R L</p> <p>Ref 107 dBµV *Atten 10 dB</p> <p>*Samp Log 10 dB/ LgAv</p> <p>MI S2 Center 2.441 000 0 GHz *VBW 100 kHz Sweep 10.00 ms (1201 pts) Span 3 MHz</p> <p>*Res BW 30 kHz</p> <p><b>Occupied Bandwidth</b> 1.1719 MHz</p> <p><b>Occ BN % Pwr</b> 99.00 % x dB -20.00 dB</p> <p><b>Transmit Freq Error</b> -9.538 kHz <b>x dB Bandwidth</b> 1.253 MHz*</p>
<p><b>Tx3_990BW</b></p> <p>* Agilent</p> <p style="text-align: right;">R L</p> <p>Ref 107 dBµV *Atten 10 dB</p> <p>*Samp Log 10 dB/ LgAv</p> <p>MI S2 Center 2.480 000 0 GHz *VBW 100 kHz Sweep 10.00 ms (1201 pts) Span 3 MHz</p> <p>*Res BW 30 kHz</p> <p><b>Occupied Bandwidth</b> 1.1671 MHz</p> <p><b>Occ BN % Pwr</b> 99.00 % x dB -20.00 dB</p> <p><b>Transmit Freq Error</b> -10.036 kHz <b>x dB Bandwidth</b> 1.255 MHz*</p>	<p><b>Tx2_Hopping990BW</b></p> <p>* Agilent</p> <p style="text-align: right;">R L</p> <p>Ref 107 dBµV *Atten 10 dB</p> <p>*Samp Log 10 dB/ LgAv</p> <p>MI S2 Center 2.441 000 GHz *VBW 3 MHz Sweep 1.04 ms (1201 pts) Span 100 MHz</p> <p>*Res BW 1 MHz</p> <p><b>Occupied Bandwidth</b> 78.6755 MHz</p> <p><b>Occ BN % Pwr</b> 99.00 % x dB -20.00 dB</p> <p><b>Transmit Freq Error</b> -7.934 kHz <b>x dB Bandwidth</b> 81.049 MHz*</p>
<p><b>Tx2_Inquiry990BW</b></p>	<p><b>Tx2_InqHopping990BW</b></p>

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**APPENDIX 2**  
**Test Instruments**

**EMI test equipment**

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2011/12/05 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2011/11/09 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2012/03/12 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2012/04/19 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2012/04/19 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2012/03/26 * 12
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	2012/02/10 * 12
SAT6-05	Attenuator	JFW	50HF-006N	-	RE	2012/02/10 * 12
SAT3-04	Attenuator	JFW	50HF-003N	-	RE	2012/02/10 * 12
SBA-01	Biconical Antenna	Schwarzbeck	BBA9106	91032664	RE	2011/10/15 * 12
SCC-A1/A3/A5/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2012/04/10 * 12
SCC-A2/A4/A6/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2012/04/10 * 12
SLA-01	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0888	RE	2011/11/23 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2012/02/06 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2011/10/22 * 12
SJM-11	Measure	PROMART	SEN1935	-	RE	-
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2011/09/01 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RF,LMF)	-	RE	-
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2012/03/12 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2012/04/10 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2012/05/22 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2011/08/11 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2012/03/30 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2012/03/12 * 12
SCC-G16	Coaxial Cable	Suhner	SUCOFLEX 102	32704/2	RE	2012/03/12 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2011/12/27 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2011/12/27 * 12

The expiration date of the calibration is the end of the expired month .  
As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .

All equipment is calibrated with valid calibrations . Each measurement data is traceable to the national or international standards .

Test Item :

- RE: Radiated emission ,
- AT: Antenna terminal conducted