



RADIO TEST REPORT

Test Report No.: 10154075S-G

Applicant : Sony Corporation
Type of Equipment : Smartphone Cradle Receiver
Model No. : XSP-N1BT
FCC ID : AK8XSPN1BT
Test regulation : FCC Part15 Subpart C: 2013
Test result : Complied

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Date of test: January 6 to 14, 2014

Representative test engineer: 

Akio Hayashi
Engineer of WiSE Japan,
UL Verification Service

Approved by : 

Toyokazu Imamura
Leader of WiSE Japan,
UL Verification Service



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13-EM-F0429

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SECTION 1: Customer information

Company Name : Sony Corporation
Address : Sony City Osaki, 2-10-1 Osaki, Shinagawa-ku, Tokyo 141-8610 Japan
Telephone Number : +81 50 3750 7634
Facsimile Number : +81 50 3750 6574
Contact Person : Toshihiro Maeda

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

2.1 Identification of E.U.T.

Type of Equipment : Smartphone Cradle Receiver
Model Number : XSP-N1BT
Serial Number : Refer to 4.2 of this report.
Rating : DC12V (car battery)
Country of Mass-production : Thailand
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample : December 25, 2013
Modification of EUT : No modification by the test lab.

2.2 Product description

Model: XSP-N1BT (referred to as the EUT in this report) is a Smartphone Cradle Receiver.

Clock frequency(ies) in the system : 48.000MHz, 36.480MHz, 26.000MHz, 16.9344MHz, 13.333MHz,
32.768kHz

Bluetooth specification:

Equipment type : Transceiver
Frequency of operation : 2402-2480MHz
Bandwidth & channel spacing : 79MHz & 1MHz
Type of modulation : FHSS
Operation temperature range : -20 to +60 deg.C.
Antenna type : Meander Monopole
Antenna connector type : U-FL Type Interchangeability
Antenna gain : 0.929dBi (Peak)
ITU code : F1D, G1D

FCC 15.31 (e)

The equipment provides the wireless transmitter with stable power supply (DC3.3V). Therefore, the equipment complies with the requirement.

FCC 15.203

The equipment and its antenna comply with the requirement since the 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: 2013,
final revised on September 30, 2013 and effective October 30, 2013
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 10154075S-F.

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)	-	-	
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		3.8dB Freq.: 46.254 MHz Polarization: Vertical Detection: Quasi-Peak Mode: Tx 2402MHz, DH5	Complied
Note: UL Japan's Work Procedures No. 13-EM-W0420 and 13-EM-W0422 *1) The test is not applicable since the EUT has no 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 ^{*1} /SR ^{*2} (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.7 dB	3.7 dB	3.6 dB
	30MHz-300MHz	4.8 dB	5.0 dB	4.8 dB
	300MHz-1GHz	5.0 dB	5.0 dB	4.8 dB
	1GHz-15GHz	4.9 dB	4.9 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	15GHz-18GHz	5.7 dB	5.6 dB	5.6 dB
	18GHz-40GHz	5.2 dB	4.3 dB	4.3 dB

*1: SAC=Semi-Anechoic Chamber

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

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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: (±) 1.6dB

Spurious emission (Conducted) measurement (1G-3GHz) uncertainty for this test was: (±) 1.4dB

Spurious emission (Conducted) measurement (3G-18GHz) uncertainty for this test was: (±) 2.8dB

Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.5dB

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

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3.5 Test location

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Telephone number : +81 463 50 6400

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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 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 checked="" 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 semi-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	-
<input checked="" type="checkbox"/> No.1 measurement room	-	-	2.55 x 4.1 x 2.5	-	-

3.6 Test setup, Data of 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

Test item	Operating mode	Tested frequency
Carrier frequency separation	Transmitting Hopping ON (DH5 / 3-DH5) / Inquiry, Payload: PRBS9	-
20dB bandwidth	Transmitting Hopping OFF (DH5 / 3-DH5) / Inquiry, Payload: PRBS9	2402MHz, 2441MHz, 2480MHz
Number of hopping frequency	Transmitting Hopping ON (DH5 / 3-DH5) / Inquiry, Payload: PRBS9	-
Dwell time	Transmitting (Hopping ON), Payload: PRBS9 - DH1, - DH3, - DH5 - 3-DH1, - 3-DH3, - 3-DH5 -Inquiry	-
Maximum peak output power	Transmitting Hopping OFF, Payload: PRBS9 - DH5, - 2-DH5, - 3-DH5	2402MHz, 2441MHz, 2480MHz
Band edge compliance & Spurious emission (Conducted)	Transmitting (DH5 / 3-DH5), Payload: PRBS9 -Hopping ON -Hopping OFF	Band edge compliance: 2402MHz, 2480MHz
(Radiated)	Transmitting (DH5 / 3-DH5), Payload: PRBS9 -Hopping OFF	Spurious emission: 2402MHz, 2441MHz, 2480MHz
99% occupied bandwidth	Transmitting (DH5 / 3-DH5), Payload: PRBS9 / Inquiry -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.
The carrier separation may be less than 20 dB bandwidth, therefore 125mW power limit was applied to it.

Software: Blue Suite ver.2.5.0, BlueTest3 ver.2.5.0.93
BtCli ver.2.5.0.93 (Inquiry mode only)
Power Settings: BDR: Ext PA: 23, Int PA: 39
EDR: Ext PA: 73, Int PA: 48

We removed 2-DH mode (2 Mb/s EDR: pi/4DQPSK) except power measurement by using 3-DH mode (3 Mb/s EDR: 8DPSK) as a representative.

Justification: The system was configured in typical fashion (as customer would normally use it) for testing.

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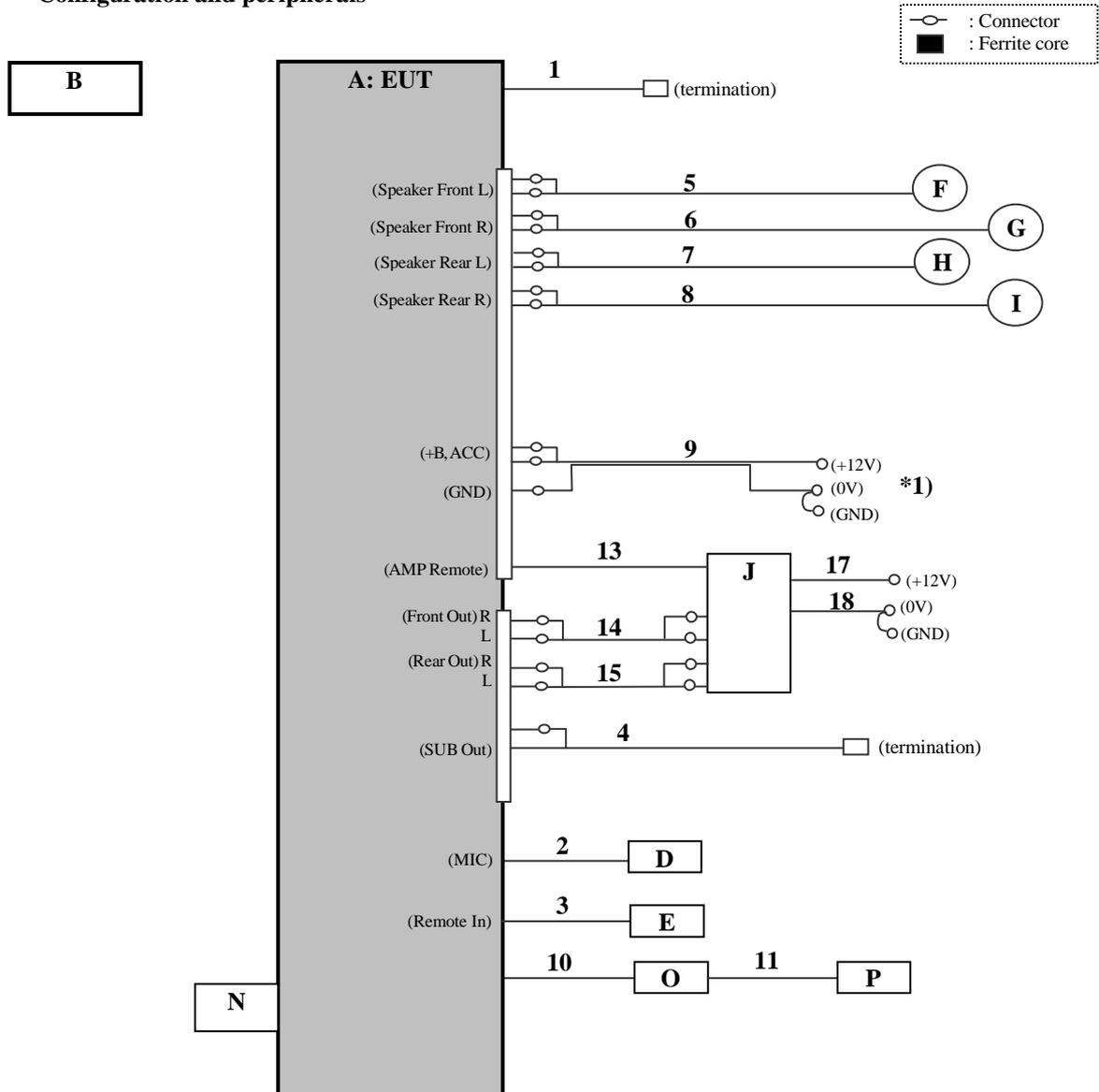
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4.2 Configuration and peripherals



* 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	Smartphone Cradle Receiver	XSP-N1BT	*2)	Sony	EUT
B	Remote Commander	RM-X331	-	Sony	-
D	MIC	-	-	Sony	-
E	Wired Remote Controller	RM-X2S	-	Sony	-
F	Speaker 1	XS-GTF1338	-	Sony	-
G	Speaker 2	XS-GTF1338	-	Sony	-
H	Speaker 3	XS-GTF1338	-	Sony	-
I	Speaker 4	XS-GTF1338	-	Sony	-
J	Stereo Power Amplifier	XM-4S	-	Sony	-
N	USB Memory	USM4GL	-	Sony	-
O	SXM Receiver	SXV100	1113	-	-
P	SXM ANTENNA	XVANT1	1046	-	-

*2) 11: Antenna terminal conducted tests, 10: Radiated emission tests

List of cables used

No.	Name	Length (m)	Shield- Cable	Shield- Connector	Remarks
1	FM antenna	2.0	Shielded	Shielded	-
2	MIC	3.5	Shielded	Shielded	-
3	REMOTE IN	1.9	Shielded	Shielded	-
4	Audio OUT(SUB)	2.0	Shielded	Shielded	-
5	Speaker (1)	0.15+2.0	Unshielded	Unshielded	-
6	Speaker (2)	0.15+2.0	Unshielded	Unshielded	-
7	Speaker (3)	0.15+2.0	Unshielded	Unshielded	-
8	Speaker (4)	0.15+2.0	Unshielded	Unshielded	-
9	DC Power	0.15+2.0	Unshielded	Unshielded	-
10	Sirius XM	0.65	Shielded	Shielded	-
11	Sirius XM Antenna	7.0	Shielded	Shielded	-
13	AMP Remote	0.15+1.4	Unshielded	Unshielded	-
14	RCA (Front Audio Out)	0.1+5.0	Shielded	Shielded	-
15	RCA (Rear Audio Out)	0.1+5.0	Shielded	Shielded	-
17	DC Power (+)	1.3	Unshielded	Unshielded	-
18	DC Power (-)	1.3	Unshielded	Unshielded	-

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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.

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.

SECTION 10: Spurious emissions (Antenna port conducted)

Test procedure

The Out of Band Emissions was 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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SECTION 11: Radiated emission

11.1 Operating environment

Test room : See test data (APPENDIX 1)
Temperature : See test data (APPENDIX 1)
Humidity : See test data (APPENDIX 1)

11.2 Test configuration

EUT was placed on a platform of nominal size, 1.0m by 2.0m (30-1000MHz) or 1.0m by 1.5m (1-25GHz), 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, including its peripherals 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 30cm to 40cm long and were hanged at a 40cm height to the ground plane. Photographs of the set up are shown in APPENDIX 3.

11.3 Test conditions

Frequency range : 30MHz - 25GHz
EUT position : Table top

11.4 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.

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 mounting angle of 0 to +45 deg (lengthwise direction) and -45 to +45 deg (crosswise direction) based on the product specification to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Antenna polarization \ Test item		Carrier	Spurious emission (Below 1GHz)	Spurious emission (1-15GHz)	Spurious emission (Above 15GHz)
Horizontal	Lengthwise	0 deg.	45 deg.	0 deg.	0 deg.
	Crosswise	0 deg.	45 deg.	0 deg.	0 deg.
Vertical	Lengthwise	0 deg.	45 deg.	0 deg.	0 deg.
	Crosswise	0 deg.	45 deg.	0 deg.	0 deg.

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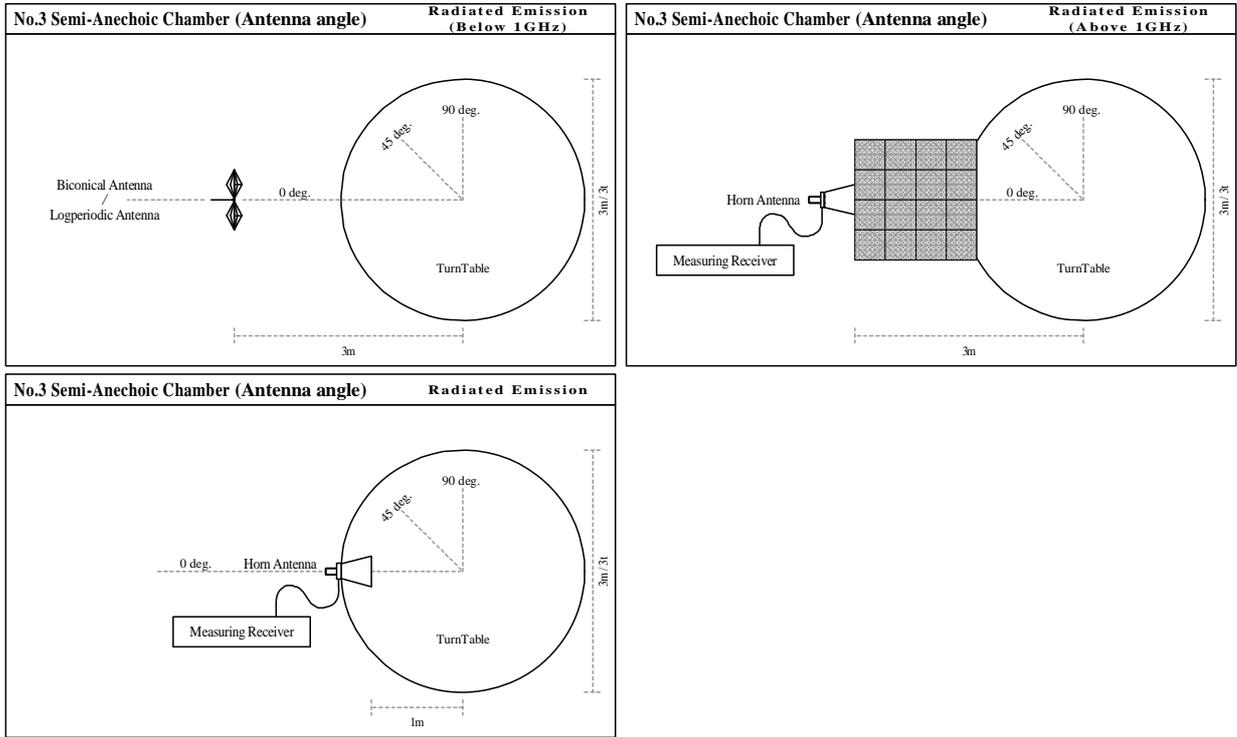
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Figure 1. Antenna angle



11.5 Band edge

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

11.6 Results

Summary of the test results: Pass *No noise was detected above the 4th order harmonics.

Refer to APPENDIX 1.

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Contents of APPENDIXES

APPENDIX 1: Data of Radio tests

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

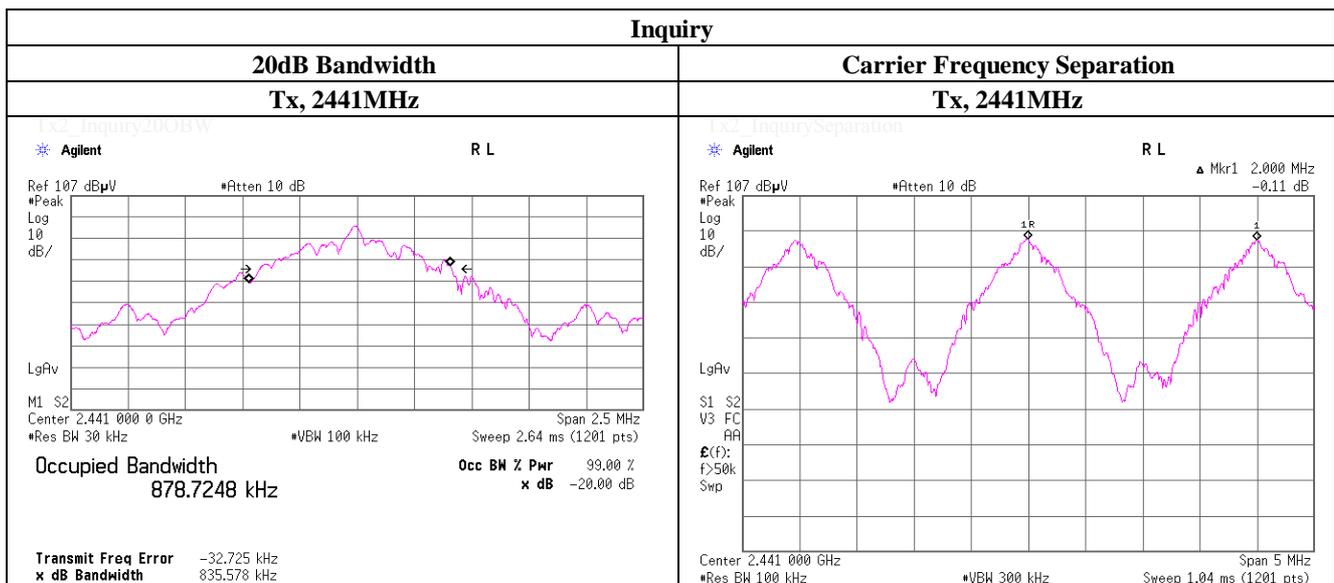
20dB Bandwidth and Carrier Frequency Separation

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 14, 2014	
Temperature / Humidity	23deg.C , 41%RH	
Engineer	Kenichi Adachi	
Mode	Tx, Bluetooth, BDR, PRBS9	

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	0.961	1.000	>= 0.640
DH5	2441.0	1.016	1.000	>= 0.677
DH5	2480.0	1.015	1.000	>= 0.677
Inquiry	2441.0	0.836	2.000	>= 0.557

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

No limit applies to 20dB Bandwidth.



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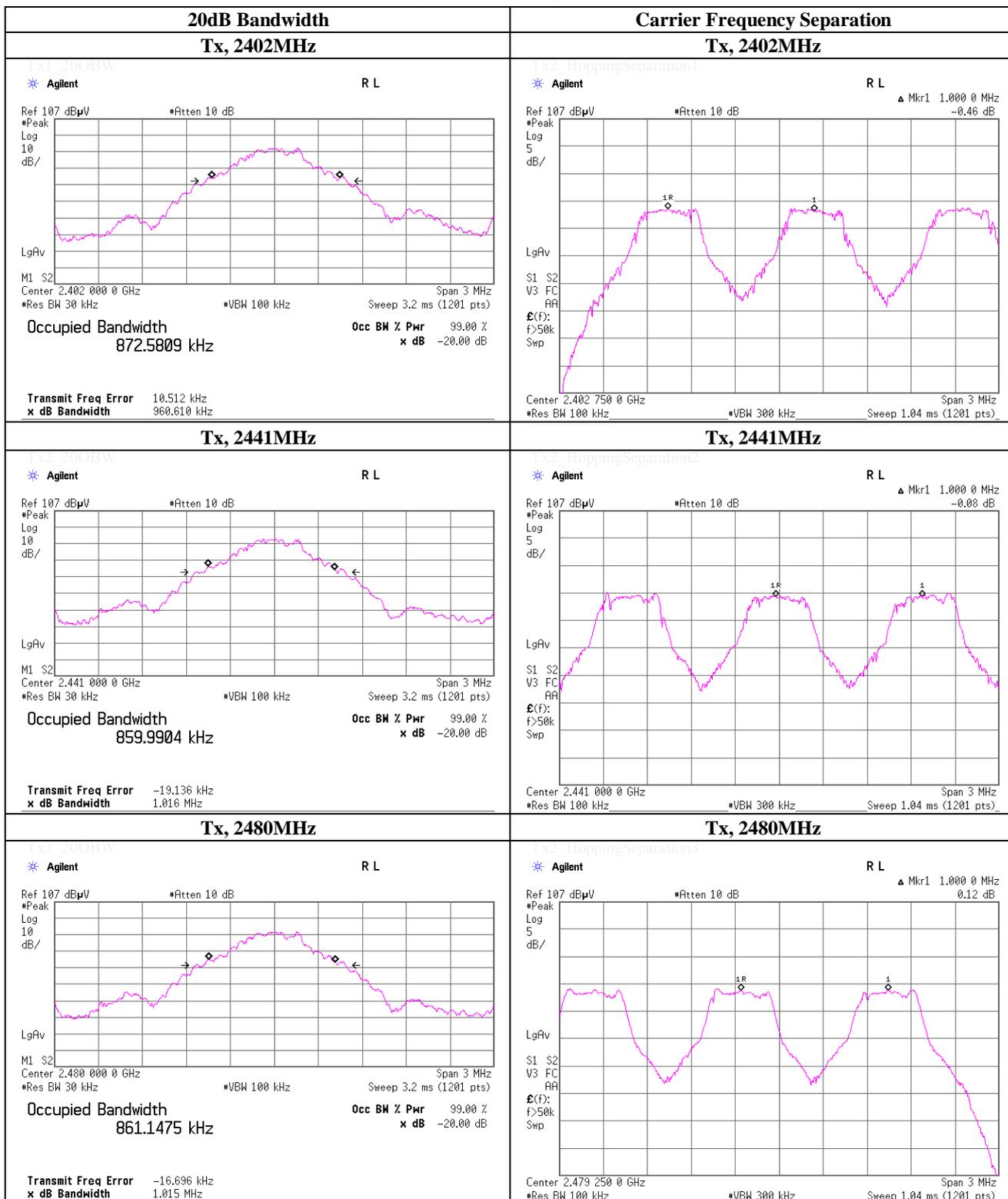
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Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date January 14, 2014
 Temperature / Humidity 23deg.C , 41%RH
 Engineer Kenichi Adachi

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 January 14, 2014
 Temperature / Humidity 23deg.C , 41%RH
 Engineer Kenichi Adachi
 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	1.277	1.008	>= 0.851
3-DH5	2441.0	1.274	1.010	>= 0.849
3-DH5	2480.0	1.298	1.000	>= 0.865

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

No limit applies to 20dB Bandwidth.

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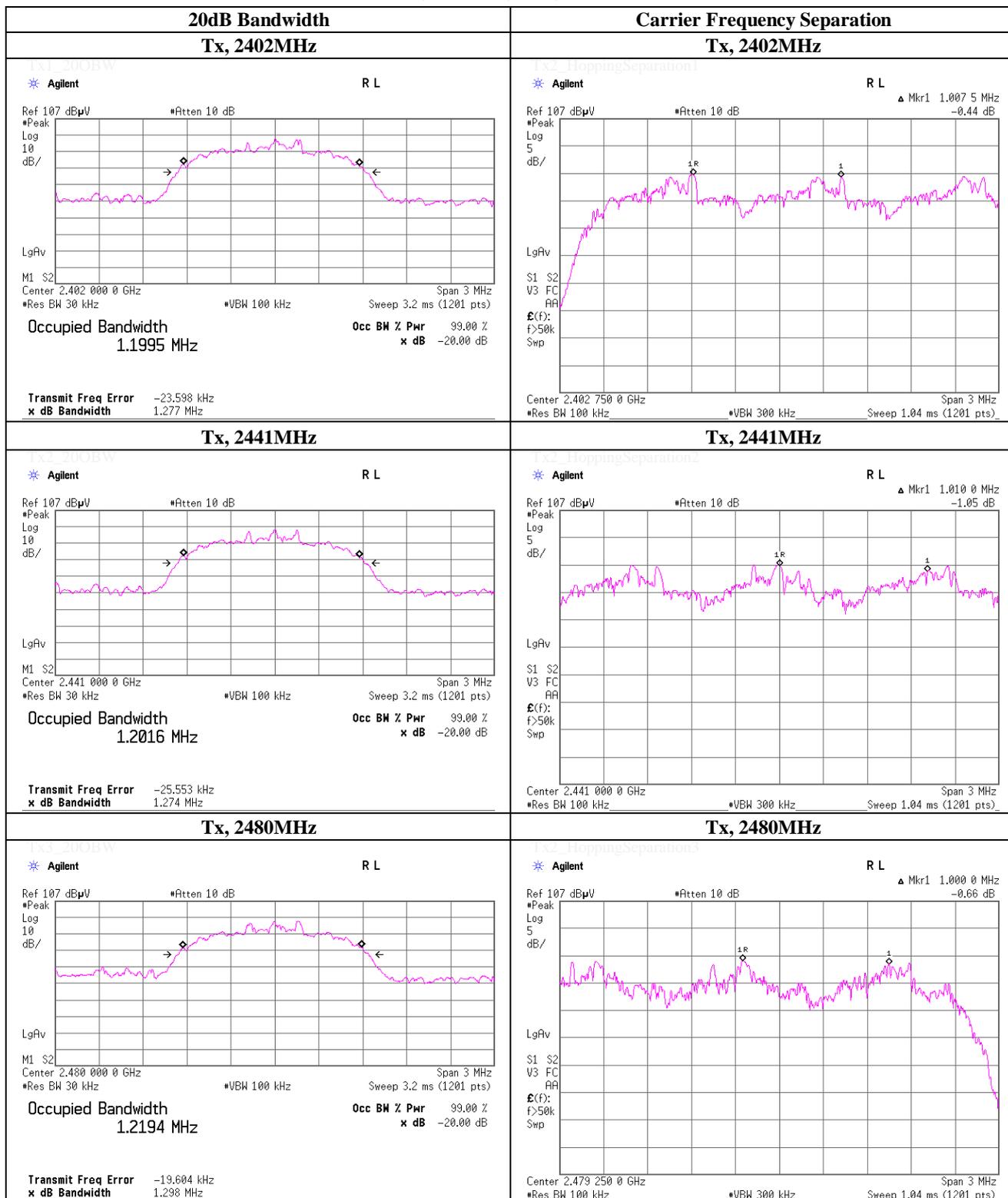
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 Date January 14, 2014
 Temperature / Humidity 23deg.C , 41%RH
 Engineer Kenichi Adachi

20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, EDR, PRBS9



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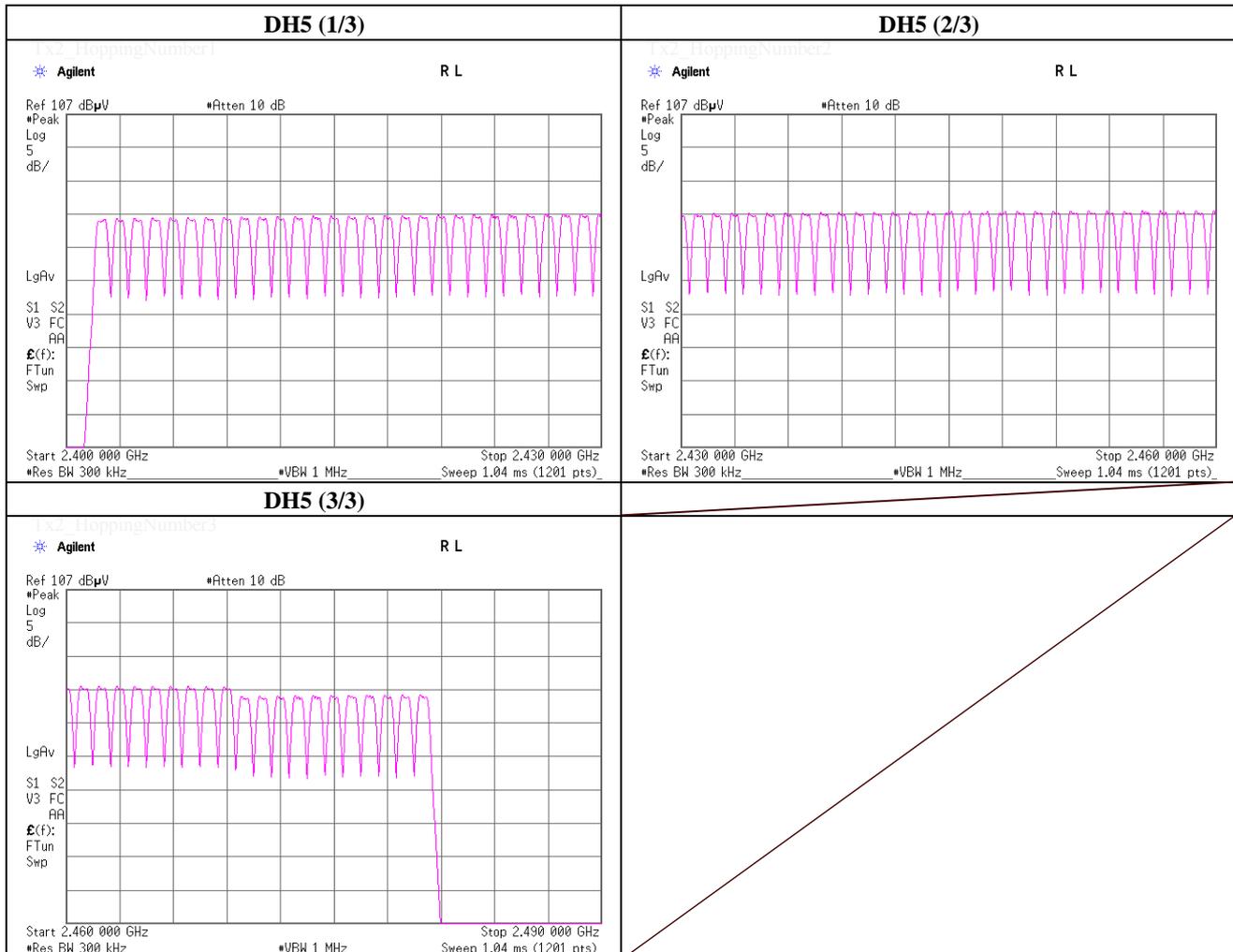
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Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 14, 2014	
Temperature / Humidity	23deg.C , 41%RH	
Engineer	Kenichi Adachi	
Mode	Tx, Bluetooth, BDR, PRBS9	

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

* Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.



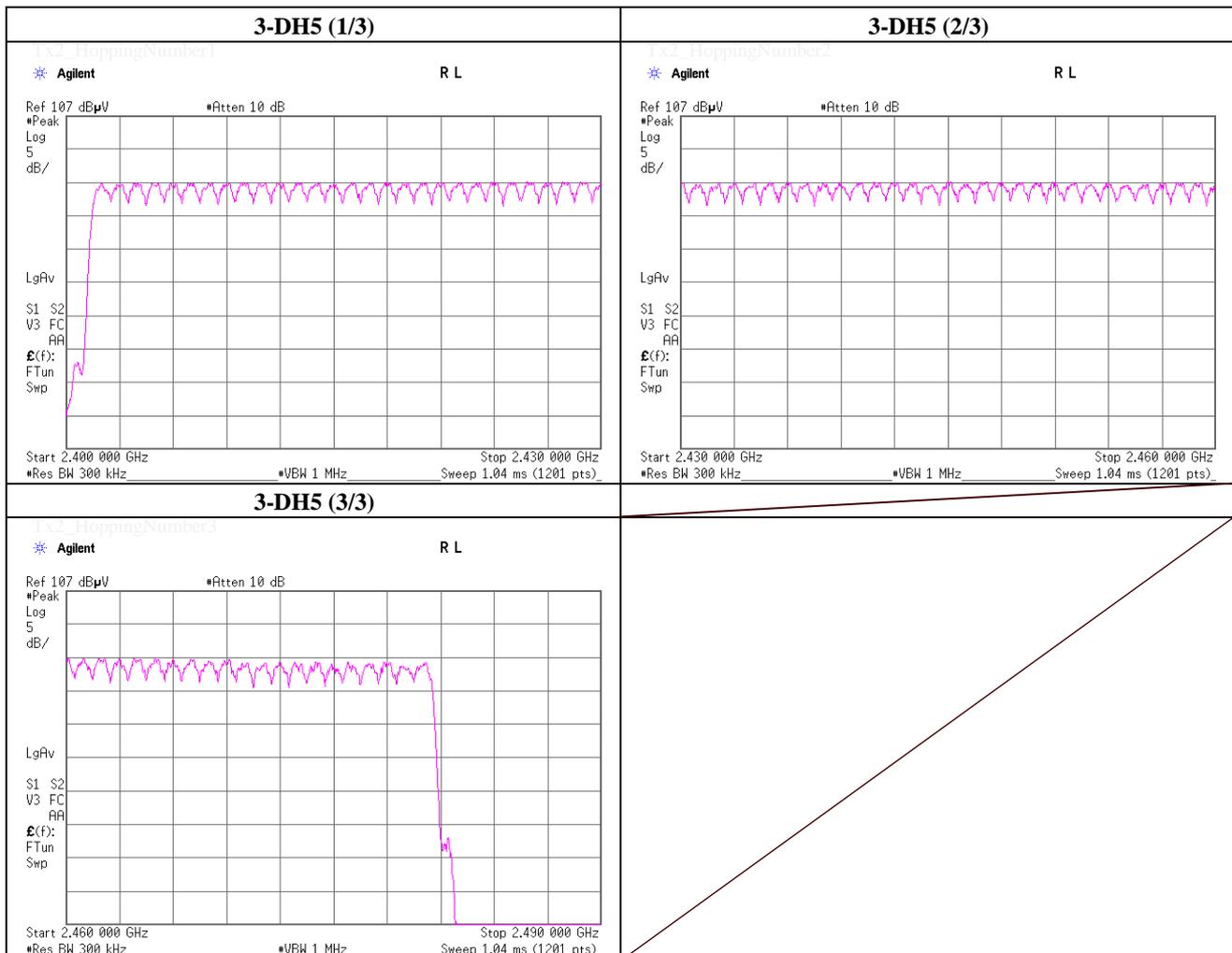
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Shonan EMC Lab.
 1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN
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 Facsimile : +81 463 50 6401

Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 14, 2014	
Temperature / Humidity	23deg.C , 41%RH	
Engineer	Kenichi Adachi	
Mode	Tx, Bluetooth, EDR, PRBS9	

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

* Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.

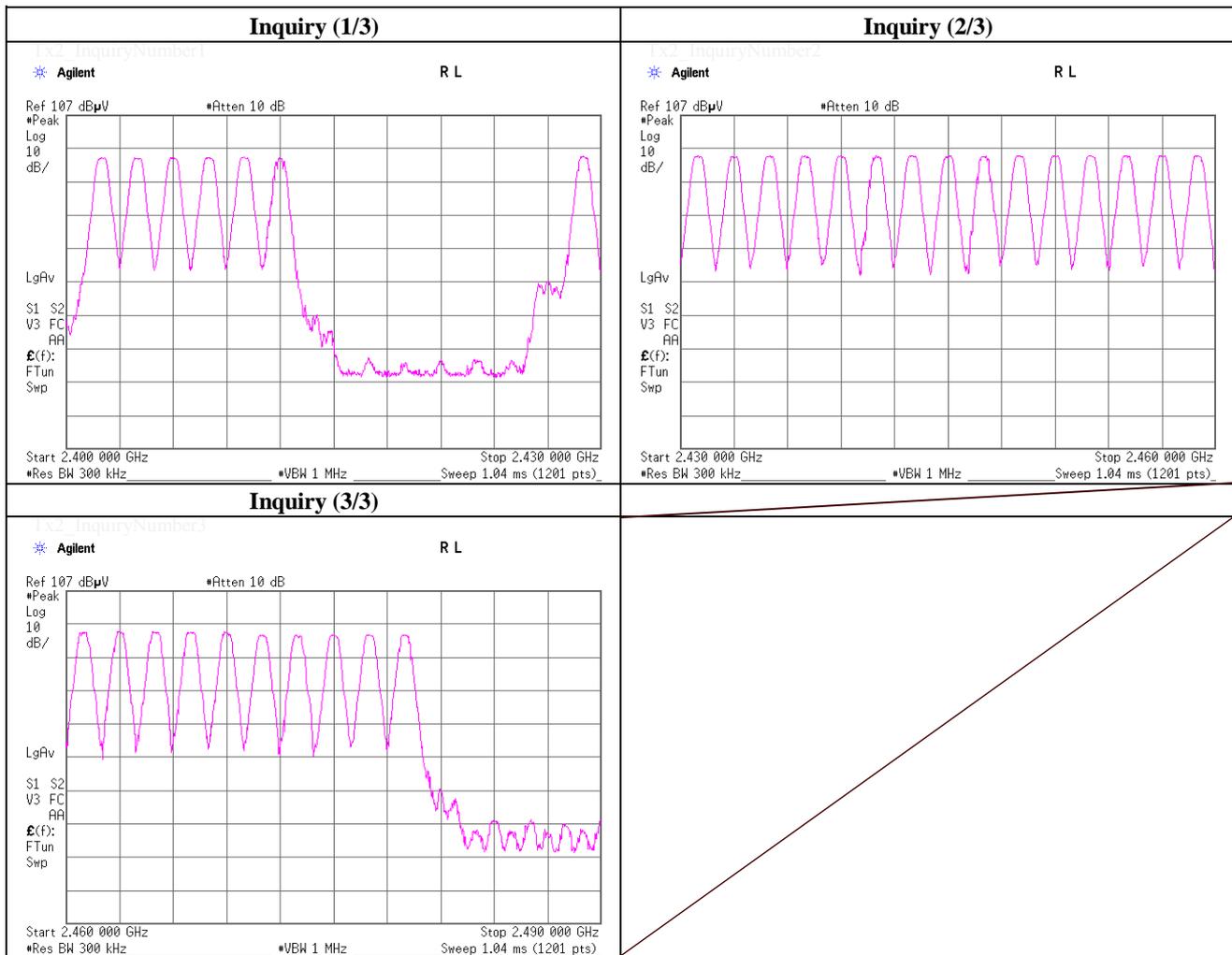


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Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 14, 2014	
Temperature / Humidity	23deg.C , 41%RH	
Engineer	Kenichi Adachi	
Mode	Tx, Bluetooth, Inquiry	

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



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Dwell Time

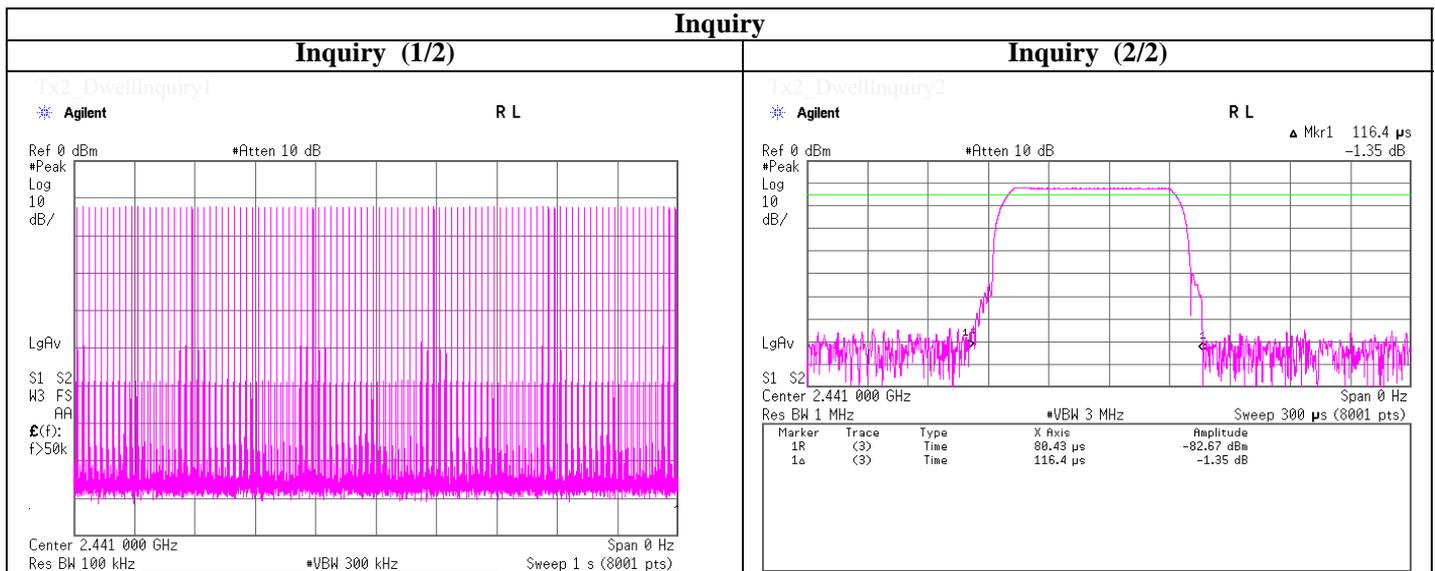
Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date January 14, 2014
 Temperature / Humidity 23deg.C , 41%RH
 Engineer Kenichi Adachi
 Mode Tx, Bluetooth, BDR, PRBS9

Mode	Number of transmission in a 31.6 (79 Hopping x 0.4) / 12.8 (32 Hopping x 0.4) second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	51.0 / 5.0 sec. x 31.6 sec. = 323 times	0.404	131	400
DH3	26.0 / 5.0 sec. x 31.6 sec. = 165 times	1.661	274	400
DH5	17.0 / 5.0 sec. x 31.6 sec. = 108 times	2.910	314	400
Inquiry	100.0 / 1.0 sec. x 12.8 sec. = 1280 times	0.116	149	400

Sample Calculation

Result = Number of transmission x Length of transmission time

* This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in $N \times 0.4s$, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4s regardless of packet size (DH1, DH3 or DH5). This is confirmed in the test report for $N=79$.



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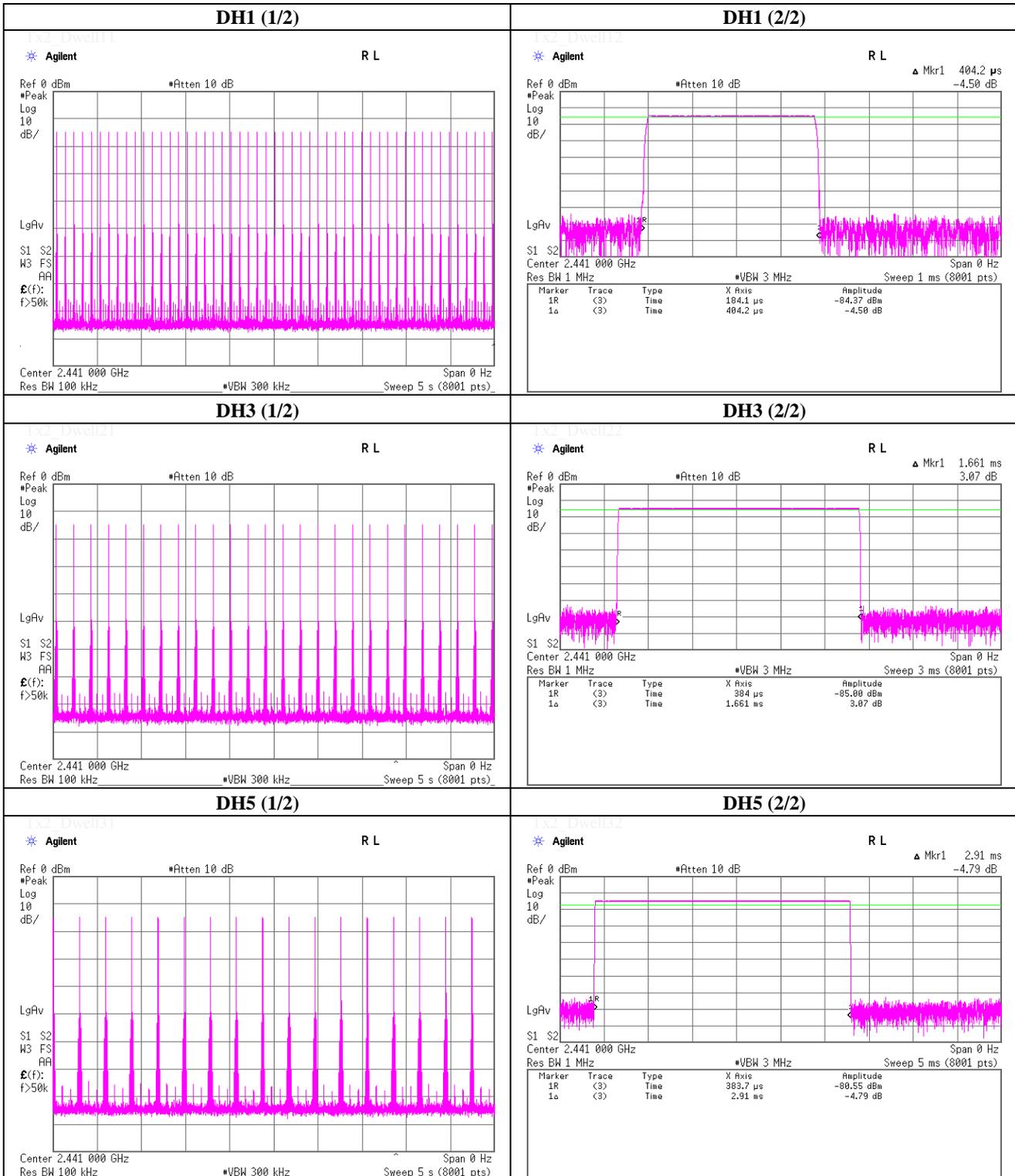
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Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date January 14, 2014
 Temperature / Humidity 23deg.C , 41%RH
 Engineer Kenichi Adachi

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 January 14, 2014
 Temperature / Humidity 23deg.C , 41%RH
 Engineer Kenichi Adachi
 Mode Tx, Bluetooth, EDR, PRBS9

Mode	Number of transmission in a 31.6 (79 Hopping x 0.4) second	Length of transmission time [msec]	Result [msec]	Limit [msec]
3-DH1	51.0 / 5.0 sec. x 31.6 sec. = 323 times	0.436	141	400
3-DH3	26.0 / 5.0 sec. x 31.6 sec. = 165 times	1.688	278	400
3-DH5	17.0 / 5.0 sec. x 31.6 sec. = 108 times	2.939	317	400

Sample Calculation

Result = Number of transmission x Length of transmission time

* This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in $N \times 0.4s$, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4s regardless of packet size (3-DH1, 3-DH3 or 3-DH5). This is confirmed in the test report for $N=79$.

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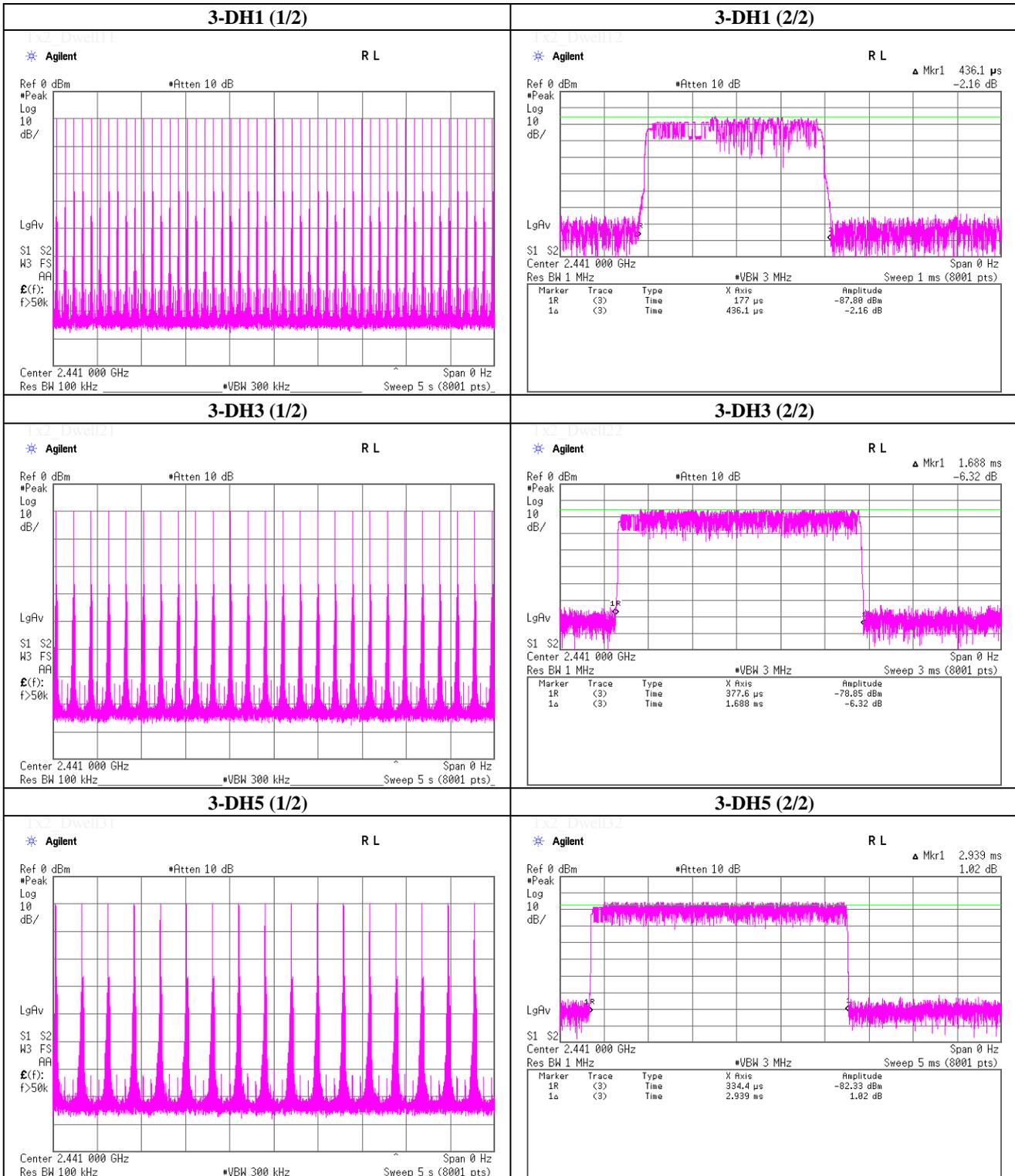
Telephone : +81 463 50 6400

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Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
 Date January 14, 2014
 Temperature / Humidity 23deg.C , 41%RH
 Engineer Kenichi Adachi

Dwell time

Tx, Bluetooth, EDR, PRBS9



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Maximum Peak Conducted Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date January 8, 2014
 Temperature / Humidity 25 deg.C , 39 %RH
 Engineer Akio Hayashi
 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	-12.60	1.32	9.98	-1.30	0.74	20.97	125	22.27
DH5	2441.0	-11.51	1.33	9.98	-0.20	0.95	20.97	125	21.17
DH5	2480.0	-11.88	1.35	9.98	-0.55	0.88	20.97	125	21.52
2-DH5	2402.0	-10.87	1.32	9.98	0.43	1.10	20.97	125	20.54
2-DH5	2441.0	-10.27	1.33	9.98	1.04	1.27	20.97	125	19.93
2-DH5	2480.0	-10.53	1.35	9.98	0.80	1.20	20.97	125	20.17
3-DH5	2402.0	-10.50	1.32	9.98	0.80	1.20	20.97	125	20.17
3-DH5	2441.0	-9.92	1.33	9.98	1.39	1.38	20.97	125	19.58
3-DH5	2480.0	-10.15	1.35	9.98	1.18	1.31	20.97	125	19.79

Sample Calculation:

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 6, 2014 January 9, 2014
 Temperature / Humidity 22deg.C , 44 %RH 21 deg.C , 33 %RH
 Engineer Makoto Hosaka Hikaru Shirasawa
 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.	121.717	QP	42.7	13.2	7.2	32.1	31.0	43.5	12.5	300	280	
Hori.	157.433	QP	44.0	14.8	7.8	32.1	34.5	43.5	9.0	220	70	
Hori.	959.990	QP	37.1	22.1	11.0	30.5	39.7	46.0	6.3	100	60	
Hori.	2390.000	PK	45.5	26.8	14.7	38.2	48.8	73.9	25.1	100	37	
Hori.	2400.000	PK	46.3	26.8	14.7	38.2	49.6	73.9	24.3	100	37	
Hori.	4804.000	PK	48.0	30.9	7.9	37.1	49.7	73.9	24.2	100	163	
Hori.	7206.000	PK	46.5	37.1	9.1	39.4	53.3	73.9	20.6	100	0	
Hori.	2390.000	AV	32.9	26.8	14.7	38.2	36.2	53.9	17.7	100	37	
Hori.	2400.000	AV	33.0	26.8	14.7	38.2	36.3	53.9	17.6	100	37	
Hori.	4804.000	AV	38.2	30.9	7.9	37.1	39.9	53.9	14.0	100	163	
Hori.	7206.000	AV	33.7	37.1	9.1	39.4	40.5	53.9	13.4	100	0	
Vert.	35.926	QP	40.0	16.2	6.5	32.2	30.5	40.0	9.5	100	162	
Vert.	46.254	QP	49.5	12.2	6.7	32.2	36.2	40.0	3.8	100	108	
Vert.	95.998	QP	44.6	9.3	7.4	32.1	29.2	43.5	14.3	100	248	
Vert.	121.696	QP	44.7	13.2	7.2	32.1	33.0	43.5	10.5	100	250	
Vert.	158.863	QP	43.0	14.8	7.8	32.1	33.5	43.5	10.0	100	290	
Vert.	959.990	QP	31.8	22.1	11.0	30.5	34.4	46.0	11.6	100	30	
Vert.	2390.000	PK	46.0	26.8	14.7	38.2	49.3	73.9	24.6	100	353	
Vert.	2400.000	PK	52.0	26.8	14.7	38.2	55.3	73.9	18.6	100	353	
Vert.	4804.000	PK	47.5	30.9	7.9	37.1	49.2	73.9	24.7	100	355	
Vert.	7206.000	PK	46.1	37.1	9.1	39.4	52.9	73.9	21.0	100	0	
Vert.	2390.000	AV	32.8	26.8	14.7	38.2	36.1	53.9	17.8	100	353	
Vert.	2400.000	AV	33.0	26.8	14.7	38.2	36.3	53.9	17.6	100	353	
Vert.	4804.000	AV	37.0	30.9	7.9	37.1	38.7	53.9	15.2	100	355	
Vert.	7206.000	AV	33.7	37.1	9.1	39.4	40.5	53.9	13.4	100	0	

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 4th harmonic or more was not seen so the result was its base noise level.

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date January 6, 2014 January 9, 2014
Temperature / Humidity 22deg.C , 44 %RH 21 deg.C , 33 %RH
Engineer Makoto Hosaka Hikaru Shirasawa
Mode Tx, 2441 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.	58.820	QP	38.5	8.4	6.6	32.2	21.3	40.0	18.7	300	220	
Hori.	119.883	QP	43.7	13.1	7.2	32.1	31.9	43.5	11.6	300	90	
Hori.	156.281	QP	45.7	14.8	7.8	32.1	36.2	43.5	7.3	300	57	
Hori.	959.999	QP	37.0	22.1	11.0	30.5	39.6	46.0	6.4	100	63	
Hori.	4882.000	PK	47.7	31.4	7.9	37.0	50.0	73.9	23.9	100	164	
Hori.	7323.000	PK	47.0	37.2	9.1	39.4	53.9	73.9	20.0	100	0	
Hori.	4882.000	AV	38.9	31.4	7.9	37.0	41.2	53.9	12.7	100	164	
Hori.	7323.000	AV	34.1	37.2	9.1	39.4	41.0	53.9	12.9	100	0	
Vert.	35.018	QP	40.0	16.6	6.5	32.2	30.9	40.0	9.1	100	159	
Vert.	46.242	QP	49.3	12.2	6.7	32.2	36.0	40.0	4.0	100	151	
Vert.	95.999	QP	44.5	9.3	7.4	32.1	29.1	43.5	14.4	100	253	
Vert.	119.873	QP	45.0	13.1	7.2	32.1	33.2	43.5	10.3	100	223	
Vert.	158.324	QP	43.0	14.8	7.8	32.1	33.5	43.5	10.0	100	258	
Vert.	959.999	QP	31.3	22.1	11.0	30.5	33.9	46.0	12.1	100	340	
Vert.	4882.000	PK	47.7	31.4	7.9	37.0	50.0	73.9	23.9	100	0	
Vert.	7323.000	PK	46.7	37.2	9.1	39.4	53.6	73.9	20.3	100	0	
Vert.	4882.000	AV	37.7	31.4	7.9	37.0	40.0	53.9	13.9	100	0	
Vert.	7323.000	AV	33.6	37.2	9.1	39.4	40.5	53.9	13.4	100	0	

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

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

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 Engineer Makoto Hosaka Hikaru Shirasawa
 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.	119.852	QP	44.8	13.0	7.2	32.1	32.9	43.5	10.6	300	100	
Hori.	156.331	QP	44.3	14.8	7.8	32.1	34.8	43.5	8.7	300	45	
Hori.	959.999	QP	37.1	22.1	11.0	30.5	39.7	46.0	6.3	100	60	
Hori.	2483.500	PK	46.3	26.9	14.8	38.1	49.9	73.9	24.0	100	336	
Hori.	4960.000	PK	46.7	31.8	7.8	37.0	49.3	73.9	24.6	100	95	
Hori.	7440.000	PK	46.0	37.4	9.3	39.4	53.3	73.9	20.6	100	335	
Hori.	2483.500	AV	33.3	26.9	14.8	38.1	36.9	53.9	17.0	100	336	
Hori.	4960.000	AV	35.1	31.8	7.8	37.0	37.7	53.9	16.2	100	95	
Hori.	7440.000	AV	33.7	37.4	9.3	39.4	41.0	53.9	12.9	100	335	
Vert.	35.016	QP	40.3	16.6	6.5	32.2	31.2	40.0	8.8	100	120	
Vert.	46.237	QP	49.0	12.2	6.7	32.2	35.7	40.0	4.3	100	130	
Vert.	95.999	QP	45.7	9.3	7.4	32.1	30.3	43.5	13.2	100	255	
Vert.	119.864	QP	46.0	13.1	7.2	32.1	34.2	43.5	9.3	100	193	
Vert.	159.865	QP	44.0	14.8	7.8	32.1	34.5	43.5	9.0	100	257	
Vert.	959.999	QP	31.1	22.1	11.0	30.5	33.7	46.0	12.3	100	340	
Vert.	2483.500	PK	46.5	26.9	14.8	38.1	50.1	73.9	23.8	100	12	
Vert.	4960.000	PK	46.7	31.8	7.8	37.0	49.3	73.9	24.6	100	355	
Vert.	7440.000	PK	47.0	37.4	9.3	39.4	54.3	73.9	19.6	100	0	
Vert.	2483.500	AV	33.3	26.9	14.8	38.1	36.9	53.9	17.0	100	12	
Vert.	4960.000	AV	36.1	31.8	7.8	37.0	38.7	53.9	15.2	100	355	
Vert.	7440.000	AV	33.7	37.4	9.3	39.4	41.0	53.9	12.9	100	0	

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).

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

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Temperature / Humidity 22deg.C , 44 %RH 21 deg.C , 33 %RH
Engineer Makoto Hosaka Hikaru Shirasawa
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.	58.806	QP	38.1	8.4	6.6	32.2	20.9	40.0	19.1	300	230	
Hori.	120.314	QP	46.0	13.1	7.2	32.1	34.2	43.5	9.3	300	66	
Hori.	159.868	QP	44.3	14.8	7.8	32.1	34.8	43.5	8.7	200	45	
Hori.	959.999	QP	37.0	22.1	11.0	30.5	39.6	46.0	6.4	100	60	
Hori.	2390.000	PK	45.5	26.8	14.7	38.2	48.8	73.9	25.1	100	50	
Hori.	2400.000	PK	48.1	26.8	14.7	38.2	51.4	73.9	22.5	100	50	
Hori.	4804.000	PK	45.8	30.9	7.9	37.1	47.5	73.9	26.4	100	150	
Hori.	7206.000	PK	46.6	37.1	9.1	39.4	53.4	73.9	20.5	100	0	
Hori.	2390.000	AV	32.7	26.8	14.7	38.2	36.0	53.9	17.9	100	50	
Hori.	2400.000	AV	34.2	26.8	14.7	38.2	37.5	53.9	16.4	100	50	
Hori.	4804.000	AV	33.7	30.9	7.9	37.1	35.4	53.9	18.5	100	150	
Hori.	7206.000	AV	33.7	37.1	9.1	39.4	40.5	53.9	13.4	100	0	
Vert.	35.914	QP	39.7	16.2	6.5	32.2	30.2	40.0	9.8	100	176	
Vert.	47.140	QP	48.7	11.9	6.7	32.2	35.1	40.0	4.9	100	190	
Vert.	95.999	QP	45.8	9.3	7.4	32.1	30.4	43.5	13.1	100	265	
Vert.	120.318	QP	46.7	13.1	7.2	32.1	34.9	43.5	8.6	100	190	
Vert.	160.930	QP	45.5	14.9	7.8	32.1	36.1	43.5	7.4	100	267	
Vert.	959.999	QP	31.2	22.1	11.0	30.5	33.8	46.0	12.2	100	350	
Vert.	2390.000	PK	51.0	26.8	14.7	38.2	54.3	73.9	19.6	120	340	
Vert.	2400.000	PK	55.0	26.8	14.7	38.2	58.3	73.9	15.6	120	340	
Vert.	4804.000	PK	46.0	30.9	7.9	37.1	47.7	73.9	26.2	100	0	
Vert.	7206.000	PK	46.5	37.1	9.1	39.4	53.3	73.9	20.6	100	0	
Vert.	2390.000	AV	34.8	26.8	14.7	38.2	38.1	53.9	15.8	120	340	
Vert.	2400.000	AV	34.7	26.8	14.7	38.2	38.0	53.9	15.9	120	340	
Vert.	4804.000	AV	34.2	30.9	7.9	37.1	35.9	53.9	18.0	100	0	
Vert.	7206.000	AV	33.9	37.1	9.1	39.4	40.7	53.9	13.2	100	0	

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 4th harmonic or more was not seen so the result was its base noise level.

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

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Temperature / Humidity 22deg.C , 44 %RH 21 deg.C , 33 %RH
Engineer Makoto Hosaka Hikaru Shirasawa
Mode Tx, 2441 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.	59.707	QP	37.7	8.2	6.5	32.2	20.2	40.0	19.8	300	200	
Hori.	119.413	QP	47.0	13.0	7.2	32.1	35.1	43.5	8.4	300	88	
Hori.	162.432	QP	47.0	15.0	7.8	32.1	37.7	43.5	5.8	200	265	
Hori.	959.999	QP	37.3	22.1	11.0	30.5	39.9	46.0	6.1	100	66	
Hori.	4882.000	PK	47.0	31.4	7.9	37.0	49.3	73.9	24.6	100	160	
Hori.	7323.000	PK	45.7	37.2	9.1	39.4	52.6	73.9	21.3	100	280	
Hori.	4882.000	AV	35.9	31.4	7.9	37.0	38.2	53.9	15.7	100	160	
Hori.	7323.000	AV	33.4	37.2	9.1	39.4	40.3	53.9	13.6	100	280	
Vert.	35.914	QP	40.5	16.2	6.5	32.2	31.0	40.0	9.0	100	110	
Vert.	47.137	QP	49.1	11.9	6.7	32.2	35.5	40.0	4.5	100	100	
Vert.	58.808	QP	42.3	8.4	6.6	32.2	25.1	40.0	14.9	100	260	
Vert.	96.021	QP	46.0	9.3	7.4	32.1	30.6	43.5	12.9	100	265	
Vert.	119.429	QP	46.5	13.0	7.2	32.1	34.6	43.5	8.9	100	157	
Vert.	161.897	QP	45.5	15.0	7.8	32.1	36.2	43.5	7.3	100	289	
Vert.	959.999	QP	33.0	22.1	11.0	30.5	35.6	46.0	10.4	100	30	
Vert.	4882.000	PK	46.1	31.4	7.9	37.0	48.4	73.9	25.5	100	0	
Vert.	7323.000	PK	46.3	37.2	9.1	39.4	53.2	73.9	20.7	100	0	
Vert.	4882.000	AV	34.7	31.4	7.9	37.0	37.0	53.9	16.9	100	0	
Vert.	7323.000	AV	33.5	37.2	9.1	39.4	40.4	53.9	13.5	100	0	

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 4th harmonic or more was not seen so the result was its base noise level.

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

UL Japan, Inc.

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date January 6, 2014 January 9, 2014
Temperature / Humidity 22deg.C , 44 %RH 21 deg.C , 33 %RH
Engineer Makoto Hosaka Hikaru Shirasawa
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.	58.803	QP	37.3	8.4	6.6	32.2	20.1	40.0	19.9	150	216	
Hori.	119.408	QP	45.5	13.0	7.2	32.1	33.6	43.5	9.9	300	77	
Hori.	161.915	QP	46.3	15.0	7.8	32.1	37.0	43.5	6.5	200	270	
Hori.	959.999	QP	37.0	22.1	11.0	30.5	39.6	46.0	6.4	100	63	
Hori.	2483.500	PK	45.7	26.9	14.8	38.1	49.3	73.9	24.6	100	90	
Hori.	4960.000	PK	45.8	31.8	7.8	37.0	48.4	73.9	25.5	100	167	
Hori.	7440.000	PK	46.5	37.4	9.3	39.4	53.8	73.9	20.1	100	0	
Hori.	2483.500	AV	33.0	26.9	14.8	38.1	36.6	53.9	17.3	100	90	
Hori.	4960.000	AV	33.7	31.8	7.8	37.0	36.3	53.9	17.6	100	167	
Hori.	7440.000	AV	33.7	37.4	9.3	39.4	41.0	53.9	12.9	100	0	
Vert.	35.911	QP	41.0	16.2	6.5	32.2	31.5	40.0	8.5	100	118	
Vert.	46.235	QP	49.0	12.2	6.7	32.2	35.7	40.0	4.3	100	72	
Vert.	96.005	QP	49.7	9.3	7.4	32.1	34.3	43.5	9.2	100	280	
Vert.	120.750	QP	46.7	13.1	7.2	32.1	34.9	43.5	8.6	100	170	
Vert.	161.895	QP	45.8	15.0	7.8	32.1	36.5	43.5	7.0	100	260	
Vert.	959.999	QP	31.0	22.1	11.0	30.5	33.6	46.0	12.4	100	60	
Vert.	2483.500	PK	45.5	26.9	14.8	38.1	49.1	73.9	24.8	100	330	
Vert.	4960.000	PK	46.0	31.8	7.8	37.0	48.6	73.9	25.3	100	355	
Vert.	7440.000	PK	46.5	37.4	9.3	39.4	53.8	73.9	20.1	100	0	
Vert.	2483.500	AV	32.8	26.9	14.8	38.1	36.4	53.9	17.5	100	330	
Vert.	4960.000	AV	34.3	31.8	7.8	37.0	36.9	53.9	17.0	100	355	
Vert.	7440.000	AV	33.6	37.4	9.3	39.4	40.9	53.9	13.0	100	0	

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 4th harmonic or more was not seen so the result was its base noise level.

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

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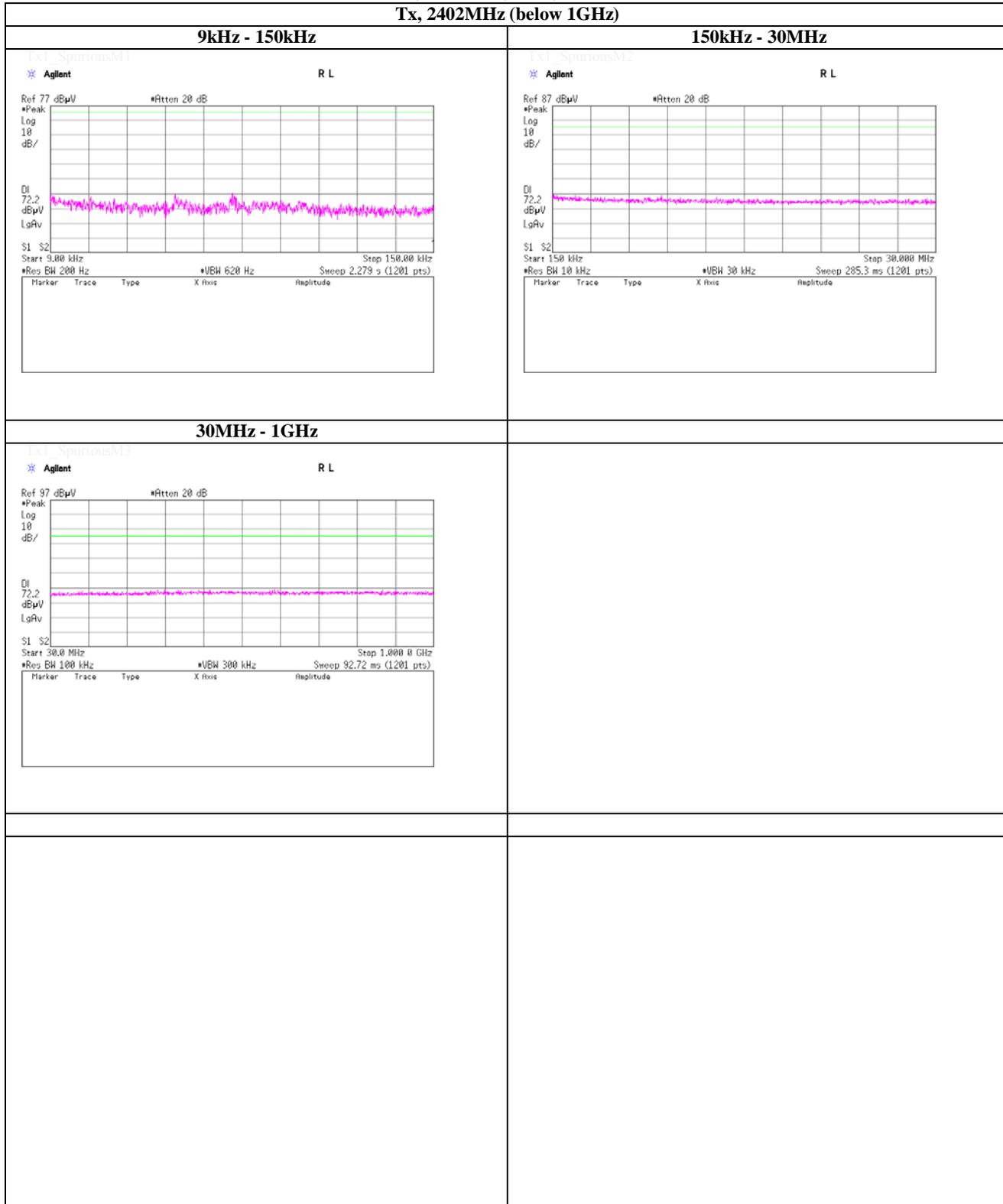
Facsimile : +81 463 50 6401

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date January 8, 2013
 Temperature / Humidity 25 deg.C , 39 %RH
 Engineer Akio Hayashi

Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2402MHz (below 1GHz)



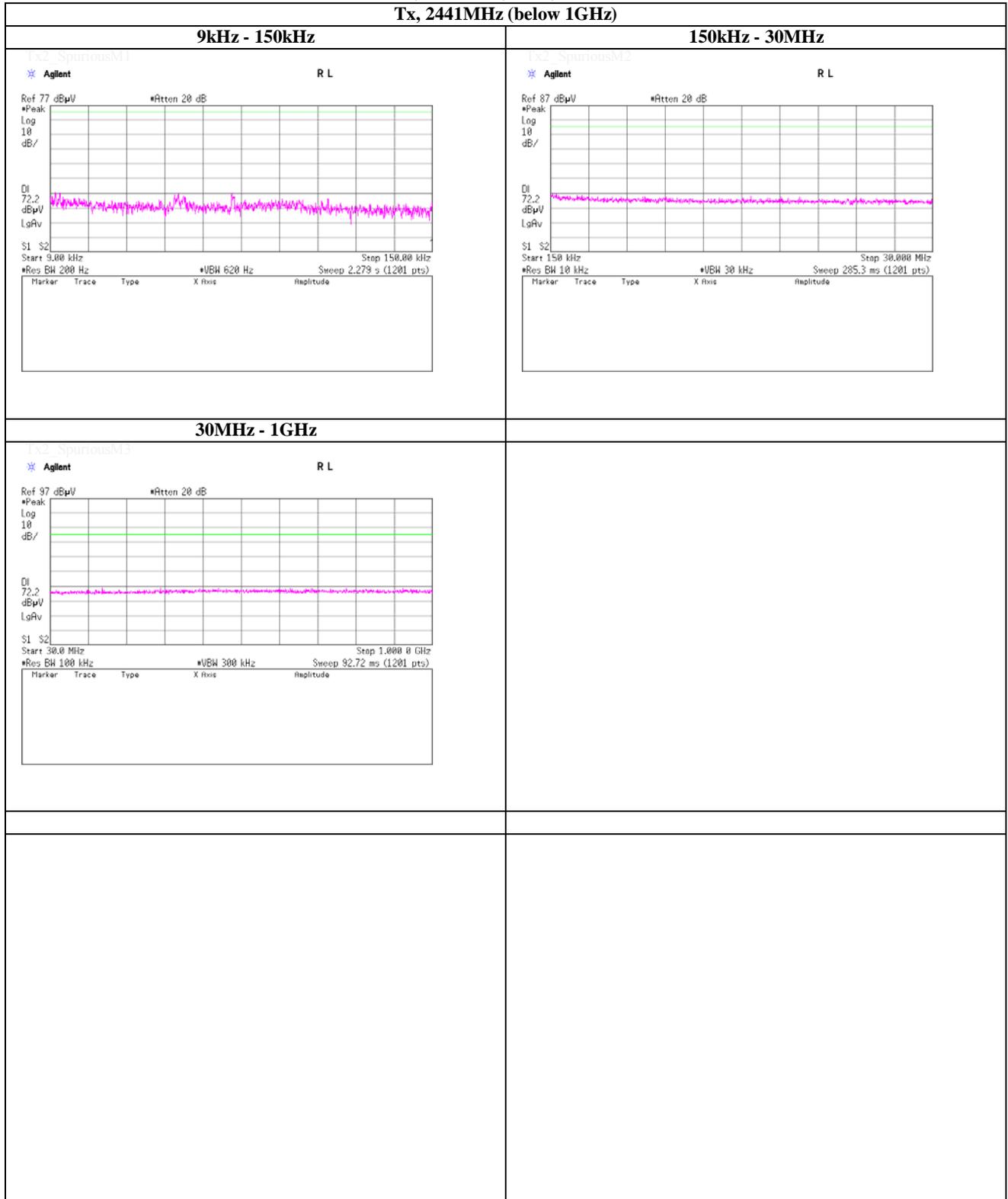
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 Date January 8, 2013
 Temperature / Humidity 25 deg.C , 39 %RH
 Engineer Akio Hayashi

Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2441MHz (below 1GHz)



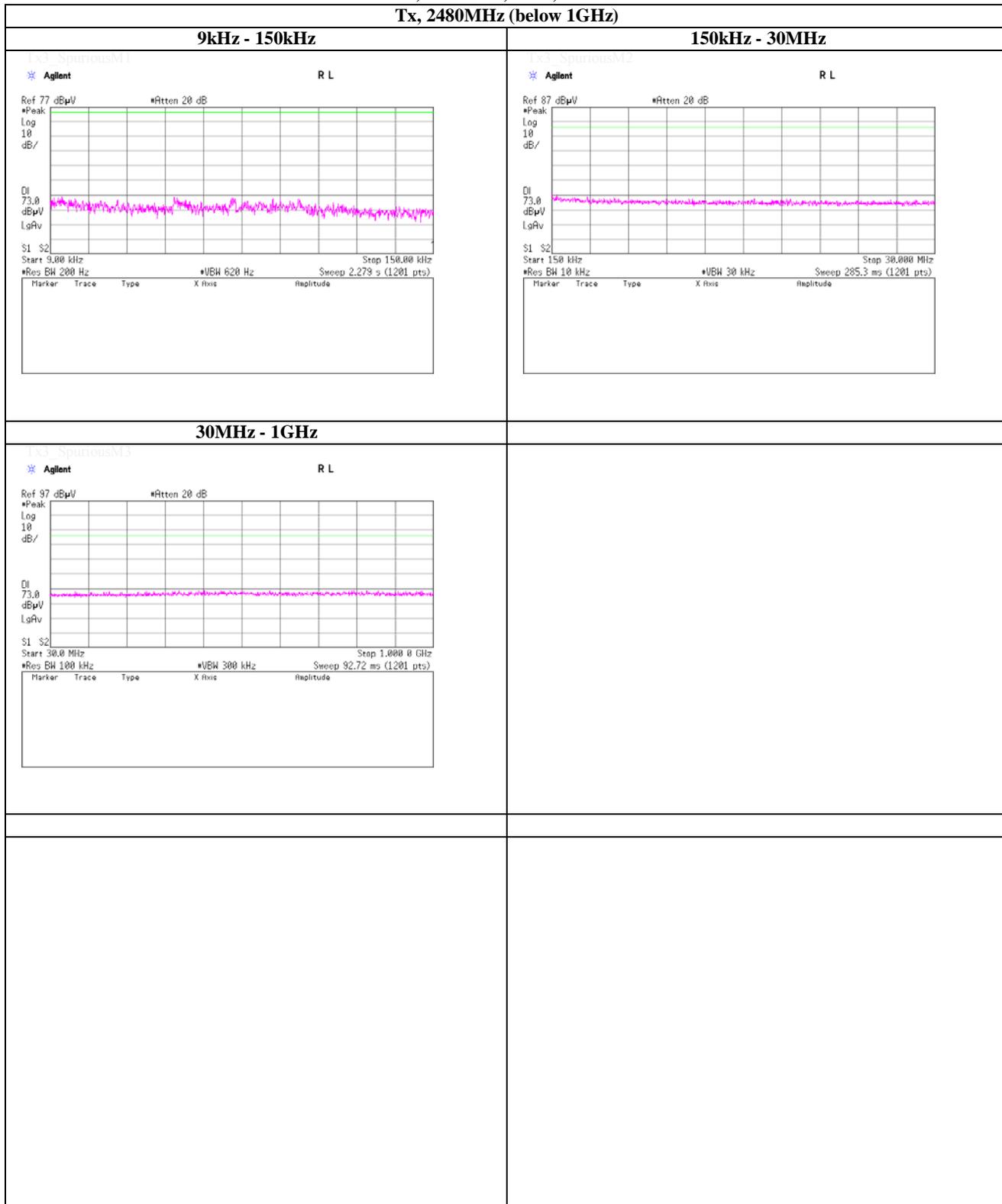
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 Date January 8, 2013
 Temperature / Humidity 25 deg.C , 39 %RH
 Engineer Akio Hayashi

Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx, 2480MHz (below 1GHz)

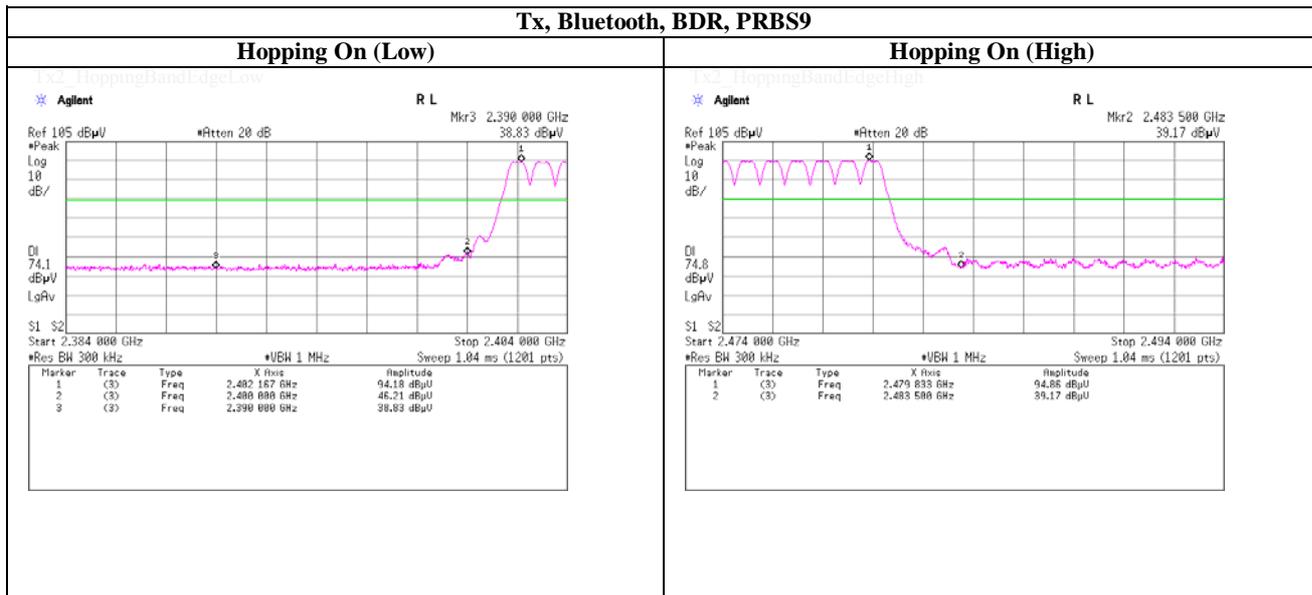
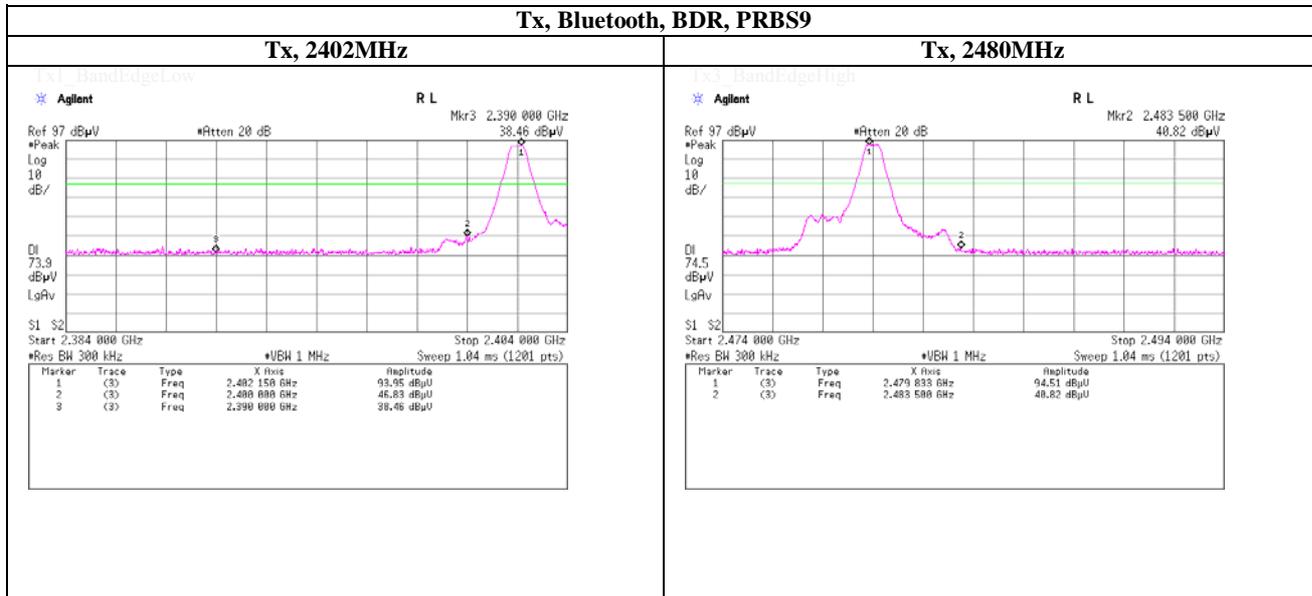


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 Date January 8, 2013
 Temperature / Humidity 25 deg.C , 39 %RH
 Engineer Akio Hayashi

Spurious emission (Conducted)

Band Edge compliance



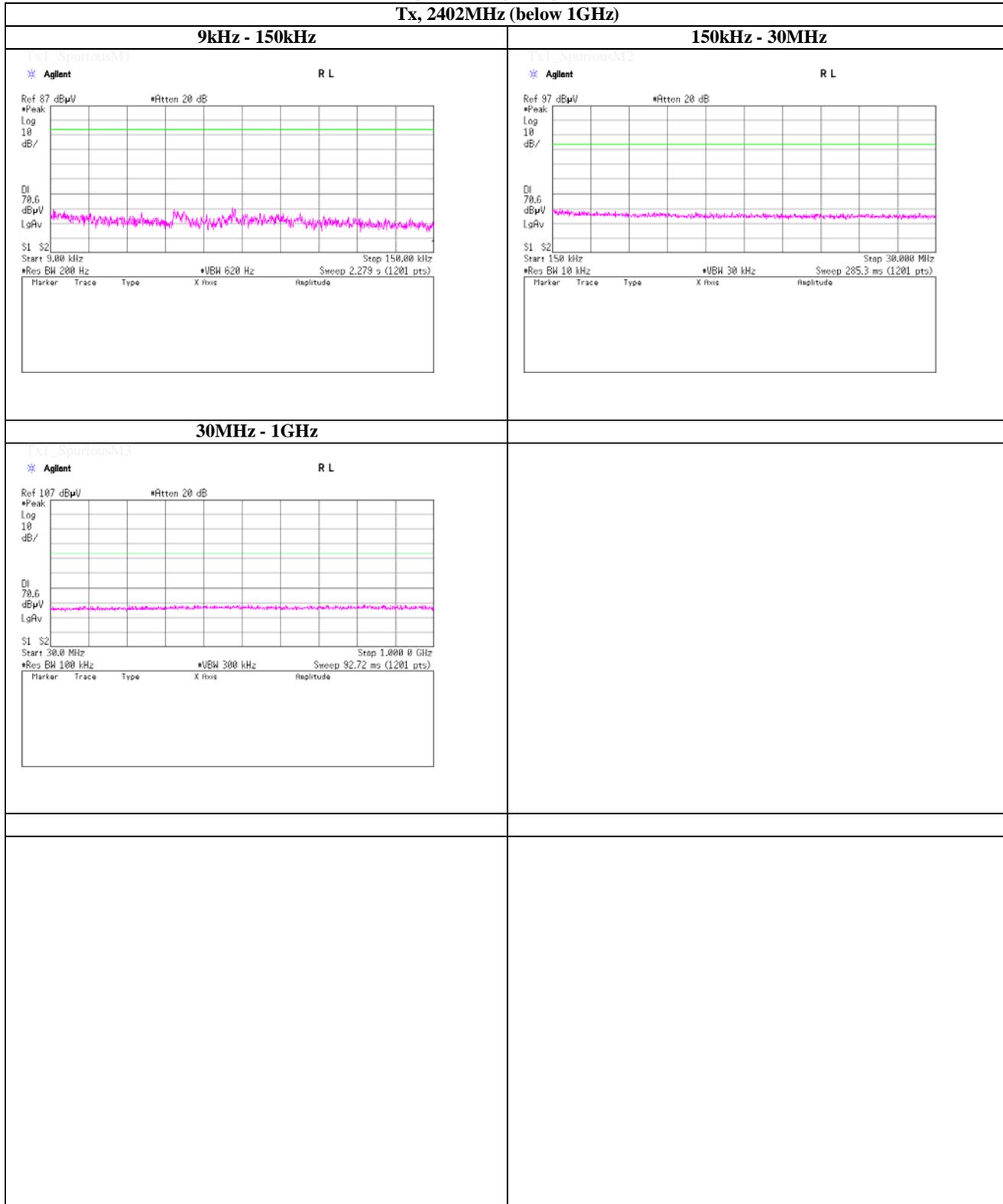
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Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date January 8, 2013
 Temperature / Humidity 25 deg.C , 39 %RH
 Engineer Akio Hayashi

Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2402MHz (below 1GHz)



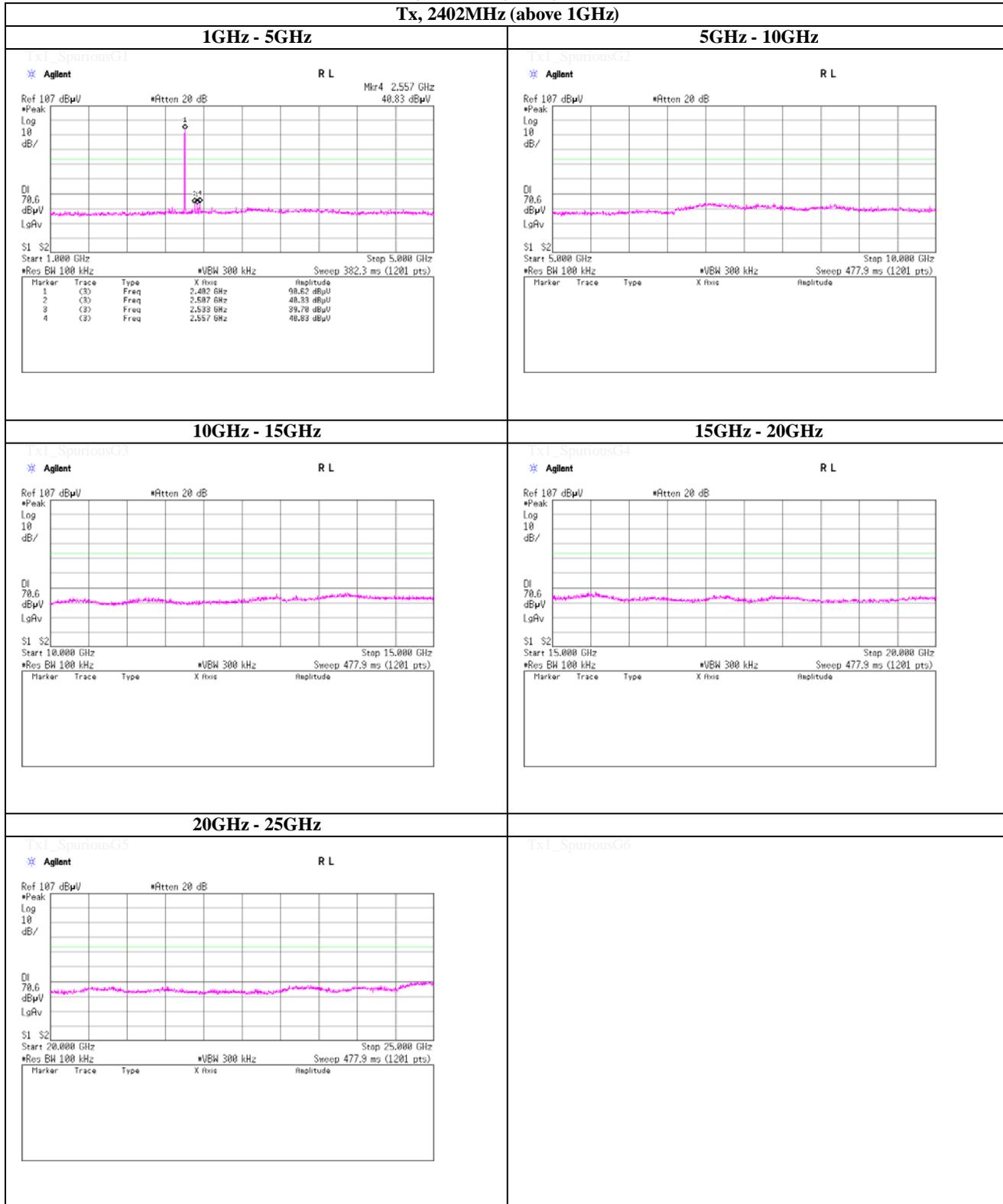
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Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date January 8, 2013
 Temperature / Humidity 25 deg.C , 39 %RH
 Engineer Akio Hayashi

Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2402MHz (above 1GHz)



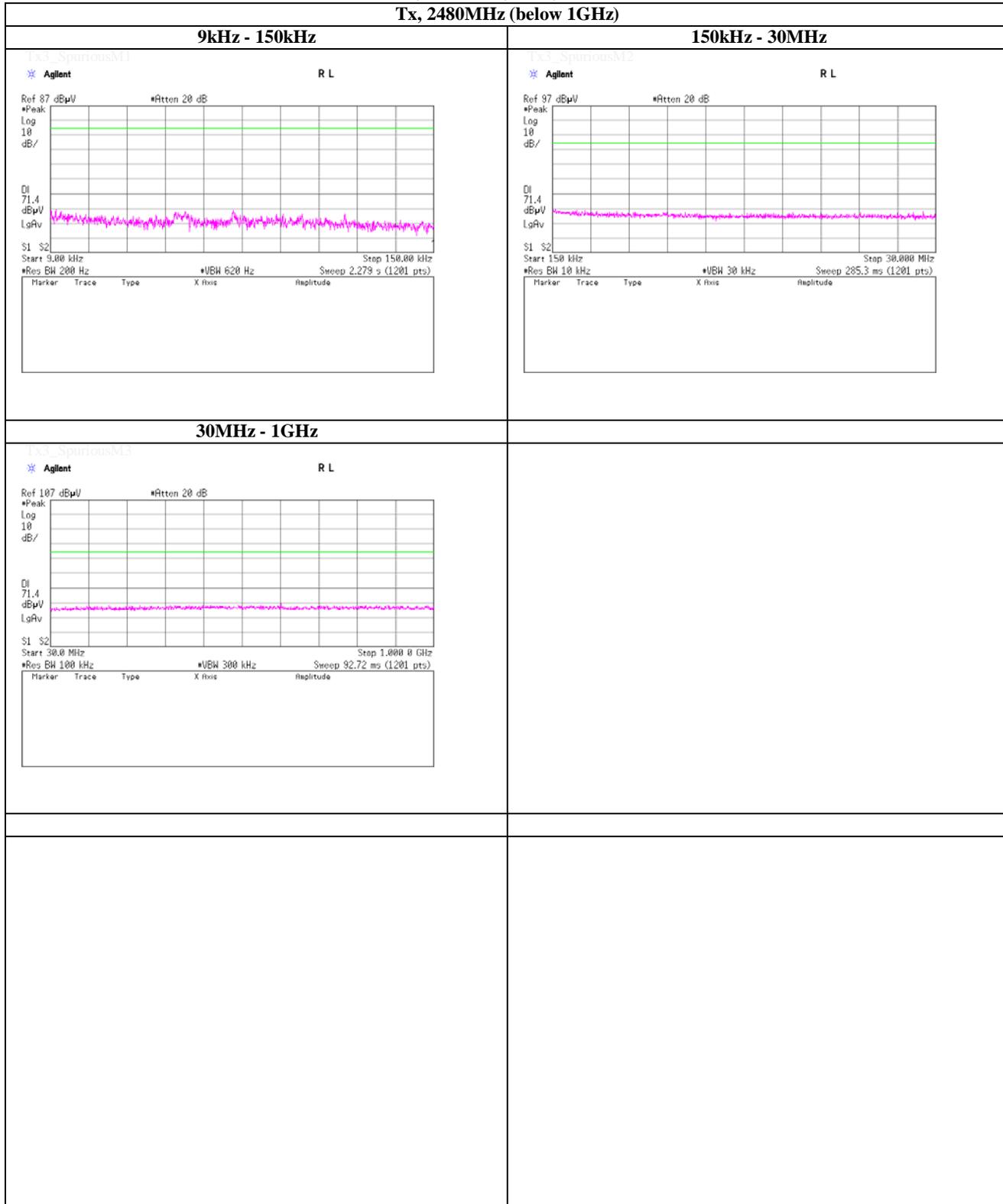
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Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date January 8, 2013
 Temperature / Humidity 25 deg.C , 39 %RH
 Engineer Akio Hayashi

Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2480MHz (below 1GHz)



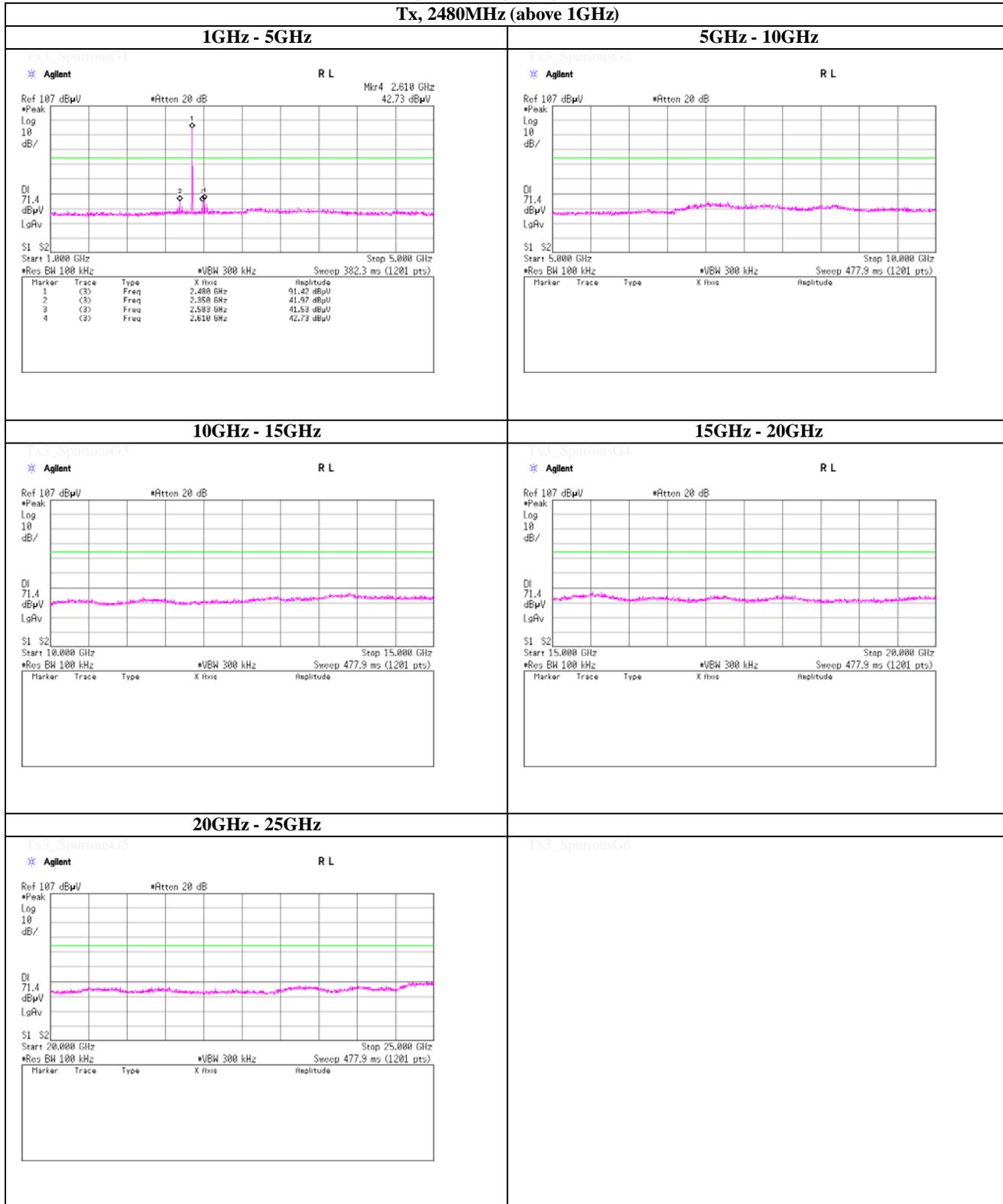
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Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date January 8, 2013
 Temperature / Humidity 25 deg.C , 39 %RH
 Engineer Akio Hayashi

Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx, 2480MHz (above 1GHz)

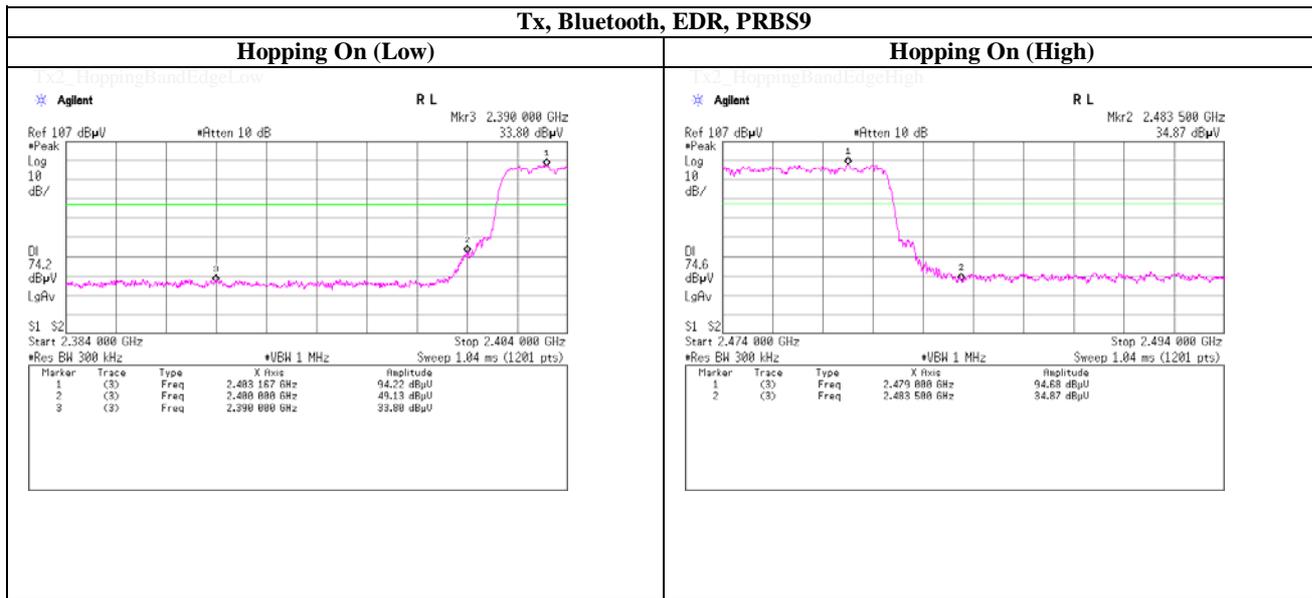
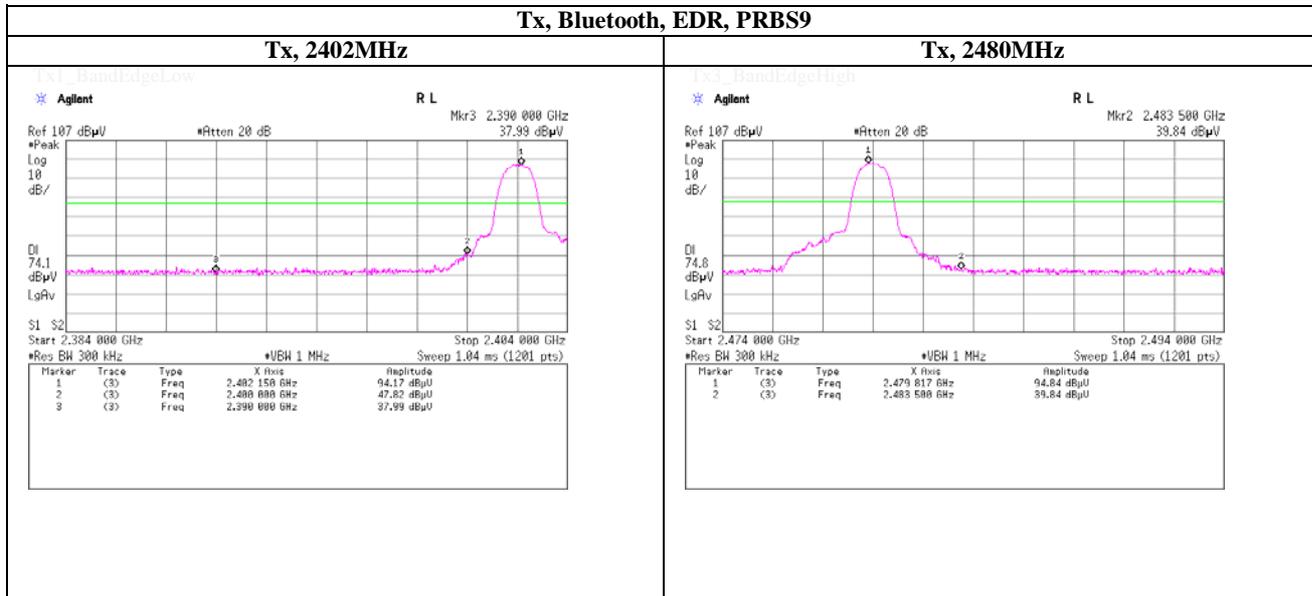


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Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date January 8, 2013
 Temperature / Humidity 25 deg.C , 39 %RH
 Engineer Akio Hayashi

Spurious emission (Conducted)

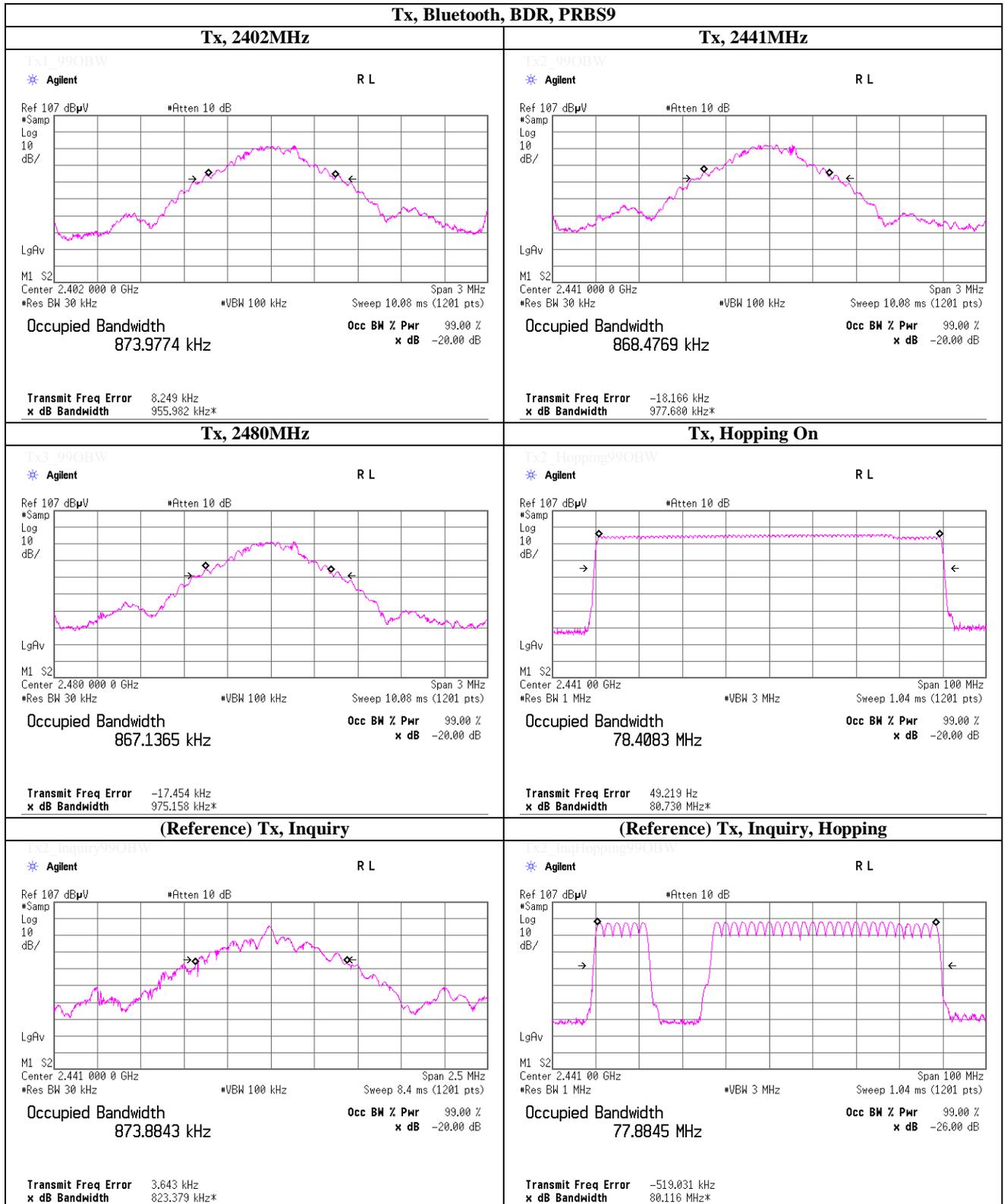
Band Edge compliance



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Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
 Date January 14, 2014
 Temperature / Humidity 23deg.C , 41%RH
 Engineer Kenichi Adachi

99% Occupied Bandwidth



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Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
 Date January 14, 2014
 Temperature / Humidity 23deg.C , 41%RH
 Engineer Kenichi Adachi

99% Occupied Bandwidth

Tx, Bluetooth, EDR, PRBS9	
<p style="text-align: center;">Tx, 2402MHz</p> <p style="text-align: center;">Tx1_99OBW</p> <p style="text-align: center;">* Agilent R L</p> <p>Ref 107 dBµV #Atten 10 dB</p> <p>#Samp Log 10 dB/</p> <p>LgAv</p> <p>M1 S2</p> <p>Center 2.402 000 0 GHz Span 3 MHz</p> <p>#Res BW 30 kHz #VBW 100 kHz Sweep 10.00 ms (1201 pts)</p> <p>Occupied Bandwidth 1.1931 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error -24.715 kHz x dB Bandwidth 1.279 MHz*</p>	<p style="text-align: center;">Tx, 2441MHz</p> <p style="text-align: center;">Tx1_99OBW</p> <p style="text-align: center;">* Agilent R L</p> <p>Ref 107 dBµV #Atten 10 dB</p> <p>#Samp Log 10 dB/</p> <p>LgAv</p> <p>M1 S2</p> <p>Center 2.441 000 0 GHz Span 3 MHz</p> <p>#Res BW 30 kHz #VBW 100 kHz Sweep 10.00 ms (1201 pts)</p> <p>Occupied Bandwidth 1.1923 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error -26.342 kHz x dB Bandwidth 1.281 MHz*</p>
<p style="text-align: center;">Tx, 2480MHz</p> <p style="text-align: center;">Tx3_99OBW</p> <p style="text-align: center;">* Agilent R L</p> <p>Ref 107 dBµV #Atten 10 dB</p> <p>#Samp Log 10 dB/</p> <p>LgAv</p> <p>M1 S2</p> <p>Center 2.480 000 0 GHz Span 3 MHz</p> <p>#Res BW 30 kHz #VBW 100 kHz Sweep 10.00 ms (1201 pts)</p> <p>Occupied Bandwidth 1.2196 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error -20.055 kHz x dB Bandwidth 1.303 MHz*</p>	<p style="text-align: center;">Tx, Hopping On</p> <p style="text-align: center;">Tx2_Hopping99OBW</p> <p style="text-align: center;">* Agilent R L</p> <p>Ref 107 dBµV #Atten 10 dB</p> <p>#Samp Log 10 dB/</p> <p>LgAv</p> <p>M1 S2</p> <p>Center 2.441 00 GHz Span 100 MHz</p> <p>#Res BW 1 MHz #VBW 3 MHz Sweep 1.04 ms (1201 pts)</p> <p>Occupied Bandwidth 78.6991 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error -42.054 kHz x dB Bandwidth 81.069 MHz*</p>
<p style="text-align: center;">Tx2_Inquiry99OBW</p>	<p style="text-align: center;">Tx2_InqHopping99OBW</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)
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2013/07/09 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2013/11/22 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2013/04/11 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2013/05/22 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2013/08/19 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2013/02/27 * 12
SSA-01	Spectrum Analyzer	Agilent	N9010A-526	MY48031482	RE	2013/04/09 * 12
SJM-11	Measure	PROMART	SEN1935	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFL,MF)	-	RE	-
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2013/11/22 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2013/11/22 * 12
SOS-13	Humidity Indicator	Custom	CTH-202	Q.C.17	AT	2013/04/25 * 12
KPM-08	Power meter	Anritsu	ML2495A	6K00003356	AT	2013/09/04 * 12
KPSS-04	Power sensor	Anritsu	MA2411B	012088	AT	2013/09/04 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2013/03/04 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2013/04/09 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2013/03/16 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2013/01/08 * 12
SAT10-11	Attenuator	Weinschel Corp.	54A-10	37588	AT	2013/04/09 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	AT	2013/03/16 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2013/03/07 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2013/03/14 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2013/03/19 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2013/03/28 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2013/03/16 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2013/02/12 * 12
SAT6-06	Attenuator	JFW	50HF-006N	-	RE	2013/02/12 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2013/10/26 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2013/04/03 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2013/10/26 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2013/02/27 * 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 tests