



RADIO TEST REPORT

Test Report No.: 32AE0305-SH-02-A

Applicant : Sony Corporation
Type of Equipment : Digital Media Player
Model No. : NWZ-Z1040
FCC ID : AK8NWZZ1000
Test regulation : FCC Part15 Subpart C: 2011
Test result : Complied

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Date of test: October 31 to November 19, 2011

Tested by:

Hikaru Shirasawa
Engineer of WiSE Japan, UL
Verification Service

Approved by :

Ichiro Isozaki
Leader of WiSE Japan, UL
Verification Service

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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, Japan
 Telephone Number : +81-3-5769-5222
 Facsimile Number : +81-3-5769-5901
 Contact Person : Shinichi Maru

SECTION 2: Equipment under test (E.U.T.)**2.1 Identification of E.U.T.**

Type of Equipment : Digital Media Player
 Model Number : NWZ-Z1040
 Serial Number : Refer to Section 4.2
 Rating : DC3.7V
 Country of Mass-production : China
 Condition of EUT : Engineering prototype
 (Not for Sale: This sample is equivalent to mass-produced items.)
 Receipt Date of Sample : October 24, 2011
 Modification of EUT : The test lab did not make the modification to the EUT supplied from the customer to have it pass the tests.

2.2 Product description

Model: NWZ-Z1040 (referred to as the EUT in this report) is a Digital Media Player.

The EUT has some derived models:

	NWZ-Z1040	NWZ-Z1050	NWZ-Z1060
NAND memory	8GB	16GB	32GB

Clock frequency(ies) in the system : 22.5792MHz(Audio), 26MHz(CPU), 32.768kHz(RTC), 26MHz(GPS), 26MHz(WiFi), 26MHz(BT)

<Radio part>

[FHSS: Bluetooth]

Equipment type : Transceiver
 Frequency of operation : 2402-2480MHz
 Bandwidth / Channel spacing : 79MHz & 1MHz
 Type of modulation : FHSS(GFSK, $\pi/4$ -DQPSK, 8DPSK)
 Antenna type : Chip Antenna
 Antenna connector type : None
 Antenna gain : 1.2dBi
 ITU code : F1D, G1D
 Operating Voltage (Radio part) : 1.8V
 Operation temperature range : +5 to +35 deg.C.

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[DSSS: Wireless LAN (IEEE802.11 series)]*1)

Equipment type : Transceiver
Frequency of operation : 2412-2462MHz (IEEE 802.11b, 11g, 11n-HT20)
Bandwidth / Channel spacing : 20MHz & 5MHz
Type of modulation : IEEE802.11b: DSSS (DBPSK, DQPSK, CCK)
IEEE802.11g/n(20HT): OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna type : Chip antenna
Antenna connector type : None
Antenna gain : 1.2dBi
ITU code : D1D, G1D
Operating Voltage (Radio part) : 1.8V
Operation temperature range : +5 to +35 deg.C.

*1) For Wireless LAN Part, Please see UL Japan, Inc. Test Report Number 32BE0305-SH-02-B.

FCC 15.31 (e) / 212 (*15.212 = for module approval only)

The RF Module has its own regulator.

The RF Module is constantly provided voltage (DC1.8V) through its own regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 / 212 (*15.212 = for module approval only)

Since the antenna used is a type of chip component and is permanently mounted by soldering on a printed circuit board in Type of Equipment, it is impossible for end users to replace it without assistance of professionals. Therefore, the equipment complies with the requirement of 15.203.

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

Test specification : FCC Part 15 Subpart C: 2011, final revised on July 8, 2011 and effective August 8, 2011

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

3.2 Procedures & Results**[FHSS]**

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	FCC Section 15.207	-	N/A	(Tx) 20.5dB (0.19280MHz, QP, L1, Tx 2442MHz, DH5)	Complied
Carrier frequency separation	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)	Conducted	N/A	*See data.	Complied
20dB bandwidth	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)	Conducted	N/A		Complied
Number of hopping frequency	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)(iii)	Conducted	N/A		Complied
Dwell time	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)(iii)	Conducted	N/A		Complied
Maximum peak output power	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (b)(1)	Conducted	N/A		Complied
Band edge compliance & Spurious emission	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (d) Section15.209	Conducted/ Radiated	N/A		(Tx) 9.6dB (2400MHz, PK, Horizontal, Tx 2402MHz, DH5)

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

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3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.4:2003 13. Measurement of intentional radiators, RSS-Gen 4.6.1	RSS-Gen 4.6.1	Conducted	-	N/A *1)

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

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

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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 (±)
Conducted emission (AC Mains) LISN	150kHz-30MHz	3.6 dB	3.6 dB	3.6 dB
Radiated emission (Measurement distance: 3m)	30MHz-300MHz	4.9 dB	5.1 dB	5.0 dB
	300MHz-1GHz	5.0 dB	5.2 dB	5.0 dB
	1GHz-18GHz	4.8 dB	4.8 dB	4.9 dB
	18GHz-26.5GHz	5.0 dB	4.5 dB	4.5 dB
Radiated emission (Measurement distance: 10m)	30MHz-300MHz	4.9 dB	5.1 dB	-
	300MHz-1GHz	4.9 dB	5.0 dB	-
Radiated emission (Measurement distance: 1m)	1GHz-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

Conducted emission test

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

Radiated emission test

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

Power Measurement uncertainty above 1GHz for this test was: (±) 1.3dB

Conducted emissions Measurement (below 1GHz) uncertainty for this test was: (±) 1.9dB

Conducted emissions Measurement (1G-3GHz) uncertainty for this test was: (±) 2.5dB

Conducted emissions Measurement (3G-18GHz) uncertainty for this test was: (±) 3.8dB

Conducted emissions Measurement (18G-26.5GHz) uncertainty for this test was: (±) 4.1dB

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 checked="" 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 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	-

3.6 Test setup, Data of EMI & 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

[FHSS: Bluetooth]

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) - DH1, - DH3, - DH5 - 3-DH1, - 3-DH3, - 3-DH5 -Inquiry	-
Maximum peak output power	Transmitting Hopping OFF (DH5 / 2-DH5 / 3-DH5) / Inquiry, Payload: PRBS9 - DH5 - 2-DH5 - 3-DH5	2402MHz, 2441MHz, 2480MHz
Band edge compliance & Spurious emission (Conducted)	Transmitting (DH5 / 3-DH5), Payload: PRBS9 -Hopping ON / Inquiry -Hopping OFF	Band edge compliance: 2402MHz, 2480MHz
(Radiated)	Transmitting (DH5 / 3-DH5), Payload: PRBS9	Spurious emission: 2402MHz, 2441MHz, 2480MHz
99% occupied bandwidth	Transmitting (DH5 / 3-DH5), Payload: PRBS9 -Hopping ON -Hopping OFF	2402MHz, 2441MHz, 2480MHz
<p>*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum packet type / payload (except Dwell time test)</p> <p>*Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT. However, the limit level 125mWof AFH mode was used for the test.</p> <p>*EUT has the power settings by the software as follows; Device driver: adb driver Version 1.0.29 Software: bccmd Version 4.69</p> <p>Power settings: BDR: 0xff2e EDR: 0xff2e</p> <p>*This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.</p>		

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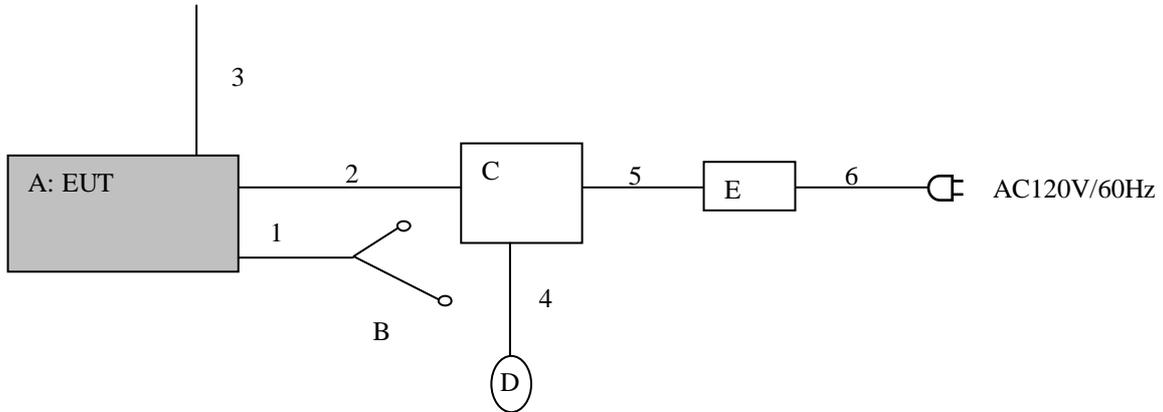
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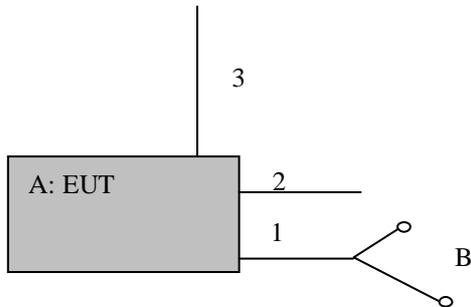
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4.2 Configuration of tested system
[Conducted emission]



[Radiated emission]



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID (Remarks)
A	Digital Media Player	NWZ-Z1040	400500 *1), 400508 *2)	Sony Corporation	AK8NWZZ1000
B	Headphone set	MDR-EX0300LP	-	Sony Corporation	-
C	Laptop PC	HP ProBook 4420s	CNF1062V3N	HP	-
D	Mouse	MO28UOL	44A0208067	lenovo	-
E	AC adapter	PA-1650-32HT	PPP009L-E	HP	-

*1) Used for Radiated emission tests.

*2) Used for Antenna terminal tests.

List of cables used

No.	Cable Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Headphone	1.5	Unshielded	Unshielded	-
2	WM-PORT Jack: USB conversion	1.0	Shielded	Shielded	-
3	HDMI	1.5	Shielded	Shielded	-
4	USB	1.8	Shielded	Shielded	-
5	DC	1.8	Shielded	Shielded	-
6	AC	1.7	Shielded	Shielded	-

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SECTION 5: Conducted emission

5.1 Operating environment

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

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals was aligned and was flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from LISN and excess AC cable was bundled in center. 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. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. All unused 50ohm connectors of the LISN were resistively terminated in 50ohm when not connected to the measuring equipment. Photographs of the set up are shown in APPENDIX 3.

5.3 Test conditions

Frequency range : 0.15 - 30MHz
EUT position : Table top
EUT operation mode : Refer to SECTION 4.1

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT via Host device within a Shielded room. The Host device was connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection has been performed. The measurements had been performed with a quasi-peak detector and if required, an average detector. The conducted emission measurements were made with the following detection of the test receiver.

Detection Type : Quasi-Peak/ Average
IF Bandwidth : 9kHz

5.5 Results

Summary of the test results : Pass
Refer to APPENDIX 1

SECTION 6: Radiated emission

6.1 Operating environment

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

6.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.

The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.

The configuration was set in accordance with ANSI C63.4: 2003.

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.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Photographs of the set up are shown in APPENDIX 3.

6.3 Test conditions

Frequency range : 30MHz to 26GHz
 Test distance : 3m(below 13GHz) / 1m(above13GHz)
 EUT position : Table top
 EUT operation mode : Refer to SECTION 4.1

6.4 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 13GHz) / 1m(above 13GHz) (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	:	30M-1000MHz	1000M-26000MHz	
Detection Type	:	Quasi-Peak	Peak	* Average
IF Bandwidth	:	120kHz	RBW:1MHz/VBW:3MHz	RBW:1MHz/VBW:See data or 10Hz

* When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

* The VBW was based on the inverse of the duty cycle (Refer to APPENDIX 1).

The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Worst position:

	Frequency	Carrier	Spurious			
			30M-1GHz	1-13GHz	13-18GHz	18-26.5GHz
EUT	Horizontal	Z	Z	Z	Z	Z
	Vertical	Y	Y	Z	Z	Z

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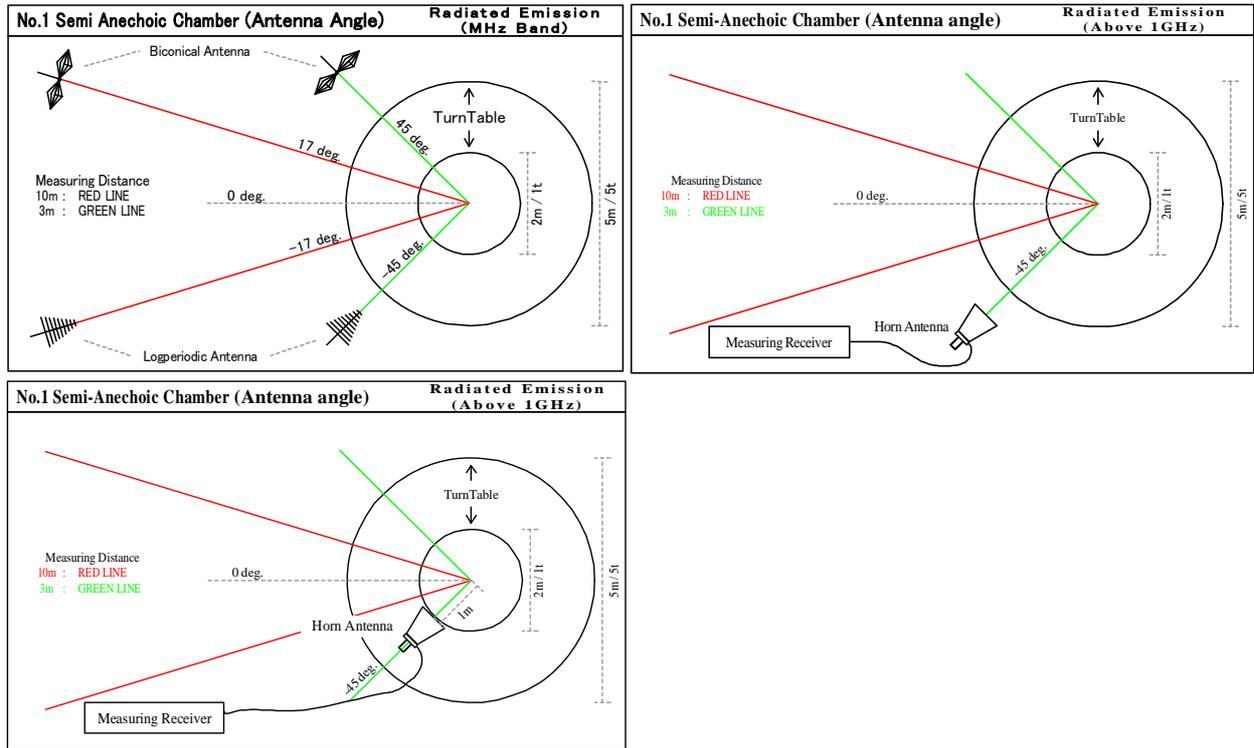


Figure 1. Antenna angle

6.5 Band edge

Band edge level at 2390MHz, 2400MHz and 2483.5MHz is below the limits of FCC 15.209. Refer to the data of Radiated emission.

6.6 Results

Summary of the test results : Pass *No noise was detected above the 5th order harmonics.
Refer to APPENDIX 1

SECTION 7: Out of band 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.

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 8: 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 9: 20dB or 6dB bandwidth & Occupied bandwidth (99%)

Test procedure

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

The bandwidth was measured 20dB bandwidth and 99% occupied bandwidth. 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 10: 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 11: 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 12: 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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Contents of APPENDIXES

APPENDIX 1: Data of EMI test

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DATA OF CONDUCTED EMISSION TEST

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Date : 2011/11/19

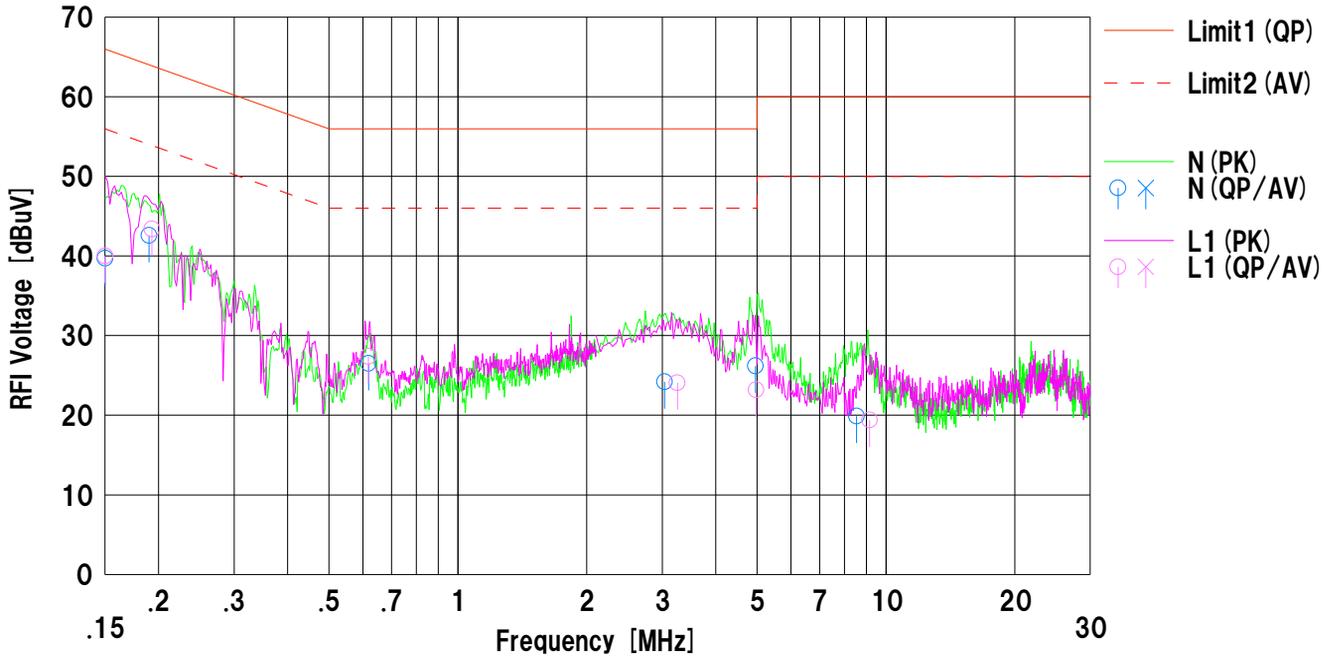
Company : Sony Corporation
Kind of EUT : Digital Media Player
Model No. : NWZ-Z1040
Serial No. : 400500

Mode : BT_Tx_DH5_2441MHz
Report No. : 32AE0305-SH-02-A
Power : AC120V/60Hz
Temp./Humi. : 23deg.C. / 56%RH

Remarks : -

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Wataru Kojima



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	27.0	---	12.7	39.7	---	66.0	56.0	26.3	---	N	
2	0.18980	29.9	---	12.7	42.6	---	64.0	54.0	21.4	---	N	
3	0.61840	13.8	---	12.7	26.5	---	56.0	46.0	29.5	---	N	
4	3.04200	11.3	---	12.9	24.2	---	56.0	46.0	31.8	---	N	
5	4.95400	13.3	---	12.9	26.2	---	56.0	46.0	29.8	---	N	
6	8.54500	6.7	---	13.2	19.9	---	60.0	50.0	40.1	---	N	
7	0.15000	27.3	---	12.7	40.0	---	65.9	55.9	25.9	---	L1	
8	0.19280	30.7	---	12.7	43.4	---	63.9	53.9	20.5	---	L1	
9	0.61800	14.7	---	12.7	27.4	---	56.0	46.0	28.6	---	L1	
10	3.25800	11.2	---	12.9	24.1	---	56.0	46.0	31.9	---	L1	
11	4.97100	10.3	---	12.9	23.2	---	56.0	46.0	32.8	---	L1	
12	9.16000	6.2	---	13.2	19.4	---	60.0	50.0	40.6	---	L1	

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber
Date : 2011/11/19

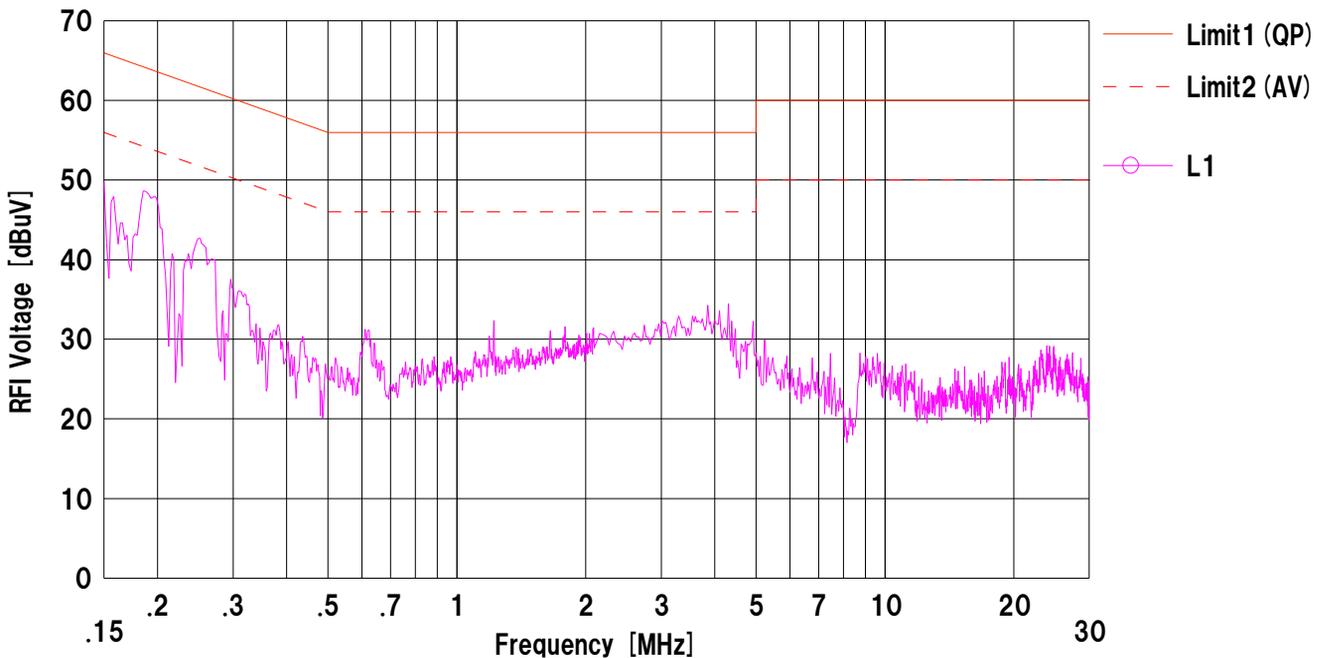
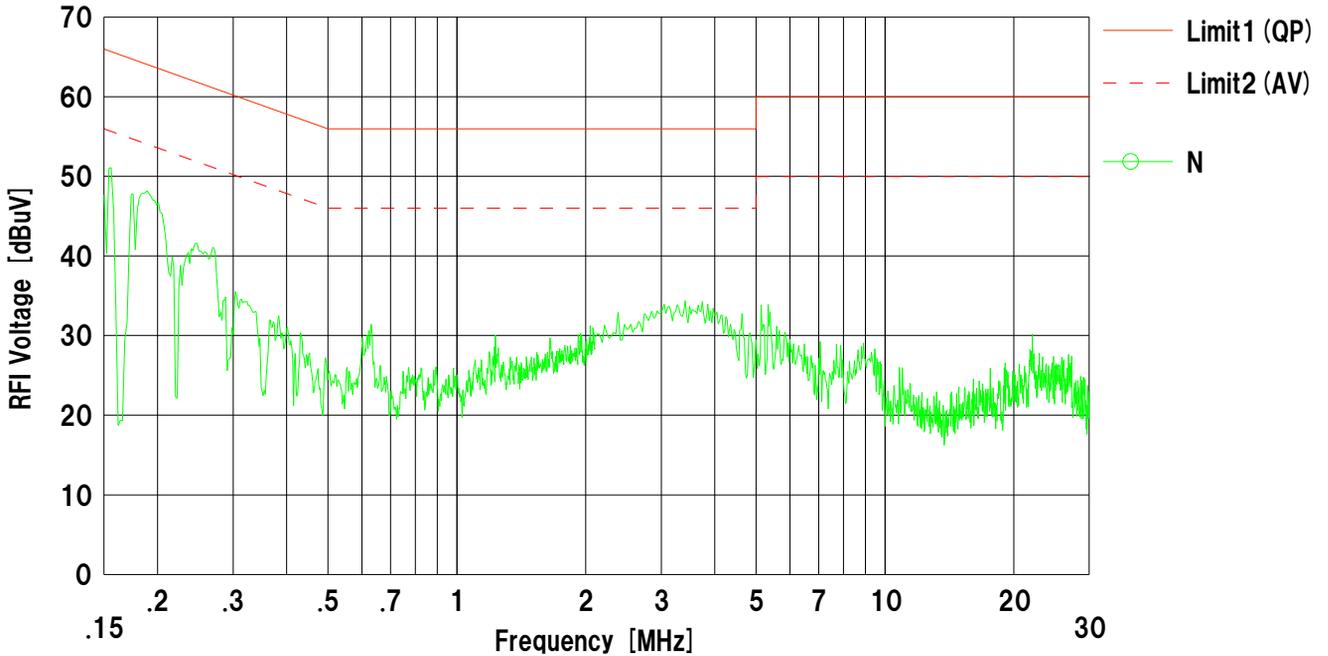
Company : Sony Corporation
Kind of EUT : Digital Media Player
Model No. : NWZ-Z1040
Serial No. : 400500

Mode : BT_Tx_DH5_2402MHz
Report No. : 32AE0305-SH-02-A
Power : AC120V/60Hz
Temp./Humi. : 23deg.C. / 56%RH

Remarks : -

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Wataru Kojima



DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber
Date : 2011/11/19

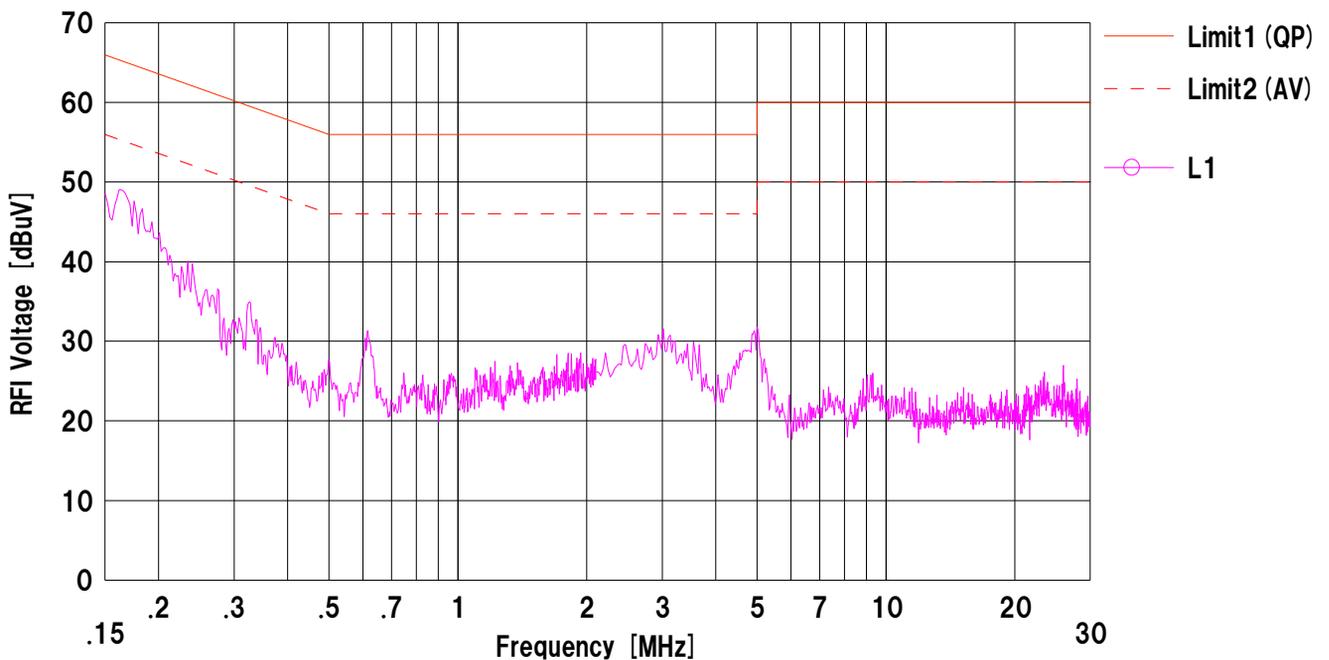
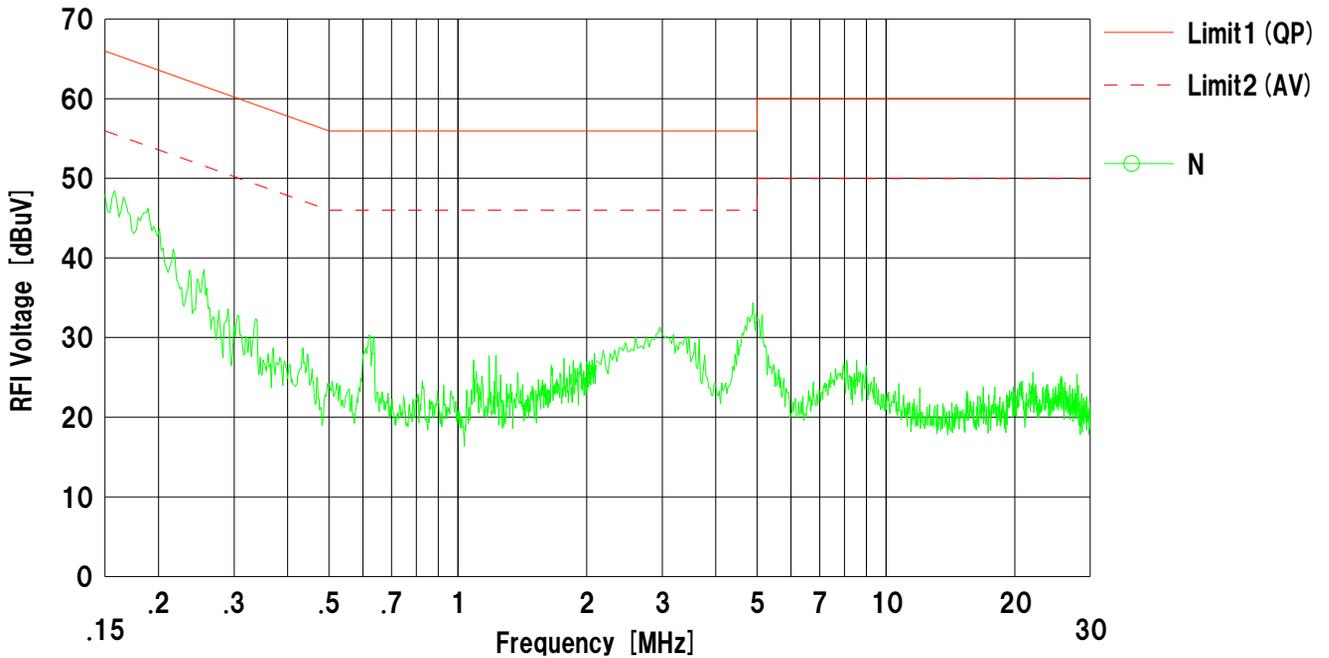
Company : Sony Corporation
Kind of EUT : Digital Media Player
Model No. : NWZ-Z1040
Serial No. : 400500

Mode : BT_Tx_DH5_2480MHz
Report No. : 32AE0305-SH-02-A
Power : AC120V/60Hz
Temp./Humi. : 23deg.C. / 56%RH

Remarks : -

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Wataru Kojima



Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-03

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber
Date : 2011/11/19

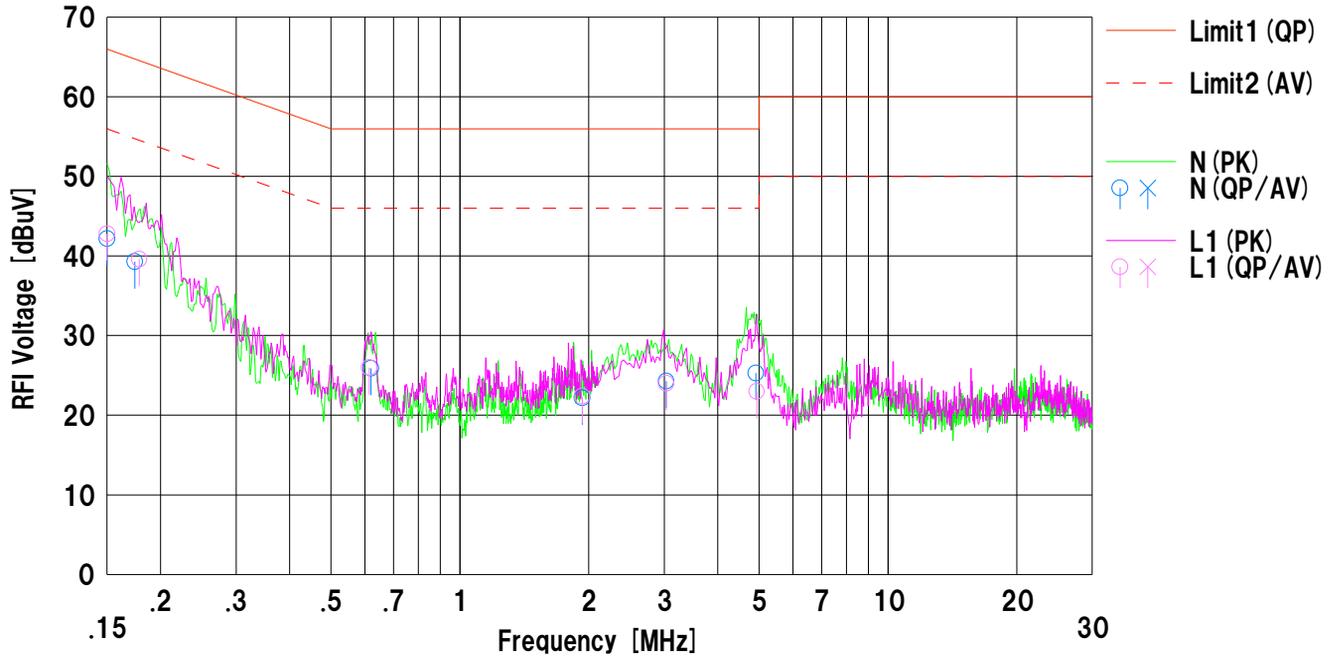
Company : Sony Corporation
Kind of EUT : Digital Media Player
Model No. : NWZ-Z1040
Serial No. : 400500

Mode : BT_Tx_3-DH5_2441MHz
Report No. : 32AE0305-SH-02-A
Power : AC120V/60Hz
Temp./Humi. : 23deg.C. / 56%RH

Remarks : -

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Wataru Kojima



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	29.5	---	12.7	42.2	---	66.0	56.0	23.8	---	N	
2	0.17400	26.6	---	12.7	39.3	---	64.7	54.7	25.4	---	N	
3	0.62000	13.2	---	12.7	25.9	---	56.0	46.0	30.1	---	N	
4	1.93120	9.4	---	12.8	22.2	---	56.0	46.0	33.8	---	N	
5	3.03520	11.4	---	12.9	24.3	---	56.0	46.0	31.7	---	N	
6	4.91400	12.4	---	12.9	25.3	---	56.0	46.0	30.7	---	N	
7	0.15000	30.1	---	12.7	42.8	---	65.9	55.9	23.1	---	L1	
8	0.17820	26.9	---	12.7	39.6	---	64.5	54.5	24.9	---	L1	
9	0.61500	13.3	---	12.7	26.0	---	56.0	46.0	30.0	---	L1	
10	1.93080	9.6	---	12.8	22.4	---	56.0	46.0	33.6	---	L1	
11	3.03300	11.1	---	12.9	24.0	---	56.0	46.0	32.0	---	L1	
12	4.93500	10.1	---	12.9	23.0	---	56.0	46.0	33.0	---	L1	

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber
Date : 2011/11/19

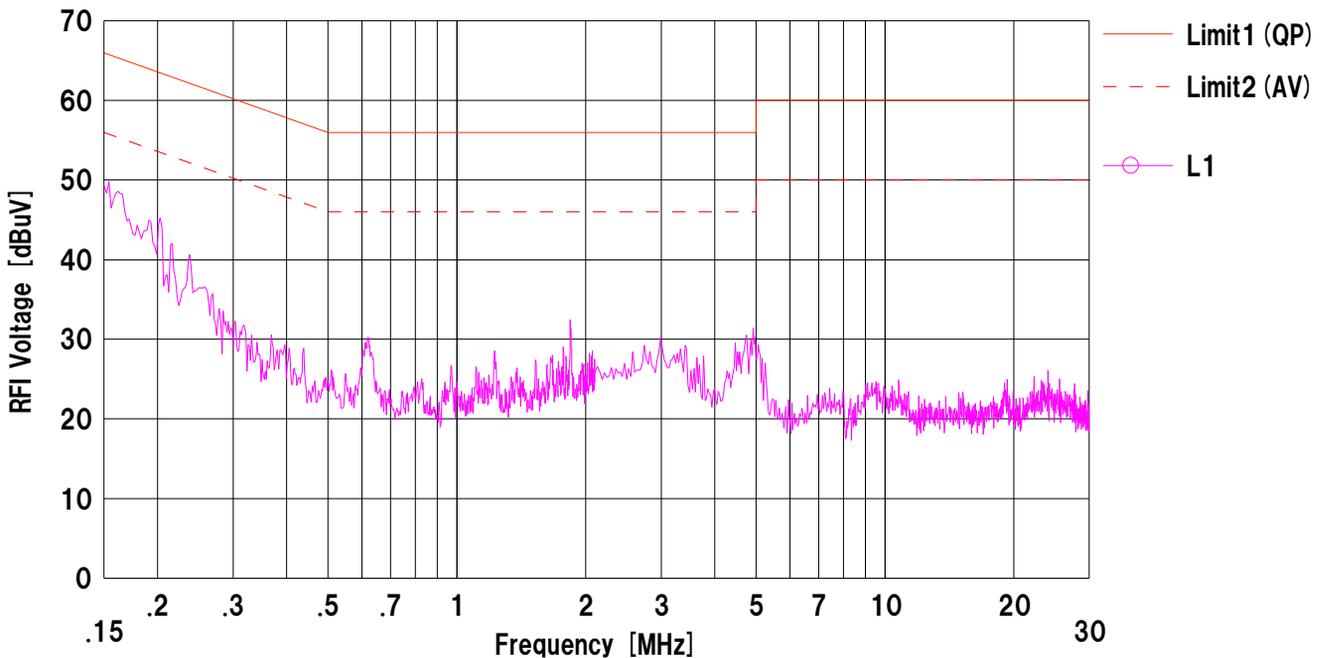
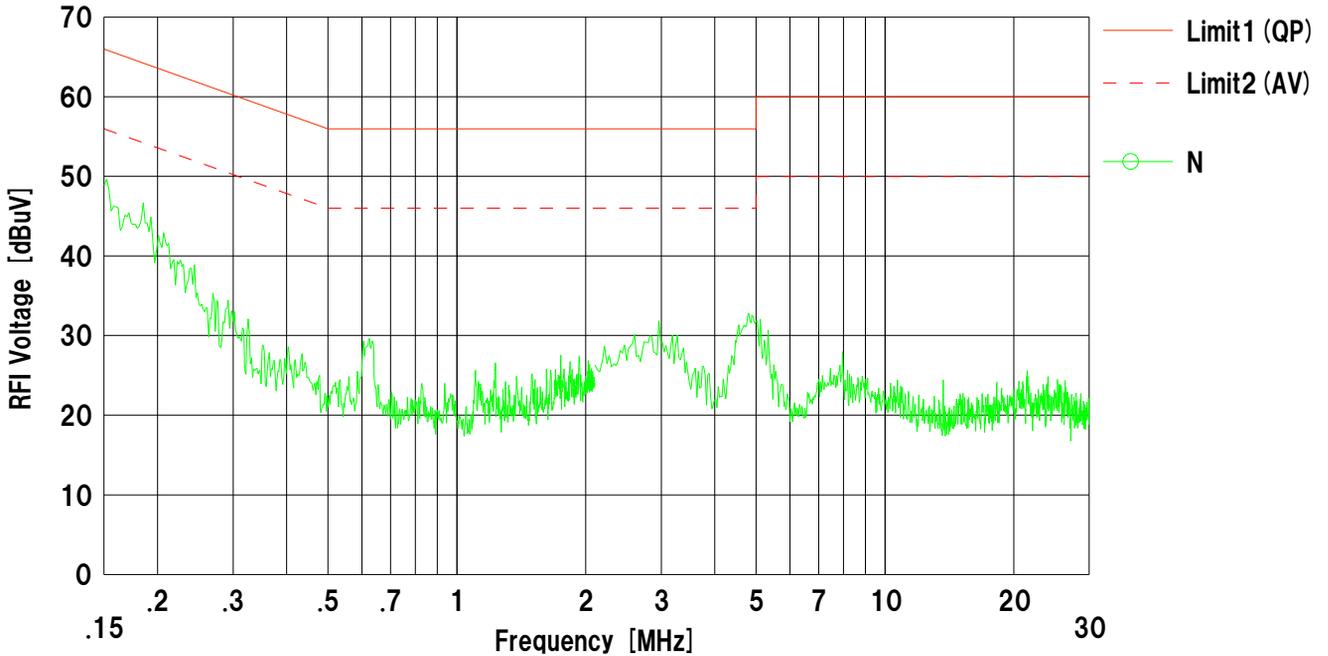
Company : Sony Corporation
Kind of EUT : Digital Media Player
Model No. : NWZ-Z1040
Serial No. : 400500

Mode : BT_Tx_3-DH5_2402MHz
Report No. : 32AE0305-SH-02-A
Power : AC120V/60Hz
Temp./Humi. : 23deg.C. / 56%RH

Remarks : -

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Wataru Kojima



DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Semi-Anechoic Chamber
Date : 2011/11/19

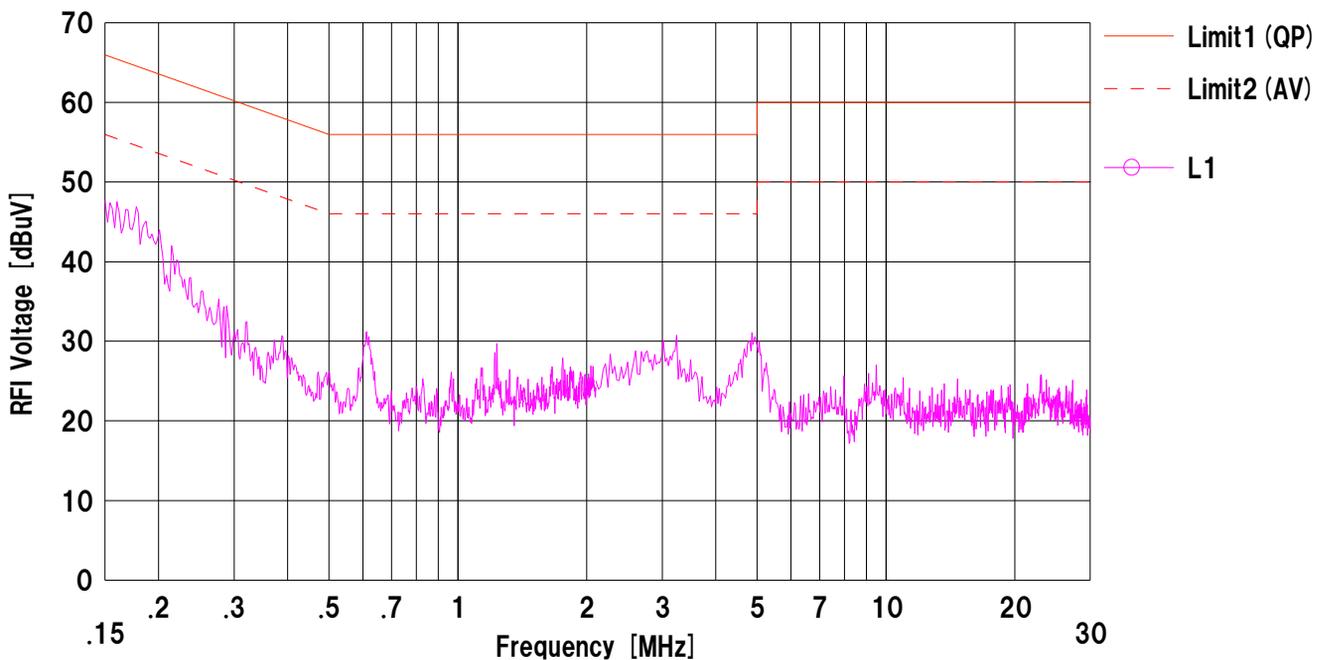
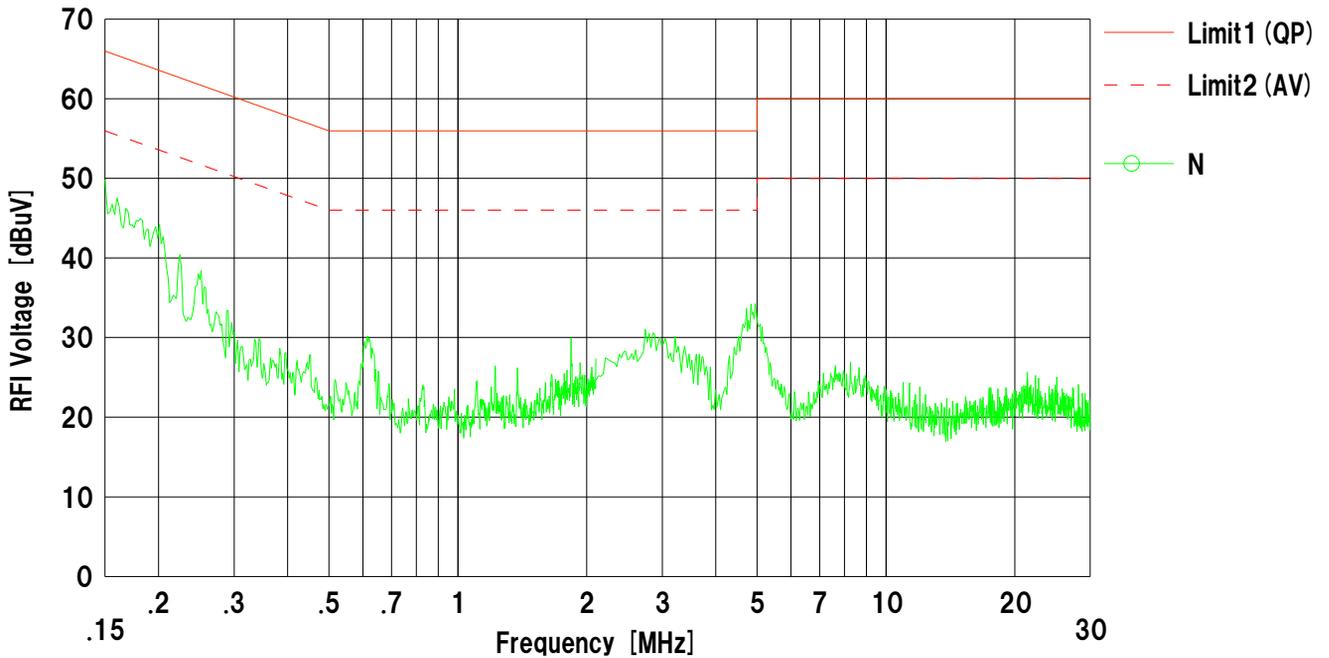
Company : Sony Corporation
Kind of EUT : Digital Media Player
Model No. : NWZ-Z1040
Serial No. : 400500

Mode : BT_Tx_3-DH5_2480MHz
Report No. : 32AE0305-SH-02-A
Power : AC120V/60Hz
Temp./Humi. : 23deg.C. / 56%RH

Remarks : -

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Wataru Kojima



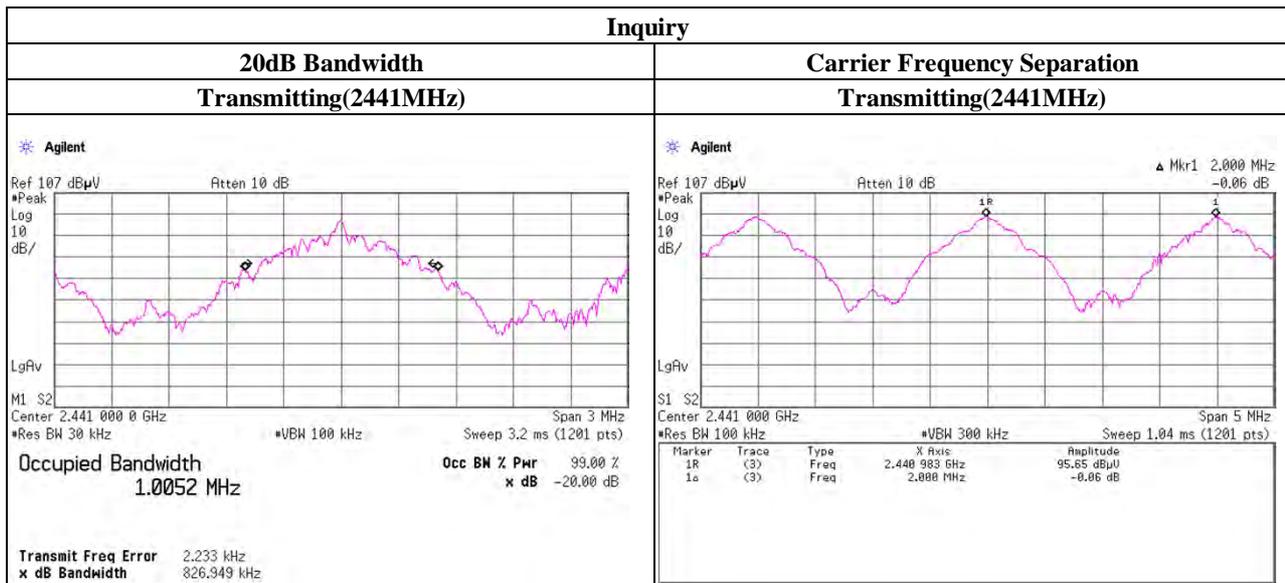
20dB Bandwidth and Carrier Frequency Separation

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	November 2, 2011	
Temperature / Humidity	24deg.C , 44%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	1.020	1.000	>= 0.680
DH5	2441.0	1.022	1.000	>= 0.681
DH5	2480.0	1.020	1.000	>= 0.680
Inquiry	2441.0	0.827	2.000	>= 0.551

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

No limit applies to 20dB Bandwidth.



UL Japan, Inc.
Shonan EMC Lab.

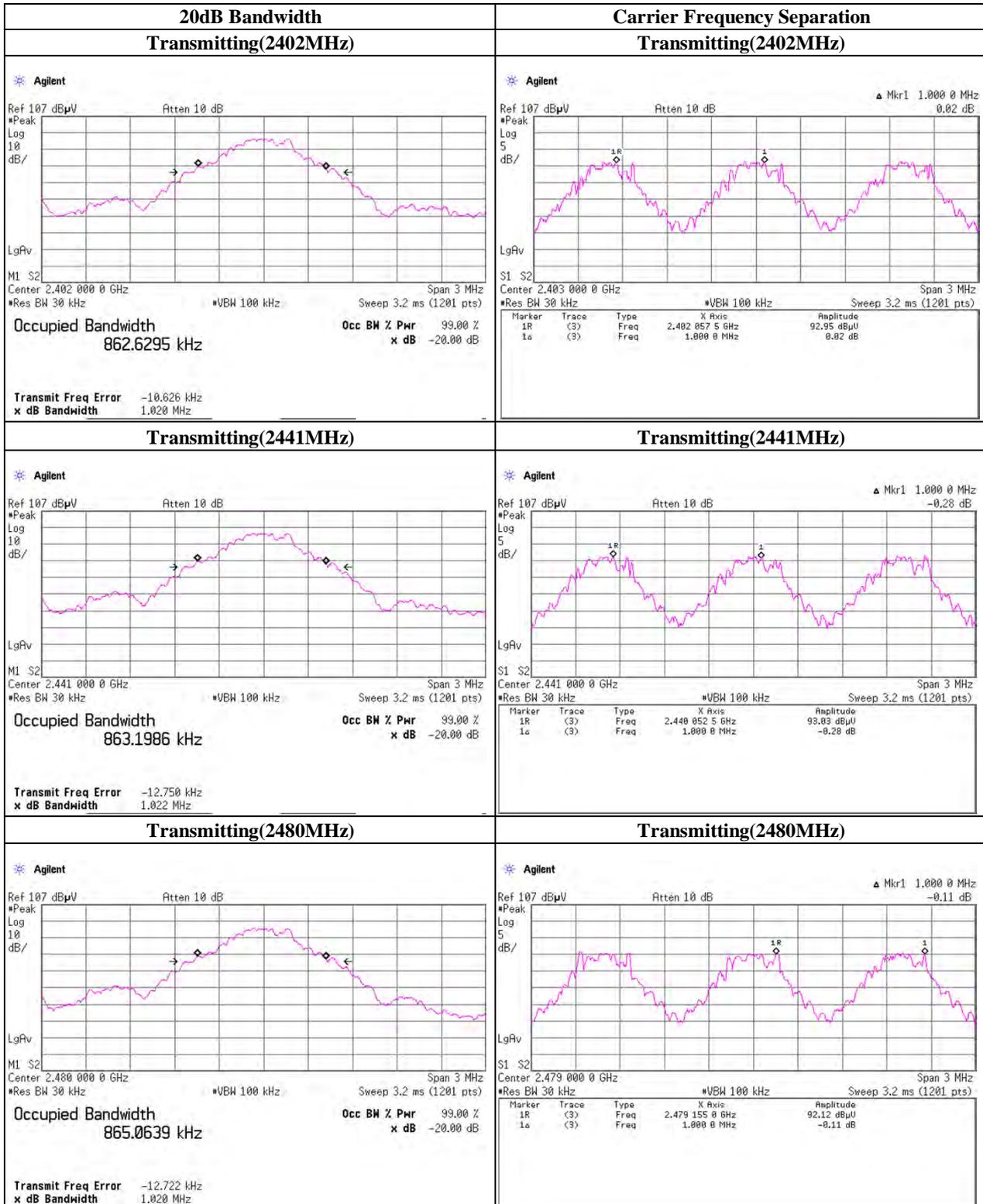
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, BDR (Worst: DH5), PRBS9



UL Japan, Inc.

Shonan EMC Lab.

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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

20dB Bandwidth and Carrier Frequency Separation

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date November 2, 2011
 Temperature / Humidity 24deg.C , 44%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	1.281	1.000	>= 0.854
3-DH5	2441.0	1.281	1.000	>= 0.854
3-DH5	2480.0	1.283	1.000	>= 0.855

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

No limit applies to 20dB Bandwidth.

UL Japan, Inc.

Shonan EMC Lab.

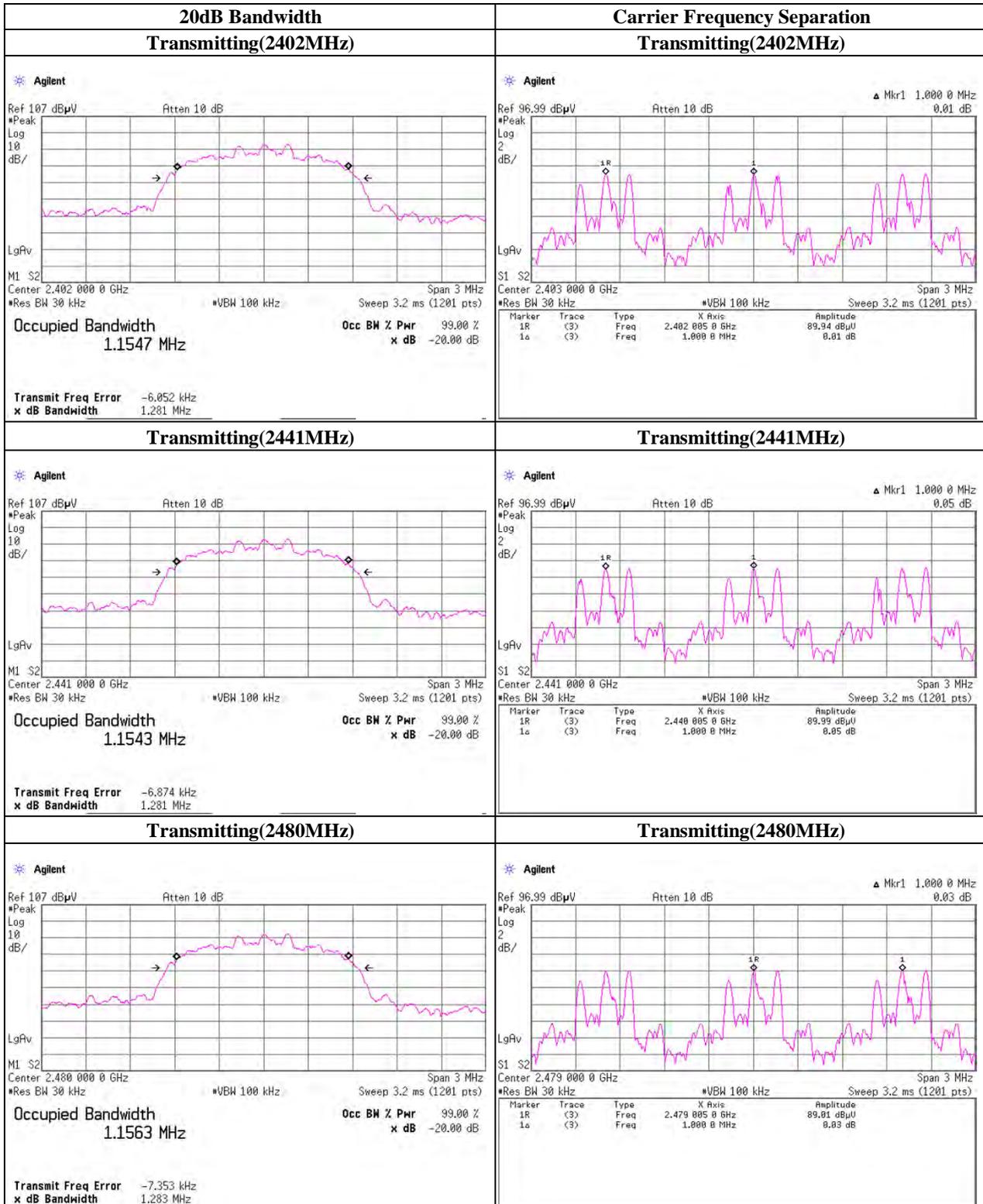
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

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20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, EDR, PRBS9



UL Japan, Inc.

Shonan EMC Lab.

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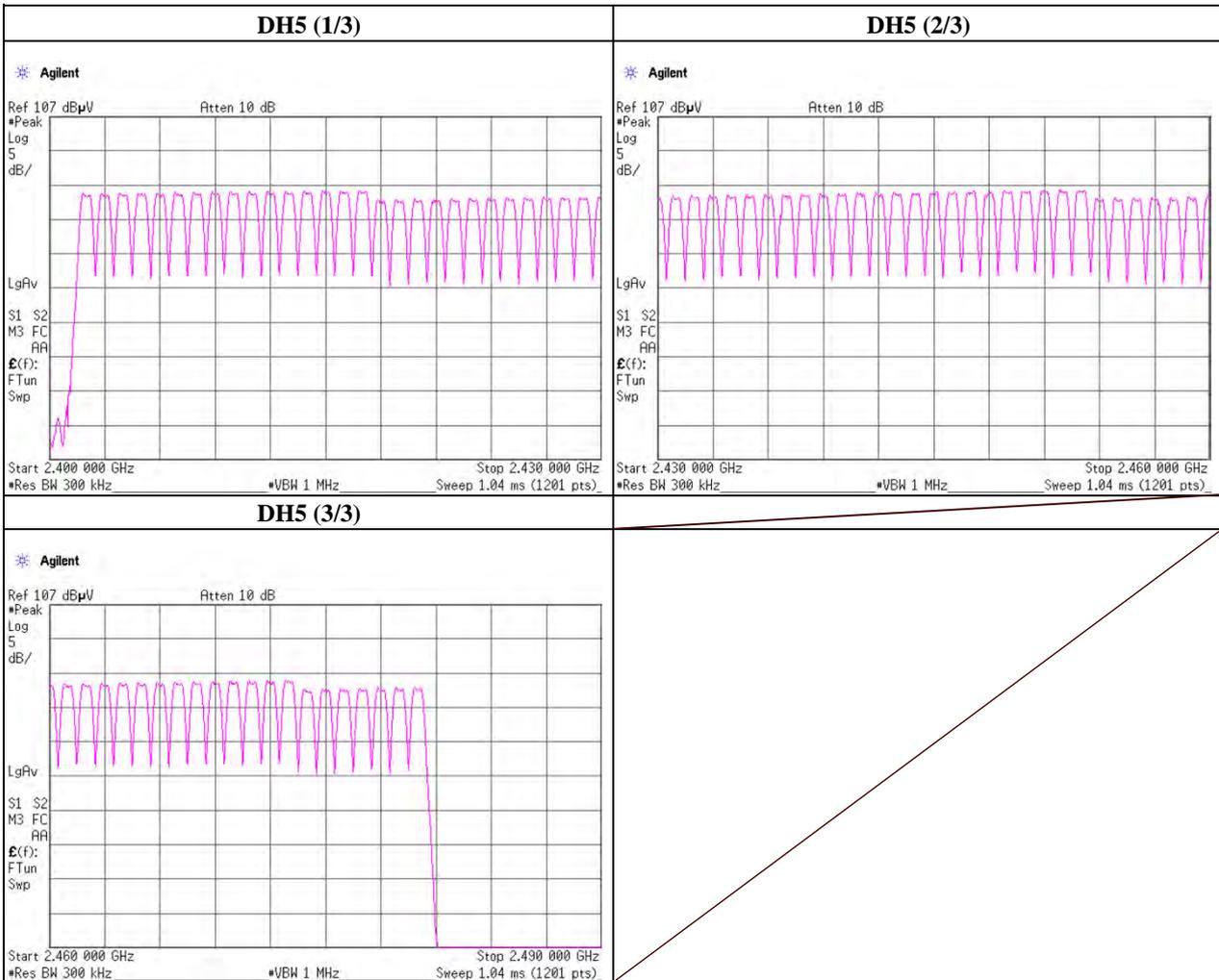
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	November 2, 2011	
Temperature / Humidity	24deg.C , 44%RH	
Engineer	Makoto Hosaka	
Mode	Tx, Bluetooth, BDR, PRBS9	

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

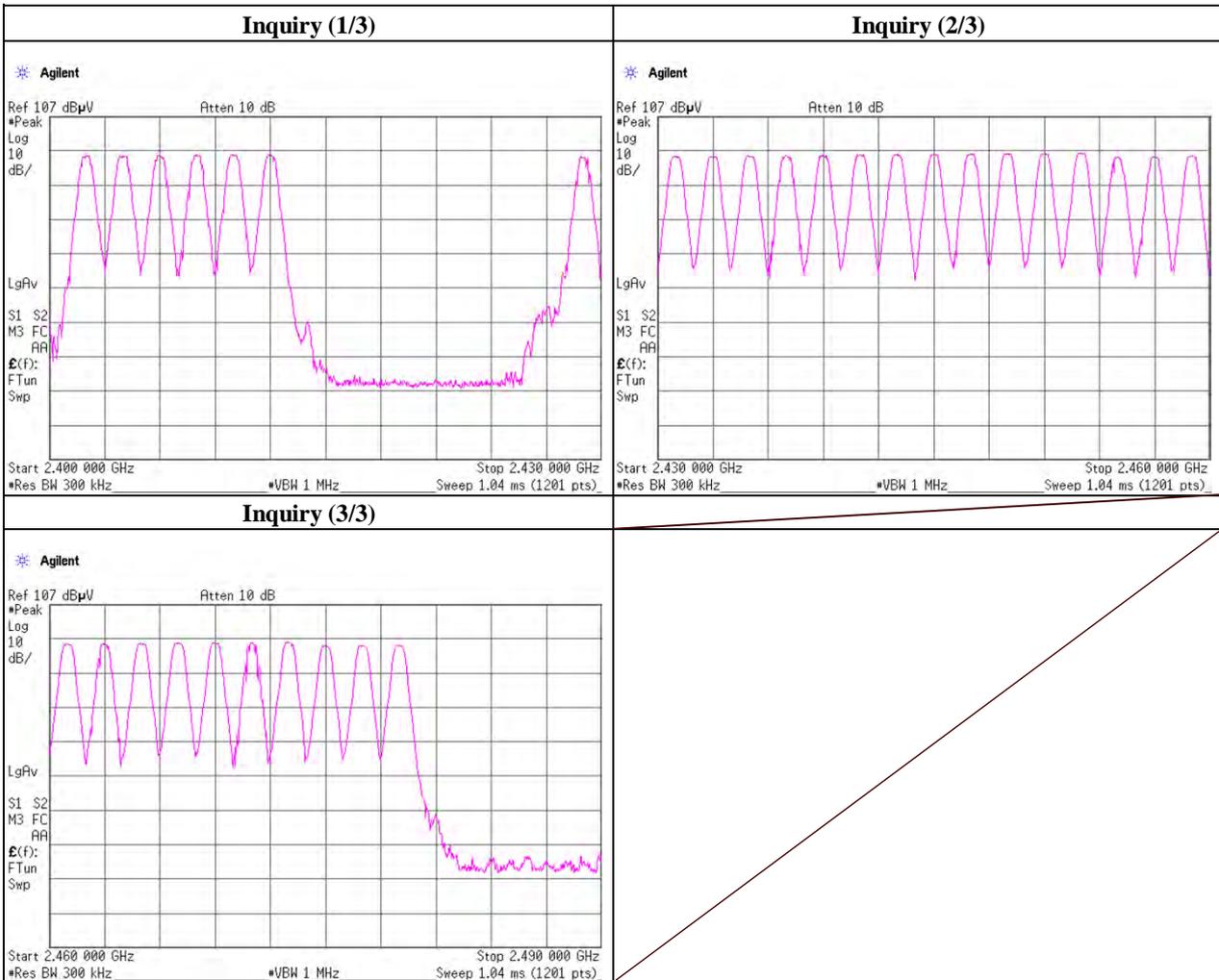


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Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	November 2, 2011	
Temperature / Humidity	24deg.C , 44%RH	
Engineer	Makoto Hosaka	
Mode	Tx, Bluetooth, BDR, Inquiry	

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

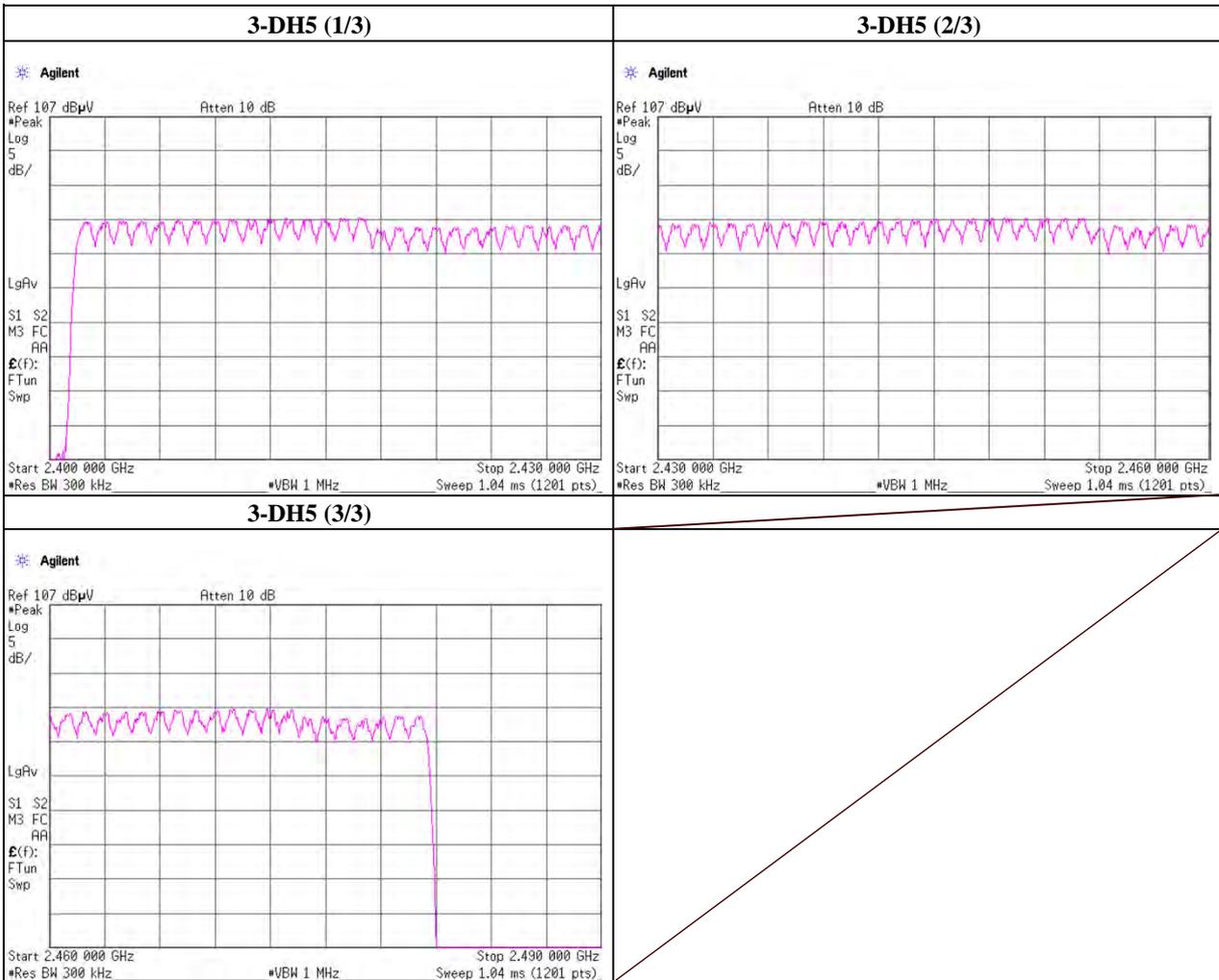


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Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	November 2, 2011	
Temperature / Humidity	24deg.C , 44%RH	
Engineer	Makoto Hosaka	
Mode	Tx, Bluetooth, EDR, PRBS9	

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



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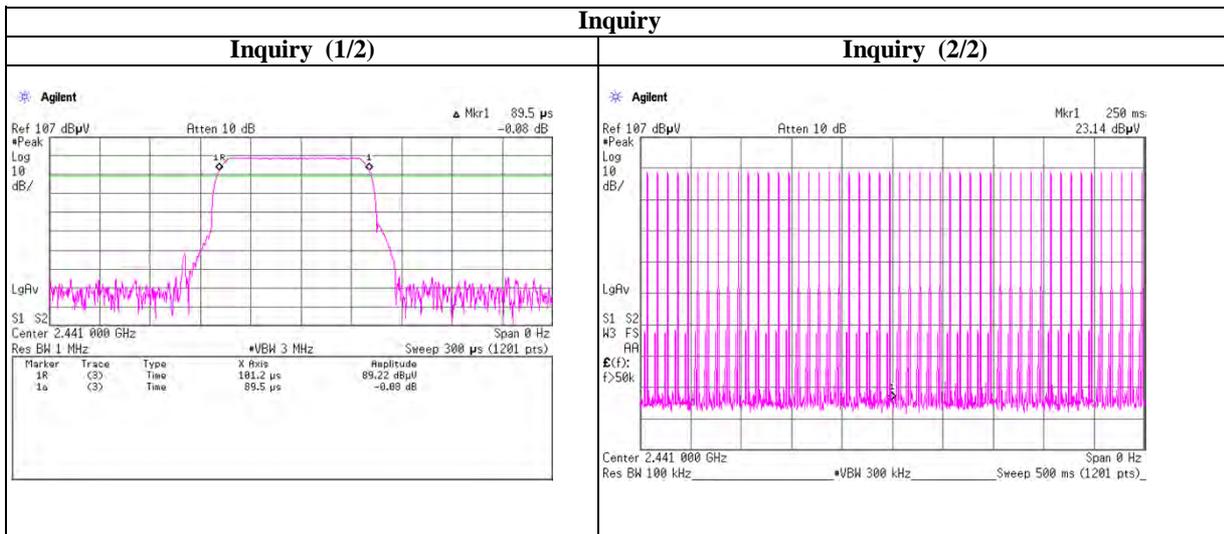
Dwell Time

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date November 2, 2011
 Temperature / Humidity 24deg.C , 44%RH
 Engineer Makoto Hosaka
 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	0.380	123	400
DH3	26.0	/ 5.0 sec. x 31.6 sec. = 165 times	1.644	271	400
DH5	17.0	/ 5.0 sec. x 31.6 sec. = 108 times	2.890	312	400
Inquiry	50.0	/ 0.5 sec. x 12.8 sec. = 1280 times	0.090	115	400

Sample Calculation

Result = Number of transmission x Length of transmittion time



UL Japan, Inc.

Shonan EMC Lab.

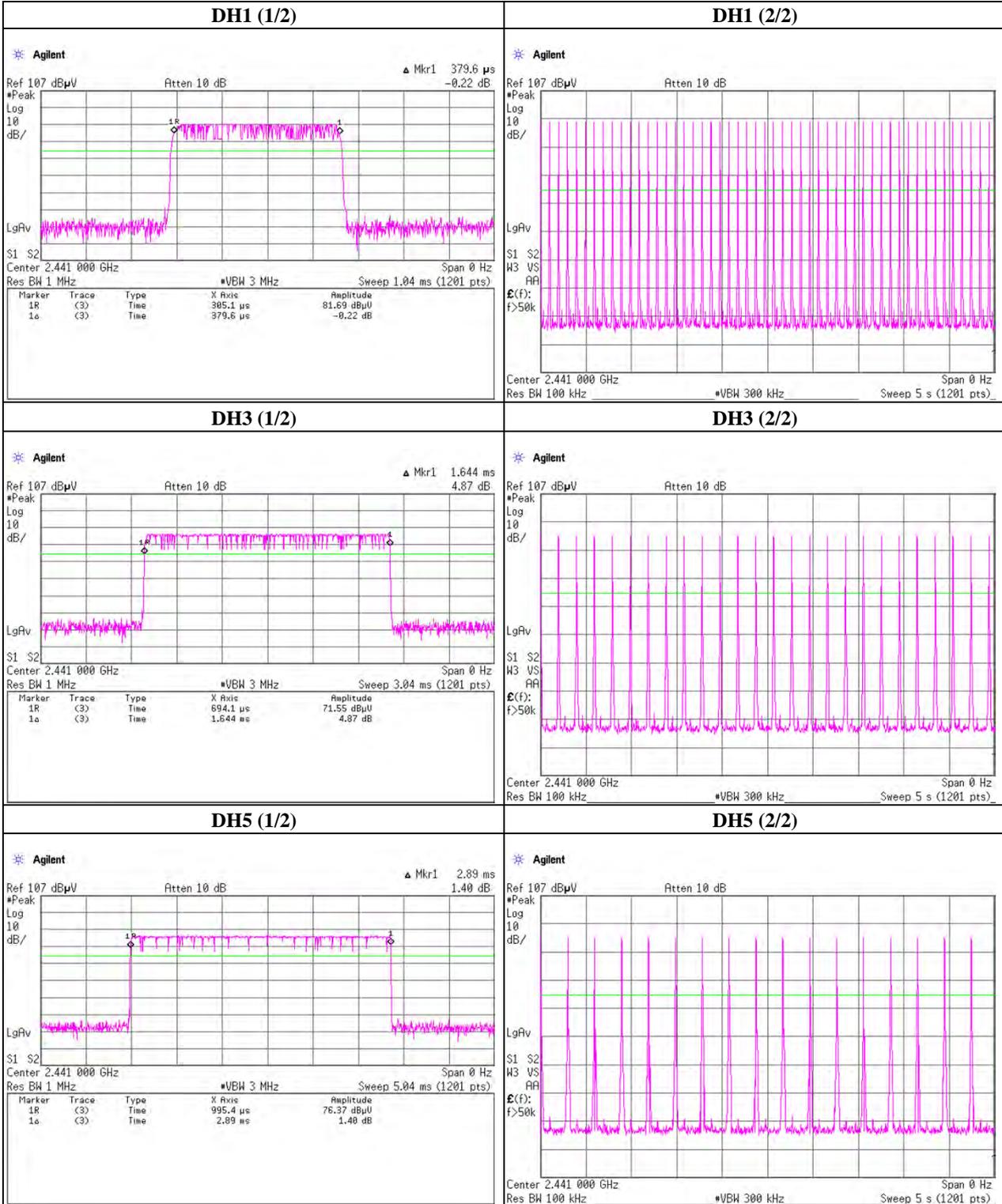
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Dwell time

Tx, Bluetooth, BDR, PRBS9



UL Japan, Inc.

Shonan EMC Lab.

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Dwell Time

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date November 2, 2011
 Temperature / Humidity 24deg.C , 44%RH
 Engineer Makoto Hosaka
 Mode Tx, Bluetooth, EDR, 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]
3-DH1	51.0	/ 5.0 sec.	x 31.6 sec. = 323 times	0.388	125	400
3-DH3	26.0	/ 5.0 sec.	x 31.6 sec. = 165 times	1.639	270	400
3-DH5	17.0	/ 5.0 sec.	x 31.6 sec. = 108 times	2.885	312	400

Sample Calculation

Result = Number of transmission x Length of transmission time

UL Japan, Inc.

Shonan EMC Lab.

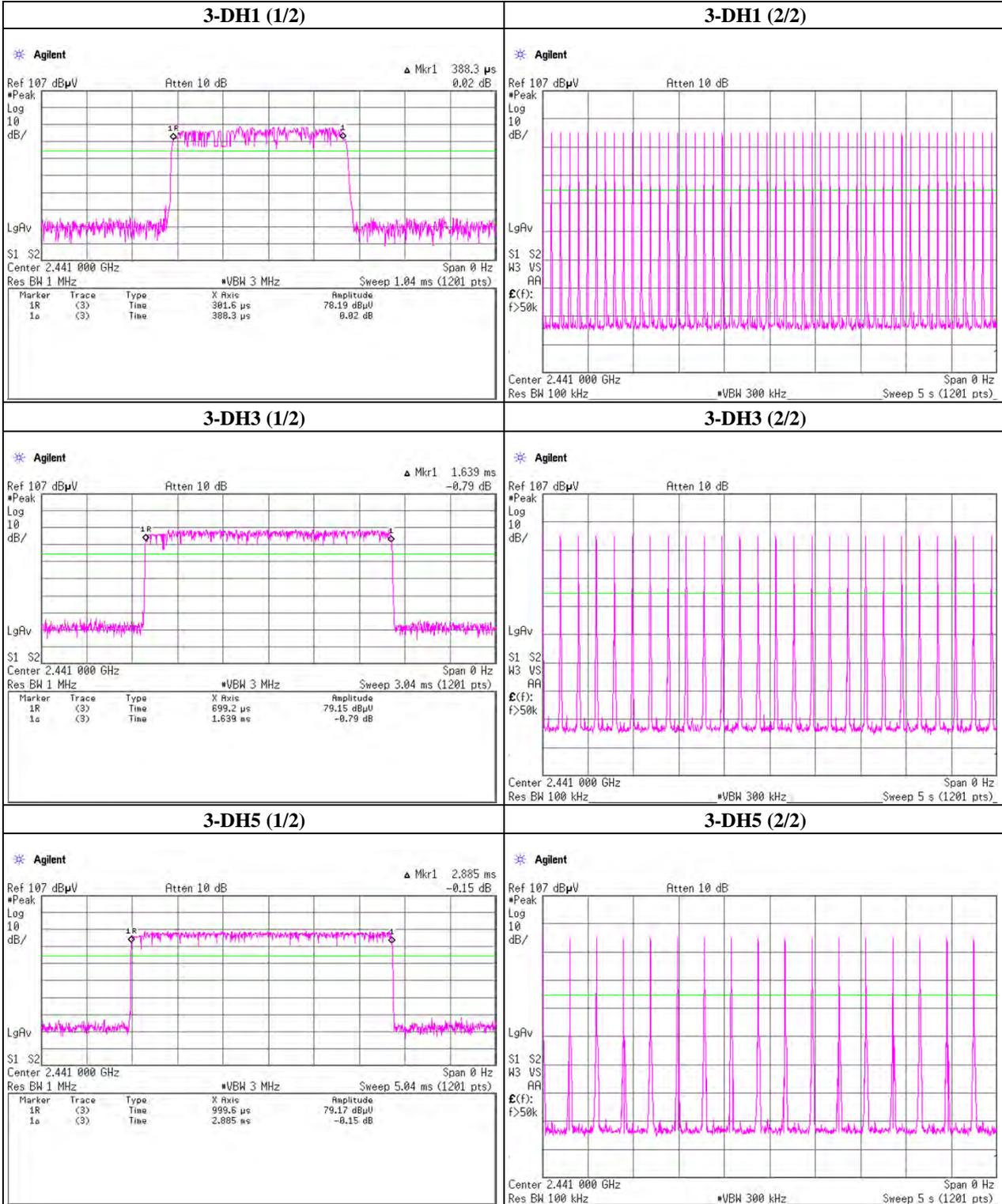
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Dwell time

Tx, Bluetooth, EDR, PRBS9



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Shonan EMC Lab.

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date October 31, 2011
 Temperature / Humidity 25deg.C , 51%RH
 Engineer Wataru Kojima
 Mode Tx, Bluetooth

(* P/M: Power Meter)

	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-10.71	1.43	9.97	0.69	1.17	20.97	125	20.28
DH5	2441.0	-10.64	1.44	9.97	0.77	1.19	20.97	125	20.20
DH5	2480.0	-11.58	1.45	9.97	-0.16	0.96	20.97	125	21.13
2-DH5	2402.0	-13.22	1.43	9.97	-1.82	0.66	20.97	125	22.79
2-DH5	2441.0	-13.15	1.44	9.97	-1.74	0.67	20.97	125	22.71
2-DH5	2480.0	-14.11	1.45	9.97	-2.69	0.54	20.97	125	23.66
3-DH5	2402.0	-12.86	1.43	9.97	-1.46	0.71	20.97	125	22.43
3-DH5	2441.0	-12.67	1.44	9.97	-1.26	0.75	20.97	125	22.23
3-DH5	2480.0	-13.63	1.45	9.97	-2.21	0.60	20.97	125	23.18

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Semi Anechoic Chamber
Date	November 11, 2011	November 12, 2011
Temperature / Humidity	23deg.C , 48%RH	23deg.C , 52%RH
Engineer	Hikaru Shirasawa	Tatsuya Arai
Mode	Tx, 2402 MHz Tx, Bluetooth, BDR, PRBS9	

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.	384.000	QP	37.3	15.9	7.5	31.8	28.9	46.0	17.1	100	35	PK Detector
Hori.	432.000	QP	34.6	16.6	7.8	31.8	27.2	46.0	18.8	100	88	RBW:1MHz
Hori.	2390.000	PK	46.6	28.2	13.8	40.6	48.0	73.9	25.9	123	158	VBW:3MHz
Hori.	2400.000	PK	62.9	28.2	13.8	40.6	64.3	73.9	9.6	123	158	
Hori.	2505.958	PK	46.0	28.7	13.8	40.5	48.0	73.9	25.9	118	298	
Hori.	2531.990	PK	45.6	28.7	13.8	40.5	47.6	73.9	26.3	118	298	
Hori.	2557.981	PK	46.2	28.7	13.8	40.6	48.1	73.9	25.8	118	298	
Hori.	2583.990	PK	45.3	28.8	13.8	40.6	47.3	73.9	26.6	118	298	
Hori.	4804.000	PK	55.8	31.2	6.0	41.5	51.5	73.9	22.4	130	165	
Hori.	7206.000	PK	50.4	36.1	7.6	40.7	53.4	73.9	20.5	104	157	
Hori.	9608.000	PK	49.3	38.6	8.7	40.5	56.1	73.9	17.8	107	36	
Hori.	12010.000	PK	46.7	39.5	10.3	39.5	57.0	73.9	16.9	100	0	
Vert.	104.176	QP	25.2	10.8	8.0	31.8	12.2	43.5	31.3	100	284	
Vert.	167.342	QP	25.0	15.3	8.7	31.8	17.2	43.5	26.3	100	80	
Vert.	240.000	QP	31.5	17.1	9.3	31.7	26.2	46.0	19.8	100	12	
Vert.	576.022	QP	32.0	18.6	8.5	32.0	27.1	46.0	18.9	100	355	
Vert.	2390.000	PK	45.9	28.2	13.8	40.6	47.3	73.9	26.6	103	164	
Vert.	2400.000	PK	62.0	28.2	13.8	40.6	63.4	73.9	10.5	103	164	
Vert.	2505.958	PK	45.8	28.7	13.8	40.5	47.8	73.9	26.1	100	206	
Vert.	2531.990	PK	45.7	28.7	13.8	40.5	47.7	73.9	26.2	100	206	
Vert.	2557.981	PK	46.5	28.7	13.8	40.6	48.4	73.9	25.5	100	206	
Vert.	2583.990	PK	45.5	28.8	13.8	40.6	47.5	73.9	26.4	100	206	
Vert.	4804.000	PK	51.5	31.2	6.0	41.5	47.2	73.9	26.7	100	267	
Vert.	7206.000	PK	50.4	36.1	7.6	40.7	53.4	73.9	20.5	108	132	
Vert.	9608.000	PK	48.5	38.6	8.7	40.5	55.3	73.9	18.6	102	62	
Vert.	12010.000	PK	47.0	39.5	10.3	39.5	57.3	73.9	16.6	100	0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

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

Distance factor: 13GHz-40GHz $20\log(3.0\text{m}/1.0\text{m})= 9.5\text{dB}$

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Semi Anechoic Chamber
Date	November 11, 2011	November 12, 2011
Temperature / Humidity	23deg.C , 48%RH	23deg.C , 52%RH
Engineer	Hikaru Shirasawa	Tatsuya Arai
Mode	Tx, 2402 MHz Tx, Bluetooth, BDR, PRBS9	

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	36.0	28.2	13.8	40.6	-24.8	12.7	53.9	41.3	All data
Hori.	2400.000	AV	59.8	28.2	13.8	40.6	-24.8	36.5	53.9	17.4	RBW:1MHz
Hori.	2505.958	AV	35.8	28.7	13.8	40.5	-24.8	13.1	53.9	40.8	VBW:270Hz
Hori.	2531.990	AV	36.2	28.7	13.8	40.5	-24.8	13.5	53.9	40.5	
Hori.	2557.981	AV	37.1	28.7	13.8	40.6	-24.8	14.3	53.9	39.7	
Hori.	2583.990	AV	35.5	28.8	13.8	40.6	-24.8	12.8	53.9	41.2	
Hori.	4804.000	AV	51.9	31.2	6.0	41.5	-24.8	22.9	53.9	31.0	
Hori.	7206.000	AV	41.3	36.1	7.6	40.7	-24.8	19.6	53.9	34.4	
Hori.	9608.000	AV	43.4	38.6	8.7	40.5	-24.8	25.5	53.9	28.4	
Hori.	12010.000	AV	36.6	39.5	10.3	39.5	-24.8	22.2	53.9	31.8	
Vert.	2390.000	AV	35.8	28.2	13.8	40.6	-24.8	12.5	53.9	41.5	
Vert.	2400.000	AV	57.7	28.2	13.8	40.6	-24.8	34.4	53.9	19.6	
Vert.	2505.958	AV	36.0	28.7	13.8	40.5	-24.8	13.3	53.9	40.7	
Vert.	2531.990	AV	36.7	28.7	13.8	40.5	-24.8	14.0	53.9	40.0	
Vert.	2557.981	AV	38.0	28.7	13.8	40.6	-24.8	15.2	53.9	38.8	
Vert.	2583.990	AV	35.6	28.8	13.8	40.6	-24.8	12.9	53.9	41.0	
Vert.	4804.000	AV	46.0	31.2	6.0	41.5	-24.8	17.0	53.9	36.9	
Vert.	7206.000	AV	42.1	36.1	7.6	40.7	-24.8	20.4	53.9	33.5	
Vert.	9608.000	AV	40.0	38.6	8.7	40.5	-24.8	22.1	53.9	31.9	
Vert.	12010.000	AV	36.6	39.5	10.3	39.5	-24.8	22.2	53.9	31.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

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

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Semi Anechoic Chamber
Date	November 11, 2011	November 12, 2011
Temperature / Humidity	23deg.C , 48%RH	23deg.C , 52%RH
Engineer	Hikaru Shirasawa	Tatsuya Arai
Mode	Tx, 2441 MHz Tx, Bluetooth, BDR, PRBS9	

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.	384.000	QP	37.4	15.9	7.5	31.8	29.0	46.0	17.0	100	351	PK Detector
Hori.	432.009	QP	34.4	16.6	7.8	31.8	27.0	46.0	19.0	100	86	RBW:1MHz
Hori.	2520.000	PK	46.1	28.7	13.8	40.5	48.1	73.9	25.8	100	0	VBW:3MHz
Hori.	2544.990	PK	46.0	28.7	13.8	40.6	47.9	73.9	26.0	100	0	
Hori.	2570.990	PK	45.9	28.7	13.8	40.6	47.8	73.9	26.1	100	0	
Hori.	2583.000	PK	45.0	28.7	13.8	40.6	46.9	73.9	27.0	100	0	
Hori.	2610.000	PK	45.1	28.8	13.8	40.6	47.1	73.9	26.8	100	0	
Hori.	2637.000	PK	46.2	28.8	13.9	40.6	48.3	73.9	25.6	100	0	
Hori.	4882.000	PK	54.3	31.4	6.1	41.5	50.3	73.9	23.6	100	112	
Hori.	7323.000	PK	49.8	36.2	7.6	40.7	52.9	73.9	21.0	103	150	
Hori.	9764.000	PK	48.5	38.7	8.7	40.5	55.4	73.9	18.5	100	36	
Hori.	12205.000	PK	46.1	39.6	10.3	39.5	56.5	73.9	17.4	100	0	
Vert.	104.176	QP	25.3	10.8	8.0	31.8	12.3	43.5	31.2	100	283	
Vert.	167.233	QP	25.1	15.3	8.7	31.8	17.3	43.5	26.2	100	81	
Vert.	239.996	QP	31.6	17.1	9.3	31.7	26.3	46.0	19.7	100	10	
Vert.	576.012	QP	31.7	18.6	8.5	32.0	26.8	46.0	19.2	100	353	
Vert.	2520.000	PK	47.1	28.7	13.8	40.5	49.1	73.9	24.8	100	277	
Vert.	2544.990	PK	46.5	28.7	13.8	40.6	48.4	73.9	25.5	100	277	
Vert.	2570.990	PK	46.5	28.7	13.8	40.6	48.4	73.9	25.5	100	277	
Vert.	2583.000	PK	45.4	28.7	13.8	40.6	47.3	73.9	26.6	100	277	
Vert.	2610.000	PK	46.3	28.8	13.8	40.6	48.3	73.9	25.6	100	277	
Vert.	2637.000	PK	45.5	28.8	13.9	40.6	47.6	73.9	26.3	100	277	
Vert.	4882.000	PK	52.7	31.4	6.1	41.5	48.7	73.9	25.2	117	154	
Vert.	7323.000	PK	49.2	36.2	7.6	40.7	52.3	73.9	21.6	100	222	
Vert.	9764.000	PK	47.6	38.7	8.7	40.5	54.5	73.9	19.4	100	61	
Vert.	12205.000	PK	45.6	39.6	10.3	39.5	56.0	73.9	17.9	100	0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

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

Distance factor: 13GHz-40GHz $20\log(3.0m/1.0m) = 9.5dB$

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Semi Anechoic Chamber
Date	November 11, 2011	November 12, 2011
Temperature / Humidity	23deg.C , 48%RH	23deg.C , 52%RH
Engineer	Hikaru Shirasawa	Tatsuya Arai
Mode	Tx, 2441 MHz Tx, Bluetooth, BDR, PRBS9	

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2520.000	AV	35.9	28.7	13.8	40.5	-24.8	13.2	53.9	40.8	All data
Hori.	2544.990	AV	35.8	28.7	13.8	40.6	-24.8	13.0	53.9	41.0	RBW:1MHz
Hori.	2570.990	AV	35.7	28.7	13.8	40.6	-24.8	12.9	53.9	41.0	VBW:270Hz
Hori.	2583.000	AV	35.6	28.7	13.8	40.6	-24.8	12.8	53.9	41.2	
Hori.	2610.000	AV	35.7	28.8	13.8	40.6	-24.8	13.0	53.9	41.0	
Hori.	2637.000	AV	35.7	28.8	13.9	40.6	-24.8	13.1	53.9	40.8	
Hori.	4882.000	AV	50.0	31.4	6.1	41.5	-24.8	21.3	53.9	32.7	
Hori.	7323.000	AV	42.1	36.2	7.6	40.7	-24.8	20.5	53.9	33.4	
Hori.	9764.000	AV	42.8	38.7	8.7	40.5	-24.8	25.0	53.9	28.9	
Hori.	12205.000	AV	35.7	39.6	10.3	39.5	-24.8	21.4	53.9	32.5	
Vert.	2520.000	AV	35.9	28.7	13.8	40.5	-24.8	13.2	53.9	40.8	
Vert.	2544.990	AV	36.3	28.7	13.8	40.6	-24.8	13.5	53.9	40.5	
Vert.	2570.990	AV	36.6	28.7	13.8	40.6	-24.8	13.8	53.9	40.2	
Vert.	2583.000	AV	35.7	28.7	13.8	40.6	-24.8	12.9	53.9	41.0	
Vert.	2610.000	AV	35.8	28.8	13.8	40.6	-24.8	13.1	53.9	40.8	
Vert.	2637.000	AV	35.8	28.8	13.9	40.6	-24.8	13.2	53.9	40.8	
Vert.	4882.000	AV	47.7	31.4	6.1	41.5	-24.8	19.0	53.9	34.9	
Vert.	7323.000	AV	40.0	36.2	7.6	40.7	-24.8	18.4	53.9	35.5	
Vert.	9764.000	AV	40.0	38.7	8.7	40.5	-24.8	22.2	53.9	31.8	
Vert.	12205.000	AV	35.7	39.6	10.3	39.5	-24.8	21.4	53.9	32.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

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

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Semi Anechoic Chamber
Date	November 11, 2011	November 12, 2011
Temperature / Humidity	23deg.C , 48%RH	23deg.C , 52%RH
Engineer	Hikaru Shirasawa	Tatsuya Arai
Mode	Tx, 2480 MHz Tx, Bluetooth, BDR, PRBS9	

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	35.6	28.7	13.7	40.5	-24.8	12.8	53.9	41.2	All data
Hori.	2583.000	AV	34.1	28.7	13.8	40.6	-24.8	11.3	53.9	42.7	RBW:1MHz
Hori.	2610.000	AV	34.1	28.8	13.8	40.6	-24.8	11.4	53.9	42.5	VBW:270Hz
Hori.	2637.000	AV	34.2	28.8	13.9	40.6	-24.8	11.6	53.9	42.3	
Hori.	2663.000	AV	34.3	28.8	14.0	40.7	-24.8	11.7	53.9	42.3	
Hori.	2687.000	AV	34.4	28.8	14.0	40.7	-24.8	11.8	53.9	42.2	
Hori.	2713.000	AV	35.1	28.8	14.0	40.7	-24.8	12.5	53.9	41.5	
Hori.	4960.000	AV	50.9	31.6	6.1	41.5	-24.8	22.4	53.9	31.5	
Hori.	7440.000	AV	40.4	36.3	7.5	40.8	-24.8	18.7	53.9	35.3	
Hori.	9920.000	AV	42.4	38.9	8.7	40.5	-24.8	24.8	53.9	29.2	
Hori.	12400.000	AV	34.4	39.7	10.3	39.4	-24.8	20.3	53.9	33.7	
Vert.	2483.500	AV	35.5	28.7	13.7	40.5	-24.8	12.7	53.9	41.3	
Vert.	2583.000	AV	34.1	28.7	13.8	40.6	-24.8	11.3	53.9	42.7	
Vert.	2610.000	AV	34.2	28.8	13.8	40.6	-24.8	11.5	53.9	42.5	
Vert.	2637.000	AV	34.1	28.8	13.9	40.6	-24.8	11.5	53.9	42.5	
Vert.	2663.000	AV	34.2	28.8	14.0	40.7	-24.8	11.6	53.9	42.3	
Vert.	2687.000	AV	34.4	28.8	14.0	40.7	-24.8	11.8	53.9	42.2	
Vert.	2713.000	AV	35.1	28.8	14.0	40.7	-24.8	12.5	53.9	41.5	
Vert.	4960.000	AV	51.8	31.6	6.1	41.5	-24.8	23.3	53.9	30.7	
Vert.	7440.000	AV	38.3	36.3	7.5	40.8	-24.8	16.6	53.9	37.4	
Vert.	9920.000	AV	39.9	38.9	8.7	40.5	-24.8	22.3	53.9	31.7	
Vert.	12400.000	AV	34.5	39.7	10.3	39.4	-24.8	20.4	53.9	33.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

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

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Semi Anechoic Chamber
Date	November 11, 2011	November 12, 2011
Temperature / Humidity	23deg.C , 48%RH	23deg.C , 52%RH
Engineer	Hikaru Shirasawa	Tatsuya Arai
Mode	Tx, 2402 MHz Tx, Bluetooth, EDR, PRBS9	

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.	384.005	QP	39.0	15.9	7.5	31.8	30.6	46.0	15.4	100	275	PK Detector
Hori.	432.002	QP	33.9	16.6	7.8	31.8	26.5	46.0	19.5	100	271	RBW:1MHz
Hori.	2390.000	PK	47.1	28.2	13.8	40.6	48.5	73.9	25.4	123	155	VBW:3MHz
Hori.	2400.000	PK	55.8	28.2	13.8	40.6	57.2	73.9	16.7	123	155	
Hori.	2507.000	PK	46.0	28.7	13.8	40.5	48.0	73.9	25.9	100	0	
Hori.	2533.000	PK	45.5	28.7	13.8	40.6	47.4	73.9	26.5	100	0	
Hori.	2557.994	PK	46.7	28.7	13.8	40.6	48.6	73.9	25.3	100	0	
Hori.	2583.000	PK	45.8	28.7	13.8	40.6	47.7	73.9	26.2	100	0	
Hori.	4804.000	PK	52.9	31.2	6.0	41.5	48.6	73.9	25.3	102	169	
Hori.	7206.000	PK	47.5	36.1	7.6	40.7	50.5	73.9	23.4	100	0	
Hori.	9608.000	PK	49.1	38.6	8.7	40.5	55.9	73.9	18.0	100	35	
Hori.	12010.000	PK	46.9	39.5	10.3	39.5	57.2	73.9	16.7	100	0	
Vert.	104.583	QP	26.2	10.8	8.0	31.8	13.2	43.5	30.3	100	280	
Vert.	167.374	QP	25.7	15.3	8.7	31.8	17.9	43.5	25.6	100	14	
Vert.	240.001	QP	29.1	17.1	9.3	31.7	23.8	46.0	22.2	100	348	
Vert.	576.132	QP	30.4	18.6	8.5	32.0	25.5	46.0	20.5	100	7	
Vert.	2390.000	PK	46.4	28.2	13.8	40.6	47.8	73.9	26.1	130	115	
Vert.	2400.000	PK	54.7	28.2	13.8	40.6	56.1	73.9	17.8	130	115	
Vert.	2507.000	PK	45.6	28.7	13.8	40.5	47.6	73.9	26.3	100	136	
Vert.	2532.000	PK	46.6	28.7	13.8	40.5	48.6	73.9	25.3	100	136	
Vert.	2557.994	PK	46.3	28.7	13.8	40.6	48.2	73.9	25.7	100	136	
Vert.	2583.000	PK	45.6	28.7	13.8	40.6	47.5	73.9	26.4	100	136	
Vert.	4804.000	PK	49.3	31.2	6.0	41.5	45.0	73.9	28.9	100	41	
Vert.	7206.000	PK	47.8	36.1	7.6	40.7	50.8	73.9	23.1	100	0	
Vert.	9608.000	PK	48.4	38.6	8.7	40.5	55.2	73.9	18.7	125	38	
Vert.	12010.000	PK	46.4	39.5	10.3	39.5	56.7	73.9	17.2	100	0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

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

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Semi Anechoic Chamber
Date	November 11, 2011	November 12, 2011
Temperature / Humidity	23deg.C , 48%RH	23deg.C , 52%RH
Engineer	Hikaru Shirasawa	Tatsuya Arai
Mode	Tx, 2402 MHz Tx, Bluetooth, EDR, PRBS9	

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	35.9	28.2	13.8	40.6	-24.7	12.6	53.9	41.3	All data
Hori.	2400.000	AV	49.6	28.2	13.8	40.6	-24.7	26.3	53.9	27.6	RBW:1MHz
Hori.	2507.000	AV	35.9	28.7	13.8	40.5	-24.7	13.2	53.9	40.7	VBW:270Hz
Hori.	2533.000	AV	35.8	28.7	13.8	40.6	-24.7	13.0	53.9	40.9	
Hori.	2557.994	AV	36.1	28.7	13.8	40.6	-24.7	13.3	53.9	40.6	
Hori.	2583.000	AV	35.8	28.7	13.8	40.6	-24.7	13.0	53.9	40.9	
Hori.	4804.000	AV	45.1	31.2	6.0	41.5	-24.7	16.1	53.9	37.8	
Hori.	7206.000	AV	37.6	36.1	7.6	40.7	-24.7	15.9	53.9	38.0	
Hori.	9608.000	AV	43.0	38.6	8.7	40.5	-24.7	25.1	53.9	28.8	
Hori.	12010.000	AV	36.7	39.5	10.3	39.5	-24.7	22.3	53.9	31.6	
Vert.	2390.000	AV	35.9	28.2	13.8	40.6	-24.7	12.6	53.9	41.3	
Vert.	2400.000	AV	48.2	28.2	13.8	40.6	-24.7	24.9	53.9	29.0	
Vert.	2507.000	AV	36.0	28.7	13.8	40.5	-24.7	13.3	53.9	40.6	
Vert.	2532.000	AV	36.2	28.7	13.8	40.5	-24.7	13.5	53.9	40.4	
Vert.	2557.994	AV	36.7	28.7	13.8	40.6	-24.7	13.9	53.9	40.0	
Vert.	2583.000	AV	35.7	28.7	13.8	40.6	-24.7	12.9	53.9	41.0	
Vert.	4804.000	AV	39.9	31.2	6.0	41.5	-24.7	10.9	53.9	43.0	
Vert.	7206.000	AV	37.6	36.1	7.6	40.7	-24.7	15.9	53.9	38.0	
Vert.	9608.000	AV	41.5	38.6	8.7	40.5	-24.7	23.6	53.9	30.3	
Vert.	12010.000	AV	36.6	39.5	10.3	39.5	-24.7	22.2	53.9	31.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

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

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Semi Anechoic Chamber
Date	November 11, 2011	November 12, 2011
Temperature / Humidity	23deg.C , 48%RH	23deg.C , 52%RH
Engineer	Hikaru Shirasawa	Tatsuya Arai
Mode	Tx, 2441 MHz Tx, Bluetooth, EDR, PRBS9	

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.	384.009	QP	39.1	15.9	7.5	31.8	30.7	46.0	15.3	100	277	PK Detector
Hori.	432.005	QP	33.8	16.6	7.8	31.8	26.4	46.0	19.6	100	270	RBW:1MHz
Hori.	2543.000	PK	45.2	28.7	13.8	40.6	47.1	73.9	26.8	100	0	VBW:3MHz
Hori.	2570.000	PK	45.4	28.7	13.8	40.6	47.3	73.9	26.6	100	0	
Hori.	2597.000	PK	44.8	28.8	13.8	40.6	46.8	73.9	27.1	100	0	
Hori.	2623.000	PK	45.2	28.8	13.8	40.6	47.2	73.9	26.7	100	0	
Hori.	2650.000	PK	45.0	28.8	14.0	40.7	47.1	73.9	26.8	100	0	
Hori.	4882.000	PK	51.3	31.4	6.1	41.5	47.3	73.9	26.6	100	103	
Hori.	7323.000	PK	46.6	36.2	7.6	40.7	49.7	73.9	24.2	100	0	
Hori.	9764.000	PK	49.3	38.7	8.7	40.5	56.2	73.9	17.7	100	35	
Hori.	12205.000	PK	46.1	39.6	10.3	39.5	56.5	73.9	17.4	100	0	
Vert.	104.401	QP	26.0	10.8	8.0	31.8	13.0	43.5	30.5	100	283	
Vert.	167.342	QP	25.6	15.3	8.7	31.8	17.8	43.5	25.7	100	11	
Vert.	240.003	QP	29.0	17.1	9.3	31.7	23.7	46.0	22.3	100	351	
Vert.	576.011	QP	30.1	18.6	8.5	32.0	25.2	46.0	20.8	100	11	
Vert.	2543.000	PK	45.2	28.7	13.8	40.6	47.1	73.9	26.8	100	0	
Vert.	2570.000	PK	45.3	28.7	13.8	40.6	47.2	73.9	26.7	100	0	
Vert.	2597.000	PK	45.7	28.8	13.8	40.6	47.7	73.9	26.2	100	0	
Vert.	2623.000	PK	45.2	28.8	13.8	40.6	47.2	73.9	26.7	100	0	
Vert.	2650.000	PK	46.5	28.8	14.0	40.7	48.6	73.9	25.3	100	0	
Vert.	4882.000	PK	50.7	31.4	6.1	41.5	46.7	73.9	27.2	117	158	
Vert.	7323.000	PK	46.9	36.2	7.6	40.7	50.0	73.9	23.9	100	0	
Vert.	9764.000	PK	47.4	38.7	8.7	40.5	54.3	73.9	19.6	102	33	
Vert.	12205.000	PK	46.2	39.6	10.3	39.5	56.6	73.9	17.3	100	0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

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

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Semi Anechoic Chamber
Date	November 11, 2011	November 12, 2011
Temperature / Humidity	23deg.C , 48%RH	23deg.C , 52%RH
Engineer	Hikaru Shirasawa	Tatsuya Arai
Mode	Tx, 2441 MHz	
	Tx, Bluetooth, EDR, PRBS9	

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2543.000	AV	35.8	28.7	13.8	40.6	-24.7	13.0	53.9	40.9	All data
Hori.	2570.000	AV	35.7	28.7	13.8	40.6	-24.7	12.9	53.9	41.0	RBW:1MHz
Hori.	2597.000	AV	35.7	28.8	13.8	40.6	-24.7	13.0	53.9	40.9	VBW:270Hz
Hori.	2623.000	AV	35.8	28.8	13.8	40.6	-24.7	13.1	53.9	40.8	
Hori.	2650.000	AV	35.7	28.8	14.0	40.7	-24.7	13.1	53.9	40.8	
Hori.	4882.000	AV	43.0	31.4	6.1	41.5	-24.7	14.3	53.9	39.6	
Hori.	7323.000	AV	37.5	36.2	7.6	40.7	-24.7	15.9	53.9	38.0	
Hori.	9764.000	AV	42.7	38.7	8.7	40.5	-24.7	24.9	53.9	29.0	
Hori.	12205.000	AV	35.8	39.6	10.3	39.5	-24.7	21.5	53.9	32.4	
Vert.	2543.000	AV	35.8	28.7	13.8	40.6	-24.7	13.0	53.9	40.9	
Vert.	2570.000	AV	35.7	28.7	13.8	40.6	-24.7	12.9	53.9	41.0	
Vert.	2597.000	AV	35.7	28.8	13.8	40.6	-24.7	13.0	53.9	40.9	
Vert.	2623.000	AV	35.7	28.8	13.8	40.6	-24.7	13.0	53.9	40.9	
Vert.	2650.000	AV	35.8	28.8	14.0	40.7	-24.7	13.2	53.9	40.7	
Vert.	4882.000	AV	42.5	31.4	6.1	41.5	-24.7	13.8	53.9	40.1	
Vert.	7323.000	AV	37.1	36.2	7.6	40.7	-24.7	15.5	53.9	38.4	
Vert.	9764.000	AV	39.8	38.7	8.7	40.5	-24.7	22.0	53.9	31.9	
Vert.	12205.000	AV	35.8	39.6	10.3	39.5	-24.7	21.5	53.9	32.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

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

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
 Date November 11, 2011 November 12, 2011
 Temperature / Humidity 23deg.C , 48%RH 23deg.C , 52%RH
 Engineer Hikaru Shirasawa Tatsuya Arai
 Mode Tx, 2480 MHz
 Tx, Bluetooth, EDR, PRBS9

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.	384.004	QP	39.0	15.9	7.5	31.8	30.6	46.0	15.4	100	274	PK Detector
Hori.	432.004	QP	34.0	16.6	7.8	31.8	26.6	46.0	19.4	100	270	RBW:1MHz
Hori.	2483.500	PK	46.2	28.7	13.7	40.5	48.1	73.9	25.8	120	159	VBW:3MHz
Hori.	2520.000	PK	44.5	28.7	13.8	40.5	46.5	73.9	27.4	100	0	
Hori.	2543.000	PK	44.6	28.7	13.8	40.6	46.5	73.9	27.4	100	0	
Hori.	2570.000	PK	44.1	28.7	13.8	40.6	46.0	73.9	27.9	100	0	
Hori.	2597.000	PK	44.4	28.8	13.8	40.6	46.4	73.9	27.5	100	0	
Hori.	2623.000	PK	43.8	28.8	13.8	40.6	45.8	73.9	28.1	100	0	
Hori.	2650.000	PK	44.4	28.8	14.0	40.7	46.5	73.9	27.4	100	0	
Hori.	4960.000	PK	51.4	31.6	6.1	41.5	47.6	73.9	26.3	100	100	
Hori.	7440.000	PK	46.8	36.3	7.5	40.8	49.8	73.9	24.1	100	0	
Hori.	9920.000	PK	48.3	38.9	8.7	40.5	55.4	73.9	18.5	112	35	
Hori.	12400.000	PK	44.5	39.7	10.3	39.4	55.1	73.9	18.8	100	0	
Vert.	104.462	QP	26.3	10.8	8.0	31.8	13.3	43.5	30.2	100	281	
Vert.	167.357	QP	25.5	15.3	8.7	31.8	17.7	43.5	25.8	100	12	
Vert.	240.001	QP	28.8	17.1	9.3	31.7	23.5	46.0	22.5	100	350	
Vert.	576.147	QP	30.2	18.6	8.5	32.0	25.3	46.0	20.7	100	10	
Vert.	2483.500	PK	46.9	28.7	13.7	40.5	48.8	73.9	25.1	100	156	
Vert.	2520.000	PK	44.8	28.7	13.8	40.5	46.8	73.9	27.1	100	0	
Vert.	2543.000	PK	44.7	28.7	13.8	40.6	46.6	73.9	27.3	100	0	
Vert.	2570.000	PK	44.0	28.7	13.8	40.6	45.9	73.9	28.0	100	0	
Vert.	2597.000	PK	44.3	28.8	13.8	40.6	46.3	73.9	27.6	100	0	
Vert.	2623.000	PK	44.4	28.8	13.8	40.6	46.4	73.9	27.5	100	0	
Vert.	2650.000	PK	44.0	28.8	14.0	40.7	46.1	73.9	27.8	100	0	
Vert.	4960.000	PK	52.5	31.6	6.1	41.5	48.7	73.9	25.2	103	136	
Vert.	7440.000	PK	46.1	36.3	7.5	40.8	49.1	73.9	24.8	100	0	
Vert.	9920.000	PK	47.0	38.9	8.7	40.5	54.1	73.9	19.8	100	33	
Vert.	12400.000	PK	43.6	39.7	10.3	39.4	54.2	73.9	19.7	100	0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

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

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

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Shonan EMC Lab.

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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	November 11, 2011	November 12, 2011
Temperature / Humidity	23deg.C , 48%RH	23deg.C , 52%RH
Engineer	Hikaru Shirasawa	Tatsuya Arai
Mode	Tx, 2480 MHz Tx, Bluetooth, EDR, PRBS9	

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	35.5	28.7	13.7	40.5	-24.7	12.7	53.9	41.2	All data
Hori.	2520.000	AV	34.4	28.7	13.8	40.5	-24.7	11.7	53.9	42.2	RBW:1MHz
Hori.	2543.000	AV	34.3	28.7	13.8	40.6	-24.7	11.5	53.9	42.4	VBW:270Hz
Hori.	2570.000	AV	34.3	28.7	13.8	40.6	-24.7	11.5	53.9	42.4	
Hori.	2597.000	AV	34.0	28.8	13.8	40.6	-24.7	11.3	53.9	42.6	
Hori.	2623.000	AV	34.2	28.8	13.8	40.6	-24.7	11.5	53.9	42.4	
Hori.	2650.000	AV	34.1	28.8	14.0	40.7	-24.7	11.5	53.9	42.4	
Hori.	4960.000	AV	42.6	31.6	6.1	41.5	-24.7	14.1	53.9	39.8	
Hori.	7440.000	AV	36.7	36.3	7.5	40.8	-24.7	15.0	53.9	38.9	
Hori.	9920.000	AV	41.8	38.9	8.7	40.5	-24.7	24.2	53.9	29.7	
Hori.	12400.000	AV	34.4	39.7	10.3	39.4	-24.7	20.3	53.9	33.6	
Vert.	2483.500	AV	35.4	28.7	13.7	40.5	-24.7	12.6	53.9	41.3	
Vert.	2520.000	AV	34.5	28.7	13.8	40.5	-24.7	11.8	53.9	42.1	
Vert.	2543.000	AV	34.4	28.7	13.8	40.6	-24.7	11.6	53.9	42.3	
Vert.	2570.000	AV	34.2	28.7	13.8	40.6	-24.7	11.4	53.9	42.5	
Vert.	2597.000	AV	34.1	28.8	13.8	40.6	-24.7	11.4	53.9	42.5	
Vert.	2623.000	AV	34.2	28.8	13.8	40.6	-24.7	11.5	53.9	42.4	
Vert.	2650.000	AV	34.1	28.8	14.0	40.7	-24.7	11.5	53.9	42.4	
Vert.	4960.000	AV	44.7	31.6	6.1	41.5	-24.7	16.2	53.9	37.7	
Vert.	7440.000	AV	36.5	36.3	7.5	40.8	-24.7	14.8	53.9	39.1	
Vert.	9920.000	AV	39.2	38.9	8.7	40.5	-24.7	21.6	53.9	32.3	
Vert.	12400.000	AV	34.2	39.7	10.3	39.4	-24.7	20.1	53.9	33.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier) + Dwell time factor (refer to Dwell time factor chart)

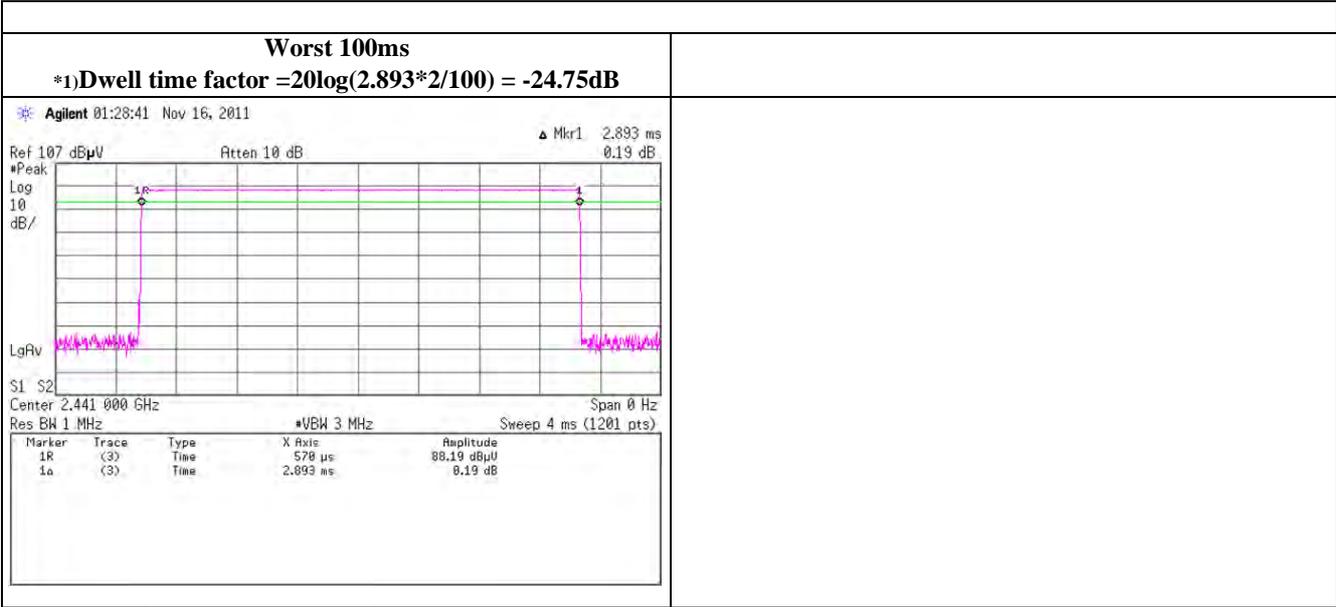
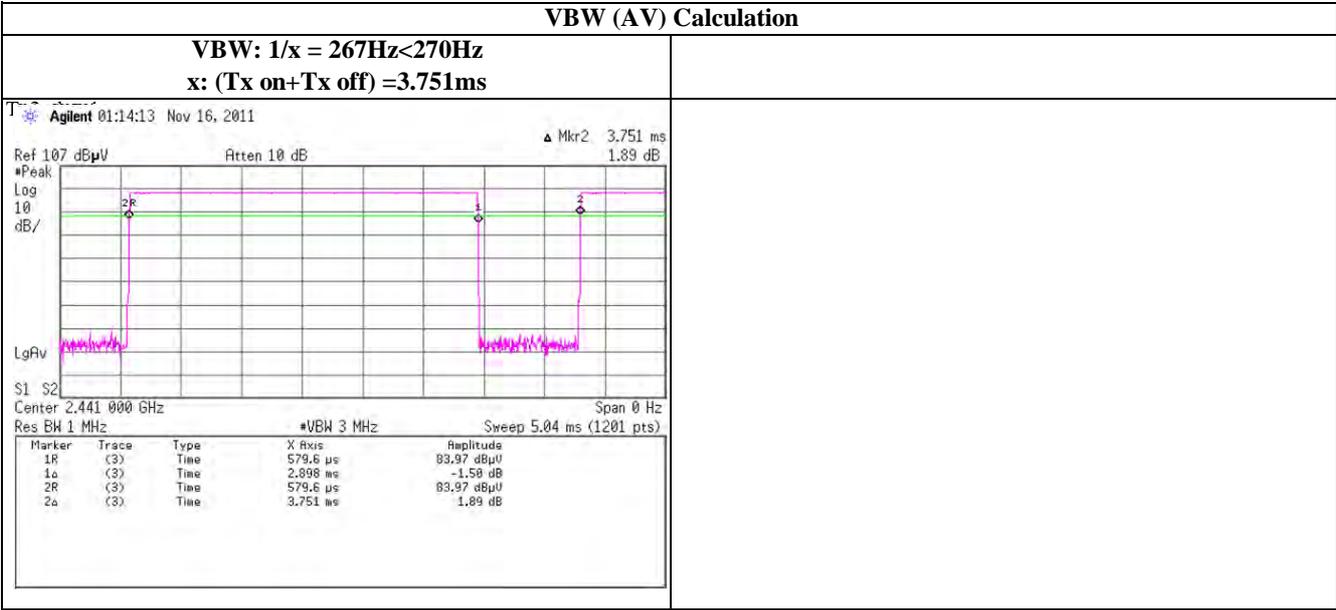
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

VBW (AV) Calculation chart

Tx, Bluetooth, BDR, PRBS9

VBW (AV) Calculation



*1) ON time of some channel during 100ms: Twice
 This is the worst case in hopping sequence of Bluetooth.

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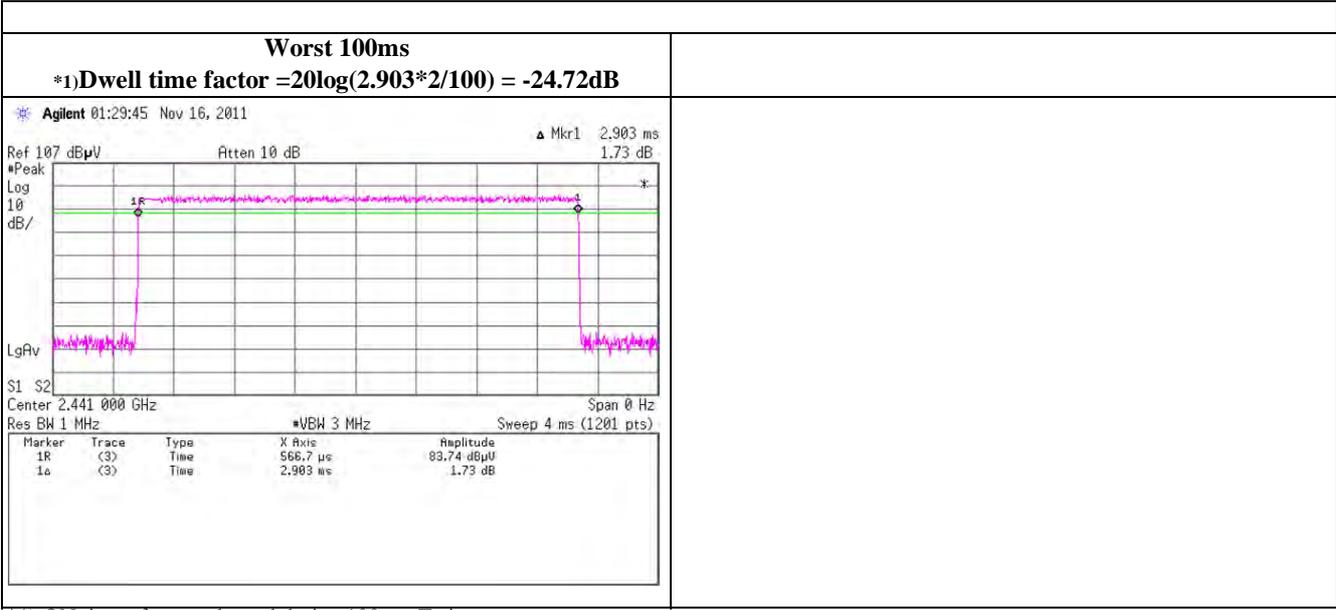
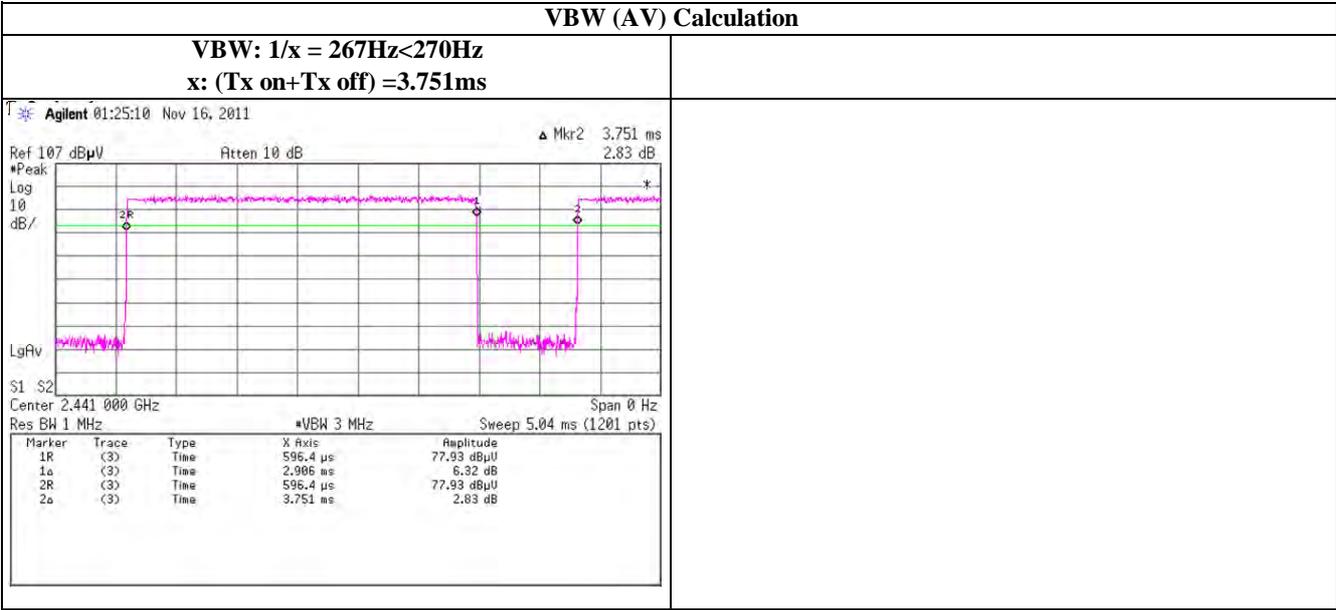
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VBW (AV) Calculation chart

Tx, Bluetooth, EDR, PRBS9

VBW (AV) Calculation



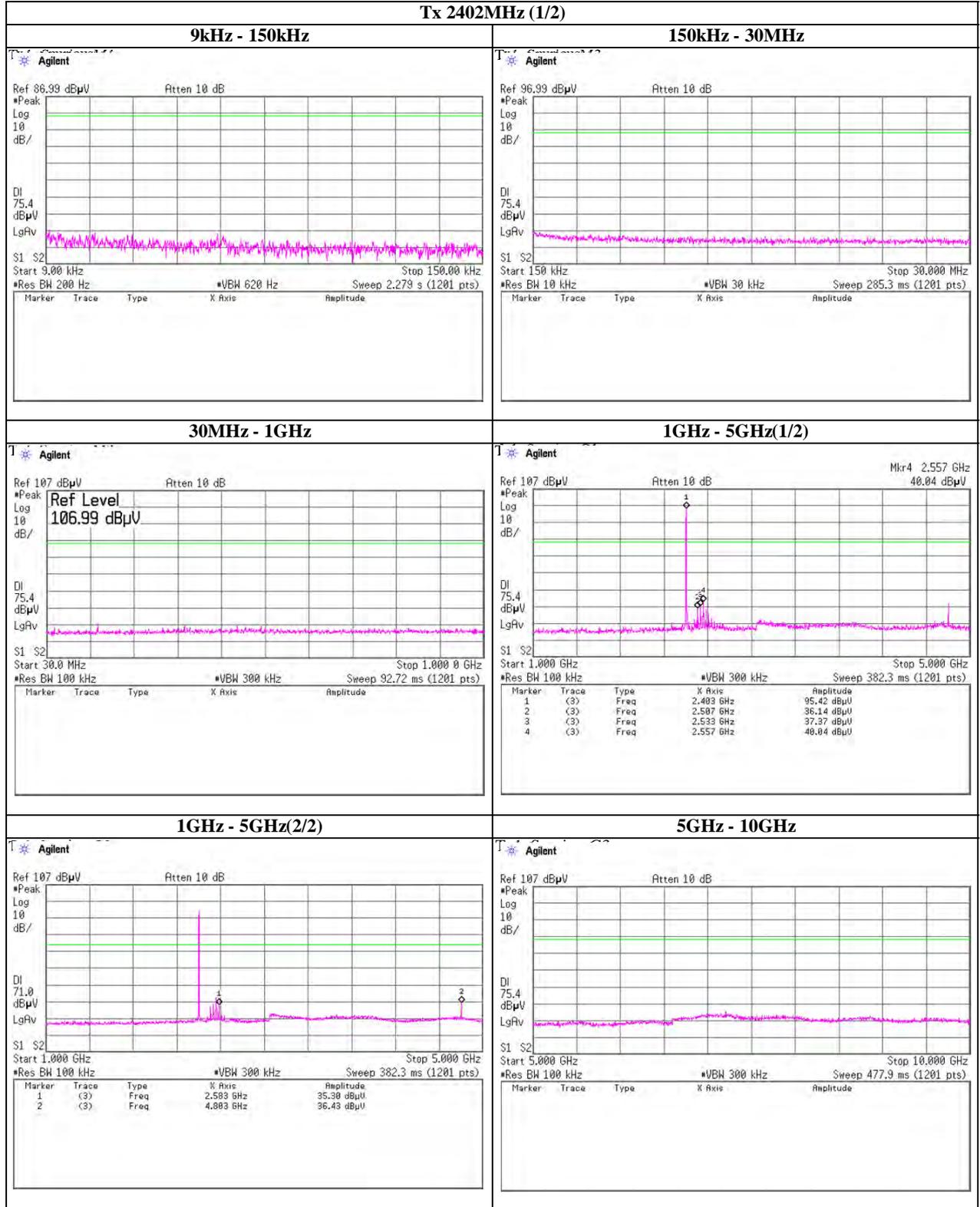
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Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx 2402MHz (1/2)



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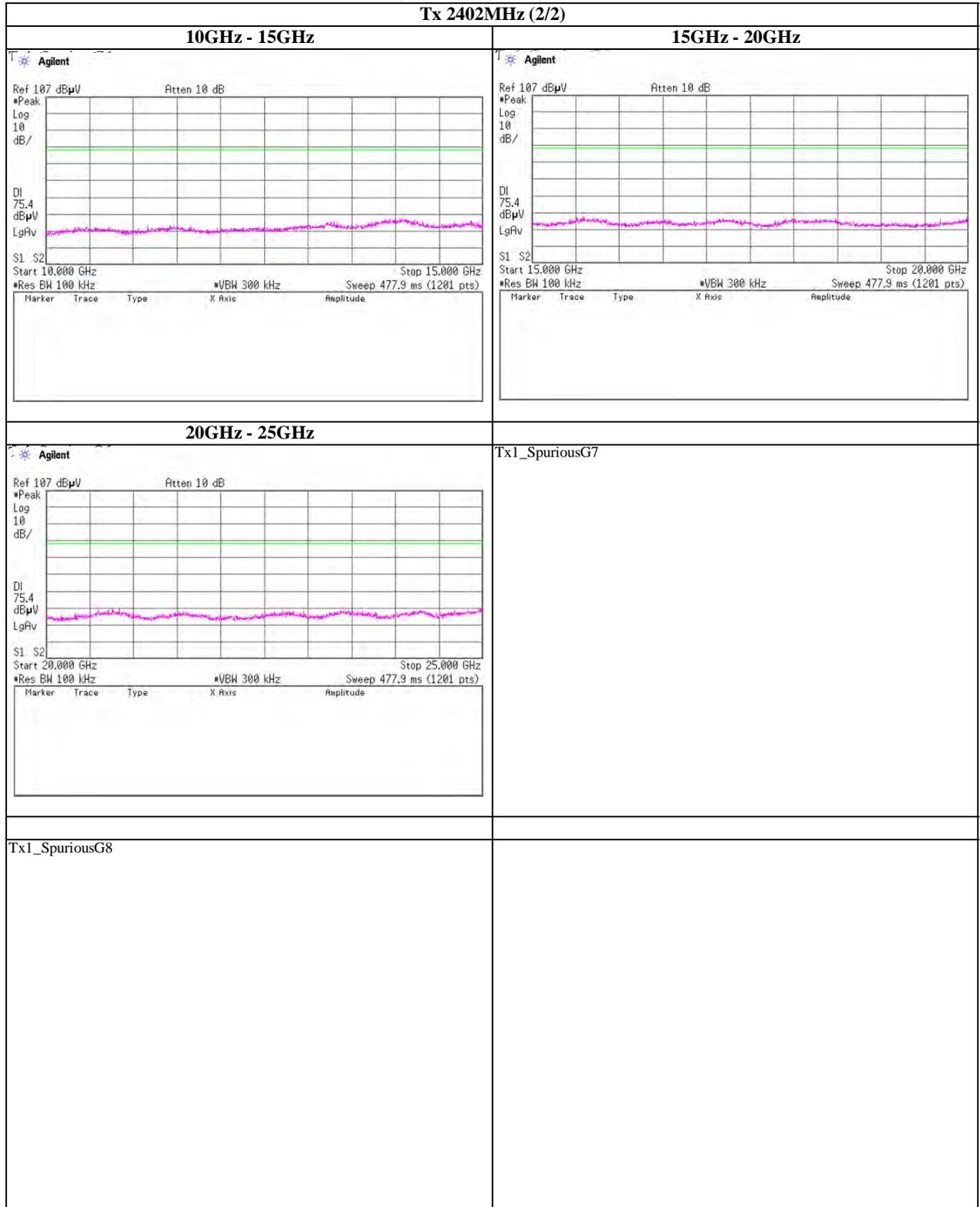
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Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx 2402MHz (2/2)



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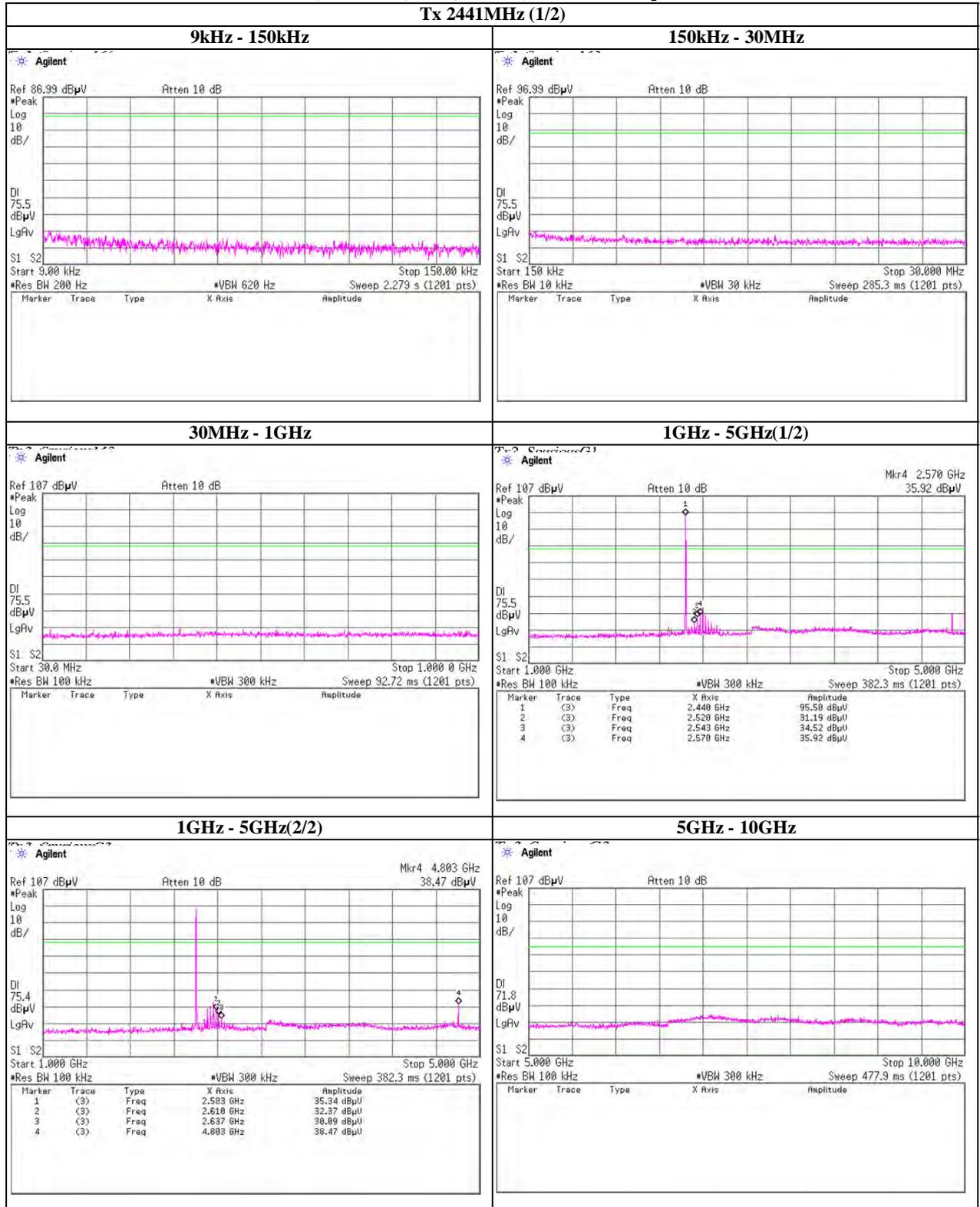
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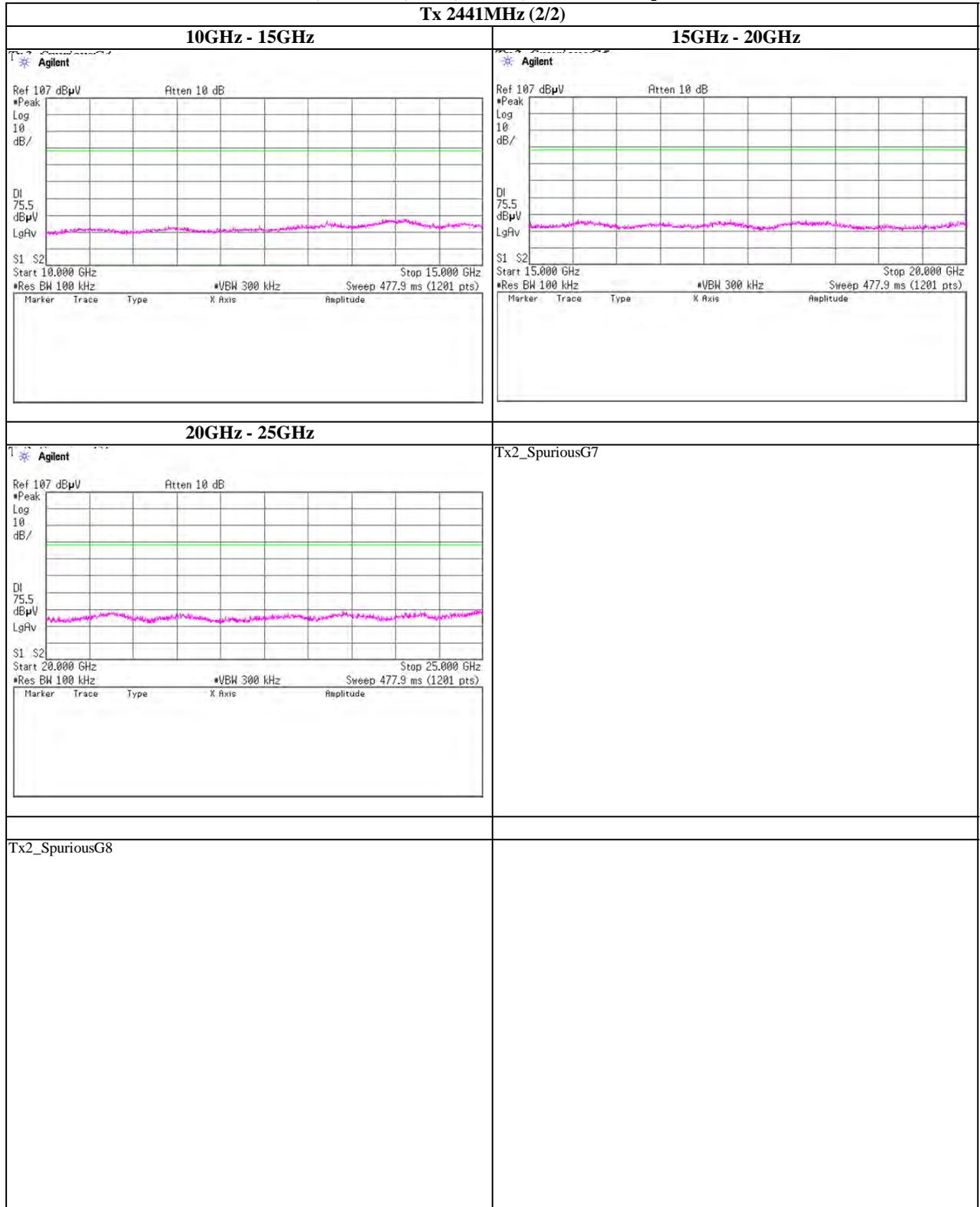
Spurious emission (Conducted)
Tx, Bluetooth, BDR, PRBS9, worst antenna port



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Spurious emission (Conducted)
Tx, Bluetooth, BDR, PRBS9, worst antenna port

Tx 2441MHz (2/2)



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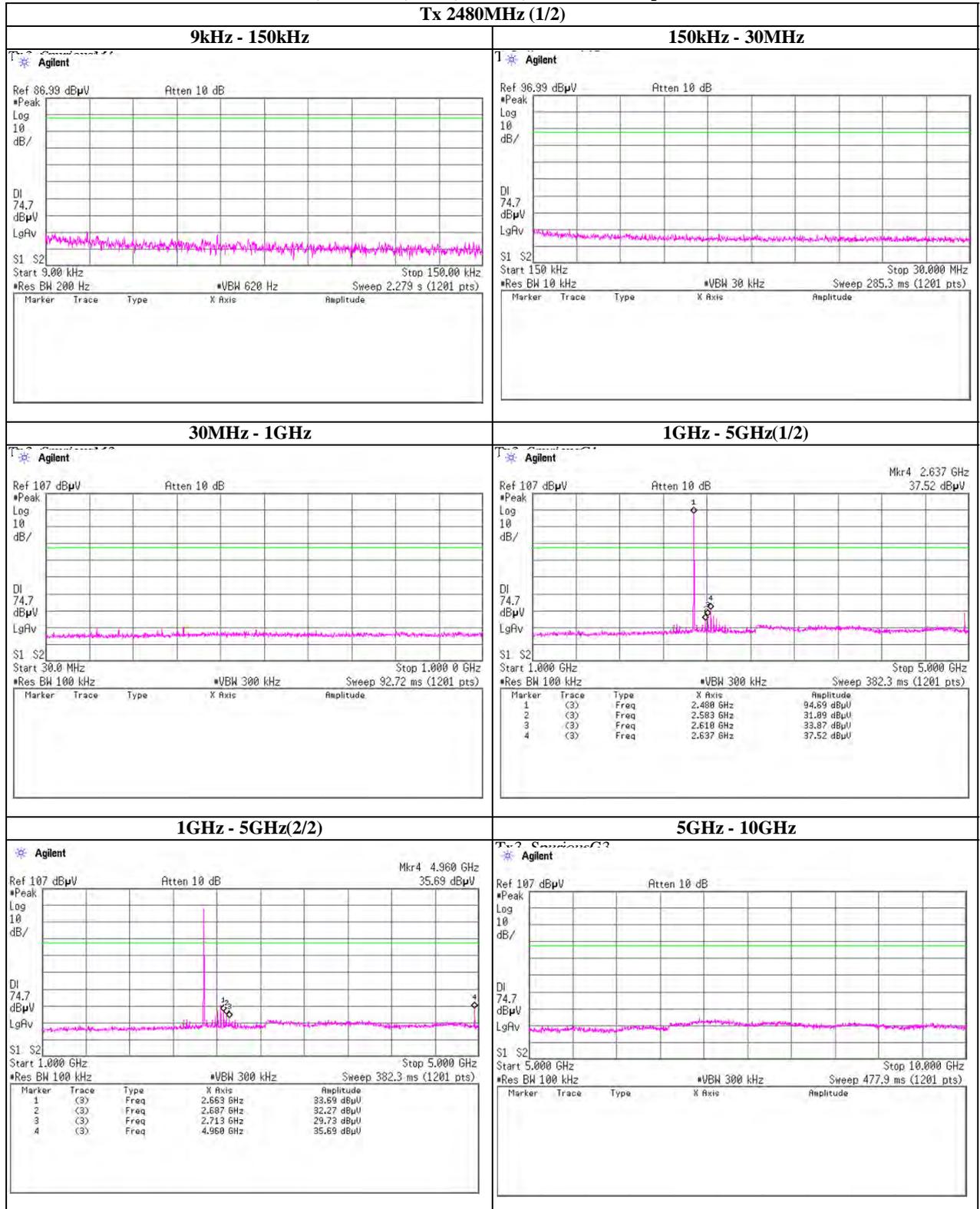
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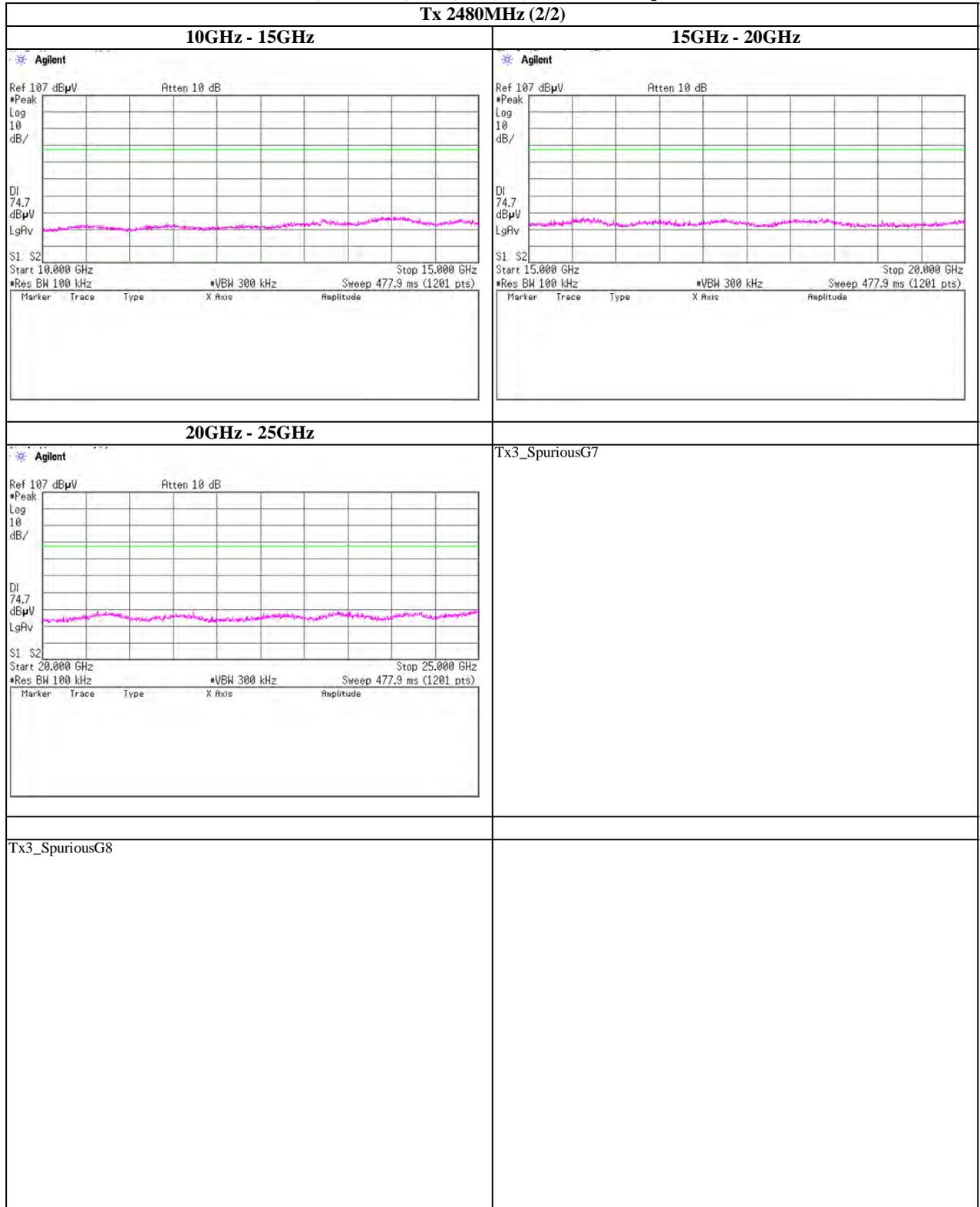
Spurious emission (Conducted)
Tx, Bluetooth, BDR, PRBS9, worst antenna port



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Spurious emission (Conducted)
Tx, Bluetooth, BDR, PRBS9, worst antenna port

Tx 2480MHz (2/2)

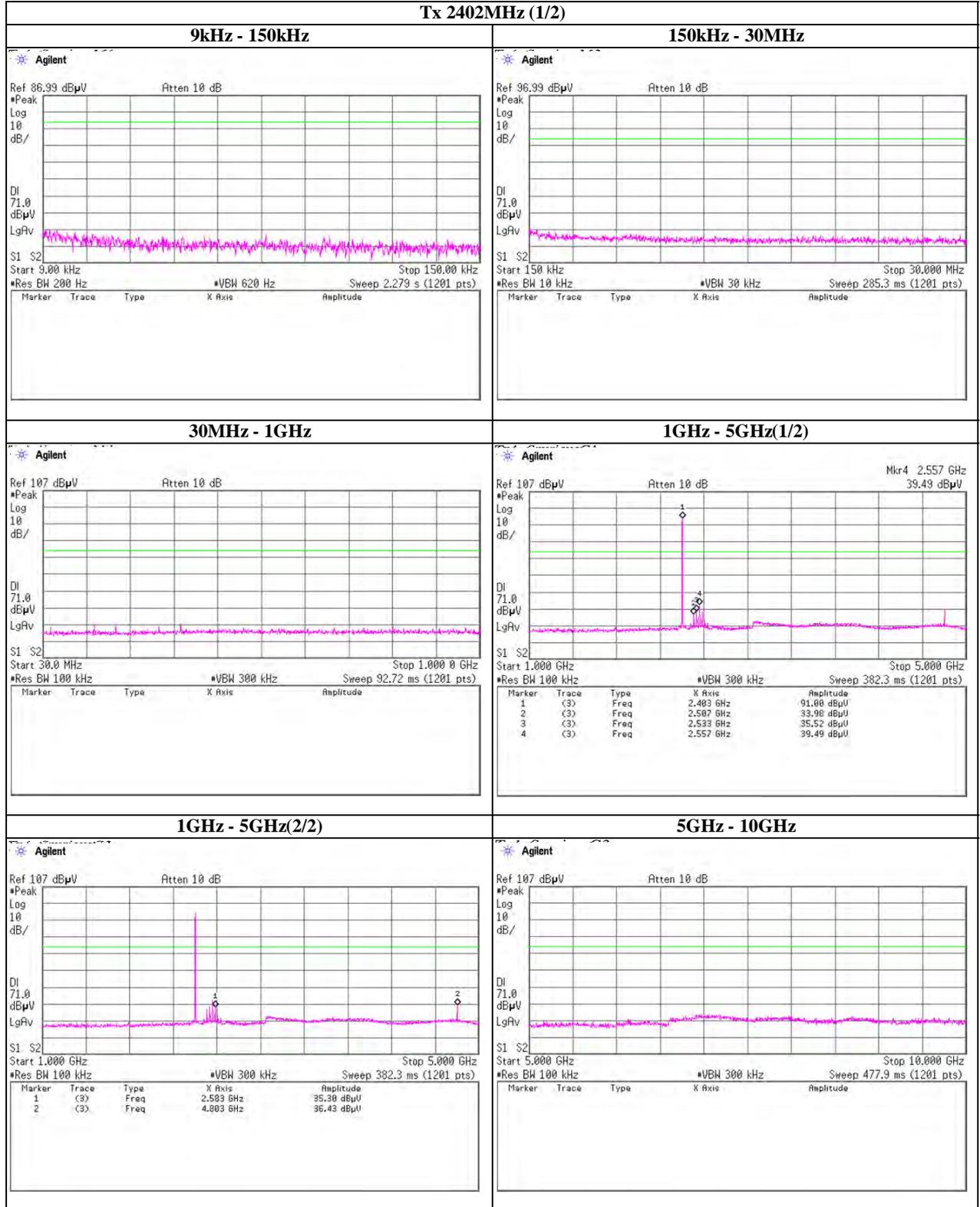


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Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2402MHz (1/2)



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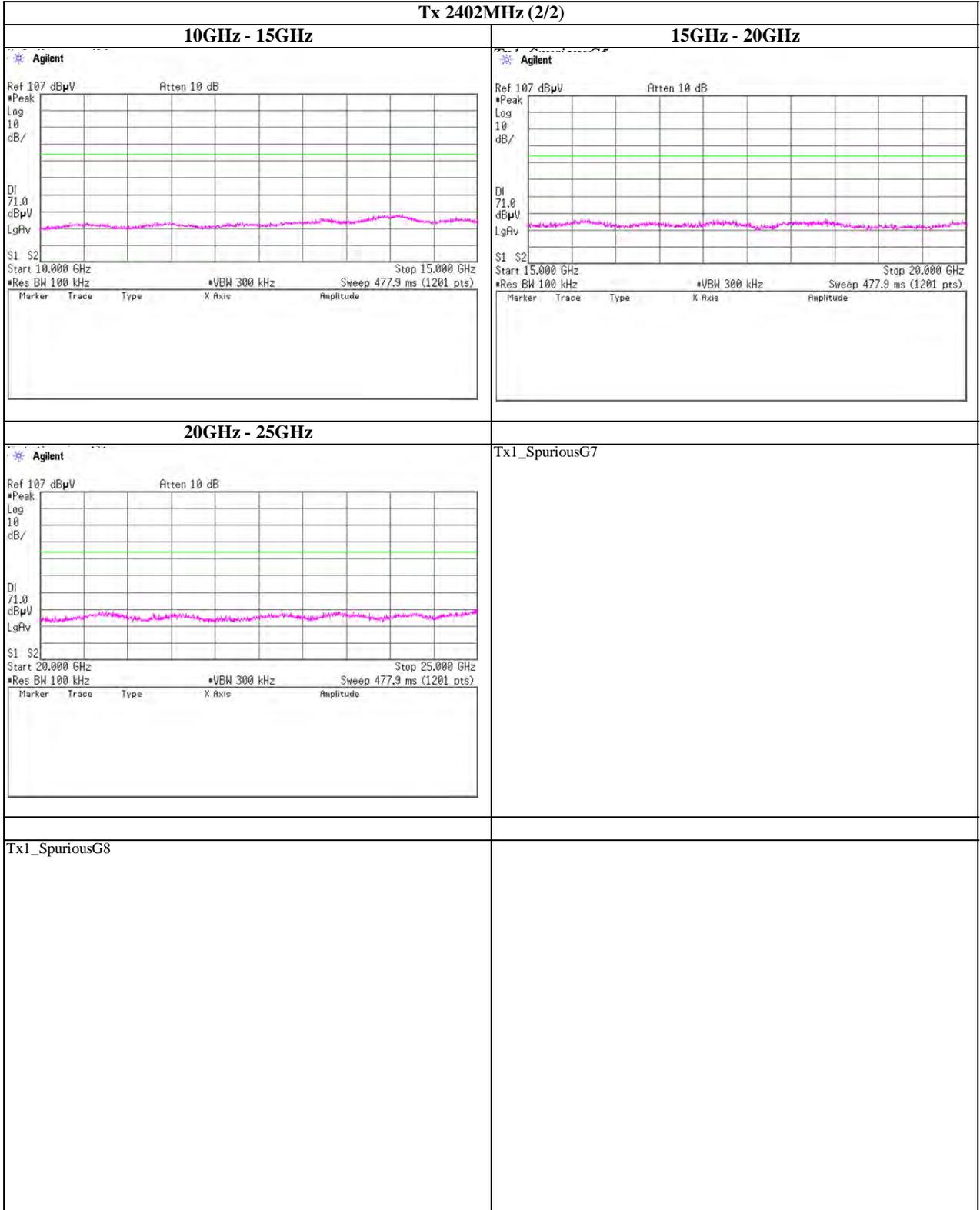
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Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2402MHz (2/2)



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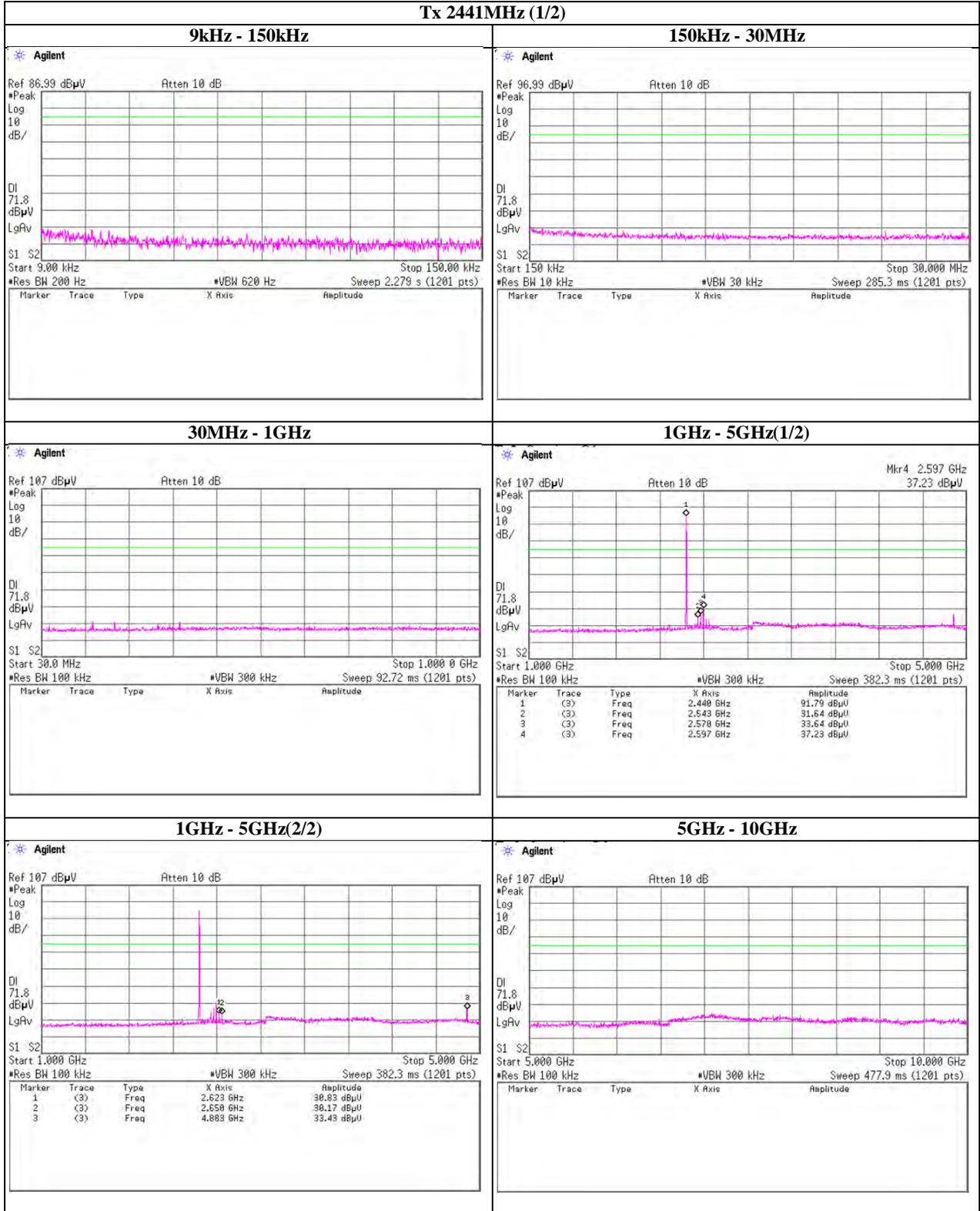
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Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2441MHz (1/2)



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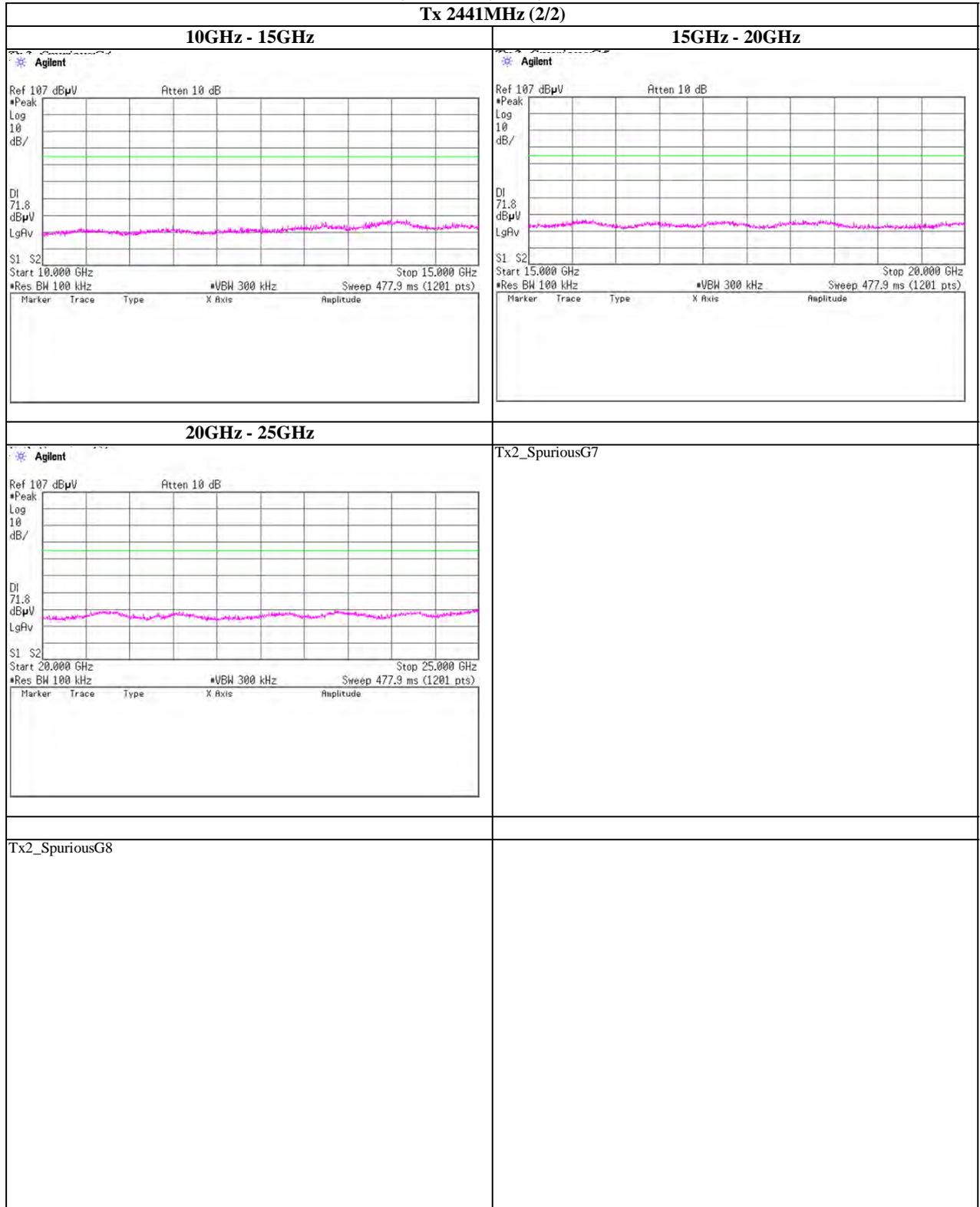
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Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2441MHz (2/2)



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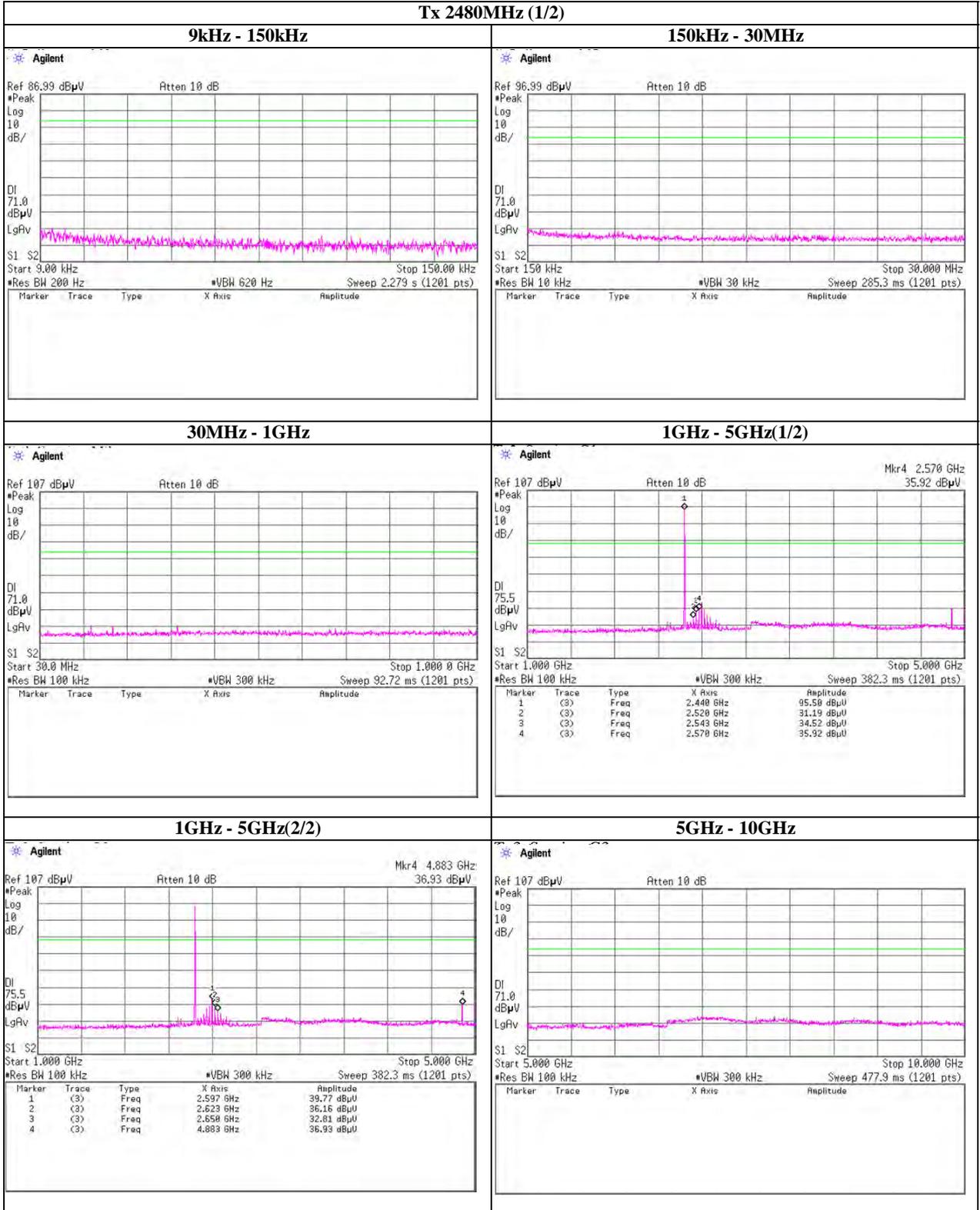
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Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx 2480MHz (1/2)



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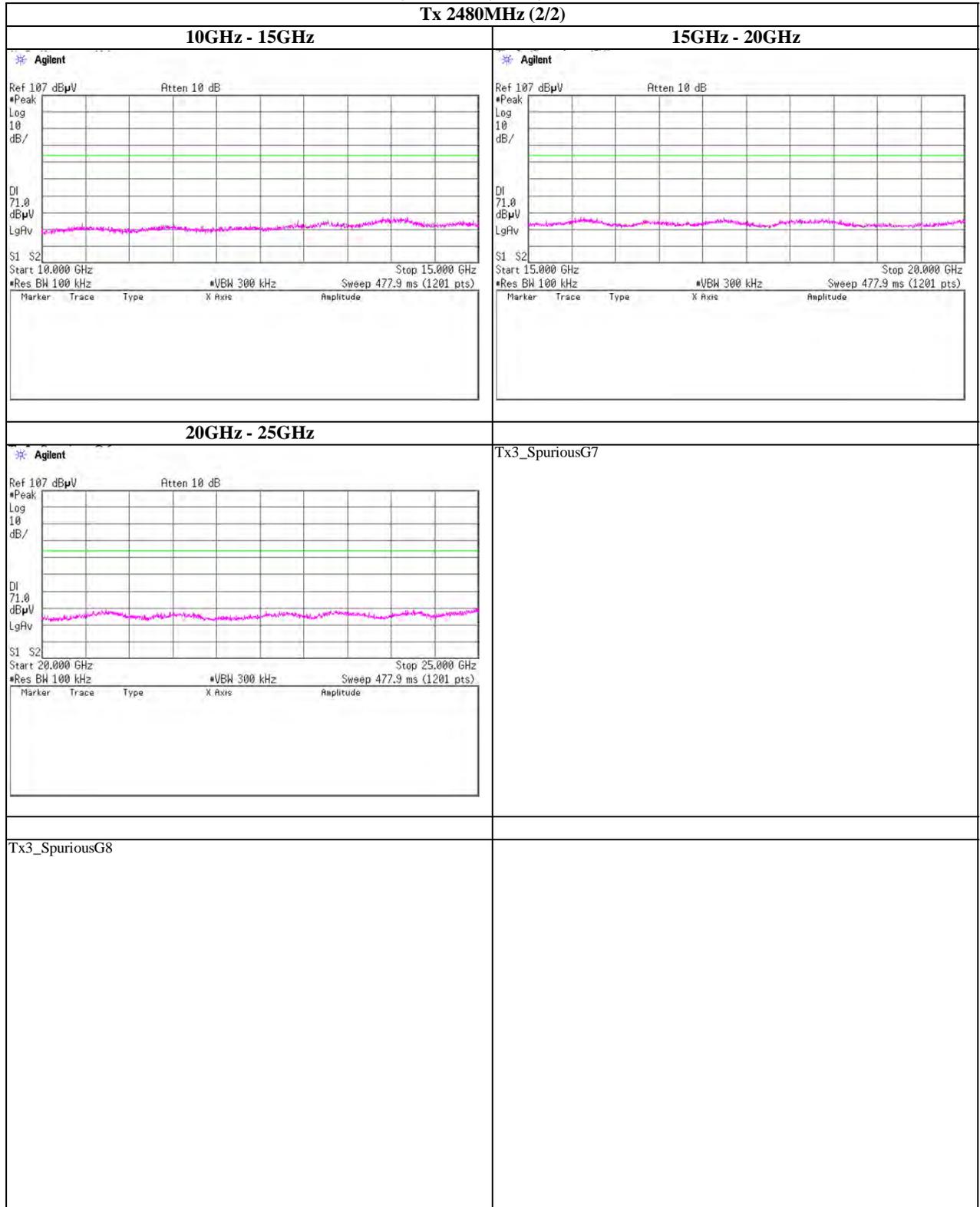
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Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2480MHz (2/2)



UL Japan, Inc.

Shonan EMC Lab.

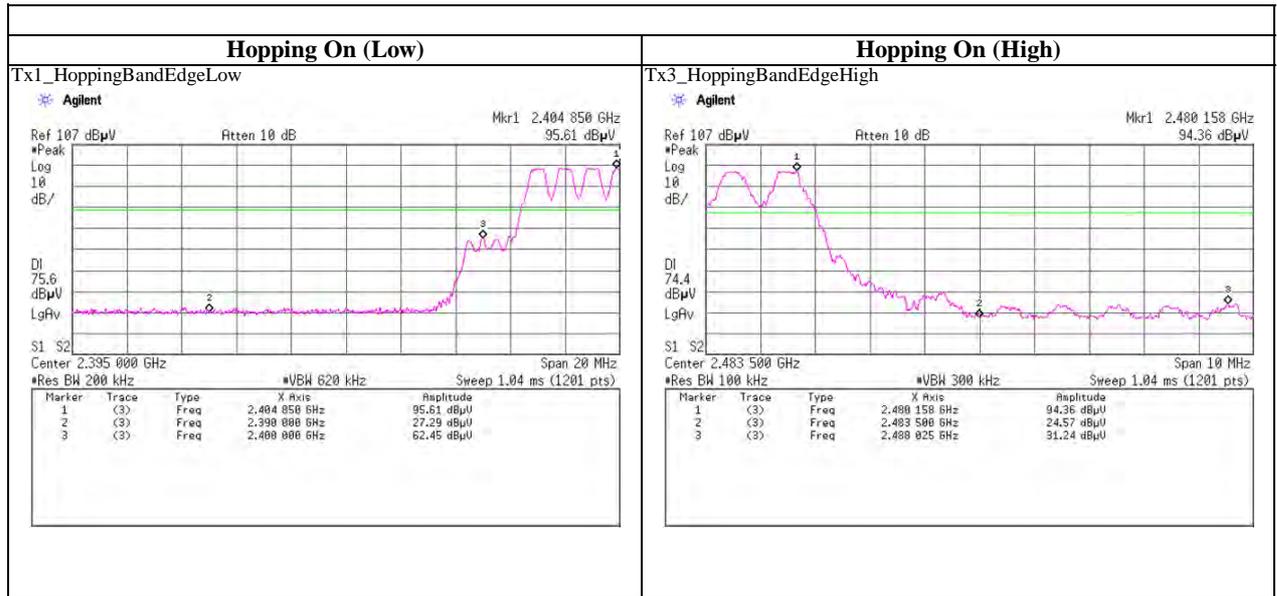
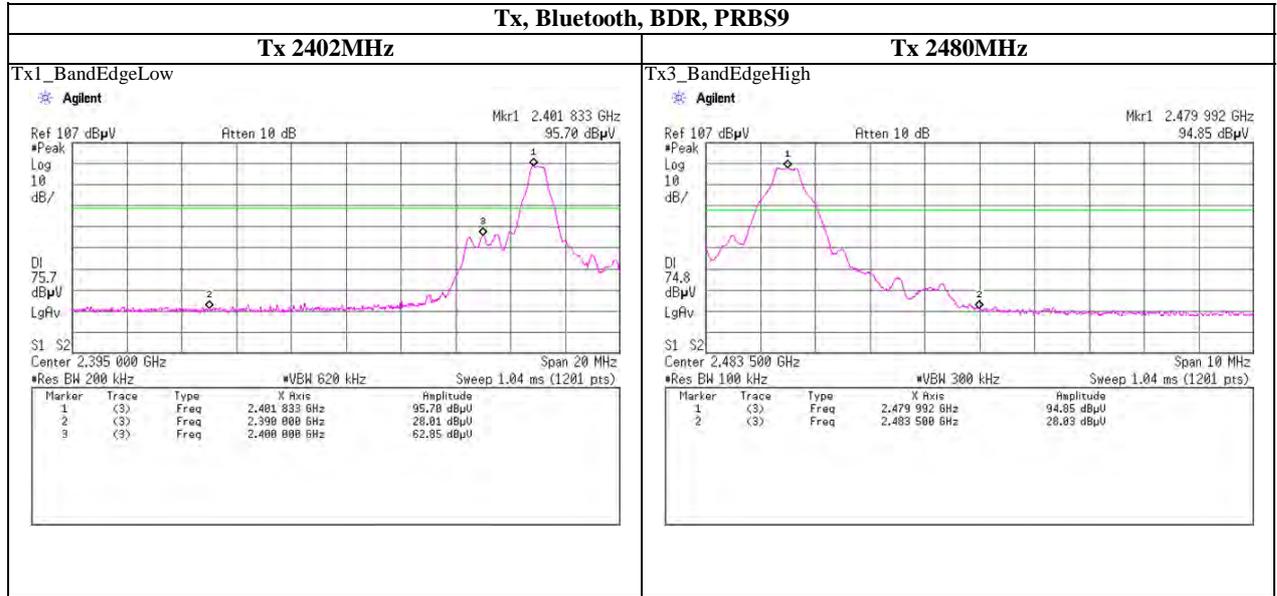
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Spurious emission (Conducted)

Band Edge compliace



UL Japan, Inc.

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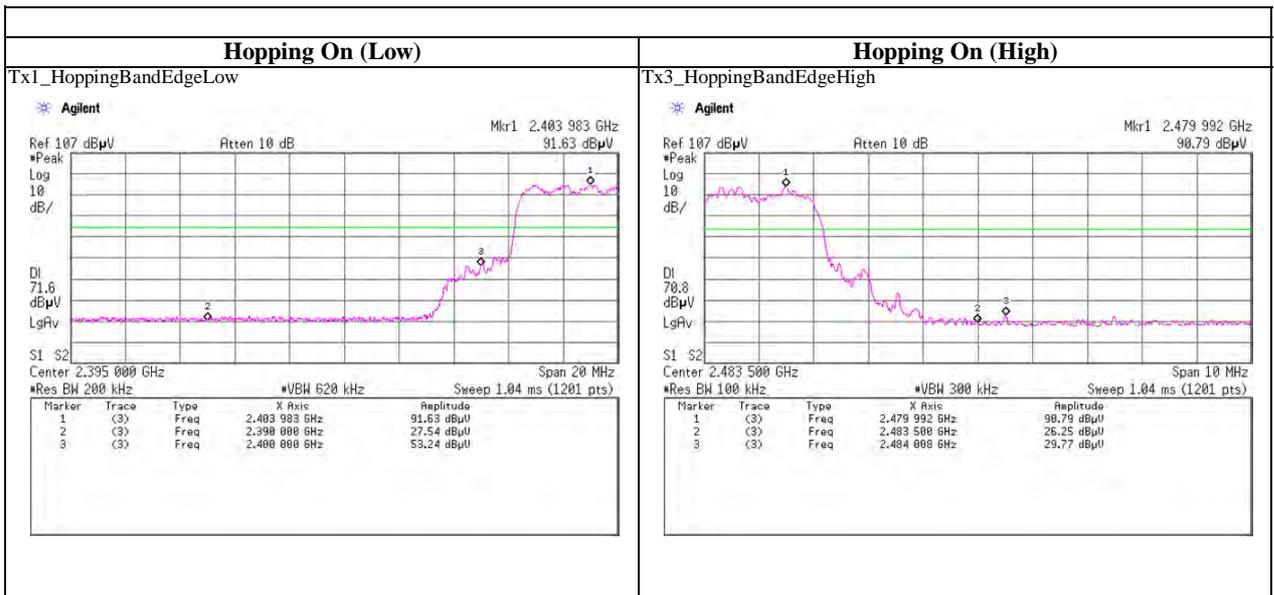
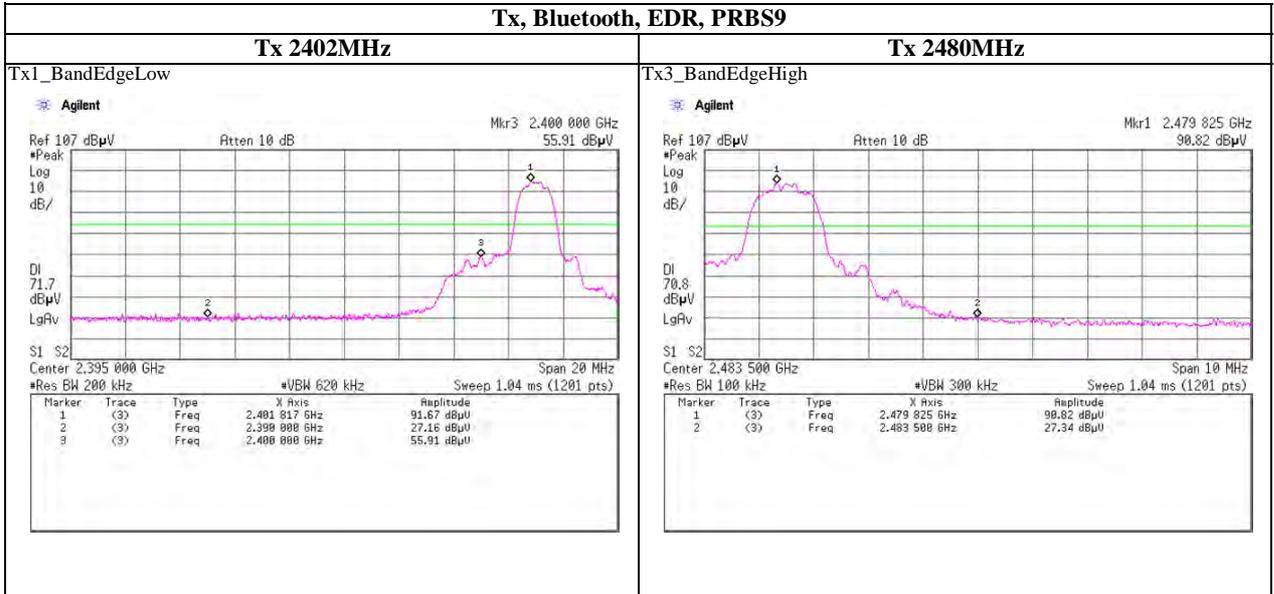
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Spurious emission (Conducted)

Band Edge compliance

Tx, Bluetooth, EDR, PRBS9



UL Japan, Inc.

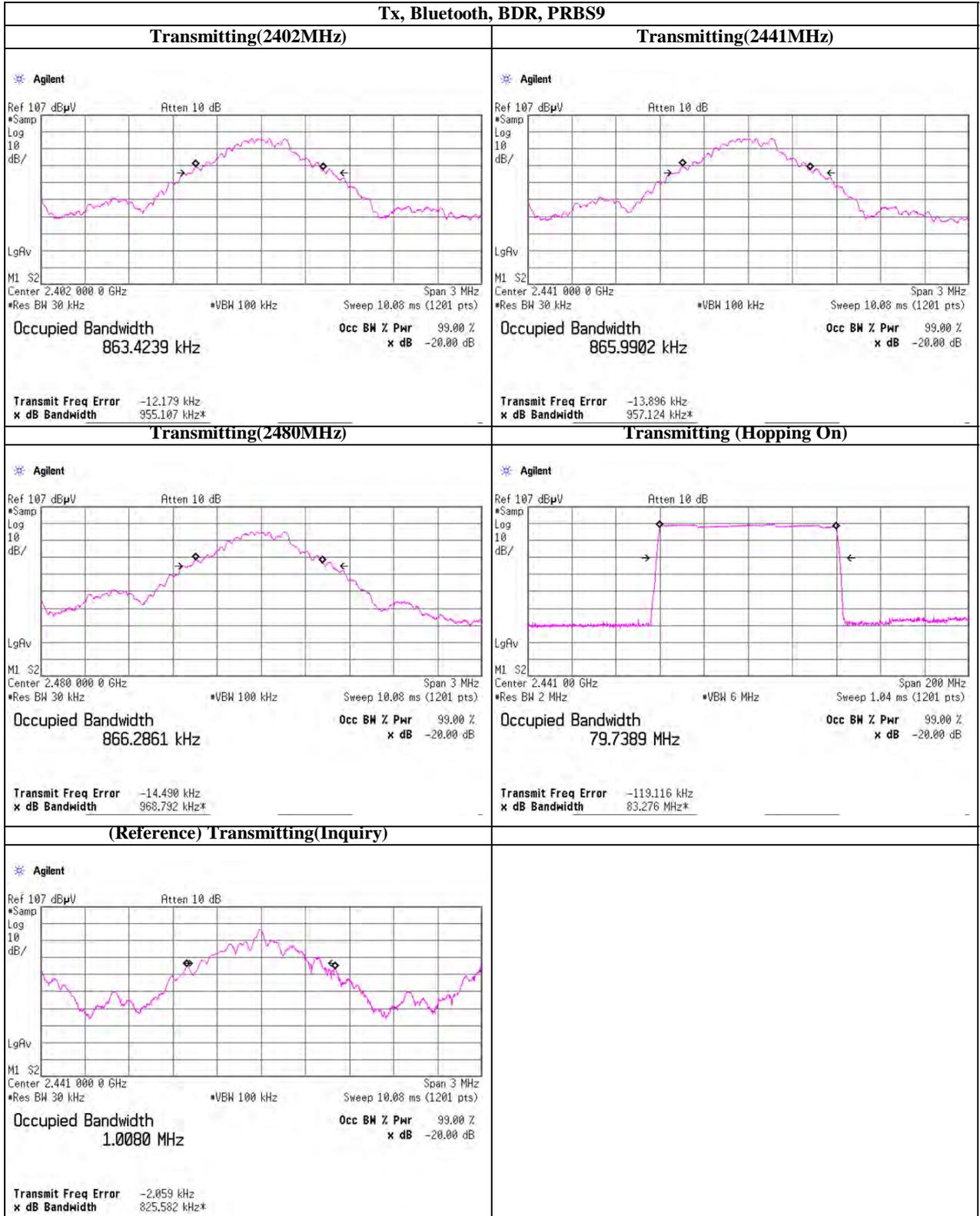
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99% Occupied Bandwidth



UL Japan, Inc.

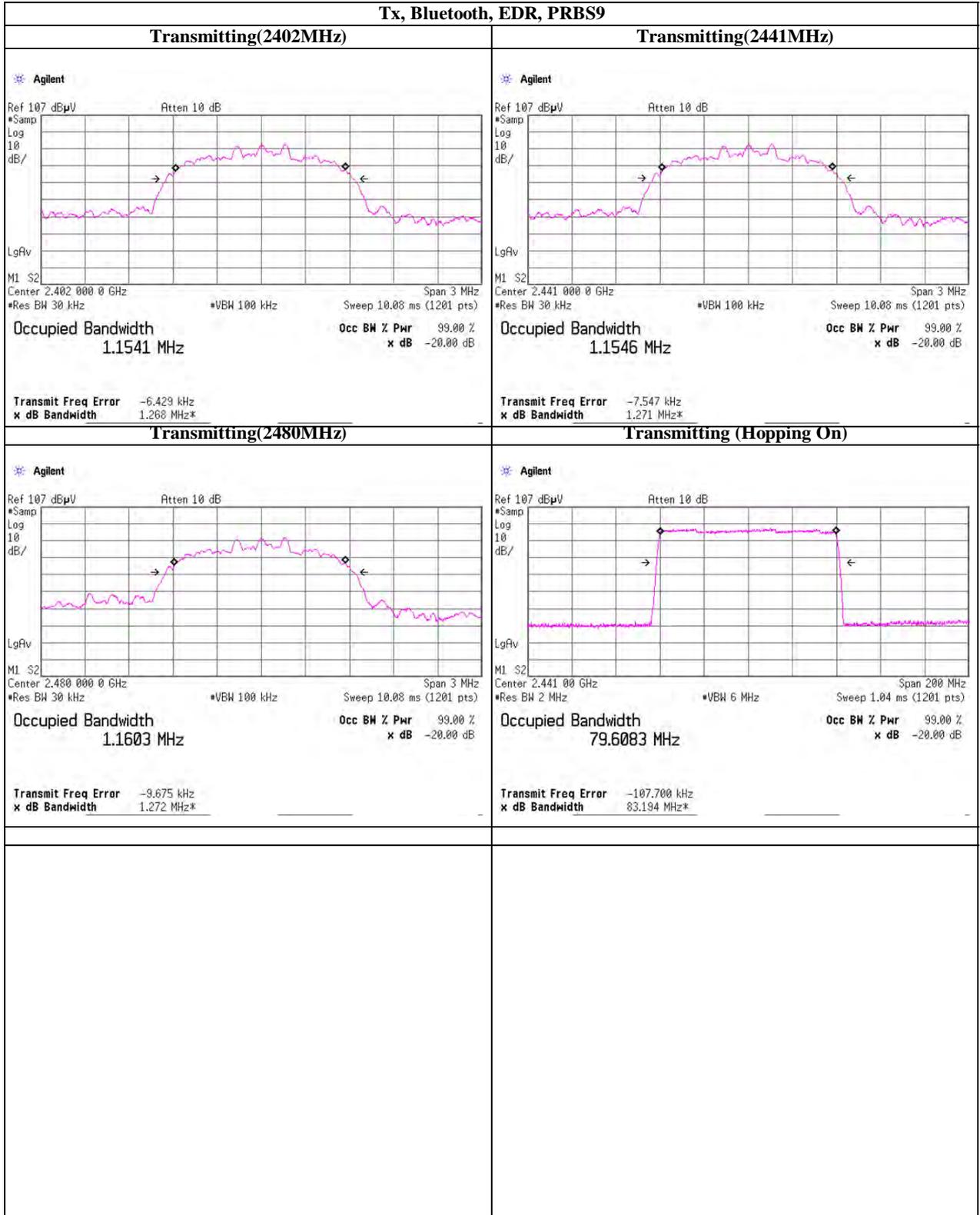
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99% Occupied Bandwidth



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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)
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2011/03/23 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2011/04/28 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2011/05/27 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2011/08/11 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2011/02/23 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2011/03/07 * 12
SJM-12	Measure	PROMART	SEN1935	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFLMF)	-	RE	-
SAT10-04	Attenuator(above1GHz)	Agilent	8493C-010	74863	RE	2010/12/15 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2010/12/15 * 12
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2011/03/15 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2011/03/16 * 12
SCC-G18	Coaxial Cable	Suhner	SUCOFLEX 104A	46292/4A	RE	2011/03/16 * 12
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	2011/02/17 * 12
SAT6-01	Attenuator	JFW	50HF-006N	-	RE	2011/02/17 * 12
SAT3-04	Attenuator	JFW	50HF-003N	-	RE	2011/02/17 * 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/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2011/04/28 * 12
SCC-A2/A4/A6/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2011/04/28 * 12
SLA-01	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0888	RE	2011/08/17 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2011/10/22 * 12
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2011/09/01 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2010/11/16 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2011/03/23 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	AT	2011/03/23 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2011/04/12 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2011/04/12 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2011/03/02 * 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 disturbance voltage

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Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SCC-B12/B13/ SRSE-02	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/N S4906	-/0901-270(RF Selector)	CE	2011/04/28 * 12
SLS-03	LISN	Rohde & Schwarz	ENV216	100513	CE	2011/02/23 * 12
SAT3-03	Attenuator	JFW	50HF-003N	-	CE	2011/02/17 * 12
SOS-04	Humidity Indicator	A&D	AD-5681	4061512	CE	2011/03/02 * 12
STM-03	Terminator	TME	CT-01 BP	-	CE	2011/01/07 * 12
STR-02	Test Receiver	Rohde & Schwarz	ESCI	100575	CE	2011/08/04 * 12
SJM-02	Measure	KOMELON	KMC-36	-	CE	-

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 :

CE: Conducted emission ,