RADIO TEST REPORT

Test Report No.: 10064467S-D-R1

Applicant	:	**Sony Corporation**
Type of Equipment	:	**Wireless Module**
Model No.	:	**WS001**
FCC ID	:	**AK8WS001**
Test regulation	:	**FCC Part15 Subpart C: 2013**
Test result	:	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
7. This report is a revised version of 10064467S-D. 10064467S-D is replaced with this report.

Date of test: September 6 to 16, 2013

Tested by: S. Takano

Shinichi Takano
Engineer of WiSE Japan,
UL Verification Service

Approved by : T. Imamura

Toyokazu Imamura
Leader of WiSE Japan,
UL Verification Service

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

RTL02610

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
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REVISION HISTORY

Original Test Report No.: 10064467S-D

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10064467S-D	October 1, 2013	-	-
1	10064467S-D-R1	October 29, 2013	Full revision	Addition of Comparison sheet of Antennas

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Shonan EMC Lab.
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Telephone : +81 463 50 6400
Facsimile : +81 463 50 6401

Contents

SECTION 1: Customer information

Company Name	:	Sony EMCS Corporation
Address	:	8-4 Shiomi Kisarazu-shi, Chiba, 292-0834 Japan
Telephone Number	:	+81-438-37-3982
Facsimile Number	:	+81-438-37-4705
Contact Person	:	Kazuhiko Nagano

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

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless Module
Model Number	:	WS001
Serial Number	:	Refer to 4.2 in this report.
Rating	:	DC3.3V
Country of Mass-production	:	Philippines
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample	:	September 5, 2013
Modification of EUT	:	No modification by the test lab.

2.2 Product description

Model: WS001 (referred to as the EUT in this report) is a Wireless Module.

Clock frequency(ies) in the system : 44MHz

Radio specification:

Equipment type	:	Transceiver
Frequency of operation *1)	:	5180-5240MHz, 5736-5814MHz
Bandwidth	:	17MHz
Channel spacing	:	30MHz
Type of modulation	:	DSSS, QPSK
Antenna type	:	Printed antenna
Antenna gain	:	Antenna A: 5.2GHz band:1.1dBi (max), 5.8GHz band: 0.8dBi (max) Antenna B: 5.2GHz band:0.5dBi (max), 5.8GHz band: 0.1dBi (max)
Antenna connector type	:	None
ITU code	:	G1D

*1) Refer to the test report 10064467S-F for FCC 15.407.

Operation temperature range	:	-10 to +60 deg.C

FCC 15.31 (e)
The module is provided the stable voltage (DC3.3V) from the host device. Therefore, the equipment complies with the **r**equirement**.**

FCC 15.203
The antenna is not removable from the EUT. Therefore, the equipment complies with the requirement.

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2013, final revised on June 11, 2013 and effective July 11, 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

3.2 Procedures & Results

Item	Test Procedure *1)	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.10:2009	FCC 15.207	-	N/A	15.2dB Freq.: 0.47865MHz Detection: Quasi-Peak Phase: N Mode: Tx 5762MHz Antenna: B Freq.: 0.47678MHz Detection: Quasi-Peak Phase: N Mode: Tx 5814MHz Antenna: B	Complied
6dB bandwidth	ANSI C63.10:2009	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak output power	ANSI C63.10:2009	FCC 15.247 (b)(3)	Conducted	N/A		Complied
Out of band emission & Restricted band edges	ANSI C63.10:2009	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	7.2dB Freq.: 86.028MHz Polarization: Vertical Detection: Quasi-Peak Mode: Tx 5814MHz Antenna: B	Complied
Power density	ANSI C63.10:2009	FCC 15.247 (e)	Conducted	N/A	* See data	Complied

Note: UL Japan's EMI Work Procedures No.13-EM-W0420 and 13-EM-W0422.
*1) These tests were also referred to KDB 558074 v03 r01 (FCC), "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.10:2009, 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 (±)
Conducted emission (AC Mains) LISN	150kHz-30MHz	3.6 dB	3.6 dB	3.5 dB
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

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.

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%

3.5 Test location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone number : +81 463 50 6400
Facsimile number : +81 463 50 6401
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
☒ No.1 semi-anechoic chamber	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☒ No.2 semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☐ No.3 semi-anechoic chamber	697847	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
☐ No.4 semi-anechoic chamber	-	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
☐ No.1 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☒ No.2 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.3 shielded room	-	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
☐ No.4 shielded room	-	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
☒ No.5 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☐ No.6 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☐ No.7 shielded room	-	-	2.76 x 3.76 x 2.4	2.76 x 3.76	-

3.6 Test setup, Test data & Test instruments

Refer to APPENDIX 1 to 3.

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

4.1 Operating mode

Test item	Mode	Tested frequency
All items	Transmitting	5736MHz, 5762MHz, 5814MHz

EUT has the power settings by the software as follows;
Test software: GUI_Demo_01.05.29_8192.exe, MCU version SERIAL_COM_8179
Power settings: Fixed

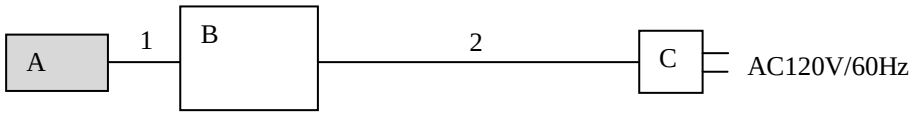
Antenna port used:

Conducted emission test *1)	- Antenna B
Radiated emission test *1)	- Antenna B
Antenna port conducted tests *2)	- Antenna A

*1) The worse antenna port was determined based on the test result of pre-check measurement. Refer to Comparison Sheet of Antenna A and B.
*2) The worse antenna port was determined based on the test result of Maximum Peak Output Power. Refer to Comparison Sheet of Antenna A and B.

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

4.2 Configuration and peripherals



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Module	WS001	*1)	Sony Corporation	EUT
B	Jig	-	-	Sony Corporation	-
C	AC Adaptor	ADS6818-0610	7620003234W	Actiontec	-

*1) Antenna port conducted tests: NR-No.4, 2000158, Other tests: NR-No.2

List of cables used

No.	Cable Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Flat	0.09	Unshielded	Unshielded	-
2	DC	1.8	Unshielded	Unshielded	-

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 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 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.
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

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT within a Shielded room.
The EUT 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, a CISPR average detector.
The conducted emission measurements were made with the following detection of the test receiver.

Detection Type : Quasi-Peak/ CISPR 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 urethane platform of nominal size, 0.5m by 0.5m, raised 0.8m above the conducting ground plane. Photographs of the set up are shown in APPENDIX 3.

6.3 Test conditions

Frequency range : 30 - 40GHz
EUT position : Table top

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 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	1-40GHz		20dBc
Detection type	Quasi-Peak	Peak	Average *1)	Peak
IF Bandwidth	120kHz	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 3MHz Detector: RMS	RBW: 100kHz VBW: 300kHz

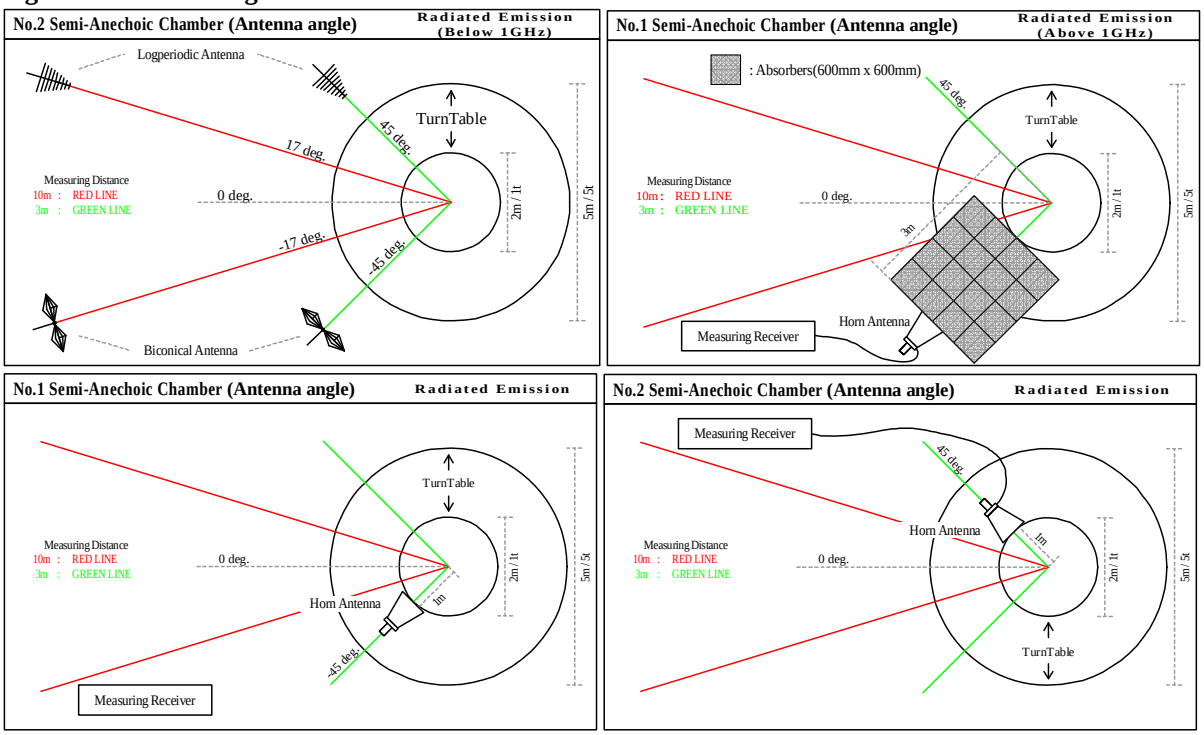
*1) Average Power Measurement was measured based on 12.2.5 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

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

Worst case:

Antenna polarization	Carrier	Spurious (Below 1GHz)	Spurious (1-15GHz)	Spurious (Above 15GHz)
Horizontal	X	Y	X	X
Vertical	Z	Y	Z	X

Figure 1. Antenna angle



6.5 Band edge

Band edge level at 5725MHz and 5850MHz is below the 20dBc. Refer to the data.

6.6 Results

Summary of the test results : Pass

* No noise was detected above the 3rd 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.
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

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

Test procedure
The bandwidth was measured with a spectrum analyzer connected to the antenna port.
The test was measured based on Method 8.1 Option 1 and 8.2 Option 2 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

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.
The test was measured based on Method 9.1.3 PKPM1 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 10: Peak power density

Test procedure
The peak power density was measured with a spectrum analyzer connected to the antenna port.
Instrument used : Spectrum Analyzer
RBW / VBW : 3kHz / 9.1kHz

The test was measured based on Method 10.2 PKPSD of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass
Refer to APPENDIX 1

Contents of APPENDIXES

APPENDIX 1: Data of Radio tests

Conducted emission
6dB bandwidth
Maximum peak output power
Radiated emission
Spurious emission (Antenna port conducted)
Peak power density
Occupied bandwidth

Comparison Sheet of Antenna A and B

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Conducted emission
Radiated emission
Pre-check of the worst position

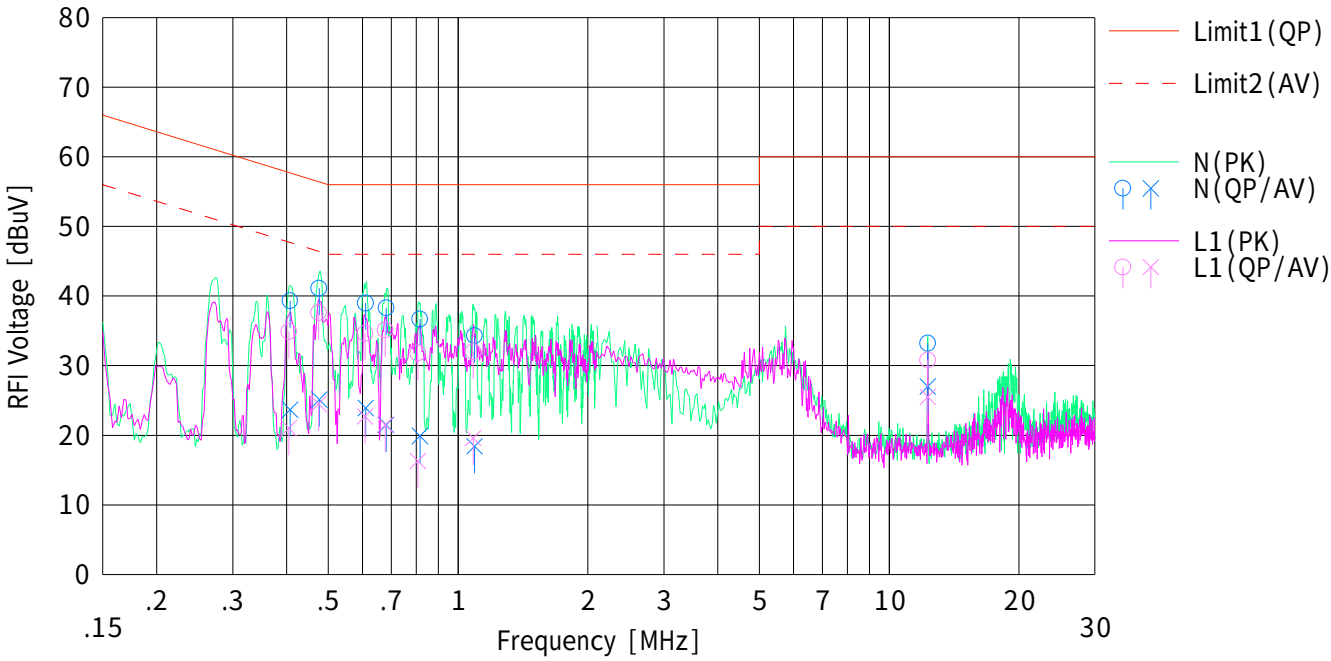
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Shielded Room
Date : 2013/09/16

Company	: SONY Corporation	Mode	: Tx 5736MHz, ANT-B
Kind of EUT	: Wireless module	Order No.	: 10064467S
Model No.	: WS001	Power	: AC 120V / 60Hz
Serial No.	: NR-No.2	Temp./Humi.	: 24deg.C / 58%RH
Remarks	: Ant-B		

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

Engineer : Wataru Kojima



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1	0.40748	26.7	11.1	12.6	39.3	23.7	57.6	47.6	18.3	23.9	N	
2	0.47590	28.5	12.5	12.6	41.1	25.1	56.4	46.4	15.3	21.3	N	
3	0.60995	26.4	11.3	12.6	39.0	23.9	56.0	46.0	17.0	22.1	N	
4	0.68105	25.7	8.9	12.6	38.3	21.5	56.0	46.0	17.7	24.5	N	
5	0.81540	24.1	7.3	12.6	36.7	19.9	56.0	46.0	19.3	26.1	N	
6	1.09185	21.6	5.7	12.7	34.3	18.4	56.0	46.0	21.7	27.6	N	
7	12.29020	19.8	13.6	13.4	33.2	27.0	60.0	50.0	26.8	23.0	N	
8	0.40475	22.3	8.4	12.6	34.9	21.0	57.7	47.7	22.8	26.7	L1	
9	0.47485	25.0	11.9	12.6	37.6	24.5	56.4	46.4	18.8	21.9	L1	
10	0.60845	22.0	10.1	12.6	34.6	22.7	56.0	46.0	21.4	23.3	L1	
11	0.67800	22.5	8.9	12.6	35.1	21.5	56.0	46.0	20.9	24.5	L1	
12	0.80710	19.2	3.7	12.6	31.8	16.3	56.0	46.0	24.2	29.7	L1	
13	1.08395	19.3	6.9	12.7	32.0	19.6	56.0	46.0	24.0	26.4	L1	
14	12.29020	17.4	12.1	13.4	30.8	25.5	60.0	50.0	29.2	24.5	L1	

Calculation:Result[dBuV]=Reading[dBuV]+C.Fac(LISN+Cable+ATT)[dB]
LISN:SLS-04

DATA OF CONDUCTED EMISSION TEST

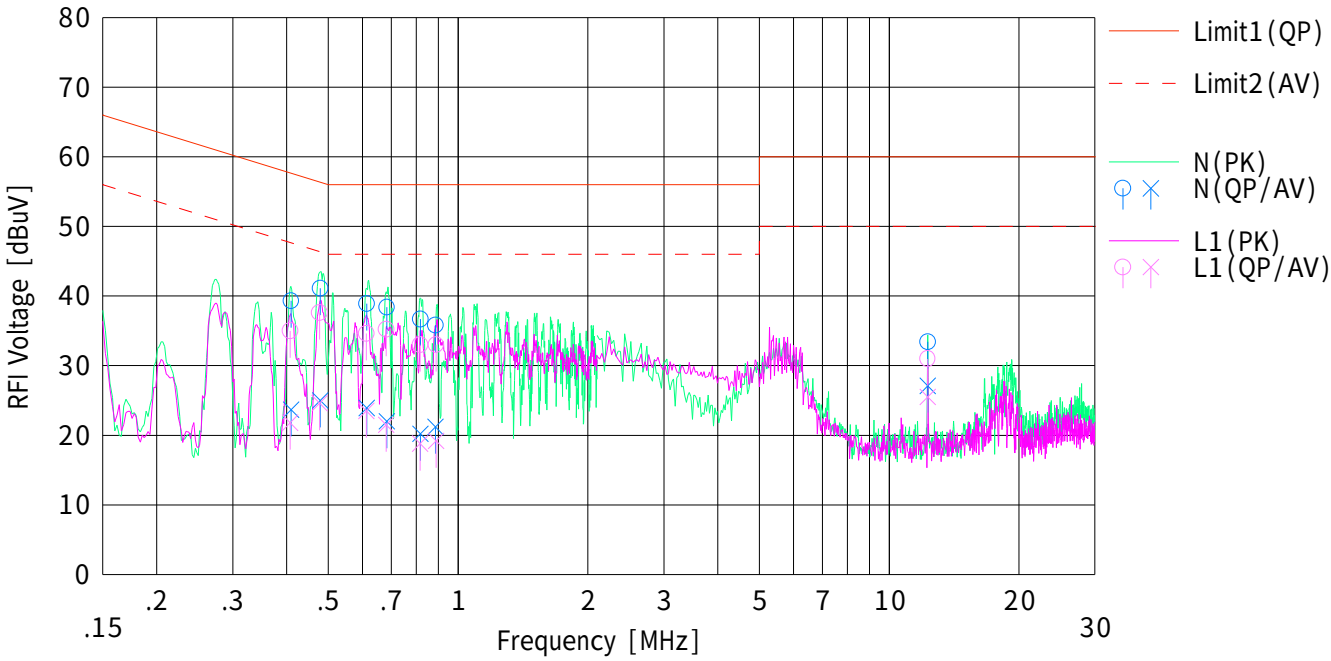
UL Japan, Inc. Shonan EMC Lab. No.2 Shielded Room
Date : 2013/09/16

Company : SONY Corporation
Kind of EUT : Wireless module
Model No. : WS001
Serial No. : NR-No.2
Remarks : Ant-B

Mode : Tx 5762MHz, ANT-B
Order No. : 10064467S
Power : AC 120V / 60Hz
Temp./Humi. : 24deg.C / 58%RH

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

Engineer : Wataru Kojima



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	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.40946	26.7	11.1	12.6	39.3	23.7	57.6	47.6	18.3	23.9	N	
2	0.47865	28.5	12.4	12.6	41.1	25.0	56.3	46.3	15.2	21.3	N	
3	0.61390	26.3	11.3	12.6	38.9	23.9	56.0	46.0	17.1	22.1	N	
4	0.68275	25.8	9.4	12.6	38.4	22.0	56.0	46.0	17.6	24.0	N	
5	0.81755	24.1	7.6	12.6	36.7	20.2	56.0	46.0	19.3	25.8	N	
6	0.88640	23.2	8.6	12.6	35.8	21.2	56.0	46.0	20.2	24.8	N	
7	12.28930	20.0	13.7	13.4	33.4	27.1	60.0	50.0	26.6	22.9	N	
8	0.40770	22.4	9.2	12.6	35.0	21.8	57.6	47.6	22.6	25.8	L1	
9	0.47705	25.0	12.0	12.6	37.6	24.6	56.3	46.3	18.7	21.7	L1	
10	0.61240	22.0	10.9	12.6	34.6	23.5	56.0	46.0	21.4	22.5	L1	
11	0.68125	22.6	8.9	12.6	35.2	21.5	56.0	46.0	20.8	24.5	L1	
12	0.81630	20.4	6.2	12.6	33.0	18.8	56.0	46.0	23.0	27.2	L1	
13	0.88860	20.4	6.6	12.6	33.0	19.2	56.0	46.0	23.0	26.8	L1	
14	12.28281	17.6	12.1	13.4	31.0	25.5	60.0	50.0	29.0	24.5	L1	

Calculation:Result[dBuV]=Reading[dBuV]+C.Fac(LISN+Cable+ATT)[dB]
LISN:SLS-04

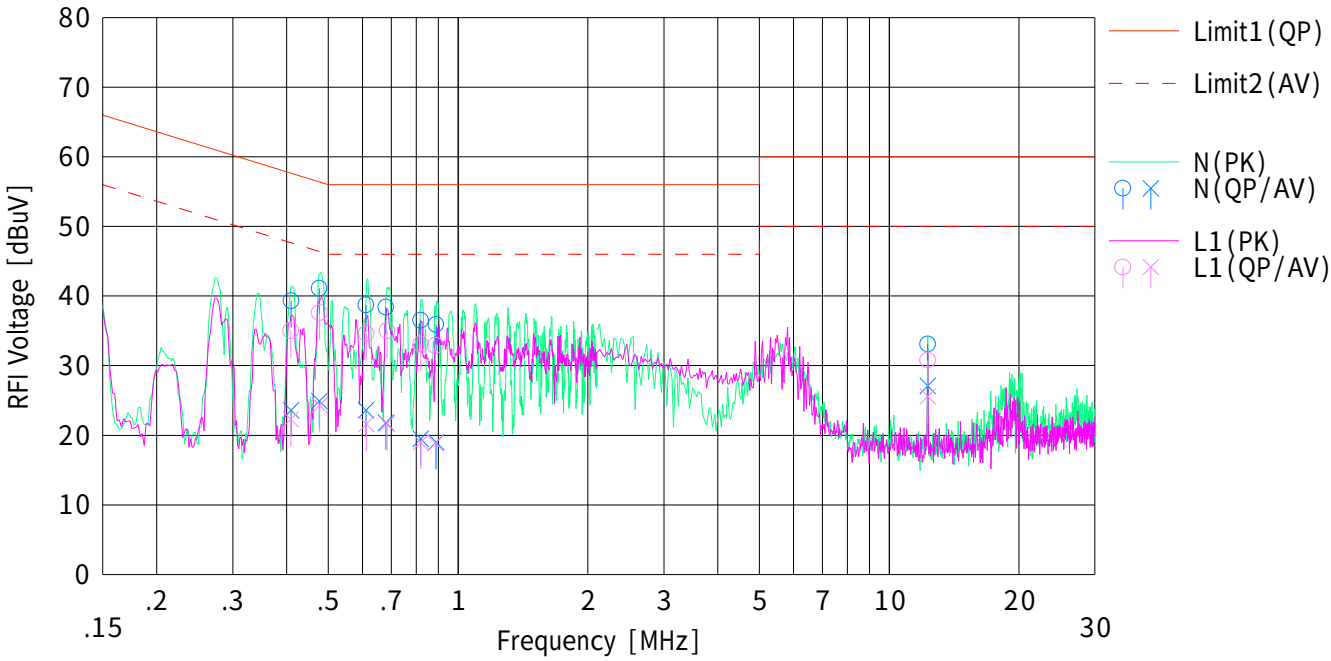
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Shielded Room
Date : 2013/09/16

Company	: SONY Corporation	Mode	: Tx 5814MHz, ANT-B
Kind of EUT	: Wireless module	Order No.	: 10064467S
Model No.	: WS001	Power	: AC 120V / 60Hz
Serial No.	: NR-No.2	Temp./Humi.	: 24deg.C / 58%RH
Remarks	: Ant-B		

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

Engineer : Wataru Kojima



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	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.40986	26.7	11.0	12.6	39.3	23.6	57.6	47.6	18.3	24.0	N	
2	0.47678	28.5	12.3	12.6	41.1	24.9	56.3	46.3	15.2	21.4	N	
3	0.61130	26.1	11.0	12.6	38.7	23.6	56.0	46.0	17.3	22.4	N	
4	0.68020	25.8	9.2	12.6	38.4	21.8	56.0	46.0	17.6	24.2	N	
5	0.81970	23.9	6.9	12.6	36.5	19.5	56.0	46.0	19.5	26.5	N	
6	0.88830	23.3	6.4	12.6	35.9	19.0	56.0	46.0	20.1	27.0	N	
7	12.28940	19.7	13.7	13.4	33.1	27.1	60.0	50.0	26.9	22.9	N	
8	0.40920	22.4	9.7	12.6	35.0	22.3	57.6	47.6	22.6	25.3	L1	
9	0.47700	25.0	11.7	12.6	37.6	24.3	56.3	46.3	18.7	22.0	L1	
10	0.61290	22.0	9.0	12.6	34.6	21.6	56.0	46.0	21.4	24.4	L1	
11	0.68465	22.4	9.1	12.6	35.0	21.7	56.0	46.0	21.0	24.3	L1	
12	0.81830	20.5	6.4	12.6	33.1	19.0	56.0	46.0	22.9	27.0	L1	
13	0.88560	20.3	6.3	12.6	32.9	18.9	56.0	46.0	23.1	27.1	L1	
14	12.28940	17.4	12.2	13.4	30.8	25.6	60.0	50.0	29.2	24.4	L1	

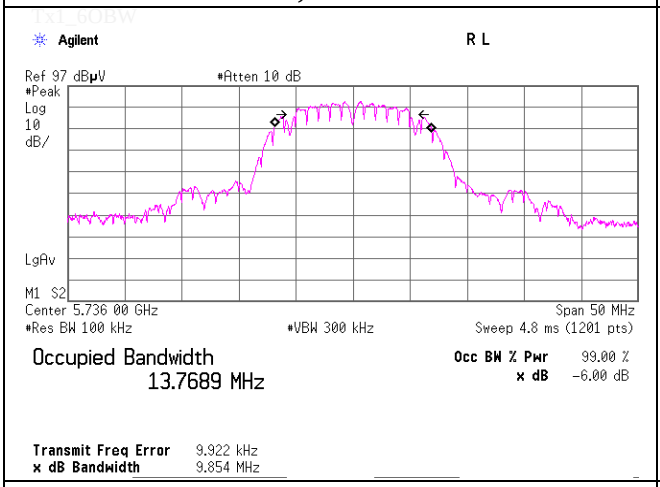
Calculation:Result[dBuV]=Reading[dBuV]+C.Fac(LISN+Cable+ATT)[dB]
LISN:SLS-04

-6dB Bandwidth

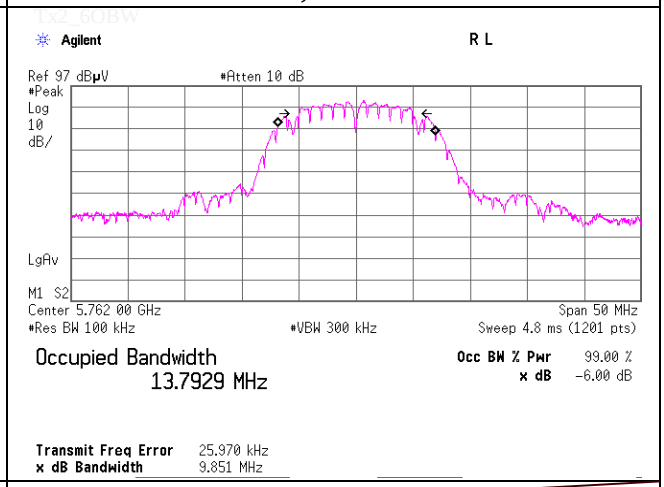
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	September 6, 2013	
Temperature / Humidity	24deg.C , 52%RH	
Engineer	Shinichi Takano	
Mode	Tx, PN9, worst antenna port A	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
5736.0000	9.854	> 0.500
5762.0000	9.851	> 0.500
5814.0000	9.855	> 0.500

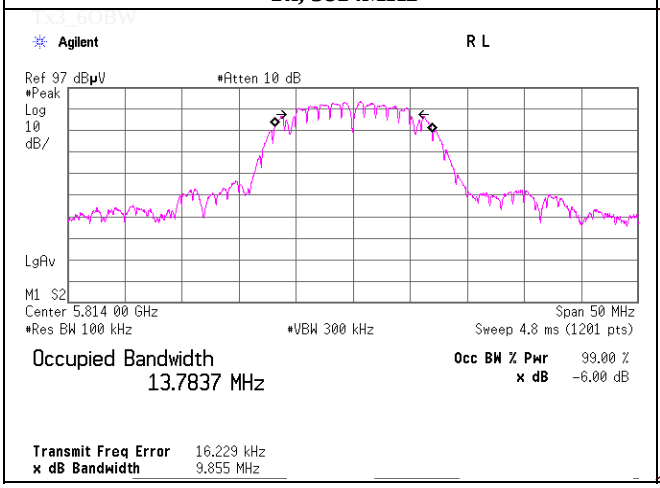
Tx, 5736MHz

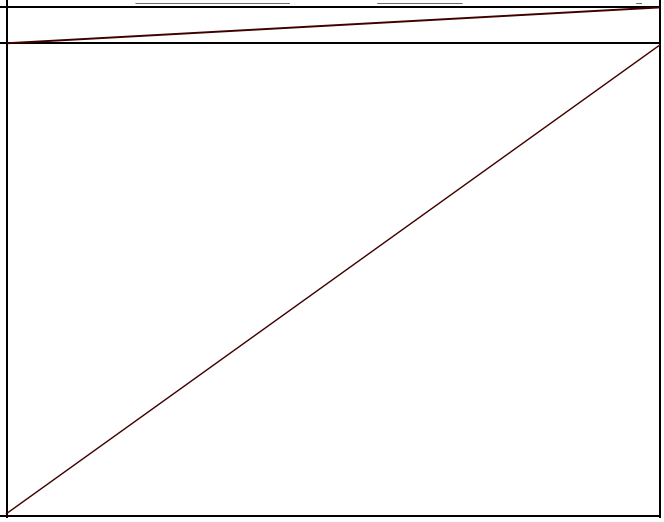


Tx, 5762MHz



Tx, 5814MHz





Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	September 6, 2013	
Temperature / Humidity	24deg.C , 52%RH	
Engineer	Shinichi Takano	
Mode	Tx, PN9,	worst antenna : A

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

Ch	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	5736.0	1.38	2.34	9.88	13.60	22.91	30.00	1000	16.40
Mid	5762.0	1.65	2.37	9.89	13.91	24.60	30.00	1000	16.09
High	5814.0	2.13	2.39	9.89	14.41	27.61	30.00	1000	15.59

Sample Calculation:
Result = Reading + Cable Loss + Atten. Loss

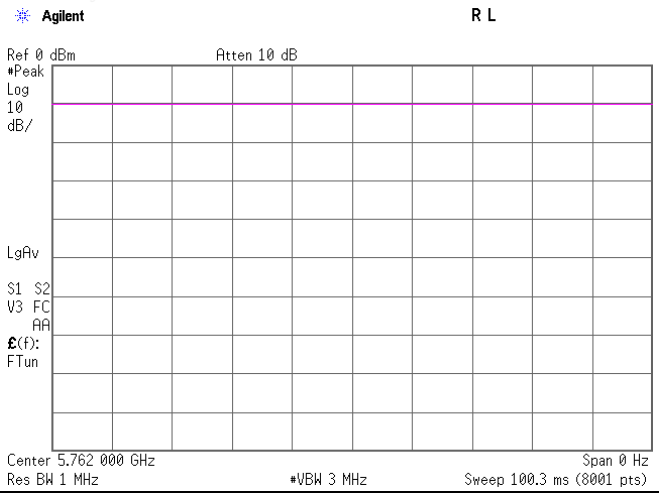
[Pre check]
Antenna A/B

Antenna	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	
A	5762.0	1.65	2.37	9.89	**13.91**	24.60	30.00	1000	**16.09**	**Worst**
B	5762.0	1.57	2.37	9.89	13.83	24.15	30.00	1000	16.17	

Sample Calculation:
Result = Reading + Cable Loss + Atten. Loss

Burst rate confirmation

Tx, PN9, worst antenna port A

Tx, 5762MHz	
	

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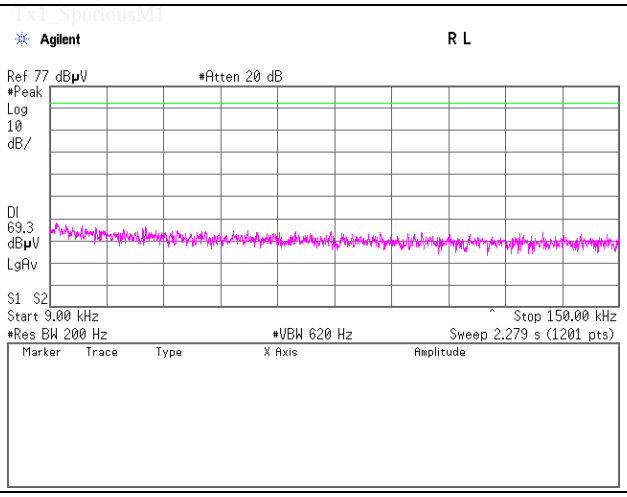
(Reference chart) Spurious emission (Conducted)

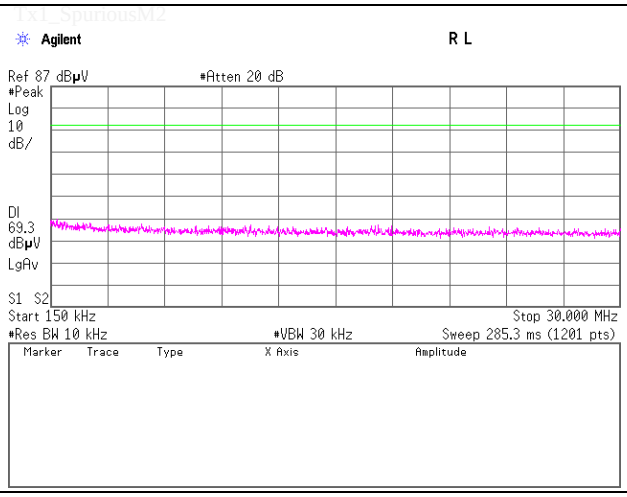
Tx, PN9, worst antenna port A

Tx, 5736MHz (below 1GHz)

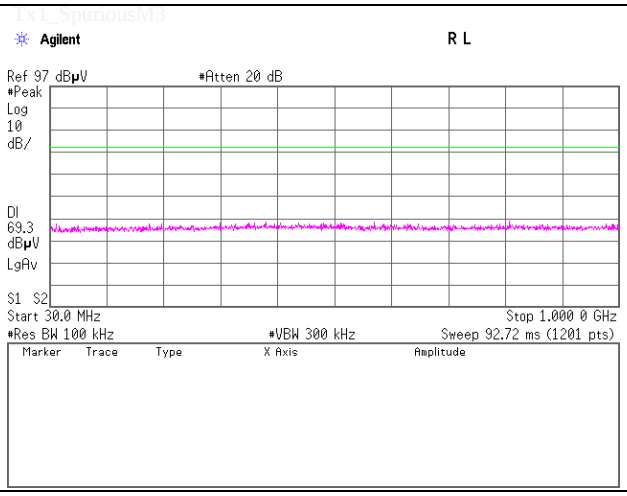
9kHz - 150kHz



150kHz - 30MHz



30MHz - 1GHz



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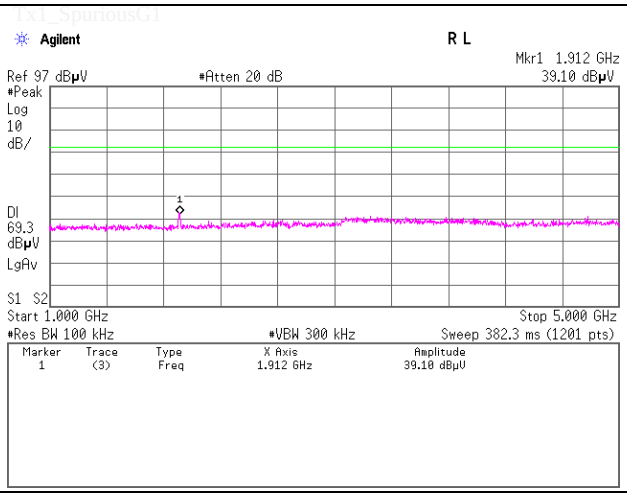
(Reference chart) Spurious emission (Conducted)

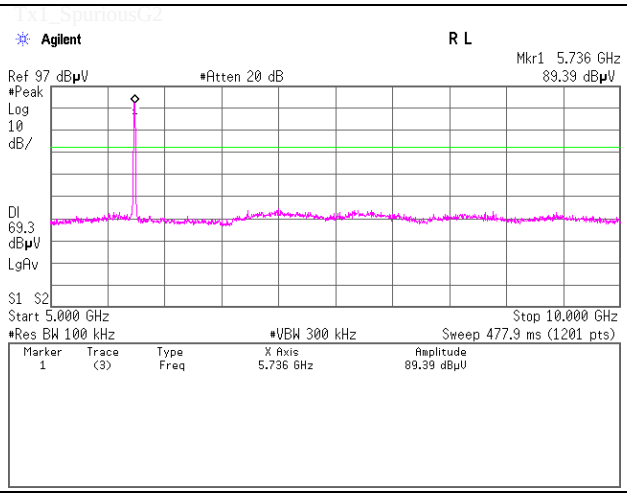
Tx, PN9, worst antenna port A

Tx, 5736MHz (above 1GHz)(1/2)

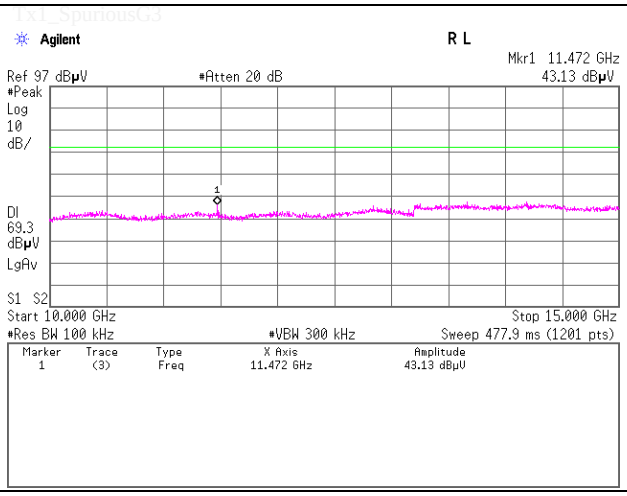
1GHz - 5GHz



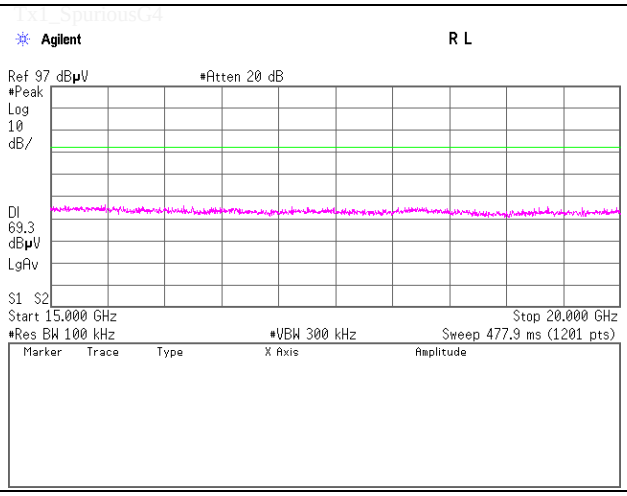
5GHz - 10GHz



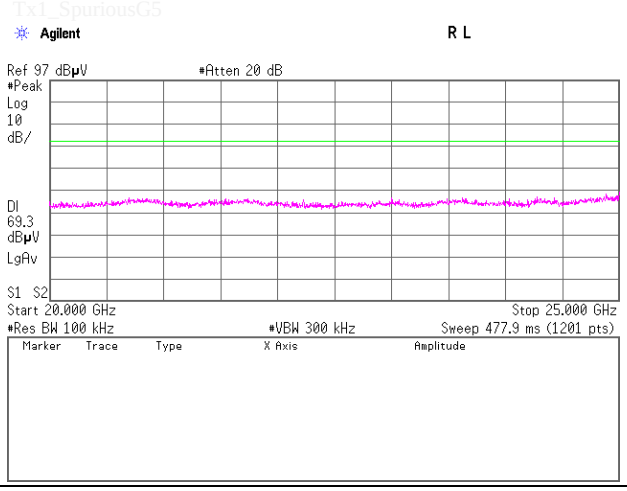
10GHz - 15GHz



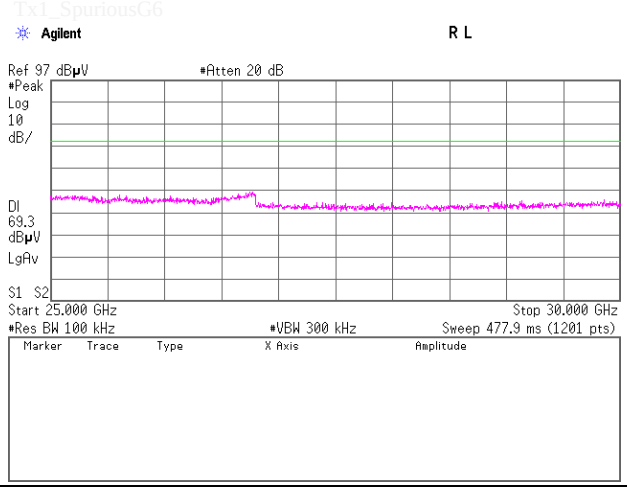
15GHz - 20GHz



20GHz - 25GHz



25GHz - 30GHz



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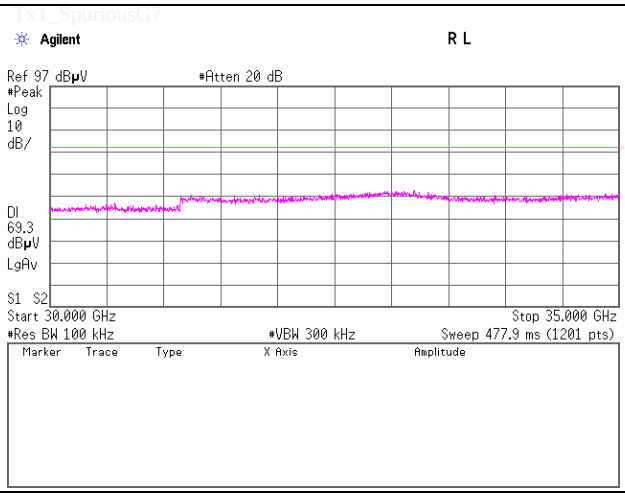
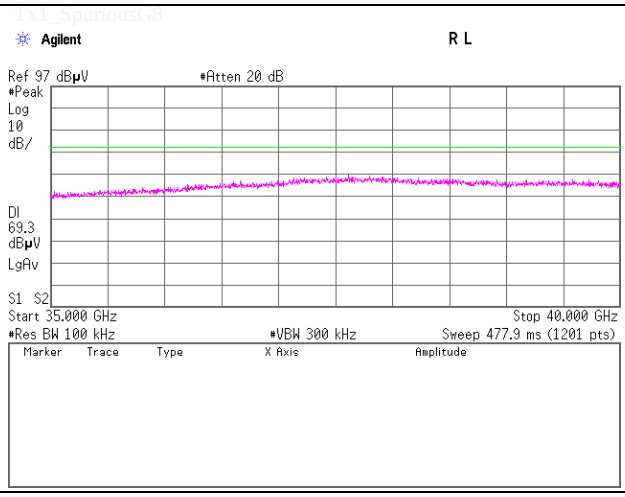
(Reference chart) Spurious emission (Conducted)

Tx, PN9, worst antenna port A

Tx, 5736MHz (above 1GHz)(2/2)	
30GHz - 35GHz	**35GHz - 40GHz**
	

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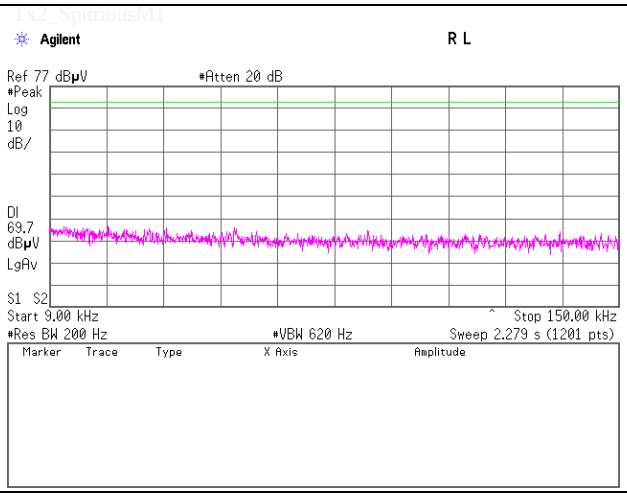
(Reference chart) Spurious emission (Conducted)

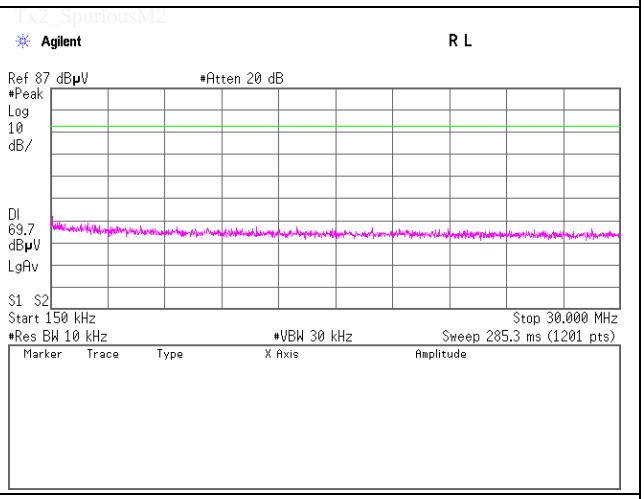
Tx, PN9, worst antenna port A

Tx, 5762MHz (below 1GHz)

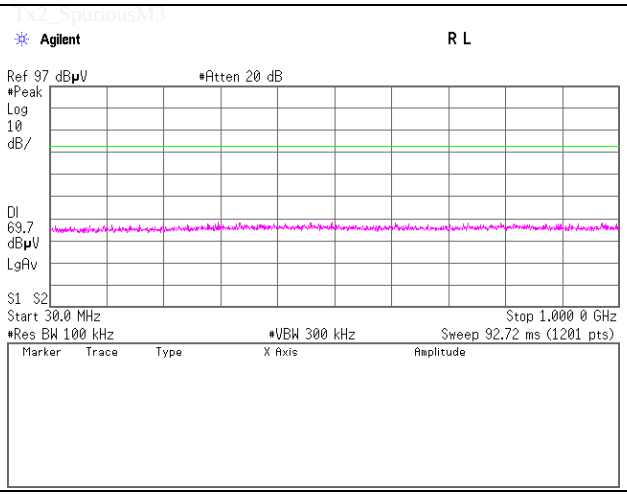
9kHz - 150kHz



150kHz - 30MHz



30MHz - 1GHz



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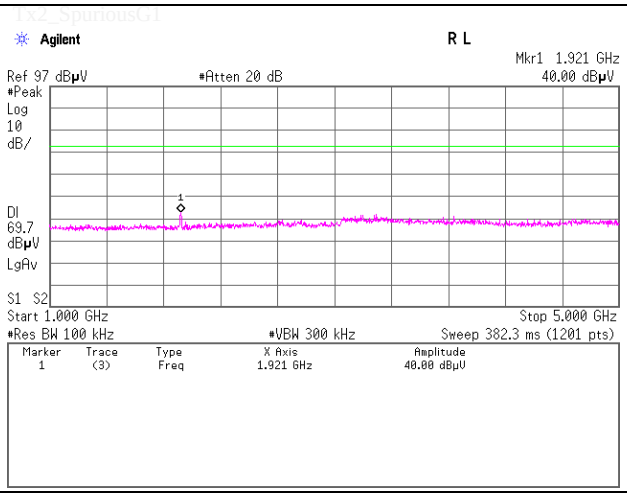
(Reference chart) Spurious emission (Conducted)

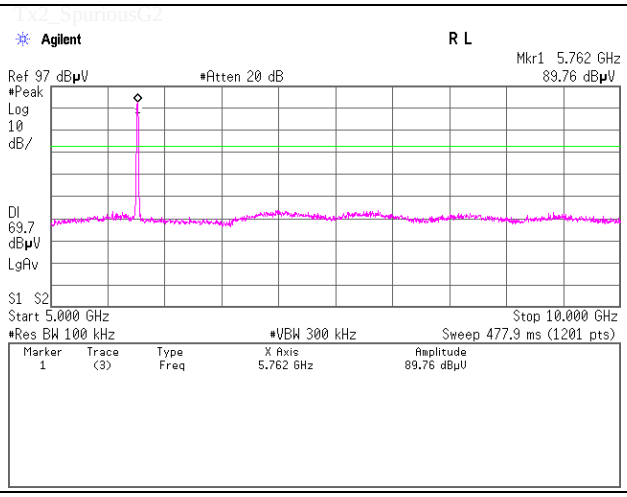
Tx, PN9, worst antenna port A

Tx, 5762MHz (above 1GHz)(1/2)

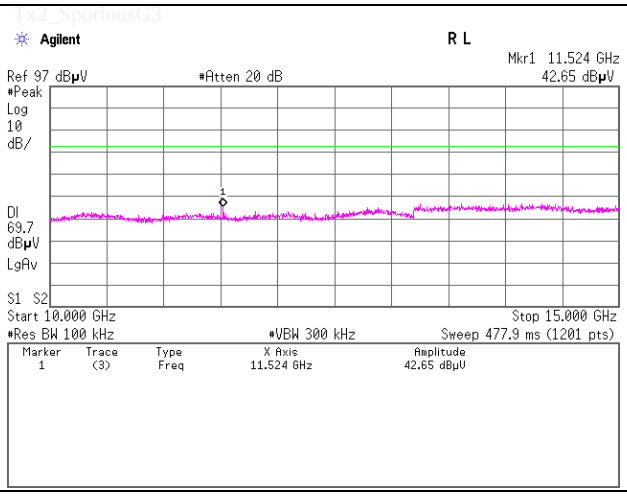
1GHz - 5GHz



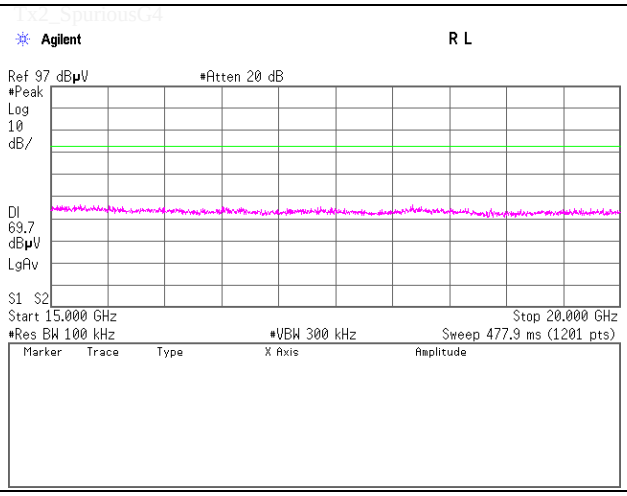
5GHz - 10GHz



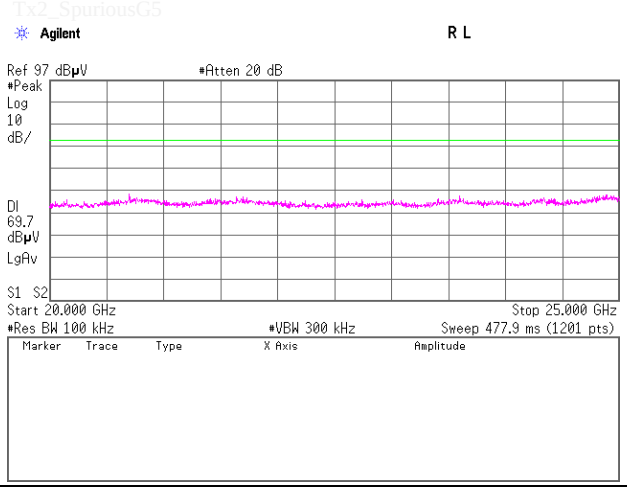
10GHz - 15GHz



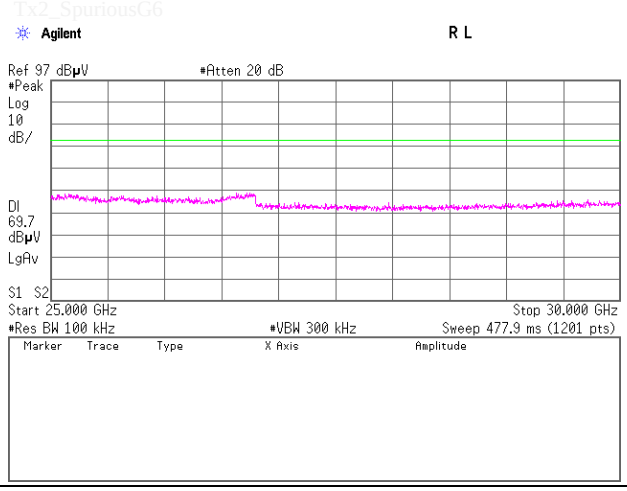
15GHz - 20GHz



20GHz - 25GHz



25GHz - 30GHz



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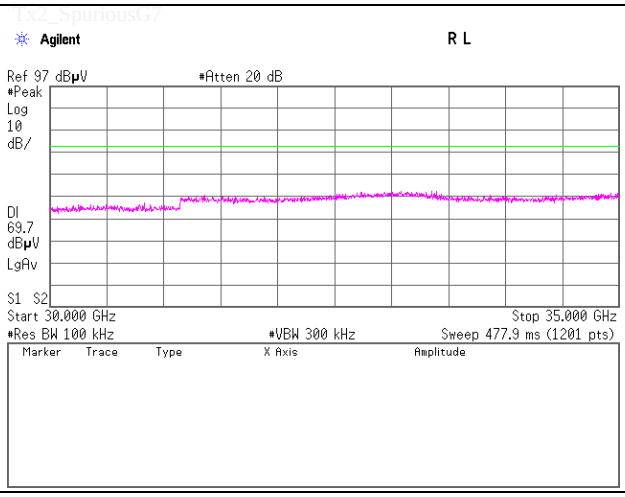
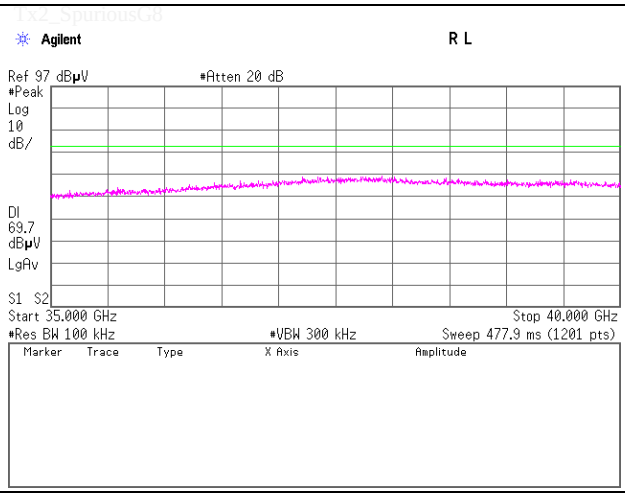
(Reference chart) Spurious emission (Conducted)

Tx, PN9, worst antenna port A

Tx, 5762MHz (above 1GHz)(2/2)	
30GHz - 35GHz	**35GHz - 40GHz**
	

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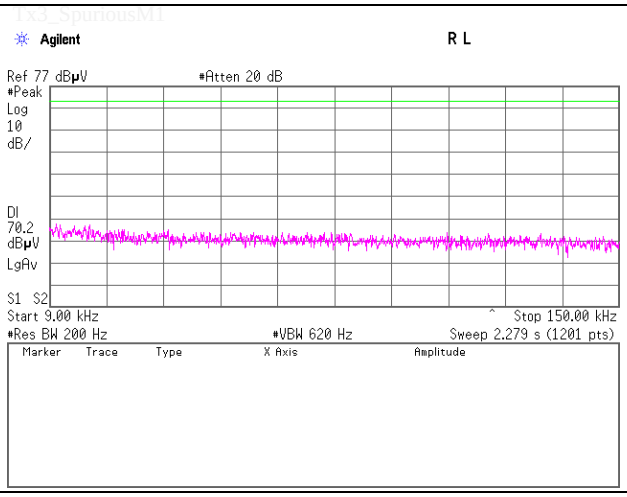
(Reference chart) Spurious emission (Conducted)

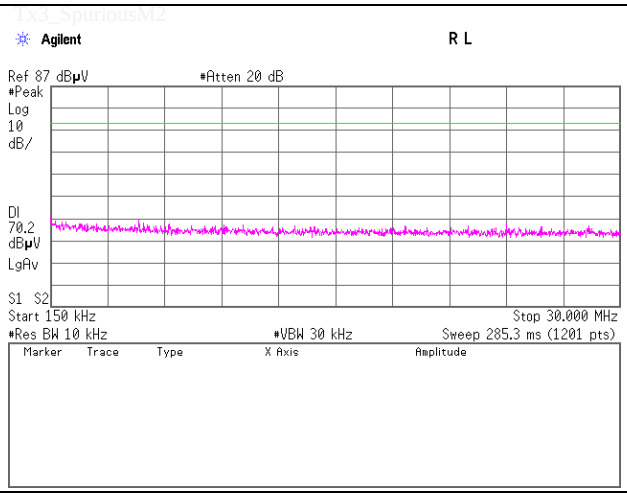
Tx, PN9, worst antenna port A

Tx, 5814MHz (below 1GHz)

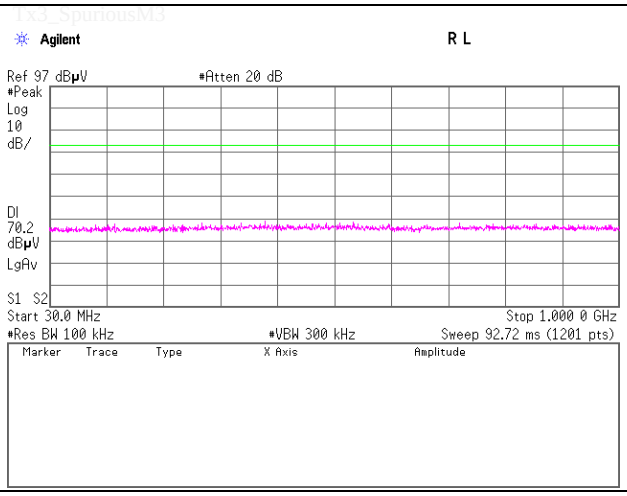
9kHz - 150kHz



150kHz - 30MHz



30MHz - 1GHz



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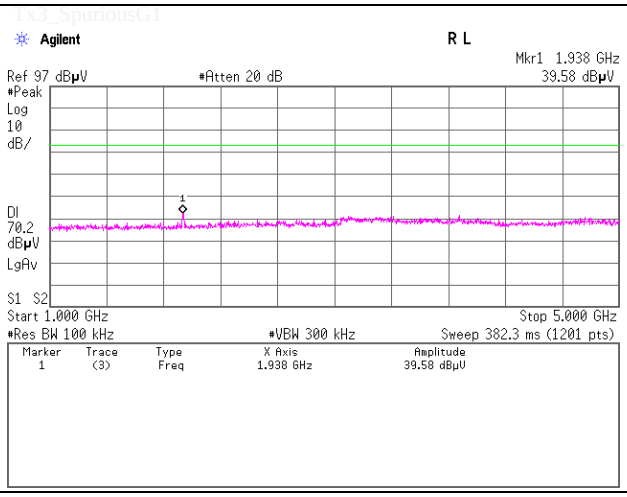
(Reference chart) Spurious emission (Conducted)

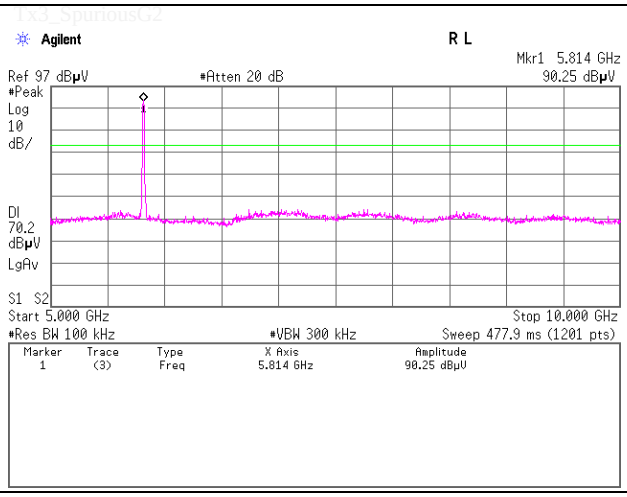
Tx, PN9, worst antenna port A

Tx, 5814MHz (above 1GHz)(1/2)

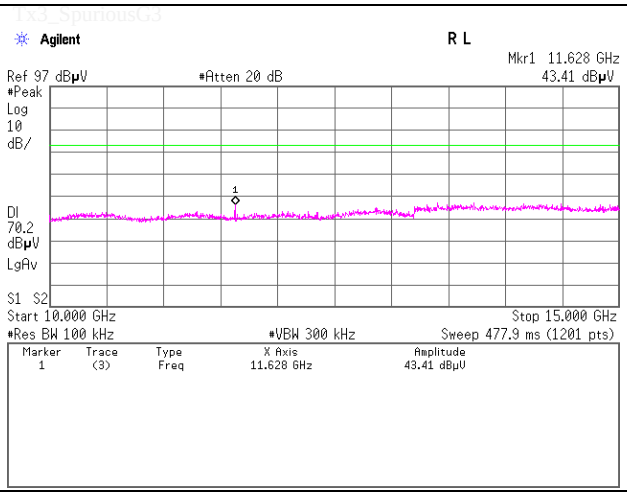
1GHz - 5GHz



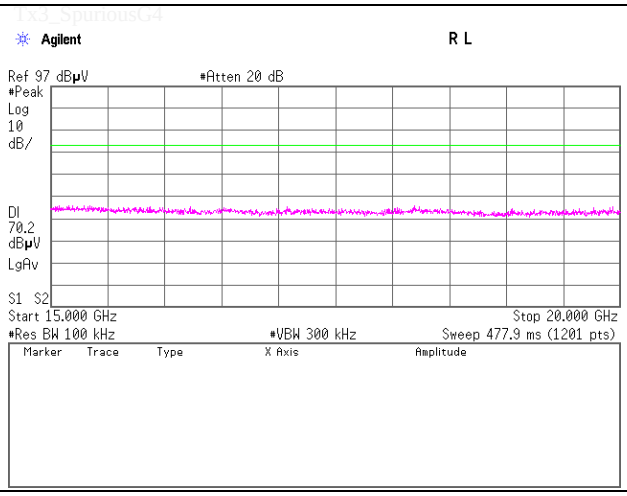
5GHz - 10GHz



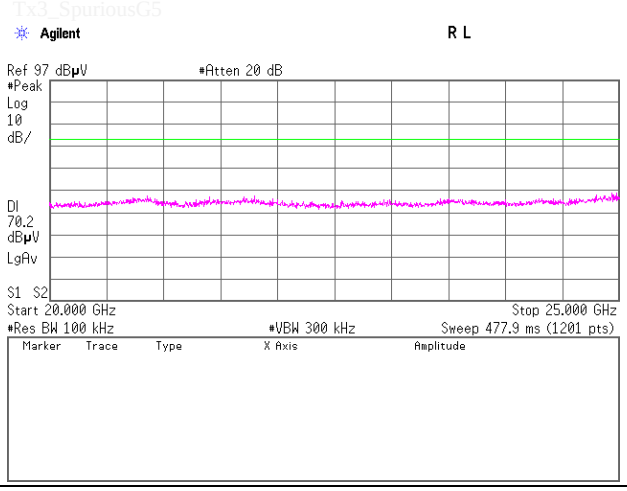
10GHz - 15GHz



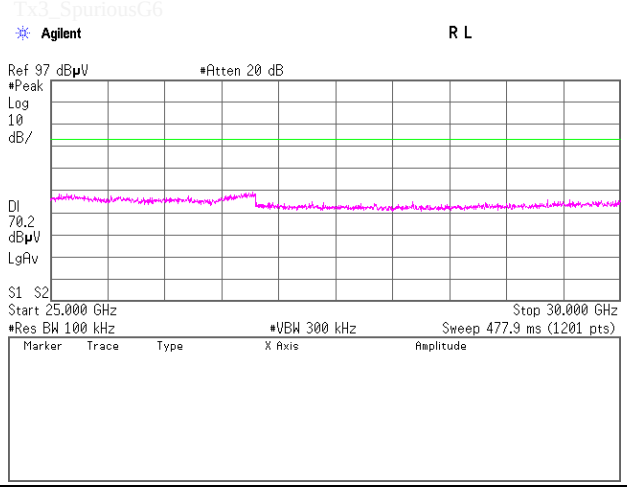
15GHz - 20GHz



20GHz - 25GHz



25GHz - 30GHz



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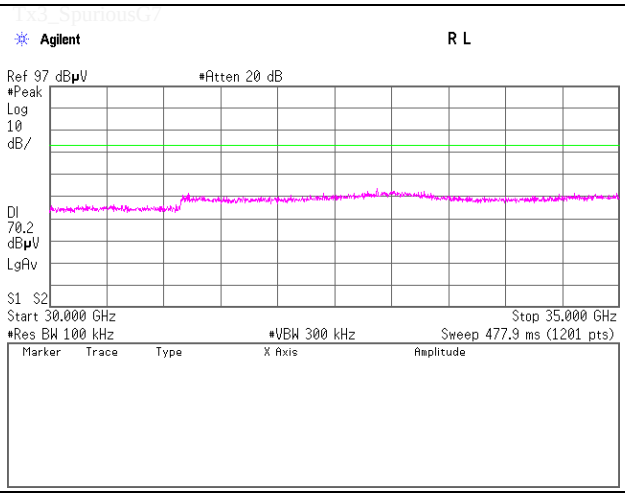
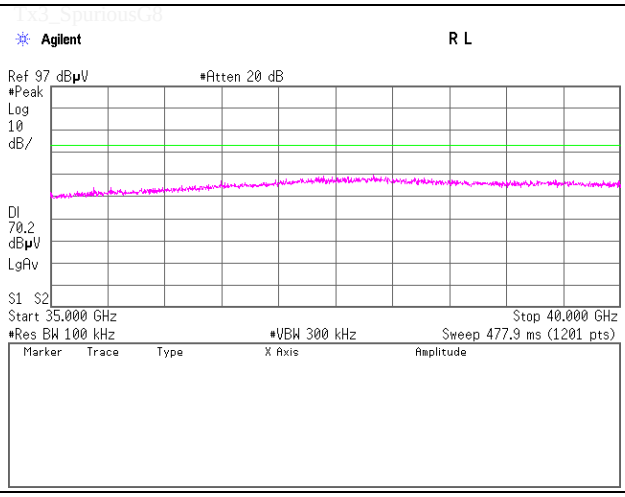
(Reference chart) Spurious emission (Conducted)

Tx, PN9, worst antenna port A

Tx, 5814MHz (above 1GHz)(2/2)	
30GHz - 35GHz	**35GHz - 40GHz**
	

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab. No.1 and No.2 Semi Anechoic Chamber		
Date	September 12, 2013	September 15, 2013	September 16, 2013
Temperature / Humidity	23 deg.C , 63 %RH	23 deg.C , 62%RH	23 deg.C , 61 %RH
Engineer	Wataru Kojima	Wataru Kojima	Wataru Kojima
Mode	Tx, 5736 MHz		
	Tx, PN9, worst antenna port B		

(* 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.	86.028	QP	41.3	7.7	8.2	31.9	25.3	40.0	14.7	223	167	
Hori.	575.988	QP	24.4	18.8	8.8	31.6	20.4	46.0	25.6	100	2	
Hori.	1912.000	PK	43.2	26.4	13.7	41.0	42.3	73.9	31.6	100	0	
Hori.	11472.000	PK	44.3	40.7	9.3	40.4	53.9	73.9	20.0	100	0	
Hori.	1912.000	AV	35.4	26.4	13.7	41.0	34.5	53.9	19.4	100	0	
Hori.	11472.000	AV	35.2	40.7	9.3	40.4	44.8	53.9	9.1	100	0	
Vert.	36.867	QP	33.4	16.0	7.0	31.9	24.5	40.0	15.5	100	76	
Vert.	61.445	QP	44.6	8.1	7.1	31.9	27.9	40.0	12.1	100	14	
Vert.	86.028	QP	48.6	7.7	8.2	31.9	32.6	40.0	7.4	100	96	
Vert.	602.201	QP	29.2	19.1	8.9	31.6	25.6	46.0	20.4	100	233	
Vert.	1912.000	PK	43.9	26.4	13.7	41.0	43.0	73.9	30.9	100	0	
Vert.	11472.000	PK	45.5	40.7	9.3	40.4	55.1	73.9	18.8	100	0	
Vert.	1912.000	AV	34.7	26.4	13.7	41.0	33.8	53.9	20.1	100	0	
Vert.	11472.000	AV	35.7	40.7	9.3	40.4	45.3	53.9	8.6	100	0	

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

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

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

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

20dBc Data Sheet (RBW 100kHz, VBW 300kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Vert.	5736.000	PK	82.6	33.5	16.7	41.1	91.7	-	-	Carrier
Vert.	5722.000	PK	42.6	33.5	16.7	41.1	51.7	71.7	20.0	
Vert.	5725.000	PK	38.4	33.5	16.7	41.1	47.5	71.7	24.2	
Vert.	17208.000	PK	45.2	41.4	2.1	40.6	48.1	71.7	23.6	
Hori.	5736.000	PK	84.6	33.5	16.7	41.1	93.7	-	-	Carrier
Hori.	5722.000	PK	44.2	33.5	16.7	41.1	53.3	73.7	20.4	
Hori.	5725.000	PK	41.2	33.5	16.7	41.1	50.3	73.7	23.4	
Hori.	17208.000	PK	45.8	41.4	2.1	40.6	48.7	73.7	25.0	

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 and No.2 Semi Anechoic Chamber	
Date	September 12, 2013	September 15, 2013	September 16, 2013
Temperature / Humidity	23 deg.C , 63 %RH	23 deg.C , 62%RH	23 deg.C , 61 %RH
Engineer	Wataru Kojima	Wataru Kojima	Wataru Kojima
Mode	Tx, 5762 MHz		
	Tx, PN9, worst antenna port B		

(* 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.	86.028	QP	41.3	7.7	8.2	31.9	25.3	40.0	14.7	290	188	
Hori.	565.330	QP	25.2	18.6	8.8	31.6	21.0	46.0	25.0	263	359	
Hori.	1921.000	PK	46.2	26.4	13.7	41.0	45.3	73.9	28.6	100	0	
Hori.	11524.000	PK	45.2	40.8	9.4	40.4	55.0	73.9	18.9	100	0	
Hori.	1921.000	AV	35.7	26.4	13.7	41.0	34.8	53.9	19.1	100	0	
Hori.	11524.000	AV	35.6	40.8	9.4	40.4	45.4	53.9	8.5	100	0	
Vert.	36.870	QP	33.5	16.0	7.0	31.9	24.6	40.0	15.4	100	358	
Vert.	61.450	QP	44.6	8.1	7.1	31.9	27.9	40.0	12.1	100	12	
Vert.	86.028	QP	48.5	7.7	8.2	31.9	32.5	40.0	7.5	100	150	
Vert.	110.607	QP	37.5	12.2	8.1	31.8	26.0	43.5	17.5	100	164	
Vert.	553.035	QP	29.0	18.4	8.8	31.7	24.5	46.0	21.5	100	47	
Vert.	1921.000	PK	47.4	26.4	13.7	41.0	46.5	73.9	27.4	100	0	
Vert.	11524.000	PK	45.6	40.8	9.4	40.4	55.4	73.9	18.5	100	0	
Vert.	1921.000	AV	35.9	26.4	13.7	41.0	35.0	53.9	18.9	100	0	
Vert.	11524.000	AV	35.4	40.8	9.4	40.4	45.2	53.9	8.7	100	0	

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

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

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

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

20dBc Data Sheet **(RBW 100kHz, VBW 300kHz)**

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5762.000	PK	85.0	33.5	16.8	41.1	94.2	-	-	Carrier
Hori.	17442.000	PK	44.3	42.0	2.2	40.6	47.9	74.2	26.3	
Vert.	5762.000	PK	82.5	33.5	16.8	41.1	91.7	-	-	Carrier
Vert.	17286.000	PK	44.7	42.0	2.2	40.6	48.3	71.7	23.4	

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 and No.2 Semi Anechoic Chamber	
Date	September 12, 2013	September 15, 2013	September 16, 2013
Temperature / Humidity	23 deg.C , 63 %RH	23 deg.C , 62%RH	23 deg.C , 61 %RH
Engineer	Wataru Kojima	Wataru Kojima	Wataru Kojima
Mode	Tx, 5814 MHz		
	Tx, PN9, worst antenna port B		

(* 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.	86.028	QP	41.9	7.7	8.2	31.9	25.9	40.0	14.1	213	185	
Hori.	651.355	QP	27.4	19.8	9.1	31.7	24.6	46.0	21.4	174	300	
Hori.	1938.000	PK	45.9	26.5	13.7	41.0	45.1	73.9	28.8	100	0	
Hori.	11628.000	PK	44.7	40.7	9.4	40.3	54.5	73.9	19.4	100	0	
Hori.	1938.000	AV	36.8	26.5	13.7	41.0	36.0	53.9	17.9	100	0	
Hori.	11628.000	AV	35.7	40.7	9.4	40.3	45.5	53.9	8.4	100	0	
Vert.	36.872	QP	33.1	16.0	7.0	31.9	24.2	40.0	15.8	100	80	
Vert.	61.320	QP	44.4	8.1	7.1	31.9	27.7	40.0	12.3	100	10	
Vert.	86.028	QP	48.8	7.7	8.2	31.9	32.8	40.0	7.2	100	200	
Vert.	110.608	QP	37.6	12.2	8.1	31.8	26.1	43.5	17.4	100	77	
Vert.	688.227	QP	23.2	20.4	9.3	31.6	21.3	46.0	24.7	100	293	
Vert.	1938.000	PK	45.6	26.5	13.7	41.0	44.8	73.9	29.1	100	0	
Vert.	11628.000	PK	44.5	40.7	9.4	40.3	54.3	73.9	19.6	100	0	
Vert.	1938.000	AV	36.8	26.5	13.7	41.0	36.0	53.9	17.9	100	0	
Vert.	11628.000	AV	35.4	40.7	9.4	40.3	45.2	53.9	8.7	100	0	

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

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

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

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

20dBc Data Sheet (RBW 100kHz, VBW 300kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5814.000	PK	85.4	33.5	16.8	41.1	94.6	-	-	Carrier
Hori.	5850.000	PK	38.6	33.5	16.9	41.1	47.9	74.6	26.7	
Hori.	17442.000	PK	46.5	43.3	2.2	40.6	51.4	74.6	23.2	
Vert.	5814.000	PK	83.2	33.5	16.8	41.1	93.7	-	-	Carrier
Vert.	5850.000	PK	38.4	33.5	16.9	41.1	53.3	73.7	20.4	
Vert.	17442.000	PK	45.8	43.3	2.2	40.6	48.7	73.7	25.0	

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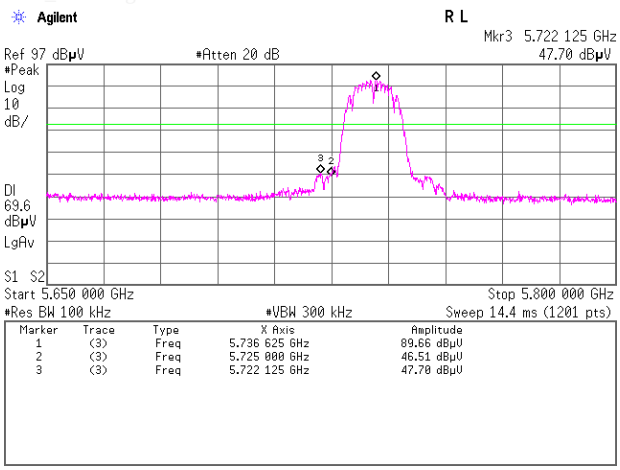
(Reference chart) Spurious emission (Conducted)

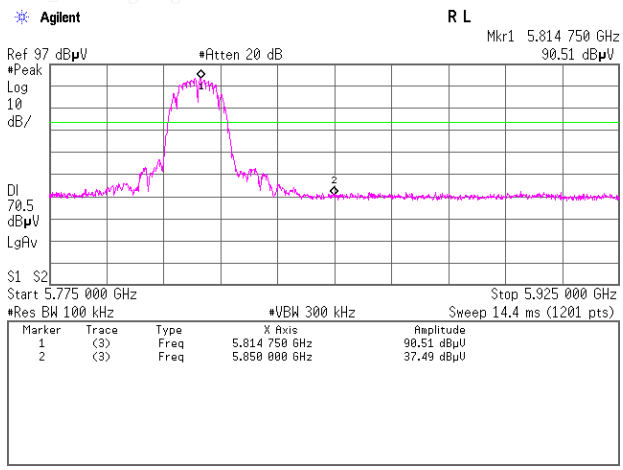
Band Edge compliance

Tx, PN9, worst antenna port A	
Tx, 5736MHz	**Tx, 5814MHz**

TX1_BandEdgeLow



TX3_BandEdgeHigh



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Maximum Power Spectral Density

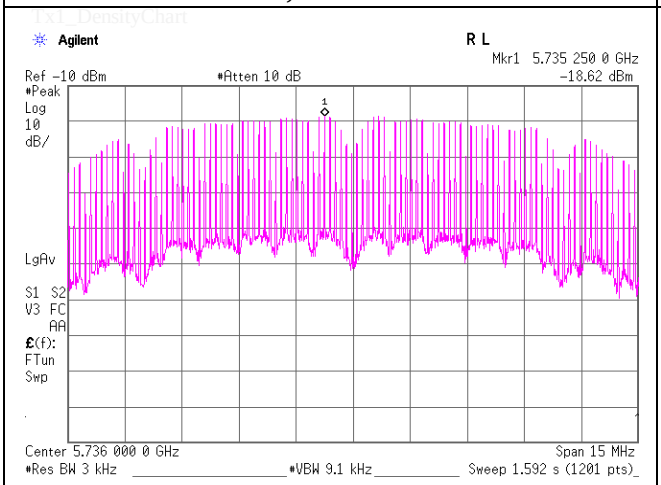
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	September 6, 2013	
Temperature / Humidity	24deg.C , 52%RH	
Engineer	Shinichi Takano	
Mode	Tx, PN9, worst antenna port A	

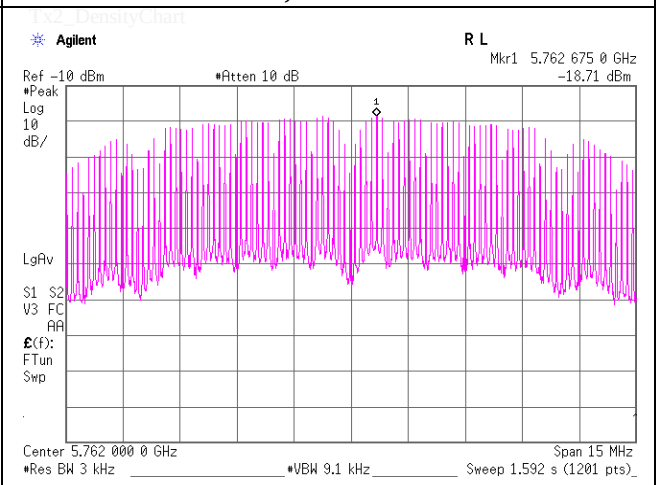
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5736.0000	5735.25	-18.62	2.34	9.88	-6.40	8.00	14.40
5762.0000	5762.68	-18.71	2.37	9.89	-6.45	8.00	14.45
5814.0000	5813.25	-17.63	2.39	9.89	-5.35	8.00	13.35

Sample Calculation:
Result = Reading + Cable Loss + Atten. Loss

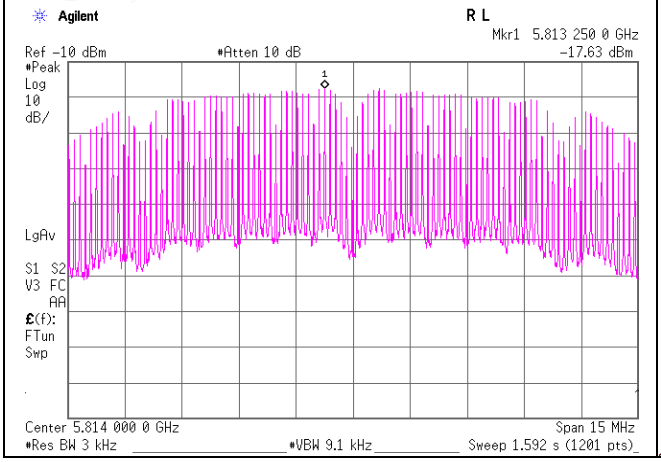
Tx, 5736MHz



Tx, 5762MHz



Tx, 5814MHz



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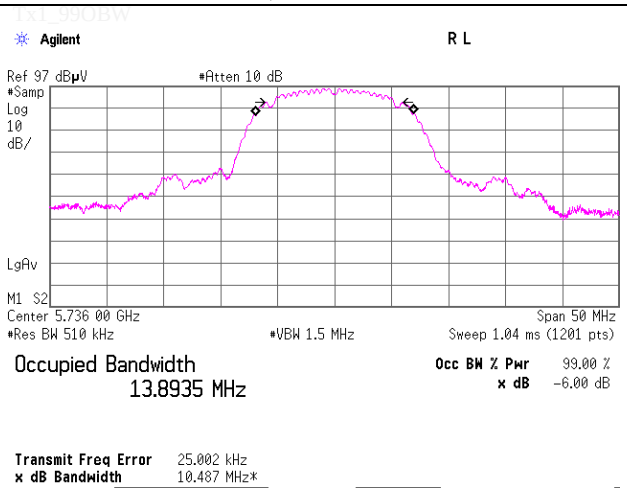
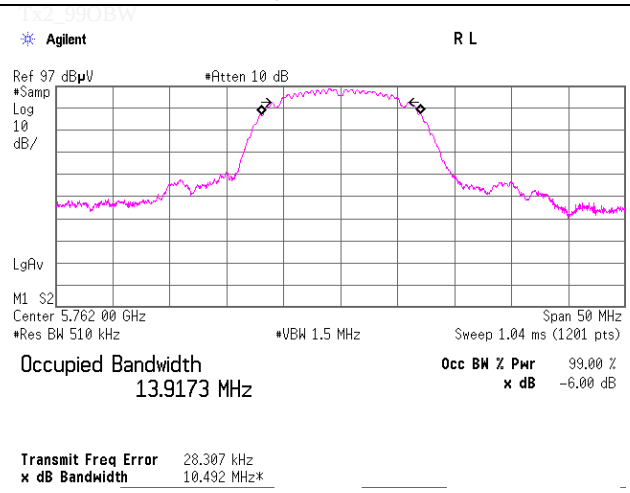
99% Occupied Bandwidth

Tx, PN9, worst antenna port A

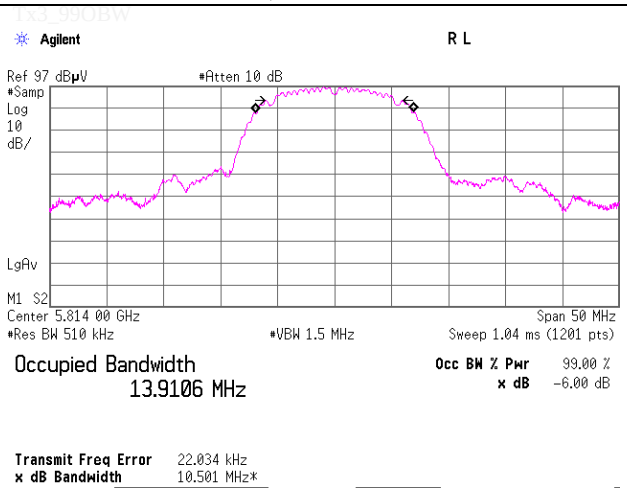
Tx, 5736MHz



Tx, 5762MHz



Tx, 5814MHz



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Comparison Sheet of Antenna A and B

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room and No.1 Anechoic Camber
Date	September 6 and 12, 2013	
Engineer	Shinichi Takano, Wataru Kojima	
Mode	Tx	

Maximum Peak Conducted Output Power (Conducted)

Freq.	Antenna A Result		Antenna B Result	
[MHz]	[dBm]	[mW]	[dBm]	[mW]
5210.0	9.65	9.23	9.51	8.93

Radiated Emission

Tx. Freq.	Freq	Antenna A Result				Antenna B Result			
		Peak		Average		Peak		Average	
		Hor	Ver	Hor	Ver	Hor	Ver	Hor	Ver
[MHz]	[MHz]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]
5210.0	5210.00	98.50	98.40	-	-	98.60	98.70	-	-
	10420.00	60.10	60.00	-	-	63.80	64.00	-	-

Conducted Emission

Tx. Freq.	Antenna A			Antenna B		
	Freq	Result		Freq	Result	
		QP	AV		QP	AV
[MHz]	[MHz]	[dBuV/m]	[dBuV/m]	[MHz]	[dBuV/m]	[dBuV/m]
5210.0	0.45735	40.80	24.70	0.45735	41.00	24.80

Comparison data of Antenna A and B was obtained with Transmitting 5210MHz mode, because the spurious emission level was highest at the mode.
Other than the above list, no difference was observed in the emission level between Antenna A and B.

APPENDIX 2
Test Instruments

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2013/01/08 * 12
SCC-G30	Coaxial Cable	Junkosha	MWX241-02000KM SKMS	SEP-20-12-004	AT	2012/09/26 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2012/11/15 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2013/04/09 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2013/04/09 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2013/03/07 * 12
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2013/07/03 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2013/03/19 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2013/04/09 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2013/05/22 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2013/08/12 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2013/02/27 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2013/03/28 * 12
SJM-08	Measure	PROMART	SEN1935	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFI,MF)	-	RE	-
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2012/12/18 * 12
SFL-03	Highpass Filter	MICRO-TRONICS	HPM50112	028	RE	2012/12/18 * 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
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2013/03/16 * 12
SHA-06	Horn Antenna	ETS LINDGREN	3160-10	LM3459	RE	2013/03/14 * 12
SAF-10	Pre Amplifier	TOYO Corporation	HAP26-40W	00000010	RE	2013/03/19 * 12
SCC-G16	Coaxial Cable	Suhner	SUCOFLEX 102	32704/2	RE	2013/03/16 * 12
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2013/02/12 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2013/02/12 * 12
KAT3-11	Attenuator	JFW IND. INC.	50HF-003N	-	RE	2013/08/19 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE	2012/11/18 * 12
SCC-B1/B3/B5/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2013/04/03 * 12
SCC-B2/B4/B6/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2013/04/03 * 12
SLA-02	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0893	RE	2012/11/18 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2013/02/27 * 12
STR-02	Test Receiver	Rohde & Schwarz	ESCI	100575	RE	2012/09/03 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2013/07/06 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2013/03/28 * 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 :
CE: Conducted emission ,
RE: Radiated emission ,
AT: Antenna terminal conducted test

APPENDIX
Test Instruments

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	2013/04/03 * 12
SLS-04	LISN	Rohde & Schwarz	ENV216	100514	CE	2013/02/25 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	2013/02/12 * 12
SOS-04	Humidity Indicator	A&D	AD-5681	4061512	CE	2013/03/07 * 12
STR-02	Test Receiver	Rohde & Schwarz	ESCI	100575	CE	2012/09/03 * 12
SJM-02	Measure	KOMELON	KMC-36	-	CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFI,MF)	-	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 ,
RE: Radiated emission ,
AT: Antenna terminal conducted test