RADIO TEST REPORT

Test Report No. : 10005116H-A-R1

Applicant	**:**	**Sony Corporation**
Type of Equipment	**:**	**WirelessHD Sink radio module**
Model No.	**:**	**SII-SK63101**
FCC ID	**:**	**AK8-HMZ-WM1**
Test regulation	**:**	**FCC Part 15 Subpart C: 2012**
Test Result	**:**	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this 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 NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 10005116H-A. 10005116H-A is replaced with this report.

Date of test: February 20 to March 6, 2013

Representative test engineer:

Hironobu Ohnishi
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service

NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

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REVISION HISTORY

Original Test Report No.: 10005116H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10005116H-A	May 10, 2013	-	-
1	10005116H-A-R1	May 16, 2013	P6	Added FCC 15B compliance statement in section 3.1

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	Sony Corporation
Address	:	1-7-1 Konan, Minato-ku, Tokyo, 108-0075, Japan
Telephone Number	:	+81-3-6748-2569
Facsimile Number	:	+81-3-6748-2574
Contact Person	:	Hirofumi Kojima

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

2.1 Identification of E.U.T.

Type of Equipment	:	WirelessHD Sink radio module
Model No.	:	SII-SK63101
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.3V
Receipt Date of Sample	:	February 17, 2013
Country of Mass-production	:	China
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

General Specification

Clock frequency(ies) in the system	:	CPU: 12MHz, 54MHz, 317MHz

Radio Specification

[WirelessHD]

Radio Type	:	Transceiver
Frequency of Operation	:	HR Channel 2: 60.48GHz + 158.625MHz * (LRP n – 2) n = 0 to 4 LRP 0: 60.162750GHz, LRP 1: 60.321375GHz, LRP 2: 60.480000GHz, LRP 3: 60.638625GHz, LRP 4: 60.797250GHz HR Channel 3: 62.64GHz + 158.625MHz * (LRP n – 2) n = 0 to 4 LRP 0: 62.322750GHz LRP 1: 62.481375GHz, LRP 2: 62.640000GHz, LRP 3: 62.798625GHz LRP 4: 62.957250GHz
Modulation	:	BPSK, OFDM
Medium access protocol	:	WirelessHD
Antenna Type	:	Dual-polarized beam-steering array antenna composed from patch antennas (integrated on the module's RF IC package)
Antenna Connector	:	None
Antenna Gain	:	LRP: 13dBi (max.) for each polarization
Usage location	:	Indoor use only
Power Supply (inner)	:	DC 1.0V
Description	:	The EUT is a WirelessHD Sink radio module. It is designed to operate as part of a Wireless Video Audio Network (WVAN) in the 57 to 64 GHz band. The EUT receives High Definition Audio/Video from a Wireless HD Source radio device.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	Test specification: FCC Part 15 Subpart C: 2012, final revised on December 27, 2012 and effective January 28, 2013
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits. Section 15.255 Operation within the band 57-64GHz.

* The EUT complies with FCC Part 15 Subpart B: 2012, final revised on December 27, 2012 and effective January 28, 2013.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.4:2003 7. AC powerline Conducted Emission measurements	**FCC:** Section 15.207	**QP** 25.5dB, 0.15000MHz, N **AV** 24.6dB, 0.15000MHz, N	Complied	-
	IC: RSS-Gen 7.2.4	**IC:** RSS-Gen 7.2.4			
6dB Bandwidth	**FCC:** Section 15.255(e) (1)	**FCC:** -	See data.	-	Radiated
	IC: RSS-Gen 4.6.2	**IC:** -			
26dB Bandwidth	**FCC:** "MILLIMETER WAVE TEST PROCEDURES"	**FCC:** Section 15.255(f)		Complied	Radiated
	IC: -	**IC:** RSS-210 A13.2.5			
Power Density	**FCC:** "MILLIMETER WAVE TEST PROCEDURES"	**FCC:** Section 15.255(b) (1)		Complied	Radiated
	IC: -	**IC:** RSS-210 A13.2.2(1) (i)			
Peak Output Power	**FCC:** Section 15.255(e)	**FCC:** Section 15.255(e)		Complied	Radiated
	IC: RSS-210 A13.2.3(1)	**IC:** RSS-210 A13.2.3			
Spurious Emissions	**FCC:** ANSI C63.4:2003, "MILLIMETER WAVE TEST PROCEDURES"	**FCC:** Section 15.255(c)	4.8dB 80.360MHz, Vertical / 80.361MHz, Vertical	Complied	Radiated
	IC: RSS-Gen 4.9	**IC:** RSS-210 A13.2.2(2) RSS-Gen 7.2.5			
Frequency Stability	**FCC:** "MILLIMETER WAVE TEST PROCEDURES"	**FCC:** Section 15.255(f)	See data.	Complied	Radiated
	IC: RSS-Gen 4.7, 7.2.6	**IC:** RSS-210 A13.2.5			
RF Exposure	**FCC:** -	**FCC:** Section 15.255(g)	See MPE report	Complied	-
	IC: RSS-Gen 5.6	**IC:** RSS-102 4.2			
Group Installation	**FCC:** -	**FCC:** Section 15.255(h)	See data.	Complied	-
	IC: -	**IC:** RSS-210 A13.2.6			
Transmitter Identification	**FCC:** -	**FCC:** Section 15.255(i)	See data.	Complied	-
	IC: -	**IC:** RSS-210 A13.2.7			
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. Millimeter wave measurement was performed accordance with FCC KDB 200443 (MILLIMETER WAVE TEST PROCEDURES). Power density and Peak output power measurements were performed accordance with FCC KDB 662911 D02 (MIMO with Cross-Polarized Antennas v01)					

* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

FCC 15.31 (e)

The RF Module has its own regulator.
The RF Module is constantly provided voltage (DC1V) through the regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna integrated on the EUT's RF IC package. Therefore, the equipment complies with the antenna requirement of Section 15.203/212.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	**IC:** RSS-Gen 4.6.1	**IC:** RSS-Gen 4.6.1	N/A	-	Radiated

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

3.4 Uncertainty

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

Test room (semi-anechoic chamber)	**Conducted emission (±dB)**
	150kHz-30MHz
No.1	3.5dB
No.2	3.6dB
No.3	3.6dB
No.4	3.6dB

*10m = Measurement distance

Test room (semi-anechoic chamber)	**Radiated emission**						
	(3m*)(±dB)				**(1m*)(±dB)**		**(0.5m*)(±dB)**
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.3dB	5.0dB	5.1dB	4.9dB	5.8dB	4.4dB	4.3dB
No.2	4.3dB	5.2dB	5.1dB	5.0dB	5.7dB	4.3dB	4.2dB
No.3	4.6dB	5.0dB	5.1dB	5.0dB	5.7dB	4.5dB	4.2dB
No.4	4.8dB	5.2dB	5.0dB	5.0dB	5.7dB	5.2dB	4.2dB

*3m/1m/0.5m = Measurement distance

Radiated emission (±dB)	
40GHz-50GHz	3.9dB
50GHz-75GHz	4.6dB
75GHz-110GHz	5.0dB
110GHz-170GHz	5.1dB
170GHz-260GHz	5.0dB

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

Radiated emission test(3m)
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999 Facsimile : +81 596 24 8124

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Data of EMI, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

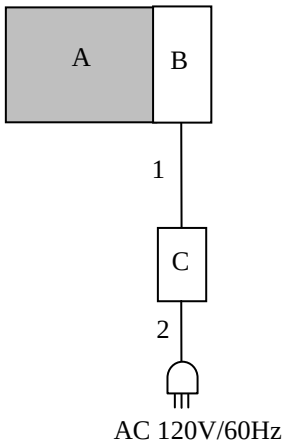
Mode	Remarks
WirelessHD low rate physical layer (LRP)	Continuous Transmitting mode
*Power of the EUT was set by the software as follows; Power settings: 1 Software: SiliconImage SiI63XX_0.3, SINK-0.3, RF-SiI6310-A3, Pkg: FW_3.2.0, Ver.: 3_2_0_2012-11-30a_dev_yquan_gen3_bug5373_SVN45330_ExternaBuilt: Nov 30 2012 16:08:49 *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.	

*The details of Operating mode(s)

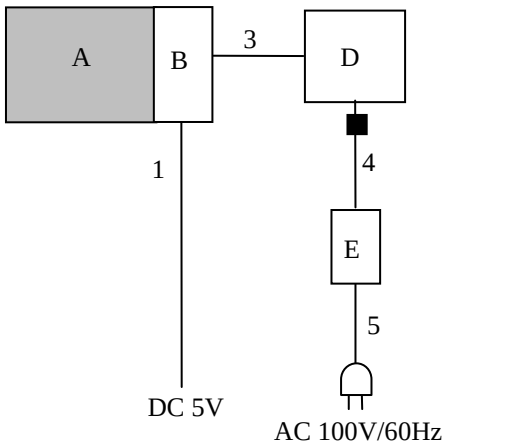
Test Item	Operating Mode	Tested channel	Tested frequency
Conducted Emission 6dB Bandwidth 26dB Bandwidth Power Density Peak Output Power Spurious Emission	Transmitting (Tx) LRP	LRP 0 of HR Channel 2: Low LRP 0 of HR Channel 3: Mid LRP 4 of HR Channel 3: High	60.16275GHz 62.32275GHz 62.95725GHz
Frequency Stability	Transmitting (Tx) LRP	LRP 4 of HR Channel 3: High	62.95725GHz (62.64000GHz) *1)
*1) The measurement was performed in highest channel which has the maximum frequency deviation. The signal appearing in the center of the HR channel 3 was measured when transmitting highest channel.			

4.2 Configuration and peripherals

[Conducted emission]



[Radiated emission]



■ : Standard ferrite core

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

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	WirelessHD Sink radio module	SII-SK63101	6C:71:D9:9D:AC:5F	Sony Corporation	EUT
B	Jig Board	-	-	Sony Corporation	-
C	DC Power Supply	PMC35-2A	13090501	KIKUSUI	-
D	Laptop PC	7661-CB9	L3-R2055 07/12	lenovo	-
E	AC Adaptor	92P1160	11S92P1160Z1ZBGH77W6YJ	lenovo	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.5	Unshielded	Unshielded	-
2	AC Cable	1.8	Unshielded	Unshielded	-
3	USB Cable	1.5	Shielded	Shielded	-
4	DC Cable	1.8	Unshielded	Unshielded	-
5	AC Cable	1.0	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane.
The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and 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 a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

I/O cable that was connected to the peripherals was bundled in center. This was folded back and forth forming a bundle 30cm to 40cm long and was hanged at a 40cm height to the ground plane. All unused 50ohm connectors of the LISN(AMN) were resistivity terminated in 50ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Detector	**: QP and CISPR AV**
Measurement range	**: 0.15-30MHz**
Test data	**: APPENDIX**
Test result	**: Pass**

SECTION 6: Radiated Emission (Spurious Emission, Power Density)

Test Procedure
[Up to 40GHz]
EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m(9kHz – 40GHz), raised 0.8m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane. The height of the measuring antenna varied between 1 and 4m (frequency 9kHz – 30MHz: loop antenna was fixed height at 1.0m) and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength. The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table. When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	Below 30MHz	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

Frequency	9kHz-150kHz	150kHz–30MHz	30MHz-1GHz	1GHz-40GHz	
Instrument used	Test Receiver	Test Receiver	Test Receiver	Spectrum Analyzer	
Detector	QP, AV	QP, AV	QP	PK	AV
IF Bandwidth	BW 200Hz	BW 9kHz	BW 120kHz	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 10Hz
Test Distance	3m	3m	3m	3m (below 10GHz), 1m*1) (above 10GHz), 0.5m*2) (above 26.5GHz)	

*1) Distance Factor: 20 x log (3.0m/1.0m) = 9.5dB
*2) Distance Factor: 20 x log (3.0m/0.5m) = 15.6dB

[Above 40GHz]
The test was performed based on "MILLIMETER WAVE TEST PROCEDURES".
The EUT was placed on a urethane platform, raised 1.5m above the conducting ground plane.
The measurements were performed on handheld method.

Set spectrum analyzer RBW, VBW, span, etc., to the proper values. Note these values. Enable two traces—one set to "clear write," and the other set to "max hold."
Begin hand-held measurements with the test antenna (horn) at a distance of 1 m from the EUT in a horizontally polarized position. Slowly adjust its position, entirely covering the plane 1 m from the EUT.
Observation of the two active traces on the spectrum analyzer will allow refined horn positioning at the point(s) of maximum field intensity. Repeat with the horn in a vertically polarized position. If the emission cannot be detected at 1 m, reduce the RBW to increase system sensitivity. Note the value. If the emission still cannot be detected, move the horn closer to the EUT, noting the distance at which a measurement is made.

Note the maximum level indicated on the spectrum analyzer. Adjust this level, if necessary, by the antenna gain, conversion loss of the external mixer and gain of LNA used, at the frequency under investigation. Calculate the field strength of the emission at the measurement distance from the Friis' transmission equation.

[About carrier measurement]
The carrier levels were confirmed at maximum direction of transmission. The maximum direction was searched under carefully since beam-widths are extremely narrow.

The carrier levels were measured in the far field. The distance of the far field was calculated from follow equation.

$$r = \frac{2D^2}{\lambda}$$

where

r is the distance from the radiating element of the EUT to the edge of the far field, in m
D is the largest dimension of both the radiating element and the test antenna (horn), in m
Lambda is the wavelength of the emission under investigation [300/f (MHz)], in m

Frequency [GHz]	Lambda [m]	Maximun Dimention D [m]	Far Field Boundary r [m]
60.16275	0.005	0.04	0.642
62.32275	0.005	0.04	0.665
62.95725	0.005	0.04	0.672

The 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.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range : 9k-200GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: Frequency Stability

Test Procedure
The external mixer was placed in side of the temperature chamber drain hole.

The power supply set to 100 % nominal setting, raise EUT operating temperature to 50 deg. C.
Record the frequency excursion of the EUT emission mask.
Repeat measurements at each 10 deg. C increment down to –20 deg. C.

Varied EUT power supply between 85 % and 115 % of nominal and record the frequency excursion of the EUT emission mask when temperature is 20 deg. C.

Emission mask was measured 26dB bandwidth. Center frequency was measured characteristic waveform.

Test data **: APPENDIX**
Test result **: Pass**

APPENDIX 1: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

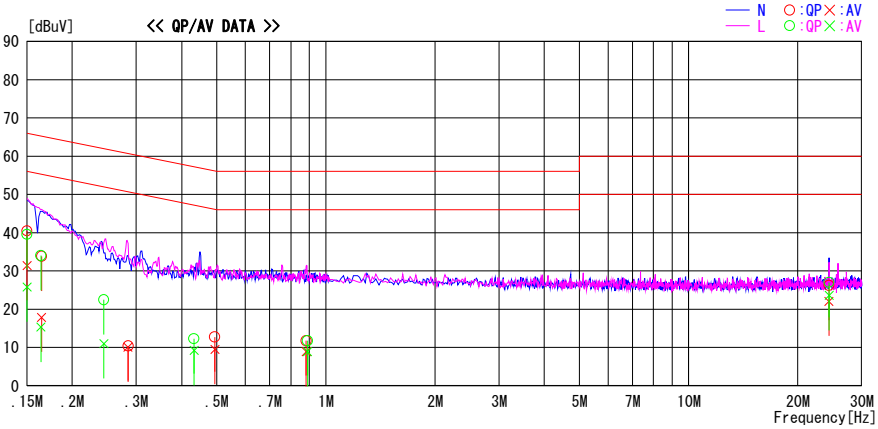
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/02/27

Report No. : 10005116H

Temp./Humi. : 21deg. C / 31% RH
Engineer : Hironobu Ohnishi

Mode / Remarks : Tx LRP Lch 60.16275GHz

LIMIT : FCC15.207 QP
FCC15.207 AV



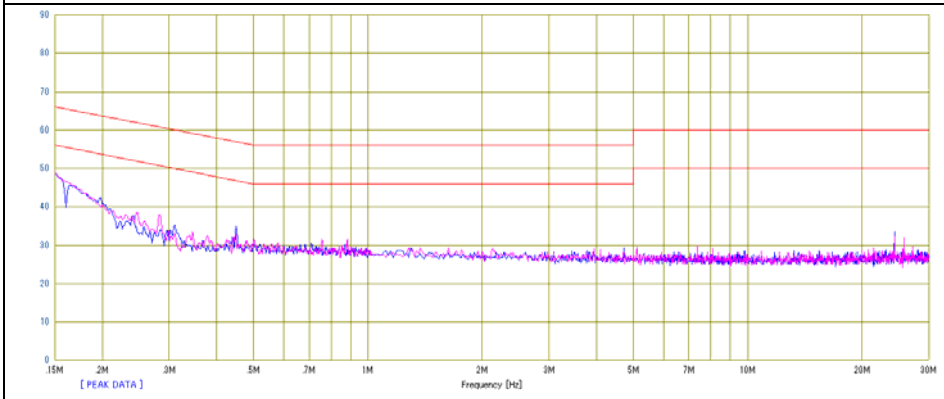
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15000	27.3	18.2	13.2	40.5	31.4	66.0	56.0	25.5	24.6	N	
0.16438	20.6	4.7	13.2	33.8	17.9	65.2	55.2	31.4	37.3	N	
0.28485	-2.9	-3.2	13.3	10.4	10.1	60.7	50.7	50.3	40.6	N	
0.49388	-0.6	-3.8	13.3	12.7	9.5	56.1	46.1	43.4	36.6	N	
0.88225	-1.7	-4.5	13.4	11.7	8.9	56.0	46.0	44.3	37.1	N	
24.35099	11.2	7.1	15.0	26.2	22.1	60.0	50.0	33.8	27.9	N	
0.15000	26.4	12.6	13.2	39.6	25.8	66.0	56.0	26.4	30.2	L	
0.16379	20.8	2.1	13.2	34.0	15.3	65.3	55.3	31.3	40.0	L	
0.24441	9.3	-2.2	13.2	22.5	11.0	61.9	51.9	39.4	40.9	L	
0.43271	-1.0	-4.1	13.3	12.3	9.2	57.2	47.2	44.9	38.0	L	
0.88958	-1.7	-4.5	13.4	11.7	8.9	56.0	46.0	44.3	37.1	L	
24.38603	12.0	8.6	15.0	27.0	23.6	60.0	50.0	33.0	26.4	L	

CHART:WITH FACTOR,Peak hold data. CALCULATION:RESULT=READING+C.F(LISN LOSS+ATT LOSS +CABLE LOSS)
Except for the above table : adequate margin data below the limits.

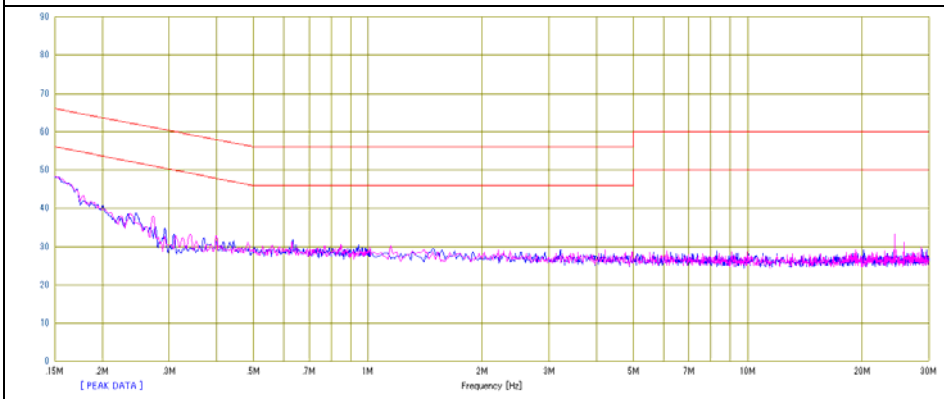
Conducted Emission

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10005116H
Date	02/27/2013
Temperature/ Humidity	21 deg. C / 31% RH
Engineer	Hironobu Ohnishi
Mode	Tx

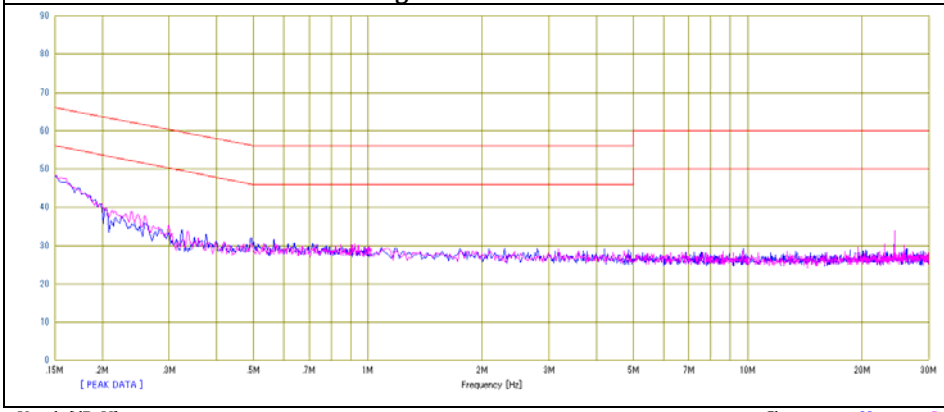
Low: 60.16275GHz



Mid: 62.32275GHz



High: 62.95725GHz



Y scale [dBuV] Chart — N — L

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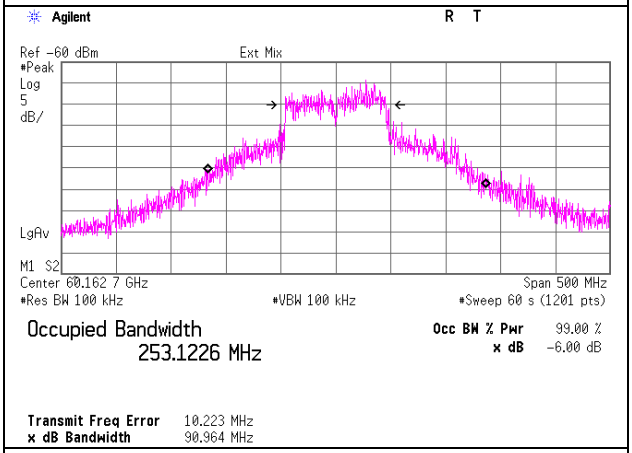
6dB Bandwidth

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10005116H
Date	02/20/2013
Temperature/ Humidity	23 deg. C / 36% RH
Engineer	Hironobu Ohnishi
Mode	Tx

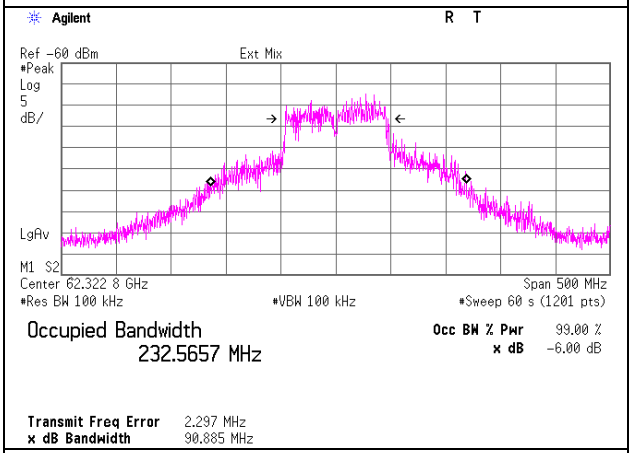
Mode	Channel	Frequency [GHz]	6dB Bandwidth [MHz]
LRP	Low	60.16275	90.964
	Mid	62.32275	90.885
	High	62.95725	90.639

6dB Bandwidth

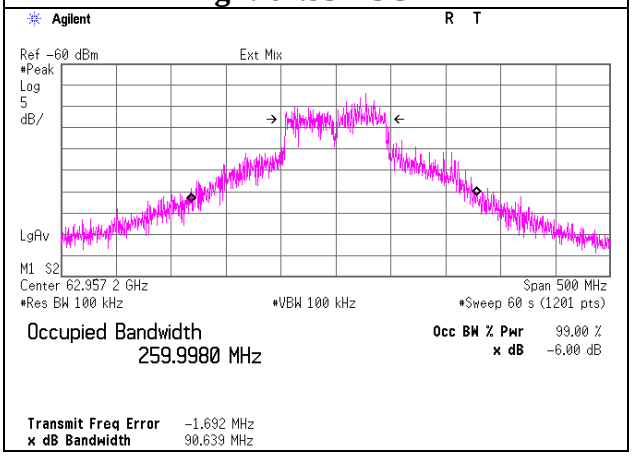
Low: 60.16275GHz



Mid: 62.32275GHz



High: 62.95725GHz



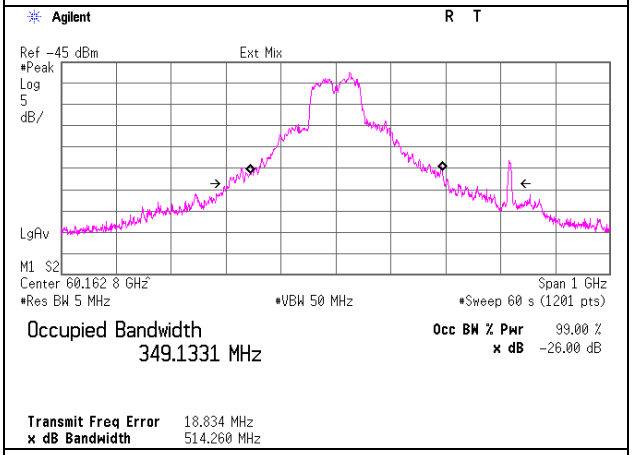
26dB and 99% Bandwidth

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10005116H
Date	02/20/2013
Temperature/ Humidity	23 deg. C / 36% RH
Engineer	Hironobu Ohnishi
Mode	Tx

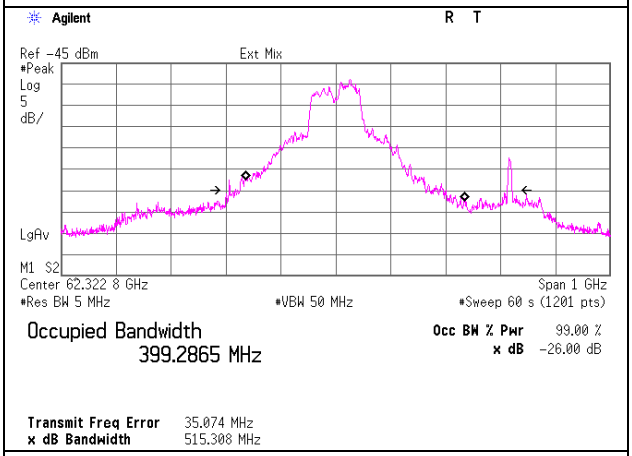
Mode	Channel	Frequency [GHz]	26dB Bandwidth [MHz]	99% Bandwidth [MHz]
LRP	Low	60.16275	514.260	349.133
	Mid	62.32275	515.308	399.287
	High	62.95725	518.118	352.805

26dB and 99% Bandwidth

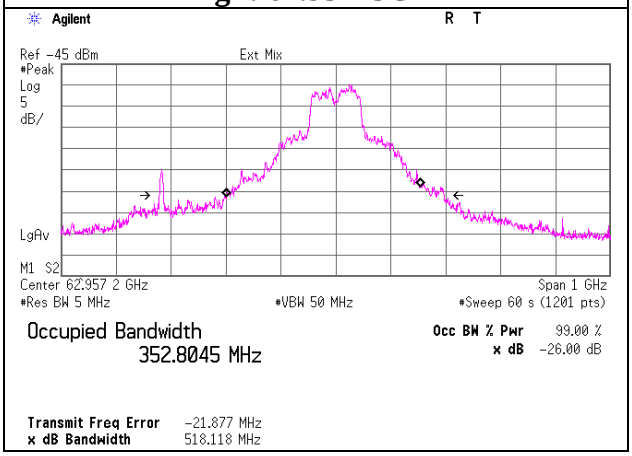
Low: 60.16275GHz



Mid: 62.32275GHz



High: 62.95725GHz



Power Density

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10005116H
Date	02/21/2013
Temperature/ Humidity	22 deg. C / 32% RH
Engineer	Hironobu Ohnishi
Mode	Tx

Polarization: Horizontal

Mode	Channel	Frequency	Measurement Distance	Measured Power	Rx Antenna Gain	System Loss	LNA Gain	Free field Attenuation	EIRP		Specification Distance	Power Density	Limit	
													Pk	Av
		[GHz]	[m]	[dBm]	[dBi]	[dB]	[dB]	[dB]	[dBm]	[mW]	[m]	[uW/cm^2]	[uW/cm^2]	[uW/cm^2]
LRP	Low	60.16275	2.0	-39.21	24.22	45.15	26.62	74.05	29.15	822.5	3.0	0.727	18	9
	Mid	62.32275	2.0	-41.48	24.46	45.70	25.99	74.36	28.12	649.0	3.0	0.574	18	9
	High	62.95725	2.0	-42.35	24.59	45.97	25.69	74.44	27.78	600.3	3.0	0.531	18	9

Polarization: Vertical

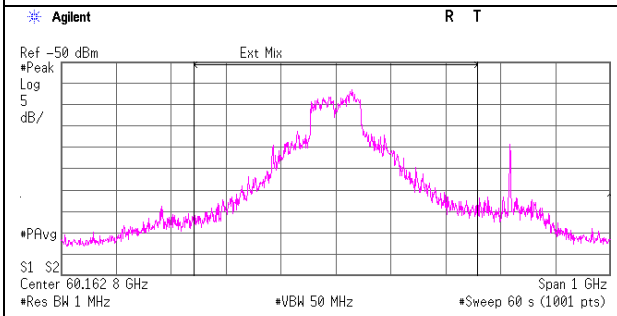
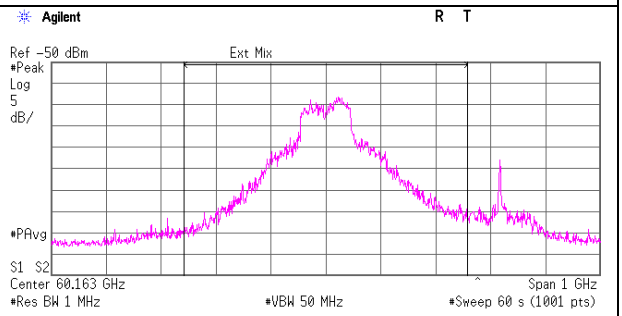
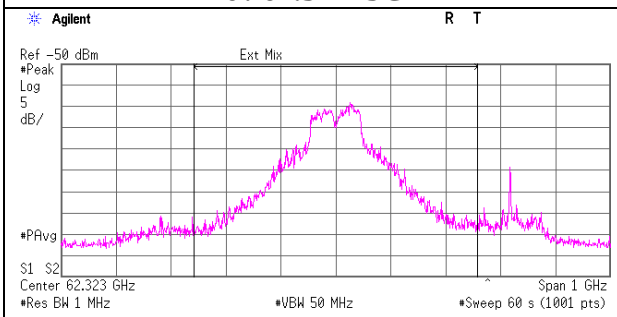
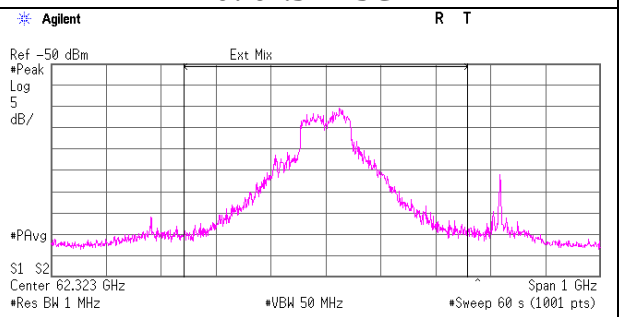
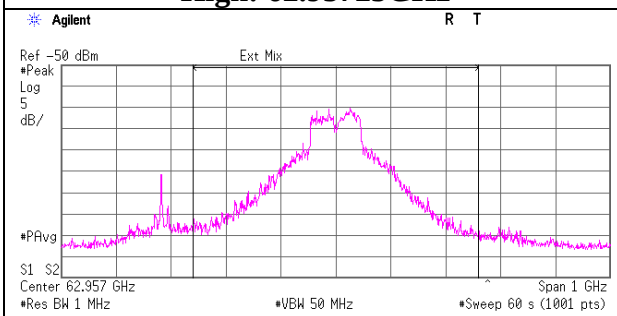
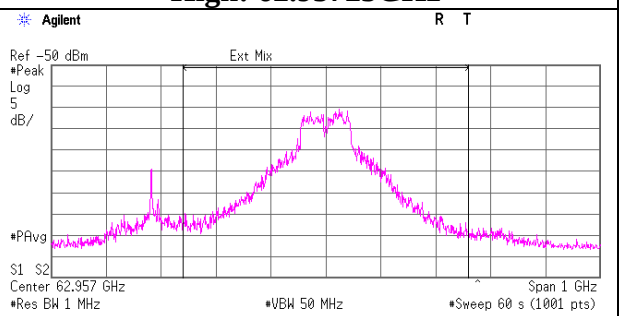
Mode	Channel	Frequency	Measurement Distance	Measured Power	Rx Antenna Gain	System Loss	LNA Gain	Free field Attenuation	EIRP		Specification Distance	Power Density	Limit	
													Pk	Av
		[GHz]	[m]	[dBm]	[dBi]	[dB]	[dB]	[dB]	[dBm]	[mW]	[m]	[uW/cm^2]	[uW/cm^2]	[uW/cm^2]
LRP	Low	60.16275	2.0	-40.44	24.22	45.15	26.62	74.05	27.92	619.6	3.0	0.548	18	9
	Mid	62.32275	2.0	-42.78	24.46	45.70	25.99	74.36	26.82	481.1	3.0	0.425	18	9
	High	62.95725	2.0	-42.67	24.59	45.97	25.69	74.44	27.46	557.6	3.0	0.493	18	9

Calculating formula:

Free Field Attenuation = 10 * log((4 * pi * Measurement Distance / lambda) ^ 2)
EIRP = Measured Power - Rx Antenna Gain + System Loss - LNA Gain + Free Field Attenuation
Power Density = EIRP / (4 * pi * Specification Distance ^ 2)

* The peak power density complies with both peak and average limits.

Power Density

Horizontal	Vertical
Low: 60.16275GHz	**Low: 60.16275GHz**
 Channel Power: -39.21 dBm /514.2600 MHz Power Spectral Density: -126.32 dBm/Hz	 Channel Power: -40.44 dBm /514.2600 MHz Power Spectral Density: -127.55 dBm/Hz
Mid: 62.32275GHz	**Mid: 62.32275GHz**
 Channel Power: -41.48 dBm /515.3080 MHz Power Spectral Density: -128.60 dBm/Hz	 Channel Power: -42.78 dBm /515.3080 MHz Power Spectral Density: -129.90 dBm/Hz
High: 62.95725GHz	**High: 62.95725GHz**
 Channel Power: -42.35 dBm /518.1180 MHz Power Spectral Density: -129.49 dBm/Hz	 Channel Power: -42.67 dBm /518.1180 MHz Power Spectral Density: -129.82 dBm/Hz

Peak Output Power

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10005116H
Date	02/21/2013
Temperature/ Humidity	22 deg. C / 32% RH
Engineer	Hironobu Ohnishi
Mode	Tx

[Horizontal]

Mode	Channel	Frequency	EIRP	EUT Antenna Gain	Output Power	
		[GHz]	[dBm]	[dBi]	[dBm]	[mW]
LRP	Low	60.16275	29.15	13.00	16.15	41.22
	Mid	62.32275	28.12	13.00	15.12	32.53
	High	62.95725	27.78	13.00	14.78	30.09

[Vertical]

Mode	Channel	Frequency	EIRP	EUT Antenna Gain	Output Power	
		[GHz]	[dBm]	[dBi]	[dBm]	[mW]
LRP	Low	60.16275	27.92	13.00	14.92	31.05
	Mid	62.32275	26.82	13.00	13.82	24.11
	High	62.95725	27.46	13.00	14.46	27.95

[Result: Horizontal + Vertical]

Mode	Channel	Frequency	Output Power Result		6dB Bandwidth	Output Power Limit
		[GHz]	[mW]	[dBm]	[MHz]	[mW]
LRP	Low	60.16275	72.28	18.59	90.964	454.82
	Mid	62.32275	56.64	17.53	90.885	454.43
	High	62.95725	58.03	17.64	90.639	453.20

Calculating formula:

Output Power = EIRP - EUT Antenna Gain

Output Power Result = Horizontal Output Power + Vertical Output Power

Output Power Limit = 6dB Bandwidth * 500mW / 100MHz; (when 6dB Bandwidth less than 100MHz)

Spurious Emission

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10005116H	
Date	02/27/2013	03/01/2013
Temperature/ Humidity	21 deg. C / 31% RH	21 deg. C / 31% RH
Engineer	Hironobu Ohnishi	Hironobu Ohnishi
	30-1000MHz	9k-30MHz, 1-40GHz
Mode	Tx Low: 60.16275GHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	37.296	QP	23.1	15.3	7.2	32.2	13.4	40.0	26.6	
Hori	63.104	QP	32.3	7.5	7.6	32.2	15.2	40.0	24.8	
Hori	80.317	QP	34.4	6.5	7.9	32.1	16.7	40.0	23.3	
Hori	81.783	QP	33.6	6.7	7.9	32.2	16.0	40.0	24.0	
Hori	94.710	QP	26.9	9.1	8.1	32.3	11.8	43.5	31.7	
Hori	175.079	QP	32.8	15.9	8.9	32.2	25.4	43.5	18.1	
Hori	743.997	QP	27.7	21.0	12.8	31.7	29.8	46.0	16.2	
Hori	5075.980	PK	40.7	32.4	3.4	31.4	45.1	73.9	28.8	
Hori	10151.960	PK	48.3	38.9	-4.7	33.1	49.4	73.9	24.5	
Hori	12095.950	PK	43.8	39.5	-4.1	33.0	46.2	73.9	27.7	
Hori	24191.910	PK	45.2	38.0	-1.1	31.0	51.1	73.9	22.8	
Hori	36287.850	PK	43.4	41.5	-8.8	22.3	53.8	73.9	20.1	
Hori	5075.980	AV	29.5	32.4	3.4	31.4	33.9	53.9	20.0	
Hori	10151.960	AV	41.0	38.9	-4.7	33.1	42.1	53.9	11.8	
Hori	12095.950	AV	31.0	39.5	-4.1	33.0	33.4	53.9	20.5	
Hori	24191.910	AV	35.5	38.0	-1.1	31.0	41.4	53.9	12.5	
Hori	36287.850	AV	29.8	41.5	-8.8	22.3	40.2	53.9	13.7	
Vert	37.296	QP	37.3	15.3	7.2	32.2	27.6	40.0	12.4	
Vert	63.104	QP	51.6	7.5	7.6	32.2	34.5	40.0	5.5	
Vert	80.317	QP	52.4	6.5	7.9	32.1	34.7	40.0	5.3	
Vert	81.783	QP	51.8	6.7	7.9	32.2	34.2	40.0	5.8	
Vert	94.710	QP	47.3	9.1	8.1	32.3	32.2	43.5	11.3	
Vert	175.079	QP	38.4	15.9	8.9	32.2	31.0	43.5	12.5	
Vert	743.997	QP	29.8	21.0	12.8	31.7	31.9	46.0	14.1	
Vert	5075.980	PK	41.8	32.4	3.4	31.4	46.2	73.9	27.7	
Vert	10151.960	PK	44.3	38.9	-4.7	33.1	45.4	73.9	28.5	
Vert	12095.950	PK	43.1	39.5	-4.1	33.0	45.5	73.9	28.4	
Vert	24191.910	PK	47.3	38.0	-1.1	31.0	53.2	73.9	20.7	
Vert	36287.850	PK	42.7	41.5	-8.8	22.3	53.1	73.9	20.8	
Vert	5075.980	AV	34.6	32.4	3.4	31.4	39.0	53.9	14.9	
Vert	10151.960	AV	35.0	38.9	-4.7	33.1	36.1	53.9	17.8	
Vert	12095.950	AV	30.8	39.5	-4.1	33.0	33.2	53.9	20.7	
Vert	24191.910	AV	39.9	38.0	-1.1	31.0	45.8	53.9	8.1	
Vert	36287.850	AV	29.8	41.5	-8.8	22.3	40.2	53.9	13.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Spurious Emission

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10005116H	
Date	02/27/2013	03/01/2013
Temperature/ Humidity	21 deg. C / 31% RH	21 deg. C / 31% RH
Engineer	Hironobu Ohnishi	Hironobu Ohnishi
	30-1000MHz	9k-30MHz, 1-40GHz
Mode	Tx Mid: 62.32275GHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	37.307	QP	23.2	15.3	7.2	32.2	13.5	40.0	26.5	
Hori	63.128	QP	32.1	7.5	7.6	32.2	15.0	40.0	25.0	
Hori	80.360	QP	34.7	6.5	7.9	32.1	17.0	40.0	23.0	
Hori	81.807	QP	33.9	6.7	7.9	32.2	16.3	40.0	23.7	
Hori	94.723	QP	27.4	9.1	8.1	32.3	12.3	43.5	31.2	
Hori	175.137	QP	33.1	15.9	8.9	32.2	25.7	43.5	17.8	
Hori	744.002	QP	27.8	21.0	12.8	31.7	29.9	46.0	16.1	
Hori	5075.980	PK	40.9	32.4	3.4	31.4	45.3	73.9	28.6	
Hori	10151.960	PK	46.6	38.9	-4.7	33.1	47.7	73.9	26.2	
Hori	12527.950	PK	45.4	39.6	-4.0	32.7	48.3	73.9	25.6	
Hori	25055.900	PK	48.1	38.2	-1.5	30.7	54.1	73.9	19.8	
Hori	37583.850	PK	45.4	41.8	-8.7	21.0	57.5	73.9	16.4	
Hori	5075.980	AV	29.3	32.4	3.4	31.4	33.7	53.9	20.2	
Hori	10151.960	AV	41.0	38.9	-4.7	33.1	42.1	53.9	11.8	
Hori	12527.950	AV	32.8	39.6	-4.0	32.7	35.7	53.9	18.2	
Hori	25055.900	AV	37.1	38.2	-1.5	30.7	43.1	53.9	10.8	
Hori	37583.850	AV	32.3	41.8	-8.7	21.0	44.4	53.9	9.5	
Vert	37.307	QP	36.9	15.3	7.2	32.2	27.2	40.0	12.8	
Vert	63.128	QP	51.4	7.5	7.6	32.2	34.3	40.0	5.7	
Vert	80.360	QP	52.9	6.5	7.9	32.1	35.2	40.0	4.8	
Vert	81.807	QP	52.2	6.7	7.9	32.2	34.6	40.0	5.4	
Vert	94.723	QP	47.9	9.1	8.1	32.3	32.8	43.5	10.7	
Vert	175.137	QP	38.4	15.9	8.9	32.2	31.0	43.5	12.5	
Vert	744.002	QP	31.1	21.0	12.8	31.7	33.2	46.0	12.8	
Vert	5075.980	PK	42.3	32.4	3.4	31.4	46.7	73.9	27.2	
Vert	10151.960	PK	44.7	38.9	-4.7	33.1	45.8	73.9	28.1	
Vert	12527.950	PK	44.7	39.6	-4.0	32.7	47.6	73.9	26.3	
Vert	25055.900	PK	47.7	38.2	-1.5	30.7	53.7	73.9	20.2	
Vert	37583.850	PK	44.1	41.8	-8.7	21.0	56.2	73.9	17.7	
Vert	5075.980	AV	34.3	32.4	3.4	31.4	38.7	53.9	15.2	
Vert	10151.960	AV	35.1	38.9	-4.7	33.1	36.2	53.9	17.7	
Vert	12527.950	AV	32.2	39.6	-4.0	32.7	35.1	53.9	18.8	
Vert	25055.900	AV	37.7	38.2	-1.5	30.7	43.7	53.9	10.2	
Vert	37583.850	AV	32.3	41.8	-8.7	21.0	44.4	53.9	9.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Spurious Emission

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10005116H	
Date	02/27/2013	03/01/2013
Temperature/ Humidity	21 deg. C / 31% RH	21 deg. C / 31% RH
Engineer	Hironobu Ohnishi	Hironobu Ohnishi
	30-1000MHz	9k-30MHz, 1-40GHz
Mode	Tx High: 62.95725GHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	37.315	QP	23.1	15.3	7.2	32.2	13.4	40.0	26.6	
Hori	63.134	QP	32.2	7.5	7.6	32.2	15.1	40.0	24.9	
Hori	80.361	QP	34.6	6.5	7.9	32.1	16.9	40.0	23.1	
Hori	81.809	QP	33.8	6.7	7.9	32.2	16.2	40.0	23.8	
Hori	94.728	QP	27.3	9.1	8.1	32.3	12.2	43.5	31.3	
Hori	176.582	QP	32.6	16.0	9.0	32.2	25.4	43.5	18.1	
Hori	744.000	QP	27.7	21.0	12.8	31.7	29.8	46.0	16.2	
Hori	5075.980	PK	40.4	32.4	3.4	31.4	44.8	73.9	29.1	
Hori	10151.960	PK	46.9	38.9	-4.7	33.1	48.0	73.9	25.9	
Hori	12527.950	PK	46.4	39.6	-4.0	32.7	49.3	73.9	24.6	
Hori	25055.900	PK	47.2	38.2	-1.5	30.7	53.2	73.9	20.7	
Hori	37583.850	PK	44.9	41.8	-8.7	21.0	57.0	73.9	16.9	
Hori	5075.980	AV	29.1	32.4	3.4	31.4	33.5	53.9	20.4	
Hori	10151.960	AV	41.0	38.9	-4.7	33.1	42.1	53.9	11.8	
Hori	12527.950	AV	32.7	39.6	-4.0	32.7	35.6	53.9	18.3	
Hori	25055.900	AV	37.2	38.2	-1.5	30.7	43.2	53.9	10.7	
Hori	37583.850	AV	32.3	41.8	-8.7	21.0	44.4	53.9	9.5	
Vert	37.315	QP	37.0	15.3	7.2	32.2	27.3	40.0	12.7	
Vert	63.134	QP	51.3	7.5	7.6	32.2	34.2	40.0	5.8	
Vert	80.361	QP	52.9	6.5	7.9	32.1	35.2	40.0	4.8	
Vert	81.809	QP	52.2	6.7	7.9	32.2	34.6	40.0	5.4	
Vert	94.728	QP	47.7	9.1	8.1	32.3	32.6	43.5	10.9	
Vert	176.582	QP	38.1	16.0	9.0	32.2	30.9	43.5	12.6	
Vert	744.000	QP	31.4	21.0	12.8	31.7	33.5	46.0	12.5	
Vert	5075.980	PK	42.8	32.4	3.4	31.4	47.2	73.9	26.7	
Vert	10151.960	PK	44.3	38.9	-4.7	33.1	45.4	73.9	28.5	
Vert	12527.950	PK	44.6	39.6	-4.0	32.7	47.5	73.9	26.4	
Vert	25055.900	PK	48.3	38.2	-1.5	30.7	54.3	73.9	19.6	
Vert	37583.850	PK	45.5	41.8	-8.7	21.0	57.6	73.9	16.3	
Vert	5075.980	AV	33.5	32.4	3.4	31.4	37.9	53.9	16.0	
Vert	10151.960	AV	35.3	38.9	-4.7	33.1	36.4	53.9	17.5	
Vert	12527.950	AV	32.3	39.6	-4.0	32.7	35.2	53.9	18.7	
Vert	25055.900	AV	37.7	38.2	-1.5	30.7	43.7	53.9	10.2	
Vert	37583.850	AV	32.3	41.8	-8.7	21.0	44.4	53.9	9.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Spurious Emission (above 40GHz)

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10005116H
Date	02/22/2013
Temperature/ Humidity	23 deg. C / 36% RH
Engineer	Hironobu Ohnishi
	(40-200GHz)
Mode	Tx

Frequency [GHz]	Measurement Distance [m]	Measured Power [dBm]	Rx Antenna Gain [dBi]	System Loss [dB]	LNA Gain [dB]	Free field Attenuation [dB]	EIRP [dBm]	EIRP [mW]	Specification Distance [m]	Power Density [pW/cm^2]	Limit Av [pW/cm^2]	Remarks
48.384	0.3	-59.15	23.46	7.57	18.81	55.68	-38.18	0.0002	3.0	0.135	90	Tx LRP L
50.112	1.0	-90.66	22.62	45.67	26.03	66.44	-27.20	0.0019	3.0	1.685	90	Tx LRP M
50.112	1.0	-90.42	22.62	45.67	26.03	66.44	-26.96	0.0020	3.0	1.780	90	Tx LRP H

Calculating formula:

Free Field Attenuation = 10 * log((4 * pi * Measurement Distance / lambda) ^ 2)
EIRP = Measured Power - Rx Antenna Gain + System Loss - LNA Gain + Free Field Attenuation
Power Density = EIRP / (4 * pi * Specification Distance ^ 2)

* The peak density is less than the average limit.

Frequency Stability

Test place	Head Office EMC Lab. No.6 Shielded room
Report No.	10005116H
Date	03/06/2013
Temperature/ Humidity	20 deg. C / 30% RH
Engineer	Hironobu Ohnishi
Mode	Tx

Test Condition		Center	Frequency
Temperature	Supply Voltage	Frequency	Difference
[deg. C]	[V]	[GHz]	[kHz]
50	3.30	62.6399600	- 42.8
40	3.30	62.6399640	- 38.8
30	3.30	62.6399961	- 6.6
20	3.30	62.6400027	Reference
10	3.30	62.6400181	+ 15.4
0	3.30	62.6400340	+ 31.2
-10	3.30	62.6400183	+ 15.5
-20	3.30	62.6399797	- 23.0
20	2.81	62.6399640	- 38.7
20	3.80	62.6400440	+ 41.3

Calculating formula:

Frequency Difference = Center Frequency - Reference Value

Group Instllation

There are no external phase-locking inputs in this EUT.
Therefore, the EUT comply this requirement.

Transmitter Identification

Not applicable.

The EUT is part of a WVAN (Wireless Video Area Network). All components of the WVAN are for indoor operation only. There are no outdoor units therefore no transmissions are directed outside the building.

APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	CE/RE	2013/02/28 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	CE/RE	2013/02/26 * 12
MJM-16	Measure	KOMELON	KMC-36	-	CE/RE	-
MHA-10	Horn Antenna	WiseWave	ARH1523-02	10766-02	RE	2012/10/24 * 12
MPA-08	Pre Amplifier	WiseWave	ALN-61226028-51	11576-01-071	RE	2012/08/10 * 12
MMX-01	Preselected Millimeter Mixer	Agilent	11974V-E01	3001A00412	RE	2012/06/28 * 12
MCC-135	Microwave Cable	HUBER+SUHNER	SUCOFLEX102	37511/2	RE	2012/08/10 * 12
MCC-136	Microwave Cable	HUBER+SUHNER	SUCOFLEX102	37512/2	RE	2012/08/10 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	CE/RE	2013/02/22 * 12
MHA-11	Horn Antenna	WiseWave	ARH1023-02	10766-01	RE	2012/10/24 * 12
MPA-18	Pre Amplifier	AmTechs Corporation	LNA-7511025	9601	RE	2012/08/10 * 12
MMX-02	Harmonic Mixer	Agilent	11970W	2521 A01909	RE	2012/06/28 * 12
MHA-24	Horn Antenna	Custom Microwave Inc.	HO6R	-	RE	2012/09/25 * 12
MMX-03	Harmonic Mixer	OML Inc.	M06HWD	D100709-1	RE	2012/09/26 * 12
MDPLX-01	Diplexer	OML Inc.	DPL26	-	RE	2012/09/25 * 12
MHA-27	Horn Antenna	Custom Microwave Inc.	HO4R	-	RE	2012/09/25 * 12
MMX-04	Harmonic Mixer	OML Inc.	M04HWD	Y100709-1	RE	2012/09/26 * 12
MHA-07	Horn Antenna	Custom	HO22R	10766-01	RE	2012/10/24 * 12
MCC-140	Microwave Cable	Junkosha	J12J101596-00	JAN-31-12-001	RE	2013/02/26 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	3950M00205	RE	2012/06/22 * 12
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	CE/RE	-
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	CE/RE	2012/08/23 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE	2013/01/07 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(3m)/ sucoform141-PE(1m)/ 421-010(1.5m)/ RFM-E321(Switcher)	-/00640	CE	2012/07/12 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2013/01/22 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2012/10/08 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2012/10/08 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2012/07/12 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2012/11/06 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2012/03/16 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2012/05/25 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2012/09/05 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2012/03/29 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2012/05/21 * 12
MMM-12	DIGITAL HiTESTER	Hioki	3805	060500120	RE	2013/02/28 * 12
MCH-04	Temperature and Humidity Chamber	Tabai Espec	PL-2KP	14015723	RE	2012/08/01 * 12

The expiration date of the calibration is the end of the expired month.

[Below 40GHz]
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

[Above 40GHz]
Acceptance criteria for untraceable equipment was formulated according to ISO/IEC 17025 5.6.2.2.2, and the regular inspection was performed based on it annually.
For 40-110GHz, power sensor is calibrated by manufacturer, and the measured calibration data is used as in-house reference. The calibration data by manufacturer is checked for acceptance by a calorie meter except for some frequency bands.
For above 110GHz, output level of millimeter wave source module is used as the reference, and inspection by the calorie meter is performed.
Electric power is checked with the calorie meter by measuring resistance and voltage of reference resistor.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: CE: Conducted Emission
RE: Radiated Emission