



# RADIO TEST REPORT

Test Report No. : 32KE0148-HO-01-A-R1

**Applicant** : Sony Corporation  
**Type of Equipment** : DIGITAL WIRELESS TRANSMITTER  
**Model No.** : ZTX-B01  
**FCC ID** : AK8ZTXB01  
**Test regulation** : FCC Part 15 Subpart C: 2012  
**Test Result** : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
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 32KE0148-HO-01-A. 32KE0148-HO-01-A is replaced with this report.

**Date of test:** August 23 and 24, 2012

**Representative test engineer:**

Hironobu Ohnishi  
Engineer of WiSE Japan,  
UL Verification Service

**Approved by:**

Masanori Nishiyama  
Manager 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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13-EM-F0429

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## **SECTION 1: Customer information**

Company Name : Sony Corporation  
Address : 1-7-1 Konan, Minato-ku, Tokyo 108-0075, Japan  
Telephone Number : +81-53-577-1012  
Facsimile Number : +81-53-577-3489  
Contact Person : Youhei Hisano

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

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

Type of Equipment : DIGITAL WIRELESS TRANSMITTER  
Model No. : ZTX-B01  
Serial No. : Refer to Section 4, Clause 4.2  
Rating : DC 3V  
Receipt Date of Sample : June 14, 2012  
Country of Mass-production : Korea  
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**

To be used in the wireless microphone system, mainly aimed at amateur musicians.

#### **General Specification**

Clock frequency(ies) in the system : 26MHz

#### **Radio Specification**

Radio Type : Transmitter  
Frequency of Operation : 2402 - 2478.5 MHz  
Modulation : GFSK  
Power Supply (radio part input) : DC1.2V, DC 2.7V, DC5.0V  
Antenna type : Lambda/4, Mono-pole (internal)  
Antenna Gain : 0dBi

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

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart C: 2012, final revised on August 13, 2012 and effective September 12, 2012

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

- \* The revision on August 13, 2012 does not affect the test specification applied to the EUT.
- \* The EUT complies with FCC Part 15 Subpart B: 2012, final revised on August 13, 2012 and effective September 12, 2012.

### **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 ----- IC: RSS-Gen 7.2.4	FCC: Section 15.207 ----- IC: RSS-Gen 7.2.4	N/A	N/A *1)	-
6dB Bandwidth	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: RSS-Gen 4.6.2	FCC: Section 15.247(a)(2) ----- IC: RSS-210 A8.2(a)	See data.	Complied	Conducted
Maximum Peak Output Power	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: RSS-Gen 4.8	FCC: Section 15.247(b)(3) ----- IC: RSS-210 A8.4(4)		Complied	Conducted
Power Density	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: -	FCC: Section 15.247 (e) ----- IC: RSS-210 A8.2(b)		Complied	Conducted
Spurious Emission Restricted Band Edges	FCC: "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" ----- IC: RSS-Gen 4.9	FCC: Section15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 7.2.3	4.2dB 4804.000MHz, AV, Hori.	Complied	Conducted/ Radiated

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.  
\*1) The test was not performed since the EUT was device operated with battery.

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

#### **FCC 15.31 (e)**

This EUT provides stable voltage (DC1.2V, DC2.7V, DC5.0V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

#### **FCC Part 15.203 Antenna requirement**

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

### 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	-	Conducted

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)	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	4.2dB	5.0dB	5.1dB	4.7dB	5.7dB	4.4dB	4.3dB
No.2	4.1dB	5.2dB	5.1dB	4.8dB	5.6dB	4.3dB	4.2dB
No.3	4.5dB	5.0dB	5.2dB	4.8dB	5.6dB	4.5dB	4.2dB
No.4	4.7dB	5.2dB	5.2dB	4.8dB	5.6dB	5.1dB	4.2dB

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

Power meter (+dB)	
Below 1GHz	Above 1GHz
1.0dB	1.0dB

Antenna terminal conducted emission and Power density (+dB)			Antenna terminal conducted emission (+dB)		Channel power (+dB)
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.0dB	1.1dB	2.7dB	3.2dB	3.3dB	1.5dB

#### 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 8116 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

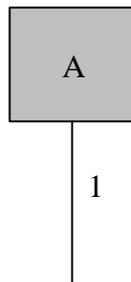
Refer to APPENDIX.

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

### **4.1 Operating Mode(s)**

<b>Mode</b>	<b>Remarks*</b>
Transmitting mode (Tx)	2402.0MHz 2442.5MHz 2478.5MHz
*Transmitting duty was 100% on all tests.	
*Power of the EUT was set by the software as follows; Power settings: 10mW e.i.r.p Software: CPU:ztx_test_specChg0605A.srec FPGA:ZTX_BP_FPGA_120606AA_High_0xA.hexout	
*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.	

### **4.2 Configuration and peripherals**



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

#### **Description of EUT**

<b>No.</b>	<b>Item</b>	<b>Model number</b>	<b>Serial number</b>	<b>Manufacturer</b>	<b>Remarks</b>
A	DIGITAL WIRELESS TRANSMITTER	ZTX-B01	013	Sony Corporation	EUT

#### **List of cables used**

<b>No.</b>	<b>Name</b>	<b>Length (m)</b>	<b>Shield</b>		<b>Remarks</b>
			<b>Cable</b>	<b>Connector</b>	
1	Audio Cable	1.5	Shielded	Shielded	-

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## **SECTION 5: Radiated Spurious Emission**

### **Test Procedure**

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, 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 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

In any 100kHz bandwidth outside the restricted 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.

### **20dBc was applied to the frequency over the limit of FCC 15.209 / Table 5 of RSS-Gen 7.2.5(IC) and outside the restricted band of FCC15.205 / Table 3 of RSS-Gen 7.2.2 (IC).**

Frequency	Below 1GHz	Above 1GHz		20dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 10Hz *1)	RBW: 100kHz VBW: 300kHz (S/A)
Test Distance	3m	3m (below 10GHz), 1m*2) (above 10GHz)		3m (below 10GHz), 1m*2) (above 10GHz)

\*1) The test was performed with VBW 10Hz since the EUT had no intervals during which the transmitter was off (see Appendix).

\*2) Distance Factor:  $20 \times \log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

- 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.

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

**Measurement range** : 30M-26.5GHz  
**Test data** : APPENDIX  
**Test result** : Pass

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## SECTION 6: Antenna Terminal Conducted Tests

### Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6dB Bandwidth	10MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	1 to 3% of Span	Three times of RBW	Auto	Sample	Single	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak	-	Power Meter (Sensor: 50MHz BW)
Peak Power Density	10MHz	30kHz	100kHz	334sec	Peak	Max Hold	Spectrum Analyzer *1) *2)
Conducted Spurious Emission *3)	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				
	30MHz to 25GHz (Less or equal to 5GHz)	100kHz	300kHz				
*1) PSD Option 1 of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 (issued on March 23, 2005)". *2) The test was not performed at RBW:3kHz however the measurement is to be performed with RBW:3kHz in the regulation, because, the measurement value with RBW:3kHz is less than the value of RBW:30kHz and the test data met the limit with RBW:30kHz. *3) 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=9.1kHz)							

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

Test data : APPENDIX  
Test result : Pass

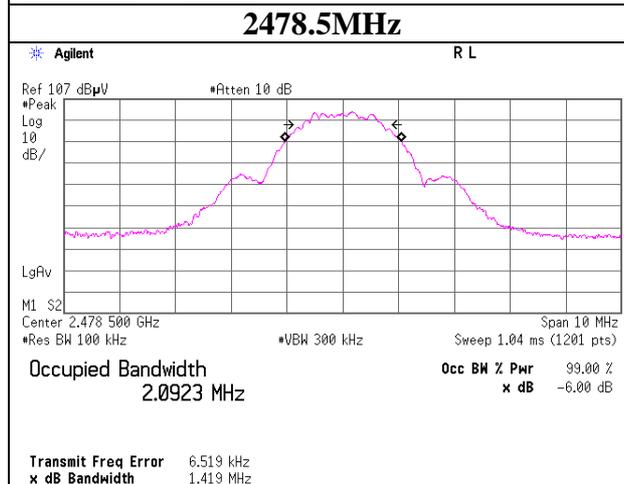
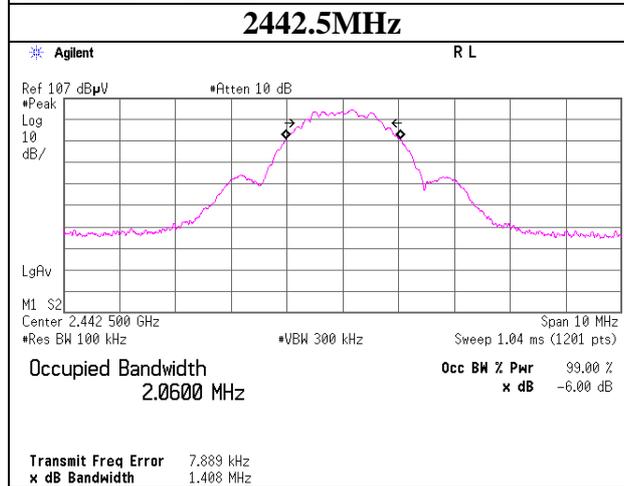
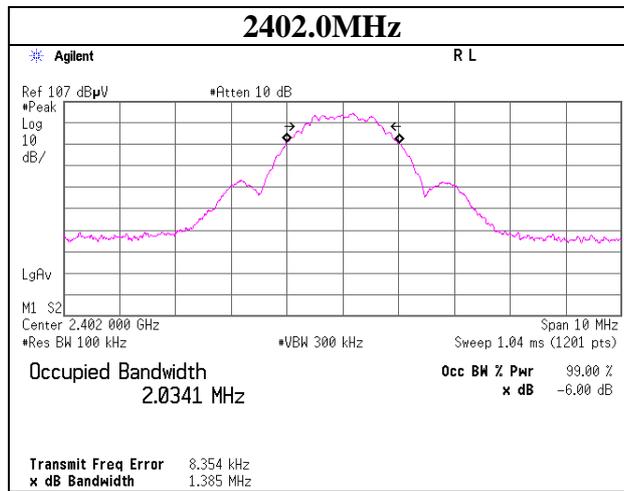
## APPENDIX 1: Data of EMI test

### 6dB Bandwidth

Test place                      Head Office EMC Lab. No.2 Measurement Room  
Report No.                      32KE0148-HO-01  
Date                              08/23/2012  
Temperature/ Humidity        25 deg. C / 60% RH  
Engineer                        Hironobu Ohnishi  
Mode                              Tx

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2402.0	1.385	>500
2442.5	1.408	>500
2478.5	1.419	>500

### 6dB Bandwidth



### Maximum Peak Output Power

Test place : Head Office EMC Lab. No.2 Measurement Room  
Report No. : 32KE0148-HO-01  
Date : 08/23/2012  
Temperature/ Humidity : 25 deg. C / 60% RH  
Engineer : Hironobu Ohnishi  
Mode : Tx

**[Peak]**

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2402.0	-3.22	0.77	10.03	7.58	5.73	30.00	1000	22.42
2442.5	-3.00	0.77	10.03	7.80	6.03	30.00	1000	22.20
2478.5	-3.42	0.78	10.03	7.39	5.48	30.00	1000	22.61

Sample Calculation:

Result = Reading + Cable Loss + Attenuator



## Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber  
Report No. 32KE0148-HO-01  
Date 08/23/2012 08/24/2012  
Temperature/ Humidity 25 deg. C / 60% RH 24 deg. C / 61% RH  
Engineer Hironobu Ohnishi Hironobu Ohnishi  
Above 1GHz Below 1GHz  
Mode Tx 2442.5MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	897.000	QP	31.6	22.4	13.5	31.0	36.5	46.0	9.5	
Hori	923.000	QP	32.3	22.7	13.7	30.9	37.8	46.0	8.2	
Hori	949.000	QP	29.7	22.9	13.8	30.7	35.7	46.0	10.3	
Hori	1586.000	PK	53.5	26.5	1.8	35.3	46.5	73.9	27.4	
Hori	2393.367	PK	54.7	27.5	2.2	34.8	49.6	73.9	24.3	
Hori	2492.216	PK	54.0	27.5	2.3	34.8	49.0	73.9	24.9	
Hori	4885.000	PK	54.8	31.4	3.9	34.0	56.1	73.9	17.8	
Hori	7327.500	PK	49.7	36.0	4.7	34.2	56.2	73.9	17.7	
Hori	9770.000	PK	44.1	39.0	5.3	34.7	53.7	73.9	20.2	
Hori	24425.000	PK	47.5	40.5	-1.7	32.2	54.1	73.9	19.8	
Hori	1586.000	AV	48.6	26.5	1.8	35.3	41.6	53.9	12.3	
Hori	2393.367	AV	48.3	27.5	2.2	34.8	43.2	53.9	10.7	
Hori	2492.216	AV	47.5	27.5	2.3	34.8	42.5	53.9	11.4	
Hori	4885.000	AV	46.8	31.4	3.9	34.0	48.1	53.9	5.8	
Hori	7327.500	AV	39.7	36.0	4.7	34.2	46.2	53.9	7.7	
Hori	9770.000	AV	31.3	39.0	5.3	34.7	40.9	53.9	13.0	
Hori	24425.000	AV	34.1	40.5	-1.7	32.2	40.7	53.9	13.2	
Vert	897.000	QP	29.6	22.4	13.5	31.0	34.5	46.0	11.5	
Vert	923.000	QP	30.6	22.7	13.7	30.9	36.1	46.0	9.9	
Vert	949.000	QP	28.3	22.9	13.8	30.7	34.3	46.0	11.7	
Vert	1586.000	PK	52.7	26.5	1.8	35.3	45.7	73.9	28.2	
Vert	2393.367	PK	53.8	27.5	2.2	34.8	48.7	73.9	25.2	
Vert	2492.216	PK	53.6	27.5	2.3	34.8	48.6	73.9	25.3	
Vert	4885.000	PK	51.3	31.4	3.9	34.0	52.6	73.9	21.3	
Vert	7327.500	PK	48.2	36.0	4.7	34.2	54.7	73.9	19.2	
Vert	9770.000	PK	43.9	39.0	5.3	34.7	53.5	73.9	20.4	
Vert	24425.000	PK	47.4	40.5	-1.7	32.2	54.0	73.9	19.9	
Vert	1586.000	AV	48.3	26.5	1.8	35.3	41.3	53.9	12.6	
Vert	2393.367	AV	46.9	27.5	2.2	34.8	41.8	53.9	12.1	
Vert	2492.216	AV	46.8	27.5	2.3	34.8	41.8	53.9	12.1	
Vert	4885.000	AV	42.7	31.4	3.9	34.0	44.0	53.9	9.9	
Vert	7327.500	AV	37.4	36.0	4.7	34.2	43.9	53.9	10.0	
Vert	9770.000	AV	31.3	39.0	5.3	34.7	40.9	53.9	13.0	
Vert	24425.000	AV	34.1	40.5	-1.7	32.2	40.7	53.9	13.2	

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

## Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber  
Report No. 32KE0148-HO-01  
Date 08/23/2012 08/24/2012  
Temperature/ Humidity 25 deg. C / 60% RH 24 deg. C / 61% RH  
Engineer Hironobu Ohnishi Hironobu Ohnishi  
Above 1GHz Below 1GHz  
Mode Tx 2478.5MHz

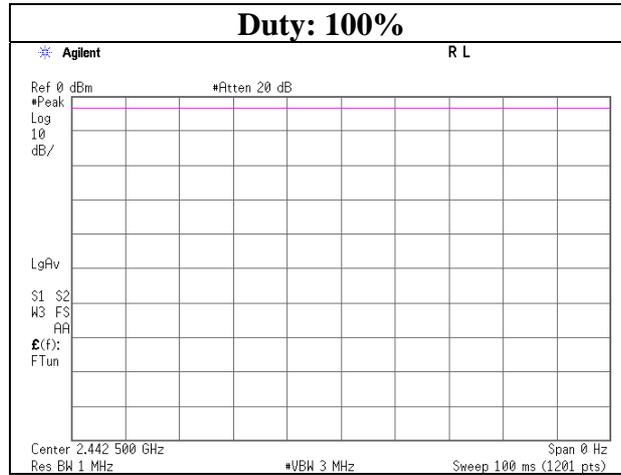
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	897.000	QP	31.7	22.4	13.5	31.0	36.6	46.0	9.4	
Hori	923.000	QP	32.3	22.7	13.7	30.9	37.8	46.0	8.2	
Hori	949.000	QP	29.8	22.9	13.8	30.7	35.8	46.0	10.2	
Hori	1586.000	PK	52.9	26.5	1.8	35.3	45.9	73.9	28.0	
Hori	2483.500	PK	62.8	27.5	2.3	34.8	57.8	73.9	16.1	
Hori	2504.414	PK	59.9	27.5	2.3	34.8	54.9	73.9	19.0	
Hori	2529.564	PK	56.2	27.6	2.3	34.8	51.3	73.9	22.6	
Hori	4957.000	PK	53.8	31.6	4.0	34.0	55.4	73.9	18.5	
Hori	7435.500	PK	51.1	36.2	4.7	34.3	57.7	73.9	16.2	
Hori	9914.000	PK	44.4	39.1	5.4	34.7	54.2	73.9	19.7	
Hori	24785.000	PK	49.9	40.6	-1.6	32.7	56.2	73.9	17.7	
Hori	1586.000	AV	48.3	26.5	1.8	35.3	41.3	53.9	12.6	
Hori	2483.500	AV	50.6	27.5	2.3	34.8	45.6	53.9	8.3	
Hori	2504.414	AV	49.4	27.5	2.3	34.8	44.4	53.9	9.5	
Hori	2529.564	AV	48.4	27.6	2.3	34.8	43.5	53.9	10.4	
Hori	4957.000	AV	45.3	31.6	4.0	34.0	46.9	53.9	7.0	
Hori	7435.500	AV	42.3	36.2	4.7	34.3	48.9	53.9	5.0	
Hori	9914.000	AV	31.6	39.1	5.4	34.7	41.4	53.9	12.5	
Hori	24785.000	AV	36.3	40.6	-1.6	32.7	42.6	53.9	11.3	
Vert	897.000	QP	29.6	22.4	13.5	31.0	34.5	46.0	11.5	
Vert	923.000	QP	30.6	22.7	13.7	30.9	36.1	46.0	9.9	
Vert	949.000	QP	28.4	22.9	13.8	30.7	34.4	46.0	11.6	
Vert	1586.000	PK	52.1	26.5	1.8	35.3	45.1	73.9	28.8	
Vert	2483.500	PK	61.1	27.5	2.3	34.8	56.1	73.9	17.8	
Vert	2504.414	PK	58.8	27.5	2.3	34.8	53.8	73.9	20.1	
Vert	2529.564	PK	54.6	27.6	2.3	34.8	49.7	73.9	24.2	
Vert	4957.000	PK	52.2	31.6	4.0	34.0	53.8	73.9	20.1	
Vert	7435.500	PK	48.9	36.2	4.7	34.3	55.5	73.9	18.4	
Vert	9914.000	PK	44.5	39.1	5.4	34.7	54.3	73.9	19.6	
Vert	24785.000	PK	49.4	40.6	-1.6	32.7	55.7	73.9	18.2	
Vert	1586.000	AV	47.5	26.5	1.8	35.3	40.5	53.9	13.4	
Vert	2483.500	AV	48.8	27.5	2.3	34.8	43.8	53.9	10.1	
Vert	2504.414	AV	47.9	27.5	2.3	34.8	42.9	53.9	11.0	
Vert	2529.564	AV	46.9	27.6	2.3	34.8	42.0	53.9	11.9	
Vert	4957.000	AV	43.0	31.6	4.0	34.0	44.6	53.9	9.3	
Vert	7435.500	AV	39.1	36.2	4.7	34.3	45.7	53.9	8.2	
Vert	9914.000	AV	31.6	39.1	5.4	34.7	41.4	53.9	12.5	
Vert	24785.000	AV	36.3	40.6	-1.6	32.7	42.6	53.9	11.3	

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).

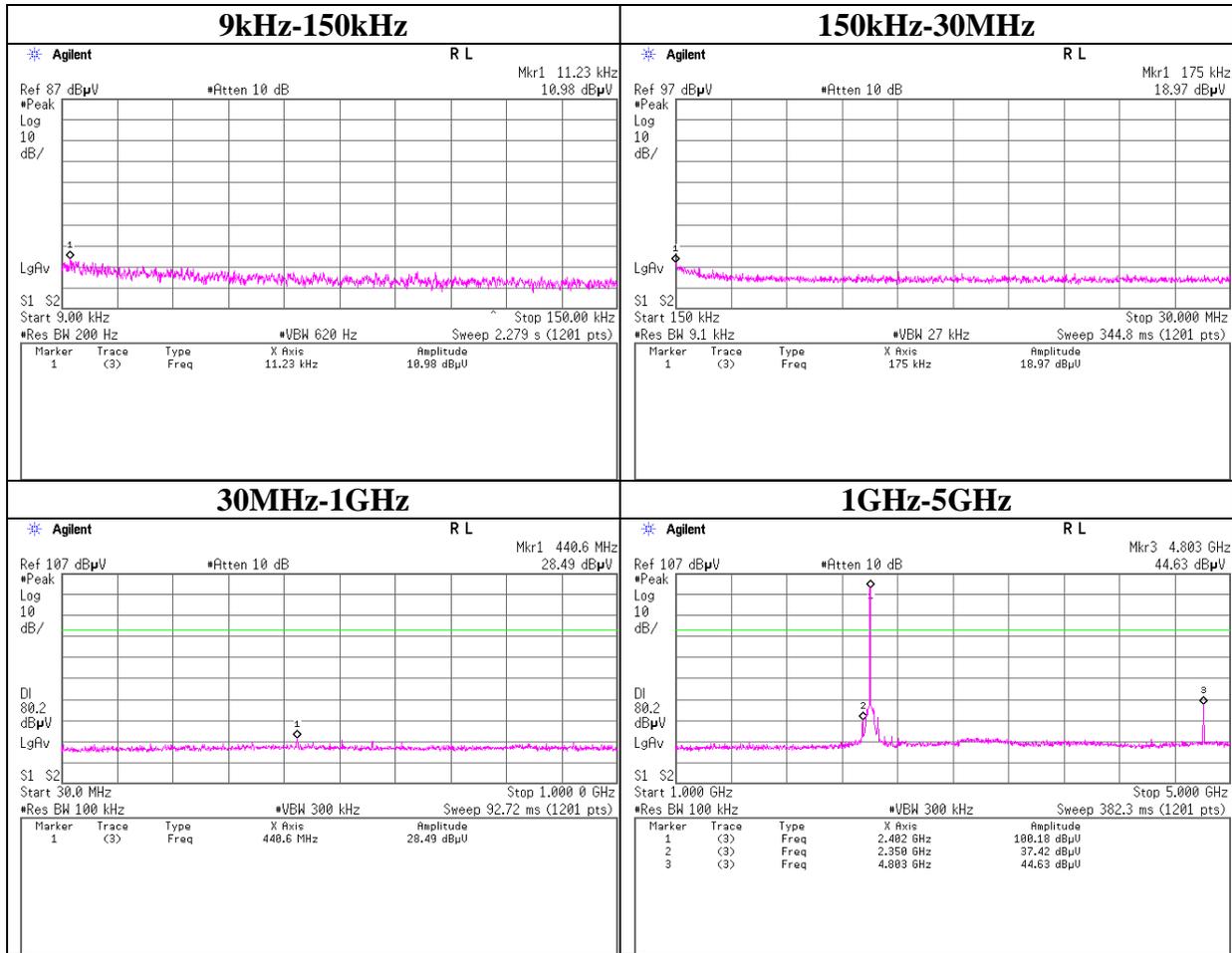
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB  
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

**Burst rate confirmation**



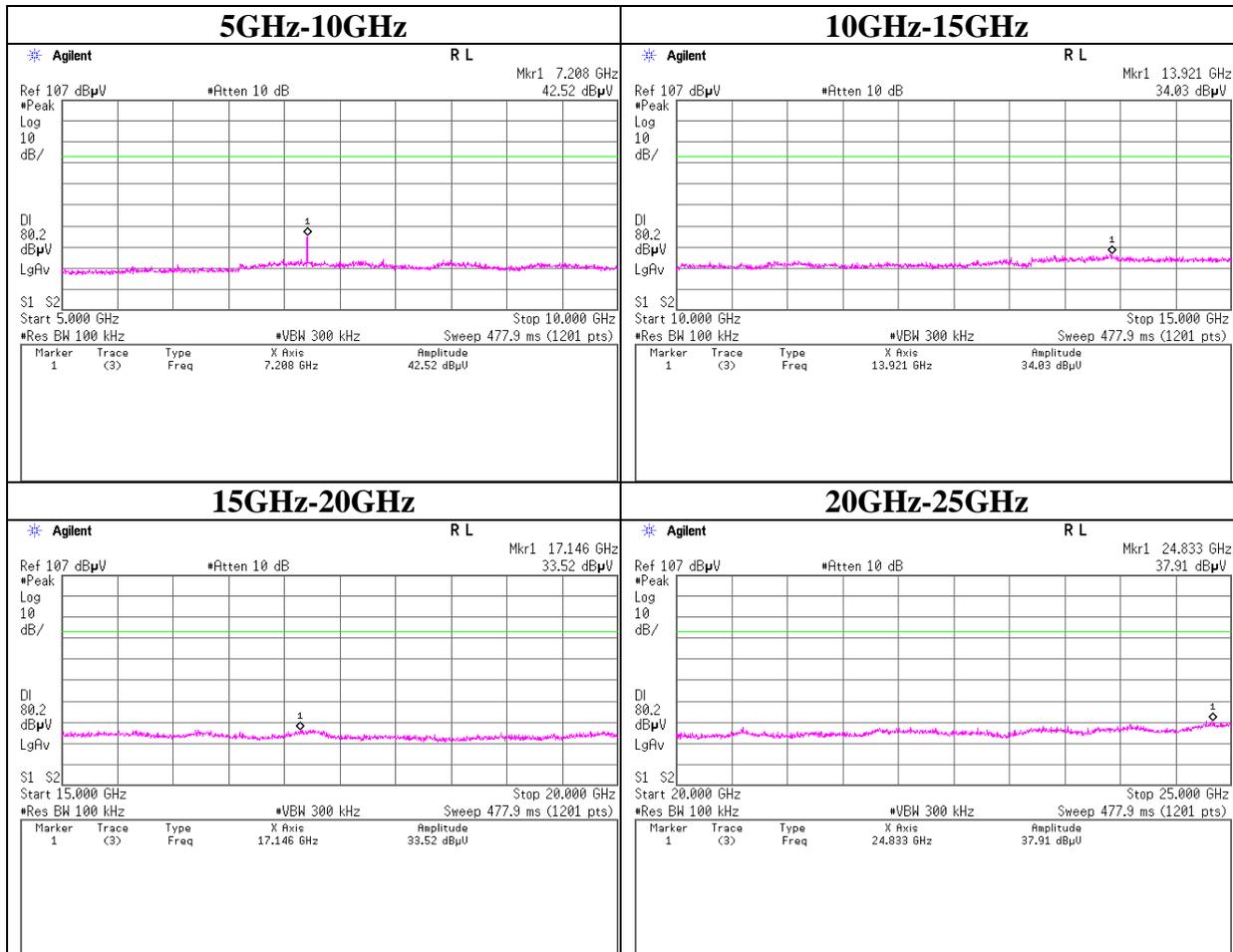
## Conducted Spurious Emission

**Tx 2402.0MHz**



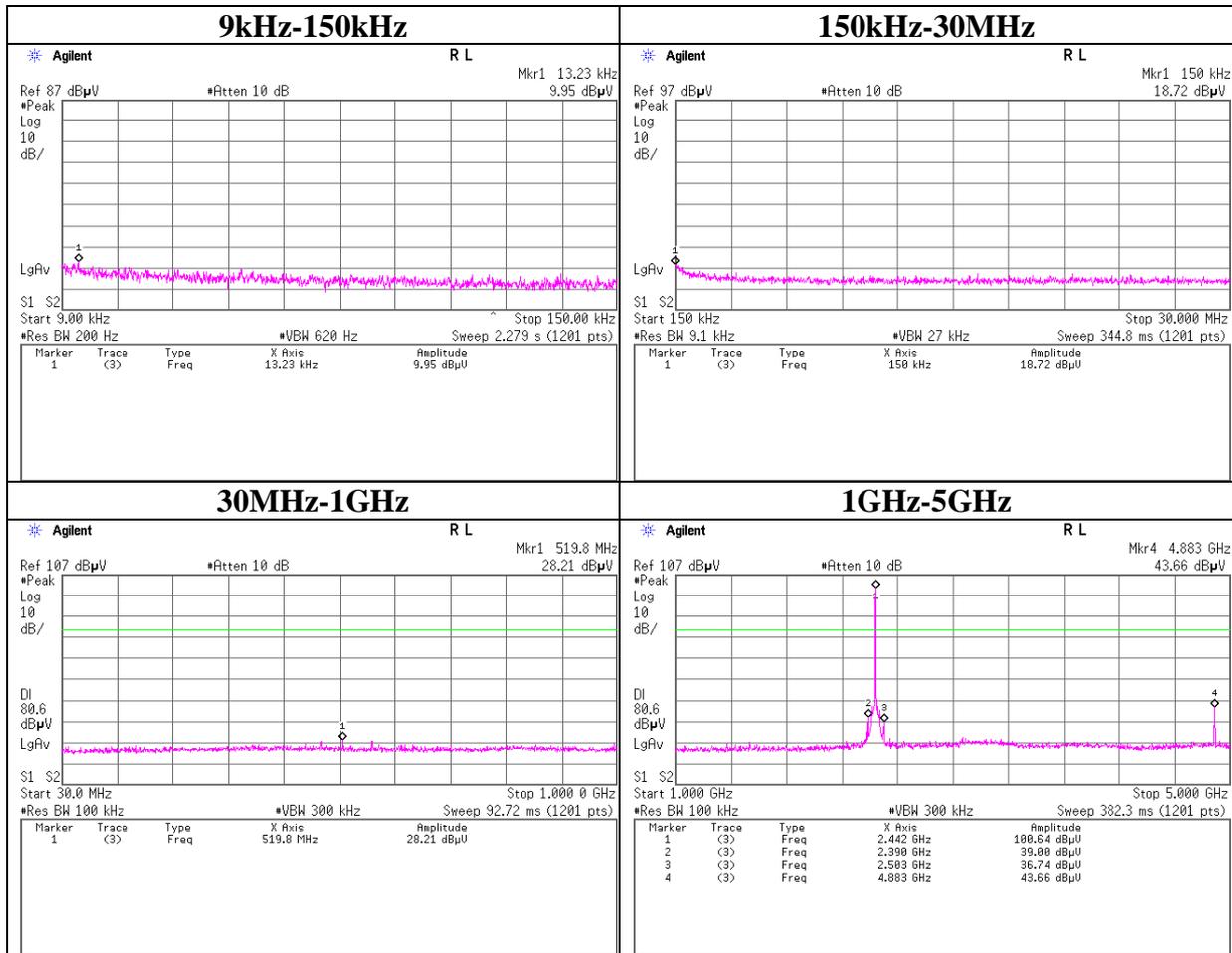
## Conducted Spurious Emission

### Tx 2402.0MHz



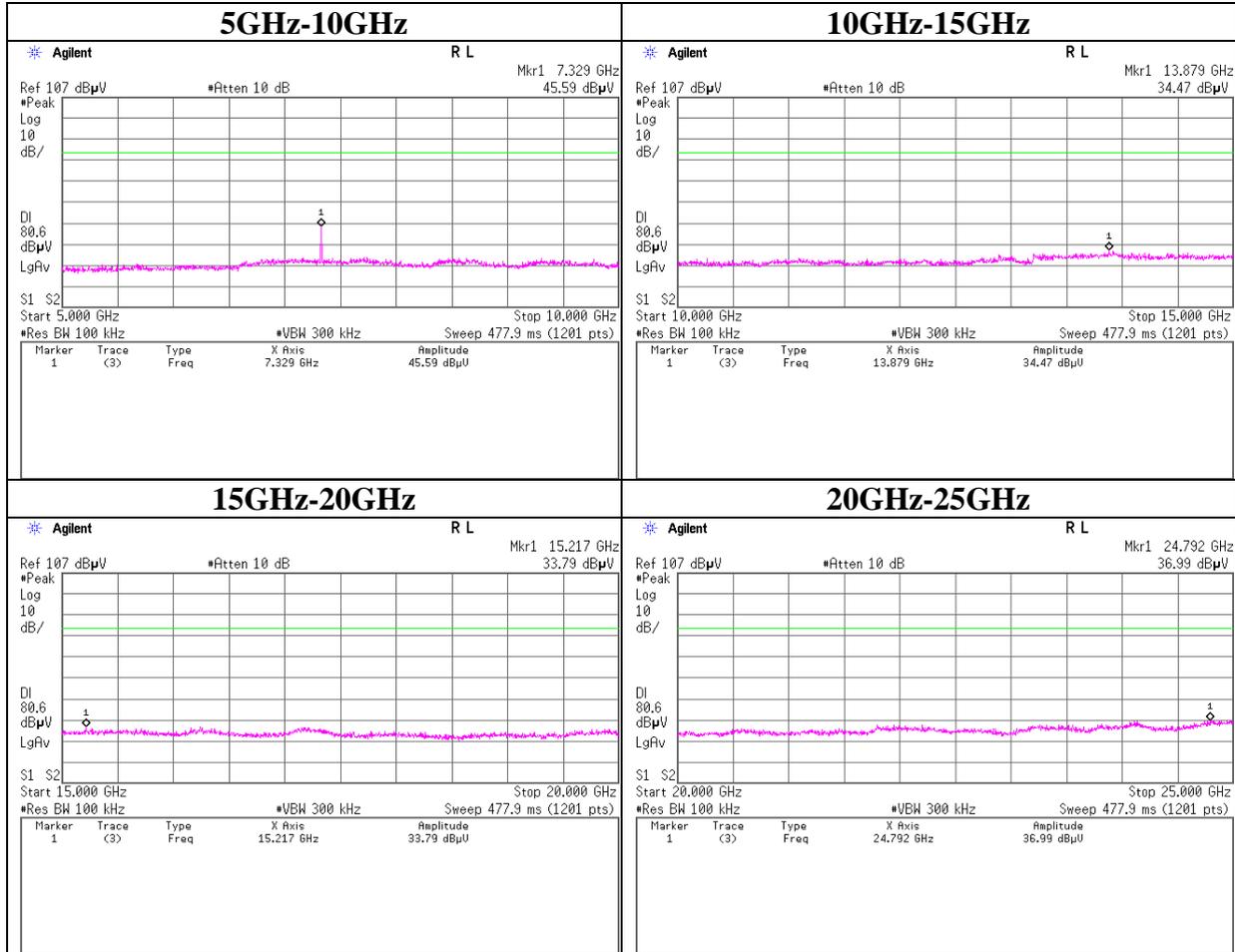
## Conducted Spurious Emission

### Tx 2442.5MHz



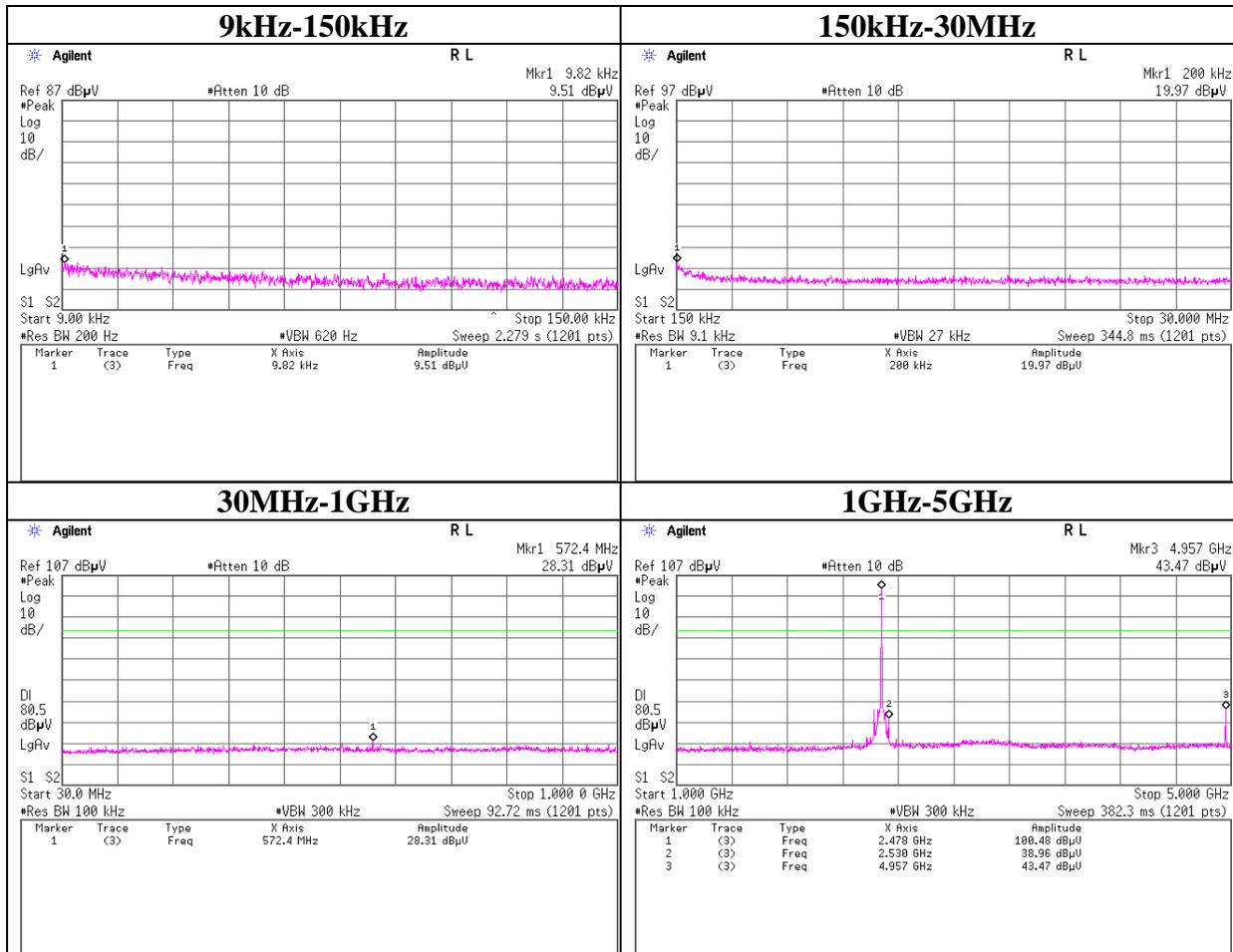
## Conducted Spurious Emission

### Tx 2442.5MHz



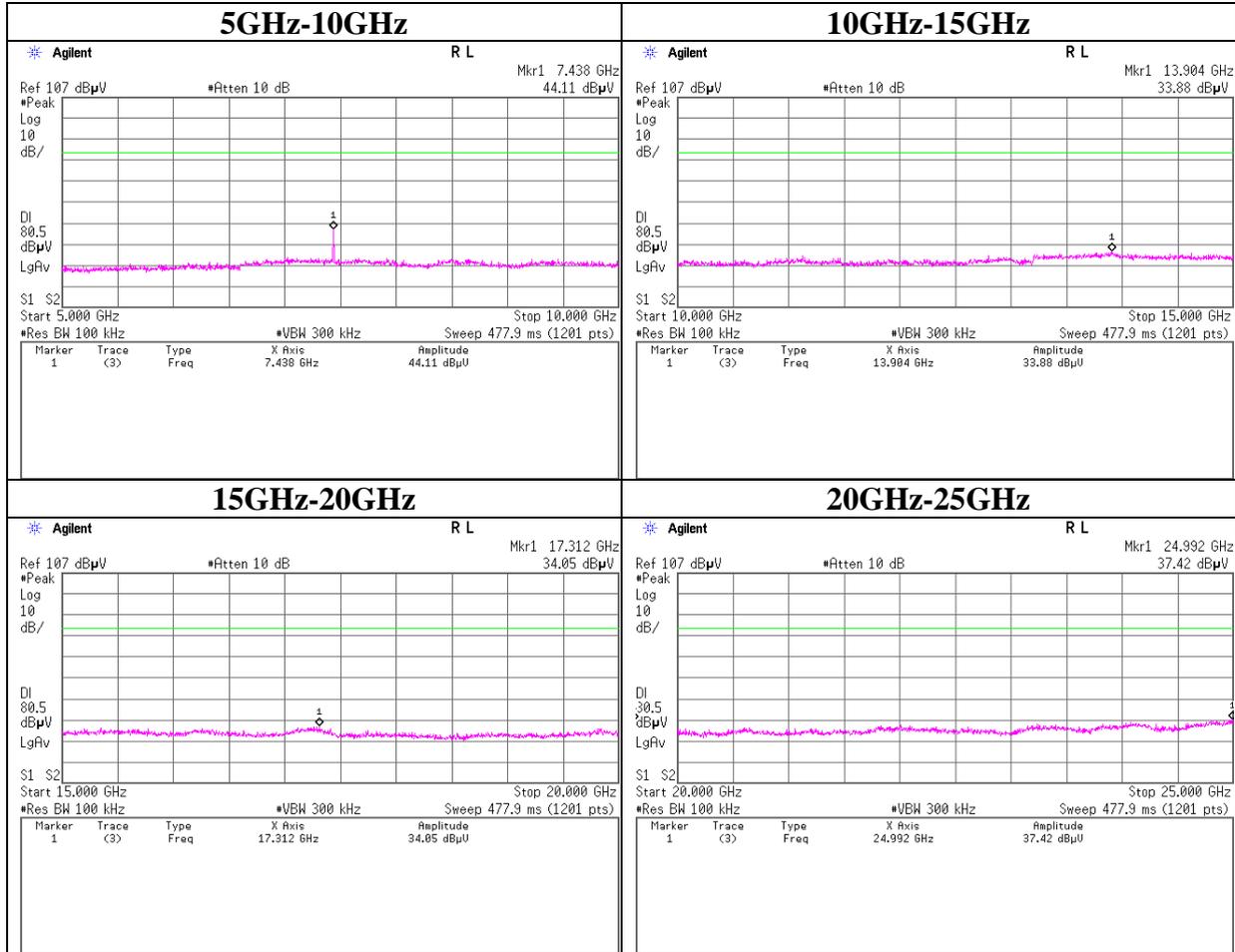
## Conducted Spurious Emission

### Tx 2478.5MHz

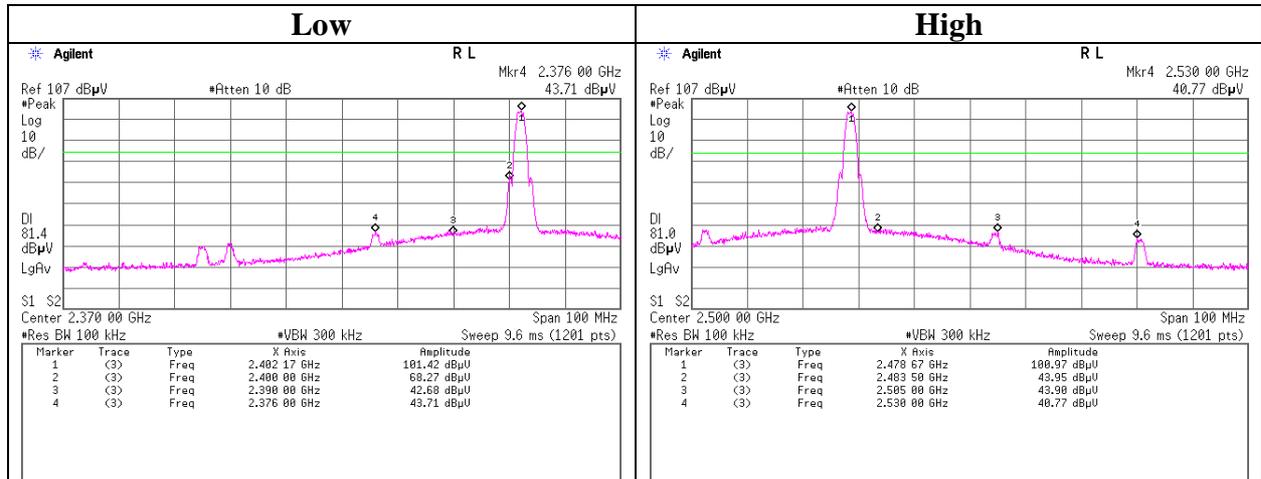


## Conducted Spurious Emission

### Tx 2478.5MHz



### Conducted Emission Band Edge compliance



### Power Density

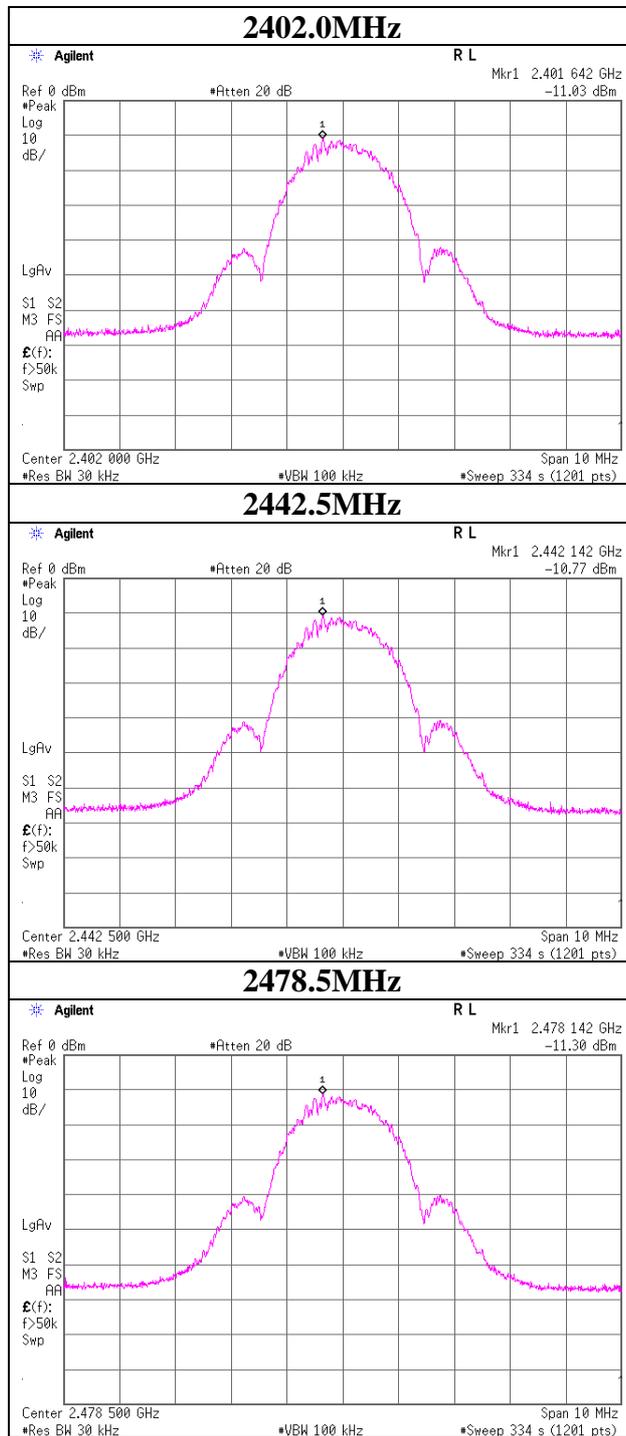
Test place Head Office EMC Lab. No.2 Measurement Room  
Report No. 32KE0148-HO-01  
Date 08/23/2012  
Temperature/ Humidity 25 deg. C / 60% RH  
Engineer Hironobu Ohnishi  
Mode Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.0	-11.03	0.77	10.03	-0.23	8.00	8.23
2442.5	-10.77	0.77	10.03	0.03	8.00	7.97
2478.5	-11.30	0.78	10.03	-0.49	8.00	8.49

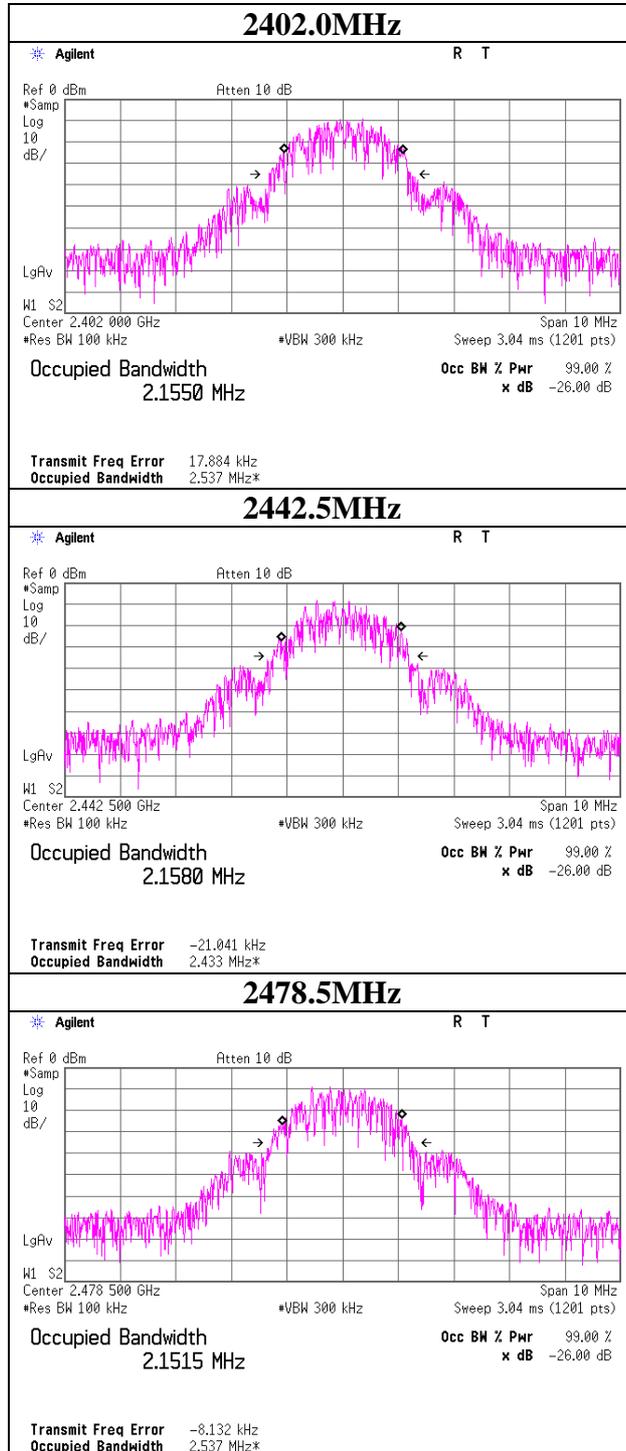
Sample Calculation:

Result = Reading + Cable Loss + Attenuator

## Power Density



### 99%Occupied Bandwidth



## **APPENDIX 2: Test instruments**

### **EMI test equipment**

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	AT/RE	2012/02/06 * 12
MMM-01	Digital Tester	Fluke	FLUKE 26-3	78030611	AT	2012/08/21 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT/RE	2011/11/23 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2012/06/01 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2012/06/01 * 12
MCC-103	Microwave Cable	Hirose Electric	U.FL-2LP-066J1-A(200)	-	AT	2012/06/27 * 12
MAT-25	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71642	AT	2012/06/27 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2012/02/22 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2011/09/06 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2012/05/30 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2012/02/24 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2012/02/06 * 12
MJM-06	Measure	PROMART	SEN1955	-	RE	
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	RE	2011/11/23 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2012/08/23 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2011/10/15 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2011/10/15 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2012/07/12 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2011/11/02 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2012/03/16 * 12

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

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

**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: RE: Radiated Emission**

**AT: Antenna Terminal Conducted test**

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**Head Office EMC Lab.**

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