RADIO TEST REPORT

Test Report No. : 32EE0092-HO-01-A-R2

Applicant	:	**ELMO COMPANY, LIMITED**
Type of Equipment	:	**USB Dongle**
Model No.	:	**CRV-CK-1R**
FCC ID	:	**X3XCRV-1R**
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 32EE0092-HO-01-A-R1. 32EE0092-HO-01-A-R1 is replaced with this report.

Date of test: February 13 to 17, 2012

Representative test engineer:
Kazuya Yoshioka
Engineer of WiSE Japan,
UL Verification Service

Approved by:
Mitsuru Fujimura
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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SECTION 1: Customer information

Company Name	:	ELMO COMPANY, LIMITED
Address	:	6-14, MEIZEN-CHO, MIZUHO-KU, NAGOYA, AICHI 467-8567 JAPAN
Telephone Number	:	+81-52-811-5136
Facsimile Number	:	+81-52-811-5179
Contact Person	:	Tomokazu Ito

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

2.1 Identification of E.U.T.

Type of Equipment	:	USB Dongle
Model No.	:	CRV-CK-1R
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 5V
Receipt Date of Sample	:	December 15, 2011
Country of Mass-production	:	Taiwan
Condition of EUT	:	Production 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	:	12MHz, 24MHz

Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	2402-2479MHz
Modulation	:	GFSK
Power Supply (radio part input)	:	DC3.3V
Antenna type	:	Pattern
Antenna Gain	:	1.16dBi

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C: 2012, final revised on February 1, 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 February 1, 2012 does not affect the test specification applied to the EUT.

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]** 12.5dB 0.19813MHz, L **[AV]** 8.6dB 0.52925MHz, L	Complied	-
	IC: RSS-Gen 7.2.4	**IC:** RSS-Gen 7.2.4			
6dB Bandwidth	**FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247"	**FCC:** Section 15.247(a)(2)	See data.	Complied	Conducted
	IC: RSS-Gen 4.6.2	**IC:** RSS-210 A8.2(a)			
Maximum Peak Output Power	**FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247"	**FCC:** Section 15.247(b)(3)		Complied	Conducted
	IC: RSS-Gen 4.8	**IC:** RSS-210 A8.4(4)			
Power Density	**FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247"	**FCC:** Section 15.247 (e)		Complied	Conducted
	IC: -	**IC:** RSS-210 A8.2(b)			
Spurious Emission Restricted Band Edges	**FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247"	**FCC:** Section15.247(d)	0.4dB 38.160MHz Vertical, QP	Complied	Conducted/ Radiated
	IC: RSS-Gen 4.9	**IC:** RSS-210 A8.5 RSS-Gen 7.2.3			
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.					

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

FCC 15.31 (e)
This EUT provides stable voltage (DC3.3V) 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)	**Conducted emission (±dB)**
	150kHz-30MHz
No.1	3.5dB
No.2	3.6dB
No.3	3.6dB
No.4	3.6dB

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	5.6dB	5.9dB	4.4dB	4.3dB
No.2	4.1dB	5.2dB	5.1dB	5.7dB	5.8dB	4.3dB	4.2dB
No.3	4.5dB	5.0dB	5.2dB	5.7dB	5.8dB	4.5dB	4.2dB
No.4	4.7dB	5.2dB	5.2dB	5.7dB	5.8dB	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

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

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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

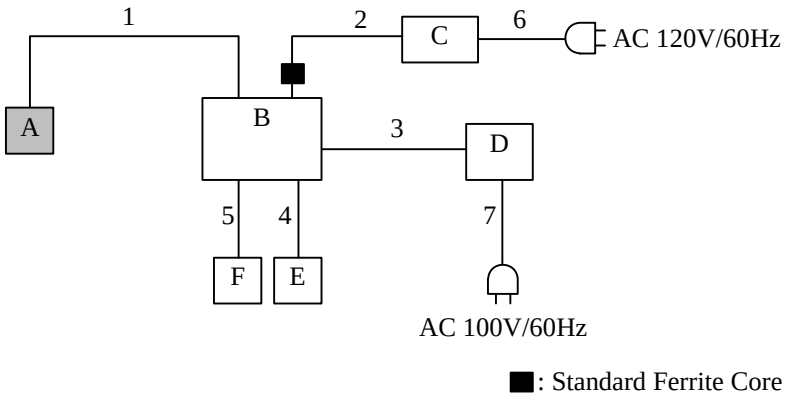
4.1 Operating Mode(s)

Mode	Remarks*
Transmitting (Tx)	-
*Power of the EUT was set by the software as follows; Power settings: PA6 Software: usbhidioc_e.exe, version 1.0.0.1 *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 frequency
Conducted Emission Spurious Emission(Radiated/Conducted)	Tx	2402MHz 2441MHz 2479MHz
6dB Bandwidth Maximum Peak Output Power Power Density 99% Occupied Bandwidth	Tx	2402MHz 2441MHz 2479MHz

Configuration and peripherals



* 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	USB Dongle	CRV-CK-1R	3	ELMO COMPANY, LIMITED	EUT
B	Laptop Computer	7661-CB9	L3-K0730 07/10	IBM	-
C	AC Adapter	92P1160	11S92P1160Z1ZBGH 77W6YJ	IBM	-
D	LCD	LCD-A154VW	U6J6004933VT	I·O DATA	-
E	External FDD	CF-VFDU03	0322374	Panasonic	-
F	USB Mouse	M-UB48	4872A001	Logitech	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Cable	1.0	Shielded	Shielded	-
2	DC Cable	2.0	Unshielded	Unshielded	-
3	Display Cable	1.6	Unshielded	Unshielded	-
4	FDD (USB) Cable	0.3	Shielded	Shielded	-
5	Mouse (USB) Cable	0.7	Shielded	Shielded	-
6	AC Cable	0.9	Unshielded	Unshielded	-
7	AC Cable	1.6	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, 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.

For the tests on EUT with other peripherals (as a whole system)
I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were 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 AV**
Measurement range	**: 0.15-30MHz**
Test data	**: APPENDIX**
Test result	**: Pass**

SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "2. Radiated emission test" of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".
EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, 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 or RBW: 1MHz VBW: 470Hz *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 VBW is based on the inverse of the transmitting on time.
*2) Distance Factor: 20 x log (3.0m/1.0m) = 9.5dB

*In order to measure the radio specification of the EUT more precisely, the EUT was tested using USB cable, which prevented the radiated emission from the EUT from being shielded by the host device.

-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-25GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: 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	5MHz	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	Peak	Max Hold	Spectrum Analyzer *1)
Maximum Peak Output Power	-	-	-	Auto	Peak	-	Power Meter (Sensor: 50MHz BW)
Peak Power Density	5MHz	30kHz	100kHz	167sec	Peak	Max Hold	Spectrum Analyzer *2) *3)
Conducted Spurious Emission *4)	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) The measurement was performed with Peak detector, Max hold, since the duty cycle was not 100%.
*2) PSD Option 1 of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".
*3) 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.
*4) 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

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

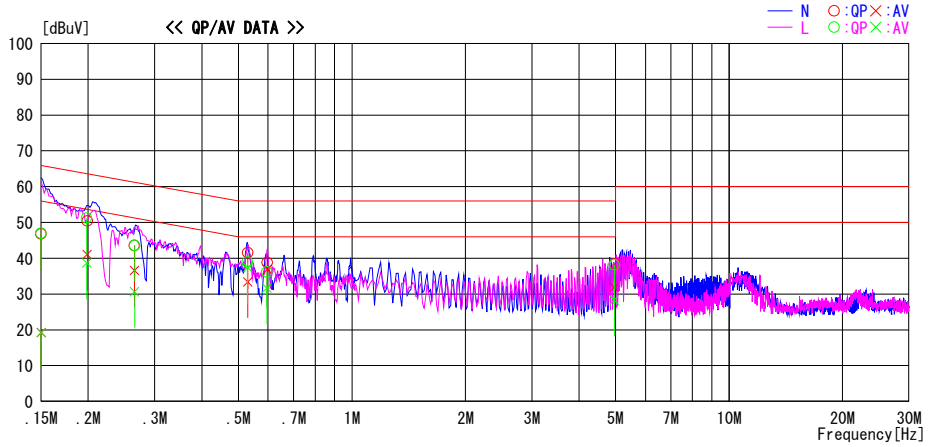
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/02/15

Report No. : 32EE0092-HO-01

Temp./Humi. : 21 deg. C / 32% RH
Engineer : Hironobu Ohnishi

Mode / Remarks : Tx 2441MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



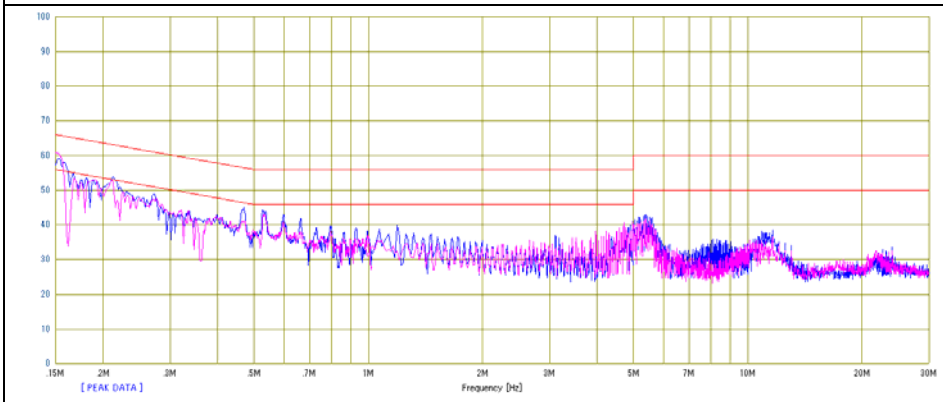
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15000	33.6	6.1	13.2	46.8	19.3	66.0	56.0	19.2	36.7	N	
0.19875	37.3	28.0	13.1	50.4	41.1	63.7	53.7	13.3	12.6	N	
0.26500	30.2	23.3	13.3	43.5	36.6	61.3	51.3	17.8	14.7	N	
0.52975	28.2	20.1	13.3	41.5	33.4	56.0	46.0	14.5	12.6	N	
0.59625	25.5	23.6	13.3	38.8	36.9	56.0	46.0	17.2	9.1	N	
4.96510	24.7	18.2	13.7	38.4	31.9	56.0	46.0	17.6	14.1	N	
0.15000	33.8	6.1	13.2	47.0	19.3	66.0	56.0	19.0	36.7	L	
0.19813	38.1	25.5	13.1	51.2	38.6	63.7	53.7	12.5	15.1	L	
0.26533	30.2	17.4	13.3	43.5	30.7	61.3	51.3	17.8	20.6	L	
0.52925	25.6	24.1	13.3	38.9	37.4	56.0	46.0	17.1	8.6	L	
0.59550	22.9	18.4	13.3	36.2	31.7	56.0	46.0	19.8	14.3	L	
4.96435	24.5	14.6	13.7	38.2	28.3	56.0	46.0	17.8	17.7	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.

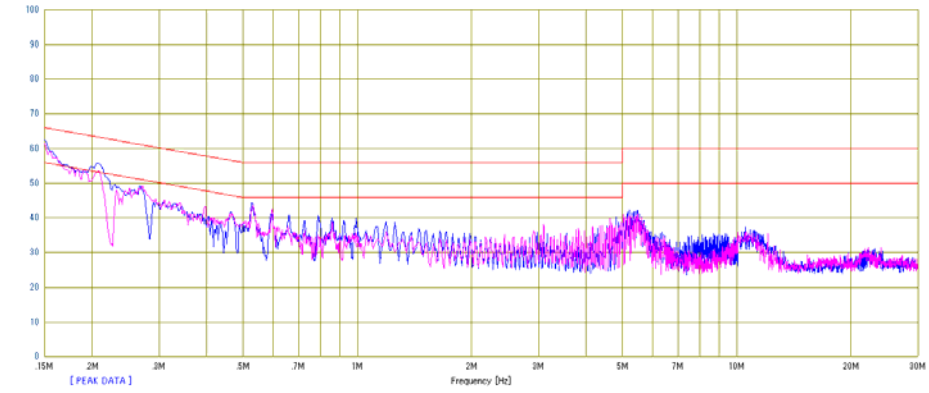
Conducted Emission

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	32EE0092-HO
Date	02/15/2012
Temperature/ Humidity	21 deg. C / 32% RH
Engineer	Hironobu Ohnishi
Mode	Tx

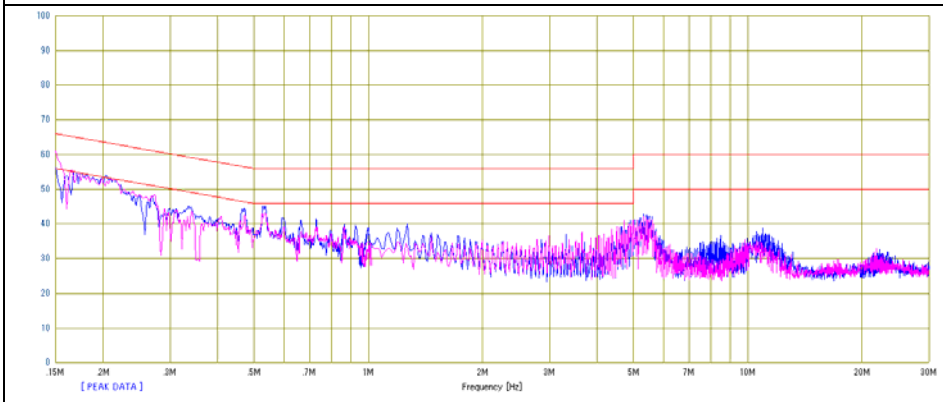
2402MHz



2441MHz



2479MHz



Y scale [dBuV] Chart — N — L

6dB Bandwidth

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32EE0092-HO-01
Date	02/17/2012
Temperature/ Humidity	23 deg. C / 34% RH
Engineer	Kazuya Yoshioka
Mode	Tx

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2402	0.959	>500
2441	0.945	>500
2479	1.106	>500

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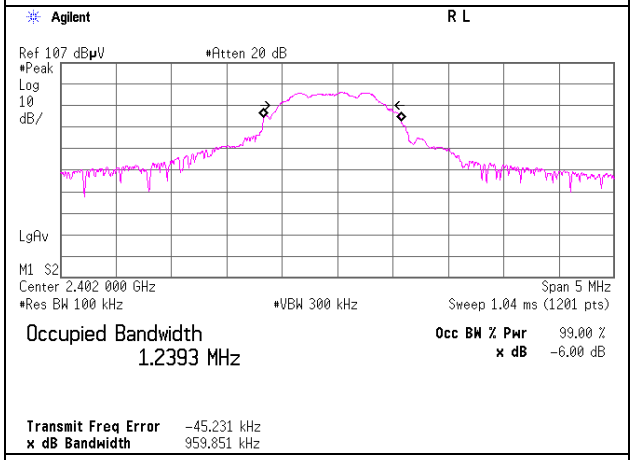
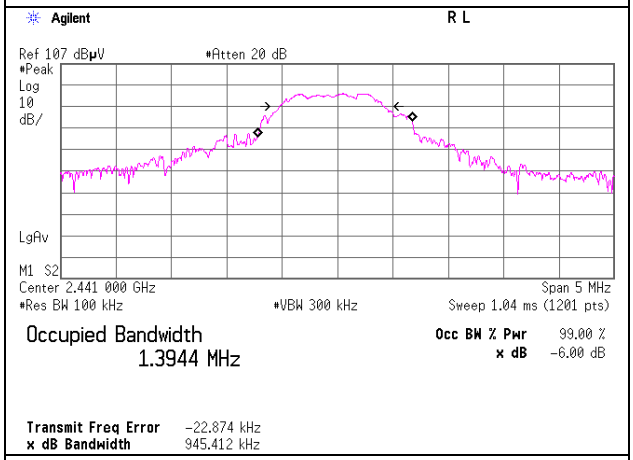
6dB Bandwidth

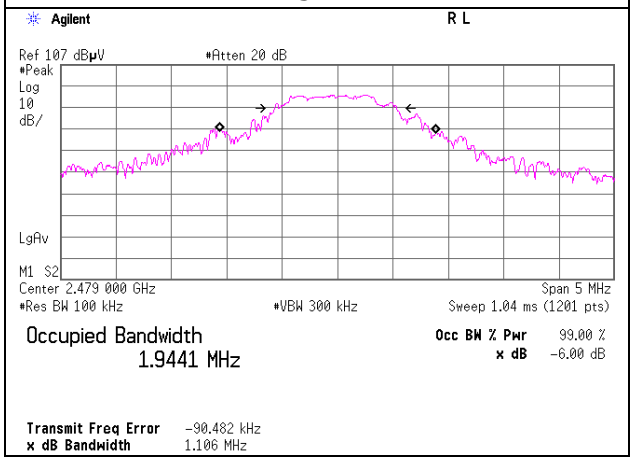
2402MHz



2441MHz



2479MHz



Maximum Peak Output Power

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32EE0092-HO-01
Date	02/17/2012
Temperature/ Humidity	23 deg. C / 34% RH
Engineer	Kazuya Yoshioka
Mode	Tx

Freq.	Reading	Cable Loss	Atten.	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2402	-11.65	0.20	9.96	-1.49	0.71	30.00	1000	31.49
2441	-11.86	0.21	9.96	-1.69	0.68	30.00	1000	31.69
2479	-12.12	0.21	9.96	-1.95	0.64	30.00	1000	31.95

Sample Calculation:
Result = Reading + Cable Loss (including the cable customer supplied) + Attenuator

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4 and No.3 Semi Anechoic Chamber	
Report No.	32EE0092-HO-01	
Date	02/13/2012	02/15/2012
Temperature/ Humidity	21 deg. C/ 35% RH	21 deg. C/ 32% RH
Engineer	Takayuki Shimada	Hironobu Ohnishi
	(1-10GHz)	(Below 1GHz /Above 10GHz)
Mode	Tx 2402MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	38.040	QP	37.1	15.6	7.2	32.2	27.7	40.0	12.3	
Hori	61.140	QP	53.5	7.9	7.6	32.1	36.9	40.0	3.1	
Hori	72.000	QP	49.7	6.6	7.8	32.1	32.0	40.0	8.0	
Hori	129.601	QP	46.2	13.7	8.5	32.1	36.3	43.5	7.2	
Hori	169.000	QP	41.2	15.7	8.9	32.0	33.8	43.5	9.7	
Hori	432.823	QP	32.3	17.9	10.9	32.0	29.1	46.0	16.9	
Hori	800.667	QP	35.1	22.0	13.0	31.4	38.7	46.0	7.3	
Hori	1601.228	PK	60.4	25.5	2.1	33.2	54.8	73.9	19.1	
Hori	2390.000	PK	65.6	28.1	2.5	32.2	64.0	73.9	9.9	
Hori	2399.898	PK	81.7	28.1	2.5	32.2	80.1	-	-	See 20dBc Data Sheet
Hori	2400.000	PK	82.2	28.1	2.5	32.2	80.6	-	-	See 20dBc Data Sheet
Hori	3202.625	PK	56.2	28.7	2.9	31.9	55.9	73.9	18.0	
Hori	4003.325	PK	46.9	30.1	5.1	31.6	50.5	73.9	23.4	
Hori	4804.000	PK	49.3	31.2	5.3	31.4	54.4	73.9	19.5	
Hori	6405.243	PK	42.9	33.9	5.8	32.0	50.6	73.9	23.3	
Hori	7206.000	PK	49.6	35.6	6.1	32.4	58.9	73.9	15.0	
Hori	9608.000	PK	42.0	38.3	7.2	33.2	54.3	73.9	19.6	
Hori	24020.000	PK	47.8	38.5	-1.8	31.6	52.9	73.9	21.0	NS
Hori	1601.228	AV	54.1	25.5	2.1	33.2	48.5	53.9	5.4	
Hori	2390.000	AV	35.2	28.1	2.5	32.2	33.6	53.9	20.3	
Hori	2399.898	AV	52.0	28.1	2.5	32.2	50.4	-	-	See 20dBc Data Sheet
Hori	2400.000	AV	53.3	28.1	2.5	32.2	51.7	-	-	See 20dBc Data Sheet
Hori	3202.625	AV	49.9	28.7	2.9	31.9	49.6	53.9	4.3	
Hori	4003.325	AV	39.8	30.1	5.1	31.6	43.4	53.9	10.5	
Hori	4804.000	AV	43.4	31.2	5.3	31.4	48.5	53.9	5.4	
Hori	6405.243	AV	32.1	33.9	5.8	32.0	39.8	53.9	14.1	
Hori	7206.000	AV	40.9	35.6	6.1	32.4	50.2	53.9	3.7	
Hori	9608.000	AV	29.8	38.3	7.2	33.2	42.1	53.9	11.8	
Hori	24020.000	AV	34.6	38.5	-1.8	31.6	39.7	53.9	14.2	NS, VBW=10Hz

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).

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

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

NS: No signal detect.

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	99.7	28.1	2.5	32.2	98.1	-	-	Carrier
Hori	2399.898	PK	64.9	28.1	2.5	32.2	63.3	78.1	14.8	
Hori	2400.000	PK	65.0	28.1	2.5	32.2	63.4	78.1	14.7	

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4 and No.3 Semi Anechoic Chamber	
Report No.	32EE0092-HO-01	
Date	02/13/2012	02/15/2012
Temperature/ Humidity	21 deg. C/ 35% RH	21 deg. C/ 32% RH
Engineer	Takayuki Shimada (1-10GHz)	Hironobu Ohnishi (Below 1GHz /Above 10GHz)
Mode	Tx 2402MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Vert	38.040	QP	48.5	15.6	7.2	32.2	39.1	40.0	0.9	
Vert	61.140	QP	46.7	7.9	7.6	32.1	30.1	40.0	9.9	
Vert	72.000	QP	49.3	6.6	7.8	32.1	31.6	40.0	8.4	
Vert	129.601	QP	44.5	13.7	8.5	32.1	34.6	43.5	8.9	
Vert	169.000	QP	38.7	15.7	8.9	32.0	31.3	43.5	12.2	
Vert	432.823	QP	40.6	17.9	10.9	32.0	37.4	46.0	8.6	
Vert	800.667	QP	33.1	22.0	13.0	31.4	36.7	46.0	9.3	
Vert	1601.228	PK	61.9	25.5	2.1	33.2	56.3	73.9	17.6	
Vert	2390.000	PK	69.0	28.1	2.5	32.2	67.4	73.9	6.5	
Vert	2399.898	PK	85.5	28.1	2.5	32.2	83.9	-	-	See 20dBc Data Sheet
Vert	2400.000	PK	86.0	28.1	2.5	32.2	84.4	-	-	See 20dBc Data Sheet
Vert	3202.625	PK	55.4	28.7	2.9	31.9	55.1	73.9	18.8	
Vert	4003.325	PK	47.3	30.1	5.1	31.6	50.9	73.9	23.0	
Vert	4804.000	PK	49.2	31.2	5.3	31.4	54.3	73.9	19.6	
Vert	6405.243	PK	45.2	33.9	5.8	32.0	52.9	73.9	21.0	
Vert	7206.000	PK	50.2	35.6	6.1	32.4	59.5	73.9	14.4	
Vert	9608.000	PK	42.3	38.3	7.2	33.2	54.6	73.9	19.3	
Vert	24020.000	PK	48.2	38.5	-1.8	31.6	53.3	73.9	20.6	NS
Vert	1601.228	AV	55.8	25.5	2.1	33.2	50.2	53.9	3.7	
Vert	2390.000	AV	36.2	28.1	2.5	32.2	34.6	53.9	19.3	
Vert	2399.898	AV	55.6	28.1	2.5	32.2	54.0	-	-	See 20dBc Data Sheet
Vert	2400.000	AV	57.2	28.1	2.5	32.2	55.6	-	-	See 20dBc Data Sheet
Vert	3202.625	AV	49.2	28.7	2.9	31.9	48.9	53.9	5.0	
Vert	4003.325	AV	40.5	30.1	5.1	31.6	44.1	53.9	9.8	
Vert	4804.000	AV	42.3	31.2	5.3	31.4	47.4	53.9	6.5	
Vert	6405.243	AV	36.7	33.9	5.8	32.0	44.4	53.9	9.5	
Vert	7206.000	AV	42.1	35.6	6.1	32.4	51.4	53.9	2.5	
Vert	9608.000	AV	29.8	38.3	7.2	33.2	42.1	53.9	11.8	
Vert	24020.000	AV	34.5	38.5	-1.8	31.6	39.6	53.9	14.3	NS, VBW=10Hz

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).

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

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

NS: No signal detect.

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Vert	2402.000	PK	103.3	28.1	2.5	32.2	101.7	-	-	Carrier
Vert	2399.920	PK	68.6	28.1	2.5	32.2	67.0	81.7	14.7	
Vert	2400.000	PK	69.0	28.1	2.5	32.2	67.4	81.7	14.3	

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4 and No.3 Semi Anechoic Chamber	
Report No.	32EE0092-HO-01	
Date	02/13/2012	02/15/2012
Temperature/ Humidity	21 deg. C/ 35% RH	21 deg. C/ 32% RH
Engineer	Takayuki Shimada (1-10GHz)	Hironobu Ohnishi (Below 1GHz /Above 10GHz)
Mode	Tx 2441MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	37.860	QP	37.2	15.7	7.2	32.2	27.9	40.0	12.1	
Hori	61.152	QP	53.2	7.8	7.6	32.1	36.5	40.0	3.5	
Hori	72.000	QP	50.4	6.6	7.8	32.1	32.7	40.0	7.3	
Hori	129.601	QP	46.0	13.7	8.5	32.1	36.1	43.5	7.4	
Hori	167.200	QP	40.6	15.7	8.9	32.0	33.2	43.5	10.3	
Hori	432.821	QP	32.2	17.9	10.9	32.0	29.0	46.0	17.0	
Hori	813.667	QP	36.6	22.1	13.1	31.4	40.4	46.0	5.6	
Hori	1627.292	PK	61.1	25.5	2.1	33.1	55.6	73.9	18.3	
Hori	3254.608	PK	55.1	28.8	3.0	31.9	55.0	73.9	18.9	
Hori	4068.233	PK	46.7	30.1	5.0	31.6	50.2	73.9	23.7	
Hori	4882.000	PK	49.3	31.4	5.3	31.4	54.6	73.9	19.3	
Hori	6509.267	PK	42.7	34.3	5.9	32.0	50.9	73.9	23.0	
Hori	7323.000	PK	48.6	35.7	6.2	32.5	58.0	73.9	15.9	
Hori	9764.000	PK	42.7	38.5	7.5	33.2	55.5	73.9	18.4	
Hori	24410.000	PK	46.9	38.8	-1.7	31.4	52.6	73.9	21.3	NS
Hori	1627.292	AV	55.3	25.5	2.1	33.1	49.8	53.9	4.1	
Hori	3254.608	AV	48.3	28.8	3.0	31.9	48.2	53.9	5.7	
Hori	4068.233	AV	39.2	30.1	5.0	31.6	42.7	53.9	11.2	
Hori	4882.000	AV	42.4	31.4	5.3	31.4	47.7	53.9	6.2	
Hori	6509.267	AV	32.5	34.3	5.9	32.0	40.7	53.9	13.2	
Hori	7323.000	AV	39.3	35.7	6.2	32.5	48.7	53.9	5.2	
Hori	9764.000	AV	29.9	38.5	7.5	33.2	42.7	53.9	11.2	
Hori	24410.000	AV	33.7	38.8	-1.7	31.4	39.4	53.9	14.5	NS, VBW=10Hz
Vert	37.860	QP	48.7	15.7	7.2	32.2	39.4	40.0	0.6	
Vert	61.152	QP	46.1	7.8	7.6	32.1	29.4	40.0	10.6	
Vert	72.000	QP	50.1	6.6	7.8	32.1	32.4	40.0	7.6	
Vert	129.601	QP	44.6	13.7	8.5	32.1	34.7	43.5	8.8	
Vert	167.200	QP	38.8	15.7	8.9	32.0	31.4	43.5	12.1	
Vert	432.821	QP	40.3	17.9	10.9	32.0	37.1	46.0	8.9	
Vert	813.667	QP	36.2	22.1	13.1	31.4	40.0	46.0	6.0	
Vert	1627.292	PK	61.4	25.5	2.1	33.1	55.9	73.9	18.0	
Vert	3254.608	PK	55.0	28.8	3.0	31.9	54.9	73.9	19.0	
Vert	4068.233	PK	46.7	30.1	5.0	31.6	50.2	73.9	23.7	
Vert	4882.000	PK	47.2	31.4	5.3	31.4	52.5	73.9	21.4	
Vert	6509.267	PK	44.2	34.3	5.9	32.0	52.4	73.9	21.5	
Vert	7323.000	PK	49.6	35.7	6.2	32.5	59.0	73.9	14.9	
Vert	9764.000	PK	42.5	38.5	7.5	33.2	55.3	73.9	18.6	
Vert	24410.000	PK	48.2	38.8	-1.7	31.4	53.9	73.9	20.0	NS
Vert	1627.292	AV	55.7	25.5	2.1	33.1	50.2	53.9	3.7	
Vert	3254.608	AV	48.2	28.8	3.0	31.9	48.1	53.9	5.8	
Vert	4068.233	AV	39.0	30.1	5.0	31.6	42.5	53.9	11.4	
Vert	4882.000	AV	39.9	31.4	5.3	31.4	45.2	53.9	8.7	
Vert	6509.267	AV	35.6	34.3	5.9	32.0	43.8	53.9	10.1	
Vert	7323.000	AV	41.0	35.7	6.2	32.5	50.4	53.9	3.5	
Vert	9764.000	AV	29.9	38.5	7.5	33.2	42.7	53.9	11.2	
Vert	24410.000	AV	33.7	38.8	-1.7	31.4	39.4	53.9	14.5	NS, VBW=10Hz

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).

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

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

NS: No signal detect.

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4 and No.3 Semi Anechoic Chamber	
Report No.	32EE0092-HO-01	
Date	02/13/2012	02/15/2012
Temperature/ Humidity	21 deg. C/ 35% RH	21 deg. C/ 32% RH
Engineer	Takayuki Shimada	Hironobu Ohnishi
	(1-10GHz)	(Below 1GHz /Above 10GHz)
Mode	Tx 2479MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	38.160	QP	44.0	15.6	7.2	32.2	34.6	40.0	5.4	
Hori	61.860	QP	50.6	7.7	7.6	32.1	33.8	40.0	6.2	
Hori	72.000	QP	51.1	6.6	7.8	32.1	33.4	40.0	6.6	
Hori	129.601	QP	46.3	13.7	8.5	32.1	36.4	43.5	7.1	
Hori	165.700	QP	40.8	15.6	8.9	32.0	33.3	43.5	10.2	
Hori	432.821	QP	32.2	17.9	10.9	32.0	29.0	46.0	17.0	
Hori	826.333	QP	41.2	22.1	13.1	31.3	45.1	-	-	See 20dBc Data Sheet
Hori	1652.625	PK	60.5	25.6	2.1	33.1	55.1	73.9	18.8	
Hori	2483.500	PK	70.1	28.5	2.6	32.2	69.0	73.9	4.9	
Hori	2483.517	PK	70.0	28.5	2.6	32.2	68.9	73.9	5.0	
Hori	3305.292	PK	55.4	28.8	3.0	31.8	55.4	73.9	18.5	
Hori	4131.592	PK	46.7	30.1	5.0	31.6	50.2	73.9	23.7	
Hori	4958.000	PK	48.8	31.6	5.3	31.4	54.3	73.9	19.6	
Hori	6610.000	PK	43.2	34.5	5.9	32.1	51.5	73.9	22.4	
Hori	7437.000	PK	49.5	35.8	6.2	32.5	59.0	73.9	14.9	
Hori	9916.000	PK	42.8	38.6	7.6	33.3	55.7	73.9	18.2	
Hori	24790.000	PK	49.0	39.0	-1.6	31.2	55.2	73.9	18.7	NS
Hori	1652.625	AV	55.2	25.6	2.1	33.1	49.8	53.9	4.1	
Hori	2483.500	AV	37.9	28.5	2.6	32.2	36.8	53.9	17.1	
Hori	2483.517	AV	37.8	28.5	2.6	32.2	36.7	53.9	17.2	
Hori	3305.292	AV	49.2	28.8	3.0	31.8	49.2	53.9	4.7	
Hori	4131.592	AV	39.4	30.1	5.0	31.6	42.9	53.9	11.0	
Hori	4958.000	AV	41.6	31.6	5.3	31.4	47.1	53.9	6.8	
Hori	6610.000	AV	32.7	34.5	5.9	32.1	41.0	53.9	12.9	
Hori	7437.000	AV	40.5	35.8	6.2	32.5	50.0	53.9	3.9	
Hori	9916.000	AV	30.2	38.6	7.6	33.3	43.1	53.9	10.8	
Hori	24790.000	AV	35.5	39.0	-1.6	31.2	41.7	53.9	12.2	NS, VBW=10Hz

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).

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

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

NS: No signal detect.

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2479.000	PK	97.7	28.5	2.6	32.2	96.6	-	-	Carrier
Hori	826.333	PK	44.1	22.1	13.1	31.3	48.0	76.6	28.6	

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

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Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4 and No.3 Semi Anechoic Chamber	
Report No.	32EE0092-HO-01	
Date	02/13/2012	02/15/2012
Temperature/ Humidity	21 deg. C/ 35% RH	21 deg. C/ 32% RH
Engineer	Takayuki Shimada	Hironobu Ohnishi
	(1-10GHz)	(Below 1GHz /Above 10GHz)
Mode	Tx 2479MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Vert	38.160	QP	49.0	15.6	7.2	32.2	39.6	40.0	0.4	
Vert	61.860	QP	43.5	7.7	7.6	32.1	26.7	40.0	13.3	
Vert	72.000	QP	49.8	6.6	7.8	32.1	32.1	40.0	7.9	
Vert	129.601	QP	44.9	13.7	8.5	32.1	35.0	43.5	8.5	
Vert	165.700	QP	39.0	15.6	8.9	32.0	31.5	43.5	12.0	
Vert	432.821	QP	40.3	17.9	10.9	32.0	37.1	46.0	8.9	
Vert	826.333	QP	39.9	22.1	13.1	31.3	43.8	-	-	See 20dBc Data Sheet
Vert	1652.625	PK	62.1	25.6	2.1	33.1	56.7	73.9	17.2	
Vert	2483.500	PK	72.1	28.5	2.6	32.2	71.0	73.9	2.9	
Vert	2483.517	PK	71.9	28.5	2.6	32.2	70.8	73.9	3.1	
Vert	3305.292	PK	52.8	28.8	3.0	31.8	52.8	73.9	21.1	
Vert	4131.592	PK	46.5	30.1	5.0	31.6	50.0	73.9	23.9	
Vert	4958.000	PK	48.8	31.6	5.3	31.4	54.3	73.9	19.6	
Vert	6610.000	PK	46.2	34.5	5.9	32.1	54.5	73.9	19.4	
Vert	7437.000	PK	51.5	35.8	6.2	32.5	61.0	73.9	12.9	
Vert	9916.000	PK	42.5	38.6	7.6	33.3	55.4	73.9	18.5	
Vert	24790.000	PK	48.3	39.0	-1.6	31.2	54.5	73.9	19.4	NS
Vert	1652.625	AV	57.0	25.6	2.1	33.1	51.6	53.9	2.3	
Vert	2483.500	AV	39.7	28.5	2.6	32.2	38.6	53.9	15.3	
Vert	2483.517	AV	39.6	28.5	2.6	32.2	38.5	53.9	15.4	
Vert	3305.292	AV	46.0	28.8	3.0	31.8	46.0	53.9	7.9	
Vert	4131.592	AV	39.2	30.1	5.0	31.6	42.7	53.9	11.2	
Vert	4958.000	AV	41.7	31.6	5.3	31.4	47.2	53.9	6.7	
Vert	6610.000	AV	37.3	34.5	5.9	32.1	45.6	53.9	8.3	
Vert	7437.000	AV	42.4	35.8	6.2	32.5	51.9	53.9	2.0	
Vert	9916.000	AV	30.2	38.6	7.6	33.3	43.1	53.9	10.8	
Vert	24790.000	AV	35.5	39.0	-1.6	31.2	41.7	53.9	12.2	NS, VBW=10Hz

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).

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

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

NS: No signal detect.

20dBc Data Sheet

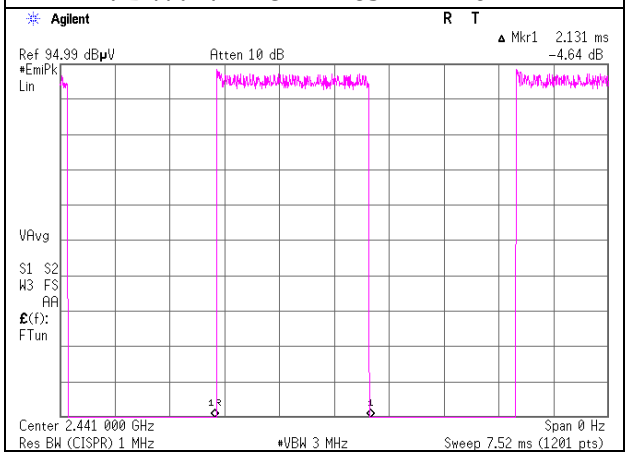
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Vert	2479.000	PK	99.4	28.5	2.6	32.2	98.3	-	-	Carrier
Vert	826.333	PK	42.3	22.1	13.1	31.3	46.2	78.3	32.1	

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

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

The tested burst timing

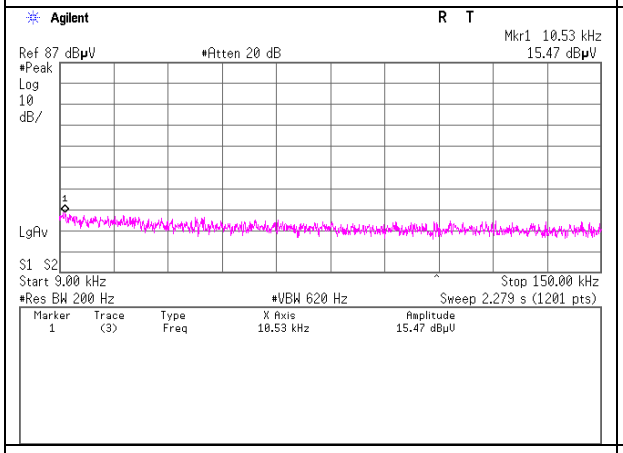
VBW: 1/Tx on = 469Hz<470Hz



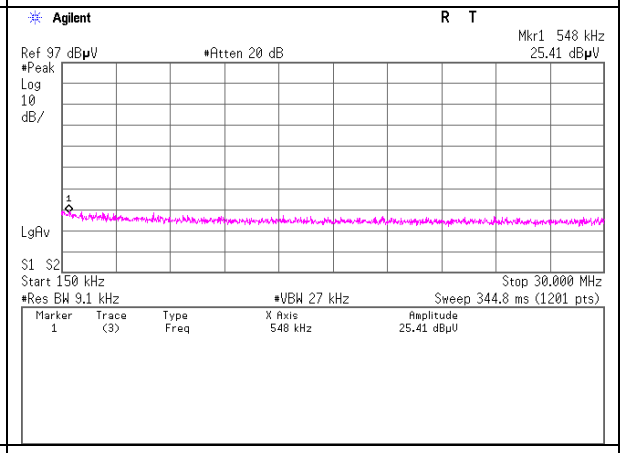
Conducted Spurious Emission

Tx 2402MHz

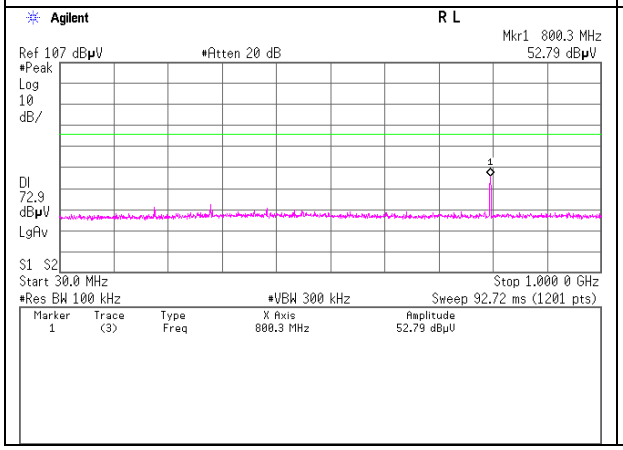
9kHz-150kHz



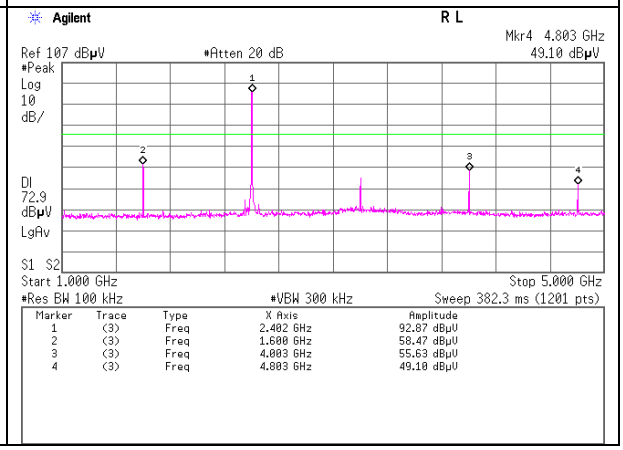
150kHz-30MHz



30MHz-1GHz



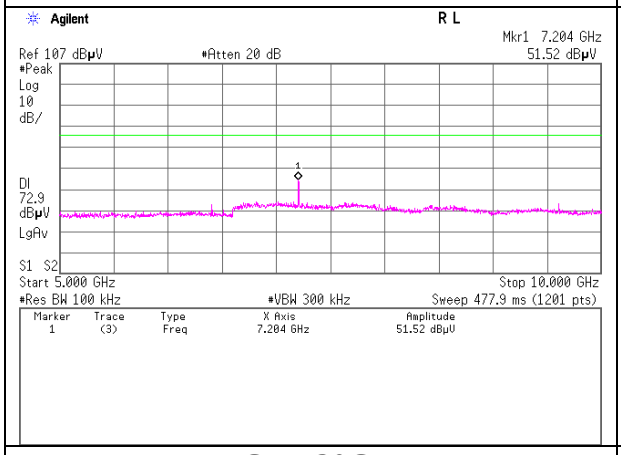
1GHz-5GHz



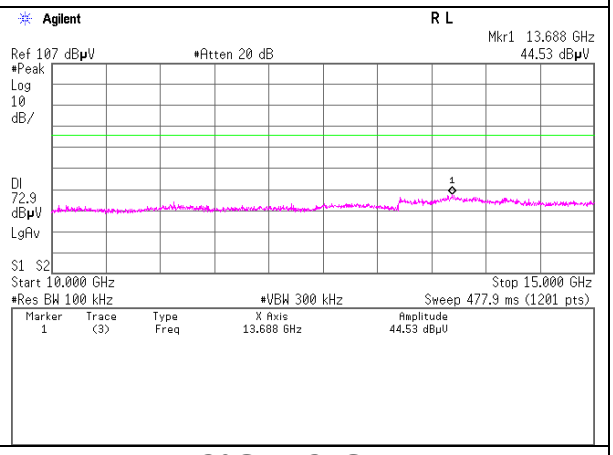
Conducted Spurious Emission

Tx 2402MHz

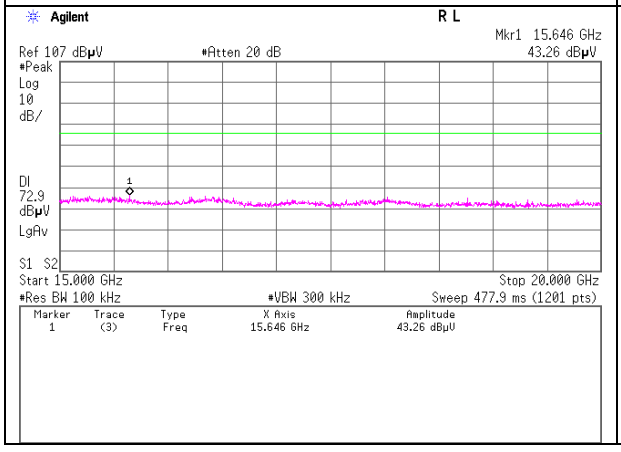
5GHz-10GHz



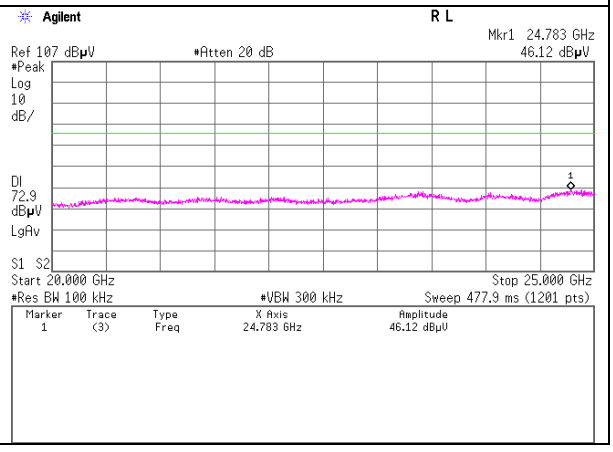
10GHz-15GHz



15GHz-20GHz



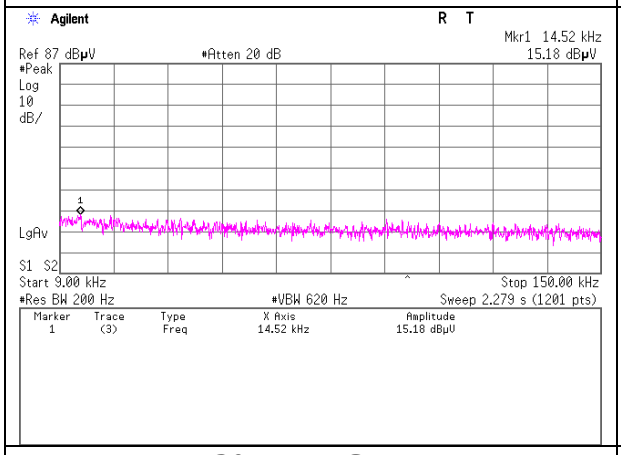
20GHz-25GHz



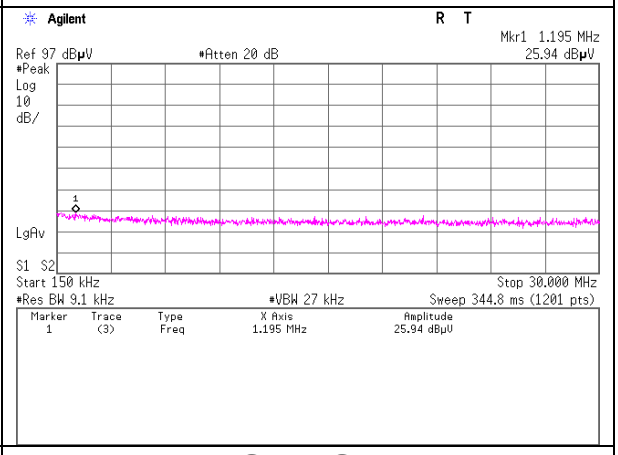
Conducted Spurious Emission

Tx 2441MHz

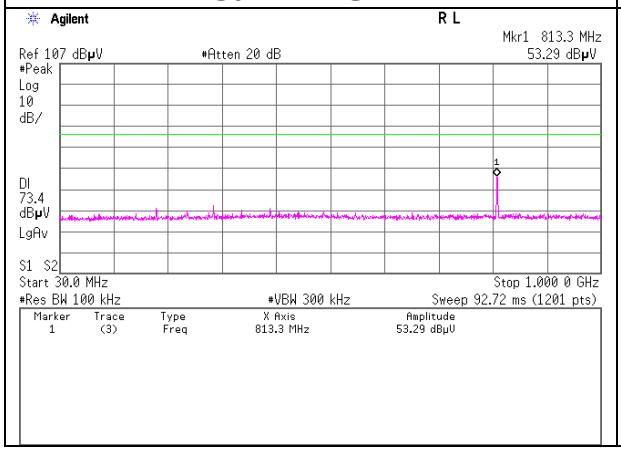
9kHz-150kHz



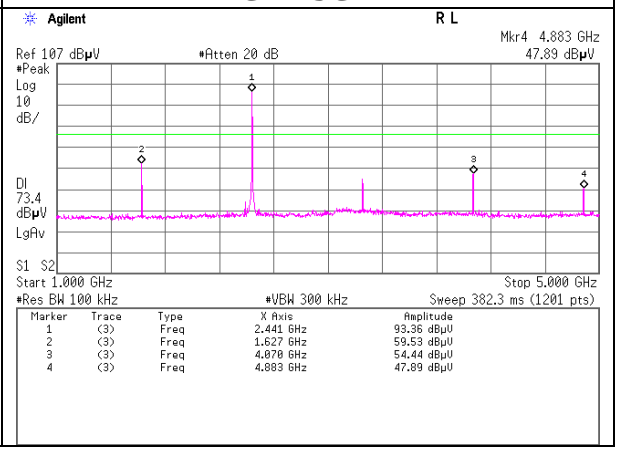
150kHz-30MHz



30MHz-1GHz



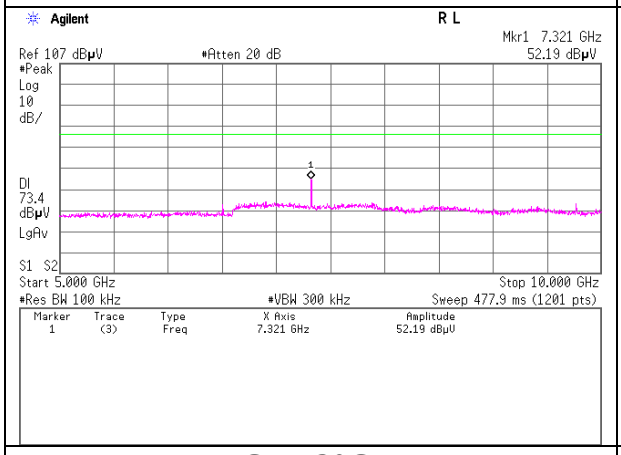
1GHz-5GHz



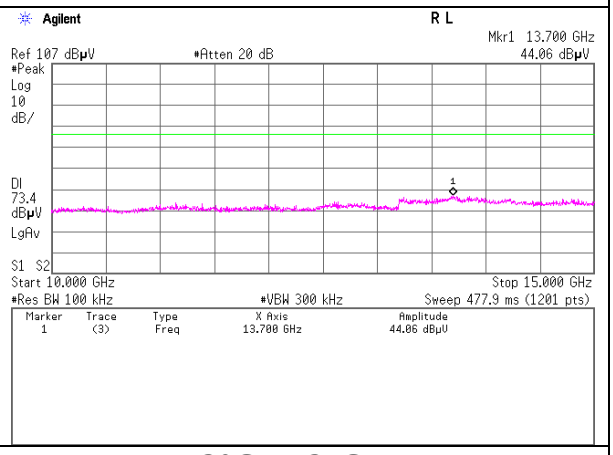
Conducted Spurious Emission

Tx 2441MHz

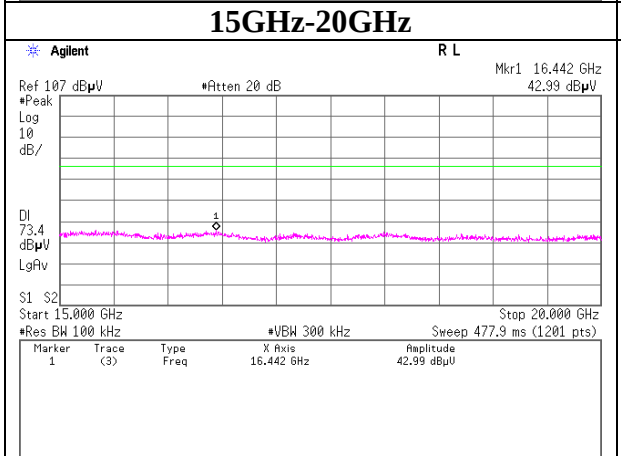
5GHz-10GHz



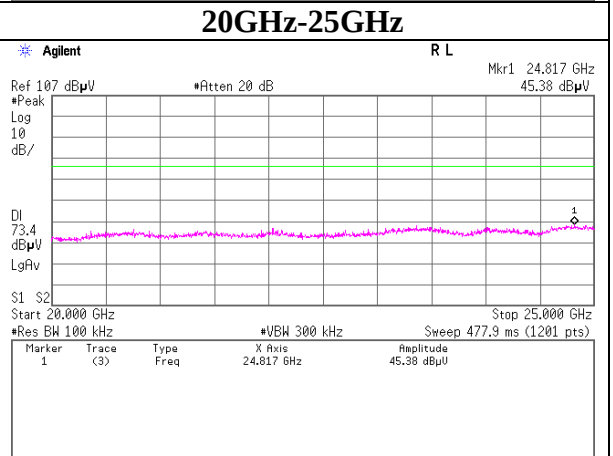
10GHz-15GHz



15GHz-20GHz



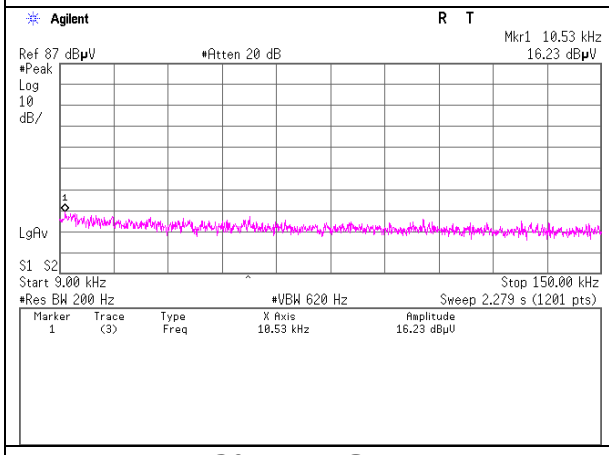
20GHz-25GHz



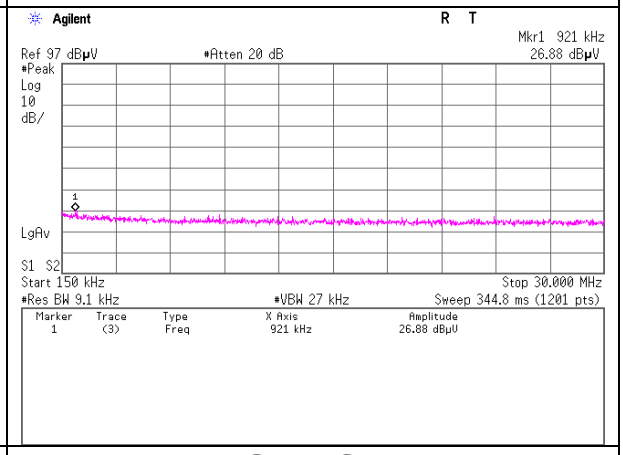
Conducted Spurious Emission

Tx 2479MHz

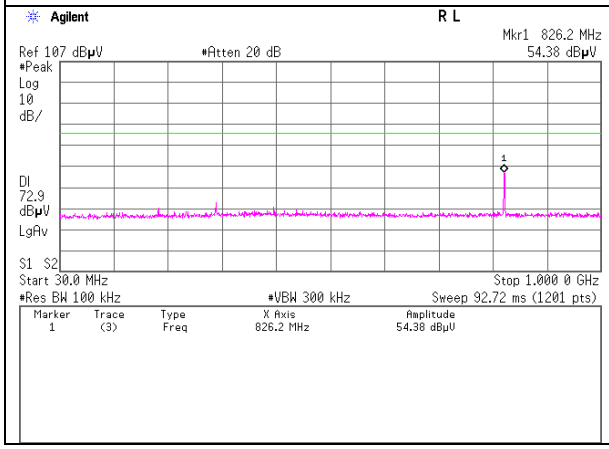
9kHz-150kHz



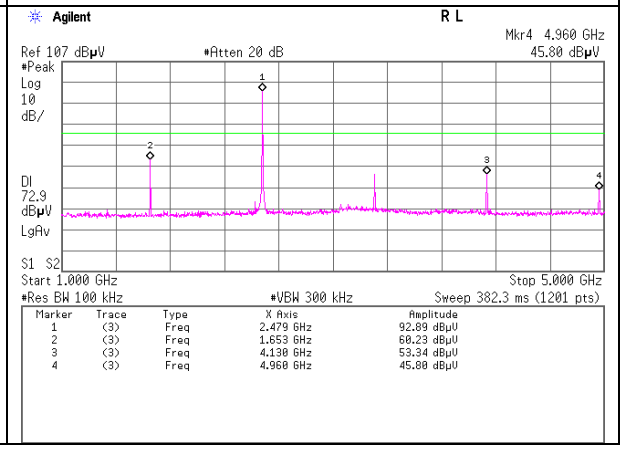
150kHz-30MHz



30MHz-1GHz



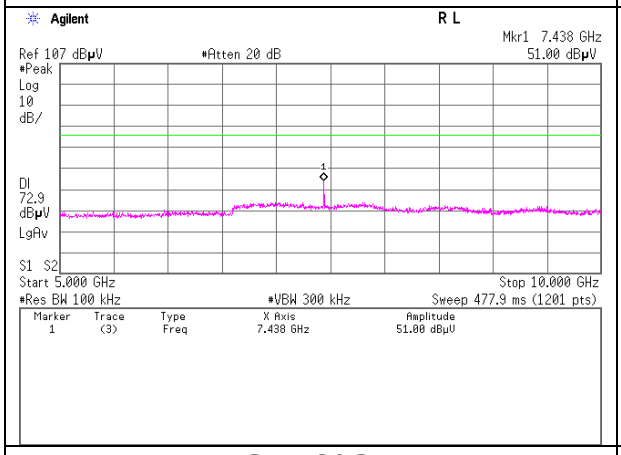
1GHz-5GHz



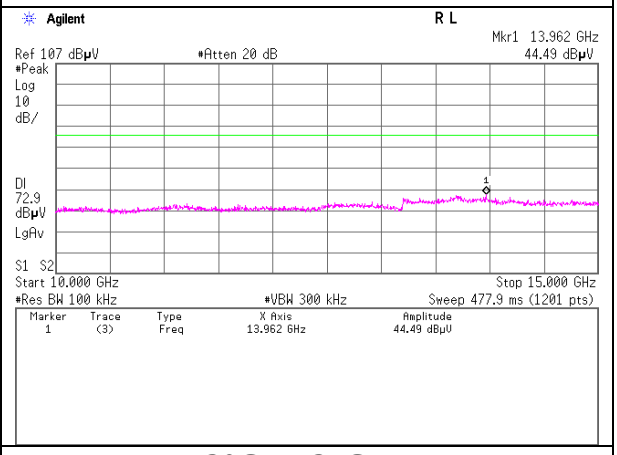
Conducted Spurious Emission

Tx 2479MHz

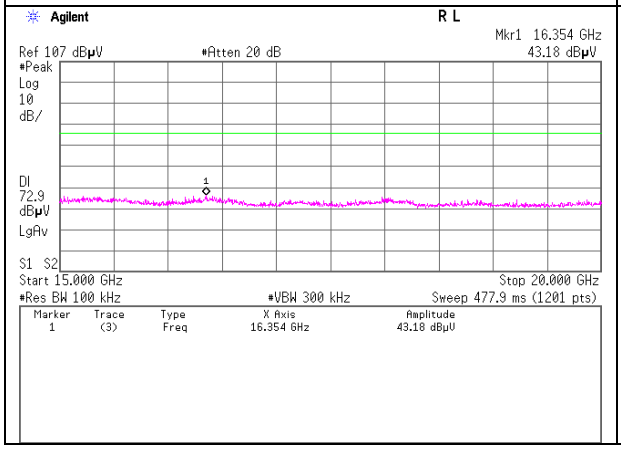
5GHz-10GHz



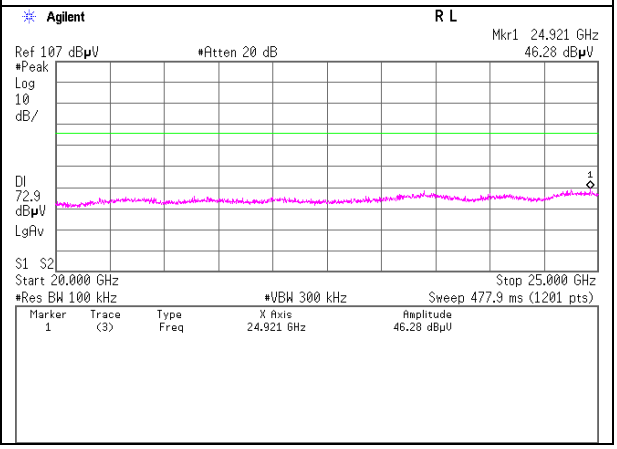
10GHz-15GHz



15GHz-20GHz

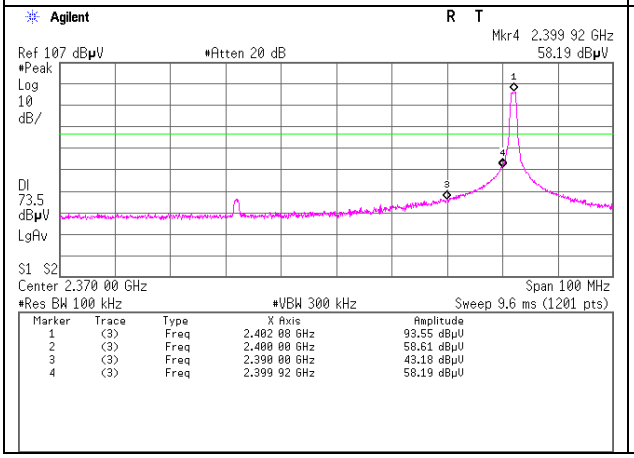


20GHz-25GHz

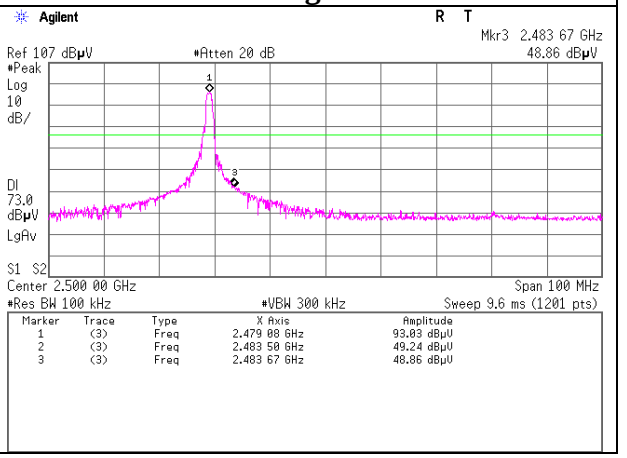


Conducted Emission Band Edge compliance

Low



High



Power Density

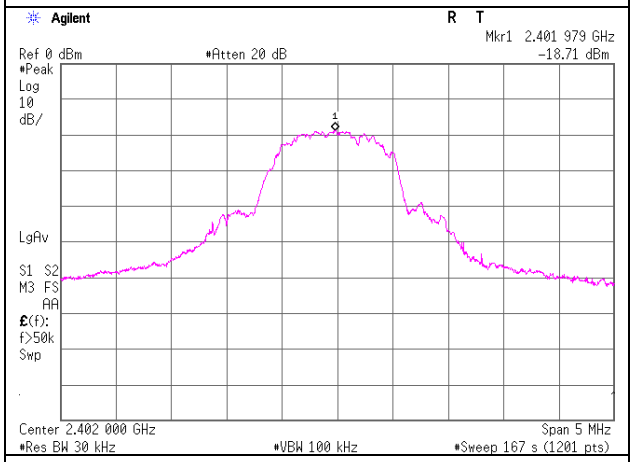
Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32EE0092-HO-01
Date	02/17/2012
Temperature/ Humidity	23 deg. C / 34% RH
Engineer	Kazuya Yoshioka
Mode	Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-18.71	0.20	9.96	-8.55	8.00	16.55
2441.00	-18.56	0.21	9.96	-8.39	8.00	16.39
2479.00	-18.75	0.21	9.96	-8.58	8.00	16.58

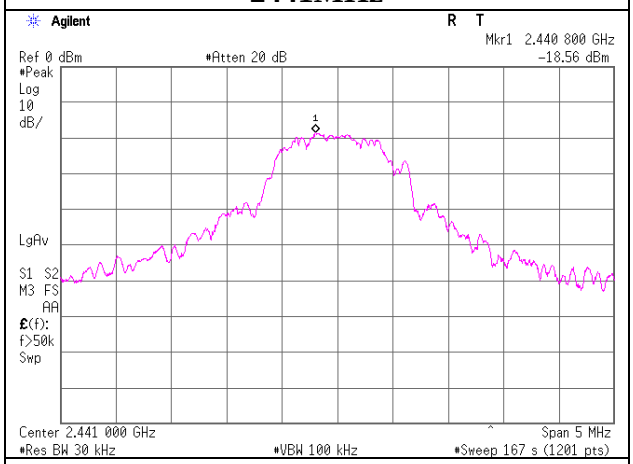
Sample Calculation:
Result = Reading + Cable Loss (including the cable customer supplied) + Attenuator

Power Density

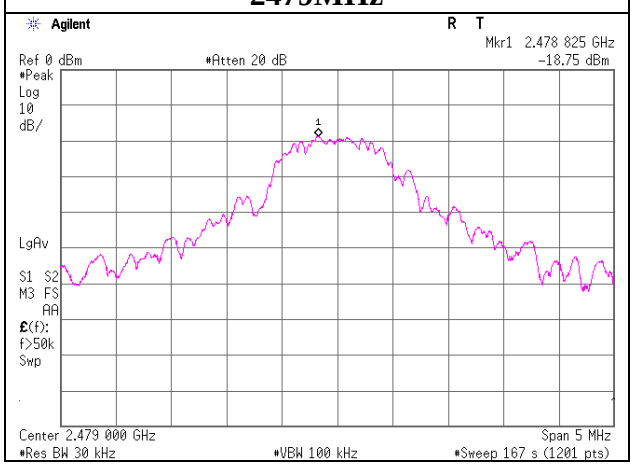
2402MHz



2441MHz

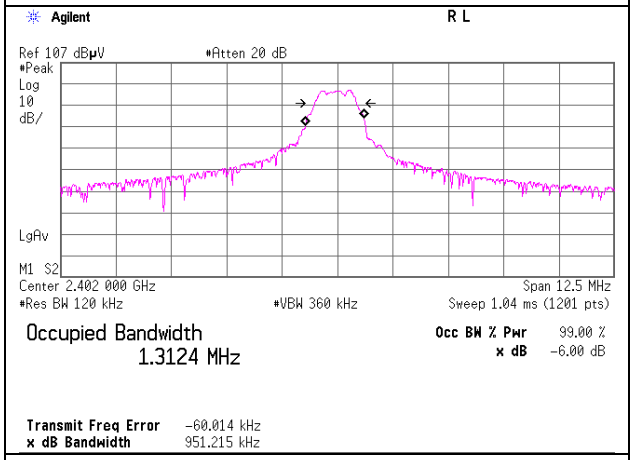


2479MHz

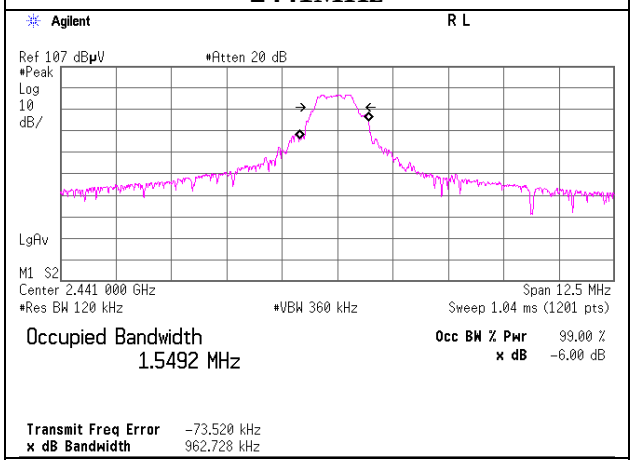


99%Occupied Bandwidth

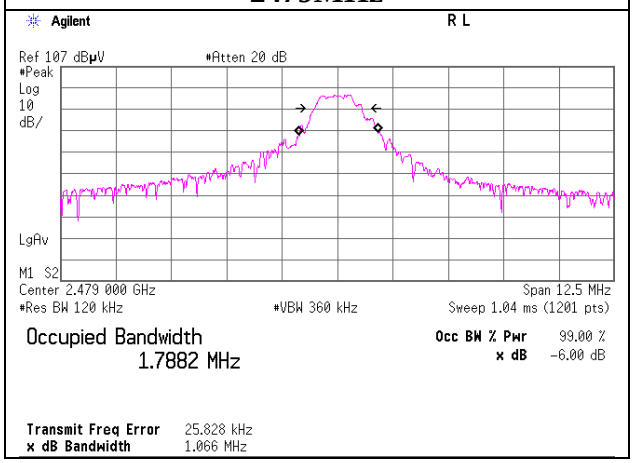
2402MHz



2441MHz



2479MHz



APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2011/03/01 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE	2012/02/06 * 12
MJM-07	Measure	PROMART	SEN1955	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2012/02/03 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2011/08/11 * 12
MCC-56	Microwave Cable	Suhner	SUCOFLEX104	270875/4(1m) / 284655(5m)	RE	2011/03/02 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2011/03/10 * 12
MCC-79	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278923/4	RE	2011/12/08 * 12
MHF-20	High Pass Filter 3.5-18.0GHz	TOKIMEC	TF323DCC	607	RE	2011/09/08 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2011/02/22 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE/CE	2012/02/06 * 12
MJM-06	Measure	PROMART	SEN1955	-	RE/CE	
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE/CE	2011/11/23 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE/CE	2011/08/11 * 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	2011/07/15 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2011/11/02 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2011/03/04 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2011/05/23 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2011/09/07 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2011/03/10 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2011/05/23 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE(AE)	2012/02/06 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	8127364	CE(EUT)	2012/02/09 * 12
MTA-31	Terminator	TME	CT-01	-	CE	2012/01/11 * 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	2011/07/15 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12

EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2012/02/06 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2012/02/03 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2011/09/13 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2011/09/13 * 12
MAT-24	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71389	AT	2011/06/23 * 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: CE: Conducted Emission
RE: Radiated Emission
AT: Antenna Terminal Conducted test