



RADIO TEST REPORT

Test Report No. : 32EE0095-HO-01-A-R1

Applicant : ROHM Co., Ltd.
Type of Equipment : Wireless LAN module
Model No. : BP3591
FCC ID : ANSBP3591
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 32EE0095-HO-01-A. 32EE0095-HO-01-A is replaced with this report.

Date of test: December 14 to 25, 2011

Representative test engineer:

Takumi Shimada
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.
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<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 : ROHM Co., Ltd.
Address : 21 Saiin Mizosaki-cho, Ukyo-ku Kyoto 615-8585 Japan
Telephone Number : +81-75-311-7068
Facsimile Number : +81-75-321-0447
Contact Person : YUSAKU KAWABATA

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

2.1 Identification of E.U.T.

Type of Equipment : Wireless LAN module
Model No. : BP3591
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC3.3V
Receipt Date of Sample : December 14, 2011
Country of Mass-production : Japan
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 : Xtal: 40MHz / CPU: 60MHz

Radio Specification

Radio Type : Transceiver
Frequency of Operation : 2412-2462MHz
Modulation : DSSS / OFDM
Power Supply (radio part input) : DC3.3V, DC2.8V
Antenna type : Internal Antenna (Chip Antenna)
Antenna Gain : 1.1dBi

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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 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 IC: RSS-Gen 7.2.4	FCC: Section 15.207 IC: RSS-Gen 7.2.4	QP 2.6dB, 0.46383MHz, N AV 1.7dB, 0.46383MHz, N	Complied	-
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	3.8dB 4924.00MHz, AV, Vert.	Complied	Conducted/ Radiated

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 (DC2.8V) constantly to RF Module regardless of input voltage.
The stable voltage (DC3.3V) is constantly to RF Module from the Host device 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 is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.
However, when the external antenna is used, additional test is needed.

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
Receiver Spurious Emission	IC: RSS-Gen 4.10	IC: RSS-Gen 6	13.7dB 4874.000MHz, AV, Hori	Complied	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

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

Conducted Emission test

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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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	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*
IEEE 802.11b (11b)	11Mbps, PN9 *1) 1Mbps, PN9 *2)
IEEE 802.11g (11g)	24Mbps, PN9 *3)
IEEE 802.11n SISO 20MHz BW (11n-20)	MCS 6 (Long GI), PN9 *3)
*Transmitting duty was 100% on all tests. *1) In the case of other than Radiated spurious emission, the worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel). *2) In the case of Radiated spurious emission, the worst condition was determined based on the test result of secondary harmonics. *3) The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
*Power of the EUT was set by the software as follows; Power settings: 11b: 15dBm 11g: 13dBm 11n-20: 12dBm Software: RADITS_11n Ver. 1.4.08 *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	11b Tx 11Mbps	2412MHz
6dB Bandwidth	11g Tx 24Mbps	2437MHz
Maximum Peak Output Power	11n-20 Tx MCS 6 (Long GI)	2462MHz
Power Density		
99% Occupied Bandwidth		
Spurious Emission	11b Tx 1Mbps	2412MHz
	11g Tx 24Mbps	2437MHz
	11n-20 Tx MCS 6 (Long GI)	2462MHz
	Rx	2437MHz
Band Edge	11b Tx 11Mbps	2412MHz
	11g Tx 24Mbps	2462MHz
	11n-20 Tx MCS 6 (Long GI)	

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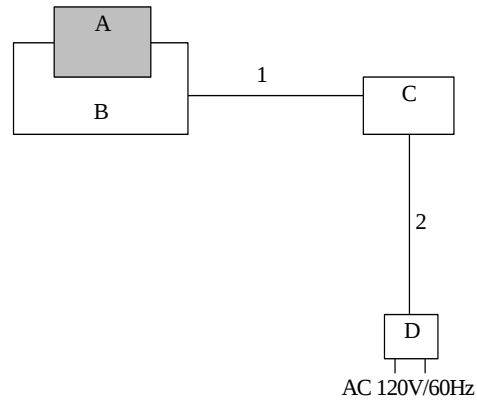
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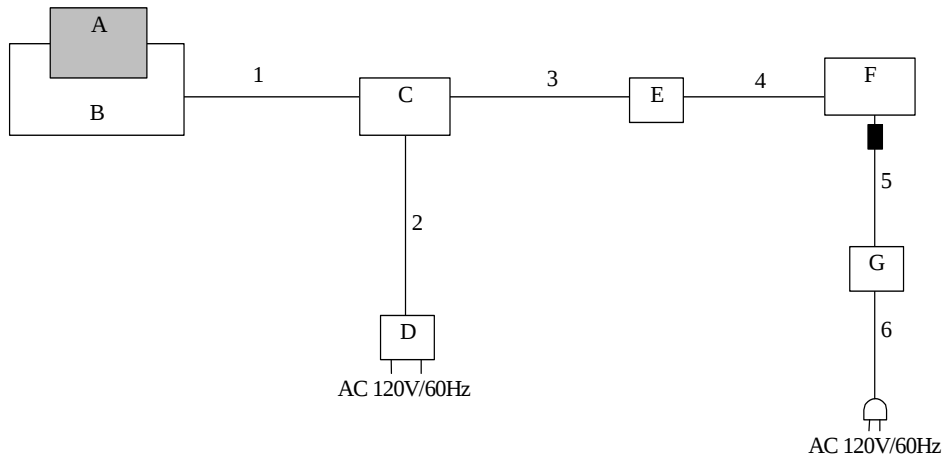
Facsimile : +81 596 24 8124

4.2 Configuration and peripherals

[Conducted emission and Radiated Spurious emission (Below 1GHz) tests only]



[All test except for Conducted emission and Radiated Spurious emission (Below 1GHz) tests]



■ : Standard Ferrite Core

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

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Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless LAN module	BP3591	001D12CF2232	ROHM Co., Ltd.	EUT
B	Jig board	-	DS1	ROHM Co., Ltd.	-
C	Jig board	BP3591-T01	137B	ROHM Co., Ltd.	-
D	AC Adapter	GF18-US0530T	0813-01	GO FORWARD ENTERPRISE CORP.	-
E	USB to Serial cable	UC-SGT	F4360E	ELECOM	-
F	Laptop	1952-E69	L3-KY149 07/04	Lenovo	-
G	AC Adapter	92P1156	11S92P1156Z1ZDXN85M5P Y	Lenovo	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	FFC Cable	0.15	Unshielded	Unshielded	-
2	DC Cable	1.6	Unshielded	Unshielded	-
3	RS-232C Cable	1.8	Shielded	Shielded	-
4	USB Cable	0.5	Shielded	Shielded	-
5	DC Cable	1.8	Unshielded	Unshielded	-
6	AC Cable	0.9	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

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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, 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 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	20MHz	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
Maximum Peak Output Power	-	-	-	Auto	Peak	-	Power Meter (Sensor: 50MHz BW)
Peak Power Density	20MHz	30kHz	100kHz	667sec	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".
*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

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

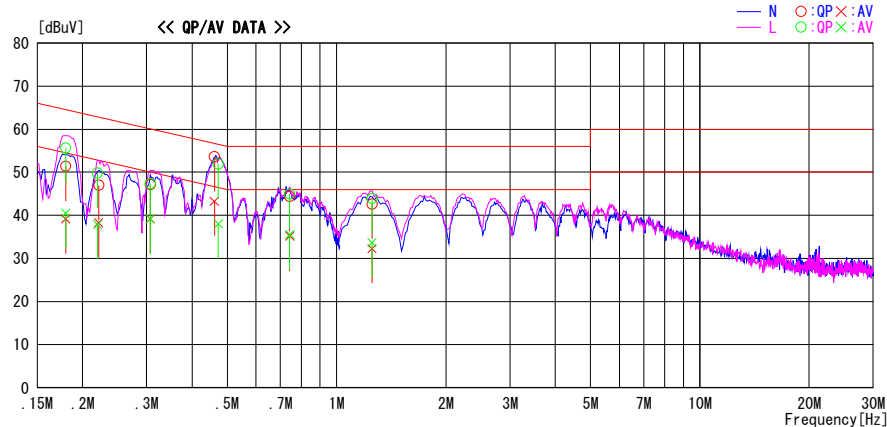
UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2011/12/25

Report No. : 32EE0095-HO-01

Temp./Humi. : 23deg. C / 25% RH
Engineer : Hisayoshi Sato

Mode / Remarks : Tx 11b 11Mbps 2412MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

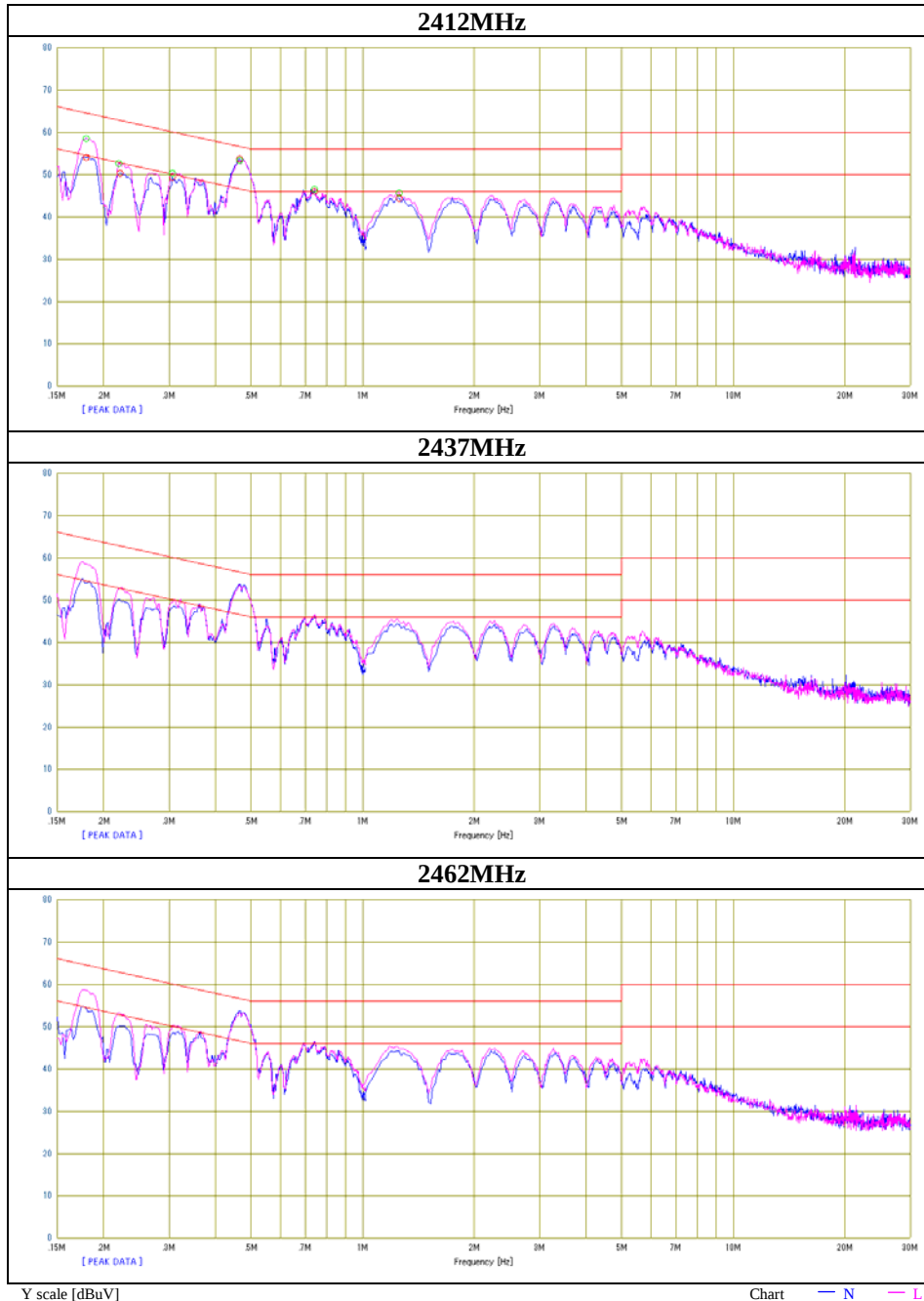


Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.17964	38.2	26.0	13.2	51.4	39.2	64.5	54.5	13.1	15.3	N	
0.22148	33.7	25.0	13.3	47.0	38.3	62.8	52.8	15.8	14.5	N	
0.30691	33.8	25.9	13.3	47.1	39.2	60.1	50.1	13.0	10.9	N	
0.46058	40.3	30.0	13.3	53.6	43.3	56.7	46.7	3.1	3.4	N	
0.74279	31.0	21.8	13.4	44.4	35.2	56.0	46.0	11.6	10.8	N	
1.25265	29.2	18.9	13.4	42.6	32.3	56.0	46.0	13.4	13.7	N	
0.17964	42.4	27.3	13.2	55.6	40.5	64.5	54.5	8.9	14.0	L	
0.21974	36.6	24.7	13.2	49.8	37.9	62.8	52.8	13.0	14.9	L	
0.30691	34.1	25.9	13.3	47.4	39.2	60.1	50.1	12.7	10.9	L	
0.47273	38.6	24.7	13.3	51.9	38.0	56.5	46.5	4.6	8.5	L	
0.74279	31.5	22.1	13.4	44.9	35.5	56.0	46.0	11.1	10.5	L	
1.25265	30.5	20.3	13.4	43.9	33.7	56.0	46.0	12.1	12.3	L	

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

Conducted Emission

Test place	Head Office EMC Lab. No.1 Semi Anechoic Chamber
Report No.	32EE0095-HO-01
Date	12/25/2011
Temperature/ Humidity	23 deg. C / 38% RH
Engineer	Hisayoshi Sato
Mode	11b Tx



Conducted Emission

DATA OF CONDUCTED EMISSION TEST

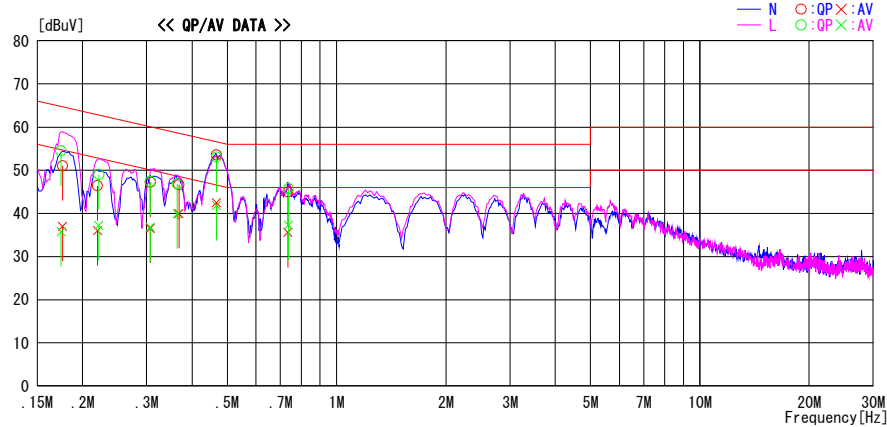
UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2011/12/25

Report No. : 32EE0095-HO-01

Temp./Humi. : 23deg. C / 25% RH
Engineer : Hisayoshi Sato

Mode / Remarks : Tx 11g 24Mbps 2412MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

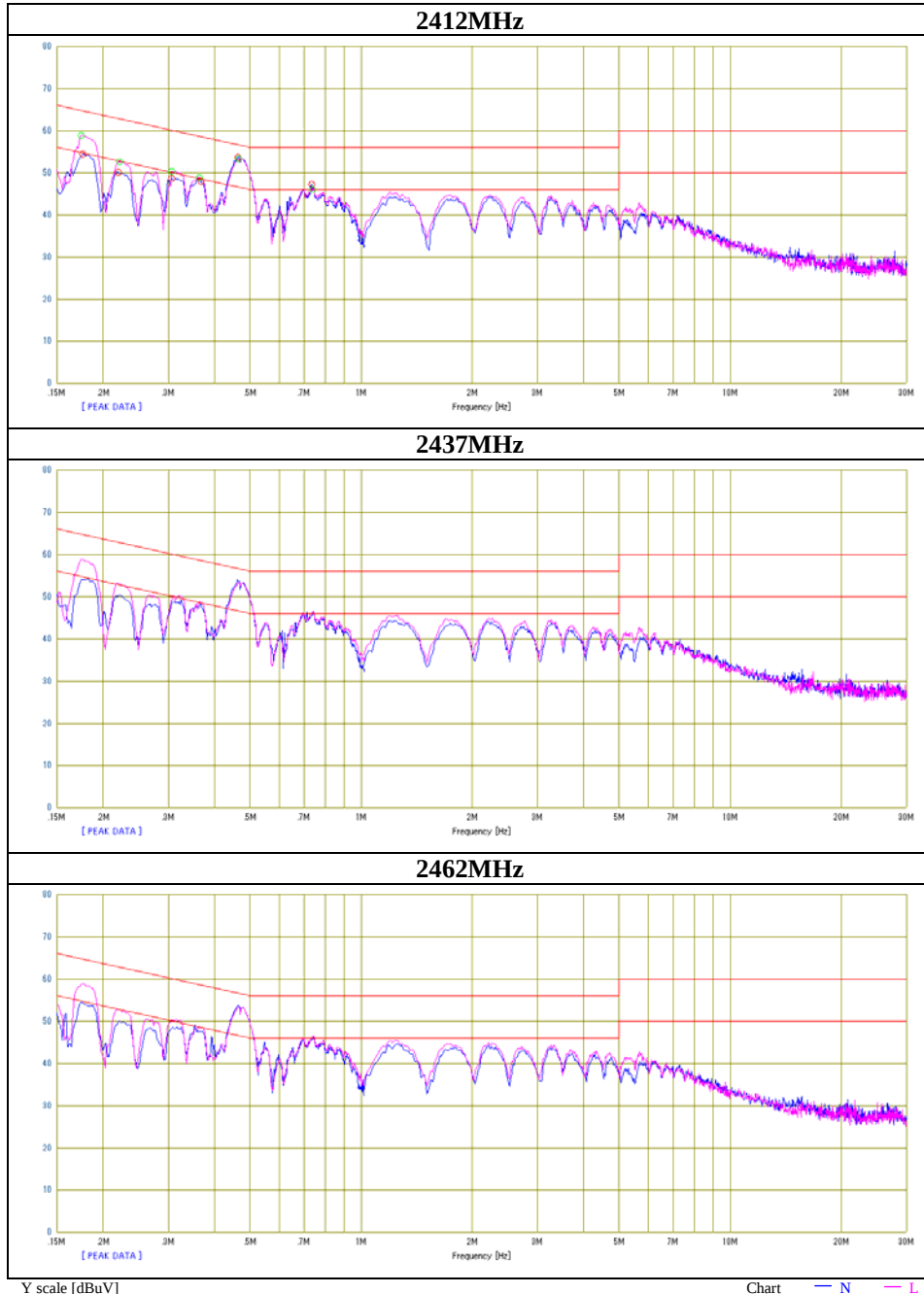


Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.17441	41.3	22.5	13.2	54.5	35.7	64.7	54.7	10.2	19.0	L	
0.17615	37.8	23.8	13.2	51.0	37.0	64.7	54.7	13.7	17.7	N	
0.21974	33.2	22.8	13.2	46.4	36.0	62.8	52.8	16.4	16.8	N	
0.22148	35.7	23.9	13.3	49.0	37.2	62.8	52.8	13.8	15.6	L	
0.30691	33.9	23.2	13.3	47.2	36.5	60.1	50.1	12.9	13.6	N	
0.30691	34.1	23.5	13.3	47.4	36.8	60.1	50.1	12.7	13.3	L	
0.36445	33.5	26.6	13.3	46.8	39.9	58.6	48.6	11.8	8.7	L	
0.36794	33.3	26.7	13.3	46.6	40.0	58.5	48.5	11.9	8.5	N	
0.46672	40.2	29.2	13.3	53.5	42.5	56.6	46.6	3.1	4.1	N	
0.46672	39.7	28.5	13.3	53.0	41.8	56.6	46.6	3.6	4.8	L	
0.73407	31.5	22.2	13.4	44.9	35.6	56.0	46.0	11.1	10.4	N	
0.73756	32.4	23.9	13.4	45.8	37.3	56.0	46.0	10.3	8.7	L	

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

Conducted Emission

Test place	Head Office EMC Lab. No.1 Semi Anechoic Chamber
Report No.	32EE0095-HO-01
Date	12/25/2011
Temperature/ Humidity	23 deg. C / 38% RH
Engineer	Hisayoshi Sato
Mode	11g Tx



Conducted Emission

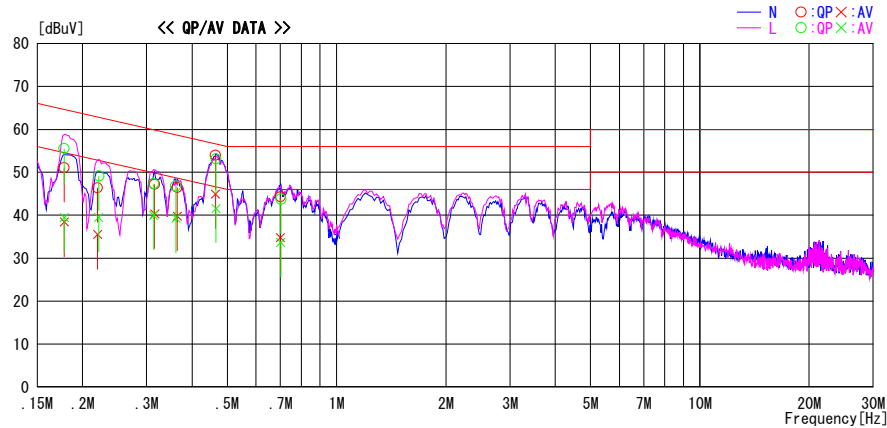
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2011/12/25

Report No. : 32EE0095-H0-01
Temp./Humi. : 23deg. C / 25% RH
Engineer : Hisayoshi Sato

Mode / Remarks : Tx 11n-20 MCS6 Long GI 2412MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

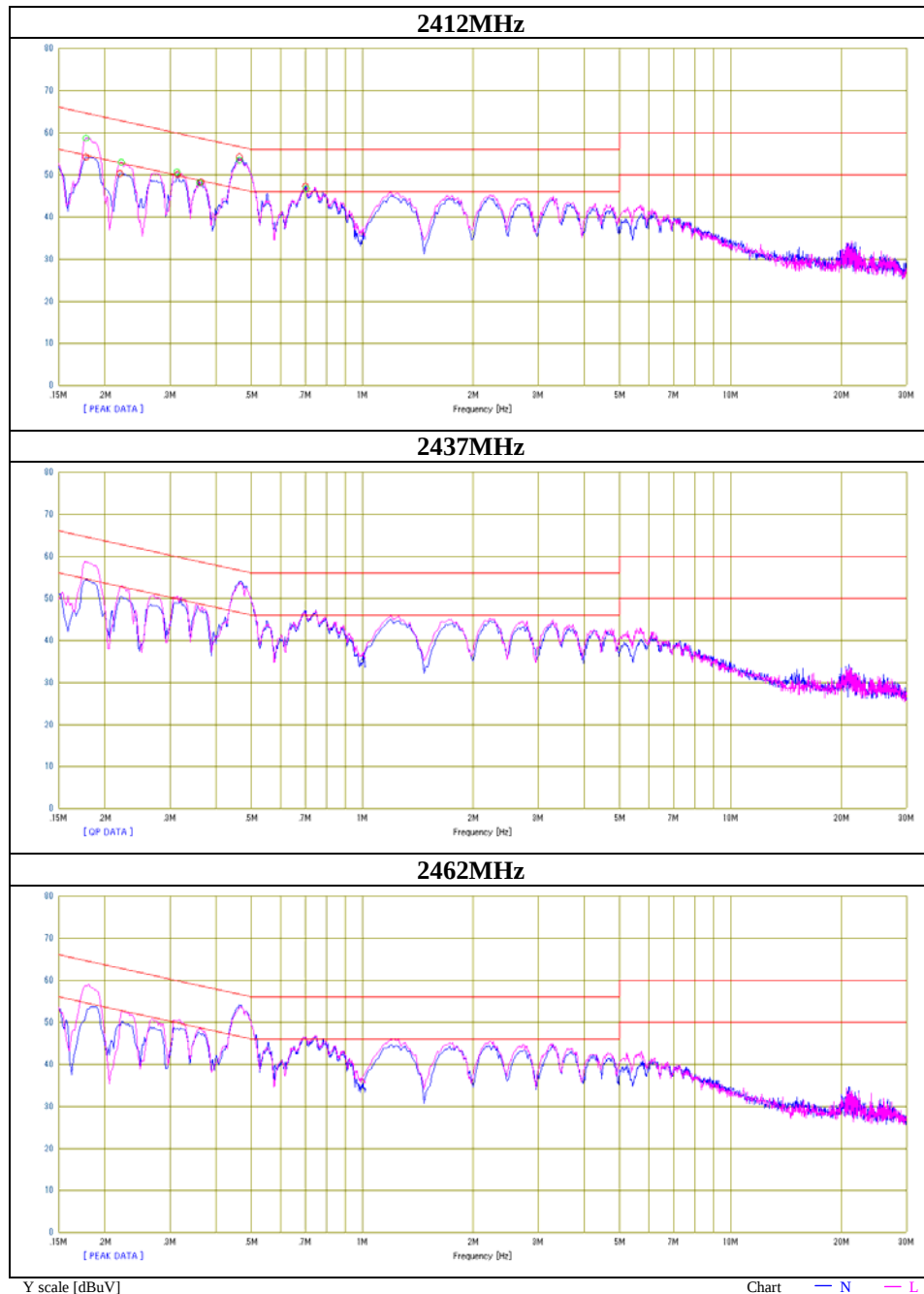


Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.17790	37.9	25.2	13.2	51.1	38.4	64.6	54.6	13.5	16.2	N	
0.21974	33.2	22.3	13.2	46.4	35.5	62.8	52.8	16.4	17.3	N	
0.31563	33.9	27.0	13.3	47.2	40.3	59.8	49.8	12.6	9.5	N	
0.36445	33.2	26.5	13.3	46.5	39.8	58.6	48.6	12.1	8.8	N	
0.46383	40.7	31.6	13.3	54.0	44.9	56.6	46.6	2.6	1.7	N	
0.70094	30.9	21.4	13.4	44.3	34.8	56.0	46.0	11.7	11.2	N	
0.17790	42.3	26.3	13.2	55.5	39.5	64.6	54.6	9.1	15.1	L	
0.22148	35.8	26.2	13.3	49.1	39.5	62.8	52.8	13.7	13.3	L	
0.31389	34.1	26.7	13.3	47.4	40.0	59.9	49.9	12.5	9.9	L	
0.36096	33.5	26.0	13.3	46.8	39.3	58.7	48.7	11.9	9.4	L	
0.46550	39.8	28.3	13.3	53.1	41.6	56.6	46.6	3.5	5.0	L	
0.70269	30.3	20.3	13.4	43.7	33.7	56.0	46.0	12.3	12.3	L	

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

Conducted Emission

Test place	Head Office EMC Lab. No.1 Semi Anechoic Chamber
Report No.	32EE0095-HO-01
Date	12/25/2011
Temperature/ Humidity	23 deg. C / 38% RH
Engineer	Hisayoshi Sato
Mode	11n-20 Tx



6dB Bandwidth

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32EE0095-HO-01
Date 12/16/2011
Temperature/ Humidity 25 deg. C / 48% RH
Engineer Takumi Shimada
Mode Tx

11b

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2412	12.554	>500
2437	11.296	>500
2462	12.471	>500

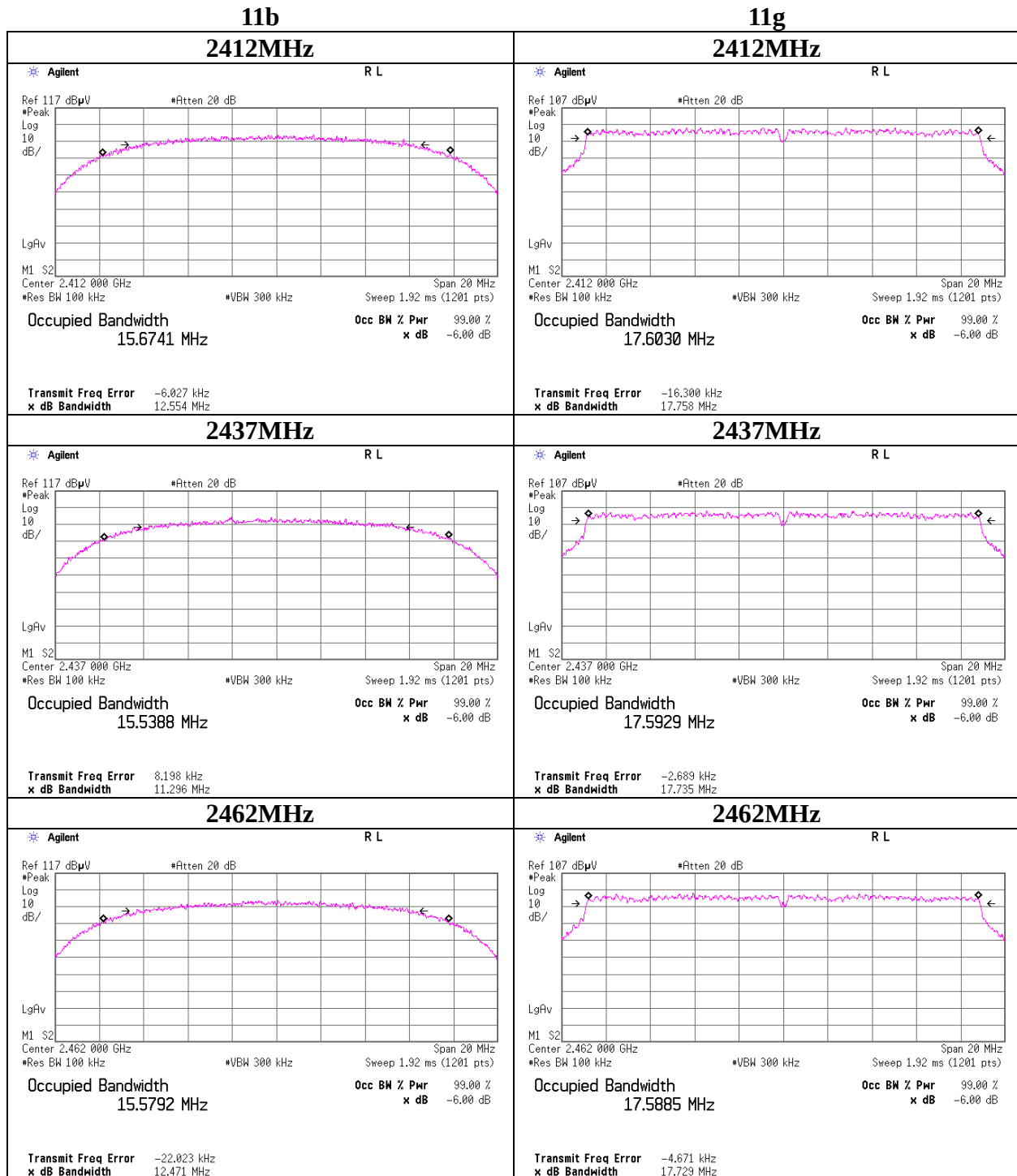
11g

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2412	17.758	>500
2437	17.735	>500
2462	17.729	>500

11n-20

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2412	16.518	>500
2437	16.533	>500
2462	16.548	>500

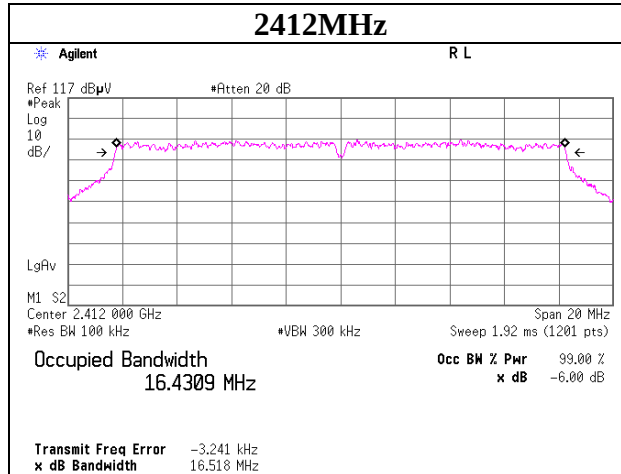
6dB Bandwidth



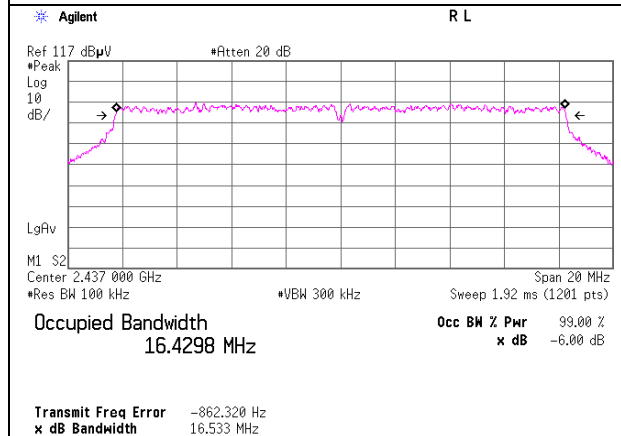
6dB Bandwidth

11n-20

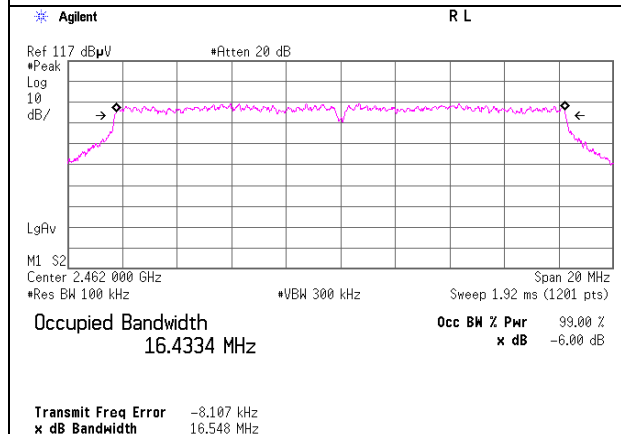
2412MHz



2437MHz



2462MHz



Maximum Peak Output Power

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32EE0095-HO-01
Date 12/16/2011
Temperature/ Humidity 25 deg. C / 48% RH
Engineer Takumi Shimada
Mode 11b Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	6.62	0.40	9.96	16.98	49.89	30.00	1000	13.02
2437	6.83	0.40	9.96	17.19	52.36	30.00	1000	12.81
2462	6.54	0.40	9.96	16.90	48.98	30.00	1000	13.10

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

2437MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	6.63	
2	6.81	
5.5	6.61	
11	6.83	*

*: Worst Rate

All comparizon were carried out on same frequency and measurement factors.

Maximum Peak Output Power

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32EE0095-HO-01
Date 12/16/2011
Temperature/ Humidity 25 deg. C / 48% RH
Engineer Takumi Shimada
Mode 11g Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	11.87	0.40	9.96	22.23	167.11	30.00	1000	7.77
2437	11.77	0.40	9.96	22.13	163.31	30.00	1000	7.87
2462	11.54	0.40	9.96	21.90	154.88	30.00	1000	8.10

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

2437MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
6	11.24	
9	10.99	
12	11.34	
18	10.83	
24	11.77	*
36	11.40	
48	11.26	
54	11.08	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

Maximum Peak Output Power

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32EE0095-HO-01
Date	12/16/2011
Temperature/ Humidity	25 deg. C / 48% RH
Engineer	Takumi Shimada
Mode	11n-20 Tx

Long GI

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	10.67	0.40	9.96	21.03	126.77	30.00	1000	8.97
2437	10.80	0.40	9.96	21.16	130.62	30.00	1000	8.84
2462	10.39	0.40	9.96	20.75	118.85	30.00	1000	9.25

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

2437MHz

Rate [MCS]	Reading [dBm]	Remark
0	10.35	
1	9.84	
2	10.58	
3	10.17	
4	9.91	
5	9.85	
6	10.80	*
7	9.80	

Rate [MCS]	GI	Reading [dBm]	Remark
0	Long	10.35	*
0	Short	9.68	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.1 and No.3 Semi Anechoic Chamber
Report No. : 32EE0095-HO-01
Date : 12/24/2011 12/25/2011
Temperature/ Humidity : 23 deg. C / 38% RH 23 deg. C / 34% RH
Engineer : Takumi Shimada Hisayoshi Sato
(Above 1GHz) (30-1000MHz)
Mode : 11b Tx 2412MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	39.198	QP	27.6	14.9	7.5	38.3	11.7	40.0	28.3	
Hori	119.820	QP	30.3	12.9	8.6	38.6	13.2	43.5	30.3	
Hori	159.860	QP	35.1	15.4	9.0	38.6	20.9	43.5	22.6	
Hori	479.559	QP	40.0	18.1	11.7	37.8	32.0	46.0	14.0	
Hori	880.768	QP	33.1	22.1	14.2	37.0	32.4	46.0	13.6	
Hori	960.729	QP	39.2	23.1	14.6	36.6	40.3	53.9	13.6	
Hori	2390.000	PK	49.1	26.4	2.2	32.6	45.1	73.9	28.8	
Hori	2395.580	PK	62.7	26.4	2.2	32.6	58.7	-	-	- See 20dBc Data Sheet
Hori	2400.000	PK	56.3	26.4	2.2	32.6	52.3	-	-	- See 20dBc Data Sheet
Hori	4824.000	PK	49.5	30.4	3.8	31.9	51.8	73.9	22.1	
Hori	7236.000	PK	41.4	35.2	4.6	32.4	48.8	73.9	25.1	
Hori	9648.000	PK	43.1	38.1	5.5	32.9	53.8	73.9	20.1	
Hori	24120.000	PK	45.4	38.6	-1.7	31.6	50.7	73.9	23.2	
Hori	2390.000	AV	35.3	26.4	2.2	32.6	31.3	53.9	22.6	
Hori	2395.580	AV	54.2	26.4	2.2	32.6	50.2	-	-	- See 20dBc Data Sheet
Hori	2400.000	AV	50.3	26.4	2.2	32.6	46.3	-	-	- See 20dBc Data Sheet
Hori	4824.000	AV	45.9	30.4	3.8	31.9	48.2	53.9	5.7	
Hori	7236.000	AV	29.7	35.2	4.6	32.4	37.1	53.9	16.8	
Hori	9648.000	AV	31.5	38.1	5.5	32.9	42.2	53.9	11.7	
Hori	24120.000	AV	33.8	38.6	-1.7	31.6	39.1	53.9	14.8	
Vert	39.739	QP	34.0	14.7	7.5	38.3	17.9	40.0	22.1	
Vert	119.820	QP	42.2	12.9	8.6	38.6	25.1	43.5	18.4	
Vert	159.860	QP	40.4	15.4	9.0	38.6	26.2	43.5	17.3	
Vert	479.559	QP	37.0	18.1	11.7	37.8	29.0	46.0	17.0	
Vert	883.574	QP	27.0	22.1	14.2	37.0	26.3	46.0	19.7	
Vert	960.729	QP	36.5	23.1	14.6	36.6	37.6	53.9	16.3	
Vert	2390.000	PK	48.1	26.4	2.2	32.6	44.1	73.9	29.8	
Vert	2395.580	PK	60.4	26.4	2.2	32.6	56.4	-	-	- See 20dBc Data Sheet
Vert	2400.000	PK	55.7	26.4	2.2	32.6	51.7	-	-	- See 20dBc Data Sheet
Vert	4824.000	PK	49.0	30.4	3.8	31.9	51.3	73.9	22.6	
Vert	7236.000	PK	41.4	35.2	4.6	32.4	48.8	73.9	25.1	
Vert	9648.000	PK	43.1	38.1	5.5	32.9	53.8	73.9	20.1	
Vert	24120.000	PK	45.7	38.6	-1.7	31.6	51.0	73.9	22.9	
Vert	2390.000	AV	35.9	26.4	2.2	32.6	31.9	53.9	22.0	
Vert	2395.580	AV	51.9	26.4	2.2	32.6	47.9	-	-	- See 20dBc Data Sheet
Vert	2400.000	AV	48.3	26.4	2.2	32.6	44.3	-	-	- See 20dBc Data Sheet
Vert	4824.000	AV	45.3	30.4	3.8	31.9	47.6	53.9	6.3	
Vert	7236.000	AV	29.9	35.2	4.6	32.4	37.3	53.9	16.6	
Vert	9648.000	AV	30.5	38.1	5.5	32.9	41.2	53.9	12.7	
Vert	24120.000	AV	33.8	38.6	-1.7	31.6	39.1	53.9	14.8	

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

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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.1 and No.3 Semi Anechoic Chamber
Report No. : 32EE0095-HO-01
Date : 12/24/2011 12/25/2011
Temperature/ Humidity : 23 deg. C / 38% RH 23 deg. C / 34% RH
Engineer : Takumi Shimada Hisayoshi Sato
(Above 1GHz) (30-1000MHz)
Mode : 11b Tx 2437MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	53.808	QP	28.4	9.9	7.7	38.4	7.6	40.0	32.4	
Hori	119.820	QP	30.2	12.9	8.6	38.6	13.1	43.5	30.4	
Hori	159.860	QP	33.2	15.4	9.0	38.6	19.0	43.5	24.5	
Hori	479.559	QP	40.3	18.1	11.7	37.8	32.3	46.0	13.7	
Hori	800.806	QP	32.0	22.0	13.7	37.3	30.4	46.0	15.6	
Hori	960.729	QP	36.5	23.1	14.6	36.6	37.6	53.9	16.3	
Hori	4874.000	PK	48.5	30.5	3.8	31.9	50.9	73.9	23.0	
Hori	7311.000	PK	42.4	35.2	4.6	32.4	49.8	73.9	24.1	
Hori	9748.000	PK	42.0	38.3	5.5	32.9	52.9	73.9	21.0	
Hori	24370.000	PK	46.4	38.8	-1.7	31.4	52.1	73.9	21.8	
Hori	4874.000	AV	44.0	30.5	3.8	31.9	46.4	53.9	7.5	
Hori	7311.000	AV	29.9	35.2	4.6	32.4	37.3	53.9	16.6	
Hori	9748.000	AV	31.3	38.3	5.5	32.9	42.2	53.9	11.7	
Hori	24370.000	AV	34.0	38.8	-1.7	31.4	39.7	53.9	14.2	
Vert	52.184	QP	41.2	10.3	7.7	38.4	20.8	40.0	19.2	
Vert	119.820	QP	42.9	12.9	8.6	38.6	25.8	43.5	17.7	
Vert	159.860	QP	39.2	15.4	9.0	38.6	25.0	43.5	18.5	
Vert	479.559	QP	37.5	18.1	11.7	37.8	29.5	46.0	16.5	
Vert	800.806	QP	29.2	22.0	13.7	37.3	27.6	46.0	18.4	
Vert	960.729	QP	34.2	23.1	14.6	36.6	35.3	53.9	18.6	
Vert	4874.000	PK	50.3	30.5	3.8	31.9	52.7	73.9	21.2	
Vert	7311.000	PK	41.7	35.2	4.6	32.4	49.1	73.9	24.8	
Vert	9748.000	PK	43.6	38.3	5.5	32.9	54.5	73.9	19.5	
Vert	24370.000	PK	36.1	38.8	-1.7	31.4	41.8	73.9	32.1	
Vert	4874.000	AV	46.9	30.5	3.8	31.9	49.3	53.9	4.6	
Vert	7311.000	AV	30.0	35.2	4.6	32.4	37.4	53.9	16.5	
Vert	9748.000	AV	31.2	38.3	5.5	32.9	42.1	53.9	11.8	
Vert	24370.000	AV	34.0	38.8	-1.7	31.4	39.7	53.9	14.2	

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).

*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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.1 and No.3 Semi Anechoic Chamber
Report No. 32EE0095-HO-01
Date 12/24/2011 12/25/2011
Temperature/ Humidity 23 deg. C / 38% RH 23 deg. C / 34% RH
Engineer Takumi Shimada Hisayoshi Sato
(Above 1GHz) (30-1000MHz)
Mode 11b Tx 2462MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.054	QP	29.4	8.9	7.7	38.4	7.6	40.0	32.4	
Hori	119.820	QP	31.0	12.9	8.6	38.6	13.9	43.5	29.6	
Hori	159.860	QP	31.4	15.4	9.0	38.6	17.2	43.5	26.3	
Hori	479.559	QP	38.7	18.1	11.7	37.8	30.7	46.0	15.3	
Hori	920.047	QP	32.7	22.4	14.4	36.8	32.7	46.0	13.3	
Hori	960.729	QP	36.0	23.1	14.6	36.6	37.1	53.9	16.8	
Hori	2483.500	PK	48.8	26.5	2.2	32.6	44.9	73.9	29.0	
Hori	4924.000	PK	48.6	30.5	3.8	31.9	51.0	73.9	22.9	
Hori	7386.000	PK	42.5	35.2	4.6	32.4	49.9	73.9	24.0	
Hori	24620.000	PK	46.7	38.9	-1.7	31.3	52.6	73.9	21.3	
Hori	2483.500	AV	37.9	26.5	2.2	32.6	34.0	53.9	19.9	
Hori	4924.000	AV	44.4	30.5	3.8	31.9	46.8	53.9	7.1	
Hori	24620.000	AV	33.8	38.9	-1.7	31.3	39.7	53.9	14.2	
Vert	57.054	QP	40.4	8.9	7.7	38.4	18.6	40.0	21.4	
Vert	119.820	QP	42.0	12.9	8.6	38.6	24.9	43.5	18.6	
Vert	159.860	QP	39.5	15.4	9.0	38.6	25.3	43.5	18.2	
Vert	479.559	QP	34.5	18.1	11.7	37.8	26.5	46.0	19.5	
Vert	920.047	QP	29.0	22.4	14.4	36.8	29.0	46.0	17.0	
Vert	960.729	QP	35.2	23.1	14.6	36.6	36.3	53.9	17.6	
Vert	2483.500	PK	48.3	26.5	2.2	32.6	44.4	73.9	29.5	
Vert	4924.000	PK	50.5	30.5	3.8	31.9	52.9	73.9	21.0	
Vert	7386.000	PK	42.0	35.2	4.6	32.4	49.4	73.9	24.6	
Vert	24620.000	PK	46.2	38.9	-1.7	31.3	52.1	73.9	21.8	
Vert	2483.500	AV	36.8	26.5	2.2	32.6	32.9	53.9	21.1	
Vert	4924.000	AV	47.7	30.5	3.8	31.9	50.1	53.9	3.8	
Vert	24620.000	AV	33.7	38.9	-1.7	31.3	39.6	53.9	14.3	

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).

*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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.1 and No.3 Semi Anechoic Chamber
Report No. : 32EE0095-HO-01
Date : 12/24/2011 12/25/2011
Temperature/ Humidity : 23 deg. C / 38% RH 23 deg. C / 34% RH
Engineer : Takumi Shimada Hisayoshi Sato
(Above 1GHz) (30-1000MHz)
Mode : 11g Tx 2412MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.595	QP	28.6	8.8	7.7	38.4	6.7	40.0	33.3	
Hori	119.820	QP	31.1	12.9	8.6	38.6	14.0	43.5	29.5	
Hori	159.860	QP	30.7	15.4	9.0	38.6	16.5	43.5	27.0	
Hori	479.559	QP	39.2	18.1	11.7	37.8	31.2	46.0	14.8	
Hori	920.047	QP	31.4	22.4	14.4	36.8	31.4	46.0	14.6	
Hori	960.729	QP	35.6	23.1	14.6	36.6	36.7	53.9	17.2	
Hori	2390.000	PK	66.6	26.4	2.2	32.6	62.6	73.9	11.3	
Hori	2399.830	PK	78.5	26.4	2.2	32.6	74.5	-	-	- See 20dBc Data Sheet
Hori	2400.000	PK	78.0	26.4	2.2	32.6	74.0	-	-	- See 20dBc Data Sheet
Hori	4824.000	PK	45.2	30.4	3.8	31.9	47.5	73.9	26.4	
Hori	7236.000	PK	42.0	35.2	4.6	32.4	49.4	73.9	24.5	
Hori	9648.000	PK	44.2	38.1	5.5	32.9	54.9	73.9	19.0	
Hori	24120.000	PK	45.2	38.6	-1.7	31.6	50.5	73.9	23.4	
Hori	2390.000	AV	47.0	26.4	2.2	32.6	43.0	53.9	10.9	
Hori	2399.830	AV	65.0	26.4	2.2	32.6	61.0	-	-	- See 20dBc Data Sheet
Hori	2400.000	AV	65.5	26.4	2.2	32.6	61.5	-	-	- See 20dBc Data Sheet
Hori	4824.000	AV	36.4	30.4	3.8	31.9	38.7	53.9	15.2	
Hori	7236.000	AV	29.7	35.2	4.6	32.4	37.1	53.9	16.8	
Hori	9648.000	AV	31.3	38.1	5.5	32.9	42.0	53.9	11.9	
Hori	24120.000	AV	33.8	38.6	-1.7	31.6	39.1	53.9	14.8	
Vert	57.054	QP	41.0	8.9	7.7	38.4	19.2	40.0	20.8	
Vert	119.820	QP	41.2	12.9	8.6	38.6	24.1	43.5	19.4	
Vert	159.860	QP	40.7	15.4	9.0	38.6	26.5	43.5	17.0	
Vert	479.559	QP	34.5	18.1	11.7	37.8	26.5	46.0	19.5	
Vert	920.047	QP	28.4	22.4	14.4	36.8	28.4	46.0	17.6	
Vert	960.729	QP	34.6	23.1	14.6	36.6	35.7	53.9	18.2	
Vert	2390.000	PK	63.9	26.4	2.2	32.6	59.9	73.9	14.0	
Vert	2399.830	PK	78.0	26.4	2.2	32.6	74.0	-	-	- See 20dBc Data Sheet
Vert	2400.000	PK	77.0	26.4	2.2	32.6	73.0	-	-	- See 20dBc Data Sheet
Vert	4824.000	PK	46.0	30.4	3.8	31.9	48.3	73.9	25.6	
Vert	7236.000	PK	42.3	35.2	4.6	32.4	49.7	73.9	24.2	
Vert	9648.000	PK	43.6	38.1	5.5	32.9	54.3	73.9	19.6	
Vert	24120.000	PK	45.6	38.6	-1.7	31.6	50.9	73.9	23.0	
Vert	2390.000	AV	46.0	26.4	2.2	32.6	42.0	53.9	11.9	
Vert	2399.830	AV	64.3	26.4	2.2	32.6	60.3	-	-	- See 20dBc Data Sheet
Vert	2400.000	AV	64.7	26.4	2.2	32.6	60.7	-	-	- See 20dBc Data Sheet
Vert	4824.000	AV	38.6	30.4	3.8	31.9	40.9	53.9	13.0	
Vert	7236.000	AV	29.8	35.2	4.6	32.4	37.2	53.9	16.7	
Vert	9648.000	AV	30.7	38.1	5.5	32.9	41.4	53.9	12.5	
Vert	24120.000	AV	33.8	38.6	-1.7	31.6	39.1	53.9	14.8	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 32EE0095-HO-01
Date 12/24/2011
Temperature/ Humidity 23 deg. C / 38% RH
Engineer Takumi Shimada
(Above 1GHz)
Mode 11g Tx 2412MHz

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	2412.000	PK	98.6	26.4	2.2	32.6	94.6	-	-	Carrier
Hori	2399.830	PK	68.7	26.4	2.2	32.6	64.7	74.6	9.9	
Hori	2400.000	PK	67.7	26.4	2.2	32.6	63.7	74.6	10.9	
Vert	2412.000	PK	98.4	26.4	2.2	32.6	94.4	-	-	Carrier
Vert	2399.830	PK	67.2	26.4	2.2	32.6	63.2	74.4	11.2	
Vert	2400.000	PK	67.3	26.4	2.2	32.6	63.3	74.4	11.1	

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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.1 and No.3 Semi Anechoic Chamber
Report No. : 32EE0095-HO-01
Date : 12/24/2011 12/25/2011
Temperature/ Humidity : 23 deg. C / 38% RH 23 deg. C / 34% RH
Engineer : Takumi Shimada Hisayoshi Sato
(Above 1GHz) (30-1000MHz)
Mode : 11g Tx 2437MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.054	QP	30.1	8.9	7.7	38.4	8.3	40.0	31.7	
Hori	119.820	QP	30.4	12.9	8.6	38.6	13.3	43.5	30.2	
Hori	159.860	QP	31.2	15.4	9.0	38.6	17.0	43.5	26.5	
Hori	188.537	QP	27.9	16.4	9.3	38.5	15.1	43.5	28.4	
Hori	479.559	QP	39.9	18.1	11.7	37.8	31.9	46.0	14.1	
Hori	960.729	QP	35.6	23.1	14.6	36.6	36.7	53.9	17.2	
Hori	4874.000	PK	44.8	30.5	3.8	31.9	47.2	73.9	26.7	
Hori	7311.000	PK	41.9	35.2	4.6	32.4	49.3	73.9	24.6	
Hori	9748.000	PK	43.3	38.3	5.5	32.9	54.2	73.9	19.7	
Hori	24370.000	PK	46.5	38.8	-1.7	31.4	52.2	73.9	21.7	
Hori	4874.000	AV	34.1	30.5	3.8	31.9	36.5	53.9	17.4	
Hori	7311.000	AV	30.0	35.2	4.6	32.4	37.4	53.9	16.5	
Hori	9748.000	AV	31.1	38.3	5.5	32.9	42.0	53.9	11.9	
Hori	24370.000	AV	34.1	38.8	-1.7	31.4	39.8	53.9	14.1	
Vert	56.513	QP	40.0	9.1	7.7	38.4	18.4	40.0	21.6	
Vert	119.820	QP	41.9	12.9	8.6	38.6	24.8	43.5	18.7	
Vert	159.860	QP	39.4	15.4	9.0	38.6	25.2	43.5	18.3	
Vert	187.996	QP	34.6	16.3	9.3	38.5	21.7	43.5	21.8	
Vert	479.559	QP	34.3	18.1	11.7	37.8	26.3	46.0	19.7	
Vert	960.729	QP	34.6	23.1	14.6	36.6	35.7	53.9	18.2	
Vert	4874.000	PK	46.5	30.5	3.8	31.9	48.9	73.9	25.0	
Vert	7311.000	PK	41.3	35.2	4.6	32.4	48.7	73.9	25.2	
Vert	9748.000	PK	43.4	38.3	5.5	32.9	54.3	73.9	19.6	
Vert	24370.000	PK	46.3	38.8	-1.7	31.4	52.0	73.9	21.9	
Vert	4874.000	AV	38.0	30.5	3.8	31.9	40.4	53.9	13.5	
Vert	7311.000	AV	30.0	35.2	4.6	32.4	37.4	53.9	16.5	
Vert	9748.000	AV	31.1	38.3	5.5	32.9	42.0	53.9	11.9	
Vert	24370.000	AV	34.0	38.8	-1.7	31.4	39.7	53.9	14.2	

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).

*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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.1, No.2 and No.3 Semi Anechoic Chamber
Report No. 32EE0095-HO-01
Date 12/14/2011 12/25/2011 12/24/2011
Temperature/ Humidity 20 deg. C / 35% RH 23 deg. C / 34% RH 23 deg. C / 38% RH
Engineer Hironobu Ohnishi Hisayoshi Sato Takumi Shimada
(1-10GHz) (30-1000MHz) (10-26.5GHz)
Mode 11g Tx 2462MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.054	QP	29.3	8.9	7.7	38.4	7.5	40.0	32.5	
Hori	119.820	QP	29.7	12.9	8.6	38.6	12.6	43.5	30.9	
Hori	159.860	QP	32.0	15.4	9.0	38.6	17.8	43.5	25.7	
Hori	479.559	QP	38.4	18.1	11.7	37.8	30.4	46.0	15.6	
Hori	920.047	QP	31.0	22.4	14.4	36.8	31.0	46.0	15.0	
Hori	960.729	QP	36.3	23.1	14.6	36.6	37.4	53.9	16.5	
Hori	2483.500	PK	56.7	27.6	2.3	32.6	54.0	73.9	19.9	
Hori	2483.580	PK	56.7	27.6	2.3	32.6	54.0	73.9	19.9	
Hori	4924.000	PK	45.1	31.6	3.9	31.9	48.7	73.9	25.2	
Hori	7386.000	PK	41.9	35.7	4.6	32.4	49.8	73.9	24.1	
Hori	9848.000	PK	42.2	38.6	5.4	32.9	53.3	73.9	20.6	
Hori	24620.000	PK	46.7	38.9	-1.7	31.3	52.6	73.9	21.3	
Hori	2483.500	AV	43.9	27.6	2.3	32.6	41.2	53.9	12.7	
Hori	2483.580	AV	44.0	27.6	2.3	32.6	41.3	53.9	12.6	
Hori	4924.000	AV	35.4	31.6	3.9	31.9	39.0	53.9	14.9	
Hori	7386.000	AV	30.0	35.7	4.6	32.4	37.9	53.9	16.0	
Hori	9848.000	AV	33.6	38.6	5.4	32.9	44.7	53.9	9.2	
Hori	24620.000	AV	33.7	38.9	-1.7	31.3	39.6	53.9	14.3	
Vert	57.054	QP	41.2	8.9	7.7	38.4	19.4	40.0	20.6	
Vert	119.820	QP	42.3	12.9	8.6	38.6	25.2	43.5	18.3	
Vert	159.860	QP	39.8	15.4	9.0	38.6	25.6	43.5	17.9	
Vert	479.559	QP	34.6	18.1	11.7	37.8	26.6	46.0	19.4	
Vert	920.047	QP	28.0	22.4	14.4	36.8	28.0	46.0	18.0	
Vert	960.729	QP	34.2	23.1	14.6	36.6	35.3	53.9	18.6	
Vert	2483.500	PK	57.4	27.6	2.3	32.6	54.7	73.9	19.2	
Vert	2483.580	PK	57.6	27.6	2.3	32.6	54.9	73.9	19.0	
Vert	4924.000	PK	44.7	31.6	3.9	31.9	48.3	73.9	25.6	
Vert	7386.000	PK	42.0	35.7	4.6	32.4	49.9	73.9	24.0	
Vert	9848.000	PK	44.2	38.6	5.4	32.9	55.3	73.9	18.6	
Vert	24620.000	PK	46.4	38.9	-1.7	31.3	52.3	73.9	21.7	
Vert	2483.500	AV	43.4	27.6	2.3	32.6	40.7	53.9	13.2	
Vert	2483.580	AV	43.6	27.6	2.3	32.6	40.9	53.9	13.0	
Vert	4924.000	AV	37.3	31.6	3.9	31.9	40.9	53.9	13.0	
Vert	7386.000	AV	28.9	35.7	4.6	32.4	36.8	53.9	17.1	
Vert	9848.000	AV	33.3	38.6	5.4	32.9	44.4	53.9	9.5	
Vert	24620.000	AV	33.8	38.9	-1.7	31.3	39.7	53.9	14.2	

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).

*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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.1 and No.3 Semi Anechoic Chamber
Report No. : 32EE0095-HO-01
Date : 12/24/2011 12/25/2011
Temperature/ Humidity : 23 deg. C / 38% RH 23 deg. C / 34% RH
Engineer : Takumi Shimada Hisayoshi Sato
(Above 1GHz) (30-1000MHz)
Mode : 11n-20 Tx 2412MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.054	QP	29.2	8.9	7.7	38.4	7.4	40.0	32.6	
Hori	119.820	QP	30.1	12.9	8.6	38.6	13.0	43.5	30.5	
Hori	159.860	QP	30.5	15.4	9.0	38.6	16.3	43.5	27.2	
Hori	479.559	QP	39.0	18.1	11.7	37.8	31.0	46.0	15.0	
Hori	920.047	QP	31.2	22.4	14.4	36.8	31.2	46.0	14.8	
Hori	960.729	QP	36.4	23.1	14.6	36.6	37.5	53.9	16.4	
Hori	2390.000	PK	62.7	26.4	2.2	32.6	58.7	73.9	15.2	
Hori	2399.920	PK	75.8	26.4	2.2	32.6	71.8	-	-	- See 20dBc Data Sheet
Hori	2400.000	PK	76.5	26.4	2.2	32.6	72.5	-	-	- See 20dBc Data Sheet
Hori	4824.000	PK	44.9	30.4	3.8	31.9	47.2	73.9	26.7	
Hori	7236.000	PK	42.3	35.2	4.6	32.4	49.7	73.9	24.2	
Hori	9648.000	PK	43.3	38.1	5.5	32.9	54.0	73.9	19.9	
Hori	24120.000	PK	45.6	38.6	-1.7	31.6	50.9	73.9	23.0	
Hori	2390.000	AV	45.5	26.4	2.2	32.6	41.5	53.9	12.4	
Hori	2399.920	AV	64.7	26.4	2.2	32.6	60.7	-	-	- See 20dBc Data Sheet
Hori	2400.000	AV	65.0	26.4	2.2	32.6	61.0	-	-	- See 20dBc Data Sheet
Hori	4824.000	AV	36.7	30.4	3.8	31.9	39.0	53.9	14.9	
Hori	7236.000	AV	30.0	35.2	4.6	32.4	37.4	53.9	16.5	
Hori	9648.000	AV	30.8	38.1	5.5	32.9	41.5	53.9	12.4	
Hori	24120.000	AV	33.9	38.6	-1.7	31.6	39.2	53.9	14.7	
Vert	57.054	QP	40.7	8.9	7.7	38.4	18.9	40.0	21.1	
Vert	119.820	QP	41.6	12.9	8.6	38.6	24.5	43.5	19.0	
Vert	159.860	QP	39.8	15.4	9.0	38.6	25.6	43.5	17.9	
Vert	479.559	QP	34.4	18.1	11.7	37.8	26.4	46.0	19.6	
Vert	920.047	QP	27.5	22.4	14.4	36.8	27.5	46.0	18.5	
Vert	960.729	QP	34.7	23.1	14.6	36.6	35.8	53.9	18.1	
Vert	2390.000	PK	64.6	26.4	2.2	32.6	60.6	73.9	13.3	
Vert	2399.920	PK	76.4	26.4	2.2	32.6	72.4	-	-	- See 20dBc Data Sheet
Vert	2400.000	PK	76.7	26.4	2.2	32.6	72.7	-	-	- See 20dBc Data Sheet
Vert	4824.000	PK	44.6	30.4	3.8	31.9	46.9	73.9	27.0	
Vert	7236.000	PK	42.6	35.2	4.6	32.4	50.0	73.9	23.9	
Vert	9648.000	PK	43.1	38.1	5.5	32.9	53.8	73.9	20.1	
Vert	24120.000	PK	45.6	38.6	-1.7	31.6	50.9	73.9	23.0	
Vert	2390.000	AV	45.9	26.4	2.2	32.6	41.9	53.9	12.0	
Vert	2399.920	AV	64.2	26.4	2.2	32.6	60.2	-	-	- See 20dBc Data Sheet
Vert	2400.000	AV	64.4	26.4	2.2	32.6	60.4	-	-	- See 20dBc Data Sheet
Vert	4824.000	AV	37.2	30.4	3.8	31.9	39.5	53.9	14.4	
Vert	7236.000	AV	30.0	35.2	4.6	32.4	37.4	53.9	16.5	
Vert	9648.000	AV	30.9	38.1	5.5	32.9	41.6	53.9	12.3	
Vert	24120.000	AV	33.8	38.6	-1.7	31.6	39.1	53.9	14.8	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 32EE0095-HO-01
Date 12/24/2011
Temperature/ Humidity 23 deg. C / 38% RH
Engineer Takumi Shimada
(Above 1GHz)
Mode 11n-20 Tx 2412MHz

20dBc Data Sheet

Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	2412.000	PK	98.1	26.4	2.2	32.6	94.1	-	-	Carrier
Hori	2399.920	PK	66.4	26.4	2.2	32.6	62.4	74.1	11.7	
Hori	2400.000	PK	66.4	26.4	2.2	32.6	62.4	74.1	11.7	
Vert	2412.000	PK	96.9	26.4	2.2	32.6	92.9	-	-	Carrier
Vert	2399.920	PK	65.5	26.4	2.2	32.6	61.5	72.9	11.4	
Vert	2400.000	PK	66.3	26.4	2.2	32.6	62.3	72.9	10.6	

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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.1 and No.3 Semi Anechoic Chamber
Report No. : 32EE0095-HO-01
Date : 12/24/2011 12/25/2011
Temperature/ Humidity : 23 deg. C / 38% RH 23 deg. C / 34% RH
Engineer : Takumi Shimada Hisayoshi Sato
(Above 1GHz) (30-1000MHz)
Mode : 11n-20 Tx 2437MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	56.513	QP	29.2	9.1	7.7	38.4	7.6	40.0	32.4	
Hori	119.820	QP	30.7	12.9	8.6	38.6	13.6	43.5	29.9	
Hori	159.860	QP	31.4	15.4	9.0	38.6	17.2	43.5	26.3	
Hori	479.559	QP	39.0	18.1	11.7	37.8	31.0	46.0	15.0	
Hori	920.047	QP	31.6	22.4	14.4	36.8	31.6	46.0	14.4	
Hori	960.729	QP	35.7	23.1	14.6	36.6	36.8	53.9	17.1	
Hori	4874.000	PK	45.8	30.5	3.8	31.9	48.2	73.9	25.7	
Hori	7311.000	PK	42.0	35.2	4.6	32.4	49.4	73.9	24.5	
Hori	9748.000	PK	43.0	38.3	5.5	32.9	53.9	73.9	20.0	
Hori	24370.000	PK	46.2	38.8	-1.7	31.4	51.9	73.9	22.0	
Hori	4874.000	AV	35.3	30.5	3.8	31.9	37.7	53.9	16.2	
Hori	7311.000	AV	29.9	35.2	4.6	32.4	37.3	53.9	16.6	
Hori	9748.000	AV	30.3	38.3	5.5	32.9	41.2	53.9	12.7	
Hori	24370.000	AV	34.1	38.8	-1.7	31.4	39.8	53.9	14.1	
Vert	57.054	QP	40.8	8.9	7.7	38.4	19.0	40.0	21.0	
Vert	119.820	QP	43.0	12.9	8.6	38.6	25.9	43.5	17.6	
Vert	159.860	QP	40.0	15.4	9.0	38.6	25.8	43.5	17.7	
Vert	479.559	QP	35.6	18.1	11.7	37.8	27.6	46.0	18.4	
Vert	920.047	QP	29.2	22.4	14.4	36.8	29.2	46.0	16.8	
Vert	960.729	QP	33.7	23.1	14.6	36.6	34.8	53.9	19.1	
Vert	4874.000	PK	45.5	30.5	3.8	31.9	47.9	73.9	26.0	
Vert	7311.000	PK	41.8	35.2	4.6	32.4	49.2	73.9	24.7	
Vert	9748.000	PK	42.5	38.3	5.5	32.9	53.4	73.9	20.5	
Vert	24370.000	PK	46.3	38.8	-1.7	31.4	52.0	73.9	21.9	
Vert	4874.000	AV	38.0	30.5	3.8	31.9	40.4	53.9	13.5	
Vert	7311.000	AV	29.9	35.2	4.6	32.4	37.3	53.9	16.6	
Vert	9748.000	AV	31.2	38.3	5.5	32.9	42.1	53.9	11.8	
Vert	24370.000	AV	34.0	38.8	-1.7	31.4	39.7	53.9	14.2	

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).

*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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.1,No.2 and No.3 Semi Anechoic Chamber
Report No. 32EE0095-HO-01
Date 12/14/2011 12/25/2011 12/24/2011
Temperature/ Humidity 20 deg. C / 35% RH 23 deg. C / 34% RH 23 deg. C / 38% RH
Engineer Hironobu Ohnishi Hisayoshi Sato Takumi Shimada
(1-10GHz) (30-1000MHz) (10-26.5GHz)
Mode 11n-20 Tx 2462MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	119.820	QP	31.0	12.9	8.6	38.6	13.9	43.5	29.6	
Hori	159.860	QP	31.1	15.4	9.0	38.6	16.9	43.5	26.6	
Hori	190.160	QP	39.0	16.4	9.3	38.5	26.2	43.5	17.3	
Hori	242.644	QP	39.7	17.4	9.8	38.3	28.6	46.0	17.4	
Hori	479.559	QP	38.8	18.1	11.7	37.8	30.8	46.0	15.2	
Hori	960.729	QP	36.6	23.1	14.6	36.6	37.7	53.9	16.2	
Hori	2483.500	PK	60.7	27.6	2.3	32.6	58.0	73.9	15.9	
Hori	2483.920	PK	59.7	27.6	2.3	32.6	57.0	73.9	16.9	
Hori	4924.000	PK	43.4	31.6	3.9	31.9	47.0	73.9	26.9	
Hori	7386.000	PK	41.1	35.7	4.6	32.4	49.0	73.9	24.9	
Hori	9848.000	PK	42.6	38.6	5.4	32.9	53.7	73.9	20.2	
Hori	24620.000	PK	46.6	38.9	-1.7	31.3	52.5	73.9	21.4	
Hori	2483.500	AV	41.9	27.6	2.3	32.6	39.2	53.9	14.7	
Hori	2483.920	AV	41.6	27.6	2.3	32.6	38.9	53.9	15.0	
Hori	4924.000	AV	35.7	31.6	3.9	31.9	39.3	53.9	14.6	
Hori	7386.000	AV	29.8	35.7	4.6	32.4	37.7	53.9	16.2	
Hori	9848.000	AV	33.0	38.6	5.4	32.9	44.1	53.9	9.8	
Hori	24620.000	AV	33.8	38.9	-1.7	31.3	39.7	53.9	14.2	
Vert	119.820	QP	42.2	12.9	8.6	38.6	25.1	43.5	18.4	
Vert	159.860	QP	39.8	15.4	9.0	38.6	25.6	43.5	17.9	
Vert	190.160	QP	28.0	16.4	9.3	38.5	15.2	43.5	28.3	
Vert	242.103	QP	27.6	17.4	9.8	38.3	16.5	46.0	29.5	
Vert	479.559	QP	36.1	18.1	11.7	37.8	28.1	46.0	17.9	
Vert	960.729	QP	34.0	23.1	14.6	36.6	35.1	53.9	18.8	
Vert	2483.500	PK	60.0	27.6	2.3	32.6	57.3	73.9	16.6	
Vert	2483.920	PK	60.3	27.6	2.3	32.6	57.6	73.9	16.3	
Vert	4924.000	PK	44.2	31.6	3.9	31.9	47.8	73.9	26.1	
Vert	7386.000	PK	42.4	35.7	4.6	32.4	50.3	73.9	23.6	
Vert	9848.000	PK	43.1	38.6	5.4	32.9	54.2	73.9	19.7	
Vert	24620.000	PK	46.5	38.9	-1.7	31.3	52.4	73.9	21.5	
Vert	2483.500	AV	41.4	27.6	2.3	32.6	38.7	53.9	15.2	
Vert	2483.920	AV	41.2	27.6	2.3	32.6	38.5	53.9	15.4	
Vert	4924.000	AV	36.8	31.6	3.9	31.9	40.4	53.9	13.5	
Vert	7386.000	AV	28.5	35.7	4.6	32.4	36.4	53.9	17.5	
Vert	9848.000	AV	32.3	38.6	5.4	32.9	43.4	53.9	10.5	
Vert	24620.000	AV	33.8	38.9	-1.7	31.3	39.7	53.9	14.2	

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).

*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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.1 and No.3 Semi Anechoic Chamber
Report No. 32EE0095-HO-01
Date 12/24/2011 12/25/2011
Temperature/ Humidity 23 deg. C / 38% RH 23 deg. C / 34% RH
Engineer Takumi Shimada Hisayoshi Sato
(Above 1GHz) (30-1000MHz)
Mode 11b Rx 2437MHz

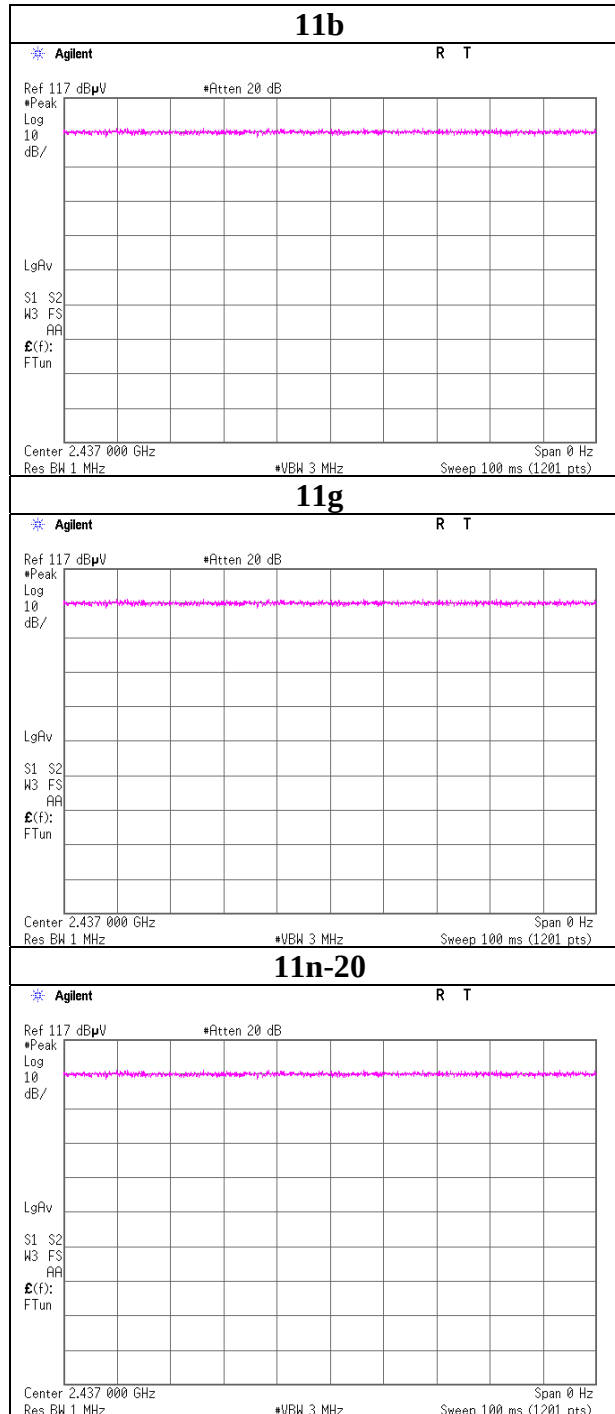
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	119.820	QP	29.9	12.9	8.6	38.6	12.8	43.5	30.7	
Hori	159.860	QP	34.4	15.4	9.0	38.6	20.2	43.5	23.3	
Hori	279.979	QP	29.9	19.1	10.2	38.3	20.9	46.0	25.1	
Hori	479.559	QP	38.2	18.1	11.7	37.8	30.2	46.0	15.8	
Hori	880.768	QP	30.9	22.1	14.2	37.0	30.2	46.0	15.8	
Hori	960.729	QP	36.2	23.1	14.6	36.6	37.3	53.9	16.6	
Hori	2437.000	PK	42.6	26.4	2.2	32.6	38.6	73.9	35.3	
Hori	4874.000	PK	45.0	30.5	3.2	31.9	46.8	73.9	27.1	
Hori	2437.000	AV	30.0	26.4	2.2	32.6	26.0	53.9	27.9	
Hori	4874.000	AV	38.4	30.5	3.2	31.9	40.2	53.9	13.7	
Vert	119.820	QP	40.8	12.9	8.6	38.6	23.7	43.5	19.8	
Vert	159.860	QP	43.2	15.4	9.0	38.6	29.0	43.5	14.5	
Vert	279.979	QP	35.1	19.1	10.2	38.3	26.1	46.0	19.9	
Vert	479.559	QP	33.4	18.1	11.7	37.8	25.4	46.0	20.6	
Vert	877.962	QP	29.2	22.1	14.1	37.0	28.4	46.0	17.6	
Vert	960.729	QP	35.7	23.1	14.6	36.6	36.8	53.9	17.1	
Vert	2437.000	PK	41.7	26.4	2.2	32.6	37.7	73.9	36.2	
Vert	4874.000	PK	45.4	30.5	3.2	31.9	47.2	73.9	26.7	
Vert	2437.000	AV	29.7	26.4	2.2	32.6	25.7	53.9	28.2	
Vert	4874.000	AV	37.9	30.5	3.2	31.9	39.7	53.9	14.2	

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).

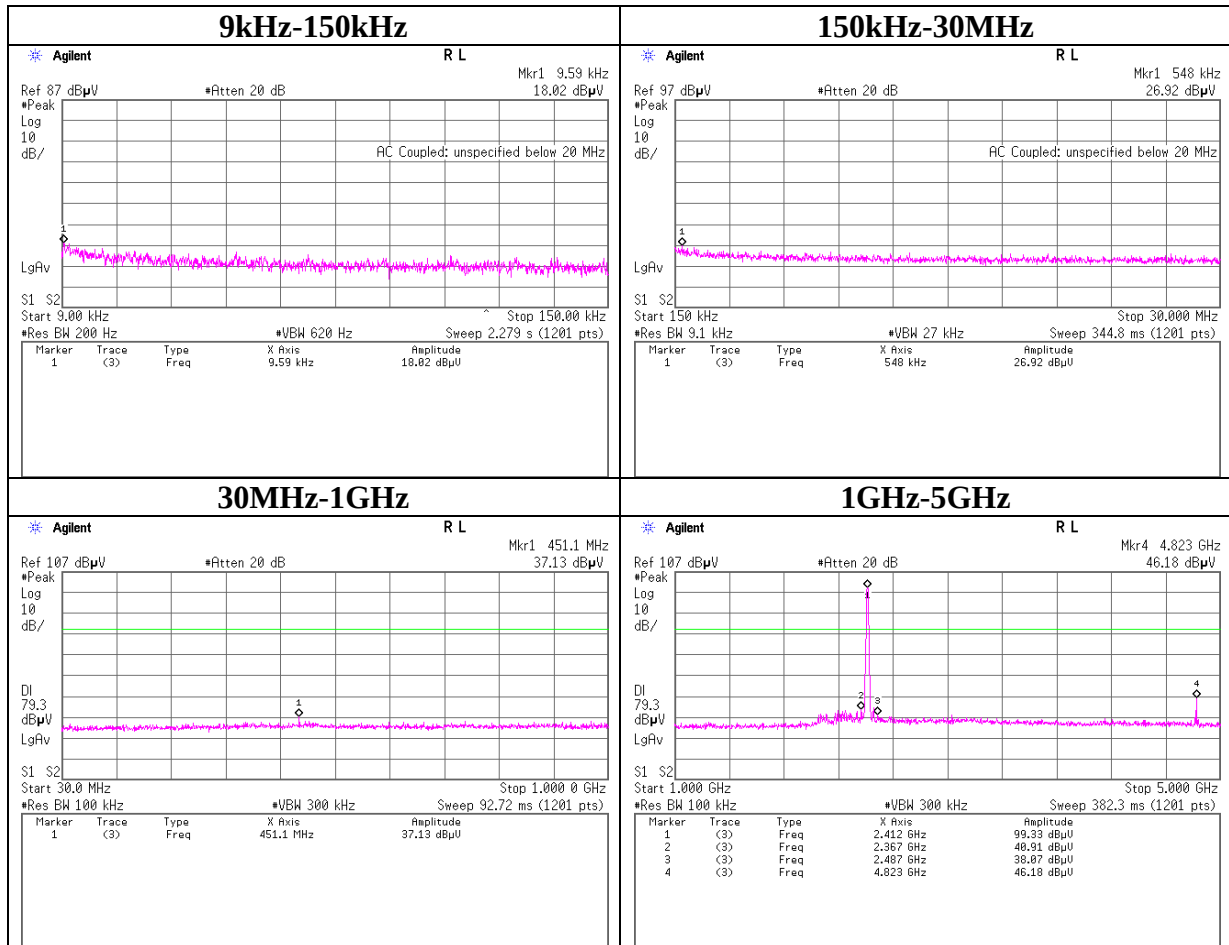
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

The tested burst timing



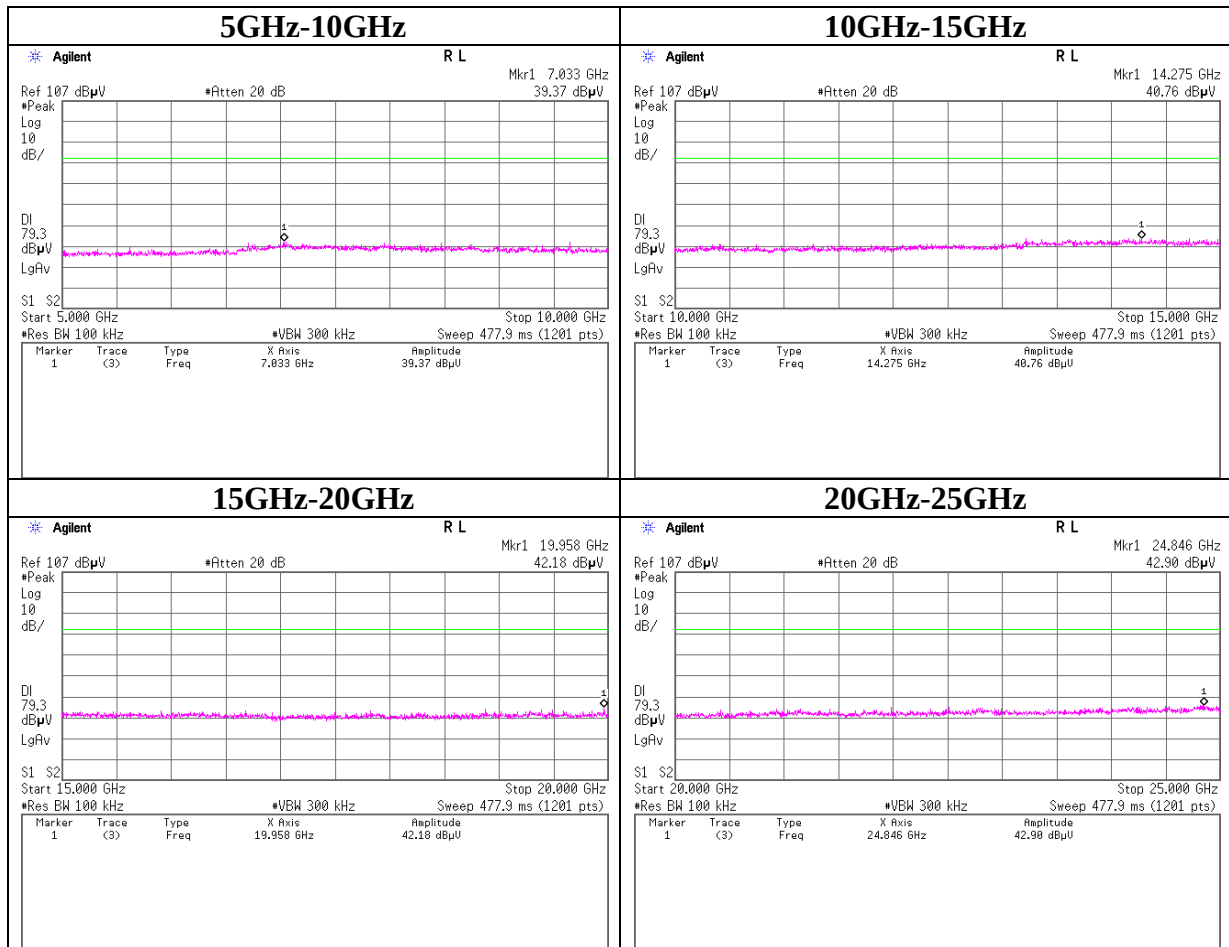
Conducted Spurious Emission

11b Tx 2412MHz



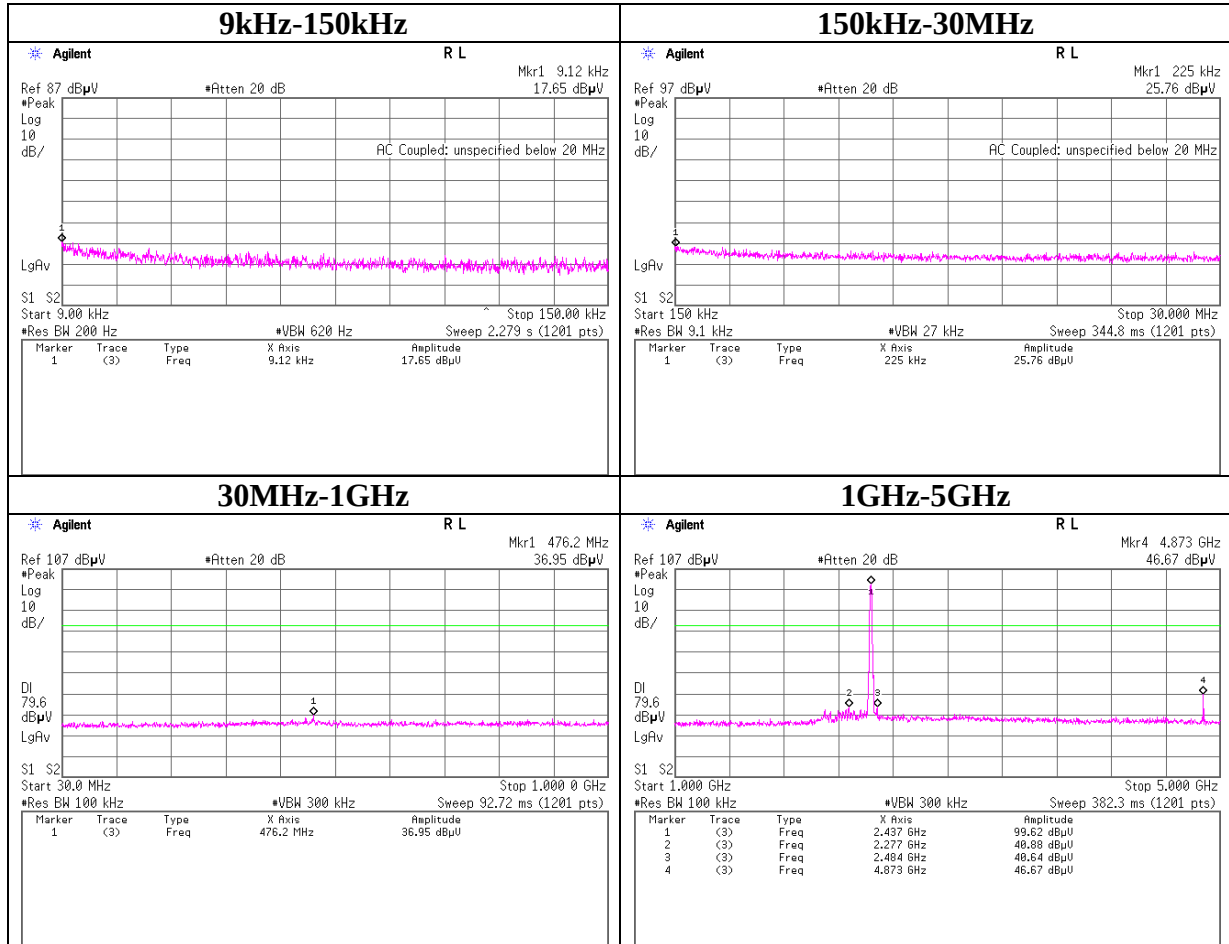
Conducted Spurious Emission

11b Tx 2412MHz



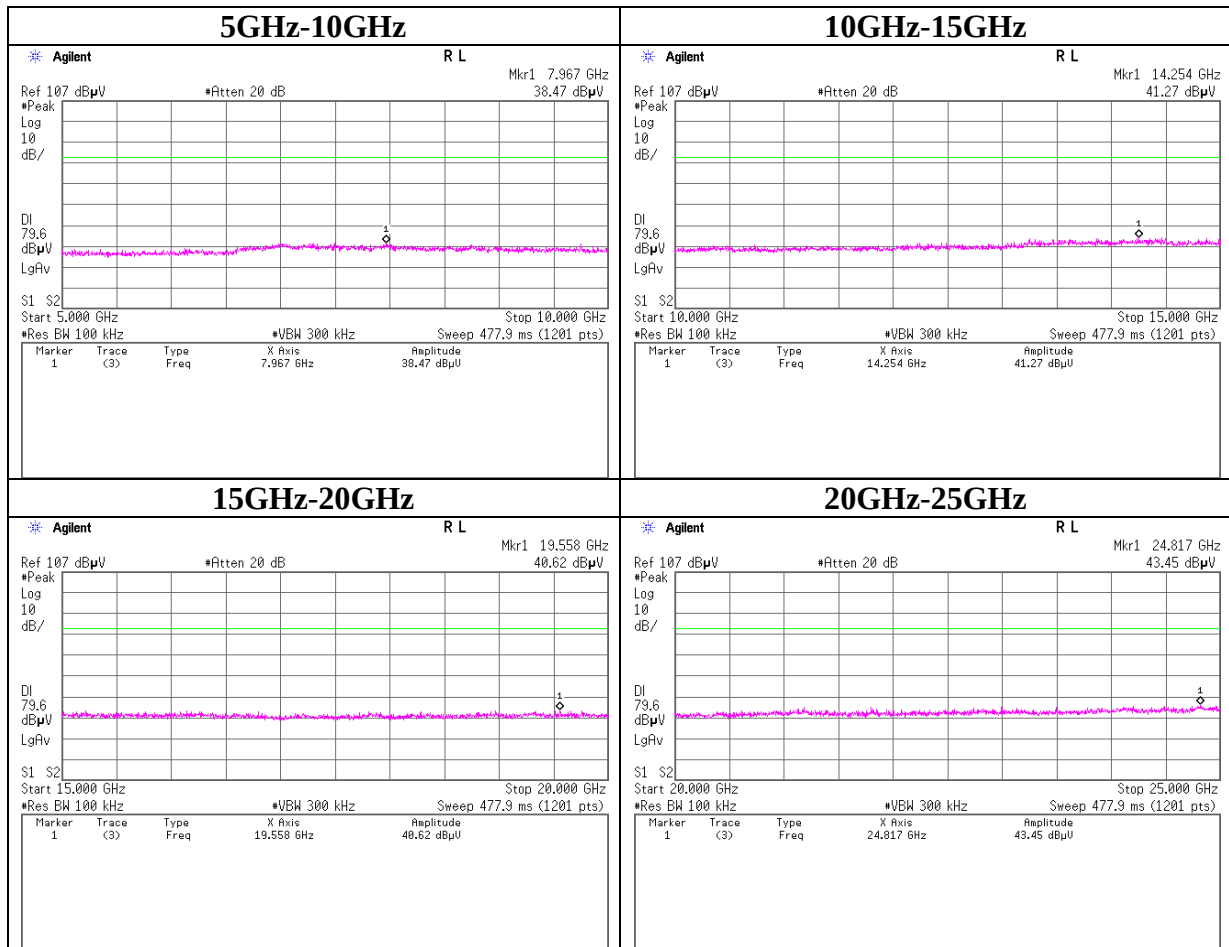
Conducted Spurious Emission

11b Tx 2437MHz



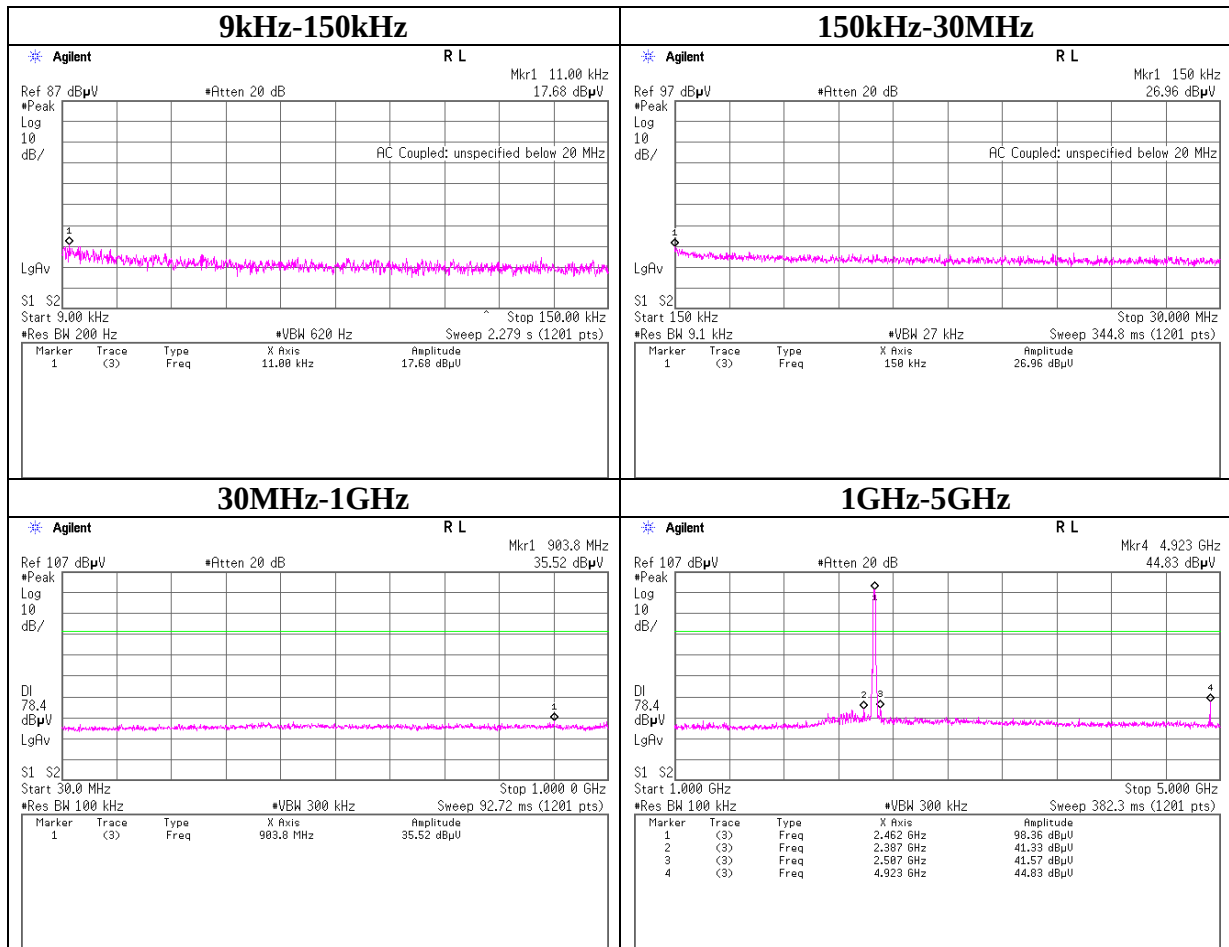
Conducted Spurious Emission

11b Tx 2437MHz



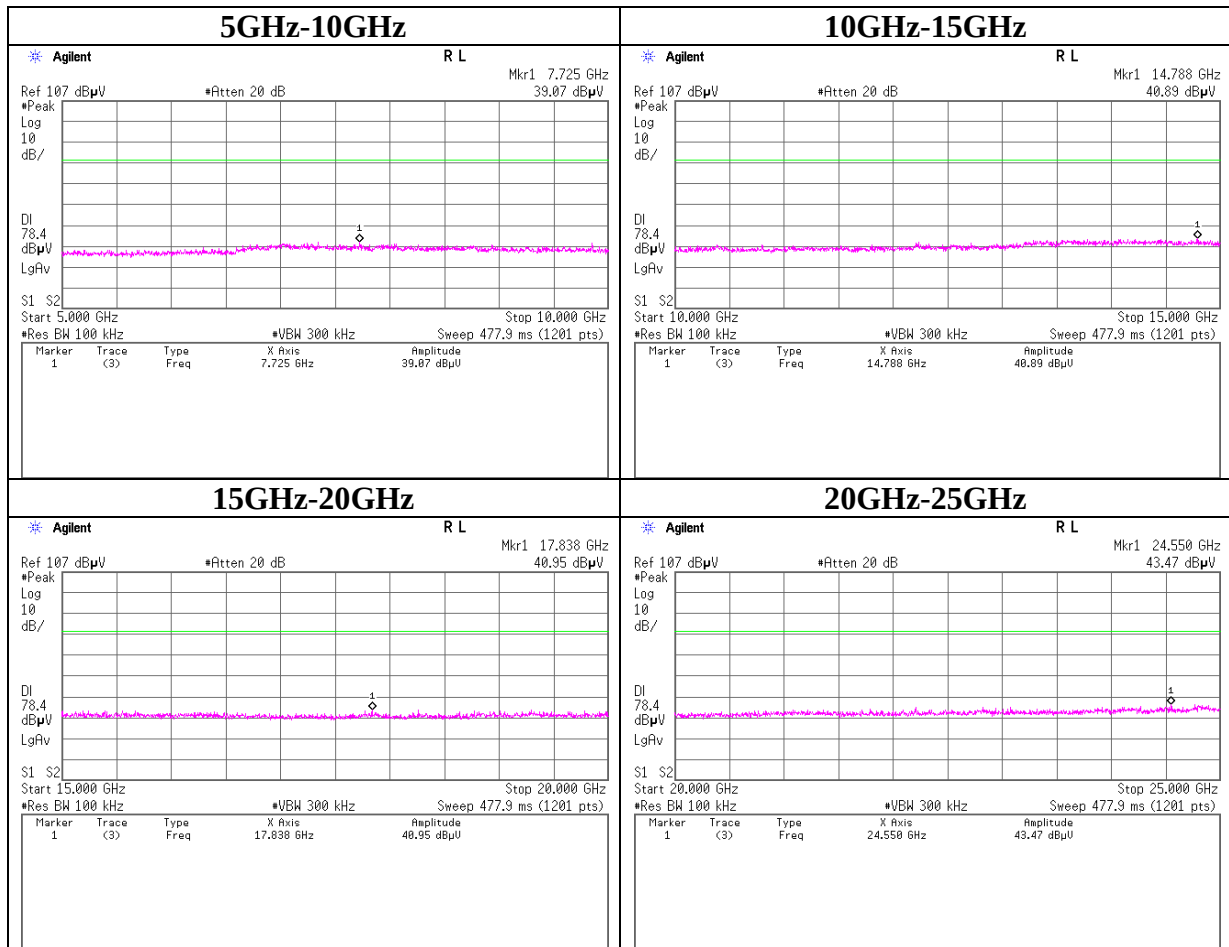
Conducted Spurious Emission

11b Tx 2462MHz



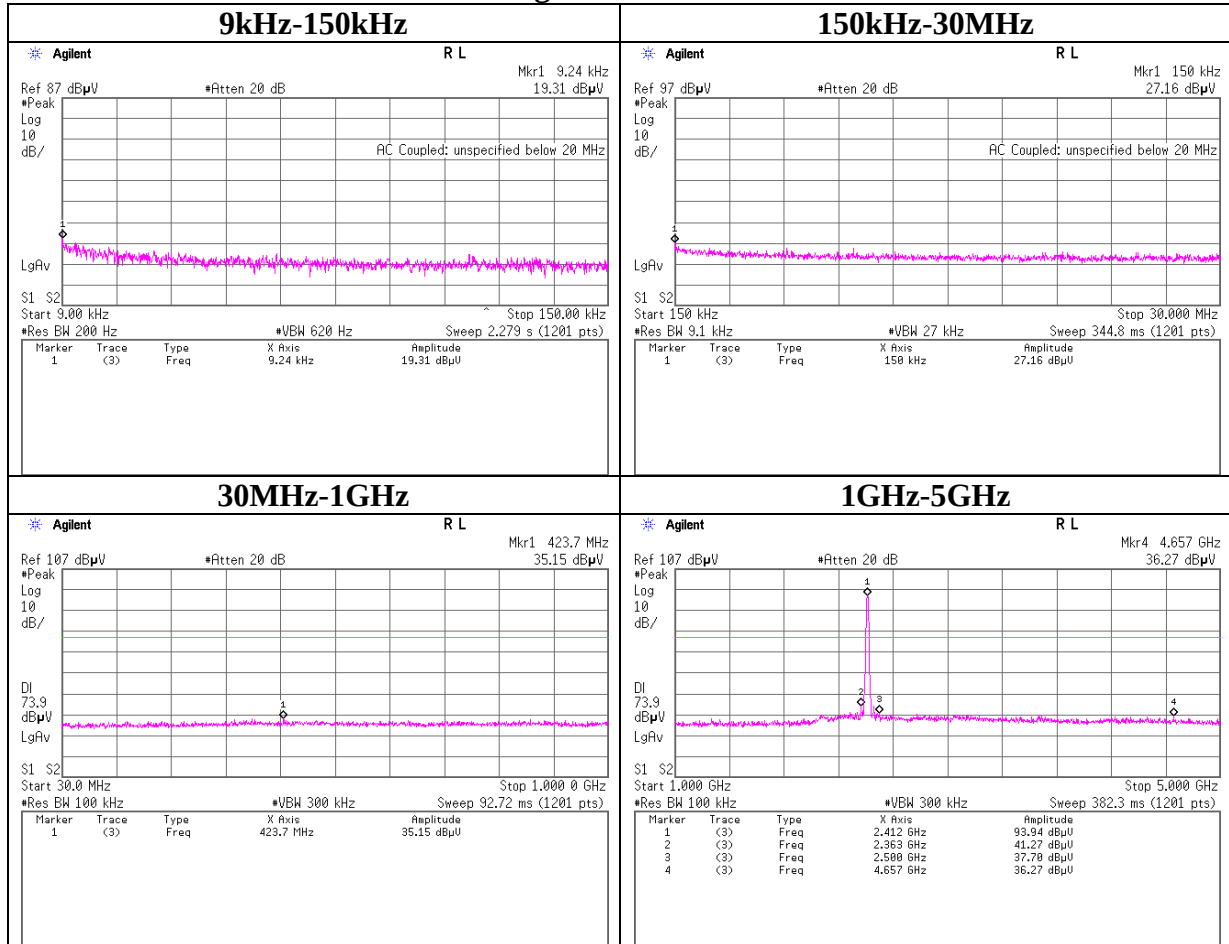
Conducted Spurious Emission

11b Tx 2462MHz



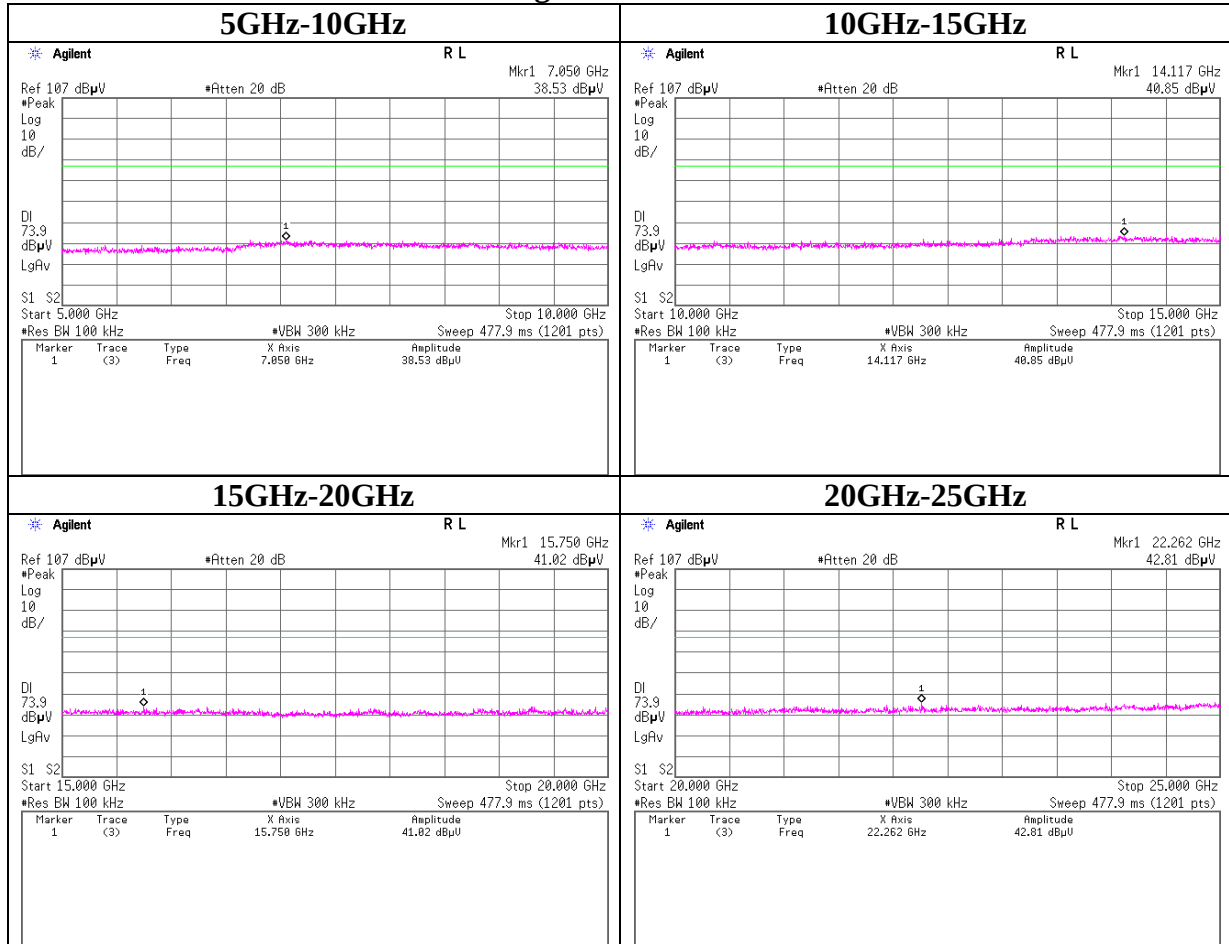
Conducted Spurious Emission

11g Tx 2412MHz



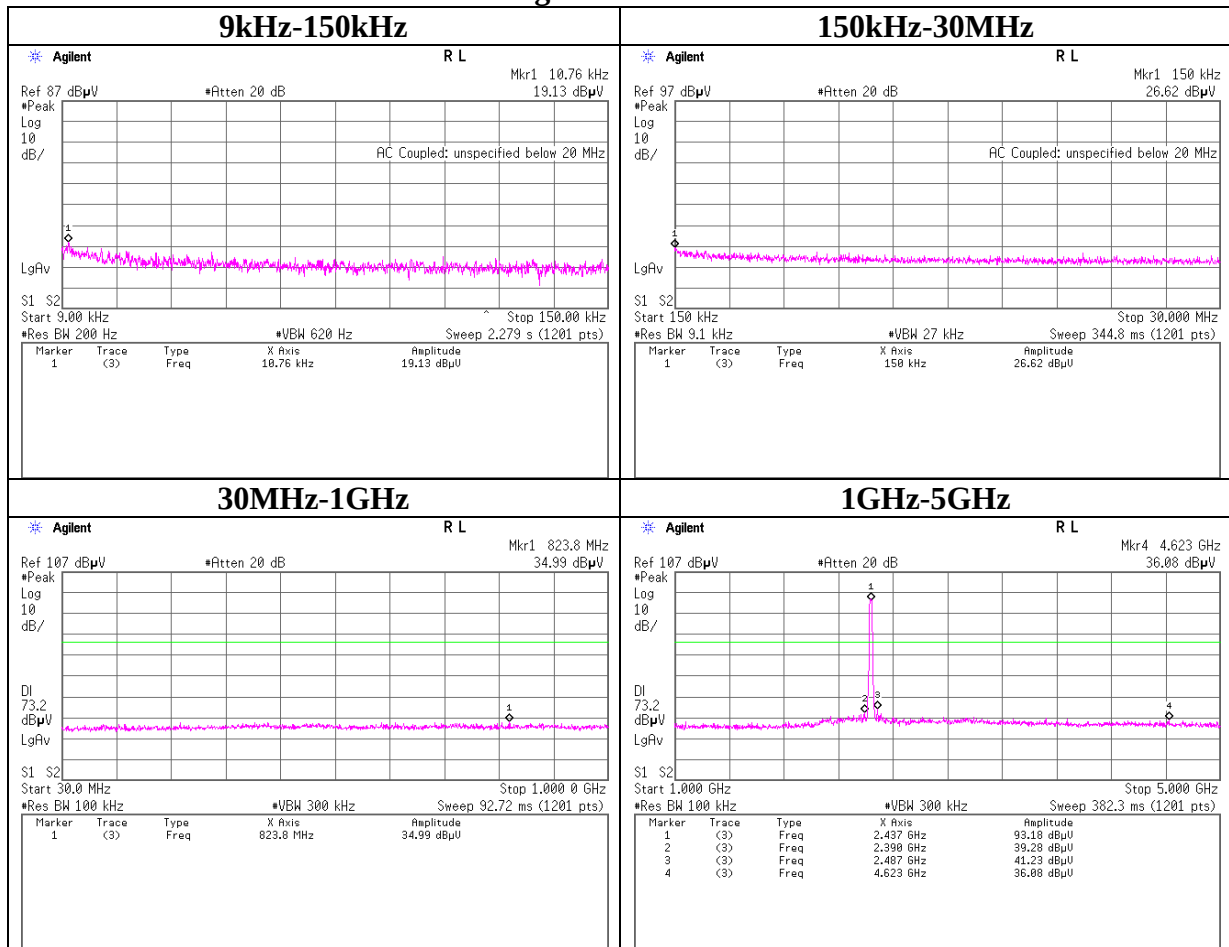
Conducted Spurious Emission

11g Tx 2412MHz



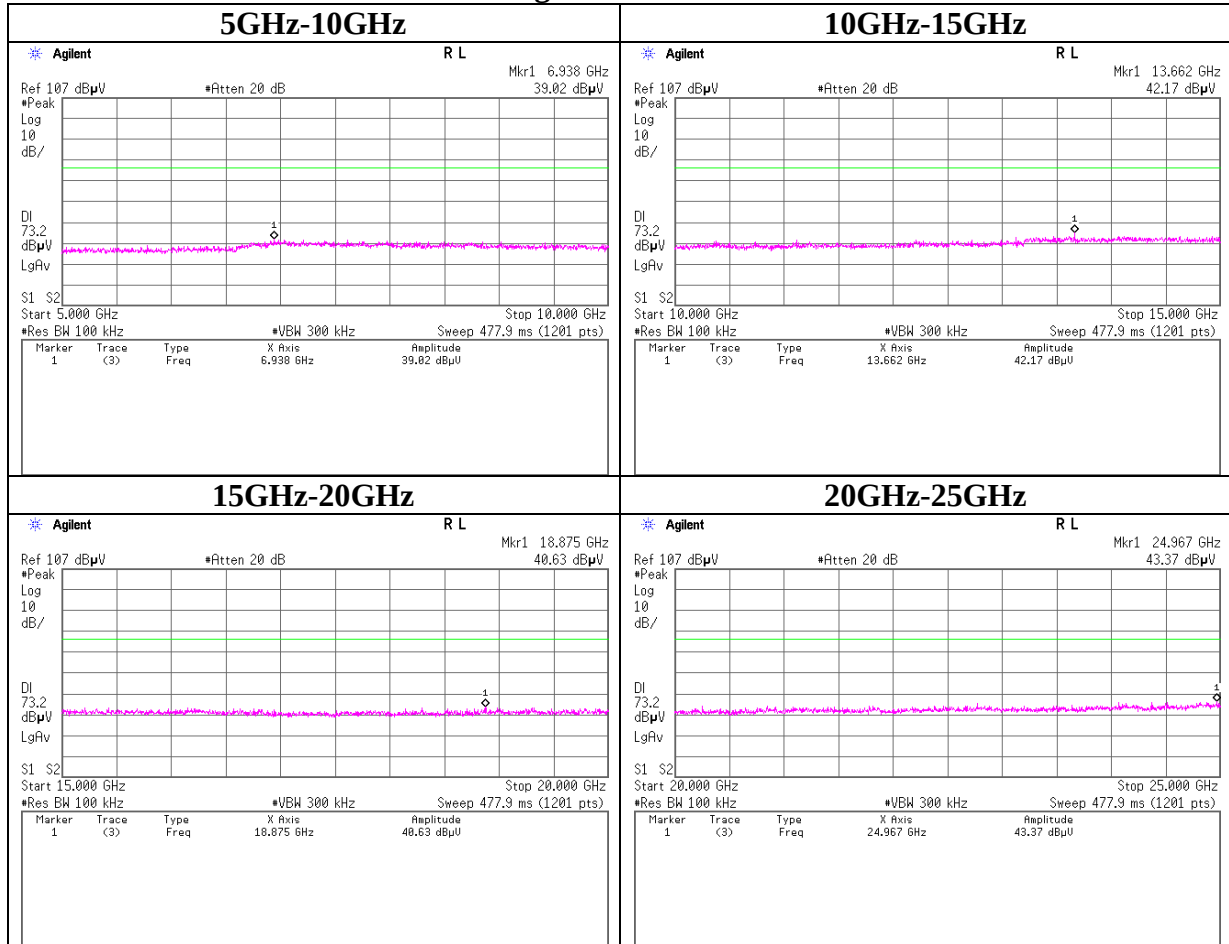
Conducted Spurious Emission

11g Tx 2437MHz



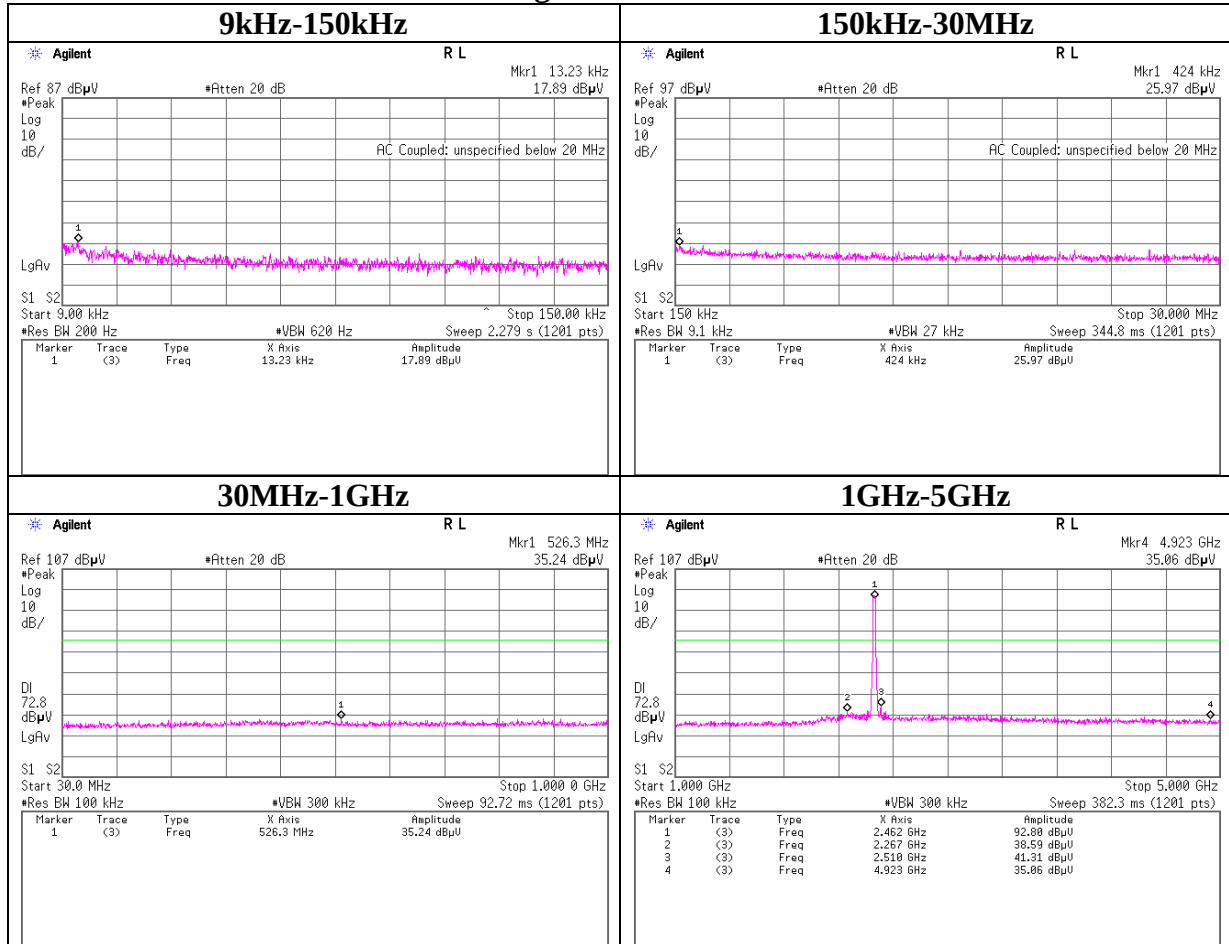
Conducted Spurious Emission

11g Tx 2437MHz



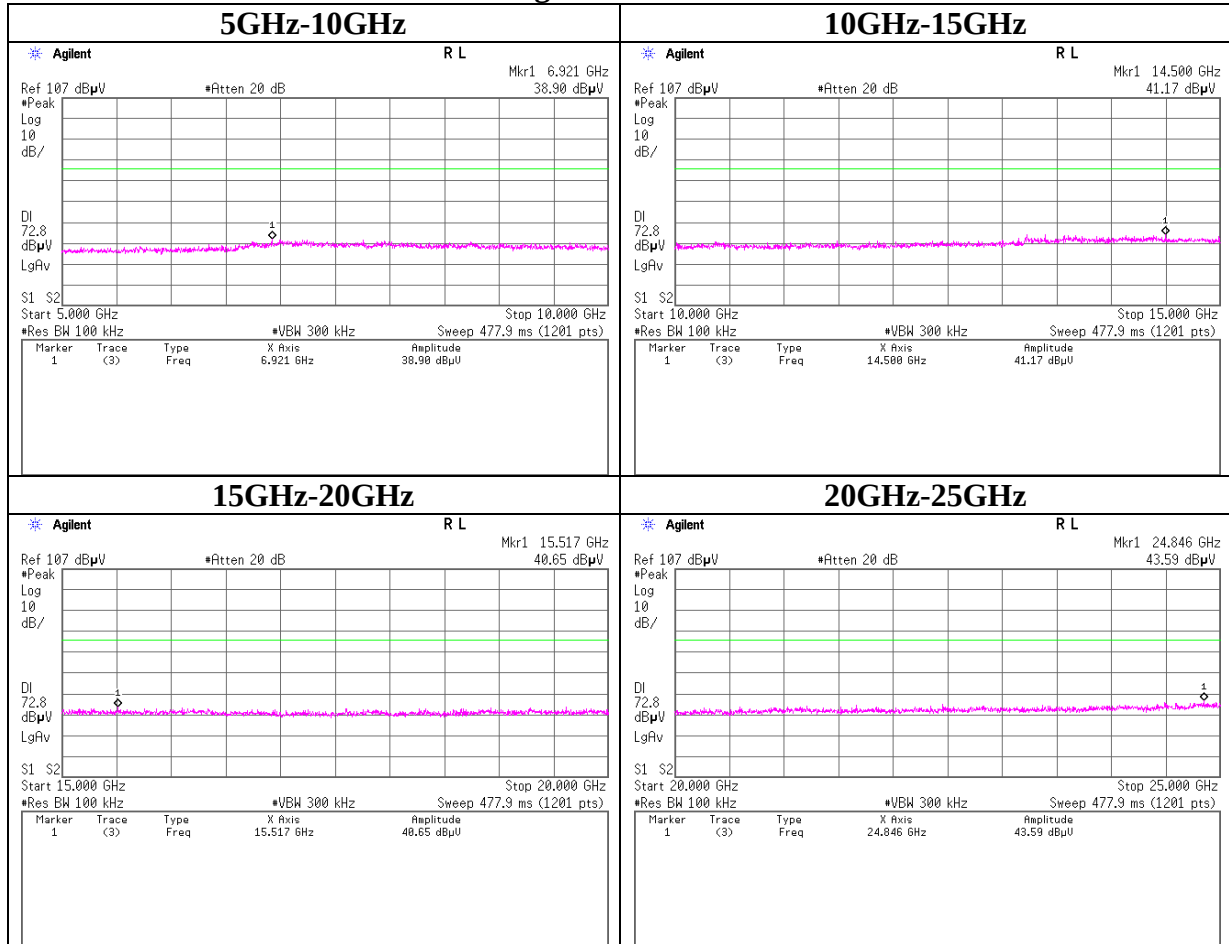
Conducted Spurious Emission

11g Tx 2462MHz



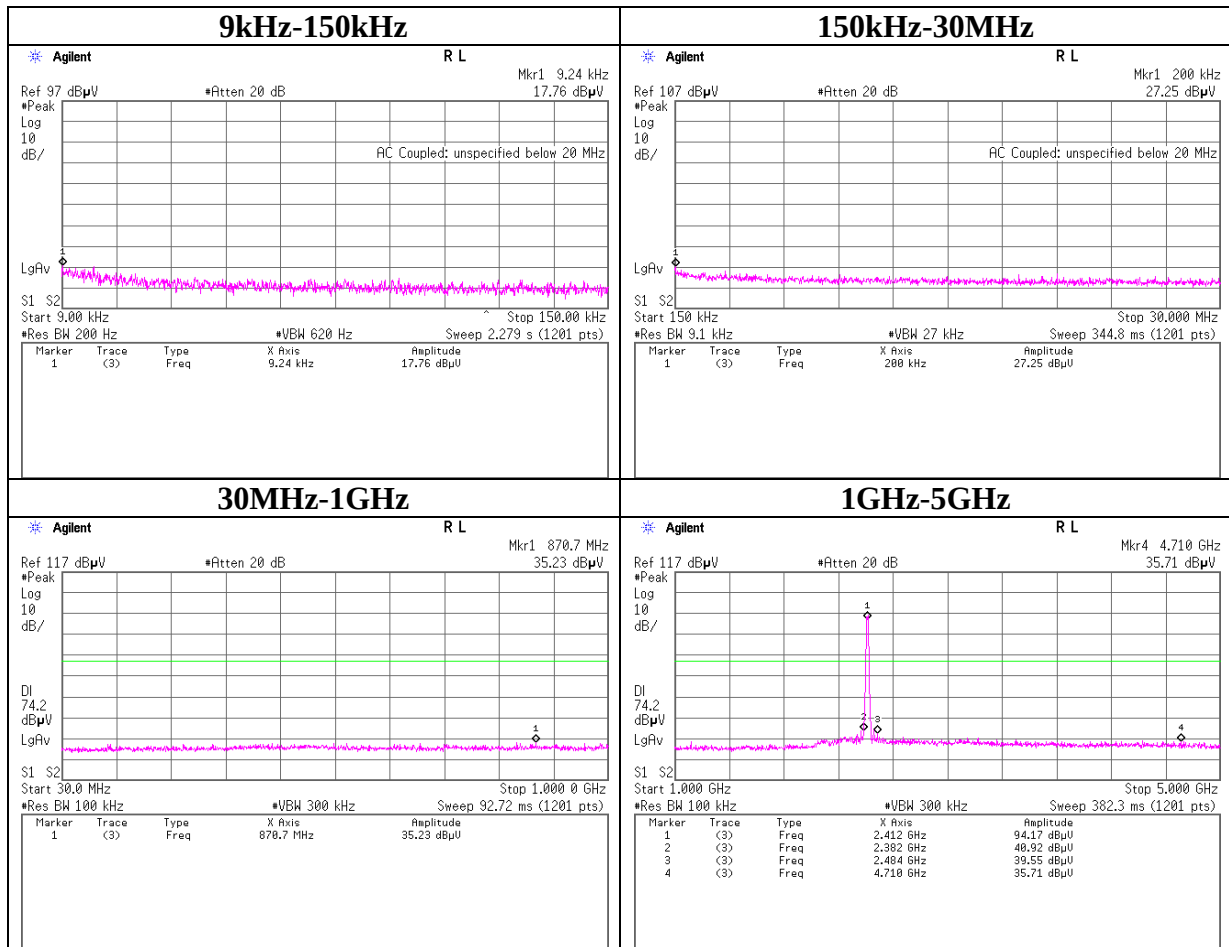
Conducted Spurious Emission

11g Tx 2462MHz



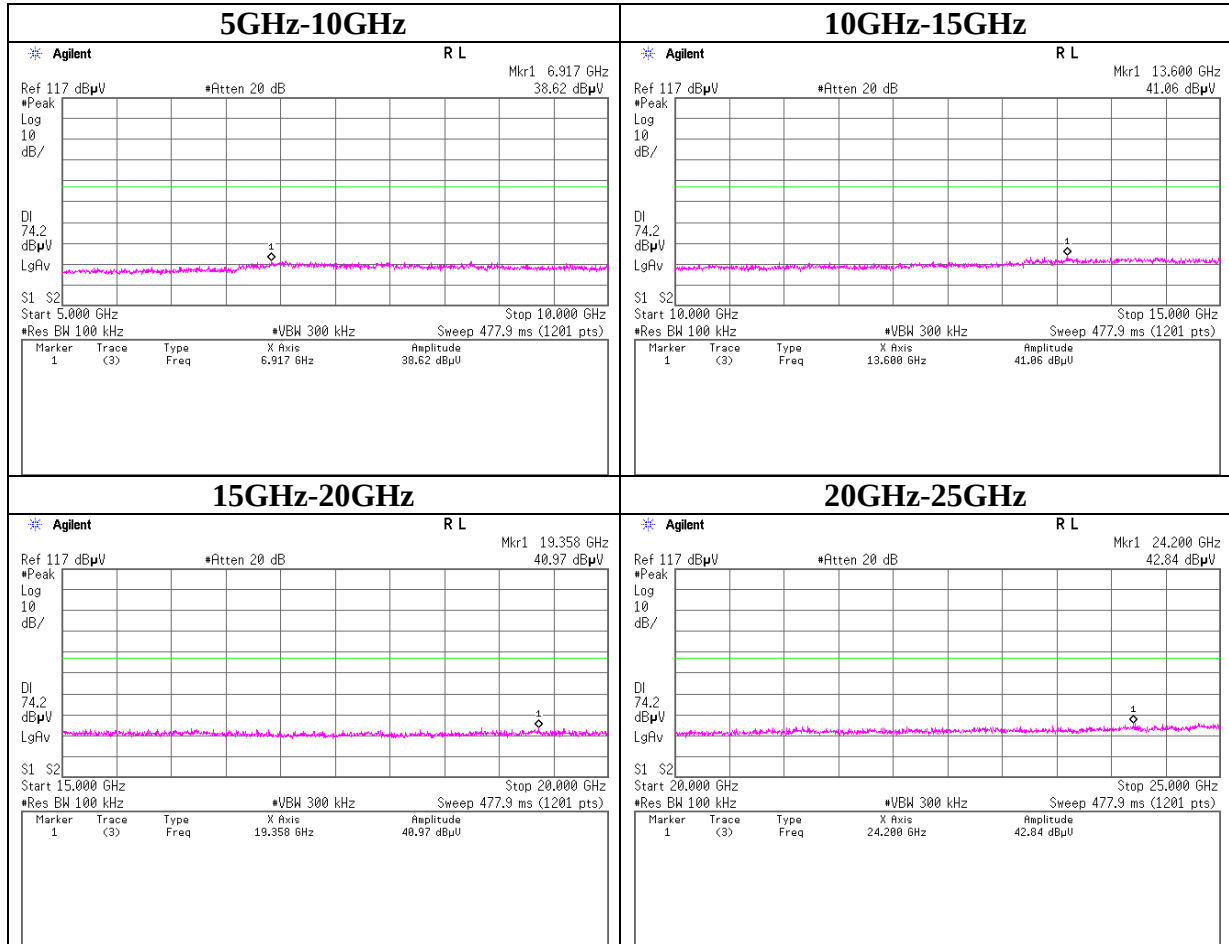
Conducted Spurious Emission

11n-20 Tx 2412MHz



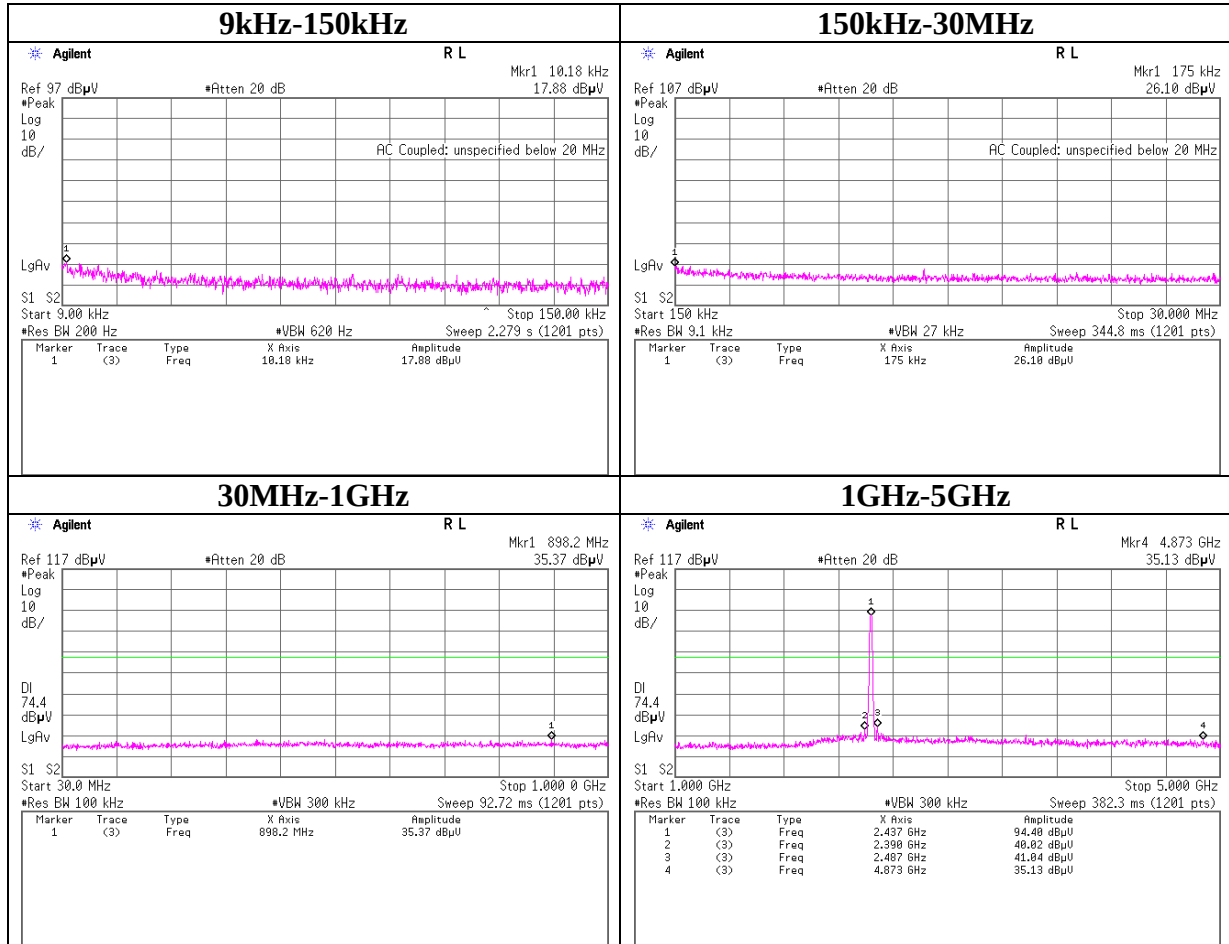
Conducted Spurious Emission

11n-20 Tx 2412MHz



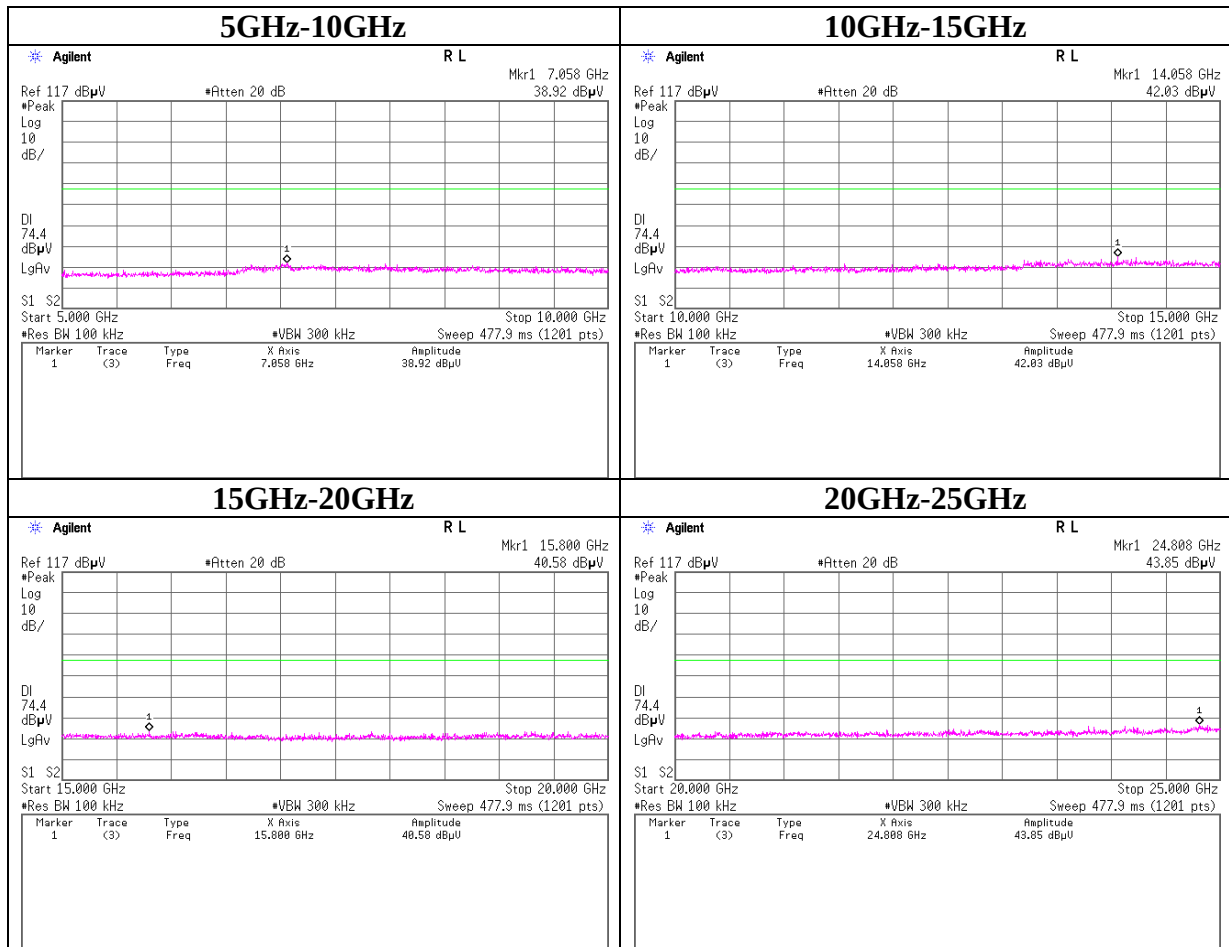
Conducted Spurious Emission

11n-20 Tx 2437MHz



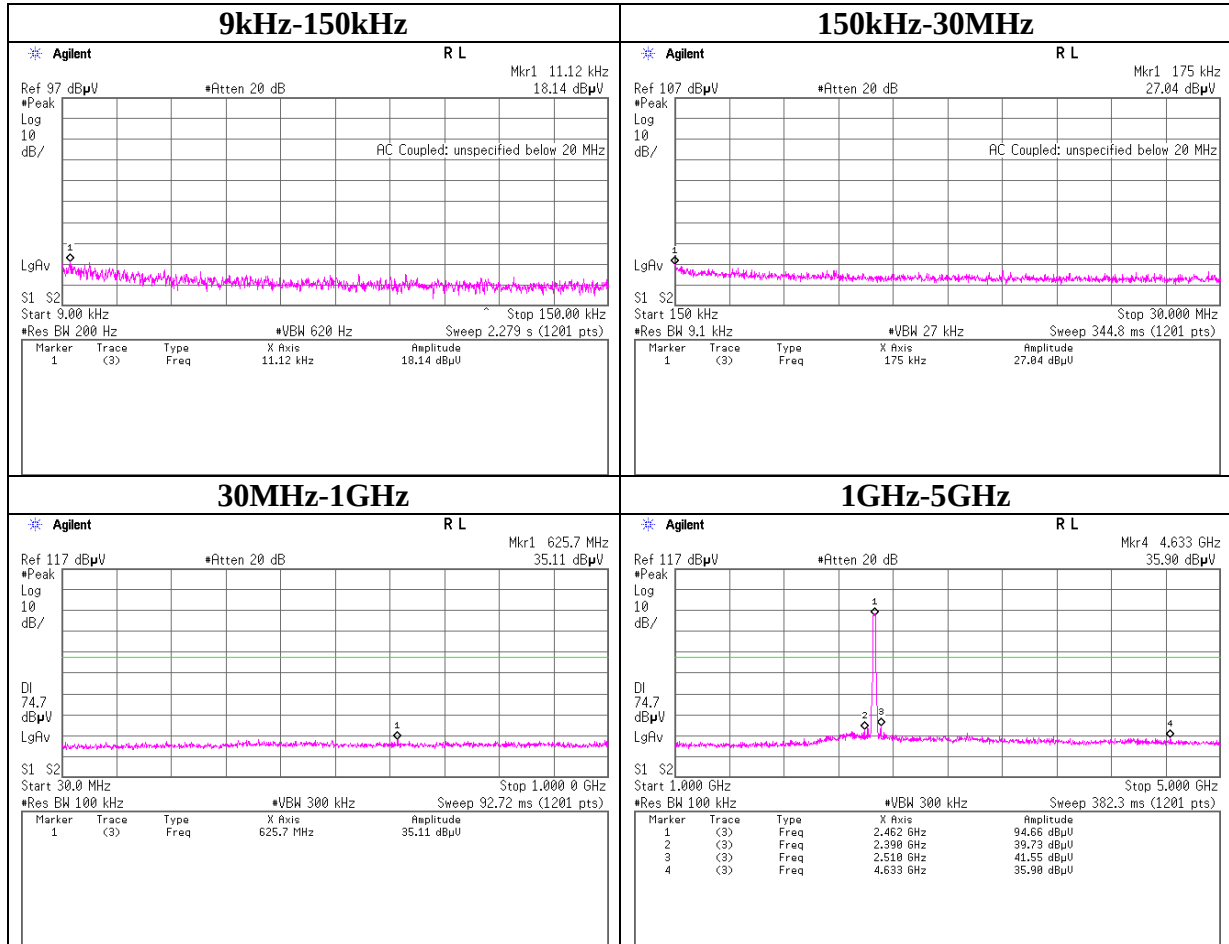
Conducted Spurious Emission

11n-20 Tx 2437MHz



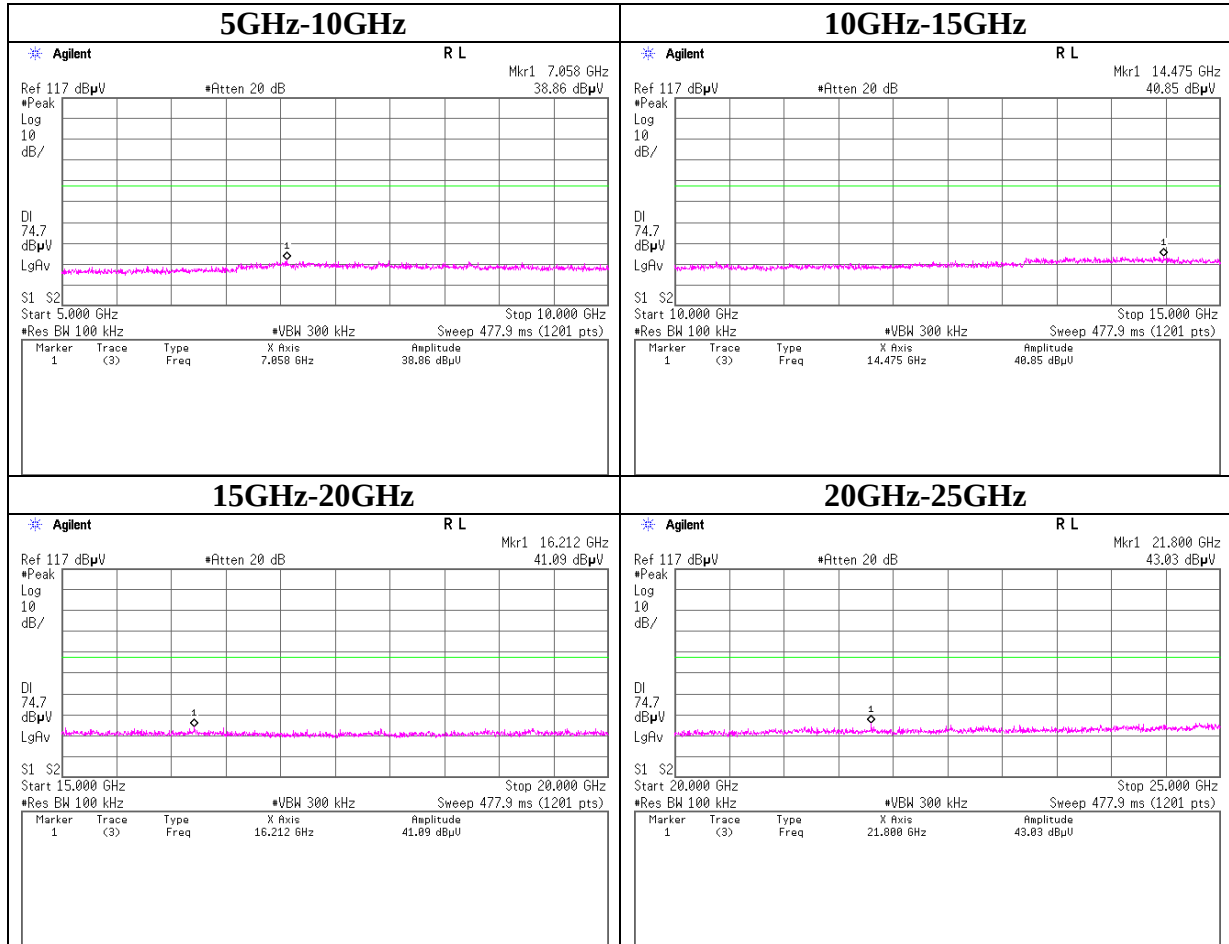
Conducted Spurious Emission

11n-20 Tx 2462MHz



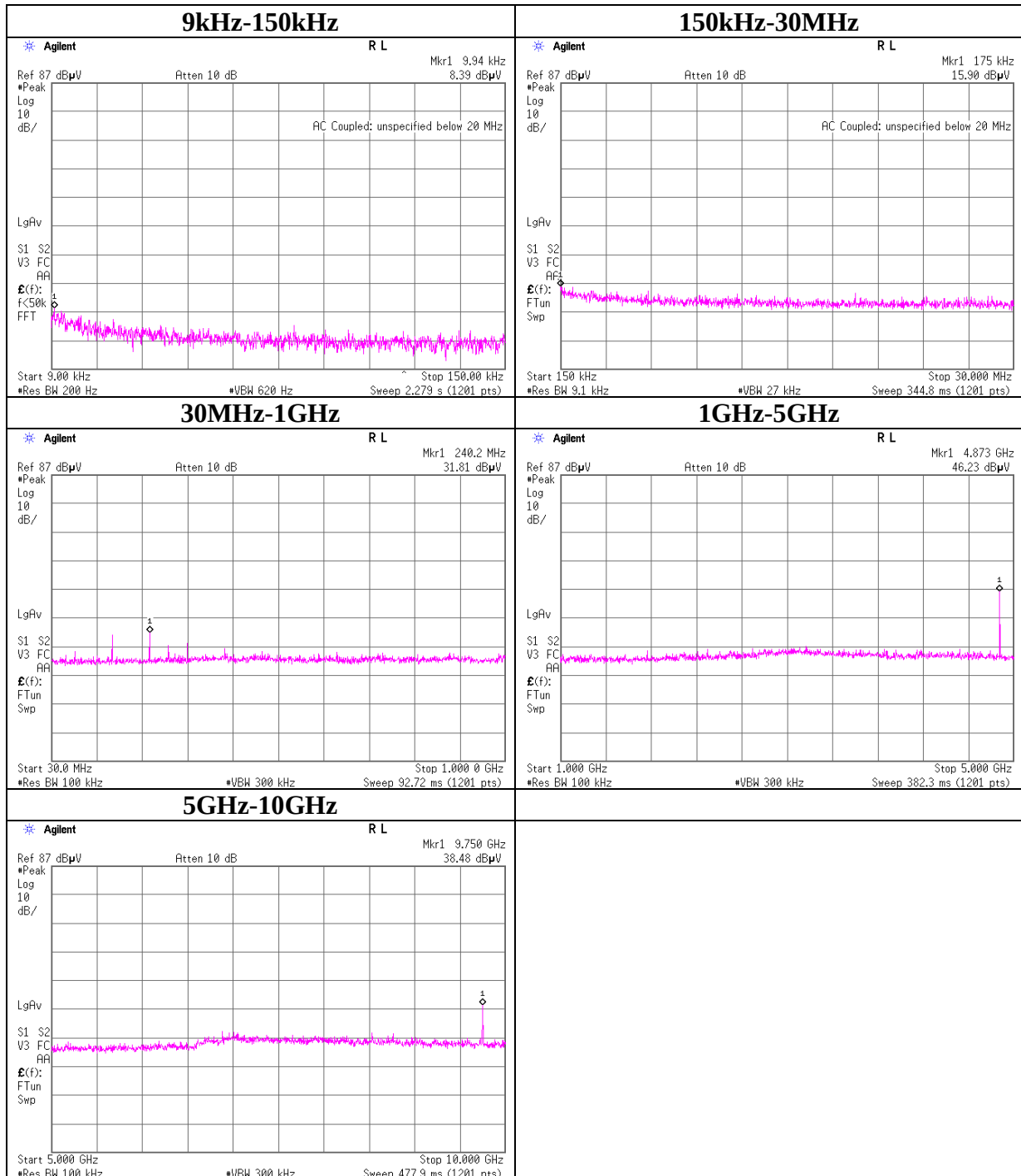
Conducted Spurious Emission

11n-20 Tx 2462MHz



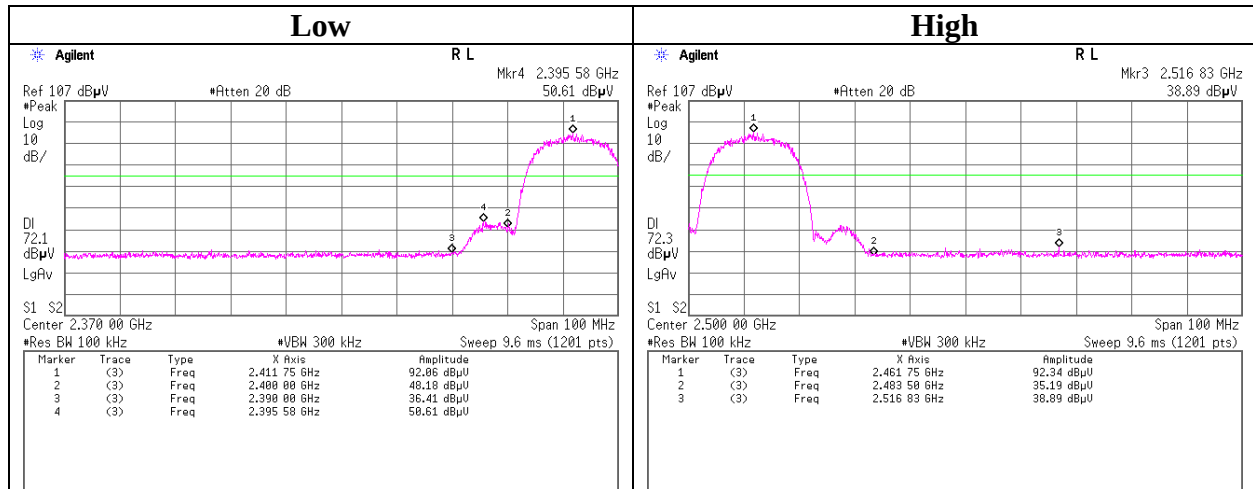
Conducted Spurious Emission

11b Rx 2437MHz

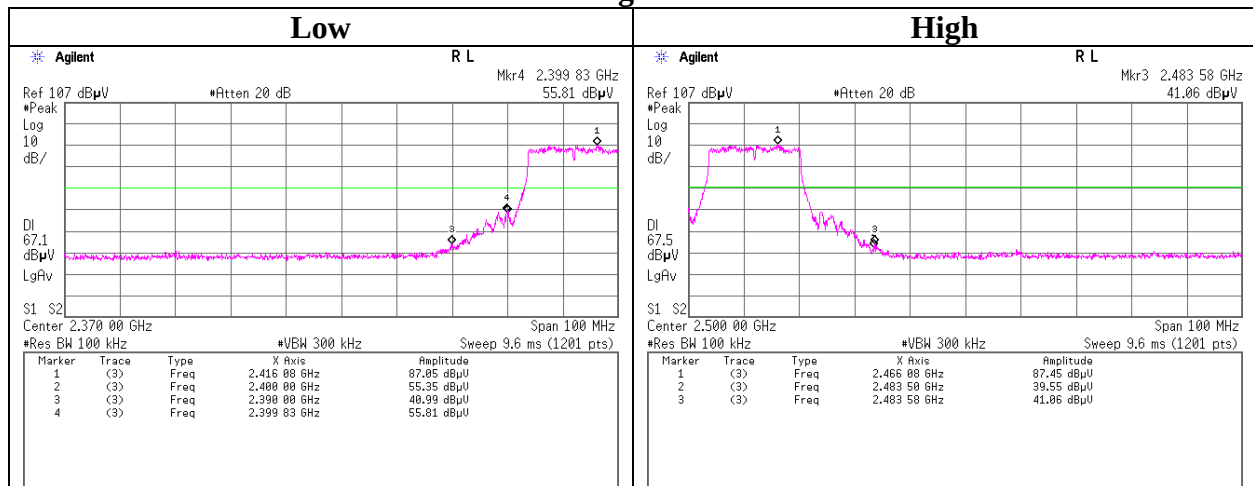


Conducted Emission Band Edge compliance

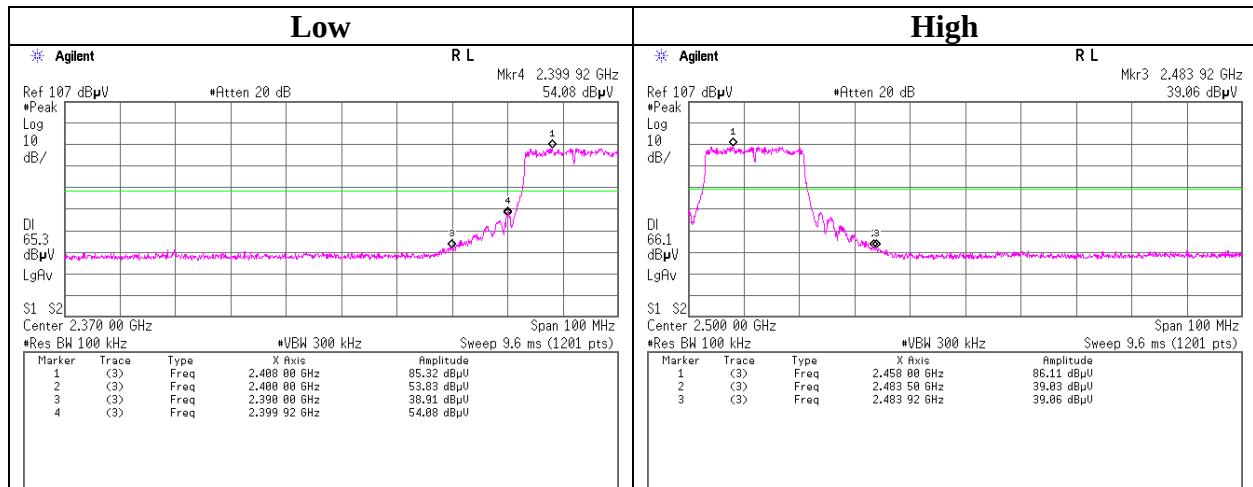
11b Tx



11g Tx



11n-20 Tx



Power Density

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32EE0095-HO-01
Date 12/16/2011
Temperature/ Humidity 25 deg. C / 48% RH
Engineer Takumi Shimada
Mode 11b, 11g, 11n-20 Tx

11b

Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-9.31	0.40	9.96	1.05	8.00	6.95
2437.00	-8.84	0.40	9.96	1.52	8.00	6.48
2462.00	-9.48	0.40	9.96	0.88	8.00	7.12

11g

Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-14.57	0.40	9.96	-4.21	8.00	12.21
2437.00	-14.31	0.40	9.96	-3.95	8.00	11.95
2462.00	-14.47	0.40	9.96	-4.11	8.00	12.11

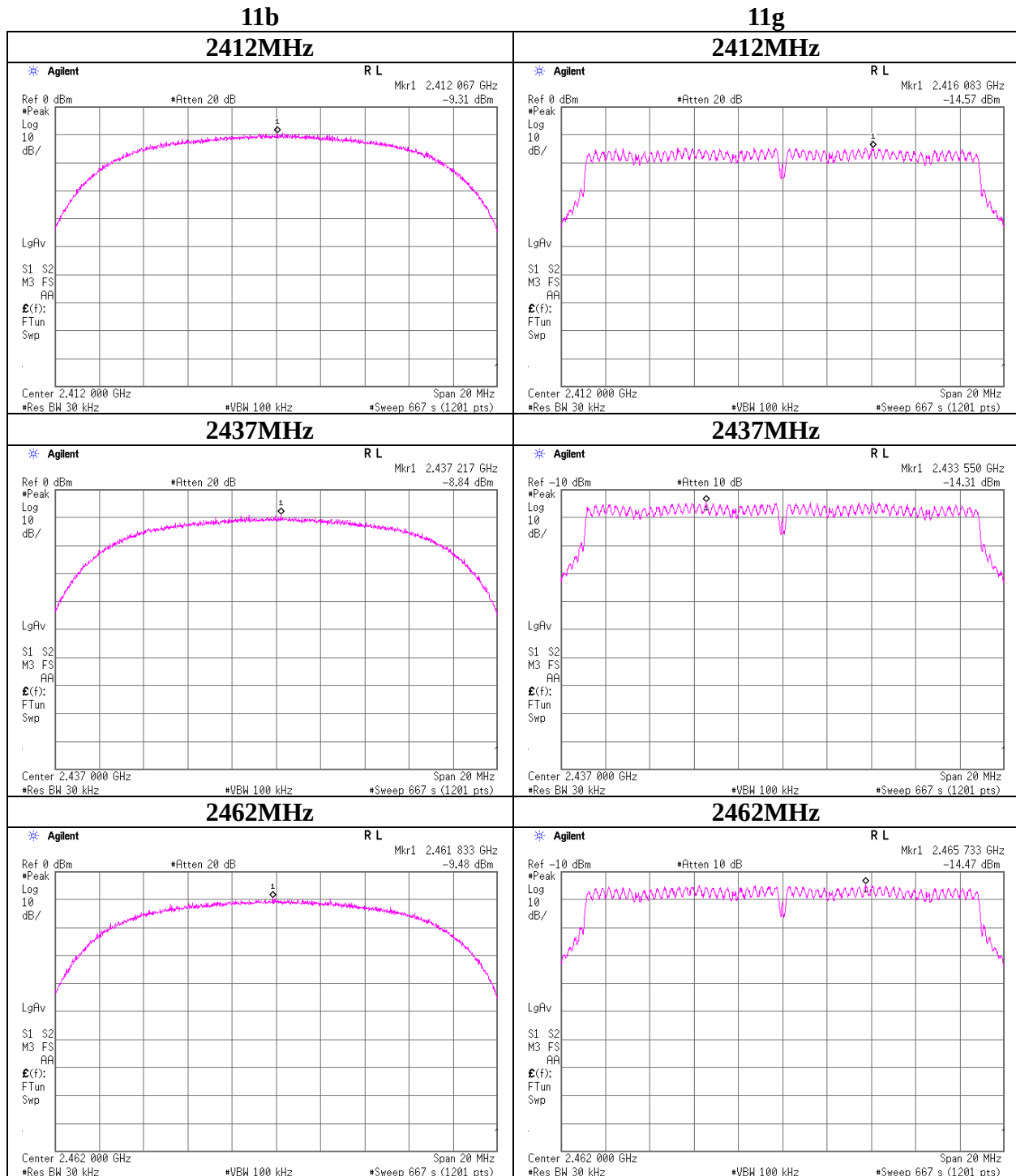
11n-20

Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-13.03	0.40	9.96	-2.67	8.00	10.67
2437.00	-12.62	0.40	9.96	-2.26	8.00	10.26
2462.00	-13.44	0.40	9.96	-3.08	8.00	11.08

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

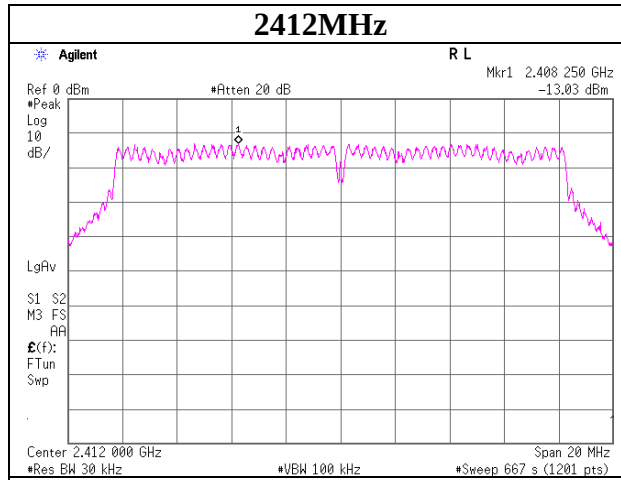
Power Density



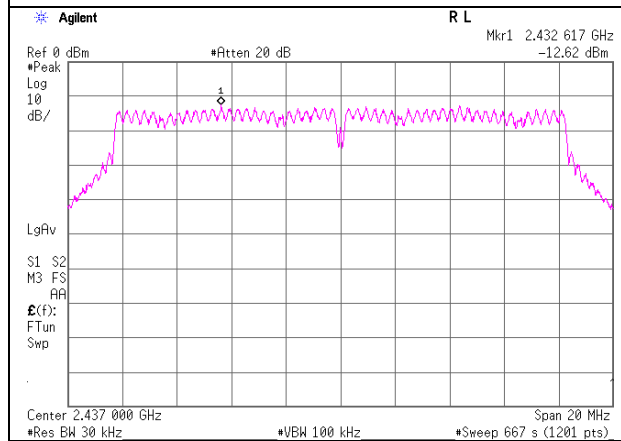
Power Density

11n-20

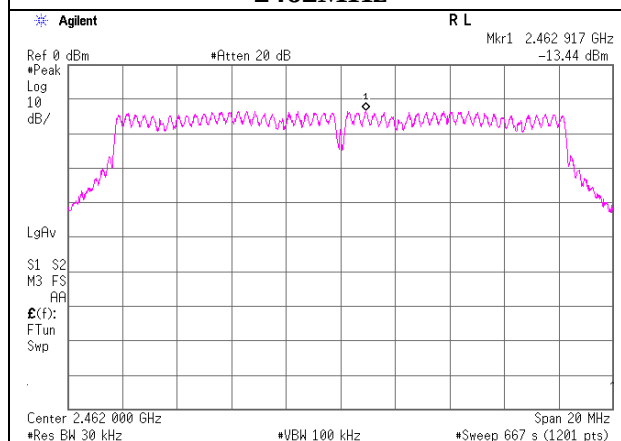
2412MHz



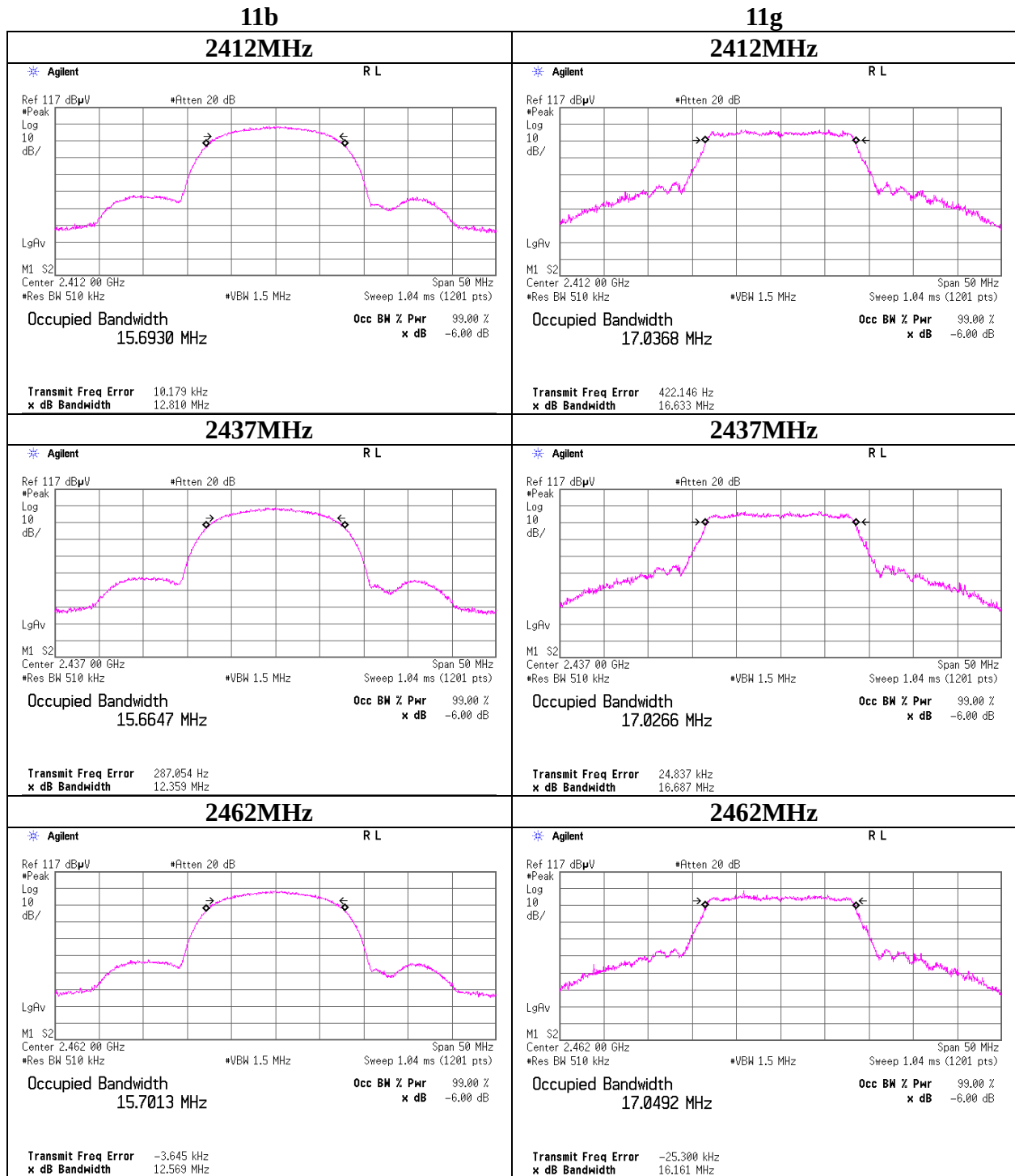
2437MHz



2462MHz



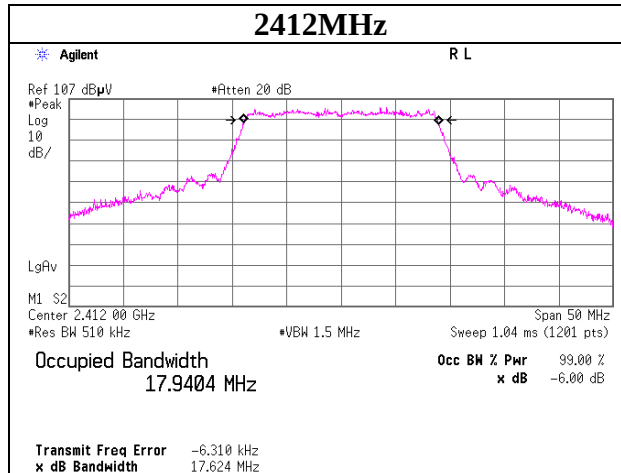
99%Occupied Bandwidth



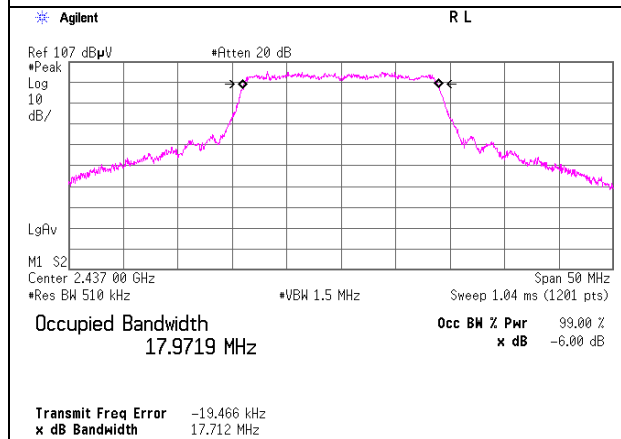
99% Occupied Bandwidth

11n-20

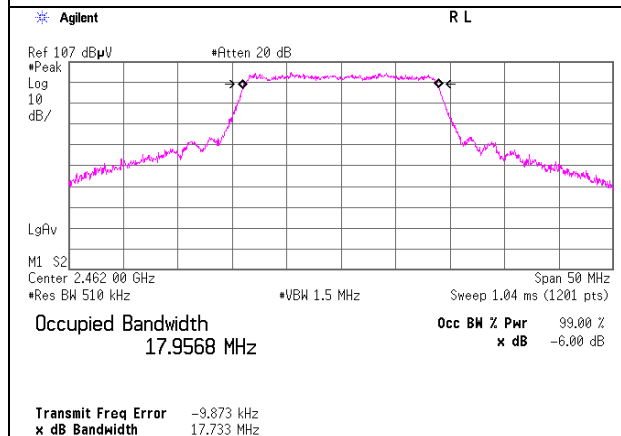
2412MHz



2437MHz



2462MHz



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2011/09/12 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2011/09/12 * 12
MAT-24	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71389	AT	2011/06/23 * 12
MAT-40	Attenuator(20dB)1-40GHz	Weinschel	54A-20	S8132	RE	2011/10/04 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2011/06/21 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2011/02/23 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE, CE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2011/04/08 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2011/01/16 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2011/03/10 * 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	2011/05/16 * 12
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT	2011/06/30 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2011/02/22 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2011/02/23 * 12
MJM-06	Measure	PROMART	SEN1955	-	RE	
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
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2011/05/23 * 12
MAEC-01	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	RE,CE	2011/07/10 * 12
MOS-01	Digital Humidity Indicator	N.T	NT-1800	MOS01	RE,CE	2011/02/23 * 12
MJM-01	Measure	KDS	ES19-55	-	RE,CE	-
MTR-01	Test Receiver	Rohde & Schwarz	ES140	100084	RE,CE	2010/12/07 * 12
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	8127383	CE(EUT)	2011/07/11 * 12
MTA-30	Terminator	TME	CT-01	-	CE	2011/01/05 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/3D-2W(7.5m)/RG400u(1.5m)/RFM-E421(Switcher)	-/01068(Switcher)	CE	2011/01/16 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2011/02/22 * 12
KBA-05	Biconical Antenna	Schwarzbeck	BBA9106	2513	RE	2011/11/23 * 12
KLA-04	Logperiodic Antenna	Schwarzbeck	USLP9143	361	RE	2011/11/23 * 12
MAT-08	Attenuator(6dB)	Weinschel Corp	2	BK7971	RE	2011/11/02 * 12
MCC-02	Coaxial Cable	Suhner/storm/Agilent/TSJ	-	-	RE	2011/09/17 * 12
MPA-19	Pre Amplifier	MITEQ	MLA-10K01-B01-35	1237616	RE	2011/02/28 * 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

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