



RADIO TEST REPORT

Test Report No. : 33BE0179-HO-D

Applicant : SAMSUNG ELECTRONICS CO., LTD.
Type of Equipment : Smart phone with GSM/GPRS/EDGE850/1900 and WCDMA850/1900, BT(EDR, LE), NFC, 802.11a/b/g/n(mobile hot spot)
Model No. : GT-I9105P
FCC ID : A3LGTI9105P
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.

Date of test: October 29 to November 8, 2012

Representative test engineer:

Takayuki Shimada
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

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

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SECTION 1: Customer information

Company Name : SAMSUNG ELECTRONICS CO., LTD.
Address : 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY,
GYEONGGI-DO 443-742, SOUTH KOREA

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

2.1 Identification of E.U.T.

Type of Equipment : Smart phone with GSM/GPRS/EDGE850/1900 and WCDMA850/1900,
BT(EDR, LE), NFC, 802.11a/b/g/n(mobile hot spot)
Model No. : GT-I9105P
Serial No. : Refer to Section 4, Clause 4.2
Rating : AC120V/60Hz (AC Adapter)
DC3.7V/1650mAh, 6.11Wh (Battery)
Receipt Date of Sample : October 24, 2012
Modification of EUT : No Modification by the test lab

2.2 Product Description

Radio Specification

NFC

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK
Antenna Type	FPCB

Bluetooth (BDR/EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Type	LDS
Antenna Gain	-1.2dBi

Bluetooth (Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	DSSS
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Type	LDS
Antenna Gain	-1.2dBi

WLAN (IEEE802.11a/b/g/n-20)

Equipment Type	Transceiver	
Frequency of Operation	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5825MHz
Type of Modulation	DSSS, OFDM	OFDM
Bandwidth & Channel spacing	20MHz & 5MHz	20MHz & 20MHz
Antenna Type	LDS	
Antenna Gain	2.4G: -1.2dBi	5G: 0.68dBi

GSM

Equipment Type	Transceiver	
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz	
Type of Modulation	GMSK , 8PSK	
Emission Designator	GSM850: 248KGXW, 254KG7W PCS: 248KGXW, 257KG7W	
Antenna Type	MID	
Antenna Gain	GSM850: -7.11dBi PCS: -4.38dBi	

W-CDMA

Equipment Type	Transceiver	
Frequency of Operation	[Up Link] Band V: 824 – 849MHz Band II: 1850 – 1910MHz [Down Link] Band V: 869 – 894MHz Band II: 1930 – 1990MHz	
Type of Modulation	QPSK	
Emission Designator	Band V: 4M15F9W Band II: 4M14F9W	
Antenna Type	MID	
Antenna Gain	Band V: -7.11dBi Band II: -4.38dBi	

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

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

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

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 10.4dB, 2.43446MHz, N AV 9.6dB, 2.38535MHz, L	Complied	-
6dB Bandwidth	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on October 4, 2012)" ----- 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 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on October 4, 2012)" ----- IC: RSS-Gen 4.8	FCC: Section 15.247(b)(3) ----- IC: RSS-210 A8.4(4)		Complied	Conducted
Power Density	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on October 4, 2012)" ----- IC: -	FCC: Section 15.247 (e) ----- IC: RSS-210 A8.2(b)		Complied	Conducted
Spurious Emission Restricted Band Edges	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on October 4, 2012)" ----- IC: RSS-Gen 4.9	FCC: Section15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 7.2.3		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.

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	4.3dB	5.0dB	5.1dB	4.9dB	5.8dB	4.4dB	4.3dB
No.2	4.3dB	5.2dB	5.1dB	5.0dB	5.7dB	4.3dB	4.2dB
No.3	4.6dB	5.0dB	5.1dB	5.0dB	5.7dB	4.5dB	4.2dB
No.4	4.8dB	5.2dB	5.0dB	5.0dB	5.7dB	5.2dB	4.2dB

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

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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	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)

Test operating mode was determined as follows according to “Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - ” of TCB Council Workshop October 2009.

Mode	Remarks*
IEEE 802.11b (11b)	11Mbps, PN9
IEEE 802.11g (11g)	6Mbps, PN9
IEEE 802.11n SISO 20MHz BW (11n-20): 2.4G Band	MCS 0, PN9
IEEE 802.11a (11a)	6Mbps, PN9
IEEE 802.11n SISO 20MHz BW (11n-20): 5G Band	MCS 0, PN9
*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:

H/W version : REV1.1
S/W version : I9105P.001

[Power Setting]

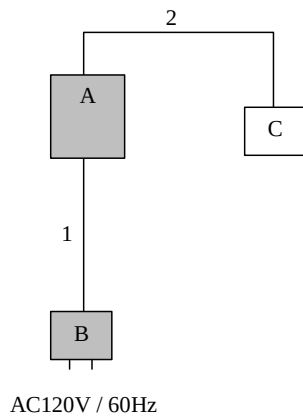
11b: 16dBm
11g: 14dBm
11n-20(2.4GHz): 12dBm
11a: 12dBm
11n-20(5GHz): 10dBm

*The above setting of the 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.

*Details of Operating mode(s)

Test Item	Operating Mode	Tested frequency
Conducted Emission	11g Tx*1)	2437MHz
6dB Bandwidth	11b Tx	2412MHz
99% Occupied Bandwidth	11g Tx	2437MHz
Maximum Peak Output Power	11n-20(2.4GHz) Tx	2462MHz
	11a Tx	5745MHz
	11n-20(5GHz) Tx	5785MHz 5825MHz
Power Density	11b Tx	2412MHz
Spurious Emission (Conducted/Radiated)	11g Tx *2)	2437MHz 2462MHz
	11a Tx *2)	5745MHz 5785MHz 5825MHz
Band Edge Compliance (Conducted/Radiated)	11b Tx	2412MHz
	11g Tx	2462MHz
	11n-20(2.4GHz) Tx	
	11a Tx	5745MHz
	11n-20(5GHz) Tx	5825MHz
*1) The mode was tested as a representative, because it had the highest power at antenna terminal test. *2) Since 11g/11a and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest peak output power.		

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Smart phone with GSM/GPRS/EDGE850/1900 and WCDMA850/1900, BT(EDR, LE), NFC, 802.11a/b/g/n(mobile hot spot)	GT-I9105P	FJ-289-D *1) FJ-289-A *2)	SAMSUNG	EUT
B	AC Adapter	ETA0U10EBE	-	SAMSUNG	EUT
C	Ear phone	-	-	SAMSUNG	-

*1) Used for Antenna Terminal conducted test

*2) Used for Conducted Emission and Radiated Emission tests

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.5	Unshielded	Unshielded	-
2	Ear phone Cable	1.2	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

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 "10.0 MAXIMUM UNWANTED EMISSION LEVELS" of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under § 15.247 (Issued on October 4, 2012)".

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	Average Power Method: Alternative 1 RBW: 1MHz VBW: 3MHz Detector: Power Averaging (RMS) Trace: Free Run (Duty factor was added to the results.)	RBW: 100kHz VBW: 300kHz (S/A)
Test Distance	3m	3m (below 10GHz), 1m*1) (above 10GHz), 0.5m*2) (above 26.5GHz)		3m (below 10GHz), 1m*1) (above 10GHz), 0.5m*2) (above 26.5GHz)

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

*2) Distance Factor: $20 \times \log (3.0\text{m}/0.5\text{m}) = 15.6\text{dB}$

- 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-40GHz
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/ Average *1)	-	Power Meter (Option 3) (Sensor: 50MHz BW)
Peak Power Density	1.5 times the 6dB bandwidth	3kHz	10kHz	Auto	Peak	Max Hold	Spectrum Analyzer *2)
Conducted Spurious Emission	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				

*1) Reference data

*2) PSD Option 1 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on October 4, 2012)".

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

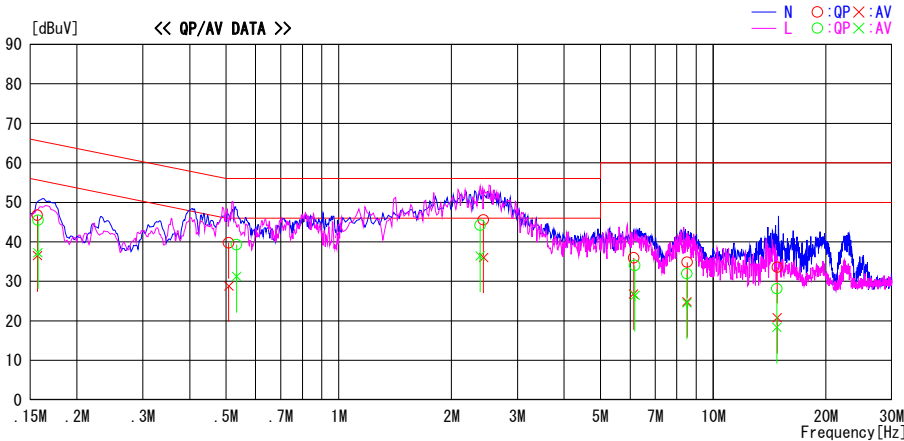
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2012/11/07

Report No. : 33BE0179-H0
Temp./Humi. : 24deg. C / 50% RH
Engineer : Tomohisa Nakagawa

Mode / Remarks : WLAN 11g 2437MHz

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]		
0.15678	33.3	23.1	13.4	46.7	36.5	65.6	55.6	18.9	19.1	N	
0.50812	26.2	15.3	13.5	39.7	28.8	56.0	46.0	16.3	17.2	N	
2.43446	31.8	22.3	13.8	45.6	36.1	56.0	46.0	10.4	9.9	N	
6.13235	21.3	12.2	14.6	35.9	26.8	60.0	50.0	24.1	23.2	N	
8.51726	19.9	10.0	14.9	34.8	24.9	60.0	50.0	25.2	25.1	N	
14.82885	17.6	4.8	16.0	33.6	20.8	60.0	50.0	26.4	29.2	N	
0.15739	32.1	23.8	13.4	45.5	37.2	65.6	55.6	20.1	18.4	L	
0.53380	25.8	17.7	13.5	39.3	31.2	56.0	46.0	16.7	14.8	L	
2.38535	30.4	22.6	13.8	44.2	36.4	56.0	46.0	11.8	9.6	L	
6.17822	19.3	11.7	14.7	34.0	26.4	60.0	50.0	26.0	23.6	L	
8.51161	17.0	9.6	14.9	31.9	24.5	60.0	50.0	28.1	25.5	L	
14.79780	12.1	2.3	16.0	28.1	18.3	60.0	50.0	31.9	31.7	L	

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

6dB Bandwidth

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 10/31/2012
Temperature/ Humidity 24deg. C / 42% RH
Engineer Keisuke Kawamura
Mode Tx

11b

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2412	9.814	>500
2437	10.078	>500
2462	7.852	>500

11g

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2412	14.203	>500
2437	14.176	>500
2462	15.047	>500

11n-20(2.4GHz)

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2412	15.106	>500
2437	15.105	>500
2462	15.101	>500

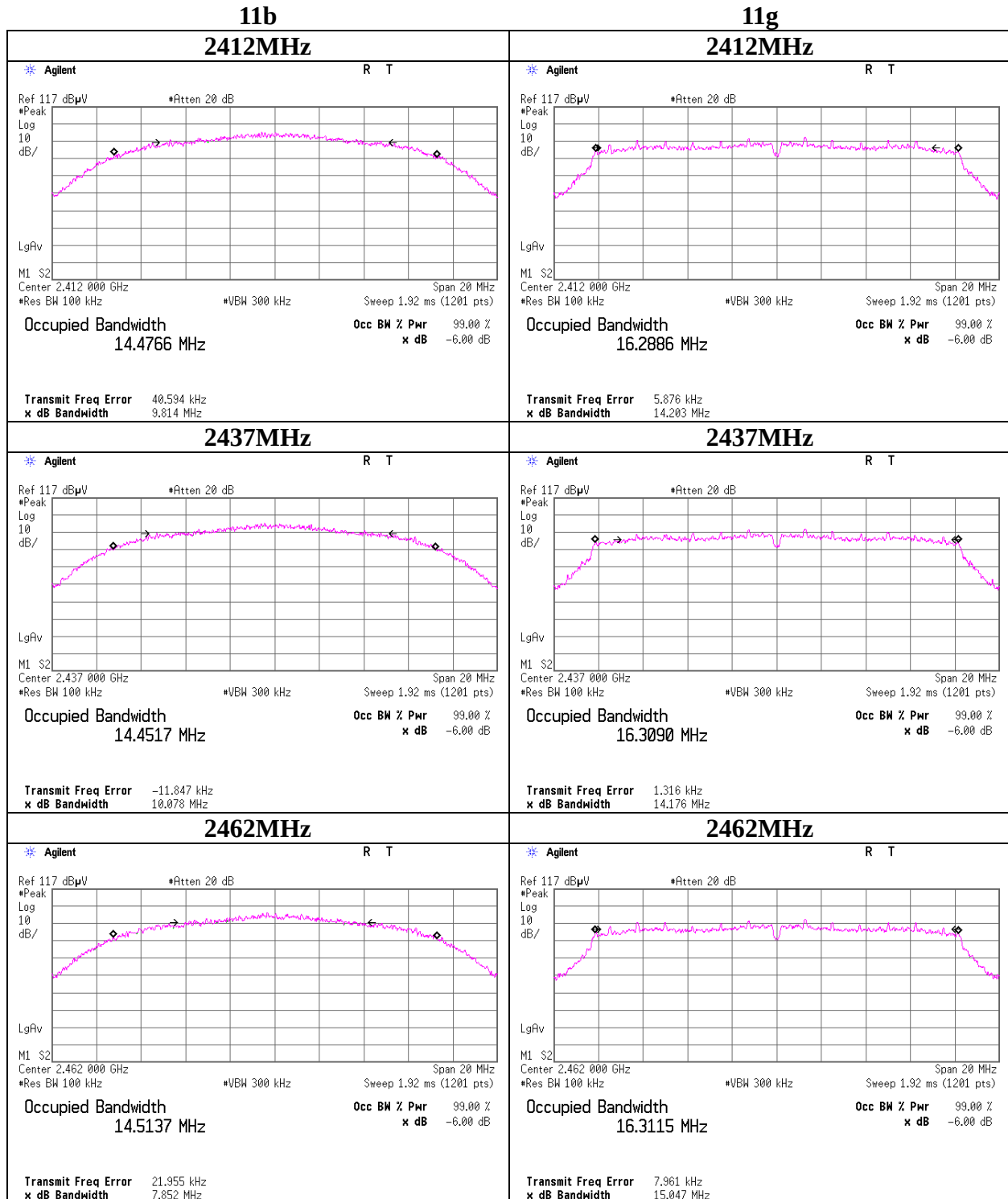
11a

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
5745	16.300	>500
5785	15.177	>500
5825	14.432	>500

11n-20(5GHz)

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
5745	17.298	>500
5785	17.511	>500
5825	17.140	>500

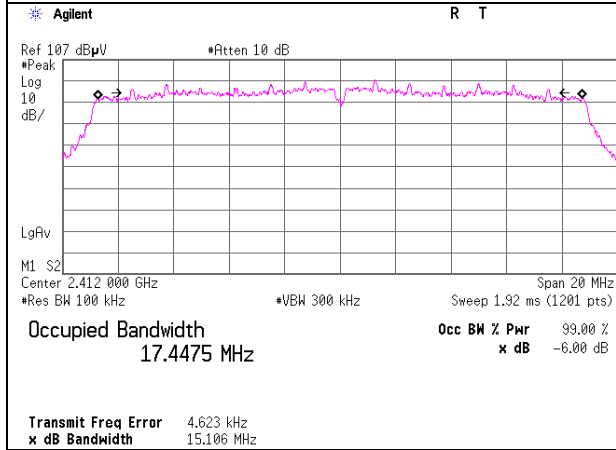
6dB Bandwidth



6dB Bandwidth

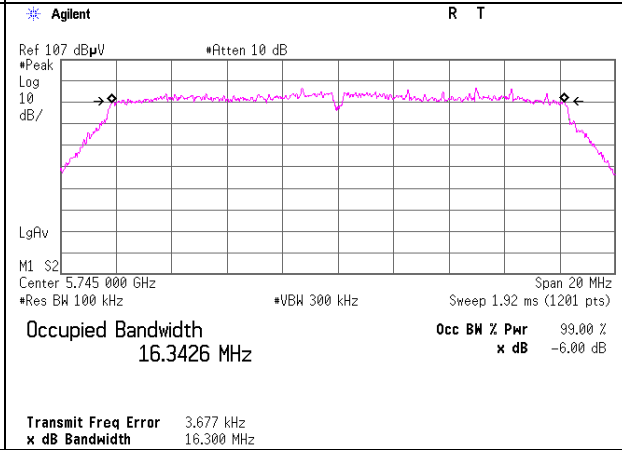
11n-20(2.4GHz)

2412MHz

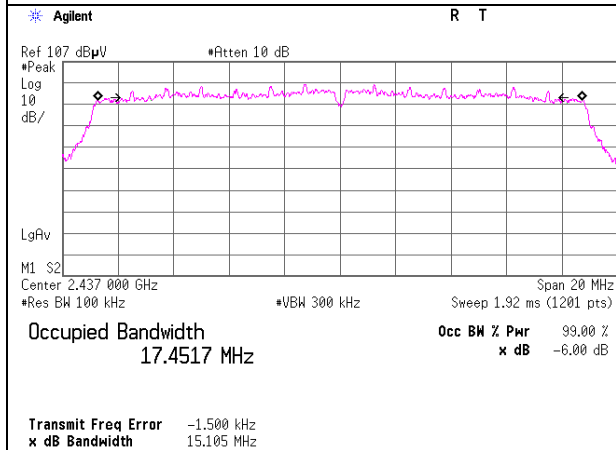


11a

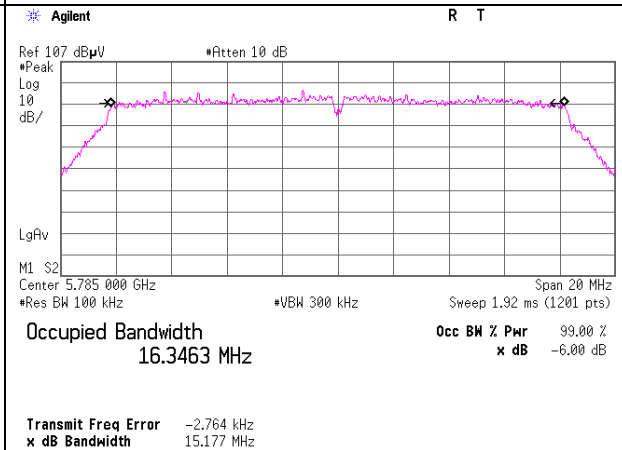
5745MHz



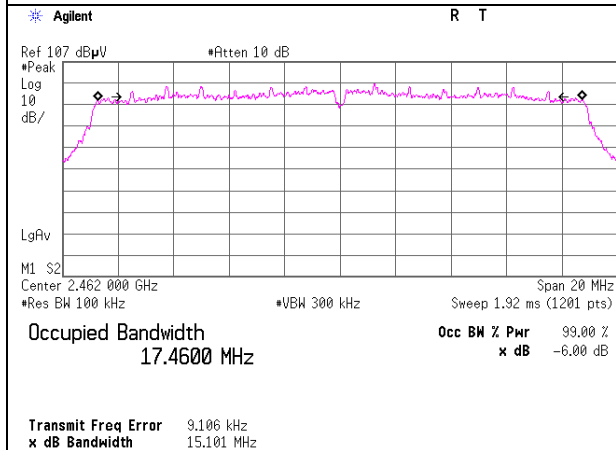
2437MHz



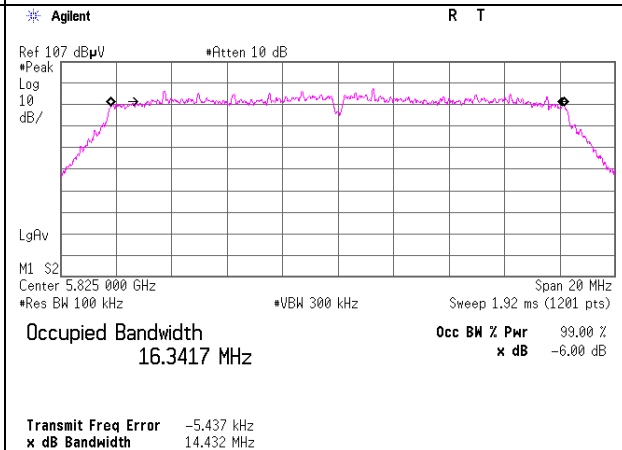
5785MHz



2462MHz

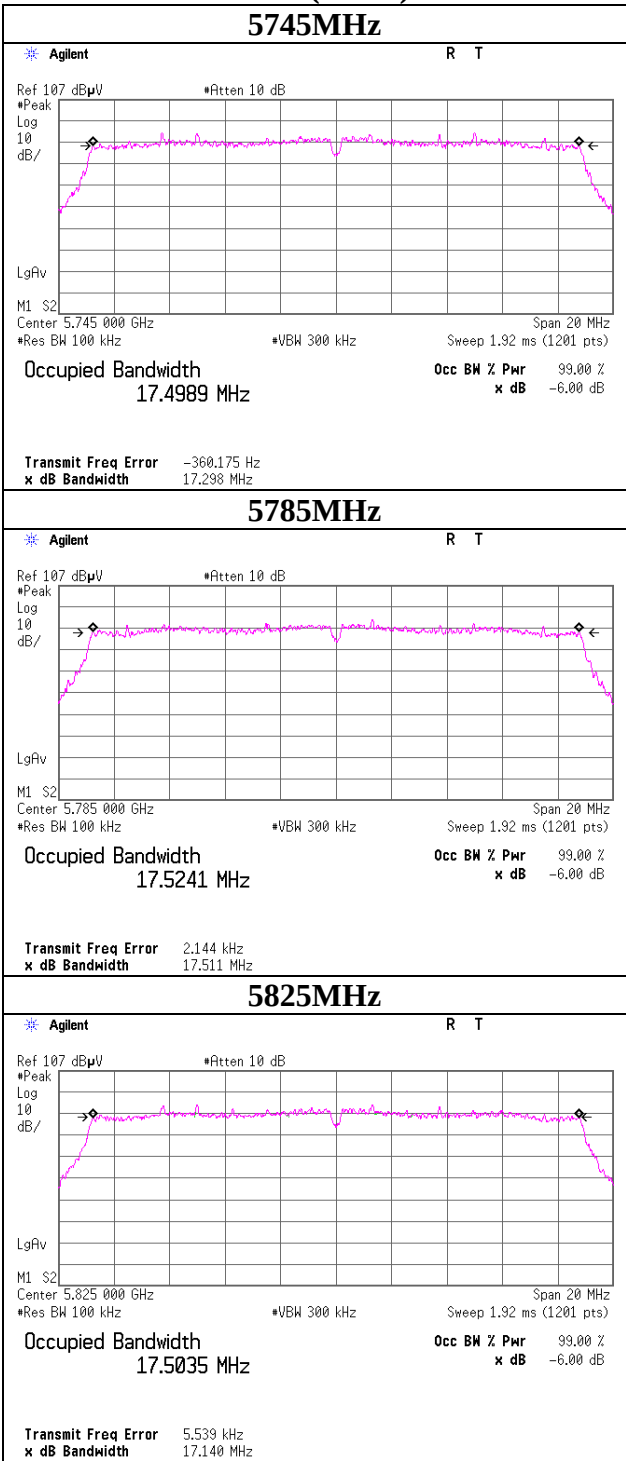


5825MHz



6dB Bandwidth

11n-20(5GHz)



Maximum Peak Output Power

Test place Head Office EMC Lab. No.11 Shielded Room
Report No. 33BE0179-HO
Date 10/29/2012
Temperature/ Humidity 24deg. C / 40% RH
Engineer Hisayoshi Sato
Mode 11b Tx

11b

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	7.31	0.00	10.07	17.38	54.70	30.00	1000	12.62
2437	7.53	0.00	10.07	17.60	57.54	30.00	1000	12.40
2462	7.57	0.00	10.07	17.64	58.08	30.00	1000	12.36

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

2437MHz

Rate [Mbps]	Reading PK [dBm]	Remark
1	7.31	
2	7.42	
5.5	7.46	
11	7.53	*

*: Worst Rate

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

Maximum Peak Output Power

Test place Head Office EMC Lab. No.11 Shielded Room
Report No. 33BE0179-HO
Date 10/29/2012
Temperature/ Humidity 24deg. C / 40% RH
Engineer Hisayoshi Sato
Mode 11g Tx

11g

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	11.54	0.00	10.07	21.61	144.88	30.00	1000	8.39
2437	11.60	0.00	10.07	21.67	146.89	30.00	1000	8.33
2462	11.35	0.00	10.07	21.42	138.68	30.00	1000	8.58

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

2437MHz

Rate [Mbps]	Reading PK [dBm]	Remark
6	11.60	*
9	11.53	
12	11.30	
18	11.31	
24	11.34	
36	11.42	
48	11.45	
54	11.43	

*: Worst Rate

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

Maximum Peak Output Power

Test place	Head Office EMC Lab. No.11 Shielded Room
Report No.	33BE0179-HO
Date	10/29/2012
Temperature/ Humidity	24deg. C / 40% RH
Engineer	Hisayoshi Sato
Mode	11n-20(2.4GHz) Tx

11n-20(2.4GHz)

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	10.45	0.00	10.07	20.52	112.72	30.00	1000	9.48
2437	10.40	0.00	10.07	20.47	111.43	30.00	1000	9.53
2462	10.04	0.00	10.07	20.11	102.57	30.00	1000	9.89

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

2437MHz

MCS Number	Reading PK [dBm]	Remark
0	10.40	*
1	10.23	
2	10.18	
3	10.22	
4	10.34	
5	10.14	
6	10.27	
7	10.15	

*: Worst Rate

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

Maximum Peak Output Power

Test place Head Office EMC Lab. No.11 Shielded Room
Report No. 33BE0179-HO
Date 10/29/2012
Temperature/ Humidity 24deg. C / 40% RH
Engineer Hisayoshi Sato
Mode 11a Tx

11a

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5745	10.14	0.00	10.07	20.21	104.95	30.00	1000	9.79
5785	10.10	0.00	10.07	20.17	103.99	30.00	1000	9.83
5825	10.03	0.00	10.07	20.10	102.33	30.00	1000	9.90

Sample Calculation:

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

5785MHz

Rate [Mbps]	Reading PK [dBm]	Remark
6	10.10	*
9	9.92	
12	9.77	
18	9.90	
24	9.89	
36	9.76	
48	9.92	
54	10.00	

*: Worst Rate

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

Maximum Peak Output Power

Test place Head Office EMC Lab. No.11 Shielded Room
Report No. 33BE0179-HO
Date 10/29/2012
Temperature/ Humidity 24deg. C / 40% RH
Engineer Hisayoshi Sato
Mode 11n-20(5GHz) Tx

11n-20(5GHz)

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5745	7.65	0.00	10.07	17.72	59.16	30.00	1000	12.28
5785	7.70	0.00	10.07	17.77	59.84	30.00	1000	12.23
5825	7.45	0.00	10.07	17.52	56.49	30.00	1000	12.48

Sample Calculation:

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

5785MHz

MCS Number	Reading PK [dBm]	Remark
0	7.70	*
1	7.63	
2	7.36	
3	7.52	
4	7.65	
5	7.51	
6	7.63	
7	7.69	

*: Worst Rate

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

Maximum Average Output Power (Reference data for SAR testing)

IEEE802.11b 1Mbps

Ch	Frequency [MHz]	P/M Reading	Cable Loss [dB]	Atten. [dB]	Result	
		AVG			[dBm] AVG	[mW] AVG
1	2412	4.55	0.00	10.07	14.62	28.97
6	2437	4.66	0.00	10.07	14.73	29.72
11	2462	4.48	0.00	10.07	14.55	28.51

IEEE802.11g 6Mbps

Ch	Frequency [MHz]	P/M Reading	Cable Loss [dB]	Atten. [dB]	Result	
		AVG			[dBm] AVG	[mW] AVG
1	2412	2.67	0.00	10.07	12.74	18.79
6	2437	2.68	0.00	10.07	12.75	18.84
11	2462	2.62	0.00	10.07	12.69	18.58

IEEE802.11n-20 MCS0

Ch	Frequency [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
		AVG			[dBm] AVG	[mW] AVG
1	2412	0.72	0.00	10.07	10.79	11.99
6	2437	0.75	0.00	10.07	10.82	12.08
11	2462	0.60	0.00	10.07	10.67	11.67

Sample Calculation: Result = Reading + Cable Loss + Attenuator

Maximum Average Output Power (Reference data for SAR testing)

IEEE802.11a 5745-5825MHz band 6Mbps

Ch	Freq. [MHz]	P/M Reading	Cable	Atten.	Result	
		[dBm]	Loss		[dBm]	[mW]
		AVG	[dB]	[dB]	AVG	AVG
149	5745.0	-1.03	0.00	10.07	9.04	8.02
153	5765.0	-1.09	0.00	10.07	8.98	7.91
157	5785.0	-1.08	0.00	10.07	8.99	7.93
161	5805.0	-1.11	0.00	10.07	8.96	7.87
165	5825.0	-1.13	0.00	10.07	8.94	7.83

IEEE802.11n-20 5745-5825MHz band MCS0

Ch	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
		AVG			[dBm] A VG	[mW] A VG
149	5745.0	-3.11	0.00	10.07	6.96	4.97
153	5765.0	-3.05	0.00	10.07	7.02	5.04
157	5785.0	-3.14	0.00	10.07	6.93	4.93
161	5805.0	-3.08	0.00	10.07	6.99	5.00
165	5825.0	-3.21	0.00	10.07	6.86	4.85

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4 and 2 Semi Anechoic Chamber	
Report No.	33BE0179-HO	
Date	11/01/2012	11/08/2012
Temperature/ Humidity	23 deg. C / 32%	20 deg. C / 40%
Engineer	Hironobu Ohnishi	Satofumi Matsuyama
	(1-10GHz)	(Above 10GHz)
Mode	11b Tx 2412MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2251.900	PK	54.6	27.6	2.3	32.3	-	52.2	73.9	21.7	See 20dBc Data Sheet
Hori	2332.170	PK	56.0	27.5	2.4	32.3	-	53.6	73.9	20.3	
Hori	2390.000	PK	56.4	27.5	2.4	32.3	-	54.0	73.9	19.9	
Hori	2491.970	PK	57.4	27.5	2.4	32.2	-	55.1	73.9	18.8	
Hori	2571.570	PK	63.6	27.7	2.5	32.2	-	61.6	-	-	
Hori	4824.000	PK	46.0	31.4	4.3	31.5	-	50.2	73.9	23.7	
Hori	7236.000	PK	42.0	35.8	5.0	32.5	-	50.3	73.9	23.6	
Hori	9648.000	PK	42.9	38.3	5.8	32.9	-	54.1	73.9	19.8	
Hori	2251.900	AV	47.8	27.6	2.3	32.3	0.4	45.8	53.9	8.1	See 20dBc Data Sheet
Hori	2332.170	AV	49.1	27.5	2.4	32.3	0.4	47.1	53.9	6.8	
Hori	2390.000	AV	46.0	27.5	2.4	32.3	0.4	44.0	53.9	9.9	
Hori	2491.970	AV	50.3	27.5	2.4	32.2	0.4	48.4	53.9	5.5	
Hori	2571.570	AV	57.2	27.7	2.5	32.2	0.4	55.6	-	-	
Hori	4824.000	AV	36.9	31.4	4.3	31.5	0.4	41.5	53.9	12.4	
Hori	7236.000	AV	32.5	35.8	5.0	32.5	0.4	41.2	53.9	12.7	
Hori	9648.000	AV	36.7	38.3	5.8	32.9	0.4	48.3	53.9	5.6	
Vert	2251.900	PK	54.7	27.6	2.3	32.3	-	52.3	73.9	21.6	See 20dBc Data Sheet
Vert	2332.170	PK	55.5	27.5	2.4	32.3	-	53.1	73.9	20.8	
Vert	2390.000	PK	55.1	27.5	2.4	32.3	-	52.7	73.9	21.2	
Vert	2491.970	PK	57.3	27.5	2.4	32.2	-	55.0	73.9	18.9	
Vert	2571.570	PK	65.1	27.7	2.5	32.2	-	63.1	-	-	
Vert	4824.000	PK	49.9	31.4	4.3	31.5	-	54.1	73.9	19.8	
Vert	7236.000	PK	51.1	35.8	5.0	32.5	-	59.4	-	-	
Vert	9648.000	PK	42.7	38.3	5.8	32.9	-	53.9	73.9	20.0	
Vert	2251.900	AV	47.6	27.6	2.3	32.3	0.4	45.6	53.9	8.3	See 20dBc Data Sheet
Vert	2332.170	AV	48.8	27.5	2.4	32.3	0.4	46.8	53.9	7.1	
Vert	2390.000	AV	44.6	27.5	2.4	32.3	0.4	42.6	53.9	11.3	
Vert	2491.970	AV	50.3	27.5	2.4	32.2	0.4	48.4	53.9	5.5	
Vert	2571.570	AV	58.6	27.7	2.5	32.2	0.4	57.0	-	-	
Vert	4824.000	AV	41.8	31.4	4.3	31.5	0.4	46.4	53.9	7.5	
Vert	7236.000	AV	41.3	35.8	5.0	32.5	0.4	50.0	-	-	
Vert	9648.000	AV	31.8	38.3	5.8	32.9	0.4	43.4	53.9	10.5	

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

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

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/01/2012
Temperature/ Humidity 23 deg. C / 32%
Engineer Hironobu Ohnishi
(20dBc)
Mode 11b 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	104.5	27.5	2.4	32.3	102.1	-	-	Carrier
Hori	2400.000	PK	63.9	27.5	2.4	32.3	61.5	82.1	20.6	
Hori	2571.570	PK	58.3	27.7	2.5	32.2	56.3	82.1	25.8	
Vert	2412.000	PK	103.4	27.5	2.4	32.3	101.0	-	-	Carrier
Vert	2400.000	PK	62.6	27.5	2.4	32.3	60.2	81.0	20.8	
Vert	2571.570	PK	59.1	27.7	2.5	32.2	57.1	81.0	23.9	
Vert	7236.000	PK	44.2	35.8	5.0	32.5	52.5	81.0	28.5	

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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 33BE0179-HO
Date : 11/01/2012
Temperature/ Humidity : 23 deg. C / 32%
Engineer : Hironobu Ohnishi
(20dBc)
Mode : 11b Tx 2437MHz

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	2437.000	PK	105.9	27.5	2.4	32.2	103.6	-	-	Carrier
Hori	2516.750	PK	51.3	27.5	2.5	32.2	49.1	83.6	34.5	
Hori	2596.170	PK	57.3	27.7	2.5	32.2	55.3	83.6	28.3	
Vert	2437.000	PK	104.3	27.5	2.4	32.2	102.0	-	-	Carrier
Vert	2516.750	PK	51.4	27.5	2.5	32.2	49.2	82.0	32.8	
Vert	2596.170	PK	56.8	27.7	2.5	32.2	54.8	82.0	27.2	

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4 and 2 Semi Anechoic Chamber	
Report No.	33BE0179-HO	
Date	11/02/2012	11/08/2012
Temperature/ Humidity	24 deg. C / 35%	20 deg. C / 40%
Engineer	Takayuki Shimada	Satofumi Matsuyama
	(1-10GHz)	(Above 10GHz)
Mode	11b Tx 2462MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2302.080	PK	57.8	27.6	2.4	32.3	-	55.5	-	-	See 20dBc Data Sheet
Hori	2382.250	PK	56.2	27.5	2.4	32.3	-	53.8	73.9	20.1	
Hori	2483.500	PK	54.7	27.5	2.4	32.2	-	52.4	73.9	21.5	
Hori	2542.250	PK	55.5	27.6	2.5	32.2	-	53.4	-	-	See 20dBc Data Sheet
Hori	2621.750	PK	60.6	27.8	2.5	32.2	-	58.7	-	-	See 20dBc Data Sheet
Hori	4924.000	PK	44.1	31.7	5.0	31.5	-	49.3	73.9	24.6	
Hori	7386.000	PK	41.0	35.9	6.0	32.6	-	50.3	73.9	23.6	
Hori	9848.000	PK	42.0	38.5	7.1	33.0	-	54.6	73.9	19.3	
Hori	2302.080	AV	50.8	27.6	2.4	32.3	0.4	48.9	53.9	5.0	
Hori	2382.250	AV	48.8	27.5	2.4	32.3	0.4	46.8	53.9	7.1	
Hori	2483.500	AV	45.2	27.5	2.4	32.2	0.4	43.3	53.9	10.6	
Hori	2542.250	AV	48.0	27.6	2.5	32.2	0.4	46.3	-	-	See 20dBc Data Sheet
Hori	2621.750	AV	54.2	27.8	2.5	32.2	0.4	52.7	-	-	See 20dBc Data Sheet
Hori	4924.000	AV	35.0	31.7	5.0	31.5	0.4	40.6	53.9	13.3	
Hori	7386.000	AV	34.2	35.9	6.0	32.6	0.4	43.9	53.9	10.0	
Hori	9848.000	AV	33.6	38.5	7.1	33.0	0.4	46.6	53.9	7.3	
Vert	2302.080	PK	59.3	27.6	2.4	32.3	-	57.0	-	-	See 20dBc Data Sheet
Vert	2382.250	PK	54.7	27.5	2.4	32.3	-	52.3	73.9	21.6	
Vert	2483.500	PK	55.1	27.5	2.4	32.2	-	52.8	73.9	21.1	
Vert	2542.250	PK	56.8	27.6	2.5	32.2	-	54.7	-	-	See 20dBc Data Sheet
Vert	2621.750	PK	62.9	27.8	2.5	32.2	-	61.0	-	-	See 20dBc Data Sheet
Vert	4924.000	PK	50.6	31.7	5.0	31.5	-	55.8	73.9	18.1	
Vert	7386.000	PK	47.3	35.9	6.0	32.6	-	56.6	73.9	17.3	
Vert	9848.000	PK	42.5	38.5	7.1	33.0	-	55.1	73.9	18.8	
Vert	2302.080	AV	52.2	27.6	2.4	32.3	0.4	50.3	53.9	3.6	
Vert	2382.250	AV	46.5	27.5	2.4	32.3	0.4	44.5	53.9	9.4	
Vert	2483.500	AV	45.4	27.5	2.4	32.2	0.4	43.5	53.9	10.4	
Vert	2542.250	AV	49.9	27.6	2.5	32.2	0.4	48.2	-	-	See 20dBc Data Sheet
Vert	2621.750	AV	56.5	27.8	2.5	32.2	0.4	55.0	-	-	See 20dBc Data Sheet
Vert	4924.000	AV	42.8	31.7	5.0	31.5	0.4	48.4	53.9	5.5	
Vert	7386.000	AV	39.3	35.9	6.0	32.6	0.4	49.0	53.9	4.9	
Vert	9848.000	AV	33.6	38.5	7.1	33.0	0.4	46.6	53.9	7.3	

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

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

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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 33BE0179-HO
Date : 11/02/2012
Temperature/ Humidity : 24 deg. C / 35%
Engineer : Takayuki Shimada
(20dBc)
Mode : 11b Tx 2462MHz

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	2462.000	PK	104.4	27.5	2.4	32.2	102.1	-	-	Carrier
Hori	2302.080	PK	51.5	27.6	2.4	32.3	49.2	82.1	32.9	
Hori	2542.250	PK	49.1	27.6	2.5	32.2	47.0	82.1	35.1	
Hori	2621.750	PK	54.8	27.8	2.5	32.2	52.9	82.1	29.2	
Vert	2462.000	PK	103.8	27.5	2.4	32.2	101.5	-	-	Carrier
Vert	2302.080	PK	52.6	27.6	2.4	32.3	50.3	81.5	31.2	
Vert	2542.250	PK	51.0	27.6	2.5	32.2	48.9	81.5	32.6	
Vert	2621.750	PK	56.4	27.8	2.5	32.2	54.5	81.5	27.0	

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4 and 2 Semi Anechoic Chamber	
Report No.	33BE0179-HO	
Date	11/02/2012	11/08/2012
Temperature/ Humidity	24 deg. C / 35%	20 deg. C / 40%
Engineer	Takayuki Shimada	Satofumi Matsuyama
	(1-10GHz)	(Above 10GHz)
Mode	11g Tx 2412MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2251.200	PK	51.8	27.6	2.3	32.3	-	49.4	73.9	24.5	See 20dBc Data Sheet
Hori	2331.140	PK	55.4	27.6	2.4	32.3	-	53.1	73.9	20.8	
Hori	2390.000	PK	70.2	27.5	2.4	32.3	-	67.8	73.9	6.1	
Hori	2491.970	PK	55.3	27.5	2.4	32.2	-	53.0	73.9	20.9	
Hori	2571.930	PK	61.7	27.7	2.5	32.2	-	59.7	-	-	
Hori	4824.000	PK	42.1	31.4	4.9	31.5	-	46.9	73.9	27.0	
Hori	7236.000	PK	42.3	35.8	5.9	32.5	-	51.5	73.9	22.4	
Hori	9648.000	PK	42.2	38.3	6.8	32.9	-	54.4	73.9	19.5	
Hori	2251.200	AV	43.4	27.6	2.3	32.3	0.3	41.3	53.9	12.6	See 20dBc Data Sheet
Hori	2331.140	AV	47.4	27.6	2.4	32.3	0.3	45.4	53.9	8.5	
Hori	2390.000	AV	54.6	27.5	2.4	32.3	0.3	52.5	53.9	1.4	
Hori	2491.970	AV	47.2	27.5	2.4	32.2	0.3	45.2	53.9	8.7	
Hori	2571.930	AV	53.9	27.7	2.5	32.2	0.3	52.2	-	-	
Hori	4824.000	AV	33.2	31.4	4.9	31.5	0.3	38.3	53.9	15.6	
Hori	7236.000	AV	33.7	35.8	5.9	32.5	0.3	43.2	53.9	10.7	
Hori	9648.000	AV	32.7	38.3	6.8	32.9	0.3	45.2	53.9	8.7	
Vert	2251.200	PK	51.5	27.6	2.3	32.3	-	49.1	73.9	24.8	See 20dBc Data Sheet
Vert	2331.140	PK	55.2	27.6	2.4	32.3	-	52.9	73.9	21.0	
Vert	2390.000	PK	69.8	27.5	2.4	32.3	-	67.4	73.9	6.5	
Vert	2491.970	PK	55.6	27.5	2.4	32.2	-	53.3	73.9	20.6	
Vert	2571.930	PK	63.3	27.7	2.5	32.2	-	61.3	-	-	
Vert	4824.000	PK	46.5	31.4	4.9	31.5	-	51.3	73.9	22.6	
Vert	7236.000	PK	48.5	35.8	5.9	32.5	-	57.7	73.9	16.2	
Vert	9648.000	PK	42.3	38.3	6.8	32.9	-	54.5	73.9	19.4	
Vert	2251.200	AV	43.4	27.6	2.3	32.3	0.3	41.3	53.9	12.6	See 20dBc Data Sheet
Vert	2331.140	AV	46.8	27.6	2.4	32.3	0.3	44.8	53.9	9.1	
Vert	2390.000	AV	53.8	27.5	2.4	32.3	0.3	51.7	53.9	2.2	
Vert	2491.970	AV	48.4	27.5	2.4	32.2	0.3	46.4	53.9	7.5	
Vert	2571.930	AV	54.3	27.7	2.5	32.2	0.3	52.6	-	-	
Vert	4824.000	AV	36.0	31.4	4.9	31.5	0.3	41.1	53.9	12.8	
Vert	7236.000	AV	37.9	35.8	5.9	32.5	0.3	47.4	53.9	6.5	
Vert	9648.000	AV	32.6	38.3	6.8	32.9	0.3	45.1	53.9	8.8	

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).

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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 33BE0179-HO
Date : 11/02/2012
Temperature/ Humidity : 24 deg. C / 35%
Engineer : Takayuki Shimada
(1-10GHz)
Mode : 11g 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	102.1	27.5	2.4	32.3	99.7	-	-	Carrier
Hori	2400.000	PK	70.0	27.5	2.4	32.3	67.6	79.7	12.1	
Hori	2571.930	PK	53.5	27.7	2.5	32.2	51.5	79.7	28.2	
Vert	2412.000	PK	100.6	27.5	2.4	32.3	98.2	-	-	Carrier
Vert	2400.000	PK	68.7	27.5	2.4	32.3	66.3	78.2	11.9	
Vert	2571.930	PK	55.5	27.7	2.5	32.2	53.5	78.2	24.7	

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4, 2 and 3 Semi Anechoic Chamber		
Report No.	33BE0179-HO		
Date	11/02/2012	11/08/2012	11/08/2012
Temperature/ Humidity	24 deg. C / 35%	20 deg. C / 40%	24 deg. C / 36%
Engineer	Takayuki Shimada (1-10GHz)	Satofumi Matsuyama (Above 10GHz)	Tomohisa Nakagawa (Below 1GHz)
Mode	11g Tx 2437MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	41.500	QP	22.8	13.9	7.3	32.2	-	11.8	40.0	28.2	
Hori	52.480	QP	22.2	10.1	7.5	32.2	-	7.6	40.0	32.4	
Hori	62.538	QP	24.3	7.6	7.6	32.2	-	7.3	40.0	32.7	
Hori	85.325	QP	31.5	7.4	8.0	32.2	-	14.7	40.0	25.3	
Hori	96.587	QP	22.5	9.4	8.1	32.3	-	7.7	43.5	35.8	
Hori	112.705	QP	22.3	12.0	8.3	32.3	-	10.3	43.5	33.2	
Hori	2277.000	PK	54.8	27.6	2.3	32.3	-	52.4	73.9	21.5	
Hori	2357.000	PK	57.0	27.5	2.4	32.3	-	54.6	73.9	19.3	
Hori	2517.000	PK	55.8	27.5	2.5	32.2	-	53.6	-	-	See 20dBc Data Sheet
Hori	2597.000	PK	61.3	27.7	2.5	32.2	-	59.3	-	-	See 20dBc Data Sheet
Hori	4874.000	PK	43.0	31.5	5.0	31.5	-	48.0	73.9	25.9	
Hori	7311.000	PK	43.1	35.8	5.9	32.5	-	52.3	73.9	21.6	
Hori	9748.000	PK	42.5	38.4	7.1	32.9	-	55.1	73.9	18.8	
Hori	2277.000	AV	46.5	27.6	2.3	32.3	0.3	44.4	53.9	9.5	
Hori	2357.000	AV	47.8	27.5	2.4	32.3	0.3	45.7	53.9	8.2	
Hori	2517.000	AV	48.2	27.5	2.5	32.2	0.3	46.3	-	-	See 20dBc Data Sheet
Hori	2597.000	AV	53.7	27.7	2.5	32.2	0.3	52.0	-	-	See 20dBc Data Sheet
Hori	4874.000	AV	32.9	31.5	5.0	31.5	0.3	38.2	53.9	15.7	
Hori	7311.000	AV	33.6	35.8	5.9	32.5	0.3	43.1	53.9	10.8	
Hori	9748.000	AV	33.3	38.4	7.1	32.9	0.3	46.2	53.9	7.7	
Vert	41.500	QP	27.9	13.9	7.3	32.2	-	16.9	40.0	23.1	
Vert	52.480	QP	28.5	10.1	7.5	32.2	-	13.9	40.0	26.1	
Vert	62.538	QP	32.4	7.6	7.6	32.2	-	15.4	40.0	24.6	
Vert	85.325	QP	31.2	7.4	8.0	32.2	-	14.4	40.0	25.6	
Vert	96.587	QP	27.2	9.4	8.1	32.3	-	12.4	43.5	31.1	
Vert	112.705	QP	28.0	12.0	8.3	32.3	-	16.0	43.5	27.5	
Vert	2277.000	PK	54.7	27.6	2.3	32.3	-	52.3	73.9	21.6	
Vert	2357.000	PK	56.0	27.5	2.4	32.3	-	53.6	73.9	20.3	
Vert	2517.000	PK	55.7	27.5	2.5	32.2	-	53.5	-	-	See 20dBc Data Sheet
Vert	2597.000	PK	62.5	27.7	2.5	32.2	-	60.5	-	-	See 20dBc Data Sheet
Vert	4874.000	PK	48.3	31.5	5.0	31.5	-	53.3	73.9	20.6	
Vert	7311.000	PK	47.9	35.8	5.9	32.5	-	57.1	73.9	16.8	
Vert	9748.000	PK	42.3	38.4	7.1	32.9	-	54.9	73.9	19.0	
Vert	2277.000	AV	46.5	27.6	2.3	32.3	0.3	44.4	53.9	9.5	
Vert	2357.000	AV	47.3	27.5	2.4	32.3	0.3	45.2	53.9	8.7	
Vert	2517.000	AV	48.3	27.5	2.5	32.2	0.3	46.4	-	-	See 20dBc Data Sheet
Vert	2597.000	AV	54.1	27.7	2.5	32.2	0.3	52.4	-	-	See 20dBc Data Sheet
Vert	4874.000	AV	36.6	31.5	5.0	31.5	0.3	41.9	53.9	12.0	
Vert	7311.000	AV	37.8	35.8	5.9	32.5	0.3	47.3	53.9	6.6	
Vert	9748.000	AV	33.3	38.4	7.1	32.9	0.3	46.2	53.9	7.7	

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

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

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

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 33BE0179-HO
Date : 11/02/2012
Temperature/ Humidity : 24 deg. C / 35%
Engineer : Takayuki Shimada
(20dBc)
Mode : 11g Tx 2437MHz

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	2437.000	PK	101.8	27.5	2.4	32.2	99.5	-	-	Carrier
Hori	2517.000	PK	47.6	27.5	2.5	32.2	45.4	79.5	34.1	
Hori	2597.000	PK	53.9	27.7	2.5	32.2	51.9	79.5	27.6	
Vert	2437.000	PK	100.5	27.5	2.4	32.2	98.2	-	-	Carrier
Vert	2517.000	PK	47.7	27.5	2.5	32.2	45.5	78.2	32.7	
Vert	2597.000	PK	54.4	27.7	2.5	32.2	52.4	78.2	25.8	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 and 2 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/02/2012 11/08/2012
Temperature/ Humidity 24 deg. C / 35% 20 deg. C / 40%
Engineer Takayuki Shimada Satofumi Matsuyama
(1-10GHz) (Above 10GHz)
Mode 11g Tx 2462MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2302.080	PK	58.0	27.6	2.4	32.3	-	55.7	-	-	See 20dBc Data Sheet
Hori	2382.250	PK	56.1	27.5	2.4	32.3	-	53.7	73.9	20.2	
Hori	2483.500	PK	71.2	27.5	2.4	32.2	-	68.9	73.9	5.0	
Hori	2542.250	PK	56.9	27.6	2.5	32.2	-	54.8	-	-	See 20dBc Data Sheet
Hori	2621.750	PK	60.7	27.8	2.5	32.2	-	58.8	-	-	See 20dBc Data Sheet
Hori	4924.000	PK	43.0	31.7	5.0	31.5	-	48.2	73.9	25.7	
Hori	7386.000	PK	41.3	35.9	6.0	32.6	-	50.6	73.9	23.3	
Hori	9848.000	PK	42.4	38.5	7.1	33.0	-	55.0	73.9	18.9	
Hori	2302.080	AV	50.4	27.6	2.4	32.3	0.3	48.4	-	-	See 20dBc Data Sheet
Hori	2382.250	AV	48.8	27.5	2.4	32.3	0.3	46.7	53.9	7.2	
Hori	2483.500	AV	54.4	27.5	2.4	32.2	0.3	52.4	53.9	1.5	
Hori	2542.250	AV	48.9	27.6	2.5	32.2	0.3	47.1	-	-	See 20dBc Data Sheet
Hori	2621.750	AV	52.1	27.8	2.5	32.2	0.3	50.5	-	-	See 20dBc Data Sheet
Hori	4924.000	AV	32.7	31.7	5.0	31.5	0.3	38.2	53.9	15.7	
Hori	7386.000	AV	34.3	35.9	6.0	32.6	0.3	43.9	53.9	10.0	
Hori	9848.000	AV	33.6	38.5	7.1	33.0	0.3	46.5	53.9	7.4	
Vert	2302.080	PK	57.0	27.6	2.4	32.3	-	54.7	-	-	See 20dBc Data Sheet
Vert	2382.250	PK	54.7	27.5	2.4	32.3	-	52.3	73.9	21.6	
Vert	2483.500	PK	69.5	27.5	2.4	32.2	-	67.2	73.9	6.7	
Vert	2542.250	PK	56.4	27.6	2.5	32.2	-	54.3	-	-	See 20dBc Data Sheet
Vert	2621.750	PK	62.8	27.8	2.5	32.2	-	60.9	-	-	See 20dBc Data Sheet
Vert	4924.000	PK	47.7	31.7	5.0	31.5	-	52.9	73.9	21.0	
Vert	7386.000	PK	46.8	35.9	6.0	32.6	-	56.1	73.9	17.8	
Vert	9848.000	PK	42.5	38.5	7.1	33.0	-	55.1	73.9	18.8	
Vert	2302.080	AV	49.8	27.6	2.4	32.3	0.3	47.8	-	-	See 20dBc Data Sheet
Vert	2382.250	AV	46.6	27.5	2.4	32.3	0.3	44.5	53.9	9.4	
Vert	2483.500	AV	53.7	27.5	2.4	32.2	0.3	51.7	53.9	2.2	
Vert	2542.250	AV	48.6	27.6	2.5	32.2	0.3	46.8	-	-	See 20dBc Data Sheet
Vert	2621.750	AV	55.4	27.8	2.5	32.2	0.3	53.8	-	-	See 20dBc Data Sheet
Vert	4924.000	AV	36.4	31.7	5.0	31.5	0.3	41.9	53.9	12.0	
Vert	7386.000	AV	36.8	35.9	6.0	32.6	0.3	46.4	53.9	7.5	
Vert	9848.000	AV	33.5	38.5	7.1	33.0	0.3	46.4	53.9	7.5	

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

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

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/02/2012
Temperature/ Humidity 24 deg. C / 35%
Engineer Takayuki Shimada
(20dBc)
Mode 11g Tx 2462MHz

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	2462.000	PK	100.7	27.5	2.4	32.2	98.4	-	-	Carrier
Hori	2302.080	PK	50.5	27.6	2.4	32.3	48.2	78.4	30.2	
Hori	2542.250	PK	48.2	27.6	2.5	32.2	46.1	78.4	32.3	
Hori	2621.750	PK	52.1	27.8	2.5	32.2	50.2	78.4	28.2	
Vert	2462.000	PK	100.7	27.5	2.4	32.2	98.4	-	-	Carrier
Vert	2302.080	PK	54.1	27.6	2.4	32.3	51.8	78.4	26.6	
Vert	2542.250	PK	48.5	27.6	2.5	32.2	46.4	78.4	32.0	
Vert	2621.750	PK	55.0	27.8	2.5	32.2	53.1	78.4	25.3	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/01/2012 11/02/2012
Temperature/ Humidity 23 deg. C / 32% 24 deg. C / 35%
Engineer Hironobu Ohnishi Takayuki Shimada
(Band Edge, Low) (Band Edge, High)
Mode 11n-20 Tx 2412MHz / 2462MHz

[Tx 2412MHz]

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	66.8	27.5	2.4	32.3	-	64.4	73.9	9.5	
Hori	2390.000	AV	52.5	27.5	2.4	32.3	0.3	50.4	53.9	3.5	
Vert	2390.000	PK	64.3	27.5	2.4	32.3	-	61.9	73.9	12.0	
Vert	2390.000	AV	49.5	27.5	2.4	32.3	0.3	47.4	53.9	6.5	

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

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

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

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	91.5	27.5	2.4	32.3	89.1	-	-	Carrier
Hori	2400.000	PK	64.3	27.5	2.4	32.3	61.9	69.1	7.2	
Vert	2412.000	PK	97.2	27.5	2.4	32.3	94.8	-	-	Carrier
Vert	2400.000	PK	62.5	27.5	2.4	32.3	60.1	74.8	14.7	

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

[Tx 2462MHz]

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	69.6	27.5	2.4	32.2	-	67.3	73.9	6.6	
Hori	2483.500	AV	51.0	27.5	2.4	32.2	0.3	49.0	53.9	4.9	
Vert	2483.500	PK	68.1	27.5	2.4	32.2	-	65.8	73.9	8.1	
Vert	2483.500	AV	53.6	27.5	2.4	32.2	0.3	51.6	53.9	2.3	

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

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

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4, 3 and 2 Semi Anechoic Chamber		
Report No.	33BE0179-HO		
Date	11/03/2012	11/08/2012	11/08/2012
Temperature/ Humidity	22 deg. C / 46%	20 deg. C / 40%	24 deg.C./ 36%
Engineer	Tomotaka Sasagawa (1-10GHz)	Satofumi Matsuyama (10-26.5GHz)	Tomohisa Nakagawa (26.5-40GHz)
Mode	11a Tx 5745MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	11490.000	PK	51.5	39.9	-1.7	33.8	-	55.9	73.9	18.0	
Hori	11490.000	AV	40.6	39.9	-1.7	33.8	0.3	45.3	53.9	8.6	
Vert	11490.000	PK	56.3	39.9	-1.7	33.8	-	60.7	73.9	13.2	
Vert	11490.000	AV	43.8	39.9	-1.7	33.8	0.3	48.5	53.9	5.4	

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

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	5745.000	PK	85.0	32.6	3.9	31.6	89.9	-	-	Carrier
Hori	5725.000	PK	37.5	32.6	3.9	31.6	42.4	69.9	27.5	
Vert	5745.000	PK	86.5	32.6	3.9	31.6	91.4	-	-	Carrier
Vert	5725.000	PK	35.4	32.6	3.9	31.6	40.3	71.4	31.1	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4, 3 and 2 Semi Anechoic Chamber
Report No. 33BE0179-HO
Date 11/03/2012 11/08/2012 11/08/2012
Temperature/ Humidity 22 deg. C / 46% 20 deg. C / 40% 24 deg.C./ 36%
Engineer Tomotaka Sasagawa Satofumi Matsuyama Tomohisa Nakagawa
(1-10GHz) (10-26.5GHz) (26.5-40GHz)
Mode 11a Tx 5785MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	11570.000	PK	51.3	39.8	-1.6	33.8	-	55.7	73.9	18.2	
Hori	11570.000	AV	39.6	39.8	-1.6	33.8	0.3	44.3	53.9	9.6	
Vert	11570.000	PK	56.9	39.8	-1.6	33.8	-	61.3	73.9	12.6	
Vert	11570.000	AV	43.2	39.8	-1.6	33.8	0.3	47.9	53.9	6.0	

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

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

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4, 3 and 2 Semi Anechoic Chamber		
Report No.	33BE0179-HO		
Date	11/03/2012	11/08/2012	11/08/2012
Temperature/ Humidity	22 deg. C / 46%	20 deg. C / 40%	24 deg.C./ 36%
Engineer	Tomotaka Sasagawa (1-10GHz)	Satofumi Matsuyama (10-26.5GHz)	Tomohisa Nakagawa (26.5-40GHz)
Mode	11a Tx 5825MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	11650.000	PK	50.6	39.6	-1.6	33.8	-	54.8	73.9	19.1	
Hori	11650.000	AV	39.5	39.6	-1.6	33.8	0.3	44.0	53.9	9.9	
Vert	11650.000	PK	55.2	39.6	-1.6	33.8	-	59.4	73.9	14.5	
Vert	11650.000	AV	44.0	39.6	-1.6	33.8	0.3	48.5	53.9	5.4	

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

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	5825.000	PK	84.6	32.8	3.9	31.6	89.7	-	-	Carrier
Hori	5850.000	PK	40.1	32.8	3.9	31.6	45.2	69.7	24.5	
Vert	5825.000	PK	84.3	32.8	3.9	31.6	89.4	-	-	Carrier
Vert	5850.000	PK	40.2	32.8	3.9	31.6	45.3	69.4	24.1	

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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No.	33BE0179-HO
Date	11/03/2012
Temperature/ Humidity	22 deg. C / 46%
Engineer	Tomotaka Sasagawa (1-10GHz)
Mode	11n-20 Tx 5745MHz / 5825MHz

[Tx 5745MHz]

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	5745.000	PK	82.4	32.6	3.9	31.6	87.3	-	-	Carrier
Hori	5725.000	PK	36.5	32.6	3.9	31.6	41.4	67.3	25.9	
Vert	5745.000	PK	82.4	32.6	3.9	31.6	87.3	-	-	Carrier
Vert	5725.000	PK	35.9	32.6	3.9	31.6	40.8	67.3	26.5	

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

[Tx 5825MHz]

20dBc Data Sheet

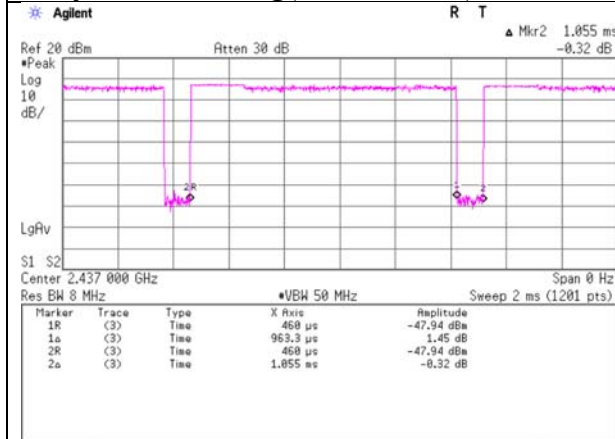
Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	5825.000	PK	84.6	32.8	3.9	31.6	89.7	-	-	Carrier
Hori	5850.000	PK	40.1	32.8	3.9	31.6	45.2	69.7	24.5	
Vert	5825.000	PK	84.3	32.8	3.9	31.6	89.4	-	-	Carrier
Vert	5850.000	PK	40.2	32.8	3.9	31.6	45.3	69.4	24.1	

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

Duty rate confirmation

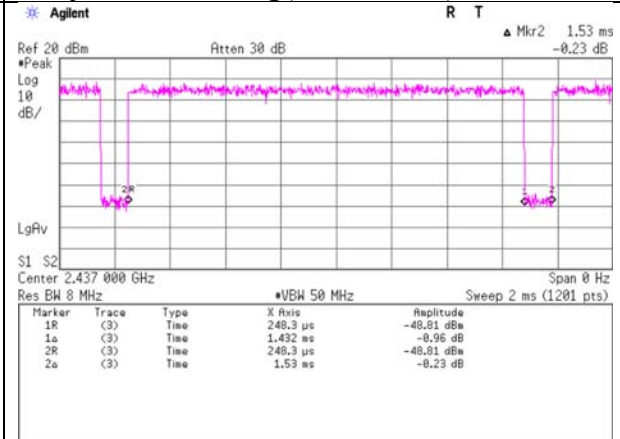
11b 11Mbps

Tx on/(Tx on+Tx off)=0.9633/1.055
Tx on/(Tx on+Tx off)*100=91.3%
Duty factor = $10\log(1.055/0.9633) = 0.39\text{dB}$



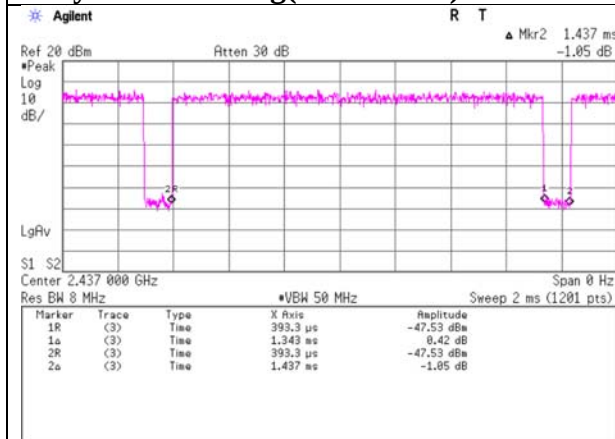
11g 6Mbps

Tx on/(Tx on+Tx off)=1.432/1.530
Tx on/(Tx on+Tx off)*100=93.6%
Duty factor = $10\log(1.530/1.432) = 0.29\text{dB}$



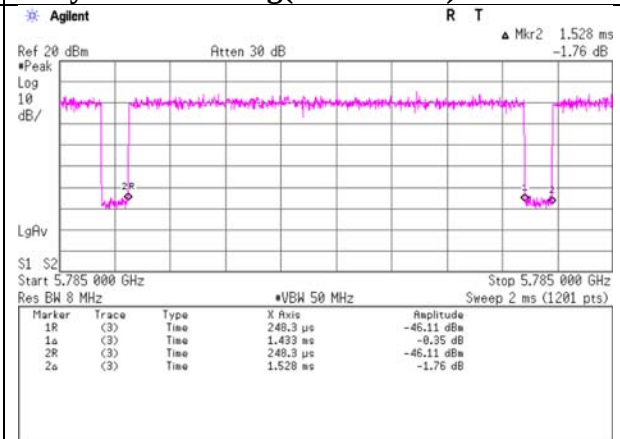
11n-20(2.4GHz) MCS0

Tx on/(Tx on+Tx off)=1.343/1.437
Tx on/(Tx on+Tx off)*100=93.5%
Duty factor = $10\log(1.437/1.343) = 0.29\text{dB}$



11a 6Mbps

Tx on/(Tx on+Tx off)=1.433/1.528
Tx on/(Tx on+Tx off)*100=93.8%
Duty factor = $10\log(1.528/1.433) = 0.28\text{dB}$



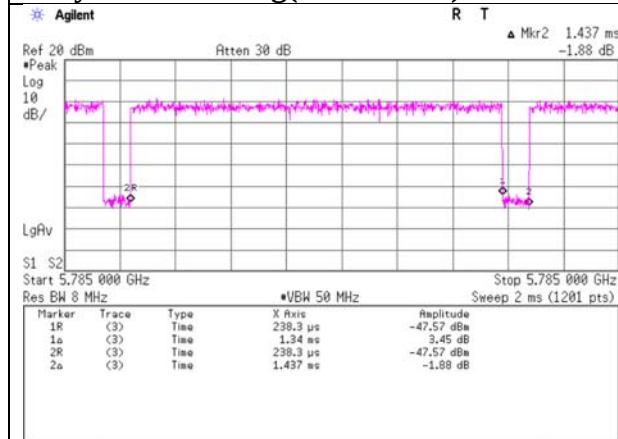
Duty rate confirmation

11n-20(5GHz) MCS0

$Tx\ on/(Tx\ on+Tx\ off)=1.340/1.437$

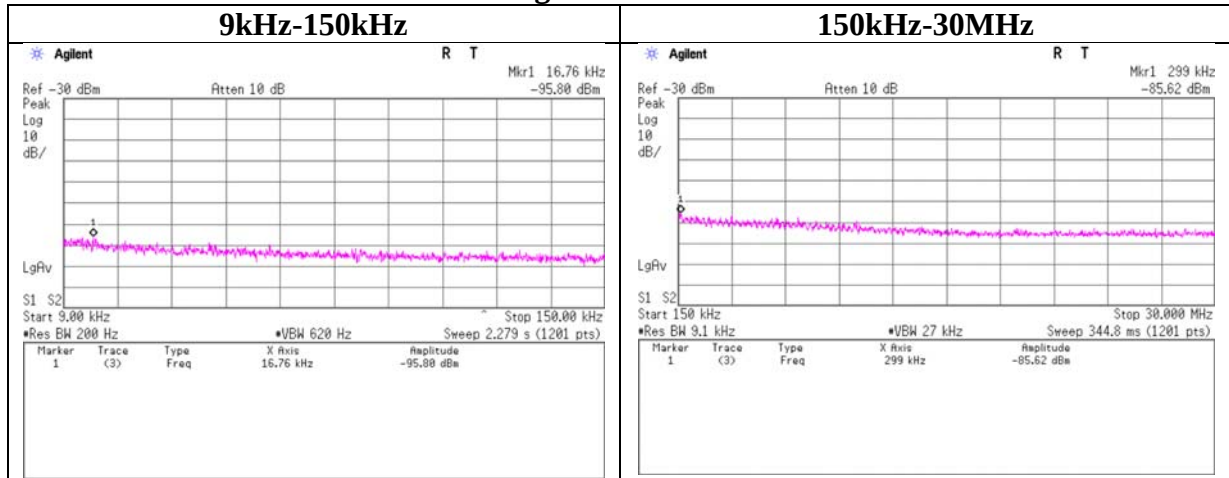
$Tx\ on/(Tx\ on+Tx\ off)*100=93.2\%$

$Duty\ factor = 10\log(1.437/1.340) = 0.30dB$



Conducted Spurious Emission

11g Tx 2437MHz



Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	EIRP	Distance	Ground bounce	E (field strength)	Limit
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[m]	[dB]	[dBuV/m]	[dBuV/m]
16.760	-95.8	0.01	5.9	-1.2	-91.1	300.0	6.0	-29.8	43.1
299.000	-85.6	0.01	5.9	-1.2	-81.0	300.0	6.0	-19.7	18.1

E=EIRP-20log(D)+Ground bounce +104.8[dBuV/m]

EIRP=Reading+Cable Loss+Attenuator+Antenna Gain

Power Density

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 10/31/2012
Temperature/ Humidity 24deg. C / 42% RH
Engineer Keisuke Kawamura
Mode 11b Tx, 11g Tx, 11a Tx

11b

Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412	-18.80	1.22	10.08	-7.50	8.00	15.50
2437	-19.03	1.23	10.08	-7.72	8.00	15.72
2462	-18.66	1.24	10.09	-7.33	8.00	15.33

11g

Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412	-22.46	1.22	10.08	-11.16	8.00	19.16
2437	-21.97	1.23	10.08	-10.66	8.00	18.66
2462	-21.95	1.24	10.09	-10.62	8.00	18.62

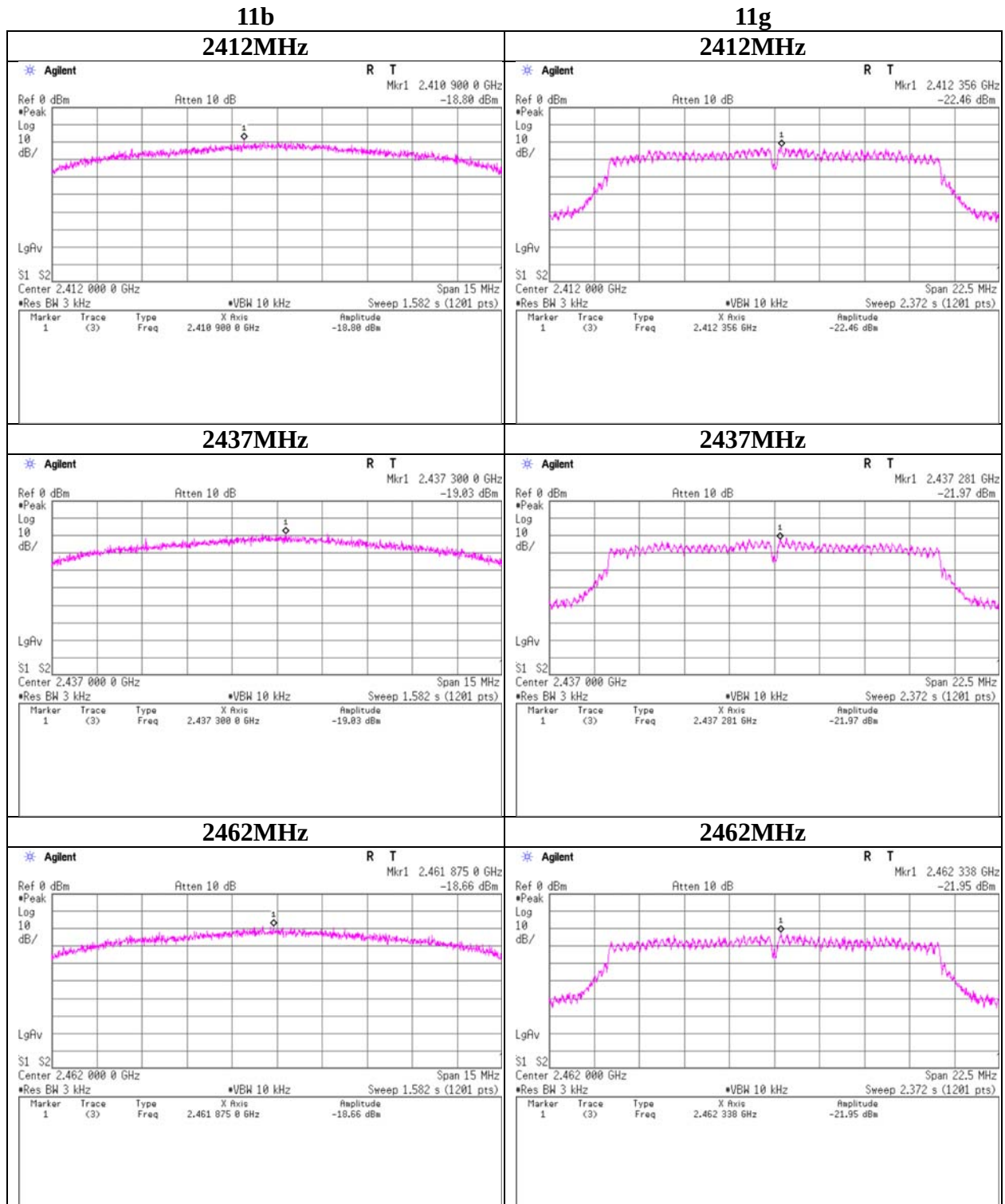
11a

Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
5745	-25.91	2.00	10.15	-13.76	8.00	21.76
5785	-26.81	2.00	10.15	-14.66	8.00	22.66
5825	-27.39	2.01	10.15	-15.23	8.00	23.23

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

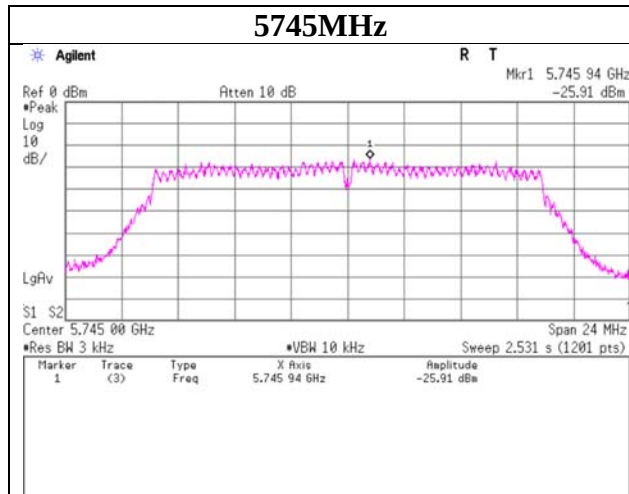
Power Density



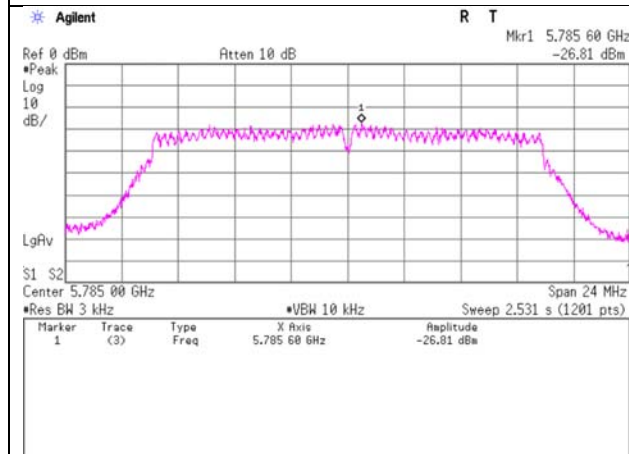
Power Density

11a

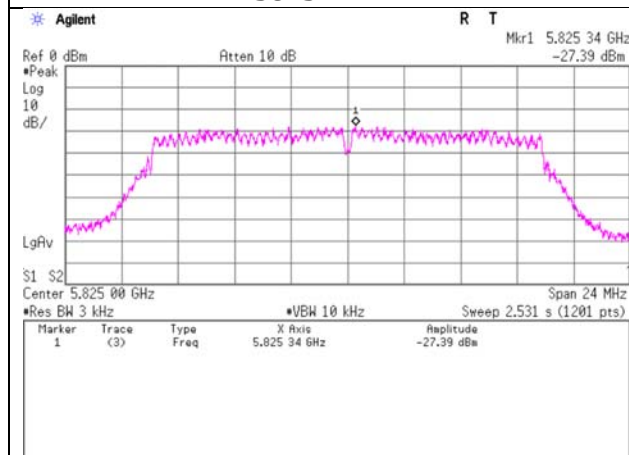
5745MHz



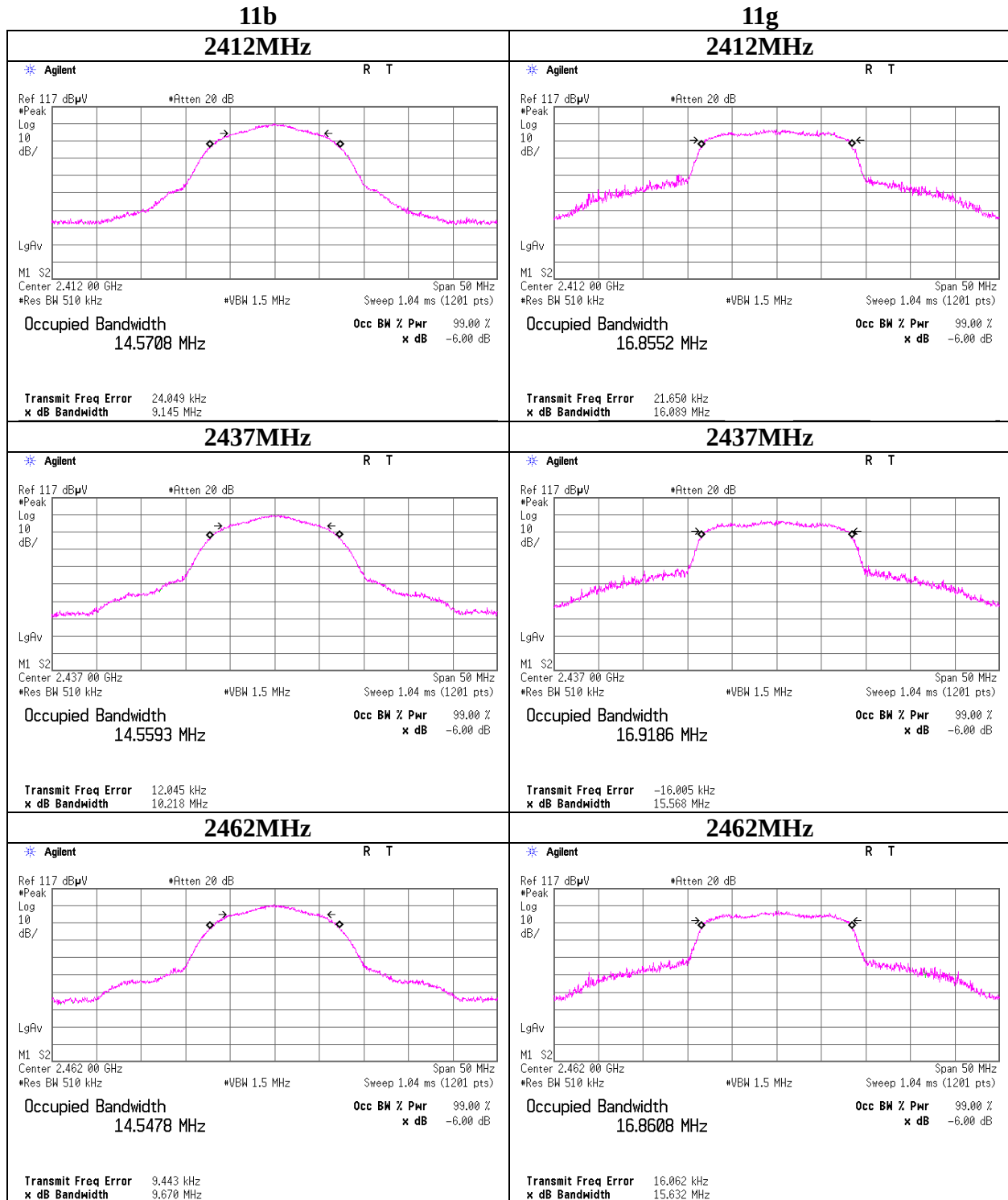
5785MHz



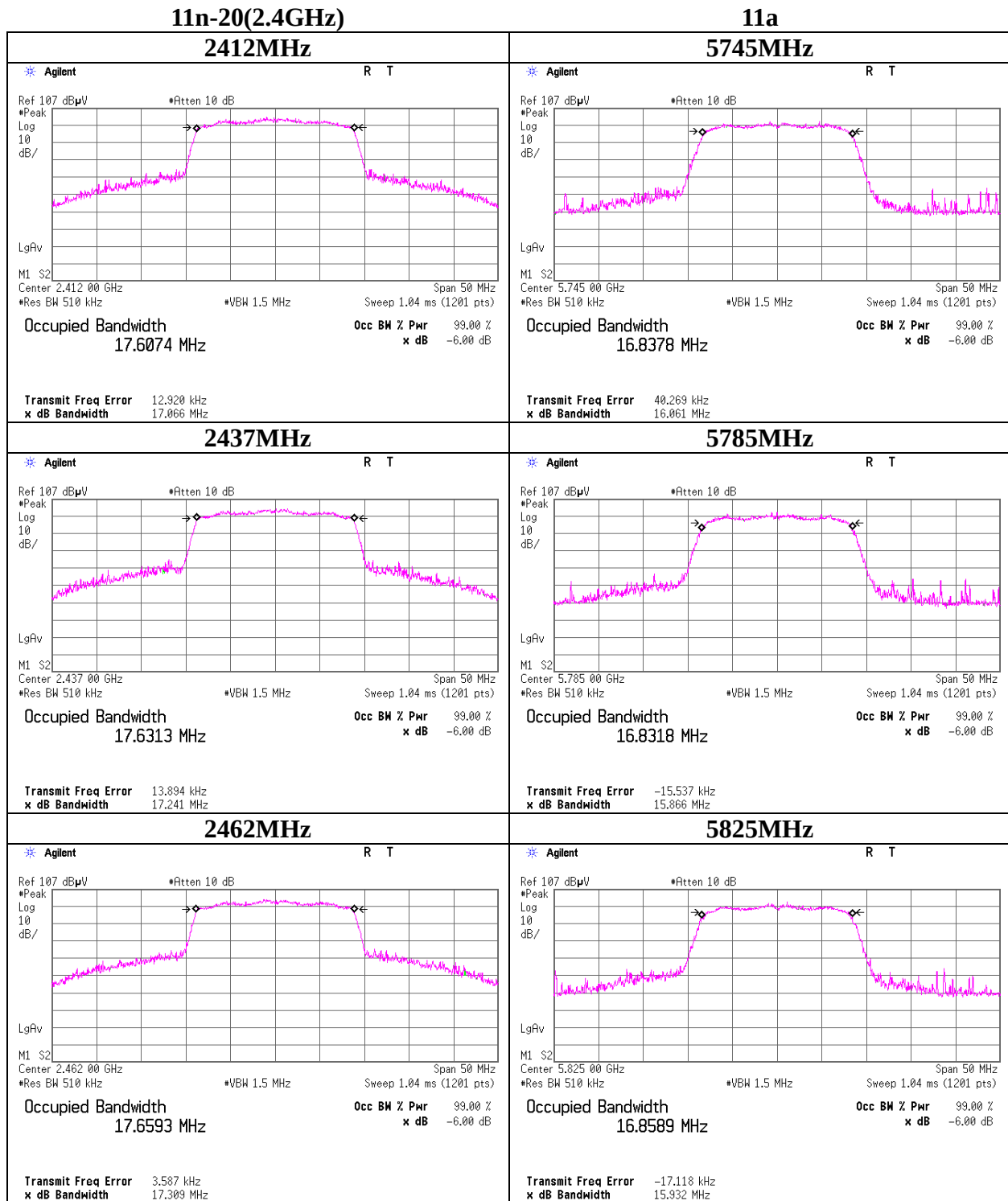
5825MHz



99% Occupied Bandwidth

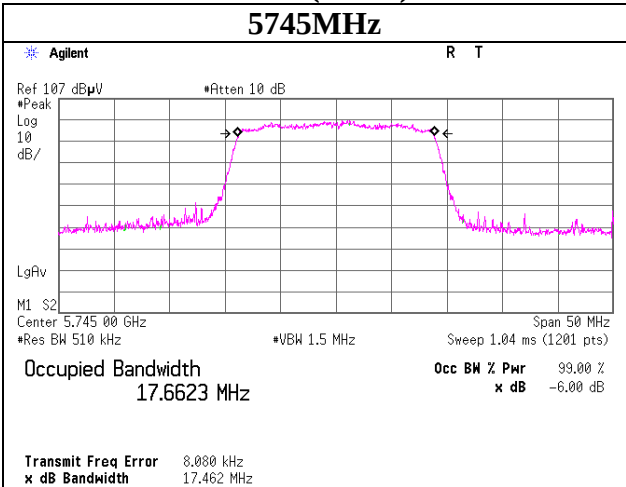


99% Occupied Bandwidth

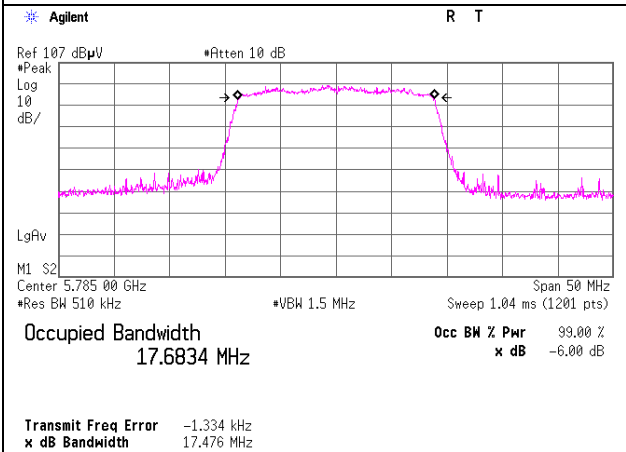


99% Occupied Bandwidth

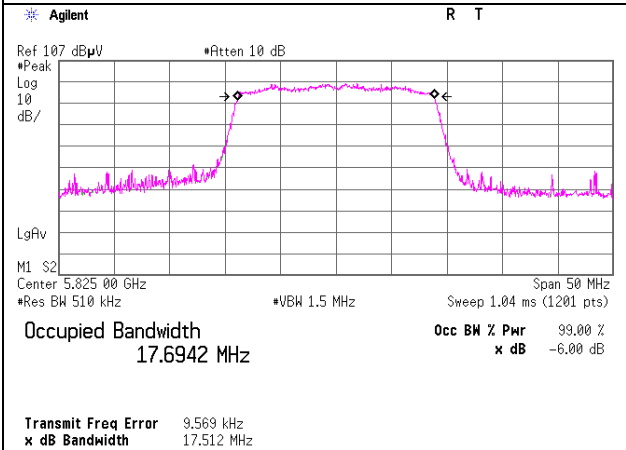
11n-20(5GHz)
5745MHz



5785MHz



5825MHz



APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2011/12/09 * 12
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2012/10/08 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2012/10/08 * 12
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2012/03/27 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT	2011/11/23 * 12
MAT-20	Attenuator(10dB) (above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2012/01/12 * 12
MCC-67	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28635/2	AT	2012/04/25 * 12
MOTS-MATM	Antenna Terminal Measurement Software	UL Japan	-	-	AT	-
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2012/02/29 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE/CE	2012/02/06 * 12
MJM-07	Measure	PROMART	SEN1955	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE/CE	2012/02/03 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2012/08/17 * 12
MCC-141	Microwave Cable	Junkosha	MWX221	1203S212(1m) / 1204S062(5m)	RE	2012/04/23 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2012/03/28 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2012/05/30 * 12
MHF-20	High Pass Filter 3.5-18.0GHz	TOKIMEC	TF323DCC	607	RE	2012/09/12 * 12
MCC-79	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278923/4	RE	2011/12/08 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2012/02/06 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	RE	2012/06/19 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2012/02/22 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2012/09/05 * 12
MHF-16	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCA	7001	RE	2012/09/06 * 12
MCC-77	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278942/4	RE	2011/12/08 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	CE	2012/04/05 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	8127364	CE	2012/02/09 * 12
MTA-31	Terminator	TME	CT-01	-	CE	2012/01/11 * 12
MAT-67	Attenuator	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(5m)/ 421-010(1m)/ suoform141-PE(1m)/ RFM-E121(Switcher)	-/04178	CE	2012/07/12 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2012/02/24 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2012/02/06 * 12

EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MJM-15	Measure	KOMELON	KMC-36	-	RE	-
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2012/03/21 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	3950M00205	RE	2012/06/22 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2012/05/21 * 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

UL Japan, Inc.

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