



RADIO TEST REPORT

Test Report No. : 10191682A-E

Applicant : CASIO COMPUTER CO., LTD.
Type of Equipment : Electronic Cash Register
Model No. : V-R7100-C
FCC ID : BBQVR7100
Test regulation : FCC Part 15 Subpart C: 2013
[WLAN part]
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: December 24, 2013 to February 5, 2014

Representative test engineer:

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Engineer of WiSE Japan,
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Approved by:

Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

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13-EM-F0429

CONTENTS	PAGE
SECTION 1: Customer information.....	4
SECTION 2: Equipment under test (E.U.T.).....	4
SECTION 3: Test specification, procedures & results.....	6
SECTION 4: Operation of E.U.T. during testing.....	9
SECTION 5: Conducted Emission.....	12
SECTION 6: Radiated Spurious Emission	13
SECTION 7: Antenna Terminal Conducted Tests.....	14
APPENDIX 1: Data of EMI test.....	15
Conducted Emission	15
6dB Bandwidth	16
Maximum Peak Output Power	22
Average Output Power	28
Radiated Spurious Emission	30
Conducted Spurious Emission	52
Power Density	53
99%Occupied Bandwidth	59
APPENDIX 2: Test instruments	63
APPENDIX 3: Photographs of test setup	65
Conducted Emission	65
Radiated Spurious Emission	66
Worst Case Position (Horizontal: X-axis/ Vertical:Y-axis).....	67

SECTION 1: Customer information

Company Name : CASIO COMPUTER CO., LTD.
Address : 2-1, Sakaecho 3-chome, Hamura-shi, Tokyo 205-8555 Japan

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

2.1 Identification of E.U.T.

Type of Equipment : Electronic Cash Register
Model No. : V-R7100-C
Serial No. : Refer to Section 4, Clause 4.2
Rating : AC 120V (AC Adapter output: DC24V)
Receipt Date of Sample : December 24, 2013
Country of Mass-production : Indonesia
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

Radio Specification

[Bluetooth (Ver. 2.0)]

Equipment Type	Transceiver	
Frequency of Operation	2402-2480MHz	
Type of Modulation	FHSS: GFSK, $\pi/4$ DQPSK, 8DPSK	
Antenna Type	FPC Antenna	
Antenna connector type	Internal Antenna	
Antenna Gain	4.09dBi (2.4GHz Main)	
Power Supply (radio part input)	DC3.7V	

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

Equipment Type	Transceiver	
Frequency of Operation	2412-2462MHz	5180-5320MHz 5500-5700MHz * 5745-5825MHz
Type of Modulation	DSSS, OFDM	OFDM
Antenna Type	FPC Antenna	
Antenna connector type	Internal Antenna	
Antenna Gain	4.09dBi (2.4GHz Main)	4.25 dBi (W52/53 Aux), 4.18 dBi (W56 Aux), 4.62 dBi (W58 Aux)

*5600MHz-5640MHz is not used in Canada.

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[WLAN (IEEE802.11n-40)]

Equipment Type	Transceiver	
Frequency of Operation	2422-2452MHz	5190-5310MHz 5510-5670MHz * 5755-5795MHz
Type of Modulation	OFDM	OFDM
Antenna Type	FPC Antenna	
Antenna connector type	Internal Antenna	
Antenna Gain	4.09dBi (2.4GHz Main)	4.25 dBi (W52/53 Aux), 4.18 dBi (W56 Aux), 4.62 dBi (W58 Aux)

*5590MHz-5630MHz is not used in Canada.

Model difference

Model	WLAN Bluetooth	iButton	Power cord (enclosed)
V-R7100-C*	X	-	X
V-R7100-AUS	X	-	-

*Tested model

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2013, final revised on September 30, 2013 and effective October 30, 2013

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 18.5dB, 0.17267MHz, L AV 20.0dB, 0.42396MHz, N	Complied	-
6dB Bandwidth	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on April 9, 2013)" ----- 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 April 9, 2013)" ----- 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 April 9, 2013)" ----- 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 April 9, 2013)" ----- IC: RSS-Gen 4.9	FCC: Section15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 7.2.3	0.2B 17265.000MHz, AV, Vert. 17385.000MHz, 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 (DC3.7V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

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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	3.5dB
No.3	3.6dB
No.4	3.5dB

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	4.0dB	5.1dB	5.0dB	5.1dB	6.0dB	4.9dB	4.3dB
No.2	3.9dB	5.2dB	5.0dB	4.9dB	5.9dB	4.7dB	4.2dB
No.3	4.3dB	5.1dB	5.2dB	5.2dB	6.0dB	4.8dB	4.2dB
No.4	4.6dB	5.2dB	5.0dB	5.2dB	6.0dB	5.7dB	4.2dB

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

Power meter (+dB)	
Below 1GHz	Above 1GHz
0.7dB	1.5dB

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	
1.5dB	1.7dB	2.8dB	2.8dB	2.9dB	2.6dB

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.

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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	4.0 x 4.5 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 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	-	6.2 x 4.7 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.

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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)	18Mbps, PN9
IEEE 802.11n SISO 20MHz BW (11n-20): 2.4GHz Band	MCS 2, PN9
IEEE 802.11n SISO 40MHz BW (11n-40) : 2.4GHz Band	MCS 6, PN9
IEEE 802.11a (11a)	18Mbps, PN9
IEEE 802.11n SISO 20MHz BW (11n-20): 5GHz Band	MCS 5, PN9
IEEE 802.11n SISO 40MHz BW (11n-40) : 5GHz Band	MCS 6, 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; - Power settings: 11b: 20000 (all Channels) 11g: 13500 (2412MHz), 20000 (2437MHz), 13500 (2462MHz) 11n-20 (2.4GHz): 15000 (2412MHz), 20000 (2437MHz), 15000 (2462MHz) 11n-40 (2.4GHz): 87500 (2422MHz), 20000 (2437MHz), 87500 (2452MHz) 11a: 20000 (W58 all Channels) 11n-20 (5GHz): 20000 (W58 all Channels) 11n-40 (5GHz): 20000 (5755MHz), 16500 (5795MHz) - Software: WLAN:18xx_test.sh *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.	

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*Details of Operating mode(s): 2.4GHz Band

Test Item	Operating Mode	Tested frequency
Conducted Emission Spurious Emission (Conducted) Spurious Emission below 1GHz (Radiated)	11g Tx *1)	2437MHz
6dB Bandwidth, Maximum Peak Output Power, Power Density, 99% Occupied Bandwidth,	11b Tx	2412MHz
	11g Tx	2437MHz
	11n-20 Tx	2462MHz
	11n-40 Tx	2422MHz
Spurious Emission above 1GHz (Radiated)	11b Tx	2412MHz
	11g Tx *2)	2437MHz
	11n-20 Tx *2)	2462MHz
	11n-40 Tx	2422MHz
		2437MHz
		2452MHz

*Details of Operating mode(s): 5GHz Band

Test Item	Operating Mode	Tested frequency
Spurious Emission (Conducted)	11a Tx *1)	5745MHz
6dB Bandwidth, Maximum Peak Output Power, Power Density, 99% Occupied Bandwidth	11a Tx	5745MHz
	11n-20 Tx	5785MHz
		5825MHz
	11n-40 Tx	5755MHz
Spurious Emission above 1GHz (Radiated)		5795MHz
	11a Tx *3)	5745MHz
		5785MHz
		5825MHz
	11n-20 Tx *3)	5745MHz
		5825MHz
	11n-40 Tx	5755MHz
		5795MHz

- *1) The mode was tested as a representative, because it had the highest power at antenna terminal test.
*2) Since 11g 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.
However, Band edge compliance test was performed on 11g and 11n-20.
*3) Since 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.
However, Band edge compliance test was performed on 11a and 11n-20.

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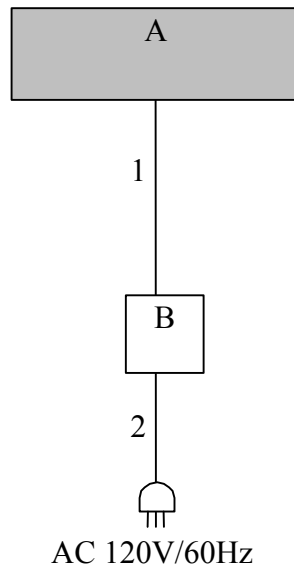
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4.2 Configuration and peripherals



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

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Electronic Cash Register	V-R7100-C	CS-01 *1) CS-19 *2) CS-41 *3)	CASIO COMPUTER CO., LTD.	EUT
B	AC Adaptor	EKF2400250X1BA	-	Mass Power Electronic Limited	-

*1) Used for Antenna Terminal conducted test

*2) Used for Conducted Emission test and Radiated Emission (Above 1GHz) test

*3) Used for Radiated Emission (Below 1GHz) test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.8	Unshielded	Unshielded	-
2	AC Cable	2.0	Unshielded	Unshielded	-

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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.

1) 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 CISPR 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 "11.0 Emissions in non-restricted frequency bands" of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on April 9, 2013)".

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	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 *1)	PK
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	Average Power Method: WLAN: 12.2.5.1 RBW: 1MHz VBW: 3MHz Detector: Power Averaging (RMS) Trace: Free Run	RBW: 100kHz VBW: 300kHz (S/A)
Test Distance	3m	3m (below 10GHz), 1m *2) (above 10GHz) 0.5m *3) (above 26.5GHz)		3m (below 10GHz), 1m *2) (above 10GHz) 0.5m *3) (above 26.5GHz)

*1) Average Power Measurement was performed based on 6.0 & 12.2.5 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on April 9, 2013)"

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

*3) 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 and Y 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, 40MHz	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*1)	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 50MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3kHz	10kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				
*1) The measurement was performed with Max Hold since the duty cycle was not 100%. *2) Reference data *3) Section 10.2 Method PKPSD (peak PSD) of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on April 9, 2013)". *4) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was low enough 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**

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APPENDIX 1: Data of EMI test

Conducted Emission

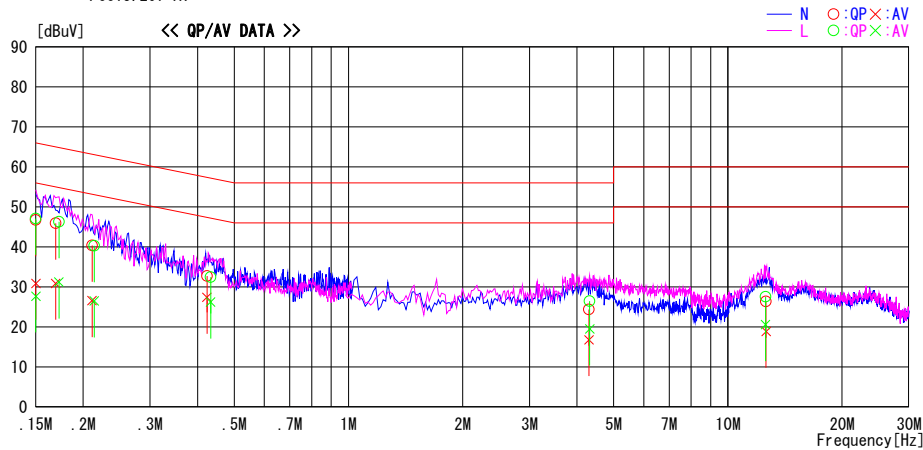
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2014/01/18

Report No. : 10191682H
Temp./Humi. : 21deg. C / 35% RH
Engineer : Yuta Moriya

Mode / Remarks : Tx_11g_18Mbps_2437MHz

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]		
0.15000	33.5	17.7	13.2	46.7	30.9	66.0	56.0	19.3	25.1	N	
0.16918	32.7	17.7	13.2	45.9	30.9	65.0	55.0	19.1	24.1	N	
0.21102	27.1	13.3	13.3	40.4	26.6	63.2	53.2	22.8	26.6	N	
0.42396	19.4	14.1	13.3	32.7	27.4	57.4	47.4	24.7	20.0	N	
4.30627	10.4	2.8	14.0	24.4	16.8	56.0	46.0	31.6	29.2	N	
12.60189	11.5	4.0	14.9	26.4	18.9	60.0	50.0	33.6	31.1	N	
0.15000	33.9	14.5	13.2	47.1	27.7	66.0	56.0	18.9	28.3	L	
0.17267	33.1	18.0	13.2	46.3	31.2	64.8	54.8	18.5	23.6	L	
0.21381	27.0	13.2	13.3	40.3	26.5	63.1	53.1	22.8	26.6	L	
0.43320	19.2	12.9	13.3	32.5	26.2	57.2	47.2	24.7	21.0	L	
4.32445	12.5	5.5	14.0	26.5	19.5	56.0	46.0	29.5	26.5	L	
12.56171	12.7	5.7	14.9	27.6	20.6	60.0	50.0	32.4	29.4	L	

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

6dB Bandwidth

Test place Head Office EMC Lab. No.4 Measurement Room
Report No. 10191682A
Date 1/10/2014 1/31/2014
Temperature/ Humidity 24deg. C / 21% RH 21deg. C / 38% RH
Engineer Yutaka Yoshida Yutaka Yoshida
Mode 11a/n-20/n-40 Tx (5GHz Band)

11a

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
5745	15.121	>500
5785	15.122	>500
5825	15.118	>500

11n-20

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
5745	15.112	>500
5785	15.137	>500
5825	15.122	>500

11n-40

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
5755	35.129	>500
5795	35.091	>500

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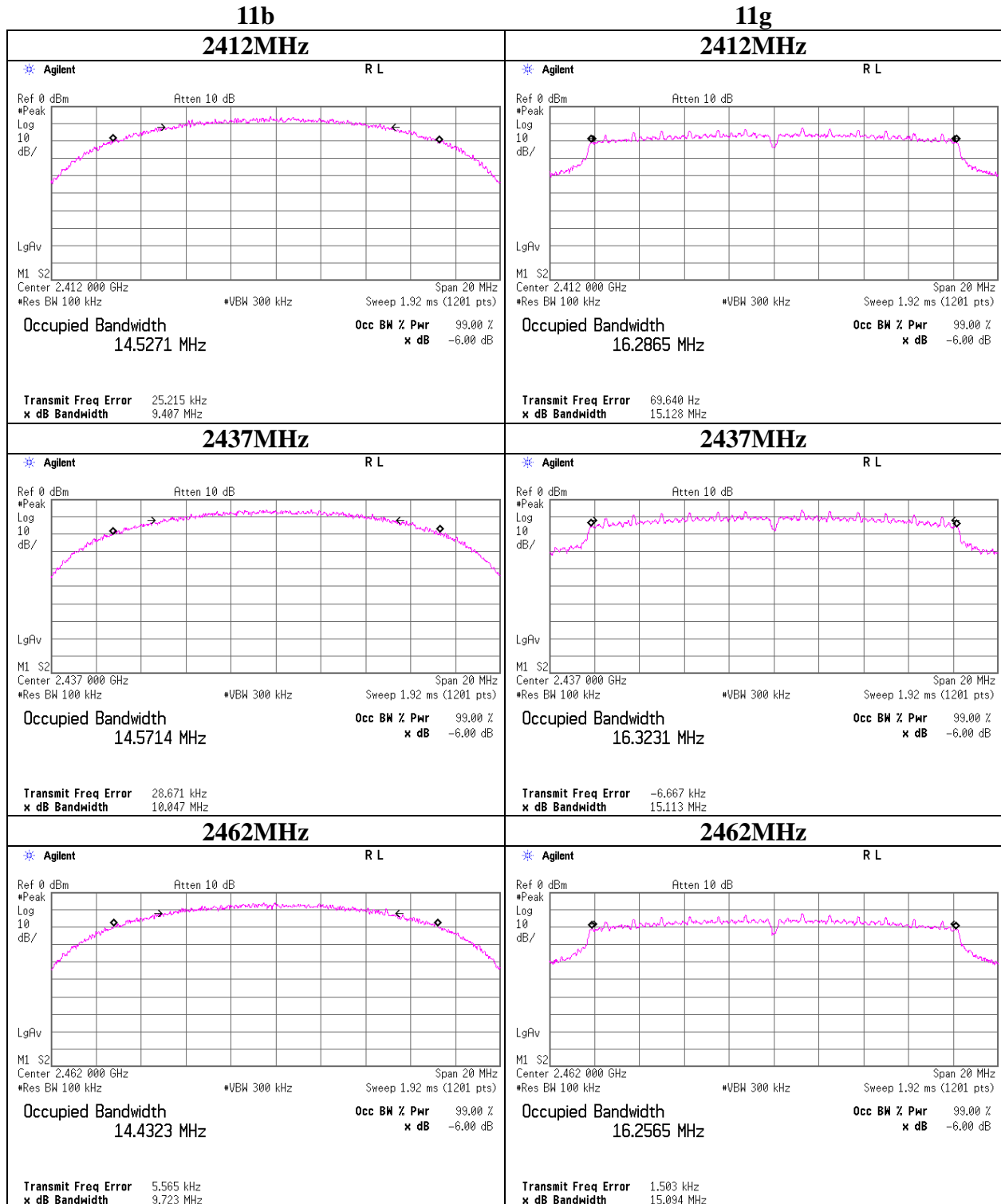
Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

6dB Bandwidth

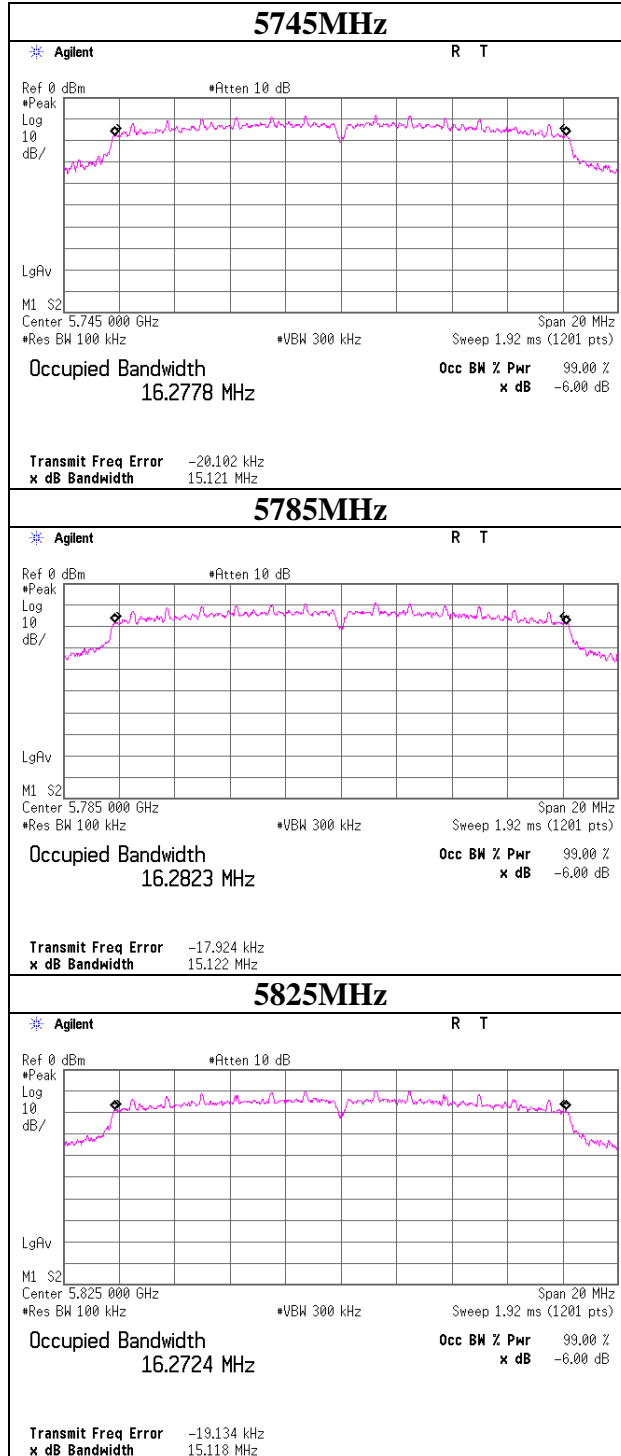


6dB Bandwidth



6dB Bandwidth

11a



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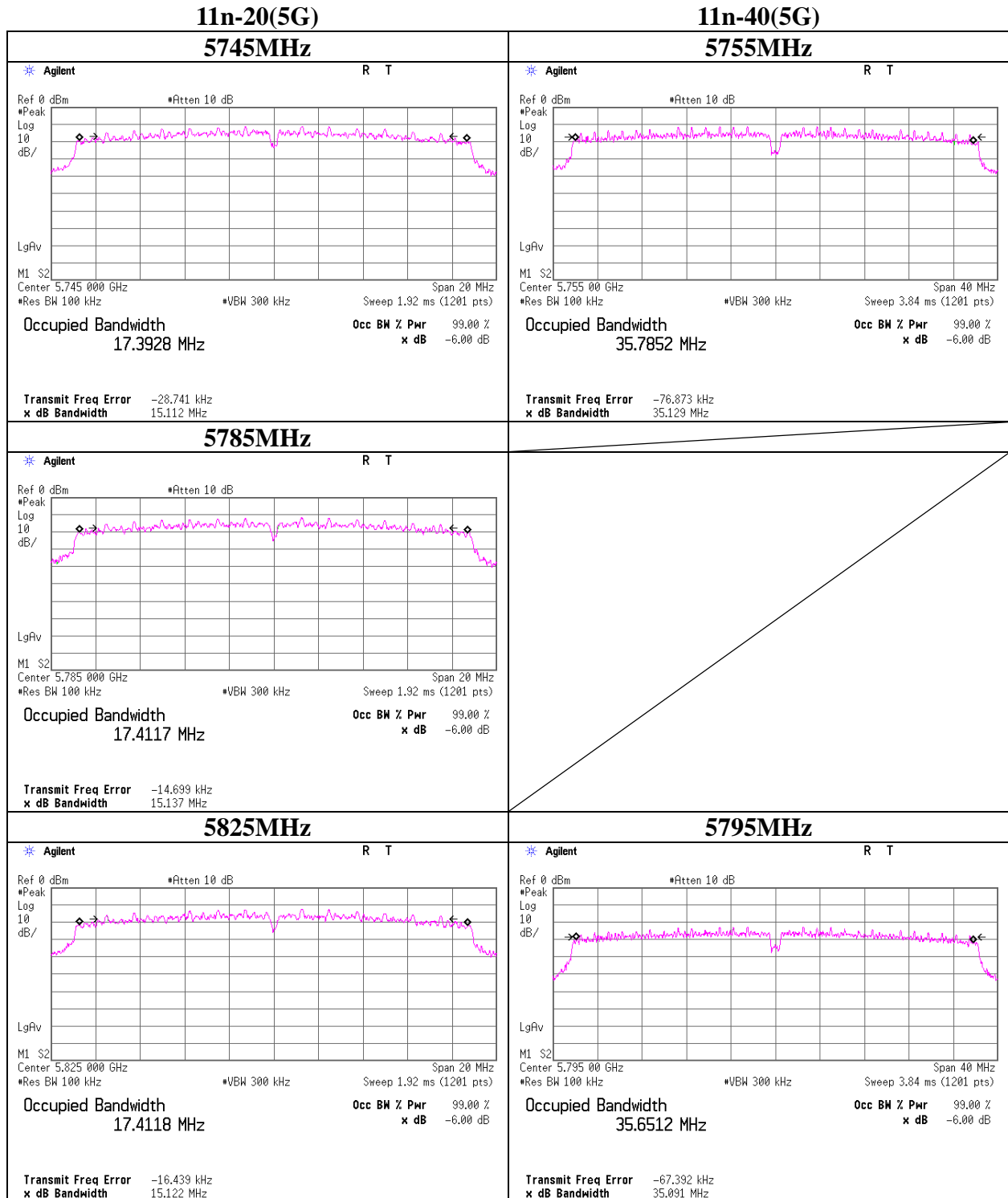
Head Office EMC Lab.

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6dB Bandwidth



Maximum Peak Output Power

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10191682A
Date	12/25/2013
Temperature/ Humidity	23 deg. C / 32% RH
Engineer	Tomohisa Nakagawa
Mode	Worst data rate check

2437MHz

Rate 11b [Mbps]	Reading PK [dBm]	Remark
1	4.50	
2	4.55	
5.5	4.60	
11	4.72	*

*: Worst Rate

2437MHz

Rate 11g [Mbps]	Reading PK [dBm]	Remark
6	8.55	
9	8.69	
12	8.63	
18	8.74	*
24	8.68	
36	8.54	
48	8.31	
54	8.24	

*: Worst Rate

2437MHz

Rate 11n20 [MCS]	Reading PK [dBm]	Remark
0	8.27	
1	8.43	
2	8.46	*
3	8.40	
4	8.24	
5	8.23	
6	8.13	
7	7.76	

*: Worst Rate

2437MHz

Rate 11n40 [MCS]	Reading PK [dBm]	Remark
0	7.32	
1	7.34	
2	7.59	
3	7.62	
4	7.61	
5	7.47	
6	8.56	*
7	8.44	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.
Difference between worst rate check data and formal test result is due to the different test condition.

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Maximum Peak Output Power

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	10191682A
Date	01/10/2014
Temperature/ Humidity	24deg. C / 21% RH
Engineer	Yutaka Yoshida
Mode	Worst data rate check

5785MHz

Rate 11a [Mbps]	Reading PK [dBm]	Remark
6	5.44	
9	5.46	
12	5.53	
18	5.55	*
24	5.51	
36	5.47	
48	5.49	
54	5.44	

*: Worst Rate

5785MHz

Rate 11n20 [MCS]	Reading PK [dBm]	Remark
0	5.33	
1	5.36	
2	5.47	
3	5.51	
4	5.47	
5	5.52	*
6	5.33	
7	5.18	

*: Worst Rate

5755MHz

Rate 11n40 [MCS]	Reading PK [dBm]	Remark
0	5.35	
1	5.16	
2	5.27	
3	5.37	
4	5.36	
5	5.36	
6	6.16	*
7	6.01	

*: Worst Rate

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

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Maximum Peak Output Power

Test place	Head Office EMC Lab. No.4 Measurement Room	
Report No.	10191682A	
Date	01/10/2014	1/31/2014
Temperature/ Humidity	24deg. C / 21% RH	21deg. C / 38% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	11a/n-20/n-40 Tx (5GHz Band)	

11a 18Mbps

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5745	6.46	1.59	10.03	18.08	64.27	30.00	1000	11.92
5785	5.55	1.59	10.03	17.17	52.12	30.00	1000	12.83
5825	4.88	1.59	10.03	16.50	44.67	30.00	1000	13.50

11n-20 MCS5

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5745	6.36	1.59	10.03	17.98	62.81	30.00	1000	12.02
5785	5.52	1.59	10.03	17.14	51.76	30.00	1000	12.86
5825	4.84	1.59	10.03	16.46	44.26	30.00	1000	13.54

11n-40 MCS6

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5755	6.16	1.59	10.03	17.78	59.98	30.00	1000	12.22
5795	1.27	1.59	10.13	12.99	19.91	30.00	1000	17.01

Sample Calculation:

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

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Maximum Average Output Power (Reference data for RF EXposure)

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10191682A
Date	12/25/2013
Temperature/ Humidity	23 deg. C / 32% RH
Engineer	Tomohisa Nakagawa
Mode	Worst data rate check

2437MHz

Rate 11b [Mbps]	Reading AV [dBm]	Remark
1	3.23	*
2	3.03	
5.5	2.74	
11	2.37	

*: Worst Rate

2437MHz

Rate 11g [Mbps]	Reading AV [dBm]	Remark
6	2.40	*
9	2.20	
12	1.93	
18	1.52	
24	-0.02	
36	-1.55	
48	-2.76	
54	-3.69	

*: Worst Rate

2437MHz

Rate 11n20 [MCS]	Reading AV [dBm]	Remark
0	1.56	*
1	1.03	
2	0.56	
3	0.23	
4	-1.48	
5	-2.73	
6	-3.63	
7	-5.01	

*: Worst Rate

2437MHz

Rate 11n40 [MCS]	Reading AV [dBm]	Remark
0	-2.82	
1	-3.55	
2	-4.19	
3	-4.68	
4	-5.57	
5	-6.13	
6	-2.04	*
7	-3.94	

*: Worst Rate

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

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Maximum Average Output Power (Reference data for RF EXposure)

Test place	Head Office EMC Lab. No.4 Measurement Room /
Report No.	10191682A
Date	01/10/2014
Temperature/ Humidity	24deg. C / 21% RH
Engineer	Yutaka Yoshida
Mode	Worst data rate check

5785MHz

Rate 11a [Mbps]	Reading AV [dBm]	Remark
6	-0.65	*
9	-0.91	
12	-1.07	
18	-1.49	
24	-3.02	
36	-4.55	
48	-5.79	
54	-6.77	

*: Worst Rate

5785MHz

Rate 11n20 [MCS]	Reading AV [dBm]	Remark
0	-1.58	*
1	-2.11	
2	-2.45	
3	-2.77	
4	-4.42	
5	-5.66	
6	-6.61	
7	-7.97	

*: Worst Rate

5755MHz

Rate 11n40 [MCS]	Reading AV [dBm]	Remark
0	-5.50	
1	-6.24	
2	-6.80	
3	-7.20	
4	-7.96	
5	-8.43	
6	-4.04	*
7	-6.03	

*: Worst Rate

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

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Average Output Power
(for reporting purpose only)

Test place	Head Office EMC Lab. No.4 Measurement Room	
Report No.	10191682A	
Date	01/10/2014	1/31/2014
Temperature/ Humidity	24deg. C / 21% RH	21deg. C / 38% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	11a/n-20/n-40 Tx	

11a 6Mbps

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5745	0.53	1.59	10.03	12.15	16.41
5785	-0.65	1.59	10.03	10.97	12.50
5825	-1.20	1.59	10.03	10.42	11.02

11n-20 MCS0

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5745	-0.66	1.59	10.03	10.96	12.47
5785	-1.58	1.59	10.03	10.04	10.09
5825	-2.19	1.59	10.03	9.43	8.77

11n-40 MCS6

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5755	-4.04	1.59	10.03	7.58	5.73
5795	-11.97	1.59	10.13	-0.25	0.94

Sample Calculation:

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10191682A
Date 12/25/2013
Temperature/ Humidity 23 deg. C / 32% RH
Engineer Tomohisa Nakagawa
(1-10GHz)
Mode 11b 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	4874.000	PK	52.1	30.6	5.3	31.4	-	56.6	73.9	17.3	
Hori	7311.000	PK	43.6	35.9	6.8	32.4	-	53.9	73.9	20.0	
Hori	9748.000	PK	42.5	39.4	7.3	33.0	-	56.2	73.9	17.7	
Hori	4874.000	AV	45.2	30.6	5.3	31.4	1.0	50.7	53.9	3.2	
Hori	7311.000	AV	33.4	35.9	6.8	32.4	1.0	44.7	53.9	9.2	
Hori	9748.000	AV	33.1	39.4	7.3	33.0	1.0	47.8	53.9	6.1	
Vert	4874.000	PK	49.1	30.6	5.3	31.4	-	53.6	73.9	20.3	
Vert	7311.000	PK	43.0	35.9	6.8	32.4	-	53.3	73.9	20.6	
Vert	9748.000	PK	43.6	39.4	7.3	33.0	-	57.3	73.9	16.6	
Vert	4874.000	AV	41.3	30.6	5.3	31.4	1.0	46.8	53.9	7.1	
Vert	7311.000	AV	33.2	35.9	6.8	32.4	1.0	44.5	53.9	9.4	
Vert	9748.000	AV	32.9	39.4	7.3	33.0	1.0	47.6	53.9	6.3	

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

*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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10191682A
Date 12/25/2013
Temperature/ Humidity 23 deg. C / 32% RH
Engineer Tomohisa Nakagawa
(1-10GHz)
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	2483.500	PK	57.0	28.4	3.1	32.3	-	56.2	73.9	17.7	
Hori	2487.400	PK	58.9	28.4	3.1	32.3	-	58.1	73.9	15.8	
Hori	4924.000	PK	48.3	30.7	5.3	31.4	-	52.9	73.9	21.0	
Hori	7386.000	PK	43.7	36.1	6.7	32.4	-	54.1	73.9	19.8	
Hori	9848.000	PK	43.0	39.6	6.9	33.1	-	56.4	73.9	17.5	
Hori	2483.500	AV	48.0	28.4	3.1	32.3	1.0	48.2	53.9	5.7	*1)
Hori	2487.400	AV	50.1	28.4	3.1	32.3	1.0	50.3	53.9	3.6	
Hori	4924.000	AV	41.0	30.7	5.3	31.4	1.0	46.6	53.9	7.3	
Hori	7386.000	AV	33.6	36.1	6.7	32.4	1.0	45.0	53.9	8.9	
Hori	9848.000	AV	33.1	39.6	7.4	33.1	1.0	48.0	53.9	5.9	
Vert	2483.500	PK	54.3	28.4	3.1	32.3	-	53.5	73.9	20.4	
Vert	2487.400	PK	54.6	28.4	3.1	32.3	-	53.8	73.9	20.1	
Vert	4924.000	PK	44.6	30.7	5.3	31.4	-	49.2	73.9	24.7	
Vert	7386.000	PK	43.8	36.1	6.7	32.4	-	54.2	73.9	19.7	
Vert	9848.000	PK	42.8	39.6	6.9	33.1	-	56.2	73.9	17.7	
Vert	2483.500	AV	45.2	28.4	3.1	32.3	1.0	45.4	53.9	8.5	*1)
Vert	2487.400	AV	46.4	28.4	3.1	32.3	1.0	46.6	53.9	7.3	
Vert	4924.000	AV	35.4	30.7	5.3	31.4	1.0	41.0	53.9	12.9	
Vert	7386.000	AV	33.6	36.1	6.7	32.4	1.0	45.0	53.9	8.9	
Vert	9848.000	AV	33.0	39.6	7.4	33.1	1.0	47.9	53.9	6.0	

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

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

*1) Not Out of band emission (Leakage Power)

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

UL Japan, Inc.

Head Office EMC Lab.

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10191682A
Date 01/09/2014 01/10/2014
Temperature/ Humidity 23 deg. C / 32% RH 22 deg. C / 32% RH
Engineer Masatoshi Nishiguchi Masatoshi Nishiguchi
(1-10GHz) (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	42.110	QP	34.5	13.7	7.2	32.2	-	23.2	40.0	16.8	
Hori	102.303	QP	43.7	10.5	8.1	32.1	-	30.2	43.5	13.3	
Hori	172.237	QP	37.4	15.8	8.8	32.1	-	29.9	43.5	13.6	
Hori	307.208	QP	46.4	14.4	9.9	32.0	-	38.7	46.0	7.3	
Hori	460.802	QP	38.6	17.9	10.9	32.0	-	35.4	46.0	10.6	
Hori	768.011	QP	41.7	21.5	12.6	31.7	-	44.1	46.0	1.9	
Hori	960.011	QP	34.7	23.6	13.6	30.7	-	41.2	53.9	12.7	
Hori	4874.000	PK	46.4	30.6	5.3	31.4	-	50.9	73.9	23.0	
Hori	7311.000	PK	42.0	35.9	6.8	32.4	-	52.3	73.9	21.6	
Hori	9748.000	PK	42.5	39.4	7.3	33.0	-	56.2	73.9	17.7	
Hori	4874.000	AV	39.8	30.6	5.3	31.4	1.8	46.1	53.9	7.8	
Hori	7311.000	AV	33.4	35.9	6.8	32.4	1.8	45.5	53.9	8.4	
Hori	9748.000	AV	33.4	39.4	7.3	33.0	1.8	48.9	53.9	5.0	
Vert	42.110	QP	38.2	13.7	7.2	32.2	-	26.9	40.0	13.1	
Vert	102.303	QP	40.9	10.5	8.1	32.1	-	27.4	43.5	16.1	
Vert	172.237	QP	39.5	15.8	8.8	32.1	-	32.0	43.5	11.5	
Vert	307.208	QP	42.3	14.4	9.9	32.0	-	34.6	46.0	11.4	
Vert	460.802	QP	33.9	17.9	10.9	32.0	-	30.7	46.0	15.3	
Vert	768.011	QP	36.2	21.5	12.6	31.7	-	38.6	46.0	7.4	
Vert	960.011	QP	34.1	23.6	13.6	30.7	-	40.6	53.9	13.3	
Vert	4874.000	PK	42.9	30.6	5.3	31.4	-	47.4	73.9	26.5	
Vert	7311.000	PK	38.6	35.9	6.8	32.4	-	48.9	73.9	25.0	
Vert	9748.000	PK	40.0	39.4	7.3	33.0	-	53.7	73.9	20.2	
Vert	4874.000	AV	35.5	30.6	5.3	31.4	1.8	41.8	53.9	12.1	
Vert	7311.000	AV	33.7	35.9	6.8	32.4	1.8	45.8	53.9	8.1	
Vert	9748.000	AV	33.2	39.4	7.3	33.0	1.8	48.7	53.9	5.2	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor
*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.3 Semi Anechoic Chamber
Report No. : 10191682A
Date : 01/09/2014
Temperature/ Humidity : 23 deg. C / 32% RH
Engineer : Masatoshi Nishiguchi
(1-10GHz)
Mode : 11n-40 Tx 2422MHz

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	64.0	28.2	3.1	32.4	-	62.9	73.9	11.0	
Hori	4844.000	PK	46.2	30.6	5.3	31.4	-	50.7	73.9	23.2	
Hori	7266.000	PK	41.8	35.9	6.8	32.4	-	52.1	73.9	21.8	
Hori	9688.000	PK	41.2	39.2	7.3	33.0	-	54.7	73.9	19.2	
Hori	2390.000	AV	49.6	28.2	3.1	32.4	5.2	53.7	53.9	0.3	*1)
Hori	4844.000	AV	37.2	30.6	5.3	31.4	5.2	46.9	53.9	7.0	
Hori	7266.000	AV	32.5	35.9	6.8	32.4	5.2	48.0	53.9	6.0	
Hori	9688.000	AV	33.5	39.2	7.3	33.0	5.2	52.2	53.9	1.8	
Vert	2390.000	PK	57.9	28.2	3.1	32.4	-	56.8	73.9	17.1	
Vert	4844.000	PK	43.8	30.6	5.3	31.4	-	48.3	73.9	25.6	
Vert	7266.000	PK	40.7	35.9	6.8	32.4	-	51.0	73.9	22.9	
Vert	9688.000	PK	40.9	39.2	7.3	33.0	-	54.4	73.9	19.5	
Vert	2390.000	AV	45.5	28.2	3.1	32.4	5.2	49.6	53.9	4.4	*1)
Vert	4844.000	AV	34.4	30.6	5.3	31.4	5.2	44.1	53.9	9.9	
Vert	7266.000	AV	33.7	35.9	6.8	32.4	5.2	49.2	53.9	4.8	
Vert	9688.000	AV	33.4	39.2	7.3	33.0	5.2	52.1	53.9	1.9	

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

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

*1) Not Out of band emission (Leakage power)

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	Detector	Reading	Ant.Fac.	Loss	Gain	Result	Limit	Margin	Remark
Hori	2422.000	PK	91.5	28.3	3.1	32.3	90.6	-	-	Carrier
Hori	2400.000	PK	58.6	28.2	3.1	32.4	57.5	70.6	13.1	
Vert	2422.000	PK	89.5	28.3	3.1	32.3	88.6	-	-	Carrier
Vert	2400.000	PK	55.4	28.2	3.1	32.4	54.3	68.6	14.3	

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

UL Japan, Inc.

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 and No.3 Semi Anechoic Chamber
Report No. 10191682A
Date 02/05/2014 02/05/2014
Temperature/ Humidity 23 deg. C / 35% RH 23 deg. C / 35% RH
Engineer Hiroshi Kukita Hiroshi Kukita
(1-18GHz) (18-40GHz)
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	3829.977	PK	48.3	29.4	3.2	31.7	-	49.2	73.9	24.7	
Hori	11490.000	PK	46.4	39.4	-1.6	33.2	-	51.0	73.9	22.9	
Hori	3829.977	AV	43.6	29.4	3.2	31.7	1.8	46.3	53.9	7.6	
Hori	11490.000	AV	37.4	39.4	-1.6	33.2	1.8	43.8	53.9	10.1	
Vert	3829.983	PK	44.8	29.4	3.2	31.7	-	45.7	73.9	28.2	
Vert	11490.000	PK	44.0	39.4	-1.6	33.2	-	48.6	73.9	25.3	
Vert	3829.983	AV	38.4	29.4	3.2	31.7	1.8	41.1	53.9	12.8	
Vert	11490.000	AV	35.5	39.4	-1.6	33.2	1.8	41.9	53.9	12.0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor
*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	95.0	31.3	4.1	31.5	98.9	-	-	Carrier
Hori	5725.000	PK	63.3	31.4	4.1	31.5	67.3	78.9	11.6	
Hori	17235.000	PK	42.8	42.2	0.1	32.3	52.8	78.9	26.1	
Vert	5745.000	PK	92.5	31.3	4.1	31.5	96.4	-	-	Carrier
Vert	5725.000	PK	59.3	31.4	4.1	31.5	63.3	76.4	13.1	
Vert	17235.000	PK	53.0	42.2	0.1	32.3	63.0	76.4	13.4	

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 and No.3 Semi Anechoic Chamber
Report No. 10191682A
Date 02/05/2014 02/05/2014
Temperature/ Humidity 23 deg. C / 35% RH 23 deg. C / 35% RH
Engineer Hiroshi Kukita Hiroshi Kukita
(1-10GHz) (10-40GHz)
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	3856.671	PK	52.9	29.4	3.2	31.7	-	53.8	73.9	20.1	
Hori	11570.000	PK	46.3	39.3	-1.9	33.7	-	50.0	73.9	23.9	
Hori	3856.671	AV	48.3	29.4	3.2	31.7	1.8	51.0	53.9	2.9	
Hori	11570.000	AV	38.1	39.3	-1.9	33.7	1.8	43.6	53.9	10.3	
Vert	3856.663	PK	45.5	29.4	3.2	31.7	-	46.4	73.9	27.5	
Vert	11570.000	PK	46.4	39.3	-1.9	33.7	-	50.1	73.9	23.8	
Vert	3856.663	AV	40.1	29.4	3.2	31.7	1.8	42.8	53.9	11.1	
Vert	11570.000	AV	37.2	39.3	-1.9	33.7	1.8	42.7	53.9	11.2	

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

*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	5785.000	PK	95.3	31.3	4.1	31.5	99.2	-	-	Carrier
Hori	17355.000	PK	36.2	43.2	-0.2	32.4	46.8	79.2	32.4	
Vert	5785.000	PK	92.0	31.3	4.1	31.5	95.9	-	-	Carrier
Vert	17355.000	PK	46.9	43.2	-0.2	32.4	57.5	75.9	18.4	

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 and No.3 Semi Anechoic Chamber
Report No. 10191682A
Date 02/05/2014 02/05/2014
Temperature/ Humidity 23 deg. C / 35% RH 23 deg. C / 35% RH
Engineer Hiroshi Kukita Hiroshi Kukita
(1-10GHz) (10-40GHz)
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	3883.317	PK	54.9	29.5	3.3	31.7	-	56.0	73.9	17.9	
Hori	11650.000	PK	44.8	39.2	-1.8	33.7	-	48.5	73.9	25.4	
Hori	3883.317	AV	49.7	29.5	3.3	31.7	1.8	52.6	53.9	1.3	
Hori	11650.000	AV	36.2	39.2	-1.8	33.7	1.8	41.7	53.9	12.2	
Vert	3883.309	PK	46.5	29.5	3.3	31.7	-	47.6	73.9	26.3	
Vert	11650.000	PK	45.4	39.2	-1.8	33.7	-	49.1	73.9	24.8	
Vert	3883.309	AV	40.3	29.5	3.3	31.7	1.8	43.2	53.9	10.7	
Vert	11650.000	AV	37.3	39.2	-1.8	33.7	1.8	42.8	53.9	11.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor
*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	93.0	31.2	4.1	31.5	96.8	-	-	Carrier
Hori	5850.000	PK	51.1	31.1	4.1	31.5	54.8	76.8	22.0	
Hori	17475.000	PK	41.6	44.2	-0.2	32.4	53.2	76.8	23.6	
Vert	5825.000	PK	91.7	31.2	4.1	31.5	95.5	-	-	Carrier
Vert	5850.000	PK	48.9	31.1	4.1	31.5	52.6	75.5	22.9	
Vert	17475.000	PK	48.0	44.2	-0.2	32.4	59.6	75.5	15.9	

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 and No.3 Semi Anechoic Chamber
Report No. 10191682A
Date 02/05/2014 02/05/2014
Temperature/ Humidity 23 deg. C / 35% RH 23 deg. C / 35% RH
Engineer Hiroshi Kukita Hiroshi Kukita
(1-10GHz) (10-40GHz)
Mode 11n-40 Tx 5755MHz

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	3836.681	PK	52.6	29.4	3.2	31.7	-	53.5	73.9	20.4	
Hori	11510.000	PK	42.8	39.4	-1.6	33.2	-	47.4	73.9	26.5	
Hori	17265.000	PK	47.1	42.4	0.1	32.3	-	57.3	73.9	16.6	
Hori	3836.681	AV	44.8	29.4	3.2	31.7	5.1	50.8	53.9	3.1	
Hori	11510.000	AV	34.3	39.4	-1.6	33.2	5.1	44.0	53.9	9.9	
Hori	17265.000	AV	37.4	42.4	0.1	32.3	5.1	52.7	53.9	1.2	
Vert	3836.645	PK	46.9	29.4	3.2	31.7	-	47.8	73.9	26.1	
Vert	11510.000	PK	41.1	39.4	-1.6	33.2	-	45.7	73.9	28.2	
Vert	17265.000	PK	50.0	42.4	0.1	32.3	-	60.2	73.9	13.7	
Vert	3836.645	AV	38.1	29.4	3.2	31.7	5.1	44.1	53.9	9.8	
Vert	11510.000	AV	33.2	39.4	-1.6	33.2	5.1	42.9	53.9	11.0	
Vert	17265.000	AV	38.4	42.4	0.1	32.3	5.1	53.7	53.9	0.2	

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

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

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

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	5755.000	PK	92.6	31.3	4.1	31.5	96.5	-	-	Carrier
Hori	5725.000	PK	65.6	31.4	4.1	31.5	69.6	76.5	6.9	Carrier
Vert	5755.000	PK	90.9	31.3	4.1	31.5	94.8	-	-	Carrier
Vert	5725.000	PK	62.1	31.4	4.1	31.5	66.1	74.8	8.7	Carrier

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 and No.3 Semi Anechoic Chamber
Report No. 10191682A
Date 02/05/2014 02/05/2014
Temperature/ Humidity 23 deg. C / 35% RH 23 deg. C / 35% RH
Engineer Hiroshi Kukita Hiroshi Kukita
(1-10GHz) (10-40GHz)
Mode 11n-40 Tx 5795MHz

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	3863.316	PK	53.0	29.4	3.3	31.7	-	54.0	73.9	19.9	
Hori	11590.000	PK	43.7	39.4	-1.6	33.2	-	48.3	73.9	25.6	
Hori	17385.000	PK	43.9	43.3	0.0	32.3	-	54.9	73.9	19.0	
Hori	3863.316	AV	44.9	29.4	3.3	31.7	5.1	51.0	53.9	2.9	
Hori	11590.000	AV	34.7	39.4	-1.6	33.2	5.1	44.4	53.9	9.5	
Hori	17385.000	AV	35.5	43.3	0.0	32.3	5.1	51.6	53.9	2.3	
Vert	3863.304	PK	45.9	29.4	3.3	31.7	-	46.9	73.9	27.0	
Vert	11590.000	PK	44.1	39.4	-1.6	33.2	-	48.7	73.9	25.2	
Vert	17385.000	PK	47.9	43.3	0.0	32.3	-	58.9	73.9	15.0	
Vert	3863.304	AV	37.3	29.4	3.3	31.7	5.1	43.4	53.9	10.5	
Vert	11590.000	AV	34.6	39.4	-1.6	33.2	5.1	44.3	53.9	9.6	
Vert	17385.000	AV	37.6	43.3	0.0	32.3	5.1	53.7	53.9	0.2	

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

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

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

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	5795.000	PK	87.9	31.2	4.1	31.5	91.7	-	-	Carrier
Hori	5850.000	PK	41.0	31.1	4.1	31.5	44.7	71.7	27.0	
Vert	5795.000	PK	85.5	31.2	4.1	31.5	89.3	-	-	Carrier
Vert	5850.000	PK	40.6	31.1	4.1	31.5	44.3	69.3	25.0	

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

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Head Office EMC Lab.

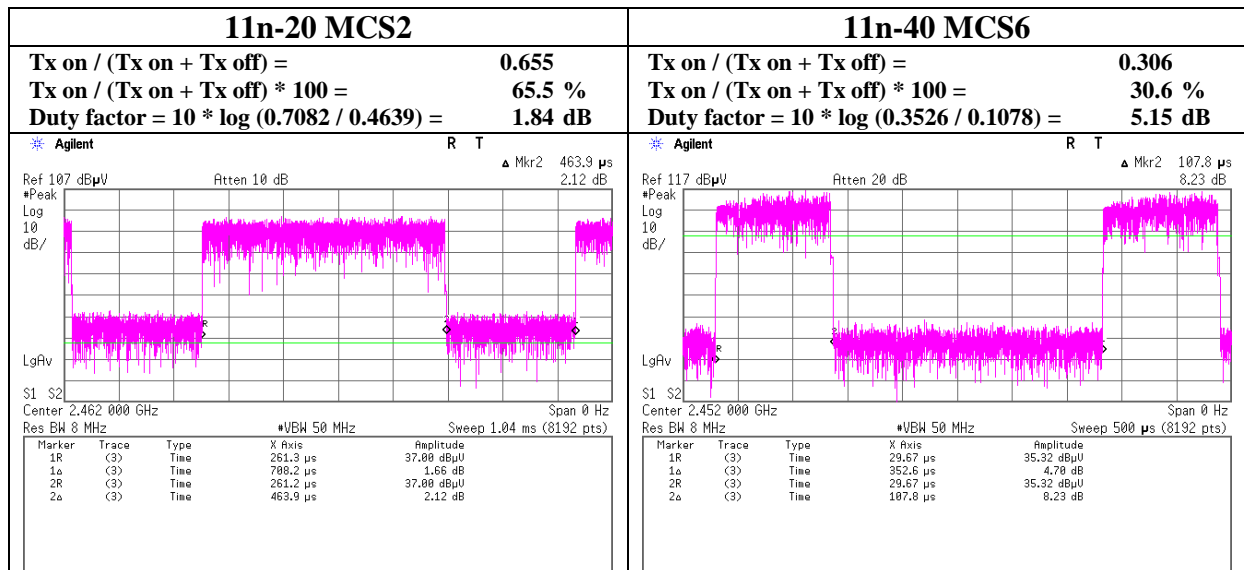
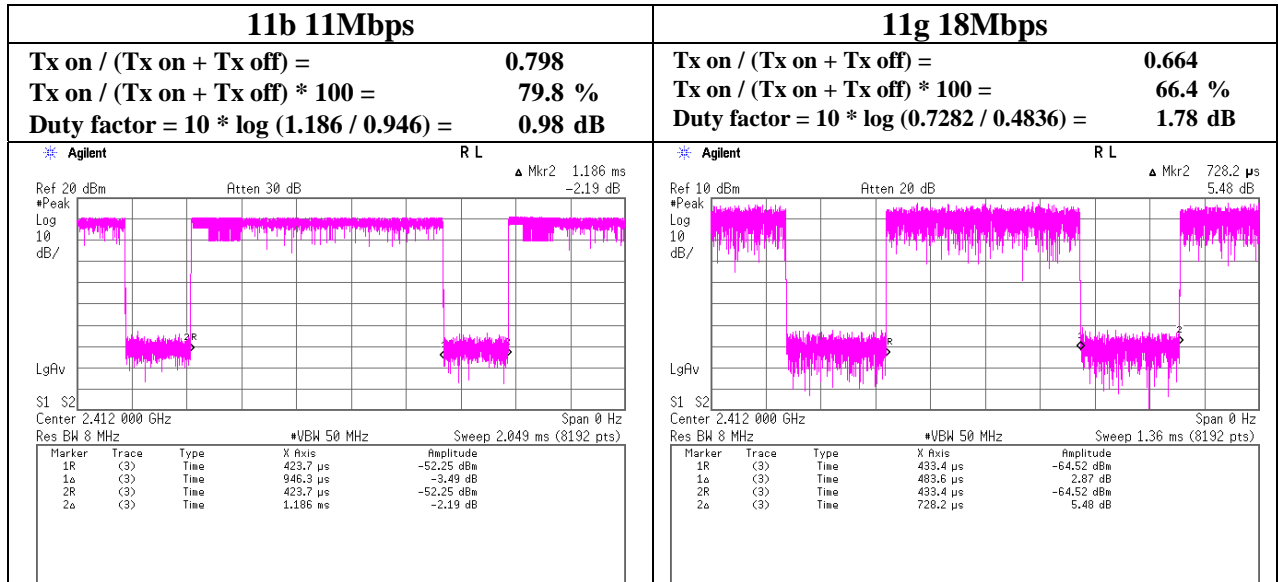
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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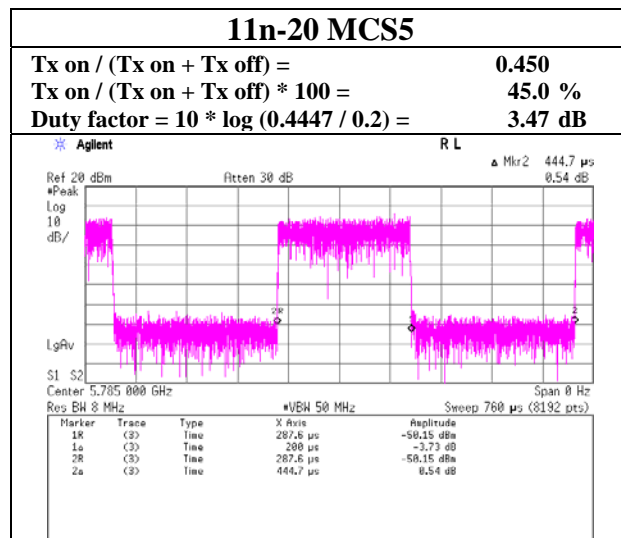
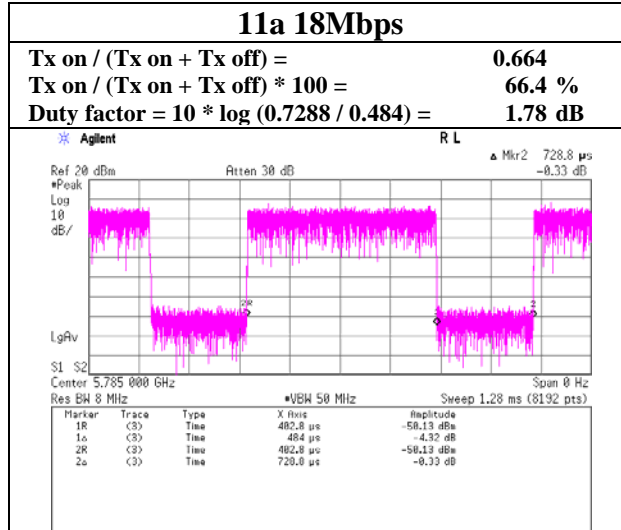
Burst rate confirmation

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	10191682A
Date	01/10/2014
Temperature/ Humidity	24deg. C / 21% RH
Engineer	Yutaka Yoshida



Burst rate confirmation

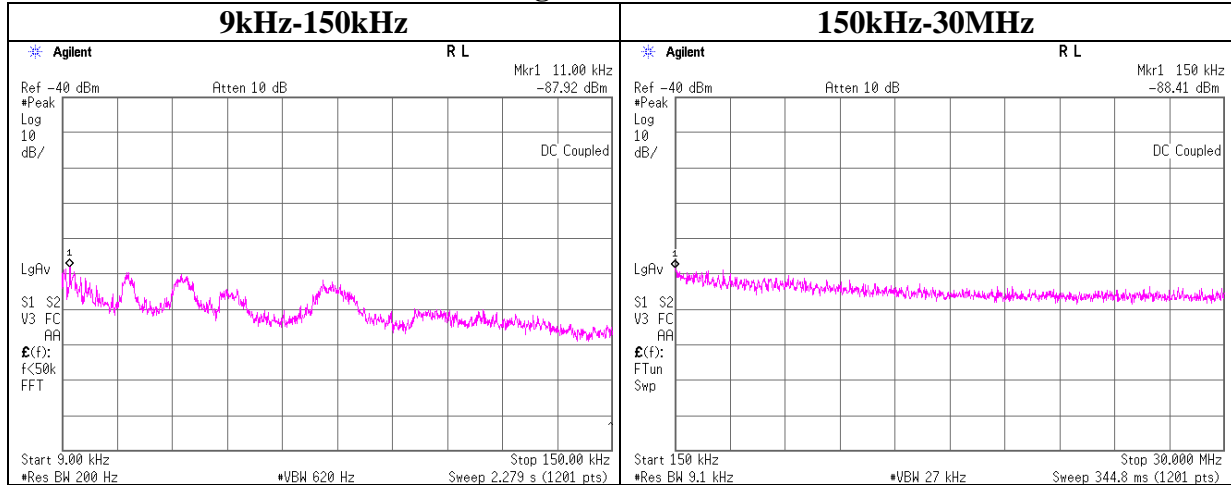
Test place : Head Office EMC Lab. No.4 Measurement Room
 Report No. : 10191682A
 Date : 01/10/2014
 Temperature/ Humidity : 24deg. C / 21% RH
 Engineer : Yutaka Yoshida



Conducted Spurious Emission

Test place : Head Office EMC Lab. No.4 Measurement Room
Report No. : 10191682A
Date : 1/10/2014
Temperature/ Humidity : 24deg. C / 21% RH
Engineer : Yutaka Yoshida
Mode : 11g/a Tx

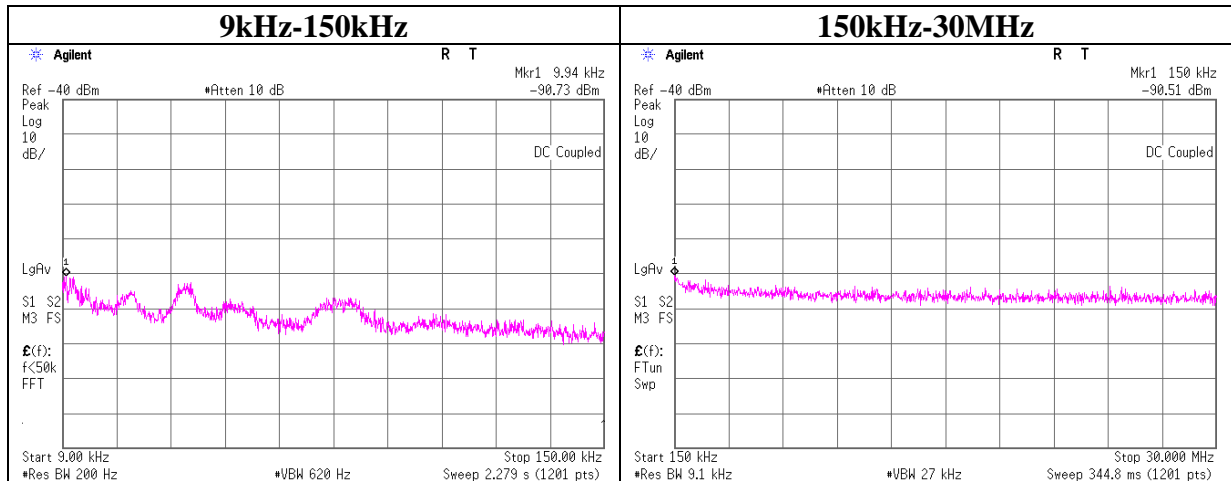
11g Tx 2437MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
11.00	-87.92	0.01	9.86	4.09	-73.96	300.00	6.00	-12.70	46.78
150.00	-88.41	0.01	9.85	4.09	-74.46	300.00	6.00	-13.20	24.08

$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8 [\text{dBuV/m}]$
 $\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

11a Tx 5745MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
9.94	-90.73	0.01	9.86	4.62	-76.24	300.00	6.00	-14.98	47.66
150.00	-90.51	0.01	9.85	4.62	-76.03	300.00	6.00	-14.77	24.08

$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8 [\text{dBuV/m}]$
 $\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

Power Density

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	10191682A
Date	1/10/2014
Temperature/ Humidity	24deg. C / 21% RH
Engineer	Yutaka Yoshida
Mode	11b/g/n-20/n-40 Tx (2.4GHz Band)

11b

Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-20.15	0.89	9.97	-9.29	8.00	17.29
2437.00	-20.85	0.89	9.97	-9.99	8.00	17.99
2462.00	-20.73	0.89	9.97	-9.87	8.00	17.87

11g

Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-27.63	0.89	9.97	-16.77	8.00	24.77
2437.00	-20.11	0.89	9.97	-9.25	8.00	17.25
2462.00	-25.97	0.89	9.97	-15.11	8.00	23.11

11n-20

Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-26.30	0.89	9.97	-15.44	8.00	23.44
2437.00	-22.53	0.89	9.97	-11.67	8.00	19.67
2462.00	-26.54	0.89	9.97	-15.68	8.00	23.68

11n-40

Freq.	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2422.00	-37.49	0.89	9.97	-26.63	8.00	34.63
2437.00	-26.56	0.89	9.97	-15.70	8.00	23.70
2452.00	-37.03	0.89	9.97	-26.17	8.00	34.17

Sample Calculation:

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

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

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Power Density

Test place Head Office EMC Lab. No.4 Measurement Room
Report No. 10191682A
Date 1/10/2014 1/31/2014
Temperature/ Humidity 24deg. C / 21% RH 21deg. C / 38% RH
Engineer Yutaka Yoshida Yutaka Yoshida
Mode 11a/n-20/n-40 Tx (5GHz Band)

11a

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5745.00	-23.75	1.59	10.03	-12.13	8.00	20.13
5785.00	-23.69	1.59	10.03	-12.07	8.00	20.07
5825.00	-24.57	1.59	10.03	-12.95	8.00	20.95

11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5745.00	-25.34	1.59	10.03	-13.72	8.00	21.72
5785.00	-26.66	1.59	10.03	-15.04	8.00	23.04
5825.00	-28.36	1.59	10.03	-16.74	8.00	24.74

11n-40

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5755.00	-29.11	1.59	10.03	-17.49	8.00	25.49
5795.00	-37.09	1.59	10.13	-25.37	8.00	33.37

Sample Calculation:

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

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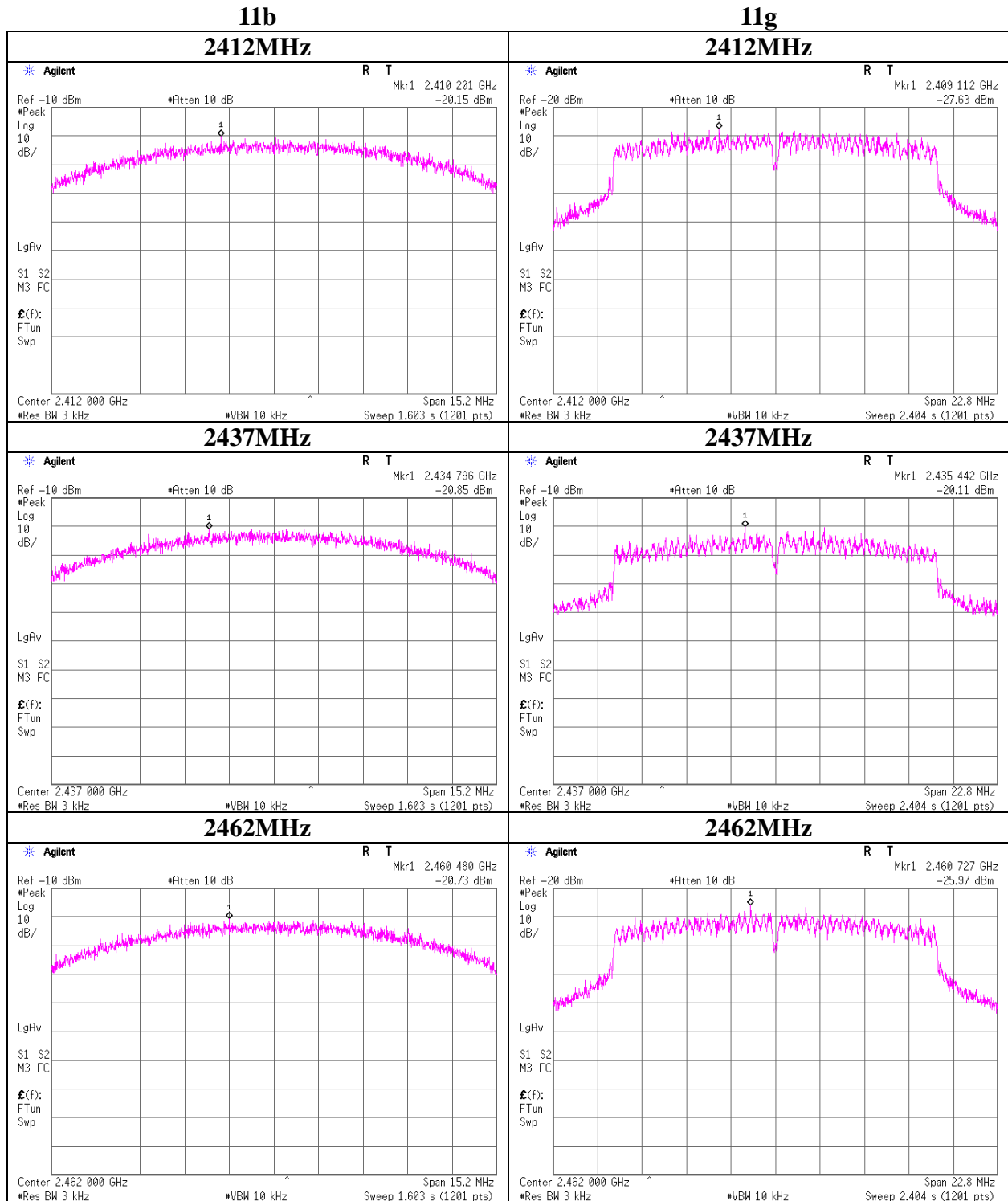
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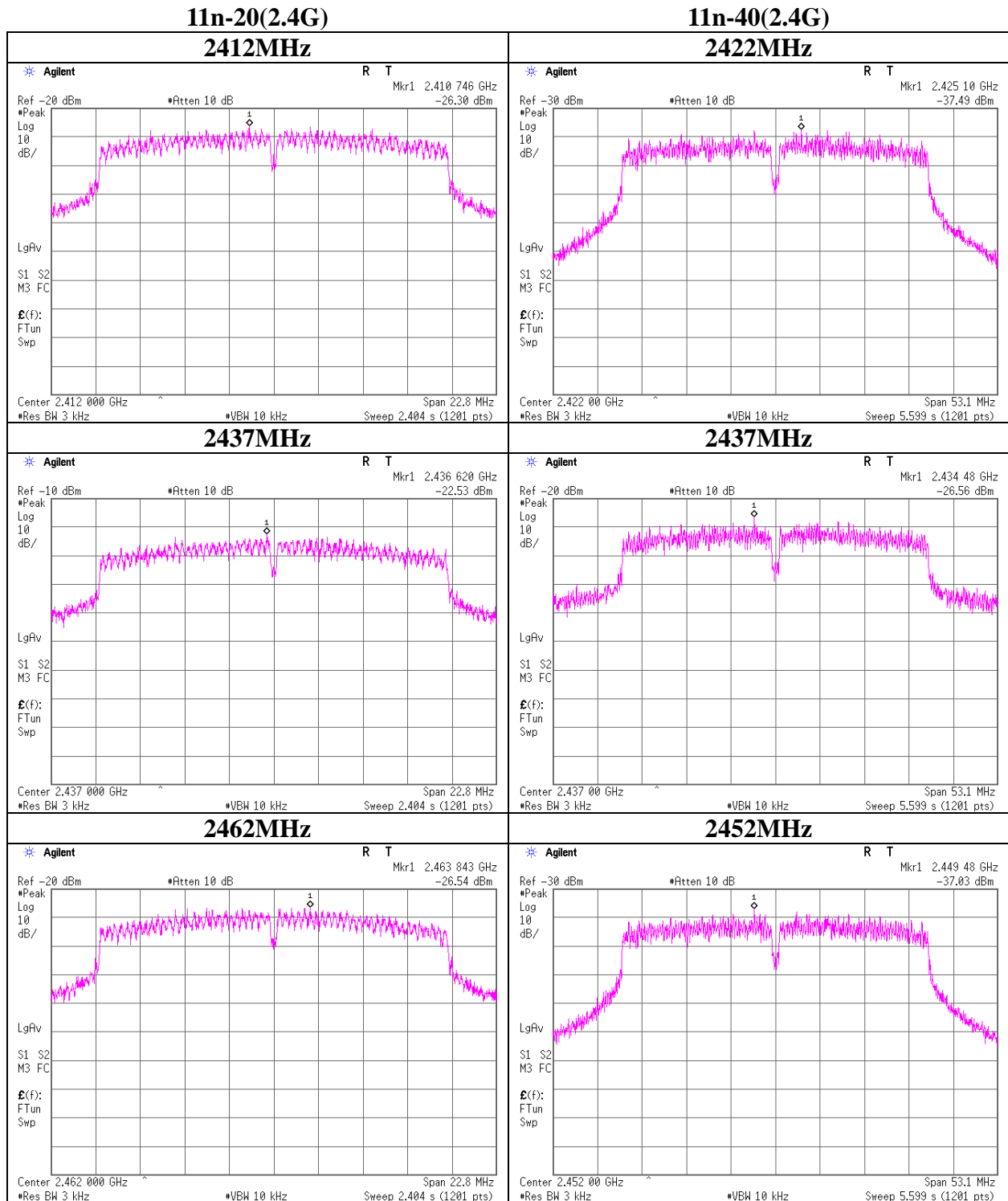
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Power Density

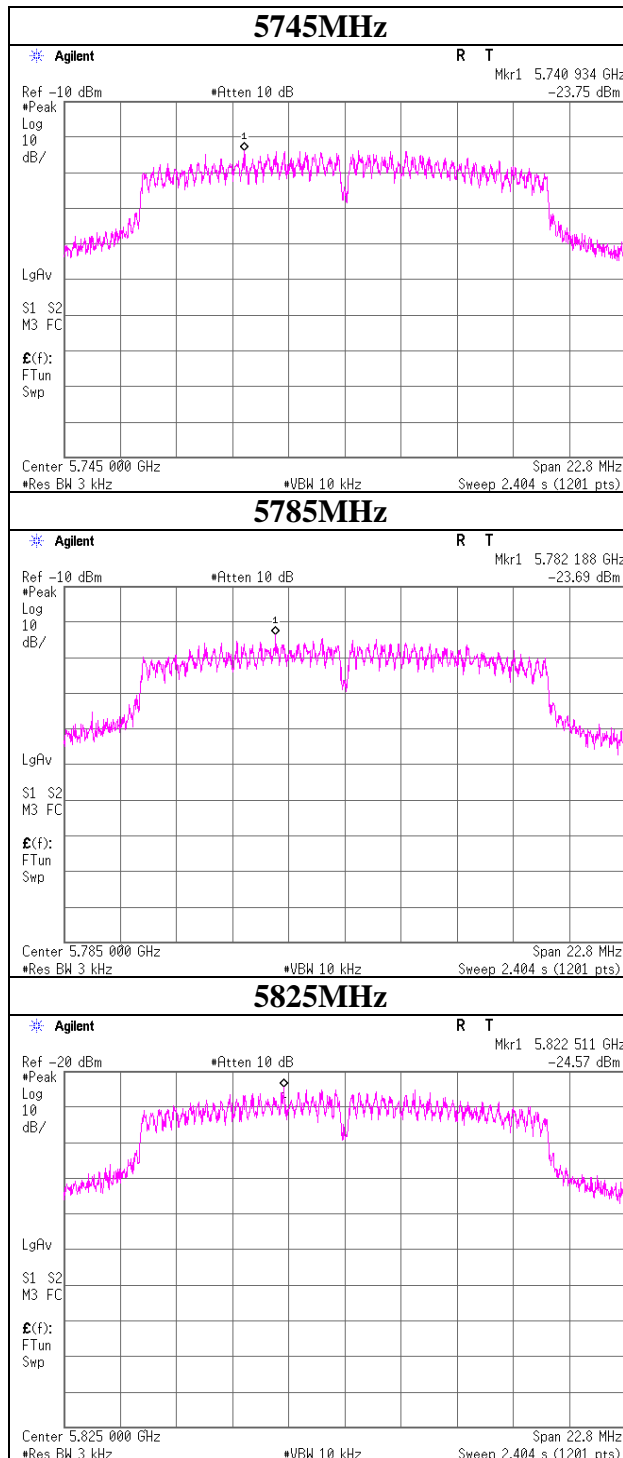


Power Density

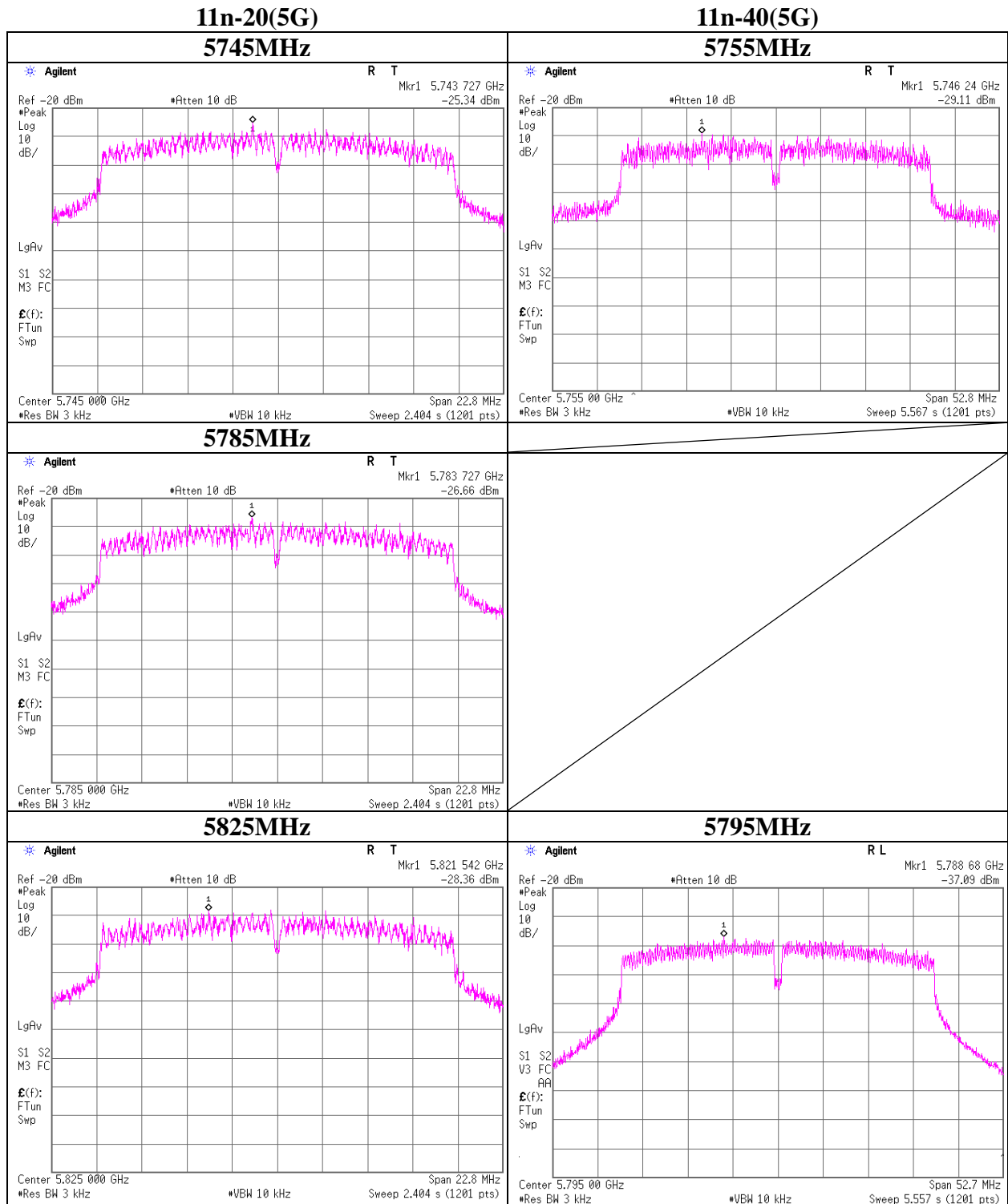


Power Density

11a

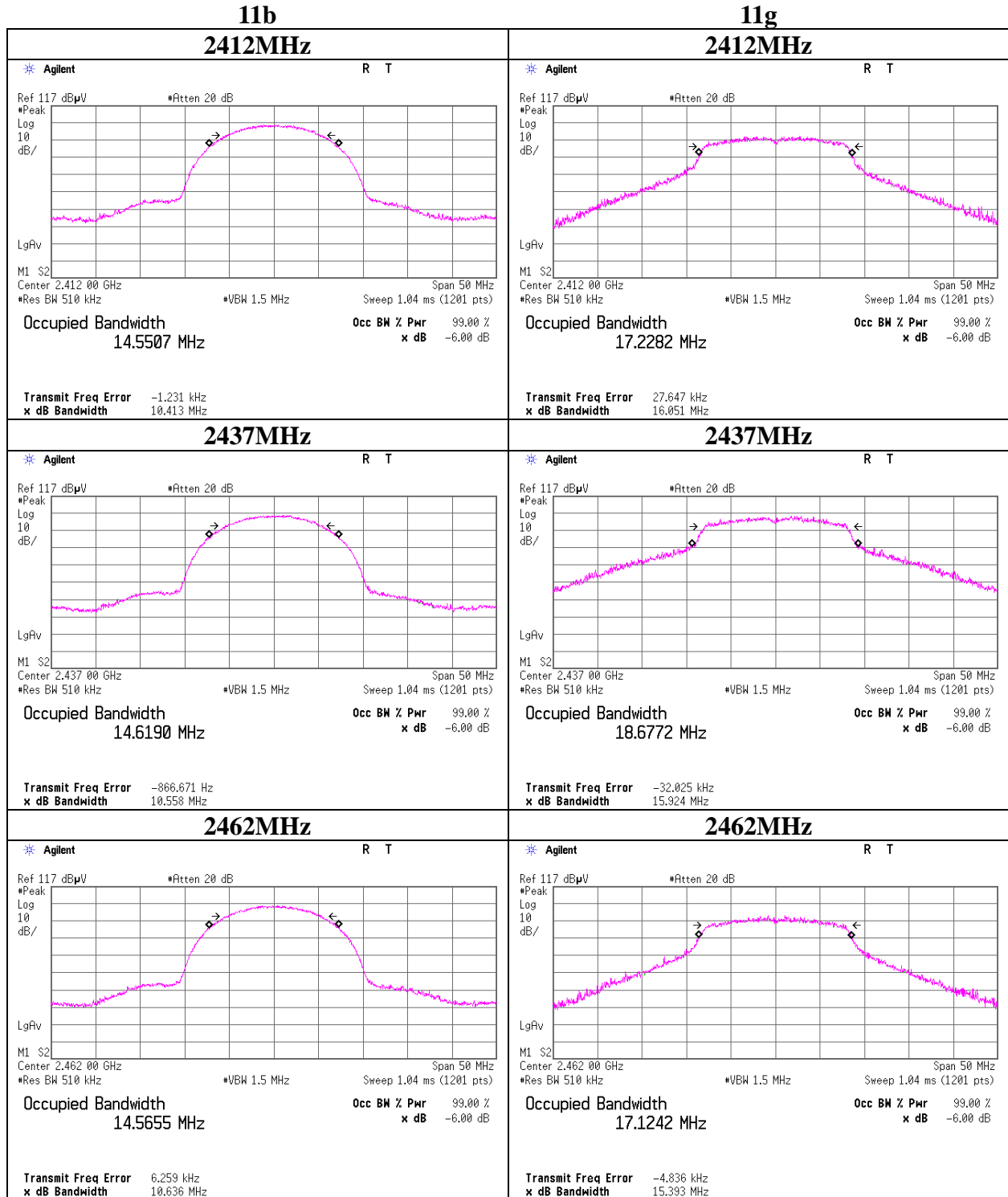


Power Density



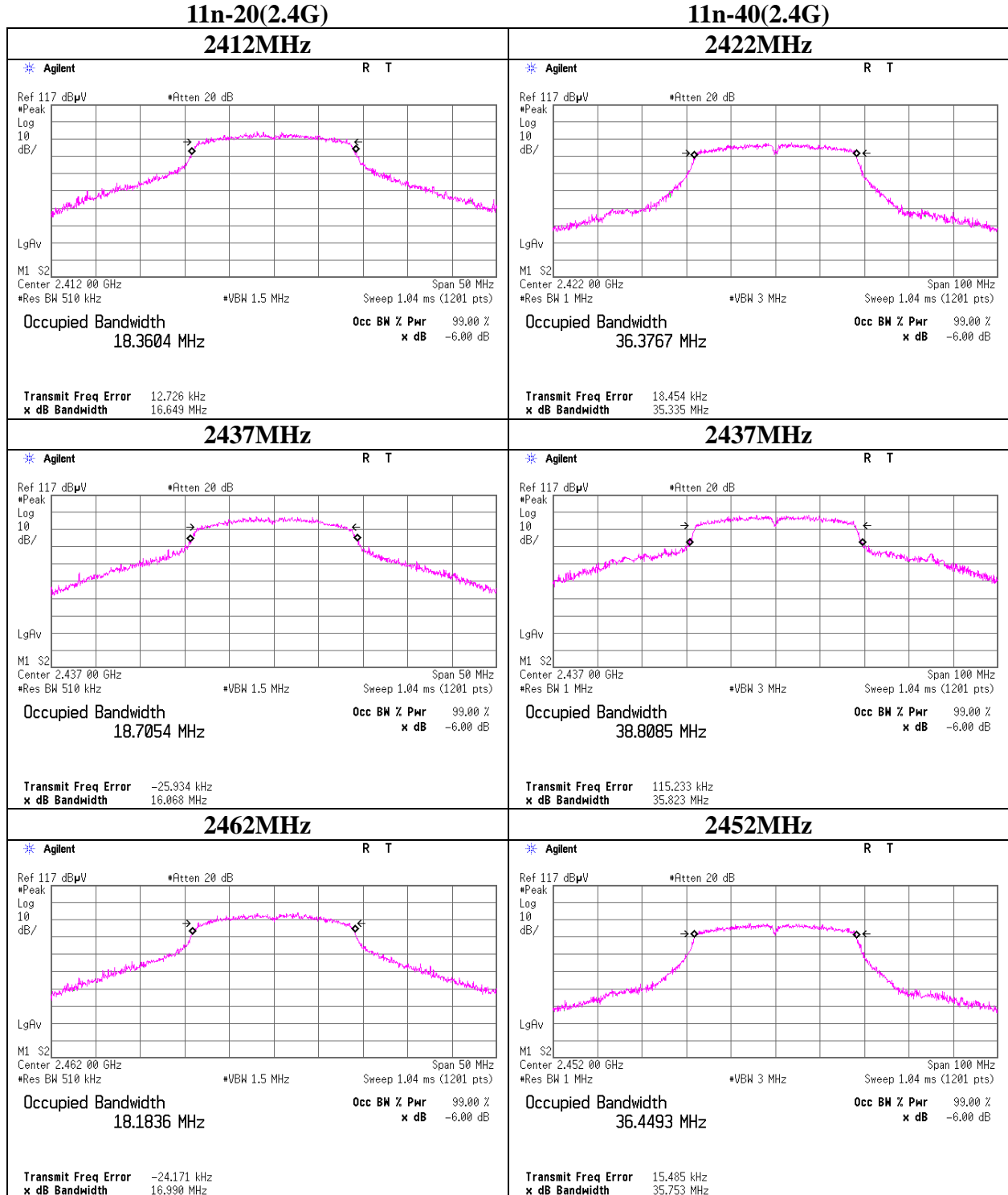
99% Occupied Bandwidth

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	10191682A
Date	1/10/2014
Temperature/ Humidity	24deg. C / 21% RH
Engineer	Yutaka Yoshida
Mode	11b/g Tx



99% Occupied Bandwidth

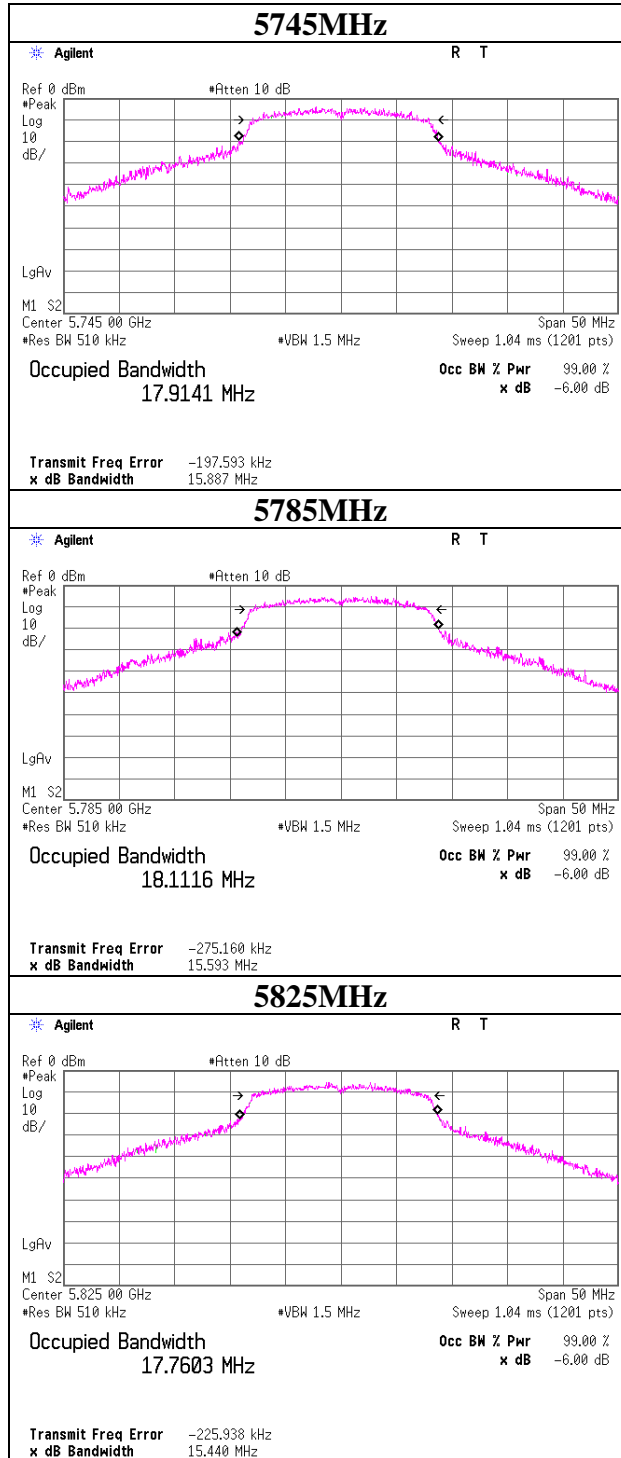
Test place : Head Office EMC Lab. No.4 Measurement Room
 Report No. : 10191682A
 Date : 1/10/2014
 Temperature/ Humidity : 24deg. C / 21% RH
 Engineer : Yutaka Yoshida
 Mode : 11n-20/n-40 Tx (2.4GHz Band)



99% Occupied Bandwidth

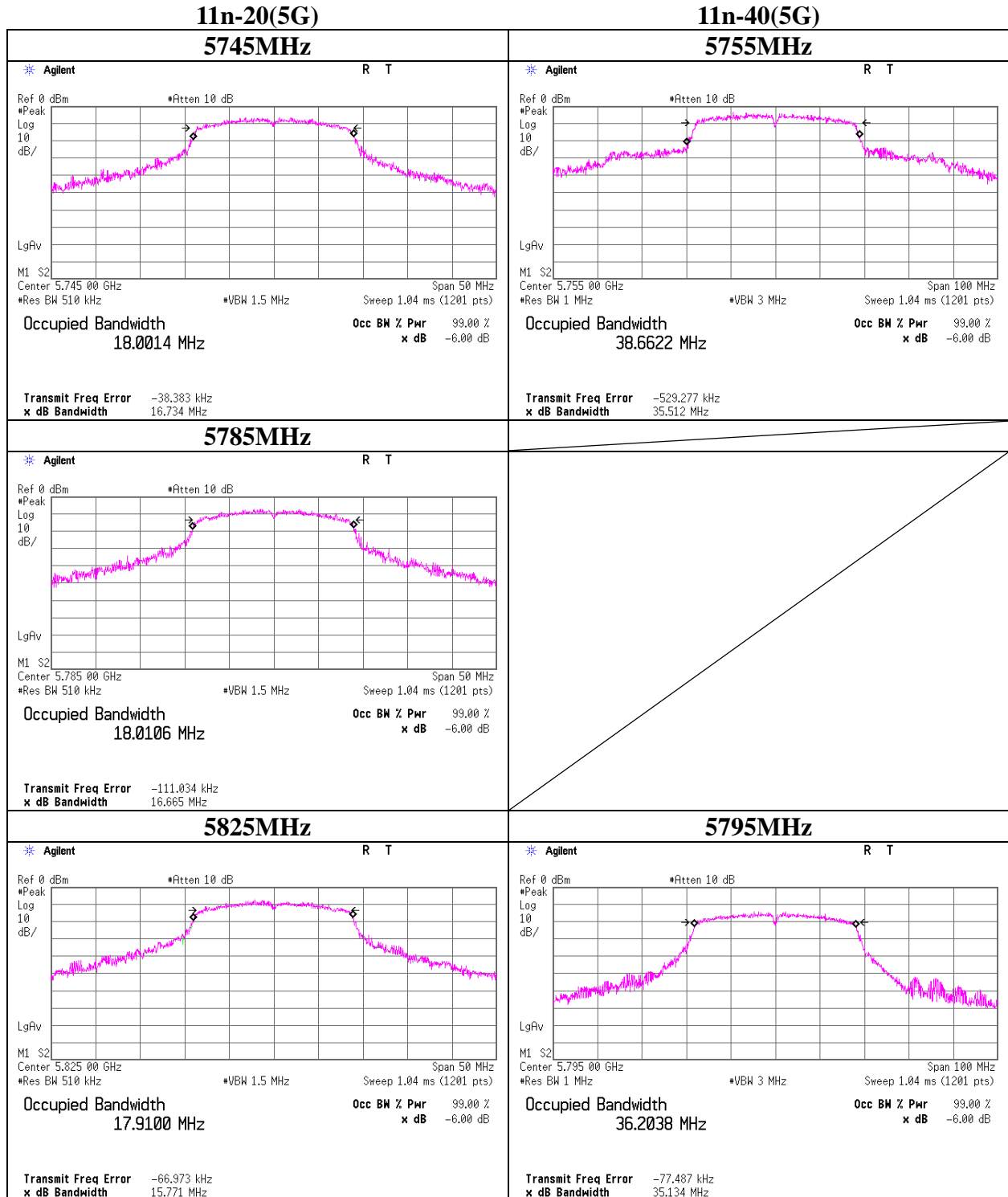
Test place : Head Office EMC Lab. No.4 Measurement Room
 Report No. : 10191682A
 Date : 1/10/2014
 Temperature/ Humidity : 24deg. C / 21% RH
 Engineer : Yutaka Yoshida
 Mode : 11a Tx

11a



99% Occupied Bandwidth

Test place : Head Office EMC Lab. No.4 Measurement Room
 Report No. : 10191682A
 Date : 1/10/2014
 Temperature/ Humidity : 24deg. C / 21% RH
 Engineer : Yutaka Yoshida
 Mode : 11n-20/n-40 Tx (5GHz Band)



APPENDIX 2: Test instruments

EMI test equipment(1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2013/02/28 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2013/02/26 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2013/02/22 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2013/05/17 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2013/09/27 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2013/03/12 * 12
MHF-25	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	RE	2013/09/01 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2013/02/26 * 12
MPM-13	Power Meter	Anritsu	ML2495A	0824014	AT	2013/11/15 * 12
MPSE-18	Power sensor	Anritsu	MA2411B	0738174	AT	2013/11/15 * 12
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT/RE	2013/06/14 * 12
MCC-138	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37953/2	AT	2013/10/18 * 12
MAT-20	Attenuator(10dB)(above 1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2013/01/09 * 12
MOS-23	Thermo-Hygrometer	Custom	CTH-201	0004	AT	2013/12/17 * 12
MMM-10	DIGITAL HiTESTER	Hioki	3805	051201148	AT	2013/01/08 * 12
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2013/10/21 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2013/10/21 * 12
MAT-24	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71389	AT	2013/06/05 * 12
MCC-93	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	30814/2	AT	2013/05/31 * 12
MCC-64	Coaxial Cable	UL Japan	-	-	AT	2013/03/22 * 12
MAT-10	Attenuator(10dB)	Weinschel Corp	2	BL1173	AT	2013/11/26 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2013/05/17 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2013/10/13 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2013/10/13 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2013/07/23 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2013/04/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2013/03/12 * 12

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EMI test equipment(2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-01	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	CE	2013/08/01 * 12
MOS-27	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q26	CE	2013/02/26 * 12
MJM-21	Measure	KOMELON	KMC-36	-	CE	-
MTR-09	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	CE	2013/06/07 * 12
MLS-03	LISN(AMN)	Schwarzbeck	NSLK8127	8127384	CE(EUT)	2013/03/18 * 12
MTA-30	Terminator	TME	CT-01	-	CE	2013/01/10 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/3D-2W(7.5m)/RG400u(1.5m)/RFM-E421(Switcher)	- /01068(Switcher)	CE	2013/09/12 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2013/01/09 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2013/06/30 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2013/02/26 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2013/08/20 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2013/10/13 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2013/10/13 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2013/02/06 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2013/11/26 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2013/09/12 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2013/02/15 * 12
MCC-166	Microwave Cable	Junkosha	MWX221	1303S120(1m) / 1311S167(5m)	RE	2013/11/27 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2014/01/21 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2013/02/15 * 12
MHA-04	Horn Antenna 26.5-40GHz	EMCO	3160-10	1140	RE	2013/11/25 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2013/03/19 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	3950M00205	RE	2013/06/20 * 12
MCC-76	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278967/4	RE	2013/12/24 * 12
MHF-16	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCA	7001	RE	2013/09/25 * 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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