RADIO TEST REPORT

Test Report No. : 10191682A-G

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 E: 2013**
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 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 7, 2014

Representative test engineer:

Yutaka Yoshida
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

REVISION HISTORY

Original Test Report No.: 10191682A-G

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10191682A-G	February 27, 2014	-	-

CONTENTS **PAGE**

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, π/4DQPSK, 8DPSK
Antenna Type	FPC Antenna
Antenna connecter 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 connecter 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.

[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 connecter 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

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart E: 2013, final revised on September 30, 2013 and effective October 30, 2013
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices Section 15.407 General technical requirements

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC :**ANSI C63.4:2003	**FCC:** 15.407(b)(6) / 15.207	**QP** 16.7dB, 0.16618MHz, N **AV** 21.1dB, 0.16618MHz, N	Complied	-
	IC: RSS-Gen 7.2.4	**IC:** RSS-Gen 7.2.4			
26dB Emission Bandwidth	**FCC :**ANSI C63.4:2003 FCC KDB Publication Number 789033	**FCC :** 15.407(a)(1)(2)(3)	See data	N/A	Conducted
	IC: -	**IC:** -			
Maximum Peak Output Power	**FCC :**ANSI C63.4:2003, FCC KDB Publication Number 789033	**FCC :** 15.407(a)(1)(2)(3)		Complied	Conducted
	IC: -	**IC:** RSS-210 A9.2(1)(2)(3)			
Peak Power Spectral Density	**FCC :**ANSI C63.4:2003, FCC KDB Publication Number 789033	**FCC :** 15.407(a)(1)(2)(3)		Complied	Conducted
	IC: -	**IC:** RSS-210 A9.2(1)(2)(3)			
Peak Excursion Ratio	**FCC :**ANSI C63.4:2003, FCC KDB Publication Number 789033	**FCC :** 15.407(a)(6)		Complied	Conducted
	IC: -	**IC:** -			
Spurious Emission Restricted Band Edge	**FCC:** ANSI C63.4:2003	**FCC :** 15.407(b), 15.205 and 15.209	0.1dB 5150.000MHz, AV, Hori.	Complied	Conducted / Radiated
	IC: -	**IC:** RSS-210 A.9.2(1)(2)(3)			
20dB Emission Bandwidth	**FCC :**ANSI C63.4:2003	**FCC :** 15.215(c)	See data	Complied	Conducted
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. For DFS tests, please see the test report number 10191682A-H issued by UL Japan, Inc.					

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.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Band Width	RSS-Gen 4.6.1	RSS-210 A9.2 (1)(2)(3)	N/A	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

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.

3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999 Facsimile : +81 596 24 8124

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.0 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	-	-	8.8 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.

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

4.1 Operating Modes

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 802.11a (11a)	18Mbps, PN9
IEEE 802.11n SISO 20MHz BW (11n-20): 5GHz Band	MCS 3, 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: See below Tables - 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.	

Table 1: Power Settings for 20MHz bandwidth system:

Frequency [MHz]	11a	11n-20 SISO
5180	17000	17000
5210	17000	17000
5220	17500	17000
5240	17500	17000
5260	19000	20000
5280	20000	20000
5300	20000	20000
5320	17500	18000
5500	18000	20000
5520	20000	20000
5540	20000	20000
5560	20000	20000
5580	20000	20000
5660	20000	20000
5680	20000	20000
5700	17000	16000

Table 2: Power Settings for 40MHz bandwidth system:

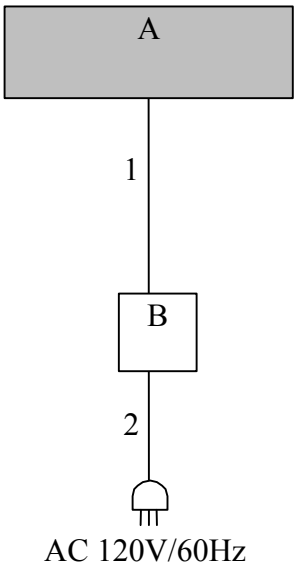
Frequency [MHz]	11n-40 SISO
5190	13500
5230	19500
5270	18500
5310	13500
5510	14500
5550	20000
5670	17500

*Details of Operating mode(s):

Test Item	Operating Mode	Tested Frequency		
		Low Band	Middle Band	Additional Band
Conducted emission	11n-40 Tx *1)	5230MHz	-	-
Spurious Emission (Radiated)	11a Tx	5180MHz	5260MHz 5320MHz	5500MHz 5580MHz 5700MHz
	11n-20 Tx	5180MHz	5320MHz	5500MHz 5700MHz *2)
	11n-40 Tx	5190MHz	5230MHz 5310MHz	5510MHz 5550MHz 5670MHz
26dB Emission Bandwidth, 99% Occupied Bandwidth, Maximum Conducted Output Power, Peak Power Spectral Density	11a Tx 11n-20 Tx, SISO	5180MHz 5220MHz 5240MHz	5260MHz 5300MHz 5320MHz	5500MHz 5580MHz 5700MHz
	11n-40 Tx, SISO	5190MHz 5230MHz	5270MHz 5310MHz	5510MHz 5550MHz 5670MHz
Spurious Emission (Conducted)(Below 30MHz)	11n-40 Tx, SISO *1)	5230MHz	-	-
20dB Bandwidth	11a Tx 11n-20 Tx, SISO	5240MHz	5260MHz	5580MHz 5660MHz
	11n-40 Tx, SISO	5230MHz	5270MHz	5550MHz 5670MHz
Peak Excursion Ratio	11a Tx 11n-20 Tx, SISO	-	-	5500MHz
	11n-40 Tx, SISO	-	-	5510MHz

*1) The mode was tested as a representative, because it had the highest power at antenna terminal test.
*2) 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.

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)	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 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	-

SECTION 5: Conducted Emission

Test Procedure

EUT was placed on a urethane platform f nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)
I/O cable and AC 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 or a Measurement Room.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

Detector : QP and CISPR AV
Measurement range : 0.15-30MHz
Test data : APPENDIX
Test result : Pass

SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.
The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
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.

Below 1GHz
The result also satisfied with the general limits specified in section 15.209(a).

Above 1GHz

Inside of restricted bands(Section 15.205):	Apply to limit in the Section 15.209(a).
Outside of the restricted bands:	Apply to limit 68.2dBuV/m(–27dBm e.i.r.p.*) in the Section 15.407(b)(1)(2)(3).
Restricted bandedge:	Apply to limit in the Section 15.209(a). Since this limit is severer than the limit of the inside of restricted bands.

*Electric Field Strength to e.i.r.p. Conversion

$$E = \frac{1000000\sqrt{30P}}{3} \text{ (uV/m)} \qquad \text{:P is the e.i.r.p. (Watts)}$$

Test Antennas are used as below;

Frequency	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Biconical	Logperiodic	Horn

Frequency	Below 1GHz	Above 1GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	PK	AV
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	Method AD *1) RBW: 1MHz VBW: 3MHz Detector: Power Averaging (RMS) Duty factor was added to the results.
Test Distance	3m	3m (below 10GHz), 1m*2) (above 10GHz), 0.5m*3) (above 26.5GHz)	

*1) The test method was also referred to KDB 789033 D01 General UNII Test Procedures v01r03 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on April 8, 2013)".
*2) Distance Factor: 20 x log (3.0m/1.0m) = 9.5dB
*3) Distance Factor: 20 x log (3.0m/0.5m) = 15.6dB

- 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

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26dB Bandwidth	1.5 times to 5 times the OBW	Close to 1% of EBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	1.5 times to 5 times the OBW	Close to 1% of Span	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
20dB Bandwidth	50MHz, 30MHz	100kHz	300MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	50MHz, 100MHz	1MHz	3MHz	Auto	Average Power Averaging (100 times)	Clear Write	Spectrum Analyzer method 1 (SA-1)
Peak Power Spectral Density	50MHz, 100MHz	1MHz	3MHz	Auto	Average Power Averaging (100 times)	Clear Write	Spectrum Analyzer method 1 (SA-1)
Peak Excursion Ratio	50MHz, 100MHz	1MHz	3MHz	Auto	Peak	Max Hold	Spectrum Analyzer
					Average Power Averaging (100 times)	Clear Write	
Conducted Spurious Emission	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				

*The test method was also referred to KDB 789033 D01 General UNII Test Procedures v01r03 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on April 8, 2013)".

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

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

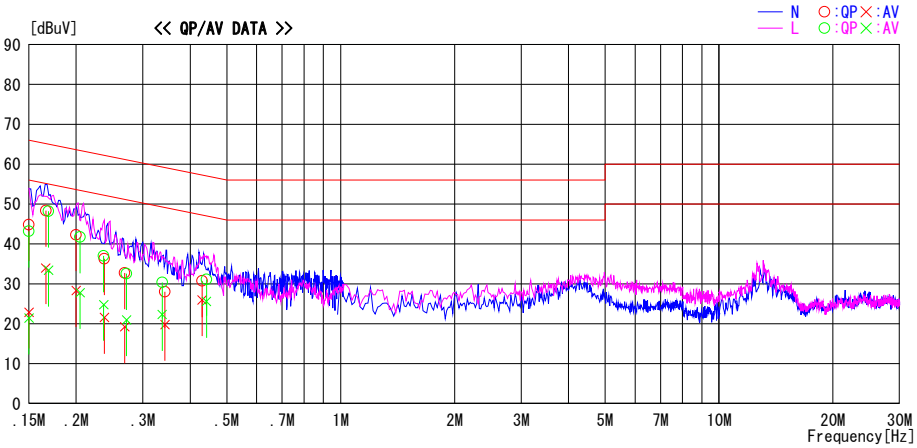
UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2014/02/07

Report No. : 10191682A

Temp./Humi. : 21deg. C / 33% RH
Engineer : Hiroshi Kukita

Mode / Remarks : Tx 11n40 5230MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15000	31.6	9.7	13.2	44.8	22.9	66.0	56.0	21.2	33.1	N	
0.16618	35.2	20.8	13.2	48.4	34.0	65.1	55.1	16.7	21.1	N	
0.19996	29.1	15.1	13.2	42.3	28.3	63.6	53.6	21.3	25.3	N	
0.23744	23.1	8.4	13.2	36.3	21.6	62.2	52.2	25.9	30.6	N	
0.26873	19.5	6.0	13.2	32.7	19.2	61.2	51.2	28.5	32.0	N	
0.34320	14.8	6.6	13.2	28.0	19.8	59.1	49.1	31.1	29.3	N	
0.43050	17.5	12.8	13.2	30.7	26.0	57.2	47.2	26.5	21.2	N	
0.15000	30.0	8.2	13.2	43.2	21.4	66.0	56.0	22.8	34.6	L	
0.16902	35.0	20.2	13.2	48.2	33.4	65.0	55.0	16.8	21.6	L	
0.20480	28.5	14.6	13.2	41.7	27.8	63.4	53.4	21.7	25.6	L	
0.23640	23.8	11.6	13.2	37.0	24.8	62.2	52.2	25.2	27.4	L	
0.27180	19.4	7.8	13.2	32.6	21.0	61.1	51.1	28.5	30.1	L	
0.33760	17.2	9.1	13.2	30.4	22.3	59.3	49.3	28.9	27.0	L	
0.44190	17.9	12.4	13.2	31.1	25.6	57.0	47.0	25.9	21.4	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.

26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place	Head Office EMC Lab. No.6 Shielded Room	
Report No.	10191682A	
Date	01/24/2014	01/27/2014
Temperature/ Humidity	24deg.C. / 24% RH	20deg.C. / 42% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	11a / 11n-20 /11n-40 Tx	

11a

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	25.625	16.7442	-
5220	27.346	16.8239	-
5240	26.913	16.8118	-
5260	27.269	16.8111	-
5300	29.206	17.1736	-
5320	27.401	16.8165	-
5500	24.751	16.6845	-
5580	29.857	17.2339	-
5700	27.075	16.7780	-

11n-20

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	24.203	17.7058	-
5220	23.183	17.7711	-
5240	23.553	17.7362	-
5260	28.122	17.8941	-
5300	27.265	17.9069	-
5320	24.597	17.8056	-
5500	27.560	17.8897	-
5600	26.349	17.8876	-
5700	23.714	17.7401	-

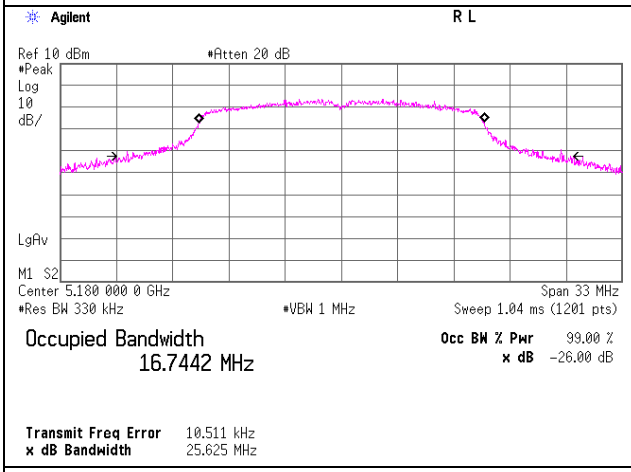
11n-40

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5190	44.202	36.1833	-
5230	69.902	37.8237	-
5270	51.194	36.4149	-
5310	47.114	36.2355	-
5510	48.102	36.1914	-
5550	74.338	38.1487	-
5670	54.528	36.3927	-

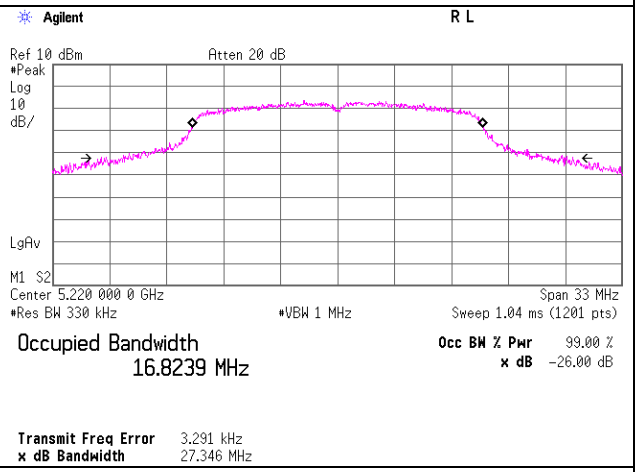
26dB Emission Bandwidth and 99% Occupied Bandwidth

11a

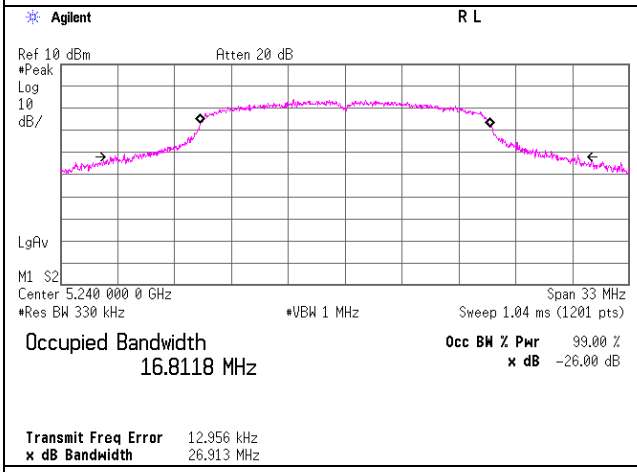
5180MHz



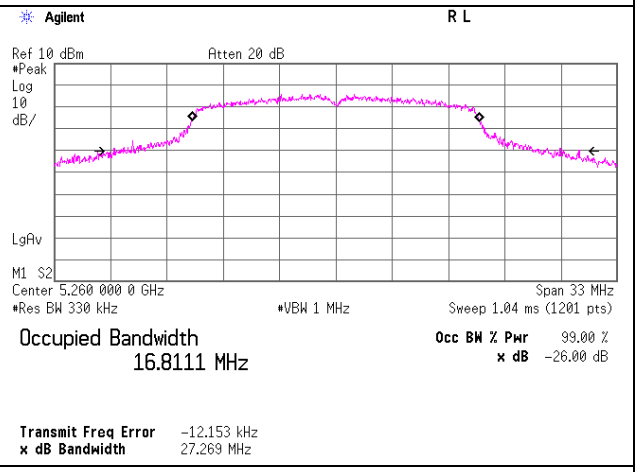
5220MHz



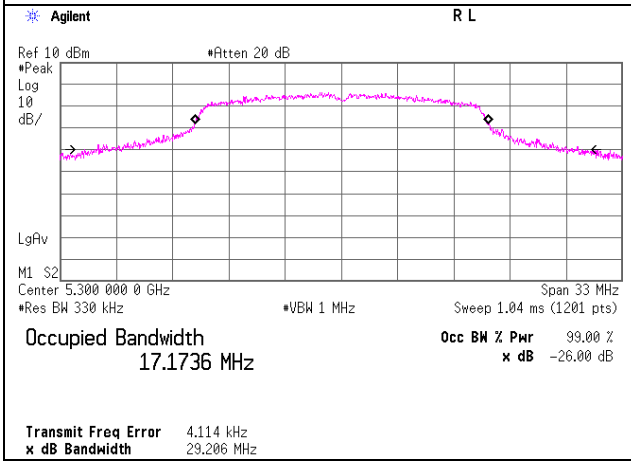
5240MHz



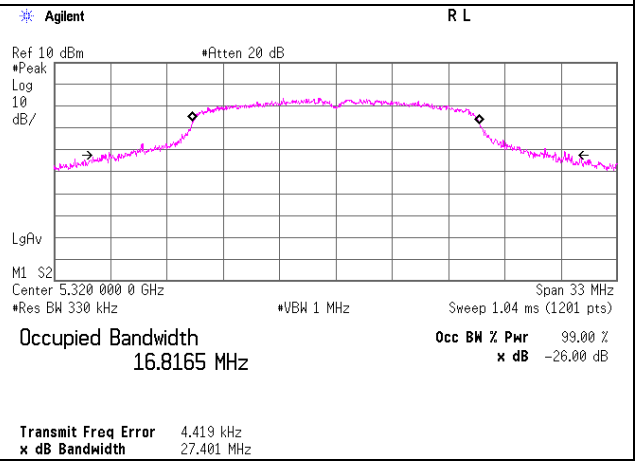
5260MHz



5300MHz



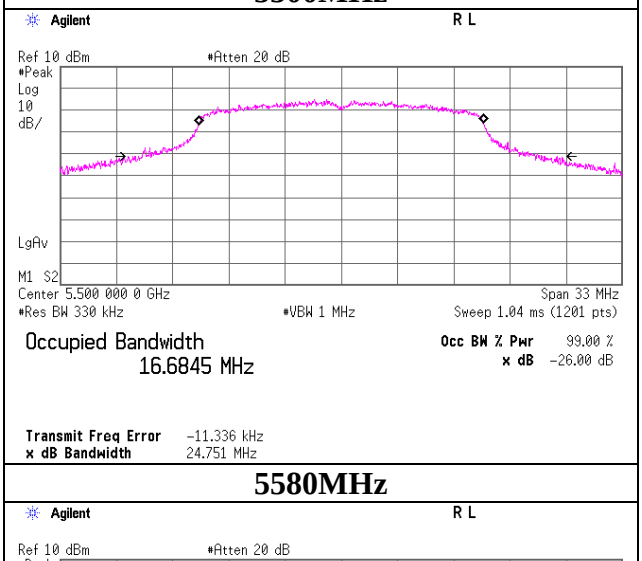
5320MHz



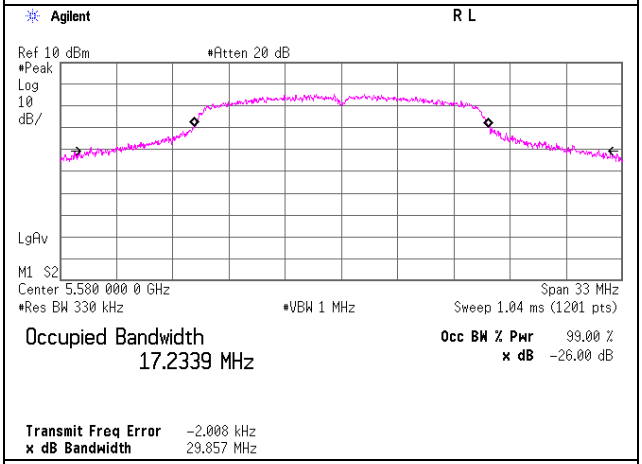
26dB Emission Bandwidth and 99% Occupied Bandwidth

11a

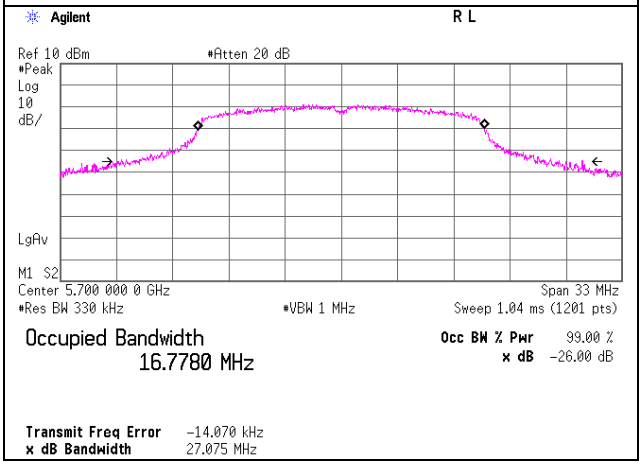
5500MHz



5580MHz



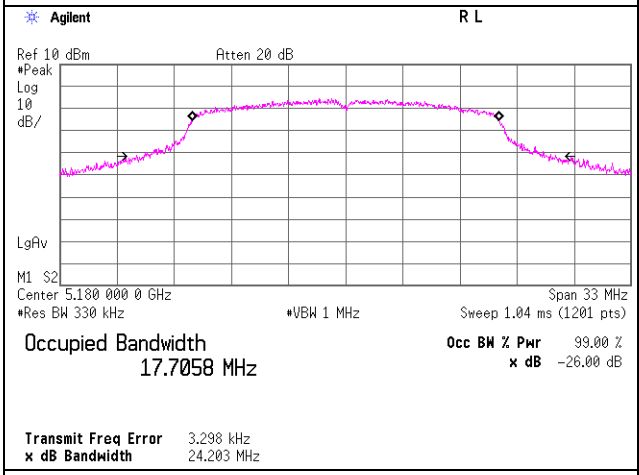
5700MHz



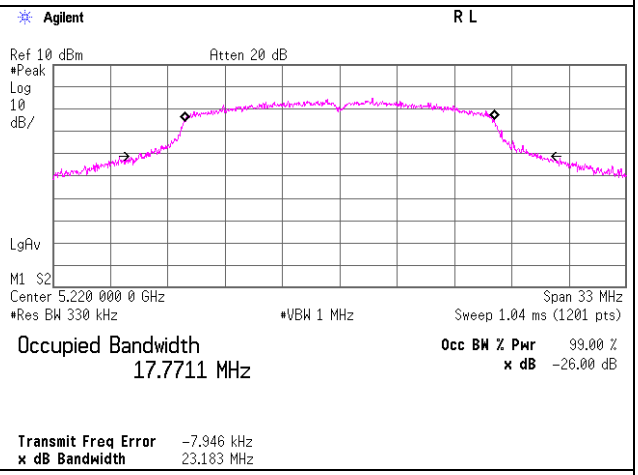
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-20

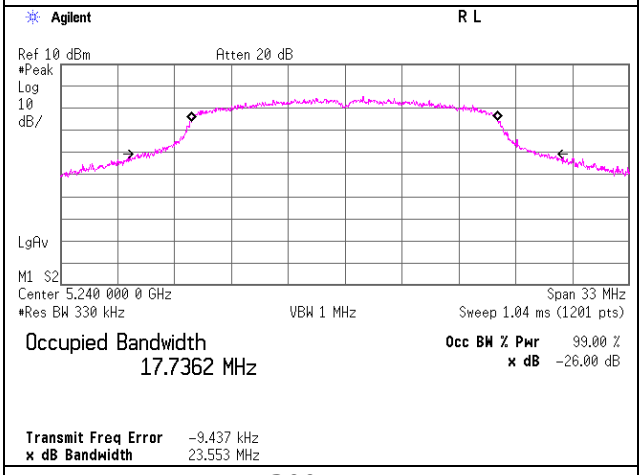
5180MHz



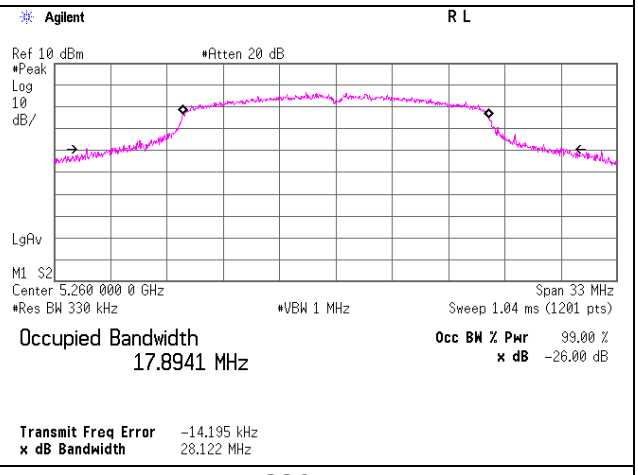
5220MHz



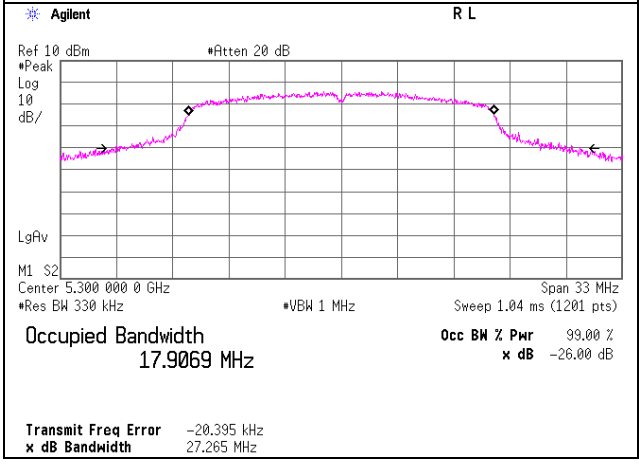
5240MHz



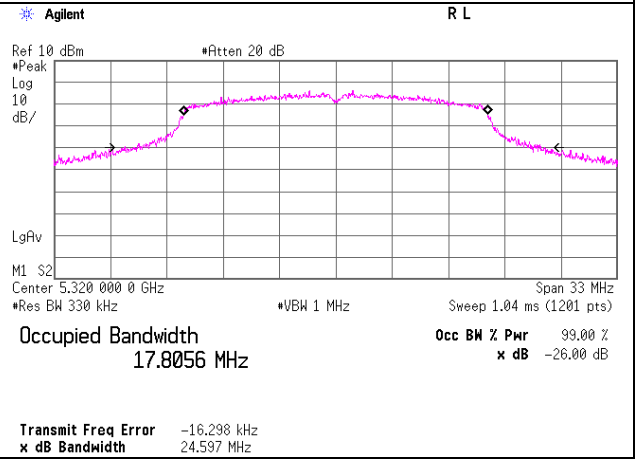
5260MHz



5300MHz



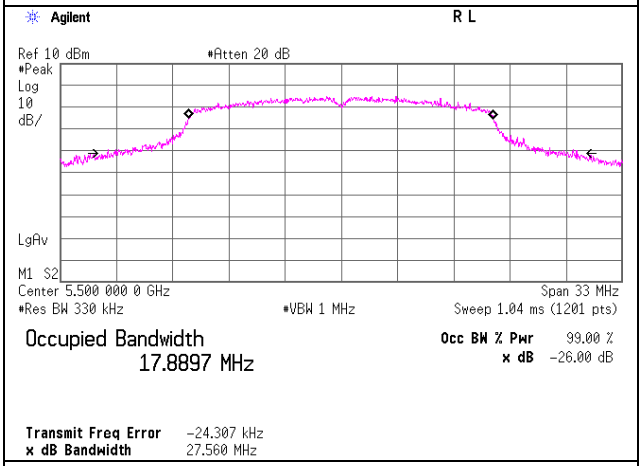
5320MHz



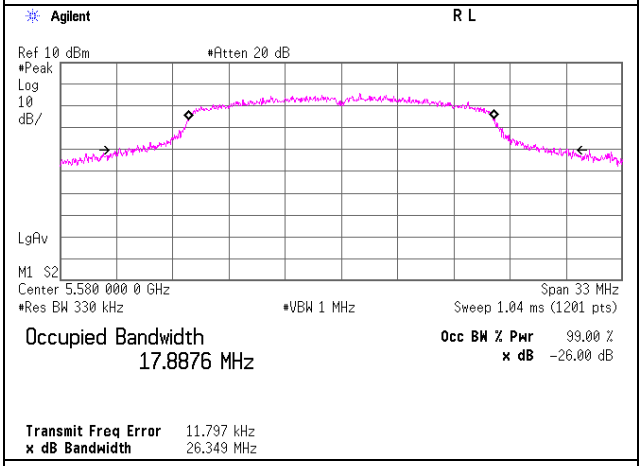
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-20

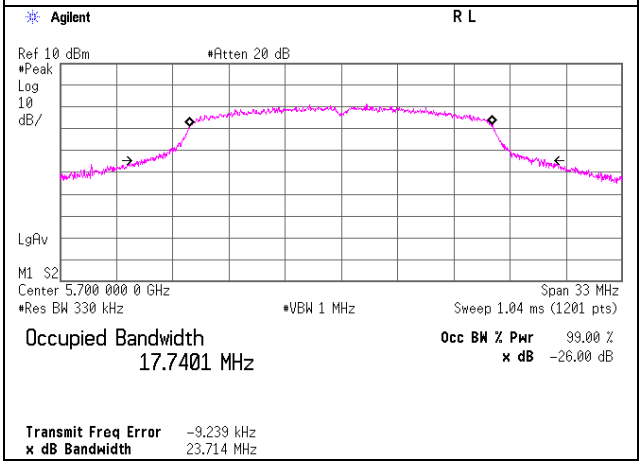
5500MHz



5580MHz



5700MHz



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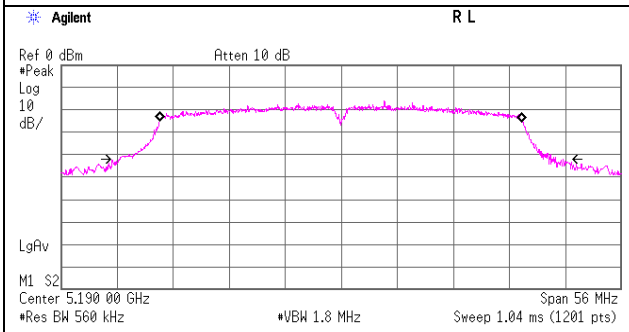
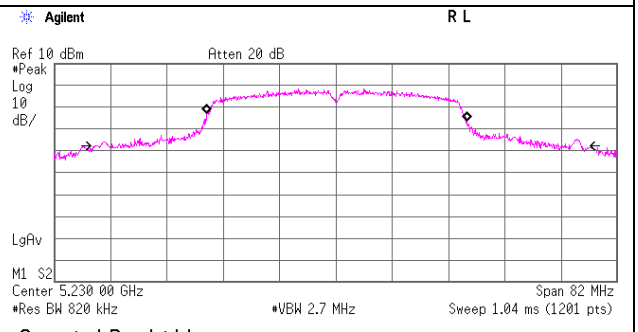
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-40

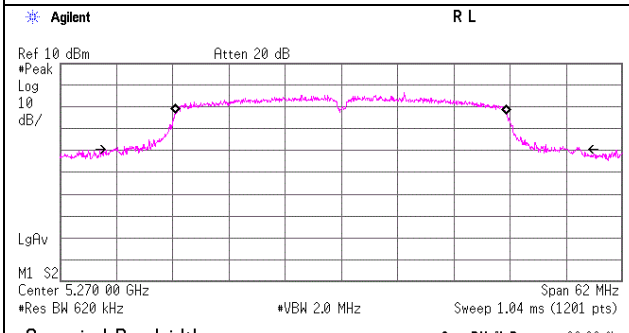
5190MHz



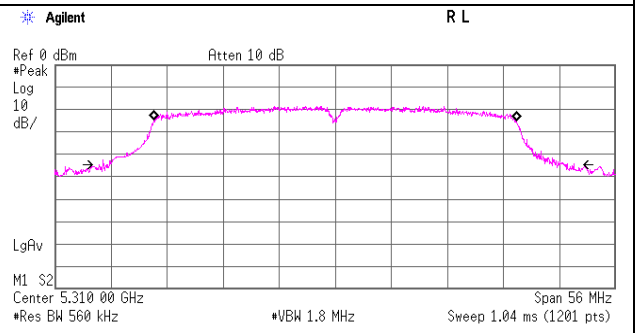
5230MHz



5270MHz



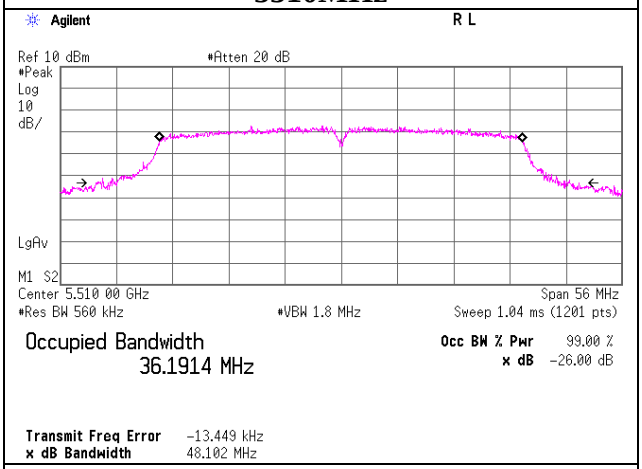
5310MHz



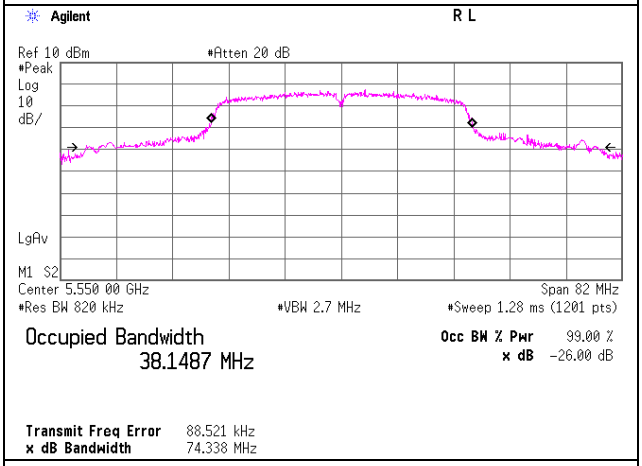
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-40

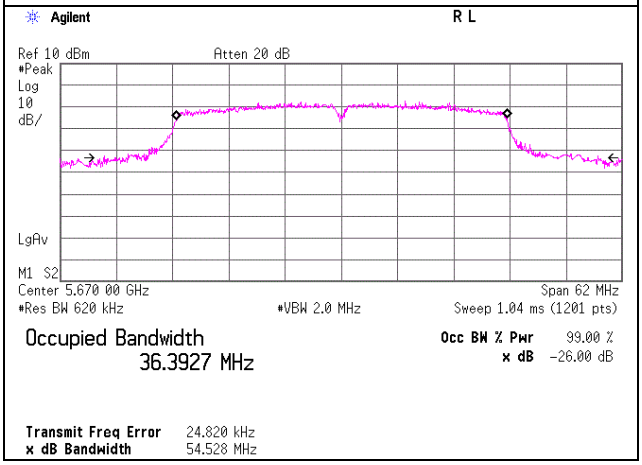
5510MHz



5550MHz



5670MHz



20dB Bandwidth

Test place	Head Office EMC Lab. No.6 Shielded Room	
Report No.	10191682A	
Date	01/24/2014	01/27/2014
Temperature/ Humidity	24deg.C. / 24% RH	20deg.C. / 42% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	11a / 11n-20 / 11n-40 Tx	

11a

Frequency [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
5240	19.383	-
5260	19.565	-
5580	20.745	-
5660	19.638	-

11n-20

Frequency [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
5240	19.266	-
5260	19.502	-
5580	19.931	-
5660	19.575	-

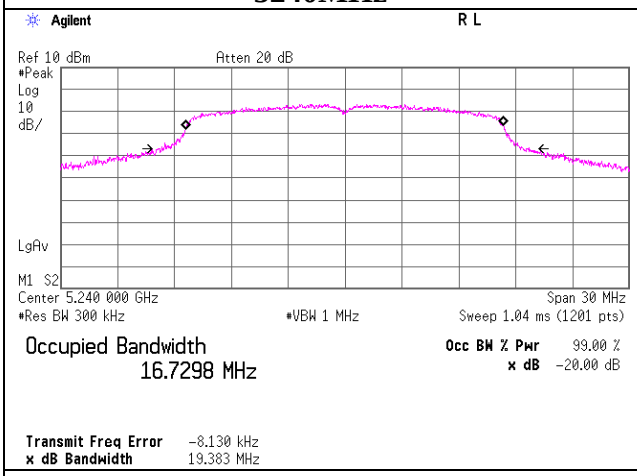
11n-40

Frequency [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
5230	39.580	-
5270	39.401	-
5550	42.320	-
5670	39.882	-

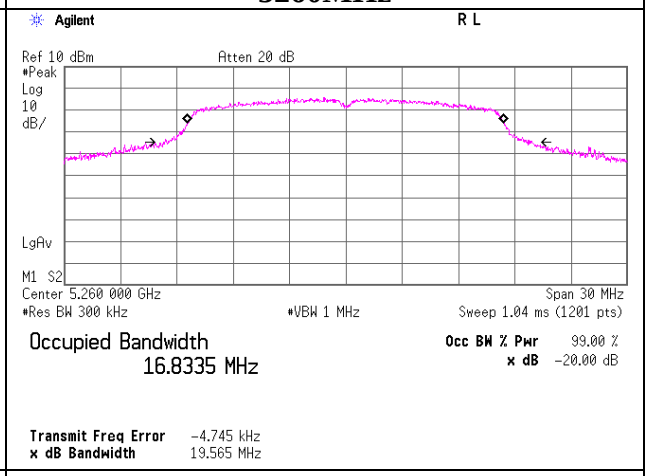
20dB Bandwidth

11a

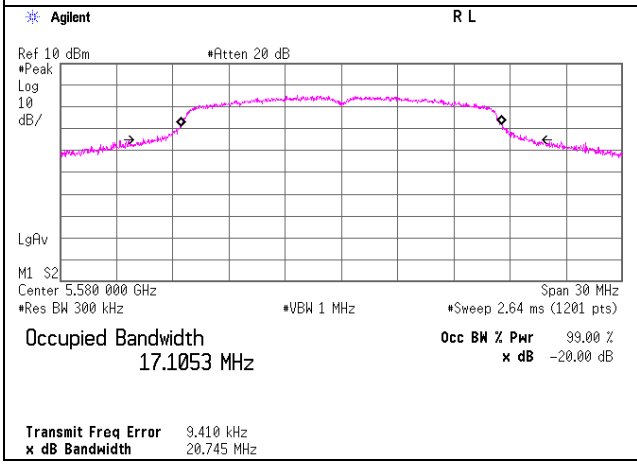
5240MHz



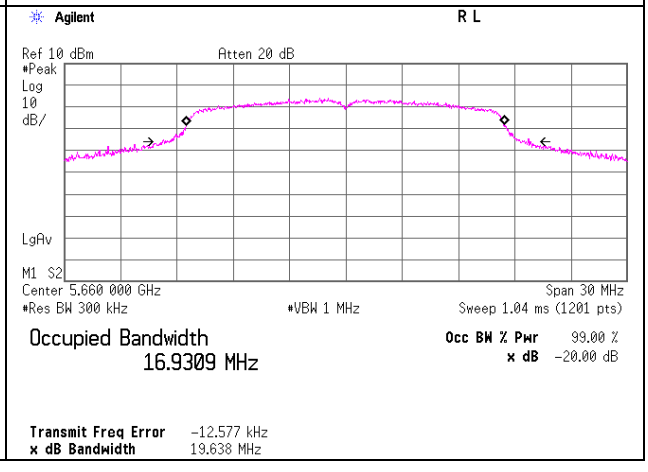
5260MHz



5580MHz



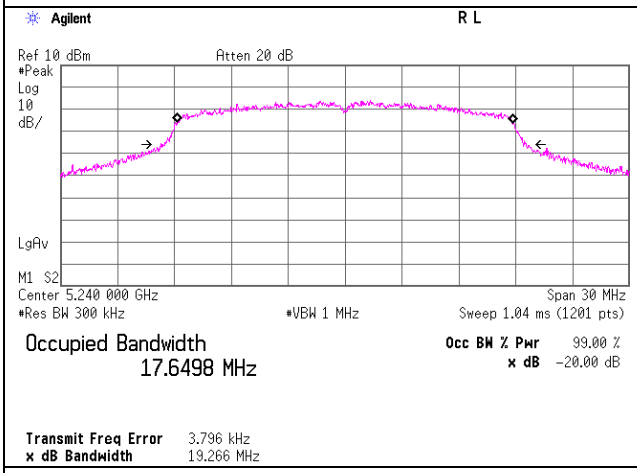
5660MHz



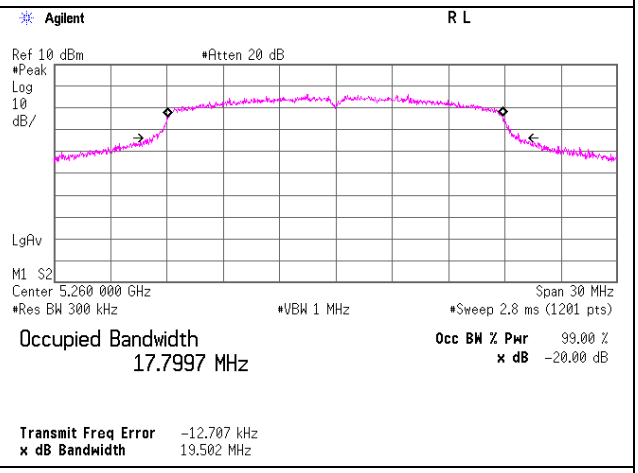
20dB Bandwidth

11n-20

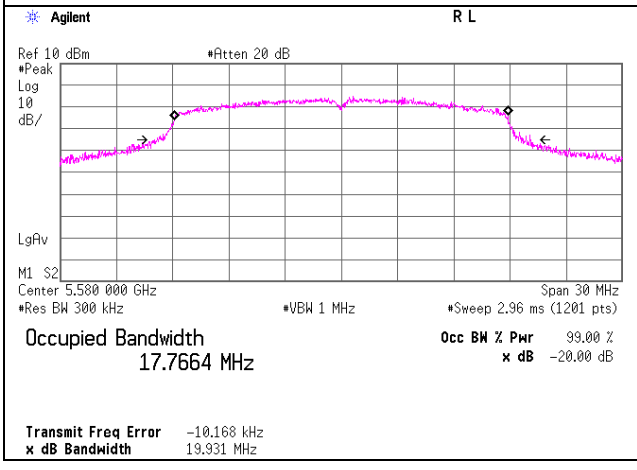
5240MHz



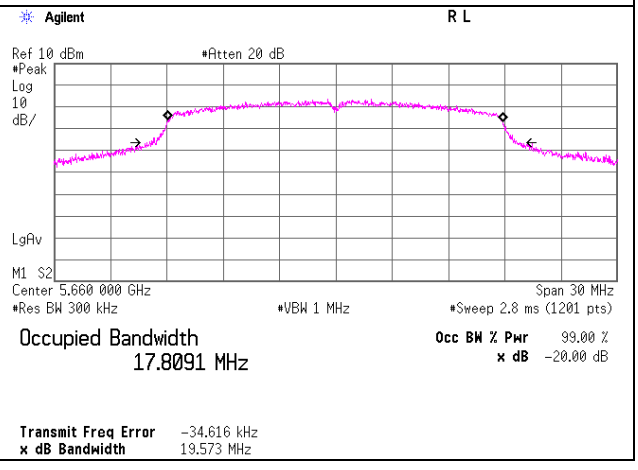
5260MHz



5580MHz



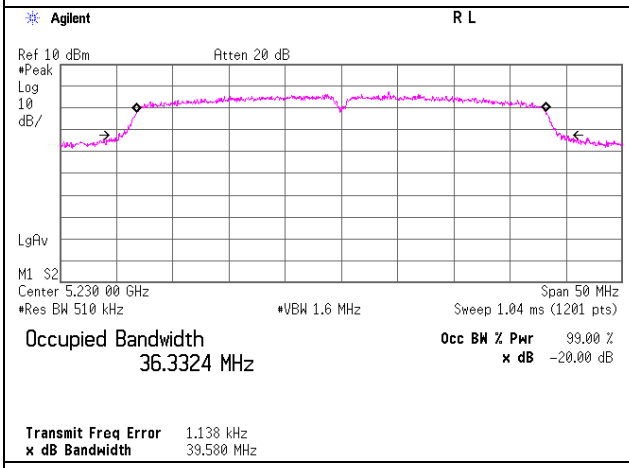
5660MHz



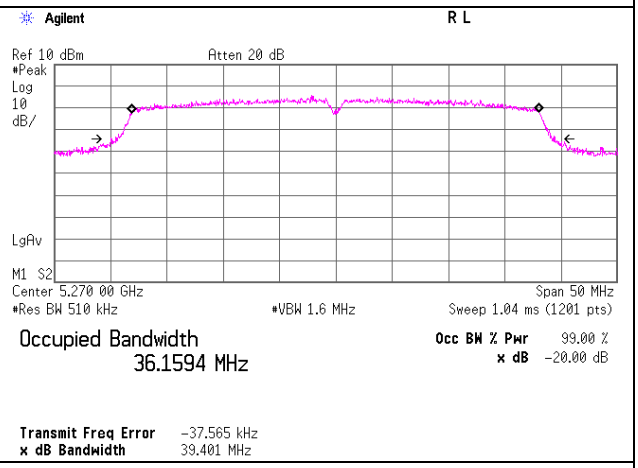
20dB Bandwidth

11n-40

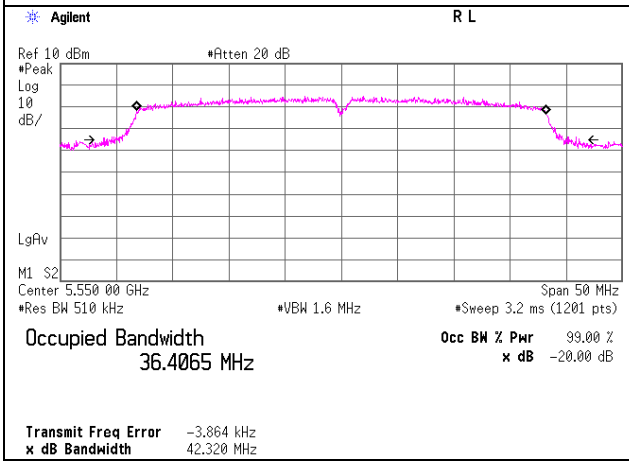
5230MHz



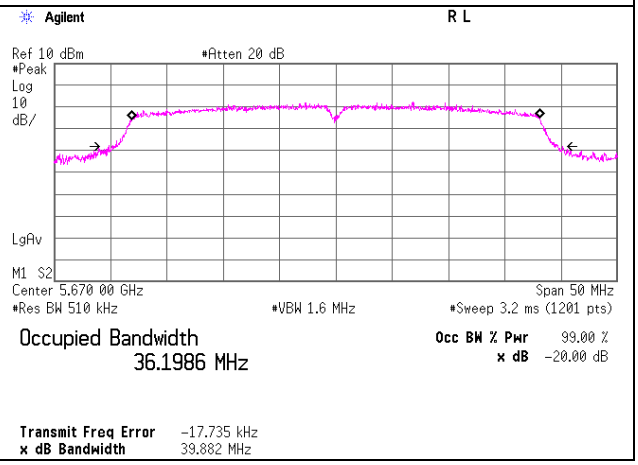
5270MHz



5550MHz



5670MHz



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Maximum Peak Output Power

Test place	Head Office EMC Lab. No.6 Shielded Room	
Report No.	10191682A	
Date	01/27/2014	01/28/2014
Temperature/ Humidity	20deg.C. / 42% RH	23deg.C. / 29% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	11a Tx	

Method SA-1

Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]
5180.0	0.30	2.89	10.02	4.25	13.21	17.46	16.98	-	3.77
5220.0	0.75	2.90	10.03	4.25	13.68	17.93	16.98	-	3.30
5240.0	0.84	2.90	10.03	4.25	13.77	18.02	16.98	-	3.21
5260.0	2.96	2.91	10.03	4.25	15.90	20.15	23.97	-	8.07
5300.0	3.31	2.92	10.03	4.25	16.26	20.51	23.97	-	7.71
5320.0	0.37	2.92	10.03	4.25	13.32	17.57	23.97	-	10.65
5500.0	1.36	2.96	10.03	4.18	14.35	18.53	23.97	-	9.62
5580.0	2.68	2.97	10.03	4.18	15.68	19.86	23.97	-	8.29
5700.0	-1.38	2.99	10.03	4.18	11.64	15.82	23.97	-	12.33

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss
Result(e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Antenna Gain
15.407(a)(1) Limit(Cond.) = 16.98dBm(50mW) or 4 + 10log(26dB BW) dBm
15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

Maximum Peak Output Power

Test place	Head Office EMC Lab. No.6 Shielded Room	
Report No.	10191682A	
Date	01/27/2014	01/28/2014
Temperature/ Humidity	20deg.C. / 42% RH	23deg.C. / 29% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	11n-20 Tx	

Method SA-1

Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]
5180.0	1.26	2.89	10.02	4.25	14.17	18.42	16.98	-	2.81
5220.0	1.09	2.90	10.03	4.25	14.02	18.27	16.98	-	2.96
5240.0	1.06	2.90	10.03	4.25	13.99	18.24	16.98	-	2.99
5260.0	2.68	2.91	10.03	4.25	15.62	19.87	23.97	-	8.35
5300.0	2.41	2.92	10.03	4.25	15.36	19.61	23.97	-	8.61
5320.0	1.97	2.92	10.03	4.25	14.92	19.17	23.97	-	9.05
5500.0	1.52	2.96	10.03	4.18	14.51	18.69	23.97	-	9.46
5580.0	1.69	2.97	10.03	4.18	14.69	18.87	23.97	-	9.28
5700.0	-2.37	2.99	10.03	4.18	10.65	14.83	23.97	-	13.32

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss
Result(e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Antenna Gain
15.407(a)(1) Limit(Cond.) = 16.98dBm(50mW) or 4 + 10log(26dB BW) dBm
15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

Maximum Peak Output Power

Test place	Head Office EMC Lab. No.6 Shielded Room
Report No.	10191682A
Date	01/27/2014
Temperature/ Humidity	20deg.C. / 42% RH
Engineer	Yutaka Yoshida
Mode	11n-40 Tx

Method SA-1

Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5190.0	-9.71	2.89	10.02	4.25	3.20	7.45	16.98	-	13.78	-
5230.0	3.88	2.90	10.03	4.25	16.81	21.06	16.98	-	0.17	-
5270.0	2.91	2.91	10.03	4.25	15.85	20.10	23.97	-	8.12	-
5310.0	-10.16	2.92	10.03	4.25	2.79	7.04	23.97	-	21.18	-
5510.0	-9.17	2.96	10.03	4.18	3.82	8.00	23.97	-	20.15	-
5550.0	2.84	2.97	10.03	4.18	15.84	20.02	23.97	-	8.13	-
5670.0	-0.38	2.98	10.03	4.18	12.63	16.81	23.97	-	11.34	-

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss
Result(e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Antenna Gain
15.407(a)(1) Limit(Cond.) = 16.98dBm(50mW) or 4 + 10log(26dB BW) dBm
15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

Peak Power Spectral Density

Test place	Head Office EMC Lab. No.6 Shielded Room	
Report No.	10191682A	
Date	01/27/2014	01/28/2014
Temperature/ Humidity	20deg.C. / 42% RH	23deg.C. / 29% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	11a / 11n-20 / 11n-40 Tx	

11a

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-10.24	2.89	10.02	4.25	2.67	4.00	1.33
5220.0	-9.74	2.90	10.03	4.25	3.19	4.00	0.81
5240.0	-9.67	2.90	10.03	4.25	3.26	4.00	0.74
5260.0	-7.56	2.91	10.03	4.25	5.39	11.00	5.62
5300.0	-7.24	2.92	10.03	4.25	5.71	11.00	5.29
5320.0	-10.16	2.92	10.03	4.25	2.79	11.00	8.21
5500.0	-9.15	2.96	10.03	4.18	3.84	11.00	7.16
5580.0	-7.80	2.97	10.03	4.18	5.20	11.00	5.80
5700.0	-11.91	2.99	10.03	4.18	1.11	11.00	9.89

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

11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-9.05	2.89	10.02	4.25	3.86	4.00	0.14
5220.0	-9.34	2.90	10.03	4.25	3.59	4.00	0.41
5240.0	-9.49	2.90	10.03	4.25	3.44	4.00	0.56
5260.0	-7.91	2.91	10.03	4.25	5.03	11.00	5.97
5300.0	-8.13	2.92	10.03	4.25	4.82	11.00	6.18
5320.0	-8.51	2.92	10.03	4.25	4.44	11.00	6.56
5500.0	-9.06	2.96	10.03	4.18	3.93	11.00	7.07
5580.0	-8.78	2.97	10.03	4.18	4.22	11.00	6.78
5700.0	-12.94	2.99	10.03	4.18	0.08	11.00	10.92

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

11n-40

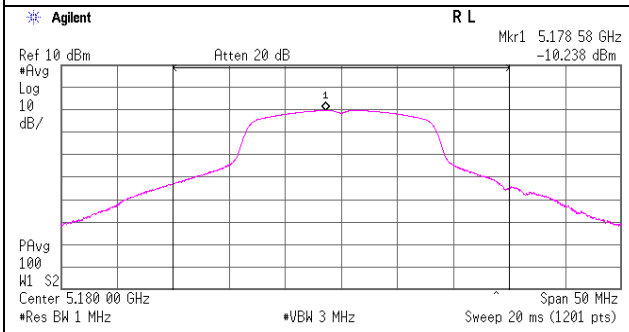
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Antenna Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
5190.0	-23.31	2.89	10.02	4.25	-10.40	4.00	14.40
5230.0	-9.52	2.90	10.03	4.25	3.41	4.00	0.59
5270.0	-10.63	2.91	10.03	4.25	2.31	11.00	8.69
5310.0	-23.97	2.92	10.03	4.25	-11.02	11.00	22.02
5510.0	-22.64	2.96	10.03	4.18	-9.65	11.00	20.65
5550.0	-10.71	2.97	10.03	4.18	2.29	11.00	8.71
5670.0	-13.77	2.98	10.03	4.18	-0.76	11.00	11.76

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

Maximum Peak Output Power & Peak Power Spectral Density

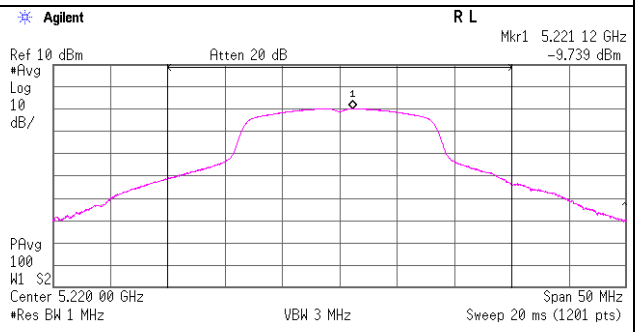
11a

5180MHz



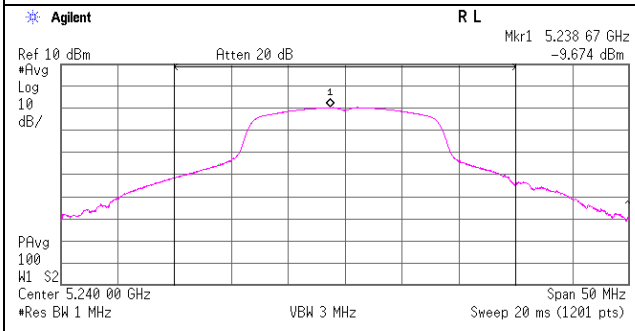
Channel Power	Power Spectral Density
0.30 dBm /30.0000 MHz	-74.47 dBm/Hz

5220MHz



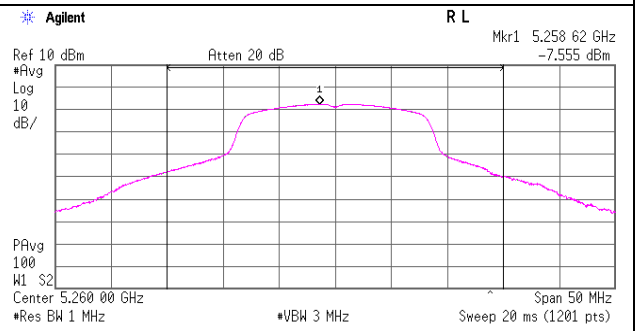
Channel Power	Power Spectral Density
0.75 dBm /30.0000 MHz	-74.02 dBm/Hz

5240MHz



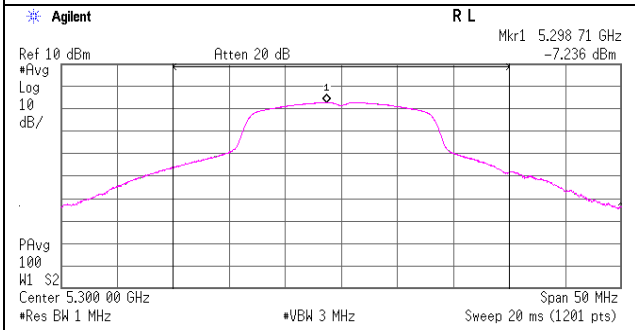
Channel Power	Power Spectral Density
0.84 dBm /30.0000 MHz	-73.93 dBm/Hz

5260MHz



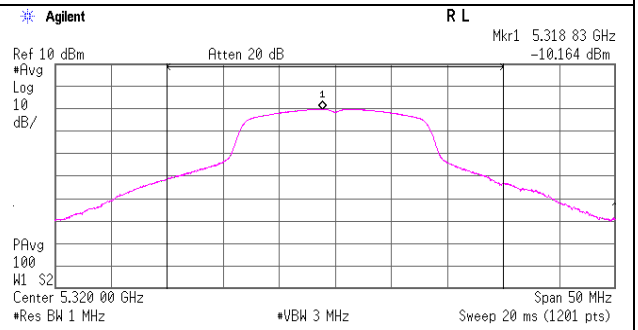
Channel Power	Power Spectral Density
2.96 dBm /30.0000 MHz	-71.81 dBm/Hz

5300MHz



Channel Power	Power Spectral Density
3.31 dBm /30.0000 MHz	-71.46 dBm/Hz

5320MHz

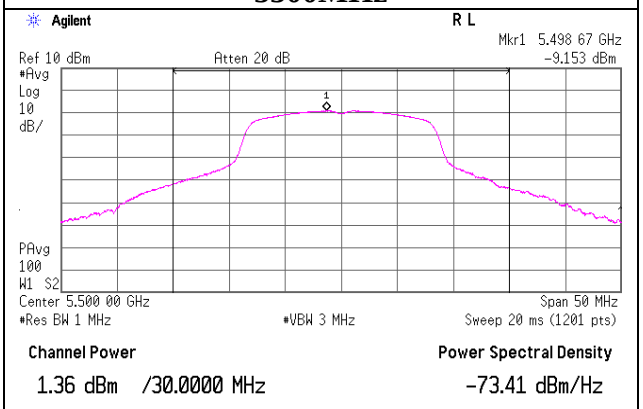


Channel Power	Power Spectral Density
0.37 dBm /30.0000 MHz	-74.40 dBm/Hz

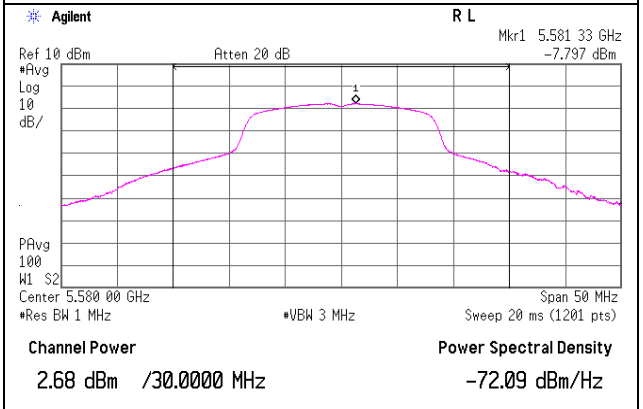
Maximum Peak Output Power & Peak Power Spectral Density

11a

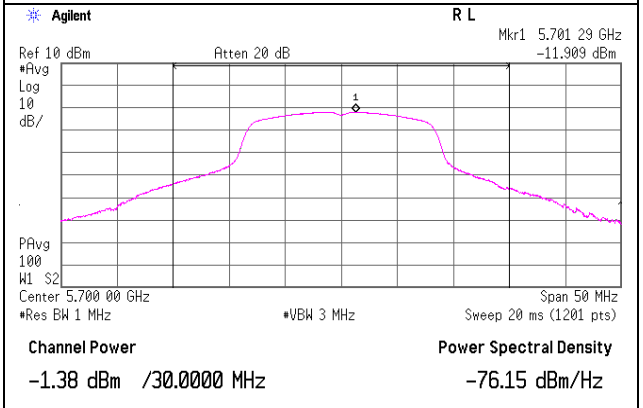
5500MHz



5580MHz



5700MHz



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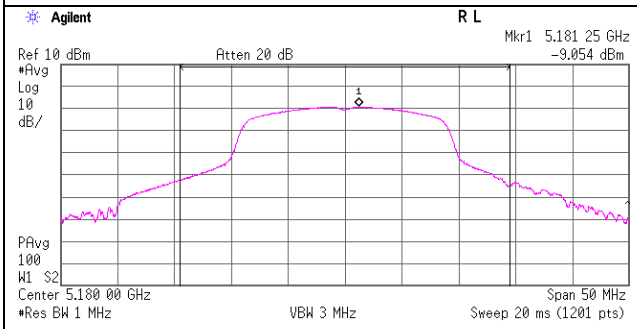
Facsimile : +81 596 24 8124

Maximum Peak Output Power & Peak Power Spectral Density

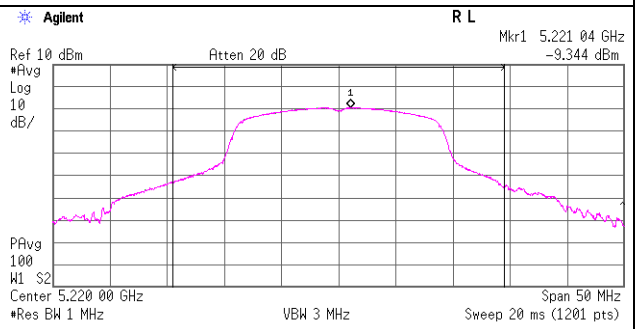
11n-20

5180MHz



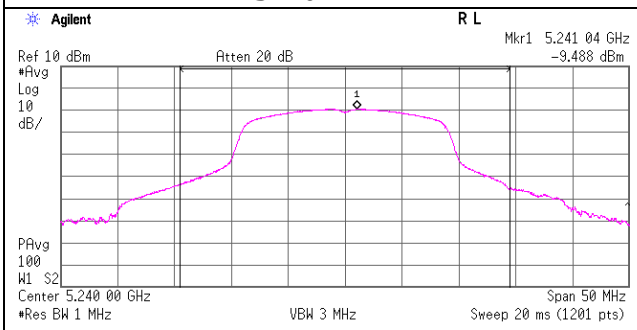
Channel Power	Power Spectral Density
1.26 dBm /29.0000 MHz	-73.36 dBm/Hz

5220MHz



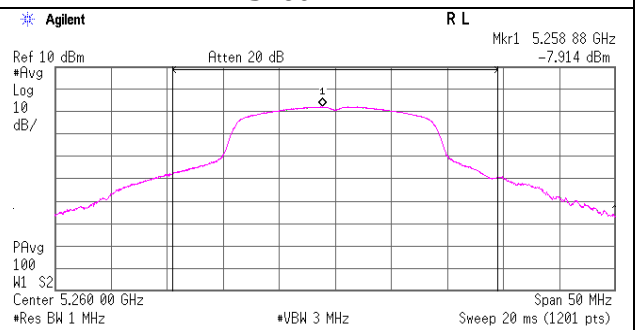
Channel Power	Power Spectral Density
1.09 dBm /29.0000 MHz	-73.53 dBm/Hz

5240MHz



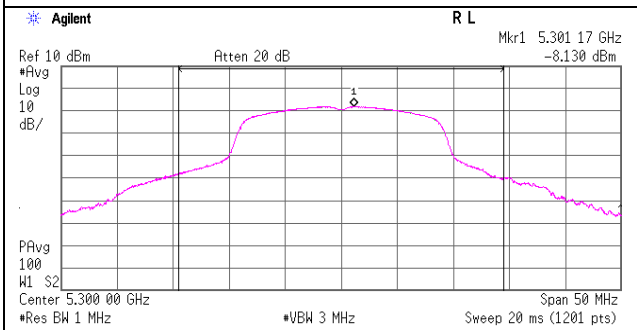
Channel Power	Power Spectral Density
1.06 dBm /29.0000 MHz	-73.56 dBm/Hz

5260MHz



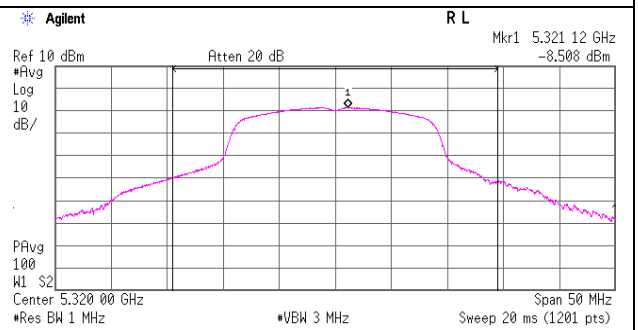
Channel Power	Power Spectral Density
2.68 dBm /29.0000 MHz	-71.94 dBm/Hz

5300MHz



Channel Power	Power Spectral Density
2.41 dBm /29.0000 MHz	-72.21 dBm/Hz

5320MHz

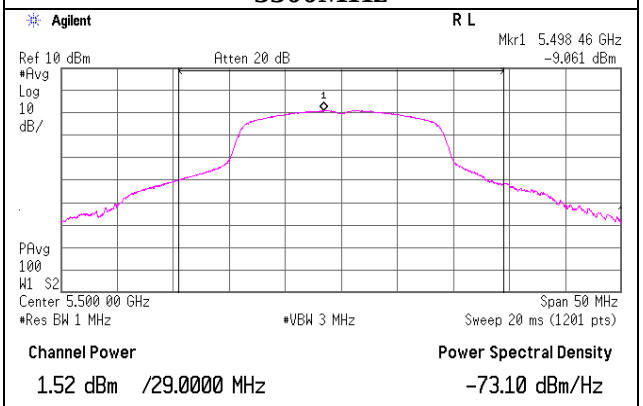


Channel Power	Power Spectral Density
1.97 dBm /29.0000 MHz	-72.66 dBm/Hz

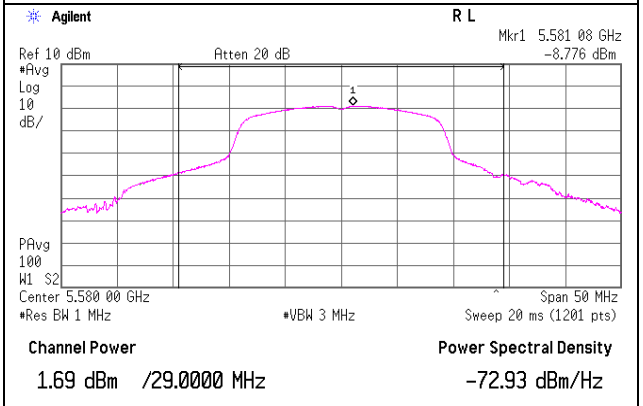
Maximum Peak Output Power & Peak Power Spectral Density

11n-20

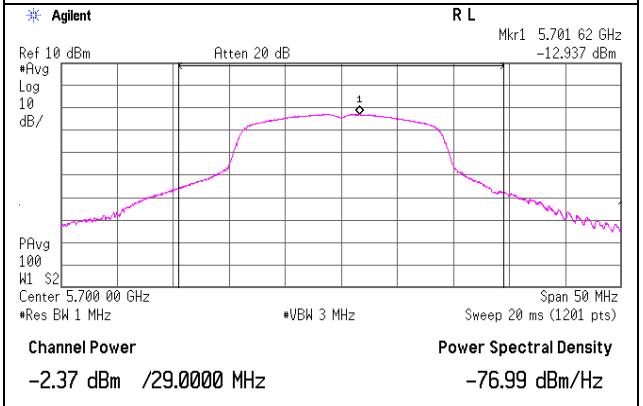
5500MHz



5580MHz



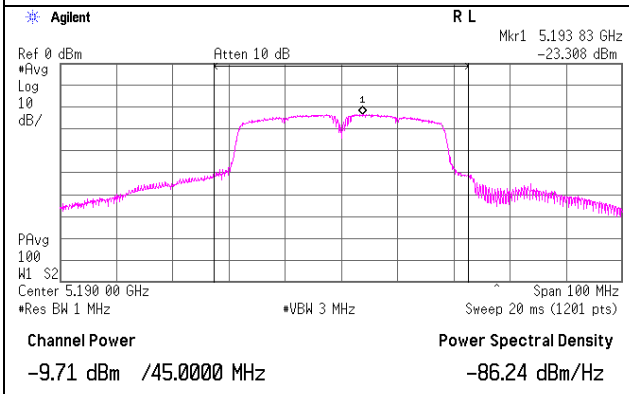
5700MHz



Maximum Peak Output Power & Peak Power Spectral Density

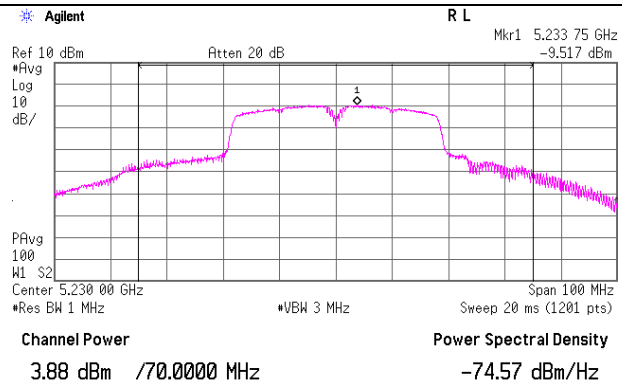
11n-40

5190MHz



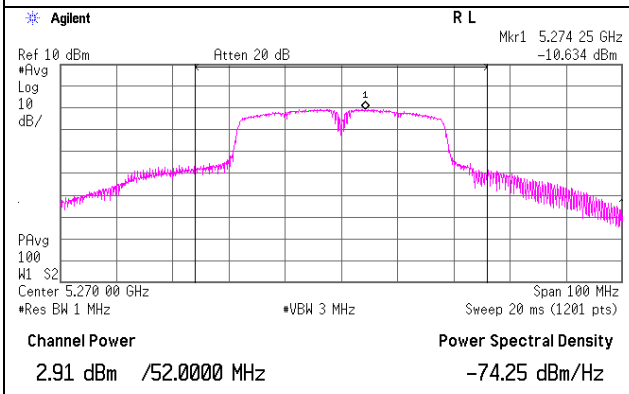
Channel Power: -9.71 dBm /45.0000 MHz
Power Spectral Density: -86.24 dBm/Hz

5230MHz



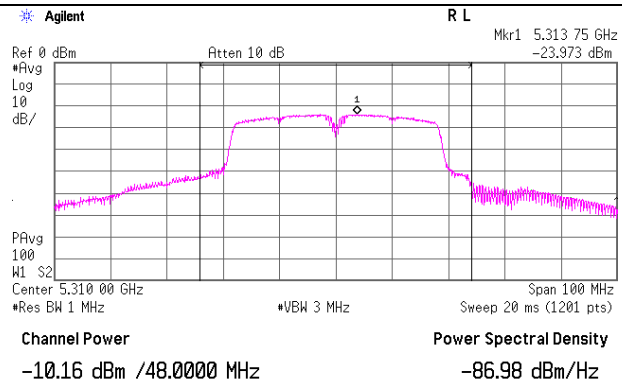
Channel Power: 3.88 dBm /70.0000 MHz
Power Spectral Density: -74.57 dBm/Hz

5270MHz



Channel Power: 2.91 dBm /52.0000 MHz
Power Spectral Density: -74.25 dBm/Hz

5310MHz

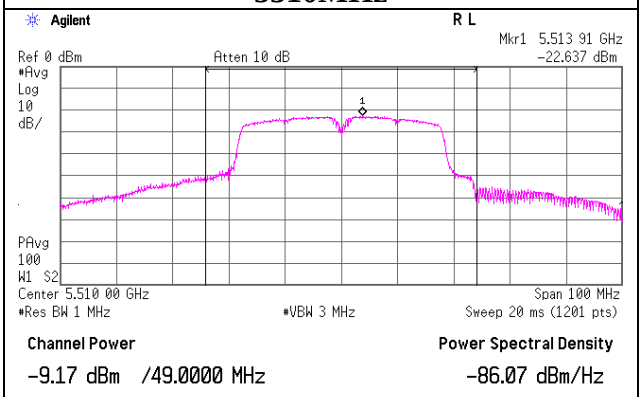


Channel Power: -10.16 dBm /48.0000 MHz
Power Spectral Density: -86.98 dBm/Hz

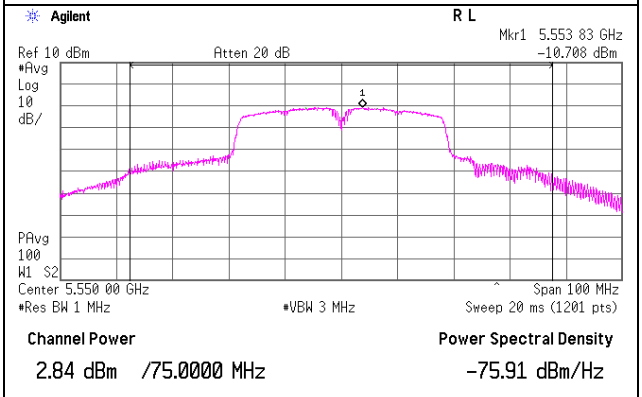
Maximum Peak Output Power & Peak Power Spectral Density

11n-40

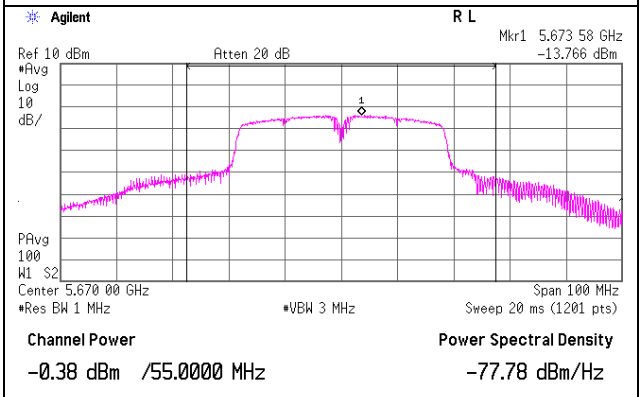
5510MHz



5550MHz



5670MHz



Maximum Peak Output Power & Peak Power Spectral Density
(Reference data : Worst data rate check)

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10191682A
Date	12/24/2013
Temperature/ Humidity	23deg.C. / 32% RH
Engineer	Tomohisa Nakagawa
Mode	11a / 11n-20 / 11n-40 Tx

11a, 5500MHz

Data Rate [Mbps]	Reading Power Meter AV(On time only) [dBm]	Ramark
6	3.29	
9	3.39	
12	3.47	
18	3.66	*
24	2.52	
36	1.62	
48	0.77	
54	-0.03	

11n-20, 5500MHz

MCS Index	Reading Power Meter AV(On time only) [dBm]	Ramark
0	3.39	
1	3.55	
2	3.73	
3	3.83	*
4	2.87	
5	2.27	
6	1.60	
7	0.36	

11n-40, 5510MHz

MCS Index	Reading Power Meter AV(On time only) [dBm]	Ramark
0	-0.47	
1	-0.16	
2	0.00	
3	0.11	
4	0.21	
5	0.24	
6	4.97	*
7	3.17	

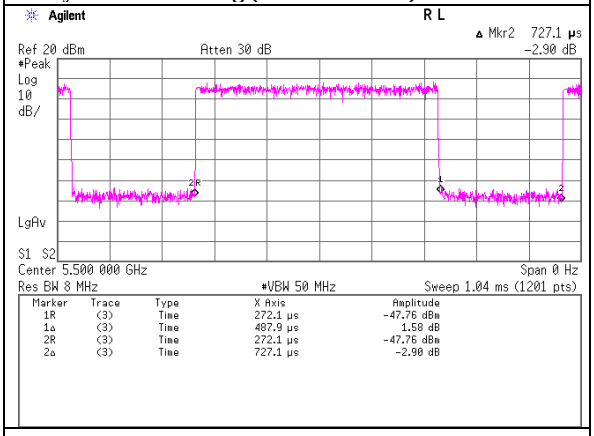
*Worst Rate
Gate function ON
All comparison were carried out on same frequency and measurement factors.

Duty cycle

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10191682A
Date	12/24/2013
Temperature/ Humidity	23deg.C. / 32% RH
Engineer	Tomohisa Nakagawa
Mode	11a / 11n-20

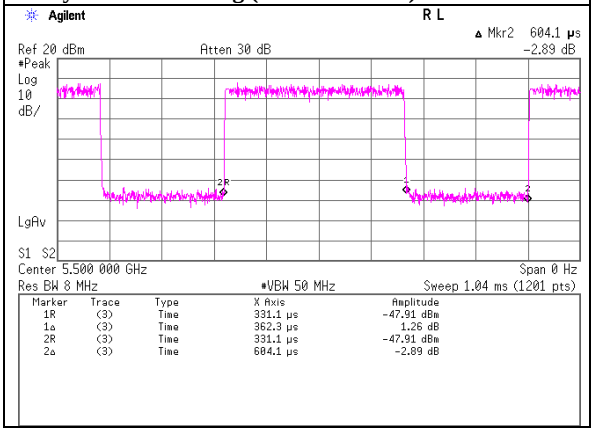
11a 18Mbps

Tx on / (Tx on + Tx off) = 0.671
Tx on / (Tx on + Tx off) * 100 = 67.1 %
Duty factor = 10 * log (0.7271 / 0.4879) = 1.73 dB



11n-20 MCS3

Tx on / (Tx on + Tx off) = 0.600
Tx on / (Tx on + Tx off) * 100 = 60.0 %
Duty factor = 10 * log (0.6041 / 0.3623) = 2.22 dB

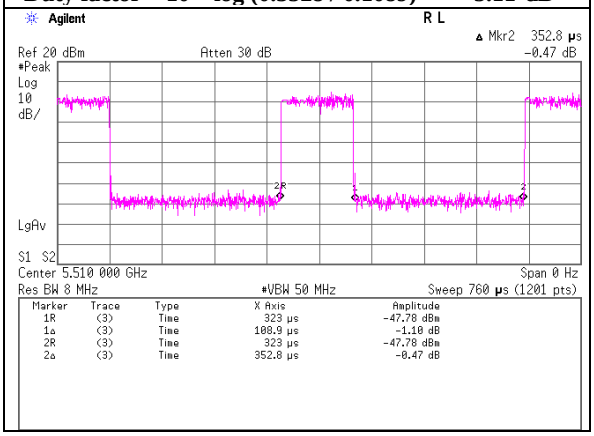


Duty cycle

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10191682A
Date	12/24/2013
Temperature/ Humidity	23deg.C. / 32% RH
Engineer	Tomohisa Nakagawa
Mode	11n-40 Tx

11n-40 MCS6

Tx on / (Tx on + Tx off) =	**0.309**
Tx on / (Tx on + Tx off) * 100 =	**30.9 %**
Duty factor = 10 * log (0.3528 / 0.1089) =	**5.11 dB**



Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-10GHz)	Katsunori Okai (10-26.5GHz)	Keisuke Kawamura (26.5-40GHz)
Mode	11a Tx 5180MHz		

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]	Inside or Outside of Restricted Bands
Hori	5150.000	PK	63.0	31.1	3.8	31.4	-	66.5	68.2	1.7	Bandedge
Hori	10360.000	PK	47.8	39.7	-2.0	33.2	-	52.3	68.2	15.9	Outside
Hori	15540.000	PK	42.6	39.9	-0.6	32.3	-	49.6	73.9	24.3	Inside
Hori	5150.000	AV	47.0	31.1	3.8	31.4	1.7	52.2	53.9	1.7	Bandedge
Hori	15540.000	AV	34.1	39.9	-0.6	32.3	1.7	42.8	53.9	11.1	Inside
Vert	5150.000	PK	58.4	31.1	3.8	31.4	-	61.9	68.2	6.3	Bandedge
Vert	10360.000	PK	47.4	39.7	-2.0	33.2	-	51.9	68.2	16.3	Outside
Vert	15540.000	PK	42.5	39.9	-0.6	32.3	-	49.5	73.9	24.4	Inside
Vert	5150.000	AV	42.4	31.1	3.8	31.4	1.7	47.6	53.9	6.3	Bandedge
Vert	15540.000	AV	33.8	39.9	-0.6	32.3	1.7	42.5	53.9	11.4	Inside

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-10GHz)	Katsunori Okai (10-26.5GHz)	Keisuke Kawamura (26.5-40GHz)
Mode	11a Tx 5260MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	10520.000	PK	49.4	39.6	-1.9	33.2	-	53.9	68.2	14.3	Outside	
Hori	15780.000	PK	43.3	39.0	-0.6	32.2	-	49.5	73.9	24.4	Inside	
Hori	15780.000	AV	35.1	39.0	-0.6	32.2	1.7	43.0	53.9	10.9	Inside	
Vert	10520.000	PK	49.9	39.6	-1.9	33.2	-	54.4	68.2	13.8	Outside	
Vert	15780.000	PK	42.6	39.0	-0.6	32.2	-	48.8	73.9	25.1	Inside	
Vert	15780.000	AV	33.9	39.0	-0.6	32.2	1.7	41.8	53.9	12.1	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-10GHz)	Katsunori Okai (10-26.5GHz)	Keisuke Kawamura (26.5-40GHz)
Mode	11a Tx 5320MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	5350.000	PK	63.2	31.5	3.9	31.4	-	67.2	68.2	1.0	Bandedge	
Hori	10640.000	PK	45.1	39.7	-1.8	33.2	-	49.8	73.9	24.1	Inside	
Hori	15960.000	PK	42.3	38.4	-0.5	32.2	-	48.0	73.9	25.9	Inside	
Hori	5350.000	AV	46.1	31.5	3.9	31.4	1.7	51.8	53.9	2.1	Bandedge	
Hori	10640.000	AV	36.7	39.7	-1.8	33.2	1.7	43.1	53.9	10.8	Inside	
Hori	15960.000	AV	34.2	38.4	-0.5	32.2	1.7	41.6	53.9	12.3	Inside	
Vert	5350.000	PK	58.9	31.5	3.9	31.4	-	62.9	68.2	5.3	Bandedge	
Vert	10640.000	PK	43.9	39.7	-1.8	33.2	-	48.6	73.9	25.3	Inside	
Vert	15960.000	PK	42.8	38.4	-0.5	32.2	-	48.5	73.9	25.4	Inside	
Vert	5350.000	AV	41.4	31.5	3.9	31.4	1.7	47.1	53.9	6.8	Bandedge	
Vert	10640.000	AV	35.6	39.7	-1.8	33.2	1.7	42.0	53.9	11.9	Inside	
Vert	15960.000	AV	34.0	38.4	-0.5	32.2	1.7	41.4	53.9	12.5	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-10GHz)	Katsunori Okai (10-26.5GHz)	Keisuke Kawamura (26.5-40GHz)
Mode	11a Tx 5500MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	3666.632	PK	44.8	29.2	3.2	31.8	-	45.4	73.9	28.5	Inside	
Hori	5470.000	PK	60.7	31.7	4.0	31.4	-	65.0	68.2	3.2	Outside	
Hori	11000.000	PK	46.7	39.9	-1.7	33.3	-	51.6	73.9	22.3	Inside	
Hori	16500.000	PK	48.0	39.4	-0.2	32.2	-	55.0	68.2	13.2	Outside	
Hori	3666.632	AV	37.6	29.2	3.2	31.8	1.7	39.9	53.9	14.0	Inside	
Hori	11000.000	AV	38.3	39.9	-1.7	33.3	1.7	44.9	53.9	9.0	Inside	
Vert	3666.632	PK	43.8	29.2	3.2	31.8	-	44.4	73.9	29.5	Inside	
Vert	5470.000	PK	56.1	31.7	4.0	31.4	-	60.4	68.2	7.8	Outside	
Vert	11000.000	PK	47.2	39.9	-1.7	33.3	-	52.1	73.9	21.8	Inside	
Vert	16500.000	PK	48.1	39.4	-0.2	32.2	-	55.1	68.2	13.1	Outside	
Vert	3666.632	AV	34.6	29.2	3.2	31.8	1.7	36.9	53.9	17.0	Inside	
Vert	11000.000	AV	38.4	39.9	-1.7	33.3	1.7	45.0	53.9	8.9	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-10GHz)	Katsunori Okai (10-26.5GHz)	Keisuke Kawamura (26.5-40GHz)
Mode	11a Tx 5580MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	3719.948	PK	45.2	29.3	3.2	31.8	-	45.9	73.9	28.0	Inside	
Hori	11160.000	PK	50.5	39.7	-1.7	33.3	-	55.2	73.9	18.7	Inside	
Hori	16740.000	PK	47.7	40.0	-0.1	32.2	-	55.4	68.2	12.8	Outside	
Hori	3719.948	AV	38.7	29.3	3.2	31.8	1.7	41.1	53.9	12.8	Inside	
Hori	11160.000	AV	43.2	39.7	-1.7	33.3	1.7	49.6	53.9	4.3	Inside	
Vert	3719.948	PK	43.7	29.3	3.2	31.8	-	44.4	73.9	29.5	Inside	
Vert	11160.000	PK	50.2	39.7	-1.7	33.3	-	54.9	73.9	19.0	Inside	
Vert	16740.000	PK	49.1	40.0	-0.1	32.2	-	56.8	68.2	11.4	Outside	
Vert	3719.948	AV	35.7	29.3	3.2	31.8	1.7	38.1	53.9	15.8	Inside	
Vert	11160.000	AV	41.3	39.7	-1.7	33.3	1.7	47.7	53.9	6.2	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-10GHz)	Katsunori Okai (10-26.5GHz)	Keisuke Kawamura (26.5-40GHz)
Mode	11a Tx 5700MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	3799.983	PK	49.2	29.4	3.2	31.7	-	50.1	73.9	23.8	Inside	
Hori	5725.000	PK	62.2	31.4	4.1	31.5	-	66.2	68.2	2.0	Outside	
Hori	11400.000	PK	47.1	39.5	-1.6	33.2	-	51.8	73.9	22.1	Inside	
Hori	17100.000	PK	45.9	41.3	0.1	32.3	-	55.0	68.2	13.2	Outside	
Hori	3799.983	AV	44.0	29.4	3.2	31.7	1.7	46.6	53.9	7.3	Inside	
Hori	11400.000	AV	38.2	39.5	-1.6	33.2	1.7	44.6	53.9	9.3	Inside	
Vert	3799.983	PK	46.7	29.4	3.2	31.7	-	47.6	73.9	26.3	Inside	
Vert	5725.000	PK	58.1	31.4	4.1	31.5	-	62.1	68.2	6.1	Outside	
Vert	11400.000	PK	45.2	39.5	-1.6	33.2	-	49.9	73.9	24.0	Inside	
Vert	17100.000	PK	47.2	41.3	0.1	32.3	-	56.3	68.2	11.9	Outside	
Vert	3799.983	AV	37.8	29.4	3.2	31.7	1.7	40.4	53.9	13.5	Inside	
Vert	11400.000	AV	36.8	39.5	-1.6	33.2	1.7	43.2	53.9	10.7	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber
Report No.	10191682A
Date	01/29/2014
Temperature/ Humidity	22deg. C / 30% RH
Engineer	Keisuke Kawamura
	Bandedge
Mode	11n-20 Tx 5180MHz

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]	Inside or Outside of Restricted Bands	Remark
Hori	5150.000	PK	64.3	31.1	3.8	31.4	-	67.8	68.2	0.4	Bandedge	
Hori	5150.000	AV	48.0	31.1	3.8	31.4	2.2	53.7	53.9	0.2	Bandedge	
Vert	5150.000	PK	58.8	31.1	3.8	31.4	-	62.3	68.2	5.9	Bandedge	
Vert	5150.000	AV	43.1	31.1	3.8	31.4	2.2	48.8	53.9	5.1	Bandedge	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber
Report No.	10191682A
Date	01/29/2014
Temperature/ Humidity	22deg. C / 30% RH
Engineer	Keisuke Kawamura
	Bandedge
Mode	11n-20 Tx 5320MHz

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]	Inside or Outside of Restricted Bands	Remark
Hori	5350.000	PK	63.6	31.5	3.9	31.4	-	67.6	68.2	0.6	Bandedge	
Hori	5350.000	AV	47.3	31.5	3.9	31.4	2.2	53.5	53.9	0.4	Bandedge	
Vert	5350.000	PK	59.4	31.5	3.9	31.4	-	63.4	68.2	4.8	Bandedge	
Vert	5350.000	AV	43.0	31.5	3.9	31.4	2.2	49.2	53.9	4.7	Bandedge	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber
Report No.	10191682A
Date	01/29/2014
Temperature/ Humidity	22deg. C / 30% RH
Engineer	Keisuke Kawamura
	Bandedge
Mode	11n-20 Tx 5500MHz

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]	Inside or Outside of Restricted Bands	Remark
Hori	5470.000	PK	60.7	31.7	4.0	31.4	-	65.0	68.2	3.2	Outside	
Vert	5470.000	PK	56.6	31.7	4.0	31.4	-	60.9	68.2	7.3	Outside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber
Report No.	10191682A
Date	01/29/2014
Temperature/ Humidity	22deg. C / 30% RH
Engineer	Keisuke Kawamura
	Bandedge
Mode	11n-20 Tx 5700MHz

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]	Inside or Outside of Restricted Bands	Remark
Hori	5725.000	PK	63.6	31.4	4.1	31.5	-	67.6	68.2	0.6	Outside	
Vert	5725.000	PK	60.3	31.4	4.1	31.5	-	64.3	68.2	3.9	Outside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-10GHz)	Katsunori Okai (10-26.5GHz)	Keisuke Kawamura (26.5-40GHz)
Mode	11n-40 Tx 5190MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	5150.000	PK	62.8	31.1	3.8	31.4	-	66.3	68.2	1.9	Bandedge	
Hori	10380.000	PK	44.5	39.7	-2.0	33.2	-	49.0	68.2	19.2	Outside	
Hori	15570.000	PK	42.0	39.8	-0.6	32.3	-	48.9	73.9	25.0	Inside	
Hori	5150.000	AV	45.2	31.1	3.8	31.4	5.1	53.8	53.9	0.1	Bandedge	
Hori	15570.000	AV	33.9	39.8	-0.6	32.3	5.1	45.9	53.9	8.0	Inside	
Vert	5150.000	PK	57.1	31.1	3.8	31.4	-	60.6	68.2	7.6	Bandedge	
Vert	10380.000	PK	41.9	39.7	-2.0	33.2	-	46.4	68.2	21.8	Outside	
Vert	15570.000	PK	42.8	39.8	-0.6	32.3	-	49.7	73.9	24.2	Inside	
Vert	5150.000	AV	41.1	31.1	3.8	31.4	5.1	49.7	53.9	4.2	Bandedge	
Vert	15570.000	AV	33.4	39.8	-0.6	32.3	5.1	45.4	53.9	8.5	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-10GHz)	Katsunori Okai (10-26.5GHz)	Keisuke Kawamura (26.5-40GHz)&(Below 1GHz)
Mode	11n-40 Tx 5230MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	76.795	QP	41.4	6.4	7.8	32.2	-	23.4	40.0	16.6	Outside	
Hori	768.011	QP	40.3	21.5	12.6	31.7	-	42.7	46.0	3.3	Outside	
Hori	844.814	QP	31.5	22.1	13.0	31.3	-	35.3	46.0	10.7	Outside	
Hori	921.615	QP	35.3	22.8	13.4	30.9	-	40.6	46.0	5.4	Outside	
Hori	960.005	QP	34.4	23.6	13.6	30.7	-	40.9	53.9	13.0	Inside	
Hori	998.414	QP	40.5	24.5	13.7	30.5	-	48.2	53.9	5.7	Inside	
Hori	10460.000	PK	48.9	39.6	-2.0	33.2	-	53.3	68.2	14.9	Outside	
Hori	15690.000	PK	42.1	39.3	-0.6	32.3	-	48.5	73.9	25.4	Inside	
Hori	15690.000	AV	33.7	39.3	-0.6	32.3	5.1	45.2	53.9	8.7	Inside	
Vert	76.795	QP	41.7	6.4	7.8	32.2	-	23.7	40.0	16.3	Outside	
Vert	170.709	QP	34.7	15.8	8.8	32.1	-	27.2	43.5	16.3	Inside	
Vert	205.551	QP	37.9	16.6	9.1	32.1	-	31.5	43.5	12.0	Outside	
Vert	768.011	QP	35.3	21.5	12.6	31.7	-	37.7	46.0	8.3	Outside	
Vert	921.615	QP	35.1	22.8	13.4	30.9	-	40.4	46.0	5.6	Outside	
Vert	999.004	QP	33.4	24.5	13.7	30.5	-	41.1	53.9	12.8	Inside	
Vert	10460.000	PK	49.8	39.6	-2.0	33.2	-	54.2	68.2	14.0	Outside	
Vert	15690.000	PK	40.7	39.3	-0.6	32.3	-	47.1	73.9	26.8	Inside	
Vert	15690.000	AV	33.6	39.3	-0.6	32.3	5.1	45.1	53.9	8.8	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-10GHz)	Katsunori Okai (10-26.5GHz)	Keisuke Kawamura (26.5-40GHz)
Mode	11n-40 Tx 5310MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	5350.000	PK	58.8	31.5	3.9	31.4	-	62.8	68.2	5.4	Bandedge	
Hori	10620.000	PK	44.6	39.7	-1.9	33.2	-	49.2	73.9	24.7	Inside	
Hori	15930.000	PK	42.8	38.5	-0.5	32.2	-	48.6	73.9	25.3	Inside	
Hori	5350.000	AV	42.0	31.5	3.9	31.4	5.1	51.1	53.9	2.8	Bandedge	
Hori	10620.000	AV	35.0	39.7	-1.9	33.2	5.1	44.7	53.9	9.2	Inside	
Hori	15930.000	AV	34.6	38.5	-0.5	32.2	5.1	45.5	53.9	8.4	Inside	
Vert	5350.000	PK	58.0	31.5	3.9	31.4	-	62.0	68.2	6.2	Bandedge	
Vert	10620.000	PK	43.3	39.7	-1.9	33.2	-	47.9	73.9	26.0	Inside	
Vert	15930.000	PK	41.2	38.5	-0.5	32.2	-	47.0	73.9	26.9	Inside	
Vert	5350.000	AV	41.1	31.5	3.9	31.4	5.1	50.2	53.9	3.7	Bandedge	
Vert	10620.000	AV	34.2	39.7	-1.9	33.2	5.1	43.9	53.9	10.0	Inside	
Vert	15930.000	AV	34.4	38.5	-0.5	32.2	5.1	45.3	53.9	8.6	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-10GHz)	Katsunori Okai (10-26.5GHz)	Keisuke Kawamura (26.5-40GHz)
Mode	11n-40 Tx 5510MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	5470.000	PK	60.4	31.7	4.0	31.4	-	64.7	68.2	3.5	Outside	
Hori	11020.000	PK	43.8	39.9	-1.7	33.3	-	48.7	73.9	25.2	Inside	
Hori	16530.000	PK	45.7	39.5	-0.2	32.2	-	52.8	68.2	15.4	Outside	
Hori	11020.000	AV	34.4	39.9	-1.7	33.3	5.1	44.4	53.9	9.5	Inside	
Vert	5470.000	PK	57.8	31.7	4.0	31.4	-	62.1	68.2	6.1	Outside	
Vert	11020.000	PK	44.6	39.9	-1.7	33.3	-	49.5	73.9	24.4	Inside	
Vert	16530.000	PK	44.8	39.5	-0.2	32.2	-	51.9	68.2	16.3	Outside	
Vert	11020.000	AV	35.2	39.9	-1.7	33.3	5.1	45.2	53.9	8.7	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-18GHz)	Katsunori Okai (18-26.5GHz)	Keisuke Kawamura (26.5-40GHz)
Mode	11n-40 Tx 5550MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	11100.000	PK	47.2	39.8	-1.7	33.3	-	52.0	73.9	21.9	Inside	
Hori	16650.000	PK	49.0	39.8	-0.1	32.2	-	56.5	68.2	11.7	Outside	
Hori	11100.000	AV	37.3	39.8	-1.7	33.3	5.1	47.2	53.9	6.7	Inside	
Vert	11100.000	PK	43.2	39.8	-1.7	33.3	-	48.0	73.9	25.9	Inside	
Vert	16650.000	PK	48.3	39.8	-0.1	32.2	-	55.8	68.2	12.4	Outside	
Vert	11100.000	AV	34.3	39.8	-1.7	33.3	5.1	44.2	53.9	9.7	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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 Anechoic Chamber		
Report No.	10191682A		
Date	01/29/2014	01/30/2014	01/31/2014
Temperature/ Humidity	22deg. C / 30% RH	22deg. C / 30% RH	25deg. C / 38% RH
Engineer	Keisuke Kawamura (1-18GHz)	Katsunori Okai (18-26.5GHz)	Keisuke Kawamura (26.5-40GHz)
Mode	11n-40 Tx 5670MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	3779.978	PK	48.0	29.4	3.2	31.7	-	48.9	73.9	25.0	Inside	
Hori	5725.000	PK	59.8	31.4	4.1	31.5	-	63.8	68.2	4.4	Outside	
Hori	11340.000	PK	46.4	39.6	-1.6	33.2	-	51.2	73.9	22.7	Inside	
Hori	17010.000	PK	46.7	40.6	0.1	32.3	-	55.1	68.2	13.1	Outside	
Hori	3779.978	AV	39.3	29.4	3.2	31.7	5.1	45.3	53.9	8.6	Inside	
Hori	11340.000	AV	36.3	39.6	-1.6	33.2	5.1	46.2	53.9	7.7	Inside	
Vert	3779.978	PK	44.5	29.4	3.2	31.7	-	45.4	73.9	28.5	Inside	
Vert	5725.000	PK	55.7	31.4	4.1	31.5	-	59.7	68.2	8.5	Outside	
Vert	11340.000	PK	43.7	39.6	-1.6	33.2	-	48.5	73.9	25.4	Inside	
Vert	17010.000	PK	47.2	40.6	0.1	32.3	-	55.6	68.2	12.6	Outside	
Vert	3779.978	AV	34.5	29.4	3.2	31.7	5.1	40.5	53.9	13.4	Inside	
Vert	11340.000	AV	34.5	39.6	-1.6	33.2	5.1	44.4	53.9	9.5	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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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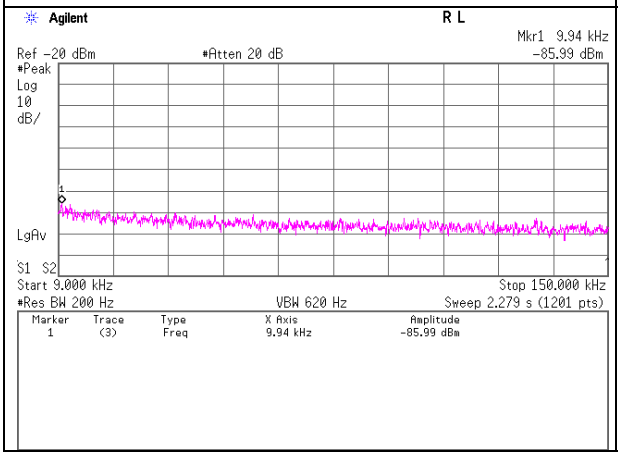
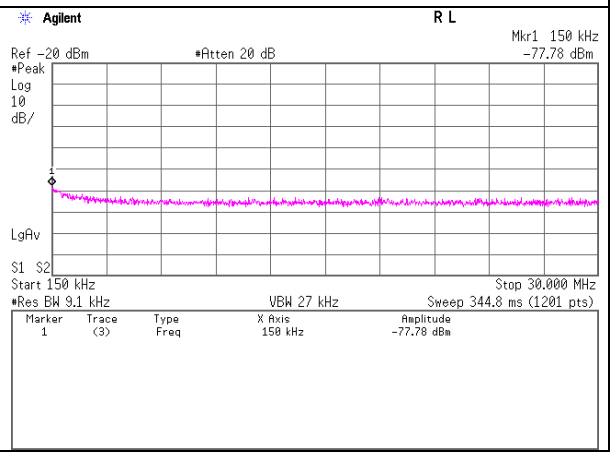
Conducted Spurious Emission

11n-40, Tx 5230MHz

9kHz-150kHz



150kHz-30MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.94	-85.99	0.01	9.86	4.25	36.99	-34.88	-27.00	7.88	
150.00	-77.78	0.01	0.85	4.25	20.41	-52.26	-27.00	25.26	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

Peak Excursion Ratio

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10191682A
Date	01/28/2014
Temperature/ Humidity	23deg.C. / 29% RH
Engineer	Yutaka Yoshida
Mode	11a / 11n-20 / 11n-40 Tx

11a

Frequency [MHz]	Peak Power Excursion [dB]	Limit [dB]
5500	9.391	13.00

11n-20

Frequency [MHz]	Peak Power Excursion [dB]	Limit [dB]
5500	9.618	13.00

11n-40

Frequency [MHz]	Peak Power Excursion [dB]	Limit [dB]
5510	9.954	13.00

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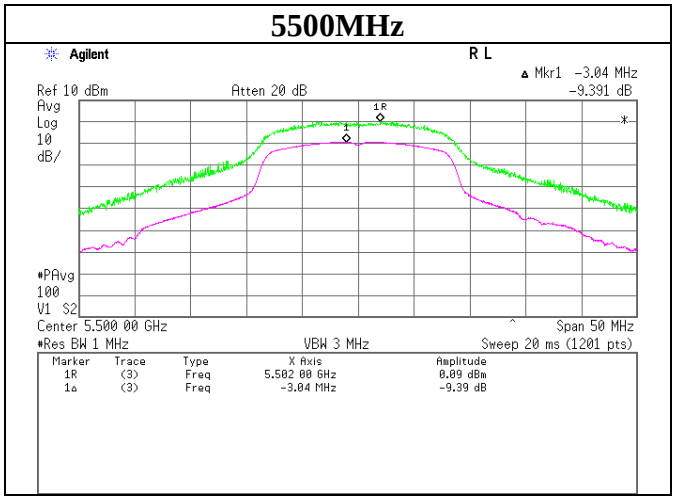
Peak Excursion Ratio

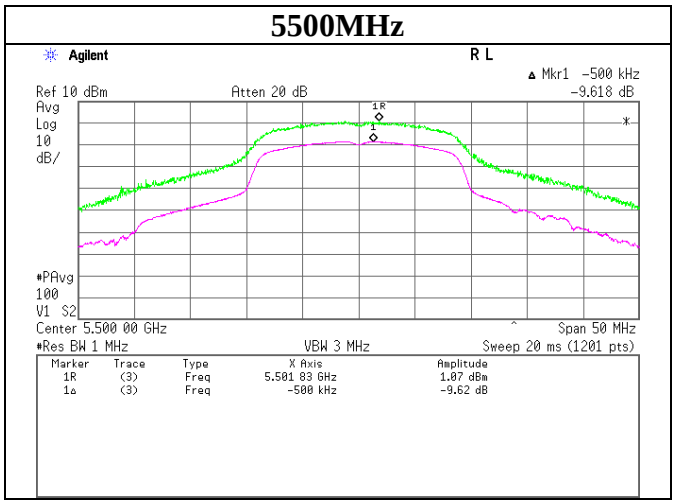
11a

5500MHz



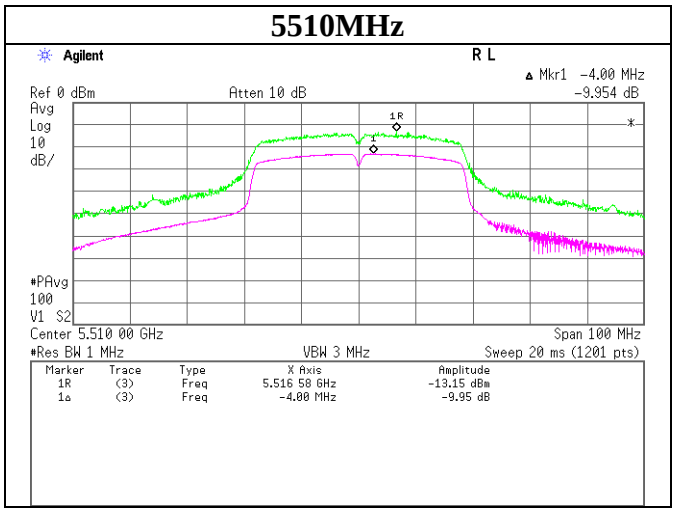
11n-20

5500MHz



11n-40

5510MHz



APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT	2013/11/15 * 12
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2013/10/18 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2013/03/21 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2013/02/26 * 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
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	-
MRENT-114	Spectrum Analyzer	Agilent	E4440A	MY46187105	RE	2013/11/11 * 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-22	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCB	602	RE	2014/01/16 * 12
MCC-79	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278923/4	RE	2013/12/24 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2013/05/17 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2013/02/22 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2013/08/20 * 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
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

EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	CE	2013/06/30 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	CE	2013/02/26 * 12
MJM-14	Measure	KOMELON	KMC-36	-	CE	-
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	CE	2013/06/14 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	CE	2013/08/20 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE(EUT)	2014/01/27 * 12
MCC-13	Coaxial Cable	Fujikura	3D-2W(12m)/5D-2W(5m)/5D-2W(0.8m)/5D-2W(1m)	-	CE	2013/02/06 * 12
MAT-65	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2014/01/29 * 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