



RADIO TEST REPORT

Test Report No. : 33BE0179-HO-E

Applicant : SAMSUNG ELECTRONICS CO., LTD.
Type of Equipment : Smart phone with GSM/GPRS/EDGE850/1900 and WCDMA850/1900, BT(EDR, LE), NFC, 802.11a/b/g/n(mobile hot spot)
Model No. : GT-I9105P
FCC ID : A3LGTI9105P
Test regulation : FCC Part 15 Subpart E: 2012
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Date of test: October 30 to November 8, 2012

Representative test engineer: T. Sasagawa
Tomotaka Sasagawa
Engineer of WiSE Japan,
UL Verification Service

Approved by: T. Hataheda
Takahiro Hataheda
Leader of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

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

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SECTION 1: Customer information

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

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

2.1 Identification of E.U.T.

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

2.2 Product Description

Radio Specification

NFC

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

Bluetooth (BDR/EDR)

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

Bluetooth (Low Energy)

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

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

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

GSM

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

W-CDMA

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

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E: 2012, final revised on July 23, 2012 and effective August 22, 2012

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 9.8dB, 2.45383MHz, N AV 9.4dB, 2.45383MHz, N	Complied	-
	IC: RSS-Gen 7.2.4	IC: RSS-Gen 7.2.4			
26dB Emission Bandwidth	FCC :ANSI C63.4:2003 KDB789033	FCC : 15.407(a)(1)(2)(3)	See data	N/A	Conducted
Maximum Peak Output Power	IC: -	IC: -		Complied	Conducted
	FCC :ANSI C63.4:2003, KDB789033	FCC : 15.407(a)(1)(2)(3)			
Peak Power Spectral Density	IC: -	IC: RSS-210 A9.2(1)(2)(3)		Complied	Conducted
	FCC :ANSI C63.4:2003, KDB789033	FCC : 15.407(a)(1)(2)(3)			
Peak Excursion Ratio	IC: -	FCC : 15.407(a)(6)	4.7dB 11400.000MHz, AV, Vert.	Complied	Conducted / Radiated
	FCC :ANSI C63.4:2003, KDB789033	IC: -			
Spurious Emission Restricted Band Edge	FCC: ANSI C63.4:2003	FCC : 15.407(b), 15.205 and 15.209	See data	Complied	Conducted
20dB Emission Bandwidth	IC: -	IC: RSS-210 A.9.2(1)(2)(3)			
	FCC :ANSI C63.4:2003	FCC : 15.215(c)			

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 33BE0179-HO-F issued by UL Japan, Inc.

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

Test room (semi-anechoic chamber)	Radiated emission (10m*)(+dB)		
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz
No.1	4.2dB	5.0dB	4.8dB
No.2	-	-	-
No.3	-	-	-
No.4	-	-	-

*10m = Measurement distance

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.3dB	5.0dB	5.1dB	4.9dB	5.8dB	4.4dB	4.3dB
No.2	4.3dB	5.2dB	5.1dB	5.0dB	5.7dB	4.3dB	4.2dB
No.3	4.6dB	5.0dB	5.1dB	5.0dB	5.7dB	4.5dB	4.2dB
No.4	4.8dB	5.2dB	5.0dB	5.0dB	5.7dB	5.2dB	4.2dB

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

Antenna terminal conducted emission and Power density (+dB)			Antenna terminal conducted emission (+dB)		Channel power (+dB)
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.0dB	1.1dB	2.7dB	3.2dB	3.3dB	1.5dB

Conducted Emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test(3m)

The data listed in this test report has enough margin, more than the site margin.

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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	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Data of EMI, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating 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)	48Mbps, PN9
IEEE 802.11n 20MHz BW (11n-20)	MCS 4, PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Low Channel)	

Power of the EUT was set by the software as follows:

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

[Power Setting]

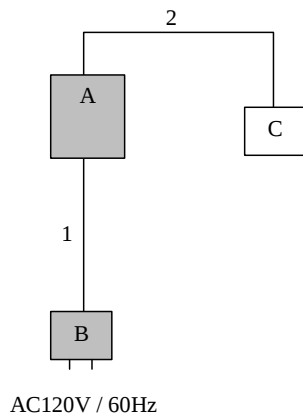
11a: 12dBm
11n-20: 10dBm

*The above setting of the software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.

*The details of Operating mode(s)

Test Item	Operating Mode	Tested Frequency		
		Low Band	Middle Band	Additional Band
AC Conducted emission Spurious Emission(Conducted)	11a Tx*1)	-	-	5500MHz
26dB Emission Bandwidth, 99% Occupied Bandwidth, Maximum Conducted Output Power, Peak Power Spectral Density, Peak Excursion Ratio	11a Tx 11n-20 Tx	5180MHz 5220MHz 5240MHz	5260MHz 5300MHz 5320MHz	5500MHz 5600MHz 5700MHz
Spurious Emission(Radiated)	11a Tx *2)	5180MHz 5240MHz	5320MHz	5500MHz 5600MHz 5700MHz
*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 conducted output power.				

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

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

*1) Used for Antenna Terminal conducted test

*2) Used for Conducted Emission and Radiated Emission tests

List of cables used

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

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SECTION 5: Conducted Emission

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 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 AV
Measurement range	: 0.15-30MHz
Test data	: APPENDIX
Test result	: Pass

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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

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

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 (Average Detection): Primary method RBW: 1MHz VBW: 3MHz Detector: RMS (Power) Trace: - 100 traces (when duty cycle is $\geq 98\%$) - Numbers of traces were increased by a factor of 1/duty cycle. Duty factor was added to the results. (when duty cycle is $<98\%$)
Test Distance	3m	3m (below 10GHz), 1m*1) (above 10GHz), 0.5m*2) (above 26.5GHz)	

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

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

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- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

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

Measurement range	: 30M-40GHz
Test data	: APPENDIX
Test result	: Pass

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	30MHz	Close to 1% of EBW	Greater than RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	Close to 1% of Span	Three times of RBW	Auto	Sample	Clear Write	Spectrum Analyzer
Maximum Conducted Output Power, Peak Power Spectral Density	46MHz	1MHz	3MHz	Auto	RMS Power Averaging (100 times)	Clear Write	Spectrum Analyzer SA-1
Peak Excursion Ratio	40MHz	1MHz	3MHz	Auto	Peak RMS Power Averaging (100 times)	Max Hold Clear Write	Spectrum Analyzer
Conducted Spurious Emission	9kHz-150kHz 150kHz-30MHz	200Hz 9.1kHz	620Hz 27kHz	Auto	Peak	Max Hold	Spectrum Analyzer

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

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Data of EMI test

Conducted Emission

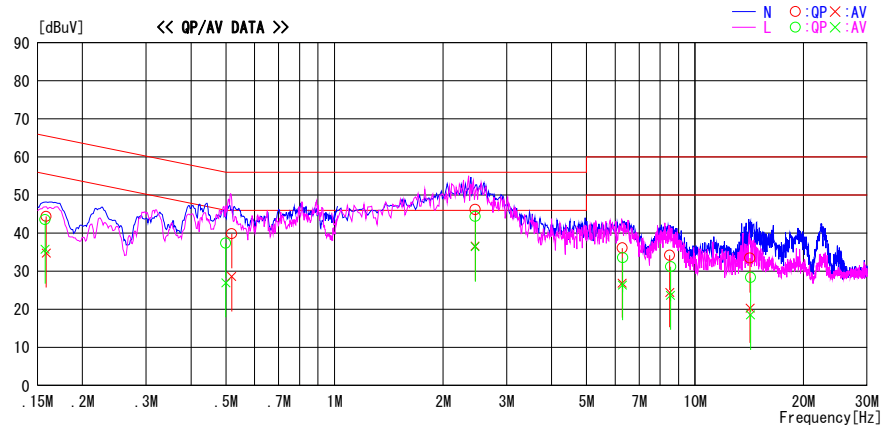
DATA OF CONDUCTED EMISSION TEST

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

Report No. : 33BE0179-HO
Power : AC 120V / 60Hz
Temp./Humi. : 24deg.C / 50% RH
Engineer : Tomohisa Nakagawa

Mode / Remarks : WLAN 11a 5500MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15863	31.0	21.4	13.4	44.4	34.8	65.5	55.5	21.1	20.7	N	
0.51818	26.3	15.1	13.5	39.8	28.6	56.0	46.0	16.2	17.4	N	
2.45383	32.4	22.8	13.8	46.2	36.6	56.0	46.0	9.8	9.4	N	
6.28358	21.4	12.2	14.7	36.1	26.9	60.0	50.0	23.9	23.1	N	
8.51164	19.3	9.5	14.9	34.2	24.4	60.0	50.0	25.8	25.6	N	
14.20426	17.6	4.4	15.9	33.5	20.3	60.0	50.0	26.5	29.7	N	
0.15741	30.2	22.4	13.4	43.6	35.8	65.6	55.6	22.0	19.8	L	
0.49963	23.9	13.5	13.5	37.4	27.0	56.0	46.0	18.6	19.0	L	
2.45383	30.6	22.6	13.8	44.4	36.4	56.0	46.0	11.6	9.6	L	
6.29704	18.9	11.6	14.7	33.6	26.3	60.0	50.0	26.4	23.7	L	
8.56049	16.3	8.8	14.9	31.2	23.7	60.0	50.0	28.8	26.3	L	
14.25652	12.5	2.6	15.9	28.4	18.5	60.0	50.0	31.6	31.5	L	

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

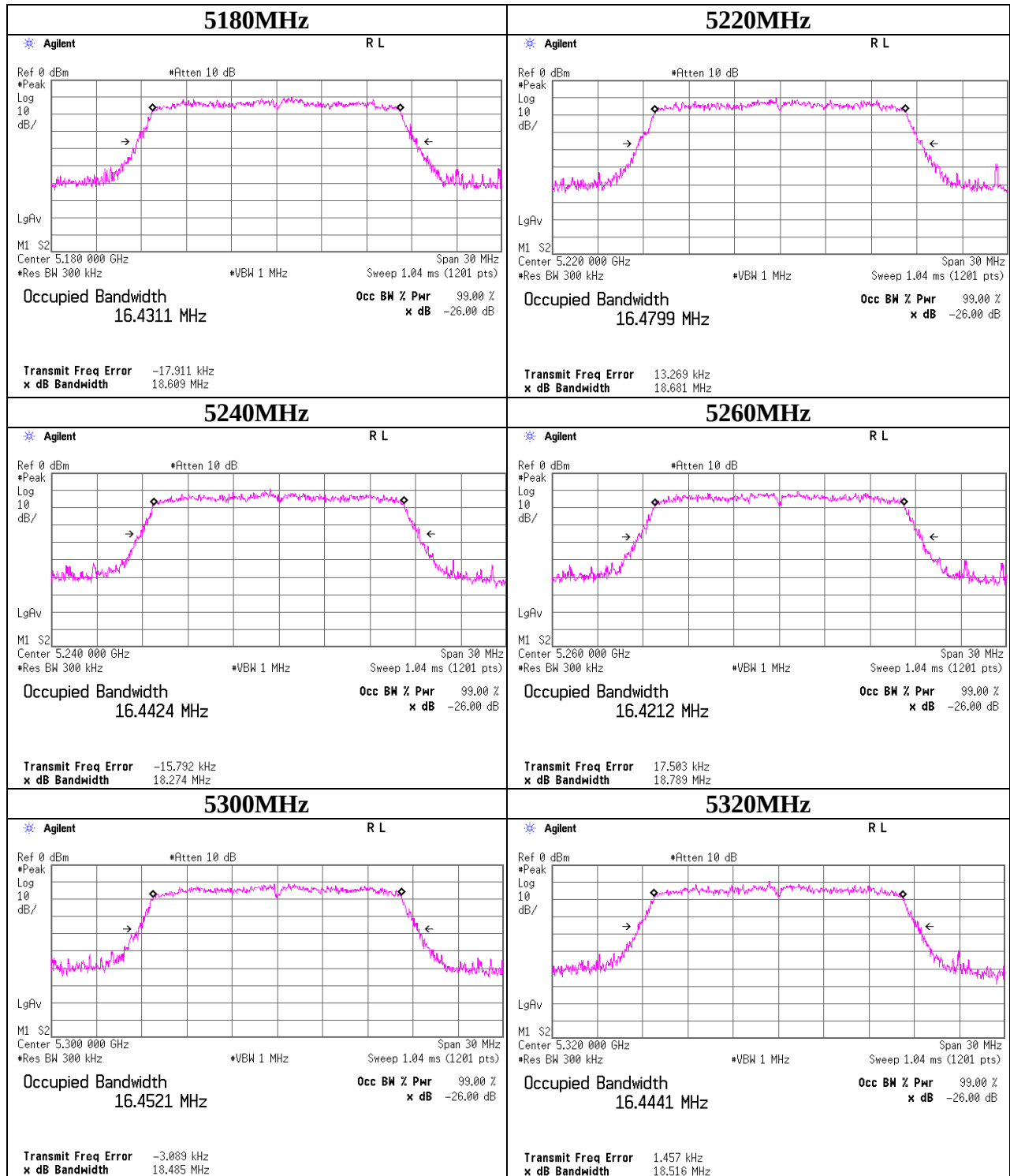
26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 10/30/2012
Temperature/ Humidity 21deg. C / 42% RH
Engineer Keisuke Kawamura
Mode 11a Tx

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	18.609	16.6013	-
5220	18.681	16.4352	-
5240	18.274	16.3551	-
5260	18.789	16.3210	-
5300	18.485	16.2219	-
5320	18.516	16.2641	-
5500	18.442	16.3640	-
5600	18.667	16.2505	-
5700	18.664	16.3854	-

26dB Emission Bandwidth

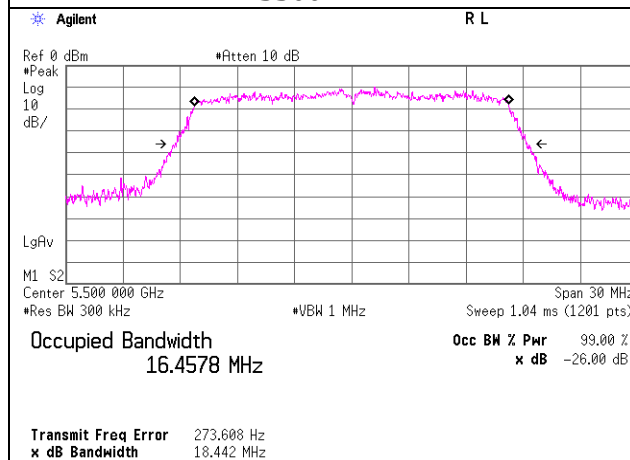
11a



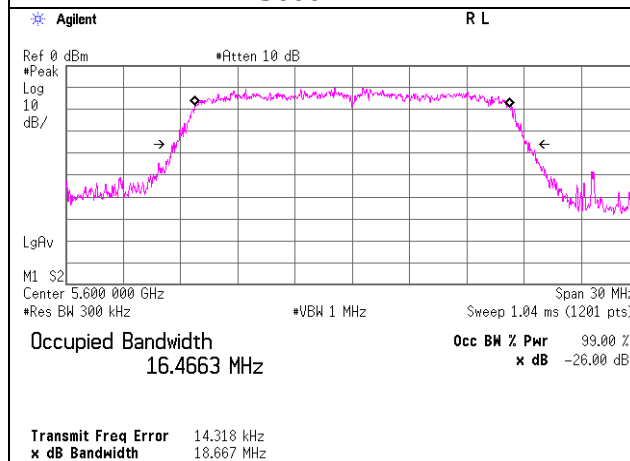
26dB Emission Bandwidth

11a

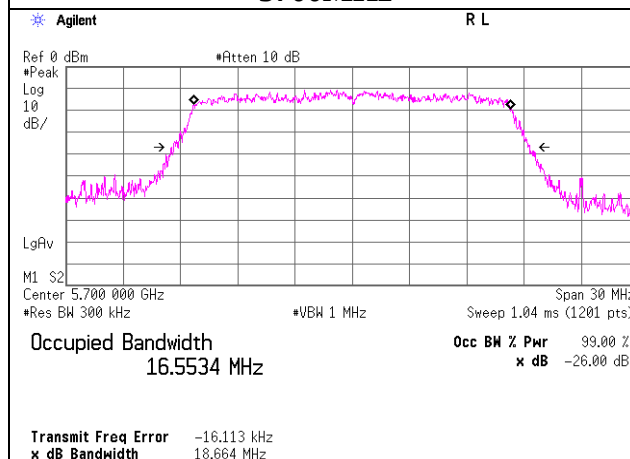
5500MHz



5600MHz

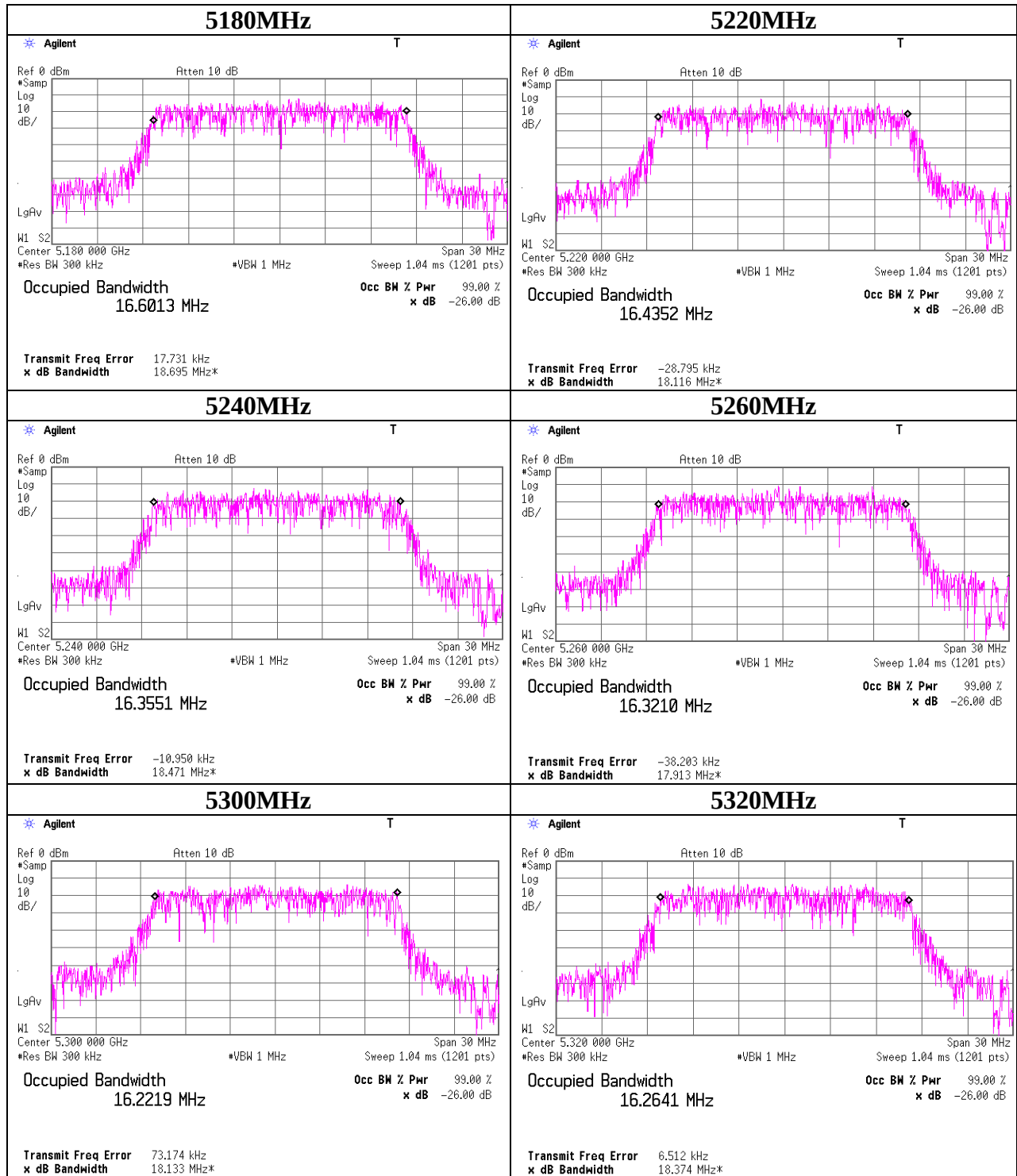


5700MHz

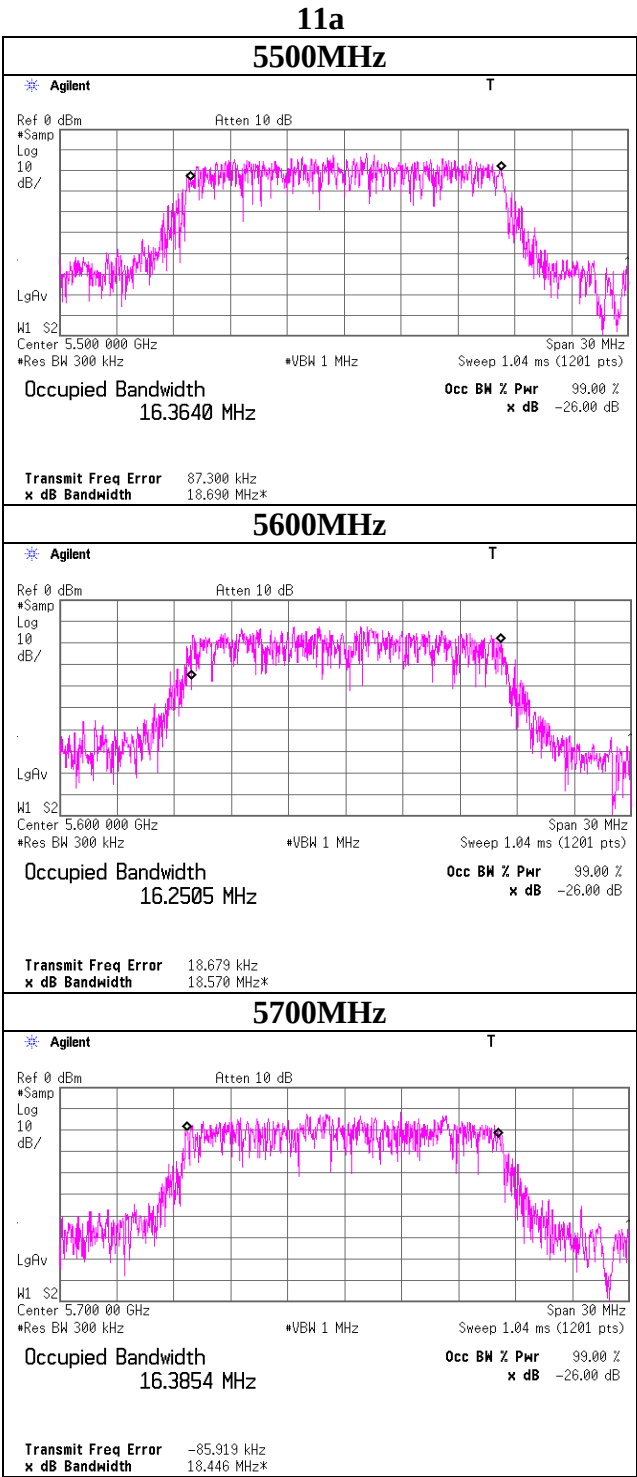


99% Occupied Bandwidth

11a



99% Occupied Bandwidth



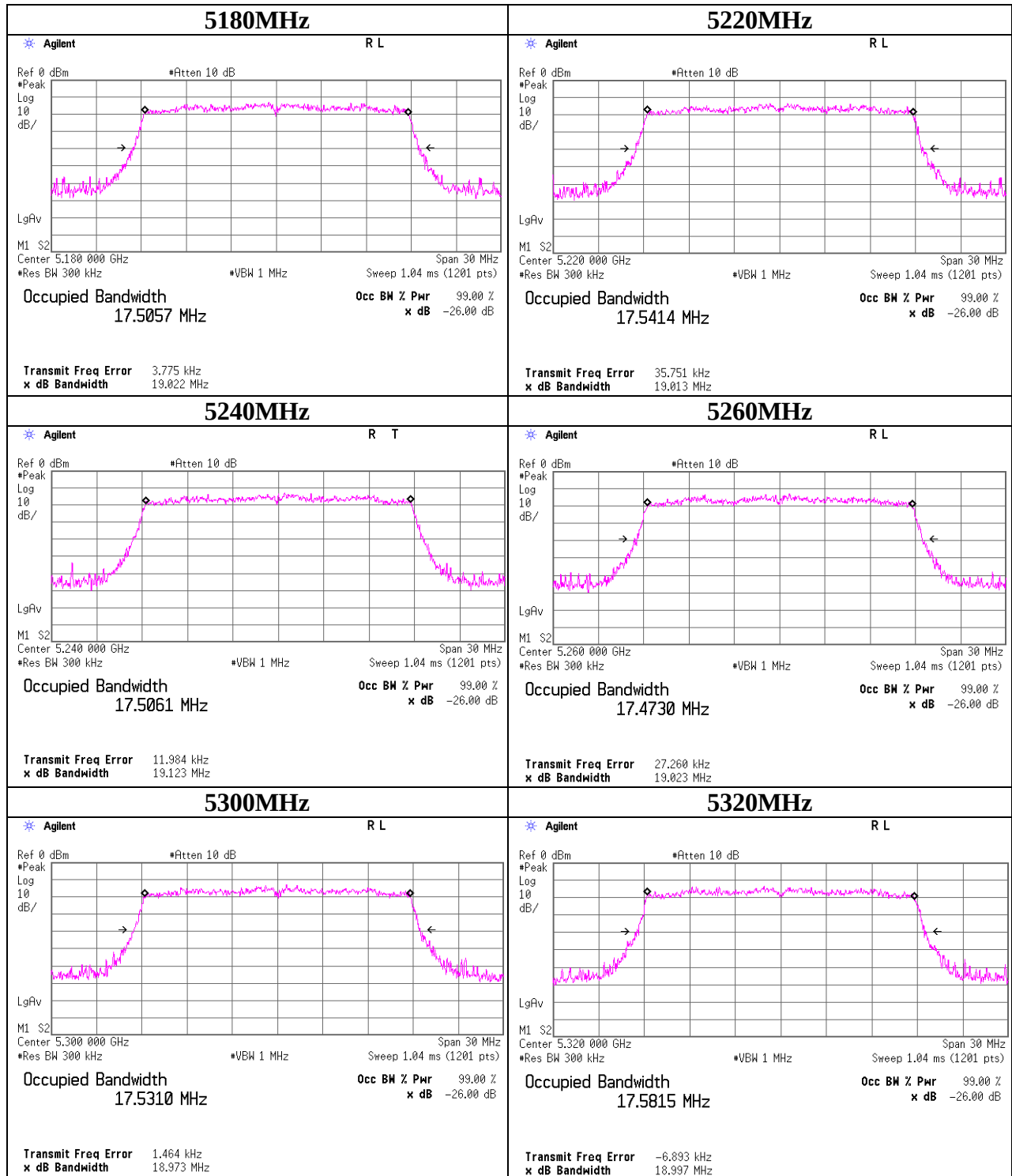
26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 10/30/2012
Temperature/ Humidity 21deg. C / 42% RH
Engineer Keisuke Kawamura
Mode 11n-20 Tx

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	19.022	17.5658	-
5220	19.013	17.5616	-
5240	19.123	17.4603	-
5260	19.023	17.5253	-
5300	18.973	17.5216	-
5320	18.997	17.6715	-
5500	18.910	17.5124	-
5600	18.908	17.6229	-
5700	19.190	17.5872	-

26dB Emission Bandwidth

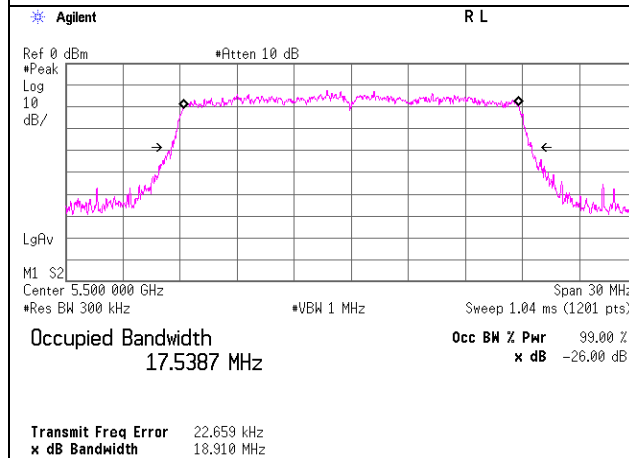
11n-20



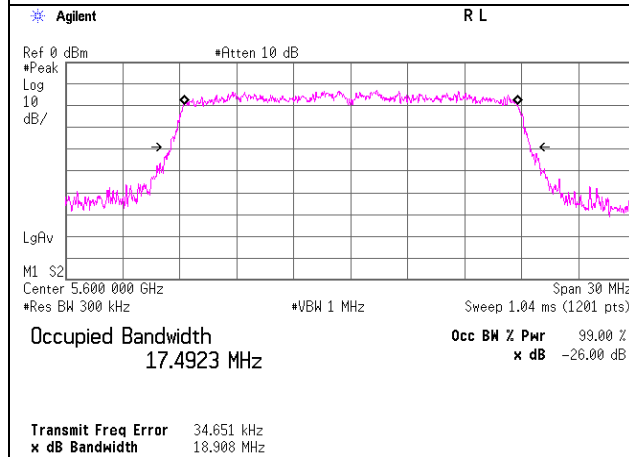
26dB Emission Bandwidth

11n-20

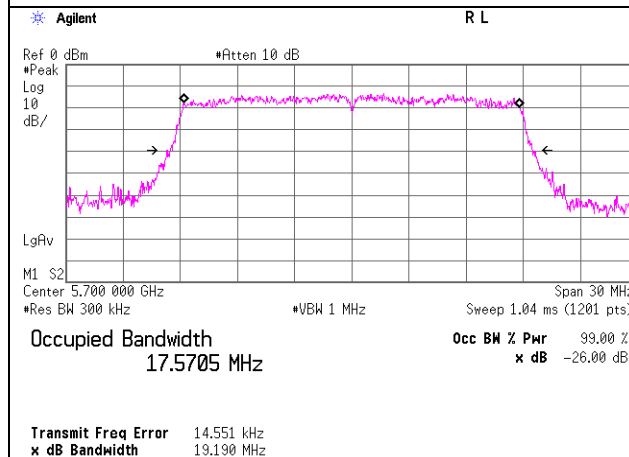
5500MHz



5600MHz

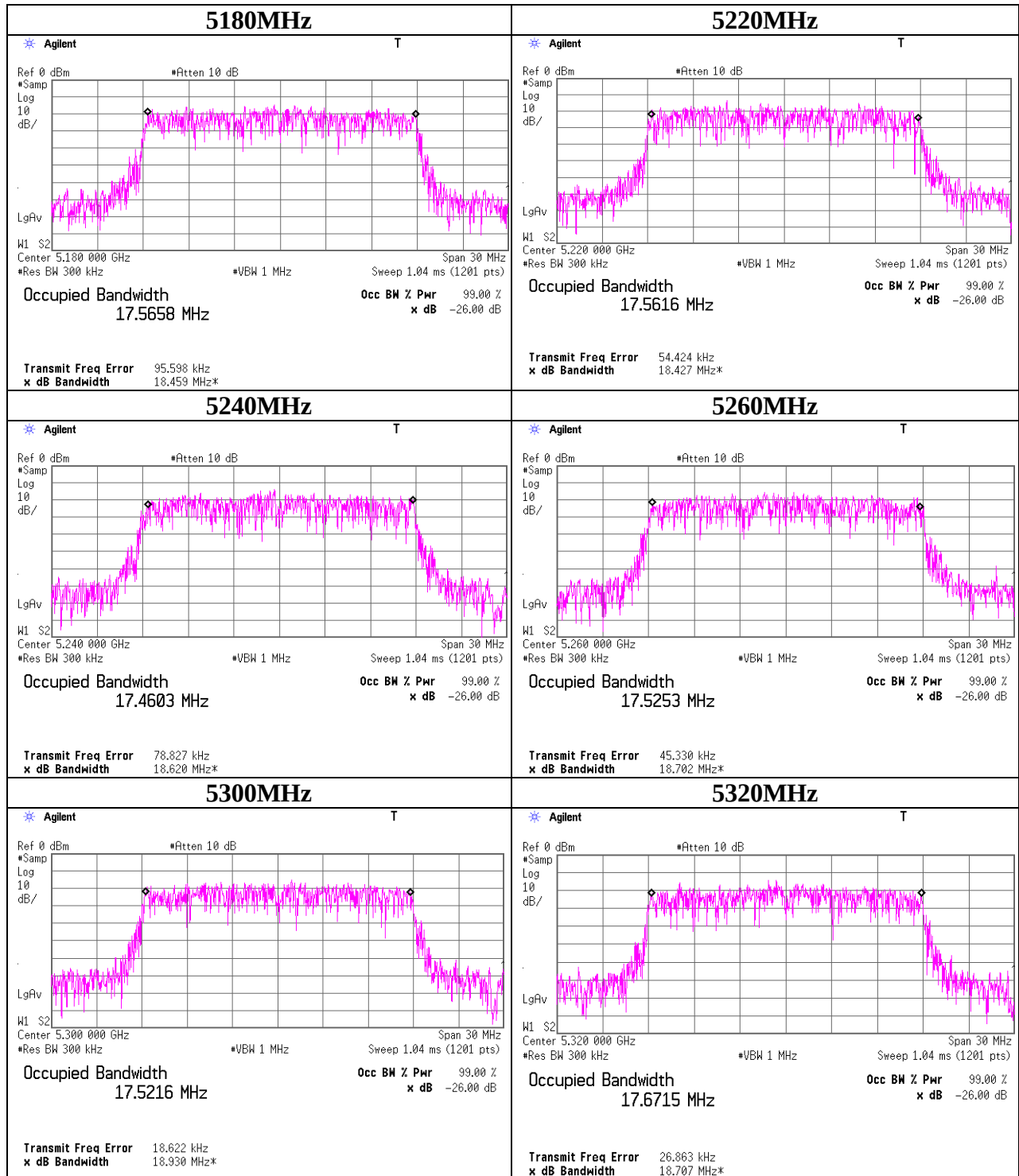


5700MHz

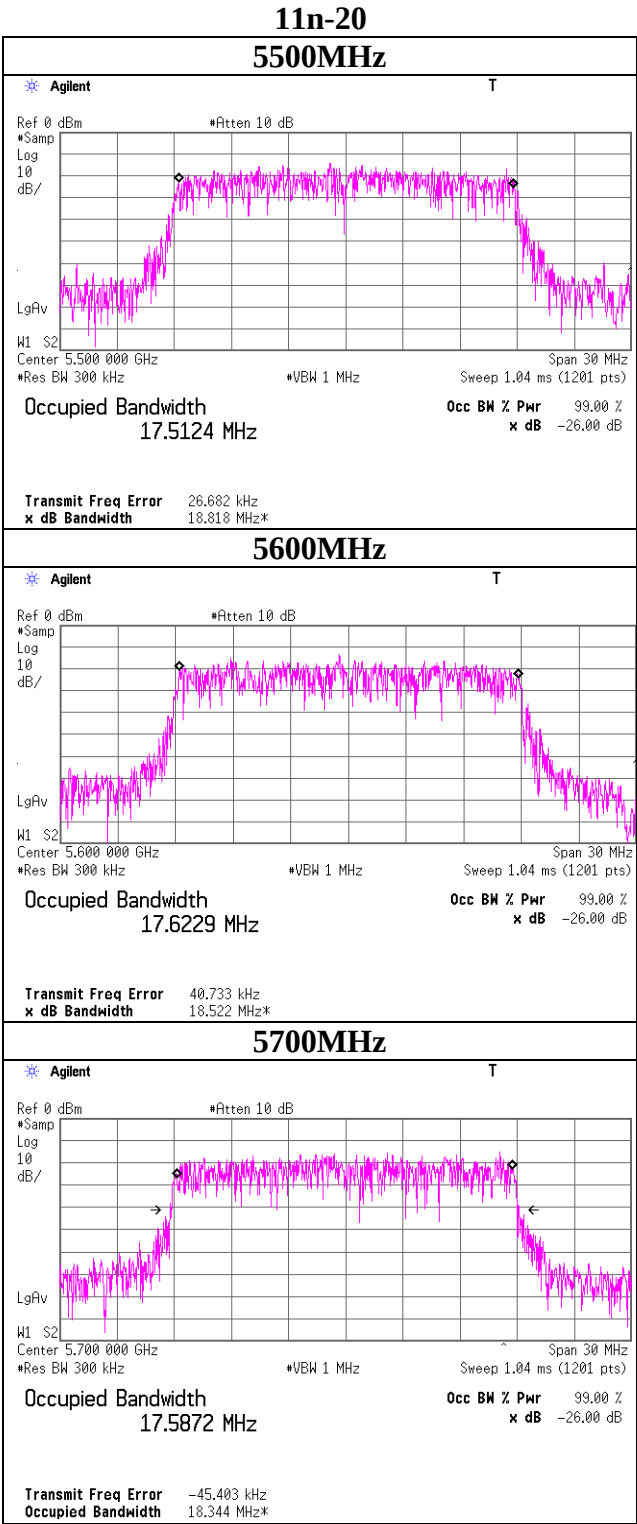


99% Occupied Bandwidth

11n-20



99% Occupied Bandwidth



Maximum Conducted Output Power

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 10/30/2012
Temperature/ Humidity 21deg. C / 42% RH
Engineer Keisuke Kawamura
Mode 11a Tx

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]
5180.0	-2.35	1.90	10.14	0.68	9.69	10.37	16.69	-	7.00	-
5220.0	-2.64	1.90	10.14	0.68	9.40	10.08	16.71	-	7.31	-
5240.0	-2.46	1.90	10.15	0.68	9.59	10.27	16.61	-	7.02	-
5260.0	-2.54	1.91	10.15	0.68	9.52	10.20	23.73	-	14.21	-
5300.0	-2.75	1.91	10.15	0.68	9.31	9.99	23.66	-	14.35	-
5320.0	-2.78	1.92	10.15	0.68	9.29	9.97	23.67	-	14.38	-
5500.0	-2.54	1.94	10.16	0.68	9.56	10.24	23.65	-	14.09	-
5600.0	-2.38	1.96	10.16	0.68	9.74	10.42	23.71	-	13.97	-
5700.0	-2.31	1.99	10.15	0.68	9.83	10.51	23.71	-	13.88	-

Result(Cond.) = Reading + Cable Loss + Atten.Loss

Result(e.i.r.p.) = Reading + Cable Loss + 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

ON time was only measured using Gate function.

Maximum Conducted Output Power

Test place : Head Office EMC Lab. No.11 Measurement Room
Report No. : 33BE0179-HO
Date : 10/30/2012
Temperature/ Humidity : 21deg. C / 42% RH
Engineer : Keisuke Kawamura
Mode : 11n-20 Tx

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]
5180.0	-4.44	1.90	10.14	0.68	7.60	8.28	16.79	-	9.19	-
5220.0	-4.71	1.90	10.14	0.68	7.33	8.01	16.79	-	9.46	-
5240.0	-4.65	1.90	10.15	0.68	7.40	8.08	16.81	-	9.41	-
5260.0	-4.68	1.91	10.15	0.68	7.38	8.06	23.79	-	16.41	-
5300.0	-4.82	1.91	10.15	0.68	7.24	7.92	23.78	-	16.54	-
5320.0	-5.07	1.92	10.15	0.68	7.00	7.68	23.78	-	16.78	-
5500.0	-4.65	1.94	10.16	0.68	7.45	8.13	23.76	-	16.31	-
5600.0	-4.60	1.96	10.16	0.68	7.52	8.20	23.76	-	16.24	-
5700.0	-4.44	1.99	10.15	0.68	7.70	8.38	23.83	-	16.13	-

Result(Cond.) = Reading + Cable Loss + Atten.Loss

Result(e.i.r.p.) = Reading + Cable Loss + 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

ON time was only measured using Gate function.

Maximum Average Output Power (Reference data for SAR testing)

IEEE802.11a 5180-5240MHz band 6Mbps

Ch	Freq.	P/M Reading [dBm]	Cable Loss	Atten.	Result	
					[dBm]	[mW]
	[MHz]	AVG	[dB]	[dB]	AVG	AVG
36	5180	-1.21	0.00	10.10	8.89	7.74
40	5200	-1.25	0.00	10.10	8.85	7.67
44	5220	-1.34	0.00	10.10	8.76	7.52
48	5240	-1.38	0.00	10.10	8.72	7.45

IEEE802.11n-20 5180-5240MHz band MCS0

Ch	Freq.	P/M Reading [dBm]	Cable Loss	Atten.	Result	
					[dBm]	[mW]
	[MHz]	AVG	[dB]	[dB]	AVG	AVG
36	5180	-3.37	0.00	10.10	6.73	4.71
40	5200	-3.44	0.00	10.10	6.66	4.63
44	5220	-3.53	0.00	10.10	6.57	4.54
48	5240	-3.54	0.00	10.10	6.56	4.53

Maximum Average Output Power (Reference data for SAR testing)

IEEE802.11a 5260-5320MHz band 6Mbps

Ch	Freq.	P/M Reading [dBm]	Cable Loss	Atten.	Result	
					[dBm]	[mW]
	[MHz]	AVG	[dB]	[dB]	AVG	AVG
52	5260	-1.48	0.00	10.09	8.61	7.26
56	5280	-1.51	0.00	10.09	8.58	7.21
60	5300	-1.56	0.00	10.09	8.53	7.13
64	5320	-1.62	0.00	10.09	8.47	7.03

IEEE802.11n-20 5260-5320MHz band MCS0

Ch	Freq.	P/M Reading [dBm]	Cable Loss	Atten.	Result	
					[dBm]	[mW]
	[MHz]	AVG	[dB]	[dB]	AVG	AVG
52	5260	-3.63	0.00	10.09	6.46	4.43
56	5280	-3.81	0.00	10.09	6.28	4.25
60	5300	-3.77	0.00	10.09	6.32	4.29
64	5320	-3.75	0.00	10.09	6.34	4.31

Maximum Average Output Power (Reference data for SAR testing)

[IEEE802.11a 5500-5700MHz band] band 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
100	5500	-1.35	0.00	10.09	8.74	7.48
104	5520	-1.31	0.00	10.09	8.78	7.55
108	5540	-1.28	0.00	10.09	8.81	7.60
112	5560	-1.28	0.00	10.09	8.81	7.60
116	5580	-1.27	0.00	10.09	8.82	7.62
120	5600	-1.26	0.00	10.08	8.82	7.62
124	5620	-1.24	0.00	10.08	8.84	7.66
128	5640	-1.31	0.00	10.08	8.77	7.53
132	5660	-1.25	0.00	10.08	8.83	7.64
136	5680	-1.25	0.00	10.08	8.83	7.64
140	5700	-1.25	0.00	10.08	8.83	7.64

[IEEE802.11n-20 5500-5700MHz band] band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
100	5500	-3.40	0.00	10.09	6.69	4.67
104	5520	-3.38	0.00	10.09	6.71	4.69
108	5540	-3.40	0.00	10.09	6.69	4.67
112	5560	-3.44	0.00	10.09	6.65	4.62
116	5580	-3.37	0.00	10.09	6.72	4.70
120	5600	-3.36	0.00	10.08	6.72	4.70
124	5620	-3.39	0.00	10.08	6.69	4.67
128	5640	-3.36	0.00	10.08	6.72	4.70
132	5660	-3.48	0.00	10.08	6.60	4.57
136	5680	-3.33	0.00	10.08	6.75	4.73
140	5700	-3.35	0.00	10.08	6.73	4.71

Peak Power Spectral Density

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 10/30/2012
Temperature/ Humidity 21deg. C / 42% RH
Engineer Keisuke Kawamura
Mode 11a / 11n-20 Tx

11a

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-12.71	1.90	10.14	-0.67	4.00	4.67
5220.0	-13.13	1.90	10.14	-1.09	4.00	5.09
5240.0	-12.94	1.90	10.15	-0.89	4.00	4.89
5260.0	-13.05	1.91	10.15	-0.99	11.00	11.99
5300.0	-13.23	1.91	10.15	-1.17	11.00	12.17
5320.0	-13.25	1.92	10.15	-1.18	11.00	12.18
5500.0	-13.00	1.94	10.16	-0.90	11.00	11.90
5600.0	-12.80	1.96	10.16	-0.68	11.00	11.68
5700.0	-12.80	1.99	10.15	-0.66	11.00	11.66

Result = Reading + Cable Loss + Attenuator
ON time was only measured using Gate function.

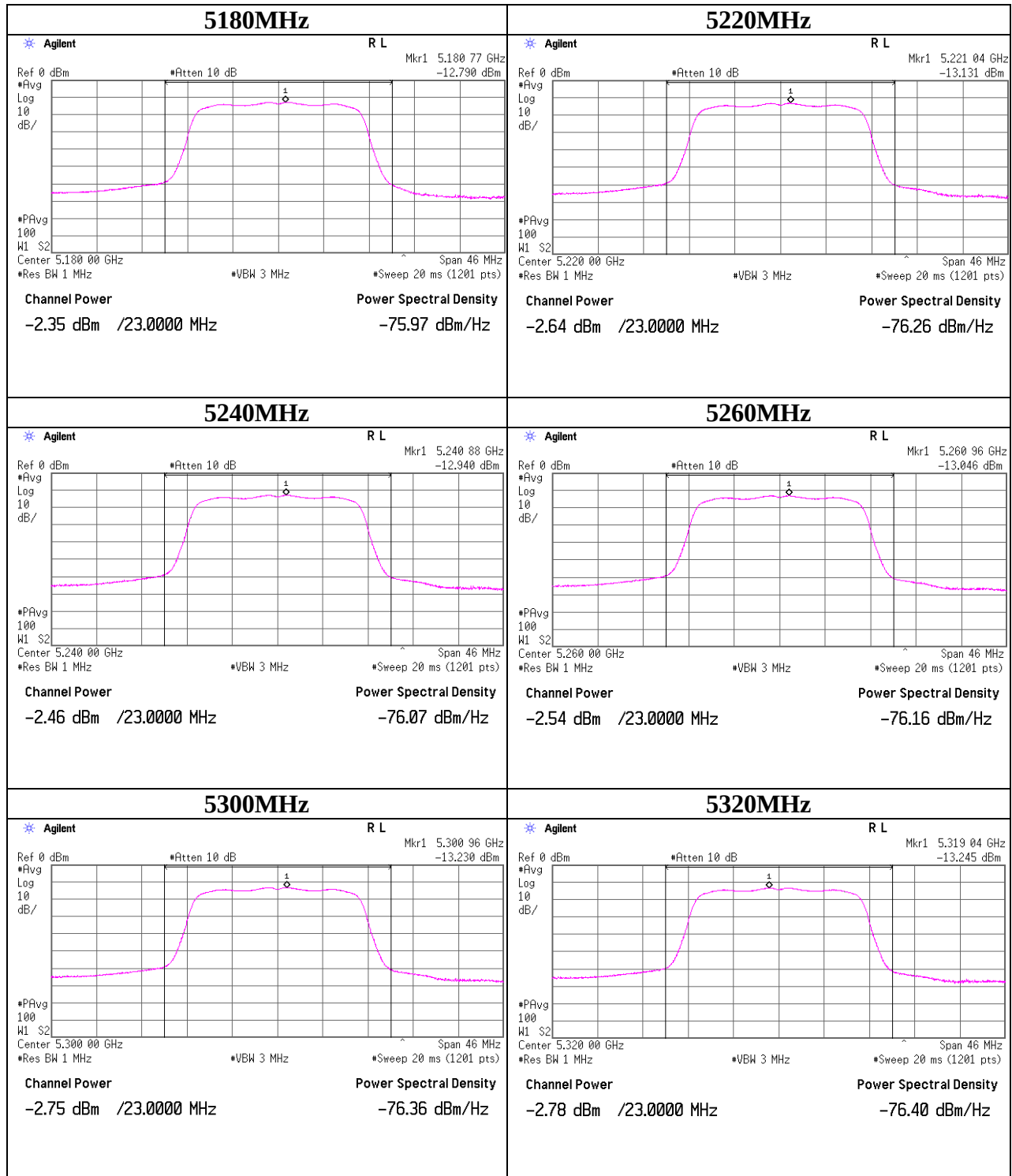
11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-15.09	1.90	10.14	-3.05	4.00	7.05
5220.0	-15.39	1.90	10.14	-3.35	4.00	7.35
5240.0	-15.37	1.90	10.15	-3.32	4.00	7.32
5260.0	-15.36	1.91	10.15	-3.30	11.00	14.30
5300.0	-15.59	1.91	10.15	-3.53	11.00	14.53
5320.0	-15.77	1.92	10.15	-3.70	11.00	14.70
5500.0	-15.34	1.94	10.16	-3.24	11.00	14.24
5600.0	-15.25	1.96	10.16	-3.13	11.00	14.13
5700.0	-15.16	1.99	10.15	-3.02	11.00	14.02

Result = Reading + Cable Loss + Attenuator
ON time was only measured using Gate function.

Maximum Peak Output Power & Peak Power Spectral Density

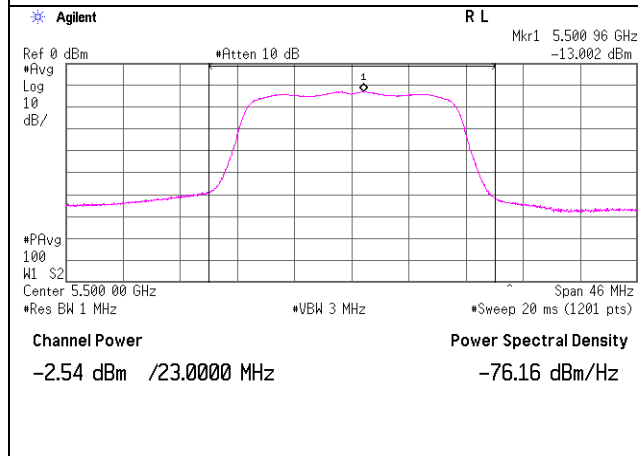
11a



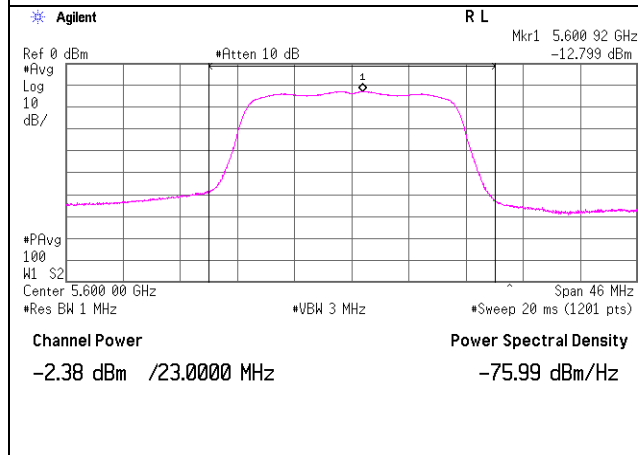
Maximum Peak Output Power & Peak Power Spectral Density

11a

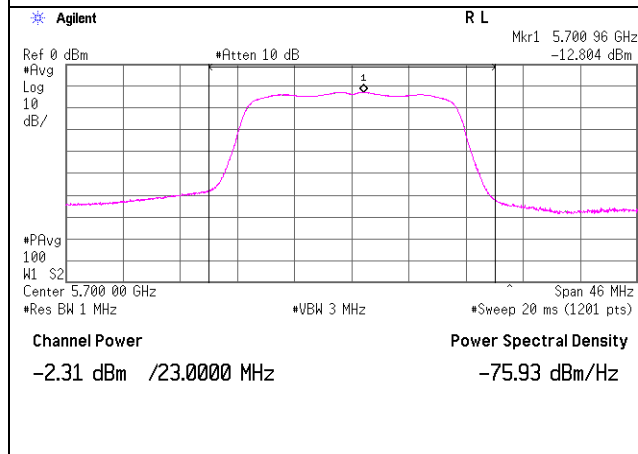
5500MHz



5600MHz

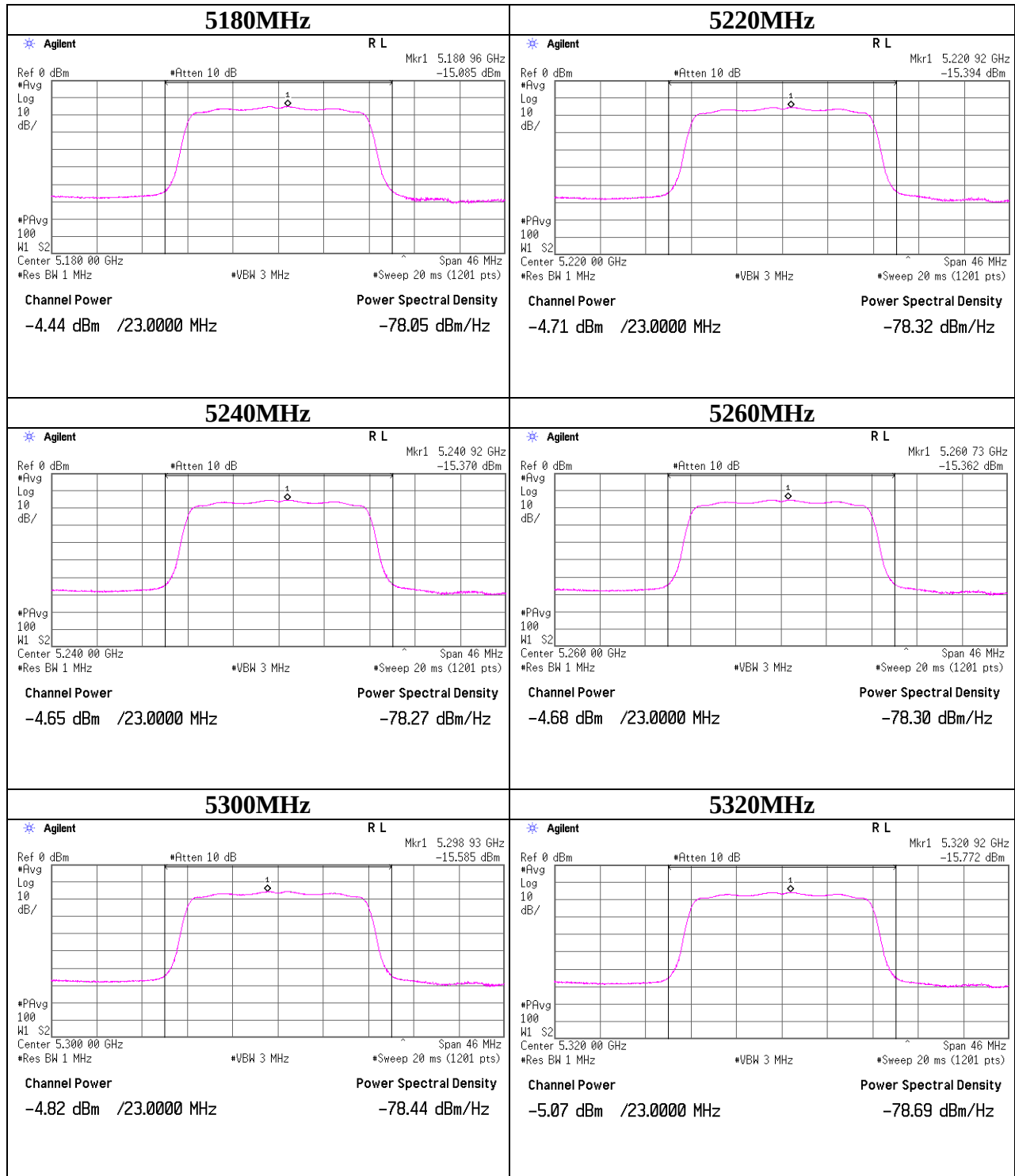


5700MHz



Maximum Peak Output Power & Peak Power Spectral Density

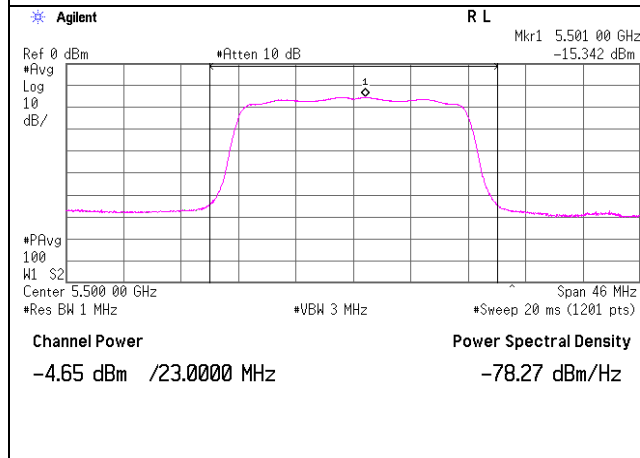
11n-20



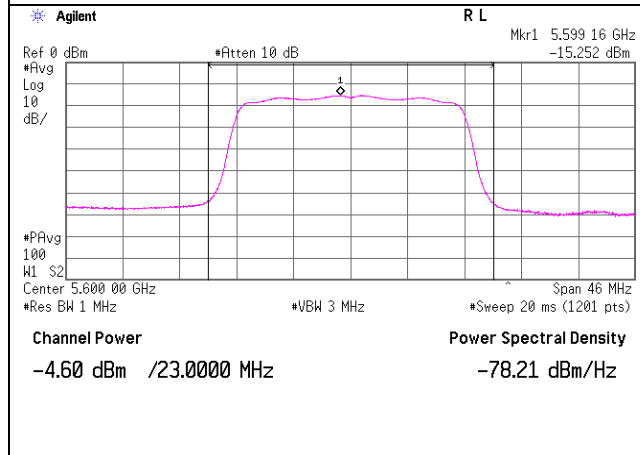
Maximum Peak Output Power & Peak Power Spectral Density

11n-20

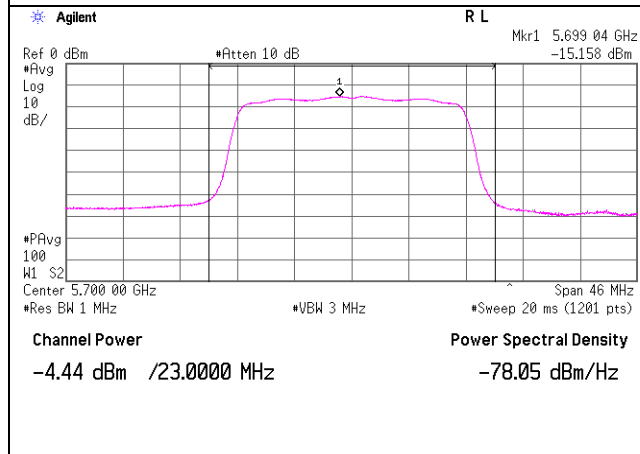
5500MHz



5600MHz



5700MHz



Peak Power Spectral Density
(Reference data : Data Rate Check)

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 10/30/2012
Temperature/ Humidity 21deg. C / 42% RH
Engineer Keisuke Kawamura
Mode 11a Tx / 11n-20 Tx

11a Tx 5180MHz

Data Rate [Mbps]	Reading [dBm]	Remark
6	-2.44	
9	-2.55	
12	-2.64	
18	-2.40	
24	-2.67	
36	-2.63	
48	-2.35	*
54	-2.40	

* Worst Rate

All comparizon were carried out on same frequency and measurement factors.
ON time was only measured using Gate function.

11n-20 Tx, 5180MHz

MCS Number	Reading [dBm]	Remark
0	-4.55	
1	-4.57	
2	-4.45	
3	-4.53	
4	-4.44	*
5	-4.51	
6	-4.49	
7	-4.45	

* Worst MCS

All comparizon were carried out on same frequency and measurement factors.
ON time was only measured using Gate function.

Radiated Spurious Emission

Test place	Head Office EMC Lab.		
Report No.	33BE0179-HO		
Anechoic Chamber	No. 4	No. 2	No. 3
Date	11/03/2012	11/08/2012	11/08/2012
Temperature/ Humidity	22deg. C / 43% RH	20deg. C / 40% RH	20deg. C / 36% RH
Engineer	Tomotaka Sasagawa	Satofumi Matsuyama	Tomohisa Nakagawa
	(1-10GHz)	(10-26.5GHz)	(26.5-40GHz)
Mode	11a Tx 5180MHz / 5240MHz / 5320MHz		

[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	Remark
Hori	5150.000	PK	53.1	32.0	3.7	31.5	-	57.3	68.2	10.9	Bandedge	
Hori	5150.000	AV	34.1	32.0	3.7	31.5	1.7	40.0	53.9	13.9	Bandedge	
Vert	5150.000	PK	53.7	32.0	3.7	31.5	-	57.9	68.2	10.3	Bandedge	
Vert	5150.000	AV	34.5	32.0	3.7	31.5	1.7	40.4	53.9	13.5	Bandedge	

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 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

[11a Tx 5240MHz]

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	10480.000	PK	NS	-	-	-	-	-	68.2	-	Outside	
Vert	10480.000	PK	NS	-	-	-	-	-	68.2	-	Outside	

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 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

[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	56.3	32.1	3.7	31.5	-	60.6	68.2	7.6	Bandedge	
Hori	5350.000	AV	35.4	32.1	3.7	31.5	1.7	41.4	53.9	12.5	Bandedge	
Vert	5350.000	PK	57.1	32.1	3.7	31.5	-	61.4	68.2	6.8	Bandedge	
Vert	5350.000	AV	37.2	32.1	3.7	31.5	1.7	43.2	53.9	10.7	Bandedge	

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 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.		
Report No.	33BE0179-HO		
Anechoic Chamber	No. 4	No.3	No. 2
Date	11/03/2012	11/08/2012	11/08/2012
Temperature/ Humidity	22deg. C / 43% RH	20deg. C / 36% RH	20deg. C / 40% RH
Engineer	Tomotaka Sasagawa (1-10GHz)	Tomohisa Nakagawa (Below 1GHz), (10-40GHz)	Satofumi Matsuyama (10-26.5GHz)
Mode	11a Tx 5500MHz		

[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	40.734	QP	23.1	14.2	7.3	32.2	-	12.4	40.0	27.6	Outside	
Hori	52.509	QP	22.9	10.1	7.5	32.2	-	8.3	40.0	31.7	Outside	
Hori	62.580	QP	23.9	7.6	7.6	32.2	-	6.9	40.0	33.1	Outside	
Hori	84.887	QP	31.5	7.3	8.0	32.2	-	14.6	40.0	25.4	Outside	
Hori	95.785	QP	24.6	9.3	8.1	32.3	-	9.7	43.5	33.8	Outside	
Hori	112.730	QP	22.6	12.0	8.3	32.3	-	10.6	43.5	32.9	Inside	
Hori	5460.000	PK	43.4	32.2	3.8	31.5	-	47.9	73.9	26.0	Inside	
Hori	5470.000	PK	48.7	32.2	3.8	31.5	-	53.2	68.2	15.0	Outside	
Hori	11000.000	PK	43.6	39.3	-2.2	33.2	-	47.5	73.9	26.4	Inside	
Hori	5460.000	AV	33.5	32.2	3.8	31.5	1.7	39.7	53.9	14.2	Inside	
Hori	11000.000	AV	34.3	39.3	-2.2	33.2	1.7	39.9	53.9	14.0	Inside	
Vert	40.734	QP	29.8	14.2	7.3	32.2	-	19.1	40.0	20.9	Outside	
Vert	52.509	QP	28.8	10.1	7.5	32.2	-	14.2	40.0	25.8	Outside	
Vert	62.580	QP	33.1	7.6	7.6	32.2	-	16.1	40.0	23.9	Outside	
Vert	84.887	QP	33.0	7.3	8.0	32.2	-	16.1	40.0	23.9	Outside	
Vert	95.785	QP	26.4	9.3	8.1	32.3	-	11.5	43.5	32.0	Outside	
Vert	112.730	QP	22.7	12.0	8.3	32.3	-	10.7	43.5	32.8	Inside	
Vert	5460.000	PK	47.2	32.2	3.8	31.5	-	51.7	73.9	22.2	Inside	
Vert	5470.000	PK	46.3	32.2	3.8	31.5	-	50.8	68.2	17.4	Outside	
Vert	11000.000	PK	43.0	39.3	-2.2	33.2	-	46.9	73.9	27.0	Inside	
Vert	5460.000	AV	33.4	32.2	3.8	31.5	1.7	39.6	53.9	14.3	Inside	
Vert	11000.000	AV	34.3	39.3	-2.2	33.2	1.7	39.9	53.9	14.0	Inside	

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 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.		
Report No.	33BE0179-HO		
Anechoic Chamber	No. 4	No. 2	No. 3
Date	11/03/2012	11/08/2012	11/08/2012
Temperature/ Humidity	22deg. C / 43% RH	20deg. C / 40% RH	20deg. C / 36% RH
Engineer	Tomotaka Sasagawa	Satofumi Matsuyama	Tomohisa Nakagawa
	(1-10GHz)	(10-26.5GHz)	(26.5-40GHz)
Mode	11a Tx 5600MHz/5700MHz		

[11a Tx 5600MHz]

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	11200.000	PK	45.0	39.5	-2.1	33.2	-	49.2	73.9	24.7	Inside
Hori	11200.000	AV	39.2	39.5	-2.1	33.2	1.7	45.1	53.9	8.8	Inside
Vert	11200.000	PK	48.5	39.5	-2.1	33.2	-	52.7	73.9	21.2	Inside
Vert	11200.000	AV	42.1	39.5	-2.1	33.2	1.7	48.0	53.9	5.9	Inside

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 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

[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	5725.000	PK	56.6	32.6	3.9	31.6	-	61.5	68.2	6.7	Outside	
Hori	11400.000	PK	42.9	39.7	-2.0	33.1	-	47.5	73.9	26.4	Inside	
Hori	11400.000	AV	36.1	39.7	-2.0	33.1	1.7	42.4	53.9	11.5	Inside	
Vert	5725.000	PK	53.2	32.6	3.9	31.6	-	58.1	68.2	10.1	Outside	
Vert	11400.000	PK	51.4	39.7	-2.0	33.1	-	56.0	73.9	17.9	Inside	
Vert	11400.000	AV	42.9	39.7	-2.0	33.1	1.7	49.2	53.9	4.7	Inside	

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 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.
Report No. 33BE0179-HO
Anechoic Chamber No. 4
Date 11/03/2012
Temperature/ Humidity 22deg. C / 43% RH
Engineer Tomotaka Sasagawa
 (1-10GHz)
Mode 11n-20 Tx 5180MHz / 5320MHz

[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	43.7	32.0	3.7	31.5	-	47.9	68.2	20.3	Bandedge	
Hori	5150.000	AV	32.4	32.0	3.7	31.5	1.4	38.0	53.9	15.9	Bandedge	
Vert	5150.000	PK	43.5	32.0	3.7	31.5	-	47.7	68.2	20.5	Bandedge	
Vert	5150.000	AV	32.7	32.0	3.7	31.5	1.4	38.3	53.9	15.6	Bandedge	

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 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

[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	52.8	32.1	3.7	31.5	-	57.1	68.2	11.1	Bandedge	
Hori	5350.000	AV	33.4	32.1	3.7	31.5	1.4	39.1	53.9	14.8	Bandedge	
Vert	5350.000	PK	52.4	32.1	3.7	31.5	-	56.7	68.2	11.5	Bandedge	
Vert	5350.000	AV	34.5	32.1	3.7	31.5	1.4	40.2	53.9	13.7	Bandedge	

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 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.
Report No. : 33BE0179-HO
Anechoic Chamber : No. 4
Date : 11/03/2012
Temperature/ Humidity : 22deg. C / 43% RH
Engineer : Tomotaka Sasagawa
(1-10GHz)
Mode : 11n-20 Tx 5500MHz / 5700MHz

[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	5460.000	PK	43.1	32.2	3.8	31.5	-	47.6	73.9	26.3	Inside	
Hori	5470.000	PK	46.9	32.2	3.8	31.5	-	51.4	68.2	16.8	Outside	
Hori	5460.000	AV	33.5	32.2	3.8	31.5	1.4	39.4	53.9	14.5	Inside	
Vert	5460.000	PK	45.6	32.2	3.8	31.5	-	50.1	73.9	23.8	Inside	
Vert	5470.000	PK	45.9	32.2	3.8	31.5	-	50.4	68.2	17.8	Outside	
Vert	5460.000	AV	34.2	32.2	3.8	31.5	1.4	40.1	53.9	13.8	Inside	

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 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

[11n-20 Tx 5700MHz]

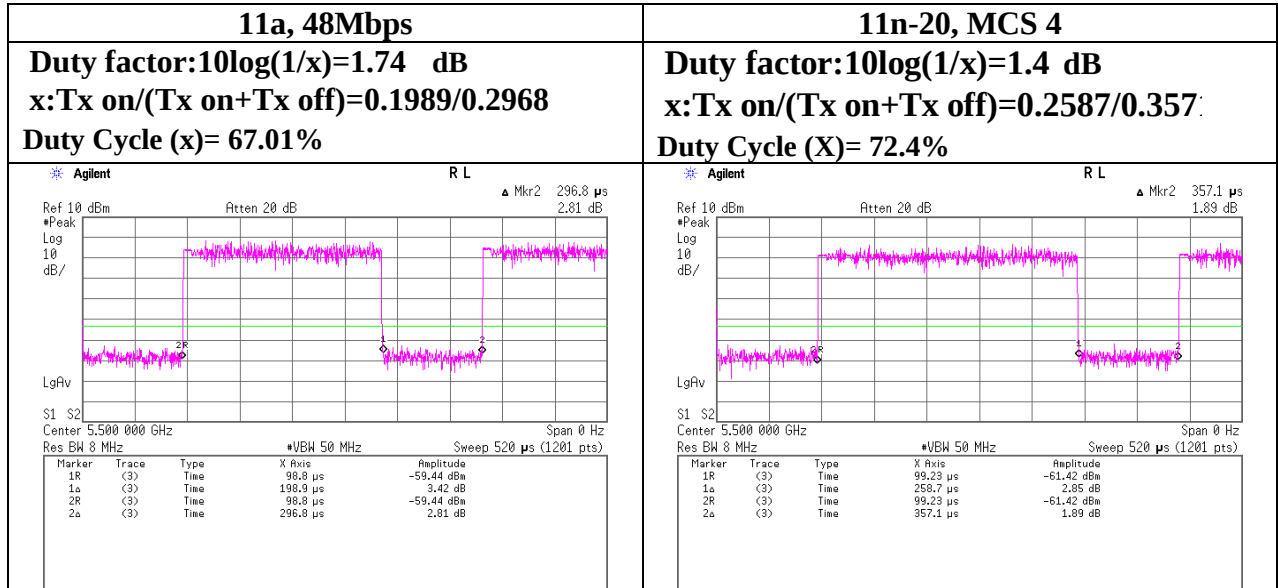
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5725.000	PK	53.0	32.6	3.9	31.6	-	57.9	68.2	10.3	Outside	
Hori	5725.000	PK	54.3	32.6	3.9	31.6	-	59.2	68.2	9.0	Outside	

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 have enough margin (more than 20dB).

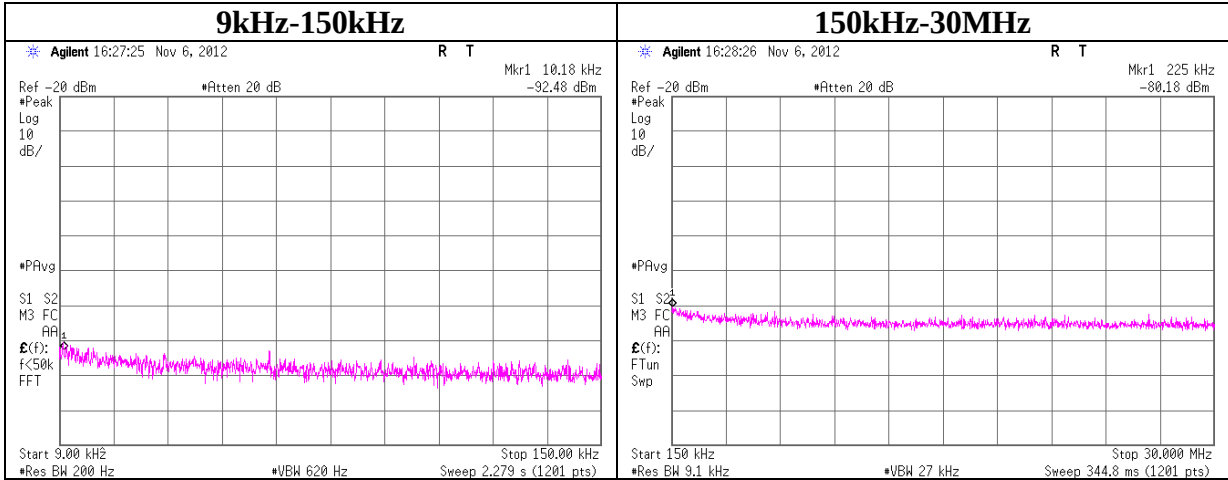
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Duty Cycle



Conducted Spurious Emission

11a, Tx 5500MHz



Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
10.18	-92.5	0.0	9.8	2.0	37.0	-43.7	-27.0	16.7	
225.00	-80.2	0.0	9.8	2.0	20.4	-48.0	-27.0	21.0	

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

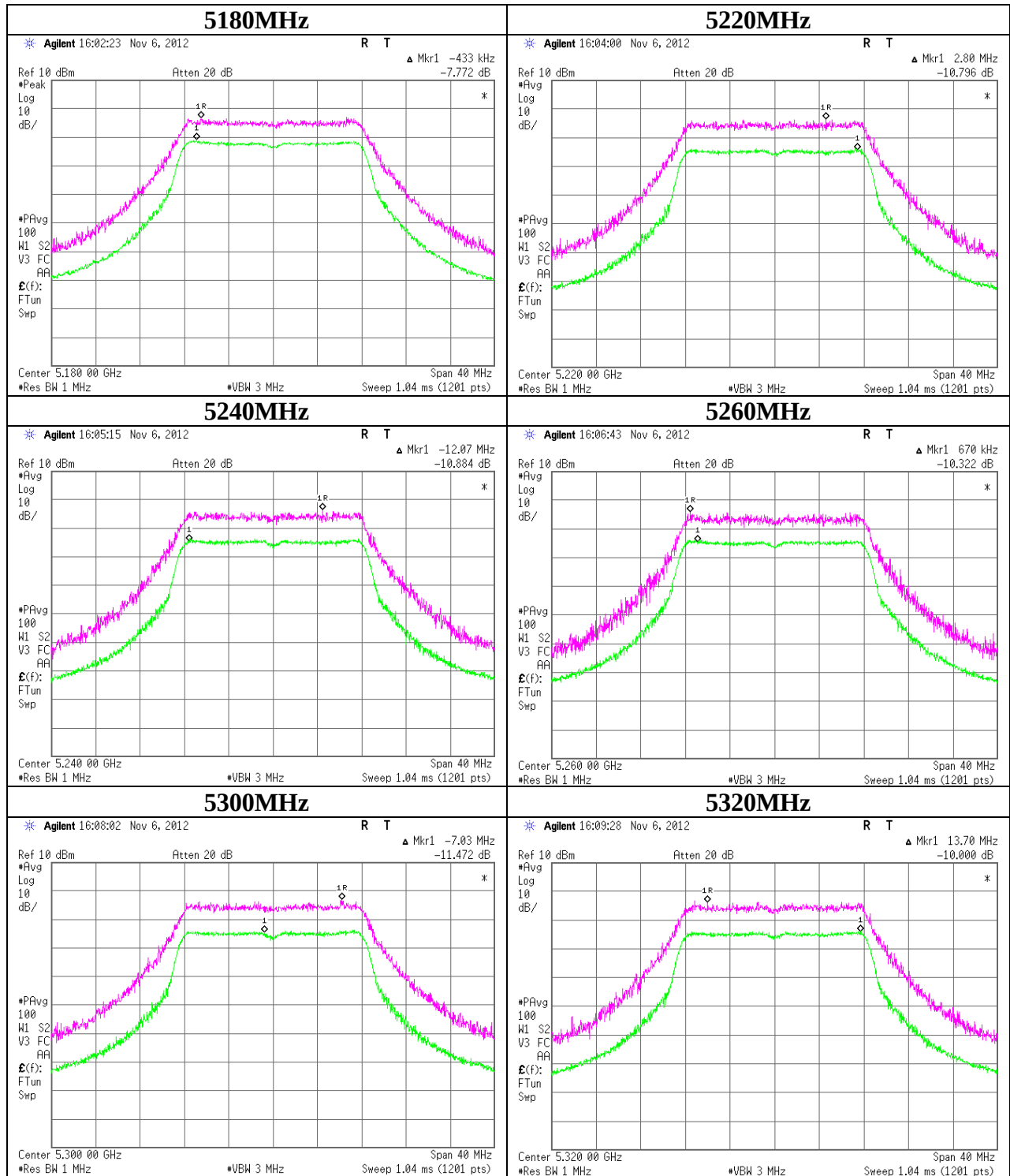
Peak Excursion Ratio

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 11/02/2012
Temperature/ Humidity 23deg. C / 43% RH
Engineer Tomotaka Sasagawa
Mode 11a Tx

Frequency [MHz]	Peak Power Excursion [dB]	Limit [dB]
5180	7.78	13.00
5220	10.81	13.00
5240	10.89	13.00
5260	10.33	13.00
5300	11.48	13.00
5320	10.01	13.00
5500	11.67	13.00
5600	11.18	13.00
5700	11.53	13.00

Peak Excursion Ratio

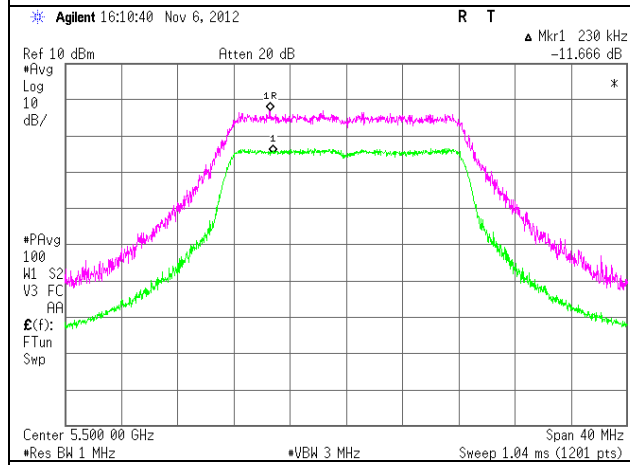
11a



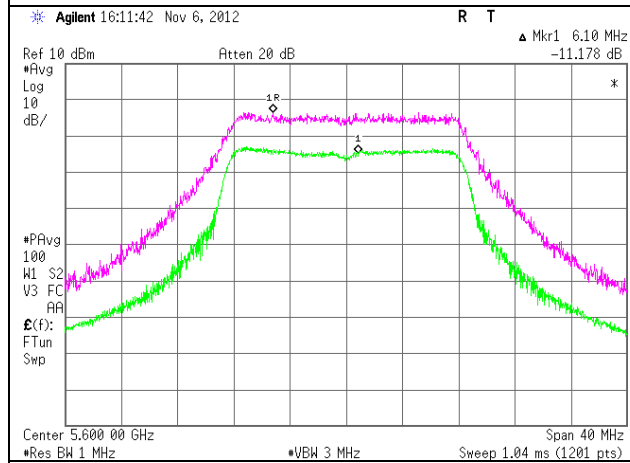
Peak Excursion Ratio

11a

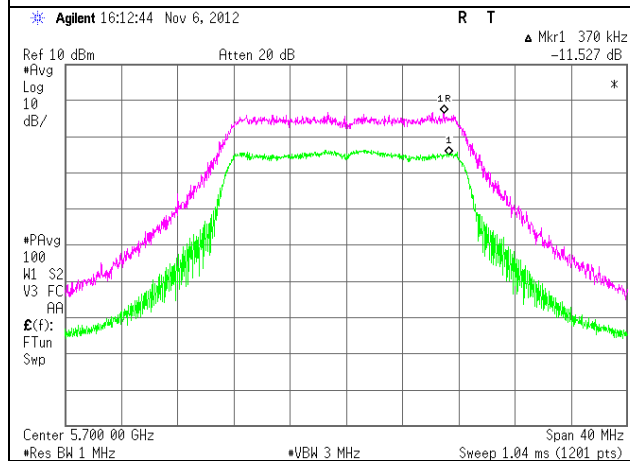
5500MHz



5600MHz



5700MHz



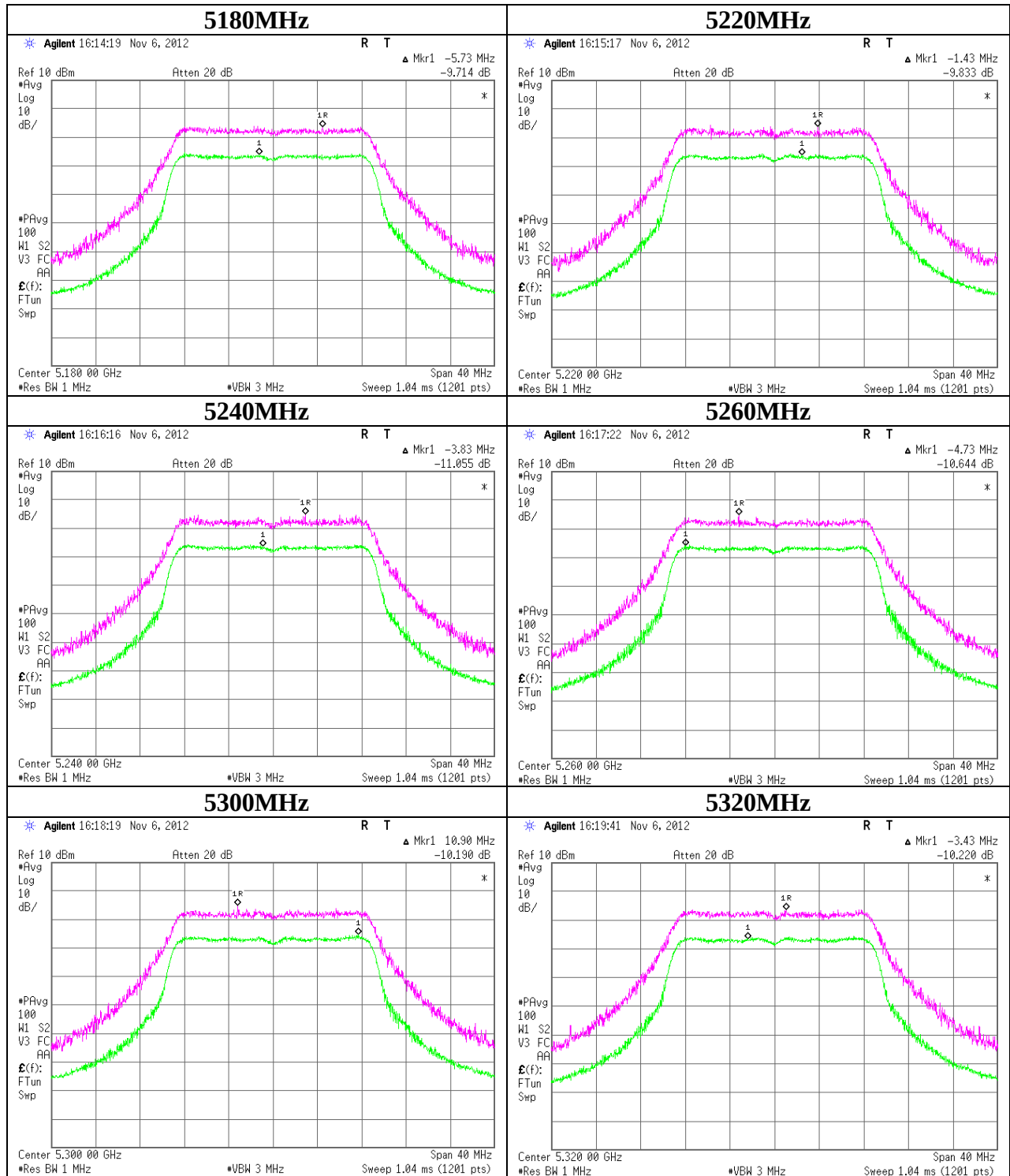
Peak Excursion Ratio

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 33BE0179-HO
Date 11/02/2012
Temperature/ Humidity 24deg. C / 43% RH
Engineer Tomotaka Sasagawa
Mode 11n-20 Tx

Frequency [MHz]	Peak Power Excursion [dB]	Limit [dB]
5180	9.72	13.00
5220	9.84	13.00
5240	11.06	13.00
5260	10.65	13.00
5300	10.20	13.00
5320	10.23	13.00
5500	9.99	13.00
5600	11.22	13.00
5700	10.48	13.00

Peak Excursion Ratio

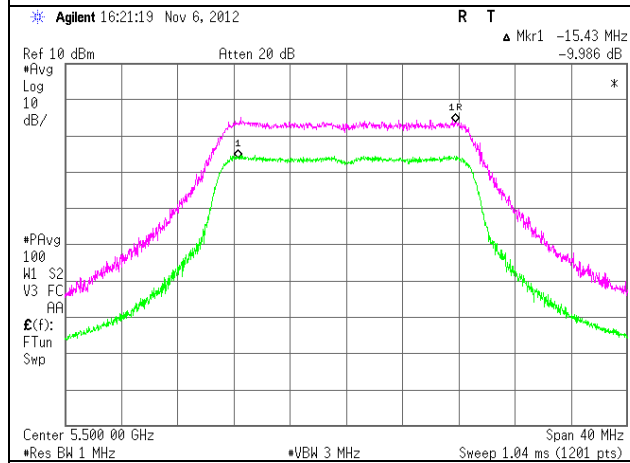
11n-20



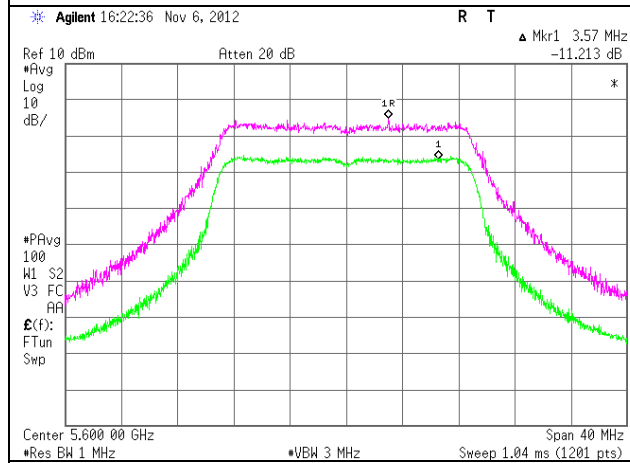
Peak Excursion Ratio

11n-20

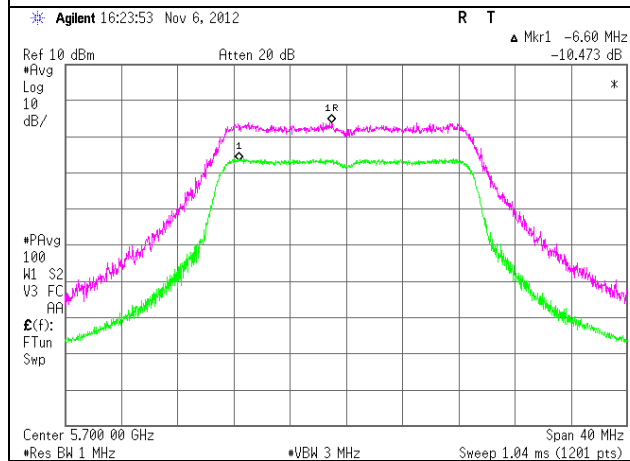
5500MHz



5600MHz



5700MHz



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2011/12/09 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT	2011/11/23 * 12
MAT-20	Attenuator(10dB) (above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2012/01/12 * 12
MCC-67	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28635/2	AT	2012/04/25 * 12
MOTS- MATM	Antenna Terminal Measurement Software	UL Japan	-	-	AT	-
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2012/02/06 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2012/02/24 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2012/02/06 * 12
MJM-15	Measure	KOMELON	KMC-36	-	RE	-
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2012/05/25 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2012/09/05 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2012/03/29 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2012/05/21 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	3950M00205	RE	2012/06/22 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2012/03/21 * 12
MHF-22	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCB	602	RE	2012/01/28 * 12
MCC-79	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278923/4	RE	2011/12/08 * 12
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	RE	2012/06/19 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2012/02/22 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2012/09/05 * 12
MHF-16	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCA	7001	RE	2012/09/06 * 12
MCC-77	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278942/4	RE	2011/12/08 * 12
COTS- MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	CE	2012/02/29 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	CE	2012/02/06 * 12
MJM-07	Measure	PROMART	SEN1955	-	CE	-
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	CE	2011/11/23 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	CE	2012/04/05 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	8127364	CE	2012/02/09 * 12
MTA-31	Terminator	TME	CT-01	-	CE	2012/01/11 * 12
MAT-67	Attenuator	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(5m)/ 421-010(1m)/ sucoform141-PE(1m)/ RFM-E121(Switcher)	-/04178	CE	2012/07/12 * 12

The expiration date of the calibration is the end of the expired month.

UL Japan, Inc.

Head Office EMC Lab.

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

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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