RADIO TEST REPORT

Test Report No. : 32BE0278-HO-L-R2

Applicant	:	**SAMSUNG ELECTRONICS CO., LTD.**
Type of Equipment	:	**Cellular/PCS GSM/GPRS/EDGE, Cellular/PCS WCDMA Tablet with 802.11abgn, BT3.0**
Model No.	:	**GT-P6200L**
FCC ID	:	**A3LGTP6200L**
Test regulation	:	**FCC Part 15 Subpart E: 2011**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
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.
6. This report is a revised version of 32BE0278-HO-L-R1. 32BE0278-HO-L-R1 is replaced with this report.

Date of test: October 5 to November 4, 2011

Representative test engineer:

Katsunori Okai
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

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

CONTENTS **PAGE**

SECTION 1: Customer information....3
SECTION 2: Equipment under test (E.U.T.)....3
SECTION 3: Test specification, procedures & results....5
SECTION 4: Operation of E.U.T. during testing....8
SECTION 5: Conducted Emission....10
SECTION 6: Radiated Spurious Emission and Band Edge Compliance....11
SECTION 7: Antenna Terminal Conducted Tests....13
APPENDIX 1: Data of EMI test....14
Conducted Emission 14
26dB Emission Bandwidth and 99% Occupied Bandwidth....15
Maximum Peak Output Power....24
Peak Power Spectral Density 28
Radiated Spurious Emission 36
VBW (AV) Calculation....48
Conducted Spurious Emission 49
Conducted emission Band Edge compliance 81
Peak Excursion Ratio....84
APPENDIX 2: Test instruments 90
APPENDIX 3: Photographs of test setup....91
Conducted Emission 91
Radiated Spurious Emission 92
Worst Case Position 93

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	:	Cellular/PCS GSM/GPRS/EDGE, Cellular/PCS WCDMA Tablet with 802.11abgn, BT3.0
Model No.	:	GT-P6200L
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC4.0V
Receipt Date of Sample	:	September 27, 2011
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Radio Specification

Bluetooth

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Type	PIFA
Antenna Gain	-0.63 dBi

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	SEMI-PIFA	
Antenna Gain	2.4G: -2.85dBi	5G: -4.15dBi

WLAN (IEEE802.11n-40)

Equipment Type	Transceiver
Frequency of Operation	5190-5230MHz 5270-5310MHz 5510-5670MHz 5755-5795MHz
Type of Modulation	OFDM
Bandwidth & Channel spacing	40MHz & 40MHz
Antenna Type	SEMI-PIFA
Antenna Gain	-4.15dBi

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
Antenna Type	PIFA
Antenna Gain	GSM850: -5.86dBi PCS: -4.02dBi

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
Antenna Type	PIFA
Antenna Gain	Band V: -5.86dBi Band II: -4.02dBi

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart E: 2011, final revised on July 8, 2011 and effective August 8, 2011
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** 14.3dB, 0.46842MHz, N **AV** 20.1dB, 0.46842MHz, N	Complied	-
	IC: RSS-Gen 7.2.4	**IC:** RSS-Gen 7.2.4			
26dB Emission Bandwidth	**FCC :**ANSI C63.4:2003 FCC Public Notice DA 02-2138A1	**FCC :** 15.407(a)(1)(2)(3)	See data	N/A	Conducted
	IC: -	**IC:** -			
Maximum Peak Output Power	**FCC :**ANSI C63.4:2003, FCC Public Notice DA 02-2138A1	**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 Public Notice DA 02-2138A1	**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 Public Notice DA 02-2138A1	**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	2.1dB 37.249MHz, QP, Vertical	Complied	Conducted / Radiated
	IC: -	**IC:** RSS-210 A.9.2(1)(2)(3)			
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 32BE0278-HO-M issued by UL Japan, Inc.					

*These tests were also referred to FCC Public Notice DA 02-2138A1 "Measurement Procedure Updated for Peak Transmit Power in the Unlicensed National Information Infrastructure (U-NII) Bands ".

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						
	(3m*)(±dB)				(1m*)(±dB)		(0.5m*)(±dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.2dB	5.0dB	5.1dB	5.6dB	5.9dB	4.4dB	4.3dB
No.2	4.1dB	5.2dB	5.1dB	5.7dB	5.8dB	4.3dB	4.2dB
No.3	4.5dB	5.0dB	5.2dB	5.7dB	5.8dB	4.5dB	4.2dB
No.4	4.7dB	5.2dB	5.2dB	5.7dB	5.8dB	5.1dB	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 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 8116 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	4.75 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) IEEE 802.11n SISO 20MHz BW (11n-20)	54Mbps, PN9 MCS 6, PN9
IEEE 802.11n SISO 40MHz BW (11n-40)	MCS 6, 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 follow:

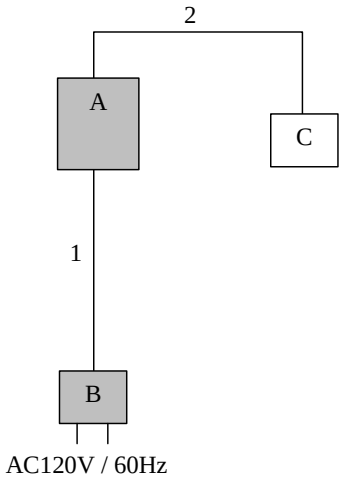
Software name & version: HW Rev 1.0, SW: P6200L.010

[Power Setting]
11a: 9dBm
11n-20(5GHz): 9dBm
11n-40(5GHz): 9dBm
*The above setting of the software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.

*Details of Operating mode(s)

Test Item	Operating Mode	Tested Frequency		
		Low Band	Middle Band	Additional Band
Conducted emission	11n-40 Tx*1)	-	5270MHz	-
26dB Emission Bandwidth, 99% Occupied Bandwidth, Spurious Emission (Conducted emission Band Edge compliance)	11a Tx 11n-20 Tx	5180MHz 5220MHz 5240MHz	5260MHz 5300MHz 5320MHz	5500MHz 5600MHz 5700MHz
	11n-40 Tx	5190MHz 5230MHz	5270MHz 5310MHz	5510MHz 5590MHz 5670MHz
Maximum Peak Output Power Peak Power Spectral Density, Peak Excursion Ratio, Spurious Emission(Conducted)	11a Tx *2)	5180MHz 5220MHz 5240MHz	5260MHz 5300MHz 5320MHz	5500MHz 5600MHz 5700MHz
	11n-40 Tx	5190MHz 5230MHz	5270MHz 5310MHz	5510MHz 5590MHz 5670MHz
Spurious Emission(Radiated)	11a Tx *2)	5180MHz 5240MHz	5320MHz	5500MHz 5600MHz 5700MHz
	11n-40 Tx	5190MHz 5230MHz	5310MHz	5510MHz 5590MHz 5670MHz
*1) The mode was tested as a representative, because it had the highest power at antenna terminal test and the noise levels at the mode/tested frequencies were equivalent to those of other modes/tested frequencies. *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.				

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	Cellular/PCS GSM/GPRS/EDGE, Cellular/PCS WCDMA Tablet with 802.11abgn, BT3.0	GT-P6200L	R2DB815121V *1) R2DB815125K *2) R2DB815124B *3)	SAMSUNG	EUT
B	AC Adapter	ETA-P11X	-	SAMSUNG	EUT
C	Ear phone	-	-	SAMSUNG	-

*1) Used for Antenna Terminal conducted test
*2) Used for Conducted Emission test
*3) Used for Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Cable	1.0	Shielded	Shielded	-
2	Ear phone Cable	1.2	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure

EUT was placed on a urethane platform / a wooden table 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

SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.
The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were 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:	Peak detector 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	Below 30MHz	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Loop	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	RBW: 1MHz VBW: 10Hz*1)
Test Distance	3m	3m (below 10GHz), 1m*2) (above 10GHz),	

*1) As both cycle and Off duration were short enough, 10Hz video bandwidth was used. (See Appendix)
*2) Distance Factor: 20 x log (3.0m/1.0m) = 9.5dB

- 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, 60MHz	Close to 1% of EBW	Greater than RBW	Auto	Peak	Max Hold	Spectrum Analyzer *1)
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	Close to 1% of Span	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer *1)
Maximum Peak Output Power	50MHz/100MHz	1MHz	3MHz	Auto	Sample Power Averaging (100 times)	Clear Write	Spectrum Analyzer method 1
Peak Power Spectral Density	50MHz/100MHz	1MHz	3MHz	Auto	Sample Power Averaging (100 times)	Clear Write	Spectrum Analyzer method 2
Peak Excursion Ratio	26MHz, 54MHz	1MHz	3MHz	Auto	Peak Sample Power Averaging (100 times)	Max Hold Clear Write	Spectrum Analyzer method 1
Conducted Spurious Emission *2)	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				
	30MHz to 1GHz	100kHz	300kHz				
	1GHz to 40GHz (Less or equal to 5GHz)	1MHz	3MHz				

*1) The measurement was performed with Max Hold since the duty cycle was not 100%.
*2) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart..

*EBW: Enough width to display Bandwidth

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

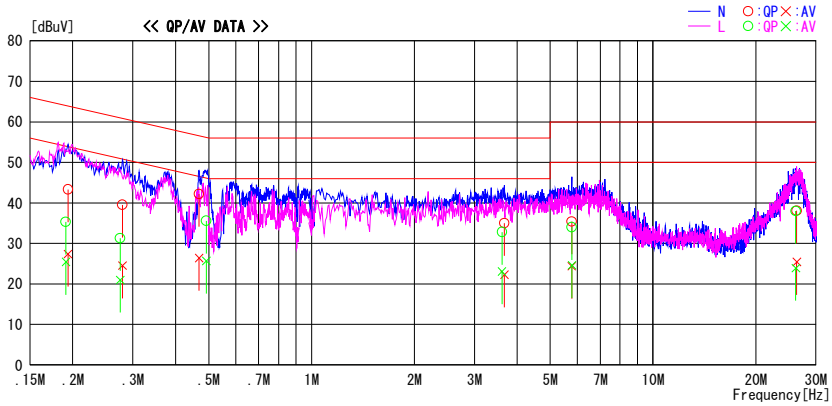
UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2011/10/06

Report No. : 32BE0278-HO

Temp./Humi. : 24deg.C / 52%RH
Engineer : Hisayoshi Sato

Mode / Remarks : Tx WLAN 11n-40 5270MHz MCS6

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]		
0.19350	30.0	14.1	13.3	43.3	27.4	63.9	53.9	20.6	26.5	N	
0.27963	26.2	11.2	13.3	39.5	24.5	60.8	50.8	21.3	26.3	N	
0.46842	28.9	13.1	13.3	42.2	26.4	56.5	46.5	14.3	20.1	N	
3.67378	20.9	8.2	14.1	35.0	22.3	56.0	46.0	21.0	23.7	N	
5.77800	20.8	9.8	14.6	35.4	24.4	60.0	50.0	24.6	25.6	N	
26.35094	19.7	7.0	18.4	38.1	25.4	60.0	50.0	21.9	24.6	N	
0.19077	22.0	12.1	13.3	35.3	25.4	64.0	54.0	28.7	28.6	L	
0.27518	18.0	7.7	13.3	31.3	21.0	61.0	51.0	29.7	30.0	L	
0.49179	22.3	12.4	13.3	35.6	25.7	56.1	46.1	20.5	20.4	L	
3.61232	18.7	9.0	14.1	32.8	23.1	56.0	46.0	23.2	22.9	L	
5.78300	19.4	10.0	14.6	34.0	24.6	60.0	50.0	26.0	25.4	L	
26.18420	19.7	5.6	18.3	38.0	23.9	60.0	50.0	22.0	26.1	L	

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

26dB Emission Bandwidth and 99% Occupied Bandwidth

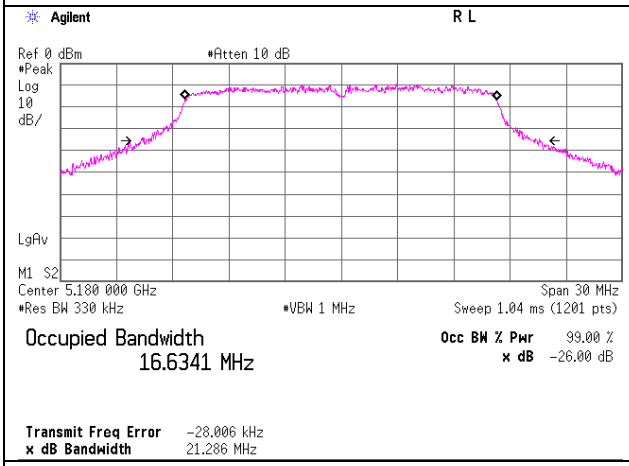
Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32BE0278-HO
Date	10/06/2011
Temperature/ Humidity	23 deg. C / 61% RH
Engineer	Takayuki Shimada
Mode	11a Tx

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	21.286	16.6341	-
5220	21.628	16.6042	-
5240	21.092	16.6262	-
5260	21.016	16.6044	-
5300	21.437	16.6288	-
5320	21.188	16.6202	-
5500	21.726	16.6463	-
5600	21.654	16.6171	-
5700	21.710	16.6489	-

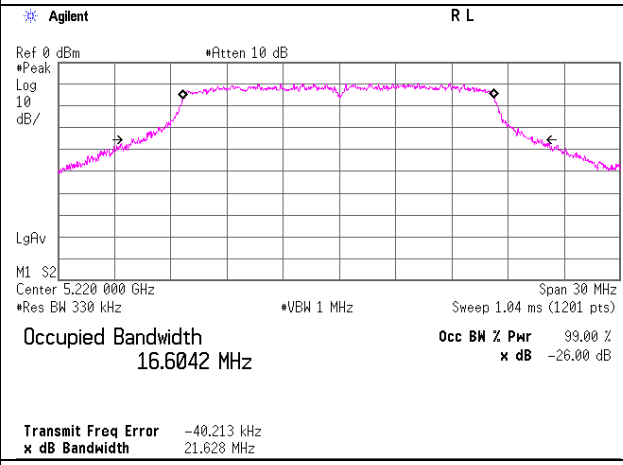
26dB Emission Bandwidth and 99% Occupied Bandwidth

11a

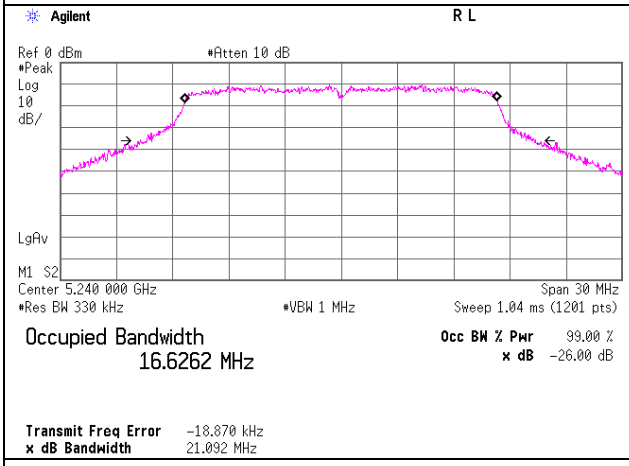
5180MHz



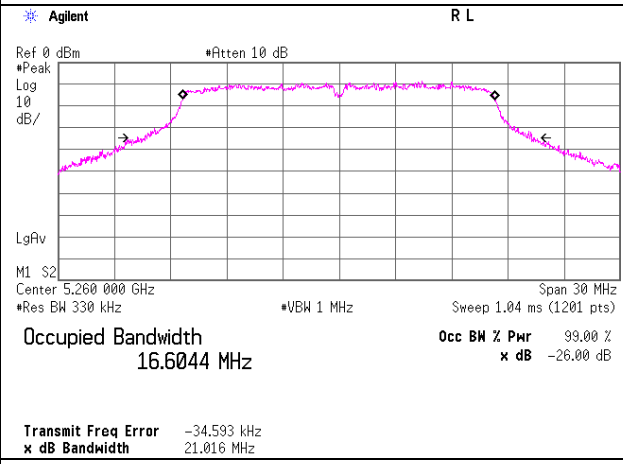
5220MHz



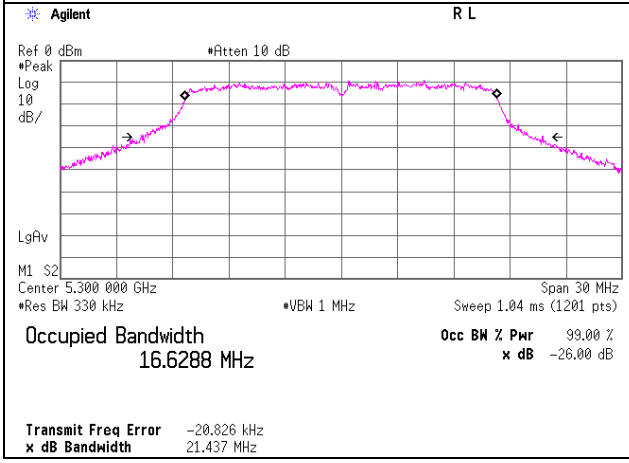
5240MHz



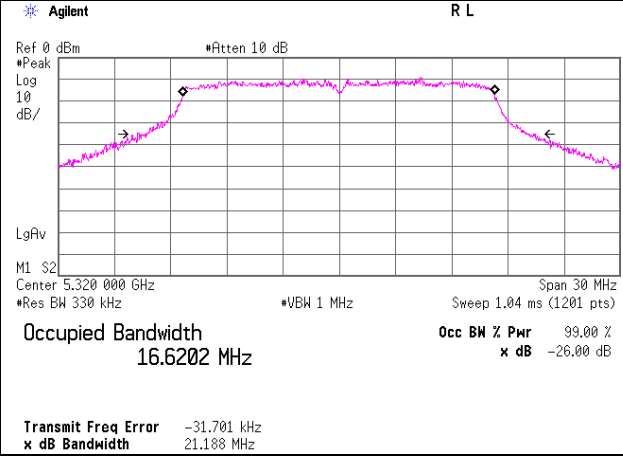
5260MHz



5300MHz



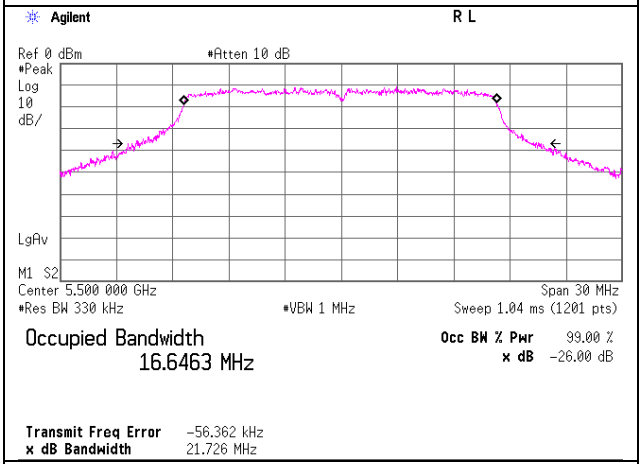
5320MHz



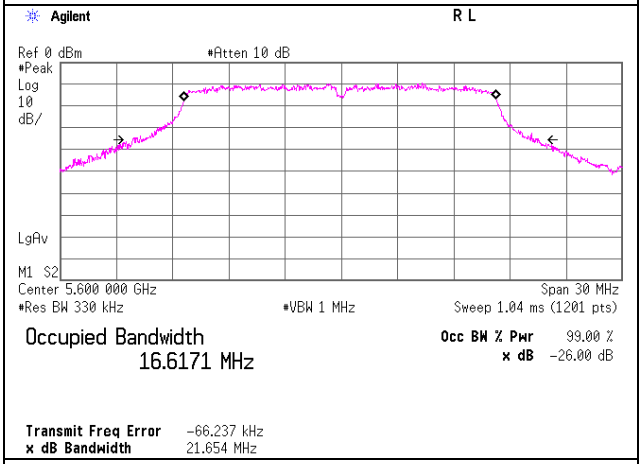
26dB Emission Bandwidth and 99% Occupied Bandwidth

11a

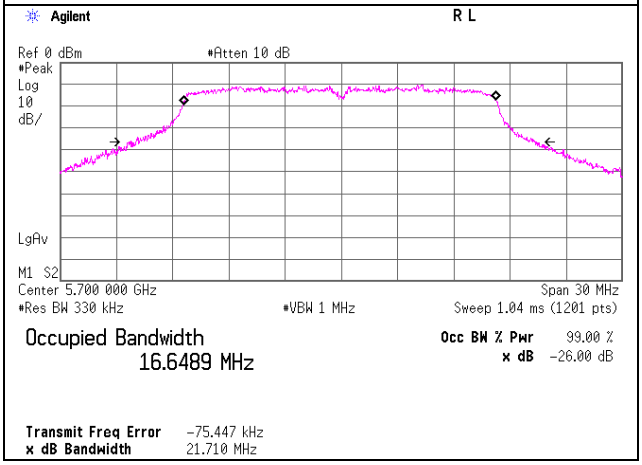
5500MHz



5600MHz



5700MHz



26dB Emission Bandwidth and 99% Occupied Bandwidth

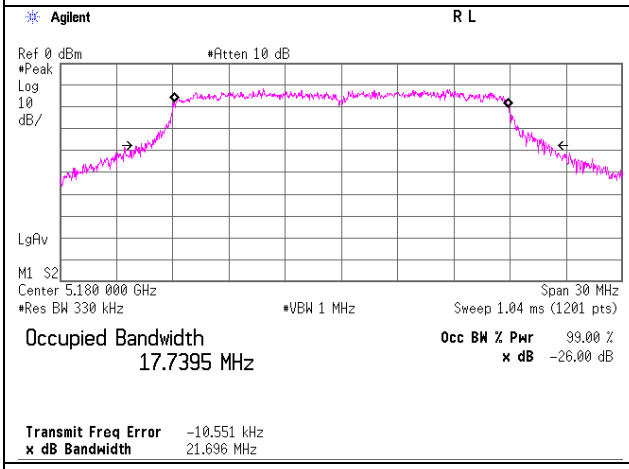
Test place	Head Office EMC Lab. No.7 shielded room
Report No.	32BE0278-HO
Date	11/04/2011
Temperature/ Humidity	25 deg. C / 52% RH
Engineer	Katsunori Okai
Mode	11n-20 Tx

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	21.696	17.7395	-
5220	22.766	17.6993	-
5240	22.112	17.6733	-
5260	21.891	17.7208	-
5300	22.272	17.6832	-
5320	21.839	17.7254	-
5500	22.203	17.6938	-
5600	22.742	17.7071	-
5700	21.894	17.7466	-

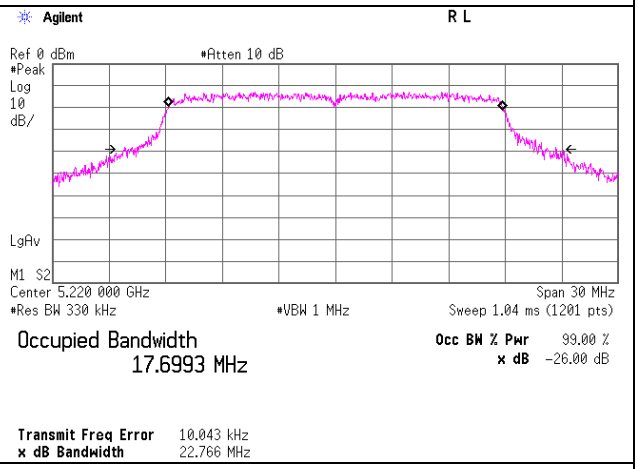
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-20

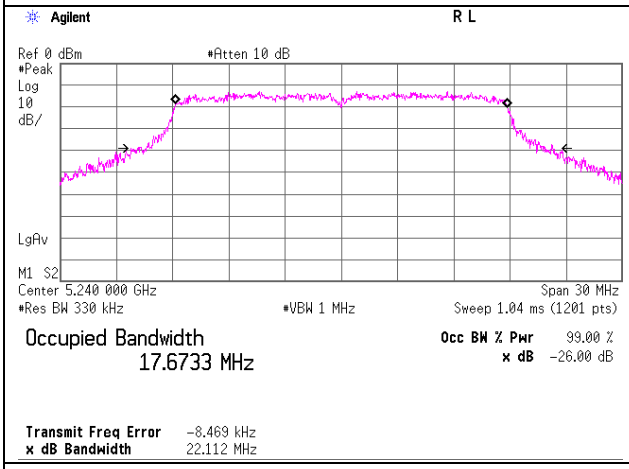
5180MHz



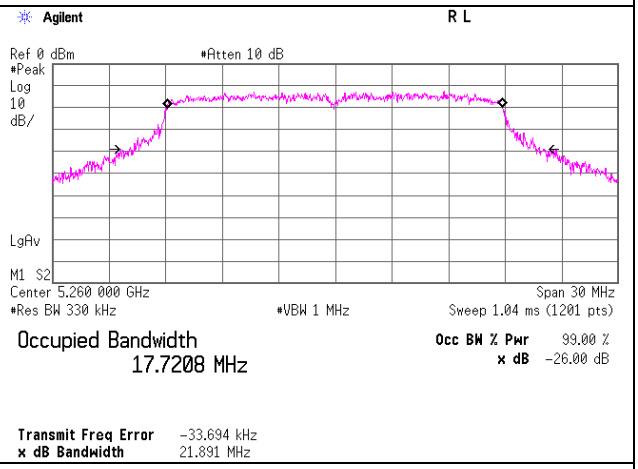
5220MHz



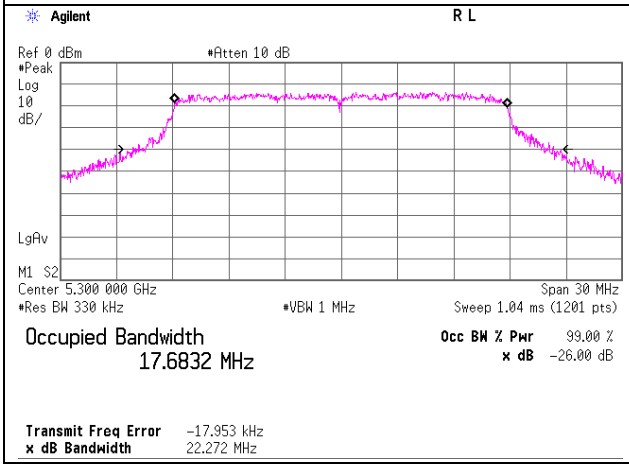
5240MHz



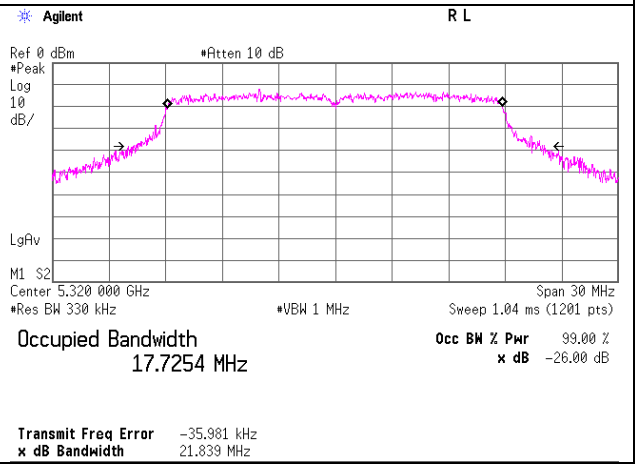
5260MHz



5300MHz



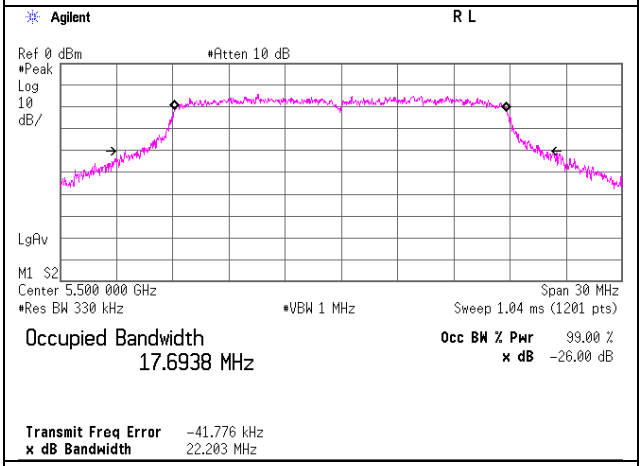
5320MHz



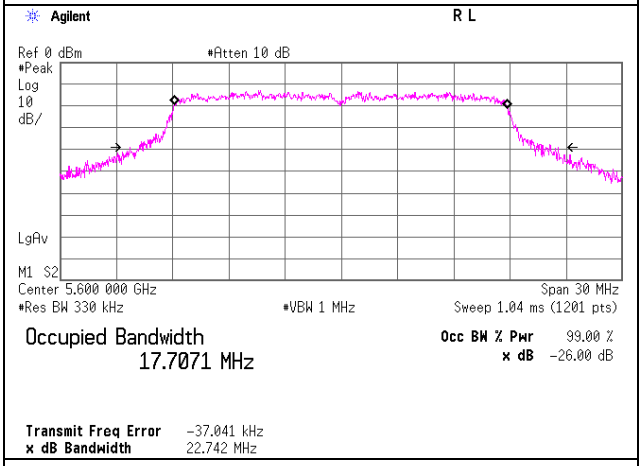
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-20

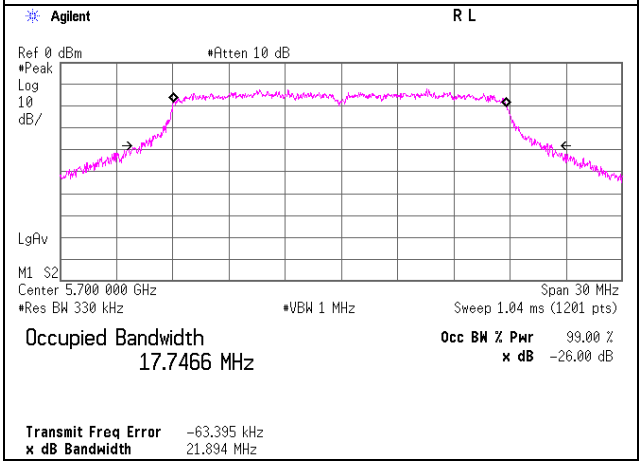
5500MHz



5600MHz



5700MHz



26dB Emission Bandwidth and 99% Occupied Bandwidth

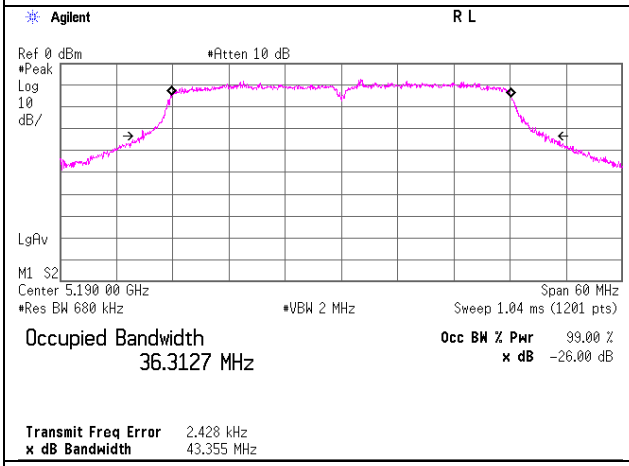
Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32BE0278-HO
Date	10/06/2011
Temperature/ Humidity	23 deg. C / 61% RH
Engineer	Takayuki Shimada
Mode	11n-40 Tx

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5190	43.355	36.3127	-
5230	43.037	36.2669	-
5270	43.461	36.3621	-
5310	43.865	36.3467	-
5510	43.387	36.3463	-
5590	43.471	36.3179	-
5670	43.993	36.3238	-

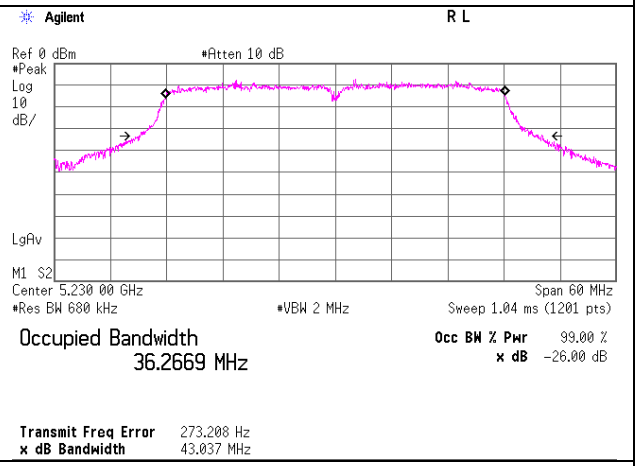
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-40

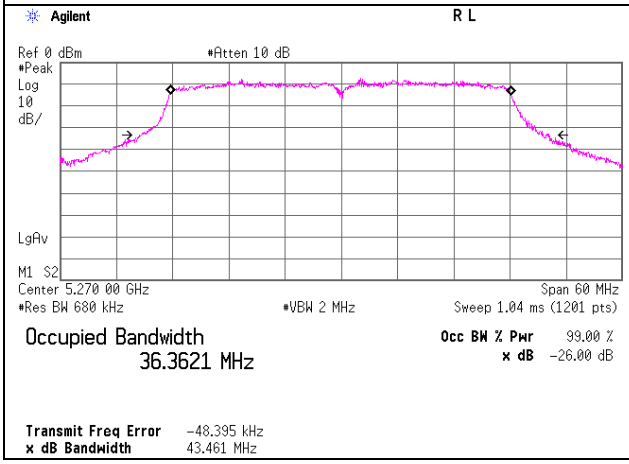
5190MHz



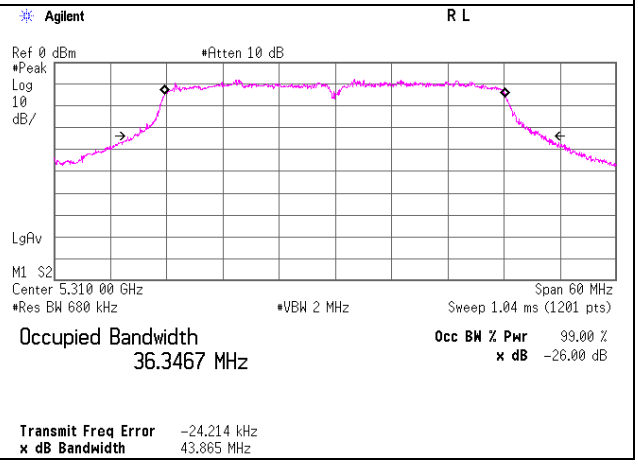
5230MHz



5270MHz



5310MHz

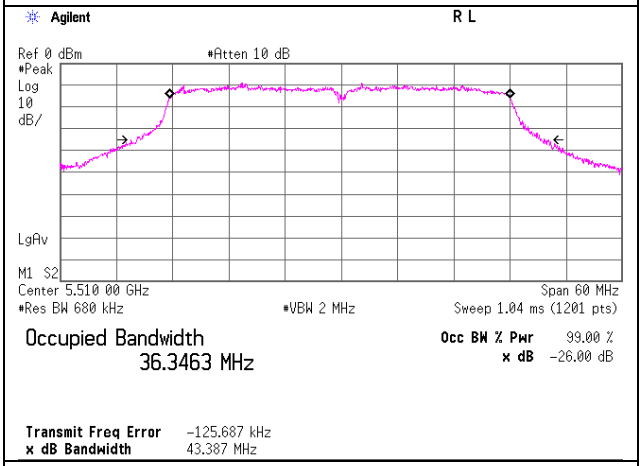


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

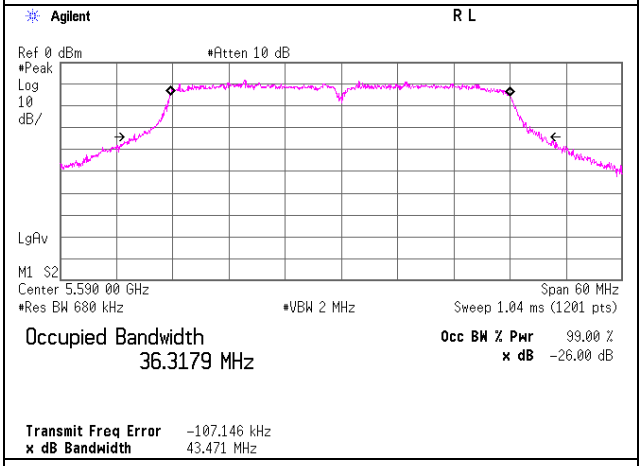
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-40

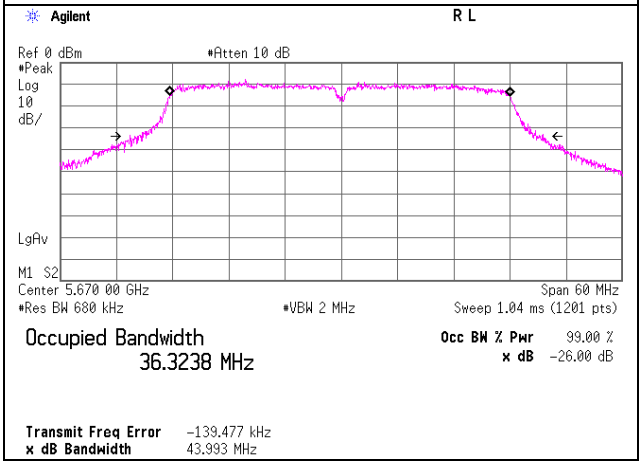
5510MHz



5590MHz



5670MHz



Maximum Peak Output Power

Test place	Head Office EMC Lab. No.7 shielded room
Report No.	32BE0278-HO
Date	10/05/2011
Temperature/ Humidity	26deg. C / 54% RH
Engineer	Katsunori Okai
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	-1.22	1.52	10.05	-4.15	10.35	6.20	16.98	-	6.63	-
5220.0	-1.28	1.52	10.05	-4.15	10.29	6.14	16.98	-	6.69	-
5240.0	-1.55	1.52	10.05	-4.15	10.02	5.87	16.98	-	6.96	-
5260.0	-1.55	1.53	10.05	-4.15	10.03	5.88	23.97	-	13.94	-
5300.0	-1.62	1.53	10.05	-4.15	9.96	5.81	23.97	-	14.01	-
5320.0	-1.77	1.53	10.05	-4.15	9.81	5.66	23.97	-	14.16	-
5500.0	-3.75	1.53	10.06	-4.15	7.84	3.69	23.97	-	16.13	-
5600.0	-1.91	1.54	10.06	-4.15	9.69	5.54	23.97	-	14.28	-
5700.0	-2.39	1.55	10.06	-4.15	9.22	5.07	23.97	-	14.75	-

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

ON time was only measured using Gate function.

Maximum Peak Output Power

Test place	Head Office EMC Lab. No.7 shielded room
Report No.	32BE0278-HO
Date	10/05/2011
Temperature/ Humidity	26deg. C / 54% RH
Engineer	Katsunori Okai
Mode	11n-40 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]
5190.0	-0.63	1.52	10.05	-4.15	10.94	6.79	16.98	-	6.04	-
5230.0	-0.69	1.52	10.05	-4.15	10.88	6.73	16.98	-	6.10	-
5270.0	-0.53	1.53	10.05	-4.15	11.05	6.90	23.97	-	12.92	-
5310.0	-0.83	1.53	10.05	-4.15	10.75	6.60	23.97	-	13.22	-
5510.0	-3.10	1.53	10.06	-4.15	8.49	4.34	23.97	-	15.48	-
5590.0	-1.77	1.54	10.06	-4.15	9.83	5.68	23.97	-	14.14	-
5670.0	-1.61	1.55	10.06	-4.15	10.00	5.85	23.97	-	13.97	-

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

ON time was only measured using Gate function.

Maximum Average Output Power (Reference data for SAR testing)

IEEE802.11a 5180-5320MHz band 24Mbps

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result [dBm] AVG	Result [mW] AVG
36	5180	-1.05	1.00	10.05	10.00	10.00
40	5200	-1.22	1.00	10.05	9.83	9.62
44	5220	-0.99	1.00	10.05	10.06	10.14
48	5240	-0.89	1.00	10.05	10.16	10.38
52	5260	-1.37	1.00	10.05	9.68	9.29
56	5280	-0.96	1.00	10.05	10.09	10.21
60	5300	-1.74	1.00	10.05	9.31	8.53
64	5320	-1.70	1.00	10.05	9.35	8.61

Sample Calculation: Result = Reading + Cable Loss + Attenuator

IEEE802.11n-20 5180-5320MHz band MCS3

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result [dBm] AVG	Result [mW] AVG
36	5180	-1.05	1.00	10.05	10.00	10.00
40	5200	-0.74	1.00	10.05	10.31	10.74
44	5220	-0.77	1.00	10.05	10.28	10.67
48	5240	-1.03	1.00	10.05	10.02	10.05
52	5260	-1.28	1.00	10.05	9.77	9.48
56	5280	-1.07	1.00	10.05	9.98	9.95
60	5300	-1.42	1.00	10.05	9.63	9.18
64	5320	-1.67	1.00	10.05	9.38	8.67

Sample Calculation: Result = Reading + Cable Loss + Attenuator

IEEE802.11n-40 5190-5310MHz band MCS3

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result [dBm] AVG	Result [mW] AVG
36	5190	-1.17	1.00	10.05	9.88	9.73
48	5230	-0.81	1.00	10.05	10.24	10.57
56	5270	-0.75	1.00	10.05	10.30	10.72
64	5310	-0.88	1.00	10.05	10.17	10.40

Sample Calculation: Result = Reading + Cable Loss + Attenuator

[IEEE802.11a 5500-5700MHz band] 24Mbps

Ch	Freq.	P/M Reading [dBm]	Cable Loss	Atten.	Result	
					[dBm]	[mW]
	[MHz]	AVG	[dB]	[dB]	AVG	AVG
100	5500	-3.43	1.00	10.06	7.63	5.79
104	5520	-3.09	1.00	10.06	7.97	6.27
108	5540	-2.78	1.00	10.06	8.28	6.73
112	5560	-3.11	1.00	10.06	7.95	6.24
116	5580	-2.67	1.00	10.06	8.39	6.90
120	5600	-2.36	1.00	10.06	8.70	7.41
124	5620	-2.29	1.00	10.06	8.77	7.53
128	5640	-2.18	1.00	10.06	8.88	7.73
132	5660	-2.16	1.00	10.06	8.90	7.76
136	5680	-2.14	1.00	10.06	8.92	7.80
140	5700	-2.29	1.00	10.06	8.77	7.53

Sample Calculation: Result = Reading + Cable Loss + Attenuator

[IEEE802.11n-20 5500-5700MHz band] MCS3

Ch	Freq.	P/M Reading [dBm]	Cable Loss	Atten.	Result	
					[dBm]	[mW]
	[MHz]	AVG	[dB]	[dB]	AVG	AVG
100	5500	-3.47	1.00	10.06	7.59	5.74
104	5520	-3.14	1.00	10.06	7.92	6.19
108	5540	-2.86	1.00	10.06	8.20	6.61
112	5560	-2.68	1.00	10.06	8.38	6.89
116	5580	-2.17	1.00	10.06	8.89	7.74
120	5600	-2.16	1.00	10.06	8.90	7.76
124	5620	-1.86	1.00	10.06	9.20	8.32
128	5640	-1.95	1.00	10.06	9.11	8.15
132	5660	-2.23	1.00	10.06	8.83	7.64
136	5680	-2.27	1.00	10.06	8.79	7.57
140	5700	-2.48	1.00	10.06	8.58	7.21

Sample Calculation: Result = Reading + Cable Loss + Attenuator

[IEEE802.11n-40 5500-5700MHz band] MCS0

Ch	Freq.	P/M Reading [dBm]	Cable Loss	Atten.	Result	
					[dBm]	[mW]
	[MHz]	AVG	[dB]	[dB]	AVG	AVG
100	5510	-3.47	1.00	10.06	7.59	5.74
104	5550	-2.25	1.00	10.06	8.81	7.60
108	5590	-1.86	1.00	10.06	9.20	8.32
112	5630	-1.95	1.00	10.06	9.11	8.15
116	5670	-2.06	1.00	10.06	9.00	7.94

Sample Calculation: Result = Reading + Cable Loss + Attenuator

Peak Power Spectral Density

Test place	Head Office EMC Lab. No.7 shielded room
Report No.	32BE0278-HO
Date	10/05/2011
Temperature/ Humidity	26deg. C / 54% RH
Engineer	Katsunori Okai
Mode	11a Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-11.58	1.52	10.05	-0.01	4.00	4.01
5220.0	-11.53	1.52	10.05	0.04	4.00	3.96
5240.0	-11.30	1.52	10.05	0.27	4.00	3.73
5260.0	-11.99	1.53	10.05	-0.41	11.00	11.41
5300.0	-11.57	1.53	10.05	0.01	11.00	10.99
5320.0	-12.14	1.53	10.05	-0.56	11.00	11.56
5500.0	-14.18	1.53	10.06	-2.59	11.00	13.59
5600.0	-12.08	1.54	10.06	-0.48	11.00	11.48
5700.0	-12.60	1.55	10.06	-0.99	11.00	11.99

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

ON time was only measured using Gate function.

Peak Power Spectral Density

Test place	Head Office EMC Lab. No.7 shielded room
Report No.	32BE0278-HO
Date	10/05/2011
Temperature/ Humidity	26deg. C / 54% RH
Engineer	Katsunori Okai
Mode	11n-40 Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5190.0	-14.12	1.52	10.05	-2.55	4.00	6.55
5230.0	-14.16	1.52	10.05	-2.59	4.00	6.59
5270.0	-13.80	1.52	10.05	-2.23	11.00	13.23
5310.0	-14.55	1.53	10.05	-2.97	11.00	13.97
5510.0	-16.69	1.53	10.06	-5.10	11.00	16.10
5590.0	-15.33	1.54	10.06	-3.73	11.00	14.73
5670.0	-15.05	1.55	10.06	-3.44	11.00	14.44

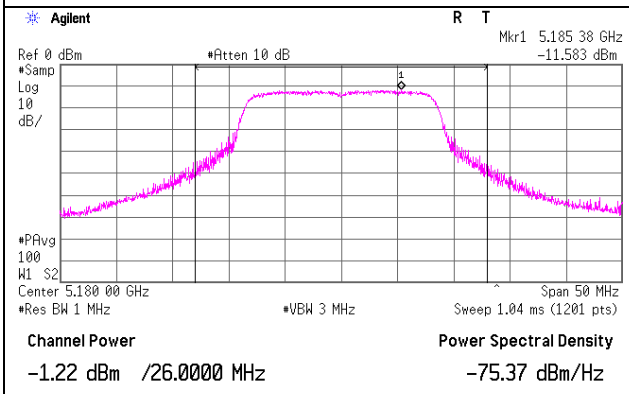
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

ON time was only measured using Gate function.

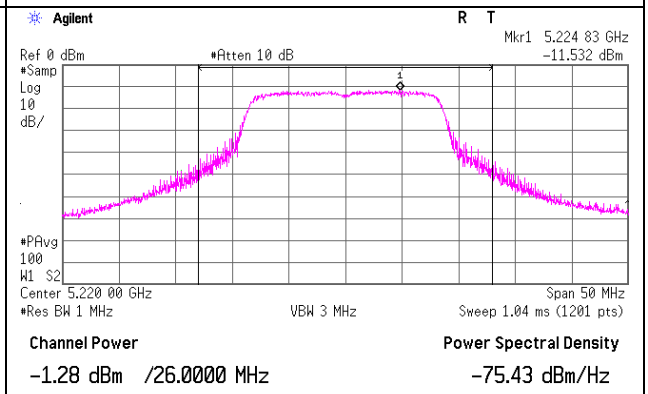
Maximum Peak Output Power & Peak Power Spectral Density

11a

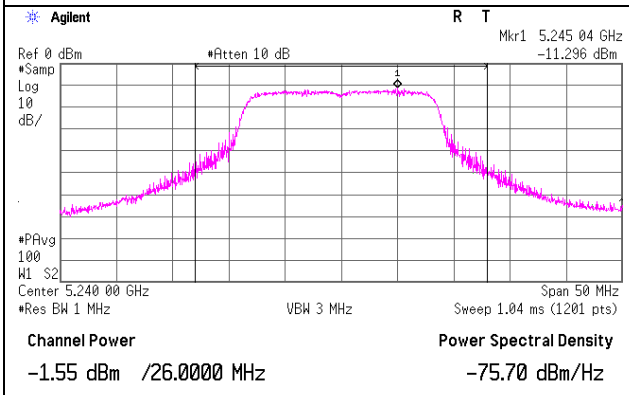
5180MHz



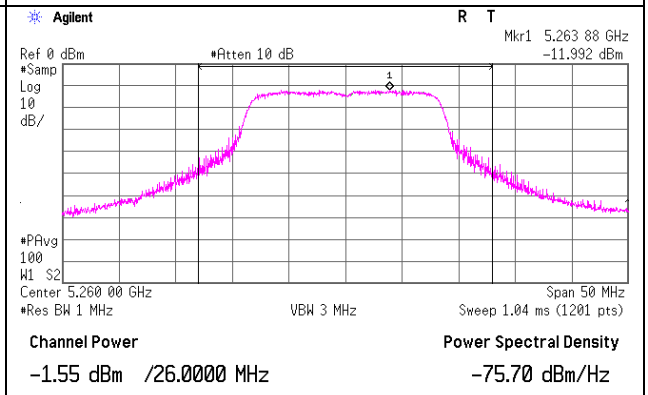
5220MHz



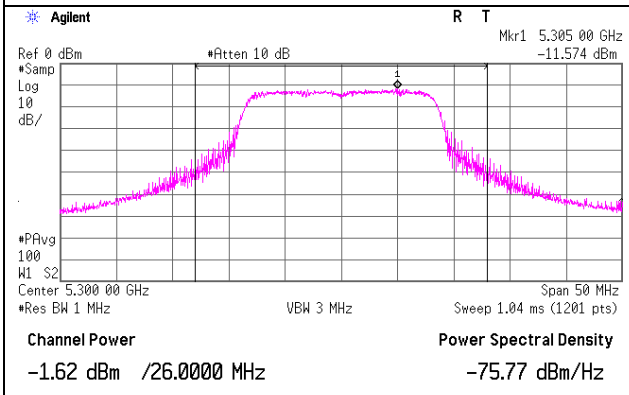
5240MHz



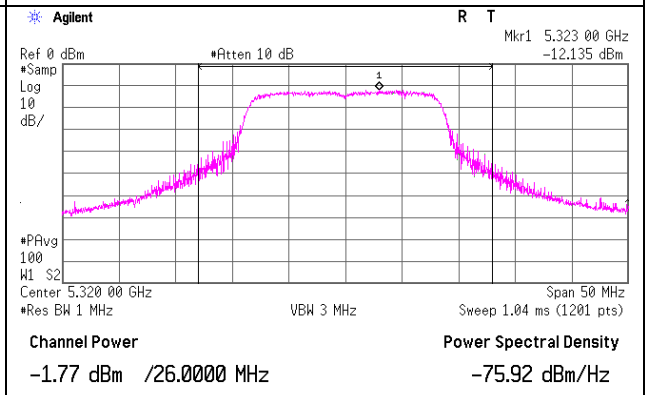
5260MHz



5300MHz



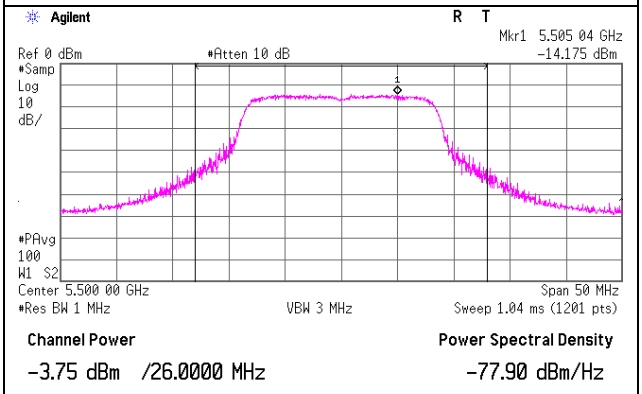
5320MHz



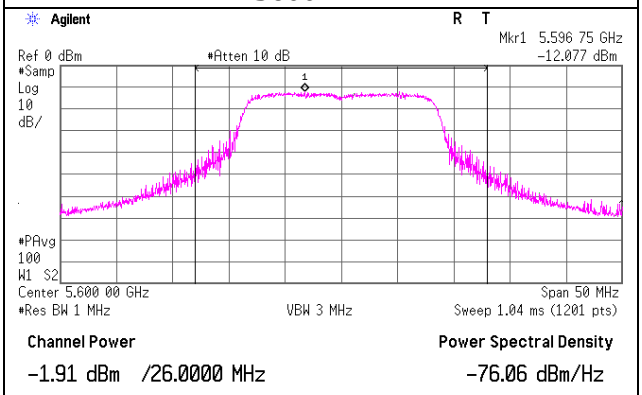
Maximum Peak Output Power & Peak Power Spectral Density

11a

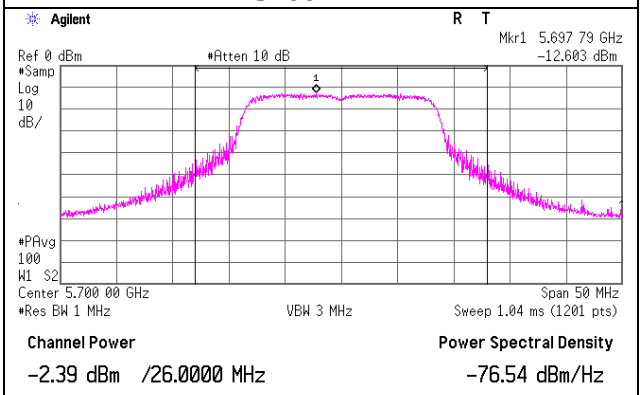
5500MHz



5600MHz



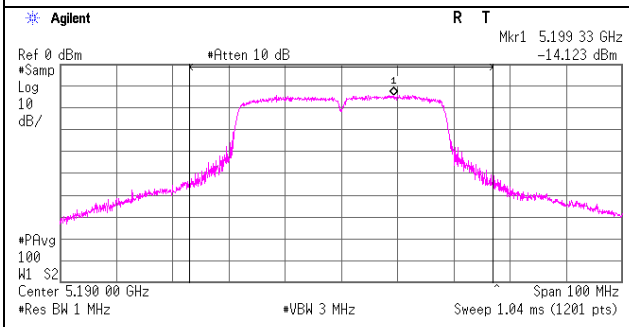
5700MHz



Maximum Peak Output Power & Peak Power Spectral Density

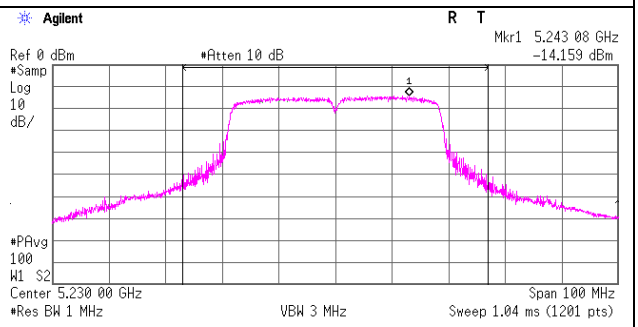
11n-40

5190MHz



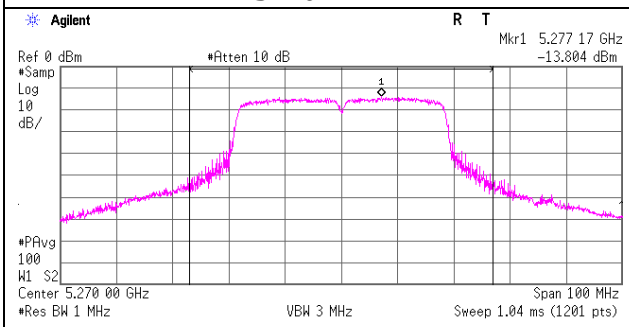
Channel Power	Power Spectral Density
-0.63 dBm /54.0000 MHz	-77.96 dBm/Hz

5230MHz



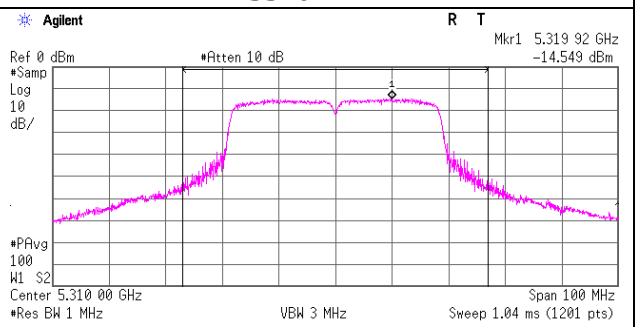
Channel Power	Power Spectral Density
-0.69 dBm /54.0000 MHz	-78.01 dBm/Hz

5270MHz



Channel Power	Power Spectral Density
-0.53 dBm /54.0000 MHz	-77.86 dBm/Hz

5310MHz

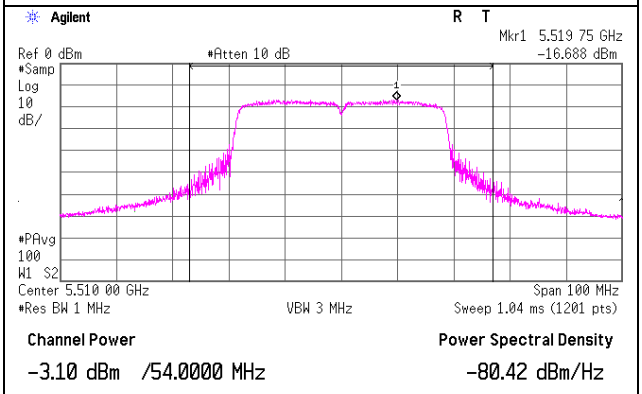


Channel Power	Power Spectral Density
-0.83 dBm /54.0000 MHz	-78.15 dBm/Hz

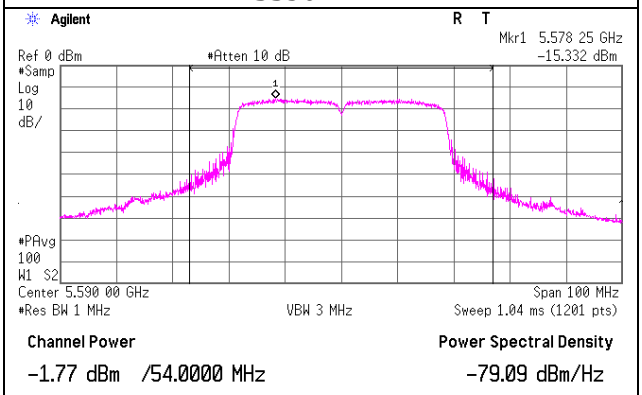
Maximum Peak Output Power & Peak Power Spectral Density

11n-40

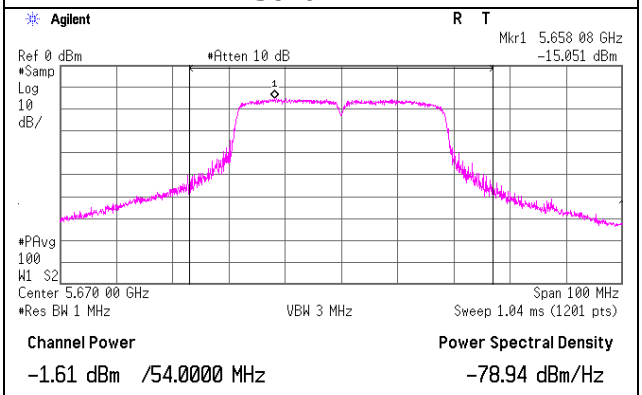
5510MHz



5590MHz



5670MHz



Maximum Peak Output Power
(Reference data)

Test place	Head Office EMC Lab. No.7 shielded room
Report No.	32BE0278-HO
Date	10/05/2011
Temperature/ Humidity	26deg. C / 54% RH
Engineer	Katsunori Okai
Mode	11a, 11n-20 Tx

5180MHz
11a

Data Rate [Mbps]	Reading [dBm]	Remark
6	-1.56	
9	-1.97	
12	-2.02	
18	-1.97	
24	-2.11	
36	-2.07	
48	-1.53	
54	-1.22	*

11n-20

MCS Number	Reading [dBm]	Remark
0	-1.58	
1	-2.10	
2	-1.91	
3	-1.31	
4	-1.31	
5	-1.30	
6	-1.23	*
7	-1.30	

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

ON time was only measured using Gate function.

Maximum Peak Output Power
(Reference data)

Test place	Head Office EMC Lab. No.7 shielded room
Report No.	32BE0278-HO
Date	10/05/2011
Temperature/ Humidity	26deg. C / 54% RH
Engineer	Katsunori Okai
Mode	11n-40 Tx

5190MHz

MCS Number	Reading [dBm]	Remark
0	-1.54	
1	-1.60	
2	-1.64	
3	-1.12	
4	-0.89	
5	-0.85	
6	-0.63	*
7	-0.71	

* Worst MCS
All comparison 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. No.3 Anechoic Chamber	
Report No.	32BE0278-HO	
Date	10/06/2011,	10/08/2011
Temperature/ Humidity	23deg. C / 61% RH	21deg. C / 60% RH
Engineer	Katsunori Okai (1-10GHz)	Katsunori Okai (10-40GHz)
Mode	11a Tx 5180MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5150.000	PK	52.1	32.5	6.1	35.9	54.8	73.9	19.1	Bandedge	
Hori	5350.000	PK	44.5	32.5	6.2	35.6	47.6	73.9	26.3	Bandedge	
Hori	10360.000	PK	44.8	39.3	8.8	36.1	56.8	68.2	11.4	Outside	
Hori	15540.000	PK	47.7	39.3	1.5	34.6	53.9	73.9	20.0	Inside	
Hori	5150.000	AV	37.3	32.5	6.1	35.9	40.0	53.9	13.9	Bandedge	
Hori	5350.000	AV	37.7	32.5	6.2	35.6	40.8	53.9	13.1	Bandedge	
Hori	10360.000	AV	35.9	39.3	8.8	36.1	47.9	68.2	20.3	Outside	
Hori	15540.000	AV	36.6	39.3	1.5	34.6	42.8	53.9	11.1	Inside	
Vert	5150.000	PK	55.6	32.5	6.1	35.9	58.3	73.9	15.6	Bandedge	
Vert	5350.000	PK	46.6	32.5	6.2	35.6	49.7	73.9	24.2	Bandedge	
Vert	10360.000	PK	46.8	39.3	8.8	36.1	58.8	68.2	9.4	Outside	
Vert	15540.000	PK	47.5	39.3	1.5	34.6	53.7	73.9	20.2	Inside	
Vert	5150.000	AV	38.6	32.5	6.1	35.9	41.3	53.9	12.6	Bandedge	
Vert	5350.000	AV	39.4	32.5	6.2	35.6	42.5	53.9	11.4	Bandedge	
Vert	10360.000	AV	35.9	39.3	8.8	36.1	47.9	68.2	20.3	Outside	
Vert	15540.000	AV	36.3	39.3	1.5	34.6	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-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber	
Report No.	32BE0278-HO	
Date	10/07/2011,	10/08/2011
Temperature/ Humidity	23deg. C / 61% RH	21deg. C / 60 % RH
Engineer	Katsunori Okai	Katsunori Okai
	(1-10GHz)	(10-40GHz)
Mode	11a Tx 5240MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5350.000	PK	48.5	32.5	6.2	35.6	51.6	73.9	22.3	Bandedge	
Hori	10480.000	PK	49.6	39.2	8.7	35.8	61.7	68.2	6.5	Outside	
Hori	15720.000	PK	45.3	38.6	1.6	35.0	50.5	73.9	23.4	Inside	
Hori	5350.000	AV	39.4	32.5	6.2	35.6	42.5	53.9	11.4	Bandedge	
Hori	10480.000	AV	36.3	39.2	8.7	35.8	48.4	68.2	19.8	Outside	
Hori	15720.000	AV	36.2	38.6	1.6	35.0	41.4	53.9	12.5	Inside	
Vert	5350.000	PK	47.2	32.5	6.2	35.6	50.3	73.9	23.6	Bandedge	
Vert	10480.000	PK	48.9	39.2	8.7	35.8	61.0	68.2	7.2	Outside	
Vert	15720.000	PK	47.8	38.6	1.6	35.0	53.0	73.9	20.9	Inside	
Vert	5350.000	AV	37.6	32.5	6.2	35.6	40.7	53.9	13.2	Bandedge	
Vert	10480.000	AV	36.8	39.2	8.7	35.8	48.9	68.2	19.3	Outside	
Vert	15720.000	AV	36.3	38.6	1.6	35.0	41.5	53.9	12.4	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-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber	
Report No.	32BE0278-HO	
Date	10/07/2011	10/08/2011
Temperature/ Humidity	23deg. C / 61% RH	21deg. C / 60% RH
Engineer	Katsunori Okai	Katsunori Okai
	(1-10GHz)	(10-40GHz)
Mode	11a Tx 5320MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5350.000	PK	49.8	32.5	6.2	35.6	52.9	73.9	21.0	Bandedge	
Hori	10640.000	PK	45.3	39.4	8.8	35.8	57.7	73.9	16.2	Inside	
Hori	15960.000	PK	46.8	37.8	1.7	35.4	50.9	73.9	23.0	Inside	
Hori	5350.000	AV	35.3	32.5	6.2	35.6	38.4	53.9	15.5	Bandedge	
Hori	10640.000	AV	33.0	39.4	8.8	35.8	45.4	53.9	8.5	Inside	
Hori	15960.000	AV	35.5	37.8	1.7	35.4	39.6	53.9	14.3	Inside	
Vert	5350.000	PK	50.7	32.5	6.2	35.6	53.8	73.9	20.1	Bandedge	
Vert	10640.000	PK	43.2	39.4	8.8	35.8	55.6	73.9	18.3	Inside	
Vert	15960.000	PK	47.1	37.8	1.7	35.4	51.2	73.9	22.7	Inside	
Vert	5350.000	AV	38.0	32.5	6.2	35.6	41.1	53.9	12.8	Bandedge	
Vert	10640.000	AV	33.0	39.4	8.8	35.8	45.4	53.9	8.5	Inside	
Vert	15960.000	AV	35.6	37.8	1.7	35.4	39.7	53.9	14.2	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-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber	
Report No.	32BE0278-HO	
Date	10/06/2011	10/08/2011
Temperature/ Humidity	23deg. C / 61% RH	21deg. C / 60% RH
Engineer	Katsunori Okai	Katsunori Okai
	(1-10GHz)	(10-40GHz)
Mode	11a Tx 5500MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5372.800	PK	50.6	32.5	6.2	35.6	53.7	73.9	20.2	Inside	
Hori	5460.000	PK	53.5	32.5	6.3	35.5	56.8	73.9	17.1	Inside	
Hori	5470.000	PK	55.6	32.5	6.3	35.5	58.9	68.2	9.3	Outside	
Hori	11000.000	PK	44.5	39.7	9.1	36.0	57.3	73.9	16.6	Inside	
Hori	16500.000	PK	45.2	38.9	1.8	35.2	50.7	68.2	17.5	Outside	
Hori	5372.800	AV	37.5	32.5	6.2	35.6	40.6	53.9	13.3	Inside	
Hori	5460.000	AV	39.1	32.5	6.3	35.5	42.4	53.9	11.5	Inside	
Hori	5470.000	AV	41.3	32.5	6.3	35.5	44.6	68.2	23.6	Outside	
Hori	11000.000	AV	34.9	39.7	9.1	36.0	47.7	53.9	6.2	Inside	
Hori	16500.000	AV	35.2	38.9	1.8	35.2	40.7	68.2	27.5	Outside	
Vert	5372.800	PK	53.0	32.5	6.2	35.6	56.1	73.9	17.8	Inside	
Vert	5460.000	PK	54.0	32.5	6.3	35.5	57.3	73.9	16.6	Inside	
Vert	5470.000	PK	56.5	32.5	6.3	35.5	59.8	68.2	8.4	Outside	
Vert	11000.000	PK	45.9	39.7	9.1	36.0	58.7	73.9	15.2	Inside	
Vert	16500.000	PK	46.3	38.9	1.8	35.2	51.8	68.2	16.4	Outside	
Vert	5372.800	AV	39.0	32.5	6.2	35.6	42.1	53.9	11.8	Inside	
Vert	5460.000	AV	40.0	32.5	6.3	35.5	43.3	53.9	10.6	Inside	
Vert	5470.000	AV	43.5	32.5	6.3	35.5	46.8	68.2	21.4	Outside	
Vert	11000.000	AV	33.4	39.7	9.1	36.0	46.2	53.9	7.7	Inside	
Vert	16500.000	AV	35.2	38.9	1.8	35.2	40.7	68.2	27.5	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-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber	
Report No.	32BE0278-HO	
Date	10/07/2011	10/08/2011
Temperature/ Humidity	21deg. C / 64% RH	21deg. C / 60% RH
Engineer	Katsunori Okai	Katsunori Okai
	(1-10GHz)	(10-40GHz)
Mode	11a Tx 5600MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5470.000	PK	43.1	32.5	6.3	35.5	46.4	68.2	21.8	Outside	
Hori	11200.000	PK	43.2	39.5	9.1	36.1	55.7	73.9	18.2	Inside	
Hori	16800.000	PK	46.5	39.6	1.9	35.4	52.6	68.2	15.6	Outside	
Hori	5470.000	AV	37.4	32.5	6.3	35.5	40.7	68.2	27.5	Outside	
Hori	11200.000	AV	34.3	39.5	9.1	36.1	46.8	53.9	7.1	Inside	
Hori	16800.000	AV	35.2	39.6	1.9	35.4	41.3	68.2	26.9	Outside	
Vert	5470.000	PK	45.7	32.5	6.3	35.5	49.0	68.2	19.2	Outside	
Vert	11200.000	PK	46.2	39.5	9.1	36.1	58.7	73.9	15.2	Inside	
Vert	16800.000	PK	47.1	39.6	1.9	35.4	53.2	68.2	15.0	Outside	
Vert	5470.000	AV	36.6	32.5	6.3	35.5	39.9	68.2	28.3	Outside	
Vert	11200.000	AV	35.0	39.5	9.1	36.1	47.5	53.9	6.4	Inside	
Vert	16800.000	AV	35.2	39.6	1.9	35.4	41.3	68.2	26.9	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-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber	
Report No.	32BE0278-HO	
Date	10/07/2011	10/08/2011
Temperature/ Humidity	23deg. C / 61% RH	21deg. C / 60% RH
Engineer	Katsunori Okai	Katsunori Okai
	(1-10GHz)	(10-40GHz)
Mode	11a Tx 5700MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5339.167	PK	48.2	32.5	6.2	35.6	51.3	68.2	16.9	Outside	
Hori	5725.000	PK	58.5	32.9	6.5	35.6	62.3	68.2	5.9	Outside	
Hori	11400.000	PK	47.0	39.3	9.7	36.2	59.8	73.9	14.1	Inside	
Hori	17100.000	PK	47.2	40.8	2.0	35.4	54.6	68.2	13.6	Outside	
Hori	5339.167	AV	37.9	32.5	6.2	35.6	41.0	68.2	27.2	Outside	
Hori	5725.000	AV	40.8	32.9	6.5	35.6	44.6	68.2	23.6	Outside	
Hori	11400.000	AV	36.1	39.3	9.7	36.2	48.9	53.9	5.0	Inside	
Hori	17100.000	AV	36.0	40.8	2.0	35.4	43.4	68.2	24.8	Outside	
Vert	5339.167	PK	52.7	32.5	6.2	35.6	55.8	68.2	12.4	Outside	
Vert	5725.000	PK	61.5	32.9	6.5	35.6	65.3	68.2	2.9	Outside	
Vert	11400.000	PK	47.3	39.3	9.7	36.2	59.6	73.9	14.3	Inside	
Vert	17100.000	PK	47.6	40.8	2.0	35.4	55.0	68.2	13.2	Outside	
Vert	5339.167	AV	41.4	32.5	6.2	35.6	44.5	68.2	23.7	Outside	
Vert	5725.000	AV	43.7	32.9	6.5	35.6	47.5	68.2	20.7	Outside	
Vert	11400.000	AV	36.1	39.3	9.7	36.2	48.4	53.9	5.5	Inside	
Vert	17100.000	AV	36.1	40.8	2.0	35.4	43.5	68.2	24.7	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-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber		
Report No.	32BE0278-HO		
Date	10/06/2011	10/08/2011	10/10/2011
Temperature/ Humidity	24deg. C / 54% RH	24deg. C / 54% RH	24deg. C / 54% RH
Engineer	Katsunori Okai (1-10GHz)	Katsunori Okai (10-40GHz)	Katsunori Okai (30-1000MHz)
Mode	11n-40 Tx 5190MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	36.370	QP	40.5	15.7	7.0	28.1	35.1	40.0	4.9	Outside	
Hori	41.361	QP	33.2	14.3	7.1	27.9	26.7	40.0	13.3	Outside	
Hori	360.001	QP	34.1	16.4	10.0	27.7	32.8	46.0	13.2	Outside	
Hori	373.342	QP	29.6	16.8	10.1	27.8	28.7	46.0	17.3	Outside	
Hori	413.132	QP	21.0	17.7	10.4	28.0	21.1	46.0	24.9	Outside	
Hori	432.033	QP	31.0	17.7	10.5	28.3	30.9	46.0	15.1	Outside	
Hori	5150.000	PK	58.5	32.5	6.1	35.9	61.2	73.9	12.7	Bandedge	
Hori	5350.000	PK	47.6	32.5	6.2	35.6	50.7	73.9	23.2	Bandedge	
Hori	10380.000	PK	46.1	39.3	8.8	36.1	58.1	68.2	10.1	Outside	
Hori	15570.000	PK	47.2	39.2	1.5	34.7	53.2	73.9	20.7	Inside	
Hori	5150.000	AV	36.5	32.5	6.1	35.9	39.2	53.9	14.7	Bandedge	
Hori	5350.000	AV	36.4	32.5	6.2	35.6	39.5	53.9	14.4	Bandedge	
Hori	10380.000	AV	33.6	39.3	8.8	36.1	45.6	68.2	22.6	Outside	
Hori	15570.000	AV	36.4	39.2	1.5	34.7	42.4	53.9	11.5	Inside	
Vert	37.249	QP	43.5	15.7	7.0	28.1	37.9	40.0	2.1	Outside	
Vert	43.341	QP	43.0	14.3	7.1	27.9	35.8	40.0	4.2	Outside	
Vert	360.000	QP	34.0	16.4	10.0	27.7	32.7	46.0	13.3	Outside	
Vert	373.343	QP	30.4	16.8	10.1	27.8	29.5	46.0	16.5	Outside	
Vert	413.383	QP	22.9	17.7	10.4	28.0	23.0	46.0	23.0	Outside	
Vert	432.033	QP	27.7	17.7	10.5	28.3	27.6	46.0	18.4	Outside	
Vert	5150.000	PK	60.0	32.5	6.1	35.9	62.7	73.9	11.2	Bandedge	
Vert	5350.000	PK	54.9	32.5	6.2	35.6	58.0	73.9	15.9	Bandedge	
Vert	10380.000	PK	44.1	39.3	8.8	36.1	56.1	68.2	12.1	Outside	
Vert	15570.000	PK	47.6	39.2	1.5	34.7	53.6	73.9	20.3	Inside	
Vert	5150.000	AV	38.0	32.5	6.1	35.9	40.7	53.9	13.2	Bandedge	
Vert	5350.000	AV	38.2	32.5	6.2	35.6	41.3	53.9	12.6	Bandedge	
Vert	10380.000	AV	33.5	39.3	8.8	36.1	45.5	68.2	22.7	Outside	
Vert	15570.000	AV	36.4	39.2	1.5	34.7	42.4	53.9	11.5	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-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber	
Report No.	32BE0278-HO	
Date	10/07/2011	10/08/2011
Temperature/ Humidity	21deg. C / 64% RH	21deg. C / 60% RH
Engineer	Katsunori Okai	Katsunori Okai
	(1-10GHz)	(10-40GHz)
Mode	11n-40 Tx 5230MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5350.000	PK	52.2	32.5	6.2	35.6	55.3	73.9	18.6	Bandedge	
Hori	10460.000	PK	47.1	39.5	8.7	35.9	59.2	68.2	9.0	Outside	
Hori	15690.000	PK	47.3	38.7	1.5	34.9	52.6	73.9	21.3	Inside	
Hori	5350.000	AV	37.8	32.5	6.2	35.6	40.9	53.9	13.0	Bandedge	
Hori	10460.000	AV	35.5	39.5	8.7	35.9	47.6	68.2	20.6	Outside	
Hori	15690.000	AV	36.4	38.7	1.5	34.9	41.7	53.9	12.2	Inside	
Vert	5350.000	PK	53.6	32.5	6.2	35.6	56.7	73.9	17.2	Bandedge	
Vert	10460.000	PK	46.3	39.5	8.7	35.9	58.4	68.2	9.8	Outside	
Vert	15690.000	PK	46.7	38.7	1.5	34.9	52.0	73.9	21.9	Inside	
Vert	5350.000	AV	38.2	32.5	6.2	35.6	41.3	53.9	12.6	Bandedge	
Vert	10460.000	AV	35.5	39.5	8.7	35.9	47.6	68.2	20.6	Outside	
Vert	15690.000	AV	36.3	38.7	1.5	34.9	41.6	53.9	12.3	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-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber	
Report No.	32BE0278-HO	
Date	10/06/2011	10/08/2011
Temperature/ Humidity	23deg. C / 61% RH	21deg. C / 60% RH
Engineer	Katsunori Okai	Katsunori Okai
	(1-10GHz)	(10-40GHz)
Mode	11n-40 Tx 5310MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5350.000	PK	59.7	32.5	6.2	35.6	62.8	73.9	11.1	Bandedge	
Hori	10620.000	PK	46.1	39.3	8.8	35.8	58.4	73.9	15.5	Inside	
Hori	15930.000	PK	47.0	37.9	1.7	35.4	51.2	73.9	22.7	Inside	
Hori	5350.000	AV	39.1	32.5	6.2	35.6	42.2	53.9	11.7	Bandedge	
Hori	10620.000	AV	33.3	39.3	8.8	35.8	45.6	53.9	8.3	Inside	
Hori	15930.000	AV	35.6	37.9	1.7	35.4	39.8	53.9	14.1	Inside	
Vert	5350.000	PK	59.9	32.5	6.2	35.6	63.0	73.9	10.9	Bandedge	
Vert	10620.000	PK	44.2	39.3	8.8	35.8	56.5	73.9	17.4	Inside	
Vert	15930.000	PK	46.5	37.9	1.7	35.4	50.7	73.9	23.2	Inside	
Vert	5350.000	AV	41.8	32.5	6.2	35.6	44.9	53.9	9.0	Bandedge	
Vert	10620.000	AV	33.3	39.3	8.8	35.8	45.6	53.9	8.3	Inside	
Vert	15930.000	AV	35.6	37.9	1.7	35.4	39.8	53.9	14.1	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-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber	
Report No.	32BE0278-HO	
Date	10/07/2011	10/08/2011
Temperature/ Humidity	21deg. C / 64% RH	21deg. C / 60% RH
Engineer	Katsunori Okai	Katsunori Okai
	(1-10GHz)	(10-40GHz)
Mode	11n-40 Tx 5510MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5460.000	PK	59.1	32.5	6.3	35.5	62.4	73.9	11.5	Inside	
Hori	5470.000	PK	59.7	32.5	6.3	35.5	63.0	68.2	5.2	Outside	
Hori	11020.000	PK	47.4	39.7	9.1	36.0	60.2	73.9	13.7	Inside	
Hori	16530.000	PK	46.5	39.0	1.8	35.2	52.1	68.2	16.1	Outside	
Hori	5460.000	AV	38.3	32.5	6.3	35.5	41.6	53.9	12.3	Inside	
Hori	5470.000	AV	42.8	32.5	6.3	35.5	46.1	68.2	22.1	Outside	
Hori	11020.000	AV	37.0	39.7	9.1	36.0	49.8	53.9	4.1	Inside	
Hori	16530.000	AV	36.0	39.0	1.8	35.2	41.6	68.2	26.6	Outside	
Vert	5460.000	PK	59.2	32.5	6.3	35.5	62.5	73.9	11.4	Inside	
Vert	5470.000	PK	62.0	32.5	6.3	35.5	65.3	68.2	2.9	Outside	
Vert	11020.000	PK	44.8	39.7	9.1	36.0	57.6	73.9	16.3	Inside	
Vert	16530.000	PK	46.3	39.0	1.8	35.2	51.9	68.2	16.3	Outside	
Vert	5460.000	AV	41.4	32.5	6.3	35.5	44.7	53.9	9.2	Inside	
Vert	5470.000	AV	44.4	32.5	6.3	35.5	47.7	68.2	20.5	Outside	
Vert	11020.000	AV	36.9	39.7	9.1	36.0	49.7	53.9	4.2	Inside	
Vert	16530.000	AV	36.0	39.0	1.8	35.2	41.6	68.2	26.6	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-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber	
Report No.	32BE0278-HO	
Date	10/07/2011	10/08/2011
Temperature/ Humidity	21deg. C / 64% RH	21deg. C / 60% RH
Engineer	Katsunori Okai	Katsunori Okai
	(1-10GHz)	(10-40GHz)
Mode	11n-40 Tx 5590MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5470.000	PK	52.7	32.5	6.3	35.5	56.0	68.2	12.2	Outside	
Hori	11180.000	PK	45.5	39.5	9.1	36.1	58.0	73.9	15.9	Inside	
Hori	16770.000	PK	46.0	39.5	1.9	35.5	52.1	68.2	16.1	Outside	
Hori	5470.000	AV	36.4	32.5	6.3	35.5	39.7	68.2	28.5	Outside	
Hori	11180.000	AV	34.7	39.5	9.1	36.1	47.2	53.9	6.7	Inside	
Hori	16770.000	AV	35.6	39.5	1.9	35.5	41.7	68.2	26.5	Outside	
Vert	5470.000	PK	57.2	32.5	6.3	35.5	60.5	68.2	7.7	Outside	
Vert	11180.000	PK	46.2	39.5	9.1	36.1	58.7	73.9	15.2	Inside	
Vert	16770.000	PK	45.4	39.5	1.9	35.5	51.5	68.2	16.7	Outside	
Vert	5470.000	AV	38.4	32.5	6.3	35.5	41.7	68.2	26.5	Outside	
Vert	11180.000	AV	34.7	39.5	9.1	36.1	47.2	53.9	6.7	Inside	
Vert	16770.000	AV	35.5	39.5	1.9	35.5	41.6	68.2	26.6	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-40GHz 20log(3.0m/1.0m)= 9.5dB

Radiated Spurious Emission

Test place	Head Office EMC Lab. No.3 Anechoic Chamber	
Report No.	32BE0278-HO	
Date	10/07/2011	10/08/2011
Temperature/ Humidity	21deg. C / 64% RH	21deg. C / 60% RH
Engineer	Katsunori Okai	
	(1-10GHz)	(10-40GHz)
Mode	11n-40 Tx 5670MHz	

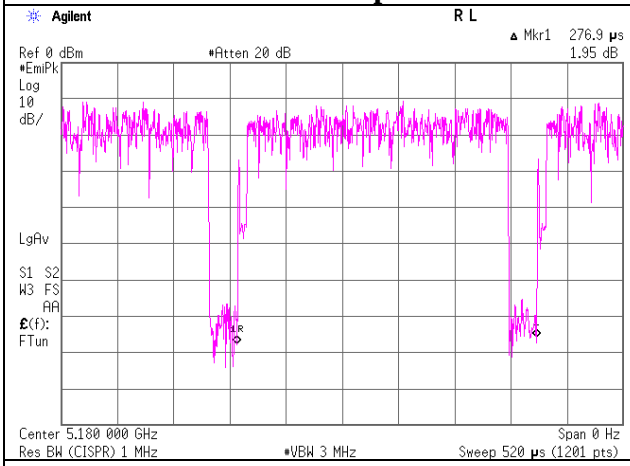
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5347.000	PK	43.5	32.5	6.2	35.6	46.6	68.2	21.6	Outside	
Hori	5725.000	PK	57.0	32.9	6.5	35.6	60.8	68.2	7.4	Outside	
Hori	11340.000	PK	46.1	39.3	9.2	36.1	58.5	73.9	15.4	Inside	
Hori	17010.000	PK	45.5	40.1	1.9	35.5	52.0	68.2	16.2	Outside	
Hori	5347.000	AV	37.0	32.5	6.2	35.6	40.1	68.2	28.1	Outside	
Hori	5725.000	AV	37.3	32.9	6.5	35.6	41.1	68.2	27.1	Outside	
Hori	11340.000	AV	33.7	39.3	9.2	36.1	46.1	53.9	7.8	Inside	
Hori	17010.000	AV	35.5	40.1	1.9	35.5	42.0	68.2	26.2	Outside	
Vert	5347.000	PK	49.0	32.5	6.2	35.6	52.1	68.2	16.1	Outside	
Vert	5725.000	PK	59.5	32.9	6.5	35.6	63.3	68.2	4.9	Outside	
Vert	11340.000	PK	44.2	39.3	9.2	36.1	56.6	73.9	17.3	Inside	
Vert	17010.000	PK	46.0	40.1	1.9	35.5	52.5	68.2	15.7	Outside	
Vert	5347.000	AV	38.0	32.5	6.2	35.6	41.1	68.2	27.1	Outside	
Vert	5725.000	AV	39.2	32.9	6.5	35.6	43.0	68.2	25.2	Outside	
Vert	11340.000	AV	33.7	39.3	9.2	36.1	46.1	53.9	7.8	Inside	
Vert	17010.000	AV	35.6	40.1	1.9	35.5	42.1	68.2	26.1	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).

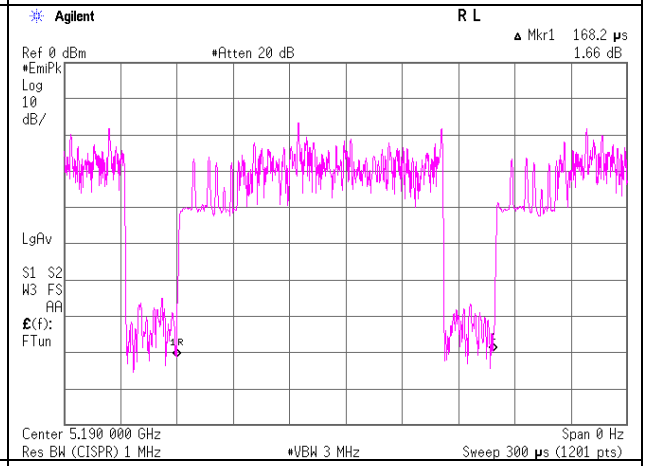
Distance factor: 10GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

VBW (AV) Calculation

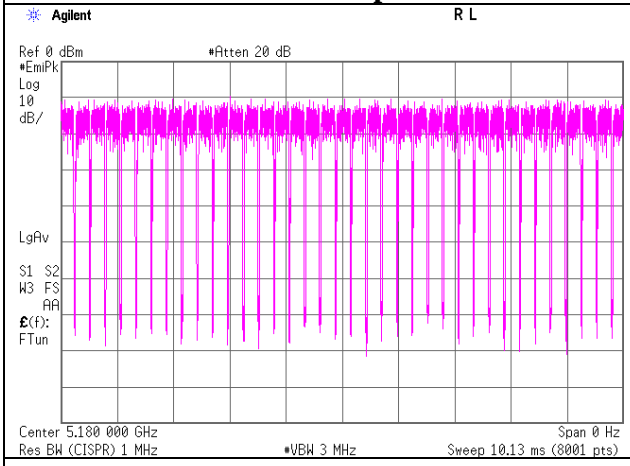
11a 54Mbps



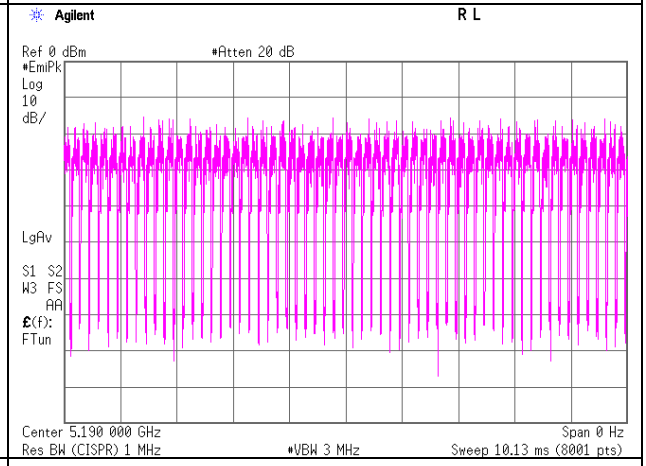
11n-40 MCS6



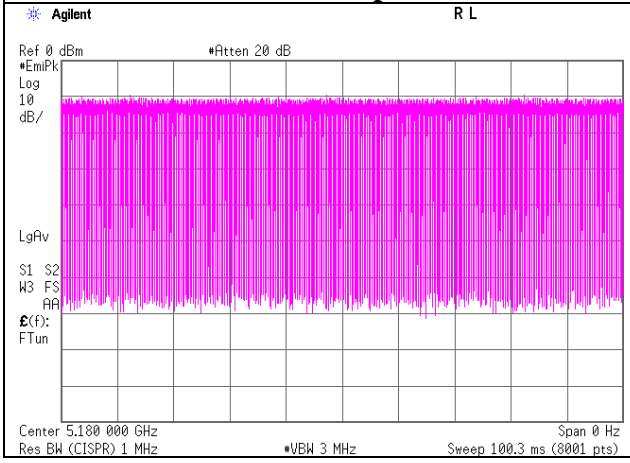
11a 54Mbps



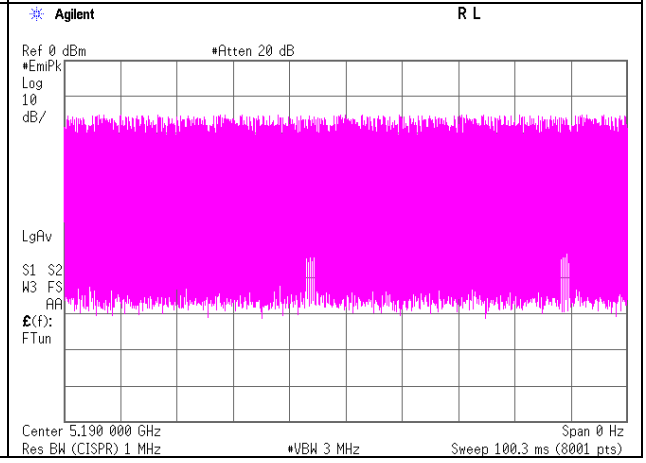
11n-40 MCS6



11a 54Mbps



11n-40 MCS6

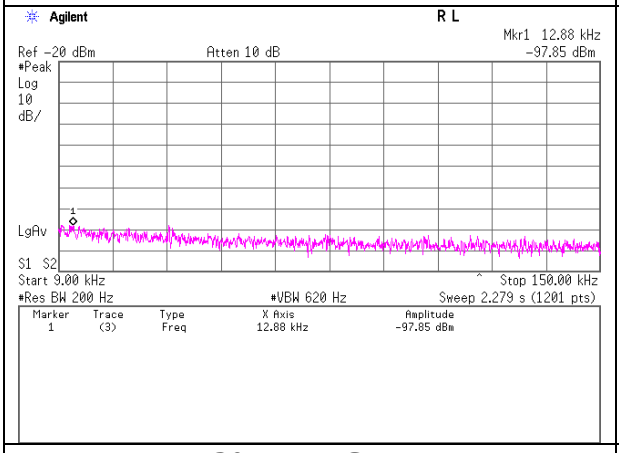


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

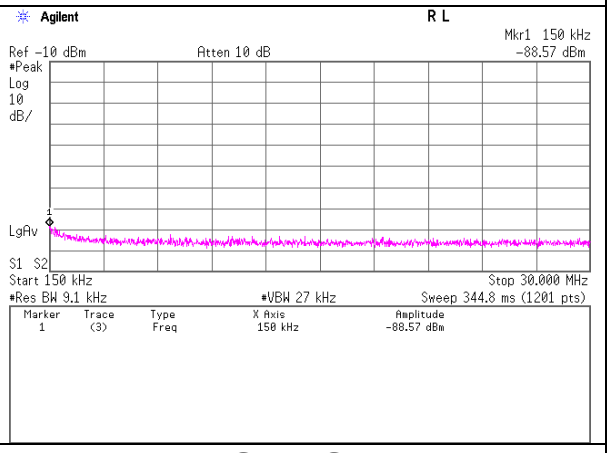
Conducted Spurious Emission

11a Tx 5180MHz

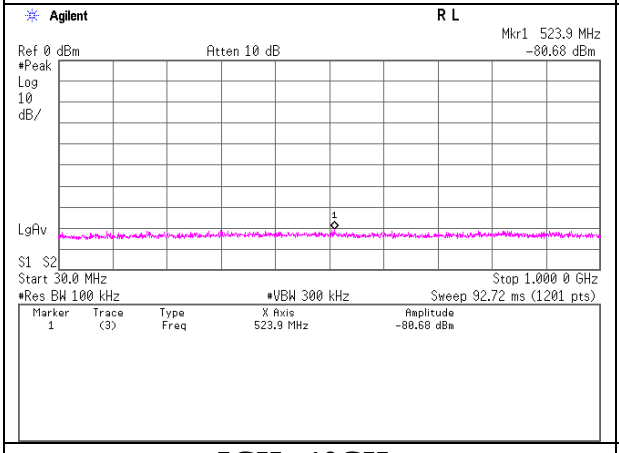
9kHz-150kHz



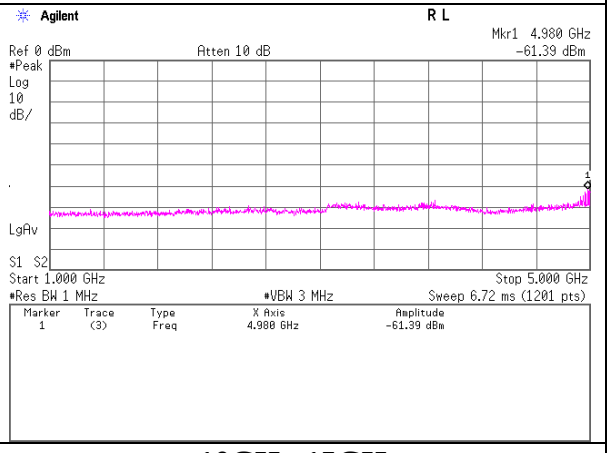
150kHz-30MHz



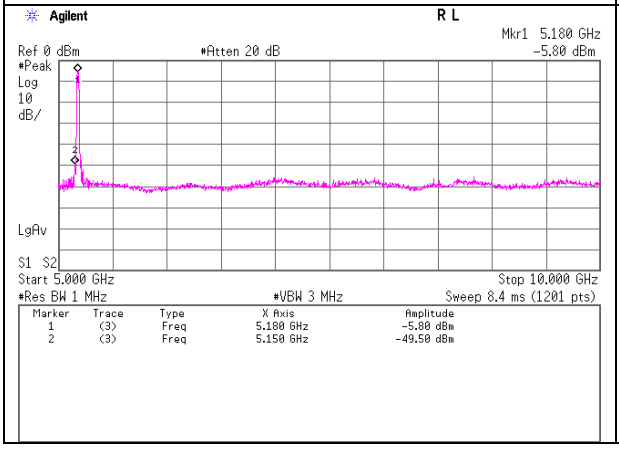
30MHz-1GHz



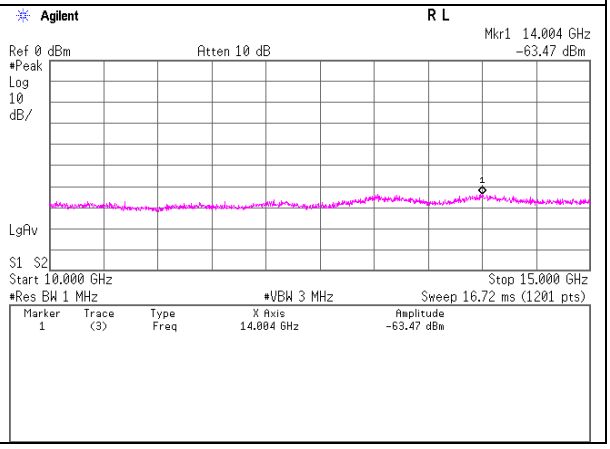
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz

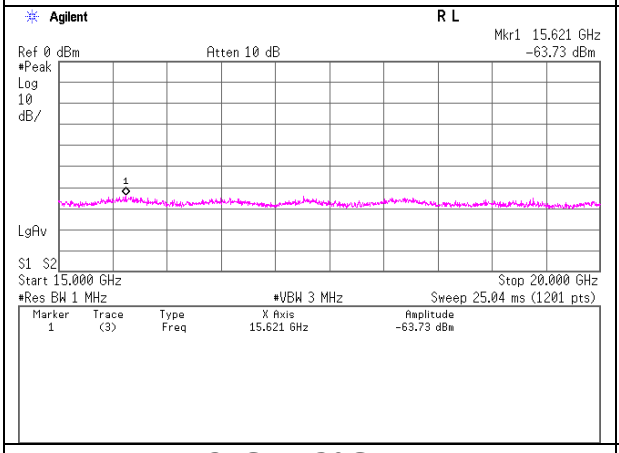


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

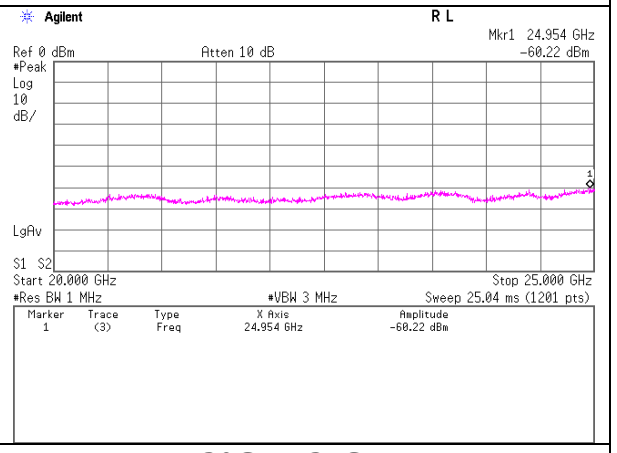
Conducted Spurious Emission

11a Tx 5180MHz

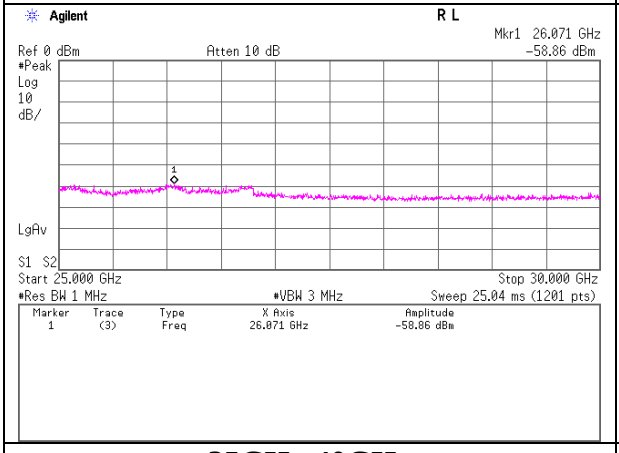
15GHz-20GHz



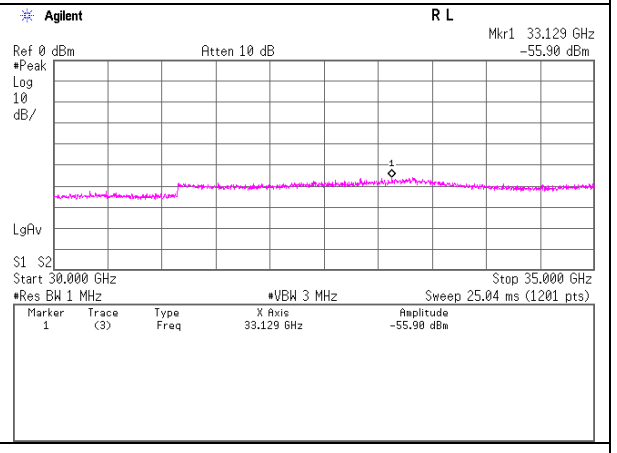
20GHz-25GHz



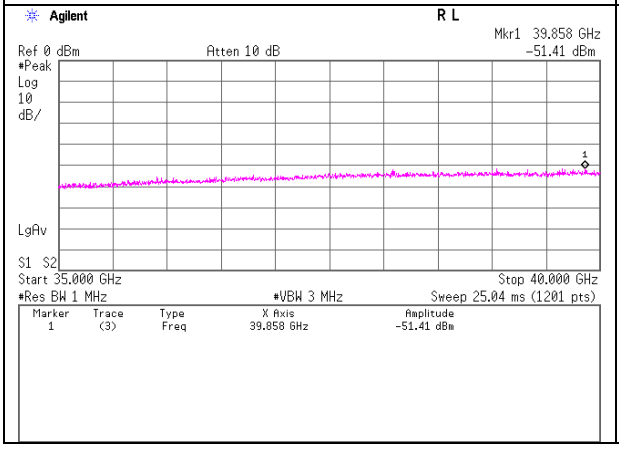
25GHz-30GHz



30GHz-35GHz



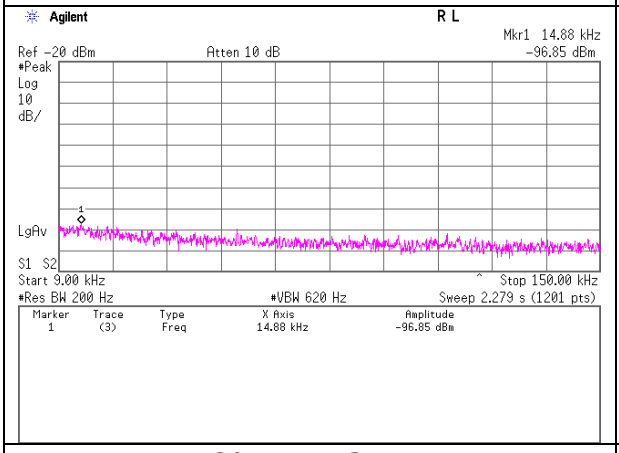
35GHz-40GHz



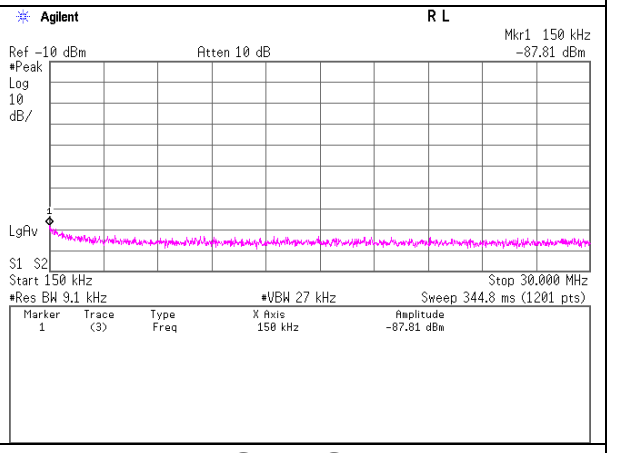
Conducted Spurious Emission

11a Tx 5220MHz

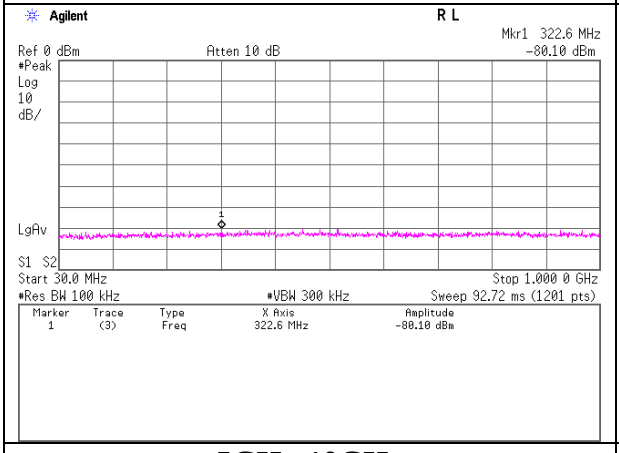
9kHz-150kHz



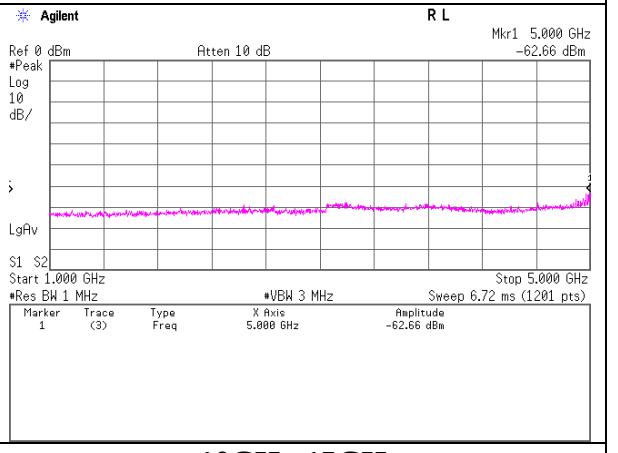
150kHz-30MHz



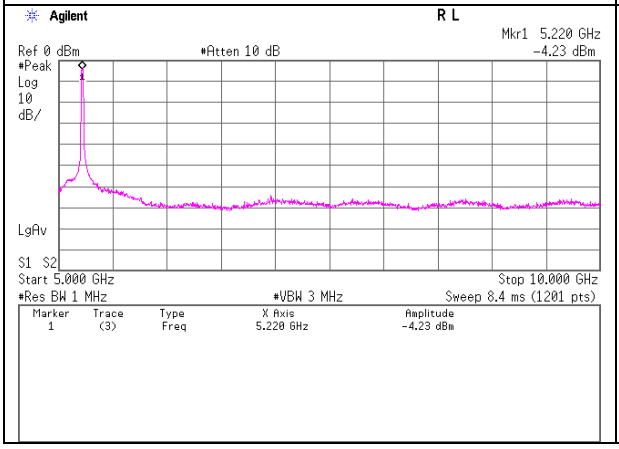
30MHz-1GHz



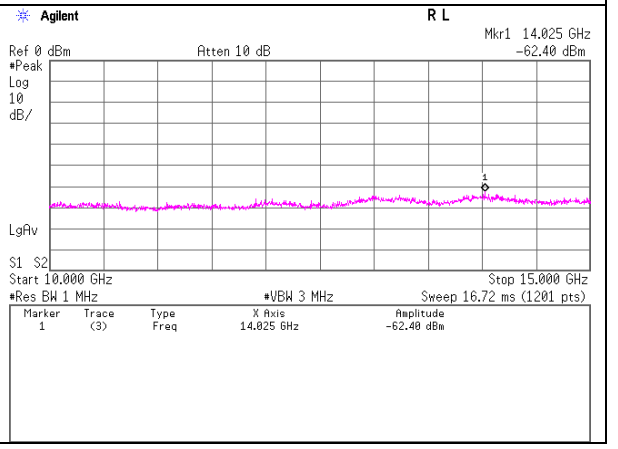
1GHz-5GHz



5GHz-10GHz



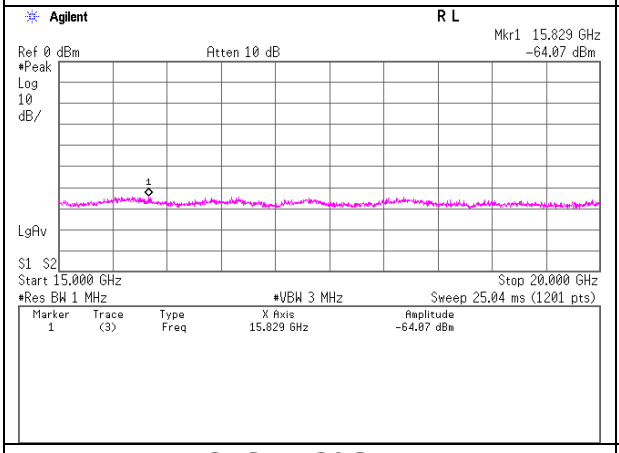
10GHz-15GHz



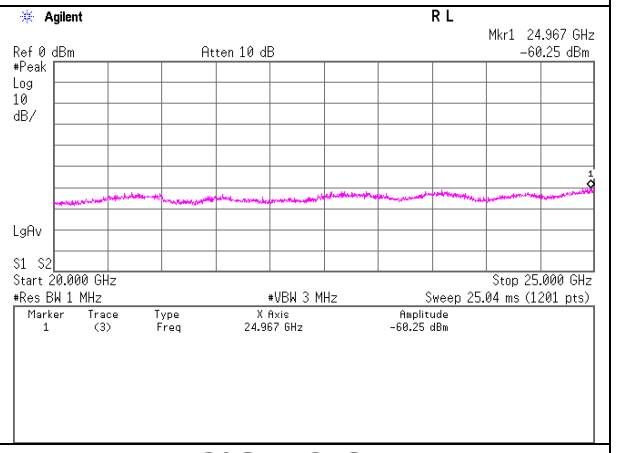
Conducted Spurious Emission

11a Tx 5220MHz

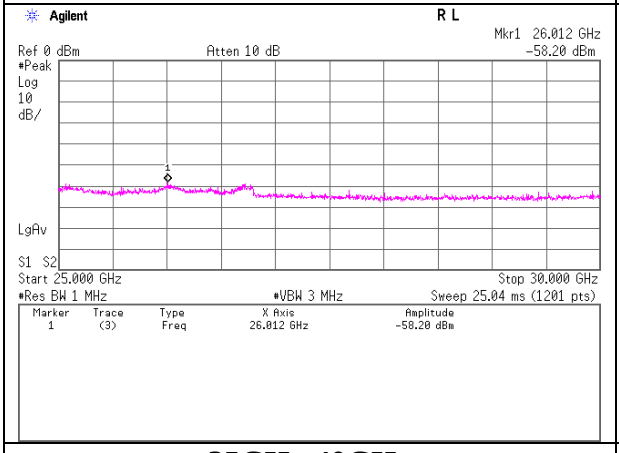
15GHz-20GHz



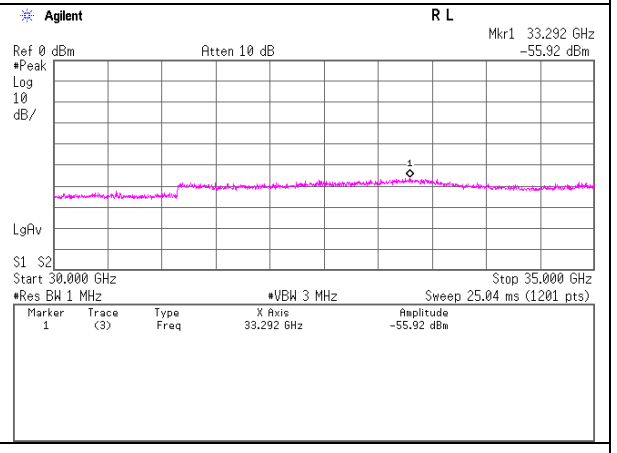
20GHz-25GHz



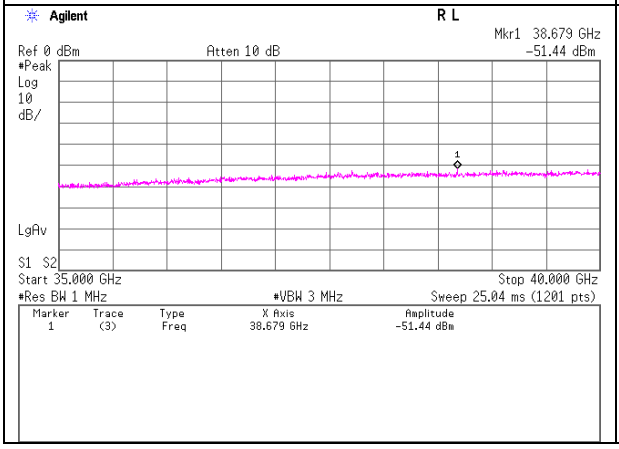
25GHz-30GHz



30GHz-35GHz



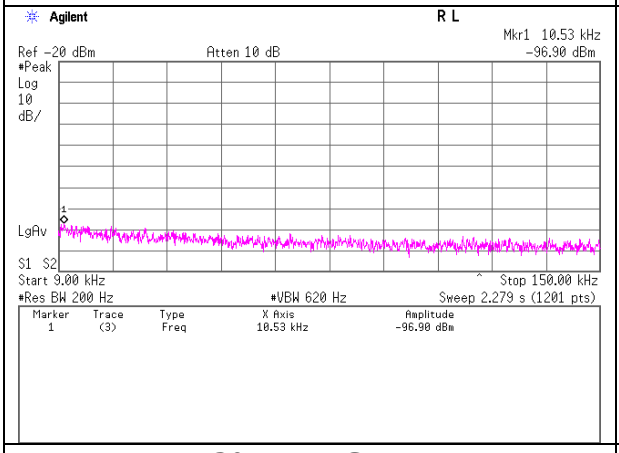
35GHz-40GHz



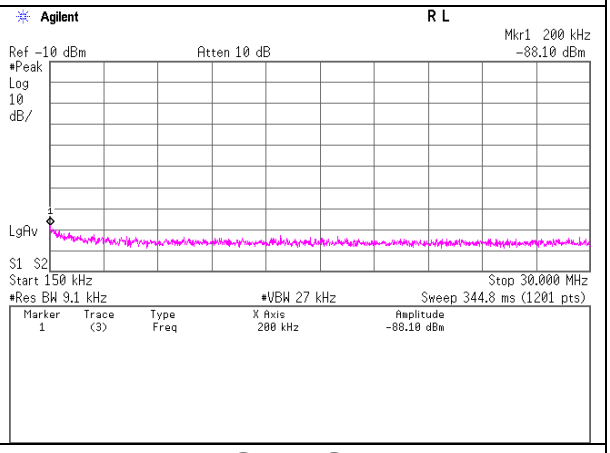
Conducted Spurious Emission

11a Tx 5240MHz

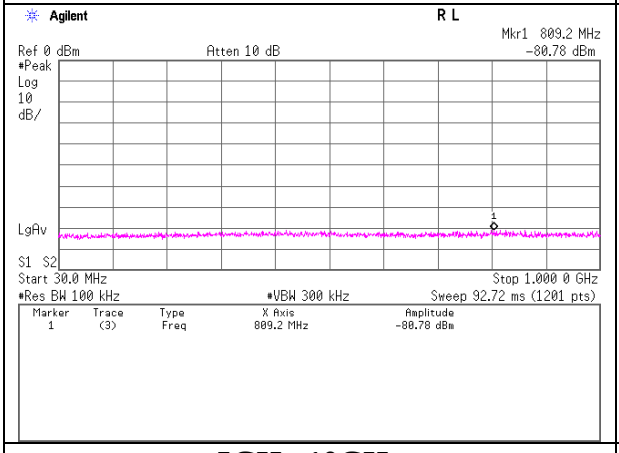
9kHz-150kHz



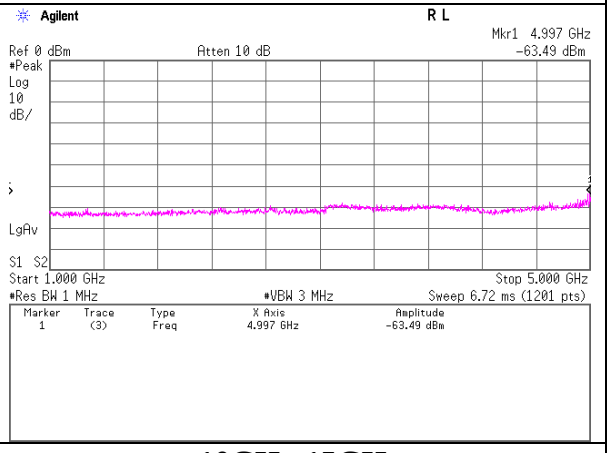
150kHz-30MHz



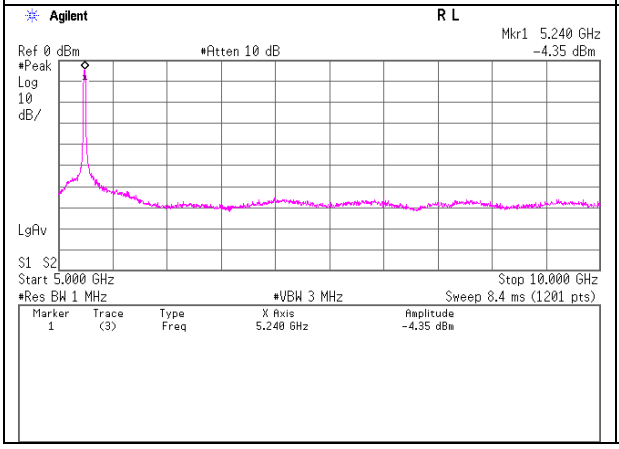
30MHz-1GHz



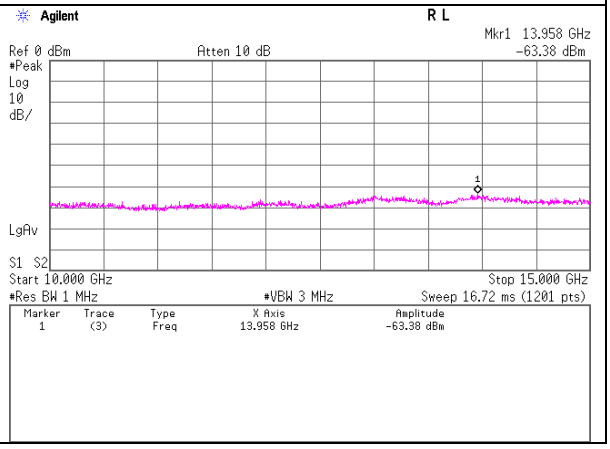
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz

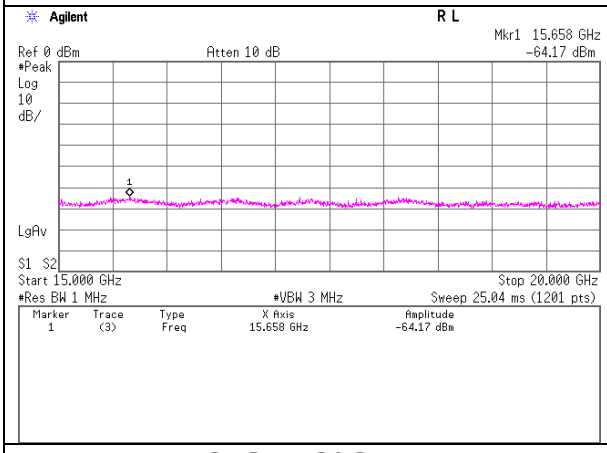


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

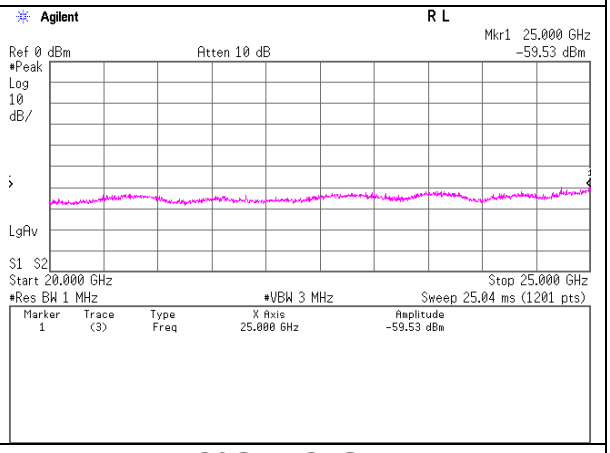
Conducted Spurious Emission

11a Tx 5240MHz

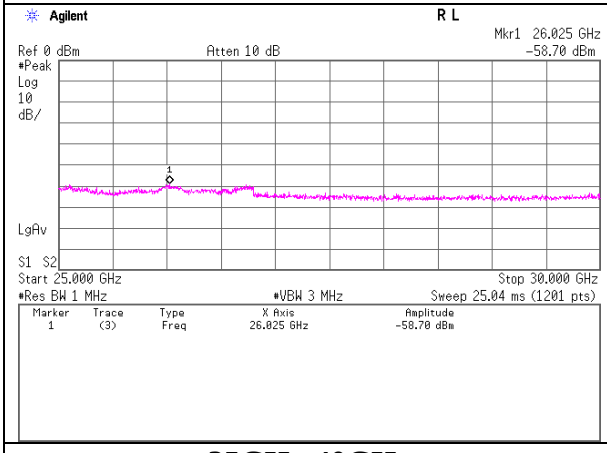
15GHz-20GHz



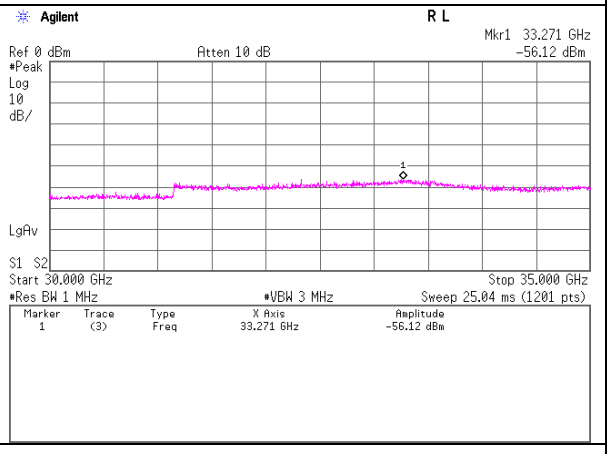
20GHz-25GHz



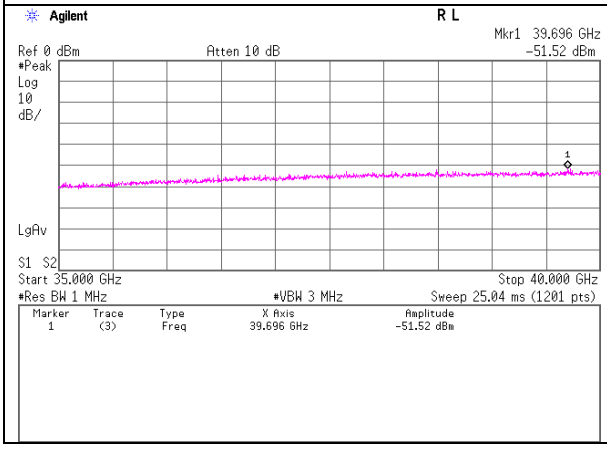
25GHz-30GHz



30GHz-35GHz



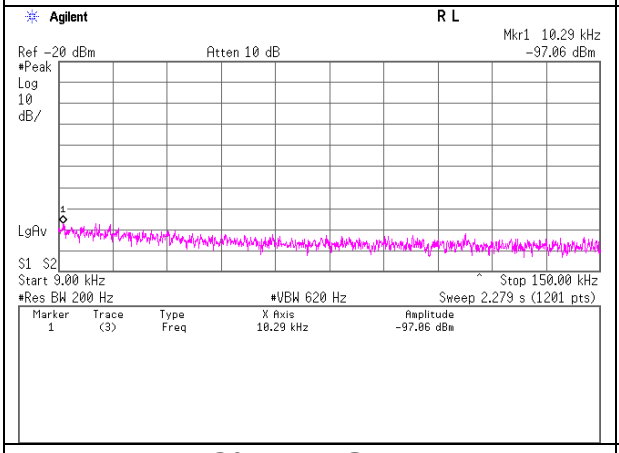
35GHz-40GHz



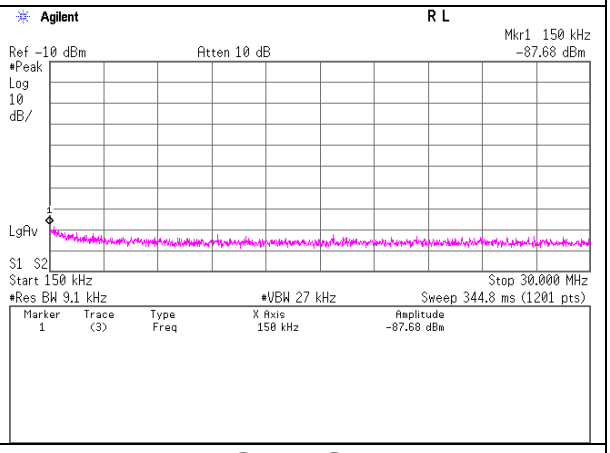
Conducted Spurious Emission

11a Tx 5260MHz

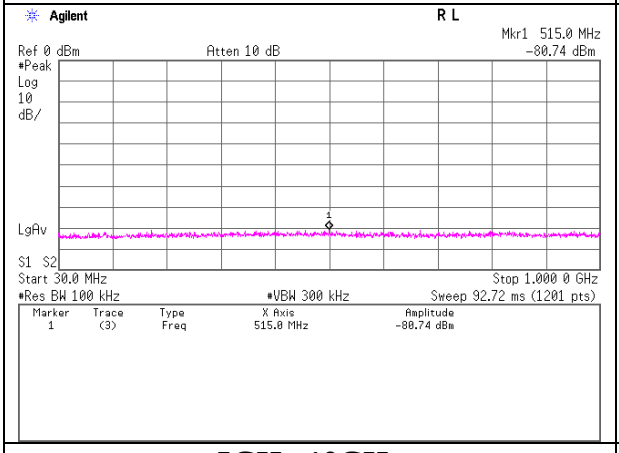
9kHz-150kHz



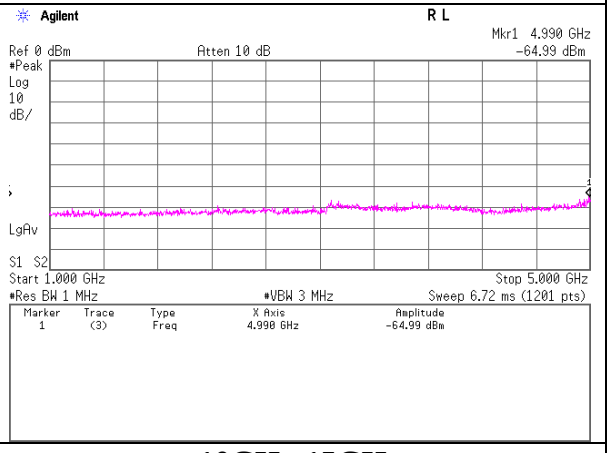
150kHz-30MHz



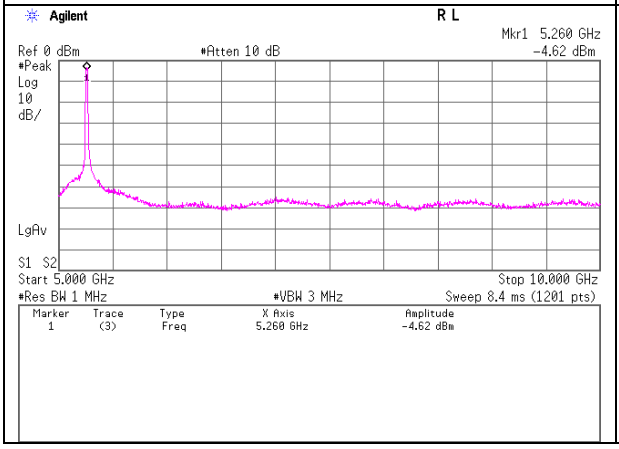
30MHz-1GHz



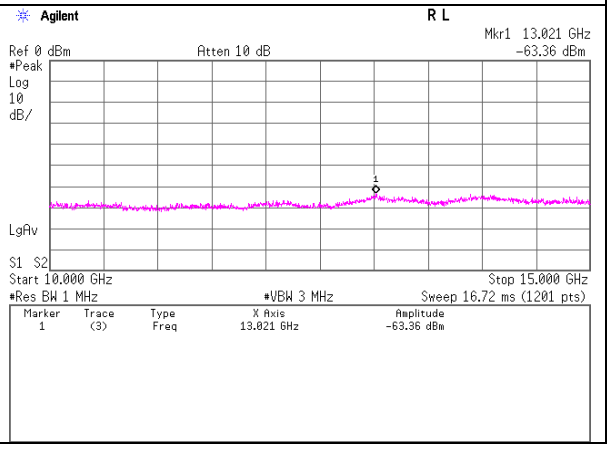
1GHz-5GHz



5GHz-10GHz



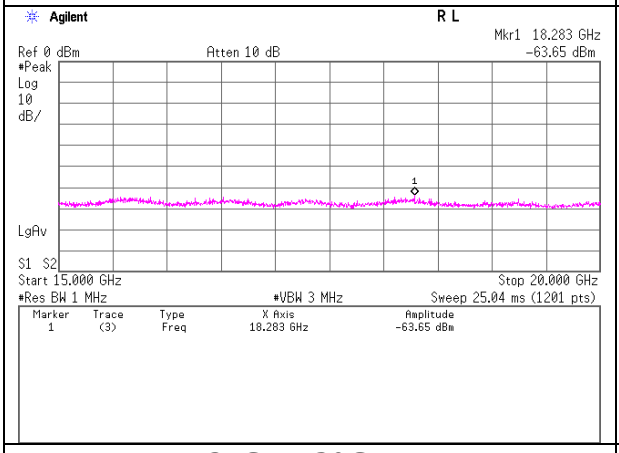
10GHz-15GHz



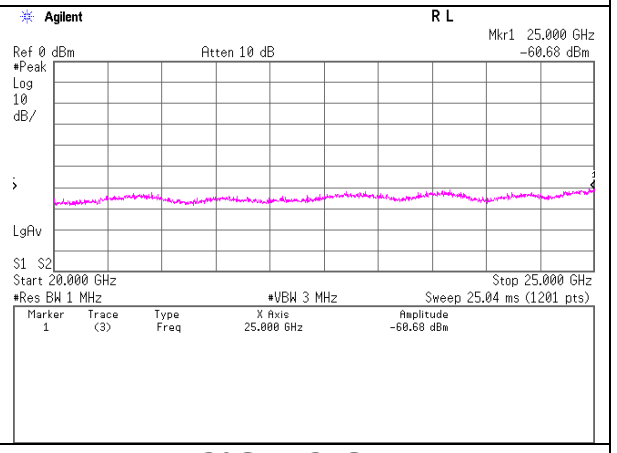
Conducted Spurious Emission

11a Tx 5260MHz

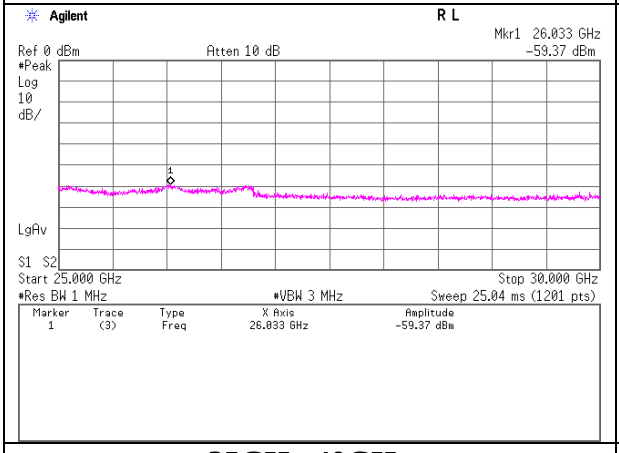
15GHz-20GHz



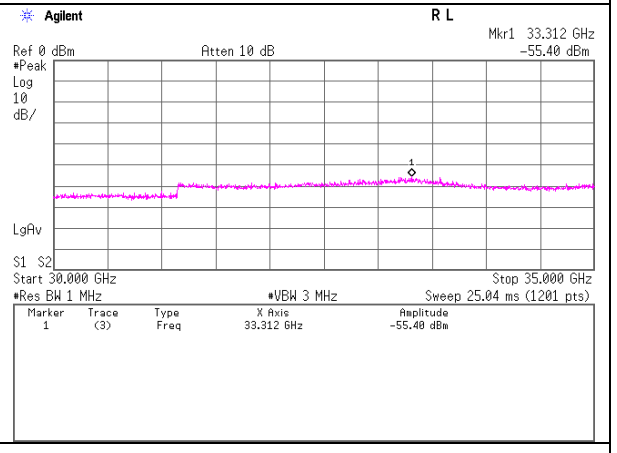
20GHz-25GHz



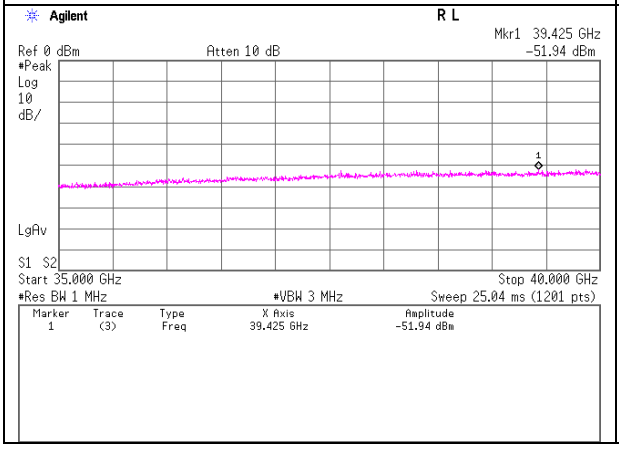
25GHz-30GHz



30GHz-35GHz



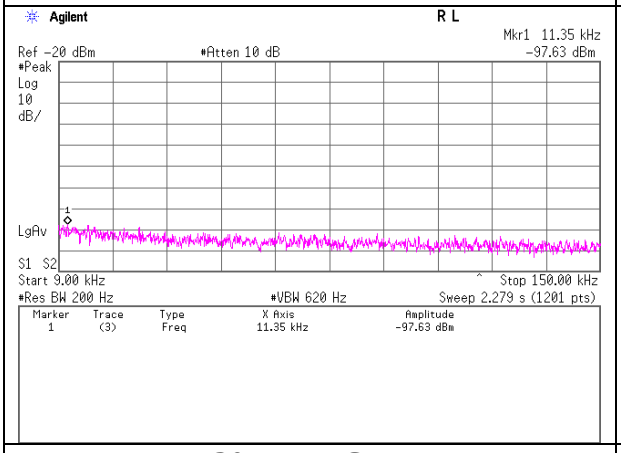
35GHz-40GHz



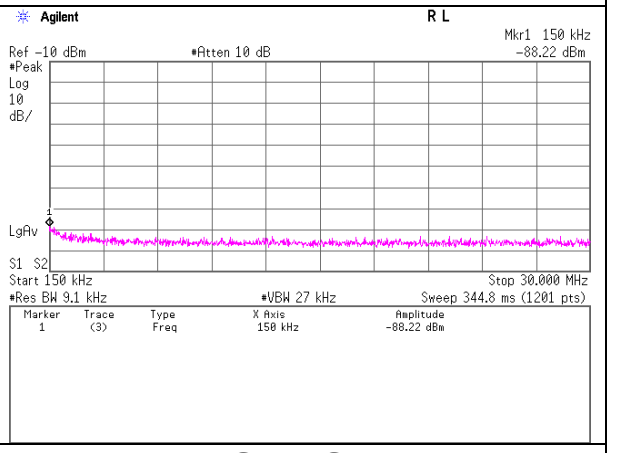
Conducted Spurious Emission

11a Tx 5300MHz

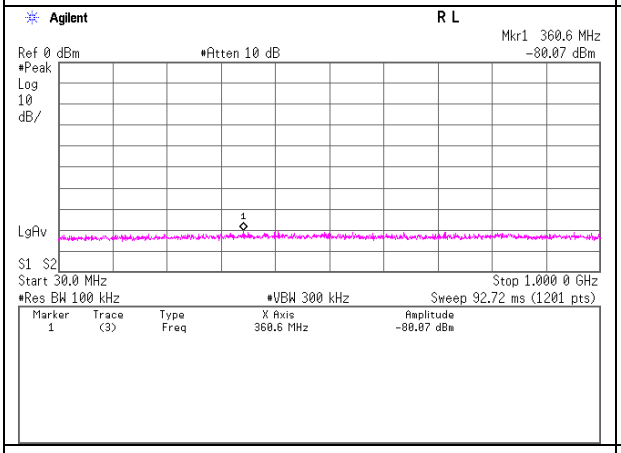
9kHz-150kHz



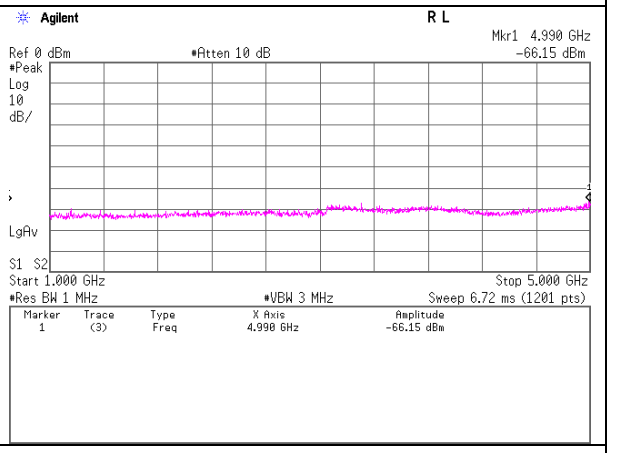
150kHz-30MHz



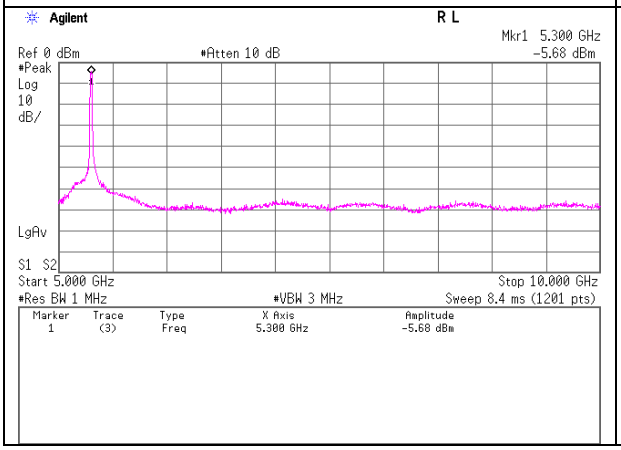
30MHz-1GHz



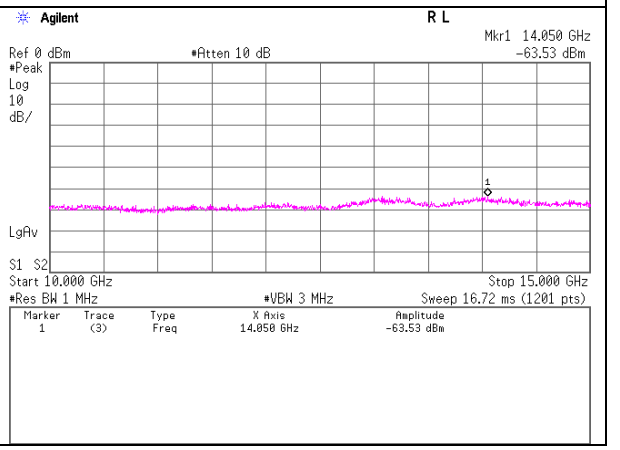
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz

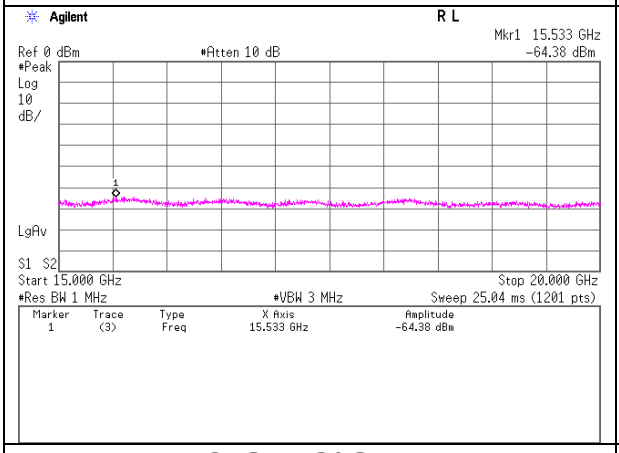


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

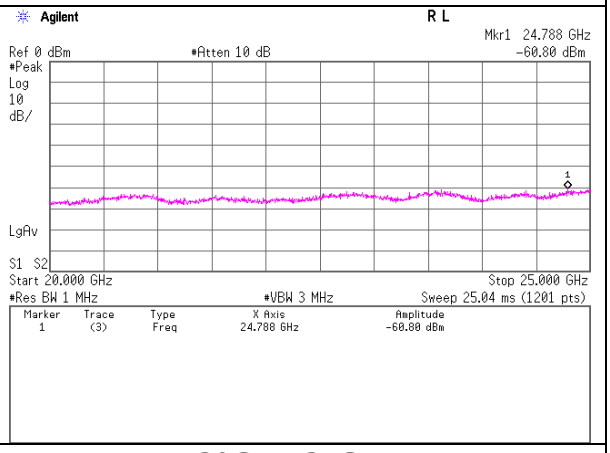
Conducted Spurious Emission

11a Tx 5300MHz

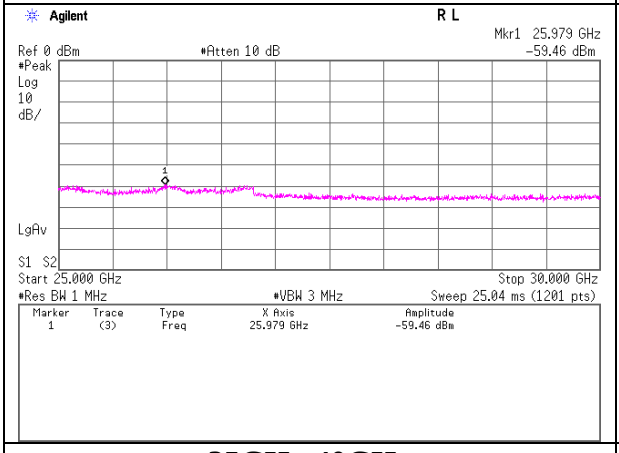
15GHz-20GHz



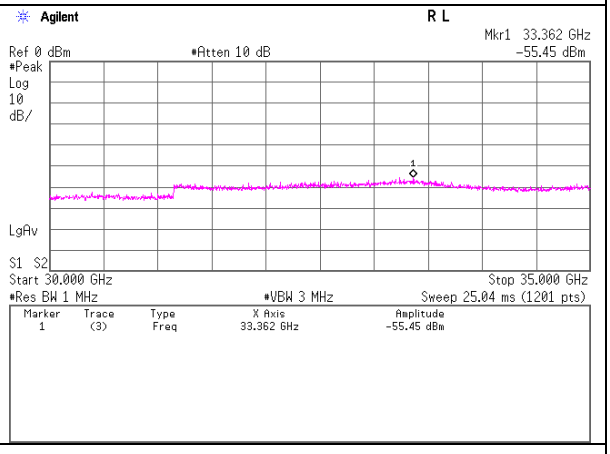
20GHz-25GHz



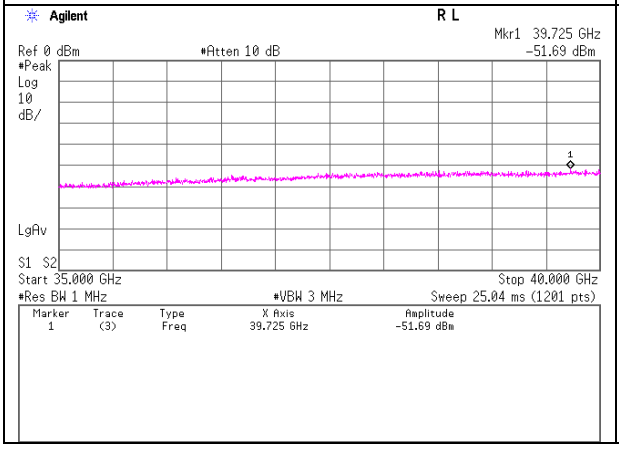
25GHz-30GHz



30GHz-35GHz



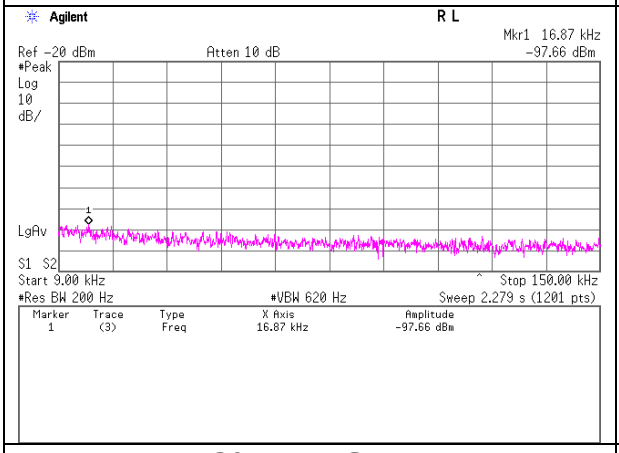
35GHz-40GHz



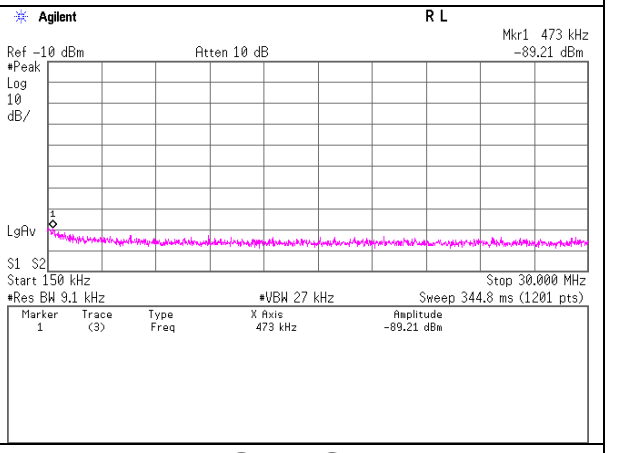
Conducted Spurious Emission

11a Tx 5320MHz

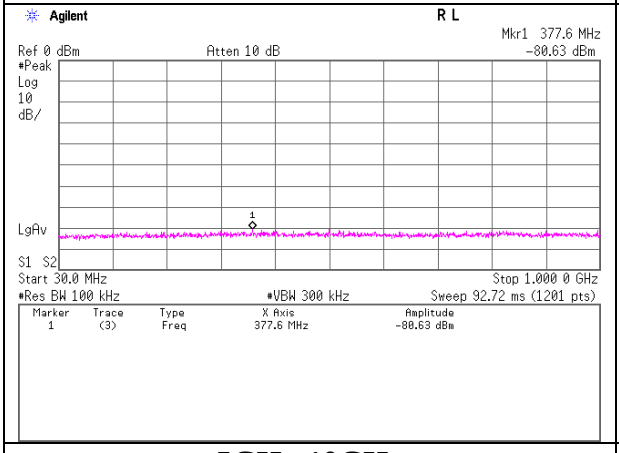
9kHz-150kHz



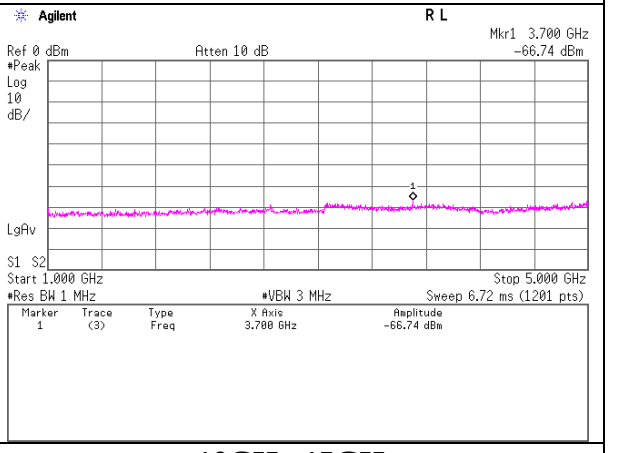
150kHz-30MHz



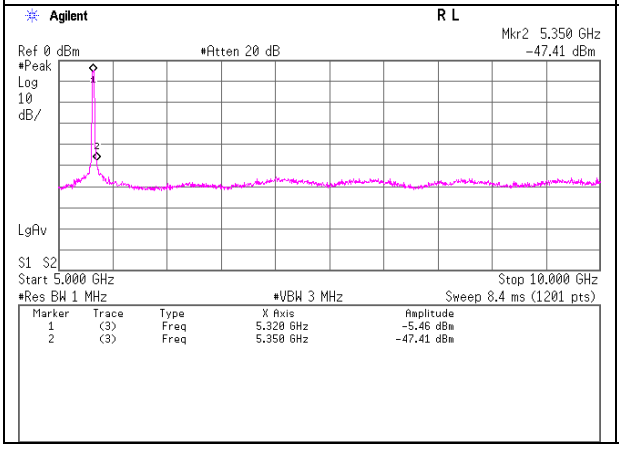
30MHz-1GHz



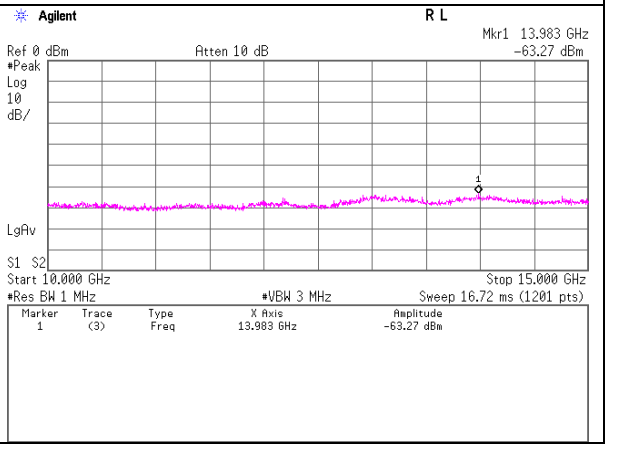
1GHz-5GHz



5GHz-10GHz



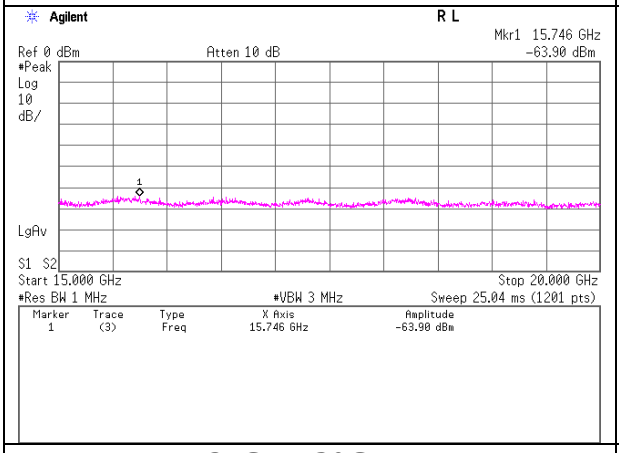
10GHz-15GHz



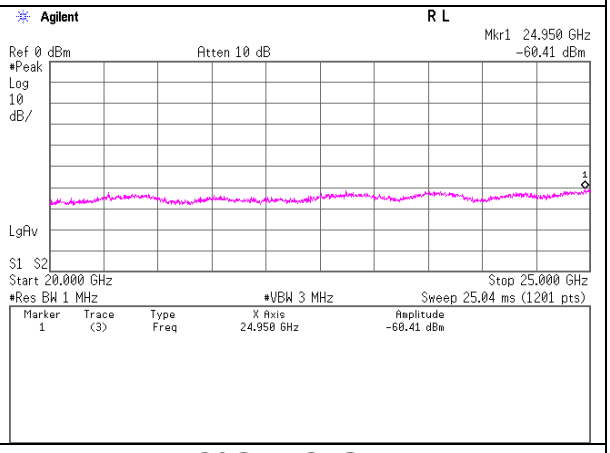
Conducted Spurious Emission

11a Tx 5320MHz

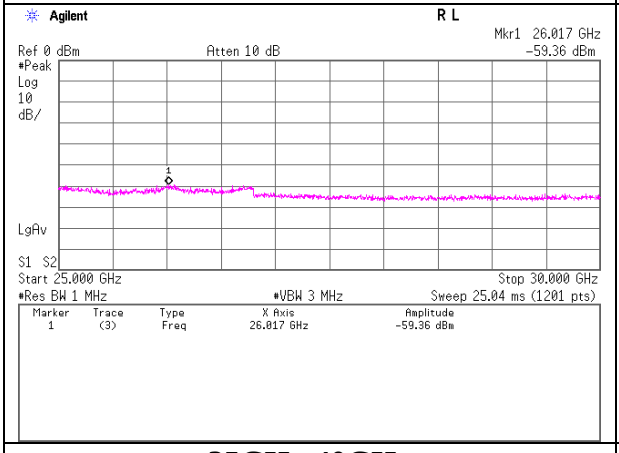
15GHz-20GHz



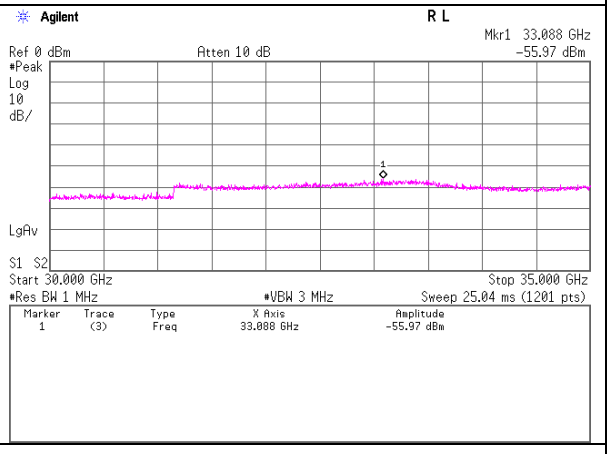
20GHz-25GHz



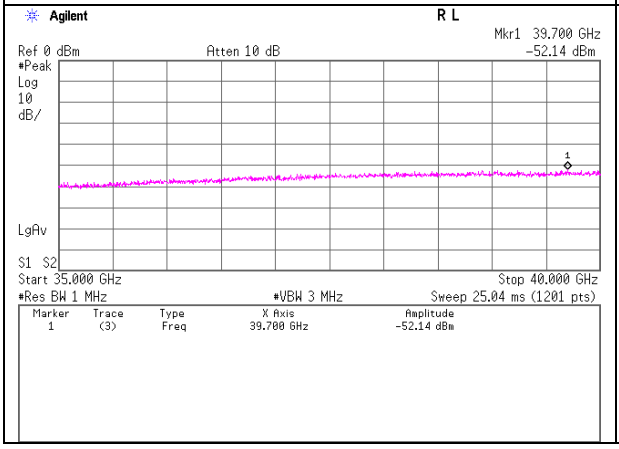
25GHz-30GHz



30GHz-35GHz



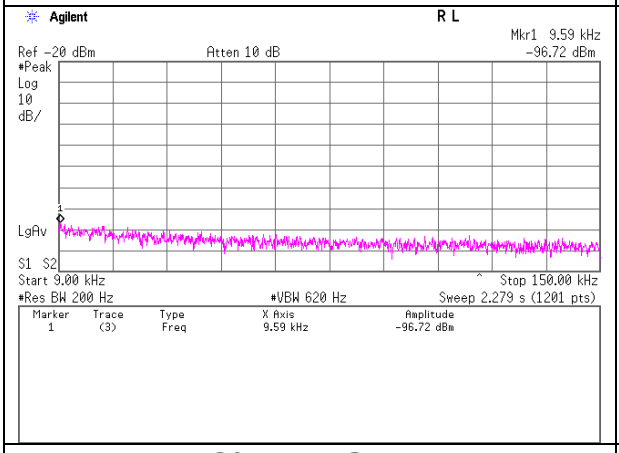
35GHz-40GHz



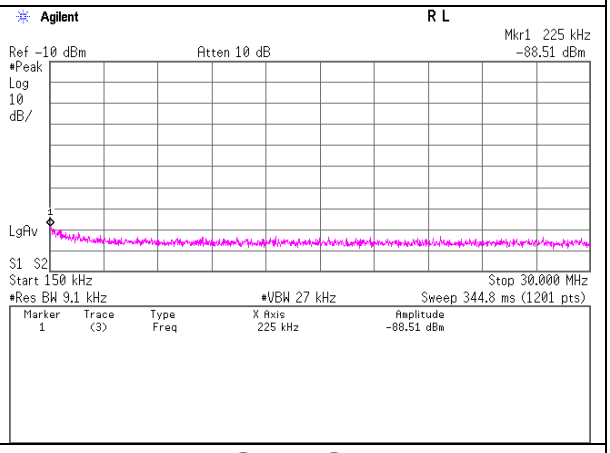
Conducted Spurious Emission

11a Tx 5500MHz

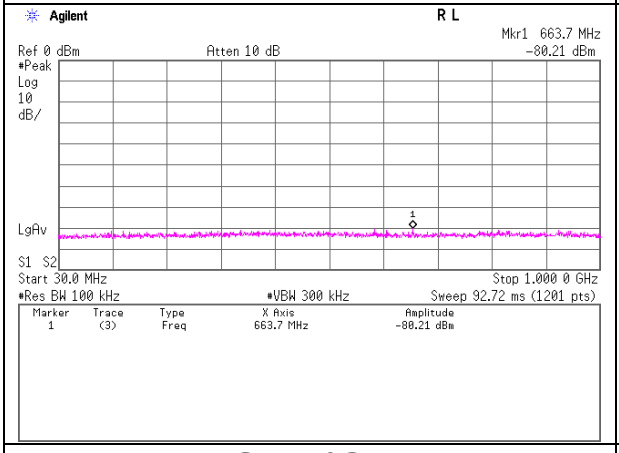
9kHz-150kHz



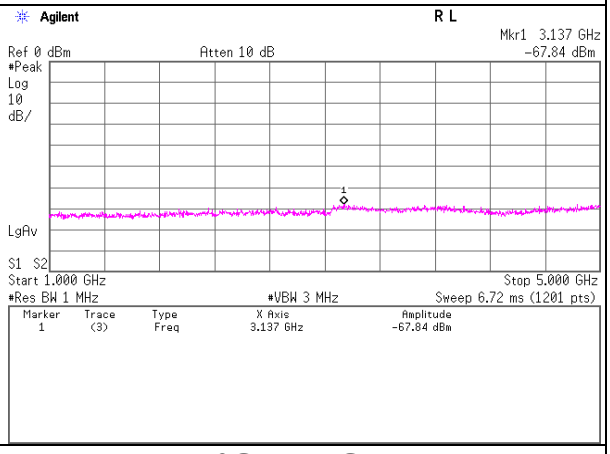
150kHz-30MHz



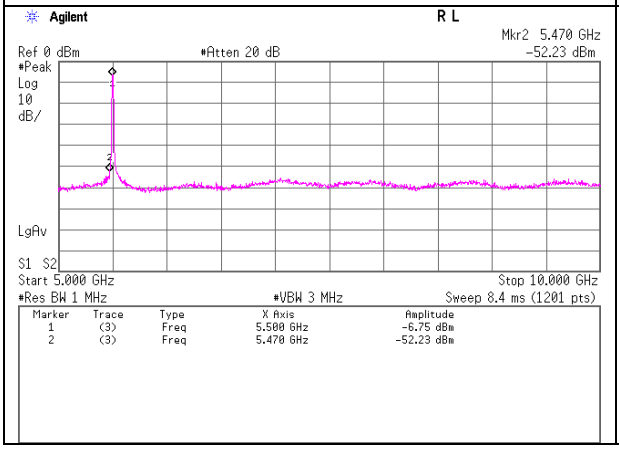
30MHz-1GHz



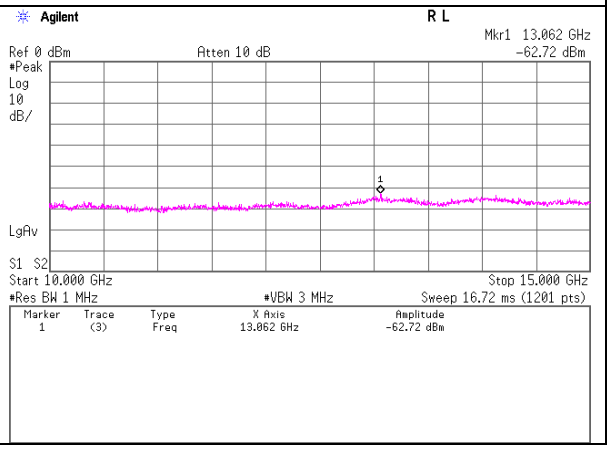
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz

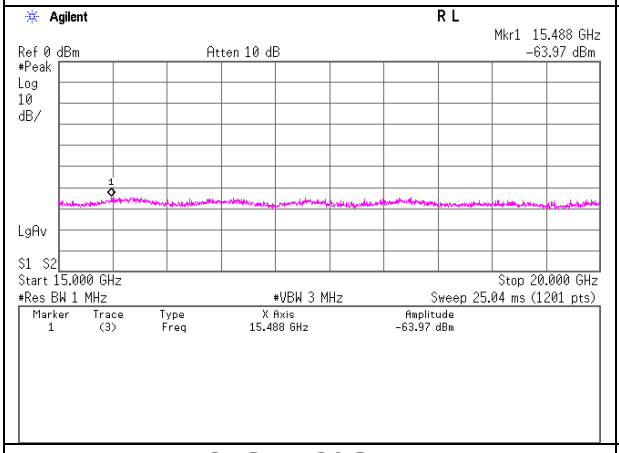


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

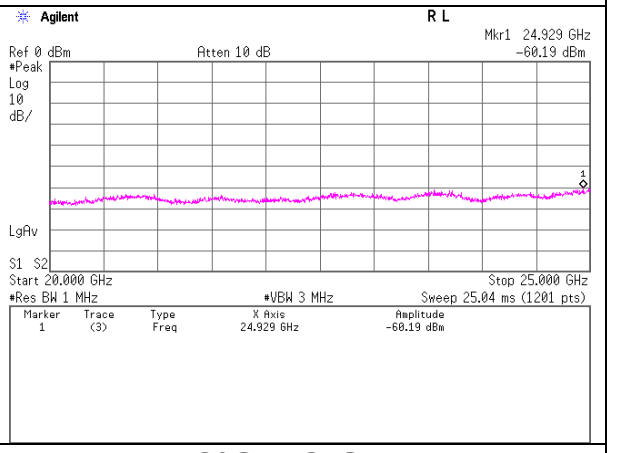
Conducted Spurious Emission

11a Tx 5500MHz

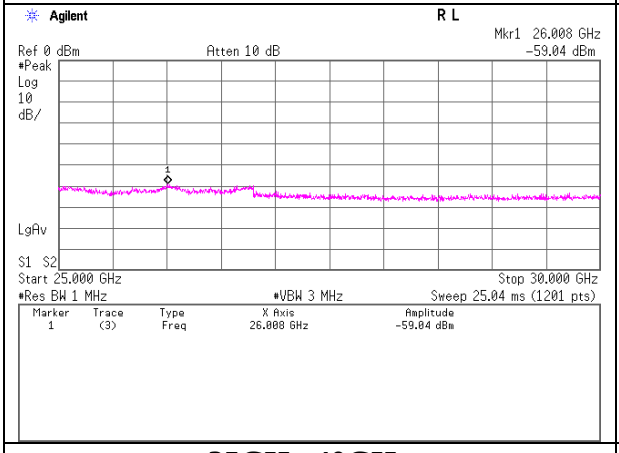
15GHz-20GHz



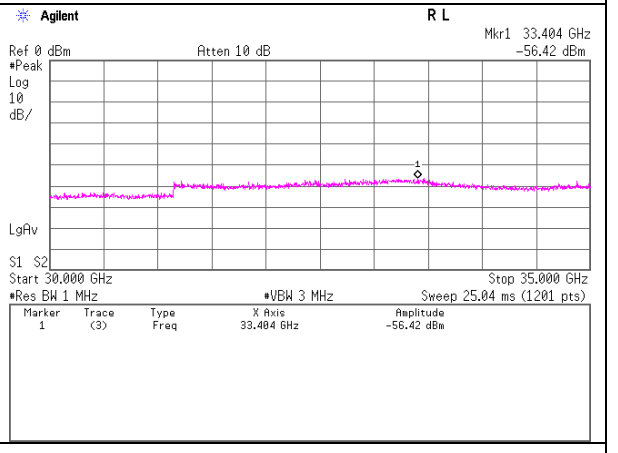
20GHz-25GHz



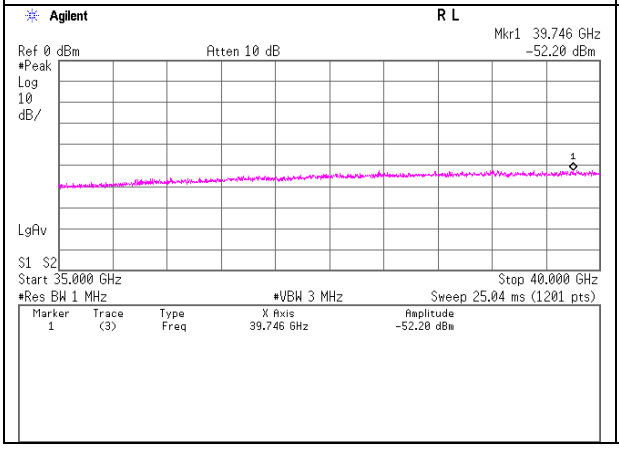
25GHz-30GHz



30GHz-35GHz



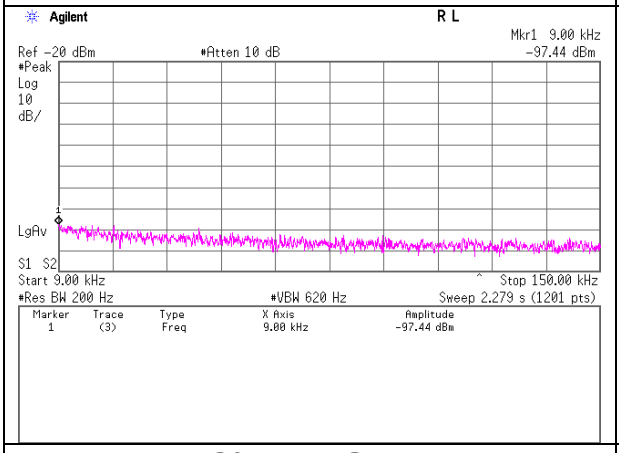
35GHz-40GHz



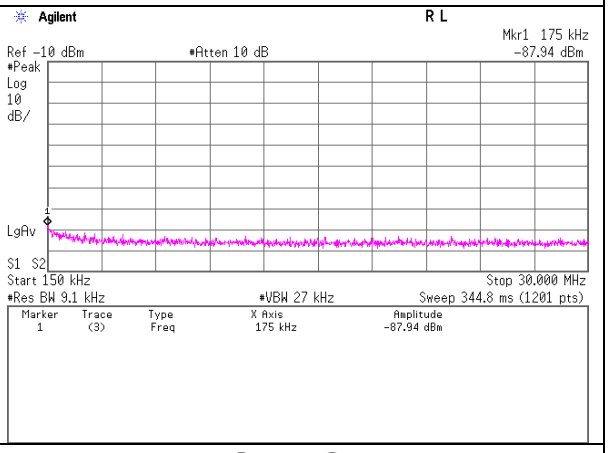
Conducted Spurious Emission

11a Tx 5600MHz

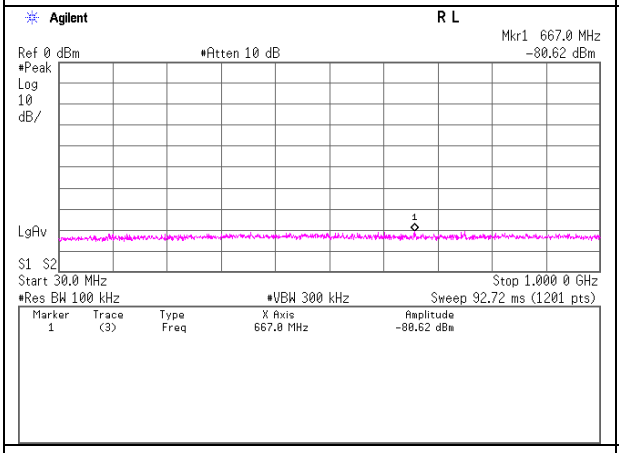
9kHz-150kHz



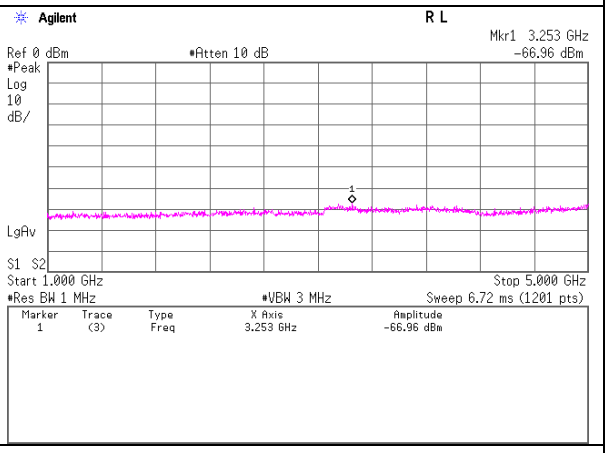
150kHz-30MHz



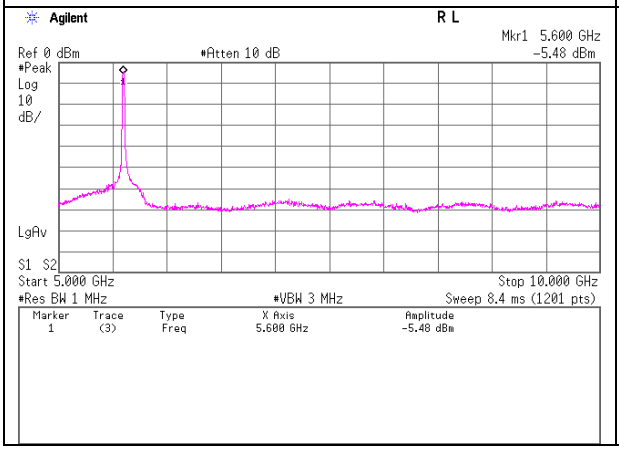
30MHz-1GHz



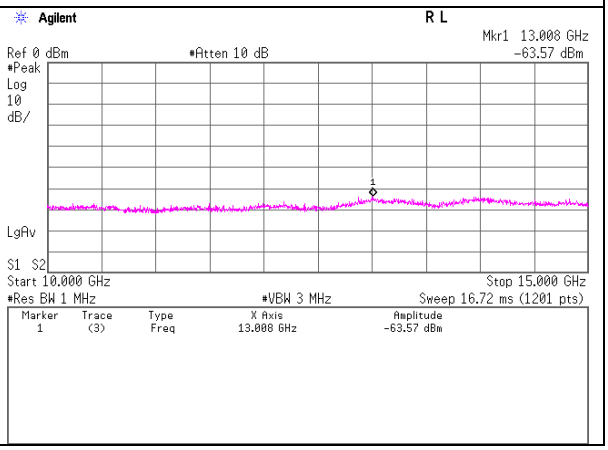
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz

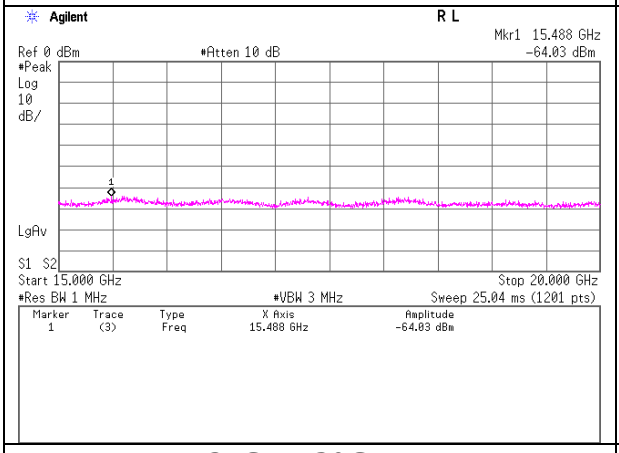


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

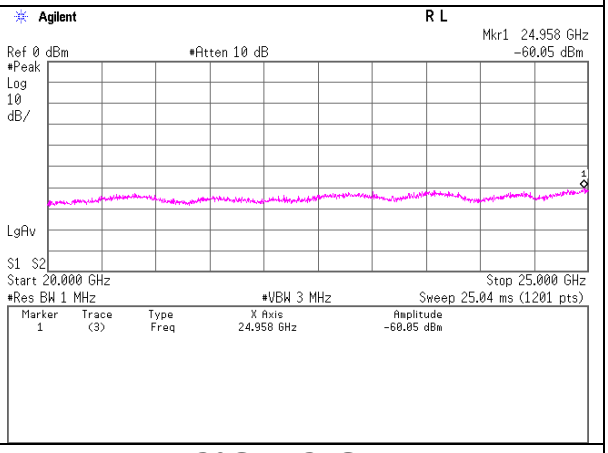
Conducted Spurious Emission

11a Tx 5600MHz

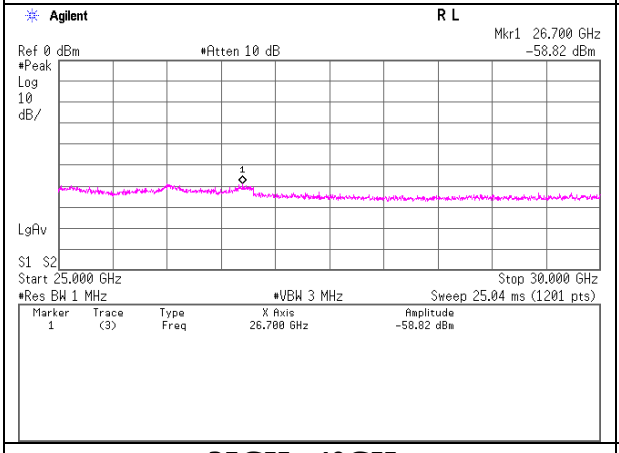
15GHz-20GHz



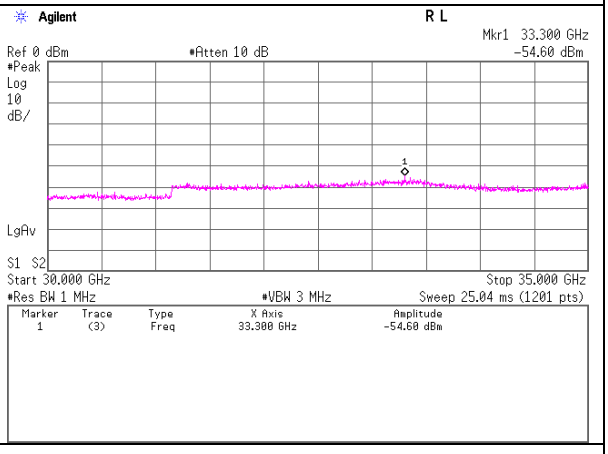
20GHz-25GHz



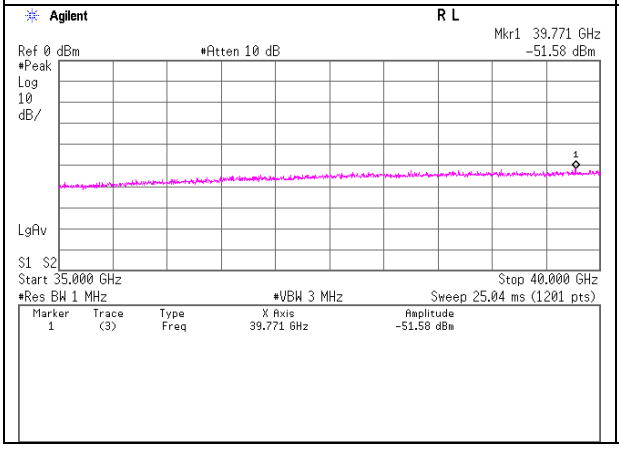
25GHz-30GHz



30GHz-35GHz



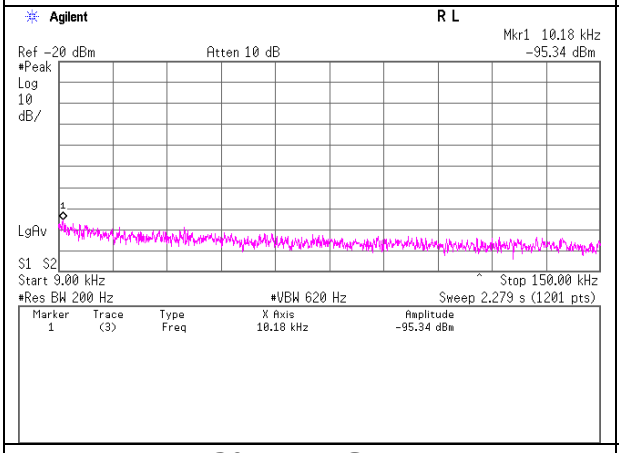
35GHz-40GHz



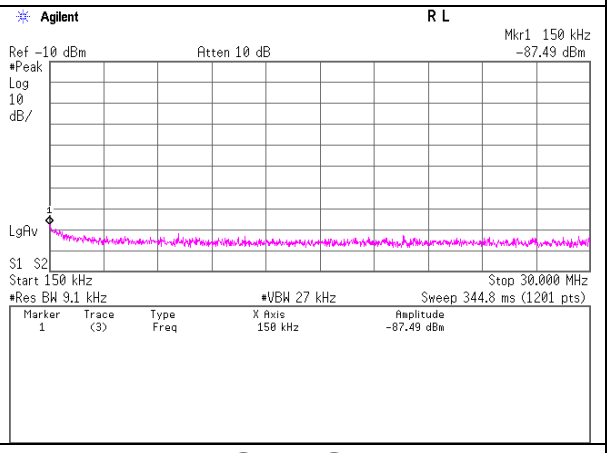
Conducted Spurious Emission

11a Tx 5700MHz

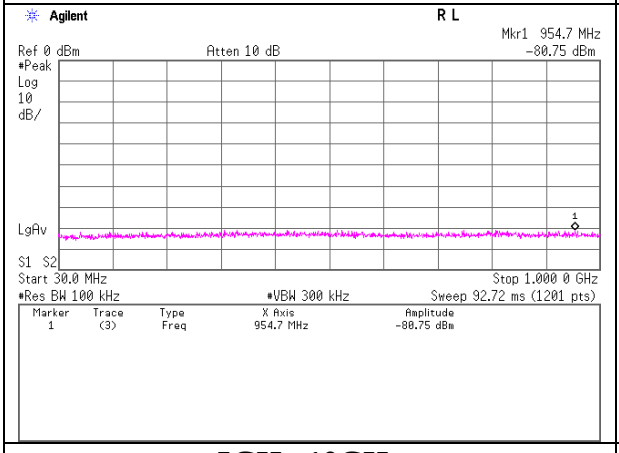
9kHz-150kHz



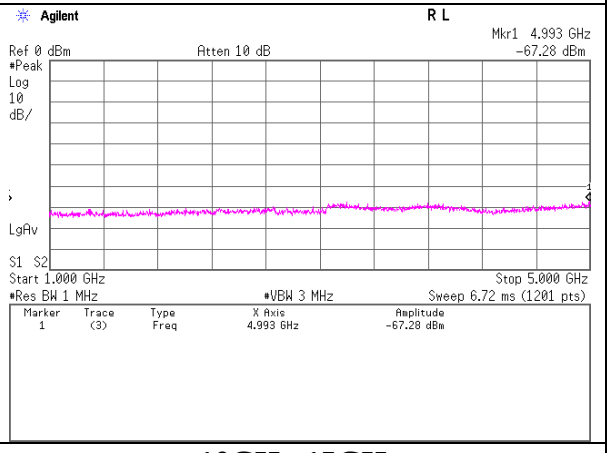
150kHz-30MHz



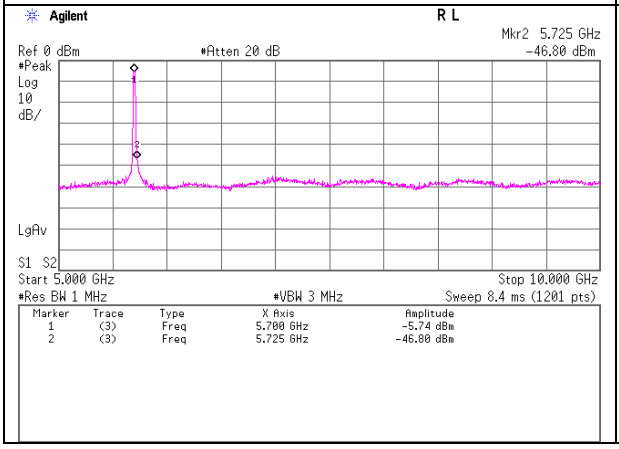
30MHz-1GHz



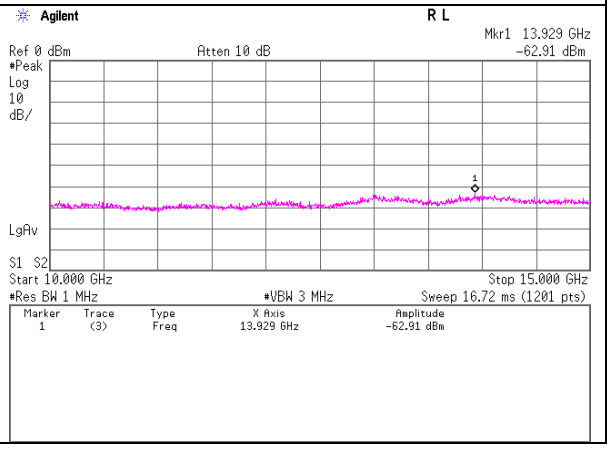
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz

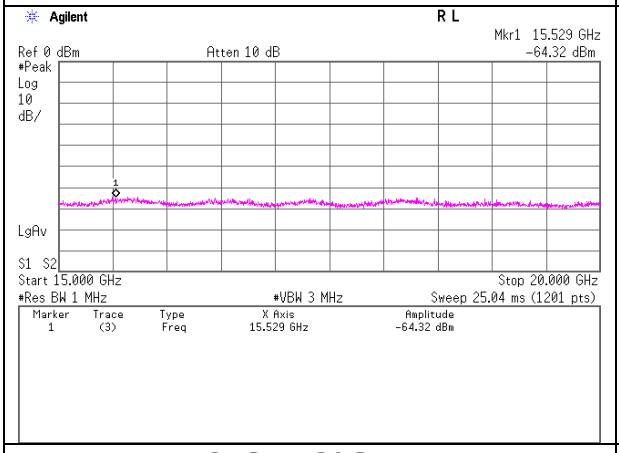


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

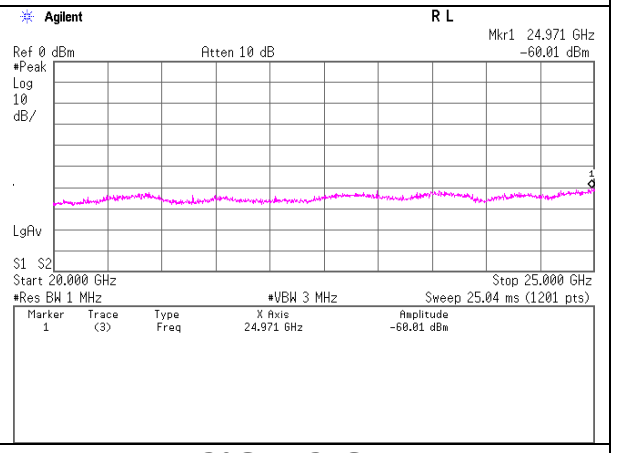
Conducted Spurious Emission

11a Tx 5700MHz

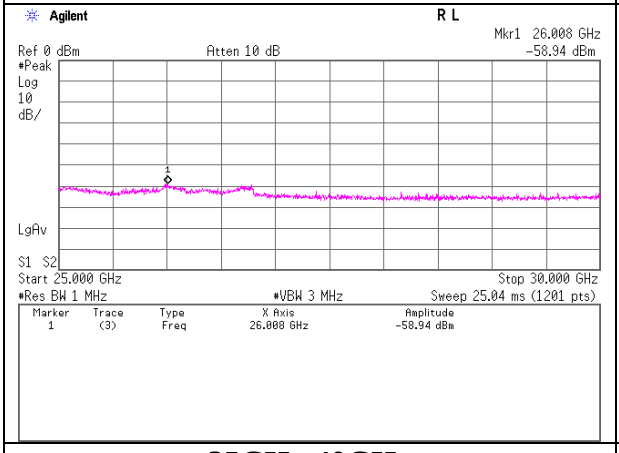
15GHz-20GHz



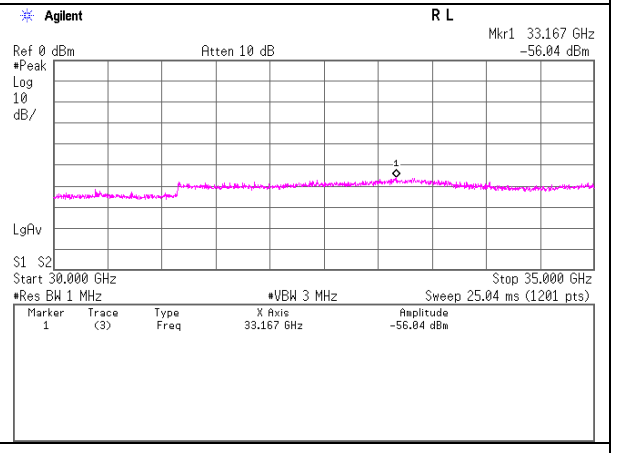
20GHz-25GHz



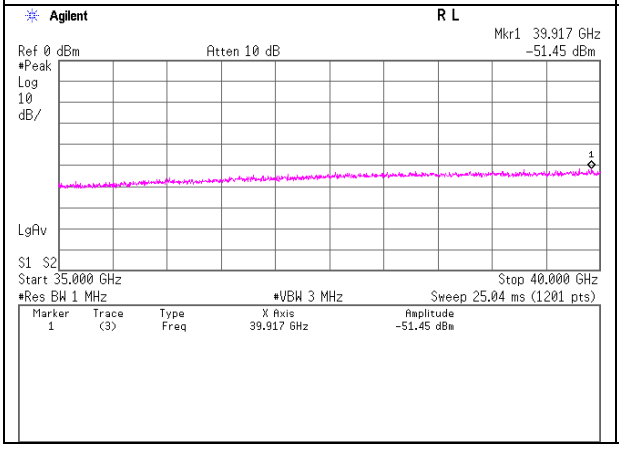
25GHz-30GHz



30GHz-35GHz



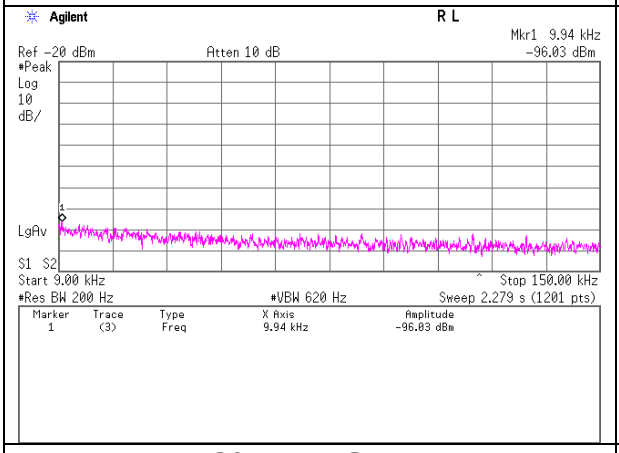
35GHz-40GHz



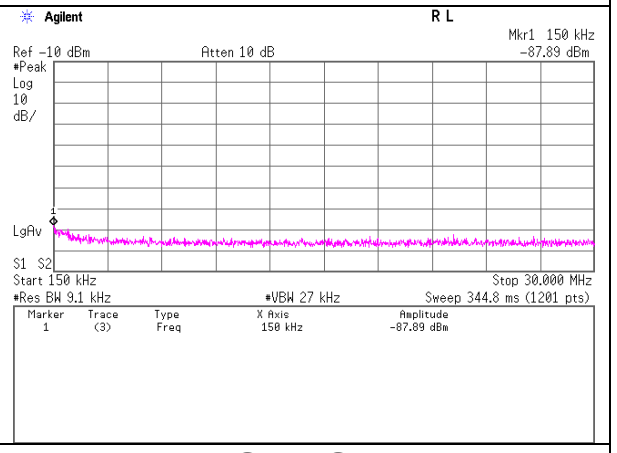
Conducted Spurious Emission

11n-40 Tx 5190MHz

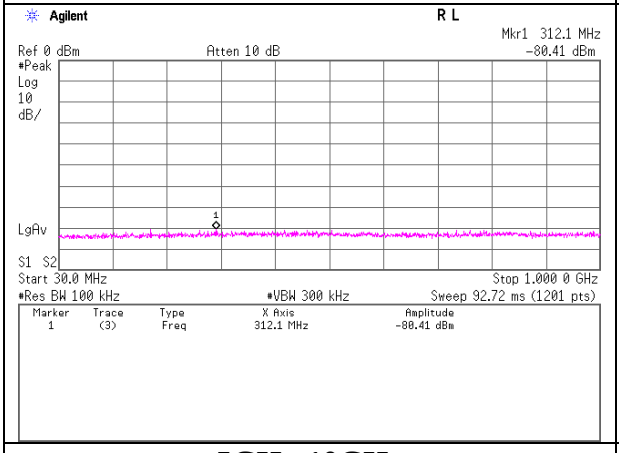
9kHz-150kHz



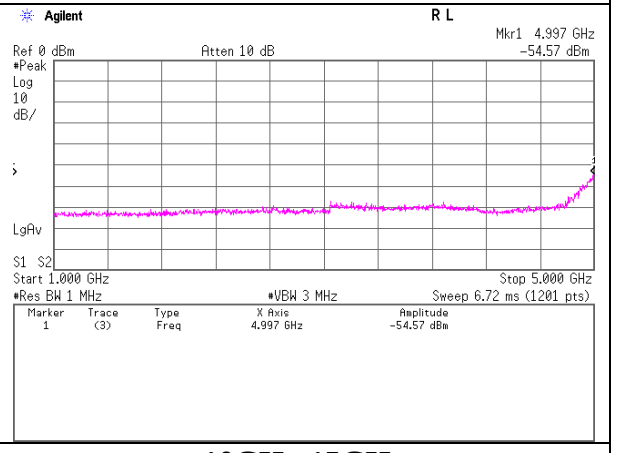
150kHz-30MHz



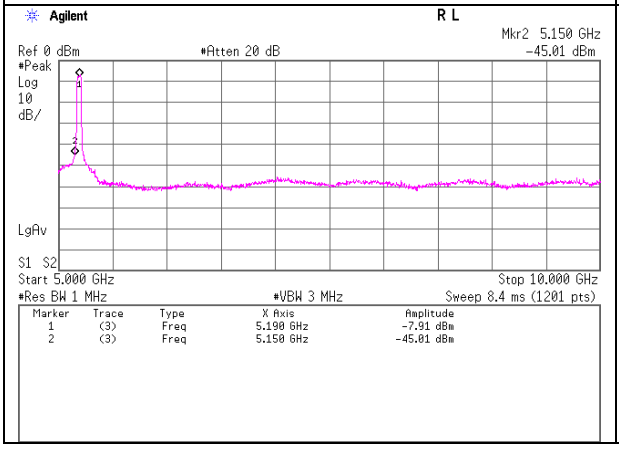
30MHz-1GHz



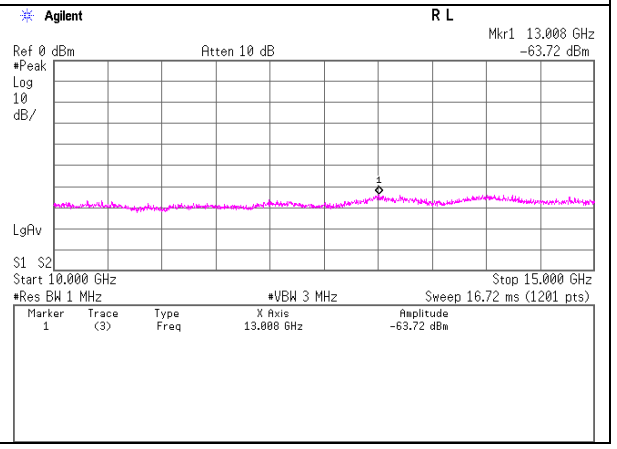
1GHz-5GHz



5GHz-10GHz



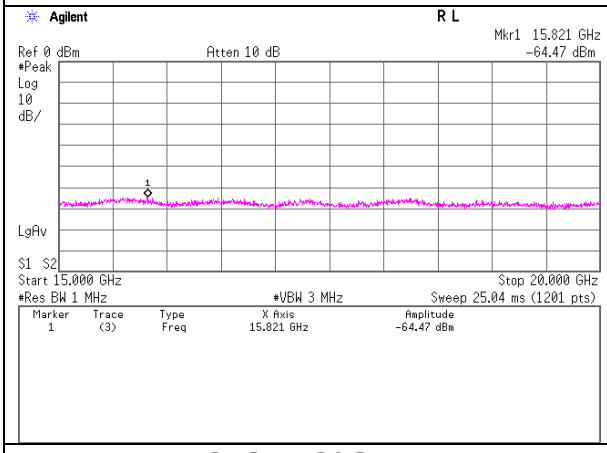
10GHz-15GHz



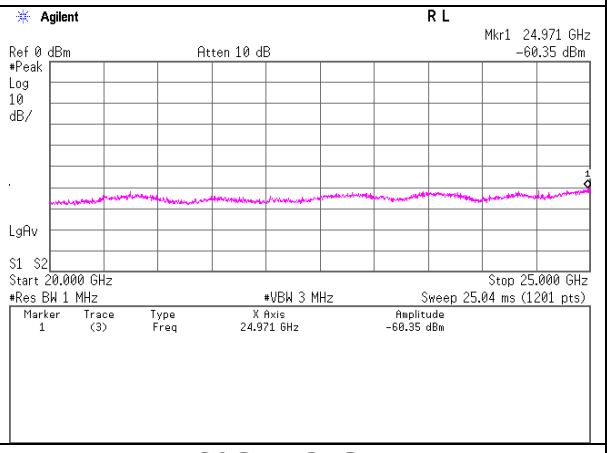
Conducted Spurious Emission

11n-40 Tx 5190MHz

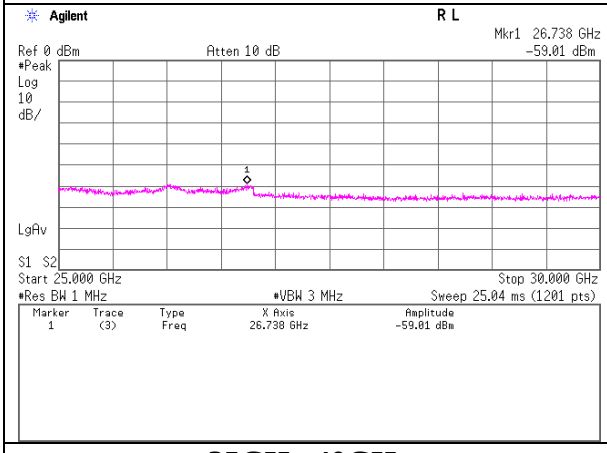
15GHz-20GHz



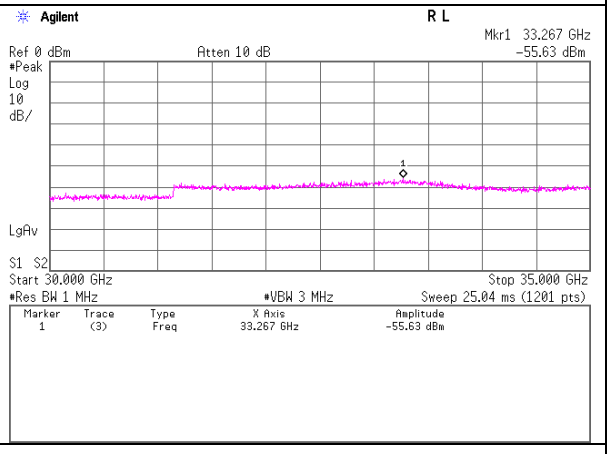
20GHz-25GHz



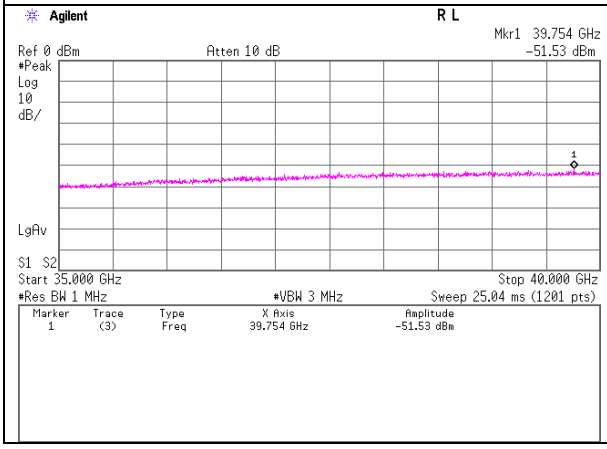
25GHz-30GHz



30GHz-35GHz



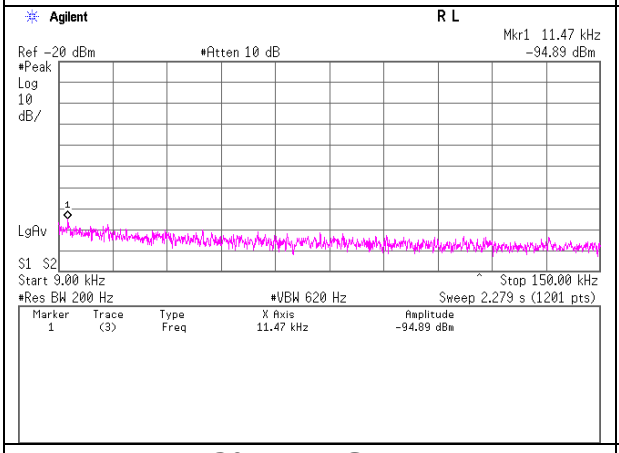
35GHz-40GHz



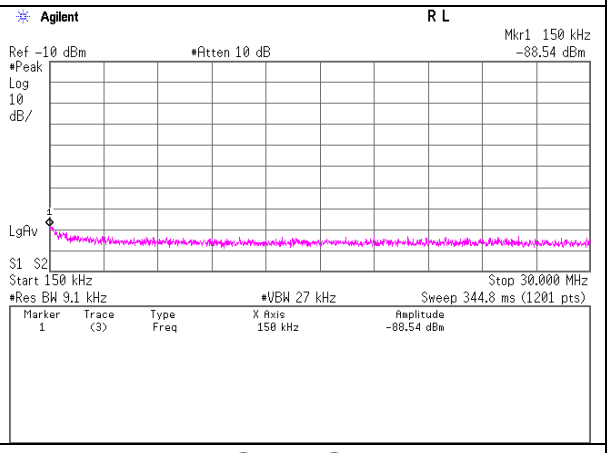
Conducted Spurious Emission

11n-40 Tx 5230MHz

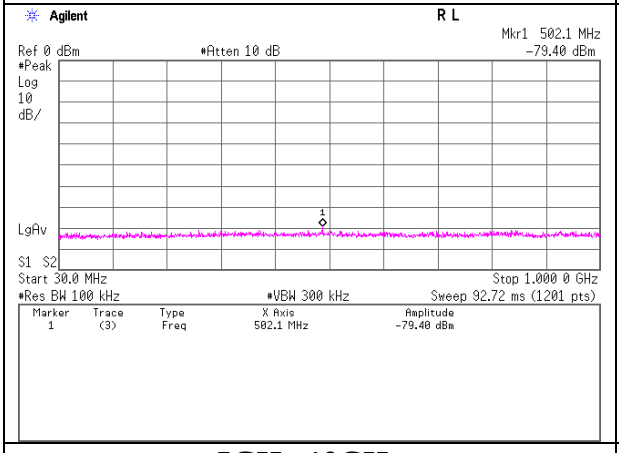
9kHz-150kHz



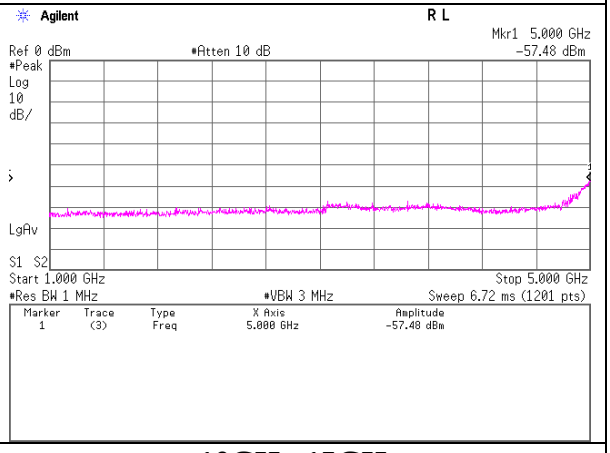
150kHz-30MHz



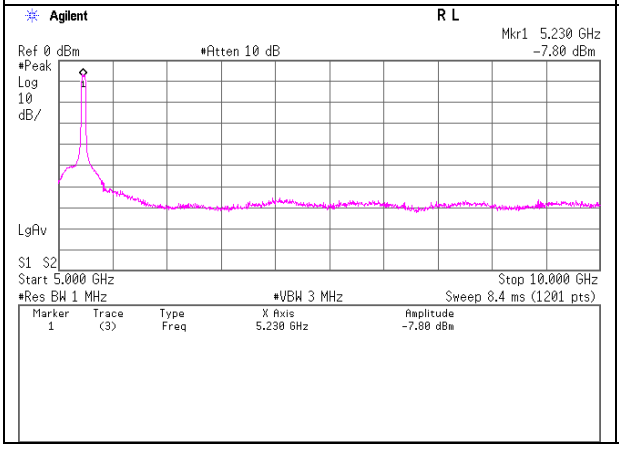
30MHz-1GHz



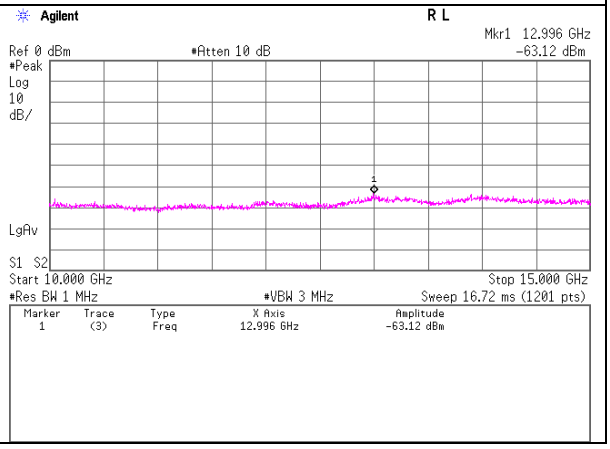
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz

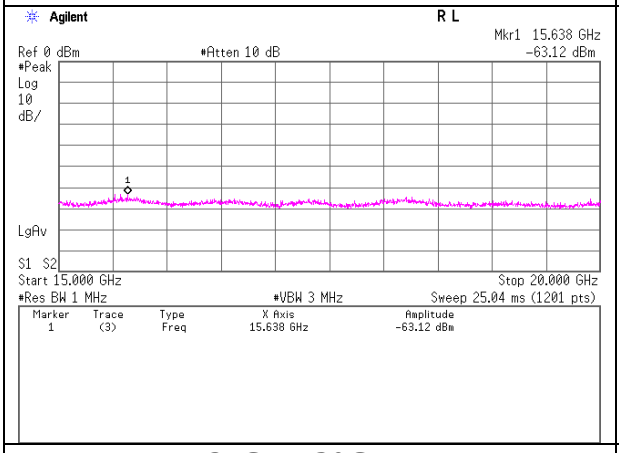


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

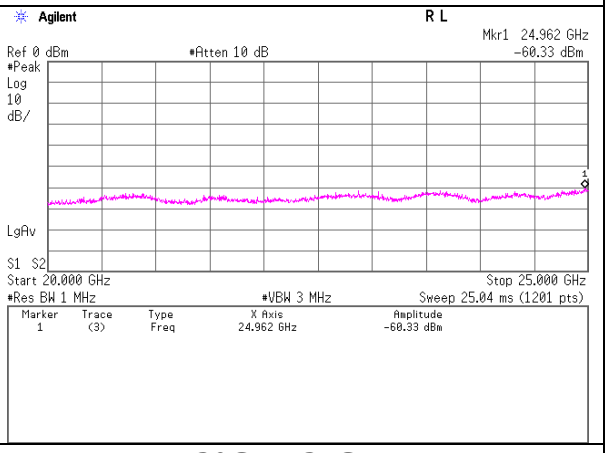
Conducted Spurious Emission

11n-40 Tx 5230MHz

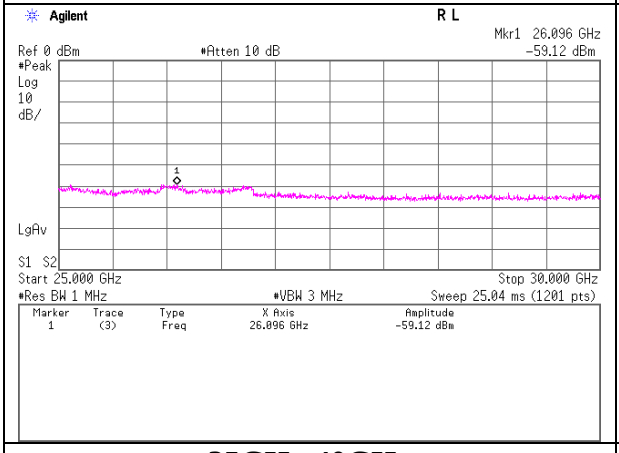
15GHz-20GHz



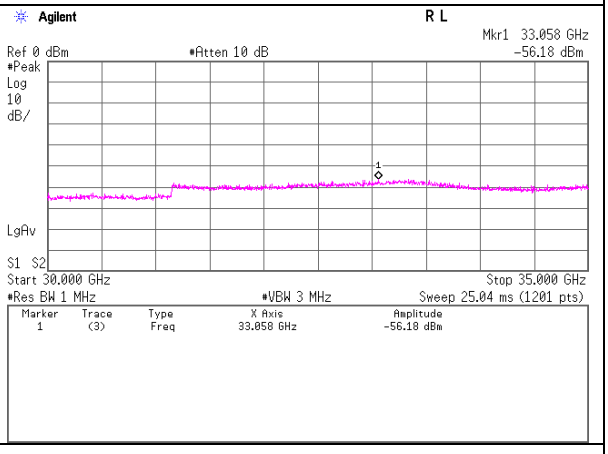
20GHz-25GHz



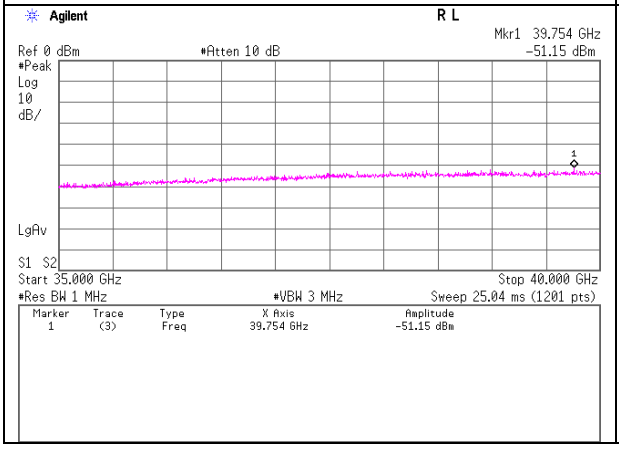
25GHz-30GHz



30GHz-35GHz



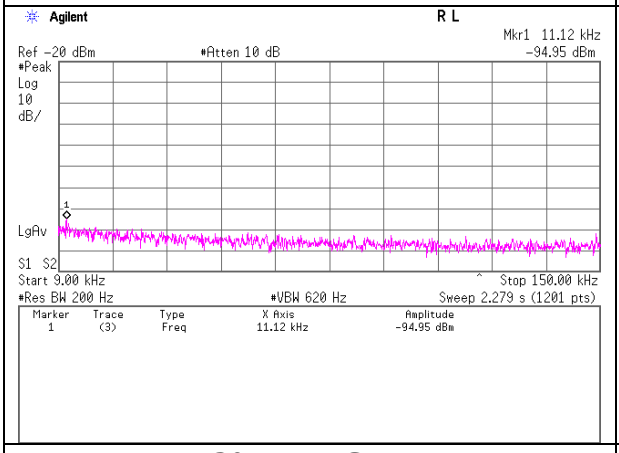
35GHz-40GHz



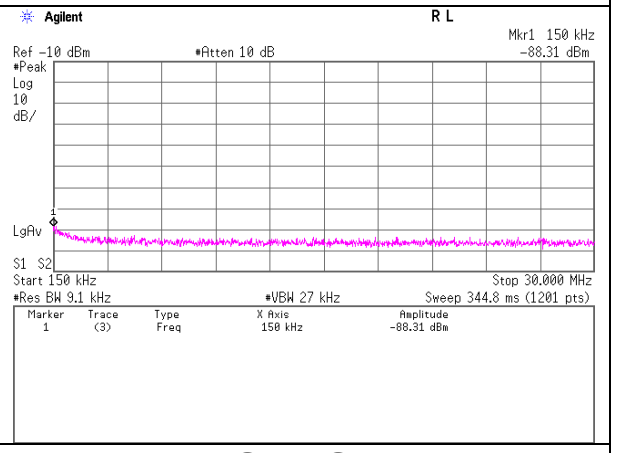
Conducted Spurious Emission

11n-40 Tx 5270MHz

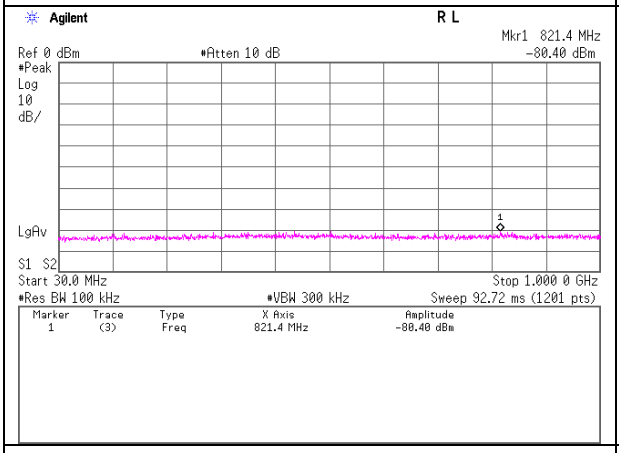
9kHz-150kHz



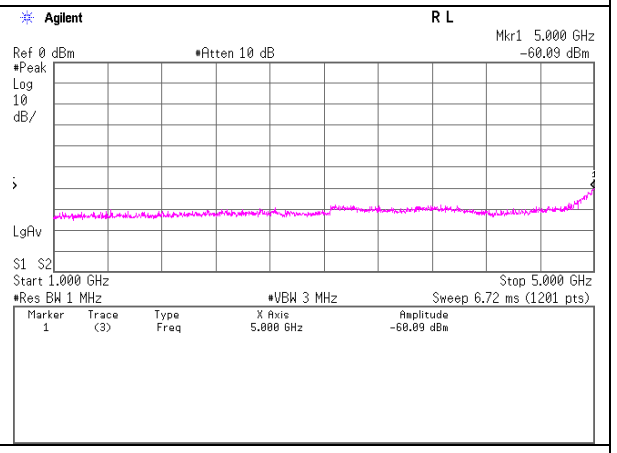
150kHz-30MHz



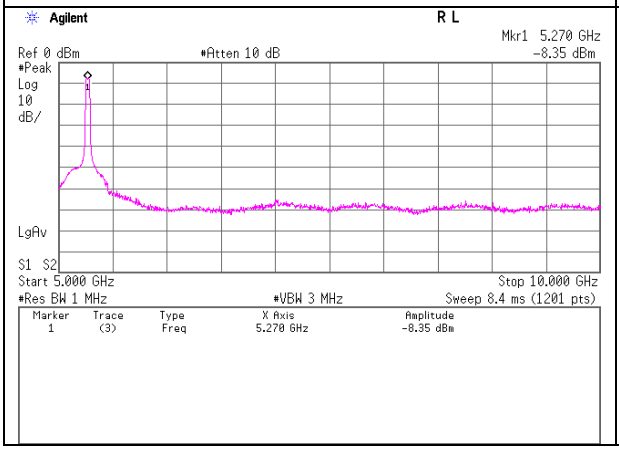
30MHz-1GHz



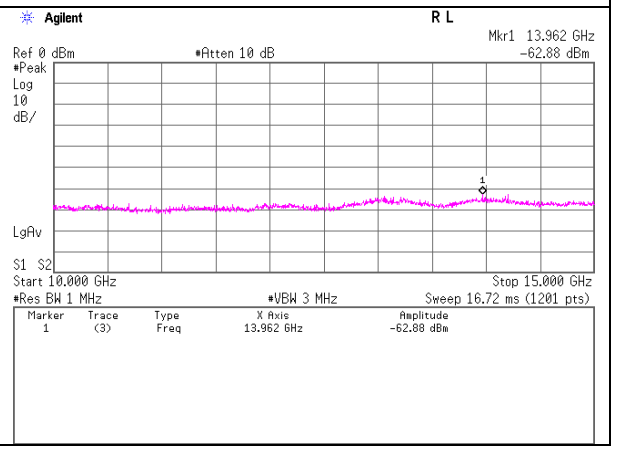
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz

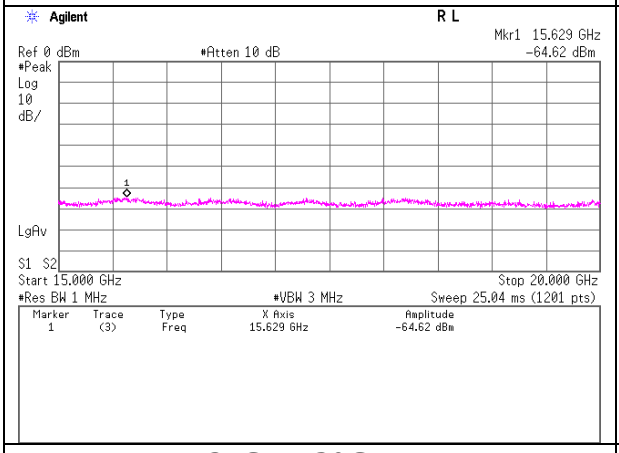


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

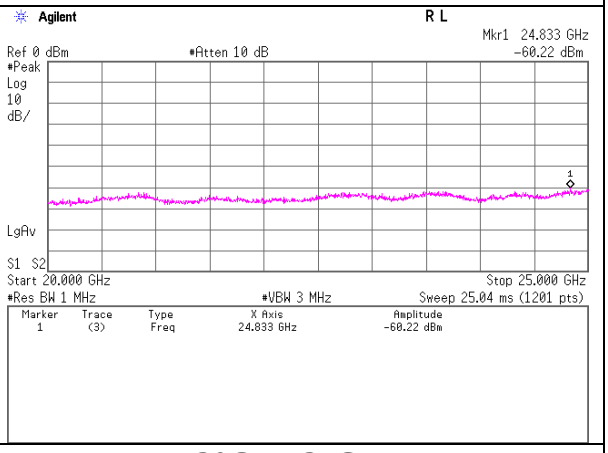
Conducted Spurious Emission

11n-40 Tx 5270MHz

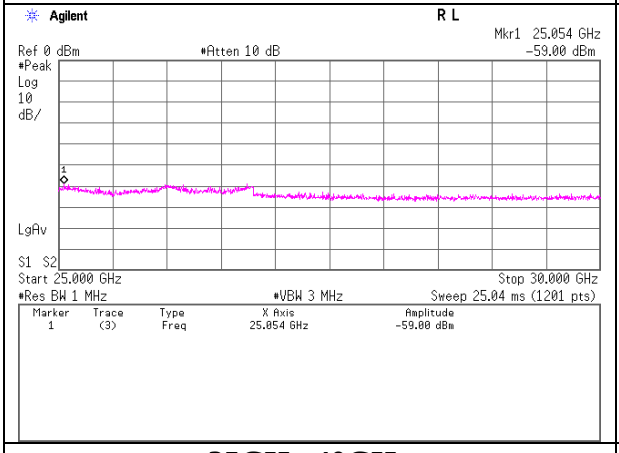
15GHz-20GHz



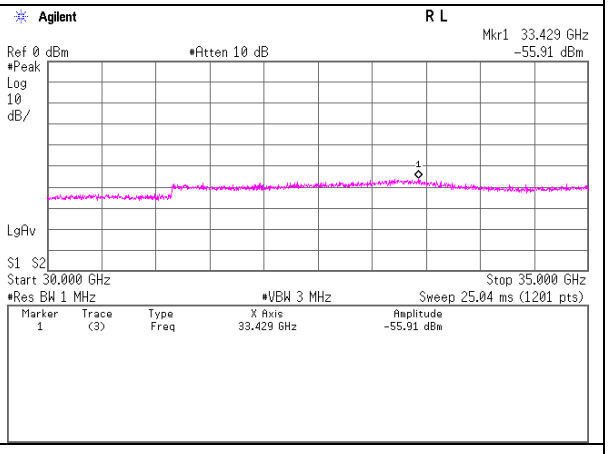
20GHz-25GHz



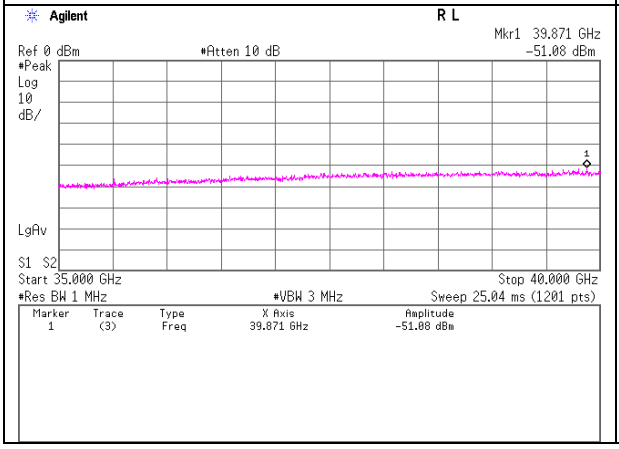
25GHz-30GHz



30GHz-35GHz



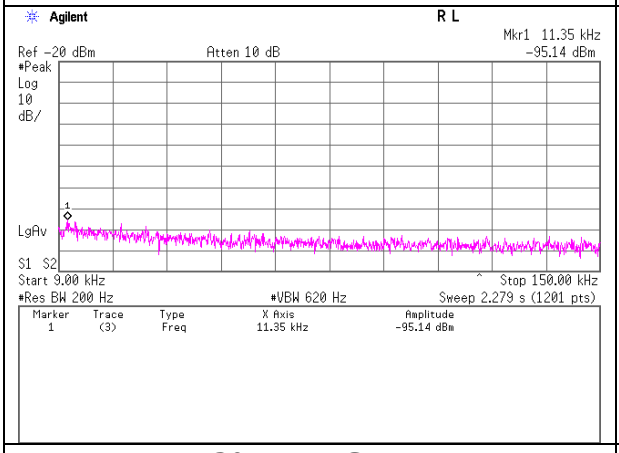
35GHz-40GHz



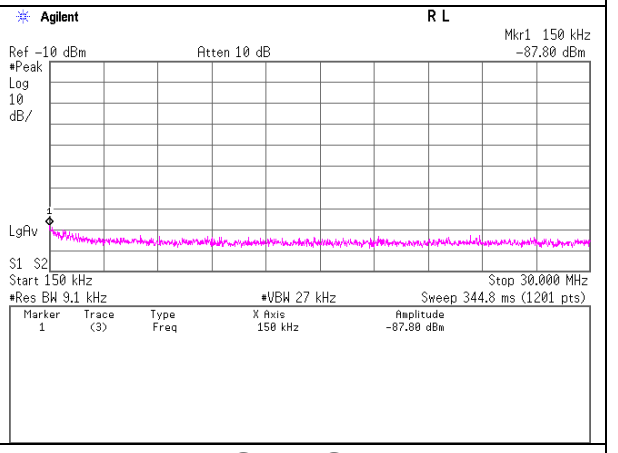
Conducted Spurious Emission

11n-40 Tx 5310MHz

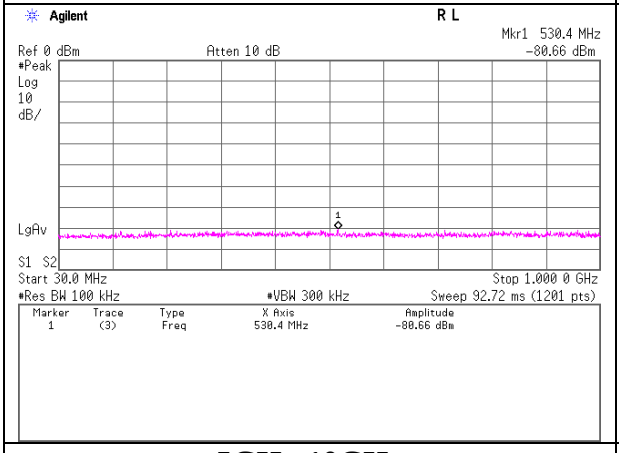
9kHz-150kHz



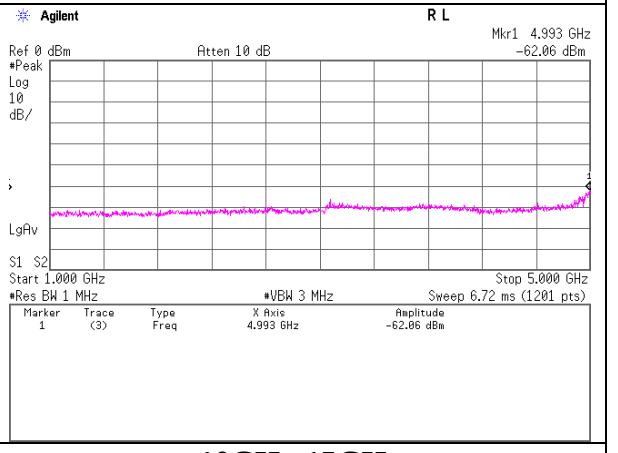
150kHz-30MHz



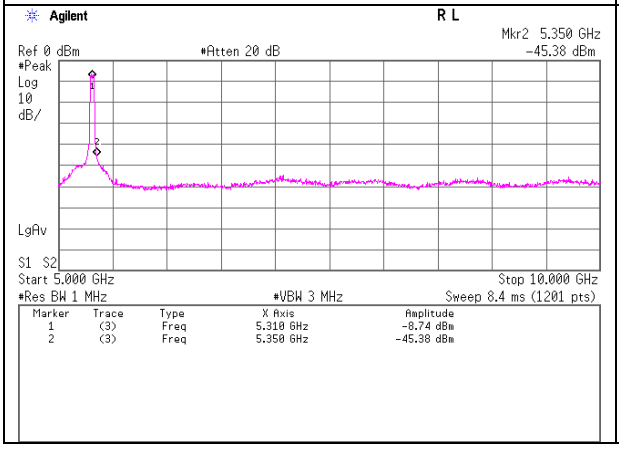
30MHz-1GHz



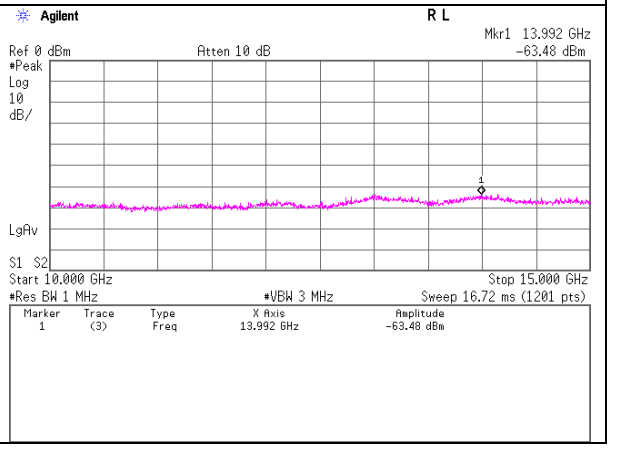
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz

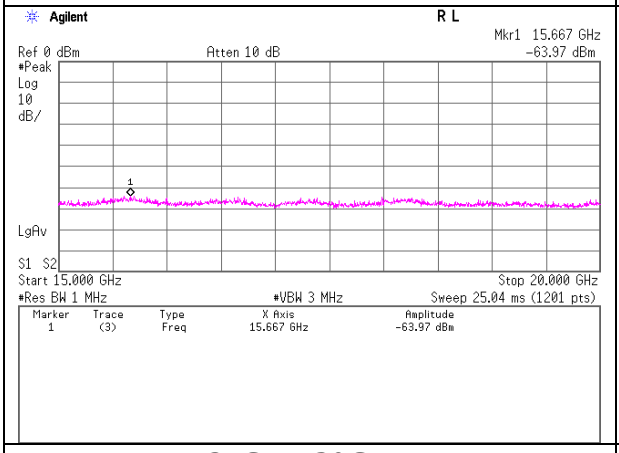


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

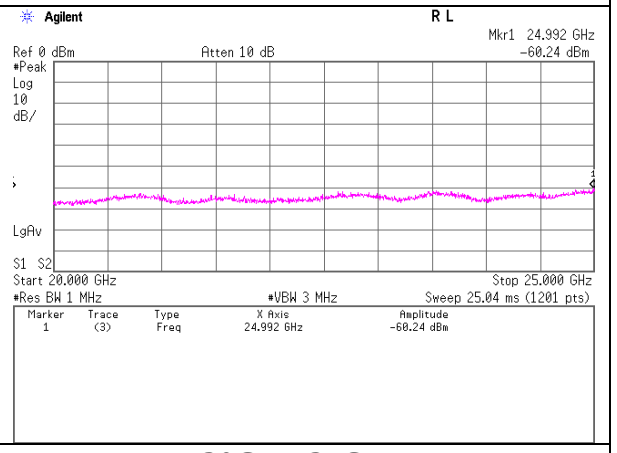
Conducted Spurious Emission

11n-40 Tx 5310MHz

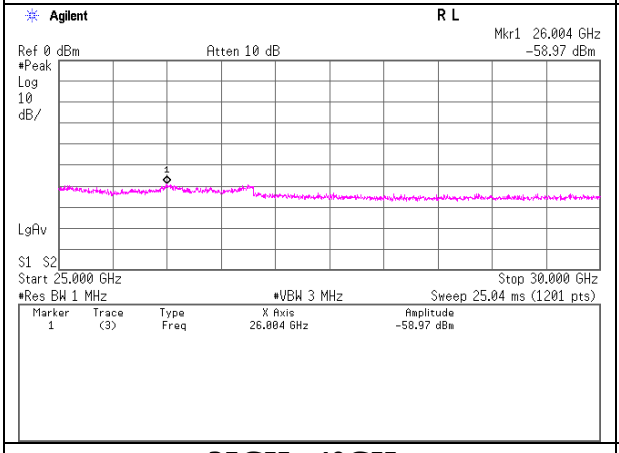
15GHz-20GHz



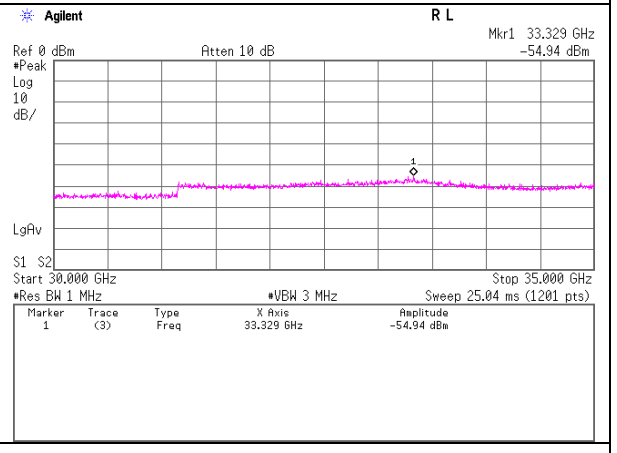
20GHz-25GHz



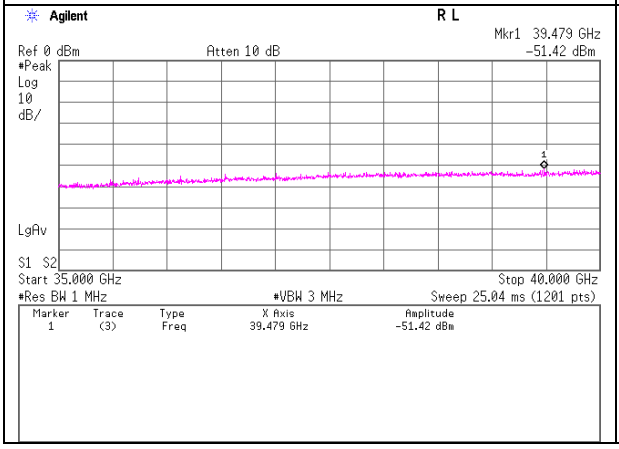
25GHz-30GHz



30GHz-35GHz



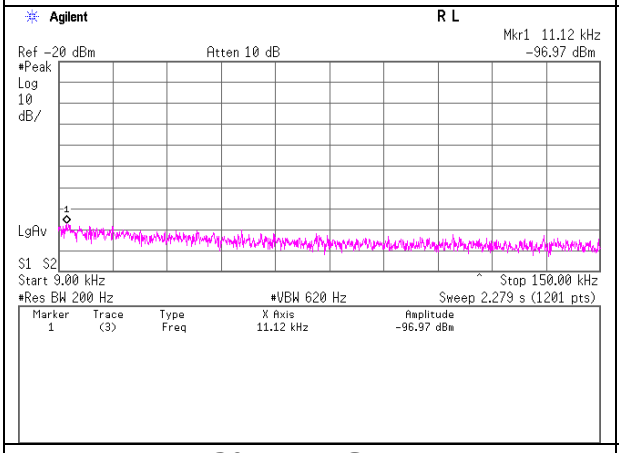
35GHz-40GHz



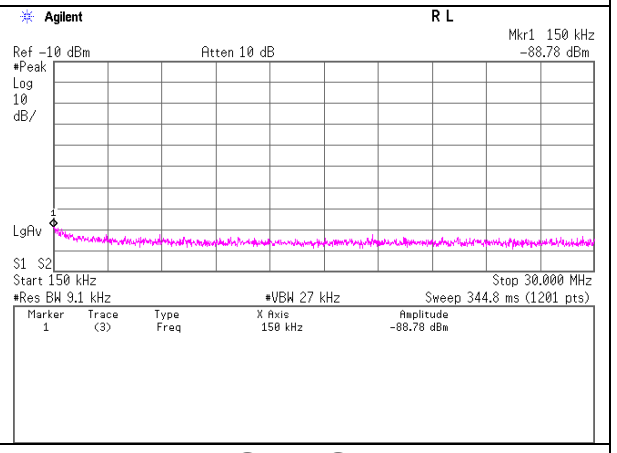
Conducted Spurious Emission

11n-40 Tx 5510MHz

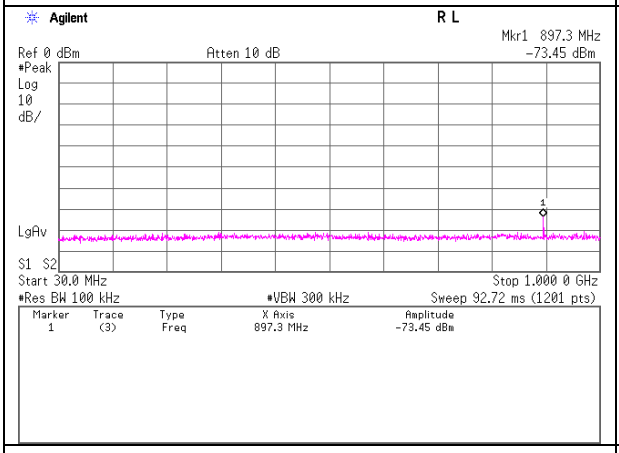
9kHz-150kHz



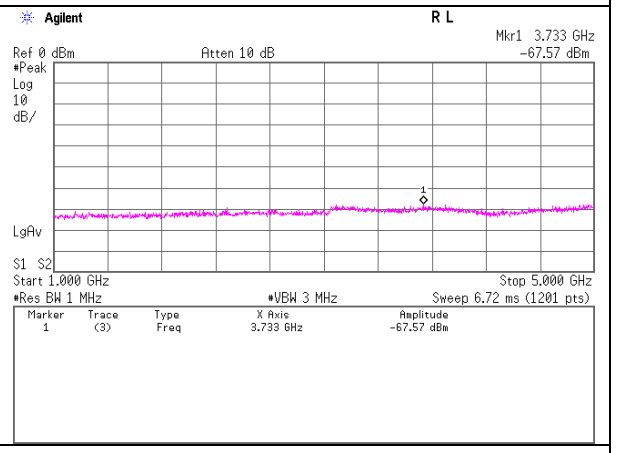
150kHz-30MHz



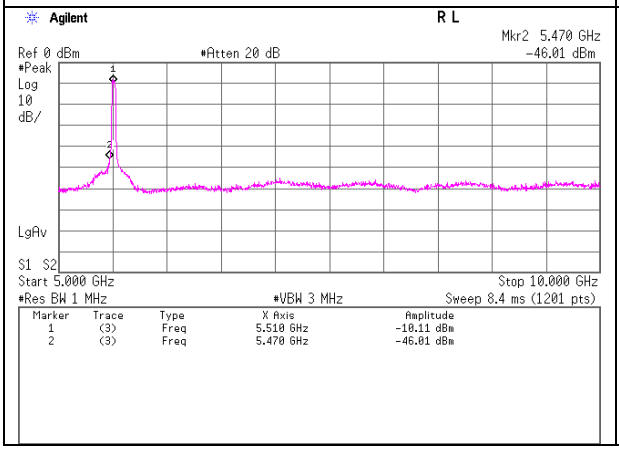
30MHz-1GHz



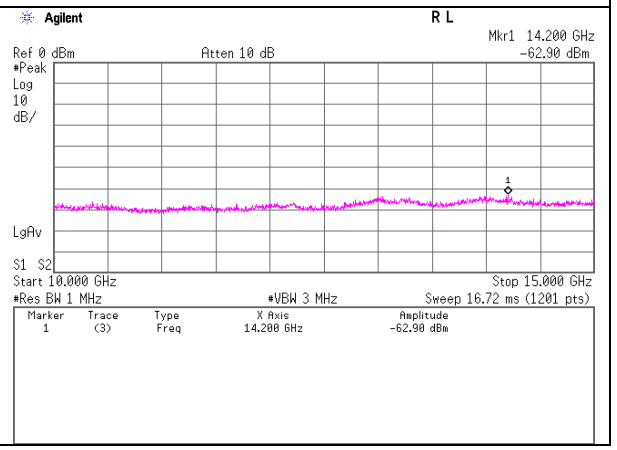
1GHz-5GHz



5GHz-10GHz



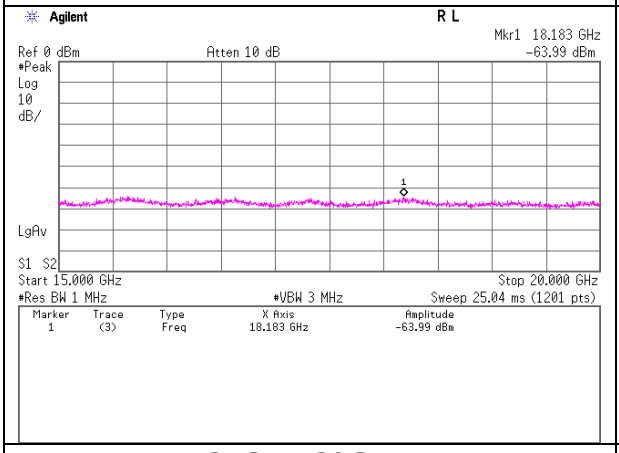
10GHz-15GHz



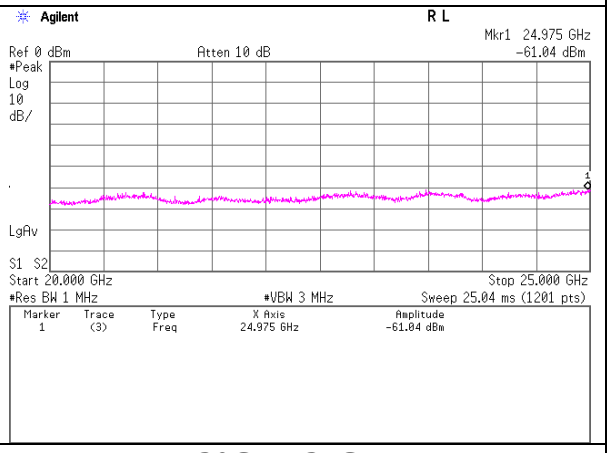
Conducted Spurious Emission

11n-40 Tx 5510MHz

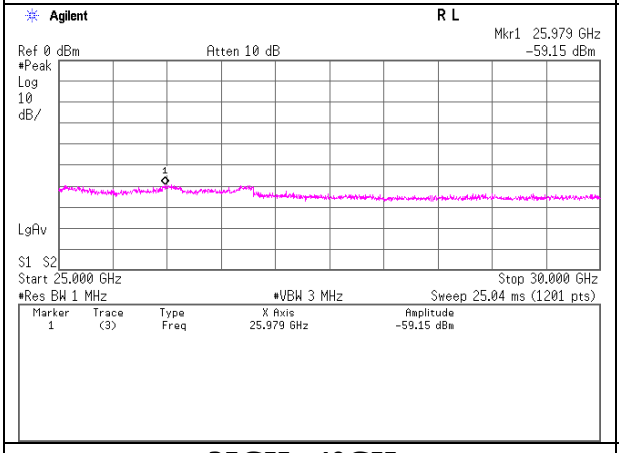
15GHz-20GHz



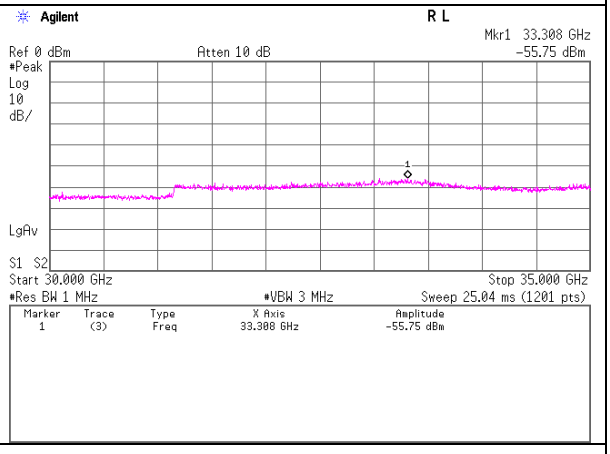
20GHz-25GHz



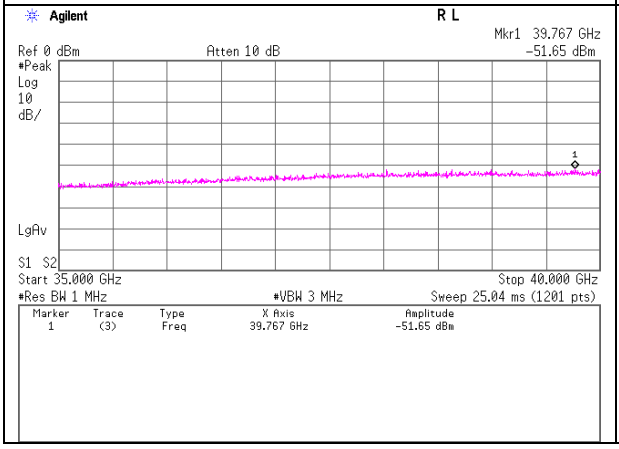
25GHz-30GHz



30GHz-35GHz



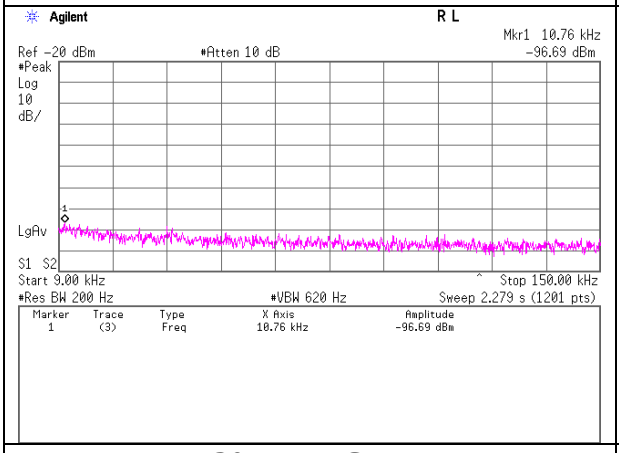
35GHz-40GHz



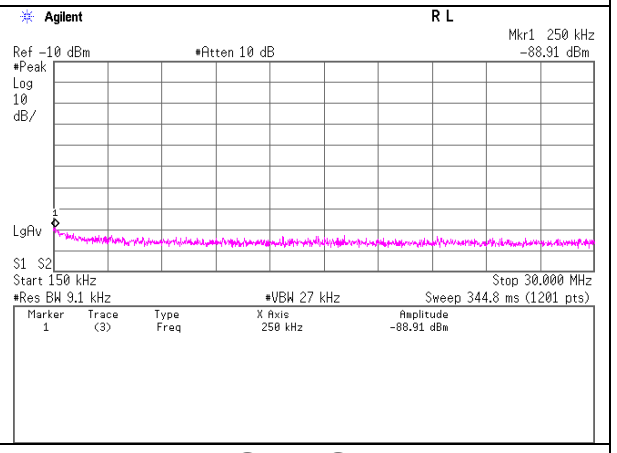
Conducted Spurious Emission

11n-40 Tx 5590MHz

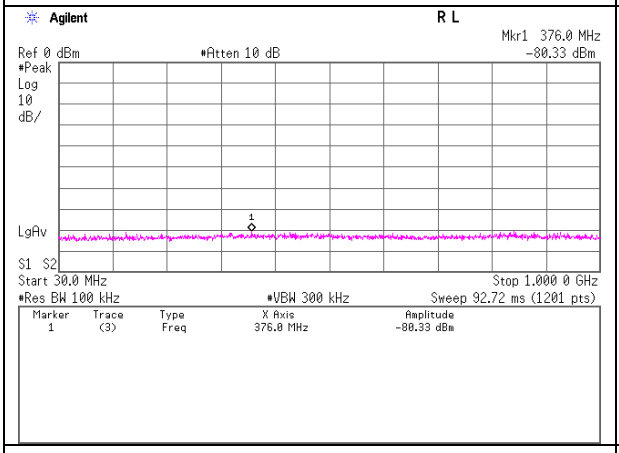
9kHz-150kHz



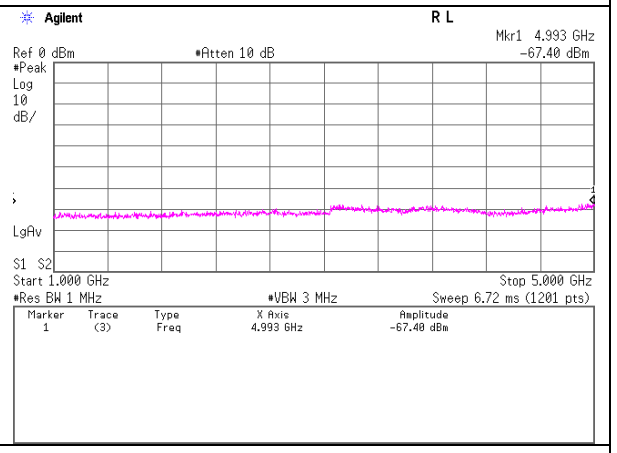
150kHz-30MHz



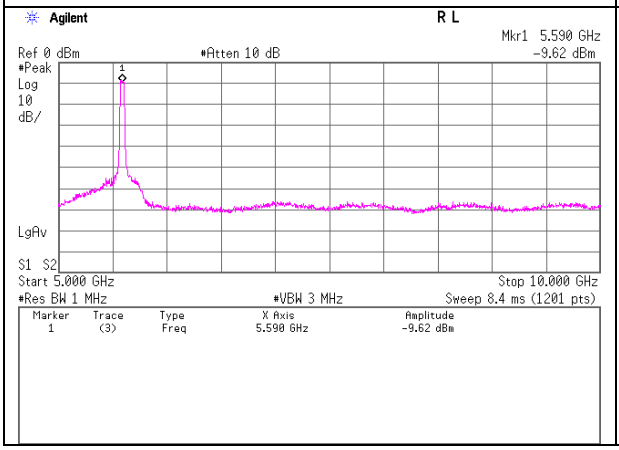
30MHz-1GHz



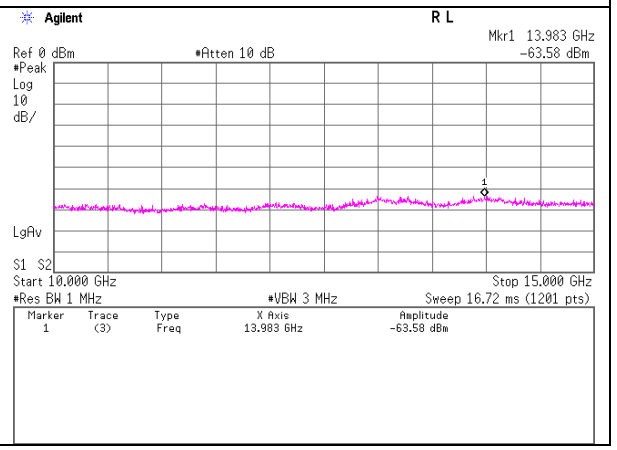
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz

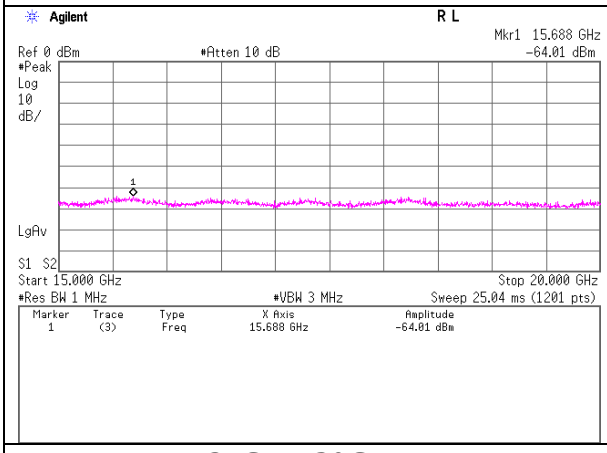


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

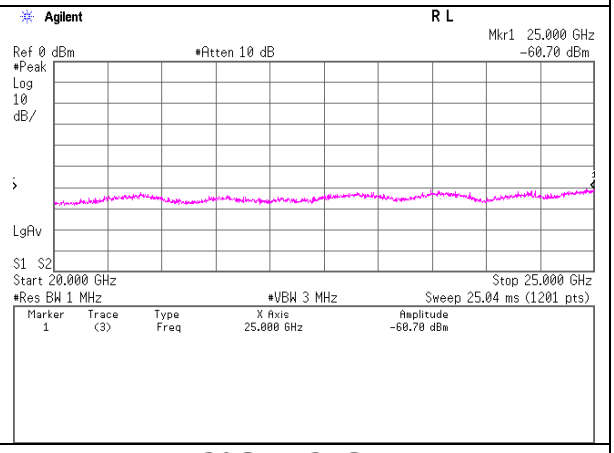
Conducted Spurious Emission

11n-40 Tx 5590MHz

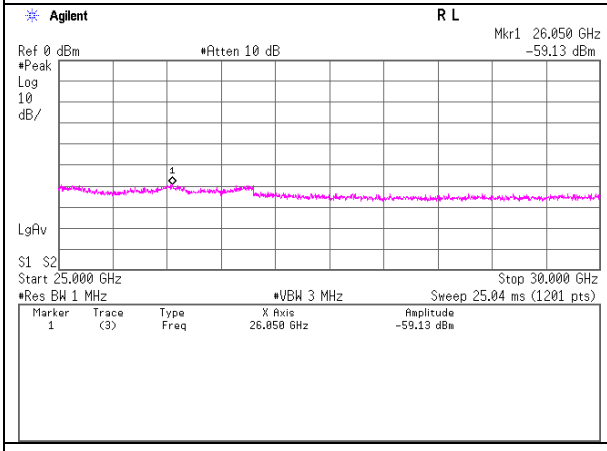
15GHz-20GHz



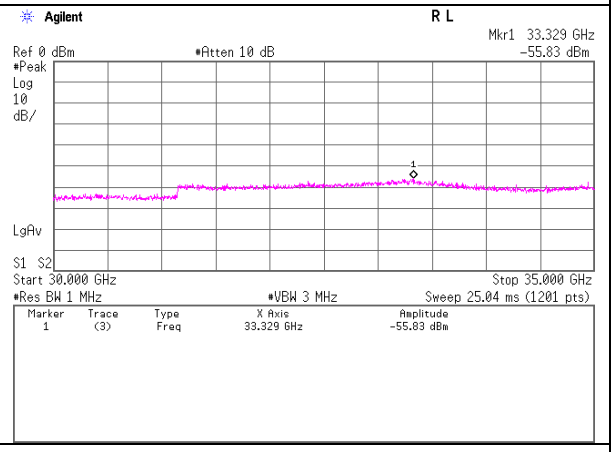
20GHz-25GHz



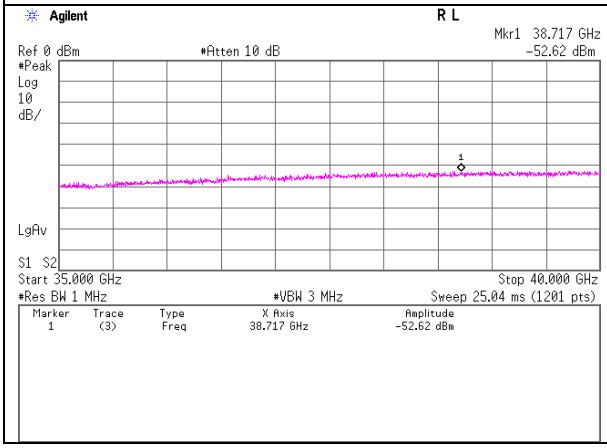
25GHz-30GHz



30GHz-35GHz



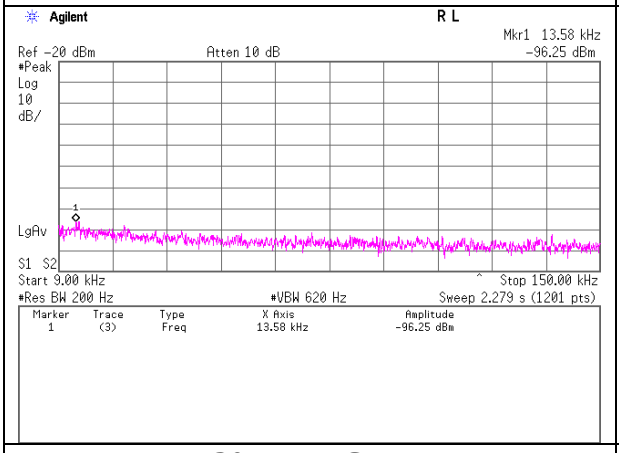
35GHz-40GHz



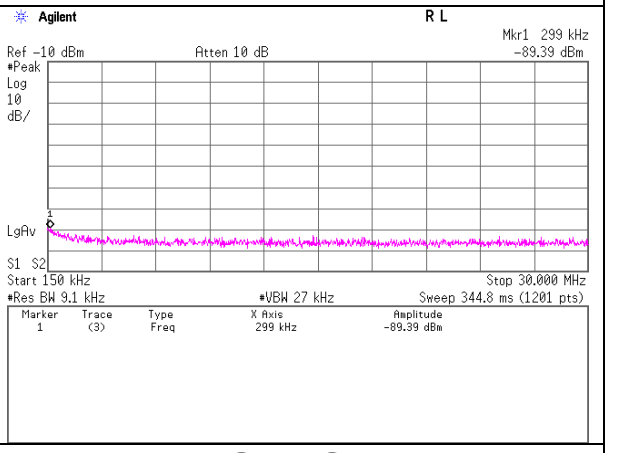
Conducted Spurious Emission

11n-40 Tx 5670MHz

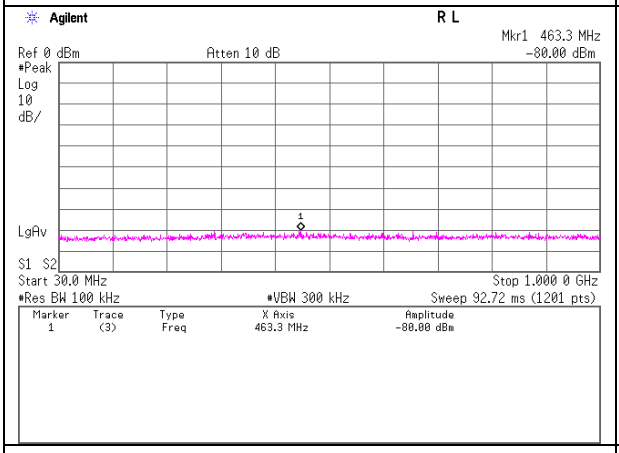
9kHz-150kHz



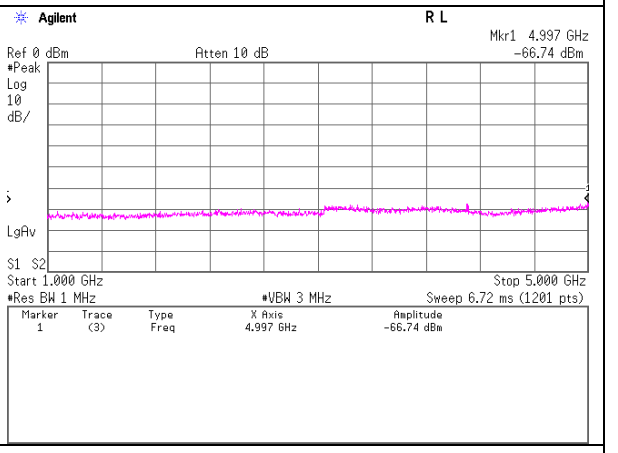
150kHz-30MHz



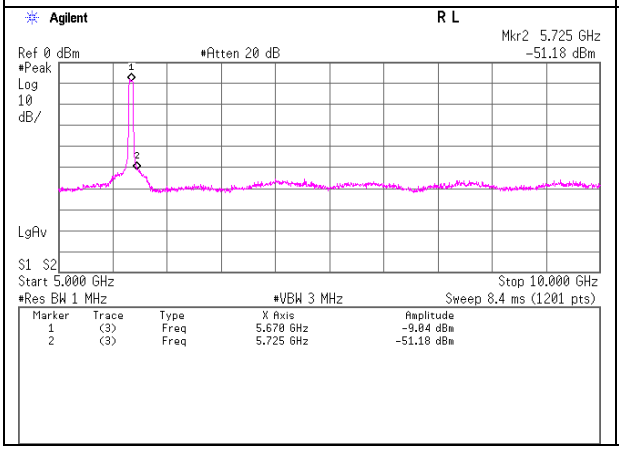
30MHz-1GHz



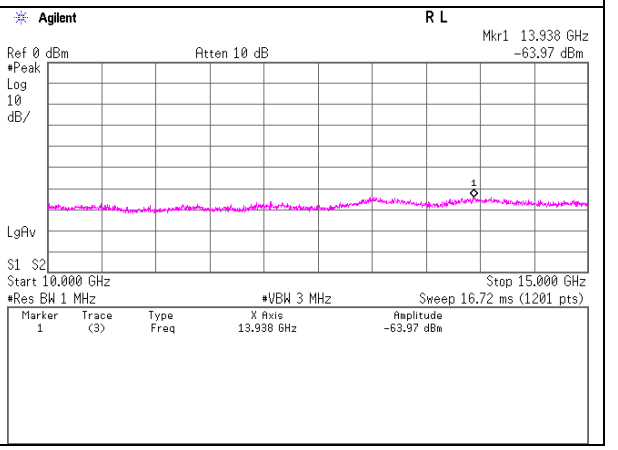
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz

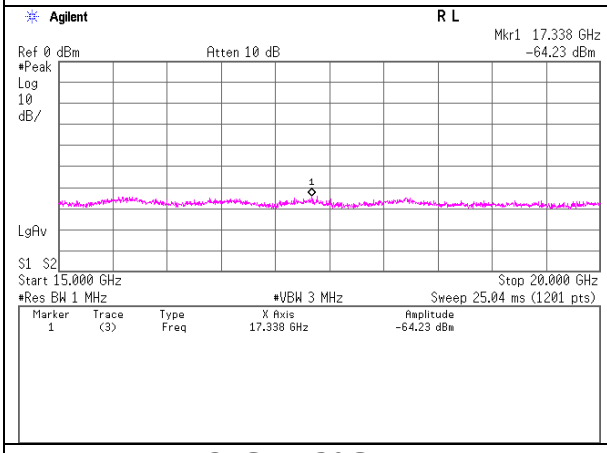


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

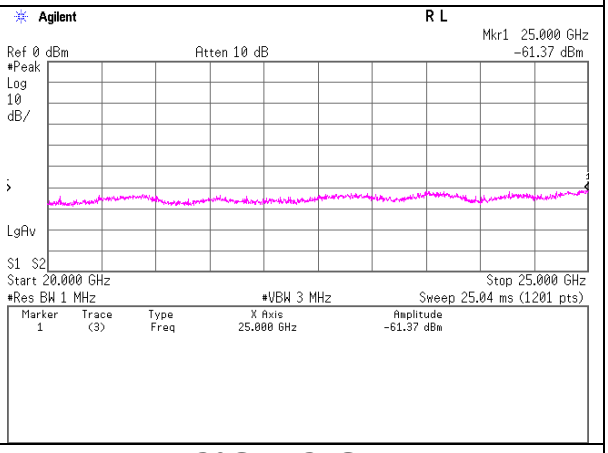
Conducted Spurious Emission

11n-40 Tx 5670MHz

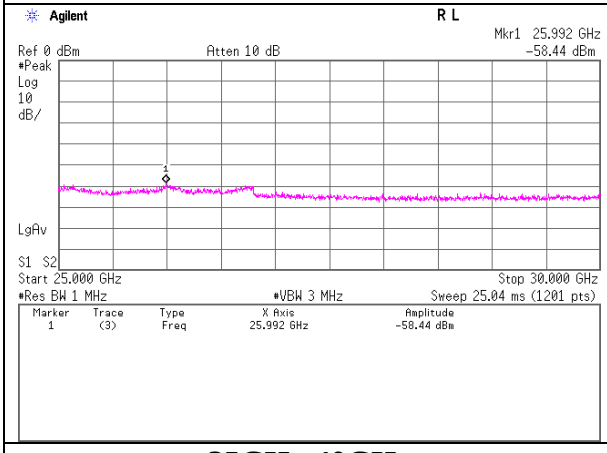
15GHz-20GHz



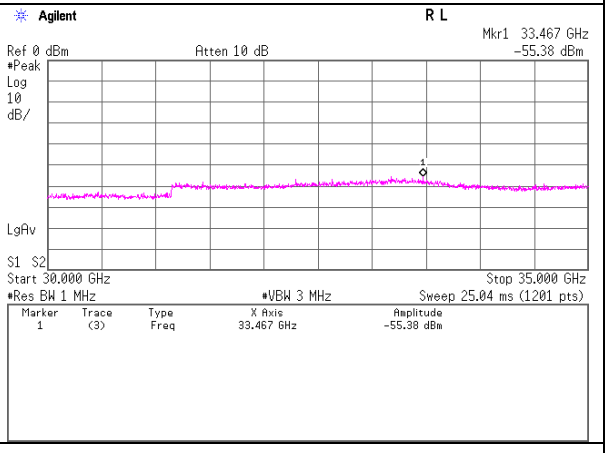
20GHz-25GHz



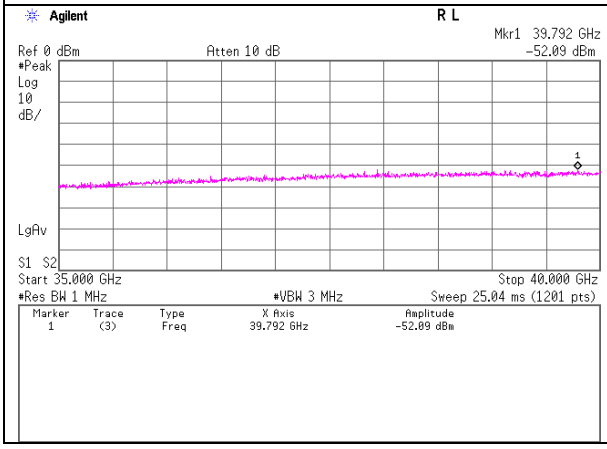
25GHz-30GHz



30GHz-35GHz



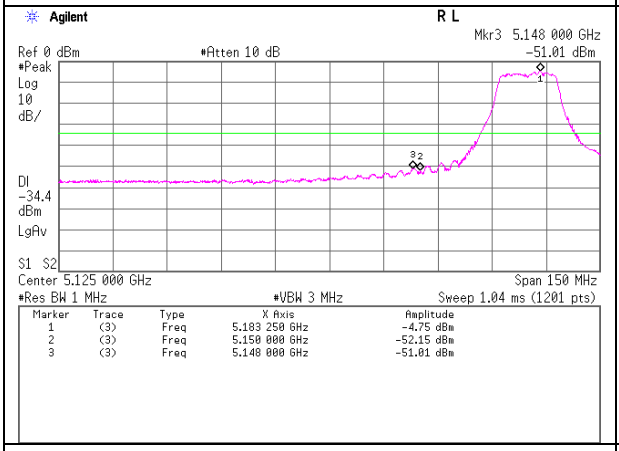
35GHz-40GHz



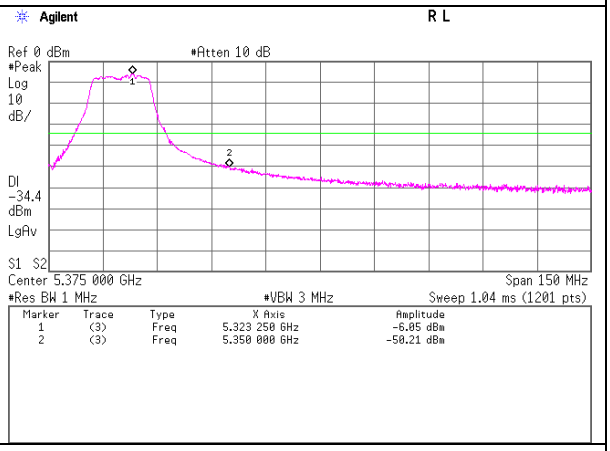
Conducted emission Band Edge compliance

11a

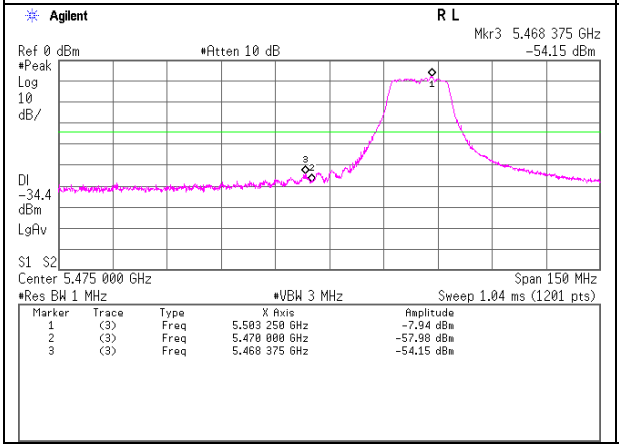
5180MHz



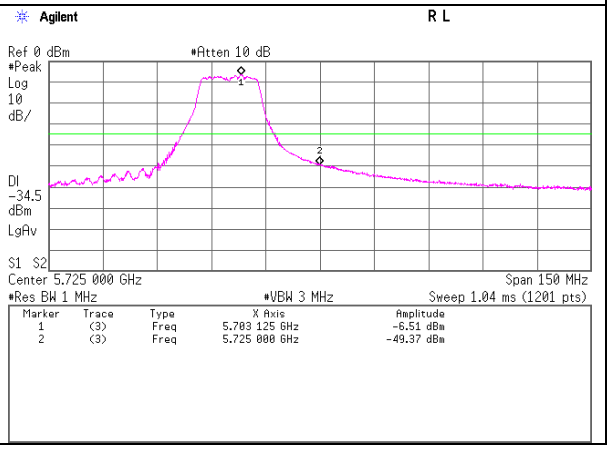
5320MHz



5500MHz



5700MHz

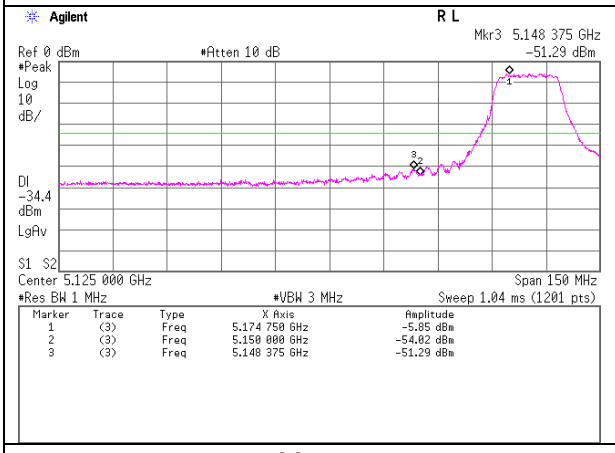


Limit line = -27dBm – Ant Gain – Cable loss – Att. loss

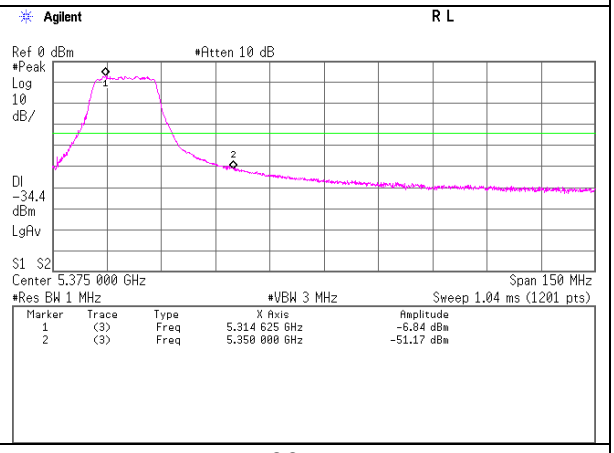
Conducted emission Band Edge compliance

11n-20

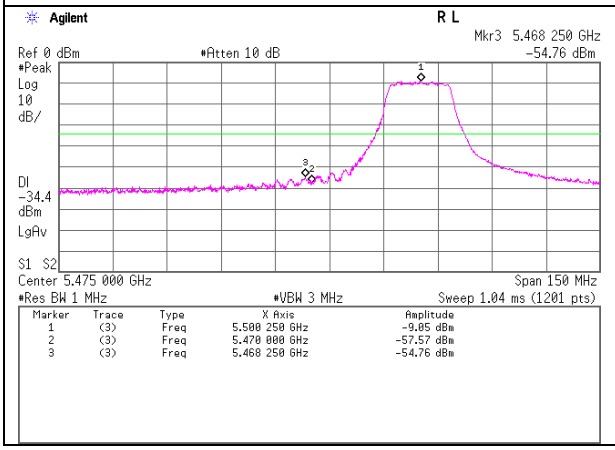
5180MHz



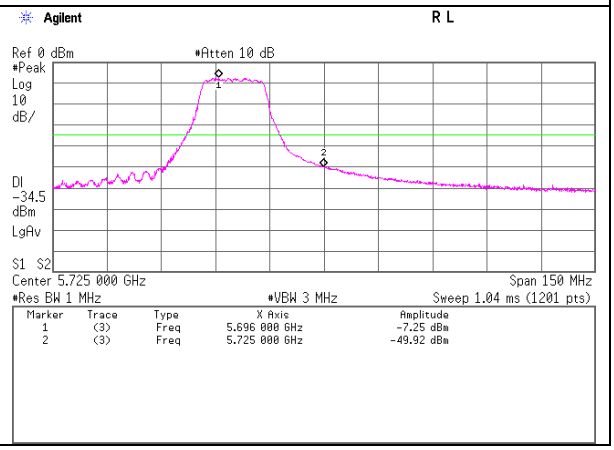
5320MHz



5500MHz



5700MHz

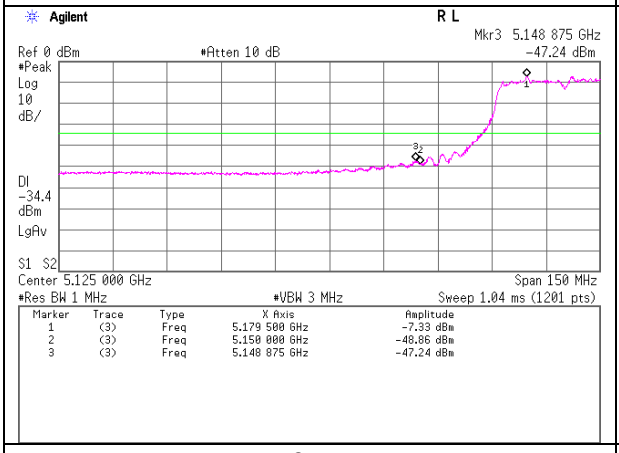


Limit line = -27dBm – Ant Gain – Cable loss – Att. loss

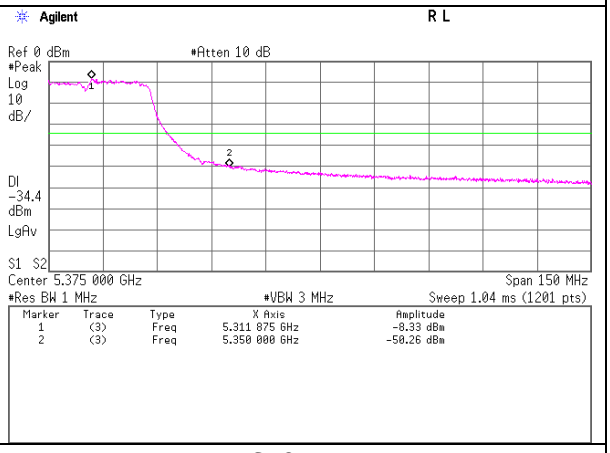
Conducted emission Band Edge compliance

11n-40

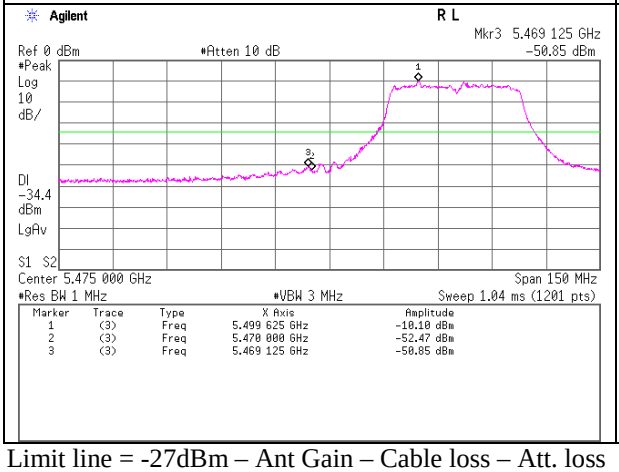
5190MHz



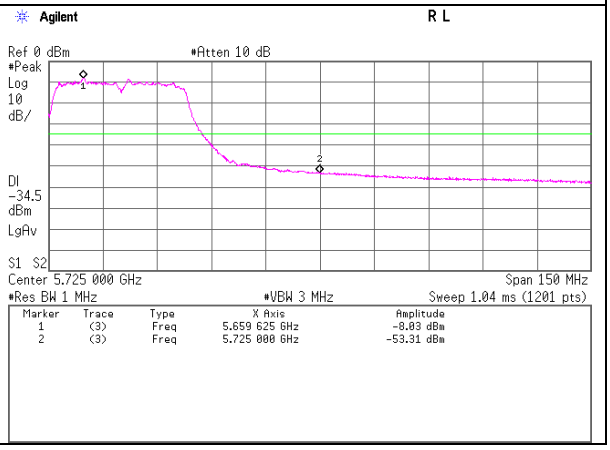
5310MHz



5510MHz



5670MHz



Limit line = -27dBm – Ant Gain – Cable loss – Att. loss

Peak Excursion Ratio

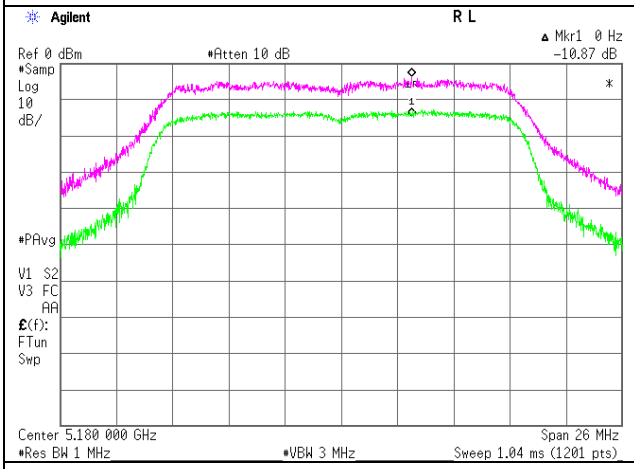
Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32BE0278-HO
Date	10/06/2011
Temperature/ Humidity	23 deg. C / 61% RH
Engineer	Takayuki Shimada
Mode	11a Tx

Frequency [MHz]	Peak Power Excursion [dB]	Limit [dB]
5180	10.87	13.00
5220	9.67	13.00
5240	9.40	13.00
5260	10.28	13.00
5300	11.25	13.00
5320	10.86	13.00
5500	11.10	13.00
5600	10.24	13.00
5700	10.54	13.00

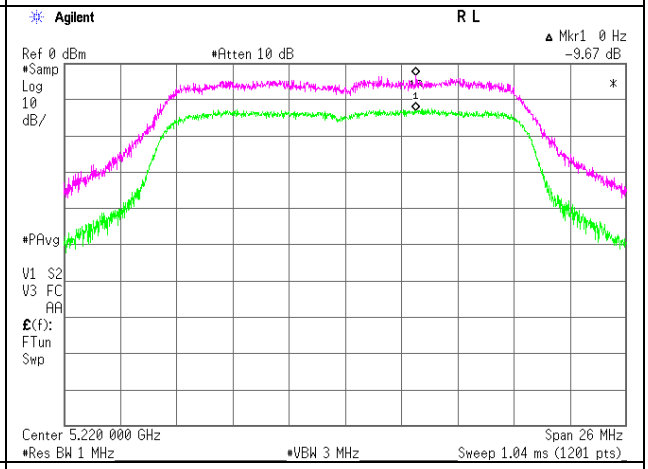
Peak Excursion Ratio

11a

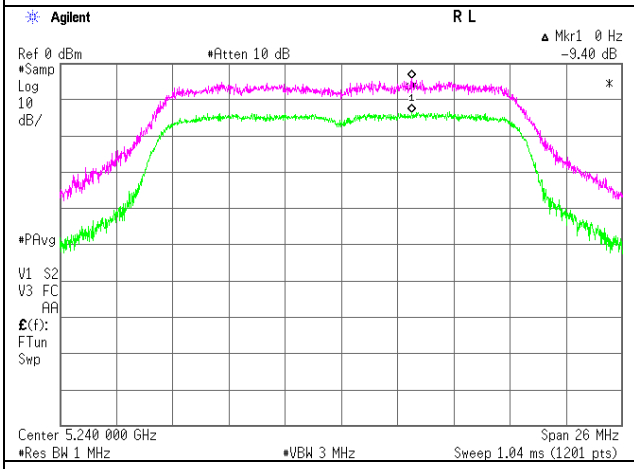
5180MHz



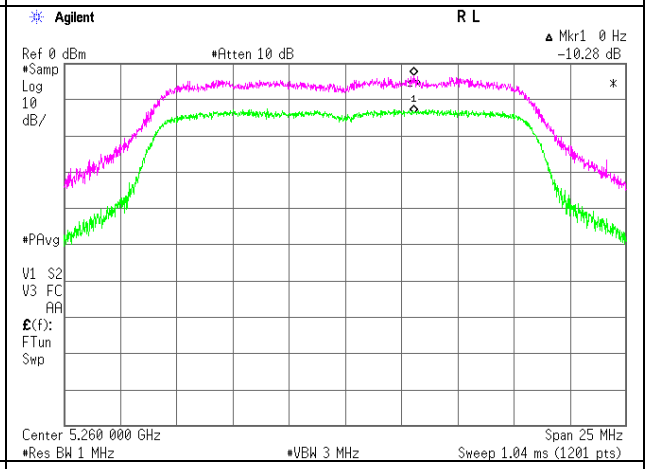
5220MHz



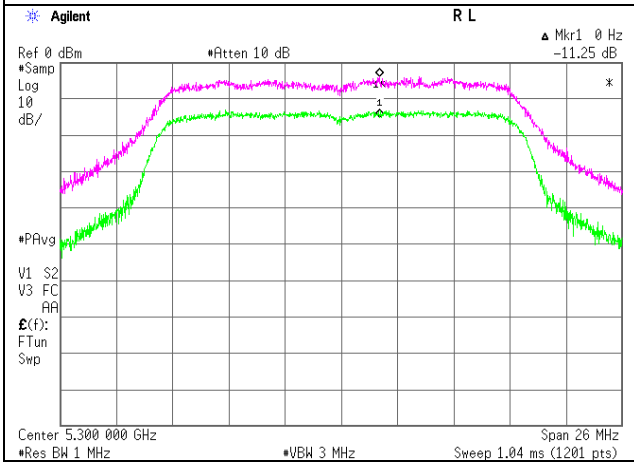
5240MHz



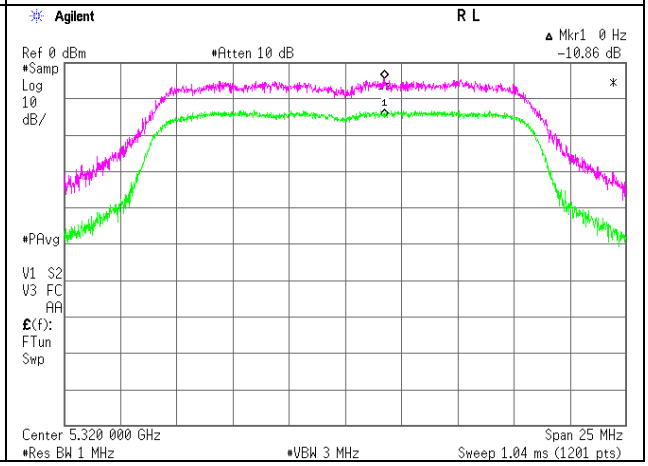
5260MHz



5300MHz



5320MHz

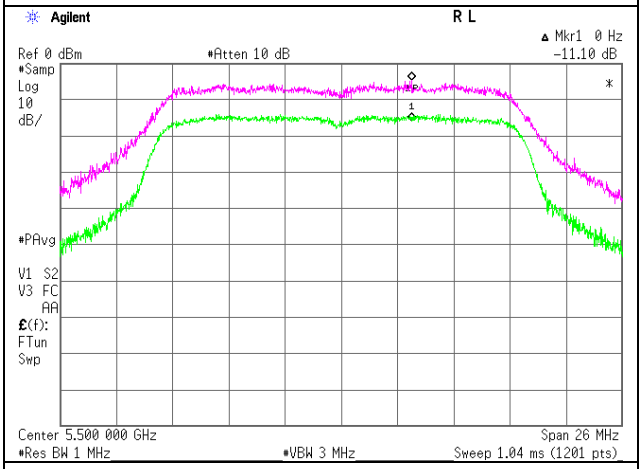


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

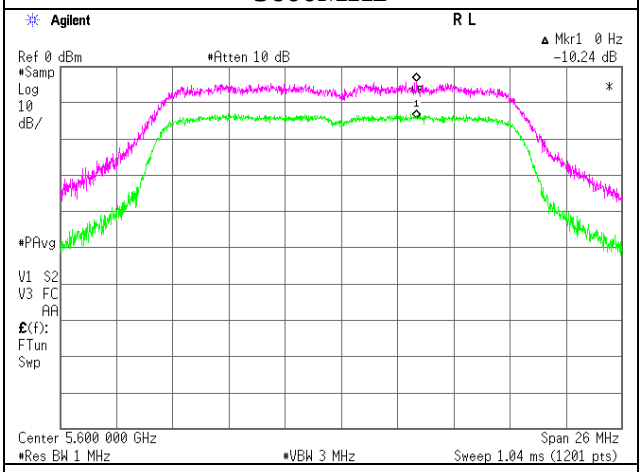
Peak Excursion Ratio

11a

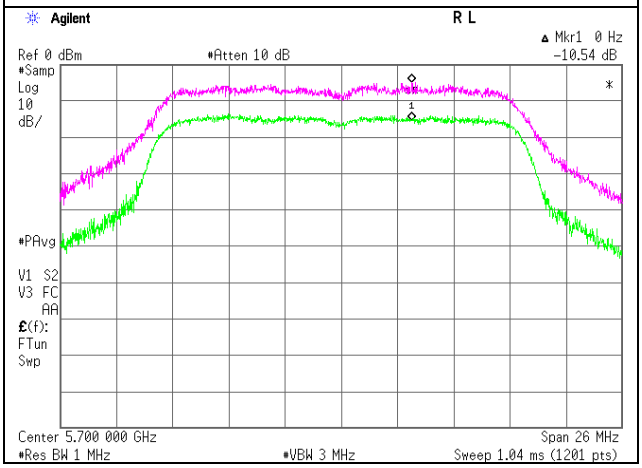
5500MHz



5600MHz



5700MHz



Peak Excursion Ratio

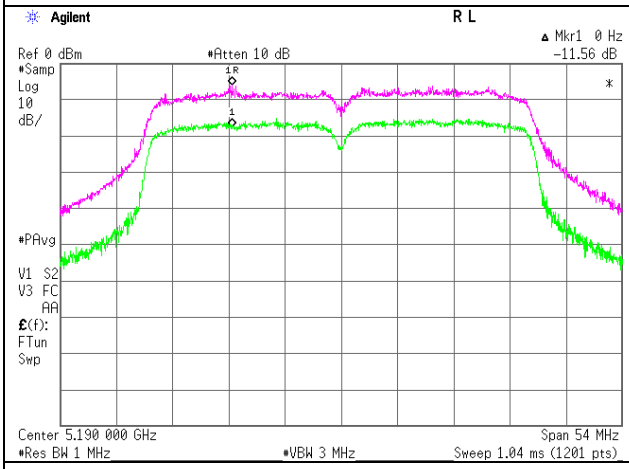
Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32BE0278-HO
Date	10/06/2011
Temperature/ Humidity	23 deg. C / 61% RH
Engineer	Takayuki Shimada
Mode	11n-40 Tx

Frequency [MHz]	Peak Power Excursion [dB]	Limit [dB]
5190	11.56	13.00
5230	11.52	13.00
5270	11.03	13.00
5310	10.64	13.00
5510	11.57	13.00
5590	11.35	13.00
5670	11.15	13.00

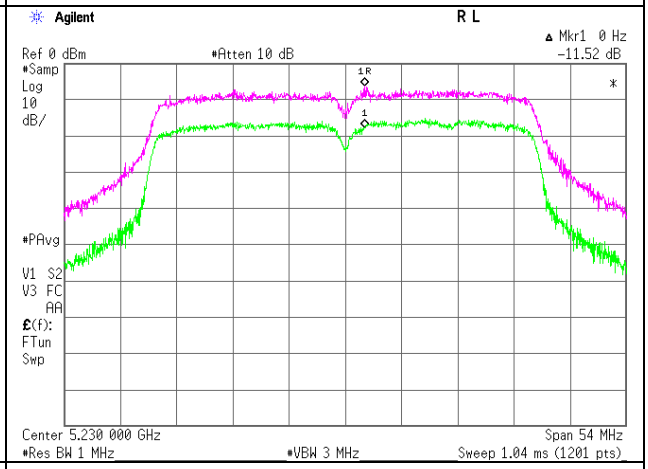
Peak Excursion Ratio

11n-40

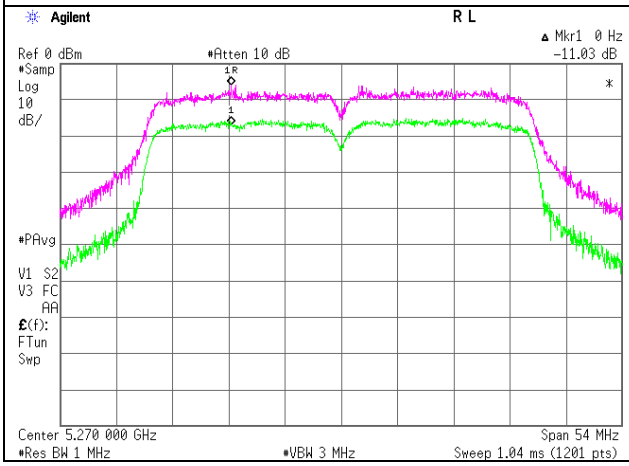
5190MHz



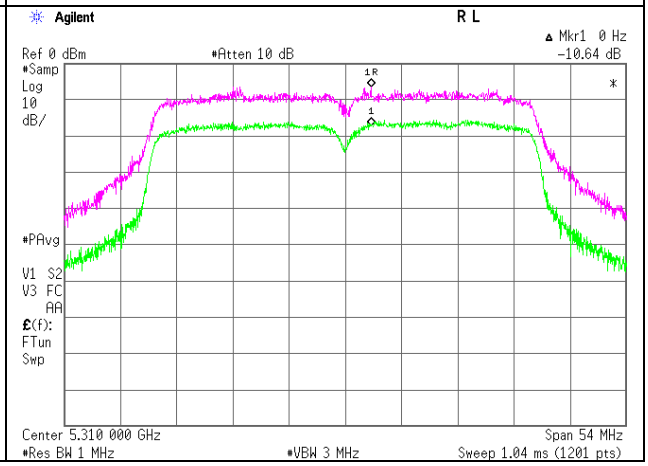
5230MHz



5270MHz



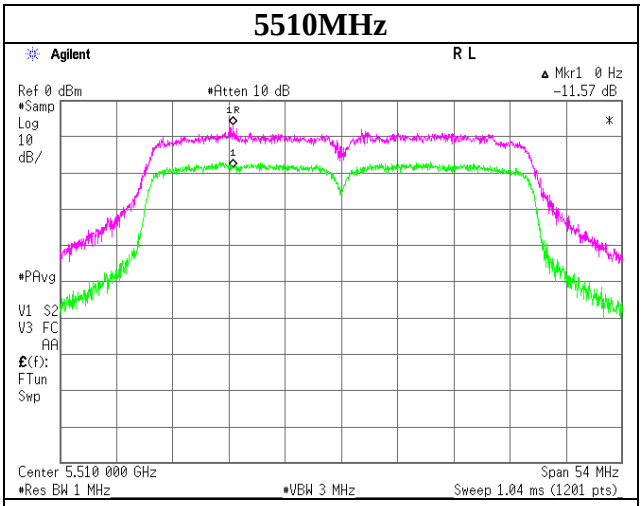
5310MHz



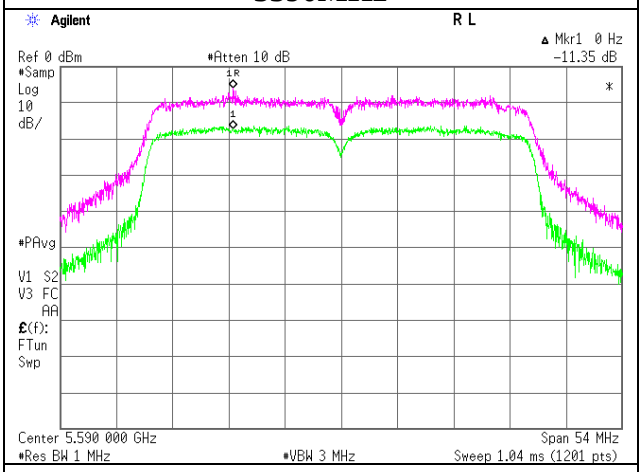
Peak Excursion Ratio

11n-40

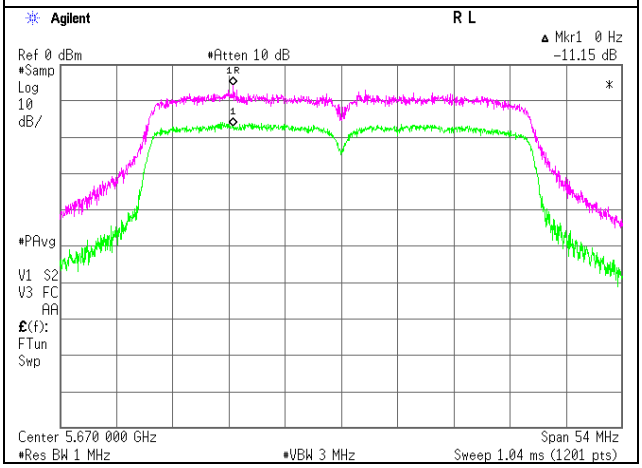
5510MHz



5590MHz



5670MHz



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-04	Digital Humidity Indicator	N.T	NT-1800	MOS04	AT	2011/02/23 * 12
MAT-25	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71642	AT	2011/06/23 * 12
MCC-93	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	30814/2	AT	2011/05/27 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE/AT	2011/02/15 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	CE	2011/06/21 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	CE	2011/02/23 * 12
MJM-14	Measure	KOMELON	KMC-36	-	CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	CE	2010/11/18 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	CE	2011/04/15 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE(EUT)	2011/02/20 * 12
MTA-31	Terminator	TME	CT-01	-	CE	2011/01/05 * 12
MCC-13	Coaxial Cable	Fujikura	3D-2W(12m)/5D-2W(5m)/5D-2W(0.8m)/5D-2W(1m)	-	CE	2011/02/18 * 12
MAT-65	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2011/02/21 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	AT	2011/04/08 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2011/02/23 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2011/02/22 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2011/02/23 * 12
MJM-06	Measure	PROMART	SEN1955	-	RE	
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2011/08/11 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2010/10/11 * 12 *1)
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2010/10/11 * 12 *1)
MCC-51	Coaxial cable	UL Japan	-	-	RE	2011/07/15 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2010/11/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2011/03/04 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2011/05/23 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2011/09/07 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2011/03/10 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2011/05/23 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2011/03/02 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	3950M00205	RE	2011/06/15 * 12

***1)This test equipment was used for the tests performed before the expiration date of the calibration.**

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