RADIO TEST REPORT

Test Report No. : 11232774H-A-R1

Applicant	:	**silex technology, Inc.**
Type of Equipment	:	**Wireless LAN PCI Express Mini Card Module**
Model No.	:	**SX-PCEAN**
FCC ID	:	**N6C-SXPCEAN**
Test regulation	:	**FCC Part 15 Subpart E: 2016 (Class II permissive change)** *This test report applies to Wireless LAN (5GHz W56 band (5500 MHz -5700 MHz)) for Class II permissive change of W56 band addition.
Test Result	:	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
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6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 11232774H-A. 11232774H-A is replaced with this report.

Date of test: May 10, 2016 to January 11, 2017

Representative test engineer:
Satofumi Matsuyama
Engineer
Consumer Technology Division

Approved by:
Tsubasa Takayama
Engineer
Consumer Technology Division

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://japan.ul.com/resources/emc_accredited/

REVISION HISTORY

Original Test Report No.: 11232774H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	11232774H-A	June 28, 2016	-	-
1	11232774H-A-R1	January 16, 2017	P 1	Addition of sentence.
1	11232774H-A-R1	January 16, 2017	P 24 - P 30	Correction of test data

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SECTION 1: Customer information

Company Name	:	silex technology, Inc.
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Contact Person	:	Toshiro Kometani

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

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless LAN PCI Express Mini Card Module
Model No.	:	SX-PCEAN
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.3 V
Receipt Date of Sample	:	April 12, 2016
Country of Mass-production	:	Japan
Condition of EUT	:	Production model
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: SX-PCEAN (referred to as the EUT in this report) is a Wireless LAN PCI Express Mini Card Module.

General Specification

Clock frequency(ies) in the system	:	40MHz

Radio Specification

Radio Type	:	Transceiver
Method of Frequency Generation	:	Synthesizer
Power Supply (inner)	:	DC1.2V

Specification of Wireless LAN (IEEE802.11b/g/a/n-20/n-40)

	IEEE802.11b	IEEE802.11g	IEEE802.11a	IEEE802.11n (20 M band)	IEEE802.11n (40 M band)
Frequency of operation	2412-2462MHz	2412-2462MHz	5180-5320MHz 5500-5700 MHz*1) 5745-5825MHz	2412 - 2462MHz 5180-5320MHz 5500-5700 MHz*1) 5745-5825MHz	2422 - 2452MHz 5190 - 5310MHz 5510-5670MHz*1) 5755 - 5795MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)		
Channel spacing	5MHz		20MHz	2.4GHz band 5MHz 5GHz band 20MHz	2.4GHz band 5MHz 5GHz band 40MHz
Antenna type	Sleeve antenna (Omni-Directional)				
Antenna Gain: G_{ANT}	1.5dBi@2.4GHz Band, 2.1dBi@5GHz Band				
Antenna Connector type	U.FL Alternative connector				

*1) W56 band is applied for this report.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart E FCC part 15 final revised on April 6, 2016.
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 C63.10-2013	**FCC:** 15.407 (b) (6) / 15.207	**QP** 16.6 dB, 0.15000 MHz, L **AV** 28.9 dB, 0.15000 MHz, L	Complied	-
	IC: RSS-Gen 8.8	**IC:** RSS-Gen 8.8			
26 dB Emission Bandwidth	**FCC:** KDB Publication Number 789033	**FCC:** 15.407 (a) (1) (2) (3)	See data	N/A	Conducted
	IC: -	**IC:** -			
Maximum Conducted Output Power	**FCC:** KDB Publication Number 789033	**FCC:** 15.407 (a) (1) (2) (3)		Complied	Conducted
	IC: -	**IC:** RSS-247 6.2.1 (1) 6.2.2 (1) 6.2.3 (1) 6.2.4 (1)			
Maximum Power Spectral Density	**FCC:** KDB Publication Number 789033	**FCC :** 15.407 (a) (1) (2) (3)		Complied	Conducted
	IC: -	**IC:** RSS-247 6.2.1 (1) 6.2.2 (1) 6.2.3 (1) 6.2.4 (1)			
Spurious Emission Restricted Band Edge	**FCC:** ANSI C63.10-2013 KDB Publication Number 789033	**FCC:** 15.407 (b), 15.205 and 15.209	1.0 dB 5725.000 MHz, AV, Hori.	Complied	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
	IC: -	**IC:** RSS-247 6.2.1 (2) 6.2.2 (2) 6.2.3 (2) 6.2.4 (2)			
6 dB Emission Bandwidth	**FCC:** ANSI C63.10-2013	**FCC:** 15.407 (e)	See data	Complied	Conducted
	IC: -	**IC:** RSS-247 6.2.4 (1)			

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 11232774H-C issued by UL Japan, Inc.
*1) Radiated test was selected over 30 MHz based on section FCC 15.407 (b) and KDB 789033 D02 G.3.b).

* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

FCC 15.31 (e)
The RF Module has own regulator.
The RF Module is constantly provided voltage through own regulator regardless of input voltage (DC1.2 V).
Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement
The EUT has a unique antenna connector (U.FL on the Module and Reverse SMA for Antenna itself).
Therefore the equipment complies with the requirement of 15.203/212.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Band Width	RSS-Gen 6.6	**IC:** -	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.

Ise EMC Lab.

Antenna terminal test Uncertainty (+/-)							
Power meter		Conducted emission and Power density			Conducted emission		Channel power
Below 1 GHz	Above 1 GHz	Below 1 GHz	1 GHz -3 GHz	3 GHz -18 GHz	18 GHz -26.5 GHz	26.5 GHz -40 GHz	
0.9 dB	1.0 dB	1.4 dB	1.7 dB	2.8 dB	2.8 dB	2.9 dB	2.6 dB

Frequency range	Conducted emission using AMN(LISN) (±dB)
0.009 – 0.15MHz	3.5 dB
0.15 – 30MHz	2.9 dB

Test distance	Radiated emission (±dB) 9 kHz - 30 MHz
3m	3.8 dB
10m	3.7 dB

Polarity	Radiated emission (Below 1GHz)			
	(3 m*)(±dB)		(10 m*)(±dB)	
	30 – 200 MHz	200 – 1000MHz	30 – 200 MHz	200 – 1000MHz
Horizontal	4.9 dB	5.2 dB	4.9 dB	5.0 dB
Vertical	4.6 dB	5.9 dB	5.0 dB	5.0 dB

Radiated emission				
(3 m*)(±dB)		(1 m*)(±dB)	(0.5 m*)(±dB)	(10 m*)(±dB)
1 – 6GHz	6 – 18GHz	10 – 26.5 GHz	26.5 – 40GHz	1 -18 GHz
5.0 dB	5.2 dB	5.1 dB	5.0 dB	5.2 dB

*Measurement distance

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

Radiated emission test
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

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

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.6 shielded room	-	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	-	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	-	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	-	3.1 x 5.0 x 2.7	N/A	-	-
No.9 measurement room	-	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	-	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

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

Mode	Remarks*
IEEE 802.11a (11a)	6 Mbps, PN9
IEEE 802.11n SISO 20 MHz BW (11n-20)	MCS 0 (Long GI, 1 Streams), PN9
IEEE 802.11n MIMO 20 MHz BW (11n-20)	MCS 8 (Long GI, 2 Streams), PN9
IEEE 802.11n SISO 40 MHz BW (11n-40)	MCS 3 (Short GI, 1 Streams), PN9
IEEE 802.11n MIMO 40 MHz BW (11n-40)	MCS 9 (Short GI, 2 Streams), PN9
*The worst antenna and condition was determined based on the test result of Maximum Conducted Output Power.	

*Power of the EUT was set by the software as follows;

Power settings:

11a(5500 MHz): 15dBm
11a(5580 MHz): 15dBm
11a(5700 MHz): 15dBm
11n-20 (5500 MHz): 13.5dBm
11n-20 (5580 MHz): 13.5dBm
11n-20 (5700 MHz): 11.0dBm
11n-40 (5510 MHz): 10.0dBm
11n-40(5550 MHz): 11.0dBm
11n-40(5670 MHz): 11.5dBm

Software: Atheros Radio Test (ART)
- Revision 0.9 BUILD #27 ART_11n
- Customer Version (ANWI BUILD)

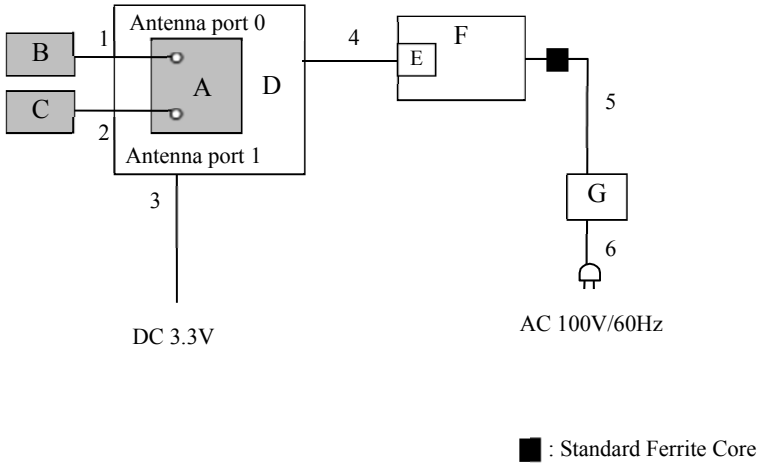
*This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

*The details of Operation mode(s)

Test Item	Operating Mode	Tested Antenna port	Tested Frequency
			Additional Band
Conducted emission *1) *4)	11n-20 Tx	0+1	5500 MHz
99 % Occupied Bandwidth, 26 dB Emission Bandwidth	11a Tx	0 *3)	5500 MHz 5580 MHz 5700 MHz
	11n-20 Tx	0	5500 MHz 5580 MHz
		1	5700 MHz
	11n-40 Tx	0	5510 MHz 5550 MHz
		1	5670 MHz
Maximum Conducted Output Power, Maximum Power Spectral Density *4)	11a Tx	0 *3)	5500 MHz 5580 MHz 5700 MHz
	11n-20 Tx	0+1	5500 MHz 5580 MHz 5700 MHz
	11n-40 Tx	0+1	5510 MHz 5550 MHz 5670 MHz
Radiated Spurious Emission (Above 1 GHz) *4)	11n-20 Tx *2)	0+1	5500 MHz 5580 MHz 5700 MHz
	11n-40 Tx	0+1	5510 MHz 5550 MHz 5670 MHz
Radiated Spurious Emission (Below1 GHz) *1) *4)	11n-20 Tx	0+1	5700 MHz
Conducted Spurious Emission *1)*4)	11n-20 Tx	1 *3)	5500 MHz 5580 MHz 5700 MHz

*1) The mode was tested as a representative, because it had the highest power at antenna terminal test.
*2) Since 11a and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest output power.
*3) After the comparison between Antenna 0 and Antenna 1, test was performed with the antenna that had higher power as a representative.
*4) After the comparison MIMO and SISO in pre-check, test was performed with MIMO as a representative as it had worst case.

4.2 Configuration and peripherals



* Cabling and setup 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	Remark
A	Wireless LAN PCI Express Mini Card Module	SX-PCEAN	00809261B68D	silex technology, Inc.	EUT
B	Antenna	ANTDP-027A0 101	01	Sansei Electric Co., Ltd.	EUT
C	Antenna	ANTDP-027A0 102	02	Sansei Electric Co., Ltd.	EUT
D	Module Jig(PCB)	-	-	-	-
E	Express Card Adaptor	-	-	-	-
F	Laptop PC	T410	-	Lenovo	-
G	AC Adaptor	42P4118	-	Lenovo	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Antenna Cable	0.10	Shielded	Shielded	-
2	Antenna Cable	0.10	Shielded	Shielded	-
3	DC Power Cable	0.50	Unshielded	Unshielded	-
4	HDMI Cable	0.25	Shielded	Shielded	-
5	DC Power Cable	1.80	Unshielded	Unshielded	-
6	AC Power Cable	1.00	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

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

1) For the tests on EUT with other peripherals (as a whole system)
I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

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

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

SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1GHz >
EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

< Above 1GHz >
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

< Below 1GHz >

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

< Above 1GHz >

Inside of restricted bands (Section 15.205):

Apply to limit in the Section 15.209 (a).

Outside of the restricted bands:

Apply to limit 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p.*) in the Section 15.407 (b) (1) (2) (3).
Apply to limit 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p.*) or
78.2 dBuV/m, 3 m (-17 dBm e.i.r.p.*) in the Section 15.407 (b).

Restricted band edge:

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:

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

Test Antennas are used as below;

Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

Frequency	Below 1 GHz	Above 1 GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	Peak	Average
IF Bandwidth	BW: 120 kHz	RBW: 1 MHz VBW: 3 MHz	Method AD *1) RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: ≥ 100 traces If duty cycle was less than 98%, a duty factor was added to the results.
Test Distance	3 m	4.4 m*2) (1 GHz – 10GHz), 1 m*3) (10 GHz – 26.5 GHz), 0.5 m*4) (26.5 GHz – 40 GHz)	

*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01r03 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".
*2) Distance Factor: 20 x log (4.4 m/3.0 m) = 3.3 dB
*3) Distance Factor: 20 x log (1.0 m/3.0 m) = -9.5 dB
*4) Distance Factor: 20 x log (0.5 m/3.0 m) = -15.6 dB

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

[Antenna]
The carrier level and noise levels were confirmed at each position of X0, X90, Y0, Y90, Z0 and Z90 axes of Antenna 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 : 30 MHz-40 GHz
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.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	> RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 80 MHz BW) (Method PM)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz	≥ 3 RBW	Auto	RMS Power Averaging (200 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*2)	9 kHz – 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz – 30 MHz	9.1 kHz	27 kHz				

* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01r03 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

*1) Peak hold was applied as Worst-case measurement.
*2) In the frequency range below 30 MHz, RBW was narrowed to separate the noise contents.
① Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 9.1 kHz)

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: Test data

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

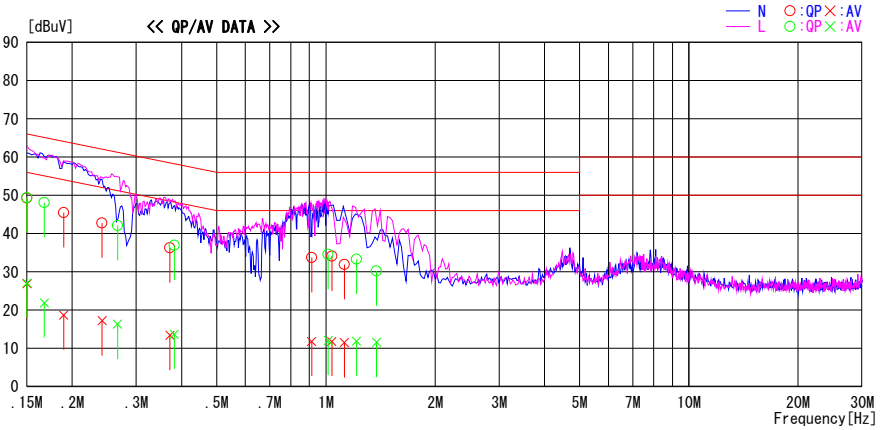
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date : 2016/06/08

Report No. : 11232774H

Temp./Humi. : 24deg. C / 60% RH
Engineer : Tomoki Matsui

Mode / Remarks : Tx 11n-20 5500MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15000	36.1	13.7	13.2	49.3	26.9	66.0	56.0	16.7	29.1	N	
0.15000	36.2	13.9	13.2	49.4	27.1	66.0	56.0	16.6	28.9	L	
0.16760	34.9	8.7	13.2	48.1	21.9	65.1	55.1	17.0	33.2	L	
0.18930	32.3	5.5	13.2	45.5	18.7	64.1	54.1	18.6	35.4	N	
0.24180	29.5	4.0	13.2	42.7	17.2	62.0	52.0	19.3	34.8	N	
0.26666	28.9	3.1	13.2	42.1	16.3	61.2	51.2	19.1	34.9	L	
0.37160	23.0	0.1	13.3	36.3	13.4	58.5	48.5	22.2	35.1	N	
0.38220	23.6	0.4	13.3	36.9	13.7	58.2	48.2	21.3	34.5	L	
0.91360	20.3	-1.6	13.4	33.7	11.8	56.0	46.0	22.3	34.2	N	
1.01400	21.2	-1.3	13.4	34.6	12.1	56.0	46.0	21.4	33.9	L	
1.03760	20.7	-1.6	13.4	34.1	11.8	56.0	46.0	21.9	34.2	N	
1.12405	18.4	-2.0	13.5	31.9	11.5	56.0	46.0	24.1	34.5	N	
1.21460	19.8	-1.6	13.5	33.3	11.9	56.0	46.0	22.7	34.1	L	
1.37800	16.7	-1.9	13.5	30.2	11.6	56.0	46.0	25.8	34.4	L	

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

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11232774H
Date	May 10, 2016
Temperature / Humidity	24deg. C / 59 % RH
Engineer	Tomoki Matsui
Mode	Tx

11a

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna 0	5500	24.325	17.470	-
	5580	24.739	17.514	-
	5700	24.845	17.719	-

11n-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna 0	5500	24.212	18.511	-
	5580	25.765	18.564	-
Antenna 1	5700	26.229	18.298	-

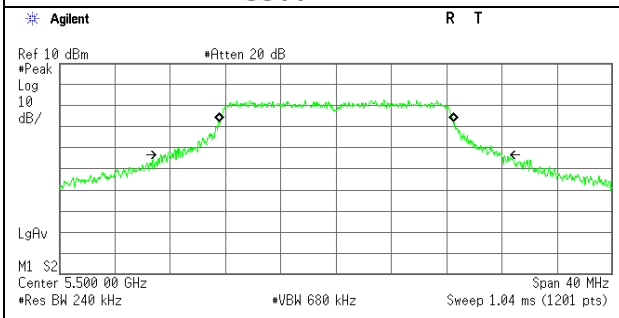
11n-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna 0	5510	46.426	36.966	-
	5550	45.987	37.160	-
Antenna 1	5670	48.222	37.223	-

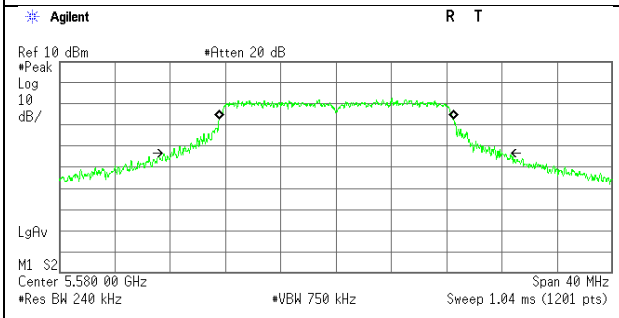
26 dB Emission Bandwidth

11a, Antenna port 0

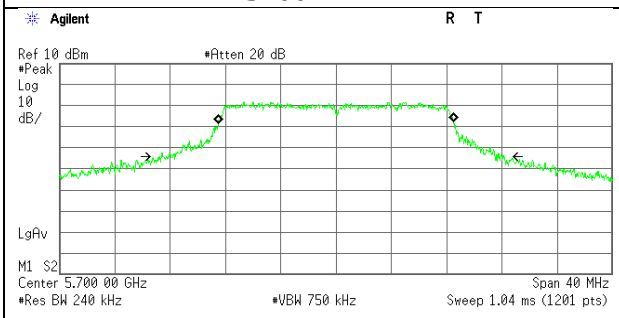
5500 MHz



5580 MHz

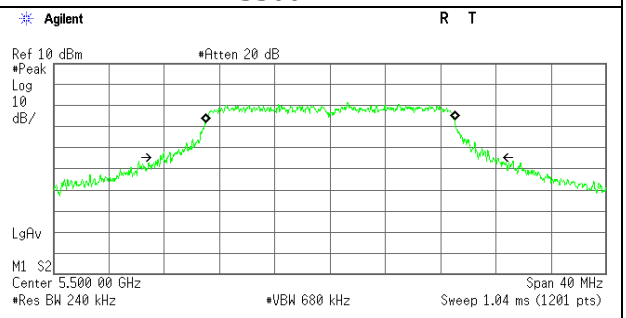


5700 MHz

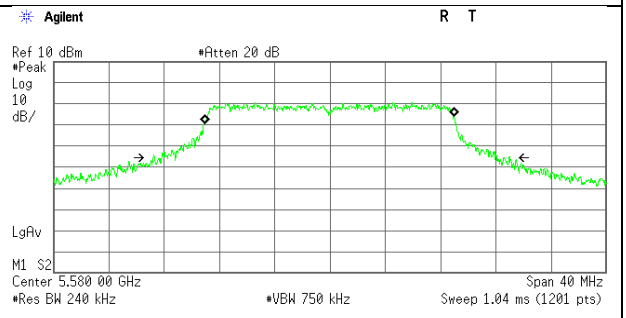


11n-20, Antenna port 0

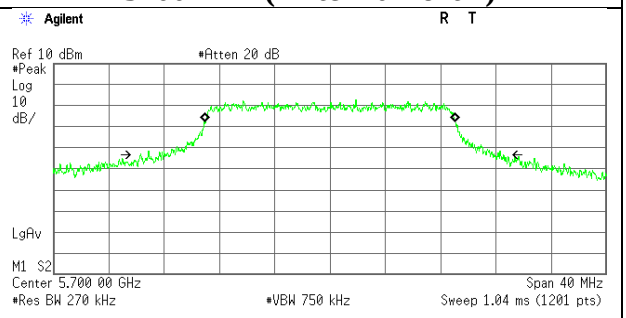
5500 MHz



5580 MHz



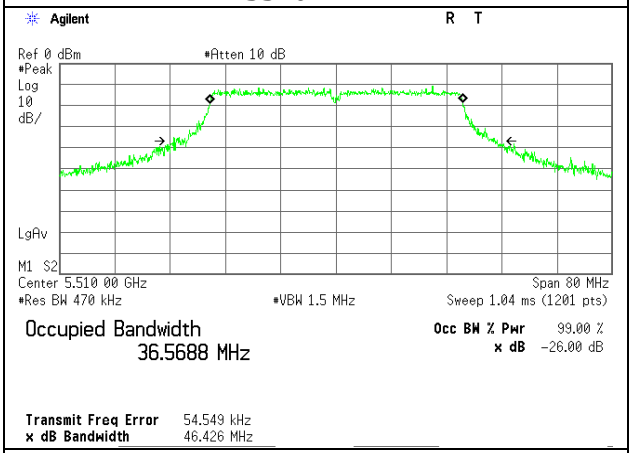
5700 MHz(Antenna Port 1)



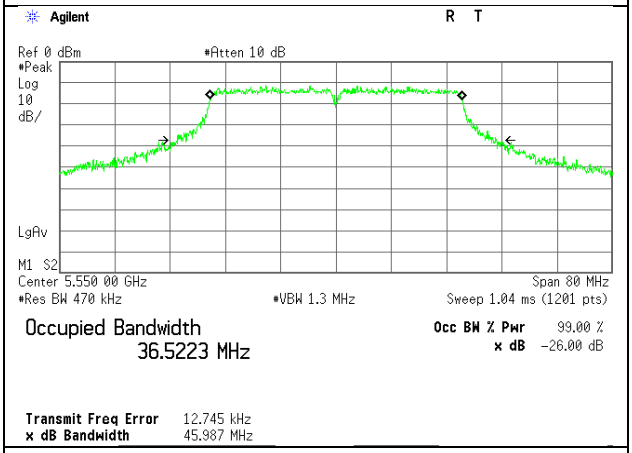
26 dB Emission Bandwidth

11n-40, Antenna port 0

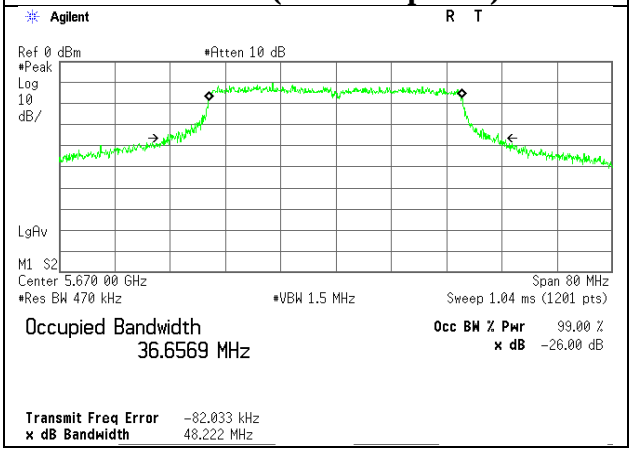
5510 MHz



5550 MHz



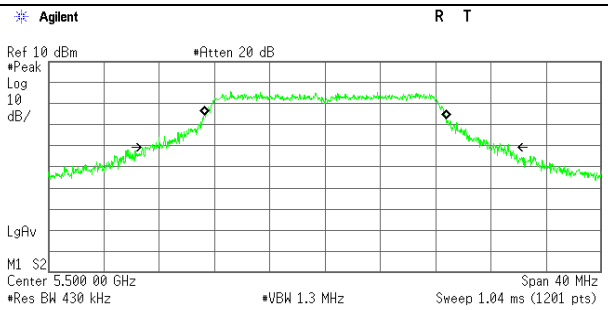
5670 MHz(Antenna port 1)



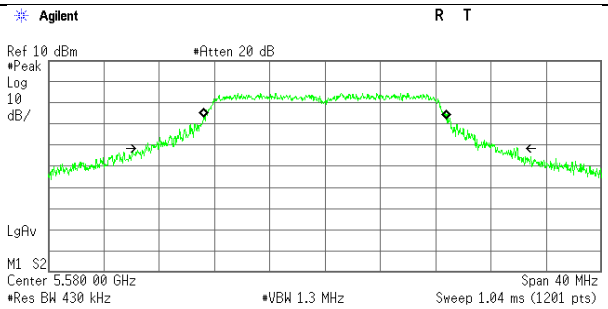
99 % Occupied Bandwidth

11a, Antenna port 0

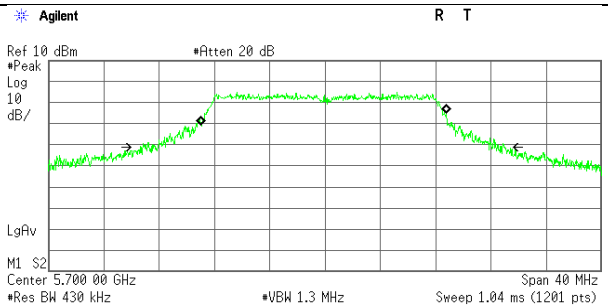
5500 MHz



5580 MHz

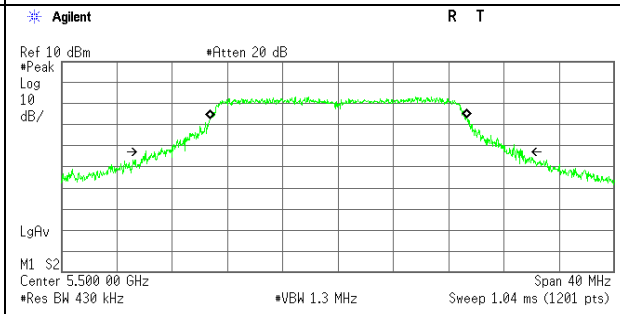


5700 MHz

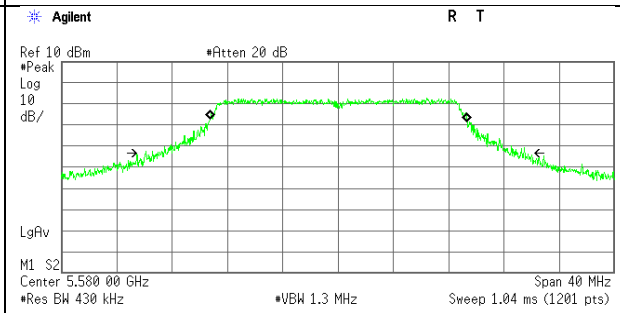


11n-20, Antenna port 0

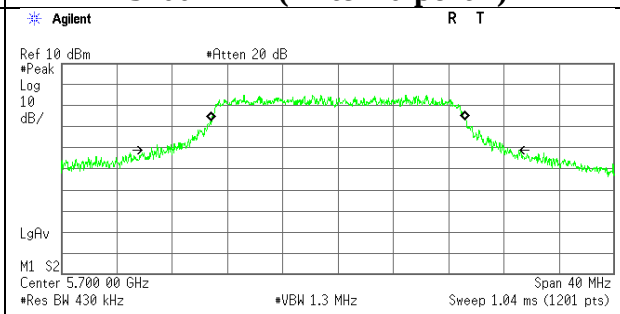
5500 MHz



5580 MHz



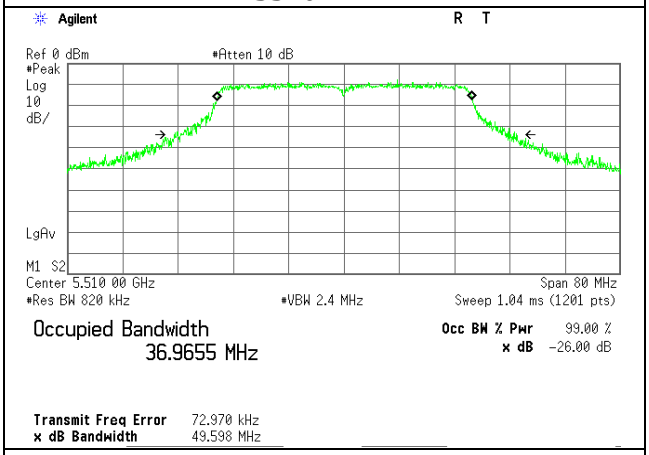
5700 MHz (Antenna port 1)



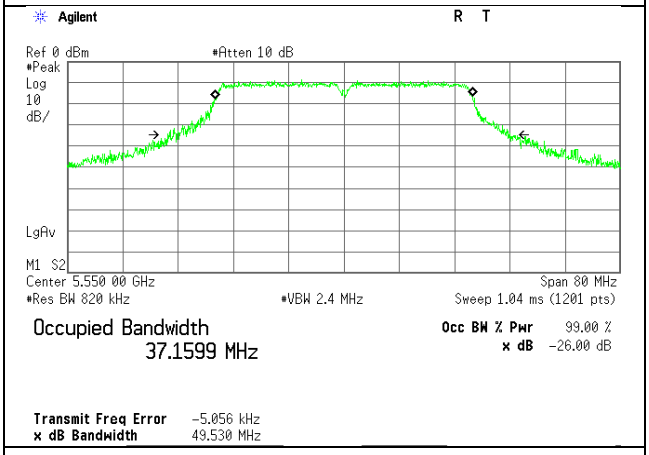
99 % Occupied Bandwidth

11n-40, Antenna port 0

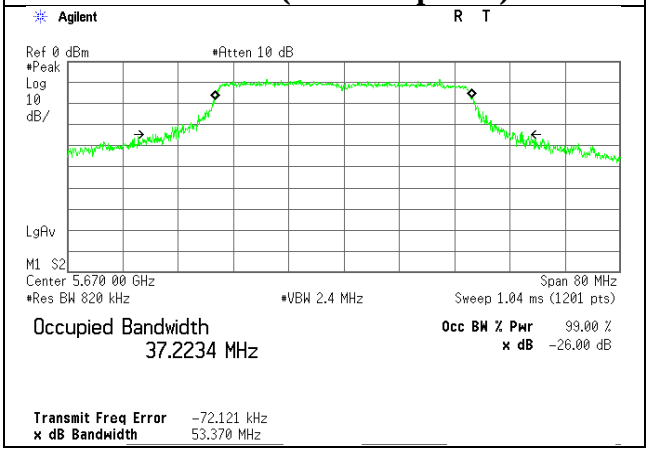
5510 MHz



5550 MHz



5670 MHz(Antenna port 1)



Maximum Conducted Output Power

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11232774H
Date	May 10, 2016
Temperature / Humidity	24deg. C / 59 % RH
Engineer	Tomoki Matsui
Mode	Tx 11a

Antenna 0

Applied limit: 15.407

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5500	2.42	2.44	9.99	0.03	2.1	24.325	17.470	14.88	30.76	23.97	9.09	16.98	49.89	29.97	12.99
5580	2.28	2.47	10.00	0.03	2.1	24.739	17.514	14.78	30.06	23.97	9.19	16.88	48.75	29.97	13.09
5700	2.14	2.51	10.02	0.03	2.1	24.845	17.719	14.70	29.51	23.97	9.27	16.80	47.86	29.97	13.17

Sample Calculation:
Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

The conducted power limit was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (All frequencies for FCC, 5725-5850MHz for IC)

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	11232774H	
Date	May 10, 2016	May 13, 2016
Temperature / Humidity	24deg. C / 59 % RH	24deg. C / 59 % RH
Engineer	Tomoki Matsui	Hiroyuki Furutaka
Mode	Tx 11n-20	

Antenna 0+1 Applied limit: 15.407

Tested Frequency	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted power Antenna 0	Antenna 1	Antenna Sum	Result	Limit	Margin	e.i.r.p. Antenna 0	Antenna 1	Antenna Sum	Result	Limit	Margin
[MHz]	[MHz]	[MHz]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]
5500	24.212	18.511	21.88	21.04	42.92	16.33	23.97	7.64	35.48	34.12	69.60	18.43	29.97	11.54
5580	25.765	18.564	21.33	20.65	41.98	16.23	23.97	7.74	34.59	33.50	68.09	18.33	29.97	11.64
5700	26.229	18.298	12.19	13.00	25.19	14.01	23.97	9.96	19.77	21.09	40.86	16.11	29.97	13.86

		Antenna 0						**Antenna 1**					
Tested Frequency	Duty Factor	Power Meter Reading	Cable Loss	Atten. Loss	Antenna Gain	Result Cond. Power	Result e.i.r.p.	Power Meter Reading	Cable Loss	Atten. Loss	Antenna Gain	Result Cond. Power	Result e.i.r.p.
[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5500	0.06	0.91	2.44	9.99	2.10	13.40	15.50	0.80	2.52	9.85	2.10	13.23	15.33
5580	0.06	0.76	2.47	10.00	2.10	13.29	15.39	0.68	2.56	9.85	2.10	13.15	15.25
5700	0.06	-1.89	2.52	10.17	2.10	10.86	12.96	-1.66	2.57	10.17	2.10	11.14	13.24

Sample Calculation:
Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

The conducted power limit was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (All frequencies for FCC, 5725 MHz-5850 MHz for IC)

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.7 Shielded Room	
Report No.	11232774H	
Date	May 10, 2016	May 13, 2016
Temperature / Humidity	24deg. C / 59 % RH	24deg. C / 59 % RH
Engineer	Tomoki Matsui	Hiroyuki Furutaka
Mode	Tx 11n-40	

Antenna 0+1 Applied limit: 15.407

Tested Frequency	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted power Antenna 0	Antenna 1	Sum	Result	Limit	Margin	e.i.r.p. Antenna 0	Antenna 1	Sum	Result	Limit	Margin
[MHz]	[MHz]	[MHz]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]
5510	46.426	36.966	10.94	10.81	21.75	13.38	23.97	10.59	17.74	17.54	35.28	15.48	29.97	14.49
5550	45.987	37.160	13.09	12.42	25.51	14.07	23.97	9.90	21.23	20.14	41.37	16.17	29.97	13.80
5670	48.222	37.223	12.79	13.30	26.10	14.17	23.97	9.80	20.75	21.58	42.33	16.27	29.97	13.70

		Antenna 0						**Antenna 1**					
Tested Frequency	Duty Factor	Power Meter Reading	Cable Loss	Atten. Loss	Antenna Gain	Result Cond. Power	Result e.i.r.p.	Power Meter Reading	Cable Loss	Atten. Loss	Antenna Gain	Result Cond. Power	Result e.i.r.p.
[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5510	0.23	-2.50	2.48	10.18	2.10	10.39	12.49	-2.56	2.48	10.19	2.10	10.34	12.44
5550	0.23	-1.52	2.46	10.00	2.10	11.17	13.27	-1.69	2.55	9.85	2.10	10.94	13.04
5670	0.23	-1.68	2.50	10.02	2.10	11.07	13.17	-1.44	2.60	9.85	2.10	11.24	13.34

Sample Calculation:
Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

The conducted power limit was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (All frequencies for FCC, 5725 MHz-5850 MHz for IC)

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11232774H
Date	May 10, 2016
Temperature / Humidity	24deg. C / 59 % RH
Engineer	Tomoki Matsui
Mode	Tx

5580 MHz

Mode	Rate Mbps	Reading Antenna port 0 [dBm]	Reading Antenna port 1 [dBm]	Remarks
11a	6	2.35	2.15	*
	9	2.20	2.02	
	12	2.17	2.12	
	18	2.17	2.15	
	24	2.14	2.08	
	36	2.09	2.06	
	48	2.22	2.18	
	54	1.74	1.63	

* Worst rate

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

Used Gate Function

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11232774H
Date	May 10, 2016
Temperature / Humidity	24deg. C / 59 % RH
Engineer	Tomoki Matsui
Mode	Tx

5580 MHz

Mode	MCS Number	Reading Antenna						Remarks
		0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11n-20	0	1.13	0.75	-	-	-	-	* 1 TX
	1	0.98	0.62	-	-	-	-	
	2	1.00	0.72	-	-	-	-	
	3	1.08	0.74	-	-	-	-	
	4	1.11	0.71	-	-	-	-	
	5	0.06	-0.26	-	-	-	-	
	6	-1.79	-2.22	-	-	-	-	
	7	-3.75	-4.68	-	-	-	-	
	8	1.14	0.88	1.30	1.22	2.52	4.02	* 2 TX
	9	0.98	0.87	1.25	1.22	2.47	3.94	
	10	1.11	0.87	1.29	1.22	2.51	4.00	
	11	1.05	0.84	1.27	1.21	2.49	3.96	
	12	1.07	0.73	1.28	1.18	2.46	3.91	
	13	0.30	0.02	1.07	1.00	2.08	3.17	
	14	-1.49	-2.21	0.71	0.60	1.31	1.18	
	15	-4.00	-4.33	0.40	0.37	0.77	-1.15	

* Worst rate

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

Used Gate Function

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11232774H
Date	May 10, 2016
Temperature / Humidity	24deg. C / 59 % RH
Engineer	Tomoki Matsui
Mode	Tx

5550 MHz

Mode	MCS Number	Reading Antenna						Remarks
		0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11n-40	0	-0.94	-1.55	-	-	-	-	
	1	-0.60	-1.56	-	-	-	-	
	2	-0.57	-1.57	-	-	-	-	
	3	-0.55	-1.53	-	-	-	-	* 1 TX
	4	-0.70	-1.46	-	-	-	-	
	5	-0.66	-1.40	-	-	-	-	
	6	-1.99	-2.28	-	-	-	-	
	7	-4.14	-4.79	-	-	-	-	
	8	-1.15	-1.46	0.77	0.71	1.48	1.71	
	9	-0.57	-0.87	0.88	0.82	1.70	2.29	* 2 TX
	10	-0.92	-0.84	0.81	0.82	1.63	2.13	
	11	-0.96	-0.73	0.80	0.85	1.65	2.17	
	12	-0.91	-0.63	0.81	0.86	1.68	2.24	
	13	-1.19	-1.52	0.76	0.70	1.47	1.66	
	14	-2.07	-2.49	0.62	0.56	1.18	0.74	
	15	-4.16	-4.66	0.38	0.34	0.73	-1.39	

* Worst rate

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

Used Gate Function

Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11232774H
Date	May 10, 2016
Temperature / Humidity	24deg. C / 59 % RH
Engineer	Tomoki Matsui
Mode	Tx 11a 6Mbps

Antenna port 0

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Result (Timed average)		Result (Burst Power)	
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]
5500	2.42	2.44	9.99	0.03	14.85	30.55	14.88	30.76
5580	2.28	2.47	10.00	0.03	14.75	29.85	14.78	30.06
5700	2.14	2.51	10.02	0.03	14.67	29.31	14.70	29.51

Sample Calculation:
Result (Timed average) = Reading + Cable Loss + Atten. Loss
Result (Burst Power) = Reading + Cable Loss + Atten. Loss + Duty Factor

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.7 Shielded Room	
Report No.	11232774H	
Date	May 10, 2016	May 13, 2016
Temperature / Humidity	24deg. C / 59 % RH	24deg. C / 59 % RH
Engineer	Tomoki Matsui	Hiroyuki Furutaka
Mode	Tx 11n-20 MSC8	

	Antenna port 0				**Antenna port 1**				**Antenna port 0 + 1**			
Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Time average)	Power Meter Reading	Cable Loss	Atten. Loss	Result (Time average)	Result (Time average) Antenna 0	Antenna 1	Sum 0+1	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[mW]	[mW]	[dBm]
5500	0.91	2.44	9.99	13.34	0.80	2.52	9.85	13.17	21.58	20.75	42.33	16.27
5580	0.76	2.47	10.00	13.23	0.68	2.56	9.85	13.09	21.04	20.37	41.41	16.17
5700	-1.89	2.52	10.17	10.80	-1.66	2.57	10.17	11.08	12.02	12.82	24.85	13.95

		Antenna port 0 + 1			
Tested Frequency	Duty Factor	Result (Burst Power) Antenna 0	Antenna 1	Sum 0+1	
[MHz]	[dB]	[mW]	[mW]	[mW]	[dBm]
5500	0.06	21.88	21.04	42.92	16.33
5580	0.06	21.33	20.65	41.98	16.23
5700	0.06	12.19	13.00	25.19	14.01

Sample Calculation:
Result (Timed average) = Reading + Cable Loss + Atten. Loss
Result (Burst Power) = Reading + Cable Loss + Atten. Loss + Duty Factor

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.7 Shielded Room	
Report No.	11232774H	
Date	May 10, 2016	May 13, 2016
Temperature / Humidity	24deg. C / 59 % RH	24deg. C / 59 % RH
Engineer	Tomoki Matsui	Hiroyuki Furutaka
Mode	Tx 11n-40 MCS8	

	Antenna port 0				**Antenna port 1**				**Antenna port 0 + 1**			
Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Time average)	Power Meter Reading	Cable Loss	Atten. Loss	Result (Time average)	Result (Time average) Antenna 0	Antenna 1	Sum 0+1	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[mW]	[mW]	[dBm]
5510	-2.40	2.48	10.18	10.26	-2.46	2.48	10.19	10.21	10.62	10.50	21.11	13.25
5550	-1.51	2.46	10.00	10.95	-1.61	2.55	9.85	10.79	12.45	11.99	24.44	13.88
5670	-1.98	2.50	10.02	10.54	-1.96	2.60	9.85	10.49	11.32	11.19	22.52	13.53

		Antenna port 0 + 1			
Tested Frequency	Duty Factor	Result (Burst Power) Antenna 0	Antenna 1	Sum 0+1	
[MHz]	[dB]	[mW]	[mW]	[mW]	[dBm]
5500	0.13	10.94	10.81	21.75	13.38
5580	0.13	12.82	12.36	25.18	14.01
5700	0.13	11.67	11.53	23.20	13.66

Sample Calculation:
Result (Timed average) = Reading + Cable Loss + Atten. Loss
Result (Burst Power) = Reading + Cable Loss + Atten. Loss + Duty Factor

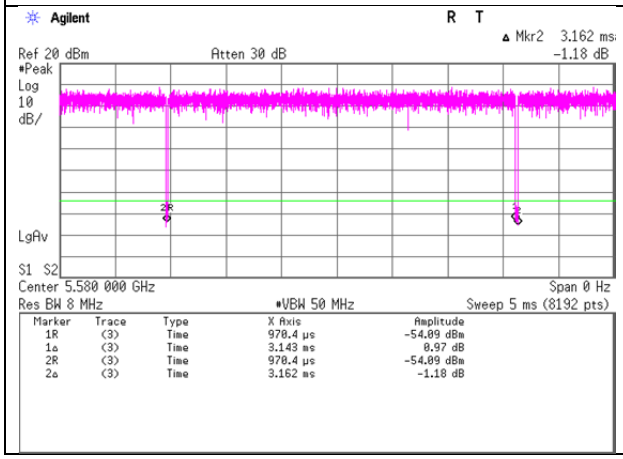
The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Burst rate confirmation

Test place	Ise EMC Lab. No.7 Shielded Room	
Report No.	11232774H	
Date	May 10, 2016	January 11, 2017
Temperature / Humidity	24deg. C / 59 % RH	22deg. C / 38 % RH
Engineer	Tomoki Matsui	Tomoki Matsui
Mode	Tx	

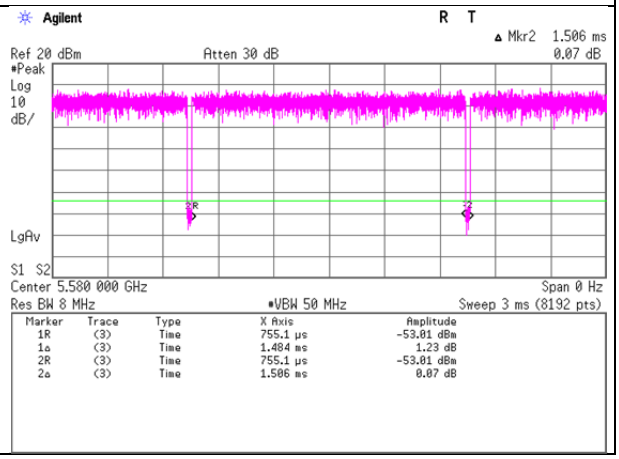
11a 6Mbps

Tx on / (Tx on + Tx off) =	**0.994**
Tx on / (Tx on + Tx off) * 100 =	**99.4 %**
Duty factor = 10 * log (3162 / 3143) =	**0.03 dB**



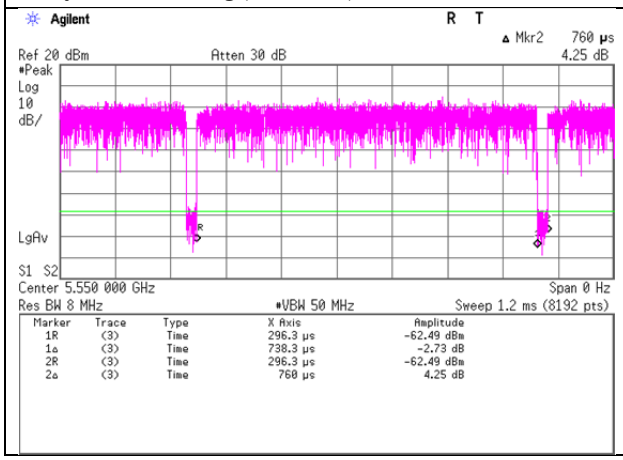
11n-20 MCS8

Tx on / (Tx on + Tx off) =	**0.985**
Tx on / (Tx on + Tx off) * 100 =	**98.5 %**
Duty factor = 10 * log (1506 / 1484) =	**0.06 dB**



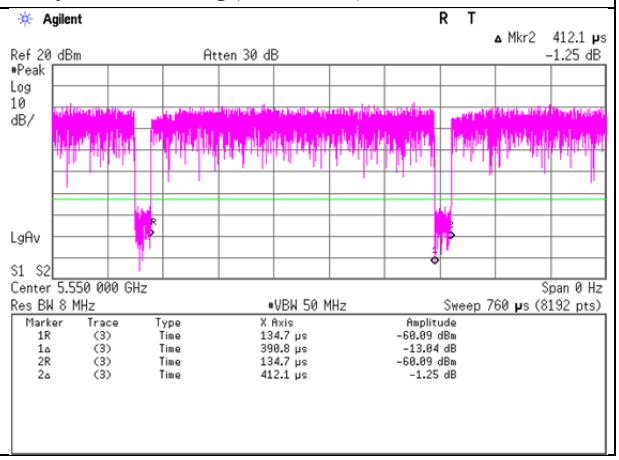
11n-40 MCS8

Tx on / (Tx on + Tx off) =	**0.971**
Tx on / (Tx on + Tx off) * 100 =	**97.1 %**
Duty factor = 10 * log (760 / 738.3) =	**0.13 dB**



11n-40 MCS9

Tx on / (Tx on + Tx off) =	**0.948**
Tx on / (Tx on + Tx off) * 100 =	**94.8 %**
Duty factor = 10 * log (412.1 / 390.8) =	**0.23 dB**



Maximum Power Spectral Density

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11232774H
Date	May 10, 2016
Temperature / Humidity	24deg. C / 59 % RH
Engineer	Tomoki Matsui
Mode	Tx 11a

Antenna port 0

Applied limit: 15.407

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5500	-8.28	2.44	9.99	0.03	2.1	0.00	4.19	11.00	6.82	6.29	17.00	10.72
5580	-8.92	2.47	10.00	0.03	2.1	0.00	3.58	11.00	7.42	5.68	17.00	11.32
5700	-8.69	2.51	10.02	0.03	2.1	0.00	3.88	11.00	7.13	5.98	17.00	11.03

Sample Calculation:
PSD: Power Spectral Density
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correct
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

Test place	Ise EMC Lab. No.7 Shielded Room	
Report No.	11232774H	
Date	May 10, 2016	May 13, 2016
Temperature / Humidity	24deg. C / 59 % RH	24deg. C / 59 % RH
Engineer	Tomoki Matsui	Hiroyuki Furutaka
Mode	Tx 11n-20	

Antenna port 0+1 Applied limit: 15.407

Tested Frequency	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna			Result	Limit	Margin	Antenna			Result	Limit	Margin
	0	1	Sum				0	1	Sum			
[MHz]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]
5500	1.58	1.53	3.10	4.92	11.00	6.08	2.56	2.48	5.04	7.02	17.00	9.98
5580	1.58	1.49	3.07	4.88	11.00	6.12	2.56	2.42	4.98	6.98	17.00	10.02
5700	0.93	0.97	1.90	2.79	11.00	8.21	1.51	1.57	3.08	4.89	17.00	12.11

			Antenna port 0						**Antenna port 1**					
Tested Frequency	Duty Factor	RBW Correction Factor	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result		PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result	
							Cond.	e.i.r.p.					Cond.	e.i.r.p.
[MHz]	[dB]	[dB]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]
5500	0.06	0.00	-10.52	2.44	9.99	2.10	1.97	4.07	-10.59	2.52	9.85	2.10	1.85	3.95
5580	0.06	0.00	-10.54	2.47	10.00	2.10	1.99	4.09	-10.73	2.56	9.85	2.10	1.74	3.84
5700	0.06	0.00	-13.05	2.52	10.17	2.10	-0.30	1.80	-12.94	2.57	10.17	2.10	-0.14	1.96

Sample Calculation:
PSD: Power Spectral Density
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

Test place	Ise EMC Lab. No.7 Shielded Room	
Report No.	11232774H	
Date	May 10, 2016	May 13, 2016
Temperature / Humidity	24deg. C / 59 % RH	24deg. C / 59 % RH
Engineer	Tomoki Matsui	Hiroyuki Furutaka
Mode	Tx 11n-40	

Antenna port 0+1 Applied limit: 15.407

Tested Frequency	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna			Result	Limit	Margin	Antenna			Result	Limit	Margin
	0	1	Sum				0	1	Sum			
[MHz]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]
5510	0.39	0.36	0.74	-1.28	11.00	12.28	0.63	0.58	1.21	0.82	17.00	16.18
5550	0.46	0.45	0.91	-0.41	11.00	11.41	0.75	0.73	1.48	1.69	17.00	15.31
5670	0.45	0.49	0.94	-0.26	11.00	11.26	0.73	0.80	1.53	1.84	17.00	15.16

			Antenna port 0						**Antenna port 1**					
Tested Frequency	Duty Factor	RBW Correction Factor	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result		PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result	
							Cond.	e.i.r.p.					Cond.	e.i.r.p.
[MHz]	[dB]	[dB]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]
5510	0.23	0.00	-16.78	2.45	9.99	2.10	-4.11	-2.01	-17.09	2.53	9.85	2.10	-4.48	-2.38
5550	0.23	0.00	-16.06	2.46	10.00	2.10	-3.37	-1.27	-16.10	2.55	9.85	2.10	-3.47	-1.37
5670	0.23	0.00	-16.25	2.50	10.02	2.10	-3.50	-1.40	-15.74	2.60	9.85	2.10	-3.06	-0.96

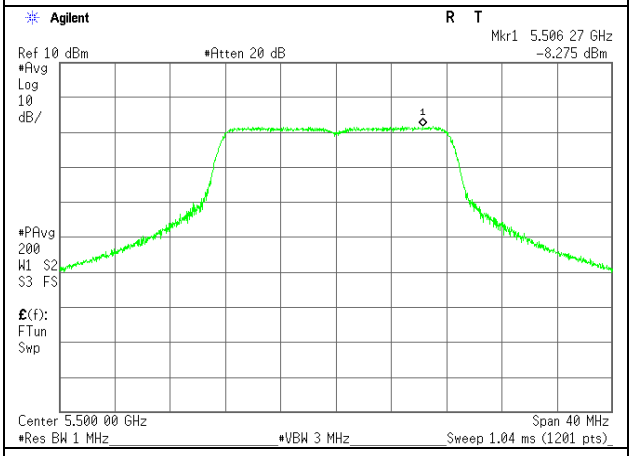
Sample Calculation:
PSD: Power Spectral Density
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

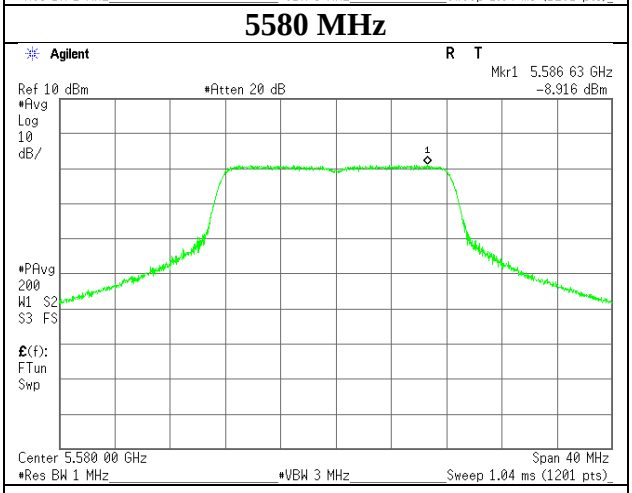
Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11232774H
Date	May 10, 2016
Temperature / Humidity	24deg. C / 59 % RH
Engineer	Tomoki Matsui
Mode	Tx

11a, Antenna port 0

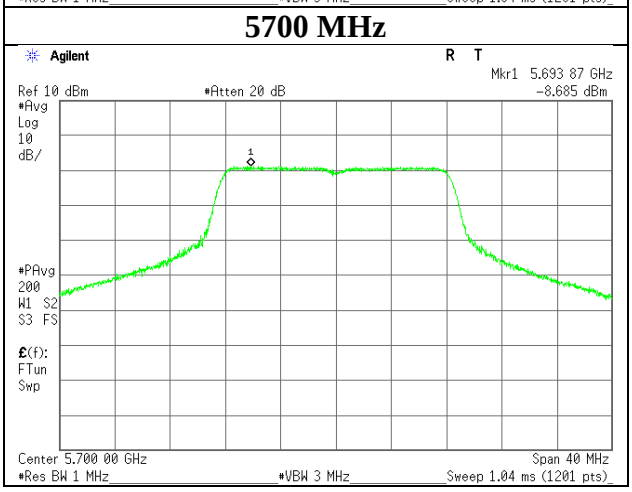
5500 MHz



5580 MHz



5700 MHz

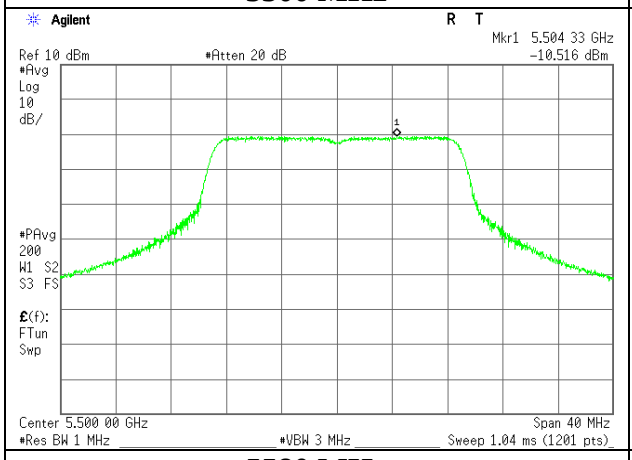


Maximum Power Spectral Density

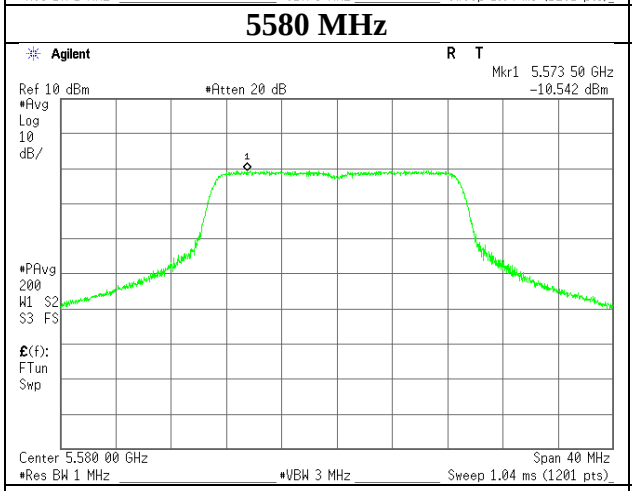
Test place	Ise EMC Lab. No.7 Shielded Room	
Report No.	11232774H	
Date	May 10, 2016	May 13, 2016
Temperature / Humidity	24deg. C / 59 % RH	24deg. C / 59 % RH
Engineer	Tomoki Matsui	Hiroyuki Furutaka
Mode	Tx	

11n-20, Antenna port 0

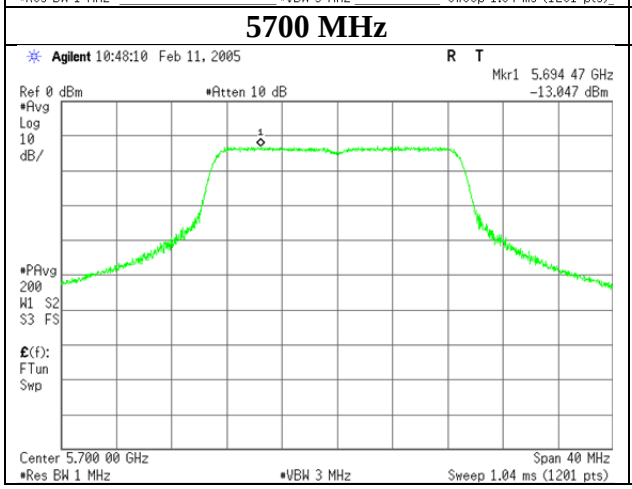
5500 MHz



5580 MHz

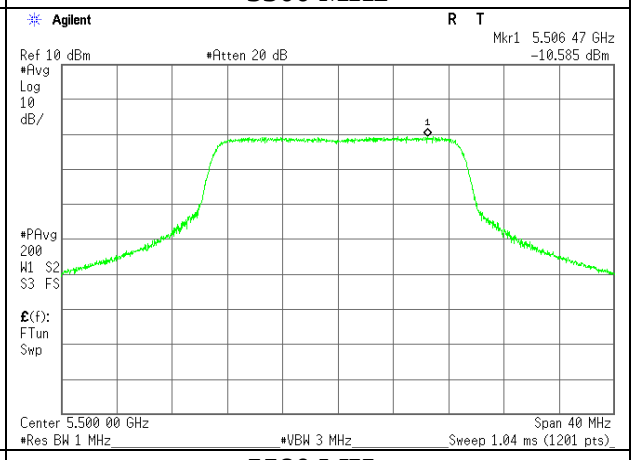


5700 MHz

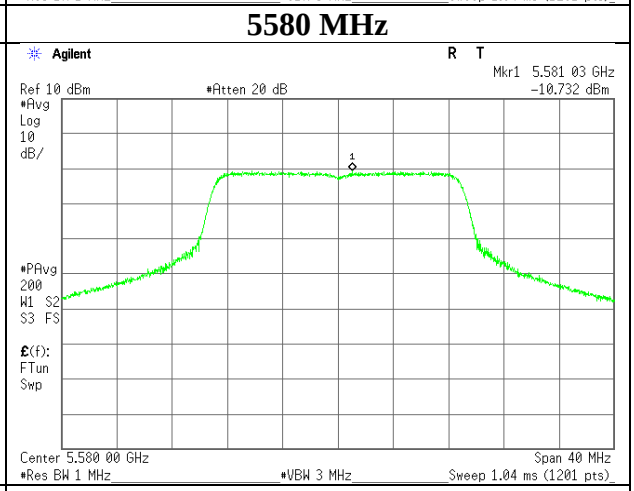


11n-20, Antenna port 1

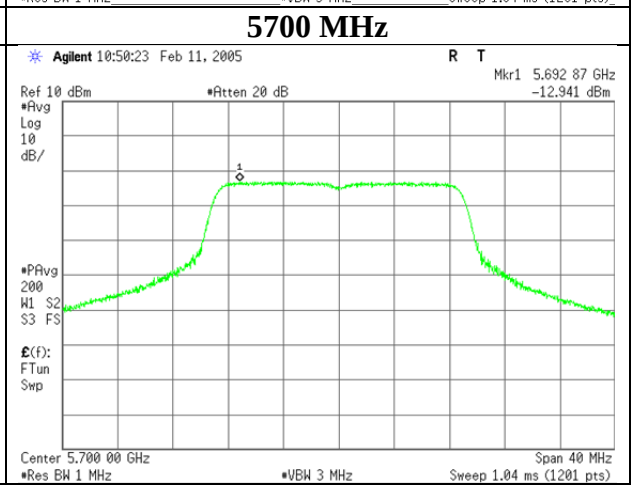
5500 MHz



5580 MHz



5700 MHz

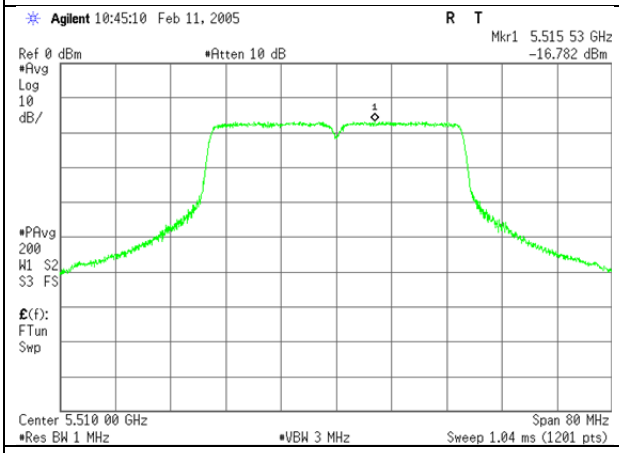


Maximum Power Spectral Density

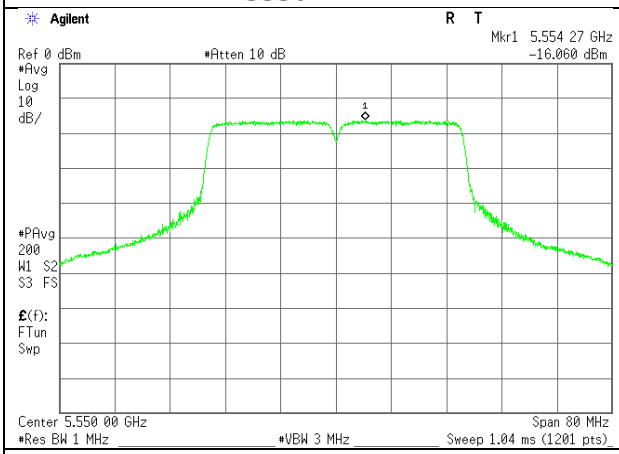
Test place	Ise EMC Lab. No.7 Shielded Room	
Report No.	11232774H	
Date	May 10, 2016	May 13, 2016
Temperature / Humidity	24deg. C / 59 % RH	24deg. C / 59 % RH
Engineer	Tomoki Matsui	Hiroyuki Furutaka
Mode	Tx	

11n-40, Antenna port 0

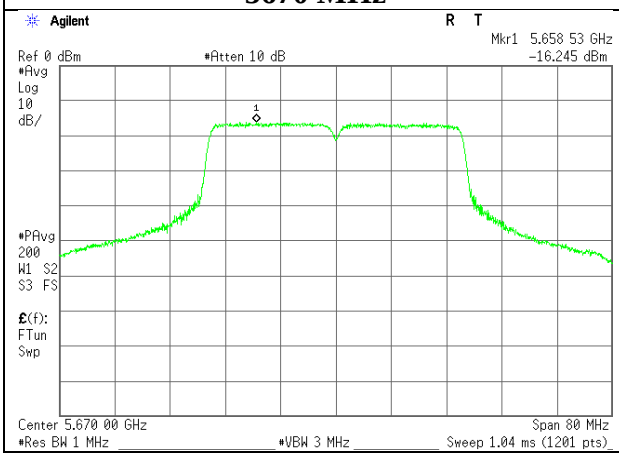
5510 MHz



5550 MHz

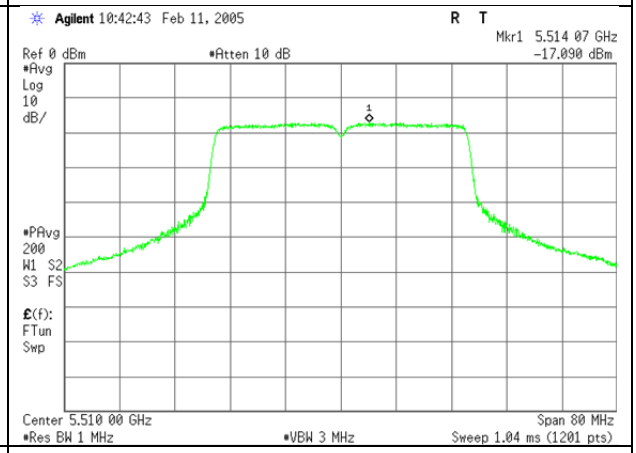


5670 MHz

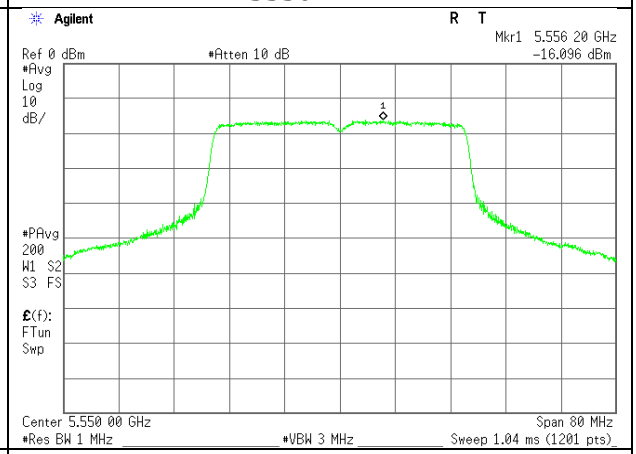


11n-40, Antenna port 1

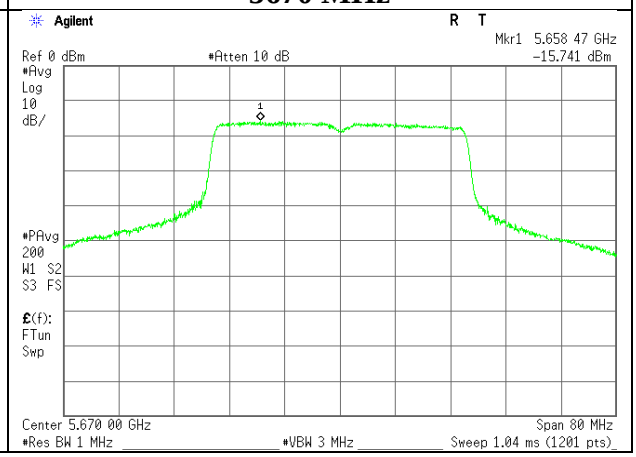
5510 MHz



5550 MHz



5670 MHz



Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11232774H	
Date	May 12, 2016	May 12, 2016
Temperature / Humidity	22 deg. C / 49 % RH	22 deg. C / 42 % RH
Engineer	Shinichi Miyazono (1 GHz - 10 GHz)	Satofumi Matsuyama (Above 10 GHz)
Mode	Tx 11n-20 5500 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	2497.416	PK	62.0	26.9	6.0	32.6	-	62.3	73.9	11.6	Inside	
Hori	5337.120	PK	49.8	32.2	7.3	31.8	-	57.5	68.2	10.7	Outside	
Hori	5460.000	PK	54.0	32.2	7.3	31.8	-	61.7	73.9	12.2	Inside	
Hori	5470.000	PK	59.6	32.2	7.3	31.8	-	67.3	73.9	6.6	Outside	
Hori	11000.000	PK	40.3	39.9	1.3	33.6	-	47.9	73.9	26.0	Inside	Floor Noise
Hori	16500.000	PK	48.6	40.4	3.2	32.8	-	59.4	68.2	8.8	Outside	
Hori	2497.416	AV	48.7	26.9	6.0	32.6	-	49.0	53.9	4.9	Inside	
Hori	5460.000	AV	42.3	32.2	7.3	31.8	-	50.0	53.9	3.9	Inside	
Hori	5470.000	AV	44.5	32.2	7.3	31.8	-	52.2	53.9	1.7	Outside	Integration method
Hori	11000.000	AV	31.3	39.9	1.3	33.6	-	38.9	53.9	15.0	Inside	Floor Noise
Vert	2497.799	PK	55.3	26.9	6.0	32.6	-	55.6	73.9	18.3	Inside	
Vert	5460.000	PK	52.2	32.2	7.3	31.8	-	59.9	73.9	14.0	Inside	
Vert	5470.000	PK	56.2	32.2	7.3	31.8	-	63.9	73.9	10.0	Outside	
Vert	11000.000	PK	40.9	39.9	1.3	33.6	-	48.5	73.9	25.4	Inside	Floor Noise
Vert	16500.000	PK	51.1	40.4	3.2	32.8	-	61.9	68.2	6.3	Outside	
Vert	2497.799	AV	42.6	26.9	6.0	32.6	-	42.9	53.9	11.0	Inside	
Vert	5460.000	AV	40.1	32.2	7.3	31.8	-	47.8	53.9	6.1	Inside	
Vert	5470.000	AV	41.8	32.2	7.3	31.8	-	49.5	53.9	4.4	Outside	Integration method
Vert	11000.000	AV	31.3	39.9	1.3	33.6	-	38.9	53.9	15.0	Inside	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

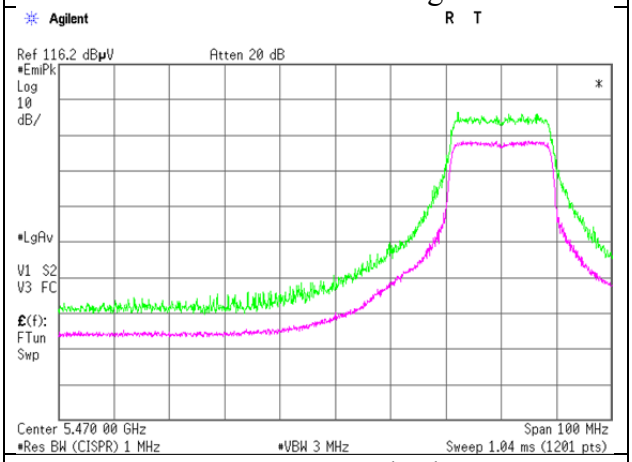
Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.5 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
26.5 GHz - 40 GHz 20log (0.5 m / 3.0 m) = -15.6 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11232774H
Date	May 12, 2016
Temperature / Humidity	22 deg. C / 49 % RH
Engineer	Shinichi Miyazono
Mode	Tx 11n-20 5500 MHz

Horizontal

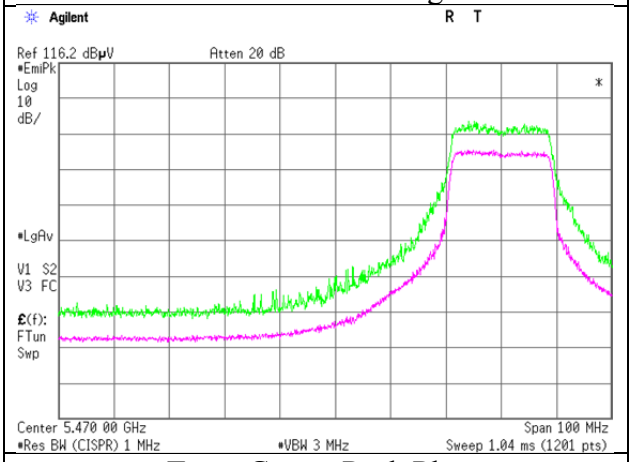
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11232774H	
Date	May 11, 2016	May 12, 2016
Temperature / Humidity	23deg. C / 57 % RH	22 deg. C / 42 % RH
Engineer	Satofumi Matsuyama	Satofumi Matsuyama
	1 GHz - 10 GHz	(Above 10 GHz)
Mode	Tx 11n-20 5580 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	2489.372	PK	62.3	26.9	6.0	32.6	-	62.6	73.9	11.3	Inside	
Hori	11160.000	PK	40.9	40.3	1.4	33.5	-	49.1	73.9	24.8	Inside	Floor Noise
Hori	16740.000	PK	47.9	40.9	3.2	32.8	-	59.2	68.2	9.0	Outside	
Hori	2489.372	AV	51.8	26.9	6.0	32.6	-	52.1	53.9	1.8	Inside	
Hori	11160.000	AV	32.6	40.3	1.4	33.5	-	40.8	53.9	13.1	Inside	Floor Noise
Vert	2489.372	PK	57.3	26.9	6.0	32.6	-	57.6	73.9	16.3	Inside	
Vert	11160.000	PK	41.3	40.3	1.4	33.5	-	49.5	73.9	24.4	Inside	Floor Noise
Vert	16740.000	PK	54.7	40.9	3.2	32.8	-	66.0	68.2	2.2	Outside	
Vert	2489.372	AV	46.3	26.9	6.0	32.6	-	46.6	53.9	7.3	Inside	
Vert	11160.000	AV	32.5	40.3	1.4	33.5	-	40.7	53.9	13.2	Inside	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.3 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
26.5 GHz - 40 GHz 20log (0.5 m / 3.0 m) = -15.6 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11232774H	
Date	May 12, 2016	May 12, 2016
Temperature / Humidity	22 deg. C / 49 % RH	22 deg. C / 42 % RH
Engineer	Shinichi Miyazono	Satofumi Matsuyama
	1 GHz - 10 GHz	(Above 10 GHz, Below 1GHz)
Mode	Tx 11n-20 5700 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	72.009	QP	40.5	6.2	7.7	32.2	-	22.2	40.0	17.8	Outside	
Hori	120.004	QP	39.2	12.8	8.3	32.2	-	28.1	43.5	15.4	Inside	
Hori	341.787	QP	41.9	14.4	10.1	31.9	-	34.5	46.0	11.5	Outside	
Hori	587.530	QP	36.4	18.9	11.8	32.0	-	35.1	46.0	10.9	Outside	
Hori	660.501	QP	34.9	19.5	12.2	32.1	-	34.5	46.0	11.5	Outside	
Hori	871.062	QP	33.5	21.7	13.2	31.1	-	37.3	46.0	8.7	Outside	
Hori	2496.733	PK	62.3	26.9	6.0	32.6	-	62.6	73.9	11.3	Inside	
Hori	5362.000	PK	47.8	32.2	7.3	31.8	-	55.5	73.9	18.4	Inside	
Hori	5725.000	PK	60.7	32.6	7.5	31.8	-	69.0	73.9	4.9	Outside	
Hori	11400.000	PK	40.8	40.8	1.6	33.4	-	49.8	73.9	24.1	Inside	Floor Noise
Hori	17100.000	PK	44.1	41.8	3.1	32.8	-	56.2	68.2	12.0	Outside	
Hori	2496.733	AV	50.4	26.9	6.0	32.6	-	50.7	53.9	3.2	Inside	
Hori	5362.000	AV	38.7	32.2	7.3	31.8	-	46.4	53.9	7.5	Inside	
Hori	5725.000	AV	44.6	32.6	7.5	31.8	-	52.9	53.9	1.0	Outside	Integration method
Hori	11400.000	AV	31.9	40.8	1.6	33.4	-	40.9	53.9	13.0	Inside	Floor Noise
Vert	38.628	QP	38.6	14.7	7.2	32.2	-	28.3	40.0	11.7	Outside	
Vert	55.945	QP	40.8	8.7	7.4	32.2	-	24.7	40.0	15.3	Outside	
Vert	59.377	QP	41.9	7.7	7.5	32.2	-	24.9	40.0	15.1	Outside	
Vert	120.004	QP	35.1	12.8	8.3	32.2	-	24.0	43.5	19.5	Inside	
Vert	568.492	QP	28.5	18.7	11.7	32.0	-	26.9	46.0	19.1	Outside	
Vert	868.232	QP	30.1	21.7	13.2	31.1	-	33.9	46.0	12.1	Outside	
Vert	2498.600	PK	55.5	26.9	6.0	32.6	-	55.8	73.9	18.1	Inside	
Vert	5725.000	PK	58.4	32.6	7.5	31.8	-	66.7	73.9	7.2	Outside	
Vert	11400.000	PK	40.7	40.8	1.6	33.4	-	49.7	73.9	24.2	Inside	Floor Noise
Vert	17100.000	PK	46.8	41.8	3.1	32.8	-	58.9	68.2	9.3	Outside	
Vert	2498.600	AV	42.8	26.9	6.0	32.6	-	43.1	53.9	10.8	Inside	
Vert	5725.000	AV	40.0	32.6	7.5	31.8	-	48.3	53.9	5.6	Outside	Integration method
Vert	11400.000	AV	31.9	40.8	1.6	33.4	-	40.9	53.9	13.0	Inside	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

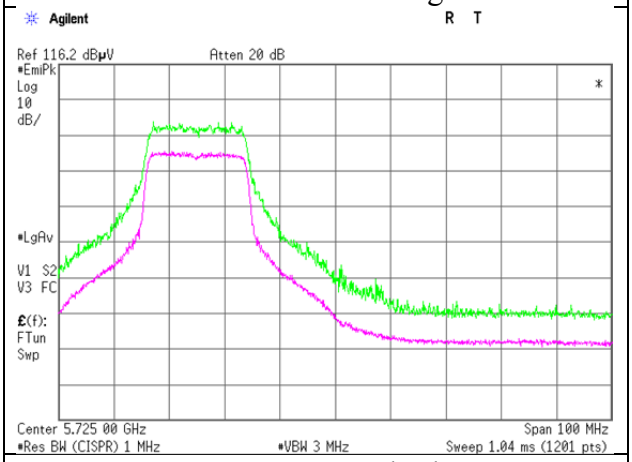
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.3 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
26.5 GHz - 40 GHz 20log (0.5 m / 3.0 m) = -15.6 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11232774H
Date	May 12, 2016
Temperature / Humidity	22 deg. C / 49 % RH
Engineer	Shinichi Miyazono
Mode	Tx 11n-20 5700 MHz

Horizontal

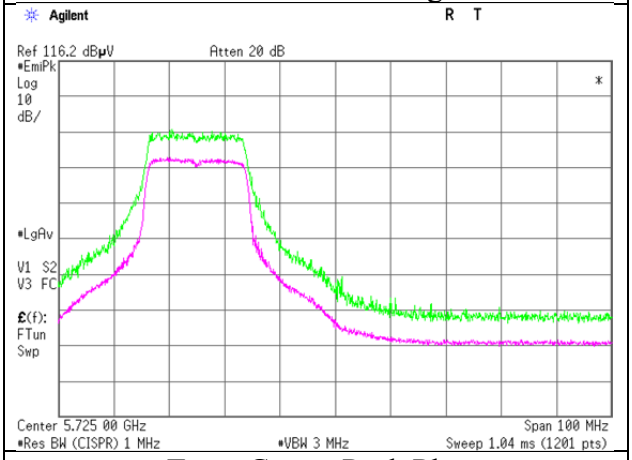
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11232774H	
Date	May 11, 2016	May 12, 2016
Temperature / Humidity	23deg. C / 57 % RH	22 deg. C / 42 % RH
Engineer	Satofumi Matsuyama	Satofumi Matsuyama
	1 GHz - 10 GHz	(Above 10 GHz)
Mode	Tx 11n-40 5510 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	2493.770	PK	63.1	26.9	6.0	32.6	-	63.4	73.9	10.5	Inside	
Hori	5460.000	PK	53.8	32.2	7.3	31.8	-	61.5	73.9	12.4	Inside	
Hori	5470.000	PK	59.0	32.2	7.3	31.8	-	66.7	68.2	1.5	Outside	
Hori	11020.000	PK	39.4	39.9	1.3	33.6	-	47.0	73.9	26.9	Inside	Floor Noise
Hori	16530.000	PK	41.9	40.5	3.2	32.8	-	52.8	68.2	15.4	Outside	Floor Noise
Hori	2493.770	AV	52.3	26.9	6.0	32.6	0.2	52.8	53.9	1.1	Inside	
Hori	5460.000	AV	41.3	32.2	7.3	31.8	0.2	49.2	53.9	4.7	Inside	
Hori	11020.000	AV	30.8	39.9	1.3	33.6	-	38.4	53.9	15.5	Inside	Floor Noise
Vert	2493.770	PK	58.2	26.9	6.0	32.6	-	58.5	73.9	15.4	Inside	
Vert	5460.000	PK	52.2	32.2	7.3	31.8	-	59.9	73.9	14.0	Inside	
Vert	5470.000	PK	54.7	32.2	7.3	31.8	-	62.4	68.2	5.8	Outside	
Vert	11020.000	PK	39.7	39.9	1.3	33.6	-	47.3	73.9	26.6	Inside	Floor Noise
Vert	16530.000	PK	41.5	40.5	3.2	32.8	-	52.4	68.2	15.8	Outside	Floor Noise
Vert	2493.770	AV	47.4	26.9	6.0	32.6	0.2	47.9	53.9	6.0	Inside	
Vert	5460.000	AV	38.6	32.2	7.3	31.8	0.2	46.5	53.9	7.4	Inside	
Vert	11020.000	AV	30.8	39.9	1.3	33.6	-	38.4	53.9	15.5	Inside	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty Factor
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

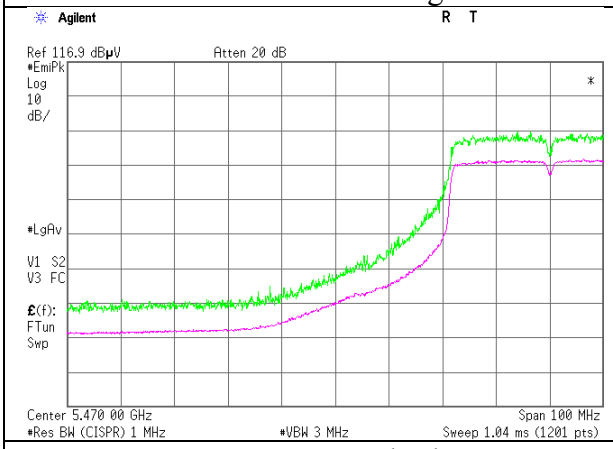
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.3 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
26.5 GHz - 40 GHz 20log (0.5 m / 3.0 m) = -15.6 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11232774H
Date	May 11, 2016
Temperature / Humidity	23deg. C / 57 % RH
Engineer	Satofumi Matsuyama
Mode	Tx 11n-40 5510 MHz

Horizontal

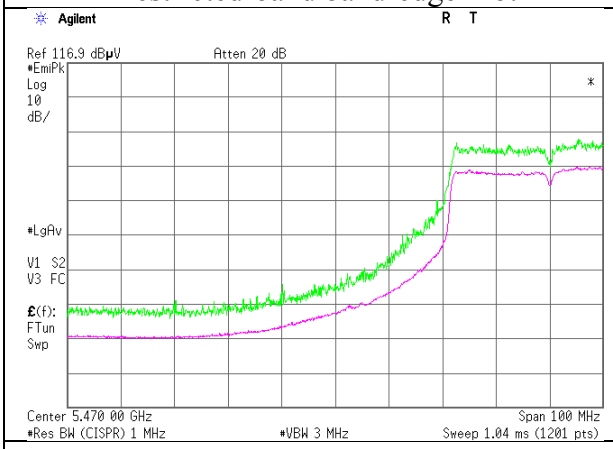
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11232774H	
Date	May 11, 2016	May 12, 2016
Temperature / Humidity	23deg. C / 57 % RH	22 deg. C / 42 % RH
Engineer	Satofumi Matsuyama	Satofumi Matsuyama
	1 GHz - 10 GHz	(Above 10 GHz)
Mode	Tx 11n-40 5550 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	2490.501	PK	62.7	26.9	6.0	32.6	-	63.0	73.9	10.9	Inside	
Hori	11100.000	PK	41.8	40.1	1.3	33.5	-	49.7	73.9	24.2	Inside	Floor Noise
Hori	16650.000	PK	42.1	40.7	3.3	32.8	-	53.3	68.2	14.9	Outside	Floor Noise
Hori	2490.501	AV	51.8	26.9	6.0	32.6	0.2	52.3	53.9	1.6	Inside	
Hori	11100.000	AV	31.1	40.1	1.3	33.5	-	39.0	53.9	14.9	Inside	Floor Noise
Vert	2490.501	PK	58.3	26.9	6.0	32.6	-	58.6	73.9	15.3	Inside	
Vert	11100.000	PK	41.0	40.1	1.3	33.5	-	48.9	73.9	25.0	Inside	Floor Noise
Vert	16650.000	PK	42.6	40.7	3.3	32.8	-	53.8	68.2	14.4	Outside	Floor Noise
Vert	2490.501	AV	47.2	26.9	6.0	32.6	0.2	47.7	53.9	6.2	Inside	
Vert	11100.000	AV	31.1	40.1	1.3	33.5	-	39.0	53.9	14.9	Inside	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty Factor
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.3 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
26.5 GHz - 40 GHz 20log (0.5 m / 3.0 m) = -15.6 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11232774H	
Date	May 11, 2016	May 12, 2016
Temperature / Humidity	23deg. C / 57 % RH	22 deg. C / 42 % RH
Engineer	Satofumi Matsuyama	Satofumi Matsuyama
	1 GHz - 10 GHz	(Above 10 GHz)
Mode	Tx 11n-40 5670 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	2489.035	PK	62.6	26.9	6.0	32.6	-	62.9	73.9	11.0	Inside	
Hori	5725.000	PK	55.2	32.6	7.5	31.8	-	63.5	68.2	4.7	Outside	
Hori	11340.000	PK	41.5	40.7	1.5	33.5	-	50.2	73.9	23.7	Inside	Floor Noise
Hori	17010.000	PK	42.1	41.5	3.1	32.8	-	53.9	68.2	14.3	Outside	Floor Noise
Hori	2489.035	AV	51.5	26.9	6.0	32.6	0.2	52.0	53.9	1.9	Inside	
Hori	11340.000	AV	31.2	40.7	1.5	33.5	-	39.9	53.9	14.0	Inside	Floor Noise
Vert	2489.035	PK	57.7	26.9	6.0	32.6	-	58.0	73.9	15.9	Inside	
Vert	5725.000	PK	53.0	32.6	7.5	31.8	-	61.3	68.2	6.9	Outside	
Vert	11340.000	PK	41.3	40.7	1.5	33.5	-	50.0	73.9	23.9	Inside	Floor Noise
Vert	17010.000	PK	42.0	41.5	3.1	32.8	-	53.8	68.2	14.4	Outside	Floor Noise
Vert	2489.035	AV	46.2	26.9	6.0	32.6	0.2	46.7	53.9	7.2	Inside	
Vert	11340.000	AV	31.2	40.7	1.5	33.5	-	39.9	53.9	14.0	Inside	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty Factor
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

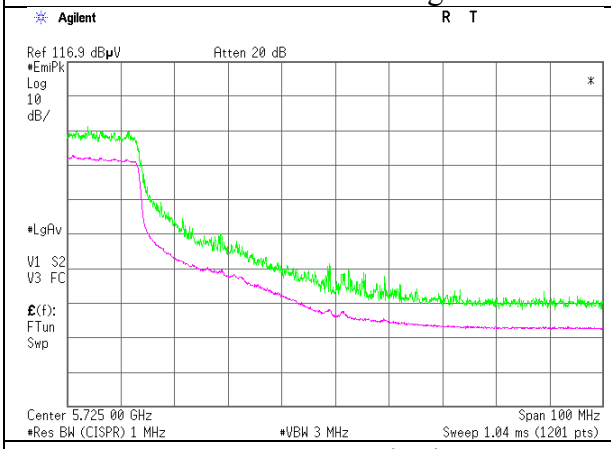
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.3 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
26.5 GHz - 40 GHz 20log (0.5 m / 3.0 m) = -15.6 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11232774H
Date	May 11, 2016
Temperature / Humidity	23deg. C / 57 % RH
Engineer	Satofumi Matsuyama
Mode	Tx 11n-40 5670 MHz

Horizontal

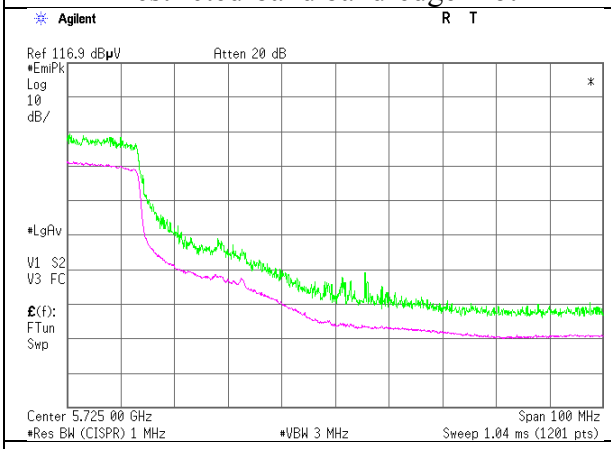
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot

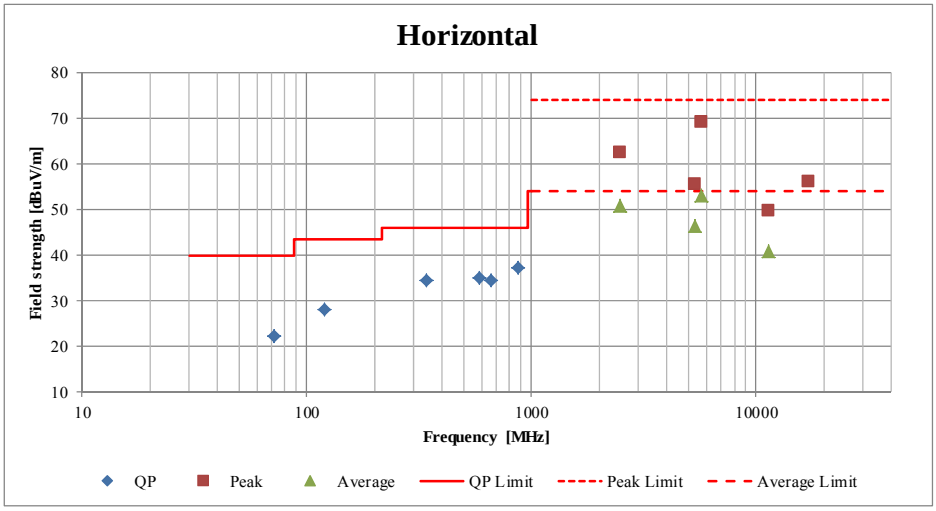


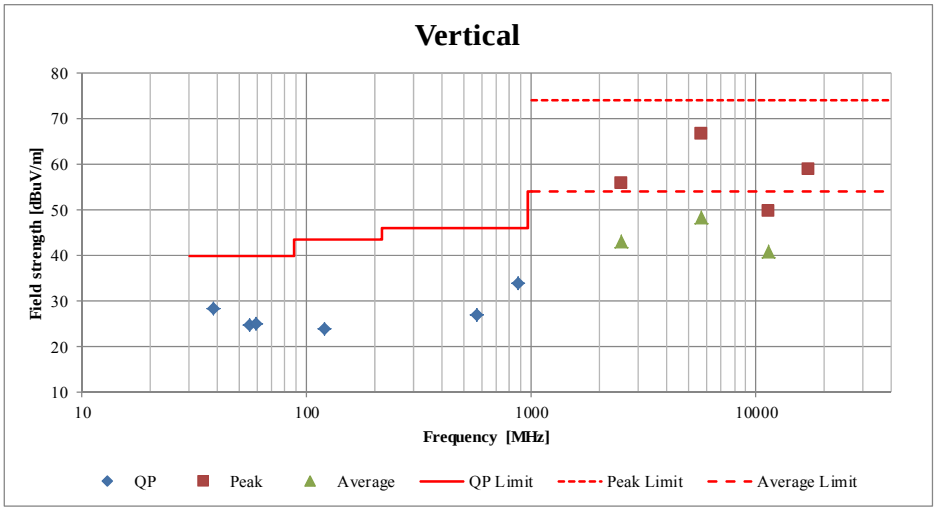
Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11232774H	
Date	May 11, 2016	May 12, 2016
Temperature / Humidity	23deg. C / 57 % RH	22 deg. C / 42 % RH
Engineer	Satofumi Matsuyama (1 GHz-10 GHz)	Satofumi Matsuyama (Above 10 GHz)
Mode	Tx 11n-20 5700 MHz	



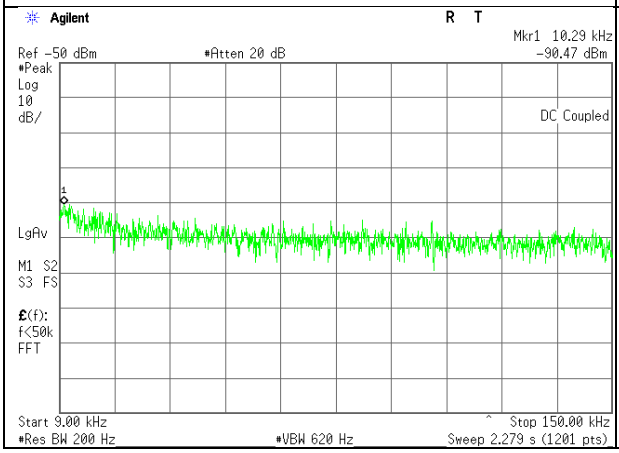


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

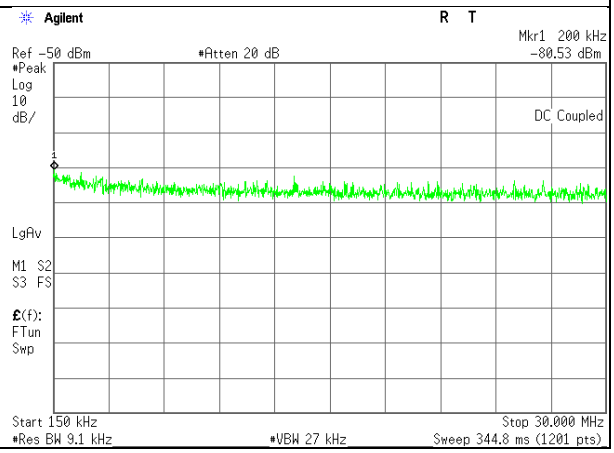
Conducted Spurious Emission

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11232774H
Date	May 10, 2016
Temperature / Humidity	24deg. C / 59 % RH
Engineer	Tomoki Matsui
Mode	Tx 11n-20 5700 MHz Antenna port 1

9 kHz-150 kHz



150 kHz-30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
10.29	-90.5	0.01	10.0	2.1	2	-75.3	300	6.0	-14.1	47.3	61.4	
200.00	-80.5	0.01	10.0	2.1	2	-65.4	300	6.0	-4.2	21.5	25.7	

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

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

N: Number of output

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MSA-13	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT	2015/06/02 * 12
MOS-34	Thermo-Hygrometer	Custom	CTH-201	3401	AT	2016/01/21 * 12
MMM-16	DIGIITAL HiTESTER	Hioki	3805	070900532	AT	2016/01/13 * 12
MRENT-126	Spectrum Analyzer	KEYSIGHT	E4440A	MY46185516	AT	2015/07/31 * 12
MPM-16	Power Meter	Agilent	8990B	MY51000271	AT	2016/04/07 * 12
MPM-13	Power Meter	Anritsu	ML2495A	0824014	AT	2015/11/11 * 12
MPSE-22	Power sensor	Agilent	N1923A	MY54070003	AT	2016/04/07 * 12
MPSE-23	Power sensor	Agilent	N1923A	MY54070004	AT	2016/04/07 * 12
MPSE-18	Power sensor	Anritsu	MA2411B	0738174	AT	2015/11/11 * 12
MCC-170	Microwave Cable	Junkosha	MWX221	1409S493	AT	2016/03/11 * 12
MCC-209	Microwave Cable	RS Components	R-132G7210200CD	-	AT	2016/04/01 * 12
MAT-88	Attenuator	Weinschel Associates	WA56-10	56100304	AT	2015/06/01 * 12
MCC-171	Microwave Cable	Junkosha	MWX221	1409S494	AT	2016/03/11 * 12
MCC-211	Microwave Cable	RS Components	R-132G7210200CD	-	AT	2016/04/01 * 12
MAT-89	Attenuator	Weinschel Associates	WA56-10	56100305	AT	2015/06/01 * 12
MCC-210	Microwave Cable	RS Components	R-132G7210200CD	-	AT	2016/04/01 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2015/10/01 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2016/01/21 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-16	Spectrum Analyzer	Agilent	E4440A	MY46186390	RE	2016/02/08 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2015/05/18 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2015/05/21 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2016/03/24 * 12
MMM-08	DIGITAL HiTESTER	Hioki	3805	051201197	RE	2016/01/13 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2015/05/19 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2016/03/18 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	3950M00205	RE	2015/06/02 * 12
MHF-22	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCB	602	RE	2016/01/19 * 12
MCC-177	Microwave Cable	Junkosha	MMX221-00500D MSDMS	1502S304	RE	2016/03/10 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2015/09/02 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2015/11/02 * 12
MLA-22	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-191	RE	2016/01/30 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2015/07/13 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2016/04/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2016/03/24 * 12
MLS-23	LISN(AMN)	Schwarzbeck	NSLK8127	8127-729	CE(EUT)	2015/07/10 * 12
MLS-24	LISN(AMN)	Schwarzbeck	NSLK8127	8127-730	CE(AE)	2015/07/10 * 12
MTA-31	Terminator	TME	CT-01	-	CE	2016/01/12 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(3m)/sucoform141-PE(1m)/421-010(1.5m)/RFM-E321(Switcher)	-/00640	CE	2015/07/02 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2016/01/14 * 12
MTA-28	Terminator	TME	CT-01	-	CE	2015/11/12 * 12

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: **RE: Radiated Emission**
AT: Antenna Terminal Conducted test