



RADIO TEST REPORT

Test Report No. : 11143372S-B-R1

Applicant : FUJIFILM Corporation
Type of Equipment : Wireless LAN Module
Model No. : SX-PCEAN(FF-E)
FCC ID : W2Z-01000008
Test regulation : FCC Part 15 Subpart E: 2015
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
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 11143372S-B. 11143372S-B is replaced with this report.

Date of test: February 2 to March 1, 2016

Representative test engineer:

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- ☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 11143372S-B

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SECTION 1: Customer information

Company Name	:	FUJIFILM Corporation
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Contact Person	:	Takao Ozaki

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

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless LAN Module
Model No.	:	SX-PCEAN(FF-E)
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.3 V
Receipt Date of Sample	:	February 1, 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(FF-E) (referred to as the EUT in this report) is a Wireless LAN Module.

General Specification

Clock frequency(ies) in the system	:	40 MHz
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Radio Specification

Radio Type	:	Transceiver
Method of Frequency Generation	:	Synthesizer

	IEEE802.11b	IEEE802.11g	IEEE802.11a	IEEE802.11n (20M band)	IEEE802.11n (40M band)
Frequency of operation *1)	2412-2462 MHz	2412-2462 MHz	5180-5320 MHz 5500-5700 MHz 5745-5825 MHz	2412-2462 MHz 5180-5320 MHz 5500-5700 MHz 5745-5825 MHz	2422-2452 MHz 5190-5310 MHz 5510-5670 MHz 5755-5795 MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)		
Channel spacing	5 MHz		20 MHz	<u>2.4 GHz band</u> 5 MHz <u>5 GHz band</u> 20 MHz	<u>2.4 GHz band</u> 5 MHz <u>5 GHz band</u> 40 MHz

Antenna	Antenna #1 (Bottom)	Antenna #0 (Side)
Antenna quantity	2 pcs. (*. Separation distance between the antenna #0 and the antenna #1: 480 mm) 11b,g,a: One selected Tx antenna operation. 11n(20HT),n(40HT): One selected Tx antenna operation (MCS0~7) / Two Tx antenna operation (MCS8~13)	
Antenna model	113Y120035A (cable length: 300 mm)	113Y120036A (cable length: 575 mm)
Antenna type / connector type	Monopole antenna / Connector; PCB side: U.FL, Antenna side: soldered	
Antenna gain (max.peak) (excluding cable loss)	-5.1 dBi (2.4 GHz), -1.3 dBi (5 GHz)	-6.9 dBi (2.4 GHz) -1.8 dBi (5 GHz)

*1) Refer to the test reports: 11143372S-A-R1 for FCC 15.247.

* The EUT does not perform simultaneous transmission of 2.4 GHz and 5 GHz Wireless LAN.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E: 2015, final revised on November 23, 2015
 Title : FCC 47CFR Part15 Radio Frequency Device Subpart E
 Unlicensed National Information Infrastructure Devices
 Section 15.407 General technical requirements

*Some parts are effective on and after December 17, 2015 or December 23, 2015. The revision does not affect the test specification applied to the EUT.

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	32.1 dB, 0.52539 MHz, L1 QP Tx 5825 MHz IEEE 802.11n (HT20)	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)	See data	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	FCC: 15.407 (b), 15.205 and 15.209	0.7 dB 5725.000 MHz, AV, Vertical, Tx 5700 MHz IEEE 802.11n-20 (MIMO)	Complied	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
	KDB Publication Number 789033 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 11143372S-C-R1 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 Part 15.31 (e)

The RF Module has own regulator. The RF Module is constantly voltage through the regulator regardless of input voltage. Therefore, the EUT complies with the requirement.

FCC Part 15.203 / 212

The EUT has a unique antenna connector (U.FL). Therefore, the EUT complies with the requirement.

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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

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k=2$.
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Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.1 dB	2.1 dB	2.6 dB	2.2 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	2.7 dB	2.7 dB	3.1 dB	-
	30 MHz-300 MHz	4.4 dB	4.4 dB	4.6 dB	-
	300 MHz-1 GHz	5.6 dB	5.5 dB	5.3 dB	-
	1 GHz-13 GHz	5.2 dB	5.2 dB	5.2 dB	-
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	4.9 dB	4.9 dB	4.9 dB	-
	18 GHz-40 GHz	4.9 dB	4.9 dB	4.9 dB	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.76 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.79 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.74 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.08 dB
Spurious emission (Conducted) below 1GHz	1.5 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.4 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.5 dB
Bandwidth Measurement	0.66 %
Duty cycle and Time Measurement	0.012 %

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

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JAB Accreditation No. RTL02610

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

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, PN9
IEEE 802.11n MIMO 20 MHz BW (11n-20(MIMO))	MCS 8, PN9
IEEE 802.11n SISO 40 MHz BW (11n-40)	MCS 0, PN9
IEEE 802.11n MIMO 40 MHz BW (11n-40(MIMO))	MCS 8, 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	IEEE 802.11a: 12.5dBm (5180-5320MHz), 15.0dBm (5500-5700MHz) IEEE 802.11n (HT20): 11.0dBm (5180-5320MHz), 13.5dBm (5500-5700MHz) IEEE 802.11n (HT40): 10.0dBm (5190, 5310MHz), 11.0dBm (5230, 5270, 5510-5670MHz)
Software	Atheros Radio Test (ART) - Revision 0.9 BUILD #34 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	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
Conducted emission, Radiated Spurious Emission (Below 1 GHz), Conducted Spurious Emission	11n-20(MIMO) Tx *1)	0+1	-	-	-	5825 MHz
26 dB Emission Bandwidth	11a Tx 11n-20 Tx	1	-	5260 MHz 5300 MHz	5500 MHz 5580 MHz	-
	11n-20(MIMO) Tx	0		5320 MHz	5700 MHz	
	11n-40 Tx 11n-40(MIMO) Tx	0	-	5270 MHz 5310 MHz	5510 MHz 5550 MHz	-
				5670 MHz		
99 % Occupied Bandwidth	11a Tx 11n-20 Tx	1	5180 MHz 5220 MHz	5260 MHz 5300 MHz	5500 MHz 5580 MHz	5745 MHz 5785 MHz
	11n-20(MIMO) Tx	0	5240 MHz	5320 MHz	5700 MHz	5825 MHz
	11n-40 Tx 11n-40(MIMO) Tx	0	5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz	5755 MHz 5795 MHz
				5670 MHz		
20 dB Bandwidth	11a Tx 11n-20 Tx	1	5240 MHz	-	-	-
	11n-20(MIMO) Tx	0	5240 MHz	-	-	-
	11n-40 Tx 11n-40(MIMO) Tx	0	5230 MHz	-	-	-
6 dB Bandwidth	11a Tx 11n-20 Tx	1	-	-	-	5745 MHz 5785 MHz
	11n-20(MIMO) Tx	0				5825 MHz
	11n-40 Tx 11n-40(MIMO) Tx	0	-	-	-	5755 MHz 5795 MHz
Maximum Conducted Output Power, Maximum Power Spectral Density	11a Tx 11n-20 Tx	1	5180 MHz 5220 MHz	5260 MHz 5300 MHz	5500 MHz 5580 MHz	5745 MHz 5785 MHz
	11n-20(MIMO) Tx	0+1	5240 MHz	5320 MHz	5700 MHz	5825 MHz
	11n-40 Tx	0	5190 MHz	5270 MHz	5510 MHz	5755 MHz
	11n-40(MIMO) Tx	0+1	5230 MHz	5310 MHz	5550 MHz	5795 MHz
					5670 MHz	
Radiated Spurious Emission (Above 1 GHz)	11n-20(MIMO) Tx	0+1	5180 MHz 5240 MHz	5320 MHz	5500 MHz 5580 MHz	5745 MHz 5785 MHz
	11n-40(MIMO) Tx	0+1	5190 MHz 5230 MHz	5310 MHz	5510 MHz 5550 MHz	5755 MHz 5795 MHz
*1) The mode was tested as a representative, because it had the highest power at antenna terminal test. *2) The test was performed with the antenna that had higher power as a representative.						

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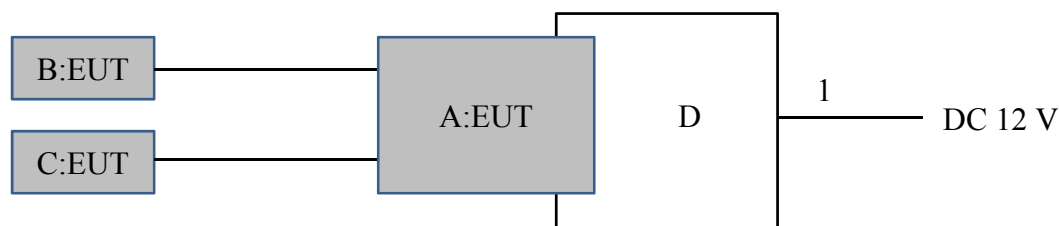
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4.2 Configuration and peripherals



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

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless LAN Module	SX-PCEAN (FF-E)	008092609256	Silex technology, Inc.	EUT
B	Antenna	ANTDC-084A0	-	-	EUT
C	Antenna	ANTDC-083A0	-	-	EUT
D	Jig	113Y120019	57024134	Silex technology, Inc.	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC	1.0	Unshielded	Unshielded	-

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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.

The rear of tabletop was located 40 cm 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 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN / (AMN) to the input power source.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a shielded room. 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. *) 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:

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

Test Antennas are used as below;

Frequency	30 MHz to 300 MHz	300 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 VB *1) RBW: 1 MHz VBW: 10 Hz (duty > 98 %)
Test Distance	3 m	3 m (below 1 GHz), 3 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 v01r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on January 8, 2016)".

*2) Distance Factor: $20 \times \log(4.25 \text{ m}/3.0 \text{ m}) = 3.1 \text{ dB}$, or $20 \times \log(3.75 \text{ m}/3.0 \text{ m}) = 2.0 \text{ dB}$

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

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.

Worst case:

Subject	Antenna polarization	Carrier	Spurious				
			Below 1GHz	1 - 6.4 GHz	6.4 – 13 GHz	18 – 26.5 GHz	26.5 – 40 GHz
Module	Horizontal	Y	X	Y	Y	Z	X
Antenna0		X	X	X	X	X	X
Antenna1		Z	X	Z	Z	X	X
Module	Vertical	Y	Y	Y	Y	X	X
Antenna0		X	X	X	X	X	X
Antenna1		Z	X	Z	Z	X	X

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
20 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
6 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 160 MHz BW) (Method PM)
Maximum Power Spectral Density	Encompass the entire EBW	100 kHz *2)	≥ 3 RBW	Auto	RMS Power Averaging (100 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3)	9 kHz – 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz – 30 MHz	10 kHz	30 kHz				

* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on January 8, 2016)".

*1) Peak hold was applied as Worst-case measurement.

*2) FCC standard says that RBW is set to be 500 kHz for 5.725 GHz-5.850 GHz, but it is not possible with spectrum analyzer, so $10\log(500\text{ kHz}/100\text{ kHz})$ was added to the test result.

*3) In the frequency range below 30 MHz, 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. (9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 10 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

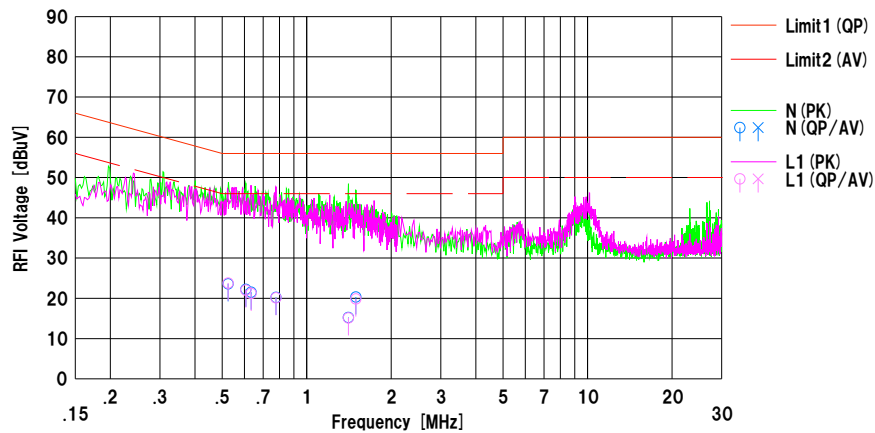
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2016/03/01

Mode : IEEE802.11n (HT20) . Tx. 5825MHz
Power : DC 12 V
Temp./Humi. : 22 deg.C / 33 %RH

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Wataru Kojima



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<OP> [dBuV]	<AV> [dBuV]		<OP> [dBuV]	<AV> [dBuV]	<OP> [dBuV]	<AV> [dBuV]	<OP> [dB]	<AV> [dB]		
1	0.52539	11.20	---	12.41	23.61	---	56.00	46.00	32.3	---	N	
2	0.60704	9.80	---	12.43	22.23	---	56.00	46.00	33.7	---	N	
3	0.63391	9.10	---	12.42	21.52	---	56.00	46.00	34.4	---	N	
4	0.77765	7.80	---	12.43	20.23	---	56.00	46.00	35.7	---	N	
5	1.40772	2.80	---	12.44	15.24	---	56.00	46.00	40.7	---	N	
6	1.49668	7.90	---	12.43	20.33	---	56.00	46.00	35.6	---	N	
7	0.52539	11.40	---	12.41	23.81	---	56.00	46.00	32.1	---	L1	
8	0.60704	9.80	---	12.43	22.03	---	56.00	46.00	33.9	---	L1	
9	0.63391	8.80	---	12.42	21.22	---	56.00	46.00	34.7	---	L1	
10	0.77765	7.70	---	12.43	20.13	---	56.00	46.00	35.8	---	L1	
11	1.40772	2.70	---	12.44	15.14	---	56.00	46.00	40.8	---	L1	
12	1.49668	7.40	---	12.43	19.83	---	56.00	46.00	36.1	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN + Cable + ATT) [dB]
LISN: SLS-01

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26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place	Shonan EMC Lab. No.1	Shonan EMC Lab. No.5	Shonan EMC Lab. No.1
	Measurement Room	Shielded Room	Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

11a

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna Port 1	5180	-	17.613	-
	5220	-	17.690	-
	5240	-	17.758	-
	5260	23.784	17.622	-
	5300	22.709	17.608	-
	5320	24.132	17.591	-
	5500	24.161	17.812	-
	5580	24.950	17.861	-
	5700	25.968	17.834	-
	5745	-	17.950	-
	5785	-	17.968	-
	5825	-	17.890	-

11n-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna Port 1	5180	-	18.707	-
	5220	-	18.690	-
	5240	-	18.631	-
	5260	23.448	18.746	-
	5300	23.626	18.685	-
	5320	23.733	18.751	-
	5500	24.329	18.927	-
	5580	24.728	18.876	-
	5700	24.663	18.869	-
	5745	-	18.870	-
	5785	-	18.944	-
	5825	-	18.935	-

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place	Shonan EMC Lab. No.1	Shonan EMC Lab. No.5	Shonan EMC Lab. No.1
	Measurement Room	Shielded Room	Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

11n-20 (MIMO)

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna Port 0	5180	-	18.456	-
	5220	-	18.411	-
	5240	-	18.443	-
	5260	22.760	18.493	-
	5300	22.337	18.441	-
	5320	23.356	18.465	-
	5500	22.070	18.458	-
	5580	23.366	18.464	-
	5700	22.695	18.478	-
	5745	-	18.763	-
	5785	-	18.760	-
	5825	-	18.726	-

11n-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna Port 0	5190	-	37.281	-
	-	-	-	-
	5230	-	37.337	-
	5270	49.692	37.263	-
	-	-	-	-
	5310	46.885	37.251	-
	5510	49.309	37.229	-
	5550	50.223	37.411	-
	5670	53.212	37.528	-
	5755	-	37.436	-
	-	-	-	-
	5795	-	37.292	-

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

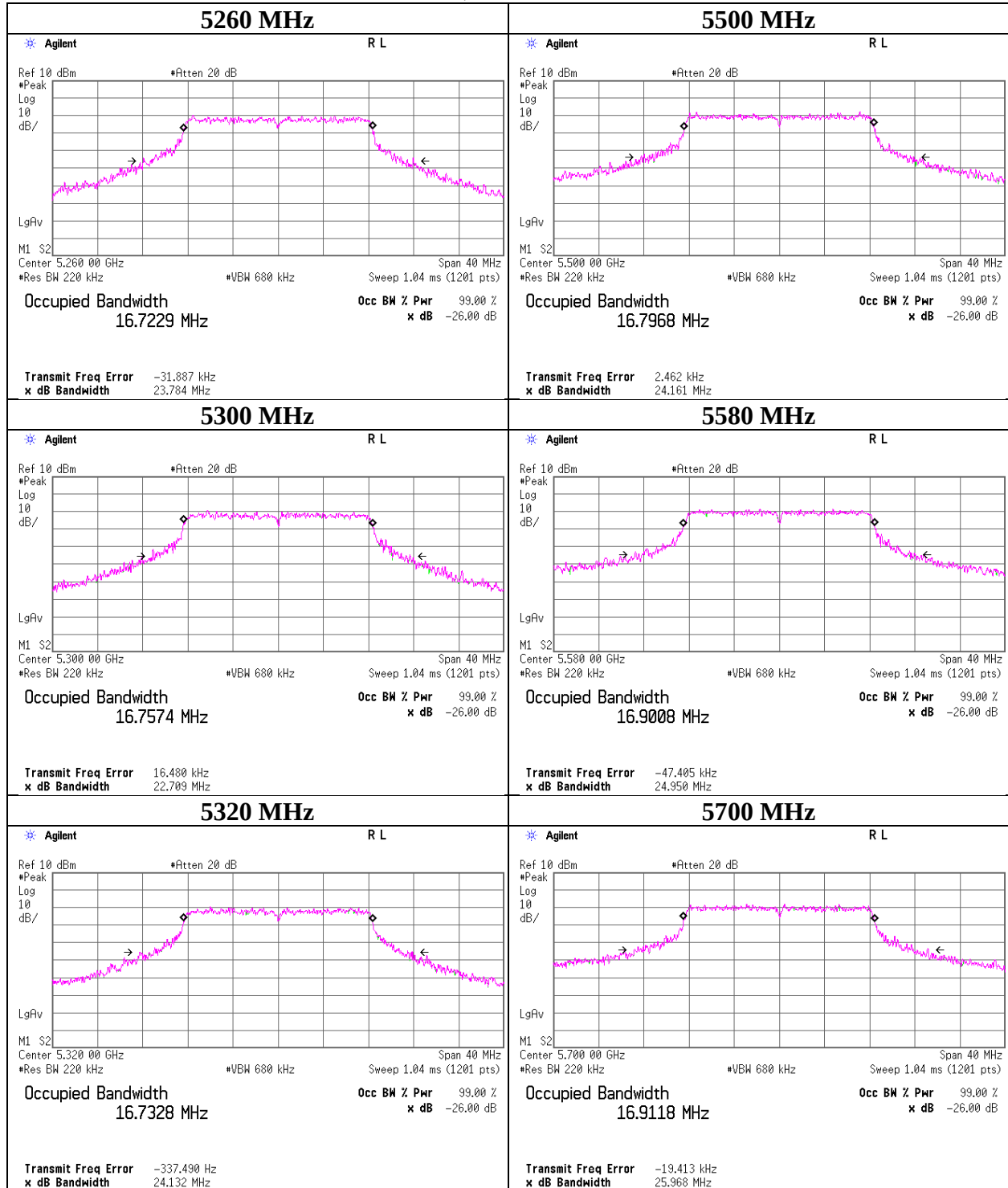
Test place	Shonan EMC Lab. No.1	Shonan EMC Lab. No.5	Shonan EMC Lab. No.1
	Measurement Room	Shielded Room	Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

11n-40 (MIMO)

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna Port 0	5190	-	37.067	-
	-	-	-	-
	5230	-	37.051	-
	5270	45.397	37.003	-
	-	-	-	-
	5310	47.811	37.141	-
	5510	45.867	37.073	-
	5550	45.779	37.027	-
	5670	45.739	37.009	-
	5755	-	37.433	-
	-	-	-	-
	5795	-	37.460	-

26 dB Emission Bandwidth

11a, Antenna 1



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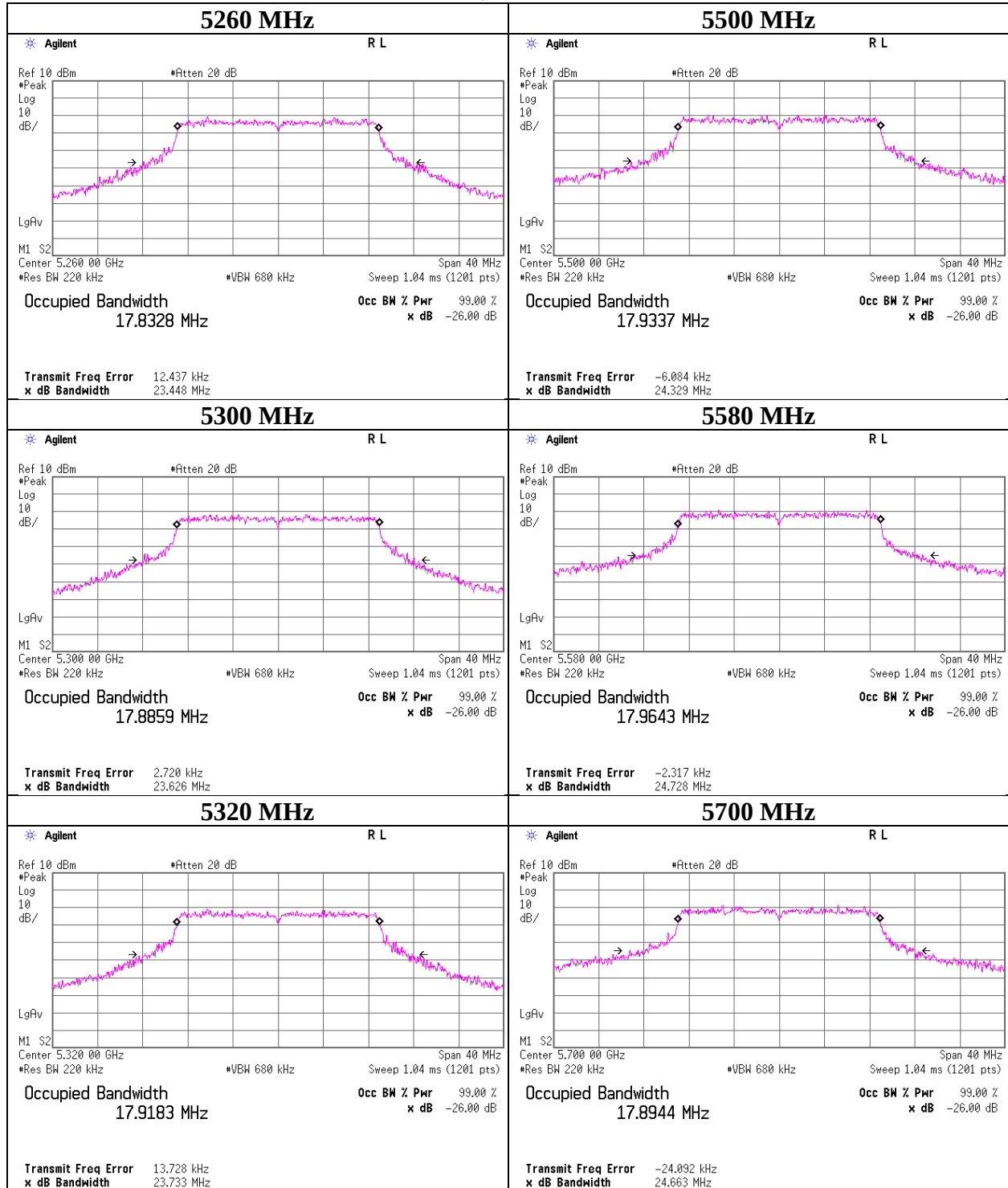
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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26 dB Emission Bandwidth

11n-20, Antenna 1



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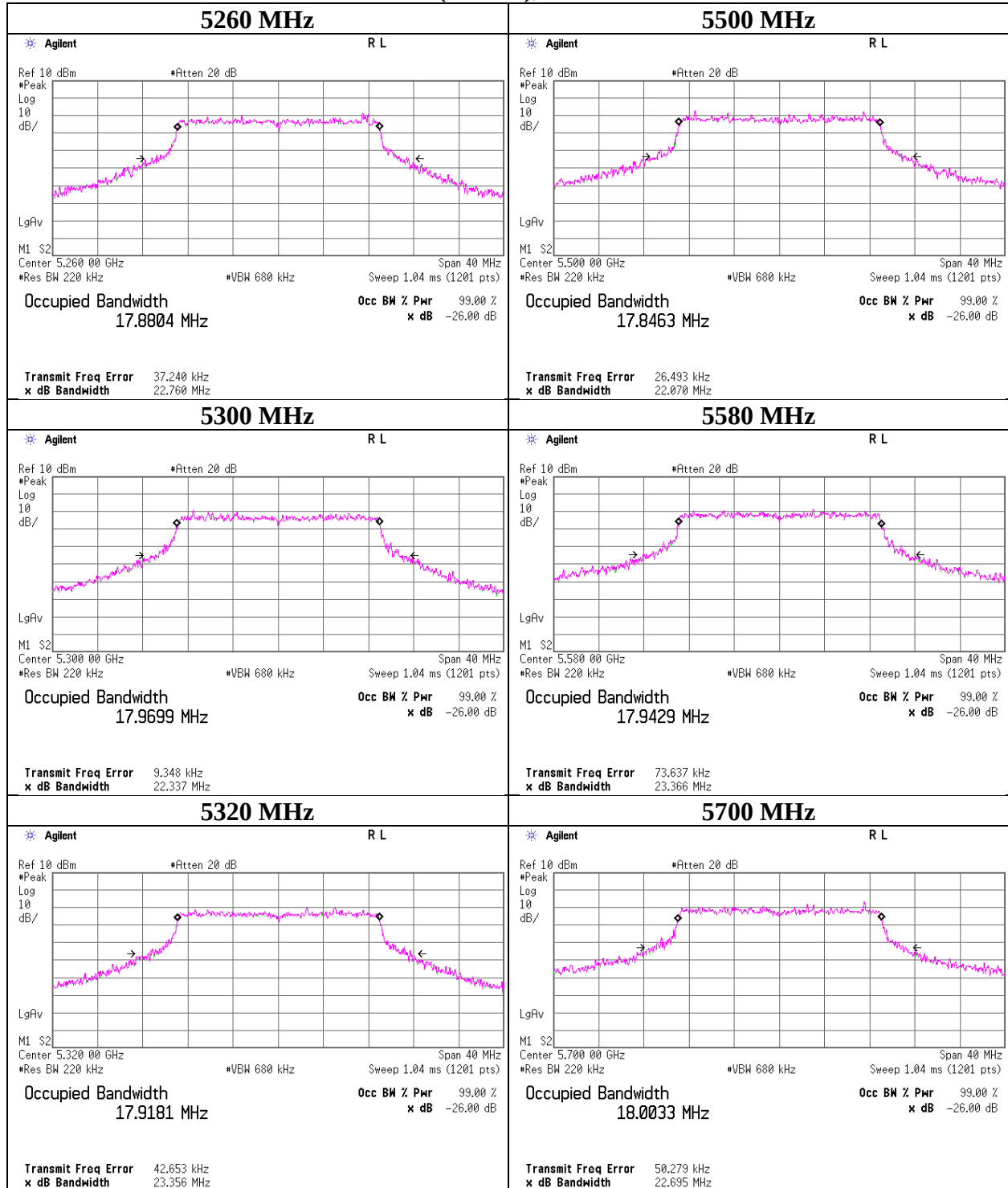
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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26 dB Emission Bandwidth

11n-20 (MIMO), Antenna 0



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Shonan EMC Lab.

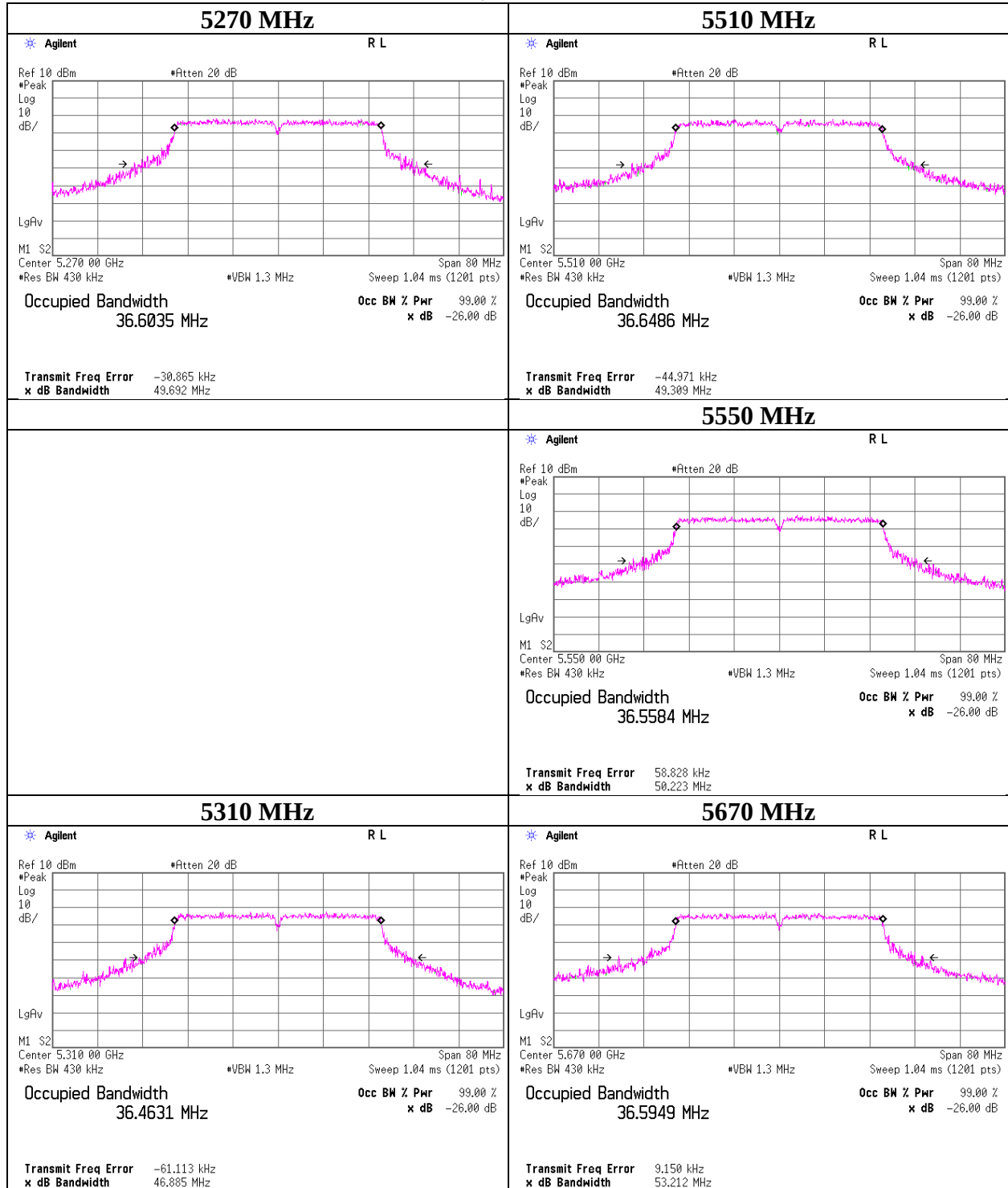
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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26 dB Emission Bandwidth

11n-40, Antenna 0



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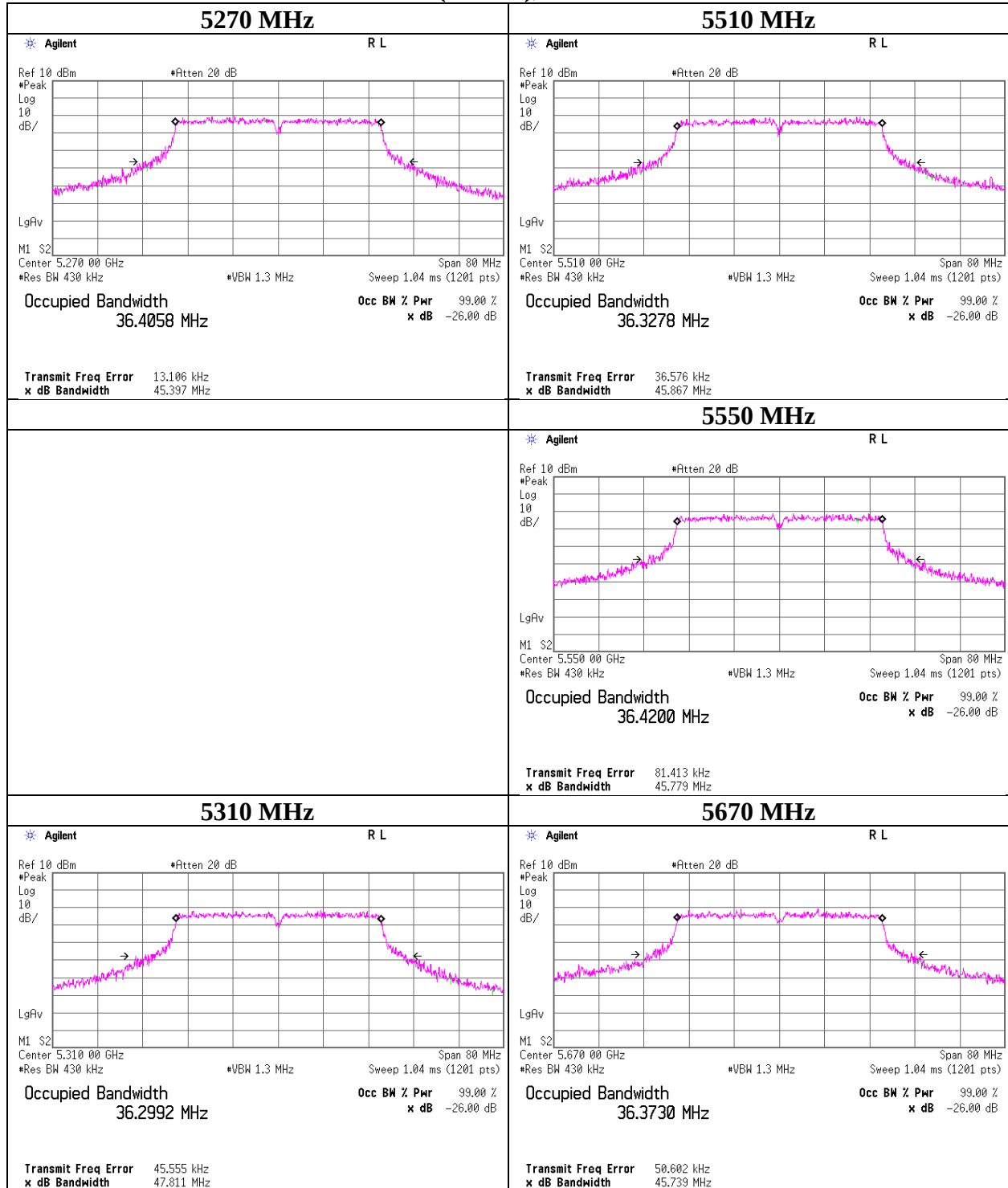
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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26 dB Emission Bandwidth

11n-40 (MIMO), Antenna 0



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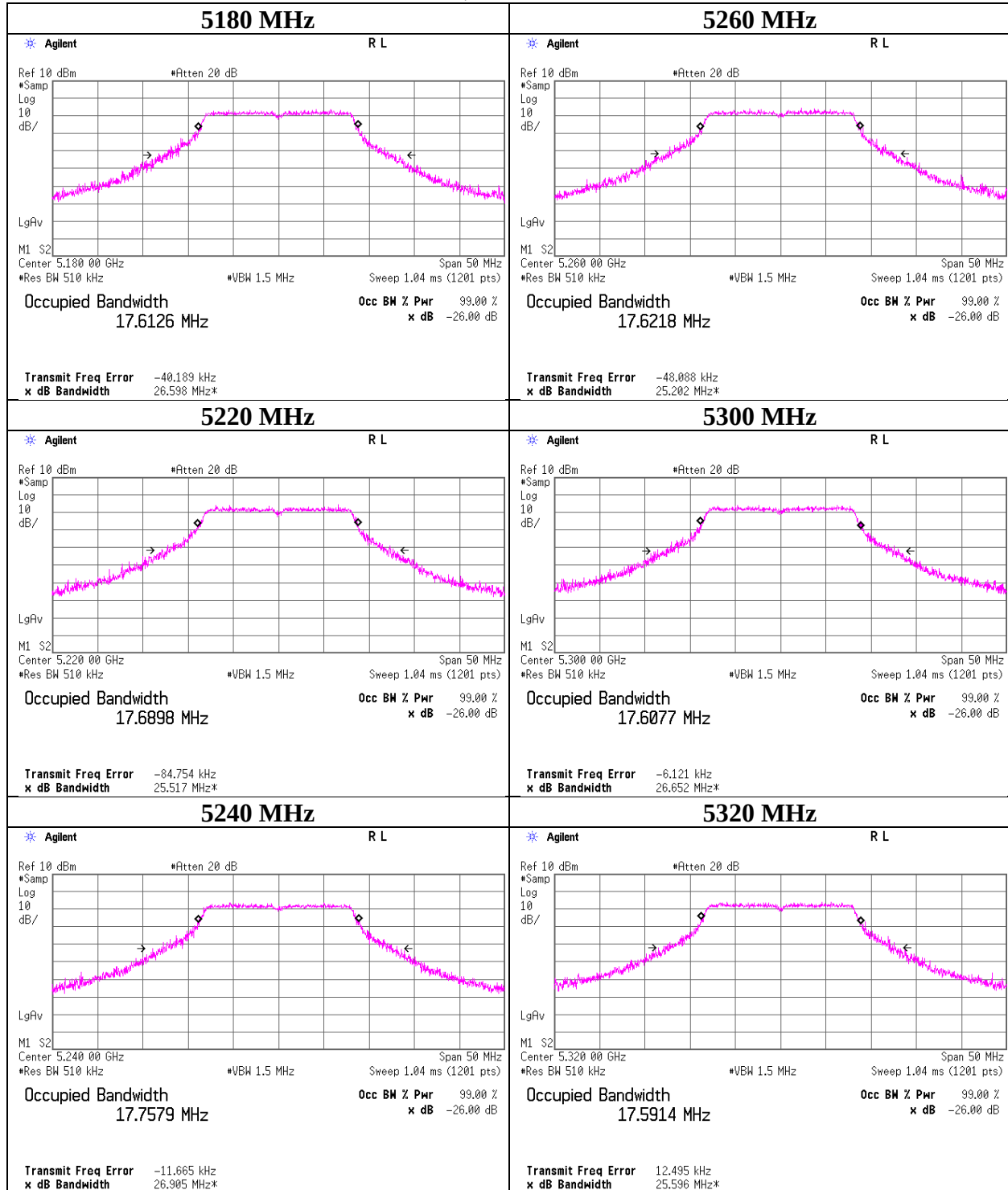
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

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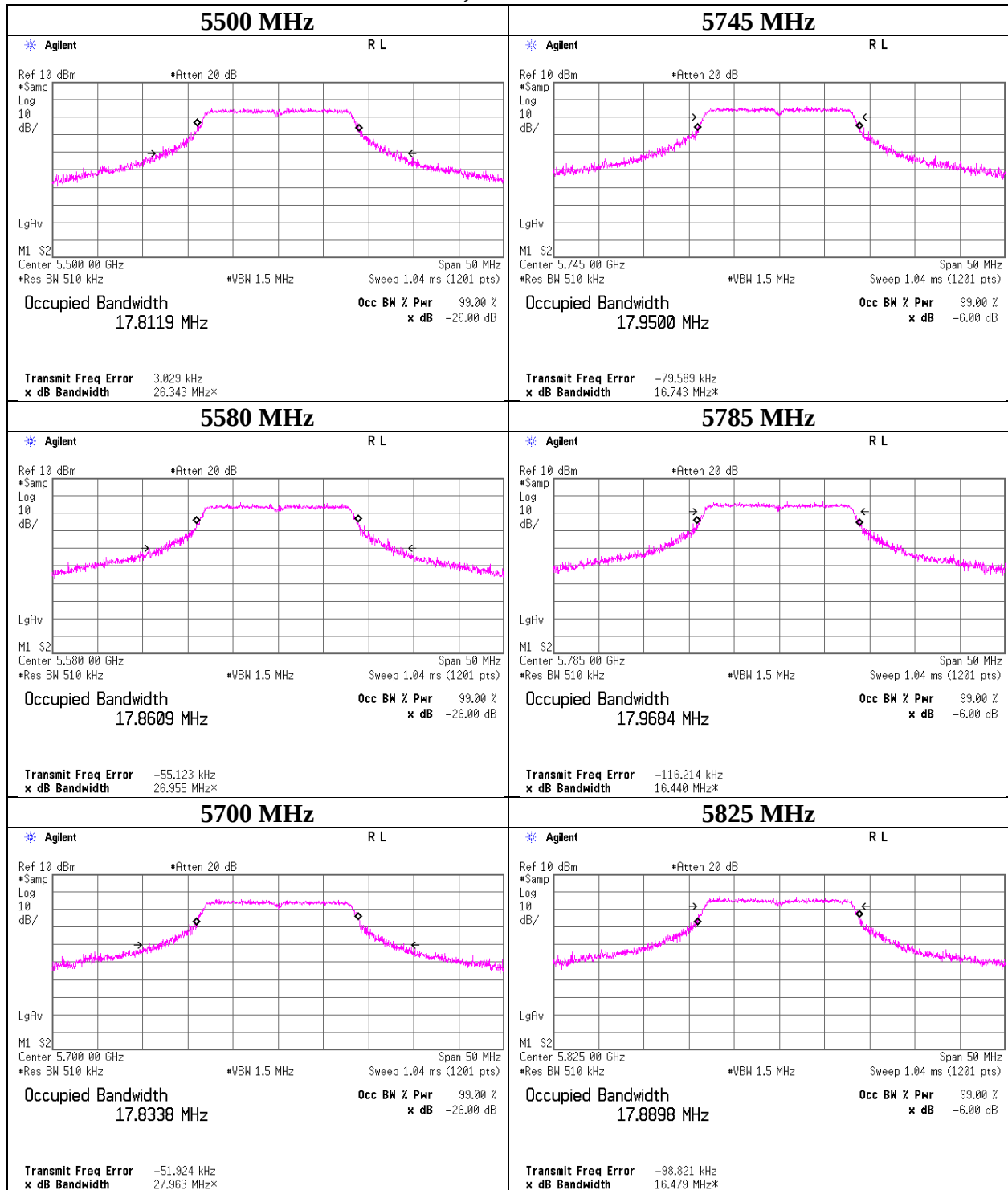
99 % Occupied Bandwidth

11a, Antenna 1



99 % Occupied Bandwidth

11a, Antenna 1



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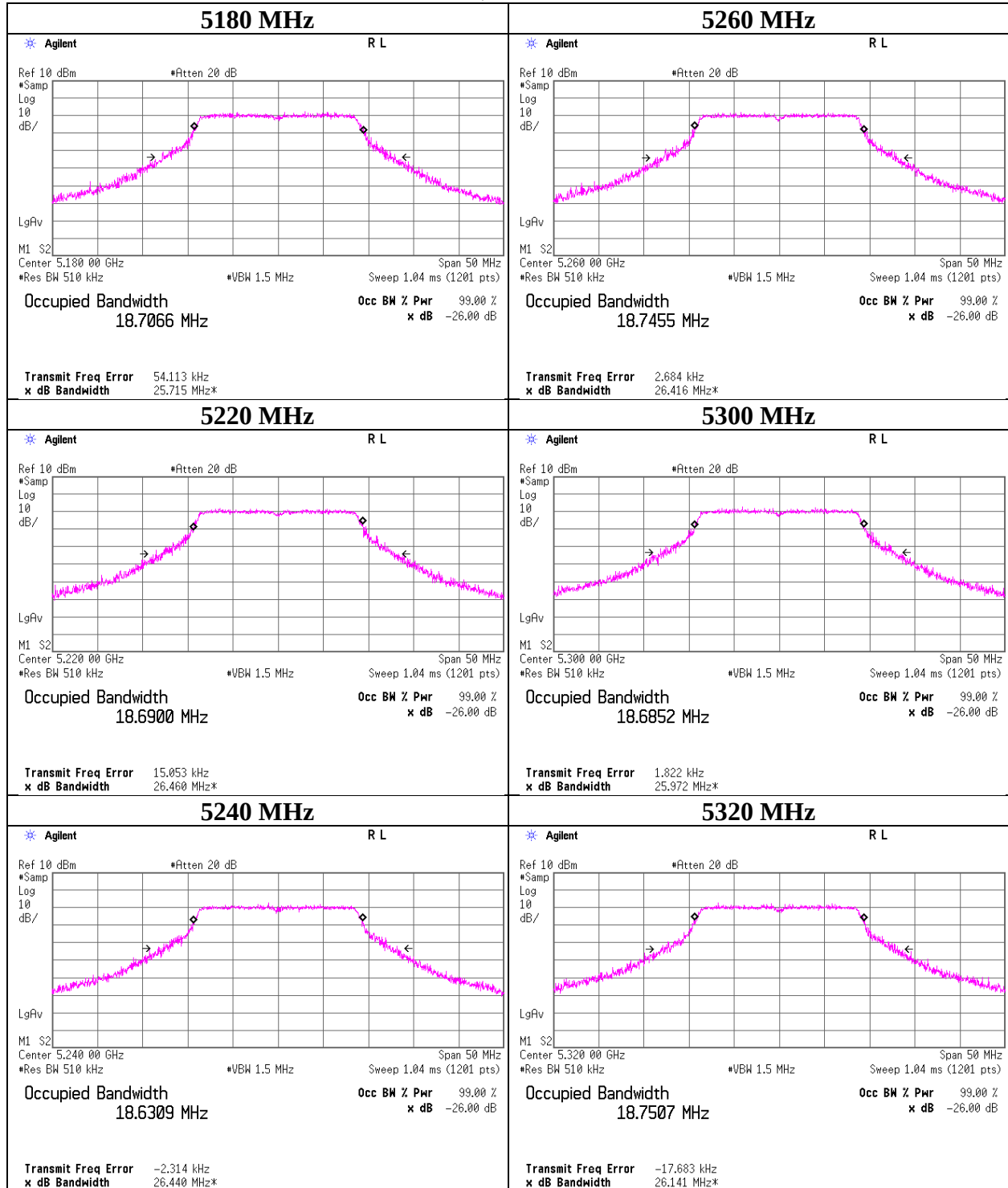
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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99 % Occupied Bandwidth

11n-20, Antenna 1



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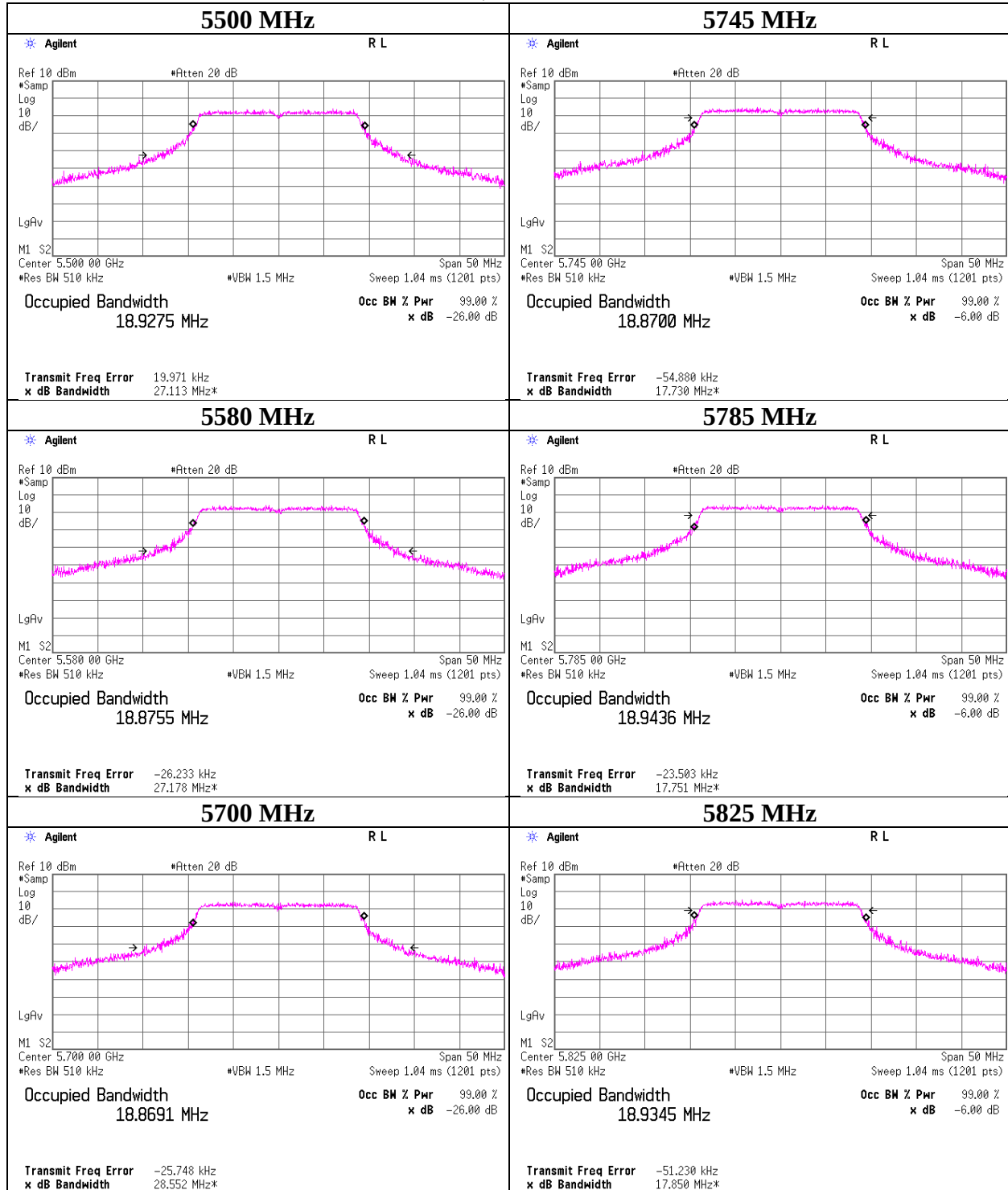
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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99 % Occupied Bandwidth

11n-20, Antenna 1



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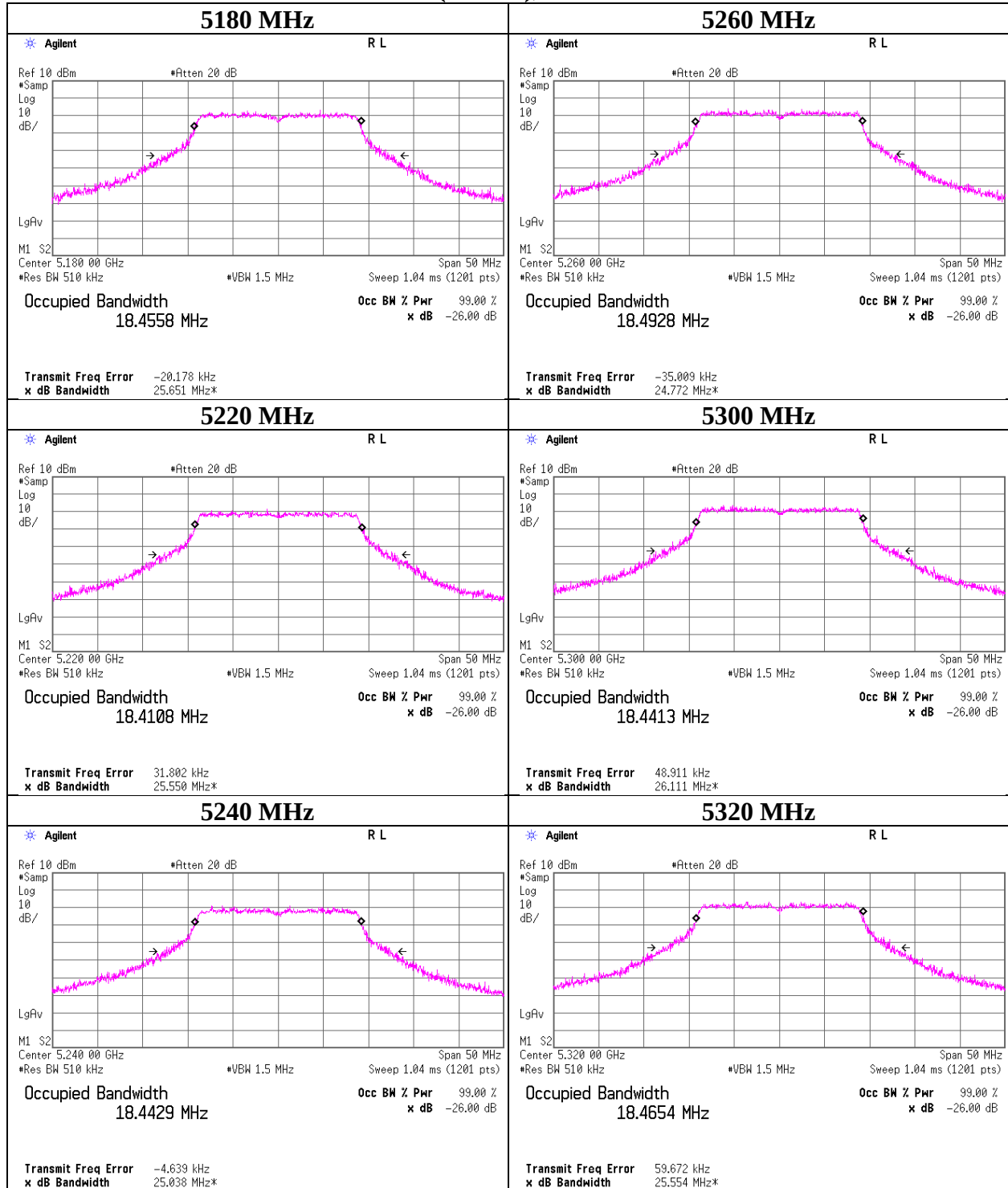
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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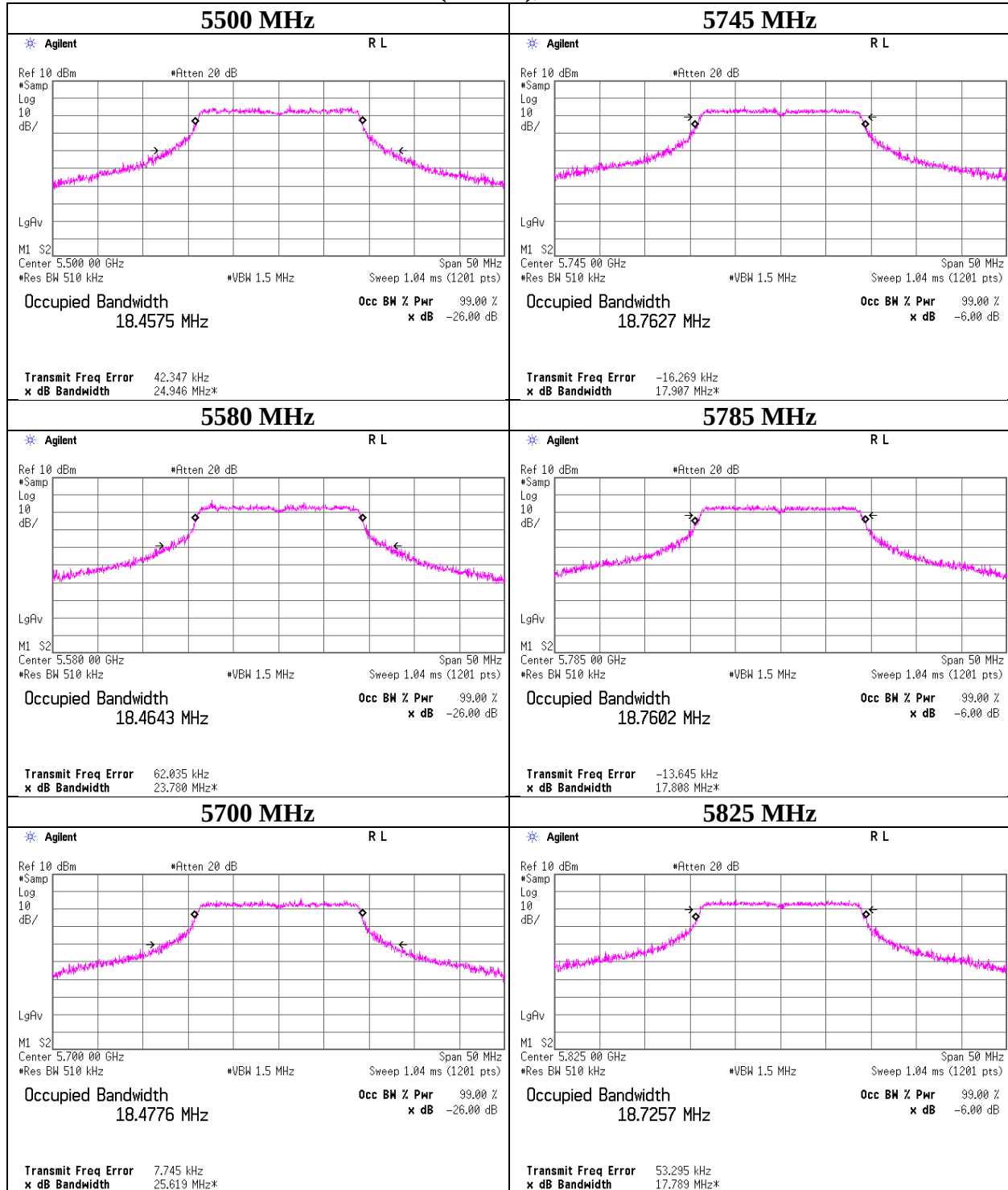
99 % Occupied Bandwidth

11n-20 (MIMO), Antenna 0



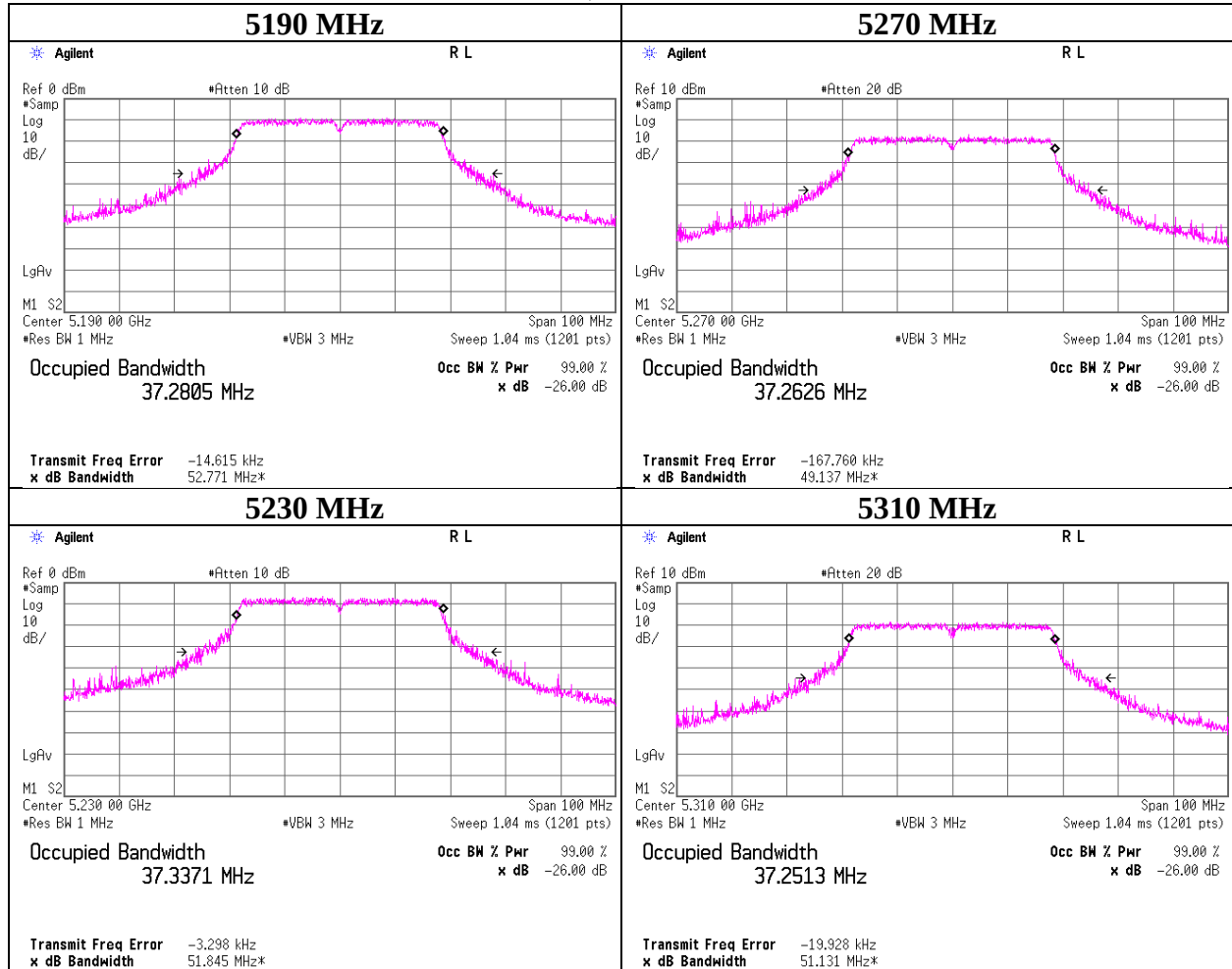
99 % Occupied Bandwidth

11n-20 (MIMO), Antenna 0



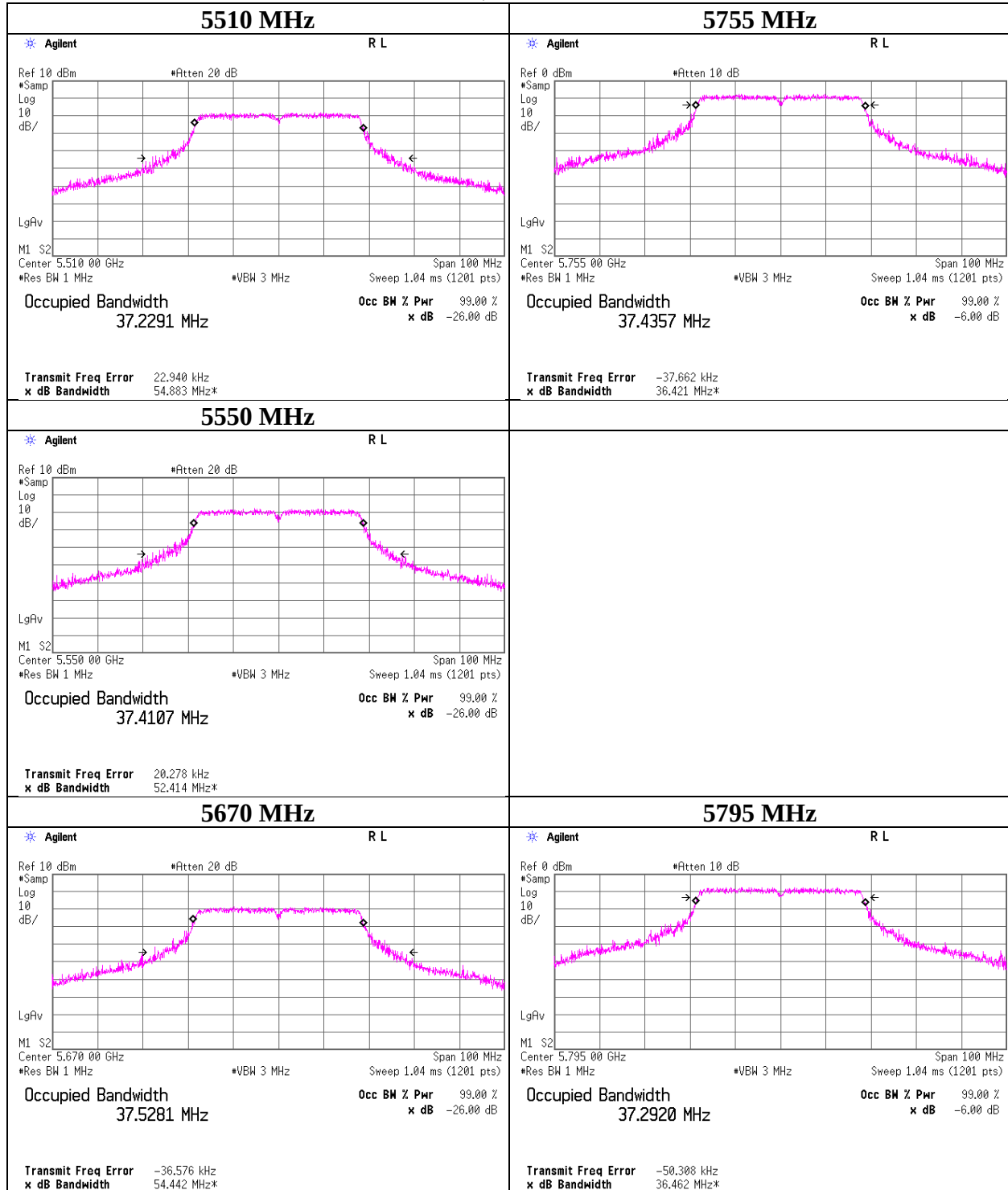
99 % Occupied Bandwidth

11n-40, Antenna 0



99 % Occupied Bandwidth

11n-40, Antenna 0



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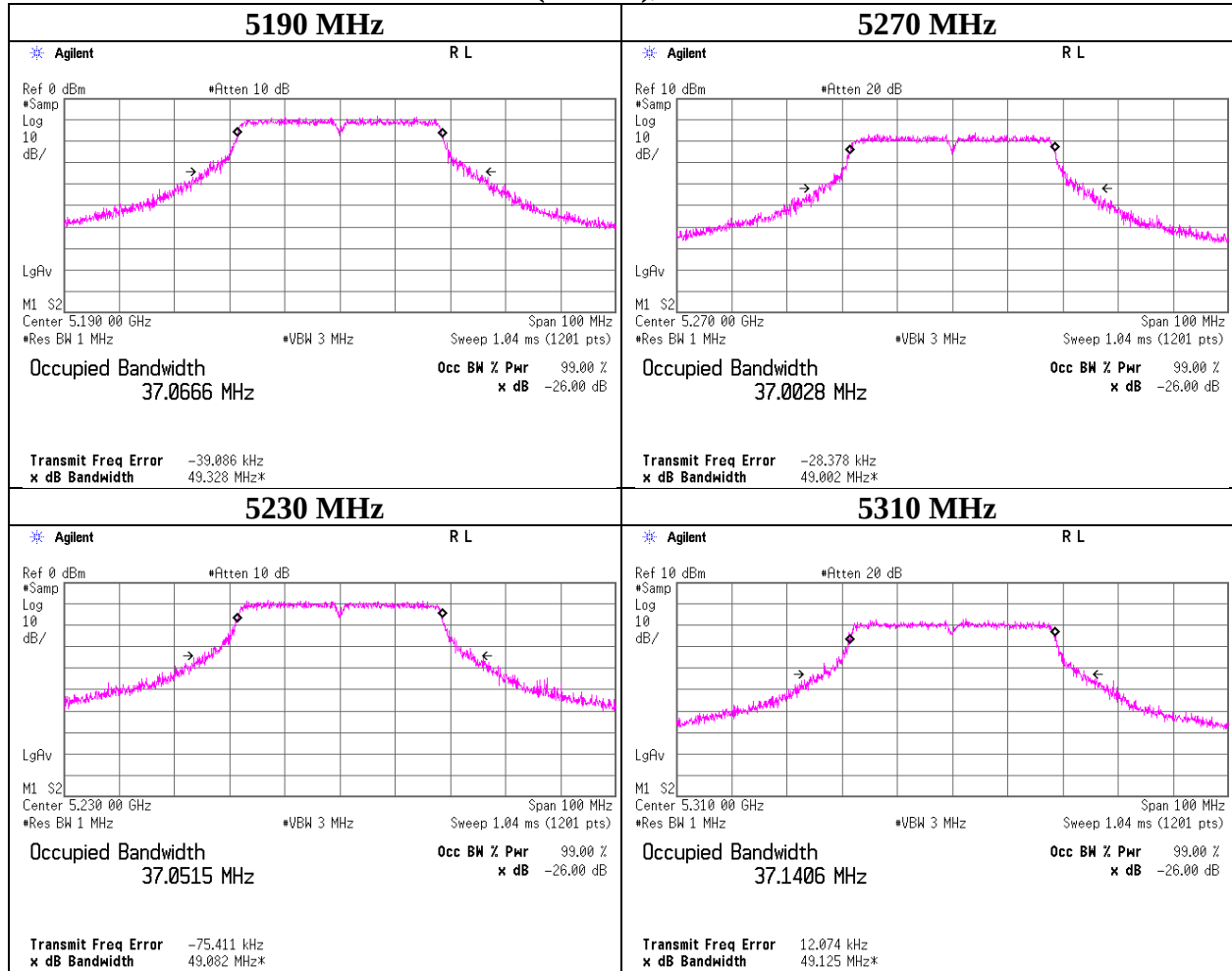
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

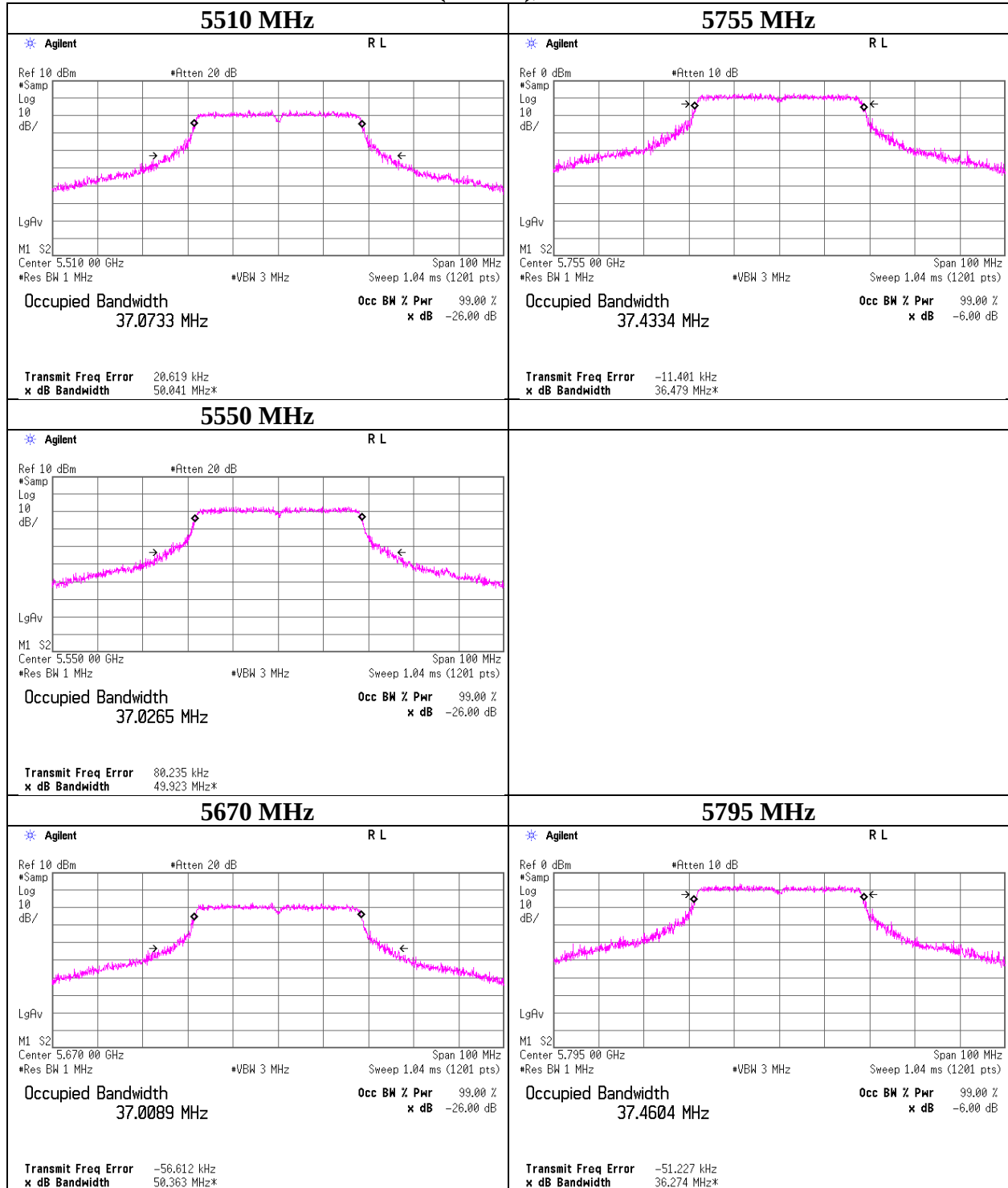
99 % Occupied Bandwidth

11n-40 (MIMO), Antenna 0



99 % Occupied Bandwidth

11n-40 (MIMO), Antenna 0



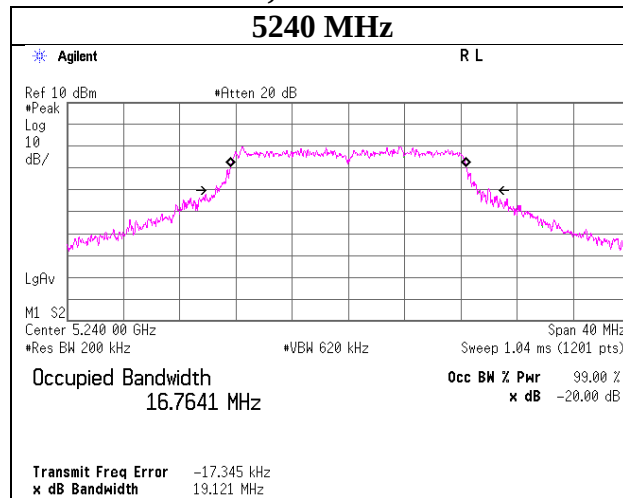
20 dB Bandwidth

Test place	Shonan EMC Lab. No.1	Shonan EMC Lab. No.5
	Measurement Room	Shielded Room
Report No.	11143372S-B-R1	
Date	February 8, 2016	February 12, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano
Mode	Tx	

11a

Antenna	Tested Frequency [MHz]	20 dB Emission Bandwidth [MHz]
Antenna 1	5240	19.121

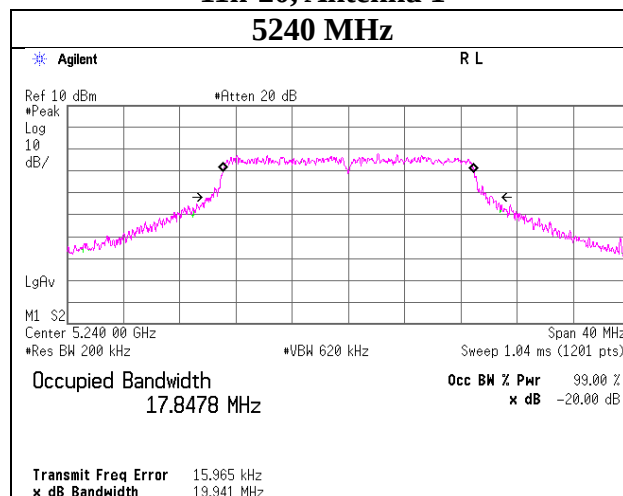
11a, Antenna 1



11n-20

Antenna	Tested Frequency [MHz]	20 dB Emission Bandwidth [MHz]
Antenna 1	5240	19.941

11n-20, Antenna 1



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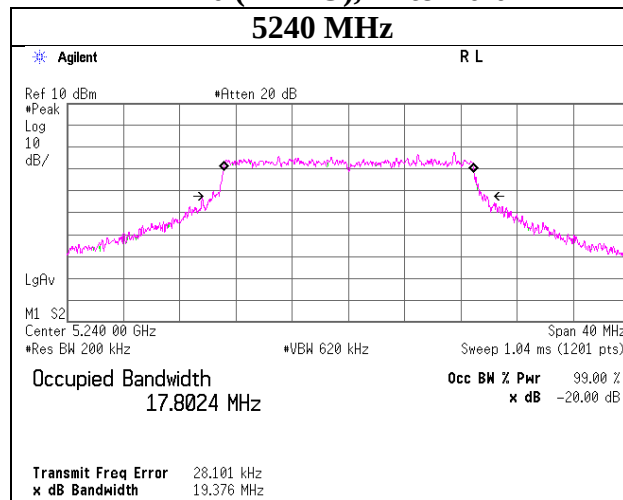
20 dB Bandwidth

Test place	Shonan EMC Lab. No.1	Shonan EMC Lab. No.5
	Measurement Room	Shielded Room
Report No.	11143372S-B-R1	
Date	February 8, 2016	February 12, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano
Mode	Tx	

11n-20 (MIMO)

Antenna	Tested Frequency [MHz]	20 dB Emission Bandwidth [MHz]
Antenna 0	5240	19.376

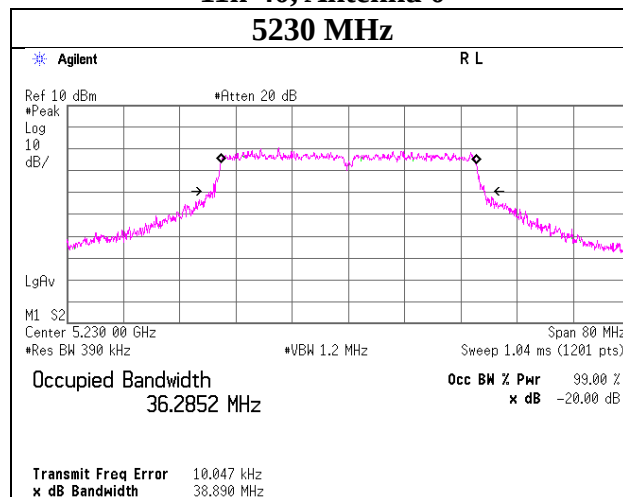
11n-20 (MIMO), Antenna 0



11n-40

Antenna	Tested Frequency [MHz]	20 dB Emission Bandwidth [MHz]
Antenna 0	5230	38.890

11n-40, Antenna 0



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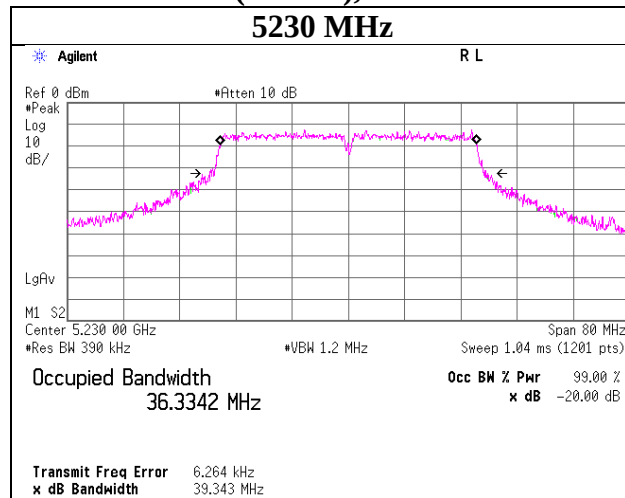
20 dB Bandwidth

Test place Shonan EMC Lab. No.1
Measurement Room
Report No. 11143372S-B-R1
Date February 8, 2016
Temperature / Humidity 23 deg. C / 45 % RH
Engineer Hiroyuki Morikawa
Mode Tx

11n-40 (MIMO)

Antenna	Tested Frequency [MHz]	20 dB Emission Bandwidth [MHz]
Antenna 0	5230	39.343

11n-40 (MIMO), Antenna 0



6 dB Bandwidth

Test place	Shonan EMC Lab. No.1
Report No.	11143372S-B-R1
Date	February 15, 2016
Temperature / Humidity	23 deg. C / 30 % RH
Engineer	Yosuke Ishikawa
Mode	Tx

11a

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna 1	5745	16.465	> 500
	5785	16.437	> 500
	5825	16.369	> 500

11n-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna 1	5745	17.610	> 500
	5785	17.621	> 500
	5825	17.651	> 500

11n-20 (MIMO)

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna 0	5745	17.633	> 500
	5785	17.624	> 500
	5825	17.654	> 500

11n-40

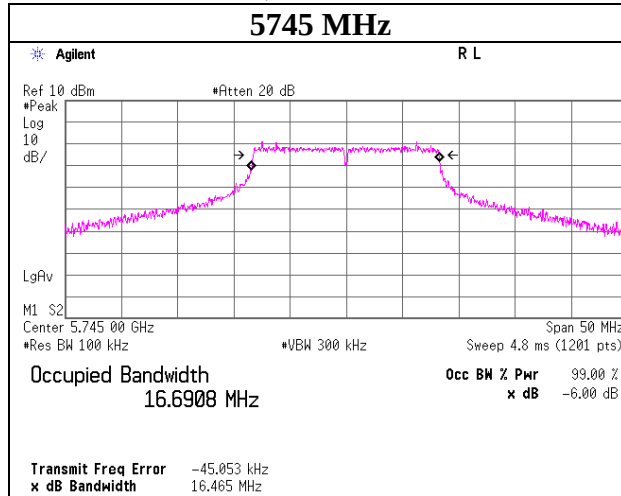
Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna 0	5755	36.360	> 500
	-	-	-
	5795	36.009	> 500

11n-40 (MIMO)

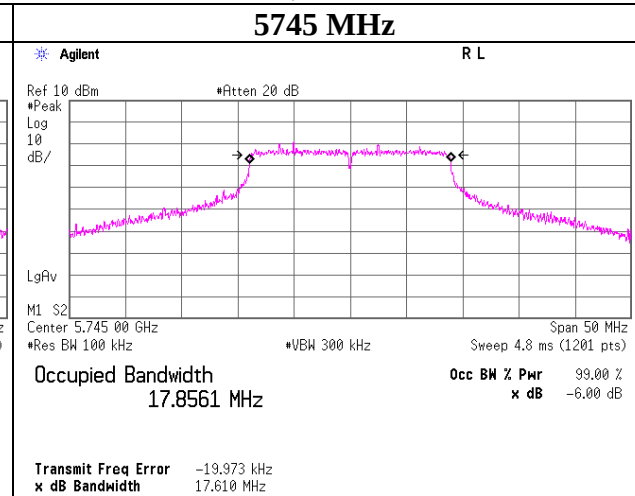
Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna 0	5755	36.136	> 500
	-	-	-
	5795	36.091	> 500

6 dB Bandwidth

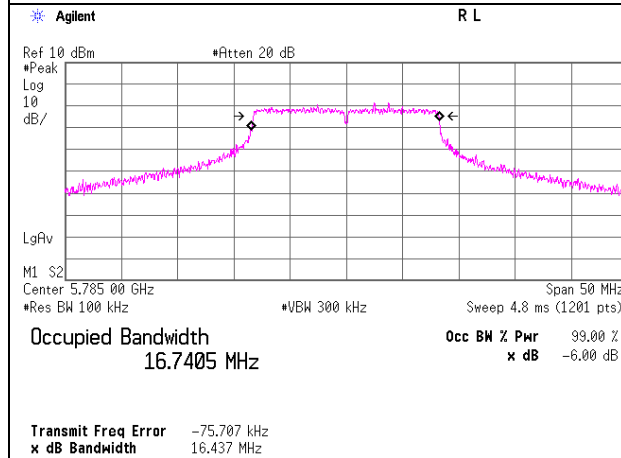
11a, Antenna 1



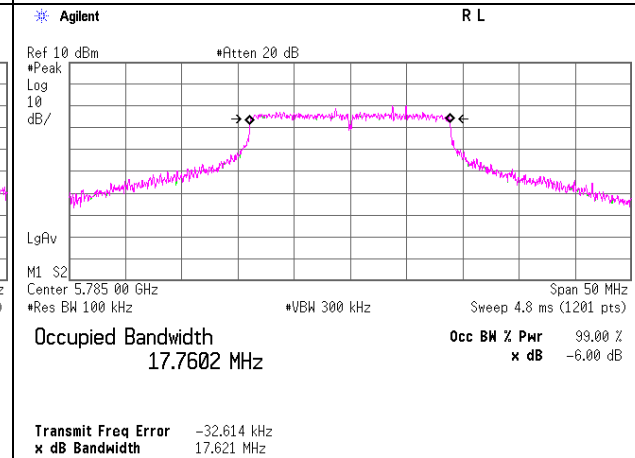
11n-20, Antenna 1



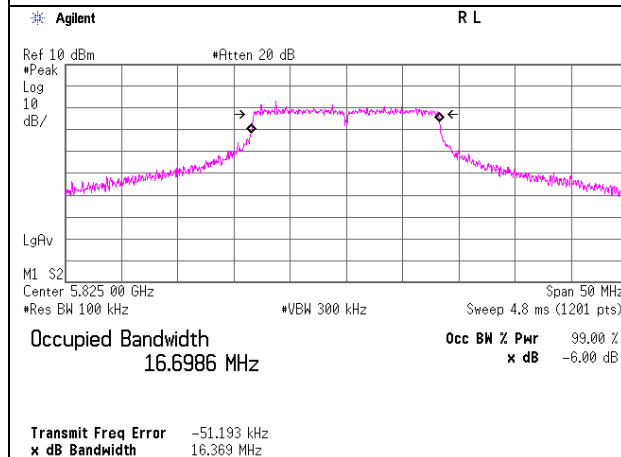
5785 MHz



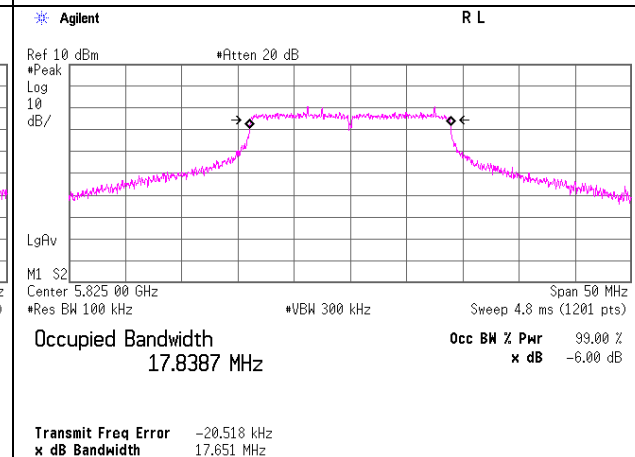
5785 MHz



5825 MHz

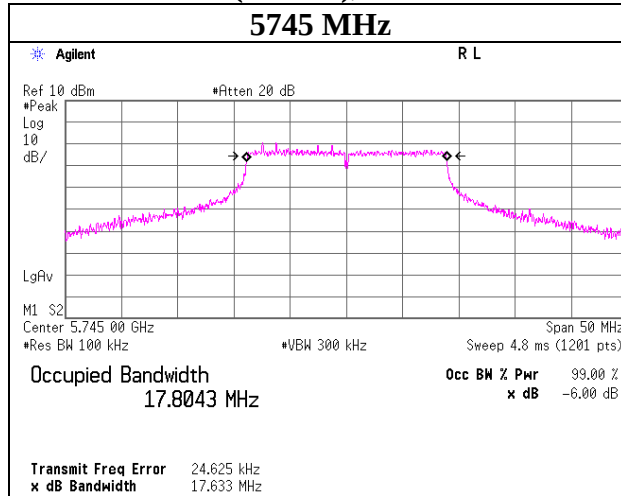


5825 MHz

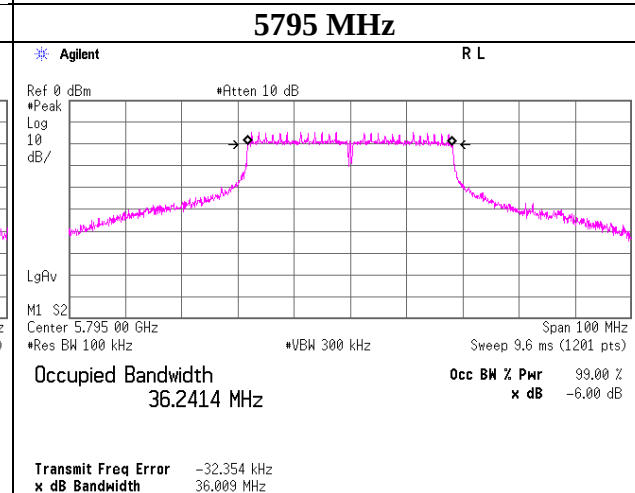
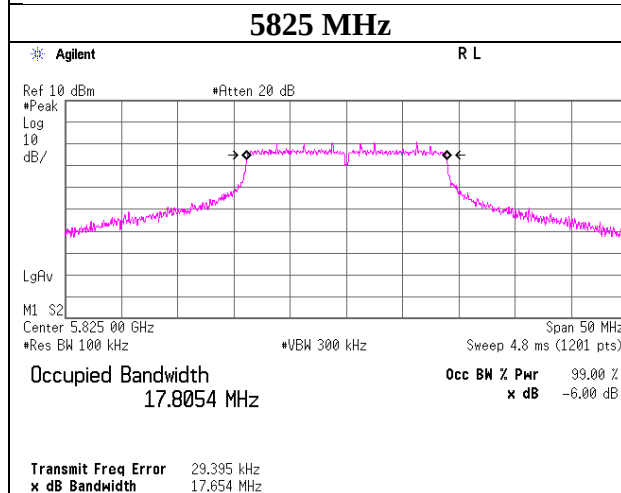
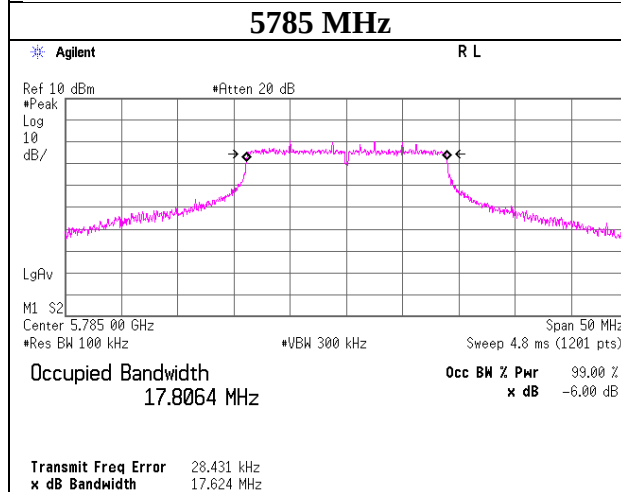
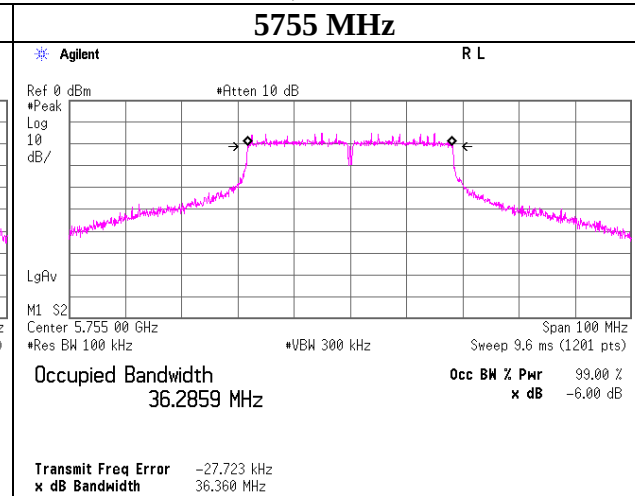


6 dB Bandwidth

11n-20 (MIMO), Antenna 0

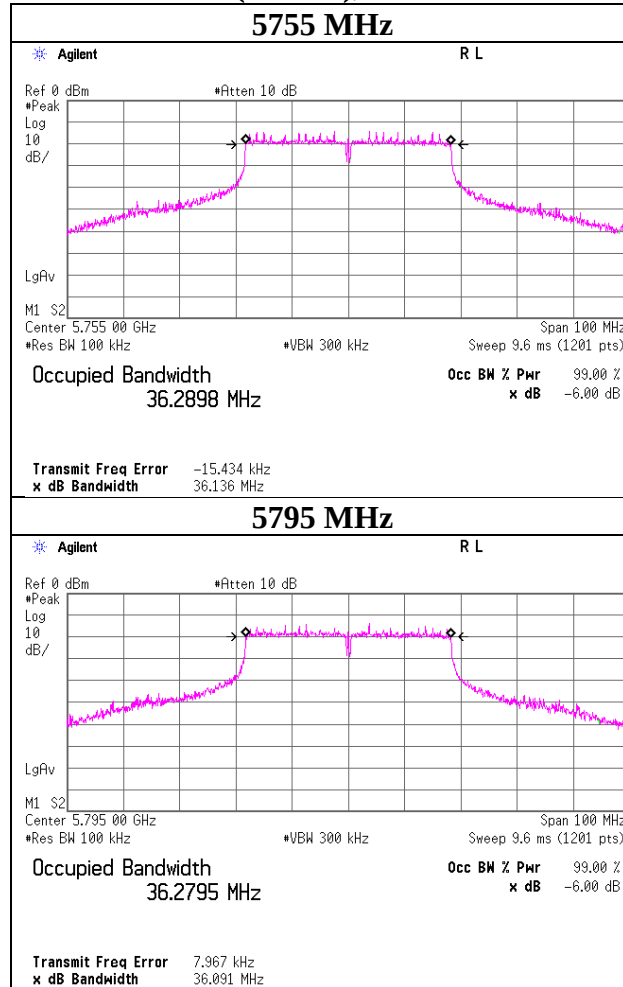


11n-40, Antenna 0



6 dB Bandwidth

11n-40 (MIMO), Antenna 0



Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room		
Report No.	11143372S-B-R1		
Date	February 2, 2016	February 3, 2016	February 5, 2016
Temperature / Humidity	24 deg. C / 47 % RH	25 deg. C / 31 % RH	26 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Hiroyuki Morikawa
Mode	Tx 11a		

Antenna 1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result	Limit	Margin		Result	Limit	Margin	
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	0.18	2.98	9.97	0.02	-1.3	-	17.613	13.15	20.65	23.97	10.82	11.85	15.31	29.97	18.12
5220	0.30	2.99	9.97	0.02	-1.3	-	17.690	13.28	21.28	23.97	10.69	11.98	15.78	29.97	17.99
5240	0.20	2.99	9.97	0.02	-1.3	-	17.758	13.18	20.80	23.97	10.79	11.88	15.42	29.97	18.09
5260	0.20	2.99	9.96	0.02	-1.3	23.784	17.622	13.17	20.75	23.97	10.80	11.87	15.38	29.97	18.10
5300	0.38	3.00	9.96	0.02	-1.3	22.709	17.608	13.36	21.68	23.97	10.61	12.06	16.07	29.97	17.91
5320	0.19	3.00	9.96	0.02	-1.3	24.132	17.591	13.17	20.75	23.97	10.80	11.87	15.38	29.97	18.10
5500	2.12	3.03	9.96	0.02	-1.3	24.161	17.812	15.13	32.58	23.97	8.84	13.83	24.15	29.97	16.14
5580	2.42	3.04	9.96	0.02	-1.3	24.950	17.861	15.44	34.99	23.97	8.53	14.14	25.94	29.97	15.83
5700	2.47	3.07	9.97	0.02	-1.3	25.968	17.834	15.53	35.73	23.97	8.44	14.23	26.49	29.97	15.74
5745	2.03	3.07	9.97	0.02	-1.3	-	-	15.09	32.28	30.00	14.91	13.79	23.93	36.00	22.21
5785	1.87	3.08	9.97	0.02	-1.3	-	-	14.94	31.19	30.00	15.06	13.64	23.12	36.00	22.36
5825	1.99	3.09	9.97	0.02	-1.3	-	-	15.07	32.14	30.00	14.93	13.77	23.82	36.00	22.23

Sample Calculation:

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

Although the EUT operates on Master mode, more stringent limit for Client device was applied. (W52 for FCC)

UL Japan, Inc.

Shonan EMC Lab.

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Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room		
Report No.	11143372S-B-R1		
Date	February 2, 2016	February 3, 2016	February 5, 2016
Temperature / Humidity	24 deg. C / 47 % RH	25 deg. C / 31 % RH	26 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Hiroyuki Morikawa
Mode	Tx 11n-20		

Antenna 1

Applied limit: 15.407, mobile and portable client device

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				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-0.88	2.98	9.97	0.02	-1.3	-	18.707	12.09	16.18	23.97	11.88	10.79	11.99	29.97	19.18
5220	-1.05	2.99	9.97	0.02	-1.3	-	18.690	11.93	15.60	23.97	12.04	10.63	11.56	29.97	19.34
5240	-1.01	2.99	9.97	0.02	-1.3	-	18.631	11.97	15.74	23.97	12.00	10.67	11.67	29.97	19.30
5260	-1.04	2.99	9.96	0.02	-1.3	23.448	18.746	11.93	15.60	23.97	12.04	10.63	11.56	29.97	19.34
5300	-0.99	3.00	9.96	0.02	-1.3	23.626	18.685	11.99	15.81	23.97	11.98	10.69	11.72	29.97	19.28
5320	-1.03	3.00	9.96	0.02	-1.3	23.733	18.751	11.95	15.67	23.97	12.02	10.65	11.61	29.97	19.32
5500	0.77	3.03	9.96	0.02	-1.3	24.329	18.927	13.78	23.88	23.97	10.19	12.48	17.70	29.97	17.49
5580	1.11	3.04	9.96	0.02	-1.3	24.728	18.876	14.13	25.88	23.97	9.84	12.83	19.19	29.97	17.14
5700	1.06	3.07	9.97	0.02	-1.3	24.663	18.869	14.12	25.82	23.97	9.85	12.82	19.14	29.97	17.15
5745	0.60	3.07	9.97	0.02	-1.3	-	-	13.66	23.23	30.00	16.34	12.36	17.22	36.00	23.64
5785	0.33	3.08	9.97	0.02	-1.3	-	-	13.40	21.88	30.00	16.60	12.10	16.22	36.00	23.90
5825	0.51	3.09	9.97	0.02	-1.3	-	-	13.59	22.86	30.00	16.41	12.29	16.94	36.00	23.71

Sample Calculation:

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

Although the EUT operates on Master mode, more stringent limit for Client device was applied. (W52 for FCC)

Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room		
Report No.	11143372S-B-R1		
Date	February 2, 2016	February 3, 2016	February 5, 2016
Temperature / Humidity	24 deg. C / 47 % RH	25 deg. C / 31 % RH	26 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Hiroyuki Morikawa
Mode	Tx 11n-20 (MIMO)		

Antenna 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			0 [mW]	1 [mW]	Sum [mW]				0 [mW]	1 [mW]	Sum [mW]			
5180	-	18.456	14.26	15.70	29.96	14.77	23.97	9.20	9.42	11.64	21.06	13.23	29.97	16.74
5220	-	18.411	15.70	15.38	31.09	14.93	23.97	9.04	10.38	11.40	21.78	13.38	29.97	16.59
5240	-	18.443	17.38	15.56	32.94	15.18	23.97	8.79	11.48	11.53	23.02	13.62	29.97	16.35
5260	22.760	18.493	16.83	15.52	32.35	15.10	23.97	8.87	11.12	11.51	22.63	13.55	29.97	16.42
5300	22.337	18.441	16.37	15.49	31.86	15.03	23.97	8.94	10.81	11.48	22.30	13.48	29.97	16.49
5320	23.356	18.465	16.11	15.67	31.77	15.02	23.97	8.95	10.64	11.61	22.26	13.47	29.97	16.50
5500	22.070	18.458	23.07	22.96	46.03	16.63	23.97	7.34	15.24	17.02	32.26	15.09	29.97	14.88
5580	23.366	18.464	24.10	23.71	47.81	16.80	23.97	7.17	15.92	17.58	33.50	15.25	29.97	14.72
5700	22.695	18.478	25.94	25.70	51.65	17.13	23.97	6.84	17.14	19.05	36.19	15.59	29.97	14.38
5745	-	-	27.10	24.10	51.20	17.09	30.00	12.91	17.91	17.86	35.77	15.54	36.00	20.46
5785	-	-	26.92	23.33	50.25	17.01	30.00	12.99	17.78	17.30	35.08	15.45	36.00	20.55
5825	-	-	27.86	24.49	52.35	17.19	30.00	12.81	18.41	18.16	36.56	15.63	36.00	20.37

Antenna 0								Antenna 1					
Tested Frequency [MHz]	Duty Factor [dB]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result	
						Cond. Power [dBm]	e.i.r.p. [dBm]					Cond. Power [dBm]	e.i.r.p. [dBm]
5180	0.03	-1.44	2.98	9.97	-1.80	11.54	9.74	-1.02	2.98	9.97	-1.30	11.96	10.66
5220	0.03	-1.03	2.99	9.97	-1.80	11.96	10.16	-1.12	2.99	9.97	-1.30	11.87	10.57
5240	0.03	-0.59	2.99	9.97	-1.80	12.40	10.60	-1.07	2.99	9.97	-1.30	11.92	10.62
5260	0.03	-0.72	2.99	9.96	-1.80	12.26	10.46	-1.07	2.99	9.96	-1.30	11.91	10.61
5300	0.03	-0.85	3.00	9.96	-1.80	12.14	10.34	-1.09	3.00	9.96	-1.30	11.90	10.60
5320	0.03	-0.92	3.00	9.96	-1.80	12.07	10.27	-1.04	3.00	9.96	-1.30	11.95	10.65
5500	0.03	0.61	3.03	9.96	-1.80	13.63	11.83	0.59	3.03	9.96	-1.30	13.61	12.31
5580	0.03	0.79	3.04	9.96	-1.80	13.82	12.02	0.72	3.04	9.96	-1.30	13.75	12.45
5700	0.03	1.07	3.07	9.97	-1.80	14.14	12.34	1.03	3.07	9.97	-1.30	14.10	12.80
5745	0.03	1.26	3.07	9.97	-1.80	14.33	12.53	0.75	3.07	9.97	-1.30	13.82	12.52
5785	0.03	1.22	3.08	9.97	-1.80	14.30	12.50	0.60	3.08	9.97	-1.30	13.68	12.38
5825	0.03	1.36	3.09	9.97	-1.80	14.45	12.65	0.80	3.09	9.97	-1.30	13.89	12.59

Sample Calculation:

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

Although the EUT operates on Master mode, more stringent limit for Client device was applied. (W52 for FCC)

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room		
Report No.	11143372S-B-R1		
Date	February 2, 2016	February 3, 2016	February 5, 2016
Temperature / Humidity	24 deg. C / 47 % RH	25 deg. C / 31 % RH	26 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Hiroyuki Morikawa
Mode	Tx 11n-40		

Antenna 0

Applied limit: 15.407, mobile and portable client device

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				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
								[MHz]	[dBm]	[dB]	[dB]	[dBi]	[MHz]	[dBm]	[mW]
5190	-2.31	2.98	9.97	0.04	-1.8	-	37.281	10.68	11.69	23.97	13.29	8.88	7.73	29.97	21.09
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5230	-0.62	2.99	9.97	0.04	-1.8	-	37.337	12.38	17.30	23.97	11.59	10.58	11.43	29.97	19.39
5270	-1.07	2.99	9.96	0.04	-1.8	49.692	37.263	11.92	15.56	23.97	12.05	10.12	10.28	29.97	19.85
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5310	-2.22	3.00	9.96	0.04	-1.8	46.885	37.251	10.78	11.97	23.97	13.19	8.98	7.91	29.97	20.99
5510	-1.63	3.03	9.96	0.04	-1.8	49.309	37.229	11.40	13.80	23.97	12.57	9.60	9.12	29.97	20.37
5550	-1.50	3.04	9.96	0.04	-1.8	50.223	37.411	11.54	14.26	23.97	12.43	9.74	9.42	29.97	20.23
5670	-1.59	3.06	9.97	0.04	-1.8	53.212	37.528	11.48	14.06	23.97	12.49	9.68	9.29	29.97	20.29
5755	-1.38	3.08	9.97	0.04	-1.8	-	-	11.71	14.83	30.00	18.29	9.91	9.79	36.00	26.09
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5795	-1.47	3.08	9.97	0.04	-1.8	-	-	11.62	14.52	30.00	18.38	9.82	9.59	36.00	26.18

Sample Calculation:

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

Although the EUT operates on Master mode, more stringent limit for Client device was applied. (W52 for FCC)

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Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room		
Report No.	11143372S-B-R1		
Date	February 2, 2016	February 3, 2016	February 5, 2016
Temperature / Humidity	24 deg. C / 47 % RH	25 deg. C / 31 % RH	26 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Hiroyuki Morikawa
Mode	Tx 11n-40 (MIMO)		

Antenna 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			0 [mW]	1 [mW]	Sum [mW]				0 [mW]	1 [mW]	Sum [mW]			
5190	-	37.067	11.91	12.94	24.85	13.95	23.97	10.02	7.87	9.59	17.46	12.42	29.97	17.55
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5240	-	37.051	17.42	15.85	33.27	15.22	23.97	8.75	11.51	11.75	23.26	13.67	29.97	16.30
5270	45.397	37.003	16.44	15.38	31.83	15.03	23.97	8.94	10.86	11.40	22.27	13.48	29.97	16.49
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5310	47.811	37.141	13.03	12.68	25.71	14.10	23.97	9.87	8.61	9.40	18.01	12.55	29.97	17.42
5510	45.867	37.073	14.03	12.91	26.94	14.30	23.97	9.67	9.27	9.57	18.84	12.75	29.97	17.22
5550	45.779	37.027	14.35	13.30	27.66	14.42	23.97	9.55	9.48	9.86	19.35	12.87	29.97	17.10
5670	45.739	37.009	14.29	13.93	28.22	14.51	23.97	9.46	9.44	10.33	19.77	12.96	29.97	17.01
5755	-	-	15.52	13.46	28.98	14.62	30.00	15.38	10.26	9.98	20.23	13.06	36.00	22.94
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5795	-	-	14.52	12.27	26.80	14.28	30.00	15.72	9.59	9.10	18.69	12.72	36.00	23.28

		Antenna 0						Antenna 1					
Tested Frequency	Duty Factor	Power Meter Reading	Cable Loss	Atten. Loss	Antenna Gain	Result		Power Meter Reading	Cable Loss	Atten. Loss	Antenna Gain	Result	
[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	Cond. Power	e.i.r.p.	[dBm]	[dB]	[dB]	[dBi]	Cond. Power	e.i.r.p.
						[dBm]	[dBm]					[dBm]	[dBm]
5190	0.06	-2.25	2.98	9.97	-1.80	10.76	8.96	-1.89	2.98	9.97	-1.30	11.12	9.82
-	-	-	-	-	-	-	-	-	-	-	-	-	-
5240	0.06	-0.61	2.99	9.97	-1.80	12.41	10.61	-1.02	2.99	9.97	-1.30	12.00	10.70
5270	0.06	-0.85	2.99	9.96	-1.80	12.16	10.36	-1.14	2.99	9.96	-1.30	11.87	10.57
-	-	-	-	-	-	-	-	-	-	-	-	-	-
5310	0.06	-1.87	3.00	9.96	-1.80	11.15	9.35	-1.99	3.00	9.96	-1.30	11.03	9.73
5510	0.06	-1.58	3.03	9.96	-1.80	11.47	9.67	-1.94	3.03	9.96	-1.30	11.11	9.81
5550	0.06	-1.49	3.04	9.96	-1.80	11.57	9.77	-1.82	3.04	9.96	-1.30	11.24	9.94
5670	0.06	-1.54	3.06	9.97	-1.80	11.55	9.75	-1.65	3.06	9.97	-1.30	11.44	10.14
5755	0.06	-1.20	3.08	9.97	-1.80	11.91	10.11	-1.82	3.08	9.97	-1.30	11.29	9.99
-	-	-	-	-	-	-	-	-	-	-	-	-	-
5795	0.06	-1.49	3.08	9.97	-1.80	11.62	9.82	-2.22	3.08	9.97	-1.30	10.89	9.59

Sample Calculation:

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

Although the EUT operates on Master mode, more stringent limit for Client device was applied. (W52 for FCC)

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Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1
Date	February 2, 2016
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11a

Antenna 0, 5500 MHz

Mode	Rate Mbps	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11a	6	1.91	0.02	1.93	
	9	1.86	0.02	1.88	
	12	1.80	0.03	1.83	
	18	1.83	0.05	1.88	
	24	1.77	0.07	1.84	
	36	1.81	0.09	1.90	
	48	1.76	0.13	1.89	
	54	0.92	0.15	1.07	

Antenna 1, 5500 MHz

Mode	Rate Mbps	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11a	6	2.10	0.02	2.12	*
	9	2.05	0.02	2.07	
	12	2.06	0.03	2.09	
	18	1.99	0.05	2.04	
	24	1.94	0.07	2.01	
	36	1.92	0.09	2.01	
	48	1.88	0.13	2.01	
	54	1.03	0.15	1.18	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1
Date	February 2, 2016
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11n-20

Antenna 0, 5500 MHz

Mode	MCS Number	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-20	0	0.73	0.02	0.75	
	1	0.67	0.04	0.71	
	2	0.54	0.05	0.59	
	3	0.56	0.07	0.63	
	4	0.49	0.09	0.58	
	5	-0.35	0.14	-0.21	
	6	-2.12	0.15	-1.97	
	7	-4.15	0.17	-3.98	

Antenna 1, 5500 MHz

Mode	MCS Number	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-20	0	0.77	0.02	0.79	*
	1	0.70	0.04	0.74	
	2	0.72	0.05	0.77	
	3	0.67	0.07	0.74	
	4	0.58	0.09	0.67	
	5	-0.49	0.14	-0.35	
	6	-2.99	0.15	-2.84	
	7	-4.62	0.17	-4.45	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1
Date	February 2, 2016
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11n-20 (MIMO)

5500 MHz

Mode	MCS Number	Reading (timed average)						Duty factor	Burst power			Remarks
		Antenna							Antenna			
		0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]		0 [dBm]	1 [dBm]	0+1 [dBm]	
11n-20	8	0.61	0.56	1.15	1.14	2.29	3.60	0.03	-	-	3.63	*
	9	0.55	0.51	1.14	1.12	2.26	3.54	0.07	-	-	3.61	
	10	0.48	0.37	1.12	1.09	2.21	3.44	0.10	-	-	3.54	
	11	0.47	0.40	1.11	1.10	2.21	3.45	0.14	-	-	3.59	
	12	0.42	0.35	1.10	1.08	2.19	3.40	0.20	-	-	3.60	
	13	-0.34	-0.79	0.92	0.83	1.76	2.45	0.24	-	-	2.69	
	14	-2.13	-3.06	0.61	0.49	1.11	0.44	0.27	-	-	0.71	
	15	-4.10	-4.73	0.39	0.34	0.73	-1.39	0.29	-	-	-1.10	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1
Date	February 2, 2016
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11n-40

Antenna 0, 5510 MHz

Mode	MCS Number	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-40	0	-1.63	0.04	-1.59	*
	1	-1.68	0.07	-1.61	
	2	-1.73	0.10	-1.63	
	3	-1.77	0.12	-1.65	
	4	-1.89	0.19	-1.70	
	5	-1.85	0.23	-1.62	
	6	-2.82	0.27	-2.55	
	7	-4.65	0.29	-4.36	

Antenna 1, 5510 MHz

Mode	MCS Number	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-40	0	-1.90	0.04	-1.86	
	1	-2.06	0.07	-1.99	
	2	-2.10	0.10	-2.00	
	3	-2.14	0.12	-2.02	
	4	-2.09	0.19	-1.90	
	5	-2.18	0.23	-1.95	
	6	-3.09	0.27	-2.82	
	7	-5.01	0.29	-4.72	

* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1
Date	February 2, 2016
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11n-40 (MIMO)

5510 MHz

Mode	MCS Number	Reading (timed average)						Duty factor	Burst power			Remarks
		Antenna							Antenna			
		0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]		0 [dBm]	1 [dBm]	0+1 [dBm]	
11n-40	8	-1.58	-1.94	0.70	0.64	1.33	1.25	0.06	-	-	1.31	*
	9	-1.72	-2.12	0.67	0.61	1.29	1.09	0.14	-	-	1.23	
	10	-1.76	-2.18	0.67	0.61	1.27	1.05	0.19	-	-	1.24	
	11	-1.86	-2.27	0.65	0.59	1.24	0.95	0.23	-	-	1.18	
	12	-1.88	-2.33	0.65	0.58	1.23	0.91	0.32	-	-	1.23	
	13	-1.99	-2.42	0.63	0.57	1.21	0.81	0.39	-	-	1.20	
	14	-2.92	-3.47	0.51	0.45	0.96	-0.18	0.39	-	-	0.21	
	15	-4.68	-5.18	0.34	0.30	0.64	-1.91	0.44	-	-	-1.47	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

Average Output Power
(Reference data for SAR Testing)

Test place	Shonan EMC Lab. No.1 Measurement Room		
Report No.	11143372S-B-R1		
Date	February 2, 2016	February 3, 2016	February 5, 2016
Temperature / Humidity	24 deg. C / 47 % RH	25 deg. C / 31 % RH	26 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Hiroyuki Morikawa
Mode	Tx 11a		

Antenna 1

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)	
				[dBm]	[mW]
5180	0.18	2.98	9.97	13.13	20.56
5220	0.30	2.99	9.97	13.26	21.18
5240	0.20	2.99	9.97	13.16	20.70
5260	0.20	2.99	9.96	13.15	20.65
5300	0.38	3.00	9.96	13.34	21.58
5320	0.19	3.00	9.96	13.15	20.65
5500	2.12	3.03	9.96	15.11	32.43
5580	2.42	3.04	9.96	15.42	34.83
5700	2.47	3.07	9.97	15.51	35.56
5745	2.03	3.07	9.97	15.07	32.14
5785	1.87	3.08	9.97	14.92	31.05
5825	1.99	3.09	9.97	15.05	31.99

Sample Calculation:

Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Average Output Power
(Reference data for SAR Testing)

Test place	Shonan EMC Lab. No.1 Measurement Room		
Report No.	11143372S-B-R1		
Date	February 2, 2016	February 3, 2016	February 5, 2016
Temperature / Humidity	24 deg. C / 47 % RH	25 deg. C / 31 % RH	26 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Hiroyuki Morikawa
Mode	Tx 11n-20		

Antenna 1

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)	
				[dBm]	[mW]
5180	-0.88	2.98	9.97	12.07	16.11
5220	-1.05	2.99	9.97	11.91	15.52
5240	-1.01	2.99	9.97	11.95	15.67
5260	-1.04	2.99	9.96	11.91	15.52
5300	-0.99	3.00	9.96	11.97	15.74
5320	-1.03	3.00	9.96	11.93	15.60
5500	0.77	3.03	9.96	13.76	23.77
5580	1.11	3.04	9.96	14.11	25.76
5700	1.06	3.07	9.97	14.10	25.70
5745	0.60	3.07	9.97	13.64	23.12
5785	0.33	3.08	9.97	13.38	21.78
5825	0.51	3.09	9.97	13.57	22.75

Sample Calculation:

Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Average Output Power
(Reference data for SAR Testing)

Test place	Shonan EMC Lab. No.1 Measurement Room		
Report No.	11143372S-B-R1		
Date	February 2, 2016	February 3, 2016	February 5, 2016
Temperature / Humidity	24 deg. C / 47 % RH	25 deg. C / 31 % RH	26 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Hiroyuki Morikawa
Mode	Tx 11n-20 (MIMO)		

Tested Frequency [MHz]	Antenna 0				Antenna 1				Antenna 0+1			
	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average) [dBm]	Result (Timed average)			
									Antenna 0	Antenna 1	Sum 0+1	
5180	-1.44	2.98	9.97	11.51	-1.02	2.98	9.97	11.93	14.16	15.60	29.75	14.74
5220	-1.03	2.99	9.97	11.93	-1.12	2.99	9.97	11.84	15.60	15.28	30.87	14.90
5240	-0.59	2.99	9.97	12.37	-1.07	2.99	9.97	11.89	17.26	15.45	32.71	15.15
5260	-0.72	2.99	9.96	12.23	-1.07	2.99	9.96	11.88	16.71	15.42	32.13	15.07
5300	-0.85	3.00	9.96	12.11	-1.09	3.00	9.96	11.87	16.26	15.38	31.64	15.00
5320	-0.92	3.00	9.96	12.04	-1.04	3.00	9.96	11.92	16.00	15.56	31.56	14.99
5500	0.61	3.03	9.96	13.60	0.59	3.03	9.96	13.58	22.91	22.80	45.71	16.60
5580	0.79	3.04	9.96	13.79	0.72	3.04	9.96	13.72	23.93	23.55	47.48	16.77
5700	1.07	3.07	9.97	14.11	1.03	3.07	9.97	14.07	25.76	25.53	51.29	17.10
5745	1.26	3.07	9.97	14.30	0.75	3.07	9.97	13.79	26.92	23.93	50.85	17.06
5785	1.22	3.08	9.97	14.27	0.60	3.08	9.97	13.65	26.73	23.17	49.90	16.98
5825	1.36	3.09	9.97	14.42	0.80	3.09	9.97	13.86	27.67	24.32	51.99	17.16

Sample Calculation:

Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Average Output Power
(Reference data for SAR Testing)

Test place	Shonan EMC Lab. No.1 Measurement Room		
Report No.	11143372S-B-R1		
Date	February 2, 2016	February 3, 2016	February 5, 2016
Temperature / Humidity	24 deg. C / 47 % RH	25 deg. C / 31 % RH	26 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Hiroyuki Morikawa
Mode	Tx 11n-40		

Antenna 0

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)	
				[dBm]	[mW]
5190	-2.31	2.98	9.97	10.64	11.59
-	-	-	-	-	-
5230	-0.62	2.99	9.97	12.34	17.14
5270	-1.07	2.99	9.96	11.88	15.42
-	-	-	-	-	-
5310	-2.22	3.00	9.96	10.74	11.86
5510	-1.63	3.03	9.96	11.36	13.68
5550	-1.50	3.04	9.96	11.50	14.13
5670	-1.59	3.06	9.97	11.44	13.93
5755	-1.38	3.08	9.97	11.67	14.69
-	-	-	-	-	-
5795	-1.47	3.08	9.97	11.58	14.39

Sample Calculation:

Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Average Output Power (Reference data for SAR Testing)

Test place	Shonan EMC Lab. No.1 Measurement Room		
Report No.	11143372S-B-R1		
Date	February 2, 2016	February 3, 2016	February 5, 2016
Temperature / Humidity	24 deg. C / 47 % RH	25 deg. C / 31 % RH	26 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Hiroyuki Morikawa
Mode	Tx 11n-40 (MIMO)		

Tested Frequency [MHz]	Antenna 0				Antenna 1				Antenna 0+1			
	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average) [dBm]	Result (Timed average)			
									Antenna 0	Antenna 1	Sum 0+1	
5190	-2.25	2.98	9.97	10.70	-1.89	2.98	9.97	11.06	11.75	12.76	24.51	13.89
-	-	-	-	-	-	-	-	-	-	-	-	-
5230	-0.61	2.99	9.97	12.35	-1.02	2.99	9.97	11.94	17.18	15.63	32.81	15.16
5270	-0.85	2.99	9.96	12.10	-1.14	2.99	9.96	11.81	16.22	15.17	31.39	14.97
-	-	-	-	-	-	-	-	-	-	-	-	-
5310	-1.87	3.00	9.96	11.09	-1.99	3.00	9.96	10.97	12.85	12.50	25.36	14.04
5510	-1.58	3.03	9.96	11.41	-1.94	3.03	9.96	11.05	13.84	12.74	26.57	14.24
5550	-1.49	3.04	9.96	11.51	-1.82	3.04	9.96	11.18	14.16	13.12	27.28	14.36
5670	-1.54	3.06	9.97	11.49	-1.65	3.06	9.97	11.38	14.09	13.74	27.83	14.45
5755	-1.20	3.08	9.97	11.85	-1.82	3.08	9.97	11.23	15.31	13.27	28.58	14.56
-	-	-	-	-	-	-	-	-	-	-	-	-
5795	-1.49	3.08	9.97	11.56	-2.22	3.08	9.97	10.83	14.32	12.11	26.43	14.22

Sample Calculation:

Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

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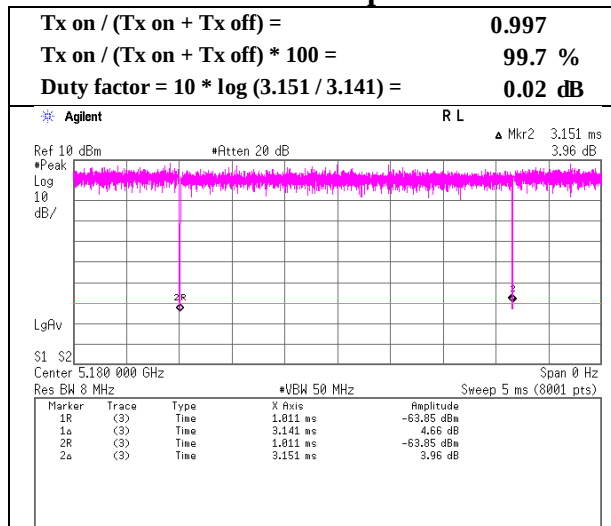
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

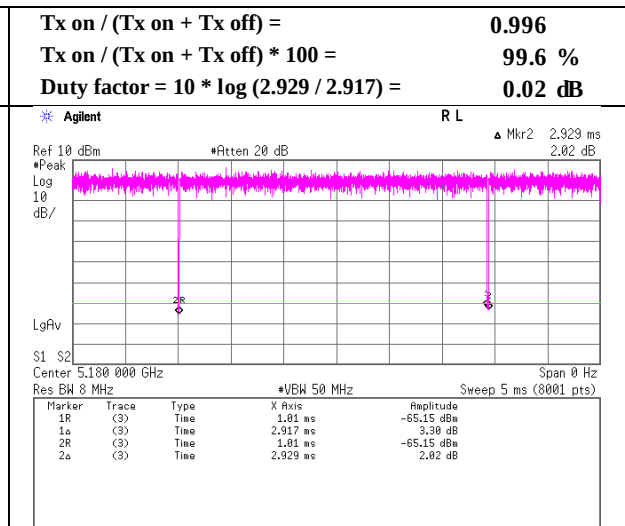
Burst rate confirmation

Test place Shonan EMC Lab. No.1 Measurement Room
Report No. 11143372S-B-R1
Date February 2, 2016
Temperature / Humidity 24 deg. C / 47 % RH
Engineer Hiroyuki Morikawa
Mode Tx

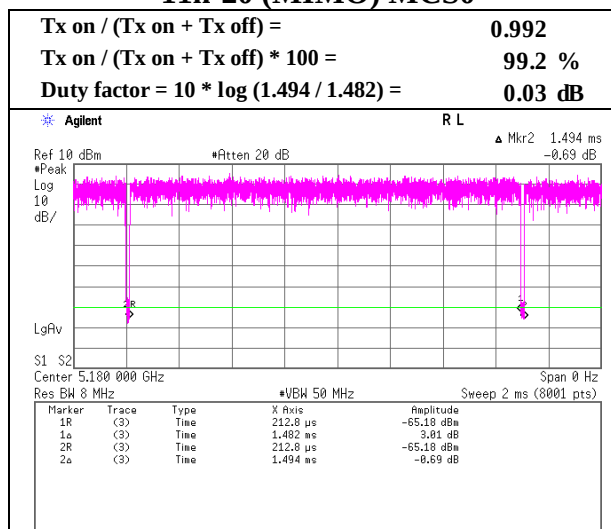
11a 6 Mbps



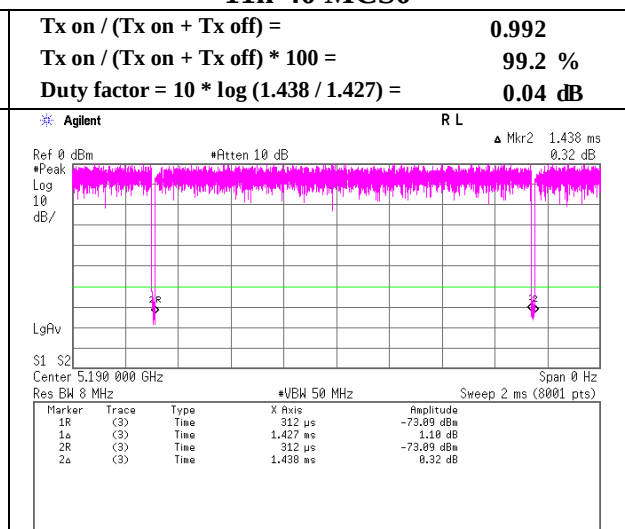
11n-20 MCS0



11n-20 (MIMO) MCS0



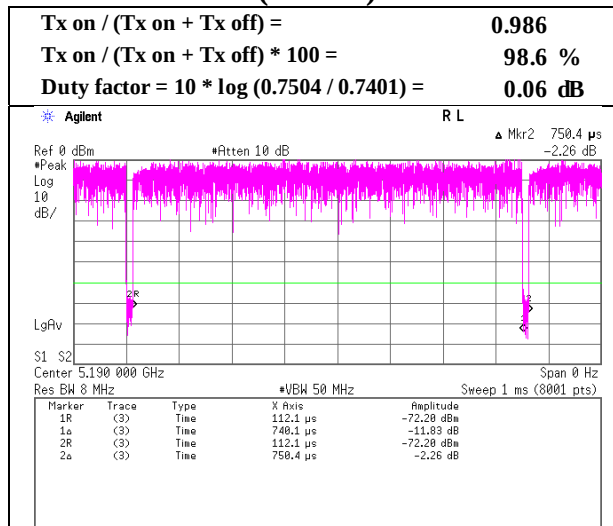
11n-40 MCS0



Burst rate confirmation

Test place Shonan EMC Lab. No.1 Measurement Room
Report No. 11143372S-B-R1
Date February 2, 2016
Temperature / Humidity 24 deg. C / 47 % RH
Engineer Hiroyuki Morikawa
Mode Tx

11n-40 (MIMO) MCS 0



Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx 11a		

Antenna 1

Applied limit: 15.407, mobile and portable client device

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)			PSD (e.i.r.p.)		
							Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5180	-10.45	2.98	9.97	0.02	-1.3	0.00	2.52	11.00	8.48	1.22	17.00	15.78
5220	-10.61	2.99	9.97	0.02	-1.3	0.00	2.37	11.00	8.63	1.07	17.00	15.93
5240	-10.44	2.99	9.97	0.02	-1.3	0.00	2.54	11.00	8.46	1.24	17.00	15.76
5260	-10.22	2.99	9.96	0.02	-1.3	0.00	2.75	11.00	8.25	1.45	17.00	15.55
5300	-10.08	3.00	9.96	0.02	-1.3	0.00	2.90	11.00	8.10	1.60	17.00	15.40
5320	-10.21	3.00	9.96	0.02	-1.3	0.00	2.78	11.00	8.23	1.48	17.00	15.53
5500	-8.75	3.03	9.96	0.02	-1.3	0.00	4.26	11.00	6.74	2.96	17.00	14.04
5580	-8.23	3.04	9.96	0.02	-1.3	0.00	4.79	11.00	6.21	3.49	17.00	13.51
5700	-7.93	3.07	9.97	0.02	-1.3	0.00	5.13	11.00	5.87	3.83	17.00	13.17
5745	-16.81	3.07	9.97	0.02	-1.3	6.99	3.24	30.00	26.76	1.94	36.00	34.06
5785	-16.73	3.08	9.97	0.02	-1.3	6.99	3.33	30.00	26.67	2.03	36.00	33.97
5825	-16.36	3.09	9.97	0.02	-1.3	6.99	3.71	30.00	26.29	2.41	36.00	33.59

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 * \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

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

Although the EUT operates on Master mode, more stringent limit for Client device was applied. (W52 for FCC)

Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx 11n-20		

Antenna 1

Applied limit: 15.407, mobile and portable client device

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)			PSD (e.i.r.p.)		
							Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5180	-12.08	2.98	9.97	0.02	-1.3	0.00	0.89	11.00	10.11	-0.41	17.00	17.41
5220	-12.16	2.99	9.97	0.02	-1.3	0.00	0.82	11.00	10.18	-0.48	17.00	17.48
5240	-11.50	2.99	9.97	0.02	-1.3	0.00	1.48	11.00	9.52	0.18	17.00	16.82
5260	-11.64	2.99	9.96	0.02	-1.3	0.00	1.33	11.00	9.67	0.03	17.00	16.97
5300	-11.79	3.00	9.96	0.02	-1.3	0.00	1.19	11.00	9.81	-0.11	17.00	17.11
5320	-12.06	3.00	9.96	0.02	-1.3	0.00	0.92	11.00	10.08	-0.38	17.00	17.38
5500	-10.05	3.03	9.96	0.02	-1.3	0.00	2.97	11.00	8.04	1.67	17.00	15.34
5580	-9.67	3.04	9.96	0.02	-1.3	0.00	3.35	11.00	7.65	2.05	17.00	14.95
5700	-9.62	3.07	9.97	0.02	-1.3	0.00	3.44	11.00	7.56	2.14	17.00	14.86
5745	-18.48	3.07	9.97	0.02	-1.3	6.99	1.57	30.00	28.43	0.27	36.00	35.73
5785	-18.32	3.08	9.97	0.02	-1.3	6.99	1.74	30.00	28.26	0.44	36.00	35.56
5825	-17.95	3.09	9.97	0.02	-1.3	6.99	2.12	30.00	27.88	0.82	36.00	35.18

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 * \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

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

Although the EUT operates on Master mode, more stringent limit for Client device was applied. (W52 for FCC)

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Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx 11n-20 (MIMO)		

Antenna 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna			Result	Limit	Margin	Antenna			Result	Limit	Margin
	1	2	Sum				1	2	Sum			
	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]
5180	1.06	0.86	1.93	2.85	11.00	8.15	0.70	0.64	1.34	1.28	17.00	15.72
5220	0.77	1.01	1.78	2.51	11.00	8.49	0.51	0.75	1.26	1.01	17.00	15.99
5240	0.69	1.13	1.82	2.60	11.00	8.40	0.46	0.84	1.29	1.11	17.00	15.89
5260	1.52	1.32	2.84	4.53	11.00	6.47	1.00	0.98	1.98	2.97	17.00	14.03
5300	1.36	1.36	2.72	4.35	11.00	6.65	0.90	1.00	1.91	2.80	17.00	14.20
5320	1.29	1.29	2.58	4.12	11.00	6.88	0.86	0.95	1.81	2.58	17.00	14.42
5500	2.14	1.89	4.04	6.06	11.00	4.94	1.42	1.40	2.82	4.50	17.00	12.50
5580	2.03	2.05	4.08	6.11	11.00	4.89	1.34	1.52	2.86	4.56	17.00	12.44
5700	2.17	1.91	4.07	6.10	11.00	4.90	1.43	1.41	2.84	4.54	17.00	12.46
5745	2.17	1.42	3.59	5.55	30.00	24.45	1.43	1.05	2.49	3.96	36.00	32.04
5785	1.64	1.40	3.04	4.82	30.00	25.18	1.08	1.04	2.12	3.26	36.00	32.74
5825	1.50	1.53	3.02	4.81	30.00	25.19	0.99	1.13	2.12	3.27	36.00	32.73

Antenna 0								Antenna 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	PSD Reading	Cable Loss	Atten. Loss
[MHz]	[dB]	[dB]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]	[dB]	[dB]
5180	0.03	0.00	-12.71	2.98	9.97	-1.80	0.27	-1.53	-13.61	2.98	9.97	-1.30	-0.63	-1.93	-1.93
5220	0.03	0.00	-14.11	2.99	9.97	-1.80	-1.12	-2.92	-12.94	2.99	9.97	-1.30	0.05	-1.25	-1.25
5240	0.03	0.00	-14.59	2.99	9.97	-1.80	-1.60	-3.40	-12.47	2.99	9.97	-1.30	0.52	-0.78	-0.78
5260	0.03	0.00	-11.17	2.99	9.96	-1.80	1.81	0.01	-11.78	2.99	9.96	-1.30	1.20	-0.10	-0.10
5300	0.03	0.00	-11.64	3.00	9.96	-1.80	1.35	-0.45	-11.67	3.00	9.96	-1.30	1.32	0.02	0.02
5320	0.03	0.00	-11.87	3.00	9.96	-1.80	1.12	-0.68	-11.89	3.00	9.96	-1.30	1.10	-0.20	-0.20
5500	0.03	0.00	-9.71	3.03	9.96	-1.80	3.31	1.51	-10.25	3.03	9.96	-1.30	2.77	1.47	1.47
5580	0.03	0.00	-9.96	3.04	9.96	-1.80	3.07	1.27	-9.91	3.04	9.96	-1.30	3.12	1.82	1.82
5700	0.03	0.00	-9.71	3.07	9.97	-1.80	3.36	1.56	-10.27	3.07	9.97	-1.30	2.80	1.50	1.50
5745	0.03	6.99	-16.70	3.07	9.97	-1.80	3.36	1.56	-18.53	3.07	9.97	-1.30	1.53	0.23	0.23
5785	0.03	6.99	-17.92	3.08	9.97	-1.80	2.15	0.35	-18.62	3.08	9.97	-1.30	1.45	0.15	0.15
5825	0.03	6.99	-18.33	3.09	9.97	-1.80	1.75	-0.05	-18.24	3.09	9.97	-1.30	1.84	0.54	0.54

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 \cdot \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

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

Although the EUT operates on Master mode, more stringent limit for Client device was applied. (W52 for FCC)

UL Japan, Inc.

Shonan EMC Lab.

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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx 11n-40		

Antenna 0

Applied limit: 15.407, mobile and portable client device

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)			PSD (e.i.r.p.)		
							Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5190	-16.32	2.98	9.97	0.04	-1.8	0.00	-3.33	11.00	14.33	-5.13	17.00	22.13
-	-	-	-	-	-	-	-	-	-	-	-	-
5230	-14.53	2.99	9.97	0.04	-1.8	0.00	-1.53	11.00	12.53	-3.33	17.00	20.33
5270	-14.94	2.99	9.96	0.04	-1.8	0.00	-1.95	11.00	12.95	-3.75	17.00	20.75
-	-	-	-	-	-	-	-	-	-	-	-	-
5310	-16.17	3.00	9.96	0.04	-1.8	0.00	-3.17	11.00	14.17	-4.97	17.00	21.97
5510	-15.57	3.03	9.96	0.04	-1.8	0.00	-2.54	11.00	13.54	-4.34	17.00	21.34
5550	-15.37	3.04	9.96	0.04	-1.8	0.00	-2.33	11.00	13.33	-4.13	17.00	21.13
5670	-15.84	3.06	9.97	0.04	-1.8	0.00	-2.77	11.00	13.77	-4.57	17.00	21.57
5755	-24.26	3.08	9.97	0.04	-1.8	6.99	-4.18	30.00	34.18	-5.98	36.00	41.98
-	-	-	-	-	-	-	-	-	-	-	-	-
5795	-22.77	3.08	9.97	0.04	-1.8	6.99	-2.69	30.00	32.69	-4.49	36.00	40.49

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 * \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

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

Although the EUT operates on Master mode, more stringent limit for Client device was applied. (W52 for FCC)

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Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1	Shonan EMC Lab. No.5	Shonan EMC Lab. No.1
	Measurement Room	Shielded Room	Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx 11n-40 (MIMO)		

Antenna 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna			Result	Limit	Margin	Antenna			Result	Limit	Margin
	1	2	Sum				1	2	Sum			
[mW/MHz]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]
5190	0.51	0.43	0.94	-0.25	11.00	11.25	0.34	0.32	0.66	-1.82	17.00	18.82
-	-	-	-	-	-	-	-	-	-	-	-	-
5230	0.67	0.45	1.12	0.50	11.00	10.50	0.44	0.33	0.78	-1.09	17.00	18.09
5270	0.69	0.59	1.28	1.06	11.00	9.94	0.46	0.43	0.89	-0.50	17.00	17.50
-	-	-	-	-	-	-	-	-	-	-	-	-
5310	0.52	0.55	1.07	0.30	11.00	10.70	0.35	0.40	0.75	-1.24	17.00	18.24
5510	0.61	0.56	1.17	0.68	11.00	10.32	0.40	0.41	0.82	-0.87	17.00	17.87
5550	0.68	0.49	1.16	0.66	11.00	10.34	0.45	0.36	0.81	-0.93	17.00	17.93
5670	0.64	0.55	1.19	0.77	11.00	10.23	0.42	0.41	0.83	-0.79	17.00	17.79
5755	1.04	0.39	1.43	1.55	30.00	28.45	0.69	0.29	0.98	-0.11	36.00	36.11
-	-	-	-	-	-	-	-	-	-	-	-	-
5795	0.88	0.36	1.24	0.93	30.00	29.07	0.58	0.27	0.85	-0.72	36.00	36.72

Tested Frequency [MHz]	Antenna 0							Antenna 1						
	Duty Factor	RBW Correction Factor	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result Cond.	PSD Result e.i.r.p.	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result Cond.	PSD Result e.i.r.p.
	[dB]	[dB]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]
5190	0.06	0.00	-15.91	2.98	9.97	-1.80	-2.90	-4.70	-16.67	2.98	9.97	-1.30	-3.66	-4.96
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5230	0.06	0.00	-14.75	2.99	9.97	-1.80	-1.73	-3.53	-16.48	2.99	9.97	-1.30	-3.46	-4.76
5270	0.06	0.00	-14.62	2.99	9.96	-1.80	-1.61	-3.41	-15.33	2.99	9.96	-1.30	-2.32	-3.62
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5310	0.06	0.00	-15.82	3.00	9.96	-1.80	-2.80	-4.60	-15.65	3.00	9.96	-1.30	-2.63	-3.93
5510	0.06	0.00	-15.18	3.03	9.96	-1.80	-2.13	-3.93	-15.59	3.03	9.96	-1.30	-2.54	-3.84
5550	0.06	0.00	-14.75	3.04	9.96	-1.80	-1.69	-3.49	-16.20	3.04	9.96	-1.30	-3.14	-4.44
5670	0.06	0.00	-15.02	3.06	9.97	-1.80	-1.93	-3.73	-15.66	3.06	9.97	-1.30	-2.57	-3.87
5755	0.06	6.99	-19.93	3.08	9.97	-1.80	0.17	-1.63	-24.20	3.08	9.97	-1.30	-4.10	-5.40
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5795	0.06	6.99	-20.65	3.08	9.97	-1.80	-0.55	-2.35	-24.55	3.08	9.97	-1.30	-4.45	-5.75

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 \cdot \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor

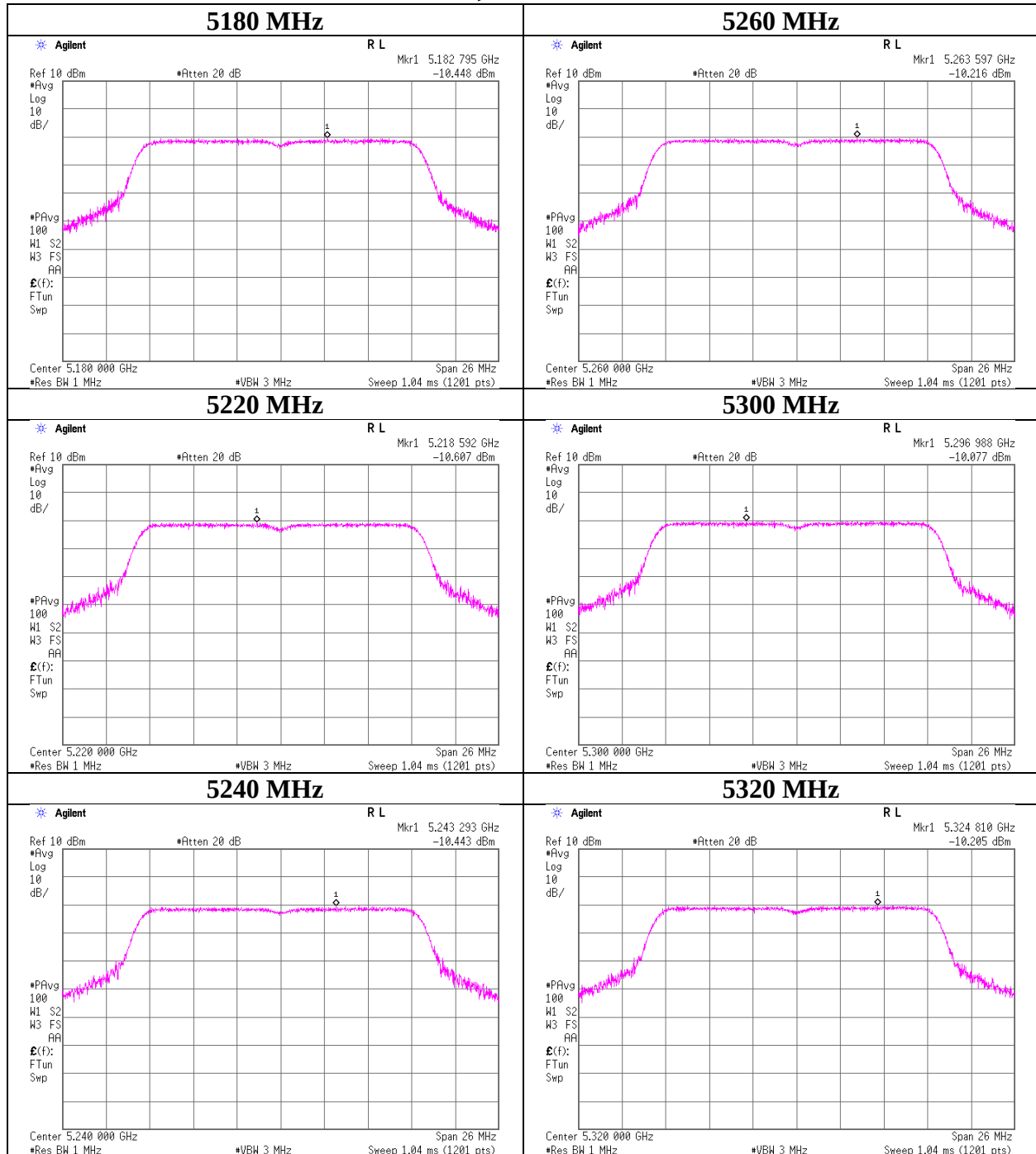
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Although the EUT operates on Master mode, more stringent limit for Client device was applied. (W52 for FCC)

Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

11a, Antenna 1



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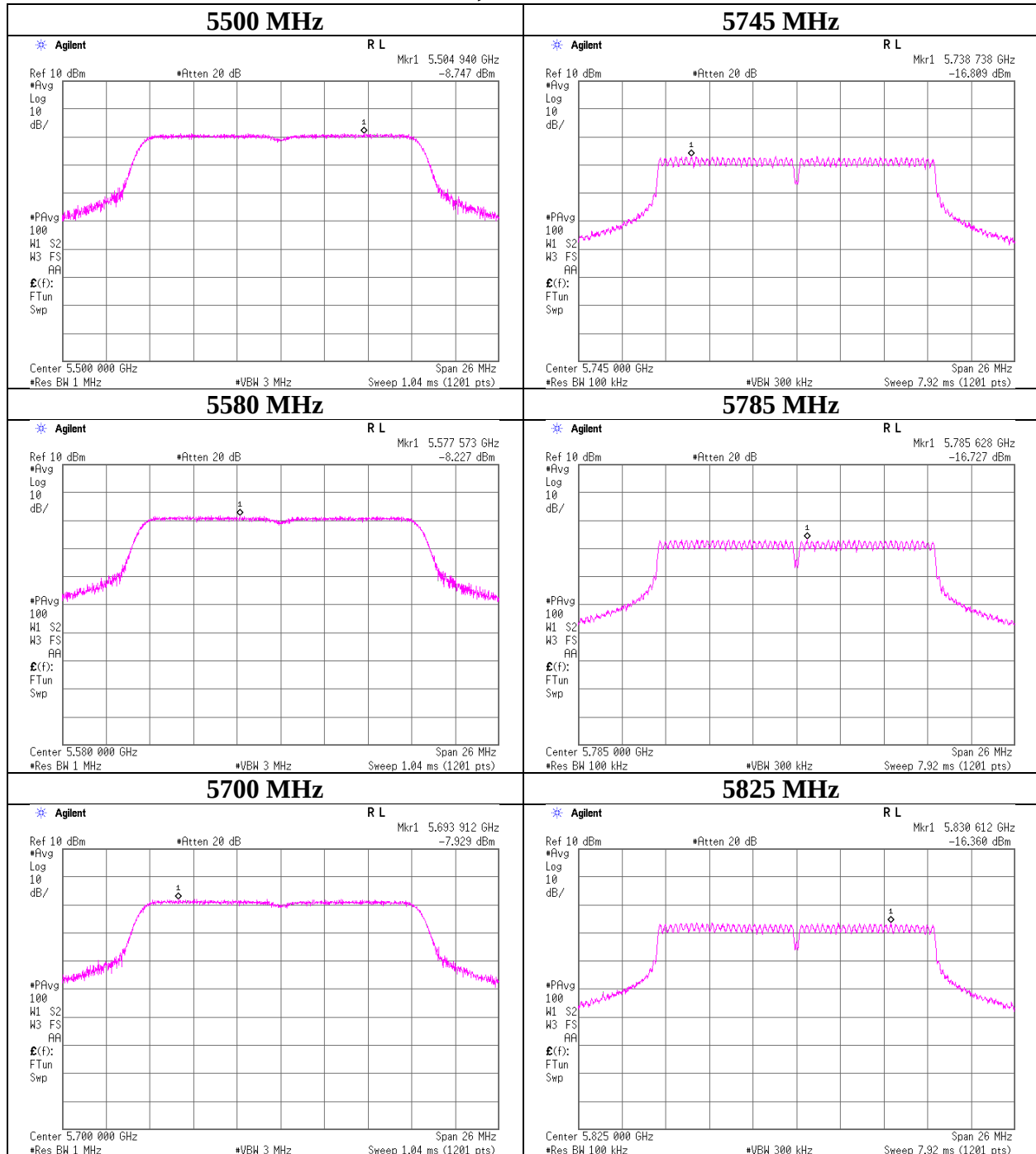
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

11a, Antenna 1



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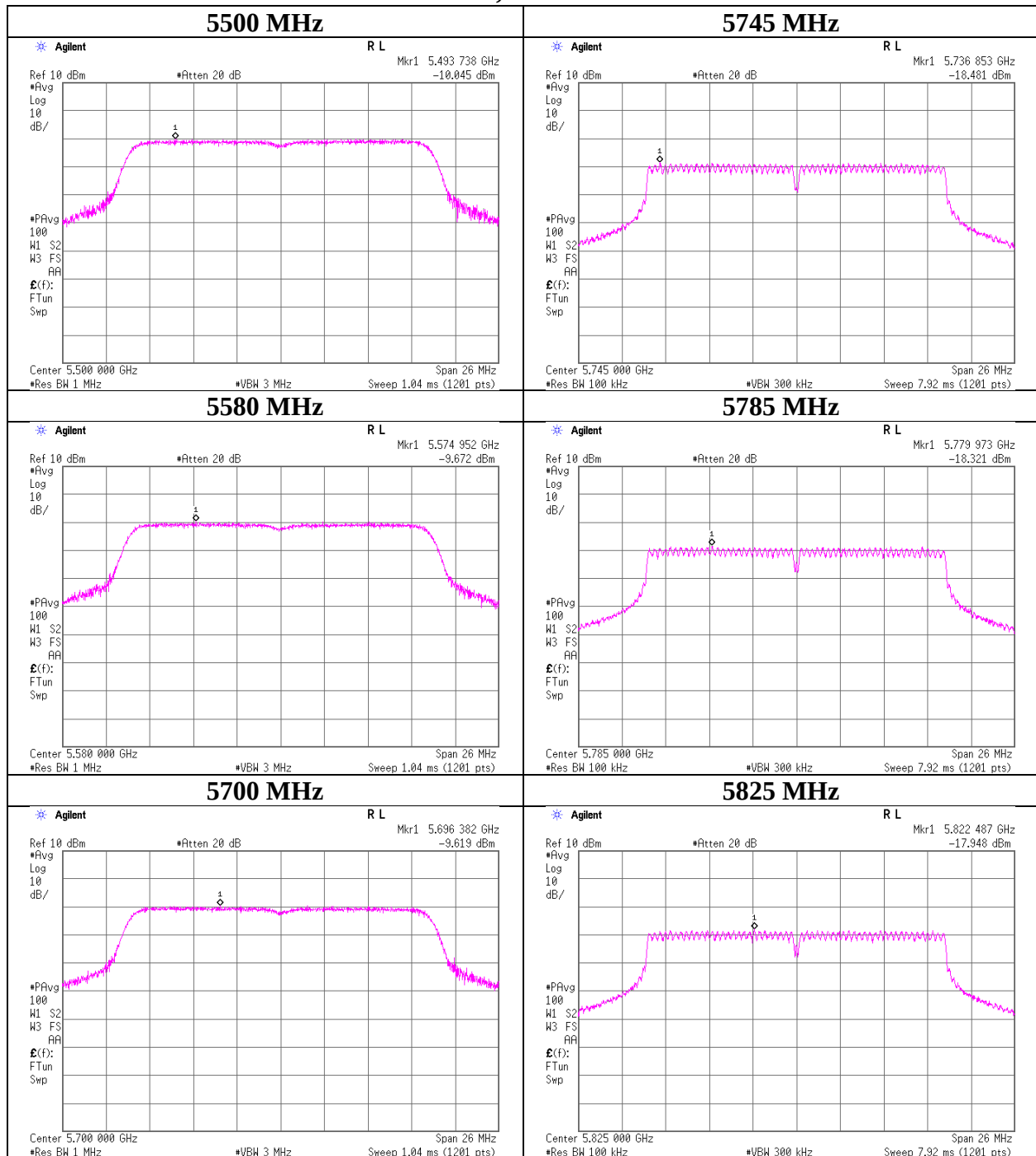
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

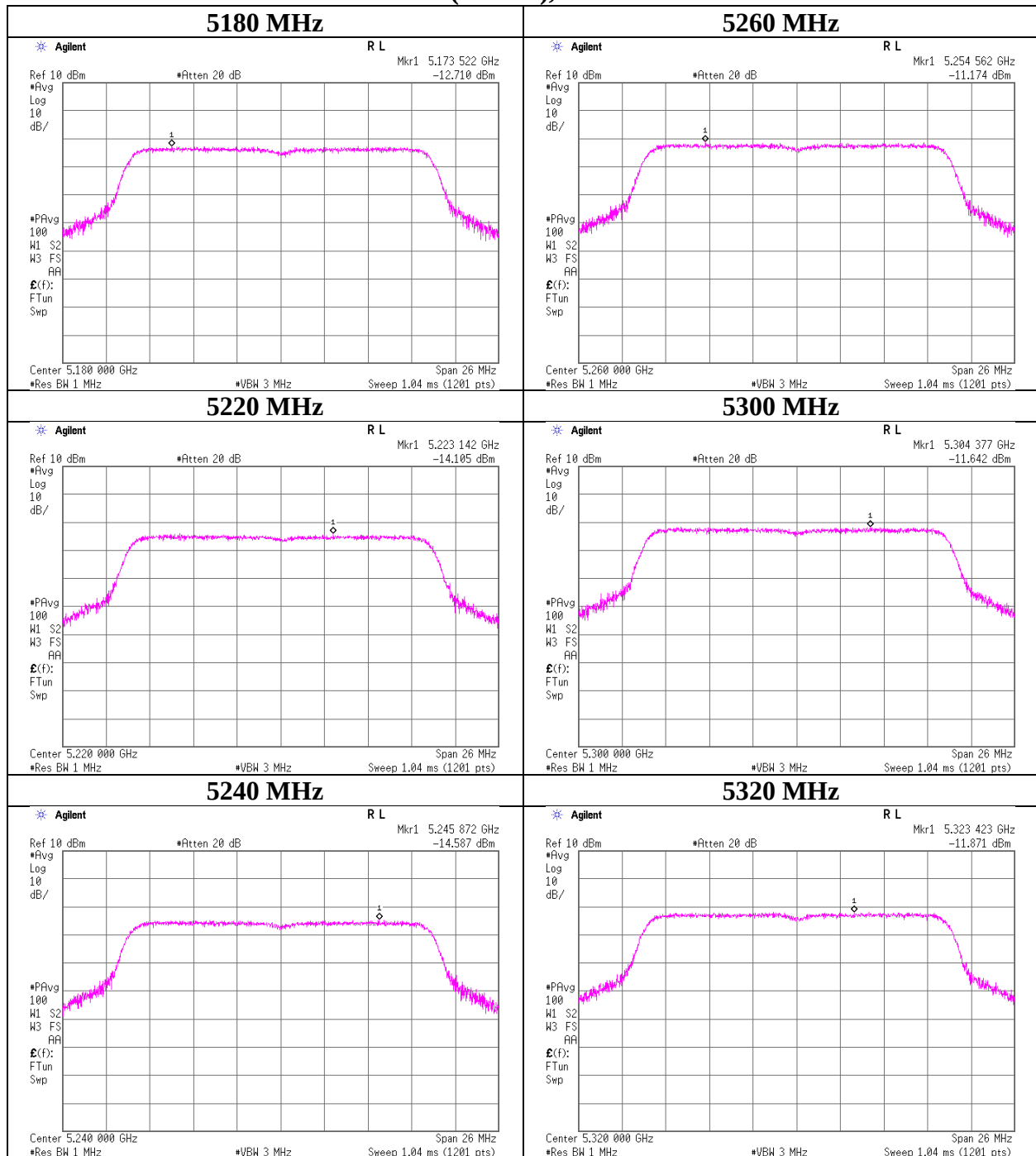
11n-20, Antenna 1



Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

11n-20 (MIMO), Antenna 0



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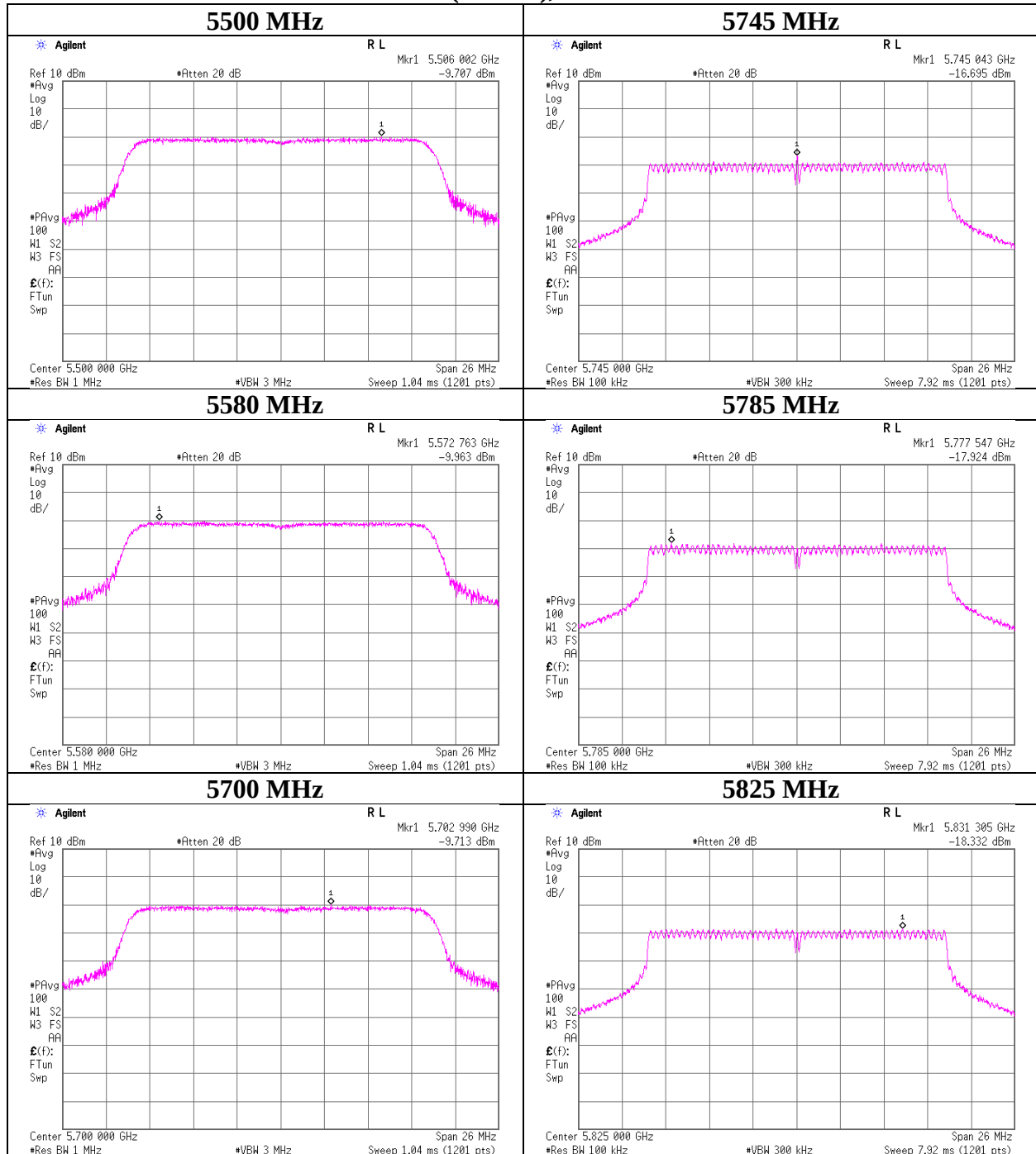
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

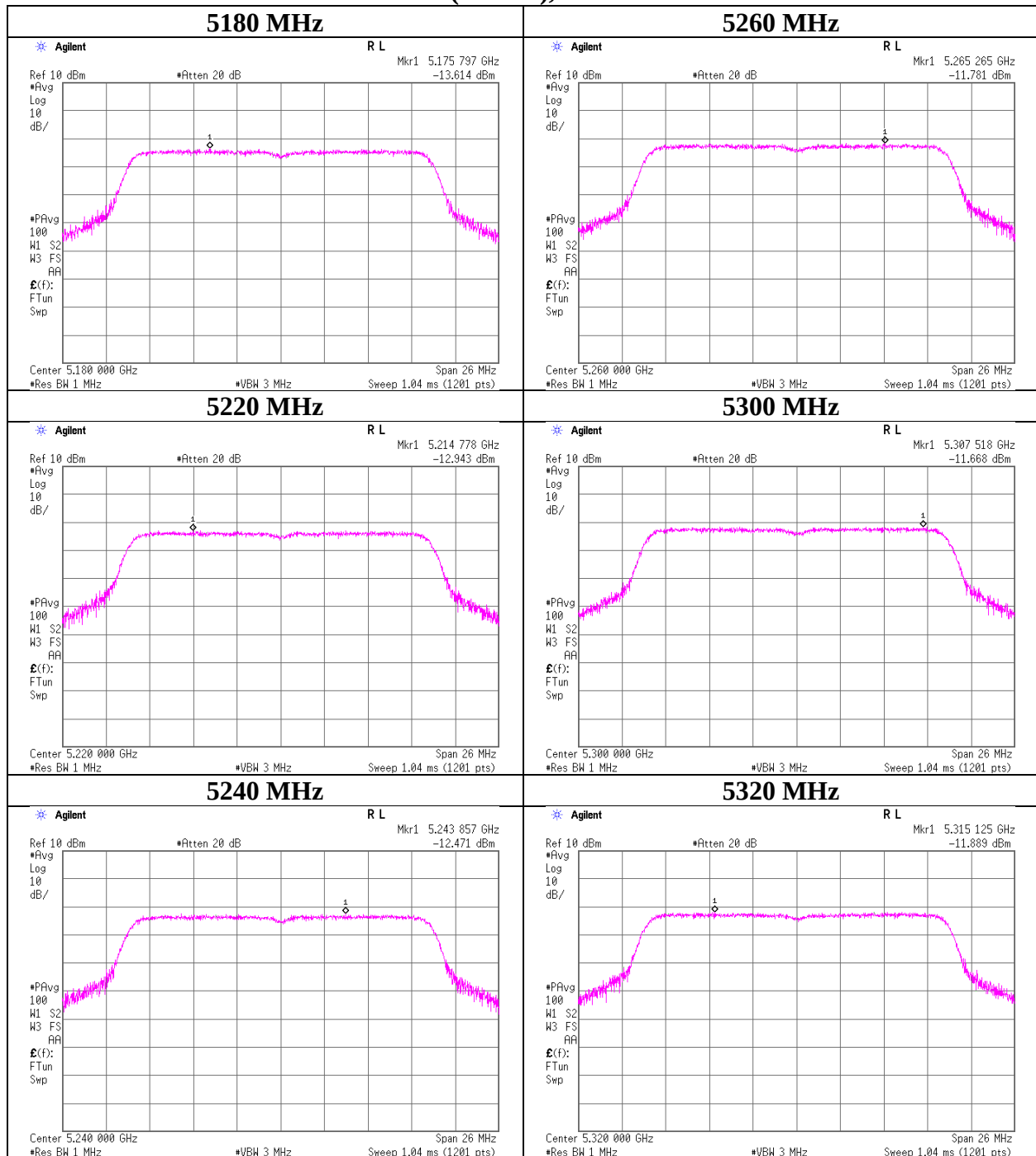
11n-20 (MIMO), Antenna 0



Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

11n-20 (MIMO), Antenna 1



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Shonan EMC Lab.

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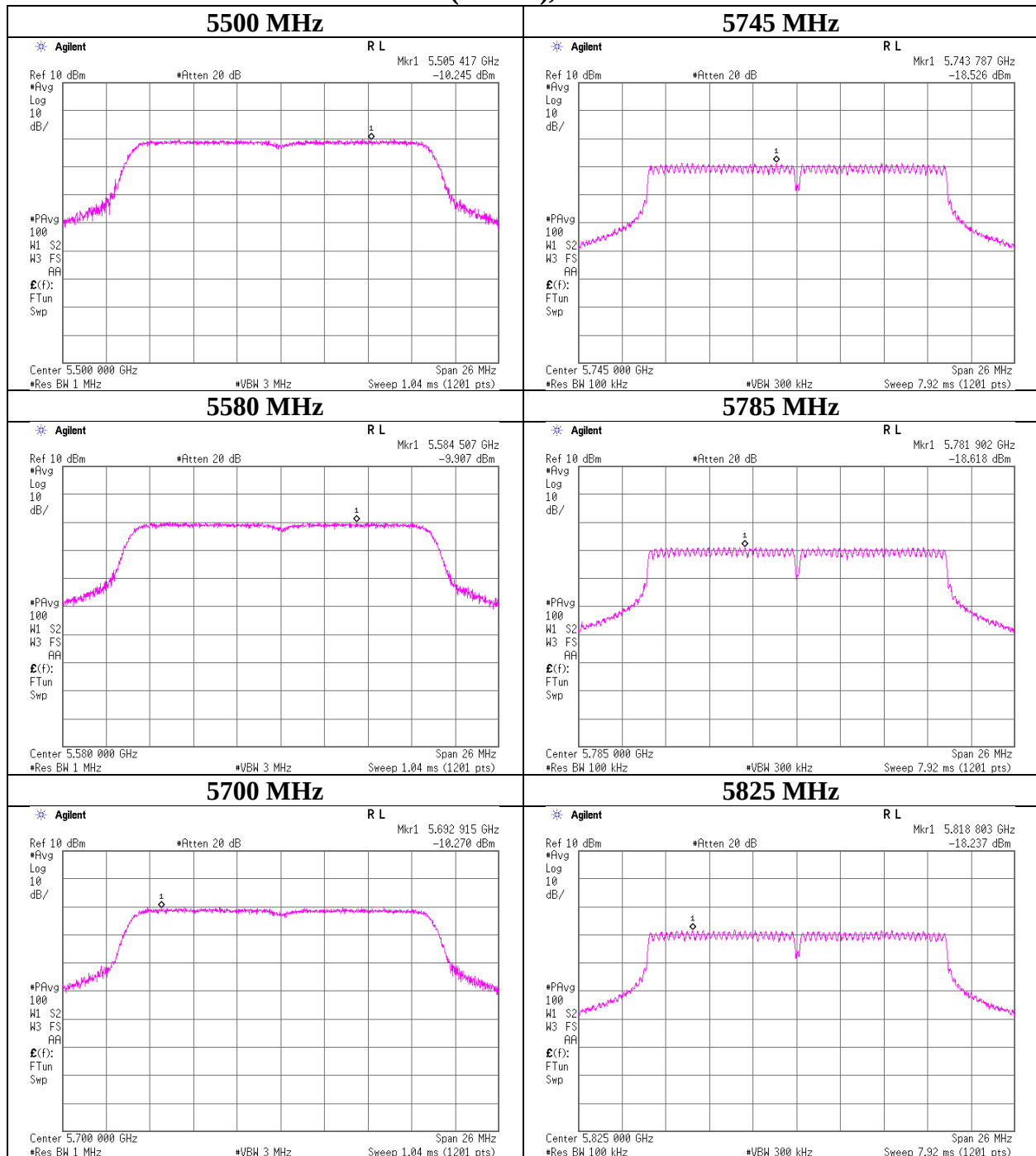
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

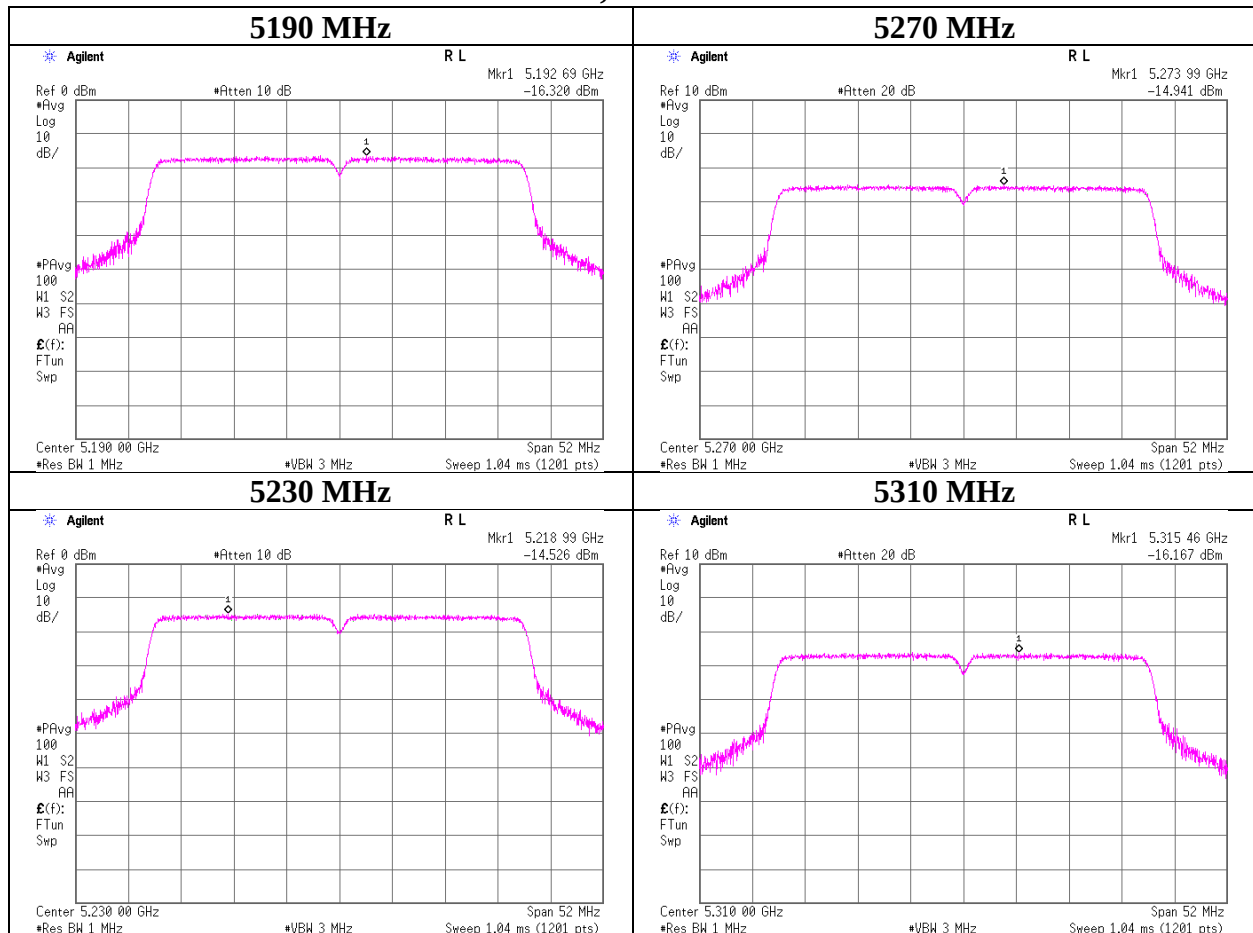
11n-20 (MIMO), Antenna 1



Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

11n-40, Antenna 0



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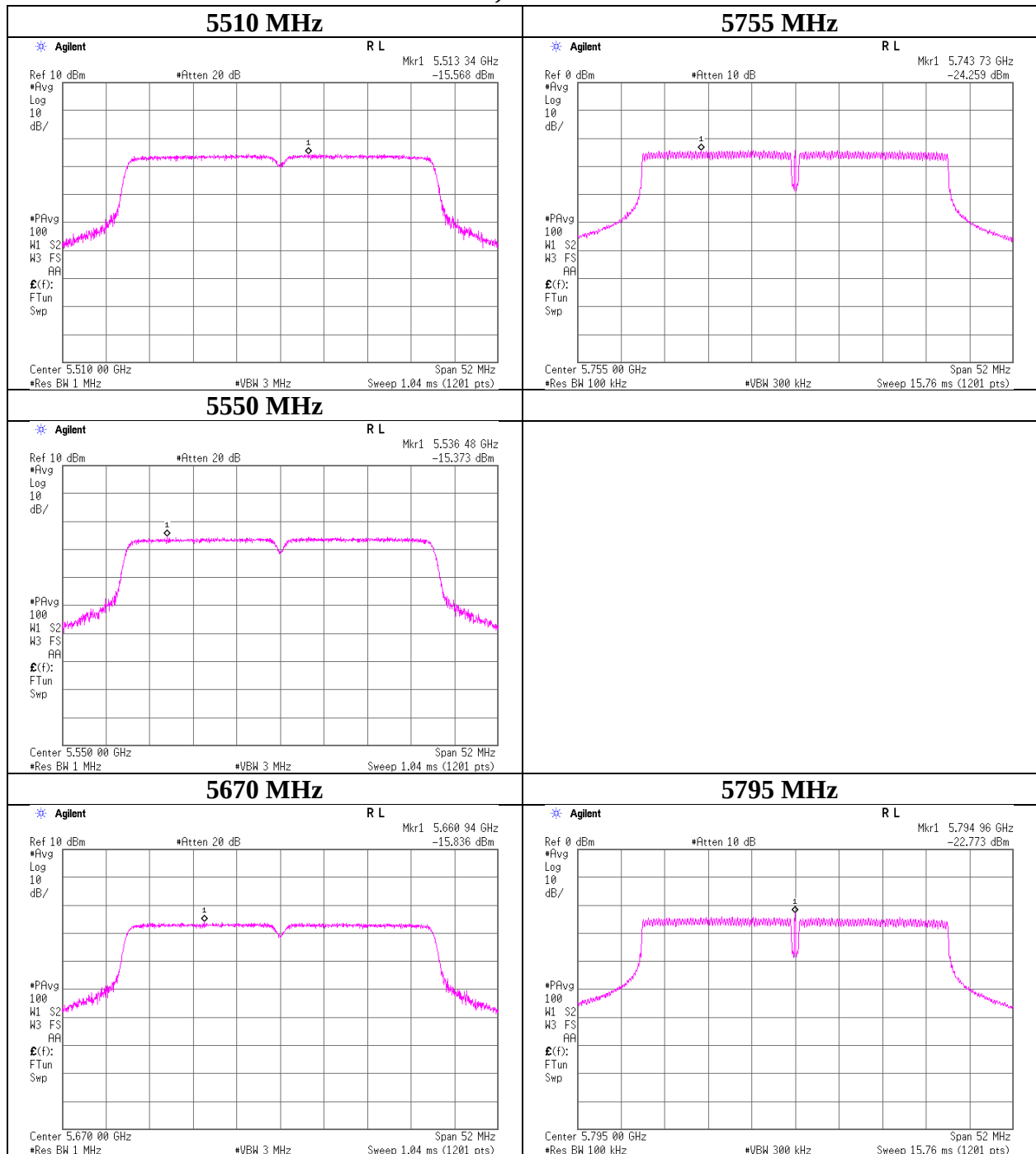
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

11n-40, Antenna 0



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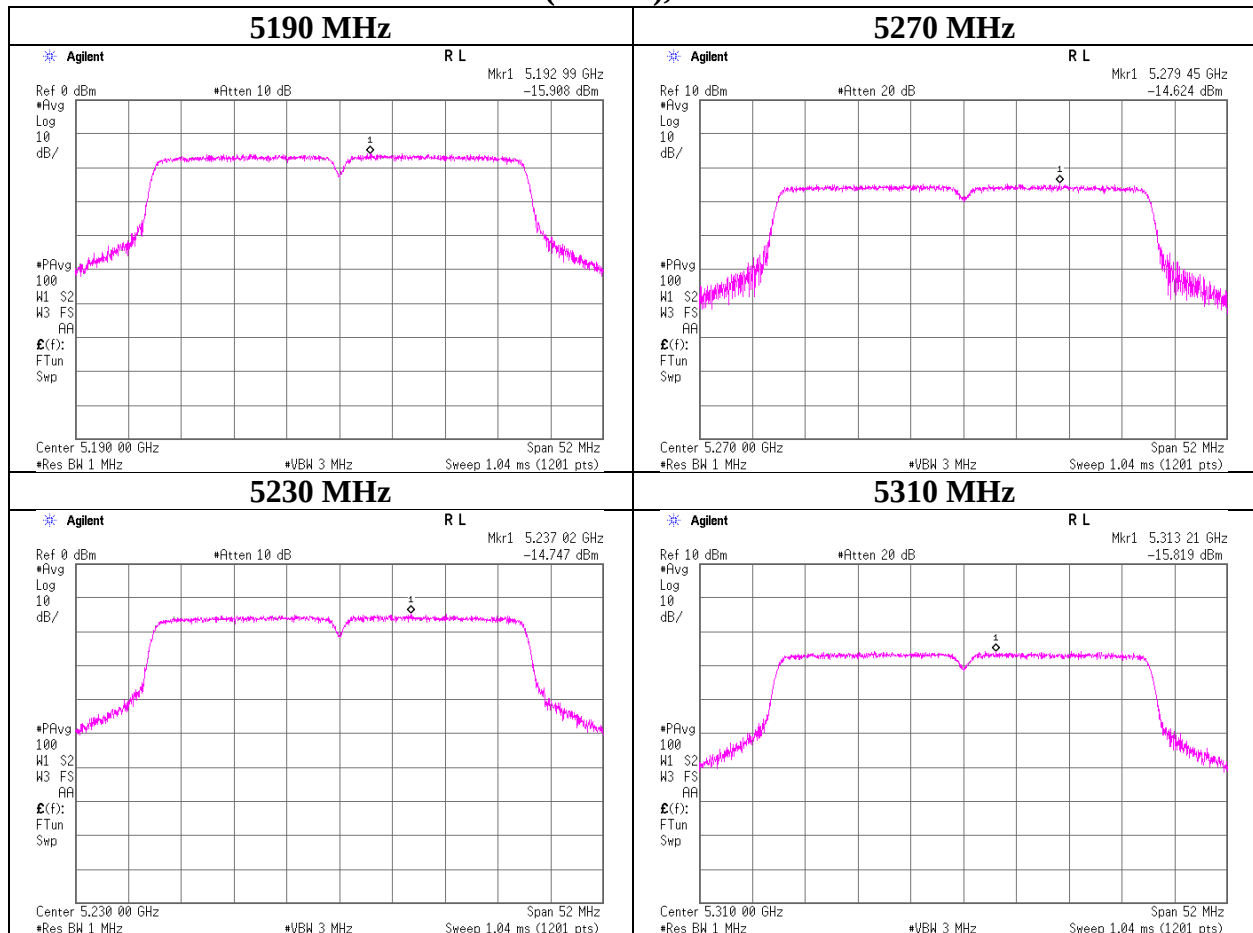
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1	Shonan EMC Lab. No.5	Shonan EMC Lab. No.1
Report No.	Measurement Room	Shielded Room	Measurement Room
Date	11143372S-B-R1		
Temperature / Humidity	February 8, 2016	February 12, 2016	February 15, 2016
Engineer	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Mode	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
	Tx		

11n-40 (MIMO), Antenna 0



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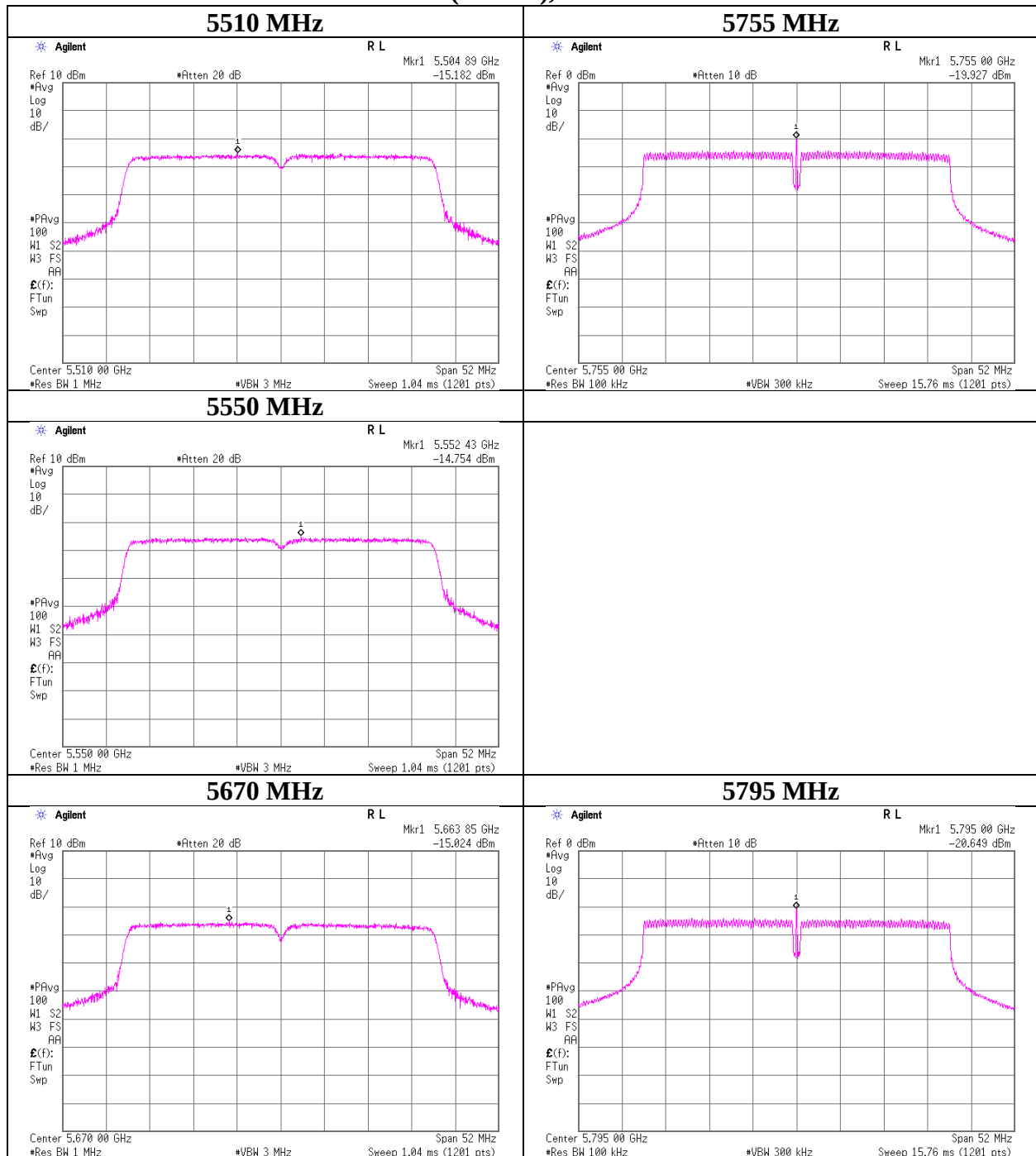
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

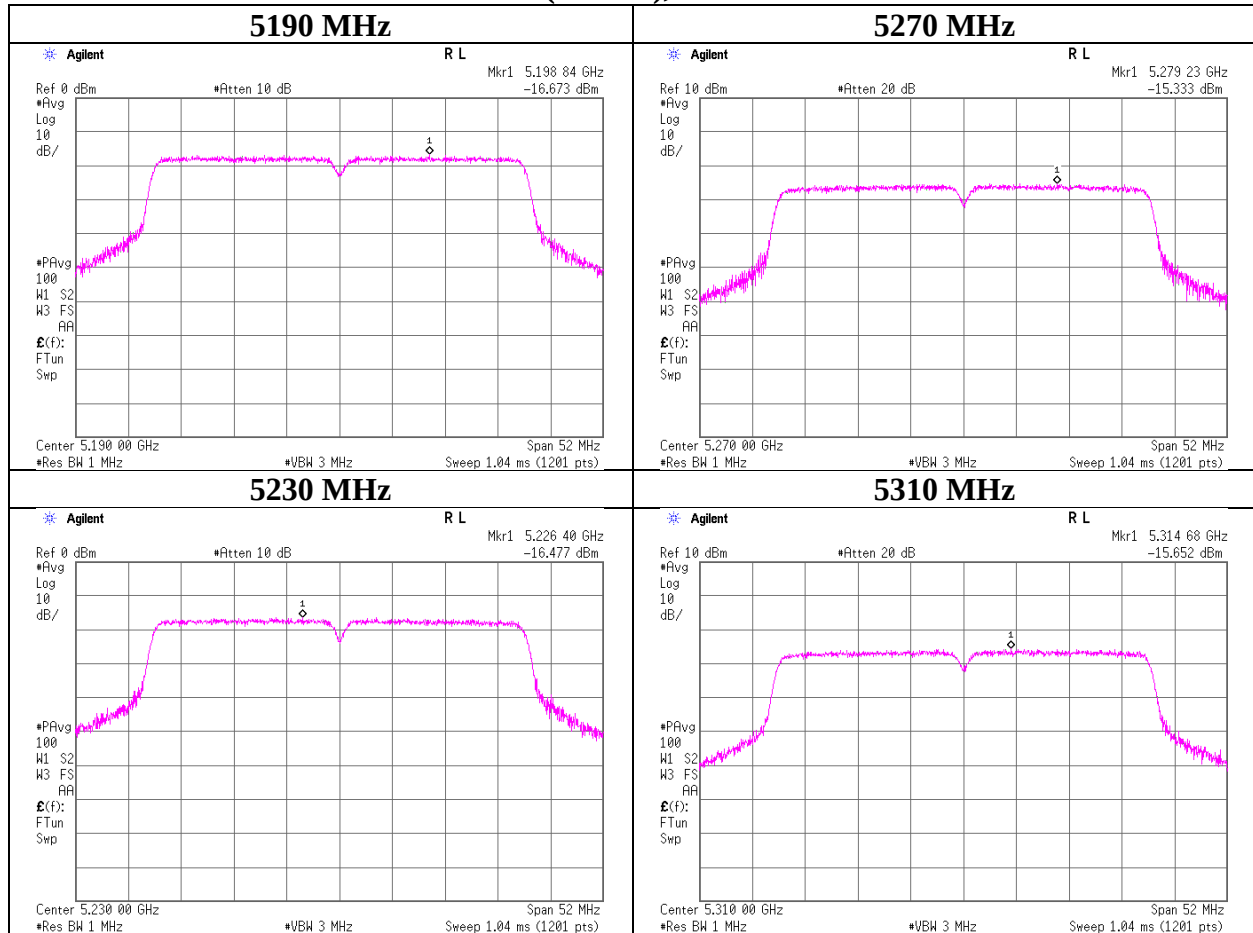
11n-40 (MIMO), Antenna 0



Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1	Shonan EMC Lab. No.5	Shonan EMC Lab. No.1
Report No.	Measurement Room	Shielded Room	Measurement Room
Date	11143372S-B-R1		
Temperature / Humidity	February 8, 2016	February 12, 2016	February 15, 2016
Engineer	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Mode	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
	Tx		

11n-40 (MIMO), Antenna 1



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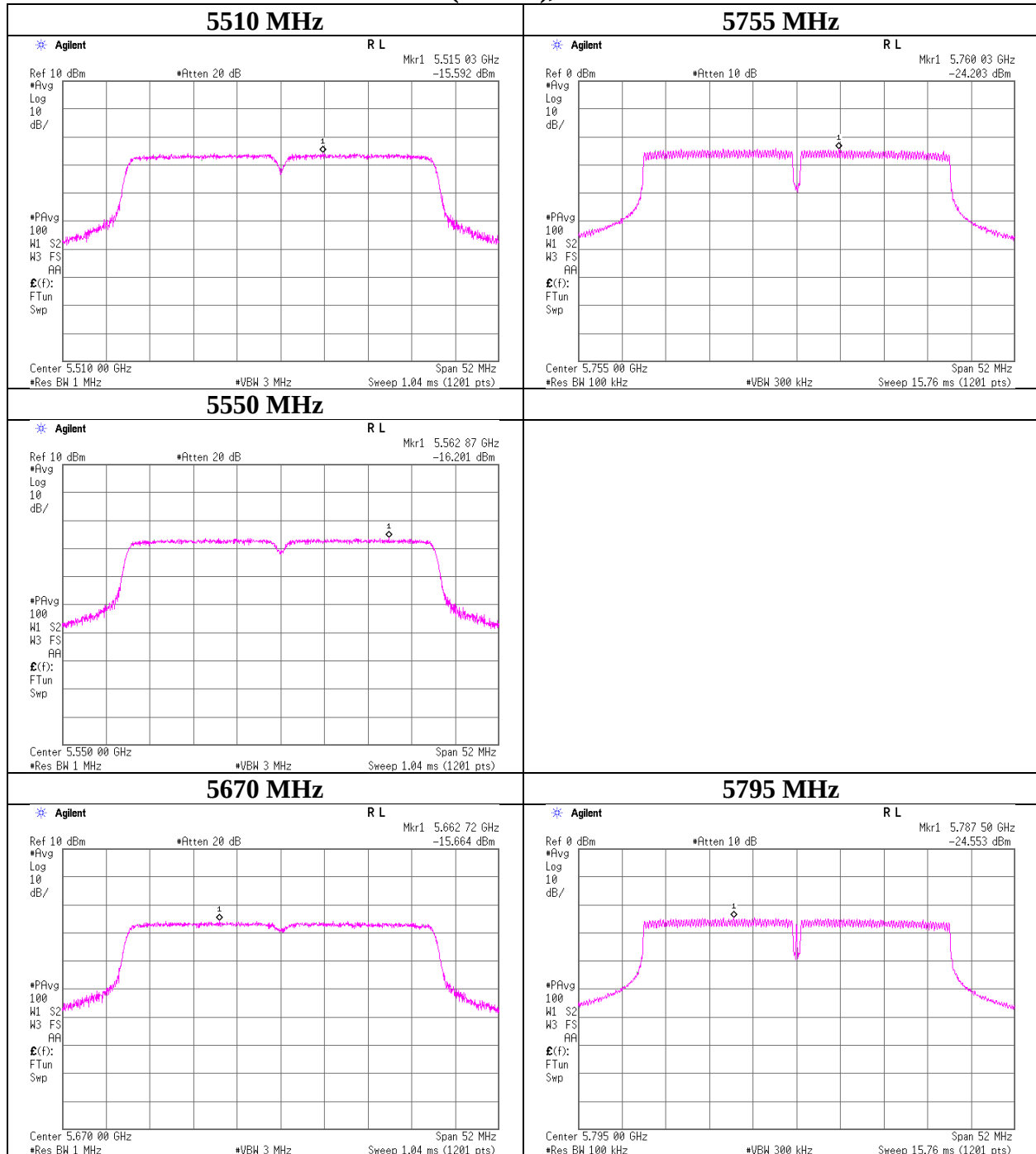
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.1 Measurement Room	Shonan EMC Lab. No.5 Shielded Room	Shonan EMC Lab. No.1 Measurement Room
Report No.	11143372S-B-R1		
Date	February 8, 2016	February 12, 2016	February 15, 2016
Temperature / Humidity	23 deg. C / 45 % RH	26 deg. C / 29 % RH	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa	Shinichi Takano	Yosuke Ishikawa
Mode	Tx		

11n-40 (MIMO), Antenna 1



UL Japan, Inc.

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Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 14, 2016	February 23, 2016	February 24, 2016
Temperature / Humidity	24 deg. C / 49 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Shinichi Takano	Hikaru Shirasawa	Shinichi Takano
Mode	Tx 11n-20 (MIMO) 5180 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	2499.994	PK	49.1	27.9	13.8	41.0	3.1	52.9	73.9	21.0	113	108	
Hori.	5150.000	PK	46.9	32.2	15.5	39.2	3.1	58.5	73.9	15.4	169	305	
Hori.	15540.000	PK	54.4	39.9	10.2	40.9	-9.5	54.1	73.9	19.8	170	123	
Hori.	2499.994	AV	41.6	27.9	13.8	41.0	3.1	45.4	53.9	8.5	113	108	VBW:10Hz
Hori.	5150.000	AV	33.3	32.2	15.5	39.2	3.1	44.9	53.9	9.0	169	305	VBW:10Hz
Hori.	15540.000	AV	42.4	39.9	10.2	40.9	-9.5	42.1	53.9	11.8	170	123	VBW:10Hz
Vert.	2500.001	PK	49.3	27.9	13.8	41.0	3.1	53.1	73.9	20.8	154	58	
Vert.	5150.000	PK	47.2	32.2	15.5	39.2	3.1	58.8	73.9	15.1	177	224	
Vert.	15540.000	PK	54.8	39.9	10.2	40.9	-9.5	54.5	73.9	19.4	150	137	
Vert.	2500.001	AV	42.6	27.9	13.8	41.0	3.1	46.4	53.9	7.5	154	58	VBW:10Hz
Vert.	5150.000	AV	33.8	32.2	15.5	39.2	3.1	45.4	53.9	8.5	177	224	VBW:10Hz
Vert.	15540.000	AV	43.4	39.9	10.2	40.9	-9.5	43.1	53.9	10.8	150	137	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	6906.707	PK	53.5	36.5	6.6	39.7	3.1	60.0	-35.2	-27.0	8.2	156	308	
Hori.	10360.000	PK	46.0	39.5	8.1	39.1	3.1	57.6	-37.6	-27.0	10.6	100	0	
Vert.	6906.716	PK	54.2	36.5	6.6	39.7	3.1	60.7	-34.5	-27.0	7.5	151	232	
Vert.	10360.000	PK	45.1	39.5	8.1	39.1	3.1	56.7	-38.5	-27.0	11.5	155	113	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])=10*LOG (({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m] } ^ 2) / 30) *10^3

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

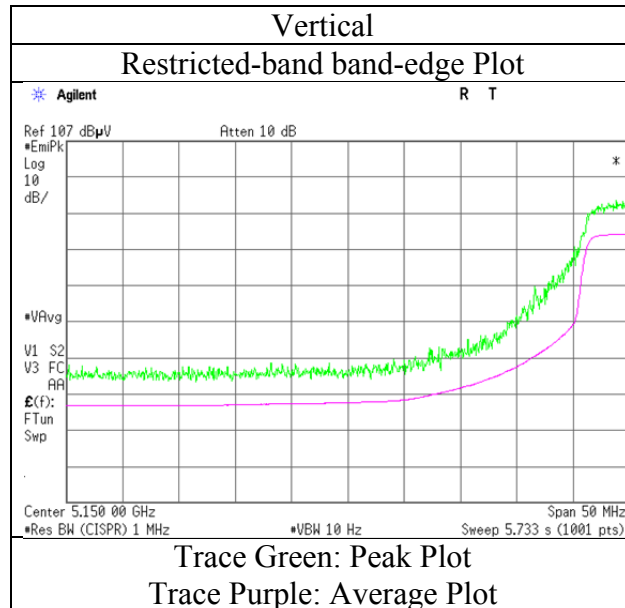
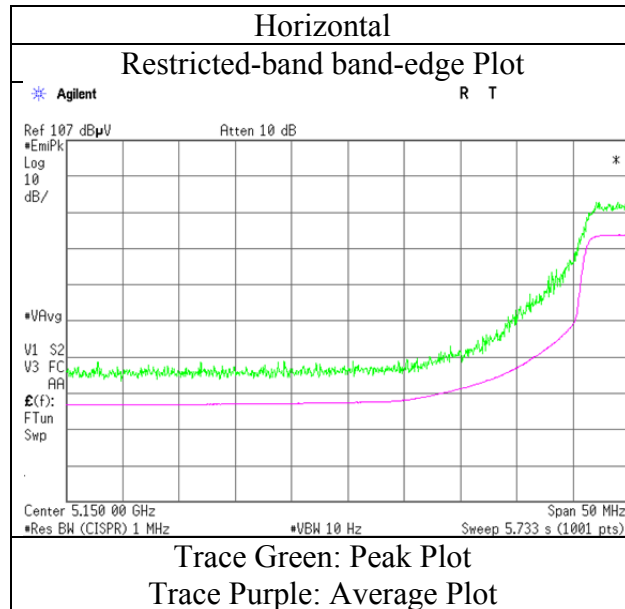
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11143372S-B-R1
Date	February 14, 2016
Temperature / Humidity	24 deg. C / 49 % RH
Engineer	Shinichi Takano
Mode	Tx 11n-20 (MIMO) 5180 MHz



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 21, 2016	February 22, 2016	February 23, 2016
Temperature / Humidity	22 deg. C / 34 % RH	20 deg. C / 45 % RH	20 deg. C / 45 % RH
Engineer	Yosuke Ishikawa	Hikaru Shirasawa	Hikaru Shirasawa
Mode	Tx 11n-20 (MIMO) 5240 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	15720.000	PK	56.0	39.7	10.3	40.8	-9.5	55.7	73.9	18.2	150	121	VBW:10Hz
Hori.	15720.000	AV	42.9	39.7	10.3	40.8	-9.5	42.6	53.9	11.3	150	121	
Vert.	15720.000	PK	54.9	39.7	10.3	40.8	-9.5	54.6	73.9	19.3	172	133	
Vert.	15720.000	AV	44.0	39.7	10.3	40.8	-9.5	43.7	53.9	10.2	172	133	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (ERP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	6986.666	PK	45.5	36.8	6.6	39.8	3.1	52.2	-43.0	-27.0	16.0	100	288	
Hori.	10480.000	PK	46.3	39.9	8.1	39.0	3.1	58.4	-36.8	-27.0	9.8	100	0	
Vert.	6986.660	PK	47.0	36.8	6.6	39.8	3.1	53.7	-41.5	-27.0	14.5	122	234	
Vert.	10480.000	PK	44.4	39.9	8.1	39.0	3.1	56.5	-38.7	-27.0	11.7	100	0	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(ERP[dBm])=10*LOG (({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 21, 2016	February 22, 2016	February 23, 2016
Temperature / Humidity	22 deg. C / 34 % RH	20 deg. C / 45 % RH	20 deg. C / 45 % RH
Engineer	Yosuke Ishikawa	Hikaru Shirasawa	Hikaru Shirasawa
Mode	Tx 11n-20 (MIMO) 5320 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5350.000	PK	47.6	32.2	15.7	38.9	3.1	59.7	73.9	14.2	184	247	
Hori.	10640.000	PK	43.7	40.0	8.1	39.1	3.1	55.8	73.9	18.1	100	0	
Hori.	15960.000	PK	53.2	39.3	10.3	40.7	-9.5	52.6	73.9	21.3	152	127	
Hori.	5350.000	AV	35.1	32.2	15.7	38.9	3.1	47.2	53.9	6.7	184	247	VBW:10Hz
Hori.	10640.000	AV	32.7	40.0	8.1	39.1	3.1	44.8	53.9	9.1	100	0	VBW:10Hz
Hori.	15960.000	AV	41.0	39.3	10.3	40.7	-9.5	40.4	53.9	13.5	152	127	VBW:10Hz
Vert.	5350.000	PK	47.0	32.2	15.7	38.9	3.1	59.1	73.9	14.8	100	155	
Vert.	10640.000	PK	44.1	40.0	8.1	39.1	3.1	56.2	73.9	17.7	100	0	
Vert.	15960.000	PK	53.3	39.3	10.3	40.7	-9.5	52.7	73.9	21.2	170	135	
Vert.	5350.000	AV	34.1	32.2	15.7	38.9	3.1	46.2	53.9	7.7	100	155	VBW:10Hz
Vert.	10640.000	AV	32.9	40.0	8.1	39.1	3.1	45.0	53.9	8.9	100	0	VBW:10Hz
Vert.	15960.000	AV	40.0	39.3	10.3	40.7	-9.5	39.4	53.9	14.5	170	135	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7093.333	PK	46.1	36.9	6.7	39.9	3.1	52.9	-42.3	-27.0	15.3	100	357	
Vert.	7093.333	PK	46.0	36.9	6.7	39.9	3.1	52.8	-42.4	-27.0	15.4	100	222	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])= $10\log((\{10^{\frac{1}{2}}(\text{Electric Field Strength [dBuV/m]} / 20) * 10^{-6}\} * \text{Distance:3[m]}^2 / 30) * 10^3)$

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

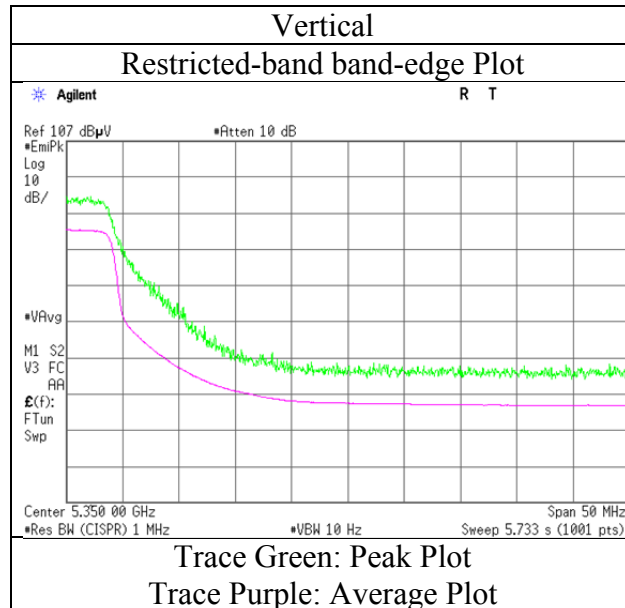
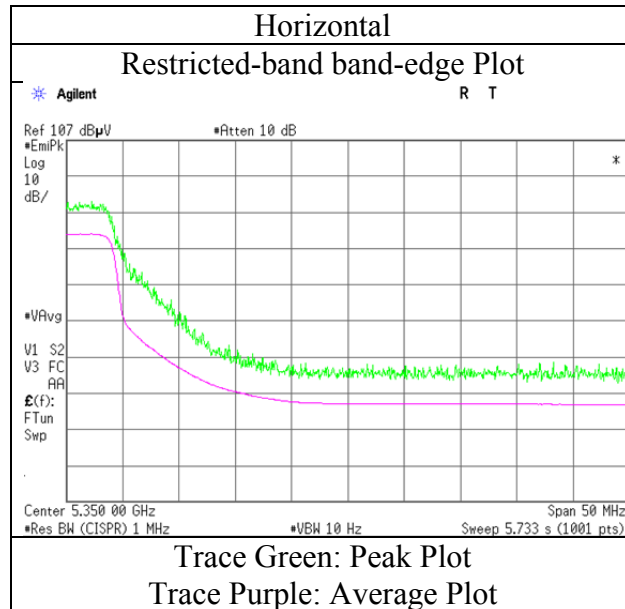
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11143372S-B-R1
Date : February 21, 2016
Temperature / Humidity : 22 deg. C / 34 % RH
Engineer : Yosuke Ishikawa
Mode : Tx 11n-20 (MIMO) 5320 MHz



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 21, 2016	February 22, 2016	February 24, 2016
Temperature / Humidity	22 deg. C / 34 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Yosuke Ishikawa	Hikaru Shirasawa	Shinichi Takano
Mode	Tx 11n-20 (MIMO) 5500 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5460.000	PK	46.8	32.2	15.8	38.8	3.1	59.1	73.9	14.8	100	79	
Hori.	7333.333	PK	45.8	36.9	7.0	40.2	3.1	52.6	73.9	21.3	100	0	
Hori.	11000.000	PK	43.7	40.3	8.2	39.1	3.1	56.2	73.9	17.7	100	0	
Hori.	5460.000	AV	34.5	32.2	15.8	38.8	3.1	46.8	53.9	7.1	100	79	VBW:10Hz
Hori.	7333.333	AV	33.6	36.9	7.0	40.2	3.1	40.4	53.9	13.5	100	0	VBW:10Hz
Hori.	11000.000	AV	32.7	40.3	8.2	39.1	3.1	45.2	53.9	8.7	100	0	VBW:10Hz
Vert.	5460.000	PK	48.6	32.2	15.8	38.8	3.1	60.9	73.9	13.0	100	163	
Vert.	7333.333	PK	45.8	36.9	7.0	40.2	3.1	52.6	73.9	21.3	100	0	
Vert.	11000.000	PK	44.4	40.3	8.2	39.1	3.1	56.9	73.9	17.0	100	0	
Vert.	5460.000	AV	35.3	32.2	15.8	38.8	3.1	47.6	53.9	6.3	100	163	VBW:10Hz
Vert.	7333.333	AV	33.8	36.9	7.0	40.2	3.1	40.6	53.9	13.3	100	0	VBW:10Hz
Vert.	11000.000	AV	32.9	40.3	8.2	39.1	3.1	45.4	53.9	8.5	100	0	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5470.000	PK	52.2	32.2	15.8	38.8	3.1	64.5	-30.7	-27.0	3.7	100	79	
Hori.	16500.000	PK	58.8	40.2	10.4	40.5	-9.5	59.4	-35.8	-27.0	8.8	151	200	
Vert.	5470.000	PK	53.6	32.2	15.8	38.8	3.1	65.9	-29.3	-27.0	2.3	100	163	
Vert.	16500.000	PK	62.0	40.2	10.4	40.5	-9.5	62.6	-32.6	-27.0	5.6	156	189	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])= $10\log((\{10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge}(-6) * \text{Distance:3[m]}^2\} / 30) * 10^{\wedge}3)$

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

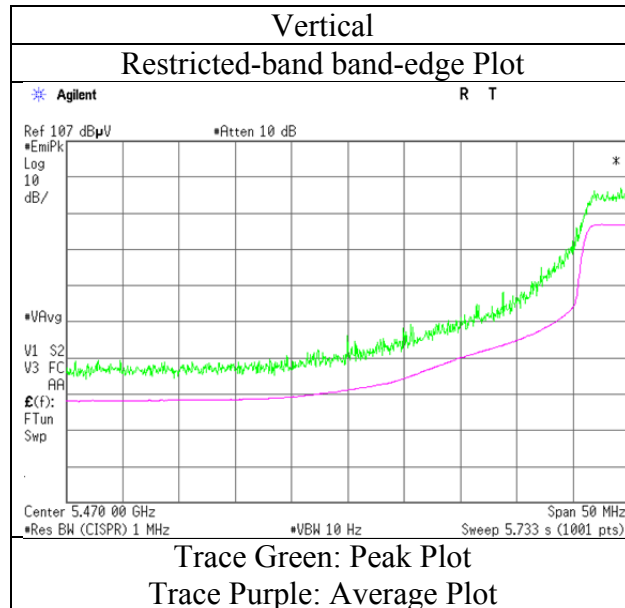
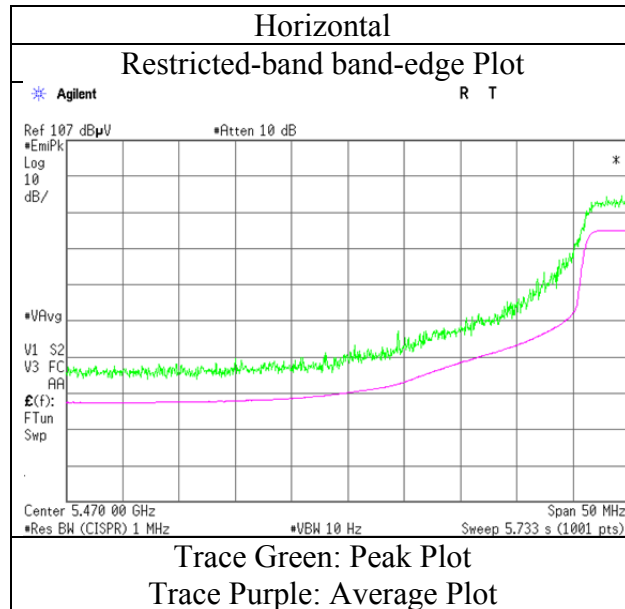
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11143372S-B-R1
Date	February 21, 2016
Temperature / Humidity	22 deg. C / 34 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11n-20 (MIMO) 5500 MHz



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 21, 2016	February 22, 2016	February 24, 2016
Temperature / Humidity	22 deg. C / 34 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Yosuke Ishikawa	Hikaru Shirasawa	Shinichi Takano
Mode	Tx 11n-20 (MIMO) 5580 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7440.000	PK	45.5	37.0	7.1	40.4	3.1	52.3	73.9	21.6	100	0	
Hori.	11160.000	PK	45.5	40.2	8.3	39.0	3.1	58.1	73.9	15.8	100	0	
Hori.	7440.000	AV	33.2	37.0	7.1	40.4	3.1	40.0	53.9	13.9	100	0	VBW:10Hz
Hori.	11160.000	AV	33.1	40.2	8.3	39.0	3.1	45.7	53.9	8.2	100	0	VBW:10Hz
Vert.	7440.000	PK	44.5	37.0	7.1	40.4	3.1	51.3	73.9	22.6	100	0	
Vert.	11160.000	PK	44.7	40.2	8.3	39.0	3.1	57.3	73.9	16.6	100	0	
Vert.	7440.000	AV	33.0	37.0	7.1	40.4	3.1	39.8	53.9	14.1	100	0	VBW:10Hz
Vert.	11160.000	AV	33.1	40.2	8.3	39.0	3.1	45.7	53.9	8.2	100	0	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	16740.000	PK	58.2	40.7	10.5	40.1	-9.5	59.8	-35.4	-27.0	8.4	143	230	
Vert.	16740.000	PK	61.4	40.7	10.5	40.1	-9.5	63.0	-32.2	-27.0	5.2	155	191	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])=10*LOG (({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 21, 2016	February 22, 2016	February 24, 2016
Temperature / Humidity	22 deg. C / 34 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Yosuke Ishikawa	Hikaru Shirasawa	Shinichi Takano
Mode	Tx 11n-20 (MIMO) 5700 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5725.000	PK	54.5	32.6	15.8	38.8	3.1	67.2	73.9	6.7	100	79	
Hori.	7600.000	PK	46.2	37.1	7.1	40.5	3.1	53.0	73.9	20.9	100	0	
Hori.	11400.000	PK	45.3	40.0	8.4	38.9	3.1	57.9	73.9	16.0	100	0	
Hori.	5725.000	AV	40.1	32.6	15.8	38.8	3.1	52.8	53.9	1.1	100	79	VBW:10Hz
Hori.	7600.000	AV	32.8	37.1	7.1	40.5	3.1	39.6	53.9	14.3	100	0	VBW:10Hz
Hori.	11400.000	AV	33.1	40.0	8.4	38.9	3.1	45.7	53.9	8.2	100	0	VBW:10Hz
Vert.	5725.000	PK	56.5	32.6	15.8	38.8	3.1	69.2	73.9	4.7	100	331	
Vert.	7600.000	PK	46.9	37.1	7.1	40.5	3.1	53.7	73.9	20.2	100	0	
Vert.	11400.000	PK	46.0	40.0	8.4	38.9	3.1	58.6	73.9	15.3	100	0	
Vert.	5725.000	AV	40.4	32.6	15.8	38.8	3.1	53.2	53.9	0.7	100	331	VBW:10Hz
Vert.	7600.000	AV	32.7	37.1	7.1	40.5	3.1	39.5	53.9	14.4	100	0	VBW:10Hz
Vert.	11400.000	AV	32.9	40.0	8.4	38.9	3.1	45.5	53.9	8.4	100	0	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	17100.000	PK	58.7	41.6	10.7	39.5	-9.5	62.0	-33.2	-27.0	6.2	143	235	
Vert.	17100.000	PK	61.4	41.6	10.7	39.5	-9.5	64.7	-30.5	-27.0	3.5	155	144	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])=10*LOG (({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

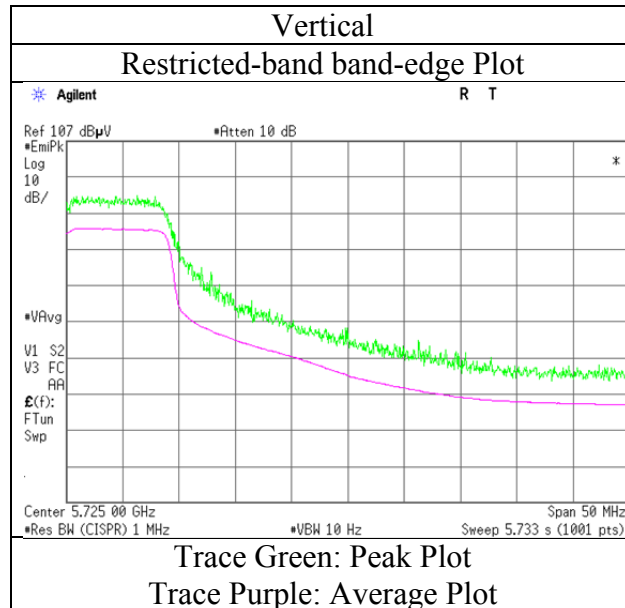
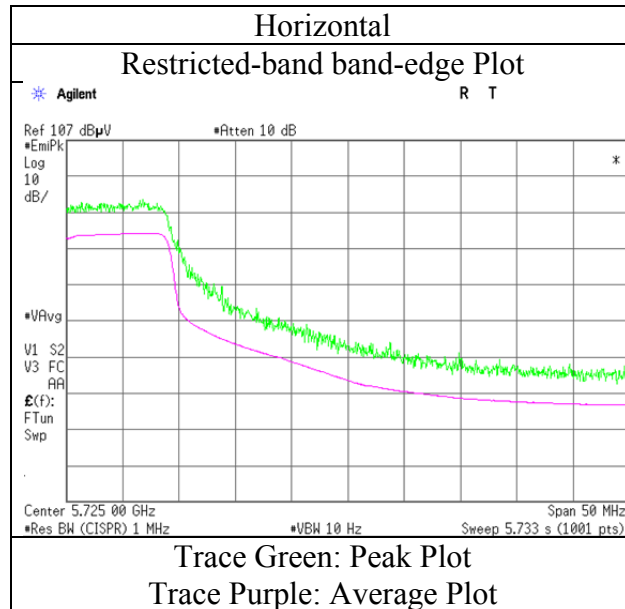
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11143372S-B-R1
Date	February 21, 2016
Temperature / Humidity	22 deg. C / 34 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11n-20 (MIMO) 5700 MHz



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 21, 2016	February 22, 2016	February 24, 2016
Temperature / Humidity	22 deg. C / 34 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Yosuke Ishikawa	Hikaru Shirasawa	Shinichi Takano
Mode	Tx 11n-20 (MIMO)5745 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7660.000	PK	45.7	37.2	7.1	40.5	3.1	52.6	73.9	21.3	100	0	
Hori.	11490.000	PK	44.0	40.0	8.5	38.8	3.1	56.8	73.9	17.1	100	0	
Hori.	7660.000	AV	33.6	37.2	7.1	40.5	3.1	40.5	53.9	13.4	100	0	VBW:10Hz
Hori.	11490.000	AV	33.0	40.0	8.5	38.8	3.1	45.8	53.9	8.1	100	0	VBW:10Hz
Vert.	7660.000	PK	45.9	37.2	7.1	40.5	3.1	52.8	73.9	21.1	100	0	
Vert.	11490.000	PK	42.6	40.0	8.5	38.8	3.1	55.4	73.9	18.5	100	0	
Vert.	7660.000	AV	33.7	37.2	7.1	40.5	3.1	40.6	53.9	13.3	100	0	VBW:10Hz
Vert.	11490.000	AV	33.0	40.0	8.5	38.8	3.1	45.8	53.9	8.1	100	0	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5715.000	PK	53.1	32.6	15.8	38.8	3.1	65.8	-29.4	-27.0	2.4	100	76	
Hori.	5725.000	PK	60.4	32.6	15.8	38.8	3.1	73.1	-22.1	-17.0	5.1	100	76	
Hori.	17235.000	PK	55.3	42.0	10.7	39.3	-9.5	59.2	-36.0	-27.0	9.0	142	238	
Vert.	5715.000	PK	52.8	32.6	15.8	38.8	3.1	65.5	-29.7	-27.0	2.7	100	9	
Vert.	5725.000	PK	61.7	32.6	15.8	38.8	3.1	74.4	-20.8	-17.0	3.8	100	9	
Vert.	17235.000	PK	57.8	42.0	10.7	39.3	-9.5	61.7	-33.5	-27.0	6.5	154	146	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])=10*LOG (({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m] } ^ 2) / 30) *10^3)

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

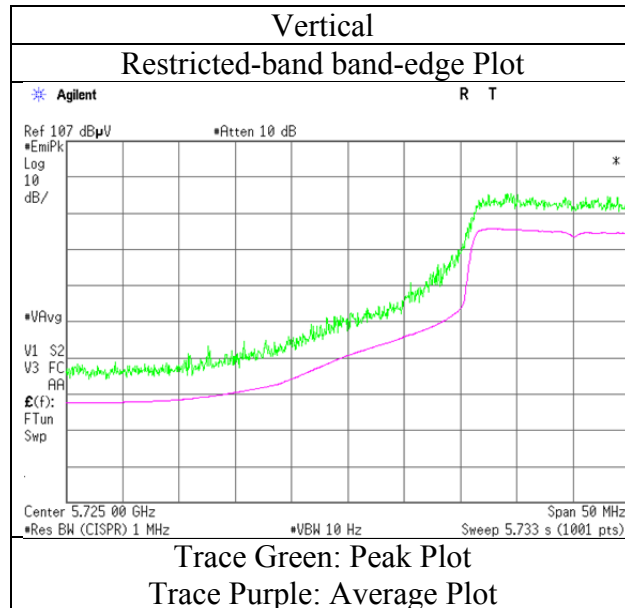
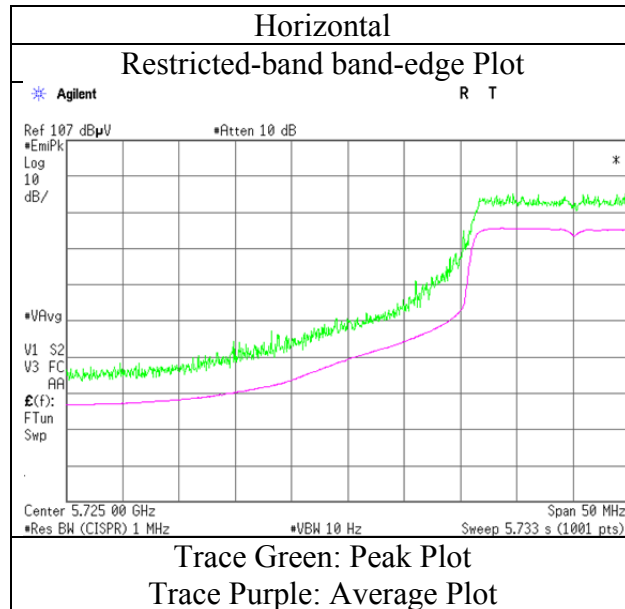
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11143372S-B-R1
Date	February 21, 2016
Temperature / Humidity	22 deg. C / 34 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11n-20 (MIMO)5745 MHz



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 21, 2016	February 22, 2016	February 24, 2016
Temperature / Humidity	22 deg. C / 34 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Yosuke Ishikawa	Hikaru Shirasawa	Shinichi Takano
Mode	Tx 11n-20 (MIMO) 5785 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7713.333	PK	44.0	37.3	7.1	40.5	3.1	51.0	73.9	22.9	100	0	
Hori.	11570.000	PK	43.7	39.9	8.5	38.9	3.1	56.3	73.9	17.6	100	0	
Hori.	7713.333	AV	34.7	37.3	7.1	40.5	3.1	41.7	53.9	12.2	100	0	VBW:10Hz
Hori.	11570.000	AV	32.3	39.9	8.5	38.9	3.1	44.9	53.9	9.0	100	0	VBW:10Hz
Vert.	7713.333	PK	45.1	37.3	7.1	40.5	3.1	52.1	73.9	21.8	100	0	
Vert.	11570.000	PK	44.1	39.9	8.5	38.9	3.1	56.7	73.9	17.2	100	0	
Vert.	7713.333	AV	34.5	37.3	7.1	40.5	3.1	41.5	53.9	12.4	100	0	VBW:10Hz
Vert.	11570.000	AV	32.1	39.9	8.5	38.9	3.1	44.7	53.9	9.2	100	0	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	17355.000	PK	53.8	42.4	10.7	39.2	-9.5	58.2	-37.0	-27.0	10.0	141	234	
Vert.	17355.000	PK	56.9	42.4	10.7	39.2	-9.5	61.3	-33.9	-27.0	6.9	152	145	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])= $10\cdot\text{LOG}((\{10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20)\cdot 10^{\wedge}(-6)\cdot \text{Distance:3[m]}^{\wedge}2\} / 30)\cdot 10^{\wedge}3)$

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

UL Japan, Inc.

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Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11143372S-B-R1
Date : February 21, 2016 February 22, 2016 February 24, 2016 February 27, 2016
Temperature / Humidity : 22 deg. C / 34 % RH 20 deg. C / 45 % RH 23 deg. C / 32 % RH 22 deg. C / 34 % RH
Engineer : Yosuke Ishikawa Hikaru Shirasawa Shinichi Takano Hiroyuki Morikawa
Mode : Tx 11n-20 (MIMO) 5825 MHz

(below 1GHz and above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	118.067	QP	49.7	12.3	7.4	32.1	0.0	37.3	43.5	6.2	170	19	
Hori.	225.000	QP	47.4	16.7	8.3	32.0	0.0	40.4	46.0	5.6	144	258	
Hori.	233.330	QP	44.4	16.8	8.3	32.0	0.0	37.5	46.0	8.5	142	347	
Hori.	300.003	QP	51.7	13.9	8.7	32.0	0.0	42.3	46.0	3.7	109	206	
Hori.	800.003	QP	37.1	21.0	10.6	31.6	0.0	37.1	46.0	8.9	106	234	
Hori.	11650.000	PK	45.3	39.9	8.5	39.0	3.1	57.8	73.9	16.1	100	0	
Hori.	11650.000	AV	31.9	39.9	8.5	39.0	3.1	44.4	53.9	9.5	100	0	VBW:10Hz
Vert.	88.864	QP	52.0	7.6	7.7	32.2	0.0	35.1	43.5	8.4	100	117	
Vert.	100.003	QP	48.9	9.7	7.5	32.1	0.0	34.0	43.5	9.5	100	80	
Vert.	125.000	QP	45.7	13.0	7.4	32.1	0.0	34.0	43.5	9.5	100	0	
Vert.	151.576	QP	39.6	14.7	7.9	32.1	0.0	30.1	43.5	13.4	100	250	
Vert.	433.327	QP	46.9	16.5	9.3	31.9	0.0	40.8	46.0	5.2	100	243	
Vert.	11650.000	PK	43.9	39.9	8.5	39.0	3.1	56.4	73.9	17.5	100	0	
Vert.	11650.000	AV	31.9	39.9	8.5	39.0	3.1	44.4	53.9	9.5	100	0	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5850.000	PK	59.0	32.9	15.9	38.8	3.1	72.1	-23.1	-17.0	6.1	100	72	
Hori.	5860.000	PK	54.0	32.9	15.9	38.8	3.1	67.1	-28.1	-27.0	1.1	100	72	
Hori.	7766.666	PK	45.3	37.4	7.1	40.5	3.1	52.4	-42.8	-27.0	15.8	100	0	
Hori.	17475.000	PK	54.6	42.8	10.7	39.1	-9.5	59.5	-35.7	-27.0	8.7	141	234	
Vert.	5850.000	PK	56.4	32.9	15.9	38.8	3.1	69.5	-25.7	-17.0	8.7	100	20	
Vert.	5860.000	PK	49.8	32.9	15.9	38.8	3.1	62.9	-32.3	-27.0	5.3	100	20	
Vert.	7766.666	PK	46.4	37.4	7.1	40.5	3.1	53.5	-41.7	-27.0	14.7	100	0	
Vert.	17475.000	PK	54.7	42.8	10.7	39.1	-9.5	59.6	-35.6	-27.0	8.6	152	145	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])=10*LOG (({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

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Shonan EMC Lab.

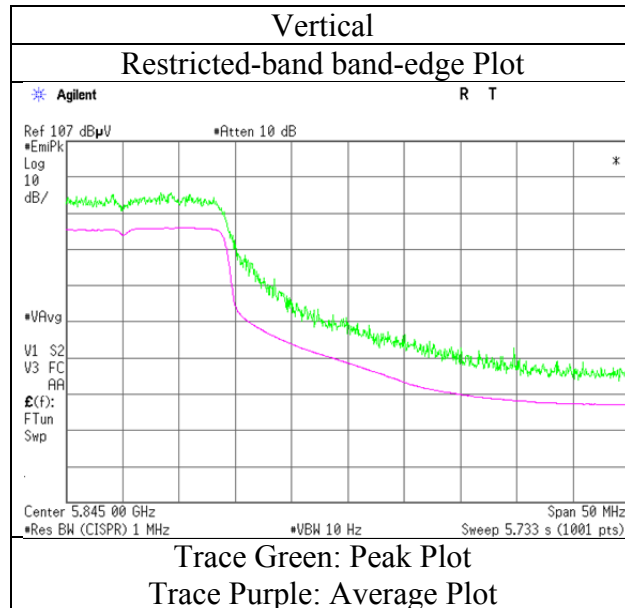
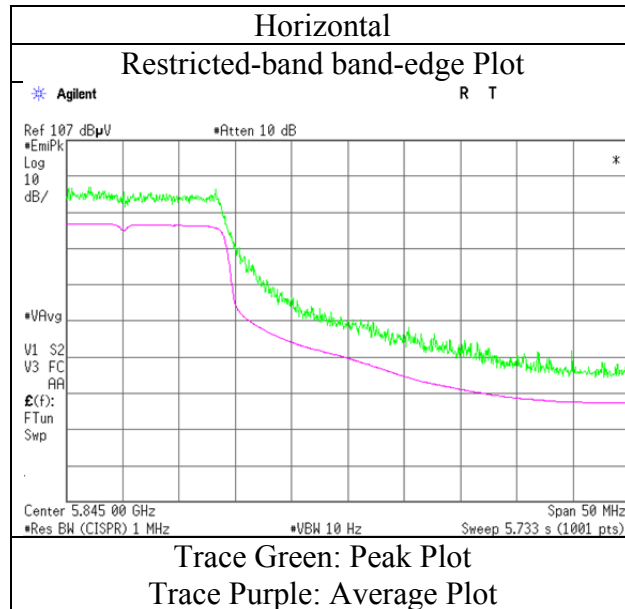
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11143372S-B-R1
Date	February 21, 2016
Temperature / Humidity	22 deg. C / 34 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11n-20 (MIMO) 5825 MHz



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, 3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 19, 2016	February 22, 2016	February 24, 2016
Temperature / Humidity	24 deg. C / 31 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa (No.1 SAC)	Hikaru Shirasawa (No.3 SAC)	Shinichi Takano (No.3 SAC)
Mode	Tx 11n-40 (MIMO) 5190 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5150.000	PK	50.1	32.0	17.2	41.2	2.0	60.1	73.9	13.8	165	235	
Hori.	15570.000	PK	53.3	39.9	10.3	40.9	-9.5	53.1	73.9	20.8	151	226	
Hori.	5150.000	AV	37.4	32.0	17.2	41.2	2.0	47.4	53.9	6.5	165	235	VBW:10Hz
Hori.	15570.000	AV	40.6	39.9	10.3	40.9	-9.5	40.4	53.9	13.5	151	226	VBW:10Hz
Vert.	5150.000	PK	52.2	32.0	17.2	41.2	2.0	62.2	73.9	11.7	156	231	
Vert.	15570.000	PK	53.4	39.9	10.3	40.9	-9.5	53.2	73.9	20.7	160	191	
Vert.	5150.000	AV	38.1	32.0	17.2	41.2	2.0	48.1	53.9	5.8	156	231	VBW:10Hz
Vert.	15570.000	AV	41.1	39.9	10.3	40.9	-9.5	40.9	53.9	13.0	160	191	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 6.4 GHz : $20\log(3.75\text{ m} / 3.0\text{ m}) = 2.0\text{ dB}$

6.4 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	6920.000	PK	50.9	36.5	6.6	39.7	3.1	57.4	-37.8	-27.0	10.8	100	79	
Hori.	10380.000	PK	44.5	39.6	8.1	39.1	3.1	56.2	-39.0	-27.0	12.0	100	0	
Vert.	6920.000	PK	50.9	36.5	6.6	39.7	3.1	57.4	-37.8	-27.0	10.8	108	345	
Vert.	10380.000	PK	45.2	39.6	8.1	39.1	3.1	56.9	-38.3	-27.0	11.3	100	0	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])=10*LOG (({ $10^{\wedge} (\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge} (-6) * \text{Distance:3[m]}^{\wedge} 2 } / 30) * 10^{\wedge} 3)$

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

*The 4th harmonic was not seen so the result was its base noise level.

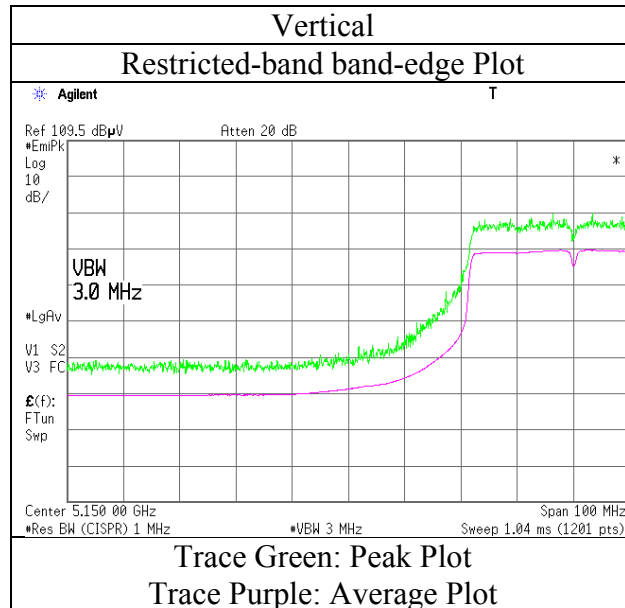
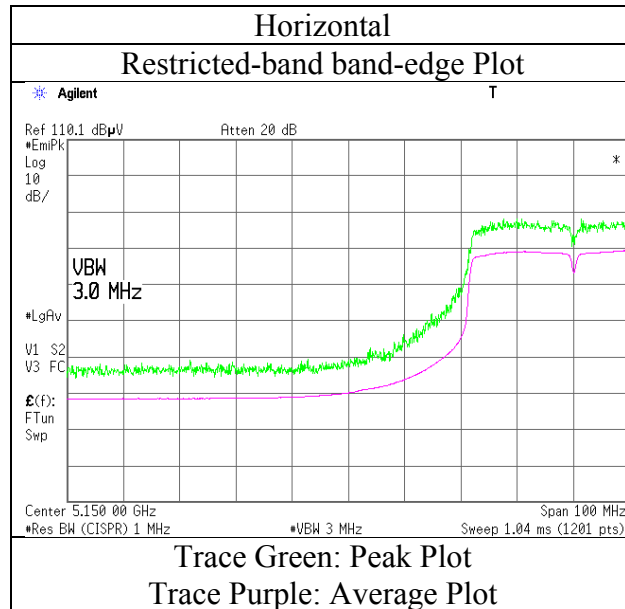
Distance factor : 1 GHz - 6.4 GHz : $20\log(3.75\text{ m} / 3.0\text{ m}) = 2.0\text{ dB}$

6.4 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No. : 11143372S-B-R1
Date : February 19, 2016
Temperature / Humidity : 24 deg. C / 31 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx 11n-40 (MIMO) 5190 MHz



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 20, 2016	February 22, 2016	February 24, 2016
Temperature / Humidity	22 deg. C / 27 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Hikaru Shirasawa (No.1 SAC)	Hikaru Shirasawa (No.3 SAC)	Shinichi Takano (No.3 SAC)
Mode	Tx 11n-40 (MIMO) 5230 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	15690.000	PK	57.6	39.7	10.3	40.8	-9.5	57.3	73.9	16.6	151	226	VBW:10Hz
Hori.	15690.000	AV	43.5	39.7	10.3	40.8	-9.5	43.2	53.9	10.7	151	226	
Vert.	15690.000	PK	58.8	39.7	10.3	40.8	-9.5	58.5	73.9	15.4	160	192	
Vert.	15690.000	AV	43.7	39.7	10.3	40.8	-9.5	43.4	53.9	10.5	160	192	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	6973.333	PK	47.2	36.7	6.6	39.8	3.1	53.8	-41.4	-27.0	14.4	107	77	
Hori.	10460.000	PK	45.2	39.8	8.1	39.1	3.1	57.1	-38.1	-27.0	11.1	100	0	
Vert.	6973.333	PK	47.3	36.7	6.6	39.8	3.1	53.9	-41.3	-27.0	14.3	140	176	
Vert.	10460.000	PK	45.5	39.8	8.1	39.1	3.1	57.4	-37.8	-27.0	10.8	100	0	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])=10*LOG (({ $10^{\wedge} (\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge} (-6) * \text{Distance:3[m]}^{\wedge} 2 } / 30) * 10^{\wedge} 3)$

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, 3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 19, 2016	February 23, 2016	February 24, 2016
Temperature / Humidity	24 deg. C / 31 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa (No.1 SAC)	Hikaru Shirasawa (No.3 SAC)	Shinichi Takano (No.3 SAC)
Mode	Tx 11n-40 (MIMO) 5310 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5350.000	PK	49.2	32.1	17.3	40.7	2.0	59.9	73.9	14.0	150	234	
Hori.	10620.000	PK	43.9	40.0	8.1	39.1	3.1	56.0	73.9	17.9	100	0	
Hori.	15930.000	PK	51.4	39.3	10.3	40.7	-9.5	50.8	73.9	23.1	153	203	
Hori.	5350.000	AV	36.5	32.1	17.3	40.7	2.0	47.2	53.9	6.7	150	234	VBW:10Hz
Hori.	10620.000	AV	32.9	40.0	8.1	39.1	3.1	45.0	53.9	8.9	100	0	VBW:10Hz
Hori.	15930.000	AV	37.8	39.3	10.3	40.7	-9.5	37.2	53.9	16.7	153	203	VBW:10Hz
Vert.	5350.000	PK	49.7	32.1	17.3	40.7	2.0	60.4	73.9	13.5	100	199	
Vert.	10620.000	PK	43.8	40.0	8.1	39.1	3.1	55.9	73.9	18.0	100	0	
Vert.	15930.000	PK	51.0	39.3	10.3	40.7	-9.5	50.4	73.9	23.5	158	160	
Vert.	5350.000	AV	37.0	32.1	17.3	40.7	2.0	47.7	53.9	6.2	100	199	VBW:10Hz
Vert.	10620.000	AV	32.9	40.0	8.1	39.1	3.1	45.0	53.9	8.9	100	0	VBW:10Hz
Vert.	15930.000	AV	37.3	39.3	10.3	40.7	-9.5	36.7	53.9	17.2	158	160	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 6.4 GHz : $20\log(3.75\text{ m} / 3.0\text{ m}) = 2.0\text{ dB}$

6.4 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7080.000	PK	45.0	36.9	6.7	39.9	3.1	51.8	-43.4	-27.0	16.4	100	0	
Vert.	7080.000	PK	45.8	36.9	6.7	39.9	3.1	52.6	-42.6	-27.0	15.6	100	0	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])= $10\cdot\text{LOG} \left(\left(\{ 10^{\wedge} (\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge} (-6) * \text{Distance:3[m]}^{\wedge} 2 \} / 30 \right) * 10^{\wedge} 3 \right)$

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

*The 4th harmonic was not seen so the result was its base noise level.

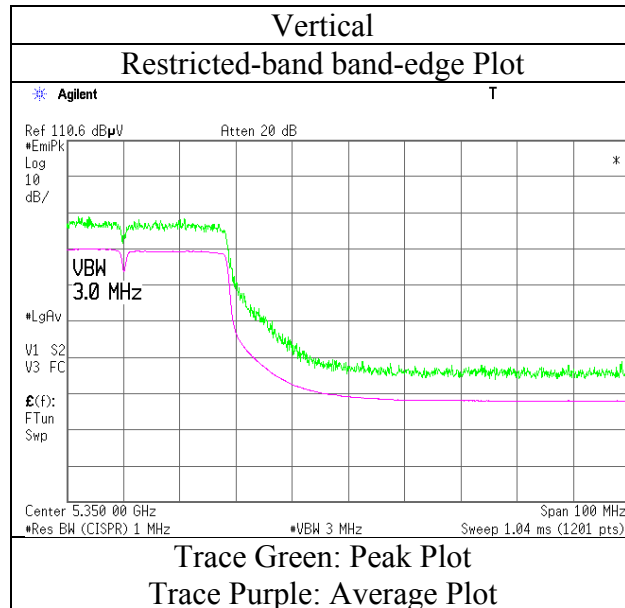
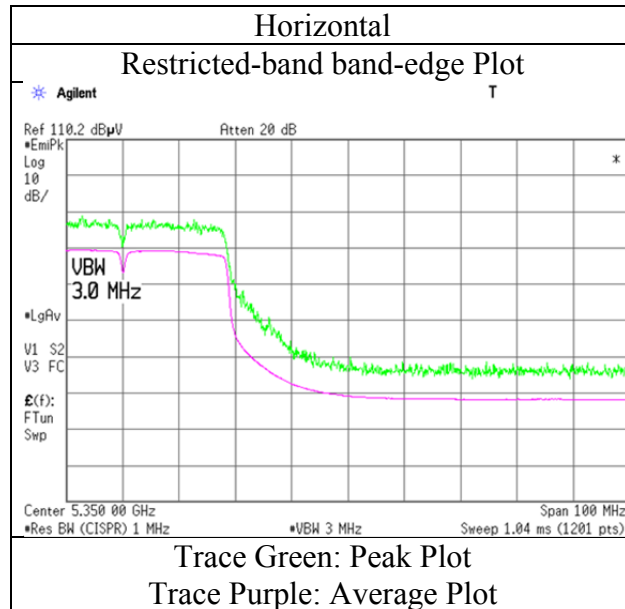
Distance factor : 1 GHz - 6.4 GHz : $20\log(3.75\text{ m} / 3.0\text{ m}) = 2.0\text{ dB}$

6.4 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No.	11143372S-B-R1
Date	February 19, 2016
Temperature / Humidity	24 deg. C / 31 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11n-40 (MIMO) 5310 MHz



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1, 3 Semi Anechoic Chamber
Report No. : 11143372S-B-R1
Date : February 19, 2016 February 23, 2016 February 24, 2016
Temperature / Humidity : 24 deg. C / 31 % RH 20 deg. C / 45 % RH 23 deg. C / 32 % RH
Engineer : Hiroyuki Morikawa Hikaru Shirasawa Shinichi Takano
 (No.1 SAC) (No.3 SAC) (No.3 SAC)
Mode : Tx 11n-40 (MIMO) 5510 MHz

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5460.000	PK	51.6	32.1	17.4	40.5	2.0	62.6	73.9	11.3	168	226	
Hori.	7346.666	PK	44.8	36.9	7.0	40.3	3.1	51.5	73.9	22.4	100	0	
Hori.	11020.000	PK	44.3	40.3	8.2	39.1	3.1	56.8	73.9	17.1	100	0	
Hori.	5460.000	AV	38.3	32.1	17.4	40.5	2.0	49.3	53.9	4.6	168	226	VBW:10Hz
Hori.	7346.666	AV	33.1	36.9	7.0	40.3	3.1	39.8	53.9	14.1	100	0	VBW:10Hz
Hori.	11020.000	AV	32.7	40.3	8.2	39.1	3.1	45.2	53.9	8.7	100	0	VBW:10Hz
Hori.	16530.000	AV	40.3	40.3	10.5	40.4	-9.5	41.2	53.9	12.7	154	223	VBW:10Hz
Vert.	5460.000	PK	53.2	32.1	17.4	40.5	2.0	64.2	73.9	9.7	168	226	
Vert.	7346.666	PK	44.7	36.9	7.0	40.3	3.1	51.4	73.9	22.5	100	0	
Vert.	11020.000	PK	44.3	40.3	8.2	39.1	3.1	56.8	73.9	17.1	100	0	
Vert.	16530.000	PK	54.3	40.3	10.5	40.4	-9.5	55.2	73.9	18.7	156	144	
Vert.	5460.000	AV	39.4	32.1	17.4	40.5	2.0	50.4	53.9	3.5	168	226	VBW:10Hz
Vert.	7346.666	AV	33.1	36.9	7.0	40.3	3.1	39.8	53.9	14.1	100	0	VBW:10Hz
Vert.	11020.000	AV	32.6	40.3	8.2	39.1	3.1	45.1	53.9	8.8	100	0	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 6.4 GHz : 20log(3.75 m / 3.0 m) = 2.0 dB

6.4 GHz - 13 GHz : 20log(4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5470.0000	PK	53.6	32.1	17.4	40.5	2.0	64.6	-30.6	-27.0	3.6	168	226	
Hori.	16530.0000	PK	53.6	40.3	10.5	40.4	-9.5	54.5	-40.7	-27.0	13.7	154	223	
Vert.	5470.0000	PK	55.2	32.1	17.4	40.5	2.0	66.2	-29.0	-27.0	2.0	228	225	
Vert.	16530.0000	PK	54.3	40.3	10.5	40.4	-9.5	55.2	-40.0	-27.0	13.0	156	144	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])=10*LOG (({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

*The 4th harmonic was not seen so the result was its base noise level.

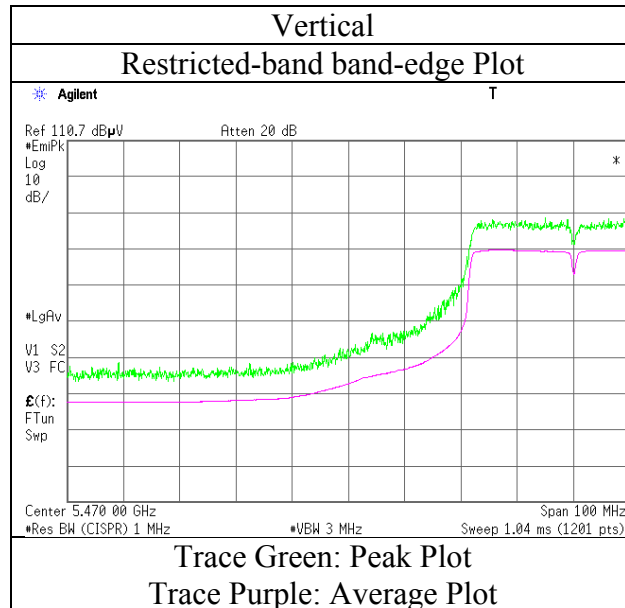
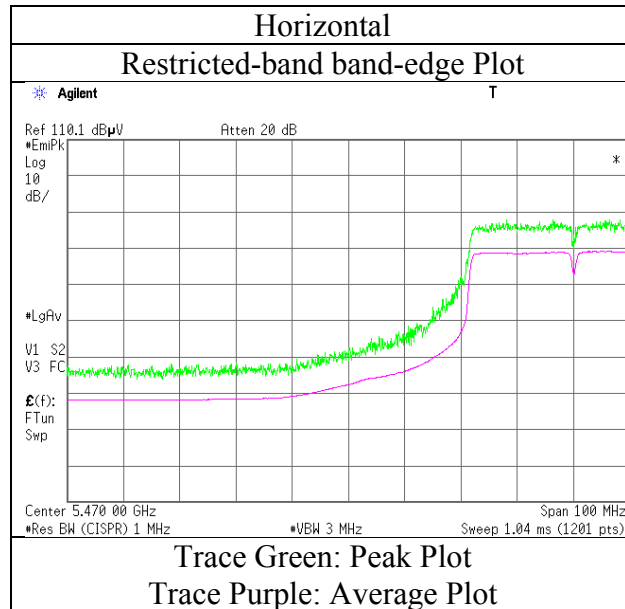
Distance factor : 1 GHz - 6.4 GHz : 20log(3.75 m / 3.0 m) = 2.0 dB

6.4 GHz - 13 GHz : 20log(4.25 m / 3.0 m) = 3.1 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No. : 11143372S-B-R1
Date : February 19, 2016
Temperature / Humidity : 24 deg. C / 31 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx 11n-40 (MIMO) 5500 MHz



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 20, 2016	February 23, 2016	February 24, 2016
Temperature / Humidity	22 deg. C / 27 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Hikaru Shirasawa	Hikaru Shirasawa	Shinichi Takano
Mode	Tx 11n-40 (MIMO) 5550 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7400.000	PK	44.4	36.9	7.1	40.3	3.1	51.2	73.9	22.7	100	0	
Hori.	11100.000	PK	44.2	40.2	8.3	39.0	3.1	56.8	73.9	17.1	100	0	
Hori.	7400.000	AV	33.0	36.9	7.1	40.3	3.1	39.8	53.9	14.1	100	0	VBW:10Hz
Hori.	11100.000	AV	33.3	40.2	8.3	39.0	3.1	45.9	53.9	8.0	100	0	VBW:10Hz
Vert.	7400.000	PK	44.5	36.9	7.1	40.3	3.1	51.3	73.9	22.6	100	0	
Vert.	11100.000	PK	45.8	40.2	8.3	39.0	3.1	58.4	73.9	15.5	100	0	
Vert.	7400.000	AV	33.0	36.9	7.1	40.3	3.1	39.8	53.9	14.1	100	0	VBW:10Hz
Vert.	11100.000	AV	33.4	40.2	8.3	39.0	3.1	46.0	53.9	7.9	100	0	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.25\text{ m} / 3.0\text{ m}) = 0.7\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	16650.000	PK	52.2	40.5	10.5	40.2	-9.5	53.5	-41.7	-27.0	14.7	155	224	
Vert.	16650.000	PK	54.6	40.5	10.5	40.2	-9.5	55.9	-39.3	-27.0	12.3	156	144	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])= $10\cdot\text{LOG}((\{10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20)\cdot 10^{\wedge}(-6)\cdot \text{Distance:3[m]}^{\wedge}2\} / 30)\cdot 10^{\wedge}3)$

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.25\text{ m} / 3.0\text{ m}) = 0.7\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, 3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 19, 2016	February 23, 2016	February 24, 2016
Temperature / Humidity	24 deg. C / 31 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa (No.1 SAC)	Hikaru Shirasawa (No.3 SAC)	Shinichi Takano (No.3 SAC)
Mode	Tx 11n-40 (MIMO) 5670 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7560.000	PK	44.4	37.1	7.2	40.5	3.1	51.3	73.9	22.6	100	0	
Hori.	11340.000	PK	45.0	40.1	8.4	38.9	3.1	57.7	73.9	16.2	100	0	
Hori.	7560.000	AV	33.3	37.1	7.2	40.5	3.1	40.2	53.9	13.7	100	0	VBW:10Hz
Hori.	11340.000	AV	33.0	40.1	8.4	38.9	3.1	45.7	53.9	8.2	100	0	VBW:10Hz
Vert.	7560.000	PK	45.5	37.1	7.2	40.5	3.1	52.4	73.9	21.5	100	0	
Vert.	11340.000	PK	44.4	40.1	8.4	38.9	3.1	57.1	73.9	16.8	100	0	
Vert.	7560.000	AV	33.4	37.1	7.2	40.5	3.1	40.3	53.9	13.6	100	0	VBW:10Hz
Vert.	11340.000	AV	32.9	40.1	8.4	38.9	3.1	45.6	53.9	8.3	100	0	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 6.4 GHz : $20\log(3.75\text{ m} / 3.0\text{ m}) = 2.0\text{ dB}$

6.4 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5725.000	PK	48.4	32.6	17.6	40.4	2.0	60.2	-35.0	-27.0	8.0	157	225	
Hori.	17010.000	PK	53.9	41.3	10.7	39.6	-9.5	56.8	-38.4	-27.0	11.4	153	232	
Vert.	5725.000	PK	48.2	32.6	17.6	40.4	2.0	60.0	-35.2	-27.0	8.2	150	308	
Vert.	17010.000	PK	56.0	41.3	10.7	39.6	-9.5	58.9	-36.3	-27.0	9.3	154	145	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])= $10\log((\{10^{\wedge}(Electric\ Field\ Strength\ [dBuV/m] / 20) * 10^{\wedge}(-6) * Distance:3[m]^{\wedge}2\} / 30) * 10^{\wedge}3)$

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

*The 4th harmonic was not seen so the result was its base noise level.

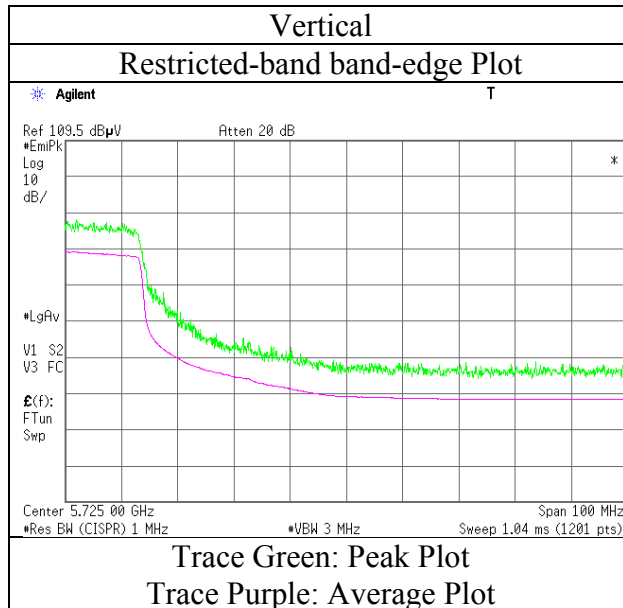
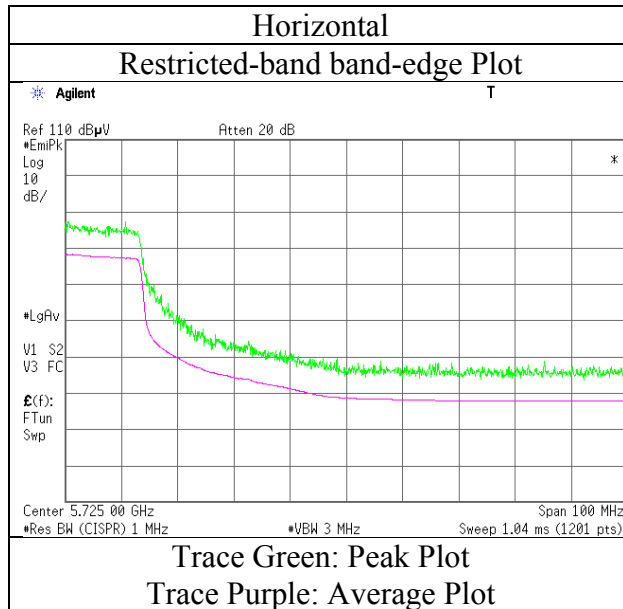
Distance factor : 1 GHz - 6.4 GHz : $20\log(3.75\text{ m} / 3.0\text{ m}) = 2.0\text{ dB}$

6.4 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No. : 11143372S-B-R1
Date : February 19, 2016
Temperature / Humidity : 24 deg. C / 31 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx 11n-40 (MIMO) 5670 MHz



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, 3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 19, 2016	February 23, 2016	February 24, 2016
Temperature / Humidity	24 deg. C / 31 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa (No.1 SAC)	Hikaru Shirasawa (No.3 SAC)	Shinichi Takano (No.3 SAC)
Mode	Tx 11n-40 (MIMO) 5755 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7673.333	PK	47.5	37.3	7.1	40.5	3.1	54.5	73.9	19.4	100	0	
Hori.	11510.000	PK	44.2	40.0	8.5	38.8	3.1	57.0	73.9	16.9	100	0	
Hori.	7673.333	AV	33.8	37.3	7.1	40.5	3.1	40.8	53.9	13.1	100	0	VBW:10Hz
Hori.	11510.000	AV	32.2	40.0	8.5	38.8	3.1	45.0	53.9	8.9	100	0	VBW:10Hz
Vert.	7673.333	PK	45.4	37.3	7.1	40.5	3.1	52.4	73.9	21.5	100	0	
Vert.	11510.000	PK	44.4	40.0	8.5	38.8	3.1	57.2	73.9	16.7	100	0	
Vert.	7673.333	AV	33.8	37.3	7.1	40.5	3.1	40.8	53.9	13.1	100	0	VBW:10Hz
Vert.	11510.000	AV	32.1	40.0	8.5	38.8	3.1	44.9	53.9	9.0	100	0	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 6.4 GHz : $20\log(3.75\text{ m} / 3.0\text{ m}) = 2.0\text{ dB}$

6.4 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5715.000	PK	53.9	32.6	17.6	40.4	2.0	65.7	-29.5	-27.0	2.5	114	276	
Hori.	5725.000	PK	58.7	32.6	17.6	40.4	2.0	70.5	-24.7	-17.0	7.7	114	276	
Hori.	17265.000	PK	46.6	42.1	10.7	39.3	-9.5	50.6	-44.6	-27.0	17.6	153	283	
Vert.	5715.000	PK	55.2	32.6	17.6	40.4	2.0	67.0	-28.2	-27.0	1.2	149	178	
Vert.	5725.000	PK	58.5	32.6	17.6	40.4	2.0	70.3	-24.9	-17.0	7.9	149	178	
Vert.	17265.000	PK	50.1	42.1	10.7	39.3	-9.5	54.1	-41.1	-27.0	14.1	152	146	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])=10*LOG (({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m] } ^ 2) / 30) *10^3

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

*The 4th harmonic was not seen so the result was its base noise level.

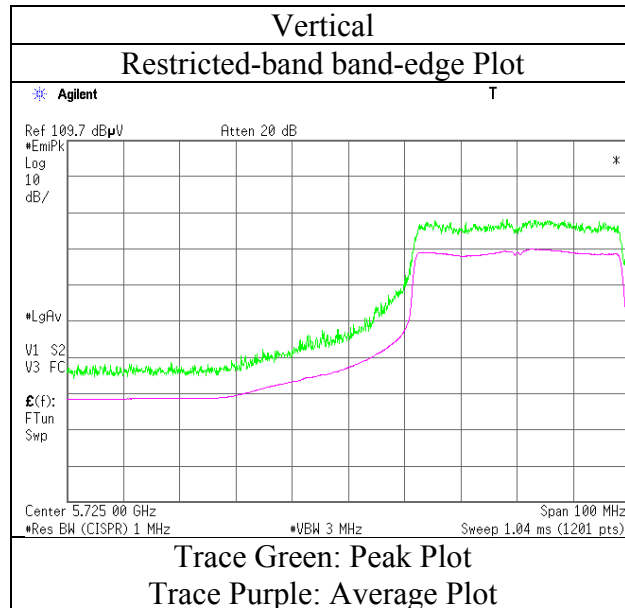
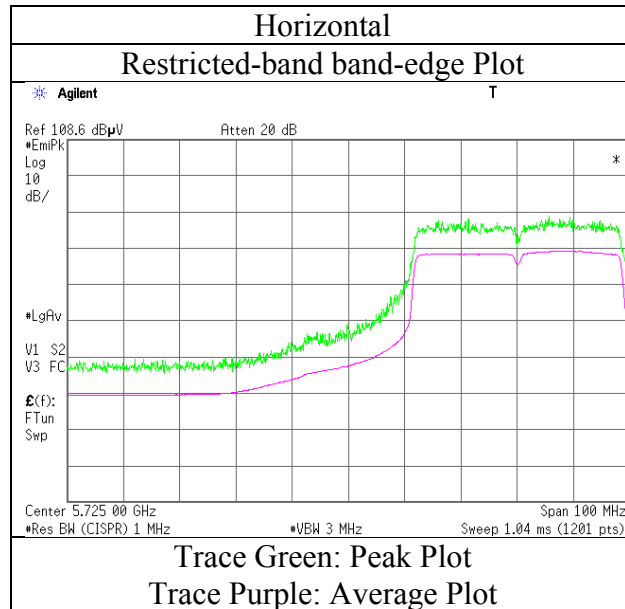
Distance factor : 1 GHz - 6.4 GHz : $20\log(3.75\text{ m} / 3.0\text{ m}) = 2.0\text{ dB}$

6.4 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No. : 11143372S-B-R1
Date : February 19, 2016
Temperature / Humidity : 24 deg. C / 31 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx 11n-40 (MIMO) 5745 MHz



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, 3 Semi Anechoic Chamber		
Report No.	11143372S-B-R1		
Date	February 19, 2016	February 23, 2016	February 24, 2016
Temperature / Humidity	24 deg. C / 31 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH
Engineer	Hiroyuki Morikawa (No.1 SAC)	Hikaru Shirasawa (No.3 SAC)	Shinichi Takano (No.3 SAC)
Mode	Tx 11n-40 (MIMO) 5795 MHz		

(above 1GHz Inside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7726.666	PK	46.0	37.3	7.1	40.5	3.1	53.0	73.9	20.9	100	0	
Hori.	11590.000	PK	43.0	39.9	8.5	38.9	3.1	55.6	73.9	18.3	100	0	
Hori.	7726.666	AV	34.5	37.3	7.1	40.5	3.1	41.5	53.9	12.4	100	0	VBW:10Hz
Hori.	11590.000	AV	31.7	39.9	8.5	38.9	3.1	44.3	53.9	9.6	100	0	VBW:10Hz
Vert.	7726.666	PK	45.8	37.3	7.1	40.5	3.1	52.8	73.9	21.1	100	0	
Vert.	11590.000	PK	43.5	39.9	8.5	38.9	3.1	56.1	73.9	17.8	100	0	
Vert.	7726.666	AV	34.6	37.3	7.1	40.5	3.1	41.6	53.9	12.3	100	0	VBW:10Hz
Vert.	11590.000	AV	31.7	39.9	8.5	38.9	3.1	44.3	53.9	9.6	100	0	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 6.4 GHz : $20\log(3.75\text{ m} / 3.0\text{ m}) = 2.0\text{ dB}$

6.4 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

(Calculation) (above 1GHz Outside of the restricted band)

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5850.000	PK	47.9	32.8	17.7	40.4	2.0	60.0	-35.2	-17.0	18.2	154	248	
Hori.	5860.000	PK	47.4	32.8	17.7	40.4	2.0	59.5	-35.7	-27.0	8.7	154	248	
Hori.	17385.000	PK	45.4	42.5	10.7	39.2	-9.5	49.9	-45.3	-27.0	18.3	156	295	
Vert.	5850.000	PK	48.3	32.8	17.7	40.4	2.0	60.4	-34.8	-17.0	17.8	149	176	
Vert.	5860.000	PK	47.8	32.8	17.7	40.4	2.0	59.9	-35.3	-27.0	8.3	149	176	
Vert.	17385.000	PK	46.6	42.5	10.7	39.2	-9.5	51.1	-44.1	-27.0	17.1	153	143	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Result(EIRP[dBm])=10*LOG (({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m] } ^ 2) / 30) *10^3

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

*The 4th harmonic was not seen so the result was its base noise level.

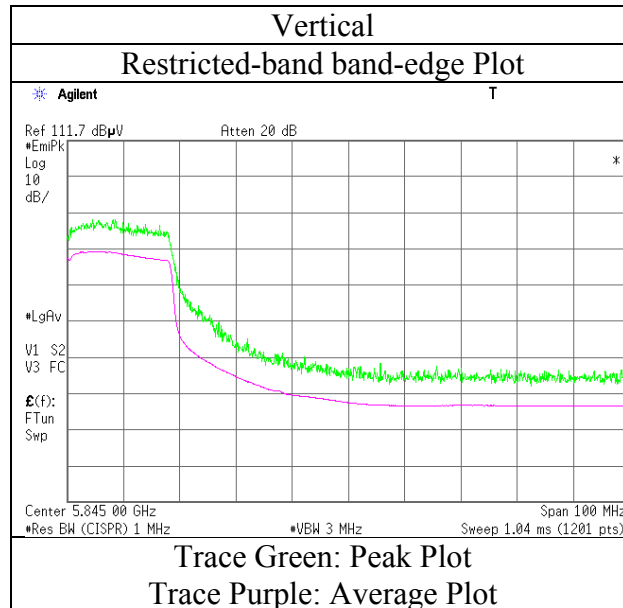
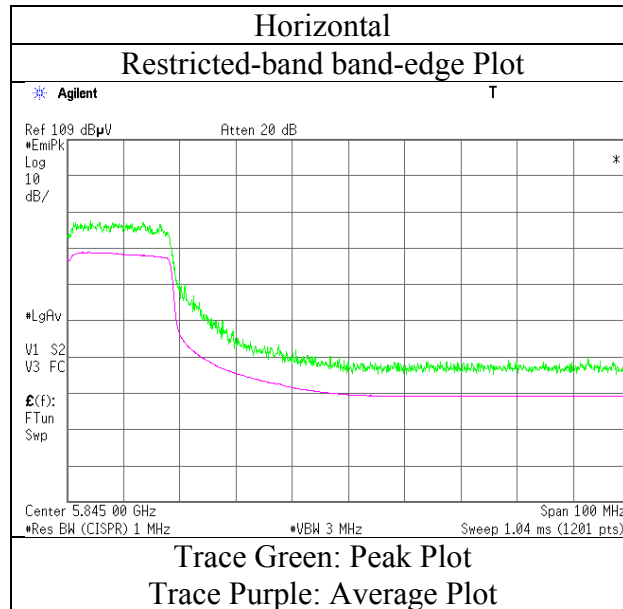
Distance factor : 1 GHz - 6.4 GHz : $20\log(3.75\text{ m} / 3.0\text{ m}) = 2.0\text{ dB}$

6.4 GHz - 13 GHz : $20\log(4.25\text{ m} / 3.0\text{ m}) = 3.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

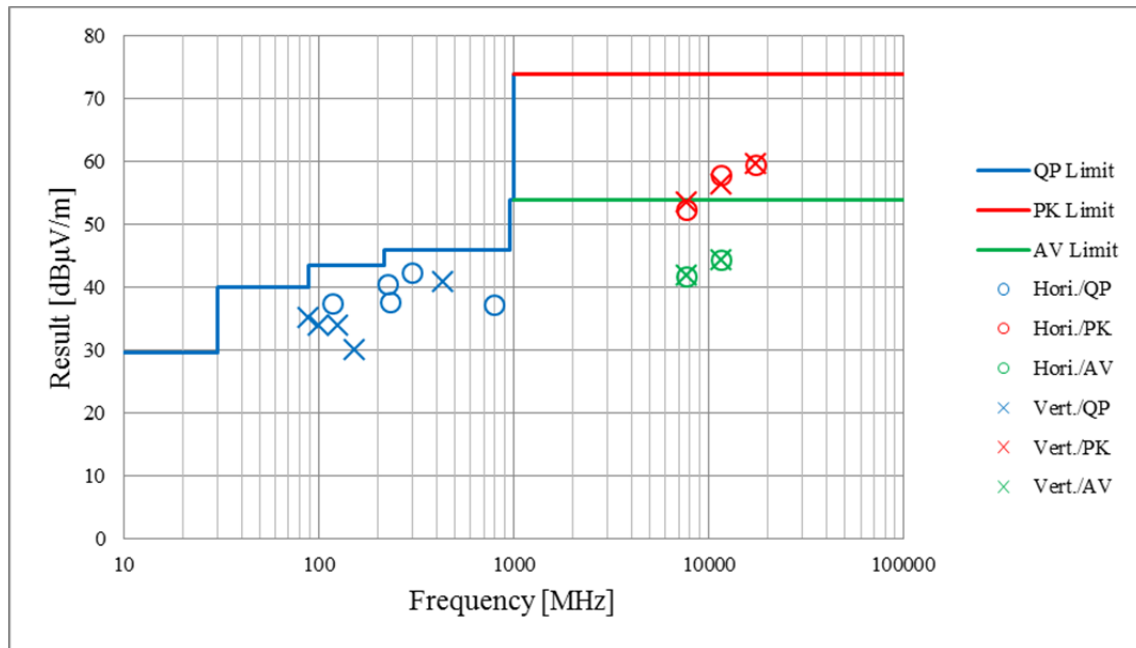
Test place : Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No. : 11143372S-B-R1
Date : February 19, 2016
Temperature / Humidity : 24 deg. C / 31 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx 11n-40 (MIMO) 5795 MHz



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

Radiated Spurious Emission (Plot data, Worst case)

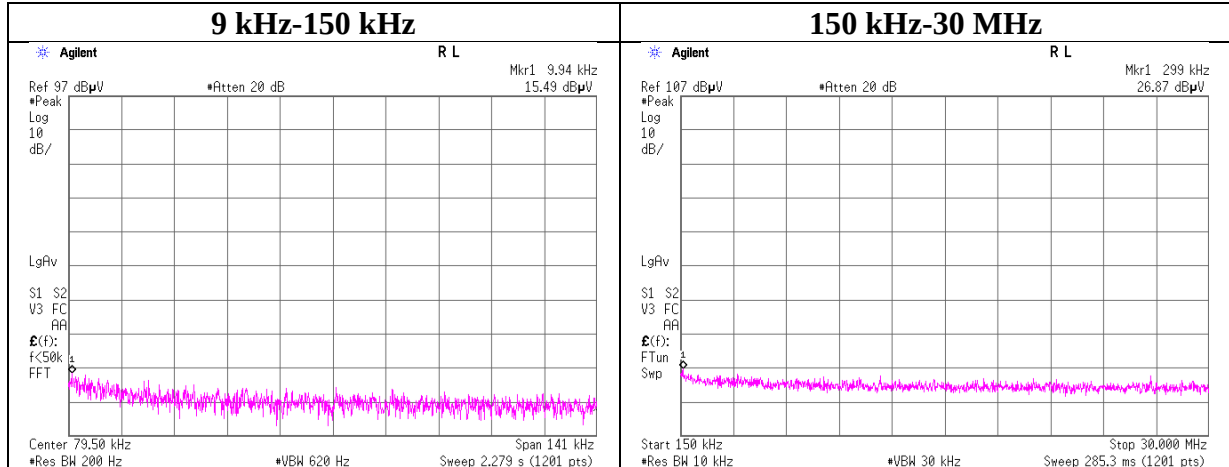
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber			
Report No.	11143372S-B-R1			
Date	February 21, 2016	February 22, 2016	February 24, 2016	February 27, 2016
Temperature / Humidity	22 deg. C / 34 % RH	20 deg. C / 45 % RH	23 deg. C / 32 % RH	22 deg. C / 34 % RH
Engineer	Yosuke Ishikawa	Hikaru Shirasawa	Shinichi Takano	Hiroyuki Morikawa
Mode	Tx 11n-20 (MIMO) 5825 MHz			



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

Conducted Spurious Emission

Test place Shonan EMC Lab. No.1
Measurement Room
Report No. 11143372S-B-R1
Date February 15, 2016
Temperature / Humidity 23 deg. C / 30 % RH
Engineer Yosuke Ishikawa
Mode Tx 11n-40 (MIMO) 5825 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [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
9.94	-91.5	1.01	9.8	-1.3	2	-78.9	300	6.0	-17.7	47.6	65.3	
299.00	-80.2	1.02	9.8	-1.3	2	-67.6	300	6.0	-6.4	18.0	24.4	

$$E = \text{EIRP} - 20 \cdot \log(D) + \text{Ground bounce} + 104.8 \text{ [dBuV/m]}$$

$$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain} + 10 \cdot \log(N)$$

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SRENT-05	Spectrum Analyzer	KEYSIGHT	E4440A	MY46187752	AT	2015/10/05 * 12
SPM-07	Power Meter	Agilent	8990B	MY5100272	AT	2015/04/02 * 12
SPSS-04	Power sensor	Agilent	N1923A	MY5326009	AT	2015/04/02 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	AT	2015/03/11 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2015/04/09 * 12
STM-G4	Terminator	Weinschel	M1459A	U6592	AT	2015/07/14 * 12
KTS-08	Digital Tester	SANWA	PC500	7019224	AT	2015/05/20 * 12
SOS-13	Humidity Indicator	Custom	CTH-202	Q.C.17	AT	2015/12/07 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT	2015/03/26 * 12
SRENT-04	Spectrum Analyzer	KEYSIGHT	E4440A	MY46186388	AT	2015/10/06 * 12
STS-05	Digital Hitester	Hioki	3805-50	080997828	AT	2015/11/18 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2015/12/07 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2015/03/23 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2015/04/17 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2015/05/19 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2015/08/10 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2015/10/22 * 12
SJM-16	Measure	ASKUL	-	-	RE	-
SAEC-01(SVS WR)	Semi-Anechoic Chamber	TDK	SAEC-01(SVSWR)	1	RE	2015/07/08 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFI,MF)	-	RE	-
STS-01	Digital Hitester	Hioki	3805-50	080997812	RE	2015/11/18 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2015/11/04 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2015/03/26 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2015/05/27 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-018	RE	2015/06/08 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2015/05/19 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2015/08/11 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2015/10/22 * 12
SJM-15	Measure	ASKUL	-	-	RE	-
SAEC-03(SVS WR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2015/08/28 * 12
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE	2015/11/18 * 12
SFL-03	Highpass Filter	MICRO-TRONICS	HPM50112	028	RE	2015/11/16 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2015/03/17 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2015/03/23 * 12
SCC-G31	Coaxial Cable	Junkosha	MWX241-01000K MSKMS	OCT-08-13-046	RE	2015/04/09 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2015/03/11 * 12
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2015/03/17 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2015/09/07 * 12
SCC-G19	Coaxial Cable	Suhner	SUCOFLEX 102A	1188/2A	RE	2015/03/11 * 12

UL Japan, Inc.

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SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2015/07/16 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2015/10/11 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2015/10/11 * 12
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2015/08/31 * 12
SCC-C1/C2/C3/ C4/C5/C10/SRS E-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/ Suhner/Suhner/Suhner/ TOYO	8D2W/12DSFA/141 PE/141PE/141PE/14 1PE/NS4906	-/0901-271(RF Selector)	RE	2015/04/17 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2016/02/25 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2015/03/24 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2015/03/23 * 12
SCC-C9	Coaxial Cable	Suhner	RG223U	-	CE	2015/04/17 * 12
SLS-01	LISN	Rohde & Schwarz	ENV216	100511	CE	2016/02/08 * 12
SAT3-10	Attenuator	JFW	50HF-003N	-	CE	2015/08/31 * 12
SOS-02	Humidity Indicator	A&D	AD-5681	4063343	CE	2015/12/07 * 12
TR-09	Test Receiver	Rohde & Schwarz	ESCI	100769	CE	2015/09/30 * 12
SJM-02	Measure	KOMELON	KMC-36	-	CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFI,MF)	-	CE	-
STS-01	Digital Hitester	Hioki	3805-50	080997812	CE	2015/11/18 * 12

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

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

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

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

UL Japan, Inc.

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