



RADIO TEST REPORT

Test Report No. : 10706993H-E-R1

Applicant : MITSUBISHI ELECTRIC CORPORATION SANDA WORKS

Type of Equipment : Display Audio

Model No. : NR-000

FCC ID : UJHNR000

Test regulation : FCC Part 15 Subpart E: 2015

Test Result : Complied

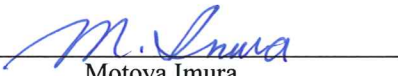
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6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 10706993H-E. 10706993H-E is replaced with this report.

Date of test: April 20 to 24, 2015

Representative test engineer:


Satofumi Matsuyama
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Approved by:


Motoya Imura
Engineer
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NVLAP LAB CODE: 200572-0

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 10706993H-E

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SECTION 1: Customer information

Company Name	:	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS
Address	:	2-3-33, Miwa, Sanda-city, Hyogo, 669-1513, Japan
Telephone Number	:	+81-79-559-3623
Facsimile Number	:	+81-79-559-3875
Contact Person	:	Kenji Otani

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

2.1 Identification of E.U.T.

Type of Equipment	:	Display Audio
Model No.	:	NR-000
Serial No.	:	Refer to Clause 4.2
Rating	:	DC 12.0 V
Receipt Date of Sample	:	March 7, 2015
Country of Mass-production	:	Thailand
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

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2.2 Product Description

General Specification

Clock frequency(ies) in the system : 900 MHz (Radio part: 26 MHz)

Radio Specification

Radio Type : Transceiver
Power Supply (inner) : DC 3.3 V / DC 1.8 V

Radio Specification

	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n (20 M band)	IEEE802.11n (40 M band)
Frequency of operation	2412 MHz - 2462 MHz	2412 MHz - 2462 MHz	[For FCC] 5180 MHz - 5240 MHz *1) 5260 MHz - 5320 MHz *1) 5500 MHz - 5700 MHz *1) 5745 MHz - 5825 MHz *1) [For IC] 5280 MHz - 5320 MHz 5745 MHz - 5825 MHz	[For FCC] 5190 MHz - 5230 MHz *1) 5270 MHz - 5310 MHz *1) 5510 MHz - 5670 MHz *1) 5755 MHz - 5795 MHz *1) [For IC] 5310 MHz 5755 MHz - 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	40 MHz
Antenna type	Inverted F Antenna			
Antenna Gain	0.29 dBi		W52, W53 band: 3.6 dBi W56, W58 band: 2.17 dBi	

*1) This test report applies for WLAN (IEEE802.11a/n-20/n-40 [5GHz band]).

	GPS/GLONASS	Bluetooth Ver.3.0 with EDR function
Frequency of operation	GPS: 1575.42 MHz GLONASS: 1597.55 MHz - 1605.89 MHz	2402 MHz - 2480 MHz
Type of modulation	GPS: BPSK GLONASS: BPSK	FHSS (GFSK, $\pi/4$ -DQPSK, 8-DPSK)
Channel spacing	GLONASS: 0.5625 MHz	1 MHz
Antenna type	Inverted F Antenna	Inverted F Antenna
Antenna Gain	0 dBi	0.29 dBi

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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 January 21, 2015

Title : FCC 47CFR Part15 Radio Frequency Device Subpart E
Unlicensed National Information Infrastructure Devices
Section 15.407 General technical requirements

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC : ANSI C63.4: 2009 IC: RSS-Gen 8.8	FCC: 15.407(b)(6) / 15.207 IC: RSS-Gen 8.8	N/A	N/A *1)	-
26dB Emission Bandwidth	FCC : ANSI C63.4: 2009, FCC KDB Publication Number 789033 IC: -	FCC : 15.407(a)(1)(2)(3) IC: -	See data	N/A	Conducted
Maximum Conducted Output Power	FCC : ANSI C63.4: 2009, FCC KDB Publication Number 789033 IC: -	FCC : 15.407(a)(1)(2)(3) IC: RSS-247 6.2.1(1) 6.2.2(1) 6.2.3(1) 6.2.4(1)		Complied	Conducted
Maximum Power Spectral Density	FCC : ANSI C63.4: 2009, FCC KDB Publication Number 789033 IC: -	FCC : 15.407(a)(1)(2)(3) IC: RSS-247 6.2.1(1) 6.2.2(1) 6.2.3(1) 6.2.4(1)		Complied	Conducted
Spurious Emission Restricted Band Edge	FCC : ANSI C63.4: 2009 IC: -	FCC : 15.407(b), 15.205 and 15.209 IC: RSS-247 6.2.1(2) 6.2.2(2) 6.2.3(2) 6.2.4(2)	2.4dB 7600.033MHz, AV, Hori. 7559.944MHz, AV, Hori.	Complied	Conducted (below 30MHz) / Radiated (above 30MHz) *2)
6dB Emission Bandwidth	FCC : ANSI C63.4: 2009	FCC : 15.407(e)	See data	Complied	Conducted

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.
*2) Radiated test was selected over 30 MHz based on section FCC15.407(b) and KDB 789033 D02 G.3.b).
* For DFS tests, please see the test report number 10706993H-G-R1 issued by UL Japan, Inc.

FCC 15.31 (e)

The EUT provides stable voltage (DC 3.3 V / DC 1.8 V) constantly to the wireless transmitter regardless of input voltage.

Instead of a new battery, DC power supply was used for the test.

That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the car. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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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

EMI

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.

Test room (semi-anechoic chamber)	Radiated emission						
	(3 m*)(+dB)				(1 m*)(+dB)		(0.5 m*)(+dB)
	9 kHz - 30 MHz	30 MHz - 300 MHz	300 MHz - 1 GHz	1 GHz - 10 GHz	10 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz
No.1	4.3 dB	5.5 dB	6.3 dB	5.5 dB	5.8 dB	5.8 dB	4.3 dB
No.2	4.2 dB	5.4 dB	6.3 dB	5.4 dB	5.7 dB	5.9 dB	5.6 dB
No.3	4.4 dB	5.4 dB	6.4 dB	5.2 dB	5.5 dB	5.8 dB	5.5 dB
No.4	4.7 dB	5.6 dB	6.4 dB	5.3 dB	5.7 dB	5.9 dB	5.5 dB

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

Antenna terminal conducted emission and Power density (+dB)			Antenna terminal conducted emission (+dB)		Channel power (+dB)
Below 1 GHz	1 GHz – 3 GHz	3 GHz – 18 GHz	18 GHz - 26.5 GHz	26.5 GHz – 40 GHz	
1.5dB	1.7dB	2.8dB	2.8dB	2.9dB	2.6dB

Radiated emission test(3m)

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

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3.5 Test Location

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

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

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

Refer to APPENDIX.

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

4.1 Operating Modes

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

Mode	Remarks*
IEEE 802.11a (11a)	18 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 3, PN9
IEEE 802.11n 40 MHz BW (11n-40)	MCS 2, PN9
*The worst 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 Setting: IEEE 802.11a/n-20: 7dBm, IEEE 802.11n-40: 5dBm - Software: Internal Software Ver1.0 *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.	

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*The details of Operating mode(s)

Test Item	Operating Mode	Tested Frequency			
		Lower Band	Middle Band	Additional Band	Upper Band
26dB Emission Bandwidth	11a Tx 11n-20 Tx	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	-
	11n-40 Tx	-	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	-
99% Occupied Bandwidth, Maximum Conducted Output Power, Maximum Power Spectral Density	11a Tx 11n-20 Tx	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx	5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
Radiated Spurious Emission (Below 1GHz)	11n-20 Tx *1)	-	-	5580MHz	-
Radiated Spurious Emission (Above 1GHz)	11n-20 Tx *2)	5180 MHz	5260 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx	5190 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
Conducted Spurious Emission	11n-20 Tx *1)	-	-	5580 MHz	-
6dB Bandwidth	11a Tx 11n-20 Tx	-	-	-	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx	-	-	-	5755 MHz 5795 MHz

*1) The operating mode and tested frequency were tested as a representative, because it had the highest power at antenna terminal test.

*2) Since 11a and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest peak output power

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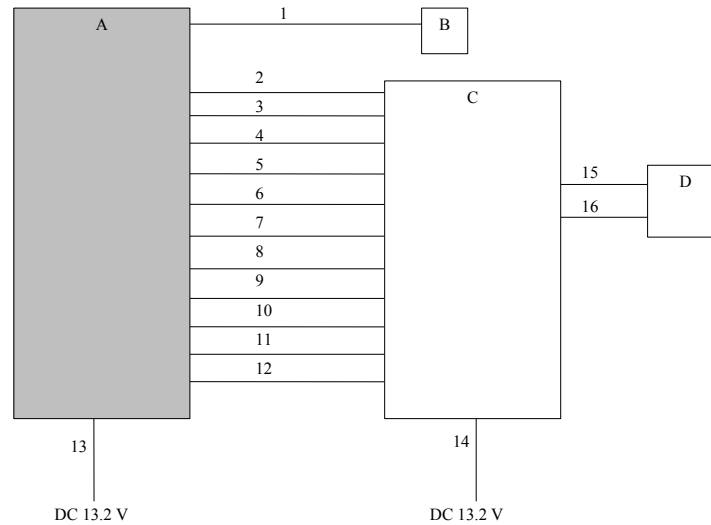
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4.2 Configuration and peripherals



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

* The testing was performed with DC 13.2 V only.

As the stable voltage (DC 3.3 V / DC 1.8 V) is provided to RF module via the internal regulator, it does not influence on the test result.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Display Audio	NR-000	94ZN6004 *1) 94ZN6003 *2)	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS	EUT
B	GPS Antenna	-	-	MITSUMI	-
C	Dummy board	-	320496A002	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS	-
D	Display	39710-TBAA-A110-M1	411V1FW000803	LG	-

*1) Used for Antenna terminal conducted test.

*2) Used for Spurious Emission test.

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	GPS Cable	3.0	Shielded	Shielded	-
2	Signal Cable	2.0	Shielded	Shielded	-
3	Signal Cable	2.0	Shielded	Shielded	-
4	Signal Cable	2.0	Shielded	Shielded	-
5	Signal Cable	2.0	Shielded	Shielded	-
6	Signal Cable	2.0	Unshielded	Unshielded	-
7	Signal Cable	2.0	Unshielded	Unshielded	-
8	Signal Cable	2.0	Unshielded	Unshielded	-
9	Signal Cable	2.0	Shielded	Shielded	-
10	Signal Cable	2.0	Shielded	Shielded	-
11	Signal Cable	2.0	Shielded	Shielded	-
12	Signal Cable	2.0	Unshielded	Unshielded	-
13	DC Cable	2.0	Unshielded	Unshielded	-
14	DC Cable	2.0	Unshielded	Unshielded	-
15	Display Cable	0.3	Shielded	Shielded	-
16	Display Cable	0.3	Unshielded	Unshielded	-

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SECTION 5: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

The height of the measuring antenna varied between 1 m 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 made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Below 1GHz

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

Above 1GHz

Inside of restricted bands(Section 15.205): Apply to limit in the Section 15.209(a).

Outside of the restricted bands: Apply to limit 68.2dBuV/m(−27dBm e.i.r.p. ^{*})
in the Section 15.407(b)(1)(2)(3).
Apply to limit 68.2dBuV/m(−27dBm e.i.r.p. ^{*}) or
78.2dBuV/m(−17dBm e.i.r.p. ^{*}) in the Section 15.407(b).

Restricted bandedge:

Apply to limit in the Section 15.209(a).

Since this limit is severer than the limit of the inside of restricted bands.

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

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

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Test Antennas are used as below;

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

Frequency	Below 1GHz	Above 1GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	PK	AV *1)
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	<u>Method AD</u> RBW: 1MHz VBW: 3MHz Detector: Power Averaging (RMS) Trace: 100 traces Duty factor was added to the results. <u>Integration Method</u> RBW: 100kHz VBW: 300kHz Band Power: 1MHz Detector: Power Averaging (RMS) Trace: 100 traces Duty factor was added to the results.
Test Distance	3m	3m (below 10GHz), 1m*2) (above 10GHz), 0.5m*3) (above 26.5GHz)	

*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on June 6, 2014)".

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

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

The test was performed with the worst angle of carrier and noise levels.

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

Measurement range : 30M-40GHz

Test data : APPENDIX

Test result : Pass

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SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26dB Bandwidth	40MHz	Close to 1% of EBW	Greater than RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	1.5 times to 5.0 times the OBW	1% to 5% of the OBW	≥ 3 RBW	Auto	Peak	Max Hold *1)	Spectrum Analyzer
6dB Bandwidth	40MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Averaging	-	Power Meter (Sensor: 80MHz BW) (Method PM-G)
Maximum Power Spectral Density	40MHz	1MHz or 500kHz *2)	3MHz or 1.5MHz	Auto	Sample Power Averaging (200 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3)	9kHz-150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz-30MHz	9.1kHz	27kHz				
Band Edge confirmation *4)	80 MHz	1 MHz	$\geq 1/T$	Auto	Peak	Max Hold	Spectrum Analyzer (Method VB)

*The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on June 6, 2014)".

*1) The measurement was performed with Max Hold since the duty cycle was not 100%.

*2) FCC standard says that RBW is set to be 500kHz for 5.725-5.850GHz, but it is not possible with spectrum analyzer, so $10\log(500\text{kHz}/470\text{kHz})$ was added to the test result.

*3) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.

Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz)

*4) Reference data

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

Test data : APPENDIX

Test result : Pass

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APPENDIX 1: Data of EMI test

26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10706993H
Date : 04/23/2015
Temperature/ Humidity : 23 deg. C / 34 % RH
Engineer : Yuta Moriya
Mode : 11a Tx / 11n-20 Tx / 11n-40 Tx

11a

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	-	16.4172	-
5220	-	16.7351	-
5240	-	16.6765	-
5260	20.484	16.6650	-
5300	19.976	16.7404	-
5320	18.969	16.3550	-
5500	18.446	16.3686	-
5580	20.837	16.7642	-
5700	18.064	16.4533	-
5745	-	16.3950	-
5785	-	16.6829	-
5825	-	16.3764	-

11n-20

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	-	17.4906	-
5220	-	17.6807	-
5240	-	17.6743	-
5260	21.137	17.6961	-
5300	21.353	17.6686	-
5320	19.924	17.5639	-
5500	19.928	17.4819	-
5580	20.760	17.7257	-
5700	19.574	17.4808	-
5745	-	17.4671	-
5785	-	17.7841	-
5825	-	17.5482	-

11n-40

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5190.0	-	35.7702	-
5230.0	-	36.0044	-
5270.0	40.943	35.9163	-
5310.0	41.157	35.8860	-
5510.0	38.618	35.7322	-
5550.0	41.364	36.1645	-
5670.0	42.747	35.9019	-
5755.0	-	35.7783	-
5795.0	-	35.8814	-

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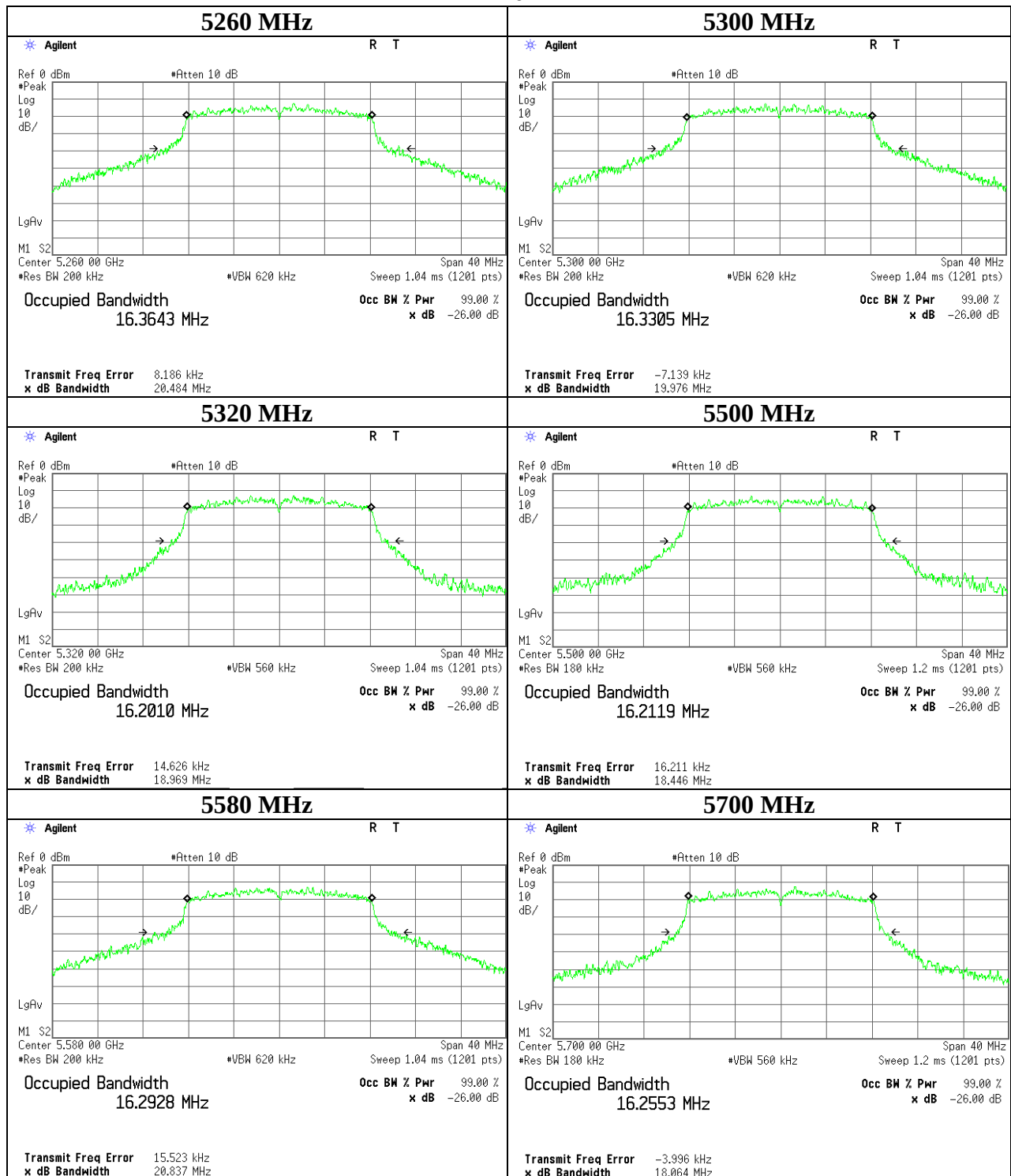
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

26dB Emission Bandwidth

11a



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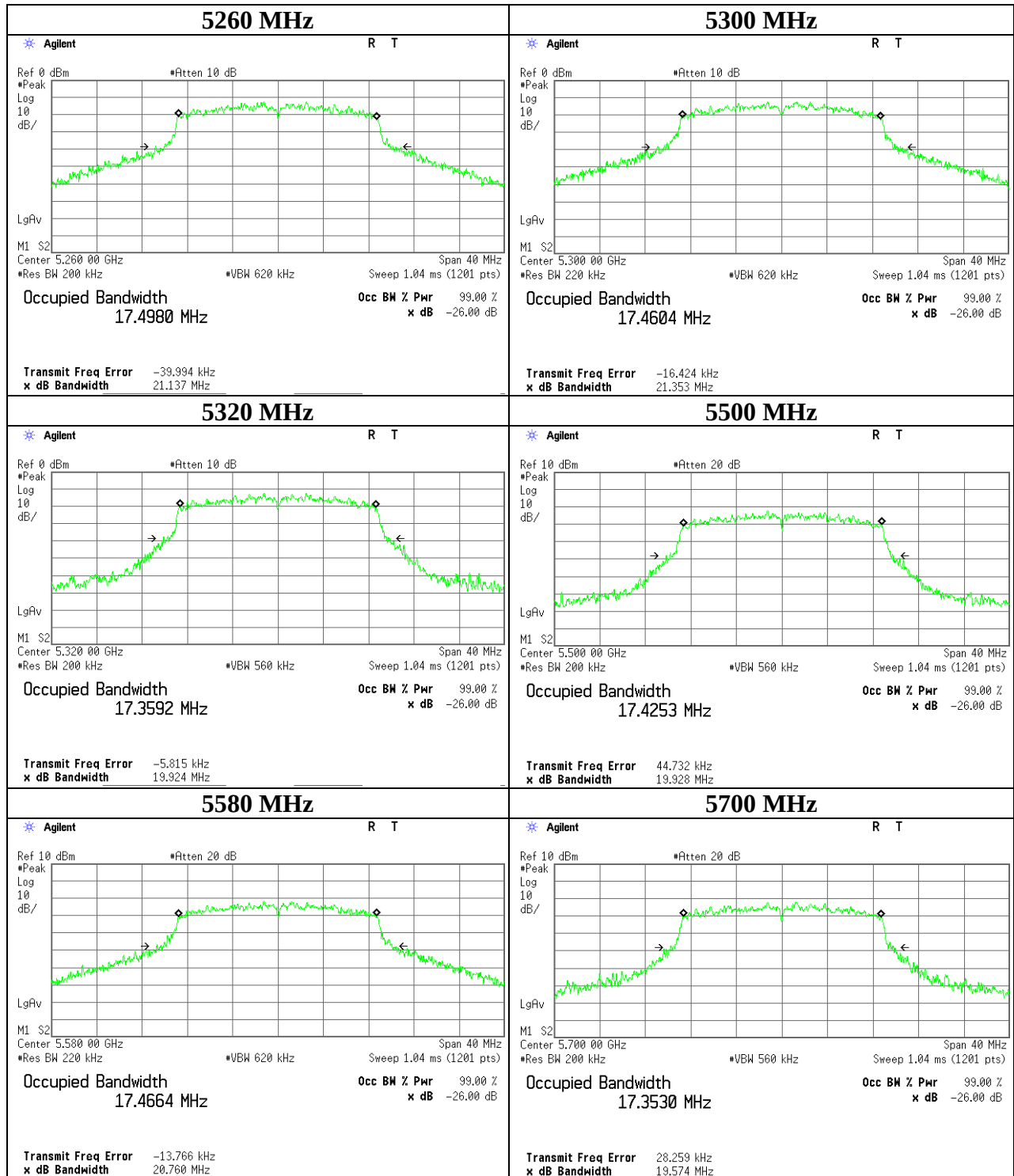
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

26dB Emission Bandwidth

11n-20



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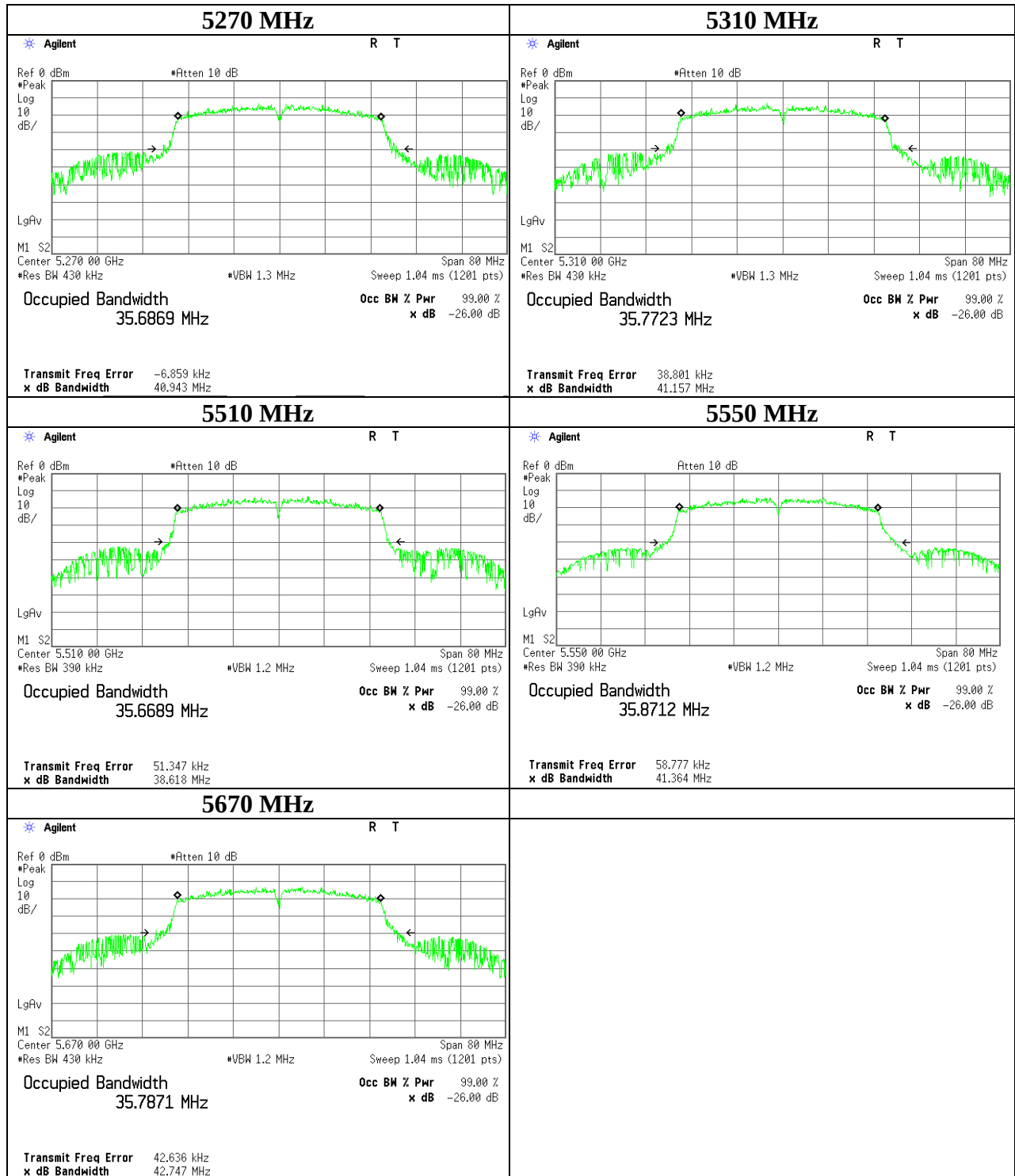
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Facsimile : +81 596 24 8124

26dB Emission Bandwidth

11n-40



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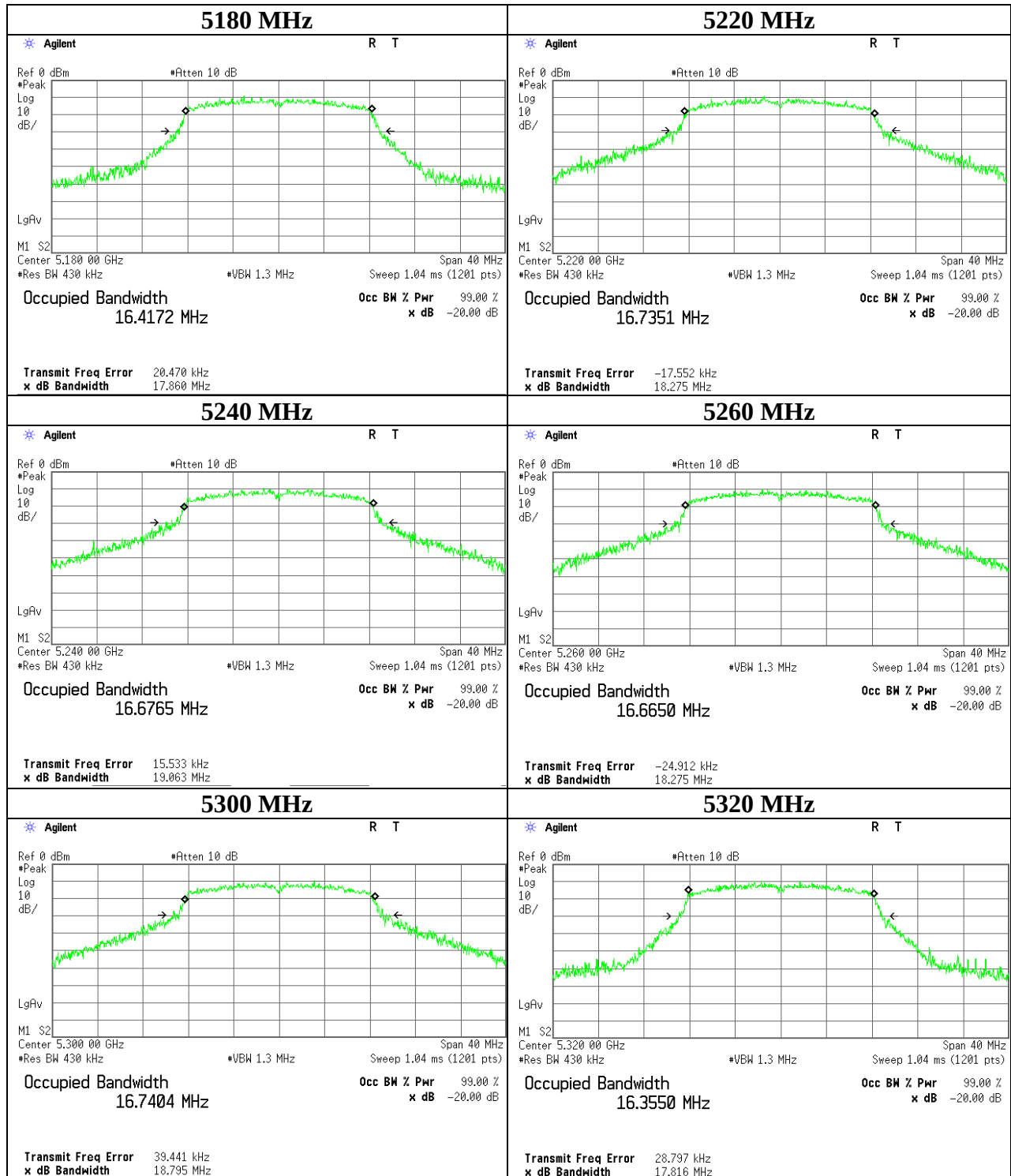
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

11a



UL Japan, Inc.

Ise EMC Lab.

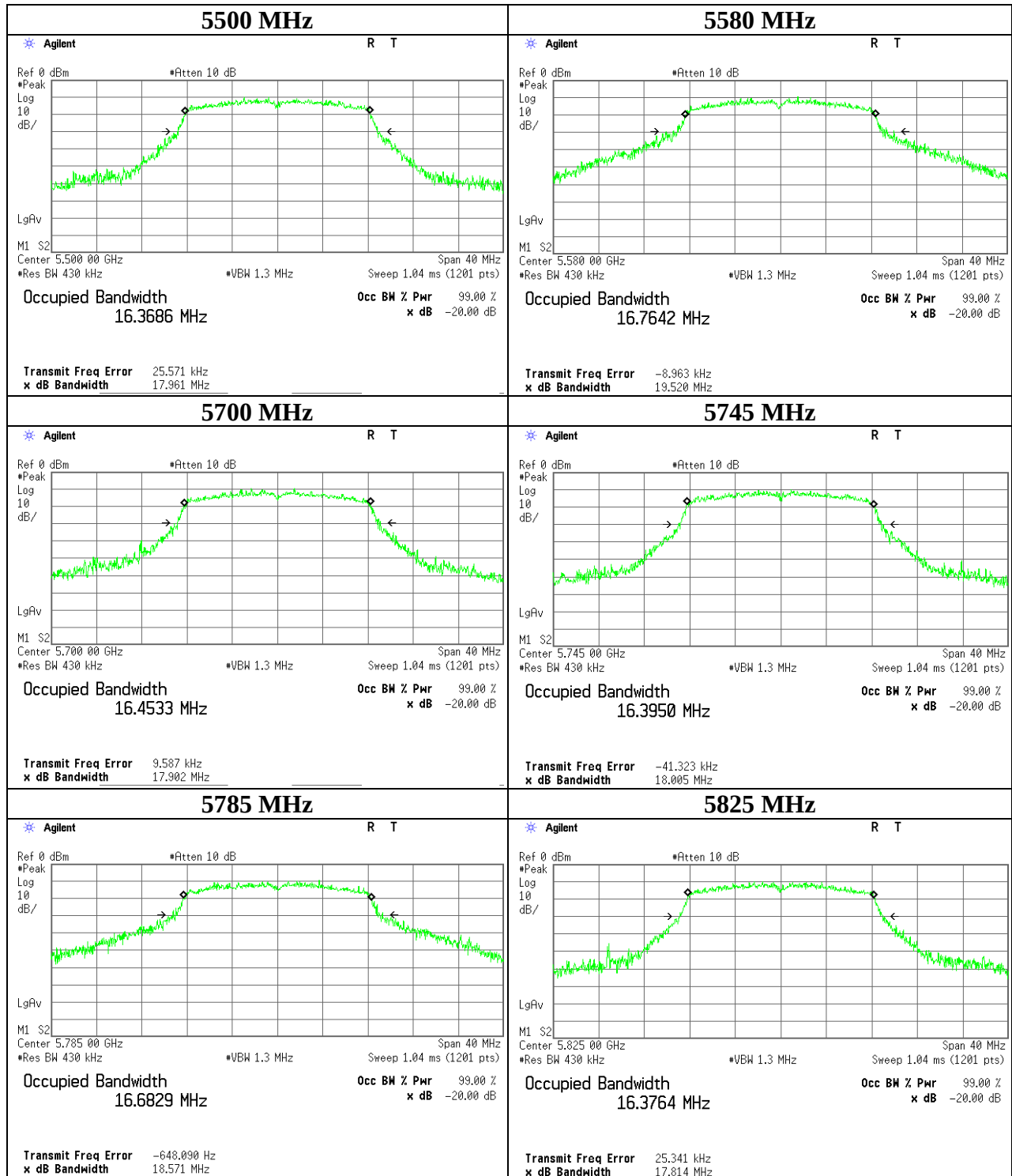
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

11a



UL Japan, Inc.

Ise EMC Lab.

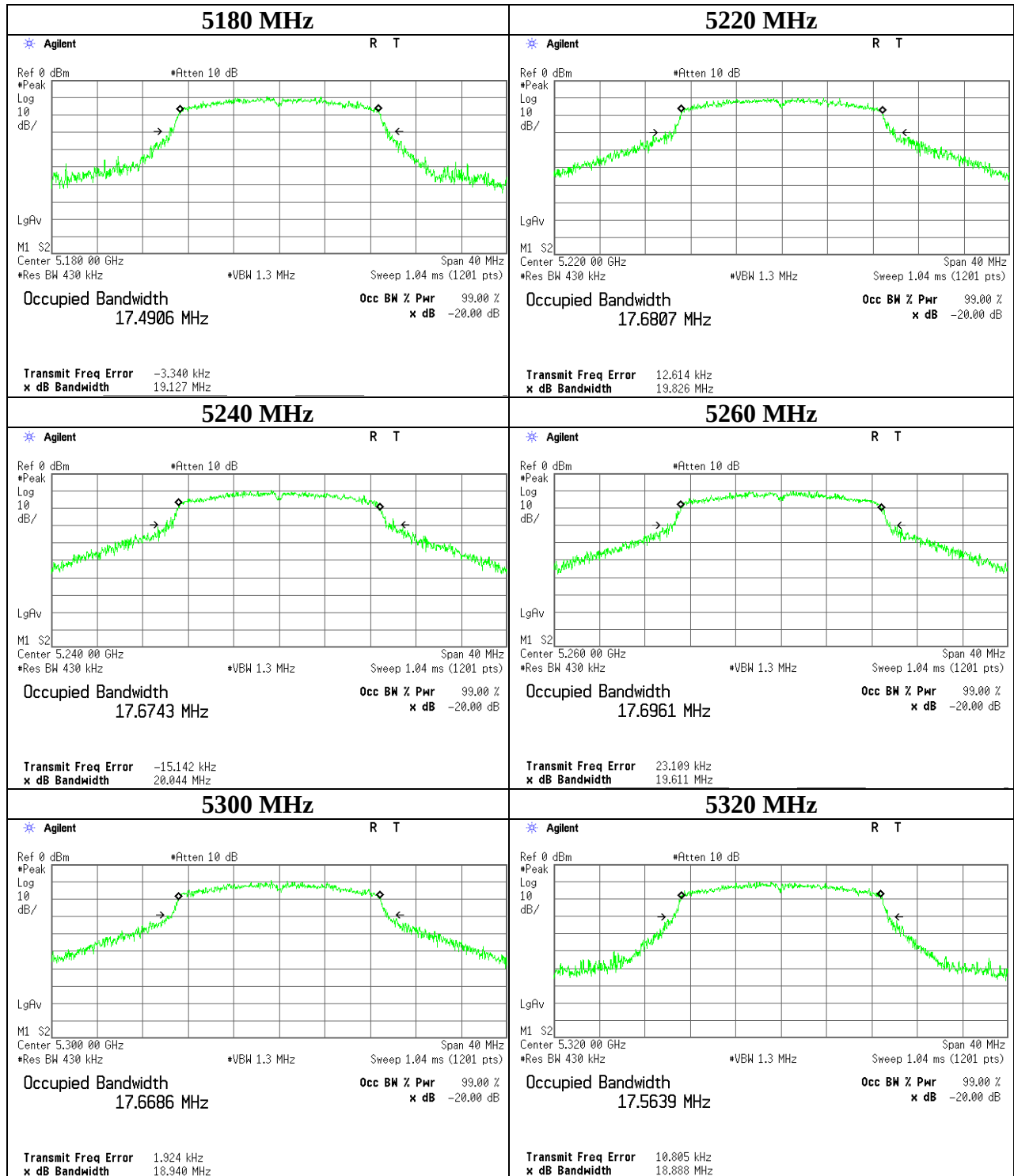
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

11n-20



UL Japan, Inc.

Ise EMC Lab.

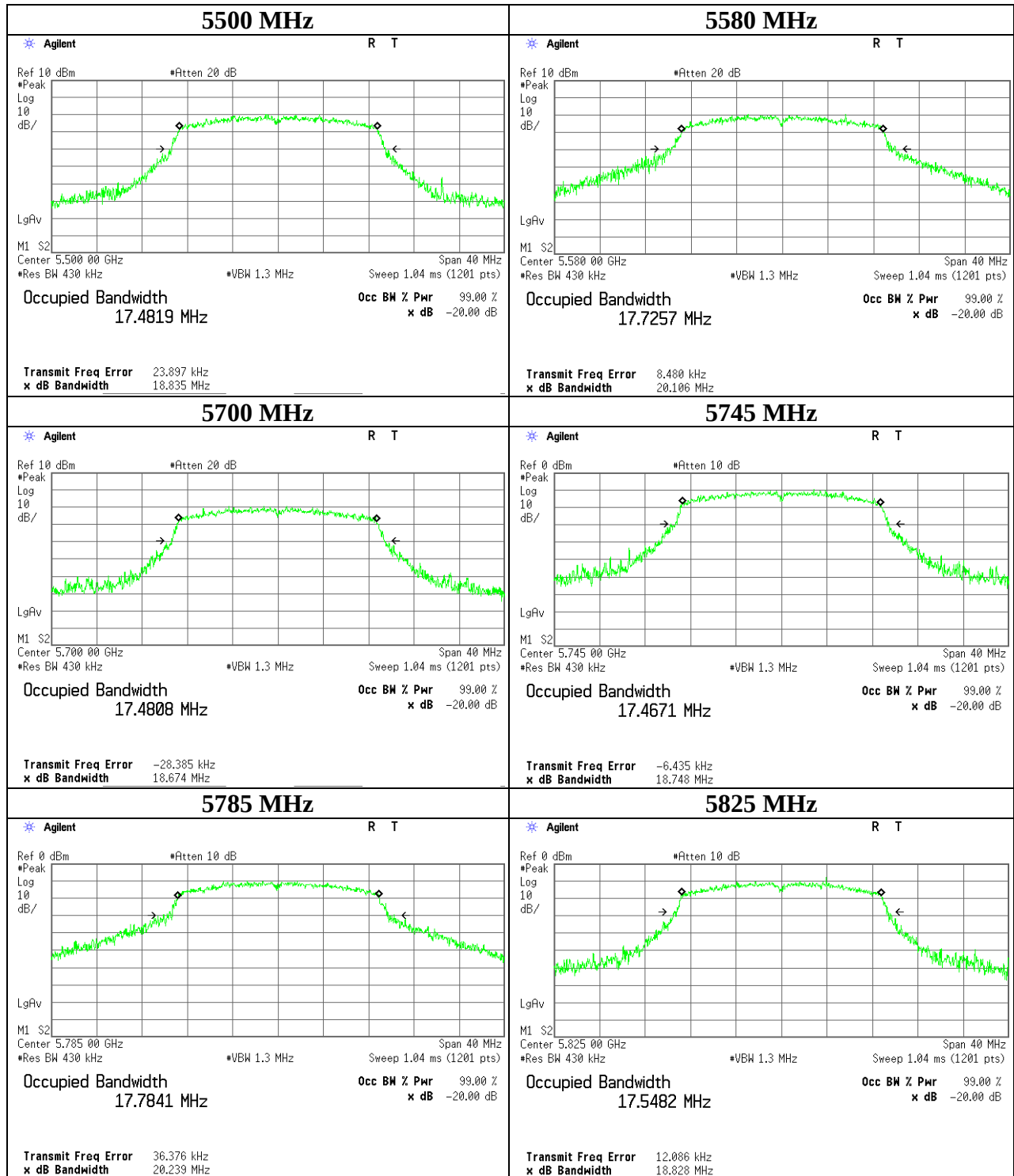
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

11n-20



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Ise EMC Lab.

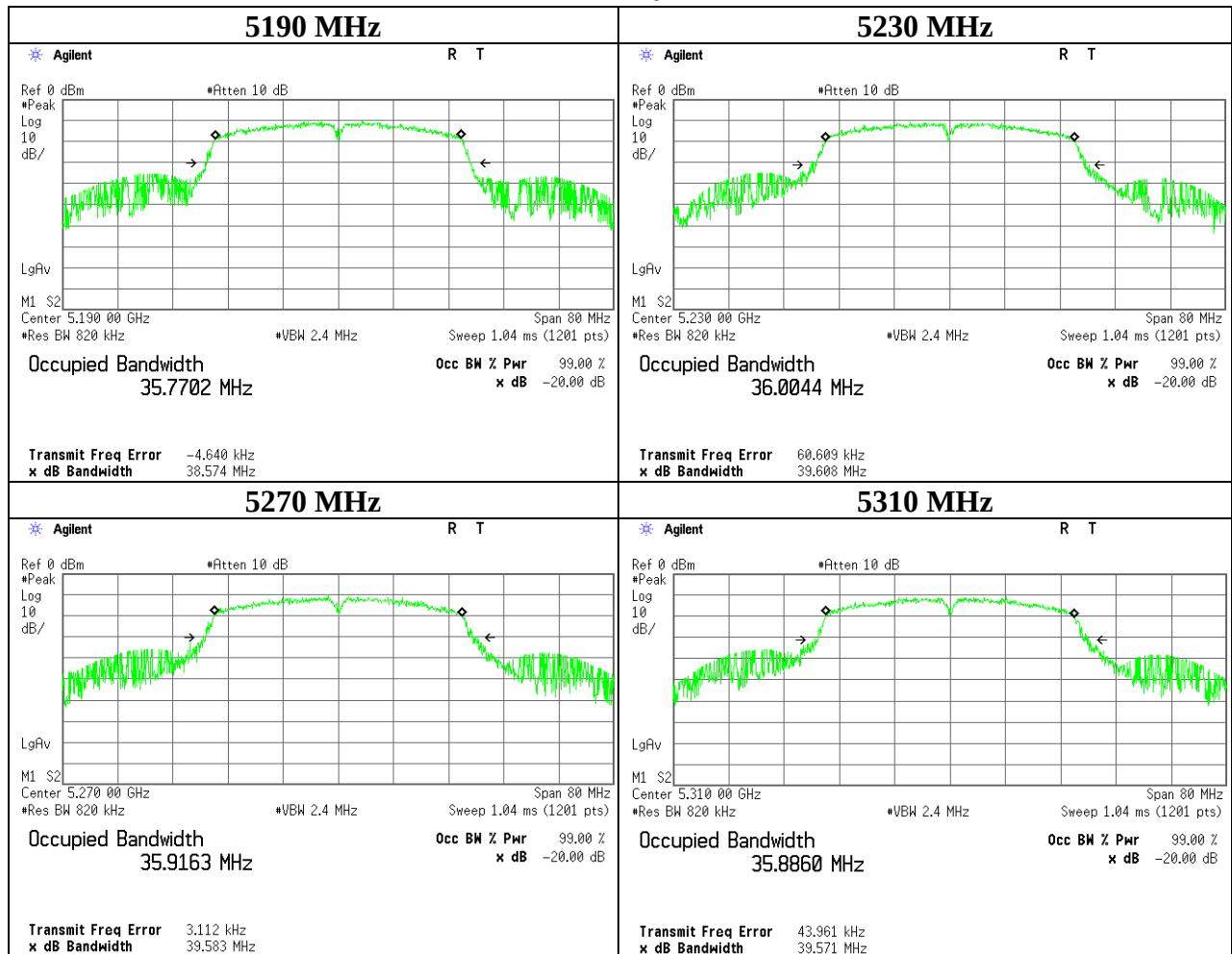
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

11n-40



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Ise EMC Lab.

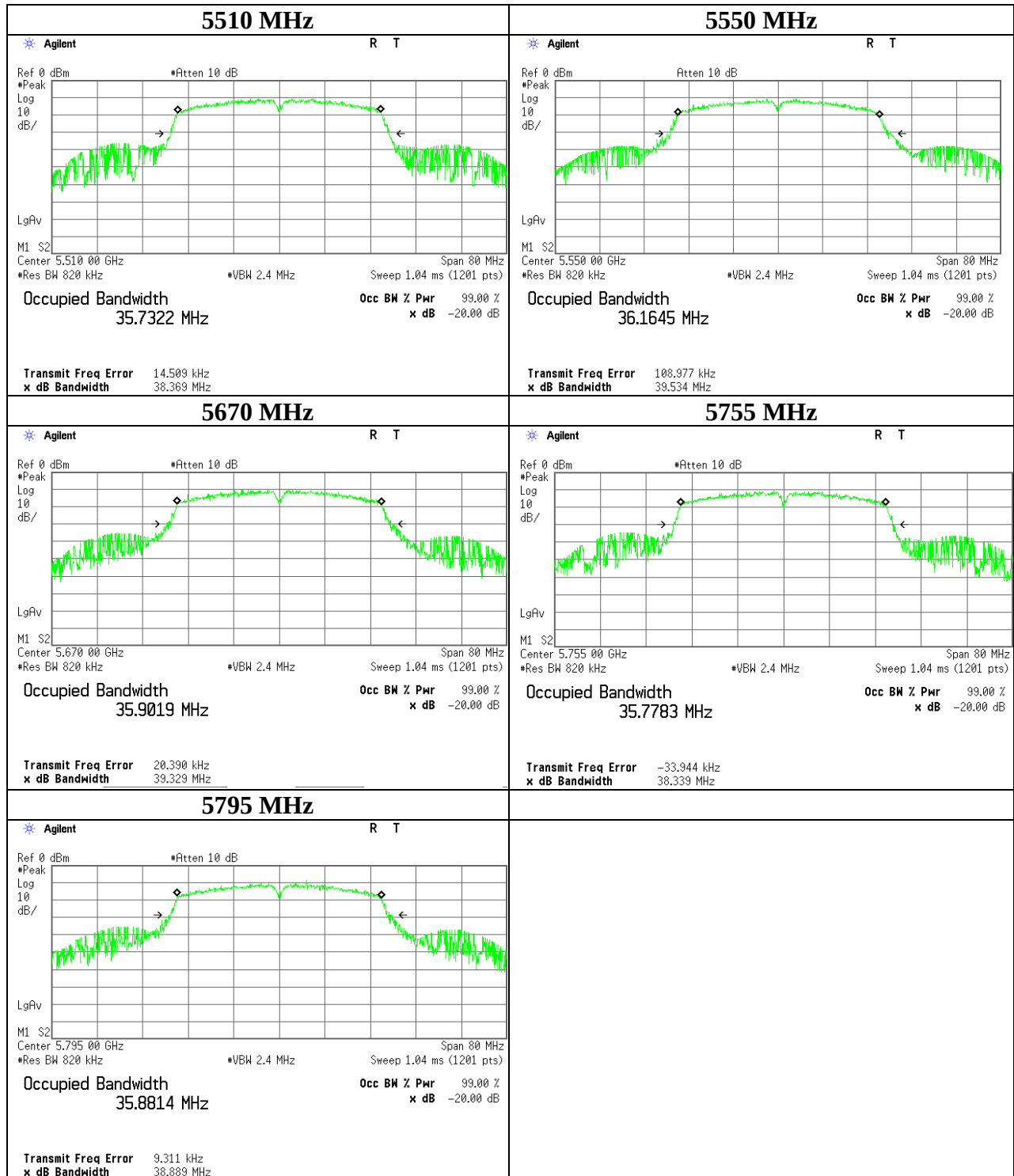
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99% Occupied Bandwidth

11n-40



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6dB Bandwidth

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 10706993H
Date 04/23/2015
Temperature/ Humidity 23 deg. C / 34 % RH
Engineer Yuta Moriya
Mode 11a Tx / 11n-20 Tx / 11n-40 Tx

11a

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
5745	15.000	> 500
5785	14.181	> 500
5825	15.030	> 500

11n-20

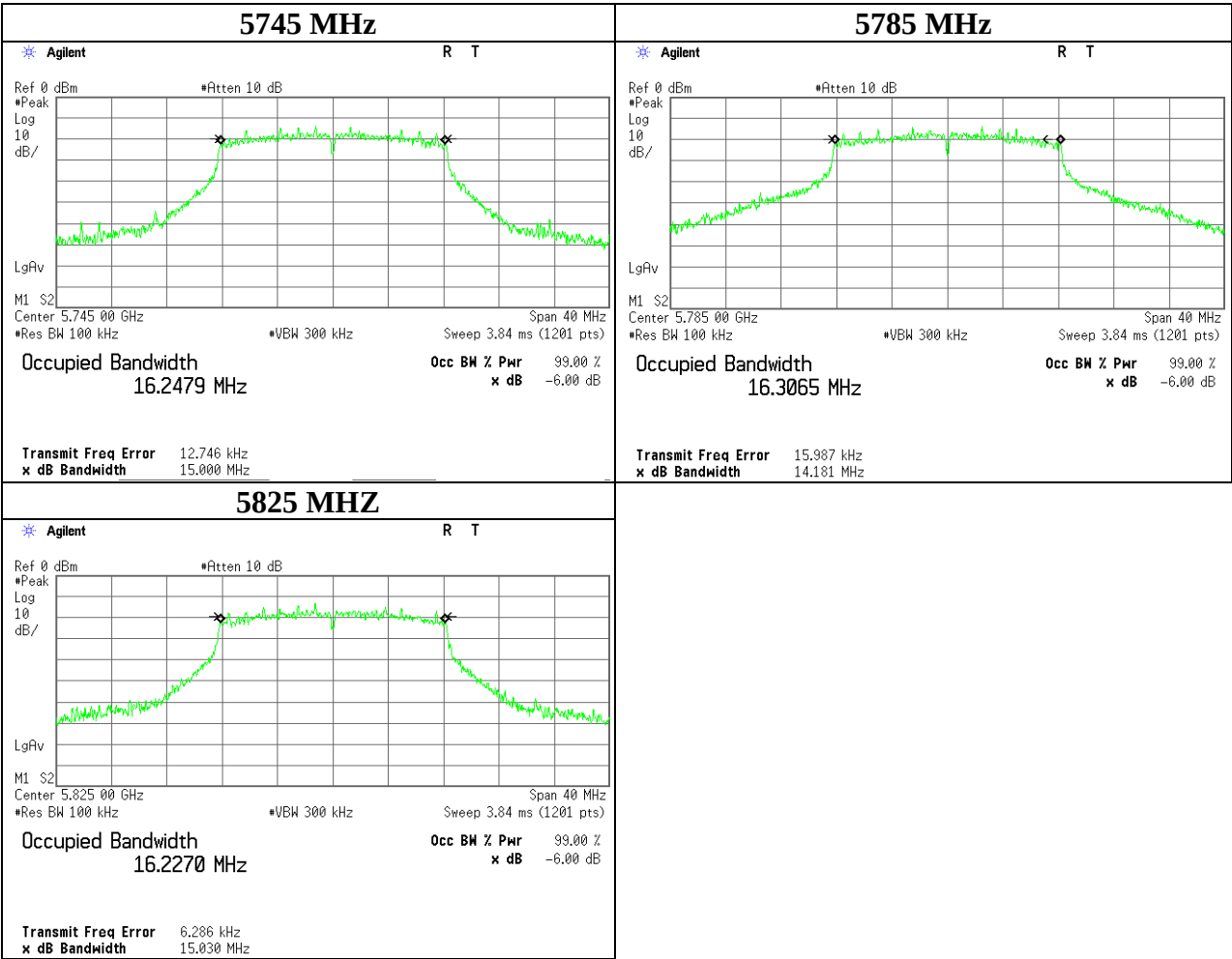
Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
5745	13.910	> 500
5785	14.427	> 500
5825	15.105	> 500

11n-40

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
5755	32.617	> 500
5795	35.017	> 500

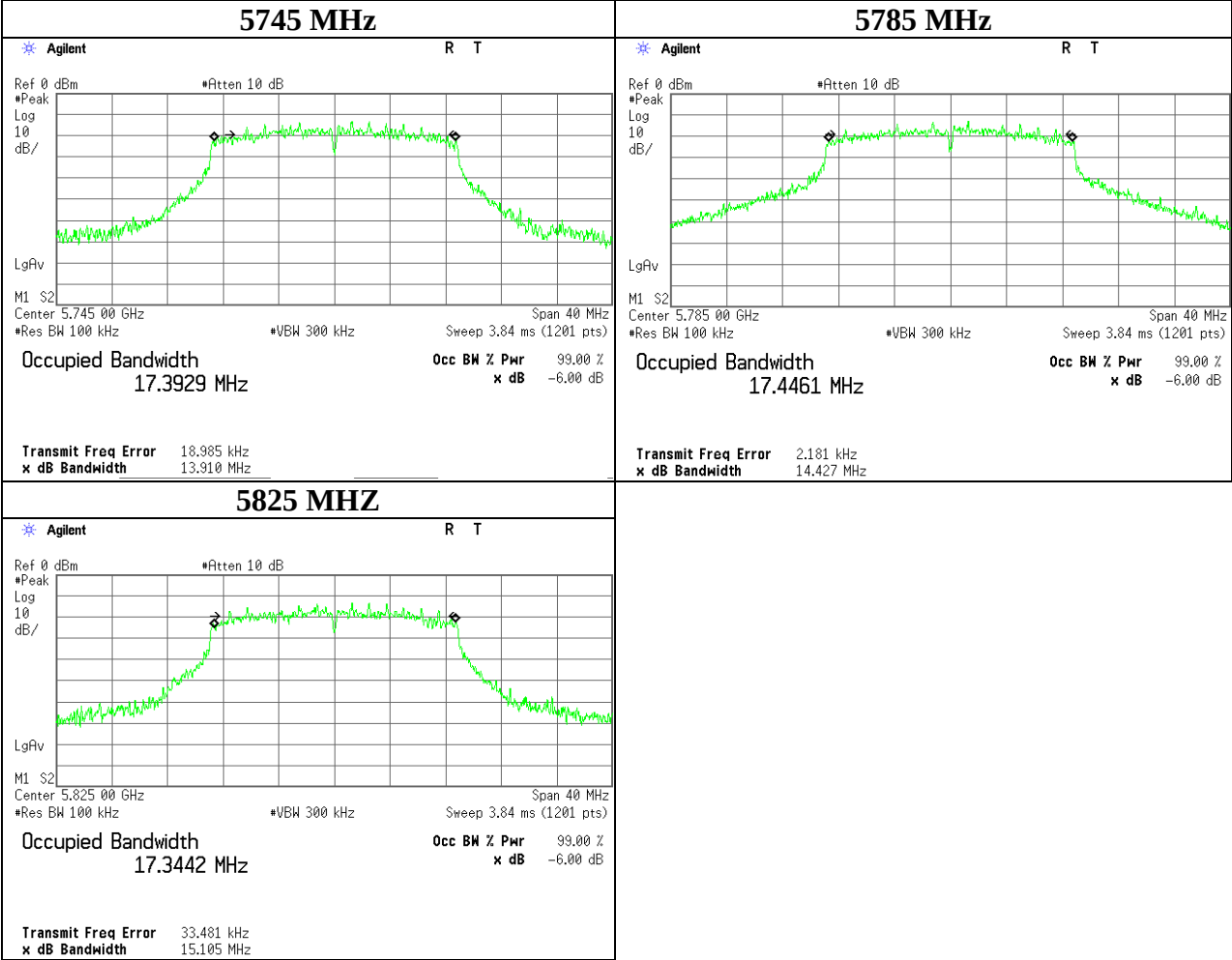
6dB Bandwidth

11a



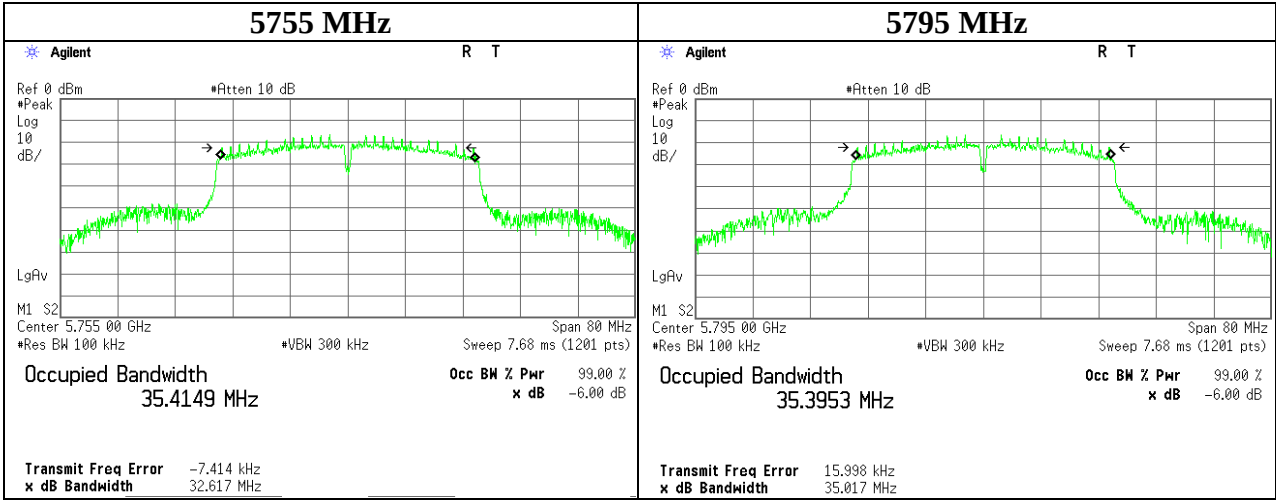
6dB Bandwidth

11n-20



6dB Bandwidth

11n-40



Maximum Conducted Output Power

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10706993H
Date : 04/22/2015
Temperature/ Humidity : 24 deg. C / 40 % RH
Engineer : Kazuya Yoshioka
Mode : 11a Tx / 11n-20 Tx

11a

Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	Result (Cond.)		Result (e.i.r.p.)		Limit (Cond.)		Limit (e.i.r.p.)		Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
						[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]		
5180.0	-6.63	1.57	10.11	3.10	3.60	8.15	6.53	11.75	14.96	23.97	250.00	-	-	15.82	-
5220.0	-6.65	1.57	10.11	3.10	3.60	8.13	6.50	11.73	14.89	23.97	250.00	-	-	15.84	-
5240.0	-6.76	1.57	10.11	3.10	3.60	8.02	6.34	11.62	14.52	23.97	250.00	-	-	15.95	-
5260.0	-7.15	1.58	10.11	3.10	3.60	7.64	5.81	11.24	13.30	23.97	250.00	-	-	16.33	-
5300.0	-7.27	1.58	10.11	3.10	3.60	7.52	5.65	11.12	12.94	23.97	250.00	-	-	16.45	-
5320.0	-7.04	1.58	10.11	3.10	3.60	7.75	5.96	11.35	13.65	23.78	238.78	-	-	16.03	-
5500.0	-6.99	1.59	10.12	3.10	2.17	7.82	6.05	9.99	9.98	23.65	231.74	-	-	15.83	-
5580.0	-6.78	1.59	10.12	3.10	2.17	8.03	6.35	10.20	10.47	23.97	250.00	-	-	15.94	-
5700.0	-7.02	1.60	10.11	3.10	2.17	7.79	6.01	9.96	9.91	23.56	226.99	-	-	15.77	-
5745.0	-6.93	1.60	10.10	3.10	2.17	7.87	6.12	10.04	10.09	30.00	1000.00	-	-	22.13	-
5785.0	-7.06	1.60	10.10	3.10	2.17	7.74	5.94	9.91	9.79	30.00	1000.00	-	-	22.26	-
5825.0	-6.92	1.60	10.10	3.10	2.17	7.88	6.14	10.05	10.12	30.00	1000.00	-	-	22.12	-

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Antenna gain + Duty Factor

15.407(a)(1)(iv) Limit(Cond.) = 23.97dBm(250mW)

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

15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

15.407(a)(3) Limit(Cond.) = 30dBm(1W)

11n20

Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	Result (Cond.)		Result (e.i.r.p.)		Limit (Cond.)		Limit (e.i.r.p.)		Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
						[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]		
5180.0	-7.03	1.57	10.11	3.62	3.60	8.27	6.71	11.87	15.38	23.97	250.00	-	-	15.70	-
5220.0	-7.17	1.57	10.11	3.62	3.60	8.13	6.50	11.73	14.89	23.97	250.00	-	-	15.84	-
5240.0	-7.19	1.57	10.11	3.62	3.60	8.11	6.47	11.71	14.83	23.97	250.00	-	-	15.86	-
5260.0	-7.65	1.58	10.11	3.62	3.60	7.66	5.83	11.26	13.37	23.97	250.00	-	-	16.31	-
5300.0	-7.66	1.58	10.11	3.62	3.60	7.65	5.82	11.25	13.34	23.97	250.00	-	-	16.32	-
5320.0	-7.54	1.58	10.11	3.62	3.60	7.77	5.98	11.37	13.71	23.97	250.00	-	-	16.20	-
5500.0	-7.31	1.59	10.12	3.62	2.17	8.02	6.34	10.19	10.45	23.97	250.00	-	-	15.95	-
5580.0	-7.05	1.59	10.12	3.62	2.17	8.28	6.73	10.45	11.09	23.97	250.00	-	-	15.69	-
5700.0	-7.51	1.60	10.11	3.62	2.17	7.82	6.05	9.99	9.98	23.91	246.04	-	-	16.09	-
5745.0	-7.38	1.60	10.10	3.62	2.17	7.94	6.22	10.11	10.26	30.00	1000.00	-	-	22.06	-
5785.0	-7.30	1.60	10.10	3.62	2.17	8.02	6.34	10.19	10.45	30.00	1000.00	-	-	21.98	-
5825.0	-7.37	1.60	10.10	3.62	2.17	7.95	6.24	10.12	10.28	30.00	1000.00	-	-	22.05	-

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Antenna gain + Duty Factor

15.407(a)(1)(iv) Limit(Cond.) = 23.97dBm(250mW)

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

15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

15.407(a)(3) Limit(Cond.) = 30dBm(1W)

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Conducted Output Power

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10706993H
Date : 04/22/2015
Temperature/ Humidity : 24 deg. C / 40 % RH
Engineer : Kazuya Yoshioka
Mode : 11n-40 Tx

11n40

Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	Result (Cond.)		Result (e.i.r.p.)		Limit (Cond.)		Limit (e.i.r.p.)		Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
						[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]		
5190.0	-8.82	1.57	10.11	4.45	3.60	7.31	5.38	10.91	12.33	23.97	250.00	-	-	16.66	-
5230.0	-9.14	1.57	10.11	4.45	3.60	6.99	5.00	10.59	11.46	23.97	250.00	-	-	16.98	-
5270.0	-9.64	1.58	10.11	4.45	3.60	6.50	4.47	10.10	10.23	23.97	250.00	-	-	17.47	-
5310.0	-9.54	1.58	10.11	4.45	3.60	6.60	4.57	10.20	10.47	23.97	250.00	-	-	17.37	-
5510.0	-8.98	1.59	10.12	4.45	2.17	7.18	5.22	9.35	8.61	23.97	250.00	-	-	16.79	-
5550.0	-9.15	1.59	10.11	4.45	2.17	7.00	5.01	9.17	8.26	23.97	250.00	-	-	16.97	-
5670.0	-9.04	1.60	10.11	4.45	2.17	7.12	5.15	9.29	8.49	23.97	250.00	-	-	16.85	-
5755.0	-9.14	1.60	10.10	4.45	2.17	7.01	5.02	9.18	8.28	30.00	1000.00	-	-	22.99	-
5795.0	-9.16	1.60	10.10	4.45	2.17	6.99	5.00	9.16	8.24	30.00	1000.00	-	-	23.01	-

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Antenna gain + Duty Factor

15.407(a)(1)(iv) Limit(Cond.) = 23.97dBm(250mW)

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

15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

15.407(a)(3) Limit(Cond.) = 30dBm(1W)

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Conducted Output Power
(Reference data)

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 10706993H
Date 04/22/2015
Temperature/ Humidity 24 deg. C / 40 % RH
Engineer Kazuya Yoshioka
Mode 11a Tx

5180 MHz

Data Rate [Mbps]	Reading [dBm]	Duty Factor [dB]	Result [dBm]	Remark
6	-5.39	1.34	-4.05	
9	-5.66	1.82	-3.84	
12	-6.01	2.32	-3.69	
18	-6.63	3.10	-3.53	*
24	-7.61	3.70	-3.91	
36	-8.37	4.58	-3.79	
48	-9.11	5.03	-4.08	
54	-9.45	5.36	-4.09	

* Worst Rate

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

Maximum Conducted Output Power
(Reference data)

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 10706993H
Date 04/22/2015
Temperature/ Humidity 24 deg. C / 40 % RH
Engineer Kazuya Yoshioka
Mode 11n-20 Tx

5180 MHz

Data Rate [MCS]	Reading [dBm]	Duty Factor [dB]	Result [dBm]	Remark
0	-5.32	1.41	-3.91	
1	-5.92	2.38	-3.54	
2	-6.58	3.09	-3.49	
3	-7.03	3.62	-3.41	*
4	-8.03	4.43	-3.60	
5	-8.66	4.99	-3.67	
6	-8.96	5.13	-3.83	
7	-9.10	5.29	-3.81	

* Worst Rate

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

Maximum Conducted Output Power
(Reference data)

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10706993H
Date : 04/22/2015
Temperature/ Humidity : 24 deg. C / 40 % RH
Engineer : Kazuya Yoshioka
Mode : 11n-40 Tx

5190 MHz

Data Rate [MCS]	Reading [dBm]	Duty Factor [dB]	Result [dBm]	Remark
0	-7.13	2.51	-4.62	
1	-8.14	3.65	-4.49	
2	-8.82	4.45	-4.37	*
3	-9.58	4.88	-4.70	
4	-10.43	5.59	-4.84	
5	-10.85	6.10	-4.75	
6	-11.09	6.19	-4.90	
7	-11.63	6.56	-5.07	

* Worst Rate

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

Maximum Average Output Power (Reference data for SAR testing)

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10706993H
Date : 04/22/2015
Temperature/ Humidity : 24 deg. C / 40 % RH
Engineer : Kazuya Yoshioka
Mode : 11a Tx / 11n-20 Tx / 11n-40 Tx

11a

Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result (Cond.)		Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]
5180.0	-6.77	3.06	10.19	3.60	6.49	4.45	10.09	10.20
5220.0	-6.84	3.07	10.19	3.60	6.43	4.39	10.03	10.06
5240.0	-6.70	3.08	10.19	3.60	6.57	4.54	10.17	10.41
5260.0	-7.03	3.08	10.19	3.60	6.24	4.21	9.84	9.64
5300.0	-7.02	3.10	10.19	3.60	6.27	4.24	9.87	9.71
5320.0	-7.02	3.10	10.19	3.60	6.27	4.24	9.87	9.71
5500.0	-7.16	3.15	10.20	2.17	6.19	4.16	8.36	6.85
5580.0	-7.18	3.17	10.19	2.17	6.18	4.15	8.35	6.84
5700.0	-7.77	3.20	10.19	2.17	5.61	3.64	7.78	6.00
5745.0	-7.69	3.21	10.18	2.17	5.70	3.71	7.87	6.12
5785.0	-7.76	3.21	10.18	2.17	5.64	3.66	7.81	6.03
5825.0	-7.76	3.22	10.18	2.17	5.64	3.67	7.81	6.04

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

Result(e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Antenna

11n-20

Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result (Cond.)		Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]
5180.0	-6.63	3.06	10.19	3.60	6.63	4.60	10.23	10.53
5220.0	-6.54	3.07	10.19	3.60	6.73	4.71	10.33	10.78
5240.0	-6.51	3.08	10.19	3.60	6.76	4.75	10.36	10.87
5260.0	-7.08	3.08	10.19	3.60	6.19	4.16	9.79	9.53
5300.0	-7.02	3.10	10.19	3.60	6.27	4.24	9.87	9.71
5320.0	-7.11	3.10	10.19	3.60	6.18	4.15	9.78	9.51
5500.0	-7.29	3.15	10.20	2.17	6.06	4.03	8.23	6.65
5580.0	-7.17	3.17	10.19	2.17	6.19	4.16	8.36	6.86
5700.0	-7.71	3.20	10.19	2.17	5.67	3.69	7.84	6.08
5745.0	-7.52	3.21	10.18	2.17	5.87	3.86	8.04	6.37
5785.0	-7.63	3.21	10.18	2.17	5.77	3.77	7.94	6.22
5825.0	-7.06	3.22	10.18	2.17	6.34	4.31	8.51	7.10

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

Result(e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Antenna

11n-40

Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result (Cond.)		Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]
5190.0	-8.62	3.06	10.19	3.60	4.64	2.91	8.24	6.66
5230.0	-8.62	3.08	10.19	3.60	4.65	2.92	8.25	6.69
5270.0	-8.81	3.09	10.19	3.60	4.47	2.80	8.07	6.41
5310.0	-8.98	3.10	10.19	3.60	4.31	2.70	7.91	6.18
5510.0	-9.09	3.15	10.20	2.17	4.26	2.67	6.43	4.39
5550.0	-9.08	3.16	10.19	2.17	4.28	2.68	6.45	4.41
5670.0	-9.21	3.19	10.19	2.17	4.17	2.61	6.34	4.30
5755.0	-9.21	3.21	10.18	2.17	4.18	2.62	6.35	4.32
5795.0	-9.32	3.22	10.18	2.17	4.08	2.56	6.25	4.22

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

Result(e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Antenna

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Ise EMC Lab.

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

Telephone : +81 596 24 8999

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Maximum Power Spectral Density

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10706993H
Date : 04/23/2015
Temperature/ Humidity : 23 deg. C / 34 % RH
Engineer : Yuta Moriya
Mode : 11a Tx / 11n-20 Tx

11a

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Correction factor [dB]	Antenna Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-16.51	1.57	10.11	3.10	0.00	3.60	-1.73	11.00	12.73
5220.0	-16.37	1.57	10.11	3.10	0.00	3.60	-1.59	11.00	12.59
5240.0	-16.30	1.57	10.11	3.10	0.00	3.60	-1.52	11.00	12.52
5260.0	-16.39	1.58	10.11	3.10	0.00	3.60	-1.60	11.00	12.60
5300.0	-16.46	1.58	10.11	3.10	0.00	3.60	-1.67	11.00	12.67
5320.0	-16.59	1.58	10.11	3.10	0.00	3.60	-1.80	11.00	12.80
5500.0	-16.38	1.59	10.12	3.10	0.00	2.17	-1.57	11.00	12.57
5580.0	-16.38	1.59	10.12	3.10	0.00	2.17	-1.57	11.00	12.57
5700.0	-16.90	1.60	10.11	3.10	0.00	2.17	-2.09	11.00	13.09
5745.0	-19.10	1.60	10.10	3.10	0.27	2.17	-4.03	30.00	34.03
5785.0	-19.59	1.60	10.10	3.10	0.27	2.17	-4.52	30.00	34.52
5825.0	-19.04	1.60	10.10	3.10	0.27	2.17	-3.97	30.00	33.97

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

11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Correction factor [dB]	Antenna Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-16.34	1.57	10.11	3.62	0.00	3.60	-1.04	11.00	12.04
5220.0	-16.04	1.57	10.11	3.62	0.00	3.60	-0.74	11.00	11.74
5240.0	-16.47	1.57	10.11	3.62	0.00	3.60	-1.17	11.00	12.17
5260.0	-16.97	1.58	10.11	3.62	0.00	3.60	-1.66	11.00	12.66
5300.0	-16.88	1.58	10.11	3.62	0.00	3.60	-1.57	11.00	12.57
5320.0	-16.95	1.58	10.11	3.62	0.00	3.60	-1.64	11.00	12.64
5500.0	-16.72	1.59	10.12	3.62	0.00	2.17	-1.39	11.00	12.39
5580.0	-16.31	1.59	10.12	3.62	0.00	2.17	-0.98	11.00	11.98
5700.0	-16.91	1.60	10.11	3.62	0.00	2.17	-1.58	11.00	12.58
5745.0	-19.58	1.60	10.10	3.62	0.27	2.17	-3.99	30.00	33.99
5785.0	-19.48	1.60	10.10	3.62	0.27	2.17	-3.89	30.00	33.89
5825.0	-19.88	1.60	10.10	3.62	0.27	2.17	-4.29	30.00	34.29

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

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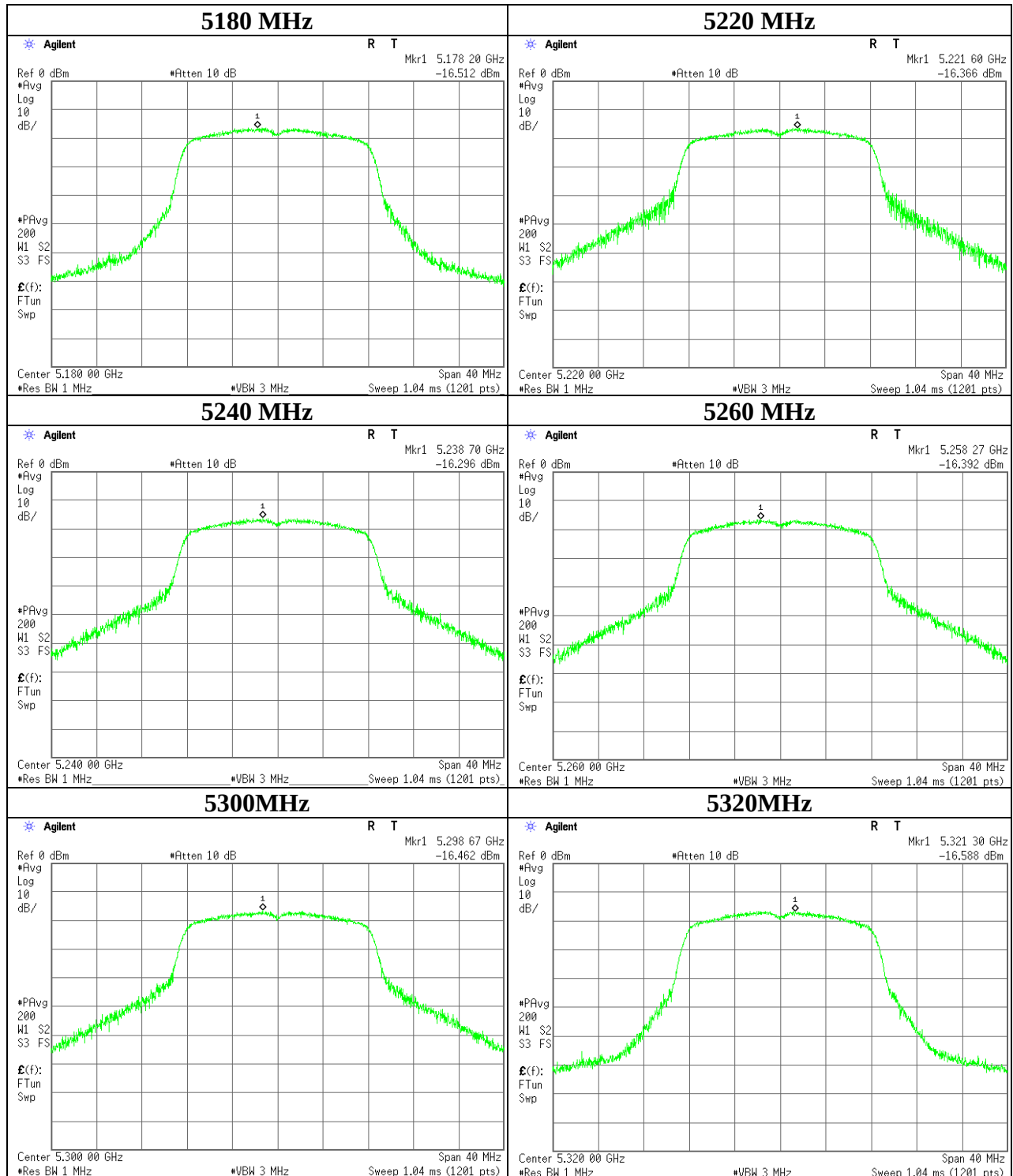
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Maximum Power Spectral Density

11a



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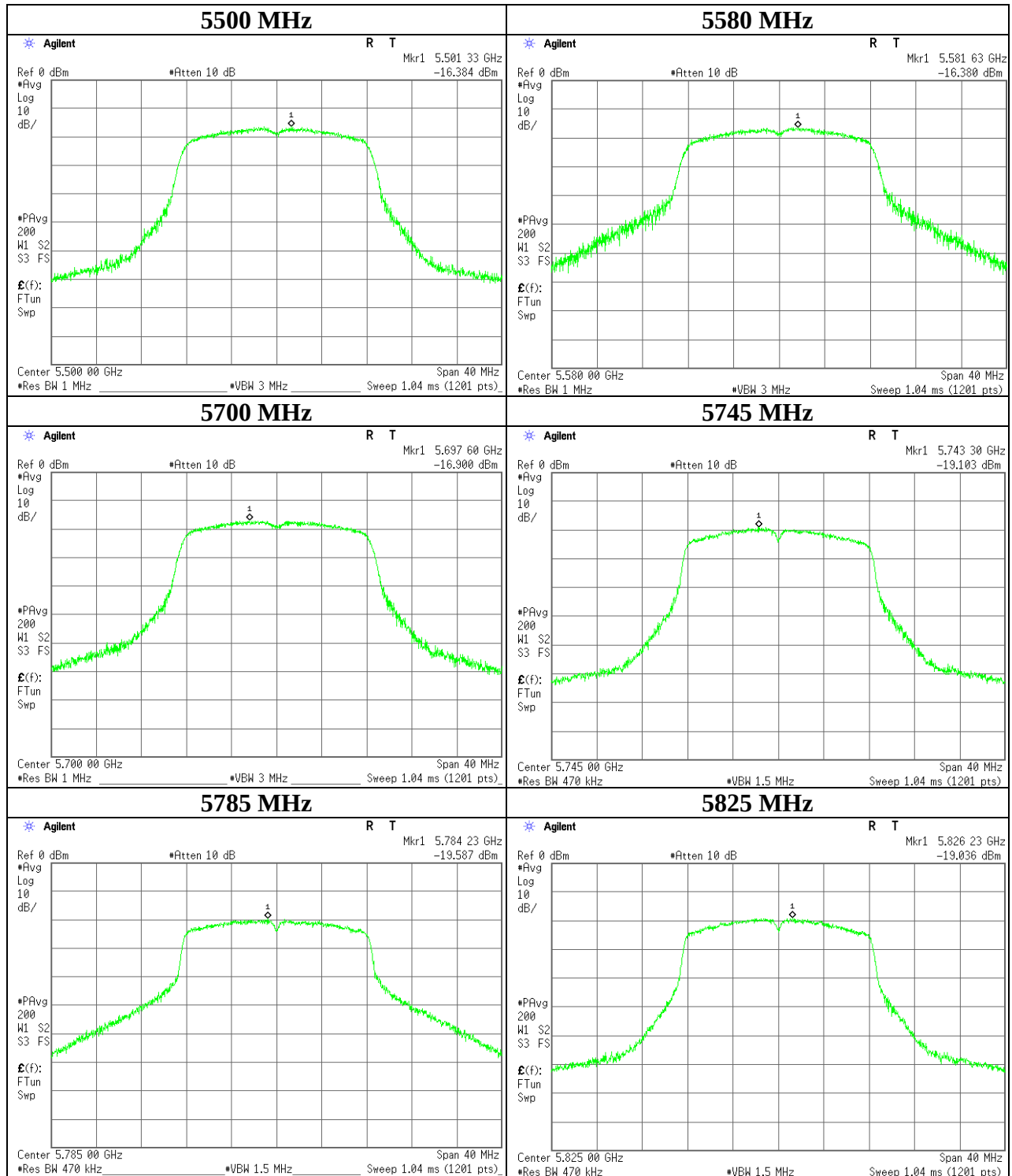
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Maximum Power Spectral Density

11a



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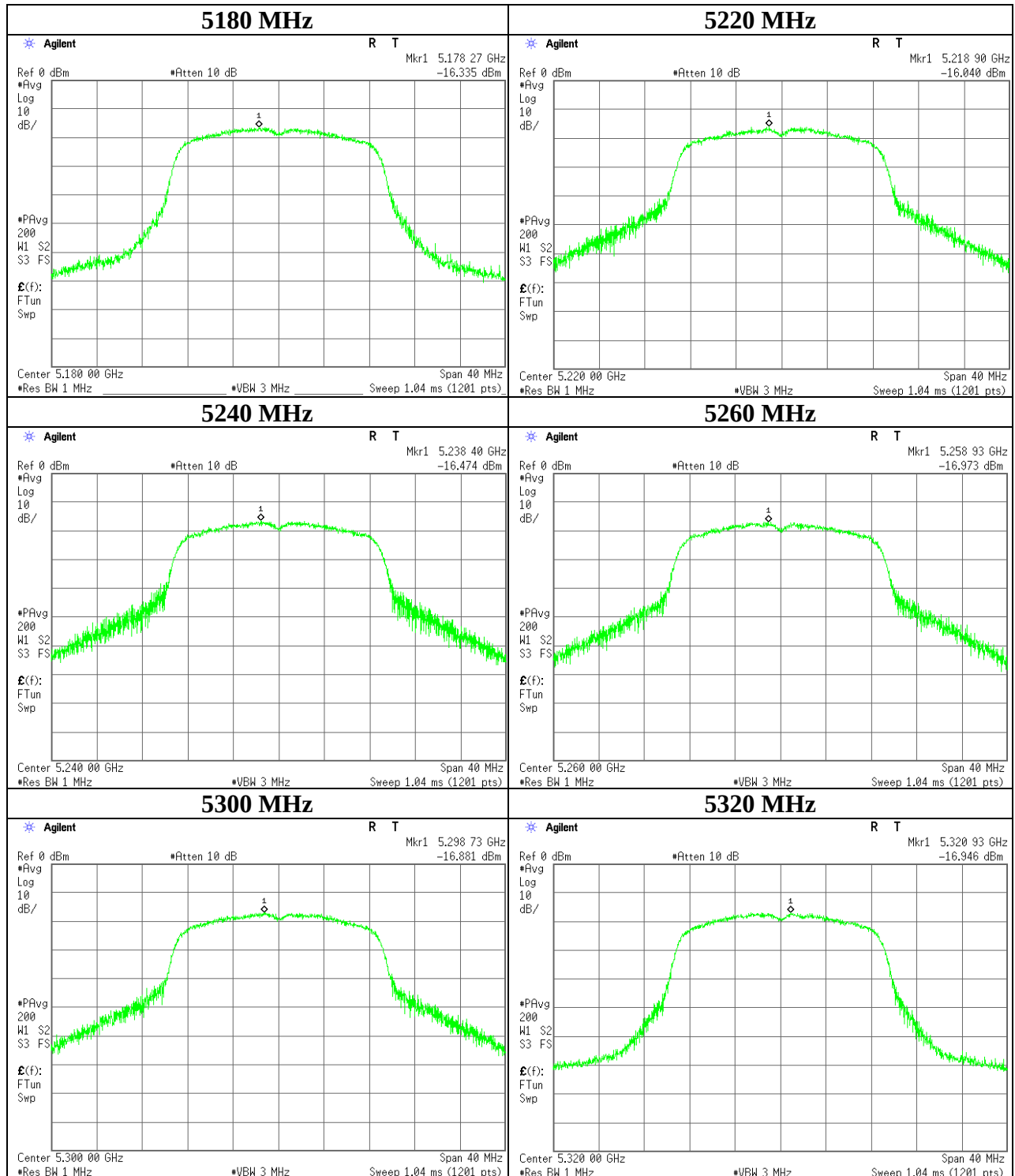
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Maximum Power Spectral Density

11n-20



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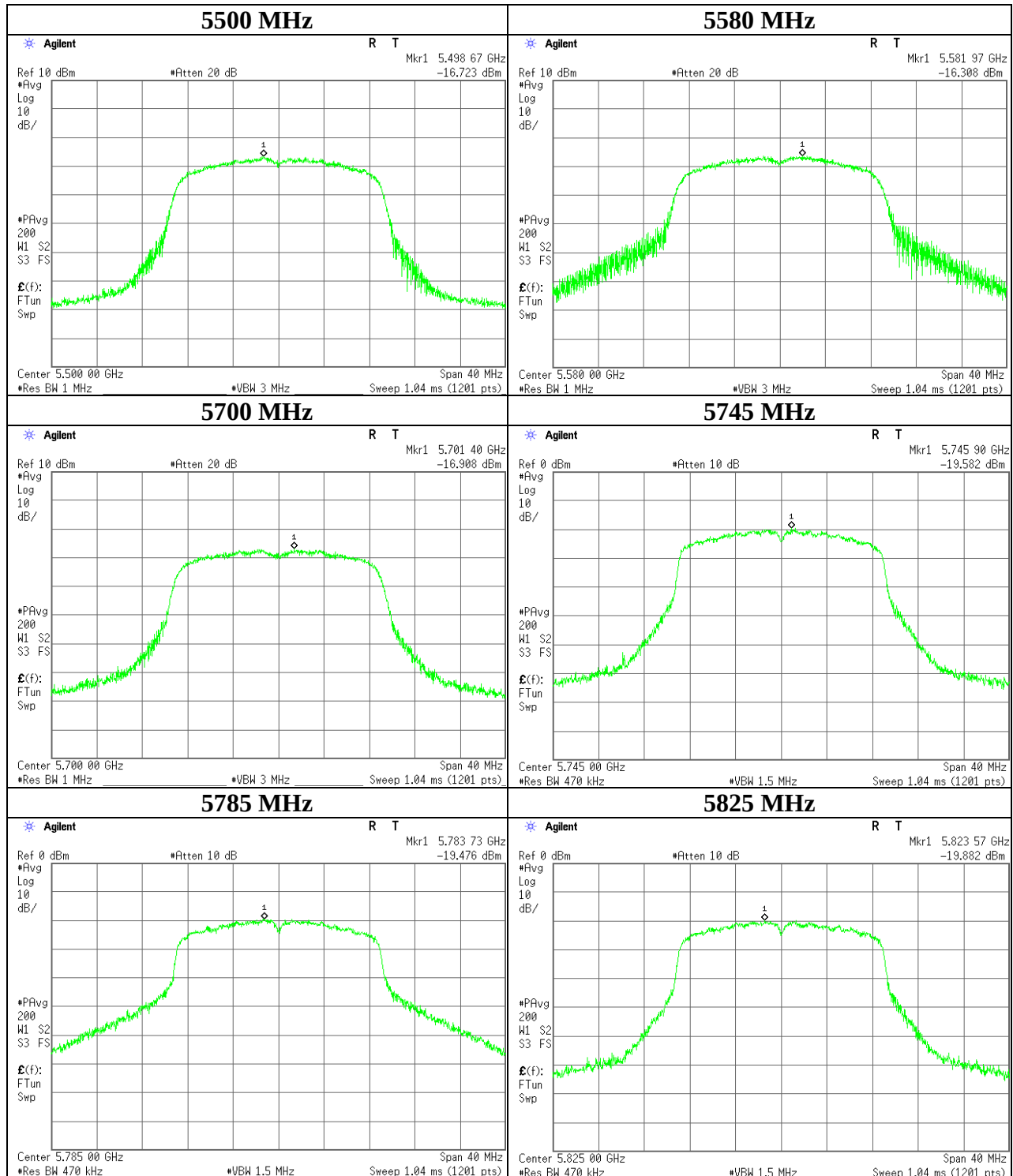
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Maximum Power Spectral Density

11n-20



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Maximum Power Spectral Density

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 10706993H
Date 04/23/2015
Temperature/ Humidity 23 deg. C / 34 % RH
Engineer Yuta Moriya
Mode 11n-40 Tx

11n-40

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Correction factor [dB]	Antenna Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
5190.0	-20.86	1.57	10.11	4.45	0.00	3.60	-4.73	11.00	15.73
5230.0	-20.87	1.57	10.11	4.45	0.00	3.60	-4.74	11.00	15.74
5270.0	-21.61	1.58	10.11	4.45	0.00	3.60	-5.47	11.00	16.47
5310.0	-22.10	1.58	10.11	4.45	0.00	3.60	-5.96	11.00	16.96
5510.0	-21.22	1.59	10.12	4.45	0.00	2.17	-5.06	11.00	16.06
5550.0	-21.70	1.59	10.11	4.45	0.00	2.17	-5.55	11.00	16.55
5670.0	-20.74	1.60	10.11	4.45	0.00	2.17	-4.58	11.00	15.58
5755.0	-24.06	1.60	10.10	4.45	0.27	2.17	-7.65	30.00	37.65
5795.0	-23.82	1.60	10.10	4.45	0.27	2.17	-7.40	30.00	37.40

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

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Ise EMC Lab.

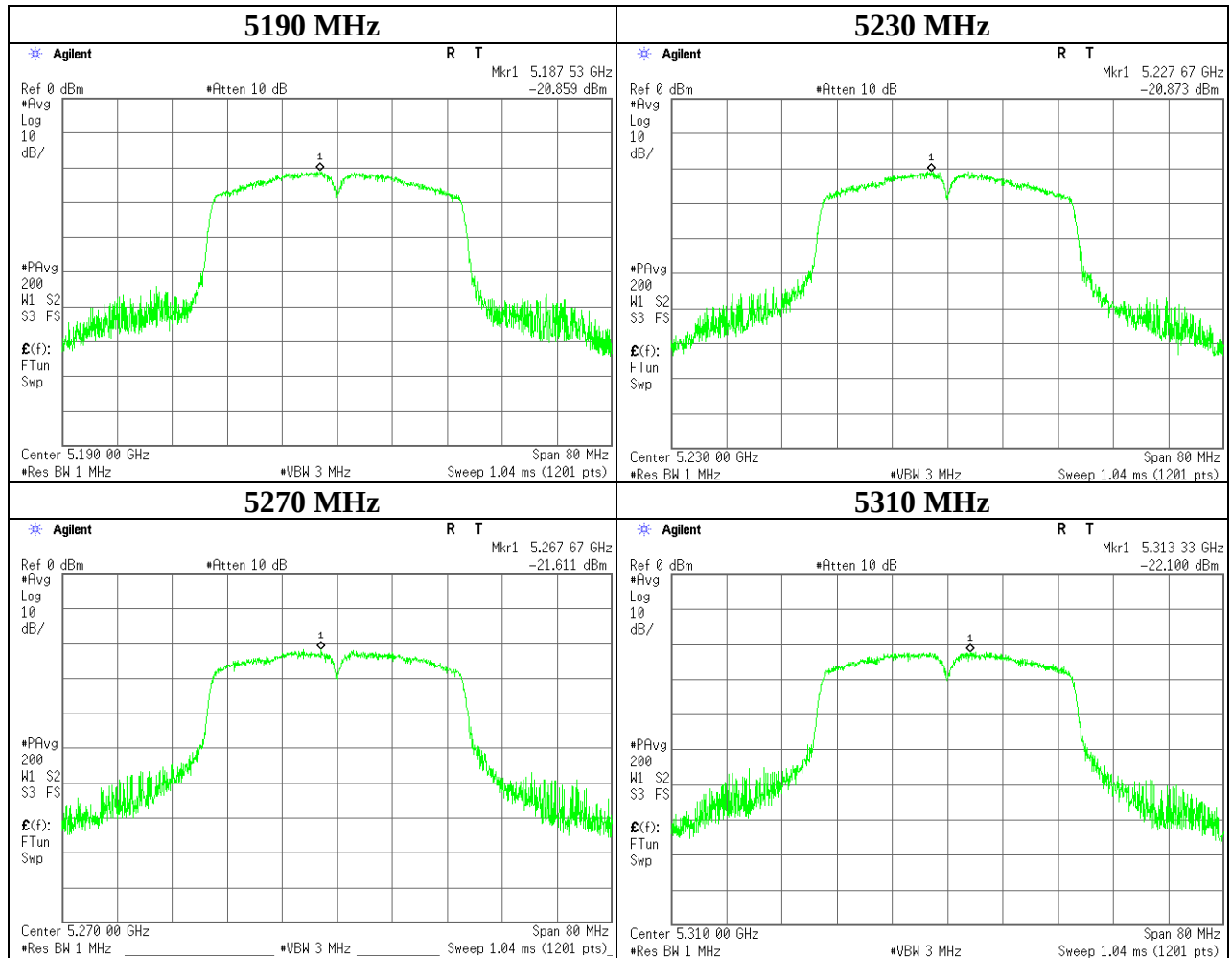
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Maximum Power Spectral Density

11n-40



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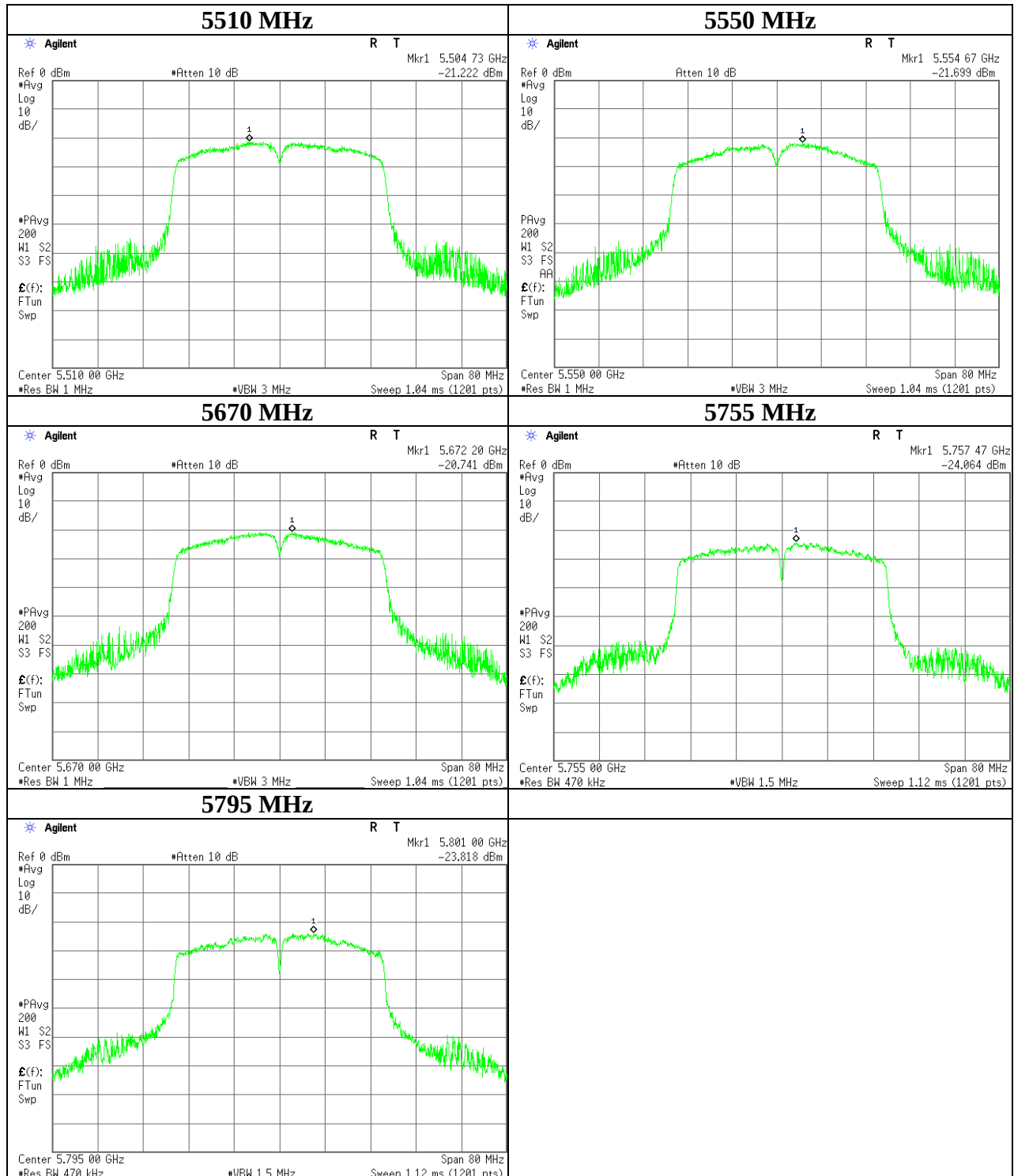
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Maximum Power Spectral Density

11n-40



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Radiated Spurious Emission

Test place Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10706993H
Date 04/21/2015 04/23/2015 04/24/2015
Temperature/ Humidity 25 deg. C / 38 % RH 21 deg. C / 49 % RH 22 deg. C / 35 % RH
Engineer Satofumi Matsuyama Tomoki Matsui Satofumi Matsuyama
(1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode 11n-20 Tx 5180 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5150.000	PK	45.0	31.3	4.2	31.2	-	49.3	73.9	24.6	
Hori	6906.518	PK	46.5	35.6	5.0	31.9	-	55.2	68.2	13.0	
Hori	10360.000	PK	44.8	38.8	-2.2	32.7	-	48.7	73.9	25.2	
Hori	15540.000	PK	43.7	39.1	-0.9	32.0	-	49.9	73.9	24.0	Floor Noise
Hori	5150.000	AV	32.8	31.3	4.2	31.2	3.6	40.7	53.9	13.2	Integration Method *1)
Hori	10360.000	AV	38.2	38.8	-2.2	32.7	3.6	45.7	53.9	8.2	
Hori	15540.000	AV	36.0	39.1	-0.9	32.0	-	42.2	53.9	11.7	Floor Noise
Vert	5150.000	PK	43.6	31.3	4.2	31.2	-	47.9	73.9	26.0	
Vert	6906.518	PK	46.5	35.6	5.0	31.9	-	55.2	68.2	13.0	
Vert	10360.000	PK	45.2	38.8	-2.2	32.7	-	49.1	73.9	24.8	
Vert	15540.000	PK	43.7	39.1	-0.9	32.0	-	49.9	73.9	24.0	Floor Noise
Vert	5150.000	AV	32.3	31.3	4.2	31.2	3.6	40.2	53.9	13.7	Integration Method *1)
Vert	10360.000	AV	37.7	38.8	-2.2	32.7	3.6	45.2	53.9	8.7	
Vert	15540.000	AV	35.8	39.1	-0.9	32.0	-	42.0	53.9	11.9	Floor Noise

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

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

Distance factor: 10GHz-26.5GHz $20\log(3.0\text{m}/1.0\text{m})= 9.5\text{dB}$

26.5GHz-40GHz $20\log(3.0\text{m}/0.5\text{m})=15.6\text{dB}$

*1) Not Out of Band emission (Leakage Power)

UL Japan, Inc.

Ise EMC Lab.

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/22/2015 04/23/2015 04/24/2015
Temperature/ Humidity : 25 deg. C / 38 % RH 21 deg. C / 49 % RH 22 deg. C / 35 % RH
Engineer : Satofumi Matsuyama Tomoki Matsui Satofumi Matsuyama
(1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-20 Tx 5260 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	7013.283	PK	46.1	35.9	4.4	32.0	-	54.4	68.2	13.8	
Hori	10520.000	PK	45.8	38.7	-2.2	32.8	-	49.5	73.9	24.4	
Hori	15780.000	PK	42.1	38.4	-0.9	32.3	-	47.3	73.9	26.6	Floor Noise
Hori	10520.000	AV	37.6	38.7	-2.2	32.8	3.6	44.9	53.9	9.0	
Hori	15780.000	AV	34.2	38.4	-0.9	32.3	-	39.4	53.9	14.5	Floor Noise
Vert	7013.283	PK	46.4	35.9	4.4	32.0	-	54.7	68.2	13.5	
Vert	10520.000	PK	45.9	38.7	-2.2	32.8	-	49.6	73.9	24.3	
Vert	15780.000	PK	42.1	38.4	-0.9	32.3	-	47.3	73.9	26.6	Floor Noise
Vert	10520.000	AV	38.6	38.7	-2.2	32.8	3.6	45.9	53.9	8.0	
Vert	15780.000	AV	34.4	38.4	-0.9	32.3	-	39.6	53.9	14.3	Floor Noise

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

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

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

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/21/2015 04/23/2015 04/24/2015
Temperature/ Humidity : 25 deg. C / 38 % RH 21 deg. C / 49 % RH 22 deg. C / 35 % RH
Engineer : Satofumi Matsuyama Tomoki Matsui Satofumi Matsuyama
(1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-20 Tx 5500 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5470.000	PK	45.1	31.8	4.3	31.2	-	50.0	73.9	23.9	
Hori	7333.360	PK	46.1	35.9	5.1	32.0	-	55.1	73.9	18.8	
Hori	11000.000	PK	45.0	38.8	-2.2	33.0	-	48.6	73.9	25.3	
Hori	16500.000	PK	42.0	38.9	-0.5	32.2	-	48.2	73.9	25.7	Floor Noise
Hori	5470.000	AV	32.1	31.8	4.3	31.2	3.6	40.6	53.9	13.3	Integration Method *1)
Hori	7333.360	AV	38.0	35.9	5.1	32.0	3.6	50.6	53.9	3.3	
Hori	11000.000	AV	37.0	38.8	-2.2	33.0	3.6	44.2	53.9	9.7	
Hori	16500.000	AV	34.2	38.9	-0.5	32.2	-	40.4	53.9	13.5	Floor Noise
Vert	5470.000	PK	44.6	31.8	4.3	31.2	-	49.5	73.9	24.4	
Vert	7333.360	PK	43.4	35.9	5.1	32.0	-	52.4	73.9	21.5	
Vert	11000.000	PK	46.0	38.8	-2.2	33.0	-	49.6	73.9	24.3	
Vert	16500.000	PK	42.1	38.9	-0.5	32.2	-	48.3	73.9	25.6	Floor Noise
Vert	5470.000	AV	31.9	31.8	4.3	31.2	3.6	40.4	53.9	13.5	Integration Method *1)
Vert	7333.360	AV	34.6	35.9	5.1	32.0	3.6	47.2	53.9	6.7	
Vert	11000.000	AV	38.2	38.8	-2.2	33.0	3.6	45.4	53.9	8.5	
Vert	16500.000	AV	34.4	38.9	-0.5	32.2	-	40.6	53.9	13.3	Floor Noise

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

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

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

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

*1) Not Out of Band emission (Leakage Power)

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Radiated Spurious Emission

Test place Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10706993H
Date 04/22/2015 04/23/2015 04/24/2015
Temperature/ Humidity 25 deg. C / 38 % RH 21 deg. C / 49 % RH 22 deg. C / 35 % RH
Engineer Satofumi Matsuyama Tomoki Matsui Satofumi Matsuyama
(1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz and Below 1 GHz)
Mode 11n-20 Tx 5580 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	76.800	QP	38.9	6.6	7.8	32.0	-	21.3	40.0	18.7	
Hori	112.855	QP	37.2	11.8	8.2	32.2	-	25.0	43.5	18.5	
Hori	124.199	QP	36.8	13.1	8.3	32.2	-	26.0	43.5	17.5	
Hori	135.201	QP	35.6	14.0	8.5	32.2	-	25.9	43.5	17.6	
Hori	443.989	QP	35.3	17.9	10.8	32.1	-	31.9	46.0	14.1	
Hori	540.823	QP	33.7	18.7	11.4	32.1	-	31.7	46.0	14.3	
Hori	7439.983	PK	46.1	35.9	4.6	32.1	-	54.5	73.9	19.4	
Hori	11160.000	PK	45.1	39.0	-2.0	32.9	-	49.2	73.9	24.7	
Hori	16740.000	PK	43.0	39.5	-0.5	32.1	-	49.9	73.9	24.0	Floor Noise
Hori	7439.983	AV	37.1	35.9	4.6	32.1	3.6	49.1	53.9	4.8	
Hori	11160.000	AV	36.8	39.0	-2.0	32.9	3.6	44.5	53.9	9.4	
Hori	16740.000	AV	34.5	39.5	-0.5	32.1	-	41.4	53.9	12.5	Floor Noise
Vert	76.821	QP	42.1	6.6	7.8	32.0	-	24.5	40.0	15.5	
Vert	112.934	QP	40.7	11.9	8.2	32.2	-	28.6	43.5	14.9	
Vert	124.196	QP	37.0	13.1	8.3	32.2	-	26.2	43.5	17.3	
Vert	135.200	QP	37.2	14.0	8.5	32.2	-	27.5	43.5	16.0	
Vert	444.002	QP	34.5	17.9	10.8	32.1	-	31.1	46.0	14.9	
Vert	540.793	QP	33.2	18.7	11.4	32.1	-	31.2	46.0	14.8	
Vert	7439.983	PK	43.1	35.9	4.6	32.1	-	51.5	73.9	22.4	
Vert	11160.000	PK	46.0	39.0	-2.0	32.9	-	50.1	73.9	23.8	
Vert	16740.000	PK	42.7	39.5	-0.5	32.1	-	49.6	73.9	24.3	Floor Noise
Vert	7439.983	AV	34.1	35.9	4.6	32.1	3.6	46.1	53.9	7.8	
Vert	11160.000	AV	37.0	39.0	-2.0	32.9	3.6	44.7	53.9	9.2	
Vert	16740.000	AV	34.4	39.5	-0.5	32.1	-	41.3	53.9	12.6	Floor Noise

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

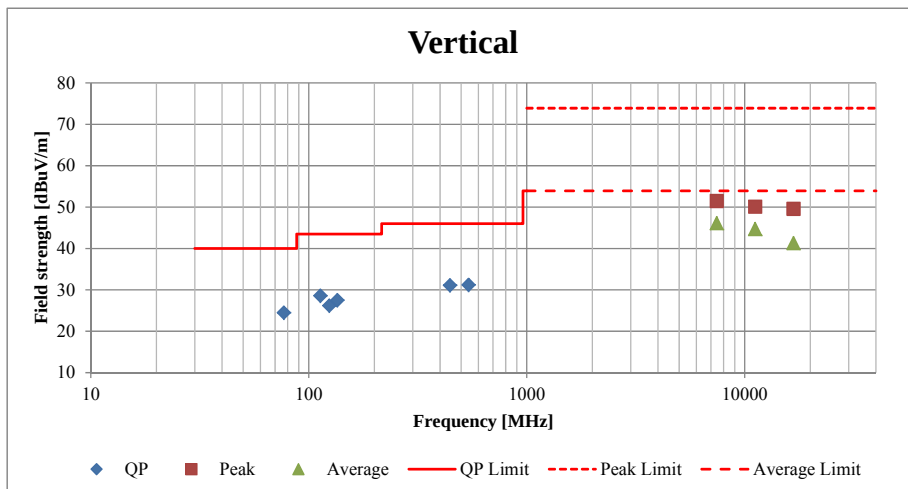
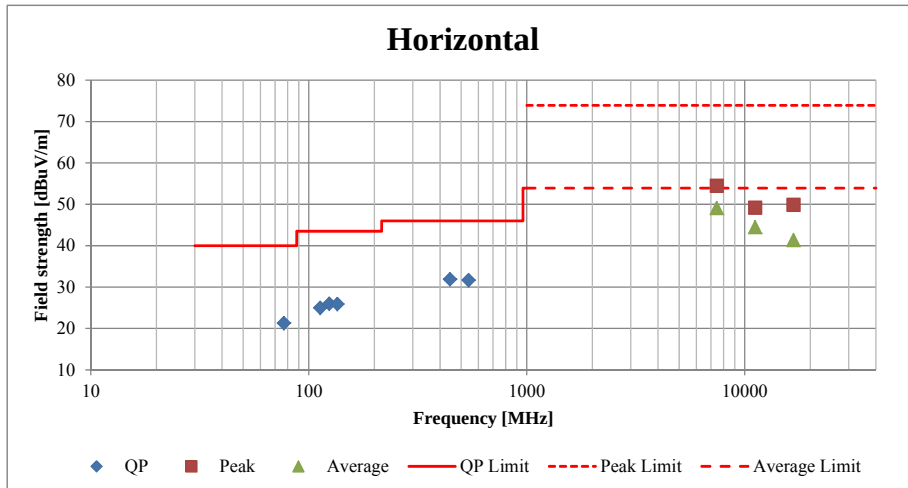
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

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

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Radiated Spurious Emission (Plot data, Worst case)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	10706993H		
Date	04/22/2015	04/23/2015	04/24/2015
Temperature/ Humidity	25 deg. C / 38 % RH	21 deg. C / 49 % RH	22 deg. C / 35 % RH
Engineer	Satofumi Matsuyama	Tomoki Matsui	Satofumi Matsuyama
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(Above 18 GHz and Below 1 GHz)
Mode	11n-20 Tx 5580 MHz		



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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/21/2015 04/23/2015 04/24/2015
Temperature/ Humidity : 25 deg. C / 38 % RH 21 deg. C / 49 % RH 22 deg. C / 35 % RH
Engineer : Satofumi Matsuyama Tomoki Matsui Satofumi Matsuyama
(1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-20 Tx 5700 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5725.000	PK	48.4	32.1	4.5	31.2	-	53.8	73.9	20.1	
Hori	7600.033	PK	47.0	36.1	5.2	32.1	-	56.2	73.9	17.7	
Hori	11400.000	PK	42.1	39.4	-1.8	32.7	-	47.0	73.9	26.9	
Hori	17100.000	PK	42.8	41.0	-0.3	31.9	-	51.6	73.9	22.3	Floor Noise
Hori	5725.000	AV	33.1	32.1	4.5	31.2	3.6	42.1	53.9	11.8	Integration Method *1)
Hori	7600.033	AV	38.7	36.1	5.2	32.1	3.6	51.5	53.9	2.4	
Hori	11400.000	AV	35.1	39.4	-1.8	32.7	3.6	43.6	53.9	10.3	
Hori	17100.000	AV	34.0	41.0	-0.3	31.9	-	42.8	53.9	11.1	Floor Noise
Vert	5725.000	PK	44.1	32.1	4.5	31.2	-	49.5	73.9	24.4	
Vert	7600.033	PK	45.0	36.1	5.2	32.1	-	54.2	73.9	19.7	
Vert	11400.000	PK	43.6	39.4	-1.8	32.7	-	48.5	73.9	25.4	
Vert	17100.000	PK	43.1	41.0	-0.3	31.9	-	51.9	73.9	22.0	Floor Noise
Vert	5725.000	AV	31.7	32.1	4.5	31.2	3.6	40.7	53.9	13.2	Integration Method *1)
Vert	7600.033	AV	35.5	36.1	5.2	32.1	3.6	48.3	53.9	5.6	
Vert	11400.000	AV	37.5	39.4	-1.8	32.7	3.6	46.0	53.9	7.9	
Vert	17100.000	AV	33.8	41.0	-0.3	31.9	-	42.6	53.9	11.3	Floor Noise

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

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

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

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

*1) Not Out of Band emission (Leakage Power)

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/21/2015 04/22/2015 04/24/2015
Temperature/ Humidity : 25 deg. C / 38 % RH 22 deg. C / 39 % RH 22 deg. C / 35 % RH
Engineer : Satofumi Matsuyama Satofumi Matsuyama Satofumi Matsuyama
(1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-20 Tx 5745 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5725.000	PK	55.7	32.1	4.5	31.2	-	61.1	73.9	12.8	
Hori	7659.967	PK	46.4	36.3	5.2	32.1	-	55.8	73.9	18.1	
Hori	11490.000	PK	43.6	39.6	-1.7	32.7	-	48.8	73.9	25.1	
Hori	17235.000	PK	44.8	42.1	-0.1	31.9	-	54.9	73.9	19.0	Floor Noise
Hori	5725.000	AV	35.3	32.1	4.5	31.2	3.6	44.3	53.9	9.6	Integration Method *1)
Hori	7659.967	AV	38.3	36.3	5.2	32.1	3.6	51.3	53.9	2.6	
Hori	11490.000	AV	35.0	39.6	-1.7	32.7	3.6	43.8	53.9	10.1	
Hori	17235.000	AV	36.6	42.1	-0.1	31.9	-	46.7	53.9	7.2	Floor Noise
Vert	5725.000	PK	50.3	32.1	4.5	31.2	-	55.7	73.9	18.2	
Vert	7659.967	PK	43.5	36.3	5.2	32.1	-	52.9	73.9	21.0	
Vert	11490.000	PK	44.4	39.6	-1.7	32.7	-	49.6	73.9	24.3	
Vert	17235.000	PK	45.3	42.1	-0.1	31.9	-	55.4	73.9	18.5	Floor Noise
Vert	5725.000	AV	32.7	32.1	4.5	31.2	3.6	41.7	53.9	12.2	Integration Method *1)
Vert	7659.967	AV	35.9	36.3	5.2	32.1	3.6	48.9	53.9	5.0	
Vert	11490.000	AV	36.6	39.6	-1.7	32.7	3.6	45.4	53.9	8.5	
Vert	17235.000	AV	36.6	42.1	-0.1	31.9	-	46.7	53.9	7.2	Floor Noise

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

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

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

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

*1) Not Out of Band emission (Leakage Power)

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/22/2015 04/22/2015 04/24/2015
Temperature/ Humidity : 25 deg. C / 38 % RH 22 deg. C / 39 % RH 22 deg. C / 35 % RH
Engineer : Satofumi Matsuyama Satofumi Matsuyama Satofumi Matsuyama
(1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-20 Tx 5785 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	7713.330	PK	44.9	36.4	4.6	32.1	-	53.8	73.9	20.1	
Hori	11570.000	PK	44.3	39.6	-1.5	32.6	-	49.8	73.9	24.1	
Hori	17355.000	PK	45.1	43.0	-0.1	31.9	-	56.1	73.9	17.8	Floor Noise
Hori	7713.330	AV	37.3	36.4	4.6	32.1	3.6	49.8	53.9	4.1	
Hori	11570.000	AV	36.2	39.6	-1.5	32.6	3.6	45.3	53.9	8.6	
Hori	17355.000	AV	36.6	43.0	-0.1	31.9	-	47.6	53.9	6.3	Floor Noise
Vert	7713.330	PK	43.6	36.4	4.6	32.1	-	52.5	73.9	21.4	
Vert	11570.000	PK	45.1	39.6	-1.5	32.6	-	50.6	73.9	23.3	
Vert	17355.000	PK	45.3	43.0	-0.1	31.9	-	56.3	73.9	17.6	Floor Noise
Vert	7713.330	AV	34.2	36.4	4.6	32.1	3.6	46.7	53.9	7.2	
Vert	11570.000	AV	37.5	39.6	-1.5	32.6	3.6	46.6	53.9	7.3	
Vert	17355.000	AV	36.6	43.0	-0.1	31.9	-	47.6	53.9	6.3	Floor Noise

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

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

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

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/21/2015 04/22/2015 04/24/2015
Temperature/ Humidity : 25 deg. C / 38 % RH 22 deg. C / 39 % RH 22 deg. C / 35 % RH
Engineer : Satofumi Matsuyama Satofumi Matsuyama Satofumi Matsuyama
(1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-20 Tx 5825 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5850.000	PK	53.5	32.2	4.5	31.2	-	59.0	73.9	14.9	
Hori	7766.733	PK	45.2	36.6	5.2	32.2	-	54.8	73.9	19.1	
Hori	11650.000	PK	45.0	39.6	-1.5	32.6	-	50.5	73.9	23.4	
Hori	17475.000	PK	45.2	44.0	-0.1	31.8	-	57.3	73.9	16.6	Floor Noise
Hori	5850.000	AV	34.4	32.2	4.5	31.2	3.6	43.5	53.9	10.4	Integration Method *1)
Hori	7766.733	AV	36.4	36.6	5.2	32.2	3.6	49.6	53.9	4.3	
Hori	11650.000	AV	37.7	39.6	-1.5	32.6	3.6	46.8	53.9	7.1	
Hori	17475.000	AV	36.4	44.0	-0.1	31.8	-	48.5	53.9	5.4	Floor Noise
Vert	5850.000	PK	47.8	32.2	4.5	31.2	-	53.3	73.9	20.6	
Vert	7766.733	PK	44.2	36.6	5.2	32.2	-	53.8	73.9	20.1	
Vert	11650.000	PK	45.3	39.6	-1.5	32.6	-	50.8	73.9	23.1	
Vert	17475.000	PK	45.1	44.0	-0.1	31.8	-	57.2	73.9	16.7	Floor Noise
Vert	5850.000	AV	31.9	32.2	4.5	31.2	3.6	41.0	53.9	12.9	Integration Method *1)
Vert	7766.733	AV	36.9	36.6	5.2	32.2	3.6	50.1	53.9	3.8	
Vert	11650.000	AV	38.0	39.6	-1.5	32.6	3.6	47.1	53.9	6.8	
Vert	17475.000	AV	36.4	44.0	-0.1	31.8	-	48.5	53.9	5.4	Floor Noise

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

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

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

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

*1) Not Out of Band emission (Leakage Power)

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/20/2015 04/22/2015 04/23/2015 04/24/2015
Temperature/ Humidity : 20 deg. C / 50 % RH 25 deg. C / 38 % RH 21 deg. C / 49 % RH 22 deg. C / 35 % RH
Engineer : Tomoki Matsui Tomoki Matsui Tomoki Matsui Satofumi Matsuyama
(Band Edge) : (1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-40 Tx 5190 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5150.000	PK	58.2	31.3	4.2	31.2	-	62.5	73.9	11.4	
Hori	6920.037	PK	47.7	35.6	4.4	31.9	-	55.8	68.2	12.4	
Hori	10380.000	PK	45.0	38.8	-2.2	32.7	-	48.9	73.9	25.0	
Hori	15570.000	PK	42.3	39.0	-0.9	32.0	-	48.4	73.9	25.5	Floor Noise
Hori	5150.000	AV	36.9	31.3	4.2	31.2	4.5	45.7	53.9	8.2	Integration Method *1)
Hori	10380.000	AV	35.2	38.8	-2.2	32.7	4.5	43.6	53.9	10.3	
Hori	15570.000	AV	33.6	39.0	-0.9	32.0	-	39.7	53.9	14.2	Floor Noise
Vert	5150.000	PK	53.0	31.3	4.2	31.2	-	57.3	73.9	16.6	
Vert	6920.025	PK	46.7	35.6	4.4	31.9	-	54.8	68.2	13.4	
Vert	10380.000	PK	44.5	38.8	-2.2	32.7	-	48.4	73.9	25.5	
Vert	15570.000	PK	42.5	39.0	-0.9	32.0	-	48.6	73.9	25.3	Floor Noise
Vert	5150.000	AV	33.5	31.3	4.2	31.2	4.5	42.3	53.9	11.6	Integration Method *1)
Vert	10380.000	AV	36.7	38.8	-2.2	32.7	4.5	45.1	53.9	8.8	
Vert	15570.000	AV	34.1	39.0	-0.9	32.0	-	40.2	53.9	13.7	Floor Noise

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

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

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

*1) Not Out of Band emission (Leakage Power)

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/20/2015 04/22/2015 04/23/2015 04/24/2015
Temperature/ Humidity : 20 deg. C / 50 % RH 25 deg. C / 38 % RH 21 deg. C / 49 % RH 22 deg. C / 35 % RH
Engineer : Tomoki Matsui Tomoki Matsui Tomoki Matsui Satofumi Matsuyama
(Band Edge) (1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-40 Tx 5270 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	7026.651	PK	45.7	35.9	4.4	32.0	-	54.0	68.2	14.2	
Hori	10540.000	PK	46.7	38.7	-2.2	32.8	-	50.4	73.9	23.5	
Hori	15810.000	PK	42.5	38.3	-0.9	32.3	-	47.6	73.9	26.3	Floor Noise
Hori	10540.000	AV	37.8	38.7	-2.2	32.8	4.5	46.0	53.9	7.9	
Hori	15810.000	AV	34.1	38.3	-0.9	32.3	-	39.2	53.9	14.7	Floor Noise
Vert	7026.768	PK	45.6	35.9	4.4	32.0	-	53.9	68.2	14.3	
Vert	10540.000	PK	45.5	38.7	-2.2	32.8	-	49.2	73.9	24.7	
Vert	15810.000	PK	41.8	38.3	-0.9	32.3	-	46.9	73.9	27.0	Floor Noise
Vert	10540.000	AV	38.1	38.7	-2.2	32.8	4.5	46.3	53.9	7.6	
Vert	15810.000	AV	34.0	38.3	-0.9	32.3	-	39.1	53.9	14.8	Floor Noise

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

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

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

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/20/2015 04/22/2015 04/23/2015 04/24/2015
Temperature/ Humidity : 20 deg. C / 50 % RH 25 deg. C / 38 % RH 21 deg. C / 49 % RH 22 deg. C / 35 % RH
Engineer : Tomoki Matsui Tomoki Matsui Tomoki Matsui Satofumi Matsuyama
(Band Edge) : (1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-40 Tx 5310 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5350.000	PK	55.6	31.6	4.3	31.2	-	60.3	73.9	13.6	
Hori	7076.210	PK	45.1	35.9	4.4	32.0	-	53.4	68.2	14.8	
Hori	10620.000	PK	44.8	38.7	-2.2	32.8	-	48.5	73.9	25.4	
Hori	15930.000	PK	43.2	37.9	-0.9	32.4	-	47.8	73.9	26.1	Floor Noise
Hori	5350.000	AV	36.1	31.6	4.3	31.2	4.5	45.3	53.9	8.6	Integration Method *1)
Hori	10620.000	AV	36.9	38.7	-2.2	32.8	4.5	45.1	53.9	8.8	
Hori	15930.000	AV	34.1	37.9	-0.9	32.4	-	38.7	53.9	15.2	Floor Noise
Vert	5350.000	PK	53.1	31.6	4.3	31.2	-	57.8	73.9	16.1	
Vert	7080.162	PK	44.3	35.9	4.4	32.0	-	52.6	68.2	15.6	
Vert	10620.000	PK	45.0	38.7	-2.2	32.8	-	48.7	73.9	25.2	
Vert	15930.000	PK	42.5	37.9	-0.9	32.4	-	47.1	73.9	26.8	Floor Noise
Vert	5350.000	AV	34.3	31.6	4.3	31.2	4.5	43.5	53.9	10.4	Integration Method *1)
Vert	10620.000	AV	37.0	38.7	-2.2	32.8	4.5	45.2	53.9	8.7	
Vert	15930.000	AV	34.0	37.9	-0.9	32.4	-	38.6	53.9	15.3	Floor Noise

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

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

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

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

*1) Not Out of Band emission (Leakage Power)

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/20/2015 04/22/2015 04/23/2015 04/24/2015
Temperature/ Humidity : 20 deg. C / 50 % RH 25 deg. C / 38 % RH 21 deg. C / 49 % RH 22 deg. C / 35 % RH
Engineer : Tomoki Matsui Tomoki Matsui Tomoki Matsui Satofumi Matsuyama
(Band Edge) : (1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-40 Tx 5510 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5470.000	PK	50.1	31.8	4.3	31.2	-	55.0	73.9	18.9	
Hori	7346.683	PK	46.0	35.9	4.5	32.0	-	54.4	73.9	19.5	
Hori	11020.000	PK	44.2	38.8	-2.2	33.0	-	47.8	73.9	26.1	
Hori	16530.000	PK	43.1	39.0	-0.5	32.2	-	49.4	73.9	24.5	Floor Noise
Hori	5470.000	AV	33.2	31.8	4.3	31.2	4.5	42.6	53.9	11.3	Integration Method *1)
Hori	7346.683	AV	37.7	35.9	4.5	32.0	4.5	50.6	53.9	3.3	
Hori	11020.000	AV	37.1	38.8	-2.2	33.0	4.5	45.2	53.9	8.7	
Hori	16530.000	AV	34.2	39.0	-0.5	32.2	-	40.5	53.9	13.4	Floor Noise
Vert	5470.000	PK	48.1	31.8	4.3	31.2	-	53.0	73.9	20.9	
Vert	7346.819	PK	43.6	35.9	4.5	32.0	-	52.0	73.9	21.9	
Vert	11020.000	PK	45.1	38.8	-2.2	33.0	-	48.7	73.9	25.2	
Vert	16530.000	PK	42.5	39.0	-0.5	32.2	-	48.8	73.9	25.1	Floor Noise
Vert	5470.000	AV	32.3	31.8	4.3	31.2	4.5	41.7	53.9	12.2	Integration Method *1)
Vert	7346.819	AV	35.1	35.9	4.5	32.0	4.5	48.0	53.9	5.9	
Vert	11020.000	AV	37.7	38.8	-2.2	33.0	4.5	45.8	53.9	8.1	
Vert	16530.000	AV	34.2	39.0	-0.5	32.2	-	40.5	53.9	13.4	Floor Noise

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

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

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

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

*1) Not Out of Band emission (Leakage Power)

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/22/2015 04/23/2015 04/24/2015
Temperature/ Humidity : 25 deg. C / 38 % RH 21 deg. C / 49 % RH 22 deg. C / 35 % RH
Engineer : Tomoki Matsui Tomoki Matsui Satofumi Matsuyama
Mode : (1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
11n-40 Tx 5550 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	7400.063	PK	44.9	35.9	4.5	32.1	-	53.2	73.9	20.7	
Hori	11100.000	PK	44.3	38.9	-2.0	33.0	-	48.2	73.9	25.7	
Hori	16650.000	PK	42.8	39.3	-0.5	32.2	-	49.4	73.9	24.5	Floor Noise
Hori	7400.063	AV	36.3	35.9	4.5	32.1	4.5	49.1	53.9	4.8	
Hori	11100.000	AV	37.0	38.9	-2.0	33.0	4.5	45.4	53.9	8.5	
Hori	16650.000	AV	34.3	39.3	-0.5	32.2	-	40.9	53.9	13.0	Floor Noise
Vert	7400.600	PK	43.2	35.9	4.5	32.1	-	51.5	73.9	22.4	
Vert	11100.000	PK	43.5	38.9	-2.0	33.0	-	47.4	73.9	26.5	
Vert	16650.000	PK	42.6	39.3	-0.5	32.2	-	49.2	73.9	24.7	Floor Noise
Vert	7400.600	AV	33.5	35.9	4.5	32.1	4.5	46.3	53.9	7.6	
Vert	11100.000	AV	36.4	38.9	-2.0	33.0	4.5	44.8	53.9	9.1	
Vert	16650.000	AV	34.4	39.3	-0.5	32.2	-	41.0	53.9	12.9	Floor Noise

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

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

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

UL Japan, Inc.

Ise EMC Lab.

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/20/2015 04/22/2015 04/23/2015 04/24/2015
Temperature/ Humidity : 20 deg. C / 50 % RH 25 deg. C / 38 % RH 21 deg. C / 49 % RH 22 deg. C / 35 % RH
Engineer : Tomoki Matsui Tomoki Matsui Tomoki Matsui Satofumi Matsuyama
(Band Edge) (1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-40 Tx 5670 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5725.000	PK	48.2	32.1	4.5	31.2	-	53.6	73.9	20.3	
Hori	7559.944	PK	47.0	36.0	4.6	32.1	-	55.5	73.9	18.4	
Hori	11340.000	PK	42.4	39.3	-1.8	32.8	-	47.1	73.9	26.8	
Hori	17010.000	PK	42.3	40.2	-0.3	32.0	-	50.2	73.9	23.7	Floor Noise
Hori	5725.000	AV	31.8	32.1	4.5	31.2	4.5	41.7	53.9	12.2	Integration Method *1)
Hori	7559.944	AV	38.5	36.0	4.6	32.1	4.5	51.5	53.9	2.4	
Hori	11340.000	AV	34.8	39.3	-1.8	32.8	4.5	44.0	53.9	9.9	
Hori	17010.000	AV	34.2	40.2	-0.3	32.0	-	42.1	53.9	11.8	Floor Noise
Vert	5725.000	PK	46.9	32.1	4.5	31.2	-	52.3	73.9	21.6	
Vert	7559.943	PK	43.5	36.0	4.6	32.1	-	52.0	73.9	21.9	
Vert	11340.000	PK	43.4	39.3	-1.8	32.8	-	48.1	73.9	25.8	
Vert	17010.000	PK	42.7	40.2	-0.3	32.0	-	50.6	73.9	23.3	Floor Noise
Vert	5725.000	AV	31.4	32.1	4.5	31.2	4.5	41.3	53.9	12.6	Integration Method *1)
Vert	7559.943	AV	35.1	36.0	4.6	32.1	4.5	48.1	53.9	5.8	
Vert	11340.000	AV	37.1	39.3	-1.8	32.8	4.5	46.3	53.9	7.6	
Vert	17010.000	AV	34.1	40.2	-0.3	32.0	-	42.0	53.9	11.9	Floor Noise

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

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

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

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

*1) Not Out of Band emission (Leakage Power)

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/20/2015 04/22/2015 04/22/2015 04/24/2015
Temperature/ Humidity : 20 deg. C / 50 % RH 25 deg. C / 38 % RH 22 deg. C / 39 % RH 22 deg. C / 35 % RH
Engineer : Tomoki Matsui Tomoki Matsui Satofumi Matsuyama Satofumi Matsuyama
(Band Edge) : (1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-40 Tx 5755 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5715.000	PK	52.5	32.1	4.5	31.2	-	57.9	68.2	10.3	
Hori	5725.000	PK	66.0	32.1	4.5	31.2	-	71.4	78.2	6.8	
Hori	7673.343	PK	46.4	36.3	5.2	32.1	-	55.8	73.9	18.1	
Hori	11510.000	PK	44.1	39.6	-1.6	32.7	-	49.4	73.9	24.5	
Hori	17265.000	PK	45.3	42.3	-0.1	31.9	-	55.6	73.9	18.3	Floor Noise
Hori	7673.343	AV	37.5	36.3	5.2	32.1	4.5	51.4	53.9	2.5	
Hori	11510.000	AV	35.1	39.6	-1.6	32.7	4.5	44.9	53.9	9.0	
Hori	17265.000	AV	36.6	42.3	-0.1	31.9	-	46.9	53.9	7.0	Floor Noise
Vert	5715.000	PK	50.9	32.1	4.5	31.2	-	56.3	68.2	11.9	
Vert	5725.000	PK	64.5	32.1	4.5	31.2	-	69.9	78.2	8.3	
Vert	7676.888	PK	43.8	36.3	5.2	32.1	-	53.2	73.9	20.7	
Vert	11510.000	PK	44.4	39.6	-1.6	32.7	-	49.7	73.9	24.2	
Vert	17265.000	PK	45.1	42.3	-0.1	31.9	-	55.4	73.9	18.5	Floor Noise
Vert	7676.888	AV	34.9	36.3	5.2	32.1	4.5	48.8	53.9	5.1	
Vert	11510.000	AV	36.6	39.6	-1.6	32.7	4.5	46.4	53.9	7.5	
Vert	17265.000	AV	36.6	42.3	-0.1	31.9	-	46.9	53.9	7.0	Floor Noise

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

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

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

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10706993H
Date : 04/20/2015 04/22/2015 04/22/2015 04/24/2015
Temperature/ Humidity : 20 deg. C / 50 % RH 25 deg. C / 38 % RH 22 deg. C / 39 % RH 22 deg. C / 35 % RH
Engineer : Tomoki Matsui Tomoki Matsui Satofumi Matsuyama Satofumi Matsuyama
(Band Edge) (1 GHz - 10 GHz) (10 GHz - 18 GHz) (Above 18 GHz)
Mode : 11n-40 Tx 5795 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5850.000	PK	45.5	32.2	4.5	31.2	-	51.0	73.9	22.9	
Hori	7726.659	PK	44.4	36.5	4.7	32.1	-	53.5	73.9	20.4	
Hori	11590.000	PK	44.2	39.6	-1.5	32.6	-	49.7	73.9	24.2	
Hori	17385.000	PK	44.9	43.3	-0.1	31.8	-	56.3	73.9	17.6	Floor Noise
Hori	5850.000	AV	31.9	32.2	4.5	31.2	4.5	41.9	53.9	12.0	Integration Method *1)
Hori	7726.659	AV	36.0	36.5	4.7	32.1	4.5	49.6	53.9	4.3	
Hori	11590.000	AV	36.3	39.6	-1.5	32.6	4.5	46.3	53.9	7.6	
Hori	17385.000	AV	36.6	43.3	-0.1	31.8	-	48.0	53.9	5.9	Floor Noise
Vert	5850.000	PK	43.2	32.2	4.5	31.2	-	48.7	73.9	25.2	
Vert	7721.056	PK	42.5	36.5	4.6	32.1	-	51.5	73.9	22.4	
Vert	11590.000	PK	44.5	39.6	-1.5	32.6	-	50.0	73.9	23.9	
Vert	17385.000	PK	45.2	43.3	-0.1	31.8	-	56.6	73.9	17.3	Floor Noise
Vert	5850.000	AV	31.5	32.2	4.5	31.2	4.5	41.5	53.9	12.4	Integration Method *1)
Vert	7721.056	AV	35.1	36.5	4.6	32.1	4.5	48.6	53.9	5.3	
Vert	11590.000	AV	36.6	39.6	-1.5	32.6	4.5	46.6	53.9	7.3	
Vert	17385.000	AV	36.6	43.3	-0.1	31.8	-	48.0	53.9	5.9	Floor Noise

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

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

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

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

*1) Not Out of Band emission (Leakage Power)

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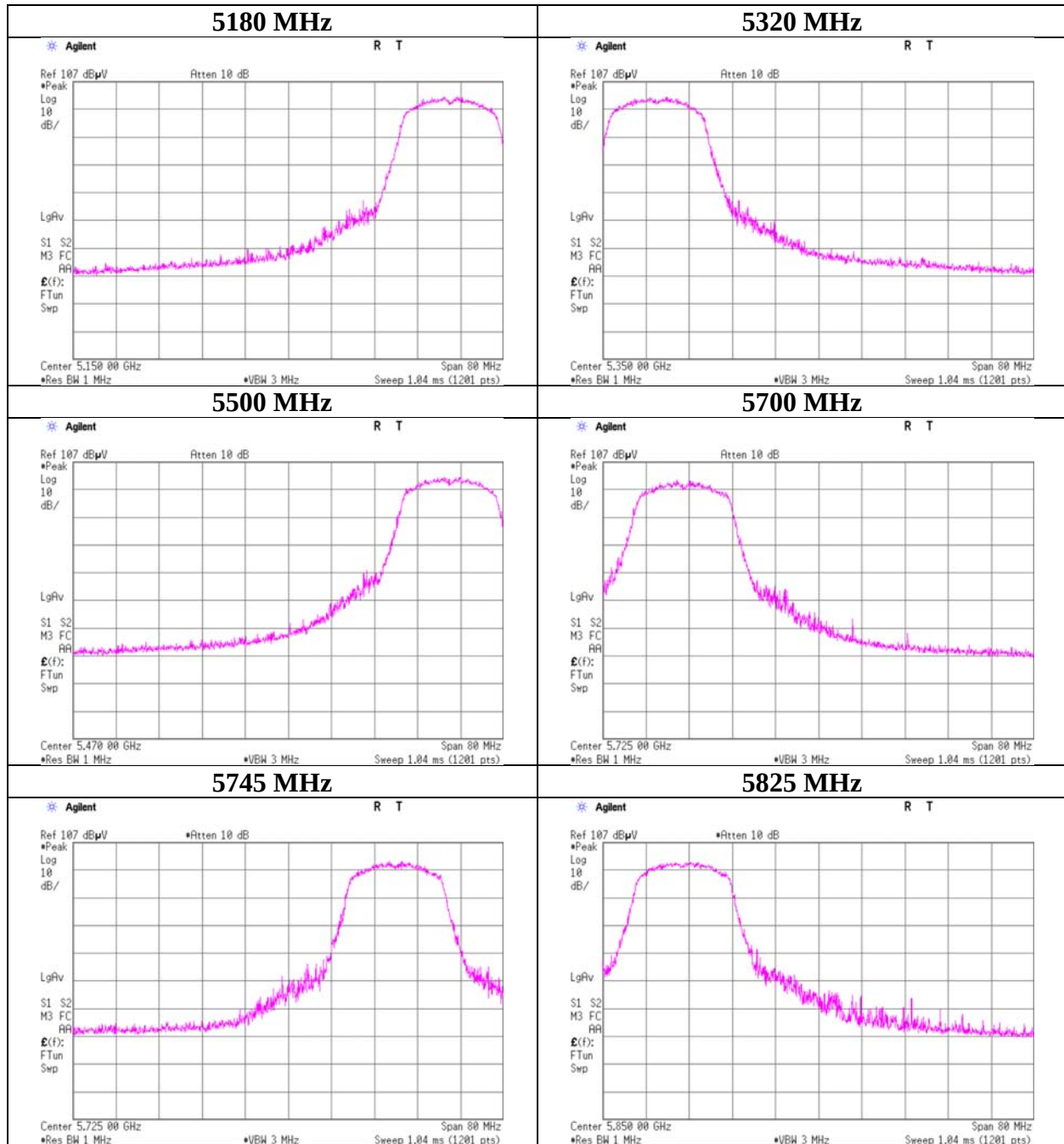
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Band Edge confirmation

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10706993H
Date	04/23/2015
Temperature/ Humidity	23 deg. C / 34 % RH
Engineer	Yuta Moriya
Mode	11n-20 Tx

11n-20 Peak detect



* Final result of band edge was measured as Radiated Spurious Emission. Refer to Radiated Spurious Emission's pages.

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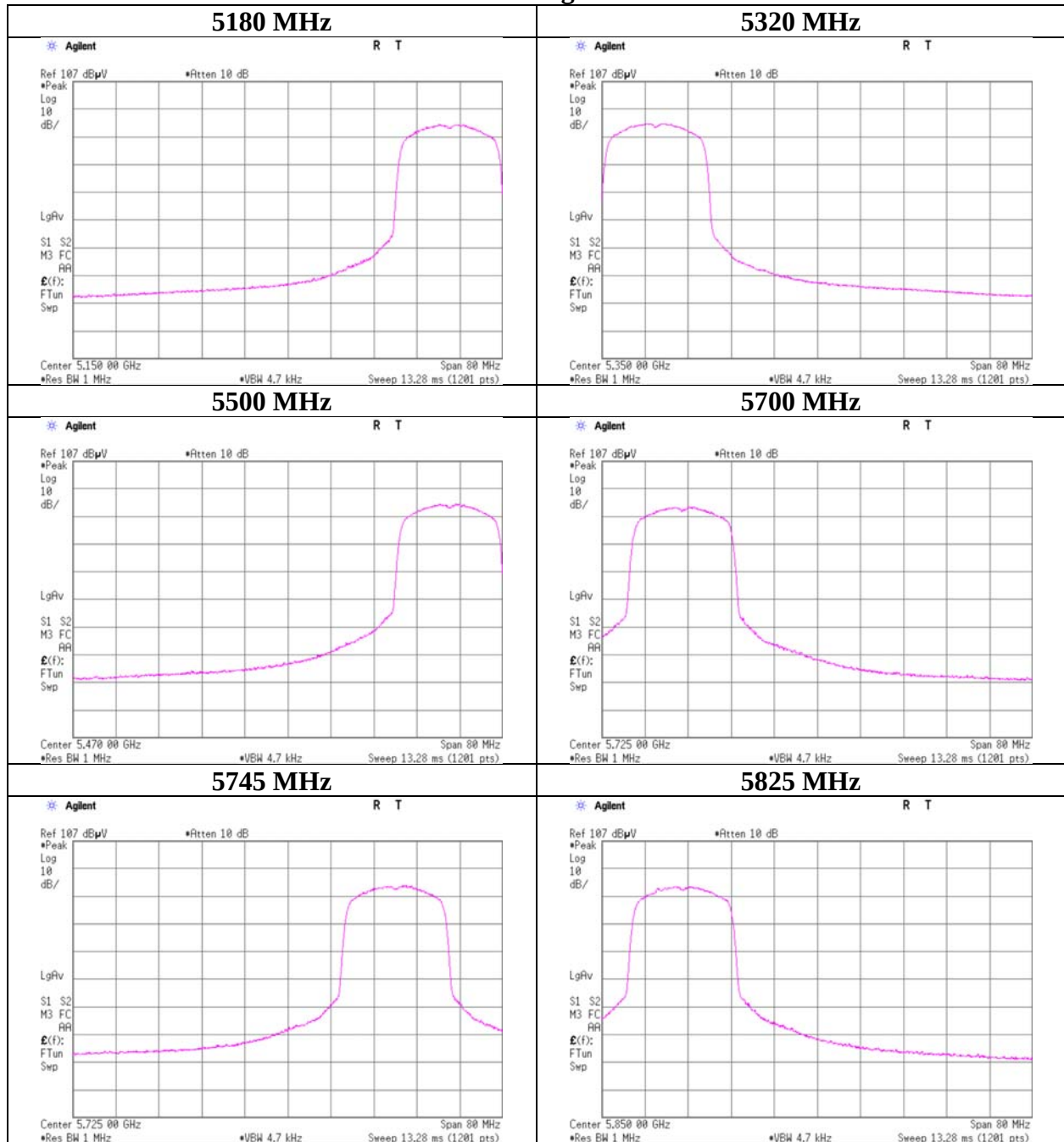
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Band Edge confirmation

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10706993H
Date	04/23/2015
Temperature/ Humidity	23 deg. C / 34 % RH
Engineer	Yuta Moriya
Mode	11n-20 Tx

11n-20 Average detect



* Final result of band edge was measured as Radiated Spurious Emission. Refer to Radiated Spurious Emission's pages.

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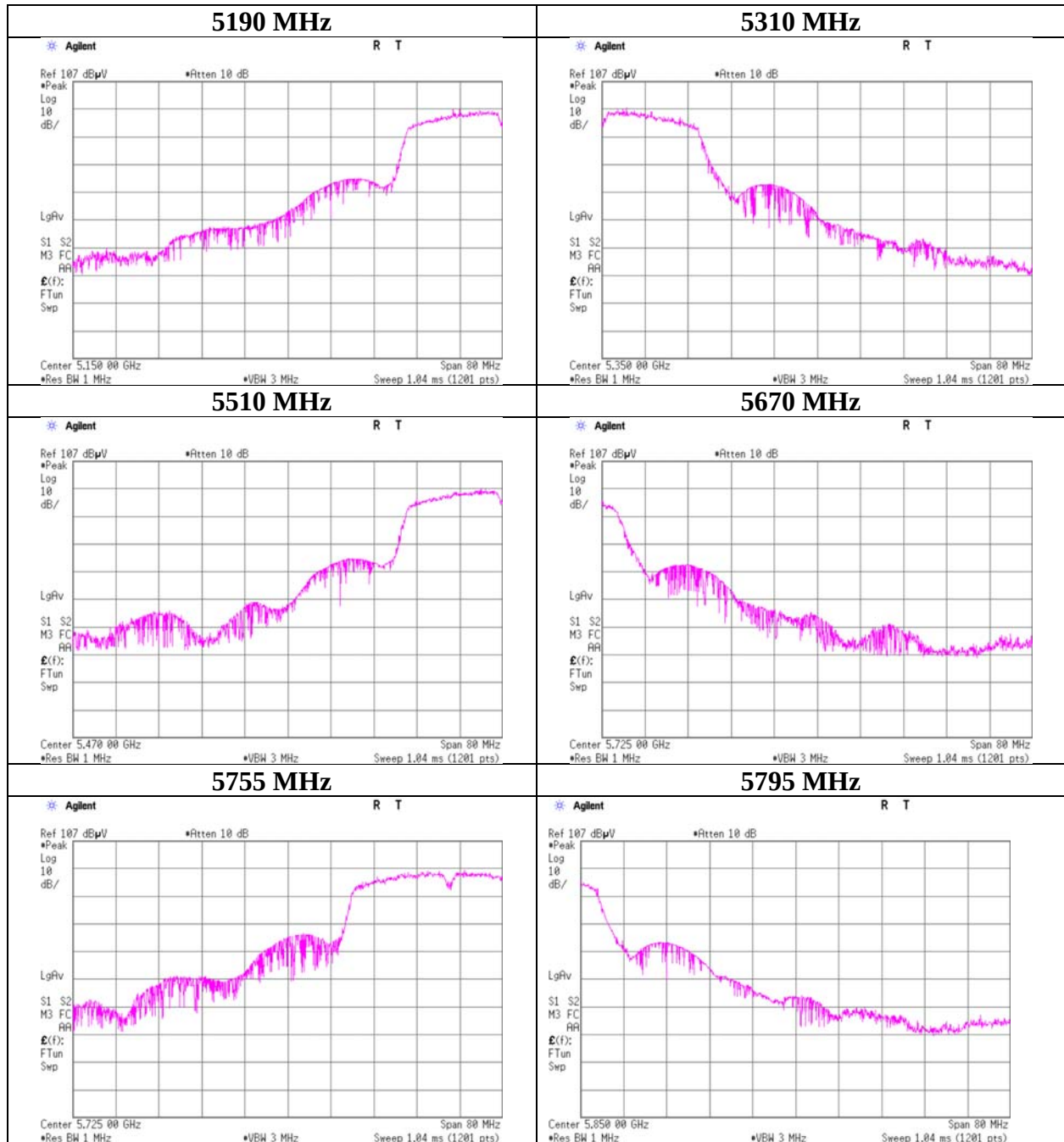
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Band Edge confirmation

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10706993H
Date	04/23/2015
Temperature/ Humidity	23 deg. C / 34 % RH
Engineer	Yuta Moriya
Mode	11n-40 Tx

11n-40 Peak detect



* Final result of band edge was measured as radiated spurious emission. Refer to Radiated Spurious Emission's pages.

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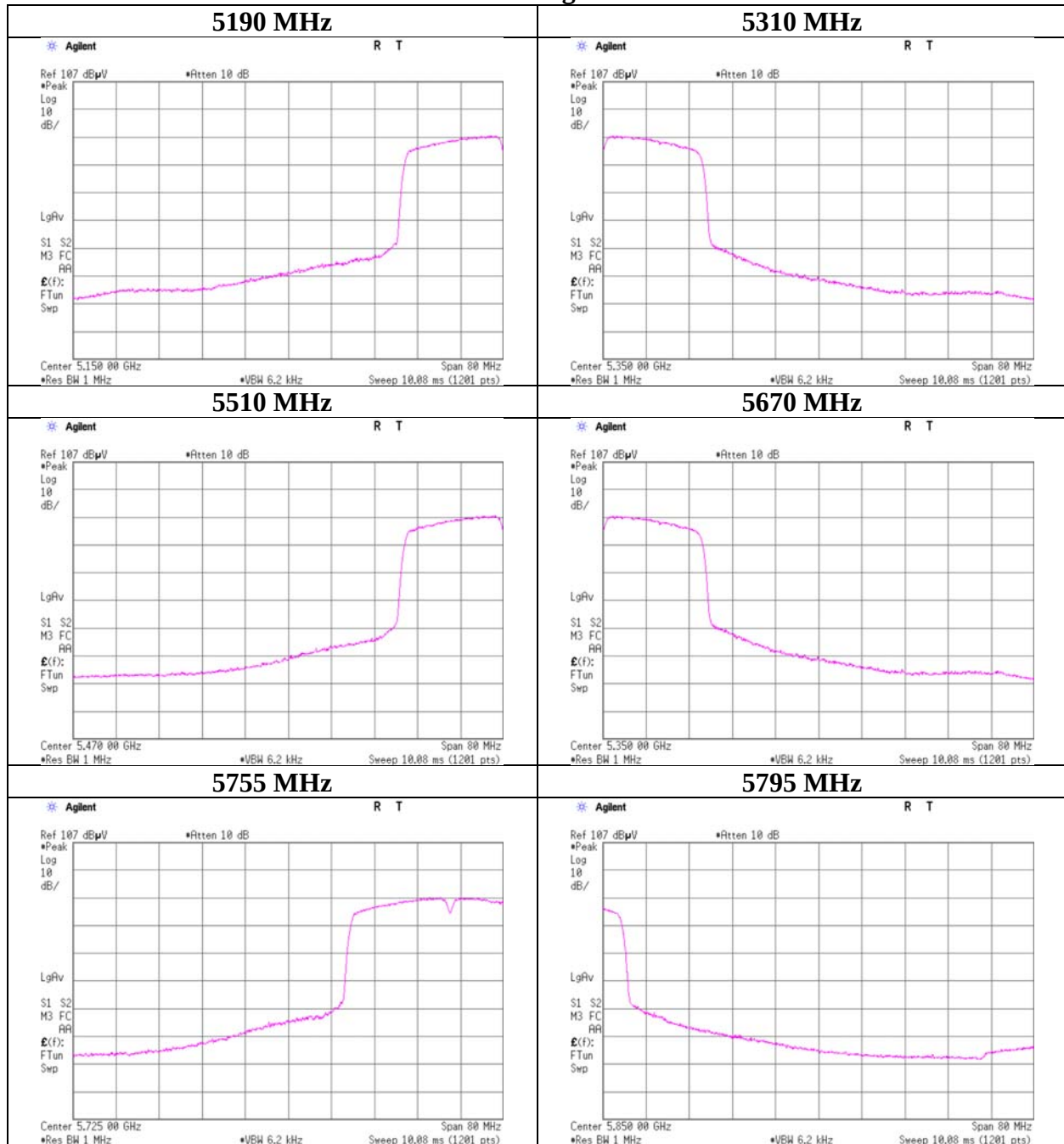
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Band Edge confirmation

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10706993H
Date	04/23/2015
Temperature/ Humidity	23 deg. C / 34 % RH
Engineer	Yuta Moriya
Mode	11n-40 Tx

11n-40 Average detect



* Final result of band edge was measured as Radiated Spurious Emission. Refer to Radiated Spurious Emission's pages.

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Ise EMC Lab.

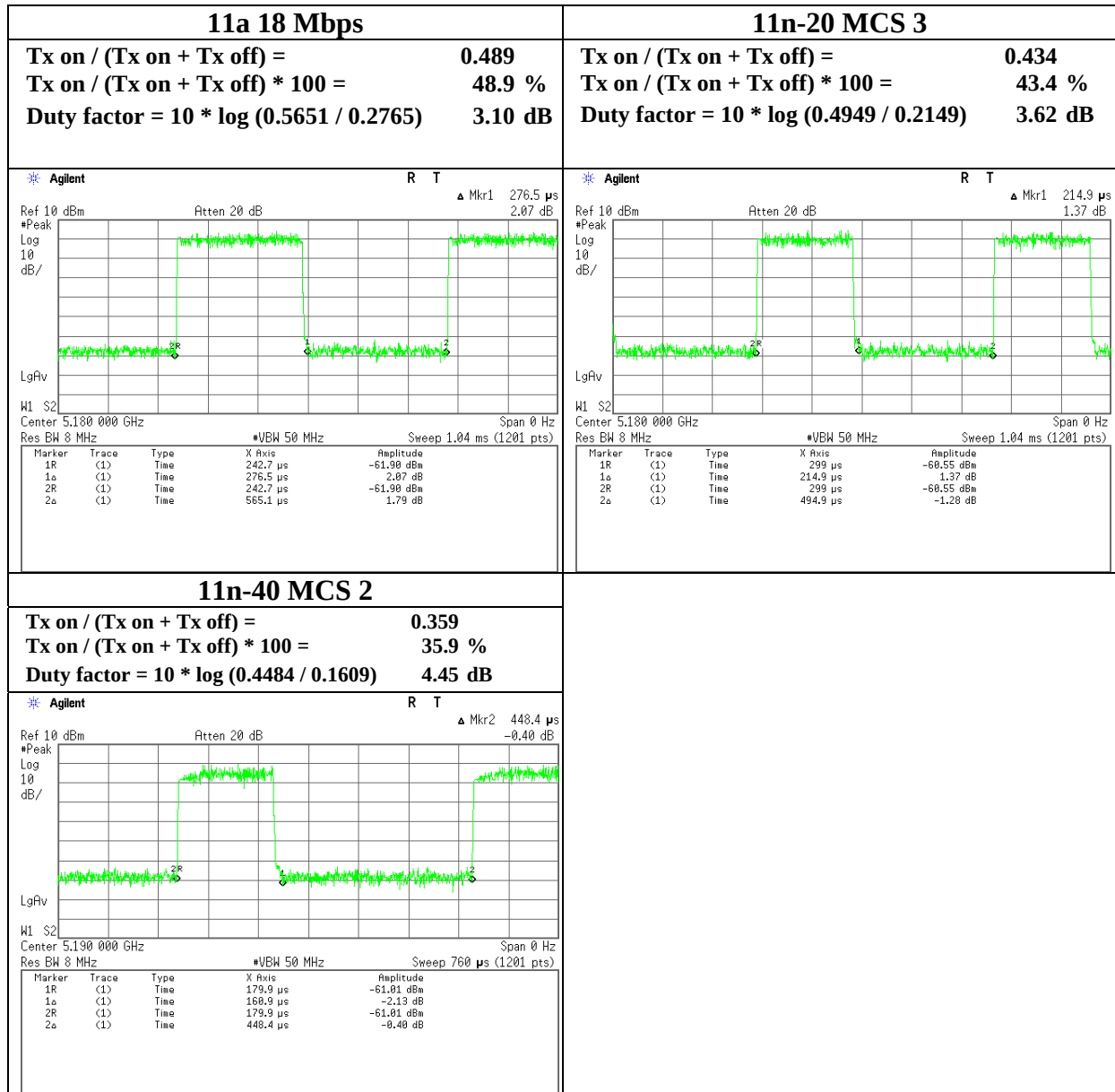
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VBW (AV) Calculation

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10706993H
Date : 4/22/2015
Temperature/ Humidity : 24 deg. C / 40 % RH
Engineer : Kazuya Yoshioka
Mode : 11a Tx / 11n-20 Tx / 11n-40 Tx



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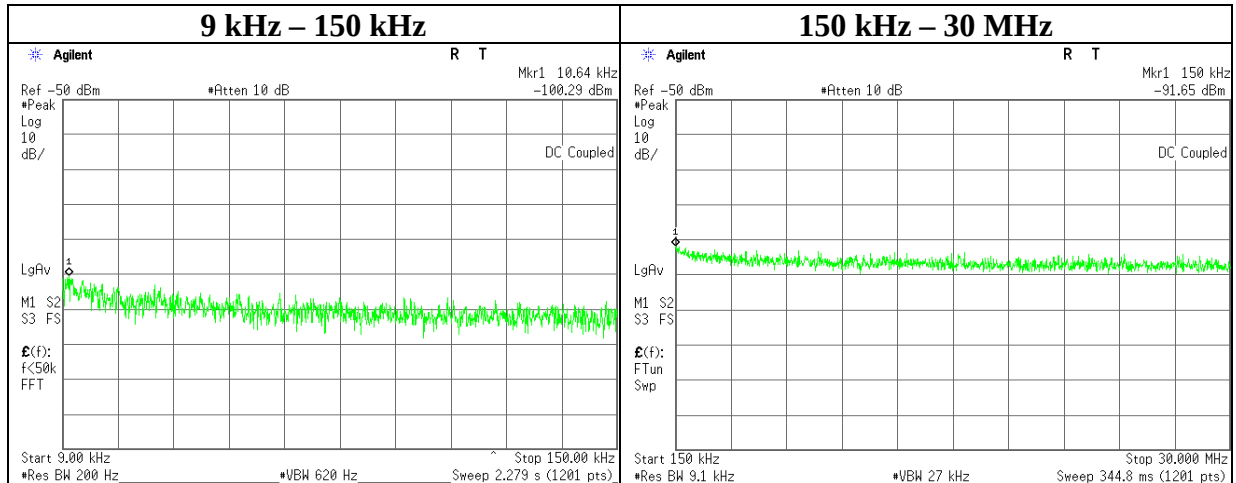
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10706993H
Date : 04/23/2015
Temperature/ Humidity : 23 deg. C / 34 % RH
Engineer : Yuta Moriya
Mode : 11n-20 Tx

11n-20 Tx 5580 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
10.64	-100.3	1.26	10.05	3.6	1	-85.4	300	6.0	-24.1	67.0	91.1	
150.00	-91.7	1.26	10.05	3.6	1	-76.7	300	6.0	-15.5	44.0	59.5	

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

$\text{EIRP} = \text{Reading} + \text{Cable Loss (including the cable(s) customer supplied)} + \text{Attenuator} + \text{Antenna Gain} + 10 * \log(N)$

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APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2014/12/22 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2015/02/26 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2014/06/16 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2014/06/16 * 12
MCC-98	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	30819/2	AT	2014/05/16 * 12
MAT-20	Attenuator(10dB)(above 1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2015/01/08 * 12
MCC-67	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28635/2	AT	2015/04/09 * 12
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2015/03/13 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2015/02/19 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2015/01/13 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MRENT-116	Spectrum Analyzer	Agilent	E4440A	MY46187620	RE	2015/03/09 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2014/05/26 * 12
MCC-166	Microwave Cable	Junkosha	MWX221	1303S120(1m) / 1311S167(5m)	RE	2014/09/24 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2015/03/19 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2014/05/26 * 12
MHF-22	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCB	602	RE	2015/01/27 * 12
MCC-177	Microwave Cable	Junkosha	MMX221-00500DMSDMS	1502S304	RE	2015/03/27 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2015/02/26 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2014/05/26 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2015/03/09 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	3950M00205	RE	2014/06/30 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2014/10/18 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2014/10/18 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2014/07/14 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2015/04/08 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2015/03/10 * 12

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

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

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

Test Item: RE: Radiated Emission test

AT: Antenna Terminal Conducted test

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