



RADIO TEST REPORT

Test Report No. : 11242579M-C-R1

Applicant : CASIO COMPUTER CO., LTD.
Type of Equipment : Handheld Terminal
Model No. : IT-G500-C21E-US
FCC ID : BBQITG500
Test regulation : FCC Part 15 Subpart E: 2016
(5 GHz Wireless LAN part except for DFS test)
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 11242579M-C. 11242579M-C is replaced with this report.

Date of test: May 10, 14, 15, 17, 18, 22, 26,
June 22, 2016

**Representative
test engineer:**

Kazuhiro Ando
Engineer
Consumer Technology Division

Approved by:

Masanori Nishiyama
Manager
Consumer Technology Division



CERTIFICATE 1266.01

- 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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SECTION 1: Customer information

Company Name : CASIO COMPUTER CO., LTD.
Address : 2951-5, Ishikawa-Machi, Hachioji-shi Tokyo 192-8556, Japan
Telephone Number : +81-42-639-5188
Facsimile Number : +81-42-639-5046
Contact Person : KATSUMASA MOTOKI

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

2.1 Identification of E.U.T.

Type of Equipment : Handheld Terminal
Model No. : IT-G500-C21E-US
Serial No. : Refer to Section 4, Clause 4.2
Rating : Li-ion battery DC3.7V 1850mAh/6.9Wh, M/N:HA-D20BAT-A
Option Battery : Li-ion battery DC3.7V 3700mAh/14Wh, M/N:HA-D21LBAT-A
Receipt Date of Sample : April 18, 2016
Country of Mass-production : Japan
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

2.2 Product Description

Model: IT-G500-C21E-US (referred to as the EUT in this report) is a Handheld Terminal.

General Specification

Clock frequency(ies) in the system	CPU: 1.5 GHz
Power Supply (inner)	DC 3.3 V / 1.8 V

Radio Specification

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

Equipment Type	Transceiver
Frequency of Operation	2412-2462MHz, 5180-5825MHz
Type of Modulation	DSSS, OFDM
Antenna type	Inverted F antenna (IEEE802.11b/g/n) Dipole antenna (IEEE802.11a/n)
Antenna Gain	0.79dBi (2412-2462MHz) 1.05dBi (5180-5825MHz)

BT

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Antenna type	Inverted F antenna
Antenna Gain	0.79dBi

RFID

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK
Antenna type	Loop antenna

- * Refer to the test reports: 11242579M-A for 2.4 GHz band (Wireless LAN part).
- * Refer to the test reports: 11242579M-B for 2.4 GHz band (Bluetooth part).
- * Refer to the test reports: 11242579M-D for 5 GHz band (DFS test only).
- * Refer to the test reports: 11242579M-E for 13.56 MHz band (RFID).

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E.
FCC part 15 final revised on April 6, 2016.

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

* Also the EUT complies with FCC Part 15 Subpart B.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013	FCC: 15.407 (b) (6) / 15.207	QP 14.0 dB, 0.48475 MHz, N AV 11.5 dB, 0.50000 MHz, N	Complied	-
	IC: RSS-Gen 8.8	IC: RSS-Gen 8.8			
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033	FCC: 15.407 (a) (1) (2) (3)	See data	N/A	Conducted
	IC: -	IC: -			
Maximum Conducted Output Power	FCC: KDB Publication Number 789033	FCC: 15.407 (a) (1) (2) (3)		Complied	Conducted
	IC: -	IC: RSS-247 6.2.1 (1) 6.2.2 (1) 6.2.3 (1) 6.2.4 (1)			
Maximum Power Spectral Density	FCC: KDB Publication Number 789033	FCC : 15.407 (a) (1) (2) (3)		Complied	Conducted
	IC: -	IC: RSS-247 6.2.1 (1) 6.2.2 (1) 6.2.3 (1) 6.2.4 (1)			
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 789033	FCC: 15.407 (b), 15.205 and 15.209	3.4 dB 21040.0 MHz, AV, Hori.	Complied	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
	IC: -	IC: RSS-247 6.2.1 (2) 6.2.2 (2) 6.2.3 (2) 6.2.4 (2)			
6 dB Emission Bandwidth	FCC: ANSI C63.10-2013	FCC: 15.407 (e)	See data	Complied	Conducted
	IC: -	IC: RSS-247 6.2.4 (1)			

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

* For DFS tests, please see the test report number 11242579M-D issued by UL Japan, Inc.

*1) Radiated test was selected over 30 MHz based on section 6.2 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)

This EUT provides stable voltage (DC 1.8V) constantly to RF Part regardless of input voltage. Therefore, this 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 EUT. 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 $k=2$.

Item	Frequency range	Uncertainty (+/-)
		No. 1 SAC / SR
Radiated emission (Measurement distance: 3m)	30MHz - 300MHz	4.7dB
	300MHz - 1GHz	3.6dB
	1GHz - 10GHz	5.1dB
Radiated emission (Measurement distance: 1m)	10GHz - 18GHz	5.7dB
	18GHz - 26.5GHz	5.1dB

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1GHz	0.7dB
Spurious emission (Conducted) below 1GHz	1.6dB
Spurious emission (Conducted) 1GHz - 3GHz	1.4dB
Spurious emission (Conducted) 3GHz - 18GHz	2.8dB
Spurious emission (Conducted) 18GHz - 26.5GHz	2.5dB
Bandwidth Measurement	5.4%

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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A2LA Accreditation No. 1266.01

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 Open site	4659A-1	6.0 x 5.5 x 2.5	20 x 40	10 m
No.2 Open site	4659A-2	4.4 x 4.4 x 2.15	18 x 20	10 m
No.5 Open site	4659A-5	8.6 x 7.1 x 2.4	18 x 23	10 m
No.1 Shielded room	4659A-1	5.4 x 4.5 x 2.3	-	-
No.2 Shielded room	4659A-2	3.6 x 2.7 x 2.3	-	-
No.3 Shielded room	-	5.4 x 3.6 x 2.3	-	-
No.4 Shielded Room	-	6.1 x 6.1 x 3.1	-	-
No.5 Shielded Room	4659A-5	4.2 x 3.1 x 2.5	-	-
No.3 Fully Anechoic Chamber	-	7.0 x 3.5 x 3.5	-	-
No.6 Semi-anechoic Chamber	4659A-6	8.5 x 5.5 x 5.2	-	3 m
No.10 Semi-anechoic Chamber	4659A-10	18.4 x 9.9 x 7.7	-	10 m
No.11 Semi-anechoic Chamber	4659A-7	9.0 x 6.5 x 5.2	-	3 m
No.1 Measurement room	-	5.0 x 3.7 x 2.6	-	-
No.6 Measurement room	-	4.3 x 4.4 x 2.7	-	-

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)	12 Mbps, PN9
IEEE 802.11n MIMO 20 MHz BW (11n-20)	MCS 4, 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 settings: 25000 Software: WL127X_TOOL *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 Frequency			
		Lower Band	Middle Band	Additional Band	Upper Band
Conducted emission	11n-20Tx *1)	-	5300 MHz	-	-
26 dB Emission Bandwidth	11a Tx 11n-20 Tx	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 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
6 dB Bandwidth	11a Tx 11n-20 Tx	-	-	-	5745 MHz 5785 MHz 5825 MHz
Radiated Spurious Emission (Below 1 GHz)	11n-20 Tx *1)	-	5300 MHz	-	-
Radiated Spurious Emission (above 1 GHz)	11n-20 Tx *1)	5180 MHz	5260 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
Conducted Spurious Emission	11n-20 Tx *1)	-	5300 MHz	-	-
*1) The mode was tested as a representative, because it had the highest power at antenna terminal test.					

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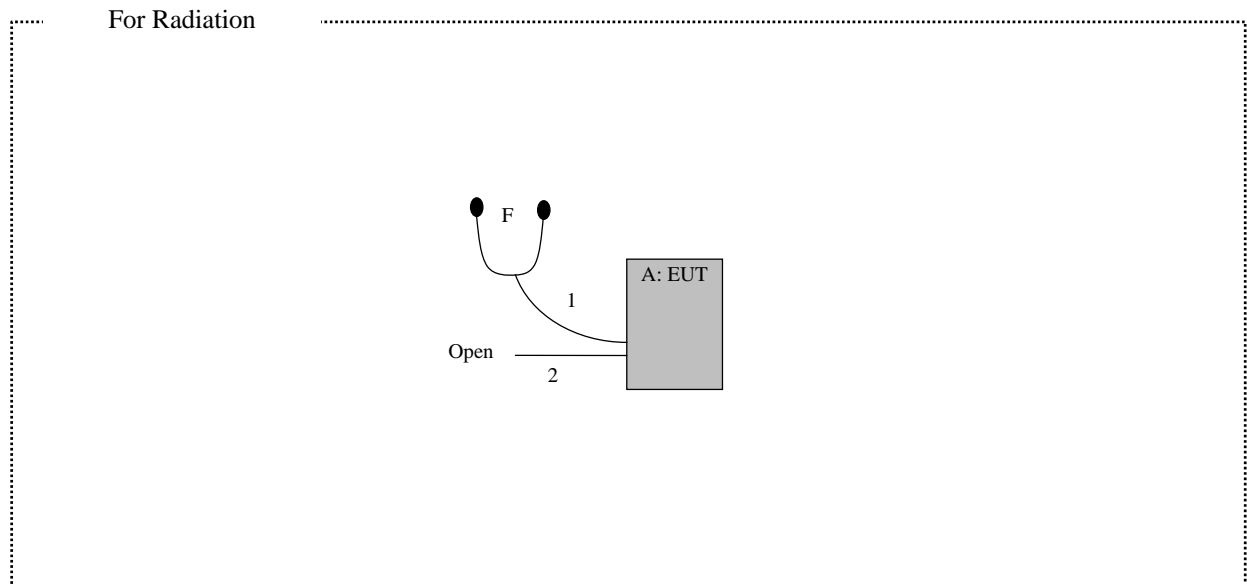
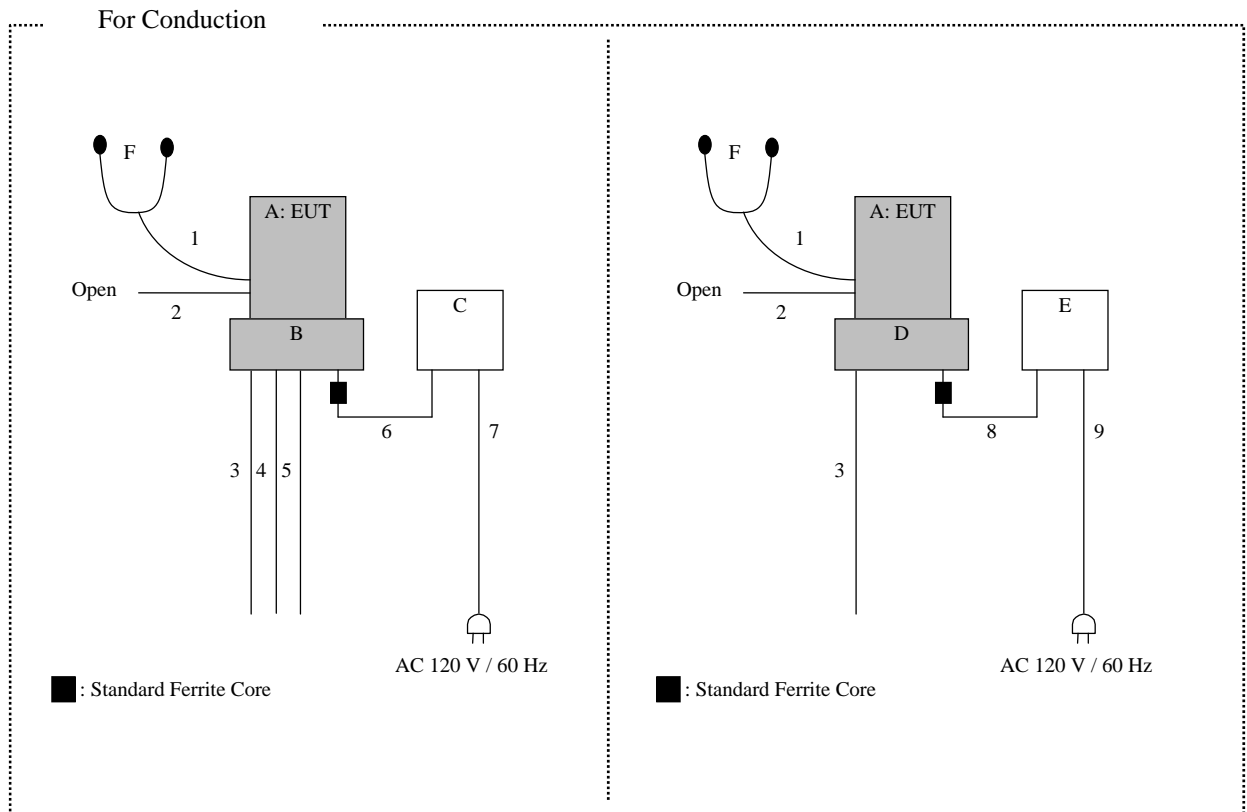
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4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Handheld Terminal	IT-G500-C21E-US	024SE LG6200795IAAD1 *1) 024SE LG6100692IAAC1 *2)	CASIO COMPUTER CO., LTD.	EUT
B	Cradle	HA-P62IO	244AA JX4B00502 GAAA1	CASIO COMPUTER CO., LTD.	EUT
C	AC Adapter	AD-S42120C	0915C	CASIO COMPUTER CO., LTD.	-
D	Cradle	HA-P60IO	241AA JW4B00501 GAAA1	CASIO COMPUTER CO., LTD.	EUT
E	AC Adapter	AD-S15050B	0711C	CASIO COMPUTER CO., LTD.	-
F	Ear phone	-	-	-	-

*1) Used for Antenna Terminal conducted tests

*2) Used for Conducted Emission test and Radiated Spurious Emission tests

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Ear phone	1.2	Unshielded	Unshielded	-
2	USB	1.8	Shielded	Shielded	-
3	USB	1.8	Shielded	Shielded	-
4	USB	2.0	Shielded	Shielded	-
5	LAN	1.0	Unshielded	Unshielded	-
6	DC	1.5	Unshielded	Unshielded	-
7	AC	2.0	Unshielded	Unshielded	-
8	DC	1.5	Unshielded	Unshielded	-
9	AC	2.0	Unshielded	Unshielded	-

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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a wooden table of nominal size, 1.0 m by 2.0 m, raised 0.8m above the conducting ground plane. 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 80 cm 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.

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane.

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. *) in the Section 15.407 (b) (1) (2) (3).

Apply to limit 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p. *) or

78.2 dBuV/m, 3 m (-17 dBm e.i.r.p. *) in the Section 15.407 (b).

Restricted band edge:

Apply to limit in the Section 15.209 (a).

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

*Electric field strength to e.i.r.p. conversion:

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

Test Antennas are used as below;

Test Antennas are used as below;

Frequency	Below 1 GHz	Above 1 GHz
Antenna Type	Hybrid	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: 1/T (*T = transmission duration)
Test Distance	3.0 m	4.0 m *2) (1 - 10 GHz), 1.0 m *3) (above 10 GHz)	

*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01r02 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on April 8, 2016)".

*2) Distance Factor: $20 \times \log(4.0 \text{ m}/3.0 \text{ m}) = 2.5 \text{ dB}$

*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 and EUT on the cradle to see the position of maximum noise, and the test was made at the position that has the maximum noise.

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

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

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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
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	1 MHz or 470 kHz *2)	≥ 3 RBW	Auto	Power Averaging (200 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3)	9 kHz – 150 kHz 150 kHz – 30 MHz	200 Hz 10 kHz	620 Hz 30 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01r02 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on April 8, 2016)".

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

*2) KDB 789033 D02 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 RBW Correction Factor ($10 \log(500 \text{ kHz} / 470 \text{ kHz})$) 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
(Cradle: HA-P62IO)

DATA OF CONDUCTED EMISSION TEST

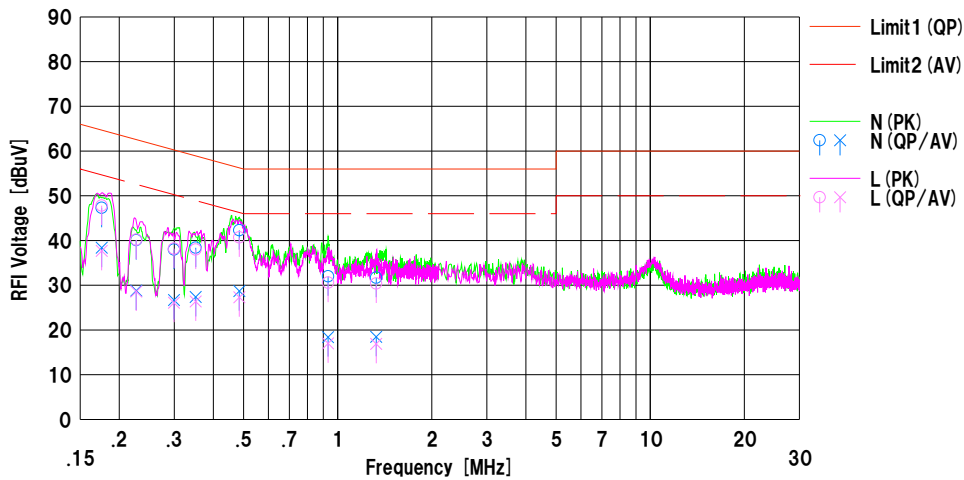
UL Japan, Inc. Kashima EMC Lab. No.2 Shielded Room
Date : 2016/05/26

Company : CASIO COMPUTER CO., LTD.
Kind of EUT : Handheld Terminal
Model No. : IT-G500-C21E-US
Serial No. : Q24SE LG6100629AAC1
Remarks : With Cradle : HA-P62IO

Mode : Tx, 11n-20, MCS4, 5300MHz
Order No. : 11242579M
Power : AC 120V / 60Hz
Temp./Humi. : 22deg.C / 59%RH

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

Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<OP> [dBuV]	<AV> [dBuV]		<OP> [dBuV]	<AV> [dBuV]	<OP> [dBuV]	<AV> [dBuV]	<OP> [dB]	<AV> [dB]		
1	0.17585	37.6	28.7	9.7	47.3	38.4	64.7	54.7	17.4	16.3	N	
2	0.22677	30.4	19.1	9.7	40.1	28.8	62.6	52.6	22.5	23.8	N	
3	0.29950	28.3	17.0	9.7	38.0	26.7	60.3	50.3	22.3	23.6	N	
4	0.35130	28.7	17.7	9.7	38.4	27.4	58.9	48.9	20.5	21.5	N	
5	0.48475	32.6	19.0	9.7	42.3	28.7	56.3	46.3	14.0	17.6	N	
6	0.93200	22.3	8.7	9.7	32.0	18.4	56.0	46.0	24.0	27.6	N	
7	1.32790	21.9	8.7	9.8	31.7	18.5	56.0	46.0	24.3	27.5	N	
8	0.17585	38.1	28.0	9.7	47.8	37.7	64.7	54.7	16.9	17.0	L	
9	0.22677	30.5	18.9	9.7	40.2	28.6	62.6	52.6	22.4	24.0	L	
10	0.29950	28.5	16.4	9.7	38.2	26.1	60.3	50.3	22.1	24.2	L	
11	0.35130	28.3	16.7	9.7	38.0	26.4	58.9	48.9	20.9	22.5	L	
12	0.48475	31.0	17.6	9.7	40.7	27.3	56.3	46.3	15.6	19.0	L	
13	0.93200	20.9	7.3	9.7	30.6	17.0	56.0	46.0	25.4	29.0	L	
14	1.32790	20.6	7.1	9.8	30.4	16.9	56.0	46.0	25.6	29.1	L	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable) [dB]
LISN:CLS-25

Conducted Emission
(Cradle: HA-P60IO)

DATA OF CONDUCTED EMISSION TEST

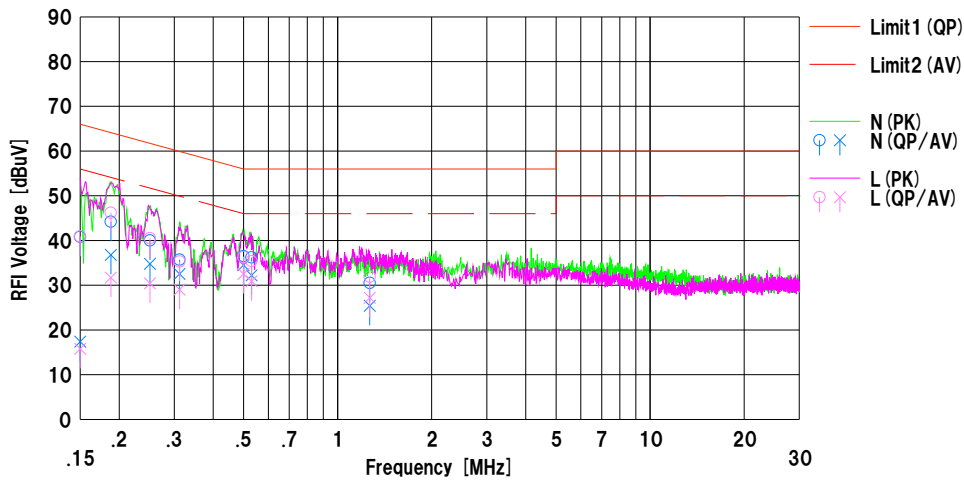
UL Japan, Inc. Kashima EMC Lab. No.2 Shielded Room
Date : 2016/05/26

Company : CASIO COMPUTER CO., LTD.
Kind of EUT : Handheld Terminal
Model No. : IT-G500-C21E-US
Serial No. : Q24SE LG6100629IAAC1
Remarks : With Cradle : HA-P60IO

Mode : Tx, 11n-20, MCS4, 5300MHz
Order No. : 11242579M
Power : AC 120V / 60Hz
Temp./Humi. : 22deg.C / 59%RH

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

Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]				
1	0.15000	31.1	7.7	9.7	40.8	17.4	66.0	56.0	25.2	38.6	N	
2	0.18815	34.5	27.1	9.7	44.2	36.8	64.1	54.1	19.9	17.3	N	
3	0.25100	30.3	25.1	9.7	40.0	34.8	61.7	51.7	21.7	16.9	N	
4	0.31220	26.0	22.8	9.7	35.7	32.5	59.9	49.9	24.2	17.4	N	
5	0.50000	26.8	24.8	9.7	36.5	34.5	56.0	46.0	19.5	11.5	N	
6	0.53055	26.5	22.5	9.7	36.2	32.2	56.0	46.0	19.8	13.8	N	
7	1.26750	20.7	15.6	9.8	30.5	25.4	56.0	46.0	25.5	20.6	N	
8	0.15000	31.2	6.1	9.7	40.9	15.8	66.0	56.0	25.1	40.2	L	
9	0.18815	36.5	22.0	9.7	46.2	31.7	64.1	54.1	17.9	22.4	L	
10	0.25100	30.8	20.7	9.7	40.5	30.4	61.7	51.7	21.2	21.3	L	
11	0.31220	25.6	19.3	9.7	35.3	29.0	59.9	49.9	24.6	20.9	L	
12	0.50000	26.6	22.8	9.7	36.3	32.5	56.0	46.0	19.7	13.5	L	
13	0.53055	25.7	21.2	9.7	35.4	30.9	56.0	46.0	20.6	15.1	L	
14	1.26750	22.1	17.4	9.8	31.9	27.2	56.0	46.0	24.1	18.8	L	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable) [dB]
LISN:CLS-25

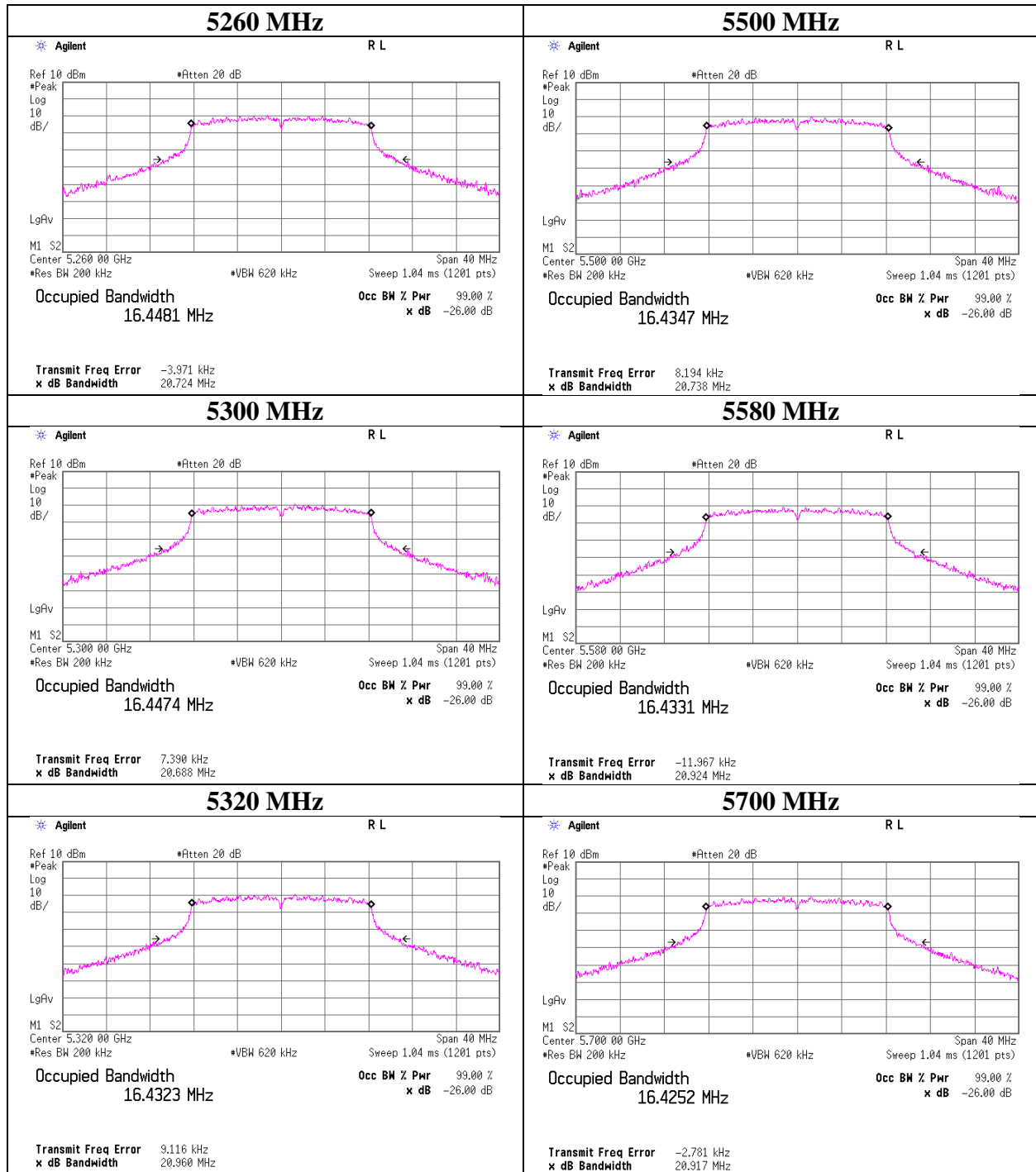
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Kashima EMC Lab. No.2 Measurement Room
Report No. 11242579M
Date May 18, 2016
Temperature / Humidity 22deg. C / 48 % RH
Engineer Kazuhiro Ando
Mode Tx 11a

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5180	-	16.925	-
5220	-	16.916	-
5240	-	16.906	-
5260	20.724	16.877	-
5300	20.688	16.868	-
5320	20.960	16.803	-
5500	20.738	16.871	-
5580	20.924	16.842	-
5700	20.917	16.856	-
5745	-	16.887	-
5785	-	16.917	-
5825	-	16.914	-

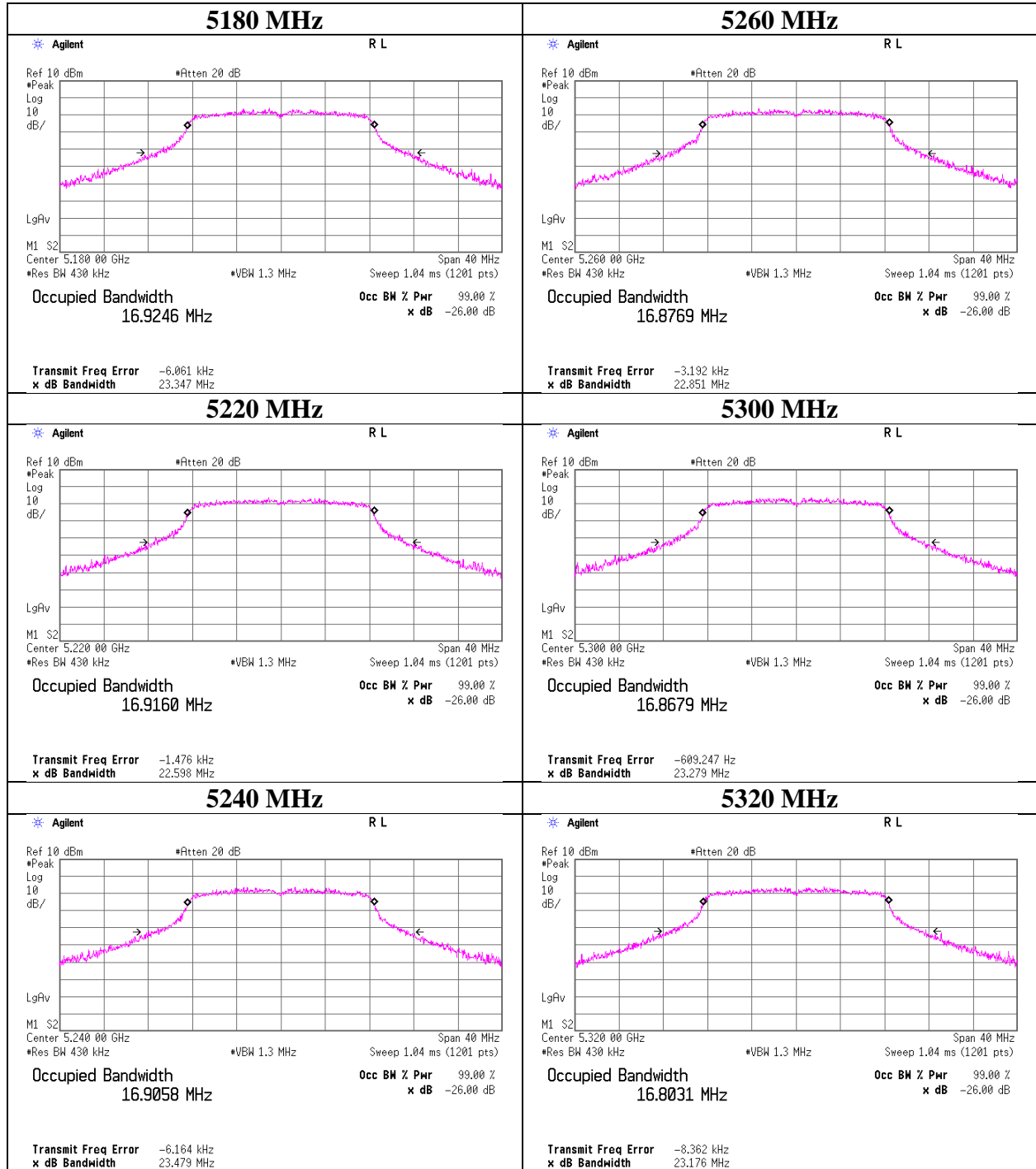
26 dB Emission Bandwidth

11a



99 % Occupied Bandwidth

11a



UL Japan, Inc.

Kashima EMC Lab.

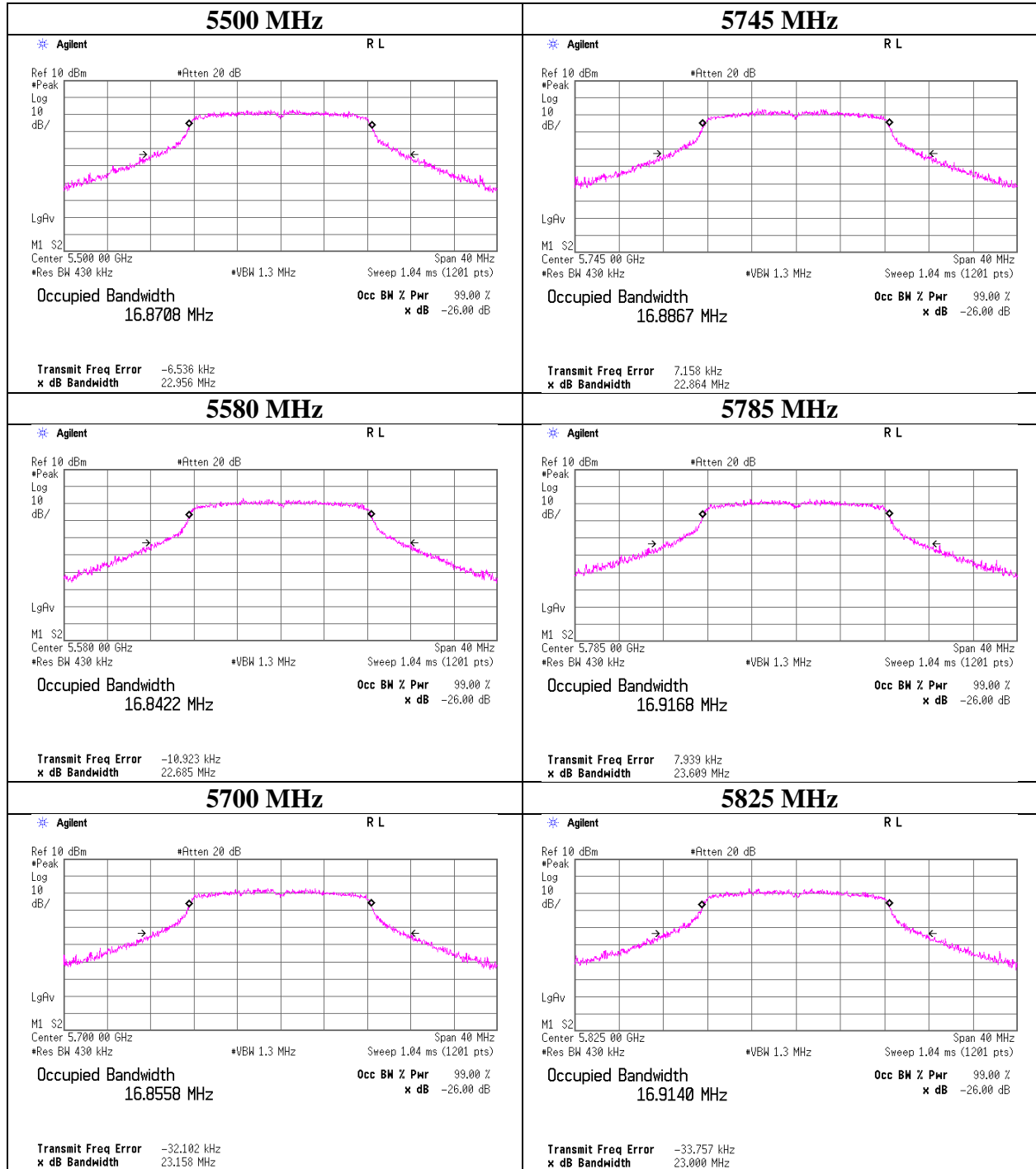
1614, Mushiata, Katori-shi, Chiba-ken, 289-0341 Japan

Telephone : +81 478 88 6500

Facsimile : +81 478 82 3373

99 % Occupied Bandwidth

11a



UL Japan, Inc.

Kashima EMC Lab.

1614, Mushiata, Katori-shi, Chiba-ken, 289-0341 Japan

Telephone : +81 478 88 6500

Facsimile : +81 478 82 3373

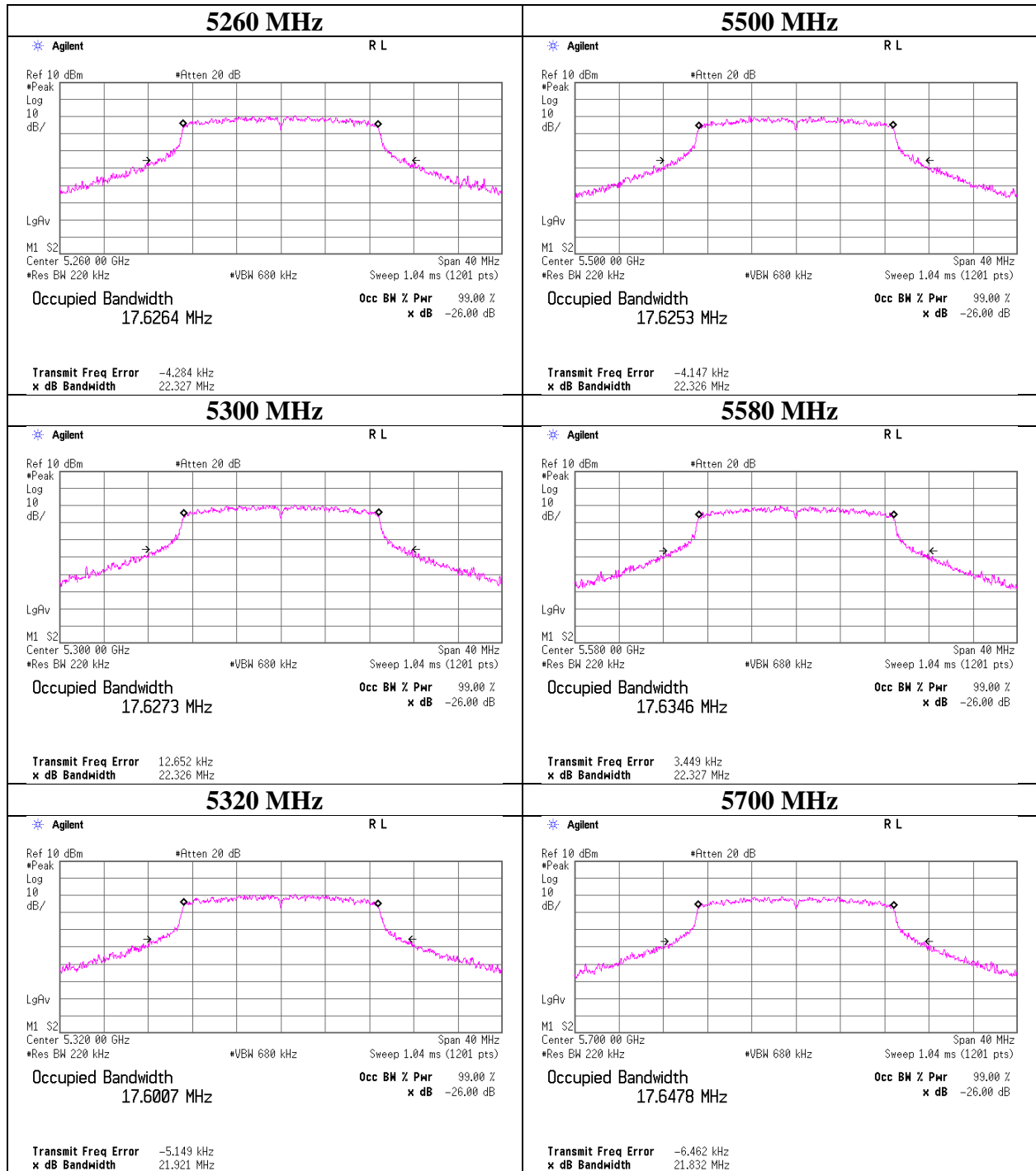
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Kashima EMC Lab. No.2 Measurement Room
Report No. 11242579M
Date May 18, 2016
Temperature / Humidity 22deg. C / 48 % RH
Engineer Kazuhiro Ando
Mode Tx 11n-20

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5180	-	17.975	-
5220	-	17.941	-
5240	-	17.992	-
5260	22.327	17.898	-
5300	22.326	17.933	-
5320	21.921	17.952	-
5500	22.326	17.956	-
5580	22.327	17.968	-
5700	21.832	17.985	-
5745	-	17.957	-
5785	-	17.945	-
5825	-	17.968	-

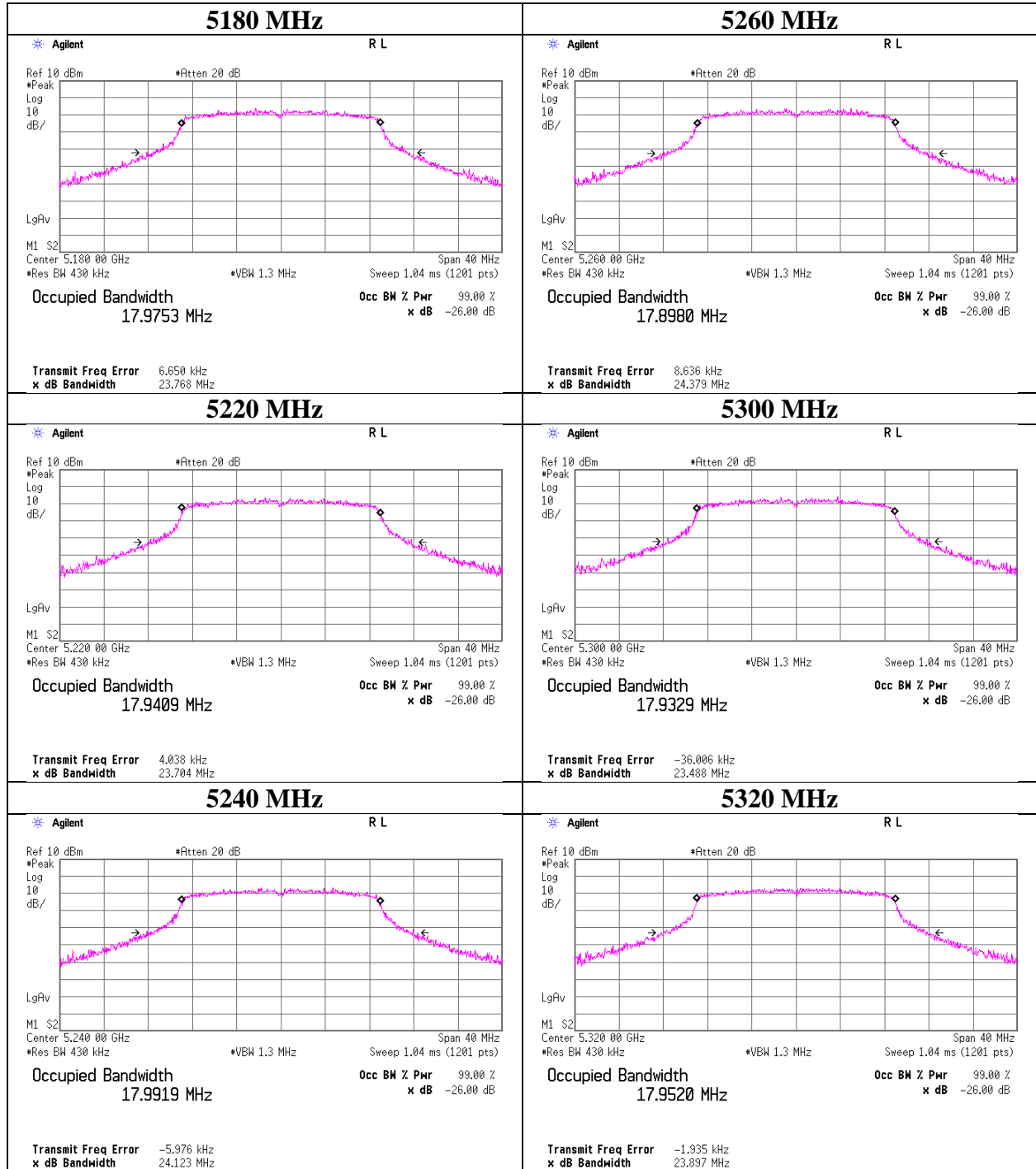
26 dB Emission Bandwidth

11n-20



99 % Occupied Bandwidth

11n-20



UL Japan, Inc.

Kashima EMC Lab.

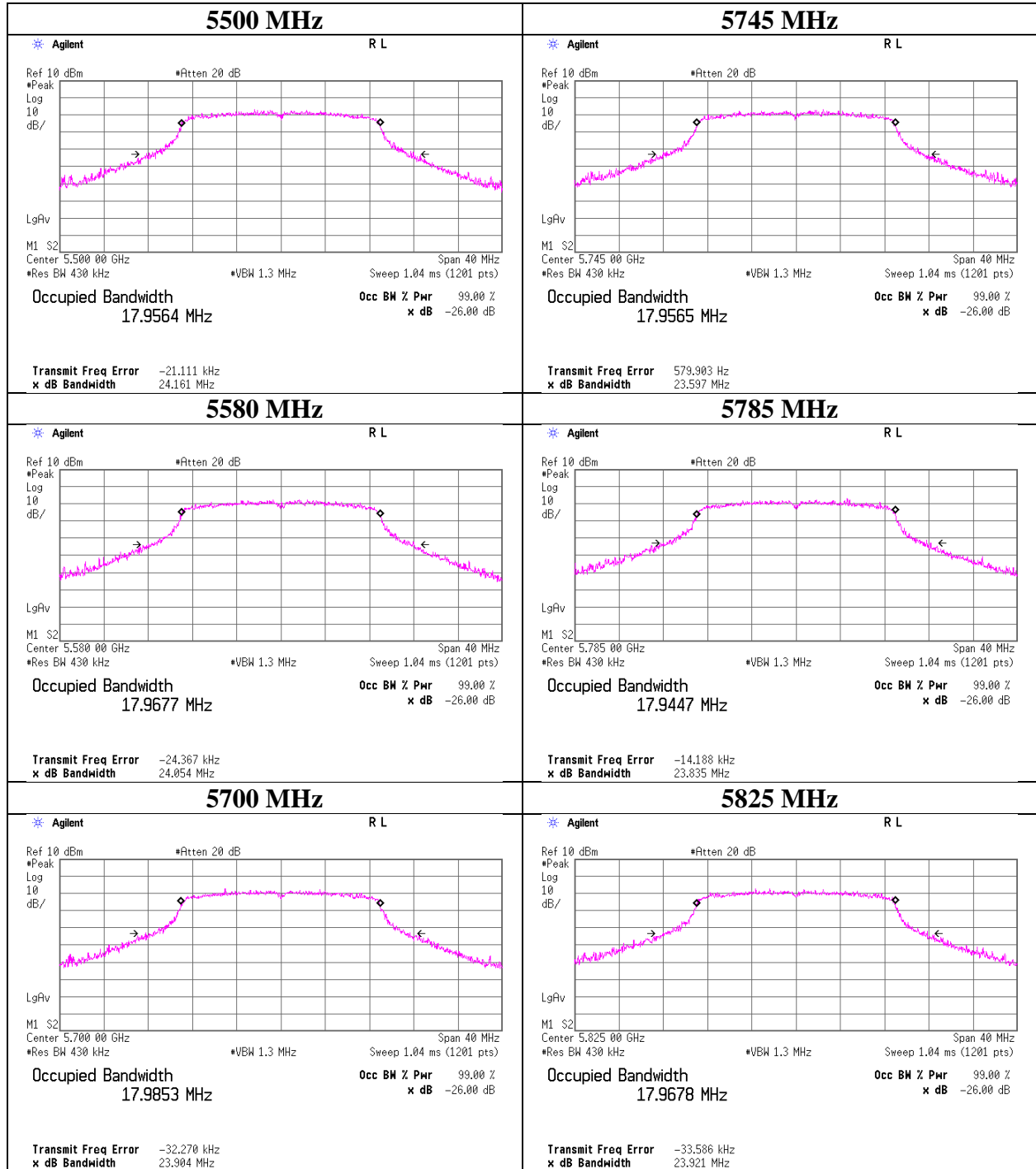
1614, Mushiata, Katori-shi, Chiba-ken, 289-0341 Japan

Telephone : +81 478 88 6500

Facsimile : +81 478 82 3373

99 % Occupied Bandwidth

11n-20



6 dB Bandwidth

Test place Kashima EMC Lab. No.2 Measurement Room
Report No. 11242579M
Date May 18, 2016
Temperature / Humidity 22deg. C / 48 % RH
Engineer Kazuhiro Ando
Mode Tx

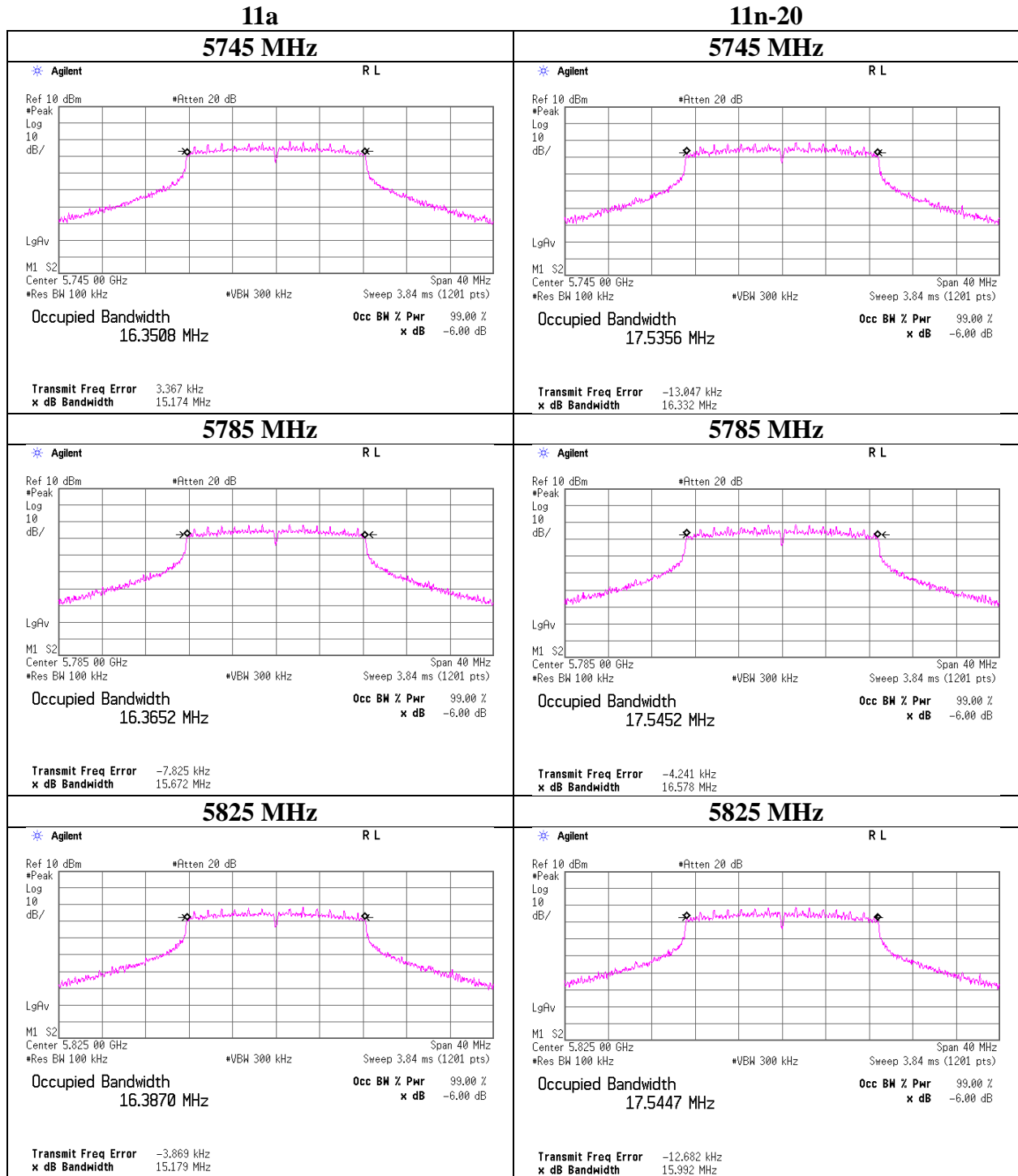
11a

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5745	15.174	> 500
5785	15.672	> 500
5825	15.179	> 500

11n-20

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5745	16.332	> 500
5785	16.578	> 500
5825	15.992	> 500

6 dB Bandwidth



Maximum Conducted Output Power

Test place : Kashima EMC Lab. No.2 Measurement Room
Report No. : 11242579M
Date : May 10, 2016
Temperature / Humidity : 22deg. C / 54 % RH
Engineer : Kazuhiro Ando
Mode : Tx 11a

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 [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]		
5180	-0.65	2.09	10.07	0.17	1.05	-	16.925	11.68	14.72	23.97	12.29	12.73	18.75	29.97	17.24
5220	-0.55	2.09	10.08	0.17	1.05	-	16.916	11.79	15.10	23.97	12.18	12.84	19.23	29.97	17.13
5240	-0.49	2.10	10.08	0.17	1.05	-	16.906	11.86	15.35	23.97	12.11	12.91	19.54	29.97	17.06
5260	-0.35	2.10	10.08	0.17	1.05	20.724	16.877	12.00	15.85	23.97	11.97	13.05	20.18	29.97	16.92
5300	-0.23	2.10	10.08	0.17	1.05	20.688	16.868	12.12	16.29	23.97	11.85	13.17	20.75	29.97	16.80
5320	-0.25	2.10	10.08	0.17	1.05	20.960	16.803	12.10	16.22	23.97	11.87	13.15	20.65	29.97	16.82
5500	-0.53	2.12	10.08	0.17	1.05	20.738	16.871	11.84	15.28	23.97	12.13	12.89	19.45	29.97	17.08
5580	-1.05	2.13	10.08	0.17	1.05	20.924	16.842	11.33	13.58	23.97	12.64	12.38	17.30	29.97	17.59
5700	-1.24	2.14	10.08	0.17	1.05	20.917	16.856	11.15	13.03	23.97	12.82	12.20	16.60	29.97	17.77
5745	-1.17	2.14	10.08	0.17	1.05	-	16.887	11.22	13.24	30.00	18.78	12.27	16.87	36.00	23.73
5785	-1.37	2.15	10.08	0.17	1.05	-	16.917	11.03	12.68	30.00	18.97	12.08	16.14	36.00	23.92
5825	-1.53	2.15	10.08	0.17	1.05	-	16.914	10.87	12.22	30.00	19.13	11.92	15.56	36.00	24.08

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 : Kashima EMC Lab. No.2 Measurement Room
Report No. : 11242579M
Date : May 10, 2016
Temperature / Humidity : 22deg. C / 54 % RH
Engineer : Kazuhiro Ando
Mode : Tx 11n-20

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 für FCC) [MHz]	99% OBW (B für IC) [MHz]	Conducted Power				e.i.r.p.			
								Result [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]		
5180	-0.94	2.09	10.07	0.47	1.05	-	17.975	11.69	14.76	23.97	12.28	12.74	18.79	29.97	17.23
5220	-0.84	2.09	10.08	0.47	1.05	-	17.941	11.80	15.14	23.97	12.17	12.85	19.28	29.97	17.12
5240	-0.78	2.10	10.08	0.47	1.05	-	17.992	11.87	15.38	23.97	12.10	12.92	19.59	29.97	17.05
5260	-0.61	2.10	10.08	0.47	1.05	22.327	17.898	12.04	16.00	23.97	11.93	13.09	20.37	29.97	16.88
5300	-0.52	2.10	10.08	0.47	1.05	22.326	17.933	12.13	16.33	23.97	11.84	13.18	20.80	29.97	16.79
5320	-0.56	2.10	10.08	0.47	1.05	21.921	17.952	12.09	16.18	23.97	11.88	13.14	20.61	29.97	16.83
5500	-0.88	2.12	10.08	0.47	1.05	22.326	17.956	11.79	15.10	23.97	12.18	12.84	19.23	29.97	17.13
5580	-1.38	2.13	10.08	0.47	1.05	22.327	17.968	11.30	13.49	23.97	12.67	12.35	17.18	29.97	17.62
5700	-1.67	2.14	10.08	0.47	1.05	21.832	17.985	11.02	12.65	23.97	12.95	12.07	16.11	29.97	17.90
5745	-1.53	2.14	10.08	0.47	1.05	-	17.957	11.16	13.06	30.00	18.84	12.21	16.63	36.00	23.79
5785	-1.76	2.15	10.08	0.47	1.05	-	17.945	10.94	12.42	30.00	19.06	11.99	15.81	36.00	24.01
5825	-1.88	2.15	10.08	0.47	1.05	-	17.968	10.82	12.08	30.00	19.18	11.87	15.38	36.00	24.13

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 : Kashima EMC Lab. No.2 Measurement Room
Report No. : 11242579M
Date : May 10, 2016
Temperature / Humidity : 22deg. C / 54 % RH
Engineer : Kazuhiro Ando
Mode : Tx

5180 MHz

Mode	Rate Mbps	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11a	6	-0.61	0.09	-0.52	
	9	-0.66	0.13	-0.53	
	12	-0.65	0.17	-0.48	*
	18	-0.77	0.25	-0.52	
	24	-0.82	0.31	-0.51	
	36	-1.02	0.46	-0.56	
	48	-1.09	0.59	-0.50	
	54	-1.17	0.65	-0.52	

* 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.

5180 MHz

Mode	MCS Number	Reading (timed average) [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n	0	-0.60	0.09	-0.51	
	1	-0.72	0.18	-0.54	
	2	-0.81	0.26	-0.55	
	3	-0.81	0.32	-0.49	
	4	-0.94	0.47	-0.47	*
	5	-1.17	0.57	-0.60	
	6	-1.17	0.63	-0.54	
	7	-1.18	0.68	-0.50	

* 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.

Average Output Power
(Reference data for RF Exposure)

Test place : Kashima EMC Lab. No.2 Measurement Room
Report No. : 11242579M
Date : May 10, 2016
Temperature / Humidity : 22deg. C / 54 % RH
Engineer : Kazuhiro Ando
Mode : Tx

11a

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)	
				[dBm]	[mW]
5180	-0.65	2.09	10.07	11.51	14.16
5220	-0.55	2.09	10.08	11.62	14.52
5240	-0.49	2.10	10.08	11.69	14.76
5260	-0.35	2.10	10.08	11.83	15.24
5300	-0.23	2.10	10.08	11.95	15.67
5320	-0.25	2.10	10.08	11.93	15.60
5500	-0.53	2.12	10.08	11.67	14.69
5580	-1.05	2.13	10.08	11.16	13.06
5700	-1.24	2.14	10.08	10.98	12.53
5745	-1.17	2.14	10.08	11.05	12.74
5785	-1.37	2.15	10.08	10.86	12.19
5825	-1.53	2.15	10.08	10.70	11.75

11n-20

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)	
				[dBm]	[mW]
5180	-0.94	2.09	10.07	11.22	13.24
5220	-0.84	2.09	10.08	11.33	13.58
5240	-0.78	2.10	10.08	11.40	13.80
5260	-0.61	2.10	10.08	11.57	14.35
5300	-0.52	2.10	10.08	11.66	14.66
5320	-0.56	2.10	10.08	11.62	14.52
5500	-0.88	2.12	10.08	11.32	13.55
5580	-1.38	2.13	10.08	10.83	12.11
5700	-1.67	2.14	10.08	10.55	11.35
5745	-1.53	2.14	10.08	10.69	11.72
5785	-1.76	2.15	10.08	10.47	11.14
5825	-1.88	2.15	10.08	10.35	10.84

Sample Calculation:

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

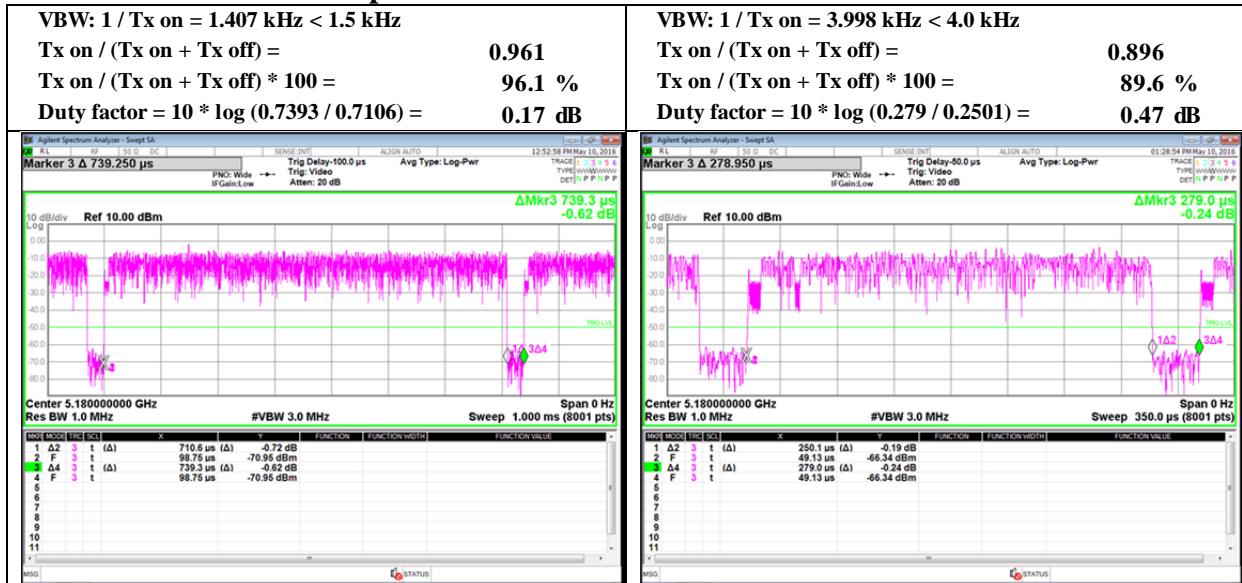
*The equipment and cables were not used for factor 0 dB of the data sheets.

Burst rate confirmation

Test place	Kashima EMC Lab. No.2 Measurement Room
Report No.	11242579M
Date	May 10, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Kazuhiro Ando
Mode	Tx

11a 12Mbps

11n-20 MCS4



UL Japan, Inc.

Kashima EMC Lab.

1614, Mushihata, Katori-shi, Chiba-ken, 289-0341 Japan

Telephone : +81 478 88 6500

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Maximum Power Spectral Density

Test place : Kashima EMC Lab. No.2 Measurement Room
Report No. : 11242579M
Date : May 18, 2016
Temperature / Humidity : 22deg. C / 48 % RH
Engineer : Kazuhiro Ando
Mode : Tx 11a

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	-10.83	2.09	10.07	0.17	1.05	0.00	1.50	11.00	9.50	2.55	17.00	14.45
5220	-11.31	2.09	10.08	0.17	1.05	0.00	1.04	11.00	9.97	2.09	17.00	14.92
5240	-11.09	2.10	10.08	0.17	1.05	0.00	1.26	11.00	9.74	2.31	17.00	14.69
5260	-10.61	2.10	10.08	0.17	1.05	0.00	1.74	11.00	9.26	2.79	17.00	14.21
5300	-10.84	2.10	10.08	0.17	1.05	0.00	1.51	11.00	9.49	2.56	17.00	14.44
5320	-11.08	2.10	10.08	0.17	1.05	0.00	1.27	11.00	9.73	2.32	17.00	14.68
5500	-11.27	2.12	10.08	0.17	1.05	0.00	1.10	11.00	9.90	2.15	17.00	14.85
5580	-11.57	2.13	10.08	0.17	1.05	0.00	0.81	11.00	10.19	1.86	17.00	15.14
5700	-11.70	2.14	10.08	0.17	1.05	0.00	0.69	11.00	10.31	1.74	17.00	15.26
5745	-14.89	2.14	10.08	0.17	1.05	0.27	-2.23	30.00	32.23	-1.18	36.00	37.18
5785	-14.94	2.15	10.08	0.17	1.05	0.27	-2.27	30.00	32.27	-1.22	36.00	37.22
5825	-14.95	2.15	10.08	0.17	1.05	0.27	-2.28	30.00	32.28	-1.23	36.00	37.23

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)

UL Japan, Inc.

Kashima EMC Lab.

1614, Mushihata, Katori-shi, Chiba-ken, 289-0341 Japan

Telephone : +81 478 88 6500

Facsimile : +81 478 82 3373

Maximum Power Spectral Density

Test place : Kashima EMC Lab. No.2 Measurement Room
Report No. : 11242579M
Date : May 18, 2016
Temperature / Humidity : 22deg. C / 48 % RH
Engineer : Kazuhiro Ando
Mode : Tx 11n-20

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	-11.18	2.09	10.07	0.47	1.05	0.00	1.45	11.00	9.55	2.50	17.00	14.50
5220	-11.45	2.09	10.08	0.47	1.05	0.00	1.19	11.00	9.81	2.24	17.00	14.76
5240	-11.76	2.10	10.08	0.47	1.05	0.00	0.89	11.00	10.11	1.94	17.00	15.06
5260	-11.23	2.10	10.08	0.47	1.05	0.00	1.43	11.00	9.58	2.48	17.00	14.53
5300	-11.46	2.10	10.08	0.47	1.05	0.00	1.19	11.00	9.81	2.24	17.00	14.76
5320	-11.46	2.10	10.08	0.47	1.05	0.00	1.19	11.00	9.81	2.24	17.00	14.76
5500	-11.74	2.12	10.08	0.47	1.05	0.00	0.93	11.00	10.07	1.98	17.00	15.02
5580	-12.31	2.13	10.08	0.47	1.05	0.00	0.37	11.00	10.63	1.42	17.00	15.58
5700	-12.55	2.14	10.08	0.47	1.05	0.00	0.14	11.00	10.86	1.19	17.00	15.81
5745	-14.90	2.14	10.08	0.47	1.05	0.27	-1.94	30.00	31.94	-0.89	36.00	36.89
5785	-15.19	2.15	10.08	0.47	1.05	0.27	-2.23	30.00	32.23	-1.18	36.00	37.18
5825	-15.05	2.15	10.08	0.47	1.05	0.27	-2.08	30.00	32.08	-1.03	36.00	37.03

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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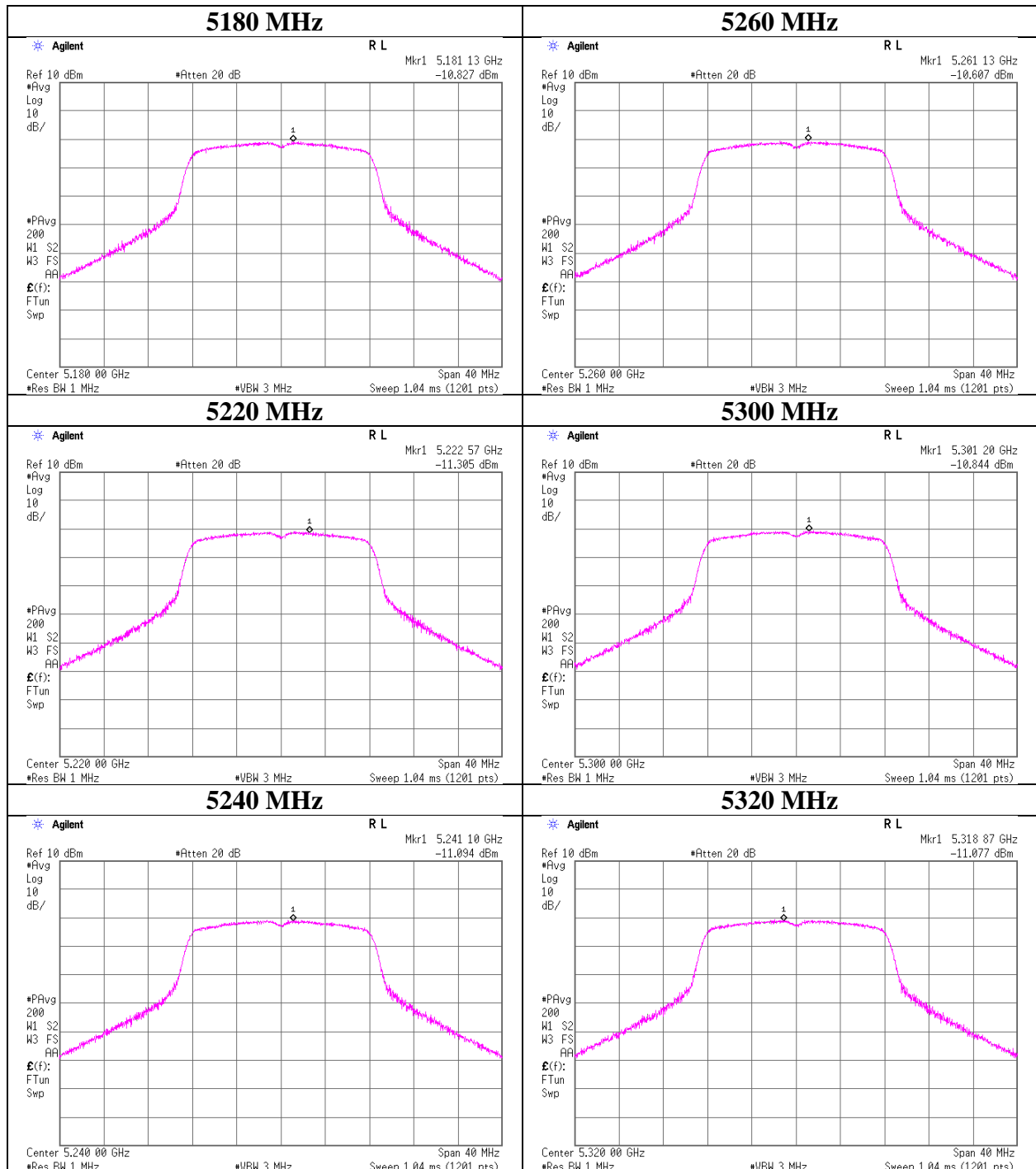
Telephone : +81 478 88 6500

Facsimile : +81 478 82 3373

Maximum Power Spectral Density

Test place	Kashima EMC Lab. No.2 Measurement Room
Report No.	11242579M
Date	May 18, 2016
Temperature / Humidity	22deg. C / 48 % RH
Engineer	Kazuhiro Ando
Mode	Tx

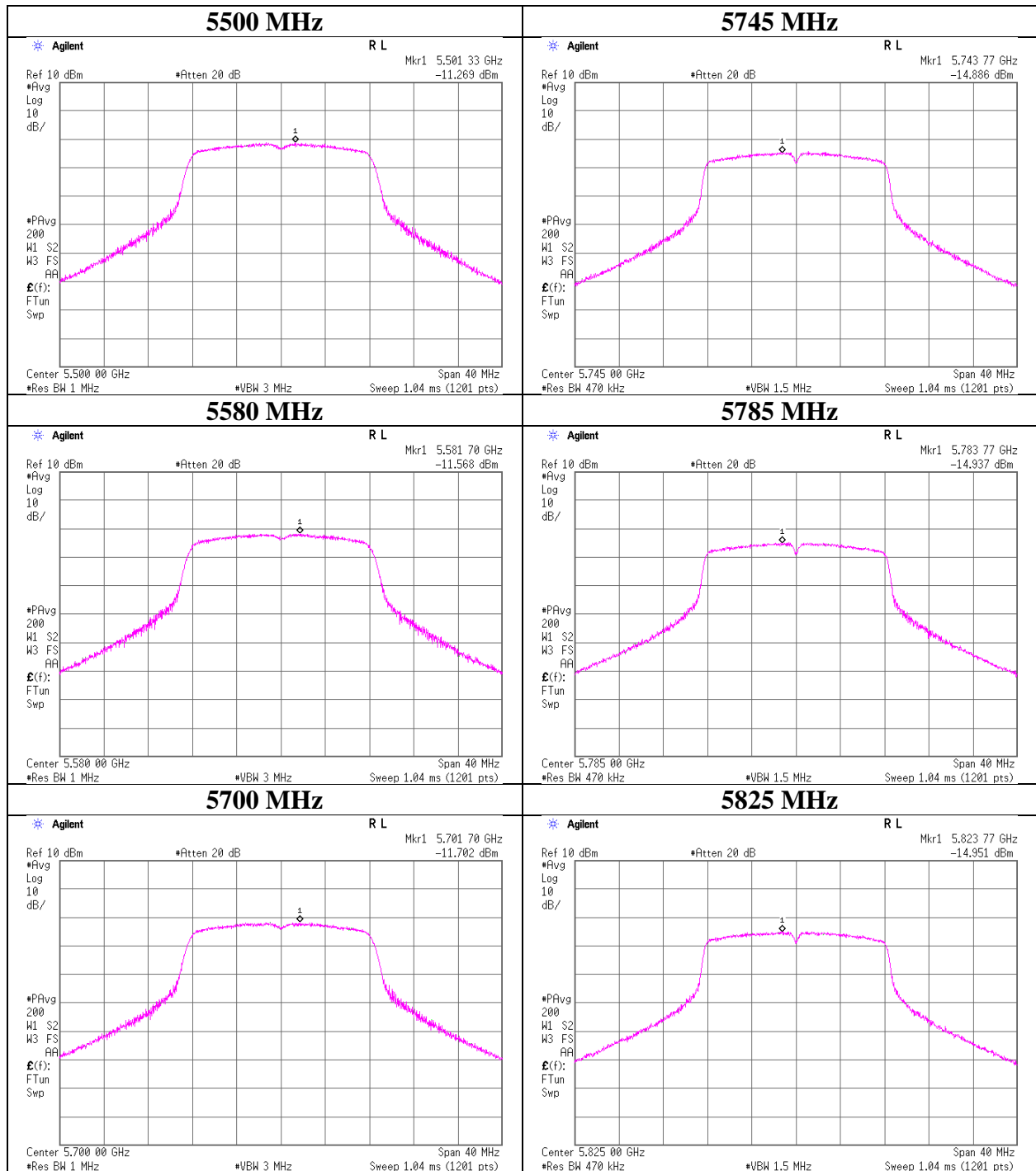
11a



Maximum Power Spectral Density

Test place	Kashima EMC Lab. No.2 Measurement Room
Report No.	11242579M
Date	May 18, 2016
Temperature / Humidity	22deg. C / 48 % RH
Engineer	Kazuhiro Ando
Mode	Tx

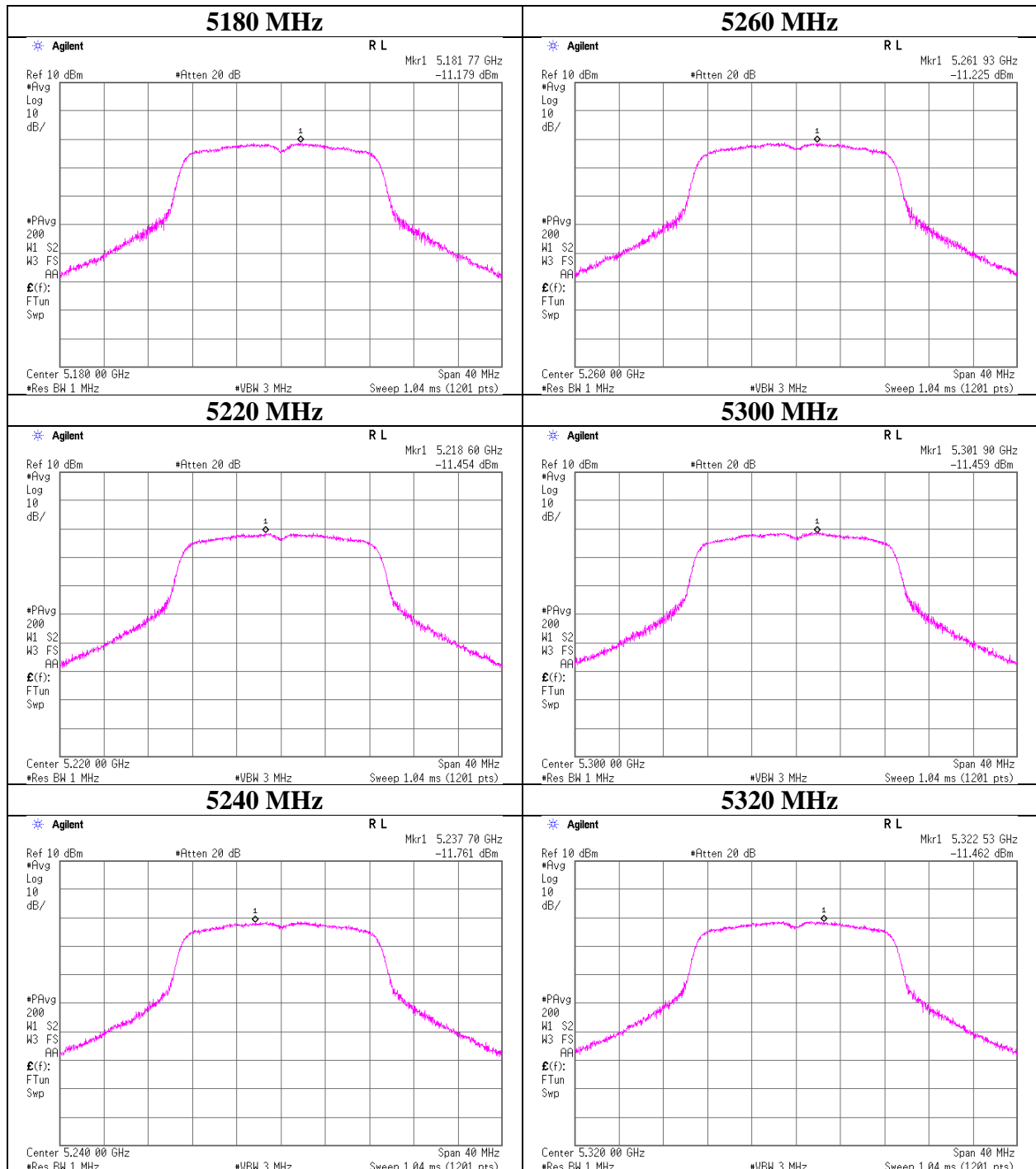
11a



Maximum Power Spectral Density

Test place	Kashima EMC Lab. No.2 Measurement Room
Report No.	11242579M
Date	May 18, 2016
Temperature / Humidity	22deg. C / 48 % RH
Engineer	Kazuhiro Ando
Mode	Tx

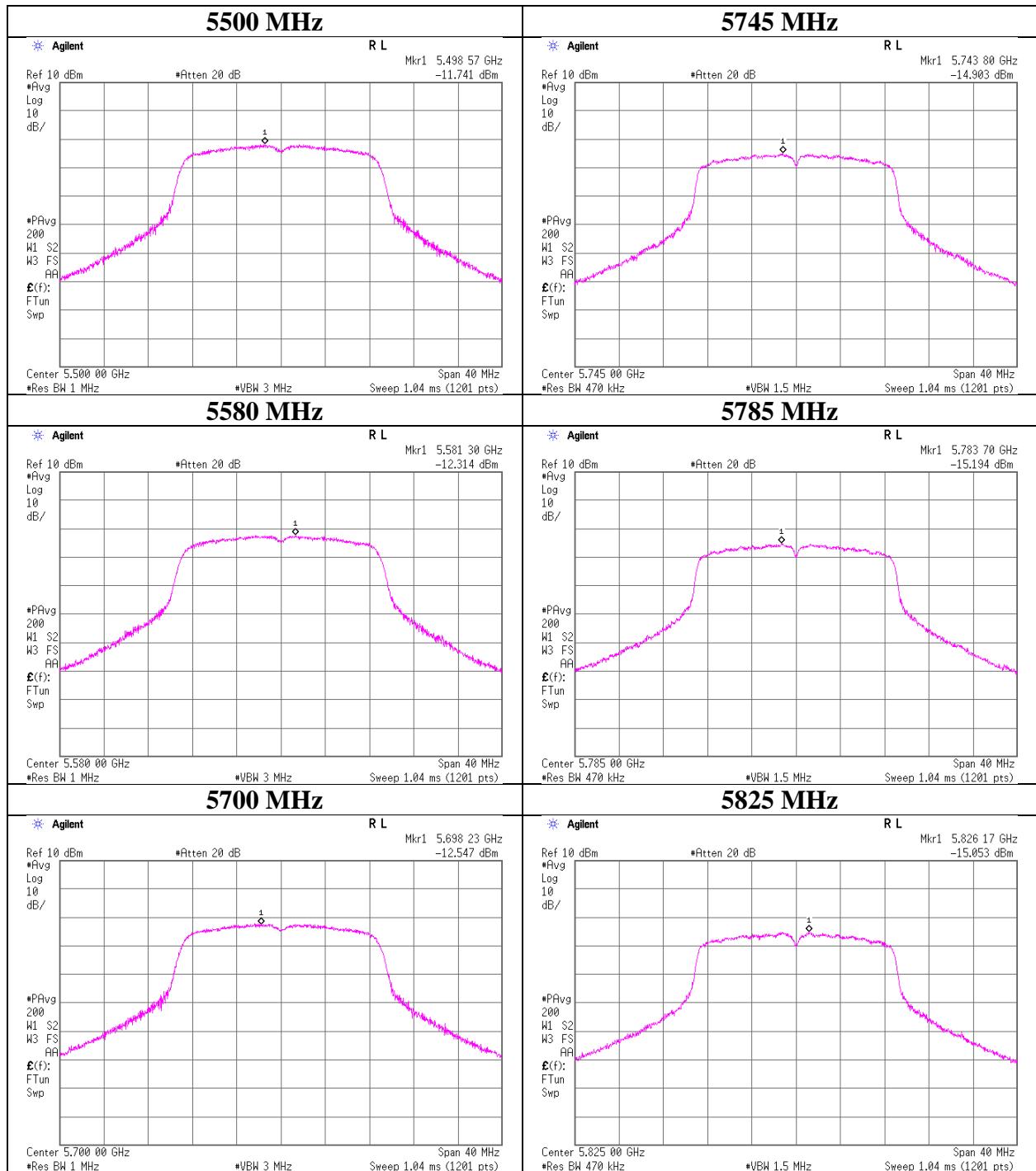
11n-20



Maximum Power Spectral Density

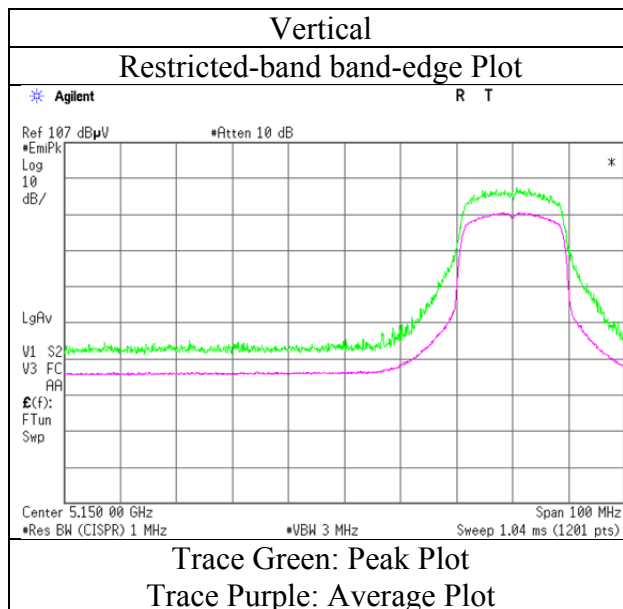
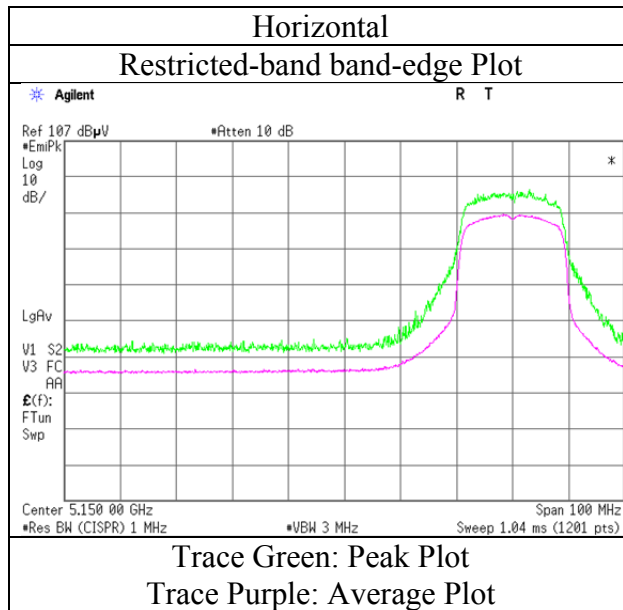
Test place	Kashima EMC Lab. No.2 Measurement Room
Report No.	11242579M
Date	May 18, 2016
Temperature / Humidity	22deg. C / 48 % RH
Engineer	Kazuhiro Ando
Mode	Tx

11n-20



Radiated Spurious Emission

Test place	Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No.	11242579M
Date	May 15, 2016
Temperature / Humidity	22deg. C / 41 % RH
Engineer	Kazuhiro Ando (1 GHz-10 GHz) (AC11)
Mode	Tx 11n-20 5180 MHz



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

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No. : 11242579M
Date : May 15, 2016 May 14, 2016 May 15, 2016 May 17, 2016
Temperature / Humidity : 22deg. C / 41 % RH 24deg. C / 52 % RH 22deg. C / 41 % RH 24deg. C / 49 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando
 (1 GHz-10 GHz) (10 GHz-18 GHz) (18 GHz-26.5 GHz) (26.5 GHz-40 GHz)
 (AC11) (AC11) (AC11) (AC6)
Mode : Tx 11n-20 5260 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.	15780.0	PK	50.5	37.6	11.0	45.4	-9.5	44.2	73.9	29.7	168.0	169.0	
Hori.	21040.0	PK	60.7	40.3	6.6	46.5	-9.5	51.6	73.9	22.3	155.0	157.0	
Hori.	31560.0	PK	53.2	43.5	13.1	61.5	-9.5	38.8	73.9	35.1	160.0	200.0	
Hori.	15780.0	AV	42.3	37.6	11.0	45.4	-9.5	36.0	53.9	17.9	168.0	169.0	
Hori.	21040.0	AV	59.6	40.3	6.6	46.5	-9.5	50.5	53.9	3.4	155.0	157.0	
Hori.	31560.0	AV	51.6	43.5	13.1	61.5	-9.5	37.2	53.9	16.7	160.0	200.0	
Vert.	15780.0	PK	51.0	37.6	11.0	45.4	-9.5	44.7	73.9	29.2	157.0	177.0	
Vert.	21040.0	PK	58.6	40.3	6.6	46.5	-9.5	49.5	73.9	24.4	167.0	192.0	
Vert.	31560.0	PK	53.5	43.5	13.1	61.5	-9.5	39.1	73.9	34.8	150.0	210.0	
Vert.	15780.0	AV	42.0	37.6	11.0	45.4	-9.5	35.7	53.9	18.2	157.0	177.0	
Vert.	21040.0	AV	56.6	40.3	6.6	46.5	-9.5	47.5	53.9	6.4	167.0	192.0	
Vert.	31560.0	AV	51.7	43.5	13.1	61.5	-9.5	37.3	53.9	16.6	150.0	210.0	

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).

Distance factor : 1 GHz - 10 GHz : 20log(4.0 m / 3.0 m) = 2.5 dB
10 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.	10520.0	PK	47.0	40.1	9.1	42.6	-9.5	44.1	-51.1	-27.0	24.1	179.0	44.0	
Vert.	10520.0	PK	47.6	40.1	9.1	42.6	-9.5	44.7	-50.5	-27.0	23.5	134.0	121.0	

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

Result(EIRP[dBm])=10*LOG (((10 ^ (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).

Distance factor : 1 GHz - 10 GHz : 20log(4.0 m / 3.0 m) = 2.5 dB
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

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Facsimile : +81 478 82 3373

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.10 Semi Anechoic Chamber
Report No. : 11242579M
Date : May 22, 2016
Temperature / Humidity : 22deg. C / 45 % RH
Engineer : Kazuhiro Ando
(30 MHz-1000 MHz)
(AC10)
Mode : Tx 11n-20 5300 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]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	170.665	QP	38.6	12.6	5.2	32.4	24.0	43.5	19.5	150	120	
Hori.	560.762	QP	37.5	19.1	7.2	32.3	31.5	46.0	14.5	130	165	
Vert.	134.071	QP	45.3	12.5	4.9	32.4	30.3	43.5	13.2	100	130	
Vert.	182.832	QP	46.5	11.3	5.3	32.4	30.7	43.5	12.8	100	195	
Vert.	207.214	QP	45.8	10.1	5.4	32.4	28.9	43.5	14.6	100	0	
Vert.	560.761	QP	38.5	19.1	7.2	32.3	32.5	46.0	13.5	100	280	

Result = Reading + Ant.Fac. + Loss (Cable) - Gain(Amplifier)

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Radiated Spurious Emission

Test place : Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No. : 11242579M
Date : May 15, 2016 May 14, 2016 May 15, 2016 May 17, 2016
Temperature / Humidity : 22deg. C / 41 % RH 24deg. C / 52 % RH 22deg. C / 41 % RH 24deg. C / 49 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando
(1 GHz-10 GHz) (10 GHz-18 GHz) (18 GHz-26.5 GHz) (26.5 GHz-40 GHz)
(AC11) (AC11) (AC11) (AC6)
Mode : Tx 11n-20 5320 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.	5350.0	PK	53.5	31.5	16.2	46.3	2.5	57.4	73.9	16.5	189.0	130.0	
Hori.	10640.0	PK	46.8	40.2	9.1	42.7	-9.5	43.9	73.9	30.0	140.0	82.0	
Hori.	15960.0	PK	50.0	37.5	11.1	45.6	-9.5	43.5	73.9	30.4	163.0	78.0	
Hori.	21280.0	PK	60.7	40.3	6.6	46.8	-9.5	51.3	73.9	22.6	156.0	148.0	
Hori.	5350.0	AV	42.9	31.5	16.2	46.3	2.5	46.8	53.9	7.1	189.0	130.0	
Hori.	10640.0	AV	39.0	40.2	9.1	42.7	-9.5	36.1	53.9	17.8	140.0	82.0	
Hori.	15960.0	AV	42.3	37.5	11.1	45.6	-9.5	35.8	53.9	18.1	163.0	78.0	
Hori.	21280.0	AV	59.6	40.3	6.6	46.8	-9.5	50.2	53.9	3.7	156.0	148.0	
Vert.	5350.0	PK	53.4	31.5	16.2	46.3	2.5	57.3	73.9	16.6	107.0	266.0	
Vert.	10640.0	PK	47.1	40.2	9.1	42.7	-9.5	44.2	73.9	29.7	100.0	182.0	
Vert.	15960.0	PK	52.3	37.5	11.1	45.6	-9.5	45.8	73.9	28.1	161.0	189.0	
Vert.	21280.0	PK	58.3	40.3	6.6	46.8	-9.5	48.9	73.9	25.0	167.0	199.0	
Vert.	5350.0	AV	43.0	31.5	16.2	46.3	2.5	46.9	53.9	7.0	107.0	266.0	
Vert.	10640.0	AV	39.3	40.2	9.1	42.7	-9.5	36.4	53.9	17.5	100.0	182.0	
Vert.	15960.0	AV	43.3	37.5	11.1	45.6	-9.5	36.8	53.9	17.1	161.0	189.0	
Vert.	21280.0	AV	56.7	40.3	6.6	46.8	-9.5	47.3	53.9	6.6	167.0	199.0	

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).

Distance factor : 1 GHz - 10 GHz : $20\log(4.0\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$
10 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.	31920.0	PK	52.0	43.5	13.2	61.6	-9.5	37.6	-57.6	-27.0	30.6	150.0	194.0	
Vert.	31920.0	PK	53.7	43.5	13.2	61.6	-9.5	39.3	-55.9	-27.0	28.9	143.0	211.0	

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

Result(EIRP[dBm])=10*LOG (({ 10 ^ (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).

Distance factor : 1 GHz - 10 GHz : $20\log(4.0\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$
10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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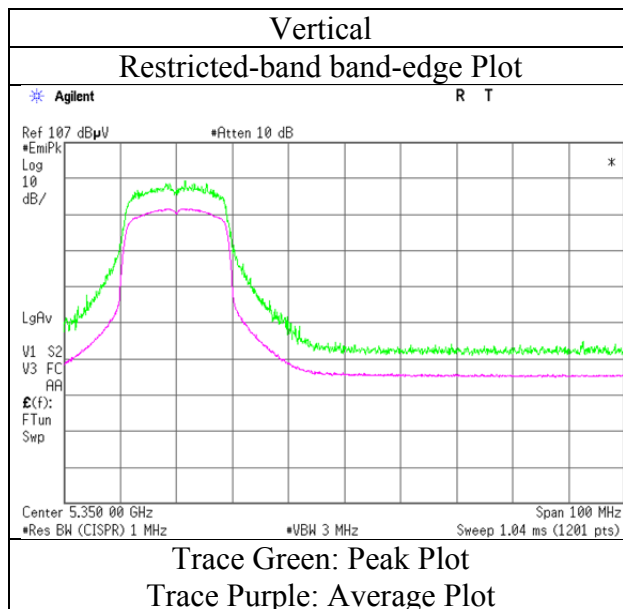
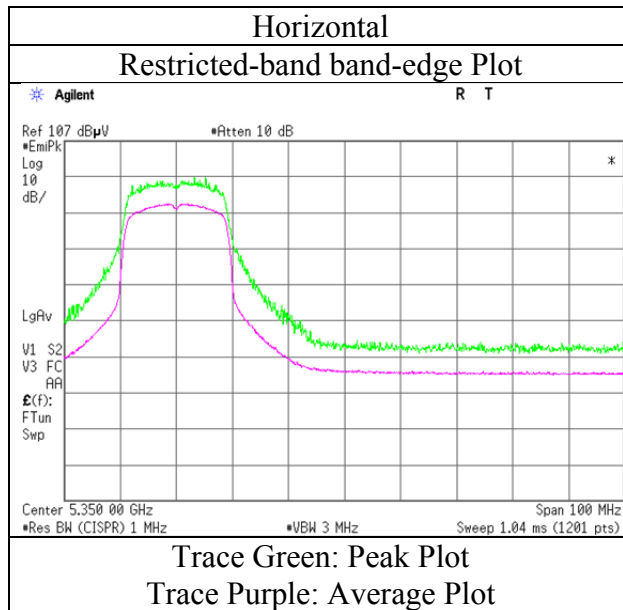
1614, Mushihata, Katori-shi, Chiba-ken, 289-0341 Japan

Telephone : +81 478 88 6500

Facsimile : +81 478 82 3373

Radiated Spurious Emission

Test place	Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No.	11242579M
Date	May 15, 2016
Temperature / Humidity	22deg. C / 41 % RH
Engineer	Kazuhiro Ando (1 GHz-10 GHz) (AC11)
Mode	Tx 11n-20 5320 MHz



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

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No. : 11242579M
Date : May 15, 2016 May 14, 2016 May 14, 2016 May 17, 2016
Temperature / Humidity : 22deg. C / 41 % RH 24deg. C / 52 % RH 24deg. C / 52 % RH 24deg. C / 49 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando
 (1 GHz-10 GHz) (10 GHz-18 GHz) (18 GHz-26.5 GHz) (26.5 GHz-40 GHz)
 (AC11) (AC11) (AC11) (AC6)
Mode : Tx 11n-20 5500 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.	5460.0	PK	53.5	31.7	16.3	46.3	2.5	57.7	73.9	16.2	166.0	214.0	
Hori.	11000.0	PK	47.9	40.2	9.1	43.4	-9.5	44.3	73.9	29.6	179.0	139.0	
Hori.	5460.0	AV	42.4	31.7	16.3	46.3	2.5	46.6	53.9	7.3	166.0	214.0	
Hori.	11000.0	AV	39.7	40.2	9.1	43.4	-9.5	36.1	53.9	17.8	179.0	139.0	
Vert.	5460.0	PK	53.9	31.7	16.3	46.3	2.5	58.1	73.9	15.8	129.0	260.0	
Vert.	11000.0	PK	47.6	40.2	9.1	43.4	-9.5	44.0	73.9	29.9	156.0	125.0	
Vert.	5460.0	AV	42.4	31.7	16.3	46.3	2.5	46.6	53.9	7.3	129.0	260.0	
Vert.	11000.0	AV	39.7	40.2	9.1	43.4	-9.5	36.1	53.9	17.8	156.0	125.0	

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).

Distance factor : 1 GHz - 10 GHz : 20log(4.0 m / 3.0 m) = 2.5 dB
10 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.	5470.0	PK	54.0	31.8	16.3	46.3	2.5	58.3	-36.9	-27.0	9.9	166.0	214.0	
Hori.	16500.0	PK	55.5	38.4	11.2	45.1	-9.5	50.5	-44.7	-27.0	17.7	169.0	121.0	
Hori.	22000.0	PK	60.3	40.2	6.7	47.4	-9.5	50.3	-44.9	-27.0	17.9	152.0	147.0	
Hori.	33000.0	PK	53.2	43.6	13.5	61.8	-9.5	39.0	-56.2	-27.0	29.2	158.0	184.0	
Vert.	5470.0	PK	54.1	31.8	16.3	46.3	2.5	58.4	-36.8	-27.0	9.8	129.0	260.0	
Vert.	16500.0	PK	54.2	38.4	11.2	45.1	-9.5	49.2	-46.0	-27.0	19.0	156.0	156.0	
Vert.	22000.0	PK	58.2	40.2	6.7	47.4	-9.5	48.2	-47.0	-27.0	20.0	152.0	203.0	
Vert.	33000.0	PK	53.3	43.6	13.5	61.8	-9.5	39.1	-56.1	-27.0	29.1	151.0	181.0	

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

Result (EIRP[dBm])=10*LOG (({ 10 ^ (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).

Distance factor : 1 GHz - 10 GHz : 20log(4.0 m / 3.0 m) = 2.5 dB
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

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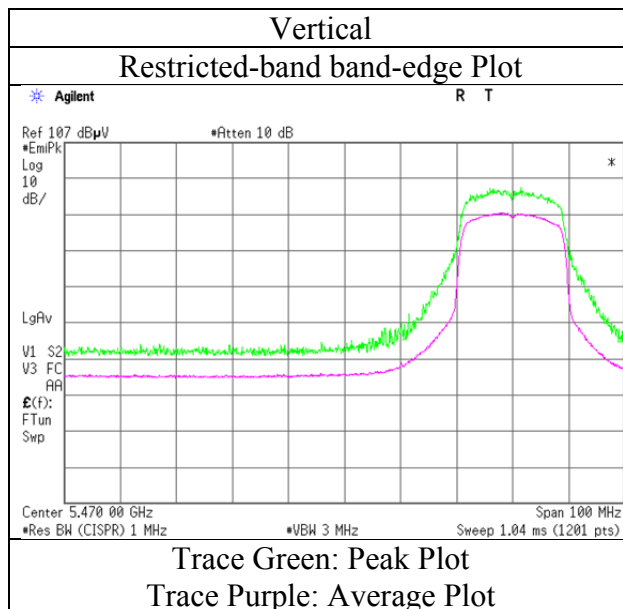
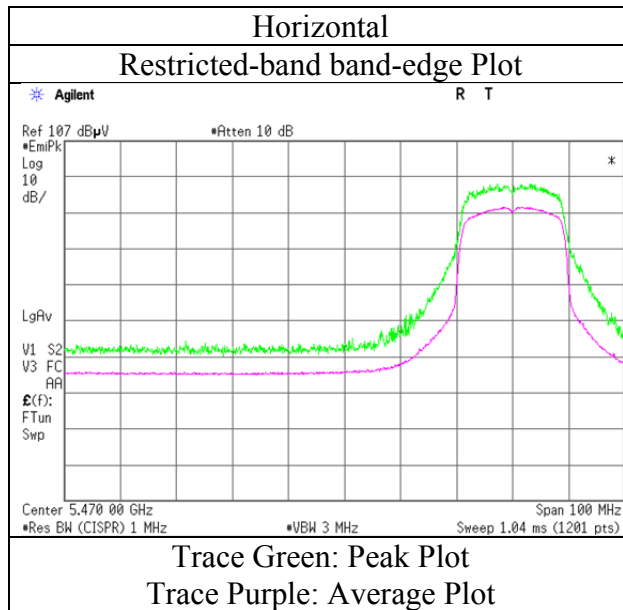
1614, Mushihata, Katori-shi, Chiba-ken, 289-0341 Japan

Telephone : +81 478 88 6500

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Radiated Spurious Emission

Test place	Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No.	11242579M
Date	May 15, 2016
Temperature / Humidity	22deg. C / 41 % RH
Engineer	Kazuhiro Ando (1 GHz-10 GHz) (AC11)
Mode	Tx 11n-20 5500 MHz



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

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No. : 11242579M
Date : May 15, 2016 May 14, 2016 May 14, 2016 May 17, 2016
Temperature / Humidity : 22deg. C / 41 % RH 24deg. C / 52 % RH 24deg. C / 52 % RH 24deg. C / 49 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando
(1 GHz-10 GHz) (10 GHz-18 GHz) (18 GHz-26.5 GHz) (26.5 GHz-40 GHz)
(AC11) (AC11) (AC11) (AC6)
Mode : Tx 11n-20 5580 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.	11160.0	PK	47.6	39.8	9.2	43.3	-9.5	43.8	73.9	30.1	184.0	144.0	
Hori.	22320.0	PK	59.8	40.4	6.8	46.9	-9.5	50.6	73.9	23.3	168.0	146.0	
Hori.	11160.0	AV	39.4	39.8	9.2	43.3	-9.5	35.6	53.9	18.3	184.0	144.0	
Hori.	22320.0	AV	58.8	40.4	6.8	46.9	-9.5	49.6	53.9	4.3	168.0	146.0	
Vert.	11160.0	PK	47.8	39.8	9.2	43.3	-9.5	44.0	73.9	29.9	158.0	129.0	
Vert.	22320.0	PK	58.4	40.4	6.8	46.9	-9.5	49.2	73.9	24.7	149.0	204.0	
Vert.	11160.0	AV	39.6	39.8	9.2	43.3	-9.5	35.8	53.9	18.1	158.0	129.0	
Vert.	22320.0	AV	57.1	40.4	6.8	46.9	-9.5	47.9	53.9	6.0	149.0	204.0	

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).

Distance factor : 1 GHz - 10 GHz : 20log(4.0 m / 3.0 m) = 2.5 dB
10 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.	16740.0	PK	50.6	39.4	11.4	45.0	-9.5	46.9	-48.3	-27.0	21.3	174.0	136.0	
Hori.	33480.0	PK	54.7	43.6	13.6	62.1	-9.5	40.3	-54.9	-27.0	27.9	160.0	180.0	
Vert.	16740.0	PK	50.2	39.4	11.4	45.0	-9.5	46.5	-48.7	-27.0	21.7	147.0	195.0	
Vert.	33480.0	PK	55.0	43.6	13.6	62.1	-9.5	40.6	-54.6	-27.0	27.6	159.0	180.0	

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Result(EIRP)[dBm]=10*LOG (({ 10 ^ (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).

Distance factor : 1 GHz - 10 GHz : 20log(4.0 m / 3.0 m) = 2.5 dB
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

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Telephone : +81 478 88 6500

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Radiated Spurious Emission

Test place : Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No. : 11242579M
Date : May 15, 2016 May 14, 2016 May 14, 2016 May 17, 2016
Temperature / Humidity : 22deg. C / 41 % RH 24deg. C / 52 % RH 24deg. C / 52 % RH 24deg. C / 49 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando
 (1 GHz-10 GHz) (10 GHz-18 GHz) (18 GHz-26.5 GHz) (26.5 GHz-40 GHz)
 (AC11) (AC11) (AC11) (AC6)
Mode : Tx 11n-20 5700 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.	11400.0	PK	46.6	40.0	-0.2	43.2	2.5	45.7	73.9	28.2	174.0	141.0	
Hori.	22800.0	PK	57.7	40.4	6.8	46.4	-9.5	49.0	73.9	24.9	161.0	194.0	
Hori.	11400.0	AV	38.6	40.0	-0.2	43.2	2.5	37.7	53.9	16.2	174.0	141.0	
Hori.	22800.0	AV	56.4	40.4	6.8	46.4	-9.5	47.7	53.9	6.2	161.0	194.0	
Vert.	11400.0	PK	47.2	40.0	-0.2	43.2	2.5	46.3	73.9	27.6	166.0	143.0	
Vert.	22800.0	PK	56.5	40.4	6.8	46.4	-9.5	47.8	73.9	26.1	161.0	215.0	
Vert.	11400.0	AV	39.0	40.0	-0.2	43.2	2.5	38.1	53.9	15.8	166.0	143.0	
Vert.	22800.0	AV	54.8	40.4	6.8	46.4	-9.5	46.1	53.9	7.8	161.0	215.0	

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).

Distance factor : 1 GHz - 10 GHz : 20log (4.0 m / 3.0 m) = 2.5 dB
10 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.	5725.0	PK	55.6	32.0	16.4	46.2	2.5	60.3	-34.9	-27.0	7.9	162.0	215.0	
Hori.	17100.0	PK	49.7	40.6	11.5	44.5	-9.5	47.8	-47.4	-27.0	20.4	169.0	148.0	
Hori.	34200.0	PK	54.7	43.6	13.7	62.4	-9.5	40.1	-55.1	-27.0	28.1	159.0	180.0	
Vert.	5725.0	PK	55.4	32.0	16.4	46.2	2.5	60.1	-35.1	-27.0	8.1	113.0	254.0	
Vert.	17100.0	PK	49.0	40.6	11.5	44.5	-9.5	47.1	-48.1	-27.0	21.1	151.0	202.0	
Vert.	34200.0	PK	54.1	43.6	13.7	62.4	-9.5	39.5	-55.7	-27.0	28.7	158.0	184.0	

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

Result(EIRP[dBm])=10*LOG (({ 10 ^ (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).

Distance factor : 1 GHz - 10 GHz : 20log (4.0 m / 3.0 m) = 2.5 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

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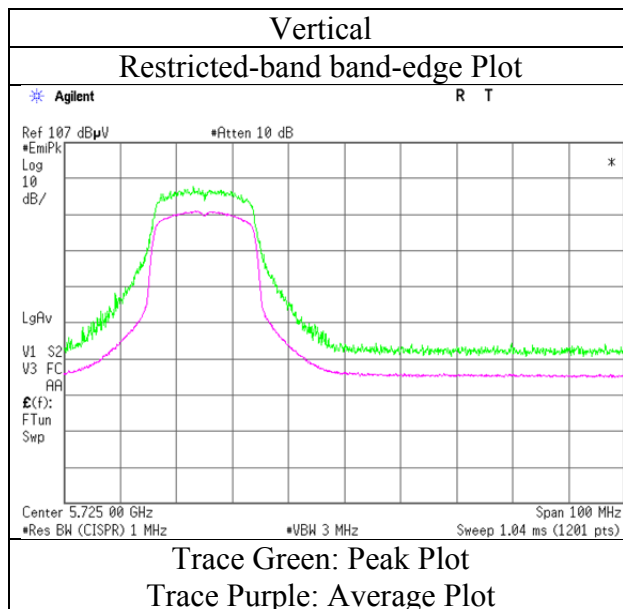
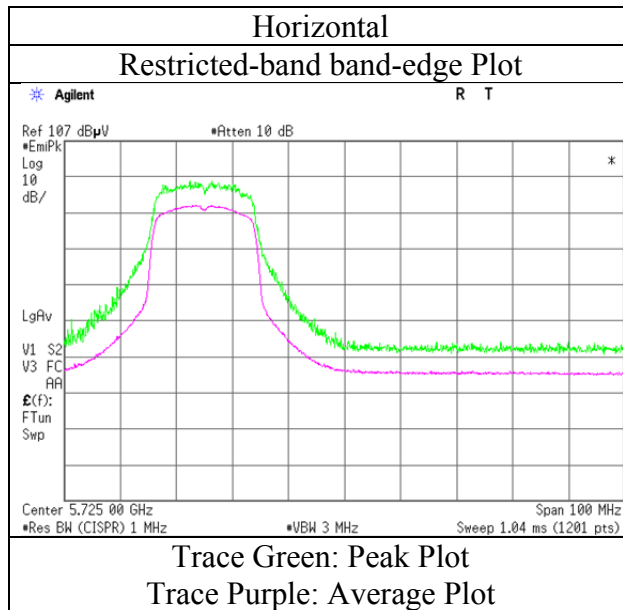
1614, Mushiata, Katori-shi, Chiba-ken, 289-0341 Japan

Telephone : +81 478 88 6500

Facsimile : +81 478 82 3373

Radiated Spurious Emission

Test place	Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No.	11242579M
Date	May 15, 2016
Temperature / Humidity	22deg. C / 41 % RH
Engineer	Kazuhiro Ando (1 GHz-10 GHz) (AC11)
Mode	Tx 11n-20 5700 MHz



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

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No. : 11242579M
Date : June 22, 2016 May 14, 2016 May 14, 2016 May 17, 2016
Temperature / Humidity : 24deg. C / 47 % RH 24deg. C / 52 % RH 24deg. C / 52 % RH 24deg. C / 49 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando
(1 GHz-10 GHz) (10 GHz-18 GHz) (18 GHz-26.5 GHz) (26.5 GHz-40 GHz)
(AC11) (AC11) (AC11) (AC6)
Mode : Tx 11n-20 5745 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.	11490.0	PK	47.6	40.0	9.3	43.4	-9.5	44.0	73.9	29.9	169.0	102.0	
Hori.	22980.0	PK	57.5	40.4	6.8	46.5	-9.5	48.7	73.9	25.2	161.0	141.0	
Hori.	11490.0	AV	39.3	40.0	9.3	43.4	-9.5	35.7	53.9	18.2	169.0	102.0	
Hori.	22980.0	AV	55.9	40.4	6.8	46.5	-9.5	47.1	53.9	6.8	161.0	141.0	
Vert.	11490.0	PK	47.8	40.0	9.3	43.4	-9.5	44.2	73.9	29.7	176.0	138.0	
Vert.	22980.0	PK	56.7	40.4	6.8	46.5	-9.5	47.9	73.9	26.0	157.0	172.0	
Vert.	11490.0	AV	39.3	40.0	9.3	43.4	-9.5	35.7	53.9	18.2	176.0	138.0	
Vert.	22980.0	AV	54.7	40.4	6.8	46.5	-9.5	45.9	53.9	8.0	157.0	172.0	

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).

Distance factor : 1 GHz - 10 GHz : 20log(4.0 m / 3.0 m) = 2.5 dB
10 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.	5650.0	PK	52.5	31.8	16.5	46.3	2.5	57.0	-38.2	-27.0	11.2	163.0	225.0	
Hori.	5700.0	PK	52.5	31.9	16.5	46.2	2.5	57.2	-38.0	10.0	48.0	163.0	225.0	
Hori.	5720.0	PK	56.8	32.0	16.5	46.2	2.5	61.6	-33.6	15.6	49.2	163.0	225.0	
Hori.	5725.0	PK	62.2	32.0	16.5	46.2	2.5	67.0	-28.2	27.0	55.2	163.0	225.0	
Hori.	17235.0	PK	48.8	41.3	11.5	44.5	-9.5	47.6	-47.6	-27.0	20.6	175.0	182.0	
Hori.	34470.0	PK	54.7	43.5	13.8	62.4	-9.5	40.1	-55.1	-27.0	28.1	170.0	150.0	
Vert.	5650.0	PK	52.4	31.8	16.5	46.3	2.5	56.9	-38.3	-27.0	11.3	116.0	267.0	
Vert.	5700.0	PK	52.7	31.9	16.5	46.2	2.5	57.4	-37.8	10.0	47.8	116.0	267.0	
Vert.	5720.0	PK	56.6	32.0	16.5	46.2	2.5	61.4	-33.8	15.6	49.4	116.0	267.0	
Vert.	5725.0	PK	62.0	32.0	16.5	46.2	2.5	66.8	-28.4	27.0	55.4	116.0	267.0	
Vert.	17235.0	PK	49.7	41.3	11.5	44.5	-9.5	48.5	-46.7	-27.0	19.7	151.0	204.0	
Vert.	34470.0	PK	53.8	43.5	13.8	62.4	-9.5	39.2	-56.0	-27.0	29.0	151.0	181.0	

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

Result(EIRP[dBm])=10*LOG (({ 10 ^ (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).

Distance factor : 1 GHz - 10 GHz : 20log(4.0 m / 3.0 m) = 2.5 dB
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

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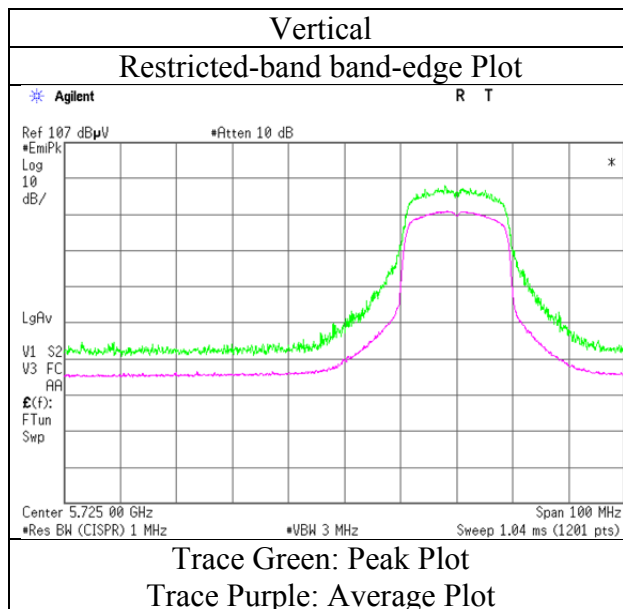
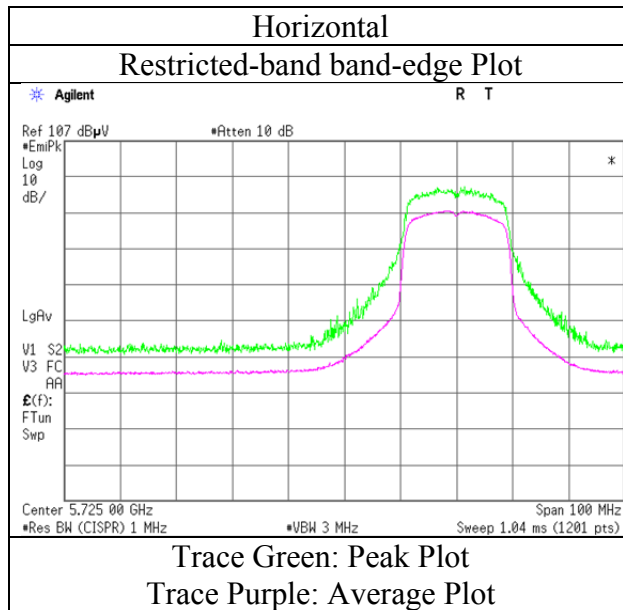
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Radiated Spurious Emission

Test place	Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No.	11242579M
Date	May 15, 2016
Temperature / Humidity	22deg. C / 41 % RH
Engineer	Kazuhiro Ando (1 GHz-10 GHz) (AC11)
Mode	Tx 11n-20 5745 MHz



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

Radiated Spurious Emission

Test place	Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber			
Report No.	11242579M			
Date	May 15, 2016	May 14, 2016	May 14, 2016	May 17, 2016
Temperature / Humidity	22deg. C / 41 % RH	24deg. C / 52 % RH	24deg. C / 52 % RH	24deg. C / 49 % RH
Engineer	Kazuhiro Ando	Kazuhiro Ando	Kazuhiro Ando	Kazuhiro Ando
	(1 GHz-10 GHz)	(10 GHz-18 GHz)	(18 GHz-26.5 GHz)	(26.5 GHz-40 GHz)
	(AC11)	(AC11)	(AC11)	(AC6)
Mode	Tx 11n-20 5785 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.	11570.0	PK	48.2	39.7	9.3	43.6	-9.5	44.1	73.9	29.8	160.0	139.0	
Hori.	11570.0	AV	40.4	39.7	9.3	43.6	-9.5	36.3	53.9	17.6	160.0	139.0	
Vert.	11570.0	PK	48.7	39.7	9.3	43.6	-9.5	44.6	73.9	29.3	172.0	139.0	
Vert.	11570.0	AV	39.7	39.7	9.3	43.6	-9.5	35.6	53.9	18.3	172.0	139.0	

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).

Distance factor : 1 GHz - 10 GHz : $20\log(4.0\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$
 10 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.	17355.0	PK	49.5	42.4	11.5	44.4	-9.5	49.5	-45.7	-27.0	18.7	177.0	133.0	
Hori.	23140.0	PK	57.1	40.4	6.9	46.8	-9.5	48.1	-47.1	-27.0	20.1	157.0	139.0	
Hori.	34710.0	PK	54.5	43.5	13.8	62.5	-9.5	39.8	-55.4	-27.0	28.4	168.0	178.0	
Vert.	17355.0	PK	49.6	42.4	11.5	44.4	-9.5	49.6	-45.6	-27.0	18.6	160.0	130.0	
Vert.	23140.0	PK	55.7	40.4	6.9	46.8	-9.5	46.7	-48.5	-27.0	21.5	161.0	217.0	
Vert.	34710.0	PK	55.1	43.5	13.8	62.5	-9.5	40.4	-54.8	-27.0	27.8	158.0	184.0	

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

Result(EIRP[dBm])=10*LOG (({ 10 ^ (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).

Distance factor : 1 GHz - 10 GHz : $20\log(4.0\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$
 10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No. : 11242579M
Date : June 22, 2016 May 14, 2016 May 14, 2016 May 17, 2016
Temperature / Humidity : 24deg. C / 47 % RH 24deg. C / 52 % RH 24deg. C / 52 % RH 24deg. C / 49 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando
 (1 GHz-10 GHz) (10 GHz-18 GHz) (18 GHz-26.5 GHz) (26.5 GHz-40 GHz)
 (AC11) (AC11) (AC11) (AC6)
Mode : Tx 11n-20 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.	11650.0	PK	49.3	39.3	9.3	43.8	-9.5	44.6	73.9	29.3	137.0	160.0	
Hori.	11650.0	AV	40.8	39.3	9.3	43.8	-9.5	36.1	53.9	17.8	137.0	160.0	
Vert.	11650.0	PK	48.2	39.3	9.3	43.8	-9.5	43.5	73.9	30.4	151.0	206.0	
Vert.	11650.0	AV	41.1	39.3	9.3	43.8	-9.5	36.4	53.9	17.5	151.0	206.0	

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).

Distance factor : 1 GHz - 10 GHz : 20log(4.0 m / 3.0 m) = 2.5 dB
10 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.	5850.0	PK	56.1	32.3	16.6	46.2	2.5	61.3	-33.9	27.0	60.9	165.0	130.0	
Hori.	5855.0	PK	54.6	32.3	16.6	46.2	2.5	59.8	-35.4	15.6	51.0	165.0	130.0	
Hori.	5875.0	PK	52.2	32.3	16.6	46.2	2.5	57.4	-37.8	10.0	47.8	165.0	130.0	
Hori.	5925.0	PK	52.2	32.3	16.6	46.2	2.5	57.4	-37.8	-27.0	10.8	165.0	130.0	
Hori.	17475.0	PK	48.8	43.6	11.6	44.2	-9.5	50.3	-44.9	-27.0	17.9	158.0	136.0	
Hori.	23300.0	PK	56.0	40.4	6.9	47.0	-9.5	46.8	-48.4	-27.0	21.4	152.0	139.0	
Hori.	34950.0	PK	54.0	43.5	13.9	62.3	-9.5	39.6	-55.6	-27.0	28.6	156.0	178.0	
Vert.	5850.0	PK	55.1	32.3	16.6	46.2	2.5	60.3	-34.9	27.0	61.9	115.0	269.0	
Vert.	5855.0	PK	53.2	32.3	16.6	46.2	2.5	58.4	-36.8	15.6	52.4	115.0	269.0	
Vert.	5875.0	PK	52.3	32.3	16.6	46.2	2.5	57.5	-37.7	10.0	47.7	115.0	269.0	
Vert.	5925.0	PK	52.2	32.3	16.6	46.2	2.5	57.4	-37.8	-27.0	10.8	115.0	269.0	
Vert.	17475.0	PK	49.5	43.6	11.6	44.2	-9.5	51.0	-44.2	-27.0	17.2	147.0	185.0	
Vert.	23300.0	PK	56.0	40.4	6.9	47.0	-9.5	46.8	-48.4	-27.0	21.4	160.0	218.0	
Vert.	34950.0	PK	54.1	43.5	13.9	62.3	-9.5	39.7	-55.5	-27.0	28.5	154.0	177.0	

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

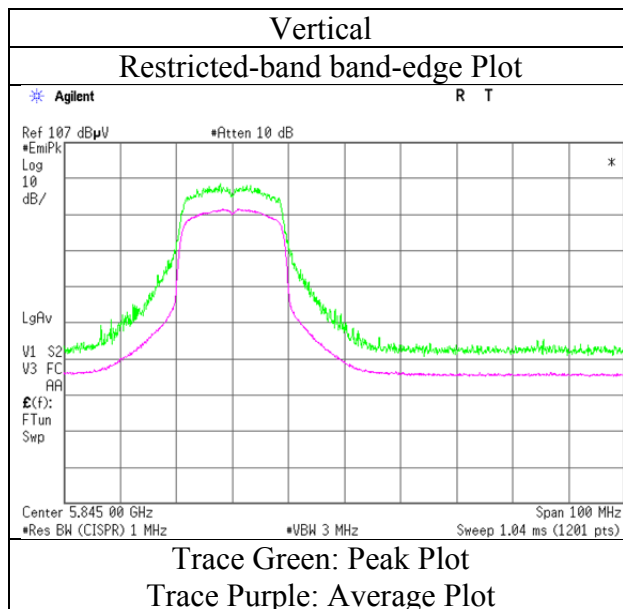
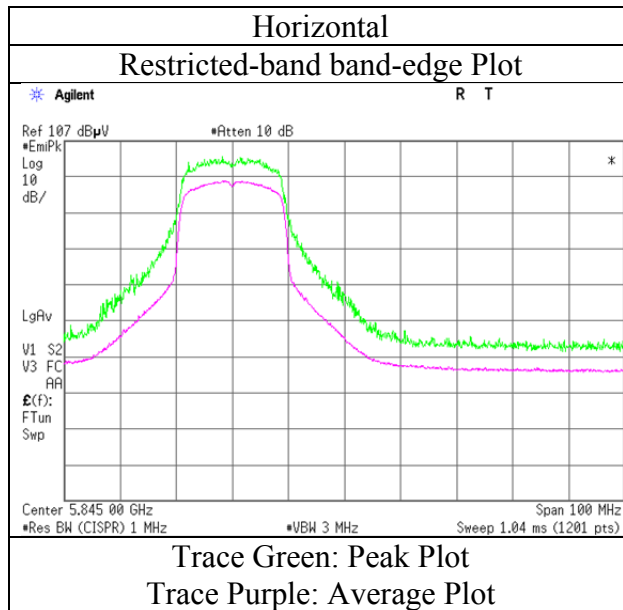
Result(EIRP[dBm])=10*LOG (({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3

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

Distance factor : 1 GHz - 10 GHz : 20log(4.0 m / 3.0 m) = 2.5 dB
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

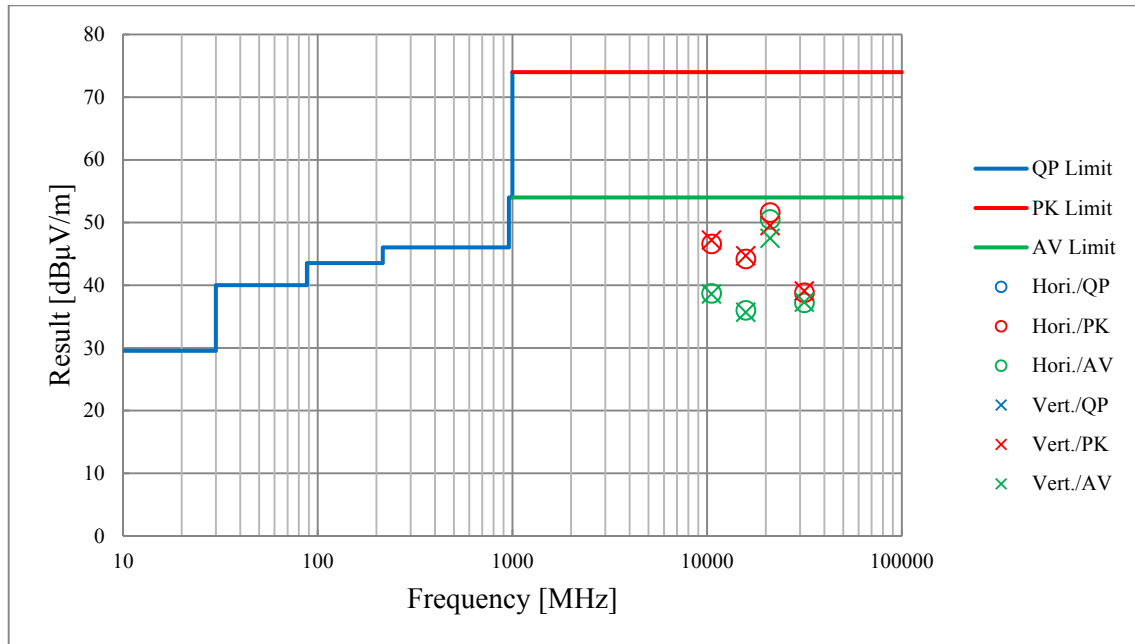
Test place	Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber
Report No.	11242579M
Date	May 15, 2016
Temperature / Humidity	22deg. C / 41 % RH
Engineer	Kazuhiro Ando (1 GHz-10 GHz) (AC11)
Mode	Tx 11n-20 5825 MHz



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

Radiated Spurious Emission
(Plot data, Worst case)

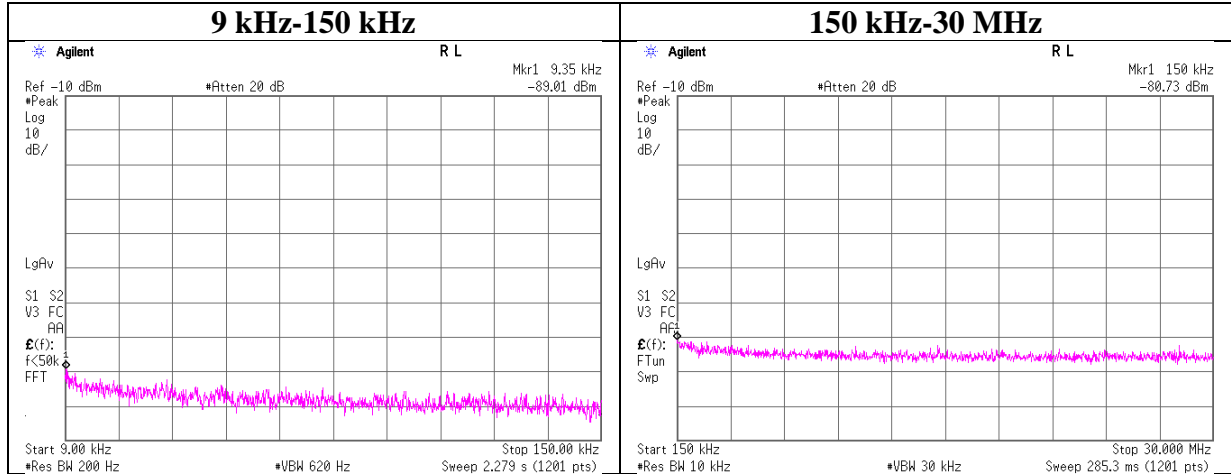
Test place	Kashima EMC Lab. No.6, 11 Semi Anechoic Chamber			
Report No.	11242579M			
Date	May 15, 2016	May 14, 2016	May 14, 2016	May 17, 2016
Temperature / Humidity	22deg. C / 41 % RH	24deg. C / 52 % RH	24deg. C / 52 % RH	24deg. C / 49 % RH
Engineer	Kazuhiro Ando (1 GHz-10 GHz) (AC11)	Kazuhiro Ando (10 GHz-18 GHz) (AC11)	Kazuhiro Ando (18 GHz-26.5 GHz) (AC11)	Kazuhiro Ando (26.5 GHz-40 GHz) (AC6)
Mode	Tx 11n-20 5260 MHz			



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

Conducted Spurious Emission

Test place	Kashima EMC Lab. No.2 Measurement Room
Report No.	11242579M
Date	May 18, 2016
Temperature / Humidity	22deg. C / 48 % RH
Engineer	Kazuhiro Ando
Mode	Tx 11n-20 5300 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
9.35	-89.0	0.01	9.97	2.0	1	-77.0	300	6.0	-15.8	48.1	63.9	
150.00	-80.7	0.01	9.97	2.0	1	-68.8	300	6.0	-7.5	24.0	31.5	

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

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

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
CSA-07	Spectrum Analyzer	Agilent	E4448A	MY52490024 Version A.11.21	AT	2015/05/28 * 12
CAT10-17	10dB Fixed Atten.	Weinschel	54A-10	56251	AT	2015/05/26 * 12
CCC-W06	Micro Wave Cable	Junkosha	MWX241	MRA-12-14-146	AT	2015/05/26 * 12
CPM-16	Peak Power Analyzer	Agilent	8990B	MY51000276	AT	2015/06/16 * 12
CPSO-24	Power Sensor	Agilent	N1923A	MY54070024	AT	2015/06/16 * 12
COS-12	Temperature & Humidity Indicator	A&D	AD-5681	6876017	AT	2015/07/13 * 12
CLS-25	A.M.N.	Rohde & Schwarz	ENV216	101042	CE	2015/08/06 * 12
CCC-S2-C(2/ 6/7/8)	Coaxial Cable	Fujikura,Fujikura, Fujikura,Fujikura	5D-2W,5D-2W,5 D-2W,5D-2W	-	CE	2015/07/14 * 12
CTM-32	Terminator	Suhner	65_BNC-50-0-2/ 133_NE	none	CE	2015/11/19 * 12
CTR-05	Test Receiver	Rohde & Schwarz	ESCI	100608 Rev 4.32	CE	2015/09/24 * 12
CSCL-02	Ruler	Tajima	L19-55	none	CE	2016/02/22 * 12
COS-02	Temperature & Humidity Indicator	A&D	AD-5681	6878345	CE	2015/07/13 * 12
CTS-06	Digital Multimeter	FLUKE	112	89790159	CE	2015/09/08 * 12
CTR-09	Test Receiver	Agilent	N9038A	MY53290016 Version A.14.03	RE	2015/06/28 * 12
CBL-08	LOGBICON	Schwarzbeck	VULB 9168	343	RE	2015/11/15 * 12
CAT3-04	3dB Fixed Atten.	TAMAGAWA	UFA-01	none	RE	2015/09/03 * 12
CCC-S10-R(2/4/CATS-11 /5/6/7/8/11/1 2)	Coaxial Cable	Fujikura,Fujikura, Agilent,Fujikura,F ujikura,Fujikura,F uhjikura,Fujikura, Fujikura	5D-2W,5D-2W,8 494A,5D-2W,5D -2W,5D-2W,5D- 2W,5D-2W,5D-2 W	MY41110200(St ep Att)	RE	2015/08/11 * 12
CAF-08	Pre-Amplifier	Hewlett Packard	8447D	2944A09041	RE	2015/08/11 * 12
CSCL-13	Ruler	Tajima	L19-55	none	RE	2016/02/22 * 12
COS-10	Temperature & Humidity Indicator	HIOKI	3641/9680-50	090999895/0909 05406	RE	2015/05/17 * 12
CTS-14	Digital Multimeter	FLUKE	115	994460954	RE	2015/10/01 * 12
COTS-CEMI -02	EMI Software	TSJ	TEPTO-DV(RE, CE,MF,PE)	Ver, RE: 2.5.0131, CE: 2.5.0131	RE	-

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Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
CSA-06	Spectrum Analyzer	Agilent	N9030A	MY53310670 Version A.13.12	RE/AT	2015/05/28 * 12
CSA-07	Spectrum Analyzer	Agilent	E4448A	MY52490024 Version A.11.21	RE	2016/05/11 * 12
CHA-20	Broad Band Horn	Schwarzbeck	BBHA 9120D	9120D-1270	RE	2015/07/31 * 12
CHA-07	Double Ridged Horn	ETS-Lindgren	3160-09	00166043	RE	2015/06/28 * 12
CHA-08	Double Ridged Horn	ETS-Lindgren	3160-10	00165191	RE	2015/06/28 * 12
CAF-21	Pre-Amplifier	Micro Wave Factory	MPR-1G26.5-35	161398	RE	2016/05/06 * 12
CAF-19	Pre-Amplifier	TOYO	HAP18-26W	00000035	RE	2015/06/28 * 12
CAF-20	Pre-Amplifier	TOYO	HAP26-40W	00000005	RE	2015/06/28 * 12
CAT10-16	10dB Fixed Atten.	Weinschel	54A-10	56246	RE	2016/05/13 * 12
CHF-05	HPF	Micro-Tronics	HPM50112-02	006	RE	2016/05/13 * 12
CCC-W05	Micro Wave Cable	Junkosha	MWX241	MRA-12-14-145	RE	2016/05/13 * 12
CCC-W07	Micro Wave Cable	Junkosha	MWX221	MRA-12-14-148	RE	2016/05/13 * 12
CCC-W09	Micro Wave Cable	SUHNER	SUCOFLEX104	MY588/4	RE	2015/07/13 * 12
CCC-W10	Micro Wave Cable	Suhner	SUCOFLEX102	MY010/2A	RE	2015/07/13 * 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

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