



RADIO TEST REPORT

Test Report No. : 11306372M-B-R2

Applicant : Sony Corporation
Type of Equipment : Digital Paper
Model No. : DPT-RP1
FCC ID : AK8DPTRP1
Test regulation : FCC Part 15 Subpart C: 2016
(2.4 GHz Wireless LAN and
Bluetooth Low Energy parts)
Test item : Conducted Emission
Radiated Spurious Emission
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with 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 11306372M-B-R1. 11306372M-B-R1 is replaced with this report.

Date of test: June 13-15, 19, 20, 23, 24, 28, 29,
July 7, 10, 11, 2016

**Representative
test engineer:** 
Kazuhiro Ando
Engineer
Consumer Technology Division

Approved by: 
Masanori Mshiyama
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".

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

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SECTION 1: Customer information

Company Name : Sony Corporation
Brand Name : SONY
Address : 1-7-1 Konan, Minato-ku, Tokyo 108-0075, Japan

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

2.1 Identification of E.U.T.

Type of Equipment : Digital Paper
Model No. : DPT-RP1
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 3.7 V
Receipt Date of Sample : May 30, 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: DPT-RP1 (referred to as the EUT in this report) is a Digital Paper.

Clock frequency : 156 MHz (CPLD), 667 MHz (LPDDR3), 200 MHz (eMMC),
40 MHz (WLAN/BT), 208 MHz (WLAN/BT), 32.768 kHz (clock) ,
26 MHz (CPU), 27 MHz (NFC)

Radio Specification

Equipment name	IEEE 802.11 2x2 MIMO a/b/g/n/ac Wireless LAN + Bluetooth + NFC		
Frequency of operation	Bluetooth	2.4GHz band: 2402-2480 MHz (BDR (Basic Data Rate), EDR (Enhanced Data Rate), LE (Low Energy mode))	
	WLAN	2.4GHz band: 2412-2462 MHz (b,g,n(HT20)); W52 (U-NII-1): 5180-5240 MHz (a,n(HT20),ac(VHT20)) / 5190-5230 MHz (n(HT40),ac(VHT40)) / 5210 MHz (ac(VHT80)); W53 (U-NII-2A): 5260-5320 MHz (a,n(HT20),ac(VHT20)) / 5270-5310 MHz (n(HT40),ac(VHT40)) / 5290 MHz (ac(VHT80)); W56 (U-NII-2C): 5500-5720 MHz (a,n(HT20),ac(VHT20)) / 5510-5710 MHz (n(HT40),ac(VHT40)) / 5530-5690 MHz (ac(VHT80)); W58 (U-NII-3): 5745-5825 MHz (a,n(HT20),ac(VHT20)) / 5755-5795 MHz (n(HT40),ac(VHT40)) / 5775 MHz (ac(VHT80))	
	NFC	13.56 MHz	
Operation mode	Wi-Fi		Bluetooth
Channel spacing	5 MHz (2.4 GHz band), 20 MHz (W52, W53, W56, W58)		1 MHz (BDR, EDR), 2 MHz (LE)
Bandwidth	20 MHz (b,g,a,n(HT20),ac(VHT20)), 40 MHz (n(HT40),ac(VHT40)), 80 MHz (ac(VHT80))		79 MHz
Type of modulation	DSSS: DBPSK, DQPSK, CCK OFDM: BPSK, QPSK, 16QAM, 64QAM, 256QAM(*1) (*1. 256QAM is only supported by 11ac mode.)		FHSS: GFSK (*. EDR: GFSK+ $\pi/4$ -DQPSK, GFSK+ 8DPSK)
Antenna	antenna #A (Wi-Fi)		antenna #B (Wi-Fi+Bluetooth)
Antenna type	Loop		
Antenna gain (Peak)	3.75 dBi (2.4 GHz), 2.81 dBi (5 GHz) (*.including cable loss)		1.38 dBi (2.4 GHz), 4.29 dBi (5 GHz) (*.including cable loss)
Antenna	NFC antenna		
Antenna type	Loop		
Card type	type A, type F		

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Kashima EMC Lab.

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

Telephone : +81 478 88 6500

Facsimile : +81 478 82 3373

SECTION 3: Test specification, procedures & results

3.1 Test Specification

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

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz

*The EUT has been tested for compliance with FCC Part 15 Subpart B. Refer to the test report 11306371S-F.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods IC: RSS-Gen 8.8	FCC: Section 15.207 IC: RSS-Gen 8.8	QP 14.9 dB, 0.65549 MHz, N AV 14.0 dB, 0.62335 MHz, N	Complied	-
6dB Bandwidth	FCC: KDB 558074 D01 DTS Meas Guidance v03r05 IC: -	FCC: Section 15.247(a)(2) IC: RSS-247 5.2(1)	N/A	N/A *1)	Conducted
Maximum Peak Output Power	FCC: KDB 558074 D01 DTS Meas Guidance v03r05 IC: RSS-Gen 6.12	FCC: Section 15.247(b)(3) IC: RSS-247 5.4(4)		N/A *1)	Conducted
Power Density	FCC: KDB 558074 D01 DTS Meas Guidance v03r05 IC: -	FCC: Section 15.247(e) IC: RSS-247 5.2(2)		N/A *1)	Conducted
Spurious Emission Restricted Band Edges	FCC: KDB 558074 D01 DTS Meas Guidance v03r05 IC: RSS-Gen 6.13	FCC: Section 15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	1.0 dB 2710.000 MHz, AV, Hori.	Complied	Conducted (below 30 MHz) *1) /Radiated (above 30 MHz) *2)

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

*1) Refer to the test report: 11306371S-B.

*2) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 DTS Meas Guidance v03r05 12.2.7.

* 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 3.3 V and 1.8 V) constantly to RF transmitter 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 requirement.

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

3.3 Addition to standard

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 (+/-)
Conducted emission	0.15 MHz-30 MHz	2.8 dB
Radiated emission	30MHz - 300MHz	5.1dB
	300MHz - 1GHz	6.3dB
	1GHz - 6GHz	4.5dB
	6GHz - 18GHz	4.8dB
	18GHz - 26.5GHz	4.9dB

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

1614 Mushihata, Katori-shi, Chiba-ken, 289-0341 JAPAN
Telephone: +81 478 88 6500, Facsimile: +81 478 82 3373
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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.2 Measurement room	-	4.3 x 4.4 x 2.7	-	-
No.3 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*	Power setting
IEEE 802.11b (11b)	1 Mbps, PN9	13
IEEE 802.11n MIMO 20 MHz BW (11n-20)	MCS 8, PN9	13
Bluetooth Low Energy (BT LE)	PRBS9	7
*Transmitting duty was refer to APEENDIX. *The worst condition was determined based on the test result of Maximum Conducted Output Power. (Refer to the test report: 11306371S-B.) *Power of the EUT was set by the software: DutApiMimoBtFmBridgeEth.exe Version 2.0.0.75 *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 Operating mode for BLE

Test Item	Operating Mode	Tested Antenna	Tested frequency
Conducted Emission	BT LE	B	2402 MHz, 2440 MHz, 2480 MHz
Spurious Emission (below 1 GHz)	BT LE	B	2402 MHz, 2440 MHz, 2480 MHz
Spurious Emission (above 1 GHz)	BT LE	B	2402 MHz, 2440 MHz, 2480 MHz

*The details of Operating mode for WLAN

Test Item	Operating Mode	Tested Antenna	Tested frequency
Conducted Emission	11n-20 Tx *1,*2)	B	2462 MHz
Spurious Emission (below 1 GHz)	11n-20 Tx*1,*2)	B	2462 MHz
Spurious Emission (above 1 GHz)	11b Tx	B	2412 MHz 2437 MHz 2462 MHz
	11n-20 Tx*2)	B	2412 MHz 2437 MHz 2462 MHz
*1) The mode was tested as a representative, because it had the highest power at antenna terminal test. *2) The test was performed on 11n-20 Tx mode according to “Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - ” of TCB Council Workshop October 2009, as the 11n-20 Tx mode had higher power than 11g mode at antenna terminal test. (Refer to the report: No. 11306371S-B)			

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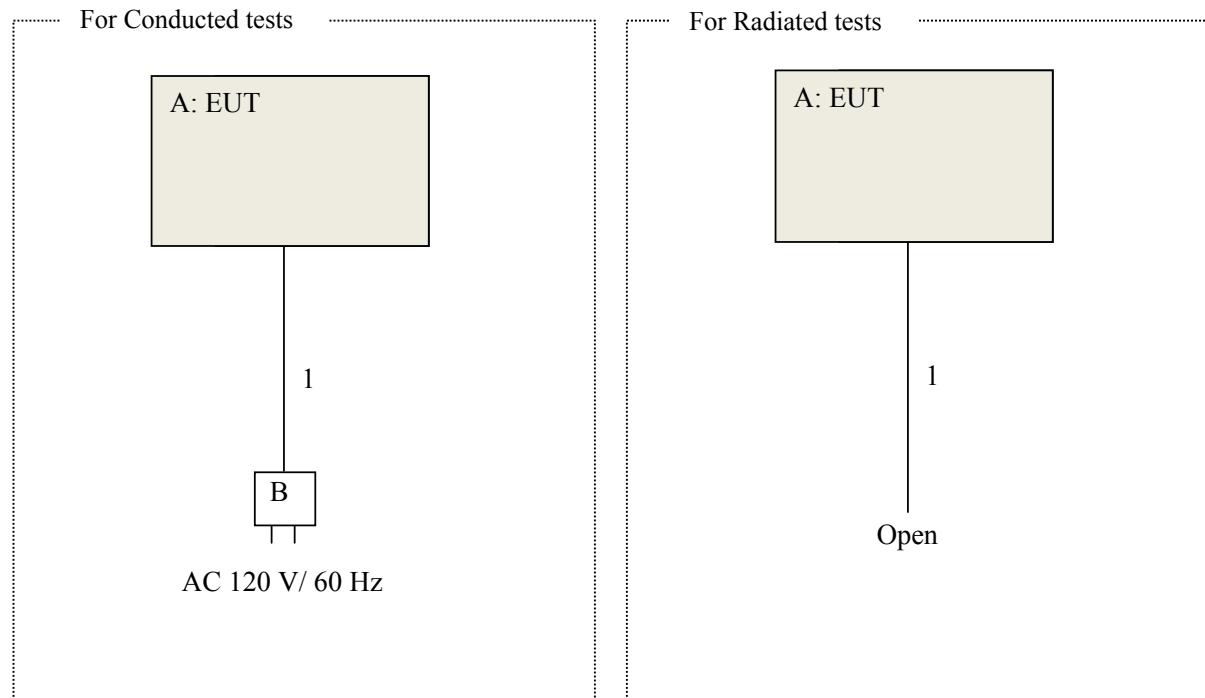
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Facsimile : +81 478 82 3373

*Simultaneously transmission

Test Item	Operating Mode *1)
Conducted Emission	Tx BT LE 2480 MHz +11n-40 (MIMO) 5190MHz
Spurious Emission (below 1 GHz)	Tx BT LE 2480 MHz +11n-40 (MIMO) 5190MHz
Spurious Emission (above 1 GHz)	Tx BT LE 2402 MHz +11n-40 (MIMO) 5190MHz Tx BT LE 2480 MHz +11n-40 (MIMO) 5190MHz
*1) The test was performed on the mode as a representative, because it had highest power of 5GHz band at the worst margin of spurious emission tests.	

4.2 Configuration and peripherals



* Test data was taken under worse case conditions.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Digital Paper	DPT-RP1	504	Sony Corporation	EUT
B	AC Adaptor	AC-UUD12	15091AR1000145	Sony Corporation	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Cable	1.5	Shielded	Shielded	-

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

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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.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT via AC adaptor in a Shielded room.

The EUT via AC adaptor 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 AV
Measurement range	: 0.15 MHz - 30 MHz
Test data	: APPENDIX
Test result	: Pass

SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "558074 D01 DTS Meas Guidance v03r05".

[For below 1 GHz]

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.

[For above 1 GHz]

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.

Test Antennas are used as below;

Frequency	Below 1 GHz	Above 1 GHz
Antenna Type	Hybrid	Horn

In any 100 kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9(IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *3)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	Average Power Method: RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces If duty cycle was less than 98%, a duty factor was added to the results.	RBW: 100 kHz VBW: 300kHz
Test Distance	3.0 m	4.0 m *1) (1 GHz - 10 GHz), 1.0 m *2) (10 GHz - 26.5 GHz)		4.0 m *1) (1 GHz - 10 GHz), 1.0 m *2) (10 GHz - 26.5 GHz)

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

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

*3) Average Power Measurement was performed based on 6.0 & 12.2.5 of "KDB 558074 D01 DTS Meas Guidance v03r05"

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Kashima EMC Lab.

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

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

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

Measurement range	: 30 MHz - 26.5 GHz
Test data	: APPENDIX
Test result	: Pass

APPENDIX 1: Test data

Conducted Emission

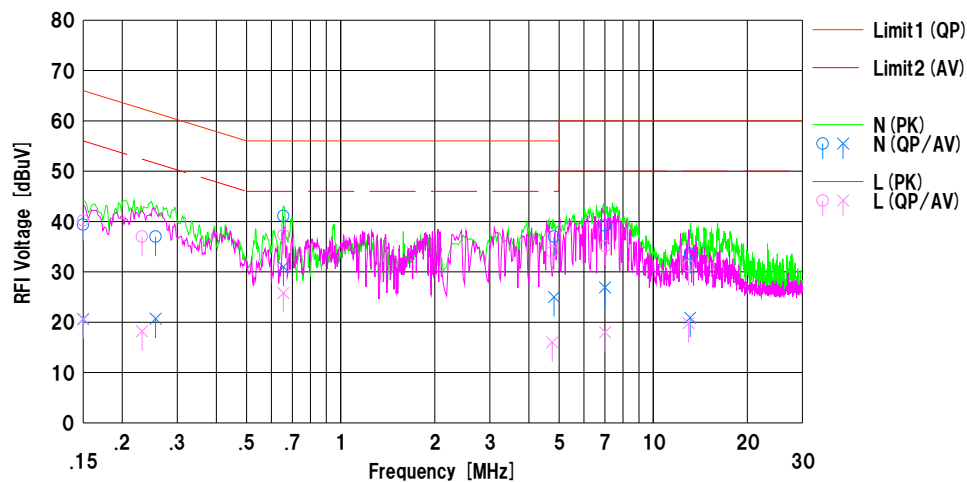
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.5 Shielded Room
Date : 2016/06/29

Mode : 11n-20 MCS8 2462MHz
Report No. : 11306372M
Power : AC 120V / 60Hz
Temp./Humi. : 24deg.C / 52%RH

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

Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<OP> [dBuV]	<AV> [dBuV]		<OP> [dBuV]	<AV> [dBuV]	<OP> [dBuV]	<AV> [dBuV]	<OP> [dB]	<AV> [dB]		
1	0.15000	29.7	10.9	9.7	39.4	20.6	66.0	56.0	26.6	35.4	N	
2	0.25585	27.3	11.0	9.7	37.0	20.7	61.6	51.6	24.6	30.9	N	
3	0.65549	31.4	21.3	9.7	41.1	31.0	56.0	46.0	14.9	15.0	N	
4	4.81528	27.0	15.0	10.0	37.0	25.0	56.0	46.0	19.0	21.0	N	
5	7.00578	29.0	16.7	10.2	39.2	26.9	60.0	50.0	20.8	23.1	N	
6	13.11855	23.3	10.6	10.3	33.6	20.9	60.0	50.0	26.4	29.1	N	
7	0.15000	30.5	11.0	9.7	40.2	20.7	66.0	56.0	25.8	35.3	L	
8	0.23148	27.3	8.5	9.7	37.0	18.2	62.4	52.4	25.4	34.2	L	
9	0.65550	27.6	16.1	9.7	37.3	25.8	56.0	46.0	18.7	20.2	L	
10	4.75050	24.0	6.0	10.0	34.0	16.0	56.0	46.0	22.0	30.0	L	
11	7.01382	24.9	7.8	10.2	35.1	18.0	60.0	50.0	24.9	32.0	L	
12	12.97628	20.9	9.5	10.3	31.2	19.8	60.0	50.0	28.8	30.2	L	

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

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Conducted Emission

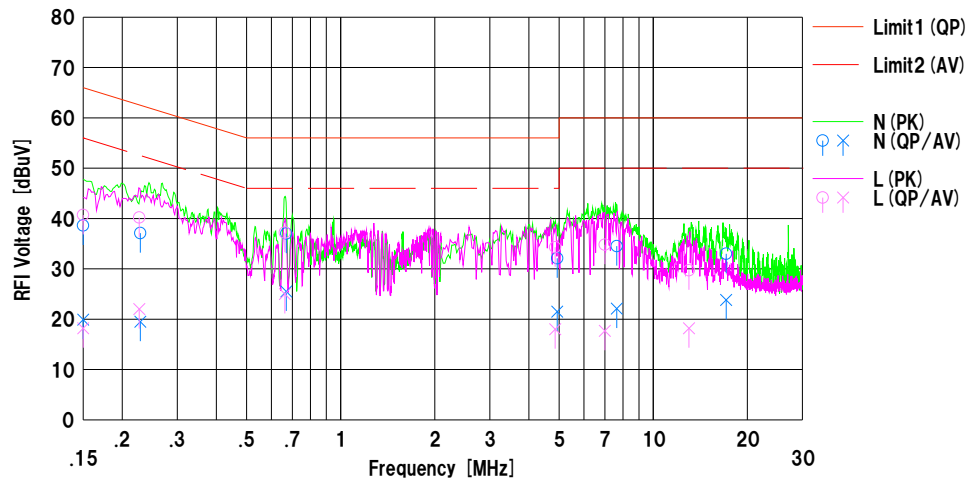
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.5 Shielded Room
Date : 2016/06/28

Mode : Tx BT LE 2402MHz
Report No. : 11306372M
Power : AC 120V / 60Hz
Temp./Humi. : 24deg.C / 52%RH

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

Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<OP> [dBuV]	<AV> [dBuV]		<OP> [dBuV]	<AV> [dBuV]	<OP> [dBuV]	<AV> [dBuV]	<OP> [dB]	<AV> [dB]		
1	0.15000	28.9	10.2	9.7	38.6	19.9	66.0	56.0	27.4	36.1	N	
2	0.22854	27.4	9.8	9.7	37.1	19.5	62.5	52.5	25.4	33.0	N	
3	0.66983	27.3	15.8	9.7	37.0	25.5	56.0	46.0	19.0	20.5	N	
4	4.92955	22.1	11.5	10.0	32.1	21.5	56.0	46.0	23.9	24.5	N	
5	7.64348	24.3	11.9	10.2	34.5	22.1	60.0	50.0	25.5	27.9	N	
6	17.11528	22.6	13.4	10.4	33.0	23.8	60.0	50.0	27.0	26.2	N	
7	0.15000	31.0	8.5	9.7	40.7	18.2	66.0	56.0	25.3	37.8	L	
8	0.22672	30.5	12.3	9.7	40.2	22.0	62.6	52.6	22.4	30.6	L	
9	0.66255	27.5	15.3	9.7	37.2	25.8	56.0	46.0	18.8	21.0	L	
10	4.85603	24.3	8.0	10.0	34.3	18.0	56.0	46.0	21.7	28.0	L	
11	7.00128	24.6	7.5	10.2	34.6	17.7	60.0	50.0	25.2	32.3	L	
12	13.00981	19.4	7.9	10.3	29.7	18.2	60.0	50.0	30.3	31.8	L	

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

Conducted Emission

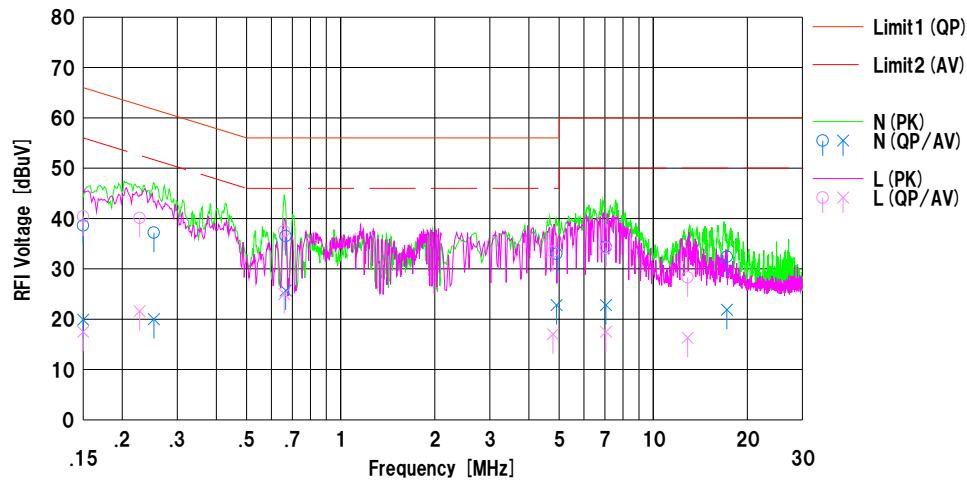
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.5 Shielded Room
Date : 2016/06/28

Mode : Tx BT LE 2440MHz
Report No. : 11306372M
Power : AC 120V / 60Hz
Temp./Humi. : 24deg.C / 52%RH

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

Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<OP> [dBuV]	<AV> [dBuV]		<OP> [dBuV]	<AV> [dBuV]	<OP> [dBuV]	<AV> [dBuV]	<OP> [dB]	<AV> [dB]		
1	0.15000	28.9	10.2	9.7	38.6	19.9	66.0	56.0	27.4	36.1	N	
2	0.25260	27.5	10.3	9.7	37.2	20.0	61.7	51.7	24.5	31.7	N	
3	0.66686	26.8	16.0	9.7	36.5	25.7	56.0	46.0	19.5	20.3	N	
4	4.90479	23.0	12.8	10.0	33.0	22.8	56.0	46.0	23.0	23.2	N	
5	7.05628	24.2	12.6	10.2	34.4	22.8	60.0	50.0	25.6	27.2	N	
6	17.20418	22.0	11.5	10.4	32.4	21.9	60.0	50.0	27.6	28.1	N	
7	0.15000	30.7	7.8	9.7	40.4	17.5	66.0	56.0	25.6	38.5	L	
8	0.22744	30.4	11.9	9.7	40.1	21.6	62.5	52.5	22.4	30.9	L	
9	0.66008	27.8	15.3	9.7	37.5	25.6	56.0	46.0	18.5	21.0	L	
10	4.77717	23.4	7.0	10.0	33.4	17.0	56.0	46.0	22.6	29.0	L	
11	7.05800	24.0	7.3	10.2	34.2	17.5	60.0	50.0	25.8	32.5	L	
12	12.88415	18.0	6.0	10.3	28.3	16.3	60.0	50.0	31.7	33.7	L	

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

Conducted Emission

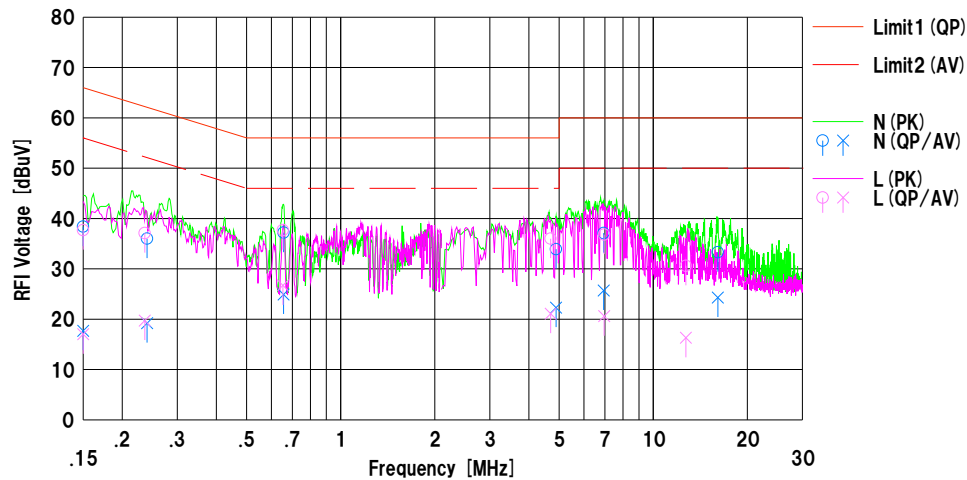
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.5 Shielded Room
Date : 2016/06/28

Mode : Tx BT LE 2480MHz
Report No. : 11306372M
Power : AC 120V / 60Hz
Temp./Humi. : 24deg.C / 52%RH

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

Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<OP> [dBuV]	<AV> [dBuV]		<OP> [dBuV]	<AV> [dBuV]	<OP> [dBuV]	<AV> [dBuV]	<OP> [dB]	<AV> [dB]		
1	0.15000	28.7	8.0	9.7	38.4	17.7	66.0	56.0	27.6	38.3	N	
2	0.24020	26.3	9.5	9.7	36.0	19.2	62.1	52.1	26.1	32.9	N	
3	0.65677	27.5	15.2	9.7	37.2	24.9	56.0	46.0	18.8	21.1	N	
4	4.88682	23.9	12.3	10.0	33.9	22.3	56.0	46.0	22.1	23.7	N	
5	6.94255	26.9	15.5	10.2	37.1	25.7	60.0	50.0	22.9	24.3	N	
6	16.09402	22.9	13.9	10.4	33.3	24.3	60.0	50.0	26.7	25.7	N	
7	0.15000	28.0	7.3	9.7	37.7	17.0	66.0	56.0	28.3	39.0	L	
8	0.23622	27.4	10.0	9.7	37.1	19.7	62.2	52.2	25.1	32.5	L	
9	0.65351	28.0	17.0	9.7	37.7	26.7	56.0	46.0	18.3	19.3	L	
10	4.69701	26.0	11.1	10.0	36.0	21.1	56.0	46.0	20.0	24.9	L	
11	6.96617	26.6	10.4	10.2	36.6	20.6	60.0	50.0	23.2	29.4	L	
12	12.71473	20.3	6.0	10.3	30.6	16.3	60.0	50.0	29.4	33.7	L	

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

Conducted Emission

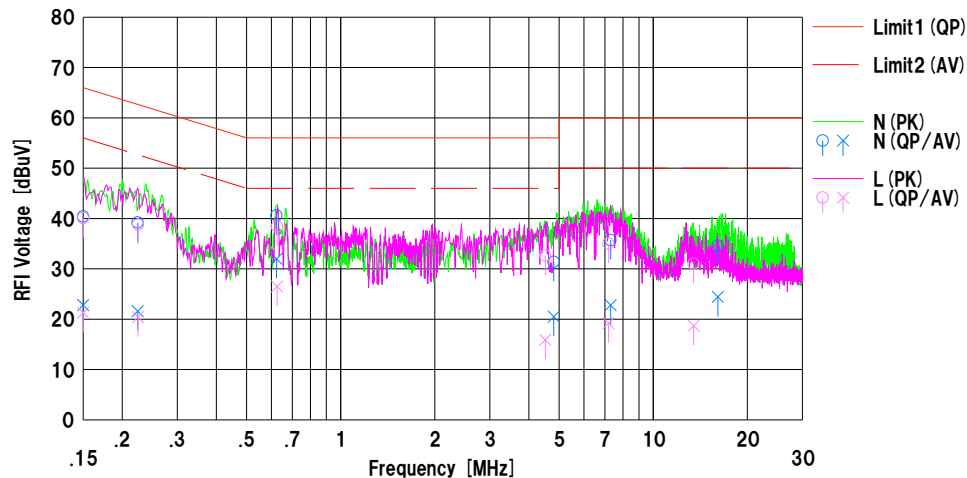
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.2 Shielded Room
Date : 2016/07/11

Mode : BLE 2480M, 11n-40 (mimo) 5190M
Order No. : 11306372M
Power : AC 120V / 60Hz
Temp./Humi. : 24deg.C / 44%RH

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

Tested by : Kazuhiro Ando

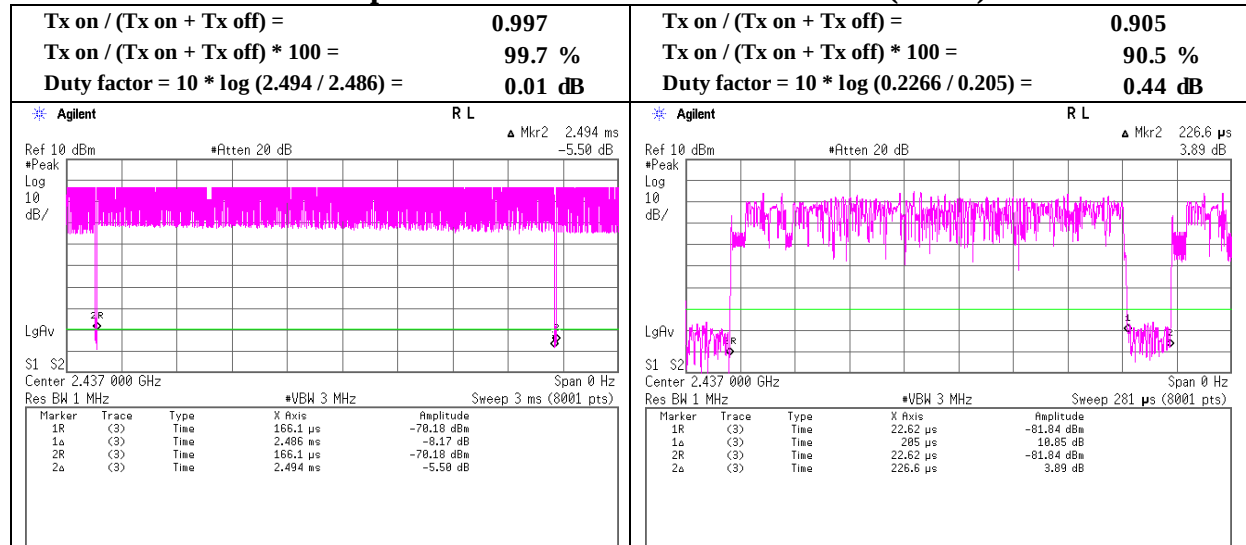


No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	30.7	13.1	9.7	40.4	22.8	66.0	56.0	25.6	33.2	N	
2	0.22420	29.5	11.9	9.7	39.2	21.6	62.7	52.7	23.5	31.1	N	
3	0.62335	30.9	22.3	9.7	40.6	32.0	56.0	46.0	15.4	14.0	N	
4	4.80642	21.5	10.6	9.9	31.4	20.5	56.0	46.0	24.6	25.5	N	
5	7.30494	25.6	12.7	10.1	35.7	22.8	60.0	50.0	24.3	27.2	N	
6	16.09521	24.3	14.1	10.3	34.6	24.4	60.0	50.0	25.4	25.6	N	
7	0.15000	30.4	11.6	9.7	40.1	21.3	66.0	56.0	25.9	34.7	L	
8	0.22477	29.1	10.7	9.7	38.8	20.4	62.6	52.6	23.8	32.2	L	
9	0.62605	28.7	16.8	9.7	38.4	26.5	56.0	46.0	17.6	19.5	L	
10	4.51703	22.7	6.0	9.9	32.6	15.9	56.0	46.0	23.4	30.1	L	
11	7.19441	24.9	9.1	10.1	35.0	19.2	60.0	50.0	25.0	30.8	L	
12	13.45950	20.7	8.4	10.3	31.0	18.7	60.0	50.0	29.0	31.3	L	

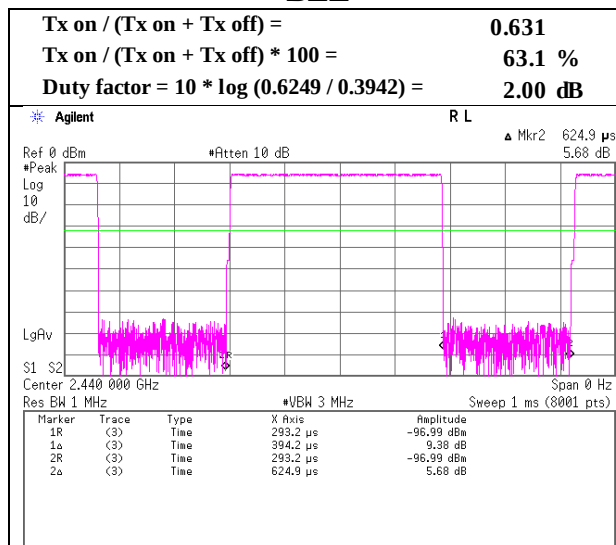
Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable) [dB]
LISN:CLS-25

Burst rate confirmation

11b 1 Mbps



BLE



Radiated Spurious Emission

Test place : Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No. : 11306372M
Date : June 13, 2016 June 15, 2016
Temperature / Humidity : 23 deg. C / 58 % RH 23 deg. C / 53 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando
(1-10GHz) (10-26.5GHz)
Mode : Tx 11b 2412 MHz

(* 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.	2390.000	PK	50.5	27.6	14.2	44.4	2.5	50.4	73.9	23.5	100	0	Floor noise
Hori.	4824.000	PK	57.6	31.3	6.3	46.1	2.5	51.6	73.9	22.3	184	128	
Hori.	7236.000	PK	49.7	36.3	7.6	44.6	2.5	51.5	73.9	22.4	100	0	
Hori.	2390.000	AV	41.6	27.6	14.2	44.4	2.5	41.5	53.9	12.4	100	0	Floor noise
Hori.	4824.000	AV	54.0	31.3	6.3	46.1	2.5	48.0	53.9	5.9	184	128	
Hori.	7236.000	AV	40.6	36.3	7.6	44.6	2.5	42.4	53.9	11.5	100	0	
Vert.	2390.000	PK	50.0	27.6	14.2	44.4	2.5	49.9	73.9	24.0	175	270	Floor noise
Vert.	4824.000	PK	54.6	31.3	6.3	46.1	2.5	48.6	73.9	25.3	180	182	
Vert.	7236.000	PK	50.2	36.3	7.6	44.6	2.5	52.0	73.9	21.9	100	0	
Vert.	2390.000	AV	41.3	27.6	14.2	44.4	2.5	41.2	53.9	12.7	175	270	Floor noise
Vert.	4824.000	AV	48.6	31.3	6.3	46.1	2.5	42.6	53.9	11.3	180	182	
Vert.	7236.000	AV	40.7	36.3	7.6	44.6	2.5	42.5	53.9	11.4	100	0	

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

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

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

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

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]	Remark
Hori.	2412.000	PK	100.6	27.6	14.2	44.4	2.5	100.5	-	-	Carrier
Hori.	2397.000	PK	57.5	27.6	14.2	44.4	2.5	57.4	80.5	23.1	
Hori.	2400.000	PK	50.4	27.6	14.2	44.4	2.5	50.3	80.5	30.2	
Vert.	2412.000	PK	98.6	27.6	14.2	44.4	2.5	98.5	-	-	Carrier
Vert.	2397.000	PK	56.3	27.6	14.2	44.4	2.5	56.2	78.5	22.3	
Vert.	2400.000	PK	50.5	27.6	14.2	44.4	2.5	50.4	78.5	28.1	

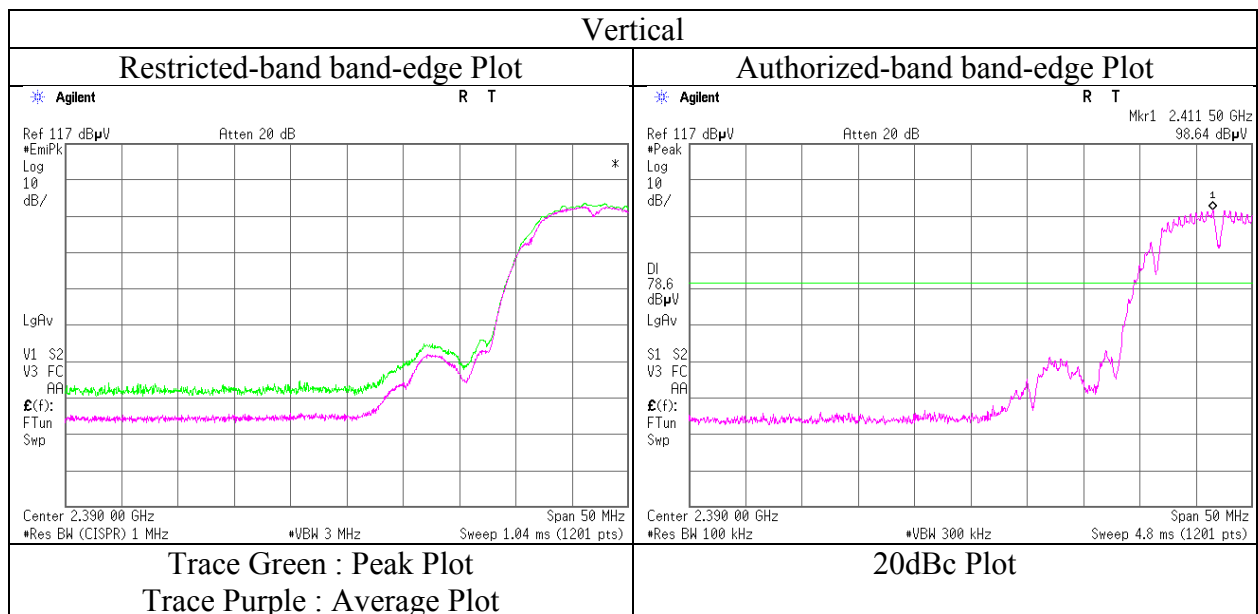
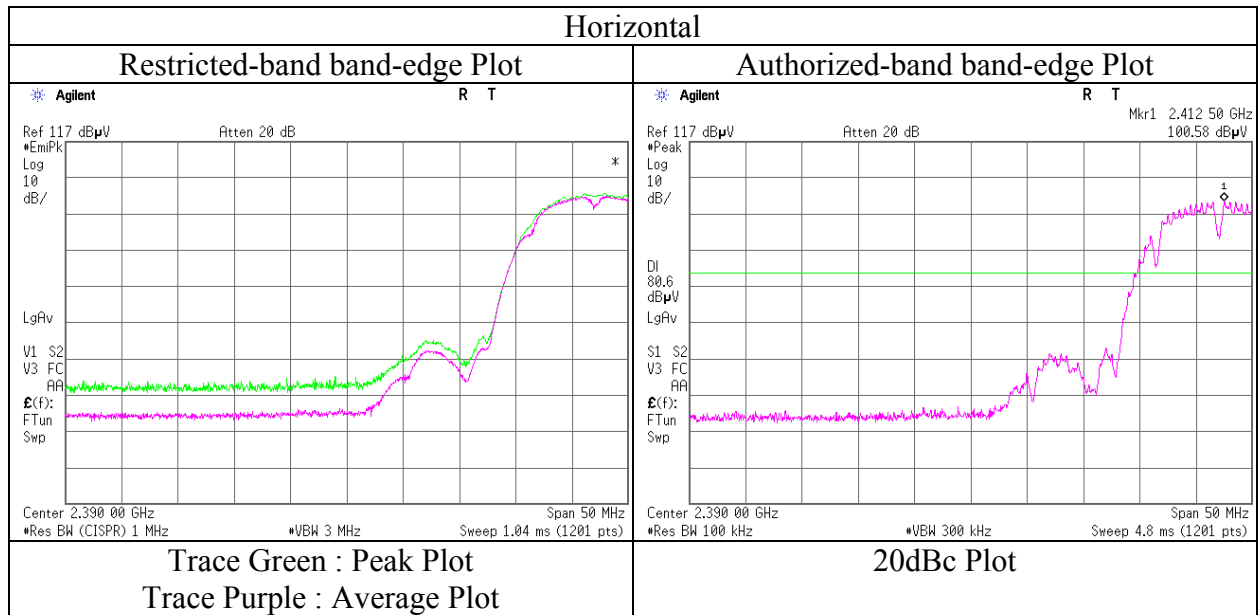
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No.	11306372M
Date	June 13, 2016
Temperature / Humidity	23 deg. C / 58 % RH
Engineer	Kazuhiro Ando (1-10GHz)
Mode	Tx 11b 2412 MHz



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

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No. : 11306372M
Date : June 13, 2016 June 15, 2016
Temperature / Humidity : 23 deg. C / 58 % RH 23 deg. C / 53 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando
(1-10GHz) (10-26.5GHz)
Mode : Tx 11b 2437 MHz

(* 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.	4874.000	PK	57.3	31.2	6.3	46.1	2.5	51.2	73.9	22.7	190	127	
Hori.	7311.000	PK	49.2	36.4	7.7	44.5	2.5	51.3	73.9	22.6	100	0	Floor noise
Hori.	4874.000	AV	53.2	31.2	6.3	46.1	2.5	47.1	53.9	6.8	190	127	
Hori.	7311.000	AV	39.8	36.4	7.7	44.5	2.5	41.9	53.9	12.0	100	0	Floor noise
Vert.	4874.000	PK	54.6	31.2	6.3	46.1	2.5	48.5	73.9	25.4	129	157	
Vert.	7311.000	PK	48.4	36.4	7.7	44.5	2.5	50.5	73.9	23.4	100	0	Floor noise
Vert.	4874.000	AV	48.3	31.2	6.3	46.1	2.5	42.2	53.9	11.7	129	157	
Vert.	7311.000	AV	39.9	36.4	7.7	44.5	2.5	42.0	53.9	11.9	100	0	Floor noise

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

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

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

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

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No. : 11306372M
Date : June 13, 2016 June 15, 2016
Temperature / Humidity : 23 deg. C / 58 % RH 23 deg. C / 53 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando
(1-10GHz) (10-26.5GHz)
Mode : Tx 11b 2462 MHz

(* 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.	2483.500	PK	48.5	27.5	14.2	44.3	2.5	48.4	73.9	25.5	160	12	
Hori.	4924.000	PK	57.5	31.3	6.4	46.1	2.5	51.6	73.9	22.3	170	133	
Hori.	7386.000	PK	49.0	36.7	7.7	44.3	2.5	51.6	73.9	22.3	100	0	Floor noise
Hori.	2483.500	AV	41.1	27.5	14.2	44.3	2.5	41.0	53.9	12.9	160	12	
Hori.	4924.000	AV	54.1	31.3	6.4	46.1	2.5	48.2	53.9	5.7	170	133	
Hori.	7386.000	AV	39.8	36.7	7.7	44.3	2.5	42.4	53.9	11.5	100	0	Floor noise
Vert.	2483.500	PK	49.7	27.5	14.2	44.3	2.5	49.6	73.9	24.3	175	270	
Vert.	4924.000	PK	54.3	31.3	6.4	46.1	2.5	48.4	73.9	25.5	138	158	
Vert.	7386.000	PK	48.4	36.7	7.7	44.3	2.5	51.0	73.9	22.9	100	0	Floor noise
Vert.	2483.500	AV	41.9	27.5	14.2	44.3	2.5	41.8	53.9	12.1	175	270	
Vert.	4924.000	AV	48.9	31.3	6.4	46.1	2.5	43.0	53.9	10.9	138	158	
Vert.	7386.000	AV	39.9	36.7	7.7	44.3	2.5	42.5	53.9	11.4	100	0	Floor noise

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

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

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

UL Japan, Inc.

Kashima EMC Lab.

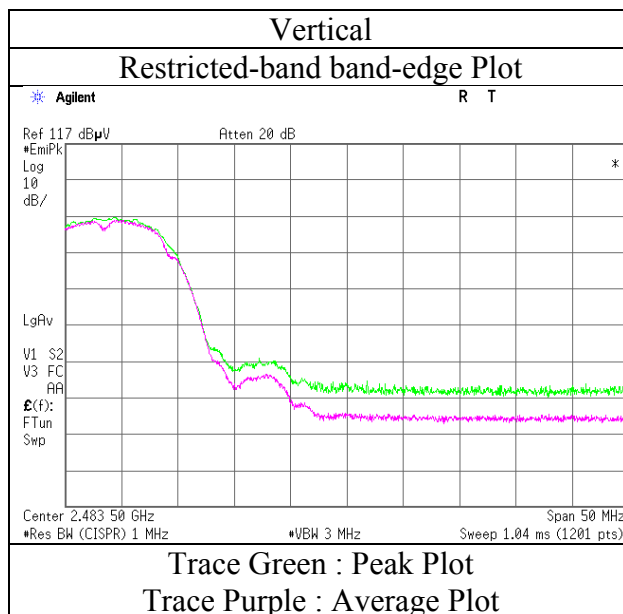
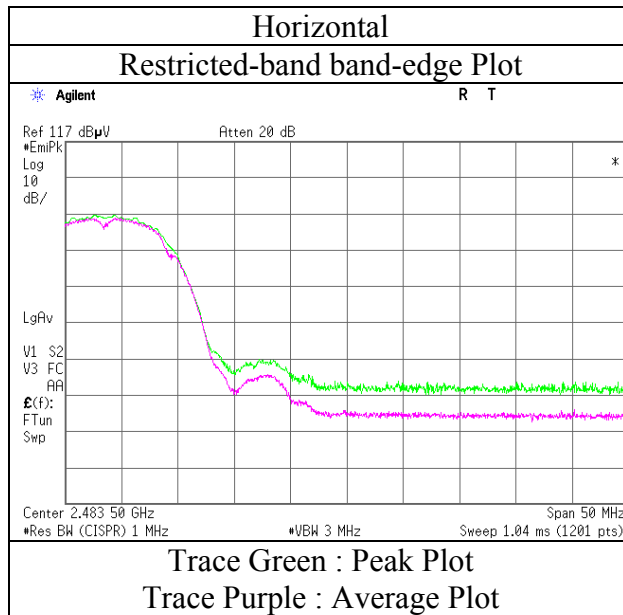
1614, Mushihata, Katori-shi, Chiba-ken, 289-0341 Japan

Telephone : +81 478 88 6500

Facsimile : +81 478 82 3373

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No.	11306372M
Date	June 13, 2016
Temperature / Humidity	23 deg. C / 58 % RH
Engineer	Kazuhiro Ando
	(1-10GHz)
Mode	Tx 11b 2462 MHz



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

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No. : 11306372M
Date : June 24, 2016 June 15, 2016
Temperature / Humidity : 23 deg. C / 54 % RH 23 deg. C / 53 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando
(1-10GHz) (10-26.5GHz)
Mode : Tx 11n-20 2412 MHz

(* 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.	2390.000	PK	58.8	27.6	20.1	44.4	2.5	64.6	73.9	9.3	100	132	
Hori.	4824.000	PK	52.0	31.3	6.3	46.1	2.5	46.0	73.9	27.9	170	134	
Hori.	7236.000	PK	49.7	36.3	7.6	44.6	2.5	51.5	73.9	22.4	100	0	Floor noise
Vert.	2390.000	PK	55.6	27.6	20.1	44.4	2.5	61.4	73.9	12.5	197	215	
Vert.	4824.000	PK	50.9	31.3	6.3	46.1	2.5	44.9	73.9	29.0	200	0	
Vert.	7236.000	PK	49.9	36.3	7.6	44.6	2.5	51.7	73.9	22.2	100	0	Floor noise

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	45.7	27.6	20.1	44.4	0.4	2.5	51.9	53.9	2.0	*1)
Hori.	4824.000	AV	43.8	31.3	6.3	46.1	0.4	2.5	38.2	53.9	15.7	
Hori.	7236.000	AV	40.3	36.3	7.6	44.6	0.4	2.5	42.5	53.9	11.4	Floor noise
Vert.	2390.000	AV	44.0	27.6	20.1	44.4	0.4	2.5	50.2	53.9	3.7	*1)
Vert.	4824.000	AV	42.7	31.3	6.3	46.1	0.4	2.5	37.1	53.9	16.8	
Vert.	7236.000	AV	40.6	36.3	7.6	44.6	0.4	2.5	42.8	53.9	11.1	Floor noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

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

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

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

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]	Remark
Hori.	2412.000	PK	95.3	27.6	20.1	44.4	2.5	101.1	-	-	Carrier
Hori.	2400.000	PK	52.7	27.6	20.1	44.4	2.5	58.5	81.1	22.6	
Vert.	2412.000	PK	95.1	27.6	20.1	44.4	2.5	100.9	-	-	Carrier
Vert.	2400.000	PK	54.4	27.6	20.1	44.4	2.5	60.2	80.9	20.7	

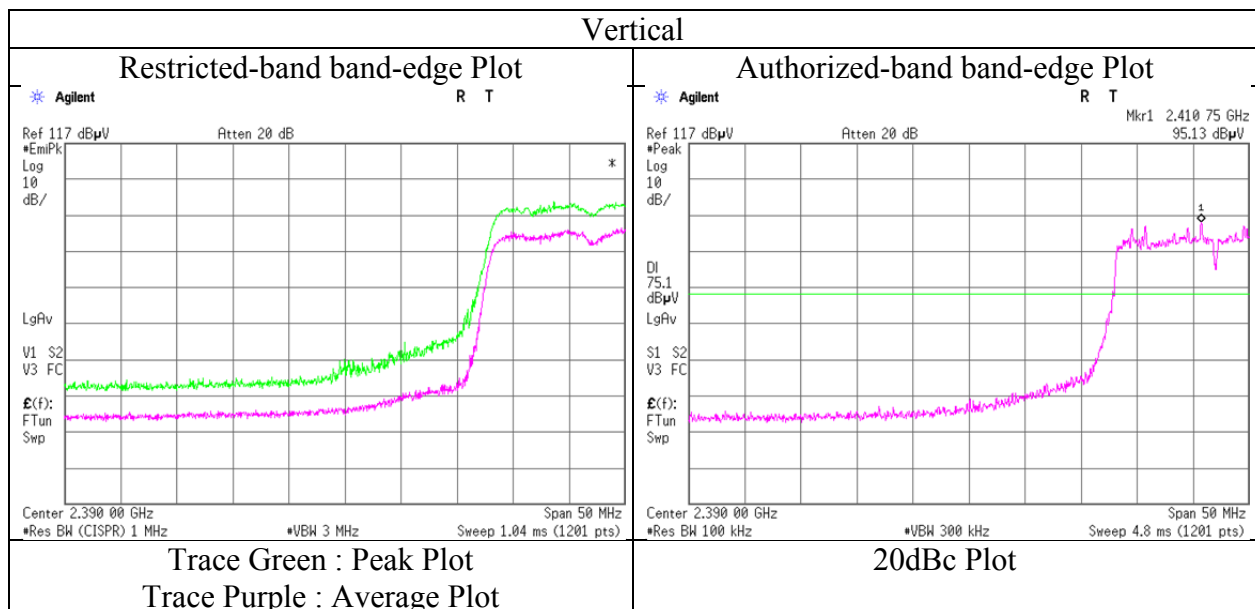
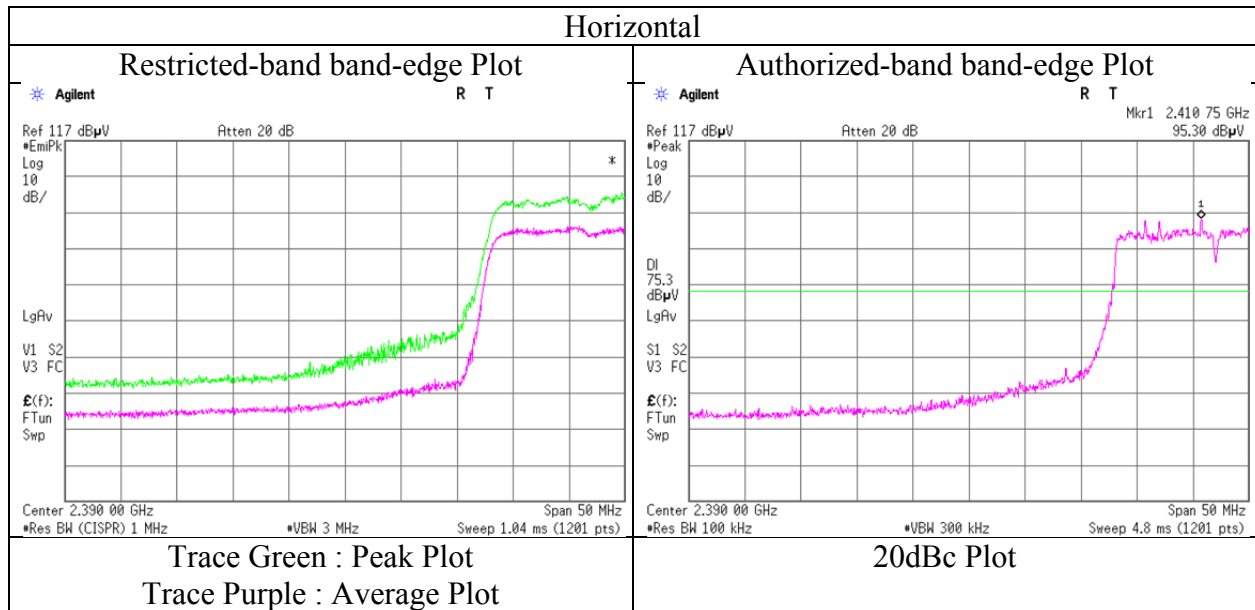
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No.	11306372M
Date	June 24, 2016
Temperature / Humidity	23 deg. C / 54 % RH
Engineer	Kazuhiro Ando (1-10GHz)
Mode	Tx 11n-20 2412 MHz



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

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No. : 11306372M
Date : June 14, 2016 June 15, 2016
Temperature / Humidity : 23 deg. C / 58 % RH 23 deg. C / 53 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando
(1-10GHz) (10-26.5GHz)
Mode : Tx 11n-20 2437 MHz

(* 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.	4874.000	PK	51.1	31.2	6.3	46.1	2.5	45.0	73.9	28.9	200	131	
Hori.	7311.000	PK	49.0	36.4	7.7	44.5	2.5	51.1	73.9	22.8	100	0	Floor noise
Vert.	4874.000	PK	50.7	31.2	6.3	46.1	2.5	44.6	73.9	29.3	200	0	
Vert.	7311.000	PK	48.4	36.4	7.7	44.5	2.5	50.5	73.9	23.4	100	0	Floor noise

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	43.2	31.2	6.3	46.1	0.4	2.5	37.5	53.9	16.4	
Hori.	7311.000	AV	39.8	36.4	7.7	44.5	0.4	2.5	42.3	53.9	11.6	Floor noise
Vert.	4874.000	AV	42.7	31.2	6.3	46.1	0.4	2.5	37.0	53.9	16.9	
Vert.	7311.000	AV	40.0	36.4	7.7	44.5	0.4	2.5	42.5	53.9	11.4	Floor noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

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

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

Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber		
Report No.	11306372M		
Date	June 19, 2016	June 24, 2016	June 15, 2016
Temperature / Humidity	22 deg. C / 59 % RH	23 deg. C / 54 % RH	23 deg. C / 53 % RH
Engineer	Kazuhiro Ando (30-1000MHz)	Kazuhiro Ando (1-10GHz)	Kazuhiro Ando (10-26.5GHz)
Mode	Tx 11n-20 2462 MHz		

(* 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.	624.000	QP	37.3	20.1	7.4	32.2	0.0	32.6	46.0	13.4	111	172	
Hori.	667.340	QP	32.3	20.5	7.5	32.2	0.0	28.1	46.0	17.9	100	178	
Hori.	2483.500	PK	60.4	27.5	20.1	44.3	2.5	66.2	73.9	7.7	178	127	
Hori.	2484.500	PK	62.3	27.5	20.1	44.3	2.5	68.1	73.9	5.8	100	215	
Hori.	4924.000	PK	52.1	31.3	6.4	46.1	2.5	46.2	73.9	27.7	200	134	
Hori.	7386.000	PK	49.0	36.7	7.7	44.3	2.5	51.6	73.9	22.3	100	0	Floor noise
Vert.	45.620	QP	31.5	13.7	4.1	32.3	0.0	17.0	40.0	23.0	100	0	
Vert.	61.160	QP	33.4	12.9	4.3	32.3	0.0	18.3	40.0	21.7	204	0	
Vert.	624.000	QP	34.3	20.1	7.4	32.2	0.0	29.6	46.0	16.4	100	155	
Vert.	2483.500	PK	60.2	27.5	20.1	44.3	2.5	66.0	73.9	7.9	200	200	
Vert.	2484.500	PK	62.0	27.5	20.1	44.3	2.5	67.8	73.9	6.1	100	132	
Vert.	4924.000	PK	50.6	31.3	6.4	46.1	2.5	44.7	73.9	29.2	200	0	
Vert.	7386.000	PK	48.9	36.7	7.7	44.3	2.5	51.5	73.9	22.4	100	0	Floor noise

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	45.2	27.5	20.1	44.3	0.4	2.5	51.4	53.9	2.5	*1)
Hori.	2484.500	AV	45.3	27.5	20.1	44.3	0.4	2.5	51.5	53.9	2.4	*1)
Hori.	4924.000	AV	43.3	31.3	6.4	46.1	0.4	2.5	37.8	53.9	16.1	
Hori.	7386.000	AV	39.8	36.7	7.7	44.3	0.4	2.5	42.8	53.9	11.1	Floor noise
Vert.	2483.500	AV	45.0	27.5	20.1	44.3	0.4	2.5	51.2	53.9	2.7	*1)
Vert.	2484.500	AV	45.1	27.5	20.1	44.3	0.4	2.5	51.3	53.9	2.6	*1)
Vert.	4924.000	AV	42.1	31.3	6.4	46.1	0.4	2.5	36.6	53.9	17.3	
Vert.	7386.000	AV	40.0	36.7	7.7	44.3	0.4	2.5	43.0	53.9	10.9	Floor noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

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

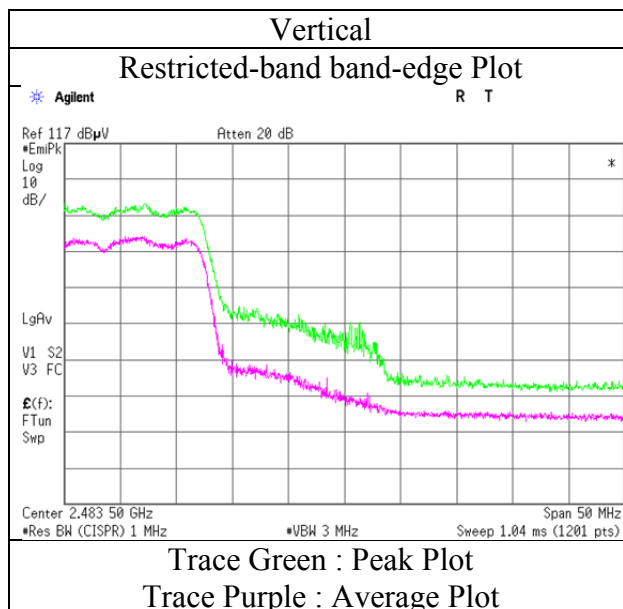
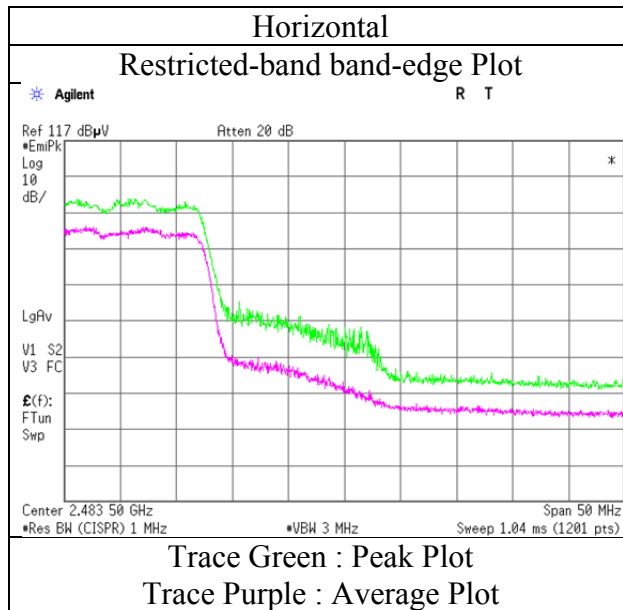
10 GHz - 26.5 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No.	11306372M
Date	June 24, 2016
Temperature / Humidity	23 deg. C / 54 % RH
Engineer	Kazuhiro Ando
	(1-10GHz)
Mode	Tx 11n-20 2462 MHz



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

Radiated Spurious Emission

Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber		
Report No.	11306372M		
Date	June 24, 2016	June 23, 2016	June 20, 2016
Temperature / Humidity	22 deg. C / 60 % RH	23 deg. C / 55 % RH	23 deg. C / 58 % RH
Engineer	Kazuhiro Ando	Kazuhiro Ando	Kazuhiro Ando
	(30-1000MHz)	(1-10GHz)	(10-26.5GHz)
Mode	Tx BT LE 2402 MHz		

(* 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.	624.003	QP	37.7	20.1	7.4	32.2	0.0	33.0	46.0	13.0	105	180	
Hori.	667.342	QP	32.3	20.5	7.5	32.2	0.0	28.1	46.0	17.9	100	189	
Hori.	2390.000	PK	57.8	27.6	14.2	44.4	2.5	57.7	73.9	16.2	165	5	
Hori.	4804.000	PK	54.2	31.3	6.3	46.1	2.5	48.2	73.9	25.7	160	125	
Hori.	7206.000	PK	49.5	36.3	7.6	44.7	2.5	51.2	73.9	22.7	100	0	Floor noise
Vert.	624.003	QP	34.6	20.1	7.4	32.2	0.0	29.9	46.0	16.1	100	153	
Vert.	667.342	QP	30.0	20.5	7.5	32.2	0.0	25.8	46.0	20.2	157	212	
Vert.	2390.000	PK	57.3	27.6	14.2	44.4	2.5	57.2	73.9	16.7	174	223	
Vert.	4804.000	PK	51.5	31.3	6.3	46.1	2.5	45.5	73.9	28.4	155	278	
Vert.	7206.000	PK	49.3	36.3	7.6	44.7	2.5	51.0	73.9	22.9	100	0	Floor noise

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	44.0	27.6	14.2	44.4	2.0	2.5	45.9	53.9	8.0	*1)
Hori.	4804.000	AV	46.6	31.3	6.3	46.1	2.0	2.5	42.6	53.9	11.3	
Hori.	7206.000	AV	41.1	36.3	7.6	44.7	2.0	2.5	44.8	53.9	9.1	Floor noise
Vert.	2390.000	AV	44.4	27.6	14.2	44.4	2.0	2.5	46.3	53.9	7.6	*1)
Vert.	4804.000	AV	43.1	31.3	6.3	46.1	2.0	2.5	39.1	53.9	14.8	
Vert.	7206.000	AV	41.4	36.3	7.6	44.7	2.0	2.5	45.1	53.9	8.8	Floor noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor

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

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

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

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]	Remark
Hori.	2402.000	PK	101.6	27.6	14.2	44.4	2.5	101.5	-	-	Carrier
Hori.	2400.000	PK	56.4	27.6	14.2	44.4	2.5	56.3	81.5	25.2	
Vert.	2402.000	PK	101.7	27.6	14.2	44.4	2.5	101.6	-	-	Carrier
Vert.	2400.000	PK	56.5	27.6	14.2	44.4	2.5	56.4	81.6	25.2	

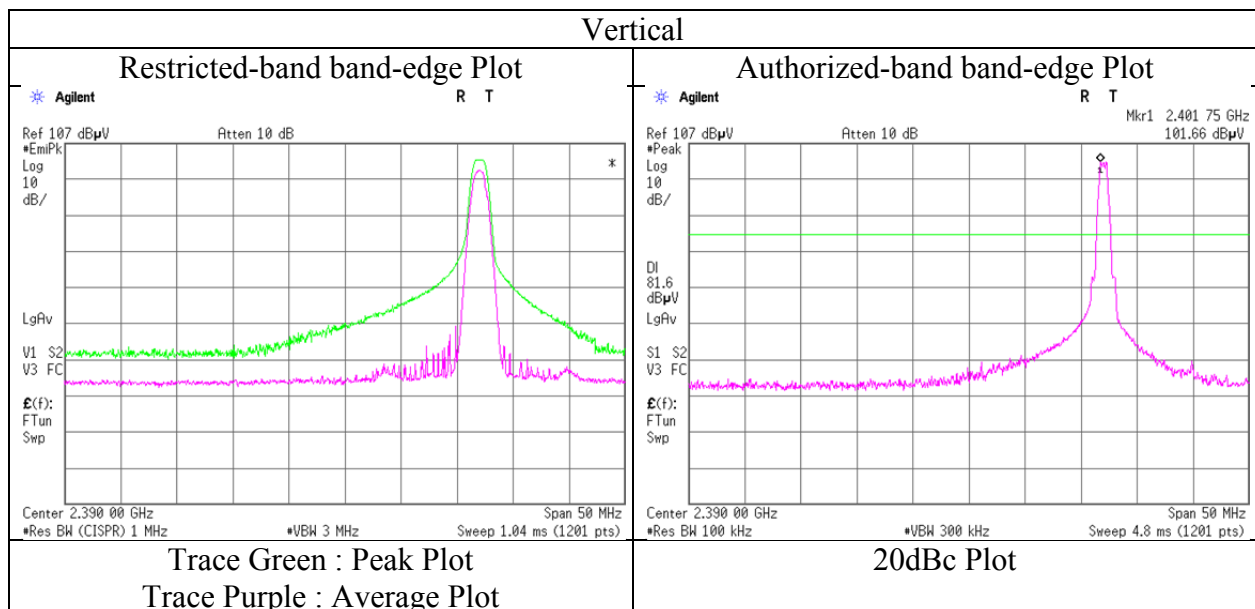
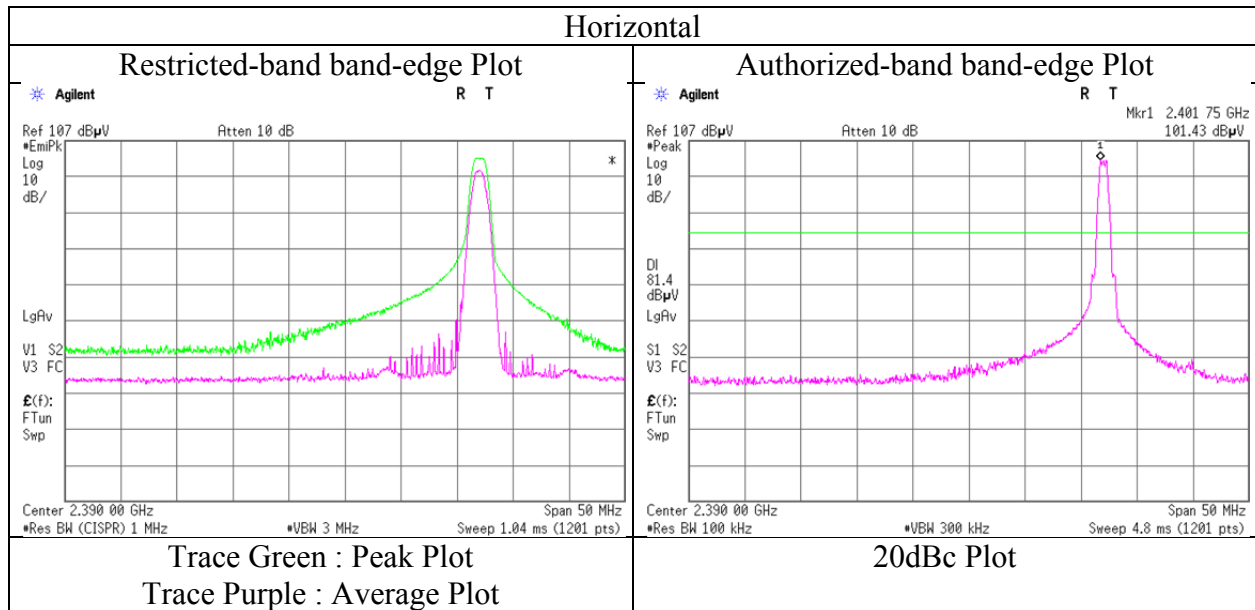
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No.	11306372M
Date	June 23, 2016
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Kazuhiro Ando
	(1-10GHz)
Mode	Tx BT LE 2402 MHz



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

Radiated Spurious Emission

Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber		
Report No.	11306372M		
Date	June 24, 2016	June 23, 2016	June 20, 2016
Temperature / Humidity	22 deg. C / 60 % RH	23 deg. C / 55 % RH	23 deg. C / 58 % RH
Engineer	Kazuhiro Ando (30-1000MHz)	Kazuhiro Ando (1-10GHz)	Kazuhiro Ando (10-26.5GHz)
Mode	Tx BT LE 2440 MHz		

(* 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.	624.004	QP	37.5	20.1	7.4	32.2	0.0	32.8	46.0	13.2	110	175	
Hori.	667.343	QP	32.4	20.5	7.5	32.2	0.0	28.2	46.0	17.8	100	178	
Hori.	4880.000	PK	51.5	31.2	6.3	46.1	2.5	45.4	73.9	28.5	170	140	
Hori.	7320.000	PK	48.5	36.4	7.7	44.4	2.5	50.7	73.9	23.2	100		Floor noise
Vert.	624.004	QP	34.5	20.1	7.4	32.2	0.0	29.8	46.0	16.2	100	152	
Vert.	667.343	QP	29.5	20.5	7.5	32.2	0.0	25.3	46.0	20.7	162	163	
Vert.	4880.000	PK	51.5	31.2	6.3	46.1	2.5	45.4	73.9	28.5	180	270	
Vert.	7320.000	PK	49.0	36.4	7.7	44.4	2.5	51.2	73.9	22.7	100	0	Floor noise

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

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

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4880.000	AV	43.4	31.2	6.3	46.1	2.0	2.5	39.3	53.9	14.6	
Hori.	7320.000	AV	41.1	36.4	7.7	44.4	2.0	2.5	45.3	53.9	8.6	Floor noise
Vert.	4880.000	AV	42.8	31.2	6.3	46.1	2.0	2.5	38.7	53.9	15.2	
Vert.	7320.000	AV	40.8	36.4	7.7	44.4	2.0	2.5	45.0	53.9	8.9	Floor noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor

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

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

Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No. : 11306372M
Date : June 24, 2016 June 23, 2016 June 20, 2016
Temperature / Humidity : 22 deg. C / 60 % RH 23 deg. C / 55 % RH 23 deg. C / 58 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando
(30-1000MHz) (1-10GHz) (10-26.5GHz)
Mode : Tx BT LE 2480 MHz

(* 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.	624.004	QP	37.8	20.1	7.4	32.2	0.0	33.1	46.0	12.9	108	173	
Hori.	667.342	QP	32.4	20.5	7.5	32.2	0.0	28.2	46.0	17.8	100	183	
Hori.	2483.500	PK	64.6	27.5	14.2	44.3	2.5	64.5	73.9	9.4	100	127	
Hori.	4960.000	PK	51.3	31.4	6.4	46.1	2.5	45.5	73.9	28.4	159	120	
Hori.	7440.000	PK	49.0	36.7	7.7	44.2	2.5	51.7	73.9	22.2	100	0	Floor noise
Vert.	624.004	QP	34.5	20.1	7.4	32.2	0.0	29.8	46.0	16.2	100	148	
Vert.	667.342	QP	30.0	20.5	7.5	32.2	0.0	25.8	46.0	20.2	159	205	
Vert.	2483.500	PK	63.6	27.5	14.2	44.3	2.5	63.5	73.9	10.4	158	144	
Vert.	4960.000	PK	50.8	31.4	6.4	46.1	2.5	45.0	73.9	28.9	150	0	
Vert.	7440.000	PK	48.5	36.7	7.7	44.2	2.5	51.2	73.9	22.7	100	0	Floor noise

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	48.4	27.5	14.2	44.3	2.0	2.5	50.3	53.9	3.6	*1)
Hori.	4960.000	AV	43.3	31.4	6.4	46.1	2.0	2.5	39.5	53.9	14.4	
Hori.	7440.000	AV	40.9	36.7	7.7	44.2	2.0	2.5	45.6	53.9	8.3	Floor noise
Vert.	2483.500	AV	48.0	27.5	14.2	44.3	2.0	2.5	49.9	53.9	4.0	*1)
Vert.	4960.000	AV	42.9	31.4	6.4	46.1	2.0	2.5	39.1	53.9	14.8	
Vert.	7440.000	AV	40.7	36.7	7.7	44.2	2.0	2.5	45.4	53.9	8.5	Floor noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor

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

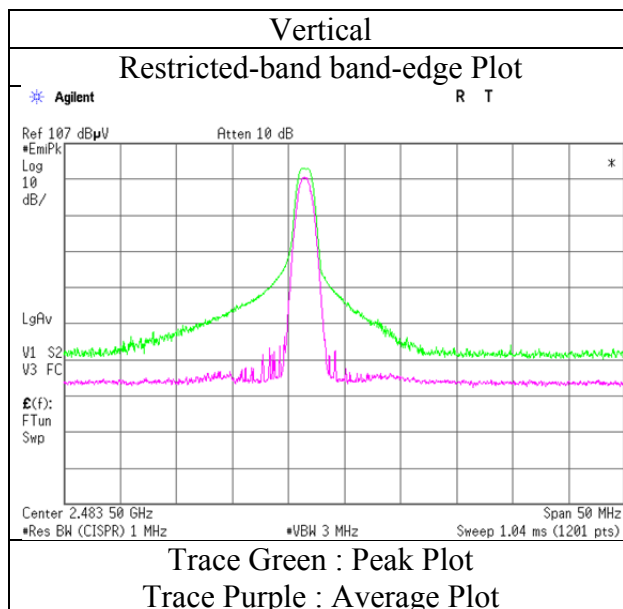
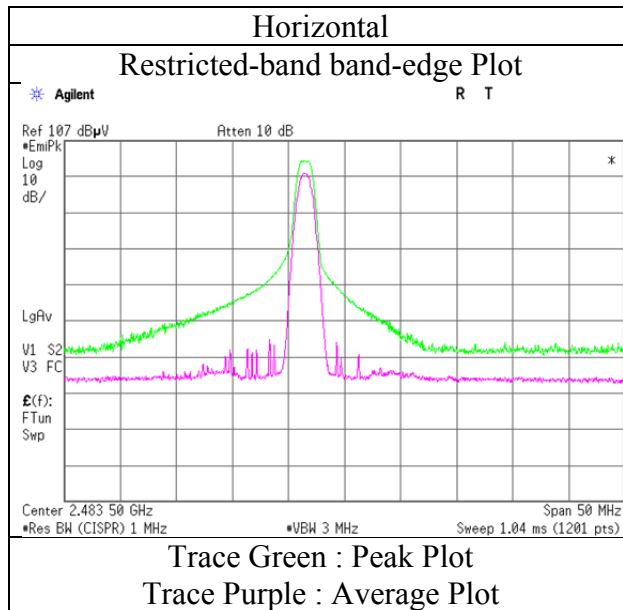
10 GHz - 26.5 GHz : 20log(1.0 m / 3.0 m) = -9.5 dB

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No.	11306372M
Date	June 23, 2016
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Kazuhiro Ando
	(1-10GHz)
Mode	Tx BT LE 2480 MHz



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

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No. : 11306372M
Date : July 10, 2016
Temperature / Humidity : 23 deg. C / 60 % RH
Engineer : Kazuhiro Ando
(1-10GHz)
Mode : Tx BT LE 2402 MHz + 11n-40 (MIMO) 5190MHz

(* 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.	2390.000	PK	57.5	27.6	14.2	44.4	2.5	57.4	73.9	16.5	201	8	
Vert.	2390.000	PK	57.9	27.6	14.2	44.4	2.5	57.8	73.9	16.1	179	198	

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	43.3	27.6	14.2	44.4	2.0	2.5	45.2	53.9	8.7	*1)
Vert.	2390.000	AV	43.2	27.6	14.2	44.4	2.0	2.5	45.1	53.9	8.8	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor

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

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

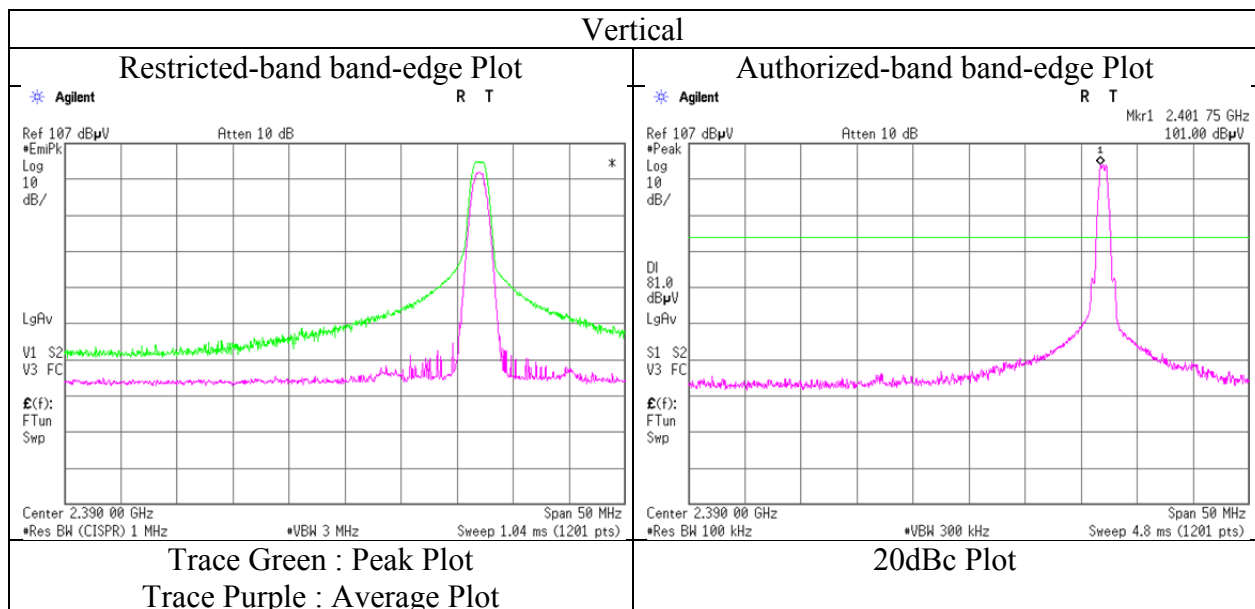
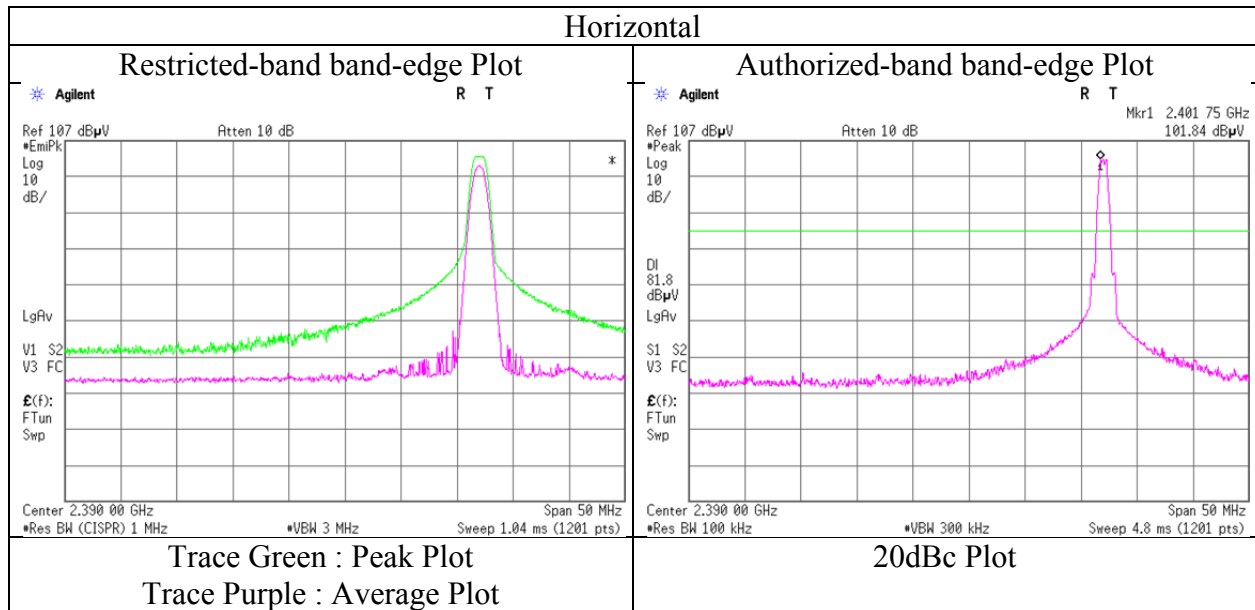
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	101.8	27.6	14.2	44.4	2.5	101.7	-	-	Carrier
Hori.	2400.000	PK	43.2	27.6	14.2	44.4	2.5	43.1	81.7	38.6	
Vert.	2402.000	PK	101.0	27.6	14.2	44.4	2.5	100.9	-	-	Carrier
Vert.	2400.000	PK	43.0	27.6	14.2	44.4	2.5	42.9	80.9	38.0	

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

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No.	11306372M
Date	July 10, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Kazuhiro Ando
	(1-10GHz)
Mode	Tx BT LE 2402 MHz + 11n-40 (MIMO) 5190MHz



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

Radiated Spurious Emission

Test place : Kashima EMC Lab. No.10, 11 Semi Anechoic Chamber
Report No. : 11306372M
Date : July 11, 2016 July 10, 2016 July 7, 2016
Temperature / Humidity : 22 deg. C / 60 % RH 23 deg. C / 60 % RH 24 deg. C / 59 % RH
Engineer : Kazuhiro Ando Kazuhiro Ando Kazuhiro Ando
(30-1000MHz)(AC10) (1-10GHz)(AC11) (10-26.5GHz)(AC11)
Mode : Tx BT LE 2480 MHz + 11n-40 (MIMO) 5190MHz

(* 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.	624.000	QP	31.2	20.2	9.4	27.6	0.0	33.2	46.0	12.8	110	186	
Hori.	667.338	QP	27.3	20.4	9.6	27.6	0.0	29.7	46.0	16.3	100	183	
Hori.	2483.500	PK	65.0	27.5	14.2	44.3	2.5	64.9	73.9	9.0	125	130	
Hori.	2710.000	PK	60.5	27.7	14.4	44.3	2.5	60.8	73.9	13.1	175	122	
Hori.	4960.000	PK	52.0	31.4	6.4	46.1	2.5	46.2	73.9	27.7	160	125	
Hori.	7440.000	PK	49.8	36.7	7.7	44.2	2.5	52.5	73.9	21.4	100	0	Floor noise
Vert.	624.000	QP	29.0	20.2	9.4	27.6	0.0	31.0	46.0	15.0	100	160	
Vert.	667.338	QP	24.8	20.4	9.6	27.6	0.0	27.2	46.0	18.8	158	157	
Vert.	2483.500	PK	63.4	27.5	14.2	44.3	2.5	63.3	73.9	10.6	148	109	
Vert.	2710.000	PK	57.2	27.7	14.4	44.3	2.5	57.5	73.9	16.4	172	0	
Vert.	4960.000	PK	51.7	31.4	6.4	46.1	2.5	45.9	73.9	28.0	150	0	
Vert.	7440.000	PK	49.5	36.7	7.7	44.2	2.5	52.2	73.9	21.7	100	0	Floor noise

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	48.7	27.5	14.2	44.3	2.0	2.5	50.6	53.9	3.3	*1)
Hori.	2710.000	AV	50.6	27.7	14.4	44.3	2.0	2.5	52.9	53.9	1.0	
Hori.	4960.000	AV	42.9	31.4	6.4	46.1	2.0	2.5	39.1	53.9	14.8	
Hori.	7440.000	AV	41.0	36.7	7.7	44.2	2.0	2.5	45.7	53.9	8.2	Floor noise
Vert.	2483.500	AV	47.8	27.5	14.2	44.3	2.0	2.5	49.7	53.9	4.2	*1)
Vert.	2710.000	AV	47.5	27.7	14.4	44.3	2.0	2.5	49.8	53.9	4.1	
Vert.	4960.000	AV	42.8	31.4	6.4	46.1	2.0	2.5	39.0	53.9	14.9	
Vert.	7440.000	AV	41.0	36.7	7.7	44.2	2.0	2.5	45.7	53.9	8.2	Floor noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor

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

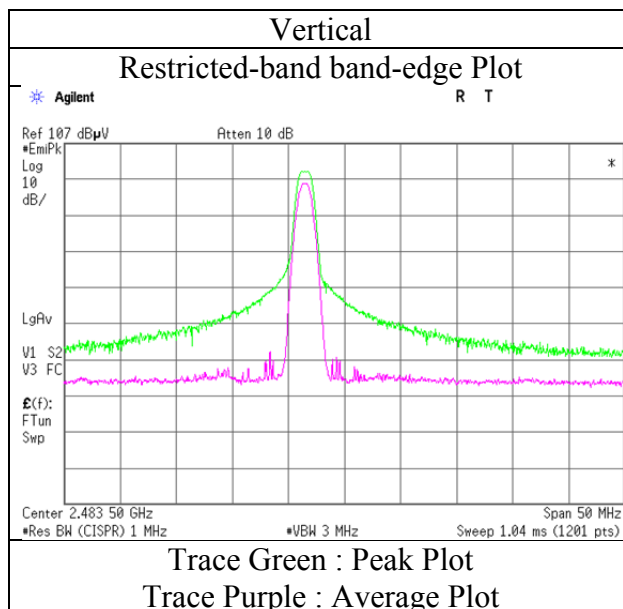
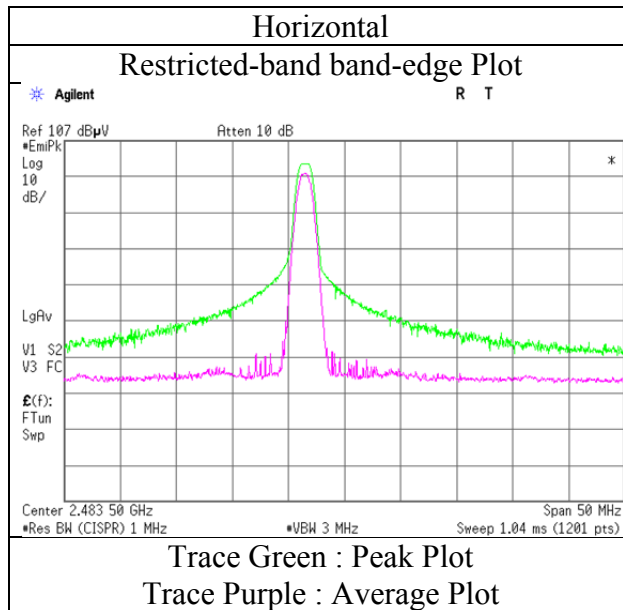
10 GHz - 26.5 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission (Reference Plot for band-edge)

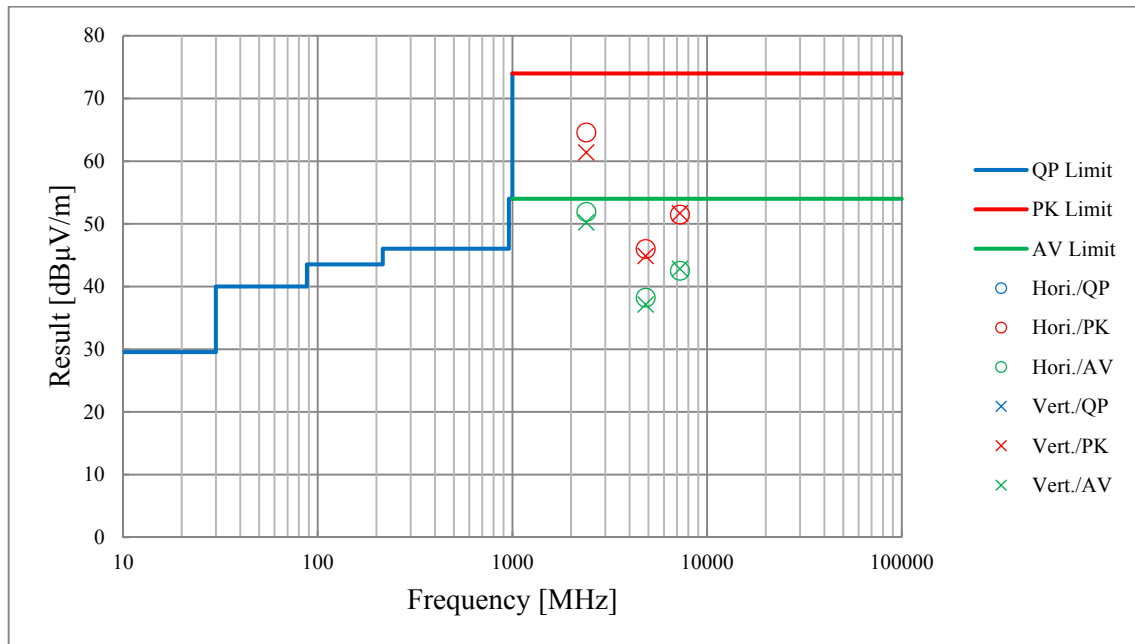
Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber
Report No.	11306372M
Date	July 10, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Kazuhiro Ando
	(1-10GHz)
Mode	Tx BT LE 2480 MHz + 11n-40 (MIMO) 5190MHz



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

Radiated Spurious Emission (Plot data, Worst case)

Test place	Kashima EMC Lab. No.11 Semi Anechoic Chamber		
Report No.	11306372M		
Date	June 24, 2016	June 15, 2016	
Temperature / Humidity	23 deg. C / 54 % RH	23 deg. C / 53 % RH	
Engineer	Kazuhiro Ando	Kazuhiro Ando	
	(1-10GHz)	(10-26.5GHz)	
Mode	Tx 11n-20 2412 MHz		



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

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
CLS-25	A.M.N.	Rohde & Schwarz	ENV216	101042	CE	2015/08/06 * 12
CCC-S5-C(2/9 /10/11)	Coaxial Cable	Fujikura,Fujikura, Fujikura,Fujikura	5D-2W,5D-2W ,5D-2W,5D-2 W	-	CE	2015/07/14 * 12
CTR-07	Test Receiver	Rohde & Schwarz	ESCS30	100014 Ver,2.30	CE	2015/08/24 * 12
CSA-11(D)	Spectrum Analyzer	Hewlett Packard	8568B	3340A21567 Rev 7.4.87	CE	2015/11/30 * 12
CSA-19(R)	Spectrum Analyzer	Hewlett Packard	8568B	3340A05799 Rev 7.4.87	CE	2015/11/30 * 12
CSCL-06	Ruler	Tajima	L19-55S	none	CE	2016/02/18 * 12
COS-05	Temperature & Humidity Indicator	A&D	AD-5681	6975761	CE	2015/07/13 * 12
CTS-09	Digital Multimeter	FLUKE	112	89790194	CE	2015/10/01 * 12
COTS-CEMI- 02	EMI Software	TSJ	TEPTO-DV(R E,CE,MF,PE)	Ver, RE: 2.5.0131, CE: 2.5.0131	CE/RE	-
CTR-06	Test Receiver	Rohde & Schwarz	ESCI	100107 Rev 4.32	CE/RE	2015/09/01 * 12
CCC-S11-R(1/ 4/5/CATS12-1 3/6/7/8/10)	Coaxial Cable	Fujikura,Suhner,S uhner,Agilent,Suh ner,-,Suhner	5D-2W,SF106, SF104,8496B+ 8494B,SF106,-, SF106	MY42143380, US00431042(Step Att)	RE	2015/11/24 * 12
CAT3-07	3dB Fixed Atten.	TAMAGAWA	UFA-01	none	RE	2016/05/12 * 12
CBL-09	LOGBICON	Schwarzbeck	VULB 9168	508	RE	2016/04/11 * 12
CAF-16	Pre-Amplifier	Sonoma Instrument	310N	325015	RE	2016/05/10 * 12
CSCL-16	Ruler	Tajima	G3 gold	none	RE	2016/02/18 * 12
COS-11	Temperature, Humidity & Atmospheric Logger	T&D	TR-73U	F8060468	RE	2016/05/24 * 12
CTS-13	Digital Multimeter	FLUKE	FLK-83- V	14610320	RE	2015/09/08 * 12
CSA-06	Spectrum Analyzer	Agilent	N9030A	MY53310670 Version A.13.12	RE	2016/05/26 * 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	2016/06/24 * 12
CAF-21	Pre-Amplifier	Micro Wave Factory	MPR-1G26.5-3 5	161398	RE	2016/05/06 * 12
CAF-19	Pre-Amplifier	TOYO	HAP18-26W	00000035	RE	2016/06/30 * 12
CAT10-16	10dB Fixed Atten.	Weinschel	54A-10	56246	RE	2016/05/13 * 12
CAT6-02	6dB Fixed Atten.	Agilent	8491B	MY39260336	RE	2015/09/18 * 12
CHF-03	HPF	Micro-Tronics	HPM50111-02	008	RE	2016/05/13 * 12

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

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
CCC-W05	Micro Wave Cable	Junkosha	MWX241	MRA-12-14-1 45	RE	2016/05/13 * 12
CCC-W07	Micro Wave Cable	Junkosha	MWX221	MRA-12-14-1 48	RE	2016/05/13 * 12
CCC-W09	Micro Wave Cable	SUHNER	SUCOFLEX10 4	MY588/4	RE	2015/07/13 * 12
CCC-S2-C(2/6 /7/8)	Coaxial Cable	Fujikura,Fujikura, Fujikura,Fujikura	5D-2W,5D-2W ,5D-2W,5D-2 W	-	CE	2015/07/14 * 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	2016/06/19 * 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/ 6/7/8/11/12)	Coaxial Cable	Fujikura,Fujikura, Agilent,Fujikura,F ujikura,Fujikura,Fu hjikura,Fujikura,Fu jikura	5D-2W,5D-2W ,8494A,5D-2W ,5D-2W,5D-2 W,5D-2W,5D- 2W,5D-2W	MY41110200(Step 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	090999895/09 0905406	RE	2016/05/24 * 12
CTS-14	Digital Multimeter	FLUKE	115	994460954	RE	2015/10/01 * 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 test
RE: Radiated Emission test**

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