



RADIO TEST REPORT

Test Report No. : 12423101S-E

Applicant : Nintendo Co., Ltd.
Type of Equipment : Game Console
Model No. : HAC-001(-01)
FCC ID : BKEHAC001
Test regulation : **FCC Part 15 Subpart E: 2019**
For Permissive Change
(Radiated Spurious Emission tests only)
* Wireless LAN (5 GHz bands) part

Test Result : **Complied (Refer to SECTION 3.2)**

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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 limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
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. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.

Date of test: August 3 to 26, 2018

Representative test engineer:

Yosuke Ishikawa
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Approved by:

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

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SECTION 1: Customer information

Company Name	:	Nintendo Co., Ltd.
Address	:	11-1 Hokotate-cho, Kamitoba, Minami-ku, Kyoto 601-8501, Japan
Telephone Number	:	+81 75 662 9600
Facsimile Number	:	+81 75 662 9624
Contact Person	:	Kazuya Kuramoto

The information provided from the customer is as follows;

- Applicant, Type of Equipment, Model No., FCC ID on the cover and other relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (E.U.T.)
- SECTION 4: Operation of E.U.T. during testing

* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

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

2.1 Identification of E.U.T.

Type of Equipment	:	Game Console
Model No.	:	HAC-001(-01)
Serial No.	:	Refer to SECTION 4.2
Rating	:	AC 100 V – 240 V, 50 Hz/60 Hz AC Adapter output: 15 V, 2.6 A Internal battery: 3.7 V
Receipt Date of Sample (Information from test lab.)	:	July 19, 2018
Country of Mass-production	:	China
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: HAC-001(-01) (referred to as the EUT in this report) is a Game Console.

General Specification

Clock frequency(ies) in the system	:	37.4 MHz
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Radio Specification

Radio Type	: Transceiver
Frequency of Operation	: Wireless LAN part: 2412 MHz - 2472 MHz, W52: 5180 MHz -5240 MHz, W53: 5260 MHz -5320 MHz, W56: 5500 MHz -5700 MHz *, W58: 5745 MHz -5825 MHz *, Bluetooth part: 2402 MHz - 2480 MHz
Modulation	: Wireless LAN part: 2.4 GHz bands: DBPSK, DQPSK, CCK, OFDM 5 GHz bands: OFDM Bluetooth part: BDR (Basic Data Rate): GFSK EDR (Enhanced Data Rate): $\pi/4$ -DQPSK, 8DPSK LE (Low Energy mode): GFSK
Antenna type	: PCB Antenna (Dipole)
Antenna connector	: (Ant: 0): MHF 4L, (Ant: 1): MHF II
Antenna Gain	: 2.4 GHz band: -0.70 dBi max (ANT0: Wireless LAN & Bluetooth), -8.38 dBi max (ANT1: Wireless LAN) 5 GHz band: +3.31 dBi max (ANT0: Wireless LAN), -0.96 dBi max (ANT1: Wireless LAN)
Operation temperature	: +5 deg.C to +35 deg.C

Remarks: This Wireless Module consists of 1 chip each of 5 GHz band and 2.4 GHz band.

*This model does not have 40 MHz Bandwidth mode on W56 and W58.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E
 FCC Part 15 final revised on June 4, 2019 and effective July 5, 2019 except 15.258

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

* The revision on June 4, 2019, does not affect the test specification applied to the EUT.

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

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 789033	FCC: 15.407 (b), 15.205 and 15.209	2.7 dB	Complied# a)	Radiated (> 30 MHz) *1)
	IC: -	IC: RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2	5460.000 MHz, AV, Vertical Tx 11ac-80, SISO, 5530 MHz		
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.					
*1) Radiated test was selected over 30 MHz based on section FCC 15.407 (b) and KDB 789033 D02 G.3.b).					
a) Refer to APPENDIX 1 (data of Radiated Spurious Emission)					
Symbols:					
Complied		The data of this test item has enough margin, more than the measurement uncertainty.			
Complied#		The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.			

* 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 constantly to RF Part regardless of input voltage. Therefore, the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.

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

Shonan EMC Lab.

Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.9 dB	2.8 dB	2.9 dB	2.9 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.0 dB	3.0 dB	3.1 dB	-
	30 MHz-200 MHz	4.6 dB	4.6 dB	4.7 dB	-
	200 MHz-1 GHz	6.0 dB	6.0 dB	6.1 dB	-
	1 GHz-6 GHz	4.8 dB	4.8 dB	4.8 dB	-
	6 GHz-18 GHz	5.4 dB	5.4 dB	5.4 dB	-
Radiated emission (Measurement distance: 1 m)	18 GHz-40 GHz	5.6 dB	5.6 dB	5.6 dB	-
	1 GHz-18 GHz	5.7 dB	5.7 dB	5.7 dB	-
	18 GHz-40 GHz	5.9 dB	5.9 dB	5.9 dB	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

3.5 Test Location

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JAB Accreditation No. RTL02610 (FCC Test Firm Registration Number: 839876, ISED Lab Company Number: 2973D)

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

Test item	Mode	Tested frequency	Worst data rate *2)	Antenna *2)
Radiated emission (below 1 GHz) *1)	Transmitting (Tx), IEEE 802.11ac VHT20 (11ac-20), SISO	5260 MHz	MCS 3, PN9	0
Radiated emission (above 1 GHz) *3)	Transmitting (Tx), IEEE 802.11n HT20 (11n-20), MIMO *4)	(Low bands): 5180 MHz (Middle bands): 5320 MHz (Additional bands): 5500 MHz, 5700 MHz, (Upper bands): 5745 MHz, 5825 MHz	MCS 11, PN9	0 & 1
	Transmitting (Tx), IEEE 802.11ac VHT20 (11ac-20), SISO	(Low bands): 5180 MHz, 5240 MHz, (Middle bands): 5260 MHz, 5320 MHz (Additional bands): 5500 MHz, 5580 MHz, 5700 MHz, (Upper bands): 5745 MHz, 5785 MHz, 5825 MHz	MCS 3, PN9	0
	Transmitting (Tx), IEEE 802.11n HT40 (11n-40), MIMO *4)	(Low bands): 5190 MHz (Middle bands): 5310 MHz	MCS 11, PN9	0 & 1
	Transmitting (Tx), IEEE 802.11n HT40 (11n-40), SISO	(Low bands): 5190 MHz, 5230 MHz, (Middle bands): 5310 MHz	MCS 3, PN9	0
	Transmitting (Tx), IEEE 802.11ac VHT80 (11ac-80), MIMO *4)	(Low bands): 5210 MHz, (Middle bands): 5290 MHz, (Additional bands): 5530 MHz, 5610MHz (Upper bands): 5775 MHz	MCS 3, PN9	0 & 1
	Transmitting (Tx), IEEE 802.11ac VHT80 (11ac-80), SISO	(Low bands): 5210 MHz, (Middle bands): 5290 MHz, (Additional bands): 5530 MHz, 5610MHz (Upper bands): 5775 MHz	MCS 3, PN9	0
*Power of the EUT was set by the software as follows; Power settings: Fixed (refer to power setting (target power) table) Software: cmd.exe, Ver. 6.3.9600.17415, *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. *1) 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 and also was judged the necessity of 802.11ac mode by the pre-test. *2) The worst condition was determined based on the test result of Maximum Conducted Output Power of 11334871S-E-R1. *3) Since 11a, 11n and 11ac mode have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest radiated carrier power. *4) This mode wasn't worst, but only band edge of spurious emissions were measured for confirmation.				

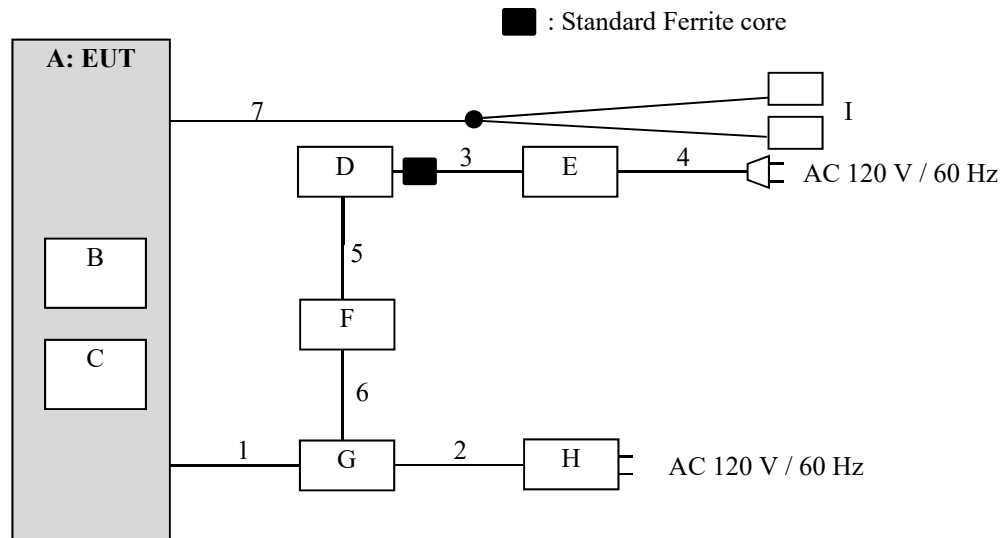
Power setting (target power) table, 1/2

Bandwidth	Channel frequency	Mode	Rate / MCS mode [dBm]									
20 MHz	5180 MHz – 5240 MHz	11a	6 M	9 M	12 M	18 M	24 M	36 M	48 M	54 M	-	-
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	-	-
	5180 MHz – 5240 MHz	11n-20 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	-	-
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	-	-
	5180 MHz – 5240 MHz	11n-20 (MIMO)	MCS 8	MCS 9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15	-	-
			10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	-	-
	5180 MHz – 5240 MHz	11ac-20 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	-
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.0	-
	5180 MHz – 5240 MHz	11ac-20 (MIMO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	-
			10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	-
40 MHz	5190 MHz	11n-40 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	-	-
			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	-	-
			MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	-	-
	5230 MHz	11n-40 (SISO)	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	-	-
			MCS 8	MCS 9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15	-	-
			7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	-	-
	5230 MHz	11n-40 (MIMO)	MCS 8	MCS 9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15	-	-
			10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	-	-
			MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
	5190 MHz	11ac-40 (SISO)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
			MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.0	13.0
	5230 MHz	11ac-40 (MIMO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
			7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
			MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
80 MHz	5210 MHz	11ac-80 (SISO)	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
			MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
	5210 MHz	11ac-80 (MIMO)	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
			MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
20 MHz	5260 MHz – 5320 MHz	11a	6 M	9 M	12 M	18 M	24 M	36 M	48 M	54 M	-	-
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	-	-
	5260 MHz – 5320 MHz	11n-20 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	-	-
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	-	-
	5260 MHz – 5320 MHz	11n-20 (MIMO)	MCS 8	MCS 9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15	-	-
			10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	-	-
	5260 MHz – 5320 MHz	11ac-20 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	-
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.0	-
	5260 MHz – 5320 MHz	11ac-20 (MIMO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	-
			10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	-
40 MHz	5270 MHz – 5310 MHz	11n-40 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	-	-
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	-	-
	5270 MHz – 5310 MHz	11n-40 (MIMO)	MCS 8	MCS 9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15	-	-
			10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	-	-
	5270 MHz – 5310 MHz	11ac-40 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.0	13.0
	5270 MHz – 5310 MHz	11ac-40 (MIMO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
			10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
80 MHz	5290 MHz	11ac-80 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
			9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
	5290 MHz	11ac-80 (MIMO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0

Power setting (target power) table, 2/2

Bandwidth	Channel frequency	Mode	Rate / MCS mode [dBm]									
20 MHz	5500 MHz – 5700 MHz, 5745 MHz – 5825 MHz	11a	6 M	9 M	12 M	18 M	24 M	36 M	48 M	54 M	-	-
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	-	-
	5500 MHz – 5700 MHz, 5745 MHz – 5825 MHz	11n-20 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	-	-
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	-	-
	5500 MHz – 5700 MHz, 5745 MHz – 5825 MHz	11n-20 (MIMO)	MCS 8	MCS 9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15	-	-
			10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	-	-
	5500 MHz – 5700 MHz, 5745 MHz – 5825 MHz	11ac-20 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	-
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	11.0	-
	5500 MHz – 5700 MHz, 5745 MHz – 5825 MHz	11ac-20 (MIMO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	-
			10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	-
80 MHz	5530 MHz, 5610 MHz, 5775MHz	11ac-80 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	10.5	10.5
	5530 MHz, 5610 MHz, 5775MHz	11ac-80 (MIMO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
			10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5

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	Game Console	HAC-001(-01)	XKW01000004029	Nintendo	EUT
B	Game Card	HAC-008	NX32GB-00310	Nintendo	-
C	Micro SDHC Card	4GB	-	TDK	-
D	Laptop PC	CF-S10AWNDS	1EKSA54822	Panasonic	-
E	AC Adapter	CF-AA6402A M1	-	Panasonic	-
F	GIGA Ethernet Adapter	LAN-GTJU3	58L349601528	Logitec	-
G	SDEV Cradle	HAT-003	XZL01000079874	Nintendo	-
H	AC Adapter	HAC-002	08	Nintendo	-
I	Headphone	-	-	Nintendo	-
J	USB-UART adaptor	TTL-232RG	-	FTDI	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB	0.4	Shielded	Shielded	-
2	USB	1.8	Shielded	Shielded	-
3	DC	1.0	Unshielded	Unshielded	-
4	AC	0.8	Unshielded	Unshielded	-
5	USB	0.1	Shielded	Shielded	-
6	LAN	0.5	Unshielded	Unshielded	-
7	Headphone	0.5 + 0.3	Shielded	Shielded	-
8	USB	1.7	Shielded	Shielded	-

SECTION 5: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

[For below 1 GHz]

EUT was placed on a platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity. The 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 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.

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).

For W58 Bandedge

-27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge in the section 15.407(b)(4)(i).

Restricted band edge:

Apply to limit in the Section 15.209 (a).

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

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

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

Test Antennas are used as below;

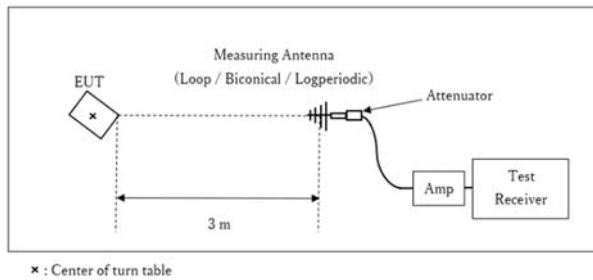
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

Frequency	Below 1 GHz	Above 1 GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	Peak	Average
IF Bandwidth	BW: 120 kHz	RBW: 1 MHz VBW: 3 MHz	Method VB *1) RBW: 1 MHz VBW: 1/T (T: burst length, refer to Burst rate confirmation sheet Detector: Peak

*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

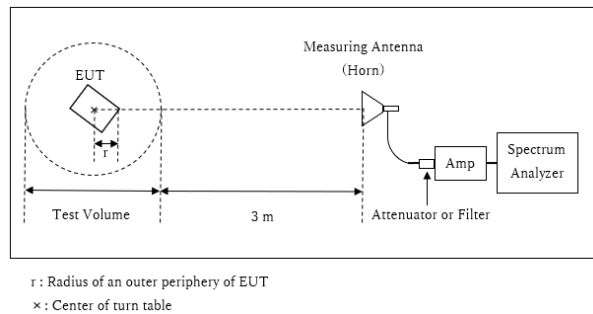
Figure 1: Test Setup

Below 1 GHz



Test Distance: 3 m

1 GHz - 13 GHz



Distance Factor: $20 \times \log (3.9 \text{ m} / 3.0 \text{ m}) = 2.28 \text{ dB}$

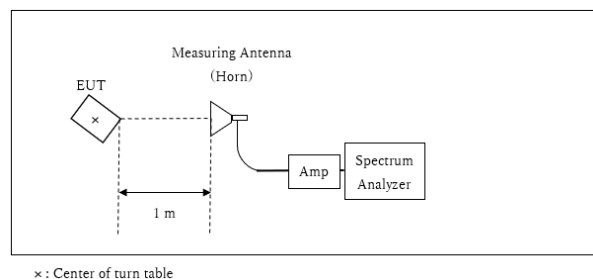
* Test Distance: $(3 + \text{Test Volume} / 2) - r = 3.9 \text{ m}$

Test Volume : 2.0 m

(Test Volume has been calibrated based on CISPR 16-1-4.)

r = 0.1 m

13 GHz - 26.5 GHz



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

*Test Distance: 1 m

- 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 - 40 GHz

Test data : APPENDIX

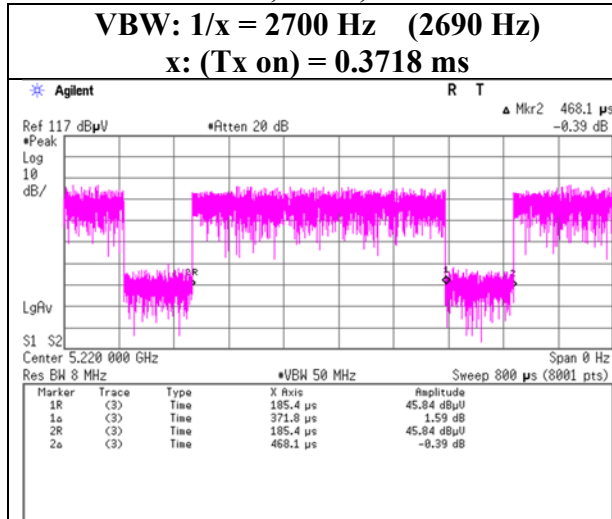
Test result : Pass

APPENDIX 1: Test data

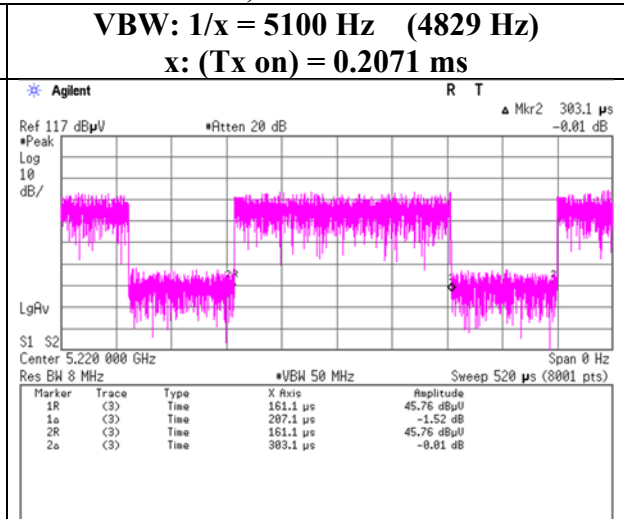
Burst rate confirmation

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	12423101S-E		
Date	August 12, 2018	August 20, 2018	August 21, 2018
Temperature / Humidity	23 deg. C / 52 % RH	26 deg. C / 63 % RH	24 deg. C / 60 % RH
Engineer	Kazuya Noda	Yosuke Ishikawa	Kazutaka Takeyama
Mode	Tx		

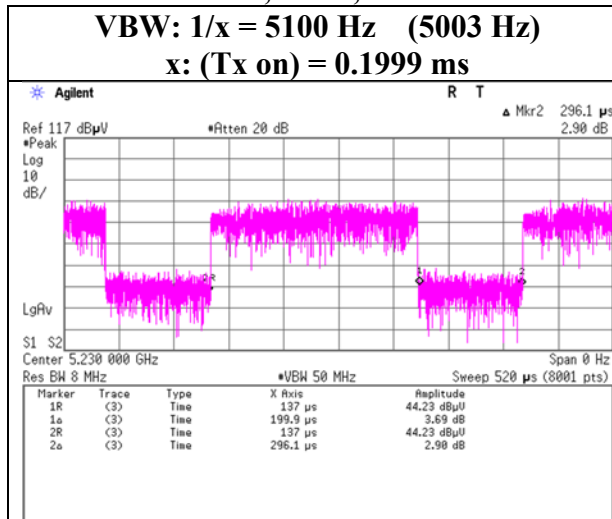
11ac-20, SISO, MCS 3



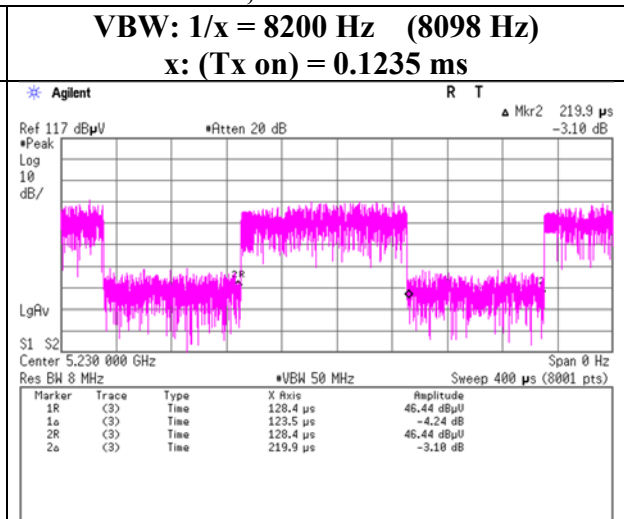
11n-20, MIMO MCS 11



11n-40, SISO, MCS 3

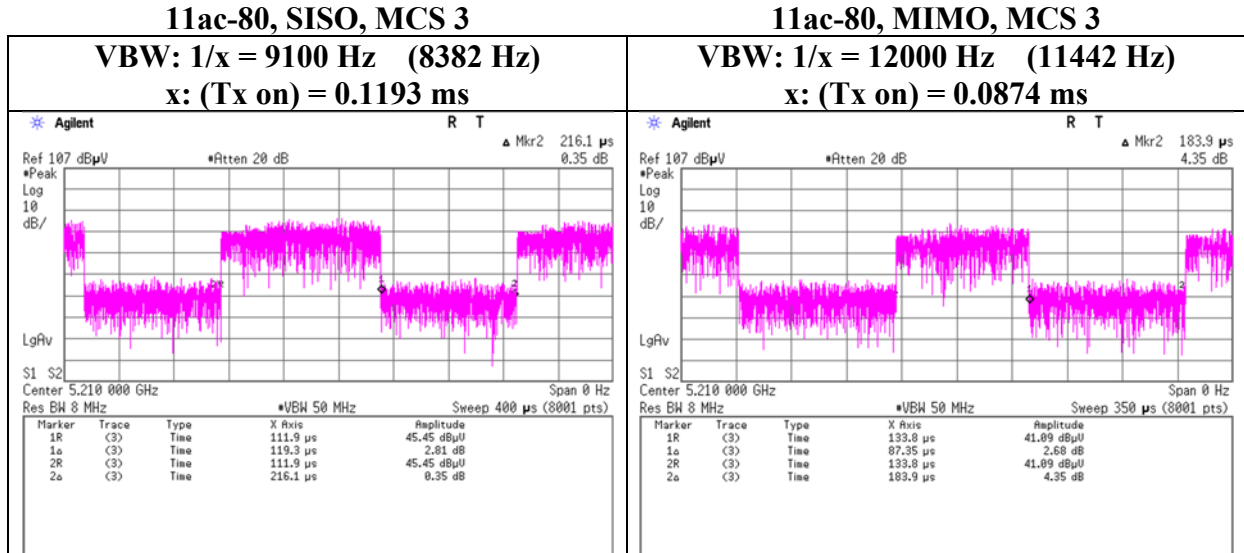


11n-40, MIMO MCS 11



Burst rate confirmation

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber	
Report No.	12423101S-E	
Date	August 20, 2018	August 21, 2018
Temperature / Humidity	26 deg. C / 63 % RH	24 deg. C / 67 % RH
Engineer	Yosuke Ishikawa	Yosuke Ishikawa
Mode	Tx	



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Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 20, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 26 deg. C / 63 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)
Mode Tx 11ac-20, SISO, 5180 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.	5150.000	PK	45.04	32.17	16.25	36.94	2.28	58.80	73.90	15.1	174	200	
Hori.	15540.000	PK	48.12	38.48	11.61	38.48	-9.54	50.19	73.90	23.7	100	30	
Hori.	5150.000	AV	34.29	32.17	16.25	36.94	2.28	48.05	53.90	5.8	174	200	VBW: 2.7 kHz
Hori.	15540.000	AV	39.58	38.48	11.61	38.48	-9.54	41.65	53.90	12.2	100	30	VBW: 2.7 kHz
Vert.	5150.000	PK	45.54	32.17	16.25	36.94	2.28	59.30	73.90	14.6	273	338	
Vert.	15540.000	PK	49.86	38.48	11.61	38.48	-9.54	51.93	73.90	21.9	100	334	
Vert.	5150.000	AV	34.41	32.17	16.25	36.94	2.28	48.17	53.90	5.7	273	338	VBW: 2.7 kHz
Vert.	15540.000	AV	39.83	38.48	11.61	38.48	-9.54	41.90	53.90	12.0	100	334	VBW: 2.7 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

(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.	10360.000	PK	45.06	39.46	9.04	38.55	2.28	57.29	-37.91	-27.00	10.9	150	0	
Vert.	10360.000	PK	45.11	39.46	9.04	38.55	2.28	57.34	-37.86	-27.00	10.9	150	0	

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

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

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

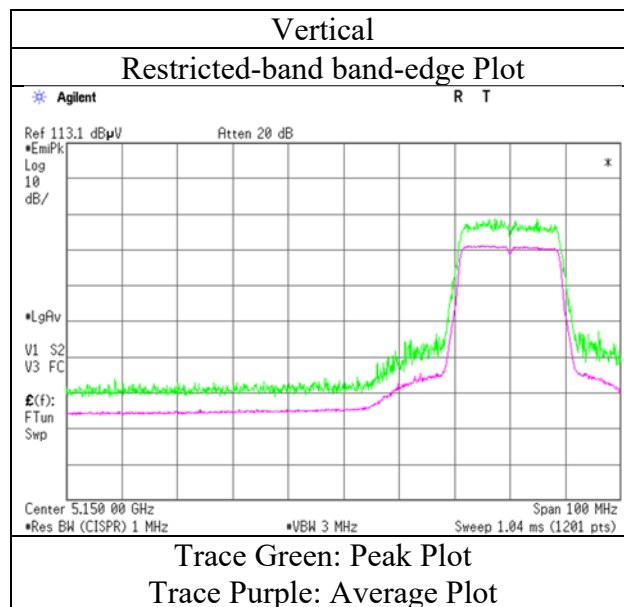
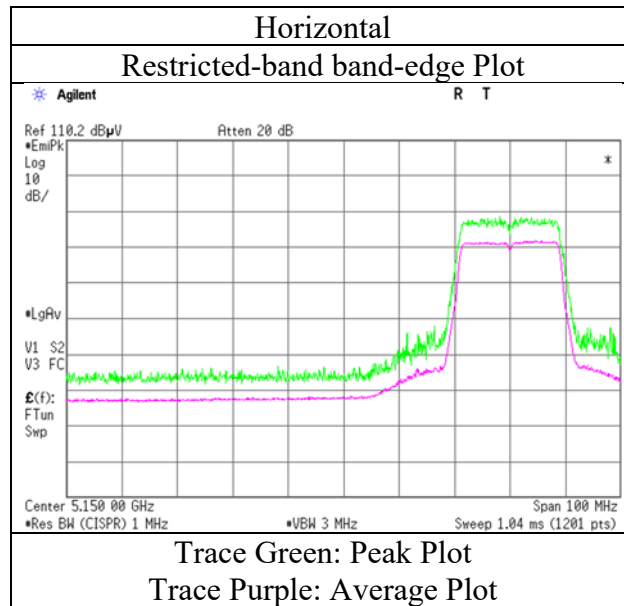
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 20, 2018
Temperature / Humidity	26 deg. C / 63 % RH
Engineer	Yosuke Ishikawa
	(1 GHz – 6.4 GHz)
Mode	Tx 11ac-20, SISO, 5180 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 20, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 26 deg. C / 63 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)
Mode Tx 11ac-20, SISO, 5240 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.	15720.000	PK	49.07	38.19	11.75	38.03	-9.54	51.44	73.90	22.4	100	29	
Hori.	15720.000	AV	37.77	38.19	11.75	38.03	-9.54	40.14	53.90	13.7	100	29	VBW: 2.7 kHz
Vert.	15720.000	PK	49.68	38.19	11.75	38.03	-9.54	52.05	73.90	21.8	100	334	
Vert.	15720.000	AV	38.73	38.19	11.75	38.03	-9.54	41.10	53.90	12.8	100	334	VBW: 2.7 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

(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.	10480.000	PK	45.19	39.75	9.16	38.42	2.28	57.96	-37.24	-27.00	10.2	150	0	
Vert.	10480.000	PK	44.52	39.75	9.16	38.42	2.28	57.29	-37.91	-27.00	10.9	150	0	

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

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 20, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 26 deg. C / 63 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)

Semi Anechoic Chamber 2
Date August 26, 2018
Temperature / Humidity 24 deg. C / 63 % RH
Engineer Makoto Hosaka
(30 MHz - 1000 MHz)
Mode Tx 11ac-20, SISO, 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.	65.806	QP	33.70	7.08	6.96	31.90	0.00	15.84	40.00	24.1	310	149	
Hori.	250.003	QP	49.90	11.74	5.81	31.73	0.00	35.72	46.00	10.2	149	359	
Hori.	287.005	QP	35.80	13.44	6.11	31.71	0.00	23.64	46.00	22.3	134	200	
Hori.	321.808	QP	35.30	14.25	6.42	31.68	0.00	24.29	46.00	21.7	115	263	
Hori.	952.219	QP	29.30	21.99	9.31	30.54	0.00	30.06	46.00	15.9	100	234	
Hori.	15780.000	PK	47.72	38.10	11.80	37.89	-9.54	50.19	73.90	23.7	100	308	
Hori.	15780.000	AV	38.35	38.10	11.80	37.89	-9.54	40.82	53.90	13.0	100	308	VBW: 2.7 kHz
Vert.	51.930	QP	33.30	10.52	7.16	31.91	0.00	19.07	40.00	20.9	100	32	
Vert.	81.066	QP	36.90	6.61	8.07	31.89	0.00	19.69	40.00	20.3	100	210	
Vert.	157.693	QP	28.50	15.12	8.64	31.82	0.00	20.44	43.50	23.0	100	248	
Vert.	250.003	QP	43.90	11.74	5.81	31.73	0.00	29.72	46.00	16.2	100	186	
Vert.	15780.000	PK	47.98	38.10	11.80	37.89	-9.54	50.45	73.90	23.4	100	328	
Vert.	15780.000	AV	37.96	38.10	11.80	37.89	-9.54	40.43	53.90	13.4	100	328	VBW: 2.7 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : 20log (3.9 m / 3.0 m) = 2.28 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 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.	10520.000	PK	45.74	39.71	9.17	38.40	2.28	58.50	-36.70	-27.00	9.7	150	0	
Vert.	10520.000	PK	44.98	39.71	9.17	38.40	2.28	57.74	-37.46	-27.00	10.5	150	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).

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

Distance factor : 1 GHz - 13 GHz : 20log (3.9 m / 3.0 m) = 2.28 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission

Report No.	12423101S-E				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	2	2	2	1	3
Date	August 20, 2018	August 21, 2018	August 22, 2018	August 24, 2018	August 3, 2018
Temperature / Humidity	26 deg. C / 63 % RH	24 deg. C / 67 % RH	23 deg. C / 66 % RH	23 deg. C / 67 % RH	27 deg. C / 48 % RH
Engineer	Yosuke Ishikawa	Yosuke Ishikawa	Yosuke Ishikawa	Yosuke Ishikawa	Tatsuya Arai
	(1 GHz – 6.4 GHz)	(6.4 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 26 GHz)	(26 GHz – 40 GHz)
Mode	Tx 11ac-20, SISO, 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.	5350.000	PK	44.98	31.59	16.25	36.92	2.28	58.18	73.90	15.7	286	347	
Hori.	10640.000	PK	45.35	39.61	9.21	38.41	2.28	58.04	73.90	15.8	150	0	
Hori.	15960.000	PK	47.31	37.68	11.94	37.44	-9.54	49.95	73.90	23.9	100	28	
Hori.	5350.000	AV	33.87	31.59	16.25	36.92	2.28	47.07	53.90	6.8	286	347	VBW: 2.7 kHz
Hori.	10640.000	AV	35.60	39.61	9.21	38.41	2.28	48.29	53.90	5.6	150	0	VBW: 2.7 kHz
Hori.	15960.000	AV	38.19	37.68	11.94	37.44	-9.54	40.83	53.90	13.0	100	28	VBW: 2.7 kHz
Vert.	5350.000	PK	45.54	31.59	16.25	36.92	2.28	58.74	73.90	15.2	108	171	
Vert.	10640.000	PK	45.11	39.61	9.21	38.41	2.28	57.80	73.90	16.1	150	0	
Vert.	15960.000	PK	49.60	37.68	11.94	37.44	-9.54	52.24	73.90	21.6	100	314	
Vert.	5350.000	AV	33.94	31.59	16.25	36.92	2.28	47.14	53.90	6.8	108	171	VBW: 2.7 kHz
Vert.	10640.000	AV	35.74	39.61	9.21	38.41	2.28	48.43	53.90	5.4	150	0	VBW: 2.7 kHz
Vert.	15960.000	AV	40.22	37.68	11.94	37.44	-9.54	42.86	53.90	11.0	100	314	VBW: 2.7 kHz

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

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

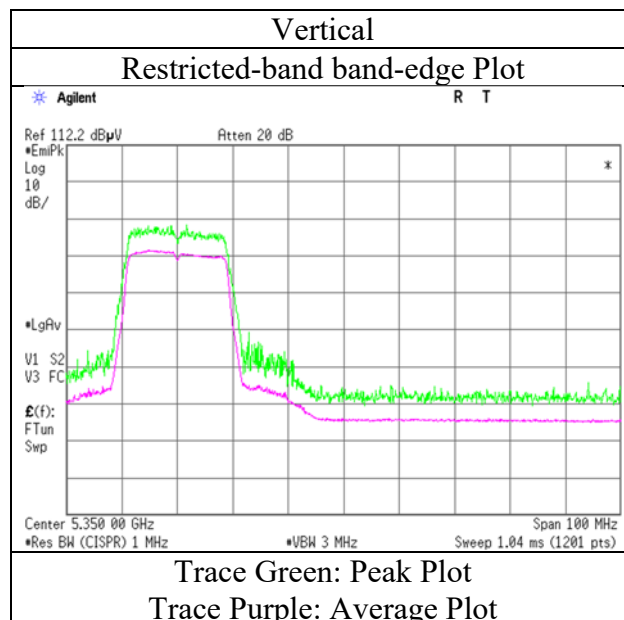
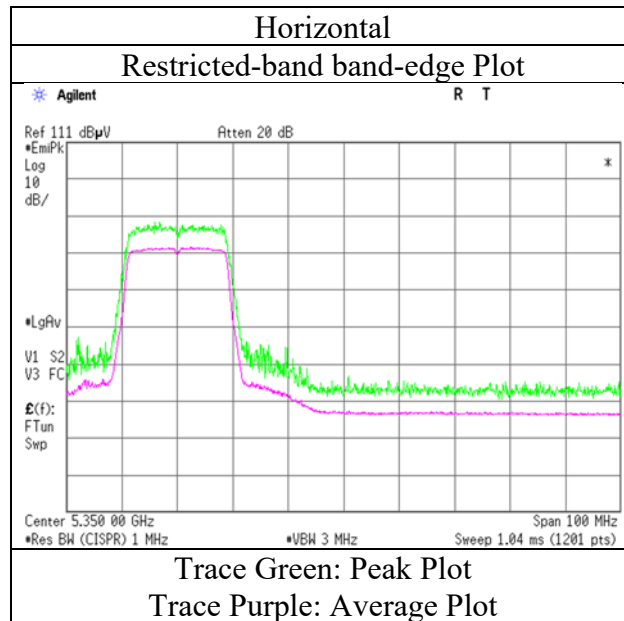
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 20, 2018
Temperature / Humidity	26 deg. C / 63 % RH
Engineer	Yosuke Ishikawa
	(1 GHz – 6.4 GHz)
Mode	Tx 11ac-20, SISO, 5320 MHz



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

UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 21, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 60 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Kazutaka Takeyama Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)
Mode Tx 11ac-20, SISO, 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.	5460.000	PK	44.60	31.91	16.24	36.91	2.28	58.12	73.90	15.7	105	354	
Hori.	11000.000	PK	45.62	40.03	9.28	38.43	2.28	58.78	73.90	15.1	150	0	
Hori.	5460.000	AV	33.20	31.91	16.24	36.91	2.28	46.72	53.90	7.1	105	354	VBW: 2.7 kHz
Hori.	11000.000	AV	35.76	40.03	9.28	38.43	2.28	48.92	53.90	4.9	150	0	VBW: 2.7 kHz
Vert.	5460.000	PK	44.40	31.91	16.24	36.91	2.28	57.92	73.90	15.9	100	176	
Vert.	11000.000	PK	45.46	40.03	9.28	38.43	2.28	58.62	73.90	15.2	150	0	
Vert.	5460.000	AV	33.40	31.91	16.24	36.91	2.28	46.92	53.90	6.9	100	176	VBW: 2.7 kHz
Vert.	11000.000	AV	35.56	40.03	9.28	38.43	2.28	48.72	53.90	5.1	150	0	VBW: 2.7 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

(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 (ERP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5470.000	PK	45.60	31.89	16.24	36.91	2.28	59.10	-36.10	-27.00	9.1	105	354	
Hori.	16500.000	PK	44.69	38.84	12.13	37.64	-9.54	48.48	-46.72	-27.00	19.7	150	0	
Hori.	22000.000	PK	42.77	39.92	22.45	47.15	-9.54	48.45	-46.75	-27.00	19.8	150	0	
Vert.	5470.000	PK	46.90	31.89	16.24	36.91	2.28	60.40	-34.80	-27.00	7.8	100	176	
Vert.	16500.000	PK	45.28	38.84	12.13	37.64	-9.54	49.07	-46.13	-27.00	19.1	150	0	
Vert.	22000.000	PK	43.61	39.92	22.45	47.15	-9.54	49.29	-45.91	-27.00	18.9	150	0	

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

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

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

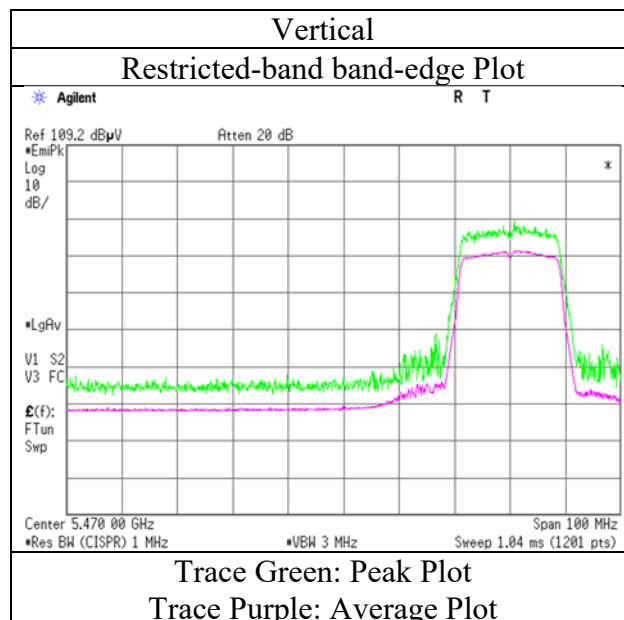
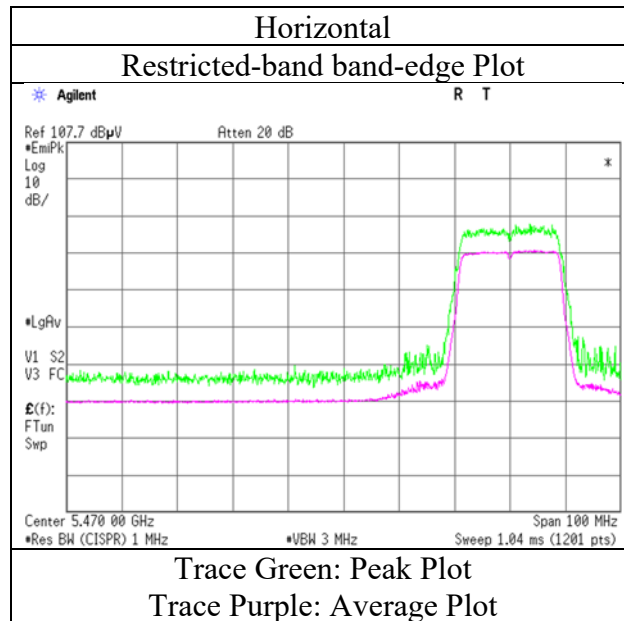
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 21, 2018
Temperature / Humidity	24 deg. C / 60 % RH
Engineer	Kazutaka Takeyama
	(1 GHz – 6.4 GHz)
Mode	Tx 11ac-20, SISO, 5500 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 21, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 60 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Kazutaka Takeyama Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)
Mode Tx 11ac-20, SISO, 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.	11160.000	PK	46.47	39.77	9.42	38.78	2.28	59.16	73.90	14.7	150	0	
Hori.	22320.000	PK	42.55	40.02	22.74	47.87	-9.54	47.90	73.90	26.0	150	0	
Hori.	11160.000	AV	36.13	39.77	9.42	38.78	2.28	48.82	53.90	5.0	150	0	VBW: 2.7 kHz
Hori.	22320.000	AV	32.92	40.02	22.74	47.87	-9.54	38.27	53.90	15.6	150	0	VBW: 2.7 kHz
Vert.	11160.000	PK	46.00	39.77	9.42	38.78	2.28	58.69	73.90	15.2	150	0	
Vert.	22320.000	PK	42.34	40.02	22.74	47.87	-9.54	47.69	73.90	26.2	150	0	
Vert.	11160.000	AV	36.11	39.77	9.42	38.78	2.28	48.80	53.90	5.1	150	0	VBW: 2.7 kHz
Vert.	22320.000	AV	32.85	40.02	22.74	47.87	-9.54	38.20	53.90	15.7	150	0	VBW: 2.7 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	16740.000	PK	44.23	39.64	12.26	37.45	-9.54	49.14	-46.06	-27.00	19.1	150	0	
Vert.	16740.000	PK	44.21	39.64	12.26	37.45	-9.54	49.12	-46.08	-27.00	19.1	150	0	

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

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 21, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 60 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Kazutaka Takeyama Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)
Mode Tx 11ac-20, SISO, 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.	11400.000	PK	43.41	39.93	9.63	39.29	2.28	55.96	73.90	17.9	150	0	
Hori.	22800.000	PK	41.81	39.86	23.06	47.46	-9.54	47.73	73.90	26.1	150	0	
Hori.	11400.000	AV	35.19	39.93	9.63	39.29	2.28	47.74	53.90	6.1	150	0	VBW: 2.7 kHz
Hori.	22800.000	AV	32.39	39.86	23.06	47.46	-9.54	38.31	53.90	15.5	150	0	VBW: 2.7 kHz
Vert.	11400.000	PK	43.95	39.93	9.63	39.29	2.28	56.50	73.90	17.4	150	0	
Vert.	22800.000	PK	41.98	39.86	23.06	47.46	-9.54	47.90	73.90	26.0	150	0	
Vert.	11400.000	AV	35.38	39.93	9.63	39.29	2.28	47.93	53.90	5.9	150	0	VBW: 2.7 kHz
Vert.	22800.000	AV	32.54	39.86	23.06	47.46	-9.54	38.46	53.90	15.4	150	0	VBW: 2.7 kHz

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

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

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

Distance factor: 1 GHz - 13 GHz : 20log (3.9 m / 3.0 m) = 2.28 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5725.000	PK	50.10	32.22	16.33	36.89	2.28	64.04	-31.16	-27.00	4.2	100	18	
Hori.	17100.000	PK	45.19	40.26	12.36	37.24	-9.54	51.03	-44.17	-27.00	17.2	150	0	
Vert.	5725.000	PK	51.00	32.22	16.33	36.89	2.28	64.94	-30.26	-27.00	3.3	194	314	
Vert.	17100.000	PK	44.10	40.26	12.36	37.24	-9.54	49.94	-45.26	-27.00	18.3	150	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).

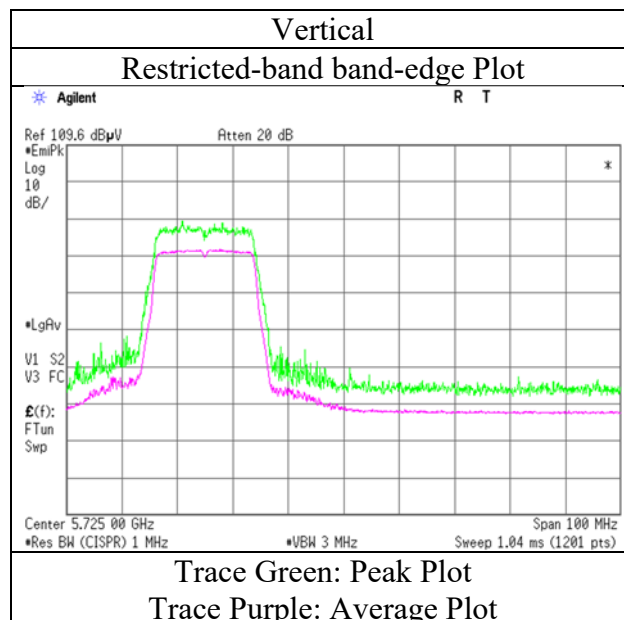
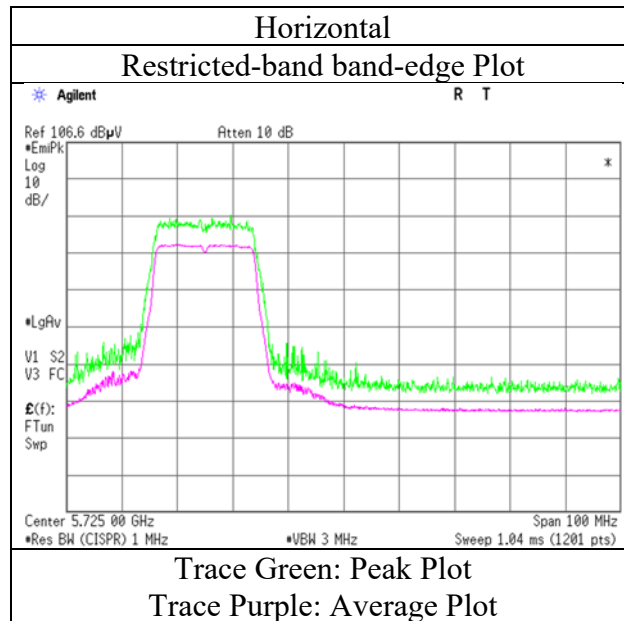
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor: 1 GHz - 13 GHz : 20log (3.9 m / 3.0 m) = 2.28 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 21, 2018
Temperature / Humidity	24 deg. C / 60 % RH
Engineer	Kazutaka Takeyama (1 GHz – 6.4 GHz)
Mode	Tx 11ac-20, SISO, 5700 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 21, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 60 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Kazutaka Takeyama Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)
Mode Tx 11ac-20, SISO, 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.	11490.000	PK	44.86	40.00	9.70	39.49	2.28	57.35	73.90	16.5	150	0	
Hori.	22980.000	PK	42.52	39.79	23.14	46.97	-9.54	48.94	73.90	24.9	150	0	
Hori.	11490.000	AV	33.95	40.00	9.70	39.49	2.28	46.44	53.90	7.4	150	0	VBW: 2.7 kHz
Hori.	22980.000	AV	33.08	39.79	23.14	46.97	-9.54	39.50	53.90	14.4	150	0	VBW: 2.7 kHz
Vert.	11490.000	PK	44.25	40.00	9.70	39.49	2.28	56.74	73.90	17.1	150	0	
Vert.	22980.000	PK	42.72	39.79	23.14	46.97	-9.54	49.14	73.90	24.7	150	0	
Vert.	11490.000	AV	34.23	40.00	9.70	39.49	2.28	46.72	53.90	7.1	150	0	VBW: 2.7 kHz
Vert.	22980.000	AV	33.09	39.79	23.14	46.97	-9.54	39.51	53.90	14.3	150	0	VBW: 2.7 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

(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.	5650.000	PK	44.30	32.03	16.30	36.90	2.28	58.01	-37.19	-27.00	10.2	137	314	
Hori.	5700.000	PK	45.00	32.12	16.31	36.89	2.28	58.82	-36.38	10.00	46.4	137	314	
Hori.	5720.000	PK	49.30	32.20	16.33	36.89	2.28	63.22	-31.98	15.60	47.6	137	314	
Hori.	5725.000	PK	56.60	32.22	16.33	36.89	2.28	70.54	-24.66	27.00	51.7	137	314	
Hori.	17235.000	PK	43.72	40.54	12.30	37.25	-9.54	49.77	-45.43	-27.00	18.4	150	0	
Vert.	5650.000	PK	44.60	32.03	16.30	36.90	2.28	58.31	-36.89	-27.00	9.9	100	306	
Vert.	5700.000	PK	44.60	32.12	16.31	36.89	2.28	58.42	-36.78	10.00	46.8	100	306	
Vert.	5720.000	PK	50.00	32.20	16.33	36.89	2.28	63.92	-31.28	15.60	46.9	100	306	
Vert.	5725.000	PK	56.60	32.22	16.33	36.89	2.28	70.54	-24.66	27.00	51.7	100	306	
Vert.	17235.000	PK	44.17	40.54	12.30	37.25	-9.54	50.22	-44.98	-27.00	18.0	150	0	

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

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

UL Japan, Inc.

Shonan EMC Lab.

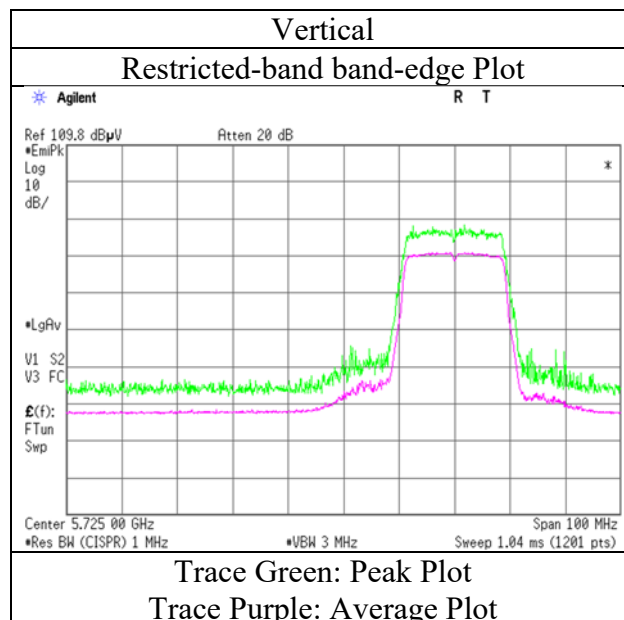
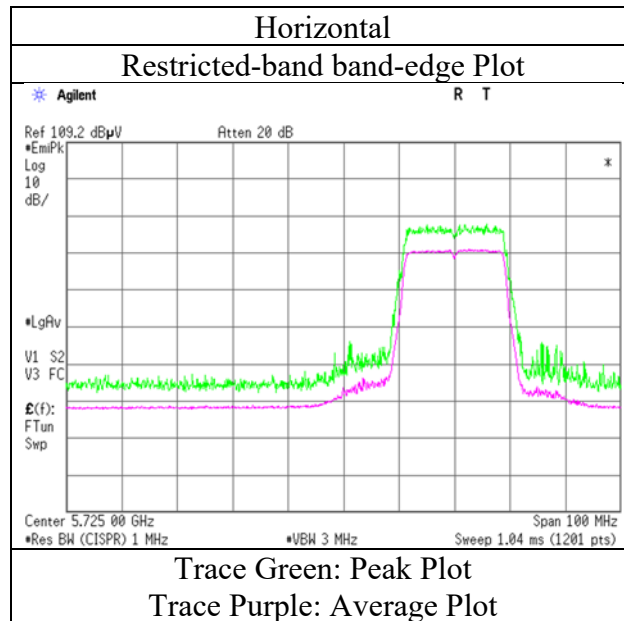
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 21, 2018
Temperature / Humidity	24 deg. C / 60 % RH
Engineer	Kazutaka Takeyama
	(1 GHz – 6.4 GHz)
Mode	Tx 11ac-20, SISO, 5745 MHz



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

UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 21, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 60 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Kazutaka Takeyama Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)
Mode Tx 11ac-20, SISO, 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.	11570.000	PK	44.56	39.97	9.78	39.30	2.28	57.29	73.90	16.6	150	0	
Hori.	11570.000	AV	33.68	39.97	9.78	39.30	2.28	46.41	53.90	7.4	150	0	VBW: 2.7 kHz
Vert.	11570.000	PK	44.16	39.97	9.78	39.30	2.28	56.89	73.90	17.0	150	0	
Vert.	11570.000	AV	33.65	39.97	9.78	39.30	2.28	46.38	53.90	7.5	150	0	VBW: 2.7 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	17355.000	PK	43.64	41.34	12.26	37.25	-9.54	50.45	-44.75	-27.00	17.8	150	0	
Hori.	23140.000	PK	42.23	39.71	23.15	47.09	-9.54	48.46	-46.74	-27.00	19.7	150	0	
Vert.	17355.000	PK	44.33	41.34	12.26	37.25	-9.54	51.14	-44.06	-27.00	17.1	150	0	
Vert.	23140.000	PK	41.80	39.71	23.15	47.09	-9.54	48.03	-47.17	-27.00	20.2	150	0	

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

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 21, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 60 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Kazutaka Takeyama Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)
Mode Tx 11ac-20, SISO, 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.	11650.000	PK	43.64	39.65	9.86	39.06	2.28	56.37	73.90	17.5	150	0	
Hori.	11650.000	AV	33.32	39.65	9.86	39.06	2.28	46.05	53.90	7.8	150	0	VBW: 2.7 kHz
Vert.	11650.000	PK	42.92	39.65	9.86	39.06	2.28	55.65	73.90	18.2	150	0	
Vert.	11650.000	AV	33.34	39.65	9.86	39.06	2.28	46.07	53.90	7.8	150	0	VBW: 2.7 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5850.000	PK	49.40	32.61	16.39	36.88	2.28	63.80	-31.40	27.00	58.4	100	319	
Hori.	5855.000	PK	47.40	32.62	16.39	36.87	2.28	61.82	-33.38	15.60	49.0	100	319	
Hori.	5875.000	PK	44.70	32.65	16.40	36.87	2.28	59.16	-36.04	10.00	46.0	100	319	
Hori.	5925.000	PK	44.20	32.66	16.43	36.87	2.28	58.70	-36.50	-27.00	9.5	100	319	
Hori.	17475.000	PK	44.40	42.36	12.21	37.26	-9.54	52.17	-43.03	-27.00	16.0	150	0	
Hori.	23300.000	PK	41.91	39.60	13.60	47.29	-9.54	38.28	-56.92	-27.00	29.9	150	0	
Vert.	5850.000	PK	49.90	32.61	16.39	36.88	2.28	64.30	-30.90	27.00	57.9	155	296	
Vert.	5855.000	PK	47.40	32.62	16.39	36.87	2.28	61.82	-33.38	15.60	49.0	155	296	
Vert.	5875.000	PK	44.30	32.65	16.40	36.87	2.28	58.76	-36.44	10.00	46.4	155	296	
Vert.	5925.000	PK	43.80	32.66	16.43	36.87	2.28	58.30	-36.90	-27.00	9.9	155	296	
Vert.	17475.000	PK	44.58	42.36	12.21	37.26	-9.54	52.35	-42.85	-27.00	15.9	150	0	
Vert.	23300.000	PK	42.19	39.60	13.60	47.29	-9.54	38.56	-56.64	-27.00	29.6	150	0	

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

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

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

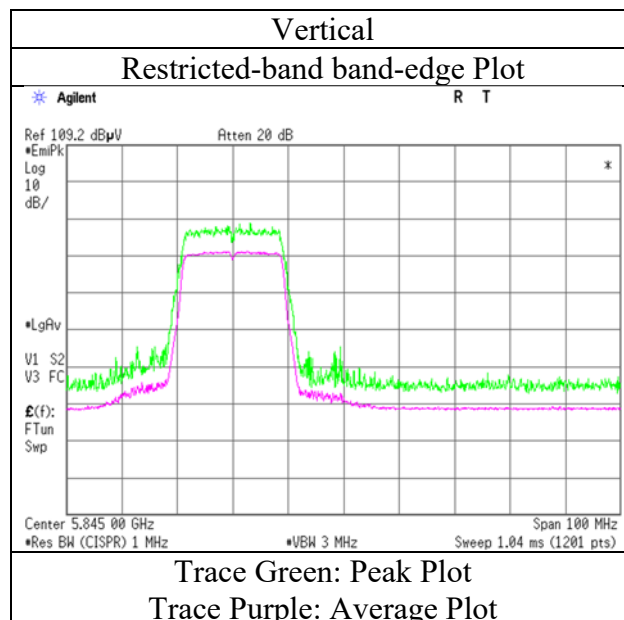
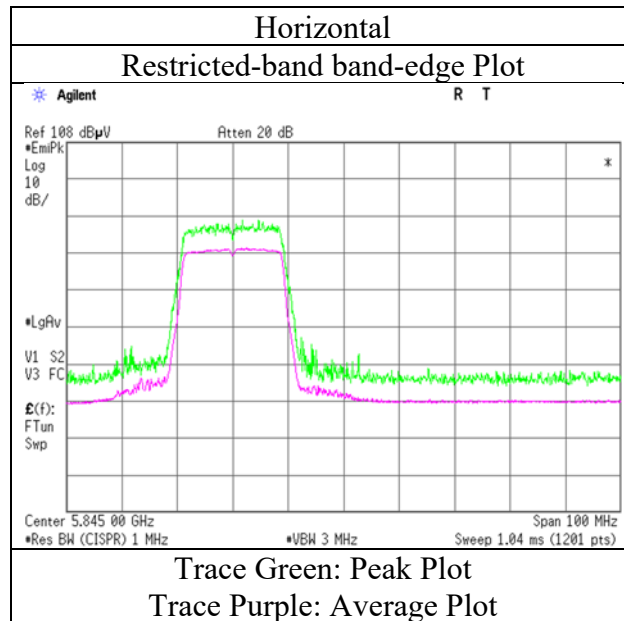
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 21, 2018
Temperature / Humidity	24 deg. C / 60 % RH
Engineer	Kazutaka Takeyama
	(1 GHz – 6.4 GHz)
Mode	Tx 11ac-20, SISO, 5825 MHz



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

UL Japan, Inc.

Shonan EMC Lab.

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Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date August 12, 2018
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Kazuya Noda
(1 GHz – 6.4 GHz)
Mode Tx 11n-20, MIMO, 5180 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.	5150.000	PK	44.79	32.18	15.94	36.94	2.28	58.25	73.90	15.6	152	17	
Hori.	5150.000	AV	34.07	32.18	15.94	36.94	2.28	47.53	53.90	6.3	152	17	VBW: 5.1 kHz
Vert.	5150.000	PK	45.06	32.18	15.94	36.94	2.28	58.52	73.90	15.3	227	277	
Vert.	5150.000	AV	34.34	32.18	15.94	36.94	2.28	47.80	53.90	6.1	227	277	VBW: 5.1 kHz

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

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

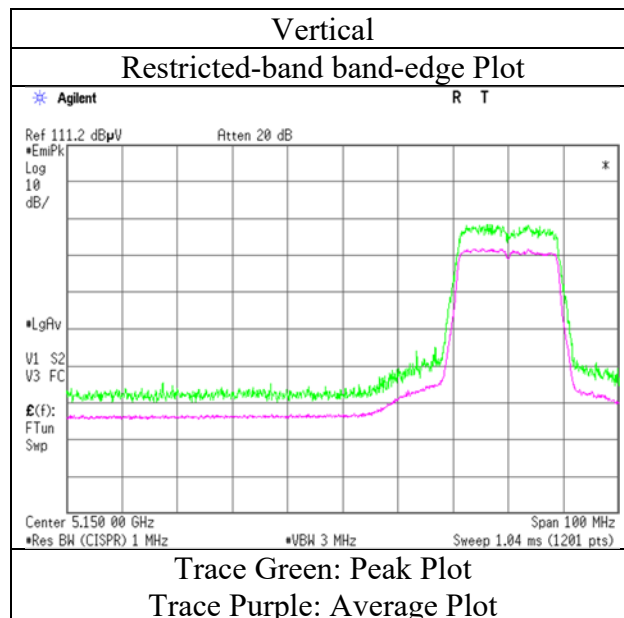
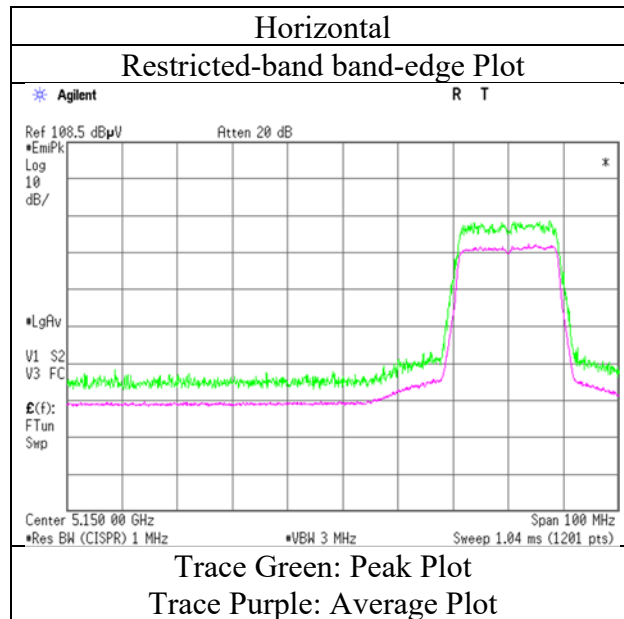
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	August 12, 2018
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Kazuya Noda
	(1 GHz – 6.4 GHz)
Mode	Tx 11n-20, MIMO, 5180 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date August 12, 2018
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Kazuya Noda
(1 GHz – 6.4 GHz)
Mode Tx 11n-20, MIMO, 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.	5350.000	PK	44.85	31.73	16.09	36.92	2.28	58.03	73.90	15.8	204	305	
Hori.	5350.000	AV	34.12	31.73	16.09	36.92	2.28	47.30	53.90	6.6	204	305	VBW: 5.1 kHz
Vert.	5350.000	PK	45.44	31.73	16.09	36.92	2.28	58.62	73.90	15.2	247	254	
Vert.	5350.000	AV	34.38	31.73	16.09	36.92	2.28	47.56	53.90	6.3	247	254	VBW: 5.1 kHz

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

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

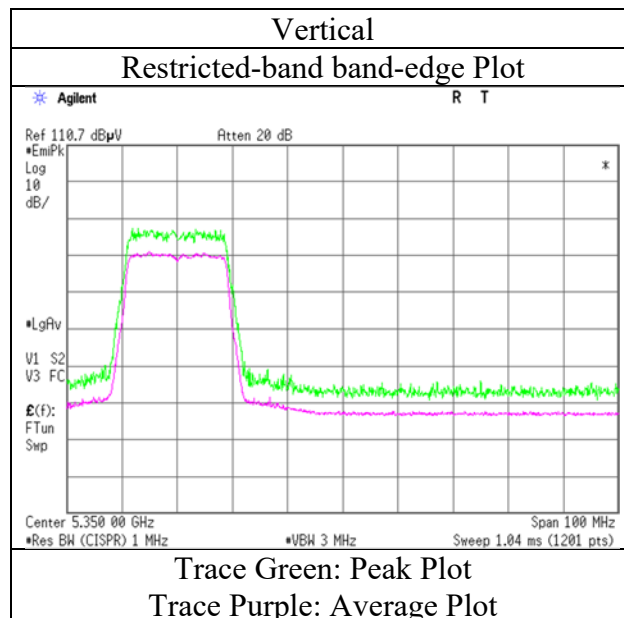
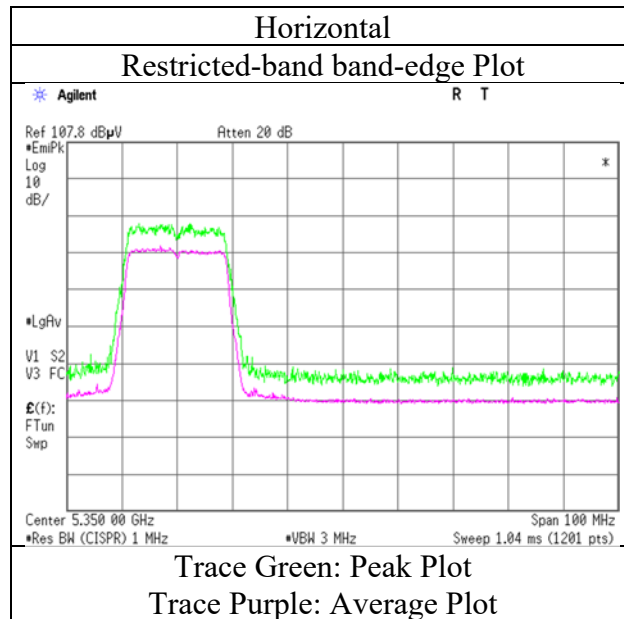
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	August 12, 2018
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Kazuya Noda
	(1 GHz -6.4 GHz)
Mode	Tx 11n-20, MIMO, 5320 MHz



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

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Shonan EMC Lab.

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Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date August 12, 2018
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Kazuya Noda
(1 GHz – 6.4 GHz)
Mode Tx 11n-20, MIMO, 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.	5460.000	PK	44.15	32.08	16.19	36.91	2.28	57.79	73.90	16.1	107	331	
Hori.	5460.000	AV	33.84	32.08	16.19	36.91	2.28	47.48	53.90	6.4	107	331	VBW: 5.1 kHz
Vert.	5460.000	PK	44.01	32.08	16.19	36.91	2.28	57.65	73.90	16.2	202	272	
Vert.	5460.000	AV	34.19	32.08	16.19	36.91	2.28	47.83	53.90	6.0	202	272	VBW: 5.1 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5470.000	PK	45.57	32.06	16.19	36.91	2.28	59.19	-36.01	-27.00	9.0	107	331	
Vert.	5470.000	PK	45.89	32.06	16.19	36.91	2.28	59.51	-35.69	-27.00	8.7	202	272	

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

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

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

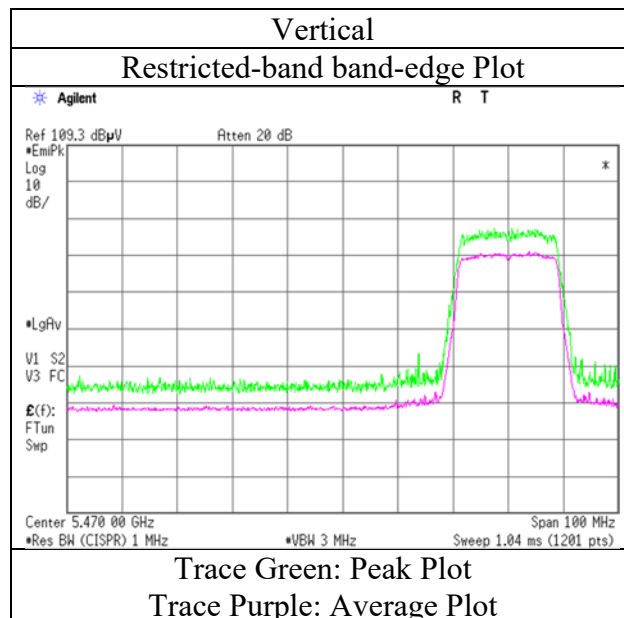
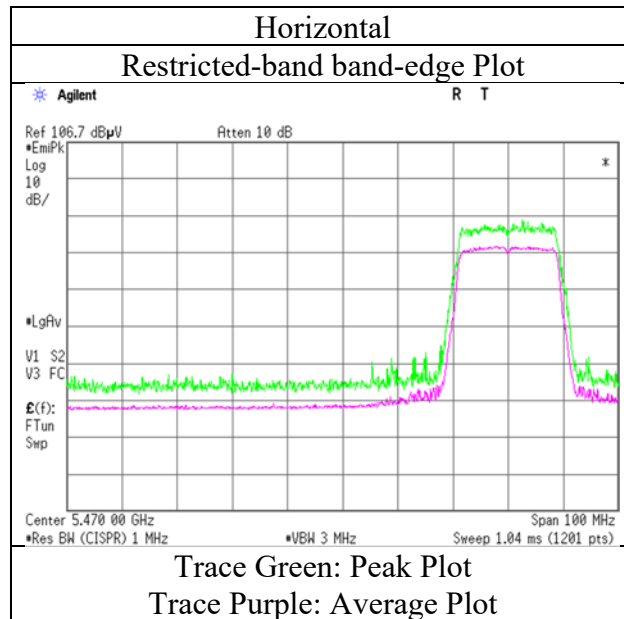
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	August 12, 2018
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Kazuya Noda
	(1 GHz -6.4 GHz)
Mode	Tx 11n-20, MIMO, 5500 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date August 12, 2018
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Kazuya Noda
(1 GHz – 6.4 GHz)
Mode Tx 11n-20, MIMO, 5700 MHz

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5725.000	PK	48.63	32.35	16.44	36.89	2.28	62.81	-32.39	-27.00	5.4	125	13	
Vert.	5725.000	PK	49.54	32.35	16.44	36.89	2.28	63.72	-31.48	-27.00	4.5	163	265	

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

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

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

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

Distance factor : 1 GHz - 13 GHz : 20log (3.9 m / 3.0 m) = 2.28 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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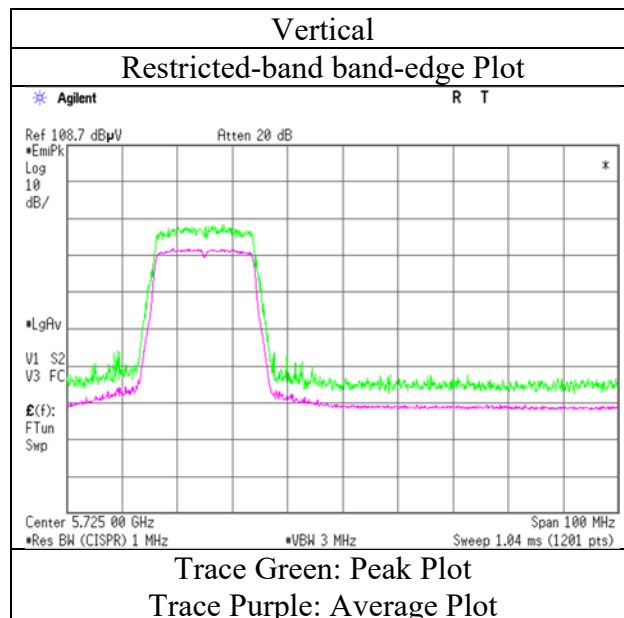
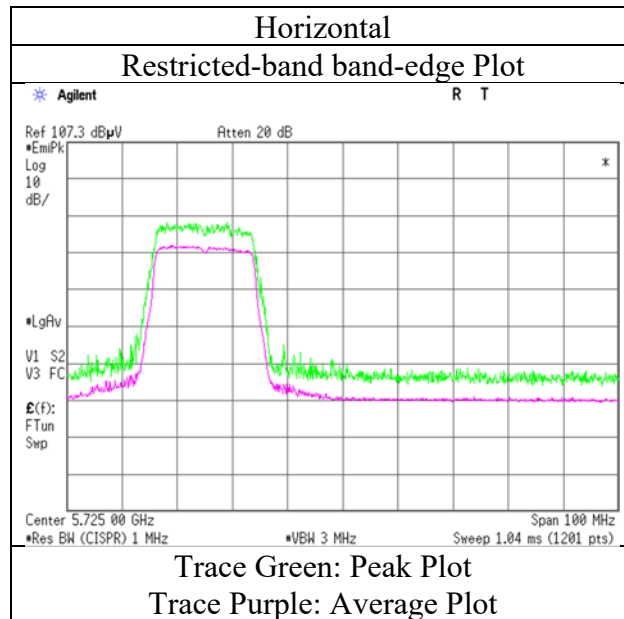
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Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	August 12, 2018
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Kazuya Noda
	(1 GHz -6.4 GHz)
Mode	Tx 11n-20, MIMO, 5700 MHz



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

UL Japan, Inc.

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Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date August 12, 2018
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Kazuya Noda
(1 GHz – 6.4 GHz)
Mode Tx 11n-20, MIMO, 5745 MHz

(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.	5650.000	PK	44.53	32.18	16.37	36.90	2.28	58.46	-36.74	-27.00	9.7	122	14	
Hori.	5700.000	PK	44.01	32.23	16.42	36.89	2.28	58.05	-37.15	10.00	47.2	122	14	
Hori.	5720.000	PK	47.32	32.33	16.44	36.89	2.28	61.48	-33.72	15.60	49.3	122	14	
Hori.	5725.000	PK	51.42	32.35	16.44	36.89	2.28	65.60	-29.60	27.00	56.6	122	14	
Vert.	5650.000	PK	44.36	32.18	16.37	36.90	2.28	58.29	-36.91	-27.00	9.9	171	279	
Vert.	5700.000	PK	44.31	32.23	16.42	36.89	2.28	58.35	-36.85	10.00	46.9	171	279	
Vert.	5720.000	PK	47.29	32.33	16.44	36.89	2.28	61.45	-33.75	15.60	49.4	171	279	
Vert.	5725.000	PK	52.27	32.35	16.44	36.89	2.28	66.45	-28.75	27.00	55.8	171	279	

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

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

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

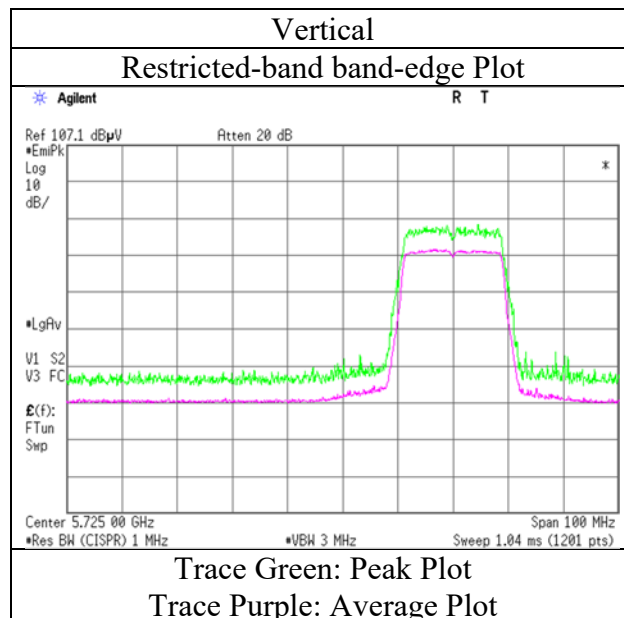
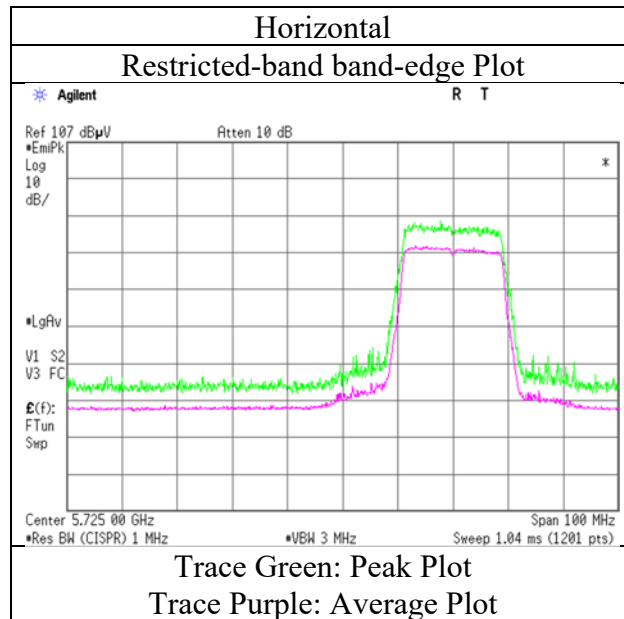
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (3.9 m / 3.0 m) = 2.28 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	August 12, 2018
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Kazuya Noda
	(1 GHz -6.4 GHz)
Mode	Tx 11n-20, MIMO, 5745 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date August 12, 2018
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Kazuya Noda
(1 GHz – 6.4 GHz)
Mode Tx 11n-20, MIMO, 5825 MHz

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5850.000	PK	47.83	32.65	16.58	36.88	2.28	62.46	-32.74	27.00	59.7	150	15	
Hori.	5855.000	PK	45.84	32.66	16.59	36.87	2.28	60.50	-34.70	15.60	50.3	150	15	
Hori.	5875.000	PK	44.30	32.72	16.60	36.87	2.28	59.03	-36.17	10.00	46.2	150	15	
Hori.	5925.000	PK	44.38	32.80	16.64	36.87	2.28	59.23	-35.97	-27.00	9.0	150	15	
Vert.	5850.000	PK	48.97	32.65	16.58	36.88	2.28	63.60	-31.60	27.00	58.6	151	271	
Vert.	5855.000	PK	46.39	32.66	16.59	36.87	2.28	61.05	-34.15	15.60	49.8	151	271	
Vert.	5875.000	PK	43.76	32.72	16.60	36.87	2.28	58.49	-36.71	10.00	46.7	151	271	
Vert.	5925.000	PK	43.86	32.80	16.64	36.87	2.28	58.71	-36.49	-27.00	9.5	151	271	

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

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

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

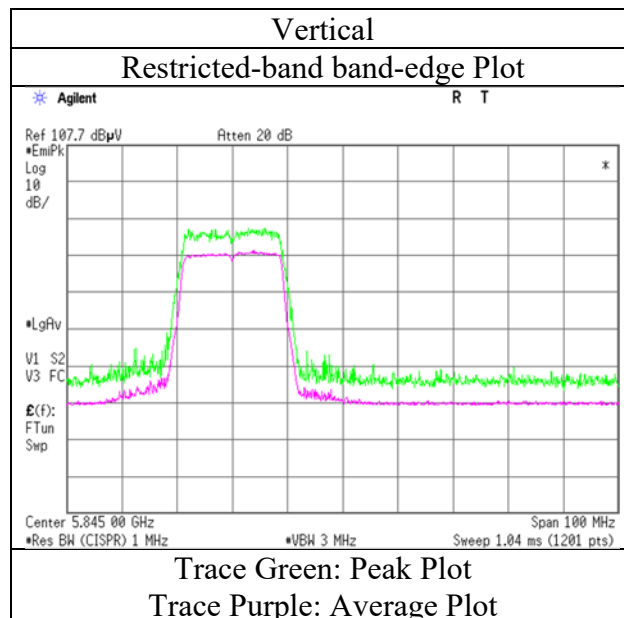
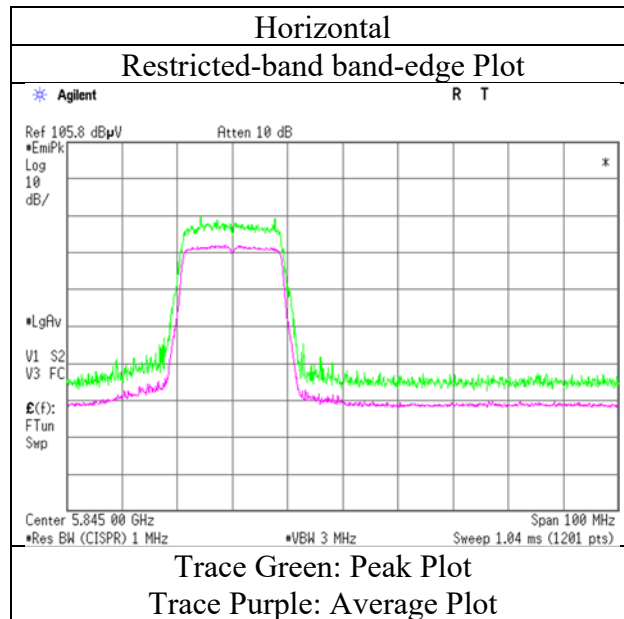
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz: 20log (3.9 m / 3.0 m) = 2.28 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	August 12, 2018
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Kazuya Noda
	(1 GHz -6.4 GHz)
Mode	Tx 11n-20, MIMO, 5825 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 21, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 60 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Kazutaka Takeyama Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)
Mode Tx 11n-40, SISO, 5190 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.	5150.000	PK	47.40	32.17	16.25	36.94	2.28	61.16	73.90	12.7	125	340	
Hori.	15570.000	PK	43.62	38.42	11.63	38.41	-9.54	45.72	73.90	28.1	100	38	
Hori.	5150.000	AV	36.40	32.17	16.25	36.94	2.28	50.16	53.90	3.7	125	340	VBW: 5.1 kHz
Hori.	15570.000	AV	35.22	38.42	11.63	38.41	-9.54	37.32	53.90	16.5	100	38	VBW: 5.1 kHz
Vert.	5150.000	PK	48.40	32.17	16.25	36.94	2.28	62.16	73.90	11.7	251	321	
Vert.	15570.000	PK	44.27	38.42	11.63	38.41	-9.54	46.37	73.90	27.5	100	312	
Vert.	5150.000	AV	37.10	32.17	16.25	36.94	2.28	50.86	53.90	3.0	251	321	VBW: 5.1 kHz
Vert.	15570.000	AV	35.99	38.42	11.63	38.41	-9.54	38.09	53.90	15.8	100	312	VBW: 5.1 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

(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.	10380.000	PK	46.10	39.55	9.05	38.53	2.28	58.45	-36.75	-27.00	9.8	150	0	
Vert.	10380.000	PK	45.58	39.55	9.05	38.53	2.28	57.93	-37.27	-27.00	10.3	150	0	

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

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

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

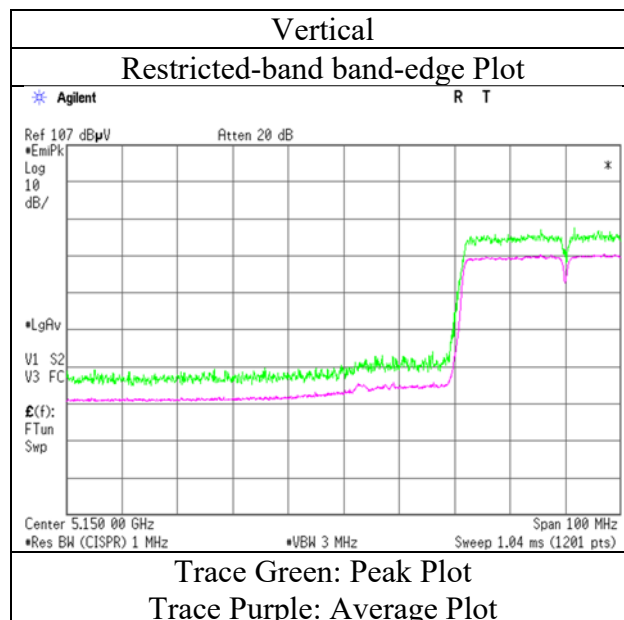
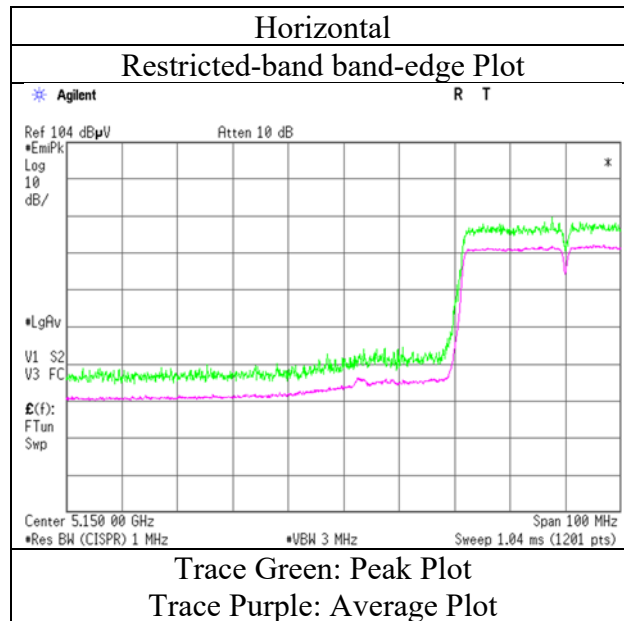
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 21, 2018
Temperature / Humidity	24 deg. C / 60 % RH
Engineer	Kazutaka Takeyama
	(1 GHz – 6.4 GHz)
Mode	Tx 11n-40, SISO, 5190 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 21, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 60 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Kazutaka Takeyama Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)
Mode Tx 11n-40, SISO, 5230 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.	15690.000	PK	46.29	38.23	11.73	38.11	-9.54	48.60	73.90	25.3	100	31	
Hori.	15690.000	AV	36.91	38.23	11.73	38.11	-9.54	39.22	53.90	14.6	100	31	VBW: 5.1 kHz
Vert.	15690.000	PK	45.74	38.23	11.73	38.11	-9.54	48.05	73.90	25.8	100	300	
Vert.	15690.000	AV	36.79	38.23	11.73	38.11	-9.54	39.10	53.90	14.8	100	300	VBW: 5.1 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

(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.	10460.000	PK	46.00	39.74	9.12	38.44	2.28	58.70	-36.50	-27.00	9.5	150	0	
Vert.	10460.000	PK	46.01	39.74	9.12	38.44	2.28	58.71	-36.49	-27.00	9.5	150	0	

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

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 2 1 3
Date August 21, 2018 August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 60 % RH 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Kazutaka Takeyama Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 26 GHz) (26 GHz – 40 GHz)
Mode Tx 11n-40, SISO, 5310 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.	5350.000	PK	52.00	31.59	16.25	36.92	2.28	65.20	73.90	8.7	100	349	
Hori.	10620.000	PK	45.34	39.69	9.19	38.41	2.28	58.09	73.90	15.8	150	0	
Hori.	15930.000	PK	47.76	37.71	11.92	37.51	-9.54	50.34	73.90	23.5	100	306	
Hori.	5350.000	AV	36.80	31.59	16.25	36.92	2.28	50.00	53.90	3.9	100	349	VBW: 5.1 kHz
Hori.	10620.000	AV	34.64	39.69	9.19	38.41	2.28	47.39	53.90	6.5	150	0	VBW: 5.1 kHz
Hori.	15930.000	AV	38.66	37.71	11.92	37.51	-9.54	41.24	53.90	12.6	100	306	VBW: 5.1 kHz
Vert.	5350.000	PK	52.90	31.59	16.25	36.92	2.28	66.10	73.90	7.8	100	19	
Vert.	10620.000	PK	45.70	39.69	9.19	38.41	2.28	58.45	73.90	15.4	150	0	
Vert.	15930.000	PK	46.67	37.71	11.92	37.51	-9.54	49.25	73.90	24.6	100	318	
Vert.	5350.000	AV	37.50	31.59	16.25	36.92	2.28	50.70	53.90	3.2	100	19	VBW: 5.1 kHz
Vert.	10620.000	AV	34.72	39.69	9.19	38.41	2.28	47.47	53.90	6.4	150	0	VBW: 5.1 kHz
Vert.	15930.000	AV	37.73	37.71	11.92	37.51	-9.54	40.31	53.90	13.5	100	318	VBW: 5.1 kHz

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

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

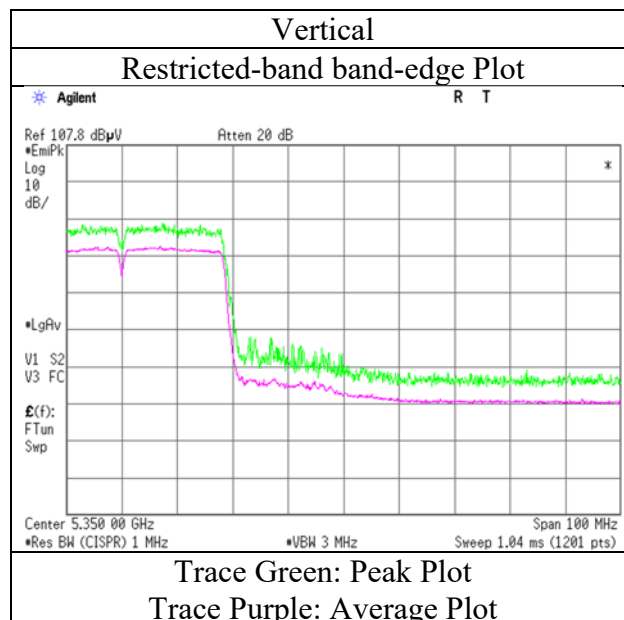
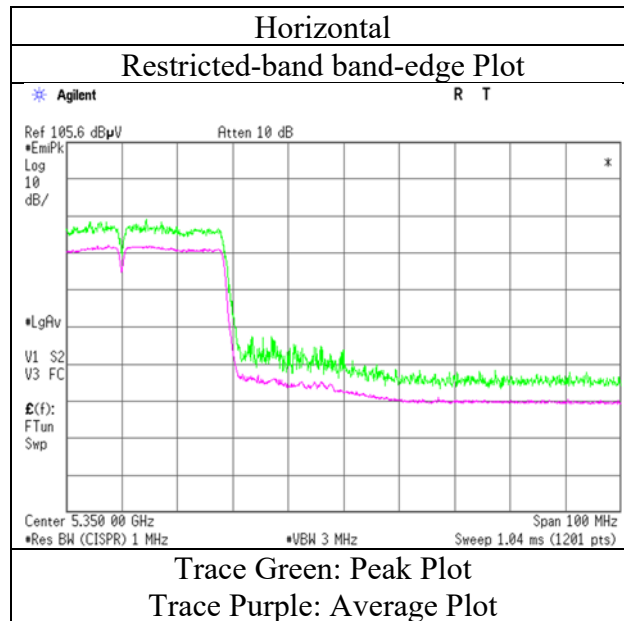
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 21, 2018
Temperature / Humidity	24 deg. C / 60 % RH
Engineer	Kazutaka Takeyama
	(1 GHz – 6.4 GHz)
Mode	Tx 11n-40, SISO, 5310 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date August 20, 2018
Temperature / Humidity 26 deg. C / 63 % RH
Engineer Yosuke Ishikawa
(1 GHz -6.4 GHz)
Mode Tx 11n-40, MIMO, 5190 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.	5150.000	PK	45.11	32.17	16.25	36.94	2.28	58.87	73.90	15.0	166	203	
Hori.	5150.000	AV	35.00	32.17	16.25	36.94	2.28	48.76	53.90	5.1	166	203	VBW: 8.2 kHz
Vert.	5150.000	PK	44.11	32.17	16.25	36.94	2.28	57.87	73.90	16.0	287	339	
Vert.	5150.000	AV	34.84	32.17	16.25	36.94	2.28	48.60	53.90	5.3	287	339	VBW: 8.2 kHz

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

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

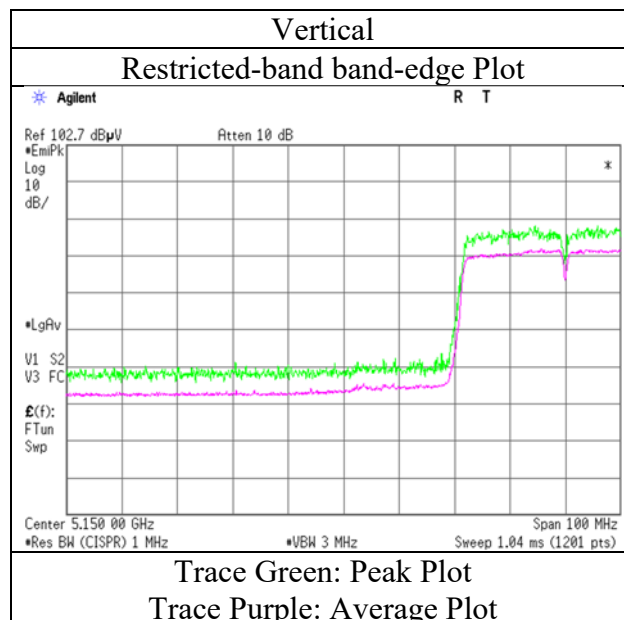
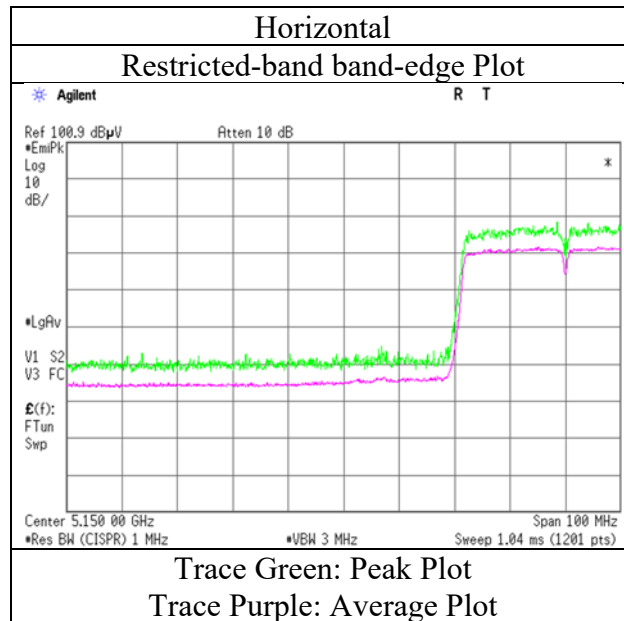
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 20, 2018
Temperature / Humidity	26 deg. C / 63 % RH
Engineer	Yosuke Ishikawa
	(1 GHz -6.4 GHz)
Mode	Tx 11n-40, MIMO, 5190 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date August 20, 2018
Temperature / Humidity 26 deg. C / 63 % RH
Engineer Yosuke Ishikawa
(1 GHz -6.4 GHz)
Mode Tx 11n-40, MIMO, 5310 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.	5350.000	PK	47.27	31.59	16.25	36.92	2.28	60.47	73.90	13.4	274	301	
Hori.	5350.000	AV	36.45	31.59	16.25	36.92	2.28	49.65	53.90	4.2	274	301	VBW: 8.2 kHz
Vert.	5350.000	PK	47.46	31.59	16.25	36.92	2.28	60.66	73.90	13.2	227	260	
Vert.	5350.000	AV	35.98	31.59	16.25	36.92	2.28	49.18	53.90	4.7	227	260	VBW: 8.2 kHz

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

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

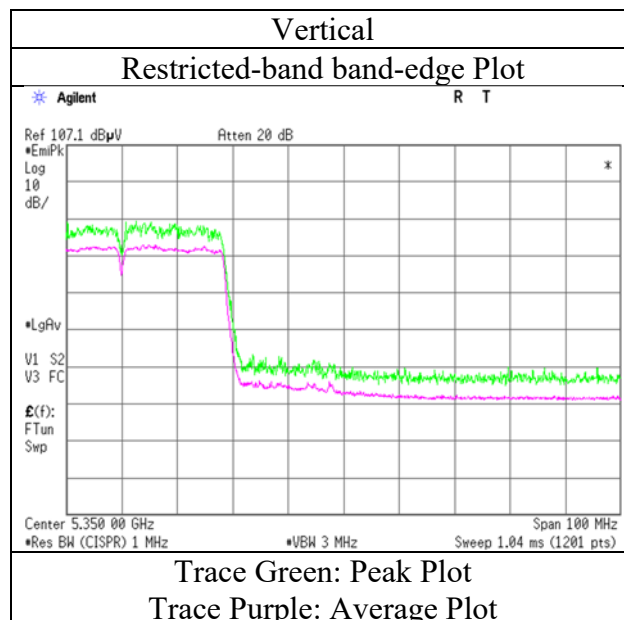
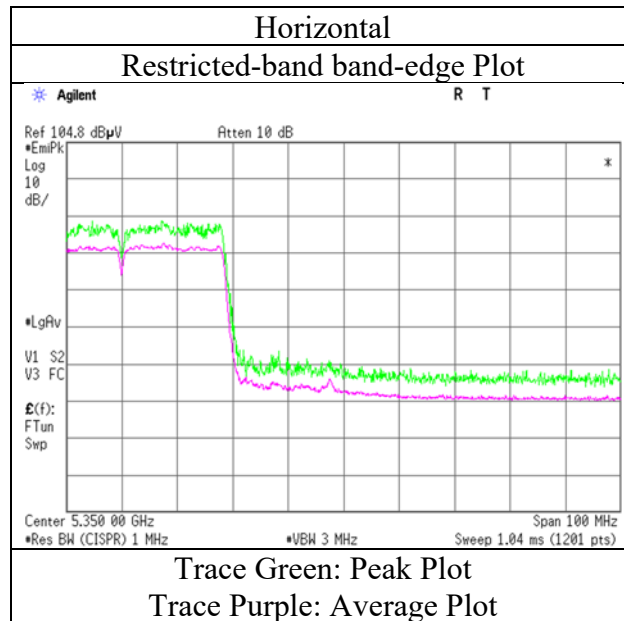
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 20, 2018
Temperature / Humidity	26 deg. C / 63 % RH
Engineer	Yosuke Ishikawa
	(1 GHz -6.4 GHz)
Mode	Tx 11n-40, MIMO, 5310 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 1 3
Date August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz - 13 GHz) (13 GHz - 18 GHz) (18 GHz - 26 GHz) (26 GHz - 40 GHz)
Mode Tx 11ac-80, SISO, 5210 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.	5150.000	PK	45.75	32.17	16.25	36.94	2.28	59.51	73.90	14.3	100	346	
Hori.	15630.000	PK	44.17	38.29	11.69	38.26	-9.54	46.35	73.90	27.5	150	0	
Hori.	5150.000	AV	36.65	32.17	16.25	36.94	2.28	50.41	53.90	3.4	100	346	VBW: 9.1 kHz
Hori.	15630.000	AV	35.48	38.29	11.69	38.26	-9.54	37.66	53.90	16.2	150	0	VBW: 9.1 kHz
Vert.	5150.000	PK	46.17	32.17	16.25	36.94	2.28	59.93	73.90	13.9	221	333	
Vert.	15630.000	PK	44.01	38.29	11.69	38.26	-9.54	46.19	73.90	27.7	150	0	
Vert.	5150.000	AV	35.98	32.17	16.25	36.94	2.28	49.74	53.90	4.1	221	333	VBW: 9.1 kHz
Vert.	15630.000	AV	35.80	38.29	11.69	38.26	-9.54	37.98	53.90	15.9	150	0	VBW: 9.1 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

(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.	10420.000	PK	43.89	39.68	9.10	38.49	2.28	56.46	-38.74	-27.00	11.7	150	0	
Vert.	10420.000	PK	43.78	39.68	9.10	38.49	2.28	56.35	-38.85	-27.00	11.9	150	0	

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

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

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

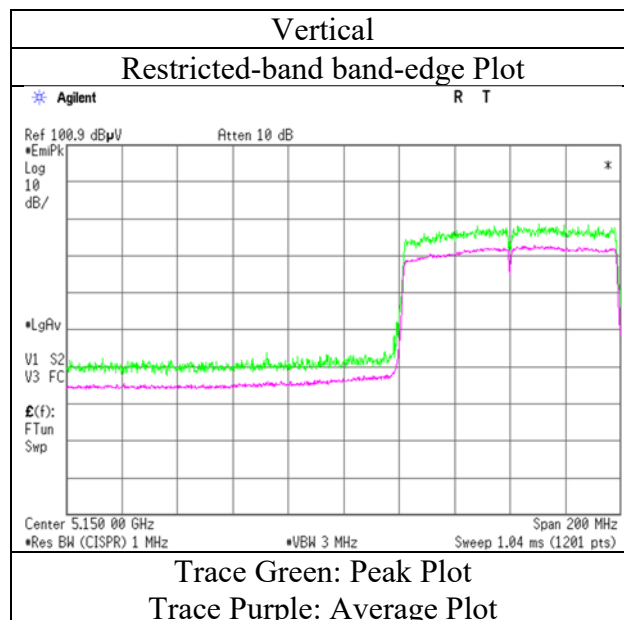
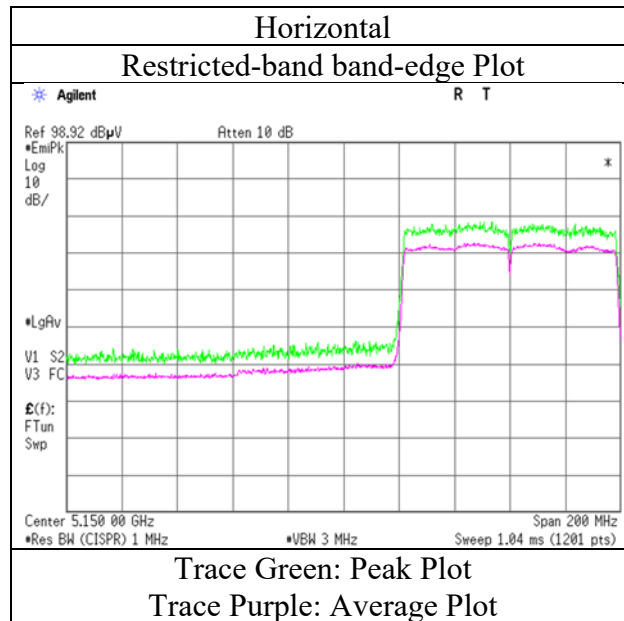
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 21, 2018
Temperature / Humidity	24 deg. C / 67 % RH
Engineer	Yosuke Ishikawa
	(1 GHz - 13 GHz)
Mode	Tx 11ac-80, SISO, 5210 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 1 3
Date August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz - 13 GHz) (13 GHz - 18 GHz) (18 GHz - 26 GHz) (26 GHz - 40 GHz)
Mode Tx 11ac-80, SISO, 5290 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.	5350.000	PK	44.03	31.59	16.25	36.92	2.28	57.23	73.90	16.6	100	359	
Hori.	15870.000	PK	45.01	37.80	11.86	37.66	-9.54	47.47	73.90	26.4	150	0	
Hori.	5350.000	AV	34.91	31.59	16.25	36.92	2.28	48.11	53.90	5.7	100	359	VBW: 9.1 kHz
Hori.	15870.000	AV	35.68	37.80	11.86	37.66	-9.54	38.14	53.90	15.7	150	0	VBW: 9.1 kHz
Vert.	5350.000	PK	45.30	31.59	16.25	36.92	2.28	58.50	73.90	15.4	220	327	
Vert.	15870.000	PK	44.40	37.80	11.86	37.66	-9.54	46.86	73.90	27.0	150	0	
Vert.	5350.000	AV	35.91	31.59	16.25	36.92	2.28	49.11	53.90	4.7	220	327	VBW: 9.1 kHz
Vert.	15870.000	AV	35.85	37.80	11.86	37.66	-9.54	38.31	53.90	15.5	150	0	VBW: 9.1 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

(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.	10580.000	PK	44.30	39.72	9.18	38.40	2.28	57.08	-38.12	-27.00	11.1	150	0	
Vert.	10580.000	PK	45.18	39.72	9.18	38.40	2.28	57.96	-37.24	-27.00	10.2	150	0	

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

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

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

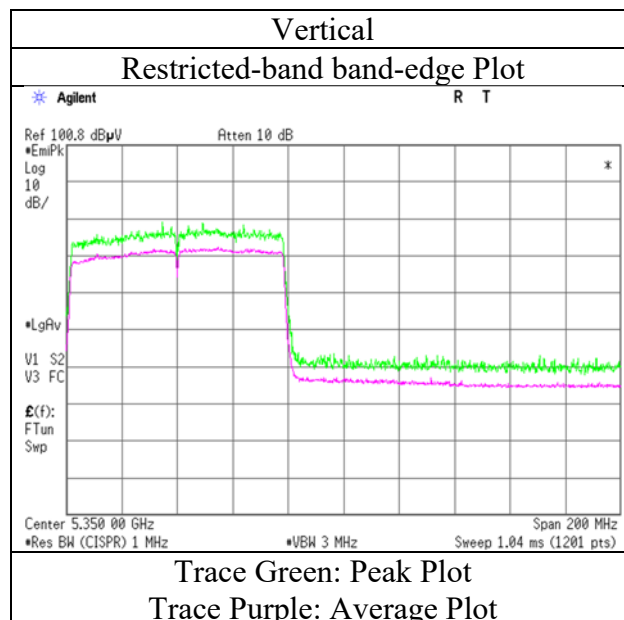
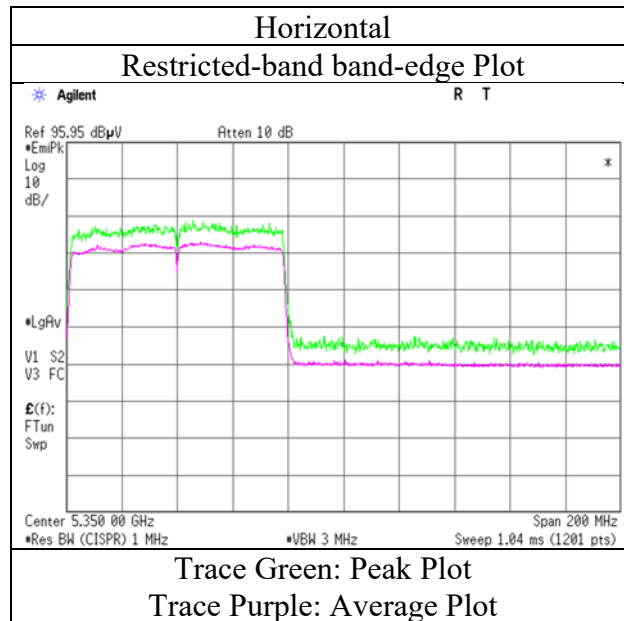
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 21, 2018
Temperature / Humidity	24 deg. C / 67 % RH
Engineer	Yosuke Ishikawa
	(1 GHz - 13 GHz)
Mode	Tx 11ac-80, SISO, 5290 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 1 3
Date August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz - 13 GHz) (13 GHz - 18 GHz) (18 GHz - 26 GHz) (26 GHz - 40 GHz)
Mode Tx 11ac-80, SISO, 5530 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.	5460.000	PK	46.79	31.91	16.24	36.91	2.28	60.31	73.90	13.5	100	306	
Hori.	11060.000	PK	45.69	40.07	9.34	38.56	2.28	58.82	73.90	15.0	150	0	
Hori.	22120.000	PK	42.48	39.97	22.56	47.42	-9.54	48.05	73.90	25.8	150	0	
Hori.	5460.000	AV	36.92	31.91	16.24	36.91	2.28	50.44	53.90	3.4	100	306	VBW: 9.1 kHz
Hori.	11060.000	AV	36.25	40.07	9.34	38.56	2.28	49.38	53.90	4.5	150	0	VBW: 9.1 kHz
Hori.	22120.000	AV	33.95	39.97	22.56	47.42	-9.54	39.52	53.90	14.3	150	0	VBW: 9.1 kHz
Vert.	5460.000	PK	47.14	31.91	16.24	36.91	2.28	60.66	73.90	13.2	220	286	
Vert.	11060.000	PK	44.96	40.07	9.34	38.56	2.28	58.09	73.90	15.8	150	0	
Vert.	22120.000	PK	42.15	39.97	22.56	47.42	-9.54	47.72	73.90	26.1	150	0	
Vert.	5460.000	AV	37.61	31.91	16.24	36.91	2.28	51.13	53.90	2.7	220	286	VBW: 9.1 kHz
Vert.	11060.000	AV	36.40	40.07	9.34	38.56	2.28	49.53	53.90	4.3	150	0	VBW: 9.1 kHz
Vert.	22120.000	AV	33.78	39.97	22.56	47.42	-9.54	39.35	53.90	14.5	150	0	VBW: 9.1 kHz

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).

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Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5470.000	PK	46.08	31.89	16.24	36.91	2.28	59.58	-35.62	-27.00	8.6	100	306	
Hori.	16590.000	PK	43.46	38.82	12.17	37.57	-9.54	47.34	-47.86	-27.00	20.9	150	0	
Vert.	5470.000	PK	47.89	31.89	16.24	36.91	2.28	61.39	-33.81	-27.00	6.8	220	286	
Vert.	16590.000	PK	43.23	38.82	12.17	37.57	-9.54	47.11	-48.09	-27.00	21.1	150	0	

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

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

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

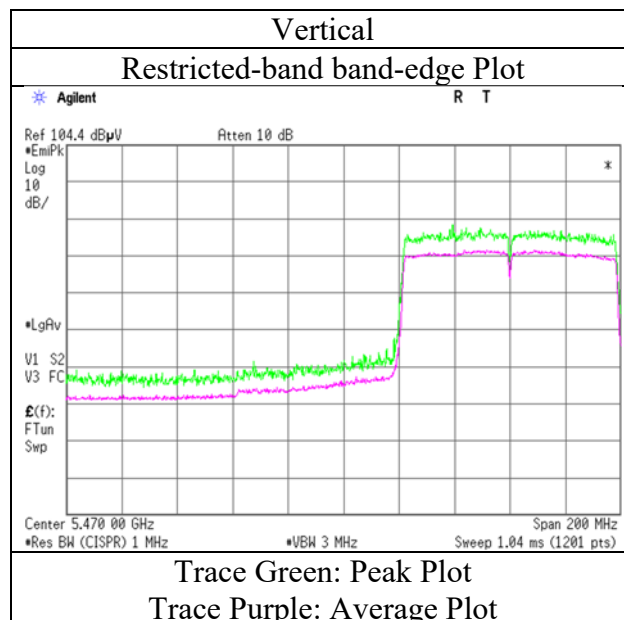
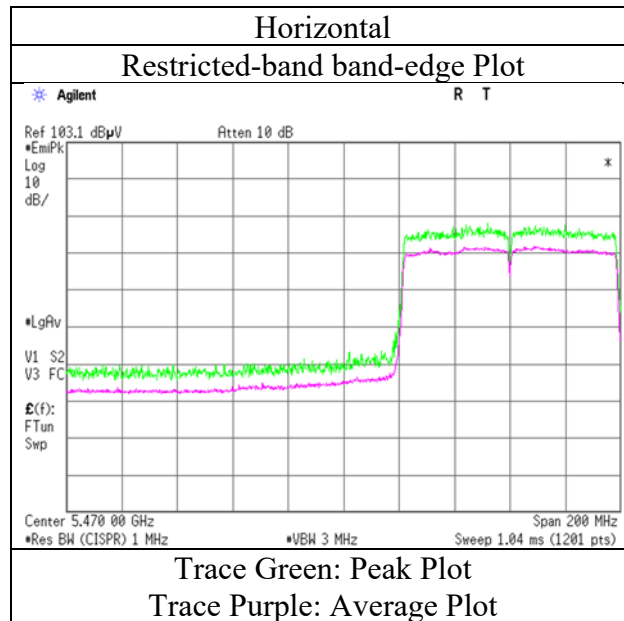
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Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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Mode	Tx 11ac-80, SISO, 5530 MHz



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

Radiated Spurious Emission

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Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 1 3
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Temperature / Humidity 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz - 13 GHz) (13 GHz - 18 GHz) (18 GHz - 26 GHz) (26 GHz - 40 GHz)
Mode Tx 11ac-80, SISO, 5610 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.	11220.000	PK	46.18	39.72	9.48	38.91	2.28	58.75	73.90	15.1	150	0	
Hori.	22440.000	PK	42.22	40.02	22.85	48.14	-9.54	47.41	73.90	26.4	150	0	
Hori.	11220.000	AV	36.95	39.72	9.48	38.91	2.28	49.52	53.90	4.3	150	0	VBW: 9.1 kHz
Hori.	22440.000	AV	34.09	40.02	22.85	48.14	-9.54	39.28	53.90	14.6	150	0	VBW: 9.1 kHz
Vert.	11220.000	PK	46.62	39.72	9.48	38.91	2.28	59.19	73.90	14.7	150	0	
Vert.	22440.000	PK	43.20	40.02	22.85	48.14	-9.54	48.39	73.90	25.5	150	0	
Vert.	11220.000	AV	36.47	39.72	9.48	38.91	2.28	49.04	53.90	4.8	150	0	VBW: 9.1 kHz
Vert.	22440.000	AV	33.71	40.02	22.85	48.14	-9.54	38.90	53.90	15.0	150	0	VBW: 9.1 kHz

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5725.000	PK	44.44	32.22	16.33	36.89	2.28	58.38	-36.82	-27.00	9.8	106	11	
Hori.	16830.000	PK	44.80	39.90	12.31	37.38	-9.54	50.09	-45.11	-27.00	18.1	150	0	
Vert.	5725.000	PK	43.67	32.22	16.33	36.89	2.28	57.61	-37.59	-27.00	10.6	190	263	
Vert.	16830.000	PK	44.30	39.90	12.31	37.38	-9.54	49.59	-45.61	-27.00	18.6	150	0	

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

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

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

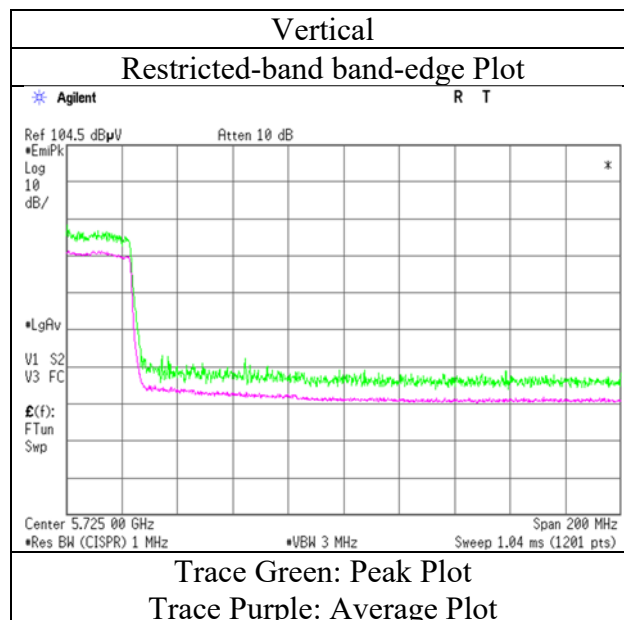
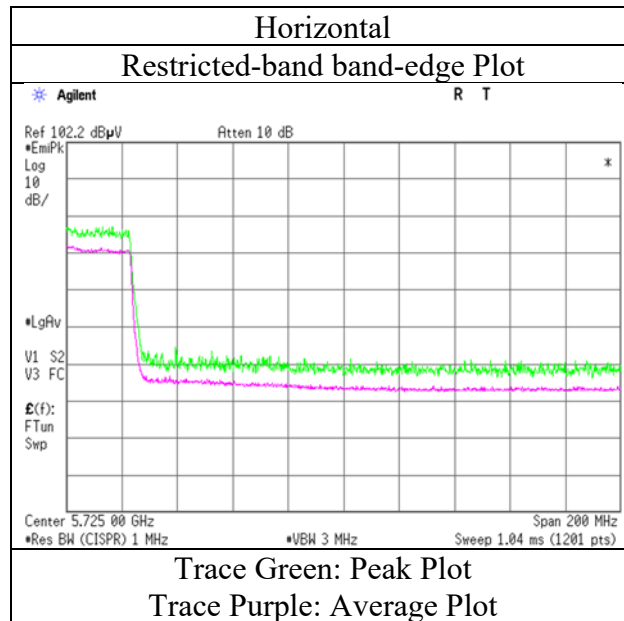
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Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

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	(1 GHz - 13 GHz)
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Semi Anechoic Chamber 2 2 1 3
Date August 21, 2018 August 22, 2018 August 24, 2018 August 3, 2018
Temperature / Humidity 24 deg. C / 67 % RH 23 deg. C / 66 % RH 23 deg. C / 67 % RH 27 deg. C / 48 % RH
Engineer Yosuke Ishikawa Yosuke Ishikawa Yosuke Ishikawa Tatsuya Arai
(1 GHz - 13 GHz) (13 GHz - 18 GHz) (18 GHz - 26 GHz) (26 GHz - 40 GHz)
Mode Tx 11ac-80, SISO, 5775 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.	11550.000	PK	44.05	40.03	9.76	39.36	2.28	56.76	73.90	17.1	150	0	
Hori.	23100.000	PK	42.17	39.74	23.15	47.04	-9.54	48.48	73.90	25.4	150	0	
Hori.	11550.000	AV	34.94	40.03	9.76	39.36	2.28	47.65	53.90	6.2	150	0	VBW: 9.1 kHz
Hori.	23100.000	AV	34.06	39.74	23.15	47.04	-9.54	40.37	53.90	13.5	150	0	VBW: 9.1 kHz
Vert.	11550.000	PK	43.81	40.03	9.76	39.36	2.28	56.52	73.90	17.3	150	0	
Vert.	23100.000	PK	43.86	39.74	23.15	47.04	-9.54	50.17	73.90	23.7	150	0	
Vert.	11550.000	AV	34.76	40.03	9.76	39.36	2.28	47.47	53.90	6.4	150	0	VBW: 9.1 kHz
Vert.	23100.000	AV	33.74	39.74	23.15	47.04	-9.54	40.05	53.90	13.8	150	0	VBW: 9.1 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

(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 (ERP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5650.000	PK	44.00	32.03	16.30	36.90	2.28	57.71	-37.49	-27.00	10.5	110	14	
Hori.	5700.000	PK	46.81	32.12	16.31	36.89	2.28	60.63	-34.57	10.00	44.6	110	14	
Hori.	5720.000	PK	47.71	32.20	16.33	36.89	2.28	61.63	-33.57	15.60	49.2	110	14	
Hori.	5725.000	PK	47.70	32.22	16.33	36.89	2.28	61.64	-33.56	27.00	60.6	110	14	
Hori.	5850.000	PK	45.37	32.61	16.39	36.88	2.28	59.77	-35.43	27.00	62.4	110	14	
Hori.	5855.000	PK	43.80	32.62	16.39	36.87	2.28	58.22	-36.98	15.60	52.6	110	14	
Hori.	5875.000	PK	43.42	32.65	16.40	36.87	2.28	57.88	-37.32	10.00	47.3	110	14	
Hori.	5925.000	PK	43.48	32.66	16.43	36.87	2.28	57.98	-37.22	-27.00	10.2	110	14	
Hori.	17325.000	PK	43.00	41.08	12.27	37.25	-9.54	49.56	-45.64	-27.00	18.6	150	0	
Vert.	5650.000	PK	44.02	32.03	16.30	36.90	2.28	57.73	-37.47	-27.00	10.5	190	294	
Vert.	5700.000	PK	47.85	32.12	16.31	36.89	2.28	61.67	-33.53	10.00	43.5	190	294	
Vert.	5720.000	PK	48.51	32.20	16.33	36.89	2.28	62.43	-32.77	15.60	48.4	190	294	
Vert.	5725.000	PK	50.20	32.22	16.33	36.89	2.28	64.14	-31.06	27.00	58.1	190	294	
Vert.	5850.000	PK	47.05	32.61	16.39	36.88	2.28	61.45	-33.75	27.00	60.8	190	294	
Vert.	5855.000	PK	45.16	32.62	16.39	36.87	2.28	59.58	-35.62	15.60	51.2	190	294	
Vert.	5875.000	PK	44.36	32.65	16.40	36.87	2.28	58.82	-36.38	10.00	46.4	190	294	
Vert.	5925.000	PK	43.23	32.66	16.43	36.87	2.28	57.73	-37.47	-27.00	10.5	190	294	
Vert.	17325.000	PK	43.07	41.08	12.27	37.25	-9.54	49.63	-45.57	-27.00	18.6	150	0	

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

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

UL Japan, Inc.

Shonan EMC Lab.

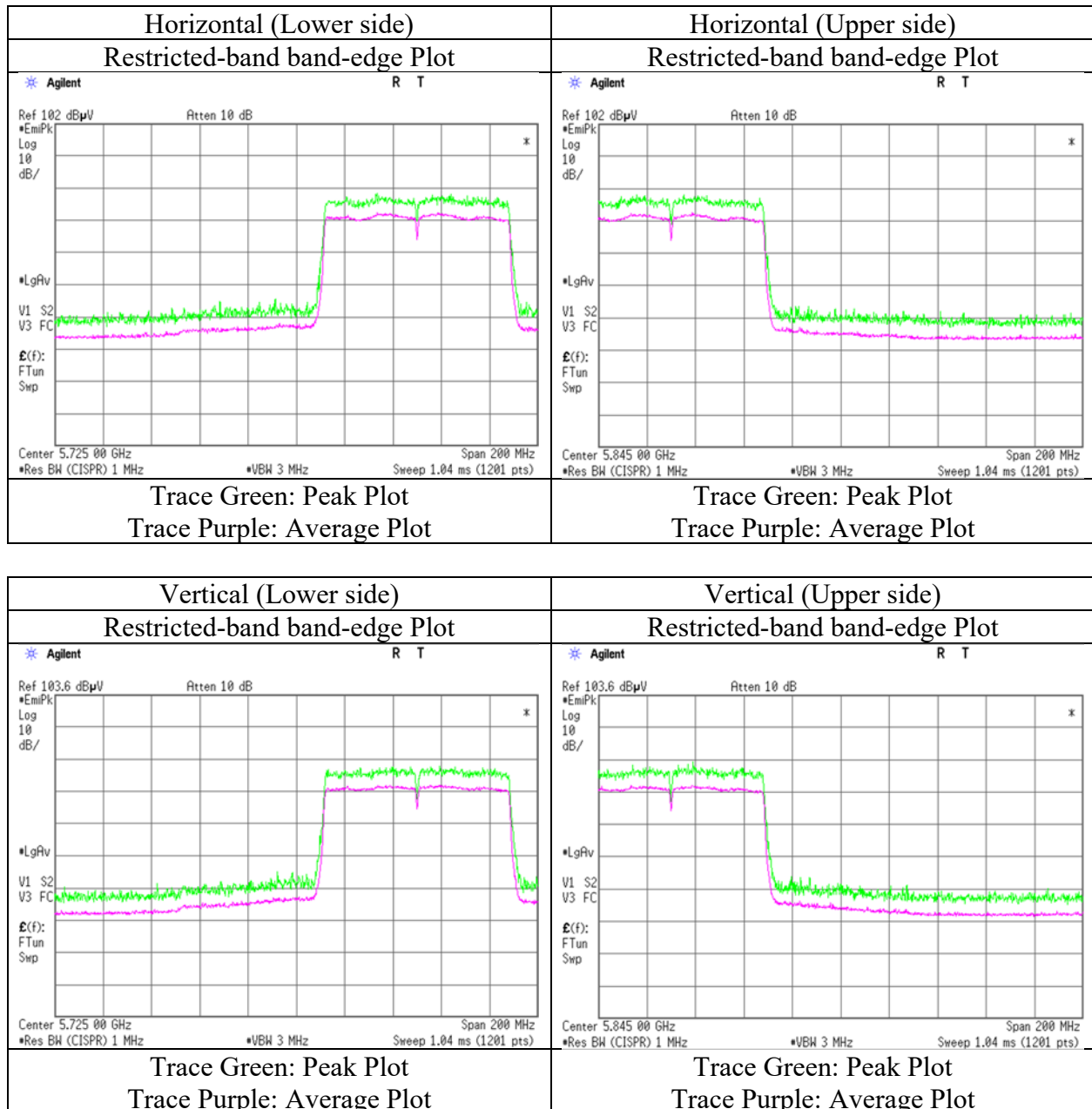
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

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Date	August 21, 2018
Temperature / Humidity	24 deg. C / 67 % RH
Engineer	Yosuke Ishikawa
	(1 GHz - 13 GHz)
Mode	Tx 11ac-80, SISO, 5775 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date August 20, 2018
Temperature / Humidity 26 deg. C / 63 % RH
Engineer Yosuke Ishikawa
(1 GHz -6.4 GHz)
Mode Tx 11ac-80, MIMO, 5210 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.	5150.000	PK	44.12	32.17	16.25	36.94	2.28	57.88	73.90	16.0	158	208	
Hori.	5150.000	AV	35.34	32.17	16.25	36.94	2.28	49.10	53.90	4.8	158	208	VBW: 12 kHz
Vert.	5150.000	PK	43.76	32.17	16.25	36.94	2.28	57.52	73.90	16.4	254	254	
Vert.	5150.000	AV	35.11	32.17	16.25	36.94	2.28	48.87	53.90	5.0	254	254	VBW: 12 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

UL Japan, Inc.

Shonan EMC Lab.

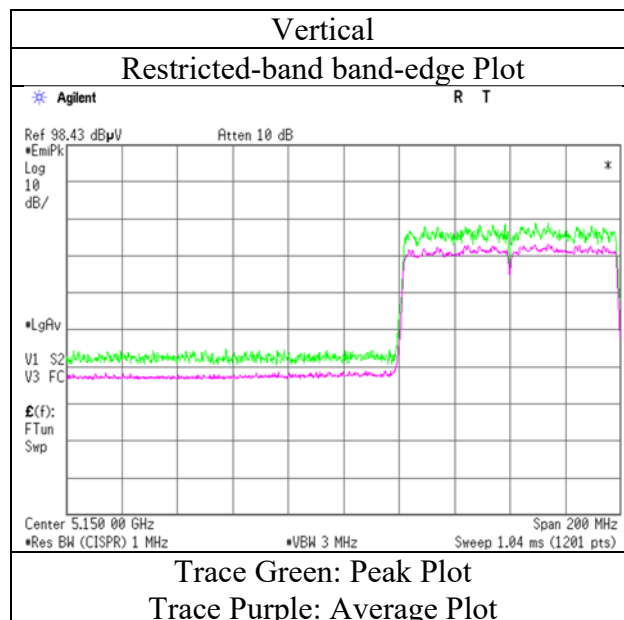
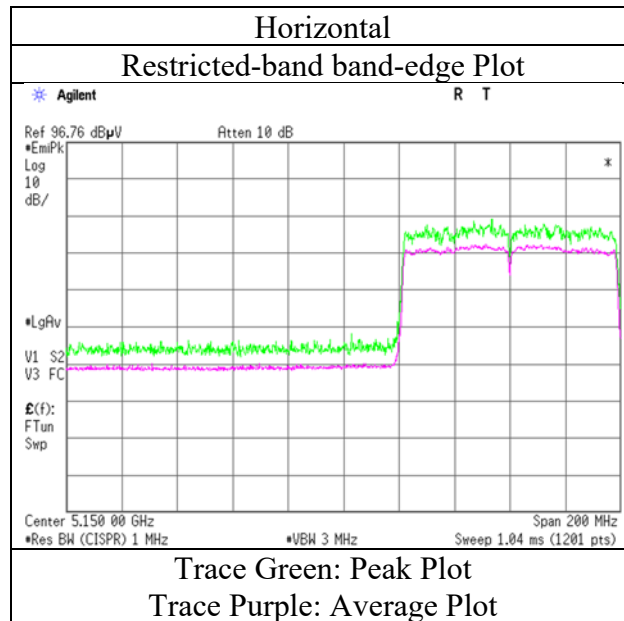
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 20, 2018
Temperature / Humidity	26 deg. C / 63 % RH
Engineer	Yosuke Ishikawa
	(1 GHz -6.4 GHz)
Mode	Tx 11ac-80, MIMO, 5210 MHz



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

UL Japan, Inc.

Shonan EMC Lab.

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

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Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date August 20, 2018
Temperature / Humidity 26 deg. C / 63 % RH
Engineer Yosuke Ishikawa
(1 GHz -6.4 GHz)
Mode Tx 11ac-80, MIMO, 5290 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.	5350.000	PK	44.57	31.59	16.25	36.92	2.28	57.77	73.90	16.1	119	215	
Hori.	5350.000	AV	34.80	31.59	16.25	36.92	2.28	48.00	53.90	5.9	119	215	VBW: 12 kHz
Vert.	5350.000	PK	44.21	31.59	16.25	36.92	2.28	57.41	73.90	16.5	231	277	
Vert.	5350.000	AV	35.32	31.59	16.25	36.92	2.28	48.52	53.90	5.4	231	277	VBW: 12 kHz

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

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

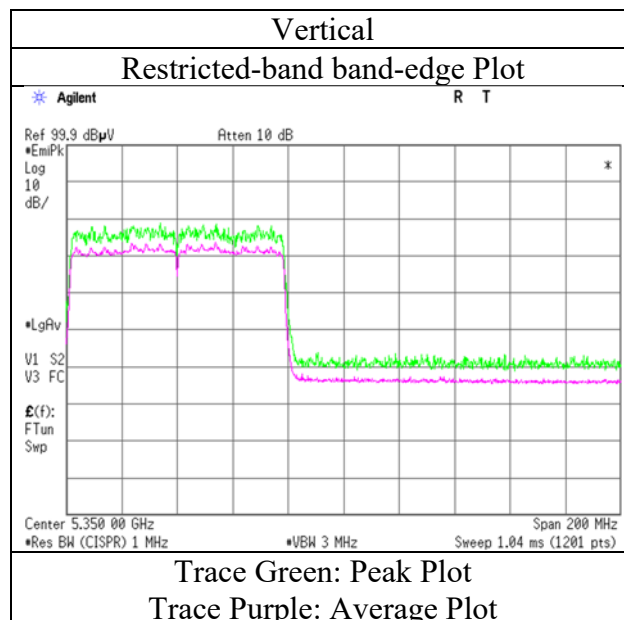
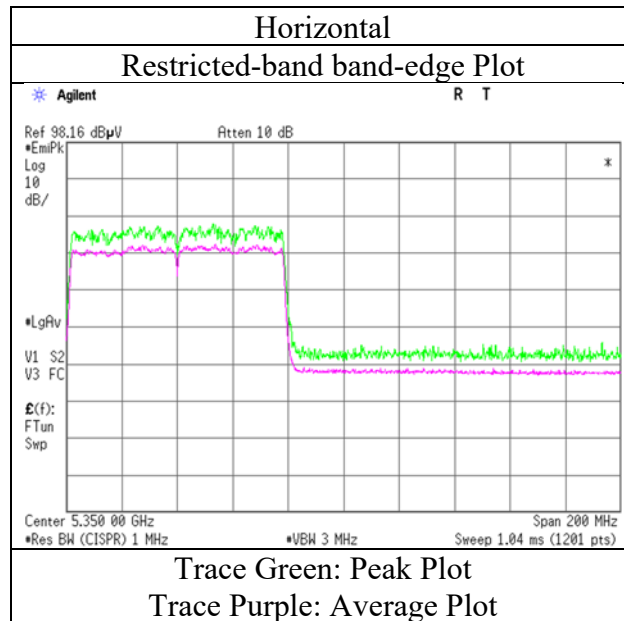
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 20, 2018
Temperature / Humidity	26 deg. C / 63 % RH
Engineer	Yosuke Ishikawa
	(1 GHz -6.4 GHz)
Mode	Tx 11ac-80, MIMO, 5290 MHz



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

UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 463 50 6400

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Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date August 20, 2018
Temperature / Humidity 26 deg. C / 63 % RH
Engineer Yosuke Ishikawa
(1 GHz -6.4 GHz)
Mode Tx 11ac-80, MIMO, 5530 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.	5460.000	PK	45.70	31.91	16.24	36.91	2.28	59.22	73.90	14.7	100	336	
Hori.	5460.000	AV	35.39	31.91	16.24	36.91	2.28	48.91	53.90	5.0	100	336	VBW: 12 kHz
Vert.	5460.000	PK	46.36	31.91	16.24	36.91	2.28	59.88	73.90	14.0	185	262	
Vert.	5460.000	AV	36.50	31.91	16.24	36.91	2.28	50.02	53.90	3.9	185	262	VBW: 12 kHz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5470.000	PK	45.94	31.89	16.24	36.91	2.28	59.44	-35.79	-27.00	8.8	100	336	
Vert.	5470.000	PK	48.30	31.89	16.24	36.91	2.28	61.80	-33.43	-27.00	6.4	185	262	

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

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

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

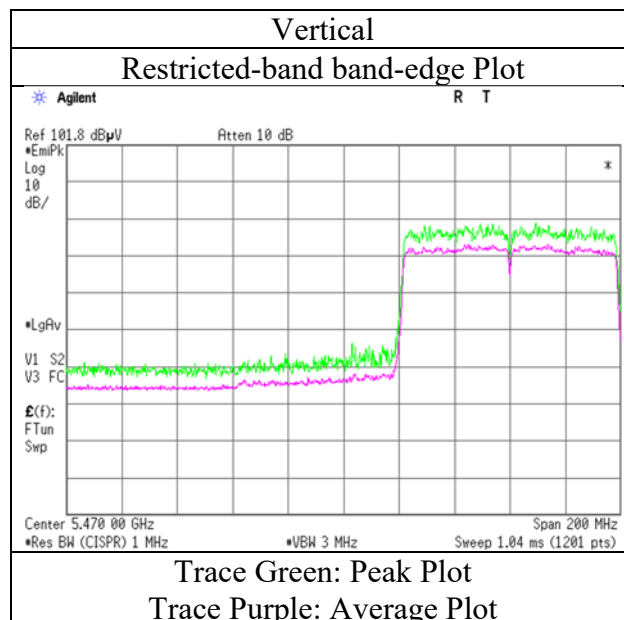
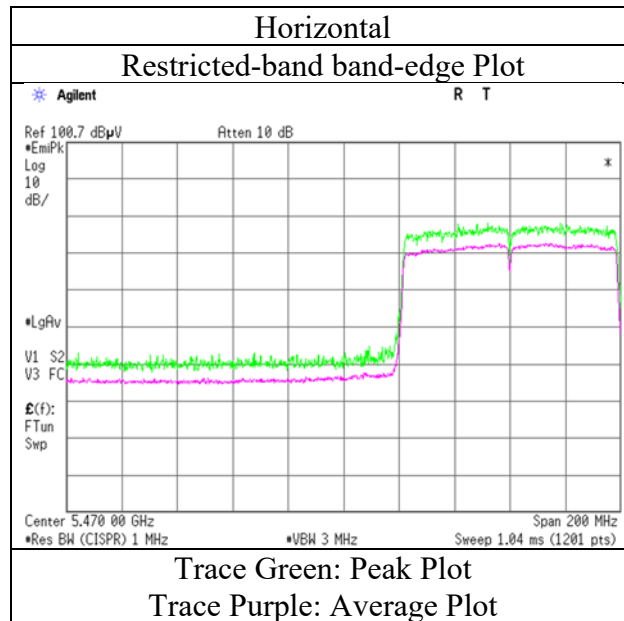
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.9\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 20, 2018
Temperature / Humidity	26 deg. C / 63 % RH
Engineer	Yosuke Ishikawa
	(1 GHz -6.4 GHz)
Mode	Tx 11ac-80, MIMO, 5530 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date August 20, 2018
Temperature / Humidity 26 deg. C / 63 % RH
Engineer Yosuke Ishikawa
(1 GHz -6.4 GHz)
Mode Tx 11ac-80, MIMO, 5610 MHz

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5725.000	PK	44.29	32.22	16.33	36.89	2.28	58.23	-39.25	-27.00	12.3	135	335	
Vert.	5725.000	PK	43.32	32.22	16.33	36.89	2.28	57.26	-40.22	-27.00	13.2	145	264	

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

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

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

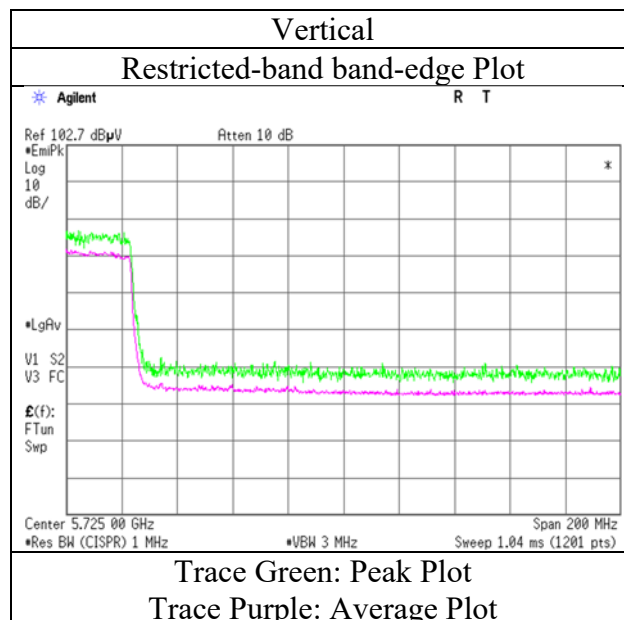
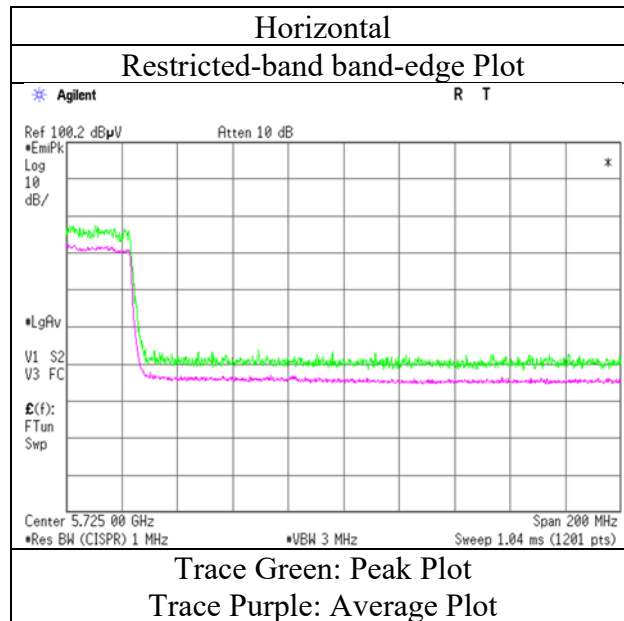
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (3.9 m / 3.0 m) = 2.28 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 20, 2018
Temperature / Humidity	26 deg. C / 63 % RH
Engineer	Yosuke Ishikawa
	(1 GHz -6.4 GHz)
Mode	Tx 11ac-80, MIMO, 5610 MHz



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

Radiated Spurious Emission

Report No. 12423101S-E
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date August 20, 2018
Temperature / Humidity 26 deg. C / 63 % RH
Engineer Yosuke Ishikawa
(1 GHz -6.4 GHz)
Mode Tx 11ac-80, MIMO, 5775 MHz

(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.	5650.000	PK	43.36	32.03	16.30	36.90	2.28	57.07	-38.16	-27.00	11.2	100	340	
Hori.	5700.000	PK	45.28	32.12	16.31	36.89	2.28	59.10	-36.13	10.00	46.1	100	340	
Hori.	5720.000	PK	45.88	32.20	16.33	36.89	2.28	59.80	-35.43	15.60	51.0	100	340	
Hori.	5725.000	PK	46.38	32.22	16.33	36.89	2.28	60.32	-34.91	27.00	61.9	100	340	
Hori.	5850.000	PK	45.37	32.61	16.39	36.88	2.28	59.77	-35.46	27.00	62.5	100	340	
Hori.	5855.000	PK	44.55	32.62	16.39	36.87	2.28	58.97	-36.26	15.60	51.9	100	340	
Hori.	5875.000	PK	43.61	32.65	16.40	36.87	2.28	58.07	-37.16	10.00	47.2	100	340	
Hori.	5925.000	PK	43.43	32.66	16.43	36.87	2.28	57.93	-37.30	-27.00	10.3	100	340	
Vert.	5650.000	PK	44.39	32.03	16.30	36.90	2.28	58.10	-37.13	-27.00	10.1	205	270	
Vert.	5700.000	PK	45.87	32.12	16.31	36.89	2.28	59.69	-35.54	10.00	45.5	205	270	
Vert.	5709.920	PK	45.50	32.16	16.33	36.89	2.28	59.38	-35.85	12.78	48.6	205	270	
Vert.	5720.000	PK	46.10	32.20	16.33	36.89	2.28	60.02	-35.21	15.60	50.8	205	270	
Vert.	5725.000	PK	46.61	32.22	16.33	36.89	2.28	60.55	-34.68	27.00	61.7	205	270	
Vert.	5850.000	PK	45.23	32.61	16.39	36.88	2.28	59.63	-35.60	27.00	62.6	205	270	
Vert.	5855.000	PK	44.20	32.62	16.39	36.87	2.28	58.62	-36.61	15.60	52.2	205	270	
Vert.	5875.000	PK	43.95	32.65	16.40	36.87	2.28	58.41	-36.82	10.00	46.8	205	270	
Vert.	5925.000	PK	44.09	32.66	16.43	36.87	2.28	58.59	-36.64	-27.00	9.6	205	270	

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

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

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

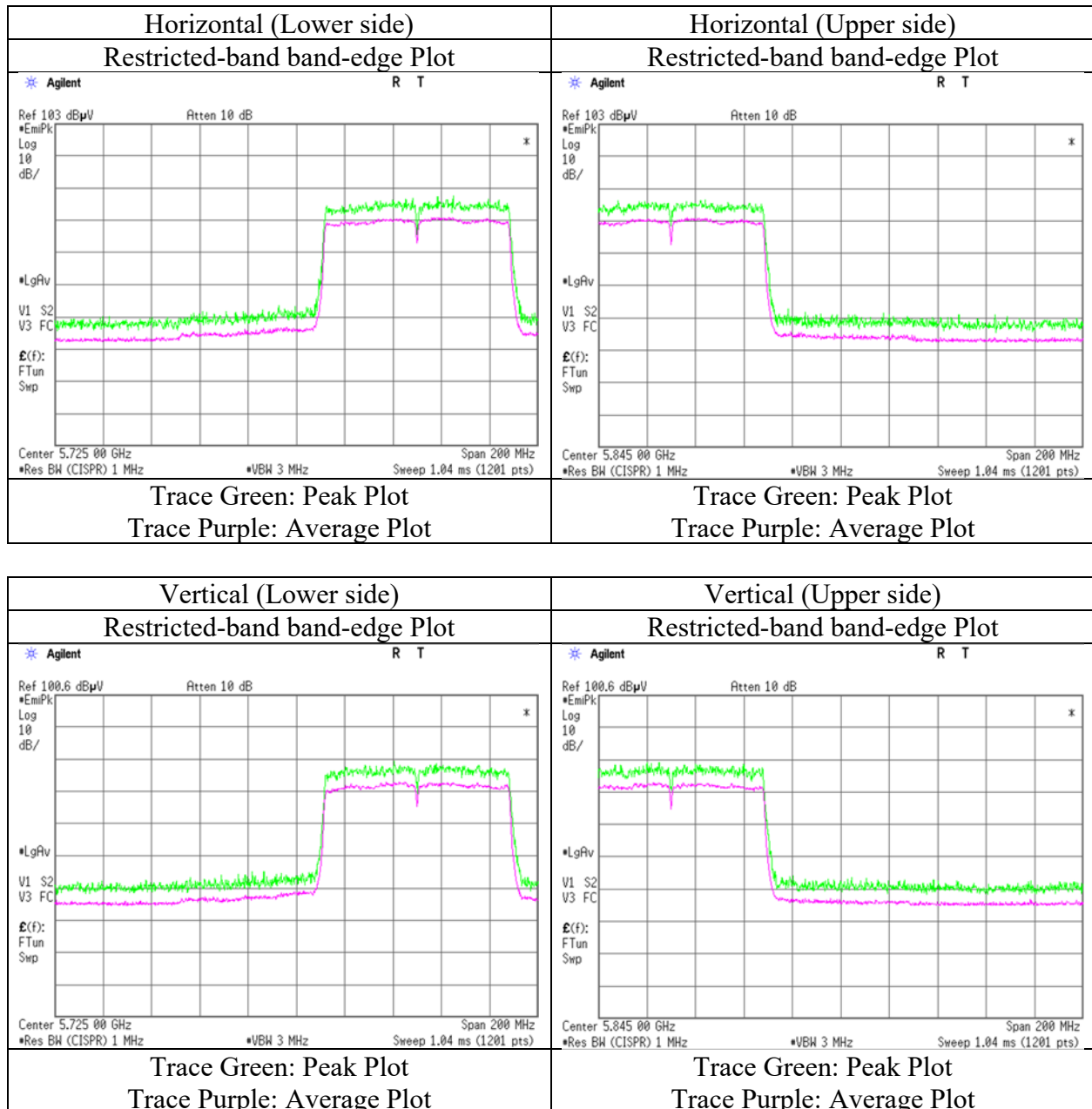
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (3.9 m/ 3.0 m) = 2.28 dB

13 GHz - 40 GHz : 20log (1.0 m/ 3.0 m) = -9.54 dB

Radiated Spurious Emission

Report No.	12423101S-E
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	August 20, 2018
Temperature / Humidity	26 deg. C / 63 % RH
Engineer	Yosuke Ishikawa
	(1 GHz -6.4 GHz)
Mode	Tx 11ac-80, MIMO, 5775 MHz

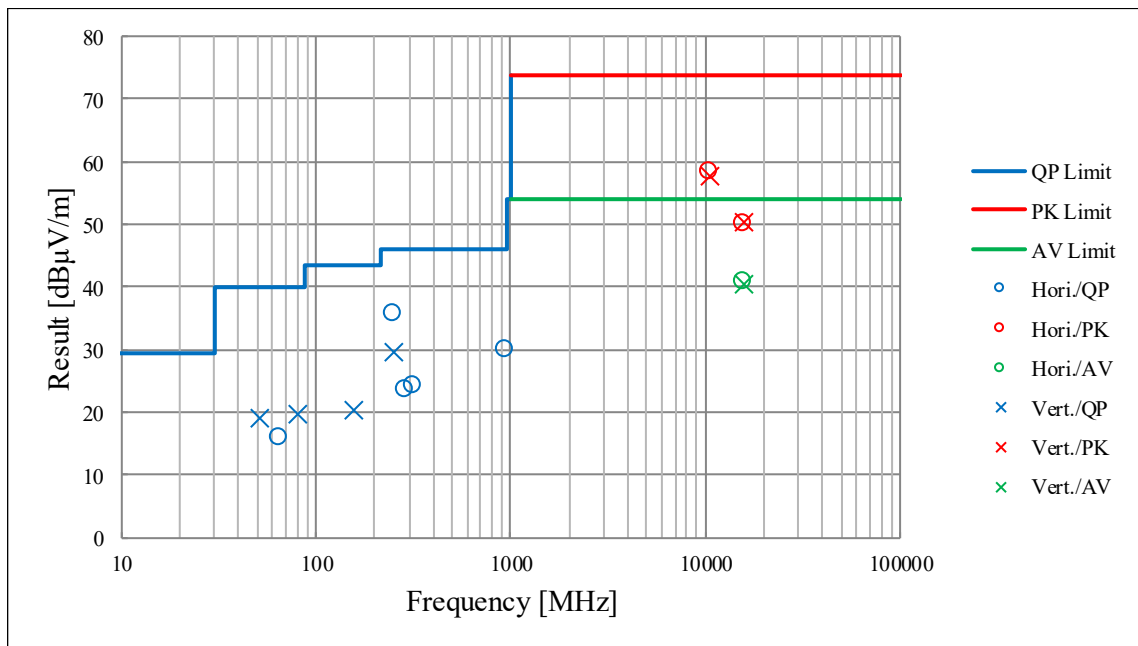


* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	12423101S-E				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	2	2	2	1	3
Date	August 20, 2018	August 21, 2018	August 22, 2018	August 24, 2018	August 3, 2018
Temperature / Humidity	26 deg. C / 63 % RH	24 deg. C / 67 % RH	23 deg. C / 66 % RH	23 deg. C / 67 % RH	27 deg. C / 48 % RH
Engineer	Yosuke Ishikawa	Yosuke Ishikawa	Yosuke Ishikawa	Yosuke Ishikawa	Tatsuya Arai
	(1 GHz – 6.4 GHz)	(6.4 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 26 GHz)	(26 GHz – 40 GHz)

Semi Anechoic Chamber	2
Date	August 26, 2018
Temperature / Humidity	24 deg. C / 63 % RH
Engineer	Makoto Hosaka
	(30 MHz - 1000 MHz)
Mode	Tx 11ac-20, SISO, 5260 MHz



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

APPENDIX 2: Test instruments

Test Instruments (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2018/02/15 * 12
SCC-G43	Coaxial Cable	HUBER+SUHNER	SUCOFLEX_10 4 E	SN MY 13406/4E	RE	2018/07/10 * 12
SCC-G40	Coaxial Cable	Junkosha	MWX221- 01000NFSNMS/ B	1612S005	RE	2018/01/29 * 12
SCC-G44	Coaxial Cable	HUBER+SUHNER	SUCOFLEX 104	800070/4A	RE	2018/03/28 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2018/07/23 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2017/10/30 * 12
STR-07	Test Receiver	Rohde & Schwarz	ESU26	100484	RE	2017/09/26 * 12
SJM-09	Measure	PROMART	SEN1935	-	RE	-
SAEC-02(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-02(SVSWR)	2	RE	2018/07/15 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI, MF)	-	RE	
STS-02	Digital Hitester	Hioki	3805-50	080997819	RE	2018/03/08 * 12
SAT10-05	Attenuator(above 1 GHz)	Agilent	8493C-010	74864	RE	2017/11/22 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2017/11/22 * 12
SFL-03	Highpass Filter	MICRO-TRONICS	HPM50112	028	RE	2017/11/16 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2017/10/10 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2018/03/05 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2018/06/02 * 12
STR-08	Test Receiver	Rohde & Schwarz	ESW44	101581	RE	2017/11/24 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM9861	RE	2018/07/23 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2018/03/27 * 12
SHA-06	Horn Antenna	ETS LINDGREN	3160-10	LM3459	RE	2018/07/23 * 12
SAF-10	Pre Amplifier	TOYO Corporation	HAP26-40W	00000010	RE	2018/03/27 * 12
SCC-G33	Coaxial Cable	Junkosha	MWX241- 01000KMSKMS	-	RE	2018/04/20 * 12
SCC-G45	Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102 E	800137/2EA	RE	2018/03/28 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2017/10/30 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE	2017/10/16 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE,CE,RFI, AT	2018/03/05 * 12
SCC-G06	Coaxial Cable	Junkosha	J12J102207-00	MAY-23-16-091	RE	2018/06/01 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2018/07/23 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2018/05/11 * 12

Test Instruments (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAEC-03(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2018/07/17 * 12
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2018/05/29 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2018/06/26 * 12
SCC-G05	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	RE	2018/01/29 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2018/05/11 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2018/07/23 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2017/10/30 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2018/04/13 * 12
KJM-09	Measure	KOMELON	KMC-36	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI, MF)	-	RE	-
STS-01	Digital Hitester	Hioki	3805-50	080997812	RE	2017/10/16 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM9861	RE	2018/07/23 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2018/03/27 * 12
SCC-G45	Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102 E	800137/2EA	RE	2018/03/28 * 12
SCC-G33	Coaxial Cable	Junkosha	MWX241-01000KMSKMS	-	RE	2018/04/20 * 12
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2018/04/20 * 12

*Hyphens for Last Calibration Date, Calibration Due Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

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

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

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

Test item:

RE: Radiated Emission

UL Japan, Inc.

Shonan EMC Lab.

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

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