



RADIO TEST REPORT

Test Report No. : 12751051S-K-R2

Applicant : Canon Inc.
Type of Equipment : Wireless LAN Module
Model No. : K30374
FCC ID : AZDK30374
Test regulation : **FCC Part 15 Subpart E: 2018**
For Permissive Change
(Radiated Spurious Emission, Conducted Spurious Emission and
Maximum Conducted Output Power)
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.
10. This report is a revised version of 12751051S-K-R1. 12751051S-K-R1 is replaced with this report.

Date of test: March 15 to April 24, 2019

Representative test engineer: *K. Takeyama*
Kazutaka Takeyama
Engineer
Consumer Technology Division

Approved by: *S. Takano*
Shinichi Takano
Engineer
Consumer Technology Division



CERTIFICATE 1266.03

- 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 : Canon Inc.
Address : 3-451 Tsukakoshi, Saiwai-ku, Kawasaki, kanagawa 212-8530 Japan
Telephone Number : +81-3-3758-2111
Contact Person : Hiroyuki Saito

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 : Wireless LAN Module
Model No. : K30374
Serial No. : Refer to SECTION 4.2
Rating : DC 3.3 V
Receipt Date of Sample : March 6, 2019
(Information from test lab.)
Country of Mass-production : Thailand
Condition of EUT : Engineering 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: K30374 (referred to as the EUT in this report) is a Wireless LAN Module.

Radio Specification

Type of radio	IEEE802.11b	IEEE802.11g	IEEE802.11a	IEEE802.11n (20 M band)	IEEE802.11n (40 M band)
Frequency of operation	2412 MHz - 2462 MHz	2412 MHz - 2462 MHz	5180 MHz -5320 MHz 5500 MHz -5700 MHz 5745 MHz -5825 MHz	2412 MHz -2462 MHz 5180 MHz -5320 MHz 5500 MHz -5700 MHz 5745 MHz -5825 MHz	2422 MHz -2452 MHz 5190 MHz -5310 MHz 5510 MHz -5670 MHz 5755 MHz -5795 MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)		
Channel spacing	5 MHz		20 MHz	<u>2.4 GHz band</u> 5 MHz <u>5 GHz band</u> 20 MHz	<u>2.4 GHz band</u> 5 MHz <u>5 GHz band</u> 40 MHz
Radio Type	Transceiver				
Antenna Gain	-1.69 dBi (2.4 GHz), -3.73 dBi (5 GHz) (In (W52,W53)) -2.22 dBi (5 GHz) (Out (W56))				
Antenna type / connector type	Inverted-L antenna / Connector : U.FL				
Clock frequency	40 MHz				

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E
FCC Part 15 final revised on March 12, 2018 and effective April 11, 2018

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

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Maximum Conducted Output Power	FCC: KDB Publication Number 789033	FCC: 15.407 (a) (1) (2) (3)	See data	Complied a)	Conducted
	IC: -	IC: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1			
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 789033	FCC: 15.407 (b), 15.205 and 15.209	4.9 dB 5470.000 MHz, PK, Horizontal, Tx 11n-40 5510MHz	Complied b) /c)	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
	IC: -	IC: RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2			
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 Maximum Conducted Output Power) b) Refer to APPENDIX 1 (data of Radiated Spurious Emission) c) Refer to APPENDIX 1 (data of Conducted 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)

The host device provides stable voltage constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

The antenna is not removable from the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.3 Addition to standard

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

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3.4 Uncertainty

EMI

There is no applicable rule of uncertainty in this applied standard. Therefore, the following 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 $k=2$.
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Item	Frequency range	Uncertainty (+/-)		
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR
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-13 GHz	5.4 dB	5.4 dB	5.4 dB
Radiated emission (Measurement distance: 1 m)	13 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

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.95 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.21 dB
Spurious emission (Conducted) below 1GHz	1.8 dB

3.5 Test Location

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A2LA Certificate Number: 1266.03

FCC Test Firm Registration Number: 626366

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

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

Mode	Remarks*
IEEE 802.11a (11a)	54 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 7, PN9
IEEE 802.11n 40 MHz BW (11n-40)	MCS 0, PN9
*Transmitting duty was 100 % on all tests. *The worst condition was determined based on the test result of RF Output power (Test report 11259492S-C-R2).	
*Power of the EUT was set by the software as follows; Power settings: 10 dBm Software: DutApiBRIDGEETH8782.exe, Ver.1.0.7.32 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

*The details of Operation mode(s)

Test Item	Operating Mode	Tested Frequency			
		Lower Band	Middle Band	Additional Band	Upper Band
Maximum Conducted Output Power *1)	11a Tx	5180 MHz 5220 MHz 5240 MHz	-	5500 MHz 5580 MHz 5700 MHz	-
	11n-20 Tx	-	5260 MHz 5300 MHz 5320 MHz	-	5745 MHz 5785 MHz 5825 MHz
Radiated Spurious Emission (Below 1 GHz)	11n-20 Tx *2)	-	-	-	5825 MHz
Radiated Spurious Emission (Above 1 GHz)	11a Tx *3)	5180 MHz	5320 MHz	5500 MHz 5700 MHz	5745 MHz 5825 MHz
	11n-20 Tx	5180 MHz 5240 MHz	5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx	5190 MHz 5230 MHz	5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
*1) The worst condition was determined based on the test result of RF Output power (Refer to Test Report 11259492S-C-R2). *2) The mode was tested as a representative, because it had the highest power at antenna terminal test. (Refer to Test Report 11259492S-C-R2) *3) There were carried out only Band edge.					

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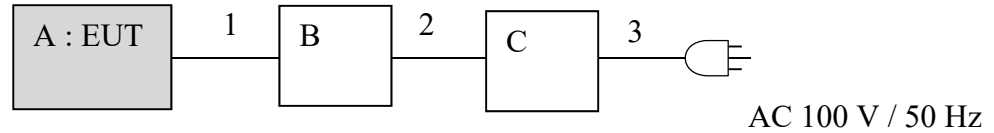
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4.2 Configuration and peripherals



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

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless LAN Module	K30374	1 *1) 2 *2)	Canon	EUT
B	WLAN JOINT PCB	-	-	Canon	-
C	Power Supply	PAN35-10A	NA000955	KIKUSUI	-

*1) Used for Antenna Terminal conducted test

*2) Used for Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Flat	0.1	Unshielded	Unshielded	-
2	DC	2.0	Unshielded	Unshielded	-
3	AC	1.8	Unshielded	Unshielded	-

SECTION 5: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1 GHz >

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

< Above 1 GHz >

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.

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

The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

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

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

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

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

< Below 1 GHz >

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

< Above 1 GHz >

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:

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

Test Antennas are used as below;

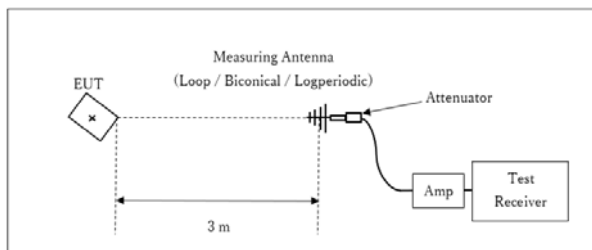
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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: 10 Hz (duty cycle ≥ 98%) Detector: Peak Trace mode : max hold

*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

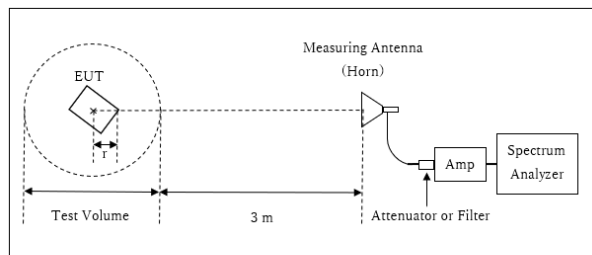
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 13 GHz



r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: $20 \times \log (3.99 \text{ m} / 3.0 \text{ m}) = 2.48 \text{ dB}$

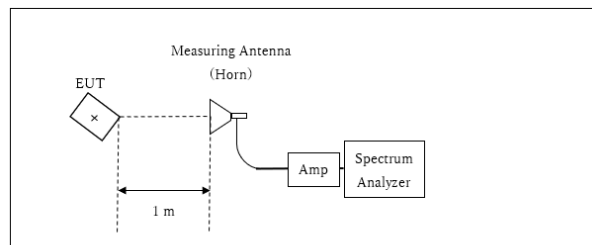
* Test Distance: $(3 + \text{Test Volume} / 2) - r = 3.99 \text{ m}$

Test Volume : 2.0 m

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

r = 0.01 m

13 GHz - 40 GHz



× : Center of turn table

Distance Factor: $20 \times \log (1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

*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.

Worst case:

Antenna polarization	Carrier (Band edge)	Spurious				
		Below 1 GHz	Above 1 GHz			
			1 GHz - 6.5 GHz	6.5 GHz - 13 GHz	13 GHz - 18 GHz	18 GHz - 40 GHz
Horizontal	Y	X	Y	Z	Z	X
Vertical	Y	X	Y	X	Y	X

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

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

SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 50 MHz BW)
Conducted Spurious Emission*1)	9 kHz – 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz – 30 MHz	10 kHz	30 Hz				

* 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".

*1) In the frequency range below 30 MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 10 kHz)

The test results and limit are rounded off to two decimals place, so some differences might be observed. The equipment and cables were not used for factor 0 dB of the data sheets.

Test data : **APPENDIX**
Test result : **Pass**

APPENDIX 1: Test data

Maximum Conducted Output Power

Report No. 12751051S-K-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date April 24, 2019
Temperature / Humidity 26 deg. C / 46 % RH
Engineer Hiromasa Sato
Mode Tx 11a, 11n-20

11a

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]		
5180	-2.60	2.86	9.83	0.00	-3.7	-	16.997	10.09	10.21	23.97	13.88	6.39	4.36	29.97	23.58
5220	-2.83	2.86	9.83	0.00	-3.7	-	16.973	9.86	9.68	23.97	14.11	6.16	4.13	29.97	23.81
5240	-2.58	2.86	9.83	0.00	-3.7	-	16.920	10.11	10.26	23.97	13.86	6.41	4.38	29.97	23.56
5500	-2.92	2.97	9.79	0.00	-2.2	19.616	17.004	9.84	9.64	23.92	14.08	7.64	5.81	29.97	22.33
5580	-2.94	2.98	9.78	0.00	-2.2	19.448	17.006	9.82	9.59	23.88	14.06	7.62	5.78	29.97	22.35
5700	-2.73	3.00	9.75	0.00	-2.2	19.405	16.991	10.02	10.05	23.87	13.85	7.82	6.05	29.97	22.15

Sample Calculation:

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

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

11n-20

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]		
5260	-2.57	2.86	9.82	0.00	-3.7	20.158	18.078	10.11	10.26	23.97	13.86	6.41	4.38	29.97	23.56
5300	-2.62	2.86	9.82	0.00	-3.7	20.358	18.154	10.06	10.14	23.97	13.91	6.36	4.33	29.97	23.61
5320	-2.73	2.86	9.82	0.00	-3.7	20.089	18.107	9.95	9.89	23.97	14.02	6.25	4.22	29.97	23.72
5745	-2.70	3.05	9.75	0.00	-2.2	-	-	10.10	10.23	30.00	19.90	7.90	6.17	36.00	28.10
5785	-2.45	3.06	9.74	0.00	-2.2	-	-	10.35	10.84	30.00	19.65	8.15	6.53	36.00	27.85
5825	-2.20	3.07	9.73	0.00	-2.2	-	-	10.60	11.48	30.00	19.40	8.40	6.92	36.00	27.60

Sample Calculation:

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

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11a 5180 MHz

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5150.000	PK	47.21	32.17	16.23	39.58	2.48	58.51	73.90	15.3	242	115	
Hori.	5150.000	AV	34.39	32.17	16.23	39.58	2.48	45.69	53.90	8.2	242	115	VBW:10Hz
Vert.	5150.000	PK	46.45	32.17	16.23	39.58	2.48	57.75	73.90	16.1	110	337	
Vert.	5150.000	AV	34.26	32.17	16.23	39.58	2.48	45.56	53.90	8.3	110	337	VBW:10Hz

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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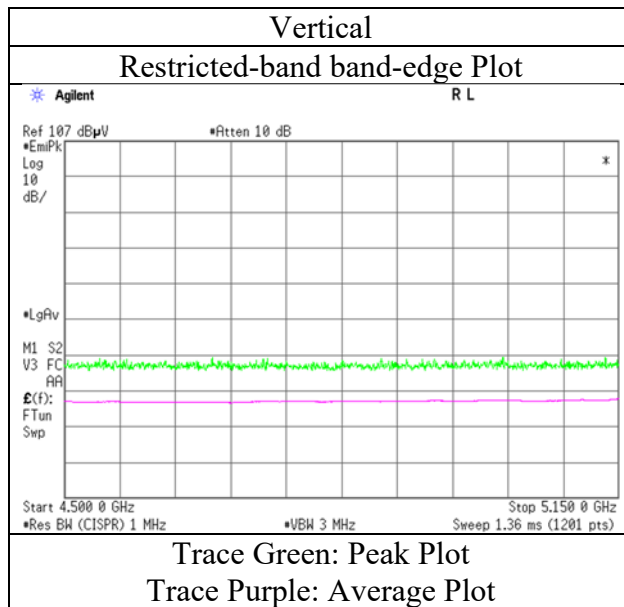
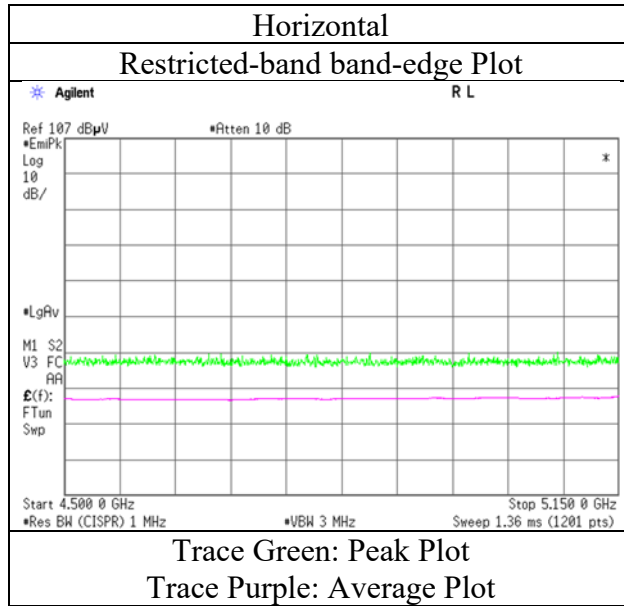
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11a 5180 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11a 5320 MHz

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5350.000	PK	47.05	31.59	16.31	39.68	2.48	57.75	73.90	16.1	209	116	
Hori.	5350.000	AV	34.91	31.59	16.31	39.68	2.48	45.61	53.90	8.2	209	116	VBW:10Hz
Vert.	5350.000	PK	47.65	31.59	16.31	39.68	2.48	58.35	73.90	15.5	106	332	
Vert.	5350.000	AV	34.88	31.59	16.31	39.68	2.48	45.58	53.90	8.3	106	332	VBW:10Hz

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99 \text{ m} / 3.0 \text{ m}) = 2.48 \text{ dB}$
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

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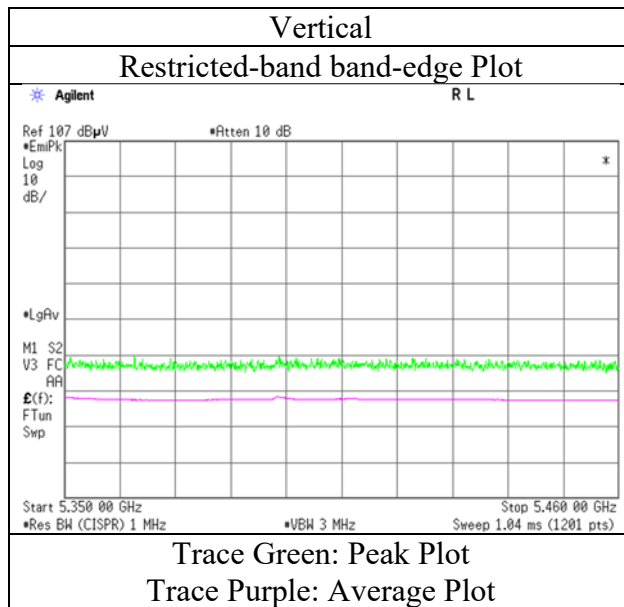
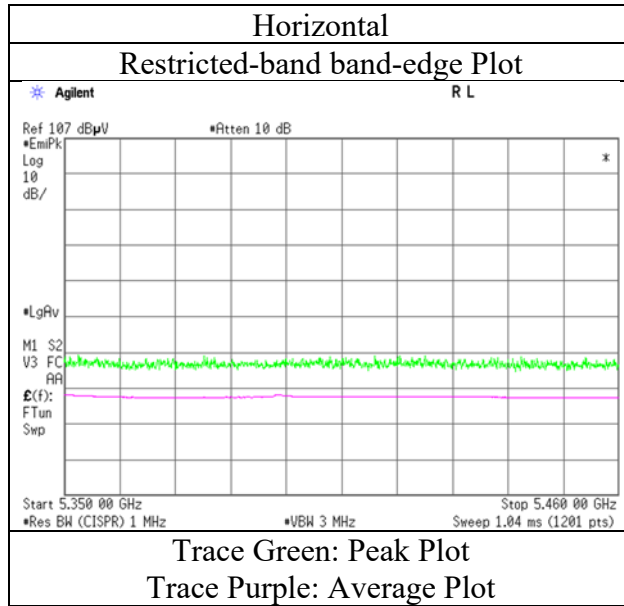
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Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11a 5320 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11a 5500 MHz

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5460.000	PK	46.32	31.91	16.34	39.73	2.48	57.32	73.90	16.5	213	120	VBW:10Hz
Hori.	5460.000	AV	34.05	31.91	16.34	39.73	2.48	45.05	53.90	8.8	213	120	
Vert.	5460.000	PK	46.12	31.91	16.34	39.73	2.48	57.12	73.90	16.7	146	357	VBW:10Hz
Vert.	5460.000	AV	33.99	31.91	16.34	39.73	2.48	44.99	53.90	8.9	146	357	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$
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	46.76	31.89	16.35	39.74	2.48	57.74	-37.48	-27.00	10.4	213	120	
Vert.	5470.000	PK	46.94	31.89	16.35	39.74	2.48	57.92	-37.30	-27.00	10.3	146	357	

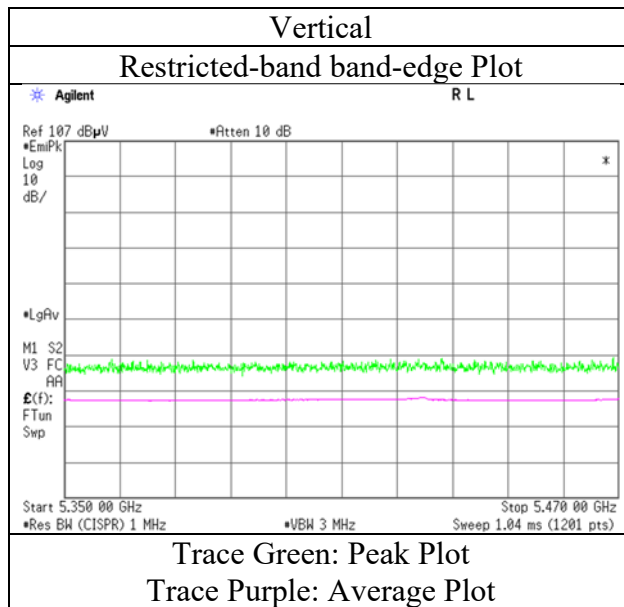
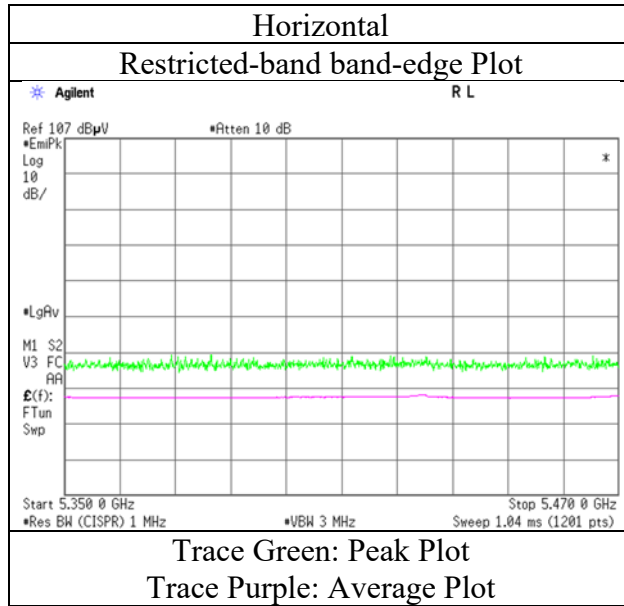
Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11a 5500 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11a 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	48.55	32.22	16.53	39.88	2.48	59.90	-35.32	-27.00	8.3	256	123	
Vert.	5725.000	PK	50.03	32.22	16.53	39.88	2.48	61.38	-33.84	-27.00	6.8	138	358	

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)

Distance factor : 1 GHz - 13 GHz: 20log (3.99 m / 3.0 m) = 2.48 dB
13 GHz - 40 GHz: 20log (1.0 m / 3.0 m) = -9.54 dB

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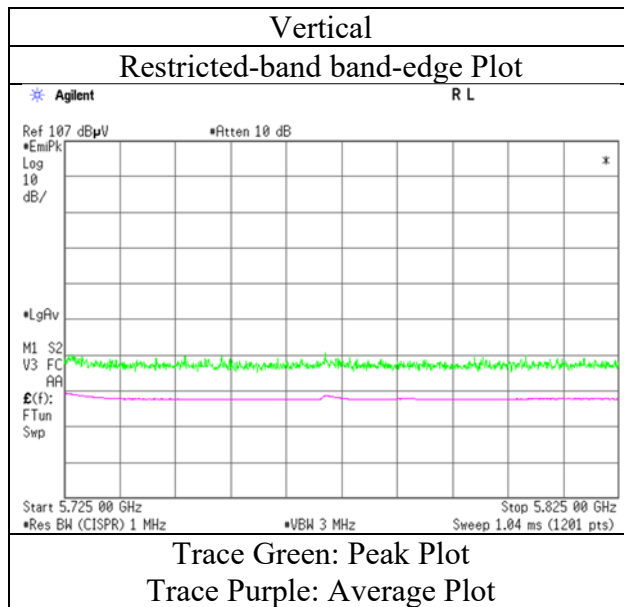
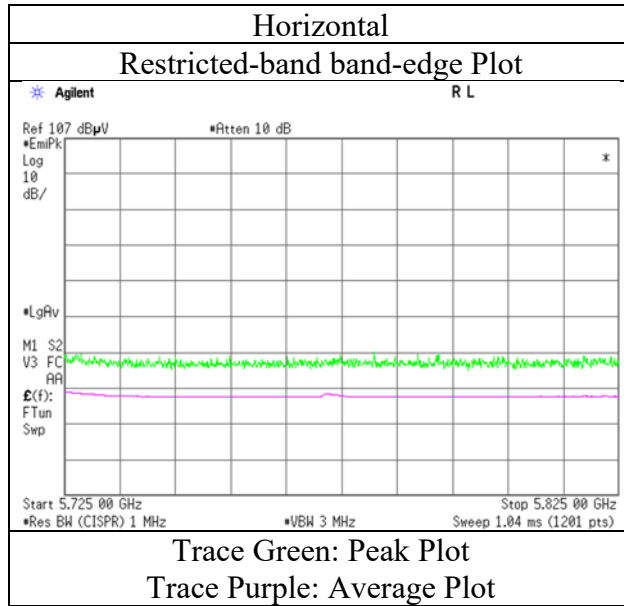
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Radiated Spurious Emission

Report No.	12751051S-K-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	March 28, 2019
Temperature / Humidity	20 deg. C / 33 % RH
Engineer	Kazutaka Takeyama (1 GHz – 6.5 GHz)
Mode	Tx 11a 5700 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
 Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11a 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	46.05	32.03	16.48	39.83	2.48	57.21	-38.01	-27.00	11.0	297	122	
Hori.	5700.000	PK	46.68	32.12	16.52	39.86	2.48	57.94	-37.28	10.00	47.2	297	122	
Hori.	5720.000	PK	51.46	32.20	16.53	39.87	2.48	62.80	-32.42	15.60	48.0	297	122	
Hori.	5725.000	PK	55.27	32.22	16.53	39.88	2.48	66.62	-28.60	27.00	55.6	297	122	
Vert.	5650.000	PK	47.10	32.03	16.48	39.83	2.48	58.26	-36.96	-27.00	9.9	105	357	
Vert.	5700.000	PK	46.94	32.12	16.52	39.86	2.48	58.20	-37.02	10.00	47.0	105	357	
Vert.	5720.000	PK	56.22	32.20	16.53	39.87	2.48	67.56	-27.66	15.60	43.2	105	357	
Vert.	5725.000	PK	56.61	32.22	16.53	39.88	2.48	67.96	-27.26	27.00	54.2	105	357	

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)

Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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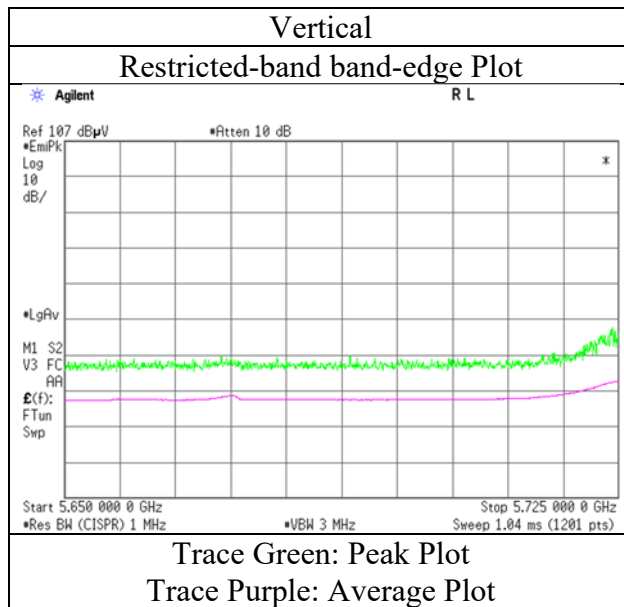
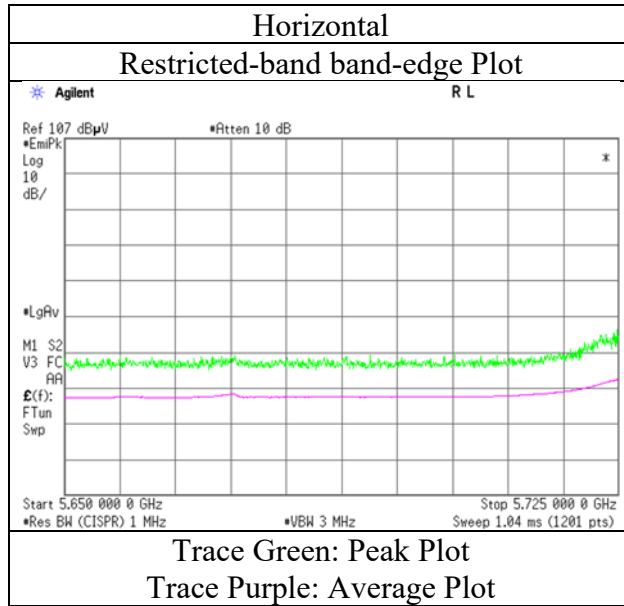
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11a 5745 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11a 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	48.87	32.61	16.64	39.95	2.48	60.65	-34.57	27.00	61.5	257	124	
Hori.	5855.000	PK	46.11	32.62	16.64	39.95	2.48	57.90	-37.32	15.60	52.9	257	124	
Hori.	5875.000	PK	46.64	32.65	16.65	39.96	2.48	58.46	-36.76	10.00	46.7	257	124	
Hori.	5925.000	PK	46.45	32.66	16.69	39.99	2.48	58.29	-36.93	-27.00	9.9	257	124	
Vert.	5850.000	PK	49.60	32.61	16.64	39.95	2.48	61.38	-33.84	27.00	60.8	101	359	
Vert.	5855.000	PK	47.81	32.62	16.64	39.95	2.48	59.60	-35.62	15.60	51.2	101	359	
Vert.	5875.000	PK	46.05	32.65	16.65	39.96	2.48	57.87	-37.35	10.00	47.3	101	359	
Vert.	5925.000	PK	46.42	32.66	16.69	39.99	2.48	58.26	-36.96	-27.00	9.9	101	359	

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)

Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

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

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Shonan EMC Lab.

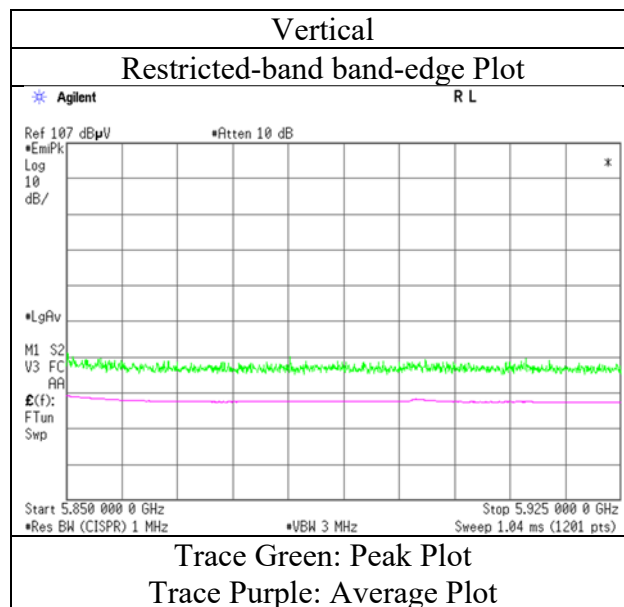
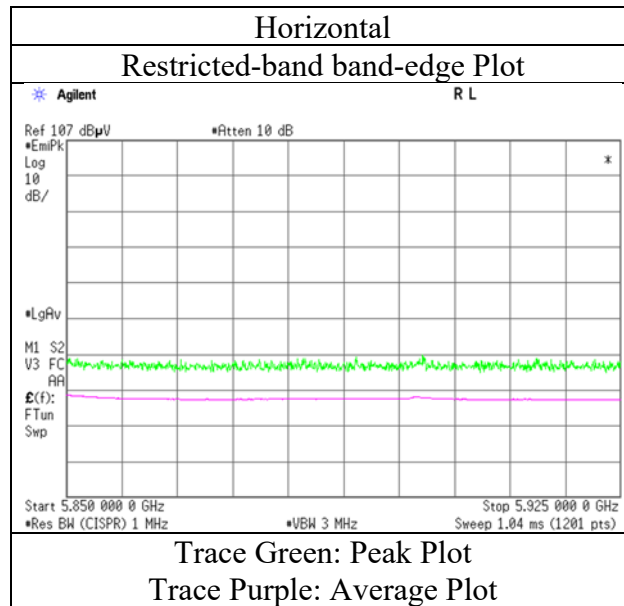
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11a 5825 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-20 5180 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5150.000	PK	47.12	32.17	16.23	39.58	2.48	58.42	73.90	15.4	267	118	
Hori.	6906.633	PK	47.35	35.26	7.86	39.32	2.48	53.63	73.90	20.2	172	202	
Hori.	10360.000	PK	46.25	39.46	9.25	39.62	2.48	57.82	73.90	16.0	173	233	
Hori.	15540.000	PK	43.82	38.48	11.47	38.78	-9.54	45.45	73.90	28.4	150	0	
Hori.	5150.000	AV	32.96	32.17	16.23	39.58	2.48	44.26	53.90	9.6	267	118	VBW:10Hz
Hori.	6906.633	AV	37.65	35.26	7.86	39.32	2.48	43.93	53.90	9.9	172	202	VBW:10Hz
Hori.	10360.000	AV	33.35	39.46	9.25	39.62	2.48	44.92	53.90	8.9	173	233	VBW:10Hz
Hori.	15540.000	AV	31.54	38.48	11.47	38.78	-9.54	33.17	53.90	20.7	150	0	VBW:10Hz
Vert.	5150.000	PK	47.65	32.17	16.23	39.58	2.48	58.95	73.90	14.9	138	302	
Vert.	6906.279	PK	46.80	35.25	7.86	39.32	2.48	53.07	73.90	20.8	120	100	
Vert.	10360.000	PK	45.56	39.46	9.25	39.62	2.48	57.13	73.90	16.7	152	218	
Vert.	15540.000	PK	44.21	38.48	11.47	38.78	-9.54	45.84	73.90	28.0	150	0	
Vert.	5150.000	AV	34.38	32.17	16.23	39.58	2.48	45.68	53.90	8.2	138	302	VBW:10Hz
Vert.	6906.279	AV	35.76	35.25	7.86	39.32	2.48	42.03	53.90	11.8	120	100	VBW:10Hz
Vert.	10360.000	AV	33.02	39.46	9.25	39.62	2.48	44.59	53.90	9.3	152	218	VBW:10Hz
Vert.	15540.000	AV	32.03	38.48	11.47	38.78	-9.54	33.66	53.90	20.2	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

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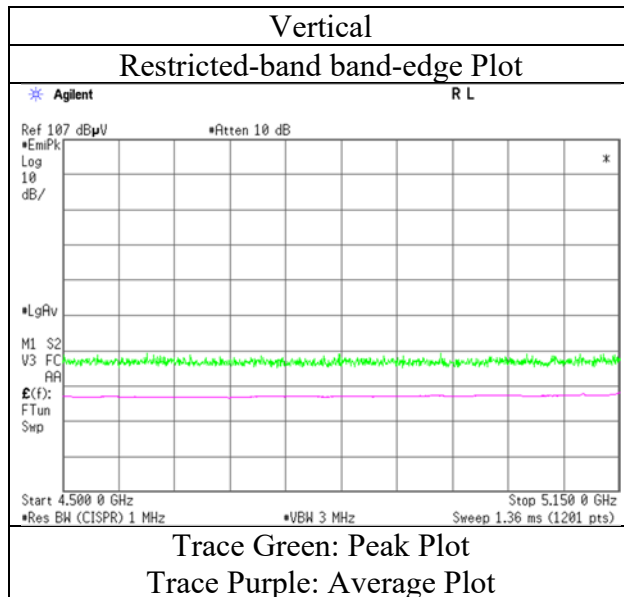
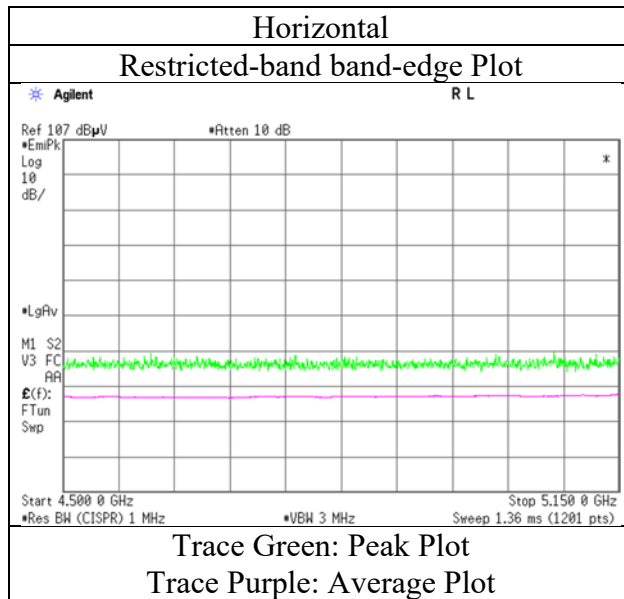
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission

Report No.	12751051S-K-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	March 28, 2019
Temperature / Humidity	20 deg. C / 33 % RH
Engineer	Kazutaka Takeyama (1 GHz – 6.5 GHz)
Mode	Tx 11n-20 5180 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
 Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-20 5240 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	6986.734	PK	47.03	36.02	7.85	39.20	2.48	54.18	73.90	19.7	102	345	
Hori.	10480.000	PK	45.57	39.75	9.25	39.75	2.48	57.30	73.90	16.6	172	225	
Hori.	15720.000	PK	43.81	38.19	11.56	39.17	-9.54	44.85	73.90	29.0	150	0	
Hori.	6986.734	AV	37.01	36.02	7.85	39.20	2.48	44.16	53.90	9.7	102	345	VBW:10Hz
Hori.	10480.000	AV	32.97	39.75	9.25	39.75	2.48	44.70	53.90	9.2	172	225	VBW:10Hz
Hori.	15720.000	AV	32.23	38.19	11.56	39.17	-9.54	33.27	53.90	20.6	150	0	VBW:10Hz
Vert.	6986.748	PK	46.37	36.02	7.85	39.20	2.48	53.52	73.90	20.3	126	95	
Vert.	10480.000	PK	45.50	39.75	9.25	39.75	2.48	57.23	73.90	16.6	171	203	
Vert.	15720.000	PK	43.93	38.19	11.56	39.17	-9.54	44.97	73.90	28.9	150	0	
Vert.	6986.748	AV	34.46	36.02	7.85	39.20	2.48	41.61	53.90	12.2	126	95	VBW:10Hz
Vert.	10480.000	AV	32.73	39.75	9.25	39.75	2.48	44.46	53.90	9.4	171	203	VBW:10Hz
Vert.	15720.000	AV	32.41	38.19	11.56	39.17	-9.54	33.45	53.90	20.4	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

UL Japan, Inc.

Shonan EMC Lab.

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Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-20 5320 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5350.000	PK	47.34	31.59	16.31	39.68	2.48	58.04	73.90	15.8	241	115	
Hori.	7093.288	PK	46.47	36.40	7.90	39.23	2.48	54.02	73.90	19.8	102	349	
Hori.	10640.000	PK	44.55	39.61	9.41	39.69	2.48	56.36	73.90	17.5	150	0	
Hori.	15960.000	PK	44.42	37.68	11.67	39.68	-9.54	44.55	73.90	29.3	150	0	
Hori.	5350.000	AV	34.92	31.59	16.31	39.68	2.48	45.62	53.90	8.2	241	115	VBW:10Hz
Hori.	7093.288	AV	36.22	36.40	7.90	39.23	2.48	43.77	53.90	10.1	102	349	VBW:10Hz
Hori.	10640.000	AV	31.86	39.61	9.41	39.69	2.48	43.67	53.90	10.2	150	0	VBW:10Hz
Hori.	15960.000	AV	32.58	37.68	11.67	39.68	-9.54	32.71	53.90	21.1	150	0	VBW:10Hz
Vert.	5350.000	PK	46.88	31.59	16.31	39.68	2.48	57.58	73.90	16.3	152	355	
Vert.	7093.256	PK	45.94	36.40	7.90	39.23	2.48	53.49	73.90	20.4	148	101	
Vert.	10640.000	PK	44.93	39.61	9.41	39.69	2.48	56.74	73.90	17.1	150	0	
Vert.	15960.000	PK	44.22	37.68	11.67	39.68	-9.54	44.35	73.90	29.5	150	0	
Vert.	5350.000	AV	34.80	31.59	16.31	39.68	2.48	45.50	53.90	8.4	152	355	VBW:10Hz
Vert.	7093.256	AV	33.62	36.40	7.90	39.23	2.48	41.17	53.90	12.7	148	101	VBW:10Hz
Vert.	10640.000	AV	31.88	39.61	9.41	39.69	2.48	43.69	53.90	10.2	150	0	VBW:10Hz
Vert.	15960.000	AV	32.64	37.68	11.67	39.68	-9.54	32.77	53.90	21.1	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

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Shonan EMC Lab.

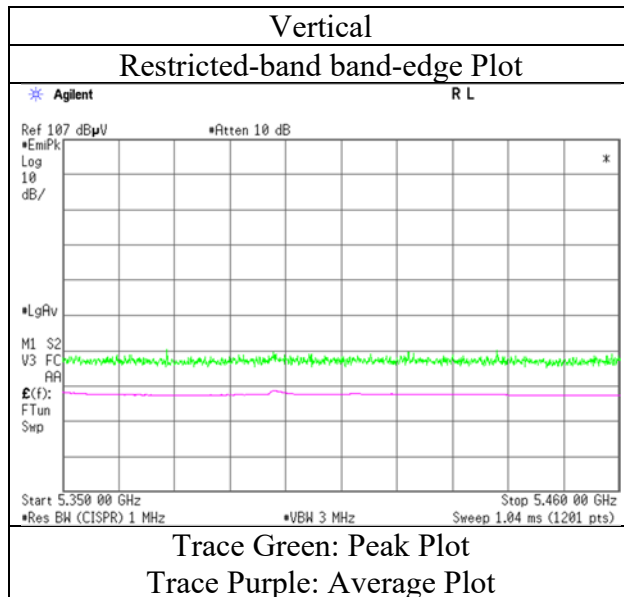
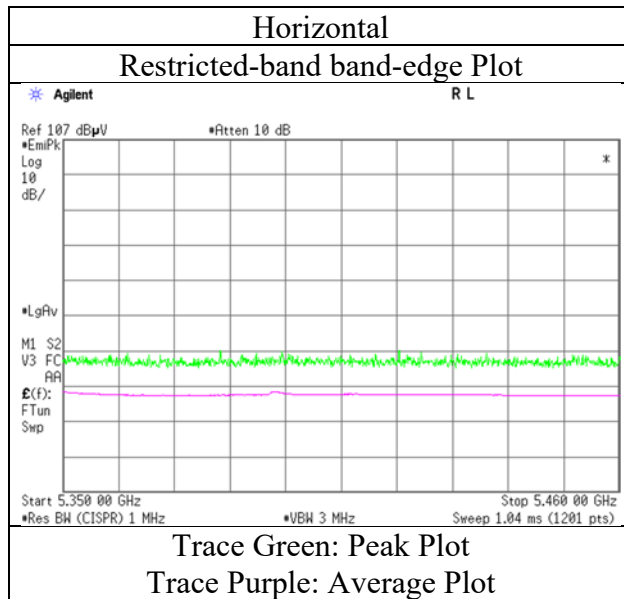
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

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Radiated Spurious Emission

Report No.	12751051S-K-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	March 28, 2019
Temperature / Humidity	20 deg. C / 33 % RH
Engineer	Kazutaka Takeyama (1 GHz – 6.5 GHz)
Mode	Tx 11n-20 5320 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
 Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 1 2 2 2
Date March 15, 2019 March 30, 2019 March 31, 2019 April 7, 2019
Temperature / Humidity 25 deg. C / 31 % RH 21 deg. C / 30 % RH 22 deg. C / 41 % RH 21 deg. C / 35 % RH
Engineer Kazuya Noda Toshinori Yamada Kazuya Noda Kazuya Noda
(1 GHz – 6.5 GHz) (6.5 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 40 GHz)
Mode Tx 11n-20 5500 MHz

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5460.000	PK	45.82	31.90	16.42	39.73	2.48	56.89	73.90	17.0	346	122	
Hori.	7333.216	PK	47.42	36.86	8.06	39.36	2.48	55.46	73.90	18.4	102	346	
Hori.	11000.000	PK	45.78	40.03	9.78	39.49	2.48	58.58	73.90	15.3	150	0	
Hori.	16500.000	PK	44.02	38.84	11.93	39.82	-9.54	45.43	73.90	28.4	150	0	
Hori.	5460.000	AV	33.92	31.90	16.42	39.73	2.48	44.99	53.90	8.9	346	122	VBW:10Hz
Hori.	7333.216	AV	35.36	36.86	8.06	39.36	2.48	43.40	53.90	10.5	102	346	VBW:10Hz
Hori.	11000.000	AV	32.77	40.03	9.78	39.49	2.48	45.57	53.90	8.3	150	0	VBW:10Hz
Hori.	16500.000	AV	32.67	38.84	11.93	39.82	-9.54	34.08	53.90	19.8	150	0	VBW:10Hz
Vert.	5460.000	PK	46.57	31.90	16.42	39.73	2.48	57.64	73.90	16.2	184	358	
Vert.	7333.223	PK	45.76	36.86	8.06	39.36	2.48	53.80	73.90	20.1	149	106	
Vert.	11000.000	PK	45.55	40.03	9.78	39.49	2.48	58.35	73.90	15.5	150	0	
Vert.	16500.000	PK	44.08	38.84	11.93	39.82	-9.54	45.49	73.90	28.4	150	0	
Vert.	5460.000	AV	33.83	31.90	16.42	39.73	2.48	44.90	53.90	9.0	184	358	VBW:10Hz
Vert.	7333.223	AV	33.55	36.86	8.06	39.36	2.48	41.59	53.90	12.3	149	106	VBW:10Hz
Vert.	11000.000	AV	32.65	40.03	9.78	39.49	2.48	45.45	53.90	8.4	150	0	VBW:10Hz
Vert.	16500.000	AV	32.73	38.84	11.93	39.82	-9.54	34.14	53.90	19.7	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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	47.34	31.89	16.41	39.74	2.48	58.38	-36.84	-27.00	9.8	346	122	
Vert.	5470.000	PK	46.92	31.89	16.41	39.74	2.48	57.96	-37.26	-27.00	10.2	184	358	

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

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

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

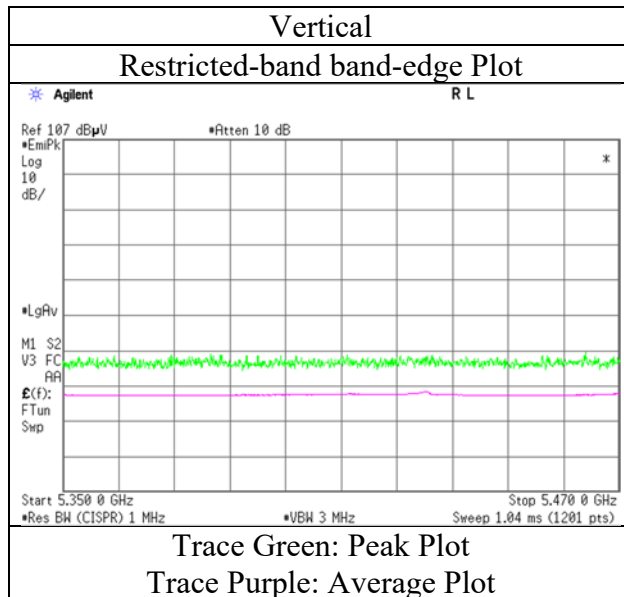
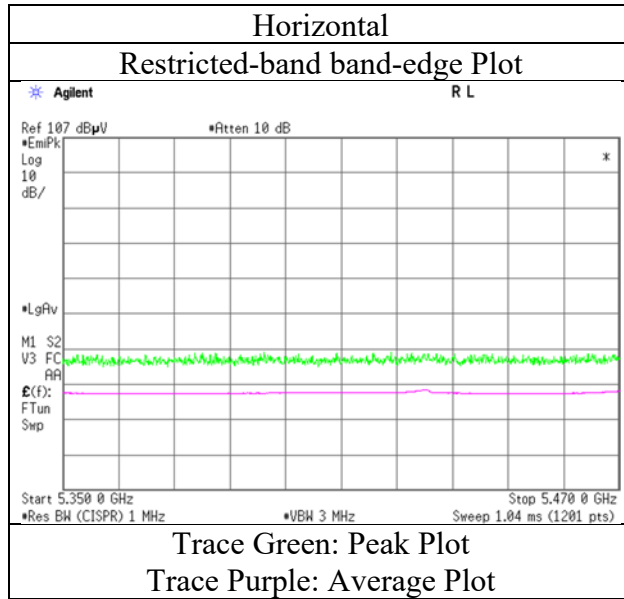
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 1
Date March 15, 2019
Temperature / Humidity 25 deg. C / 31 % RH
Engineer Kazuya Noda
(1 GHz – 6.5 GHz)
Mode Tx 11n-20 5500 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-20 5580 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7439.989	PK	46.35	36.97	8.12	39.42	2.48	54.50	73.90	19.4	381	350	
Hori.	11160.000	PK	44.80	39.77	9.78	39.42	2.48	57.41	73.90	16.4	150	0	
Hori.	16740.000	PK	43.89	39.64	12.02	39.49	-9.54	46.52	73.90	27.3	150	0	
Hori.	7439.989	AV	34.24	36.97	8.12	39.42	2.48	42.39	53.90	11.5	381	350	VBW:10Hz
Hori.	11160.000	AV	32.33	39.77	9.78	39.42	2.48	44.94	53.90	8.9	150	0	VBW:10Hz
Hori.	16740.000	AV	32.25	39.64	12.02	39.49	-9.54	34.88	53.90	19.0	150	0	VBW:10Hz
Vert.	7439.967	PK	45.10	36.97	8.12	39.42	2.48	53.25	73.90	20.6	166	106	
Vert.	11160.000	PK	45.06	39.77	9.78	39.42	2.48	57.67	73.90	16.2	150	0	
Vert.	16740.000	PK	43.93	39.64	12.02	39.49	-9.54	46.56	73.90	27.3	150	0	
Vert.	7439.967	AV	33.02	36.97	8.12	39.42	2.48	41.17	53.90	12.7	166	106	VBW:10Hz
Vert.	11160.000	AV	32.27	39.77	9.78	39.42	2.48	44.88	53.90	9.0	150	0	VBW:10Hz
Vert.	16740.000	AV	32.14	39.64	12.02	39.49	-9.54	34.77	53.90	19.1	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

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Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	1	2	2	2
Date	March 15, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	25 deg. C / 31 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazuya Noda	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-20 5700 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7600.000	PK	46.15	36.71	7.75	39.28	2.48	53.81	73.90	20.0	345	2	
Hori.	11400.000	PK	45.29	39.93	9.53	39.31	2.48	57.92	73.90	15.9	150	0	
Hori.	17100.000	PK	43.49	40.26	12.15	38.93	-9.54	47.43	73.90	26.4	150	0	
Hori.	7600.000	AV	33.87	36.71	7.75	39.28	2.48	41.53	53.90	12.3	345	2	VBW:10Hz
Hori.	11400.000	AV	32.61	39.93	9.53	39.31	2.48	45.24	53.90	8.6	150	0	VBW:10Hz
Hori.	17100.000	AV	32.02	40.26	12.15	38.93	-9.54	35.96	53.90	17.9	150	0	VBW:10Hz
Vert.	7600.001	PK	45.63	36.71	7.75	39.28	2.48	53.29	73.90	20.6	110	272	
Vert.	11400.000	PK	44.95	39.93	9.53	39.31	2.48	57.58	73.90	16.3	150	0	
Vert.	17100.000	PK	43.52	40.26	12.15	38.93	-9.54	47.46	73.90	26.4	150	0	
Vert.	7600.001	AV	33.86	36.71	7.75	39.28	2.48	41.52	53.90	12.3	110	272	VBW:10Hz
Vert.	11400.000	AV	32.69	39.93	9.53	39.31	2.48	45.32	53.90	8.5	150	0	VBW:10Hz
Vert.	17100.000	AV	32.04	40.26	12.15	38.93	-9.54	35.98	53.90	17.9	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : 20log(3.99 m / 3.0 m) = 2.48 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	51.15	32.20	16.45	39.88	2.48	62.40	-32.82	-27.00	5.8	374	134	
Vert.	5725.000	PK	51.40	32.20	16.45	39.88	2.48	62.65	-32.57	-27.00	5.5	154	355	

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(3.99 m / 3.0 m) = 2.48 dB

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

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Shonan EMC Lab.

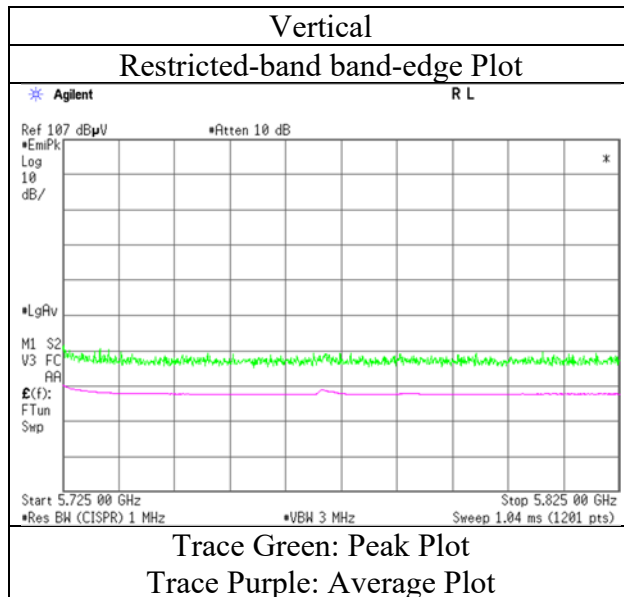
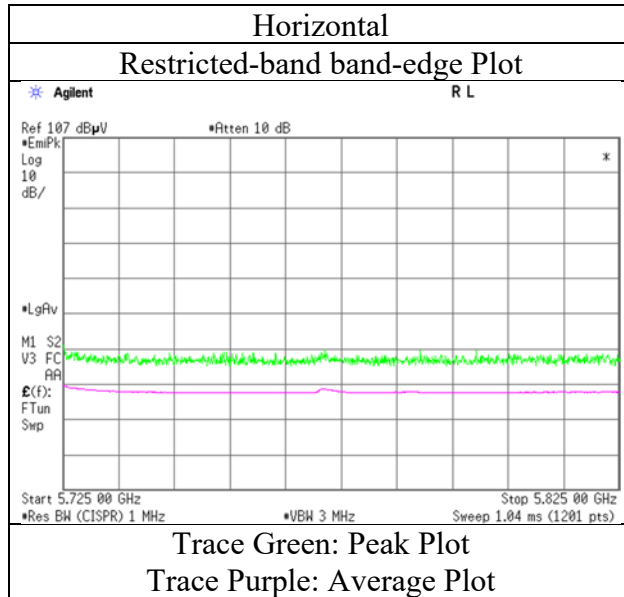
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 1
Date March 15, 2019
Temperature / Humidity 25 deg. C / 31 % RH
Engineer Kazuya Noda
(1 GHz – 6.5 GHz)
Mode Tx 11n-20 5700 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-20 5745 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7659.982	PK	45.73	36.78	8.28	39.18	2.48	54.09	73.90	19.8	350	357	
Hori.	11490.000	PK	44.49	40.00	9.79	39.27	2.48	57.49	73.90	16.4	150	0	
Hori.	17235.000	PK	42.68	40.54	12.24	38.66	-9.54	47.26	73.90	26.6	150	0	
Hori.	7659.982	AV	34.31	36.78	8.28	39.18	2.48	42.67	53.90	11.2	350	357	VBW:10Hz
Hori.	11490.000	AV	32.01	40.00	9.79	39.27	2.48	45.01	53.90	8.8	150	0	VBW:10Hz
Hori.	17235.000	AV	31.56	40.54	12.24	38.66	-9.54	36.14	53.90	17.7	150	0	VBW:10Hz
Vert.	7659.415	PK	45.22	36.78	8.28	39.18	2.48	53.58	73.90	20.3	161	269	
Vert.	11490.000	PK	44.27	40.00	9.79	39.27	2.48	57.27	73.90	16.6	150	0	
Vert.	17235.000	PK	42.79	40.54	12.24	38.66	-9.54	47.37	73.90	26.5	150	0	
Vert.	7659.415	AV	33.39	36.78	8.28	39.18	2.48	41.75	53.90	12.1	161	269	VBW:10Hz
Vert.	11490.000	AV	32.08	40.00	9.79	39.27	2.48	45.08	53.90	8.8	150	0	VBW:10Hz
Vert.	17235.000	AV	31.61	40.54	12.24	38.66	-9.54	36.19	53.90	17.7	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 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.	5650.000	PK	46.49	32.03	16.48	39.83	2.48	57.65	-37.57	-27.00	10.5	179	124	
Hori.	5700.000	PK	46.93	32.12	16.52	39.86	2.48	58.19	-37.03	10.00	47.0	179	124	
Hori.	5720.000	PK	48.64	32.20	16.53	39.87	2.48	59.98	-35.24	15.60	50.8	179	124	
Hori.	5725.000	PK	53.12	32.22	16.53	39.88	2.48	64.47	-30.75	27.00	57.7	179	124	
Vert.	5650.000	PK	46.90	32.03	16.48	39.83	2.48	58.06	-37.16	-27.00	10.1	140	359	
Vert.	5700.000	PK	46.12	32.12	16.52	39.86	2.48	57.38	-37.84	10.00	47.8	140	359	
Vert.	5720.000	PK	50.60	32.20	16.53	39.87	2.48	61.94	-33.28	15.60	48.8	140	359	
Vert.	5725.000	PK	54.32	32.22	16.53	39.88	2.48	65.67	-29.55	27.00	56.5	140	359	

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:[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 (3.99 m / 3.0 m) = 2.48 dB

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

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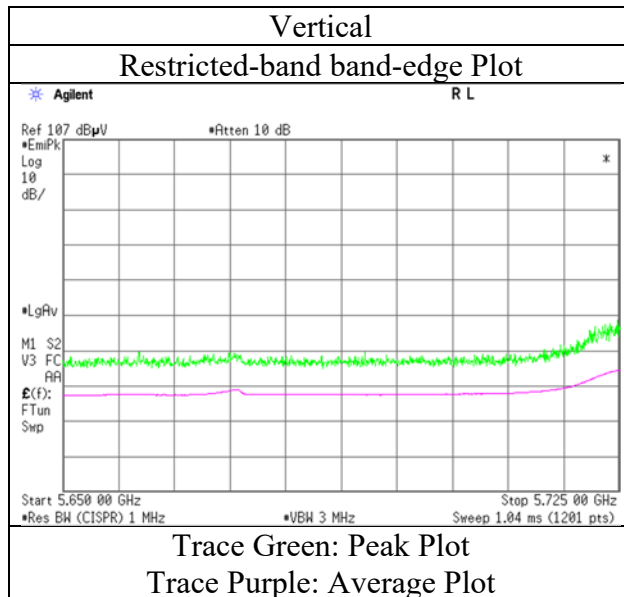
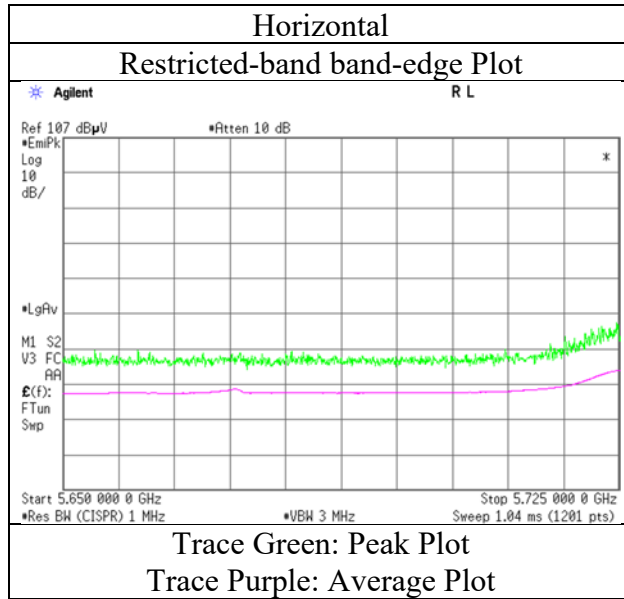
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Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11n-20 5745 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-20 5785 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7713.808	PK	45.99	36.68	8.33	39.09	2.48	54.39	73.90	19.5	356	2	
Hori.	11570.000	PK	44.13	39.97	9.83	39.21	2.48	57.20	73.90	16.7	150	0	
Hori.	17355.000	PK	42.58	41.34	12.31	38.42	-9.54	48.27	73.90	25.6	150	0	
Hori.	7713.808	AV	34.28	36.68	8.33	39.09	2.48	42.68	53.90	11.2	356	2	VBW:10Hz
Hori.	11570.000	AV	31.54	39.97	9.83	39.21	2.48	44.61	53.90	9.2	150	0	VBW:10Hz
Hori.	17355.000	AV	31.39	41.34	12.31	38.42	-9.54	37.08	53.90	16.8	150	0	VBW:10Hz
Vert.	7712.796	PK	45.66	36.68	8.32	39.09	2.48	54.05	73.90	19.8	113	261	
Vert.	11570.000	PK	43.95	39.97	9.83	39.21	2.48	57.02	73.90	16.8	150	0	
Vert.	17355.000	PK	42.87	41.34	12.31	38.42	-9.54	48.56	73.90	25.3	150	0	
Vert.	7712.796	AV	33.78	36.68	8.32	39.09	2.48	42.17	53.90	11.7	113	261	VBW:10Hz
Vert.	11570.000	AV	31.58	39.97	9.83	39.21	2.48	44.65	53.90	9.2	150	0	VBW:10Hz
Vert.	17355.000	AV	31.41	41.34	12.31	38.42	-9.54	37.10	53.90	16.8	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

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Radiated Spurious Emission

Report No.	12751051S-K-R2				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	1	2	2	2	2
Date	March 15, 2019	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	25 deg. C / 31 % RH	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazuya Noda	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
Mode	(30 MHz - 1 GHz) Tx 11n-20 5825 MHz	(1 GHz - 6.5 GHz)	(6.5 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 40 GHz)

(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.	30.605	QP	23.50	18.35	7.02	31.84	0.00	17.03	40.00	22.9	300	243	
Hori.	199.999	QP	22.56	16.76	9.06	31.78	0.00	16.60	43.50	26.9	300	2	
Hori.	814.578	QP	22.61	20.89	9.29	31.73	0.00	21.06	46.00	24.9	150	163	
Hori.	926.016	QP	22.45	22.09	9.74	31.13	0.00	23.15	46.00	22.8	150	298	
Hori.	7766.396	PK	46.33	36.72	8.37	39.00	2.48	54.90	73.90	19.0	365	3	
Hori.	11650.000	PK	45.16	39.65	9.89	39.14	2.48	58.04	73.90	15.8	150	0	
Hori.	17475.000	PK	42.94	42.36	12.38	38.18	-9.54	49.96	73.90	23.9	150	0	
Hori.	7766.375	AV	34.26	36.72	8.37	39.00	2.48	42.83	53.90	11.0	365	3	VBW:10Hz
Hori.	11650.000	AV	32.12	39.65	9.89	39.14	2.48	45.00	53.90	8.9	150	0	VBW:10Hz
Hori.	17475.000	AV	31.51	42.36	12.38	38.18	-9.54	38.53	53.90	15.3	150	0	VBW:10Hz
Vert.	33.605	QP	22.41	17.25	7.10	31.84	0.00	14.92	40.00	25.0	100	359	
Vert.	200.000	QP	22.61	16.76	9.06	31.78	0.00	16.65	43.50	26.8	100	211	
Vert.	806.578	QP	22.45	20.87	9.25	31.76	0.00	20.81	46.00	25.1	100	0	
Vert.	933.021	QP	22.19	22.07	9.76	31.07	0.00	22.95	46.00	23.0	100	99	
Vert.	7766.375	PK	46.45	36.72	8.37	39.00	2.48	55.02	73.90	18.8	103	259	
Vert.	11650.000	PK	44.92	39.65	9.89	39.14	2.48	57.80	73.90	16.1	150	0	
Vert.	17475.000	PK	42.90	42.36	12.38	38.18	-9.54	49.92	73.90	23.9	150	0	
Vert.	7766.375	AV	33.89	36.72	8.37	39.00	2.48	42.46	53.90	11.4	103	259	VBW:10Hz
Vert.	11650.000	AV	32.21	39.65	9.89	39.14	2.48	45.09	53.90	8.8	150	0	VBW:10Hz
Vert.	17475.000	AV	31.42	42.36	12.38	38.18	-9.54	38.44	53.90	15.4	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 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.	5850.000	PK	48.74	32.61	16.64	39.95	2.48	60.52	-34.70	27.00	61.7	212	125	
Hori.	5855.000	PK	46.62	32.62	16.64	39.95	2.48	58.41	-36.81	15.60	52.4	212	125	
Hori.	5875.000	PK	46.91	32.65	16.65	39.96	2.48	58.73	-36.49	10.00	46.4	212	125	
Hori.	5925.000	PK	46.29	32.66	16.69	39.99	2.48	58.13	-37.09	-27.00	10.0	212	125	
Vert.	5850.000	PK	51.27	32.61	16.64	39.95	2.48	63.05	-32.17	27.00	59.1	131	359	
Vert.	5855.000	PK	47.46	32.62	16.64	39.95	2.48	59.25	-35.97	15.60	51.5	131	359	
Vert.	5875.000	PK	46.56	32.65	16.65	39.96	2.48	58.38	-36.84	10.00	46.8	131	359	
Vert.	5925.000	PK	46.01	32.66	16.69	39.99	2.48	57.85	-37.37	-27.00	10.3	131	359	

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 (3.99 m / 3.0 m) = 2.48 dB

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

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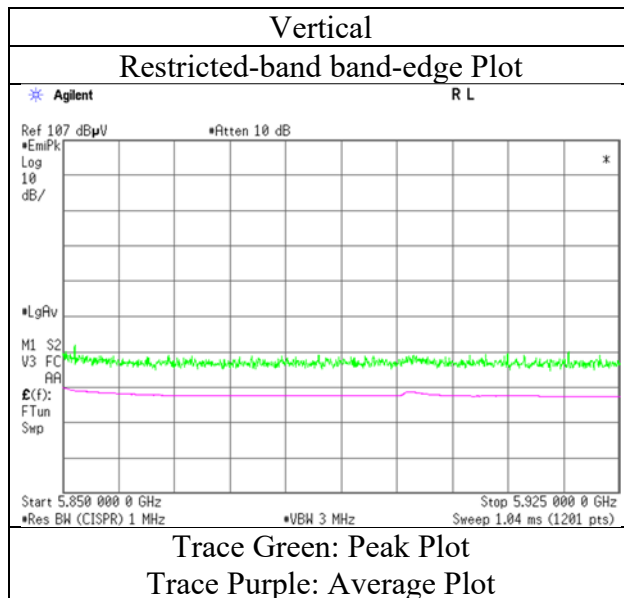
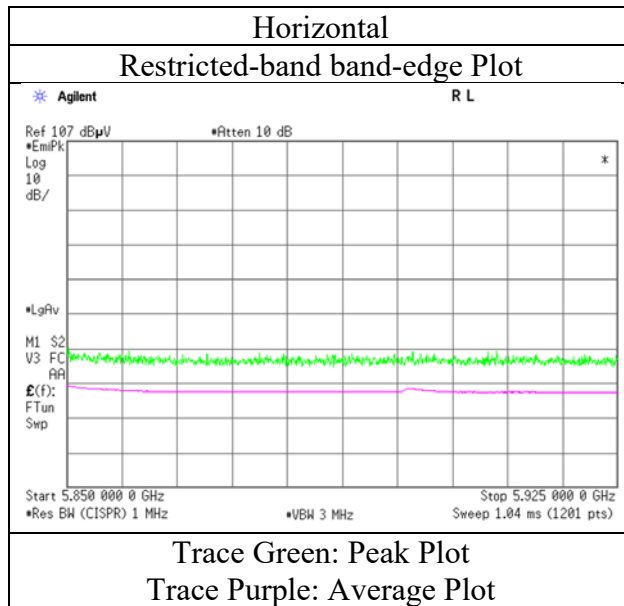
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission

Report No.	12751051S-K-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	March 28, 2019
Temperature / Humidity	20 deg. C / 33 % RH
Engineer	Kazutaka Takeyama (1 GHz – 6.5 GHz)
Mode	Tx 11n-20 5825 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-40 5190 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5150.000	PK	51.53	32.17	16.23	39.58	2.48	62.83	73.90	11.0	191	112	
Hori.	6920.004	PK	47.53	35.37	7.87	39.30	2.48	53.95	73.90	19.9	119	332	
Hori.	10380.000	PK	45.43	39.55	9.24	39.64	2.48	57.06	73.90	16.8	108	221	
Hori.	15570.000	PK	43.21	38.42	11.48	38.84	-9.54	44.73	73.90	29.1	150	0	
Hori.	5150.000	AV	37.50	32.17	16.23	39.58	2.48	48.80	53.90	5.1	191	112	VBW:10Hz
Hori.	6920.004	AV	38.27	35.37	7.87	39.30	2.48	44.69	53.90	9.2	119	332	VBW:10Hz
Hori.	10380.000	AV	33.21	39.55	9.24	39.64	2.48	44.84	53.90	9.0	108	221	VBW:10Hz
Hori.	15570.000	AV	31.92	38.42	11.48	38.84	-9.54	33.44	53.90	20.4	150	0	VBW:10Hz
Vert.	5150.000	PK	49.74	32.17	16.23	39.58	2.48	61.04	73.90	12.8	130	355	
Vert.	6920.124	PK	47.04	35.37	7.87	39.30	2.48	53.46	73.90	20.4	123	99	
Vert.	10380.000	PK	45.03	39.56	9.24	39.64	2.48	56.67	73.90	17.2	152	217	
Vert.	15570.000	PK	43.02	38.42	11.48	38.84	-9.54	44.54	73.90	29.3	150	0	
Vert.	5150.000	AV	36.01	32.17	16.23	39.58	2.48	47.31	53.90	6.5	130	355	VBW:10Hz
Vert.	6920.124	AV	35.34	35.37	7.87	39.30	2.48	41.76	53.90	12.1	123	99	VBW:10Hz
Vert.	10380.000	AV	33.17	39.56	9.24	39.64	2.48	44.81	53.90	9.0	152	217	VBW:10Hz
Vert.	15570.000	AV	31.95	38.42	11.48	38.84	-9.54	33.47	53.90	20.4	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

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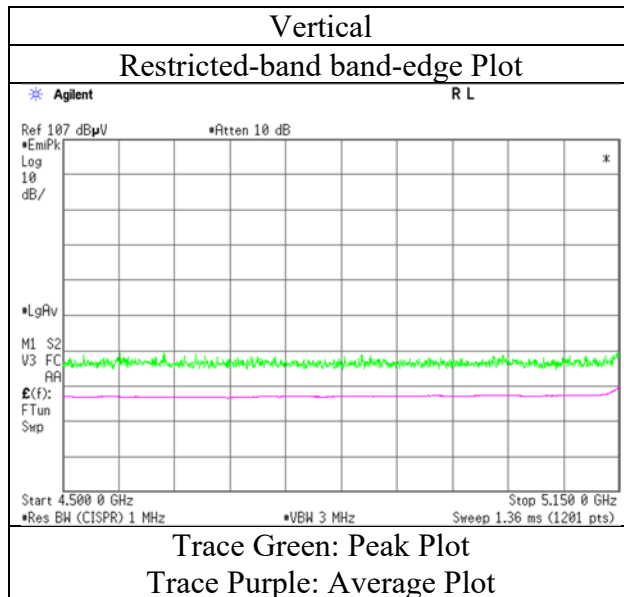
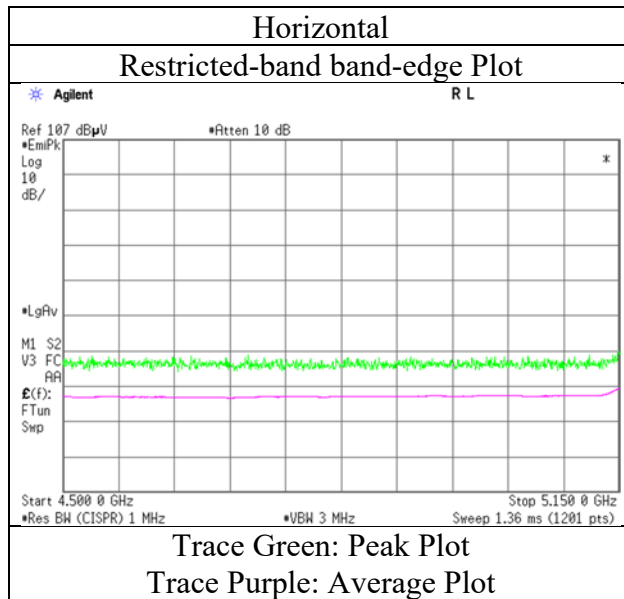
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Radiated Spurious Emission

Report No.	12751051S-K-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	March 28, 2019
Temperature / Humidity	20 deg. C / 33 % RH
Engineer	Kazutaka Takeyama (1 GHz – 6.5 GHz)
Mode	Tx 11n-40 5190 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
 Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-40 5230 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	6973.160	PK	47.43	35.87	7.86	39.22	2.48	54.42	73.90	19.4	100	343	
Hori.	10460.000	PK	45.06	39.74	9.26	39.73	2.48	56.81	73.90	17.0	100	219	
Hori.	15690.000	PK	42.94	38.23	11.54	39.10	-9.54	44.07	73.90	29.8	150	0	
Hori.	6973.160	AV	37.43	35.87	7.86	39.22	2.48	44.42	53.90	9.4	100	343	VBW:10Hz
Hori.	10460.000	AV	32.66	39.74	9.26	39.73	2.48	44.41	53.90	9.4	100	219	VBW:10Hz
Hori.	15690.000	AV	32.15	38.23	11.54	39.10	-9.54	33.28	53.90	20.6	150	0	VBW:10Hz
Vert.	6973.315	PK	46.06	35.88	7.86	39.22	2.48	53.06	73.90	20.8	122	100	
Vert.	10460.000	PK	46.31	39.74	9.26	39.73	2.48	58.06	73.90	15.8	154	223	
Vert.	15690.000	PK	43.31	38.23	11.54	39.10	-9.54	44.44	73.90	29.4	150	0	
Vert.	6973.315	AV	34.32	35.88	7.86	39.22	2.48	41.32	53.90	12.5	122	100	VBW:10Hz
Vert.	10460.000	AV	32.43	39.74	9.26	39.73	2.48	44.18	53.90	9.7	154	223	VBW:10Hz
Vert.	15690.000	AV	32.22	38.23	11.54	39.10	-9.54	33.35	53.90	20.5	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

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Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-40 5310 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5350.000	PK	52.13	31.59	16.31	39.68	2.48	62.83	73.90	11.0	207	115	
Hori.	7079.976	PK	46.33	36.31	7.90	39.22	2.48	53.80	73.90	20.1	100	333	
Hori.	10620.000	PK	44.37	39.69	9.39	39.70	2.48	56.23	73.90	17.6	150	0	
Hori.	15930.000	PK	43.22	37.71	11.66	39.62	-9.54	43.43	73.90	30.4	150	0	
Hori.	5350.000	AV	36.56	31.59	16.31	39.68	2.48	47.26	53.90	6.6	207	115	VBW:10Hz
Hori.	7079.976	AV	36.11	36.31	7.90	39.22	2.48	43.58	53.90	10.3	100	333	VBW:10Hz
Hori.	10620.000	AV	31.90	39.69	9.39	39.70	2.48	43.76	53.90	10.1	150	0	VBW:10Hz
Hori.	15930.000	AV	31.98	37.71	11.66	39.62	-9.54	32.19	53.90	21.7	150	0	VBW:10Hz
Vert.	5350.000	PK	52.24	31.59	16.31	39.68	2.48	62.94	73.90	10.9	107	327	
Vert.	7079.900	PK	45.91	36.31	7.90	39.22	2.48	53.38	73.90	20.5	131	103	
Vert.	10620.000	PK	45.23	39.69	9.39	39.70	2.48	57.09	73.90	16.8	150	0	
Vert.	15930.000	PK	43.38	37.71	11.66	39.62	-9.54	43.59	73.90	30.3	150	0	
Vert.	5350.000	AV	38.03	31.59	16.31	39.68	2.48	48.73	53.90	5.1	107	327	VBW:10Hz
Vert.	7079.900	AV	33.32	36.31	7.90	39.22	2.48	40.79	53.90	13.1	131	103	VBW:10Hz
Vert.	10620.000	AV	31.86	39.69	9.39	39.70	2.48	43.72	53.90	10.1	150	0	VBW:10Hz
Vert.	15930.000	AV	32.01	37.71	11.66	39.62	-9.54	32.22	53.90	21.6	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

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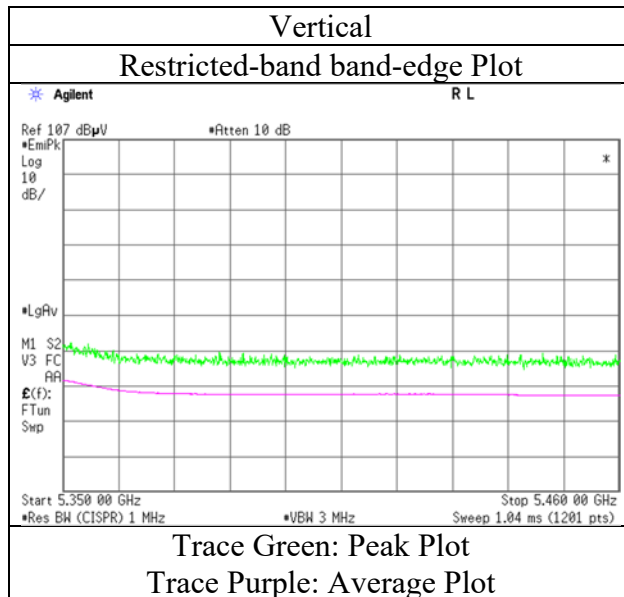
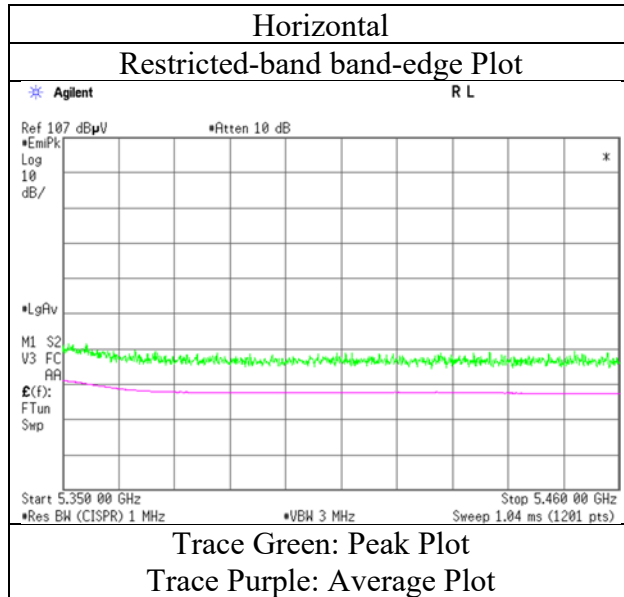
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

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Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11n-40 5310 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 1 2 2 2
Date March 15, 2019 March 30, 2019 March 31, 2019 April 7, 2019
Temperature / Humidity 25 deg. C / 31 % RH 21 deg. C / 30 % RH 22 deg. C / 41 % RH 21 deg. C / 35 % RH
Engineer Kazuya Noda Toshinori Yamada Kazuya Noda Kazuya Noda
(1 GHz – 6.5 GHz) (6.5 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 40 GHz)
Mode Tx 11n-40 5510 MHz

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5460.000	PK	48.24	31.90	16.56	39.73	2.48	59.45	73.90	14.4	348	123	
Hori.	7346.640	PK	46.39	36.88	8.06	39.37	2.48	54.44	73.90	19.4	100	341	
Hori.	11020.000	PK	45.48	40.06	9.79	39.48	2.48	58.33	73.90	15.5	150	0	
Hori.	16530.000	PK	44.14	38.85	11.93	39.78	-9.54	45.60	73.90	28.3	150	0	
Hori.	5460.000	AV	35.33	31.90	16.56	39.73	2.48	46.54	53.90	7.3	348	123	VBW:10Hz
Hori.	7346.640	AV	34.83	36.88	8.06	39.37	2.48	42.88	53.90	11.0	100	341	VBW:10Hz
Hori.	11020.000	AV	32.58	40.06	9.79	39.48	2.48	45.43	53.90	8.4	150	0	VBW:10Hz
Hori.	16530.000	AV	33.18	38.85	11.93	39.78	-9.54	34.64	53.90	19.2	150	0	VBW:10Hz
Vert.	5460.000	PK	48.48	31.90	16.56	39.73	2.48	59.69	73.90	14.2	154	317	
Vert.	7346.649	PK	45.77	36.88	8.06	39.37	2.48	53.82	73.90	20.0	396	103	
Vert.	11020.000	PK	45.24	40.06	9.79	39.48	2.48	58.09	73.90	15.8	150	0	
Vert.	16530.000	PK	44.35	38.85	11.93	39.78	-9.54	45.81	73.90	28.0	150	0	
Vert.	5460.000	AV	35.29	31.90	16.56	39.73	2.48	46.50	53.90	7.4	154	317	VBW:10Hz
Vert.	7346.649	AV	33.94	36.88	8.06	39.37	2.48	41.99	53.90	11.9	396	103	VBW:10Hz
Vert.	11020.000	AV	32.51	40.06	9.79	39.48	2.48	45.36	53.90	8.5	150	0	VBW:10Hz
Vert.	16530.000	AV	33.14	38.85	11.93	39.78	-9.54	34.60	53.90	19.3	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 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.	5470.000	PK	52.05	31.89	16.55	39.74	2.48	63.23	-31.99	-27.00	4.9	348	123	
Vert.	5470.000	PK	51.57	31.89	16.55	39.74	2.48	62.75	-32.47	-27.00	5.4	154	317	

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 (3.99 m / 3.0 m) = 2.48 dB

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

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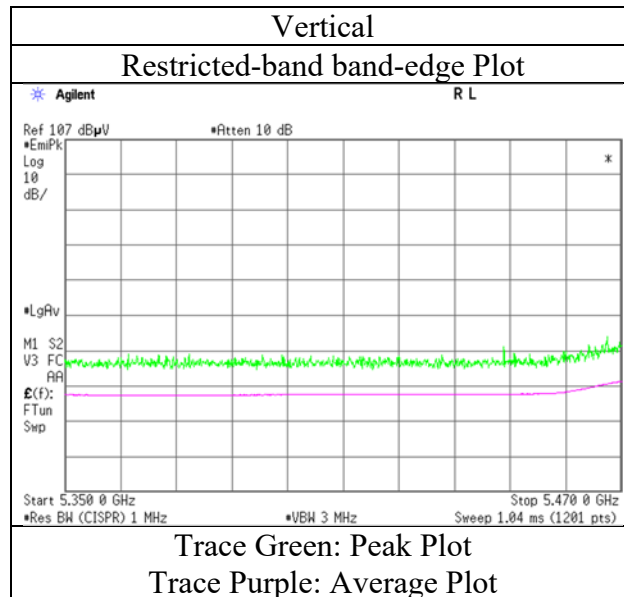
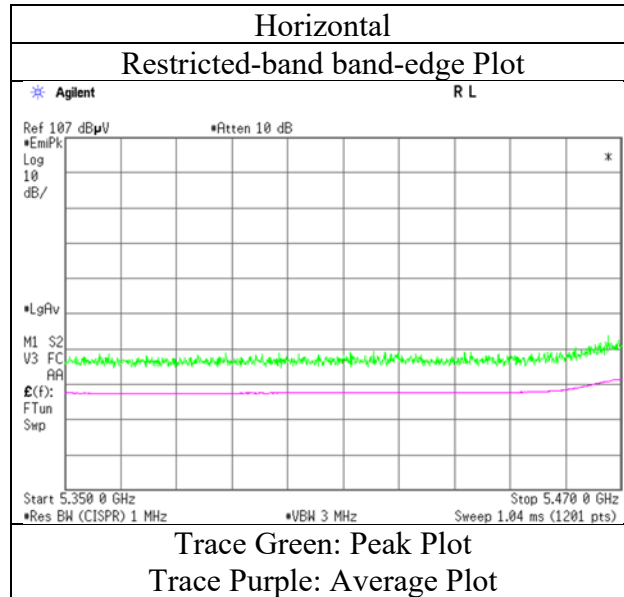
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission

Report No. 12751051S-K-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 1
 Date March 15, 2019
 Temperature / Humidity 25 deg. C / 31 % RH
 Engineer Kazuya Noda
 (1 GHz – 6.5 GHz)
 Mode Tx 11n-40 5510 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
 Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-40 5550 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7399.979	PK	46.77	36.87	8.10	39.40	2.48	54.82	73.90	19.0	371	2	
Hori.	11100.000	PK	44.47	39.93	9.79	39.45	2.48	57.22	73.90	16.6	150	0	
Hori.	16650.000	PK	43.82	38.93	11.98	39.61	-9.54	45.58	73.90	28.3	150	0	
Hori.	7399.979	AV	35.14	36.87	8.10	39.40	2.48	43.19	53.90	10.7	371	2	VBW:10Hz
Hori.	11100.000	AV	32.11	39.93	9.79	39.45	2.48	44.86	53.90	9.0	150	0	VBW:10Hz
Hori.	16650.000	AV	32.50	38.93	11.98	39.61	-9.54	34.26	53.90	19.6	150	0	VBW:10Hz
Vert.	7400.000	PK	45.67	36.87	8.10	39.40	2.48	53.72	73.90	20.1	163	112	
Vert.	11100.000	PK	44.26	39.93	9.79	39.45	2.48	57.01	73.90	16.8	150	0	
Vert.	16650.000	PK	43.85	38.93	11.98	39.61	-9.54	45.61	73.90	28.2	150	0	
Vert.	7400.000	AV	33.46	36.87	8.10	39.40	2.48	41.51	53.90	12.3	163	112	VBW:10Hz
Vert.	11100.000	AV	32.02	39.93	9.79	39.45	2.48	44.77	53.90	9.1	150	0	VBW:10Hz
Vert.	16650.000	AV	32.51	38.93	11.98	39.61	-9.54	34.27	53.90	19.6	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

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Shonan EMC Lab.

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Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 1 2 2 2
Date March 15, 2019 March 30, 2019 March 31, 2019 April 7, 2019
Temperature / Humidity 25 deg. C / 31 % RH 21 deg. C / 30 % RH 22 deg. C / 41 % RH 21 deg. C / 35 % RH
Engineer Kazuya Noda Toshinori Yamada Kazuya Noda Kazuya Noda
(1 GHz – 6.5 GHz) (6.5 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 40 GHz)
Mode Tx 11n-40 5670 MHz

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7559.980	PK	46.07	36.89	8.20	39.35	2.48	54.29	73.90	19.6	372	3	
Hori.	11340.000	PK	45.57	39.77	9.79	39.34	2.48	58.27	73.90	15.6	150	0	
Hori.	17010.000	PK	43.72	40.06	12.09	39.11	-9.54	47.22	73.90	26.6	150	0	
Hori.	7559.980	AV	33.91	36.89	8.20	39.35	2.48	42.13	53.90	11.7	372	3	VBW:10Hz
Hori.	11340.000	AV	32.91	39.77	9.79	39.34	2.48	45.61	53.90	8.2	150	0	VBW:10Hz
Hori.	17010.000	AV	32.16	40.06	12.09	39.11	-9.54	35.66	53.90	18.2	150	0	VBW:10Hz
Vert.	7560.301	PK	45.78	36.89	8.20	39.35	2.48	54.00	73.90	19.9	268	158	
Vert.	11340.000	PK	45.69	39.77	9.79	39.34	2.48	58.39	73.90	15.5	150	0	
Vert.	17010.000	PK	43.63	40.06	12.09	39.11	-9.54	47.13	73.90	26.7	150	0	
Vert.	7560.301	AV	32.85	36.89	8.20	39.35	2.48	41.07	53.90	12.8	268	158	VBW:10Hz
Vert.	11340.000	AV	33.02	39.77	9.79	39.34	2.48	45.72	53.90	8.1	150	0	VBW:10Hz
Vert.	17010.000	AV	32.03	40.06	12.09	39.11	-9.54	35.53	53.90	18.3	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : 20log(3.99 m / 3.0 m) = 2.48 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	46.55	32.20	16.55	39.88	2.48	57.90	-37.32	-27.00	10.3	337	137	
Vert.	5725.000	PK	47.12	32.20	16.55	39.88	2.48	58.47	-36.75	-27.00	9.7	154	8	

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).

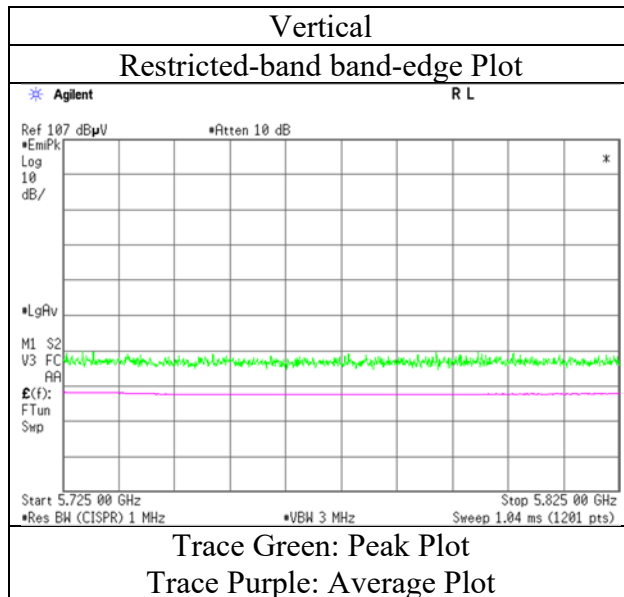
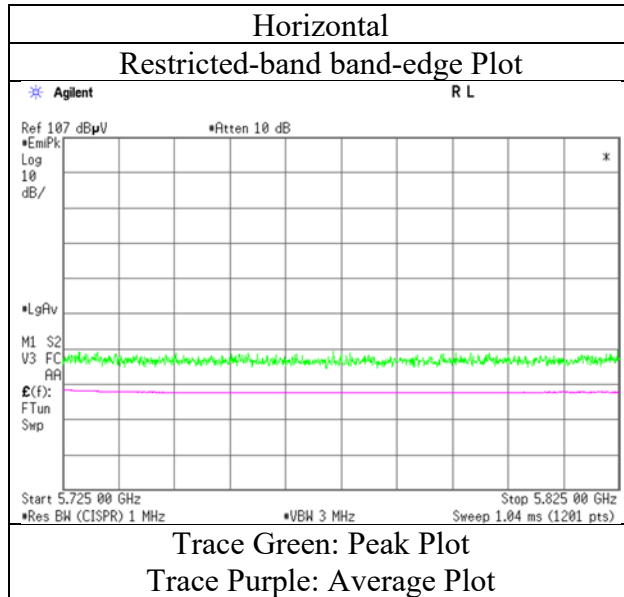
*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log(3.99 m / 3.0 m) = 2.48 dB

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

Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 1
Date March 15, 2019
Temperature / Humidity 25 deg. C / 31 % RH
Engineer Kazuya Noda
(1 GHz – 6.5 GHz)
Mode Tx 11n-40 5670 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-40 5755 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7673.324	PK	45.90	36.74	8.29	39.16	2.48	54.25	73.90	19.6	367	358	
Hori.	11510.000	PK	43.67	40.01	9.79	39.26	2.48	56.69	73.90	17.2	150	0	
Hori.	17265.000	PK	43.24	40.65	12.25	38.60	-9.54	48.00	73.90	25.9	150	0	
Hori.	7673.324	AV	33.98	36.74	8.29	39.16	2.48	42.33	53.90	11.5	367	358	VBW:10Hz
Hori.	11510.000	AV	31.64	40.01	9.79	39.26	2.48	44.66	53.90	9.2	150	0	VBW:10Hz
Hori.	17265.000	AV	31.55	40.65	12.25	38.60	-9.54	36.31	53.90	17.5	150	0	VBW:10Hz
Vert.	7673.318	PK	45.64	36.74	8.29	39.16	2.48	53.99	73.90	19.9	162	257	
Vert.	11510.000	PK	43.63	40.01	9.79	39.26	2.48	56.65	73.90	17.2	150	0	
Vert.	17265.000	PK	43.39	40.65	12.25	38.60	-9.54	48.15	73.90	25.7	150	0	
Vert.	7673.318	AV	33.29	36.74	8.29	39.16	2.48	41.64	53.90	12.2	162	257	VBW:10Hz
Vert.	11510.000	AV	31.64	40.01	9.79	39.26	2.48	44.66	53.90	9.2	150	0	VBW:10Hz
Vert.	17265.000	AV	31.53	40.65	12.25	38.60	-9.54	36.29	53.90	17.6	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : 20log(3.99 m / 3.0 m) = 2.48 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.	5650.000	PK	47.08	32.03	16.48	39.83	2.48	58.24	-36.98	-27.00	9.9	187	128	
Hori.	5700.000	PK	47.69	32.12	16.52	39.86	2.48	58.95	-36.27	10.00	46.2	187	128	
Hori.	5720.000	PK	55.29	32.20	16.53	39.87	2.48	66.63	-28.59	15.60	44.1	187	128	
Hori.	5725.000	PK	54.95	32.22	16.53	39.88	2.48	66.30	-28.92	27.00	55.9	187	128	
Vert.	5650.000	PK	46.65	32.03	16.48	39.83	2.48	57.81	-37.41	-27.00	10.4	132	2	
Vert.	5700.000	PK	48.95	32.12	16.52	39.86	2.48	60.21	-35.01	10.00	45.0	132	2	
Vert.	5720.000	PK	57.36	32.20	16.53	39.87	2.48	68.70	-26.52	15.60	42.1	132	2	
Vert.	5725.000	PK	57.53	32.22	16.53	39.88	2.48	68.88	-26.34	27.00	53.3	132	2	

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(3.99 m / 3.0 m) = 2.48 dB
13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

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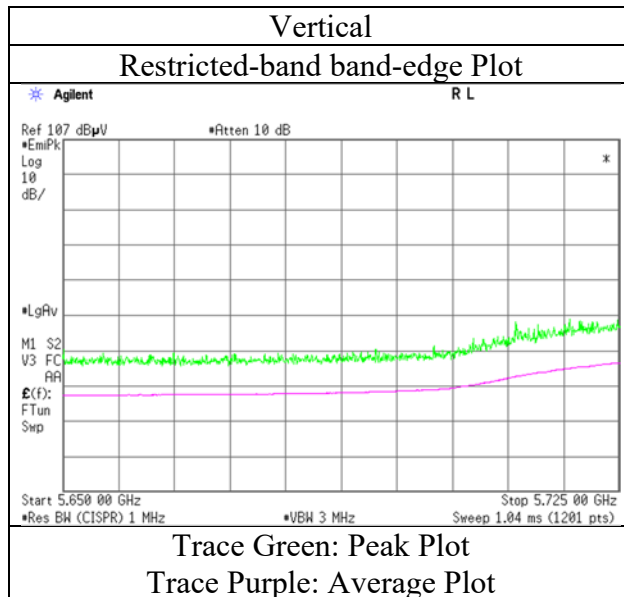
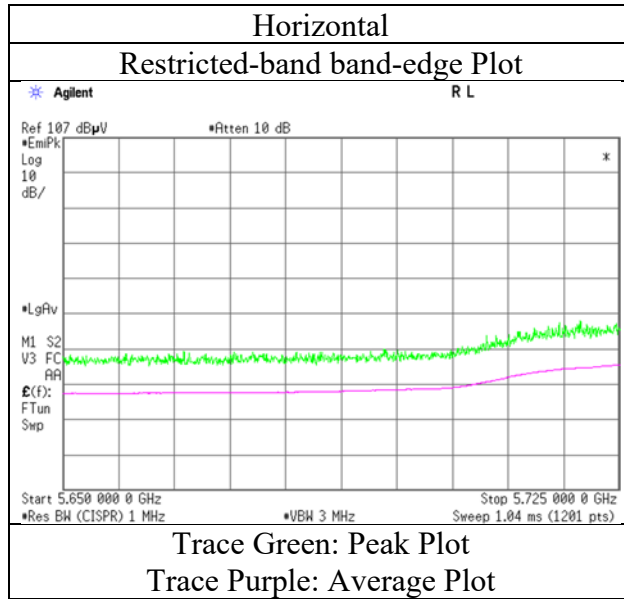
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Radiated Spurious Emission

Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11n-40 5755 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12751051S-K-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	2	2	2	2
Date	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
	(1 GHz – 6.5 GHz)	(6.5 GHz – 13 GHz)	(13 GHz – 18 GHz)	(18 GHz – 40 GHz)
Mode	Tx 11n-40 5795 MHz			

(above 1GHz Inside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	7726.653	PK	46.08	36.68	8.32	39.07	2.48	54.49	73.90	19.4	372	1	
Hori.	11590.000	PK	44.03	39.92	9.85	39.19	2.48	57.09	73.90	16.8	150	0	
Hori.	17385.000	PK	43.68	41.59	12.33	38.36	-9.54	49.70	73.90	24.2	150	0	
Hori.	7726.653	AV	34.64	36.68	8.32	39.07	2.48	43.05	53.90	10.8	372	1	VBW:10Hz
Hori.	11590.000	AV	31.68	39.92	9.85	39.19	2.48	44.74	53.90	9.1	150	0	VBW:10Hz
Hori.	17385.000	AV	31.53	41.59	12.33	38.36	-9.54	37.55	53.90	16.3	150	0	VBW:10Hz
Vert.	7726.700	PK	46.50	36.68	8.32	39.07	2.48	54.91	73.90	18.9	165	269	
Vert.	11590.000	PK	44.42	39.92	9.85	39.19	2.48	57.48	73.90	16.4	150	0	
Vert.	17385.000	PK	43.39	41.59	12.33	38.36	-9.54	49.41	73.90	24.4	150	0	
Vert.	7726.700	AV	33.77	36.68	8.32	39.07	2.48	42.18	53.90	11.7	165	269	VBW:10Hz
Vert.	11590.000	AV	31.87	39.92	9.85	39.19	2.48	44.93	53.90	8.9	150	0	VBW:10Hz
Vert.	17385.000	AV	31.61	41.59	12.33	38.36	-9.54	37.63	53.90	16.2	150	0	VBW:10Hz

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

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

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$
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	47.29	32.61	16.64	39.95	2.48	59.07	-36.15	27.00	63.1	200	125	
Hori.	5855.000	PK	47.00	32.62	16.64	39.95	2.48	58.79	-36.43	15.60	52.0	200	125	
Hori.	5875.000	PK	47.25	32.65	16.65	39.96	2.48	59.07	-36.15	10.00	46.1	200	125	
Hori.	5925.000	PK	46.33	32.66	16.69	39.99	2.48	58.17	-37.05	-27.00	10.0	200	125	
Vert.	5850.000	PK	48.11	32.61	16.64	39.95	2.48	59.89	-35.33	27.00	62.3	122	359	
Vert.	5855.000	PK	47.20	32.62	16.64	39.95	2.48	58.99	-36.23	15.60	51.8	122	359	
Vert.	5875.000	PK	46.81	32.65	16.65	39.96	2.48	58.63	-36.59	10.00	46.5	122	359	
Vert.	5925.000	PK	46.47	32.66	16.69	39.99	2.48	58.31	-36.91	-27.00	9.9	122	359	

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

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

*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 : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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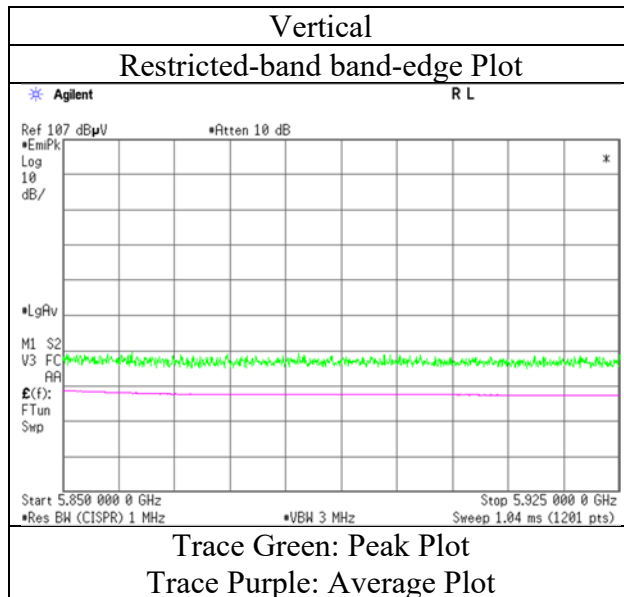
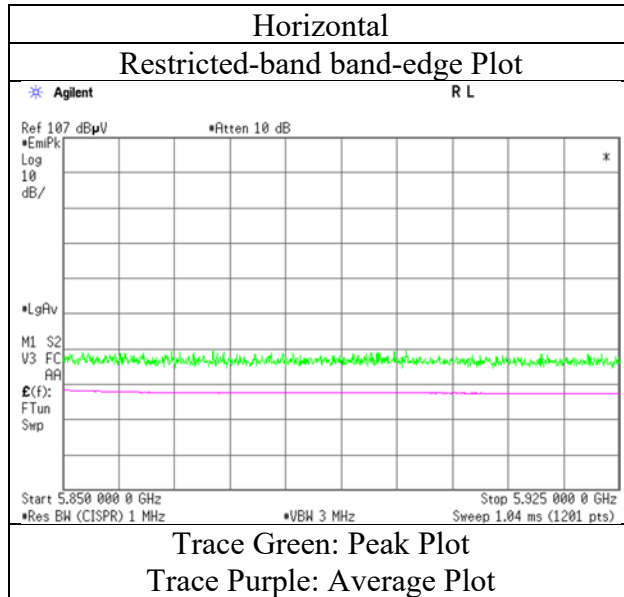
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Radiated Spurious Emission

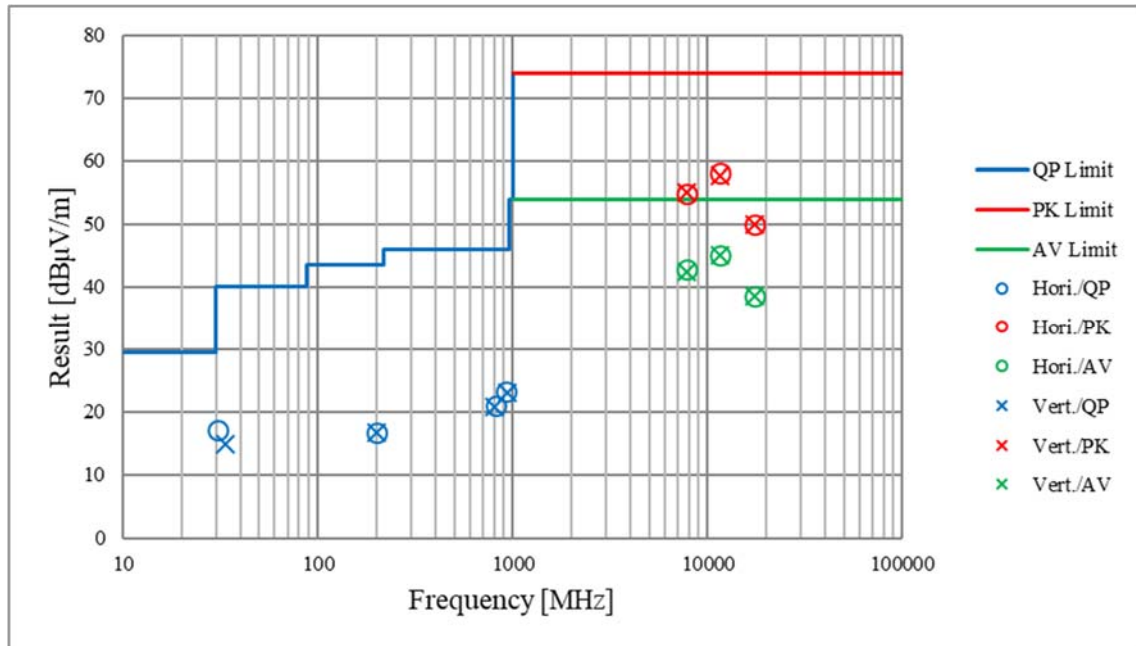
Report No. 12751051S-K-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2
Date March 28, 2019
Temperature / Humidity 20 deg. C / 33 % RH
Engineer Kazutaka Takeyama
(1 GHz – 6.5 GHz)
Mode Tx 11n-40 5795 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

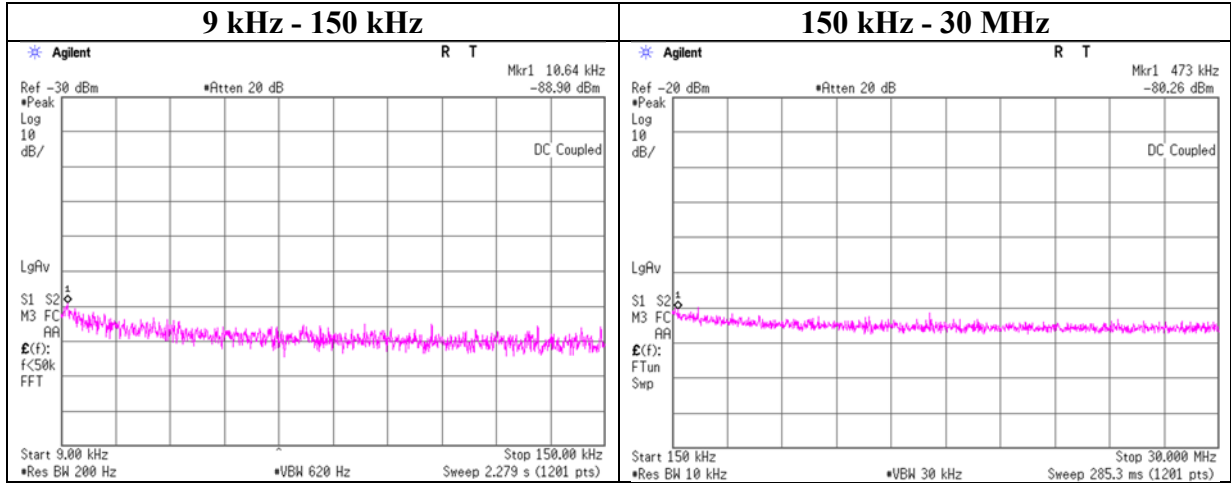
Report No.	12751051S-K-R2				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	1	2	2	2	2
Date	March 15, 2019	March 28, 2019	March 30, 2019	March 31, 2019	April 7, 2019
Temperature / Humidity	25 deg. C / 31 % RH	20 deg. C / 33 % RH	21 deg. C / 30 % RH	22 deg. C / 41 % RH	21 deg. C / 35 % RH
Engineer	Kazuya Noda	Kazutaka Takeyama	Toshinori Yamada	Kazuya Noda	Kazuya Noda
Mode	(30 MHz - 1 GHz) Tx 11n-20 5825 MHz	(1 GHz - 6.5 GHz)	(6.5 GHz - 13 GHz)	(13 GHz - 18 GHz)	(18 GHz - 40 GHz)



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

Conducted Spurious Emission

Report No. 12751051S-K-R2
 Test place Shonan EMC Lab. No.5 Shielded Room
 Date March 27, 2019
 Temperature / Humidity 24 deg. C / 42 % RH
 Engineer Kazuya Noda
 Mode Tx 11n-20 5825 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
10.64	-88.9	0.01	9.74	2.0	1	-77.2	300	6.0	-15.9	47.0	62.9	
473.00	-80.3	0.01	9.77	2.0	1	-68.5	300	6.0	-7.2	14.1	21.3	

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

$$\text{EIRP [dBm]} = \text{Reading [dBm]} + \text{Cable loss [dB]} + \text{Attenuator Loss [dB]} + \text{Antenna gain [dBi]} + 10 * \log(N)$$

N: Number of output

*2.0 dBi was applied to the test result based on KDB 789033 since antenna gain was less than 2.0 dBi.

APPENDIX 2: Test instruments

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
COTS-SEMI-5	RE	170932	EMI Software	TSJ	TEPTO-DV3(RE,CE,ME,PE)	-	-	-	-
KAF-02	RE	144878	Pre Amplifier	HEWLETT PACKARD	8449B	3008A01268	2018/4/4	2019/4/30	12
KAT6-04	RE	144899	Attenuator	Inmet	18N-6dB	-	2018/12/25	2019/12/31	12
KFL-15	RE	144938	Highpass Filter	MICRO-TRONICS	HPM50112	7	2018/11/25	2019/11/30	12
KJM-09	RE	145929	Measure	KOMELON	KMC-36	-	-	-	-
KSA-08	RE	145089	Spectrum Analyzer	AGILENT	E4446A	MY46180525	2018/10/7	2019/10/31	12
SAEC-01(NSA)	RE	145597	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	2018/5/29	2019/5/31	12
SAEC-02(NSA)	RE	145563	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	2018/5/31	2019/5/31	12
SAEC-02(SVSWR)	RE	145598	Semi-Anechoic Chamber	TDK	SAEC-02(SVSWR)	2	2018/7/15	2019/7/31	12
SAF-01	RE	145003	Pre Amplifier	SONOMA	310N	290211	2019/2/5	2020/2/29	12
SAF-04	RE	145127	Pre Amplifier	Toyo Corporation	TPA0118-36	2072554	2018/6/26	2019/6/30	12
SAF-08	RE	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2019/3/5	2020/3/31	12
SAF-10	RE	145129	Pre Amplifier	Toyo Corporation	HAP26-40W	10	2019/3/22	2020/3/31	12
SAT10-05	RE	145136	Attenuator(above1GHz)	AGILENT	8493C-010	74864	2018/11/25	2019/11/30	12
SAT10-06	RE	145137	Attenuator	AGILENT	8493C-010	74865	2018/11/25	2019/11/30	12
SAT3-09	RE	144959	Attenuator	JFW	50HF-003N	-	2018/8/23	2019/8/31	12
SBA-01	RE	145161	Biconical Antenna	Schwarzbeck	BBA9106	91032664	2018/6/5	2019/6/30	12
SCC-A1/A3/A5/A7/A8/A13/SRSE-01	RE	144967	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141P	-/0901-269(RF Selector)	2018/4/9	2019/4/30	12
SCC-A2/A4/A6/A7/A8/A13/SRSE-01	RE	144968	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141P	-/0901-269(RF Selector)	2018/4/9	2019/4/30	12
SCC-G33	RE	145184	Coaxial Cable	Junkosha	MWX241-01000KMSKMS	-	2018/4/20	2019/4/30	12
SCC-G40	RE	166491	Coaxial Cable	Junkosha	MWX221-01000NFSNMS/B	1612S005	2019/1/25	2020/1/31	12
SCC-G41	RE	151617	Coaxial Cable	Junkosha	MWX221-01000NFSNMS/B	1612S006	2019/1/25	2020/1/31	12
SCC-G43	RE	156380	Coaxial Cable	HUBER+SUNER	SUCOFLEX_104 E	SN MY 13406/4E	2018/7/10	2019/7/31	12
SCC-G44	RE	168300	Coaxial Cable	HUBER+SUNER	SUCOFLEX 104	800070/4A	2019/3/26	2020/3/31	12
SCC-G45	RE	168301	Coaxial Cable	HUBER+SUNER	SUCOFLEX 102 E	800137/2EA	2019/3/26	2020/3/31	12
SCC-G50	RE	178573	Coaxial Cable	HUBER+SUNER	SUCOFLEX_104 E	MY13407/4E	2019/3/26	2020/3/31	12
SCC-G51	RE	178572	Coaxial Cable	HUBER+SUNER	SUCOFLEX 104	800288/4A	2019/3/26	2020/3/31	12
SFL-03	RE	145377	Highpass Filter	MICRO-TRONICS	HPM50112	28	2018/11/16	2019/11/30	12

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Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
SHA-01	RE	145383	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	2018/7/23	2019/7/31	12
SHA-02	RE	145384	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	2018/7/23	2019/7/31	12
SHA-04	RE	145512	Horn Antenna	ETS LINDGREN	Sep-60	LM3640	2018/7/23	2019/7/31	12
SHA-06	RE	145514	Horn Antenna	ETS LINDGREN	Oct-60	LM3459	2018/7/23	2019/7/31	12
SJM-09	RE	145336	Measure	PROMART	SEN1935	-	-	-	-
SLA-05	RE	145527	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	193	2018/6/5	2019/6/30	12
SOS-01	RE	146316	Humidity Indicator	A&D	AD-5681	4062555	2018/10/25	2019/10/31	12
SOS-03	RE	146317	Humidity Indicator	A&D	AD-5681	4063325	2018/10/25	2019/10/31	12
SRENT-15	RE	160899	Spectrum Analyzer	AGILENT (KEYSIGHT)	E4440A	MY46185516	2019/1/21	2020/1/31	12
SSA-02	RE	145800	Spectrum Analyzer	AGILENT	E4448A	MY48250106	2018/3/5	2019/3/31 (*1)	12
STR-01	RE	145790	Test Receiver	Rohde & Schwarz	ESU40	100093	2018/4/13	2019/4/30	12
STS-01	RE	145792	Digital Hitester	HIOKI	3805-50	80997812	2018/10/16	2019/10/31	12
STS-02	RE	145793	Digital Hitester	HIOKI	3805-50	80997819	2019/4/2	2020/4/30	12
STS-03	RE	146210	Digital Hitester	HIOKI	3805-50	80997823	2018/10/16	2019/10/31	12
KSA-07	AT	142283	Spectrum Analyzer	AGILENT	N9320A	CN0163000434	-	-	-
KTS-07	AT	145111	Digital Tester	SANWA	PC500	7019232	2018/10/17	2019/10/31	12
SAT10-09	AT	145132	Attenuator	Weinschel Corp.	54A-10	W5692	2018/11/25	2019/11/30	12
SAT10-14	AT	154591	Attenuator	Weinschel Corp.	54A-10	81595	2019/4/16	2020/4/30	12
SCC-G32	AT	145183	Coaxial Cable	Junkosha	MWX241-02000KMSK MS	OCT-09-13-005	2018/11/25	2019/11/30	12
SOS-09	AT	146318	Humidity Indicator	A&D	AD-5681	4061484	2018/12/5	2019/12/31	12
SPM-07	AT	146247	Power Meter	AGILENT	8990B	MY5100272	2018/7/13	2019/7/31	12
SPSS-04	AT	146310	Power sensor	AGILENT	N1923A	MY5326009	2018/7/13	2019/7/31	12
SSA-03	AT	145801	Spectrum Analyzer	AGILENT	E4448A	MY48250152	2018/8/30	2019/8/31	12

*1) This test equipment was used for the tests before the expiration date of the calibration.

*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 test

AT: Antenna Terminal Conducted test

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