RADIO TEST REPORT

Test Report No.: 14387934H-D-R1

Customer	**SHOFU INC.**
Description of EUT	**Smart digital camera designed exclusively for dentistry**
Model Number of EUT	**EyeSpecial C-V**
FCC ID	**2A93KESPC5-1**
Test Regulation	**FCC Part 15 Subpart E**
Test Result	**Complied (Refer to SECTION 3)**
Issue Date	**March 16, 2023**
Remarks	**WLAN (5 GHz band) part**

Representative Test Engineer	Approved By
Keiya Ido Engineer	Satofumi Matsuyama Engineer

CERTIFICATE 5107.02

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.

☒ There is no testing item of "Non-accreditation".

UL Japan, Inc. Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 Japan / +81-596-24-8999

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- The information provided from the customer for this report is identified in Section 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No.: 14387934H-D

This report is a revised version of 14387934H-D. 14387934H-D is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14387934H-D	October 31, 2022	-
1	14387934H-D-R1	March 16, 2023	APPENDIX 1: Test Data Maximum Conducted Output Power -Table of 11ac-20 Correction of value for 5220 MHz of 99 % OBW 18.216→18.217 -Table of 11ac-40 Correction of value of 99 % OBW 5190 MHz: 36.839→37.033 5230 MHz: 36.800→37.084
1	14387934H-D-R1	March 16, 2023	APPENDIX 1: Test Data Maximum Power Spectral Density -Correction of Antenna Gain (and relevant value) 5190 MHz: 2.2→2.23 5230 MHz: 9.0→2.23
1	14387934H-D-R1	March 16, 2023	APPENDIX 1: Test Data Radiated Spurious Emission -11a and 11ac-20:5180 MHz Correction of Limit of 3453.3 MHz 73.9→68.2 -11a Deletion of Duty Factor
1	14387934H-D-R1	March 16, 2023	Section 4.1: Operation of EUT during testing *The Details of Operation Mode(s) -Deletion of 5755 MHz for 11ac-40 Tx mode of Radiated Spurious Emission (Above 1 GHz).

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation	ICES	Interference-Causing Equipment Standard
AC	Alternating Current	IEC	International Electrotechnical Commission
AFH	Adaptive Frequency Hopping	IEEE	Institute of Electrical and Electronics Engineers
AM	Amplitude Modulation	IF	Intermediate Frequency
Amp, AMP	Amplifier	ILAC	International Laboratory Accreditation Conference
ANSI	American National Standards Institute	ISED	Innovation, Science and Economic Development Canada
Ant, ANT	Antenna	ISO	International Organization for Standardization
AP	Access Point	JAB	Japan Accreditation Board
ASK	Amplitude Shift Keying	LAN	Local Area Network
Atten., ATT	Attenuator	LIMS	Laboratory Information Management System
AV	Average	MCS	Modulation and Coding Scheme
BPSK	Binary Phase-Shift Keying	MRA	Mutual Recognition Arrangement
BR	Bluetooth Basic Rate	N/A	Not Applicable
BT	Bluetooth	NIST	National Institute of Standards and Technology
BT LE	Bluetooth Low Energy	NS	No signal detect.
BW	BandWidth	NSA	Normalized Site Attenuation
Cal Int	Calibration Interval	NVLAP	National Voluntary Laboratory Accreditation Program
CCK	Complementary Code Keying	OBW	Occupied Band Width
Ch., CH	Channel	OFDM	Orthogonal Frequency Division Multiplexing
CISPR	Comite International Special des Perturbations Radioelectriques	P/M	Power meter
CW	Continuous Wave	PCB	Printed Circuit Board
DBPSK	Differential BPSK	PER	Packet Error Rate
DC	Direct Current	PHY	Physical Layer
D-factor	Distance factor	PK	Peak
DFS	Dynamic Frequency Selection	PN	Pseudo random Noise
DQPSK	Differential QPSK	PRBS	Pseudo-Random Bit Sequence
DSSS	Direct Sequence Spread Spectrum	PSD	Power Spectral Density
EDR	Enhanced Data Rate	QAM	Quadrature Amplitude Modulation
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power	QP	Quasi-Peak
EMC	ElectroMagnetic Compatibility	QPSK	Quadri-Phase Shift Keying
EMI	ElectroMagnetic Interference	RBW	Resolution Band Width
EN	European Norm	RDS	Radio Data System
ERP, e.r.p.	Effective Radiated Power	RE	Radio Equipment
EU	European Union	RF	Radio Frequency
EUT	Equipment Under Test	RMS	Root Mean Square
Fac.	Factor	RSS	Radio Standards Specifications
FCC	Federal Communications Commission	Rx	Receiving
FHSS	Frequency Hopping Spread Spectrum	SA, S/A	Spectrum Analyzer
FM	Frequency Modulation	SG	Signal Generator
Freq.	Frequency	SVSWR	Site-Voltage Standing Wave Ratio
FSK	Frequency Shift Keying	TR	Test Receiver
GFSK	Gaussian Frequency-Shift Keying	Tx	Transmitting
GNSS	Global Navigation Satellite System	VBW	Video BandWidth
GPS	Global Positioning System	Vert.	Vertical
Hori.	Horizontal	WLAN	Wireless LAN

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SECTION 1: Customer Information

Company Name	SHOFU INC.
Address	11 Kamitakamatsu-cho, Fukuine, Higashiyama-ku, Kyoto 605-0983, Japan
Telephone Number	+81-75-561-1112
Contact Person	Koji Sho

The information provided from the customer is as follows;
- Customer, Description of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer Information
- SECTION 2: Equipment Under Test (EUT) other than the Receipt Date and Test Date
- SECTION 4: Operation of EUT 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 (EUT)

2.1 Identification of EUT

Description	Smart digital camera designed exclusively for dentistry
Model Number	EyeSpecial C-V
Serial Number	Refer to SECTION 4.2
Condition	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	August 17, 2022
Test Date	August 23 to September 11, 2022

2.2 Product Description

General Specification

Rating	DC 4.8 V to 6 V (Battery (4 x Alkaline AA Batteries)
Operating temperature	0 deg. C to 40 deg. C

Radio Specification

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

Equipment Type	Transceiver
Frequency of Operation	2412 MHz to 2462 MHz
Type of Modulation	DSSS, OFDM
Antenna Gain	1.59 dBi

WLAN (IEEE802.11a/11n-20/11ac-20/11n-40/11ac-40/11ac-80)

Equipment Type	Transceiver	
Frequency of Operation	20 MHz Band:	5180 MHz to 5240 MHz
	40 MHz Band:	5190 MHz to 5230 MHz
	80 MHz Band:	5210 MHz
Type of Modulation	OFDM	
Antenna Gain	2.23 dBi	

SECTION 3: Test specification, Procedures & Results

3.1 Test Specification

Test Specification	FCC Part 15 Subpart E The latest version on the first day of the testing period
Title	FCC 47 CFR Part 15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices Section 15.407 General technical requirements

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

3.2 Procedures and Results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013	**FCC:** 15.407 (b) (6) / 15.207	N/A	N/A	*1)
	ISED: RSS-Gen 8.8	**ISED:** RSS-Gen 8.8			
26 dB Emission Bandwidth	**FCC:** KDB Publication Number 789033	**FCC:** 15.407 (a) (1) (2) (3)	See data	N/A	*2)
	ISED: -	**ISED:** -			
Maximum Conducted Output Power	**FCC:** KDB Publication Number 789033	**FCC:** 15.407 (a) (1) (2) (3)		Complied a)	Conducted
	ISED: -	**ISED:** RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1			
Maximum Power Spectral Density	**FCC:** KDB Publication Number 789033	**FCC :** 15.407 (a) (1) (2) (3)		Complied b)	Conducted
	ISED: -	**ISED:** 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	4.8 dB 5150.0 MHz, AV, Vertical	Complied c) / d)	Conducted (< 30 MHz) / Radiated > 30 MHz) *3)
	ISED: -	**ISED:** RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2			
6 dB Emission Bandwidth	**FCC:** ANSI C63.10-2013	**FCC:** 15.407 (e)	See data	N/A	*4)
	ISED: -	**ISED:** RSS-247 6.2.4.1			

Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.
* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

*1) The test was not performed on since the EUT does not have AC Power ports.
*2) The test is not applicable since the EUT does not support to W53 and W56 bands.
*3) Radiated test was selected over 30 MHz based on FCC 15.407 (b) and KDB 789033 D02 G.3.b).
*4) The test is not applicable since the EUT does not support to W58 bands.

a) Refer to APPENDIX 1 (data of Maximum Conducted Output Power)
b) Refer to APPENDIX 1 (data of Maximum Power Spectral Density)
c) Refer to APPENDIX 1 (data of Radiated Spurious Emission)
d) Refer to APPENDIX 1 (data of Conducted Spurious Emission)

FCC Part 15.31 (e)

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

FCC Part 15.203 Antenna requirement

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

3.3 Addition to Standard

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
99 % Occupied Bandwidth	RSS-Gen 6.7	**ISED:** -	N/A	- a)	Conducted
a) Refer to APPENDIX 1 (data of 99 % Occupied Bandwidth)					

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.
Note: When margins obtained from test results are less than the measurement uncertainty, the test results may exceed the limit.

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

Radiated emission

Measurement distance	Frequency range		Uncertainty (+/-)
3 m	9 kHz to 30 MHz		3.2 dB
10 m			3.0 dB
3 m	30 MHz to 200 MHz	(Horizontal)	4.8 dB
		(Vertical)	5.0 dB
	200 MHz to 1000 MHz	(Horizontal)	5.1 dB
		(Vertical)	6.2 dB
10 m	30 MHz to 200 MHz	(Horizontal)	4.8 dB
		(Vertical)	4.8 dB
	200 MHz to 1000 MHz	(Horizontal)	5.0 dB
		(Vertical)	5.0 dB
3 m	1 GHz to 6 GHz		4.9 dB
	6 GHz to 18 GHz		5.2 dB
1 m	10 GHz to 26.5 GHz		5.4 dB
	26.5 GHz to 40 GHz		5.4 dB
0.5 m	26.5 GHz to 40 GHz		5.4 dB
10 m	1 GHz to 18 GHz		5.4 dB

Antenna Terminal test

Test Item	Uncertainty (+/-)
26 dB Emission Bandwidth / 6 dB Emission Bandwidth / 99 % Occupied Bandwidth	0.96 %
Maximum Conducted Output Power / Average Output Power	1.5 dB
Burst Rate	0.10 %
Maximum Power Spectral Density	2.7 dB
Conducted Spurious Emission	2.7 dB

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.
*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919
ISED Lab Company Number: 2973C / CAB identifier: JP0002
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 Japan
Telephone: +81-596-24-8999

Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.10 shielded room	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room	2.6 x 3.4 x 2.5	N/A	-	-
Large Chamber	16.9 x 22.1 x 10.17	16.9 x 22.1	-	10 m
Small Chamber	5.3 x 6.69 x 3.59	5.3 x 6.69	-	-

3.6 Test Data, Test Instruments, and Test Set Up

Refer to APPENDIX.

SECTION 4: Operation of EUT 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)	6 Mbps, PN9
IEEE 802.11n SISO 20 MHz BW (11n-20)	MCS 0, PN9
IEEE 802.11n SISO 40 MHz BW (11n-40)	MCS 5, PN9
IEEE 802.11ac SISO 20 MHz BW (11ac-20)	MCS 1, PN9
IEEE 802.11ac SISO 40 MHz BW (11ac-40)	MCS 9, PN9
IEEE 802.11ac SISO 80 MHz BW (11ac-80)	MCS 6, PN9
*The worst condition was determined based on the test result of Maximum Conducted Output Power.	

*Power of the EUT was set by the software as follows;

Power Setting: 11a: 16.5 dBm
11n-20: 16.5 dBm
11n-40: 16 dBm
11ac-20: 16.5 dBm
11ac-40: 16 dBm
11ac-80: 15 dBm

Software: 4AE6282 Ver.00.03.00
(Date: June 30, 2022, Storage location: EUT memory)

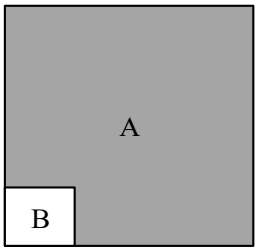
*This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

*The Details of Operation Mode(s)

Test Item	Operating Mode	Tested Frequency			
		Lower Band	Middle Band	Additional Band	Upper Band
99 % Occupied Bandwidth, Maximum Conducted Output Power, Maximum Power Spectral Density	11a Tx 11ac-20 Tx *1)	5180 MHz 5220 MHz 5240 MHz	-	-	-
	11ac-40 Tx *1)	5190 MHz 5230 MHz	-	-	-
	11ac-80 Tx	5210 MHz	-	-	-
Radiated Spurious Emission (Below 1 GHz)	11a Tx *2)	5220 MHz	-	-	-
Radiated Spurious Emission (Above 1 GHz)	11a Tx 11ac-20 Tx *1)	5180 MHz 5220 MHz 5240 MHz	-	-	-
	11ac-40 Tx *1)	5190 MHz 5230 MHz	-	-	-
	11ac-80 Tx	5210 MHz	-	-	-
Conducted Spurious Emission	11a Tx *2)	5220 MHz		-	-

*1) Since 11n-20 and 11ac-20, 11n-40 and 11ac-40, have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest output power.
*2) The mode was tested as a representative, because it had the highest power at antenna terminal test.

4.2 Configuration and Peripherals



* Setup was taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support Equipment

No.	Item	Model number	Serial Number	Manufacturer	Remarks
A	Smart digital camera designed exclusively for dentistry	EyeSpecial C-V	No.9	SHOFU INC.	EUT
B	SD card	-	C16344 5471	-	-

SECTION 5: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1GHz >
EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

< Above 1GHz >
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

< Below 1GHz >

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

< Above 1GHz >

Inside of restricted bands (Section 15.205):

Apply to limit in the Section 15.209 (a).

Outside of the restricted bands:

Apply to limit 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p.*) in the Section 15.407 (b) (1) (2) (3).

Restricted band edge:

Apply to limit in the Section 15.209 (a).
Since this limit is severer than the limit of the inside of restricted bands.

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

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

Test Antennas are used as below;

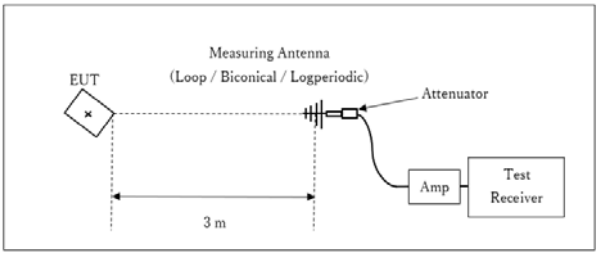
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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 AD *1) RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: ≥ 100 traces If duty cycle was less than 98%, a duty factor was added to the results.

*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 2: Test Setup

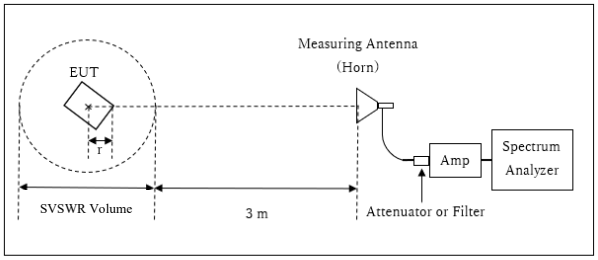
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz to 10 GHz

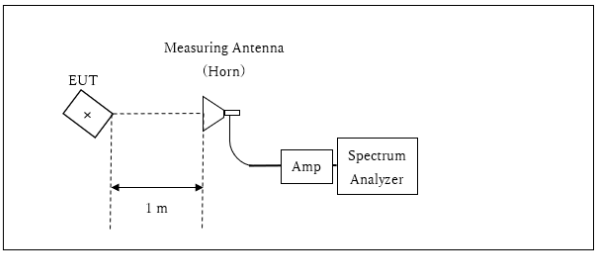


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.95 m / 3.0 m) = 2.39 dB
* Test Distance: (3 + SVSWR Volume /2) - r = 3.95 m

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.05 m

10 GHz to 40 GHz



× : Center of turn table

Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.5 dB
*Test Distance: 1 m

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

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

Measurement Range : **30 MHz to 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
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 80 MHz BW) (Method PM)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz	≥ 3 RBW	Auto	RMS Power Averaging (200 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*2) *3)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	9.1 kHz	27 kHz				

* 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) Peak hold was applied as Worst-case measurement.
*2) 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 to 150 kHz: RBW = 200 Hz, 150 kHz to 30 MHz: RBW = 9.1 kHz)
*3) The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohmes. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to 45.5 – 51.5 = -6.0 dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

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

99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Date	August 31, 2022
Temperature / Humidity	23 deg. C / 48 % RH
Engineer	Keiya Ido
Mode	Tx

11a

Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
5180	17581.6
5220	17488.7
5240	17412.6

11ac-20

Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
5180	18287.0
5220	18216.6
5240	18261.5

11ac-40

Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
5190	37033.2
5230	37084.4

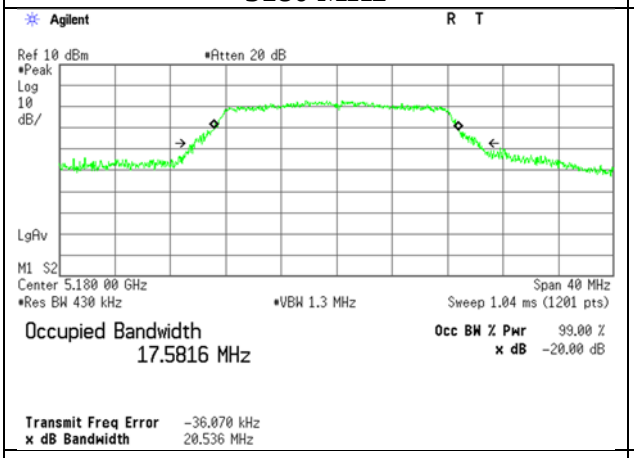
11ac-80

Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
5210	76331.2

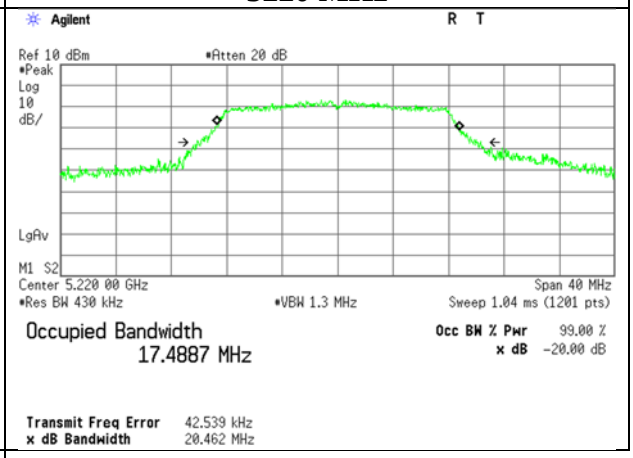
99 % Occupied Bandwidth

11a

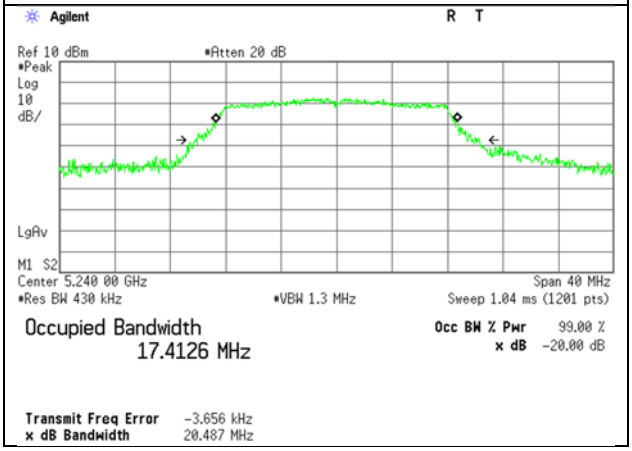
5180 MHz



5220 MHz



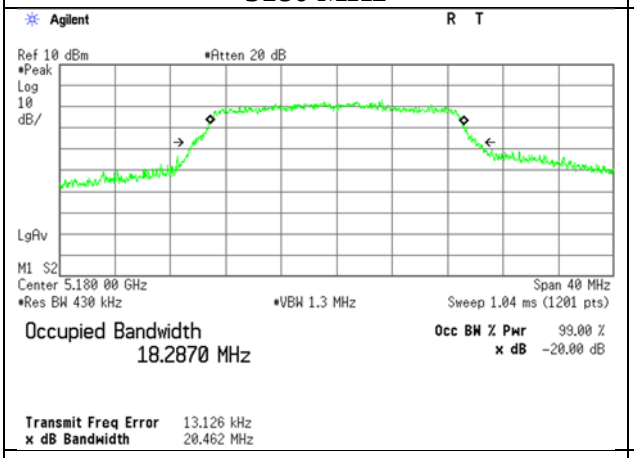
5240 MHz



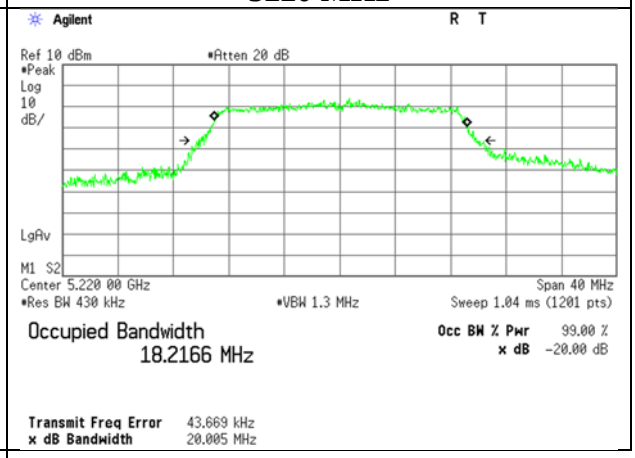
99 % Occupied Bandwidth

11ac-20

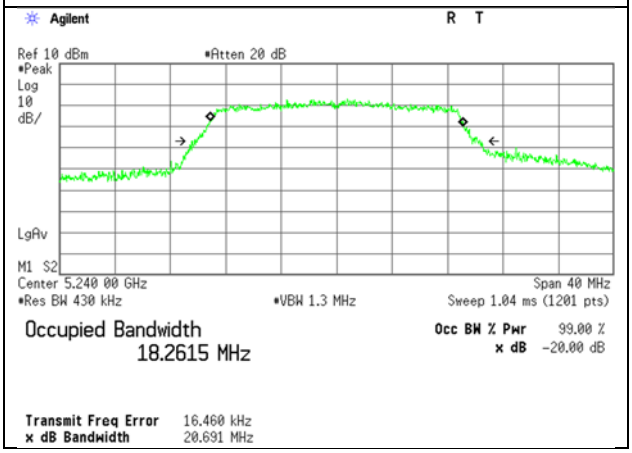
5180 MHz



5220 MHz



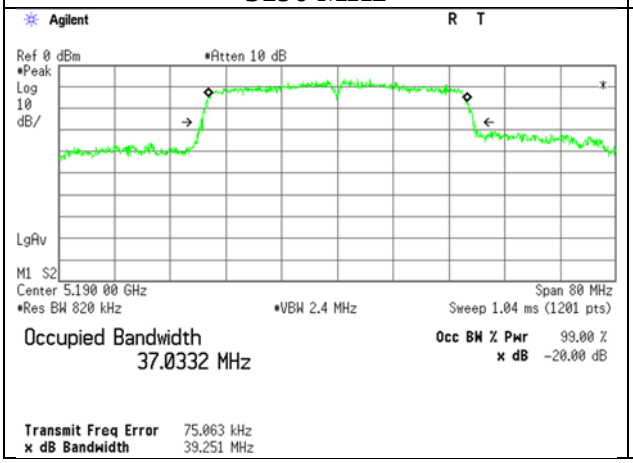
5240 MHz



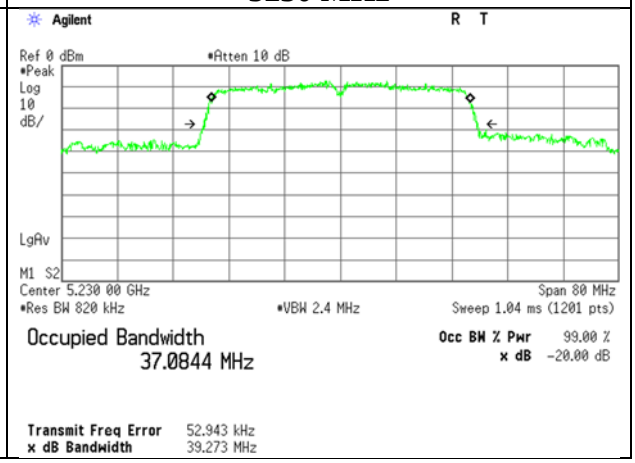
99 % Occupied Bandwidth

11ac-40

5190 MHz

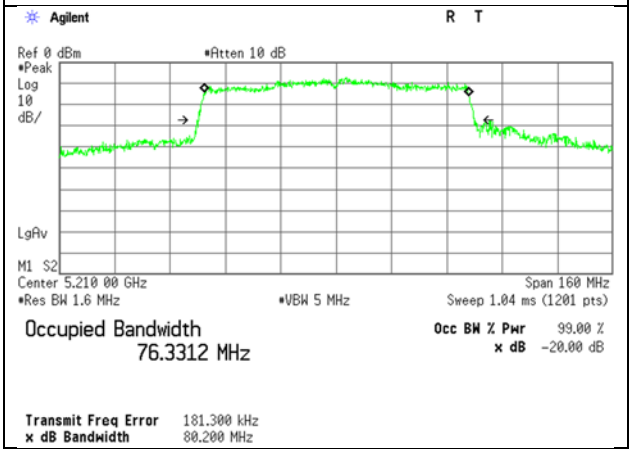


5230 MHz



11ac-80

5210 MHz



Maximum Conducted Output Power

Test place	Ise EMC Lab. No.6 Measurement Room
Date	August 25, 2022
Temperature / Humidity	23 deg. C / 56 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx

11a

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-0.56	2.03	10.07	0.06	2.23	-	17.582	11.60	14.45	23.97	12.37	13.83	24.15	29.97	16.14
5220	-0.35	2.04	10.07	0.06	2.23	-	17.489	11.82	15.21	23.97	12.15	14.05	25.41	29.97	15.92
5240	-0.81	2.04	10.07	0.06	2.23	-	17.413	11.36	13.68	23.97	12.61	13.59	22.86	29.97	16.38

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

11ac20

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-0.48	2.03	10.07	0.12	2.23	-	18.287	11.74	14.93	23.97	12.23	13.97	24.95	29.97	16.00
5220	-0.65	2.04	10.07	0.12	2.23	-	18.217	11.58	14.39	23.97	12.39	13.81	24.04	29.97	16.16
5240	-0.90	2.04	10.07	0.12	2.23	-	18.262	11.33	13.58	23.97	12.64	13.56	22.70	29.97	16.41

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

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.6 Measurement Room
Date	August 25, 2022
Temperature / Humidity	23 deg. C / 56 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx

11ac-40 Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5190	-2.41	2.03	10.07	0.92	2.23	-	37.033	10.61	11.51	23.97	13.36	12.84	19.23	29.97	17.13
5230	-2.32	2.04	10.07	0.92	2.23	-	37.084	10.71	11.78	23.97	13.26	12.94	19.68	29.97	17.03

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

11ac-80 Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5210	-3.49	2.03	10.07	1.04	2.23	-	76.331	9.65	9.23	23.97	14.32	11.88	15.42	29.97	18.09

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

Worst data rate check

Test place	Ise EMC Lab. No.6 Measurement Room
Date	August 23, 2022
Temperature / Humidity	22 deg. C / 53 % RH
Engineer	Hiroki Numata
Mode	Tx

5220 MHz

Mode	Rate Mbps	Burst power [dBm]	Remarks
11a	6	-4.22	*
	9	-4.37	
	12	-4.31	
	18	-4.34	
	24	-4.55	
	36	-4.71	
	48	-4.69	
	54	-4.68	

* Worst rate
This test was conducted by the use of Gate function.
All comparison were carried out on same frequency and measurement factors.

5220 MHz

Mode	MCS Number	Burst power [dBm]	Remarks
11n-20	0	-4.44	*
	1	-4.61	
	2	-4.60	
	3	-4.64	
	4	-5.04	
	5	-4.92	
	6	-5.12	
	7	-4.69	

* Worst rate
This test was conducted by the use of Gate function.
All comparison were carried out on same frequency and measurement factors.

5190 MHz

Mode	MCS Number	Burst power [dBm]	Remarks
11n-40	0	-4.94	
	1	-4.91	
	2	-4.63	
	3	-4.60	
	4	-4.61	
	5	-4.56	*
	6	-4.97	
	7	-4.73	

* Worst rate
This test was conducted by the use of Gate function.
All comparison were carried out on same frequency and measurement factors.

Worst data rate check

Test place	Ise EMC Lab. No.6 Measurement Room
Date	August 23, 2022
Temperature / Humidity	22 deg. C / 53 % RH
Engineer	Hiroki Numata
Mode	Tx

5220 MHz

Mode	MCS Number	Burst power [dBm]	Remarks
11ac-20	0	-4.82	
	1	-4.40	*
	2	-5.11	
	3	-4.61	
	4	-4.81	
	5	-4.79	
	6	-4.90	
	7	-4.79	
	8	-4.71	

* Worst rate
This test was conducted by the use of Gate function.
All comparison were carried out on same frequency and measurement factors.

5190 MHz

Mode	MCS Number	Burst power [dBm]	Remarks
11ac-40	0	-4.52	
	1	-4.58	
	2	-4.56	
	3	-4.52	
	4	-4.59	
	5	-4.63	
	6	-4.57	
	7	-4.52	
	8	-4.63	
	9	-4.47	*

* Worst rate
This test was conducted by the use of Gate function.
All comparison were carried out on same frequency and measurement factors.

5210 MHz

Mode	MCS Number	Burst power [dBm]	Remarks
11ac-80	0	-8.17	
	1	-8.16	
	2	-8.13	
	3	-8.10	
	4	-7.91	
	5	-8.15	
	6	-7.89	*
	7	-7.97	
	8	-8.15	
	9	-8.16	

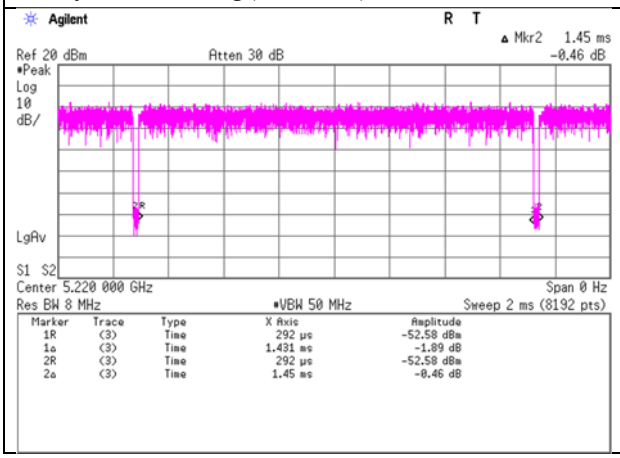
* Worst rate
This test was conducted by the use of Gate function.
All comparison were carried out on same frequency and measurement factors.

Burst rate confirmation

Test place	Ise EMC Lab. No.6 Measurement Room
Date	August 25, 2022
Temperature / Humidity	23 deg. C / 56 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx

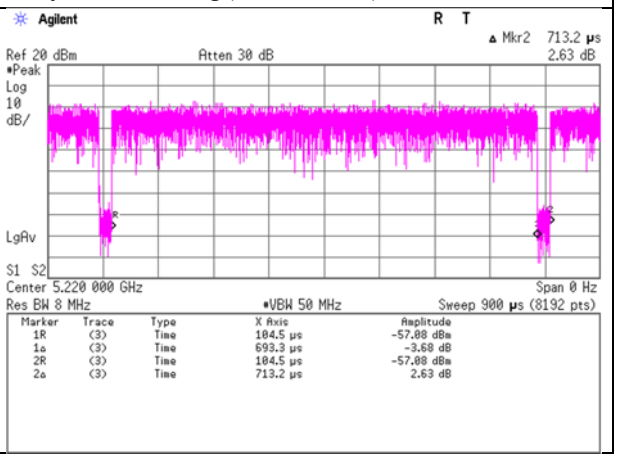
11a 6 Mbps

Tx on / (Tx on + Tx off) = 0.987
Tx on / (Tx on + Tx off) * 100 = 98.7 %
Duty factor = 10 * log (1.45 / 1.431) = 0.06 dB



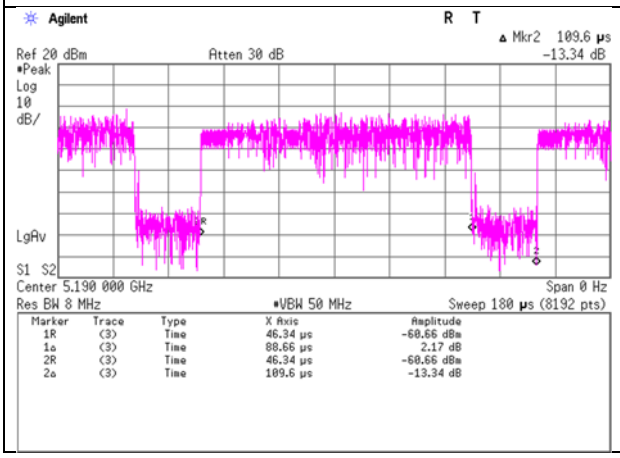
11ac20 MCS 1

Tx on / (Tx on + Tx off) = 0.972
Tx on / (Tx on + Tx off) * 100 = 97.2 %
Duty factor = 10 * log (0.7132 / 0.6933) = 0.12 dB



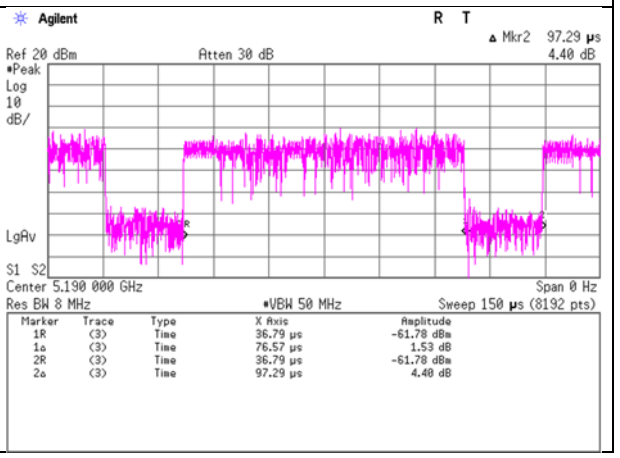
11ac40 MCS 9

Tx on / (Tx on + Tx off) = 0.809
Tx on / (Tx on + Tx off) * 100 = 80.9 %
Duty factor = 10 * log (0.1096 / 0.08866) = 0.92 dB



11ac80 MCS 6

Tx on / (Tx on + Tx off) = 0.787
Tx on / (Tx on + Tx off) * 100 = 78.7 %
Duty factor = 10 * log (0.9729 / 0.7657) = 1.04 dB



Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 2, 2022
Temperature / Humidity	22 deg. C / 48 % RH
Engineer	Keiya Ido
Mode	Tx 11a

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
5180	-0.50	2.03	10.07	11.60	14.45
5220	-0.29	2.04	10.07	11.82	15.21
5240	-0.75	2.04	10.07	11.36	13.68

Sample Calculation:

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

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

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 2, 2022
Temperature / Humidity	22 deg. C / 48 % RH
Engineer	Keiya Ido
Mode	Tx 11ac-20

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average) [dBm]	[mW]
5180	-0.85	2.03	10.07	11.25	13.34
5220	-0.68	2.04	10.07	11.43	13.90
5240	-0.92	2.04	10.07	11.19	13.15

Sample Calculation:

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

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

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 2, 2022
Temperature / Humidity	22 deg. C / 48 % RH
Engineer	Keiya Ido
Mode	Tx 11ac-40

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
5190	-1.68	2.03	10.07	10.42	11.02
5230	-1.63	2.03	10.07	10.47	11.14

Sample Calculation:

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

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

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 2, 2022
Temperature / Humidity	22 deg. C / 48 % RH
Engineer	Keiya Ido
Mode	Tx 11ac-80

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
5210	-2.77	2.03	10.07	9.33	8.57

Sample Calculation:

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

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

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Maximum Power Spectral Density

Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 1, 2022
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Keiya Ido
Mode	Tx 11a

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5180	-10.41	2.03	10.07	0.06	2.23	0.00	1.75	11.00	9.25	3.98	17.00	13.02
5220	-10.27	2.04	10.07	0.06	2.23	0.00	1.90	11.00	9.10	4.13	17.00	12.87
5240	-10.25	2.04	10.07	0.06	2.23	0.00	1.92	11.00	9.08	4.15	17.00	12.85

Sample Calculation:
PSD: Power Spectral Density
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 1, 2022
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Keiya Ido
Mode	Tx 11ac-20

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5180	-11.28	2.03	10.07	0.12	2.23	0.00	0.94	11.00	10.06	3.17	17.00	13.83
5220	-11.08	2.04	10.07	0.12	2.23	0.00	1.15	11.00	9.85	3.38	17.00	13.62
5240	-11.02	2.04	10.07	0.12	2.23	0.00	1.21	11.00	9.79	3.44	17.00	13.56

Sample Calculation:
PSD: Power Spectral Density
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 1, 2022
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Keiya Ido
Mode	Tx 11ac-40

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5190	-15.07	2.03	10.07	0.92	2.23	0.00	-2.05	11.00	13.05	0.18	17.00	16.82
5230	-15.43	2.04	10.07	0.92	2.23	0.00	-2.40	11.00	13.40	-0.17	17.00	17.17

Sample Calculation:
PSD: Power Spectral Density
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 1, 2022
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Keiya Ido
Mode	Tx 11ac-80

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5210	-19.30	2.03	10.07	1.04	2.23	0.00	-6.16	11.00	17.16	-3.93	17.00	20.93

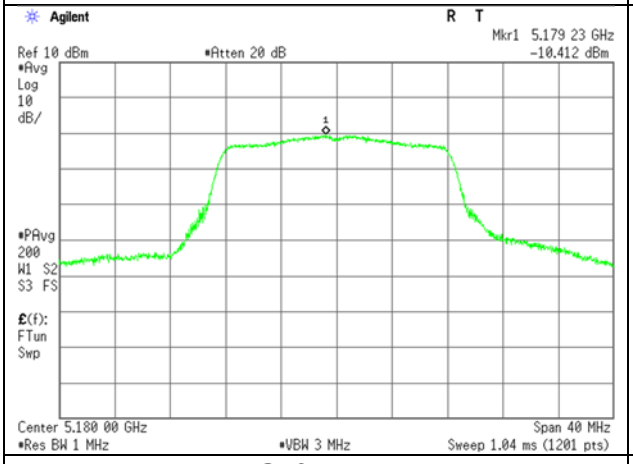
Sample Calculation:
PSD: Power Spectral Density
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

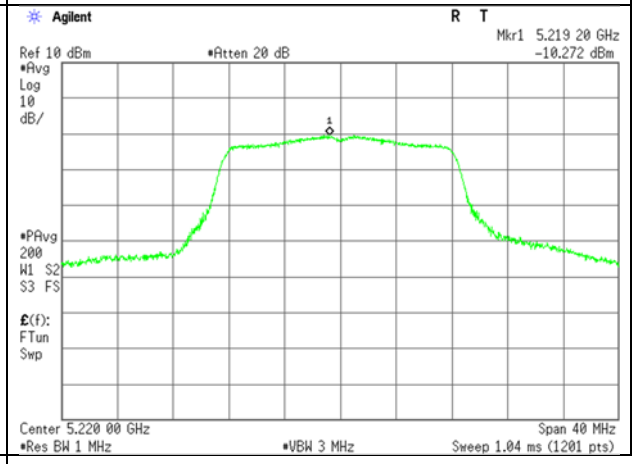
Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 1, 2022
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Keiya Ido
Mode	Tx 11a

11a

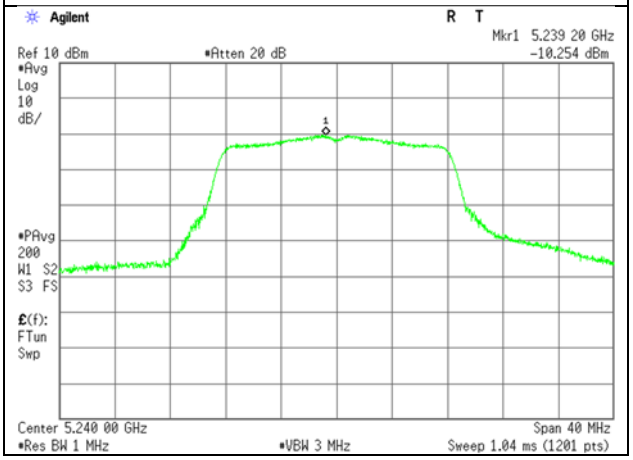
5180 MHz



5220 MHz



5240 MHz

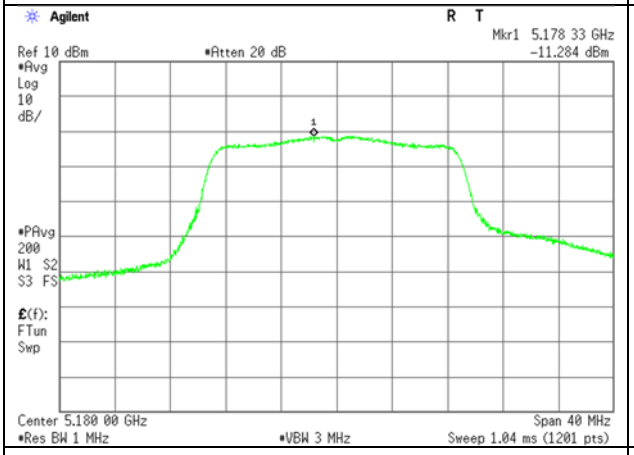


Maximum Power Spectral Density

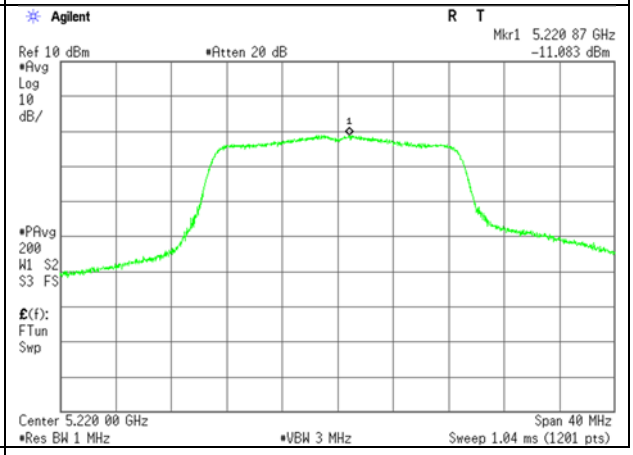
Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 1, 2022
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Keiya Ido
Mode	Tx 11ac-20

11ac-20

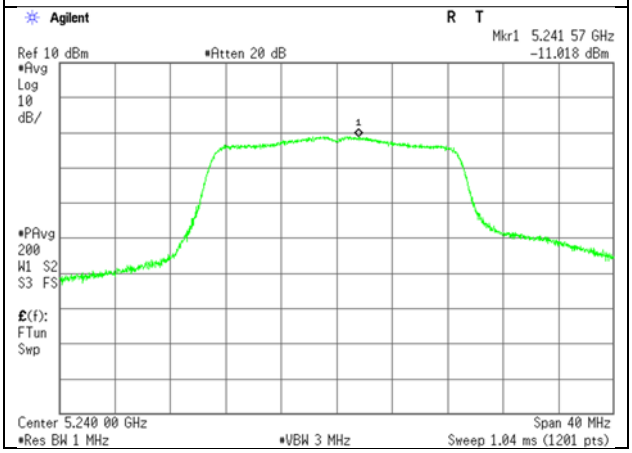
5180 MHz



5220 MHz



5240 MHz

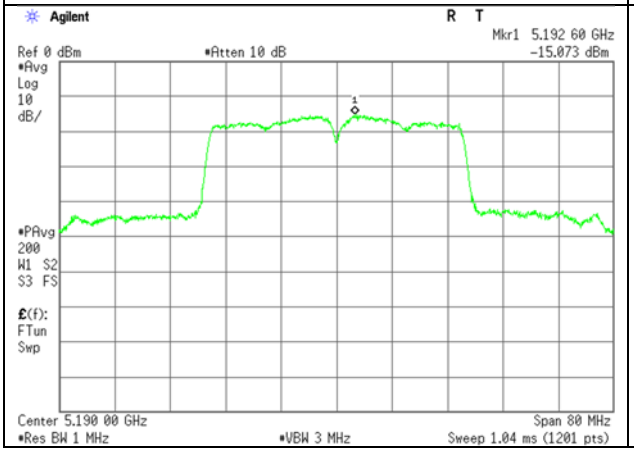


Maximum Power Spectral Density

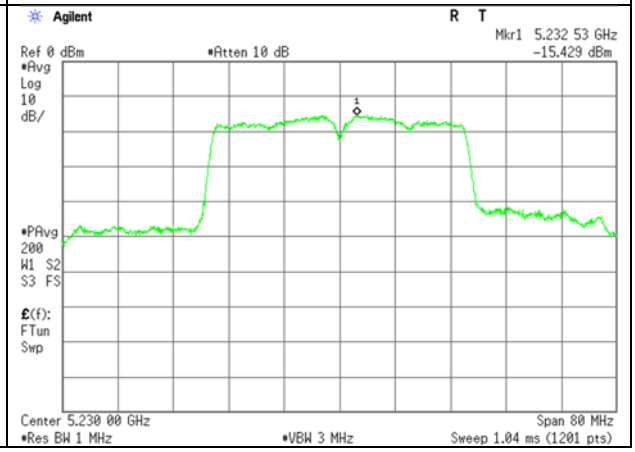
Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 1, 2022
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Keiya Ido
Mode	Tx 11ac-40

11ac-40

5190 MHz



5230 MHz

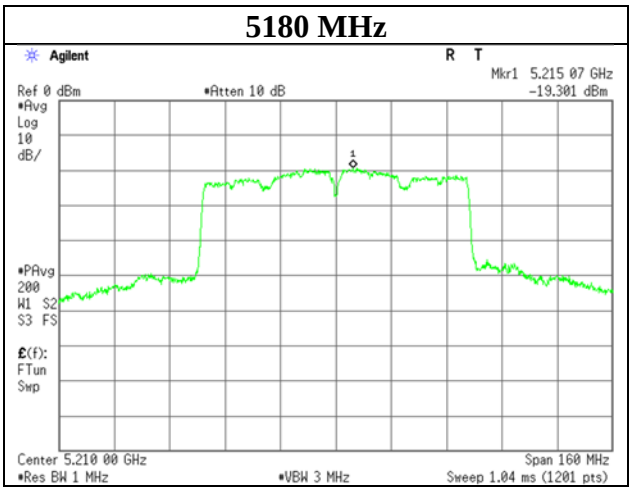


Maximum Power Spectral Density

Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 1, 2022
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Keiya Ido
Mode	Tx 11ac-80

11ac-80

5180 MHz



Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	August 28, 2022	September 11, 2022	September 11, 2022
Temperature / Humidity	22 deg. C / 54 % RH	22 deg. C / 55 % RH	20 deg. C / 51 % RH
Engineer	Tetsuro Yoshida	Tetsuro Yoshida	Keiya Ido
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11a 5180 MHz		

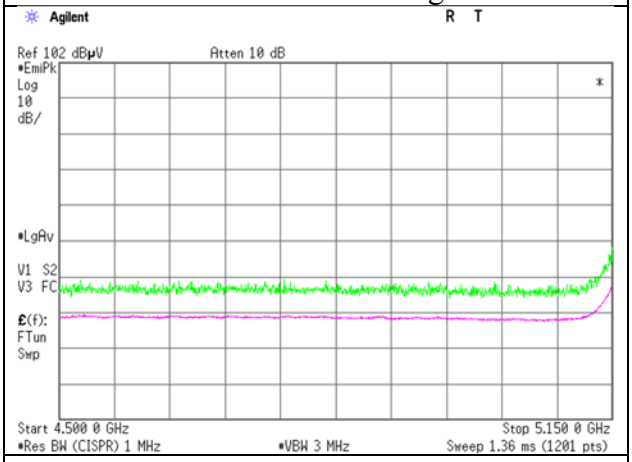
Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	3453.3	44.2	-	28.6	5.6	32.4	-	45.9	-	68.2	-	22.3	-	
Hori.	5150.0	55.5	41.1	31.9	6.2	31.9	-	61.7	47.3	73.9	53.9	12.2	6.6	*1)
Hori.	10360.0	42.4	-	39.9	-2.1	33.8	-	46.4	-	68.2	-	21.8	-	Floor noise
Hori.	15540.0	43.0	35.0	37.6	-0.1	33.0	-	47.6	39.6	73.9	53.9	26.3	14.3	Floor noise
Vert.	3453.3	43.3	-	28.6	5.6	32.4	-	45.0	-	68.2	-	23.2	-	
Vert.	5150.0	50.9	39.6	31.9	6.2	31.9	-	57.1	45.8	73.9	53.9	16.8	8.1	*1)
Vert.	10360.0	42.5	-	39.9	-2.1	33.8	-	46.5	-	68.2	-	21.7	-	Floor noise
Vert.	15540.0	43.0	35.1	37.6	-0.1	33.0	-	47.5	39.7	73.9	53.9	26.4	14.2	Floor noise

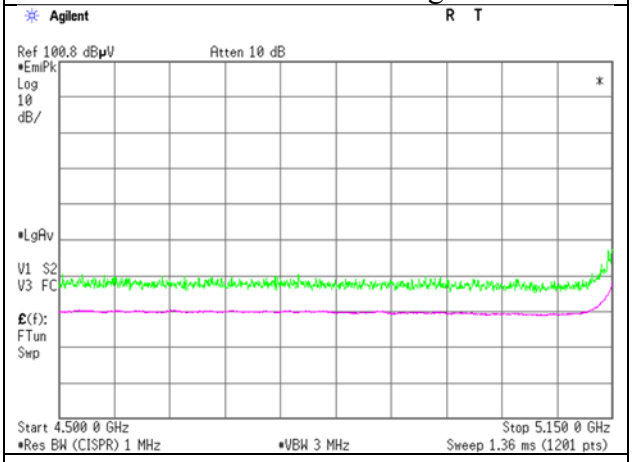
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.
*1) Not Out of Band emission(Leakage Power)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	August 28, 2022
Temperature / Humidity	22 deg. C / 54 % RH
Engineer	Tetsuro Yoshida
	(1 GHz - 10 GHz)
Mode	Tx 11a 5180 MHz

Horizontal
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

Vertical
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

* 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

Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.2
Date	August 28, 2022	September 11, 2022	September 11, 2022	September 12, 2022
Temperature / Humidity	22 deg. C / 54 % RH	22 deg. C / 55 % RH	20 deg. C / 51 % RH	20 deg. C / 54 % RH
Engineer	Tetsuro Yoshida	Tetsuro Yoshida	Keiya Ido	Kiyoshiro Okazaki
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)	(Below 1 GHz)
Mode	Tx 11a 5220 MHz			

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	153.9	34.5	-	15.1	7.8	28.2	-	29.1	-	43.5	-	14.4	-	
Hori.	274.4	22.5	-	13.7	8.5	27.7	-	17.0	-	46.0	-	29.0	-	
Hori.	401.6	26.2	-	16.2	9.5	28.5	-	23.4	-	46.0	-	22.7	-	
Hori.	501.4	26.9	-	18.1	9.6	29.1	-	25.5	-	46.0	-	20.5	-	
Hori.	575.0	29.9	-	18.8	9.9	29.3	-	29.3	-	46.0	-	16.7	-	
Hori.	925.6	22.6	-	22.2	11.2	28.8	-	27.2	-	46.0	-	18.8	-	
Hori.	3480.0	42.9	-	28.7	5.6	32.4	-	44.8	-	68.2	-	23.4	-	
Hori.	10440.0	40.0	-	39.9	-2.1	33.8	-	43.9	-	68.2	-	24.3	-	Floor noise
Hori.	15660.0	42.0	34.6	37.5	-0.1	33.0	-	46.5	39.1	73.9	53.9	27.4	14.8	Floor noise
Vert.	153.9	38.3	-	15.1	7.8	28.2	-	32.9	-	43.5	-	10.6	-	
Vert.	274.4	22.4	-	13.7	8.5	27.7	-	16.9	-	46.0	-	29.1	-	
Vert.	401.6	26.4	-	16.2	9.5	28.5	-	23.6	-	46.0	-	22.5	-	
Vert.	501.4	27.4	-	18.1	9.6	29.1	-	26.0	-	46.0	-	20.0	-	
Vert.	575.0	33.0	-	18.8	9.9	29.3	-	32.4	-	46.0	-	13.6	-	
Vert.	925.6	22.7	-	22.2	11.2	28.8	-	27.3	-	46.0	-	18.7	-	
Vert.	3480.0	43.9	-	28.7	5.6	32.4	-	45.8	-	68.2	-	22.4	-	
Vert.	10440.0	40.8	-	39.9	-2.1	33.8	-	44.8	-	68.2	-	23.4	-	Floor noise
Vert.	15660.0	42.1	34.7	37.5	-0.1	33.0	-	46.6	39.2	73.9	53.9	27.3	14.7	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	August 28, 2022	September 11, 2022	September 11, 2022
Temperature / Humidity	22 deg. C / 54 % RH	22 deg. C / 55 % RH	20 deg. C / 51 % RH
Engineer	Tetsuro Yoshida	Tetsuro Yoshida	Keiya Ido
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11a 5240 MHz		

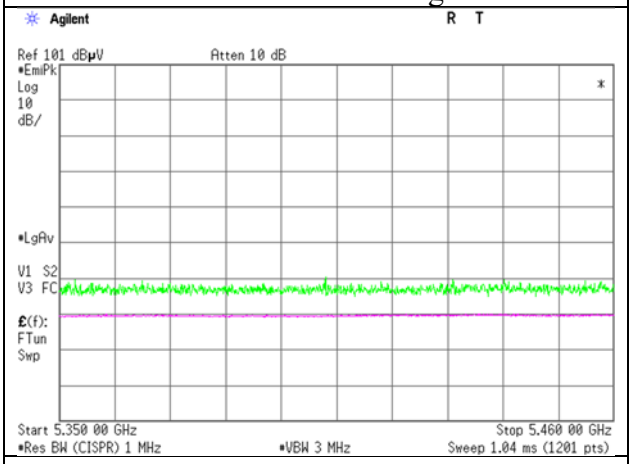
Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	3493.3	41.9	-	28.7	5.6	32.4	-	43.8	-	68.2	-	24.4	-	
Hori.	5350.0	41.3	32.0	31.7	6.3	31.9	-	47.3	38.1	73.9	53.9	26.6	15.8	*1)
Hori.	10480.0	42.3	-	39.9	-2.1	33.8	-	46.3	-	68.2	-	21.9	-	Floor noise
Hori.	15720.0	42.2	34.6	37.6	-0.1	33.0	-	46.7	39.1	73.9	53.9	27.2	14.8	Floor noise
Vert.	3493.3	45.2	-	28.7	5.6	32.4	-	47.1	-	68.2	-	21.1	-	
Vert.	5350.0	42.2	32.0	31.7	6.3	31.9	-	48.3	38.1	73.9	53.9	25.7	15.8	*1)
Vert.	10480.0	42.3	-	39.9	-2.1	33.8	-	46.3	-	68.2	-	21.9	-	Floor noise
Vert.	15720.0	42.2	34.4	37.6	-0.1	33.0	-	46.7	39.0	73.9	53.9	27.2	14.9	Floor noise

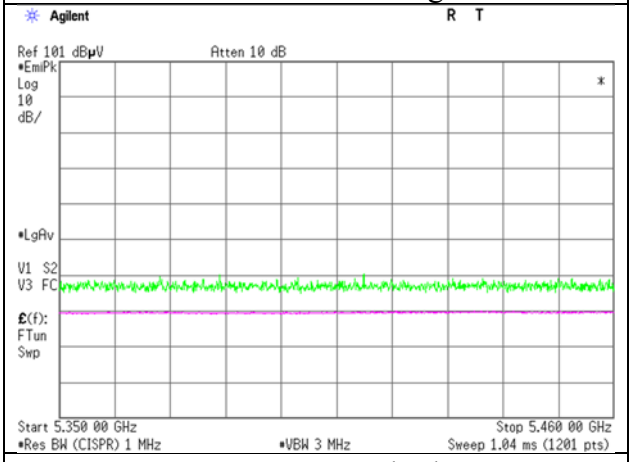
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.
*1) Not Out of Band emission(Leakage Power)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	August 28, 2022
Temperature / Humidity	22 deg. C / 54 % RH
Engineer	Tetsuro Yoshida
Mode	Tx 11a 5240 MHz

Horizontal
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

Vertical
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

* 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

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	August 28, 2022	September 11, 2022	September 11, 2022
Temperature / Humidity	22 deg. C / 51 % RH	22 deg. C / 55 % RH	20 deg. C / 51 % RH
Engineer	Hiroki Numata	Tetsuro Yoshida	Keiya Ido
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11ac-20 5180 MHz		

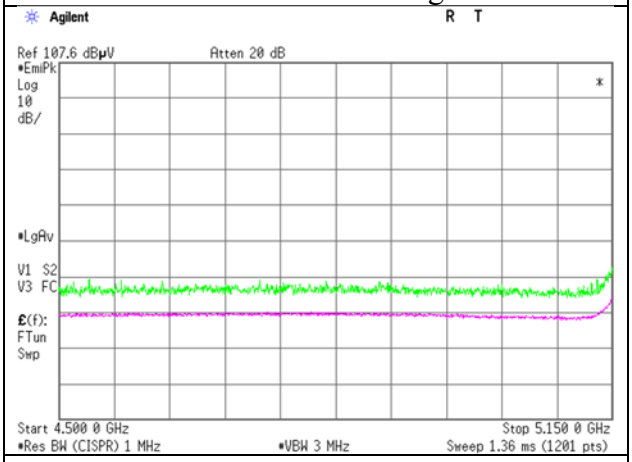
Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	3453.3	44.9	-	28.6	5.6	32.4	-	46.6	-	68.2	-	21.6	-	
Hori.	5150.0	53.6	41.2	31.9	6.2	31.9	0.1	59.8	47.5	73.9	53.9	14.1	6.4	*1)
Hori.	10360.0	42.4	-	39.9	-2.1	33.8	-	46.4	-	68.2	-	21.8	-	Floor noise
Hori.	15540.0	43.2	35.2	37.6	-0.1	33.0	-	47.8	39.8	73.9	53.9	26.1	14.1	Floor noise
Vert.	3453.3	45.0	-	28.6	5.6	32.4	-	46.7	-	68.2	-	21.5	-	
Vert.	5150.0	52.0	39.1	31.9	6.2	31.9	0.1	58.2	45.4	73.9	53.9	15.7	8.5	*1)
Vert.	10360.0	42.5	-	39.9	-2.1	33.8	-	46.5	-	68.2	-	21.7	-	Floor noise
Vert.	15540.0	43.5	35.4	37.6	-0.1	33.0	-	48.1	40.0	73.9	53.9	25.8	13.9	Floor noise

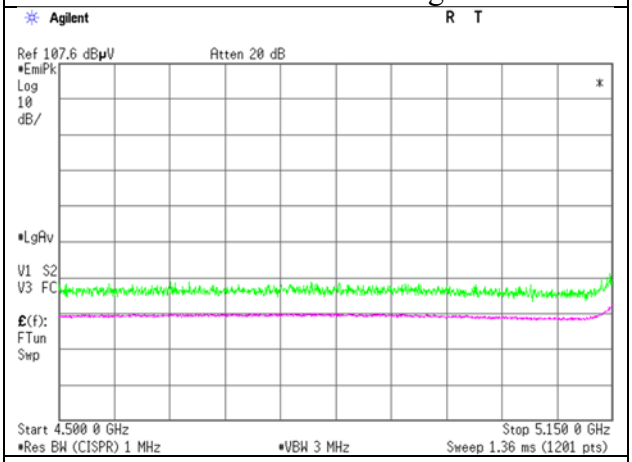
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.
*1) Not Out of Band emission(Leakage Power)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	August 28, 2022
Temperature / Humidity	22 deg. C / 51 % RH
Engineer	Hiroki Numata
	(1 GHz - 10 GHz)
Mode	Tx 11ac-20 5180 MHz

Horizontal
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

Vertical
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

* 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

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	August 28, 2022	September 11, 2022	September 11, 2022
Temperature / Humidity	22 deg. C / 51 % RH	22 deg. C / 55 % RH	20 deg. C / 51 % RH
Engineer	Hiroki Numata	Tetsuro Yoshida	Keiya Ido
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11ac-20 5220 MHz		

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	3480.0	44.5	-	28.7	5.6	32.4	-	46.3	-	68.2	-	21.9	-	
Hori.	10440.0	40.0	-	39.9	-2.1	33.8	-	44.0	-	68.2	-	24.2	-	Floor noise
Hori.	15660.0	42.0	34.5	37.5	-0.1	33.0	-	46.5	39.0	73.9	53.9	27.4	14.9	Floor noise
Vert.	3480.0	45.3	-	28.7	5.6	32.4	-	47.1	-	68.2	-	21.1	-	
Vert.	10440.0	40.8	-	39.9	-2.1	33.8	-	44.8	-	68.2	-	23.4	-	Floor noise
Vert.	15660.0	42.3	34.7	37.5	-0.1	33.0	-	46.8	39.2	73.9	53.9	27.1	14.7	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	August 28, 2022	September 11, 2022	September 11, 2022
Temperature / Humidity	22 deg. C / 51 % RH	22 deg. C / 55 % RH	20 deg. C / 51 % RH
Engineer	Hiroki Numata	Tetsuro Yoshida	Keiya Ido
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11ac-20 5240 MHz		

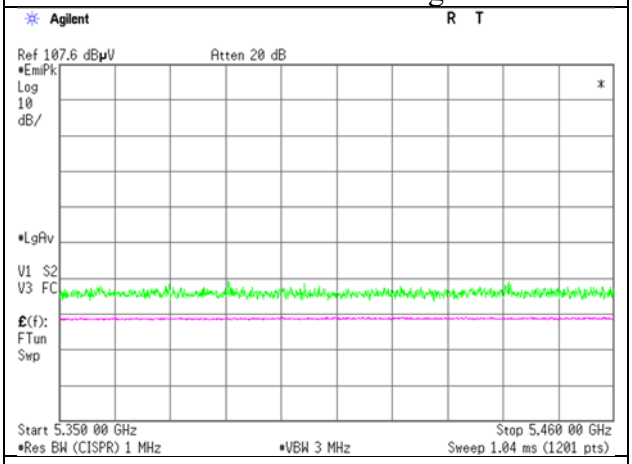
Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	3493.3	44.8	-	28.7	5.6	32.4	-	46.7	-	68.2	-	21.5	-	
Hori.	5350.0	42.6	32.0	31.7	6.3	31.9	0.1	48.7	38.2	73.9	53.9	25.2	15.7	*1)
Hori.	10480.0	42.1	-	39.9	-2.1	33.8	-	46.1	-	68.2	-	22.1	-	Floor noise
Hori.	15720.0	42.0	34.5	37.6	-0.1	33.0	-	46.6	39.0	73.9	53.9	27.4	14.9	Floor noise
Vert.	3493.3	44.7	-	28.7	5.6	32.4	-	46.6	-	68.2	-	21.6	-	
Vert.	5350.0	42.4	32.0	31.7	6.3	31.9	0.1	48.5	38.2	73.9	53.9	25.4	15.7	*1)
Vert.	10480.0	42.2	-	39.9	-2.1	33.8	-	46.2	-	68.2	-	22.0	-	Floor noise
Vert.	15720.0	42.1	34.3	37.6	-0.1	33.0	-	46.6	38.8	73.9	53.9	27.3	15.1	Floor noise

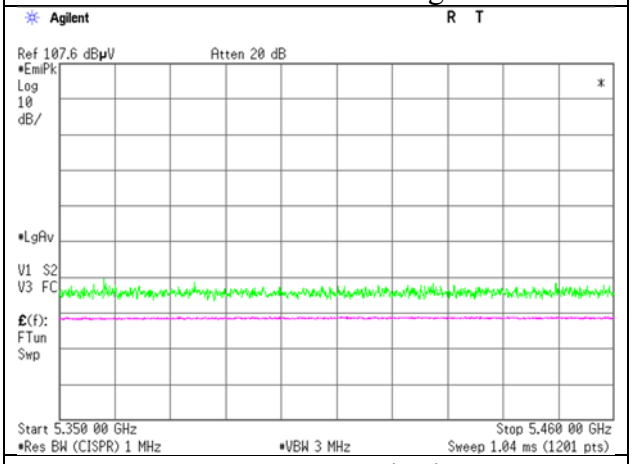
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.
*1) Not Out of Band emission(Leakage Power)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	August 28, 2022
Temperature / Humidity	22 deg. C / 51 % RH
Engineer	Hiroki Numata
Mode	Tx 11ac-20 5240 MHz

Horizontal
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

Vertical
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

* 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

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	August 28, 2022	September 11, 2022	September 11, 2022
Temperature / Humidity	22 deg. C / 51 % RH	22 deg. C / 55 % RH	20 deg. C / 51 % RH
Engineer	Hiroki Numata	Tetsuro Yoshida	Keiya Ido
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11ac-40 5190 MHz		

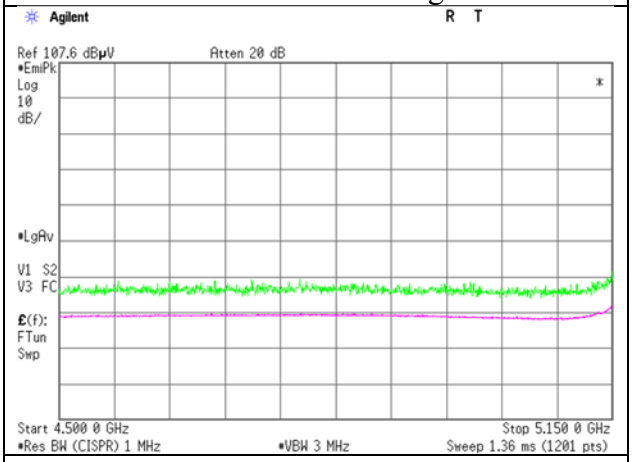
Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	3460.0	45.0	-	28.6	5.6	32.4	-	46.7	-	68.2	-	21.5	-	
Hori.	5150.0	52.3	38.7	31.9	6.2	31.9	0.9	58.5	45.8	73.9	53.9	15.4	8.1	*1)
Hori.	10380.0	41.4	-	39.9	-2.1	33.8	-	45.4	-	68.2	-	22.8	-	
Hori.	15570.0	42.9	34.6	37.7	-0.1	33.0	0.9	47.5	40.1	73.9	53.9	26.4	13.8	
Vert.	3460.0	45.4	-	28.6	5.6	32.4	-	47.1	-	68.2	-	21.1	-	
Vert.	5150.0	53.1	39.5	31.9	6.2	31.9	0.9	59.3	46.6	73.9	53.9	14.6	7.3	*1)
Vert.	10380.0	41.3	-	39.9	-2.1	33.8	-	45.3	-	68.2	-	22.9	-	
Vert.	15570.0	42.8	34.6	37.7	-0.1	33.0	0.9	47.4	40.1	73.9	53.9	26.5	13.8	

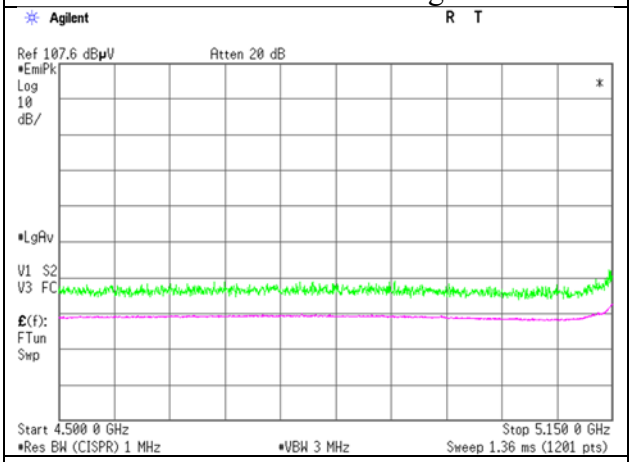
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.
*1) Not Out of Band emission(Leakage Power)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	August 28, 2022
Temperature / Humidity	22 deg. C / 51 % RH
Engineer	Hiroki Numata
	(1 GHz - 10 GHz)
Mode	Tx 11ac-40 5190 MHz

Horizontal
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

Vertical
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

* 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

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	August 28, 2022	September 11, 2022	September 11, 2022
Temperature / Humidity	22 deg. C / 51 % RH	22 deg. C / 55 % RH	20 deg. C / 51 % RH
Engineer	Hiroki Numata	Tetsuro Yoshida	Keiya Ido
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11ac-40 5230 MHz		

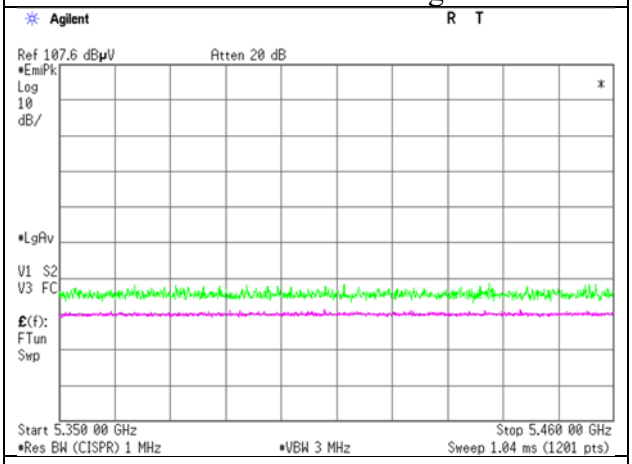
Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	3486.7	44.6	-	28.7	5.6	32.4	-	46.5	-	68.2	-	21.8	-	
Hori.	5350.0	43.5	32.8	31.7	6.3	31.9	0.9	49.6	39.8	73.9	53.9	24.4	14.1	*1)
Hori.	10460.0	41.6	-	39.9	-2.1	33.8	-	45.5	-	68.2	-	22.7	-	Floor noise
Hori.	15690.0	42.9	34.6	37.6	-0.1	33.0	-	47.5	39.2	73.9	53.9	26.4	14.7	Floor noise
Vert.	3486.7	44.8	-	28.7	5.6	32.4	-	46.7	-	68.2	-	21.5	-	
Vert.	5350.0	43.6	32.7	31.7	6.3	31.9	0.9	49.7	39.7	73.9	53.9	24.2	14.2	*1)
Vert.	10460.0	41.3	-	39.9	-2.1	33.8	-	45.3	-	68.2	-	22.9	-	Floor noise
Vert.	15690.0	42.7	34.6	37.6	-0.1	33.0	-	47.3	39.1	73.9	53.9	26.6	14.8	Floor noise

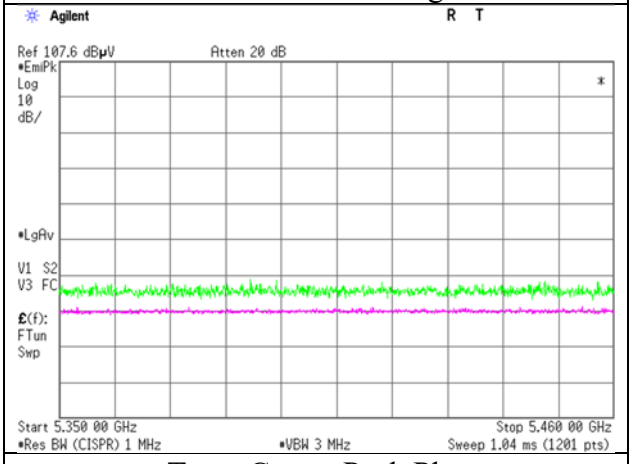
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.
*1) Not Out of Band emission(Leakage Power)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	August 28, 2022
Temperature / Humidity	22 deg. C / 51 % RH
Engineer	Hiroki Numata
Mode	Tx 11ac-40 5230 MHz

Horizontal
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

Vertical
Restricted-band band-edge Plot

Trace Green: Peak Plot Trace Purple: Average Plot

* 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

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	August 28, 2022	September 11, 2022	September 11, 2022
Temperature / Humidity	22 deg. C / 51 % RH	22 deg. C / 55 % RH	20 deg. C / 51 % RH
Engineer	Hiroki Numata	Tetsuro Yoshida	Keiya Ido
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11ac-80 5210 MHz		

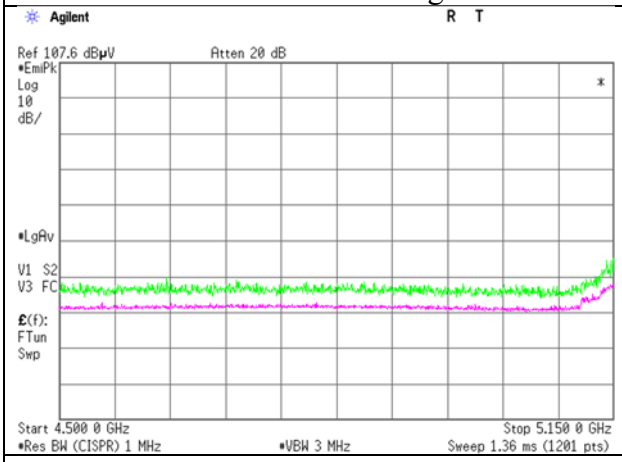
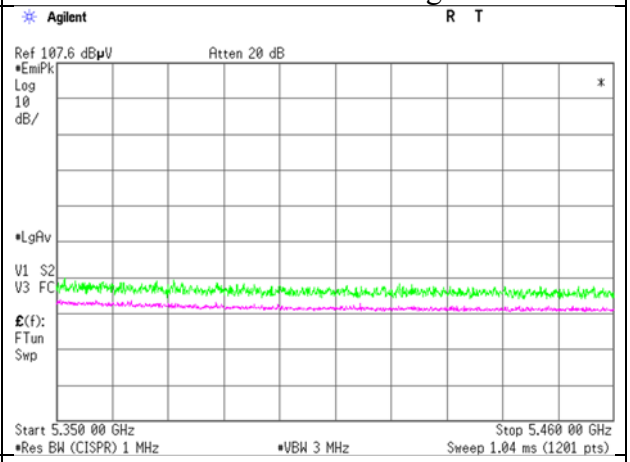
Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	3473.3	44.6	-	28.7	5.6	32.4	-	46.4	-	68.2	-	21.8	-	
Hori.	5150.0	54.0	40.9	31.9	6.2	31.9	1.0	60.3	48.1	73.9	53.9	13.7	5.8	*1)
Hori.	5350.0	48.3	35.4	31.7	6.3	31.9	1.0	54.4	42.5	73.9	53.9	19.5	11.4	*1)
Hori.	10420.0	41.4	-	39.9	-2.1	33.8	-	45.4	-	68.2	-	22.8	-	Floor noise
Hori.	15630.0	42.7	34.5	37.6	-0.1	33.0	-	47.3	39.1	73.9	53.9	26.6	14.8	Floor noise
Vert.	3473.3	45.1	-	28.7	5.6	32.4	-	46.9	-	68.2	-	21.3	-	
Vert.	5150.0	54.9	41.9	31.9	6.2	31.9	1.0	61.1	49.1	73.9	53.9	12.8	4.8	*1)
Vert.	5350.0	47.6	35.5	31.7	6.3	31.9	1.0	53.7	42.6	73.9	53.9	20.2	11.3	*1)
Vert.	10420.0	41.3	-	39.9	-2.1	33.8	-	45.3	-	68.2	-	22.9	-	Floor noise
Vert.	15630.0	42.6	34.5	37.6	-0.1	33.0	-	47.2	39.1	73.9	53.9	26.7	14.9	Floor noise

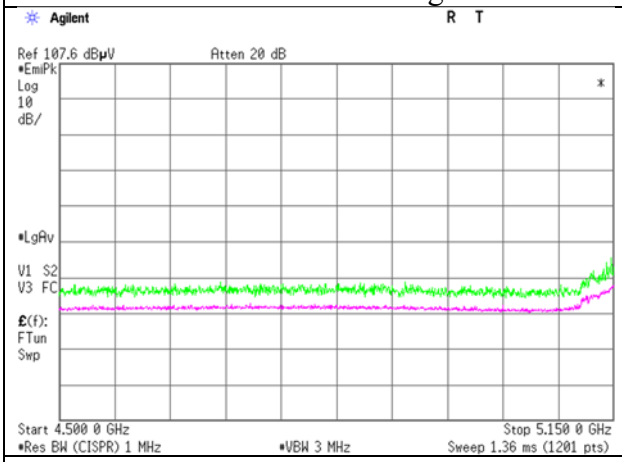
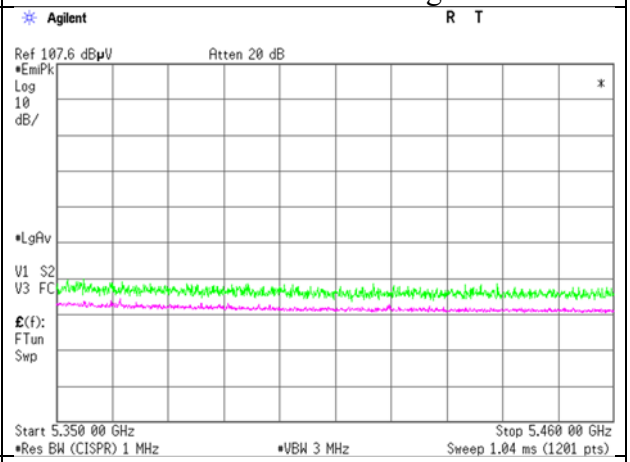
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).
*QP detector was used up to 1GHz.
*1) Not Out of Band emission(Leakage Power)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	August 28, 2022
Temperature / Humidity	22 deg. C / 51 % RH
Engineer	Hiroki Numata
	(1 GHz - 10 GHz)
Mode	Tx 11ac-80 5210 MHz

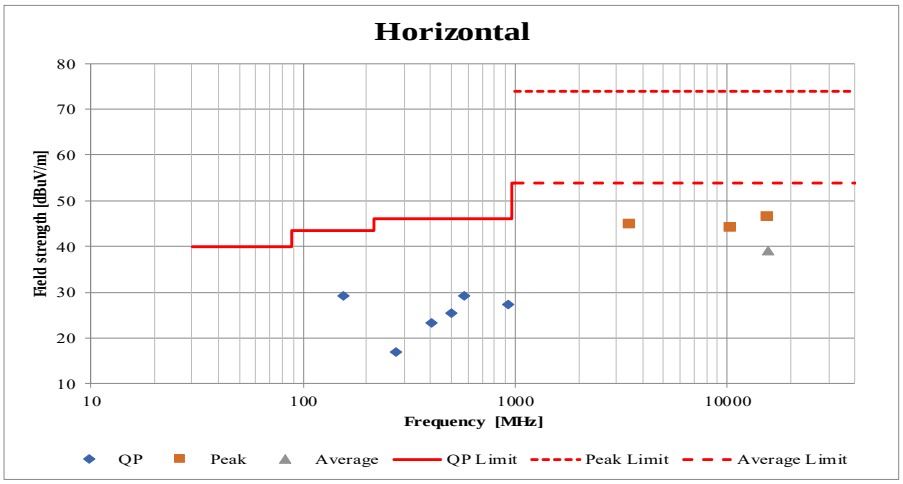
Horizontal	Horizontal
Restricted-band band-edge Plot	Restricted-band band-edge Plot
	
Trace Green: Peak Plot Trace Purple: Average Plot	Trace Green: Peak Plot Trace Purple: Average Plot

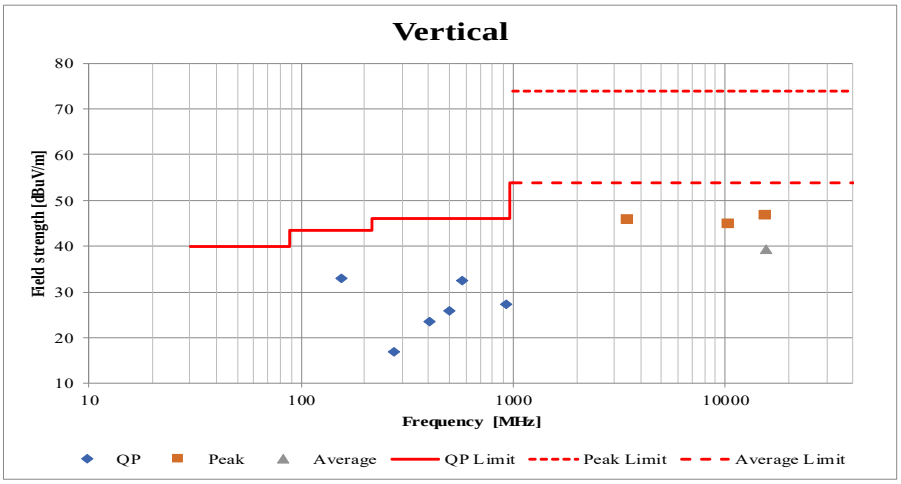
Vertical	Vertical
Restricted-band band-edge Plot	Restricted-band band-edge Plot
	
Trace Green: Peak Plot Trace Purple: Average Plot	Trace Green: Peak Plot Trace Purple: Average Plot

* 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 mode for Maximum Conducted Output Power)

Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.2
Date	August 28, 2022	September 11, 2022	September 11, 2022	September 12, 2022
Temperature / Humidity	22 deg. C / 54 % RH	22 deg. C / 55 % RH	20 deg. C / 51 % RH	20 deg. C / 54 % RH
Engineer	Tetsuro Yoshida	Tetsuro Yoshida	Keiya Ido	Kiyoshiro Okazaki
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)	(Below 1 GHz)
Mode	Tx 11a 5220 MHz			



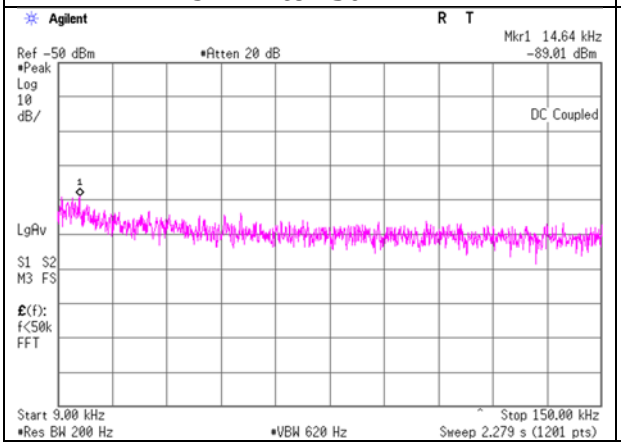


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

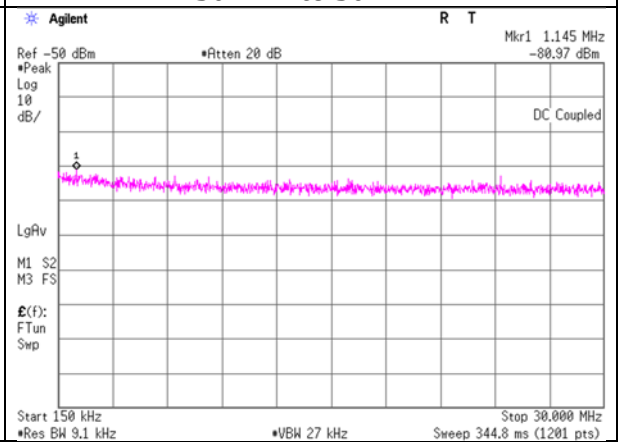
Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Date	September 1, 2022
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Keiya Ido
Mode	Tx 11a 5220 MHz

9 kHz to 150 kHz



150 kHz to 30 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
14.64	-89.0	0.69	9.68	2.23	1	-76.4	300	6.0	-15.2	44.2	59.4	
1145.00	-81.0	0.70	9.68	2.23	1	-68.4	30	6.0	12.9	26.4	13.5	

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

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

N: Number of output

APPENDIX 2: Test Instruments

Test Equipment

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	MAT-23	141361	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	04/06/2022	12
AT	MAT-26	141244	Attenuator(10dB)	Weinschel - API Technologies Corp	WA8-10-34	A198	02/25/2022	12
AT	MAT-58	141334	Attenuator(10dB)	Suhner	6810.19.A	-	12/08/2021	12
AT	MCC-244	197219	Microwave cable	Huber+Suhner	SF126E/11PC35/ 11PC35/2000MM	536999/126E	03/17/2022	12
AT	MCC-64	141327	Coaxial Cable	UL Japan	-	-	02/28/2022	12
AT	MJM-24	142225	Measure	ASKUL	-	-	-	-
AT	MMM-18	141558	Digital Tester (TRUE RMS MULTIMETER)	Fluke Corporation	115	17930030	05/17/2022	12
AT	MOS-14	141561	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	1401	01/10/2022	12
AT	MPM-16	141812	Power Meter	Keysight Technologies Inc	8990B	MY51000271	08/05/2022	12
AT	MPSE-22	141842	Power sensor	Keysight Technologies Inc	N1923A	MY54070003	08/05/2022	12
AT	MRENT-130	141855	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46187750	11/28/2021	12
AT	MSA-10	141899	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY46180655	02/18/2022	12
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MAEC-02	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	05/30/2022	24
RE	MAEC-03	142008	AC3_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	05/23/2022	24
RE	MAT-112	220646	Attenuator	Huber+Suhner	6806_N-50-1	-	06/07/2022	12
RE	MBA-08	141427	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103B+ BBA9106	08031	07/30/2022	12
RE	MCC-12	141317	Coaxial Cable	UL Japan	-	-	09/27/2022	12
RE	MCC-177	141226	Microwave Cable	Junkosha	MMX221-00500DMSDMS	1502S304	03/17/2022	12
RE	MCC-217	141393	Microwave Cable	Junkosha	MWX221	1604S254(1 m) / 1608S088(5 m)	08/02/2022	12
RE	MCC-54	141325	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	03/17/2022	12
RE	MHA-16	141513	Horn Antenna 15-40GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9170	BBHA9170306	07/05/2022	12
RE	MHA-20	141507	Horn Antenna 1-18GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	258	11/09/2021	12
RE	MHF-22	141293	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCB	602	02/24/2022	12
RE	MJM-16	142183	Measure	KOMELON	KMC-36	-	10/03/2022	12
RE	MJM-27	142228	Measure	KOMELON	KMC-36	-	-	-
RE	MLA-21	141265	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-190	07/30/2022	12
RE	MMM-01	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/12/2022	12

Test Equipment (2/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MMM-08	141532	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	51201197	01/16/2022	12
RE	MOS-13	141554	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	1301	01/10/2022	12
RE	MOS-41	192300	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0013	12/19/2021	12
RE	MPA-11	141580	MicroWave System Amplifier	Keysight Technologies Inc	83017A	MY39500779	03/17/2022	12
RE	MPA-22	141588	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P	1871355 /1871328	09/29/2022	12
RE	MPA-24	141594	Pre Amplifier	Keysight Technologies Inc	8447D	2944A10150	02/25/2022	12
RE	MSA-04	141885	Spectrum Analyzer	Keysight Technologies Inc	E4448A	US44300523	11/10/2021	12
RE	MSA-16	141903	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46186390	01/07/2022	12
RE	MTR-03	141942	Test Receiver	Rohde & Schwarz	ESCI	100300	07/29/2022	12
RE	MAEC-03-SVSWR	142013	AC3_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-10005	04/01/2021	24

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

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

Test item: **RE: Radiated Emission**
AT: Antenna Terminal Conducted