RADIO TEST REPORT

Test Report No. 15489623S-C

Customer	**Nintendo Co., Ltd.**
Description of EUT	**Development tool**
Model Number of EUT	**BEE-056**
FCC ID	**BKEBEE056**
Test Regulation	**FCC Part 15 Subpart E**
Test Result	**Complied**
Issue Date	**December 25, 2024**
Remarks	**WLAN (5 GHz band) part** *** Conducted Emission, Maximum Conducted Output Power, Spurious Emission Restricted Band Edge tests**

Representative Test Engineer	Approved By
Y. Tanikawara	K. Noda
Yusuke Tanikawara Engineer	Kazuya Noda Leader

CERTIFICATE 1266.03

☐ 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".

Report Cover Page - Form-ULID-003532 (DCS:13-EM-F0429) Issue# 24.0

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REVISION HISTORY

Original Test Report No. 15489623S-C

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	15489623S-C	December 25, 2024	-

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer Information

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

The information provided by 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

SECTION 2: Equipment Under Test (EUT)

2.1 Identification of EUT

Description	Development tool
Model Number	BEE-056
Serial Number	Refer to SECTION 4.2
Condition	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	September 10, 2024 (Radiated emission and Conducted emission test) August 6, 2024 (Antenna terminal test)
Test Date	September 10, 2024 to September 20, 2024

2.2 Product Description

General Specification

Rating	BEE-056 DC: 5 V to 15 V (*AC Adaptor) Internal battery: 3.78 V *AC Adaptor AC 100 V to 240 V, 50 / 60 Hz AC Adaptor output: 5 V to 20 V
Operating temperature	+5 deg. C to +35 deg. C

Radio Specification

This report contains data provided by the customer which can impact the validity of results. UL Japan, Inc. is only responsible for the validity of results after the integration of the data provided by the customer.
The data provided by the customer is marked “a)” in the table below.

Bluetooth (BR / EDR / Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402 MHz to 2480 MHz
Type of Modulation	BT: FHSS (GFSK, π/4 DQPSK, 8 DPSK) BT LE: GFSK
Antenna Type	LDS Antenna
Antenna Gain a)	Antenna 0: -2.51 dBi
	Antenna 1: -1.74 dBi

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

Equipment Type	Transceiver
Frequency of Operation	2412 MHz to 2472 MHz
Type of Modulation	DSSS, OFDM
	OFDMA (IEEE802.11ax Only): 26/52/106/242-tone RU
Antenna Type	LDS Antenna
Antenna Gain	Antenna 0: -2.51 dBi
	Antenna 2: 0.21 dBi

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

Equipment Type	Transceiver	
Frequency of Operation	20 MHz Band	5180 MHz to 5240 MHz 5260 MHz to 5320 MHz
	40 MHz Band	5190 MHz to 5230 MHz 5270 MHz to 5310 MHz
	80 MHz band	5210 MHz 5290 MHz
Type of Modulation	OFDM	
	OFDMA (IEEE802.11ax only)	20 MHz band: 26/52/106/242-tone RU
		40 MHz band: 26/52/106/242/484-tone RU
		80 MHz band: 26/52/106/242/484/996-tone RU
Antenna Type	LDS Antenna	
Antenna Gain	Antenna 0 0.70 dBi (WLAN U-NII-1, U-NII-2A band)	
	Antenna 2 4.07 dBi (WLAN U-NII-1, U-NII-2A band)	

LDS: Laser Direct Structuring

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 **ISED:** RSS-Gen 8.8	**FCC:** 15.407 (b) (9) / 15.207 **ISED:** RSS-Gen 8.8	15.8 dB, 11.46286 MHz, L1, AV	Complied	-
Maximum Conducted Output Power	**FCC:** KDB Publication Number 789033 **ISED:** -	**FCC:** 15.407 (a) (1) (2) (3) **ISED:** RSS-247 6.2	See data	Complied	Conducted
Spurious Emission Restricted BandEdge	**FCC:** ANSI C63.10-2013 KDB Publication Number 789033 **ISED:** -	**FCC:** 15.407 (b), 15.205 and 15.209 **ISED:** RSS-247 6.2	4.0 dB 5150.000 MHz, AV, Hori, 11ax-80 (SDM) (OFDM) 5210 MHz	Complied	Radiated (above 30 MHz) *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) Radiated test was selected over 30 MHz based on FCC 15.407 (b) and KDB 789033 D02 G.3.b).

FCC Part 15.31 (e)
This EUT provides the 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

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.

Item	Frequency range	Uncertainty (+/-)
Conducted Emission (AC Mains) LISN	150 kHz to 30 MHz	3.0 dB
Radiated Emission (Measurement distance: 3 m)	9 kHz to 30 MHz	3.3 dB
	30 MHz to 200 MHz	4.8 dB
	200 MHz to 1 GHz	6.1 dB
	1 GHz to 6 GHz	4.7 dB
	6 GHz to 18 GHz	5.3 dB
	18 GHz to 40 GHz	5.5 dB
Radiated Emission (Measurement distance: 1 m)	1 GHz to 18 GHz	5.6 dB
	18 GHz to 40 GHz	5.8 dB

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)	1.3 dB
Power Measurement above 1 GHz (Peak Detector)	1.5 dB
Spurious Emission (Conducted) below 1 GHz	0.93 dB
Conducted Emissions Power Density Measurement 1 GHz to 3 GHz	0.93 dB
Conducted Emissions Power Density Measurement 3 GHz to 18 GHz	3.0 dB
Spurious Emission (Conducted) 18 GHz to 26.5 GHz	2.8 dB
Spurious Emission (Conducted) 26.5 GHz to 40 GHz	2.3 dB
Bandwidth Measurement	0.012 %
Duty Cycle and Time Measurement	0.27 %
Temperature	2.2 deg.C.
Humidity	3.4 %
Voltage	0.92 %

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 Japan
Telephone: +81-463-50-6400
A2LA Certificate Number: 1266.03
(FCC test firm registration number: 626366, ISED lab company number: 2973D / CAB identifier: JP0001)

Test room	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber (SAC1)	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.2 Semi-anechoic chamber (SAC2)	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber (SAC3)	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber (SAC4)	8.1 x 5.1 x 3.55	8.1 x 5.1	-
Wireless anechoic chamber 1 (WAC1)	9.5 x 6.0 x 5.4	9.5 x 6.0	3 m
Wireless anechoic chamber 2 (WAC2)	9.5 x 6.0 x 5.4	9.5 x 6.0	3 m
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	-	-
No.2 Measurement room	4.5 x 3.5 x 2.5	-	-
Wireless shielded room 1	3.0 x 4.5 x 2.7	3.0 x 4.5	-
Wireless shielded room 2	3.0 x 4.5 x 2.7	3.0 x 4.5	-

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)

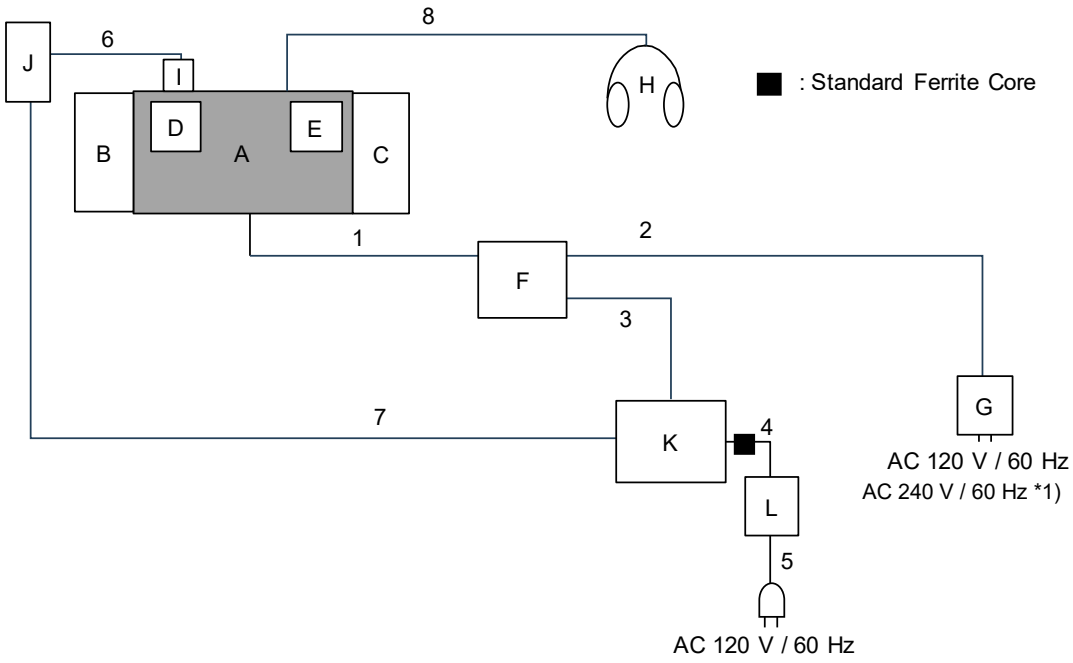
Mode	Remarks*
IEEE 802.11n MIMO 20 MHz BW (11n-20 (SDM))	MCS 8 (2ss), PN9
IEEE 802.11ax MIMO 20 MHz BW OFDM (11ax-20 (SDM)(OFDM))	MCS 11 (2ss), PN9
IEEE 802.11ax MIMO 80 MHz BW (11ax-80 (SDM)(OFDM))	MCS 0 (2ss), PN9
*Operating mode, tested antenna and tested frequency are selected for worst result for Test Report No. 14724442S-C-R1.	
*Power of the EUT was set by the software as follows; Power Setting: 7 Software: WlanBtRelayTool Version: 0358079 (Date: 2023.09.19, Storage location: Driven by connected PC) * 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)

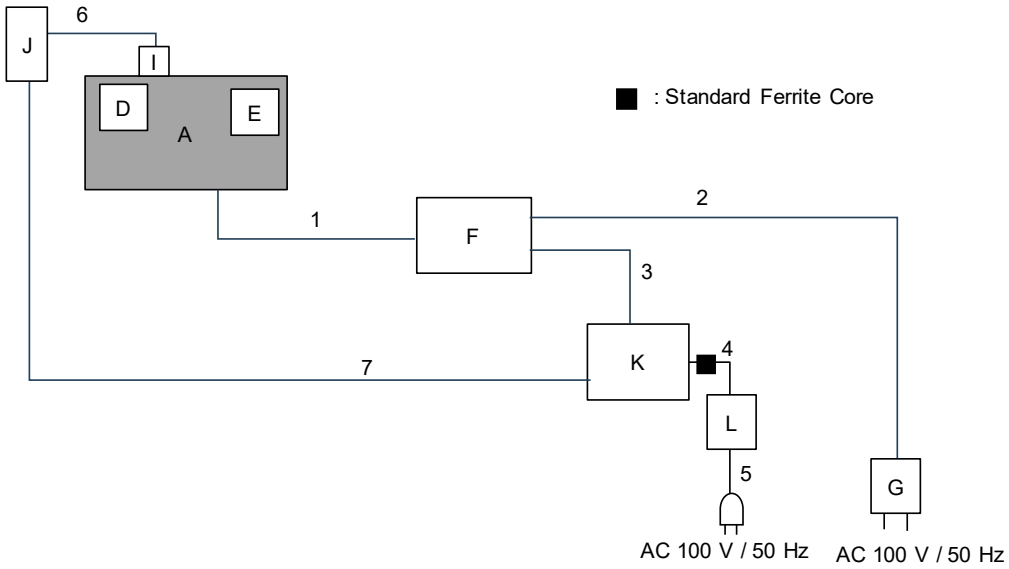
Test Item	Operating Mode	Tested Antenna	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
Conducted emission, Radiated Spurious Emission (Below 1 GHz)	(SDM) Tx 11ax-20 (OFDM)	Ant 0 + Ant 2	5180 MHz	-	-	-
Maximum Conducted Output Power	(SDM) Tx 11ax-20 (OFDM)	Ant 0 + Ant 2	5180 MHz	-	-	-
Radiated Spurious Emission (Above 1 GHz)	(SDM) Tx 11ax-80 (OFDM) *1)	Ant 0 + Ant 2	5210 MHz	-	-	-
	(SDM) Tx 11n-20 *2)	Ant 0 + Ant 2		5320 MHz	-	-
*Operating mode, tested antenna and tested frequency are selected for worst result for Test Report No. 14724442S-C-R1. *1) The test was performed on only Band edge. *2) The test was performed on only spurious emission.						

4.2 Configuration and Peripherals

Radiated emission test and Conducted emission test



Antenna terminal conducted test



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
* The carrier level and noise levels were confirmed with and without the controller (B and C), and the test was made at the condition that has the maximum noise. (Only Radiated emission test)
* The EUT is equipped with two rechargeable USB ports (top and bottom side), a pre-check was performed on the worst port (bottom side) for conducted emissions.
*1) As a result of comparing AC 120 V and AC 240 V at pre-check, conducted emission test was performed with AC 240 V of the worst voltage as representative.

Description of EUT and Support Equipment

No.	Item	Model number	Serial Number	Manufacturer	Remarks
A	Development tool	BEE-056	HAL00110047513 *1) HAL00110048510 *2)	Nintendo Co., Ltd.	EUT
B	Joy-Con (L)	BEE-012	HBL01000022108	Nintendo Co., Ltd.	-
C	Joy-Con (R)	BEE-014	HCL01000022467	Nintendo Co., Ltd.	-
D	Game Card	HAC-008	DFCAA22L000	Nintendo Co., Ltd.	-
E	Micro SD Card	-	S944	Sandisk	-
F	Relay Box	BEE-053	HYL01100004738	Nintendo Co., Ltd.	-
G	AC Adapter	NGN-01	0A0003529 *1) 0A0000165 *2)	Nintendo Co., Ltd.	-
H	Earphones	MDR-EX255AP	-	Sony	-
I	USB TypeA - Type C Adapter	-	-	-	-
J	Wired LAN Adapter	EDC-GUA3-B	16L167005977A	ELECOM	-
K	Laptop PC	CF-SV9RDQVS	0JKSC39510	Panasonic	-
L	AC Adapter	CF-AA65D2A M1	65D2AM1208002424WA	Panasonic	-

*1) Used for Antenna Terminal conducted test
*2) Used for Conducted Emission test and Radiated Emission test

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Custom Cable	1.3	Shielded	Shielded	-
2	USB	1.5	Shielded	Shielded	-
3	USB	1.5	Shielded	Shielded	-
4	DC	0.9	Unshielded	Unshielded	-
5	AC	0.8	Unshielded	Unshielded	-
6	USB	0.1	Shielded	Shielded	-
7	LAN	1.0	Unshielded	Unshielded	Cat.6
8	Earphones	1.25	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and Conditions

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.
The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN).

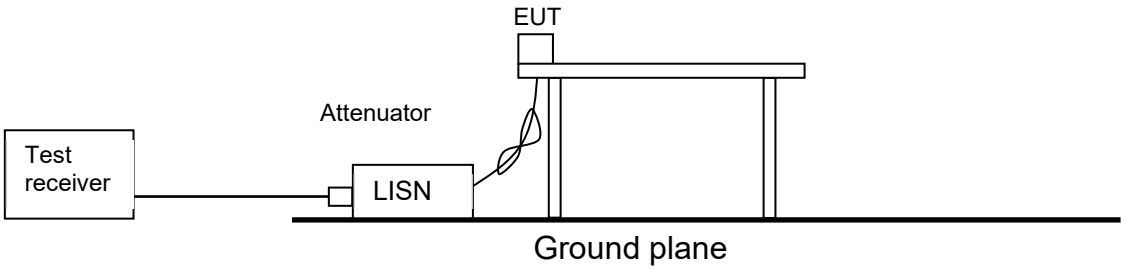
For the tests on EUT with other peripherals (as a whole system)
I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Shielded Room.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

Test results are rounded off and limit are rounded down, so some differences might be observed.

Detector : QP and CISPR Average
Measurement Range : 0.15 MHz to 30 MHz
Test Data : APPENDIX
Test Result : Pass

Figure 1: Test Setup



SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1 GHz >
EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 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. 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 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.
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).

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:

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

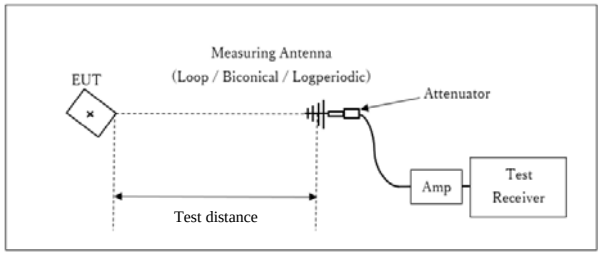
Test Antennas are used as below;

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	RBW: 1 MHz VBW: 1/T (T: burst length, refer to Burst rate confirmation sheet of Test Report No.: 14724442S-C-R1 Detector: Peak

Figure 2: Test Setup

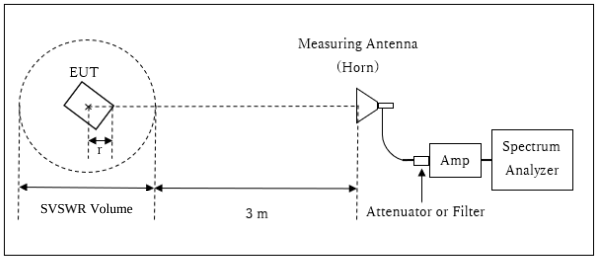
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz to 10 GHz

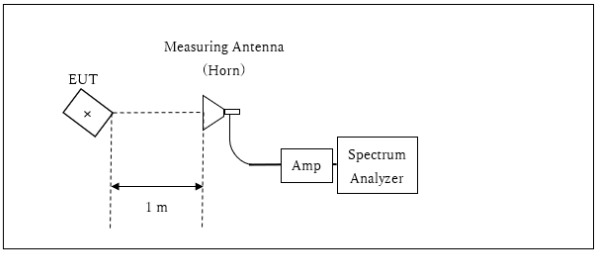


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.94 m / 3.0 m) = 2.37 dB
* Test Distance: (3 + SVSWR Volume /2) - r = 3.94 m

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.06 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.

Antenna polarization	Carrier	Spurious (30 MHz - 1 GHz)	Spurious (1 GHz - 6.4 GHz)	Spurious (6.4 GHz - 10 GHz)	Spurious (10 GHz - 18 GHz)	Spurious (18 GHz - 40 GHz)
Horizontal	Y With controller	X With controller	Y With controller	X With controller	Y With controller	X With controller
Vertical	Y With controller	Y With controller	Y With controller	X With controller	Z With controller	X With controller

Test results are rounded off and limit are rounded down, so some differences might be observed.

Measurement Range : 30 MHz to 40 GHz
Test Data : APPENDIX
Test Result : Pass

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 160 MHz BW) (Method PM)

Test results are rounded off and limit are rounded down, 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

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.2 Shielded Room
Date : 2024/09/13

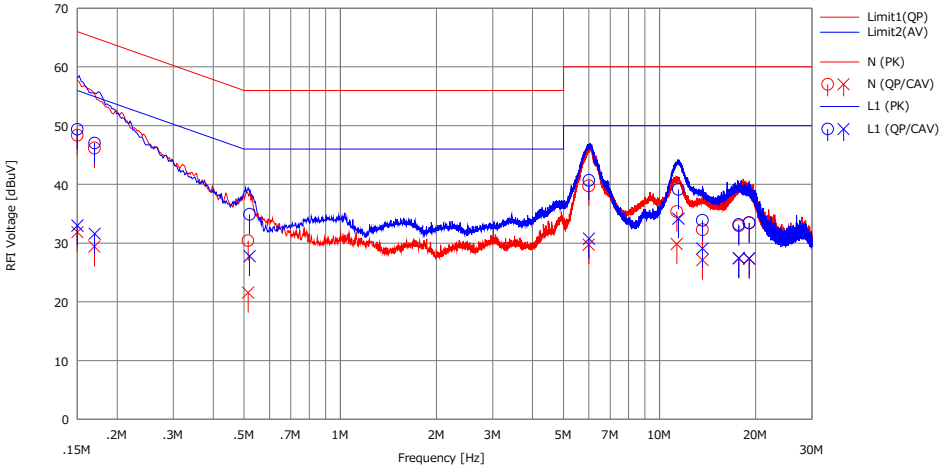
Mode : Tx, 11ax-20(SDM)(OFDM), 5180 MHz

Power : AC 240 V / 60 Hz
Temp./Humi. : 23 deg.C / 52 %RH

Remarks : -

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Yusuke Tanikawara



No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		〈QP〉	〈CAV〉		〈QP〉	〈CAV〉	〈QP〉	〈AV〉	〈QP〉	〈AV〉		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	35.81	19.32	12.55	48.36	31.87	66.00	56.00	17.6	24.1	N	
2	0.16987	33.60	16.84	12.58	46.18	29.42	64.97	54.97	18.7	25.5	N	
3	0.51397	17.77	8.94	12.62	30.39	21.56	56.00	46.00	25.6	24.4	N	
4	6.00258	26.56	16.58	13.18	39.74	29.76	60.00	50.00	20.2	20.2	N	
5	11.32105	21.66	16.15	13.69	35.35	29.84	60.00	50.00	24.6	20.1	N	
6	13.62760	18.40	13.26	13.87	32.27	27.13	60.00	50.00	27.7	22.8	N	
7	17.71266	18.82	13.24	14.14	32.96	27.38	60.00	50.00	27.0	22.6	N	
8	19.08804	19.25	13.11	14.22	33.47	27.33	60.00	50.00	26.5	22.6	N	
9	0.15000	36.81	20.42	12.57	49.38	32.99	66.00	56.00	16.6	23.0	L1	
10	0.17006	34.45	19.01	12.57	47.02	31.58	64.96	54.96	17.9	23.3	L1	
11	0.51961	22.27	15.16	12.61	34.88	27.77	56.00	46.00	21.1	18.2	L1	
12	6.00601	27.55	17.63	13.12	40.67	30.75	60.00	50.00	19.3	19.2	L1	
13	11.46286	25.63	20.65	13.52	39.15	34.17	60.00	50.00	20.8	15.8	L1	
14	13.62641	20.21	15.44	13.66	33.87	29.10	60.00	50.00	26.1	20.9	L1	
15	17.69115	19.26	13.55	13.88	33.14	27.43	60.00	50.00	26.8	22.5	L1	
16	19.08293	19.48	13.43	13.96	33.44	27.39	60.00	50.00	26.5	22.6	L1	

Calculation:Result[dBuV]=Reading[dBuV]+C.Fac(LISN(AMN)+Cable+ATT)[dB]

Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room
Date	September 20, 2024
Temperature / Humidity	24 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx, Ant 0 + Ant 2

11ax-20 (SDM)

Tested	Conducted power								e.i.r.p.							
Frequency	Ant			Result	FCC 15.407		RSS-247		Ant			Result	FCC 15.407		RSS-247	
	0	2	Sum		Limit	Margin	Limit	Margin	0	2	Sum		Limit	Margin	Limit	Margin
[MHz]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]	[dBm]	[dB]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]	[dBm]	[dB]
5180	6.20	6.29	12.49	10.97	23.97	13.00	-	-	7.29	16.06	23.34	13.68	29.97	16.29	22.77	9.09

		Ant 0						Ant 2					
Tested	Duty	Power	Cable	Atten.	Antenna	Result		Power	Cable	Atten.	Antenna	Result	
Frequency	Factor	Meter Reading	Loss	Loss	Gain	Cond. Power	e.i.r.p.	Meter Reading	Loss	Loss	Gain	Cond. Power	e.i.r.p.
[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5180	1.42	-6.44	2.94	10.01	0.70	7.93	8.63	-6.36	2.93	10.00	4.07	7.99	12.06

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

RSS-247 Limit
e.i.r.p. Limit (5150 MHz-5250 MHz) = 200 mW or (10 + 10logB) dBm, whichever is lower
For all test frequencies, B was applied the minimum value (18.950 MHz) as conservative limit.

The conducted power limit was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (All frequencies for FCC, 5725 MHz-5850 MHz for IC)

For Duty Factor, see the Test Report No. 14724442S-C-R1.

Radiated Spurious Emission

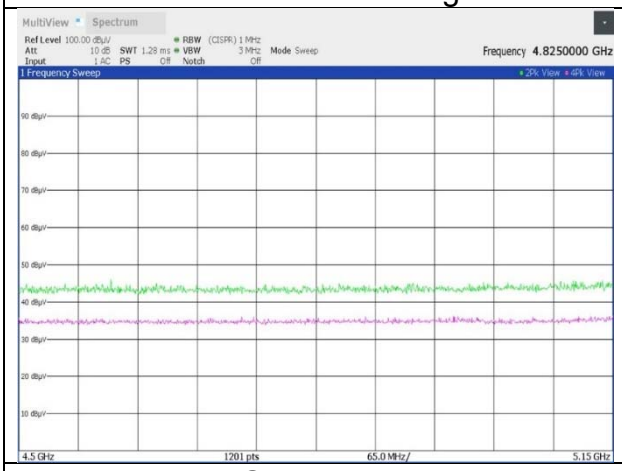
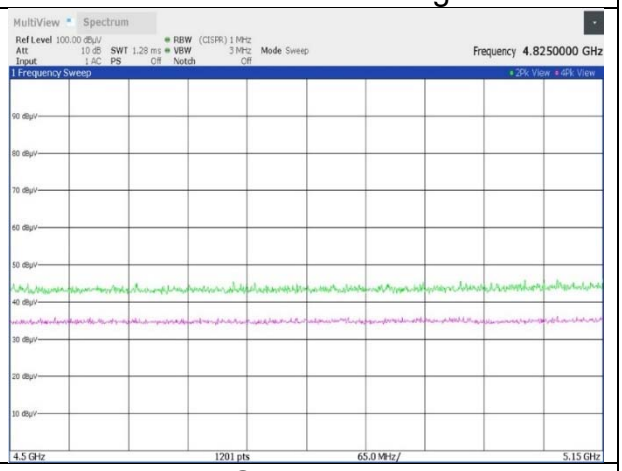
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	WAC2
Date	September 10, 2024
Temperature / Humidity	23 deg. C / 58 % RH
Engineer	Kouki Yamada
	(1 GHz to 6.4 GHz)
Mode	Tx 11ax-80 (SDM)(OFDM) 5210 MHz, Ant 0 + Ant 2

(above 1 GHz 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	49.53	32.12	-25.24	-	2.37	58.78	73.9	15.1	151	77	-
Hori.	5150.000	AV	40.56	32.12	-25.24	-	2.37	49.81	53.9	**4.0**	151	77	VBW: 20 kHz
Vert.	5150.000	PK	49.71	32.12	-25.24	-	2.37	58.96	73.9	14.9	153	117	-
Vert.	5150.000	AV	39.98	32.12	-25.24	-	2.37	49.23	53.9	4.6	153	117	VBW: 20 kHz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz) - Gain(Amplifier)) + Distance factor
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).
Distance factor : 1 GHz - 10 GHz : 20log (3.94 m / 3.0 m) = 2.37 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Horizontal	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

Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	WAC2	WAC2
Date	September 10, 2024	September 12, 2024
Temperature / Humidity	23 deg. C / 58 % RH	24 deg. C / 56 % RH
Engineer	Kouki Yamada	Miku Ikudone
	(1 GHz to 10 GHz)	(10 GHz to 40 GHz)
Mode	Tx 11n-20 (SDM)(OFDM) 5320 MHz, Ant 0 + Ant 2	

(above 1 GHz 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.	10640.000	PK	45.94	36.97	10.27	35.74	-9.54	47.90	73.9	26.0	154	349	-
Hori.	15960.000	PK	45.31	39.67	12.71	35.19	-9.54	52.96	73.9	20.9	150	0	-
Hori.	10640.000	AV	33.36	36.97	10.27	35.74	-9.54	35.32	53.9	18.5	154	349	VBW:2 kHz
Hori.	15960.000	AV	33.38	39.67	12.71	35.19	-9.54	41.03	53.9	**12.8**	150	0	VBW:2 kHz, Floor noise
Vert.	10640.000	PK	46.08	36.97	10.27	35.74	-9.54	48.04	73.9	25.8	160	216	-
Vert.	15960.000	PK	45.58	39.67	12.71	35.19	-9.54	53.23	73.9	20.6	150	0	-
Vert.	10640.000	AV	32.93	36.97	10.27	35.74	-9.54	34.89	53.9	19.0	160	216	VBW:2 kHz
Vert.	15960.000	AV	33.12	39.67	12.71	35.19	-9.54	40.77	53.9	13.1	150	0	VBW:2 kHz, Floor noise

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 20 dB).
Distance factor : 1 GHz - 10 GHz : 20log (3.94 m / 3.0 m) = 2.37 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	September 11, 2024
Temperature / Humidity	23 deg. C / 58 % RH
Engineer	Miku Ikudome
	(Below 1 GHz)
Mode	Tx 11ax-20(SDM)(OFDM) 5180 MHz, Ant 0 + Ant 2

(below 1 GHz)

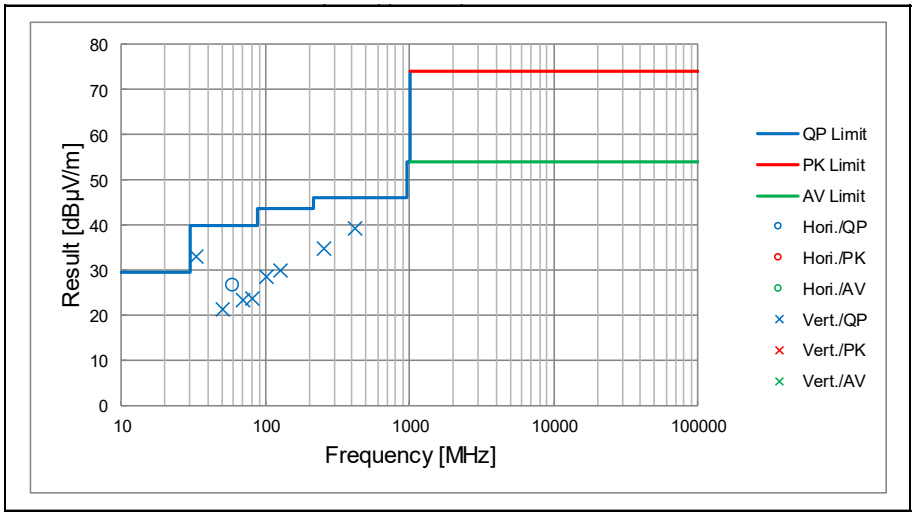
(* PK: Peak, AV: Average, QP: Quasi-Peak)

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.	60.054	QP	43.64	9.48	6.42	33.14	0.00	26.40	40.0	13.6	337	200	-
Vert.	32.414	QP	46.38	13.07	6.27	32.73	0.00	32.99	40.0	7.0	100	317	-
Vert.	49.911	QP	38.00	10.09	6.46	33.06	0.00	21.49	40.0	18.5	100	145	-
Vert.	69.132	QP	40.91	9.27	6.48	33.18	0.00	23.48	40.0	16.5	100	242	-
Vert.	79.843	QP	41.30	8.95	6.79	33.20	0.00	23.84	40.0	16.1	100	96	-
Vert.	101.236	QP	45.54	9.50	6.98	33.21	0.00	28.81	43.5	14.6	100	213	-
Vert.	125.002	QP	45.50	10.98	6.81	33.19	0.00	30.10	43.5	13.4	100	253	-
Vert.	250.008	QP	48.59	11.86	7.39	32.92	0.00	34.92	46.0	11.0	100	176	-
Vert.	416.402	QP	47.73	16.10	7.88	32.48	0.00	39.23	46.0	**6.7**	140	246	-

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 20 dB).
Distance factor : 1 GHz - 10 GHz : 20log (3.94 m / 3.0 m) = 2.37 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

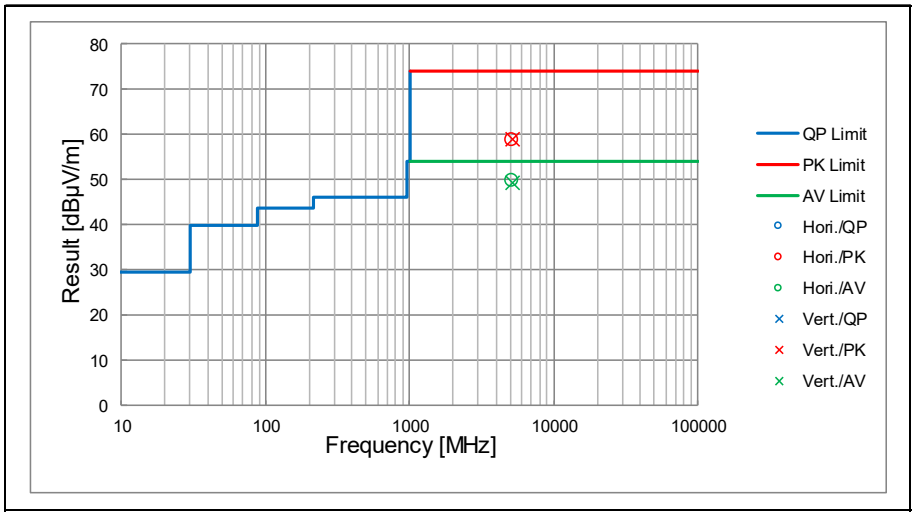
Radiated Spurious Emission
(Plot data, Worst case mode for Test Report No. 14724442S-C-R1)

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	WAC2
Date	September 11, 2024
Temperature / Humidity	23 deg. C / 58 % RH
Engineer	Miku Ikudome
	(Below 1 GHz)
Mode	Tx 11ax-20(SDM)(OFDM) 5180 MHz, Ant 0 + Ant 2



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

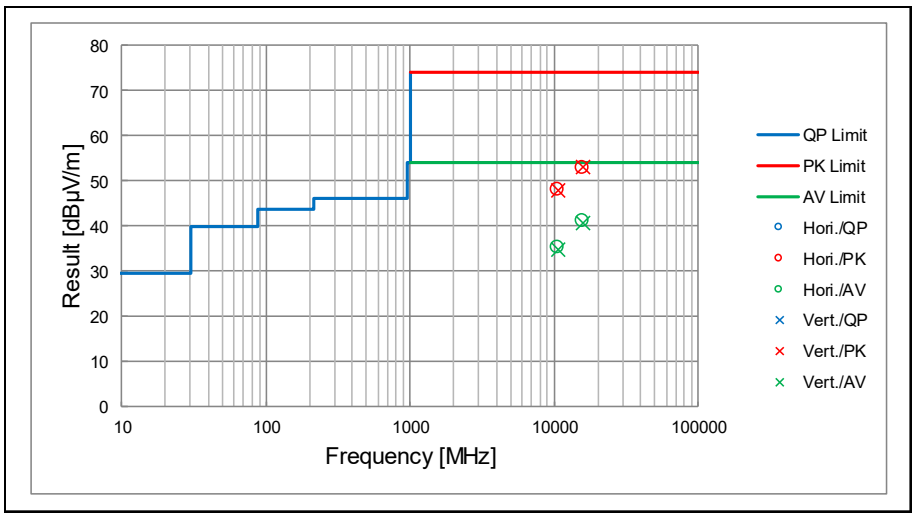
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	WAC2
Date	September 10, 2024
Temperature / Humidity	23 deg. C / 58 % RH
Engineer	Kouki Yamada
	(1 GHz to 6.4 GHz)
Mode	Tx 11ax-80 (SDM)(OFDM) 5210 MHz, Ant 0 + Ant 2



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

Radiated Spurious Emission
(Plot data, Worst case mode for Test Report No. 14724442S-C-R1)

Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	WAC2	WAC2
Date	September 10, 2024	September 12, 2024
Temperature / Humidity	23 deg. C / 58 % RH	24 deg. C / 56 % RH
Engineer	Kouki Yamada	Miku Ikudone
	(1 GHz to 10 GHz)	(10 GHz to 40 GHz)
Mode	Tx 11ax-20(SDM)(OFDM) 5180 MHz, Ant 0 + Ant 2	



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

APPENDIX 2: Test Instruments

Test Equipment

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	145089	Spectrum Analyzer	Keysight Technologies Inc	E4446A	MY46180525	2024/08/19	12
AT	145095	Digital Tester	SANWA	PC500	7019224	2024/05/29	12
AT	146247	Power Meter	Keysight Technologies Inc	8990B	MY51000272	2024/05/14	12
AT	146310	Power sensor	Keysight Technologies Inc	N1923A	MY5326009	2024/05/14	12
AT	146311	Power sensor	Keysight Technologies Inc	N1923A	MY5349008	2024/05/14	12
AT	146362	Thermo-Hygrometer	CUSTOM. Inc	CTH-190	K-07	2024/08/11	12
AT	150461	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46186392	2024/06/11	12
AT	169910	Power Meter	Keysight Technologies Inc	8990B	MY51000448	2024/09/11	12
AT	169911	Power sensor	Keysight Technologies Inc	N1923A	MY57270004	2024/09/11	12
AT	169912	Power sensor	Keysight Technologies Inc	N1923A	MY57290005	2024/09/11	12
AT	171615	Terminator	Weinschel - API Technologies Corp	M1459A	88997	2024/05/09	12
AT	171616	Terminator	Weinschel - API Technologies Corp	M1459A	89025	2024/05/09	12
AT	196942	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	803416/2	2024/03/07	12
AT	196946	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	803411/2	2024/03/07	12
AT	204927	Attenuator	Weinschel Corp.	54A-10	109972	2024/02/09	12
AT	204928	Attenuator	Weinschel Corp.	54A-10	109973	2024/02/09	12
CE	144969	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-270(RF Selector)	2024/04/10	12
CE	145541	LISN	Rohde & Schwarz	ENV216	100514	2024/02/06	12
CE	145746	Terminator	TME	CT-01 BP	-	2024/11/21	12
CE	207277	Tape Measure	ASKUL	-	-	-	-
CE	235739	Thermo-Hygrometer	CUSTOM. Inc	CTH-230	-	2024/04/28	12
RE	144878	Pre Amplifier	Hewlett Packard	8449B	3008A01268	2024/04/04	12
RE	145008	Pre Amplifier	Toyo Corporation	HAP18-26W	18	2024/08/21	12
RE	145129	Pre Amplifier	Toyo Corporation	HAP26-40W	B3208602403-176	2024/05/09	12
RE	145136	Attenuator	Keysight Technologies Inc	8493C-010	74864	2024/10/10	12
RE	145301	Highpass Filter	Micro-Tronics	HPM50111	51	2024/10/10	12
RE	145377	Highpass Filter	Micro-Tronics	HPM50112	28	2024/10/10	12
RE	145513	Horn Antenna	ETS-Lindgren	3160-09	00094867	2024/06/20	12
RE	145514	Horn Antenna	ETS-Lindgren	3160-10	00092383	2024/06/20	12
RE	145528	Logperiodic Antenna	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	195	2024/04/10	12
RE	196945	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	803414/2	2024/03/12	12
RE	199783	Attenuator	JFW	50HF-006N	-	2024/06/14	12
RE	207281	Tape Measure	ASKUL	-	-	-	-
RE	235268	Test Receiver	Rohde & Schwarz	ESW44	103212	2023/12/26	12
RE	235640	DIGITAL MULTIMETER	HIOKI E.E. CORPORATION	DT4261	230313157	2024/05/29	12
RE	235738	Thermo-Hygrometer	CUSTOM. Inc	CTH-230	-	2024/04/28	12
RE	236584	Horn Antenna	AINFO Inc.	LB-8180-NF	2030013000112	2024/04/04	12
RE	236615	Semi-Anechoic Chamber	TDK	SWAC-02(NSA)	2	2024/05/10	12
RE	236617	Semi-Anechoic Chamber	TDK	SWAC-02(SVSWR)	2	2024/06/06	12

***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:

AT: Antenna Terminal Conducted test
CE: Conducted Emission
RE: Radiated Emission