

RADIO TEST REPORT

Test Report No. 15096679S-D

Customer	Sony Group Corporation
Description of EUT	Wireless Stereo Headset
Model Number of EUT	YY2964
FCC ID	AK8YY2964
Test Regulation	FCC Part 15 Subpart C
Test Result	Complied
Issue Date	February 13, 2024
Remarks	Bluetooth (BR / EDR) parts

Representative Test EngineerMiku Ikudome
Engineer**Approved By**Toyokazu Imamura
Engineer

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".

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REVISION HISTORY

Original Test Report No.: 15096679S-D

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	15096679S-D	February 13, 2024	-

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	Sony Group Corporation
Address	1-7-1 Konan Minato-ku, Tokyo, 108-0075 Japan
Contact Person	Kouhei Nagamine

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	Wireless Stereo Headset
Model Number	YY2964
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	December 12, 2023
Test Date	December 18, 2023 to January 9, 2024

2.2 Product Description

General Specification

Rating	DC 3.85 V (Battery)
Operating temperature	0 deg. C to 40 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, $\pi/4$ DQPSK, 8 DPSK) BT LE: GFSK
Antenna Gain ^{a)}	-4.5 dBi

SECTION 3: Test Specification, Procedures & Results

3.1 Test Specification

Test Specification	FCC Part 15 Subpart C The latest version on the first day of the testing period
Title	FCC 47 CFR Part 15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

*The customer has declared that the EUT complies with FCC Part 15 Subpart B as SDoC.

3.2 Procedures and Results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods ISED: RSS-Gen 8.8	FCC: Section 15.207 ISED: RSS-Gen 8.8	-	N/A	*1)
Carrier Frequency Separation	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ISED: -	FCC: Section15.247(a)(1) ISED: RSS-247 5.1 (b)	See data.	Complied	Conducted
20dB Bandwidth	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ISED: -	FCC: Section15.247(a)(1) ISED: RSS-247 5.1 (a)		Complied	Conducted
Number of Hopping Frequency	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ISED: -	FCC: Section15.247(a)(1)(iii) ISED: RSS-247 5.1 (d)		Complied	Conducted
Dwell time	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ISED: -	FCC: Section15.247(a)(1)(iii) ISED: RSS-247 5.1 (d)		Complied	Conducted
Maximum Peak Output Power	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ISED: RSS-Gen 6.12	FCC: Section15.247(b)(1) ISED: RSS-247 5.4 (b)		Complied	Conducted
Spurious Emission & Band Edge Compliance	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ISED: RSS-Gen 6.13	FCC: Section15.247(d) ISED: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	11.9 dB 7440.000 MHz AV, Vert. Mode: Tx, Hopping Off, DH5 2480 MHz, Left	Complied	Conducted/ Radiated (above 30 MHz) *2)
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 applicable since the Bluetooth does not operate during charging. *2) Radiated test was selected over 30 MHz based on section 15.247(d).					

FCC Part 15.31 (e)

This EUT provides the stable voltage constantly to RF Part 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	ISED: RSS-Gen 6.7	ISED: -	N/A	-	Conducted

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 $k = 2$.

Item	Frequency range	Uncertainty (+/-)
Conducted Emission (AC Mains) LISN	150 kHz to 30 MHz	3.2 dB
Radiated Emission (Measurement distance: 3 m)	9 kHz to 30 MHz	3.3 dB
	30 MHz to 200 MHz	4.9 dB
	200 MHz to 1 GHz	6.2 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) SPM-06	1.1 dB
Power Measurement above 1 GHz (Peak Detector) SPM-06	1.8 dB
Power Measurement above 1 GHz (Average Detector) SPM-07	1.0 dB
Power Measurement above 1 GHz (Peak Detector) SPM-07	1.2 dB
Power Measurement above 1 GHz (Average Detector) SPM-13	0.81 dB
Power Measurement above 1 GHz (Peak Detector) SPM-13	1.1 dB
Spurious Emission (Conducted) below 1 GHz	0.91 dB
Conducted Emissions Power Density Measurement 1 GHz to 3 GHz	1.3 dB
Conducted Emissions Power Density Measurement 3 GHz to 18 GHz	2.5 dB
Spurious Emission (Conducted) 18 GHz to 26.5 GHz	2.8 dB
Spurious Emission (Conducted) 26.5 GHz to 40 GHz	2.6 dB
Bandwidth Measurement	0.012 %
Duty Cycle and Time Measurement	0.27 %
Temperature_SCH-01	0.96 deg.C.
Humidity_SCH-01	4.0 %
Temperature_SCH-02	2.2 deg.C.
Voltage	0.74 %

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)

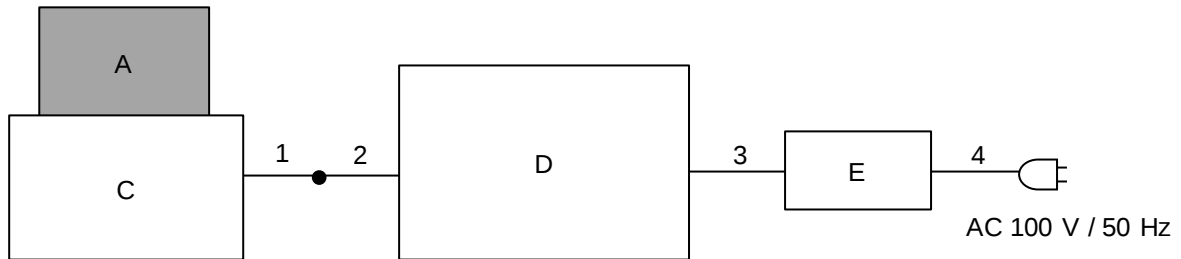
Mode	Remarks*
Bluetooth (BT)	BR / EDR, Payload: PRBS9
*EUT has the power settings by the software as follows; Power Setting: BR 2402 MHz - 2480 MHz : 56 EDR 2402 MHz : 56 2403-2480 MHz : 57 Software: Earbuds RF Test Ver 1.05 (Date: 2023.12.18, Storage location: Driven by connected PC) *This setting of 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.	

Details of Operating Mode(s)

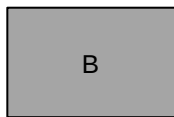
Test Item	Mode	Hopping	Tested Frequency
Radiated Spurious Emission (Below 1 GHz)	Tx DH5 *1)	Off	2480 MHz
Radiated Spurious Emission (Above 1 GHz), Conducted Spurious Emission	Tx DH5 Tx 3DH5	Off	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx DH5 Tx 3DH5	On	2402 MHz 2441 MHz 2480 MHz
20dB Bandwidth	Tx DH5 Tx 3DH5	Off	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx DH5 Tx 3DH5	On	-
Dwell time	Tx DH1, DH3, DH5 Tx 3DH1, 3DH3, 3DH5	On	-
Maximum Peak Output Power	Tx DH5 Tx 2DH5 Tx 3DH5	Off	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5 Tx 3DH5	On ----- Off	2402 MHz 2480 MHz
99% Occupied Bandwidth	Tx DH5 Tx 3DH5	On ----- Off	2402 MHz 2441 MHz 2480 MHz
*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test) *2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative. *It is considered that the non-tested packet type (e.g. inquiry) can be omitted as it is complied with above all the test items based on Bluetooth Core specification.			
*1) Spurious emissions for frequencies below 1 GHz were limited to the channel that had the highest power during the antenna terminal test, as preliminary testing indicated that changing the operating frequency had no significant impact on the emissions in those frequency bands.			

4.2 Configuration and Peripherals

[Antenna Terminal Conducted tests]



[Radiated Emission test]



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

Description of EUT and Support Equipment

No.	Item	Model number	Serial Number	Manufacturer	Remarks
A	Wireless Stereo Headset	YY2964	1200844	Sony Group Corporation	EUT (Left)
B	Wireless Stereo Headset	YY2964	1200825	Sony Group Corporation	EUT (Left, Right)
C	Case	YY2964	1200844	Sony Group Corporation	-
D	Laptop Computer	ThinkPad L580	PF1PLZHX	LENOVO	-
E	AC Adapter	ADLX45YLC2A	8SSA10E75842L1CZ94J0D3R	LENOVO	-

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB	0.2	Shielded	Shielded	-
2	USB	2.0	Shielded	Shielded	-
3	DC	1.8	Unshielded	Unshielded	-
4	AC	0.9	Unshielded	Unshielded	-

SECTION 5: Radiated Spurious Emission

Test Procedure

[For below 1 GHz]

EUT was placed on a urethane platform of nominal size, 1.0 m by 2.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]

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

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

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

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

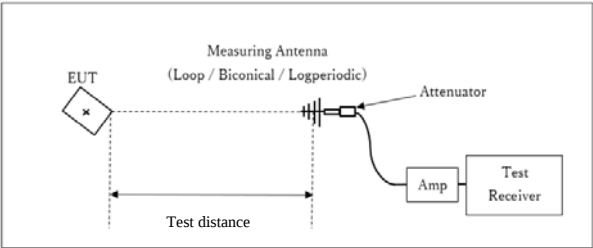
Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer *a)		Spectrum Analyzer
Detector	QP	PK	AV *1)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	RBW: 1 MHz VBW: 1/T (T: burst length, refer to Burst rate confirmation sheet) Detector: Peak	RBW: 100 kHz VBW: 300 kHz

*1) Average Power Measurement was performed based on KDB 558074 D01 15.247 Meas Guidance v05r02.

*a) The Spectrum Analyzer was used in 3 dB resolution bandwidth.

Figure 2: Test Setup

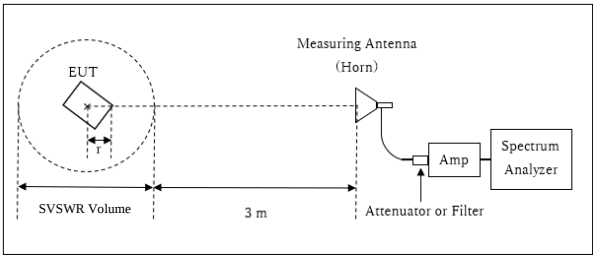
Below 1 GHz



x : Center of turn table

Test Distance: 3 m

1 GHz to 10 GHz



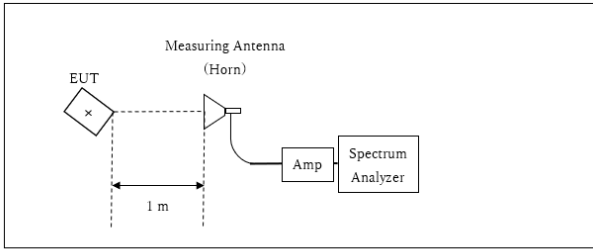
r : Radius of an outer periphery of EUT
x : Center of turn table

Distance Factor: $20 \times \log (3.99 \text{ m} / 3.0 \text{ m}) = 2.48 \text{ dB}$
* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.99 \text{ m}$

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
 $r = 0.01 \text{ m}$

* The test was performed with $r = 0.0 \text{ m}$ since EUT is small and it was the rather conservative condition.

10 GHz to 26.5 GHz



x : Center of turn table

Distance Factor: $20 \times \log (1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$
*Test Distance: 1 m

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

		Below 30 MHz	1-2.8 GHz	2.8-10 GHz	10-18 GHz	18-26.5 GHz
EUT (Left)	Horizontal	X	Y	Y	Y	X
	Vertical	X	X	Z	Z	X
EUT (Right)	Horizontal	X	Y	Z	Y	X
	Vertical	X	X	Z	Z	X

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

Measurement Range : 30 MHz to 26.5 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.
The antenna terminal conducted test was performed only for the left side as representative.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument Used
20dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 160 MHz BW)
Carrier Frequency Separation	3 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Dwell Time	Zero Span	100 kHz, 1 MHz	300 kHz, 3 MHz	As necessary capture the entire dwell time per hopping channel	Peak	Clear Write	Spectrum Analyzer
Conducted Spurious Emission *3) *4)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	10 kHz	30 kHz				
	30 MHz to 25 GHz	100 kHz	300 kHz				
Conducted Spurious Emission Band Edge compliance	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*1) Peak hold was applied as Worst-case measurement.

*2) Reference data

*3) In the frequency range below 30MHz, 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.

*4) 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 Ohms. 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.

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

20dB Bandwidth, 99 %Occupied Bandwidth and Carrier Frequency Separation

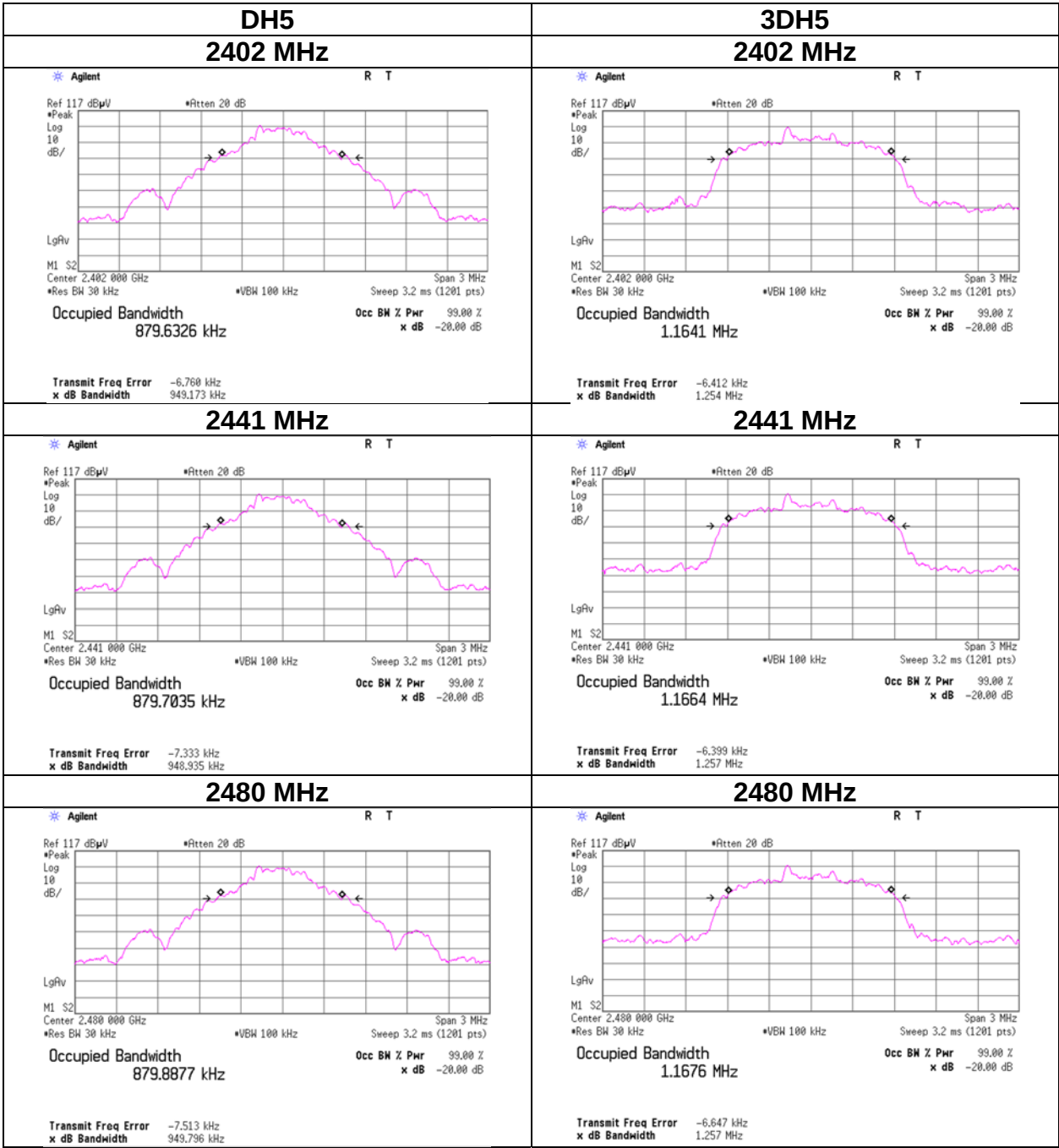
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	December 19, 2023
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Yohsuke Matsuzawa
Mode	Tx, Hopping Off, Tx, Hopping On

Mode	Freq. [MHz]	20 dB Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.949	879.6	1.000	≥ 0.633
DH5	2441.0	0.949	879.7	1.000	≥ 0.633
DH5	2480.0	0.950	879.9	1.000	≥ 0.633
DH5	Hopping On	-	78655.0	-	-
3DH5	2402.0	1.254	1164.1	1.000	≥ 0.836
3DH5	2441.0	1.257	1166.4	1.000	≥ 0.838
3DH5	2480.0	1.257	1167.6	1.000	≥ 0.838
3DH5	Hopping On	-	78747.1	-	-

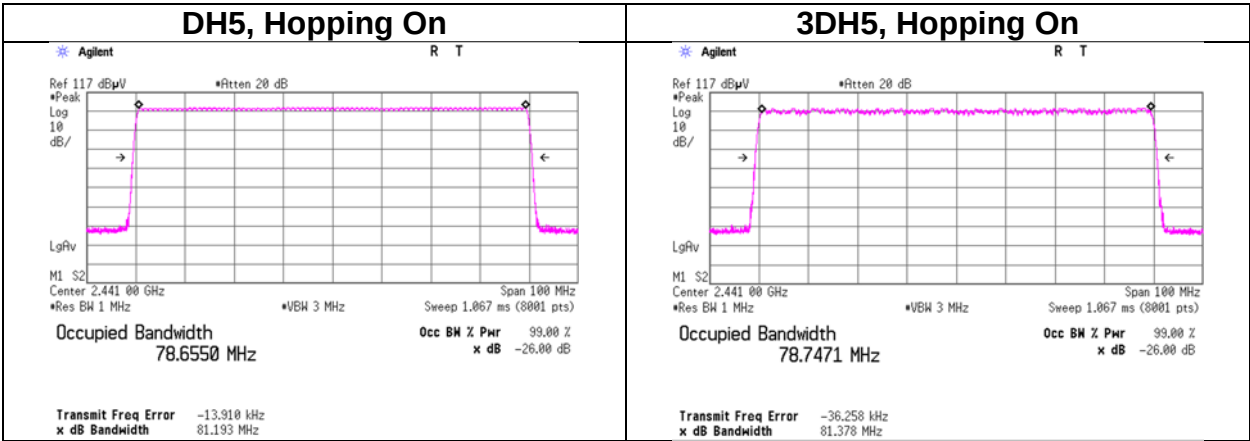
Limit: Two-thirds of 20 dB Bandwidth or 25 kHz (whichever is greater).

No limit applies to 20 dB Bandwidth.

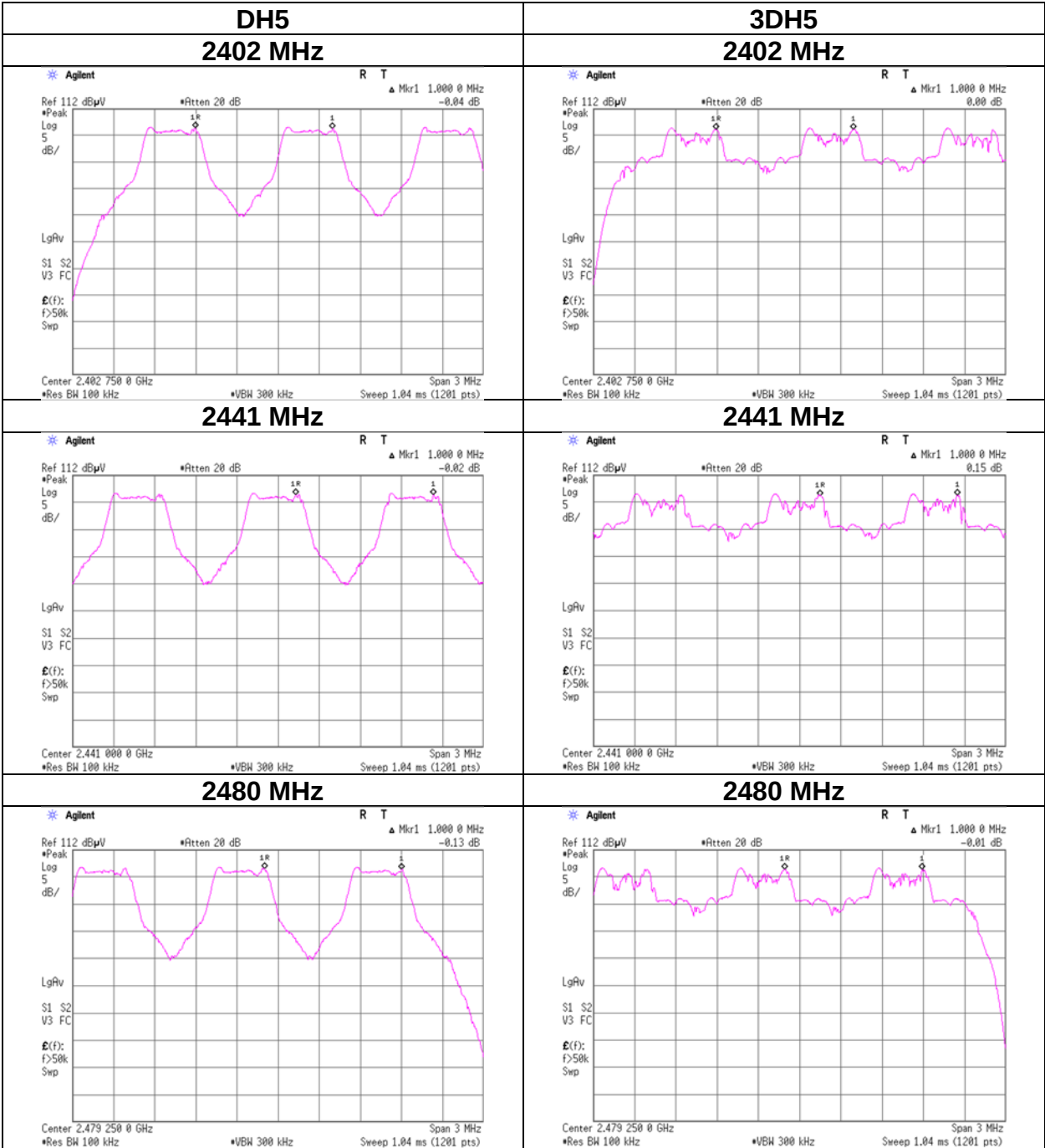
20dB Bandwidth and 99% Occupied Bandwidth



20dB Bandwidth and 99% Occupied Bandwidth



Carrier Frequency Separation



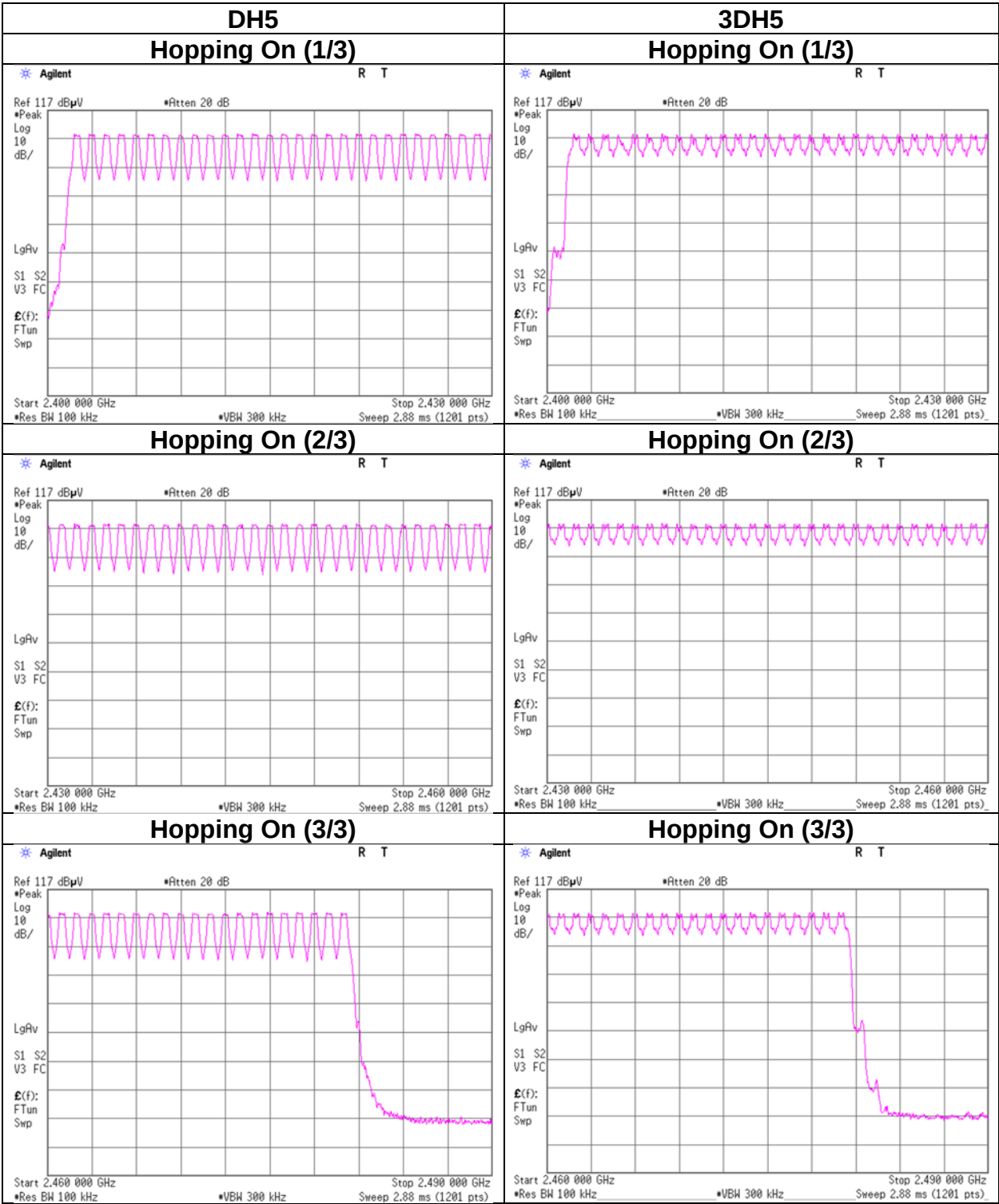
Number of Hopping Frequency

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	December 20, 2023
Temperature / Humidity	22 deg. C / 36 % RH
Engineer	Miku Ikudome
Mode	Tx, Hopping On

Mode	Number of channel [channels]	Limit [channels]
DH5	79	>= 15
3DH5	79	>= 15

Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.

Number of Hopping Frequency



Dwell time

Test place Shonan EMC Lab. No.5 Shielded Room
Date December 20, 2023
Temperature / Humidity 22 deg. C / 36 % RH
Engineer Miku Ikudome
Mode Tx, Hopping On

Mode	Number of transmission in a 31.6 (79 Hopping x 0.4)	Length of transmission [ms]	Result [ms]	Limit [ms]
DH1	51.0 times / 5 s x 31.6 s = 323 times	0.393	127	400
DH3	26.0 times / 5 s x 31.6 s = 165 times	1.662	274	400
DH5	17.0 times / 5 s x 31.6 s = 108 times	2.910	314	400
3DH1	51.0 times / 5 s x 31.6 s = 323 times	0.399	129	400
3DH3	26.0 times / 5 s x 31.6 s = 165 times	1.652	273	400
3DH5	17.0 times / 5 s x 31.6 s = 108 times	2.907	314	400

Sample Calculation

Result = Number of transmission x Length of transmission

*Average data of 5 tests.

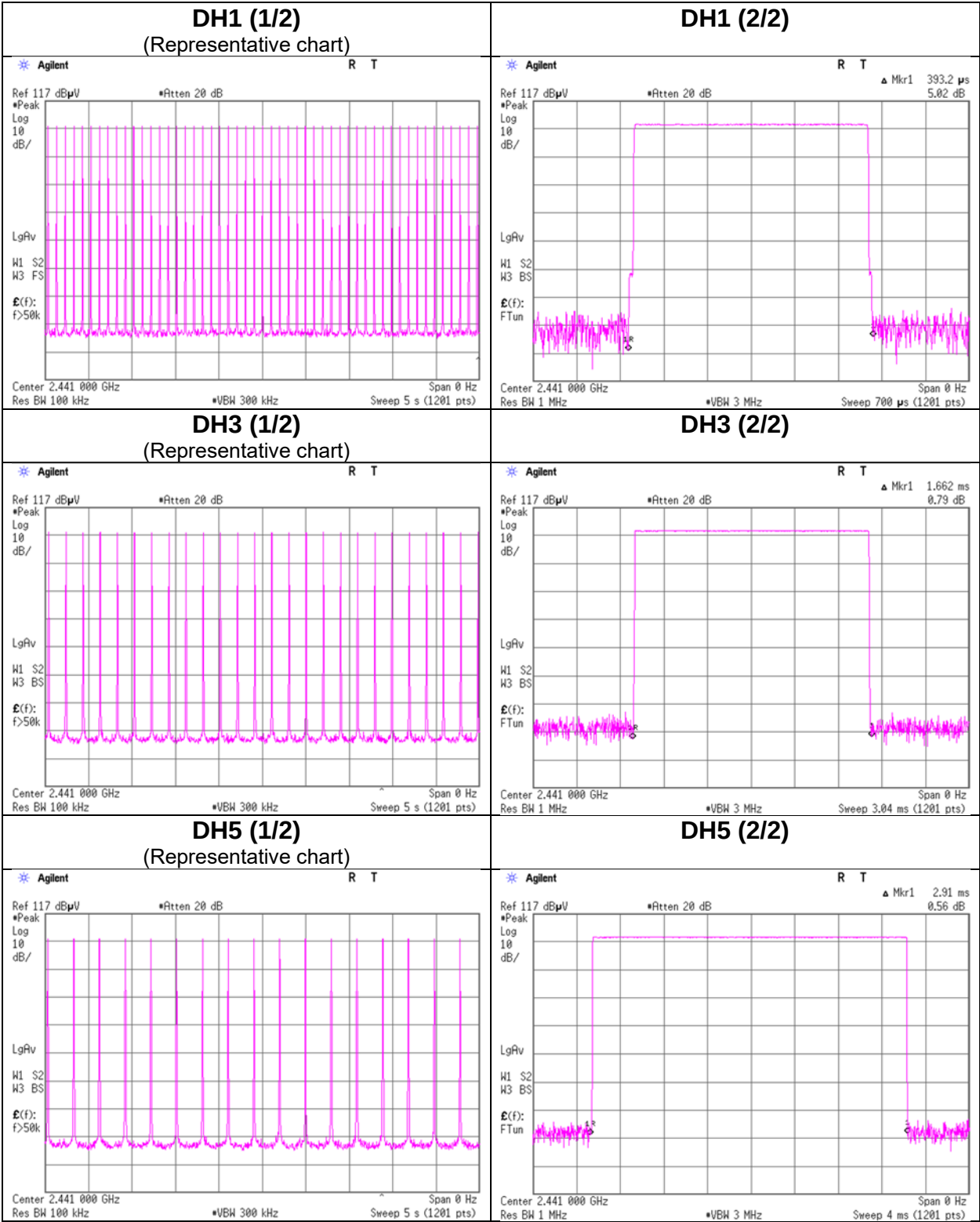
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	51	51	51	51	51	51
DH3	26	26	26	26	26	26
DH5	17	17	17	17	17	17
3DH1	51	51	51	51	51	51
3DH3	26	26	26	26	26	26
3DH5	17	17	17	17	17	17

Sample Calculation

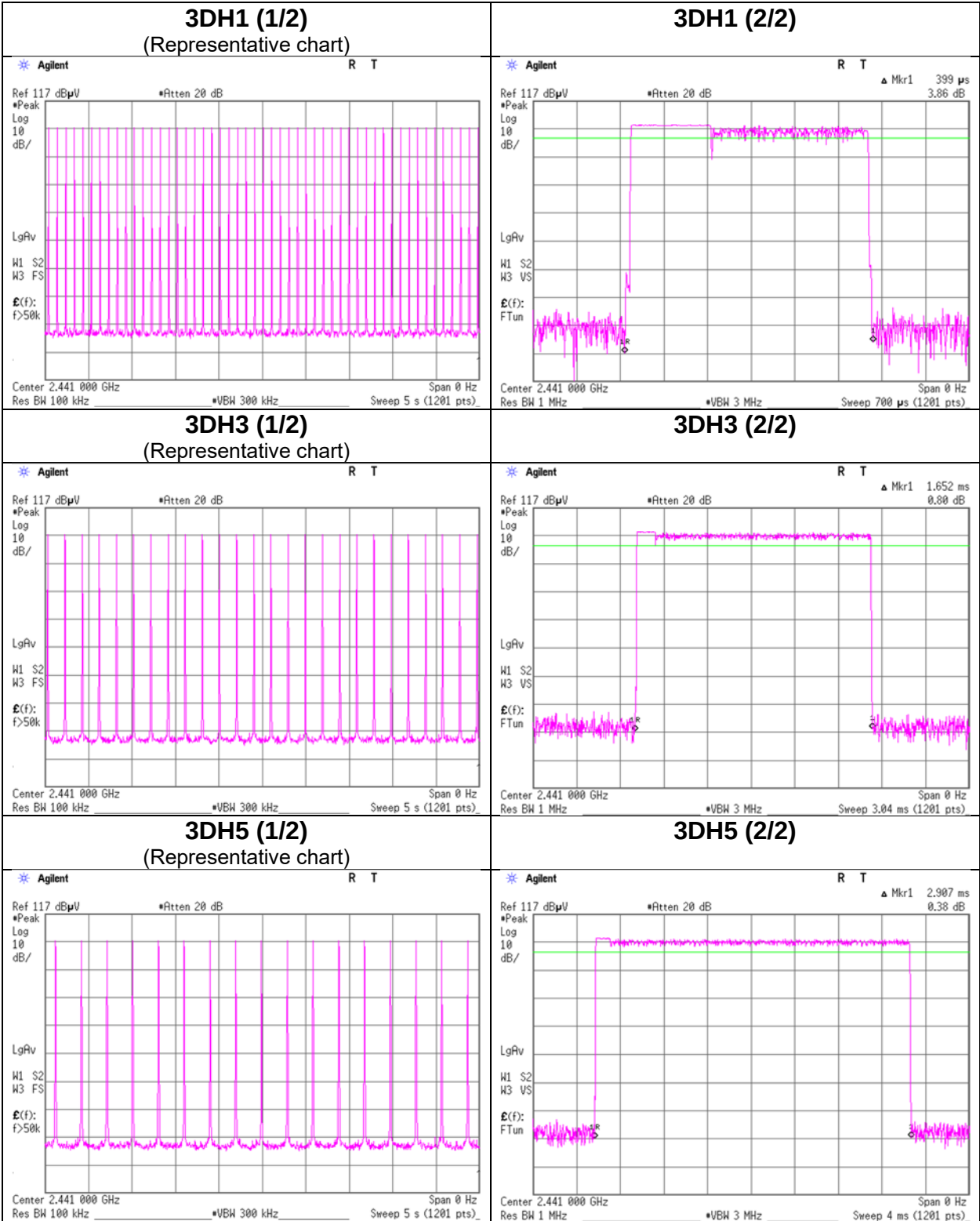
Average = Summation (Sampling 1 to 5) / 5

This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in $N \times 0.4$ s, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4 s regardless of packet size. This is confirmed in the test report for $N = 79$.

Dwell time



Dwell time



Maximum Peak Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Date December 18, 2023
Temperature / Humidity 23 deg. C / 35 % RH
Engineer Miku Ikudome
Mode Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power					e.i.r.p. for RSS-247					
					Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]	[dBm]	[mW]	
DH5	2402	1.70	3.26	9.82	14.78	30.06	20.97	125	6.19	-4.50	10.28	10.67	36.02	4000	25.74
DH5	2441	1.77	3.27	9.82	14.86	30.62	20.97	125	6.11	-4.50	10.36	10.86	36.02	4000	25.66
DH5	2480	1.91	3.28	9.82	15.01	31.70	20.97	125	5.96	-4.50	10.51	11.25	36.02	4000	25.51
2DH5	2402	0.79	3.26	9.82	13.87	24.38	20.97	125	7.10	-4.50	9.37	8.65	36.02	4000	26.65
2DH5	2441	1.57	3.27	9.82	14.66	29.24	20.97	125	6.31	-4.50	10.16	10.38	36.02	4000	25.86
2DH5	2480	1.76	3.28	9.82	14.86	30.62	20.97	125	6.11	-4.50	10.36	10.86	36.02	4000	25.66
3DH5	2402	0.85	3.26	9.82	13.93	24.72	20.97	125	7.04	-4.50	9.43	8.77	36.02	4000	26.59
3DH5	2441	1.64	3.27	9.82	14.73	29.72	20.97	125	6.24	-4.50	10.23	10.54	36.02	4000	25.79
3DH5	2480	1.80	3.28	9.82	14.90	30.90	20.97	125	6.07	-4.50	10.40	10.96	36.02	4000	25.62

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

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

Test was not performed at AFH mode, because the decrease of number of channel (min: 20 ch) at AFH mode does not influence on the output power and bandwidth of the EUT.
As this device had AFH mode and frequency separation could not meet the requirement of over 20 dB BW without 2/3 relaxation, 125 mW power limit was applied to it.

Average Output Power **(Reference data for RF Exposure)**

Test place	Shonan EMC Lab. No.5 Shielded Room
Date	December 18, 2023
Temperature / Humidity	23 deg. C / 35 % RH
Engineer	Miku Ikudome
Mode	Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
					[dBm]	[mW]		[dBm]	[mW]
DH5	2402	0.20	3.26	9.82	13.28	21.28	1.12	14.40	27.52
DH5	2441	0.24	3.27	9.82	13.33	21.53	1.12	14.45	27.84
DH5	2480	0.45	3.28	9.82	13.55	22.65	1.12	14.67	29.28
2DH5	2402	-3.12	3.26	9.82	9.96	9.91	1.12	11.08	12.81
2DH5	2441	-2.18	3.27	9.82	10.91	12.33	1.12	12.03	15.95
2DH5	2480	-1.96	3.28	9.82	11.14	13.00	1.12	12.26	16.81
3DH5	2402	-3.10	3.26	9.82	9.98	9.95	1.12	11.10	12.87
3DH5	2441	-2.14	3.27	9.82	10.95	12.45	1.12	12.07	16.09
3DH5	2480	-1.94	3.28	9.82	11.16	13.06	1.12	12.28	16.89

Sample Calculation:

Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

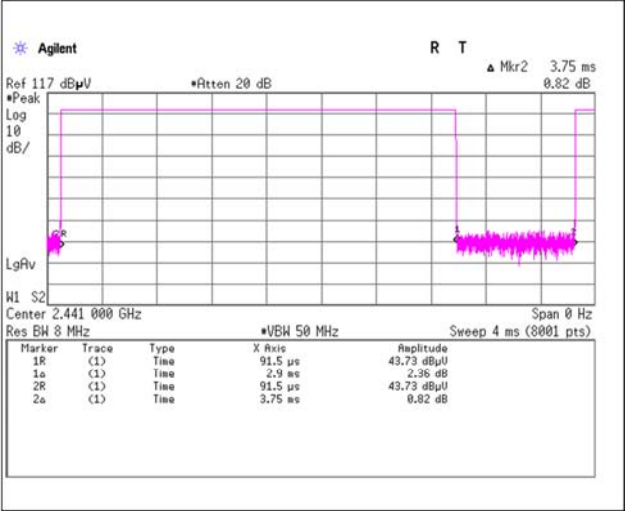
Result (Burst power average) = Result (Time average) + Duty factor

Burst Rate Confirmation

Test place Shonan EMC Lab. No.5 Shielded Room
Date December 20, 2023
Temperature / Humidity 22 deg. C / 36 % RH
Engineer Miku Ikudome
Mode Tx, Hopping Off

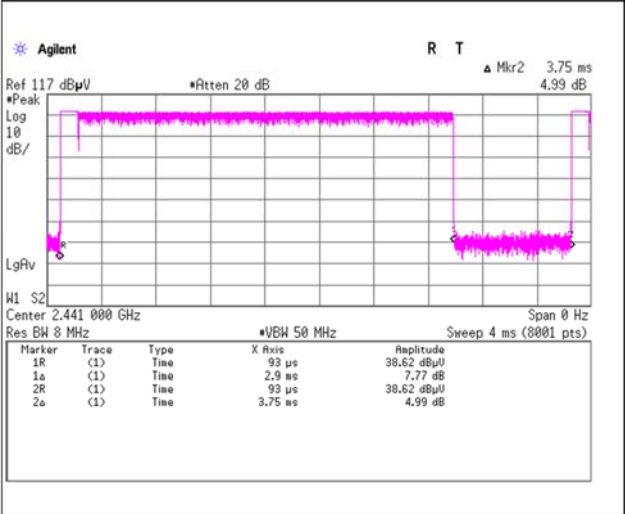
DH5

Tx on / (Tx on + Tx off) = **0.773**
Tx on / (Tx on + Tx off) * 100 = **77.3 %**
Duty factor = 10 * log (3.75 / 2.9) = **1.12 dB**
VBW: 1 / on time = 344.83 Hz < **500.00 Hz**



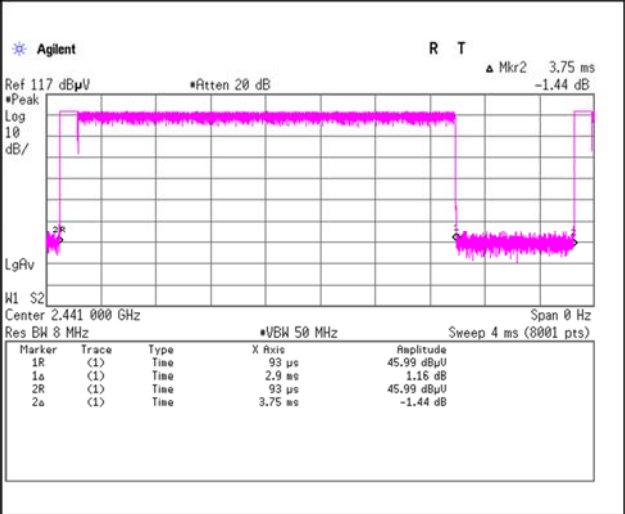
2DH5

Tx on / (Tx on + Tx off) = **0.773**
Tx on / (Tx on + Tx off) * 100 = **77.3 %**
Duty factor = 10 * log (3.75 / 2.9) = **1.12 dB**
VBW: 1 / on time = 344.83 Hz < **500.00 Hz**



3DH5

Tx on / (Tx on + Tx off) = **0.773**
Tx on / (Tx on + Tx off) * 100 = **77.3 %**
Duty factor = 10 * log (3.75 / 2.9) = **1.12 dB**
VBW: 1 / on time = 344.83 Hz < **500.00 Hz**



Radiated Spurious Emission

Test place Shonan EMC Lab.
Semi Anechoic Chamber No.1
Date January 7, 2024 January 9, 2024 January 9, 2024
Temperature / Humidity 18 deg. C / 30 % RH 18 deg. C / 27 % RH 18 deg. C / 27 % RH
Engineer Shiro Kobayashi Makoto Hosaka Takahiro Suzuki
(1 GHz to 10 GHz) (10 GHz to 18 GHz) (18 GHz to 26.5 GHz)
Mode Tx, Hopping Off, DH5 2402 MHz, Left

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	46.42	27.77	14.80	39.49	2.48	51.98	73.9	21.9	113	231	-
Hori.	4804.000	PK	45.91	31.06	7.59	39.62	2.48	47.42	73.9	26.4	150	0	-
Hori.	7206.000	PK	46.61	36.74	9.32	39.36	2.48	55.79	73.9	18.1	121	42	-
Hori.	9608.000	PK	45.57	38.14	10.77	39.60	2.48	57.36	73.9	16.5	150	0	-
Hori.	12010.000	PK	46.55	38.65	12.29	38.57	-9.54	49.38	73.9	24.5	120	351	-
Hori.	2390.000	AV	32.14	27.77	14.80	39.49	2.48	37.70	53.9	16.2	113	231	VBW:500 Hz
Hori.	4804.000	AV	32.06	31.06	7.59	39.62	2.48	33.57	53.9	20.3	150	0	VBW:500 Hz, Floor Noise
Hori.	7206.000	AV	32.31	36.74	9.32	39.36	2.48	41.49	53.9	12.4	121	42	VBW:500 Hz
Hori.	9608.000	AV	31.79	38.14	10.77	39.60	2.48	43.58	53.9	10.3	150	0	VBW:500 Hz, Floor Noise
Hori.	12010.000	AV	34.08	38.65	12.29	38.57	-9.54	36.91	53.9	16.9	120	351	VBW:500 Hz
Vert.	2390.000	PK	46.16	27.77	14.80	39.49	2.48	51.72	73.9	22.1	130	302	-
Vert.	4804.000	PK	45.97	31.06	7.59	39.62	2.48	47.48	73.9	26.4	150	0	-
Vert.	7206.000	PK	46.10	36.74	9.32	39.36	2.48	55.28	73.9	18.6	130	319	-
Vert.	9608.000	PK	45.97	38.14	10.77	39.60	2.48	57.76	73.9	16.1	150	0	-
Vert.	12010.000	PK	47.22	38.65	12.29	38.57	-9.54	50.05	73.9	23.8	132	340	-
Vert.	2390.000	AV	32.33	27.77	14.80	39.49	2.48	37.89	53.9	16.0	130	302	VBW:500 Hz
Vert.	4804.000	AV	32.01	31.06	7.59	39.62	2.48	33.52	53.9	20.3	150	0	VBW:500 Hz, Floor Noise
Vert.	7206.000	AV	32.33	36.74	9.32	39.36	2.48	41.51	53.9	12.3	130	319	VBW:500 Hz
Vert.	9608.000	AV	31.72	38.14	10.77	39.60	2.48	43.51	53.9	10.3	150	0	VBW:500 Hz, Floor Noise
Vert.	12010.000	AV	34.34	38.65	12.29	38.57	-9.54	37.17	53.9	16.7	132	340	VBW:500 Hz

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

Distance factor : 1 GHz - 10 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

*These results have sufficient margin without taking account Duty cycle correction factor.

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	92.40	27.76	14.81	39.49	2.48	97.96	-	-	Carrier
Hori.	2400.000	PK	38.85	27.76	14.81	39.49	2.48	44.41	77.9	33.4	-
Vert.	2402.000	PK	90.75	27.76	14.81	39.49	2.48	96.31	-	-	Carrier
Vert.	2400.000	PK	38.60	27.76	14.81	39.49	2.48	44.16	76.3	32.1	-

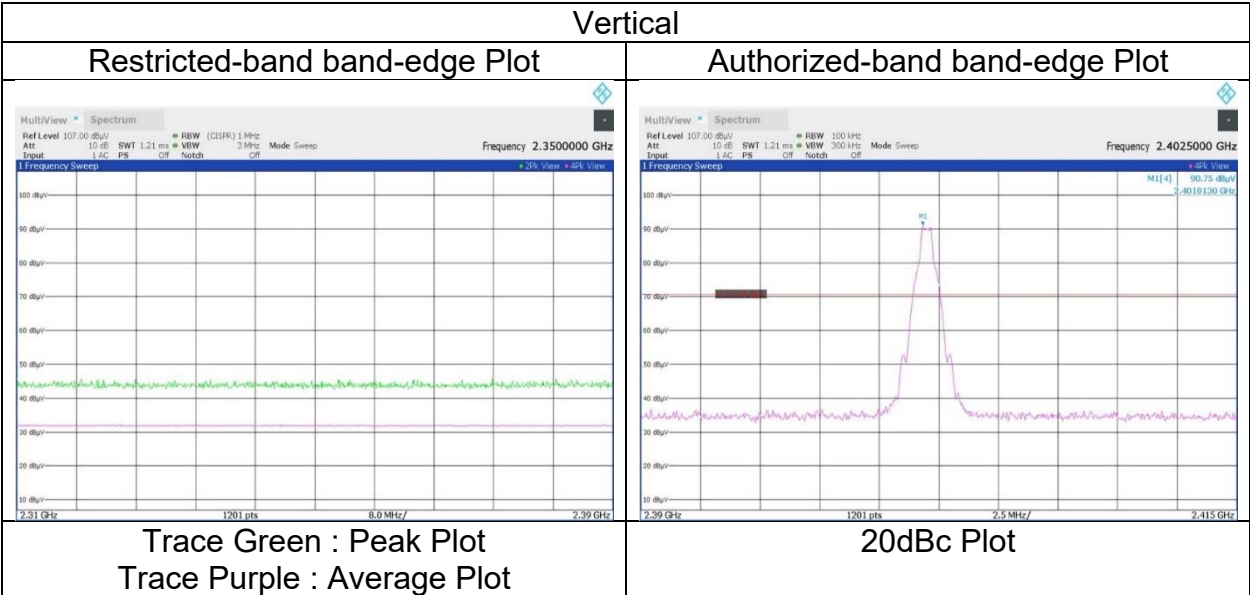
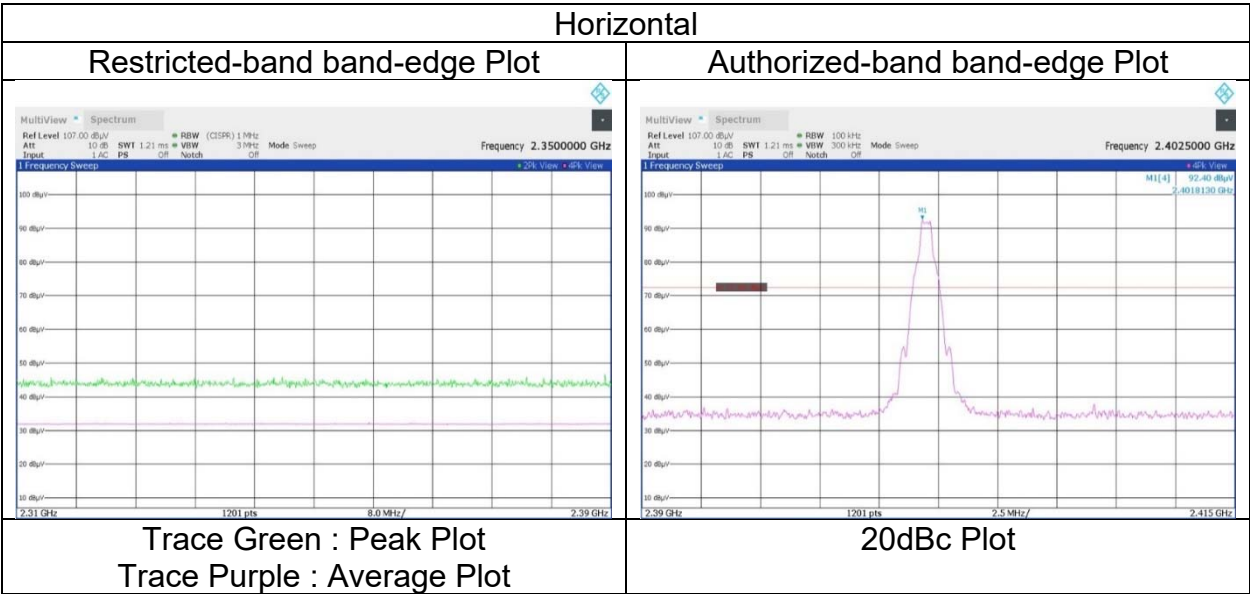
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	January 7, 2024
Temperature / Humidity	18 deg. C / 30 % RH
Engineer	Shiro Kobayashi
	(1 GHz to 10 GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz, Left



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

Radiated Spurious Emission

Test place Shonan EMC Lab.
Semi Anechoic Chamber No.1
Date January 8, 2024 January 9, 2024 January 9, 2024
Temperature / Humidity 19 deg. C / 29 % RH 18 deg. C / 27 % RH 18 deg. C / 27 % RH
Engineer Kenichi Adachi Makoto Hosaka Takahiro Suzuki
(1 GHz to 10 GHz) (10 GHz to 18 GHz) (18 GHz to 26.5 GHz)
Mode Tx, Hopping Off, DH5 2441 MHz, Left

(* 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.	4882.000	PK	46.35	31.09	7.64	39.64	2.48	47.92	73.9	25.9	150	0	-
Hori.	7323.000	PK	46.10	36.82	9.41	39.36	2.48	55.45	73.9	18.4	139	26	-
Hori.	9764.000	PK	46.23	38.70	10.87	39.46	2.48	58.82	73.9	15.0	150	0	-
Hori.	12205.000	PK	46.05	38.44	12.46	38.42	-9.54	48.99	73.9	24.9	123	353	-
Hori.	4882.000	AV	32.09	31.09	7.64	39.64	2.48	33.66	53.9	20.2	150	0	VBW:500 Hz, Floor Noise
Hori.	7323.000	AV	32.20	36.82	9.41	39.36	2.48	41.55	53.9	12.3	139	26	VBW:500 Hz
Hori.	9764.000	AV	32.06	38.70	10.87	39.46	2.48	44.65	53.9	9.2	150	0	VBW:500 Hz, Floor Noise
Hori.	12205.000	AV	32.60	38.44	12.46	38.42	-9.54	35.54	53.9	18.3	123	353	VBW:500 Hz
Vert.	4882.000	PK	46.32	31.09	7.64	39.64	2.48	47.89	73.9	26.0	150	0	-
Vert.	7323.000	PK	45.98	36.82	9.41	39.36	2.48	55.33	73.9	18.5	139	345	-
Vert.	9764.000	PK	46.03	38.70	10.87	39.46	2.48	58.62	73.9	15.2	150	0	-
Vert.	12205.000	PK	45.89	38.44	12.46	38.42	-9.54	48.83	73.9	25.0	131	341	-
Vert.	4882.000	AV	32.12	31.09	7.64	39.64	2.48	33.69	53.9	20.2	150	0	VBW:500 Hz, Floor Noise
Vert.	7323.000	AV	32.09	36.82	9.41	39.36	2.48	41.44	53.9	12.4	139	345	VBW:500 Hz
Vert.	9764.000	AV	32.01	38.70	10.87	39.46	2.48	44.60	53.9	9.3	150	0	VBW:500 Hz, Floor Noise
Vert.	12205.000	AV	32.27	38.44	12.46	38.42	-9.54	35.21	53.9	18.6	131	341	VBW:500 Hz

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

Distance factor : 1 GHz - 10 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

*These results have sufficient margin without taking account Duty cycle correction factor.

Radiated Spurious Emission

Test place Shonan EMC Lab.
Semi Anechoic Chamber No.1
Date January 5, 2024 January 8, 2024 January 9, 2024 January 9, 2024
Temperature / Humidity 18 deg. C / 32 % RH 19 deg. C / 29 % RH 18 deg. C / 27 % RH 18 deg. C / 27 % RH
Engineer Makoto Hosaka Kenichi Adachi Makoto Hosaka Takahiro Suzuki
(30 MHz to 1 GHz) (1 GHz to 10 GHz) (10 GHz to 18 GHz) (18 GHz to 26.5 GHz)
Mode Tx, Hopping Off, DH5 2480 MHz, Left

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

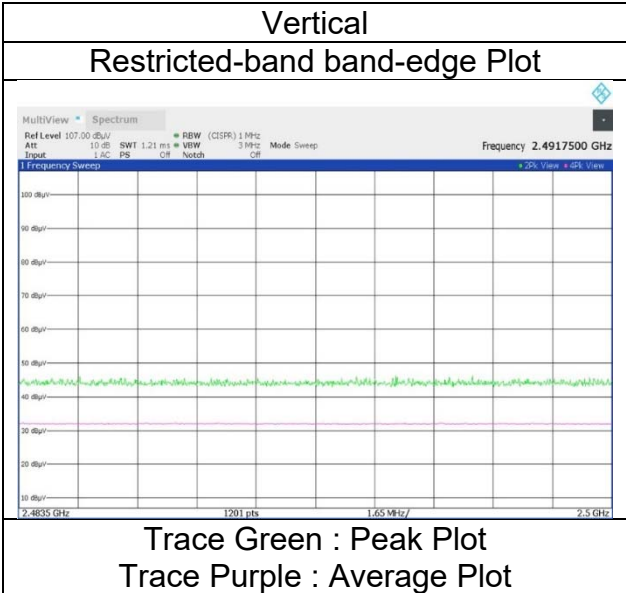
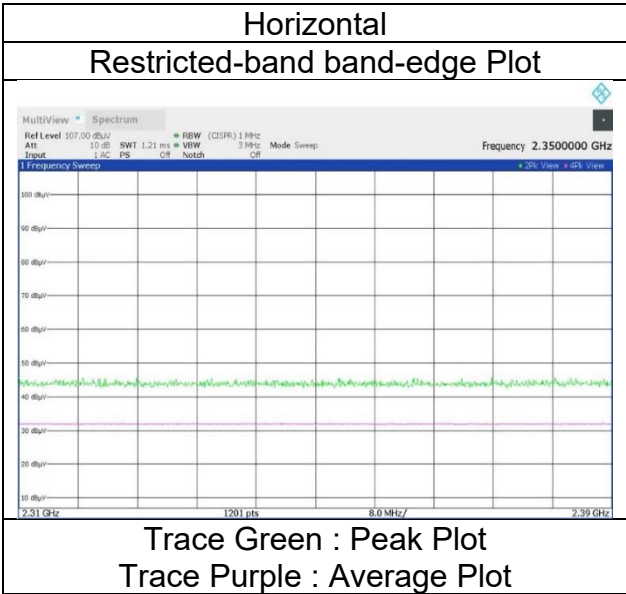
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	31.870	QP	21.10	17.91	7.06	31.83	0.00	14.24	40.0	25.7	100	0	-
Hori.	199.330	QP	20.60	16.68	9.06	31.77	0.00	14.57	43.5	28.9	100	0	-
Hori.	914.399	QP	19.90	22.97	10.04	31.20	0.00	21.71	46.0	24.2	100	0	-
Hori.	957.504	QP	19.40	23.35	10.19	30.91	0.00	22.03	46.0	23.9	100	0	-
Hori.	2483.500	PK	46.27	27.65	14.91	39.53	2.48	51.78	73.9	22.1	137	234	-
Hori.	4960.000	PK	45.54	31.30	7.71	39.66	2.48	47.37	73.9	26.5	150	0	-
Hori.	7440.000	PK	46.43	36.95	9.53	39.36	2.48	56.03	73.9	17.8	103	28	-
Hori.	9920.000	PK	45.02	38.66	10.97	39.31	2.48	57.82	73.9	16.0	150	0	-
Hori.	12400.000	PK	45.60	38.09	12.62	38.28	-9.54	48.49	73.9	25.4	118	340	-
Hori.	2483.500	AV	32.36	27.65	14.91	39.53	2.48	37.87	53.9	16.0	137	234	VBW:500 Hz
Hori.	4960.000	AV	32.00	31.30	7.71	39.66	2.48	33.83	53.9	20.0	150	0	VBW:500 Hz, Floor Noise
Hori.	7440.000	AV	31.94	36.95	9.53	39.36	2.48	41.54	53.9	12.3	103	28	VBW:500 Hz
Hori.	9920.000	AV	31.34	38.66	10.97	39.31	2.48	44.14	53.9	9.7	150	0	VBW:500 Hz, Floor Noise
Hori.	12400.000	AV	33.18	38.09	12.62	38.28	-9.54	36.07	53.9	17.8	118	340	-
Vert.	30.681	QP	20.50	18.36	7.04	31.83	0.00	14.07	40.0	25.9	100	0	-
Vert.	190.665	QP	20.60	16.46	9.01	31.77	0.00	14.30	43.5	29.2	100	0	-
Vert.	879.202	QP	20.10	22.12	9.89	31.40	0.00	20.71	46.0	25.2	100	0	-
Vert.	918.423	QP	20.20	23.05	10.05	31.18	0.00	22.12	46.0	23.8	100	0	-
Vert.	2483.500	PK	47.01	27.65	14.91	39.53	2.48	52.52	73.9	21.3	152	242	-
Vert.	4960.000	PK	45.60	31.30	7.71	39.66	2.48	47.43	73.9	26.4	150	0	-
Vert.	7440.000	PK	46.24	36.95	9.53	39.36	2.48	55.84	73.9	18.0	152	339	-
Vert.	9920.000	PK	45.50	38.66	10.97	39.31	2.48	58.30	73.9	15.6	150	0	-
Vert.	12400.000	PK	45.77	38.09	12.62	38.28	-9.54	48.66	73.9	25.2	134	349	-
Vert.	2483.500	AV	32.11	27.65	14.91	39.53	2.48	37.62	53.9	16.2	152	242	VBW:500 Hz
Vert.	4960.000	AV	32.11	31.30	7.71	39.66	2.48	33.94	53.9	19.9	150	0	VBW:500 Hz, Floor Noise
Vert.	7440.000	AV	32.32	36.95	9.53	39.36	2.48	41.92	53.9	11.9	152	339	VBW:500 Hz
Vert.	9920.000	AV	31.57	38.66	10.97	39.31	2.48	44.37	53.9	9.5	150	0	VBW:500 Hz, Floor Noise
Vert.	12400.000	AV	32.46	38.09	12.62	38.28	-9.54	35.35	53.9	18.5	134	349	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz: 20log (3.99 m / 3.0 m) = 2.48 dB
10 GHz - 40 GHz: 20log (1.0 m / 3.0 m) = -9.54 dB

*These results have sufficient margin without taking account Duty cycle correction factor.

Radiated Spurious Emission
(Reference Plot for bandto edge)

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	January 8, 2024
Temperature / Humidity	19 deg. C / 29 % RH
Engineer	Kenichi Adachi
	(1 GHz to 10 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz, Left



* 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 No.1
Date January 8, 2024 January 9, 2024 January 9, 2024
Temperature / Humidity 19 deg. C / 29 % RH 18 deg. C / 27 % RH 18 deg. C / 27 % RH
Engineer Kenichi Adachi Makoto Hosaka Takahiro Suzuki
(1 GHz to 10 GHz) (10 GHz to 18 GHz) (18 GHz to 26.5 GHz)
Mode Tx, Hopping Off, 3DH5 2402 MHz, Left

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	46.08	27.77	14.80	39.49	2.48	51.64	73.9	22.2	114	243	-
Hori.	4804.000	PK	45.71	31.06	7.59	39.62	2.48	47.22	73.9	26.6	150	0	-
Hori.	7206.000	PK	45.57	36.74	9.32	39.36	2.48	54.75	73.9	19.1	150	0	-
Hori.	9608.000	PK	45.43	38.14	10.77	39.60	2.48	57.22	73.9	16.6	150	0	-
Hori.	12010.000	PK	45.05	38.65	12.29	38.57	-9.54	47.88	73.9	26.0	120	334	-
Hori.	2390.000	AV	32.06	27.77	14.80	39.49	2.48	37.62	53.9	16.2	114	243	VBW:500 Hz
Hori.	4804.000	AV	31.73	31.06	7.59	39.62	2.48	33.24	53.9	20.6	150	0	VBW:500 Hz, Floor Noise
Hori.	7206.000	AV	31.54	36.74	9.32	39.36	2.48	40.72	53.9	13.1	150	0	VBW:500 Hz, Floor Noise
Hori.	9608.000	AV	31.65	38.14	10.77	39.60	2.48	43.44	53.9	10.4	150	0	VBW:500 Hz, Floor Noise
Hori.	12010.000	AV	31.05	38.65	12.29	38.57	-9.54	33.88	53.9	20.0	120	334	VBW:500 Hz
Vert.	2390.000	PK	46.19	27.77	14.80	39.49	2.48	51.75	73.9	22.1	118	290	-
Vert.	4804.000	PK	45.74	31.06	7.59	39.62	2.48	47.25	73.9	26.6	150	0	-
Vert.	7206.000	PK	45.79	36.74	9.32	39.36	2.48	54.97	73.9	18.9	150	0	-
Vert.	9608.000	PK	45.54	38.14	10.77	39.60	2.48	57.33	73.9	16.5	150	0	-
Vert.	12010.000	PK	45.25	38.65	12.29	38.57	-9.54	48.08	73.9	25.8	143	359	-
Vert.	2390.000	AV	32.05	27.77	14.80	39.49	2.48	37.61	53.9	16.2	118	290	VBW:500 Hz
Vert.	4804.000	AV	31.75	31.06	7.59	39.62	2.48	33.26	53.9	20.6	150	0	VBW:500 Hz, Floor Noise
Vert.	7206.000	AV	31.47	36.74	9.32	39.36	2.48	40.65	53.9	13.2	150	0	VBW:500 Hz, Floor Noise
Vert.	9608.000	AV	31.67	38.14	10.77	39.60	2.48	43.46	53.9	10.4	150	0	VBW:500 Hz, Floor Noise
Vert.	12010.000	AV	31.23	38.65	12.29	38.57	-9.54	34.06	53.9	19.8	143	359	VBW:500 Hz

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

Distance factor: 1 GHz - 10 GHz: 20log (3.99 m / 3.0 m) = 2.48 dB

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

*These results have sufficient margin without taking account Duty cycle correction factor.

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	91.33	27.76	14.81	39.49	2.48	96.89	-	-	Carrier
Hori.	2400.000	PK	38.46	27.76	14.81	39.49	2.48	44.02	76.8	32.7	-
Vert.	2402.000	PK	88.86	27.76	14.81	39.49	2.48	94.42	-	-	Carrier
Vert.	2400.000	PK	37.23	27.76	14.81	39.49	2.48	42.79	74.4	31.6	-

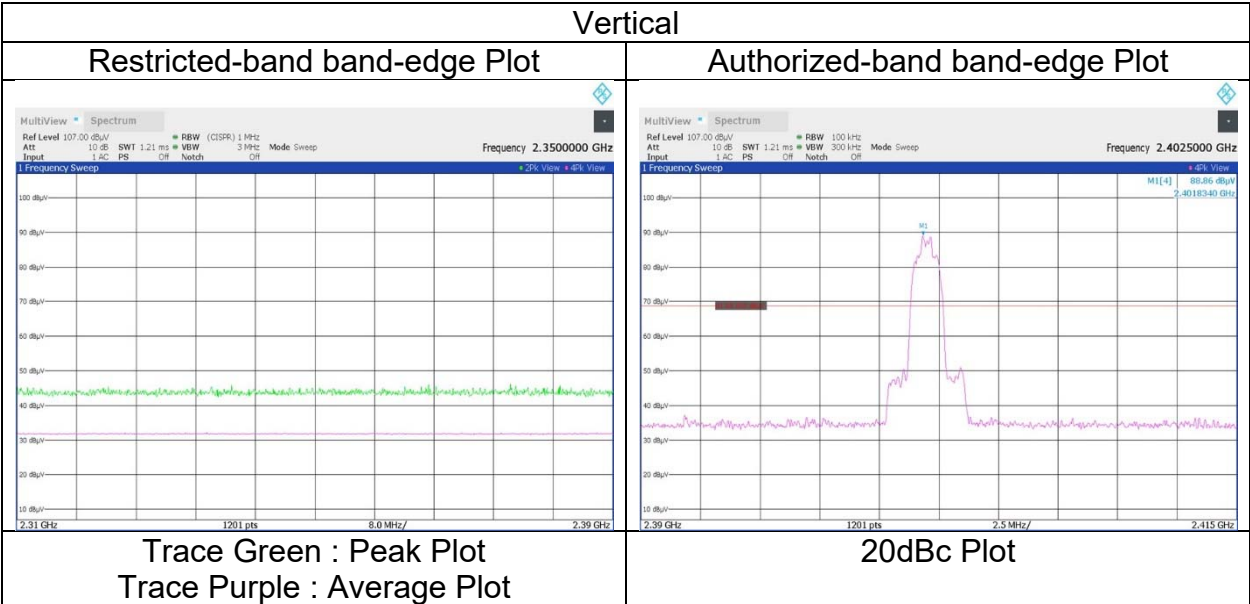
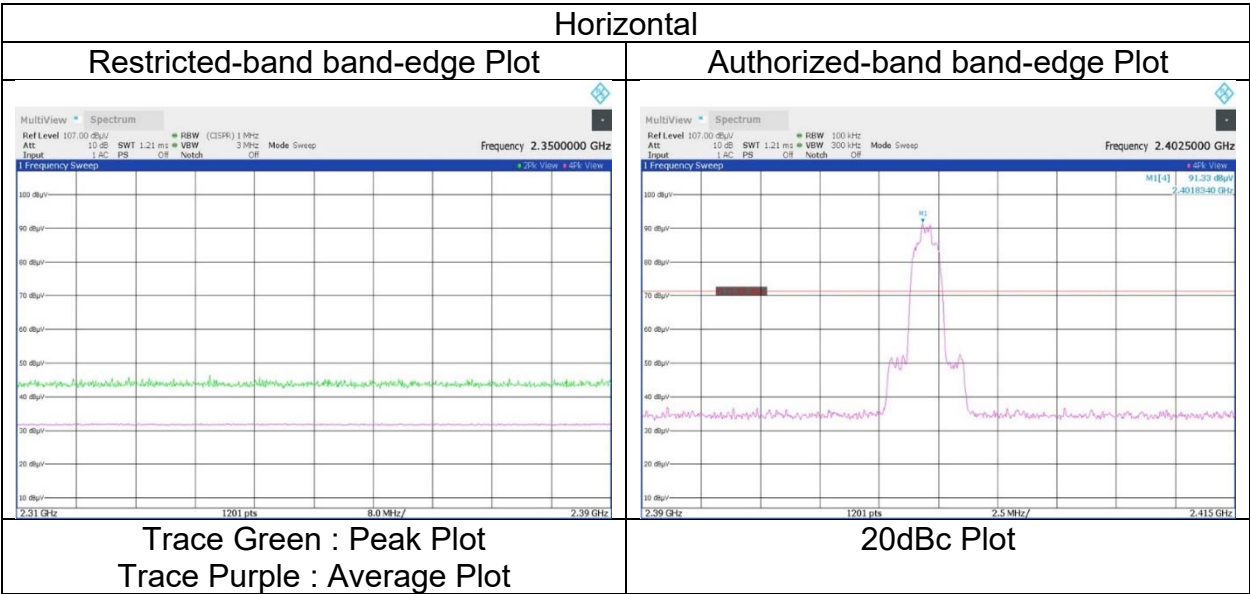
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor: 1 GHz - 10 GHz: 20log (3.99 m / 3.0 m) = 2.48 dB

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	January 8, 2024
Temperature / Humidity	19 deg. C / 29 % RH
Engineer	Kenichi Adachi
	(1 GHz to 10 GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz, Left



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

Radiated Spurious Emission

Test place Shonan EMC Lab.
Semi Anechoic Chamber No.1
Date January 8, 2024 January 9, 2024 January 9, 2024
Temperature / Humidity 19 deg. C / 29 % RH 18 deg. C / 27 % RH 18 deg. C / 27 % RH
Engineer Kenichi Adachi Makoto Hosaka Takahiro Suzuki
(1 GHz to 10 GHz) (10 GHz to 18 GHz) (18 GHz to 26.5 GHz)
Mode Tx, Hopping Off, 3DH5 2441 MHz, Left

(* 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.	4882.000	PK	45.62	31.09	7.64	39.64	2.48	47.19	73.9	26.7	150	0	-
Hori.	7323.000	PK	45.04	36.82	9.41	39.36	2.48	54.39	73.9	19.5	150	0	-
Hori.	9764.000	PK	45.56	38.70	10.87	39.46	2.48	58.15	73.9	15.7	150	0	-
Hori.	12205.000	PK	45.30	38.44	12.46	38.42	-9.54	48.24	73.9	25.6	116	332	-
Hori.	4882.000	AV	31.76	31.09	7.64	39.64	2.48	33.33	53.9	20.5	150	0	VBW:500 Hz, Floor Noise
Hori.	7323.000	AV	31.30	36.82	9.41	39.36	2.48	40.65	53.9	13.2	150	0	VBW:500 Hz, Floor Noise
Hori.	9764.000	AV	31.44	38.70	10.87	39.46	2.48	44.03	53.9	9.8	150	0	VBW:500 Hz, Floor Noise
Hori.	12205.000	AV	31.10	38.44	12.46	38.42	-9.54	34.04	53.9	19.8	116	332	VBW:500 Hz
Vert.	4882.000	PK	45.92	31.09	7.64	39.64	2.48	47.49	73.9	26.4	150	0	-
Vert.	7323.000	PK	45.60	36.82	9.41	39.36	2.48	54.95	73.9	18.9	150	0	-
Vert.	9764.000	PK	45.28	38.70	10.87	39.46	2.48	57.87	73.9	16.0	150	0	-
Vert.	12205.000	PK	45.27	38.44	12.46	38.42	-9.54	48.21	73.9	25.6	124	1	-
Vert.	4882.000	AV	31.85	31.09	7.64	39.64	2.48	33.42	53.9	20.4	150	0	VBW:500 Hz, Floor Noise
Vert.	7323.000	AV	31.28	36.82	9.41	39.36	2.48	40.63	53.9	13.2	150	0	VBW:500 Hz, Floor Noise
Vert.	9764.000	AV	31.42	38.70	10.87	39.46	2.48	44.01	53.9	9.8	150	0	VBW:500 Hz, Floor Noise
Vert.	12205.000	AV	31.12	38.44	12.46	38.42	-9.54	34.06	53.9	19.8	124	1	VBW:500 Hz

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

Distance factor : 1 GHz - 10 GHz: 20log (3.99 m / 3.0 m) = 2.48 dB

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

*These results have sufficient margin without taking account Duty cycle correction factor.

Radiated Spurious Emission

Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.1		
Date	January 8, 2024	January 9, 2024	January 9, 2024
Temperature / Humidity	19 deg. C / 29 % RH	18 deg. C / 27 % RH	18 deg. C / 27 % RH
Engineer	Kenichi Adachi	Makoto Hosaka	Takahiro Suzuki
	(1 GHz to 10 GHz)	(10 GHz to 18 GHz)	(18 GHz to 26.5 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz, Left		

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dBm]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	46.34	27.65	14.91	39.53	2.48	51.85	73.9	22.0	144	222	-
Hori.	4960.000	PK	46.15	31.30	7.71	39.66	2.48	47.98	73.9	25.9	150	0	-
Hori.	7440.000	PK	45.59	36.95	9.53	39.36	2.48	55.19	73.9	18.7	150	0	-
Hori.	9920.000	PK	45.50	38.66	10.97	39.31	2.48	58.30	73.9	15.6	150	0	-
Hori.	2483.500	AV	32.26	27.65	14.91	39.53	2.48	37.77	53.9	16.1	144	222	VBW:500 Hz
Hori.	4960.000	AV	31.98	31.30	7.71	39.66	2.48	33.81	53.9	20.0	150	0	VBW:500 Hz, Floor Noise
Hori.	7440.000	AV	31.41	36.95	9.53	39.36	2.48	41.01	53.9	12.8	150	0	VBW:500 Hz, Floor Noise
Hori.	9920.000	AV	31.09	38.66	10.97	39.31	2.48	43.89	53.9	10.0	150	0	VBW:500 Hz, Floor Noise
Vert.	2483.500	PK	46.14	27.65	14.91	39.53	2.48	51.65	73.9	22.2	149	259	-
Vert.	4960.000	PK	45.95	31.30	7.71	39.66	2.48	47.78	73.9	26.1	150	0	-
Vert.	7440.000	PK	45.43	36.95	9.53	39.36	2.48	55.03	73.9	18.8	150	0	-
Vert.	9920.000	PK	45.31	38.66	10.97	39.31	2.48	58.11	73.9	15.7	150	0	-
Vert.	2483.500	AV	32.26	27.65	14.91	39.53	2.48	37.77	53.9	16.1	149	259	VBW:500 Hz
Vert.	4960.000	AV	31.93	31.30	7.71	39.66	2.48	33.76	53.9	20.1	150	0	VBW:500 Hz, Floor Noise
Vert.	7440.000	AV	31.52	36.95	9.53	39.36	2.48	41.12	53.9	12.7	150	0	VBW:500 Hz, Floor Noise
Vert.	9920.000	AV	31.21	38.66	10.97	39.31	2.48	44.01	53.9	9.8	150	0	VBW:500 Hz, Floor Noise

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

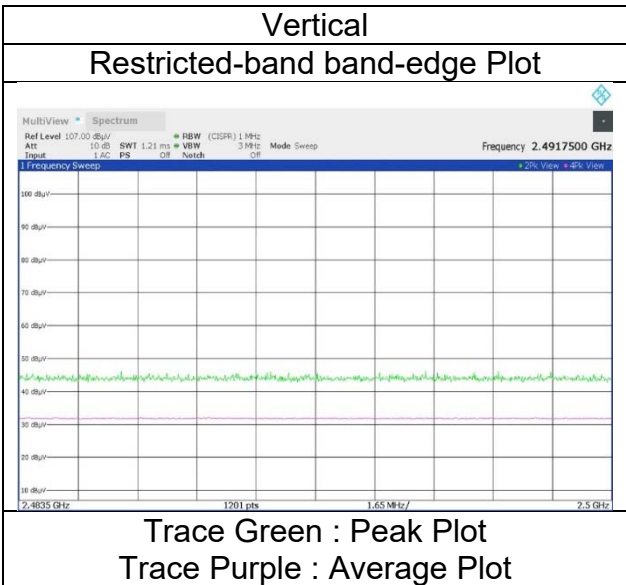
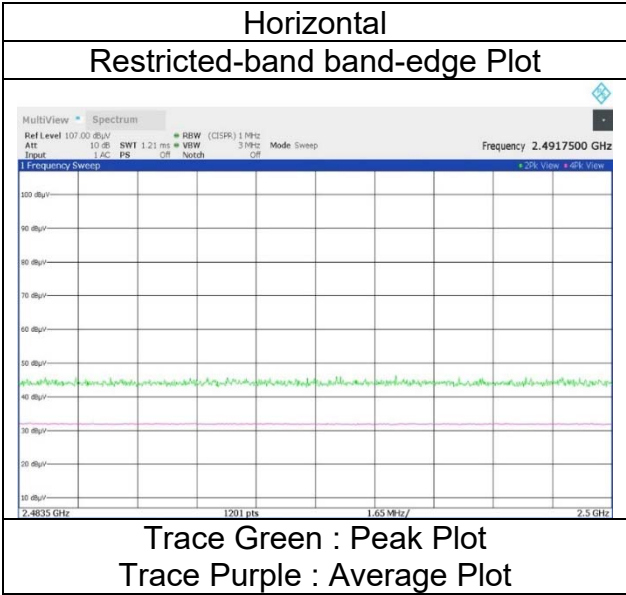
Distance factor : 1 GHz - 10 GHz: $20\log (3.99 \text{ m} / 3.0 \text{ m}) = 2.48 \text{ dB}$

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

*These results have sufficient margin without taking account Duty cycle correction factor.

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	January 8, 2024
Temperature / Humidity	19 deg. C / 29 % RH
Engineer	Kenichi Adachi
	(1 GHz to 10 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz, Left



* 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	No.1		
Date	January 8, 2024	January 9, 2024	January 9, 2024
Temperature / Humidity	18 deg. C / 30 % RH	18 deg. C / 27 % RH	18 deg. C / 27 % RH
Engineer	Shiro Kobayashi	Makoto Hosaka	Takahiro Suzuki
	(1 GHz to 10 GHz)	(10 GHz to 18 GHz)	(18 GHz to 26.5 GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz, Right		

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dBm]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	46.65	27.77	14.80	39.49	2.48	52.21	73.9	21.6	152	129	-
Hori.	4804.000	PK	47.68	31.06	7.59	39.62	2.48	49.19	73.9	24.7	365	253	-
Hori.	7206.000	PK	45.58	36.74	9.32	39.36	2.48	54.76	73.9	19.1	150	0	-
Hori.	9608.000	PK	45.83	38.14	10.77	39.60	2.48	57.62	73.9	16.2	150	0	-
Hori.	12010.000	PK	49.29	38.65	12.29	38.57	-9.54	52.12	73.9	21.7	132	331	-
Hori.	2390.000	AV	32.21	27.77	14.80	39.49	2.48	37.77	53.9	16.1	152	129	VBW:500 Hz
Hori.	4804.000	AV	33.47	31.06	7.59	39.62	2.48	34.98	53.9	18.9	365	253	VBW:500 Hz
Hori.	7206.000	AV	31.66	36.74	9.32	39.36	2.48	40.84	53.9	13.0	150	0	VBW:500 Hz, Floor Noise
Hori.	9608.000	AV	31.95	38.14	10.77	39.60	2.48	43.74	53.9	10.1	150	0	VBW:500 Hz, Floor Noise
Hori.	12010.000	AV	37.67	38.65	12.29	38.57	-9.54	40.50	53.9	13.4	132	331	VBW:500 Hz
Vert.	2390.000	PK	47.46	27.77	14.80	39.49	2.48	53.02	73.9	20.8	124	313	-
Vert.	4804.000	PK	46.85	31.06	7.59	39.62	2.48	48.36	73.9	25.5	363	177	-
Vert.	7206.000	PK	46.88	36.74	9.32	39.36	2.48	56.06	73.9	17.8	114	359	-
Vert.	9608.000	PK	45.56	38.14	10.77	39.60	2.48	57.35	73.9	16.5	150	0	-
Vert.	12010.000	PK	48.18	38.65	12.29	38.57	-9.54	51.01	73.9	22.8	120	359	-
Vert.	2390.000	AV	33.41	27.77	14.80	39.49	2.48	38.97	53.9	14.9	124	313	VBW:500 Hz
Vert.	4804.000	AV	32.48	31.06	7.59	39.62	2.48	33.99	53.9	19.9	363	177	VBW:500 Hz
Vert.	7206.000	AV	32.03	36.74	9.32	39.36	2.48	41.21	53.9	12.6	114	359	VBW:500 Hz
Vert.	9608.000	AV	31.76	38.14	10.77	39.60	2.48	43.55	53.9	10.3	150	0	VBW:500 Hz, Floor Noise
Vert.	12010.000	AV	36.15	38.65	12.29	38.57	-9.54	38.98	53.9	14.9	120	359	VBW:500 Hz

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

Distance factor : 1 GHz - 10 GHz: $20\log (3.99 \text{ m} / 3.0 \text{ m}) = 2.48 \text{ dB}$

$$10 \text{ GHz} - 40 \text{ GHz}: 20 \log (1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$$

*These results have sufficient margin without taking account Duty cycle correction factor.

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dBm]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	90.78	27.76	14.81	39.49	2.48	96.34	-	-	Carrier
Hori.	2400.000	PK	38.23	27.76	14.81	39.49	2.48	43.79	76.3	32.5	-
Vert.	2402.000	PK	89.36	27.76	14.81	39.49	2.48	94.92	-	-	Carrier
Vert.	2400.000	PK	38.20	27.76	14.81	39.49	2.48	43.76	74.9	31.1	-

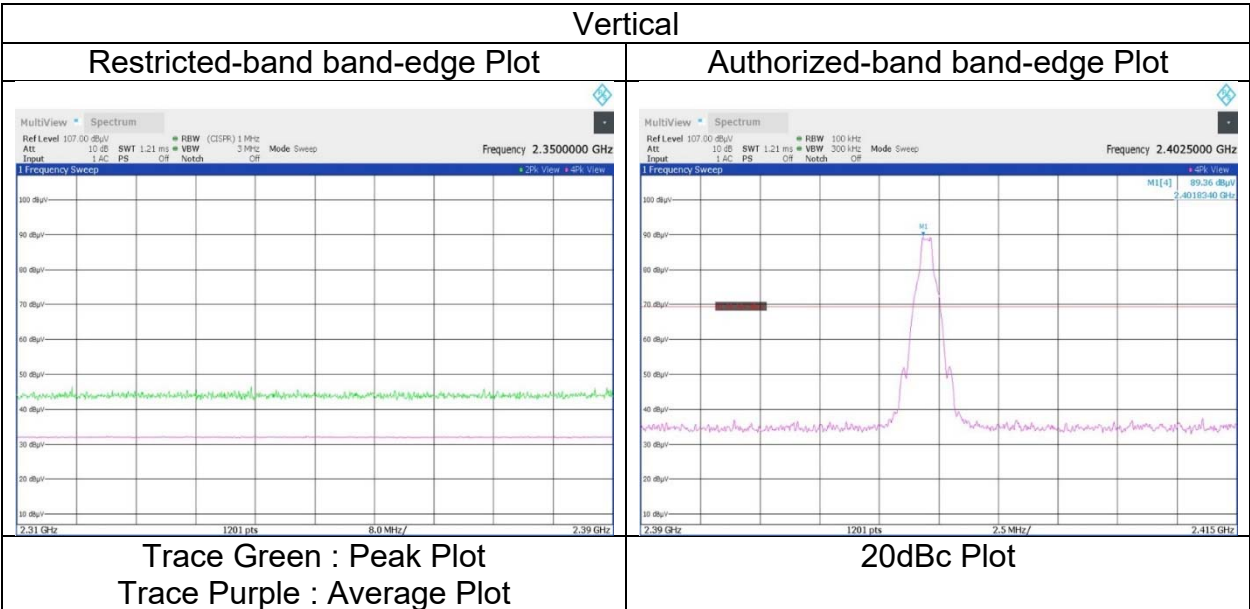
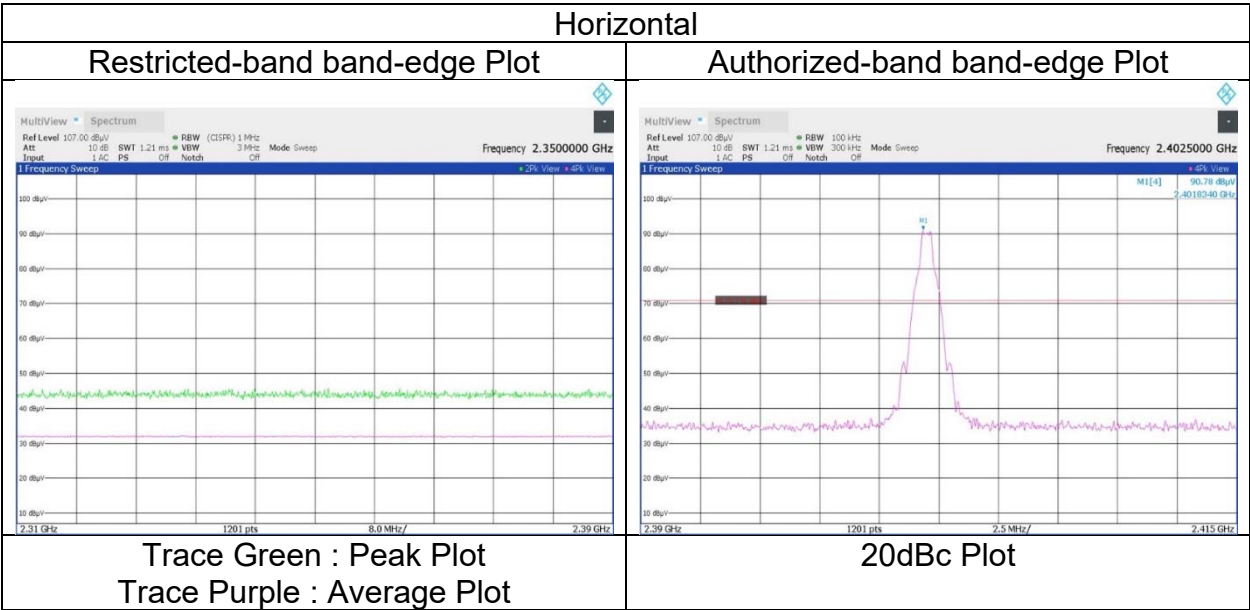
$$\text{Result} = \text{Reading} + \text{Ant.Fac.} + \text{Loss (Cable+(Attenuator or Filter)(below 18 GHz))} - \text{Gain(Amplifier)} + \text{Distance factor}$$

Distance factor: 1 GHz - 10 GHz: $20 \log (3.99 \text{ m} / 3.0 \text{ m}) = 2.48 \text{ dB}$

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	January 8, 2024
Temperature / Humidity	18 deg. C / 30 % RH
Engineer	Shiro Kobayashi
	(1 GHz to 10 GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz, Right



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

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Shonan EMC Lab.
No.1
January 8, 2024
19 deg. C / 29 % RH
Kenichi Adachi
(1 GHz to 10 GHz)
Tx, Hopping Off, DH5 2441 MHz, Right

January 9, 2024
18 deg. C / 27 % RH
Makoto Hosaka
(10 GHz to 18 GHz)

January 9, 2024
18 deg. C / 27 % RH
Takahiro Suzuki
(18 GHz to 26.5 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.	4882.000	PK	46.68	31.09	7.64	39.64	2.48	48.25	73.9	25.6	313	258	-	
Hori.	7323.000	PK	45.52	36.82	9.41	39.36	2.48	54.87	73.9	19.0	150	0	-	
Hori.	9764.000	PK	45.91	38.70	10.87	39.46	2.48	58.50	73.9	15.4	150	0	-	
Hori.	12205.000	PK	46.36	38.44	12.46	38.42	-9.54	49.30	73.9	24.6	131	334	-	
Hori.	4882.000	AV	32.52	31.09	7.64	39.64	2.48	34.09	53.9	19.8	313	258	VBW:500 Hz	
Hori.	7323.000	AV	31.31	36.82	9.41	39.36	2.48	40.66	53.9	13.2	150	0	VBW:500 Hz, Floor Noise	
Hori.	9764.000	AV	31.91	38.70	10.87	39.46	2.48	44.50	53.9	9.4	150	0	VBW:500 Hz, Floor Noise	
Hori.	12205.000	AV	34.06	38.44	12.46	38.42	-9.54	37.00	53.9	16.9	131	334	VBW:500 Hz	
Vert.	4882.000	PK	46.07	31.09	7.64	39.64	2.48	47.64	73.9	26.2	150	0	-	
Vert.	7323.000	PK	45.21	36.82	9.41	39.36	2.48	54.56	73.9	19.3	150	0	-	
Vert.	9764.000	PK	45.80	38.70	10.87	39.46	2.48	58.39	73.9	15.5	150	0	-	
Vert.	12205.000	PK	46.94	38.44	12.46	38.42	-9.54	49.88	73.9	24.0	120	352	-	
Vert.	4882.000	AV	32.17	31.09	7.64	39.64	2.48	33.74	53.9	20.1	150	0	VBW:500 Hz, Floor Noise	
Vert.	7323.000	AV	31.63	36.82	9.41	39.36	2.48	40.98	53.9	12.9	150	0	VBW:500 Hz, Floor Noise	
Vert.	9764.000	AV	31.76	38.70	10.87	39.46	2.48	44.35	53.9	9.5	150	0	VBW:500 Hz, Floor Noise	
Vert.	12205.000	AV	33.05	38.44	12.46	38.42	-9.54	35.99	53.9	17.9	120	352	VBW:500 Hz	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

*These results have sufficient margin without taking account Duty cycle correction factor.

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer

Mode

Shonan EMC Lab.
No.1
January 5, 2024
18 deg. C / 32 % RH
Makoto Hosaka
(30 MHz to 1 GHz)
Tx, Hopping Off, DH5 2480 MHz, Right

January 8, 2024
19 deg. C / 29 % RH
Kenichi Adachi
(1 GHz to 10 GHz)

January 9, 2024
18 deg. C / 27 % RH
Makoto Hosaka
(10 GHz to 18 GHz)

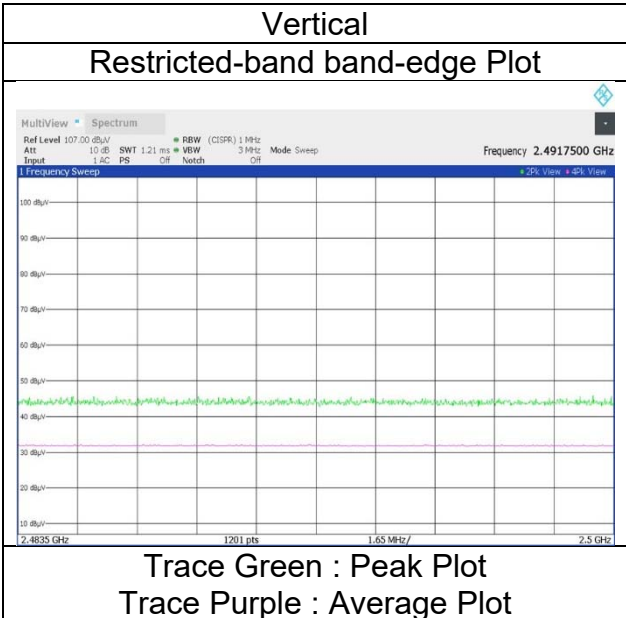
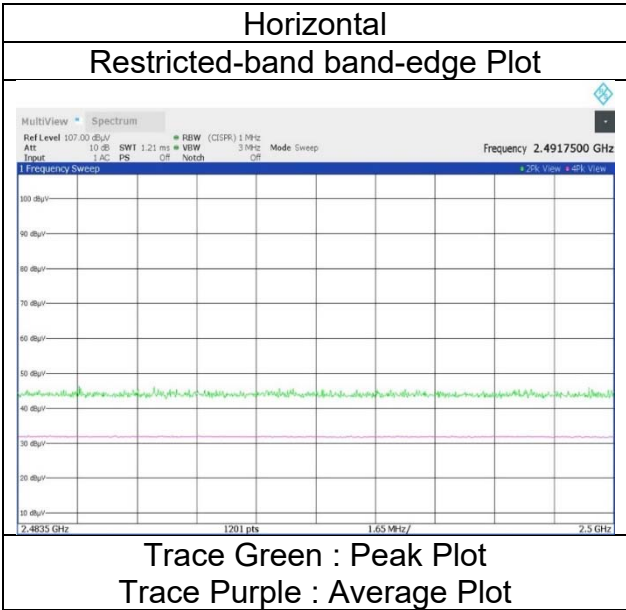
January 9, 2024
18 deg. C / 27 % RH
Takahiro Suzuki
(18 GHz to 26.5 GHz)

(* 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.	31.530	QP	20.70	18.03	7.06	31.83	0.00	13.96	40.0	26.0	100	0	-
Hori.	199.163	QP	20.10	16.68	9.06	31.77	0.00	14.07	43.5	29.4	100	0	-
Hori.	883.197	QP	19.50	22.24	9.91	31.38	0.00	20.27	46.0	25.7	100	0	-
Hori.	952.016	QP	19.10	23.27	10.15	30.97	0.00	21.55	46.0	24.4	100	0	-
Hori.	2483.500	PK	46.18	27.65	14.91	39.53	2.48	51.69	73.9	22.2	112	113	-
Hori.	4960.000	PK	46.82	31.30	7.71	39.66	2.48	48.65	73.9	25.2	165	163	-
Hori.	7440.000	PK	45.21	36.95	9.53	39.36	2.48	54.81	73.9	19.0	100	163	-
Hori.	9920.000	PK	45.41	38.66	10.97	39.31	2.48	58.21	73.9	15.6	150	0	-
Hori.	12400.000	PK	44.96	38.09	12.62	38.28	-9.54	47.85	73.9	26.0	124	335	-
Hori.	2483.500	AV	32.13	27.65	14.91	39.53	2.48	37.64	53.9	16.2	112	113	VBW:500 Hz
Hori.	4960.000	AV	32.41	31.30	7.71	39.66	2.48	34.24	53.9	19.6	165	163	VBW:500 Hz
Hori.	7440.000	AV	31.36	36.95	9.53	39.36	2.48	40.96	53.9	12.9	100	163	VBW:500 Hz, Floor Noize
Hori.	9920.000	AV	31.30	38.66	10.97	39.31	2.48	44.10	53.9	9.8	150	0	VBW:500 Hz, Floor Noize
Hori.	12400.000	AV	31.77	38.09	12.62	38.28	-9.54	34.66	53.9	19.2	124	335	VBW:500 Hz
Vert.	31.871	QP	20.90	17.91	7.06	31.83	0.00	14.04	40.0	25.9	100	0	-
Vert.	187.094	QP	20.20	16.33	8.99	31.77	0.00	13.75	43.5	29.7	100	0	-
Vert.	892.796	QP	19.40	22.49	9.96	31.33	0.00	20.52	46.0	25.4	100	0	-
Vert.	960.000	QP	19.50	23.40	10.21	30.88	0.00	22.23	46.0	23.7	100	0	-
Vert.	2483.500	PK	46.14	27.65	14.91	39.53	2.48	51.65	73.9	22.2	127	181	-
Vert.	4960.000	PK	46.01	31.30	7.71	39.66	2.48	47.84	73.9	26.0	100	158	-
Vert.	7440.000	PK	45.22	36.95	9.53	39.36	2.48	54.82	73.9	19.0	116	347	-
Vert.	9920.000	PK	45.75	38.66	10.97	39.31	2.48	58.55	73.9	15.3	150	0	-
Vert.	12400.000	PK	44.77	38.09	12.62	38.28	-9.54	47.66	73.9	26.2	131	13	-
Vert.	2483.500	AV	32.23	27.65	14.91	39.53	2.48	37.74	53.9	16.1	127	181	VBW:500 Hz
Vert.	4960.000	AV	32.31	31.30	7.71	39.66	2.48	34.14	53.9	19.7	100	158	VBW:500 Hz
Vert.	7440.000	AV	31.82	36.95	9.53	39.36	2.48	41.42	53.9	12.4	116	347	VBW:500 Hz
Vert.	9920.000	AV	31.30	38.66	10.97	39.31	2.48	44.10	53.9	9.8	150	0	VBW:500 Hz, Floor Noize
Vert.	12400.000	AV	31.68	38.09	12.62	38.28	-9.54	34.57	53.9	19.3	131	13	VBW:500 Hz

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
*These results have sufficient margin without taking account Duty cycle correction factor.

Radiated Spurious Emission
(Reference Plot for bandto edge)

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	January 8, 2024
Temperature / Humidity	19 deg. C / 29 % RH
Engineer	Kenichi Adachi
	(1 GHz to 10 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz, Right



* 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 No.1
Date January 8, 2024 January 9, 2024 January 9, 2024
Temperature / Humidity 19 deg. C / 29 % RH 18 deg. C / 27 % RH 18 deg. C / 27 % RH
Engineer Kenichi Adachi Makoto Hosaka Takahiro Suzuki
(1 GHz to 10 GHz) (10 GHz to 18 GHz) (18 GHz to 26.5 GHz)
Mode Tx, Hopping Off, 3DH5 2402 MHz, Right

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	46.59	27.77	14.80	39.49	2.48	52.15	73.9	21.7	149	129	-
Hori.	4804.000	PK	45.57	31.06	7.59	39.62	2.48	47.08	73.9	26.8	150	0	-
Hori.	7206.000	PK	45.43	36.74	9.32	39.36	2.48	54.61	73.9	19.2	150	0	-
Hori.	9608.000	PK	45.54	38.14	10.77	39.60	2.48	57.33	73.9	16.5	150	0	-
Hori.	12010.000	PK	46.03	38.65	12.29	38.57	-9.54	48.86	73.9	25.0	127	330	-
Hori.	2390.000	AV	32.04	27.77	14.80	39.49	2.48	37.60	53.9	16.3	149	129	VBW:500 Hz
Hori.	4804.000	AV	31.75	31.06	7.59	39.62	2.48	33.26	53.9	20.6	150	0	VBW:500 Hz, Floor Noise
Hori.	7206.000	AV	31.56	36.74	9.32	39.36	2.48	40.74	53.9	13.1	150	0	VBW:500 Hz, Floor Noise
Hori.	9608.000	AV	31.64	38.14	10.77	39.60	2.48	43.43	53.9	10.4	150	0	VBW:500 Hz, Floor Noise
Hori.	12010.000	AV	31.39	38.65	12.29	38.57	-9.54	34.22	53.9	19.6	127	330	VBW:500 Hz
Vert.	2390.000	PK	46.12	27.77	14.80	39.49	2.48	51.68	73.9	22.2	139	113	-
Vert.	4804.000	PK	46.05	31.06	7.59	39.62	2.48	47.56	73.9	26.3	150	0	-
Vert.	7206.000	PK	45.87	36.74	9.32	39.36	2.48	55.05	73.9	18.8	150	0	-
Vert.	9608.000	PK	45.50	38.14	10.77	39.60	2.48	57.29	73.9	16.6	150	0	-
Vert.	12010.000	PK	45.32	38.65	12.29	38.57	-9.54	48.15	73.9	25.7	114	358	-
Vert.	2390.000	AV	32.05	27.77	14.80	39.49	2.48	37.61	53.9	16.2	139	113	VBW:500 Hz
Vert.	4804.000	AV	31.81	31.06	7.59	39.62	2.48	33.32	53.9	20.5	150	0	VBW:500 Hz, Floor Noise
Vert.	7206.000	AV	31.52	36.74	9.32	39.36	2.48	40.70	53.9	13.2	150	0	VBW:500 Hz, Floor Noise
Vert.	9608.000	AV	31.68	38.14	10.77	39.60	2.48	43.47	53.9	10.4	150	0	VBW:500 Hz, Floor Noise
Vert.	12010.000	AV	31.10	38.65	12.29	38.57	-9.54	33.93	53.9	19.9	114	358	VBW:500 Hz

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

Distance factor : 1 GHz - 10 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

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

*These results have sufficient margin without taking account Duty cycle correction factor.

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	90.06	27.76	14.81	39.49	2.48	95.62	-	-	Carrier
Hori.	2400.000	PK	38.09	27.76	14.81	39.49	2.48	43.65	75.6	31.9	-
Vert.	2402.000	PK	89.79	27.76	14.81	39.49	2.48	95.35	-	-	Carrier
Vert.	2400.000	PK	37.77	27.76	14.81	39.49	2.48	43.33	75.3	31.9	-

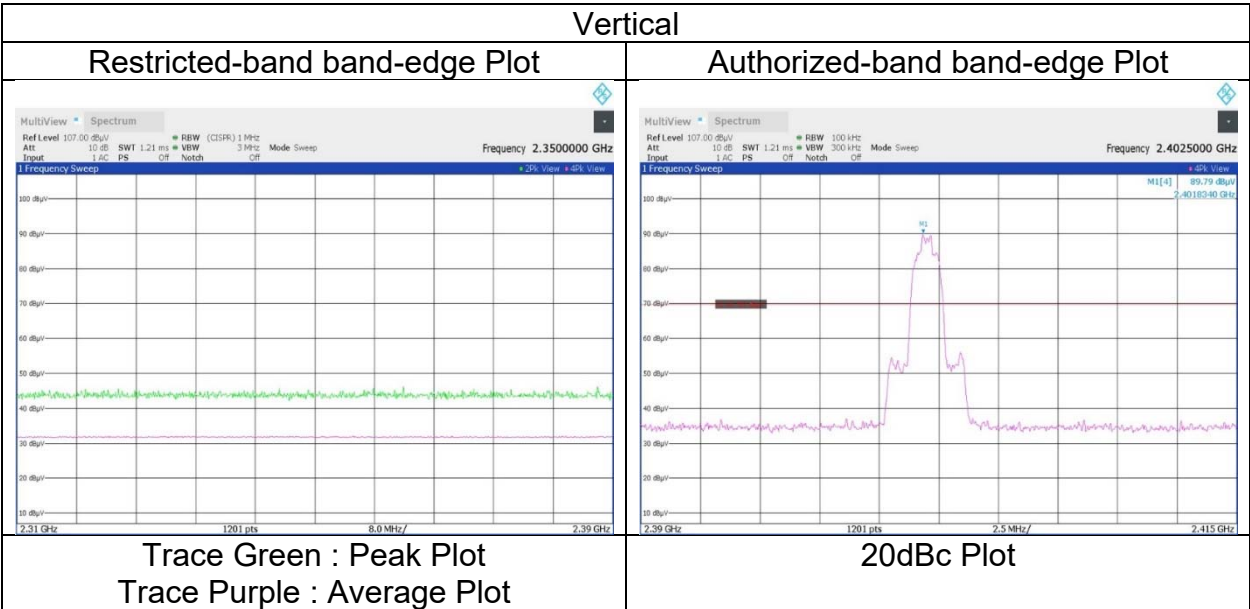
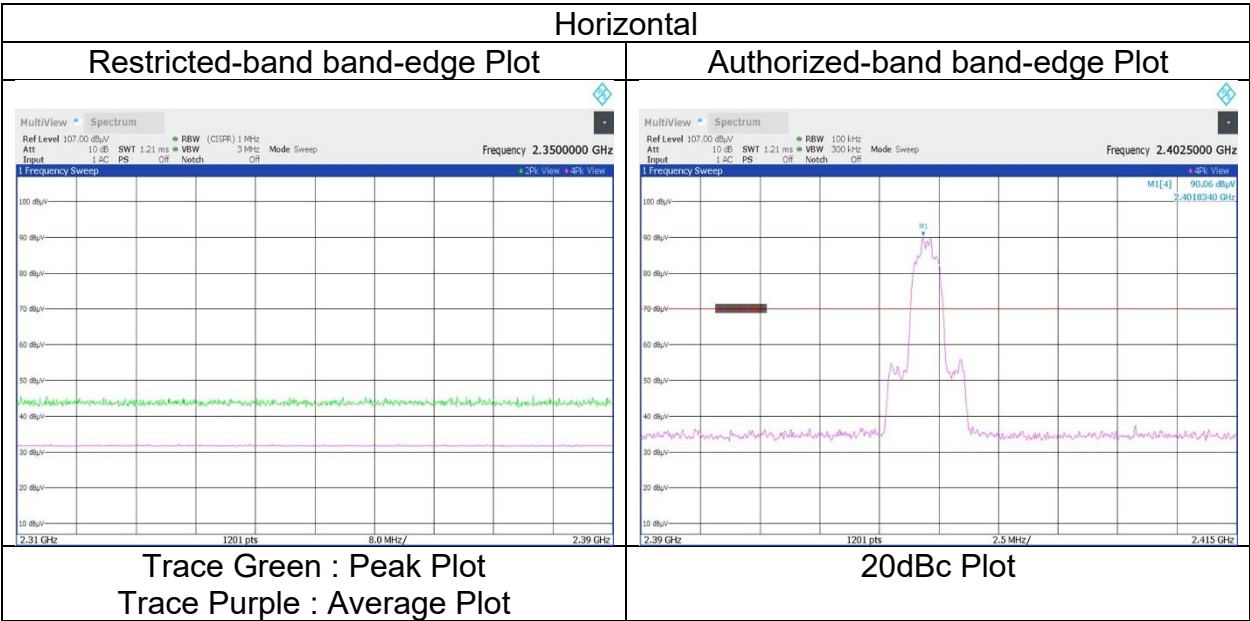
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	January 8, 2024
Temperature / Humidity	19 deg. C / 29 % RH
Engineer	Kenichi Adachi
	(1 GHz to 10 GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz, Right



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

Radiated Spurious Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Shonan EMC Lab.
No.1
January 8, 2024
19 deg. C / 29 % RH
Kenichi Adachi
(1 GHz to 10 GHz)
Tx, Hopping Off, 3DH5 2441 MHz, Right

January 9, 2024
18 deg. C / 27 % RH
Makoto Hosaka
(10 GHz to 18 GHz)

January 9, 2024
18 deg. C / 27 % RH
Takahiro Suzuki
(18 GHz to 26.5 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.	4882.000	PK	45.51	31.09	7.64	39.64	2.48	47.08	73.9	26.8	150	0	-	
Hori.	7323.000	PK	45.38	36.82	9.41	39.36	2.48	54.73	73.9	19.1	150	0	-	
Hori.	9764.000	PK	45.59	38.70	10.87	39.46	2.48	58.18	73.9	15.7	150	0	-	
Hori.	12205.000	PK	45.75	38.44	12.46	38.42	-9.54	48.69	73.9	25.2	120	345	-	
Hori.	4882.000	AV	31.86	31.09	7.64	39.64	2.48	33.43	53.9	20.4	150	0	VBW:500 Hz, Floor Noise	
Hori.	7323.000	AV	31.21	36.82	9.41	39.36	2.48	40.56	53.9	13.3	150	0	VBW:500 Hz, Floor Noise	
Hori.	9764.000	AV	31.49	38.70	10.87	39.46	2.48	44.08	53.9	9.8	150	0	VBW:500 Hz, Floor Noise	
Hori.	12205.000	AV	32.18	38.44	12.46	38.42	-9.54	35.12	53.9	18.7	120	345	VBW:500 Hz	
Vert.	4882.000	PK	46.27	31.09	7.64	39.64	2.48	47.84	73.9	26.0	150	0	-	
Vert.	7323.000	PK	45.28	36.82	9.41	39.36	2.48	54.63	73.9	19.2	150	0	-	
Vert.	9764.000	PK	45.87	38.70	10.87	39.46	2.48	58.46	73.9	15.4	150	0	-	
Vert.	12205.000	PK	45.19	38.44	12.46	38.42	-9.54	48.13	73.9	25.7	115	16	-	
Vert.	4882.000	AV	31.86	31.09	7.64	39.64	2.48	33.43	53.9	20.4	150	0	VBW:500 Hz, Floor Noise	
Vert.	7323.000	AV	31.21	36.82	9.41	39.36	2.48	40.56	53.9	13.3	150	0	VBW:500 Hz, Floor Noise	
Vert.	9764.000	AV	31.49	38.70	10.87	39.46	2.48	44.08	53.9	9.8	150	0	VBW:500 Hz, Floor Noise	
Vert.	12205.000	AV	31.96	38.44	12.46	38.42	-9.54	34.90	53.9	19.0	115	16	VBW:500 Hz	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 10 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

*These results have sufficient margin without taking account Duty cycle correction factor.

Radiated Spurious Emission

Test place Shonan EMC Lab.
Semi Anechoic Chamber No.1
Date January 8, 2024 January 9, 2024 January 9, 2024
Temperature / Humidity 19 deg. C / 29 % RH 18 deg. C / 27 % RH 18 deg. C / 27 % RH
Engineer Kenichi Adachi Makoto Hosaka Takahiro Suzuki
(1 GHz to 10 GHz) (10 GHz to 18 GHz) (18 GHz to 26.5 GHz)
Mode Tx, Hopping Off, 3DH5 2480 MHz, Right

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	46.33	27.65	14.91	39.53	2.48	51.84	73.9	22.0	112	134	-
Hori.	4960.000	PK	45.99	31.30	7.71	39.66	2.48	47.82	73.9	26.0	150	0	-
Hori.	7440.000	PK	45.35	36.95	9.53	39.36	2.48	54.95	73.9	18.9	150	0	-
Hori.	9920.000	PK	45.03	38.66	10.97	39.31	2.48	57.83	73.9	16.0	150	0	-
Hori.	12400.000	PK	44.85	38.09	12.62	38.28	-9.54	47.74	73.9	26.1	115	353	-
Hori.	2483.500	AV	32.19	27.65	14.91	39.53	2.48	37.70	53.9	16.2	112	134	VBW:500 Hz
Hori.	4960.000	AV	31.99	31.30	7.71	39.66	2.48	33.82	53.9	20.0	150	0	VBW:500 Hz, Floor Noize
Hori.	7440.000	AV	31.39	36.95	9.53	39.36	2.48	40.99	53.9	12.9	150	0	VBW:500 Hz, Floor Noize
Hori.	9920.000	AV	31.04	38.66	10.97	39.31	2.48	43.84	53.9	10.0	150	0	VBW:500 Hz, Floor Noize
Hori.	12400.000	AV	30.13	38.09	12.62	38.28	-9.54	33.02	53.9	20.8	115	353	VBW:500 Hz
Vert.	2483.500	PK	46.49	27.65	14.91	39.53	2.48	52.00	73.9	21.9	124	184	-
Vert.	4960.000	PK	45.96	31.30	7.71	39.66	2.48	47.79	73.9	26.1	150	0	-
Vert.	7440.000	PK	45.71	36.95	9.53	39.36	2.48	55.31	73.9	18.5	150	0	-
Vert.	9920.000	PK	45.06	38.66	10.97	39.31	2.48	57.86	73.9	16.0	150	0	-
Vert.	12400.000	PK	44.84	38.09	12.62	38.28	-9.54	47.73	73.9	26.1	111	2	-
Vert.	2483.500	AV	32.23	27.65	14.91	39.53	2.48	37.74	53.9	16.1	124	184	VBW:500 Hz
Vert.	4960.000	AV	32.01	31.30	7.71	39.66	2.48	33.84	53.9	20.0	150	0	VBW:500 Hz, Floor Noize
Vert.	7440.000	AV	31.50	36.95	9.53	39.36	2.48	41.10	53.9	12.8	150	0	VBW:500 Hz, Floor Noize
Vert.	9920.000	AV	31.13	38.66	10.97	39.31	2.48	43.93	53.9	9.9	150	0	VBW:500 Hz, Floor Noize
Vert.	12400.000	AV	30.06	38.09	12.62	38.28	-9.54	32.95	53.9	20.9	111	2	VBW:500 Hz

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

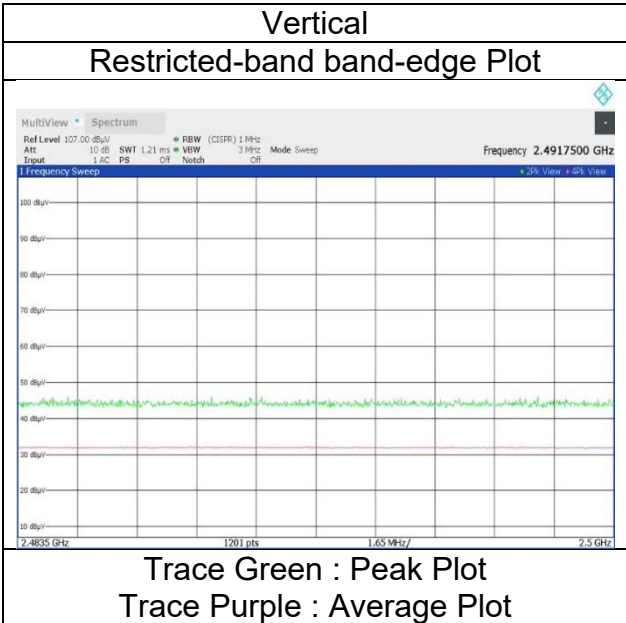
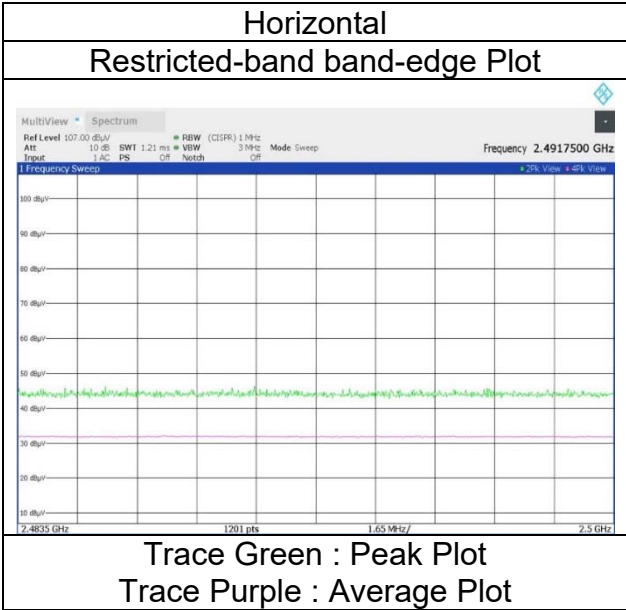
Distance factor : 1 GHz - 10 GHz: 20log (3.99 m / 3.0 m) = 2.48 dB

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

*These results have sufficient margin without taking account Duty cycle correction factor.

**Radiated Spurious Emission
(Reference Plot for band-edge)**

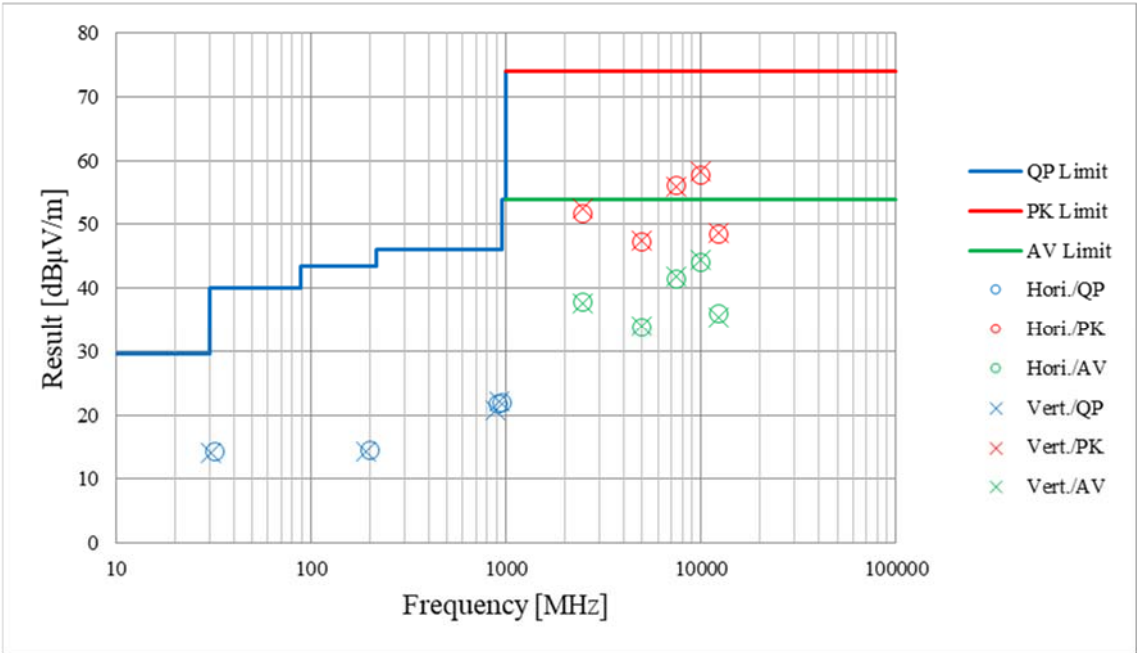
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	January 8, 2024
Temperature / Humidity	19 deg. C / 29 % RH
Engineer	Kenichi Adachi
	(1 GHz to 10 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz, Right



* 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 Peak Output Power)

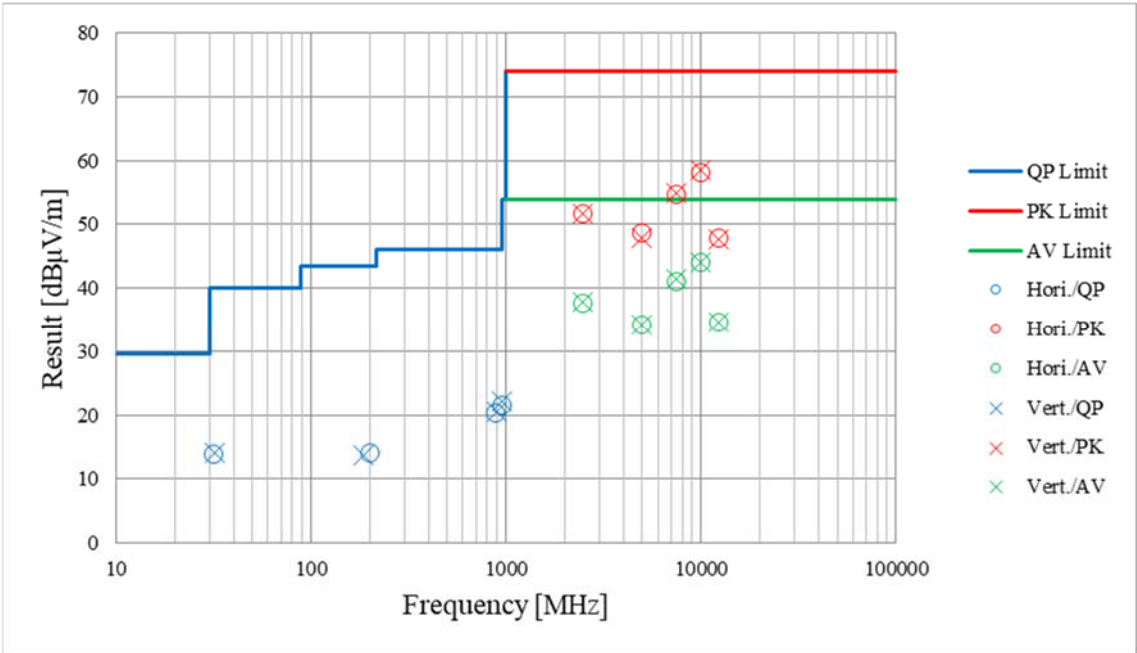
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	No.1			
Date	January 5, 2024	January 8, 2024	January 9, 2024	January 9, 2024
Temperature / Humidity	18 deg. C / 32 % RH	19 deg. C / 29 % RH	18 deg. C / 27 % RH	18 deg. C / 27 % RH
Engineer	Makoto Hosaka	Kenichi Adachi	Makoto Hosaka	Takahiro Suzuki
	(30 MHz to 1 GHz)	(1 GHz to 10 GHz)	(10 GHz to 18 GHz)	(18 GHz to 26.5 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz, Left			



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

Radiated Spurious Emission
(Plot data, Worst case mode for Maximum Peak Output Power)

Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	No.1			
Date	January 5, 2024	January 8, 2024	January 9, 2024	January 9, 2024
Temperature / Humidity	18 deg. C / 32 % RH	19 deg. C / 29 % RH	18 deg. C / 27 % RH	18 deg. C / 27 % RH
Engineer	Makoto Hosaka (30 MHz to 1 GHz)	Kenichi Adachi (1 GHz to 10 GHz)	Makoto Hosaka (10 GHz to 18 GHz)	Takahiro Suzuki (18 GHz to 26.5 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz, Right			

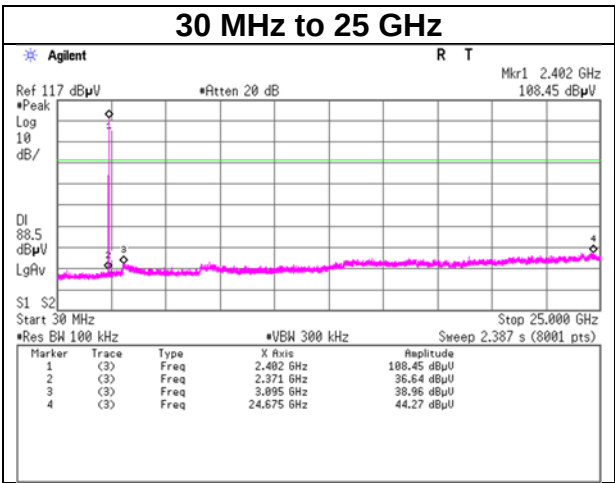
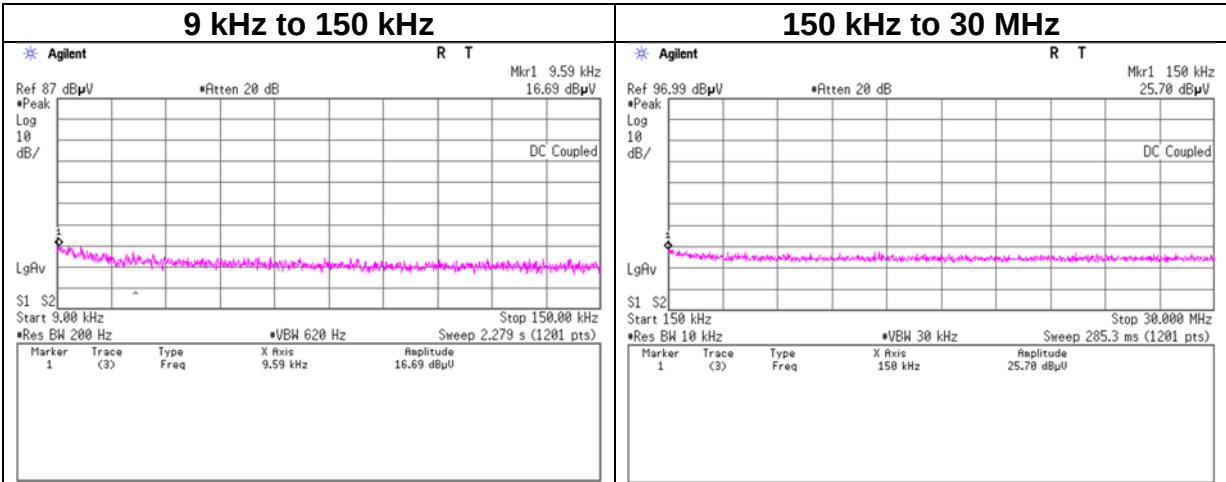


*These plots data contain sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Test place Shonan EMC Lab. No.5 Shielded Room
Date December 20, 2023
Temperature / Humidity 22 deg. C / 36 % RH
Engineer Miku Ikudome
Mode Tx, Hopping Off, DH5

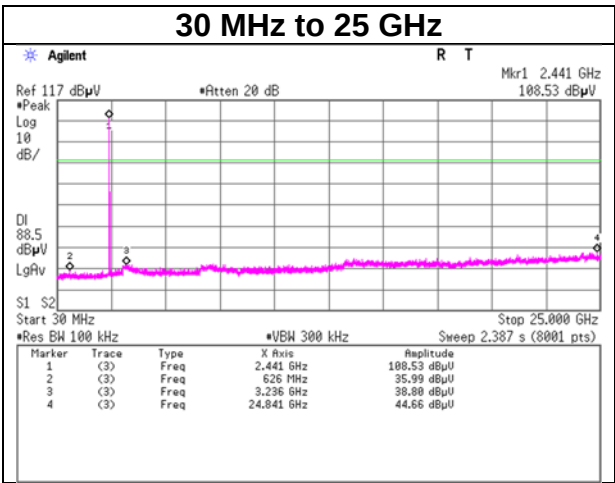
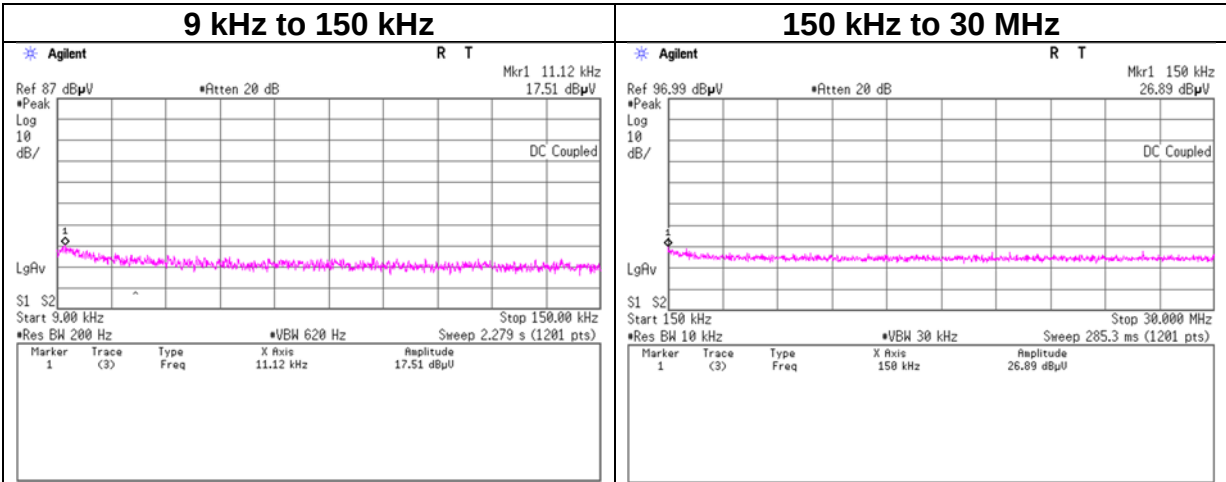
2402 MHz



Conducted Spurious Emission

Test place Shonan EMC Lab. No.5 Shielded Room
Date December 20, 2023
Temperature / Humidity 22 deg. C / 36 % RH
Engineer Miku Ikudome
Mode Tx, Hopping Off, DH5

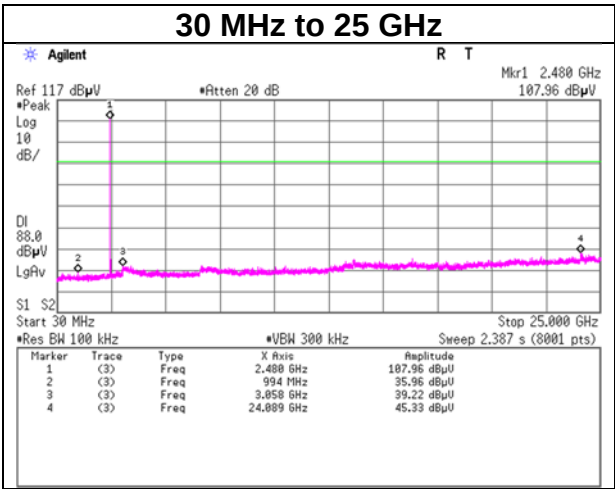
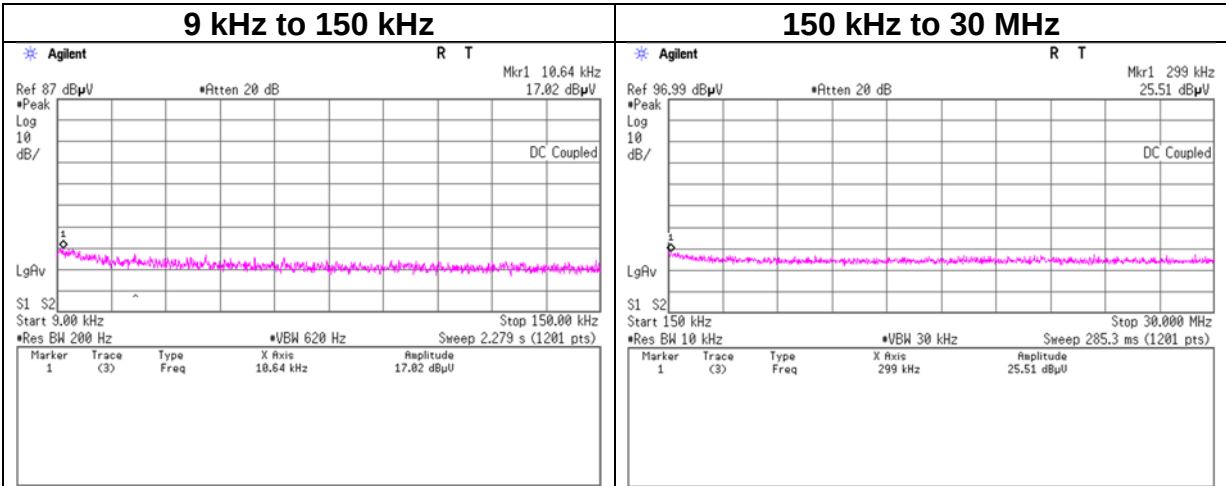
2441 MHz



Conducted Spurious Emission

Test place Shonan EMC Lab. No.5 Shielded Room
Date December 20, 2023
Temperature / Humidity 22 deg. C / 36 % RH
Engineer Miku Ikudome
Mode Tx, Hopping Off, DH5

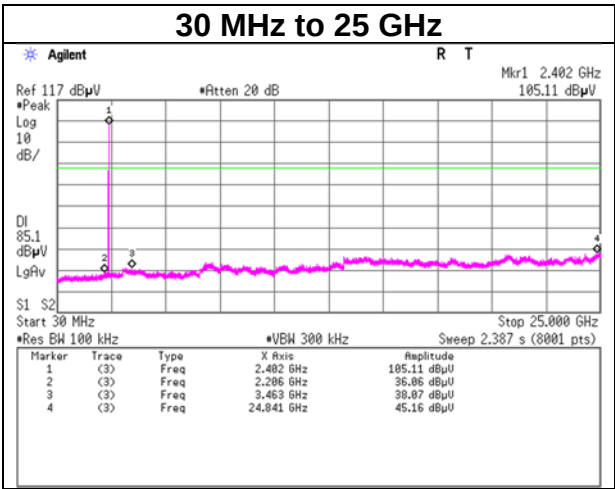
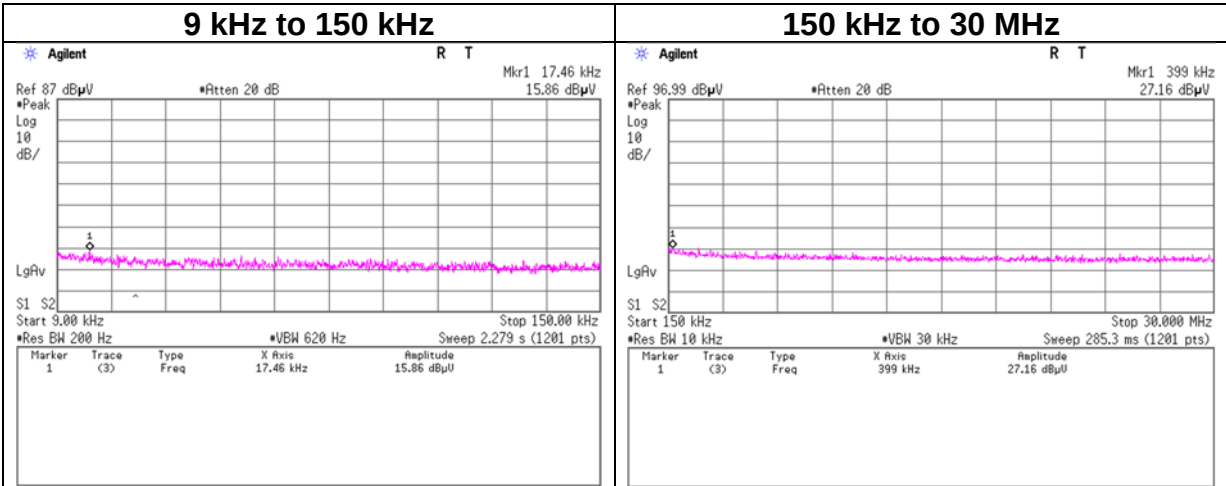
2480 MHz



Conducted Spurious Emission

Test place Shonan EMC Lab. No.5 Shielded Room
Date December 20, 2023
Temperature / Humidity 22 deg. C / 36 % RH
Engineer Miku Ikudome
Mode Tx, Hopping Off, 3DH5

2402 MHz



Conducted Spurious Emission

Test place

Shonan EMC Lab. No.5 Shielded Room

Date

December 20, 2023

Temperature / Humidity

22 deg. C / 36 % RH

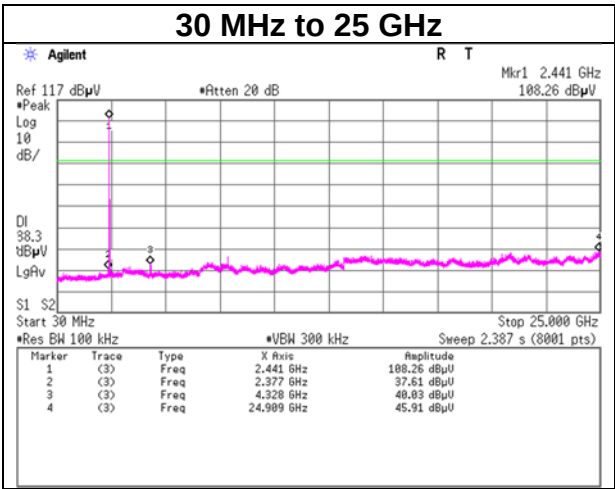
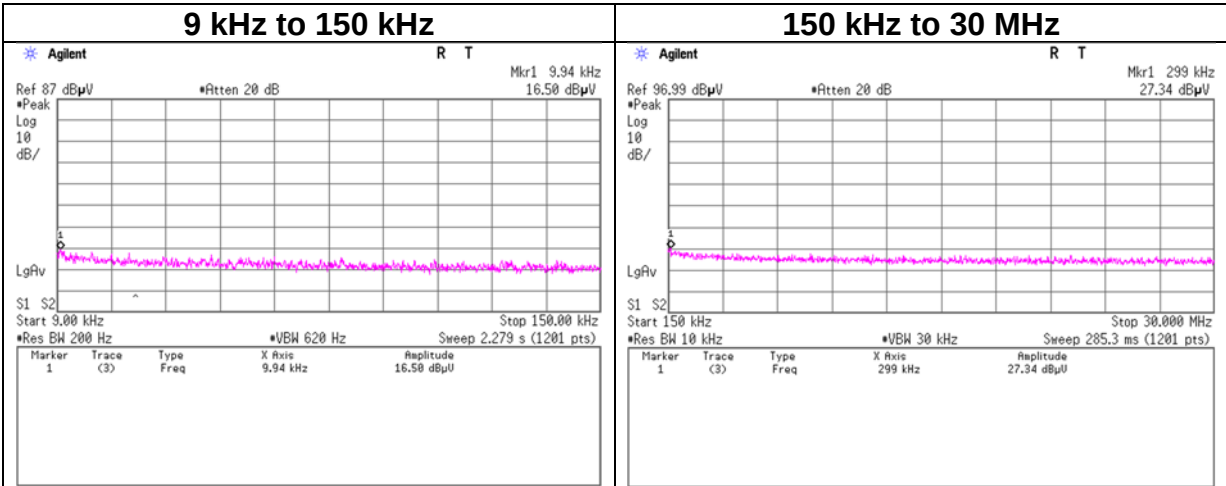
Engineer

Miku Ikudome

Mode

Tx, Hopping Off, 3DH5

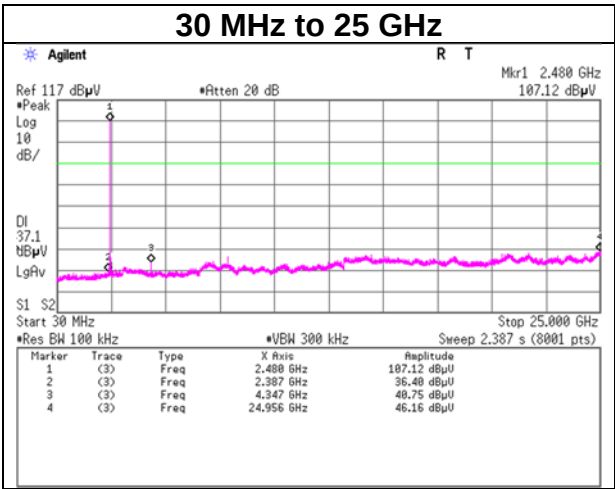
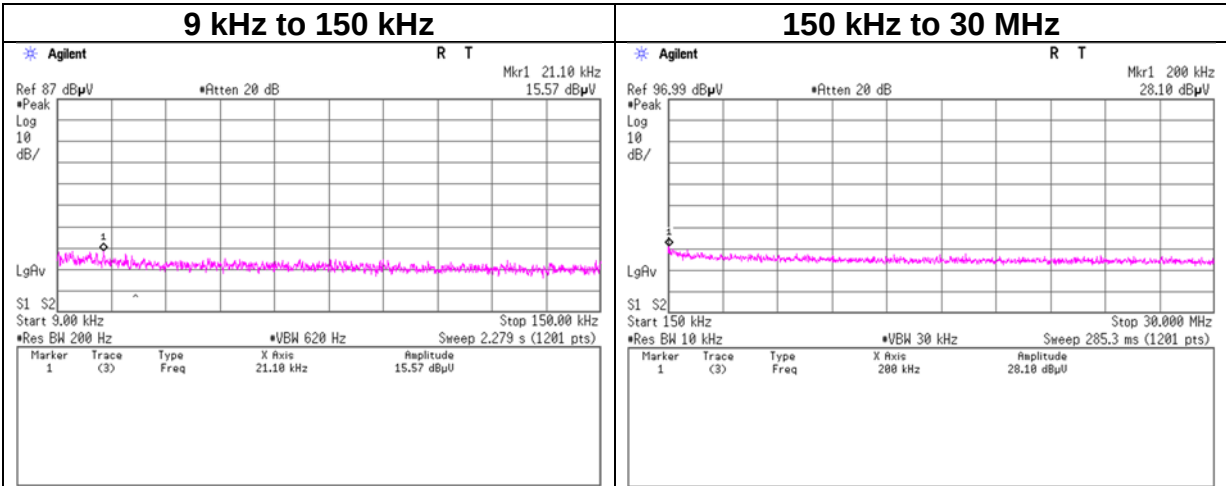
2441 MHz



Conducted Spurious Emission

Test place Shonan EMC Lab. No.5 Shielded Room
Date December 20, 2023
Temperature / Humidity 22 deg. C / 36 % RH
Engineer Miku Ikudome
Mode Tx, Hopping Off, 3DH5

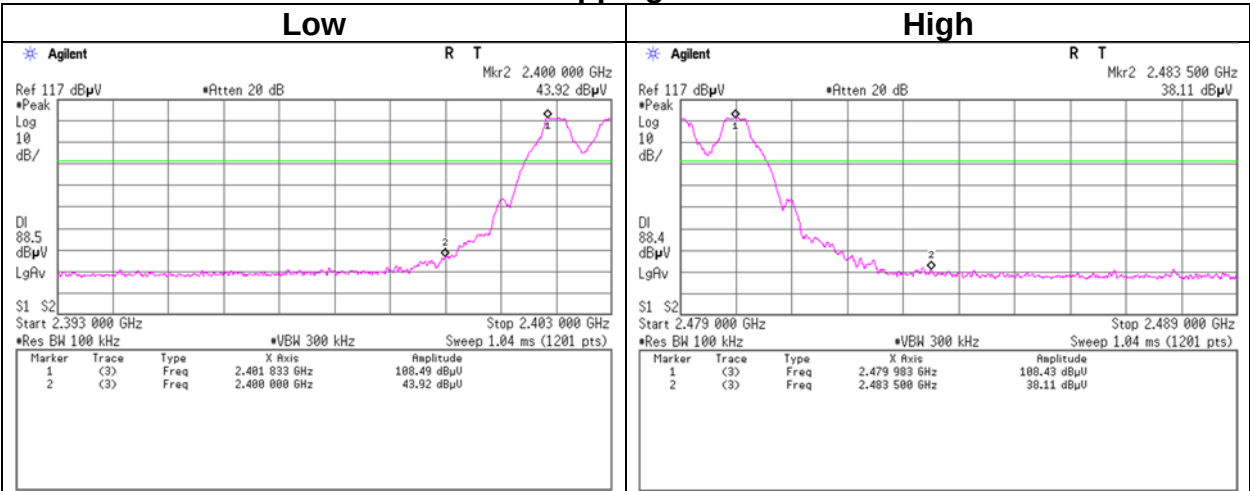
2480 MHz



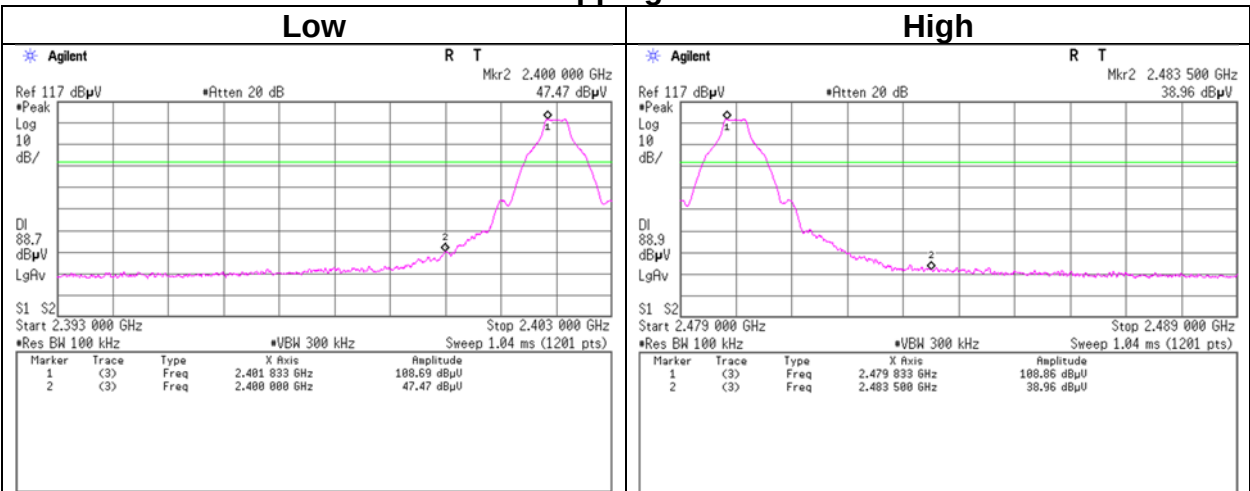
Conducted Emission Band Edge compliance

Test place Shonan EMC Lab. No.5 Shielded Room
Date December 20, 2023
Temperature / Humidity 22 deg. C / 36 % RH
Engineer Miku Ikudome
Mode Tx DH5

Hopping On



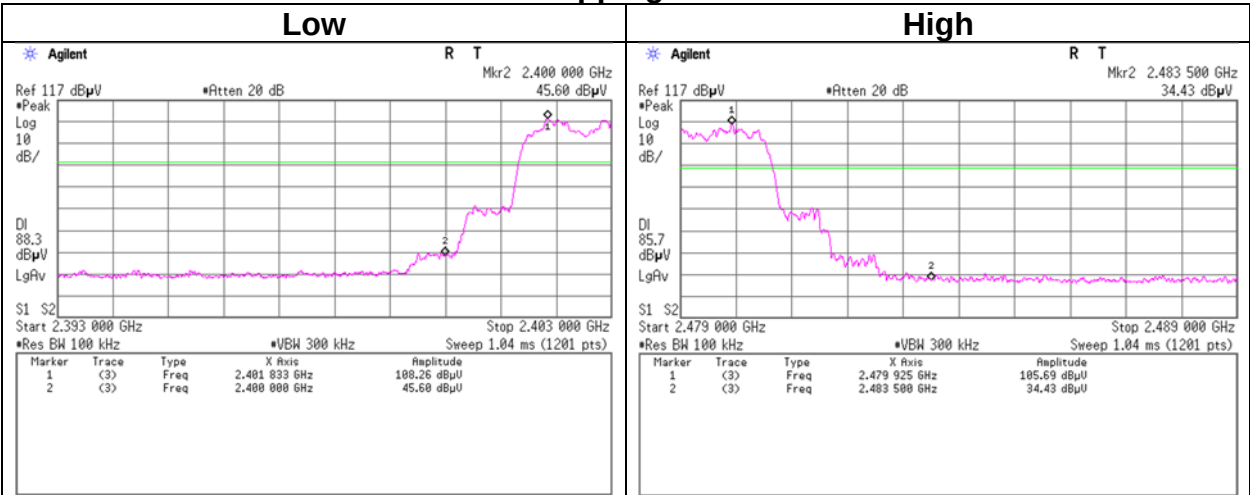
Hopping Off



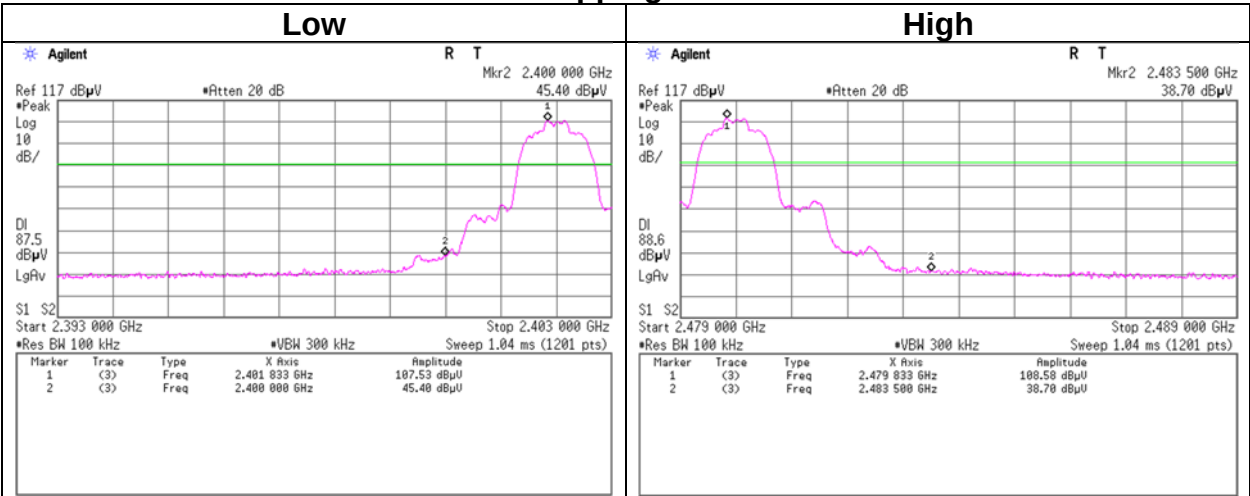
Conducted Emission Band Edge compliance

Test place Shonan EMC Lab. No.5 Shielded Room
Date December 20, 2023
Temperature / Humidity 22 deg. C / 36 % RH
Engineer Miku Ikudome
Mode Tx 3DH5

Hopping On



Hopping Off



APPENDIX 2: Test Instruments

Test Equipment (1/2)

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	145175	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	2023/12/08	12
AT	145800	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY48250106	2023/03/01	12
AT	146212	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997828	2023/09/25	12
AT	146247	Power Meter	Keysight Technologies Inc	8990B	MY51000272	2023/05/29	12
AT	146310	Power sensor	Keysight Technologies Inc	N1923A	MY5326009	2023/05/29	12
AT	154591	Attenuator	Weinschel Corp.	54A-10	81595	2023/04/12	12
AT	191845	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	-	2023/08/07	12
AT	235604	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY45300743	2023/05/18	12
RE	144892	Attenuator	Keysight Technologies Inc	8490D 010	6036	2023/10/12	12
RE	144899	Attenuator	Inmet	18N-6dB	-	2023/12/08	12
RE	144959	Attenuator	JFW	50HF-003N	-	2023/08/22	12
RE	144967	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	2023/04/18	12
RE	144968	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	2023/04/18	12
RE	145003	Pre Amplifier	SONOMA	310N	290211	2023/02/09	12
RE	145008	Pre Amplifier	Toyo Corporation	HAP18-26W	18	2023/09/20	12
RE	145127	Pre Amplifier	Toyo Corporation	TPA0118-36	2072554	2023/05/11	12
RE	145161	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	BBA9106	91032664	2023/04/12	12
RE	145176	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	2023/08/23	12
RE	145301	Highpass Filter	Micro-Tronics	HPM50111	51	2023/10/13	12
RE	145383	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	9120D-725	2023/03/01	12
RE	145513	Horn Antenna	ETS-Lindgren	3160-09	00094867	2023/06/12	12
RE	145561	Semi-Anechoic Chamber	TDK	SAEC-01(SVSWR)	1	2023/05/16	12
RE	145597	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	2023/04/04	12
RE	145792	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997812	2023/09/25	12
RE	150463	Test Receiver	Rohde & Schwarz	ESW44	101581	2023/08/25	12
RE	170932	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3(RE,CE,ME,PE)	-	-	-
RE	179540	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	802815/2	2023/03/03	12
RE	191837	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	-	2023/08/03	12
RE	194683	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA 9120 C	694	2023/03/01	12

Test Equipment (2/2)

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	196985	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	803650/2	2023/03/02	12
RE	200008	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	575616/4	2023/06/06	12
RE	207279	Tape Measure	ASKUL	-	-	-	-
RE	236416	Logperiodic Antenna	Schwarzbeck Mess-Elektronik OHG	VULP 9118 B	00974	2023/07/11	12
RE	239643	Coaxial Cable	Junkosha	MWX221-01000NFSNMS/B	2306S021	2023/08/22	12
RE	243212	Coaxial Cable	Hayashi-Repic co., Ltd.	SMS13-13A26-NMS13-9.0m	49306-01-01	2023/12/20	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

RE: Radiated Emission