

EMI TEST REPORT

Test Report No. 14913531H-A-R1

Customer	Panasonic Automotive Systems Co., Ltd.
Description of EUT	Car Navigation
Model Number of EUT	AT2403
FCC ID	ACJ932AT2403
Test Regulation	FCC Part 15 Subpart B
Test Result	Complied
Issue Date	May 8, 2025
Remarks	-

Representative test engineerYuta Moriya
Engineer**Approved by**Takumi Shimada
Engineer

CERTIFICATE 5107.02

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

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

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REVISION HISTORY

Original Test Report No. 14913531H-A

This report is a revised version of 14913531H-A. 14913531H-A is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14913531H-A	December 20, 2024	-
1	14913531H-A-R1	May 8, 2025	<u>4.2 Configuration and Peripherals</u> - Exchanged cable information of Cable No.9 and No.10 in Table of List of Cables Used (Page 11)

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation	Hori.	Horizontal
AAN	Asymmetric Artificial Network	ICES	Interference-Causing Equipment Standard
AC	Alternating Current	I/O	Input/Output
AE	Auxiliary equipment	IEC	International Electrotechnical Commission
AM	Amplitude Modulation	IEEE	Institute of Electrical and Electronics Engineers
AMN	Artificial Mains Network	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	ISN	Impedance Stabilization Network
AP	Access Point	ISO	International Organization for Standardization
ASK	Amplitude Shift Keying	JAB	Japan Accreditation Board
Atten., ATT	Attenuator	LAN	Local Area Network
AV	Average	LCL	Longitudinal Conversion Loss
BPSK	Binary Phase-Shift Keying	LIMS	Laboratory Information Management System
BR	Bluetooth Basic Rate	LISN	Line Impedance Stabilization Network
BT	Bluetooth	MRA	Mutual Recognition Arrangement
BT LE	Bluetooth Low Energy	N/A	Not Applicable
BW	BandWidth	NIST	National Institute of Standards and Technology
C.F	Correction Factor	NS	No signal detect.
Cal Int	Calibration Interval	NSA	Normalized Site Attenuation
CAV	CISPR AV	OBW	Occupied BandWidth
CCK	Complementary Code Keying	OFDM	Orthogonal Frequency Division Multiplexing
CDN	Coupling Decoupling Network	PER	Packet Error Rate
Ch., CH	Channel	PK	Peak
CISPR	Comite International Special des Perturbations Radioelectriques	P _{LT}	long-term flicker severity
Corr.	Correction	POHC(A)	Partial Odd Harmonic Current
CPE	Customer premise equipment	Pol., Pola.	Polarization
CW	Continuous Wave	PR-ASK	Phase Reversal ASK
DBPSK	Differential BPSK	P _{ST}	short-term flicker severity
DC	Direct Current	QAM	Quadrature Amplitude Modulation
DET	Detector	QP	Quasi-Peak
D-factor, D.fac.	Distance factor	QPSK	Quadrature Phase Shift Keying
Dmax	maximum absolute voltage change during an observation period	r.m.s., RMS	Root Mean Square
DQPSK	Differential QPSK	RBW	Resolution BandWidth
DSSS	Direct Sequence Spread Spectrum	RE	Radio Equipment
DUT	Device Under Test	REV	Reverse
EDR	Enhanced Data Rate	RF	Radio Frequency
e.i.r.p., EIRP	Equivalent Isotropically Radiated Power	RFID	Radio Frequency Identifier
EM clamp	Electromagnetic clamp	RNSS	Radio Navigation Satellite Service
EMC	ElectroMagnetic Compatibility	RSS	Radio Standards Specifications
EMI	ElectroMagnetic Interference	Rx	Receiving
EMS	ElectroMagnetic Susceptibility	S.fac.	Site factor
EN	European Norm	SINAD	Ratio of (Signal + Noise + Distortion) to (Noise + Distortion)
e.r.p., ERP	Effective Radiated Power	S/N	Signal to Noise ratio
ETSI	European Telecommunications Standards Institute	SA, S/A	Spectrum Analyzer
EU	European Union	SABS	South African Bureau of Standards
EUT	Equipment Under Test	SANS	South African National Standards
Fac.	Factor	SG	Signal Generator
FCC	Federal Communications Commission	SVSWR	Site-Voltage Standing Wave Ratio
FHSS	Frequency Hopping Spread Spectrum	THC(A)	Total Harmonic Current
FM	Frequency Modulation	THD(%)	Total Harmonic Distortion
Freq.	Frequency	TR, T/R	Test Receiver
FSK	Frequency Shift Keying	Tx	Transmitting
Fund	Fundamental	UFA	Uniform field area
FWD	Forward	VBW	Video BandWidth
GFSK	Gaussian Frequency-Shift Keying	Vert.	Vertical
GNSS	Global Navigation Satellite System	WLAN	Wireless LAN
GPS	Global Positioning System	xDSL	Generic term for all types of DSL technology (DSL: Digital Subscriber Line)

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SECTION 1: Customer information

Company Name	Panasonic Automotive Systems Co., Ltd. *1)
Address	4261, Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken 224-8520, Japan
Telephone Number	+81-50-1802-5117
Contact Person	Daisuke Takahata

*1) The Grantee name in the FCC application is "Panasonic Corporation of North America".

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	Car Navigation
Model Number	AT2403
Serial Number	Refer to SECTION 4.2
Condition	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	October 25, 2024
Test Date	November 8 to December 1, 2024

2.2 Product Description

General Specification

Rating	DC 13.2 V
Clock frequency (ies) in the system	(SOC) 38.4 MHz, (CPU) 20 MHz, 0.03277 MHz, (DTCP) 13.56 MHz, (AM/FM) 36.4 MHz, 36.864 MHz, (GNSS) 26 MHz, 0.03277 MHz, (Ether) 25 MHz, (Video) 32 MHz

Radio Specification

Bluetooth (BR / EDR / BT LE)

Equipment Type	Transceiver
Frequency of Operation	2402 MHz to 2480 MHz
Type of Modulation	FHSS, GFSK / $\pi/4$ -DQPSK, 8DPSK / GFSK
Antenna Gain	4 dBi

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

Equipment Type	Transceiver
Frequency of Operation	2412 MHz to 2462 MHz
Type of Modulation	DSSS, OFDM
	OFDMA (IEEE802.11ax only) 26/52/106/242-tone RU
Antenna Gain	4 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 5745 MHz to 5825 MHz
	40 MHz Band	5190 MHz to 5230 MHz 5755 MHz to 5795 MHz
	80 MHz Band	5210 MHz, 5775 MHz
Type of Modulation	OFDM	
	OFDMA (IEEE802.11ax only)	20 MHz: 26/52/106/242-tone RU
		40 MHz: 26/52/106/242/484-tone RU
80 MHz: 26/52/106/242/484/996-tone RU		
Antenna Gain	RF0: 5 dBi RF1: 5 dBi	

AM / FM

Equipment Type	Receiver
Frequency of Operation	AM: 530 kHz to 1710 kHz FM: 87.75 MHz to 107.9 MHz
Type of Modulation	AM FM
Antenna Connector Type	Car manufacturer original
Impedance	75 ohm

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	FCC Part 15 Subpart B The latest version on the first day of the testing period
Title	FCC 47CFR Part15 Radio Frequency Device Subpart B Unintentional Radiators

3.2 Procedures and results

Item	Test Procedure	Limits	Worst margin	Result	Remarks
Conducted emission	ANSI C63.4: 2014 + C63.4a: 2017 7. AC power - line conducted emission measurements	Part 15 Subpart B 15.107(a)	-	N/A	*1)
Radiated emission	ANSI C63.4: 2014 + C63.4a: 2017 8. Radiated emission measurements	Part 15 Subpart B 15.109(a)	12.99 dB 5000.000 MHz Vertical, AV	Complied	-
Antenna Terminal	ANSI C63.4: 2014 + C63.4a: 2017 12. Measurement of unintentional radiators other than ITE	Part 15 Subpart B 15.111(a)	26.97 dB 36.389 MHz	Complied	-
* Note: UL Japan, Inc.'s EMI Work Procedure: Work Instructions-ULID-003591. *1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.					

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 $k = 2$.

Radiated emission

Measurement distance	Frequency range		Unit	Calculated Uncertainty (+/-)
3 m	9 kHz to 30 MHz		dB	3.3
10 m			dB	3.1
3 m	30 MHz to 200 MHz	Horizontal	dB	5.0
		Vertical	dB	5.0
	200 MHz to 1000 MHz	Horizontal	dB	5.2
		Vertical	dB	6.2
10 m	30 MHz to 200 MHz	Horizontal	dB	5.5
		Vertical	dB	5.4
	200 MHz to 1000 MHz	Horizontal	dB	5.5
		Vertical	dB	5.5
3 m	1 GHz to 6 GHz		dB	5.1
	6 GHz to 18 GHz		dB	5.4
1 m	10 GHz to 18 GHz		dB	5.4
	18 GHz to 26.5 GHz		dB	5.3
	26.5 GHz to 40 GHz		dB	4.8
0.5 m	26.5 GHz to 40 GHz		dB	5.0

Antenna Terminal test

Item	Unit	Calculated Uncertainty (+/-)
Antenna terminal conducted emission	dB	3.1

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 Japan

Telephone: +81-596-24-8999

A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919

ISED Lab Company Number: 2973C / CAB identifier: JP0002

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

3.6 Test data, Test instruments, and Test set up

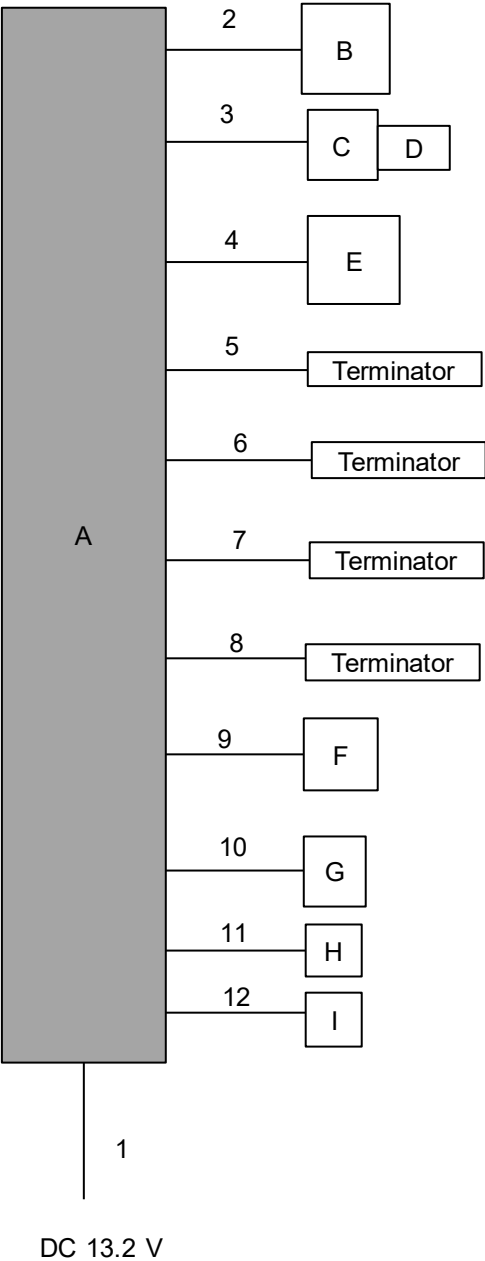
Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

Mode	1. FM Receiving (Local) mode (Analog / Digital): for RE 2. FM Receiving (Other) mode (Analog / Digital): for RE 3. Antenna Terminal mode (Local) (Analog / Digital): for AT 4. Antenna Terminal mode (Other) (Analog / Digital): for AT
Software(s)	YEP1RM09303B
Abbreviations for test items	RE: Radiated Emission, AT: Antenna Terminal Conducted Emission

4.2 Configuration and peripherals



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

Description of EUT and Support Equipment

No.	Item	Model number	Serial Number	Manufacturer	Remarks
A	Car Navigation	AT2403	500001	Panasonic Automotive Systems Co., Ltd.	EUT
B	ADAS Jig	GVIF3OUT2A	8	Persol AVC Technology Co., Ltd.	-
C	USB BOX	DEP38-10029	-	Japan Aviation Electronics Industry, Ltd.	-
D	USB Memory	RUF3-K16GB	P10416	Buffalo	-
E	Steering switch	-	1400	Panasonic	-
F	GPS Antenna	ANN-MS	20N40132	U-Blox	-
G	Microphone	SDA3520A	4AC011628	Panasonic	-
H	Microphone	SDA3520A	4AC011628	Panasonic	-
I	Amplifier	7669	01A230000384V	DENSO	-

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	4.3	Unshielded	Unshielded	-
2	Signal Cable	1.9	Unshielded	Unshielded	-
3	USB Cable	2.3	Shielded	Shielded	-
4	Signal Cable	3.0	Unshielded	Unshielded	-
5	XM Antenna Cable	3.0	Shielded	Shielded	-
6	Signal Cable	1.0	Shielded	Shielded	-
7	FM Cable	3.0	Shielded	Shielded	-
8	FM Cable	3.0	Shielded	Shielded	-
9	GPS Antenna Cable	2.0	Shielded	Shielded	-
10	Signal Cable	4.3	Unshielded	Unshielded	-
11	Signal Cable	4.3	Unshielded	Unshielded	-
12	Signal Cable	3.0	Unshielded	Unshielded	-

SECTION 5: Radiated Emission

5.1 Operating environment

Date : See data
Test place : See data
Temperature : See data
Humidity : See data
Test engineer : See data

5.2 Test configuration

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 EUT was set on the edge of the tabletop.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

Photographs of the set up are shown in APPENDIX 3.

5.3 Test conditions

Frequency range : 30 MHz to 200 MHz (Biconical antenna)
200 MHz to 1000 MHz (Logperiodic antenna)
1000 MHz to 40000 MHz (Horn antenna)
Test distance : 3 m (Below 1 GHz)
4 m (1 GHz to 6 GHz)
5 m (6 GHz to 10 GHz)
1 m (Above 10 GHz)
EUT position : Table top
EUT operation mode : See Clause 4.1

5.4 Test procedure

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

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

The radiated emission measurements were made with the following detector function of the Test Receiver and the Spectrum Analyzer.

The test of Local oscillator spurious has been measured up to appropriate frequency based on the result of the antenna terminal test.

Test antenna was aimed at the emission source for receiving the maximum signal and always kept. (Above 1 GHz)

Frequency	Below 1 GHz	1 GHz to 26 GHz *1)	26 GHz to 40 GHz *1)
Instrument used	Test Receiver	Test Receiver	Spectrum Analyzer
IF Bandwidth	QP: BW 120 kHz	PK: BW 1 MHz, CAV: BW 1 MHz	PK: RBW: 1 MHz / VBW: 3 MHz AV *2): RBW: 1 MHz / VBW: 10 Hz

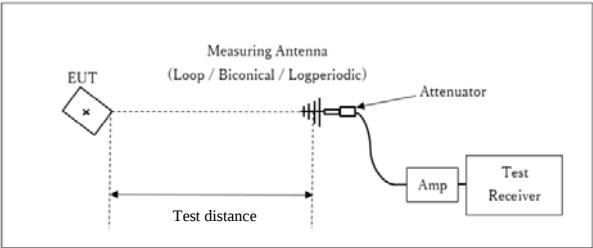
*1) The measurement data was adjusted to a 3 m distance using the following Distance Factor.

Distance Factor: See Figure 1.

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

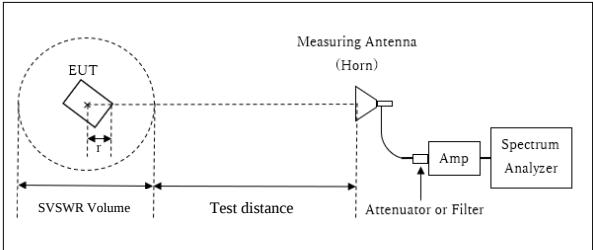
Figure 1: Test Setup

Below 1 GHz



Test Distance: 3 m

1 GHz to 10 GHz



[1 GHz to 6 GHz]

Distance Factor: $20 \times \log (3.30 \text{ m}^* / 3.00 \text{ m}) = 0.83 \text{ dB}$
*(Test Distance + SVSWR Volume /2) - r = 3.30 m

Test Distance: 3.00 m
SVSWR Volume: 2.00 m

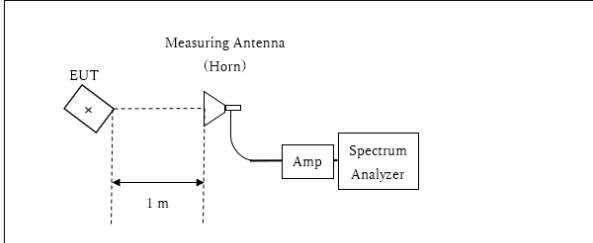
[6 GHz to 10 GHz]

Distance Factor: $20 \times \log (4.30 \text{ m}^* / 3.00 \text{ m}) = 3.13 \text{ dB}$
*(Test Distance + SVSWR Volume /2) - r = 4.30 m

Test Distance: 4.30 m
SVSWR Volume: 1.40 m

(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r: 0.70 m

10 GHz to 40 GHz



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

The test was made on EUT at the normal use position.

5.5 Test result

Summary of the test results: Pass

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

SECTION 6: Antenna Terminal

6.1 Operating environment

Date : See data
Test place : See data
Temperature : See data
Humidity : See data
Test engineer : See data

6.2 Test configuration

EUT was placed on a wooden table of nominal size, 1.0 m by 1.5 m, raised 0.8 m from the ground. Photographs of the set up are shown in APPENDIX 3.

6.3 Test conditions

Frequency range : 30 MHz to 1000 MHz / 1000 MHz to 40000 MHz
Test distance : N/A
EUT position : Table top
EUT operation mode : See Clause 4.1

6.4 Test procedure

The Antenna Terminal was measured with a spectrum analyzer connected to the antenna port.

Frequency	Below 1 GHz	Above 1 GHz
Instrument used	Spectrum Analyzer *1)	Spectrum Analyzer
IF Bandwidth	PK: RBW: 100 kHz / VBW: 300 kHz	EMI PK: RBW: 1 MHz / VBW: 3 MHz

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

6.5 Test result

Summary of the test results: Pass

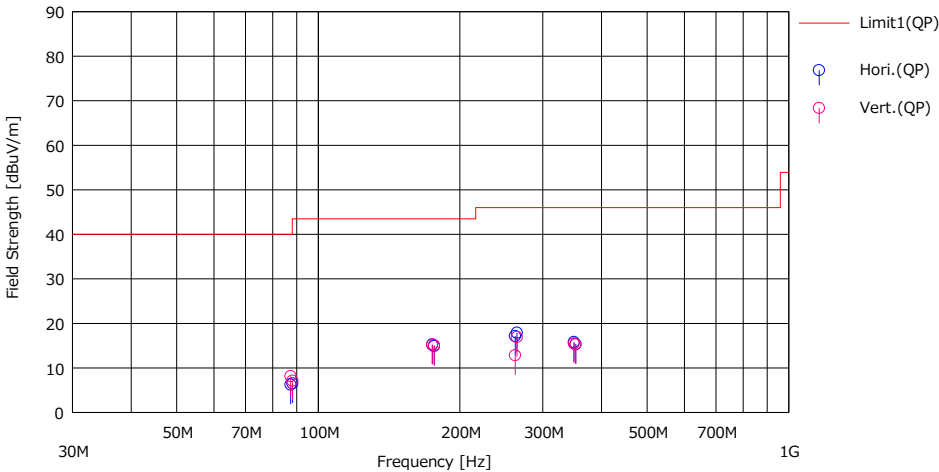
APPENDIX 1: Test data

Radiated Emission
(Analog)

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
November 28, 2024
23 deg. C / 44 % RH
Tetsuro Yoshida
(Below 1 GHz)
Mode 1 (87.75 MHz)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



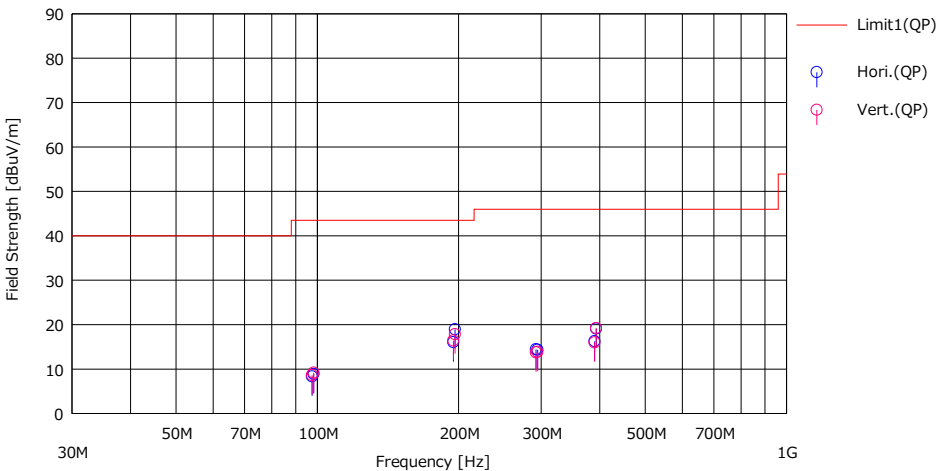
No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pda. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]				[dBuV/m]	[dBuV/m]	[dB]					
1	87.362	22.70	7.92	7.78	32.16	6.24	40.00	33.76	Hori.	100	359	BA	
2	88.138	22.80	8.07	7.79	32.16	6.50	43.50	37.00	Hori.	100	359	BA	
3	174.724	22.60	16.01	8.66	32.08	15.19	43.50	28.31	Hori.	100	359	BA	
4	176.276	22.20	16.06	8.68	32.07	14.87	43.50	28.63	Hori.	100	359	BA	
5	262.086	27.40	12.36	9.38	32.01	17.13	46.00	28.87	Hori.	100	359	LA22	
6	264.414	28.00	12.50	9.40	32.01	17.89	46.00	28.11	Hori.	100	359	LA22	
7	349.448	22.70	15.05	10.04	32.00	15.79	46.00	30.21	Hori.	100	359	LA22	
8	352.552	22.20	15.08	10.06	32.00	15.34	46.00	30.66	Hori.	100	359	LA22	
9	87.362	24.60	7.92	7.78	32.16	8.14	40.00	31.86	Vert.	100	359	BA	
10	88.138	23.40	8.07	7.79	32.16	7.10	43.50	36.40	Vert.	100	359	BA	
11	174.724	22.70	16.01	8.66	32.08	15.29	43.50	28.21	Vert.	100	359	BA	
12	176.276	22.40	16.06	8.68	32.07	15.07	43.50	28.43	Vert.	100	359	BA	
13	262.086	23.10	12.36	9.38	32.01	12.83	46.00	33.17	Vert.	100	359	LA22	
14	264.414	27.00	12.50	9.40	32.01	16.89	46.00	29.11	Vert.	100	359	LA22	
15	349.448	22.40	15.05	10.04	32.00	15.49	46.00	30.51	Vert.	100	359	LA22	
16	352.552	22.10	15.08	10.06	32.00	15.24	46.00	30.76	Vert.	100	359	LA22	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

Radiated Emission
(Analog)

Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date November 28, 2024
Temperature / Humidity 23 deg. C / 44 % RH
Engineer Tetsuro Yoshida
 (Below 1 GHz)
Mode Mode 1 (97.9 MHz)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



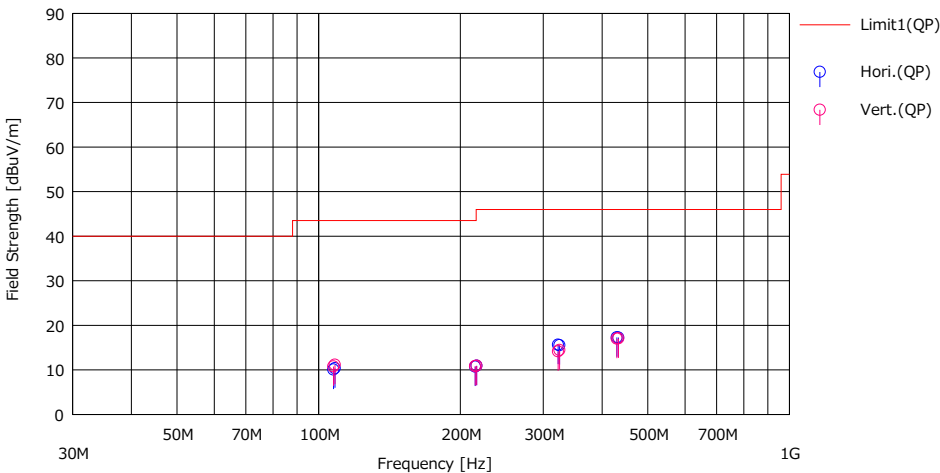
No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP)	Limit (QP)	Margin (QP)	Pda. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]				[dBuV/m]	[dBuV/m]	[dB]					
1	97.512	22.70	9.88	7.89	32.15	8.32	43.50	35.18	Hori.	100	359	BA	
2	98.288	23.10	10.02	7.90	32.15	8.87	43.50	34.63	Hori.	100	359	BA	
3	195.024	22.70	16.52	8.85	32.05	16.02	43.50	27.48	Hori.	100	359	BA	
4	196.576	25.60	16.53	8.86	32.05	18.94	43.50	24.56	Hori.	100	359	BA	
5	292.536	23.20	13.61	9.62	31.99	14.44	46.00	31.56	Hori.	100	359	LA22	
6	294.864	23.10	13.60	9.64	31.99	14.35	46.00	31.65	Hori.	100	359	LA22	
7	390.048	22.60	15.37	10.32	32.01	16.28	46.00	29.72	Hori.	100	359	LA22	
8	393.152	25.30	15.47	10.34	32.01	19.10	46.00	26.90	Hori.	100	359	LA22	
9	97.512	23.00	9.88	7.89	32.15	8.62	43.50	34.88	Vert.	100	359	BA	
10	98.288	23.40	10.02	7.90	32.15	9.17	43.50	34.33	Vert.	100	359	BA	
11	195.024	23.10	16.52	8.85	32.05	16.42	43.50	27.08	Vert.	100	359	BA	
12	196.576	24.50	16.53	8.86	32.05	17.84	43.50	25.66	Vert.	100	359	BA	
13	292.536	22.50	13.61	9.62	31.99	13.74	46.00	32.26	Vert.	100	359	LA22	
14	294.864	22.60	13.60	9.64	31.99	13.85	46.00	32.15	Vert.	100	359	LA22	
15	390.048	22.30	15.37	10.32	32.01	15.98	46.00	30.02	Vert.	100	359	LA22	
16	393.152	25.40	15.47	10.34	32.01	19.20	46.00	26.80	Vert.	100	359	LA22	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

Radiated Emission
(Analog)

Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date November 28, 2024
Temperature / Humidity 23 deg. C / 44 % RH
Engineer Tetsuro Yoshida
 (Below 1 GHz)
Mode Mode 1 (107.9 MHz)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



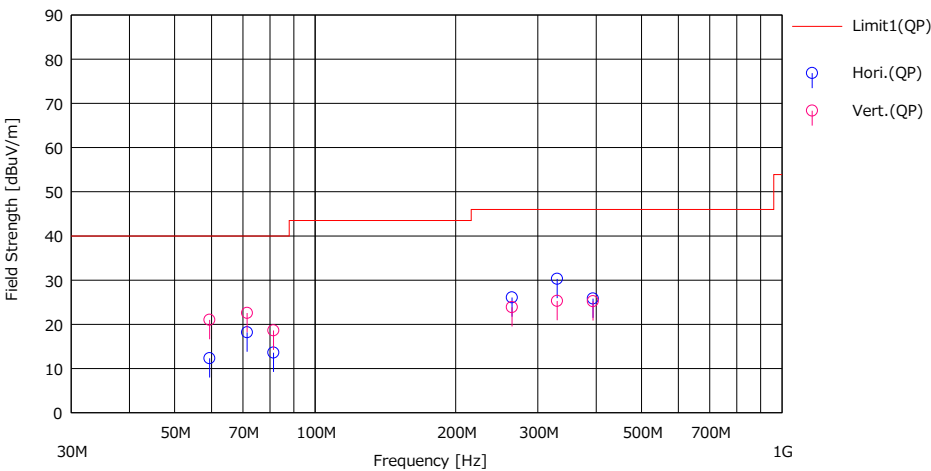
No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margn.	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBP]				[dBP]	[dBP]	[dBP]					
		[dBuV]				[dBuV/m]	[dBuV/m]	[dB]					
1	107.512	22.70	11.51	8.00	32.14	10.07	43.50	33.43	Hori.	100	359	BA	
2	108.288	22.90	11.59	8.00	32.14	10.35	43.50	33.15	Hori.	100	359	BA	
3	215.024	22.50	11.24	9.02	32.04	10.72	43.50	32.78	Hori.	100	359	LA22	
4	216.576	22.70	11.23	9.03	32.04	10.92	46.00	35.08	Hori.	100	359	LA22	
5	322.536	23.60	14.20	9.84	32.00	15.64	46.00	30.36	Hori.	100	359	LA22	
6	324.864	23.40	14.29	9.85	32.00	15.54	46.00	30.46	Hori.	100	359	LA22	
7	430.048	22.60	16.14	10.57	32.02	17.29	46.00	28.71	Hori.	100	359	LA22	
8	433.152	22.50	16.18	10.59	32.02	17.25	46.00	28.75	Hori.	100	359	LA22	
9	107.512	23.40	11.51	8.00	32.14	10.77	43.50	32.73	Vert.	100	359	BA	
10	108.288	23.70	11.59	8.00	32.14	11.15	43.50	32.35	Vert.	100	359	BA	
11	215.024	22.60	11.24	9.02	32.04	10.82	43.50	32.68	Vert.	100	359	LA22	
12	216.576	22.70	11.23	9.03	32.04	10.92	46.00	35.08	Vert.	100	359	LA22	
13	322.536	22.10	14.20	9.84	32.00	14.14	46.00	31.86	Vert.	100	359	LA22	
14	324.864	22.30	14.29	9.85	32.00	14.44	46.00	31.56	Vert.	100	359	LA22	
15	430.048	22.30	16.14	10.57	32.02	16.99	46.00	29.01	Vert.	100	359	LA22	
16	433.152	22.30	16.18	10.59	32.02	17.05	46.00	28.95	Vert.	100	359	LA22	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

Radiated Emission
(Analog)

Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date November 28, 2024
Temperature / Humidity 23 deg. C / 44 % RH
Engineer Tetsuro Yoshida
 (Below 1 GHz)
Mode Mode 2

Limit : FCC_Part 15 Subpart B(15.109)_Class B



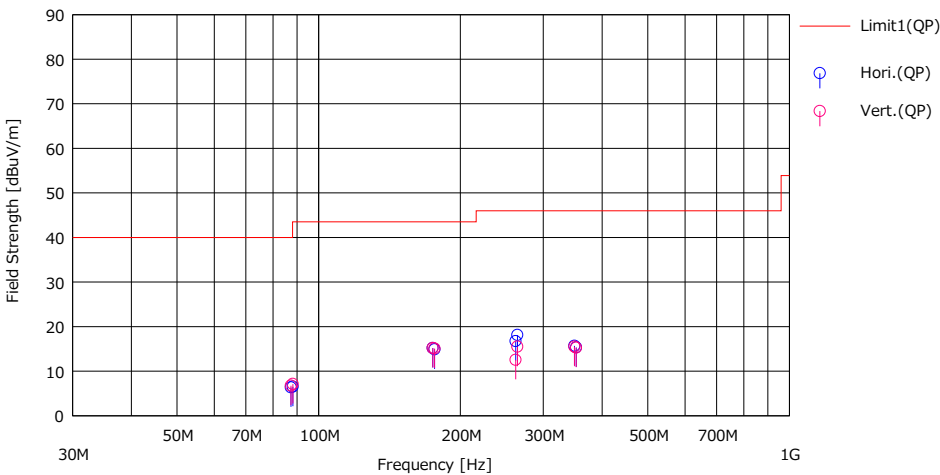
No.	Freq. [MHz]	Reading (QP)	Ant Fac [dBuV/m]	Loss [dB]	Gain [dB]	Result (QP)	Limit (QP)	Margn (QP)	Pola [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]				[dBuV/m]	[dBuV/m]	[dB]					
1	59.412	28.90	8.17	7.41	32.18	12.30	40.00	27.70	Hori.	300	199	BA	
2	71.505	36.40	6.36	7.58	32.18	18.16	40.00	21.84	Hori.	219	264	BA	
3	81.418	31.10	6.96	7.71	32.17	13.60	40.00	26.40	Hori.	211	92	BA	
4	263.999	36.20	12.47	9.40	32.01	26.06	46.00	19.94	Hori.	100	243	LA22	
5	330.007	37.90	14.50	9.89	32.00	30.29	46.00	15.71	Hori.	100	244	LA22	
6	393.604	32.00	15.48	10.35	32.01	25.82	46.00	20.18	Hori.	108	10	LA22	
7	59.412	37.60	8.17	7.41	32.18	21.00	40.00	19.00	Vert.	100	289	BA	
8	71.505	40.80	6.36	7.58	32.18	22.56	40.00	17.44	Vert.	100	313	BA	
9	81.418	36.10	6.96	7.71	32.17	18.60	40.00	21.40	Vert.	135	33	BA	
10	263.999	34.00	12.47	9.40	32.01	23.86	46.00	22.14	Vert.	100	205	LA22	
11	330.007	32.90	14.50	9.89	32.00	25.29	46.00	20.71	Vert.	100	103	LA22	
12	393.604	31.40	15.48	10.35	32.01	25.22	46.00	20.78	Vert.	145	356	LA22	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

Radiated Emission
(Digital)

Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date November 28, 2024
Temperature / Humidity 23 deg. C / 44 % RH
Engineer Tetsuro Yoshida
 (Below 1 GHz)
Mode Mode 1 (87.75 MHz)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBUV]				[dBUV/m]	[dBUV/m]	[dB]					
1	87.362	22.80	7.92	7.78	32.16	6.34	40.00	33.66	Hori.	100	359	BA	
2	88.138	22.80	8.07	7.79	32.16	6.50	43.50	37.00	Hori.	100	359	BA	
3	174.724	22.60	16.01	8.66	32.08	15.19	43.50	28.31	Hori.	100	359	BA	
4	176.276	22.20	16.06	8.68	32.07	14.87	43.50	28.63	Hori.	100	359	BA	
5	262.086	27.00	12.36	9.38	32.01	16.73	46.00	29.27	Hori.	100	359	LA22	
6	264.414	28.20	12.50	9.40	32.01	18.09	46.00	27.91	Hori.	100	359	LA22	
7	349.448	22.60	15.05	10.04	32.00	15.69	46.00	30.31	Hori.	100	359	LA22	
8	352.552	22.20	15.08	10.06	32.00	15.34	46.00	30.66	Hori.	100	359	LA22	
9	87.362	23.20	7.92	7.78	32.16	6.74	40.00	33.26	Vert.	100	359	BA	
10	88.138	23.40	8.07	7.79	32.16	7.10	43.50	36.40	Vert.	100	359	BA	
11	174.724	22.60	16.01	8.66	32.08	15.19	43.50	28.31	Vert.	100	359	BA	
12	176.276	22.40	16.06	8.68	32.07	15.07	43.50	28.43	Vert.	100	359	BA	
13	262.086	22.80	12.36	9.38	32.01	12.53	46.00	33.47	Vert.	100	359	LA22	
14	264.414	25.60	12.50	9.40	32.01	15.49	46.00	30.51	Vert.	100	359	LA22	
15	349.448	22.40	15.05	10.04	32.00	15.49	46.00	30.51	Vert.	100	359	LA22	
16	352.552	22.10	15.08	10.06	32.00	15.24	46.00	30.76	Vert.	100	359	LA22	

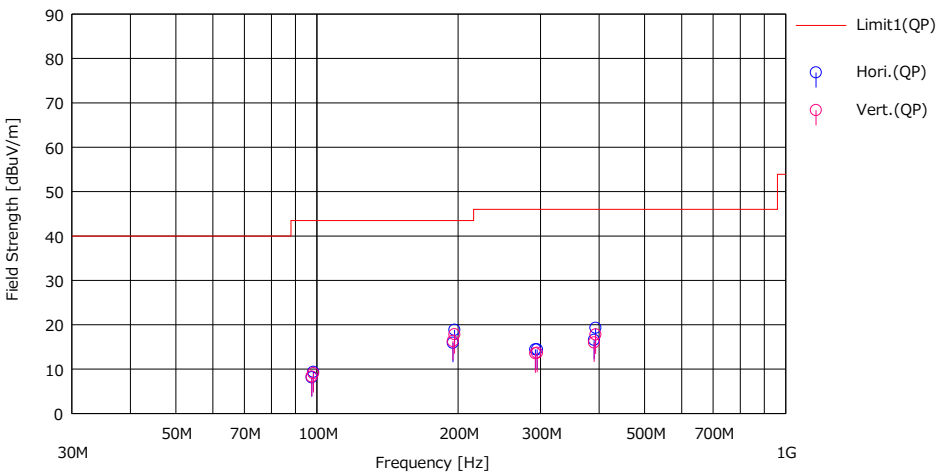
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

Radiated Emission
(Digital)

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
November 28, 2024
23 deg. C / 44 % RH
Tetsuro Yoshida
(Below 1 GHz)
Mode 1 (97.9 MHz)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



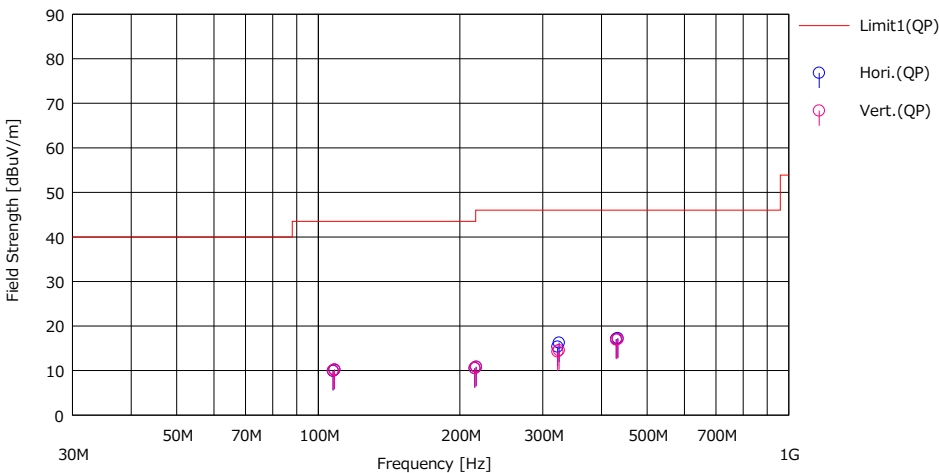
No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP)	Limit (QP)	Margn (QP)	Pda. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]				[dBuV/m]	[dBuV/m]	[dB]					
1	97.512	22.50	9.88	7.89	32.15	8.12	43.50	35.38	Hori.	100	359	BA	
2	98.288	23.60	10.02	7.90	32.15	9.37	43.50	34.13	Hori.	100	359	BA	
3	195.024	22.60	16.52	8.85	32.05	15.92	43.50	27.58	Hori.	100	359	BA	
4	196.576	25.50	16.53	8.86	32.05	18.84	43.50	24.66	Hori.	100	359	BA	
5	292.536	23.20	13.61	9.62	31.99	14.44	46.00	31.56	Hori.	100	359	LA22	
6	294.864	23.20	13.60	9.64	31.99	14.45	46.00	31.55	Hori.	100	359	LA22	
7	390.048	22.90	15.37	10.32	32.01	16.58	46.00	29.42	Hori.	100	359	LA22	
8	393.152	25.50	15.47	10.34	32.01	19.30	46.00	26.70	Hori.	100	359	LA22	
9	97.512	22.70	9.88	7.89	32.15	8.32	43.50	35.18	Vert.	100	359	BA	
10	98.288	23.30	10.02	7.90	32.15	9.07	43.50	34.43	Vert.	100	359	BA	
11	195.024	23.00	16.52	8.85	32.05	16.32	43.50	27.18	Vert.	100	359	BA	
12	196.576	24.50	16.53	8.86	32.05	17.84	43.50	25.66	Vert.	100	359	BA	
13	292.536	22.30	13.61	9.62	31.99	13.54	46.00	32.46	Vert.	100	359	LA22	
14	294.864	22.40	13.60	9.64	31.99	13.65	46.00	32.35	Vert.	100	359	LA22	
15	390.048	22.30	15.37	10.32	32.01	15.98	46.00	30.02	Vert.	100	359	LA22	
16	393.152	24.00	15.47	10.34	32.01	17.80	46.00	28.20	Vert.	100	359	LA22	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

Radiated Emission
(Digital)

Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date November 28, 2024
Temperature / Humidity 23 deg. C / 44 % RH
Engineer Tetsuro Yoshida
 (Below 1 GHz)
Mode Mode 1 (107.9 MHz)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP)	Limit (QP)	Margin (QP)	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]				[dBuV/m]	[dBuV/m]	[dB]					
1	107.512	22.50	11.51	8.00	32.14	9.87	43.50	33.63	Hori.	100	359	BA	
2	108.288	22.70	11.59	8.00	32.14	10.15	43.50	33.35	Hori.	100	359	BA	
3	215.024	22.30	11.24	9.02	32.04	10.52	43.50	32.98	Hori.	100	359	LA22	
4	216.576	22.60	11.23	9.03	32.04	10.82	46.00	35.18	Hori.	100	359	LA22	
5	322.536	23.30	14.20	9.84	32.00	15.34	46.00	30.66	Hori.	100	359	LA22	
6	324.864	24.10	14.29	9.85	32.00	16.24	46.00	29.76	Hori.	100	359	LA22	
7	430.048	22.40	16.14	10.57	32.02	17.09	46.00	28.91	Hori.	100	359	LA22	
8	433.152	22.50	16.18	10.59	32.02	17.25	46.00	28.75	Hori.	100	359	LA22	
9	107.512	22.60	11.51	8.00	32.14	9.97	43.50	33.53	Vert.	100	359	BA	
10	108.288	22.80	11.59	8.00	32.14	10.25	43.50	33.25	Vert.	100	359	BA	
11	215.024	22.30	11.24	9.02	32.04	10.52	43.50	32.98	Vert.	100	359	LA22	
12	216.576	22.60	11.23	9.03	32.04	10.82	46.00	35.18	Vert.	100	359	LA22	
13	322.536	22.20	14.20	9.84	32.00	14.24	46.00	31.76	Vert.	100	359	LA22	
14	324.864	22.40	14.29	9.85	32.00	14.54	46.00	31.46	Vert.	100	359	LA22	
15	430.048	22.20	16.14	10.57	32.02	16.89	46.00	29.11	Vert.	100	359	LA22	
16	433.152	22.30	16.18	10.59	32.02	17.05	46.00	28.95	Vert.	100	359	LA22	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

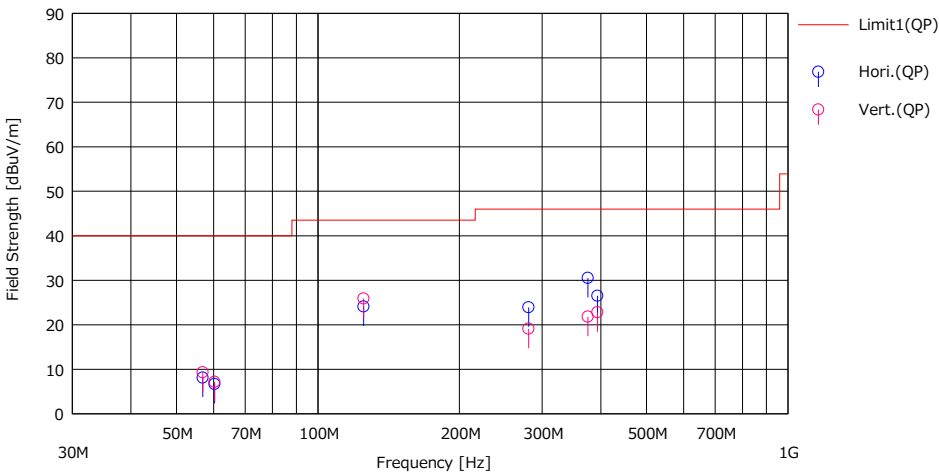
Radiated Emission
(Digital)

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer

Mode

Ise EMC Lab.
No.3
November 28, 2024
23 deg. C / 44 % RH
Tetsuro Yoshida
(Below 1 GHz)
Mode 2

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBUV]				[dBUV/m]	[dBUV/m]	[dB]					
1	56.859	24.00	8.93	7.37	32.19	8.11	40.00	31.89	Hori.	300	289	BA	
2	60.262	23.50	7.93	7.42	32.18	6.67	40.00	33.33	Hori.	300	182	BA	
3	125.020	34.70	13.32	8.18	32.12	24.08	43.50	19.42	Hori.	134	325	BA	
4	280.626	32.90	13.47	9.53	32.00	23.90	46.00	22.10	Hori.	105	135	LA22	
5	375.066	37.20	15.09	10.22	32.01	30.50	46.00	15.50	Hori.	222	262	LA22	
6	393.212	32.70	15.47	10.34	32.01	26.50	46.00	19.50	Hori.	100	16	LA22	
7	56.859	25.20	8.93	7.37	32.19	9.31	40.00	30.69	Vert.	100	206	BA	
8	60.262	24.00	7.93	7.42	32.18	7.17	40.00	32.83	Vert.	219	144	BA	
9	125.020	36.50	13.32	8.18	32.12	25.88	43.50	17.62	Vert.	100	257	BA	
10	280.626	28.10	13.47	9.53	32.00	19.10	46.00	26.90	Vert.	100	179	LA22	
11	375.066	28.50	15.09	10.22	32.01	21.80	46.00	24.20	Vert.	123	269	LA22	
12	393.212	29.00	15.47	10.34	32.01	22.80	46.00	23.20	Vert.	100	3	LA22	

CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

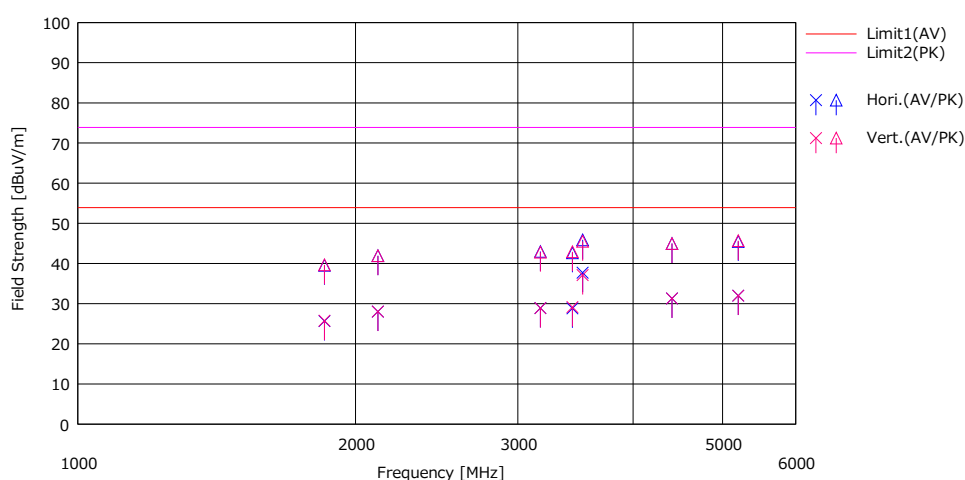
Radiated Emission (Analog)

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.3
December 1, 2024
23 deg. C / 42 % RH
Takafumi Noguchi
(1 GHz to 6 GHz)
Mode 1 (87.75 MHz)

No.3
December 1, 2024
23 deg. C / 42 % RH
Yuta Moriya
(Above 6 GHz)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pda.	Height [cm]	Angle [deg]	Ant. Type	Comment
		(AV)	(PK)				(AV)	(PK)	(AV)	(PK)	(AV)	(PK)					
		[dBuV]	[dBuV]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]					
1	1850.898	29.90	43.80	25.58	2.89	32.72	25.65	39.55	53.90	73.90	28.25	34.35	Hori.	100	0	H2O	
2	2115.312	29.90	43.80	27.39	3.05	32.32	28.02	41.92	53.90	73.90	25.88	31.98	Hori.	100	0	H2O	
3	3172.968	28.40	42.50	28.78	3.59	31.88	28.89	42.99	53.90	73.90	25.01	30.91	Hori.	100	0	H2O	
4	3437.382	28.20	42.00	28.67	3.70	31.75	28.82	42.62	53.90	73.90	25.08	31.28	Hori.	100	0	H2O	
5	3525.520	36.60	44.80	29.07	3.74	31.71	37.70	45.90	53.90	73.90	16.20	28.00	Hori.	113	170	H2O	
6	4406.900	27.80	41.50	30.69	4.11	31.32	31.28	44.98	53.90	73.90	22.62	28.92	Hori.	100	0	H2O	
7	5200.142	27.00	40.50	31.68	4.42	31.12	31.98	45.48	53.90	73.90	21.92	28.42	Hori.	100	0	H2O	
8	1850.898	30.00	43.90	25.58	2.89	32.72	25.75	39.65	53.90	73.90	28.15	34.25	Vert.	100	0	H2O	
9	2115.312	29.90	43.80	27.39	3.05	32.32	28.02	41.92	53.90	73.90	25.88	31.98	Vert.	100	0	H2O	
10	3172.968	28.40	42.30	28.78	3.59	31.88	28.89	42.79	53.90	73.90	25.01	31.11	Vert.	100	0	H2O	
11	3437.382	28.50	42.30	28.67	3.70	31.75	29.12	42.92	53.90	73.90	24.78	30.98	Vert.	100	0	H2O	
12	3525.520	36.00	44.40	29.07	3.74	31.71	37.10	45.50	53.90	73.90	16.80	28.40	Vert.	274	35	H2O	
13	4406.900	27.80	41.50	30.69	4.11	31.32	31.28	44.98	53.90	73.90	22.62	28.92	Vert.	100	0	H2O	
14	5200.142	27.00	40.70	31.68	4.42	31.12	31.98	45.68	53.90	73.90	21.92	28.22	Vert.	100	0	H2O	

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

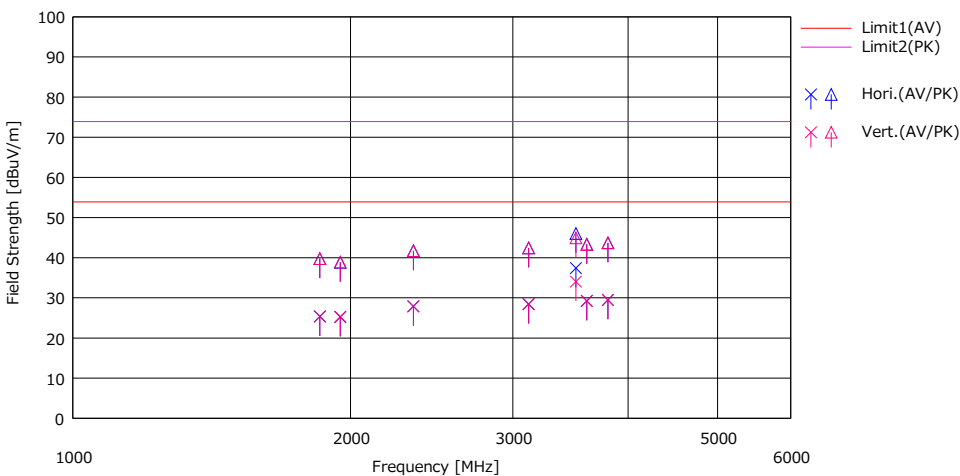
Except for the above table: adequate margin data below the limits.

* No signal was detected above 6 GHz.

Radiated Emission
(Analog)

Test place	Ise EMC Lab.	No.3
Semi Anechoic Chamber	No.3	No.3
Date	December 1, 2024	December 1, 2024
Temperature / Humidity	23 deg. C / 42 % RH	23 deg. C / 42 % RH
Engineer	Takafumi Noguchi	Yuta Moriya
	(1 GHz to 6 GHz)	(Above 6 GHz)
Mode	Mode 1 (97.9 MHz)	

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola.	Height [cm]	Angle [deg]	Ant. Type	Comment
		(AV)	(PK)				(AV)	(PK)	(AV)	(PK)	(AV)	(PK)					
1	1852.728	29.60	44.00	25.59	2.89	32.71	25.37	39.77	53.90	73.90	28.53	34.13	Hori.	100	0	H2O	
2	1950.240	28.80	42.40	25.94	2.96	32.48	25.22	38.82	53.90	73.90	28.68	35.08	Hori.	100	0	H2O	
3	2340.288	29.10	42.90	27.86	3.17	32.23	27.90	41.70	53.90	73.90	26.00	32.20	Hori.	100	0	H2O	
4	3120.384	28.00	42.00	28.77	3.56	31.91	28.42	42.42	53.90	73.90	25.48	31.48	Hori.	100	0	H2O	
5	3510.432	36.40	45.00	29.01	3.73	31.71	37.43	46.03	53.90	73.90	16.47	27.87	Hori.	115	170	H2O	
6	3607.944	27.90	42.00	29.25	3.78	31.67	29.26	43.36	53.90	73.90	24.64	30.64	Hori.	100	0	H2O	
7	3802.968	27.70	41.90	29.50	3.86	31.57	29.49	43.69	53.90	73.90	24.41	30.21	Hori.	100	0	H2O	
8	1852.728	29.60	44.00	25.59	2.89	32.71	25.37	39.77	53.90	73.90	28.53	34.13	Vert.	100	0	H2O	
9	1950.240	28.90	42.50	25.94	2.96	32.48	25.32	38.92	53.90	73.90	28.58	34.98	Vert.	100	0	H2O	
10	2340.288	29.10	42.90	27.86	3.17	32.23	27.90	41.70	53.90	73.90	26.00	32.20	Vert.	100	0	H2O	
11	3120.384	28.00	42.00	28.77	3.56	31.91	28.42	42.42	53.90	73.90	25.48	31.48	Vert.	100	0	H2O	
12	3510.432	33.00	43.90	29.01	3.73	31.71	34.03	44.93	53.90	73.90	19.87	28.97	Vert.	100	160	H2O	
13	3607.944	27.90	41.90	29.25	3.78	31.67	29.26	43.26	53.90	73.90	24.64	30.64	Vert.	100	0	H2O	
14	3802.968	27.70	41.90	29.50	3.86	31.57	29.49	43.69	53.90	73.90	24.41	30.21	Vert.	100	0	H2O	

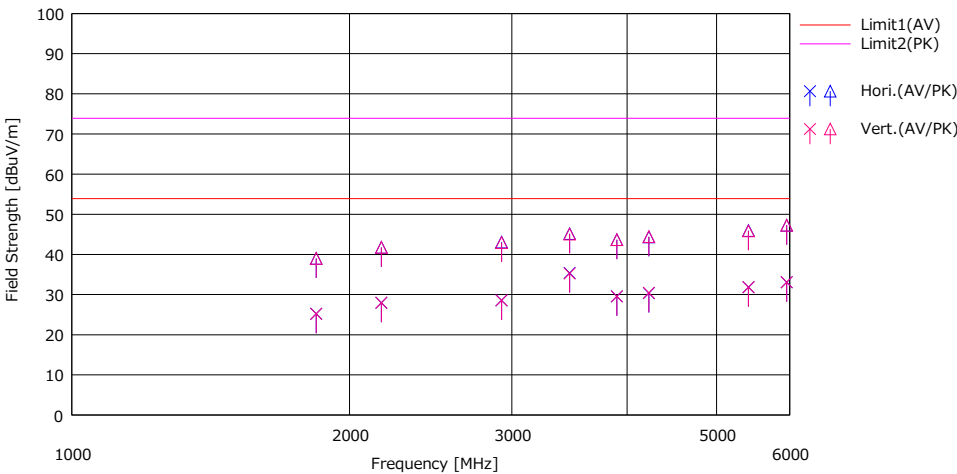
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 6 GHz.

Radiated Emission
(Analog)

Test place	Ise EMC Lab.	No.3
Semi Anechoic Chamber	No.3	No.3
Date	December 1, 2024	December 1, 2024
Temperature / Humidity	23 deg. C / 42 % RH	23 deg. C / 42 % RH
Engineer	Takafumi Noguchi	Yuta Moriya
Mode	(1 GHz to 6 GHz)	(Above 6 GHz)
	Mode 1 (107.9 MHz)	

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant Fac [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		(AV) [dBuV]	(PK) [dBuV]				(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dB]	(PK) [dB]					
1	1840.896	29.50	43.30	25.55	2.89	32.74	25.20	39.00	53.90	73.90	28.70	34.90	Hori.	100	0	H20	
2	2165.760	29.20	43.00	27.98	3.08	32.30	27.96	41.76	53.90	73.90	25.94	32.14	Hori.	100	0	H20	
3	2923.776	28.50	43.00	28.58	3.47	32.00	28.55	43.05	53.90	73.90	25.35	30.85	Hori.	100	0	H20	
4	3465.216	34.60	44.40	28.80	3.71	31.74	35.37	45.17	53.90	73.90	18.53	28.73	Hori.	100	167	H20	
5	3898.368	27.40	41.50	29.77	3.91	31.52	29.56	43.66	53.90	73.90	24.34	30.24	Hori.	100	0	H20	
6	4223.232	27.40	41.40	30.29	4.04	31.39	30.34	44.34	53.90	73.90	23.56	29.56	Hori.	100	0	H20	
7	5414.400	26.60	40.70	31.87	4.50	31.13	31.84	45.94	53.90	73.90	22.06	27.96	Hori.	100	0	H20	
8	5955.840	27.10	41.30	32.44	4.69	31.17	33.06	47.26	53.90	73.90	20.84	26.64	Hori.	100	0	H20	
9	1840.896	29.50	43.30	25.55	2.89	32.74	25.20	39.00	53.90	73.90	28.70	34.90	Vert.	100	0	H20	
10	2165.760	29.20	43.00	27.98	3.08	32.30	27.96	41.76	53.90	73.90	25.94	32.14	Vert.	100	0	H20	
11	2923.776	28.50	42.90	28.58	3.47	32.00	28.55	42.95	53.90	73.90	25.35	30.95	Vert.	100	0	H20	
12	3465.216	34.50	44.30	28.80	3.71	31.74	35.27	45.07	53.90	73.90	18.63	28.83	Vert.	100	165	H20	
13	3898.368	27.40	41.50	29.77	3.91	31.52	29.56	43.66	53.90	73.90	24.34	30.24	Vert.	100	0	H20	
14	4223.232	27.50	41.50	30.29	4.04	31.39	30.44	44.44	53.90	73.90	23.46	29.46	Vert.	100	0	H20	
15	5414.400	26.60	40.60	31.87	4.50	31.13	31.84	45.84	53.90	73.90	22.06	28.06	Vert.	100	0	H20	
16	5955.840	27.10	41.30	32.44	4.69	31.17	33.06	47.26	53.90	73.90	20.84	26.64	Vert.	100	0	H20	

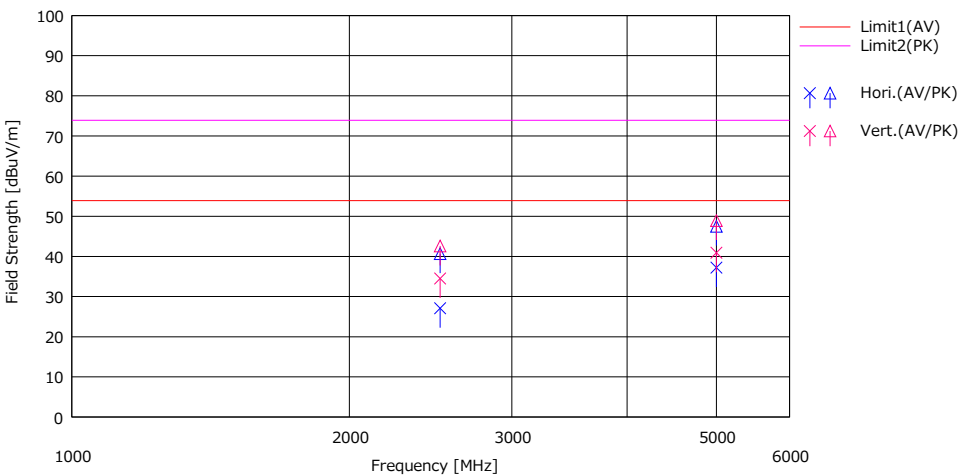
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 6 GHz.

Radiated Emission
(Analog)

Test place	Ise EMC Lab.	No.3
Semi Anechoic Chamber	No.3	No.3
Date	December 1, 2024	December 1, 2024
Temperature / Humidity	23 deg. C / 42 % RH	23 deg. C / 42 % RH
Engineer	Takafumi Noguchi	Yuta Moriya
	(1 GHz to 6 GHz)	(Above 6 GHz)
Mode	Mode 2	

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant Fac [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pola.	Height [cm]	Angle [deg]	Ant. Type	Comment
		(AV) [dBuV]	(PK) [dBuV]				(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dB]	(PK) [dB]					
1	2508.423	28.60	42.20	27.40	3.26	32.16	27.10	40.70	53.90	73.90	26.80	33.20	Hori.	100	0	H20	
2	5000.000	32.20	42.50	31.77	4.35	31.11	37.21	47.51	53.90	73.90	16.69	26.39	Hori.	100	238	H20	
3	2508.423	36.00	44.10	27.40	3.26	32.16	34.50	42.60	53.90	73.90	19.40	31.30	Vert.	332	118	H20	
4	5000.000	35.90	43.90	31.77	4.35	31.11	40.91	48.91	53.90	73.90	12.99	24.99	Vert.	331	117	H20	

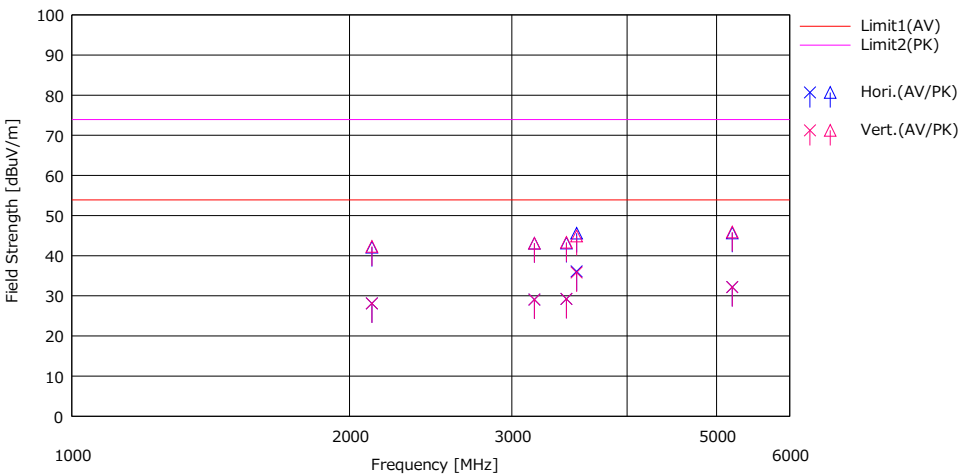
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 6 GHz.

Radiated Emission
(Digital)

Test place	Ise EMC Lab.	No.3
Semi Anechoic Chamber	No.3	No.3
Date	December 1, 2024	December 1, 2024
Temperature / Humidity	23 deg. C / 42 % RH	23 deg. C / 42 % RH
Engineer	Takafumi Noguchi	Yuta Moriya
	(1 GHz to 6 GHz)	(Above 6 GHz)
Mode	Mode 1 (87.75 MHz)	

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola.	Height [cm]	Angle [deg]	Ant. Type	Comment
		(AV) [dBuV]	(PK) [dBuV]				(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dB]	(PK) [dB]					
1	2115.312	30.00	44.00	27.39	3.05	32.32	28.12	42.12	53.90	73.90	25.78	31.78	Hori.	100	0	H2O	
2	3172.968	28.60	42.60	28.78	3.59	31.88	29.09	43.09	53.90	73.90	24.81	30.81	Hori.	100	0	H2O	
3	3437.382	28.60	42.50	28.67	3.70	31.75	29.22	43.12	53.90	73.90	24.68	30.78	Hori.	100	0	H2O	
4	3525.520	35.00	44.50	29.07	3.74	31.71	36.10	45.60	53.90	73.90	17.80	28.30	Hori.	113	172	H2O	
5	5200.142	27.20	40.70	31.68	4.42	31.12	32.18	45.68	53.90	73.90	21.72	28.22	Hori.	100	0	H2O	
6	2115.312	30.00	44.20	27.39	3.05	32.32	28.12	42.32	53.90	73.90	25.78	31.58	Vert.	100	0	H2O	
7	3172.968	28.60	42.60	28.78	3.59	31.88	29.09	43.09	53.90	73.90	24.81	30.81	Vert.	100	0	H2O	
8	3437.382	28.60	42.70	28.67	3.70	31.75	29.22	43.32	53.90	73.90	24.68	30.58	Vert.	100	0	H2O	
9	3525.520	34.70	43.80	29.07	3.74	31.71	35.80	44.90	53.90	73.90	18.10	29.00	Vert.	274	58	H2O	
10	5200.142	27.20	40.90	31.68	4.42	31.12	32.18	45.88	53.90	73.90	21.72	28.02	Vert.	100	0	H2O	

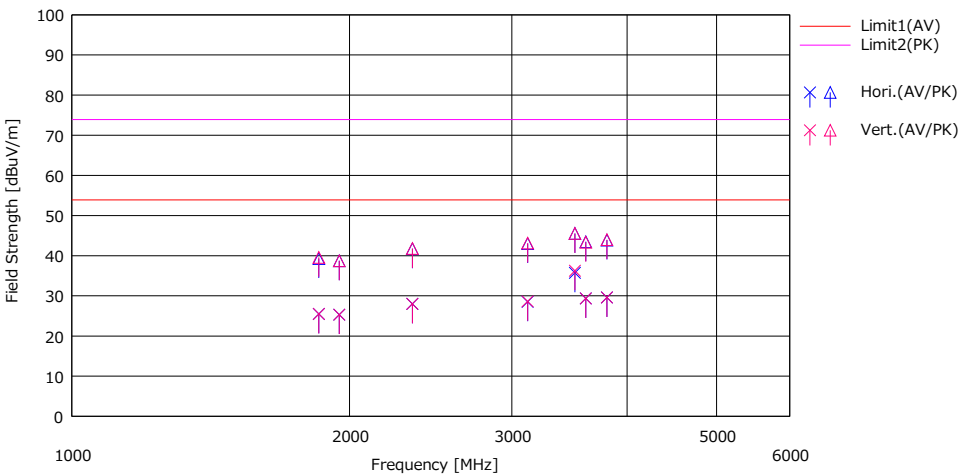
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 6 GHz.

Radiated Emission
(Digital)

Test place	Ise EMC Lab.	No.3
Semi Anechoic Chamber	No.3	No.3
Date	December 1, 2024	December 1, 2024
Temperature / Humidity	23 deg. C / 42 % RH	23 deg. C / 42 % RH
Engineer	Takafumi Noguchi	Yuta Moriya
	(1 GHz to 6 GHz)	(Above 6 GHz)
Mode	Mode 1 (97.9 MHz)	

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola.	Height [cm]	Angle [deg]	Ant. Type	Comment
		(AV)	(PK)				(AV)	(PK)	(AV)	(PK)	(AV)	(PK)					
1	1852.728	29.70	43.50	25.59	2.89	32.71	25.47	39.27	53.90	73.90	28.43	34.63	Hori.	100	0	H20	
2	1950.240	28.90	42.30	25.94	2.96	32.48	25.32	38.72	53.90	73.90	28.58	35.18	Hori.	100	0	H20	
3	2340.288	29.20	42.90	27.86	3.17	32.23	28.00	41.70	53.90	73.90	25.90	32.20	Hori.	100	0	H20	
4	3120.384	28.10	42.60	28.77	3.56	31.91	28.52	43.02	53.90	73.90	25.38	30.88	Hori.	100	0	H20	
5	3510.432	34.70	44.50	29.01	3.73	31.71	35.73	45.53	53.90	73.90	18.17	28.37	Hori.	100	174	H20	
6	3607.944	28.00	42.10	29.25	3.78	31.67	29.36	43.46	53.90	73.90	24.54	30.44	Hori.	100	0	H20	
7	3802.968	27.80	42.10	29.50	3.86	31.57	29.59	43.89	53.90	73.90	24.31	30.01	Hori.	100	0	H20	
8	1852.728	29.70	43.80	25.59	2.89	32.71	25.47	39.57	53.90	73.90	28.43	34.33	Vert.	100	0	H20	
9	1950.240	28.90	42.30	25.94	2.96	32.48	25.32	38.72	53.90	73.90	28.58	35.18	Vert.	100	0	H20	
10	2340.288	29.20	43.00	27.86	3.17	32.23	28.00	41.80	53.90	73.90	25.90	32.10	Vert.	100	0	H20	
11	3120.384	28.20	42.70	28.77	3.56	31.91	28.62	43.12	53.90	73.90	25.28	30.78	Vert.	100	0	H20	
12	3510.432	35.20	44.50	29.01	3.73	31.71	36.23	45.53	53.90	73.90	17.67	28.37	Vert.	302	162	H20	
13	3607.944	28.00	42.00	29.25	3.78	31.67	29.36	43.36	53.90	73.90	24.54	30.54	Vert.	100	0	H20	
14	3802.968	27.80	42.20	29.50	3.86	31.57	29.59	43.99	53.90	73.90	24.31	29.91	Vert.	100	0	H20	

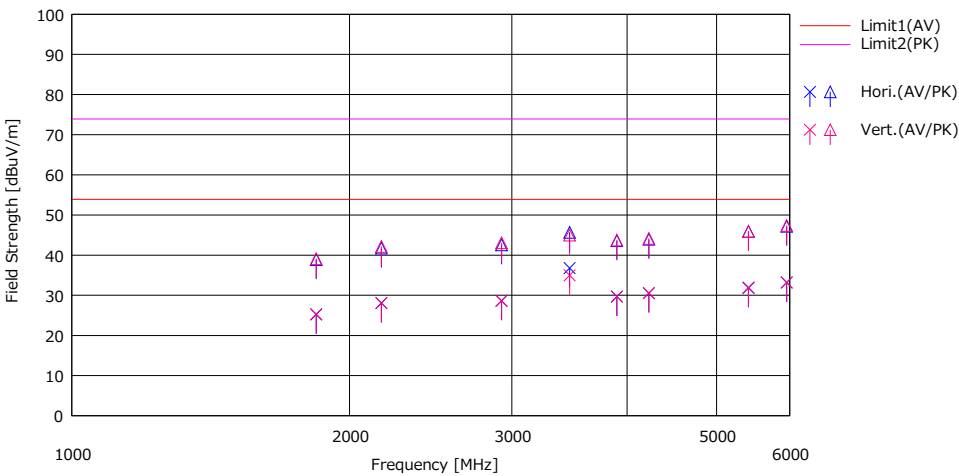
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 6 GHz.

Radiated Emission
(Digital)

Test place	Ise EMC Lab.	No.3
Semi Anechoic Chamber	No.3	No.3
Date	December 1, 2024	December 1, 2024
Temperature / Humidity	23 deg. C / 42 % RH	23 deg. C / 42 % RH
Engineer	Takafumi Noguchi	Yuta Moriya
	(1 GHz to 6 GHz)	(Above 6 GHz)
Mode	Mode 1 (107.9 MHz)	

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		(AV) [dBuV]	(PK) [dBuV]				(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dB]	(PK) [dB]					
1	1840.896	29.50	43.20	25.55	2.89	32.74	25.20	38.90	53.90	73.90	28.70	35.00	Hori.	100	0	H2O	
2	2165.760	29.30	43.00	27.98	3.08	32.30	28.06	41.76	53.90	73.90	25.84	32.14	Hori.	100	0	H2O	
3	2923.776	28.60	42.50	28.58	3.47	32.00	28.65	42.55	53.90	73.90	25.25	31.35	Hori.	100	0	H2O	
4	3465.216	36.00	44.90	28.80	3.71	31.74	36.77	45.67	53.90	73.90	17.13	28.23	Hori.	100	175	H2O	
5	3898.368	27.50	41.40	29.77	3.91	31.52	29.66	43.56	53.90	73.90	24.24	30.34	Hori.	100	0	H2O	
6	4223.232	27.60	41.00	30.29	4.04	31.39	30.54	43.94	53.90	73.90	23.36	29.96	Hori.	100	0	H2O	
7	5414.400	26.60	40.70	31.87	4.50	31.13	31.84	45.94	53.90	73.90	22.06	27.96	Hori.	100	0	H2O	
8	5955.840	27.20	41.20	32.44	4.69	31.17	33.16	47.16	53.90	73.90	20.74	26.74	Hori.	100	0	H2O	
9	1840.896	29.60	43.40	25.55	2.89	32.74	25.30	39.10	53.90	73.90	28.60	34.80	Vert.	100	0	H2O	
10	2165.760	29.30	43.40	27.98	3.08	32.30	28.06	42.16	53.90	73.90	25.84	31.74	Vert.	100	0	H2O	
11	2923.776	28.60	43.00	28.58	3.47	32.00	28.65	43.05	53.90	73.90	25.25	30.85	Vert.	100	0	H2O	
12	3465.216	34.20	44.20	28.80	3.71	31.74	34.97	44.97	53.90	73.90	18.93	28.93	Vert.	100	174	H2O	
13	3898.368	27.50	41.60	29.77	3.91	31.52	29.66	43.76	53.90	73.90	24.24	30.14	Vert.	100	0	H2O	
14	4223.232	27.60	41.20	30.29	4.04	31.39	30.54	44.14	53.90	73.90	23.36	29.76	Vert.	100	0	H2O	
15	5414.400	26.70	40.60	31.87	4.50	31.13	31.94	45.84	53.90	73.90	21.96	28.06	Vert.	100	0	H2O	
16	5955.840	27.20	41.40	32.44	4.69	31.17	33.16	47.36	53.90	73.90	20.74	26.54	Vert.	100	0	H2O	

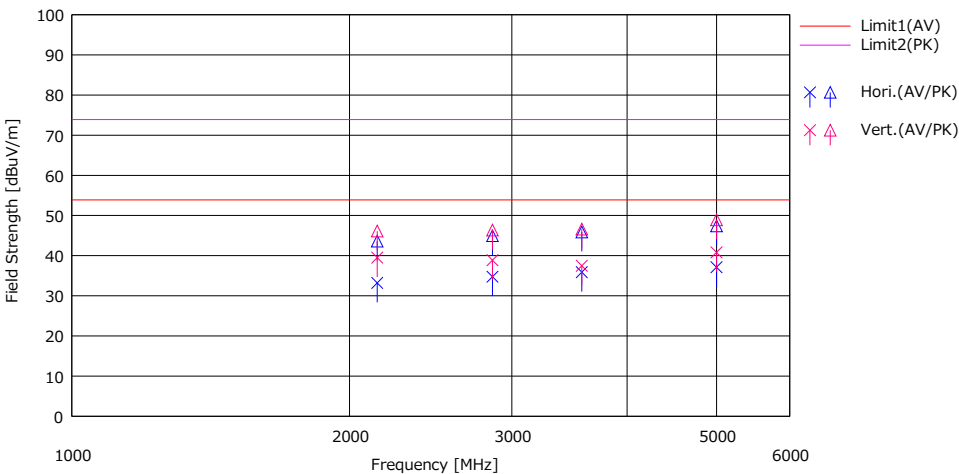
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 6 GHz.

Radiated Emission
(Digital)

Test place	Ise EMC Lab.	No.3
Semi Anechoic Chamber	No.3	No.3
Date	December 1, 2024	December 1, 2024
Temperature / Humidity	23 deg. C / 42 % RH	23 deg. C / 42 % RH
Engineer	Takafumi Noguchi	Yuta Moriya
	(1 GHz to 6 GHz)	(Above 6 GHz)
Mode	Mode 2	

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		(AV) [dBuV]	(PK) [dBuV]				(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dB]	(PK) [dB]					
1	2143.258	34.70	45.10	27.74	3.07	32.30	33.21	43.61	53.90	73.90	20.69	30.29	Hori.	110	226	H2O	
2	2857.677	34.80	45.00	28.54	3.44	32.03	34.75	44.95	53.90	73.90	19.15	28.95	Hori.	100	235	H2O	
3	3572.096	34.60	44.60	29.20	3.76	31.68	35.88	45.88	53.90	73.90	18.02	28.02	Hori.	100	235	H2O	
4	5000.000	32.10	42.40	31.77	4.35	31.11	37.11	47.41	53.90	73.90	16.79	26.49	Hori.	100	235	H2O	
5	2143.258	41.00	47.60	27.74	3.07	32.30	39.51	46.11	53.90	73.90	14.39	27.79	Vert.	117	182	H2O	
6	2857.677	38.90	46.40	28.54	3.44	32.03	38.85	46.35	53.90	73.90	15.05	27.55	Vert.	100	202	H2O	
7	3572.096	36.20	45.30	29.20	3.76	31.68	37.48	46.58	53.90	73.90	16.42	27.32	Vert.	157	168	H2O	
8	5000.000	35.80	43.90	31.77	4.35	31.11	40.81	48.91	53.90	73.90	13.09	24.99	Vert.	330	116	H2O	

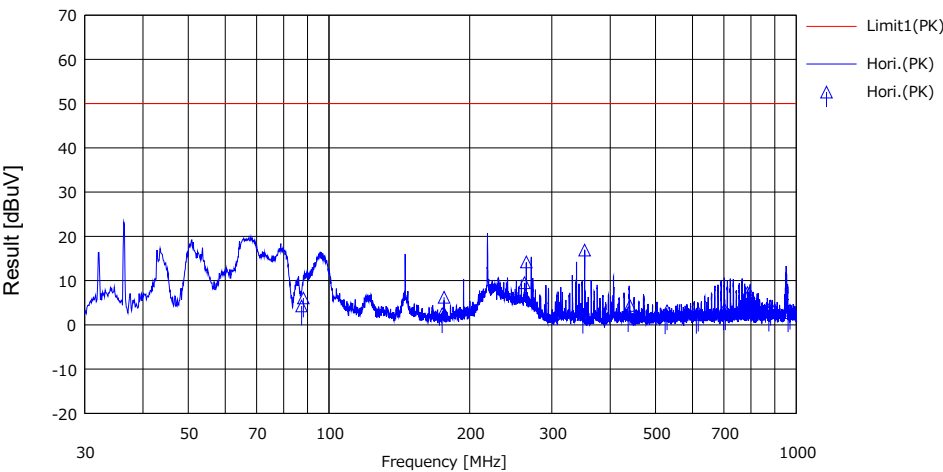
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 6 GHz.

Antenna Terminal Conducted Emission
(Analog)

Test place Ise EMC Lab.
Measurement Room No.6
Date November 8, 2024
Temperature / Humidity 20 deg. C / 49 % RH
Engineer Hiroyuki Furutaka
Mode Mode 3 (87.75 MHz)

Limit : FCC15.111 Antenna terminal measurement



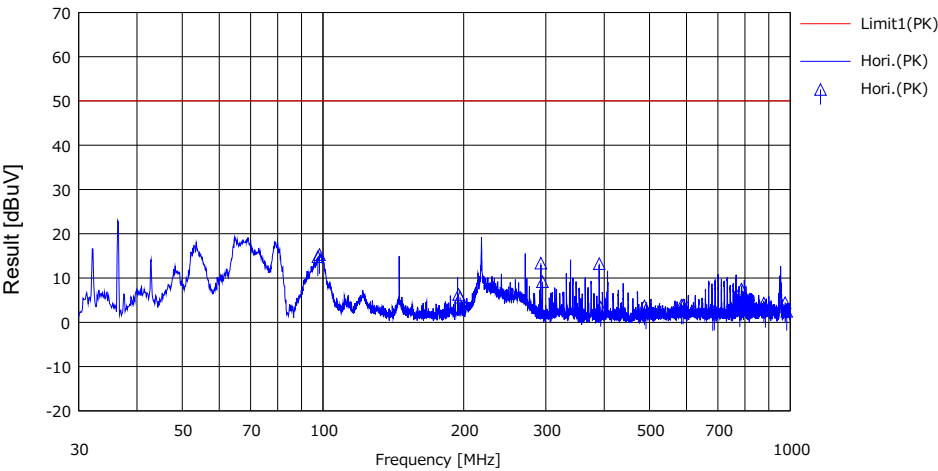
No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit *1)	Margin	Pols. [H/V]	Ant. Type	Comment
		(PK) [dBuV]				(PK) [dBuV]	(PK) [dBuV]	(PK) [dB]			
1	87.362	30.10	0.00	6.24	32.08	4.26	50.00	45.74		---	
2	88.138	31.90	0.00	6.25	32.08	6.07	50.00	43.93		---	
3	174.724	28.20	0.00	6.34	32.02	2.52	50.00	47.48		---	
4	176.276	31.90	0.00	6.35	32.02	6.23	50.00	43.77		---	
5	262.086	35.10	0.00	6.44	32.02	9.52	50.00	40.48		---	
6	264.414	39.80	0.00	6.45	32.02	14.23	50.00	35.77		---	
7	349.448	27.90	0.00	6.55	32.06	2.39	50.00	47.61		---	
8	352.552	42.40	0.00	6.57	32.06	16.91	50.00	33.09		---	
9	436.810	28.10	0.00	6.80	32.14	2.76	50.00	47.24		---	
10	440.690	29.70	0.00	6.81	32.14	4.37	50.00	45.63		---	
11	524.172	27.60	0.00	6.86	32.20	2.26	50.00	47.74		---	
12	528.828	28.50	0.00	6.86	32.20	3.16	50.00	46.84		---	
13	611.534	27.80	0.00	6.82	32.25	2.37	50.00	47.63		---	
14	616.966	28.30	0.00	6.82	32.25	2.87	50.00	47.13		---	
15	698.896	28.60	0.00	6.83	32.29	3.14	50.00	46.86		---	
16	705.104	28.60	0.00	6.83	32.26	3.17	50.00	46.83		---	
17	786.258	32.20	0.00	6.87	31.78	7.29	50.00	42.71		---	
18	793.242	32.10	0.00	6.88	31.74	7.24	50.00	42.76		---	
19	873.620	27.20	0.00	6.94	31.27	2.87	50.00	47.13		---	
20	881.380	28.50	0.00	6.95	31.23	4.22	50.00	45.78		---	
21	960.982	26.50	0.00	7.00	30.76	2.74	50.00	47.26		---	
22	969.518	27.00	0.00	7.00	30.71	3.29	50.00	46.71		---	

* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad) – GAIN (AMP)
Except for the above table: adequate margin data below the limits.

Antenna Terminal Conducted Emission
(Analog)

Test place Ise EMC Lab.
Measurement Room No.6
Date November 8, 2024
Temperature / Humidity 20 deg. C / 49 % RH
Engineer Hiroyuki Furutaka
Mode Mode 3 (97.9 MHz)

Limit : FCC15.111 Antenna terminal measurement



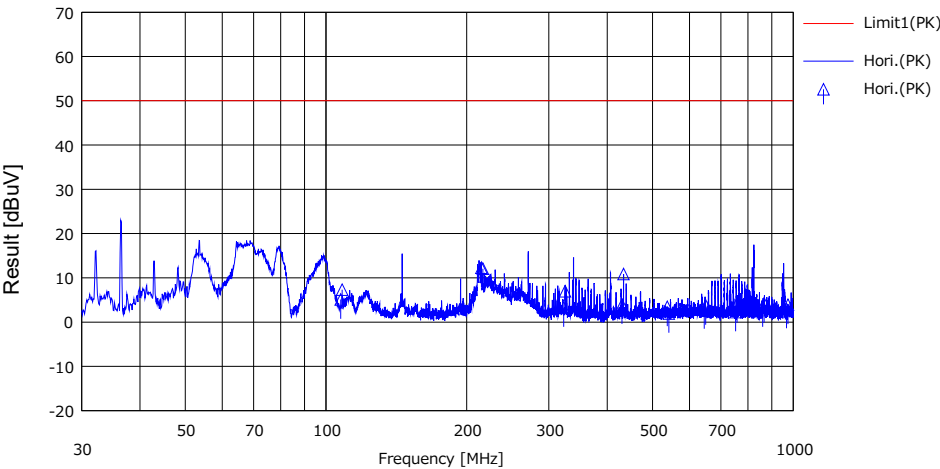
No.	Freq. [MHz]	Reading (PK)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK)	Limit*1)	Margin (PK)	Pols. [H/V]	Ant. Type	Comment
		[dBuV]				[dBuV]	[dBuV]				
1	97.512	40.60	0.00	6.26	32.06	14.80	50.00	35.20	---	---	
2	98.288	41.10	0.00	6.26	32.06	15.30	50.00	34.70	---	---	
3	195.024	31.90	0.00	6.37	32.01	6.26	50.00	43.74	---	---	
4	196.576	31.30	0.00	6.37	32.01	5.66	50.00	44.34	---	---	
5	292.536	38.90	0.00	6.48	32.02	13.36	50.00	36.64	---	---	
6	294.864	34.70	0.00	6.48	32.02	9.16	50.00	40.84	---	---	
7	390.048	38.70	0.00	6.65	32.10	13.25	50.00	36.75	---	---	
8	393.152	28.80	0.00	6.65	32.10	3.35	50.00	46.65	---	---	
9	487.560	29.00	0.00	6.88	32.18	3.70	50.00	46.30	---	---	
10	491.440	28.10	0.00	6.88	32.18	2.80	50.00	47.20	---	---	
11	585.072	29.30	0.00	6.82	32.23	3.89	50.00	46.11	---	---	
12	589.728	29.30	0.00	6.81	32.23	3.88	50.00	46.12	---	---	
13	682.584	27.90	0.00	6.82	32.28	2.44	50.00	47.56	---	---	
14	688.016	28.00	0.00	6.83	32.28	2.55	50.00	47.45	---	---	
15	780.096	28.20	0.00	6.87	31.82	3.25	50.00	46.75	---	---	
16	786.304	32.40	0.00	6.87	31.78	7.49	50.00	42.51	---	---	
17	877.608	28.60	0.00	6.95	31.25	4.30	50.00	45.70	---	---	
18	884.592	27.40	0.00	6.95	31.21	3.14	50.00	46.86	---	---	
19	975.120	28.10	0.00	7.01	30.68	4.43	50.00	45.57	---	---	
20	982.880	26.10	0.00	7.01	30.63	2.48	50.00	47.52	---	---	

* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad) – GAIN (AMP)
Except for the above table: adequate margin data below the limits.

Antenna Terminal Conducted Emission
(Analog)

Test place Ise EMC Lab.
Measurement Room No.6
Date November 8, 2024
Temperature / Humidity 20 deg. C / 49 % RH
Engineer Hiroyuki Furutaka
Mode Mode 3 (107.9 MHz)

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit *1)	Margin [dB]	Polt. [H/V]	Ant. Type	Comment
		(PK) [dBuV]				(PK) [dBuV]	(PK) [dBuV]				
1	107.512	30.90	0.00	6.27	32.06	5.11	50.00	44.89		---	
2	108.288	33.10	0.00	6.27	32.06	7.31	50.00	42.69		---	
3	215.024	37.90	0.00	6.39	32.01	12.28	50.00	37.72		---	
4	216.576	37.70	0.00	6.39	32.01	12.08	50.00	37.92		---	
5	322.536	28.80	0.00	6.52	32.04	3.28	50.00	46.72		---	
6	324.864	32.50	0.00	6.52	32.04	6.98	50.00	43.02		---	
7	430.048	29.30	0.00	6.77	32.13	3.94	50.00	46.06		---	
8	433.152	36.20	0.00	6.78	32.13	10.85	50.00	39.15		---	
9	537.560	28.80	0.00	6.84	32.21	3.43	50.00	46.57		---	
10	541.440	27.30	0.00	6.84	32.21	1.93	50.00	48.07		---	
11	645.072	28.30	0.00	6.81	32.26	2.85	50.00	47.15		---	
12	649.728	29.20	0.00	6.81	32.26	3.75	50.00	46.25		---	
13	752.584	27.40	0.00	6.85	31.98	2.27	50.00	47.73		---	
14	758.016	29.30	0.00	6.85	31.95	4.20	50.00	45.80		---	
15	860.096	27.70	0.00	6.94	31.35	3.29	50.00	46.71		---	
16	866.304	28.60	0.00	6.94	31.31	4.23	50.00	45.77		---	
17	967.608	26.70	0.00	7.00	30.72	2.98	50.00	47.02		---	
18	974.592	27.60	0.00	7.00	30.68	3.92	50.00	46.08		---	

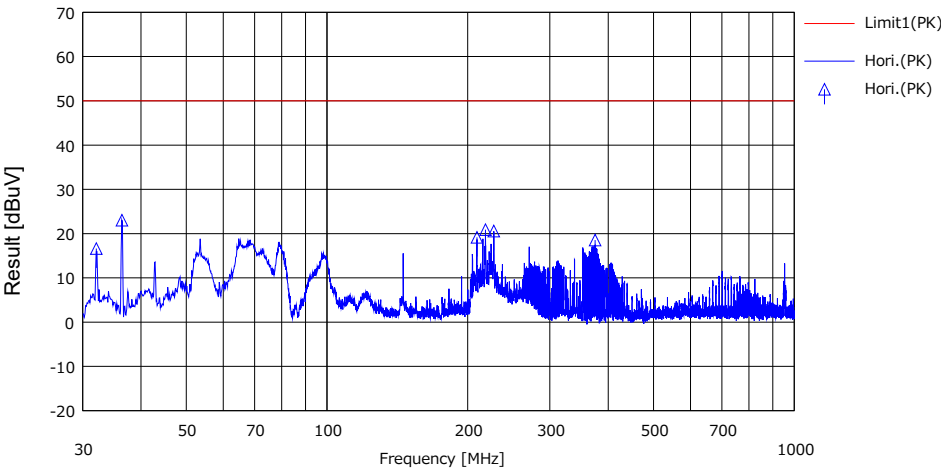
* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad) – GAIN (AMP)
Except for the above table: adequate margin data below the limits.

Antenna Terminal Conducted Emission
(Analog)

Test place
Measurement Room
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.6
November 8, 2024
20 deg. C / 49 % RH
Hiroyuki Furutaka
Mode 4

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading (PK)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK)	Limit *1)	Margin	Polt. [H/V]	Ant. Type	Comment
		[dBuV]				[dBuV]	(PK) [dBuV]	(PK) [dB]			
1	32.090	42.60	0.00	6.13	32.12	16.61	50.00	33.39	---	---	
2	36.389	49.00	0.00	6.14	32.11	23.03	50.00	26.97	---	---	
3	209.302	44.80	0.00	6.38	32.01	19.17	50.00	30.83	---	---	
4	218.409	46.50	0.00	6.39	32.01	20.88	50.00	29.12	---	---	
5	227.493	46.20	0.00	6.40	32.01	20.59	50.00	29.41	---	---	
6	374.752	44.00	0.00	6.61	32.08	18.53	50.00	31.47	---	---	

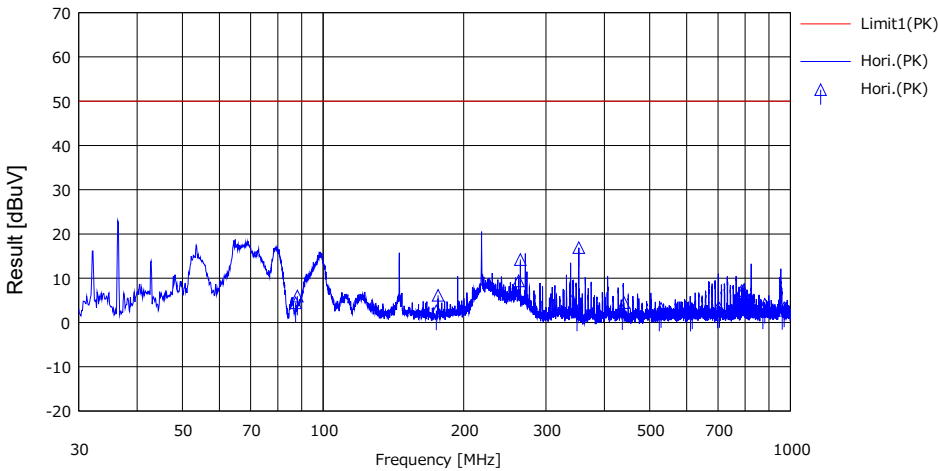
* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad) – GAIN (AMP)
Except for the above table: adequate margin data below the limits.

Antenna Terminal Conducted Emission
(Digital)

Test place
Measurement Room
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.6
November 8, 2024
20 deg. C / 49 % RH
Hiroyuki Furutaka
Mode 3 (87.75 MHz)

Limit : FCC15.111 Antenna terminal measurement



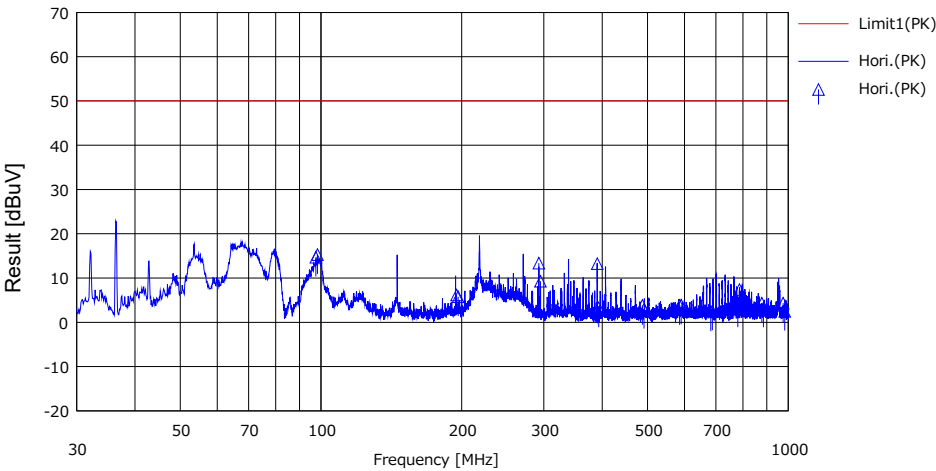
No.	Freq. [MHz]	Reading (PK)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK)	Limit *1)	Margin	Pola [H/V]	Ant. Type	Comment
		[dBuV]				[dBuV]	[dBuV]	[dB]			
1	87.362	30.30	0.00	6.24	32.08	4.46	50.00	45.54		---	
2	88.138	31.80	0.00	6.25	32.08	5.97	50.00	44.03		---	
3	174.724	28.30	0.00	6.34	32.02	2.62	50.00	47.38		---	
4	176.276	31.80	0.00	6.35	32.02	6.13	50.00	43.87		---	
5	262.086	35.00	0.00	6.44	32.02	9.42	50.00	40.58		---	
6	264.414	39.80	0.00	6.45	32.02	14.23	50.00	35.77		---	
7	349.448	27.90	0.00	6.55	32.06	2.39	50.00	47.61		---	
8	352.552	42.40	0.00	6.57	32.06	16.91	50.00	33.09		---	
9	436.810	28.00	0.00	6.80	32.14	2.66	50.00	47.34		---	
10	440.690	29.80	0.00	6.81	32.14	4.47	50.00	45.53		---	
11	524.172	27.70	0.00	6.86	32.20	2.36	50.00	47.64		---	
12	528.828	28.50	0.00	6.86	32.20	3.16	50.00	46.84		---	
13	611.534	27.80	0.00	6.82	32.25	2.37	50.00	47.63		---	
14	616.966	28.30	0.00	6.82	32.25	2.87	50.00	47.13		---	
15	698.896	28.50	0.00	6.83	32.29	3.04	50.00	46.96		---	
16	705.104	28.60	0.00	6.83	32.26	3.17	50.00	46.83		---	
17	786.258	32.10	0.00	6.87	31.78	7.19	50.00	42.81		---	
18	793.242	32.10	0.00	6.88	31.74	7.24	50.00	42.76		---	
19	873.620	27.20	0.00	6.94	31.27	2.87	50.00	47.13		---	
20	881.380	28.40	0.00	6.95	31.23	4.12	50.00	45.88		---	
21	960.982	26.50	0.00	7.00	30.76	2.74	50.00	47.26		---	
22	969.518	27.00	0.00	7.00	30.71	3.29	50.00	46.71		---	

* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad) – GAIN (AMP)
Except for the above table: adequate margin data below the limits.

Antenna Terminal Conducted Emission
(Digital)

Test place Ise EMC Lab.
Measurement Room No.6
Date November 8, 2024
Temperature / Humidity 20 deg. C / 49 % RH
Engineer Hiroyuki Furutaka
Mode Mode 3 (97.9 MHz)

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading (PK)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK)	Limit *1)	Margn. (PK)	Pols. [H/V]	Ant. Type	Comment
		[dBuV]				[dBuV]	[dBuV]	[dB]			
1	97.512	40.50	0.00	6.26	32.06	14.70	50.00	35.30	---	---	
2	98.288	41.10	0.00	6.26	32.06	15.30	50.00	34.70	---	---	
3	195.024	31.80	0.00	6.37	32.01	6.16	50.00	43.84	---	---	
4	196.576	31.40	0.00	6.37	32.01	5.76	50.00	44.24	---	---	
5	292.536	38.90	0.00	6.48	32.02	13.36	50.00	36.64	---	---	
6	294.864	34.80	0.00	6.48	32.02	9.26	50.00	40.74	---	---	
7	390.048	38.70	0.00	6.65	32.10	13.25	50.00	36.75	---	---	
8	393.152	28.70	0.00	6.65	32.10	3.25	50.00	46.75	---	---	
9	487.560	29.10	0.00	6.88	32.18	3.80	50.00	46.20	---	---	
10	491.440	28.20	0.00	6.88	32.18	2.90	50.00	47.10	---	---	
11	585.072	29.20	0.00	6.82	32.23	3.79	50.00	46.21	---	---	
12	589.728	29.30	0.00	6.81	32.23	3.88	50.00	46.12	---	---	
13	682.584	27.80	0.00	6.82	32.28	2.34	50.00	47.66	---	---	
14	688.016	28.00	0.00	6.83	32.28	2.55	50.00	47.45	---	---	
15	780.096	28.20	0.00	6.87	31.82	3.25	50.00	46.75	---	---	
16	786.304	32.30	0.00	6.87	31.78	7.39	50.00	42.61	---	---	
17	877.608	28.60	0.00	6.95	31.25	4.30	50.00	45.70	---	---	
18	884.592	27.50	0.00	6.95	31.21	3.24	50.00	46.76	---	---	
19	975.120	28.00	0.00	7.01	30.68	4.33	50.00	45.67	---	---	
20	982.880	26.10	0.00	7.01	30.63	2.48	50.00	47.52	---	---	

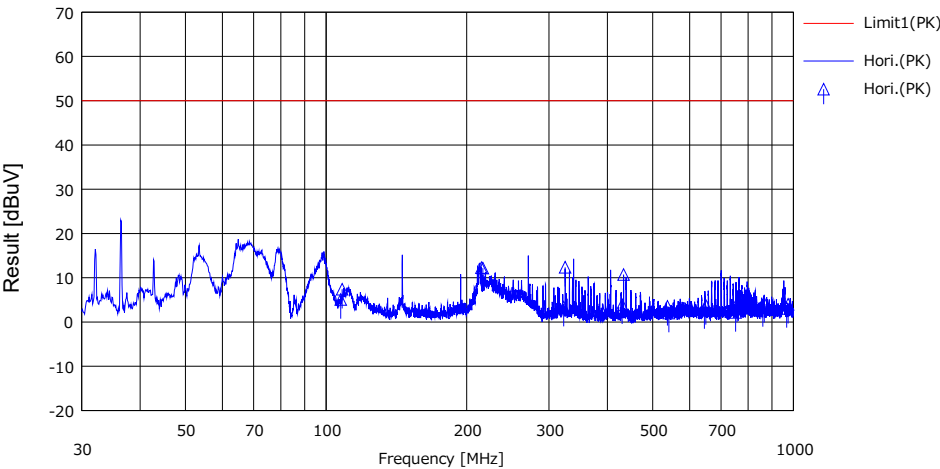
* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad) – GAIN (AMP)
Except for the above table: adequate margin data below the limits.

Antenna Terminal Conducted Emission
(Digital)

Test place
Measurement Room
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.6
November 8, 2024
20 deg. C / 49 % RH
Hiroyuki Furutaka
Mode 3 (107.9 MHz)

Limit : FCC15.111 Antenna terminal measurement



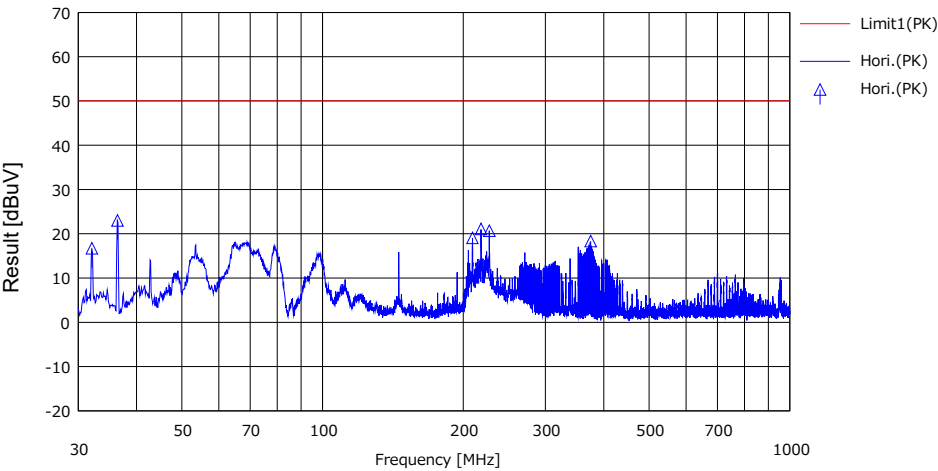
No.	Freq. [MHz]	Reading (PK)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK)	Limit *1)	Margin	Pols. [H/V]	Ant. Type	Comment
		[dBuV]				[dBuV]	[dBuV]	[dB]			
1	107.512	30.90	0.00	6.27	32.06	5.11	50.00	44.89		---	
2	108.288	33.20	0.00	6.27	32.06	7.41	50.00	42.59		---	
3	215.024	37.90	0.00	6.39	32.01	12.28	50.00	37.72		---	
4	216.576	37.80	0.00	6.39	32.01	12.18	50.00	37.82		---	
5	322.536	28.90	0.00	6.52	32.04	3.38	50.00	46.62		---	
6	324.864	37.90	0.00	6.52	32.04	12.38	50.00	37.62		---	
7	430.048	29.30	0.00	6.77	32.13	3.94	50.00	46.06		---	
8	433.152	36.10	0.00	6.78	32.13	10.75	50.00	39.25		---	
9	537.560	28.90	0.00	6.84	32.21	3.53	50.00	46.47		---	
10	541.440	27.40	0.00	6.84	32.21	2.03	50.00	47.97		---	
11	645.072	28.30	0.00	6.81	32.26	2.85	50.00	47.15		---	
12	649.728	29.20	0.00	6.81	32.26	3.75	50.00	46.25		---	
13	752.584	27.30	0.00	6.85	31.98	2.17	50.00	47.83		---	
14	758.016	29.40	0.00	6.85	31.95	4.30	50.00	45.70		---	
15	860.096	27.70	0.00	6.94	31.35	3.29	50.00	46.71		---	
16	866.304	28.60	0.00	6.94	31.31	4.23	50.00	45.77		---	
17	967.608	26.80	0.00	7.00	30.72	3.08	50.00	46.92		---	
18	974.592	27.70	0.00	7.00	30.68	4.02	50.00	45.98		---	

* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad) – GAIN (AMP)
Except for the above table: adequate margin data below the limits.

Antenna Terminal Conducted Emission
(Digital)

Test place Ise EMC Lab.
Measurement Room No.6
Date November 8, 2024
Temperature / Humidity 20 deg. C / 49 % RH
Engineer Hiroyuki Furutaka
Mode Mode 4

Limit : FCC15.111 Antenna terminal measurement



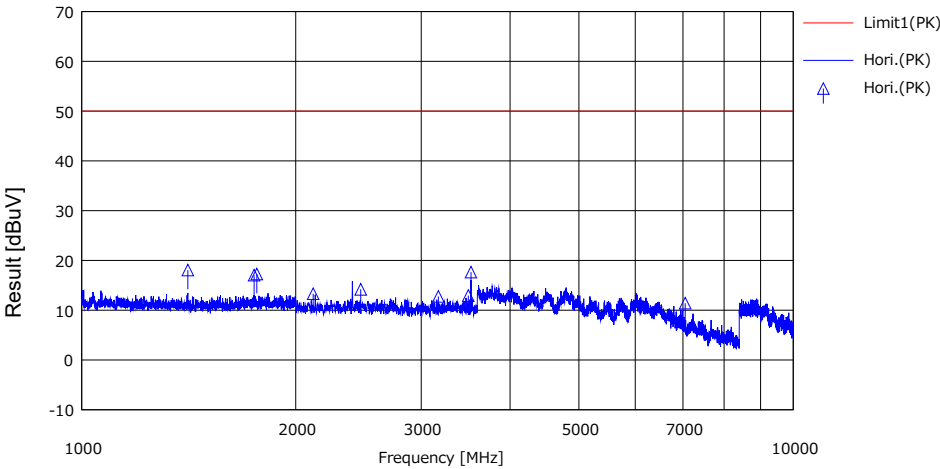
No.	Freq. [MHz]	Reading (PK) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK) [dBuV]	Limit **1) (PK) [dBuV]	Margn (PK) [dB]	Pola. [H/V]	Ant. Type	Comment
1	32.090	42.70	0.00	6.13	32.12	16.71	50.00	33.29		---	
2	36.389	49.00	0.00	6.14	32.11	23.03	50.00	26.97		---	
3	209.302	44.70	0.00	6.38	32.01	19.07	50.00	30.93		---	
4	218.409	46.70	0.00	6.39	32.01	21.08	50.00	28.92		---	
5	227.493	46.30	0.00	6.40	32.01	20.69	50.00	29.31		---	
6	374.752	43.80	0.00	6.61	32.08	18.33	50.00	31.67		---	

* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad) – GAIN (AMP)
Except for the above table: adequate margin data below the limits.

Antenna Terminal Conducted Emission
(Analog)

Test place Ise EMC Lab.
Measurement Room No.6
Date November 8, 2024
Temperature / Humidity 20 deg. C / 49 % RH
Engineer Hiroyuki Furutaka
Mode Mode 3 (87.75 MHz)

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result	Limit *1)	Margin	Pola. [H/V]	Ant. Type	Comment
		(PK) [dBuV]				(PK) [dBuV]	(PK) [dBuV]	(PK) [dB]			
1	1410.208	45.40	0.00	6.44	33.78	18.06	50.00	31.94		---	
2	1747.240	43.50	0.00	6.50	32.97	17.03	50.00	32.97		---	
3	1762.760	43.70	0.00	6.50	32.93	17.27	50.00	32.73		---	
4	2115.312	43.40	0.00	2.22	32.32	13.30	50.00	36.70		---	
5	2467.864	44.10	0.00	2.27	32.18	14.19	50.00	35.81		---	
6	3172.968	42.30	0.00	2.34	31.88	12.76	50.00	37.24		---	
7	3494.480	42.30	0.00	2.36	31.72	12.94	50.00	37.06		---	
8	3525.520	47.00	0.00	2.37	31.71	17.66	50.00	32.34		---	
9	7051.040	40.70	0.00	2.64	31.94	11.40	50.00	38.60		---	

* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
1000 to 2000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad + DC Block) – GAIN (AMP)
2000 to 10000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + ATT + DC Block) – GAIN (AMP)

Except for the above table: adequate margin data below the limits.

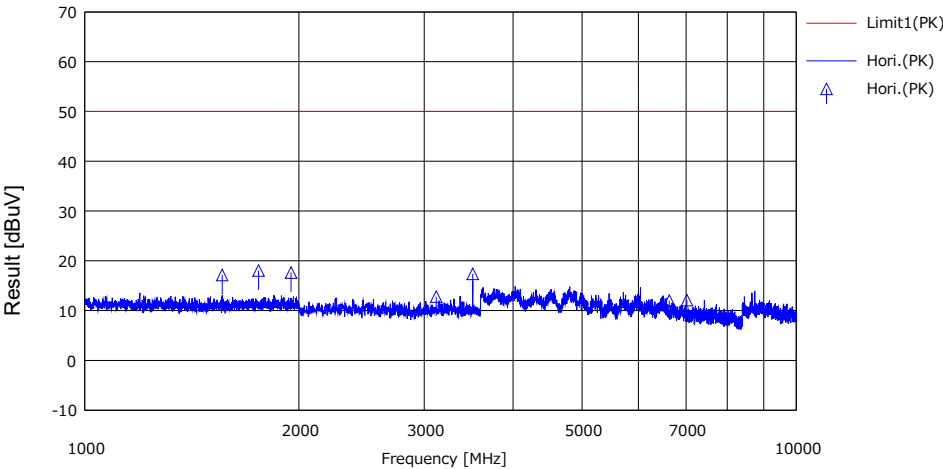
* No signal was detected above 10 GHz.

Antenna Terminal Conducted Emission
(Analog)

Test place
Measurement Room
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.6
November 8, 2024
20 deg. C / 49 % RH
Hiroyuki Furutaka
Mode 3 (97.9 MHz)

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit *1)	Margin	Pola. [H/V]	Ant. Type	Comment
		(PK) [dBuV]				(PK) [dBuV]	(PK) [dBuV]	(PK) [dB]			
1	1560.192	44.10	0.00	6.47	33.42	17.15	50.00	32.85	---	---	
2	1755.216	44.50	0.00	6.50	32.95	18.05	50.00	31.95	---	---	
3	1950.240	43.60	0.00	6.52	32.48	17.64	50.00	32.36	---	---	
4	3120.384	42.40	0.00	2.33	31.91	12.82	50.00	37.18	---	---	
5	3510.432	46.70	0.00	2.37	31.71	17.36	50.00	32.64	---	---	
6	6630.816	41.00	0.00	2.63	31.64	11.99	50.00	38.01	---	---	
7	7020.864	41.40	0.00	2.64	31.93	12.11	50.00	37.89	---	---	

* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
1000 to 2000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad + DC Block) – GAIN (AMP)
2000 to 10000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + ATT + DC Block) – GAIN (AMP)

Except for the above table: adequate margin data below the limits.

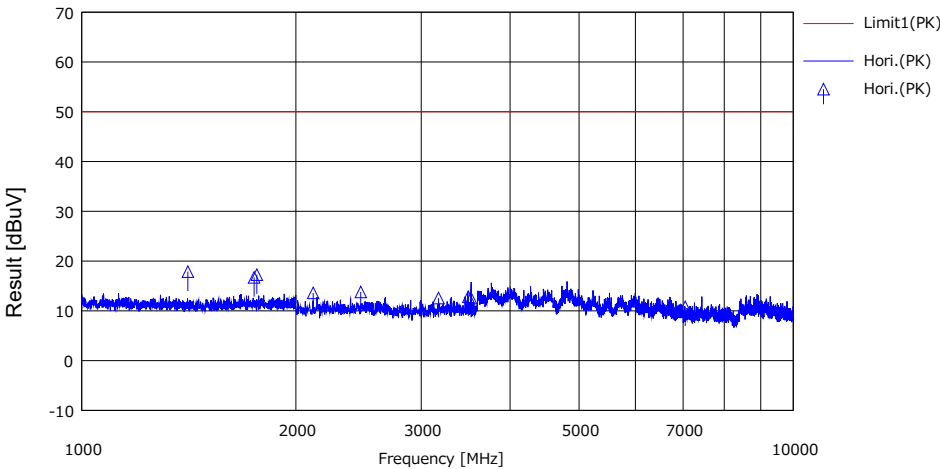
* No signal was detected above 10 GHz.

Antenna Terminal Conducted Emission
(Analog)

Test place
Measurement Room
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab.
No.6
November 8, 2024
20 deg. C / 49 % RH
Hiroyuki Furutaka
Mode 3 (107.9 MHz)

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading (PK) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK) [dBuV]	Limit *1) (PK) [dBuV]	Margin (PK) [dB]	Pols. [H/V]	Ant. Type	Comment
1	1410.208	45.20	0.00	6.44	33.78	17.86	50.00	32.14		---	
2	1747.240	43.20	0.00	6.50	32.97	16.73	50.00	33.27		---	
3	1762.760	43.70	0.00	6.50	32.93	17.27	50.00	32.73		---	
4	2115.312	43.70	0.00	2.22	32.32	13.60	50.00	36.40		---	
5	2467.864	43.70	0.00	2.27	32.18	13.79	50.00	36.21		---	
6	3172.968	42.10	0.00	2.34	31.88	12.56	50.00	37.44		---	
7	3494.480	42.20	0.00	2.36	31.72	12.84	50.00	37.16		---	
8	3525.520	41.90	0.00	2.37	31.71	12.56	50.00	37.44		---	
9	7061.040	40.10	0.00	2.64	31.94	10.80	50.00	39.20		---	

* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
1000 to 2000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad + DC Block) – GAIN (AMP)
2000 to 10000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + ATT + DC Block) – GAIN (AMP)

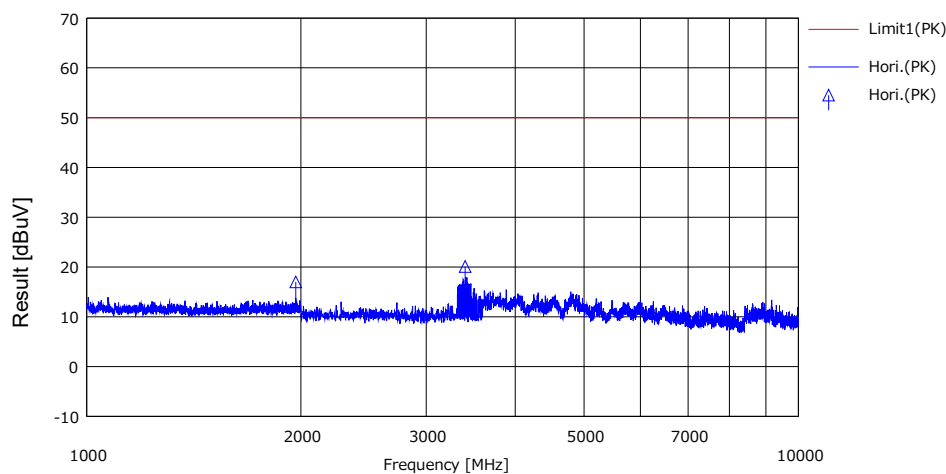
Except for the above table: adequate margin data below the limits.

* No signal was detected above 10 GHz.

Antenna Terminal Conducted Emission (Analog)

Test place	Ise EMC Lab.
Measurement Room	No.6
Date	November 8, 2024
Temperature / Humidity	20 deg. C / 49 % RH
Engineer	Hiroyuki Furutaka
Mode	Mode 4

Limit : FCC15.111 Antenna terminal measurement



No.	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit *1)	Margin	Pola.	Ant. Type	Comment
		(PK)				(PK)	(PK)				
		[dBuV]				[dB/m]	[dB]	[dBuV]			
1	1966.505	42.90	0.00	6.53	32.44	16.99	50.00	33.01		---	
2	3401.730	49.50	0.00	2.36	31.77	20.09	50.00	29.91		---	Load 94.1 MHz

* 2 nW = -57 dBm = 50 dBuV

CHART: WITH FACTOR

1000 to 2000 MHz

CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad + DC Block) – GAIN (AMP)

2000 to 10000 MHz

CALCULATION: RESULT = READING + LOSS (CABLE + ATT + DC Block) – GAIN (AMP)

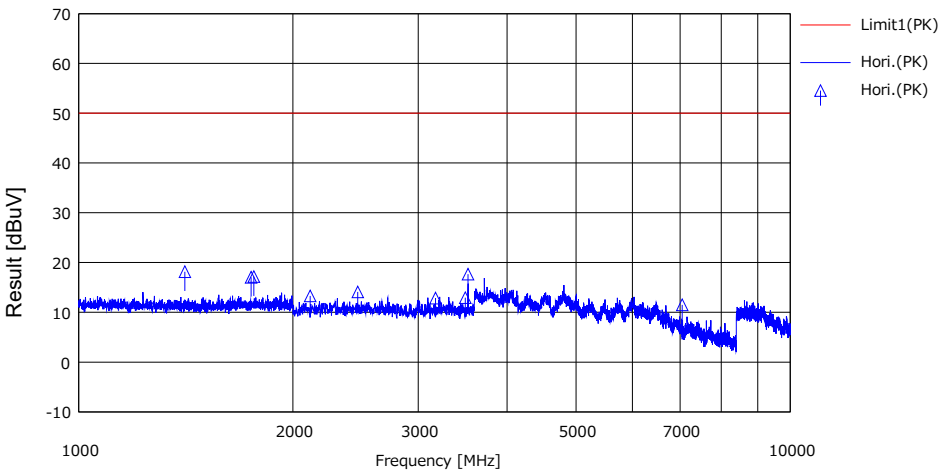
Except for the above table: adequate margin data below the limits.

* No signal was detected above 10 GHz.

Antenna Terminal Conducted Emission
(Digital)

Test place Ise EMC Lab.
Measurement Room No.6
Date November 8, 2024
Temperature / Humidity 20 deg. C / 49 % RH
Engineer Hiroyuki Furutaka
Mode Mode 3 (87.75 MHz)

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading (PK)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK)	Limit *1)	Margin (PK)	Pols. [H/V]	Ant. Type	Comment
		[dBuV]				[dBuV]	[dBuV]	[dB]			
1	1410.208	45.50	0.00	6.44	33.78	18.16	50.00	31.84		---	
2	1747.240	43.50	0.00	6.50	32.97	17.03	50.00	32.97		---	
3	1762.760	43.60	0.00	6.50	32.93	17.17	50.00	32.83		---	
4	2115.312	43.40	0.00	2.22	32.32	13.30	50.00	36.70		---	
5	2467.864	44.00	0.00	2.27	32.18	14.09	50.00	35.91		---	
6	3172.968	42.40	0.00	2.34	31.88	12.86	50.00	37.14		---	
7	3494.480	42.30	0.00	2.36	31.72	12.94	50.00	37.06		---	
8	3525.520	47.00	0.00	2.37	31.71	17.66	50.00	32.34		---	
9	7051.040	40.80	0.00	2.64	31.94	11.50	50.00	38.50		---	

* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
1000 to 2000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad + DC Block) – GAIN (AMP)
2000 to 10000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + ATT + DC Block) – GAIN (AMP)

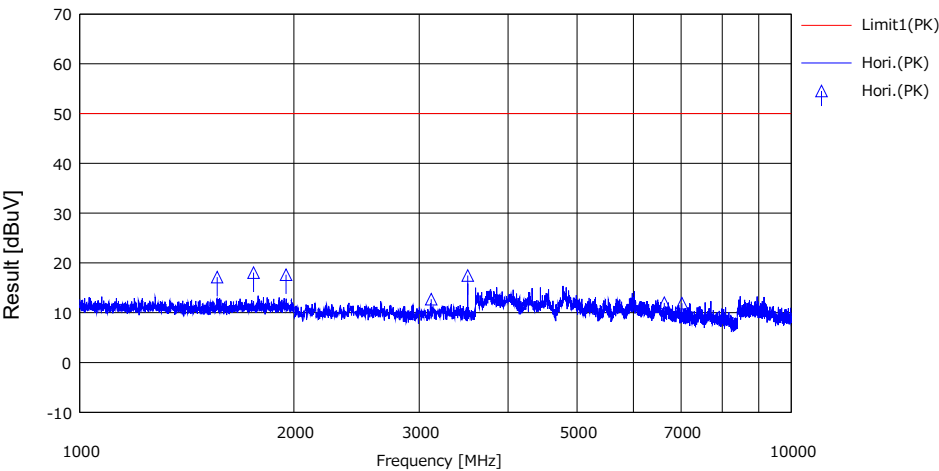
Except for the above table: adequate margin data below the limits.

* No signal was detected above 10 GHz.

Antenna Terminal Conducted Emission
(Digital)

Test place Ise EMC Lab.
Measurement Room No.6
Date November 8, 2024
Temperature / Humidity 20 deg. C / 49 % RH
Engineer Hiroyuki Furutaka
Mode Mode 3 (97.9 MHz)

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit *1)	Margn	Polz. [H/V]	Ant. Type	Comment
		(PK) [dBuV]				(PK) [dBuV]	(PK) [dBuV]	(PK) [dB]			
1	1560.192	44.10	0.00	6.47	33.42	17.15	50.00	32.85		---	
2	1755.216	44.50	0.00	6.50	32.95	18.05	50.00	31.95		---	
3	1950.240	43.60	0.00	6.52	32.48	17.64	50.00	32.36		---	
4	3120.384	42.30	0.00	2.33	31.91	12.72	50.00	37.28		---	
5	3510.432	46.80	0.00	2.37	31.71	17.46	50.00	32.54		---	
6	6630.816	41.00	0.00	2.63	31.64	11.99	50.00	38.01		---	
7	7020.864	41.20	0.00	2.64	31.93	11.91	50.00	38.09		---	

* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
1000 to 2000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad + DC Block) – GAIN (AMP)
2000 to 10000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + ATT + DC Block) – GAIN (AMP)

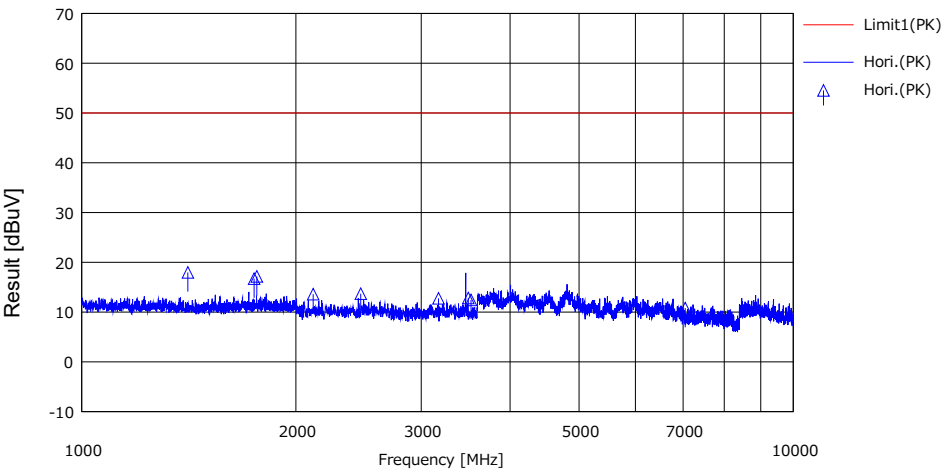
Except for the above table: adequate margin data below the limits.

* No signal was detected above 10 GHz.

Antenna Terminal Conducted Emission
(Digital)

Test place Ise EMC Lab.
Measurement Room No.6
Date November 8, 2024
Temperature / Humidity 20 deg. C / 49 % RH
Engineer Hiroyuki Furutaka
Mode Mode 3 (107.9 MHz)

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading (PK)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK)	Limit *1)	Margin	Pols. [H/V]	Ant. Type	Comment
		[dBuV]				[dBuV]	(PK) [dBuV]	(PK) [dB]			
1	1410.208	45.30	0.00	6.44	33.78	17.96	50.00	32.04		---	
2	1747.240	43.20	0.00	6.50	32.97	16.73	50.00	33.27		---	
3	1762.760	43.60	0.00	6.50	32.93	17.17	50.00	32.83		---	
4	2115.312	43.70	0.00	2.22	32.32	13.60	50.00	36.40		---	
5	2467.864	43.60	0.00	2.27	32.18	13.69	50.00	36.31		---	
6	3172.968	42.30	0.00	2.34	31.88	12.76	50.00	37.24		---	
7	3494.480	42.20	0.00	2.36	31.72	12.84	50.00	37.16		---	
8	3525.520	41.80	0.00	2.37	31.71	12.46	50.00	37.54		---	
9	7051.040	40.10	0.00	2.64	31.94	10.80	50.00	39.20		---	

* 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
1000 to 2000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + Matching Pad + DC Block) – GAIN (AMP)
2000 to 10000 MHz
CALCULATION: RESULT = READING + LOSS (CABLE + ATT + DC Block) – GAIN (AMP)

Except for the above table: adequate margin data below the limits.

* No signal was detected above 10 GHz.

APPENDIX 2: Test instruments

Test equipment

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	141327	Coaxial Cable	UL-ISE	-	-	02/09/2024	12
AT	141550	Matching Pad Anritsu	Anritsu Corporation	MB-009	40063	07/04/2024	12
AT	141558	Digital Tester(TRUE RMS MULTIMETER)	Fluke Corporation	115	17930030	05/17/2024	12
AT	141580	MicroWave System Amplifier	Keysight Technologies Inc	83017A	MY39500779	03/08/2024	12
AT	141583	Pre Amplifier	SONOMA INSTRUMENT	310	260833	04/04/2024	12
AT	141904	Spectrum Analyzer	Keysight Technologies Inc	N9030A	US51350215	11/18/2024	12
AT	156190	DC Block	EMC Instruments Corporation	N9398C	MY46457635	07/04/2024	12
AT	237927	Broadband Amplifier	ERAVANT	SBB-0115033218-2F2F-E3	27554-01	07/04/2024	12
AT	244712	Thermo-Hygrometer	HIOKI E.E. CORPORATION	LR5001	231202106	01/25/2024	12
AT	248911	Microwave Cable	Huber+Suhner	SF126E/11PC35/11 PC35/1000MM	537060/126E	05/29/2024	12
RE	141266	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-191	08/23/2024	12
RE	141323	Coaxial cable	UL-ISE	-	-	09/13/2024	12
RE	141424	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103+BBA9106	1915	03/15/2024	12
RE	141507	Horn Antenna 1-18GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	258	11/11/2024	12
RE	141513	Horn Antenna 15-40GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9170	BBHA9170306	07/19/2024	12
RE	141517	Horn Antenna 26.5-40GHz	ETS-Lindgren	3160-10	152399	11/11/2024	12
RE	141532	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	051201197	01/31/2024	12
RE	141580	MicroWave System Amplifier	Keysight Technologies Inc	83017A	MY39500779	03/08/2024	12
RE	141582	Pre Amplifier	SONOMA INSTRUMENT	310	260834	02/17/2024	12
RE	141588	Pre Amplifier	L3 Narda-MITEQ	AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P	1871355 /1871328	01/22/2024	12
RE	141884	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY44020357	05/09/2024	12
RE	141894	Signal Generator	Rohde & Schwarz	SMC100A	103408	10/28/2024	12
RE	141949	Test Receiver	Rohde & Schwarz	ESCI	100767	06/05/2024	12
RE	141951	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	05/17/2024	12
RE	142008	AC3 Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	12/11/2023	24
RE	142013	AC3 Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-10005	04/12/2023	24
RE	142183	Measure	KOMELON	KMC-36	-	10/21/2024	12
RE	142314	Attenuator	Pasternack Enterprises	PE7390-6	D/C 1504	06/06/2024	12
RE	145817	HD Radio Vector Signal Generator	MEGURO ELECTRONICS CORPORATION	MSG-3100	2100109	-	-
RE	160324	Coaxial Cable	Huber+Suhner	SUCOFLEX 102A	MY009/2A	10/25/2024	12
RE	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	208246	Vertial Machine Software	UL-ISE	VMware(R) Workstation Player	ver.16.1.2 build 17966106	-	-
RE	244709	Thermo-Hygrometer	HIOKI E.E. CORPORATION	LR5001	231202103	01/25/2024	12
RE	245787	Double Ridge Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA 9120 C	689	03/06/2024	12
RE	246001	Microwave Cable	Huber+Suhner	SF103/11PC35/11P C35/1000mm / SF126E/5000mm	800673(1m) / 610204(5m)	03/06/2024	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:

RE: Radiated emission

AT: Antenna Terminal Conducted