

EMI TEST REPORT

Test Report No. 15028994H-D-R1

Customer	DENSO TEN Limited
Description of EUT	Car Audio
Model Number of EUT	TN0023A
FCC ID	BABTN0023A
Test Regulation	FCC Part 15 Subpart B
Test Result	Complied
Issue Date	January 18, 2024
Remarks	Radiated Emission test only

Representative test engineerDaiki Matsui
Engineer**Approved by**Ryota Yamanaka
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".

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

REVISION HISTORY

Original Test Report No. 15028994H-D

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	15028994H-D	December 25, 2023	-
1	15028994H-D-R1-	January 18, 2024	P.10 Exchange the description of Item I and J

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)

CONTENTS	PAGE
SECTION 1: Customer information	5
SECTION 2: Equipment under test (EUT)	5
SECTION 3: Test specification, procedures & results	7
SECTION 4: Operation of EUT during testing	9
SECTION 5: Radiated Emission	11
APPENDIX 1: Test data	13
Radiated Emission	13
APPENDIX 2: Test instruments	34
APPENDIX 3: Photographs of test setup.....	35
Radiated Emission	35

SECTION 1: Customer information

Company Name	DENSO TEN Limited
Address	2-28, Goshō-dori 1-Chome, Hyogo-ku, Kobe, 652-8510 Japan
Telephone Number	+81-78-682-2159
Contact Person	Kaoru Abe

The information provided from the customer is as follows;

- Customer, Description of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer Information
- SECTION 2: Equipment Under Test (EUT) other than the Receipt Date and Test Date
- SECTION 4: Operation of EUT during testing

* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Description	Car Audio
Model Number	TN0023A
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	November 10, 2023
Test Date	November 22, 2023

2.2 Product Description

General Specification

Rating	DC 12 V
Clock frequency (ies) in the system	7.3333333 GHz (Max)

Radio Specification

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

Equipment Type	Transceiver
Frequency of Operation	2412 MHz to 2462 MHz
Type of Modulation	DSSS, OFDM
Antenna Gain	0.28 dBi (Peak)

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	0.08 dBi (Peak)

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

Equipment Type	Transceiver	
Frequency of Operation	20 MHz Band	5180 MHz to 5240 MHz 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	
Antenna Gain	3.67 dBi (Peak) (ANT 1) / 3.37 dBi (Peak) (ANT 2)	

[AM, HD_AM / FM, RBDS/HD_FM / SDARS]

Equipment Type	Receiver
Frequency of Operation	AM, HD_AM: 530 kHz to 1710 kHz FM, RBDS/HD_FM: 87.75 MHz to 107.9 MHz SDARS: 2320 MHz to 2345 MHz

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
Radiated emission	ANSI C63.4: 2014 + C63.4a: 2017 8. Radiated emission measurements IEEE 187:2003	Part 15 Subpart B 15.109(a)	10.71 dB 12500.000 MHz, CAV, Horizontal, Mode 1 (Other) Main port	Complied	-
* Note: UL Japan, Inc.'s EMI Work Procedure: Work Instructions-ULID-003591.					

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	4.8
		Vertical	dB	5.0
	200 MHz to 1000 MHz	Horizontal	dB	5.1
		Vertical	dB	6.2
10 m	30 MHz to 200 MHz	Horizontal	dB	4.8
		Vertical	dB	4.8
	200 MHz to 1000 MHz	Horizontal	dB	4.9
		Vertical	dB	5.0
3 m	1 GHz to 6 GHz	Test Receiver	dB	5.1
		Spectrum Analyzer	dB	4.9
	6 GHz to 18 GHz	Test Receiver	dB	5.4
		Spectrum Analyzer	dB	5.2
1 m	10 GHz to 18 GHz	Spectrum analyzer	dB	5.0
	18 GHz to 26.5 GHz	Spectrum analyzer	dB	5.6
	26.5 GHz to 40 GHz	Spectrum analyzer	dB	4.9
0.5 m	26.5 GHz to 40 GHz	Spectrum analyzer	dB	4.9
10 m	1 GHz to 18 GHz	Test Receiver	dB	5.4

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

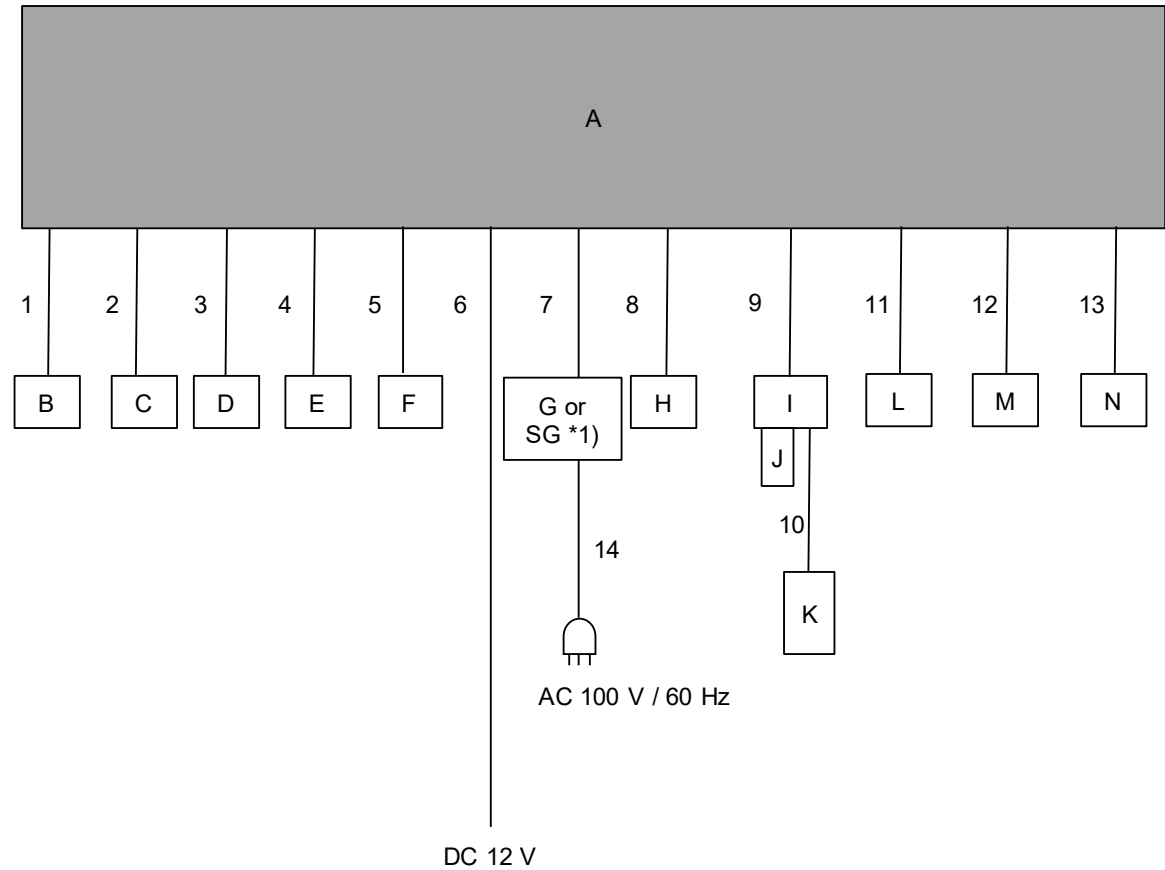
Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

Mode	1. FM Main Port Receiving mode (Local / Other) 2. FM Sub Port Receiving mode (Local / Other) 3. USB Memory Play mode
Software(s)	NAME03.045441C

4.2 Configuration and peripherals



*1) SG(Signal Generator) is used Mode 1,2

* 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 Audio	TN0023A	100262165-0007	DENSO TEN Limited	EUT
B	Switch	-	-	-	-
C	DCM	19MC_DCM	E-033720026/015	DENSO TEN Limited	-
D	Steering Switch	84250-33500	033722021/015	TOYOTA	-
E	Low noise Amplifier	ZX60-242GLN-S+	S 2036302044	Mini-Circuits	-
F	GPS Antenna	29020043	033722058/002	DENSO TEN Limited	-
G	FM/AM Antenna	86300-30C30	PS600103	DENSO TEN Limited	-
H	Back Camera	86790-33260	033721012/001	Panasonic	-
I	USB/AUX socket	86190-12040	No.39	Kojima Industries Corporation	-
J	USB Memory	RUF3-K16GB	P10416	Buffalo Inc.	-
K	iPod touch	A1367	CCQ50WDDCPC	Apple	-
L	Mic	86730-11010	E-033720014/016	Panasonic	-
M	Mic	86730-11010	No.11	Panasonic	-
N	Speaker Dummy	-	-	-	-

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Signal Cable	2.4	Unshielded	Unshielded	-
2	Signal Cable	2.4	Unshielded	Unshielded	-
3	Signal Cable	2.4	Unshielded	Unshielded	-
4	Signal Cable	1.0	Unshielded	Unshielded	-
5	GNSS Antenna Cable	6.4	Shielded	Shielded	-
6	DC Cable	5.8	Unshielded	Unshielded	-
7	Antenna Cable	2.6	Shielded	Shielded	-
8	Signal Cable	2.4	Unshielded	Unshielded	-
9	USB Cable	2.5	Shielded	Shielded	-
10	Audio Cable	1.5	Shielded	Shielded	-
11	MIC Cable	2.6	Unshielded	Unshielded	-
12	MIC Cable	2.6	Unshielded	Unshielded	-
13	Speaker Cable	2.6	Unshielded	Unshielded	-
14	AC Cable	2.0	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.

6.3 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
EUT position : Table top
EUT operation mode : See Clause 4.1

6.4 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

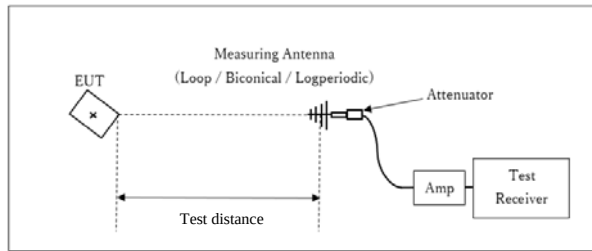
*1) The measurement data was adjusted to a 3 m distance using the following Distance Factor.

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

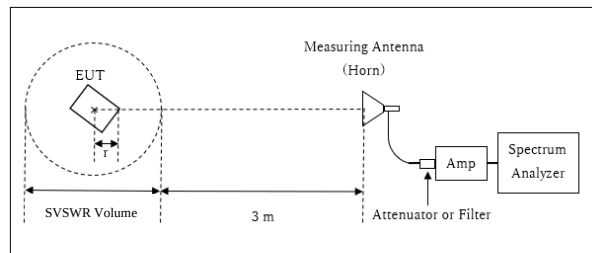
Below 1 GHz



x : Center of turn table

Test Distance: 3 m

1 GHz to 10 GHz



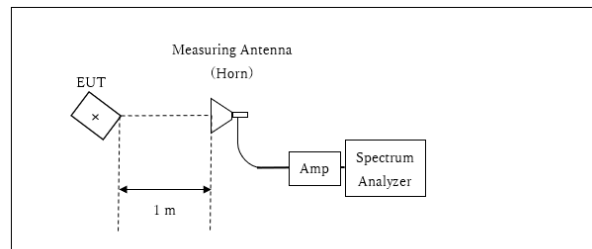
r : Radius of an outer periphery of EUT

x : Center of turn table

Distance Factor: $20 \times \log (3.0 \text{ m}^* / 3.0 \text{ m}) = 0.00 \text{ dB}$
*Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.0 \text{ m}$

SVSWR Volume: 1.5 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
 $r = 0.75 \text{ m}$

10 GHz to 40 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 test was made on EUT at the normal use position.

6.5 Test result

Summary of the test results: Pass

The limit is rounded down to one decimal place.

The test result is rounded off to one or two decimal places, so some differences might be observed.

APPENDIX 1: Test data

Radiated Emission

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 40 % RH
Engineer Daiki Matsui
 (Below 1 GHz)
Mode Mode 1 (Local) 87.75 MHz Main port

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK

<< QP DATA >>

No.	Freq.	Reading	Ant.Foc	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant. Type	Comment
		[dBUV]				[dBUV/m]	[dBUV/m]						
	[MHz]	[dBUV]	[dB/m]	[dB]	[dB]	[dBUV/m]	[dBUV/m]	[dB]	[H/V]	[cm]	[deg]		
1	88.207	21.80	8.14	7.26	28.46	8.74	43.52	34.78	Hori.	100	0	BA	
2	176.414	21.70	16.16	7.93	28.10	17.69	43.52	25.83	Hori.	100	0	BA	
3	264.621	20.80	12.78	8.50	27.76	14.32	46.02	31.70	Hori.	100	0	LA21	
4	352.828	20.90	15.17	9.02	28.07	17.02	46.02	29.00	Hori.	100	0	LA21	
5	441.035	21.20	16.43	9.51	28.81	18.33	46.02	27.69	Hori.	100	0	LA21	
6	529.242	21.40	17.77	9.90	29.21	19.86	46.02	26.16	Hori.	100	0	LA21	
7	617.449	21.30	19.41	10.20	29.30	21.61	46.02	24.41	Hori.	100	0	LA21	
8	705.656	20.90	19.87	10.51	29.26	22.02	46.02	24.00	Hori.	100	0	LA21	
9	793.863	22.20	20.78	10.84	29.12	24.70	46.02	21.32	Hori.	100	0	LA21	
10	882.070	21.20	22.05	11.15	28.90	25.50	46.02	20.52	Hori.	100	0	LA21	
11	970.277	20.90	22.16	11.47	28.69	25.84	53.98	28.14	Hori.	100	0	LA21	
12	88.207	23.10	8.14	7.26	28.46	10.04	43.52	33.48	Vert.	100	0	BA	
13	176.414	22.40	16.16	7.93	28.10	18.39	43.52	25.13	Vert.	100	0	BA	
14	264.621	21.90	12.78	8.50	27.76	15.42	46.02	30.60	Vert.	100	0	LA21	
15	352.828	21.00	15.17	9.02	28.07	17.12	46.02	28.90	Vert.	100	6	LA21	
16	441.035	21.10	16.43	9.51	28.81	18.23	46.02	27.79	Vert.	100	0	LA21	
17	529.242	21.40	17.77	9.90	29.21	19.86	46.02	26.16	Vert.	100	0	LA21	
18	617.449	21.40	19.41	10.20	29.30	21.71	46.02	24.31	Vert.	100	0	LA21	
19	705.656	20.70	19.87	10.51	29.26	21.82	46.02	24.20	Vert.	100	0	LA21	
20	793.863	21.30	20.78	10.84	29.12	23.80	46.02	22.22	Vert.	100	0	LA21	
21	882.070	21.20	22.05	11.15	28.90	25.50	46.02	20.52	Vert.	100	0	LA21	
22	970.277	20.70	22.16	11.47	28.69	25.64	53.98	28.34	Vert.	100	0	LA21	

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

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer

Mode

Ise EMC Lab.
No.2
November 22, 2023
22 deg. C / 42 % RH
Kiyoshiro Okazaki
(Above 1 GHz)
Mode 1 (Local) 87.75 MHz Main port

Limit : FCC_Part 15 Subpart B(15.109)_Class B

<< AV/PK DATA >>																	
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	1047.511	32.10	51.30	24.68	1.52	35.97	22.33	41.53	53.90	73.90	31.57	32.37	Hori.	100	0	HA5	
2	1058.489	31.70	45.50	24.77	1.53	35.96	22.04	35.84	53.90	73.90	31.86	38.06	Hori.	100	0	HA5	
3	3055.242	30.10	44.70	28.70	2.66	34.62	26.84	41.44	53.90	73.90	27.06	32.46	Hori.	100	0	HA5	
4	3087.258	30.20	44.10	28.76	2.68	34.60	27.04	40.94	53.90	73.90	26.86	32.96	Hori.	100	0	HA5	
5	4277.338	29.50	42.90	30.56	3.19	34.02	29.23	42.63	53.90	73.90	24.67	31.27	Hori.	100	0	HA5	
6	5027.820	28.50	42.30	31.93	3.48	34.16	29.75	43.55	53.90	73.90	24.15	30.35	Hori.	100	0	HA5	
7	6023.191	29.30	43.40	32.75	3.83	33.99	31.89	45.99	53.90	73.90	22.01	27.91	Hori.	100	0	HA5	
8	1047.511	32.00	46.10	24.68	1.52	35.97	22.23	36.33	53.90	73.90	31.67	37.57	Vert.	100	0	HA5	
9	1058.489	31.50	45.10	24.77	1.53	35.96	21.84	35.44	53.90	73.90	32.06	38.46	Vert.	100	0	HA5	
10	3055.242	30.30	44.40	28.70	2.66	34.62	27.04	41.14	53.90	73.90	26.86	32.76	Vert.	100	0	HA5	
11	3087.258	30.10	44.30	28.76	2.68	34.60	26.94	41.14	53.90	73.90	26.96	32.76	Vert.	100	0	HA5	
12	4277.338	29.10	43.50	30.56	3.19	34.02	28.83	43.23	53.90	73.90	25.07	30.67	Vert.	100	0	HA5	
13	5027.820	28.40	42.20	31.93	3.48	34.16	29.65	43.45	53.90	73.90	24.25	30.45	Vert.	100	0	HA5	
14	6023.191	29.20	43.40	32.75	3.83	33.99	31.79	45.99	53.90	73.90	22.11	27.91	Vert.	100	0	HA5	

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.

Radiated Emission

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 40 % RH
Engineer Daiki Matsui
(Below 1 GHz)
Mode Mode 1 (Local) 97.7 MHz Main port

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK

<< QP DATA >>

No.	Freq. [MHz]	Reading (QP)	Ant Fac	Loss	Gain	Result (QP)	Limit (QP)	Margn (QP)	Pola	Height	Angle	Ant. Type	Comment
		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[m]	[deg]		
1	97.297	22.50	9.73	7.35	28.44	11.14	43.52	32.38	HrL	100	0	BA	
2	194.594	20.70	16.52	8.06	28.01	17.26	43.52	26.26	HrL	100	0	BA	
3	291.891	22.50	13.76	8.66	27.75	17.17	46.02	28.85	HrL	100	0	LA21	
4	389.188	20.60	15.60	9.28	28.39	17.09	46.02	28.93	HrL	100	0	LA21	
5	486.485	21.20	17.59	9.72	29.07	19.44	46.02	26.58	HrL	100	0	LA21	
6	583.782	21.50	18.94	10.08	29.28	21.24	46.02	24.78	HrL	100	0	LA21	
7	681.079	21.60	19.61	10.42	29.29	22.34	46.02	23.68	HrL	100	0	LA21	
8	778.376	21.20	20.53	10.78	29.16	23.35	46.02	22.67	HrL	100	0	LA21	
9	875.673	20.70	22.01	11.13	28.92	24.92	46.02	21.10	HrL	100	0	LA21	
10	972.970	20.70	22.16	11.48	28.68	25.66	53.98	28.32	HrL	100	0	LA21	
11	97.297	21.40	9.73	7.35	28.44	10.04	43.52	33.48	Vert.	100	0	BA	
12	194.594	21.20	16.52	8.06	28.01	17.76	43.52	25.76	Vert.	100	0	BA	
13	291.891	20.60	13.76	8.66	27.75	15.27	46.02	30.75	Vert.	100	0	LA21	
14	389.188	20.50	15.60	9.28	28.39	16.99	46.02	29.03	Vert.	100	0	LA21	
15	486.485	21.20	17.59	9.72	29.07	19.44	46.02	26.58	Vert.	100	0	LA21	
16	583.782	21.50	18.94	10.08	29.28	21.24	46.02	24.78	Vert.	100	0	LA21	
17	681.079	21.40	19.61	10.42	29.29	22.14	46.02	23.88	Vert.	100	0	LA21	
18	778.376	21.40	20.53	10.78	29.16	23.55	46.02	22.47	Vert.	100	0	LA21	
19	875.673	20.70	22.01	11.13	28.92	24.92	46.02	21.10	Vert.	100	0	LA21	
20	972.970	20.60	22.16	11.48	28.68	25.56	53.98	28.42	Vert.	100	0	LA21	

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

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 22, 2023
Temperature / Humidity	22 deg. C / 42 % RH
Engineer	Kiyoshiro Okazaki
	(Above 1 GHz)
Mode	Mode 1 (Local) 97.7 MHz Main port

Limit : FCC_Part 15 Subpart B(15.109)_Class B

<< AV/PK DATA >>

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	1070.270	31.70	50.30	24.84	1.54	35.95	22.13	40.73	53.90	73.90	31.77	33.17	Horl.	100	0	HA5	
2	1079.130	31.40	45.60	24.87	1.54	35.94	21.87	36.07	53.90	73.90	32.03	37.83	Horl.	100	0	HA5	
3	3016.215	29.60	44.50	28.62	2.65	34.65	26.22	41.12	53.90	73.90	27.68	32.78	Horl.	100	0	HA5	
4	3041.185	29.40	43.20	28.67	2.66	34.63	26.10	39.90	53.90	73.90	27.80	34.00	Horl.	100	0	HA5	
5	4022.213	29.60	43.50	29.99	3.09	33.96	28.72	42.62	53.90	73.90	25.18	31.28	Horl.	100	0	HA5	
6	5059.457	28.90	42.40	32.01	3.49	34.15	30.25	43.75	53.90	73.90	23.65	30.15	Horl.	100	0	HA5	
7	5984.268	28.60	43.40	32.70	3.81	33.99	31.12	45.92	53.90	73.90	22.78	27.98	Horl.	100	0	HA5	
8	1070.270	31.50	46.60	24.84	1.54	35.95	21.93	37.03	53.90	73.90	31.97	36.87	Vert.	100	0	HA5	
9	1079.130	31.70	45.50	24.87	1.54	35.94	22.17	35.97	53.90	73.90	31.73	37.93	Vert.	100	0	HA5	
10	3016.215	29.60	43.70	28.62	2.65	34.65	26.22	40.32	53.90	73.90	27.68	33.58	Vert.	100	0	HA5	
11	3041.185	29.40	43.50	28.67	2.66	34.63	26.10	40.20	53.90	73.90	27.80	33.70	Vert.	100	0	HA5	
12	4022.213	29.60	43.30	29.99	3.09	33.96	28.72	42.42	53.90	73.90	25.18	31.48	Vert.	100	0	HA5	
13	5059.457	28.40	42.80	32.01	3.49	34.15	29.75	44.15	53.90	73.90	24.15	29.75	Vert.	100	0	HA5	
14	5984.268	28.60	43.00	32.70	3.81	33.99	31.12	45.52	53.90	73.90	22.78	28.38	Vert.	100	0	HA5	

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.

Radiated Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 22, 2023
Temperature / Humidity	22 deg. C / 40 % RH
Engineer	Daiki Matsui
	(Below 1 GHz)
Mode	Mode 1 (Local) 107.9 MHz Main port

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK

<< QP DATA >>

No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/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	107.496	23.10	11.28	7.43	28.40	13.41	43.52	30.11	Hori.	100	0	BA	
2	214.992	21.40	11.54	8.18	27.92	13.20	43.52	30.32	Hori.	100	0	LA21	
3	322.488	20.80	14.54	8.84	27.88	16.30	46.02	29.72	Hori.	100	0	LA21	
4	429.984	20.70	16.29	9.47	28.72	17.74	46.02	28.28	Hori.	100	0	LA21	
5	537.480	21.20	17.84	9.92	29.23	19.73	46.02	26.29	Hori.	100	0	LA21	
6	644.976	21.60	19.32	10.29	29.32	21.89	46.02	24.13	Hori.	100	0	LA21	
7	752.472	21.30	20.28	10.68	29.21	23.05	46.02	22.97	Hori.	100	0	LA21	
8	859.968	20.80	21.81	11.07	28.96	24.72	46.02	21.30	Hori.	100	0	LA21	
9	967.464	20.60	22.15	11.46	28.69	25.52	53.98	28.46	Hori.	100	0	LA21	
10	107.496	22.40	11.28	7.43	28.40	12.71	43.52	30.81	Vert.	100	0	BA	
11	214.992	22.90	11.54	8.18	27.92	14.70	43.52	28.82	Vert.	100	0	LA21	
12	322.488	20.80	14.54	8.84	27.88	16.30	46.02	29.72	Vert.	100	0	LA21	
13	429.984	20.70	16.29	9.47	28.72	17.74	46.02	28.28	Vert.	100	0	LA21	
14	537.480	21.30	17.84	9.92	29.23	19.83	46.02	26.19	Vert.	100	0	LA21	
15	644.976	21.70	19.32	10.29	29.32	21.99	46.02	24.03	Vert.	100	0	LA21	
16	752.472	21.40	20.28	10.68	29.21	23.15	46.02	22.87	Vert.	100	0	LA21	
17	859.968	20.90	21.81	11.07	28.96	24.82	46.02	21.20	Vert.	100	0	LA21	
18	967.464	20.70	22.15	11.46	28.69	25.62	53.98	28.36	Vert.	100	0	LA21	

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

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 22, 2023
Temperature / Humidity	22 deg. C / 42 % RH
Engineer	Kiyoshiro Okazaki
	(Above 1 GHz)
Mode	Mode 1 (Local) 107.9 MHz Main port

Limit : FCC_Part 15 Subpart B(15.109)_Class B

<< AV/PK DATA >>

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
		(AV) [dBuV]	(PK) [dBuV]				(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dB]	(PK) [dB]					
1	1074.959	31.70	44.80	24.85	1.54	35.94	22.15	35.25	53.90	73.90	31.75	38.65	Hor.	100	0	HA5	
2	1083.041	32.50	46.30	24.88	1.54	35.93	22.99	36.79	53.90	73.90	30.91	37.11	Hor.	100	0	HA5	
3	3009.885	30.20	44.50	28.61	2.64	34.65	26.80	41.10	53.90	73.90	27.10	32.80	Hor.	100	0	HA5	
4	3032.515	29.50	43.50	28.66	2.65	34.64	26.17	40.17	53.90	73.90	27.73	33.73	Hor.	100	0	HA5	
5	4223.861	29.60	43.30	30.41	3.17	34.01	29.17	42.87	53.90	73.90	24.73	31.03	Hor.	100	0	HA5	
6	5052.306	28.70	42.60	32.00	3.49	34.15	30.04	43.94	53.90	73.90	23.86	29.96	Hor.	100	0	HA5	
7	6065.031	29.20	42.60	32.82	3.84	33.98	31.88	45.28	53.90	73.90	22.02	28.62	Hor.	100	0	HA5	
8	1074.959	31.10	44.50	24.85	1.54	35.94	21.55	34.95	53.90	73.90	32.35	38.95	Vert.	100	0	HA5	
9	1083.041	32.50	46.10	24.88	1.54	35.93	22.99	36.59	53.90	73.90	30.91	37.31	Vert.	100	0	HA5	
10	3009.885	29.50	44.00	28.61	2.64	34.65	26.10	40.60	53.90	73.90	27.80	33.30	Vert.	100	0	HA5	
11	3032.515	29.60	43.80	28.66	2.65	34.64	26.27	40.47	53.90	73.90	27.63	33.43	Vert.	100	0	HA5	
12	4223.861	29.60	43.60	30.41	3.17	34.01	29.17	43.17	53.90	73.90	24.73	30.73	Vert.	100	0	HA5	
13	5052.306	28.20	42.40	32.00	3.49	34.15	29.54	43.74	53.90	73.90	24.36	30.16	Vert.	100	0	HA5	
14	6065.031	29.30	42.60	32.82	3.84	33.98	31.98	45.28	53.90	73.90	21.92	28.62	Vert.	100	0	HA5	

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.

Radiated Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 22, 2023
Temperature / Humidity	22 deg. C / 40 % RH
Engineer	Daiki Matsui
	(Below 1 GHz)
Mode	Mode 2 (Local) 87.75 MHz Sub port

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK

<< QP DATA >>

No.	Freq. [MHz]	Reading [dBμV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg.]	Ant. Type	Comment
		[dBμV]	[dB/m]	[dB]	[dB]	[dBμV/m]	[dBμV/m]	[dB]	[H/V]	[cm]	[deg.]		
1	88.207	21.60	8.14	7.26	28.46	8.54	43.52	34.98	Hori.	100	0	BA	
2	176.414	21.80	16.16	7.93	28.10	17.79	43.52	25.73	Hori.	100	0	BA	
3	264.621	20.90	12.78	8.50	27.76	14.42	46.02	31.60	Hori.	100	0	LA21	
4	352.828	20.90	15.17	9.02	28.07	17.02	46.02	29.00	Hori.	100	0	LA21	
5	441.035	21.10	16.43	9.51	28.81	18.23	46.02	27.79	Hori.	100	0	LA21	
6	529.242	21.40	17.77	9.90	29.21	19.86	46.02	26.16	Hori.	100	0	LA21	
7	617.449	21.40	19.41	10.20	29.30	21.71	46.02	24.31	Hori.	100	0	LA21	
8	705.656	20.90	19.87	10.51	29.26	22.02	46.02	24.00	Hori.	100	0	LA21	
9	793.863	22.20	20.78	10.84	29.12	24.70	46.02	21.32	Hori.	100	0	LA21	
10	882.070	21.10	22.05	11.15	28.90	25.40	46.02	20.62	Hori.	100	0	LA21	
11	970.277	20.70	22.16	11.47	28.69	25.64	53.98	28.34	Hori.	100	0	LA21	
12	88.207	24.00	8.14	7.26	28.46	10.94	43.52	32.58	Vert.	100	0	BA	
13	176.414	22.70	16.16	7.93	28.10	18.69	43.52	24.83	Vert.	100	0	BA	
14	264.621	21.90	12.78	8.50	27.76	15.42	46.02	30.60	Vert.	100	0	LA21	
15	352.828	21.00	15.17	9.02	28.07	17.12	46.02	28.90	Vert.	100	6	LA21	
16	441.035	21.00	16.43	9.51	28.81	18.13	46.02	27.89	Vert.	100	0	LA21	
17	529.242	21.40	17.77	9.90	29.21	19.86	46.02	26.16	Vert.	100	0	LA21	
18	617.449	21.40	19.41	10.20	29.30	21.71	46.02	24.31	Vert.	100	0	LA21	
19	705.656	20.80	19.87	10.51	29.26	21.92	46.02	24.10	Vert.	100	0	LA21	
20	793.863	21.30	20.78	10.84	29.12	23.80	46.02	22.22	Vert.	100	0	LA21	
21	882.070	21.00	22.05	11.15	28.90	25.30	46.02	20.72	Vert.	100	0	LA21	
22	970.277	20.70	22.16	11.47	28.69	25.64	53.98	28.34	Vert.	100	0	LA21	

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

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 22, 2023
Temperature / Humidity	22 deg. C / 42 % RH
Engineer	Kiyoshiro Okazaki (Above 1 GHz)
Mode	Mode 2 (Local) 87.75 MHz Sub port

Limit : FCC_Part 15 Subpart B(15.109)_Class B

<< AV/PK DATA >>

No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola	Height	Angle	Ant. Type	Comment
		(AV)	(PK)				(AV)	(PK)	(AV)	(PK)	(AV)	(PK)					
		[MHz]	[dBuV]				[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]					
1	1047.511	32.20	51.00	24.68	1.52	35.97	22.43	41.23	53.90	73.90	31.47	32.67	Hori.	100	0	HA5	
2	1058.489	31.90	45.40	24.77	1.53	35.96	22.24	35.74	53.90	73.90	31.66	38.16	Hori.	100	0	HA5	
3	3055.242	30.00	44.40	28.70	2.66	34.62	26.74	41.14	53.90	73.90	27.16	32.76	Hori.	100	0	HA5	
4	3087.258	30.00	44.30	28.76	2.68	34.60	26.84	41.14	53.90	73.90	27.06	32.76	Hori.	100	0	HA5	
5	4277.338	29.30	42.80	30.56	3.19	34.02	29.03	42.53	53.90	73.90	24.87	31.37	Hori.	100	0	HA5	
6	5027.820	28.60	42.30	31.93	3.48	34.16	29.85	43.55	53.90	73.90	24.05	30.35	Hori.	100	0	HA5	
7	6023.191	29.10	43.30	32.75	3.83	33.99	31.69	45.89	53.90	73.90	22.21	28.01	Hori.	100	0	HA5	
8	1047.511	32.10	46.00	24.68	1.52	35.97	22.33	36.23	53.90	73.90	31.57	37.67	Vert.	100	0	HA5	
9	1058.489	31.80	45.50	24.77	1.53	35.96	22.14	35.84	53.90	73.90	31.76	38.06	Vert.	100	0	HA5	
10	3055.242	30.00	44.10	28.70	2.66	34.62	26.74	40.84	53.90	73.90	27.16	33.06	Vert.	100	0	HA5	
11	3087.258	30.00	44.50	28.76	2.68	34.60	26.84	41.34	53.90	73.90	27.06	32.56	Vert.	100	0	HA5	
12	4277.338	29.40	43.60	30.56	3.19	34.02	29.13	43.33	53.90	73.90	24.77	30.57	Vert.	100	0	HA5	
13	5027.820	28.60	42.60	31.93	3.48	34.16	29.85	43.85	53.90	73.90	24.05	30.05	Vert.	100	0	HA5	
14	6023.191	29.10	43.50	32.75	3.83	33.99	31.69	46.09	53.90	73.90	22.21	27.81	Vert.	100	0	HA5	

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.

Radiated Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer

Mode

Ise EMC Lab.
No.2
November 22, 2023
22 deg. C / 40 % RH
Daiki Matsui
(Below 1 GHz)
Mode 2 (Local) 97.7 MHz Sub port

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK

<< QP DATA >>													
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
		[QP] [dBuV]				[QP] [dBuV/m]	[QP] [dBuV/m]	[QP] [dB]					
1	97.297	22.40	9.73	7.35	28.44	11.04	43.52	32.48	Hori.	100	0	BA	
2	194.594	20.80	16.52	8.05	28.01	17.36	43.52	26.16	Hori.	100	0	BA	
3	291.891	22.50	13.76	8.66	27.76	17.17	46.02	28.85	Hori.	100	0	LA21	
4	389.188	20.60	15.60	9.28	28.39	17.09	46.02	28.93	Hori.	100	0	LA21	
5	486.485	21.30	17.59	9.72	29.07	19.54	46.02	26.48	Hori.	100	0	LA21	
6	583.782	21.50	18.94	10.08	29.28	21.24	46.02	24.78	Hori.	100	0	LA21	
7	681.079	21.60	19.61	10.42	29.29	22.34	46.02	23.68	Hori.	100	0	LA21	
8	778.376	21.30	20.53	10.78	29.16	23.45	46.02	22.57	Hori.	100	0	LA21	
9	875.673	20.70	22.01	11.13	28.92	24.92	46.02	21.10	Hori.	100	0	LA21	
10	972.970	20.70	22.16	11.48	28.68	25.66	53.98	28.32	Hori.	100	0	LA21	
11	97.297	21.20	9.73	7.35	28.44	9.84	43.52	33.68	Vert.	100	0	BA	
12	194.594	21.30	16.52	8.05	28.01	17.86	43.52	25.66	Vert.	100	0	BA	
13	291.891	20.60	13.76	8.66	27.76	15.27	46.02	30.75	Vert.	100	0	LA21	
14	389.188	20.60	15.60	9.28	28.39	17.09	46.02	28.93	Vert.	100	0	LA21	
15	486.485	21.20	17.59	9.72	29.07	19.44	46.02	26.58	Vert.	100	0	LA21	
16	583.782	21.50	18.94	10.08	29.28	21.24	46.02	24.78	Vert.	100	0	LA21	
17	681.079	21.60	19.61	10.42	29.29	22.34	46.02	23.68	Vert.	100	0	LA21	
18	778.376	21.40	20.53	10.78	29.16	23.55	46.02	22.47	Vert.	100	0	LA21	
19	875.673	20.70	22.01	11.13	28.92	24.92	46.02	21.10	Vert.	100	0	LA21	
20	972.970	20.70	22.16	11.48	28.68	25.66	53.98	28.32	Vert.	100	0	LA21	

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

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 22, 2023
Temperature / Humidity	22 deg. C / 42 % RH
Engineer	Kiyoshiro Okazaki (Above 1 GHz)
Mode	Mode 2 (Local) 97.7 MHz Sub port

Limit : FCC_Part 15 Subpart B(15.109)_Class B

<< AV/PK DATA >>

No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pda	Height	Angle	Ant. Type	Comment
		(AV)	(PK)				(AV)	(PK)	(AV)	(PK)	(AV)	(PK)					
		[MHz]	[dBuV]														
1	1070.270	31.90	50.50	24.84	1.54	35.95	22.33	40.93	53.90	73.90	31.57	32.97	Hori.	100	0	HA5	
2	1079.130	31.70	45.40	24.87	1.54	35.94	22.17	35.87	53.90	73.90	31.73	38.03	Hori.	100	0	HA5	
3	3016.215	29.90	44.20	28.62	2.65	34.65	26.52	40.82	53.90	73.90	27.38	33.08	Hori.	100	0	HA5	
4	3041.185	29.80	43.50	28.67	2.65	34.63	26.50	40.20	53.90	73.90	27.40	33.70	Hori.	100	0	HA5	
5	4022.213	29.40	43.30	29.99	3.09	33.96	28.52	42.42	53.90	73.90	25.38	31.48	Hori.	100	0	HA5	
6	5059.457	28.60	42.90	32.01	3.49	34.15	29.95	44.25	53.90	73.90	23.95	29.65	Hori.	100	0	HA5	
7	5984.268	28.90	43.20	32.70	3.81	33.99	31.42	45.72	53.90	73.90	22.48	28.18	Hori.	100	0	HA5	
8	1070.270	31.90	46.90	24.84	1.54	35.95	22.33	37.33	53.90	73.90	31.57	36.57	Vert.	100	0	HA5	
9	1079.130	31.50	45.90	24.87	1.54	35.94	21.97	36.37	53.90	73.90	31.93	37.53	Vert.	100	0	HA5	
10	3016.215	29.90	43.50	28.62	2.65	34.65	26.52	40.12	53.90	73.90	27.38	33.78	Vert.	100	0	HA5	
11	3041.185	29.80	43.80	28.67	2.66	34.63	26.50	40.50	53.90	73.90	27.40	33.40	Vert.	100	0	HA5	
12	4022.213	29.40	43.20	29.99	3.09	33.96	28.52	42.32	53.90	73.90	25.38	31.58	Vert.	100	0	HA5	
13	5059.457	28.60	42.60	32.01	3.49	34.15	29.95	43.95	53.90	73.90	23.95	29.95	Vert.	100	0	HA5	
14	5984.268	28.90	42.90	32.70	3.81	33.99	31.42	45.42	53.90	73.90	22.48	28.48	Vert.	100	0	HA5	

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.

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

Radiated Emission

Test place
Semi Anechoic Chamber
Date
Temperature / Humidity
Engineer

Ise EMC Lab.
No.2
November 22, 2023
22 deg. C / 40 % RH
Daiki Matsui
(Below 1 GHz)
Mode 2 (Local) 107.9 MHz Sub port

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK

<< OP DATA >>

No.	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margn	Pda	Height	Angle	Ant. Type	Comment
		(QP)				(QP)	(QP)						
		[MHz]				[dBuV]	[dB/m]	[dB]					
1	107.496	23.10	11.28	7.43	28.40	13.41	43.52	30.11	Horiz	100	0	BA	
2	214.992	21.40	11.54	8.18	27.92	13.20	43.52	30.32	Horiz	100	0	LA21	
3	322.488	20.90	14.54	8.84	27.88	16.40	46.02	29.62	Horiz	100	0	LA21	
4	429.984	20.70	16.29	9.47	28.72	17.74	46.02	28.28	Horiz	100	0	LA21	
5	537.480	21.30	17.84	9.92	29.23	19.83	46.02	26.19	Horiz	100	0	LA21	
6	644.976	21.60	19.32	10.29	29.32	21.89	46.02	24.13	Horiz	100	0	LA21	
7	752.472	21.30	20.28	10.68	29.21	23.05	46.02	22.97	Horiz	100	0	LA21	
8	859.968	20.90	21.81	11.07	28.96	24.82	46.02	21.20	Horiz	100	0	LA21	
9	967.464	20.60	22.15	11.46	28.69	25.52	53.98	28.46	Horiz	100	0	LA21	
10	107.496	22.40	11.28	7.43	28.40	12.71	43.52	30.81	Vert.	100	0	BA	
11	214.992	23.00	11.54	8.18	27.92	14.80	43.52	28.72	Vert.	100	0	LA21	
12	322.488	20.80	14.54	8.84	27.88	16.30	46.02	29.72	Vert.	100	0	LA21	
13	429.984	20.60	16.29	9.47	28.72	17.64	46.02	28.38	Vert.	100	0	LA21	
14	537.480	21.40	17.84	9.92	29.23	19.93	46.02	26.09	Vert.	100	0	LA21	
15	644.976	21.80	19.32	10.29	29.32	22.09	46.02	23.93	Vert.	100	0	LA21	
16	752.472	21.30	20.28	10.68	29.21	23.05	46.02	22.97	Vert.	100	0	LA21	
17	859.968	20.90	21.81	11.07	28.96	24.82	46.02	21.20	Vert.	100	0	LA21	
18	967.464	20.70	22.15	11.46	28.69	25.62	53.98	28.36	Vert.	100	0	LA21	

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

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 42 % RH
Engineer Kiyoshiro Okazaki
(Above 1 GHz)
Mode Mode 2 (Local) 107.9 MHz Sub port

Limit : FCC_Part 15 Subpart B(15.109)_Class B

<< AV/PK DATA >>

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	1074.959	31.40	45.00	24.85	1.54	35.94	21.85	35.45	53.90	73.90	32.05	38.45	Hori	100	0	HA5	
2	1083.041	32.30	46.50	24.88	1.54	35.93	22.79	36.99	53.90	73.90	31.11	36.91	Hori	100	0	HA5	
3	3009.885	29.90	44.20	28.61	2.64	34.65	26.50	40.80	53.90	73.90	27.40	33.10	Hori	100	0	HA5	
4	3032.515	29.80	43.60	28.66	2.65	34.64	26.47	40.27	53.90	73.90	27.43	33.63	Hori	100	0	HA5	
5	4223.861	29.40	43.20	30.41	3.17	34.01	28.97	42.77	53.90	73.90	24.93	31.13	Hori	100	0	HA5	
6	5052.306	28.50	42.60	32.00	3.49	34.15	29.84	43.94	53.90	73.90	24.06	29.96	Hori	100	0	HA5	
7	6065.031	29.00	42.90	32.82	3.84	33.98	31.68	45.58	53.90	73.90	22.22	28.32	Hori	100	0	HA5	
8	1074.959	31.40	44.90	24.85	1.54	35.94	21.85	35.35	53.90	73.90	32.05	38.55	Vert.	100	0	HA5	
9	1083.041	32.30	46.50	24.88	1.54	35.93	22.79	36.99	53.90	73.90	31.11	36.91	Vert.	100	0	HA5	
10	3009.885	29.90	43.80	28.61	2.64	34.65	26.50	40.40	53.90	73.90	27.40	33.50	Vert.	100	0	HA5	
11	3032.515	29.90	43.60	28.66	2.65	34.64	26.57	40.27	53.90	73.90	27.33	33.63	Vert.	100	0	HA5	
12	4223.861	29.40	43.50	30.41	3.17	34.01	28.97	43.07	53.90	73.90	24.93	30.83	Vert.	100	0	HA5	
13	5052.306	28.50	42.80	32.00	3.49	34.15	29.84	44.14	53.90	73.90	24.06	29.76	Vert.	100	0	HA5	
14	6065.031	29.00	42.90	32.82	3.84	33.98	31.68	45.58	53.90	73.90	22.22	28.32	Vert.	100	0	HA5	

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN

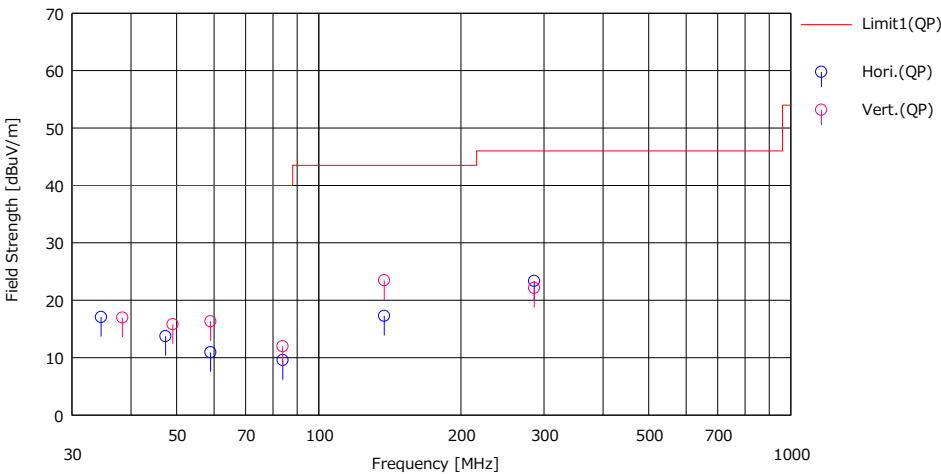
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

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

Radiated Emission

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 40 % RH
Engineer Daiki Matsui
Mode (Below 1 GHz)
Mode 1 (Other) Main port

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK



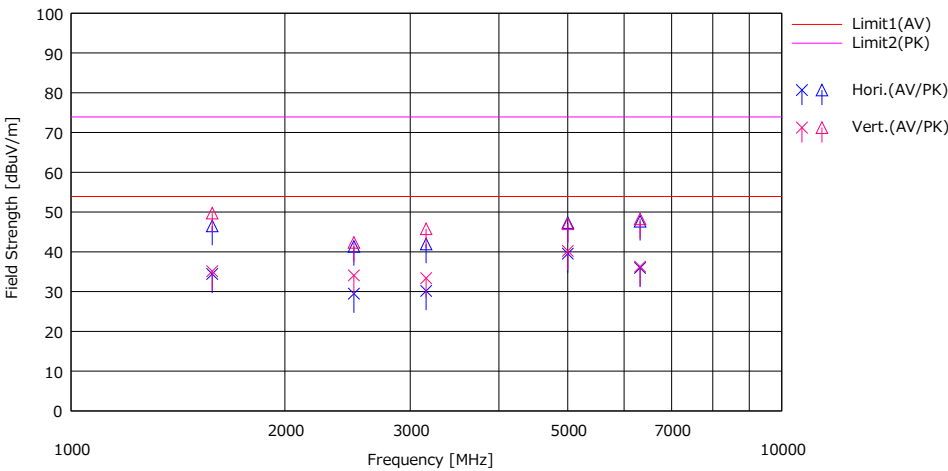
No.	Freq. [MHz]	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margn	Pola	Height	Angle	Ant. Type	Comment
		[dBP]				[dBP]	[dBP]	[dBP]					
1	34.582	22.20	16.76	6.69	28.57	17.08	40.00	22.92	Hori.	189	273	BA	
2	47.362	23.40	12.05	6.85	28.56	13.74	40.00	26.26	Hori.	231	192	BA	
3	58.979	24.40	8.08	6.98	28.54	10.92	40.00	29.08	Hori.	354	145	BA	
4	83.866	23.40	7.43	7.22	28.47	9.58	40.00	30.42	Hori.	182	67	BA	
5	137.622	23.70	14.20	7.66	28.29	17.27	43.52	26.25	Hori.	161	4	BA	
6	285.976	28.70	13.78	8.63	27.76	23.35	46.02	22.67	Hori.	142	100	LA21	
7	38.372	23.40	15.40	6.74	28.57	16.97	40.00	23.03	Vert.	100	163	BA	
8	49.037	26.10	11.39	6.87	28.56	15.80	40.00	24.20	Vert.	100	14	BA	
9	58.979	29.80	8.08	6.98	28.54	16.32	40.00	23.68	Vert.	100	248	BA	
10	83.854	25.80	7.43	7.22	28.47	11.98	40.00	28.02	Vert.	100	102	BA	
11	137.624	29.90	14.20	7.66	28.29	23.47	43.52	20.05	Vert.	100	3	BA	
12	285.967	27.50	13.78	8.63	27.76	22.15	46.02	23.87	Vert.	100	4	LA21	

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

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 42 % RH
Engineer Kiyoshiro Okazaki
Mode Mode 1 (Other) Main port

Limit : FCC_Part 15 Subpart B(15.109)_Class B



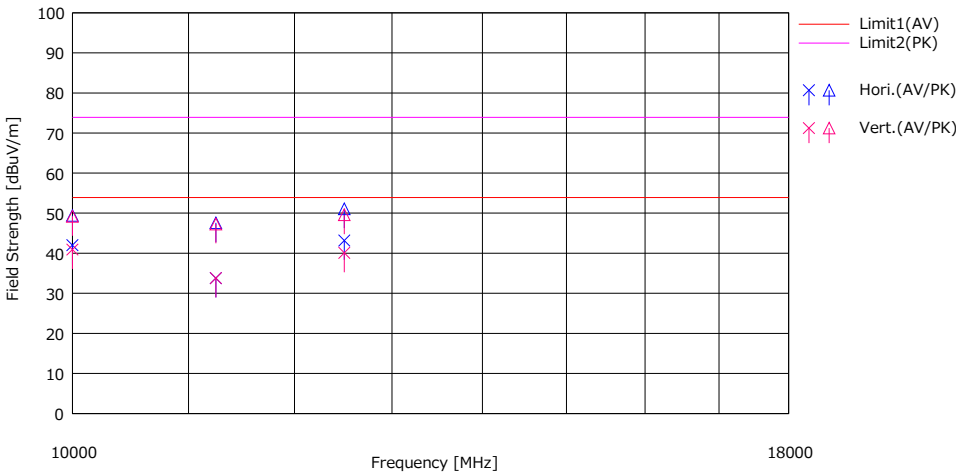
No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		(AV) [dBuV]	(PK) [dBuV]				(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dB]	(PK) [dB]					
1	1579.975	42.60	54.70	25.43	1.87	35.48	34.42	46.52	53.90	73.90	19.48	27.38	Hori.	100	141	HA5	
2	2500.000	34.30	46.20	27.64	2.41	34.89	29.46	41.36	53.90	73.90	24.44	32.54	Hori.	100	139	HA5	
3	3159.943	33.20	45.00	28.80	2.71	34.55	30.16	41.96	53.90	73.90	23.74	31.94	Hori.	100	302	HA5	
4	5000.000	38.40	46.20	31.84	3.47	34.18	39.53	47.33	53.90	73.90	14.37	26.57	Hori.	100	220	HA5	
5	6319.887	32.50	44.20	33.51	3.92	33.96	35.97	47.67	53.90	73.90	17.93	26.23	Hori.	100	123	HA5	
6	1579.975	43.30	57.90	25.43	1.87	35.48	35.12	49.72	53.90	73.90	18.78	24.18	Vert.	100	180	HA5	
7	2500.000	38.90	47.20	27.64	2.41	34.89	34.06	42.36	53.90	73.90	19.84	31.54	Vert.	100	148	HA5	
8	3159.943	36.40	48.80	28.80	2.71	34.55	33.36	45.76	53.90	73.90	20.54	28.14	Vert.	100	140	HA5	
9	5000.000	39.10	45.90	31.84	3.47	34.18	40.23	47.03	53.90	73.90	13.67	26.87	Vert.	100	222	HA5	
10	6319.887	32.80	44.80	33.51	3.92	33.96	36.27	48.27	53.90	73.90	17.63	25.63	Vert.	100	205	HA5	

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.

Radiated Emission

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 42 % RH
Engineer Kiyoshiro Okazaki
(10 GHz to 18 GHz)
Mode Mode 1 (Other) Main port

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pda.	Height	Angle	Ant. Type	Comment
		(AV)	(PK)				(AV)	(PK)	(AV)	(PK)	(AV)	(PK)					
8	10000.000	42.00	49.40	39.25	-4.50	34.74	42.01	49.41	53.90	73.90	11.89	24.49	Hori.	100	192	HA5	
9	11250.000	32.20	46.00	39.69	-4.17	33.93	33.79	47.59	53.90	73.90	20.11	26.31	Hori.	100	2	HA5	
10	12500.000	41.40	49.30	39.06	-3.82	33.45	43.19	51.09	53.90	73.90	10.71	22.81	Hori.	100	197	HA5	
18	10000.000	40.90	49.20	39.25	-4.50	34.74	40.91	49.21	53.90	73.90	12.99	24.69	Vert.	100	56	HA5	
19	11250.000	32.20	45.70	39.69	-4.17	33.93	33.79	47.29	53.90	73.90	20.11	26.61	Vert.	100	12	HA5	
20	12500.000	38.30	47.80	39.06	-3.82	33.45	40.09	49.59	53.90	73.90	13.81	24.31	Vert.	100	167	HA5	

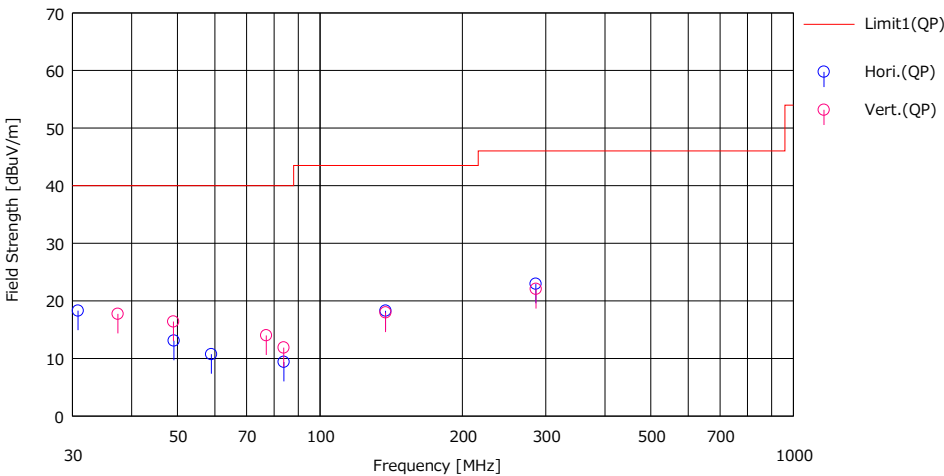
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

*No signal was detected above 18 GHz

Radiated Emission

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 42 % RH
Engineer Kiyoshiro Okazaki
Mode Mode 2 (Other) Sub port
(1 GHz to 10 GHz)

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK



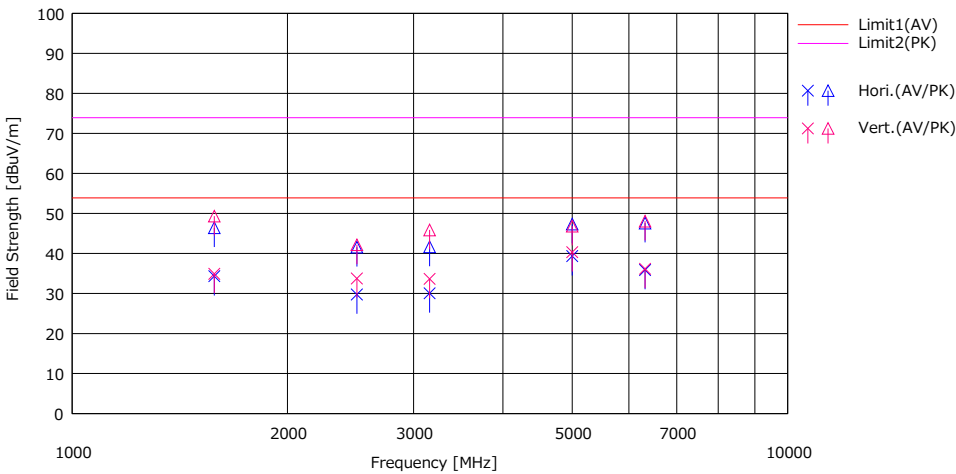
No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP)	Limit (QP)	Margin (QP)	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]				[dBuV/m]	[dBuV/m]						
1	30.825	21.90	18.32	6.64	28.57	18.29	40.00	21.71	Hori.	172	16	BA	
2	49.126	23.40	11.36	6.87	28.56	13.07	40.00	26.93	Hori.	232	191	BA	
3	58.967	24.20	8.08	6.98	28.54	10.72	40.00	29.28	Hori.	334	172	BA	
4	83.872	23.20	7.43	7.22	28.47	9.38	40.00	30.62	Hori.	188	72	BA	
5	137.623	24.70	14.20	7.66	28.29	18.27	43.52	25.25	Hori.	155	10	BA	
6	285.728	28.30	13.78	8.62	27.76	22.94	46.02	23.08	Hori.	144	102	LA21	
7	37.401	23.80	15.77	6.73	28.57	17.73	40.00	22.27	Vert.	100	172	BA	
8	49.026	26.70	11.39	6.87	28.56	16.40	40.00	23.60	Vert.	100	16	BA	
9	77.004	28.80	6.53	7.16	28.49	14.00	40.00	26.00	Vert.	100	175	BA	
10	83.855	25.70	7.43	7.22	28.47	11.88	40.00	28.12	Vert.	100	107	BA	
11	137.624	24.40	14.20	7.66	28.29	17.97	43.52	25.55	Vert.	100	5	BA	
12	285.966	27.40	13.78	8.63	27.76	22.05	46.02	23.97	Vert.	100	12	LA21	

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

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 42 % RH
Engineer Kiyoshiro Okazaki
Mode (1 GHz to 10 GHz)
Mode 2 (Other) Sub port

Limit : FCC_Part 15 Subpart B(15.109)_Class B



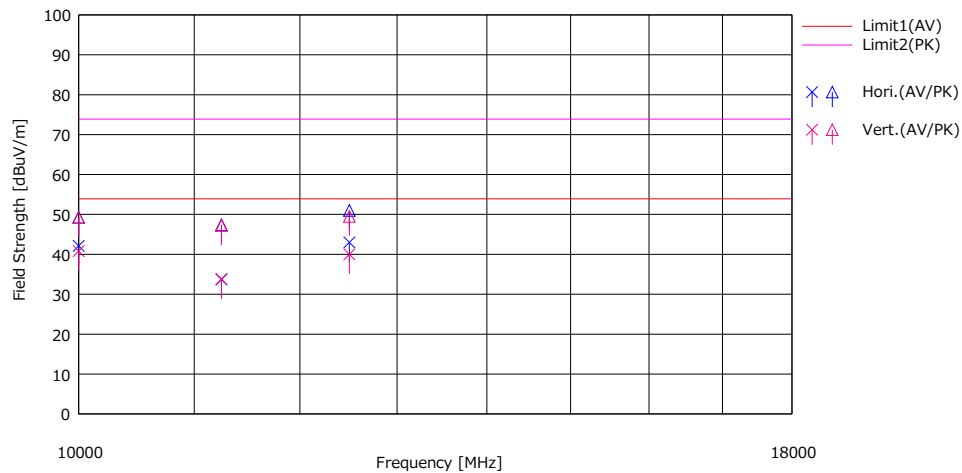
No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		(AV) [dBuV]	(PK) [dBuV]				(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dB]	(PK) [dB]					
1	1579.975	42.50	54.60	25.43	1.87	35.48	34.32	46.42	53.90	73.90	19.58	27.48	Hori.	100	134	HA5	
2	2500.000	34.60	46.40	27.64	2.41	34.89	29.76	41.56	53.90	73.90	24.14	32.34	Hori.	100	127	HA5	
3	3159.943	33.10	44.70	28.80	2.71	34.55	30.06	41.66	53.90	73.90	23.84	32.24	Hori.	100	301	HA5	
4	5000.000	38.20	46.20	31.84	3.47	34.18	39.33	47.33	53.90	73.90	14.57	26.57	Hori.	100	203	HA5	
5	6319.887	32.40	44.10	33.51	3.92	33.96	35.87	47.57	53.90	73.90	18.03	26.33	Hori.	100	122	HA5	
6	1579.975	43.10	57.50	25.43	1.87	35.48	34.92	49.32	53.90	73.90	18.98	24.58	Vert.	100	137	HA5	
7	2500.000	38.60	47.00	27.64	2.41	34.89	33.76	42.16	53.90	73.90	20.14	31.74	Vert.	100	135	HA5	
8	3159.943	36.70	48.90	28.80	2.71	34.55	33.66	45.86	53.90	73.90	20.24	28.04	Vert.	100	143	HA5	
9	5000.000	39.20	45.70	31.84	3.47	34.18	40.33	46.83	53.90	73.90	13.57	27.07	Vert.	100	221	HA5	
10	6319.887	32.70	44.60	33.51	3.92	33.96	36.17	48.07	53.90	73.90	17.73	25.83	Vert.	100	204	HA5	

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.

Radiated Emission

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 42 % RH
Engineer Kiyoshiro Okazaki
(10 GHz to 18 GHz)
Mode Mode 2 (Other) Sub port

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]					
8	1000.0000	42.10	49.30	39.25	-4.50	34.74	42.11	49.31	53.90	73.90	11.79	24.59	Hori.	100	193	HA5	
9	1125.0000	32.10	45.80	39.69	-4.17	33.93	33.69	47.39	53.90	73.90	20.21	26.51	Hori.	100	3	HA5	
10	1250.0000	41.20	49.20	39.06	-3.82	33.45	42.99	50.99	53.90	73.90	10.91	22.91	Hori.	100	195	HA5	
18	1000.0000	40.80	49.20	39.25	-4.50	34.74	40.81	49.21	53.90	73.90	13.09	24.69	Vert.	100	54	HA5	
19	1125.0000	32.20	45.60	39.69	-4.17	33.93	33.79	47.19	53.90	73.90	20.11	26.71	Vert.	100	14	HA5	
20	1250.0000	38.20	47.70	39.06	-3.82	33.45	39.99	49.49	53.90	73.90	13.91	24.41	Vert.	100	173	HA5	

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)

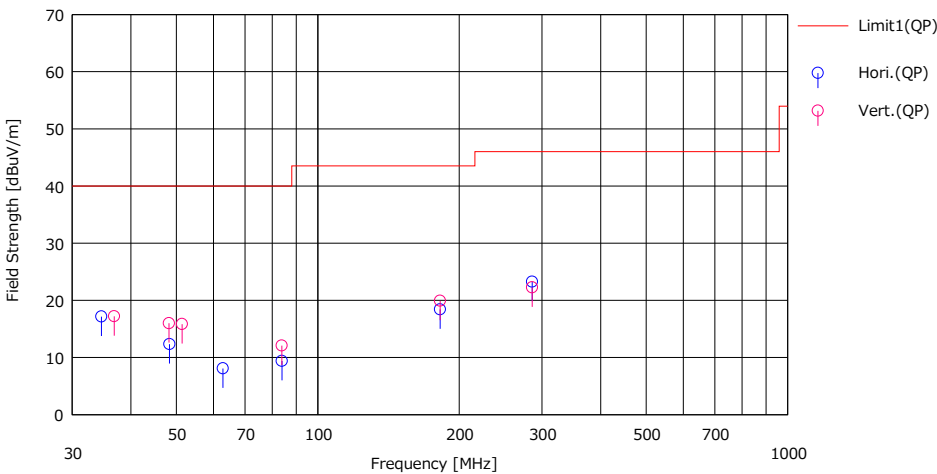
Except for the above table: adequate margin data below the limits.

*No signal was detected above 18 GHz

Radiated Emission

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 40 % RH
Engineer Daiki Matsui
Mode (Below 1 GHz)
Mode 3

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK



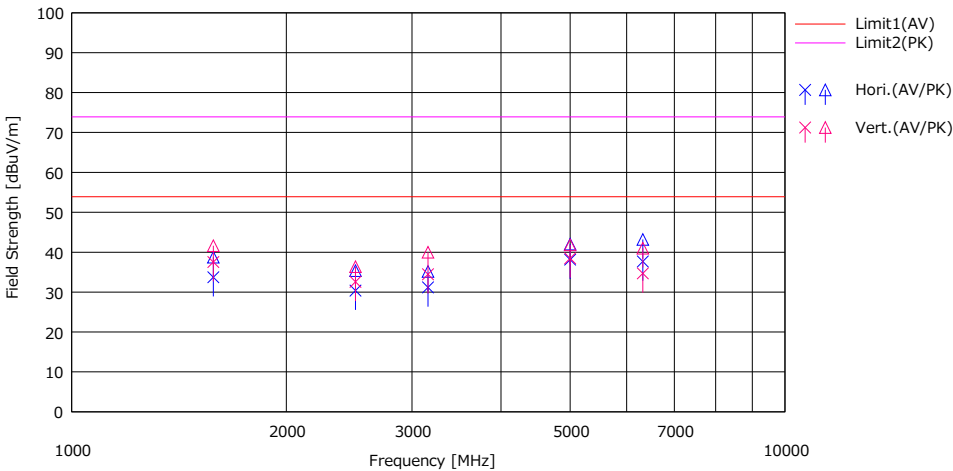
No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP)	Limit (QP)	Margin (QP)	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]				[dBuV/m]	[dBuV/m]	[dB]					
1	34.630	22.30	16.74	6.69	28.57	17.16	40.00	22.84	Hori.	201	13	BA	
2	48.361	22.40	11.64	6.86	28.56	12.34	40.00	27.66	Hori.	221	271	BA	
3	62.826	22.50	7.10	7.02	28.53	8.09	40.00	31.91	Hori.	123	23	BA	
4	83.862	23.20	7.43	7.22	28.47	9.38	40.00	30.62	Hori.	172	64	BA	
5	182.166	22.30	16.21	7.97	28.07	18.41	43.52	25.11	Hori.	161	7	BA	
6	285.976	28.60	13.78	8.63	27.76	23.25	46.02	22.77	Hori.	116	91	LA21	
7	36.864	23.10	15.96	6.72	28.57	17.21	40.00	22.79	Vert.	100	263	BA	
8	48.241	26.00	11.69	6.86	28.56	15.99	40.00	24.01	Vert.	100	12	BA	
9	51.423	26.90	10.59	6.90	28.56	15.83	40.00	24.17	Vert.	100	14	BA	
10	83.854	25.90	7.43	7.22	28.47	12.08	40.00	27.92	Vert.	100	95	BA	
11	182.167	23.80	16.22	7.97	28.07	19.92	43.52	23.60	Vert.	100	2	BA	
12	285.967	27.60	13.78	8.63	27.76	22.25	46.02	23.77	Vert.	100	5	LA21	

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

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 42 % RH
Engineer Kiyoshiro Okazaki
Mode (1 GHz to 10 GHz)
Mode 3

Limit : FCC_Part 15 Subpart B(15.109)_Class B



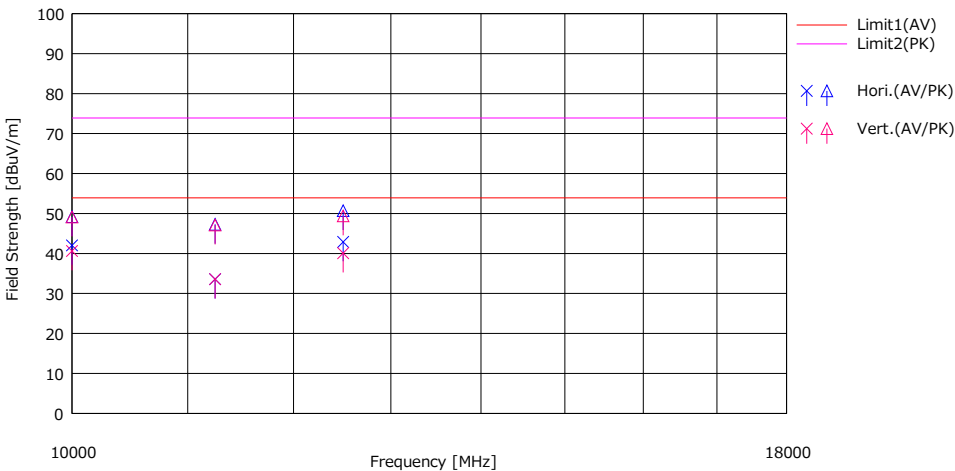
No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		(AV) [dBuV]	(PK) [dBuV]				(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dBuV/m]	(PK) [dBuV/m]	(AV) [dB]	(PK) [dB]					
1	1579.975	41.90	46.90	25.43	1.87	35.48	33.72	38.72	53.90	73.90	20.18	35.18	Hori.	100	273	HA5	
2	2500.000	35.20	40.20	27.64	2.41	34.89	30.39	35.39	53.90	73.90	23.54	38.54	Hori.	220	217	HA5	
3	3159.943	34.20	38.20	28.80	2.71	34.55	31.16	35.16	53.90	73.90	22.74	38.74	Hori.	158	182	HA5	
4	5000.000	37.00	40.90	31.84	3.47	34.18	38.13	42.03	53.90	73.90	15.77	31.87	Hori.	146	151	HA5	
5	6319.887	34.20	39.70	33.51	3.92	33.96	37.67	43.17	53.90	73.90	16.23	30.73	Hori.	141	117	HA5	
6	1579.975	45.70	49.80	25.43	1.87	35.48	37.52	41.62	53.90	73.90	16.38	32.28	Vert.	100	179	HA5	
7	2500.000	37.40	41.20	27.64	2.41	34.89	32.56	36.36	53.90	73.90	21.34	37.54	Vert.	100	143	HA5	
8	3159.943	37.50	43.00	28.80	2.71	34.55	34.46	39.96	53.90	73.90	19.44	33.94	Vert.	100	165	HA5	
9	5000.000	37.30	40.70	31.84	3.47	34.18	38.43	41.83	53.90	73.90	15.47	32.07	Vert.	100	224	HA5	
10	6319.887	31.20	37.50	33.51	3.92	33.96	34.67	40.97	53.90	73.90	19.23	32.93	Vert.	100	182	HA5	

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.

Radiated Emission

Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date November 22, 2023
Temperature / Humidity 22 deg. C / 42 % RH
Engineer Kiyoshiro Okazaki
(10 GHz to 18 GHz)
Mode Mode 3

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]					
8	1000.0000	42.00	49.20	39.25	-4.50	34.74	42.01	49.21	53.90	73.90	11.89	24.69	Hori.	100	192	HA5	
9	1125.0000	32.00	45.70	39.69	-4.17	33.93	33.59	47.29	53.90	73.90	20.31	26.61	Hori.	100	12	HA5	
10	1250.0000	41.10	48.90	39.06	-3.82	33.45	42.89	50.69	53.90	73.90	11.01	23.21	Hori.	100	186	HA5	
18	1000.0000	40.60	49.10	39.25	-4.50	34.74	40.61	49.11	53.90	73.90	13.29	24.79	Vert.	100	35	HA5	
19	1125.0000	32.00	45.50	39.69	-4.17	33.93	33.59	47.09	53.90	73.90	20.31	26.81	Vert.	100	16	HA5	
20	1250.0000	38.30	47.60	39.06	-3.82	33.45	40.09	49.39	53.90	73.90	13.81	24.51	Vert.	100	175	HA5	

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 18 GHz

APPENDIX 2: Test instruments

Test Equipment

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	141265	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-190	07/11/2023	12
RE	141317	Coaxial Cable	UL Japan	-	-	09/12/2023	12
RE	141427	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103B+BBA9106	08031	07/11/2023	12
RE	141511	Horn Antenna 1-18GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	253	09/25/2023	12
RE	141513	Horn Antenna 15-40GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9170	BBHA9170306	07/19/2023	12
RE	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/01/2023	12
RE	141579	Pre Amplifier	Keysight Technologies Inc	8449B	3008A02142	02/14/2023	12
RE	141594	Pre Amplifier	Keysight Technologies Inc	8447D	2944A10150	02/02/2023	12
RE	141884	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY44020357	03/13/2023	12
RE	141951	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	04/10/2023	12
RE	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	05/30/2022	24
RE	142006	AC2_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-06902	10/20/2023	12
RE	142228	Measure, Tape, Steel	KOMELON	KMC-36	-	-	-
RE	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	192300	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0013	12/17/2022	12
RE	196409	Microwave Cable	Huber+Suhner	SF101EA/11PC24/11PC24/2500MM	SN 800093/1EA	01/23/2023	12
RE	220646	Attenuator	Huber+Suhner	6806 N-50-1	-	03/17/2023	12
RE	237927	Broadband Amplifier	ERAVANT	SBB-0115033218-2F2F-E3	27554-01	07/10/2023	12
RE	240023	Microwave Cable	Huber+Suhner	SF126E/11PC35/11PC35/1000MM,5000MM	537060/126E / 537075/126E	09/08/2023	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