EMI TEST REPORT

Test Report No.: 14433880H-B-R1

Customer	**DENSO TEN Limited**
Description of EUT	**Car Audio**
Model Number of EUT	**TN0035B**
FCC ID	**BABTN0035B**
Test Regulation	**FCC Part 15 Subpart B**
Test Result	**Complied (Refer to SECTION 3)**
Issue Date	**April 21, 2023**
Remarks	**-**

Representative test engineer

Junki Nagatomi
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".

Report Cover Page - Form-ULID-003532 (DCS:13-EM-F0429) Issue# 21.0

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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.: 14433880H-B

This report is a revised version of 14433880H-B. 14433880H-B is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14433880H-B	October 4, 2022	-
1	14433880H-B-R1	April 21, 2023	**4.1 Operating Mode(s)** Corrected operating mode for Mode 1 and Mode 2: - "(Local / Other)" was deleted.
1	14433880H-B-R1	April 21, 2023	**APPENDIX 1: Test data** 1. Modified data for Mode 1 and Mode 2 of Radiated Emission - Combined Local data and Other data - Added Local Harmonics to data - Added explanatory text, "The test was conducted at the worst local frequency." 2. Corrected Limit for Mode 4 and Mode 5 of Antenna Terminal Conducted (26.5 GHz to 40 GHz)

Reference: Abbreviations (Including words undescribed in this report)

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

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	DENSO TEN Limited
Address	2-28, Gosho-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	TN0035B
Serial Number	Refer to SECTION 4.2
Condition	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	August 10, 2022
Test Date	August 25 to 29, 2022

2.2 Product Description

General Specification

Rating	DC 12 V
Clock frequency (ies) in the system	2.6 GHz (MAX)

Radio Specification

Bluetooth (BR / EDR)

Equipment Type	Transceiver
Frequency of Operation	2402 MHz to 2480 MHz
Type of Modulation	GFSK, π/4 DQPSK, 8 DPSK
Antenna Gain	-1.22 dBi

AM / FM (incl. RDS)/ DAB

Equipment Type	Receiver
Frequency of Operation	AM: 531 kHz - 1602 kHz FM: 87.5 MHz - 108.0 MHz DAB:174.928 MHz - 229.072 MHz
Type of Modulation	AM FM DAB: OFDM
Antenna Connector Type	HFC IV
Impedance	AM, FM: 75 ohm DAB: 50 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	Deviation	Worst margin	Result	Remarks
Conducted emission	ANSI C63.4: 2014 7. AC power - line conducted emission measurements IEEE 187:2003	Part 15 Subpart B 15.107(a)	N/A	-	N/A	*1)
Radiated emission	ANSI C63.4: 2014 8. Radiated emission measurements IEEE 187:2003	Part 15 Subpart B 15.109(a)	N/A	8.6 dB 877.838 MHz, QP, Hori., Mode 3	Complied a)	-
Antenna Terminal	ANSI C63.4: 2014 12. Measurement of unintentional radiators other than ITE IEEE 187:2003	Part 15 Subpart B 15.111(a)	N/A	5.9 dB 1980.000 MHz, PK, Mode 5	Complied b)	-

* 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.

a) Refer to APPENDIX 1 (data of Radiated Emission)
b) Refer to APPENDIX 1 (data of Antenna Terminal Conducted Emission)

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		Uncertainty (+/-)
3 m	30 MHz to 200 MHz	Horizontal	4.8 dB
		Vertical	5.0 dB
	200 MHz to 1000 MHz	Horizontal	5.1 dB
		Vertical	6.2 dB
10 m	30 MHz to 200 MHz	Horizontal	4.8 dB
		Vertical	4.8 dB
	200 MHz to 1000 MHz	Horizontal	5.0 dB
		Vertical	5.0 dB
3 m	1 GHz to 6 GHz		5.1 dB
	6 GHz to 18 GHz		5.4 dB
1 m	10 GHz to 26.5 GHz		5.4 dB
	26.5 GHz to 40 GHz		5.4 dB
0.5 m	26.5 GHz to 40 GHz		5.4 dB
10 m	1 GHz to 18 GHz		5.4 dB

Antenna Terminal test

Test Item	Uncertainty (+/-)
Antenna terminal conducted emission	2.7 dB

3.5 Test Location

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

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

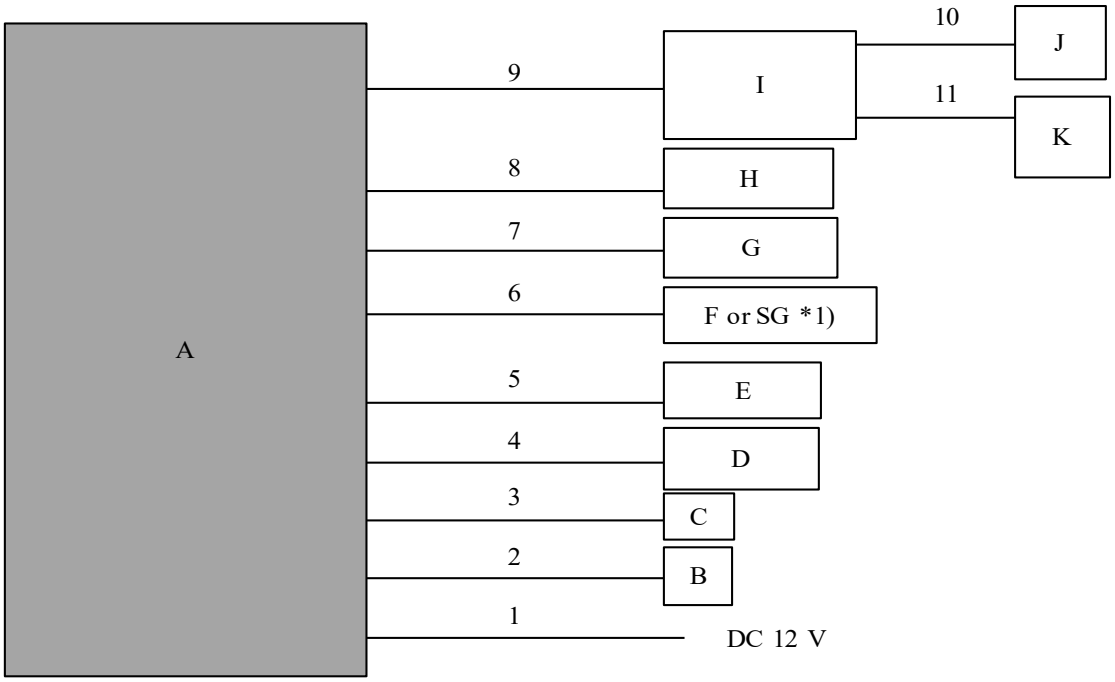
4.1 Operating Mode(s)

Mode	Remarks
Mode 1: FM Main Port Receiving Mode	Radiated Emission test
Mode 2: FM Sub Port Receiving Mode	Radiated Emission test
Mode 3: USB Play Mode	Radiated Emission test
Mode 4: FM Main Port Tuning Mode	Antenna Terminal test
Mode 5: FM Sub Port Tuning Mode	Antenna Terminal test

Software(s)	E-DA2M software V1.0.0

4.2 Configuration and peripherals

for Radiated Emission



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
*1) SG (Signal Generator) used other than Mode 3, 4 and 5.

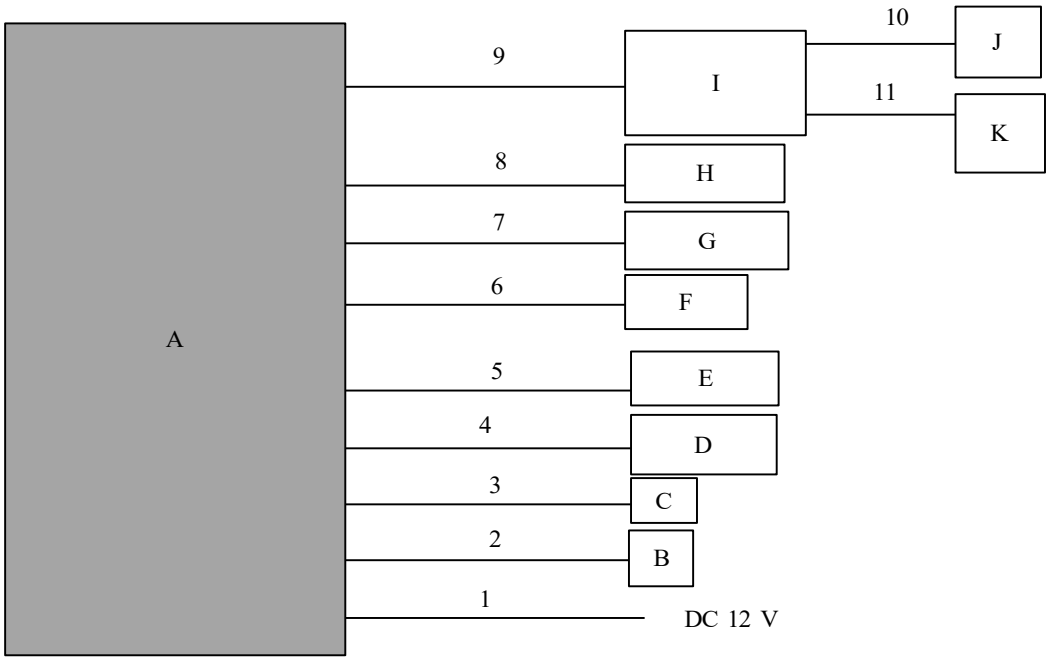
Description of EUT and Support Equipment

No.	Item	Model number	Serial Number	Manufacturer	Remarks
A	Car Audio	TN0035B	100210369-0008	DENSO TEN Limited	EUT
B	Microphone	86730-78010(SDD303)	0LC000079	Panasonic	-
C	Camera	86790-62010(GP-KD63B1RC)	96C300228	Panasonic	-
D	Steering Switch	84250-58150-BO	884-6191	-	-
E	Speaker Dummy	EDA2(MID) SP Dummy	DUMMY-210906-001	DENSO TEN Limited	-
F	AM/FM SharkFin Antenna	86760-K0010	210906-002	YOKOWO	-
G	DAB Antenna AMP	863C0-60050	PQB02831	DENSO TEN Limited	-
H	GNSS Antenna	86880-78010	UI 034337	HARADA	-
I	USB I/F BOX	86190-78020	500863	Panasonic	-
J	USB memory	RUF3-K8GA-BK/N	P90611	Buffalo	-
K	iPhone	MD297B/A	C34JJ55EDTWD	Apple	-

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	3.5	Unshielded	Unshielded	-
2	MiC Cable	3.5	Unshielded	Unshielded	-
3	Camera Cable	3.5	Unshielded	Unshielded	-
4	System Cable	3.5	Unshielded	Unshielded	-
5	Speaker Cable	3.5	Unshielded	Unshielded	-
6	Antenna Cable	3.0	Shielded	Shielded	-
7	Antenna Cable	2.9	Shielded	Shielded	-
8	Antenna Cable	3.0	Shielded	Shielded	-
9	Signal Cable	3.0	Unshielded	Unshielded	-
10	USB Cable	2.0	Shielded	Shielded	-
11	USB Cable	1.0	Shielded	Shielded	-

for Antenna Terminal



* 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	TN0035B	100210369-0008	DENSO TEN Limited	EUT
B	Microphone	86730-78010(SDD303)	0LC000079	Panasonic	-
C	Camera	86790-62010(GP-KD63B1RC)	96C300228	Panasonic	-
D	Steering Switch	84250-58150-BO	884-6191	-	-
E	Speaker Dummy	EDA2(MID) SP Dummy	DUMMY-210906-001	DENSO TEN Limited	-
F	FM Matching Pad	828-00064-D5KAI	-	DENSO TEN Limited	-
G	DAB Antenna AMP	863C0-60050	PQB02831	DENSO TEN Limited	-
H	GNSS Antenna	86880-78010	UI 034337	HARADA	-
I	USB I/F BOX	86190-78020	500863	Panasonic	-
J	USB memory	RUF3-K8GA-BK/N	P90611	Buffalo	-
K	iPhone	MD297B/A	C34JJ55EDTWD	Apple	-

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	3.5	Unshielded	Unshielded	-
2	MiC Cable	3.5	Unshielded	Unshielded	-
3	Camera Cable	3.5	Unshielded	Unshielded	-
4	System Cable	3.5	Unshielded	Unshielded	-
5	Speaker Cable	3.5	Unshielded	Unshielded	-
6	Antenna Cable	3.0	Shielded	Shielded	-
7	Antenna Cable	2.9	Shielded	Shielded	-
8	Antenna Cable	3.0	Shielded	Shielded	-
9	Signal Cable	3.0	Unshielded	Unshielded	-
10	USB Cable	2.0	Shielded	Shielded	-
11	USB Cable	1.0	Shielded	Shielded	-

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

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna 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
EUT position	:	Table top
EUT operation mode	:	See Clause 4.1

5.4 Test procedure

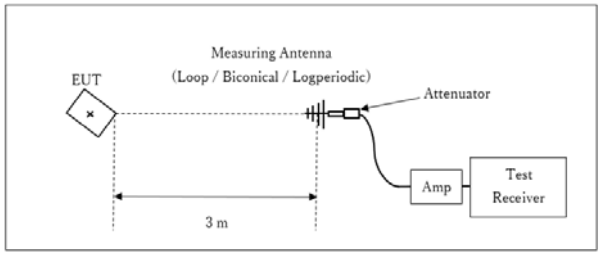
The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver.
The radiated emission measurements were made with the following detector function of the Test Receiver .
The test of Local oscillator spurious has been measured up to appropriate frequency based on the result of the antenna terminal test.
For above 1 GHz, test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.

Frequency	Below 1 GHz	Above 1 GHz *1)
Instrument used	Test Receiver	Test Receiver
IF Bandwidth	QP: BW 120 kHz	PK: BW 1 MHz, CAV: BW 1 MHz

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

Figure 1: Test Setup

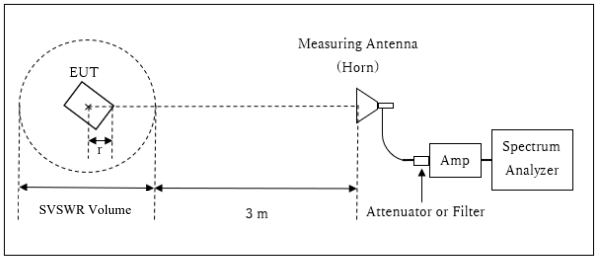
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz to 13 GHz

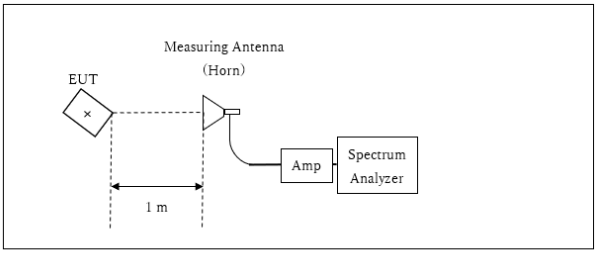


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.10 m*/3.0 m) = 0.29 dB
* Test Distance: (3 + SVSWR Volume /2) - r = 3.10 m

SVSWR Volume: 2 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.9 m.

13 GHz to 26.5 GHz



× : Center of turn table

Distance Factor: 20 x log (1.0 m* / 3.0 m) = -9.54 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

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.

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 - 1000 MHz / 1000 MHz - 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	Spectrum Analyzer *1)
IF Bandwidth	PK: RBW: 100 kHz / VBW: 100 kHz	PK: RBW: 1 MHz / VBW: 3 MHz

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

6.5 Test result

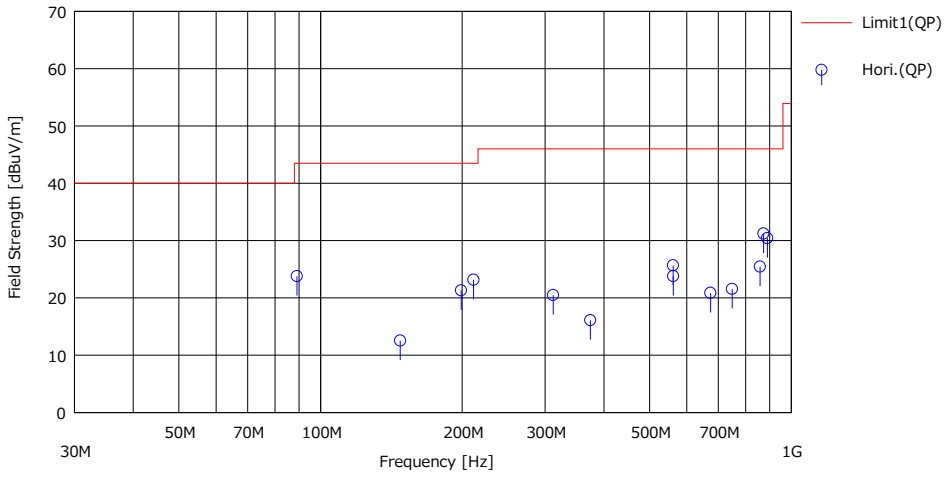
Summary of the test results: Pass

APPENDIX 1: Test data

Radiated Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	August 28, 2022
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Nachi Konegawa
	(Below 1 GHz)
Mode	Mode 1

Limit : FCC_Part 15 Subpart B(15.109)_Class B



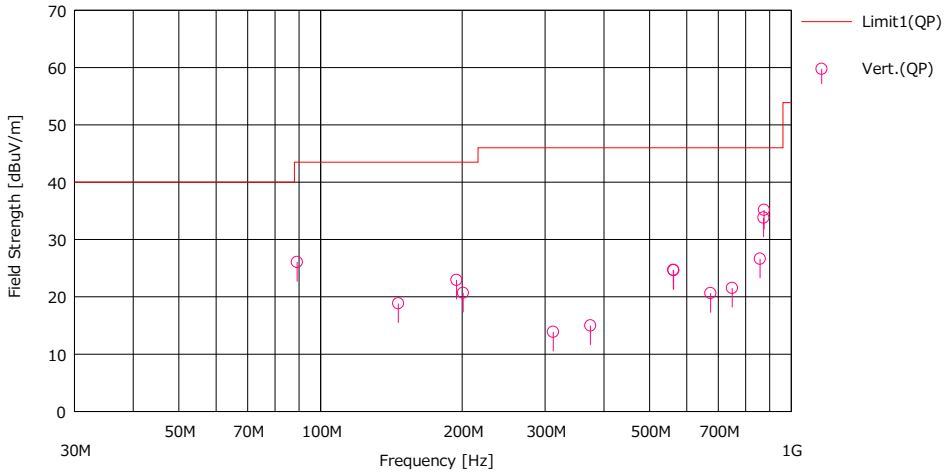


CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.
The test was conducted at the worst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

Radiated Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	August 28, 2022
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Nachi Konegawa
	(Below 1 GHz)
Mode	Mode 1

Limit : FCC_Part 15 Subpart B(15.109)_Class B

<< QP DATA >>

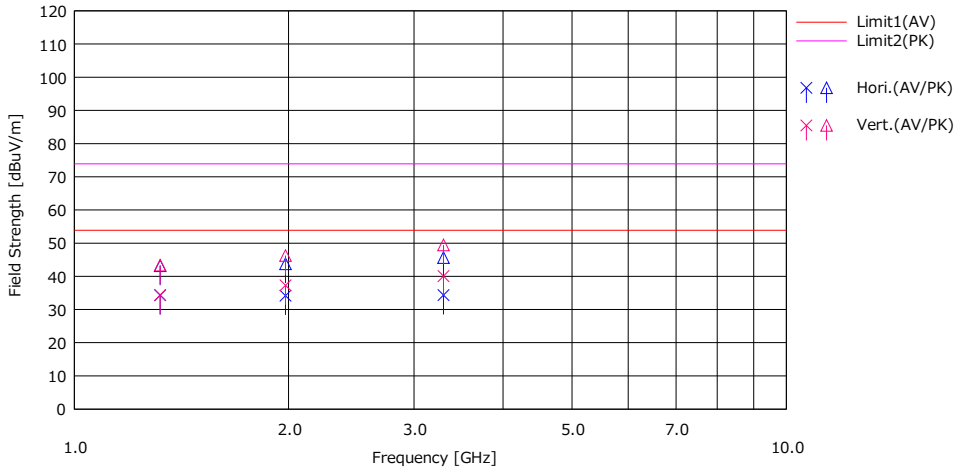
No.	Freq.	Reading (QP)	Ant.Fac	Loss	Gain	Result (QP)	Limit (QP)	Margin (QP)	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	89.112	38.60	9.51	7.74	32.08	23.77	43.50	19.73	Hori.	239	315	BA	
2	147.668	24.10	12.18	8.28	32.03	12.53	43.50	30.97	Hori.	146	136	BA	
3	198.940	30.10	14.50	8.68	32.00	21.28	43.50	22.22	Hori.	100	294	BA	
4	211.400	34.90	11.48	8.77	32.00	23.15	43.50	20.35	Hori.	152	268	LA23	
5	312.000	29.00	14.02	9.49	32.04	20.47	46.00	25.53	Hori.	100	275	LA23	
6	374.400	23.10	15.20	9.90	32.11	16.09	46.00	29.91	Hori.	100	284	LA23	
7	560.982	28.70	18.21	11.08	32.33	25.66	46.00	20.34	Hori.	137	221	LA23	
8	561.600	26.80	18.23	11.09	32.33	23.79	46.00	22.21	Hori.	143	215	LA23	
9	673.930	22.20	19.60	11.47	32.42	20.85	46.00	25.15	Hori.	100	322	LA23	
10	748.800	21.60	20.36	11.70	32.12	21.54	46.00	24.46	Hori.	100	0	LA23	
11	858.290	23.00	21.80	12.14	31.50	25.44	46.00	20.56	Hori.	100	67	LA23	Local Harmonics
12	873.600	28.30	22.10	12.22	31.41	31.21	46.00	14.79	Hori.	100	243	LA23	
13	889.675	27.20	22.24	12.30	31.32	30.42	46.00	15.58	Hori.	100	304	LA23	
14	89.146	40.90	9.51	7.74	32.08	26.07	43.50	17.43	Vert.	100	73	BA	
15	146.221	30.50	12.11	8.27	32.03	18.85	43.50	24.65	Vert.	100	0	BA	
16	194.509	32.00	14.29	8.65	32.00	22.94	43.50	20.56	Vert.	100	357	BA	
17	200.850	32.30	11.67	8.70	32.00	20.67	43.50	22.83	Vert.	100	12	LA23	
18	312.000	22.40	14.02	9.49	32.04	13.87	46.00	32.13	Vert.	100	320	LA23	
19	374.400	22.00	15.20	9.90	32.11	14.99	46.00	31.01	Vert.	100	146	LA23	
20	561.600	27.70	18.23	11.09	32.33	24.69	46.00	21.31	Vert.	100	0	LA23	
21	562.767	27.60	18.28	11.09	32.33	24.64	46.00	21.36	Vert.	100	0	LA23	
22	673.930	22.00	19.60	11.47	32.42	20.65	46.00	25.35	Vert.	145	180	LA23	
23	748.800	21.60	20.36	11.70	32.12	21.54	46.00	24.46	Vert.	100	0	LA23	
24	858.290	24.20	21.80	12.14	31.50	26.64	46.00	19.36	Vert.	100	193	LA23	Local Harmonics
25	873.600	30.90	22.10	12.22	31.41	33.81	46.00	12.19	Vert.	100	160	LA23	
26	875.421	32.20	22.13	12.23	31.40	35.16	46.00	10.84	Vert.	100	152	LA23	

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.
The test was conducted at the worst local frequency.

Radiated Emission

Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.4	No.4
Date	August 29, 2022	August 29, 2022
Temperature / Humidity	22 deg. C / 42 % RH	22 deg. C / 46 % RH
Engineer	Junki Nagatomi	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 40 GHz)
Mode	Mode 1	

Limit : FCC_Part 15 Subpart B(15.109)_Class B



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]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	1319.998	40.40	49.30	25.48	2.18	33.78	34.28	43.18	53.90	73.90	19.62	30.72	Hori.	100	123	H21	
2	1980.000	37.40	47.00	26.08	2.69	31.99	34.18	43.78	53.90	73.90	19.72	30.12	Hori.	100	218	H21	
3	3299.996	33.70	45.00	28.56	3.38	31.28	34.36	45.66	53.90	73.90	19.54	28.24	Hori.	100	175	H21	
4	1319.998	40.50	49.50	25.48	2.18	33.78	34.38	43.38	53.90	73.90	19.52	30.52	Vert.	124	143	H21	
5	1980.000	40.50	49.50	26.08	2.69	31.99	37.28	46.28	53.90	73.90	16.62	27.62	Vert.	124	143	H21	
6	3299.996	39.40	48.80	28.56	3.38	31.28	40.06	49.46	53.90	73.90	13.84	24.44	Vert.	107	177	H21	

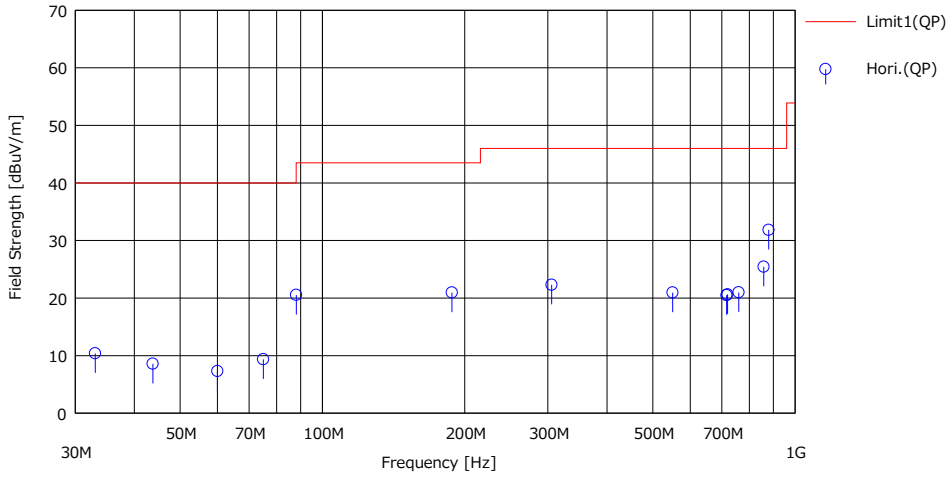
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.
The test was conducted at the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

* No signal was detected above 10 GHz.

Radiated Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	August 28, 2022
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Nachi Konegawa
	(Below 1 GHz)
Mode	Mode 2

Limit : FCC_Part 15 Subpart B(15.109)_Class B



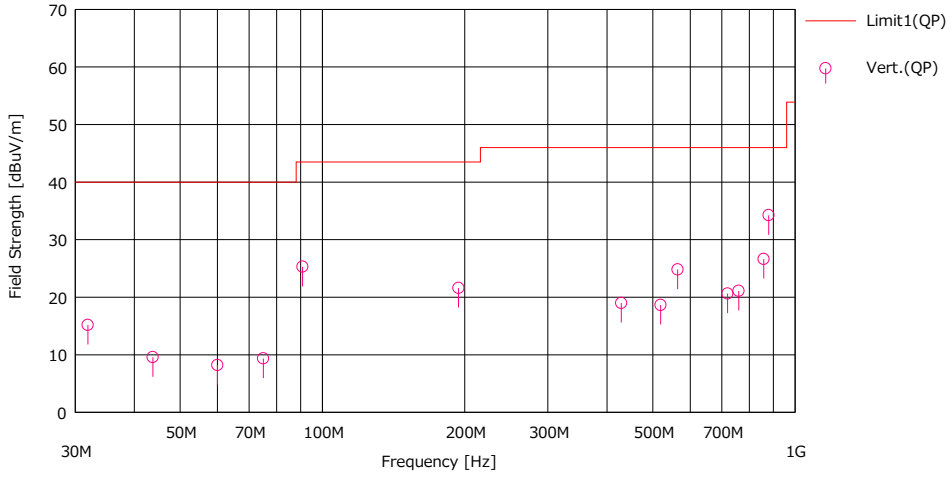


CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.
The test was conducted at the worst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

Radiated Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	August 28, 2022
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Nachi Konegawa
	(Below 1 GHz)
Mode	Mode 2

Limit : FCC_Part 15 Subpart B(15.109)_Class B

<< QP DATA >>

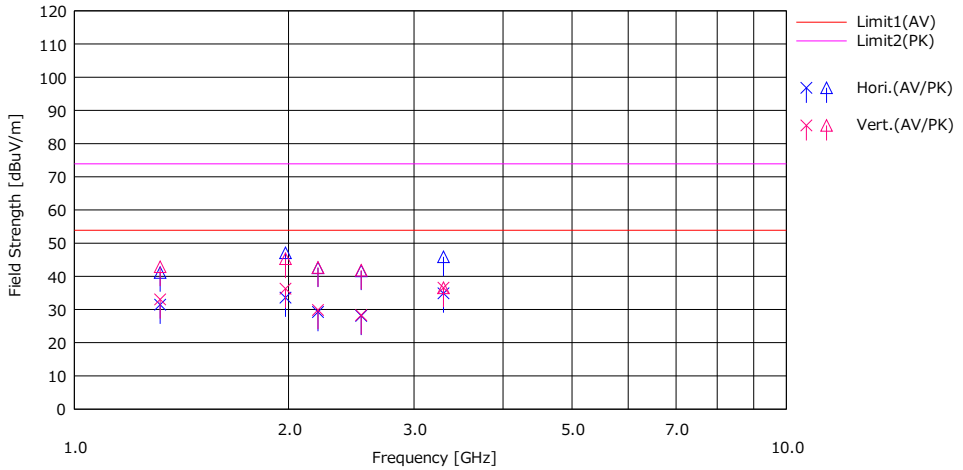
No.	Freq.	Reading (QP)	Ant.Fac	Loss	Gain	Result (QP)	Limit (QP)	Margin (QP)	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	33.064	22.60	12.83	7.06	32.10	10.39	40.00	29.61	Hori.	100	49	BA	
2	43.800	22.60	10.86	7.21	32.09	8.58	40.00	31.42	Hori.	100	222	BA	
3	60.000	22.90	9.08	7.42	32.09	7.31	40.00	32.69	Hori.	305	54	BA	
4	75.000	24.80	9.04	7.60	32.09	9.35	40.00	30.65	Hori.	239	178	BA	
5	88.064	35.40	9.47	7.73	32.08	20.52	43.50	22.98	Hori.	236	314	BA	
6	188.004	30.40	13.96	8.60	32.01	20.95	43.50	22.55	Hori.	100	287	BA	
7	305.501	31.10	13.80	9.45	32.04	22.31	46.00	23.69	Hori.	100	278	LA23	
8	550.718	24.30	17.93	11.04	32.32	20.95	46.00	25.05	Hori.	152	245	LA23	
9	716.394	21.00	20.20	11.59	32.30	20.49	46.00	25.51	Hori.	100	359	LA23	
10	720.000	21.10	20.21	11.60	32.28	20.63	46.00	25.37	Hori.	100	287	LA23	
11	760.000	20.90	20.40	11.74	32.05	20.99	46.00	25.01	Hori.	100	87	LA23	
12	858.290	23.00	21.80	12.14	31.50	25.44	46.00	20.56	Hori.	100	67	LA23	Local Harmonics
13	879.500	28.80	22.16	12.25	31.38	31.83	46.00	14.17	Hori.	100	302	LA23	
14	31.906	27.10	13.13	7.04	32.10	15.17	40.00	24.83	Vert.	100	7	BA	
15	43.800	23.60	10.86	7.21	32.09	9.58	40.00	30.42	Vert.	100	0	BA	
16	60.000	23.80	9.08	7.42	32.09	8.21	40.00	31.79	Vert.	100	9	BA	
17	75.000	24.80	9.04	7.60	32.09	9.35	40.00	30.65	Vert.	100	0	BA	
18	90.807	40.10	9.50	7.76	32.07	25.29	43.50	18.21	Vert.	100	78	BA	
19	194.080	30.70	14.26	8.64	32.00	21.60	43.50	21.90	Vert.	100	356	BA	
20	429.001	24.60	16.31	10.25	32.17	18.99	46.00	27.01	Vert.	100	177	LA23	
21	519.624	22.20	17.87	10.85	32.28	18.64	46.00	27.36	Vert.	100	26	LA23	
22	564.449	27.70	18.35	11.10	32.34	24.81	46.00	21.19	Vert.	100	0	LA23	
23	720.000	21.10	20.21	11.60	32.28	20.63	46.00	25.37	Vert.	100	188	LA23	
24	760.000	21.00	20.40	11.74	32.05	21.09	46.00	24.91	Vert.	100	176	LA23	
25	858.290	24.20	21.80	12.14	31.50	26.64	46.00	19.36	Vert.	100	193	LA23	Local Harmonics
26	879.500	31.20	22.16	12.25	31.38	34.23	46.00	11.77	Vert.	100	188	LA23	

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.
The test was conducted at the worst local frequency.

Radiated Emission

Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.4	No.4
Date	August 29, 2022	August 29, 2022
Temperature / Humidity	22 deg. C / 42 % RH	22 deg. C / 46 % RH
Engineer	Junki Nagatomi	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 40 GHz)
Mode	Mode 2	

Limit : FCC_Part 15 Subpart B(15.109)_Class B



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]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	1319.998	37.60	47.30	25.48	2.18	33.78	31.48	41.18	53.90	73.90	22.42	32.72	Hori.	158	134	H21	
2	1980.000	36.80	50.30	26.08	2.69	31.99	33.58	47.08	53.90	73.90	20.32	26.82	Hori.	100	158	H21	
3	2199.580	30.20	43.50	28.10	2.80	31.83	29.27	42.57	53.90	73.90	24.63	31.33	Hori.	136	275	H21	
4	2529.600	29.10	42.60	27.72	2.95	31.65	28.12	41.62	53.90	73.90	25.78	32.28	Hori.	100	121	H21	
5	3299.996	34.20	45.20	28.56	3.38	31.28	34.86	45.86	53.90	73.90	19.04	28.04	Hori.	106	151	H21	
6	1319.998	39.20	49.00	25.48	2.18	33.78	33.08	42.88	53.90	73.90	20.82	31.02	Vert.	110	179	H21	
7	1980.000	39.50	48.50	26.08	2.69	31.99	36.28	45.28	53.90	73.90	17.62	28.62	Vert.	170	136	H21	
8	2199.580	30.80	43.60	28.10	2.80	31.83	29.87	42.67	53.90	73.90	24.03	31.23	Vert.	100	18	H21	
9	2529.600	29.30	42.80	27.72	2.95	31.65	28.32	41.82	53.90	73.90	25.58	32.08	Vert.	100	189	H21	
10	3299.996	35.90	35.90	28.56	3.38	31.28	36.56	36.56	53.90	73.90	17.34	37.34	Vert.	102	154	H21	

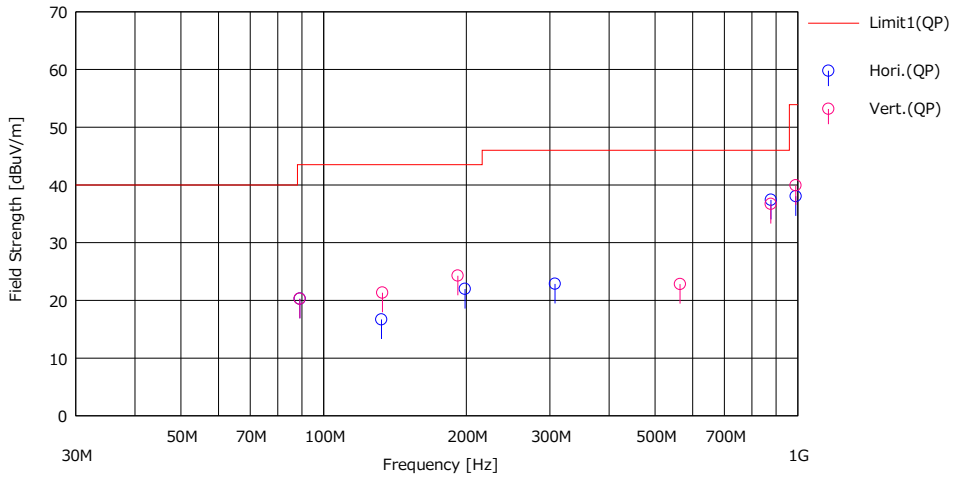
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.
The test was conducted at the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

* No signal was detected above 10 GHz.

Radiated Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	August 28, 2022
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Nachi Konegawa
	(Below 1 GHz)
Mode	Mode 3

Limit : FCC_Part 15 Subpart B(15.109)_Class B



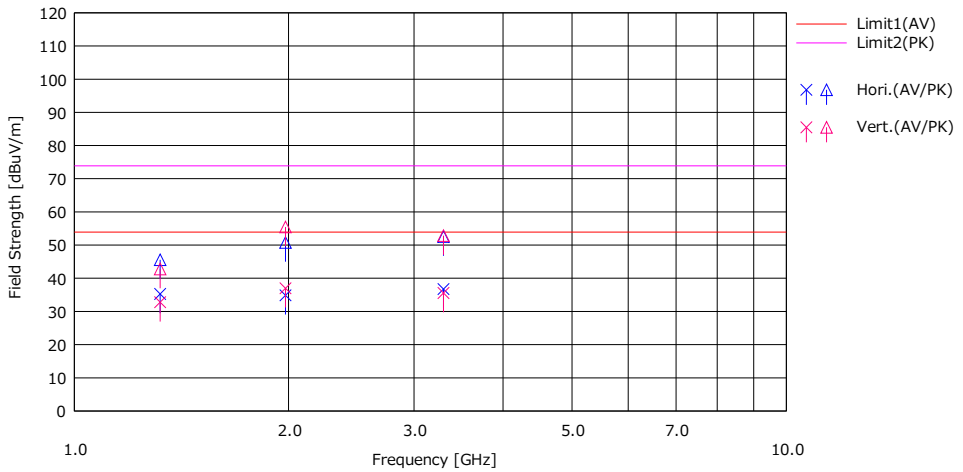
No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	89.082	35.10	9.51	7.74	32.08	20.27	43.50	23.23	Hori.	222	333	BA	
2	132.400	29.10	11.49	8.14	32.04	16.69	43.50	26.81	Hori.	156	118	BA	
3	198.613	30.80	14.48	8.68	32.00	21.96	43.50	21.54	Hori.	100	233	BA	
4	307.479	31.60	13.85	9.46	32.04	22.87	46.00	23.13	Hori.	100	72	LA23	
5	877.838	34.40	22.15	12.24	31.39	37.40	46.00	8.60	Hori.	166	120	LA23	
6	990.315	33.60	22.43	12.75	30.75	38.03	53.90	15.87	Hori.	100	75	LA23	
7	89.042	35.10	9.51	7.74	32.08	20.27	43.50	23.23	Vert.	212	250	BA	
8	133.018	33.70	11.51	8.15	32.04	21.32	43.50	22.18	Vert.	100	9	BA	
9	191.861	33.40	14.23	8.63	32.00	24.26	43.50	19.24	Vert.	100	0	BA	
10	564.518	25.70	18.35	11.10	32.34	22.81	46.00	23.19	Vert.	100	354	LA23	
11	877.410	33.70	22.15	12.24	31.39	36.70	46.00	9.30	Vert.	100	186	LA23	
12	989.981	35.50	22.42	12.75	30.76	39.91	53.90	13.99	Vert.	100	171	LA23	

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.4	No.4
Date	August 29, 2022	August 29, 2022
Temperature / Humidity	22 deg. C / 42 % RH	22 deg. C / 46 % RH
Engineer	Junki Nagatomi	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 40 GHz)
Mode	Mode 3	

Limit : FCC_Part 15 Subpart B(15.109)_Class B



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]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	1319.998	41.40	51.70	25.48	2.18	33.78	35.28	45.58	53.90	73.90	18.62	28.32	Hori.	100	122	H21	
2	1979.998	38.10	54.00	26.08	2.69	31.99	34.88	50.78	53.90	73.90	19.02	23.12	Hori.	123	220	H21	
3	3299.996	36.10	51.90	28.56	3.38	31.28	36.76	52.56	53.90	73.90	17.14	21.34	Hori.	100	198	H21	
4	1319.998	38.90	48.90	25.48	2.18	33.78	32.78	42.78	53.90	73.90	21.12	31.12	Vert.	141	297	H21	
5	1979.998	40.20	58.70	26.08	2.69	31.99	36.98	55.48	53.90	73.90	16.92	18.42	Vert.	183	145	H21	
6	3299.996	34.90	52.20	28.56	3.38	31.28	35.56	52.86	53.90	73.90	18.34	21.04	Vert.	100	158	H21	

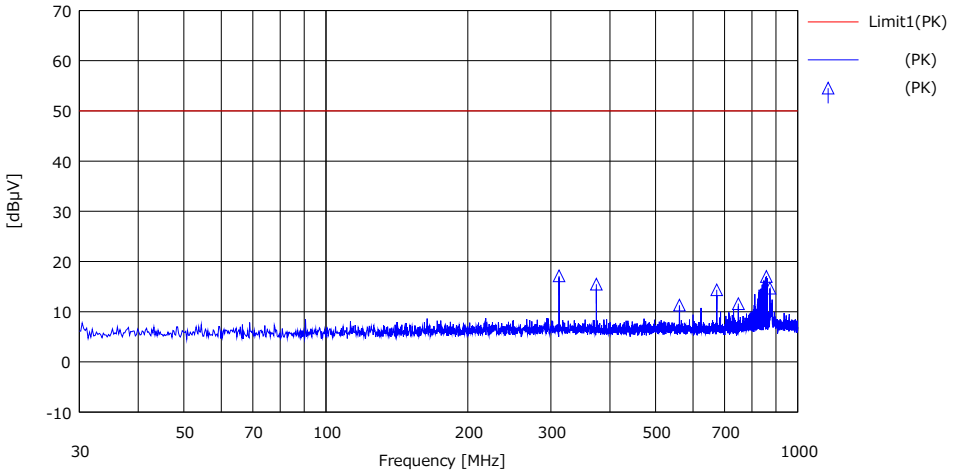
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 10 GHz.

Antenna Terminal Conducted Emission

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.6 Shielded Room
Date	August 25, 2022
Temperature / Humidity	24 deg. C / 65 % RH
Engineer	Daiki Matsui
Mode	Mode 4

Limit : FCC15.111 Antenna terminal measurement



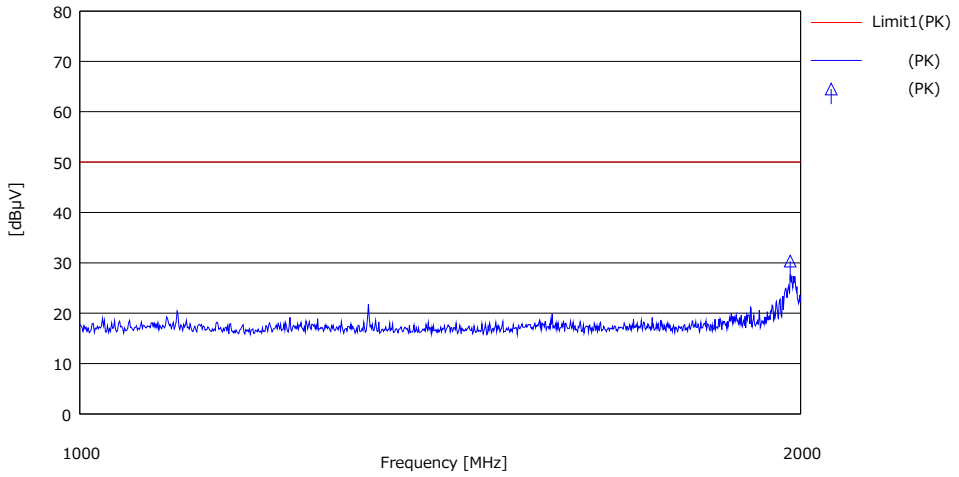
No.	Freq. [MHz]	Reading ⟨PK⟩ [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result ⟨PK⟩ [dBµV]	Limit *1) ⟨PK⟩ [dBµV]	Margin ⟨PK⟩ [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	312.000	38.65	0.00	6.29	27.80	17.14	50.00	32.8					
2	374.400	37.42	0.00	6.32	28.26	15.48	50.00	34.5					
3	561.600	34.13	0.00	6.41	29.25	11.29	50.00	38.7					
4	673.930	37.16	0.00	6.45	29.27	14.34	50.00	35.6					
5	748.800	34.33	0.00	6.46	29.18	11.61	50.00	38.3					
6	858.290	39.45	0.00	6.50	28.93	17.02	50.00	32.9					Local 107.6MHz
7	873.600	37.09	0.00	6.50	28.90	14.69	50.00	35.3					

* 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

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.6 Shielded Room
Date	August 25, 2022
Temperature / Humidity	24 deg. C / 65 % RH
Engineer	Daiki Matsui
Mode	Mode 4

Limit : FCC15.111 Antenna terminal measurement



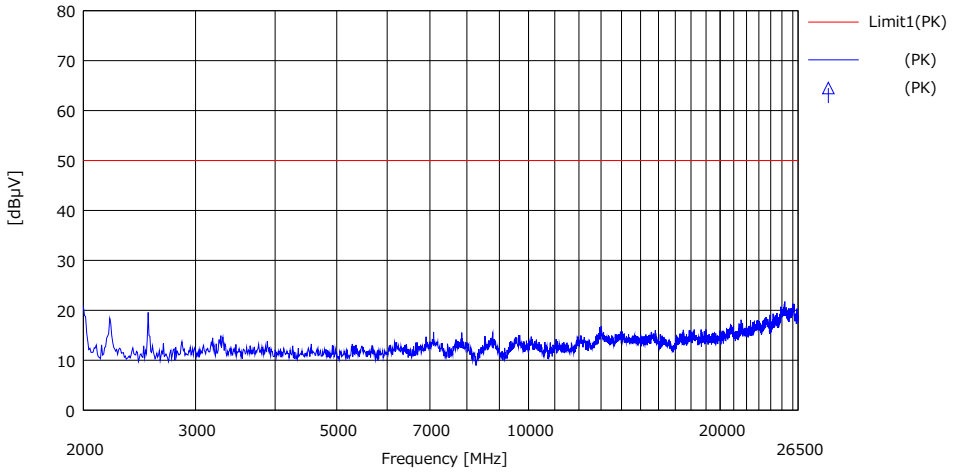
No.	Freq. [MHz]	Reading 〈PK〉 [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result 〈PK〉 [dBµV]	Limit*1) 〈PK〉 [dBµV]	Margin 〈PK〉 [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	1980.000	55.56	0.00	6.78	31.99	30.35	50.00	19.6					

* 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

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.6 Shielded Room
Date	August 25, 2022
Temperature / Humidity	24 deg. C / 65 % RH
Engineer	Daiki Matsui
Mode	Mode 4

Limit : FCC15.111 Antenna terminal measurement



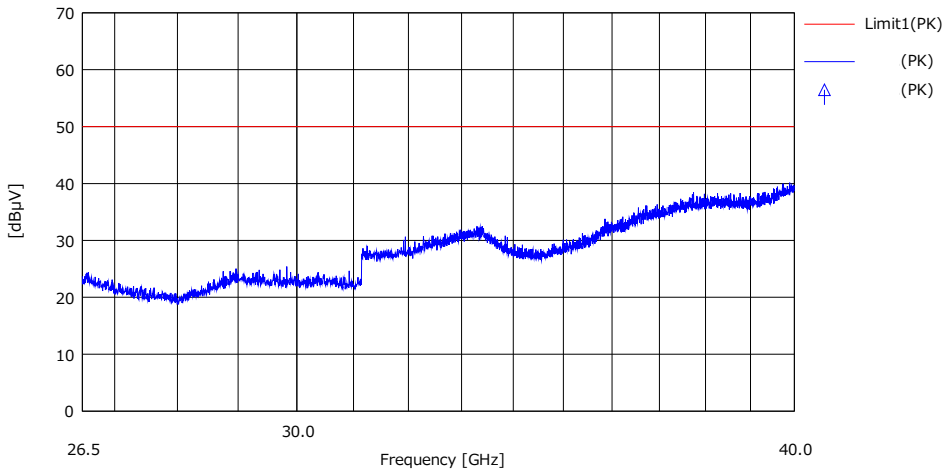
No.	Freq. [MHz]	Reading (PK) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK) [dBµV]	Limit*1) (PK) [dBµV]	Margin (PK) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment

* 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

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.6 Shielded Room
Date	August 25, 2022
Temperature / Humidity	24 deg. C / 65 % RH
Engineer	Daiki Matsui
Mode	Mode 4

Limit : FCC15.111 Antenna terminal measurement



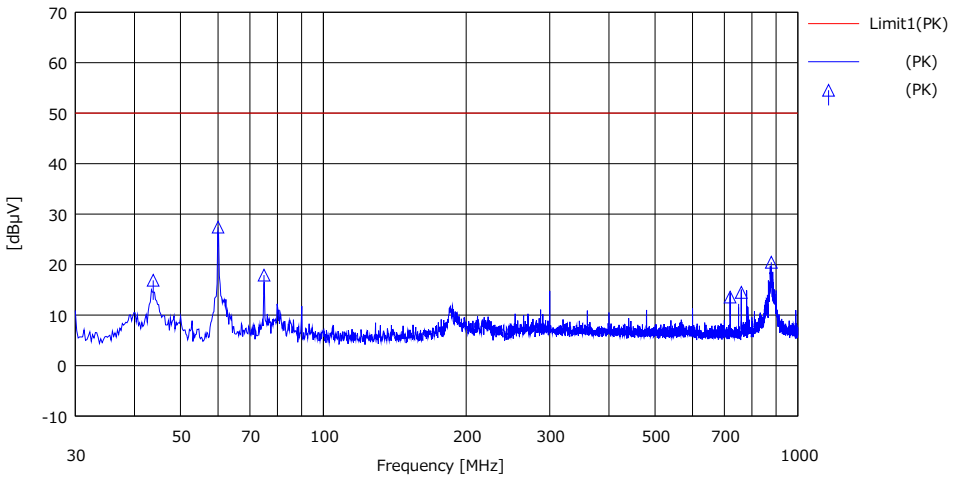
No.	Freq. [MHz]	Reading <PK> [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result <PK> [dBµV]	Limit <PK> [dBµV]	Margin <PK> [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment

* 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

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.6 Shielded Room
Date	August 25, 2022
Temperature / Humidity	24 deg. C / 65 % RH
Engineer	Daiki Matsui
Mode	Mode 5

Limit : FCC15.111 Antenna terminal measurement



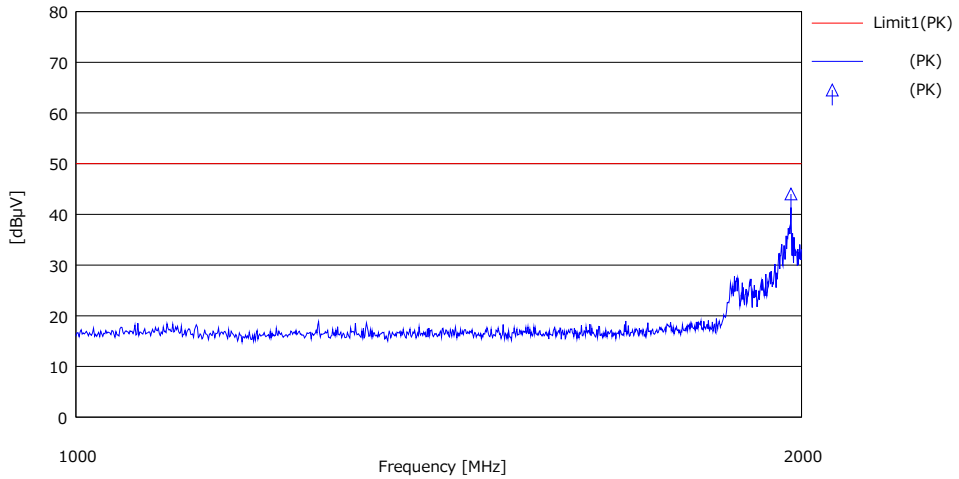
No.	Freq. [MHz]	Reading ⟨PK⟩ [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result ⟨PK⟩ [dBµV]	Limit*1) ⟨PK⟩ [dBµV]	Margin ⟨PK⟩ [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	43.800	39.33	0.00	6.10	28.54	16.89	50.00	33.1					
2	60.000	49.80	0.00	6.11	28.51	27.40	50.00	22.6					
3	75.000	40.27	0.00	6.12	28.48	17.91	50.00	32.0					
4	720.000	36.32	0.00	6.46	29.22	13.56	50.00	36.4					
5	760.000	37.20	0.00	6.47	29.16	14.51	50.00	35.4					
6	879.500	42.85	0.00	6.51	28.89	20.47	50.00	29.5					

* 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

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.6 Shielded Room
Date	August 25, 2022
Temperature / Humidity	24 deg. C / 65 % RH
Engineer	Daiki Matsui
Mode	Mode 5

Limit : FCC15.111 Antenna terminal measurement



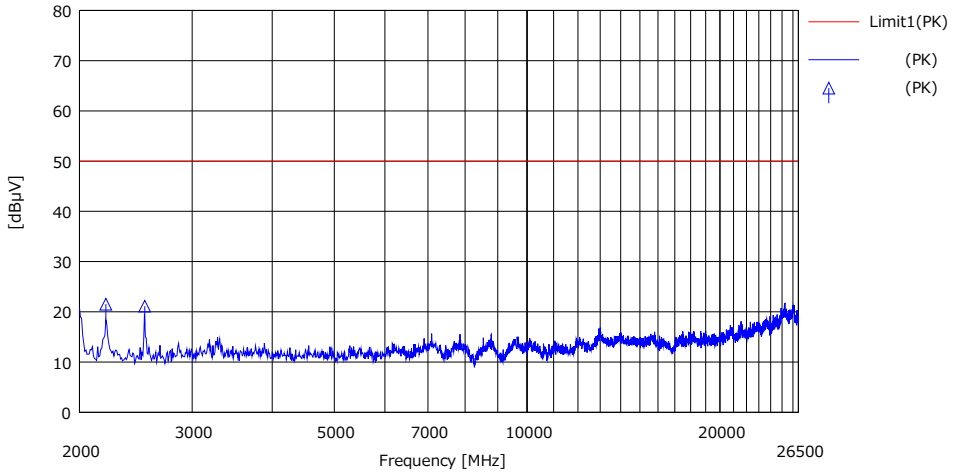
No.	Freq. [MHz]	Reading (PK) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK) [dBµV]	Limit*1) (PK) [dBµV]	Margin (PK) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	1980.000	69.23	0.00	6.78	31.99	44.02	50.00	5.9					

* 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

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.6 Shielded Room
Date	August 25, 2022
Temperature / Humidity	24 deg. C / 65 % RH
Engineer	Daiki Matsui
Mode	Mode 5

Limit : FCC15.111 Antenna terminal measurement



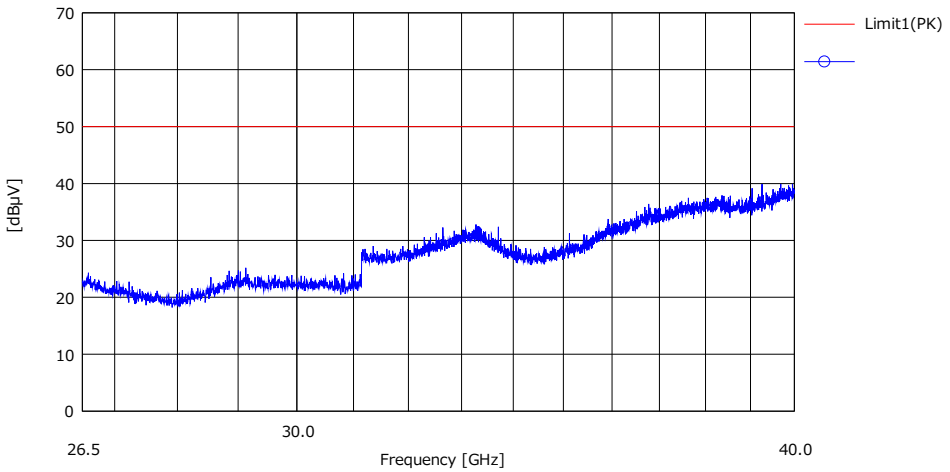
No.	Freq. [MHz]	Reading (PK) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK) [dBµV]	Limit *1) (PK) [dBµV]	Margin (PK) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	2199.850	52.73	0.00	0.63	31.83	21.53	50.00	28.4					
2	2529.600	52.09	0.00	0.67	31.65	21.11	50.00	28.8					

* 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

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.6 Shielded Room
Date	August 25, 2022
Temperature / Humidity	24 deg. C / 65 % RH
Engineer	Daiki Matsui
Mode	Mode 5

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBµV]	Limit *1) <PK> [dBµV]	Margin <PK> [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment

* 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.

APPENDIX 2: Test instruments

Test equipment

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MAEC-04	142011	AC4_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	05/22/2022	24
RE	MAEC-04-SVSWR	142017	AC4_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-10005	04/12/2021	24
RE	MAT-34	141331	Attenuator(6dB)	TME	UFA-01	-	02/25/2022	12
RE	MCC-217	141393	Microwave Cable	Junkosha	MWX221	1604S254(1 m) / 1608S088(5 m)	08/02/2022	12
RE	MCC-231	177964	Microwave Cable	Junkosha INC.	MMX221	1901S329(1m)/ 1902S579(5m)	03/15/2022	12
RE	MCC-50	141397	Coaxial Cable	UL Japan	-	-	11/03/2021	12
RE	MCC-54	141325	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	03/17/2022	12
RE	MDCB-04	156190	DC Block	EMC Instruments Corporation	N9398C	MY46457635	07/09/2022	12
RE	MHA-17	141506	Horn Antenna 15-40GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9170	BBHA9170307	07/22/2022	12
RE	MHA-21	141508	Horn Antenna 1-18GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	557	05/20/2022	12
RE	MJM-29	142230	Measure	KOMELON	KMC-36	-	-	-
RE	MLA-23	141267	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-192	08/28/2021	12
RE	MMM-10	141545	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	51201148	01/16/2022	12
RE	MMP-01	141550	Matching Pad Anritsu	Anritsu Corporation	MB-009	40063	07/28/2022	12
RE	MOS-15	141562	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0010	01/10/2022	12
RE	MPA-12	141581	MicroWave System Amplifier	Keysight Technologies Inc	83017A	00650	10/07/2021	12
RE	MPA-14	141583	Pre Amplifier	SONOMA INSTRUMENT	310	260833	04/04/2022	12
RE	MPA-33	220253	Broadband Amplifier	SAGE Millimeter, Inc.	SBB-0115033218-2F2F-E3	0001	05/13/2022	12
RE	MSA-10	141899	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY46180655	02/18/2022	12
RE	MSG-14	141894	Signal Generator	Rohde & Schwarz	SMC100A	1411.4002k02	10/22/2021	12
RE	MSG-17	141897	Signal Generator	Keysight Technologies Inc	N5182B	MY56200024	11/22/2021	12
RE	MTA-56	141938	Terminator	TME	CT-01BP	-	12/16/2021	12
RE	MTR-10	141951	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	07/25/2022	12
RE	YBA-03	197990	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHBB 9124 + BBA 9106	01365	11/13/2021	12
AT	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
AT	MCC-177	141226	Microwave Cable	Junkosha	MMX221-00500DMSDMS	1502S304	03/17/2022	12
AT	MCC-178	141227	Microwave Cable	Junkosha	MMX221-00500DMSDMS	1502S305	03/15/2022	12
AT	MCC-54	141325	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	03/17/2022	12
AT	MDCB-02	141485	DC Block Filter	Keysight Technologies Inc	N9398C	51053	11/19/2021	12
AT	MJM-24	142225	Measure	ASKUL	-	-	-	-
AT	MMM-18	141558	Digital Tester(TRUE RMS MULTIMETER)	Fluke Corporation	115	17930030	05/17/2022	12
AT	MMP-01	141550	Matching Pad Anritsu	Anritsu Corporation	MB-009	40063	07/28/2022	12
AT	MOS-14	141561	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	1401	01/10/2022	12
AT	MPA-12	141581	MicroWave System Amplifier	Keysight Technologies Inc	83017A	00650	10/07/2021	12
AT	MPA-22	141588	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P	1871355 / 1871328	09/30/2021	12
AT	MPA-24	141594	Pre Amplifier	Keysight Technologies Inc	8447D	2944A10150	02/25/2022	12
AT	MRENT-130	141855	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46187750	11/28/2021	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