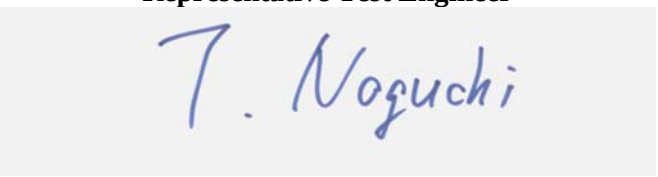
RADIO TEST REPORT

Test Report No.: 14298322H-R2

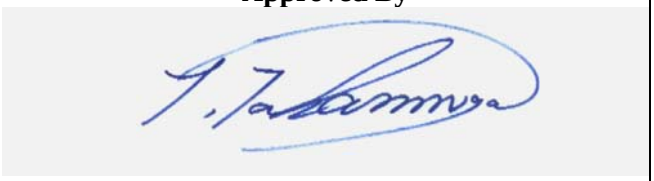
Customer	**Panasonic Automotive Systems Co., Ltd.**
Description of EUT	**Wireless Charger**
Model Number of EUT	**AT2301**
FCC ID	**ACJ932AT2301**
Test Regulation	**FCC Part 15 Subpart C**
Test Result	**Complied (Refer to SECTION 3)**
Issue Date	**August 26, 2022**
Remarks	**-**

Representative Test Engineer



Takafumi Noguchi
Engineer

Approved By



Tsubasa Takayama
Leader

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 applicant 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.: 14298322H

This report is a revised version of 14298322H-R1. 14298322H-R1 is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14298322H	July 11, 2022	-
1	14298322H-R1	August 24, 2022	Correction of the Plot data (Page 24)
1	14298322H-R1	August 24, 2022	Addition of the Setup photo for Above 30 MHz (Page 44 to 46)
2	14298322H-R2	August 26, 2022	Correction of the Setup photo for Above 30 MHz (Page 44 to 46)

Reference: Abbreviations (Including words undescribed in this report)

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

CONTENTS **PAGE**

SECTION 1: Customer Information

Company Name	Panasonic Automotive Systems Co., Ltd. *1)
Address	4261, Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken 224-8520, Japan
Telephone Number	+81-80-3444-7148
Contact Person	Takahisa Sakai

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

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	Wireless Charger
Model Number	AT2301
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	April 25, 2022
Test Date	June 5 to 7, 2022

2.2 Product Description

General Specification

Rating	DC +10.5 V to +16 V (Typ: +12 V)
Feature of EUT	Use the ACC KEY of the car to turn the Wireless charger power ON/OFF. Place the charging side of the portable device (etc. mobile phone) down. When charging, the operation indicator light (orange) comes on. If charging is not occurring, try placing the portable device as close to the center of the charging area as possible. When charging is complete, the operation indicator light (green) comes on.

Radio Specification

Frequency Band	120.3 kHz / 127.0 kHz / 127.5 kHz / 116.4 kHz to 132.2 kHz
Rated Output Power	5 W / 15 W
Coil system	Single Coil
Charging distance	Contact

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	FCC Part 15 Subpart C FCC Part 15 final revised on April 1, 2022 and effective May 2, 2022
Title	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.209 Radiated emission limits; general requirements.

3.2 Procedures and results

Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
Conducted Emission	<FCC> ANSI C63.10:2013 6 Standard test methods <ISED> RSS-Gen 8.8	<FCC> Section 15.207 <ISED> RSS-Gen 8.8	-	N/A	N/A	N/A *1)
Electric Field Strength of Fundamental Emission	<FCC> ANSI C63.10:2013 6 Standard test methods <ISED> RSS-Gen 6.5, 6.12	<FCC> Section 15.209 <ISED> RSS-210 7.2 RSS-Gen 8.9	Radiated	N/A	10.7 dB 120.187 kHz, 0 deg. Peak with Duty factor <Mode 8>	Complied a)
Electric Field Strength of Spurious Emission	<FCC> ANSI C63.10:2013 6 Standard test methods <ISED> RSS-Gen 6.5, 6.6, 6.13	<FCC> Section 15.209 <ISED> RSS-210 7.3 RSS-Gen 8.9	Radiated	N/A	14.2 dB 187.905 MHz, Vertical, QP <Mode 11>	Complied a)
-20 dB Bandwidth	<FCC> ANSI C63.10:2013 6 Standard test methods <ISED> -	<FCC> Reference data <ISED> -	Radiated	N/A	N/A	Complied b)

Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.
*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 -20 dB Bandwidth / 99 % emission bandwidth)

Symbols:
Complied The data of this test item has enough margin, more than the measurement uncertainty.
Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration

FCC Part 15.31 (e)

This EUT constantly provides the stable voltage to RF part through the regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
99 % emission bandwidth	RSS-Gen 6.7	-	Radiated	N/A	N/A	-

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.
The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor *k*=2.

Test Item		**Frequency range**		**Uncertainty (+/-)**
Conducted emission AMN (LISN)		0.15 MHz to 30 MHz		3.3 dB
Radiated emission	3 m	9 kHz to 30 MHz		3.2 dB
	10 m			3.0 dB
	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		4.9 dB
		6 GHz to 18 GHz		5.2 dB
	1 m	10 GHz to 26.5 GHz		5.4 dB
		26.5 GHz to 40 GHz		5.4 dB
	10 m	1 GHz to 18 GHz		5.4 dB
-20 dB Bandwidth / 99 % emission bandwidth		-		0.96 %

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

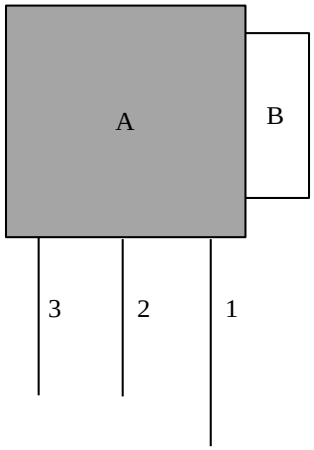
4.1. Operating Mode(s)

Test mode	Remarks
1) Normal Operating mode (120.3 kHz / BPP 5 W)	Mode 1
2) Normal Operating mode (127.0 kHz / BPP 5 W)	Mode 2
3) Normal Operating mode (127.5 kHz / BPP 5 W)	Mode 3
4) Normal Operating mode (120.3 kHz / EPP 15 W)	Mode 4
5) Normal Operating mode (127.0 kHz / EPP 15 W)	Mode 5
6) Normal Operating mode (127.5 kHz / EPP 15 W)	Mode 6
7) Normal Operating mode (116.4 kHz / EPP 15 W)	Mode 7
8) Normal Operating mode (119.4 kHz / EPP 15 W)	Mode 8
9) Normal Operating mode (124.5 kHz / EPP 15 W)	Mode 9
10) Normal Operating mode (122.6 kHz / EPP 15 W)	Mode 10
11) Normal Operating mode (126.0 kHz / EPP 15 W)	Mode 11
12) Normal Operating mode (131.7 kHz / EPP 15 W)	Mode 12
13) Normal Operating mode (123.1 kHz / EPP 15 W)	Mode 13
14) Normal Operating mode (126.5 kHz / EPP 15 W)	Mode 14
15) Normal Operating mode (132.2 kHz / EPP 15 W)	Mode 15
*Power of the EUT was set by the software as follows; Software: WC3_0411_2S_GEN5.hexVersion0411 (Date: 2022.3.1, Storage location: EUT memory) *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

For Radiated emission test, the test for FSK (Mode 7 to 15) was performed near center frequency each the channel as representative.

4.2. Configuration and peripherals

[Mode 1 to 6]



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

Description of EUT and Support equipment

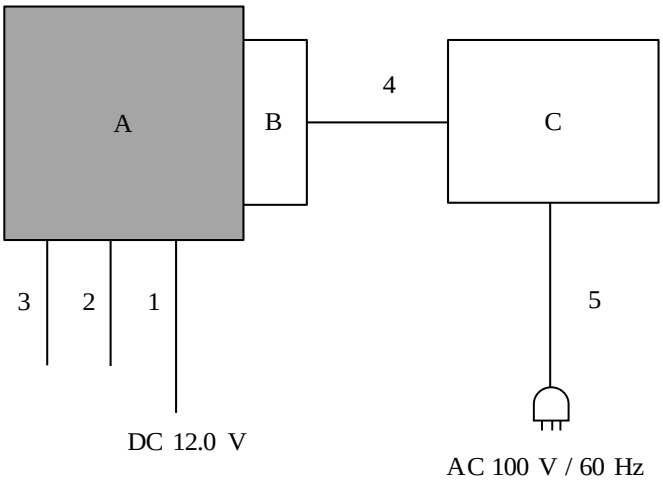
No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Charger	AT2301	3T-20220421-008	Panasonic Automotive Systems Co., Ltd.	EUT
B	Test Jig	PAS-J015 for BPP PAS-JS100 for EPP	015 for BPP 102 for EPP	Panasonic Automotive Systems Co., Ltd.	-

*A and B communicates and charges via air interface.

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	2.0	Unshielded	Unshielded	-
2	CAN Cable	2.0	Unshielded	Unshielded	-
3	Signal Cable	2.0	Unshielded	Unshielded	-

[**Mode 7 to 15**]



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Charger	AT2301	3T-20220421-008	Panasonic Automotive Systems Co., Ltd.	EUT
B	Reference Receiver	TPR#MP1B	001	Nok9	-
C	Qi Reference Tester	LP/MP/FOD	200134-1807	Nok9	-

*A and B communicates and charges via air interface.

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	2.0	Unshielded	Unshielded	-
2	CAN Cable	2.0	Unshielded	Unshielded	-
3	Signal Cable	2.0	Unshielded	Unshielded	-
4	Communication Cable	0.6	Unshielded	Unshielded	-
5	AC Cable	1.5	Unshielded	Unshielded	-

SECTION 5: Radiated emission (Fundamental and Spurious Emission)

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

Frequency: From 9 kHz to 30 MHz
The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for vertical polarization (antenna angle: 0 deg., 45 deg., 90 deg., and 135 deg.) and horizontal polarization.
*Refer to Figure 1 about Direction of the Loop Antenna.

Frequency: From 30 MHz to 1 GHz
The measuring antenna height 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.

The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	Below 30 MHz	30 MHz to 200 MHz	200 MHz to 1 GHz
Antenna Type	Loop	Biconical	Logperiodic

Frequency	From 9 kHz to 90 kHz and From 110 kHz to 150 kHz	From 90 kHz to 110 kHz	From 150 kHz to 490 kHz	From 490 kHz to 30 MHz	From 30 MHz to 1 GHz
Instrument used	Test Receiver				
Detector	PK / AV	QP	PK / AV	QP	QP
IF Bandwidth	200 Hz	200 Hz	9 kHz	9 kHz	120 kHz
Test Distance	3 m *1)	3 m *1)	3 m *1)	3 m *2)	3 m

*1) Distance Factor: 40 x log (3 m / 300 m) = -80 dB
*2) Distance Factor: 40 x log (3 m / 30 m) = -40 dB

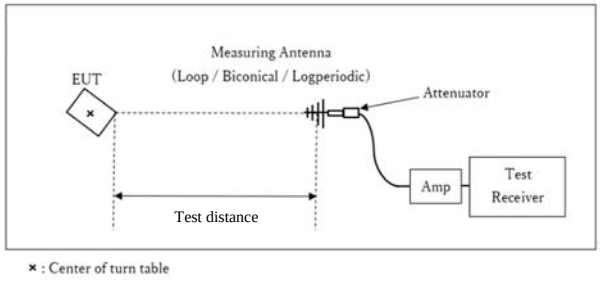
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open field test site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

These tests were performed in semi anechoic chamber. Therefore, the measured level of emissions may be higher than if measurements were made without a ground plane.
However, test results were confirmed to pass against standard limit.

The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohmes. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to 45.5 - 51.5 = -6.0 dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

[Test Setup]

Below 1 GHz



Test Distance: 3 m

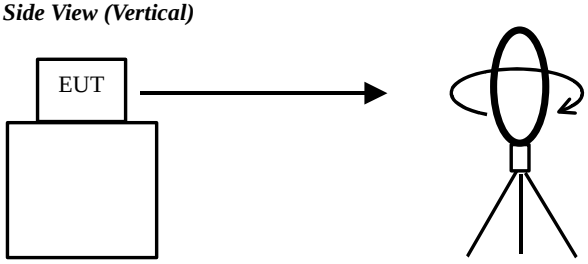
- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

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

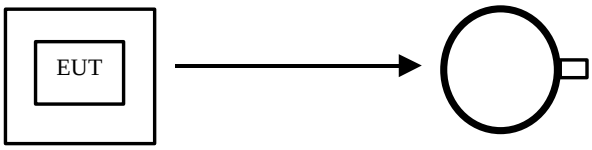
Measurement range : **9 kHz to 1 GHz**
Test data : **APPENDIX**
Test result : **Pass**

Figure 1: Direction of the Loop Antenna

Side View (Vertical)

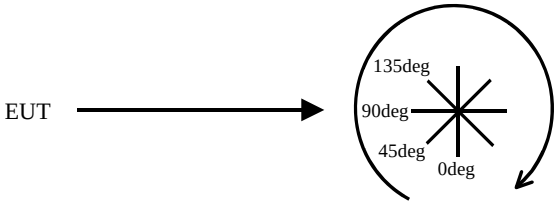


Top View (Horizontal)



Antenna was not rotated.

Top View (Vertical)



Front side: 0 deg.
Forward direction: clockwise

SECTION 6: -20 dB Bandwidth

Test Procedure
The test was measured with a spectrum analyzer.

For the Mode 1 through 6

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
-20 dB Bandwidth	2 to 5 times of OBW	10 kHz	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
* Above settings are not followed by ANSI requirement, because signal is almost sine wave, the smaller RBW setting is, the narrower result is. So actual settings are 10 kHz for RBW.							

For the Mode other than 1 through 6

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
-20 dB Bandwidth	2 to 5 times of OBW	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer

Test data : **APPENDIX**
Test result : **Pass**

SECTION 7: 99 % emission bandwidth

Test Procedure
The test was measured with a spectrum analyzer.

For the Mode 1 through 6

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
99 % Occupied Bandwidth	Enough width to display emission skirts	10kHz	Three times of RBW	Auto	Peak *1)	Max Hold *1)	Spectrum Analyzer
*1) The measurement was performed with Peak detector, Max Hold since the duty cycle was not 100 %. * Above settings are not followed by ANSI requirement, because signal is almost sine wave, the smaller RBW setting is, the narrower result is. So actual settings are 10kHz for RBW. Peak hold was applied as Worst-case measurement.							

For the Mode other than 1 through 6

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
99 % Occupied Bandwidth	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak *1)	Max Hold *1)	Spectrum Analyzer
*1) The measurement was performed with Peak detector, Max Hold since the duty cycle was not 100 %. Peak hold was applied as Worst-case measurement.							

Test data : **APPENDIX**
Test result : **Pass**

APPENDIX 1: Test data

Radiated Emission (Fundamental and Spurious Emission)

Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	June 5, 2022	June 6, 2022
Temperature / Humidity	21 deg. C / 66 % RH	22 deg. C / 65 % RH
Engineer	Takafumi Noguchi	Sayaka Hara
	(30 MHz to 1 GHz)	(9 kHz to 30 MHz)
Mode	Mode 1	

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12030	PK	92.6	19.1	-73.9	32.2	-	5.6	45.9	40.3	Fundamental
0deg	0.24060	PK	51.1	19.1	-73.8	32.2	-	-35.8	39.9	75.7	
0deg	0.36090	PK	56.5	19.0	-73.8	32.2	-	-30.5	36.4	66.9	
0deg	0.48120	PK	42.5	19.0	-73.8	32.1	-	-44.4	34.0	78.4	
0deg	0.60150	QP	49.0	19.0	-33.8	32.1	-	2.1	32.0	29.9	
0deg	0.72180	QP	35.9	19.1	-33.7	32.2	-	-10.9	30.4	41.3	
0deg	0.84210	QP	44.0	19.1	-33.7	32.2	-	-2.8	29.1	31.9	
0deg	0.96240	QP	34.8	19.0	-33.7	32.2	-	-12.1	27.9	40.0	
0deg	1.08270	QP	40.9	19.0	-33.7	32.2	-	-6.0	26.9	32.9	
0deg	1.20300	QP	35.9	19.1	-33.7	32.2	-	-10.9	26.0	36.9	
Hori.	61.475	QP	22.3	7.5	7.2	28.5	-	8.5	40.0	31.5	
Hori.	64.002	QP	22.4	7.0	7.2	28.5	-	8.1	40.0	31.9	
Hori.	68.811	QP	22.3	6.5	7.3	28.5	-	7.6	40.0	32.4	
Hori.	78.641	QP	22.3	6.8	7.3	28.5	-	7.9	40.0	32.1	
Hori.	94.318	QP	21.7	9.3	7.5	28.4	-	10.1	43.5	33.4	
Hori.	98.303	QP	22.0	10.0	7.5	28.4	-	11.1	43.5	32.4	
Vert.	61.475	QP	26.8	7.5	7.2	28.5	-	13.0	40.0	27.0	
Vert.	64.002	QP	26.7	7.0	7.2	28.5	-	12.4	40.0	27.6	
Vert.	68.811	QP	26.9	6.5	7.3	28.5	-	12.2	40.0	27.8	
Vert.	78.641	QP	26.3	6.8	7.3	28.5	-	11.9	40.0	28.1	
Vert.	94.318	QP	22.7	9.3	7.5	28.4	-	11.1	43.5	32.4	
Vert.	98.303	QP	22.8	10.0	7.5	28.4	-	11.9	43.5	31.6	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12030	PK	92.6	19.1	-73.9	32.2	0.0	5.6	25.9	20.3	Fundamental
0deg	0.24060	PK	51.1	19.1	-73.8	32.2	0.0	-35.8	19.9	55.7	
0deg	0.36090	PK	56.5	19.0	-73.8	32.2	0.0	-30.5	16.4	46.9	
0deg	0.48120	PK	42.5	19.0	-73.8	32.1	0.0	-44.4	14.0	58.4	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3 m without Distance factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12030	PK	92.6	19.1	6.1	32.2	-	85.6	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

If Gain 0.0dB shown in the above table, pre-amplifier was not used to avoid the influence of carrier power.
The pre-amplifier used for carrier frequency measurement was not saturated.
Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Emission (Fundamental and Spurious Emission)

Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	June 5, 2022	June 6, 2022
Temperature / Humidity	21 deg. C / 66 % RH	22 deg. C / 65 % RH
Engineer	Takafumi Noguchi (30 MHz to 1 GHz)	Sayaka Hara (9 kHz to 30 MHz)
Mode	Mode 2	

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12700	PK	92.4	19.1	-73.9	32.2	-	5.4	45.5	40.1	Fundamental
0deg	0.25400	PK	52.1	19.1	-73.8	32.2	-	-34.8	39.5	74.3	
0deg	0.38100	PK	61.3	19.0	-73.8	32.2	-	-25.7	36.0	61.7	
0deg	0.50800	QP	35.3	19.0	-33.8	32.1	-	-11.6	33.5	45.1	
0deg	0.63500	QP	51.1	19.0	-33.7	32.1	-	4.3	31.5	27.2	
0deg	0.76200	QP	36.5	19.1	-33.7	32.2	-	-10.3	29.9	40.2	
0deg	0.88900	QP	45.2	19.1	-33.7	32.2	-	-1.6	28.6	30.2	
0deg	1.01600	QP	37.0	19.0	-33.7	32.2	-	-9.9	27.4	37.3	
0deg	1.14300	QP	41.3	19.0	-33.7	32.2	-	-5.6	26.4	32.0	
0deg	1.27000	QP	36.7	19.1	-33.7	32.2	-	-10.1	25.5	35.6	
Hori.	61.818	QP	22.1	7.5	7.2	28.5	-	8.3	40.0	31.7	
Hori.	64.002	QP	22.3	7.0	7.2	28.5	-	8.0	40.0	32.0	
Hori.	68.812	QP	22.2	6.5	7.3	28.5	-	7.5	40.0	32.5	
Hori.	78.641	QP	22.3	6.8	7.3	28.5	-	7.9	40.0	32.1	
Hori.	94.728	QP	21.7	9.4	7.5	28.4	-	10.2	43.5	33.3	
Hori.	98.300	QP	22.1	10.0	7.5	28.4	-	11.2	43.5	32.3	
Vert.	61.818	QP	26.8	7.5	7.2	28.5	-	13.0	40.0	27.0	
Vert.	64.002	QP	26.0	7.0	7.2	28.5	-	11.7	40.0	28.3	
Vert.	68.812	QP	28.0	6.5	7.3	28.5	-	13.3	40.0	26.7	
Vert.	78.641	QP	26.1	6.8	7.3	28.5	-	11.7	40.0	28.3	
Vert.	94.728	QP	22.5	9.4	7.5	28.4	-	11.0	43.5	32.5	
Vert.	98.300	QP	22.9	10.0	7.5	28.4	-	12.0	43.5	31.5	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12700	PK	92.4	19.1	-73.9	32.2	0.0	5.4	25.5	20.1	Fundamental
0deg	0.25400	PK	52.1	19.1	-73.8	32.2	0.0	-34.8	19.5	54.3	
0deg	0.38100	PK	61.3	19.0	-73.8	32.2	0.0	-25.7	16.0	41.7	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3 m without Distance factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12700	PK	92.4	19.1	6.1	32.2	-	85.4	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

If Gain 0.0dB shown in the above table, pre-amplifier was not used to avoid the influence of carrier power.
The pre-amplifier used for carrier frequency measurement was not saturated.
Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Emission (Fundamental and Spurious Emission)

Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	June 5, 2022	June 6, 2022
Temperature / Humidity	21 deg. C / 66 % RH	22 deg. C / 65 % RH
Engineer	Takafumi Noguchi	Sayaka Hara
	(30 MHz to 1 GHz)	(9 kHz to 30 MHz)
Mode	Mode 3	

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12750	PK	91.3	19.1	-73.9	32.2	-	4.3	45.4	41.1	Fundamental
0deg	0.25500	PK	51.0	19.1	-73.8	32.2	-	-35.9	39.4	75.3	
0deg	0.38250	PK	59.6	19.0	-73.8	32.2	-	-27.4	35.9	63.3	
0deg	0.51000	QP	34.8	19.0	-33.8	32.1	-	-12.1	33.5	45.6	
0deg	0.63750	QP	49.8	19.0	-33.7	32.1	-	3.0	31.5	28.5	
0deg	0.76500	QP	35.9	19.1	-33.7	32.2	-	-10.9	29.9	40.8	
0deg	0.89250	QP	44.2	19.1	-33.7	32.2	-	-2.6	28.6	31.2	
0deg	1.02000	QP	35.9	19.0	-33.7	32.2	-	-11.0	27.4	38.4	
0deg	1.14750	QP	40.3	19.0	-33.7	32.2	-	-6.6	26.4	33.0	
0deg	1.27500	QP	35.8	19.1	-33.7	32.2	-	-11.0	25.4	36.4	
Hori.	61.474	QP	22.3	7.5	7.2	28.5	-	8.5	40.0	31.5	
Hori.	64.002	QP	22.3	7.0	7.2	28.5	-	8.0	40.0	32.0	
Hori.	68.812	QP	22.3	6.5	7.3	28.5	-	7.6	40.0	32.4	
Hori.	78.641	QP	22.3	6.8	7.3	28.5	-	7.9	40.0	32.1	
Hori.	94.728	QP	21.7	9.4	7.5	28.4	-	10.2	43.5	33.3	
Hori.	98.300	QP	22.1	10.0	7.5	28.4	-	11.2	43.5	32.3	
Vert.	61.474	QP	27.9	7.5	7.2	28.5	-	14.1	40.0	25.9	
Vert.	64.002	QP	26.3	7.0	7.2	28.5	-	12.0	40.0	28.0	
Vert.	68.812	QP	27.3	6.5	7.3	28.5	-	12.6	40.0	27.4	
Vert.	78.641	QP	26.4	6.8	7.3	28.5	-	12.0	40.0	28.0	
Vert.	94.728	QP	22.7	9.4	7.5	28.4	-	11.2	43.5	32.3	
Vert.	98.300	QP	22.6	10.0	7.5	28.4	-	11.7	43.5	31.8	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12750	PK	91.3	19.1	-73.9	32.2	0.0	4.3	25.4	21.1	Fundamental
0deg	0.25500	PK	51.0	19.1	-73.8	32.2	0.0	-35.9	19.4	55.3	
0deg	0.38250	PK	59.6	19.0	-73.8	32.2	0.0	-27.4	15.9	43.3	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3 m without Distance factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12750	PK	91.3	19.1	6.1	32.2	-	84.3	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

If Gain 0.0dB shown in the above table, pre-amplifier was not used to avoid the influence of carrier power.
The pre-amplifier used for carrier frequency measurement was not saturated.
Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Emission (Fundamental and Spurious Emission)

Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	June 5, 2022	June 6, 2022
Temperature / Humidity	21 deg. C / 66 % RH	22 deg. C / 64 % RH
Engineer	Takafumi Noguchi (30 MHz to 1 GHz)	Takafumi Noguchi (9 kHz to 30 MHz)
Mode	Mode 4	

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12030	PK	98.3	19.1	-73.9	32.2	-	11.3	45.9	34.6	Fundamental
0deg	0.24060	PK	54.2	19.1	-73.8	32.2	-	-32.7	39.9	72.6	
0deg	0.36090	PK	71.1	19.0	-73.8	32.2	-	-15.9	36.4	52.3	
0deg	0.48120	PK	47.8	19.0	-73.8	32.1	-	-39.1	34.0	73.1	
0deg	0.60150	QP	61.9	19.0	-33.8	32.1	-	15.0	32.0	17.0	
0deg	0.72180	QP	40.5	19.1	-33.7	32.2	-	-6.3	30.4	36.7	
0deg	0.84210	QP	55.0	19.1	-33.7	32.2	-	8.2	29.1	20.9	
0deg	0.96240	QP	37.5	19.0	-33.7	32.2	-	-9.4	27.9	37.3	
0deg	1.08270	QP	49.1	19.0	-33.7	32.2	-	2.2	26.9	24.7	
0deg	1.20300	QP	35.3	19.1	-33.7	32.2	-	-11.5	26.0	37.5	
Hori.	59.073	QP	24.8	8.2	7.1	28.5	-	11.6	40.0	28.4	
Hori.	60.753	QP	25.8	7.7	7.2	28.5	-	12.2	40.0	27.8	
Hori.	67.611	QP	26.3	6.6	7.2	28.5	-	11.6	40.0	28.4	
Hori.	74.708	QP	28.8	6.5	7.3	28.5	-	14.1	40.0	25.9	
Hori.	98.170	QP	22.9	10.0	7.5	28.4	-	12.0	43.5	31.5	
Hori.	109.843	QP	22.8	11.7	7.6	28.4	-	13.7	43.5	29.8	
Vert.	59.073	QP	36.5	8.2	7.1	28.5	-	23.3	40.0	16.7	
Vert.	60.753	QP	38.5	7.7	7.2	28.5	-	24.9	40.0	15.1	
Vert.	67.611	QP	37.0	6.6	7.2	28.5	-	22.3	40.0	17.7	
Vert.	74.708	QP	37.0	6.5	7.3	28.5	-	22.3	40.0	17.7	
Vert.	98.170	QP	27.9	10.0	7.5	28.4	-	17.0	43.5	26.5	
Vert.	109.843	QP	28.6	11.7	7.6	28.4	-	19.5	43.5	24.0	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12030	PK	98.3	19.1	-73.9	32.2	0.0	11.3	25.9	14.6	Fundamental
0deg	0.24060	PK	54.2	19.1	-73.8	32.2	0.0	-32.7	19.9	52.6	
0deg	0.36090	PK	71.1	19.0	-73.8	32.2	0.0	-15.9	16.4	32.3	
0deg	0.48120	PK	47.8	19.0	-73.8	32.1	0.0	-39.1	14.0	53.1	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3 m without Distance factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12030	PK	98.3	19.1	6.1	32.2	-	91.3	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

If Gain 0.0dB shown in the above table, pre-amplifier was not used to avoid the influence of carrier power.
The pre-amplifier used for carrier frequency measurement was not saturated.
Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Emission (Fundamental and Spurious Emission)

Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	June 5, 2022	June 6, 2022
Temperature / Humidity	21 deg. C / 66 % RH	22 deg. C / 64 % RH
Engineer	Takafumi Noguchi (30 MHz to 1 GHz)	Takafumi Noguchi (9 kHz to 30 MHz)
Mode	Mode 5	

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12700	PK	98.4	19.1	-73.9	32.2	-	11.4	45.5	34.1	Fundamental
0deg	0.25400	PK	55.3	19.1	-73.8	32.2	-	-31.6	39.5	71.1	
0deg	0.38100	PK	72.3	19.0	-73.8	32.2	-	-14.7	36.0	50.7	
0deg	0.50800	QP	44.5	19.0	-33.8	32.1	-	-2.4	33.5	35.9	
0deg	0.63500	QP	63.2	19.0	-33.7	32.1	-	16.4	31.5	15.1	
0deg	0.76200	QP	40.6	19.1	-33.7	32.2	-	-6.2	29.9	36.1	
0deg	0.88900	QP	57.5	19.1	-33.7	32.2	-	10.7	28.6	17.9	
0deg	1.01600	QP	38.5	19.0	-33.7	32.2	-	-8.4	27.4	35.8	
0deg	1.14300	QP	53.0	19.0	-33.7	32.2	-	6.1	26.4	20.3	
0deg	1.27000	QP	36.7	19.1	-33.7	32.2	-	-10.1	25.5	35.6	
Hori.	57.908	QP	23.2	8.6	7.1	28.5	-	10.4	40.0	29.6	
Hori.	60.956	QP	25.7	7.7	7.2	28.5	-	12.1	40.0	27.9	
Hori.	67.685	QP	22.2	6.6	7.2	28.5	-	7.5	40.0	32.5	
Hori.	80.006	QP	24.7	6.9	7.4	28.5	-	10.5	40.0	29.5	
Hori.	97.782	QP	23.3	9.9	7.5	28.4	-	12.3	43.5	31.2	
Hori.	110.231	QP	21.6	11.7	7.6	28.4	-	12.5	43.5	31.0	
Vert.	57.908	QP	33.0	8.6	7.1	28.5	-	20.2	40.0	19.8	
Vert.	60.956	QP	38.0	7.7	7.2	28.5	-	24.4	40.0	15.6	
Vert.	67.685	QP	27.2	6.6	7.2	28.5	-	12.5	40.0	27.5	
Vert.	80.006	QP	31.9	6.9	7.4	28.5	-	17.7	40.0	22.3	
Vert.	97.782	QP	28.8	9.9	7.5	28.4	-	17.8	43.5	25.7	
Vert.	110.231	QP	24.4	11.7	7.6	28.4	-	15.3	43.5	28.2	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12700	PK	98.4	19.1	-73.9	32.2	0.0	11.4	25.5	14.1	Fundamental
0deg	0.25400	PK	55.3	19.1	-73.8	32.2	0.0	-31.6	19.5	51.1	
0deg	0.38100	PK	72.3	19.0	-73.8	32.2	0.0	-14.7	16.0	30.7	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3 m without Distance factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12700	PK	98.4	19.1	6.1	32.2	-	91.4	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

If Gain 0.0dB shown in the above table, pre-amplifier was not used to avoid the influence of carrier power.
The pre-amplifier used for carrier frequency measurement was not saturated.
Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Emission (Fundamental and Spurious Emission)

Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.2
Date	June 5, 2022	June 6, 2022
Temperature / Humidity	21 deg. C / 66 % RH	22 deg. C / 64 % RH
Engineer	Takafumi Noguchi	Takafumi Noguchi
	(30 MHz to 1 GHz)	(9 kHz to 30 MHz)
Mode	Mode 6	

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12750	PK	98.1	19.1	-73.9	32.2	-	11.1	45.4	34.3	Fundamental
0deg	0.25500	PK	56.6	19.1	-73.8	32.2	-	-30.3	39.4	69.7	
0deg	0.38250	PK	72.5	19.0	-73.8	32.2	-	-14.5	35.9	50.4	
0deg	0.51000	QP	44.1	19.0	-33.8	32.1	-	-2.8	33.5	36.3	
0deg	0.63750	QP	63.5	19.0	-33.7	32.1	-	16.7	31.5	14.8	
0deg	0.76500	QP	39.8	19.1	-33.7	32.2	-	-7.0	29.9	36.9	
0deg	0.89250	QP	57.8	19.1	-33.7	32.2	-	11.0	28.6	17.6	
0deg	1.02000	QP	38.0	19.0	-33.7	32.2	-	-8.9	27.4	36.3	
0deg	1.14750	QP	53.4	19.0	-33.7	32.2	-	6.5	26.4	19.9	
0deg	1.27500	QP	36.1	19.1	-33.7	32.2	-	-10.7	25.4	36.1	
Hori.	58.012	QP	23.1	8.6	7.1	28.5	-	10.3	40.0	29.7	
Hori.	61.198	QP	25.8	7.6	7.2	28.5	-	12.1	40.0	27.9	
Hori.	68.337	QP	22.7	6.5	7.3	28.5	-	8.0	40.0	32.0	
Hori.	81.216	QP	23.2	7.1	7.4	28.5	-	9.2	40.0	30.8	
Hori.	98.556	QP	23.0	10.0	7.5	28.4	-	12.1	43.5	31.4	
Hori.	107.227	QP	22.2	11.4	7.6	28.4	-	12.8	43.5	30.7	
Vert.	58.012	QP	32.7	8.6	7.1	28.5	-	19.9	40.0	20.1	
Vert.	61.198	QP	38.7	7.6	7.2	28.5	-	25.0	40.0	15.0	
Vert.	68.337	QP	29.1	6.5	7.3	28.5	-	14.4	40.0	25.6	
Vert.	81.216	QP	31.3	7.1	7.4	28.5	-	17.3	40.0	22.7	
Vert.	98.556	QP	28.4	10.0	7.5	28.4	-	17.5	43.5	26.0	
Vert.	107.227	QP	26.9	11.4	7.6	28.4	-	17.5	43.5	26.0	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12750	PK	98.1	19.1	-73.9	32.2	0.0	11.1	25.4	14.3	Fundamental
0deg	0.25500	PK	56.6	19.1	-73.8	32.2	0.0	-30.3	19.4	49.7	
0deg	0.38250	PK	72.5	19.0	-73.8	32.2	0.0	-14.5	15.9	30.4	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3 m without Distance factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12750	PK	98.1	19.1	6.1	32.2	-	91.1	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

If Gain 0.0dB shown in the above table, pre-amplifier was not used to avoid the influence of carrier power.
The pre-amplifier used for carrier frequency measurement was not saturated.
Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Emission (Fundamental and Spurious Emission)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
	(9 kHz to 1 GHz)
Mode	Mode 8

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.11940	PK	102.2	19.1	-73.9	32.2	-	15.2	45.9	30.7	Fundamental
0deg	0.23880	PK	64.0	19.1	-73.8	32.2	-	-22.9	40.0	62.9	
0deg	0.35820	PK	69.1	19.0	-73.8	32.2	-	-17.9	36.5	54.4	
0deg	0.47760	PK	48.5	19.0	-73.8	32.1	-	-38.4	34.0	72.4	
0deg	0.59700	QP	60.6	19.0	-33.8	32.1	-	13.7	32.0	18.3	
0deg	0.71640	QP	41.3	19.1	-33.7	32.2	-	-5.5	30.4	35.9	
0deg	0.83580	QP	54.2	19.1	-33.7	32.2	-	7.4	29.1	21.7	
0deg	0.95520	QP	36.4	19.0	-33.7	32.2	-	-10.5	27.9	38.4	
0deg	1.07460	QP	50.0	19.0	-33.7	32.2	-	3.1	26.9	23.8	
0deg	1.19400	QP	36.2	19.1	-33.7	32.2	-	-10.6	26.0	36.6	
Hori.	30.076	QP	21.2	19.0	6.8	28.6	-	18.4	40.0	21.6	
Hori.	93.142	QP	24.9	9.1	7.5	28.4	-	13.1	43.5	30.4	
Hori.	104.424	QP	26.8	10.9	7.6	28.4	-	16.9	43.5	26.6	
Hori.	133.790	QP	29.4	14.0	7.8	28.3	-	22.9	43.5	20.6	
Hori.	187.904	QP	29.1	16.3	8.2	28.1	-	25.5	43.5	18.0	
Hori.	280.000	QP	35.0	14.1	8.7	27.7	-	30.1	46.0	15.9	
Vert.	30.076	QP	25.8	19.0	6.8	28.6	-	23.0	40.0	17.0	
Vert.	93.142	QP	31.4	9.1	7.5	28.4	-	19.6	43.5	23.9	
Vert.	104.424	QP	38.7	10.9	7.6	28.4	-	28.8	43.5	14.7	
Vert.	133.790	QP	30.9	14.0	7.8	28.3	-	24.4	43.5	19.1	
Vert.	187.904	QP	32.8	16.3	8.2	28.1	-	29.2	43.5	14.3	
Vert.	280.000	QP	30.6	14.1	8.7	27.7	-	25.7	46.0	20.3	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.11940	PK	102.2	19.1	-73.9	32.2	0.0	15.2	25.9	10.7	Fundamental
0deg	0.23880	PK	64.0	19.1	-73.8	32.2	0.0	-22.9	20.0	42.9	
0deg	0.35820	PK	69.1	19.0	-73.8	32.2	0.0	-17.9	16.5	34.4	
0deg	0.47760	PK	48.5	19.0	-73.8	32.1	0.0	-38.4	14.0	52.4	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3 m without Distance factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.11940	PK	102.2	19.1	6.1	32.2	-	95.2	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

If Gain 0.0dB shown in the above table, pre-amplifier was not used to avoid the influence of carrier power.
The pre-amplifier used for carrier frequency measurement was not saturated.
Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Emission (Fundamental and Spurious Emission)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
	(9 kHz to 1 GHz)
Mode	Mode 11

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12600	PK	100.5	19.1	-73.9	32.2	-	13.5	45.5	32.0	Fundamental
0deg	0.25200	PK	61.3	19.1	-73.8	32.2	-	-25.6	39.5	65.1	
0deg	0.37800	PK	70.4	19.0	-73.8	32.2	-	-16.6	36.0	52.6	
0deg	0.50400	QP	47.0	19.0	-33.8	32.1	-	0.1	33.5	33.4	
0deg	0.63000	QP	60.2	19.0	-33.7	32.1	-	13.4	31.5	18.1	
0deg	0.75600	QP	38.6	19.1	-33.7	32.2	-	-8.2	30.0	38.2	
0deg	0.88200	QP	53.7	19.1	-33.7	32.2	-	6.9	28.6	21.7	
0deg	1.00800	QP	36.5	19.0	-33.7	32.2	-	-10.4	27.4	37.8	
0deg	1.13400	QP	49.0	19.0	-33.7	32.2	-	2.1	26.4	24.3	
0deg	1.26000	QP	34.3	19.1	-33.7	32.2	-	-12.5	25.5	38.0	
Hori.	30.050	QP	21.2	19.1	6.8	28.6	-	18.5	40.0	21.5	
Hori.	93.142	QP	24.9	9.1	7.5	28.4	-	13.1	43.5	30.4	
Hori.	104.384	QP	26.1	10.9	7.6	28.4	-	16.2	43.5	27.3	
Hori.	133.790	QP	28.9	14.0	7.8	28.3	-	22.4	43.5	21.1	
Hori.	187.905	QP	28.7	16.3	8.2	28.1	-	25.1	43.5	18.4	
Hori.	280.000	QP	34.6	14.1	8.7	27.7	-	29.7	46.0	16.3	
Vert.	30.050	QP	25.8	19.1	6.8	28.6	-	23.1	40.0	16.9	
Vert.	93.142	QP	31.6	9.1	7.5	28.4	-	19.8	43.5	23.7	
Vert.	104.384	QP	35.0	10.9	7.6	28.4	-	25.1	43.5	18.4	
Vert.	133.790	QP	30.0	14.0	7.8	28.3	-	23.5	43.5	20.0	
Vert.	187.905	QP	32.9	16.3	8.2	28.1	-	29.3	43.5	14.2	
Vert.	280.000	QP	30.6	14.1	8.7	27.7	-	25.7	46.0	20.3	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12600	PK	100.5	19.1	-73.9	32.2	0.0	13.5	25.5	12.0	Fundamental
0deg	0.25200	PK	61.3	19.1	-73.8	32.2	0.0	-25.6	19.5	45.1	
0deg	0.37800	PK	70.4	19.0	-73.8	32.2	0.0	-16.6	16.0	32.6	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3 m without Distance factor

Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12600	PK	100.5	19.1	6.1	32.2	-	93.5	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

If Gain 0.0dB shown in the above table, pre-amplifier was not used to avoid the influence of carrier power.
The pre-amplifier used for carrier frequency measurement was not saturated.
Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Emission (Fundamental and Spurious Emission)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
	(9 kHz to 1 GHz)
Mode	Mode 14

PK or QP

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12650	PK	101.1	19.1	-73.9	32.2	-	14.1	45.4	31.3	Fundamental
0deg	0.25300	PK	61.3	19.1	-73.8	32.2	-	-25.6	39.5	65.1	
0deg	0.37950	PK	71.1	19.0	-73.8	32.2	-	-15.9	36.0	51.9	
0deg	0.50600	QP	47.7	19.0	-33.8	32.1	-	0.8	33.5	32.7	
0deg	0.63250	QP	60.6	19.0	-33.7	32.1	-	13.8	31.5	17.7	
0deg	0.75900	QP	38.4	19.1	-33.7	32.2	-	-8.4	29.9	38.3	
0deg	0.88550	QP	54.0	19.1	-33.7	32.2	-	7.2	28.6	21.4	
0deg	1.01200	QP	36.8	19.0	-33.7	32.2	-	-10.1	27.4	37.5	
0deg	1.13850	QP	49.4	19.0	-33.7	32.2	-	2.5	26.4	23.9	
0deg	1.26500	QP	34.2	19.1	-33.7	32.2	-	-12.6	25.5	38.1	
Hori.	30.091	QP	21.2	19.0	6.8	28.6	-	18.4	40.0	21.6	
Hori.	93.145	QP	24.5	9.1	7.5	28.4	-	12.7	43.5	30.8	
Hori.	104.426	QP	27.9	10.9	7.6	28.4	-	18.0	43.5	25.5	
Hori.	134.000	QP	29.2	14.0	7.8	28.3	-	22.7	43.5	20.8	
Hori.	187.924	QP	29.4	16.3	8.2	28.1	-	25.8	43.5	17.7	
Hori.	280.000	QP	34.8	14.1	8.7	27.7	-	29.9	46.0	16.1	
Vert.	30.091	QP	27.0	19.0	6.8	28.6	-	24.2	40.0	15.8	
Vert.	93.145	QP	30.6	9.1	7.5	28.4	-	18.8	43.5	24.7	
Vert.	104.426	QP	38.2	10.9	7.6	28.4	-	28.3	43.5	15.2	
Vert.	134.000	QP	30.2	14.0	7.8	28.3	-	23.7	43.5	19.8	
Vert.	187.924	QP	32.1	16.3	8.2	28.1	-	28.5	43.5	15.0	
Vert.	280.000	QP	30.7	14.1	8.7	27.7	-	25.8	46.0	20.2	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier)

PK with Duty factor

Ant Deg [deg] or Polarity [Hori/Vert]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12650	PK	101.1	19.1	-73.9	32.2	0.0	14.1	25.4	11.3	Fundamental
0deg	0.25300	PK	61.3	19.1	-73.8	32.2	0.0	-25.6	19.5	45.1	
0deg	0.37950	PK	71.1	19.0	-73.8	32.2	0.0	-15.9	16.0	31.9	

Result = Reading + Ant Factor + Loss (Cable + Attenuator + D.Factor) - Gain(Amprifier) + Duty factor *

* Since the peak emission result satisfied the average limit, duty factor was omitted.

Result of the fundamental emission at 3 m without Distance factor

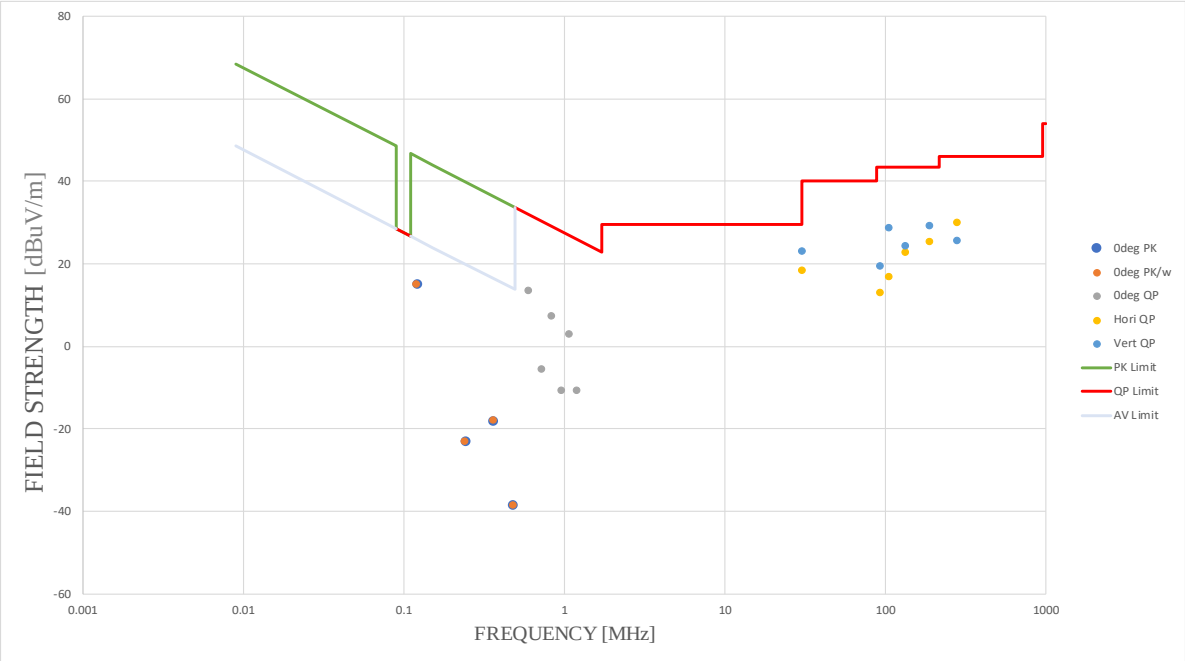
Ant Deg [deg]	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0deg	0.12650	PK	101.1	19.1	6.1	32.2	-	94.1	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amprifier)

If Gain 0.0dB shown in the above table, pre-amplifier was not used to avoid the influence of carrier power.
The pre-amplifier used for carrier frequency measurement was not saturated.
Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Radiated Spurious Emission
(Plot data, Worst case for Fundamental Emission)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
	(9 kHz to 1 GHz)
Mode	Mode 8



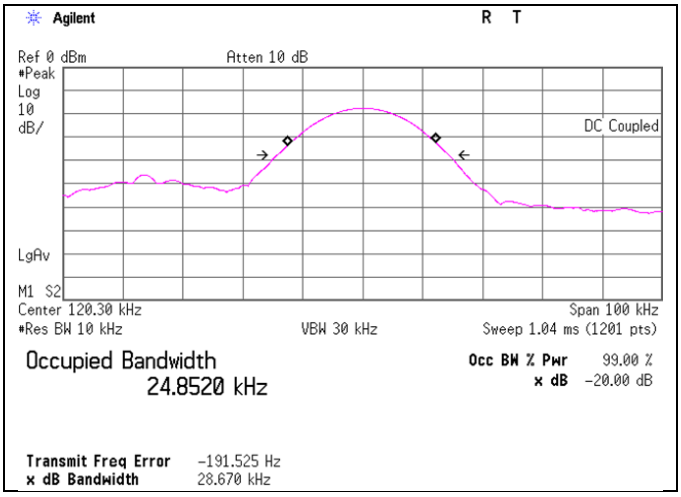
Distance of Limit

0.009 MHz to 0.490 MHz:	300 m
0.490 MHz to 30 MHz:	30 m
30 MHz to 1000 MHz:	3 m

-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 6, 2022
Temperature / Humidity	22 deg. C / 64 % RH
Engineer	Takafumi Noguchi
Mode	Mode 1

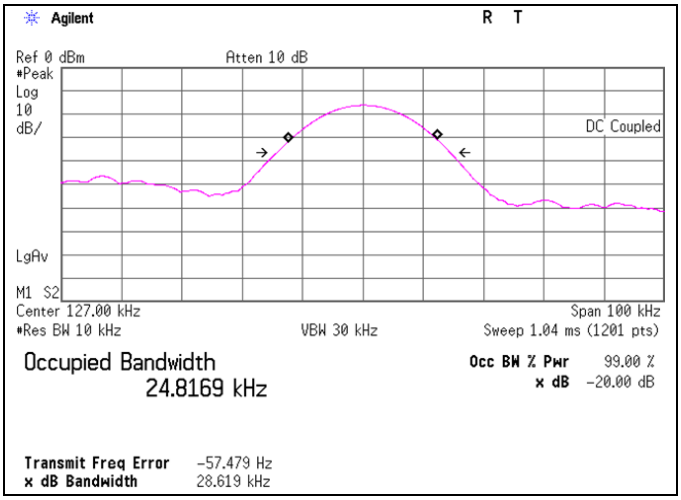
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
28.670	24.8520



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 6, 2022
Temperature / Humidity	22 deg. C / 64 % RH
Engineer	Takafumi Noguchi
Mode	Mode 2

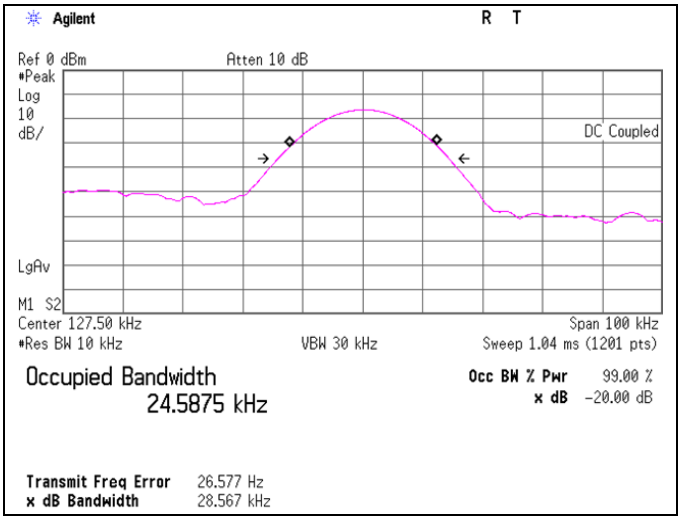
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
28.619	24.8169



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 6, 2022
Temperature / Humidity	22 deg. C / 64 % RH
Engineer	Takafumi Noguchi
Mode	Mode 3

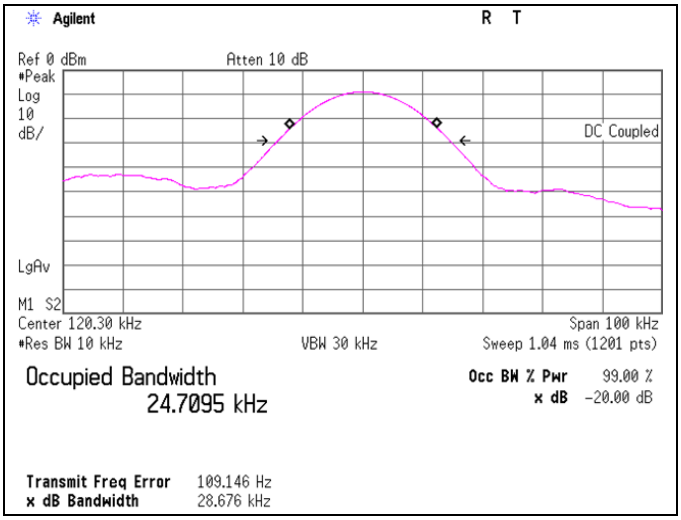
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
28.567	24.5875



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 6, 2022
Temperature / Humidity	22 deg. C / 64 % RH
Engineer	Takafumi Noguchi
Mode	Mode 4

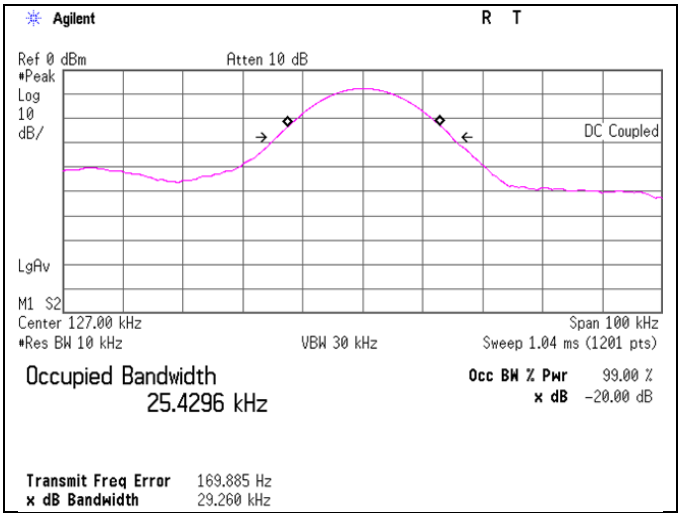
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
28.676	24.7095



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 6, 2022
Temperature / Humidity	22 deg. C / 64 % RH
Engineer	Takafumi Noguchi
Mode	Mode 5

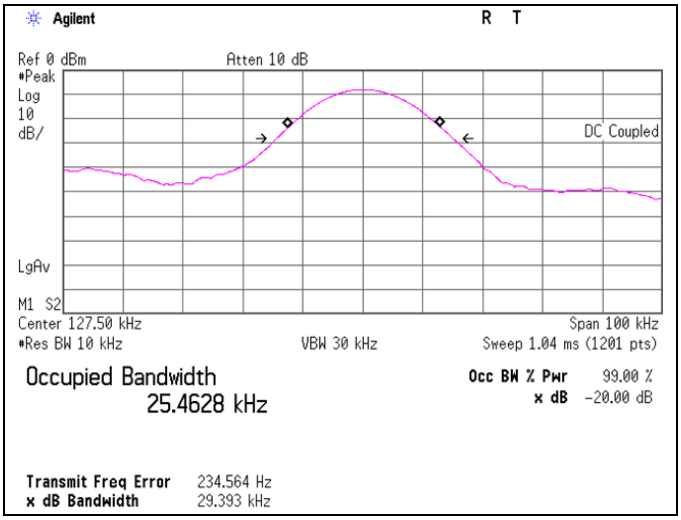
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
29.260	25.4296



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 6, 2022
Temperature / Humidity	22 deg. C / 64 % RH
Engineer	Takafumi Noguchi
Mode	Mode 6

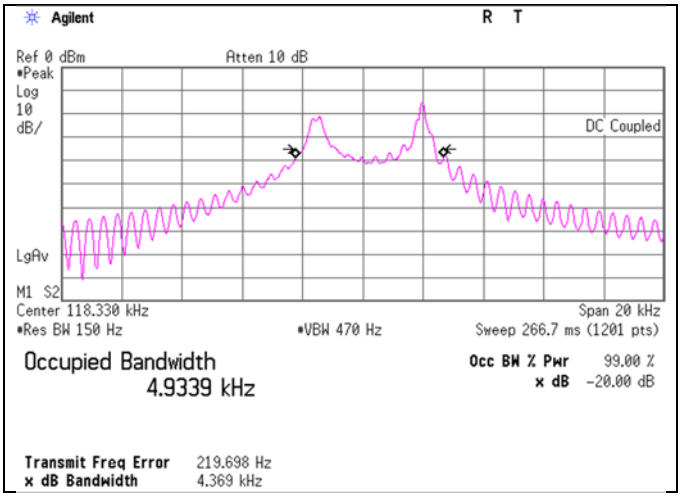
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
29.393	25.4628



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
Mode	Mode 7

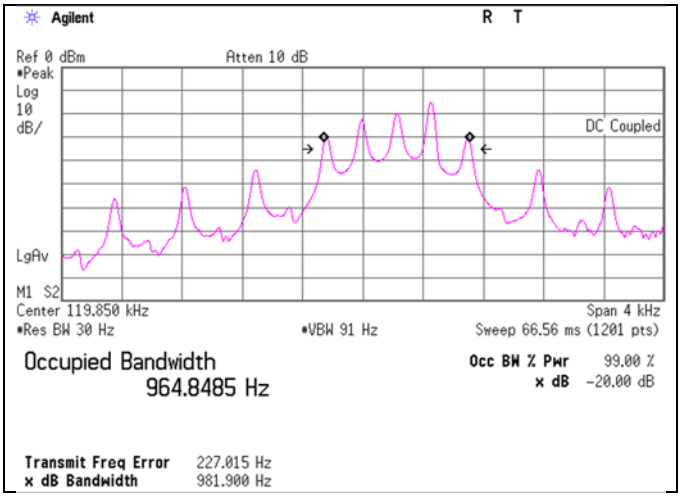
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
4.369	4.9339



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
Mode	Mode 8

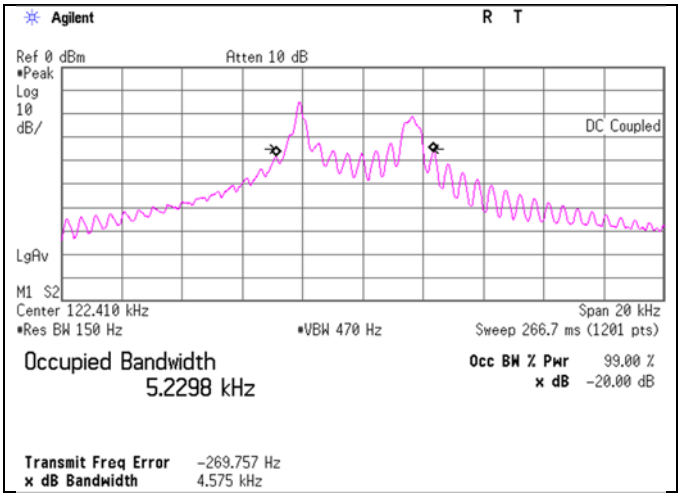
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
0.981900	0.9648485



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
Mode	Mode 9

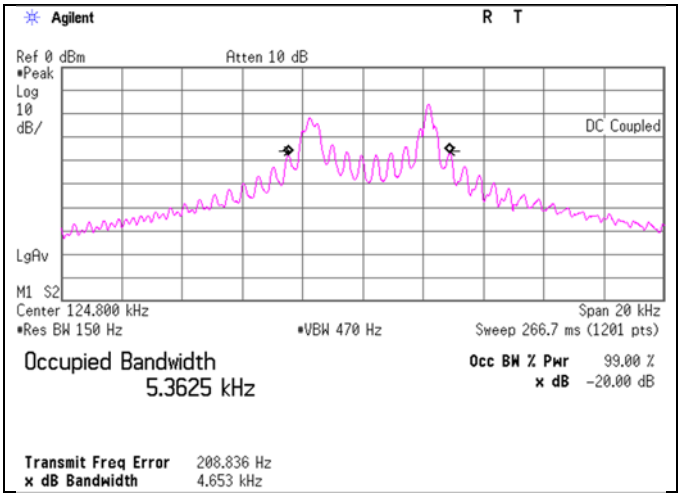
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
4.575	5.2298



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
Mode	Mode 10

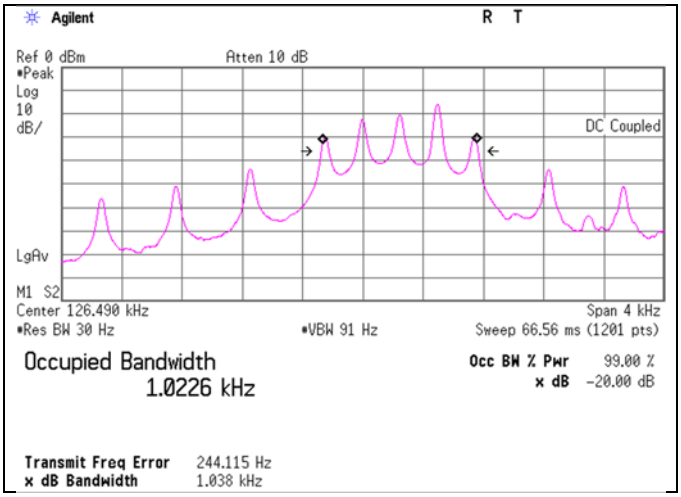
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
4.653	5.3625



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
Mode	Mode 11

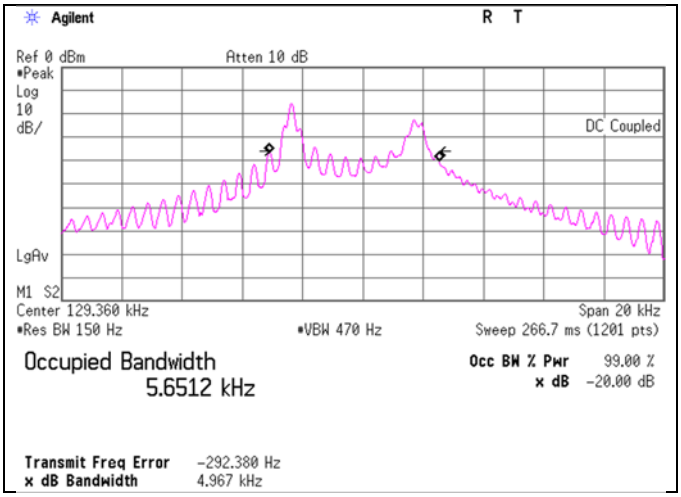
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
1.038	1.0226



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
Mode	Mode 12

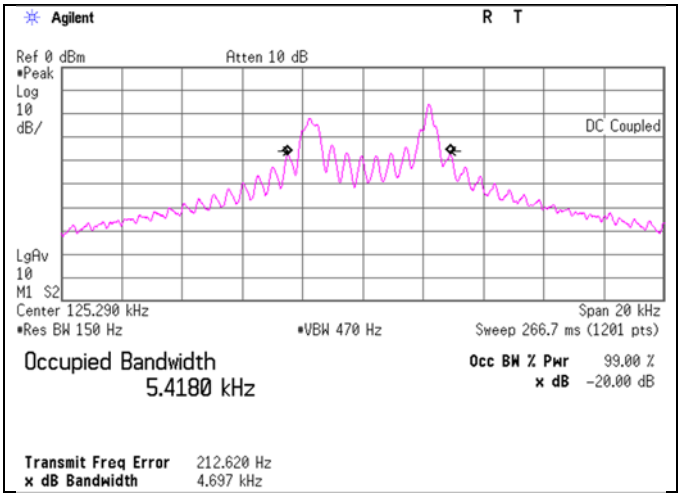
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
4.967	5.6512



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
Mode	Mode 13

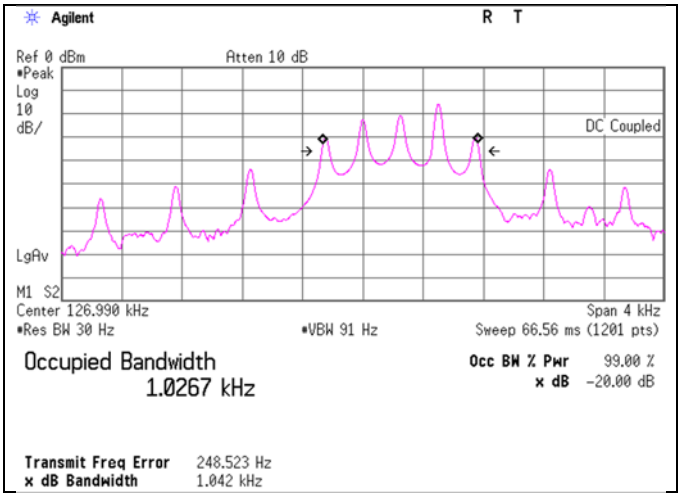
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
4.697	5.4180



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
Mode	Mode 14

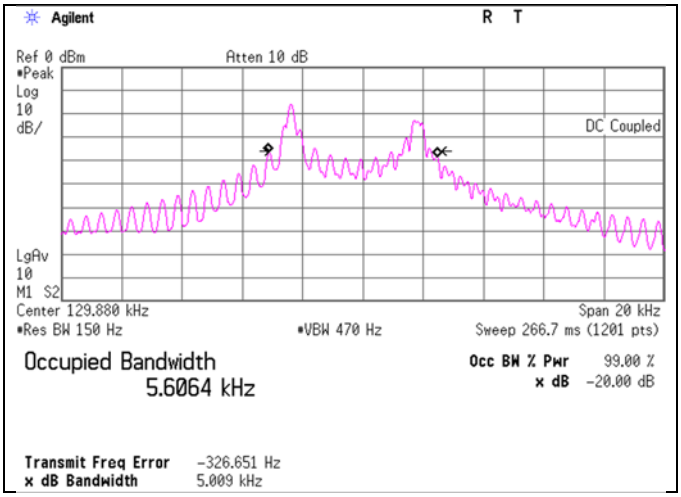
-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
1.042	1.0267



-20 dB Bandwidth / 99 % emission bandwidth

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 7, 2022
Temperature / Humidity	21 deg. C / 57 % RH
Engineer	Takafumi Noguchi
Mode	Mode 15

-20 dB Bandwidth [kHz]	99 % emission bandwidth [kHz]
5.009	5.6064



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-02	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	05/30/2022	24
RE	MAT-34	141331	Attenuator(6dB)	TME	UFA-01	-	02/25/2022	12
RE	MBA-08	141427	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103B+BBA9106	08031	07/10/2021	12
RE	MCC-12	141317	Coaxial Cable	UL Japan	-	-	09/06/2021	12
RE	MCC-13	141222	Coaxial Cable	Fujikura,HP,Mini-Circits,Fujikura	3D-2W(12m)/ 5D-2W(5m)/ 5D-2W(0.8m)/ 5D-2W(1m)	-	02/20/2022	12
RE	MCC-255	207745	Coaxial Cable	UL Japan	-	-	05/17/2022	12
RE	MJM-27	142228	Measure	KOMELON	KMC-36	-	-	-
RE	MLA-21	141265	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-190	07/10/2021	12
RE	MLPA-01	141254	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100017	05/31/2022	12
RE	MMM-01	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/10/2021	12
RE	MOS-41	192300	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0013	12/19/2021	12
RE	MPA-14	141583	Pre Amplifier	SONOMA INSTRUMENT	310	260833	04/04/2022	12
RE	MPA-24	141594	Pre Amplifier	Keysight Technologies Inc	8447D	2944A10150	02/25/2022	12
RE	MSA-14	141901	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250080	01/10/2022	12
RE	MTR-03	141942	Test Receiver	Rohde & Schwarz	ESCI	100300	08/05/2021	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