





# EMI TEST REPORT

## Test Report No. 15204675H-C-R1

Customer	Hosiden Corporation
Description of EUT	CRADLE ASSY, MOBILE WIRELESS CHARGER
Model Number of EUT	861C0-B2010-C0
FCC ID	VIYCBC4077
Test Regulation	FCC Part 18
Test Result	Complied
Issue Date	June 3, 2024
Remarks	-

<b>Representative test engineer</b>	<b>Approved by</b>
	
Hiroki Numata Engineer	Tsubasa Takayama Leader
 	
CERTIFICATE 5107.02	
<input type="checkbox"/> The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.	
<input checked="" type="checkbox"/> There is no testing item of "Non-accreditation".	

Report Cover Page - Form-ULID-003532 (DCS:13-EM-F0429) Issue# 23.0

## **ANNOUNCEMENT**

- This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
- The results in this report apply only to the sample tested. (Laboratory was not involved in sampling.)
- This sample tested is in compliance with the limits of the above regulation.
- The test results in this test report are traceable to the national or international standards.
- This test report must not be used by the customer to claim product certification, approval, or endorsement by the A2LA accreditation body.
- This test report covers Radio technical requirements.  
It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
- The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
- The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan, Inc. has been accredited.
- The information provided by the customer for this report is identified in SECTION 1.
- The laboratory is not responsible for information provided by the customer which can impact the validity of the results.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

## **REVISION HISTORY**

### **Original Test Report No. 15204675H-C**

This report is a revised version of 15204675H-C. 15204675H-C is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	15204675H-C	March 19, 2024	-
1	15204675H-C-R1	June 3, 2024	Correction of APPENDIX 2: Test equipment list as follows; - Deletion of Power sensor (LIMS ID: 146866) - Addition of Test Receiver and Loop Antenna (LIMS ID: 144194 and 146966)

**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

---

<b>CONTENTS</b>	<b>PAGE</b>
<b>SECTION 1 : Customer Information .....</b>	<b>5</b>
<b>SECTION 2 : Equipment Under Test (EUT).....</b>	<b>5</b>
<b>SECTION 3 : Test Specification, Procedures &amp; Results .....</b>	<b>6</b>
<b>SECTION 4 : Operation of EUT during testing .....</b>	<b>8</b>
<b>SECTION 5 : Radiated Emission .....</b>	<b>11</b>
<b>APPENDIX 1 : Test Data .....</b>	<b>14</b>
<b>APPENDIX 2 : Test Instruments.....</b>	<b>34</b>
<b>APPENDIX 3 : Photographs of Test Setup.....</b>	<b>35</b>
Radiated Emission .....	35

## **SECTION 1: Customer Information**

Company Name	Hosiden Corporation
Address	4-33, Kitakyuhoji 1-Chome, Yao-City, Osaka, 581-0071 Japan
Telephone Number	+81-72-924-1293
Contact Person	Fumitaka Sekiguchi

The information provided by the customer is as follows;

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

## **SECTION 2: Equipment Under Test (EUT)**

### **2.1. Identification of EUT**

Description	CRADLE ASSY, MOBILE WIRELESS CHARGER
Model Number	861C0-B2010-C0
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	January 22, 2024
Test Date	January 24 and 25, 2024

### **2.2. Product Description**

#### **General Specification**

Rating	DC 14 V / 2 A
Operating frequency	-30 deg. C to +60 deg. C (Wireless power transmission (Qi)) -30 deg. C to +80 deg. C (NFC)

#### **Radio Specification**

##### **Wireless power transmission (Qi)**

Operating Frequency	127.70 kHz (Power transmit) / 125.73 kHz to 129.81 kHz (Communication)
Rated Output Power	15 W
Modulation	FSK
Coil system	Single Coil
Charging distance	Contact

##### **NFC**

Equipment Type	Transceiver
Frequency of Operation	13.56 MHz
Type of Modulation	ASK

## SECTION 3: Test Specification, Procedures & Results

### 3.1 Test specification

Test Specification	FCC Part 18 The latest version on the first day of the testing period
Title	FCC 47CFR Part18 Industrial, scientific, and medical equipment

### 3.2 Procedures and results

Item	Test Procedure & Limits	Worst margin	Result	Remarks
Radiated Emission	Section 18.305 FCC/OET MP-5	7.9 dB 593.4040 MHz, Horizontal (15W)	Complied	-
Conducted Emission	Section 18.307 FCC/OET MP-5	N/A	N/A	*1)
* Note: UL Japan, Inc.'s EMI Work Procedure: Work Instructions-ULID-003591.				
*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.				

### 3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

### 3.4 Uncertainty

#### EMI

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.  
Note: When margins obtained from test results are less than the measurement uncertainty, the test results may exceed the limit.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor  $k = 2$ .

#### Radiated emission

Measurement distance	Frequency range		Unit	Calculated Uncertainty (+/-)
3 m	9 kHz to 30 MHz		dB	3.3
10 m			dB	3.1
3 m	30 MHz to 200 MHz	Horizontal	dB	4.7
		Vertical	dB	4.7
	200 MHz to 1000 MHz	Horizontal	dB	4.8
		Vertical	dB	6.0
10 m	30 MHz to 200 MHz	Horizontal	dB	5.2
		Vertical	dB	5.1
	200 MHz to 1000 MHz	Horizontal	dB	5.2
		Vertical	dB	5.2

### 3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

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

Telephone: +81-596-24-8999

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

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

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

### 3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

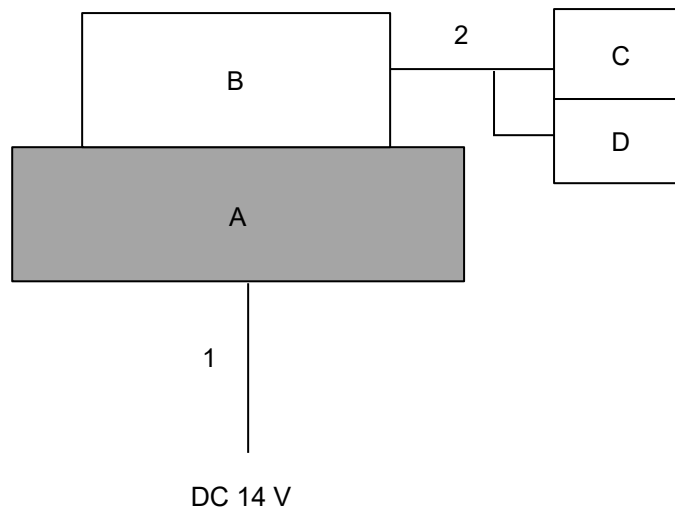
## SECTION 4: Operation of EUT during testing

### 4.1. Operating mode(s)

Test mode	Remarks
1) Tx 15 W (127.70 kHz)	-
2) Tx 5 W (127.70 kHz)	
3) Tx FSK (127.96 kHz / 128.21 kHz / 128.74 kHz / 129.81 kHz / 127.45 kHz / 127.19 kHz / 126.70 kHz / 125.73 kHz)	
Justification: The system was configured in typical fashion (as a user would normally use it) for testing.	

### 4.2. Configuration and peripherals

#### Tx 15 W



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

#### Description of EUT and Support Equipment

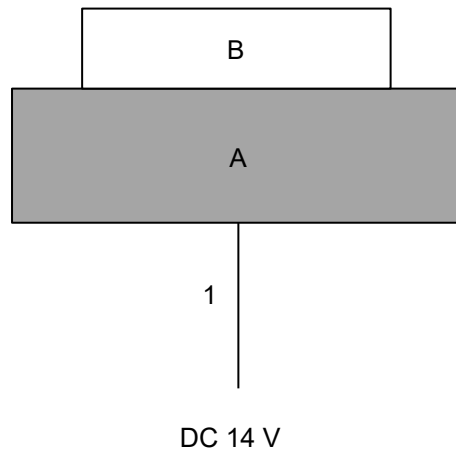
No.	Item	Model number	Serial Number	Manufacturer	Remark
A	CRADLE ASSY, MOBILE WIRELESS CHARGER	861C0-B2010-C0	102	Hosiden Corporation	EUT
B	Receiver coil	CBC-4091	ES-35	-	-
C	Resistance	HS50F	19.3	ARCOL	-
D	Resistance	HS50	20.03	ARCOL	-

#### List of Cables Used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	2.5	Unshielded	Unshielded	-
2	DC Cable	0.2	Unshielded	Unshielded	-



**Tx 5 W**



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

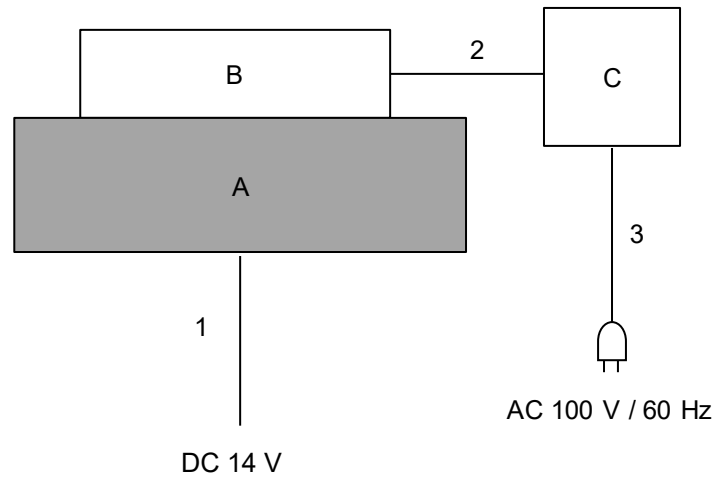
**Description of EUT and Support Equipment**

No.	Item	Model number	Serial Number	Manufacturer	Remark
A	CRADLE ASSY, MOBILE WIRELESS CHARGER	861C0-B2010-C0	101	Hosiden Corporation	EUT
B	Receiver	SM-G9810	86	Samsung Electronics	-

**List of Cables Used**

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	2.5	Unshielded	Unshielded	-

**FSK**



\* 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	Remark
A	CRADLE ASSY, MOBILE WIRELESS CHARGER	861C0-B2010-C0	102	Hosiden Corporation	EUT
B	Receiver coil	TPR#MP1B	EBST-01-03	nok9	-
C	Qi measurement instrument	CATS II BST	200134-1807	nok9	-

**List of Cables Used**

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	2.5	Unshielded	Unshielded	-
2	DC Cable	0.5	Unshielded	Unshielded	-
3	AC Cable	1.5	Unshielded	Unshielded	-

## **SECTION 5: Radiated Emission**

### **5.1 Operating environment**

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

### **5.2 Test configuration**

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 1.0 m above the conducting ground plane.

The EUT was set on the edge of the tabletop.

Test was made with the antenna positioned in 0 deg., 45 deg., 90 deg., 135 deg., 180 deg., and Horizontal. 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.

\*Refer to Figure 1 about Direction of the Loop Antenna.

### **5.3 Test conditions**

Frequency range	9 kHz to 30 MHz (Loop antenna)
	30 MHz to 200 MHz (Biconical antenna)
	200 MHz to 1000 MHz (Logperiodic antenna)
Test distance	3 m / 10 m
EUT position	Table top
EUT operation mode	See Clause 4.1

### **5.4 Test procedure**

[Below 30 MHz]

The height of antenna was fixed in 2 m.

EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed in 0 deg., 45 deg., 90 deg., 135deg., 180 deg., and Horizontal with the Test Receiver.

The electric field intensity at a distance of 300 m was calculated from the measurement results at distances of 3 m and 10 m.

[Above 30 MHz]

Maximum electric field intensity was confirmed with the measurements at distances of 3 m and 10 m. The electric field intensity at a distance of 300 m was calculated from the measurement results at distances of 3 m and 10 m.

The radiated emission measurements were made with the following detector function of the test receiver.

The test was made with the detector (RBW) in the following table.

Frequency	9 kHz to 150 kHz	150 kHz to 30 MHz	30 MHz to 1000 MHz
Instrument used	Test Receiver		
IF Bandwidth	AV: 200 Hz	AV: 9 kHz	AV: 120 kHz

The measurement result was calculated by the following formula:

[Frequency at which the signal was confirmed at both 10 m and 3 m]

Result = Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain

Extrapolation Factor = decade \* Log (Test distance (3 m) / Separate distance (300 m))

decade = (10 m reading - 3 m reading) / (log 3 m - log 10 m)

\*Refer to Part 18 Section 305 Notes 2 and KDB 629601.

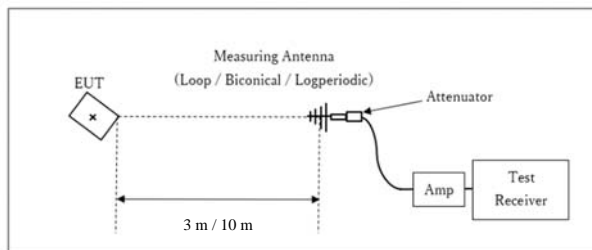
[Other Frequency]

Result = Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain

Extrapolation Factor = 20 \* Log (Test distance (3 m) / Separate distance (300 m))

<Test Setup>

Below 1 GHz



Test Distance: 3 m / 10 m

x : Center of turn table

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

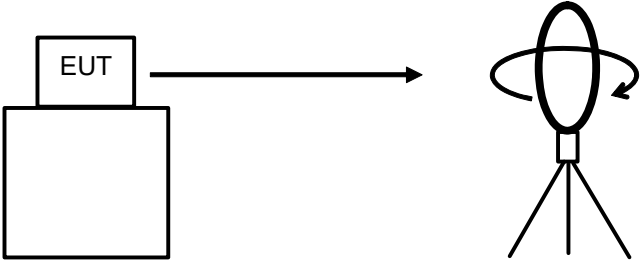
The test results and limit are rounded off to one decimal place, so some differences might be observed.

## 5.5 Test result

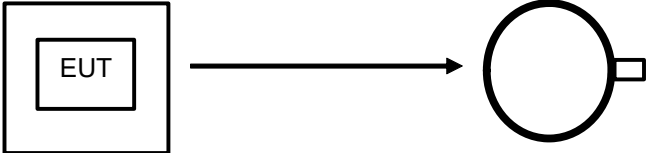
Summary of the test results: Pass

Figure 1: Direction of the Loop Antenna

*Side View (Vertical)*

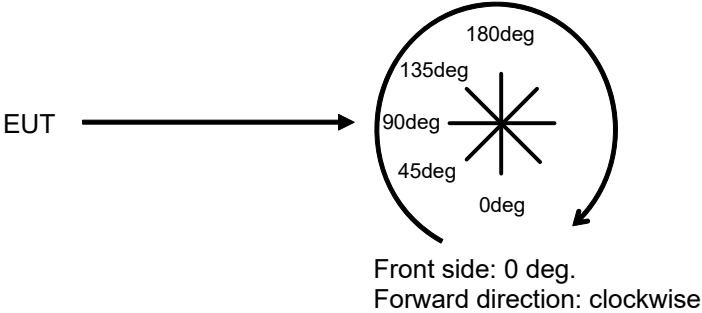


*Top View (Horizontal)*



Antenna was not rotated.

*Top View (Vertical)*



## APPENDIX 1: Test Data

### Radiated Emission (Below 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 24, 2024
Temperature / Humidity	21 deg. C / 42 % RH
Engineer	Hiroki Numata
Mode	Tx 15 W 127.70 kHz

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna [deg]
0.1277	108.1	80.7	19.1	5.8	33.0	-104.8	-4.8	23.5	28.3	0
0.1277	106.8	78.8	19.1	5.8	33.0	-107.1	-8.4	23.5	31.9	45
0.1277	105.3	80.0	19.1	5.8	33.0	-96.8	0.5	23.5	23.0	90
0.1277	107.2	81.6	19.1	5.8	33.0	-97.9	1.2	23.5	22.3	135
0.1277	108.0	71.5	19.1	5.8	33.0	-139.6	-39.7	23.5	63.2	180
0.1277	105.8	81.7	19.1	5.8	33.0	-92.2	5.5	23.5	18.0	Horizontal
0.2554	45.7	28.6	19.2	15.6	33.0	-65.4	-17.9	23.5	41.4	0
0.3831	65.3	40.2	19.3	15.6	33.0	-96.0	-28.9	23.5	52.4	0
0.5108	29.2	NS	19.3	15.6	33.1	-40.0	-9.0	25.5	34.5	0
0.6385	52.8	30.2	19.3	15.6	33.1	-86.4	-31.9	23.5	55.4	0
0.7662	25.3	NS	19.3	15.6	33.0	-40.0	-12.9	23.5	36.4	0
0.8939	47.1	27.0	19.3	15.6	33.0	-76.9	-28.0	23.5	51.5	0
1.0216	25.4	NS	19.3	15.6	33.0	-40.0	-12.8	23.5	36.3	0
1.1493	42.4	25.0	19.3	15.6	33.0	-66.6	-22.3	23.5	45.8	0
1.2770	24.7	NS	19.3	15.6	33.0	-40.0	-13.5	23.5	37.0	0

NS : No-Signal

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

**Radiated Emission**  
(Below 30 MHz)

Test place Ise EMC Lab.  
Semi Anechoic Chamber Large Chamber  
Date January 24, 2024  
Temperature / Humidity 21 deg. C / 42 % RH  
Engineer Hiroki Numata  
Mode Tx 5 W 127.70 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
0.1277	95.1	68.9	19.1	5.8	33.0	-100.2	-13.2	23.5	36.7	0
0.1277	93.6	67.7	19.1	5.8	33.0	-99.1	-13.5	23.5	37.0	45
0.1277	91.8	65.7	19.1	5.8	33.0	-99.8	-16.1	23.5	39.6	90
0.1277	93.4	67.1	19.1	5.8	33.0	-100.6	-15.3	23.5	38.8	135
0.1277	95.0	68.8	19.1	5.8	33.0	-100.2	-13.3	23.5	36.8	180
0.1277	93.7	60.6	19.1	5.8	33.0	-126.6	-41.0	23.5	64.5	Horizontal
0.2554	33.5	NS	19.2	15.6	33.0	-40.0	-4.7	23.5	28.2	0
0.3831	54.3	31.5	19.3	15.6	33.0	-87.2	-31.1	23.5	54.6	0
0.5108	27.6	NS	19.3	15.6	33.1	-40.0	-10.6	25.5	36.1	0
0.6385	44.3	26.1	19.3	15.6	33.1	-69.6	-23.5	23.5	47.0	0
0.7662	25.1	NS	19.3	15.6	33.0	-40.0	-13.1	23.5	36.6	0
0.8939	38.6	24.5	19.3	15.6	33.0	-53.9	-13.5	23.5	37.0	0
1.0216	23.9	NS	19.3	15.6	33.0	-40.0	-14.3	23.5	37.8	0
1.1493	34.2	NS	19.3	15.6	33.0	-40.0	-4.0	23.5	27.5	0
1.2770	23.7	NS	19.3	15.6	33.0	-40.0	-14.5	23.5	38.0	0

NS : No-Signal

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

**Radiated Emission**  
(Below 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 24, 2024
Temperature / Humidity	21 deg. C / 42 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 127.96 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
0.1280	99.5	72.6	19.1	5.8	33.0	-102.9	-11.5	23.5	35.0	0
0.1280	97.7	71.5	19.1	5.8	33.0	-100.2	-10.6	23.5	34.1	45
0.1280	97.0	69.5	19.1	5.8	33.0	-105.2	-16.3	23.5	39.8	90
0.1280	99.1	71.1	19.1	5.8	33.0	-107.1	-16.1	23.5	39.6	135
0.1280	99.4	72.5	19.1	5.8	33.0	-102.9	-11.6	23.5	35.1	180
0.1280	96.6	62.9	19.1	5.8	33.0	-128.9	-40.4	23.5	63.9	Horizontal
0.2559	39.6	NS	19.2	15.6	33.0	-40.0	1.4	23.5	22.1	0
0.3839	55.0	31.3	19.3	15.6	33.0	-90.7	-33.9	23.5	57.4	0
0.5118	25.8	NS	19.3	15.6	33.1	-40.0	-12.4	25.5	37.9	0
0.6398	48.0	27.7	19.3	15.6	33.1	-77.6	-27.9	23.5	51.4	0
0.7677	24.3	NS	19.3	15.6	33.0	-40.0	-13.9	23.5	37.4	0
0.8957	43.0	25.8	19.3	15.6	33.0	-65.8	-21.0	23.5	44.5	0
1.0237	23.9	NS	19.3	15.6	33.0	-40.0	-14.3	23.5	37.8	0
1.1516	39.0	24.6	19.3	15.6	33.0	-55.1	-14.2	23.5	37.7	0
1.2796	23.7	NS	19.3	15.6	33.0	-40.0	-14.5	23.5	38.0	0

NS : No-Signal

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



**Radiated Emission**  
(Below 30 MHz)

Test place Ise EMC Lab.  
Semi Anechoic Chamber Large Chamber  
Date January 24, 2024  
Temperature / Humidity 21 deg. C / 42 % RH  
Engineer Hiroki Numata  
Mode Tx FSK 128.21 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
0.1282	98.4	72.6	19.1	5.8	33.0	-98.7	-8.3	23.5	31.8	0
0.1282	97.0	71.5	19.1	5.8	33.0	-97.5	-8.6	23.5	32.1	45
0.1282	95.3	69.5	19.1	5.8	33.0	-98.7	-11.4	23.5	34.9	90
0.1282	96.9	71.1	19.1	5.8	33.0	-98.7	-9.8	23.5	33.3	135
0.1282	98.3	72.5	19.1	5.8	33.0	-98.7	-8.4	23.5	31.9	180
0.1282	96.6	62.9	19.1	5.8	33.0	-128.9	-40.4	23.5	63.9	Horizontal
0.2564	36.2	NS	19.2	15.6	33.0	-40.0	-2.0	23.5	25.5	0
0.3846	56.2	31.3	19.3	15.6	33.0	-95.2	-37.2	23.5	60.7	0
0.5129	27.1	NS	19.3	15.6	33.0	-40.0	-11.1	25.5	36.6	0
0.6411	49.3	27.6	19.3	15.6	33.0	-83.0	-31.9	23.5	55.4	0
0.7693	24.2	NS	19.3	15.6	33.0	-40.0	-14.0	23.5	37.5	0
0.8975	44.1	25.8	19.3	15.6	33.0	-70.0	-24.0	23.5	47.5	0
1.0257	24.2	NS	19.3	15.6	33.0	-40.0	-13.9	23.5	37.4	0
1.1539	40.0	24.6	19.3	15.6	33.0	-58.9	-17.0	23.5	40.5	0
1.2821	23.9	NS	19.3	15.6	33.0	-40.0	-14.2	23.5	37.7	0

NS : No-Signal

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

**Radiated Emission**  
(Below 30 MHz)

Test place Ise EMC Lab.  
Semi Anechoic Chamber Large Chamber  
Date January 24, 2024  
Temperature / Humidity 21 deg. C / 42 % RH  
Engineer Hiroki Numata  
Mode Tx FSK 128.74 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
0.1287	97.5	72.6	19.1	5.8	33.0	-95.2	-5.8	23.5	29.3	0
0.1287	96.5	71.5	19.1	5.8	33.0	-95.6	-7.2	23.5	30.7	45
0.1287	94.8	69.5	19.1	5.8	33.0	-96.8	-10.0	23.5	33.5	90
0.1287	96.5	71.1	19.1	5.8	33.0	-97.2	-8.7	23.5	32.2	135
0.1287	97.9	72.5	19.1	5.8	33.0	-97.2	-7.3	23.5	30.8	180
0.1287	96.6	62.9	19.1	5.8	33.0	-128.9	-40.4	23.5	63.9	Horizontal
0.2575	30.5	NS	19.2	15.6	33.0	-40.0	-7.7	23.5	31.2	0
0.3862	53.4	31.3	19.3	15.6	33.0	-84.5	-29.3	23.5	52.8	0
0.5149	26.9	NS	19.3	15.6	33.0	-40.0	-11.3	25.5	36.8	0
0.6437	48.1	27.5	19.3	15.6	33.0	-78.8	-28.9	23.5	52.4	0
0.7724	24.1	NS	19.3	15.6	33.0	-40.0	-14.1	23.5	37.6	0
0.9012	43.2	25.8	19.3	15.6	33.0	-66.6	-21.5	23.5	45.0	0
1.0299	23.7	NS	19.3	15.6	33.0	-40.0	-14.4	23.5	37.9	0
1.1586	39.4	24.5	19.3	15.6	33.0	-57.0	-15.7	23.5	39.2	0
1.2874	23.5	NS	19.3	15.6	33.0	-40.0	-14.6	23.5	38.1	0

NS : No-Signal

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

**Radiated Emission**  
(Below 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 24, 2024
Temperature / Humidity	21 deg. C / 42 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 129.81 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
0.1298	98.6	72.6	19.1	5.8	33.0	-99.4	-8.9	23.5	32.4	0
0.1298	97.3	71.4	19.1	5.8	33.0	-99.1	-9.8	23.5	33.3	45
0.1298	95.6	69.6	19.1	5.8	33.0	-99.4	-11.9	23.5	35.4	90
0.1298	97.1	71.2	19.1	5.8	33.0	-99.1	-10.0	23.5	33.5	135
0.1298	98.5	72.5	19.1	5.8	33.0	-99.4	-9.0	23.5	32.5	180
0.1298	96.5	62.9	19.1	5.8	33.0	-128.5	-40.1	23.5	63.6	Horizontal
0.2596	30.3	NS	19.2	15.6	33.0	-40.0	-7.9	23.5	31.4	0
0.3894	53.4	31.3	19.3	15.6	33.0	-84.5	-29.3	23.5	52.8	0
0.5192	26.1	NS	19.3	15.6	33.0	-40.0	-12.1	25.5	37.6	0
0.6490	48.1	27.8	19.3	15.6	33.0	-77.6	-27.7	23.5	51.2	0
0.7788	24.2	NS	19.3	15.6	33.0	-40.0	-14.0	23.5	37.5	0
0.9086	43.2	25.7	19.3	15.6	33.0	-66.9	-21.9	23.5	45.4	0
1.0385	24.0	NS	19.3	15.6	33.0	-40.0	-14.1	23.5	37.6	0
1.1683	39.4	24.6	19.3	15.6	33.0	-56.6	-15.3	23.5	38.8	0
1.2981	23.6	NS	19.3	15.6	33.0	-40.0	-14.5	23.5	38.0	0

NS : No-Signal

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

**Radiated Emission**  
(Below 30 MHz)

Test place Ise EMC Lab.  
Semi Anechoic Chamber Large Chamber  
Date January 24, 2024  
Temperature / Humidity 21 deg. C / 42 % RH  
Engineer Hiroki Numata  
Mode Tx FSK 127.45 kHz

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna [deg]
0.1275	98.7	72.6	19.1	5.8	33.0	-99.8	-9.2	23.5	32.7	0
0.1275	97.3	71.4	19.1	5.8	33.0	-99.1	-9.8	23.5	33.3	45
0.1275	95.6	69.5	19.1	5.8	33.0	-99.8	-12.3	23.5	35.8	90
0.1275	97.1	71.2	19.1	5.8	33.0	-99.1	-10.0	23.5	33.5	135
0.1275	98.6	72.5	19.1	5.8	33.0	-99.8	-9.3	23.5	32.8	180
0.1275	96.6	62.9	19.1	5.8	33.0	-128.9	-40.4	23.5	63.9	Horizontal
0.2549	38.5	NS	19.2	15.6	33.0	-40.0	0.3	23.5	23.2	0
0.3824	53.3	31.2	19.3	15.6	33.0	-84.5	-29.4	23.5	52.9	0
0.5098	26.9	NS	19.3	15.6	33.0	-40.0	-11.3	25.5	36.8	0
0.6373	48.1	27.8	19.3	15.6	33.0	-77.6	-27.7	23.5	51.2	0
0.7647	24.1	NS	19.3	15.6	33.0	-40.0	-14.1	23.5	37.6	0
0.8922	43.1	25.7	19.3	15.6	33.0	-66.6	-21.6	23.5	45.1	0
1.0196	23.8	NS	19.3	15.6	33.0	-40.0	-14.3	23.5	37.8	0
1.1471	39.4	24.6	19.3	15.6	33.0	-56.6	-15.3	23.5	38.8	0
1.2745	23.5	NS	19.3	15.6	33.0	-40.0	-14.6	23.5	38.1	0

NS : No-Signal

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

**Radiated Emission**  
(Below 30 MHz)

Test place Ise EMC Lab.  
Semi Anechoic Chamber Large Chamber  
Date January 24, 2024  
Temperature / Humidity 21 deg. C / 42 % RH  
Engineer Hiroki Numata  
Mode Tx FSK 127.19 kHz

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna [deg]
0.1272	98.7	72.6	19.1	5.8	33.0	-99.8	-9.2	23.5	32.7	0
0.1272	97.4	71.5	19.1	5.8	33.0	-99.1	-9.7	23.5	33.2	45
0.1272	95.7	69.4	19.1	5.8	33.0	-100.6	-12.9	23.5	36.4	90
0.1272	97.2	71.2	19.1	5.8	33.0	-99.4	-10.3	23.5	33.8	135
0.1272	98.6	72.5	19.1	5.8	33.0	-99.8	-9.3	23.5	32.8	180
0.1272	96.6	62.9	19.1	5.8	33.0	-128.9	-40.4	23.5	63.9	Horizontal
0.2544	37.6	NS	19.2	15.6	33.0	-40.0	-0.6	23.5	24.1	0
0.3816	53.3	31.2	19.3	15.6	33.0	-84.5	-29.4	23.5	52.9	0
0.5088	26.8	NS	19.3	15.6	33.0	-40.0	-11.4	25.5	36.9	0
0.6360	48.1	27.7	19.3	15.6	33.0	-78.0	-28.1	23.5	51.6	0
0.7632	24.1	NS	19.3	15.6	33.0	-40.0	-14.1	23.5	37.6	0
0.8904	43.1	25.7	19.3	15.6	33.0	-66.6	-21.6	23.5	45.1	0
1.0176	23.9	NS	19.3	15.6	33.0	-40.0	-14.2	23.5	37.7	0
1.1448	39.5	24.6	19.3	15.6	33.0	-57.0	-15.6	23.5	39.1	0
1.2719	23.5	NS	19.3	15.6	33.0	-40.0	-14.6	23.5	38.1	0

NS : No-Signal

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

**Radiated Emission**  
(Below 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 24, 2024
Temperature / Humidity	21 deg. C / 42 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 126.70 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
0.1267	98.7	72.6	19.1	5.8	33.0	-99.8	-9.2	23.5	32.7	0
0.1267	97.5	71.5	19.1	5.8	33.0	-99.4	-10.0	23.5	33.5	45
0.1267	95.7	69.6	19.1	5.8	33.0	-99.8	-12.2	23.5	35.7	90
0.1267	97.2	71.0	19.1	5.8	33.0	-100.2	-11.1	23.5	34.6	135
0.1267	98.6	72.5	19.1	5.8	33.0	-99.8	-9.3	23.5	32.8	180
0.1267	96.6	62.9	19.1	5.8	33.0	-128.9	-40.4	23.5	63.9	Horizontal
0.2534	31.6	NS	19.2	15.6	33.0	-40.0	-6.6	23.5	30.1	0
0.3801	53.3	31.1	19.3	15.6	33.0	-84.9	-29.8	23.5	53.3	0
0.5068	26.3	NS	19.3	15.6	33.0	-40.0	-11.9	25.5	37.4	0
0.6335	48.1	27.5	19.3	15.6	33.0	-78.8	-28.9	23.5	52.4	0
0.7602	24.1	NS	19.3	15.6	33.0	-40.0	-14.1	23.5	37.6	0
0.8869	43.1	25.6	19.3	15.6	33.0	-66.9	-22.0	23.5	45.5	0
1.0136	23.9	NS	19.3	15.6	33.0	-40.0	-14.2	23.5	37.7	0
1.1403	39.5	24.4	19.3	15.6	33.0	-57.8	-16.4	23.5	39.9	0
1.2670	23.6	NS	19.3	15.6	33.0	-40.0	-14.5	23.5	38.0	0

NS : No-Signal  
Except for the above table : adequate margin data below the limits.

**Radiated Emission**  
(Below 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 24, 2024
Temperature / Humidity	21 deg. C / 42 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 125.73 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
0.1257	98.7	72.6	19.1	5.8	33.0	-99.8	-9.2	23.5	32.7	0
0.1257	97.5	71.5	19.1	5.8	33.0	-99.4	-10.0	23.5	33.5	45
0.1257	95.8	69.5	19.1	5.8	33.0	-100.6	-12.8	23.5	36.3	90
0.1257	97.2	71.1	19.1	5.8	33.0	-99.8	-10.7	23.5	34.2	135
0.1257	98.6	72.5	19.1	5.8	33.0	-99.8	-9.3	23.5	32.8	180
0.1257	96.6	62.9	19.1	5.8	33.0	-128.9	-40.4	23.5	63.9	Horizontal
0.2515	30.2	NS	19.2	15.6	33.0	-40.0	-8.0	23.5	31.5	0
0.3772	53.5	31.3	19.3	15.6	33.0	-84.9	-29.6	23.5	53.1	0
0.5029	27.0	NS	19.3	15.6	33.0	-40.0	-11.2	25.5	36.7	0
0.6286	48.3	27.6	19.3	15.6	33.0	-79.2	-29.1	23.5	52.6	0
0.7544	24.1	NS	19.3	15.6	33.0	-40.0	-14.1	23.5	37.6	0
0.8801	43.2	25.7	19.3	15.6	33.0	-66.9	-21.9	23.5	45.4	0
1.0058	23.8	NS	19.3	15.6	33.0	-40.0	-14.3	23.5	37.8	0
1.1315	39.6	24.5	19.3	15.6	33.0	-57.8	-16.3	23.5	39.8	0
1.2573	23.6	NS	19.3	15.6	33.0	-40.0	-14.5	23.5	38.0	0

NS : No-Signal

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

## Radiated Emission (Above 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 25, 2024
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Hiroki Numata
Mode	Tx 15 W 127.7 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
39.0660	22.2	NS	11.6	7.3	33.0	-40.0	-31.9	23.5	55.4	Horizontal
46.4710	25.3	23.0	10.5	7.4	33.0	-8.8	1.4	23.5	22.1	Horizontal
57.0670	24.9	23.1	9.6	7.6	33.0	-6.9	2.2	23.5	21.3	Horizontal
132.0070	27.4	NS	11.4	8.4	33.0	-40.0	-25.8	23.5	49.3	Horizontal
217.1270	27.6	NS	10.6	9.2	33.0	-40.0	-25.6	23.5	49.1	Horizontal
593.4040	29.2	26.4	18.9	11.4	33.1	-10.7	15.6	23.5	7.9	Horizontal
39.0660	37.5	26.9	11.6	7.3	33.0	-40.5	-17.1	23.5	40.6	Vertical
46.4710	39.0	29.7	10.5	7.4	33.0	-35.6	-11.7	23.5	35.2	Vertical
57.0670	39.7	32.2	9.6	7.6	33.0	-28.7	-4.8	25.5	30.3	Vertical
132.0070	29.0	24.7	11.4	8.4	33.0	-16.4	-0.6	23.5	24.1	Vertical
214.2270	28.1	22.8	10.7	9.1	33.0	-20.3	-5.3	23.5	28.8	Vertical
593.4040	26.6	NS	18.9	11.4	33.1	-40.0	-16.3	23.5	39.8	Vertical

NS : No-Signal

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



## Radiated Emission (Above 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 25, 2024
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Hiroki Numata
Mode	Tx 5 W 127.7 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
39.0660	22.2	NS	11.6	7.3	33.0	-40.0	-31.9	23.5	55.4	Horizontal
42.0020	21.8	NS	11.1	7.3	33.0	-40.0	-32.8	23.5	56.3	Horizontal
46.5980	23.5	NS	10.5	7.4	33.0	-40.0	-31.6	23.5	55.1	Horizontal
52.3500	21.6	NS	9.9	7.5	33.0	-40.0	-34.0	23.5	57.5	Horizontal
57.0670	23.0	NS	9.6	7.6	33.0	-40.0	-32.8	23.5	56.3	Horizontal
357.8450	21.3	NS	14.1	10.1	33.0	-40.0	-27.5	23.5	51.0	Horizontal
39.0660	27.9	25.8	11.6	7.3	33.0	-8.0	5.8	23.5	17.7	Vertical
42.0020	28.9	23.9	11.1	7.3	33.0	-19.1	-4.8	23.5	28.3	Vertical
46.5980	32.7	24.9	10.5	7.4	33.0	-29.8	-12.3	25.5	37.8	Vertical
52.3500	27.9	24.3	9.9	7.5	33.0	-13.8	-1.5	23.5	25.0	Vertical
57.0670	33.4	29.4	9.6	7.6	33.0	-15.3	2.3	23.5	21.2	Vertical
357.8450	22.0	NS	14.1	10.1	33.0	-40.0	-26.8	23.5	50.3	Vertical

NS : No-Signal  
Except for the above table : adequate margin data below the limits.

**Radiated Emission**  
(Above 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 25, 2024
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 127.96 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
97.8750	20.9	NS	9.8	8.1	33.0	-40.0	-34.2	23.5	57.7	Horizontal
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Horizontal
219.7410	19.2	NS	10.5	9.2	33.0	-40.0	-34.1	23.5	57.6	Horizontal
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Horizontal
384.8210	22.3	NS	14.9	10.3	33.0	-40.0	-25.6	23.5	49.1	Horizontal
569.8200	17.6	NS	18.6	11.3	33.2	-40.0	-25.7	23.5	49.2	Horizontal
97.8750	20.9	NS	9.8	8.1	33.0	-40.0	-34.2	23.5	57.7	Vertical
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Vertical
219.7410	22.3	NS	10.5	9.2	33.0	-40.0	-31.0	25.5	56.5	Vertical
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Vertical
384.8210	22.2	NS	14.9	10.3	33.0	-40.0	-25.7	23.5	49.2	Vertical
569.8200	17.7	NS	18.6	11.3	33.2	-40.0	-25.6	23.5	49.1	Vertical

NS : No-Signal  
Except for the above table : adequate margin data below the limits.

**Radiated Emission**  
(Above 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 25, 2024
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 128.21 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
97.8750	20.9	NS	9.8	8.1	33.0	-40.0	-34.2	23.5	57.7	Horizontal
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Horizontal
219.7410	19.2	NS	10.5	9.2	33.0	-40.0	-34.1	23.5	57.6	Horizontal
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Horizontal
384.8210	22.3	NS	14.9	10.3	33.0	-40.0	-25.6	23.5	49.1	Horizontal
569.8200	17.7	NS	18.6	11.3	33.2	-40.0	-25.6	23.5	49.1	Horizontal
97.8750	20.9	NS	9.8	8.1	33.0	-40.0	-34.2	23.5	57.7	Vertical
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Vertical
219.7410	22.3	NS	10.5	9.2	33.0	-40.0	-31.0	25.5	56.5	Vertical
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Vertical
384.8210	22.3	NS	14.9	10.3	33.0	-40.0	-25.6	23.5	49.1	Vertical
569.8200	17.7	NS	18.6	11.3	33.2	-40.0	-25.6	23.5	49.1	Vertical

NS : No-Signal

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

## Radiated Emission (Above 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 25, 2024
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 128.74 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
97.8750	20.8	NS	9.8	8.1	33.0	-40.0	-34.3	23.5	57.8	Horizontal
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Horizontal
219.7410	19.3	NS	10.5	9.2	33.0	-40.0	-34.0	23.5	57.5	Horizontal
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Horizontal
384.8210	22.3	NS	14.9	10.3	33.0	-40.0	-25.6	23.5	49.1	Horizontal
569.8200	17.7	NS	18.6	11.3	33.2	-40.0	-25.6	23.5	49.1	Horizontal
97.8750	20.9	NS	9.8	8.1	33.0	-40.0	-34.2	23.5	57.7	Vertical
154.1280	21.4	NS	12.2	8.6	33.0	-40.0	-30.8	23.5	54.3	Vertical
219.7410	22.2	NS	10.5	9.2	33.0	-40.0	-31.1	25.5	56.6	Vertical
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Vertical
384.8210	22.3	NS	14.9	10.3	33.0	-40.0	-25.6	23.5	49.1	Vertical
569.8200	17.7	NS	18.6	11.3	33.2	-40.0	-25.6	23.5	49.1	Vertical

NS : No-Signal

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

## Radiated Emission (Above 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 25, 2024
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 129.81 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
97.8750	20.8	NS	9.8	8.1	33.0	-40.0	-34.3	23.5	57.8	Horizontal
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Horizontal
219.7410	19.2	NS	10.5	9.2	33.0	-40.0	-34.1	23.5	57.6	Horizontal
306.4080	20.7	NS	13.0	9.8	33.0	-40.0	-29.5	23.5	53.0	Horizontal
384.8210	22.3	NS	14.9	10.3	33.0	-40.0	-25.6	23.5	49.1	Horizontal
569.8200	17.7	NS	18.6	11.3	33.2	-40.0	-25.6	23.5	49.1	Horizontal
97.8750	20.8	NS	9.8	8.1	33.0	-40.0	-34.3	23.5	57.8	Vertical
154.1280	21.5	NS	12.2	8.6	33.0	-40.0	-30.7	23.5	54.2	Vertical
219.7410	22.2	NS	10.5	9.2	33.0	-40.0	-31.1	25.5	56.6	Vertical
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Vertical
384.8210	22.2	NS	14.9	10.3	33.0	-40.0	-25.7	23.5	49.2	Vertical
569.8200	17.7	NS	18.6	11.3	33.2	-40.0	-25.6	23.5	49.1	Vertical

NS : No-Signal

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

## Radiated Emission (Above 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 25, 2024
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 127.45 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
97.8750	20.9	NS	9.8	8.1	33.0	-40.0	-34.2	23.5	57.7	Horizontal
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Horizontal
219.7410	19.2	NS	10.5	9.2	33.0	-40.0	-34.1	23.5	57.6	Horizontal
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Horizontal
384.8210	22.3	NS	14.9	10.3	33.0	-40.0	-25.6	23.5	49.1	Horizontal
569.8200	17.6	NS	18.6	11.3	33.2	-40.0	-25.7	23.5	49.2	Horizontal
97.8750	20.9	NS	9.8	8.1	33.0	-40.0	-34.2	23.5	57.7	Vertical
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Vertical
219.7410	22.2	NS	10.5	9.2	33.0	-40.0	-31.1	25.5	56.6	Vertical
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Vertical
384.8210	22.2	NS	14.9	10.3	33.0	-40.0	-25.7	23.5	49.2	Vertical
569.8200	17.7	NS	18.6	11.3	33.2	-40.0	-25.6	23.5	49.1	Vertical

NS : No-Signal

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

**Radiated Emission**  
(Above 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 25, 2024
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 127.19 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
97.8750	20.8	NS	9.8	8.1	33.0	-40.0	-34.3	23.5	57.8	Horizontal
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Horizontal
219.7410	19.2	NS	10.5	9.2	33.0	-40.0	-34.1	23.5	57.6	Horizontal
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Horizontal
384.8210	23.4	NS	14.9	10.3	33.0	-40.0	-24.5	23.5	48.0	Horizontal
569.8200	17.7	NS	18.6	11.3	33.2	-40.0	-25.6	23.5	49.1	Horizontal
97.8750	20.9	NS	9.8	8.1	33.0	-40.0	-34.2	23.5	57.7	Vertical
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Vertical
219.7410	22.2	NS	10.5	9.2	33.0	-40.0	-31.1	25.5	56.6	Vertical
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Vertical
384.8210	22.3	NS	14.9	10.3	33.0	-40.0	-25.6	23.5	49.1	Vertical
569.8200	17.8	NS	18.6	11.3	33.2	-40.0	-25.5	23.5	49.0	Vertical

NS : No-Signal  
Except for the above table : adequate margin data below the limits.

## Radiated Emission (Above 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 25, 2024
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 126.70 kHz

FREQ [MHz]	Reading (3m) [dB $\mu$ V]	Reading (10m) [dB $\mu$ V]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dB $\mu$ V/m]	Limit (300 m) [dB $\mu$ V/m]	Margin [dB]	Antenna [deg]
97.8750	20.8	NS	9.8	8.1	33.0	-40.0	-34.3	23.5	57.8	Horizontal
154.1280	21.4	NS	12.2	8.6	33.0	-40.0	-30.8	23.5	54.3	Horizontal
219.7410	19.3	NS	10.5	9.2	33.0	-40.0	-34.0	23.5	57.5	Horizontal
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Horizontal
384.8210	22.3	NS	14.9	10.3	33.0	-40.0	-25.6	23.5	49.1	Horizontal
569.8200	17.6	NS	18.6	11.3	33.2	-40.0	-25.7	23.5	49.2	Horizontal
97.8750	20.9	NS	9.8	8.1	33.0	-40.0	-34.2	23.5	57.7	Vertical
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Vertical
219.7410	22.2	NS	10.5	9.2	33.0	-40.0	-31.1	25.5	56.6	Vertical
306.4080	20.9	NS	13.0	9.8	33.0	-40.0	-29.3	23.5	52.8	Vertical
384.8210	22.2	NS	14.9	10.3	33.0	-40.0	-25.7	23.5	49.2	Vertical
569.8200	17.7	NS	18.6	11.3	33.2	-40.0	-25.6	23.5	49.1	Vertical

NS : No-Signal

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



**Radiated Emission**  
(Above 30 MHz)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	Large Chamber
Date	January 25, 2024
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Hiroki Numata
Mode	Tx FSK 125.73 kHz

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	Atten + Cable loss [dB]	AMP Gain [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna [deg]
97.8750	20.8	NS	9.8	8.1	33.0	-40.0	-34.3	23.5	57.8	Horizontal
154.1280	21.3	NS	12.2	8.6	33.0	-40.0	-30.9	23.5	54.4	Horizontal
219.7410	19.2	NS	10.5	9.2	33.0	-40.0	-34.1	23.5	57.6	Horizontal
306.4080	20.7	NS	13.0	9.8	33.0	-40.0	-29.5	23.5	53.0	Horizontal
384.8210	22.3	NS	14.9	10.3	33.0	-40.0	-25.6	23.5	49.1	Horizontal
569.8200	17.6	NS	18.6	11.3	33.2	-40.0	-25.7	23.5	49.2	Horizontal
97.8750	20.9	NS	9.8	8.1	33.0	-40.0	-34.2	23.5	57.7	Vertical
154.1280	21.2	NS	12.2	8.6	33.0	-40.0	-31.0	23.5	54.5	Vertical
219.7410	22.3	NS	10.5	9.2	33.0	-40.0	-31.0	25.5	56.5	Vertical
306.4080	20.8	NS	13.0	9.8	33.0	-40.0	-29.4	23.5	52.9	Vertical
384.8210	22.1	NS	14.9	10.3	33.0	-40.0	-25.8	23.5	49.3	Vertical
569.8200	17.8	NS	18.6	11.3	33.2	-40.0	-25.5	23.5	49.0	Vertical

NS : No-Signal  
Except for the above table : adequate margin data below the limits.

## APPENDIX 2: Test Instruments

### Test equipment

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	141295	High Pass Filter 0.15-30MHz	Rohde & Schwarz	EZ-25/3	100041	2024/02/14	12
RE	198470	Broadband Amplifier	SONOMA	310N	400557	2024/01/17	12
RE	199020	Attenuator(6dB)	JFW Industries, Inc.	50HF-006 N	001	2023/05/19	12
RE	199050	Attenuator(6dB)	Anritsu Corporation	BW-N6W5+	1926	2023/11/15	12
RE	199211	Microwave Cable	Huber+Suhner	S04272B/RFM-E721/ RG223/Sucofeed/SF106	-	2023/11/20	12
RE	199240	EMI Test Receiver	Rohde & Schwarz	ESW44	101914	2024/03/27	12
RE	199242	Semi-Anechoic Chamber	Riken Environmental System	Large Chamber	1	2023/02/09	24
RE	199476	Biconical antenna	Schwarzbeck Mess- Elektronik OHG	VHBB9124+BBA9106	01410	2023/05/16	12
RE	199477	Logperiodic antenna	Schwarzbeck Mess- Elektronik OHG	VULP9118A	00831	2023/05/16	12
RE	221241	Thermo-Hygrometer	Mother tool	MHB-382SD	55534	2023/07/26	12
RE	144194	Test Receiver	Rohde & Schwarz	ESCI	100601	2023/09/11	12
RE	146966	Loop Antenna	Rohde & Schwarz	HFH2-Z2	829425/014	2023/06/19	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