



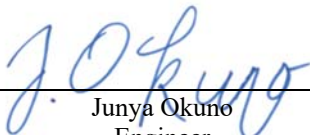
# EMI TEST REPORT


**Test Report No. : 13762994H**

**Applicant** : Panasonic Corporation  
**Type of EUT** : Wireless Charger  
**Model Number of EUT** : AF2201  
**FCC ID** : ACJ932AF2201  
**Test regulation** : FCC Part 18: 2017  
**Test Result** : Complied (Refer to SECTION 3)

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by the A2LA accreditation body.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in Section 1.

**Date of test:** April 18 to 20, 2021

**Representative test engineer:**   
Junya Okuno  
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.  
 There is no testing item of "Non-accreditation".

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## **REVISION HISTORY**

**Original Test Report No.: 13762994H**

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13762994H	July 1, 2021	-	-

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## Reference: Abbreviations (Including words undescribed in this report)

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

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## **SECTION 1: Customer information**

Company Name : Panasonic Corporation  
Address : 4261, Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken, 224-8520,  
Japan  
Telephone Number : +81-80-3444-7148  
Facsimile Number : +81-45-931-0806  
Contact Person : Takahisa Sakai

The information provided from the customer is as follows;

- Applicant, Type 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
  - 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**

Type : Wireless Charger  
Model Number : AF2201  
Serial Number : Refer to SECTION 4.2  
Rating : DC 10.5 V to 16.0 V (Typ. DC 12.0 V)  
Receipt Date : April 16, 2021  
Country of Mass-production : China and Thailand  
Condition : Production prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)  
Modification : No Modification by the test lab.

### **2.2 Product Description**

Model: AF2201 (referred to as the EUT in this report) is a Wireless Charger.

Feature of EUT : Press the supply switch of the wireless charger. Each press the power supply switch it on/off.  
When turned the hybrid system off, the state of the power supply for wireless charger is memorized.  
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**

Operating Frequency : 120.3 kHz / 127.0 kHz / 127.5 kHz / 126.515 kHz to 128.549 kHz  
Rated Output Power : 5 W / 10 W  
Coil system : Single Coil  
Charging distance : Contact  
Clock frequency (maximum) : 8 MHz

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## **SECTION 3: Test specification, procedures & results**

### **3.1 Test specification**

Test Specification : FCC Part 18 2017, final revised on November 2, 2017.  
 Title : FCC 47CFR Part18 Industrial, scientific, and medical equipment

### **3.2 Procedures and results**

Item	Test Procedure & Limits	Deviation	Worst margin	Results	Remarks
Radiated emission	Section 18.305 FCC/OST MP-5	N/A	27.7 dB, 0.8421 MHz, 0 deg. C <Mode 1>	Complied a)	-
Conducted emission	Section 18.307 FCC/OST MP-5	N/A	N/A	N/A	*1)
*Note: UL Japan, Inc.'s EMI Work Procedure 13-EM-W0420. *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)					
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.					

### **3.3 Addition to standard**

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

### **3.4 Uncertainty**

#### **EMI**

There is no applicable rule of uncertainty in this applied standard. Therefore, the following 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  $k = 2$ .

#### **Radiated emission**

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.3 dB
10 m		3.2 dB
3 m	30 MHz to 200 MHz	(Horizontal) 4.8 dB
		(Vertical) 5.0 dB
	200 MHz to 1000 MHz	(Horizontal) 5.2 dB
		(Vertical) 6.3 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

### 3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

\*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 199967

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

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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	-	-

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

Refer to APPENDIX.

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## **SECTION 4: Operation of EUT during testing**

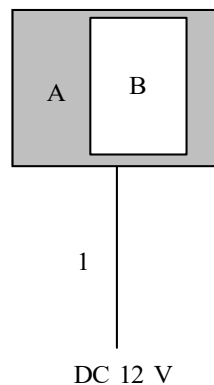
### **4.1 Operating mode(s)**

The mode is used :

Test mode	Remarks
1) Normal Operating mode (120.3 kHz / 5 W)	Mode 1
2) Normal Operating mode (127.5 kHz / 10 W)	Mode 2
3) Normal Operating mode (127.0 kHz / 5 W)	Mode 3
4) Normal Operating mode (127.627 kHz / 10 W)	Mode 4
5) Normal Operating mode (127.756 kHz / 10 W)	Mode 5
6) Normal Operating mode (128.016 kHz / 10 W)	Mode 6
7) Normal Operating mode (128.549 kHz / 10 W)	Mode 7
8) Normal Operating mode (127.373 kHz / 10 W)	Mode 8
9) Normal Operating mode (127.248 kHz / 10 W)	Mode 9
10) Normal Operating mode (126.999 kHz / 10 W)	Mode 10
11) Normal Operating mode (126.515 kHz / 10 W)	Mode 11

### **4.2 Configuration and peripherals**

[Mode 1 to 3]



\* 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	AF2201	500051	Panasonic Corporation	EUT
B	Test Jig	PAS-JS100	103	Panasonic Corporation	-

\*A and B communicates and charges via air interface.

#### **List of cables used**

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	2.2	Unshielded	Unshielded	-

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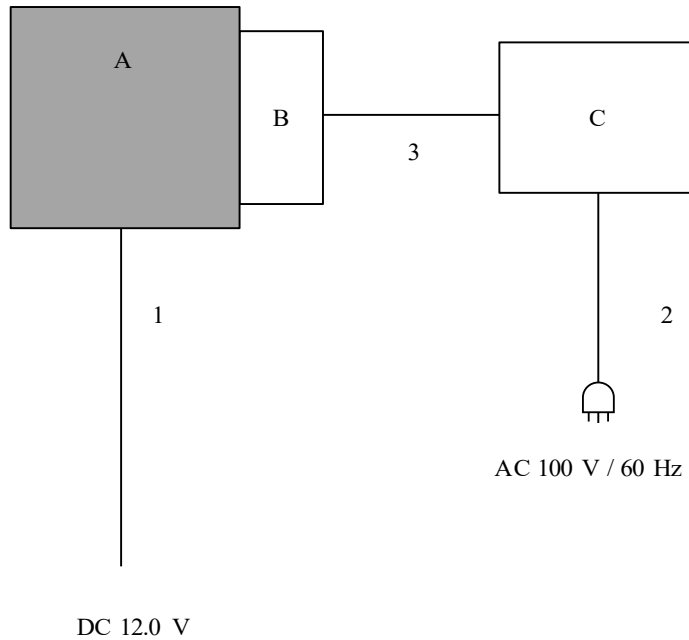
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[Mode 4 to 11]



\* 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	AF2201	500051	Panasonic Corporation	EUT
B	Communication probe	-	-	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	2.2	Unshielded	Unshielded	-
2	AC Cable	1.0	Unshielded	Unshielded	-
3	Communication Cable	0.6	Shielded	Shielded	-

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## **SECTION 5: Radiated Emission**

### **5.1 Operating environment**

Test place : No.1 semi anechoic chamber  
Temperature : See data  
Humidity : See data

### **5.2 Test configuration**

EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 1.0 m above the conducting ground plane. The EUT was set on the center of the table top.  
Test was made with the antenna positioned in 0 deg., 45 deg., 90 deg., 135deg., and 180 deg.  
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 - 30 MHz (Loop antenna)  
30 MHz - 200 MHz (Biconical antenna)  
200 MHz - 400 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., and 180 deg. with the Test Receiver.  
The test was made with the detector (RBW) in the following table.  
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 - 150 kHz	150 kHz - 30 MHz	30 MHz - 400 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 10m and 3m]

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

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

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

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

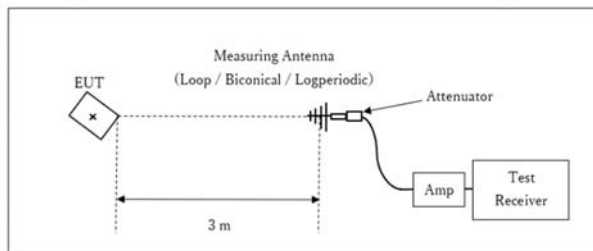
[Other Frequency]

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

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

<Test Setup>

Below 1 GHz



Test Distance: 3 m

x : Center of turn table

- 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.

## 5.5 Test result

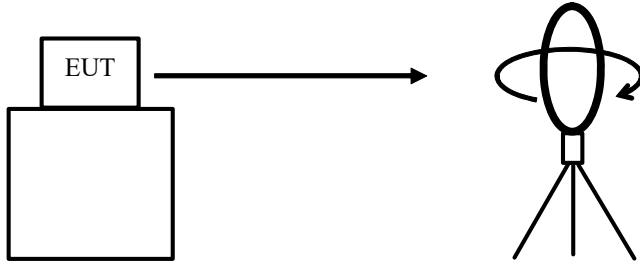
Summary of the test results: Pass

Date: April 18, 19 and 20, 2021  
April 19 and 20, 2021

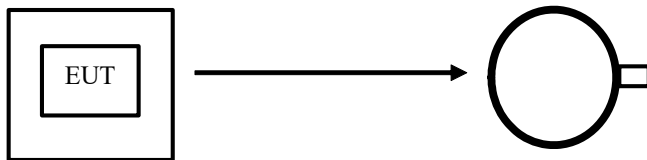
Test engineer: Junya Okuno  
Takeshi Hiyaji

Figure 1: Direction of the Loop Antenna

*Side View (Vertical)*



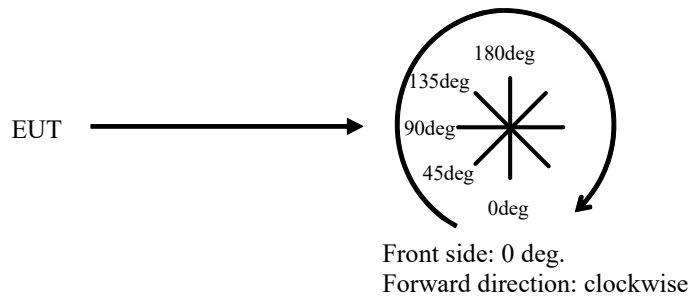
.....  
*Top View (Horizontal)*



Antenna was not rotated.

.....

*Top View (Vertical)*



## APPENDIX 1: Test data

### Radiated Emission (Below 30 MHz)

Report No.	13762994H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.1
Date	April 18, 2021
Temperature / Humidity	20 deg. C / 40 % RH
Engineer	Junya Okuno (3m / 10m)
Mode	Mode 1

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]
0.1203	79.2	49.5	18.9	6.0	32.2	-113.6	-41.7	23.5	65.2	0
0.1203	78.0	49.0	18.9	6.0	32.2	-110.9	-40.2	23.5	63.7	45
0.1203	76.1	48.9	18.9	6.0	32.2	-104.0	-35.3	23.5	58.8	90
0.1203	77.1	49.2	18.9	6.0	32.2	-106.7	-36.9	23.5	60.4	135
0.1203	79.0	49.3	18.9	6.0	32.2	-113.6	-41.9	23.5	65.4	180
0.1203	75.5	40.8	18.9	6.0	32.2	-132.7	-64.5	23.5	88.0	Horizontal
0.2406	38.5	NS	18.9	6.0	32.2	-40.0	-8.8	23.5	32.3	0
0.3609	58.0	31.6	18.8	6.1	32.2	-101.0	-50.3	23.5	73.8	0
0.4812	28.5	NS	18.8	6.1	32.2	-40.0	-18.9	25.5	44.4	0
0.6015	48.9	27.4	18.8	6.1	32.3	-82.2	-40.7	23.5	64.2	0
0.7218	26.8	NS	18.8	6.1	32.3	-40.0	-20.6	23.5	44.1	0
0.8421	43.1	NS	18.8	6.2	32.3	-40.0	-4.2	23.5	27.7	0
1.0827	39.0	NS	18.8	6.2	32.3	-40.0	-8.3	23.5	31.8	0

NS : No-Signal

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

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**Radiated emission**  
**(Below 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 18, 2021  
Temperature / Humidity 20 deg. C / 40 % RH  
Engineer Junya Okuno  
(3m / 10m)  
Mode Mode 2

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	81.4	53.9	18.9	6.0	32.2	-105.2	-31.1	23.5	54.6	0
0.1275	80.3	53.5	18.9	6.0	32.2	-102.5	-29.5	23.5	53.0	45
0.1275	78.2	53.4	18.9	6.0	32.2	-94.9	-24.0	23.5	47.5	90
0.1275	79.4	53.5	18.9	6.0	32.2	-99.1	-27.0	23.5	50.5	135
0.1275	81.2	53.7	18.9	6.0	32.2	-105.2	-31.3	23.5	54.8	180
0.1275	78.1	46.2	18.9	6.0	32.2	-122.0	-51.2	23.5	74.7	Horizontal
0.2550	34.1	NS	18.9	6.0	32.2	-40.0	-13.3	23.5	36.8	0
0.3825	59.2	32.7	18.8	6.1	32.2	-101.4	-49.5	23.5	73.0	0
0.5100	28.3	NS	18.8	6.1	32.2	-40.0	-19.1	25.5	44.6	0
0.6375	47.8	27.7	18.8	6.1	32.3	-76.9	-36.5	23.5	60.0	0
0.7649	27.0	NS	18.8	6.1	32.3	-40.0	-20.4	23.5	43.9	0
0.8924	41.2	NS	18.8	6.2	32.3	-40.0	-6.1	23.5	29.7	0
1.1474	33.2	NS	18.8	6.2	32.3	-40.0	-14.1	23.5	37.6	0

NS : No-Signal

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

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**Radiated Emission**  
**(Below 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 18, 2021  
Temperature / Humidity 20 deg. C / 40 % RH  
Engineer Junya Okuno  
(3m / 10m)  
Mode Mode 3

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]
0.1270	80.4	51.8	18.9	6.0	32.2	-109.4	-36.3	23.5	59.8	0
0.1270	79.1	51.3	18.9	6.0	32.2	-106.3	-34.6	23.5	58.1	45
0.1270	77.0	51.2	18.9	6.0	32.2	-98.7	-29.0	23.5	52.5	90
0.1270	78.5	51.4	18.9	6.0	32.2	-103.7	-32.5	23.5	56.0	135
0.1270	80.3	51.6	18.9	6.0	32.2	-109.8	-36.8	23.5	60.3	180
0.1270	77.3	42.2	18.9	6.0	32.2	-134.3	-64.3	23.5	87.8	Horizontal
0.2540	32.4	NS	18.9	6.0	32.2	-40.0	-15.0	23.5	38.5	0
0.3810	58.7	31.9	18.8	6.1	32.2	-102.5	-51.2	23.5	74.7	0
0.5080	27.9	NS	18.8	6.1	32.2	-40.0	-19.5	25.5	45.0	0
0.6350	49.4	27.5	18.8	6.1	32.3	-83.8	-41.7	23.5	65.2	0
0.7620	27.1	NS	18.8	6.1	32.3	-40.0	-20.3	23.5	43.8	0
0.8890	42.9	NS	18.8	6.2	32.3	-40.0	-4.5	23.5	28.0	0
1.0160	38.0	NS	18.8	6.2	32.3	-40.0	-9.3	23.5	32.8	0

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

**Radiated Emission**  
**(Below 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 19, 2021 No.1  
Temperature / Humidity 20 deg. C / 40 % RH April 20, 2021  
Engineer Takeshi Hiyaji Takeshi Hiyaji  
(3m) (10m)  
Mode Mode 4

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]
0.1276	85.6	58.1	18.9	6.0	32.2	-105.2	-26.9	23.5	50.4	0
0.1276	84.4	57.2	18.9	6.0	32.2	-104.0	-27.0	23.5	50.5	45
0.1276	82.1	55.7	18.9	6.0	32.2	-101.0	-26.2	23.5	49.7	90
0.1276	82.3	57.3	18.9	6.0	32.2	-95.6	-20.7	23.5	44.2	135
0.1276	83.9	57.7	18.9	6.0	32.2	-100.2	-23.6	23.5	47.1	180
0.1276	84.9	50.1	18.9	6.0	32.2	-133.1	-55.5	23.5	79.0	Horizontal
0.2553	40.0	NS	18.9	6.0	32.2	-40.0	-7.3	23.5	30.9	0
0.3829	61.0	34.7	18.8	6.1	32.2	-100.6	-46.9	23.5	70.4	0
0.5105	30.4	NS	18.8	6.1	32.2	-40.0	-17.0	23.5	40.5	0
0.6382	48.6	27.3	18.8	6.1	32.3	-81.5	-40.2	23.5	63.7	0
0.7658	27.8	NS	18.8	6.1	32.3	-40.0	-19.6	23.5	43.1	0
0.8934	32.3	NS	18.8	6.2	32.3	-40.0	-15.1	23.5	38.6	0
1.0210	26.1	NS	18.8	6.2	32.3	-40.0	-21.2	23.5	44.7	0
1.1487	32.4	NS	18.8	6.2	32.3	-40.0	-14.9	25.5	40.4	0
1.2763	25.6	NS	18.8	6.2	32.3	-40.0	-21.7	23.5	45.2	0

NS : No-Signal

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



**Radiated Emission**  
**(Below 30 MHz)**

Report No.	13762994H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.1	No.1
Date	April 19, 2021	April 20, 2021
Temperature / Humidity	20 deg. C / 40 % RH	20 deg. C / 40 % RH
Engineer	Takeshi Hiyaji	Takeshi Hiyaji
	(3m)	(10m)
Mode	Mode 5	

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]
0.1278	85.5	58.1	18.9	6.0	32.2	-104.8	-26.6	23.5	50.1	0
0.1278	84.4	57.1	18.9	6.0	32.2	-104.4	-27.4	23.5	50.9	45
0.1278	82.3	55.8	18.9	6.0	32.2	-101.4	-26.4	23.5	49.9	90
0.1278	84.1	57.1	18.9	6.0	32.2	-103.3	-26.5	23.5	50.0	135
0.1278	85.4	57.6	18.9	6.0	32.2	-106.3	-28.3	23.5	51.8	180
0.1278	85.0	50.4	18.9	6.0	32.2	-132.3	-54.7	23.5	78.2	Horizontal
0.2555	40.1	NS	18.9	6.0	32.2	-40.0	-7.3	23.5	30.8	0
0.3833	61.5	34.6	18.8	6.1	32.2	-102.9	-48.7	23.5	72.2	0
0.5110	30.3	NS	18.8	6.1	32.2	-40.0	-17.1	23.5	40.6	0
0.6388	48.6	27.3	18.8	6.1	32.3	-81.5	-40.2	23.5	63.7	0
0.7666	27.6	NS	18.8	6.1	32.3	-40.0	-19.8	23.5	43.3	0
0.8943	36.1	NS	18.8	6.2	32.3	-40.0	-11.3	23.5	34.8	0
1.0221	26.3	NS	18.8	6.2	32.3	-40.0	-21.0	23.5	44.5	0
1.1498	32.3	NS	18.8	6.2	32.3	-40.0	-15.0	25.5	40.5	0
1.2776	25.9	NS	18.8	6.2	32.3	-40.0	-21.4	23.5	44.9	0

NS : No-Signal

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

**UL Japan, Inc.**

**Ise EMC Lab.**

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**Radiated Emission**  
**(Below 30 MHz)**

Report No.	13762994H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.1	No.1
Date	April 19, 2021	April 20, 2021
Temperature / Humidity	20 deg. C / 40 % RH	20 deg. C / 40 % RH
Engineer	Takeshi Hiyaji	Takeshi Hiyaji
	(3m)	(10m)
Mode	Mode 6	

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]
0.1280	85.6	58.2	18.9	6.0	32.2	-104.8	-26.5	23.5	50.0	0
0.1280	84.3	57.2	18.9	6.0	32.2	-103.7	-26.7	23.5	50.2	45
0.1280	82.2	55.7	18.9	6.0	32.2	-101.4	-26.5	23.5	50.0	90
0.1280	84.0	57.4	18.9	6.0	32.2	-101.7	-25.1	23.5	48.6	135
0.1280	85.3	57.6	18.9	6.0	32.2	-106.0	-28.0	23.5	51.5	180
0.1280	84.8	50.3	18.9	6.0	32.2	-132.0	-54.5	23.5	78.0	Horizontal
0.2560	40.0	NS	18.9	6.0	32.2	-40.0	-7.3	23.5	30.9	0
0.3841	61.0	34.6	18.8	6.1	32.2	-101.0	-47.3	23.5	70.8	0
0.5121	30.3	NS	18.8	6.1	32.2	-40.0	-17.1	23.5	40.6	0
0.6401	48.9	27.4	18.8	6.1	32.3	-82.2	-40.7	23.5	64.2	0
0.7681	27.7	NS	18.8	6.1	32.3	-40.0	-19.7	23.5	43.2	0
0.8961	35.5	NS	18.8	6.2	32.3	-40.0	-11.9	23.5	35.4	0
1.0241	26.2	NS	18.8	6.2	32.3	-40.0	-21.1	23.5	44.6	0
1.1521	32.2	NS	18.8	6.2	32.3	-40.0	-15.1	25.5	40.6	0
1.2802	25.6	NS	18.8	6.2	32.3	-40.0	-21.7	23.5	45.2	0

NS : No-Signal

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

**Radiated Emission**  
**(Below 30 MHz)**

Report No.	13762994H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.1	No.1
Date	April 19, 2021	April 20, 2021
Temperature / Humidity	20 deg. C / 40 % RH	20 deg. C / 40 % RH
Engineer	Takeshi Hiyaji	Takeshi Hiyaji
	(3m)	(10m)
Mode	Mode 7	

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]
0.1286	85.7	58.3	18.9	6.0	32.2	-104.8	-26.4	23.5	49.9	0
0.1286	84.2	57.3	18.9	6.0	32.2	-102.9	-26.0	23.5	49.5	45
0.1286	82.4	55.9	18.9	6.0	32.2	-101.4	-26.3	23.5	49.8	90
0.1286	84.1	57.2	18.9	6.0	32.2	-102.9	-26.1	23.5	49.6	135
0.1286	85.4	57.6	18.9	6.0	32.2	-106.3	-28.3	23.5	51.8	180
0.1286	84.8	50.1	18.9	6.0	32.2	-132.7	-55.3	23.5	78.8	Horizontal
0.2571	40.6	NS	18.9	6.0	32.2	-40.0	-6.8	23.5	30.3	0
0.3857	61.2	34.6	18.8	6.1	32.2	-101.7	-47.9	23.5	71.4	0
0.5142	29.7	NS	18.8	6.1	32.2	-40.0	-17.7	23.5	41.2	0
0.6428	49.0	27.3	18.8	6.1	32.3	-83.0	-41.4	23.5	64.9	0
0.7713	27.5	NS	18.8	6.1	32.3	-40.0	-19.9	23.5	43.4	0
0.8998	35.8	NS	18.8	6.2	32.3	-40.0	-11.6	23.5	35.1	0
1.0284	26.2	NS	18.8	6.2	32.3	-40.0	-21.1	23.5	44.6	0
1.1569	29.5	NS	18.8	6.2	32.3	-40.0	-17.8	23.5	43.3	0
1.2855	25.7	NS	18.8	6.2	32.3	-40.0	-21.6	23.5	45.1	0

NS : No-Signal

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

**UL Japan, Inc.**

**Ise EMC Lab.**

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**Radiated Emission**  
**(Below 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 19, 2021  
Temperature / Humidity 23 deg. C / 33 % RH  
Engineer Junya Okuno  
(3m / 10m)  
Mode Mode 8

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]
0.1274	85.5	58.2	18.9	6.0	32.2	-104.4	-26.3	23.5	49.8	0
0.1274	84.1	57.2	18.9	6.0	32.2	-102.9	-26.1	23.5	49.6	45
0.1274	82.0	55.8	18.9	6.0	32.2	-100.2	-25.5	23.5	49.0	90
0.1274	83.8	57.3	18.9	6.0	32.2	-101.4	-24.9	23.5	48.4	135
0.1274	85.1	58.0	18.9	6.0	32.2	-103.7	-25.9	23.5	49.4	180
0.1274	85.3	51.0	18.9	6.0	32.2	-131.2	-53.2	23.5	76.7	0
0.2547	39.1	NS	18.9	6.0	32.2	-40.0	-8.3	23.5	31.8	0
0.3821	60.9	34.6	18.8	6.1	32.2	-100.6	-47.0	23.5	70.5	0
0.5095	29.8	NS	18.8	6.1	32.2	-40.0	-17.6	23.5	41.1	0
0.6369	48.2	27.3	18.8	6.1	32.3	-79.9	-39.1	23.5	62.6	0
0.7642	27.4	NS	18.8	6.1	32.3	-40.0	-20.0	23.5	43.5	0
0.8916	34.0	NS	18.8	6.2	32.3	-40.0	-13.4	23.5	36.9	0
1.1463	30.6	NS	18.8	6.2	32.3	-40.0	-16.7	25.5	42.2	0

NS : No-Signal

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

**UL Japan, Inc.**

**Ise EMC Lab.**

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**Radiated Emission**  
**(Below 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 19, 2021  
Temperature / Humidity 23 deg. C / 33 % RH  
Engineer Junya Okuno  
(3m / 10m)  
Mode Mode 9

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]
0.1273	85.6	58.2	18.9	6.0	32.2	-104.8	-26.5	23.5	50.0	0
0.1273	84.2	57.3	18.9	6.0	32.2	-102.9	-26.0	23.5	49.5	45
0.1273	82.0	55.8	18.9	6.0	32.2	-100.2	-25.5	23.5	49.0	90
0.1273	83.8	57.2	18.9	6.0	32.2	-101.7	-25.3	23.5	48.8	135
0.1273	85.3	58.0	18.9	6.0	32.2	-104.4	-26.5	23.5	50.0	180
0.1273	85.4	50.9	18.9	6.0	32.2	-132.0	-53.9	23.5	77.4	0
0.2545	41.0	NS	18.9	6.0	32.2	-40.0	-6.3	23.5	29.9	0
0.3817	60.9	34.6	18.8	6.1	32.2	-100.6	-47.0	23.5	70.5	0
0.5090	29.8	NS	18.8	6.1	32.2	-40.0	-17.6	23.5	41.1	0
0.6362	48.2	27.2	18.8	6.1	32.3	-80.3	-39.5	23.5	63.0	0
0.7635	27.4	NS	18.8	6.1	32.3	-40.0	-20.0	23.5	43.5	0
0.8907	34.0	NS	18.8	6.2	32.3	-40.0	-13.4	23.5	36.9	0
1.1452	30.5	NS	18.8	6.2	32.3	-40.0	-16.8	25.5	42.3	0

NS : No-Signal

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

**UL Japan, Inc.**

**Ise EMC Lab.**

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

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**Radiated Emission**  
**(Below 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 19, 2021  
Temperature / Humidity 23 deg. C / 33 % RH  
Engineer Junya Okuno  
(3m / 10m)  
Mode Mode 10

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]
0.1270	85.5	58.2	18.9	6.0	32.2	-104.4	-26.3	23.5	49.8	0
0.1270	84.1	57.3	18.9	6.0	32.2	-102.5	-25.7	23.5	49.2	45
0.1270	81.9	55.8	18.9	6.0	32.2	-99.8	-25.3	23.5	48.8	90
0.1270	83.8	57.1	18.9	6.0	32.2	-102.1	-25.7	23.5	49.2	135
0.1270	85.2	58.0	18.9	6.0	32.2	-104.0	-26.2	23.5	49.7	180
0.1270	85.4	50.7	18.9	6.0	32.2	-132.7	-54.7	23.5	78.2	0
0.2540	41.0	NS	18.9	6.0	32.2	-40.0	-6.3	23.5	29.9	0
0.3810	60.9	34.6	18.8	6.1	32.2	-100.6	-47.0	23.5	70.5	0
0.5080	29.8	NS	18.8	6.1	32.2	-40.0	-17.6	23.5	41.1	0
0.6350	48.2	27.2	18.8	6.1	32.3	-80.3	-39.5	23.5	63.0	0
0.7620	27.4	NS	18.8	6.1	32.3	-40.0	-20.0	23.5	43.5	0
0.8890	34.0	NS	18.8	6.2	32.3	-40.0	-13.4	23.5	36.9	0
1.1430	30.5	NS	18.8	6.2	32.3	-40.0	-16.8	25.5	42.3	0

NS : No-Signal

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

**UL Japan, Inc.**

**Ise EMC Lab.**

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

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## Radiated Emission (Below 30 MHz)

Report No.	13762994H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.1
Date	April 19, 2021
Temperature / Humidity	23 deg. C / 33 % RH
Engineer	Junya Okuno (3m / 10m)
Mode	Mode 11

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]
0.1265	85.5	58.2	18.9	6.0	32.2	-104.4	-26.3	23.5	49.8	0
0.1265	84.2	57.3	18.9	6.0	32.2	-102.9	-26.0	23.5	49.5	45
0.1265	81.9	55.8	18.9	6.0	32.2	-99.8	-25.3	23.5	48.8	90
0.1265	83.8	57.1	18.9	6.0	32.2	-102.1	-25.7	23.5	49.2	135
0.1265	85.1	58.0	18.9	6.0	32.2	-103.7	-25.9	23.5	49.4	180
0.1265	85.3	50.8	18.9	6.0	32.2	-132.0	-54.0	23.5	77.5	0
0.2530	40.9	NS	18.9	6.0	32.2	-40.0	-6.5	23.5	30.0	0
0.3796	60.8	34.6	18.8	6.1	32.2	-100.2	-46.8	23.5	70.3	0
0.5061	29.7	NS	18.8	6.1	32.2	-40.0	-17.7	23.5	41.2	0
0.6326	48.2	27.2	18.8	6.1	32.3	-80.3	-39.5	23.5	63.0	0
0.7591	27.3	NS	18.8	6.1	32.3	-40.0	-20.1	23.5	43.6	0
0.8856	34.0	NS	18.8	6.2	32.3	-40.0	-13.4	23.5	36.9	0
1.1386	30.5	NS	18.8	6.2	32.3	-40.0	-16.8	25.5	42.3	0

NS : No-Signal

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

**UL Japan, Inc.**

**Ise EMC Lab.**

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

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**Radiated Emission**  
**(Above 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 20, 2021 April 20, 2021  
Temperature / Humidity 20 deg. C / 40 % RH 24 deg. C / 40 % RH  
Engineer Takeshi Hiyaji Junya Okuno  
(3m) (10m)  
Mode Mode 1

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	AMP gain [dB]	Atten + Cable loss [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna Polarization
32.828	28.3	NS	12.8	38.7	7.4	-40.0	-30.3	23.5	53.8	Horizontal
52.930	29.1	NS	9.6	38.7	7.8	-40.0	-32.3	23.5	55.8	Horizontal
65.643	30.3	NS	8.9	38.8	8.0	-40.0	-31.5	23.5	55.0	Horizontal
130.986	30.1	NS	11.4	38.9	8.9	-40.0	-28.5	23.5	52.0	Horizontal
250.470	32.5	NS	12.2	38.8	10.2	-40.0	-23.9	23.5	47.4	Horizontal
368.187	27.7	NS	14.7	38.5	11.2	-40.0	-24.8	23.5	48.3	Horizontal
32.828	39.6	NS	12.8	38.7	7.4	-40.0	-19.0	23.5	42.5	Vertical
52.930	41.1	NS	9.6	38.7	7.8	-40.0	-20.3	23.5	43.8	Vertical
65.643	45.7	NS	8.9	38.8	8.0	-40.0	-16.1	23.5	39.6	Vertical
130.986	39.3	NS	11.4	38.9	8.9	-40.0	-19.3	23.5	42.8	Vertical
250.470	33.3	NS	12.2	38.8	10.2	-40.0	-23.1	23.5	46.6	Vertical
368.187	27.8	NS	14.7	38.5	11.2	-40.0	-24.7	23.5	48.2	Vertical

CALCULATION(Result) : Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain  
Extrapolation Factor = 20\*Log (Test distance(3m) / Separate distance(300m))

NS : No-Signal

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



**Radiated Emission**  
**(Above 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 20, 2021 No.1  
Temperature / Humidity 20 deg. C / 40 % RH April 20, 2021  
Engineer Takeshi Hiyaji Junya Okuno  
(3m) (10m)  
Mode Mode 2

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	AMP gain [dB]	Atten + Cable loss [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna Polarization
31.738	29.8	NS	13.1	38.7	7.3	-40.0	-28.5	23.5	52.0	Horizontal
50.473	28.5	NS	9.9	38.7	7.7	-40.0	-32.6	23.5	56.1	Horizontal
64.792	30.2	NS	9.0	38.8	8.0	-40.0	-31.6	23.5	55.1	Horizontal
132.208	31.0	NS	11.4	38.9	9.0	-40.0	-27.5	23.5	51.0	Horizontal
253.603	33.4	NS	12.2	38.7	10.3	-40.0	-22.9	23.5	46.4	Horizontal
343.902	27.8	NS	14.8	38.5	11.0	-40.0	-24.9	23.5	48.4	Horizontal
31.738	38.8	NS	13.1	38.7	7.3	-40.0	-19.5	23.5	43.0	Vertical
50.473	35.6	NS	9.9	38.7	7.7	-40.0	-25.5	23.5	49.0	Vertical
64.792	42.1	NS	9.0	38.8	8.0	-40.0	-19.7	23.5	43.2	Vertical
130.208	38.1	NS	11.4	38.9	8.9	-40.0	-20.5	23.5	44.0	Vertical
253.603	34.6	NS	12.2	38.7	10.3	-40.0	-21.7	23.5	45.2	Vertical
343.902	28.2	NS	14.8	38.5	11.0	-40.0	-24.5	23.5	48.0	Vertical

CALCULATION(Result) : Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain  
Extrapolation Factor = 20\*Log (Test distance(3m) / Separate distance(300m))

NS : No-Signal

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

**Radiated Emission**  
**(Above 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 20, 2021 April 20, 2021  
Temperature / Humidity 20 deg. C / 40 % RH 24 deg. C / 40 % RH  
Engineer Takeshi Hiyaji Junya Okuno  
(3m) (10m)  
Mode Mode 3

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	AMP gain [dB]	Atten + Cable loss [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna Polarization
32.242	29.0	NS	12.9	38.7	7.4	-40.0	-29.5	23.5	53.0	Horizontal
47.023	28.8	NS	10.3	38.7	7.7	-40.0	-32.0	23.5	55.5	Horizontal
65.671	30.7	NS	8.9	38.8	8.0	-40.0	-31.1	23.5	54.6	Horizontal
131.244	30.4	NS	11.4	38.9	9.0	-40.0	-28.2	23.5	51.7	Horizontal
249.920	33.0	NS	12.2	38.8	10.2	-40.0	-23.4	23.5	46.9	Horizontal
367.027	27.7	NS	14.7	38.5	11.2	-40.0	-24.8	23.5	48.3	Horizontal
32.242	42.1	NS	12.9	38.7	7.4	-40.0	-16.4	23.5	39.9	Vertical
47.023	41.3	NS	10.3	38.7	7.7	-40.0	-19.5	23.5	43.0	Vertical
65.671	46.9	NS	8.9	38.8	8.0	-40.0	-14.9	23.5	38.4	Vertical
131.244	40.5	NS	11.4	38.9	9.0	-40.0	-18.1	23.5	41.6	Vertical
249.920	33.6	NS	12.2	38.8	10.2	-40.0	-22.8	23.5	46.3	Vertical
367.027	27.8	NS	14.7	38.5	11.2	-40.0	-24.7	23.5	48.2	Vertical

CALCULATION(Result) : Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain  
Extrapolation Factor = 20\*Log (Test distance(3m) / Separate distance(300m))

NS : No-Signal

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

**Radiated Emission**  
**(Above 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 20, 2021 April 20, 2021  
Temperature / Humidity 20 deg. C / 40 % RH 24 deg. C / 40 % RH  
Engineer Takeshi Hiyaji Junya Okuno  
(3m) (10m)  
Mode Mode 4

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	AMP gain [dB]	Atten + Cable loss [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna Polarization
30.363	30.6	NS	13.4	38.7	7.3	-40.0	-27.5	23.5	51.0	Horizontal
42.358	35.6	NS	11.0	38.7	7.6	-40.0	-24.6	23.5	48.1	Horizontal
68.778	40.5	NS	9.0	38.8	8.1	-40.0	-21.3	23.5	44.8	Horizontal
187.302	37.3	NS	13.9	38.9	9.6	-40.0	-18.1	23.5	41.6	Horizontal
212.814	42.2	NS	10.4	38.9	9.9	-40.0	-16.4	23.5	39.9	Horizontal
331.179	35.4	NS	14.1	38.6	10.9	-40.0	-18.1	23.5	41.6	Horizontal
30.363	45.3	NS	13.4	38.7	7.3	-40.0	-12.8	23.5	36.3	Vertical
42.358	42.7	NS	11.0	38.7	7.6	-40.0	-17.5	23.5	41.0	Vertical
68.778	43.4	NS	9.0	38.8	8.1	-40.0	-18.4	23.5	41.9	Vertical
187.302	33.2	NS	13.9	38.9	9.6	-40.0	-22.2	23.5	45.7	Vertical
212.814	37.7	NS	10.4	38.9	9.9	-40.0	-20.9	23.5	44.4	Vertical
331.179	35.8	NS	14.1	38.6	10.9	-40.0	-17.7	23.5	41.2	Vertical

CALCULATION(Result) : Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain  
Extrapolation Factor = 20\*Log (Test distance(3m) / Separate distance(300m))

NS : No-Signal

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

**Radiated Emission**  
**(Above 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 20, 2021 April 20, 2021  
Temperature / Humidity 20 deg. C / 40 % RH 24 deg. C / 40 % RH  
Engineer Takeshi Hiyaji Junya Okuno  
(3m) (10m)  
Mode Mode 5

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	AMP gain [dB]	Atten + Cable loss [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna Polarization
30.238	30.5	NS	13.4	38.7	7.3	-40.0	-27.5	23.5	51.0	Horizontal
42.339	35.2	NS	11.0	38.7	7.6	-40.0	-25.0	23.5	48.5	Horizontal
67.674	40.2	NS	9.0	38.8	8.0	-40.0	-21.6	23.5	45.1	Horizontal
186.556	37.0	NS	13.9	38.9	9.6	-40.0	-18.4	23.5	41.9	Horizontal
211.444	42.3	NS	10.4	38.9	9.8	-40.0	-16.4	23.5	39.9	Horizontal
332.146	35.2	NS	14.2	38.6	10.9	-40.0	-18.3	23.5	41.8	Horizontal
30.238	45.1	NS	13.4	38.7	7.3	-40.0	-12.9	23.5	36.4	Vertical
42.339	42.3	NS	11.0	38.7	7.6	-40.0	-17.9	23.5	41.4	Vertical
67.674	43.0	NS	9.0	38.8	8.0	-40.0	-18.8	23.5	42.3	Vertical
186.556	33.3	NS	13.9	38.9	9.6	-40.0	-22.1	23.5	45.6	Vertical
211.444	37.4	NS	10.4	38.9	9.8	-40.0	-21.3	23.5	44.8	Vertical
332.146	35.1	NS	14.2	38.6	10.9	-40.0	-18.4	23.5	41.9	Vertical

CALCULATION(Result) : Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain  
Extrapolation Factor = 20\*Log (Test distance(3m) / Separate distance(300m))

NS : No-Signal

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

**Radiated Emission**  
**(Above 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 20, 2021 April 20, 2021  
Temperature / Humidity 20 deg. C / 40 % RH 24 deg. C / 40 % RH  
Engineer Takeshi Hiyaji Junya Okuno  
(3m) (10m)  
Mode Mode 6

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	AMP gain [dB]	Atten + Cable loss [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna Polarization
31.147	30.4	NS	13.2	38.7	7.3	-40.0	-27.8	23.5	51.3	Horizontal
42.313	35.4	NS	11.0	38.7	7.6	-40.0	-24.8	23.5	48.3	Horizontal
69.246	40.3	NS	9.0	38.8	8.1	-40.0	-21.4	23.5	44.9	Horizontal
188.110	37.4	NS	13.9	38.9	9.6	-40.0	-18.0	23.5	41.5	Horizontal
225.196	42.2	NS	11.2	38.8	10.0	-40.0	-15.4	23.5	38.9	Horizontal
367.265	35.4	NS	14.7	38.5	11.2	-40.0	-17.1	23.5	40.6	Horizontal
31.147	44.7	NS	13.2	38.7	7.3	-40.0	-13.5	23.5	37.0	Vertical
42.313	42.8	NS	11.0	38.7	7.6	-40.0	-17.4	23.5	40.9	Vertical
69.246	43.6	NS	9.0	38.8	8.1	-40.0	-18.1	23.5	41.6	Vertical
188.110	33.8	NS	13.9	38.9	9.6	-40.0	-21.6	23.5	45.1	Vertical
225.196	37.8	NS	11.2	38.8	10.0	-40.0	-19.8	23.5	43.3	Vertical
367.265	35.4	NS	14.7	38.5	11.2	-40.0	-17.1	23.5	40.6	Vertical

CALCULATION(Result) : Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain  
Extrapolation Factor = 20\*Log (Test distance(3m) / Separate distance(300m))

NS : No-Signal

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

**Radiated Emission**  
**(Above 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 20, 2021 April 20, 2021  
Temperature / Humidity 20 deg. C / 40 % RH 24 deg. C / 40 % RH  
Engineer Takeshi Hiyaji Junya Okuno  
(3m) (10m)  
Mode Mode 7

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	AMP gain [dB]	Atten + Cable loss [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna Polarization
31.233	31.1	NS	13.2	38.7	7.3	-40.0	-27.2	23.5	50.7	Horizontal
42.119	35.0	NS	11.0	38.7	7.6	-40.0	-25.1	23.5	48.6	Horizontal
69.584	27.2	NS	9.0	38.8	8.1	-40.0	-34.5	23.5	58.0	Horizontal
187.158	38.8	NS	13.9	38.9	9.6	-40.0	-16.6	23.5	40.1	Horizontal
227.244	35.4	NS	11.3	38.8	10.0	-40.0	-22.1	23.5	45.6	Horizontal
329.743	32.1	NS	14.1	38.6	10.9	-40.0	-21.5	23.5	45.0	Horizontal
31.233	45.4	NS	13.2	38.7	7.3	-40.0	-12.9	23.5	36.4	Vertical
42.119	42.9	NS	11.0	38.7	7.6	-40.0	-17.2	23.5	40.7	Vertical
69.584	45.1	NS	9.0	38.8	8.1	-40.0	-16.6	23.5	40.1	Vertical
187.158	33.9	NS	13.9	38.9	9.6	-40.0	-21.5	23.5	45.0	Vertical
227.224	31.4	NS	11.3	38.8	10.0	-40.0	-26.1	23.5	49.6	Vertical
327.884	29.0	NS	14.0	38.6	10.9	-40.0	-24.7	23.5	48.2	Vertical

CALCULATION(Result) : Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain  
Extrapolation Factor = 20\*Log (Test distance(3m) / Separate distance(300m))

NS : No-Signal

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

**Radiated Emission**  
**(Above 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 20, 2021  
Temperature / Humidity 24 deg. C / 40 % RH  
Engineer Junya Okuno  
(3m / 10m)  
Mode Mode 8

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	AMP gain [dB]	Atten + Cable loss [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna Polarization
30.714	29.2	NS	13.3	38.7	7.3	-40.0	-28.9	23.5	52.4	Horizontal
42.061	32.1	NS	11.0	38.7	7.6	-40.0	-28.0	23.5	51.5	Horizontal
69.898	32.4	NS	9.0	38.8	8.1	-40.0	-29.3	23.5	52.8	Horizontal
187.181	36.4	NS	13.9	38.9	9.6	-40.0	-19.0	23.5	42.5	Horizontal
226.802	41.0	NS	11.3	38.8	10.0	-40.0	-16.5	23.5	40.0	Horizontal
331.273	31.4	NS	14.1	38.6	10.9	-40.0	-22.1	23.5	45.6	Horizontal
30.714	45.0	NS	13.3	38.7	7.3	-40.0	-13.1	23.5	36.6	Vertical
42.061	44.9	NS	11.0	38.7	7.6	-40.0	-15.2	23.5	38.7	Vertical
69.898	44.7	NS	9.0	38.8	8.1	-40.0	-17.0	23.5	40.5	Vertical
187.181	31.1	NS	13.9	38.9	9.6	-40.0	-24.3	23.5	47.8	Vertical
226.802	33.3	NS	11.3	38.8	10.0	-40.0	-24.2	23.5	47.7	Vertical
331.273	28.6	NS	14.1	38.6	10.9	-40.0	-24.9	23.5	48.4	Vertical

CALCULATION(Result) : Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain  
Extrapolation Factor = 20\*Log (Test distance(3m) / Separate distance(300m))

NS : No-Signal

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

**Radiated Emission**  
**(Above 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 20, 2021  
Temperature / Humidity 24 deg. C / 40 % RH  
Engineer Junya Okuno  
(3m / 10m)  
Mode Mode 9

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	AMP gain [dB]	Atten + Cable loss [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna Polarization
30.617	28.8	NS	13.3	38.7	7.3	-40.0	-29.3	23.5	52.8	Horizontal
42.344	32.0	NS	11.0	38.7	7.6	-40.0	-28.2	23.5	51.7	Horizontal
70.002	31.4	NS	9.0	38.8	8.1	-40.0	-30.3	23.5	53.8	Horizontal
187.556	35.1	NS	13.9	38.9	9.6	-40.0	-20.3	23.5	43.8	Horizontal
226.813	41.3	NS	11.3	38.8	10.0	-40.0	-16.2	23.5	39.7	Horizontal
331.190	32.4	NS	14.1	38.6	10.9	-40.0	-21.1	23.5	44.6	Horizontal
30.617	44.8	NS	13.3	38.7	7.3	-40.0	-13.3	23.5	36.8	Vertical
42.344	45.1	NS	11.0	38.7	7.6	-40.0	-15.1	23.5	38.6	Vertical
70.002	44.1	NS	9.0	38.8	8.1	-40.0	-17.6	23.5	41.1	Vertical
187.556	30.9	NS	13.9	38.9	9.6	-40.0	-24.5	23.5	48.0	Vertical
226.813	32.3	NS	11.3	38.8	10.0	-40.0	-25.2	23.5	48.7	Vertical
331.190	30.8	NS	14.1	38.6	10.9	-40.0	-22.7	23.5	46.2	Vertical

CALCULATION(Result) : Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain  
Extrapolation Factor = 20\*Log (Test distance(3m) / Separate distance(300m))

NS : No-Signal

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

**UL Japan, Inc.**

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**Radiated Emission**  
**(Above 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 20, 2021  
Temperature / Humidity 24 deg. C / 40 % RH  
Engineer Junya Okuno  
(3m / 10m)  
Mode Mode 10

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	AMP gain [dB]	Atten + Cable loss [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna Polarization
30.448	29.0	NS	13.3	38.7	7.3	-40.0	-29.1	23.5	52.6	Horizontal
42.033	32.2	NS	11.0	38.7	7.6	-40.0	-27.9	23.5	51.4	Horizontal
69.962	31.8	NS	9.0	38.8	8.1	-40.0	-29.9	23.5	53.4	Horizontal
187.632	35.3	NS	13.9	38.9	9.6	-40.0	-20.1	23.5	43.6	Horizontal
228.342	40.8	NS	11.4	38.8	10.0	-40.0	-16.6	23.5	40.1	Horizontal
331.277	32.4	NS	14.1	38.6	10.9	-40.0	-21.1	23.5	44.6	Horizontal
30.448	45.0	NS	13.3	38.7	7.3	-40.0	-13.1	23.5	36.6	Vertical
42.033	44.7	NS	11.0	38.7	7.6	-40.0	-15.4	23.5	38.9	Vertical
69.962	44.3	NS	9.0	38.8	8.1	-40.0	-17.4	23.5	40.9	Vertical
187.632	31.2	NS	13.9	38.9	9.6	-40.0	-24.2	23.5	47.7	Vertical
228.342	33.0	NS	11.4	38.8	10.0	-40.0	-24.4	23.5	47.9	Vertical
331.277	31.2	NS	14.1	38.6	10.9	-40.0	-22.3	23.5	45.8	Vertical

CALCULATION(Result) : Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain  
Extrapolation Factor = 20\*Log (Test distance(3m) / Separate distance(300m))

NS : No-Signal

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

**Radiated Emission**  
**(Above 30 MHz)**

Report No. 13762994H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date April 20, 2021  
Temperature / Humidity 24 deg. C / 40 % RH  
Engineer Junya Okuno  
(3m / 10m)  
Mode Mode 11

FREQ [MHz]	Reading (3m) [dBμV]	Reading (10m) [dBμV]	ANT Factor [dB/m]	AMP gain [dB]	Atten + Cable loss [dB]	Extrapolation Factor [dB]	Result (300 m) [dBμV/m]	Limit (300 m) [dBμV/m]	Margin [dB]	Antenna Polarization
30.502	28.6	NS	13.3	38.7	7.3	-40.0	-29.5	23.5	53.0	Horizontal
42.000	31.8	NS	11.1	38.7	7.6	-40.0	-28.3	23.5	51.8	Horizontal
70.022	31.1	NS	9.0	38.8	8.1	-40.0	-30.6	23.5	54.1	Horizontal
187.733	35.6	NS	13.9	38.9	9.6	-40.0	-19.8	23.5	43.3	Horizontal
226.817	41.4	NS	11.3	38.8	10.0	-40.0	-16.1	23.5	39.6	Horizontal
331.184	32.0	NS	14.1	38.6	10.9	-40.0	-21.5	23.5	45.0	Horizontal
30.502	44.7	NS	13.3	38.7	7.3	-40.0	-13.4	23.5	36.9	Vertical
42.000	45.4	NS	11.1	38.7	7.6	-40.0	-14.7	23.5	38.2	Vertical
70.022	43.7	NS	9.0	38.8	8.1	-40.0	-18.0	23.5	41.5	Vertical
187.733	31.2	NS	13.9	38.9	9.6	-40.0	-24.2	23.5	47.7	Vertical
226.817	32.4	NS	11.3	38.8	10.0	-40.0	-25.1	23.5	48.6	Vertical
331.184	30.0	NS	14.1	38.6	10.9	-40.0	-23.5	23.5	47.0	Vertical

CALCULATION(Result) : Reading + ANT Factor + Cable loss + Atten loss + Extrapolation Factor - AMP gain  
Extrapolation Factor = 20\*Log (Test distance(3m) / Separate distance(300m))

NS : No-Signal

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

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## **APPENDIX 2: Test instruments**

### **Test equipment**

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MAEC-01	141998	AC1_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	06/08/2020	24
RE	MOS-27	141566	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	A08Q26	01/15/2021	12
RE	MMM-03	141530	Digital Tester	Fluke Corporation	FLUKE 26-3	78030621	08/18/2020	12
RE	MJM-25	142226	Measure	KOMELON	KMC-36	-	-	-
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MAT-08	141213	Attenuator(6dB)	Weinschel Corp	2	BK7971	11/13/2020	12
RE	MCC-03	141215	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W/3D-2W/ RG400u/ RFM-E421(SW)	-/01068 (Switcher)	06/25/2020	12
RE	MPA-13	141582	Pre Amplifier	SONOMA INSTRUMENT	310	260834	02/18/2021	12
RE	MTR-09	141950	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	06/03/2020	12
RE	MCC-219	159670	Coaxial Cable	UL Japan Inc.	-	-	11/17/2020	12
RE	MLPA-02	142152	Loop Antenna	Rohde & Schwarz	HFH2-Z2	836553/009	12/04/2020	12
RE	YBA-03	197990	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHBB 9124 + BBA 9106	01365	11/15/2020	12
RE	MCC-02	141350	Coaxial Cable	Suhner/storm/Agilent/TSJ	-	-	06/25/2020	12
RE	LA-17	160924	Logperiodic Antenna	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	225	11/15/2020	12
RE	MPA-19	141585	Pre Amplifier	MITEQ	MLA-10K01-B01-35	1237616	02/18/2021	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

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