

# EMI TEST REPORT

## Test Report No. 15456656H-R1

Customer	TaiyoGikenCo.
Description of EUT	Fully automatic mahjong table
Model Number of EUT	RIICHI-STYLE
FCC ID	2BMR5AMOS000
Test Regulation	FCC Part 15 Subpart B, Class B
Test Result	Complied
Issue Date	April 22, 2025
Remarks	-

Representative test engineer



Takeshi Hiyaji  
Engineer

Approved by



Shinichi Miyazono  
Leader



CERTIFICATE 5107.02

The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.  
 There is no testing item of "Non-accreditation".

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## **REVISION HISTORY**

### **Original Test Report No. 15456656H**

This report is a revised version of 15456656H. 15456656H is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	15456656H	October 2, 2024	-
1	15456656H-R1	April 22, 2025	Correction of the Rating in Clause 2.2; From AC 100 V to 120 V To AC 110 V to 120 V
1	15456656H-R1	April 22, 2025	Correction of the Clock frequency in Clause 2.2; From 27 MHz to 27.12 MHz
1	15456656H-R1	April 22, 2025	Addition of the cable number in Clause 4.2.

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

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

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## **SECTION 1: Customer information**

Company Name	TaiyoGikenCo.
Address	90 Wada, Mihama-cho, Hidaka-Gun, Wakayama Pref.
Telephone Number	+81-738-22-6153
Contact Person	Takeshi Tomita

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	Fully automatic mahjong table
Model Number	RIICHI-STYLE
Serial Number	Refer to SECTION 4.2
Condition	Production model
Modification	No Modification by the test lab
Receipt Date	September 9, and 11, 2024
Test Date	September 11, 2024

### **2.2 Product Description**

#### **General Specification**

Rating	AC 110 V to 120 V
Clock frequency (ies) in the system	27.12 MHz

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

### **3.1 Test Specification**

Test Specification	FCC Part 15 Subpart B The latest version on the first day of the testing period
Title	FCC 47CFR Part15 Radio Frequency Device Subpart B Unintentional Radiators

### **3.2 Procedures and results**

Item	Test Procedure	Limits	Worst margin	Result	Remarks
Conducted emission	ANSI C63.4: 2014 + C63.4a: 2017 7. AC power - line conducted emission measurements	Class B	20.05 dB 0.15000 MHz, QP, Phase L	Complied	-
Radiated emission	ANSI C63.4: 2014 + C63.4a: 2017 8. Radiated emission measurements	Class B	17.34 dB 156.441 MHz, Vertical, QP	Complied	*1)

\* Note: UL Japan, Inc.'s EMI Work Procedure: Work Instructions-ULID-003591.

\*1) Measurements were limited up to 1 GHz since the highest frequency of internal source of the EUT is less than 108 MHz.

### **3.3 Addition to standard**

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

### **3.4 Uncertainty**

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

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

#### **Conducted emission**

Item	Frequency range	Unit	Calculated Uncertainty (+/-)
AMN (LISN)	0.15 MHz to 30 MHz	dB	3.3

#### **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	5.0
		Vertical	5.0
	200 MHz to 1000 MHz	Horizontal	5.2
		Vertical	6.2
10 m	30 MHz to 200 MHz	Horizontal	5.5
		Vertical	5.4
	200 MHz to 1000 MHz	Horizontal	5.5
		Vertical	5.5

### 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	-	-

\* Size of vertical conducting plane (for Conducted Emission test): 2.0 x 3.0 m for No.1, No.2, No.3, No.4, and No.5 semi-anechoic chambers and No.3 and No.4 shielded rooms.

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

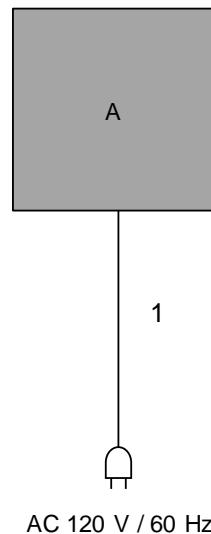
Refer to APPENDIX.

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

### **4.1 Operating Mode(s)**

Mode	1. Fully automatic mode
Software(s)	LX2300 Version: 2.00

### **4.2 Configuration and peripherals**



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

#### **Description of EUT**

No.	Item	Model number	Serial Number	Manufacturer	Remarks
A	Fully automatic mahjong table	RIIUCHI-STYLE	24G3052 JP II	TaiyoGikenCo.	EUT

#### **List of Cables Used**

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	AC Cable	2.6	Unshielded	Unshielded	-

## **SECTION 5: Conducted Emission**

### **5.1 Operating environment**

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

### **5.2 Test configuration**

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT and its peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80 cm from any other grounded conducting surface. EUT was located 80 cm from the LISN/AMN and excess AC cable was bundled in center. I/O cables that were connected to the other peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/AMN to the input power source. All unused 50 ohm connectors of the LISN/AMN were resistivity terminated in 50 ohm when not connected to the measuring equipment.

Photographs of the set up are shown in APPENDIX 3.

Frequency range	:	0.15 MHz to 30 MHz
EUT position	:	Table top
EUT operation mode	:	See Clause 4.1

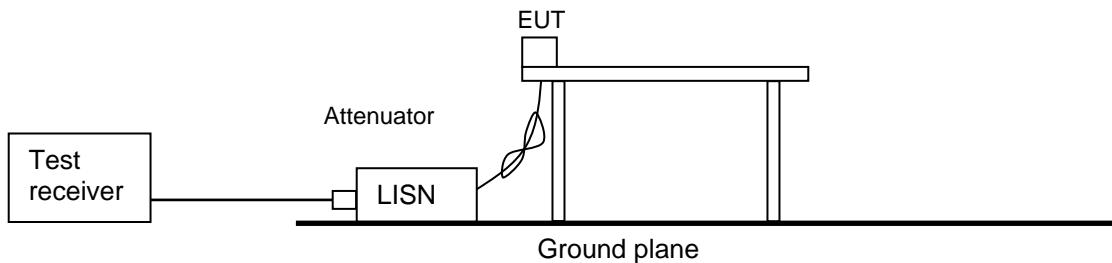
### **5.3 Test procedure**

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT within a semi anechoic chamber. The EUT was connected to a Line Impedance Stabilization Network (LISN)/ Artificial Mains network (AMN). An overview sweep with peak detection has been performed. The measurements have been performed with a quasi-peak detector and if required, with an average detector.

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

Detector Type	:	QP and CAV
IF Bandwidth	:	9 kHz

**Figure 1: Test Setup**



### **5.4 Test result**

Summary of the test results: Pass

The test result is rounded off, so some differences might be observed.

## **SECTION 6: Radiated Emission**

### **6.1 Operating environment**

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

### **6.2 Test configuration**

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The EUT was set on the edge of the tabletop.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

Photographs of the set up are shown in APPENDIX 3.

### **6.3 Test conditions**

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

### **6.4 Test procedure**

The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

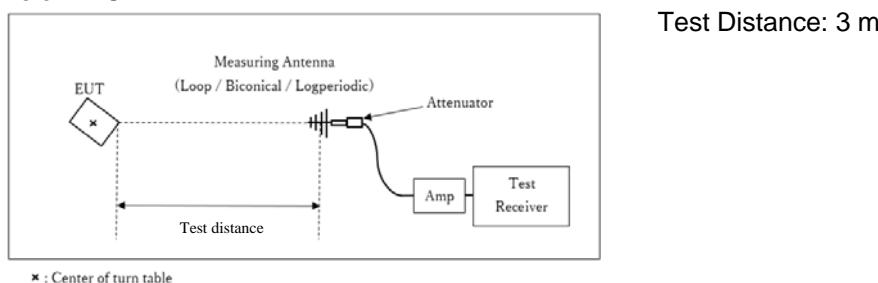
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver.

The radiated emission measurements were made with the following detector function of the Test Receiver.

Frequency	Below 1 GHz
Instrument used	Test Receiver
IF Bandwidth	QP: BW 120 kHz

**Figure 2: Test Setup**

Below 1 GHz



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

### **6.5 Test result**

Summary of the test results: Pass

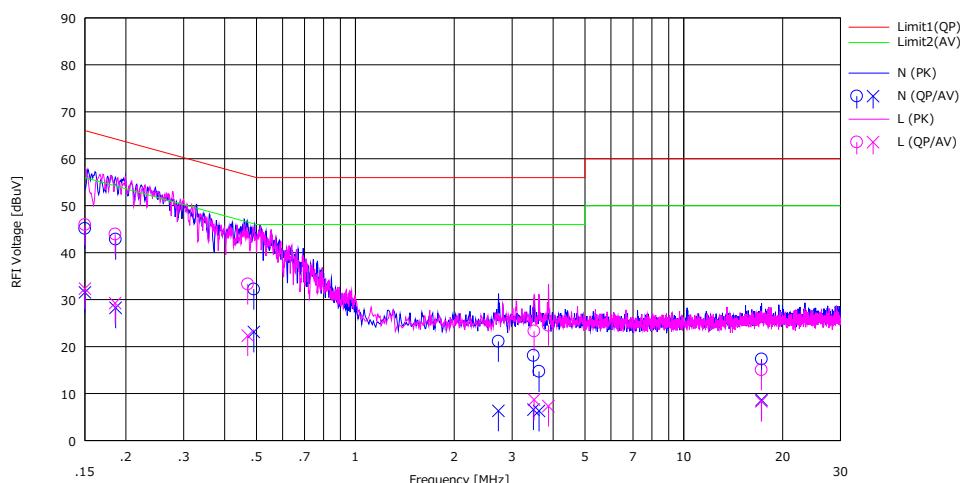
Test results are rounded off and limit are rounded down, so some differences might be observed.

## APPENDIX 1: Test data

### Conducted Emission

Test place Ise EMC Lab.  
 Semi Anechoic Chamber No.3  
 Date September 11, 2024  
 Temperature / Humidity 22 deg. C / 56 % RH  
 Engineer Takeshi Hiyaji  
 Mode Mode 1

Limit : FCC\_Part 15 Subpart B(15.107)\_Class B



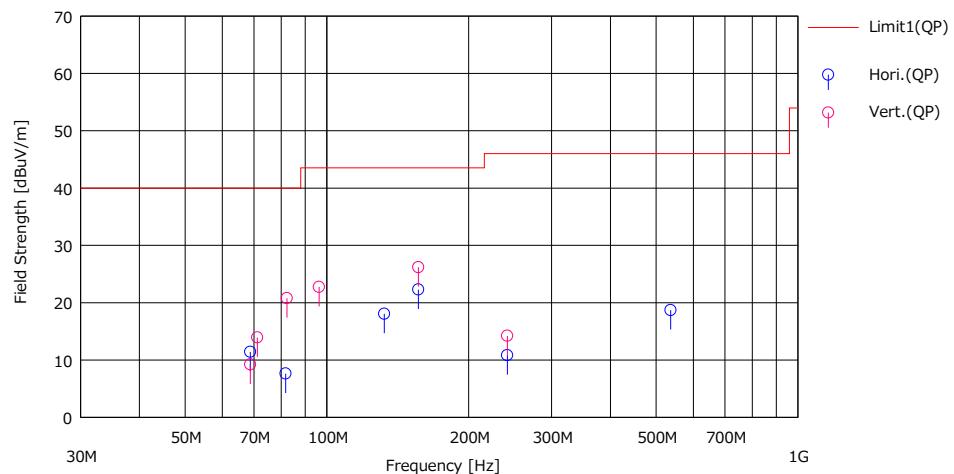
No.	Freq. [MHz]	Reading		LISN [dB]	LOSS [dB]	Results		Limit		Margin		Phase	Comment
		$\langle QP \rangle$ [dBuV]	$\langle AV \rangle$ [dBuV]			$\langle QP \rangle$ [dBuV]	$\langle AV \rangle$ [dBuV]	$\langle QP \rangle$ [dBuV]	$\langle AV \rangle$ [dBuV]	$\langle QP \rangle$ [dB]	$\langle AV \rangle$ [dB]		
		$\langle QP \rangle$ [dBuV]	$\langle AV \rangle$ [dBuV]			$\langle QP \rangle$ [dBuV]	$\langle AV \rangle$ [dBuV]	$\langle QP \rangle$ [dBuV]	$\langle AV \rangle$ [dBuV]	$\langle QP \rangle$ [dB]	$\langle AV \rangle$ [dB]		
1	0.15000	32.10	18.50	0.00	13.05	45.15	31.55	66.00	56.00	20.85	24.45	N	
2	0.18606	29.80	15.20	0.00	13.06	42.86	28.26	64.21	54.21	21.35	25.95	N	
3	0.49044	19.10	10.00	0.00	13.13	32.23	23.13	56.16	46.16	23.93	23.03	N	
4	2.72632	7.70	-7.10	0.00	13.42	21.12	6.32	56.00	46.00	34.88	39.68	N	
5	3.48550	4.60	-6.90	0.00	13.49	18.09	6.59	56.00	46.00	37.91	39.41	N	
6	3.62626	1.20	-7.20	0.00	13.51	14.71	6.31	56.00	46.00	41.29	39.69	N	
7	17.25342	3.10	-5.60	0.00	14.24	17.34	8.64	60.00	50.00	42.66	41.36	N	
8	0.15000	32.90	19.30	0.00	13.05	45.95	32.35	66.00	56.00	20.05	23.65	L	
9	0.18552	30.90	16.20	0.00	13.06	43.96	29.26	64.23	54.23	20.27	24.97	L	
10	0.47024	20.20	9.20	0.00	13.12	33.32	22.32	56.51	46.51	23.19	24.19	L	
11	3.50000	9.80	-4.80	0.00	13.50	23.30	8.70	56.00	46.00	32.70	37.30	L	
12	3.87220	11.00	-6.20	0.00	13.53	24.53	7.33	56.00	46.00	31.47	38.67	L	
13	17.23248	0.80	-5.90	0.00	14.24	15.04	8.34	60.00	50.00	44.96	41.66	L	

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + LISN + LOSS (CABLE + ATT)  
Except for the above table: adequate margin data below the limits.

## Radiated Emission

Test place Ise EMC Lab.  
Semi Anechoic Chamber No.3  
Date September 11, 2024  
Temperature / Humidity 22 deg. C / 66 % RH  
Engineer Daiki Matsui  
Mode Mode 1

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



No.	Freq. [MHz]	Reading (QP)			Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola	Height [cm]	Angle [deg]	Ant. Type	Comment
		Reading [dBuV]	Ant.Fac [dB/m]	Loss [dB]											
1	68,807	29,60	6,49	7,50	32,18	11,41	40,00	28,59	Hori.	242	10	BA			
2	81,762	25,10	7,01	7,68	32,17	7,62	40,00	32,38	Hori.	100	233	BA			
3	132,426	28,20	13,76	8,22	32,12	18,06	43,52	25,46	Hori.	242	277	BA			
4	156,441	30,70	15,20	8,47	32,09	22,28	43,52	21,24	Hori.	237	298	BA			
5	241,671	22,00	11,66	9,19	32,03	10,82	46,02	35,20	Hori.	198	356	LA22			
6	536,886	21,85	17,79	11,11	32,05	18,70	46,02	27,32	Hori.	217	211	LA22			
7	68,807	27,40	6,49	7,50	32,18	9,21	40,00	30,79	Vert.	100	245	BA			
8	71,190	32,20	6,37	7,54	32,18	13,93	40,00	26,07	Vert.	100	174	BA			
9	82,254	38,20	7,07	7,68	32,17	20,78	40,00	19,22	Vert.	100	193	BA			
10	96,253	37,40	9,65	7,85	32,15	22,75	43,52	20,77	Vert.	100	250	BA			
11	156,441	34,60	15,20	8,47	32,09	26,18	43,52	17,34	Vert.	100	19	BA			
12	241,671	25,40	11,66	9,19	32,03	14,22	46,02	31,80	Vert.	100	354	LA22			

### CHART: WITH FACTOR

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

## **APPENDIX 2: Test instruments**

### **Test equipment**

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
CE	141216	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W/SFM14/sucoform141-PE/421-010/RFM-E321(SW)	-/00640	07/06/2024	12
CE	141290	Attenuator (13dB)	JFW Industries, Inc.	50FP-013H2 N	-	12/07/2023	12
CE	141357	LISN (AMN)	Schwarzbeck Mess-Elektronik OHG	NSLK8127	8127-729	07/09/2024	12
CE	141532	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	051201197	01/31/2024	12
CE	141949	Test Receiver	Rohde & Schwarz	ESCI	100767	06/05/2024	12
CE	142183	Measure	KOMELON	KMC-36	-	10/20/2023	12
CE	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
CE	244709	Thermo-Hygrometer	HIOKI E.E. CORPORATION	LR5001	231202103	01/25/2024	12
RE	141266	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-191	08/23/2024	12
RE	141323	Coaxial cable	UL Japan	-	-	09/10/2023	12
RE	141424	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103+BBA9106	1915	03/15/2024	12
RE	141532	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	051201197	01/31/2024	12
RE	141582	Pre Amplifier	SONOMA INSTRUMENT	310	260834	02/17/2024	12
RE	141949	Test Receiver	Rohde & Schwarz	ESCI	100767	06/05/2024	12
RE	142008	AC3_Semi Anechoic Chamber (NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	12/11/2023	24
RE	142183	Measure	KOMELON	KMC-36	-	10/20/2023	12
RE	142314	Attenuator	Pasternack Enterprises	PE7390-6	D/C 1504	06/06/2024	12
RE	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	244709	Thermo-Hygrometer	HIOKI E.E. CORPORATION	LR5001	231202103	01/25/2024	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:**

**CE: Conducted emission**

**RE: Radiated emission**